

KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
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004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

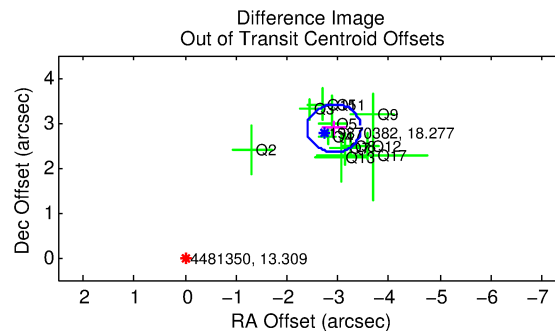
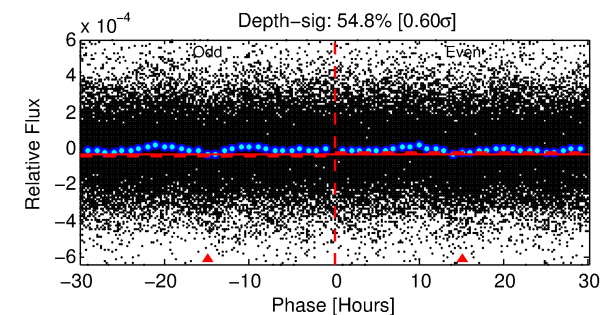
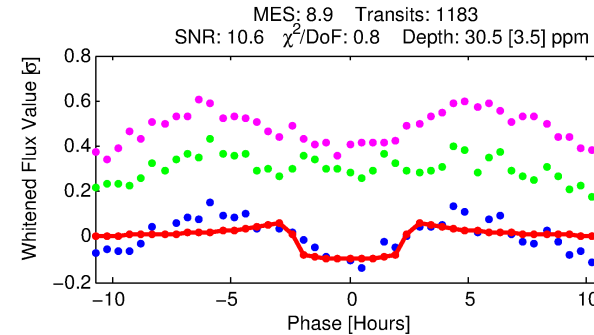
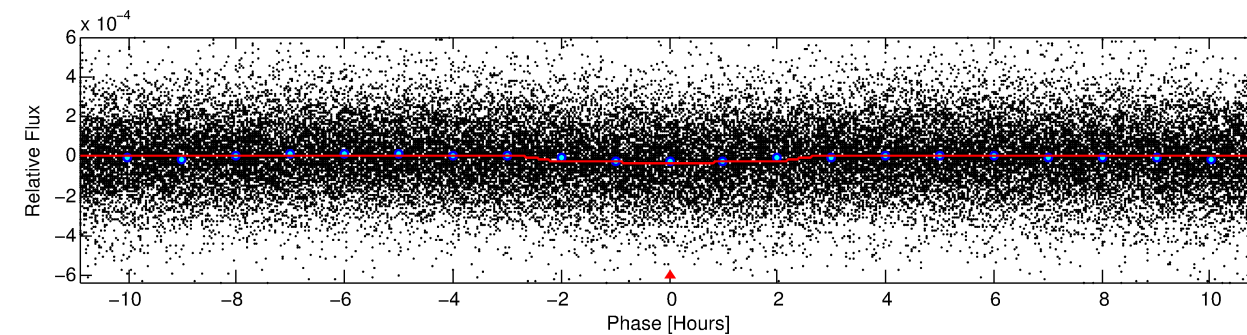
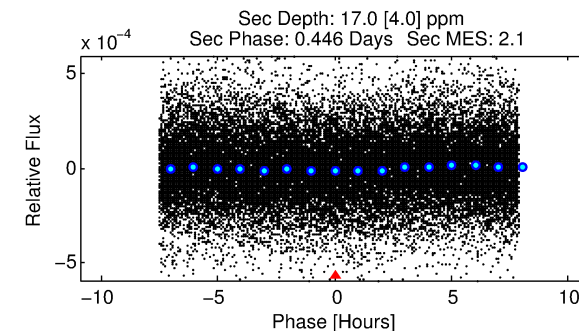
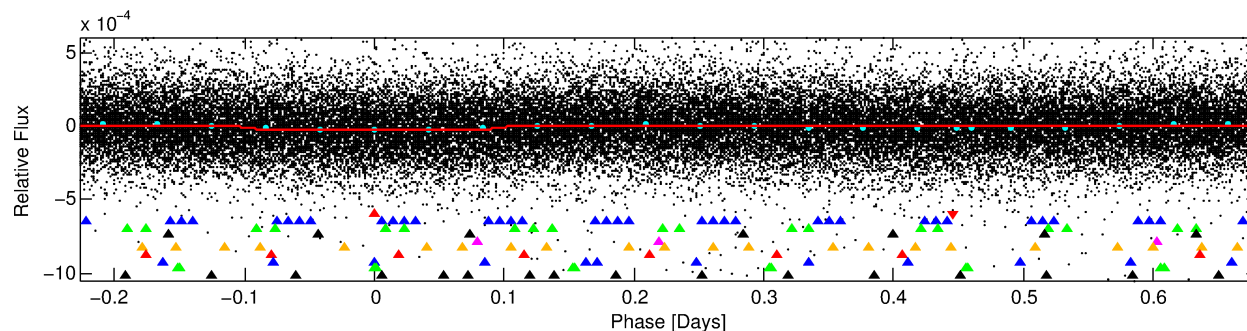
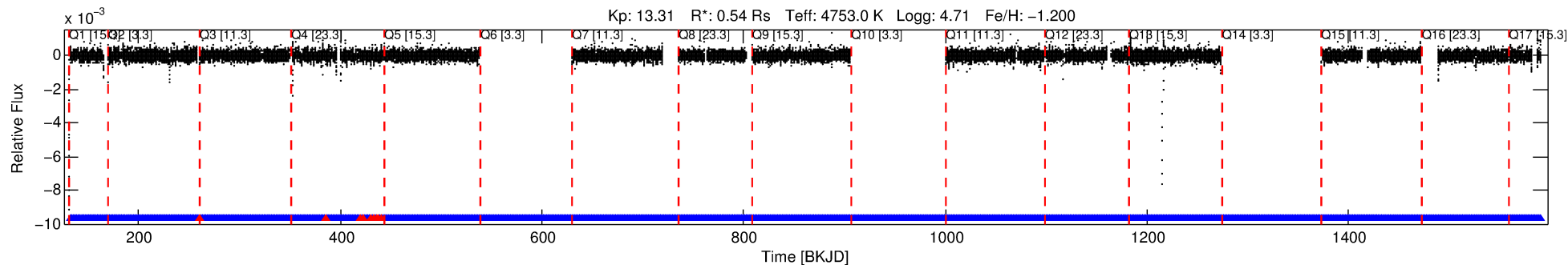
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-01

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 1 of 10 Period: 0.908 d



DV Fit Results:

Period = 0.90848 [0.00001] d
Epoch = 132.2836 [0.0033] BKJD
Rp/R* = 0.0060 [0.0027]
a/R* = 1.14 [0.51]
b = 0.88 [0.48]
Seff = 592.76 [83.39]
Teq = 1258 [44] K
Rp = 0.35 [0.16] Re
a = 0.0151 [0.0008] AU
Ag = 16.95 [15.60] [1.02σ]
Teffp = 3947 [912] K [2.94σ]

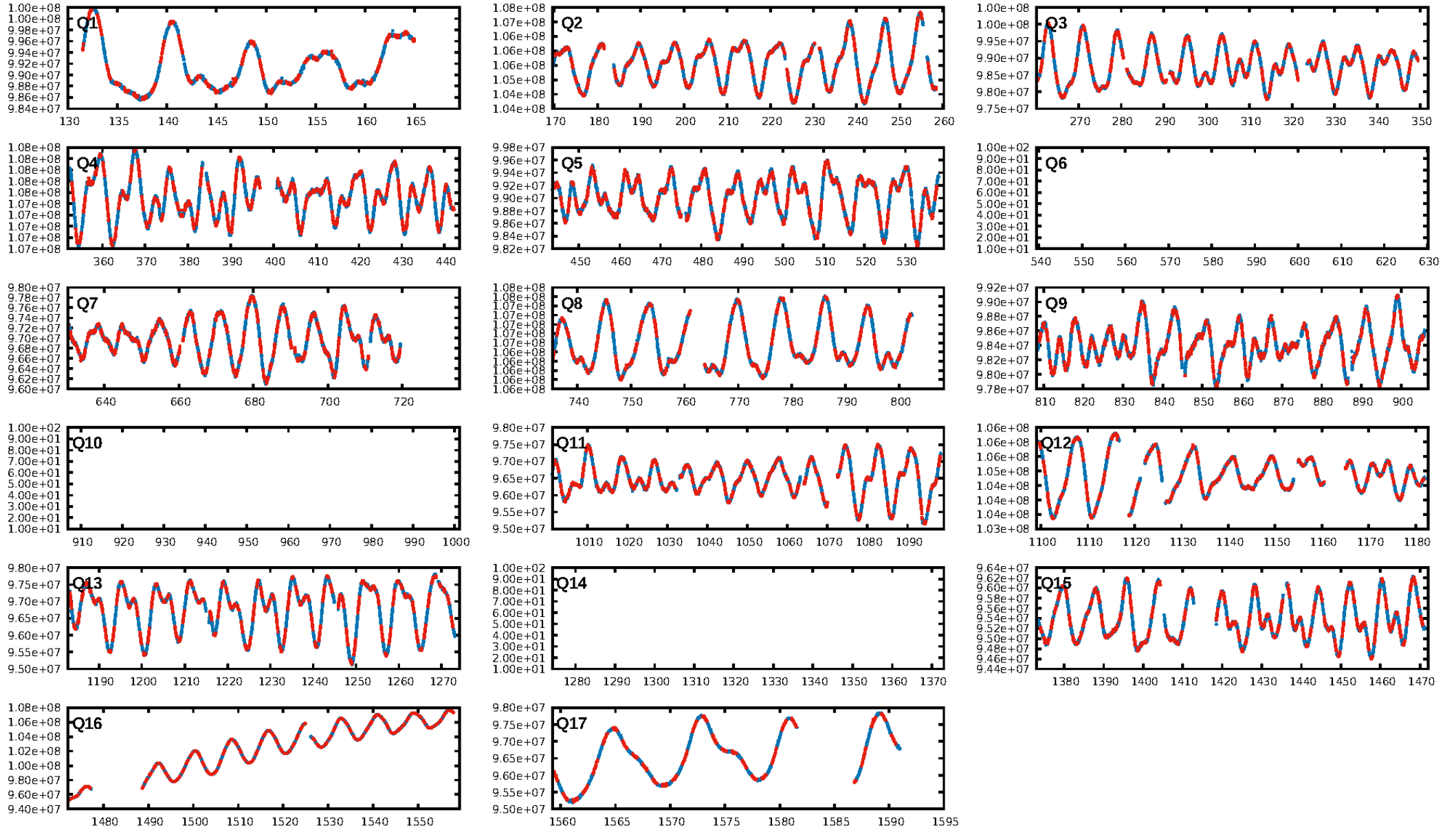
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [95.91σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1106/1116]
GhostDiagnostic-chr: 0.5464
Centroid-sig: N/A
Centroid-so: 4.391 arcsec [5.16σ]
OotOffset-rm: 4.103 arcsec [23.11σ]
KicOffset-rm: 4.036 arcsec [24.31σ]
OotOffset-st: 1/4/3/4 [12]
KicOffset-st: 1/4/3/4 [12]
DiffImageQuality-fgm: 0.83 [10/12]
DiffImageOverlap-fno: 1.00 [14/14]

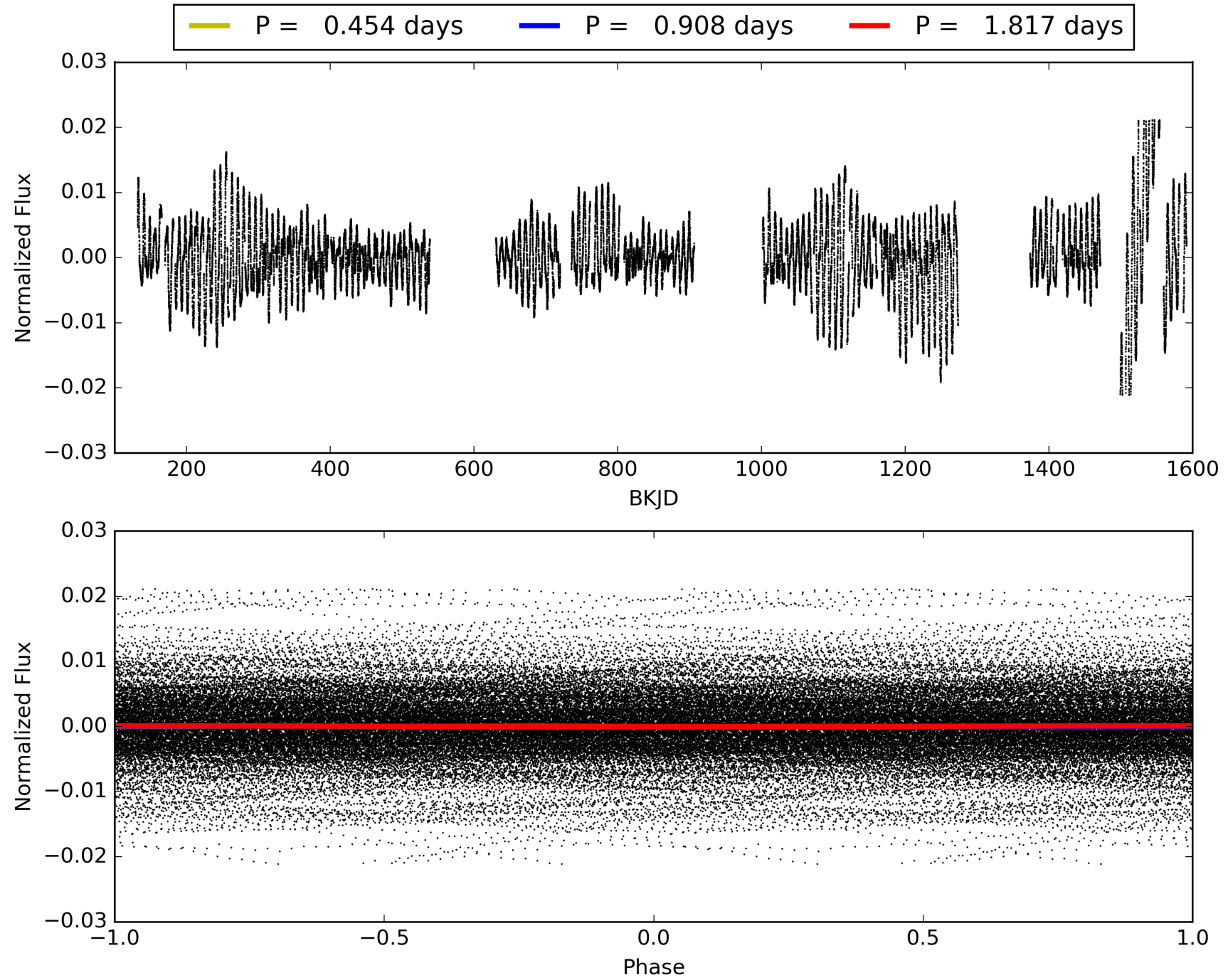
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:20 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-01, PDC Light Curves

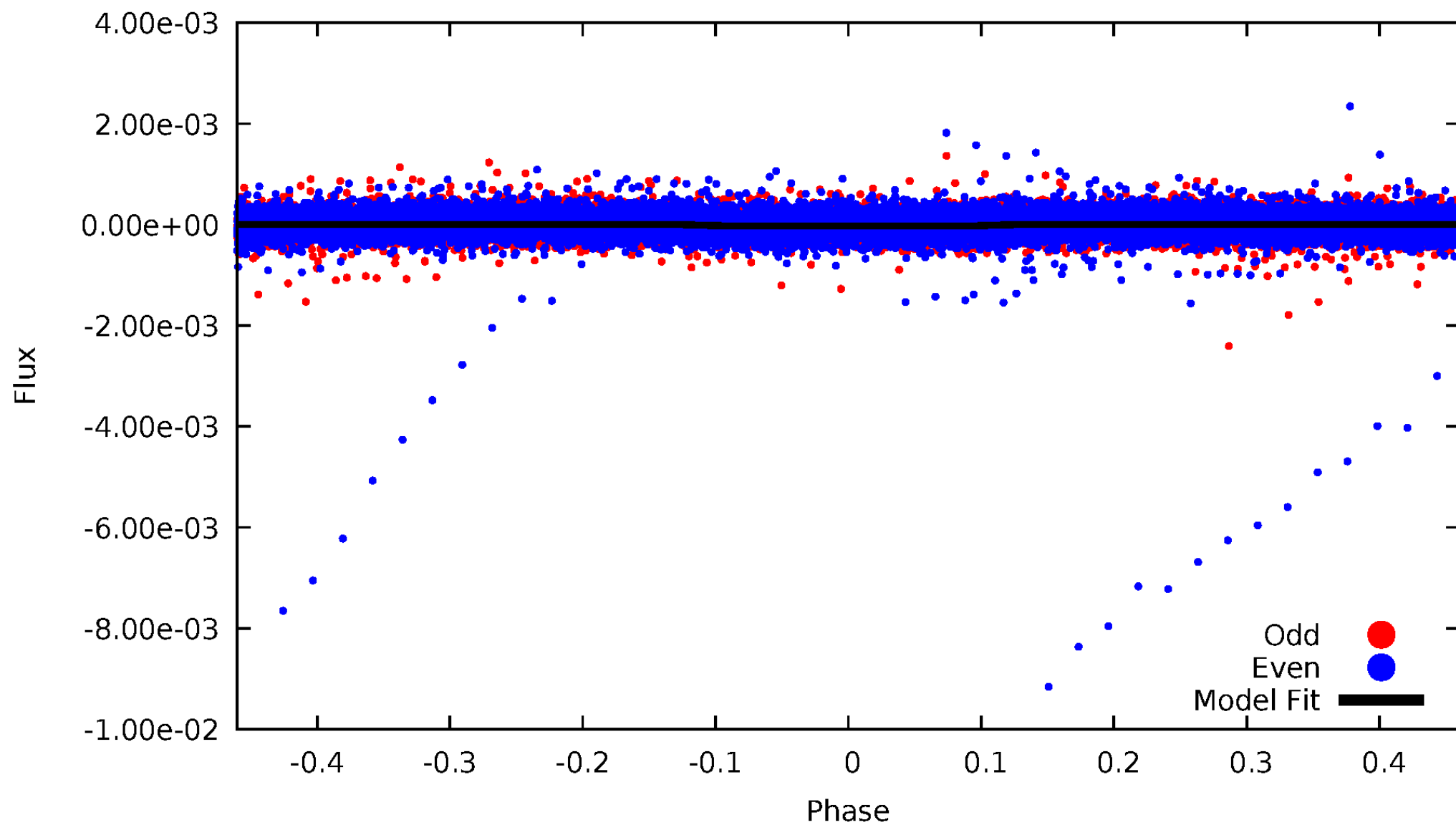


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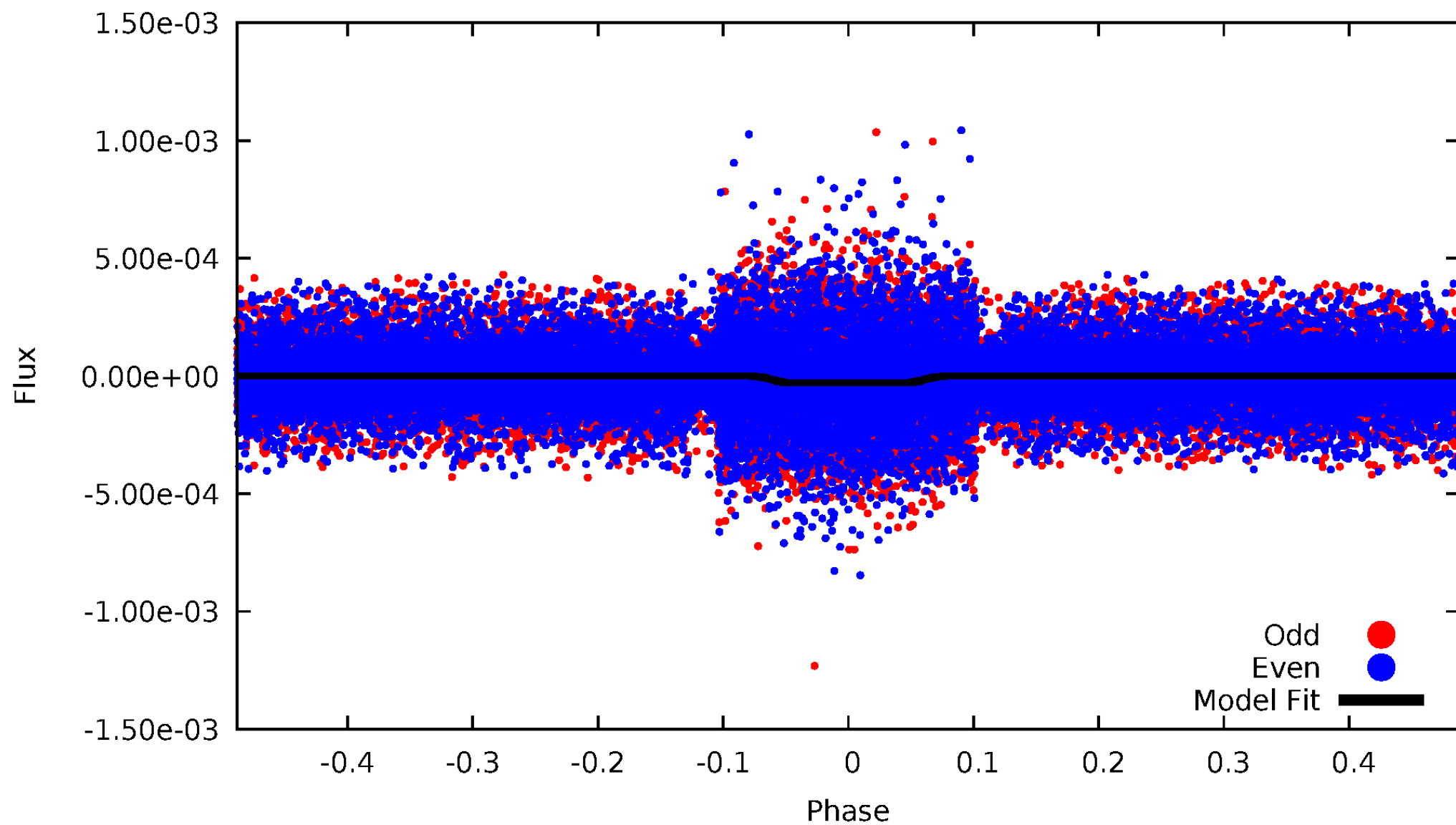
DV Odd/Even

TCE 004481350-01



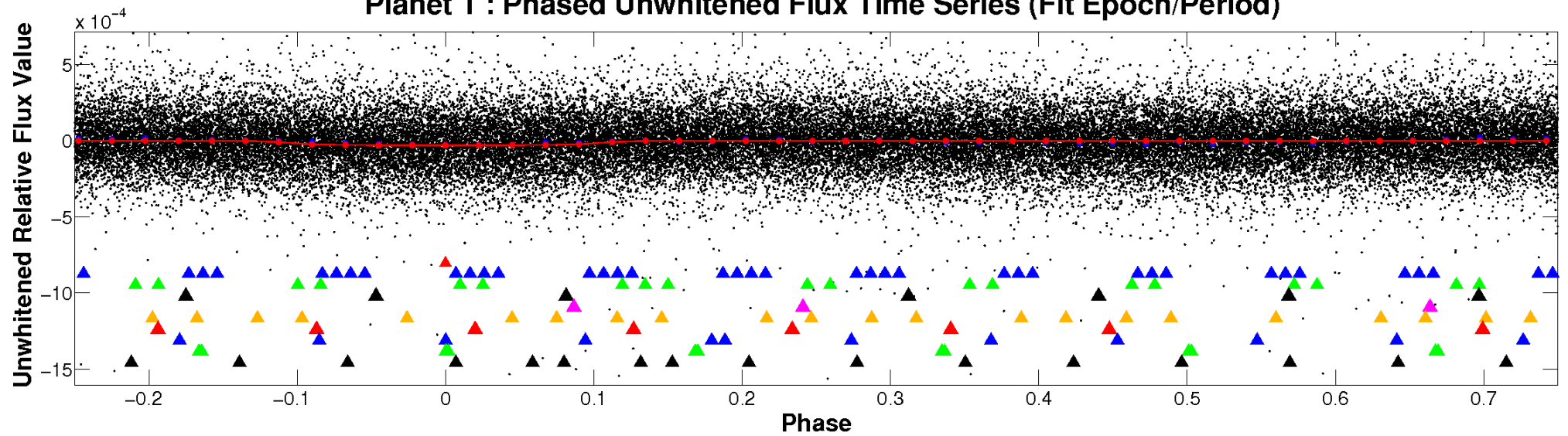
ALT Odd/Even

TCE 004481350-01

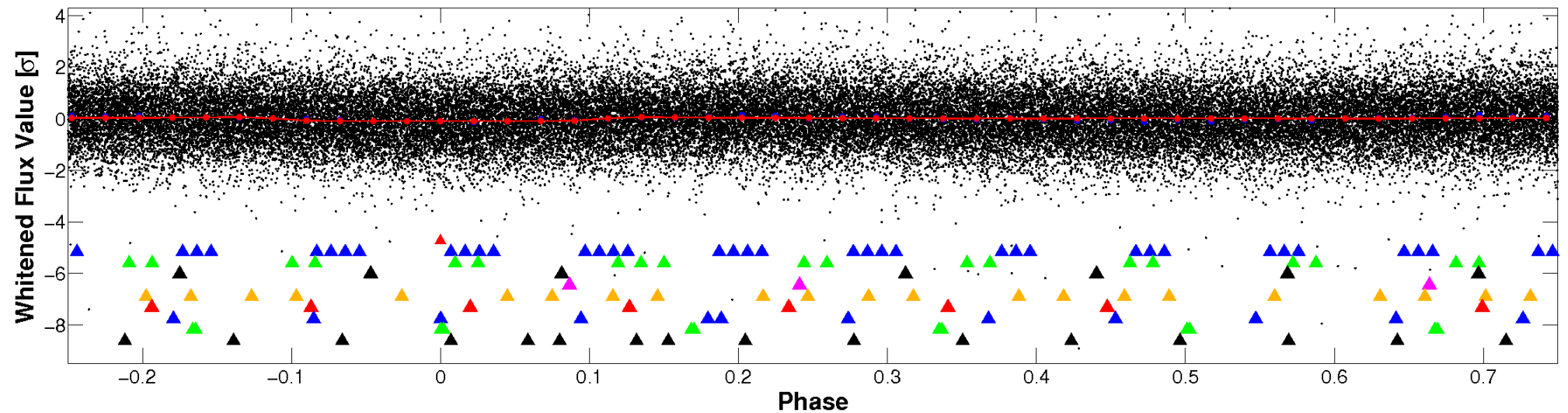


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

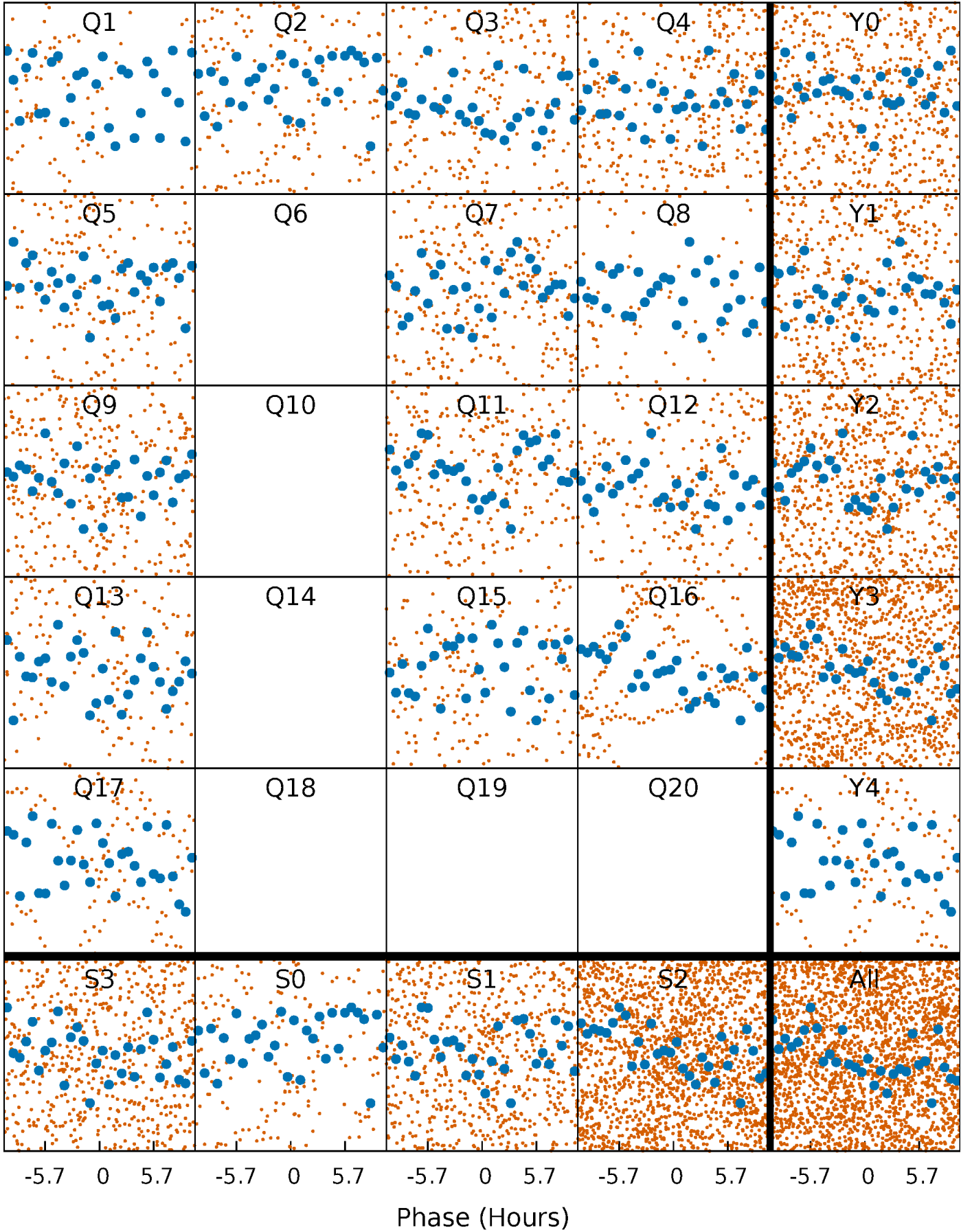


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



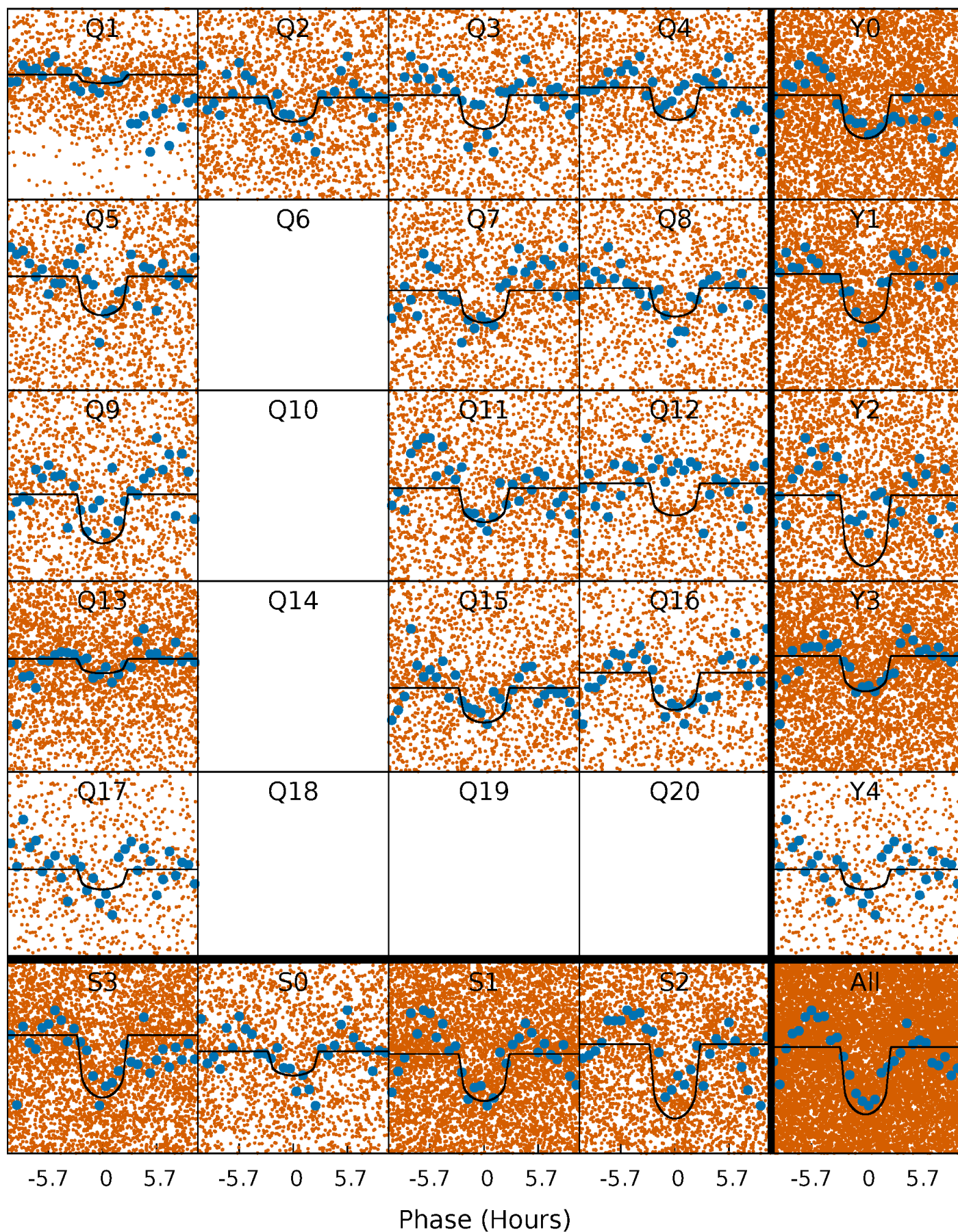
PDC Quarter-Phased Transit Curves

TCE 004481350-01 P= 0.908483 Days $T_0=132.283635$ (BKJD)



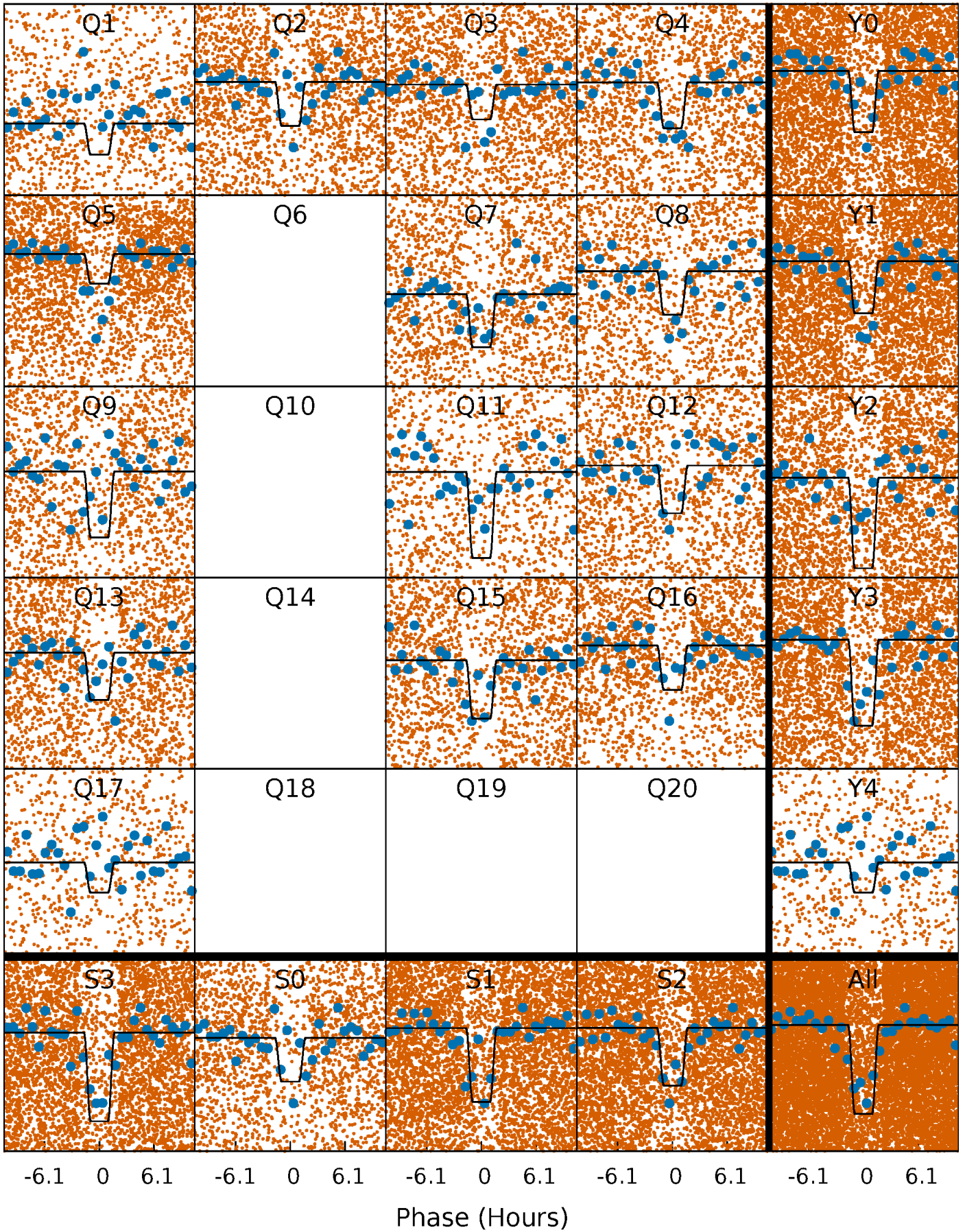
DV Quarter-Phased Transit Curves

TCE 004481350-01 P= 0.908483 Days $T_0=132.283635$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

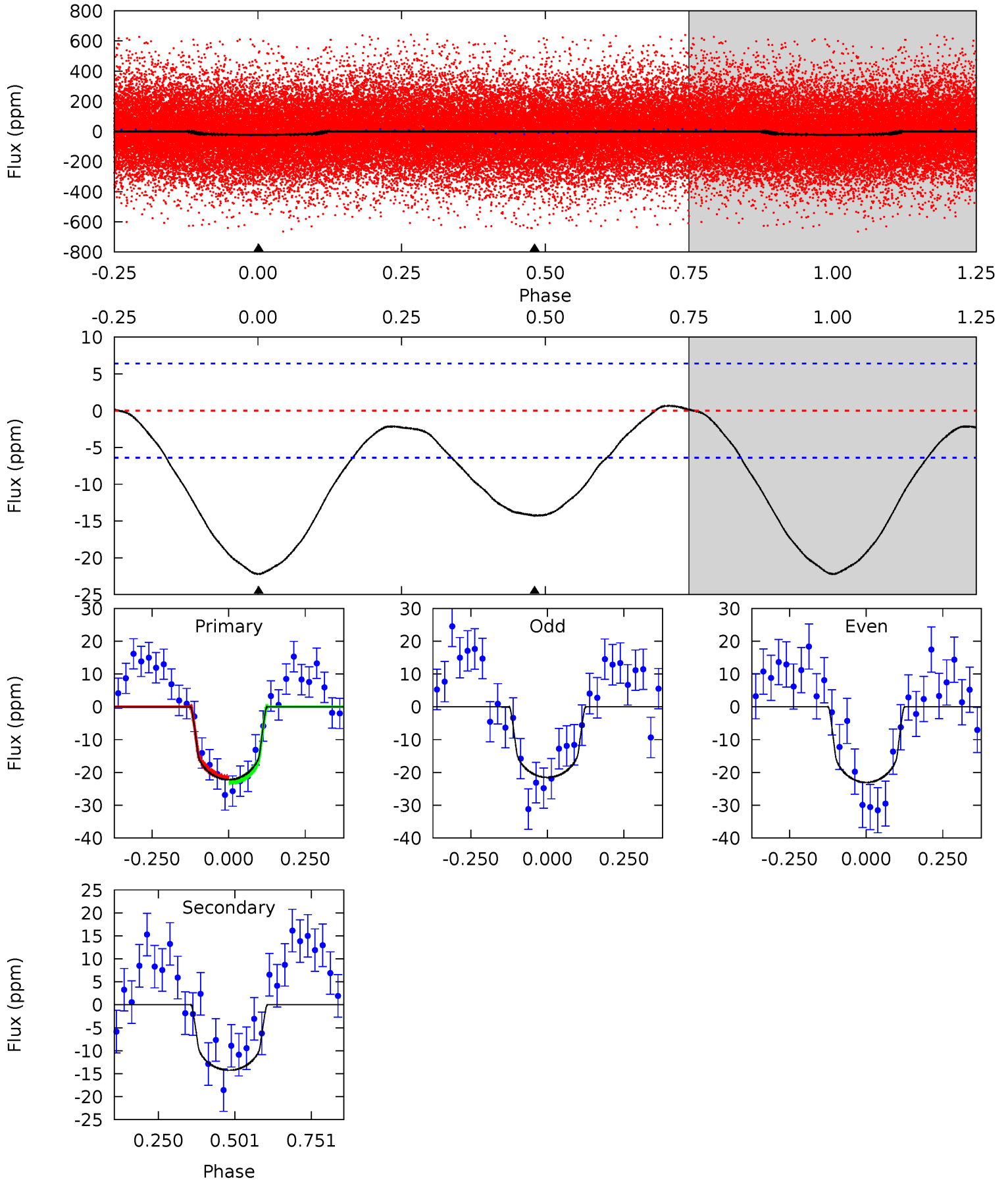
TCE 004481350-01 P= 0.908466 Days $T_0=132.290152$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-01, $P = 0.908483$ Days, $E = 131.375152$ Days

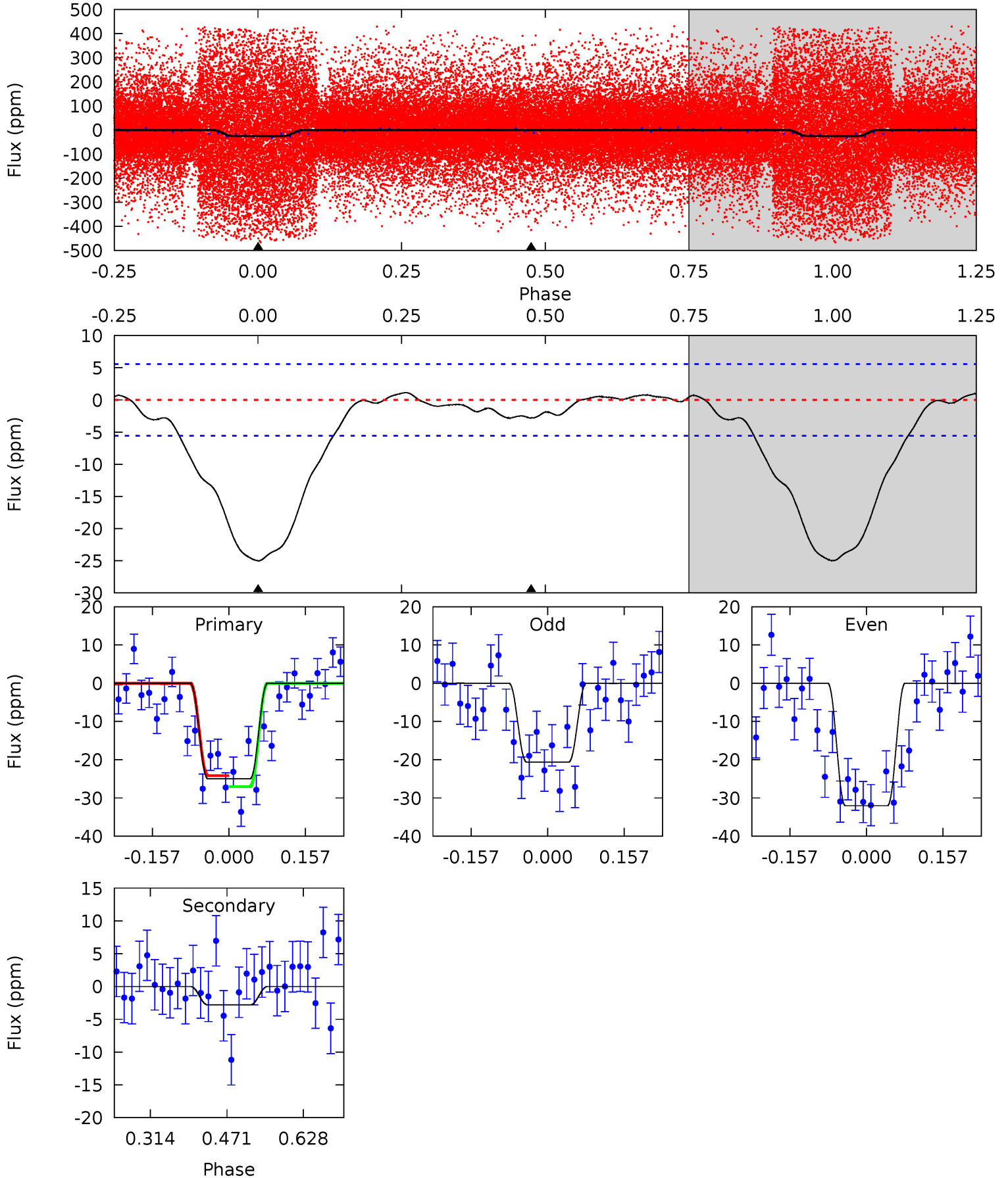
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	9.73	0	0	4.37	1.15	0.81	15.2	15.2	9.73	9.73	0.52	1.06	0.03	0.48



Alt Model-Shift Uniqueness Test

004481350-01, P = 0.908466 Days, E = 131.381686 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.0	2.26	0	0	4.47	1.42	0.90	20.0	20.0	2.26	2.26	4.57	0.94	0.04	1.14



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-14 ± 1	$0.36^{+0.16}_{-0.15}$	1751^{+56}_{-53}	3939^{+945}_{-450}	14^{+27}_{-7}
Alt.	-3 ± 1	$0.33^{+0.15}_{-0.15}$	1756^{+54}_{-58}	3104^{+772}_{-441}	$3.145^{+9.158}_{-1.895}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

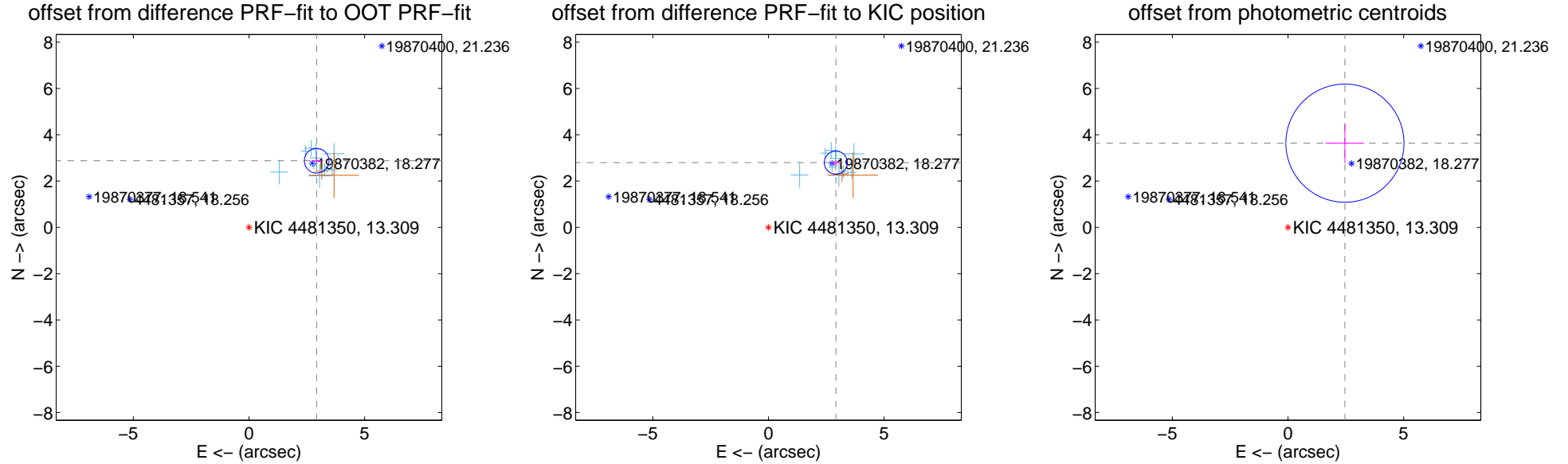
DV Centroid Data

Supplemental centroid analysis for 004481350-01. Kepler magnitude: 13.31. Transit SNR 10.58

There are 10 quarters with good PRF difference image offsets

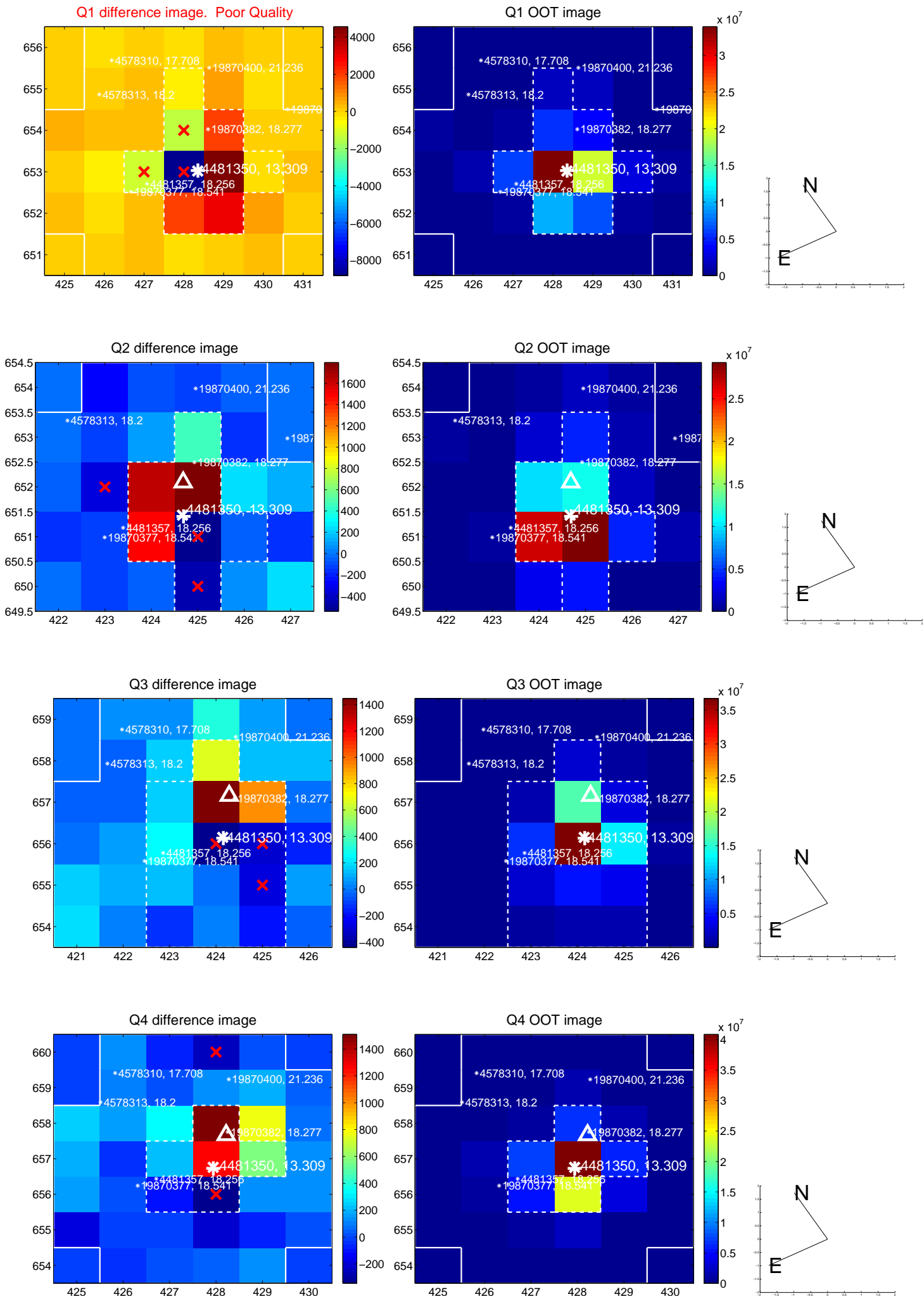
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.103 ± 0.178	23.11	-2.925 ± 0.218	2.878 ± 0.146
PRF-fit source offset from KIC position	4.036 ± 0.166	24.31	-2.910 ± 0.197	2.796 ± 0.125
photometric centroid source offset	4.39 ± 0.85	5.16	-2.46 ± 0.83	3.64 ± 0.86

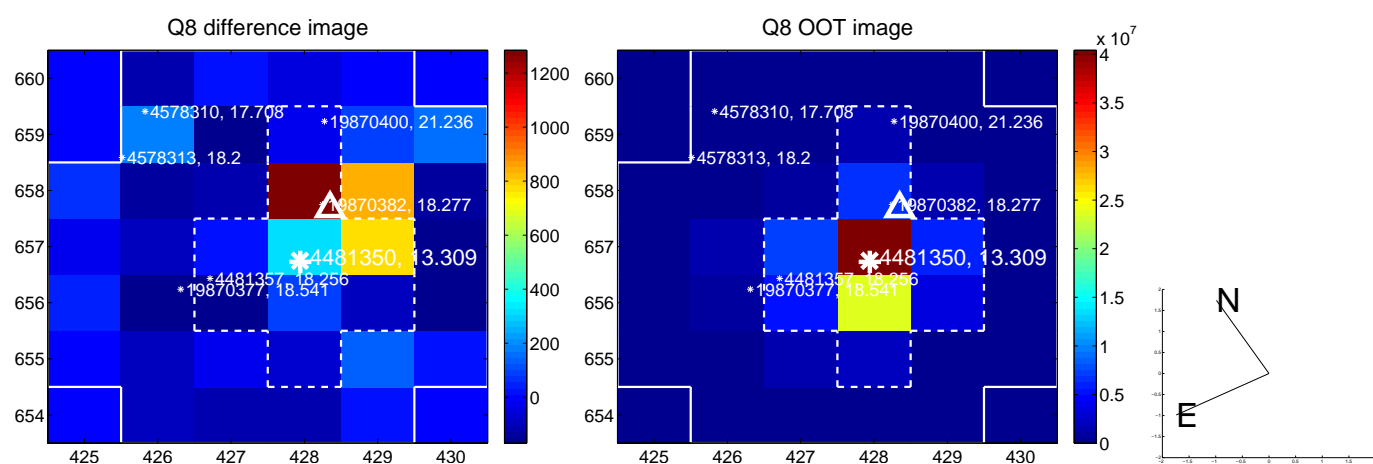
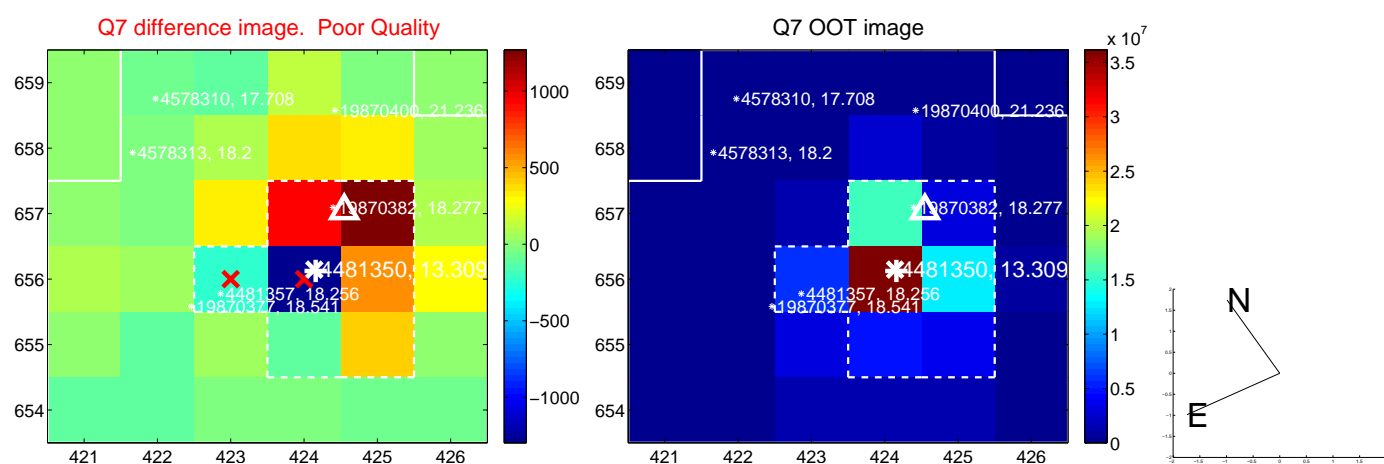
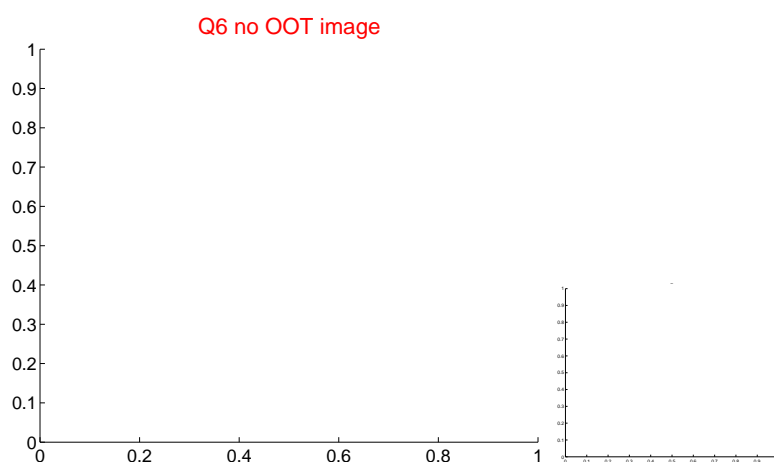
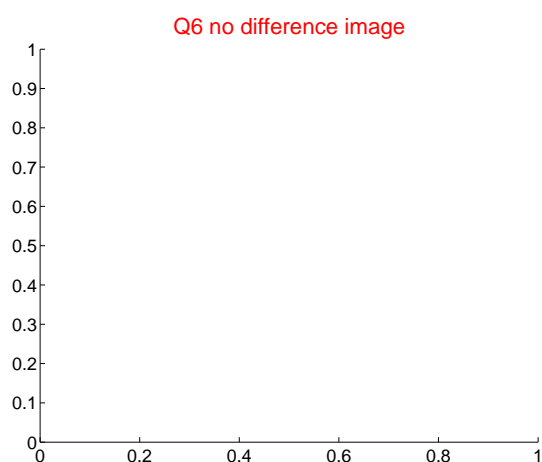
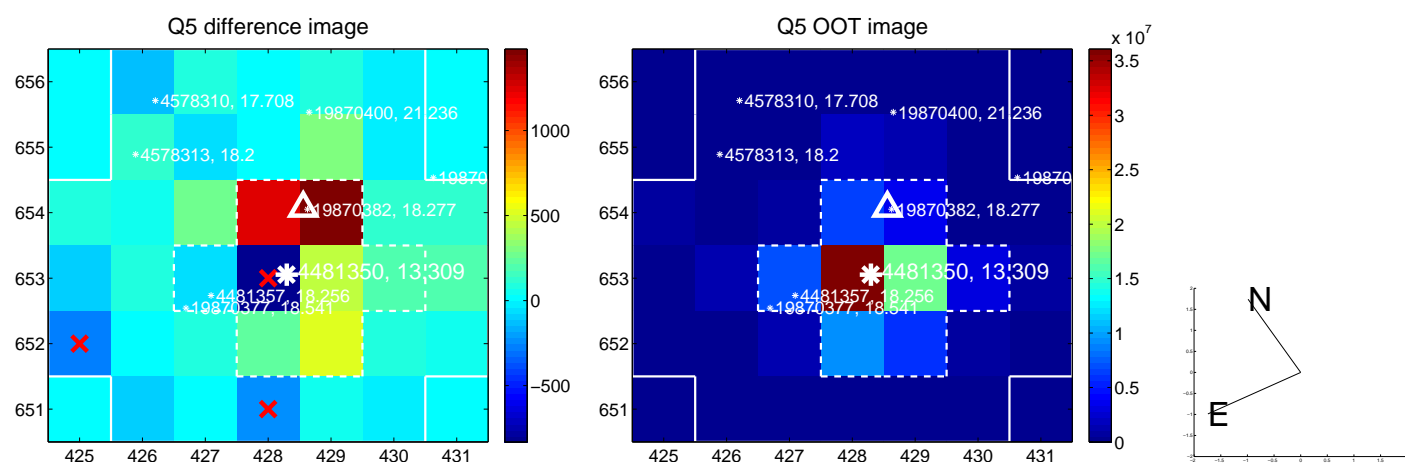


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

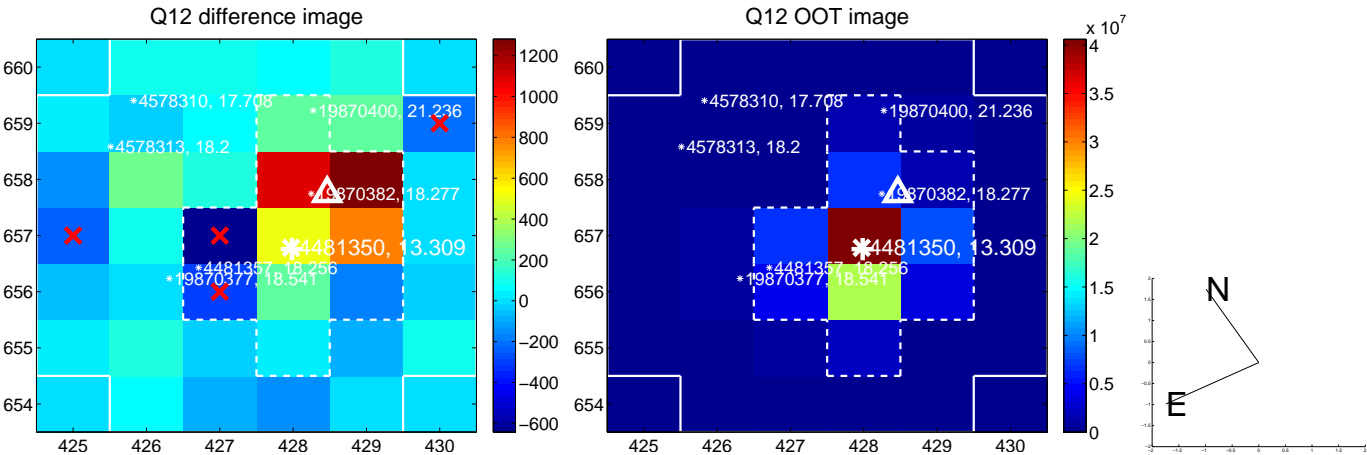
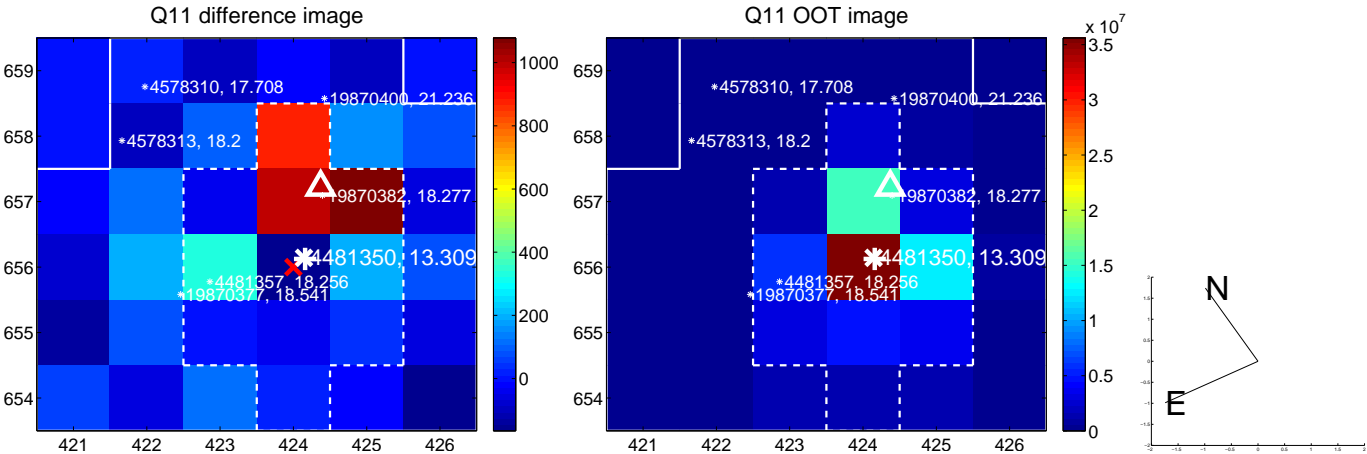
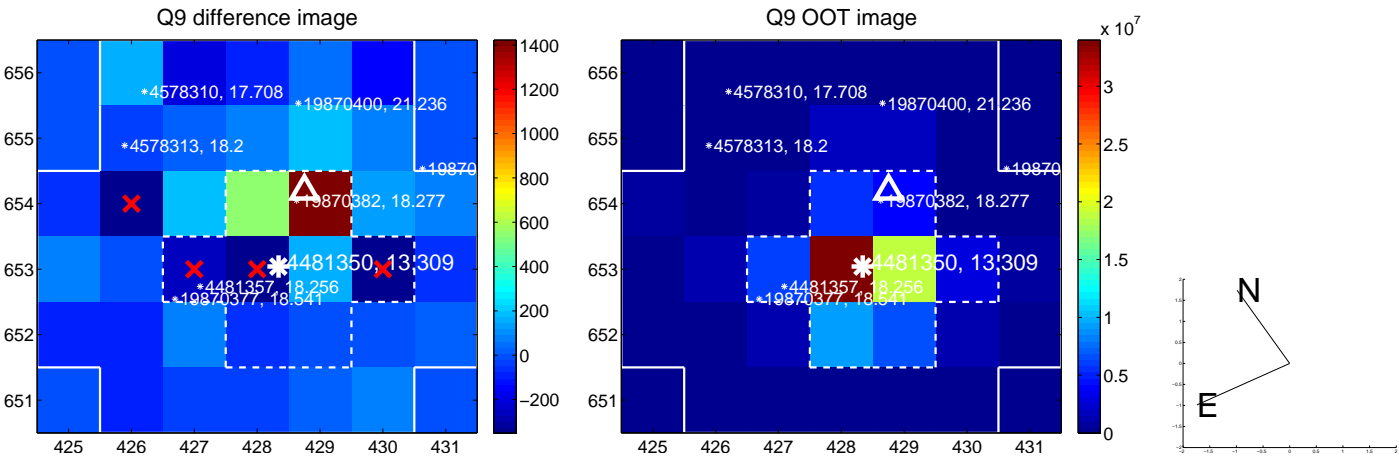
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



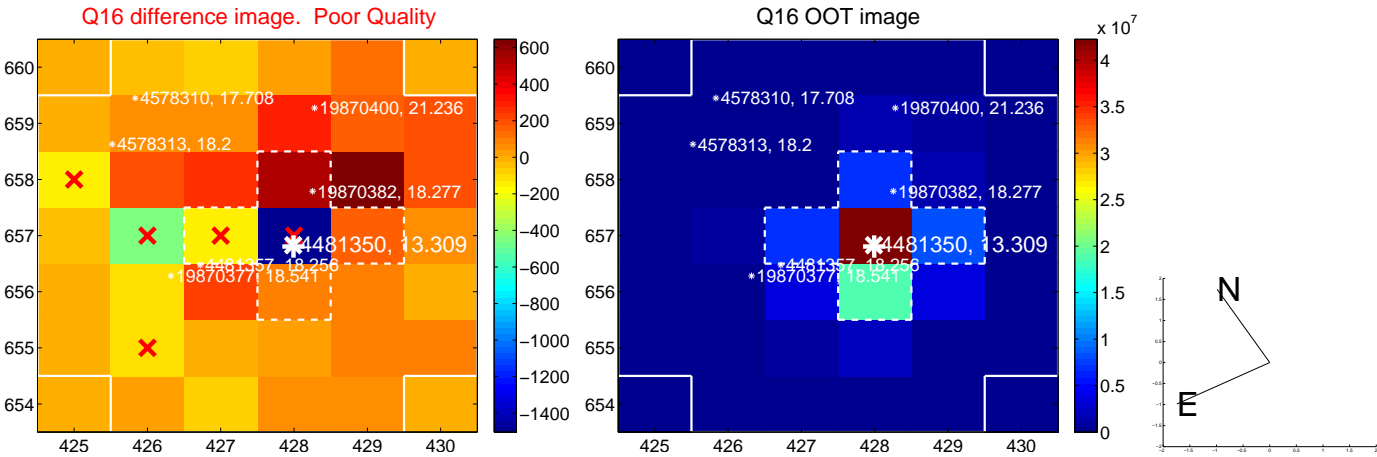
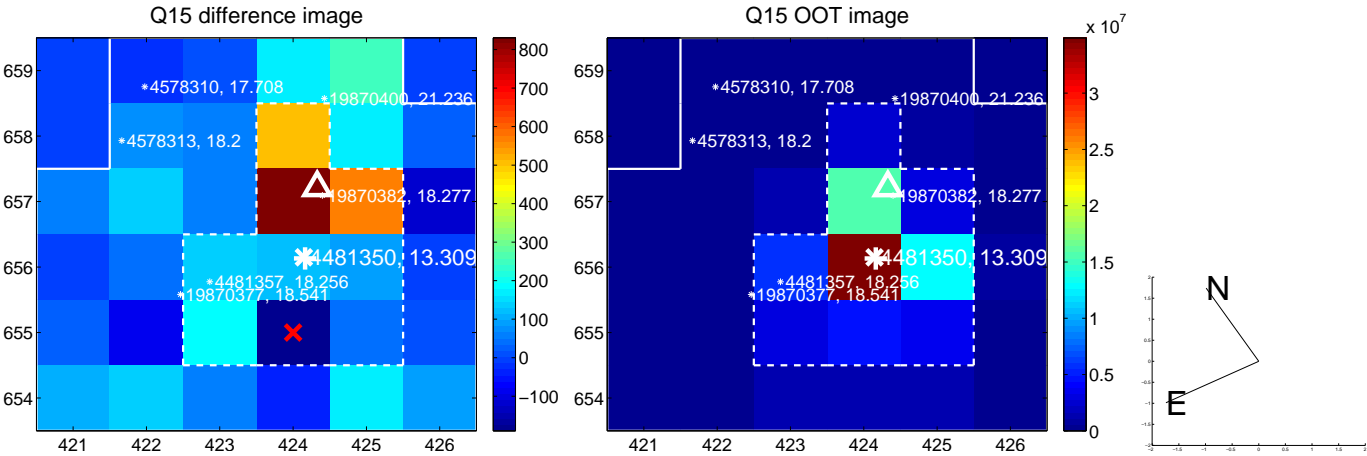
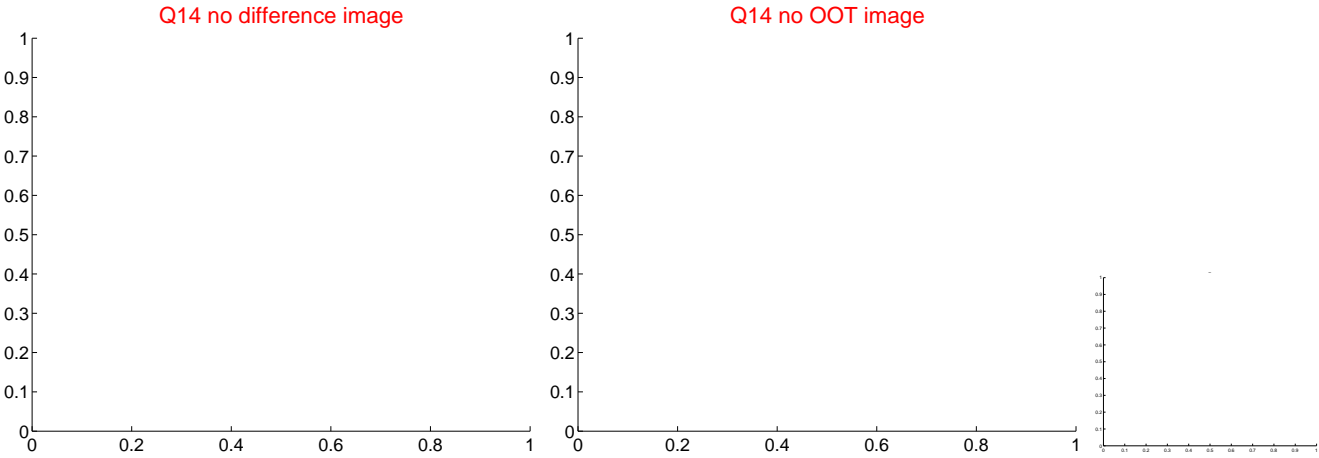
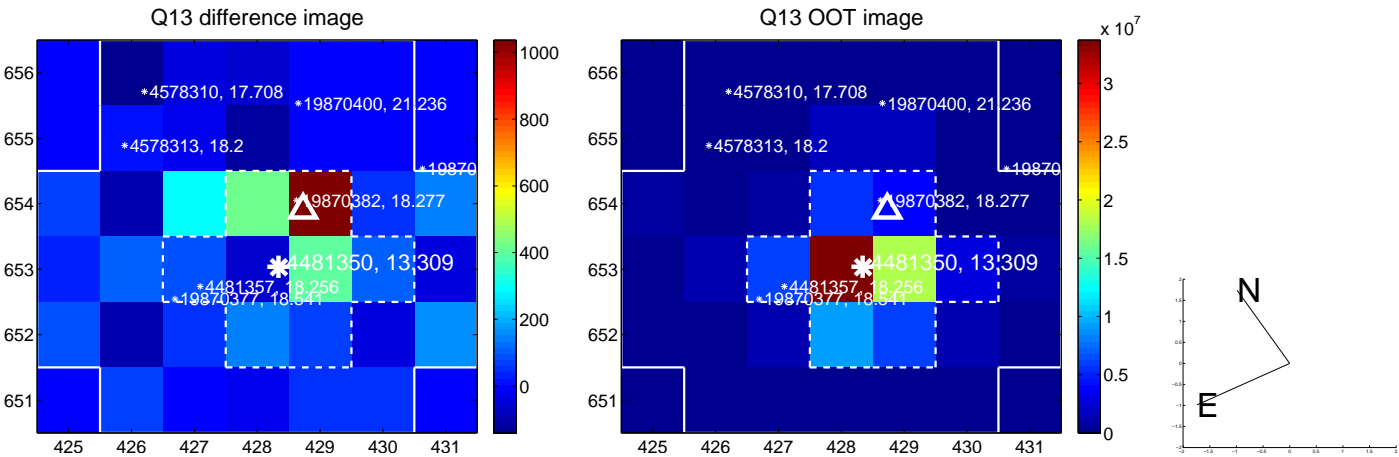
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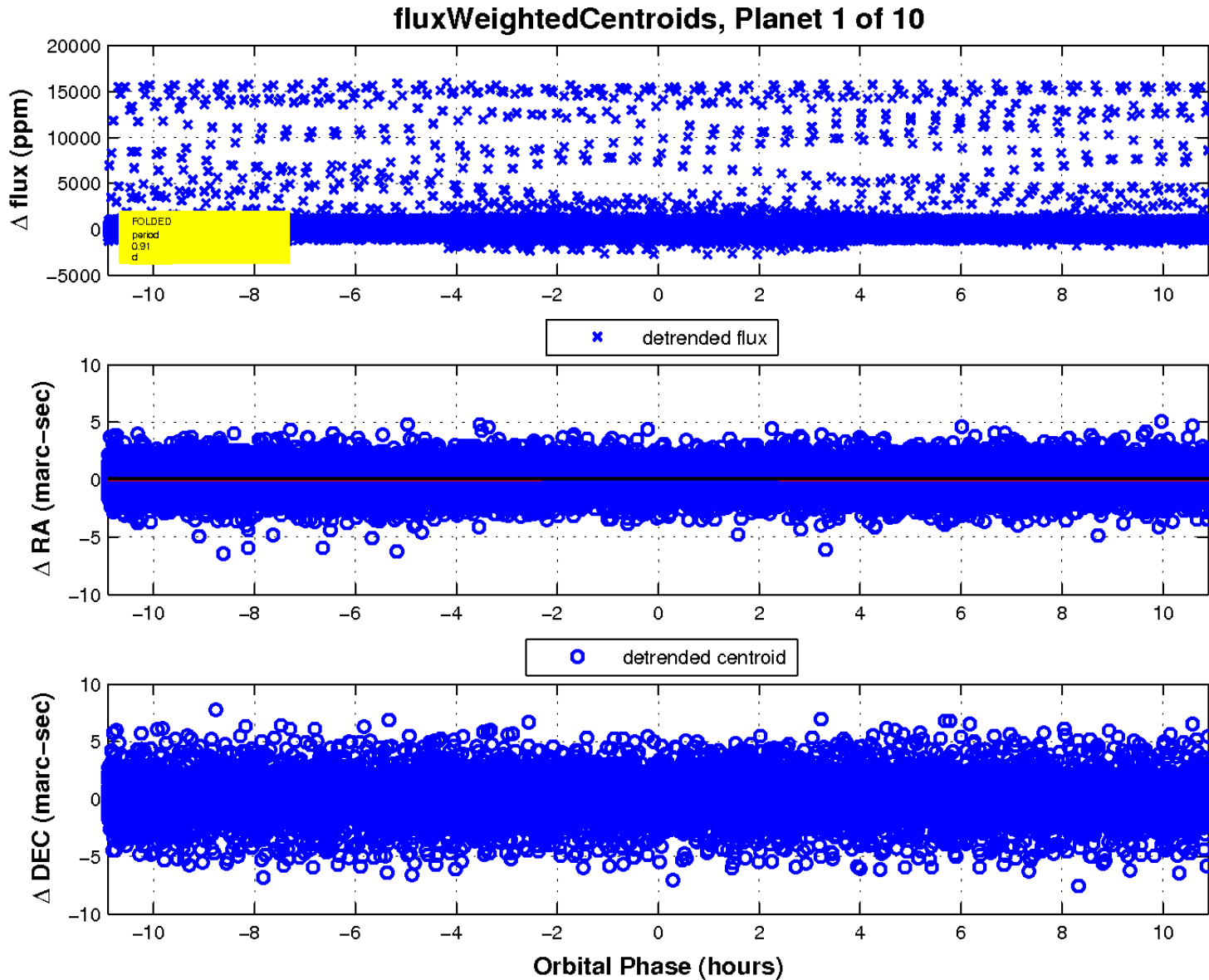
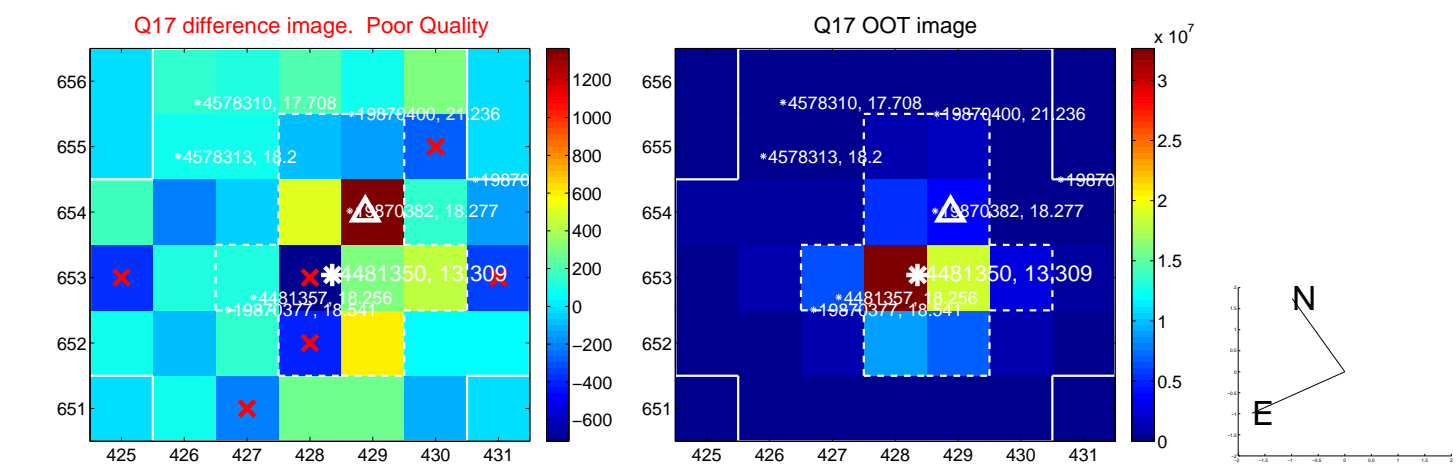
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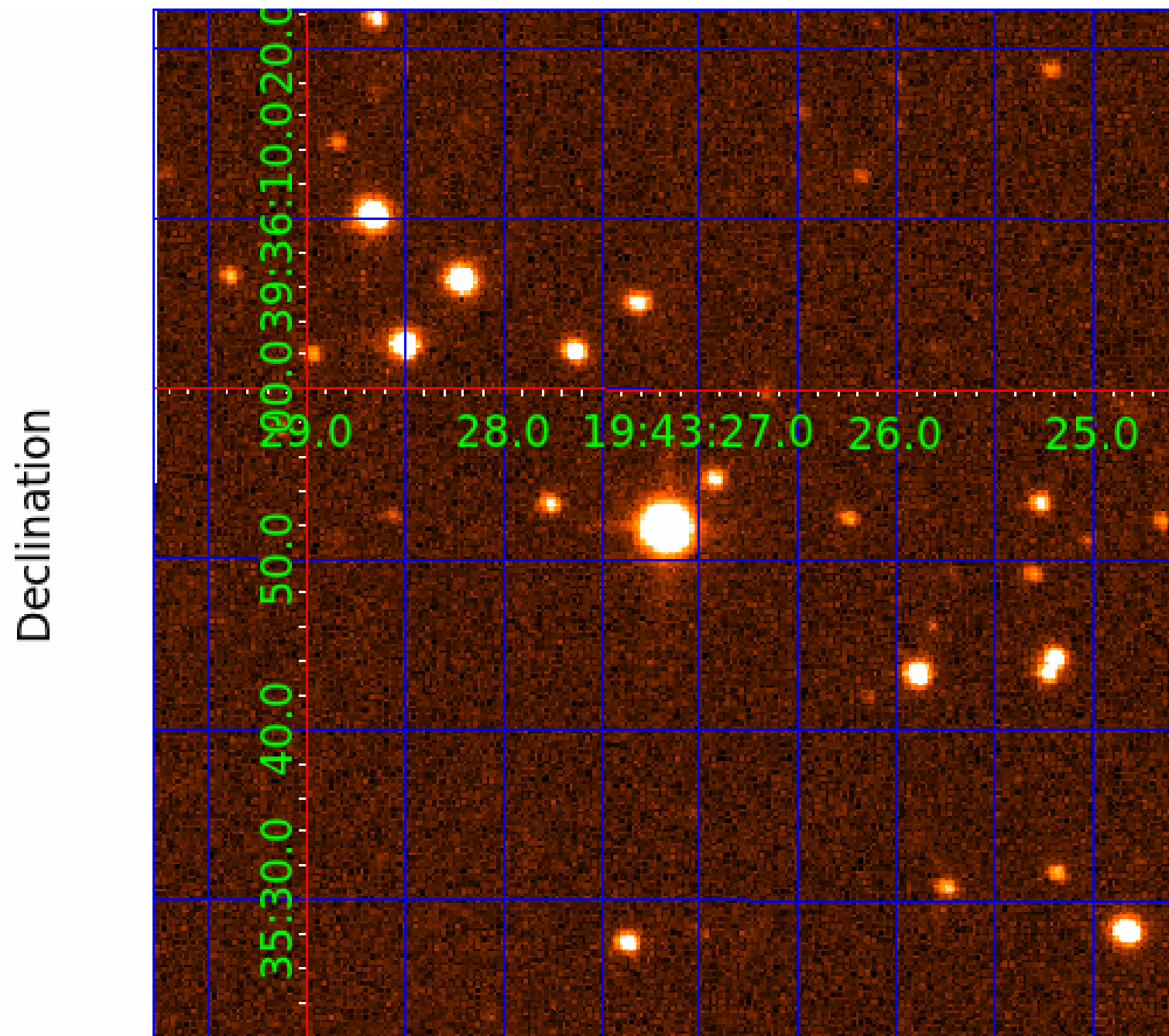
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UKIRT Image



KIC 004481350

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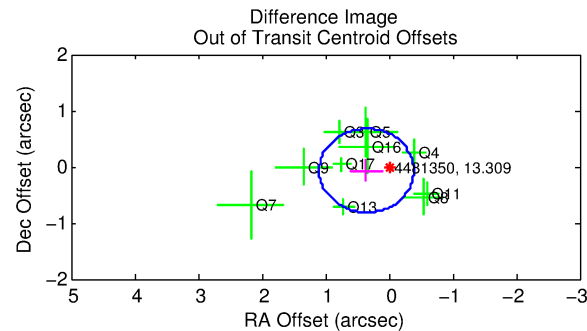
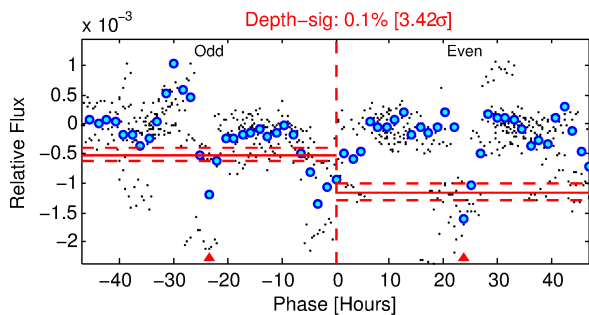
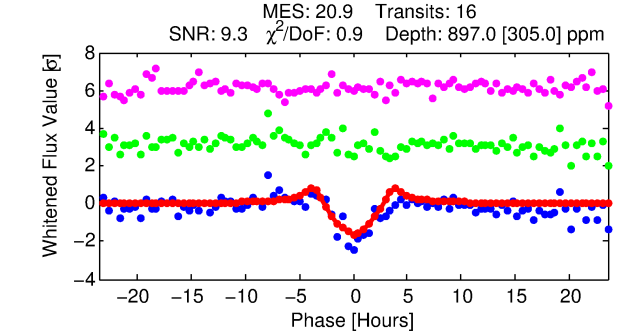
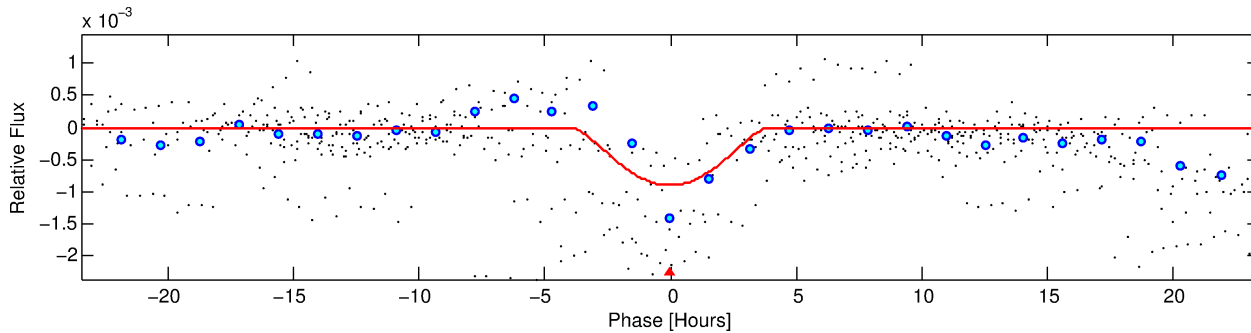
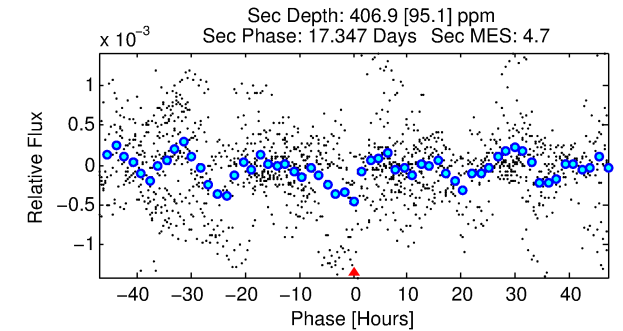
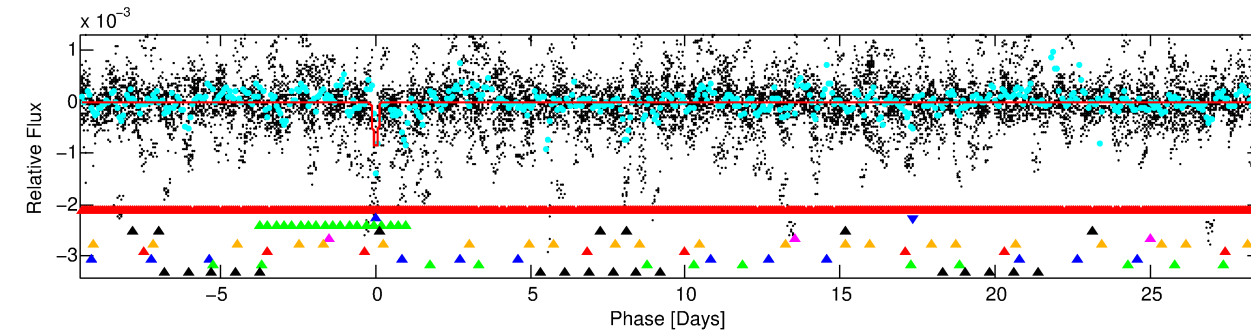
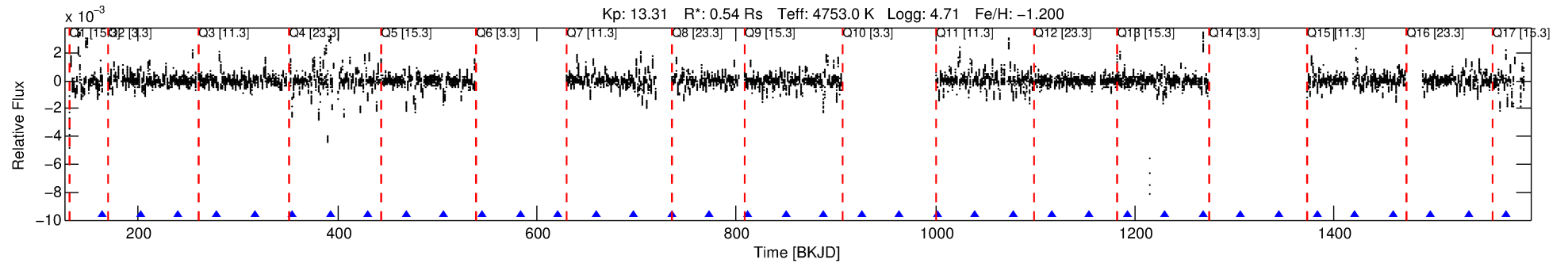
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-02

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 2 of 10 Period: 38.074 d



DV Fit Results:

Period = 38.07450 [0.00061] d
Epoch = 164.3323 [0.0126] BKJD
Rp/R* = 0.0551 [0.0953]
a/R* = 12.54 [4.87]
b = 1.00 [0.12]
Seff = 4.07 [0.57]
Teq = 362 [13] K
Rp = 3.26 [5.65] Re
a = 0.1820 [0.0094] AU
Ag = 695.45 [2412.66] [0.29 σ]
Teffp = 2876 [2495] K [1.01 σ]

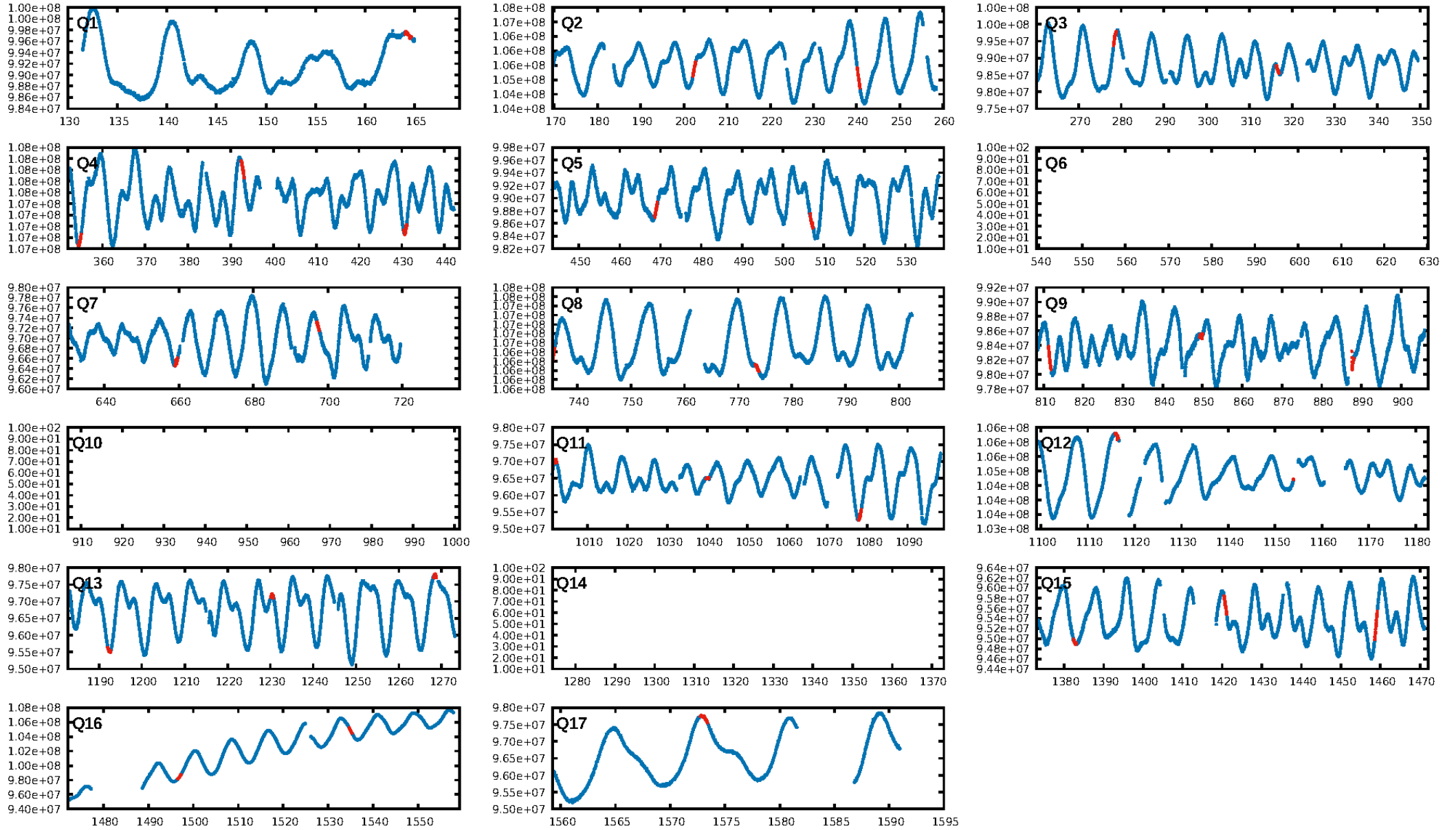
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [95.91 σ]
LongPeriod-sig: 100.0% [51.86 σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: 0.8847
Centroid-sig: N/A
Centroid-so: 0.122 arcsec [0.60 σ]
OotOffset-rm: 0.363 arcsec [1.46 σ]
KicOffset-rm: 0.382 arcsec [1.46 σ]
OotOffset-st: 0/3/3/4 [10]
KicOffset-st: 0/3/3/4 [10]
DiffImageQuality-fgm: 0.60 [6/10]
DiffImageOverlap-fno: 0.00 [0/13]

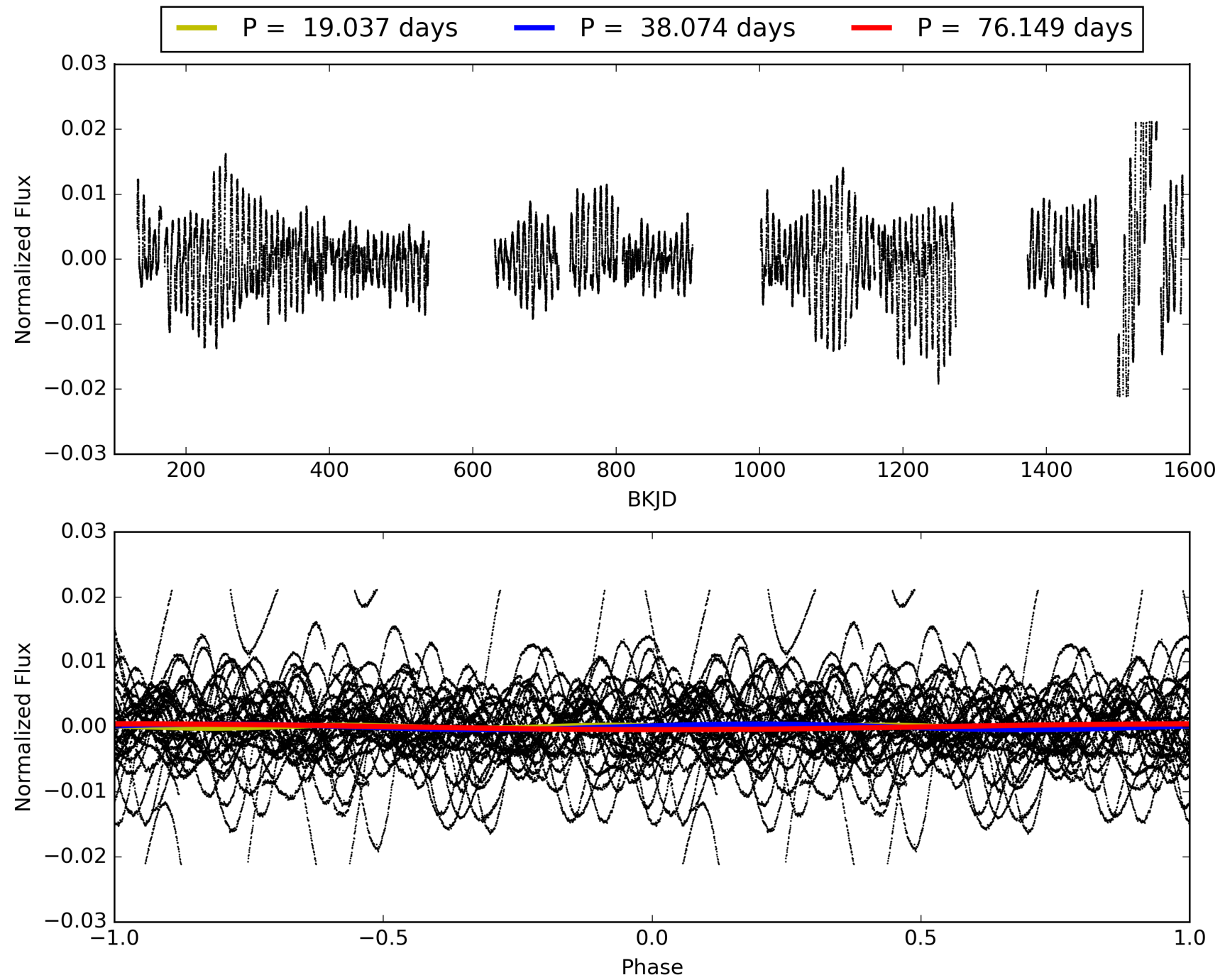
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:29 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-02, PDC Light Curves

