

KIC 012258225

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})
012258225-01	OBS	No	615.694066	299.907904	2401.1	5.157	10.9	6.2	0.55	3849	2.75	0.04
012258225-02	OBS	No	110.576544	167.895072	605.2	1.586	11.4	2.9	0.55	3849	1.43	0.43
012258225-03	OBS	No	525.058780	175.155718	3629.1	9.618	14.1	9.1	0.55	3849	3.22	0.05
012258225-04	OBS	No	1.014317	131.850416	175.3	2.009	10.6	9.8	0.55	3849	0.88	223.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258225-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012258225-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
012258225-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
012258225-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_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.

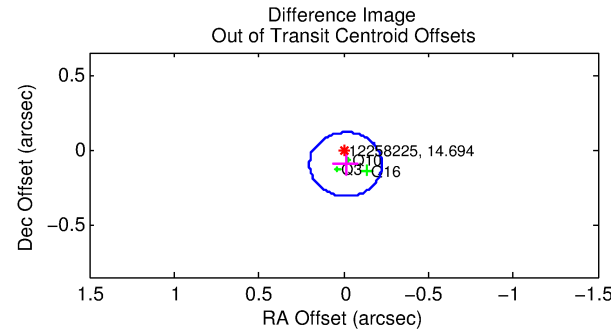
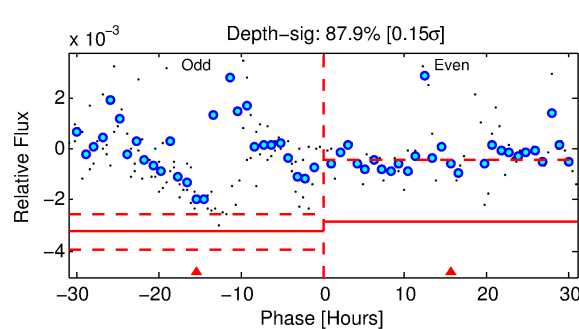
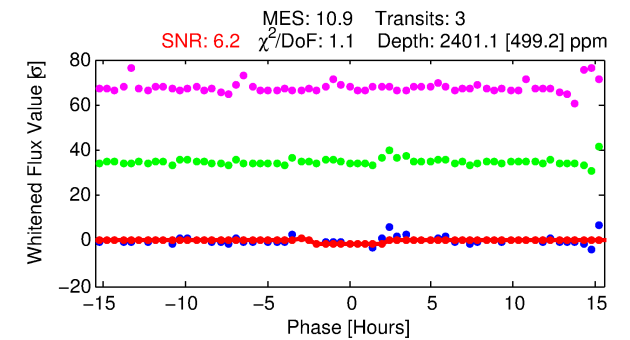
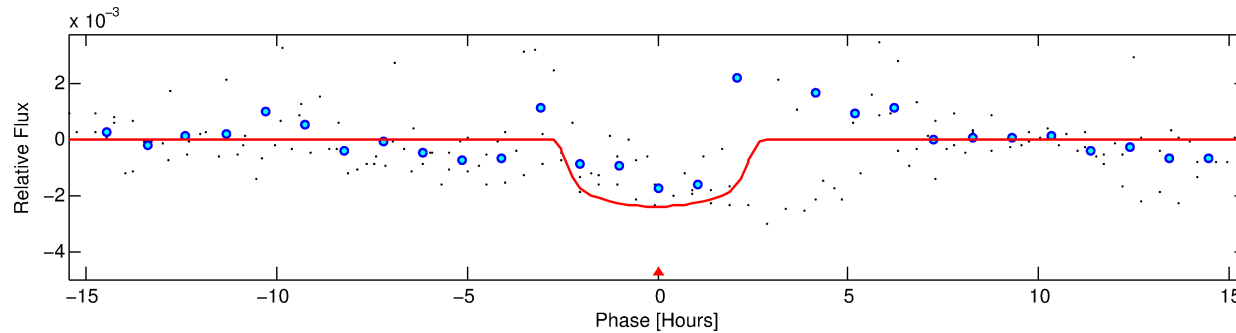
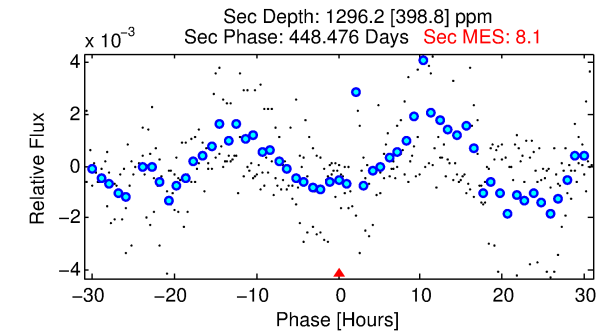
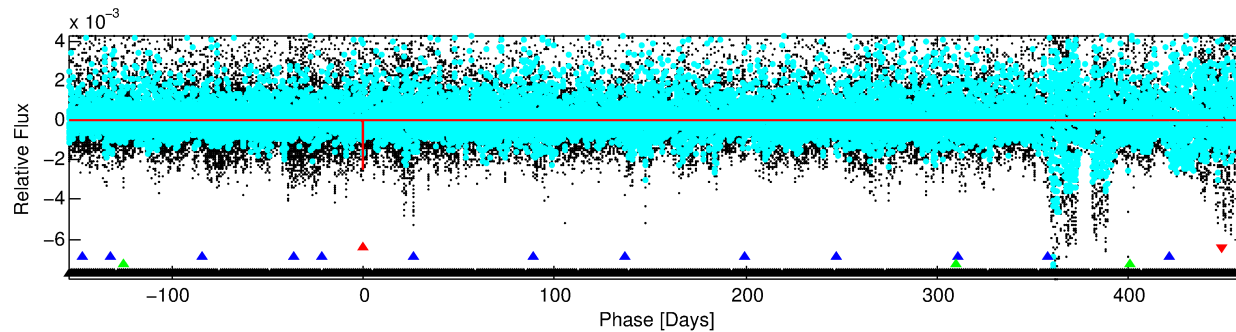
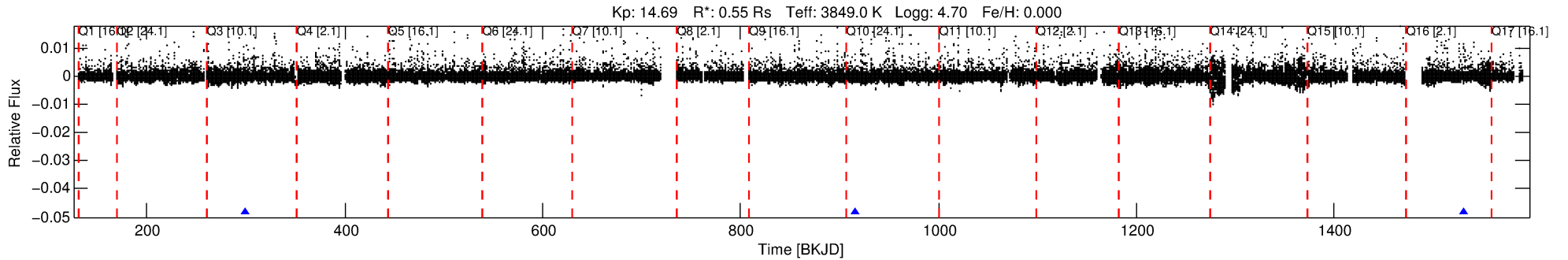
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012258225-01