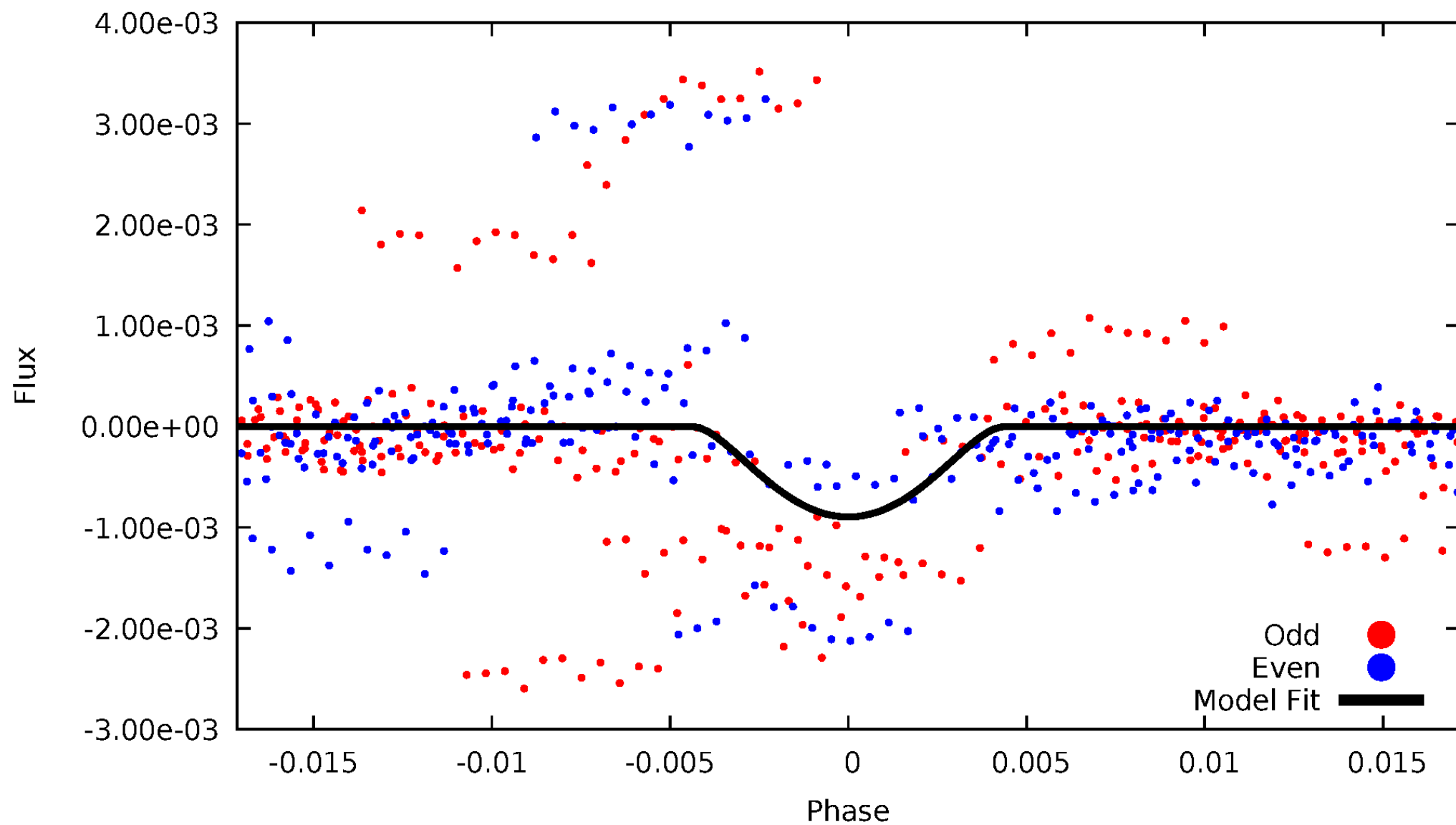


TCE 004481350-02



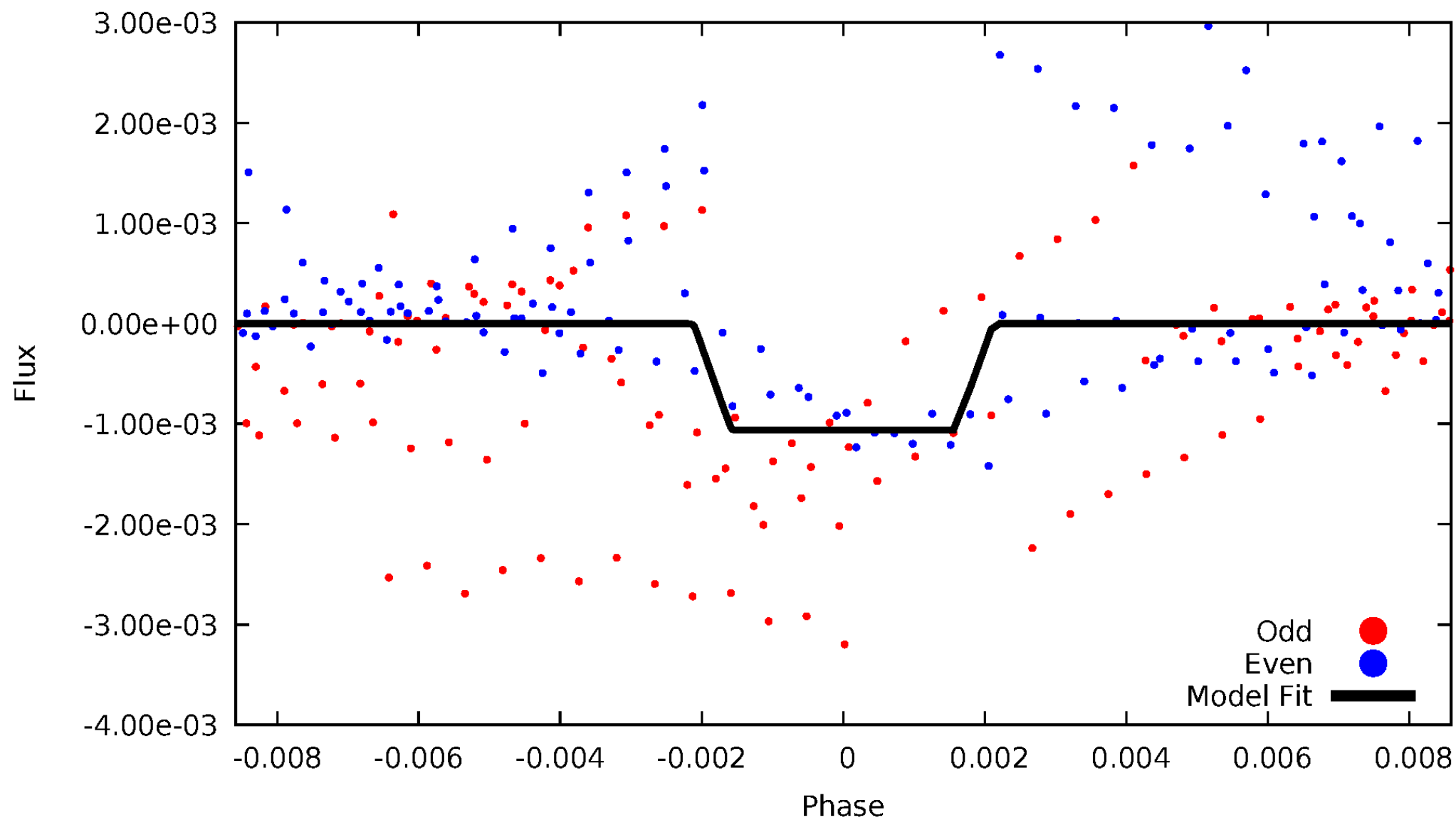
DV Odd/Even

TCE 004481350-02



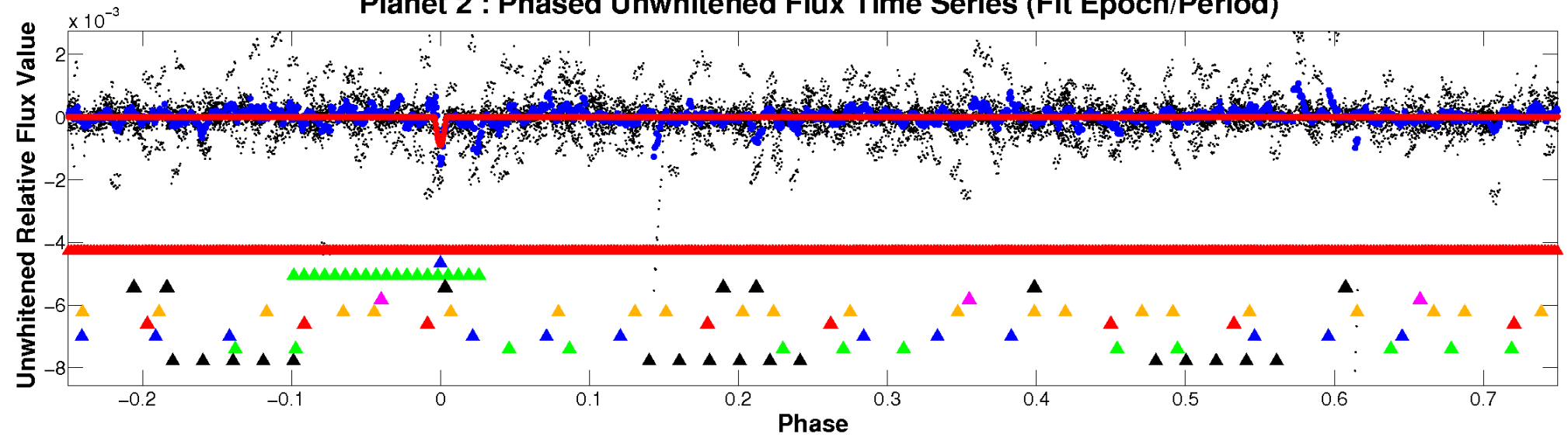
ALT Odd/Even

TCE 004481350-02

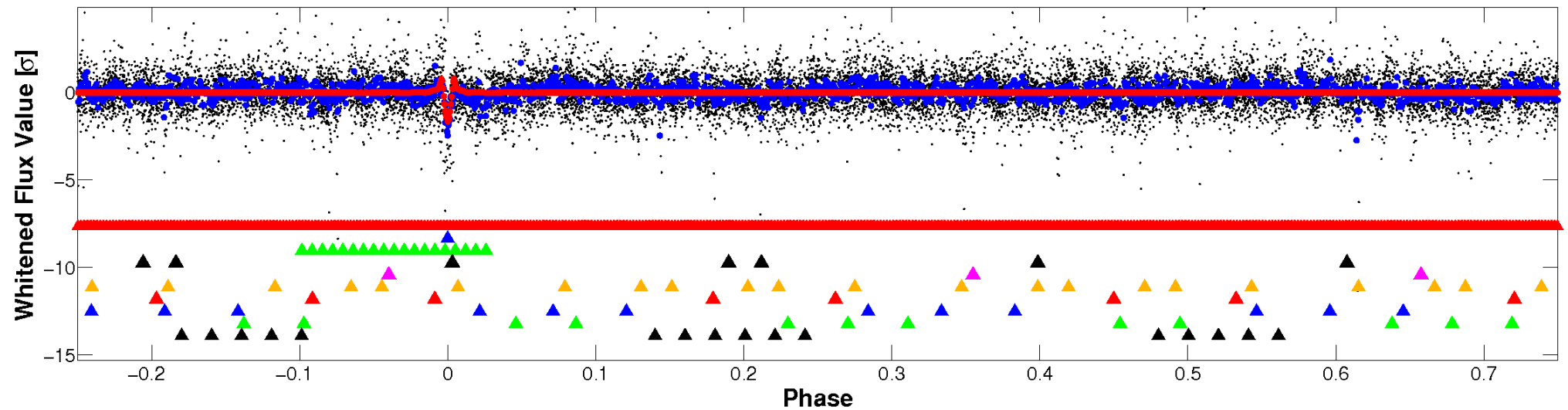


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

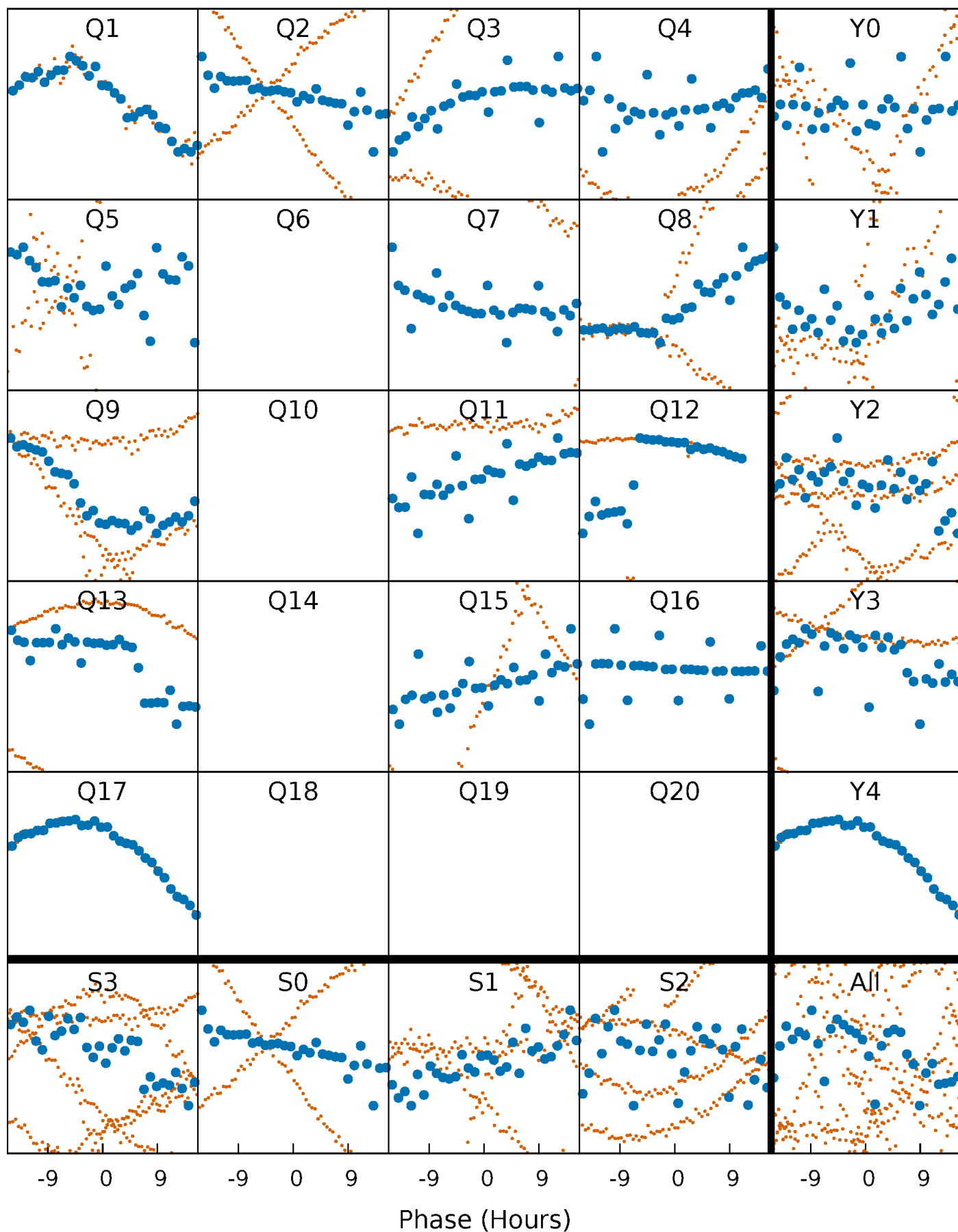


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



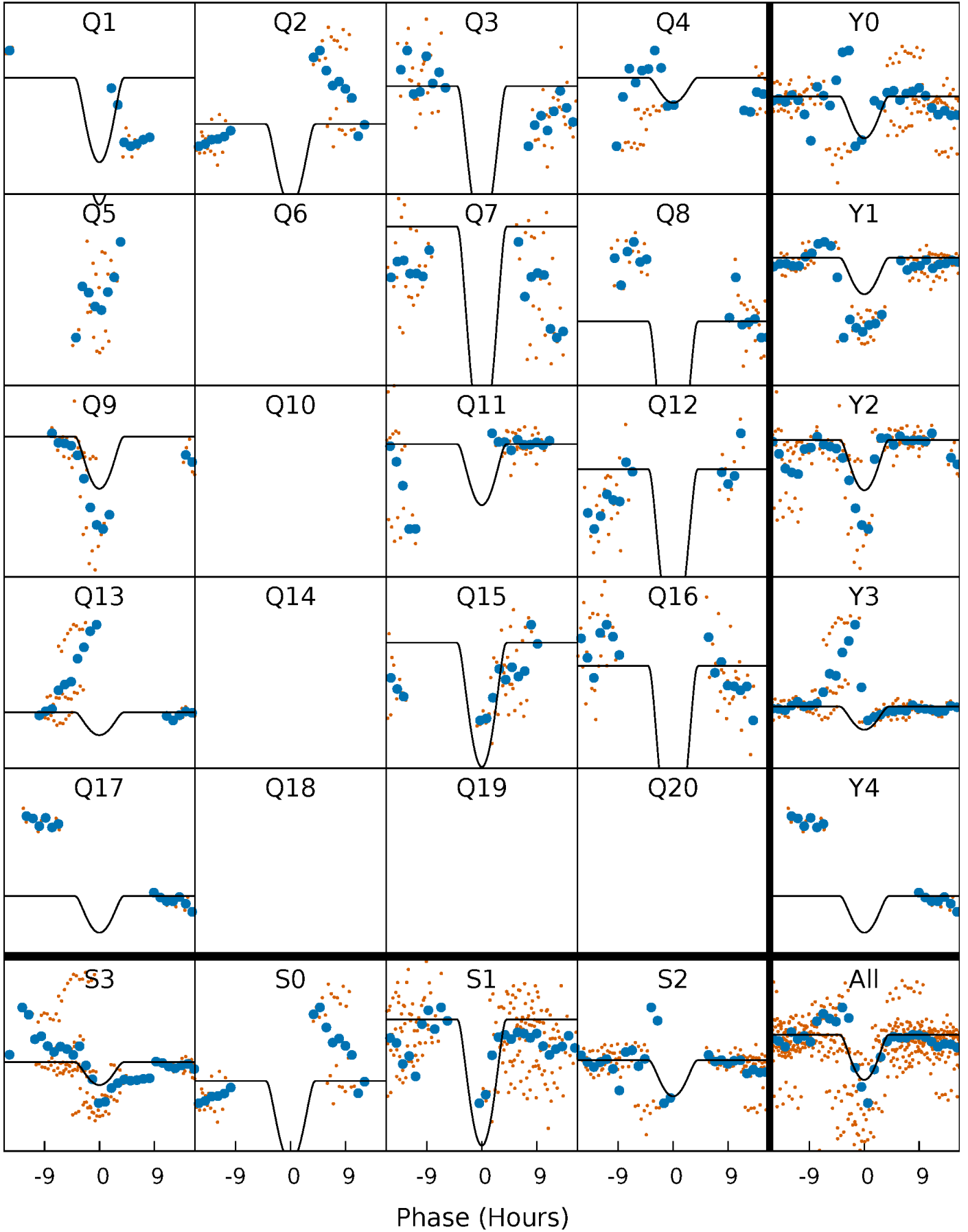
PDC Quarter-Phased Transit Curves

TCE 004481350-02 $P = 38.074498$ Days $T_0 = 164.332328$ (BKJD)



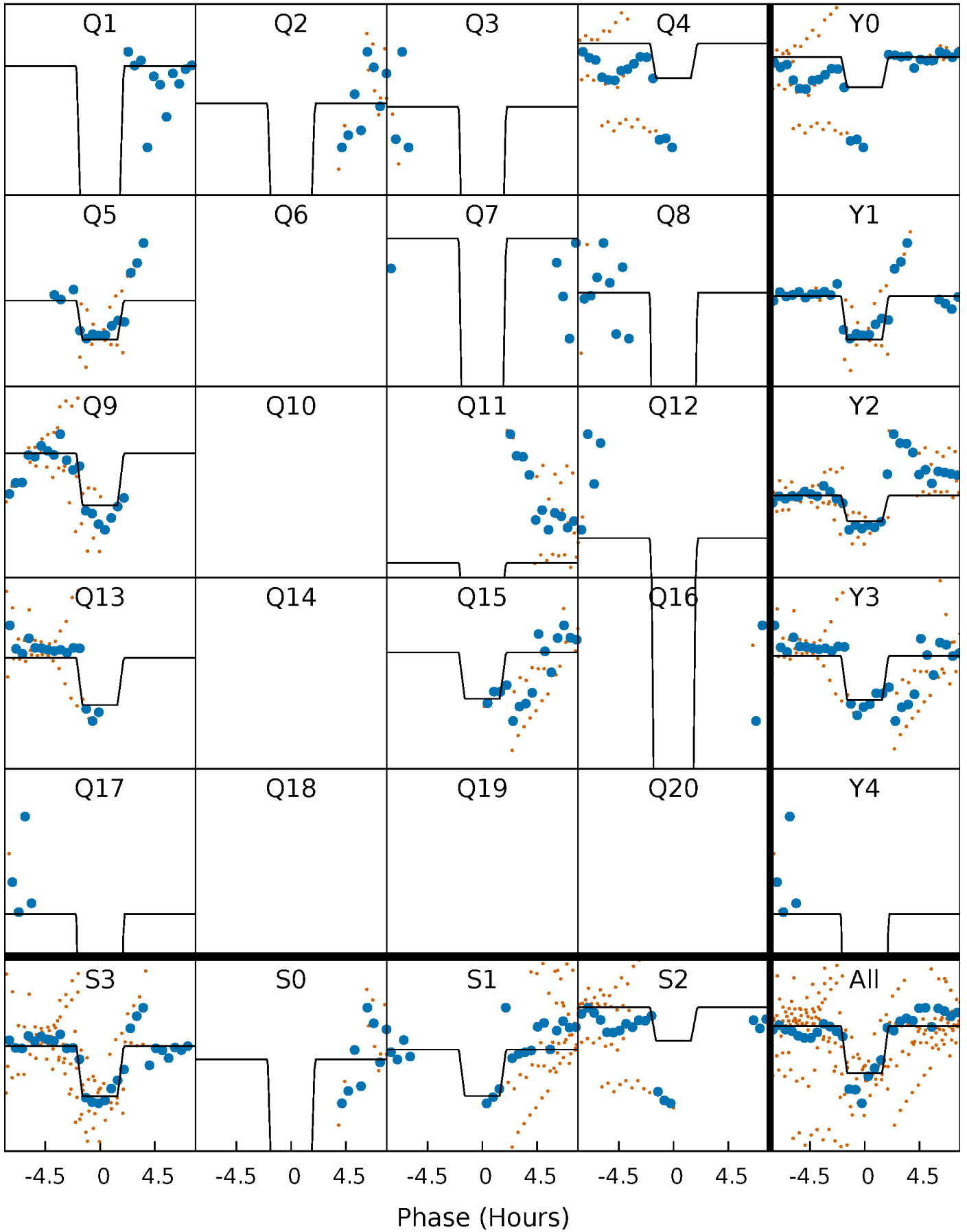
DV Quarter-Phased Transit Curves

TCE 004481350-02 P= 38.074498 Days $T_0=164.332328$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

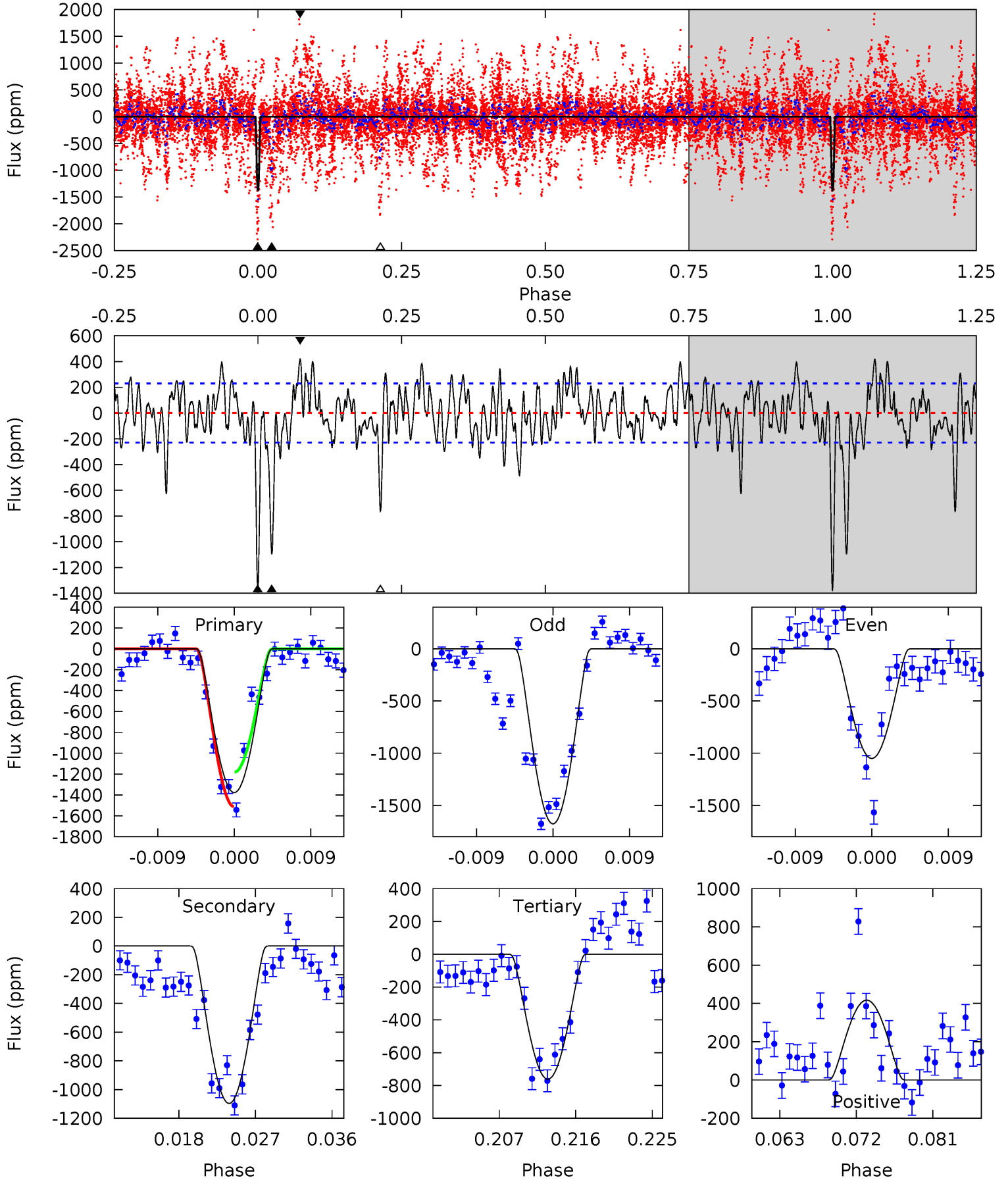
TCE 004481350-02 P= 38.073447 Days $T_0=164.326199$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-02, P = 38.074498 Days, E = 126.257830 Days

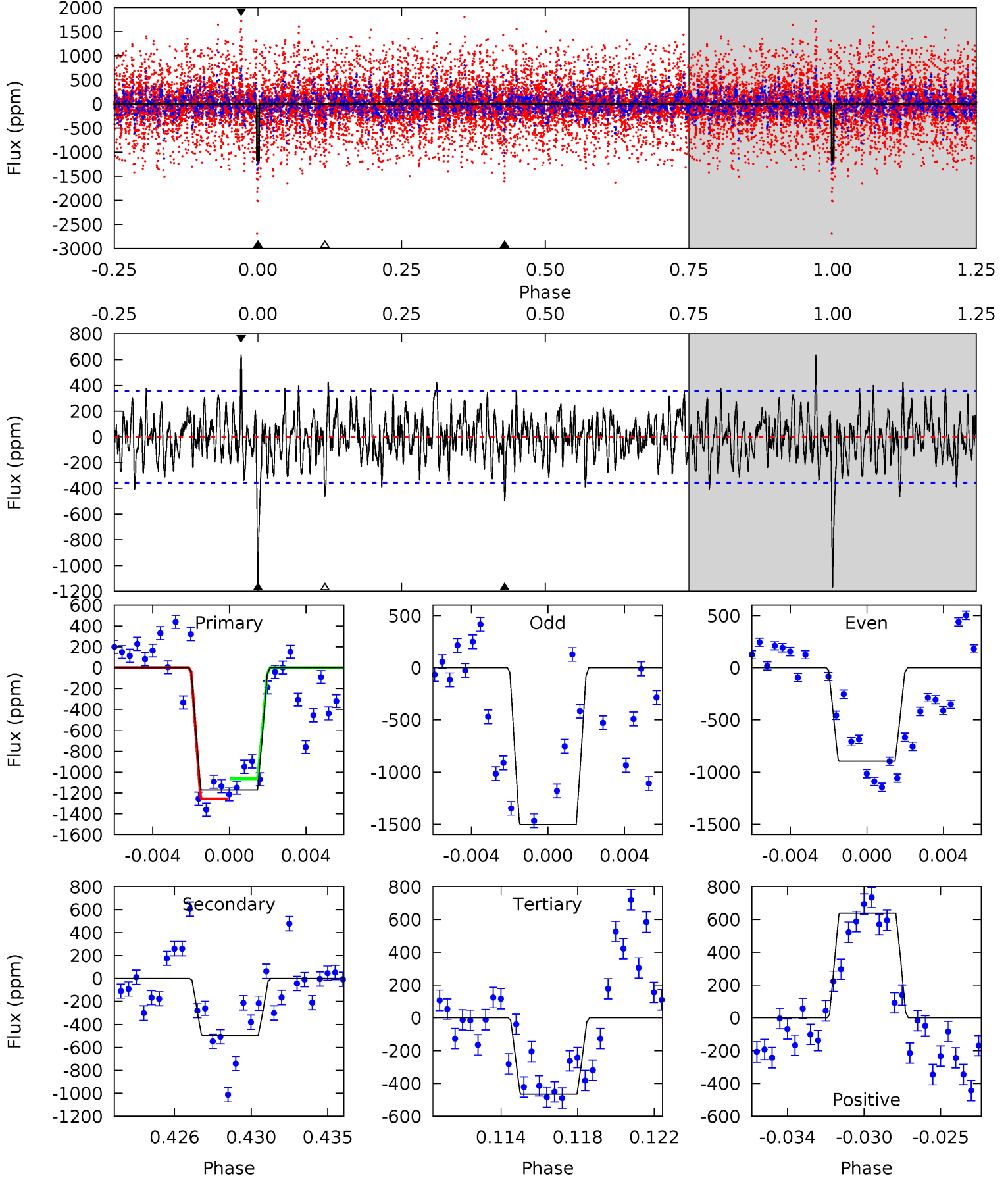
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.3	24.1	16.8	9.19	5.05	2.61	3.67	13.6	21.1	7.38	15.0	6.60	-1.36	0.23	3.69



Alt Model-Shift Uniqueness Test

004481350-02, P = 38.073447 Days, E = 126.252752 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	7.18	6.77	9.27	5.19	2.86	1.99	10.3	7.79	0.41	-2.09	4.44	1.21	0.35	1.40



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1096 ± 45	$5.08^{+4.56}_{-3.22}$	504^{+16}_{-16}	3390^{+1463}_{-564}	783^{+5078}_{-571}
Alt.	-494 ± 69	$4.73^{+4.65}_{-3.24}$	505^{+16}_{-16}	3078^{+1427}_{-509}	412^{+3559}_{-309}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

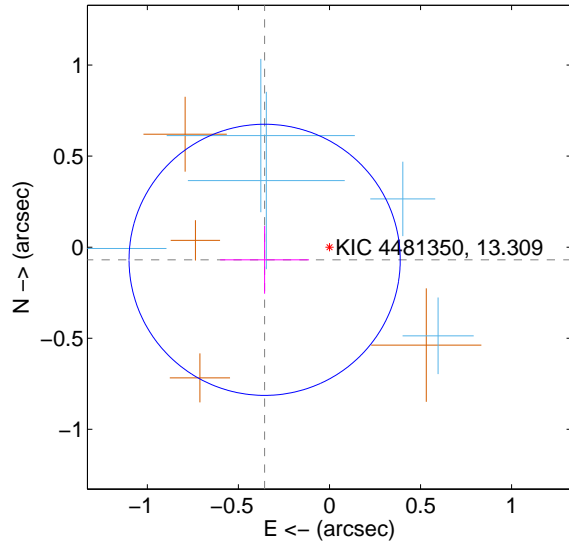
Supplemental centroid analysis for 004481350-02. Kepler magnitude: 13.31. Transit SNR 9.27

There are 6 quarters with good PRF difference image offsets

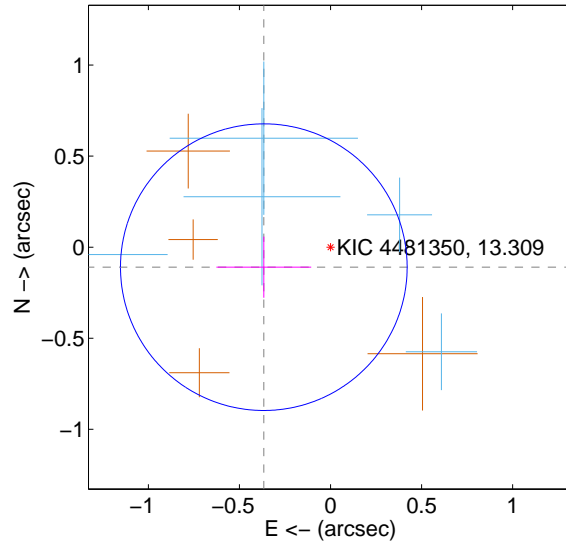
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.363 ± 0.248	1.46	0.356 ± 0.244	-0.069 ± 0.186
PRF-fit source offset from KIC position	0.382 ± 0.262	1.46	0.366 ± 0.260	-0.110 ± 0.168
photometric centroid source offset	0.12 ± 0.20	0.60	0.09 ± 0.20	-0.09 ± 0.20

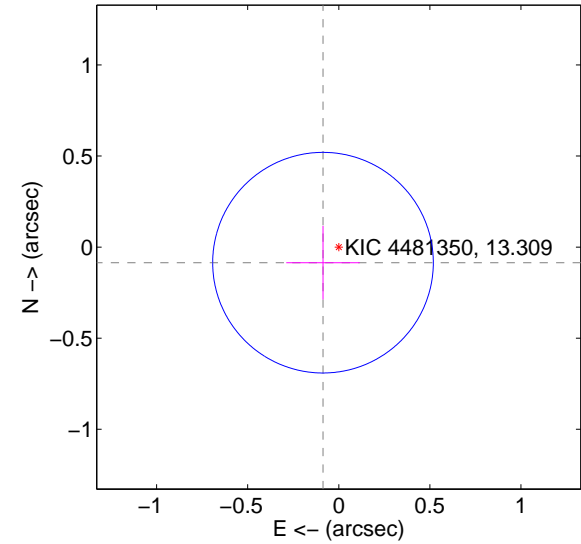
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

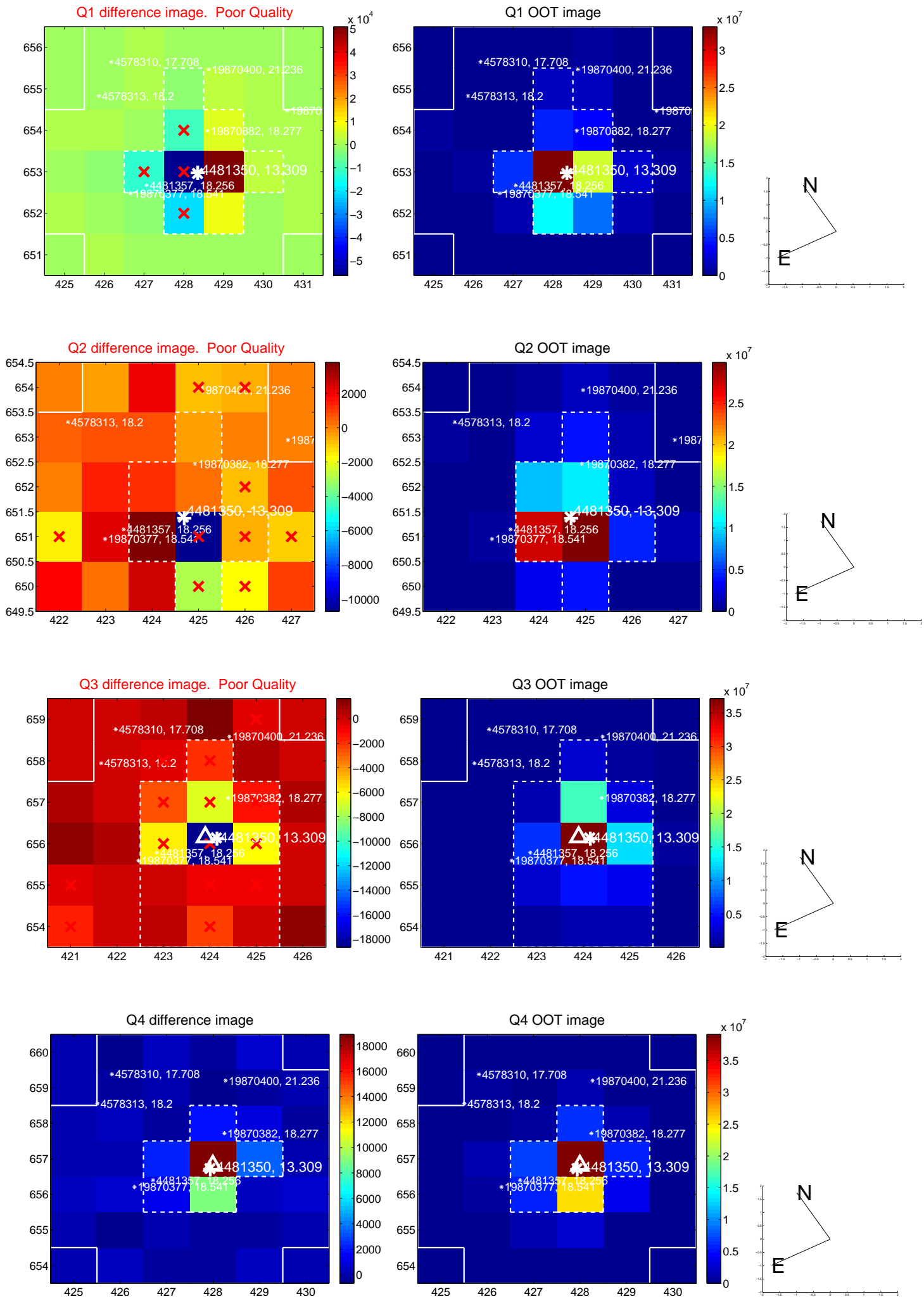


offset from photometric centroids

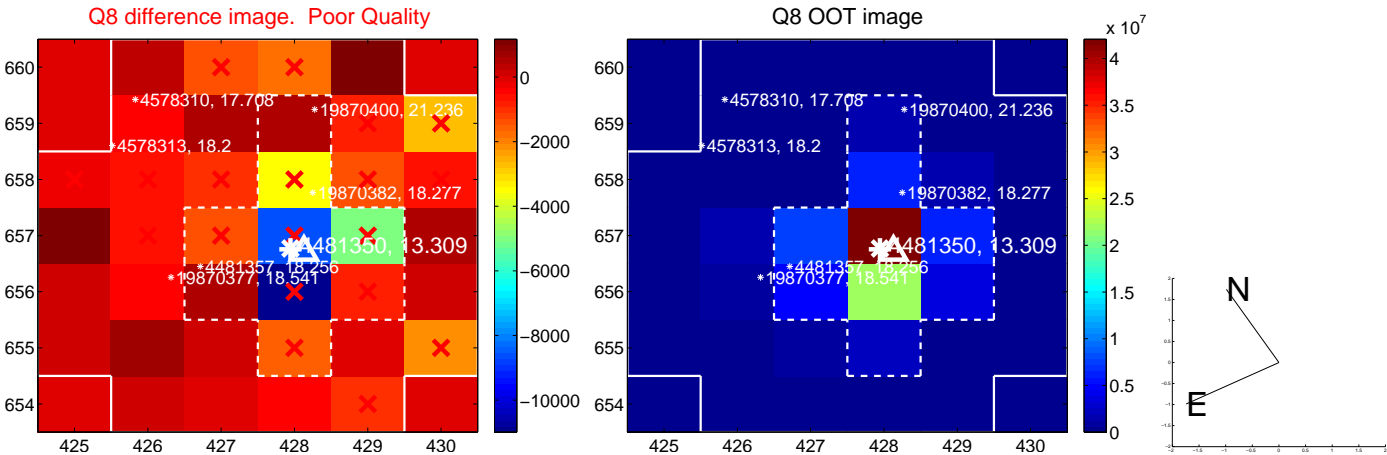
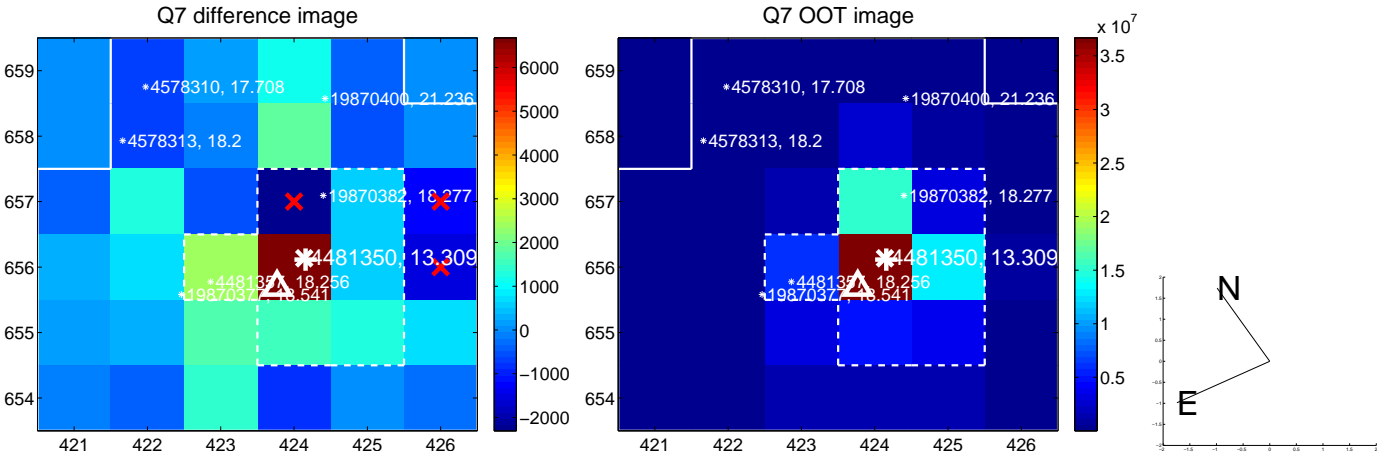
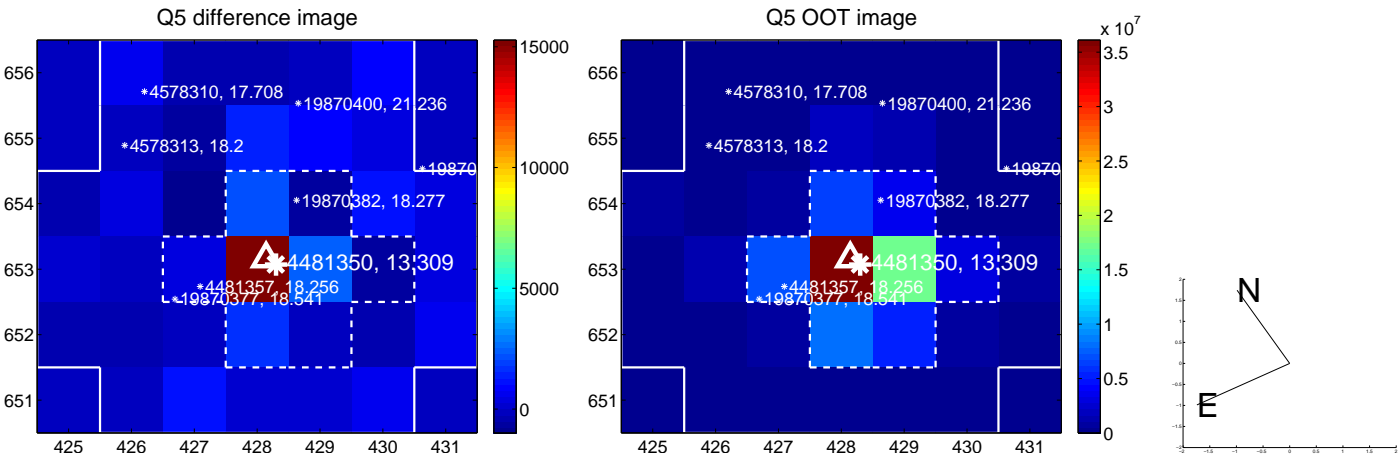


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

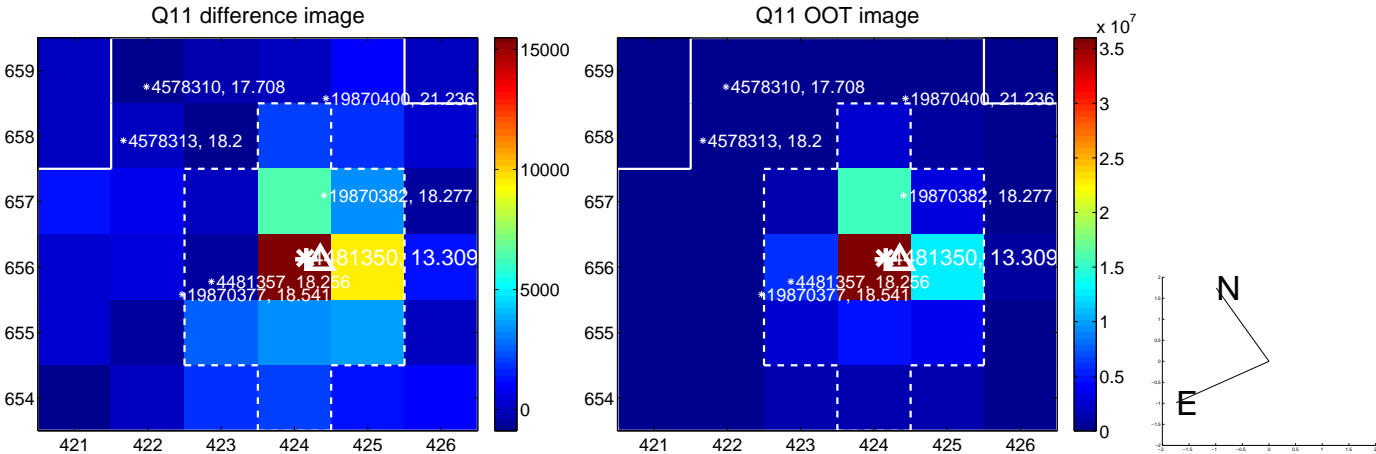
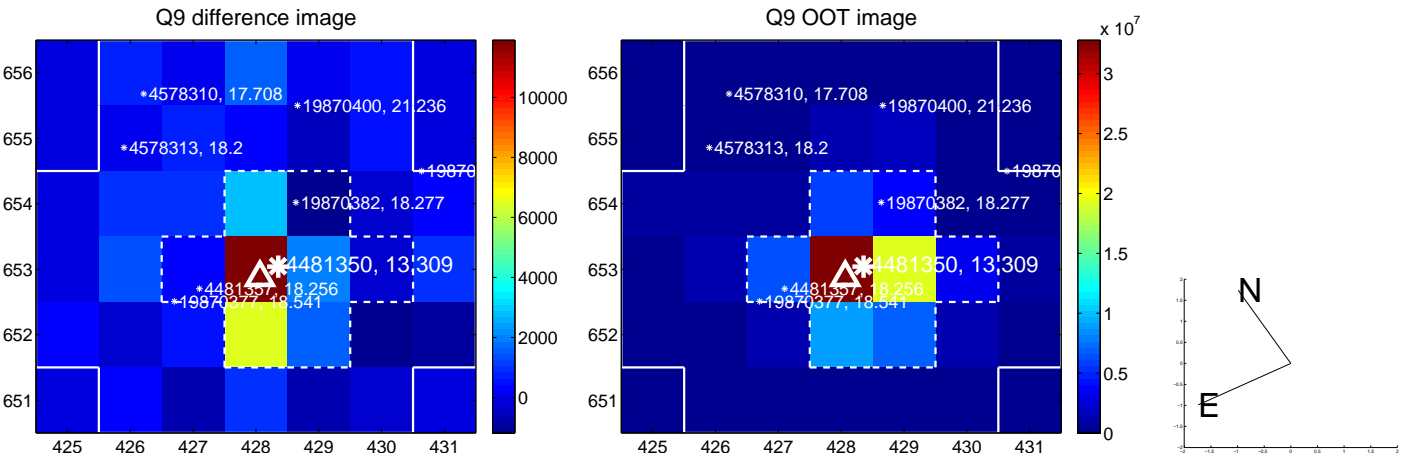
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



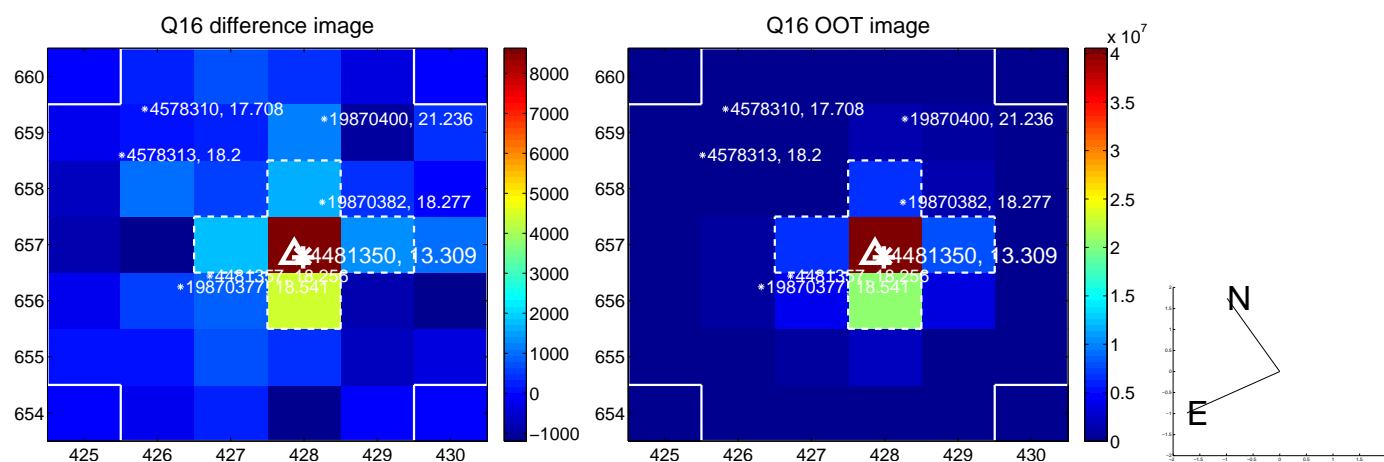
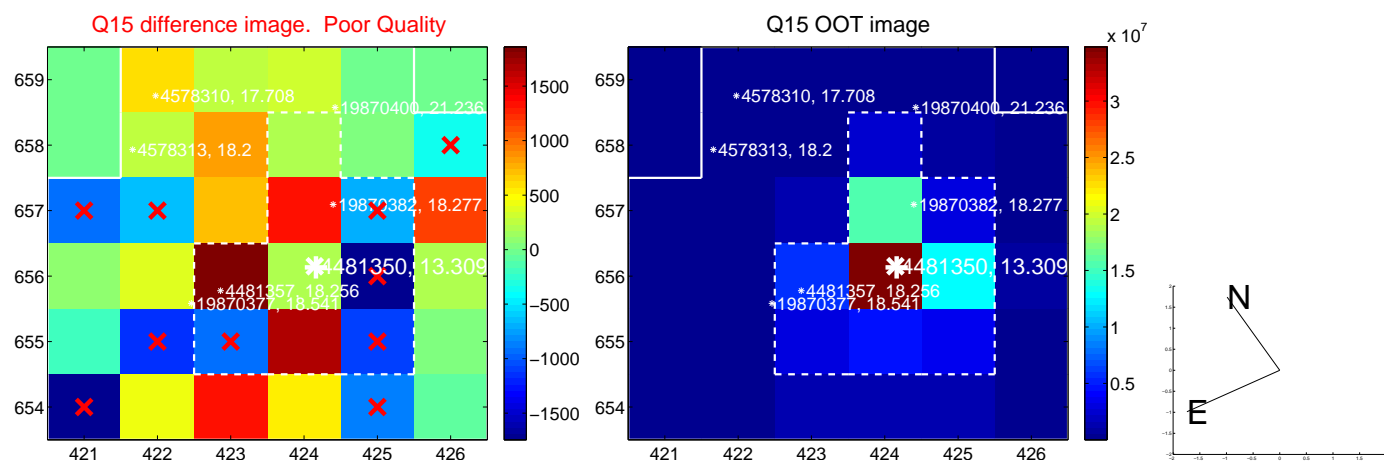
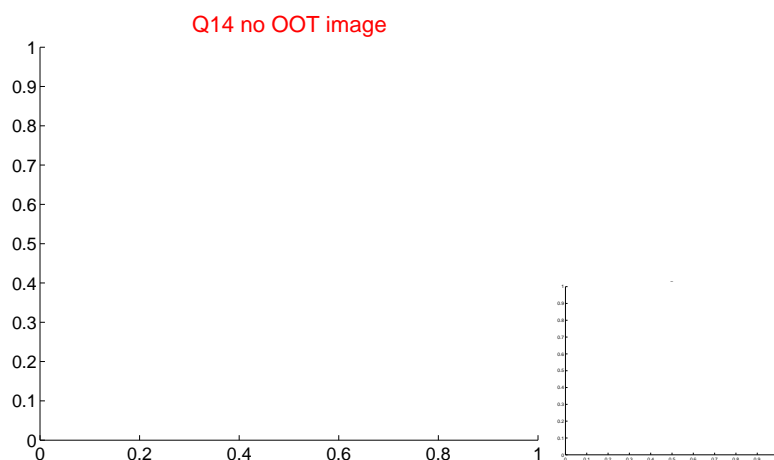
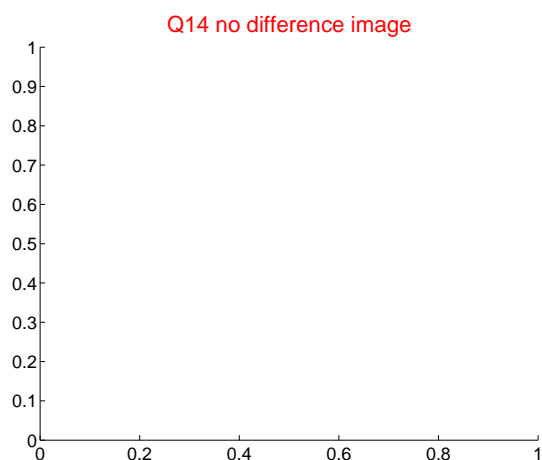
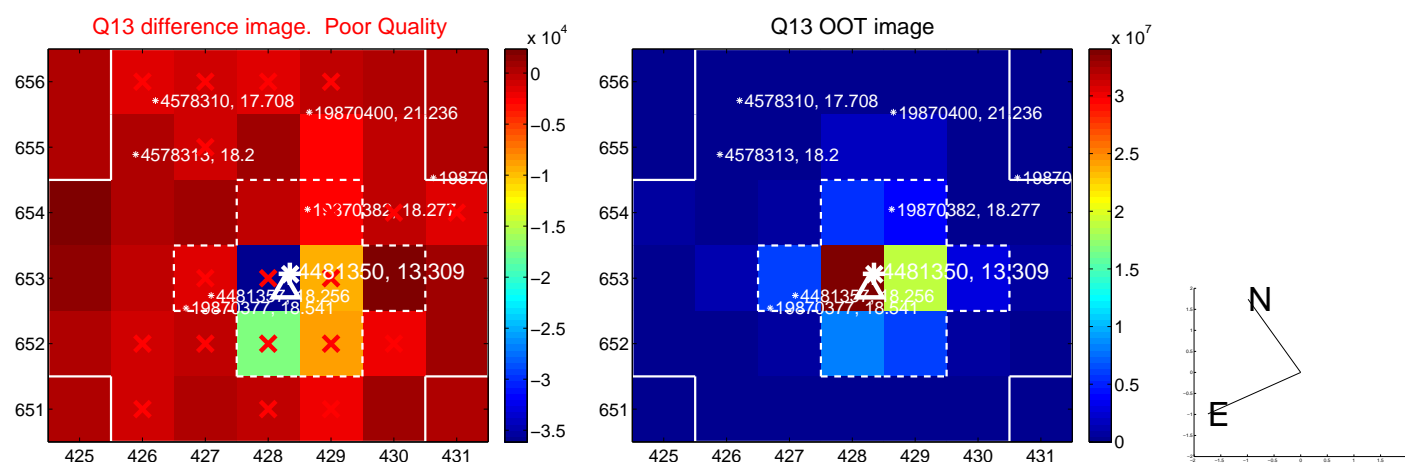
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



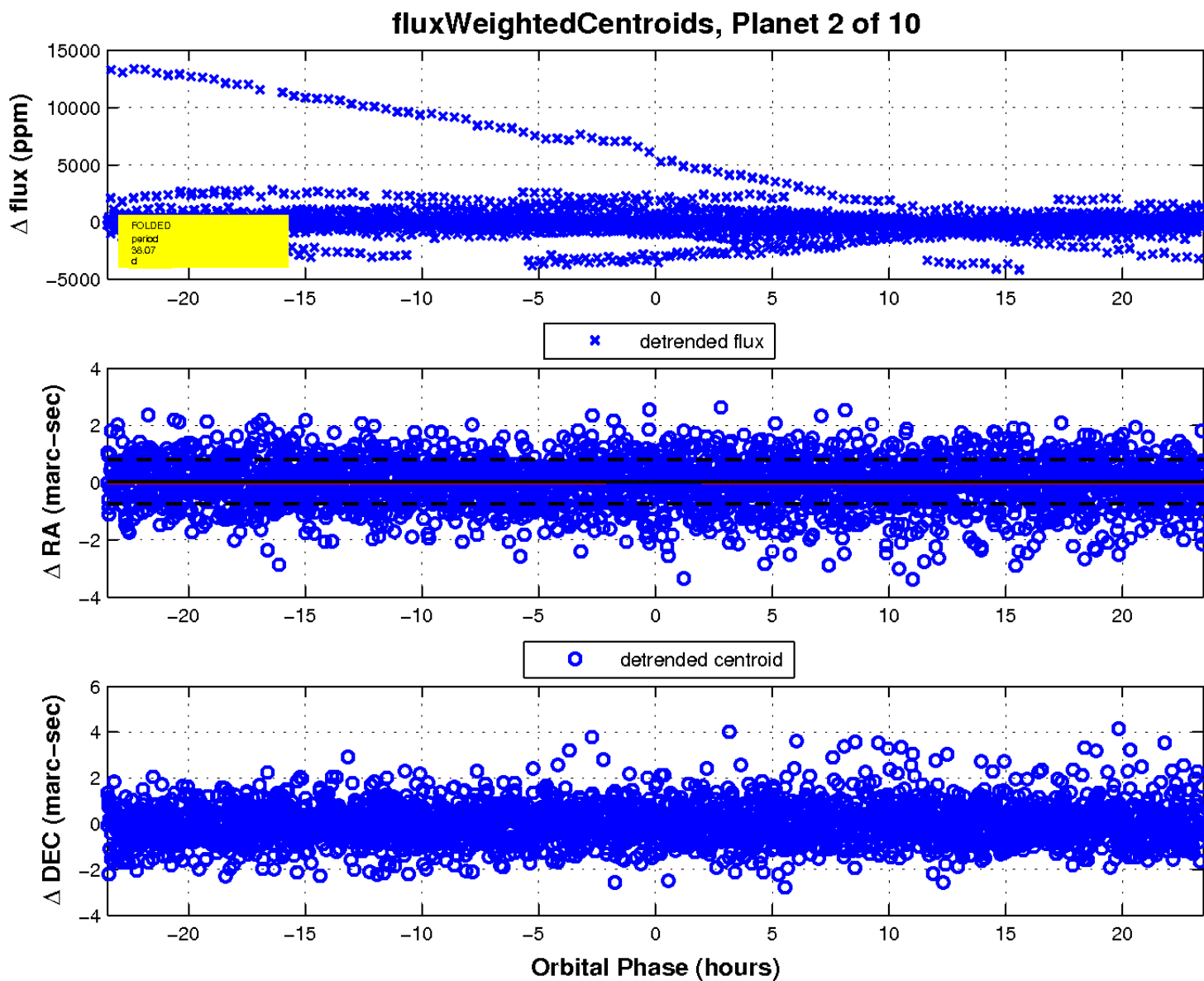
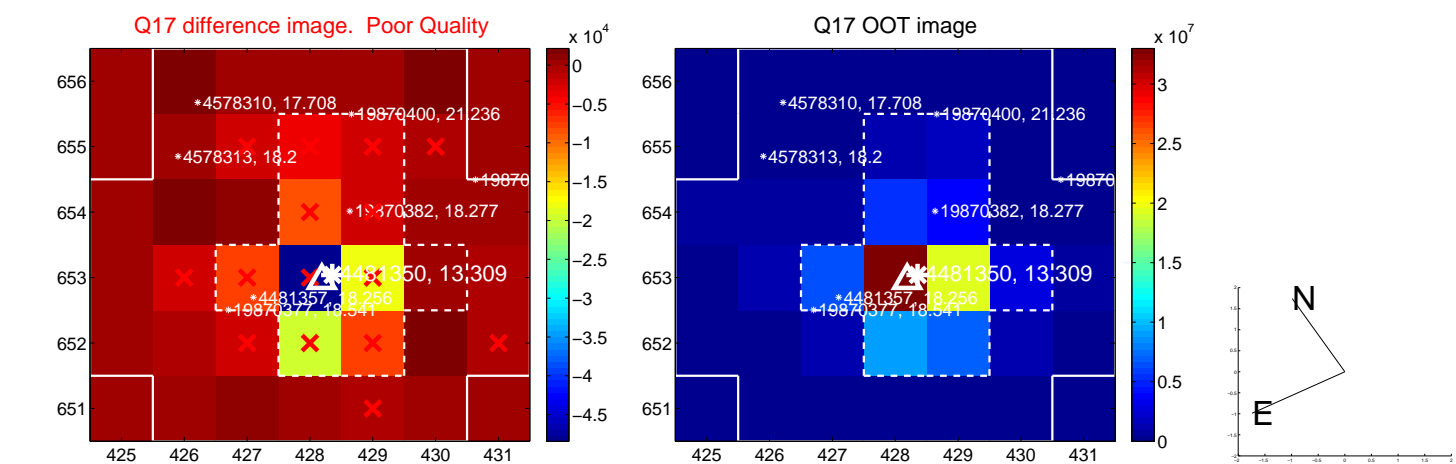
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



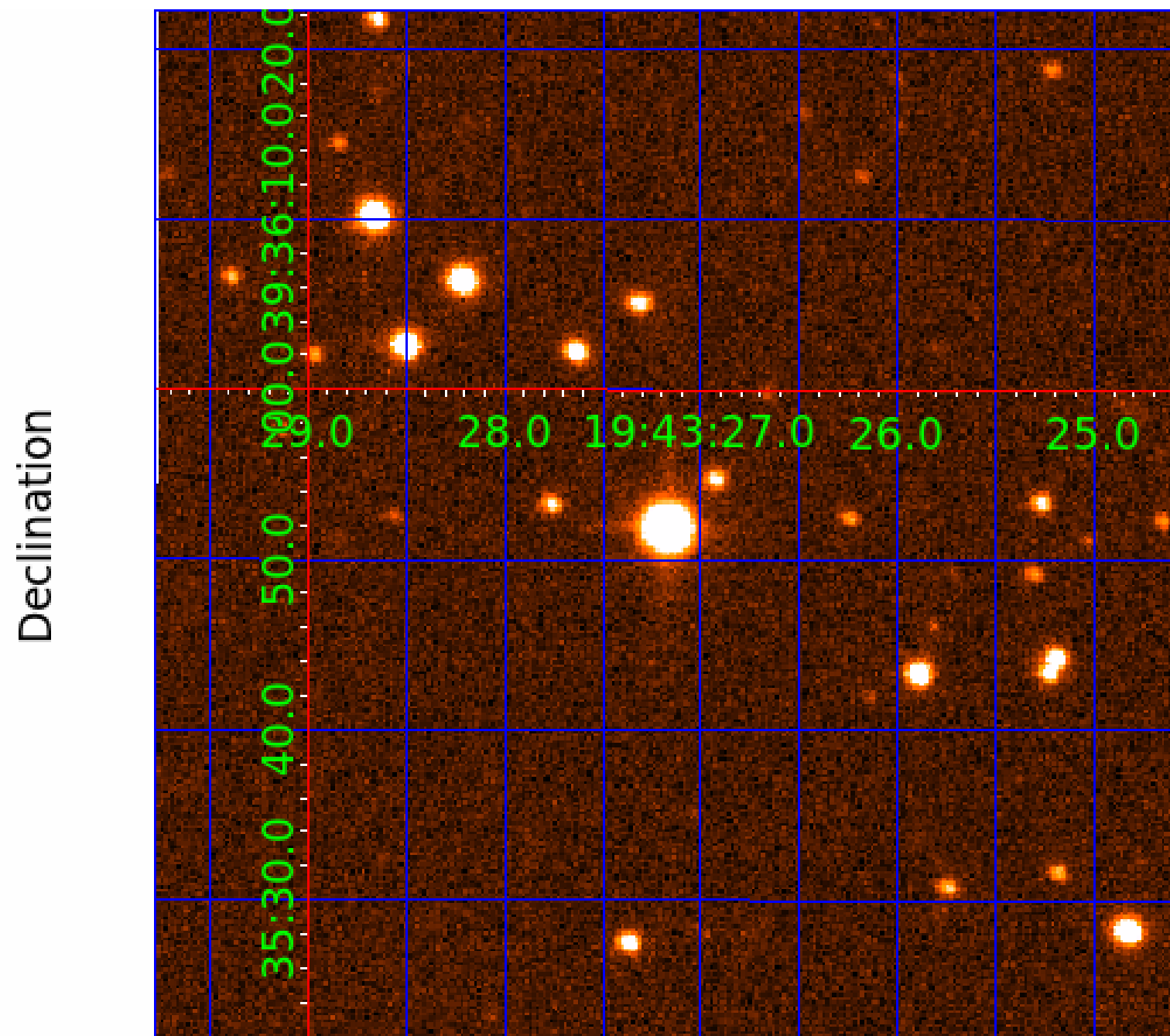
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

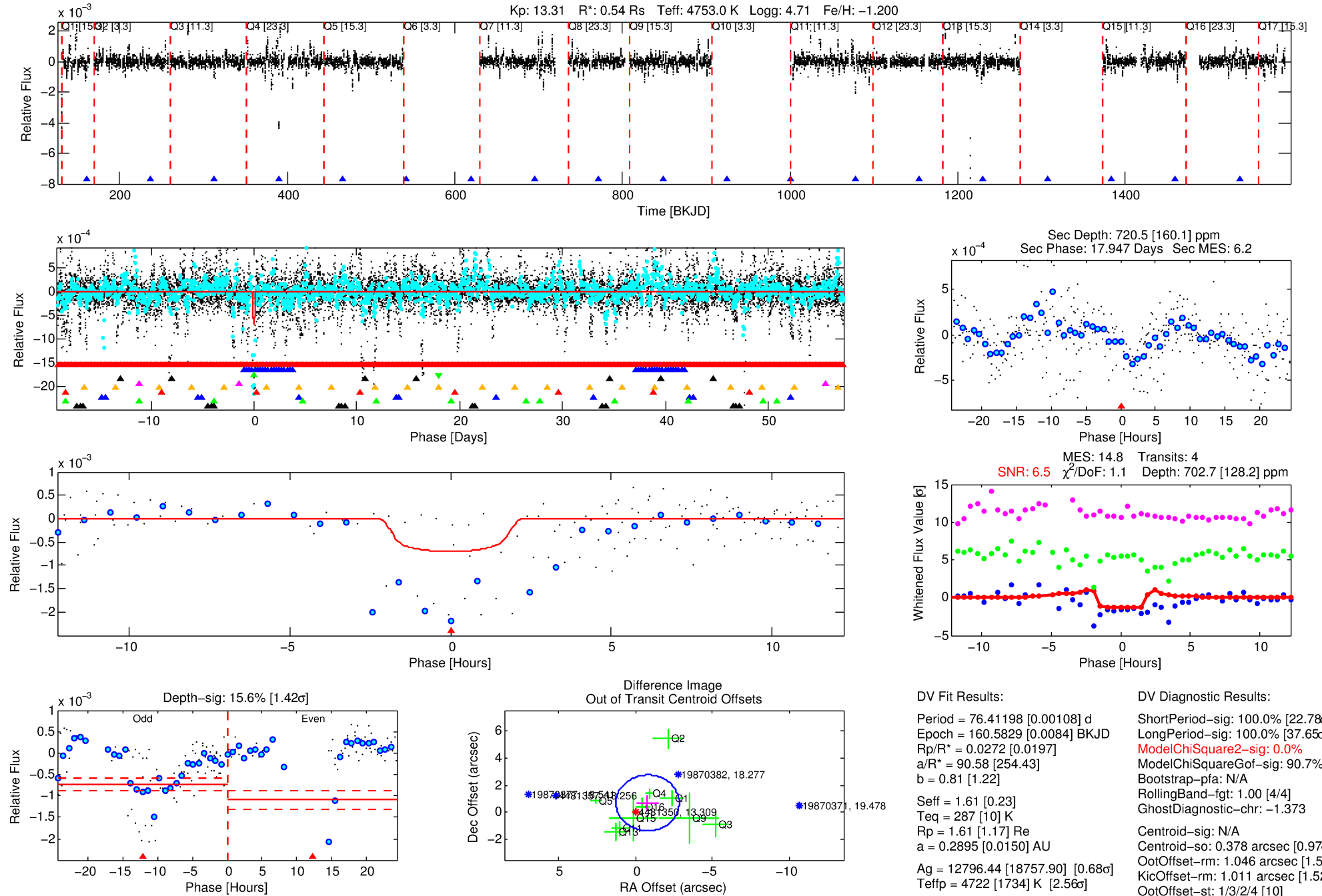
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-03

No Significant Match Found

DV One-Page Summary

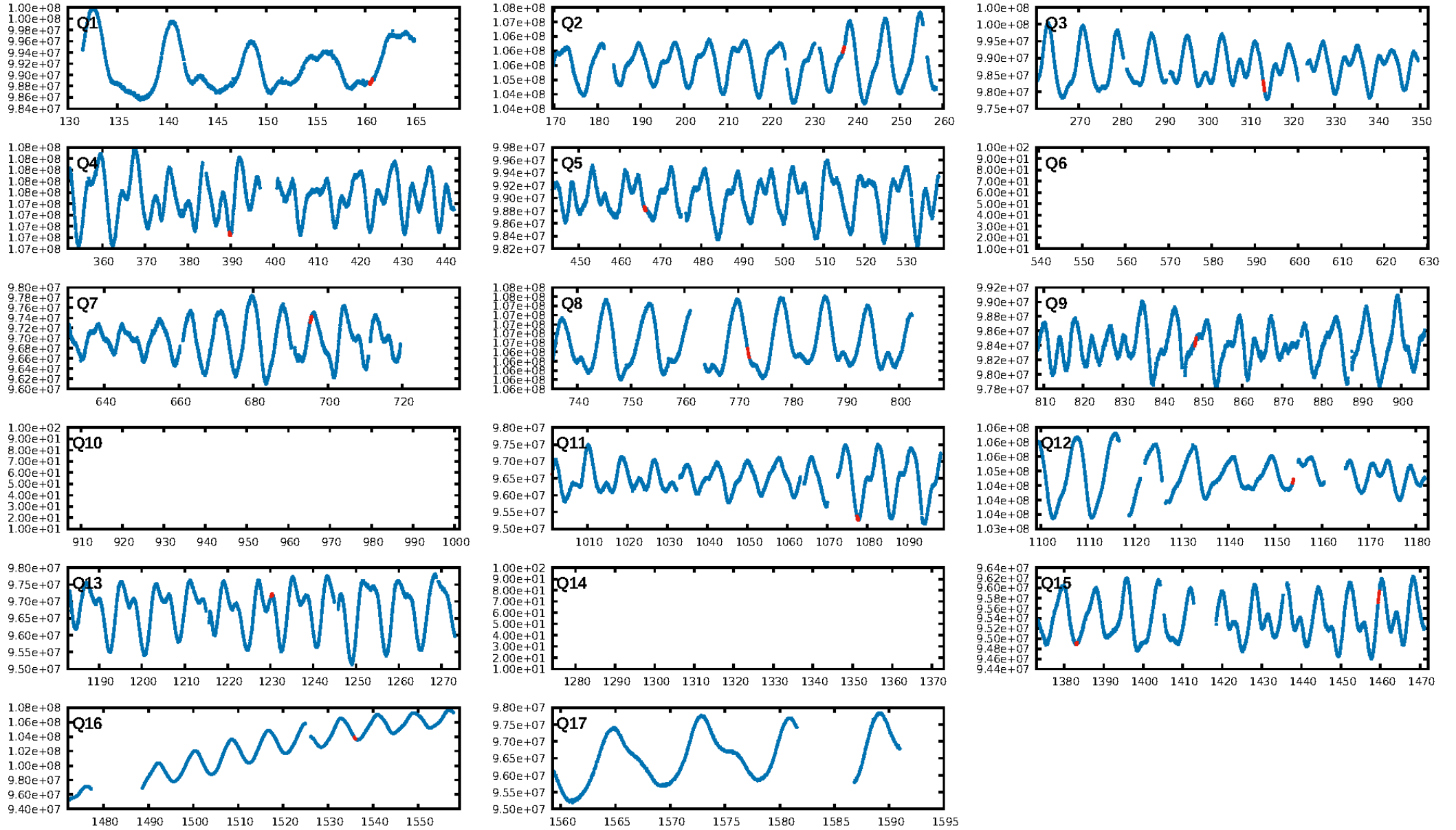
KIC: 4481350 Candidate: 3 of 10 Period: 76.412 d



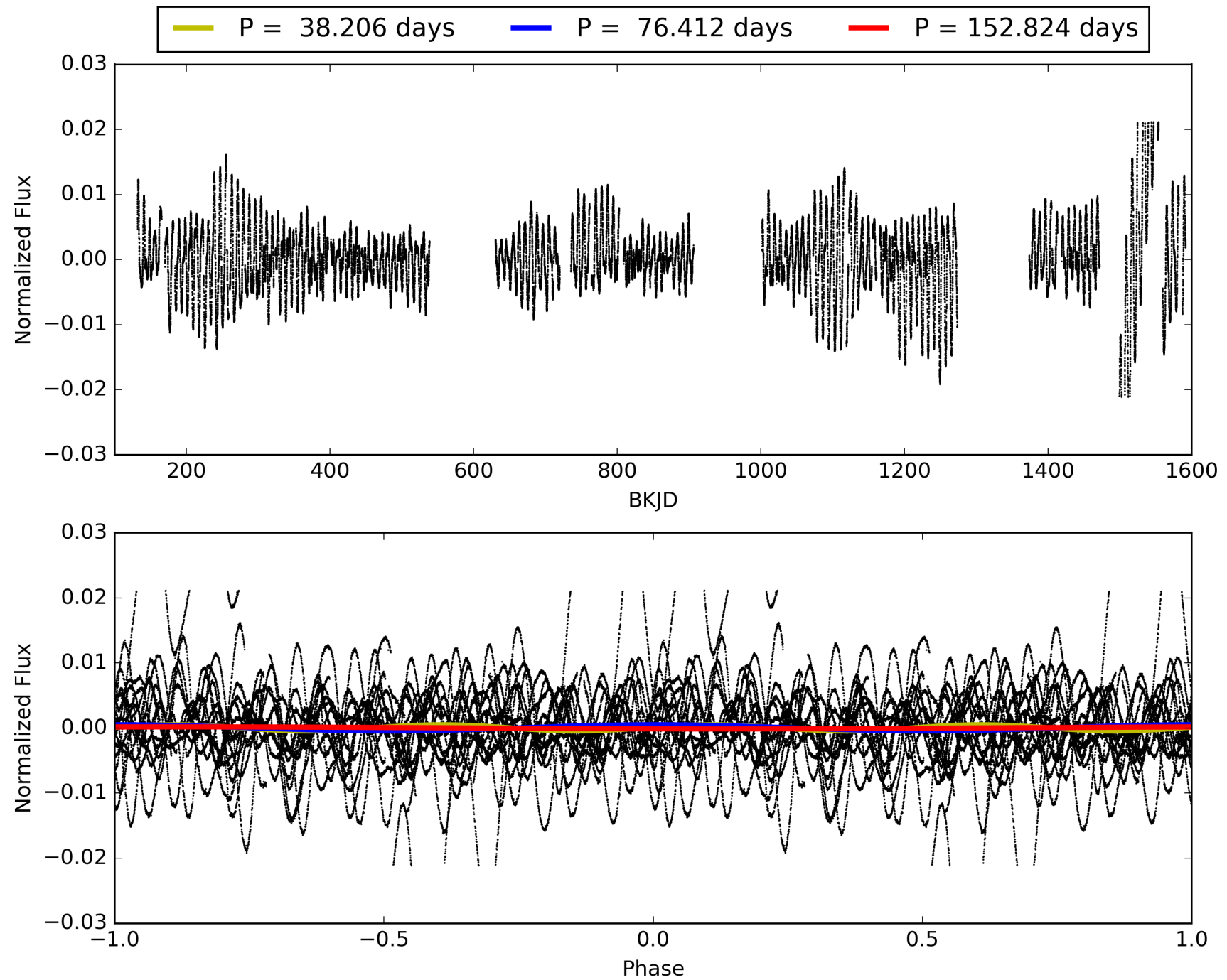
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:33 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-03, PDC Light Curves

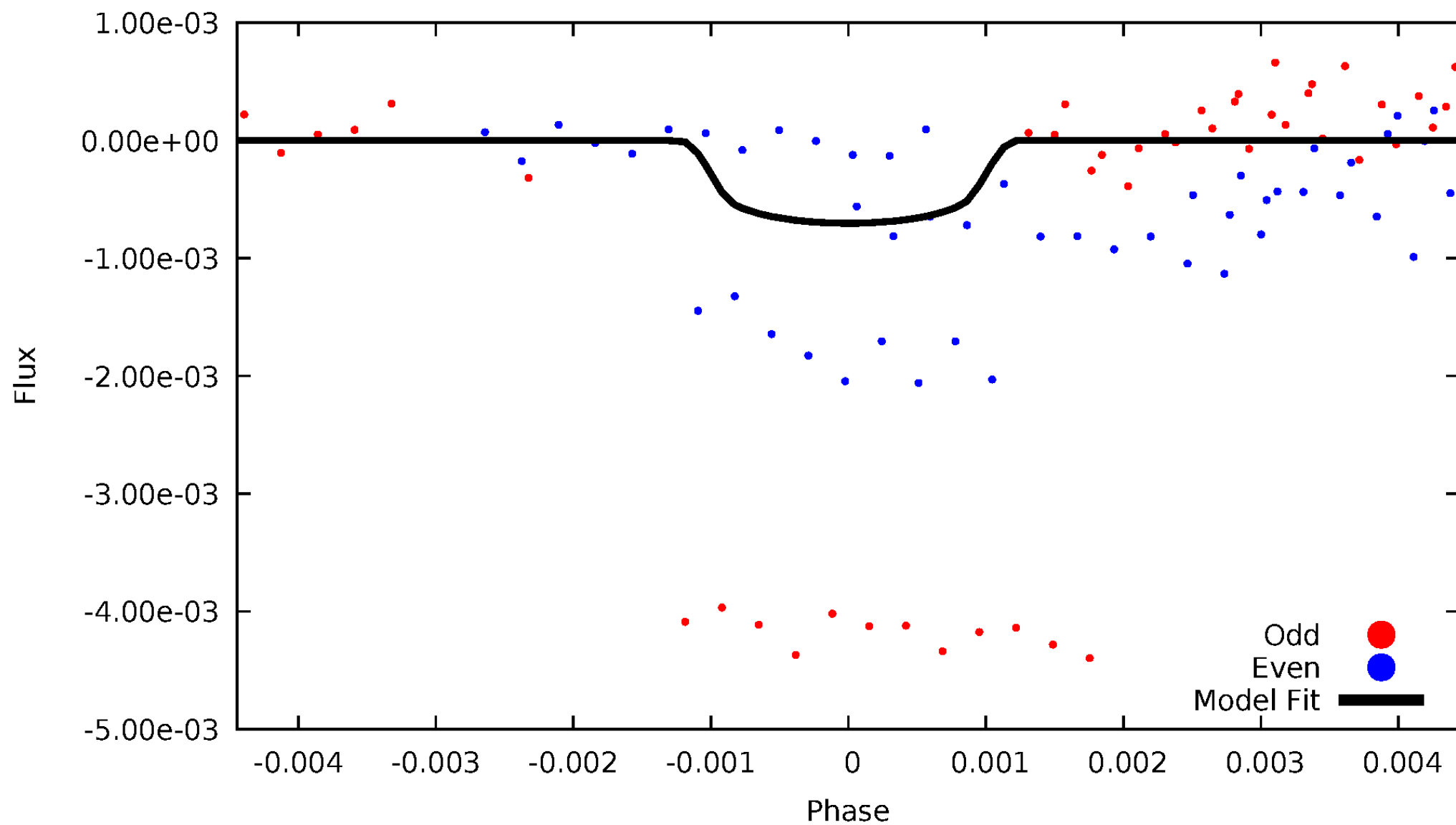


TCE 004481350-03



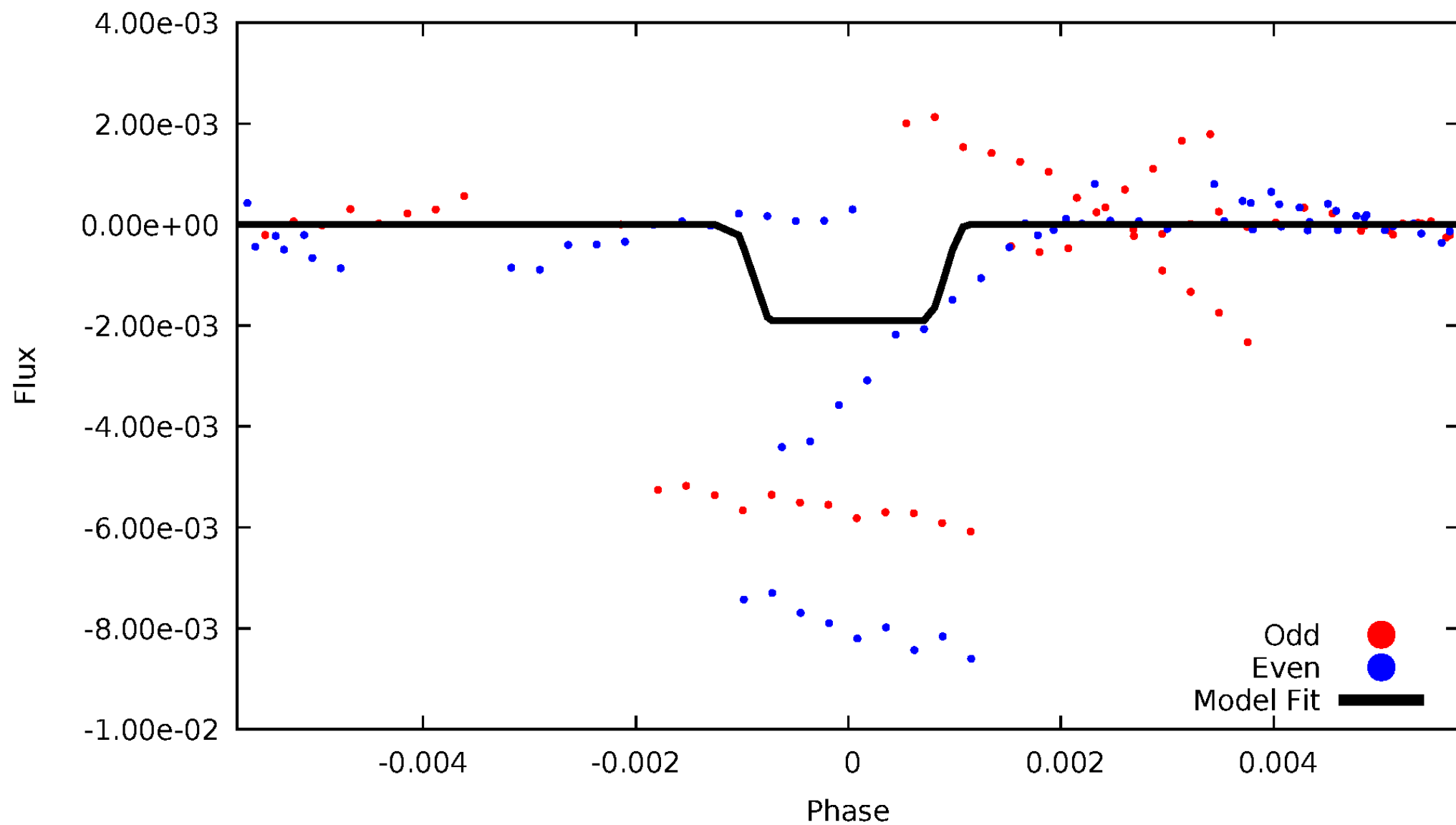
DV Odd/Even

TCE 004481350-03



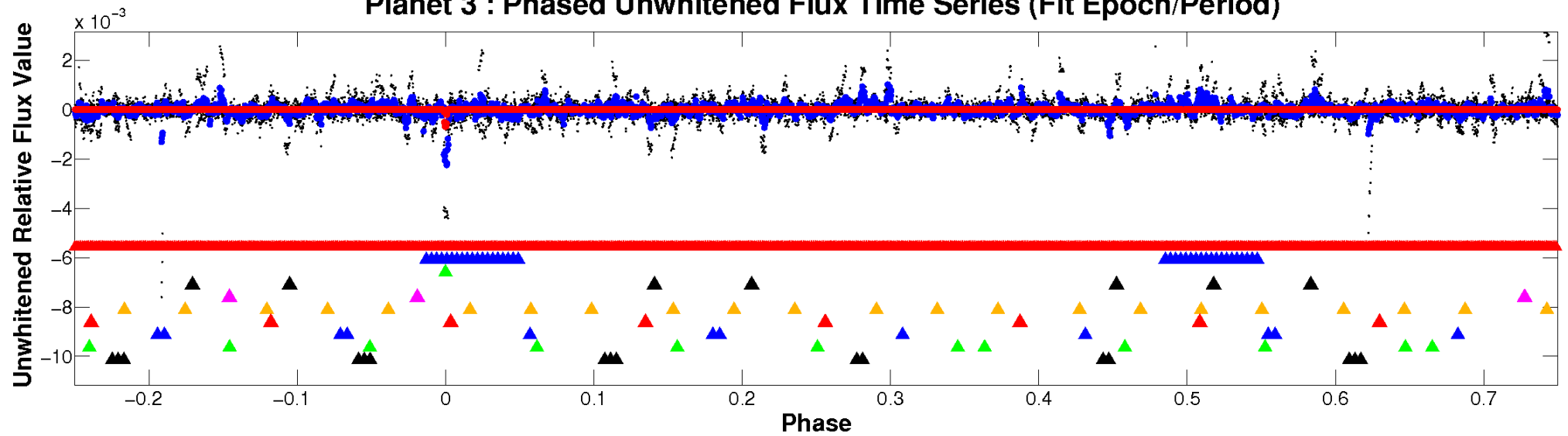
ALT Odd/Even

TCE 004481350-03

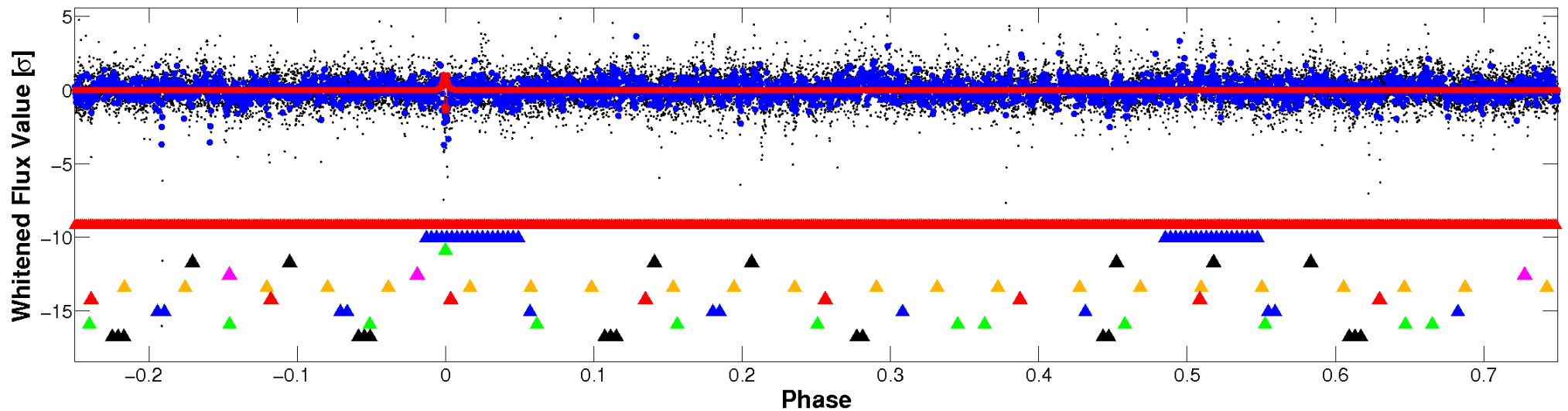


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

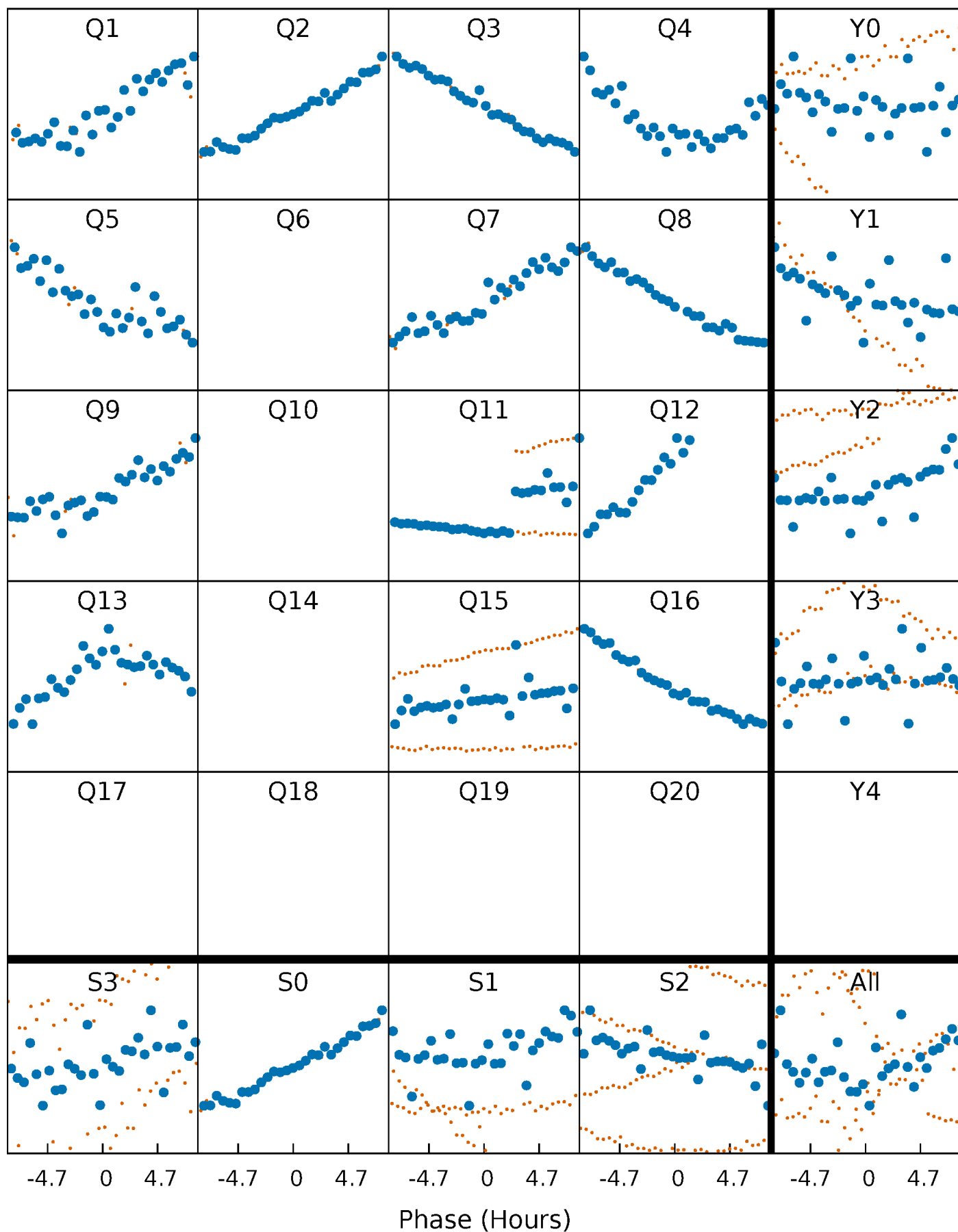


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



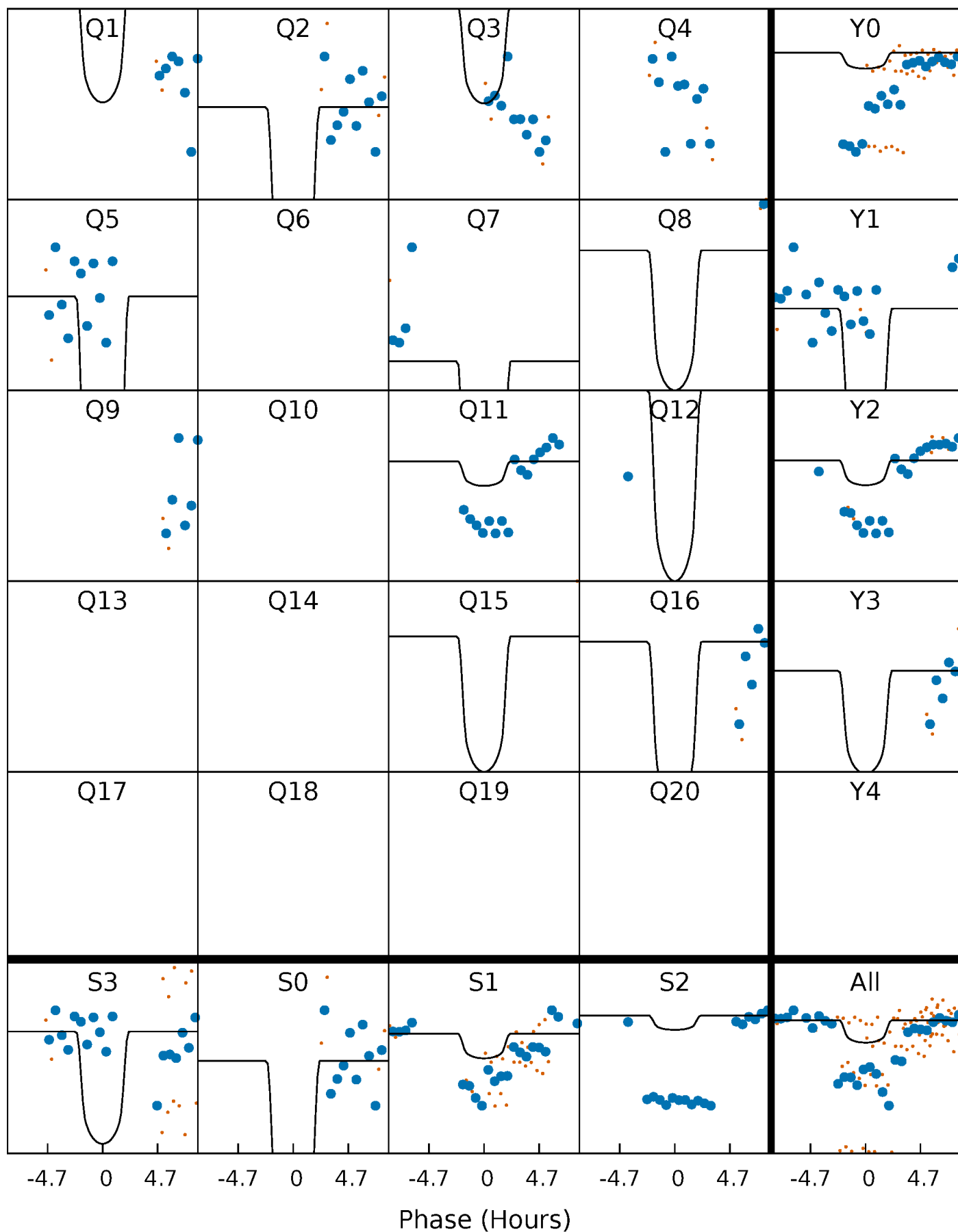
PDC Quarter-Phased Transit Curves

TCE 004481350-03 P= 76.411983 Days $T_0=160.582925$ (BKJD)



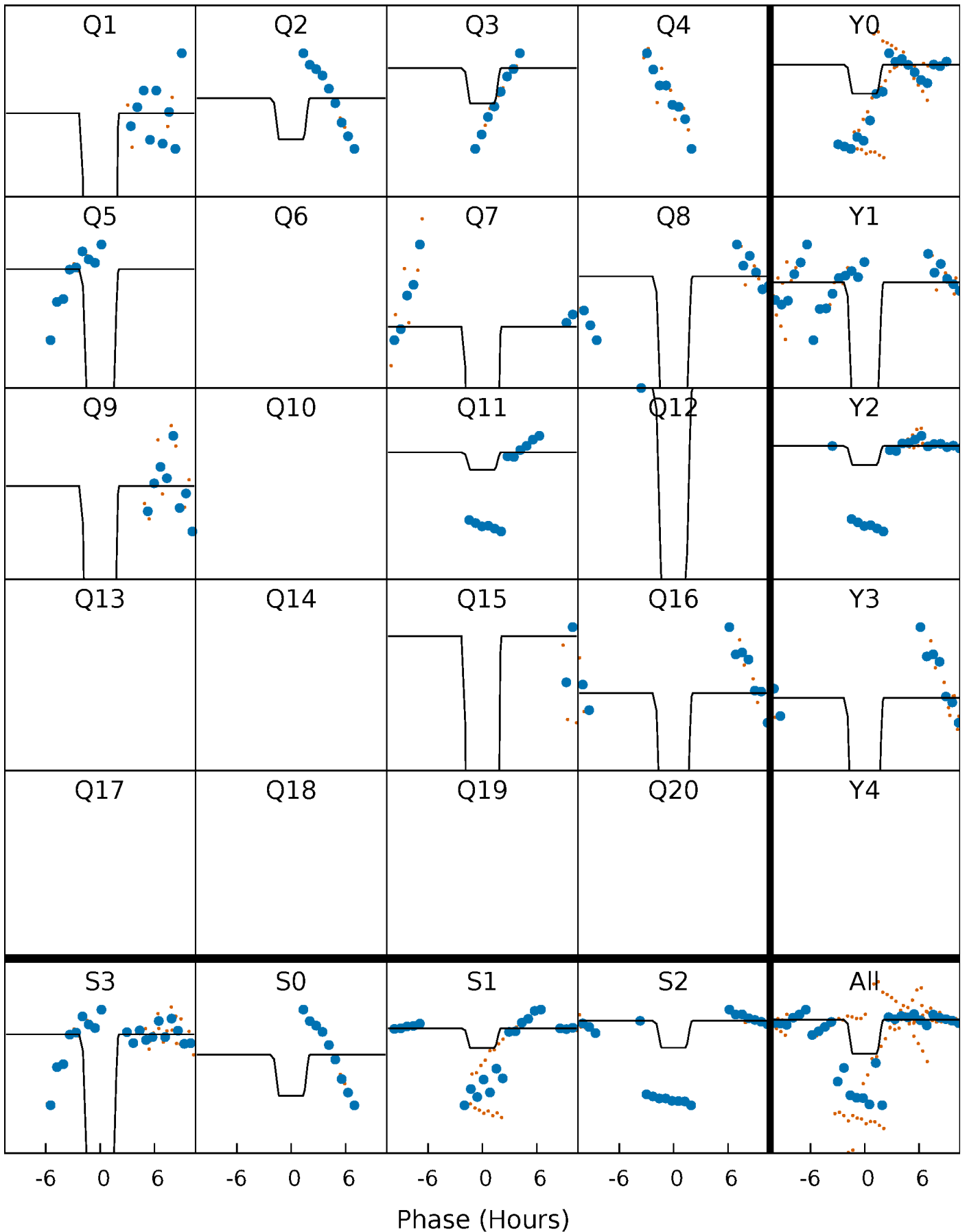
DV Quarter-Phased Transit Curves

TCE 004481350-03 P= 76.411983 Days $T_0=160.582925$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

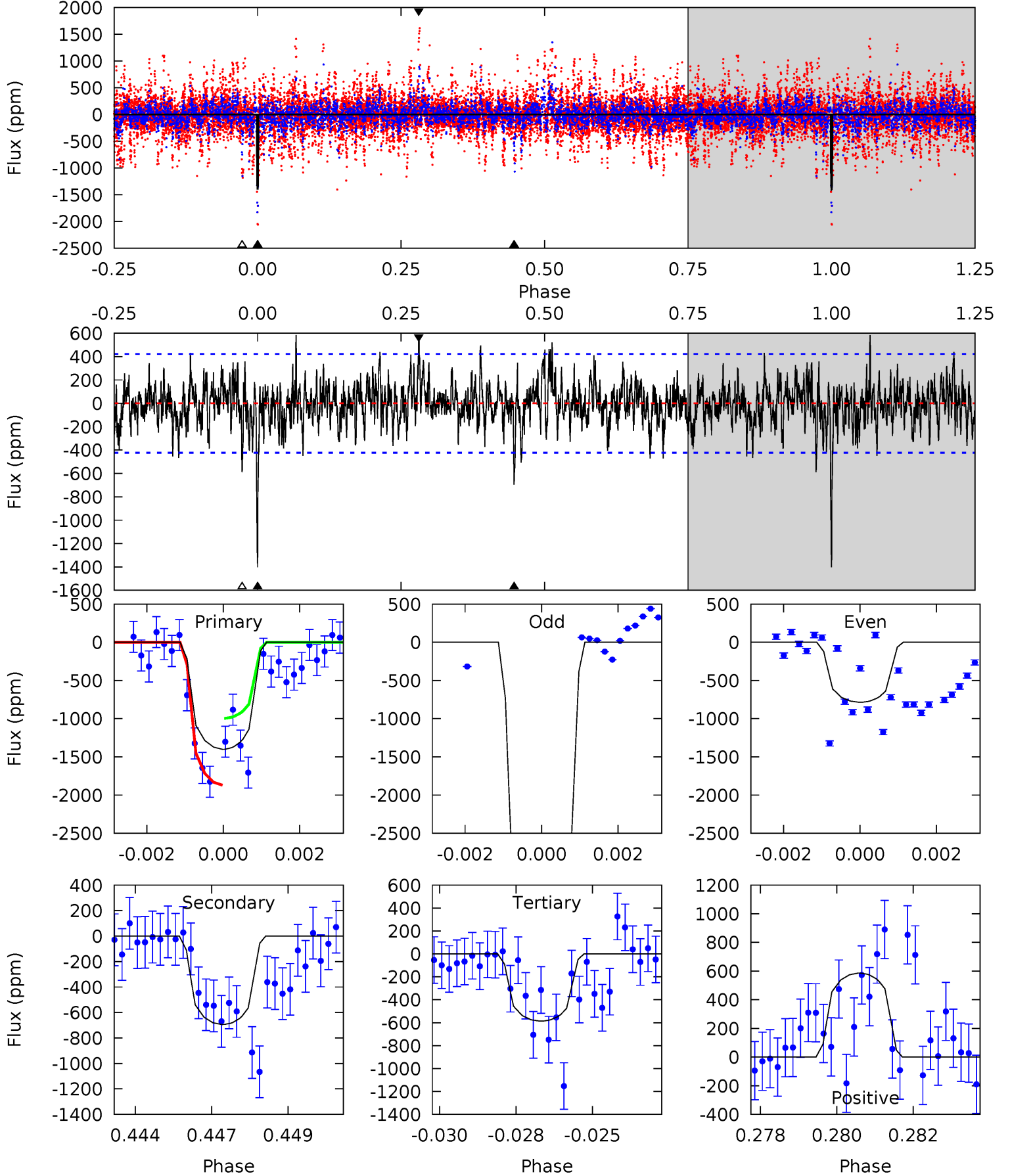
TCE 004481350-03 P= 76.405909 Days $T_0=160.647443$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-03, P = 76.411983 Days, E = 84.170942 Days

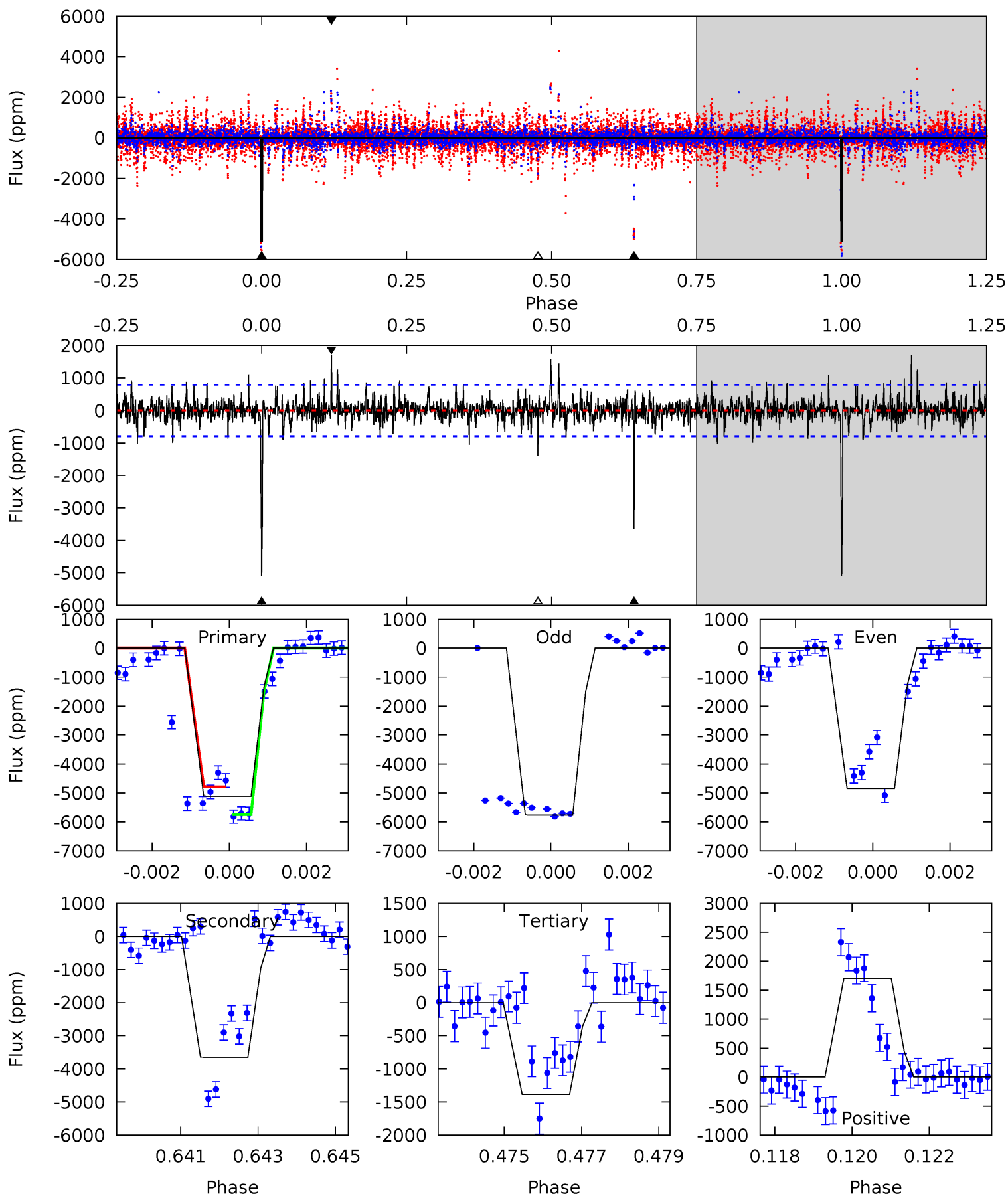
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	8.71	7.36	7.35	5.30	3.05	1.79	10.2	10.2	1.35	1.35	27.3	1.35	0.30	5.50



Alt Model-Shift Uniqueness Test

004481350-03, P = 76.405909 Days, E = 84.241534 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.3	24.5	9.32	11.5	5.31	3.06	1.62	25.0	22.8	15.2	13.0	2.71	0.93	0.25	3.21



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-694 ± 80	$1.74^{+1.19}_{-0.94}$	401^{+13}_{-13}	4553^{+2020}_{-765}	10390^{+40940}_{-6623}
Alt.	-3648 ± 149	$2.56^{+1.18}_{-1.09}$	399^{+14}_{-13}	5474^{+1864}_{-812}	25869^{+54247}_{-13826}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

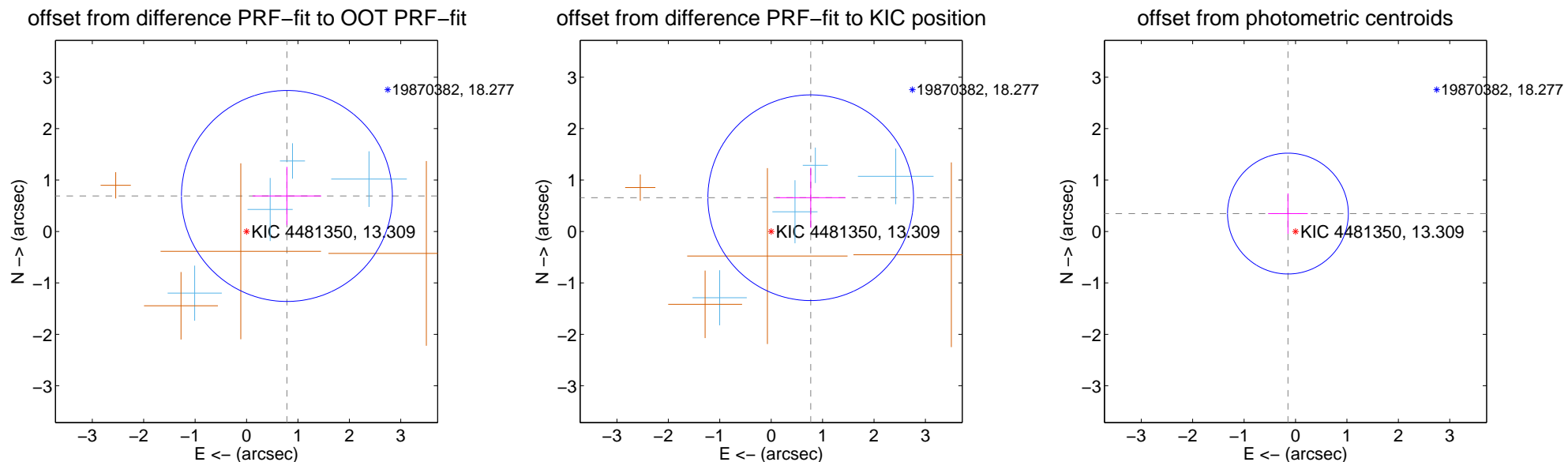
DV Centroid Data

Supplemental centroid analysis for 004481350-03. Kepler magnitude: 13.31. Transit SNR 6.49

There are 4 quarters with good PRF difference image offsets

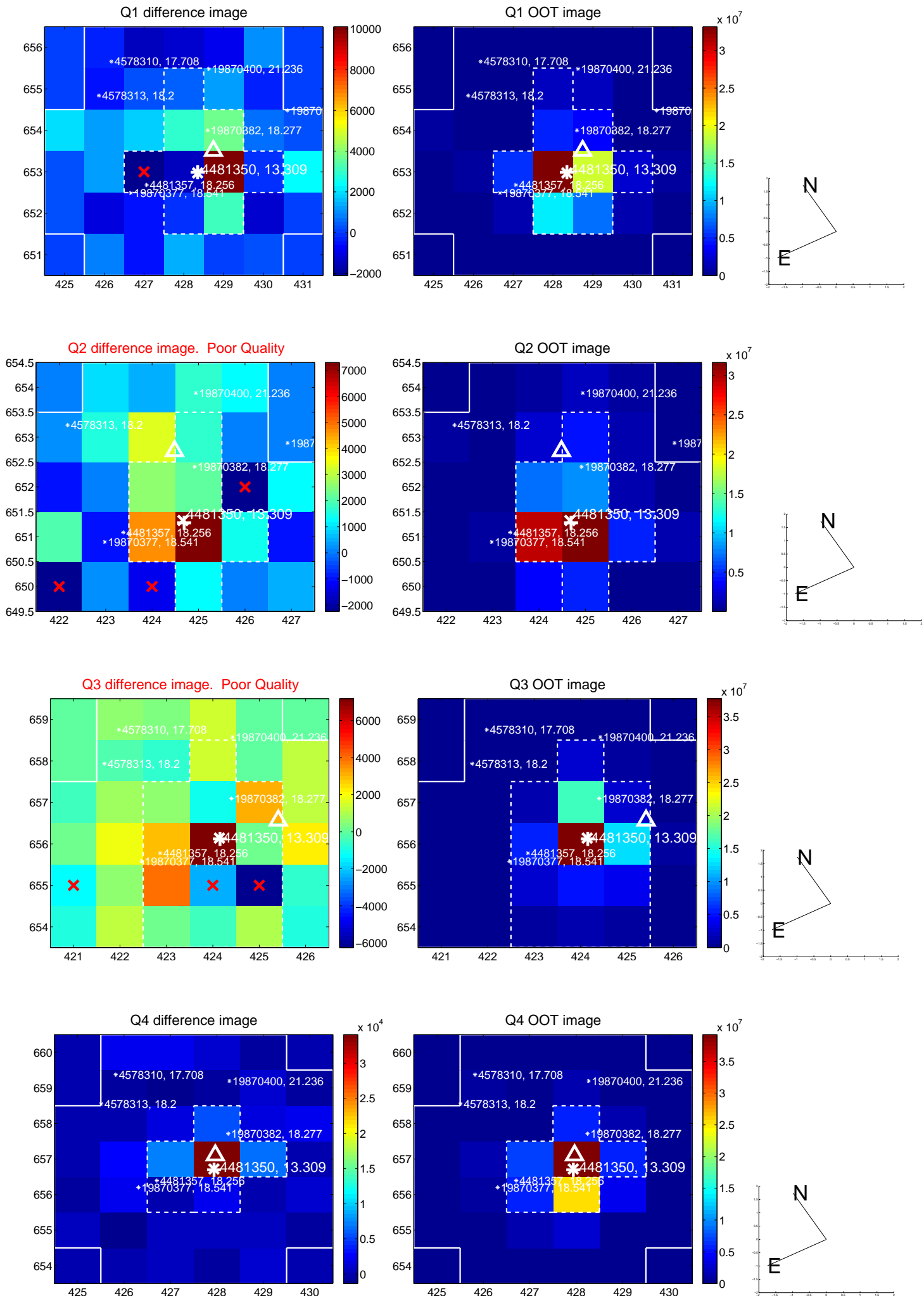
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.046 ± 0.684	1.53	-0.785 ± 0.668	0.690 ± 0.565
PRF-fit source offset from KIC position	1.011 ± 0.667	1.52	-0.769 ± 0.677	0.656 ± 0.585
photometric centroid source offset	0.38 ± 0.39	0.97	0.15 ± 0.39	0.35 ± 0.39

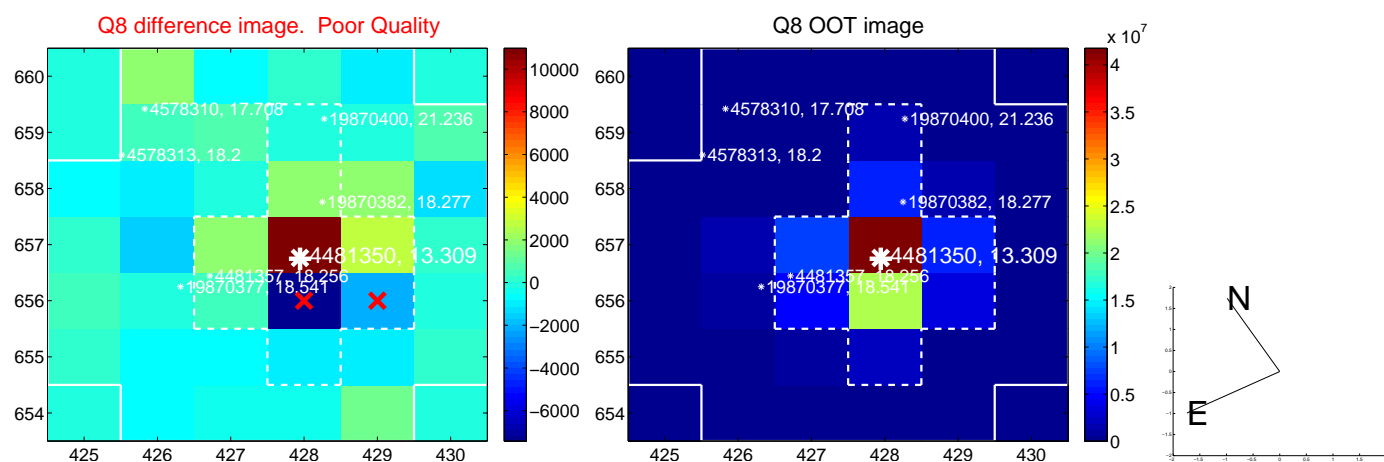
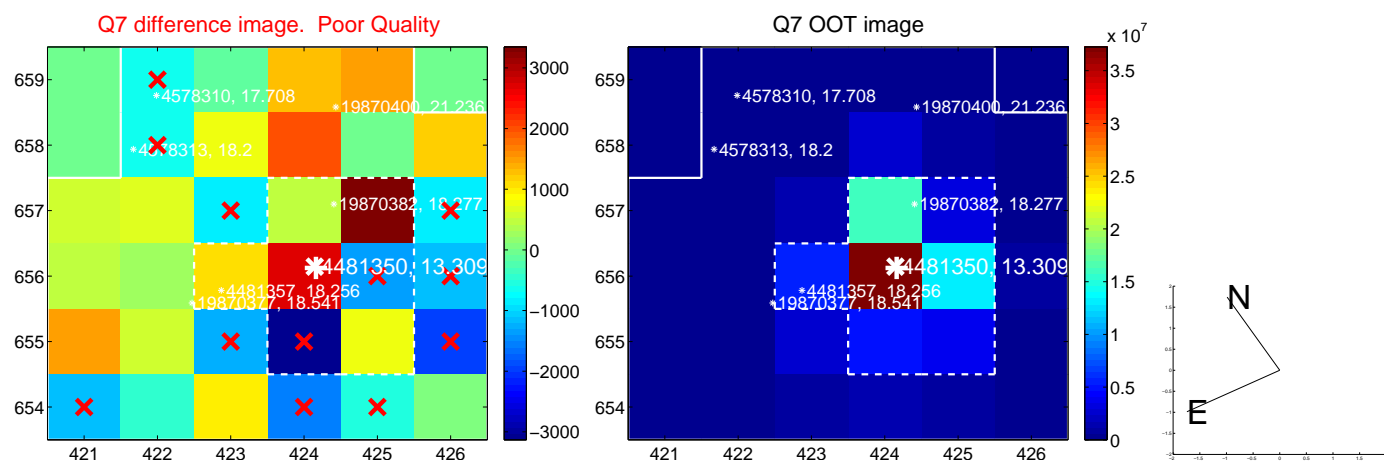
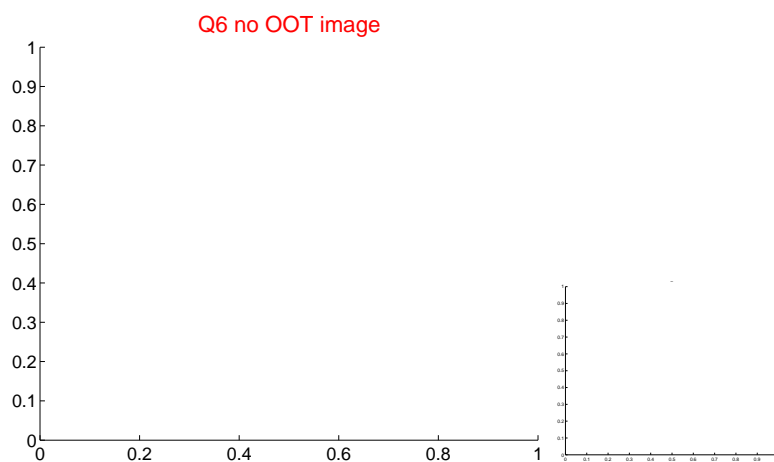
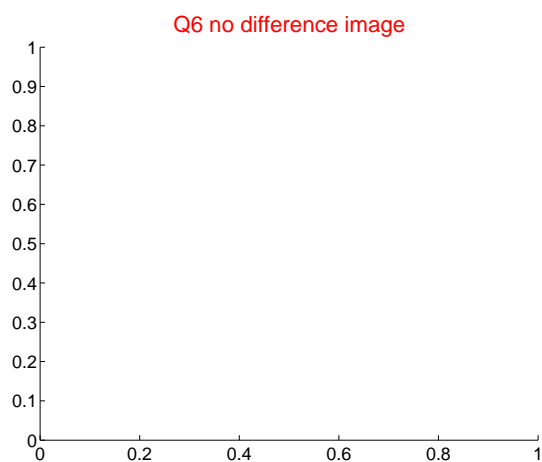
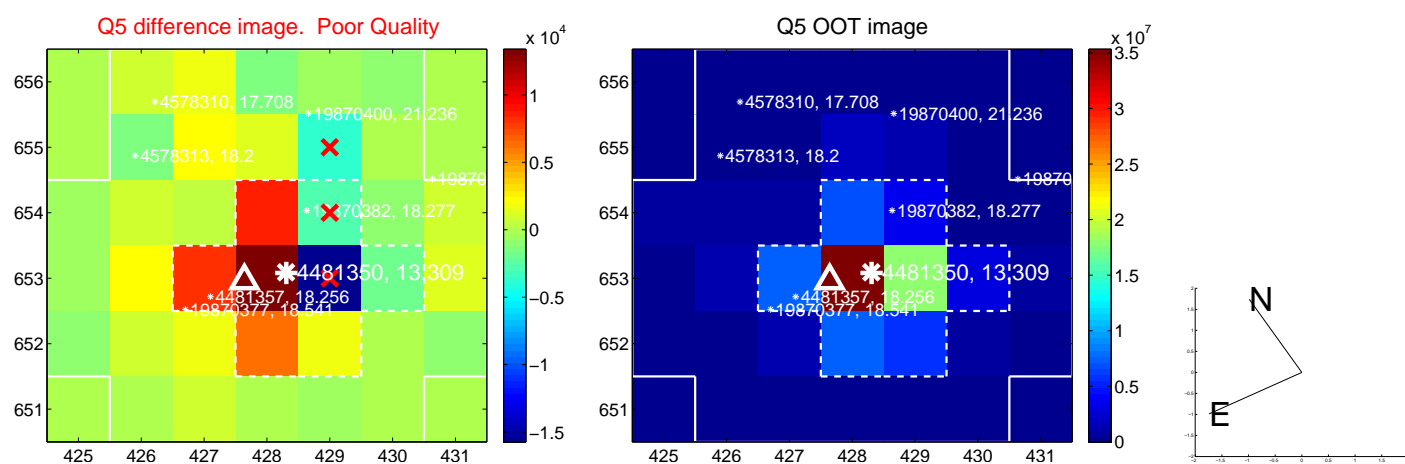


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

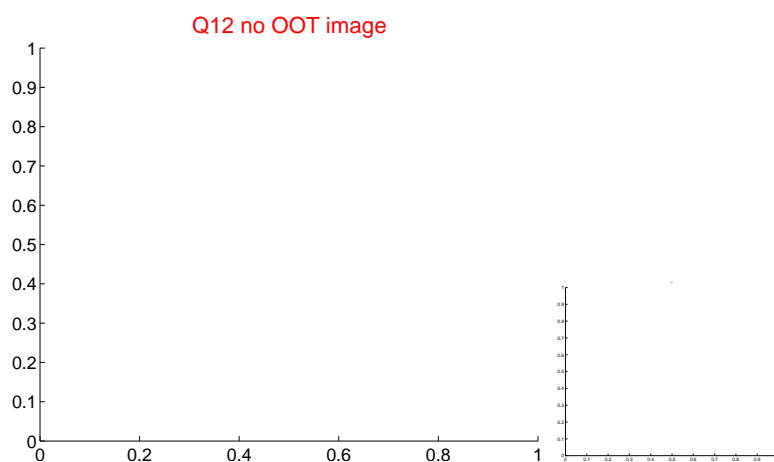
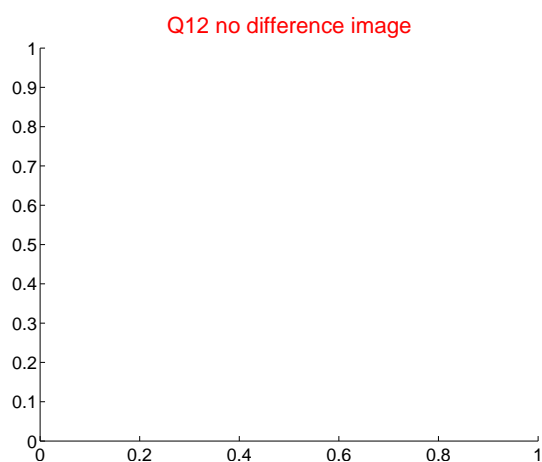
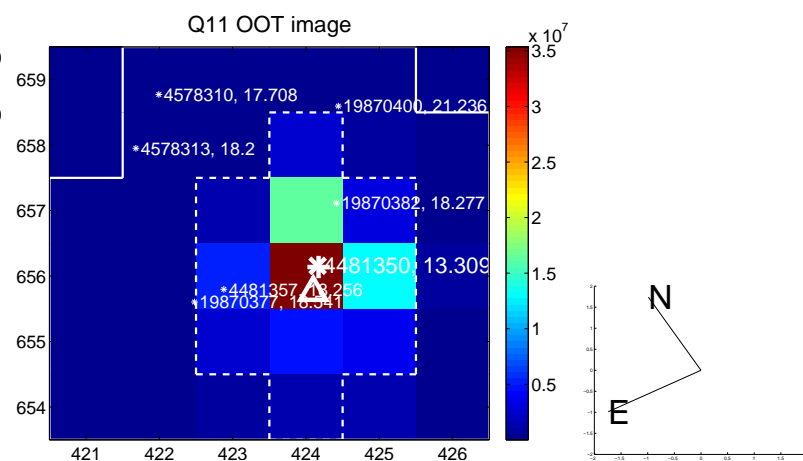
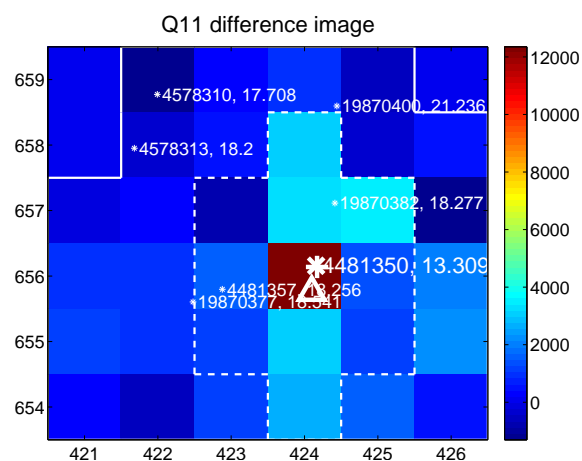
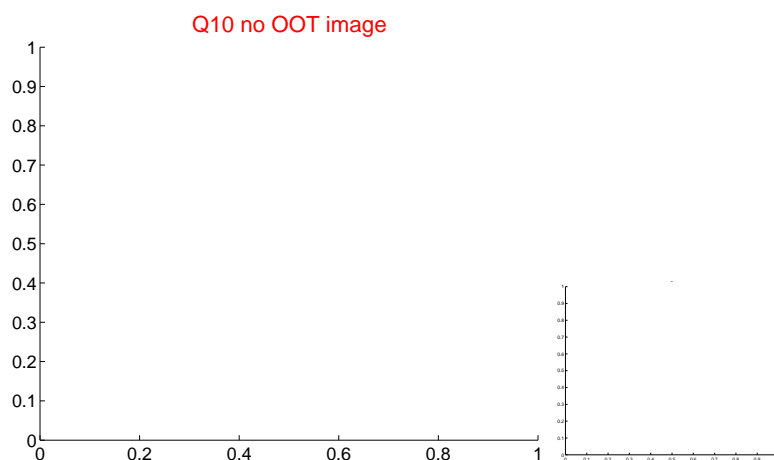
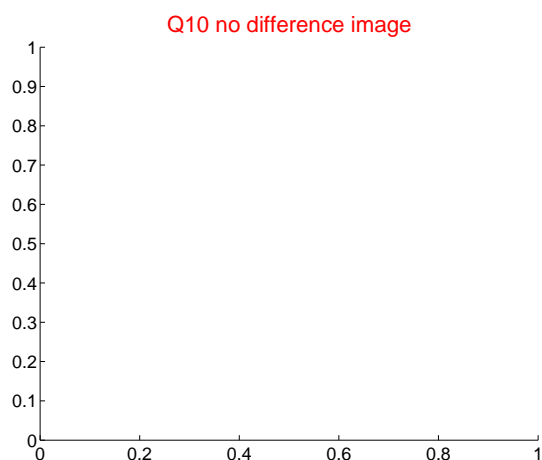
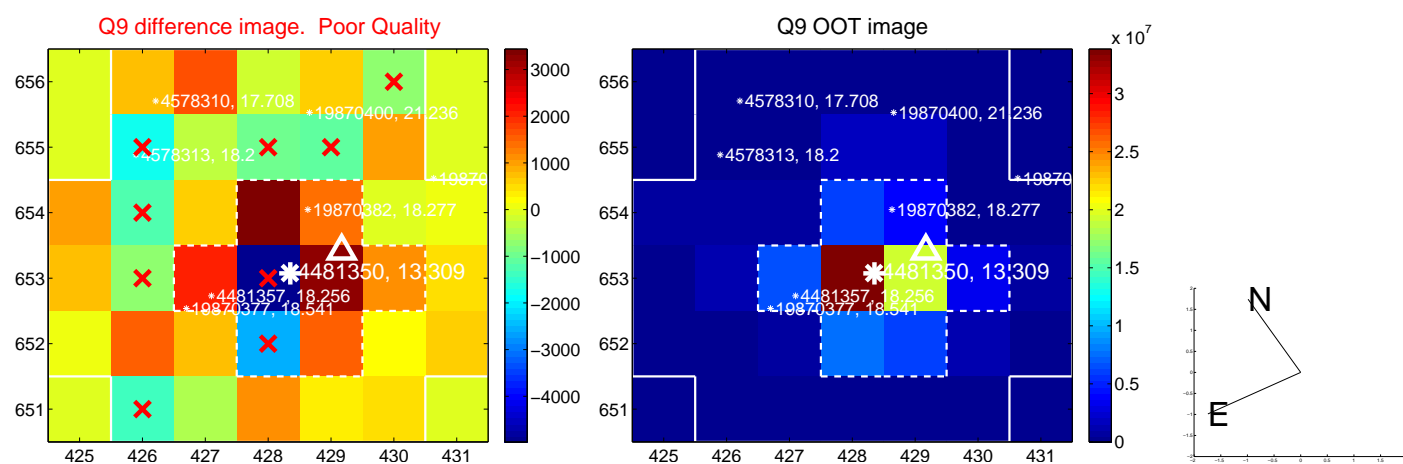
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



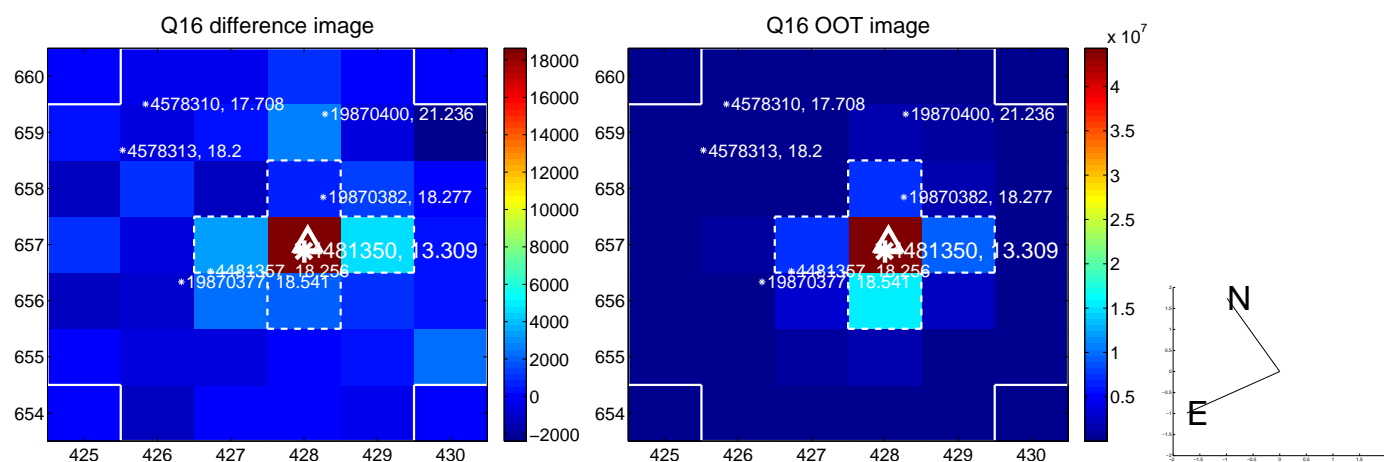
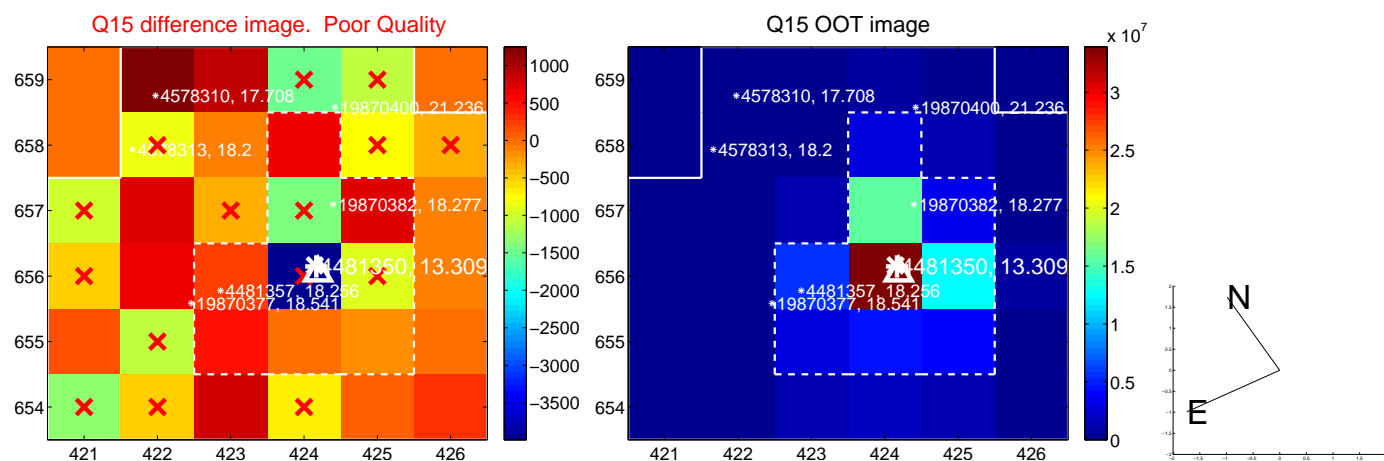
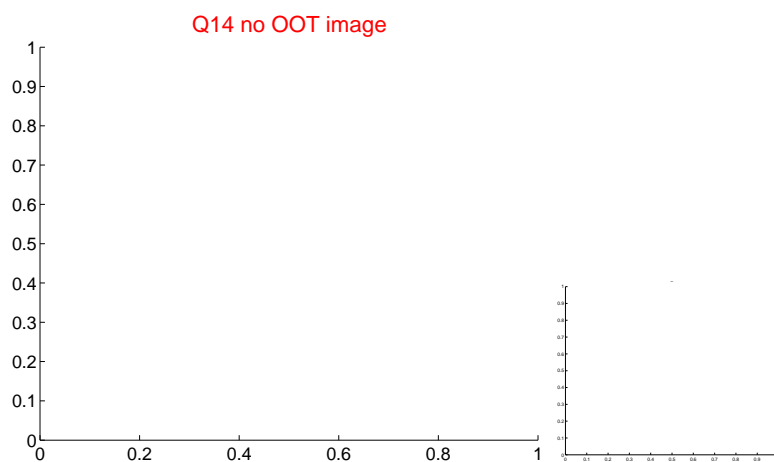
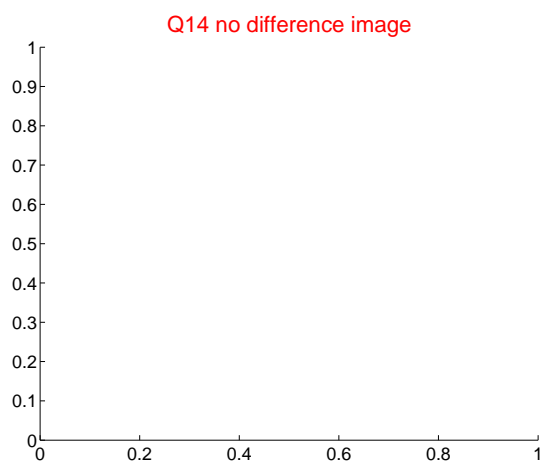
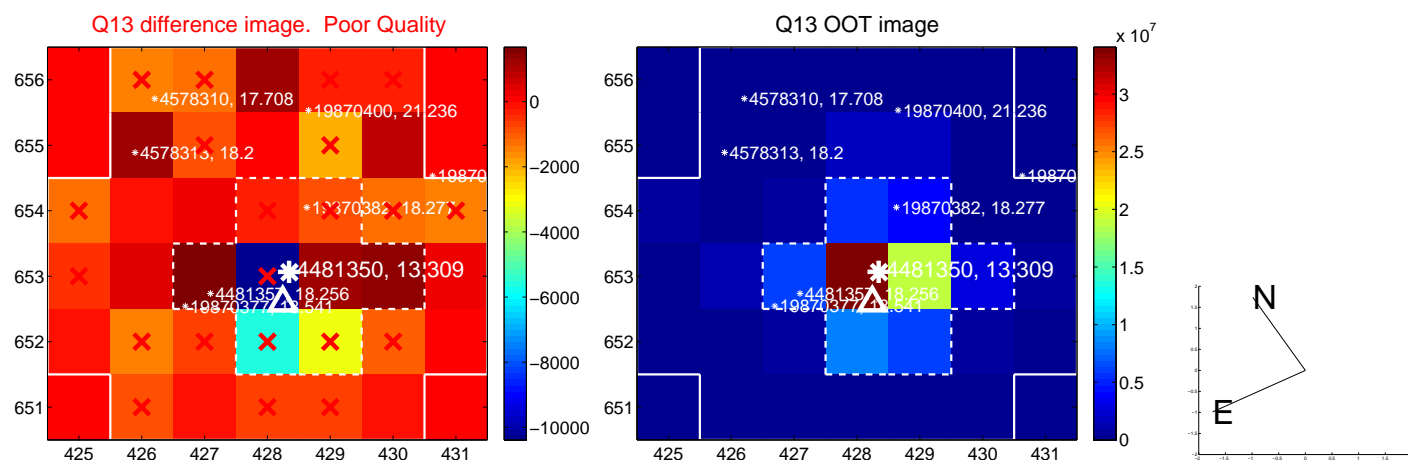
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



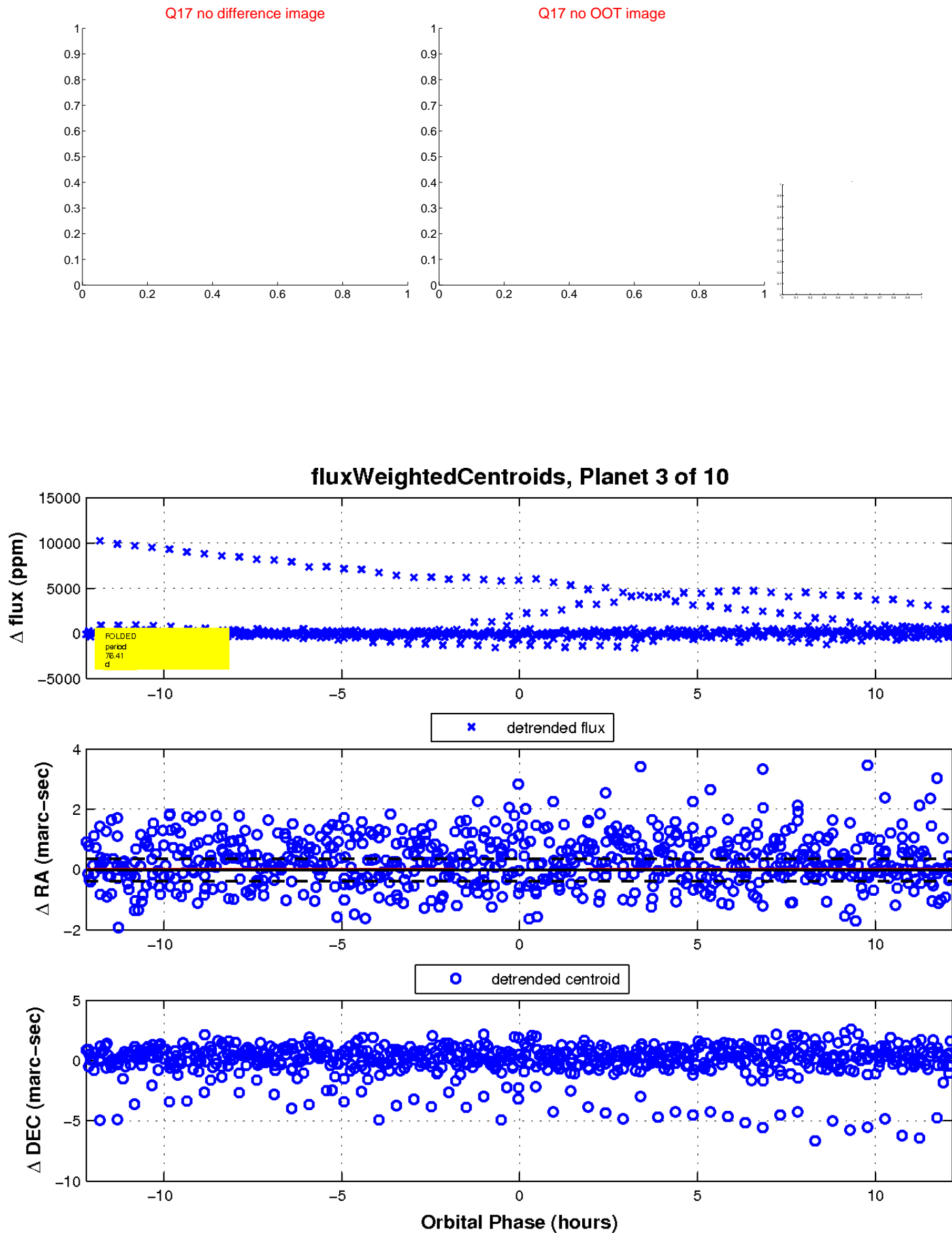
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



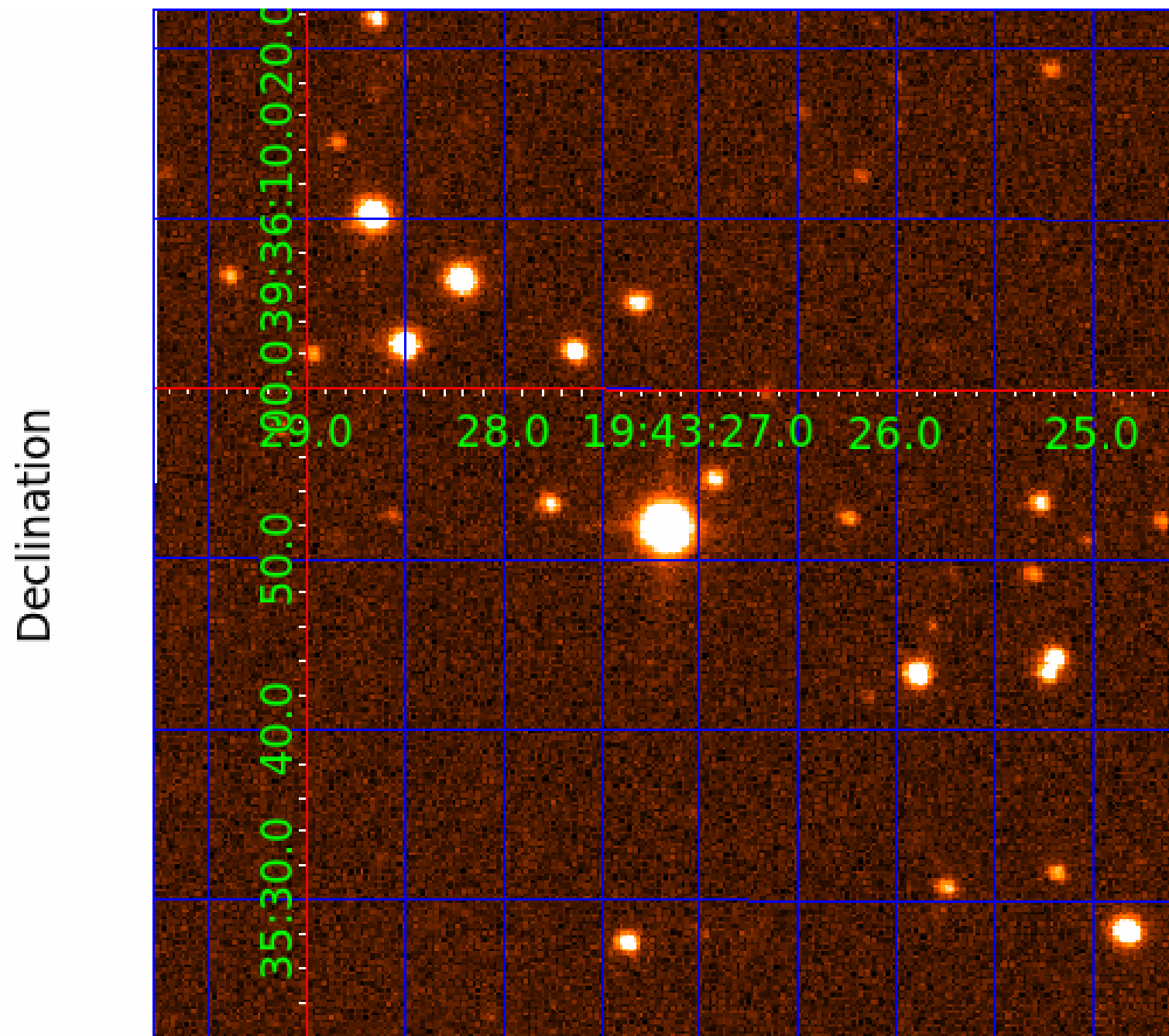
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

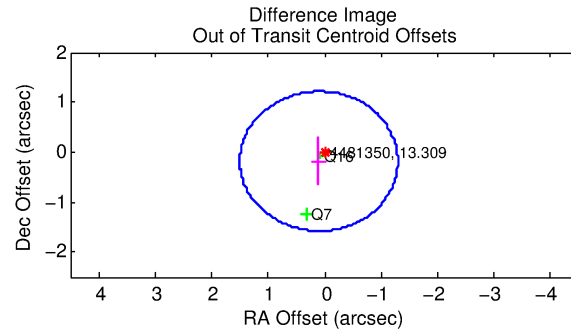
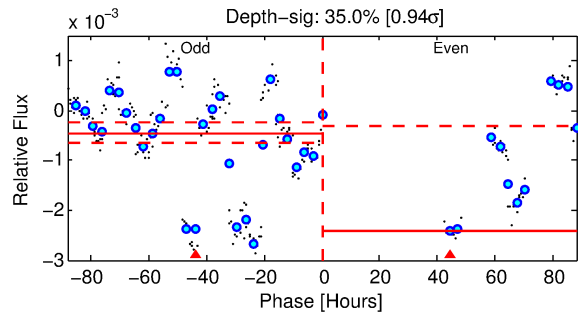
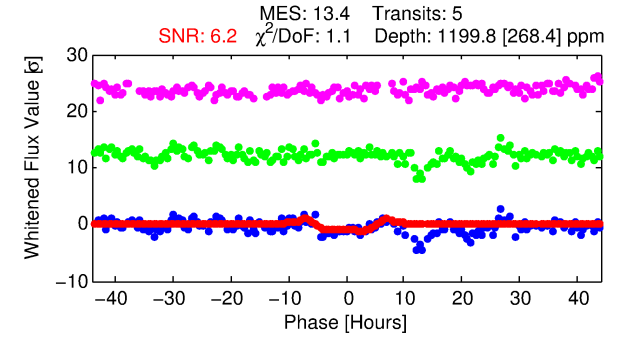
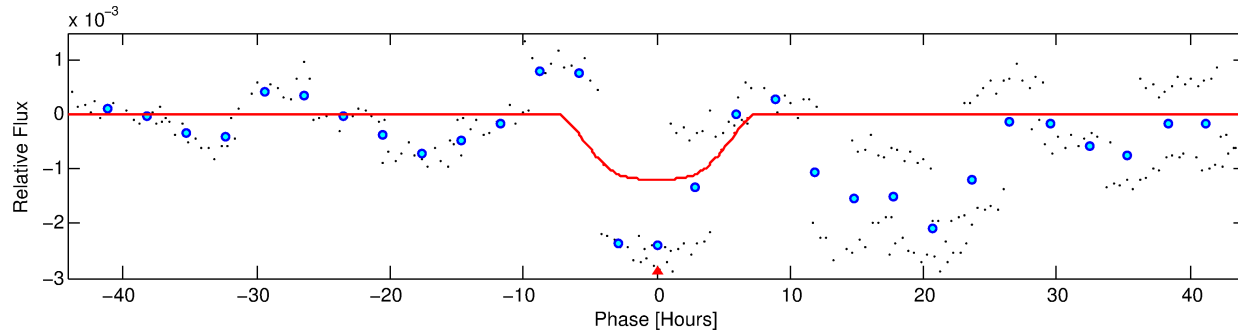
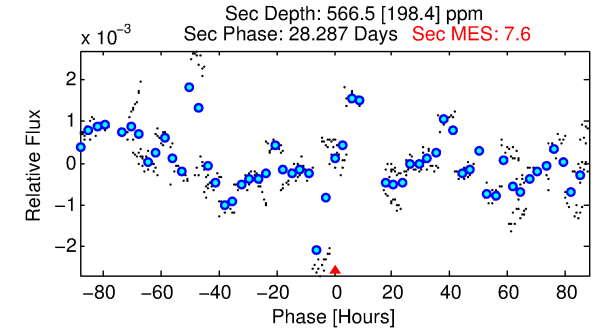
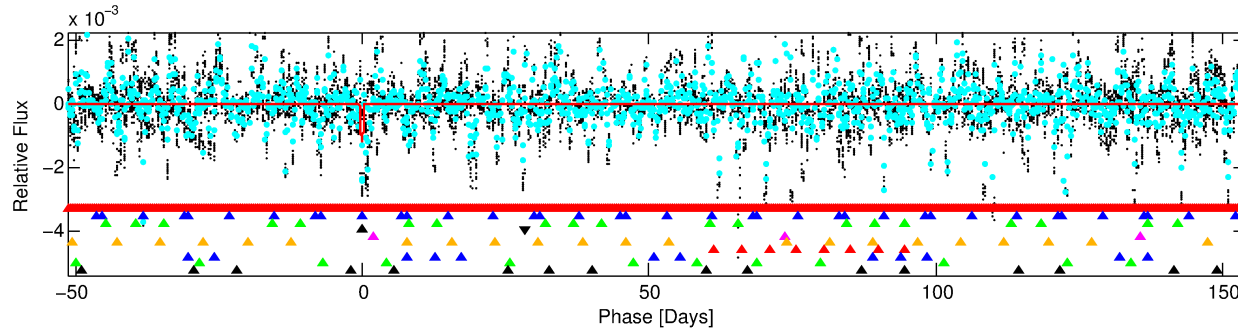
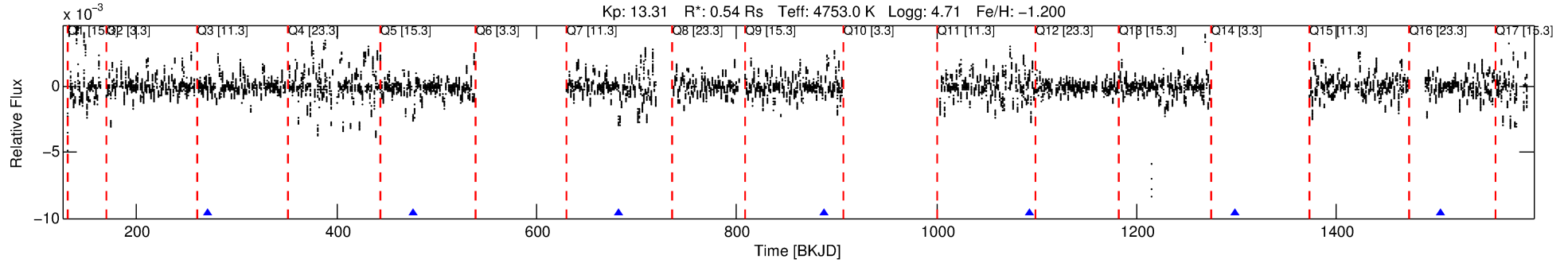
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-04

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 4 of 10 Period: 205.434 d



DV Fit Results:

Period = 205.43369 [0.00852] d
Epoch = 271.5652 [0.0287] BKJD
Rp/R* = 0.0410 [0.0049]
a/R* = 46.18 [5.78]
b = 0.95 [0.02]
Seff = 0.43 [0.06]
Teq = 207 [7] K
Rp = 2.43 [0.32] Re
a = 0.5598 [0.0290] AU
Ag = 16580.84 [7143.54] [2.32 σ]
Teffp = 3623 [398] K [8.58 σ]

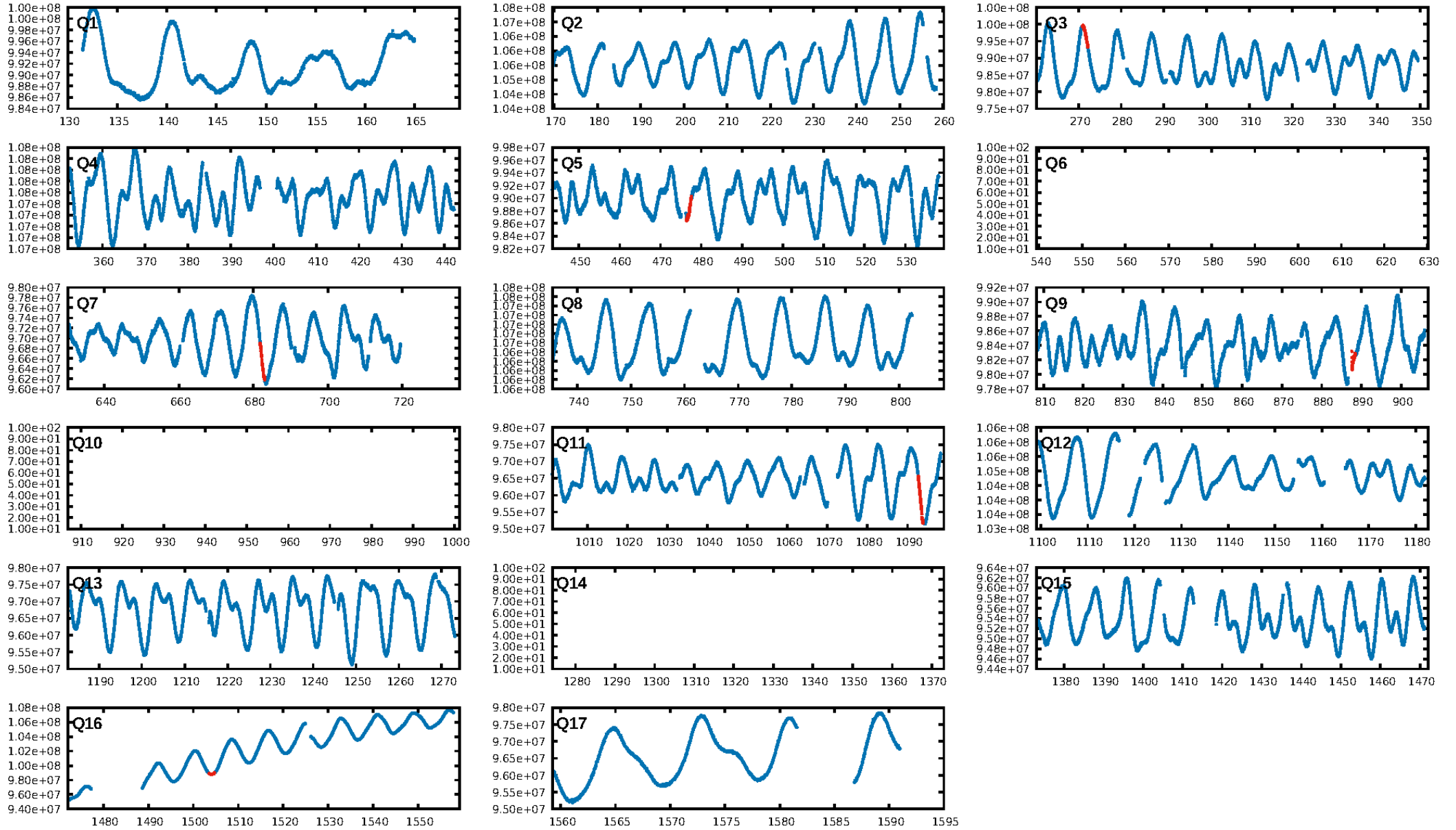
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.44 σ]
LongPeriod-sig: 100.0% [83.31 σ]
ModelChiSquare2-sig: 2.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 3.443
Centroid-sig: N/A
Centroid-so: 0.171 arcsec [0.64 σ]
OotOffset-rm: 0.208 arcsec [0.45 σ]
KicOffset-rm: 0.278 arcsec [0.81 σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.00 [0/2]

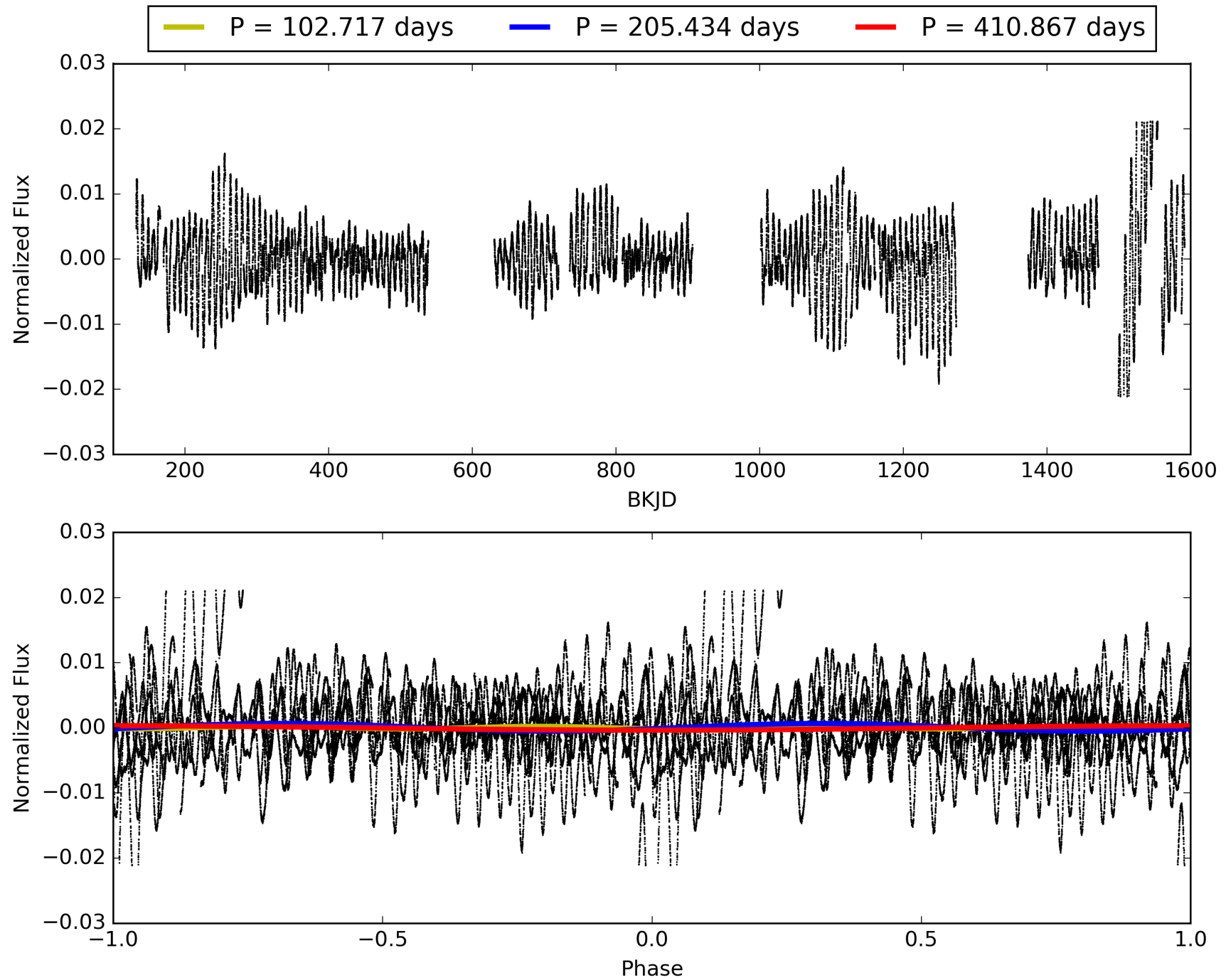
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:37 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-04, PDC Light Curves

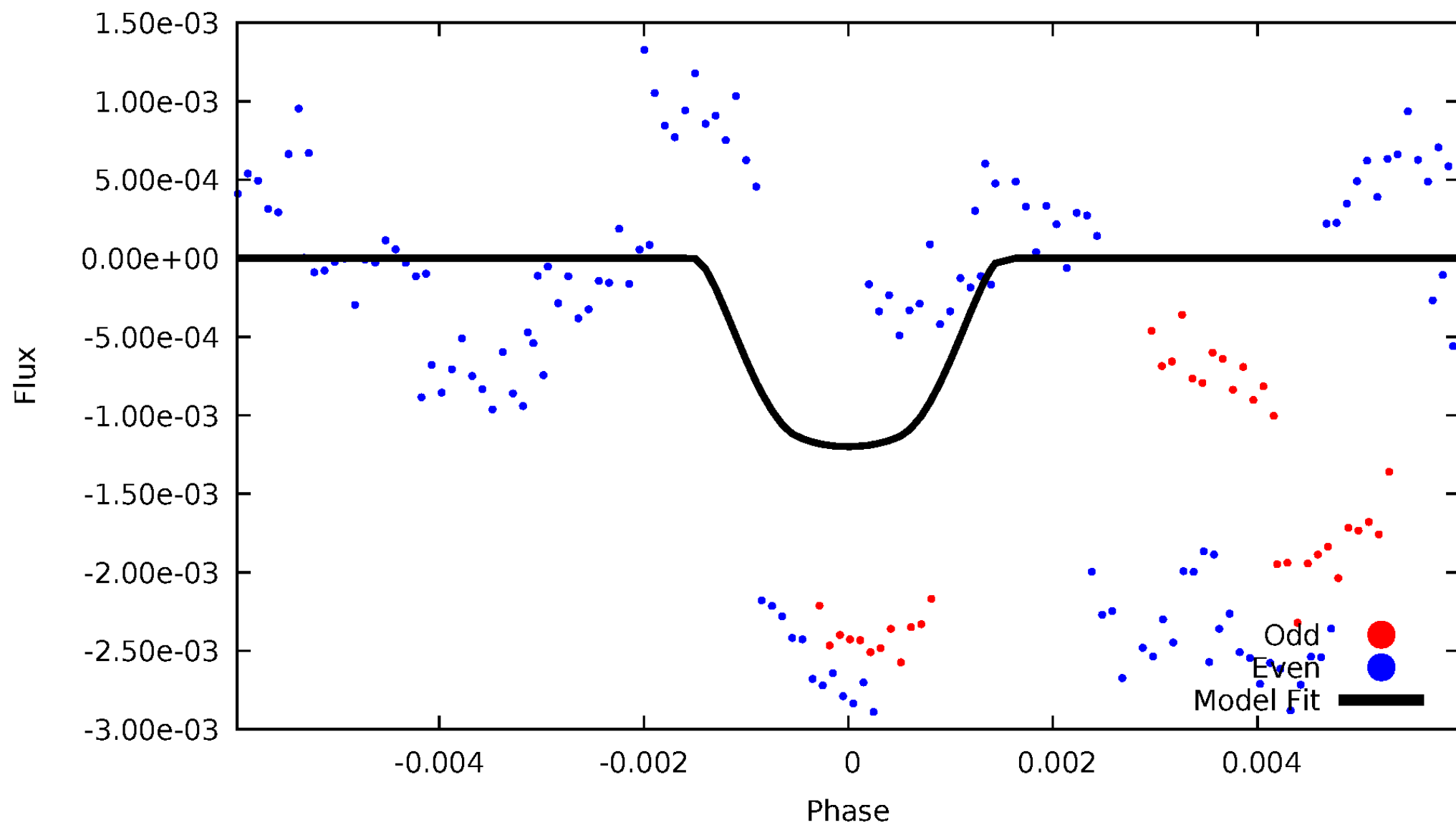


TCE 004481350-04



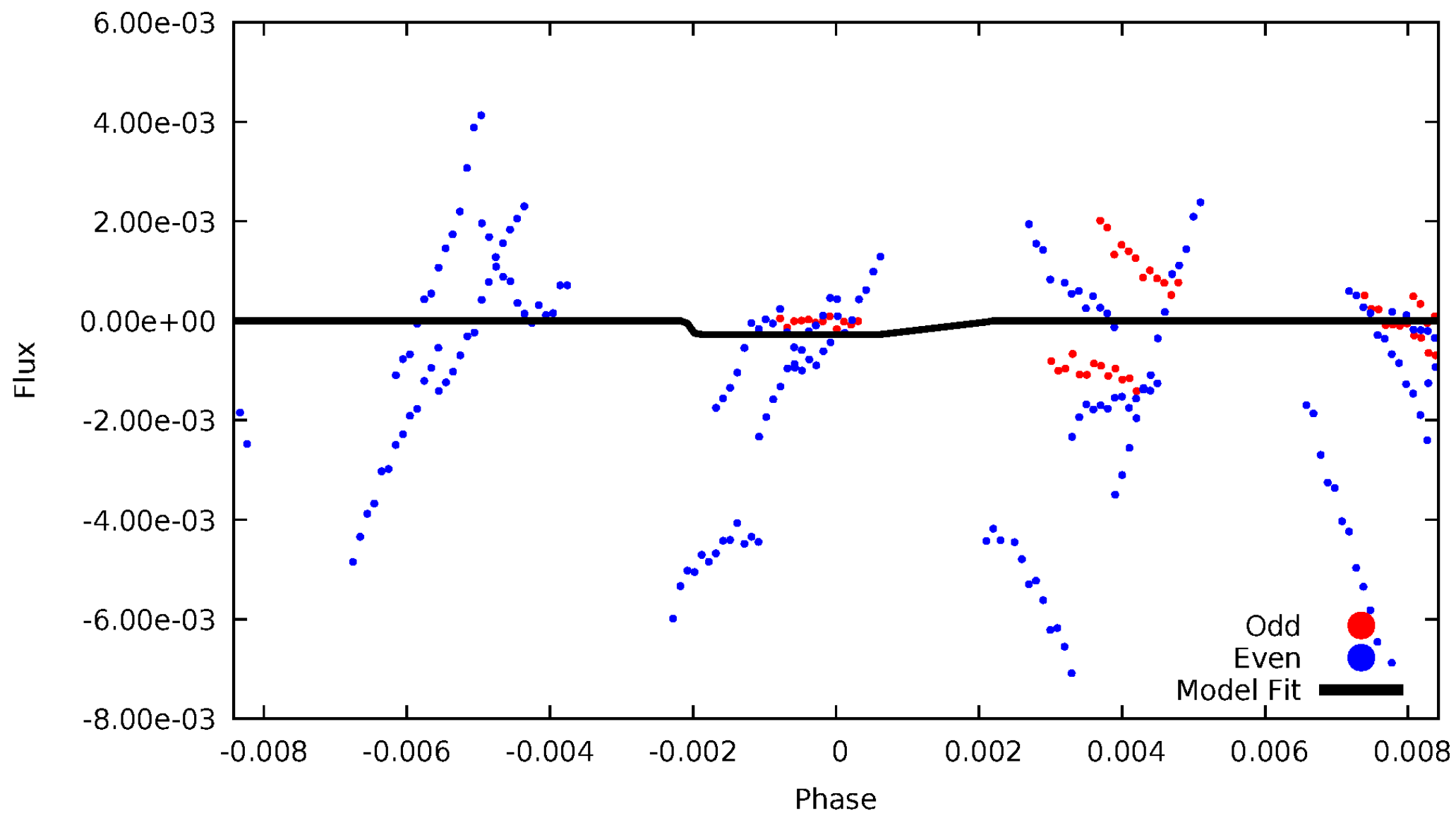
DV Odd/Even

TCE 004481350-04



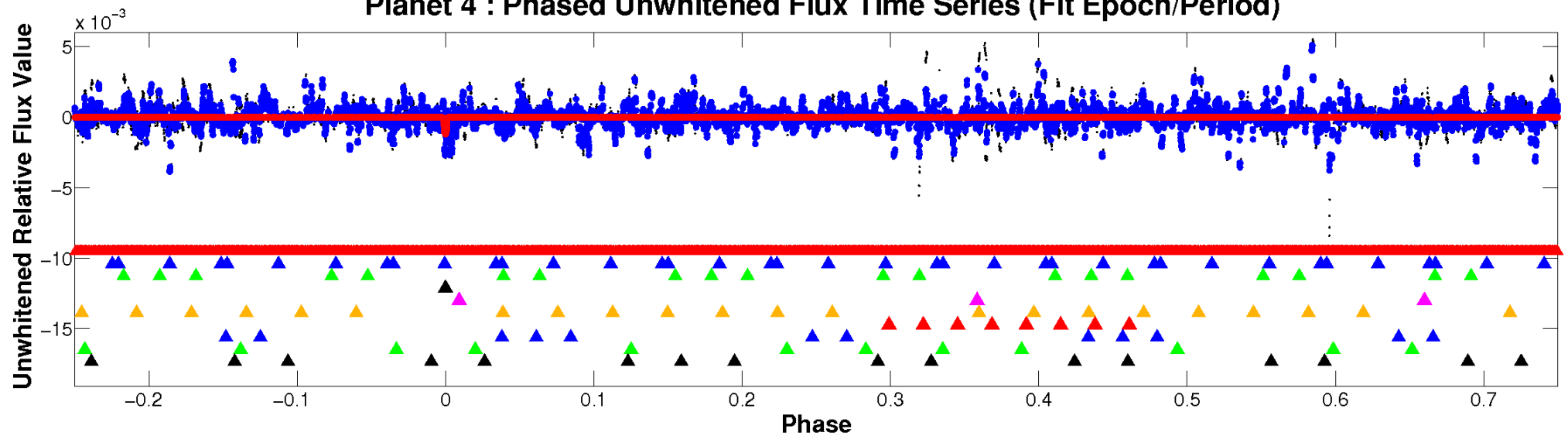
ALT Odd/Even

TCE 004481350-04

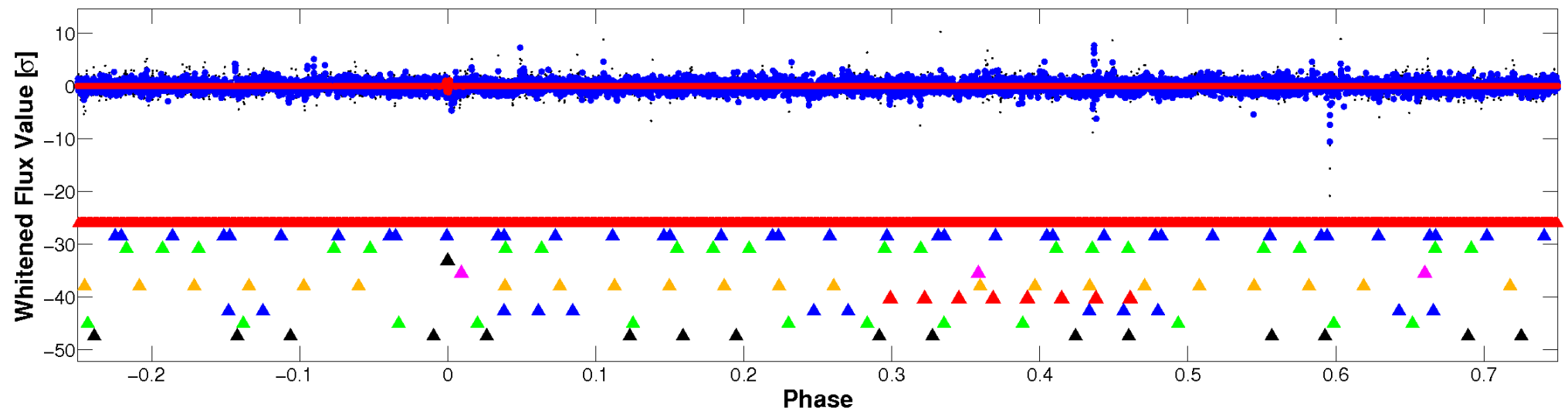


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

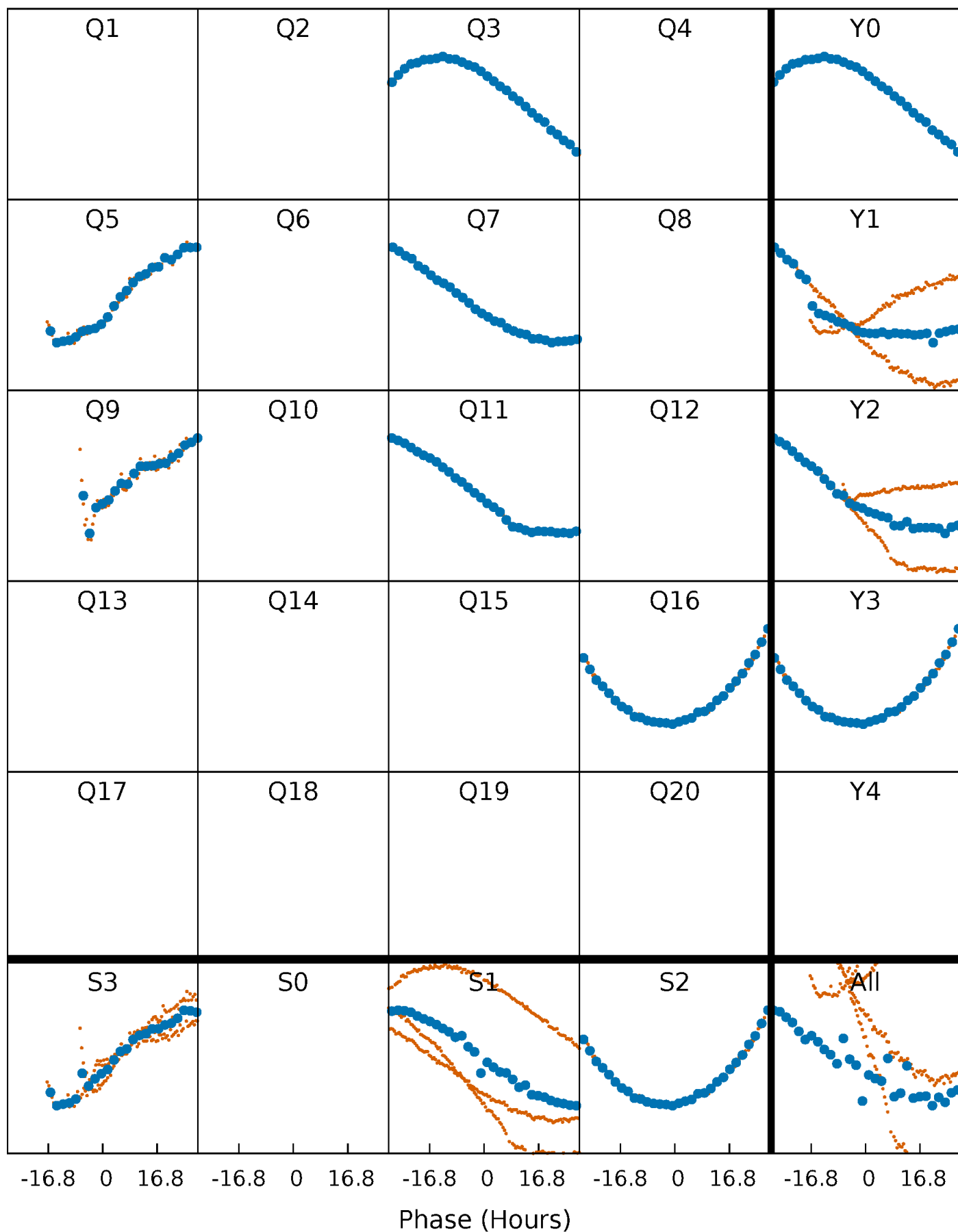


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



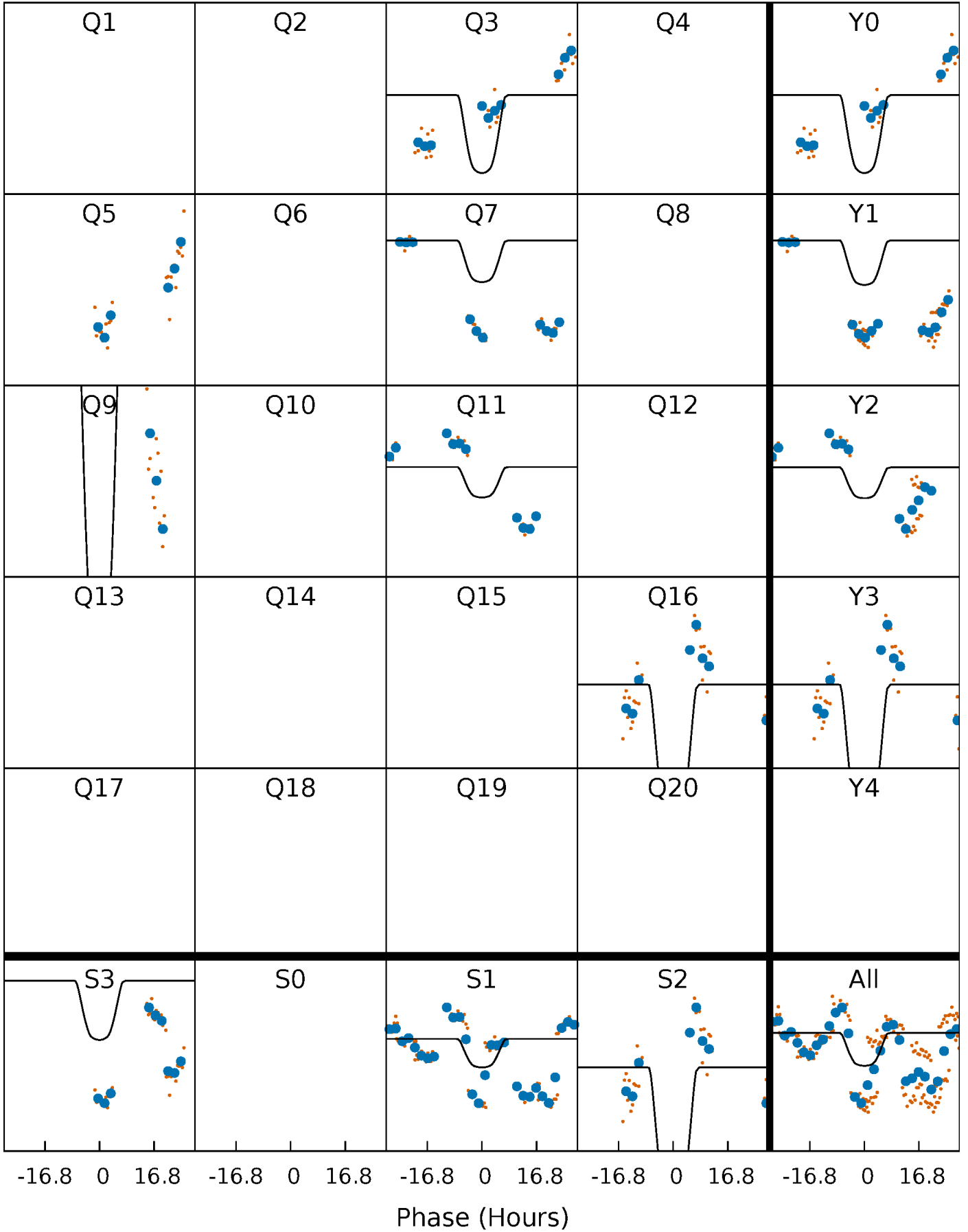
PDC Quarter-Phased Transit Curves

TCE 004481350-04 P=205.433689 Days $T_0=271.565193$ (BKJD)



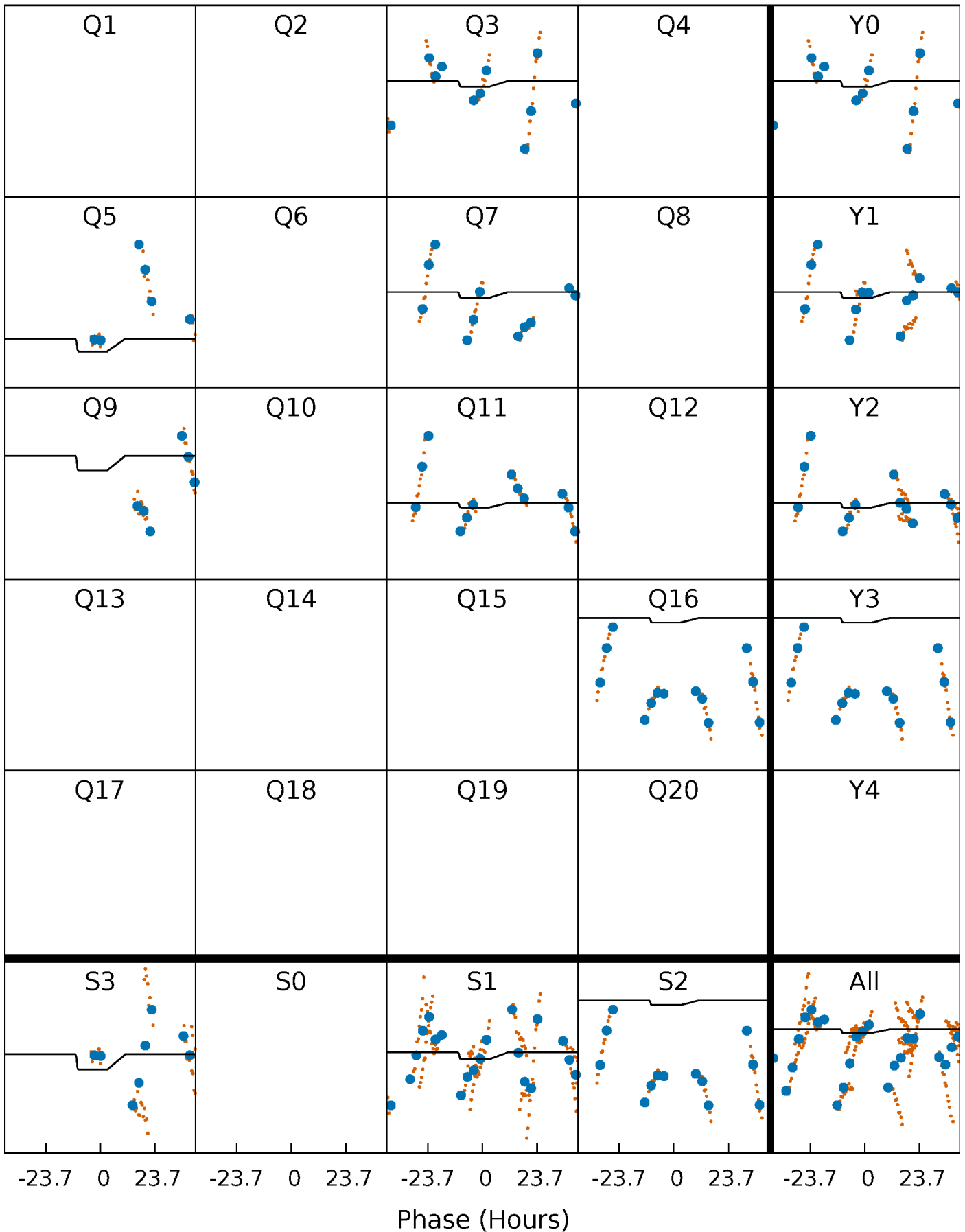
DV Quarter-Phased Transit Curves

TCE 004481350-04 $P=205.433689$ Days $T_0=271.565193$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

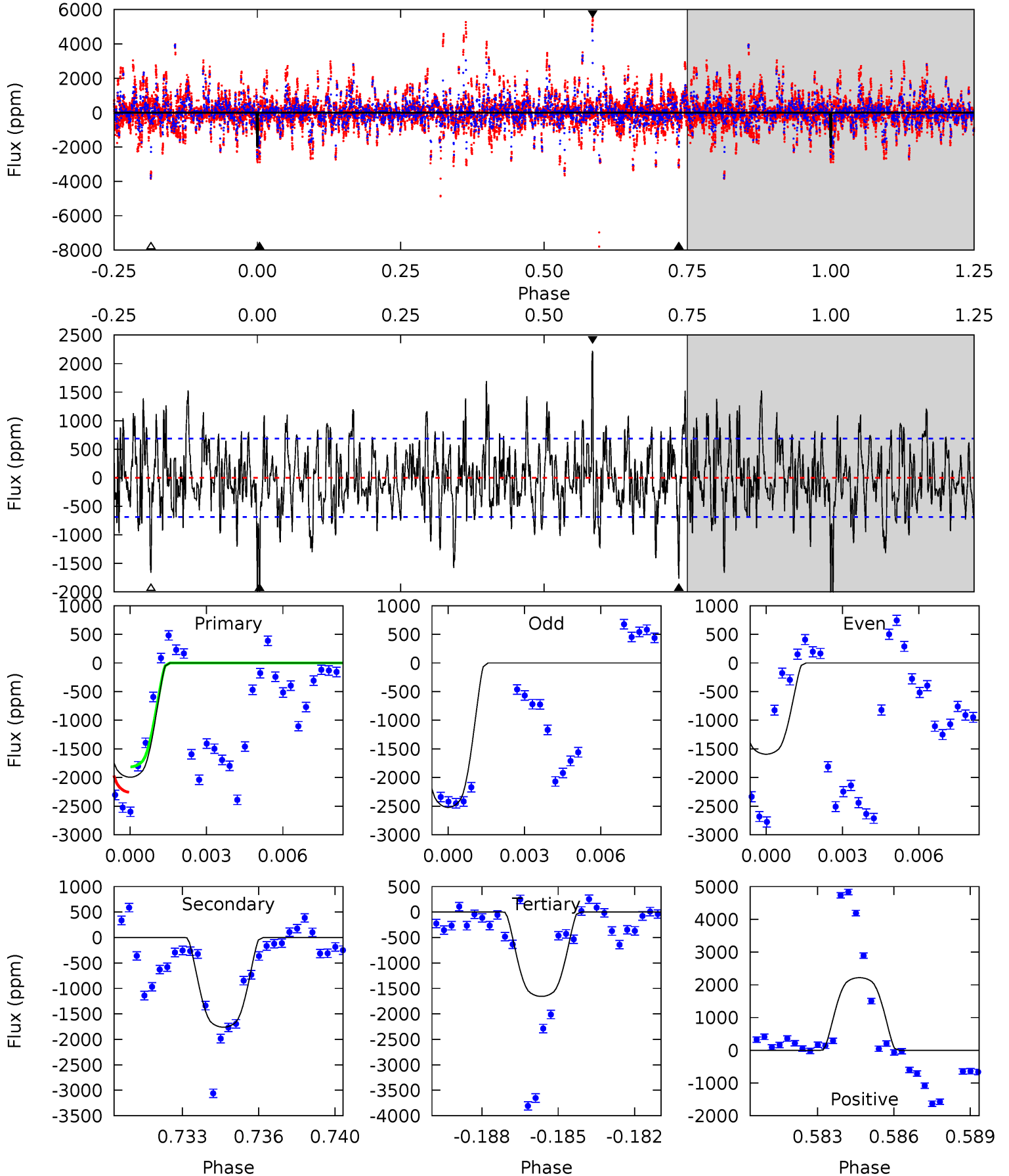
TCE 004481350-04 $P=205.377712$ Days $T_0=271.724186$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-04, P = 205.433689 Days, E = 66.131504 Days

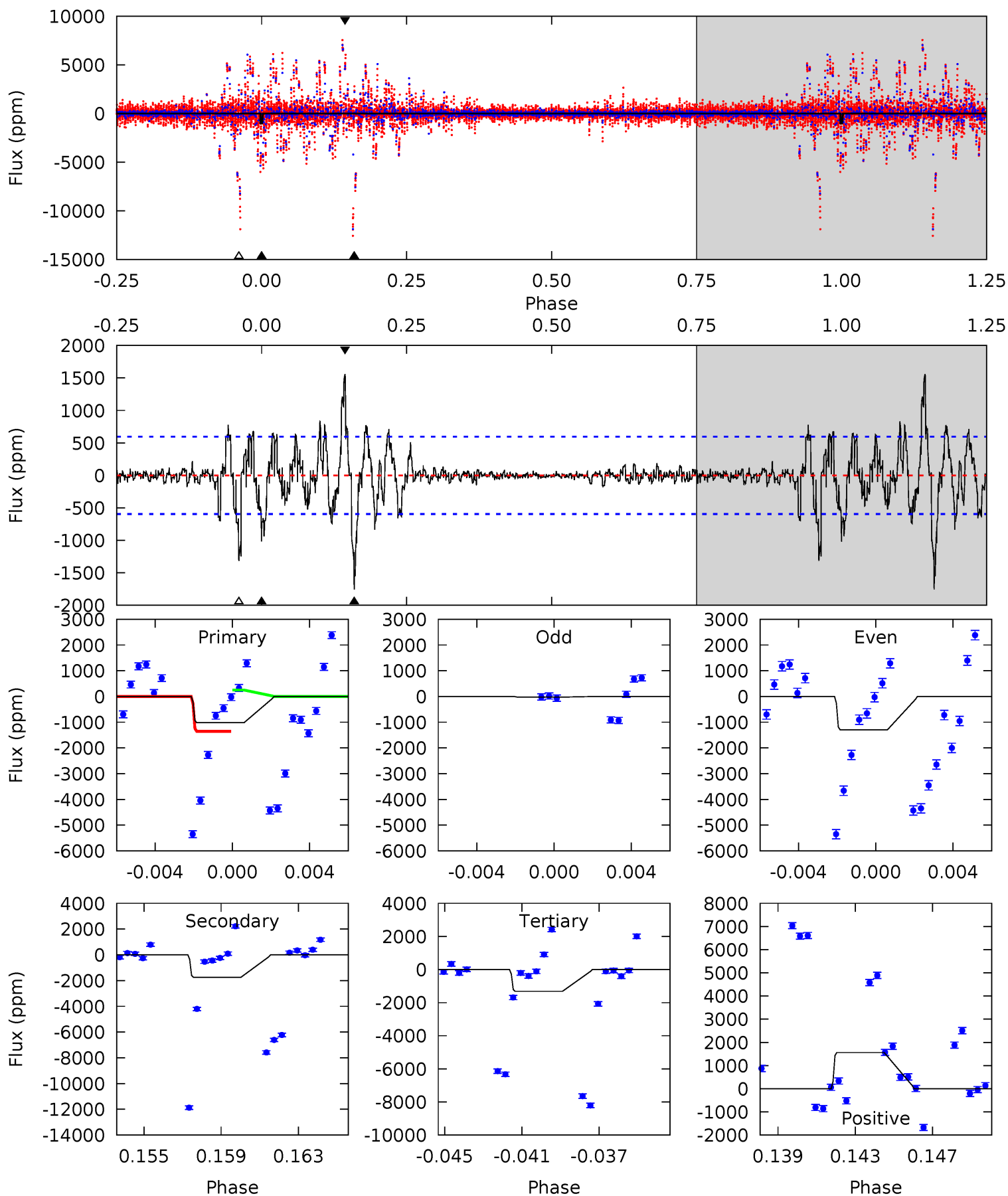
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	13.4	12.6	16.9	5.24	2.95	3.88	2.58	-1.71	0.80	-3.49	2.83	1.14	0.53	1.66



Alt Model-Shift Uniqueness Test

004481350-04, P = 205.377712 Days, E = 66.346474 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.90	15.3	11.5	13.6	5.20	2.87	2.07	-2.61	-4.75	3.84	1.69	6.11	2.11	0.47	3.42



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1761 ± 131	$2.42^{+0.31}_{-0.30}$	287^{+10}_{-9}	4790^{+321}_{-264}	52206^{+15511}_{-11415}
Alt.	-1755 ± 114	$0.97^{+0.31}_{-0.29}$	288^{+9}_{-10}	7459^{+1991}_{-1015}	$328160^{+329076}_{-140801}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

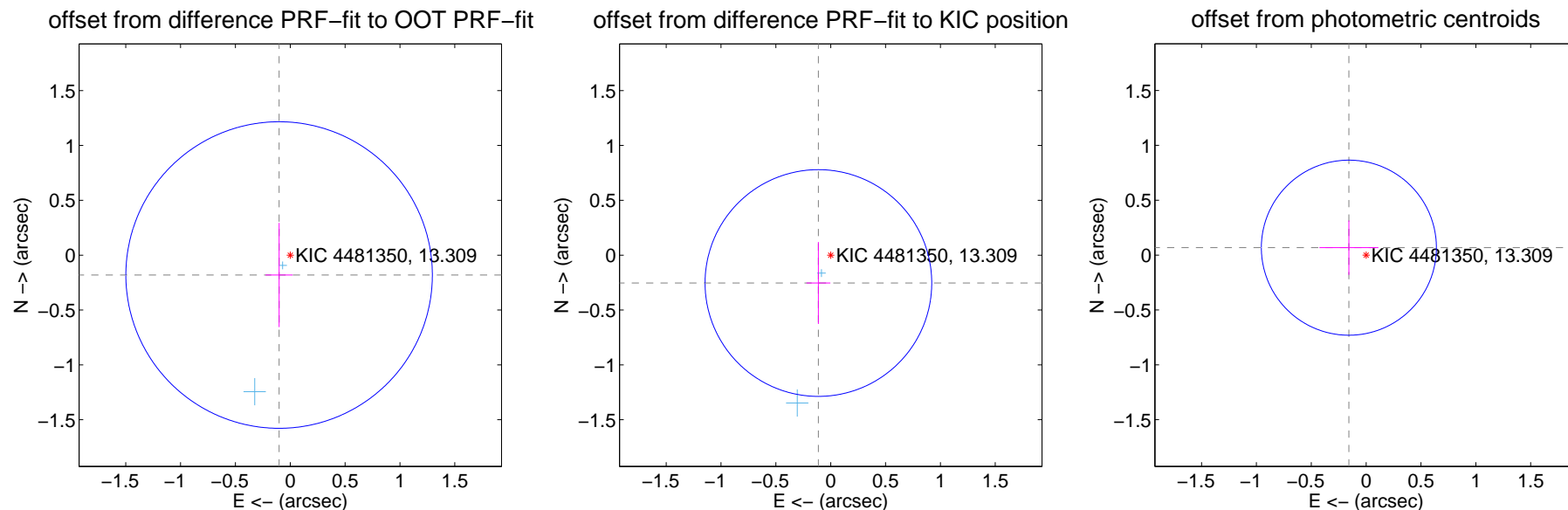
DV Centroid Data

Supplemental centroid analysis for 004481350-04. Kepler magnitude: 13.31. Transit SNR 6.19