No Significant Match Found

DV One-Page Summary

KIC: 12258225 Candidate: 1 of 4 Period: 615.694 d



DV Fit Results:

Period = 615.69407 [0.00750] d
Epoch = 299.9079 [0.0105] BKJD
Rp/R* = 0.0461 [0.0304]
a/R* = 810.04 [2035.19]
b = 0.55 [3.17]
Seff = 0.04 [0.00]
Teq = 117 [2] K
Rp = 2.75 [1.82] Re
a = 1.1599 [0.0466] AU
Ag = 127254.19 [172508.76] [0.74σ]
Teffp = 3402 [1153] K [2.85σ]

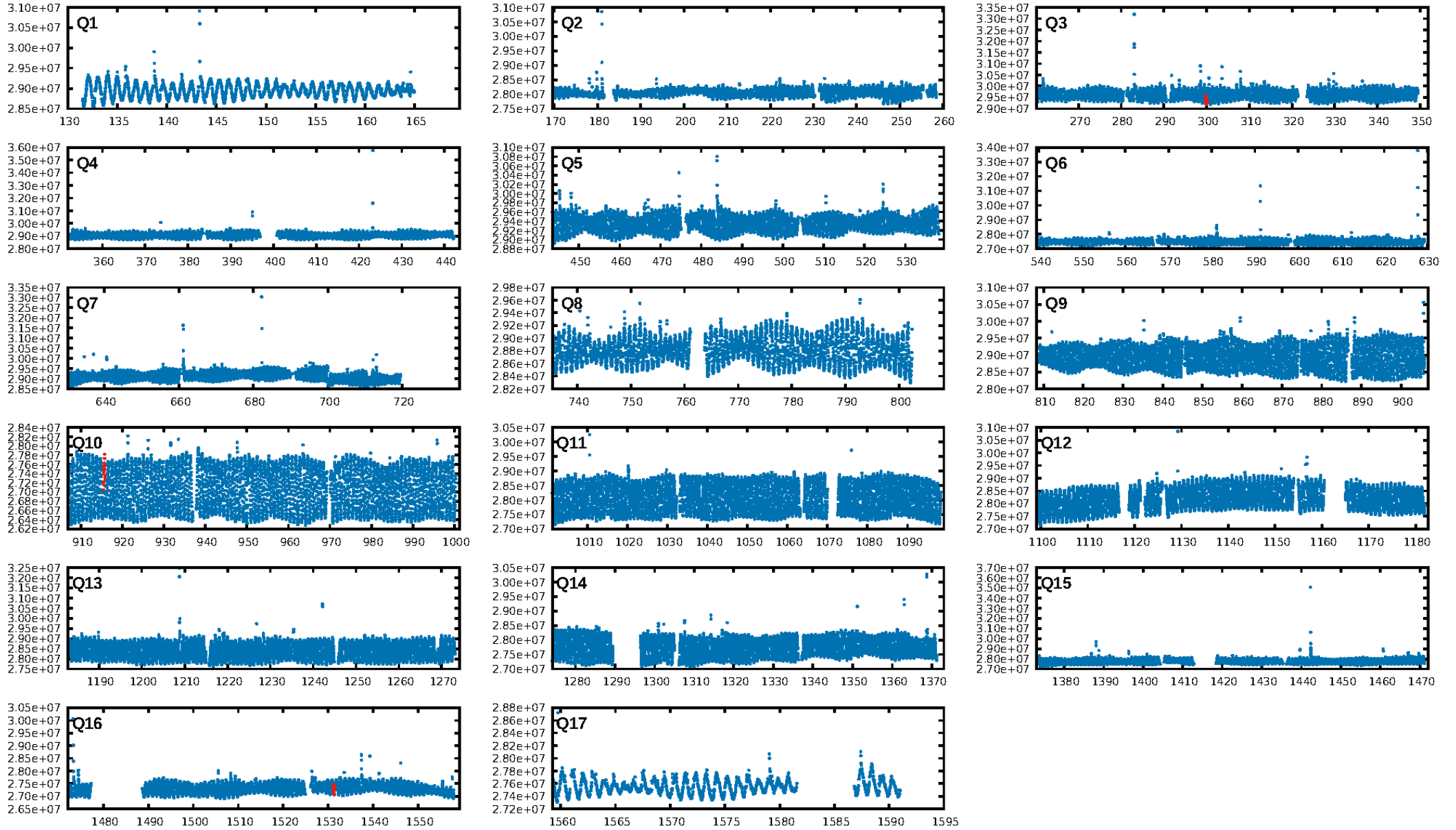
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [199.32σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 40.3%
ModelChiSquareGof-sig: 98.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.854
Centroid-sig: 79.9%
Centroid-so: 0.548 arcsec [1.21σ]
OotOffset-rm: 0.099 arcsec [1.39σ]
KicOffset-rm: 0.072 arcsec [0.83σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