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.208 ± 0.466	0.45	0.102 ± 0.124	-0.181 ± 0.475
PRF-fit source offset from KIC position	0.278 ± 0.344	0.81	0.112 ± 0.109	-0.254 ± 0.374
photometric centroid source offset	0.17 ± 0.27	0.64	0.16 ± 0.27	0.07 ± 0.25

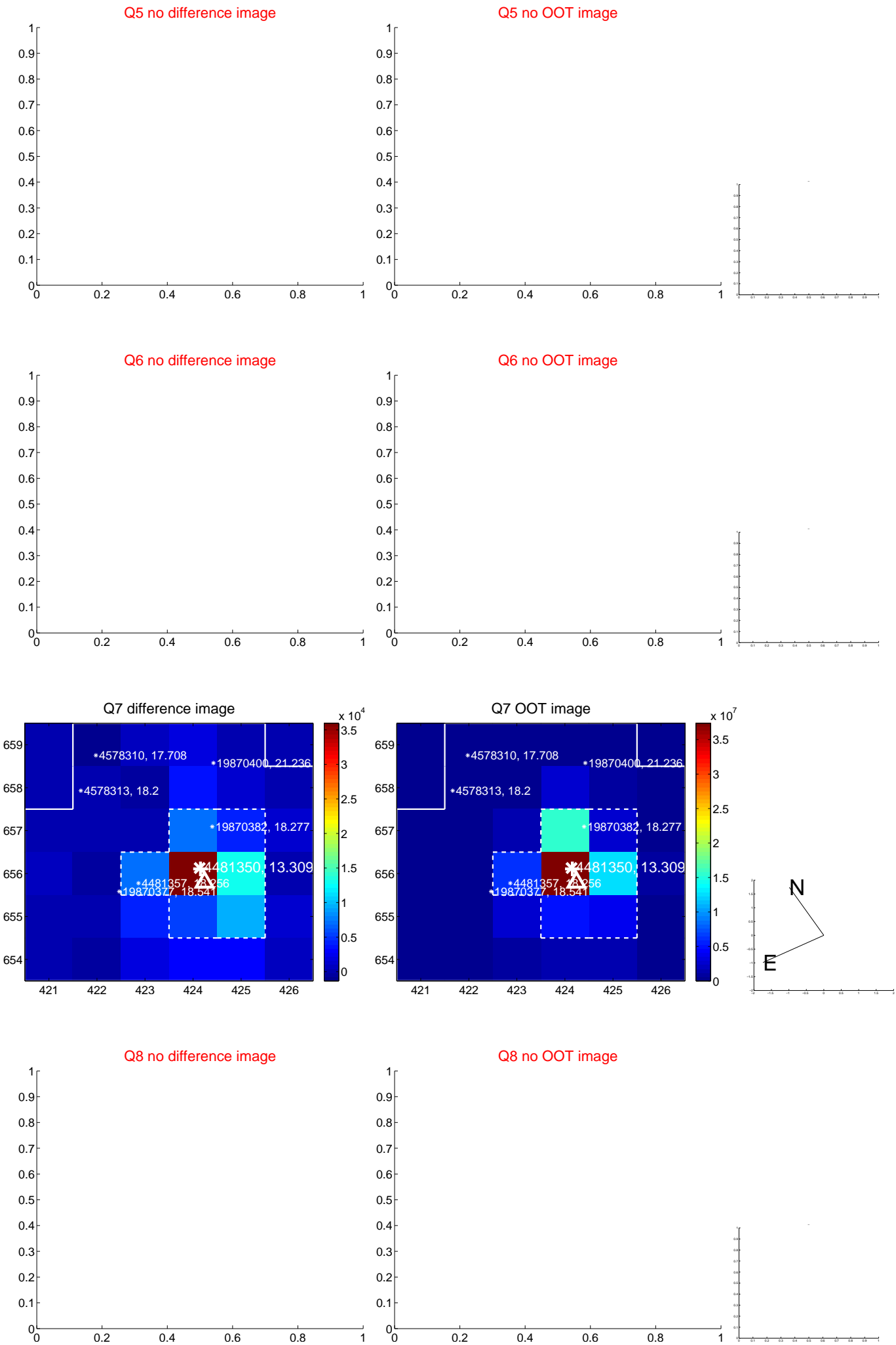


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



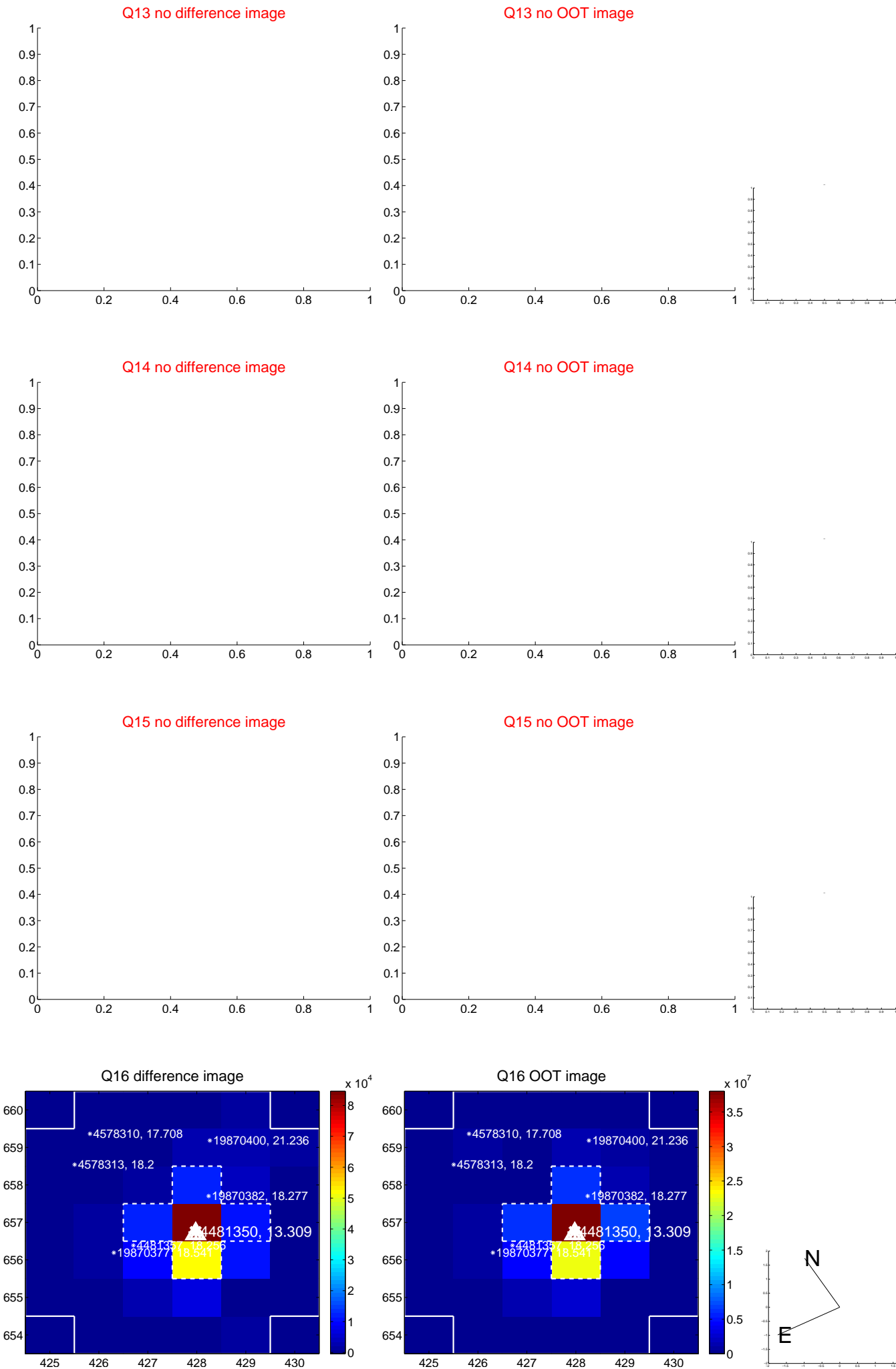
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



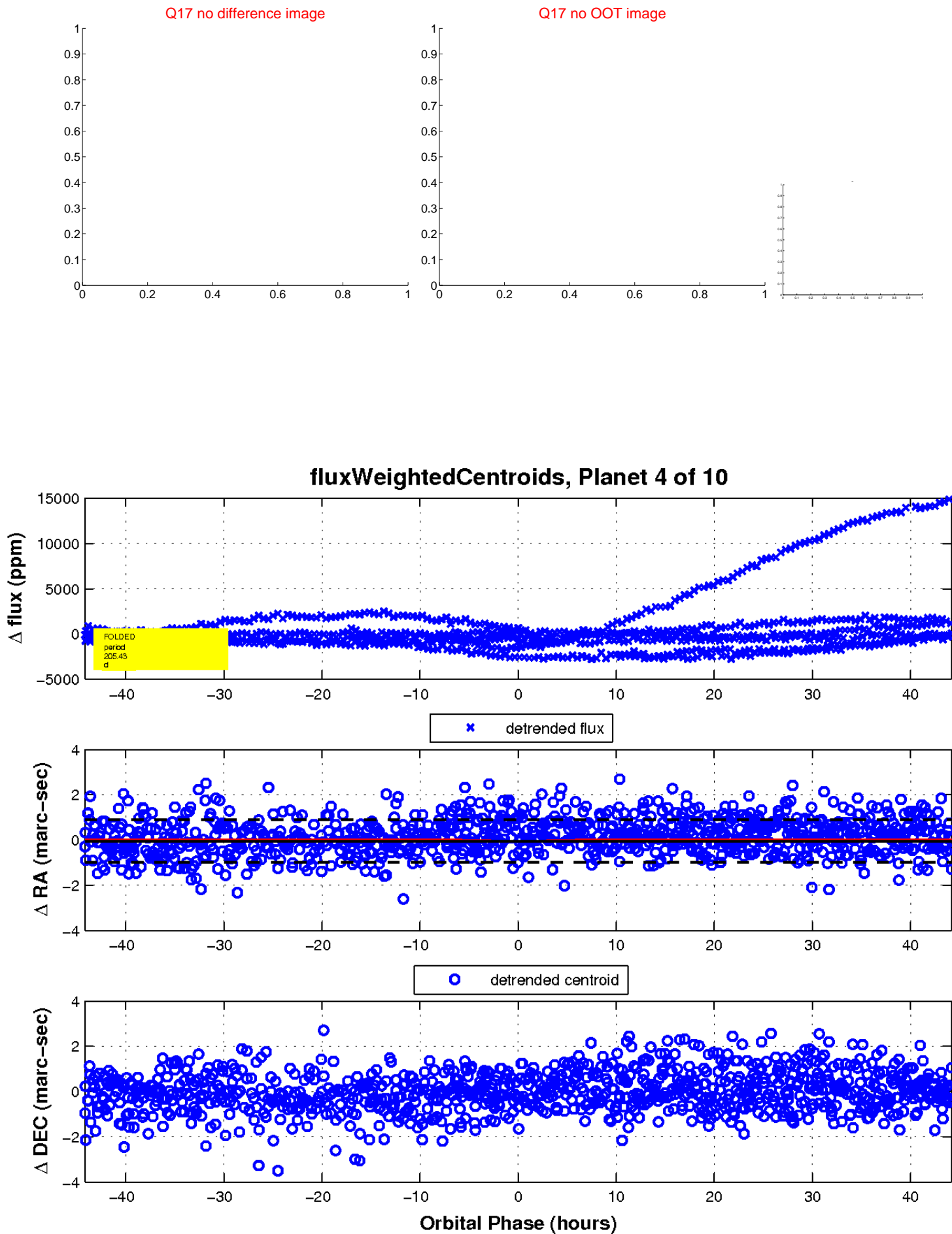
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



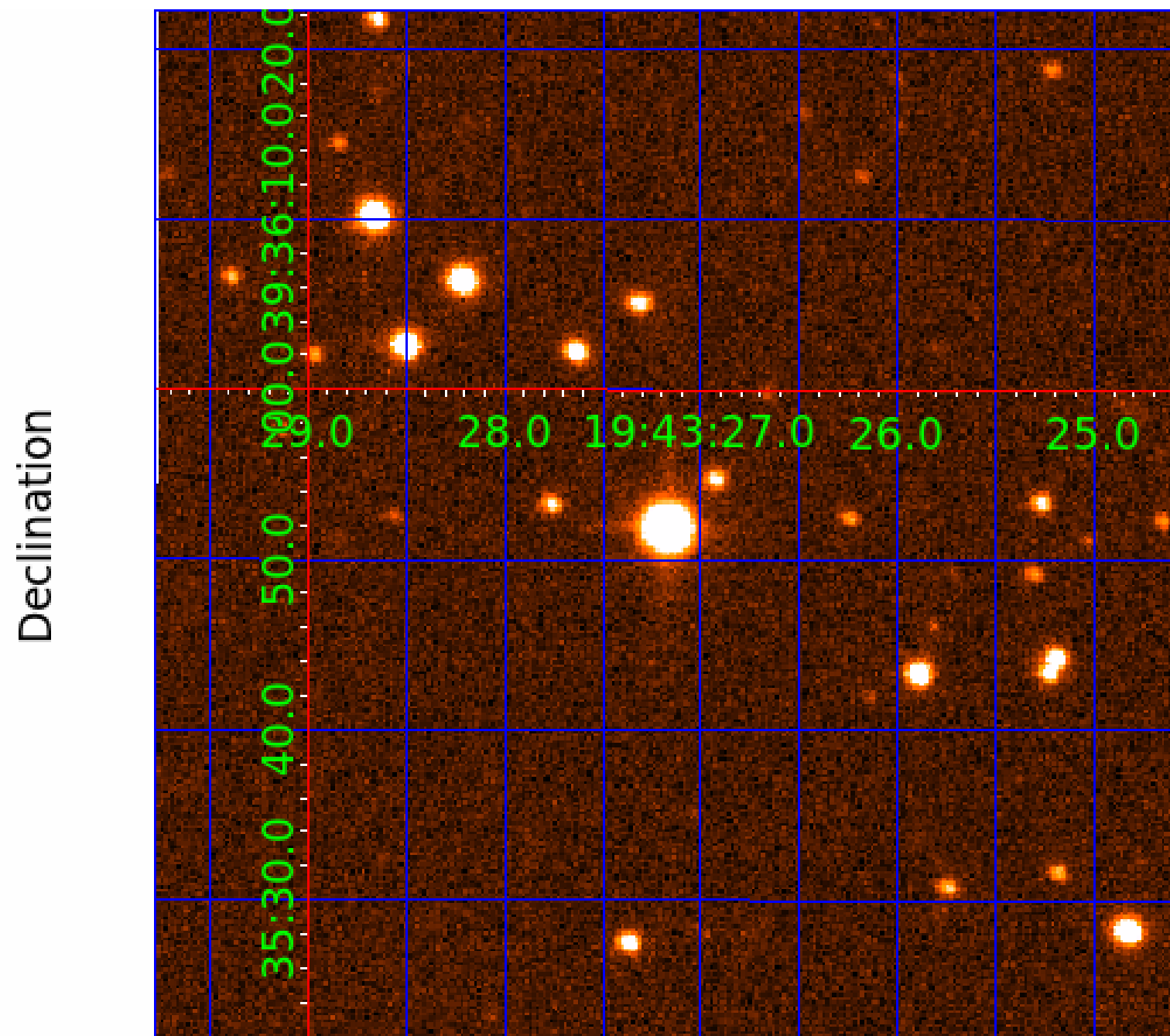
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

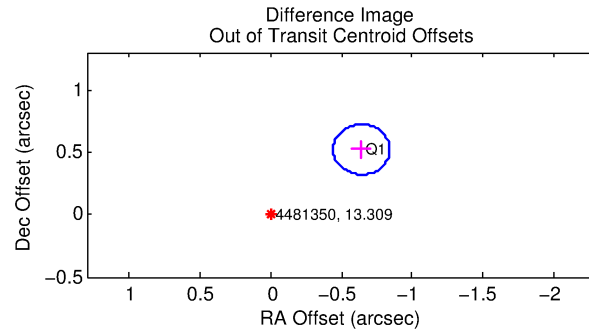
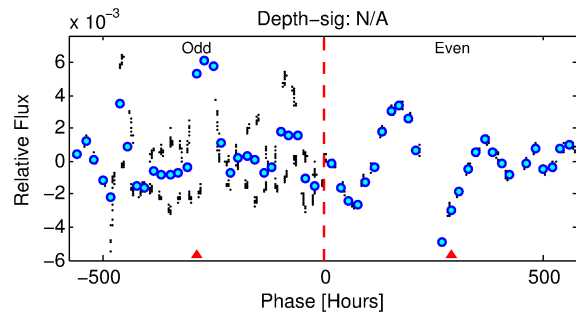
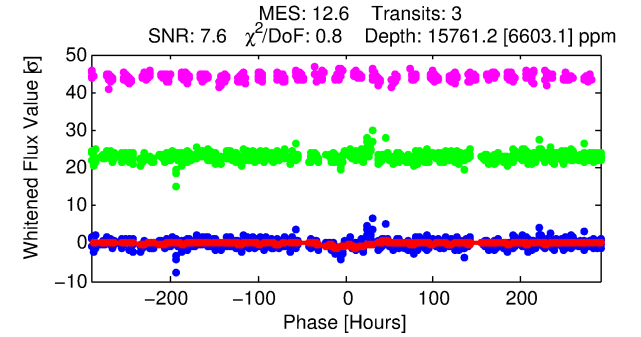
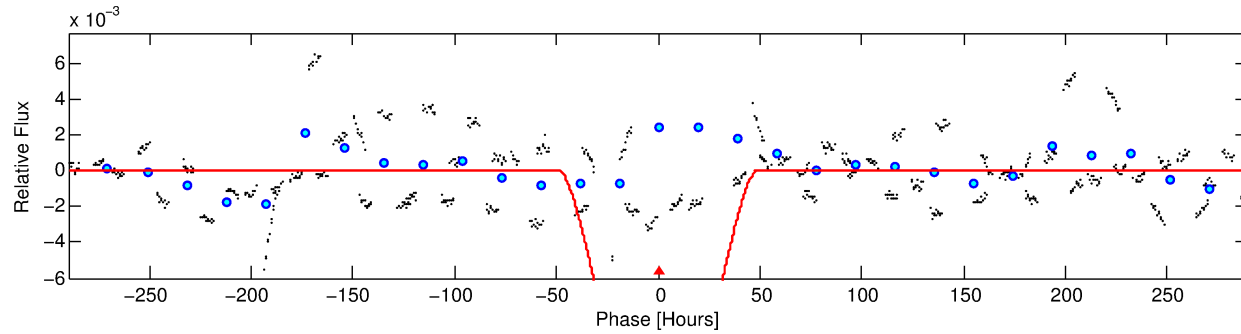
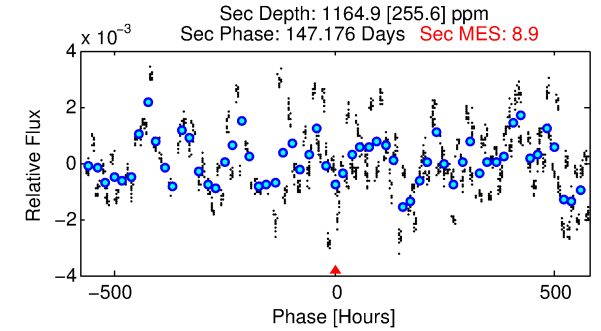
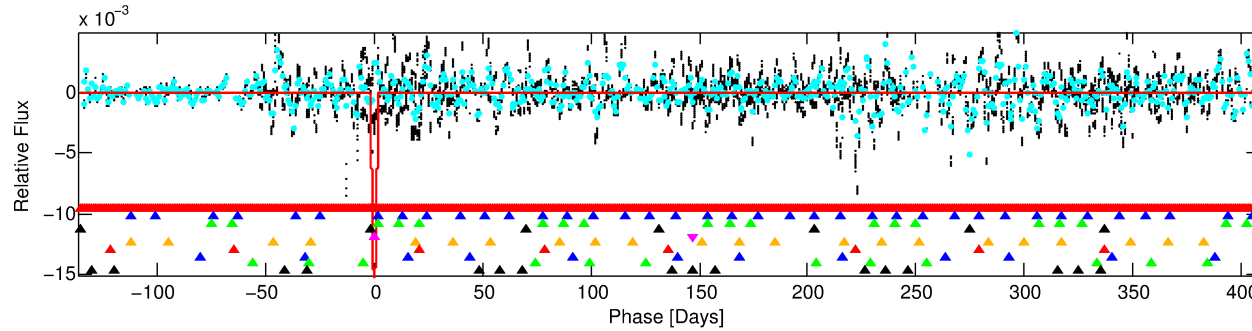
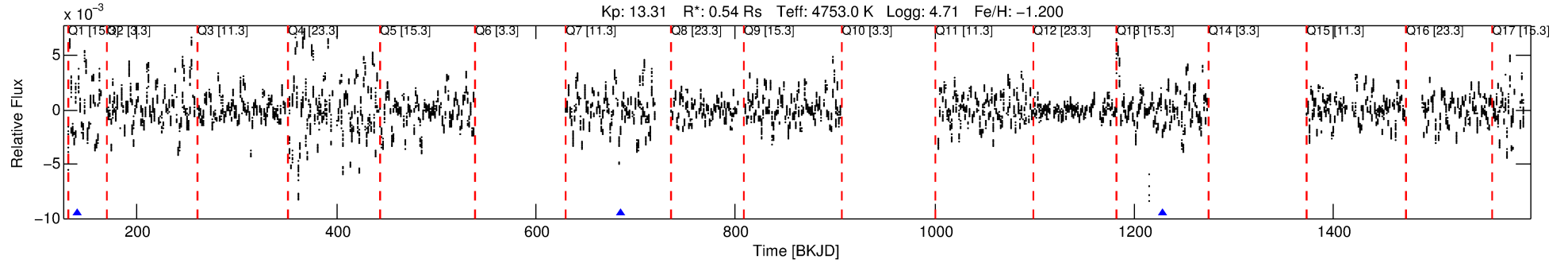
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-05

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 5 of 10 Period: 544.566 d



DV Fit Results:

Period = 544.56561 [0.07459] d
Epoch = 139.7704 [0.1224] BKJD
Rp/R* = 0.2072 [0.3863]
a/R* = 29.15 [5.41]
b = 1.00 [0.58]
Seff = 0.12 [0.02]
Teq = 149 [5] K
Rp = 12.28 [22.90] Re
a = 1.0722 [0.0555] AU
Ag = 4889.19 [18269.85] [0.27σ]
Teffp = 1929 [1803] K [0.99σ]

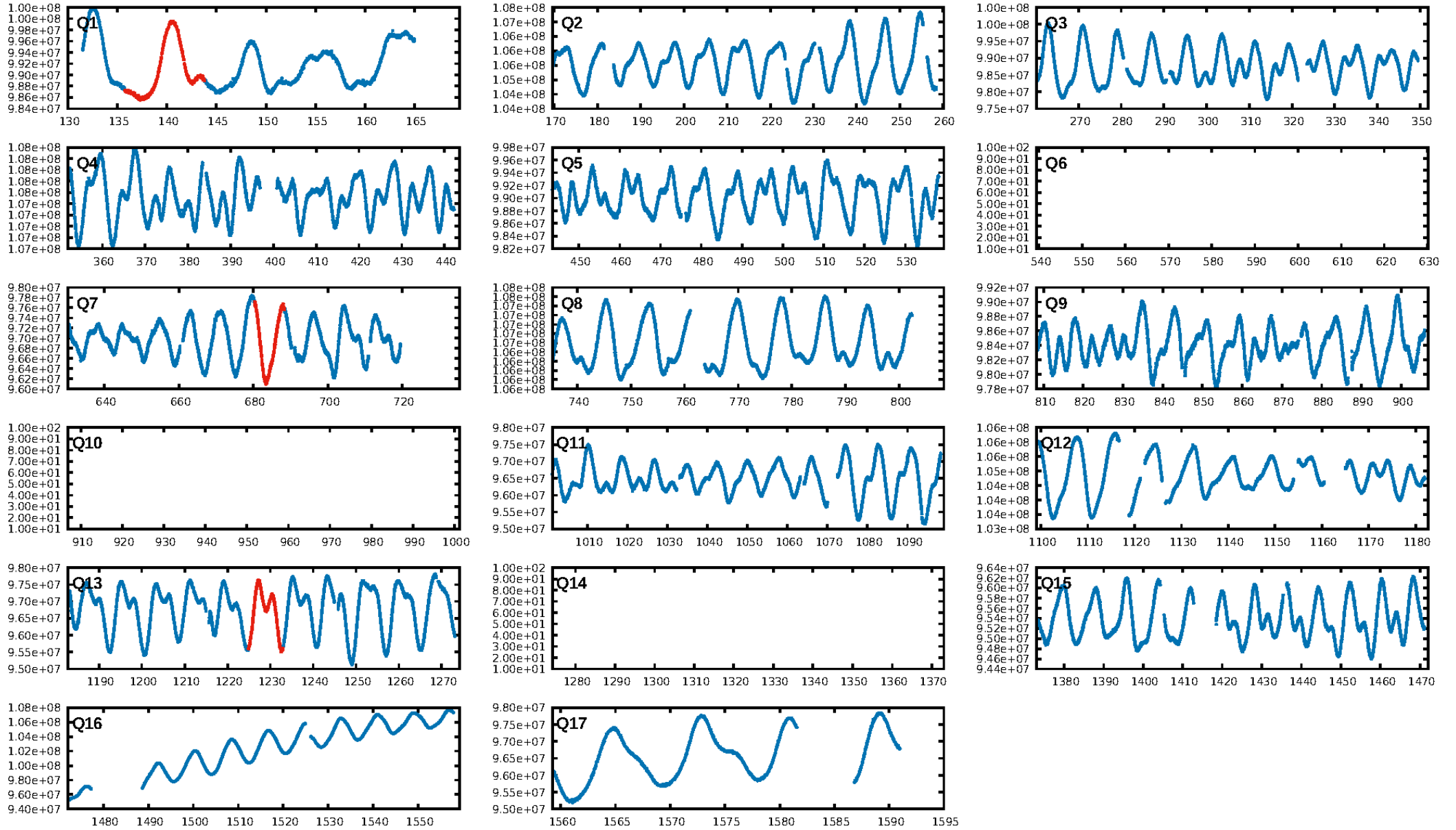
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [83.31σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 6.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.1337
Centroid-sig: N/A
Centroid-so: 0.148 arcsec [9.61σ]
OotOffset-rm: 0.826 arcsec [12.35σ]
KicOffset-rm: 0.854 arcsec [12.77σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.00 [0/1]

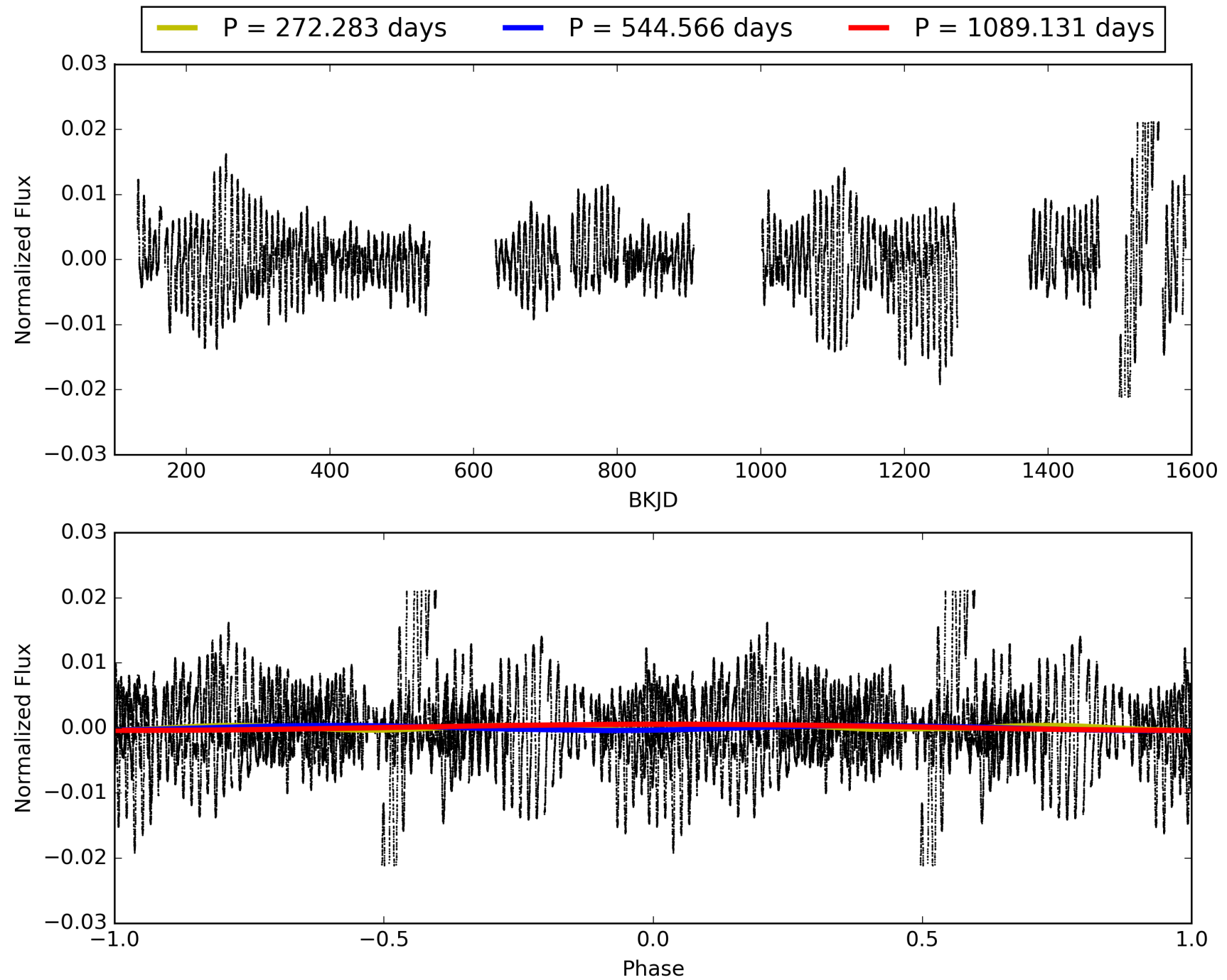
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:44 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-05, PDC Light Curves

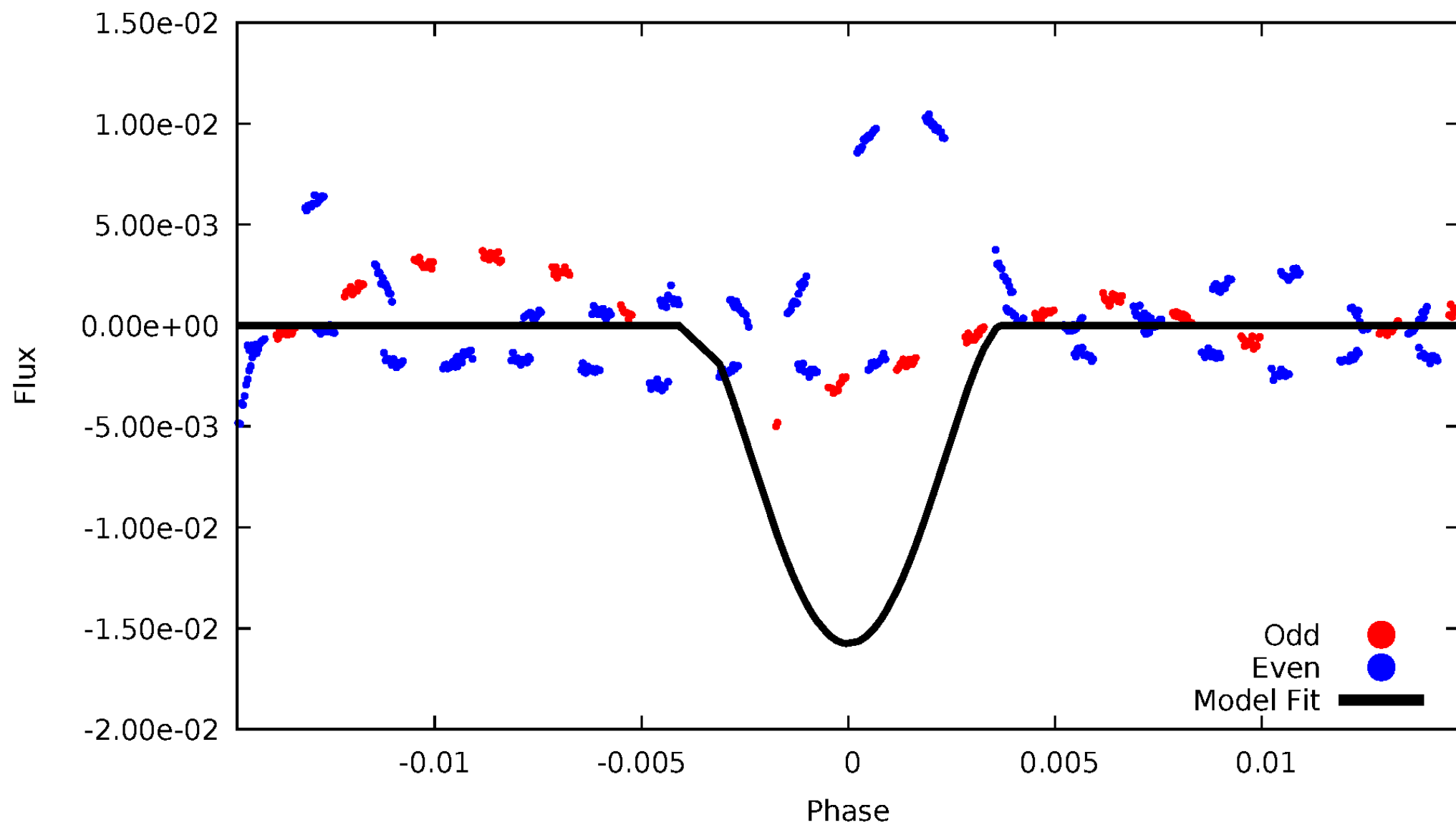


TCE 004481350-05



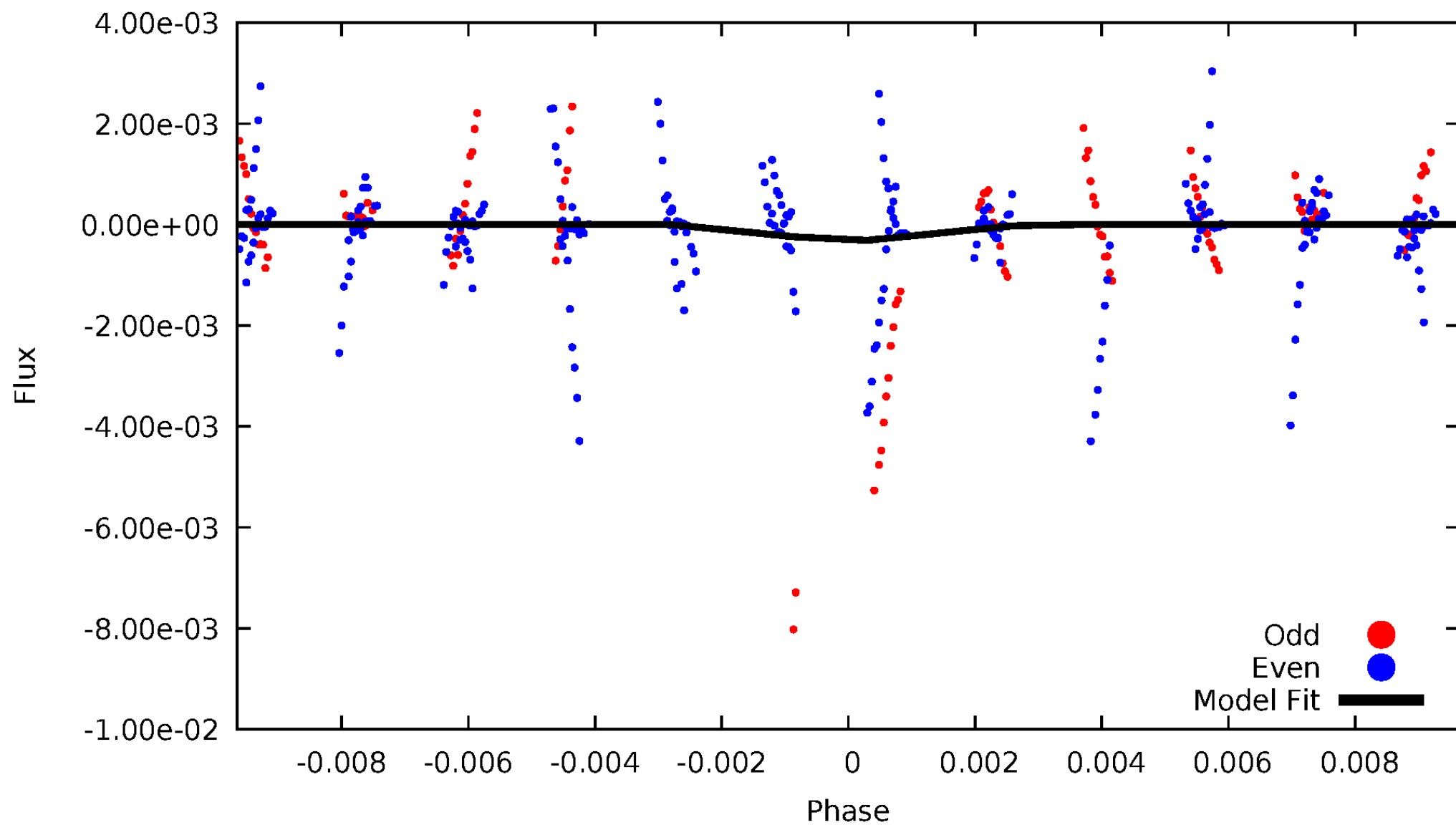
DV Odd/Even

TCE 004481350-05



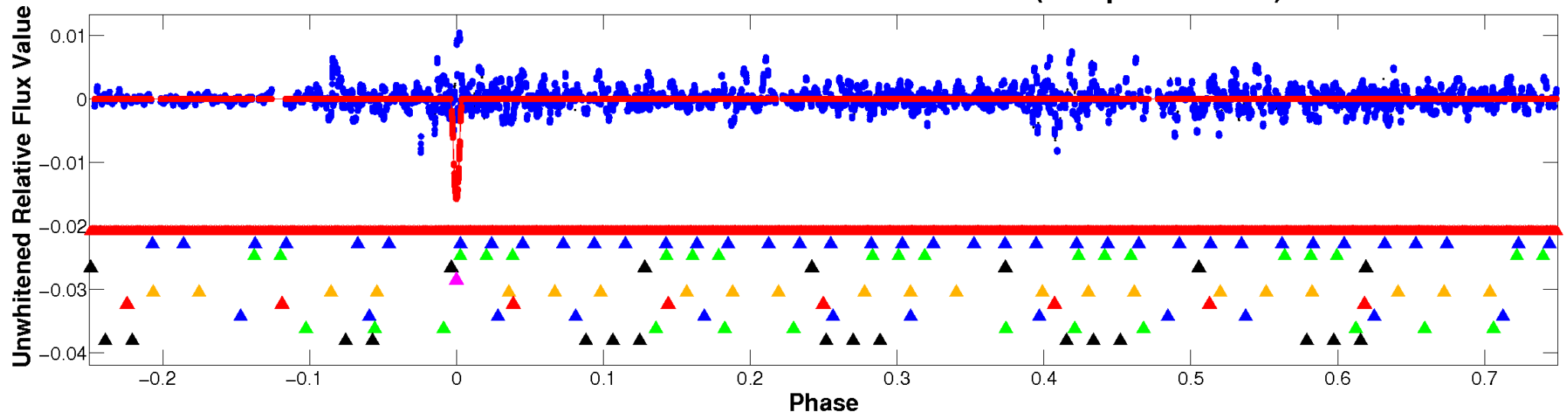
ALT Odd/Even

TCE 004481350-05

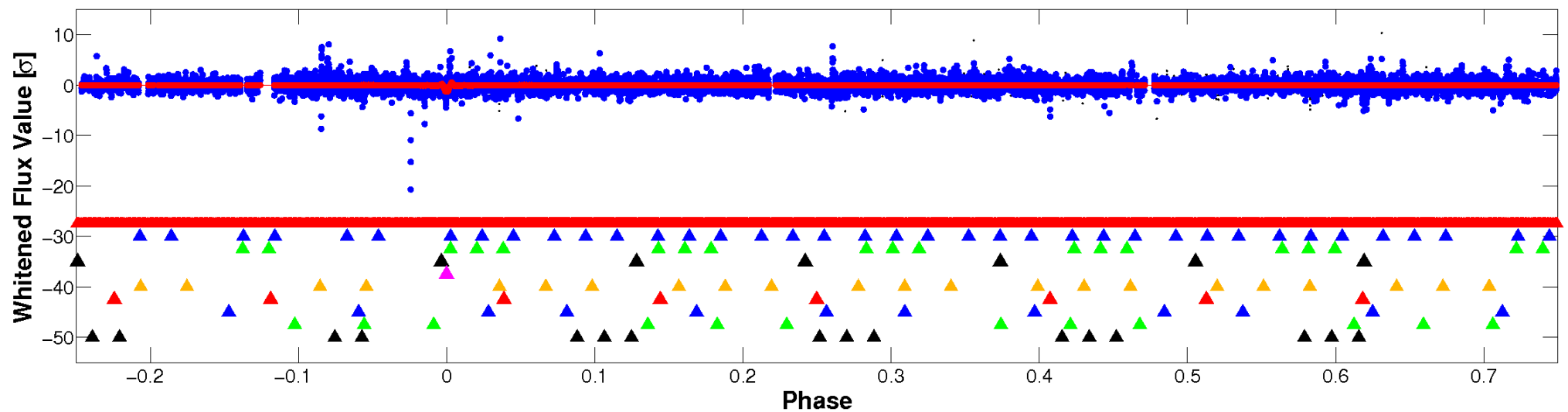


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

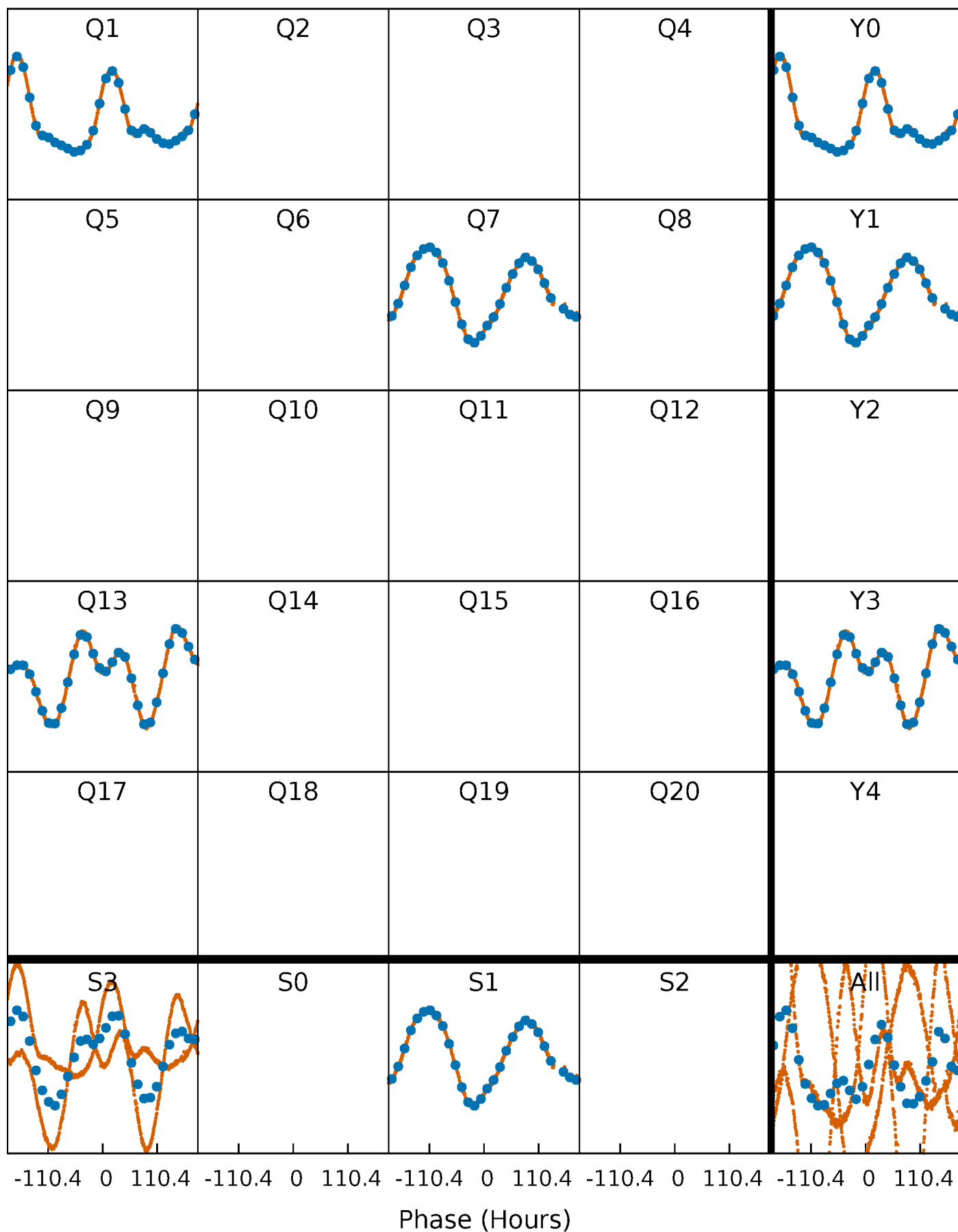


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



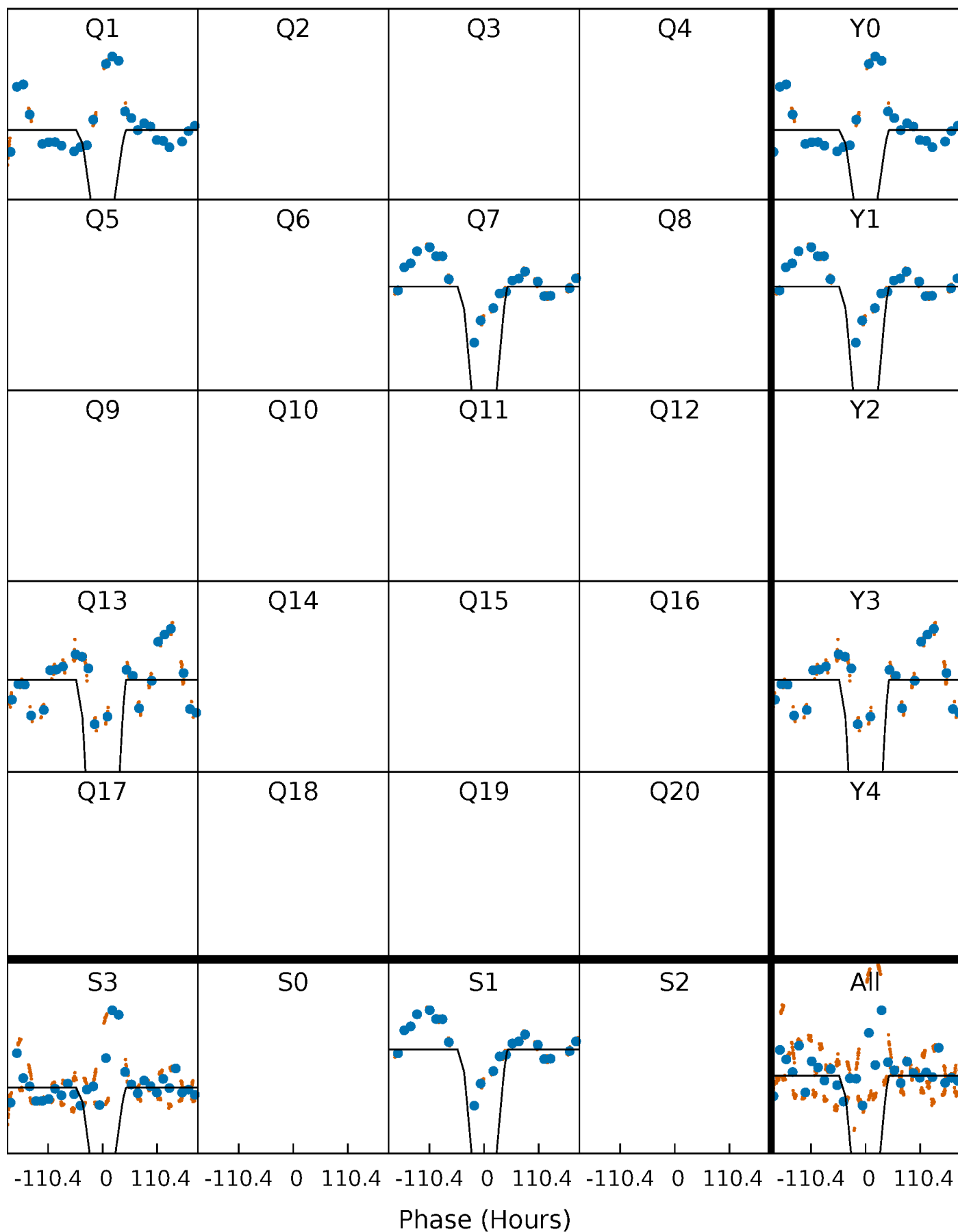
PDC Quarter-Phased Transit Curves

TCE 004481350-05 $P=544.565609$ Days $T_0=139.770443$ (BKJD)



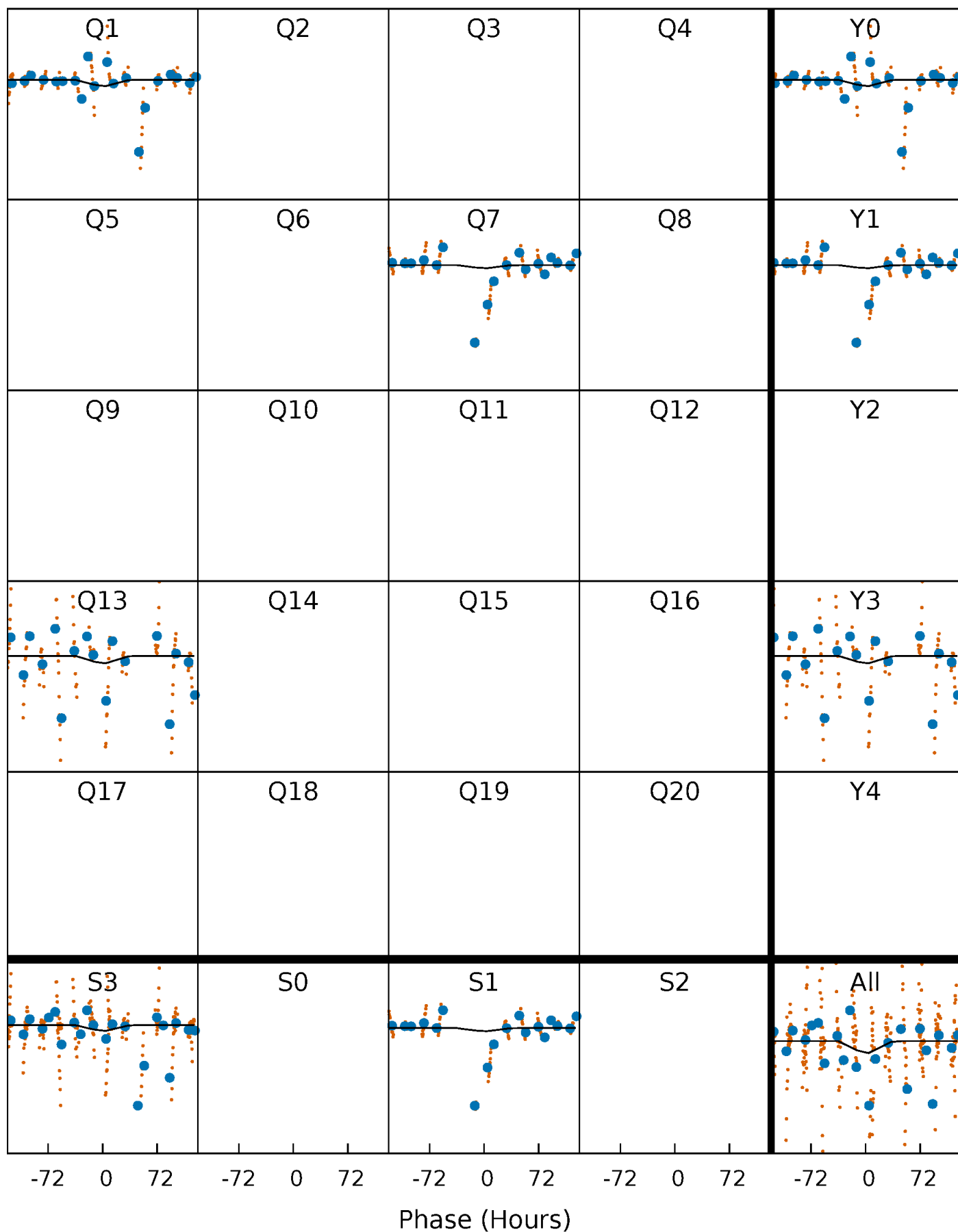
DV Quarter-Phased Transit Curves

TCE 004481350-05 $P=544.565609$ Days $T_0=139.770443$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

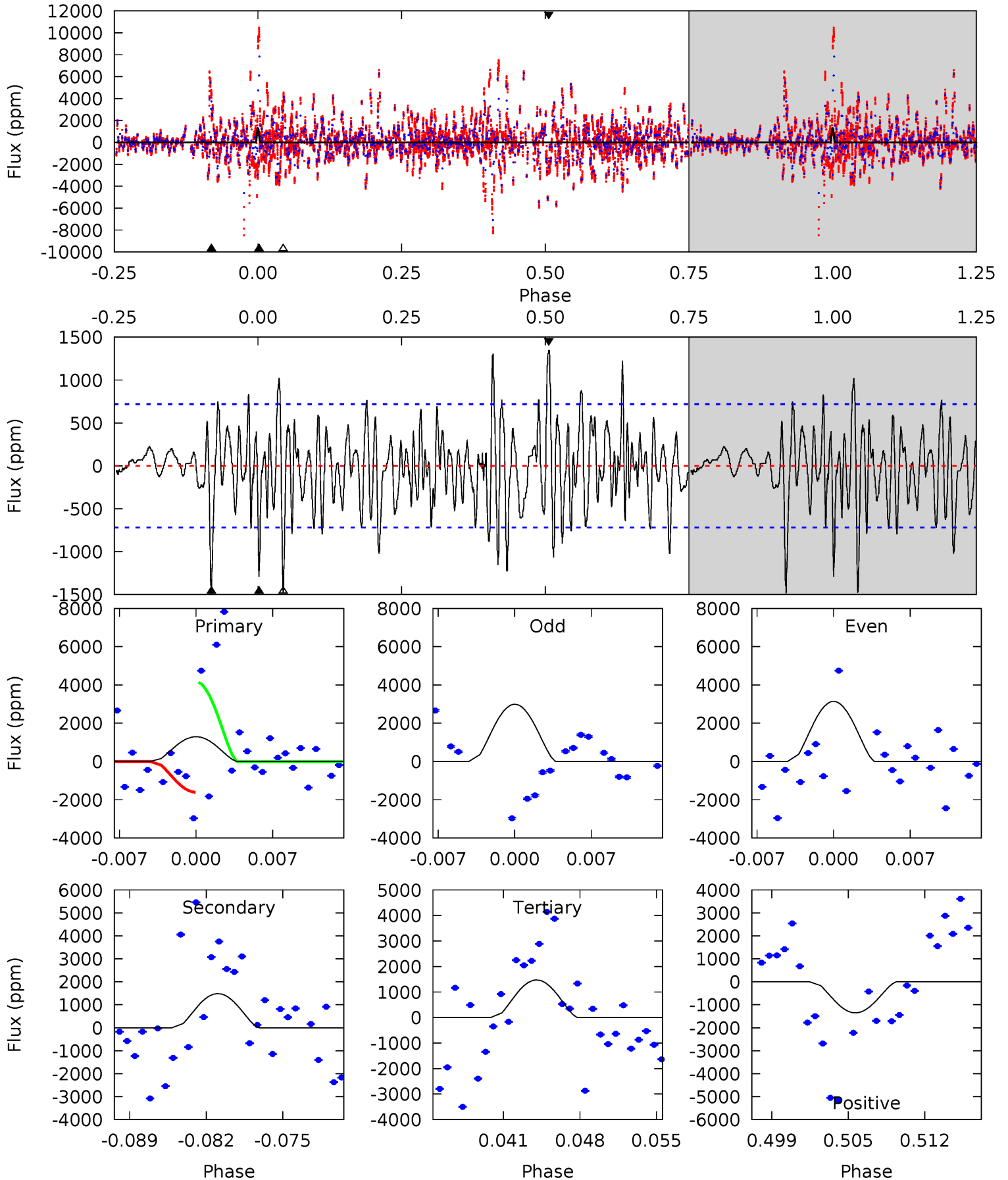
TCE 004481350-05 $P=544.227437$ Days $T_0=139.626876$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-05, P = 544.565609 Days, E = 139.770443 Days

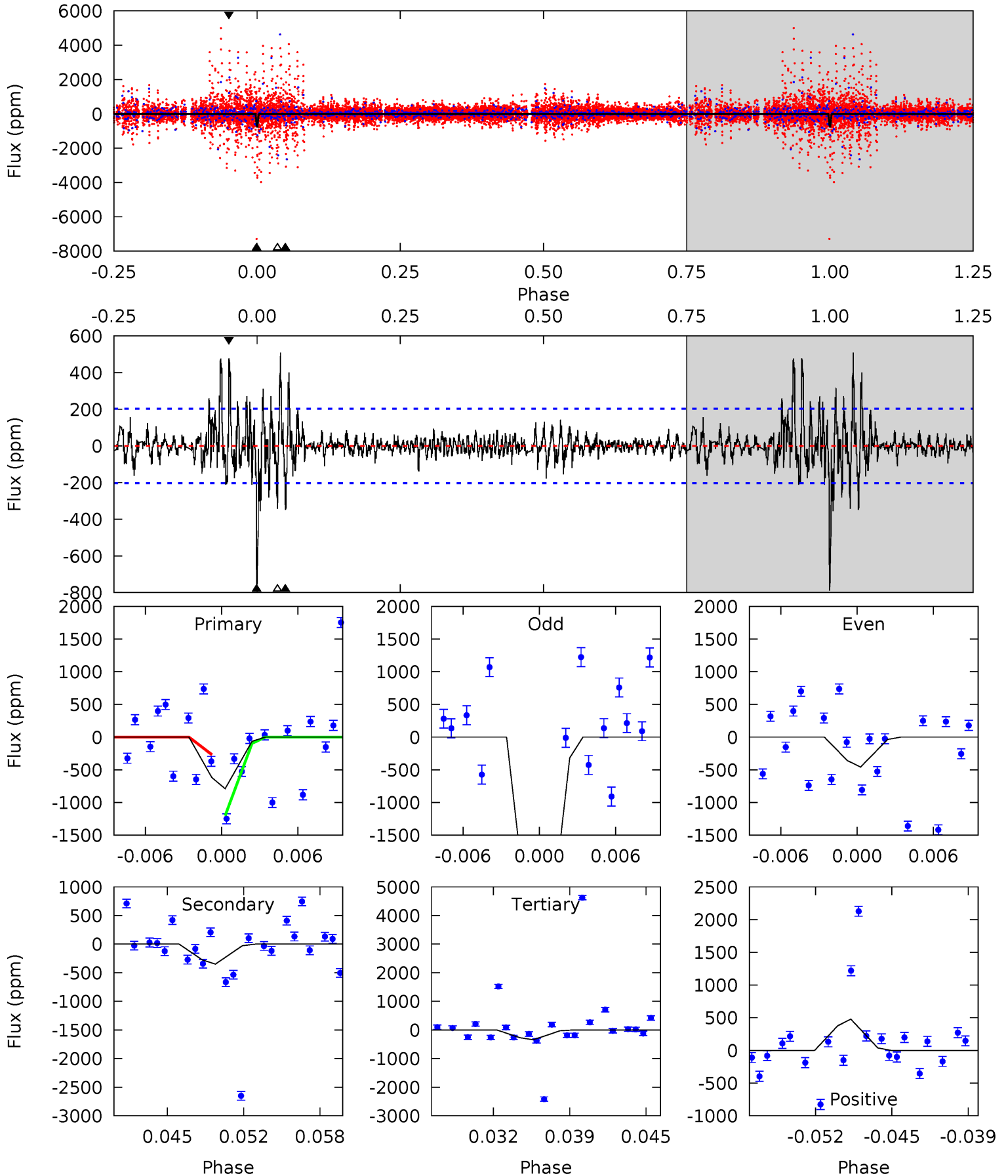
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.16	10.5	10.4	9.57	5.10	2.71	2.90	-1.27	-0.41	0.10	0.95	0.50	-0.46	0.48	9.08



Alt Model-Shift Uniqueness Test

004481350-05, P = 544.227437 Days, E = 139.626876 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.9	8.78	8.62	12.0	5.11	2.72	1.77	11.2	7.84	0.15	-3.24	40.3	1.56	0.39	11.3



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1484 ± 141	$19.78^{+20.12}_{-12.62}$	208^{+7}_{-7}	2435^{+755}_{-353}	2297^{+15745}_{-1715}
Alt.	-349 ± 40	$15.73^{+17.37}_{-10.66}$	208^{+6}_{-7}	2178^{+744}_{-311}	894^{+8382}_{-697}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

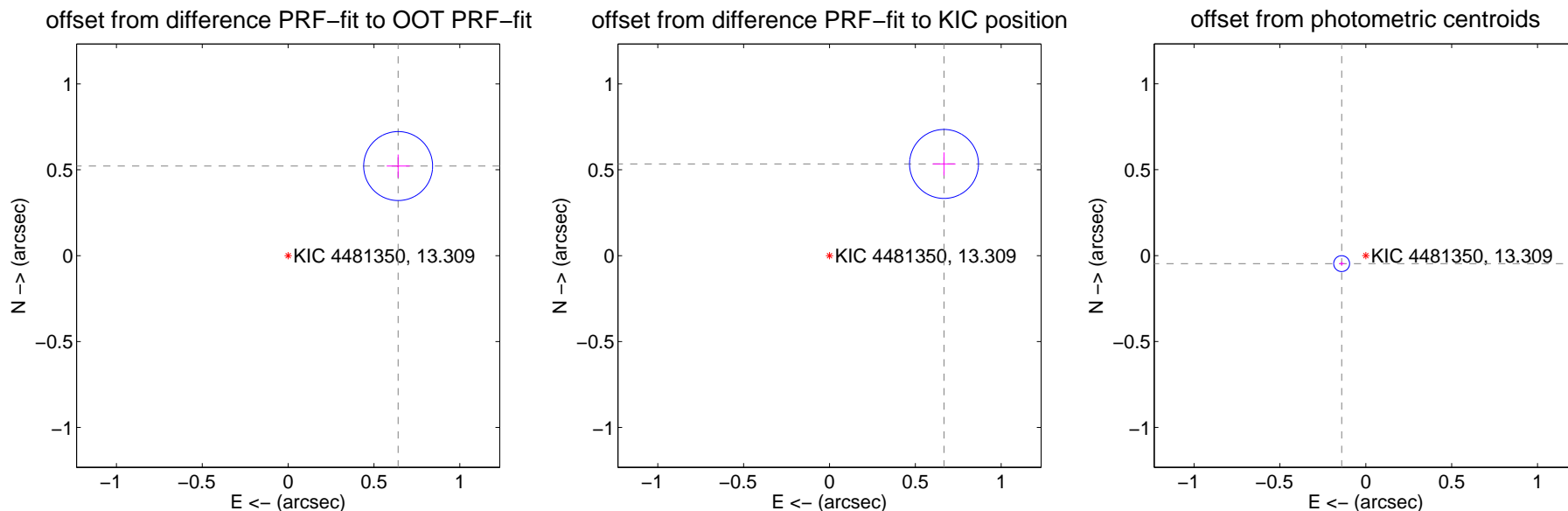
DV Centroid Data

Supplemental centroid analysis for 004481350-05. Kepler magnitude: 13.31. Transit SNR 7.59

There are 0 quarters with good PRF difference image offsets

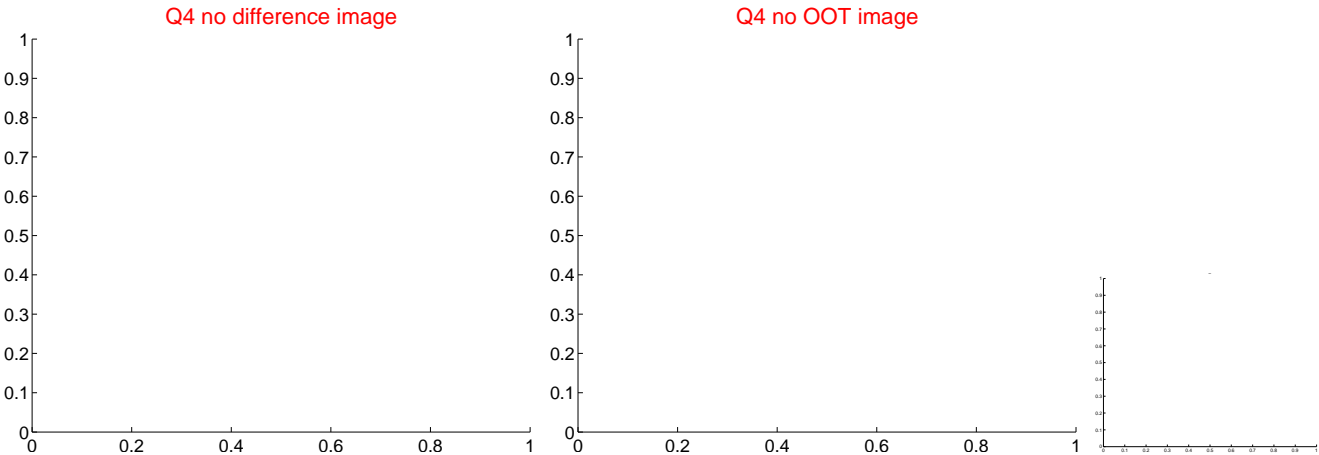
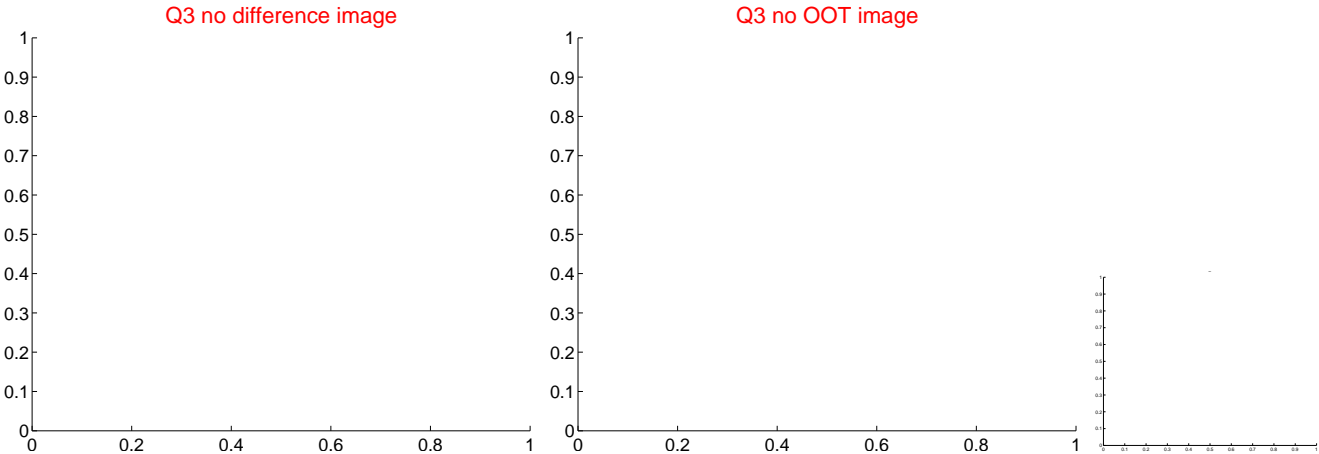
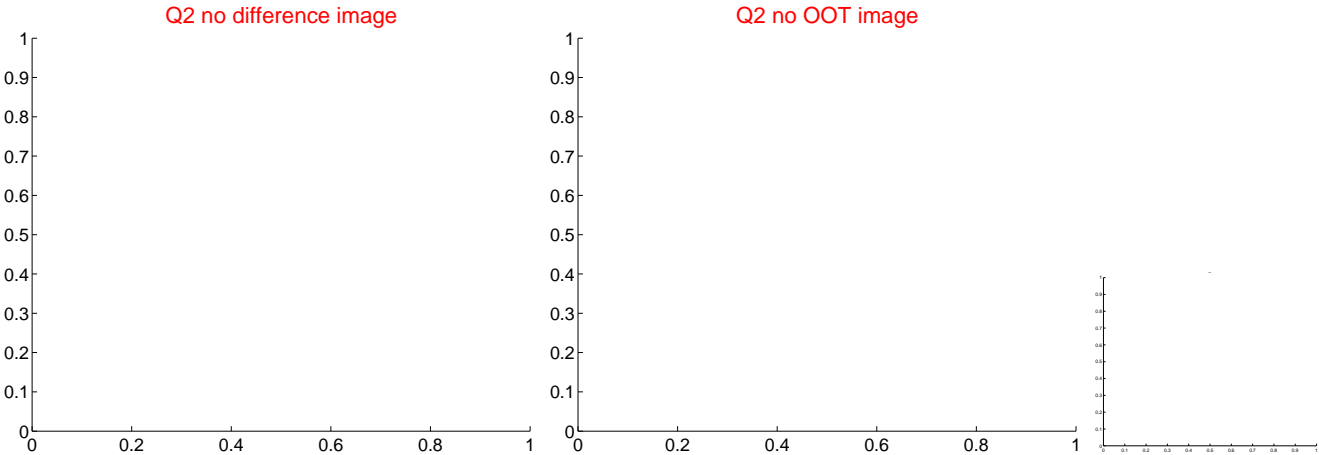
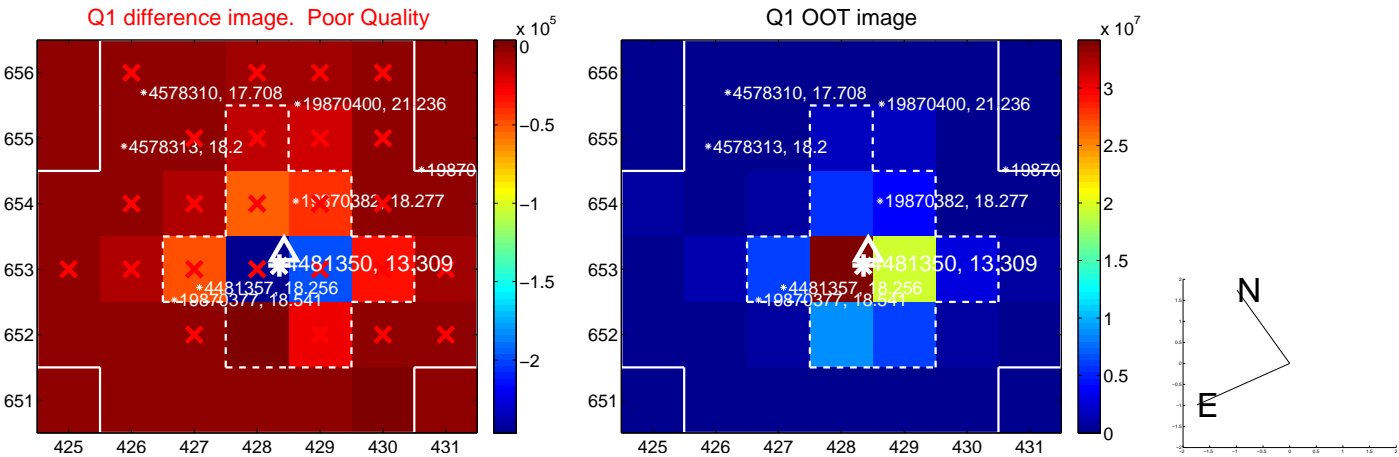
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.826 ± 0.067	12.35	-0.641 ± 0.067	0.522 ± 0.067
PRF-fit source offset from KIC position	0.854 ± 0.067	12.77	-0.667 ± 0.067	0.534 ± 0.067
photometric centroid source offset	0.15 ± 0.02	9.61	0.14 ± 0.02	-0.05 ± 0.01



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



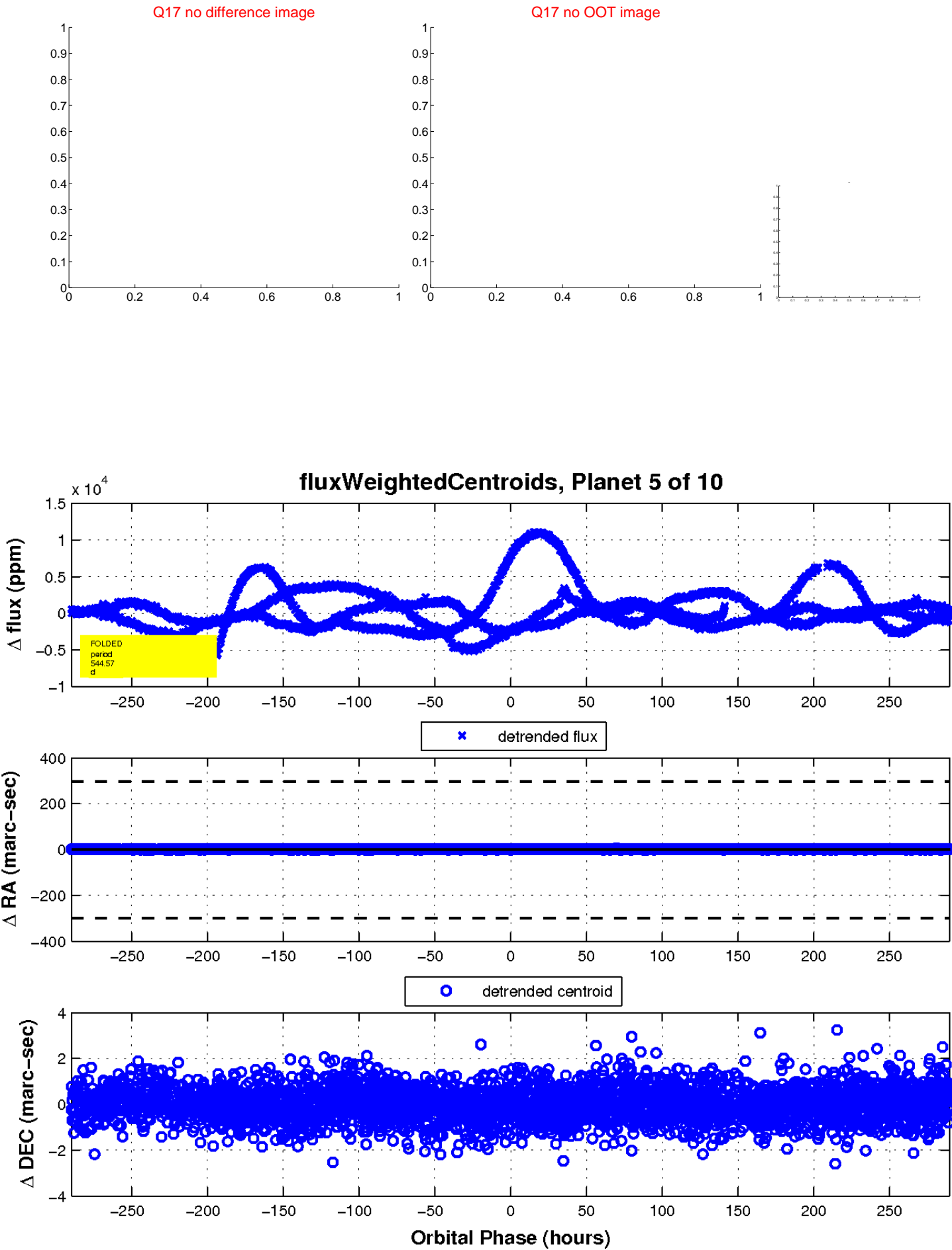
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



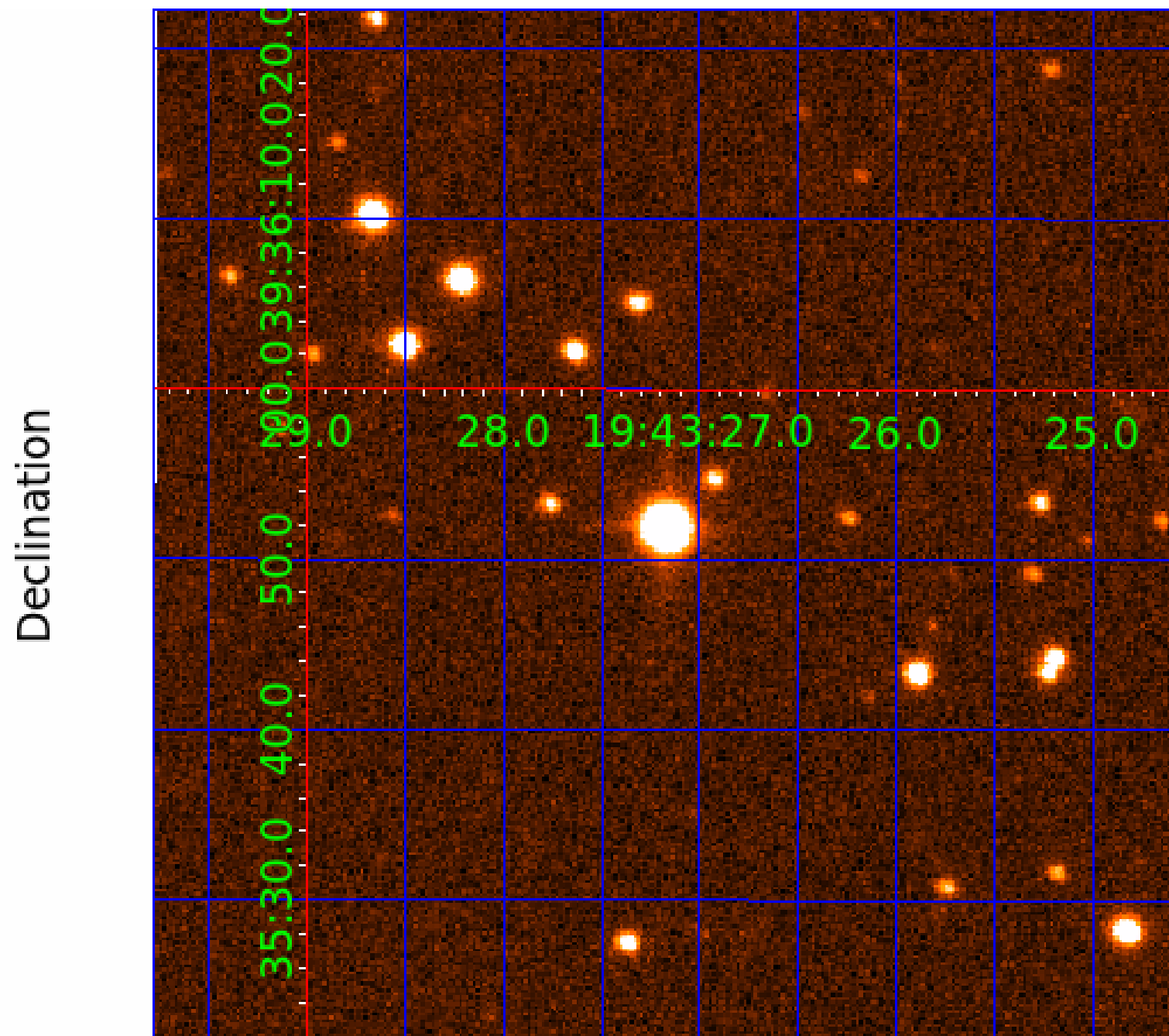
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

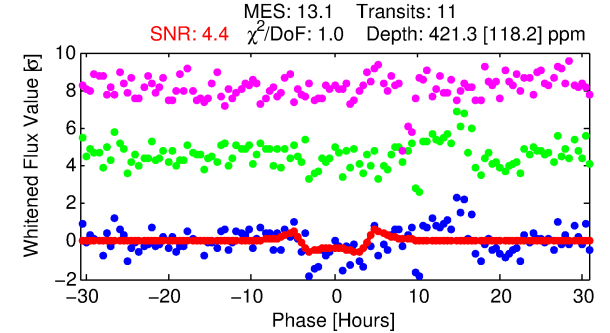
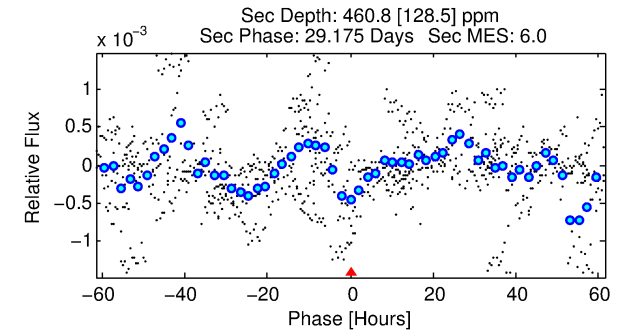
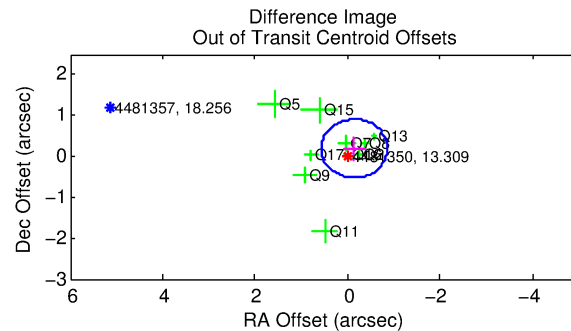
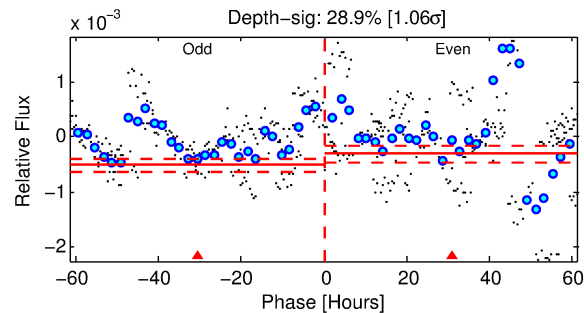
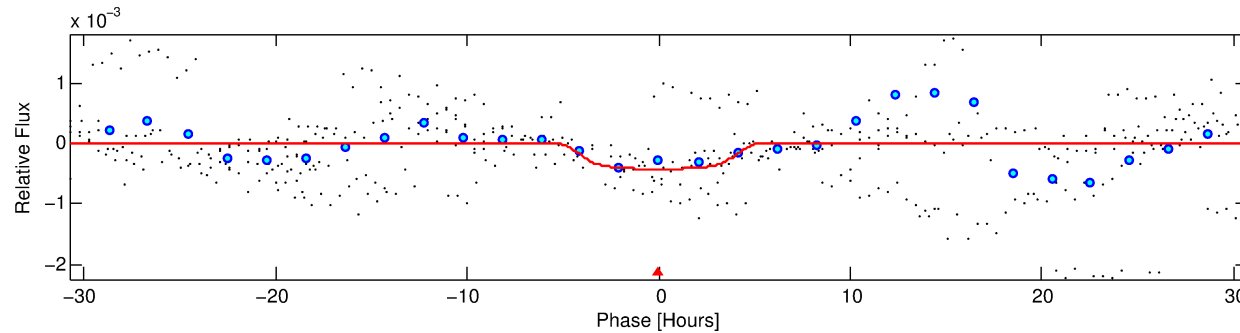
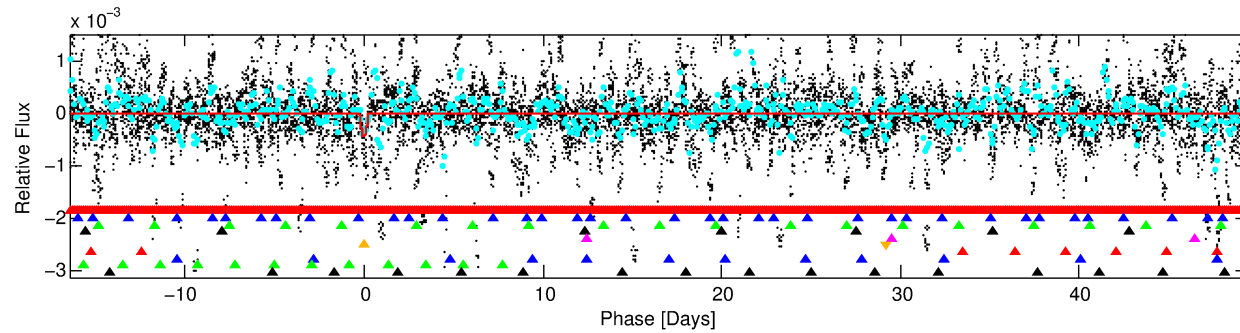
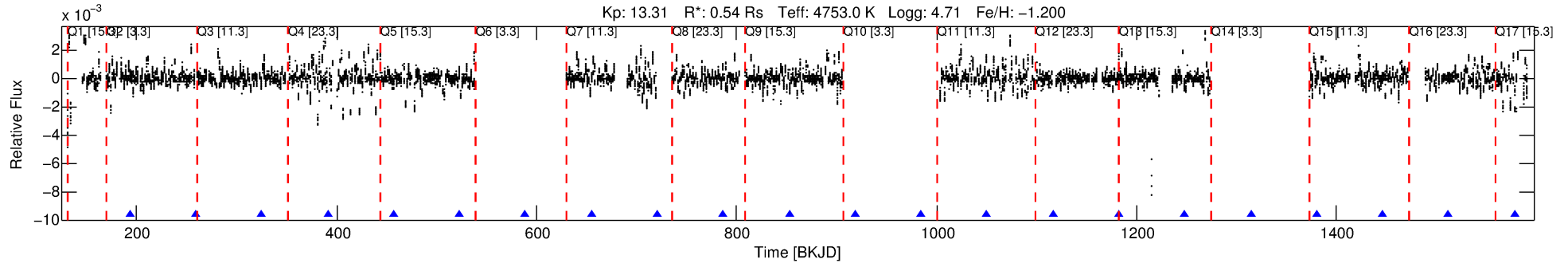
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-06

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 6 of 10 Period: 65.943 d



DV Fit Results:

Period = 65.94302 [0.00219] d
Epoch = 193.2571 [0.0311] BKJD
Rp/R* = 0.0243 [0.0041]
a/R* = 18.97 [5.32]
b = 0.95 [0.03]
Seff = 1.96 [0.28]
Teq = 302 [11] K
Rp = 1.44 [0.25] Re
a = 0.2624 [0.0136] AU
Ag = 8420.58 [3719.27] [2.26 σ]
Teffp = 4467 [503] K [8.28 σ]

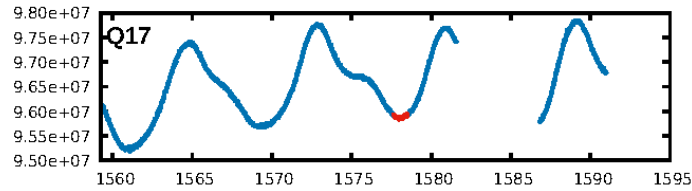
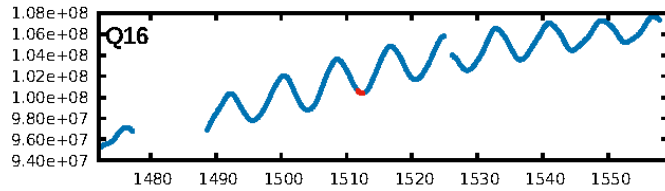
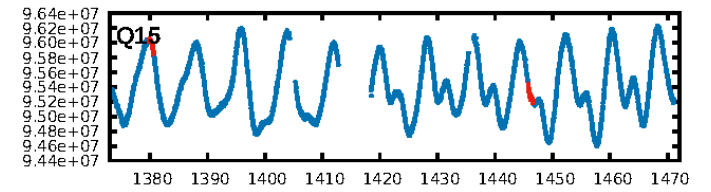
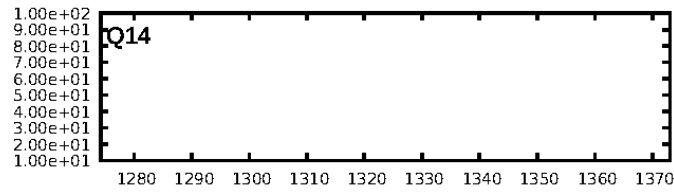
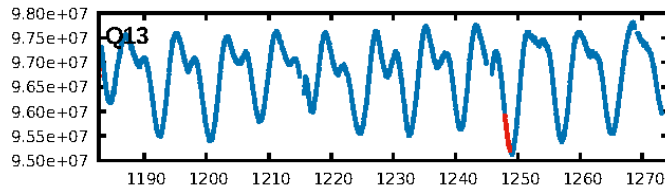
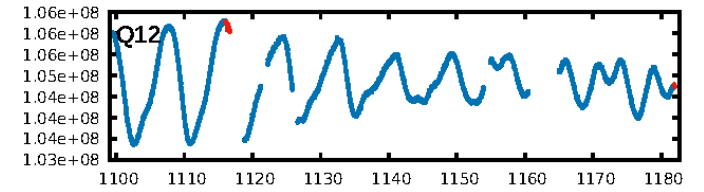
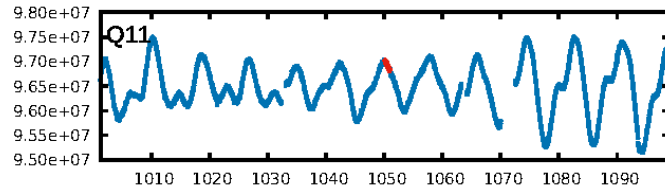
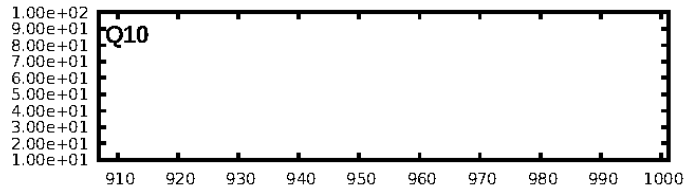
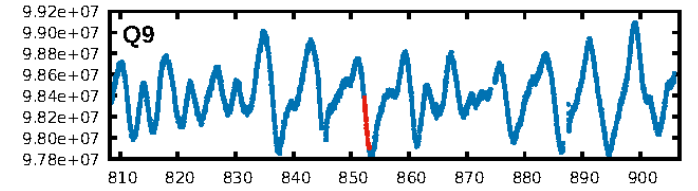
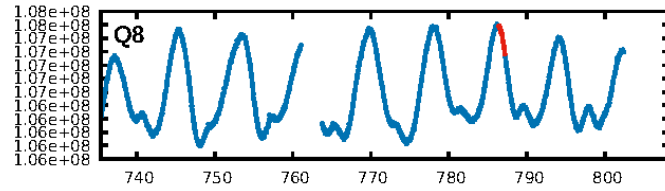
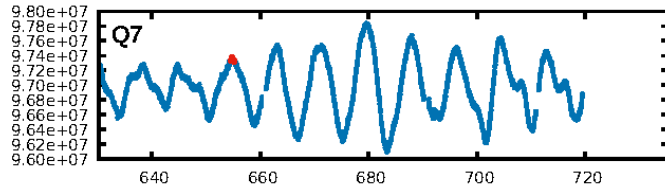
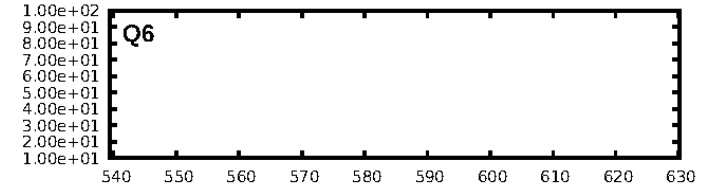
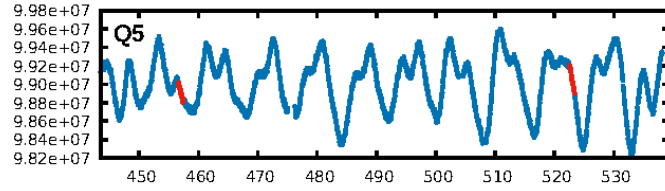
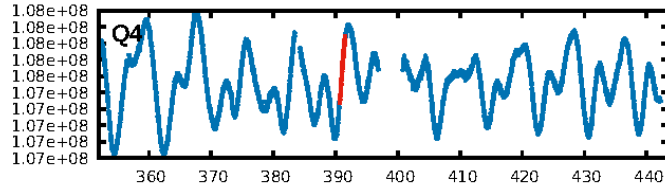
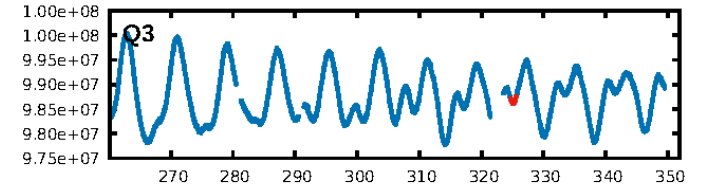
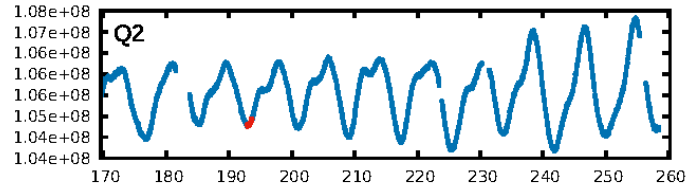
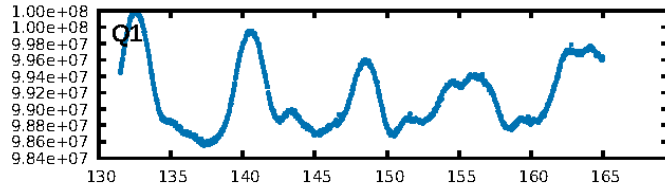
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [51.86 σ]
LongPeriod-sig: 100.0% [22.78 σ]
ModelChiSquare2-sig: 1.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: 2.542
Centroid-sig: N/A
Centroid-so: 0.482 arcsec [0.99 σ]
OotOffset-rm: 0.238 arcsec [0.99 σ]
KicOffset-rm: 0.201 arcsec [0.91 σ]
OotOffset-st: 1/3/2/4 [10]
KicOffset-st: 1/3/2/4 [10]
DiffImageQuality-fgm: 0.50 [5/10]
DiffImageOverlap-fno: 0.00 [0/11]

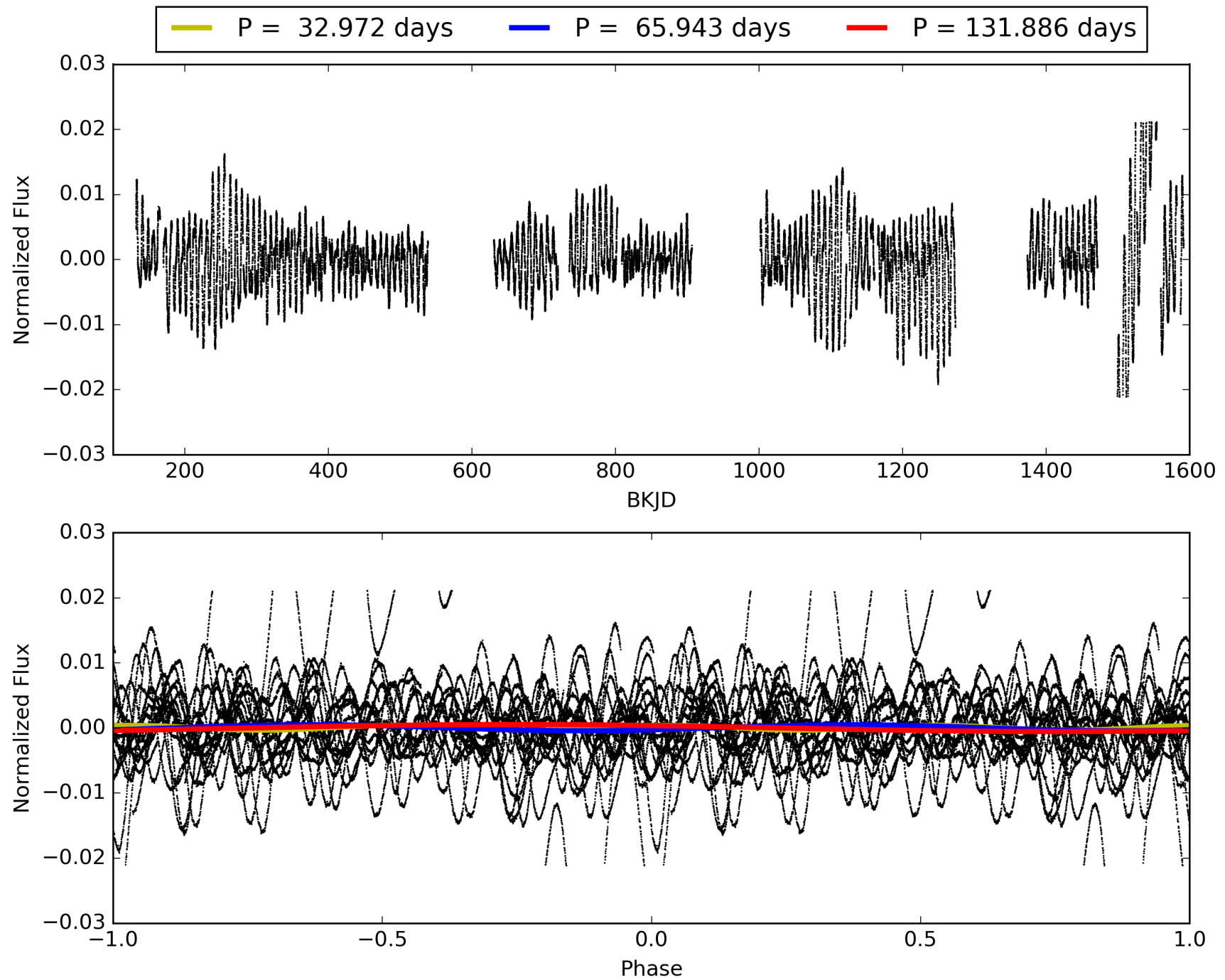
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:47 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-06, PDC Light Curves

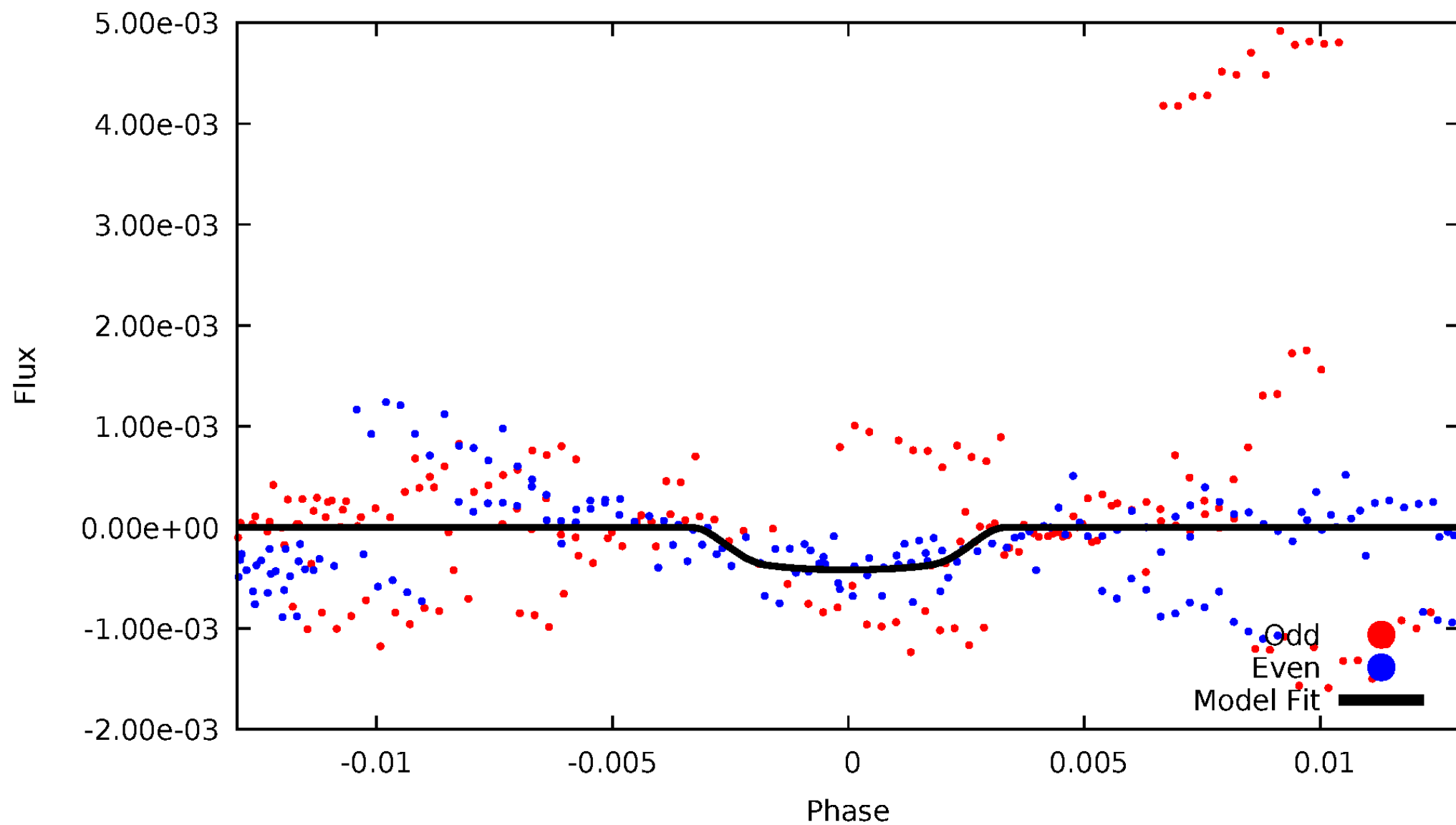


TCE 004481350-06



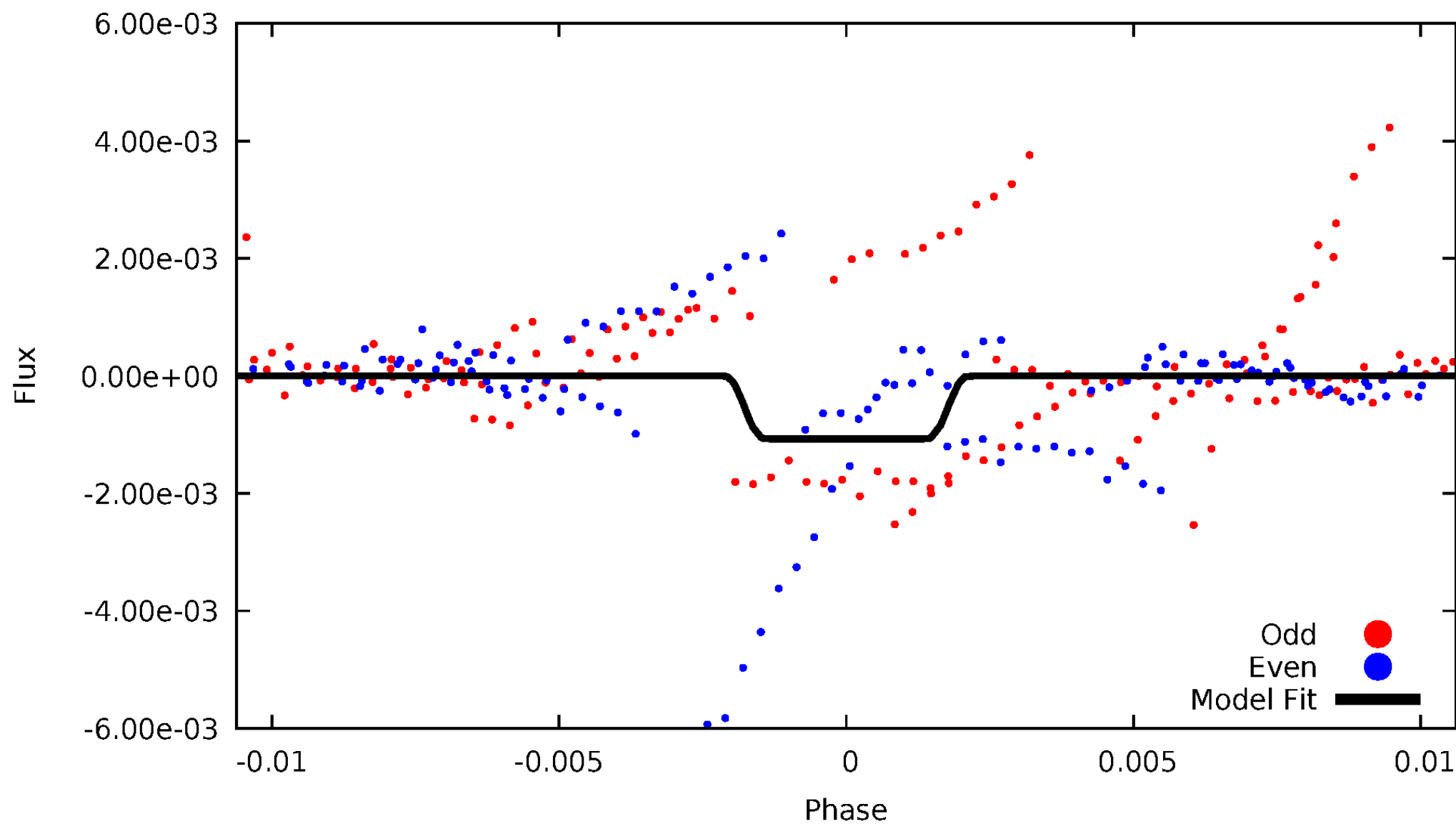
DV Odd/Even

TCE 004481350-06



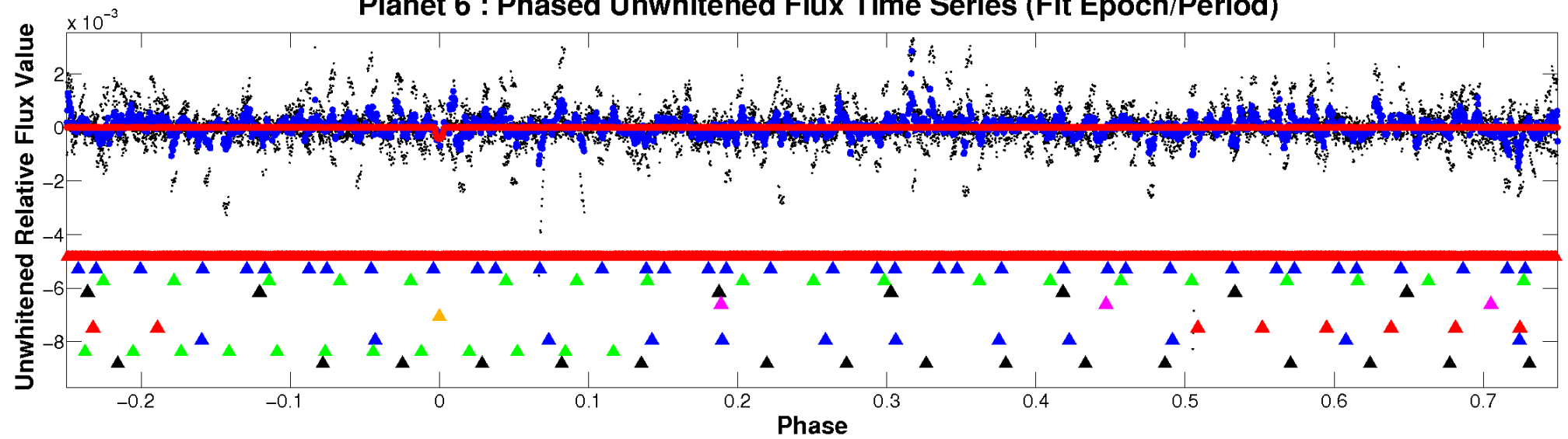
ALT Odd/Even

TCE 004481350-06

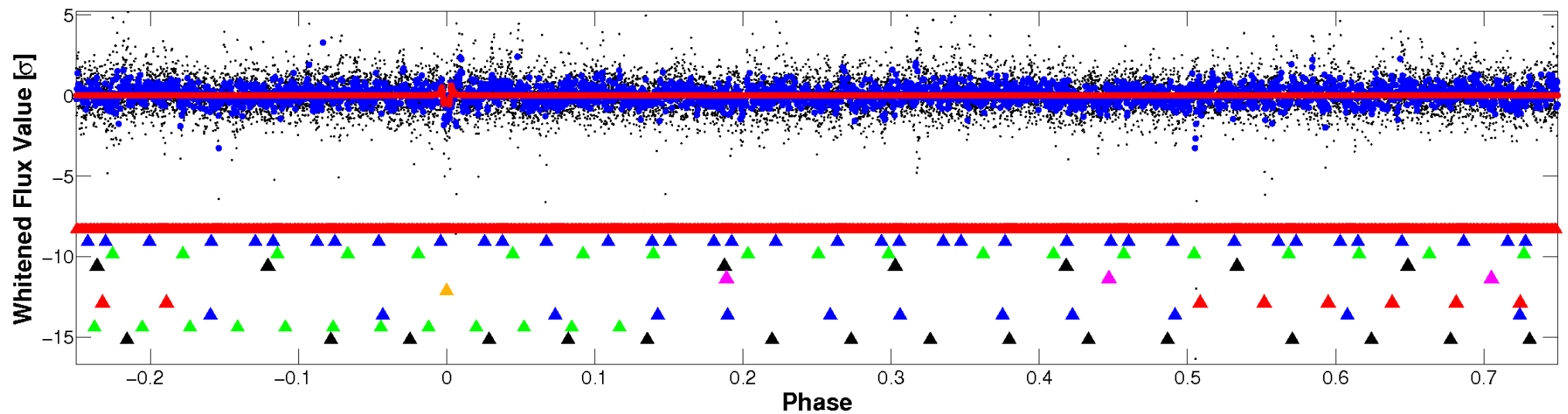


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

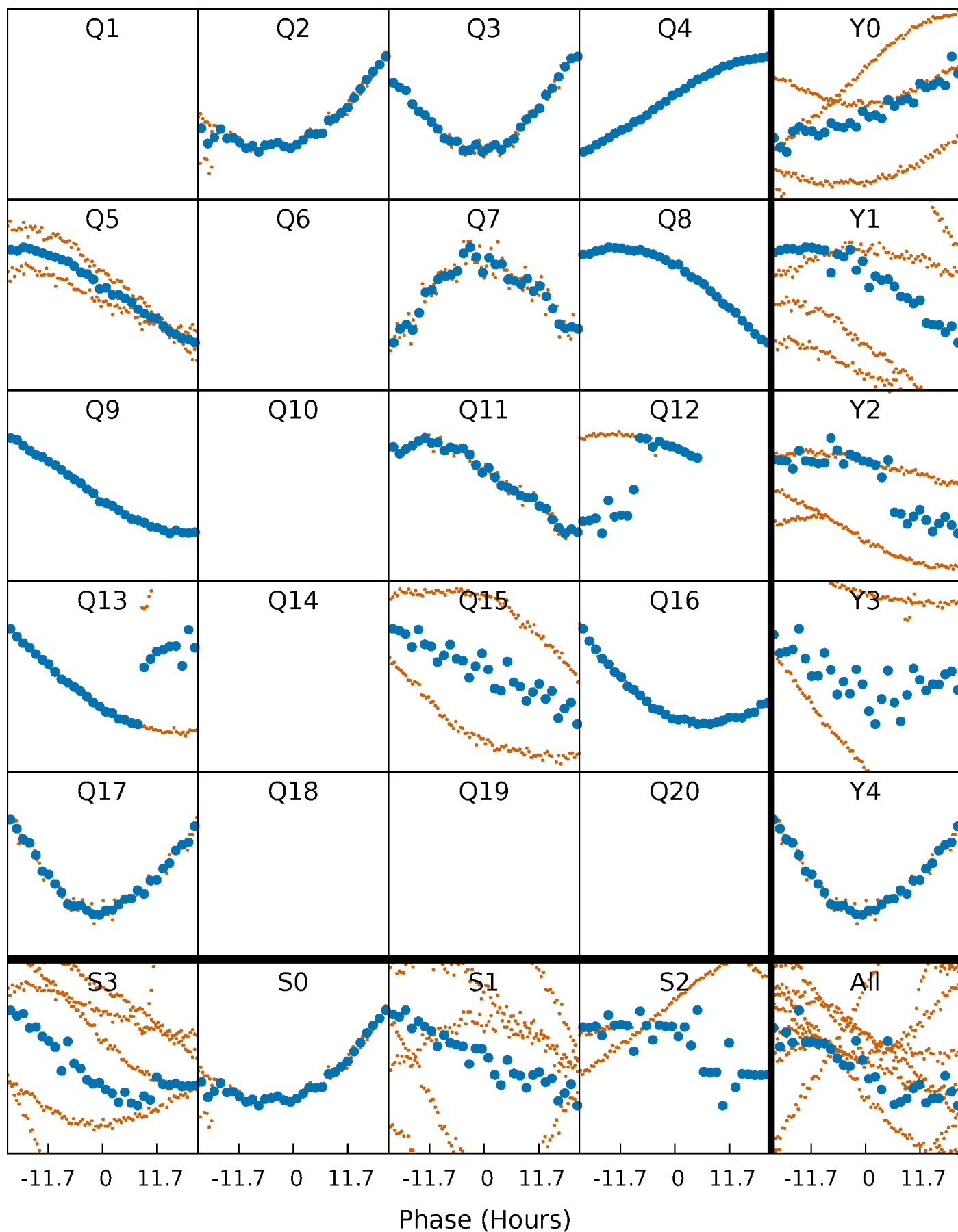


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



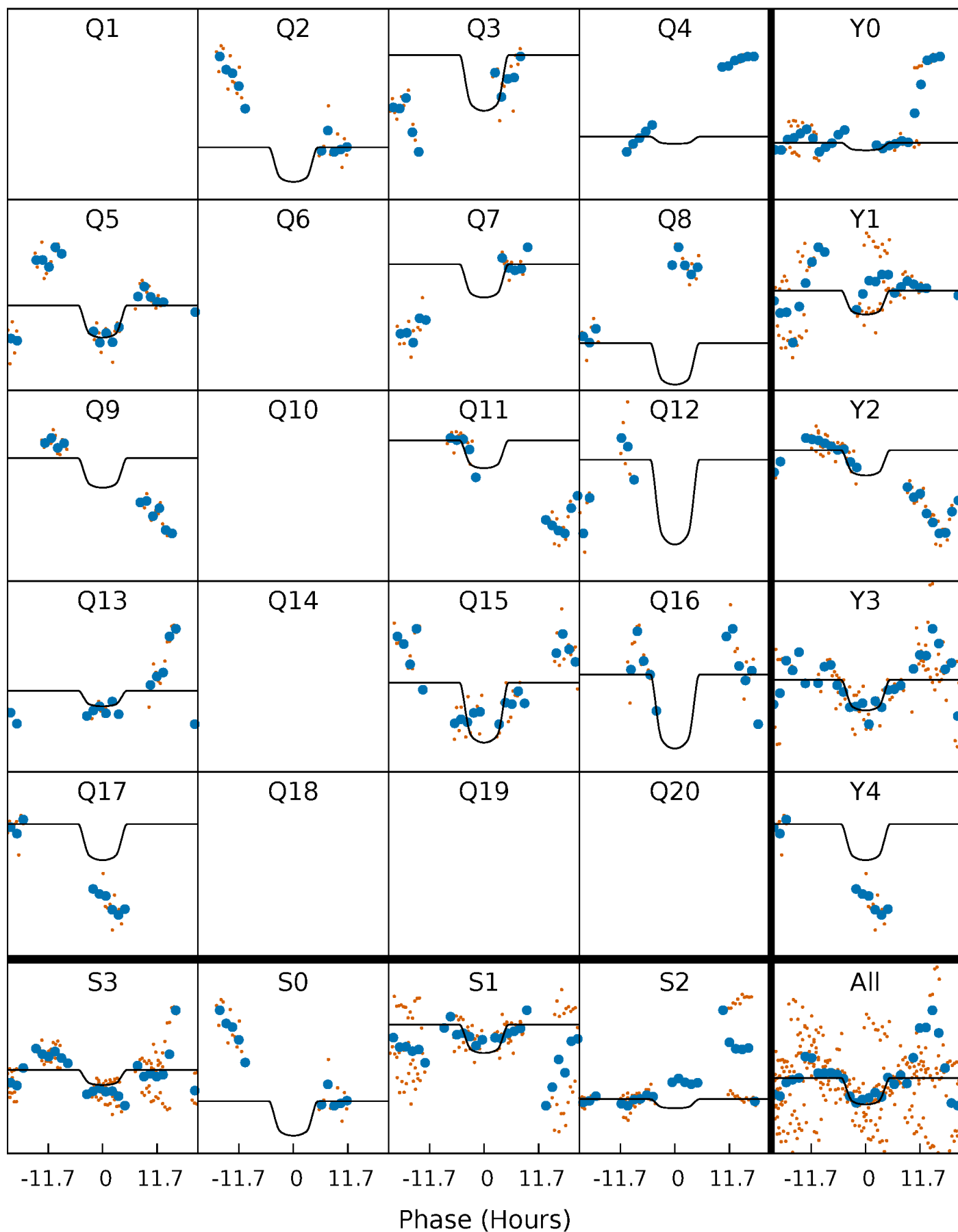
PDC Quarter-Phased Transit Curves

TCE 004481350-06 P= 65.943020 Days $T_0=193.257136$ (BKJD)



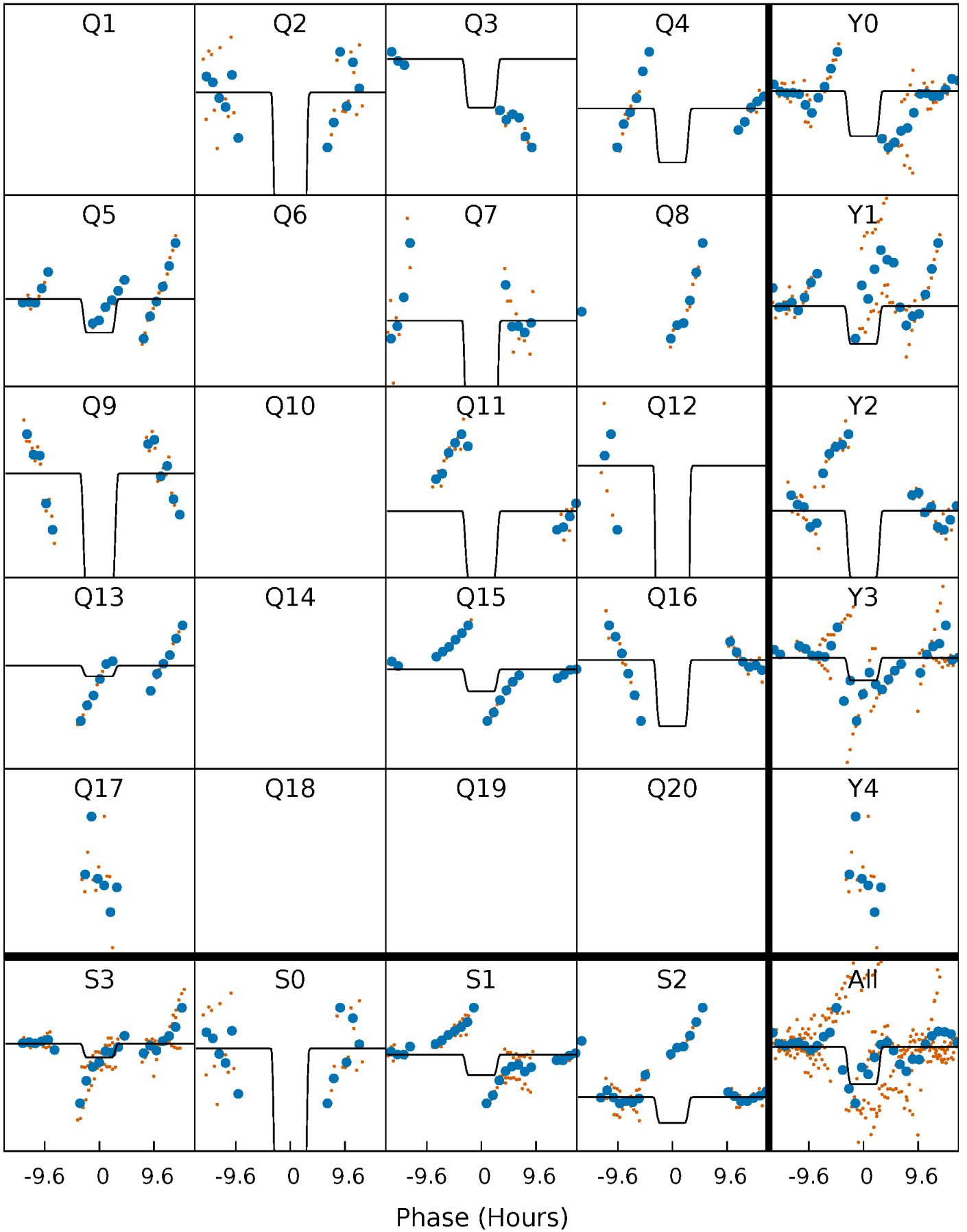
DV Quarter-Phased Transit Curves

TCE 004481350-06 P= 65.943020 Days $T_0=193.257136$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

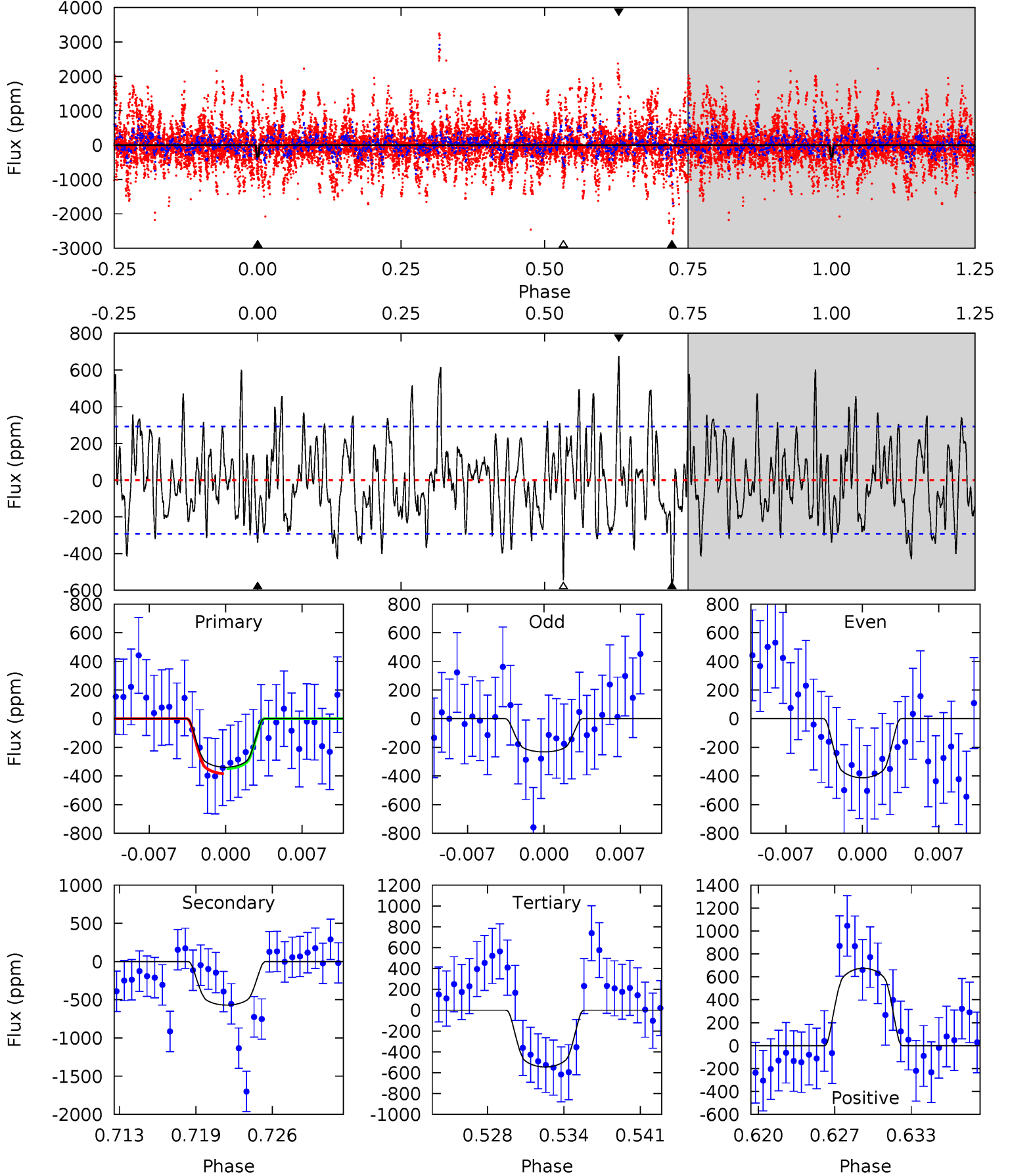
TCE 004481350-06 P= 65.948767 Days $T_0=193.208018$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-06, P = 65.943020 Days, E = 127.314116 Days

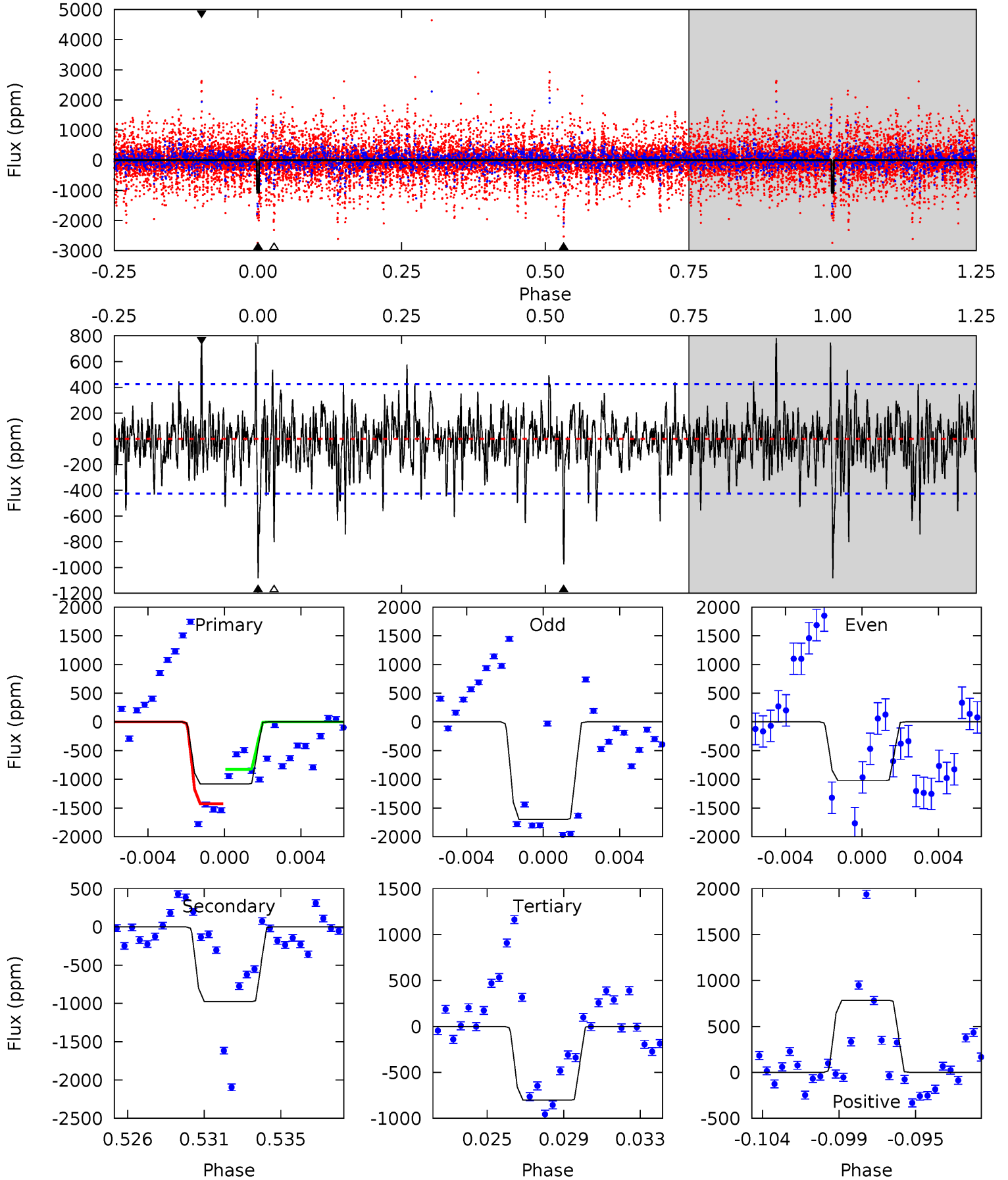
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.93	9.97	9.53	11.8	5.11	2.72	3.36	-3.61	-5.88	0.44	-1.83	1.43	0.73	0.54	0.30



Alt Model-Shift Uniqueness Test

004481350-06, P = 65.948767 Days, E = 127.259251 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	11.9	9.80	9.55	5.19	2.87	2.03	3.42	3.66	2.10	2.34	3.96	0.29	0.42	3.70



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-570 ± 57	$1.43^{+0.24}_{-0.23}$	420^{+13}_{-13}	4731^{+433}_{-321}	10691^{+4913}_{-2998}
Alt.	-974 ± 82	$1.94^{+0.24}_{-0.25}$	421^{+12}_{-13}	4660^{+304}_{-244}	9892^{+3217}_{-2176}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

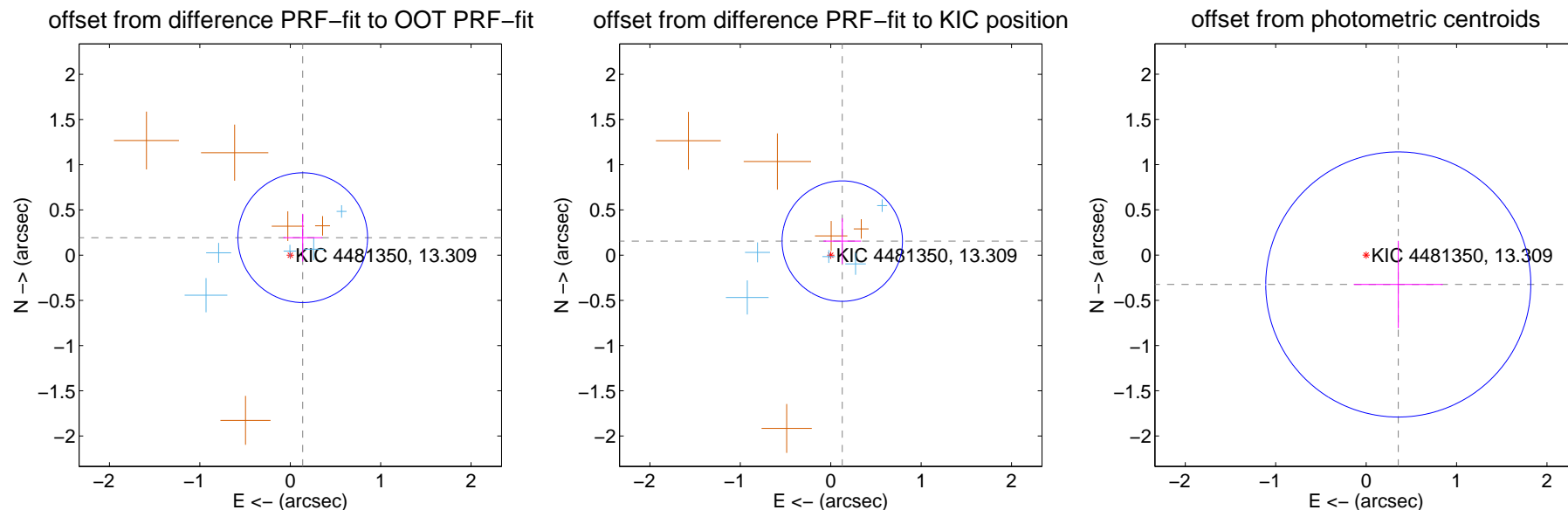
DV Centroid Data

Supplemental centroid analysis for 004481350-06. Kepler magnitude: 13.31. Transit SNR 4.39

There are 5 quarters with good PRF difference image offsets

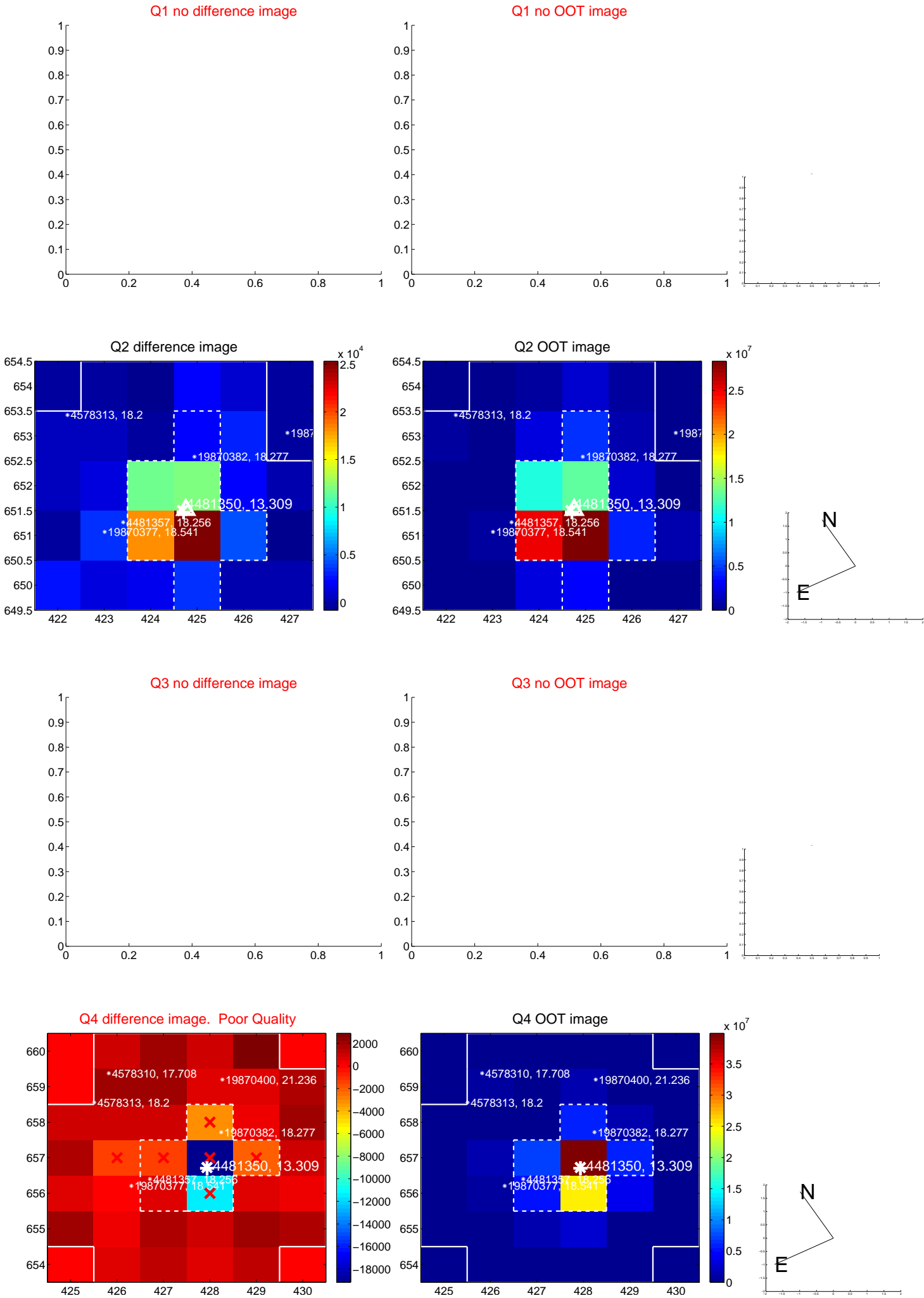
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.238 ± 0.239	0.99	-0.138 ± 0.216	0.193 ± 0.264
PRF-fit source offset from KIC position	0.201 ± 0.222	0.91	-0.128 ± 0.208	0.156 ± 0.253
photometric centroid source offset	0.48 ± 0.49	0.99	-0.36 ± 0.49	-0.32 ± 0.48

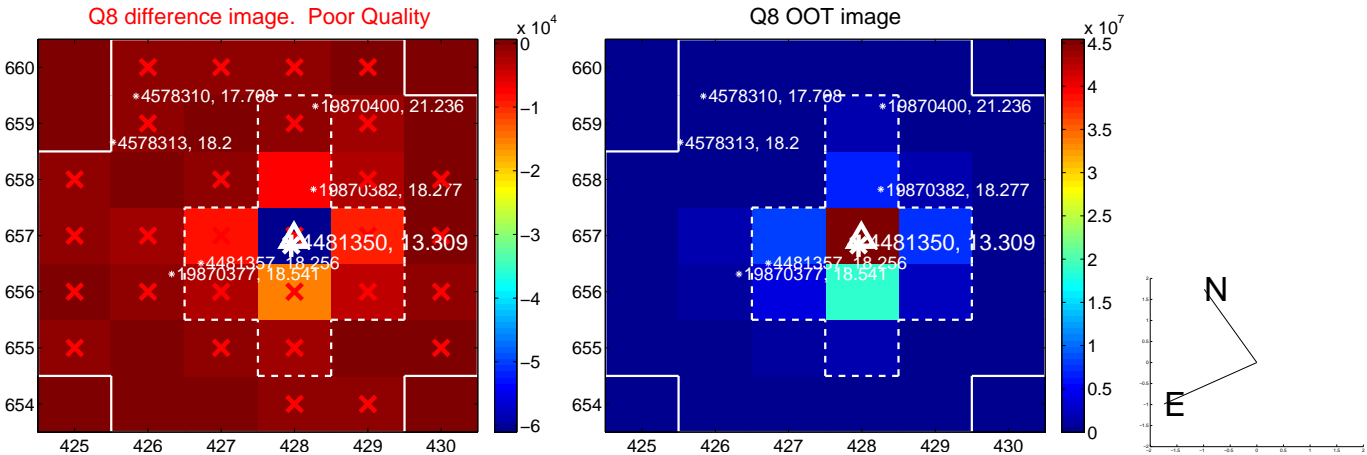
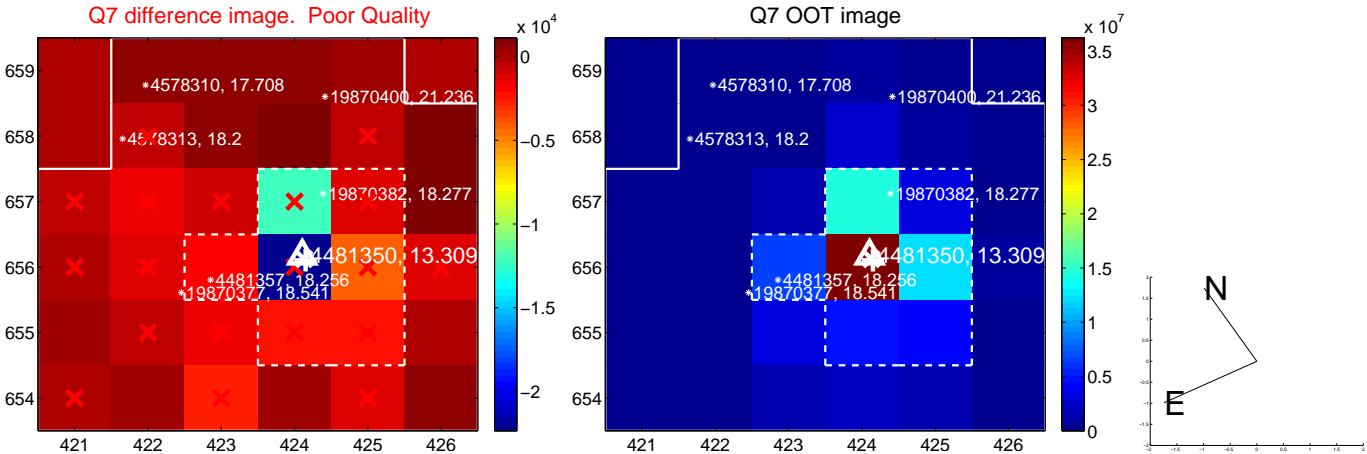
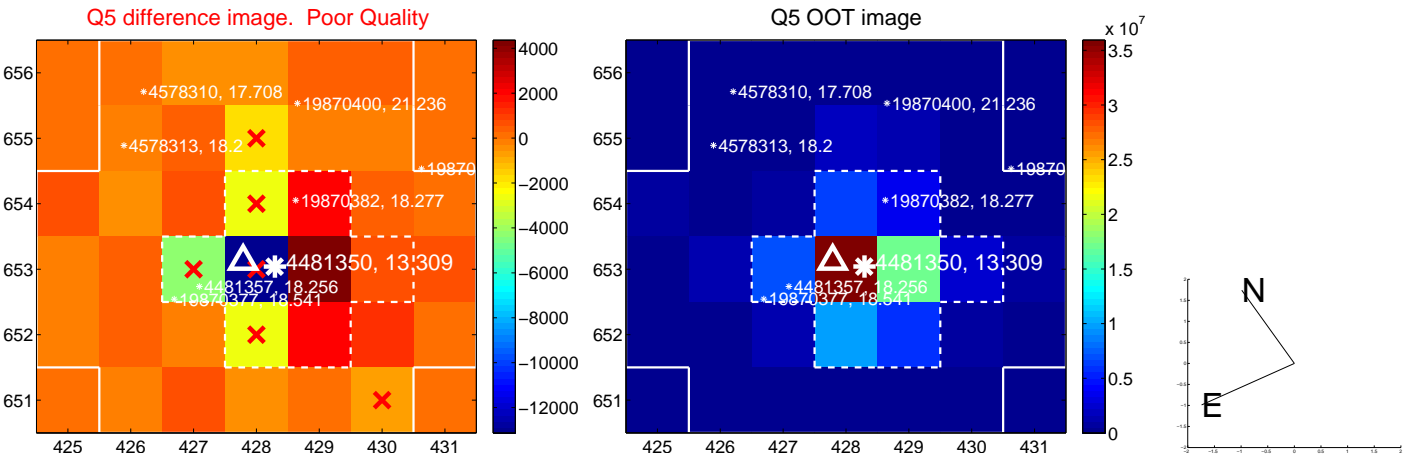


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

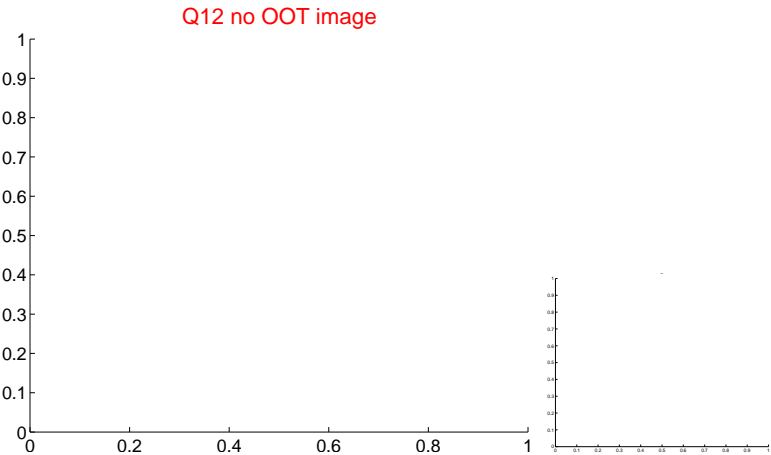
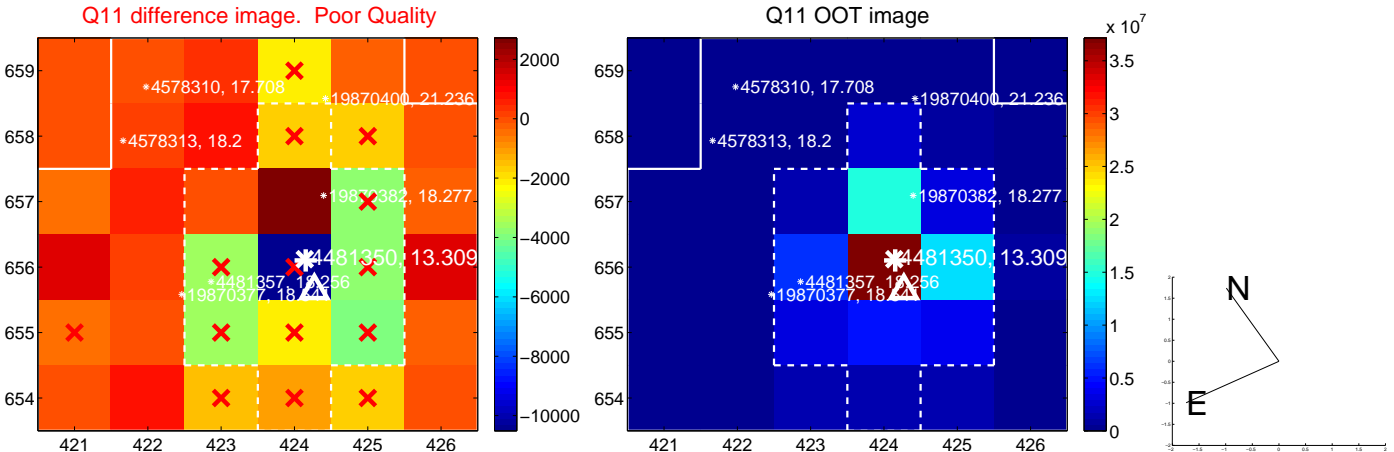
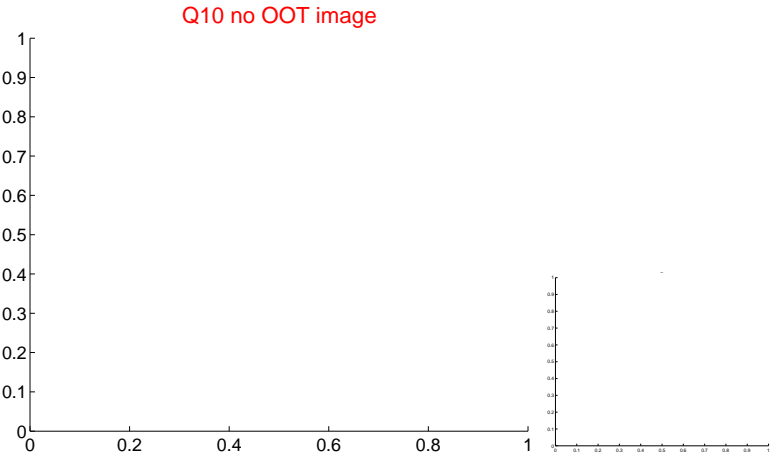
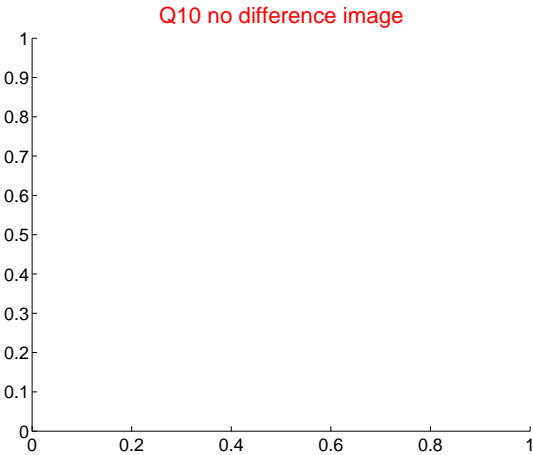
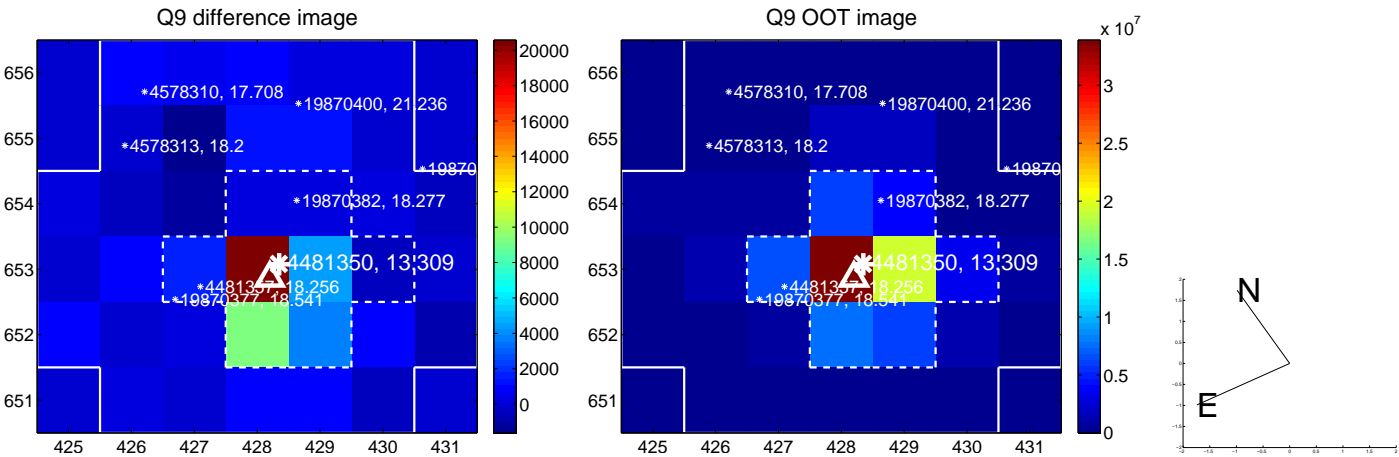
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



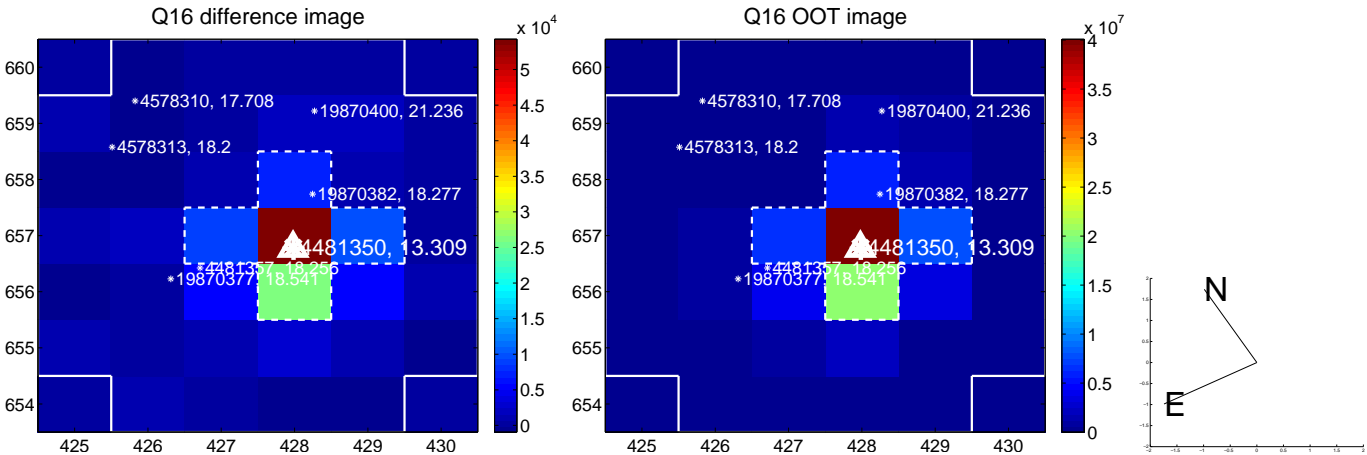
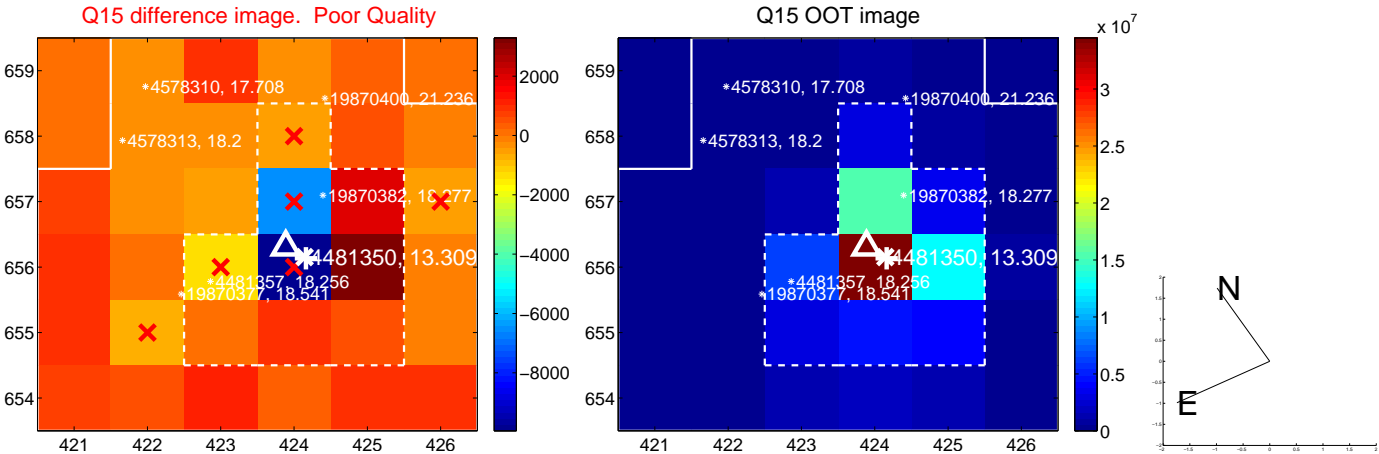
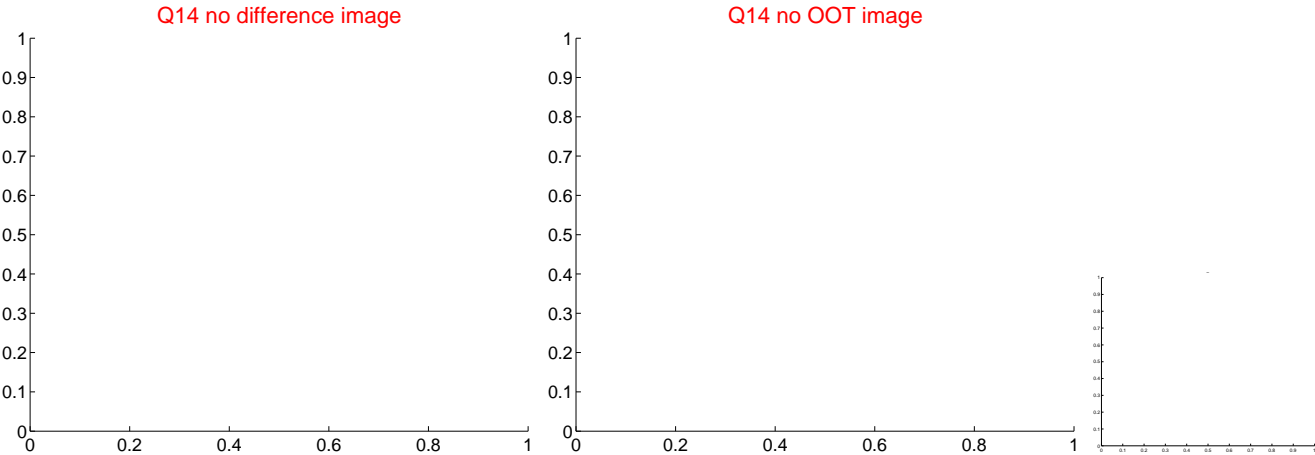
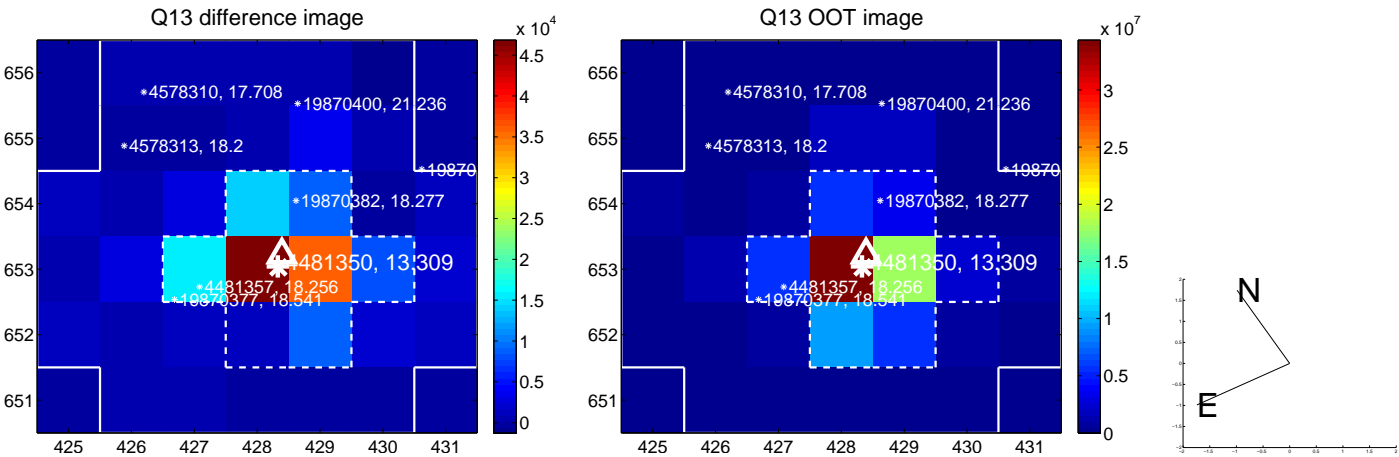
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



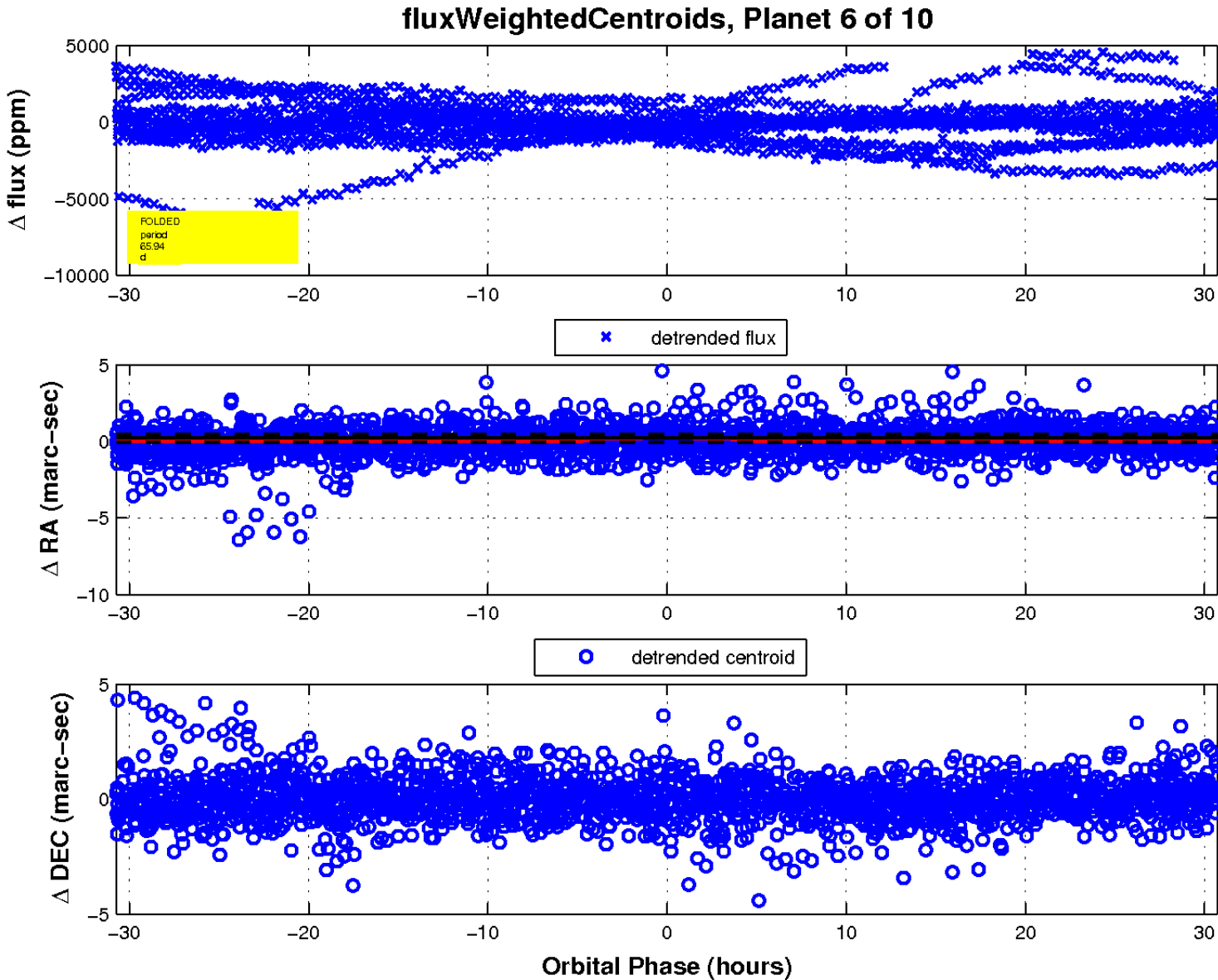
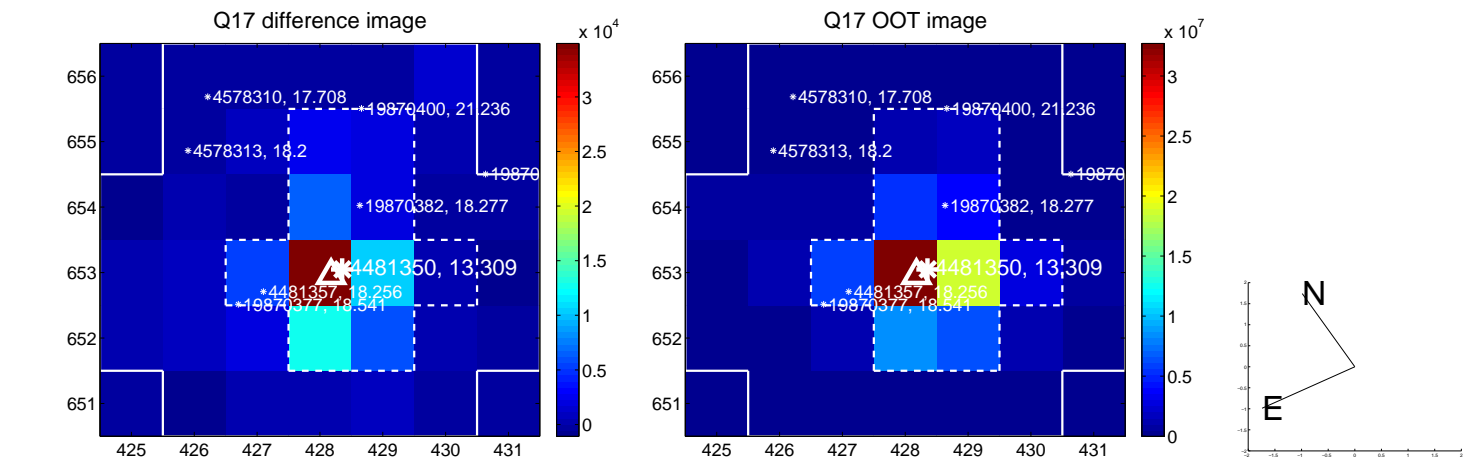
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



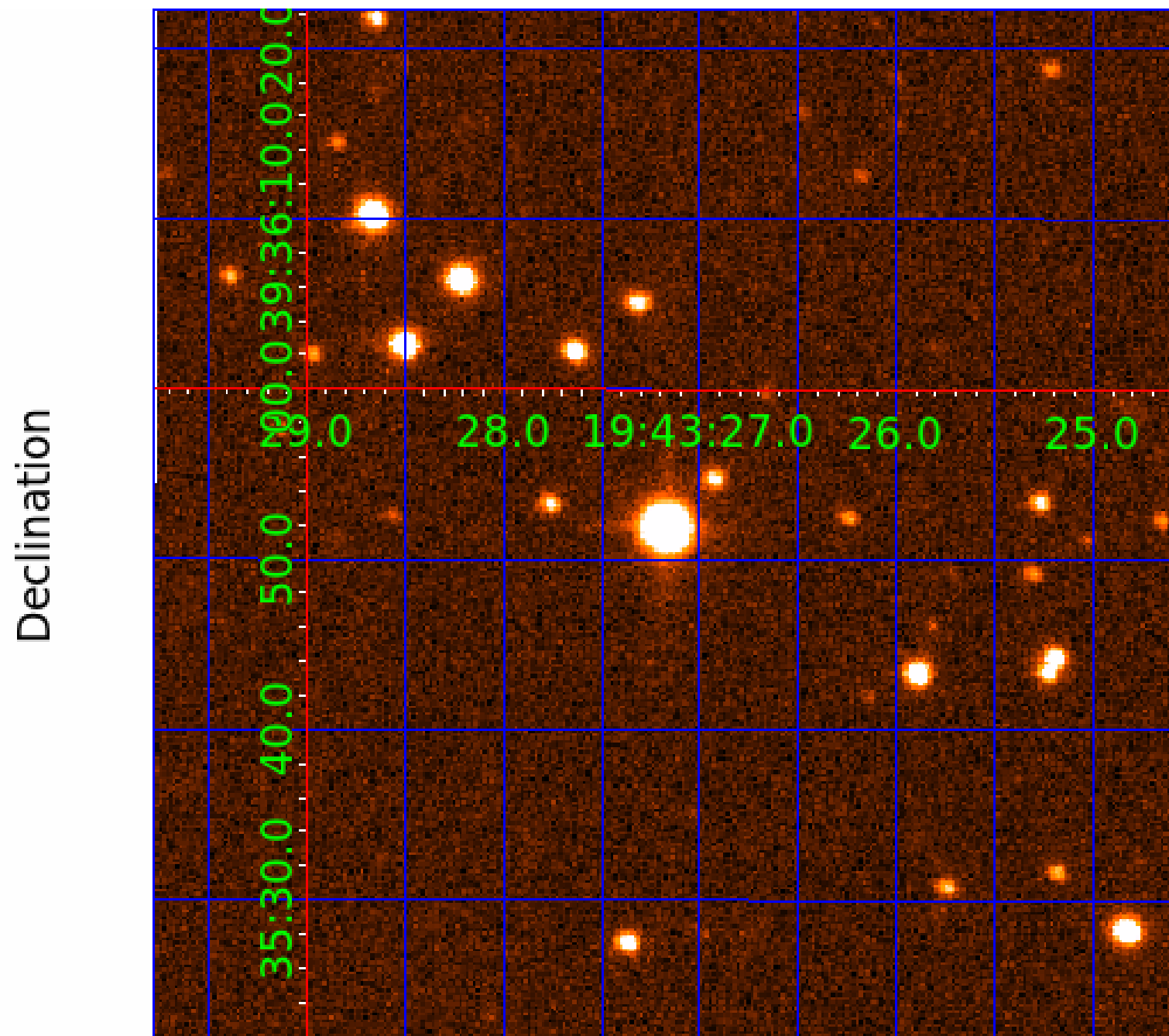
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

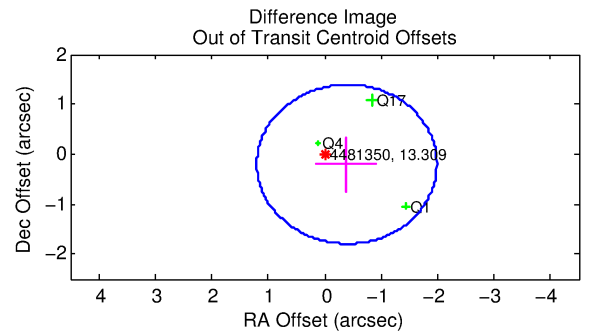
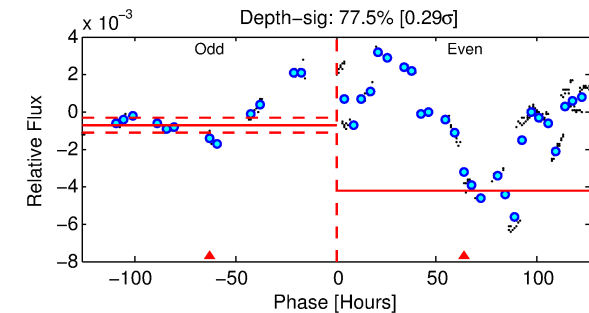
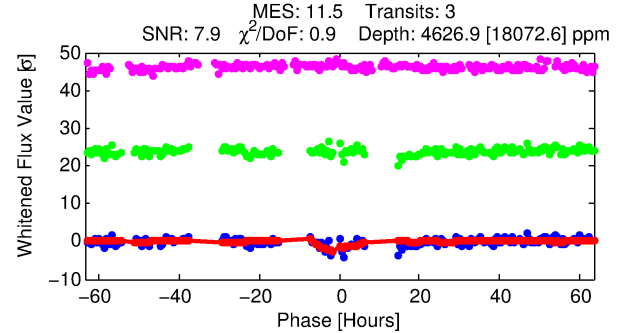
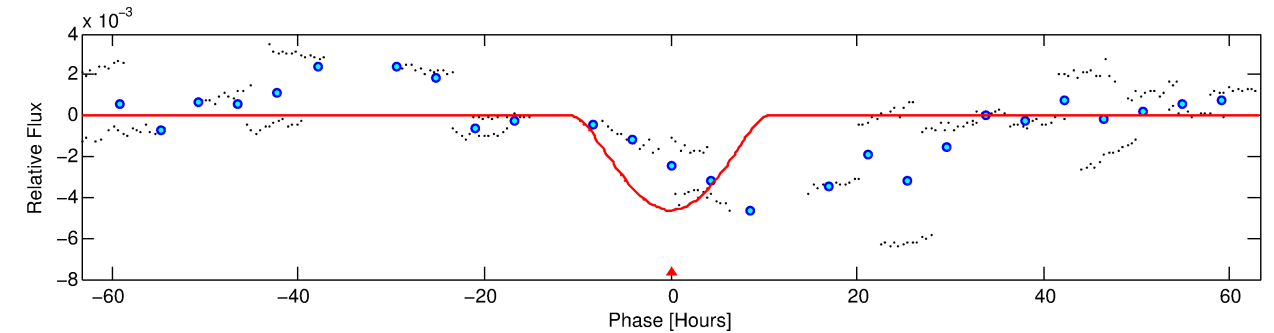
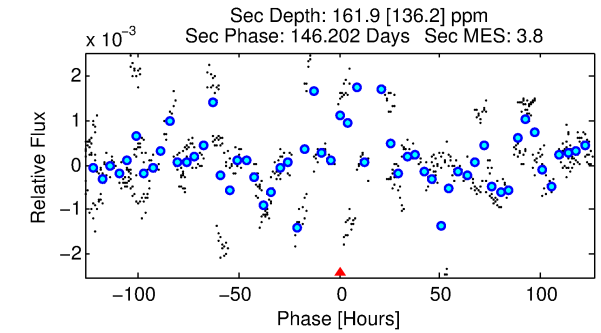
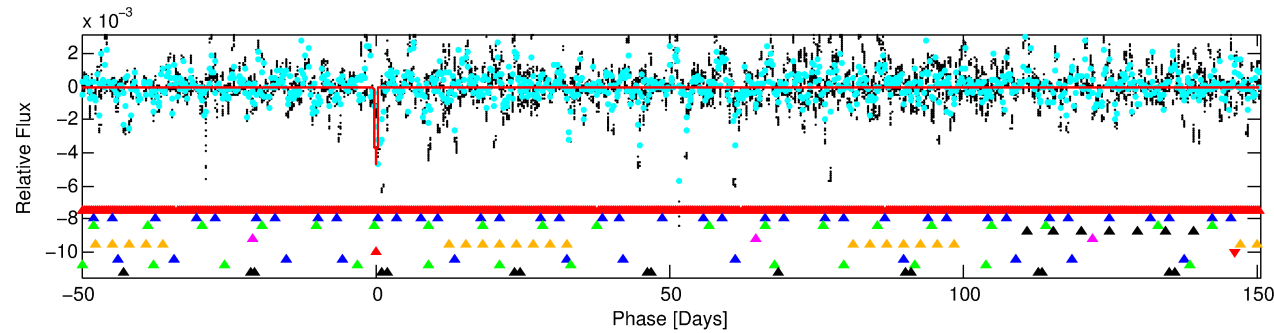
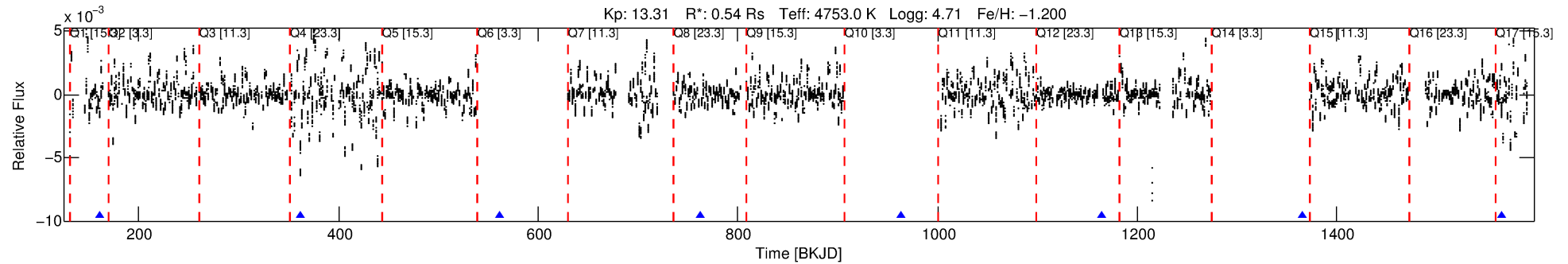
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-07

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 7 of 10 Period: 200.678 d



DV Fit Results:

Period = 200.67770 [0.12700] d
Epoch = 160.8532 [0.5044] BKJD
Rp/R* = 0.1176 [0.3242]
a/R* = 36.27 [21.26]
b = 1.00 [0.17]
Seff = 0.44 [0.06]
Teq = 208 [7] K
Rp = 6.97 [19.21] Re
a = 0.5511 [0.0286] AU
Ag = 557.51 [3111.14] [0.18 σ]
Teffp = 1564 [2182] K [0.62 σ]

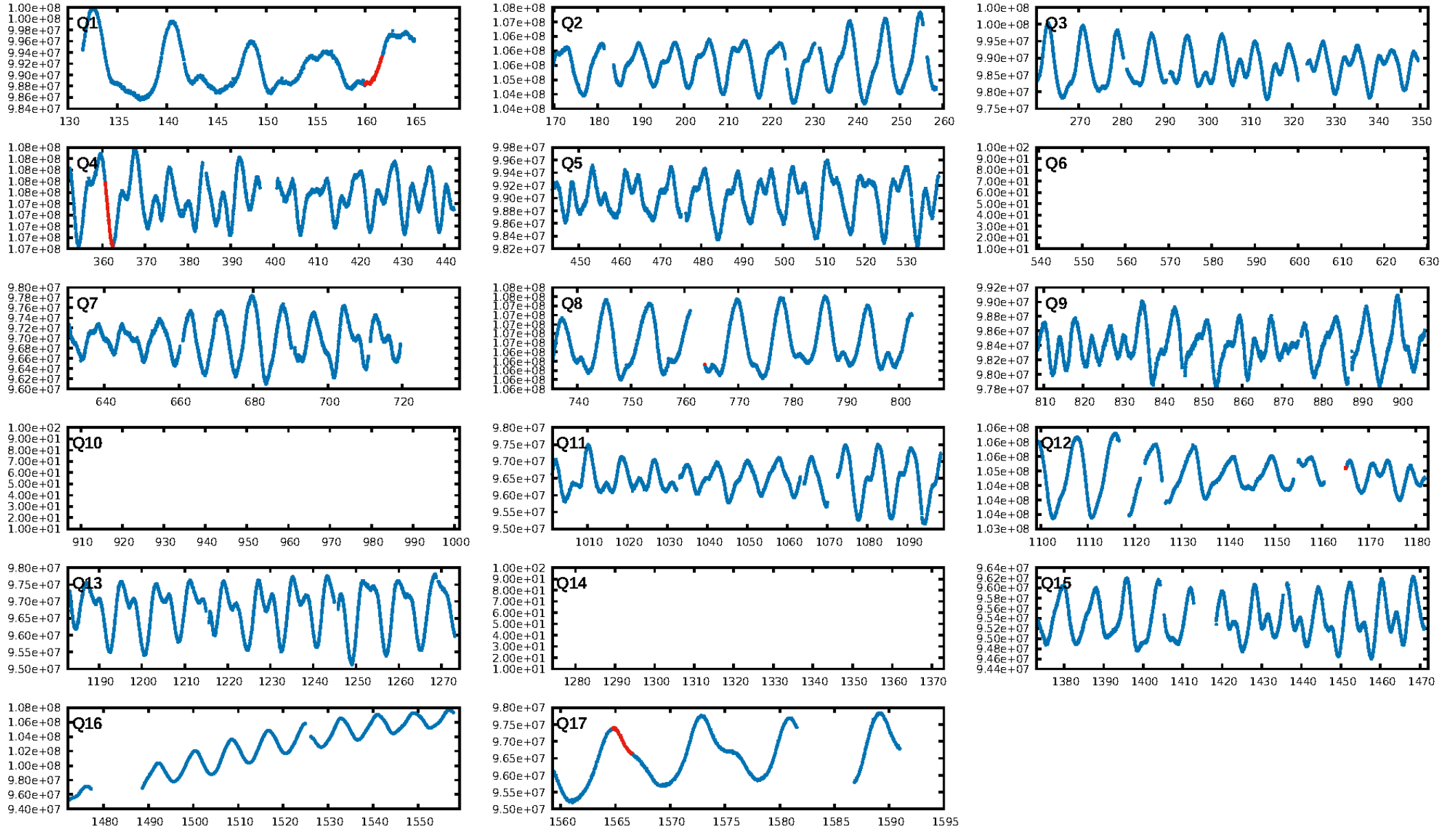
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [72.06 σ]
LongPeriod-sig: 100.0% [4.44 σ]
ModelChiSquare2-sig: 63.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1/1]
GhostDiagnostic-chr: 2.095
Centroid-sig: N/A
Centroid-so: 0.144 arcsec [1.77 σ]
OotOffset-rm: 0.443 arcsec [0.83 σ]
KicOffset-rm: 0.462 arcsec [0.87 σ]
OotOffset-st: 0/0/1/2 [3]
KicOffset-st: 0/0/1/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

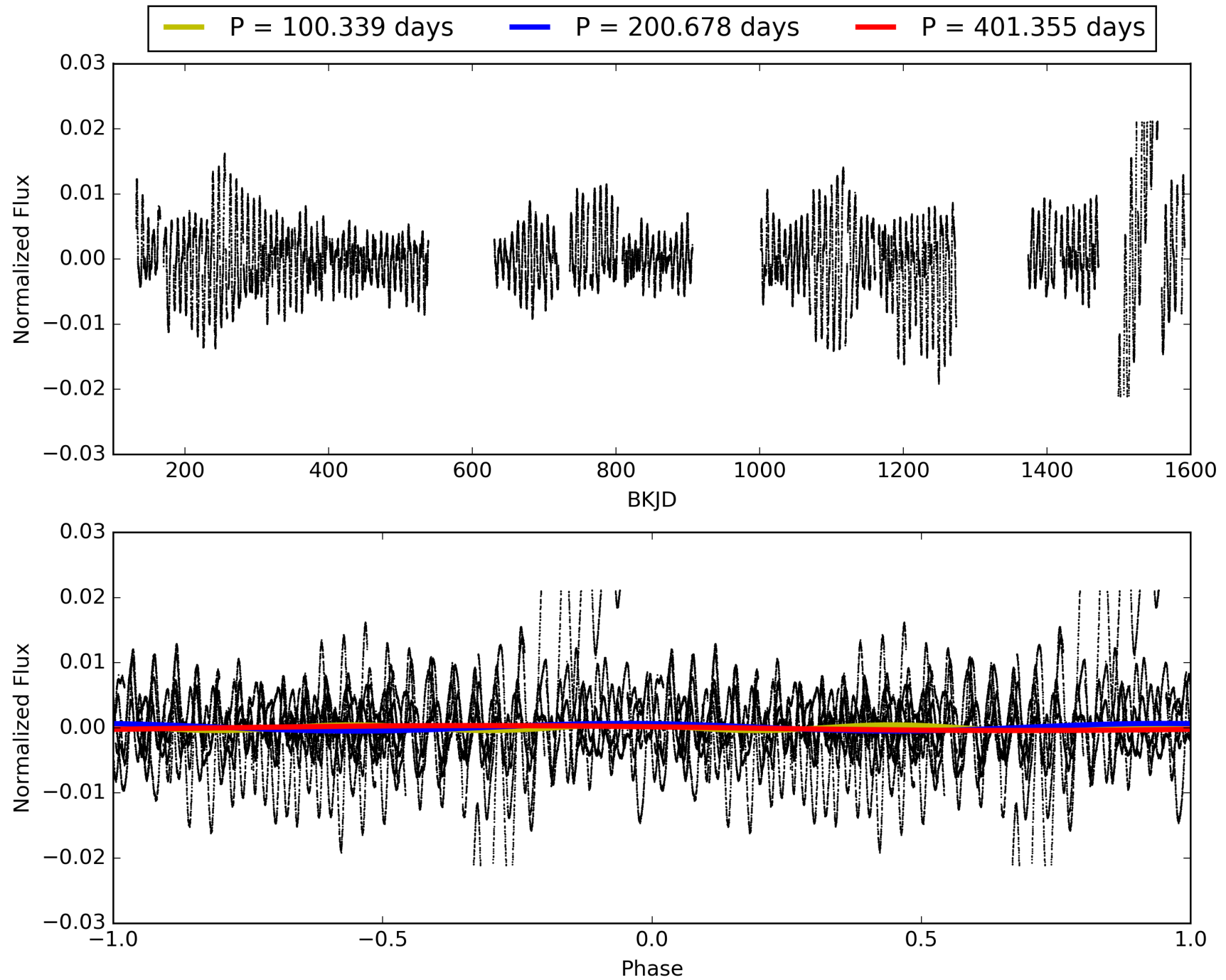
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:51 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-07, PDC Light Curves

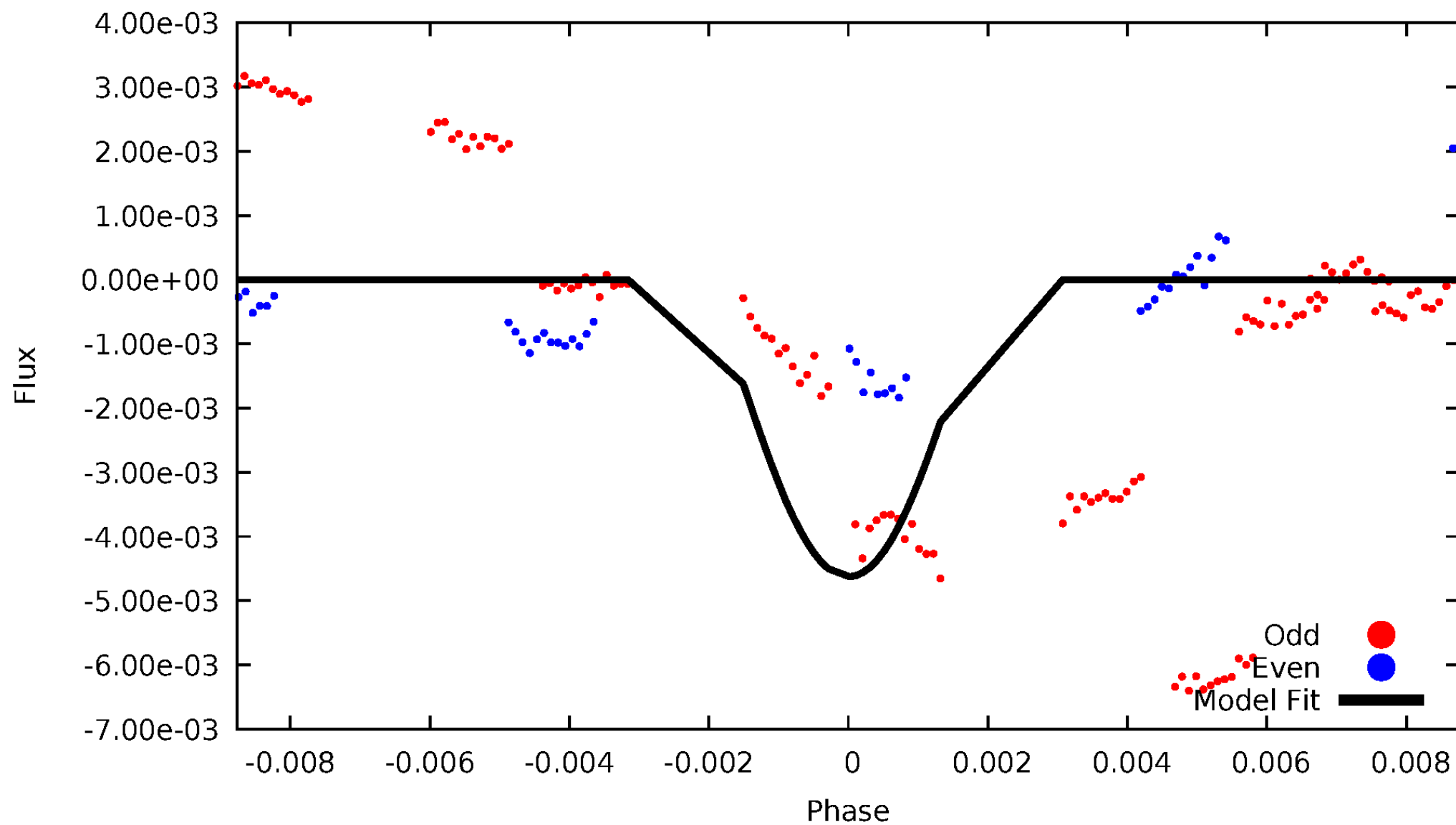


TCE 004481350-07



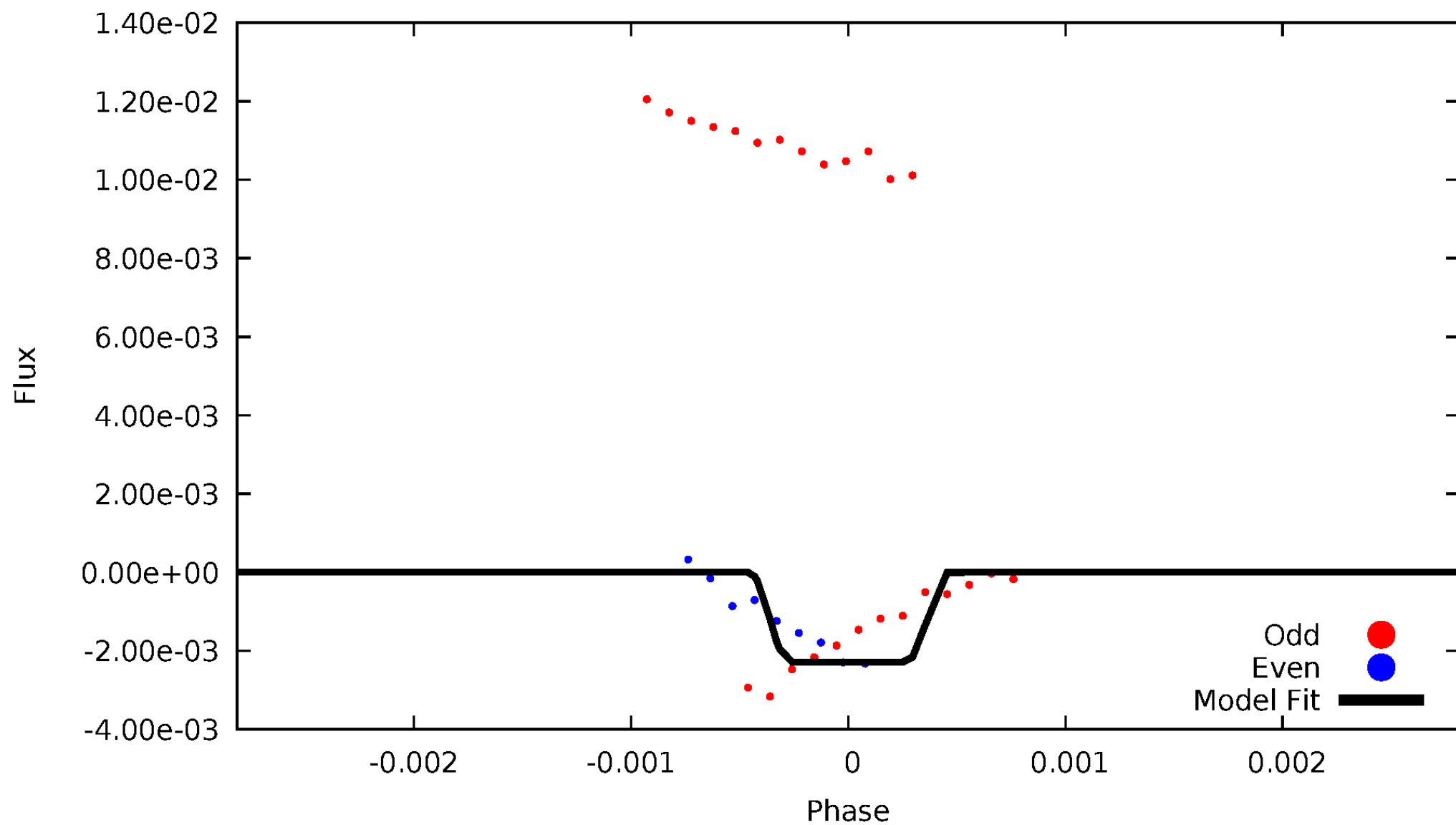
DV Odd/Even

TCE 004481350-07

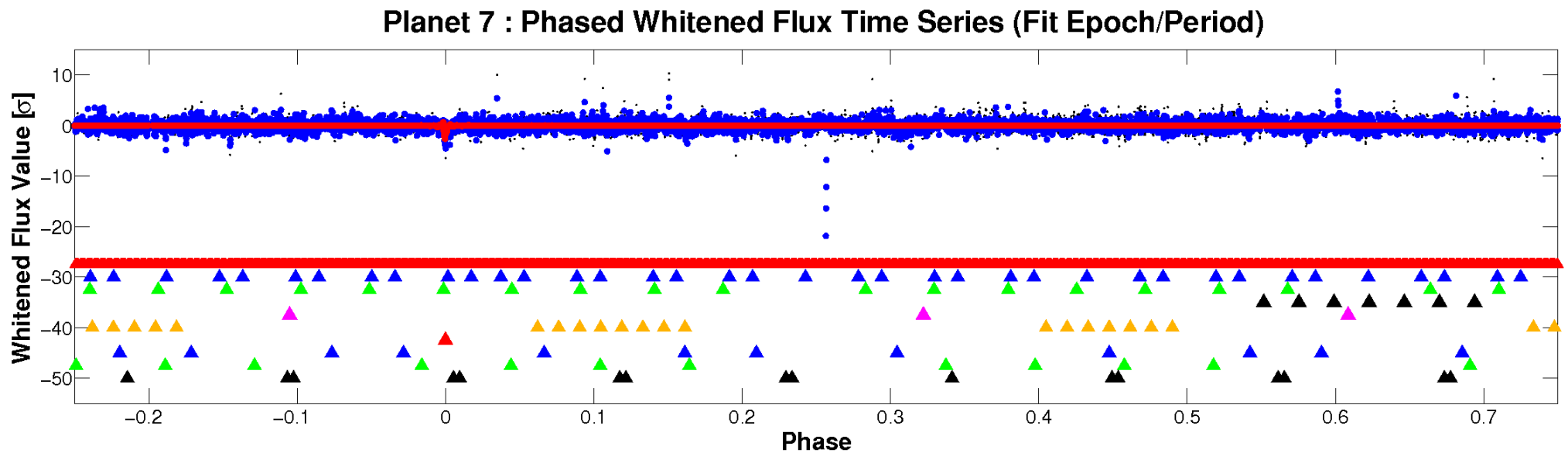
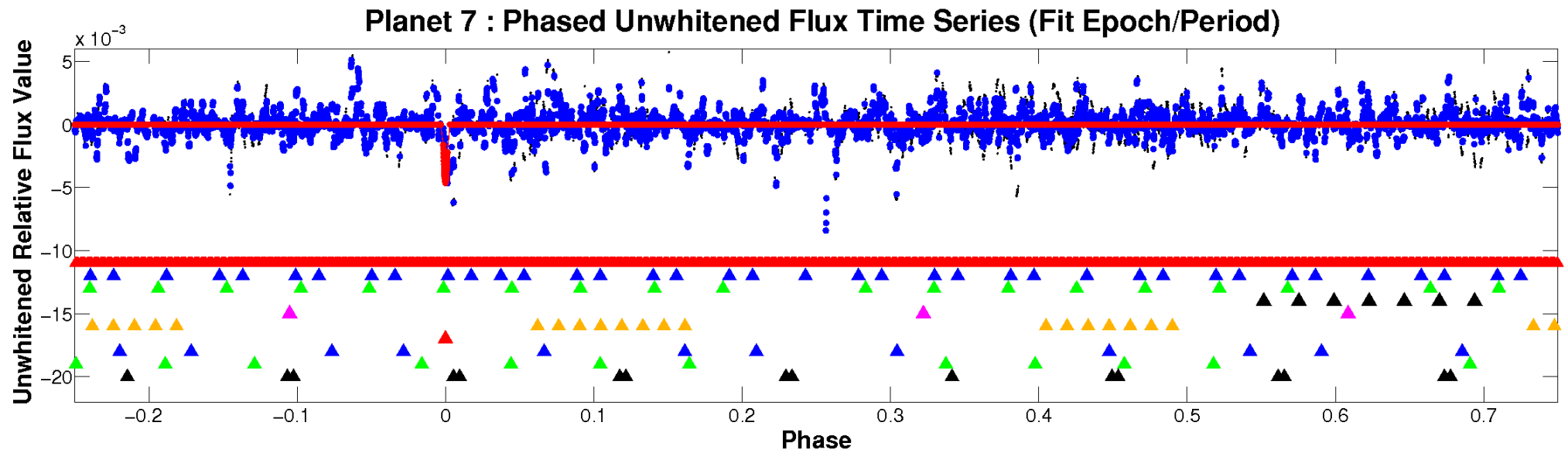


ALT Odd/Even

TCE 004481350-07

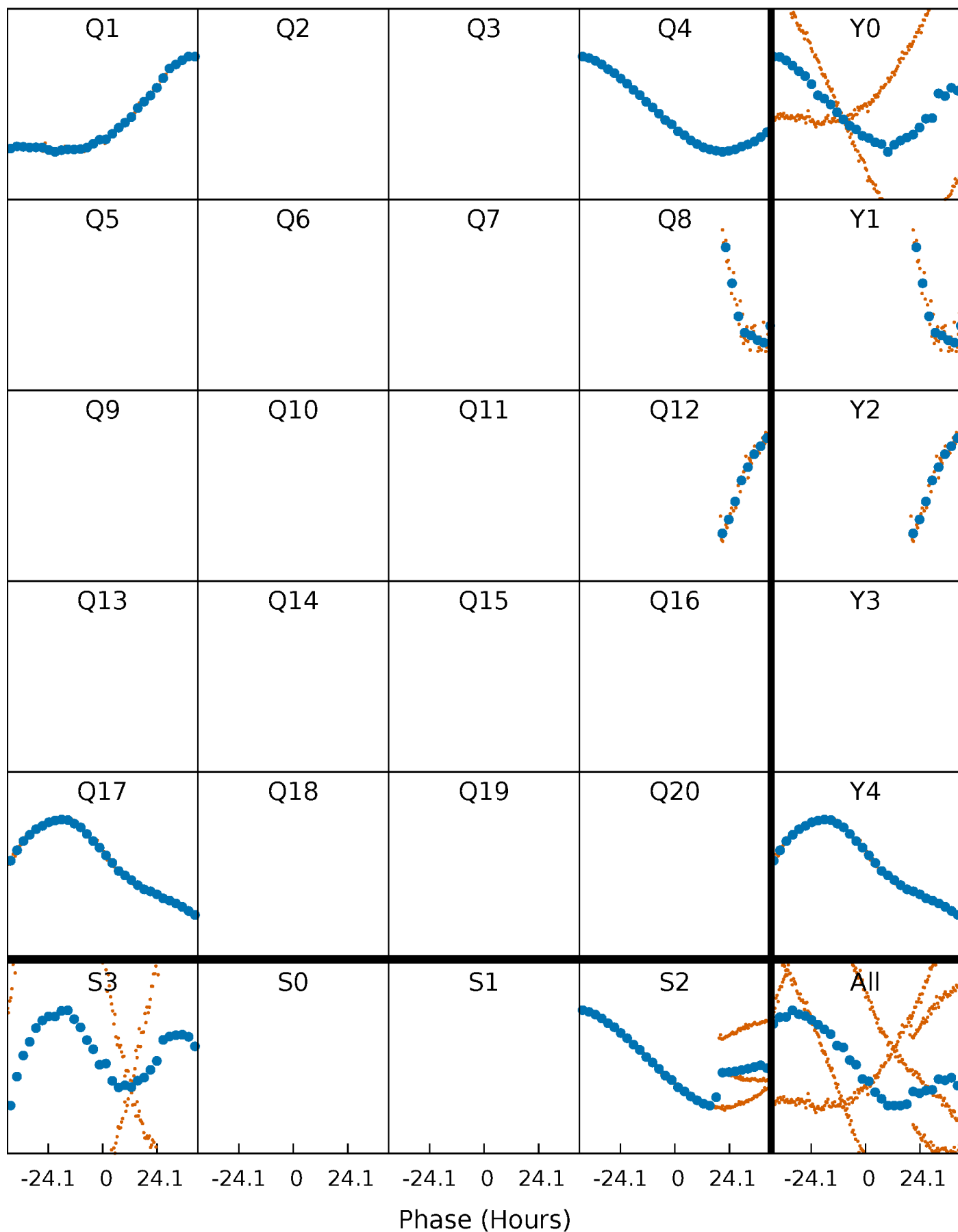


Non-Whitened Vs. Whitened Light Curve



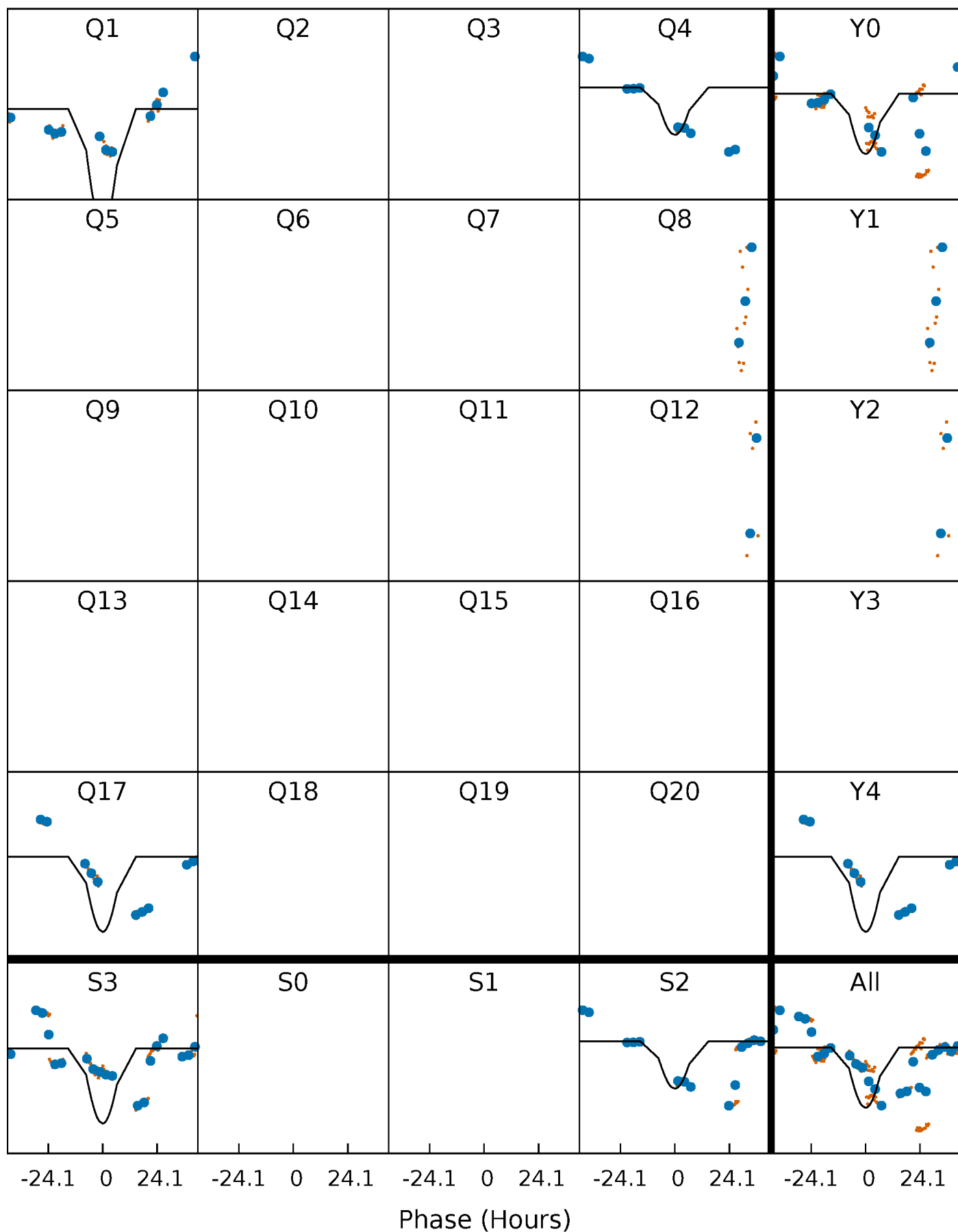
PDC Quarter-Phased Transit Curves

TCE 004481350-07 $P=200.677698$ Days $T_0=160.853226$ (BKJD)



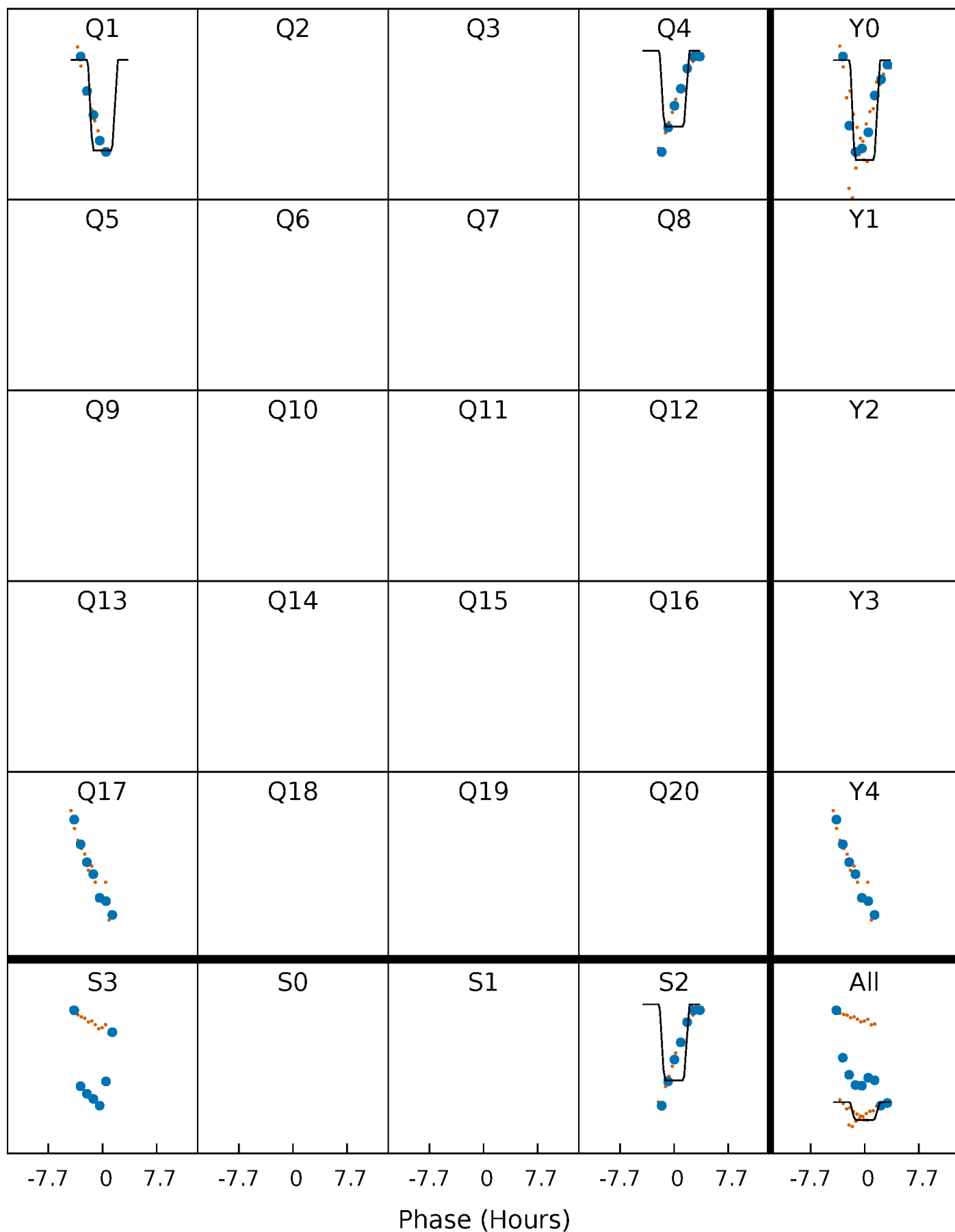
DV Quarter-Phased Transit Curves

TCE 004481350-07 $P=200.677698$ Days $T_0=160.853226$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

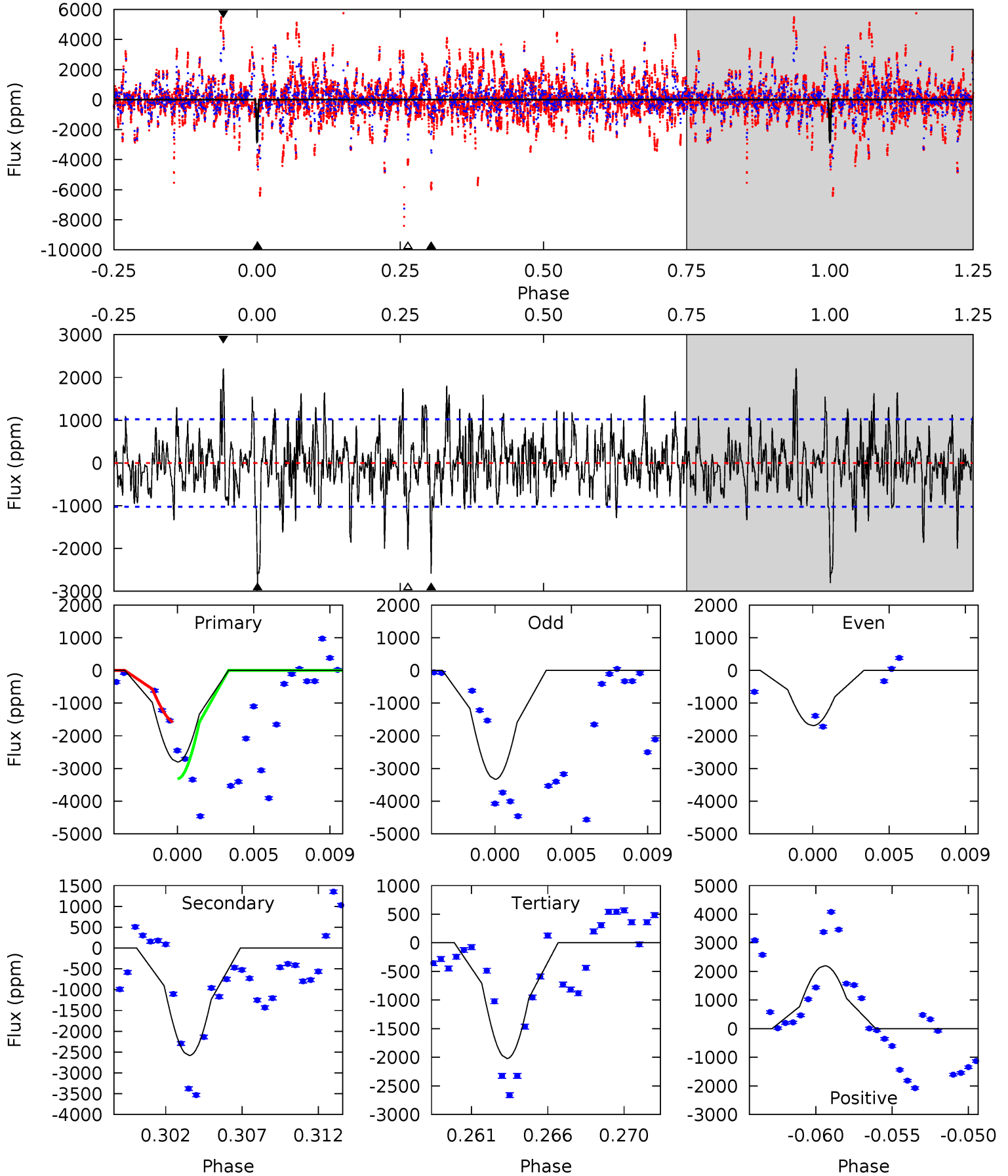
TCE 004481350-07 P=200.639486 Days $T_0=161.004097$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-07, P = 200.677698 Days, E = 160.853226 Days

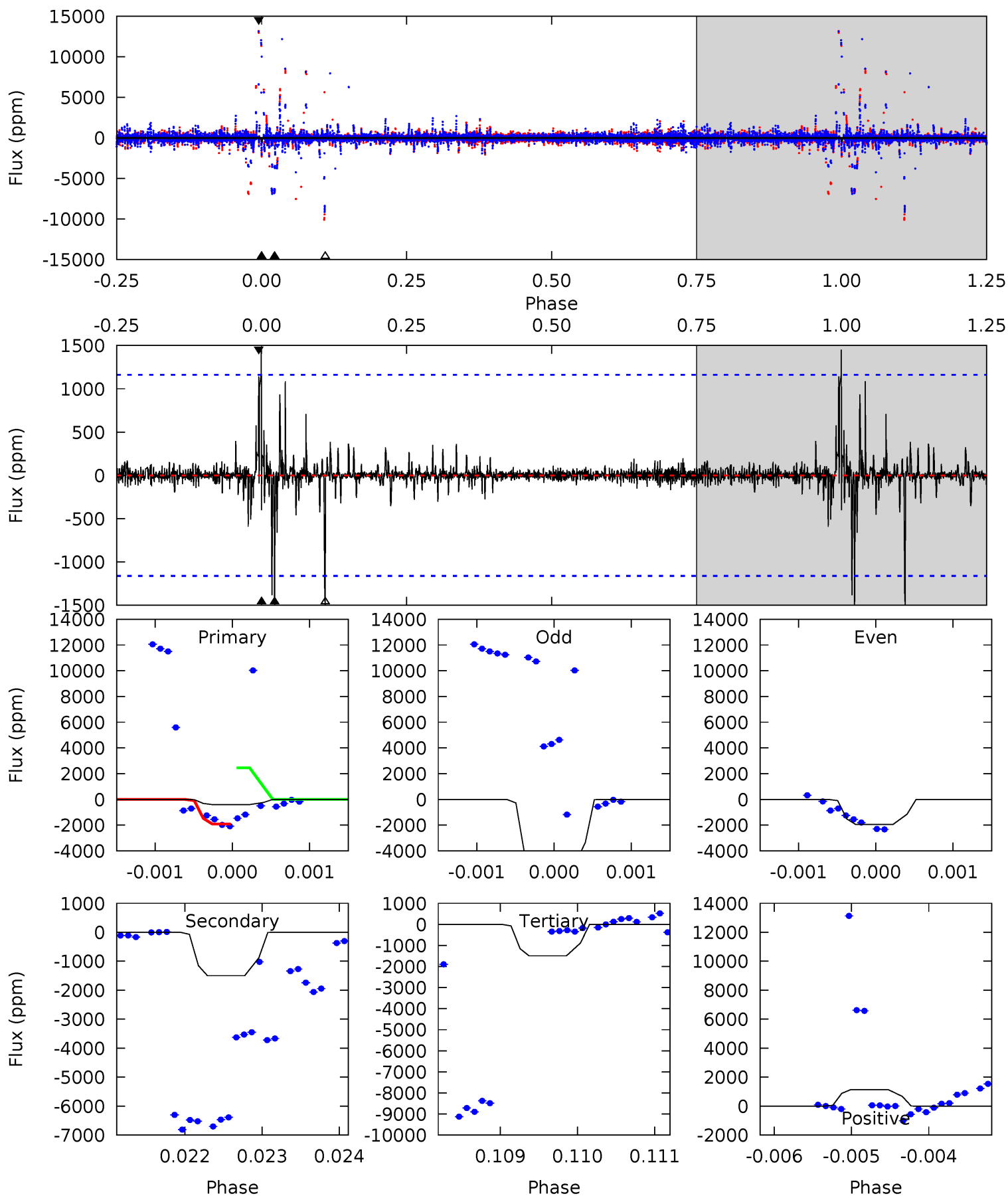
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	13.1	10.2	11.1	5.17	2.84	2.75	3.95	3.06	2.84	1.95	3.74	1.59	0.44	4.36



Alt Model-Shift Uniqueness Test

004481350-07, P = 200.639486 Days, E = 161.004097 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.89	7.05	7.05	5.38	5.48	3.33	0.50	-5.16	-3.49	0.00	1.67	10.3	-1.29	0.49	0



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-07 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2585 ± 198	$16.78^{+16.06}_{-11.76}$	290^{+10}_{-9}	2731^{+1187}_{-431}	1586^{+15218}_{-1195}
Alt.	-1495 ± 212	$14.73^{+15.24}_{-10.57}$	291^{+9}_{-11}	2643^{+1182}_{-423}	1192^{+12927}_{-917}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

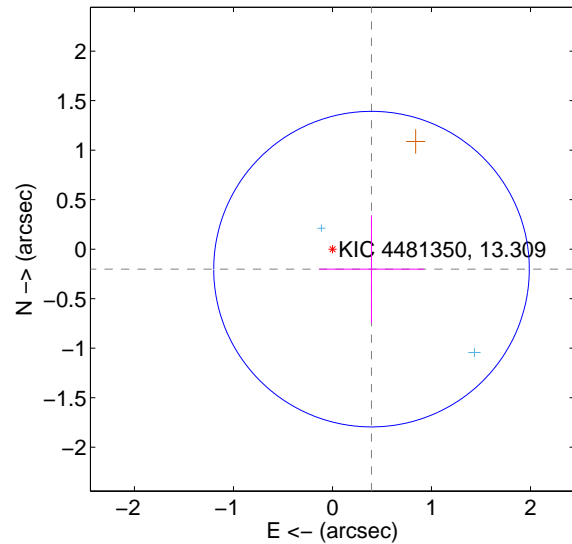
Supplemental centroid analysis for 004481350-07. Kepler magnitude: 13.31. Transit SNR 7.86

There are 2 quarters with good PRF difference image offsets

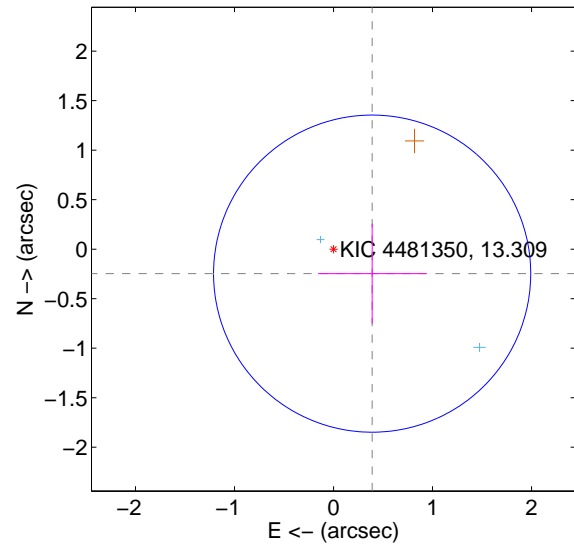
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.443 ± 0.531	0.83	-0.394 ± 0.528	-0.202 ± 0.544
PRF-fit source offset from KIC position	0.462 ± 0.534	0.87	-0.390 ± 0.545	-0.247 ± 0.504
photometric centroid source offset	0.14 ± 0.08	1.77	0.14 ± 0.08	0.03 ± 0.07

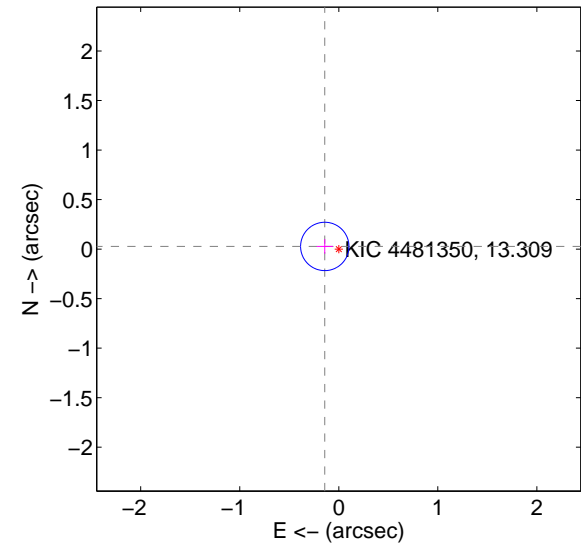
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

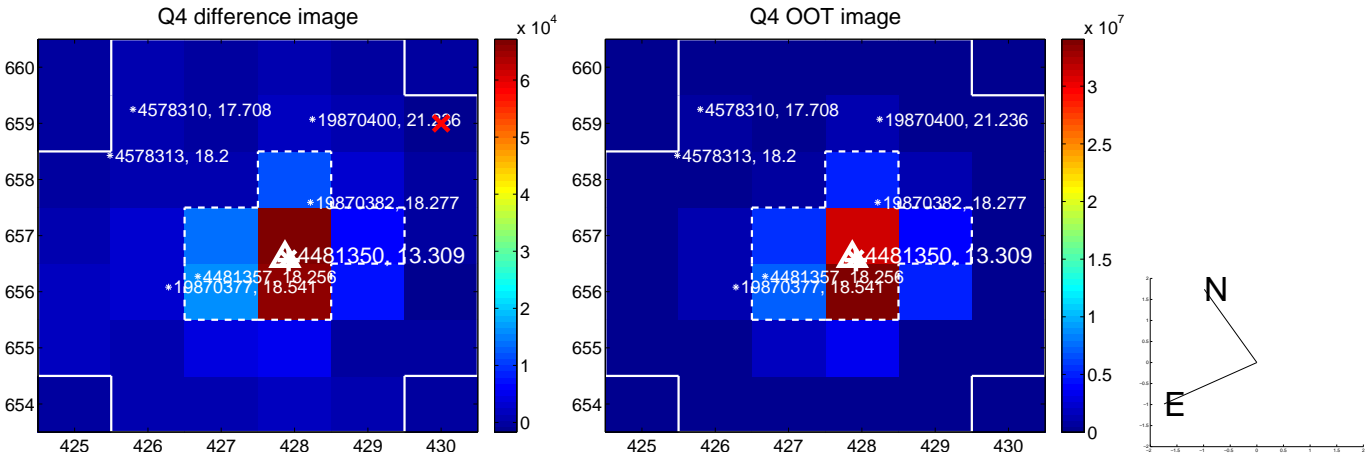
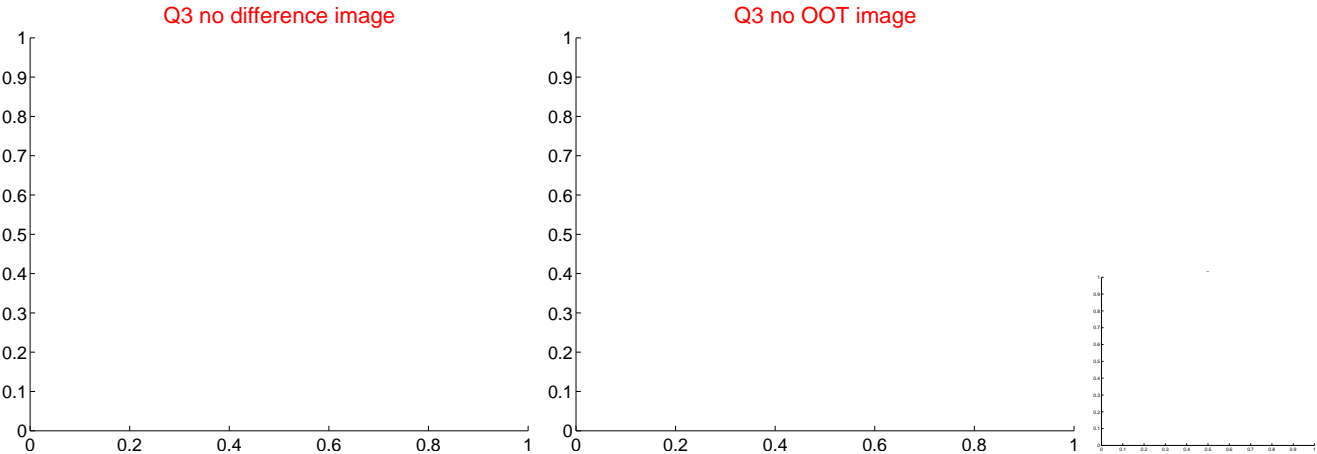
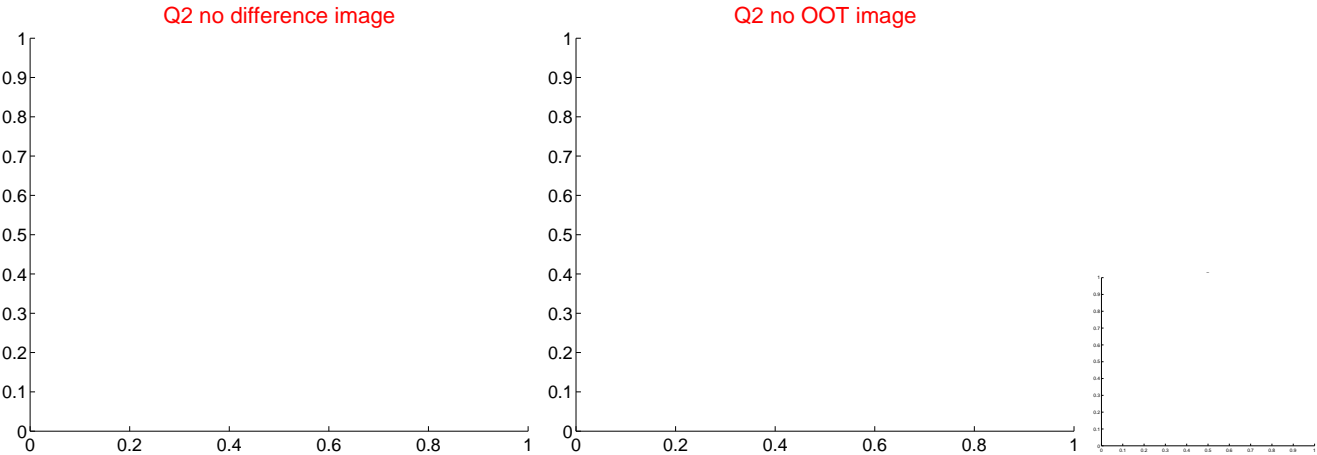
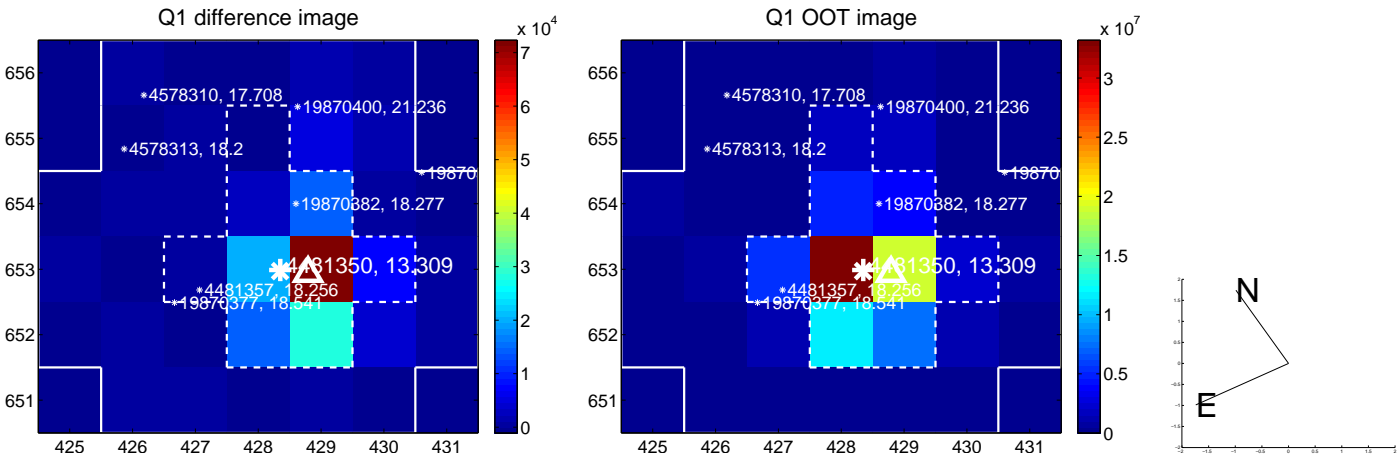


offset from photometric centroids

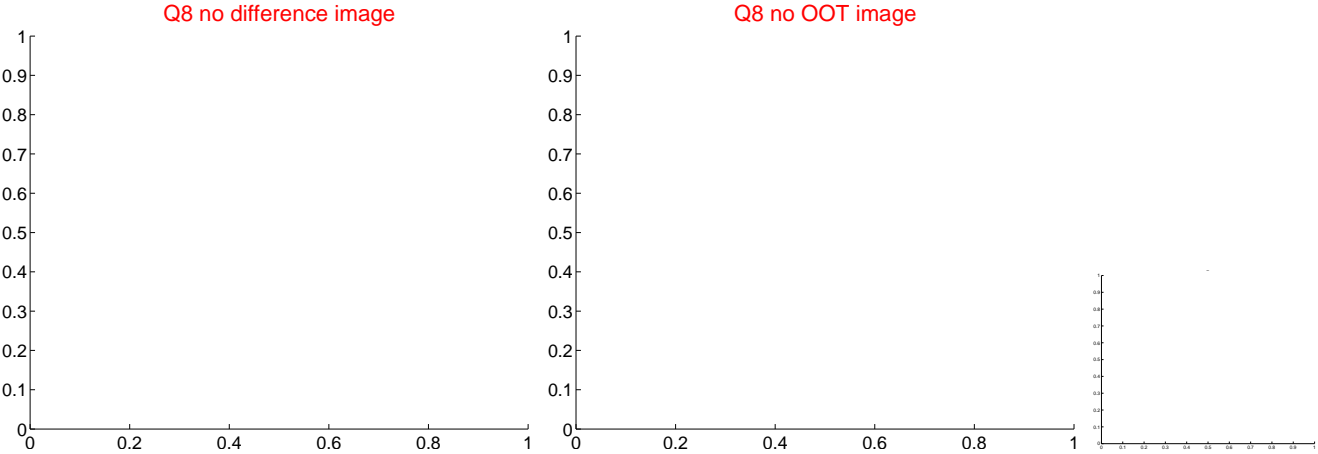
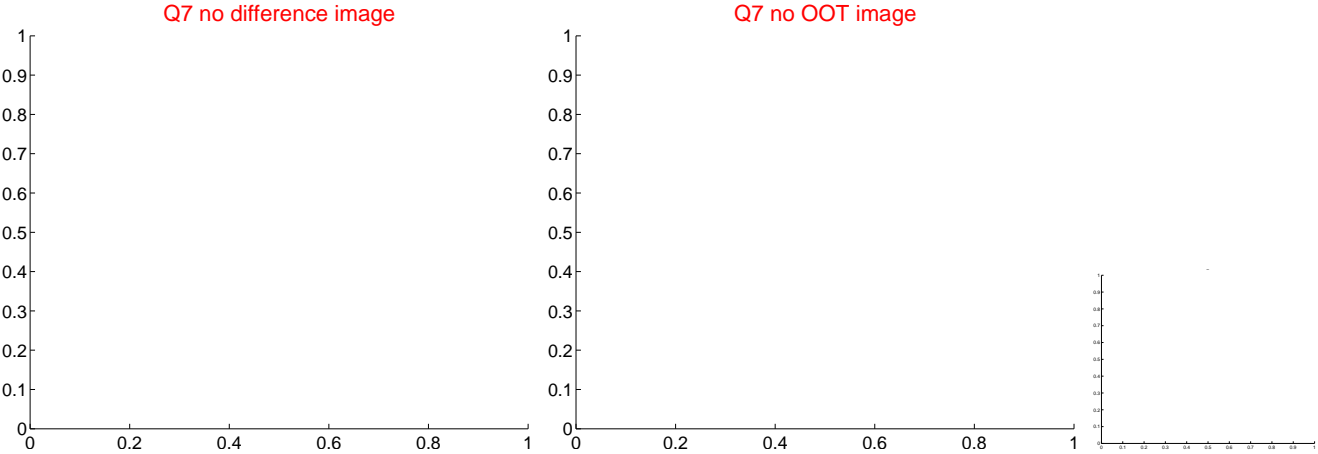
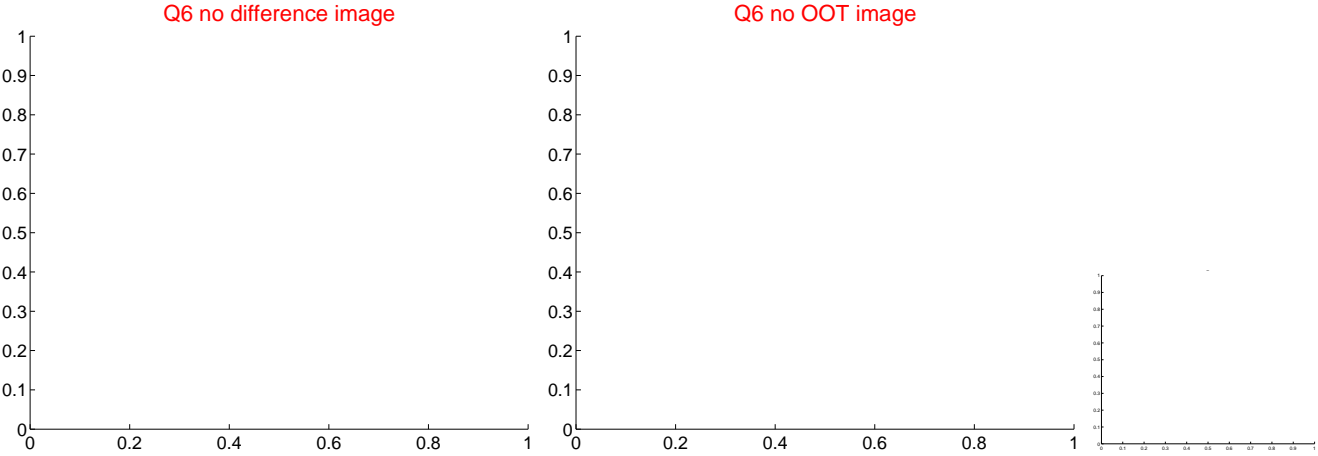
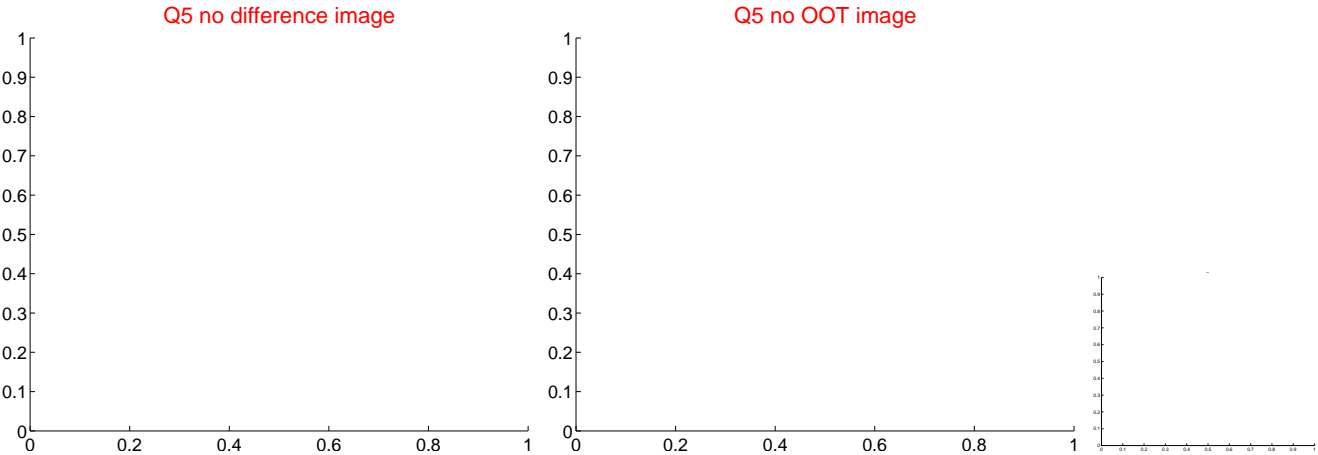


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs $> 15,000,000$ are from the UKIRT catalog.

white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



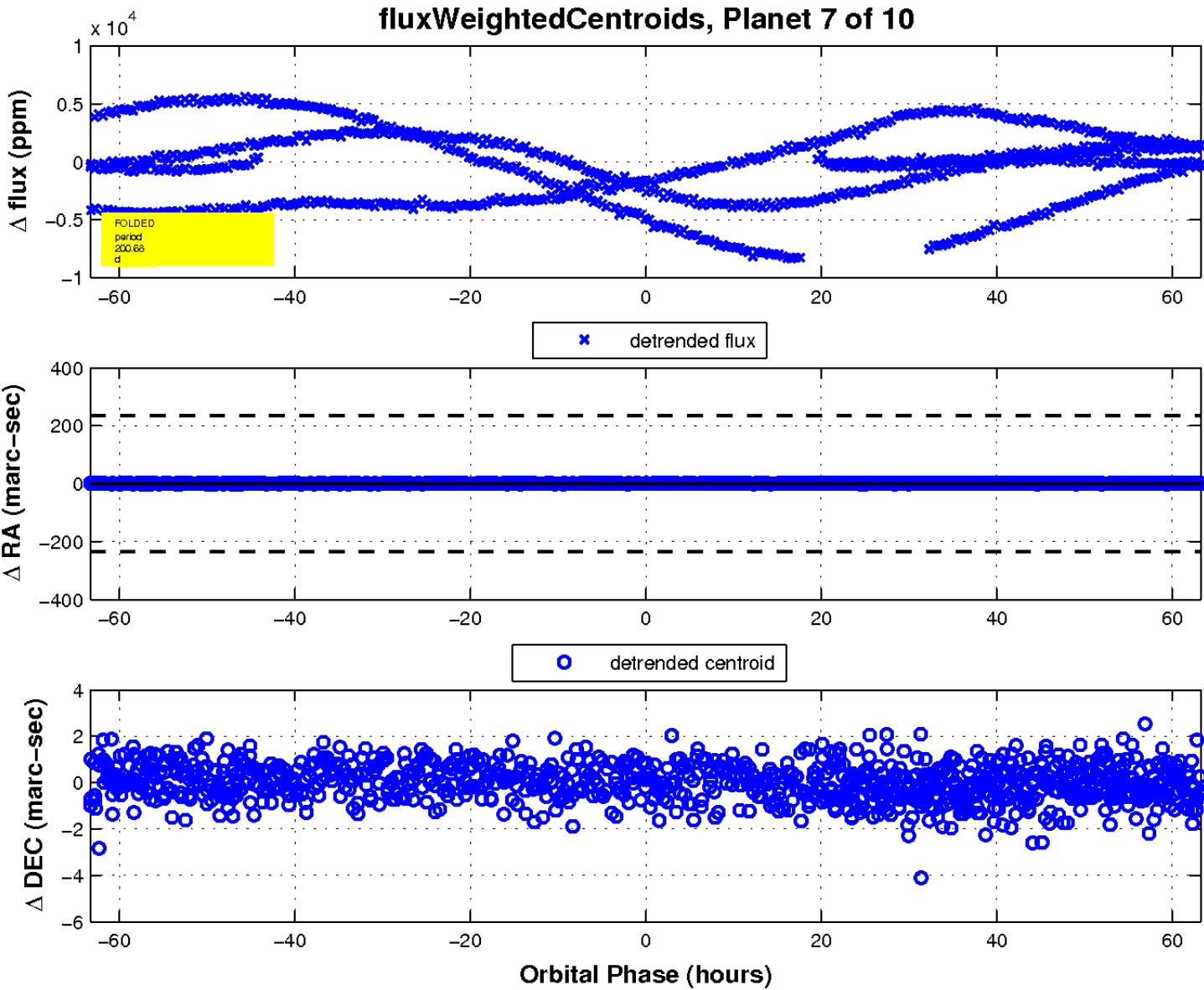
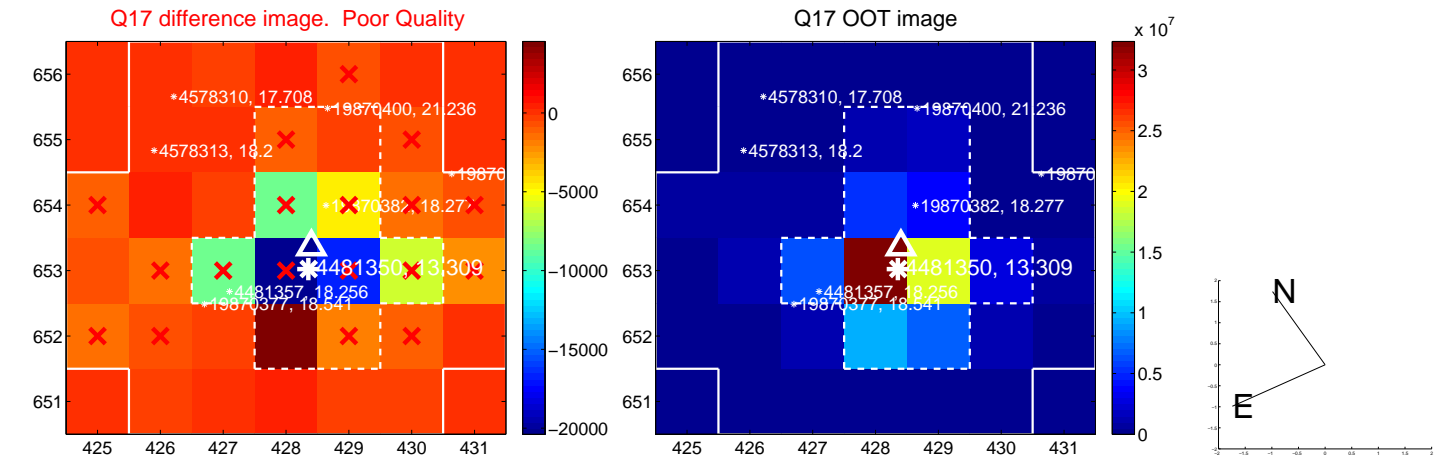
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



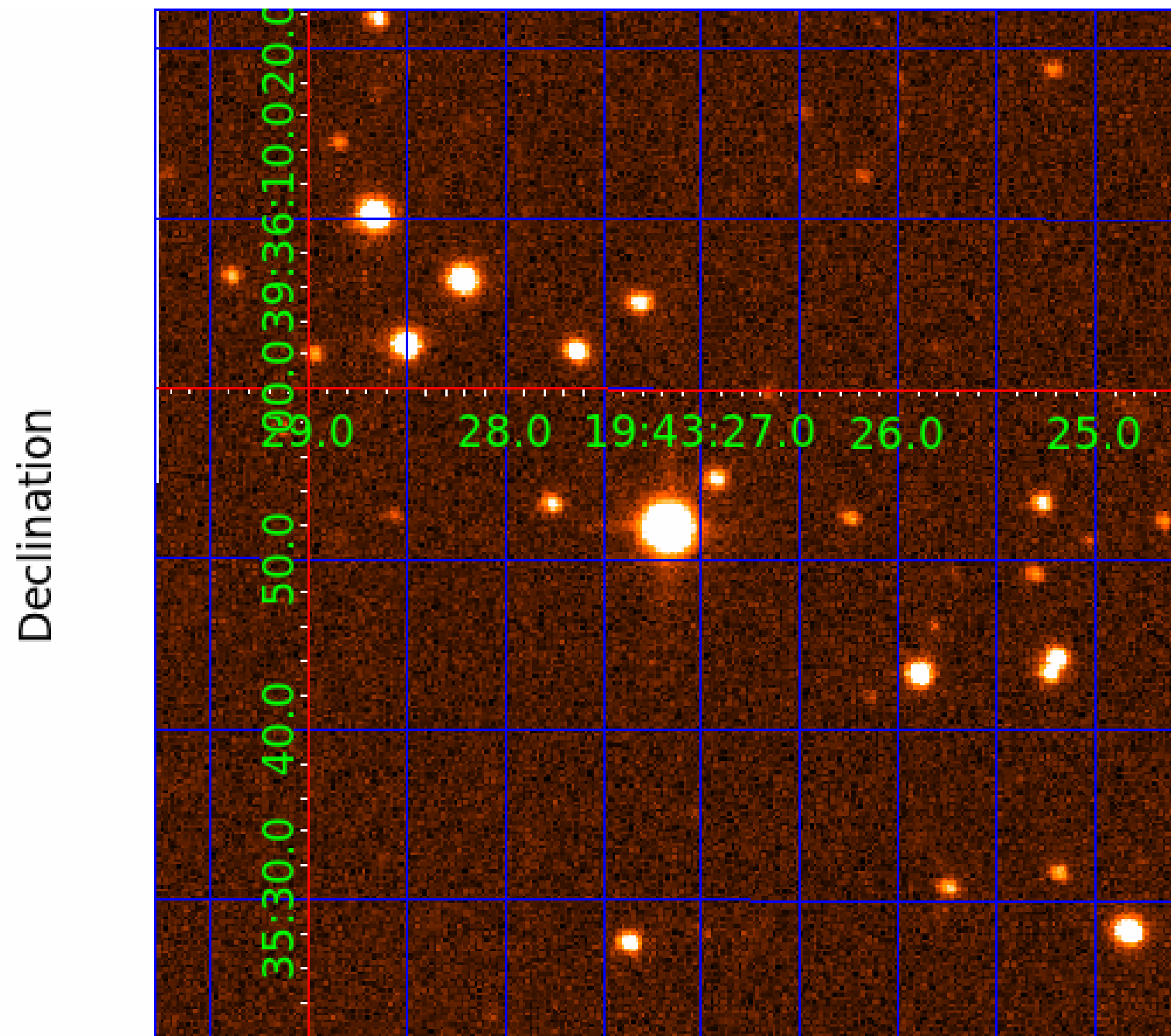
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

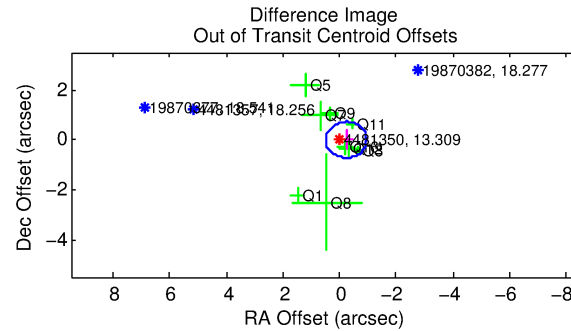
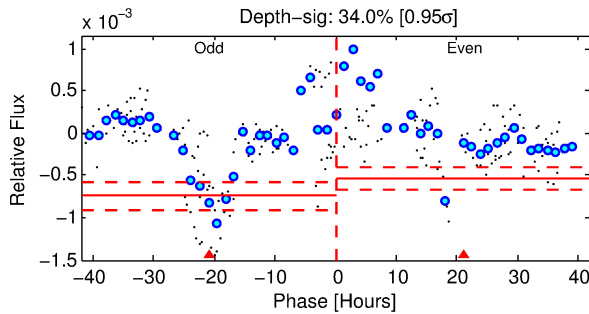
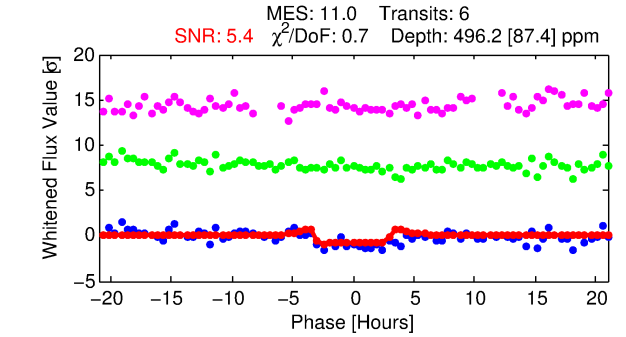
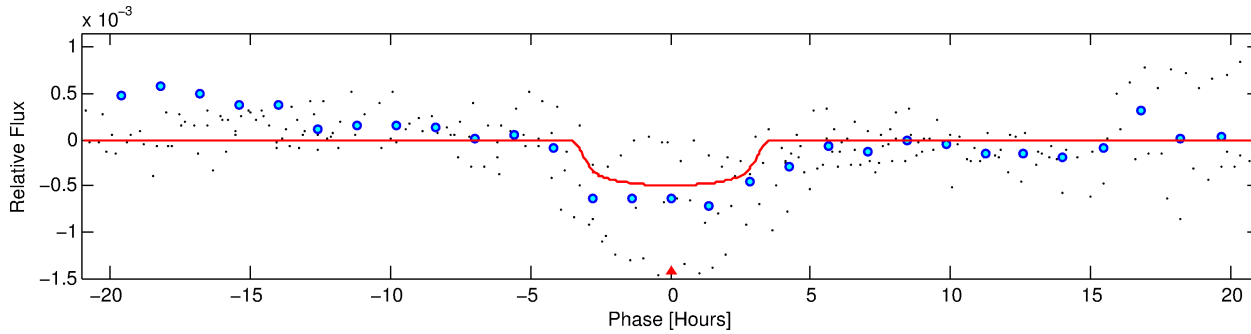
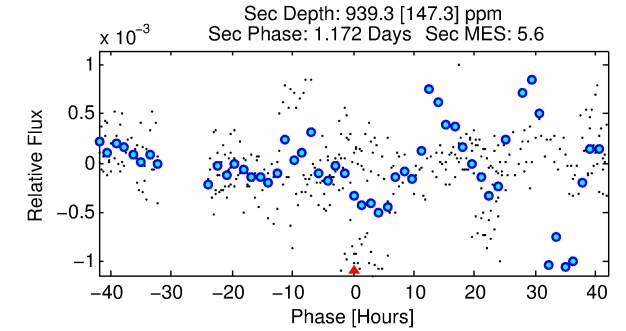
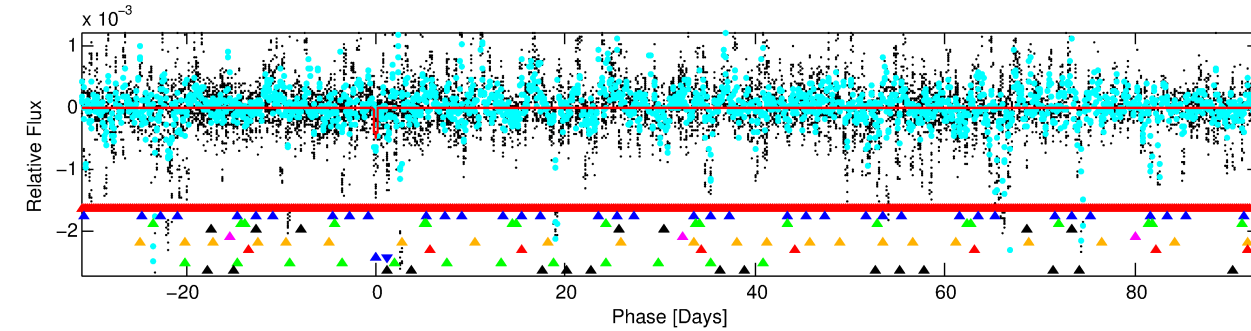
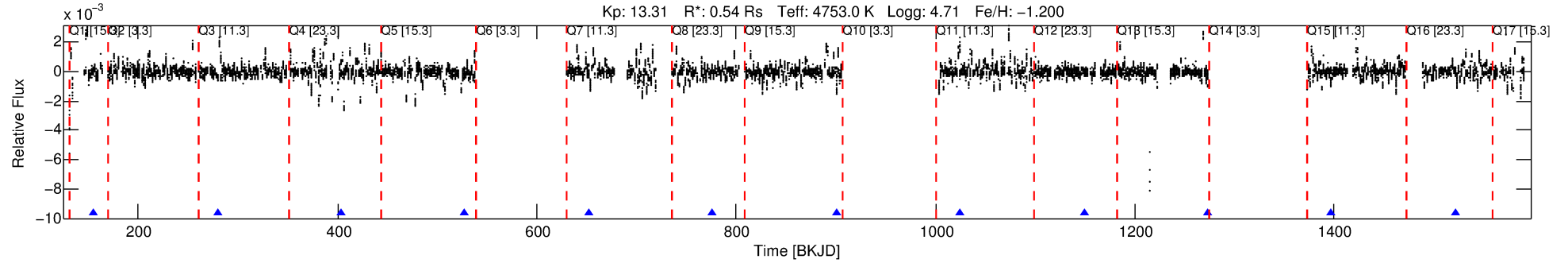
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-08

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 8 of 10 Period: 124.214 d



DV Fit Results:

Period = 124.21371 [0.00196] d
Epoch = 155.1669 [0.0140] BKJD
Rp/R* = 0.0244 [0.0036]
a/R* = 67.49 [29.65]
b = 0.90 [0.10]
Seff = 0.84 [0.12]
Teq = 244 [9] K
Rp = 1.45 [0.23] Re
a = 0.4003 [0.0207] AU
Ag = 39596.68 [13700.23] [2.89 σ]
Teffp = 5327 [475] K [10.70 σ]

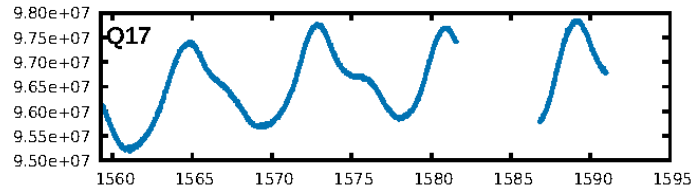
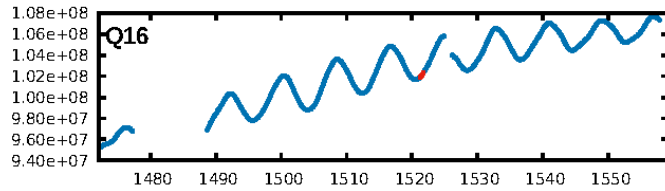
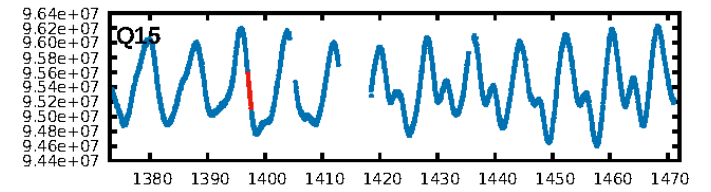
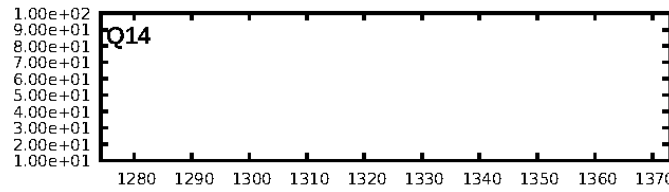
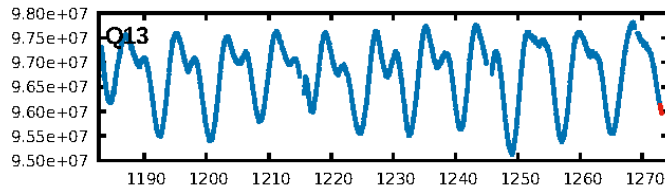
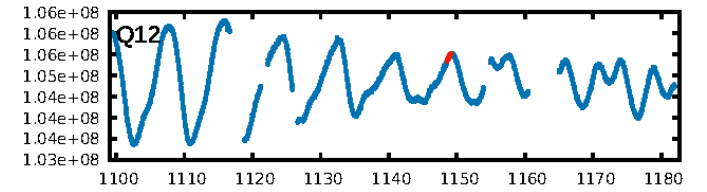
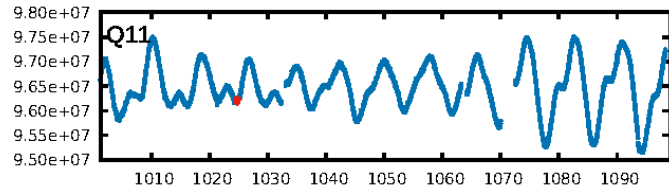
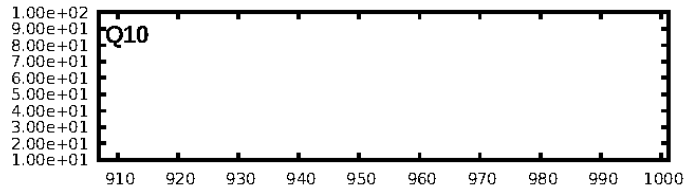
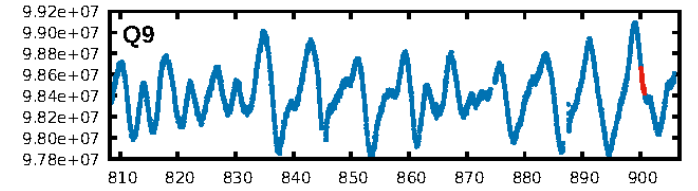
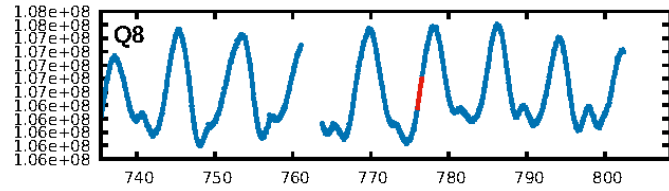
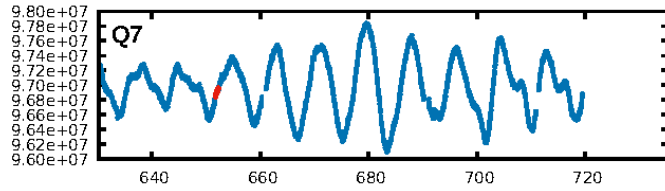
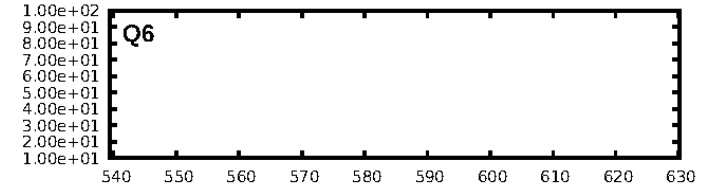
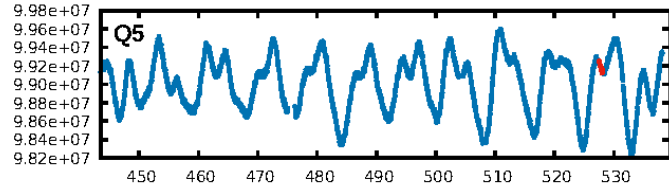
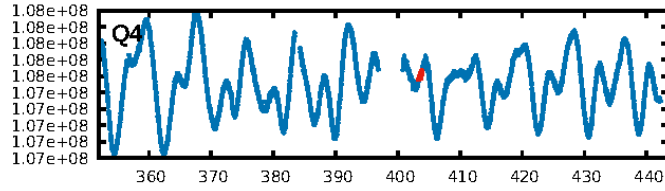
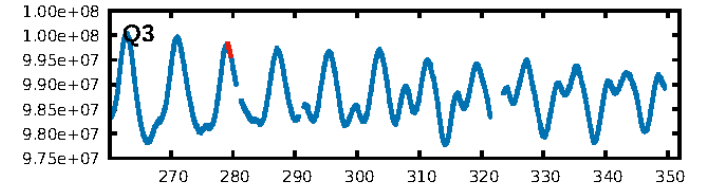
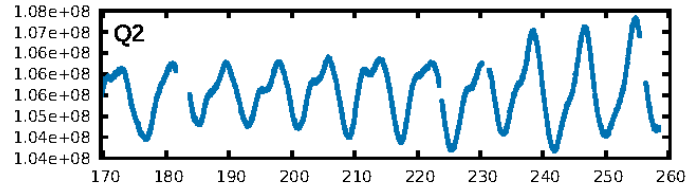
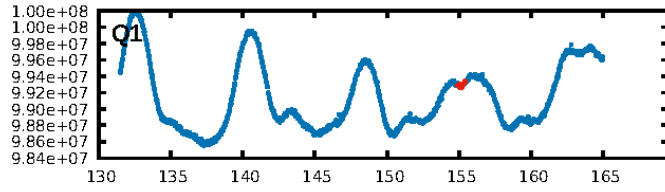
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [85.23 σ]
LongPeriod-sig: 100.0% [10.47 σ]
ModelChiSquare2-sig: 74.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 2.592
Centroid-sig: N/A
Centroid-so: 0.740 arcsec [1.49 σ]
OotOffset-rm: 0.230 arcsec [0.95 σ]
KicOffset-rm: 0.254 arcsec [1.01 σ]
OotOffset-st: 0/3/3/3 [9]
KicOffset-st: 0/3/3/3 [9]
DiffImageQuality-fgm: 0.56 [5/9]
DiffImageOverlap-fno: 0.00 [0/10]

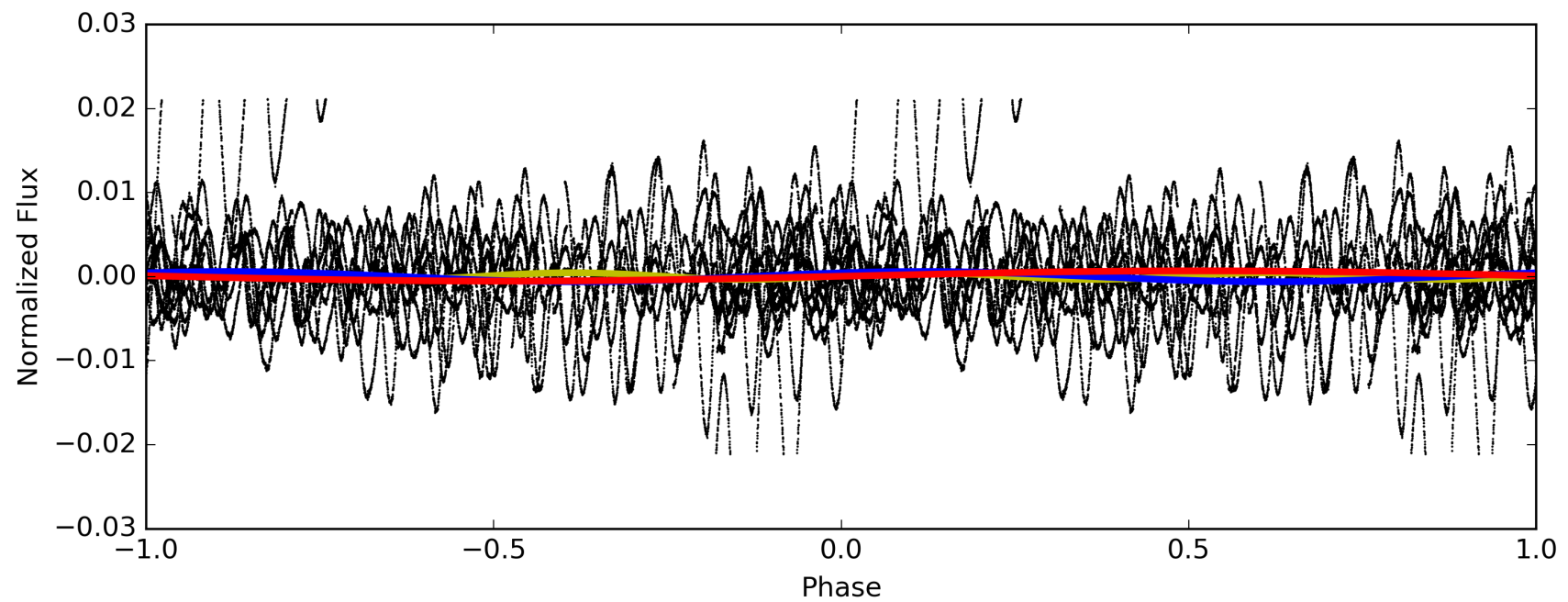
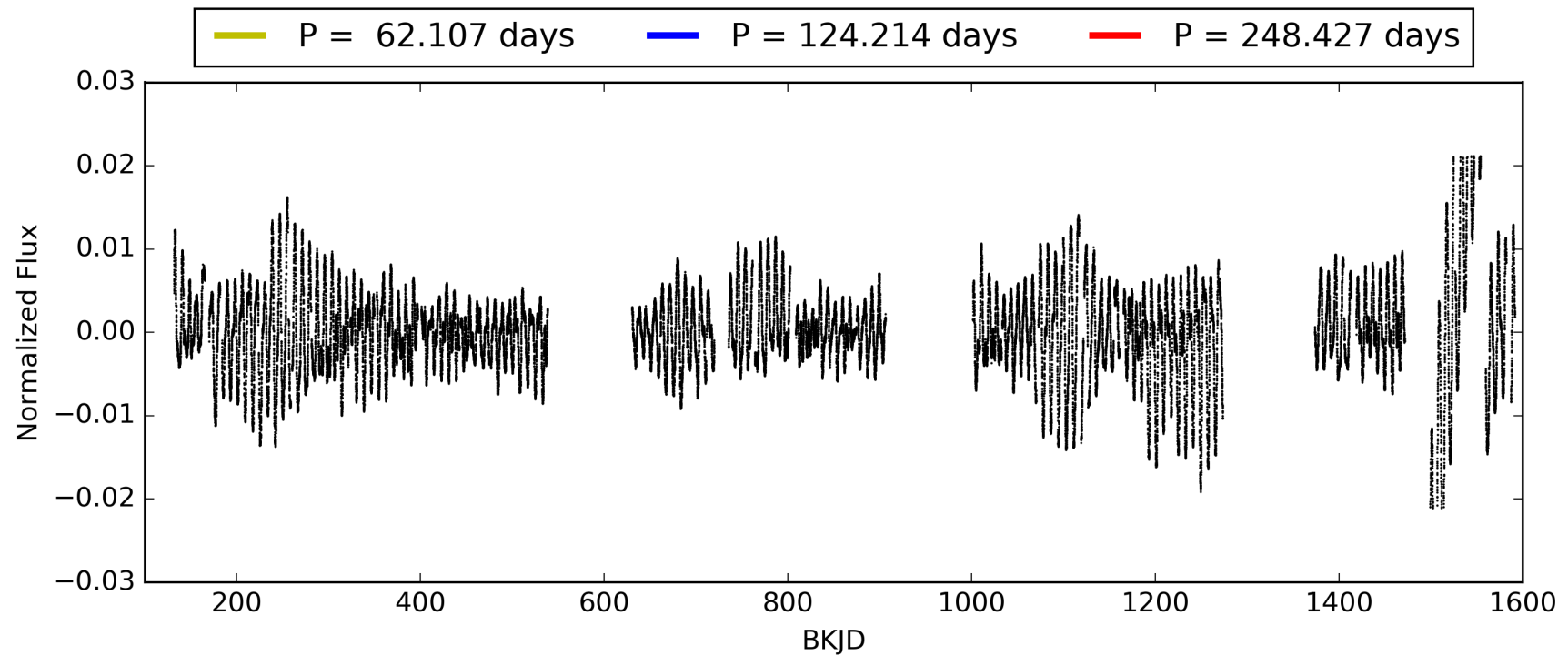
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:55 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-08, PDC Light Curves

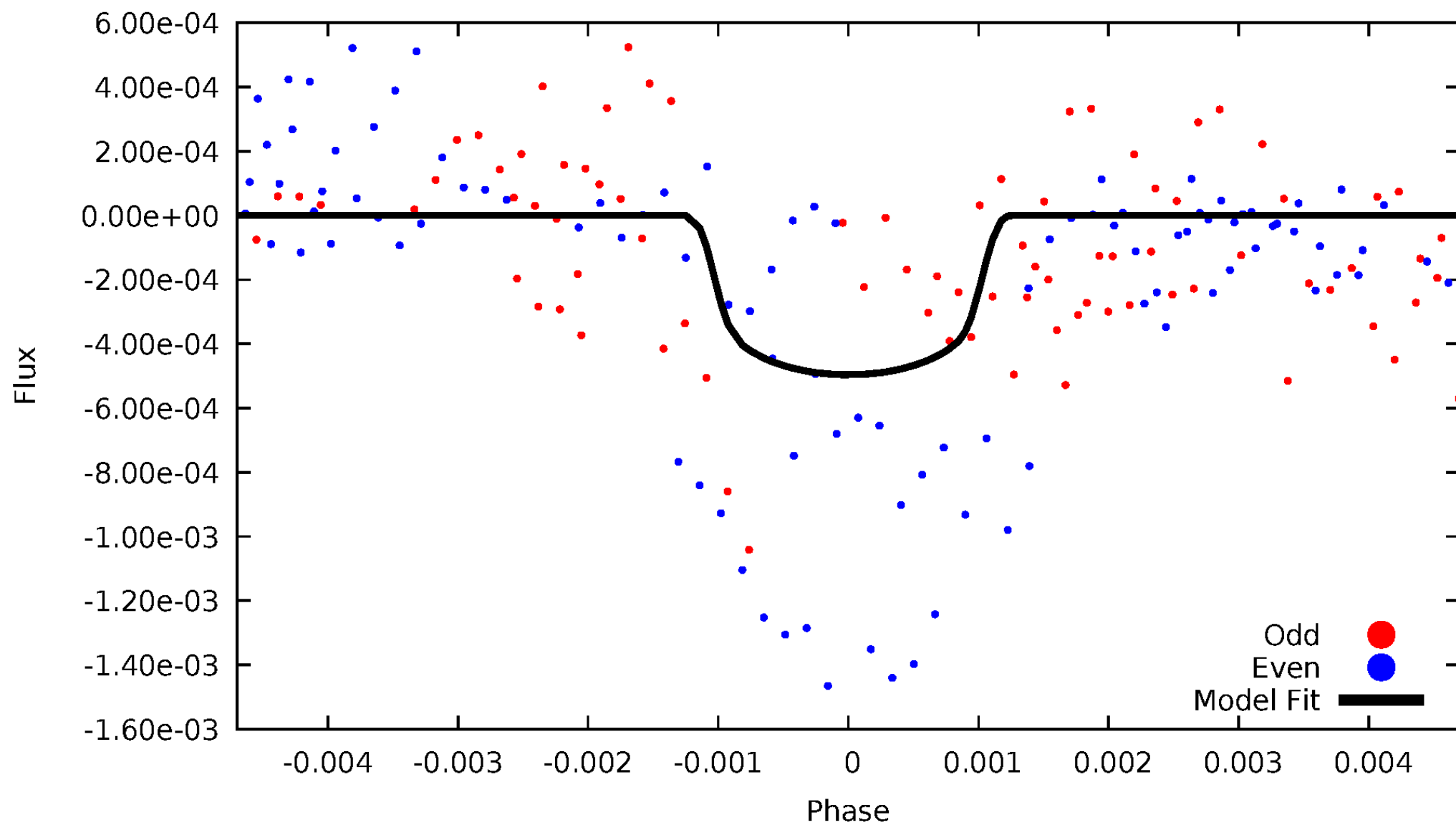


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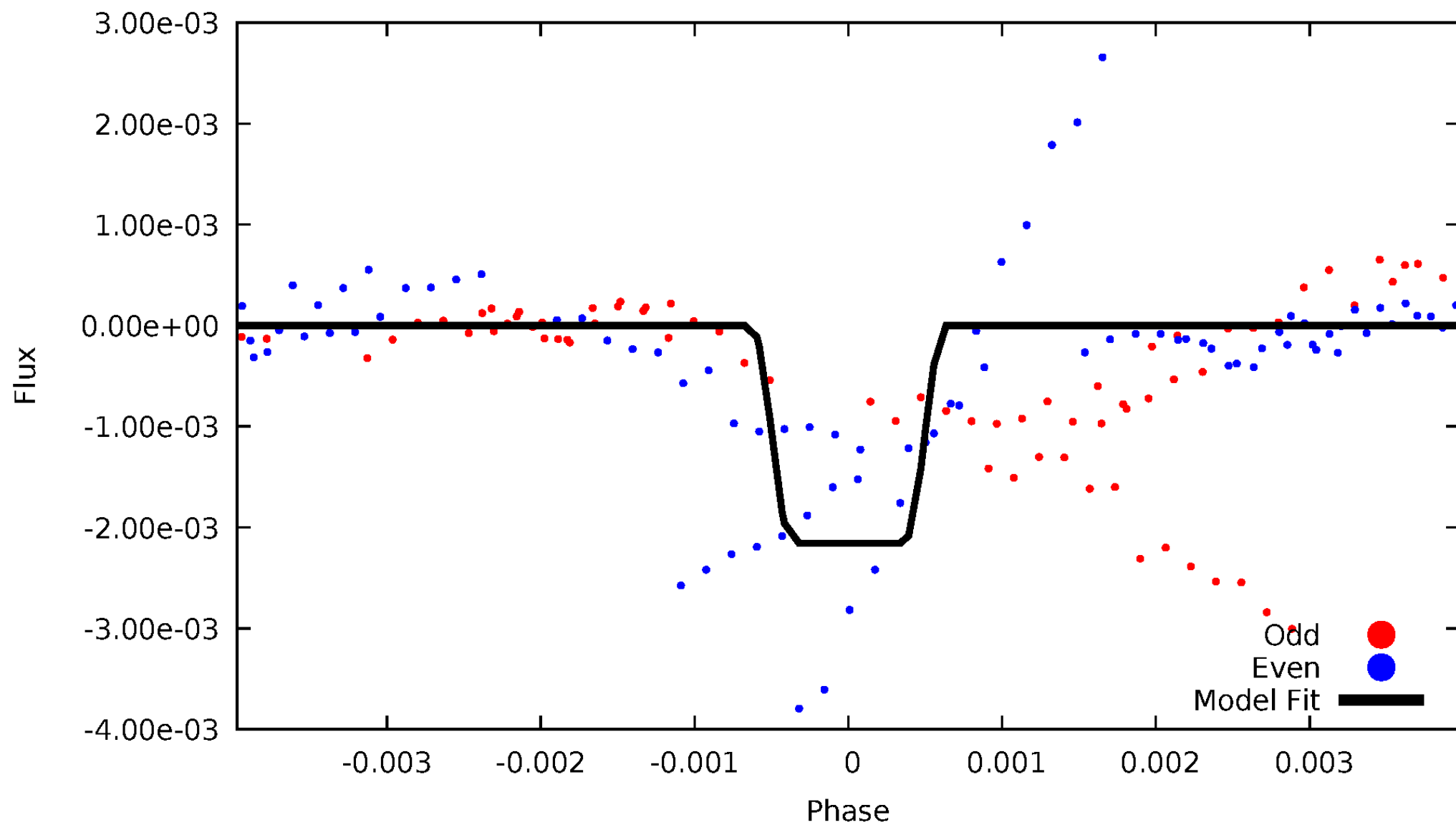
DV Odd/Even

TCE 004481350-08



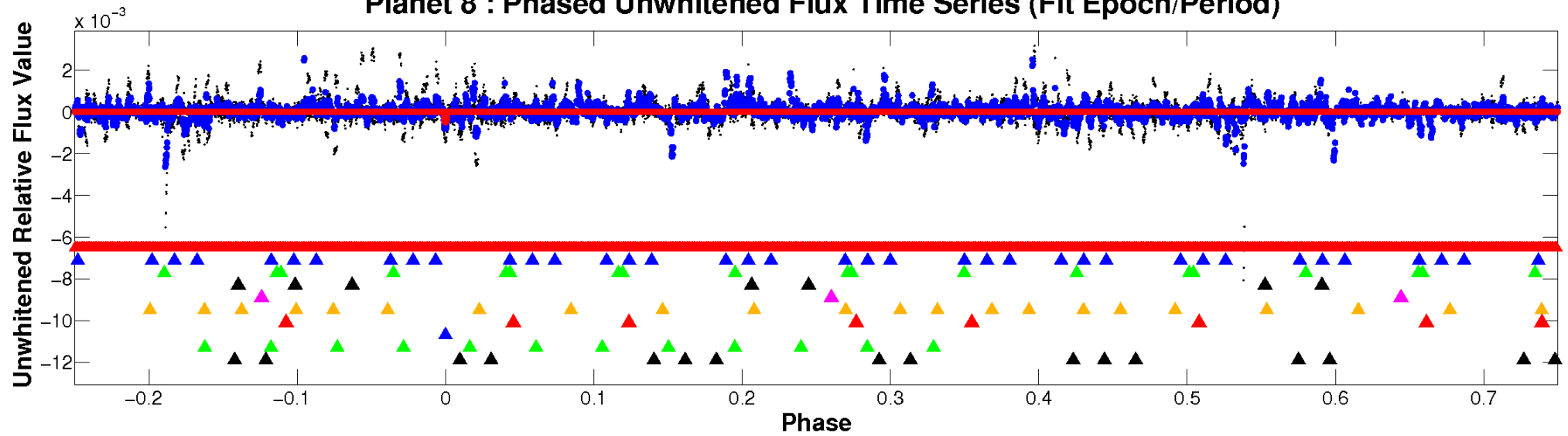
ALT Odd/Even

TCE 004481350-08

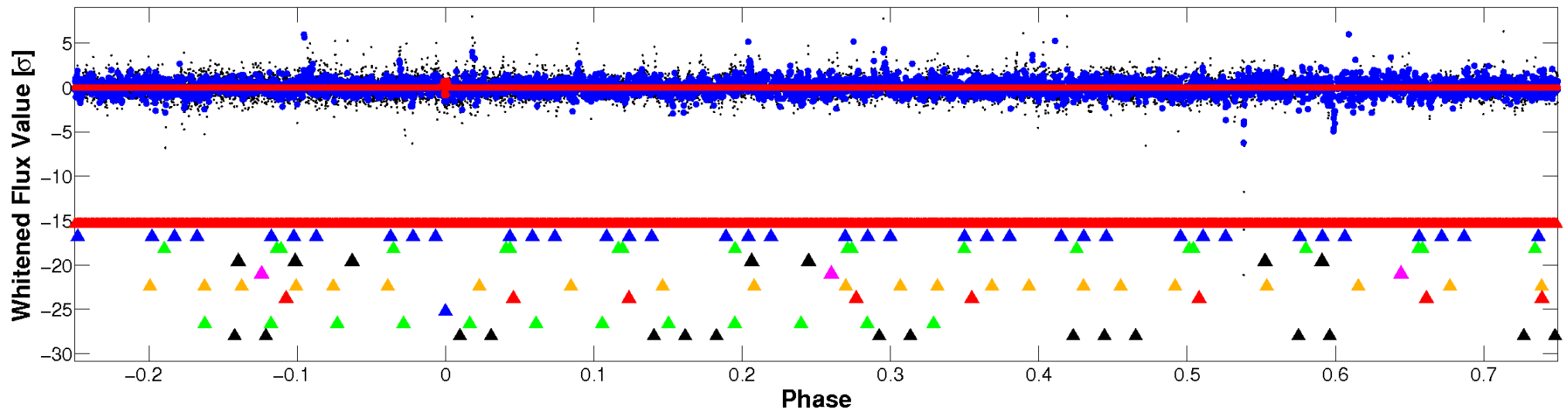


Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

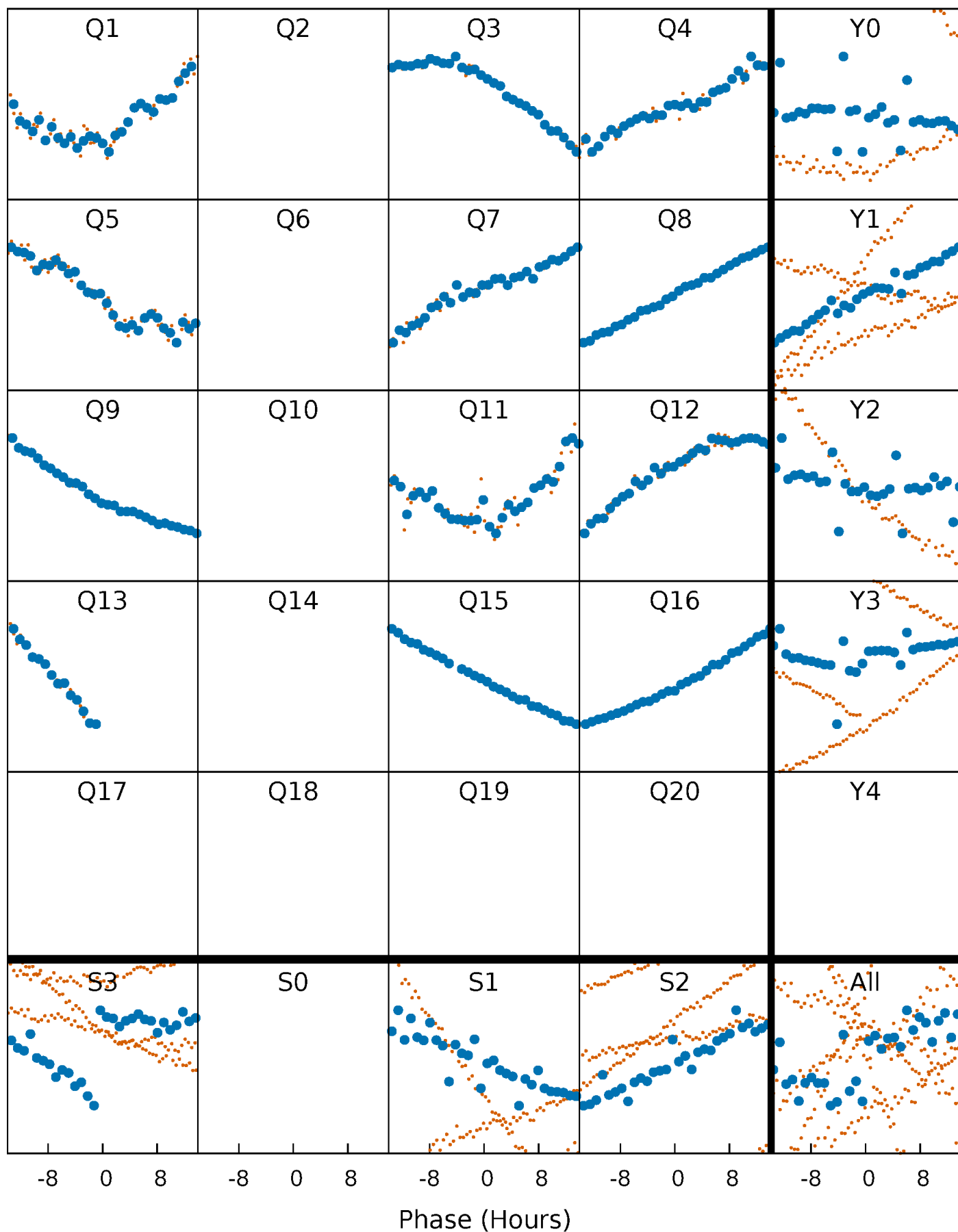


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



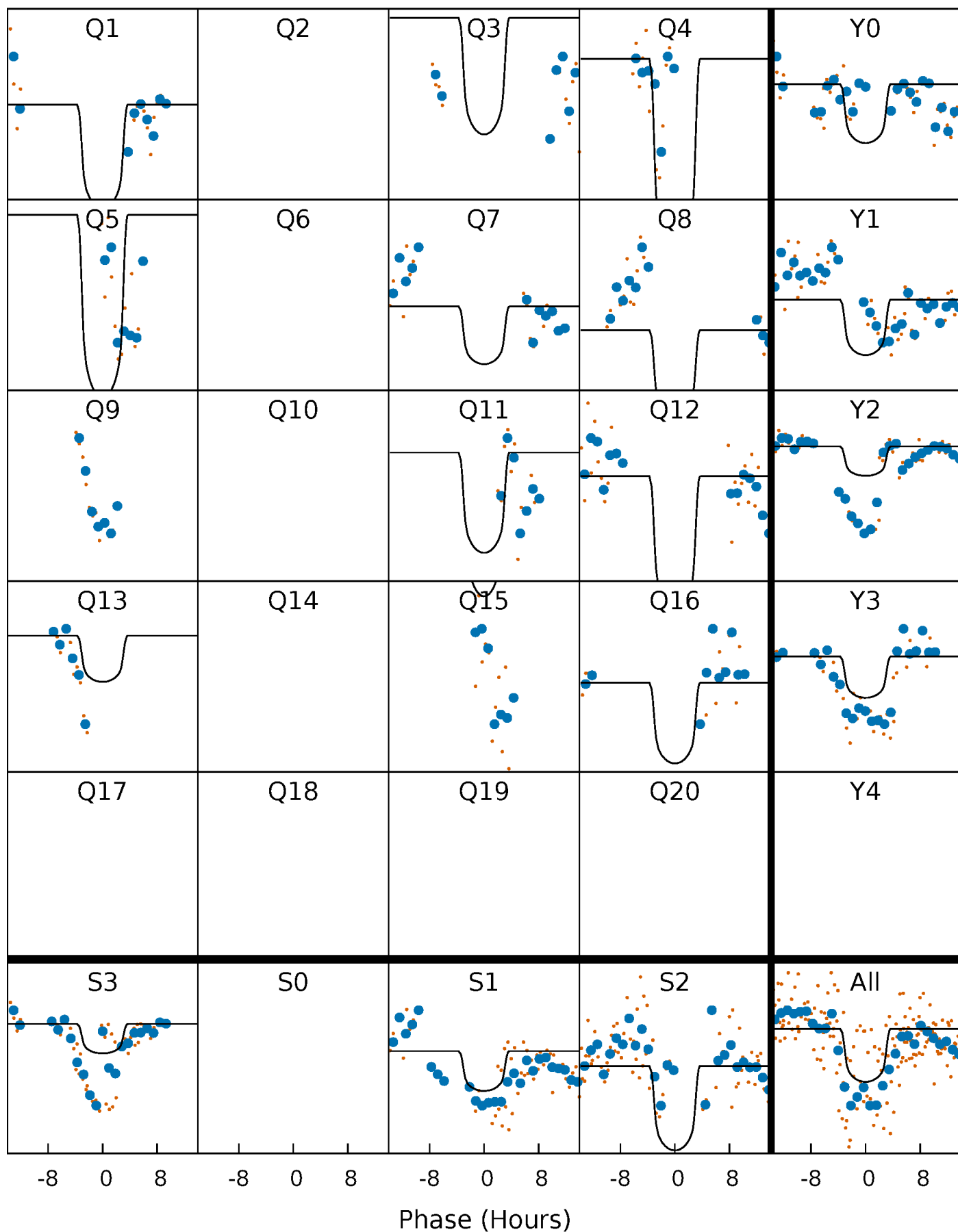
PDC Quarter-Phased Transit Curves

TCE 004481350-08 P=124.213708 Days $T_0=155.166923$ (BKJD)



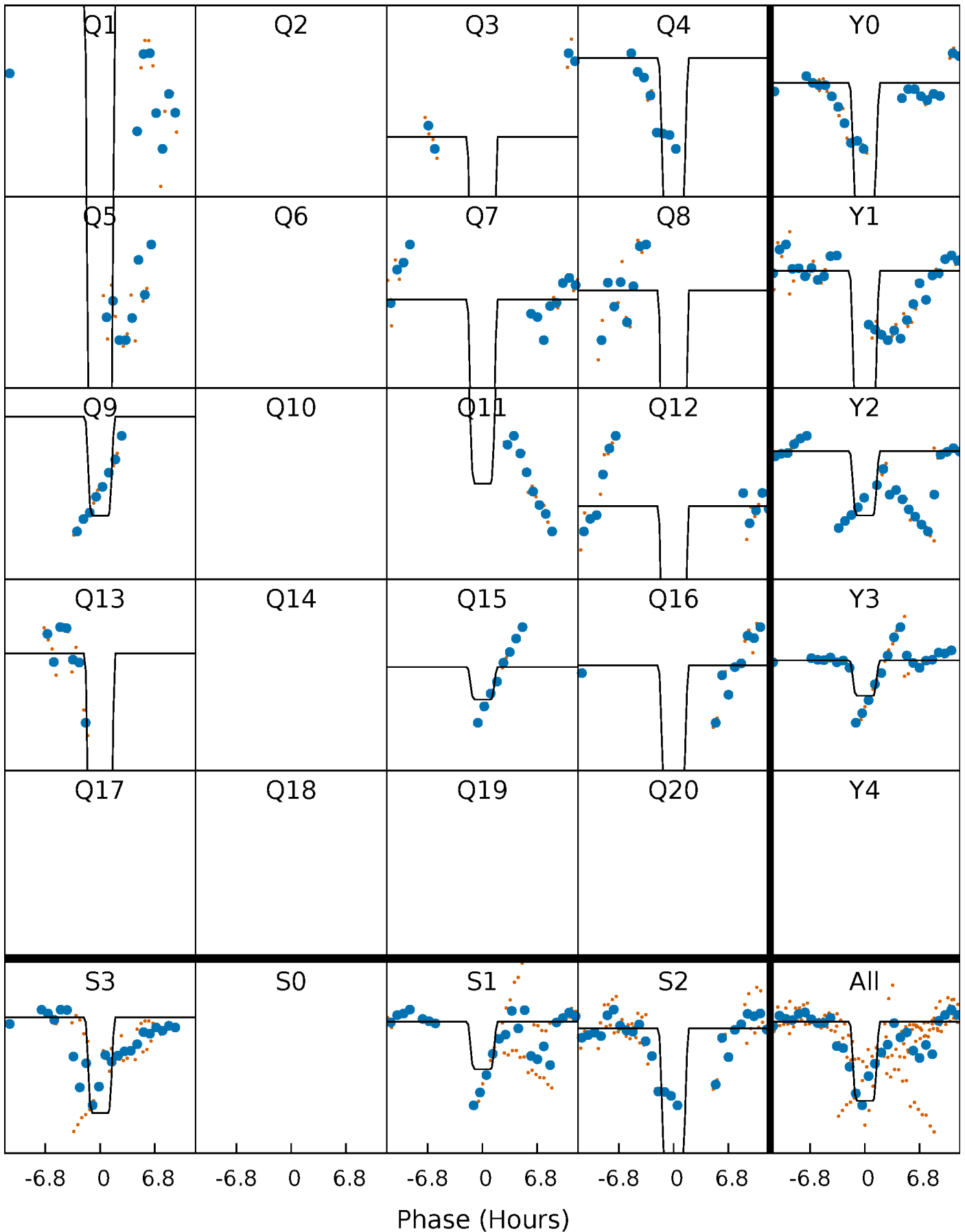
DV Quarter-Phased Transit Curves

TCE 004481350-08 $P=124.213708$ Days $T_0=155.166923$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

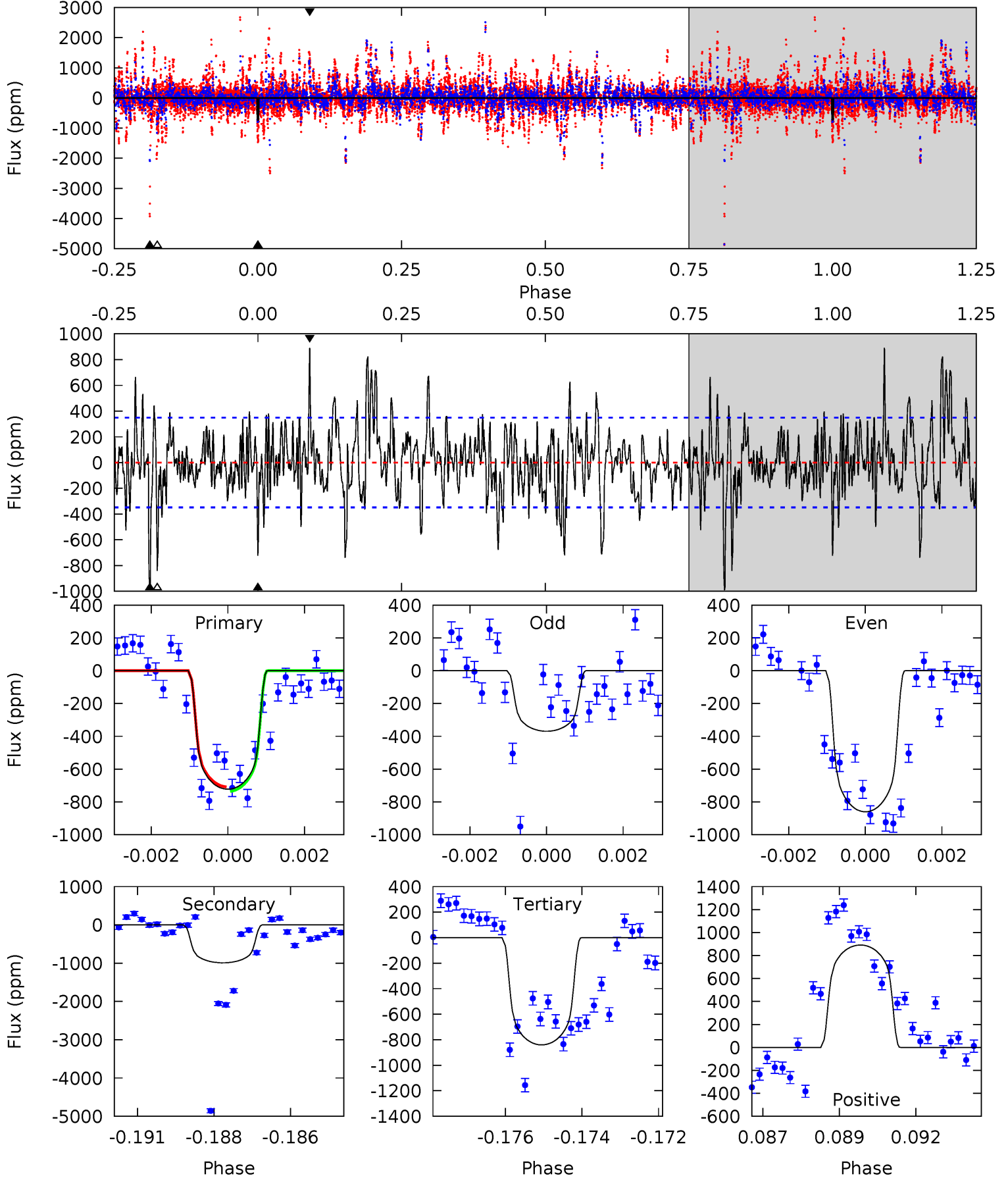
TCE 004481350-08 P=124.212367 Days $T_0=155.147760$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-08, P = 124.213708 Days, E = 30.953215 Days

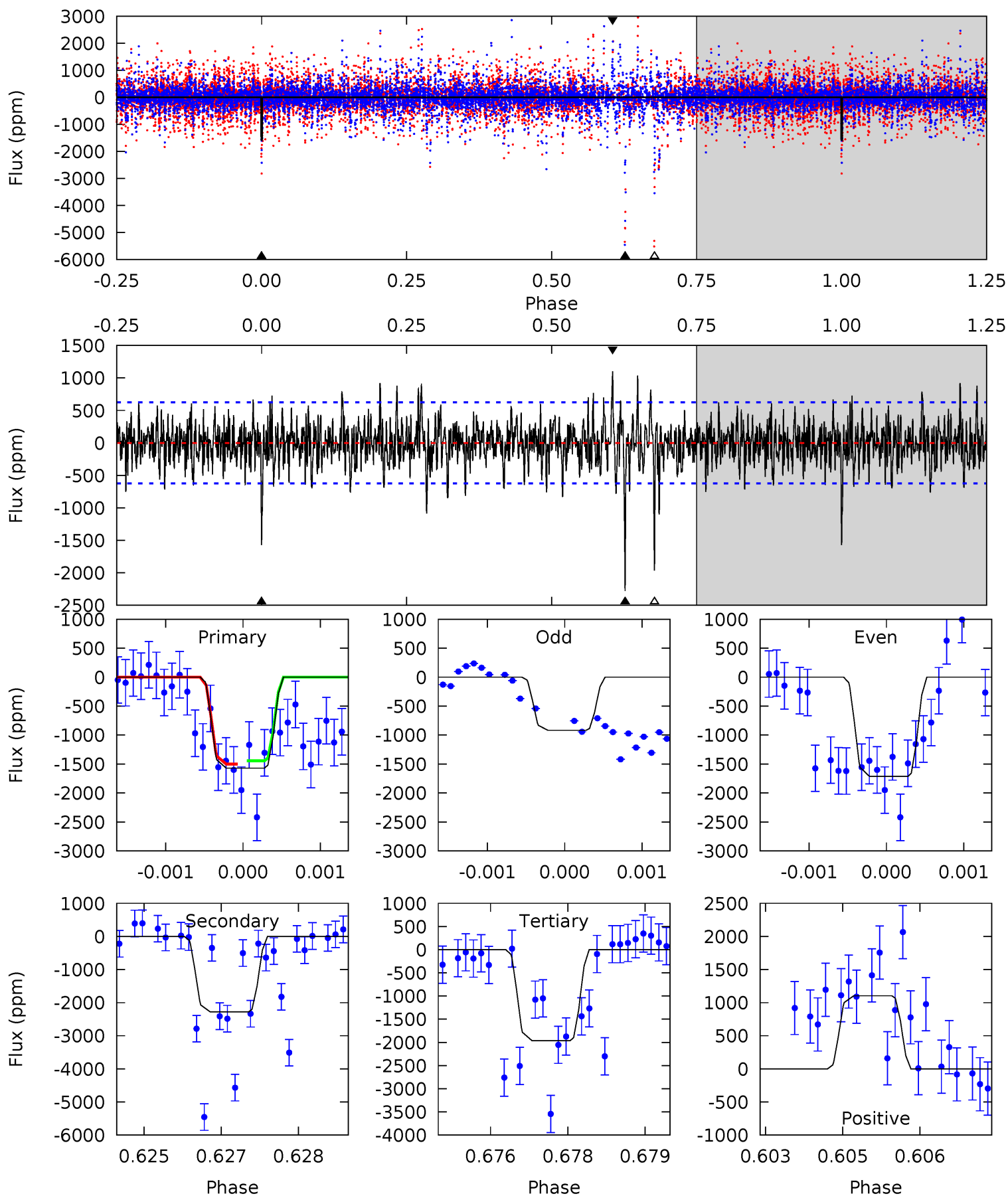
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	15.0	12.7	13.5	5.29	3.03	3.29	-1.79	-2.56	2.29	1.51	3.21	1.37	0.47	0.21



Alt Model-Shift Uniqueness Test

004481350-08, $P = 124.212367$ Days, $E = 30.935393$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.6	19.8	17.0	9.55	5.42	3.23	2.19	-3.40	4.05	2.76	10.2	2.65	1.15	0.33	0.23



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-08 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-991 ± 66	$1.45^{+0.21}_{-0.21}$	340^{+10}_{-11}	5304^{+430}_{-369}	42605^{+15649}_{-10764}
Alt.	-2281 ± 115	$2.73^{+0.26}_{-0.24}$	340^{+11}_{-11}	4812^{+238}_{-205}	27198^{+5363}_{-4603}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

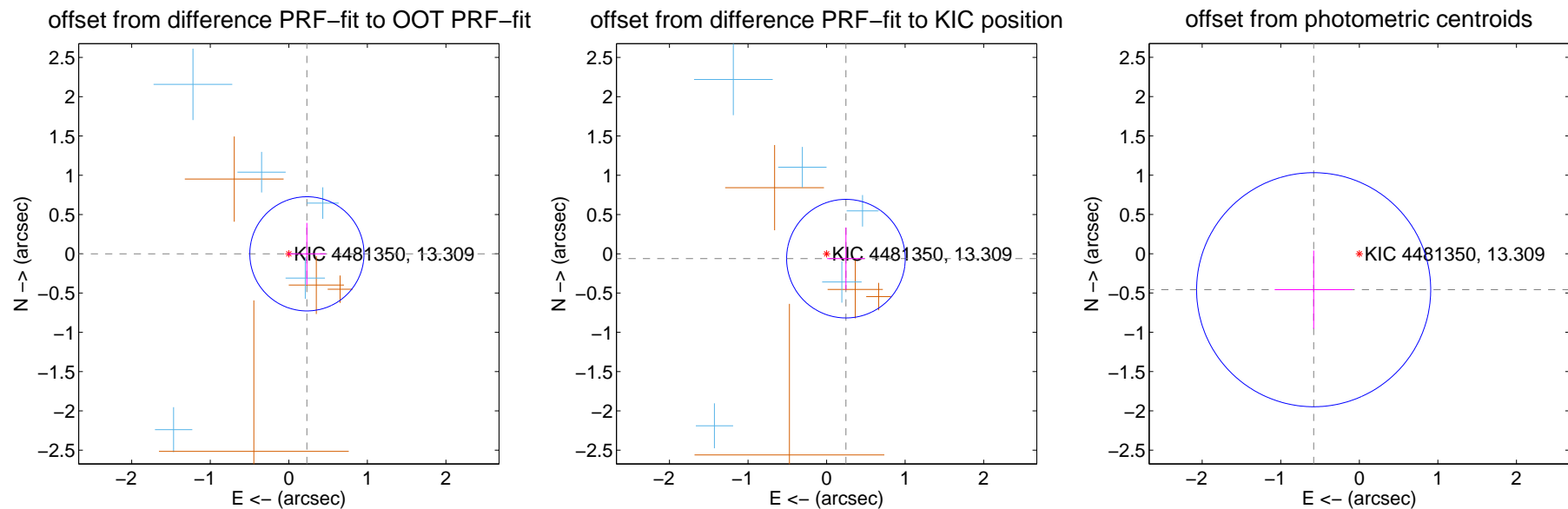
DV Centroid Data

Supplemental centroid analysis for 004481350-08. Kepler magnitude: 13.31. Transit SNR 5.37

There are 5 quarters with good PRF difference image offsets

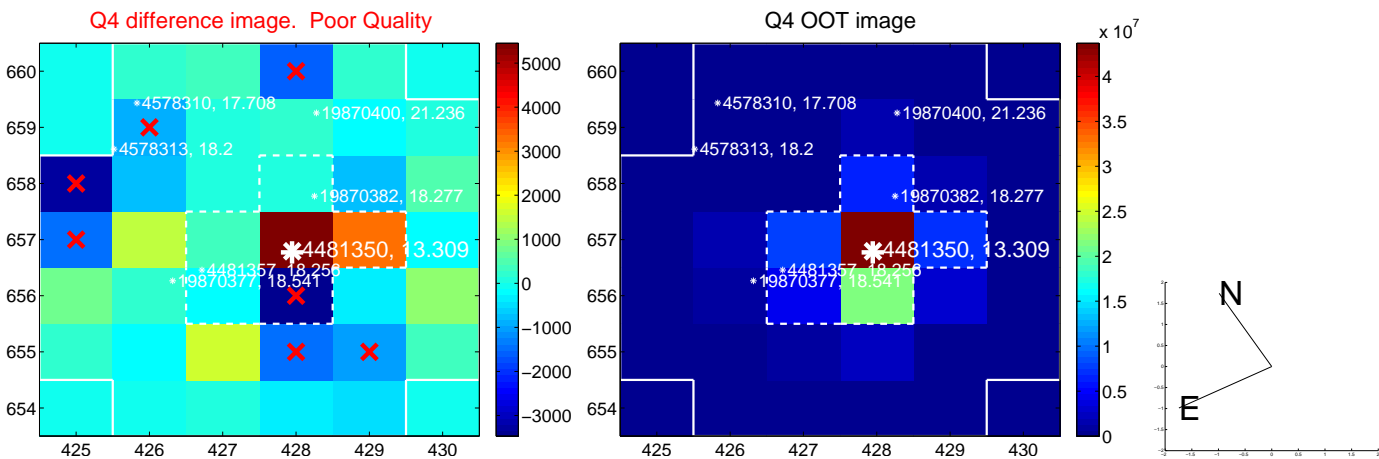
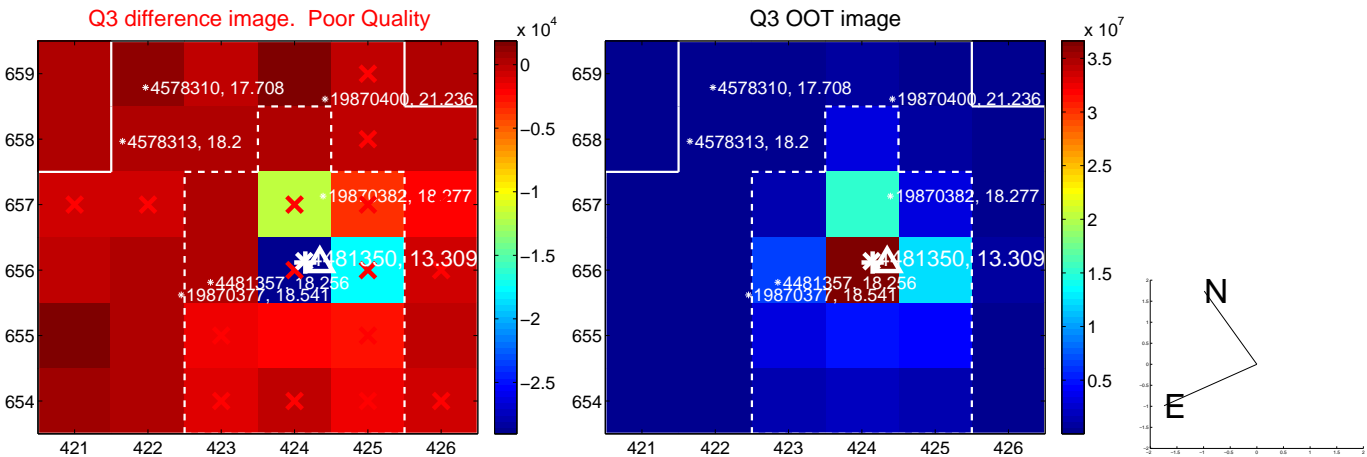
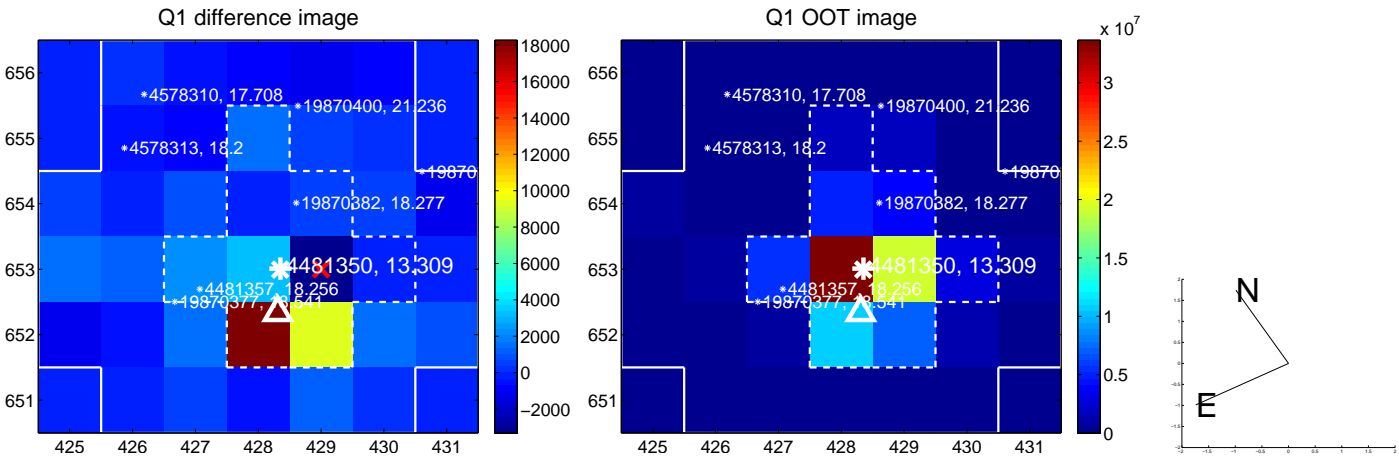
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.230 ± 0.242	0.95	-0.230 ± 0.242	-0.001 ± 0.394
PRF-fit source offset from KIC position	0.254 ± 0.252	1.01	-0.246 ± 0.239	-0.062 ± 0.397
photometric centroid source offset	0.74 ± 0.50	1.49	0.58 ± 0.50	-0.46 ± 0.50

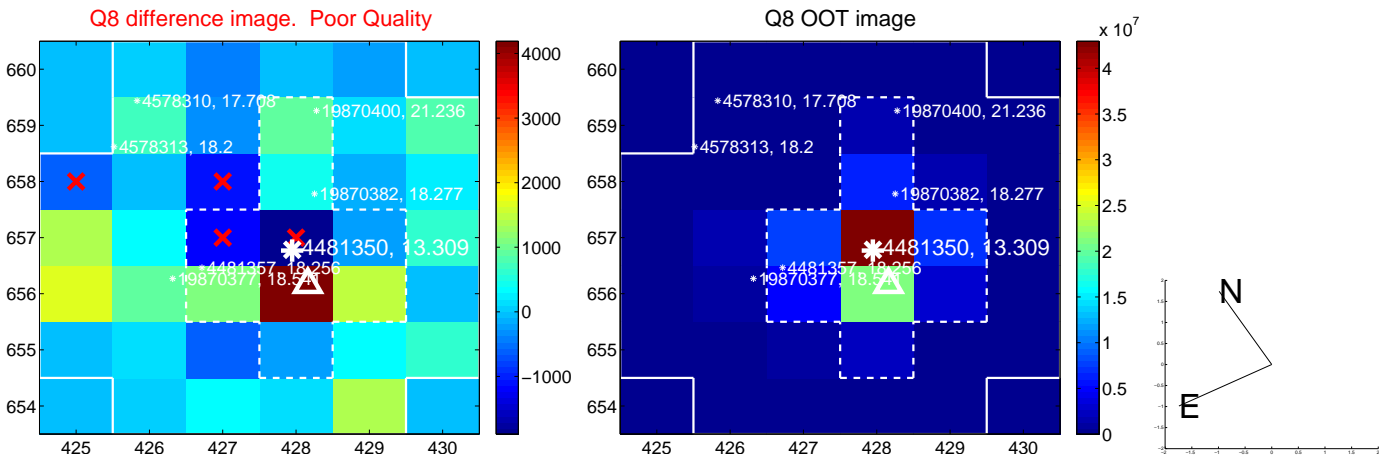
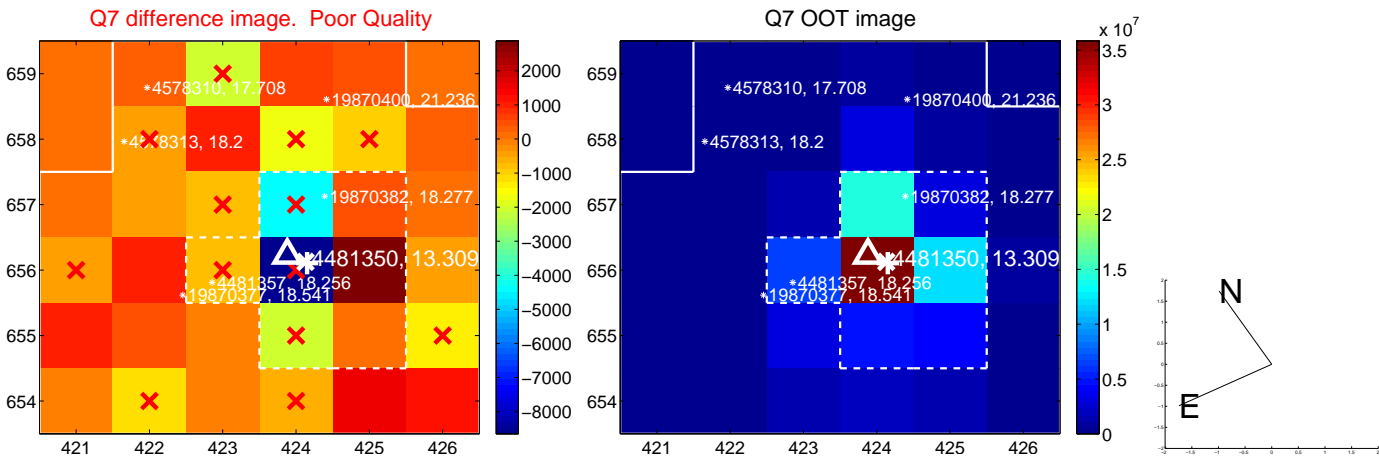
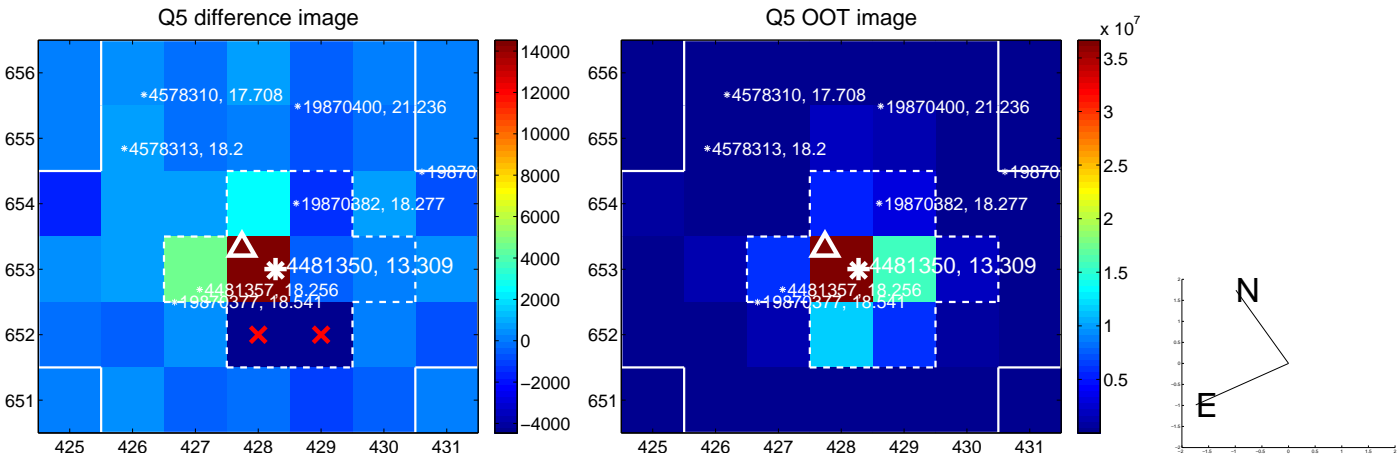


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

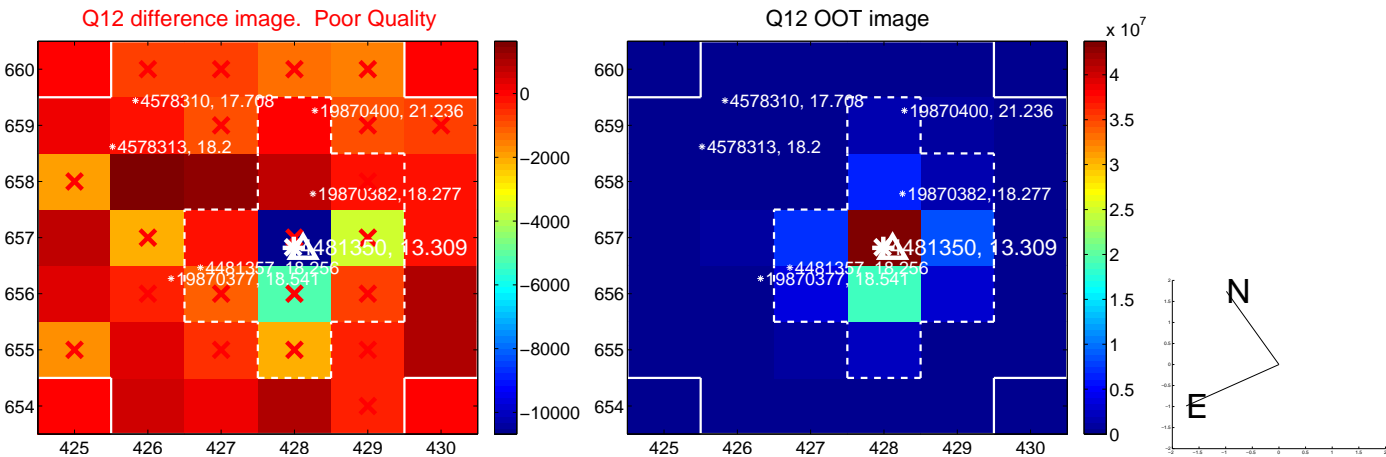
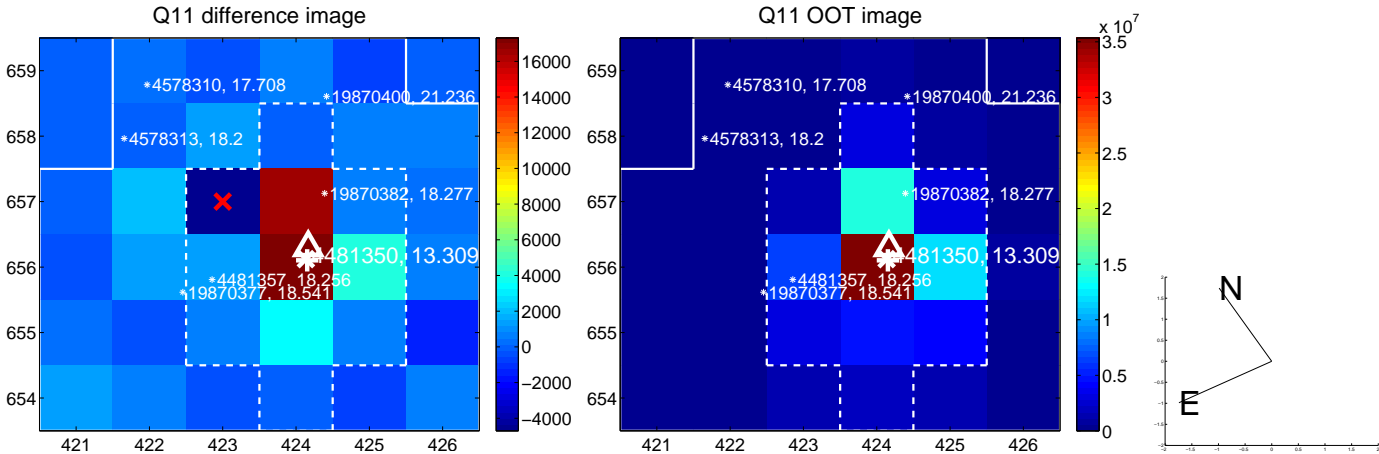
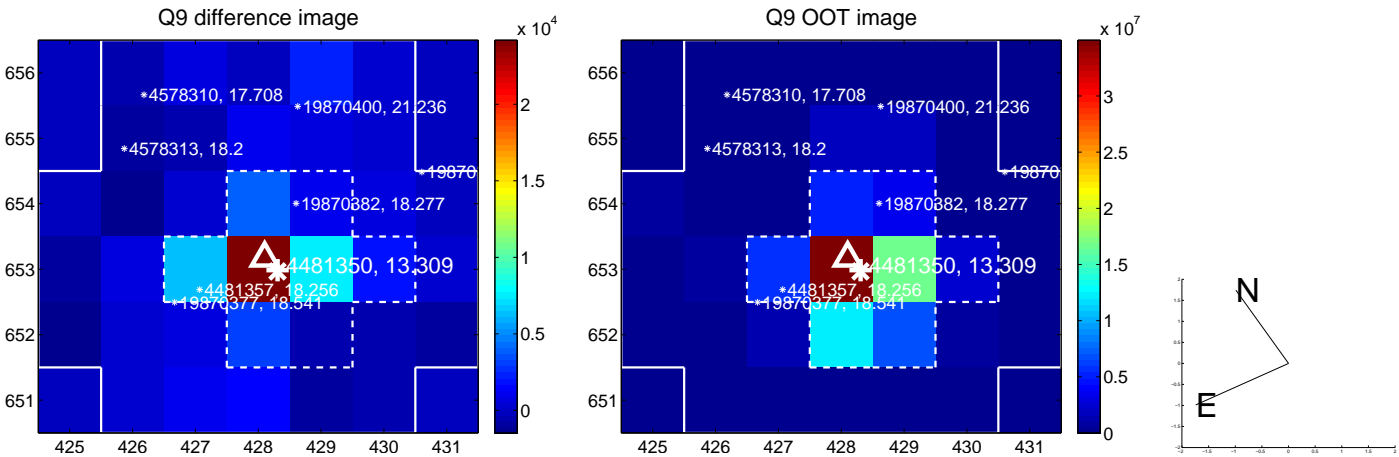
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



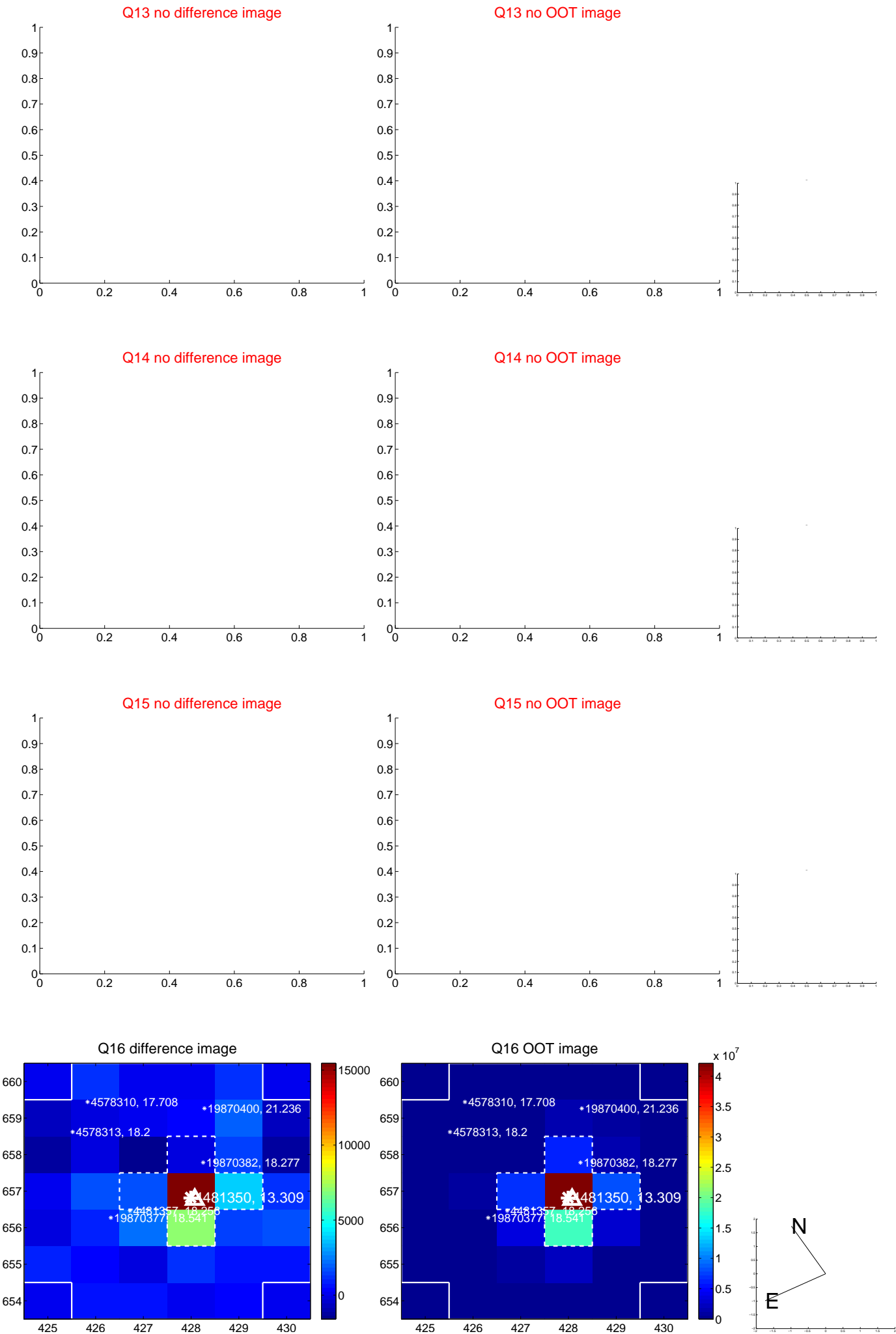
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



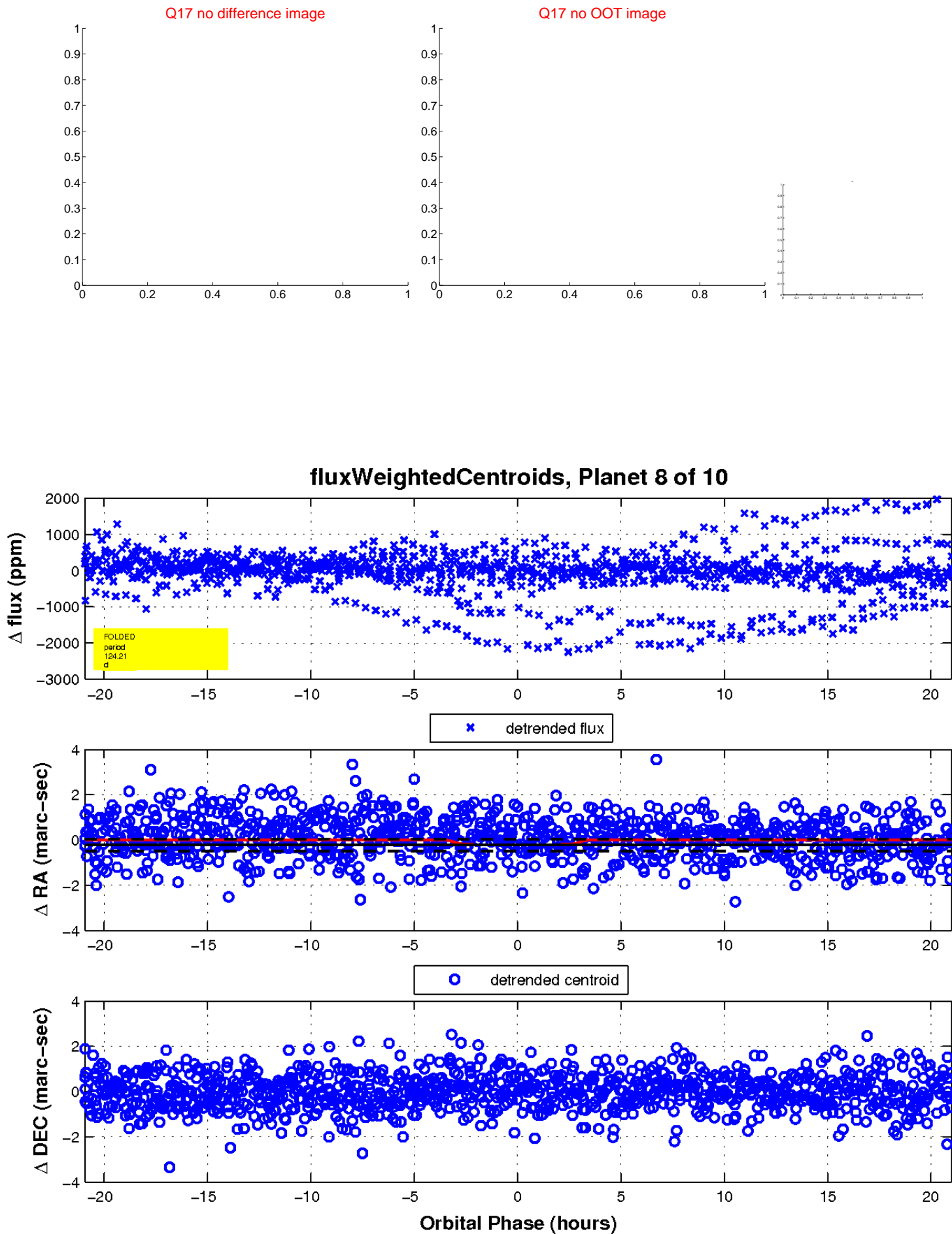
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



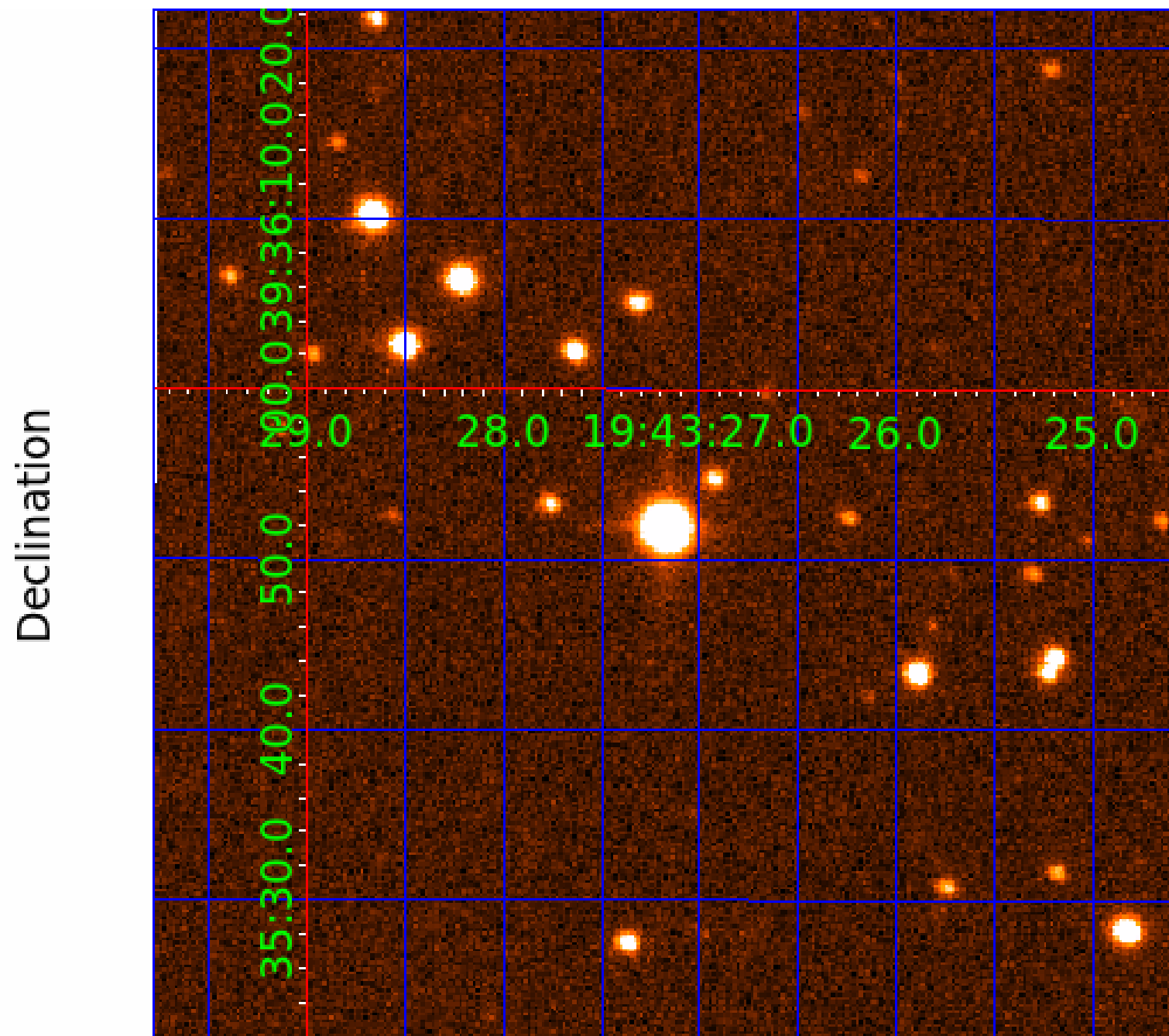
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

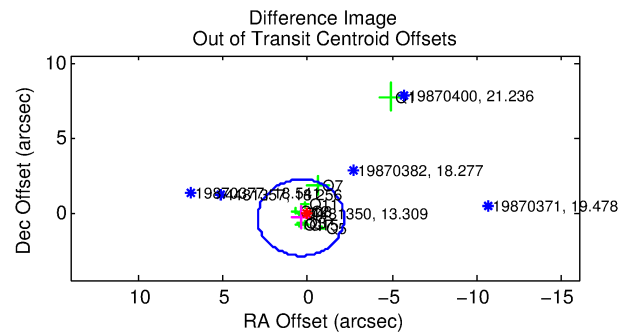
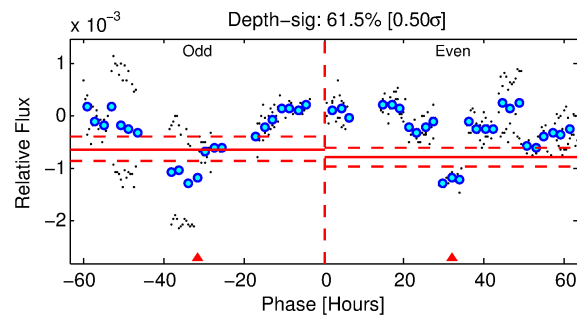
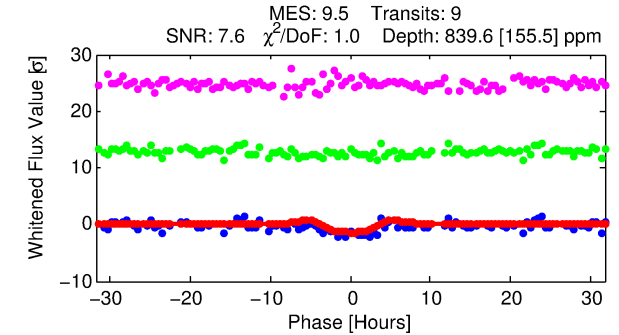
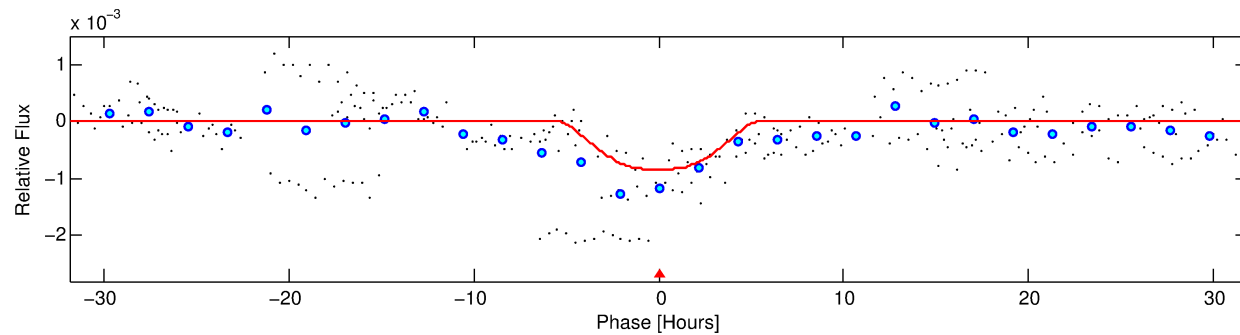
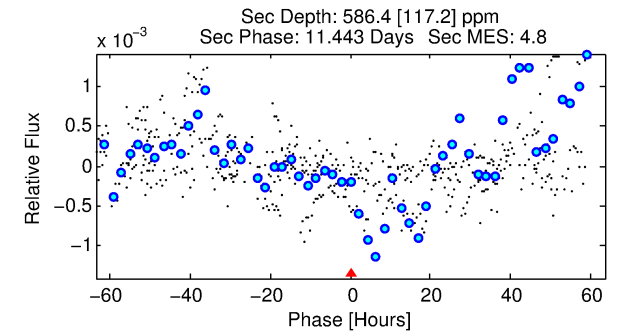
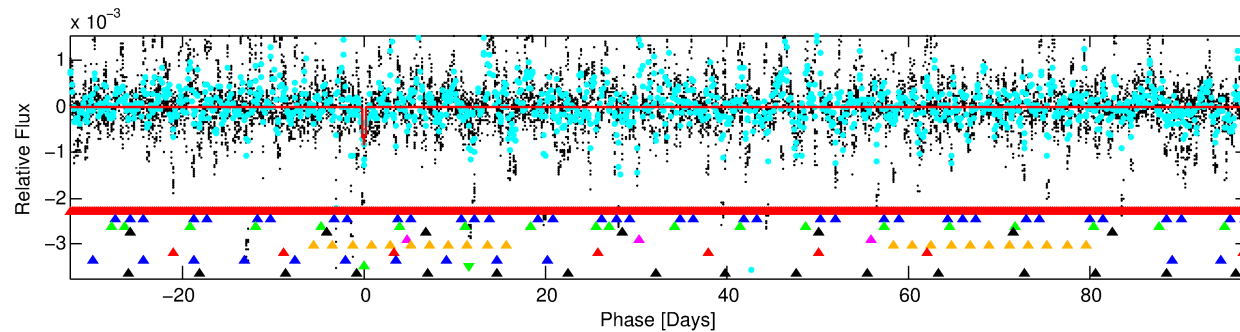
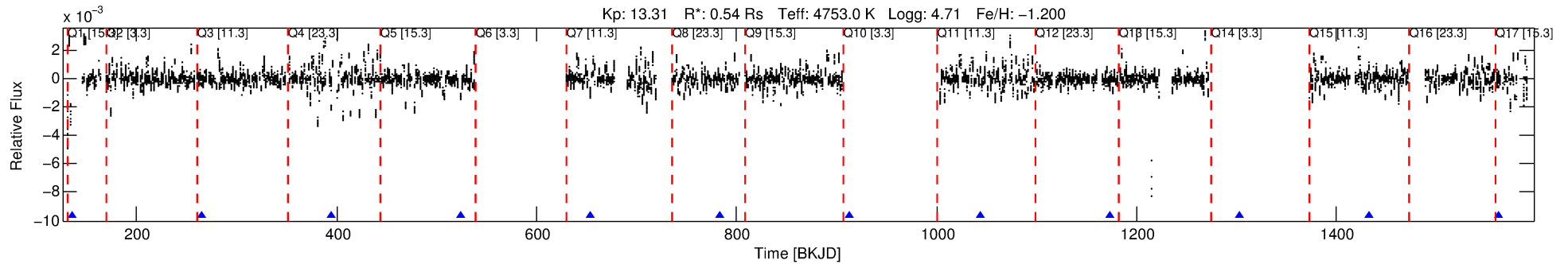
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-09

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 9 of 10 Period: 129.762 d



DV Fit Results:

Period = 129.76197 [0.00370] d
Epoch = 135.0092 [0.0250] BKJD
Rp/R* = 0.0356 [0.0041]
a/R* = 35.70 [4.21]
b = 0.96 [0.01]
Seff = 0.79 [0.11]
Teq = 241 [8] K
Rp = 2.11 [0.27] Re
a = 0.4121 [0.0213] AU
Ag = 12298.35 [3884.93] [3.17 σ]
Teffp = 3919 [321] K [11.45 σ]

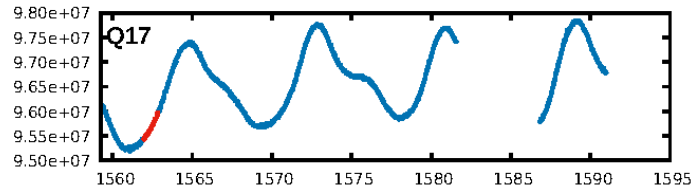
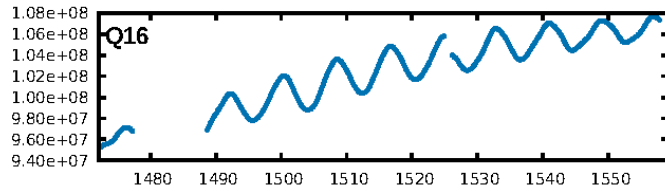
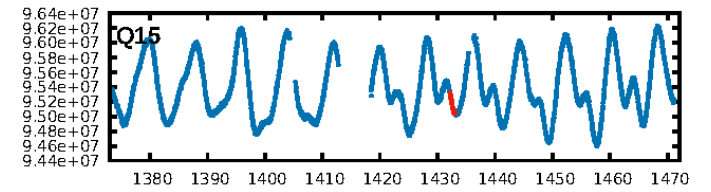
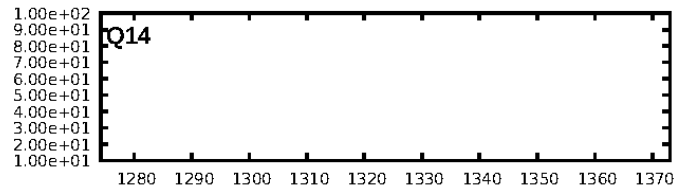
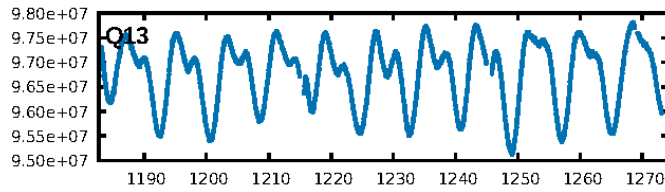
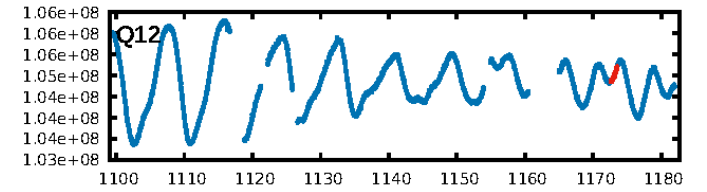
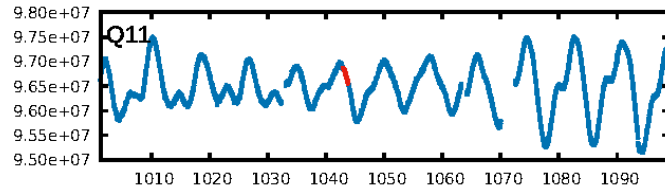
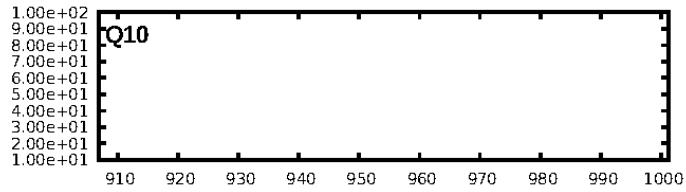
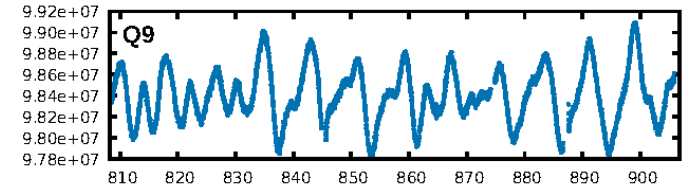
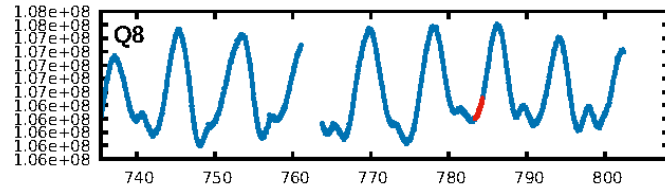
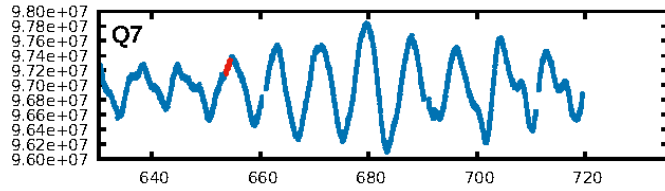
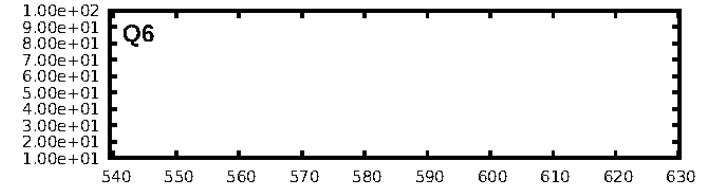
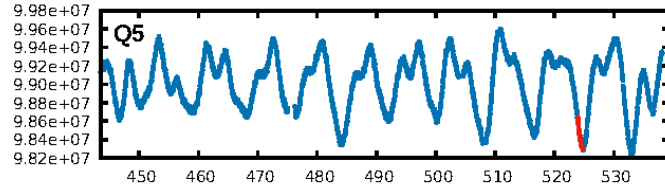
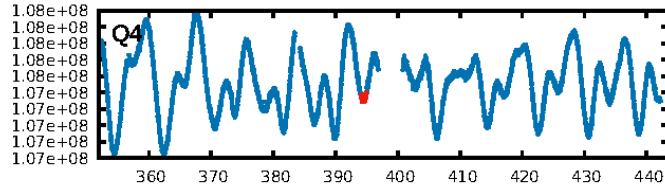
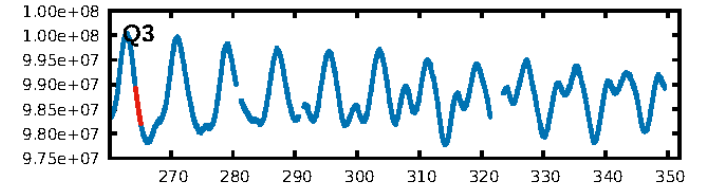
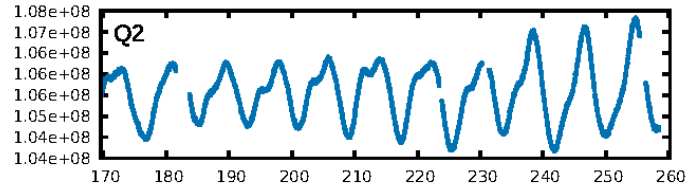
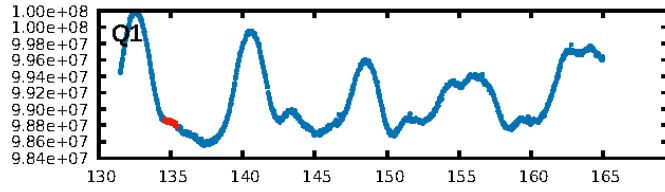
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.47 σ]
LongPeriod-sig: 100.0% [72.06 σ]
ModelChiSquare2-sig: 38.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 3.264
Centroid-sig: N/A
Centroid-so: 0.714 arcsec [2.30 σ]
OotOffset-rm: 0.527 arcsec [0.62 σ]
KicOffset-rm: 0.553 arcsec [0.65 σ]
OotOffset-st: 0/4/3/3 [10]
KicOffset-st: 0/4/3/3 [10]
DiffImageQuality-fgm: 0.80 [8/10]
DiffImageOverlap-fno: 0.00 [0/10]

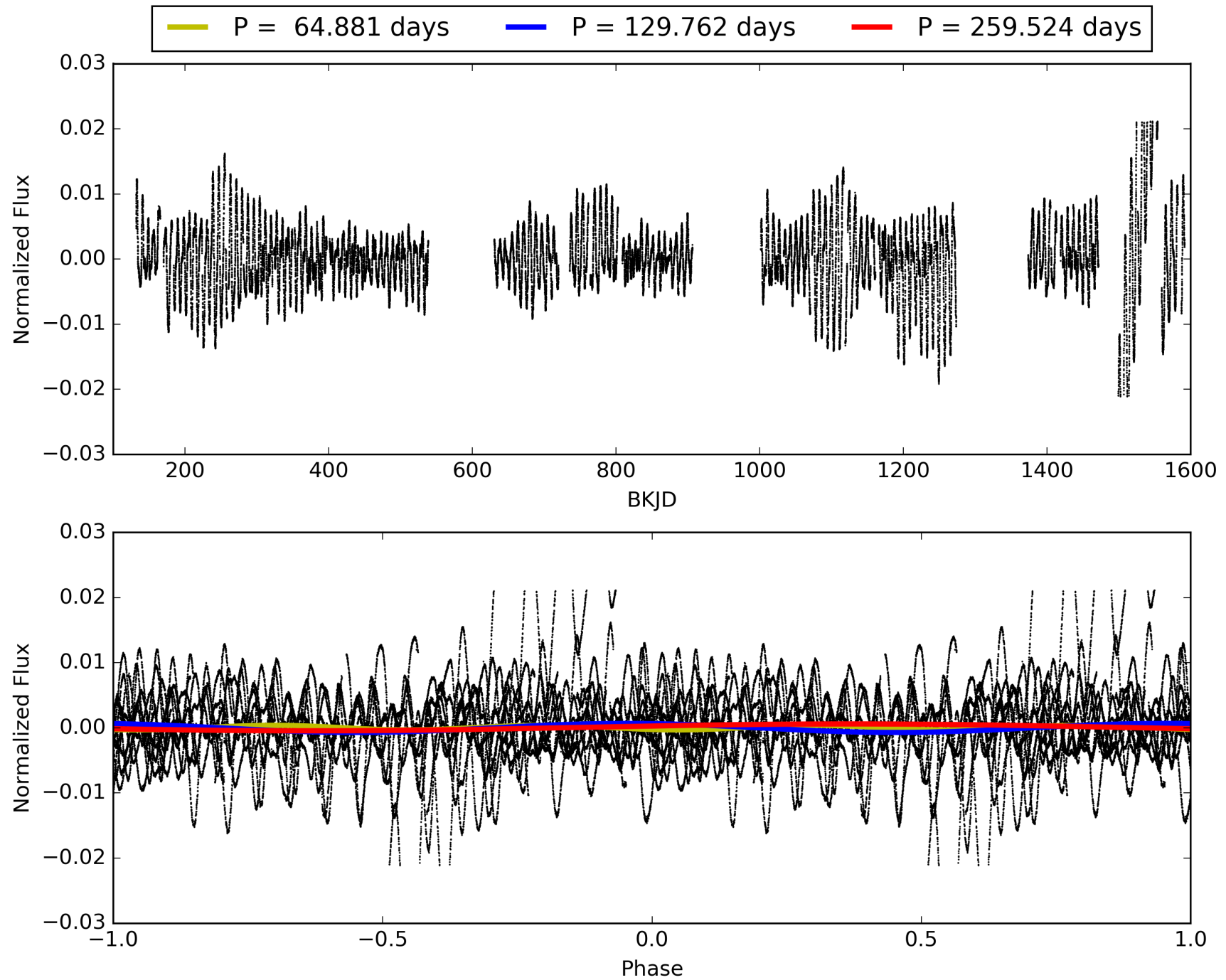
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:41:59 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-09, PDC Light Curves

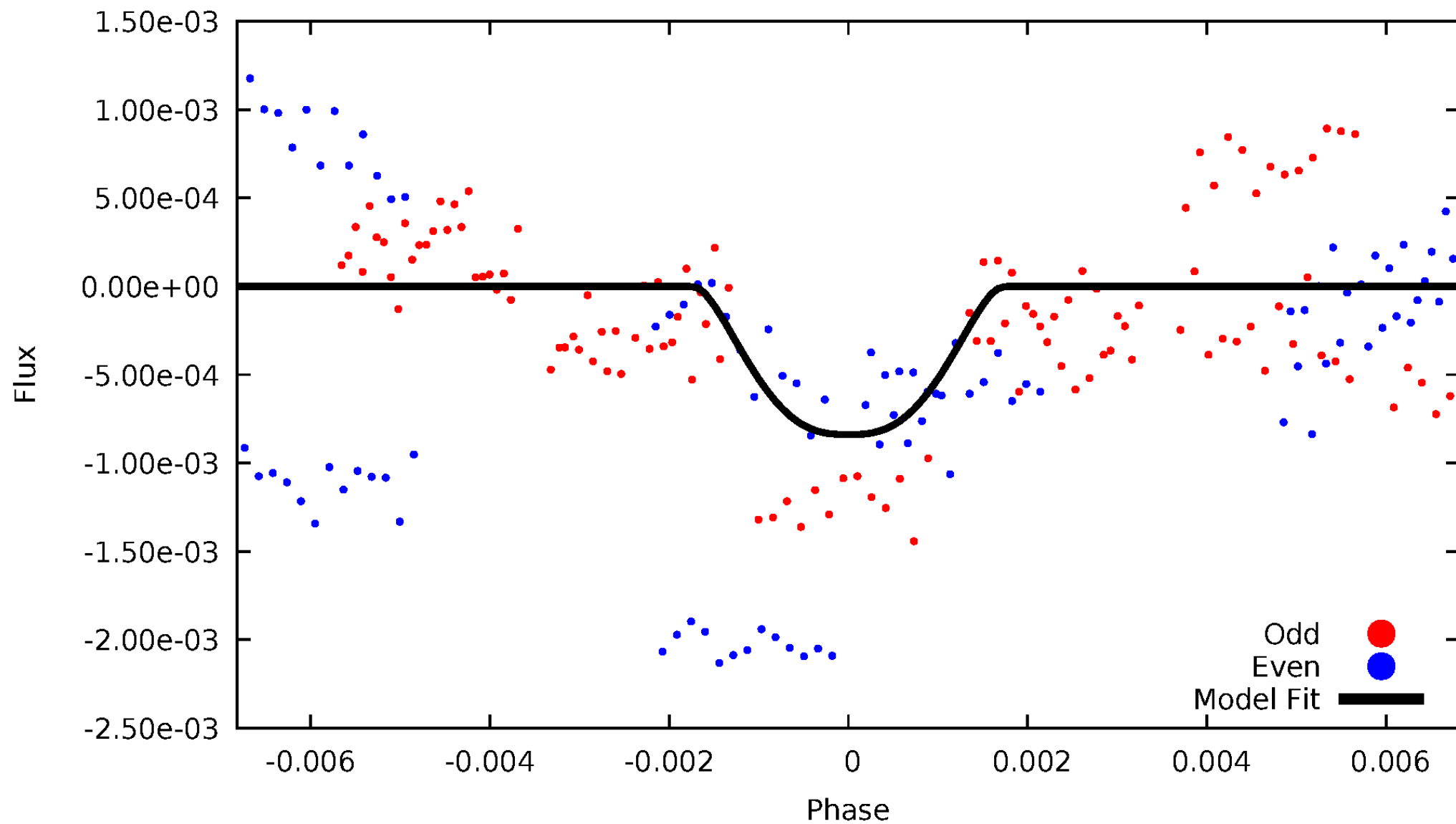


TCE 004481350-09



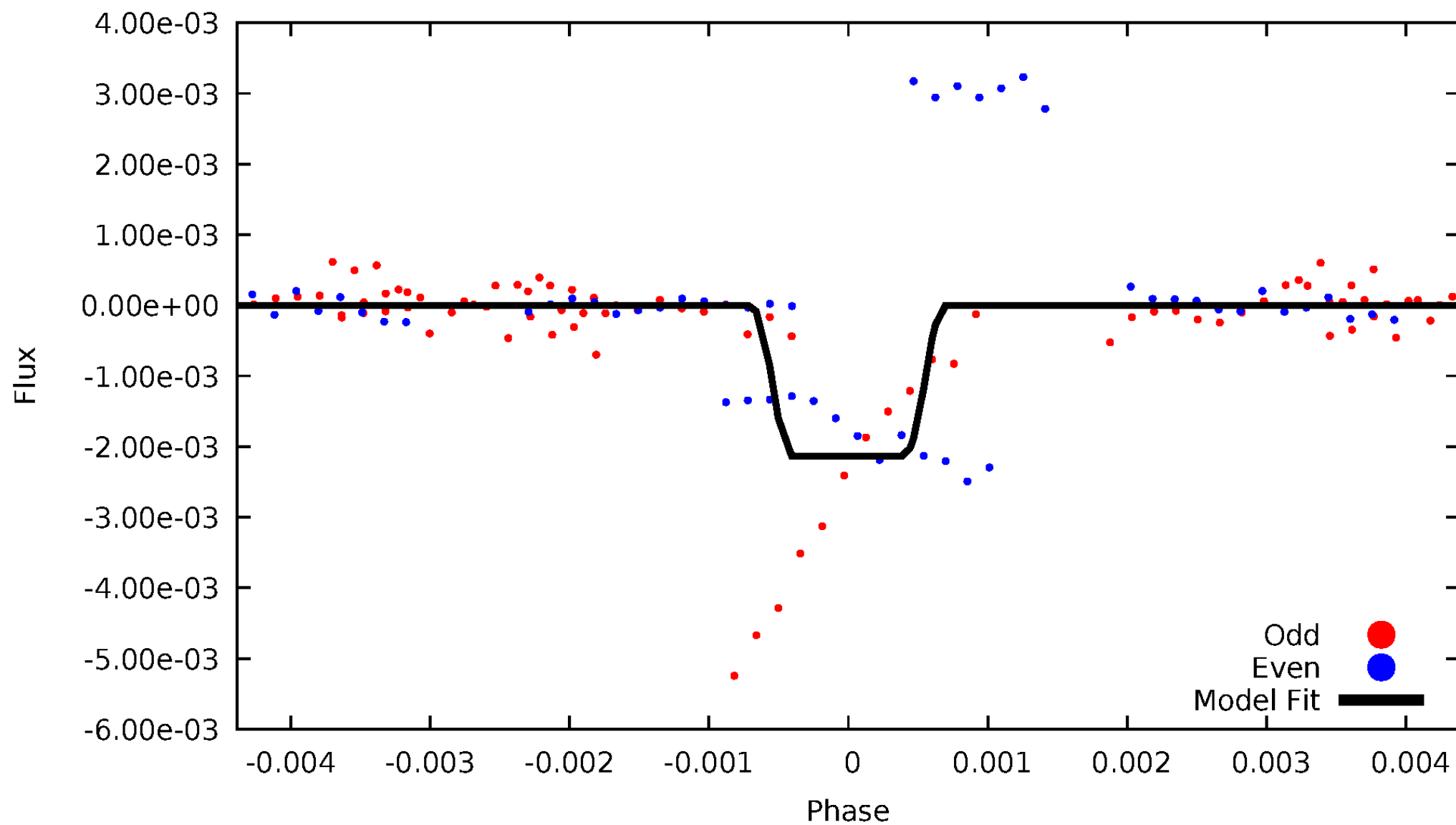
DV Odd/Even

TCE 004481350-09



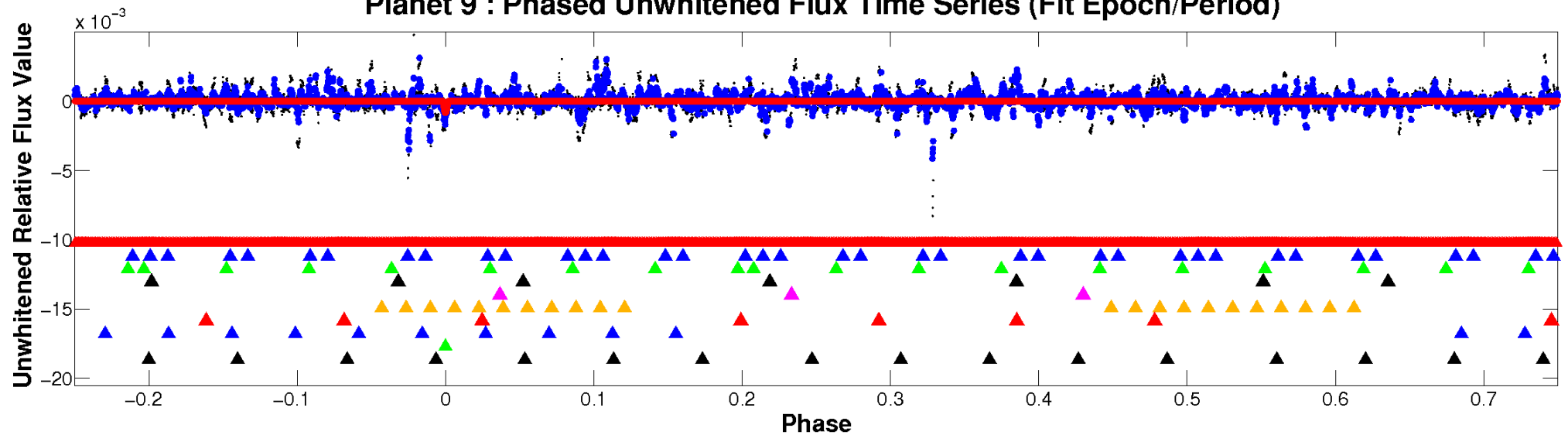
ALT Odd/Even

TCE 004481350-09

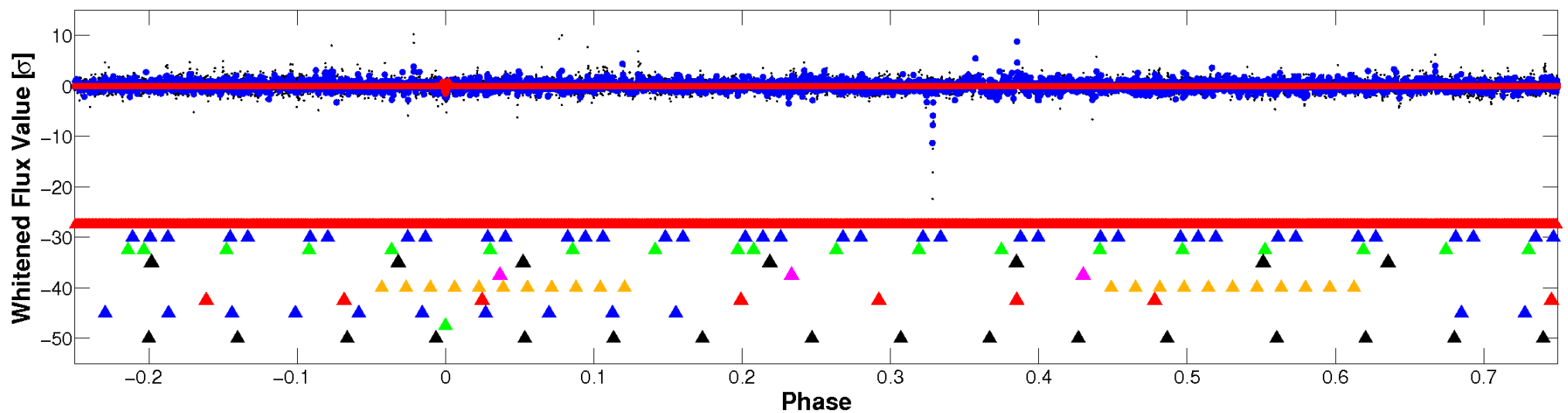


Non-Whitened Vs. Whitened Light Curve

Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

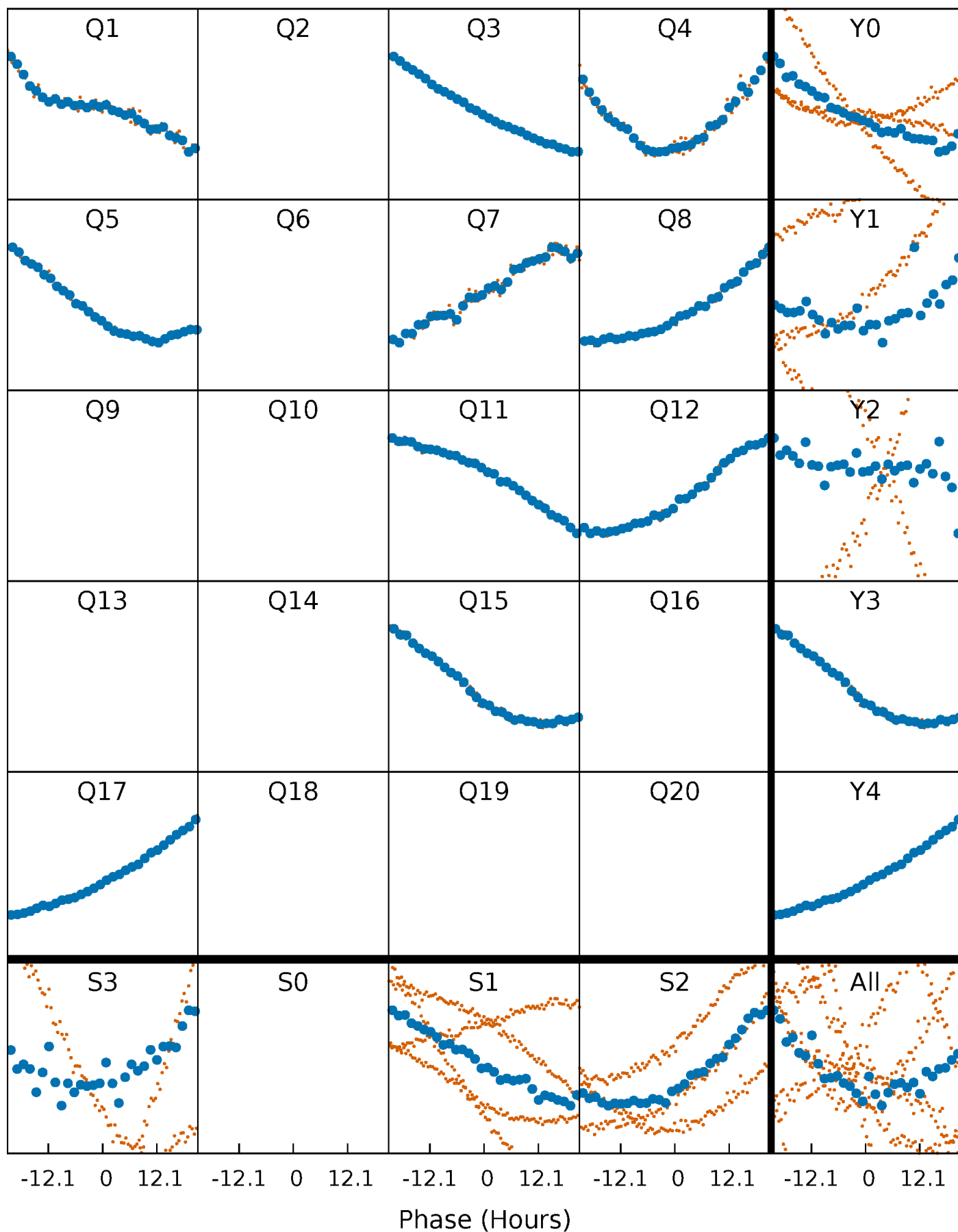


Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



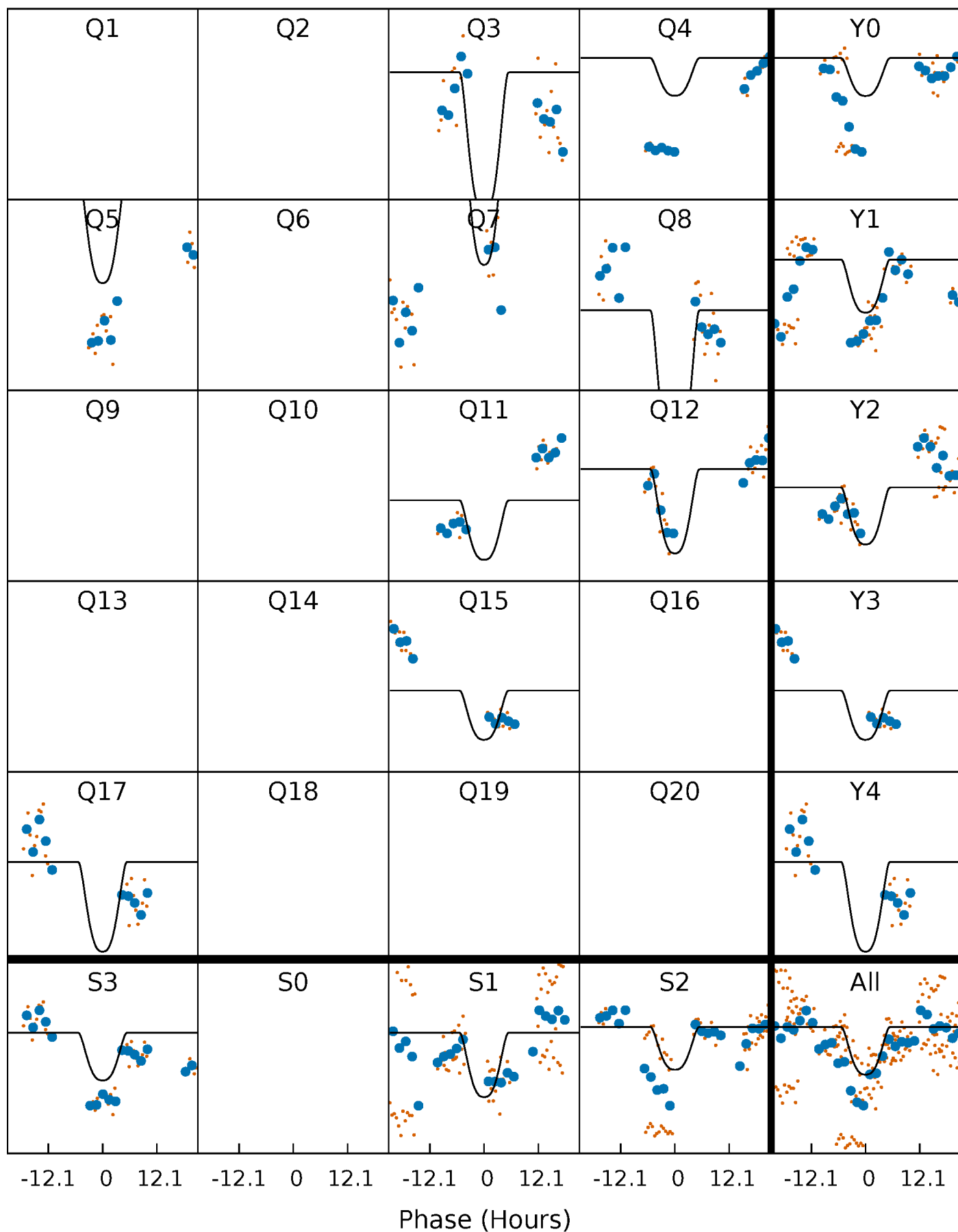
PDC Quarter-Phased Transit Curves

TCE 004481350-09 P=129.761974 Days $T_0=135.009221$ (BKJD)



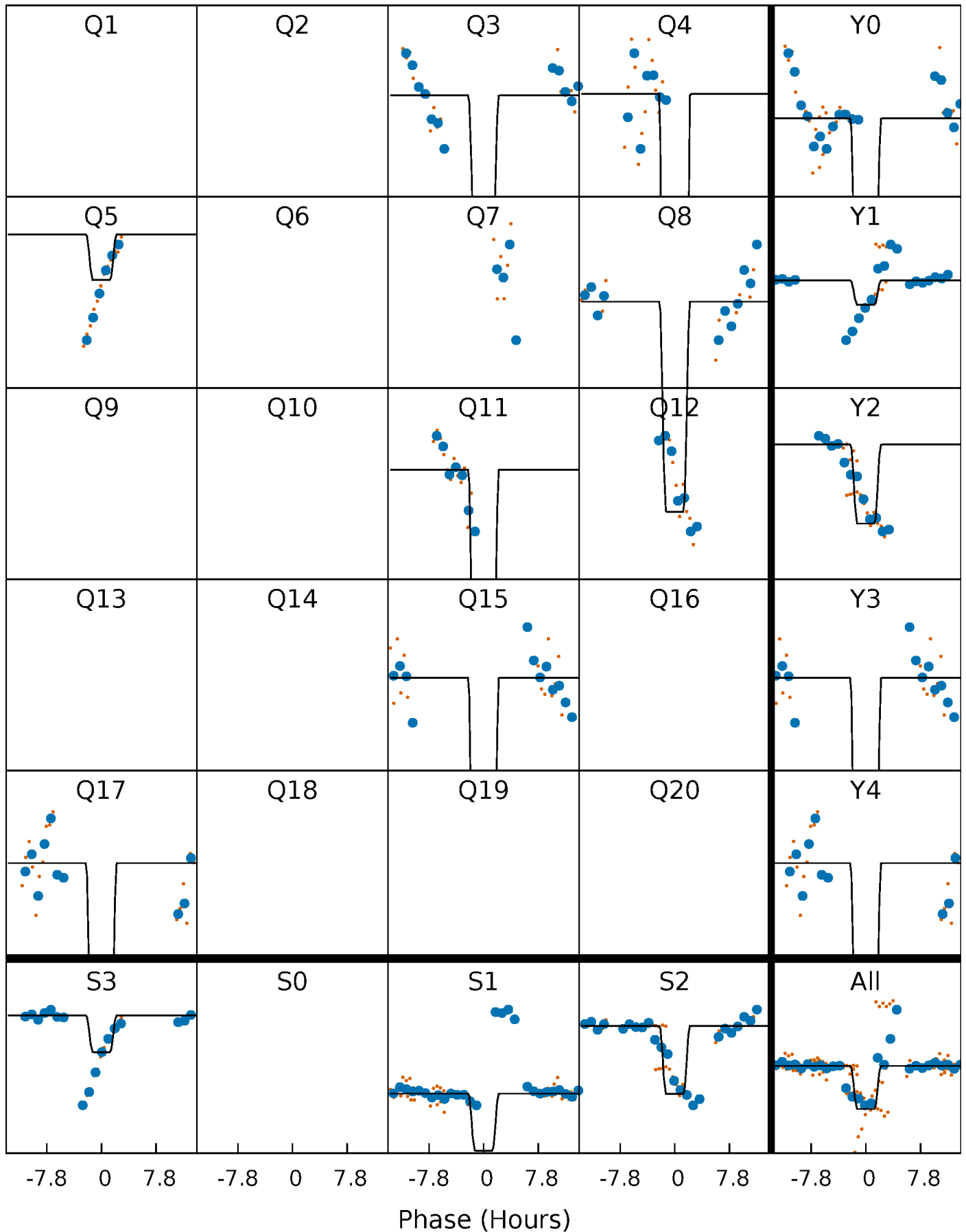
DV Quarter-Phased Transit Curves

TCE 004481350-09 $P=129.761974$ Days $T_0=135.009221$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

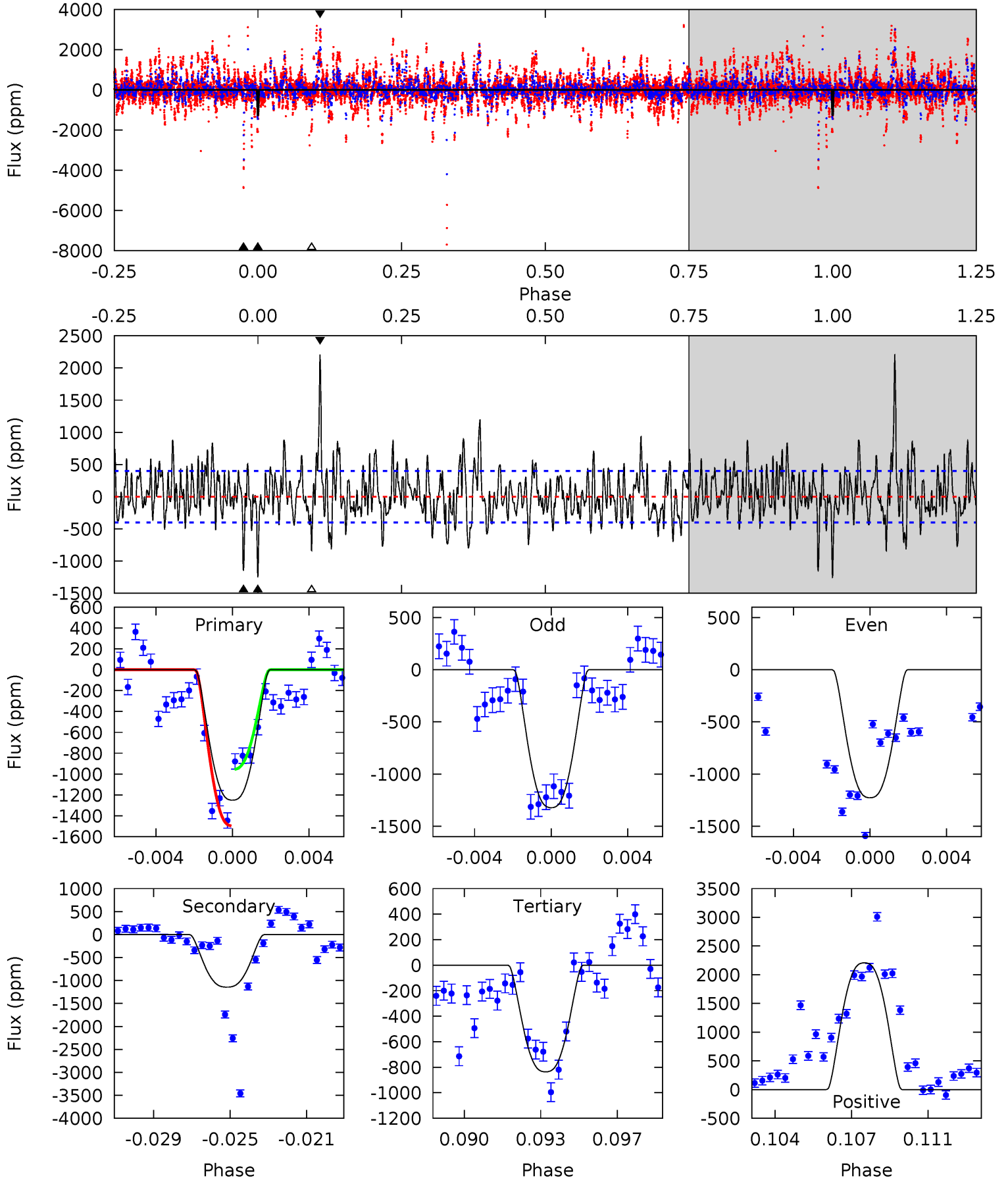
TCE 004481350-09 P=129.729591 Days $T_0=135.103026$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-09, P = 129.761974 Days, E = 5.247247 Days

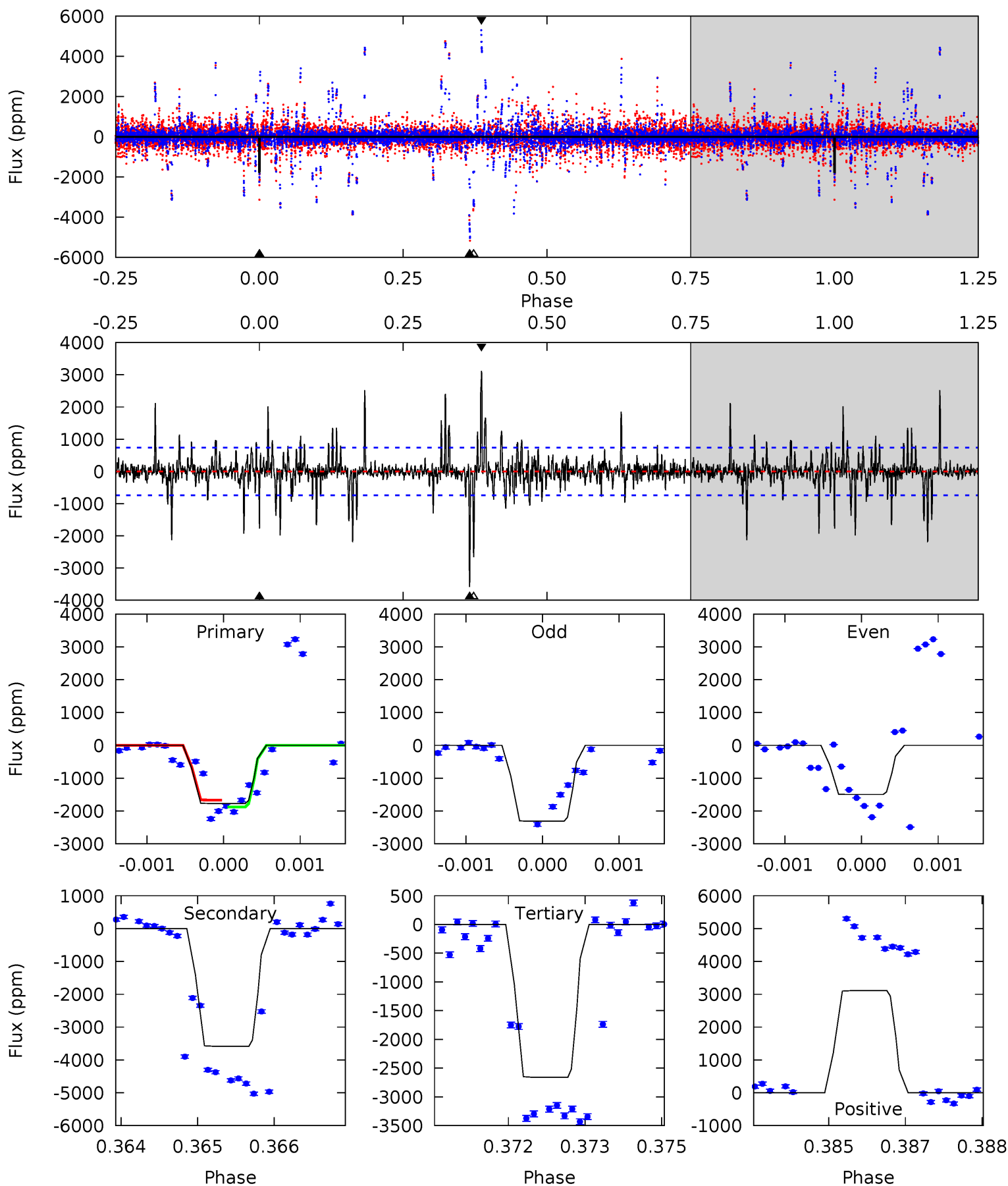
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	14.9	10.9	28.8	5.22	2.91	4.32	5.41	-12.5	4.03	-13.9	0.58	1.24	0.64	3.55



Alt Model-Shift Uniqueness Test

004481350-09, P = 129.729591 Days, E = 5.373435 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	26.1	19.4	22.7	5.40	3.20	2.45	-6.47	-9.76	6.74	3.46	2.82	0.42	0.46	0.75



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-09 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1145 ± 77	$2.11^{+0.25}_{-0.26}$	335^{+11}_{-10}	4661^{+256}_{-257}	24308^{+6544}_{-5047}
Alt.	-3584 ± 137	$2.75^{+0.28}_{-0.26}$	335^{+11}_{-10}	5296^{+279}_{-240}	45025^{+9973}_{-8054}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

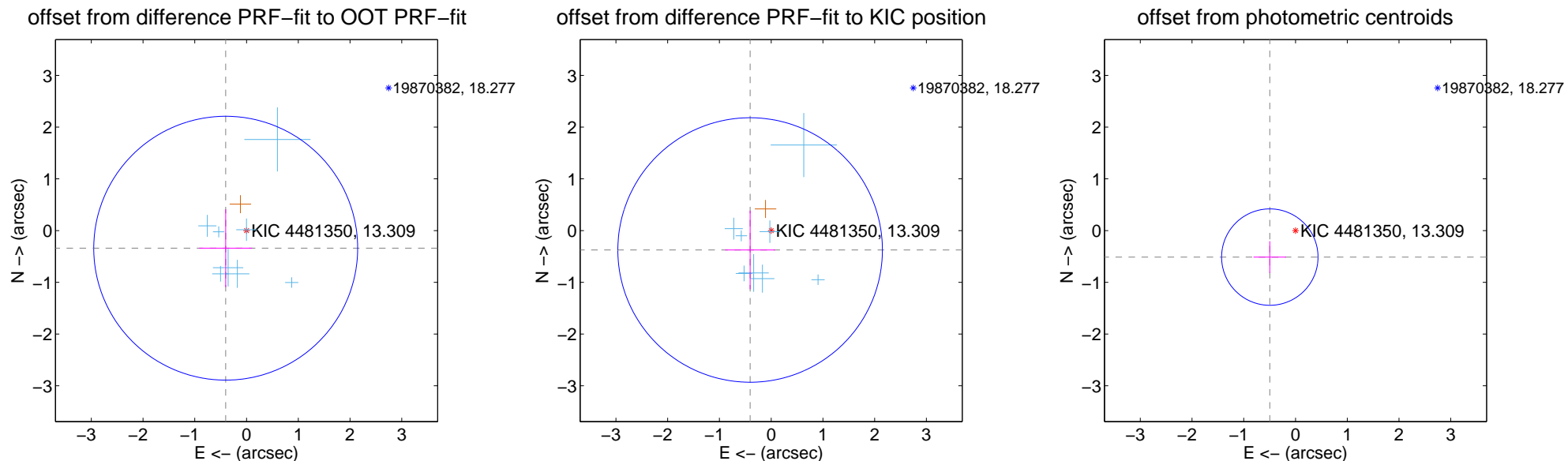
DV Centroid Data

Supplemental centroid analysis for 004481350-09. Kepler magnitude: 13.31. Transit SNR 7.55

There are 8 quarters with good PRF difference image offsets

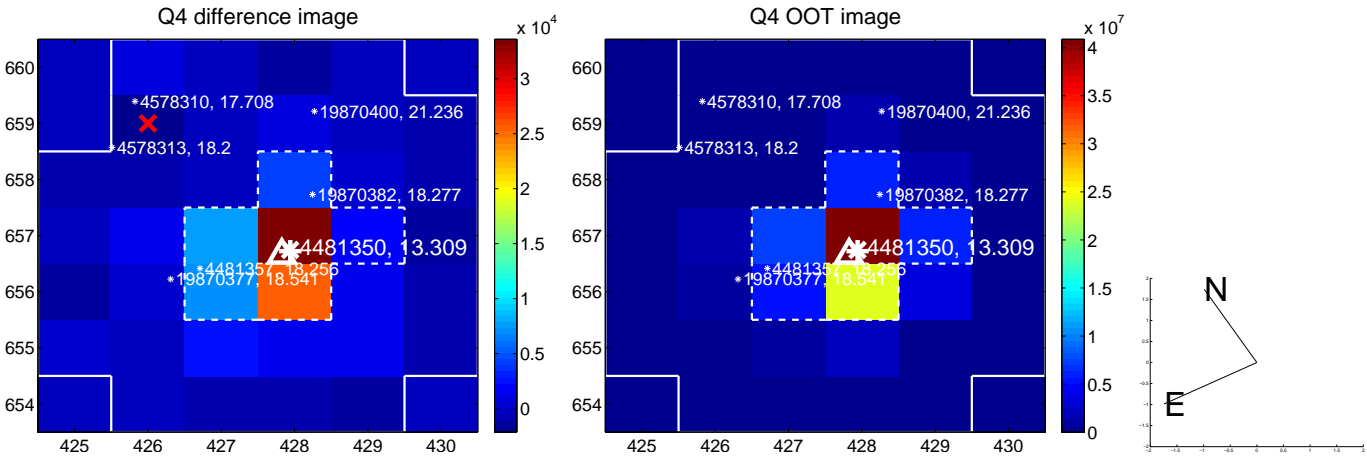
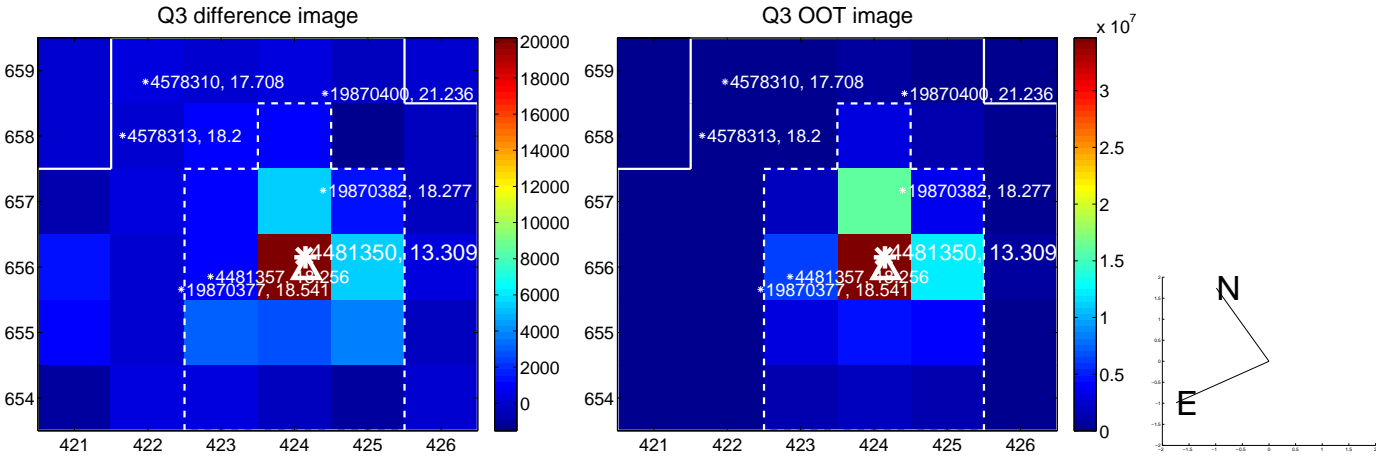
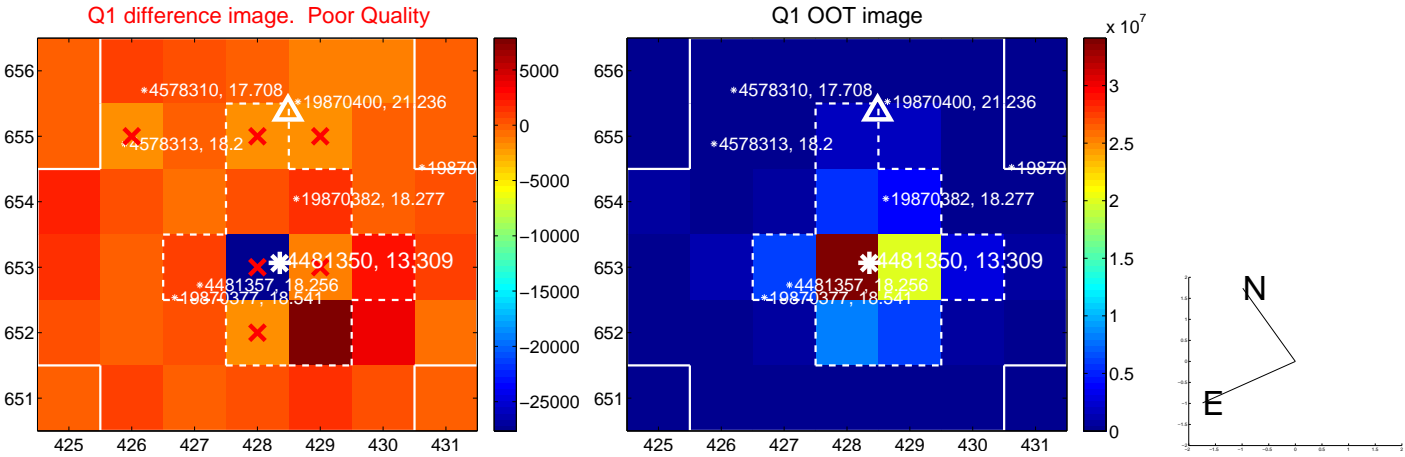
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.527 ± 0.850	0.62	0.403 ± 0.512	-0.340 ± 0.752
PRF-fit source offset from KIC position	0.553 ± 0.852	0.65	0.407 ± 0.485	-0.375 ± 0.761
photometric centroid source offset	0.71 ± 0.31	2.30	0.50 ± 0.31	-0.51 ± 0.31

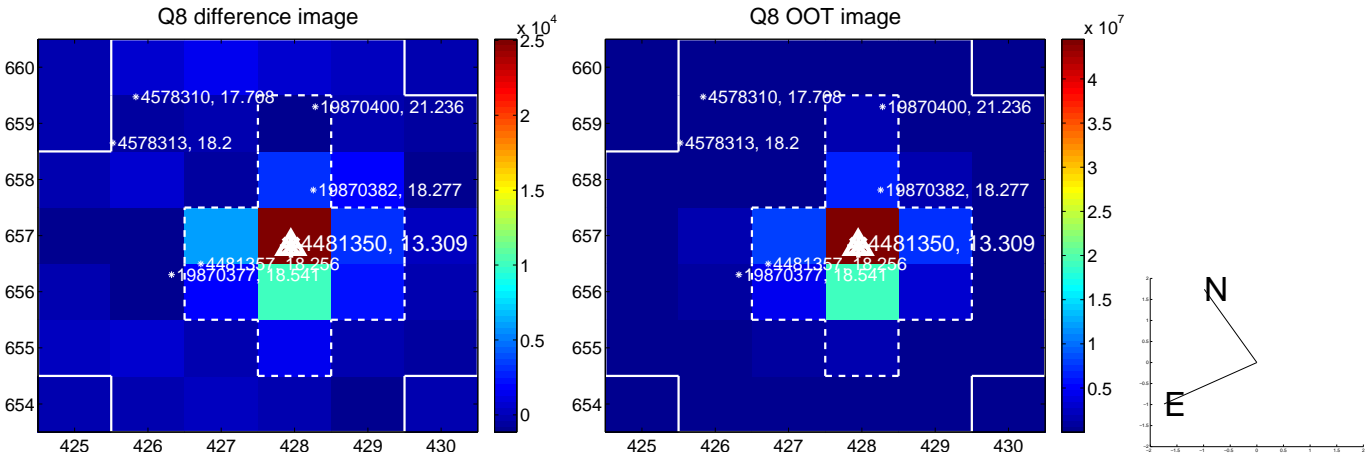
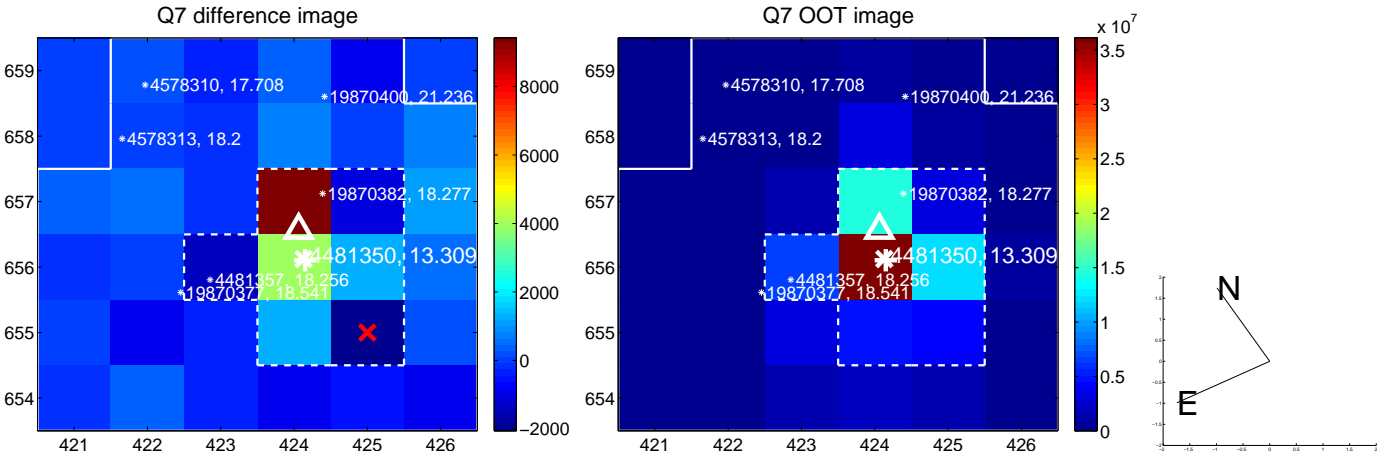
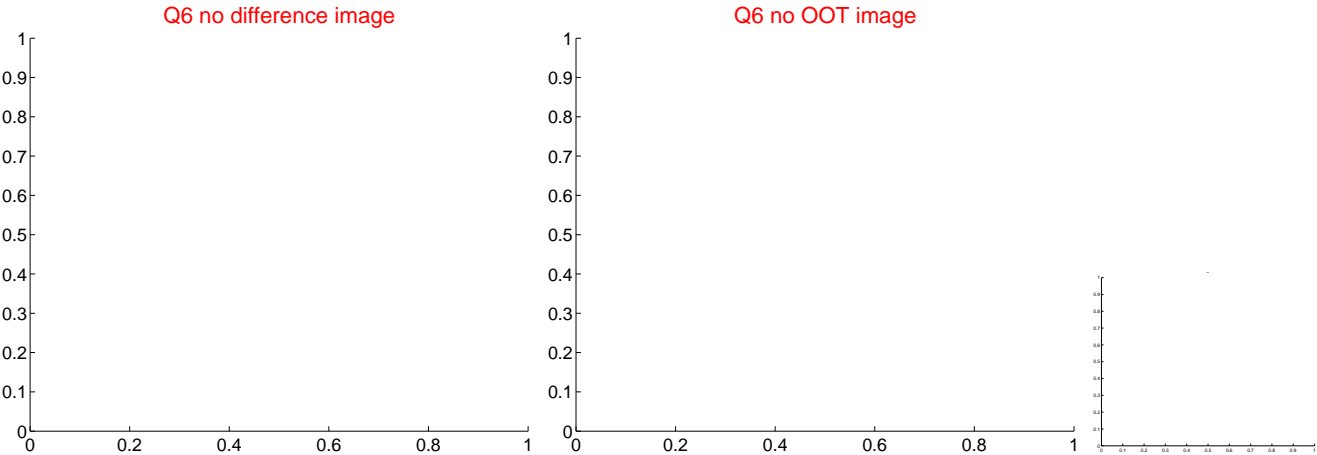
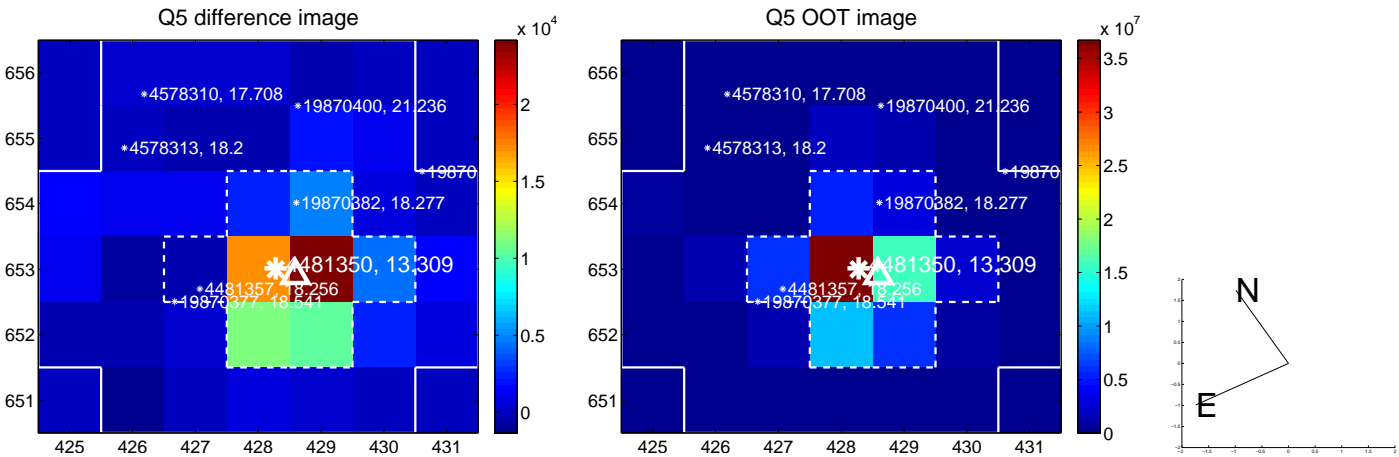


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

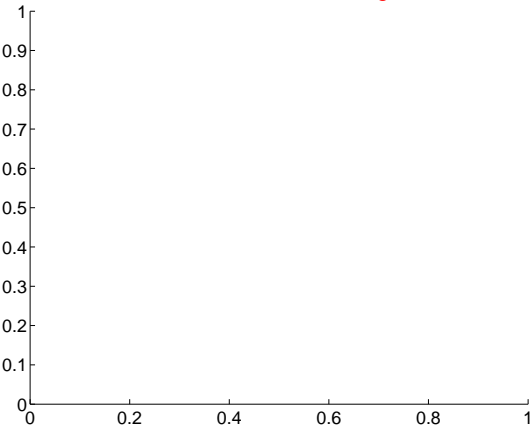
Q9 no difference image



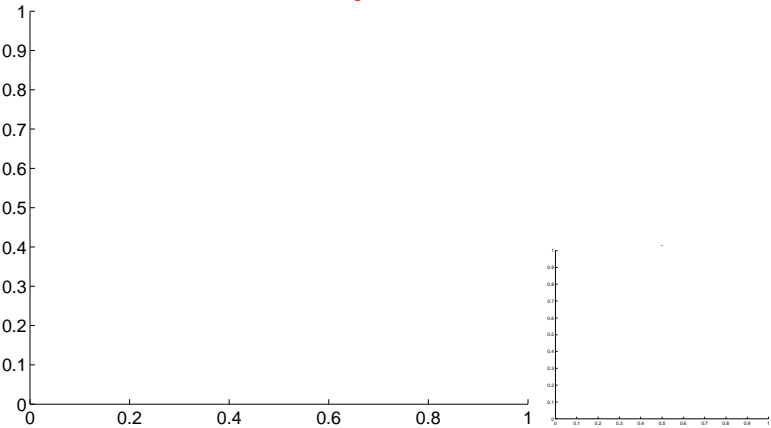
Q9 no OOT image



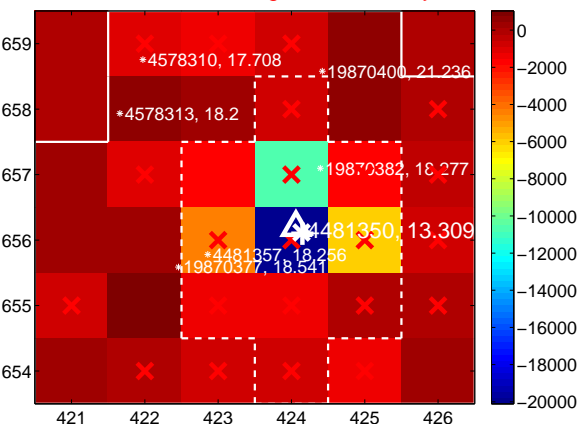
Q10 no difference image



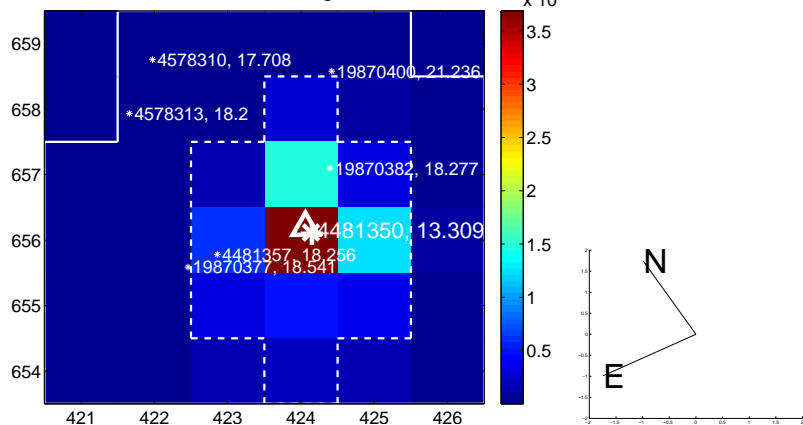
Q10 no OOT image



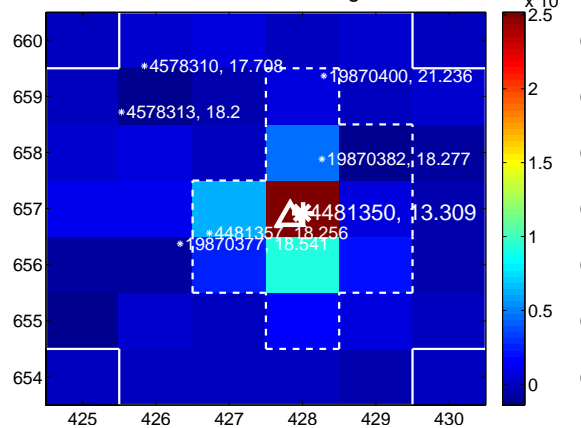
Q11 difference image. Poor Quality



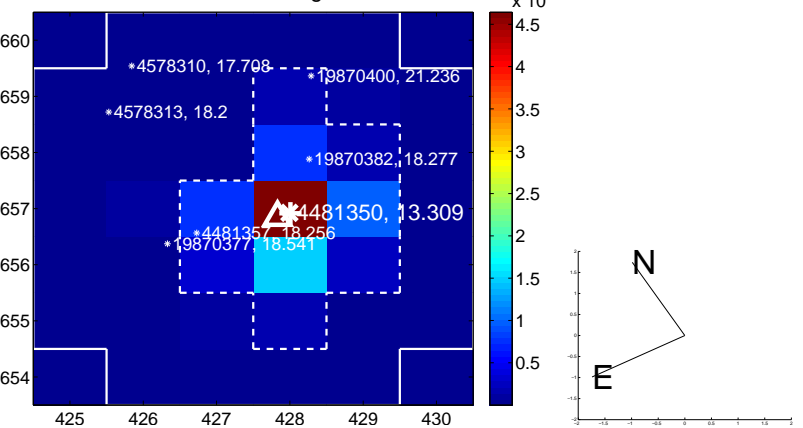
Q11 OOT image



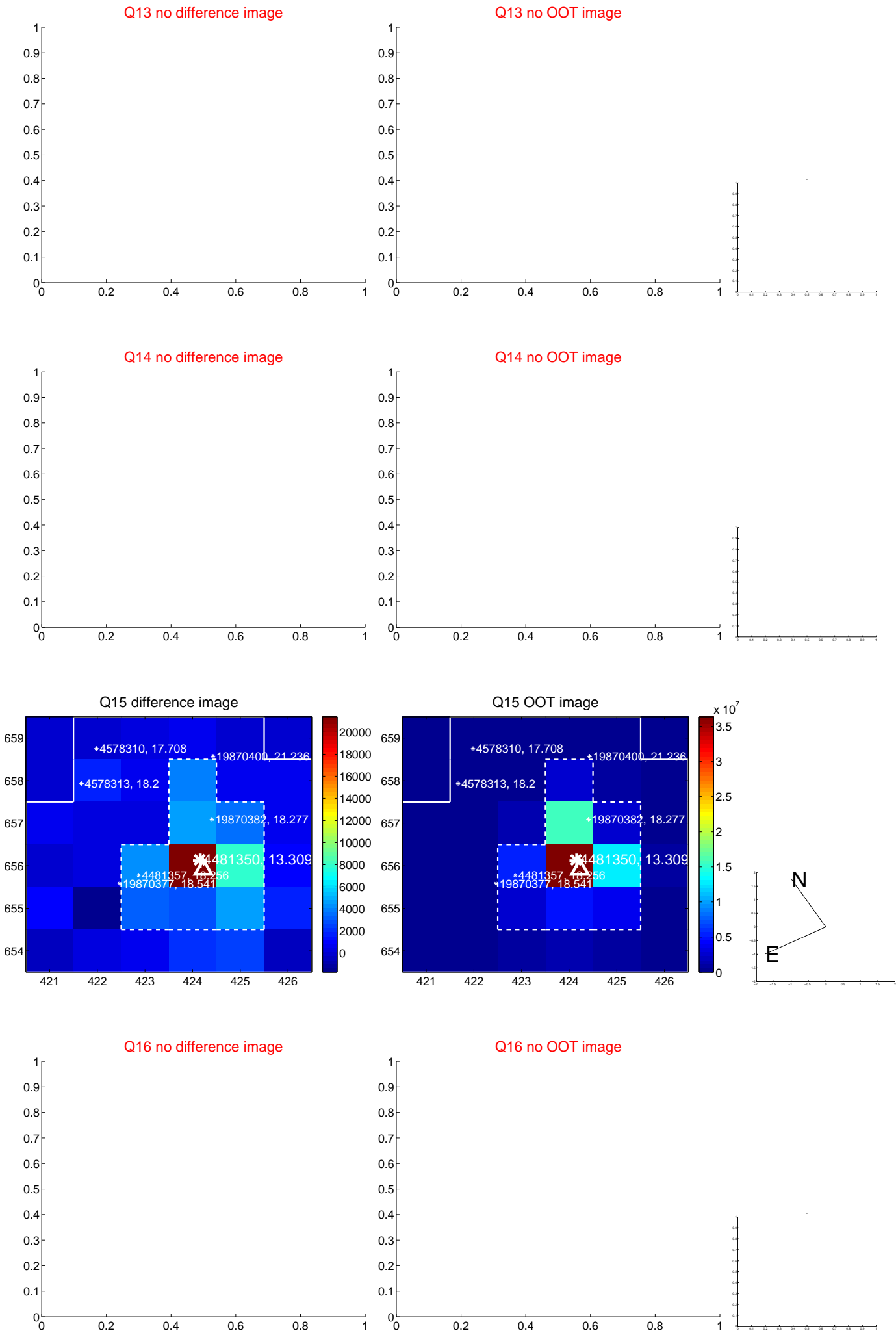
Q12 difference image



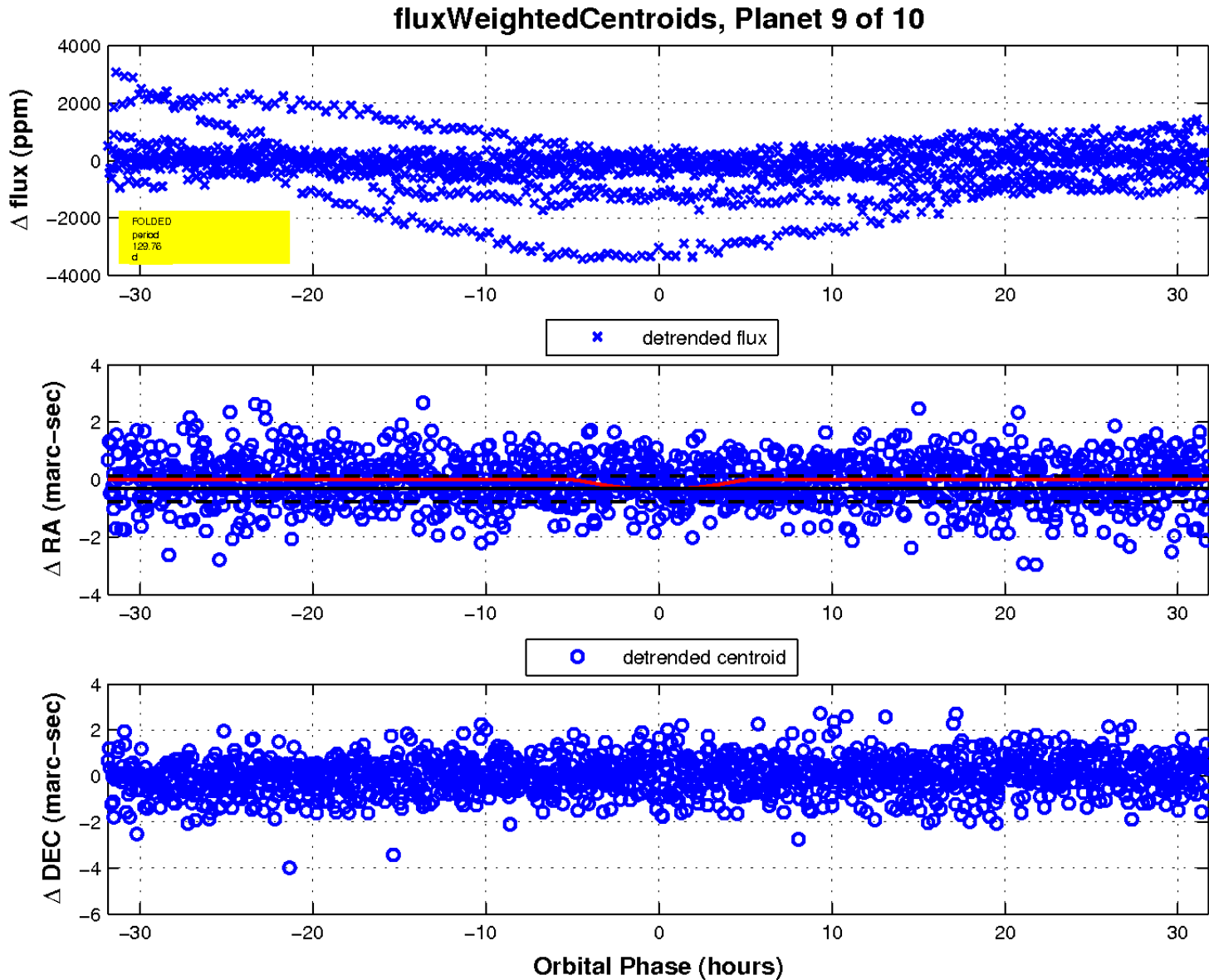
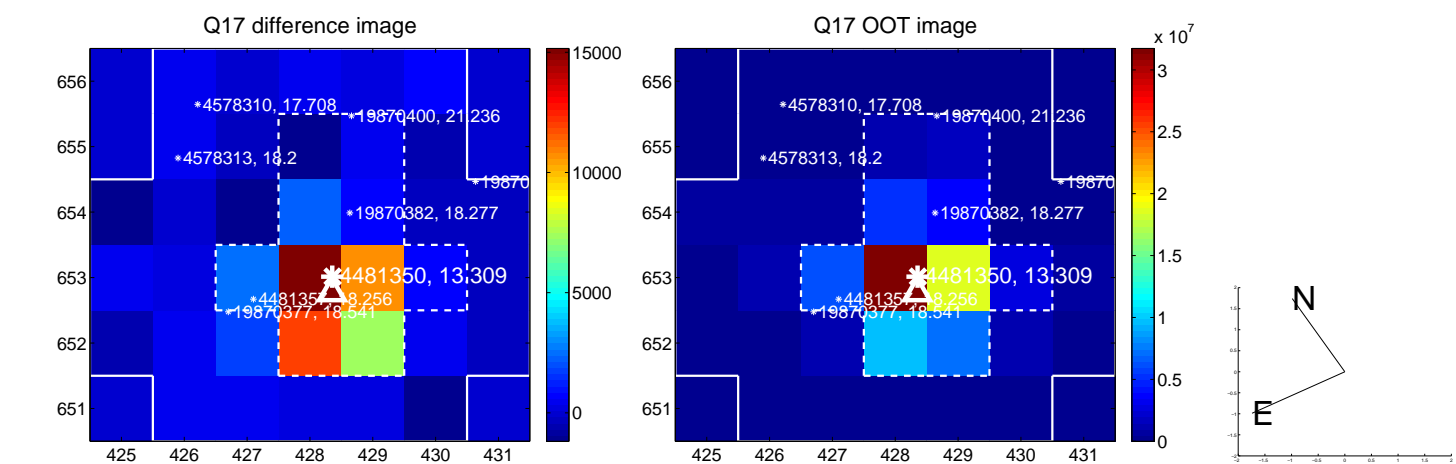
Q12 OOT image



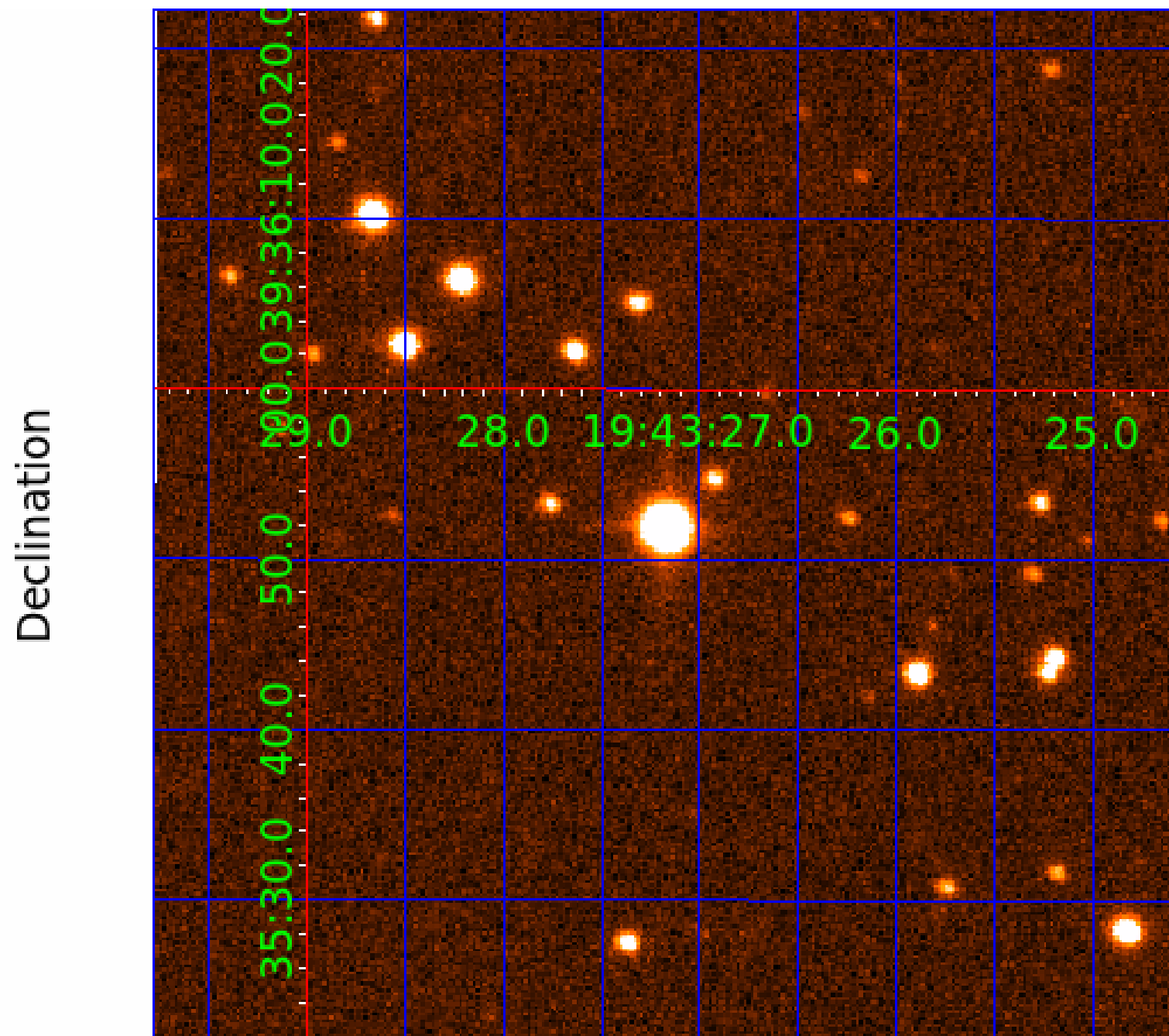
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image



KIC 004481350

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
004481350-01	OBS	No	0.908483	132.283635	30.5	5.016	8.9	10.6	0.54	4753	0.35	592.76
004481350-02	OBS	No	38.074498	164.332328	897.0	7.832	20.9	9.3	0.54	4753	3.26	4.07
004481350-03	OBS	No	76.411983	160.582925	702.7	4.075	14.8	6.5	0.54	4753	1.61	1.61
004481350-04	OBS	No	205.433689	271.565193	1199.8	14.733	13.4	6.2	0.54	4753	2.43	0.43
004481350-05	OBS	No	544.565609	139.770443	15761.2	96.578	12.6	7.6	0.54	4753	12.28	0.12
004481350-06	OBS	No	65.943020	193.257136	421.3	10.247	13.1	4.4	0.54	4753	1.44	1.96
004481350-07	OBS	No	200.677698	160.853225	4626.9	21.097	11.5	7.9	0.54	4753	6.96	0.44
004481350-08	OBS	No	124.213708	155.166923	496.2	7.000	11.0	5.4	0.54	4753	1.45	0.84
004481350-09	OBS	No	129.761974	135.009221	839.6	10.617	9.5	7.6	0.54	4753	2.11	0.79
004481350-10	OBS	No	89.097635	207.741074	661.1	6.984	12.7	6.1	0.54	4753	1.54	1.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004481350-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_UNRESOLVED_OFFSET
004481350-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV
004481350-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV
004481350-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
004481350-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
004481350-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
004481350-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS
004481350-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT
004481350-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
004481350-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

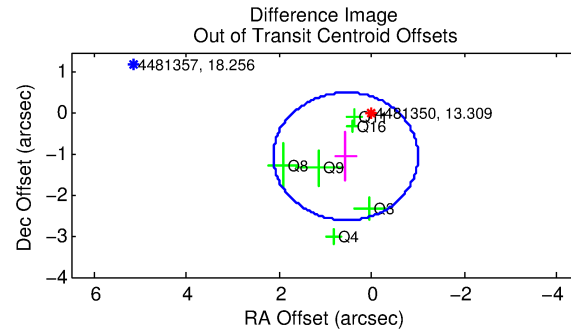
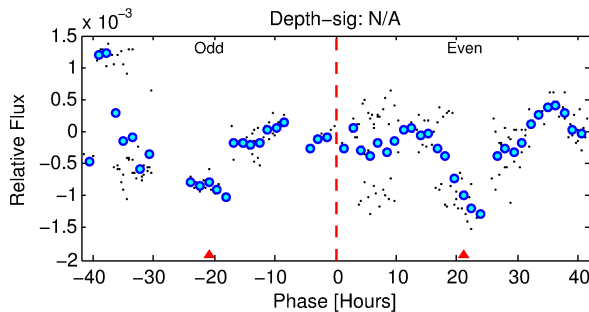
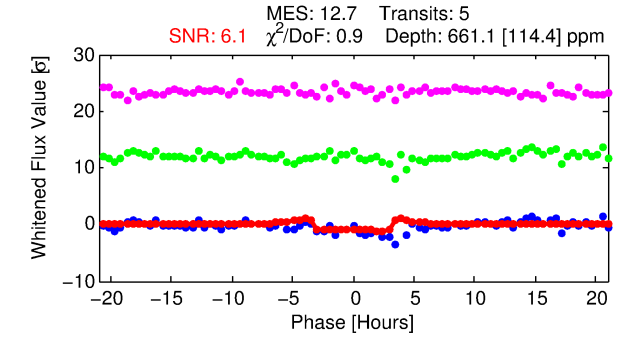
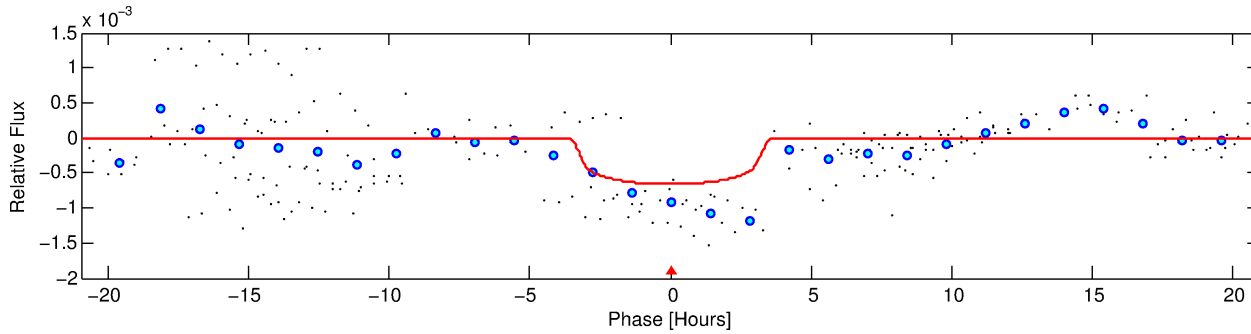
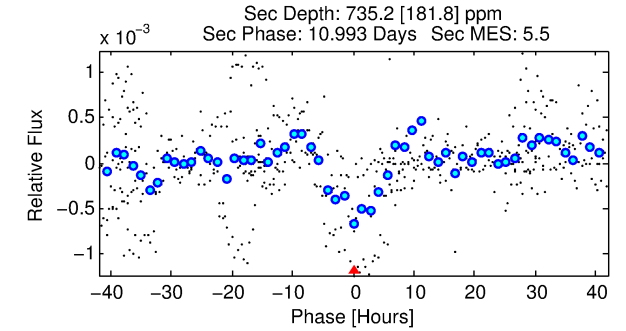
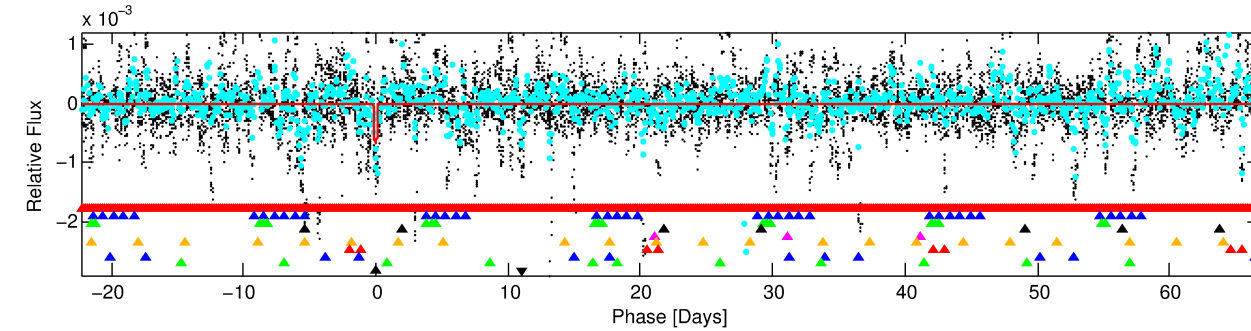
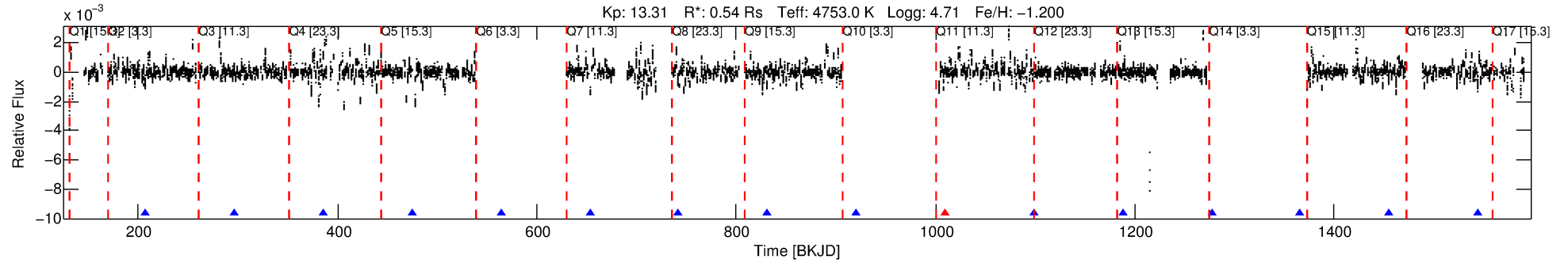
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004481350-10

No Significant Match Found

DV One-Page Summary

KIC: 4481350 Candidate: 10 of 10 Period: 89.098 d



DV Fit Results:

Period = 89.09763 [0.00447] d
Epoch = 207.7411 [0.0306] BKJD
Rp/R* = 0.0261 [0.0118]
a/R* = 64.04 [111.81]
b = 0.79 [0.83]
Seff = 1.31 [0.18]
Teq = 273 [10] K
Rp = 1.54 [0.71] Re
a = 0.3207 [0.0166] AU
Ag = 17453.24 [16474.41] [1.06] σ
Teffp = 4848 [1149] K [3.98] σ

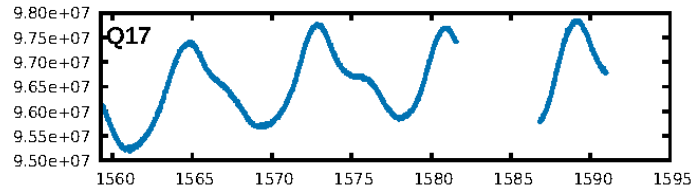
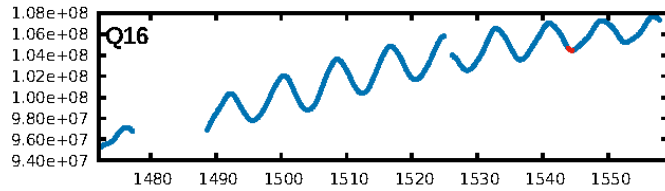
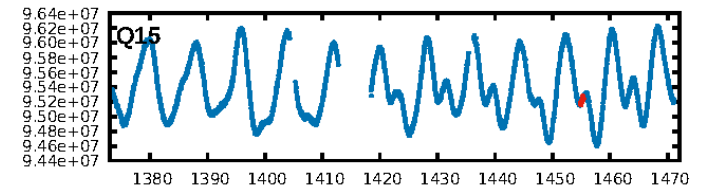
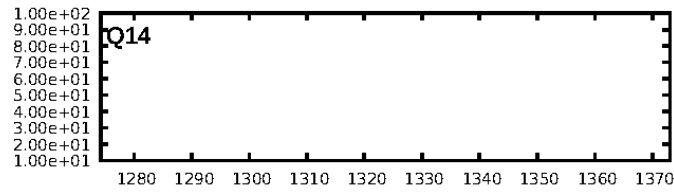
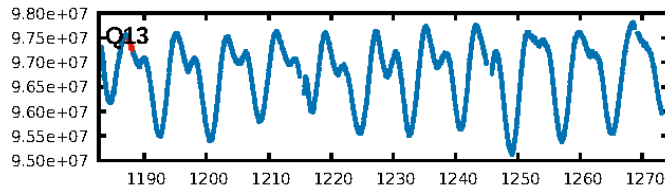
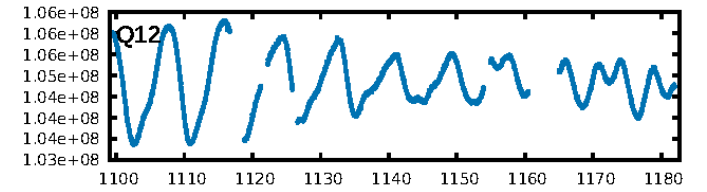
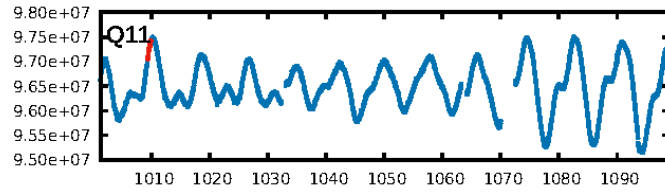
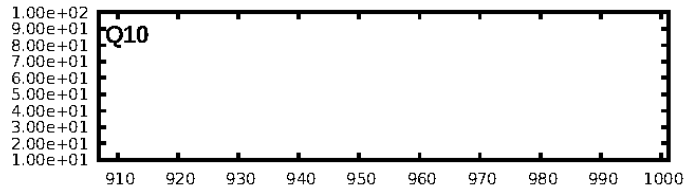
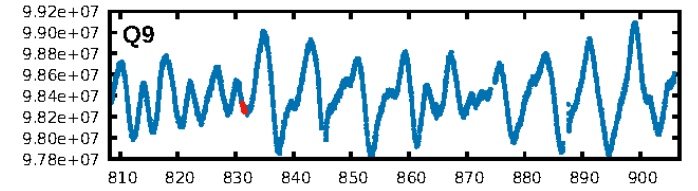
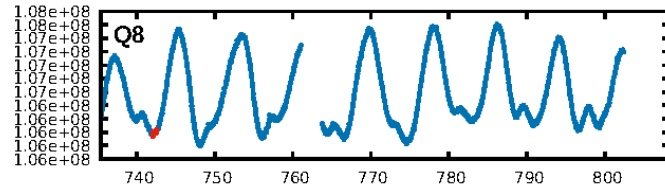
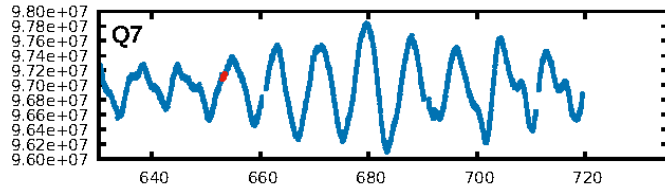
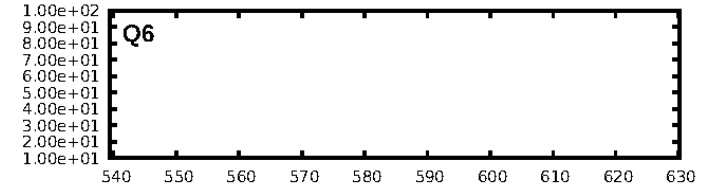
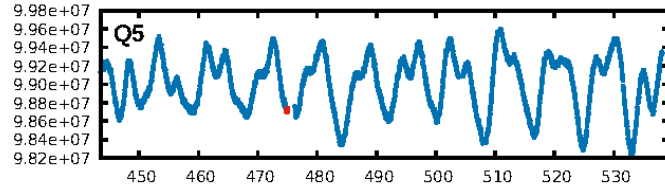
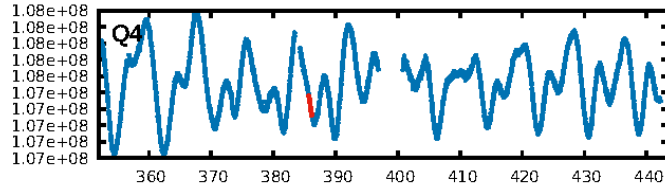
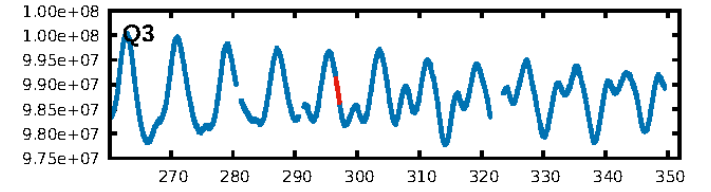
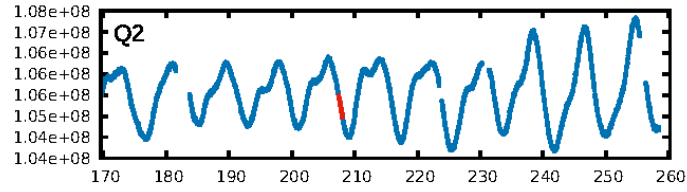
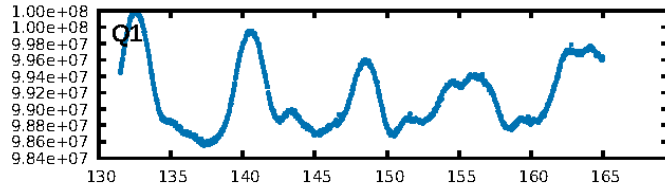
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.65] σ
LongPeriod-sig: 100.0% [85.23] σ
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.80 [4/5]
GhostDiagnostic-chr: -5.172
Centroid-sig: N/A
Centroid-so: 0.819 arcsec [2.04] σ
OotOffset-rm: 1.189 arcsec [2.28] σ
KicOffset-rm: 1.251 arcsec [2.35] σ
OotOffset-st: 0/2/3/1 [6]
KicOffset-st: 0/2/3/1 [6]
DiffImageQuality-fgm: 0.50 [3/6]
DiffImageOverlap-fno: 0.00 [0/9]

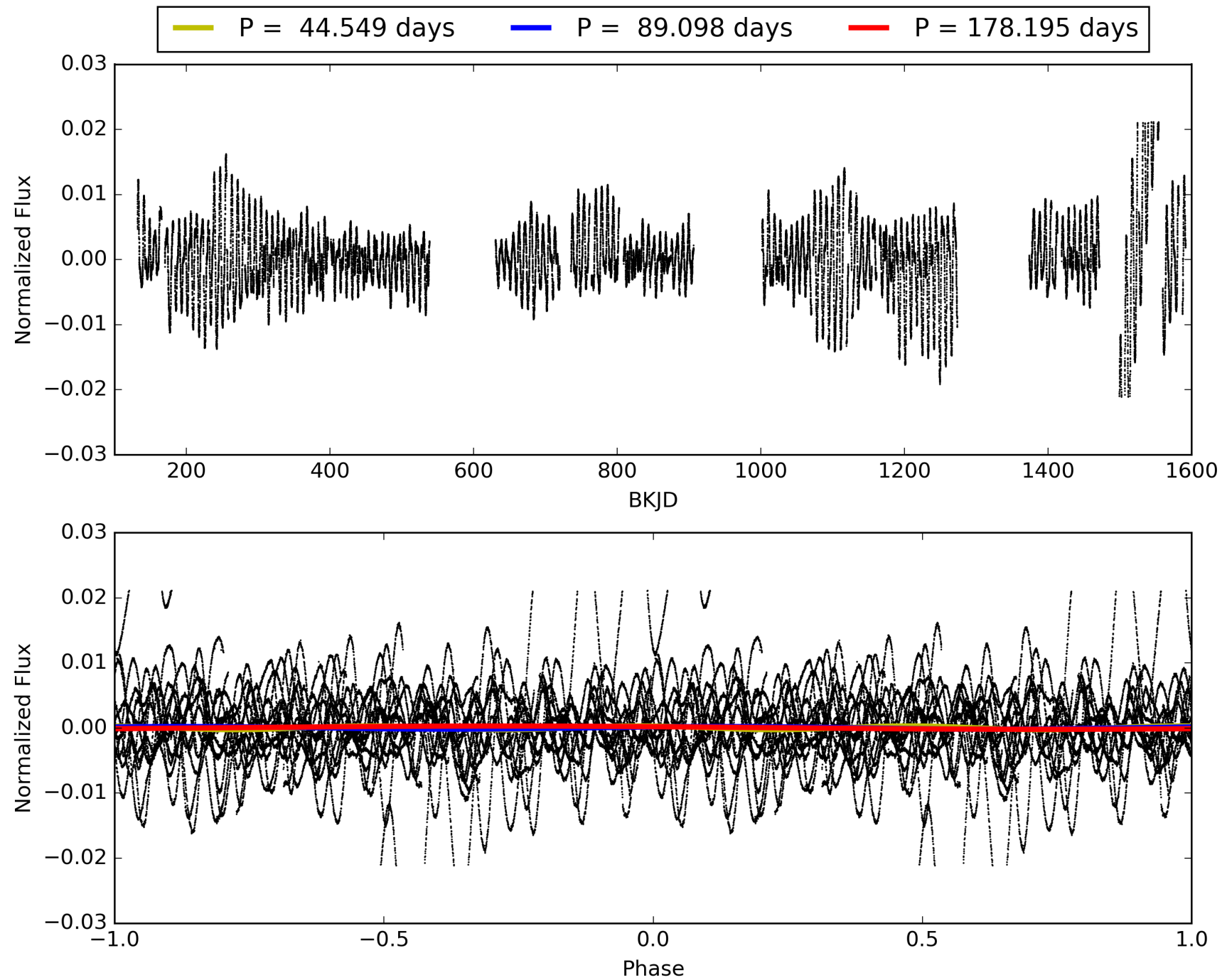
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:42:03 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004481350-10, PDC Light Curves

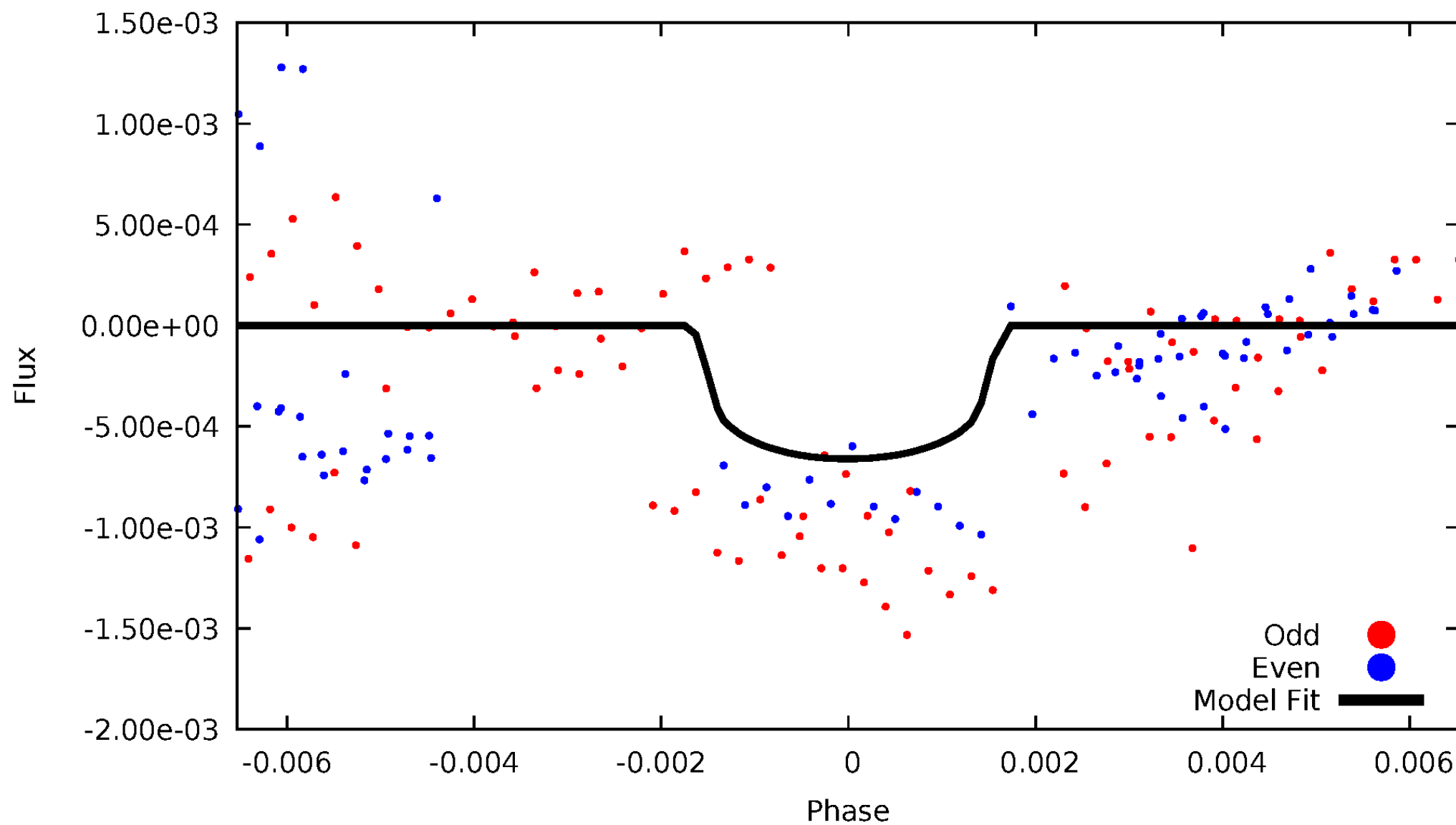


TCE 004481350-10



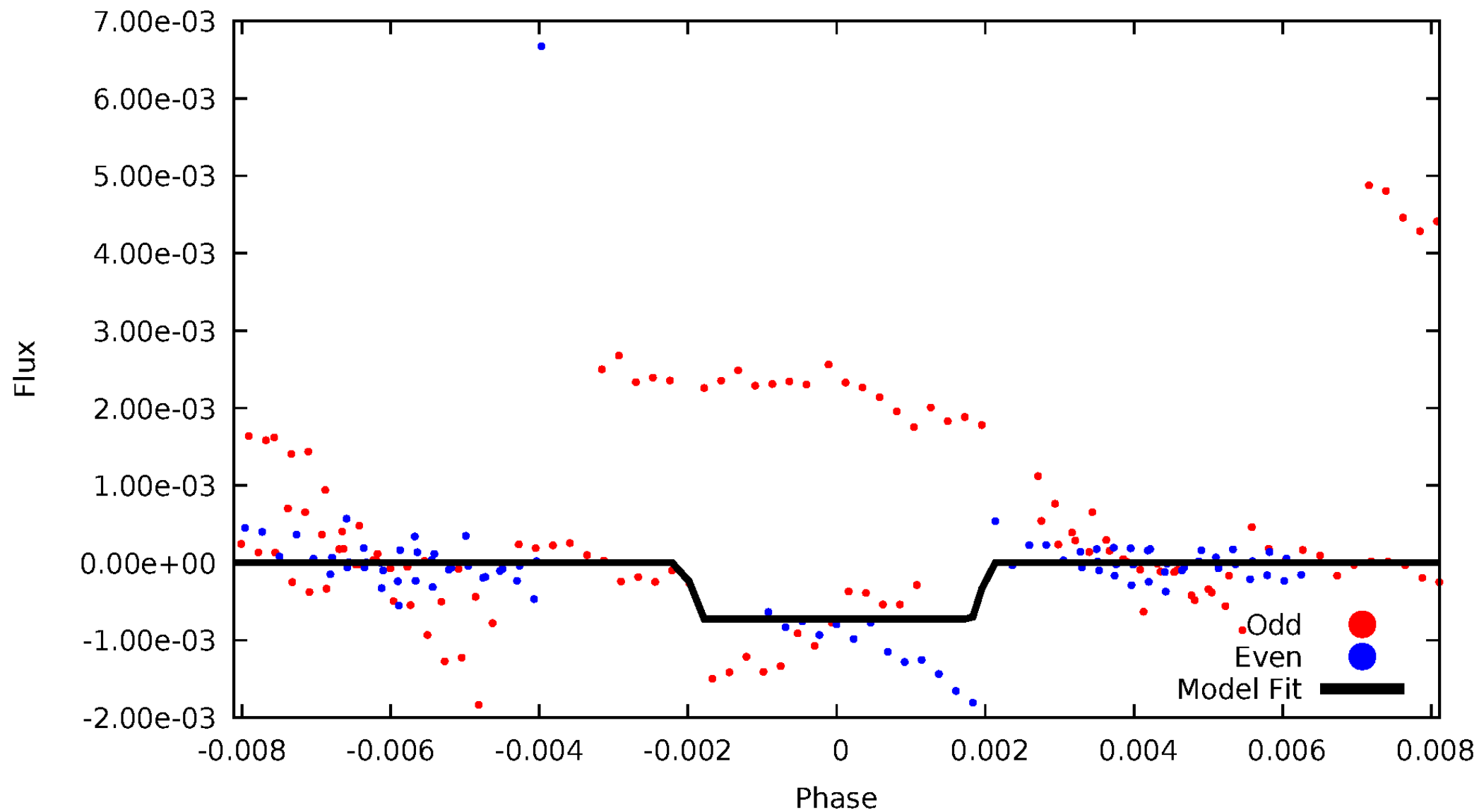
DV Odd/Even

TCE 004481350-10



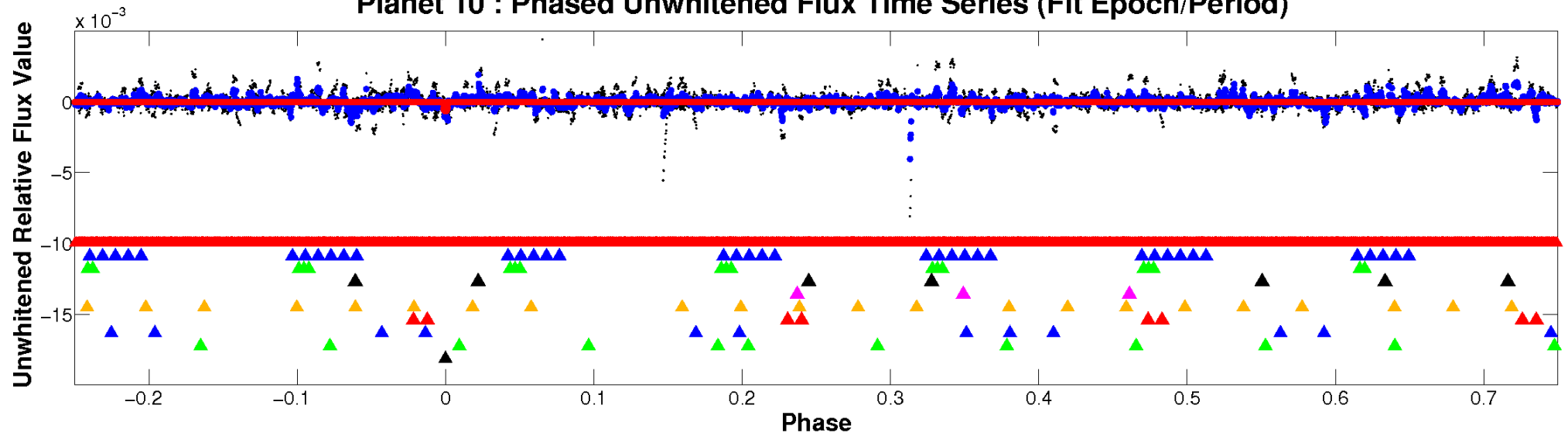
ALT Odd/Even

TCE 004481350-10

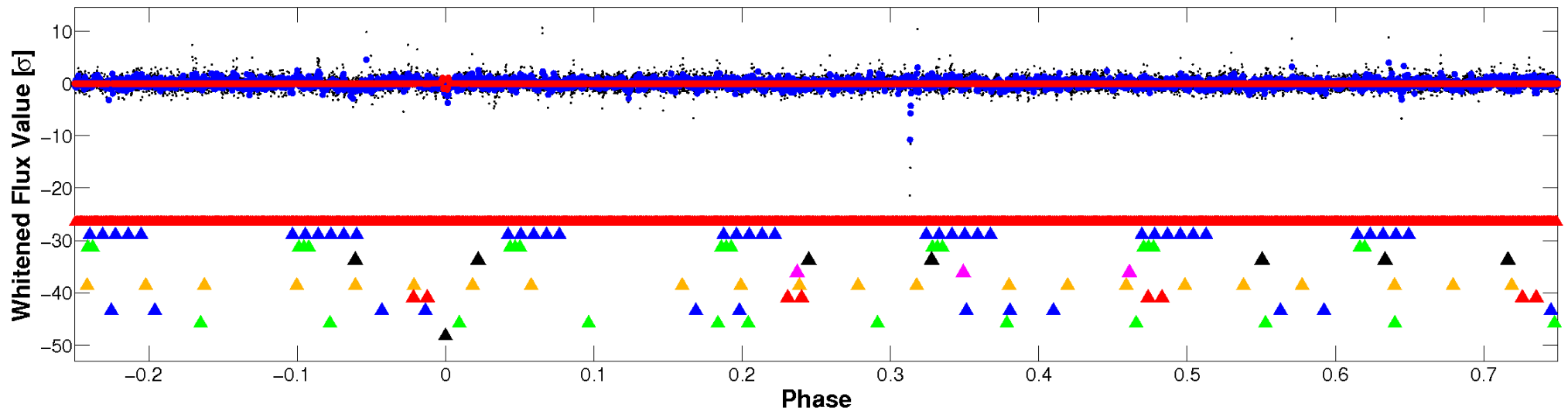


Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

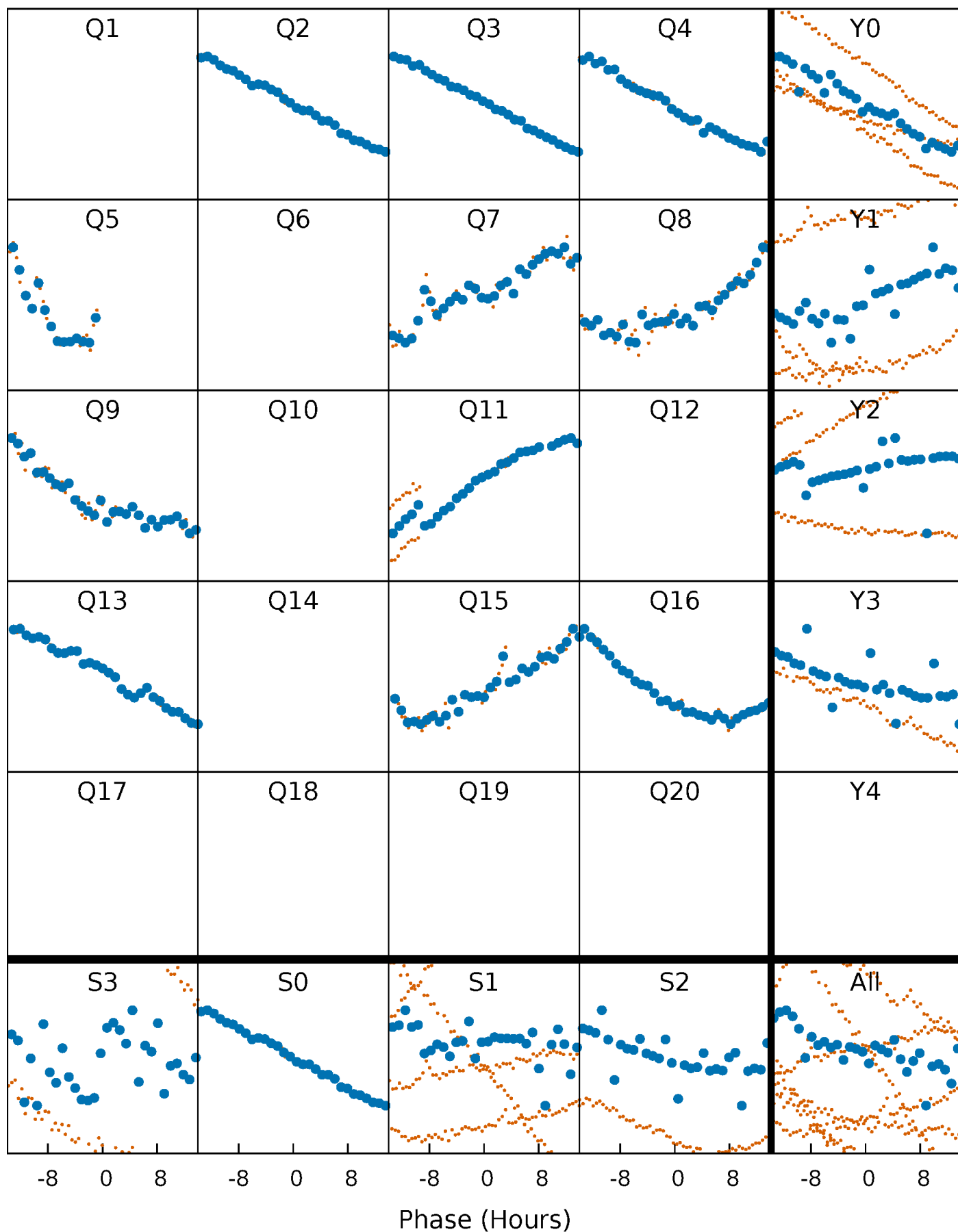


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



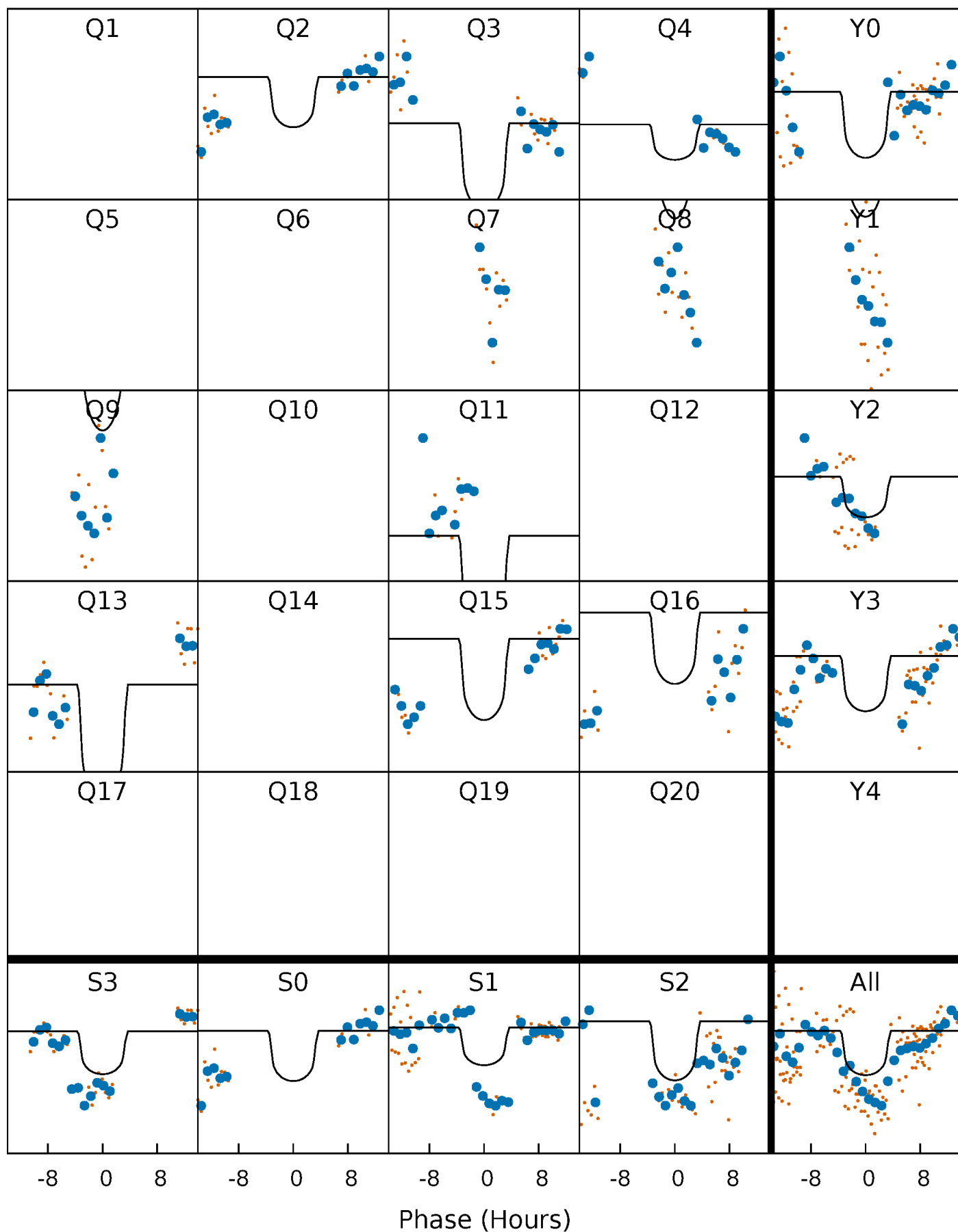
PDC Quarter-Phased Transit Curves

TCE 004481350-10 P= 89.097635 Days $T_0=207.741074$ (BKJD)



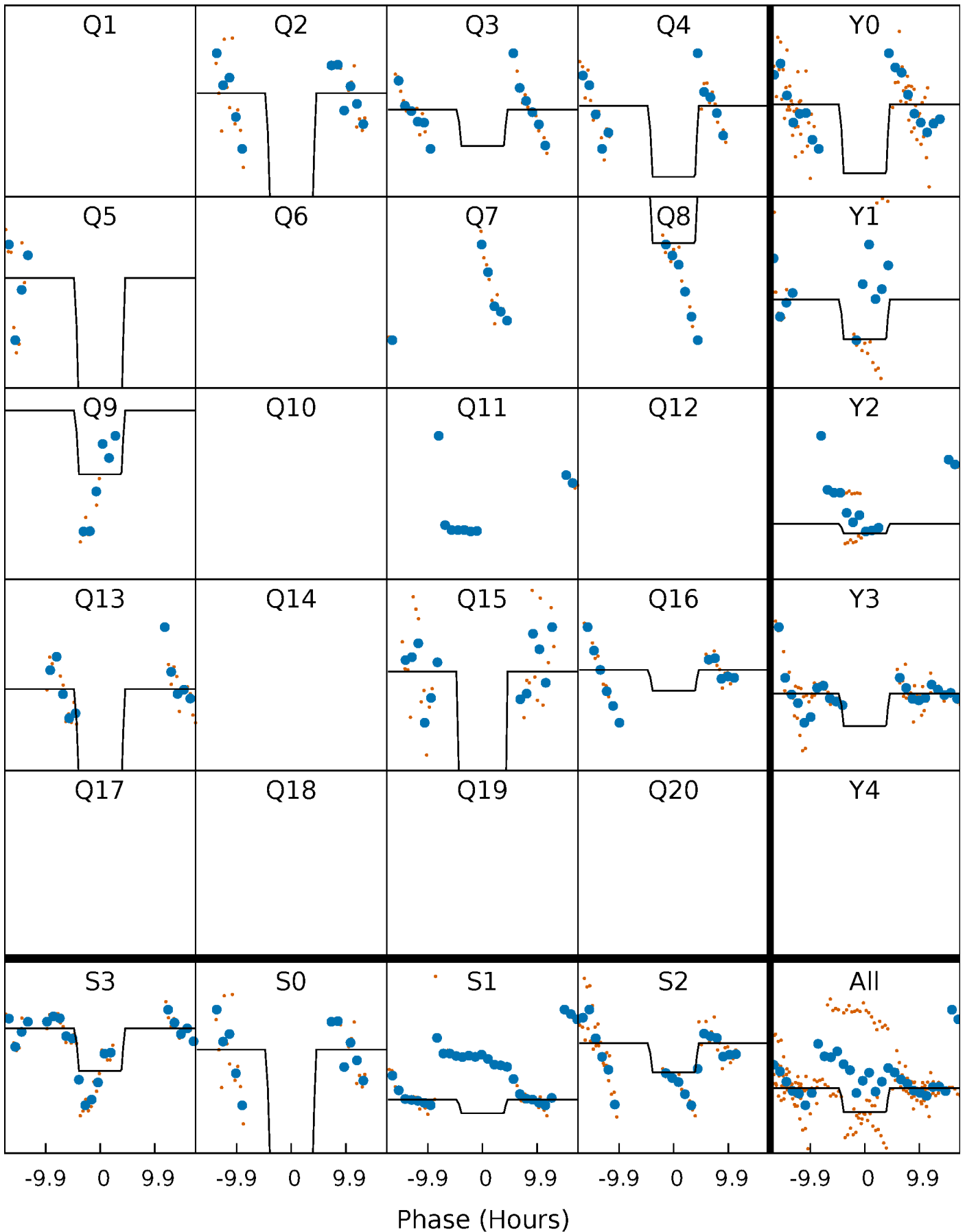
DV Quarter-Phased Transit Curves

TCE 004481350-10 P= 89.097635 Days $T_0=207.741074$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

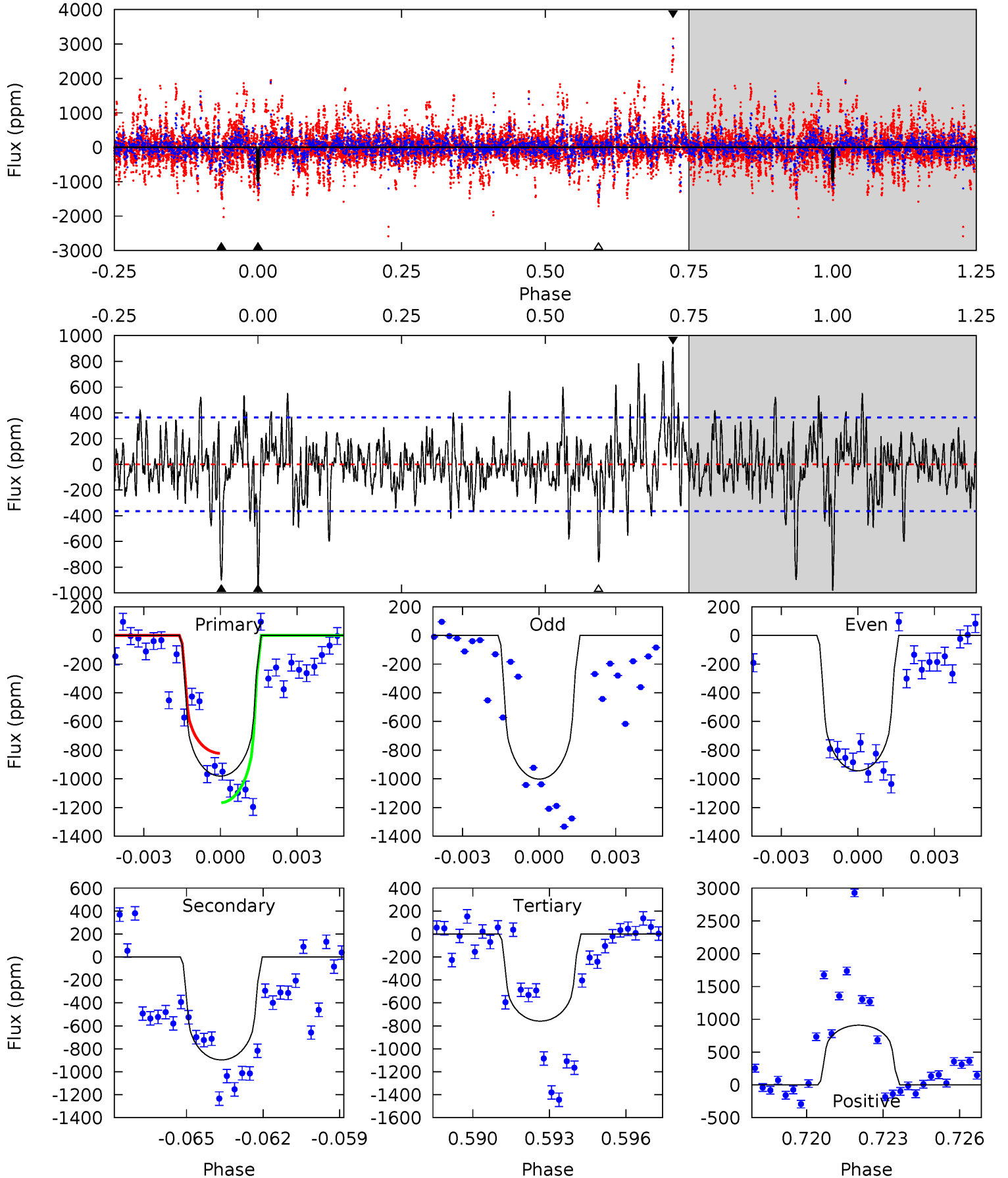
TCE 004481350-10 $P = 89.097271$ Days $T_0 = 207.706428$ (BKJD)



DV Model-Shift Uniqueness Test

004481350-10, P = 89.097635 Days, E = 118.643439 Days

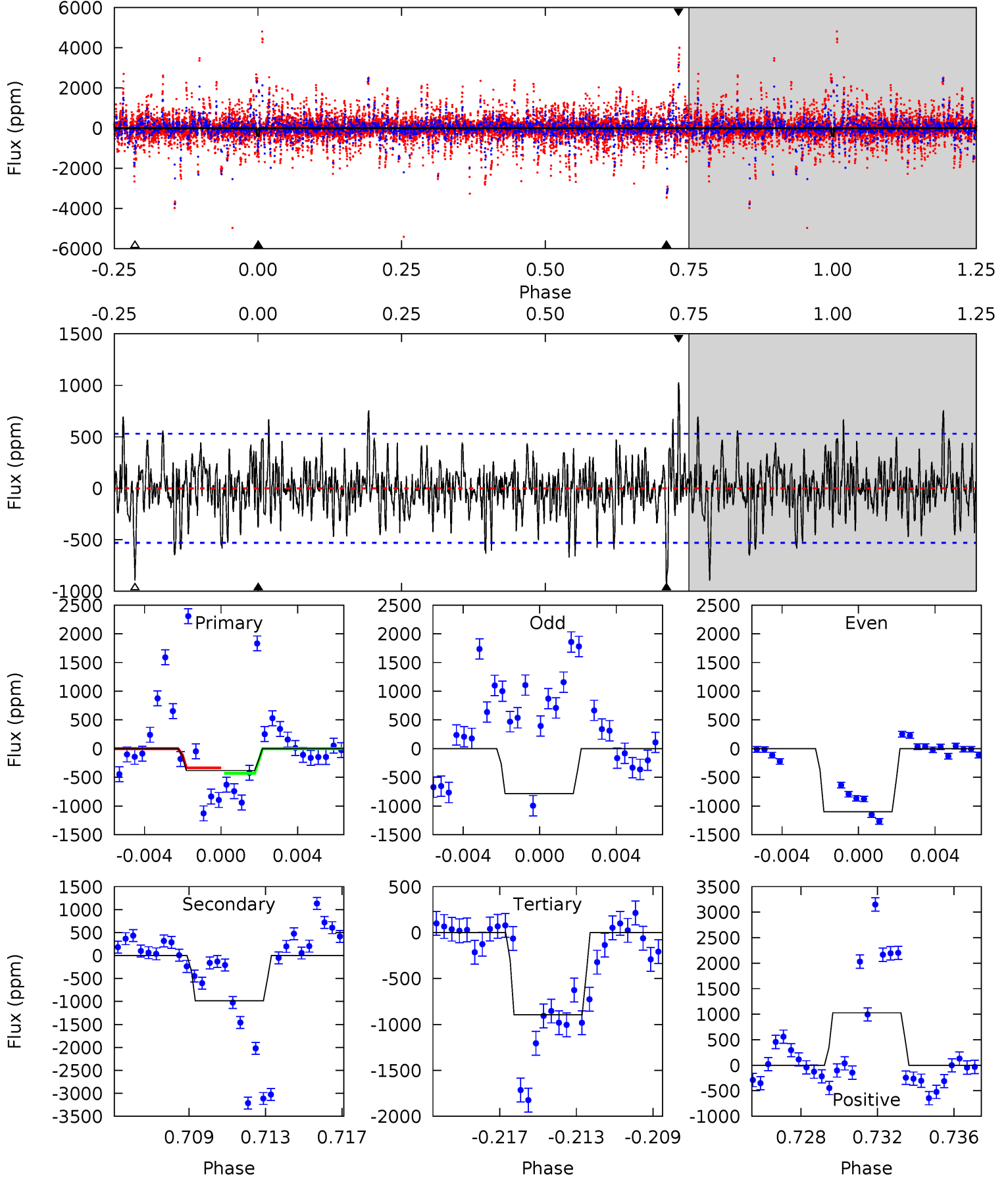
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	12.9	10.9	13.1	5.24	2.94	2.66	3.19	1.02	1.99	-0.18	0.37	0.76	0.48	2.52



Alt Model-Shift Uniqueness Test

004481350-10, $P = 89.097271$ Days, $E = 118.609157$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.75	9.68	8.79	10.1	5.20	2.88	1.83	-5.04	-6.34	0.89	-0.41	1.32	1.01	0.51	0.47



Stellar Parameters For KIC 004481350

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4753^{+139}_{-139}	$4.712^{+0.044}_{-0.028}$	$-1.200^{+0.300}_{-0.300}$	$0.543^{+0.032}_{-0.032}$	$0.554^{+0.036}_{-0.022}$	$4.873^{+0.878}_{-0.569}$
	+3%/-3%	+1%/-1%	+25%/-25%	+6%/-6%	+6%/-4%	+18%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004481350-10 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-897 ± 69	$1.57^{+0.63}_{-0.68}$	380^{+12}_{-12}	5021^{+1446}_{-731}	20996^{+40870}_{-10812}
Alt.	-985 ± 102	$1.60^{+0.68}_{-0.71}$	379^{+13}_{-13}	5071^{+1672}_{-703}	22314^{+49433}_{-11603}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

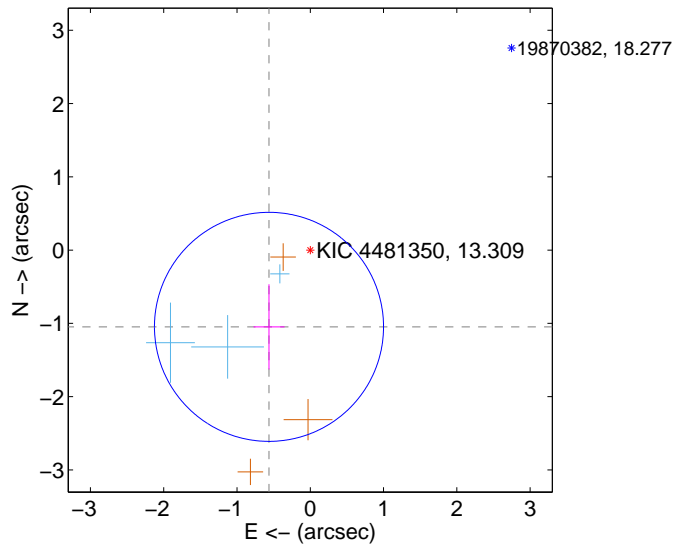
Supplemental centroid analysis for 004481350-10. Kepler magnitude: 13.31. Transit SNR 6.14

There are 3 quarters with good PRF difference image offsets

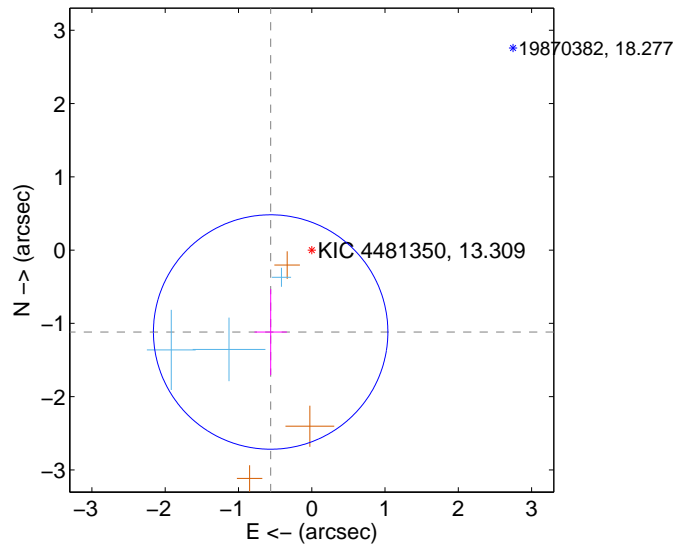
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.189 ± 0.521	2.28	0.563 ± 0.212	-1.047 ± 0.580
PRF-fit source offset from KIC position	1.251 ± 0.533	2.35	0.561 ± 0.221	-1.118 ± 0.586
photometric centroid source offset	0.82 ± 0.40	2.04	-0.05 ± 0.40	-0.82 ± 0.40

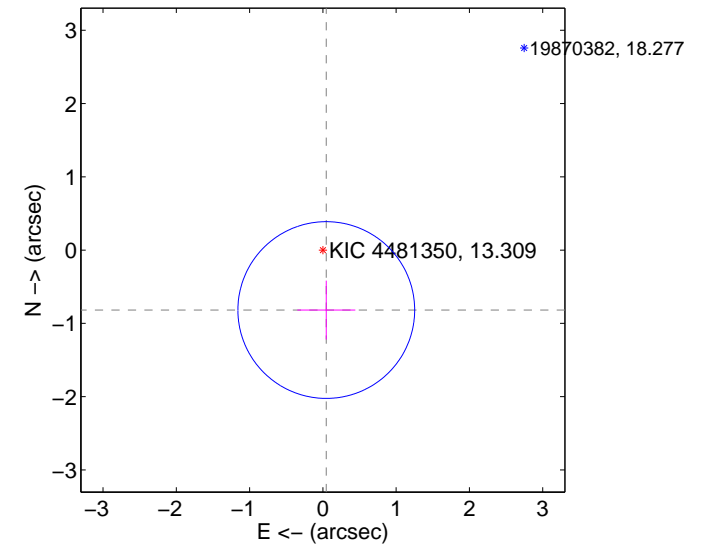
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

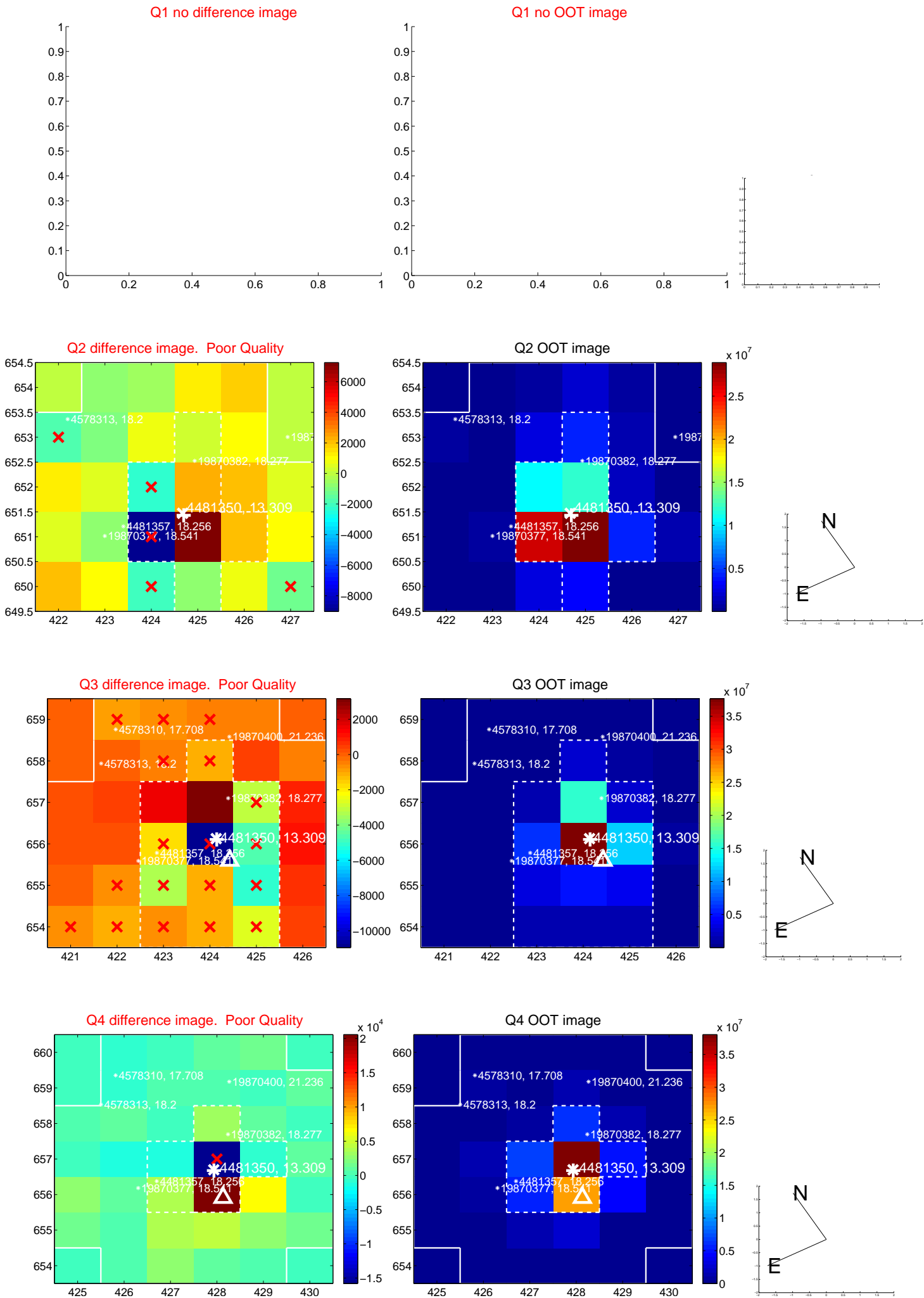


offset from photometric centroids



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q5 no difference image



Q5 no OOT image



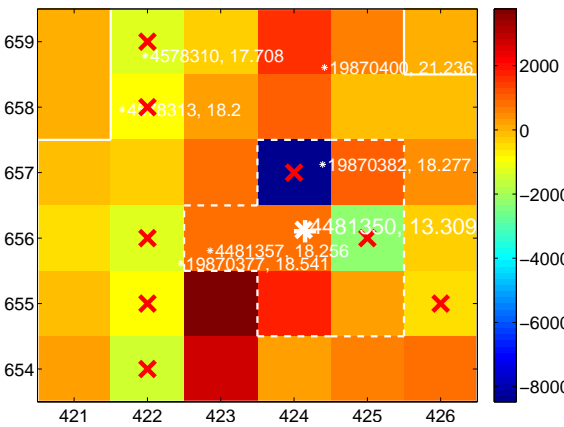
Q6 no difference image



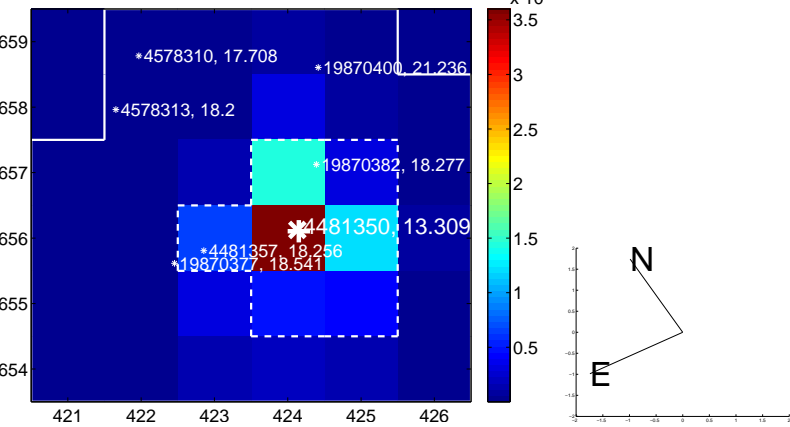
Q6 no OOT image



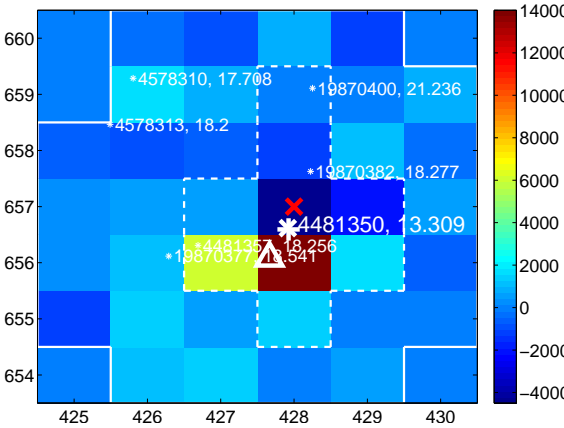
Q7 difference image. Poor Quality



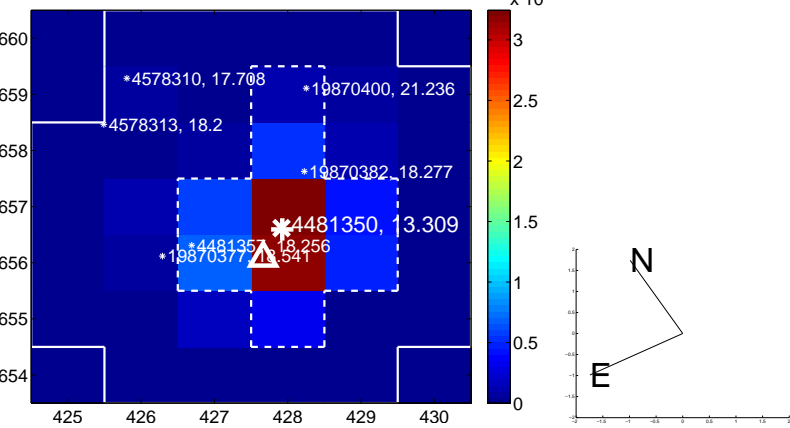
Q7 OOT image



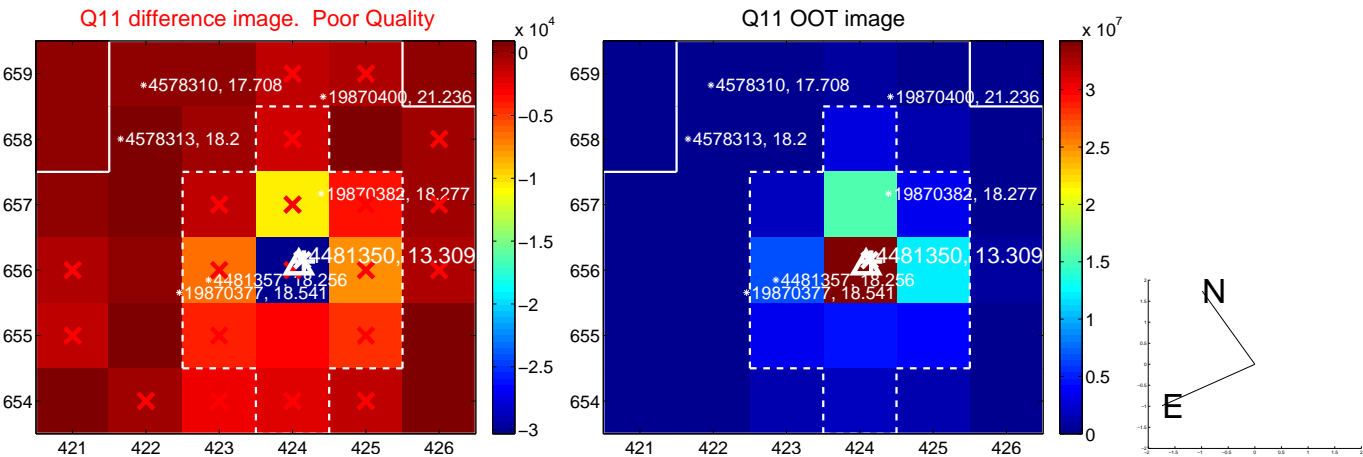
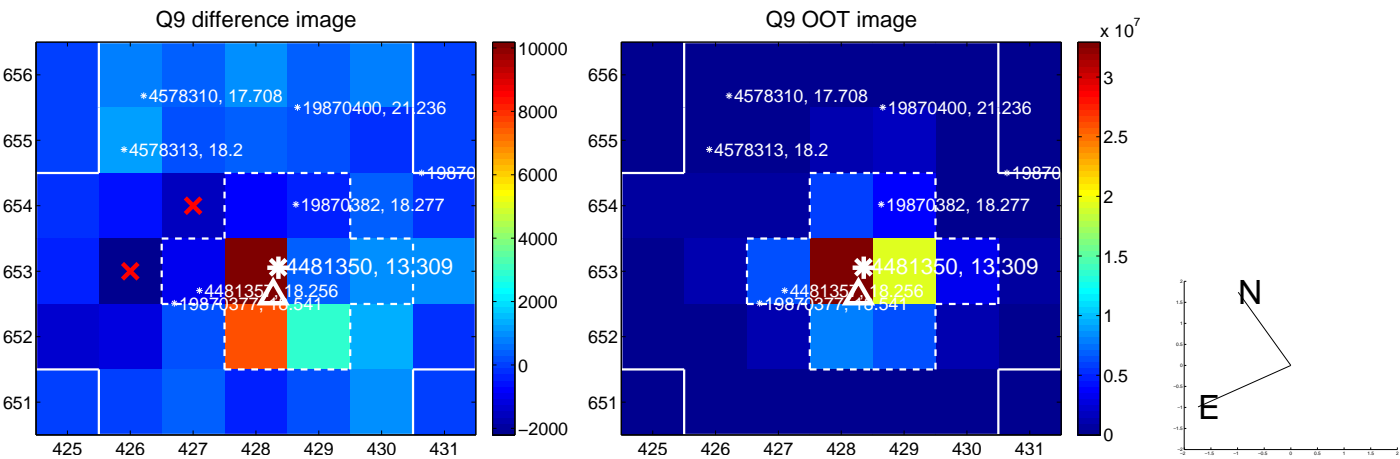
Q8 difference image



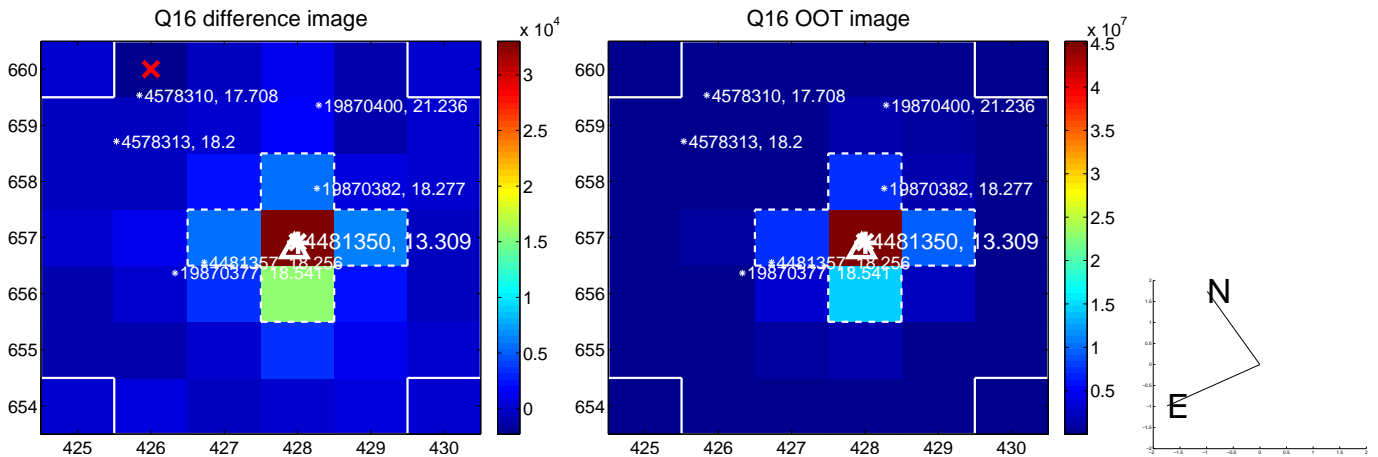
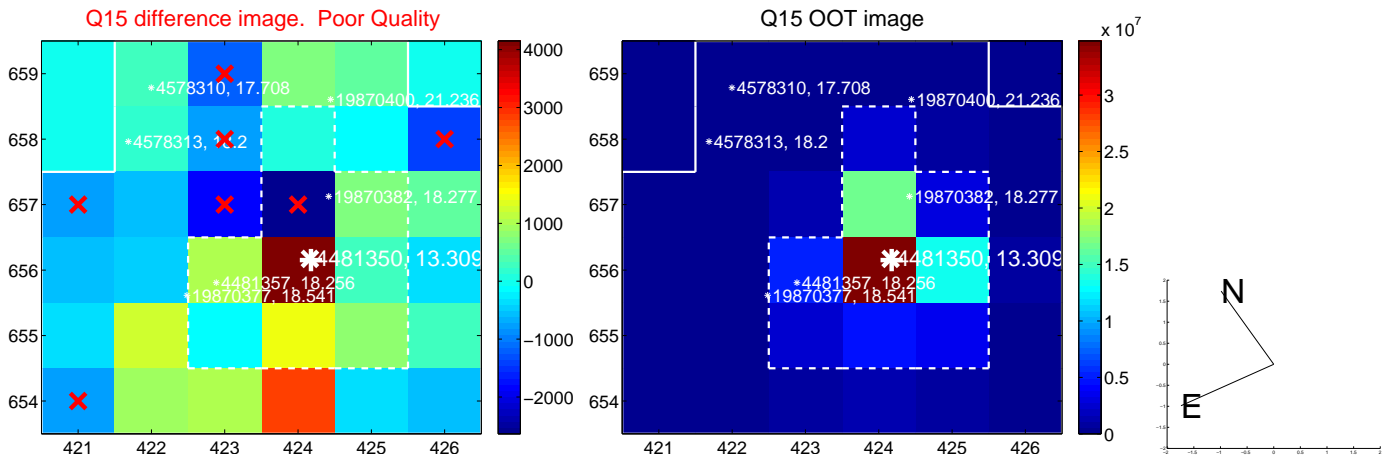
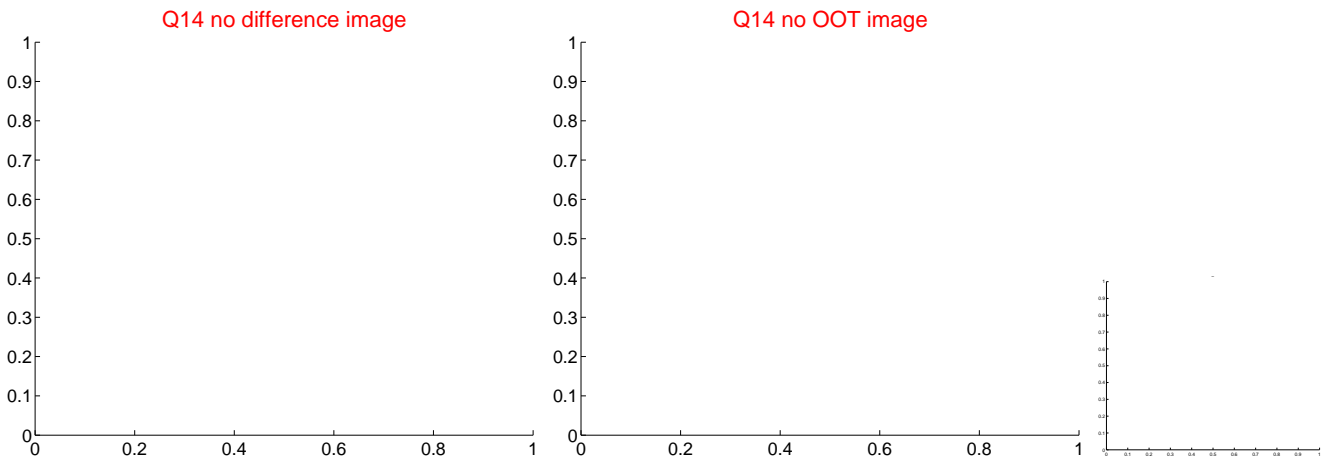
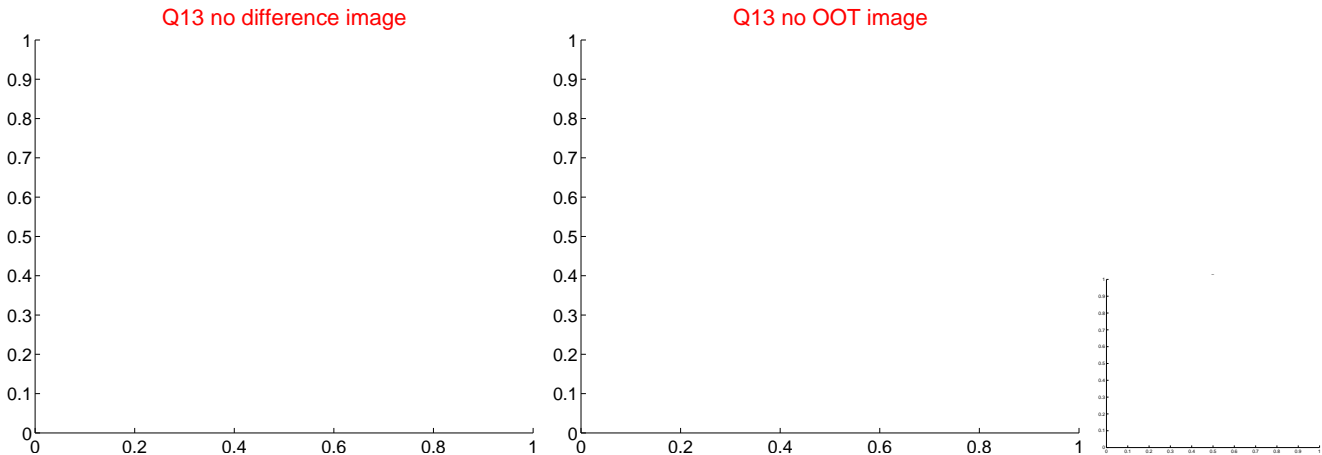
Q8 OOT image



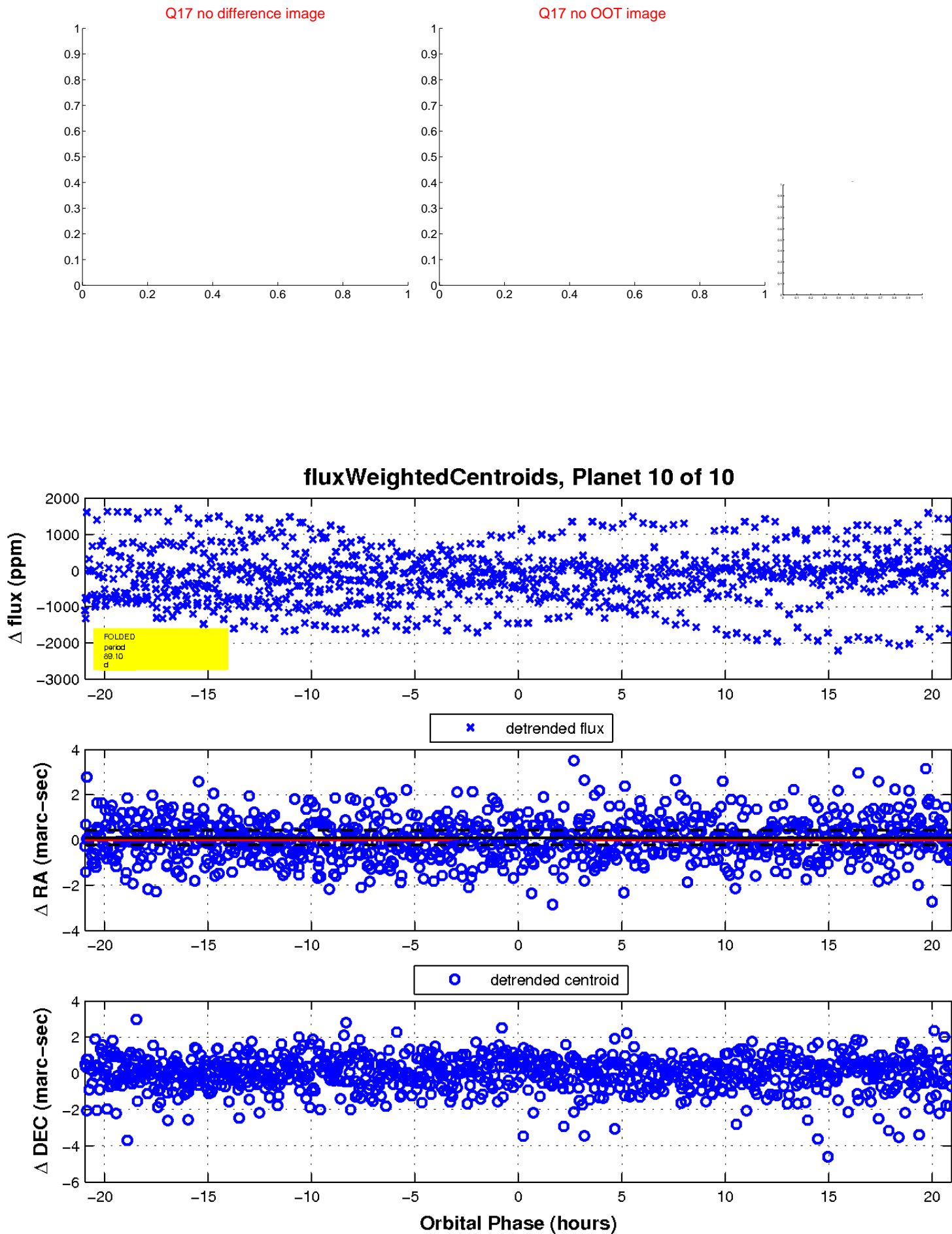
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