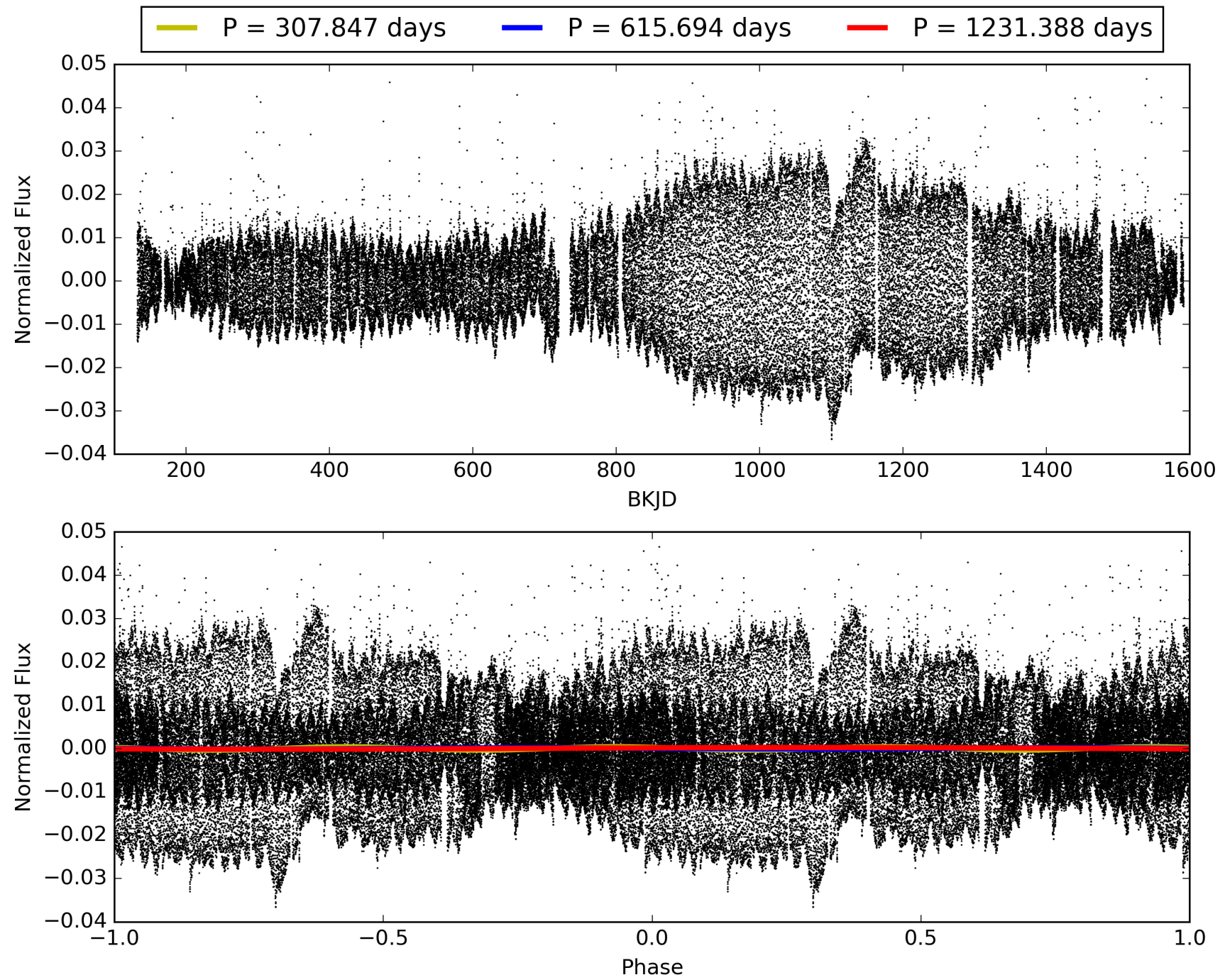
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:03:36 Z

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

TCE 012258225-01, PDC Light Curves

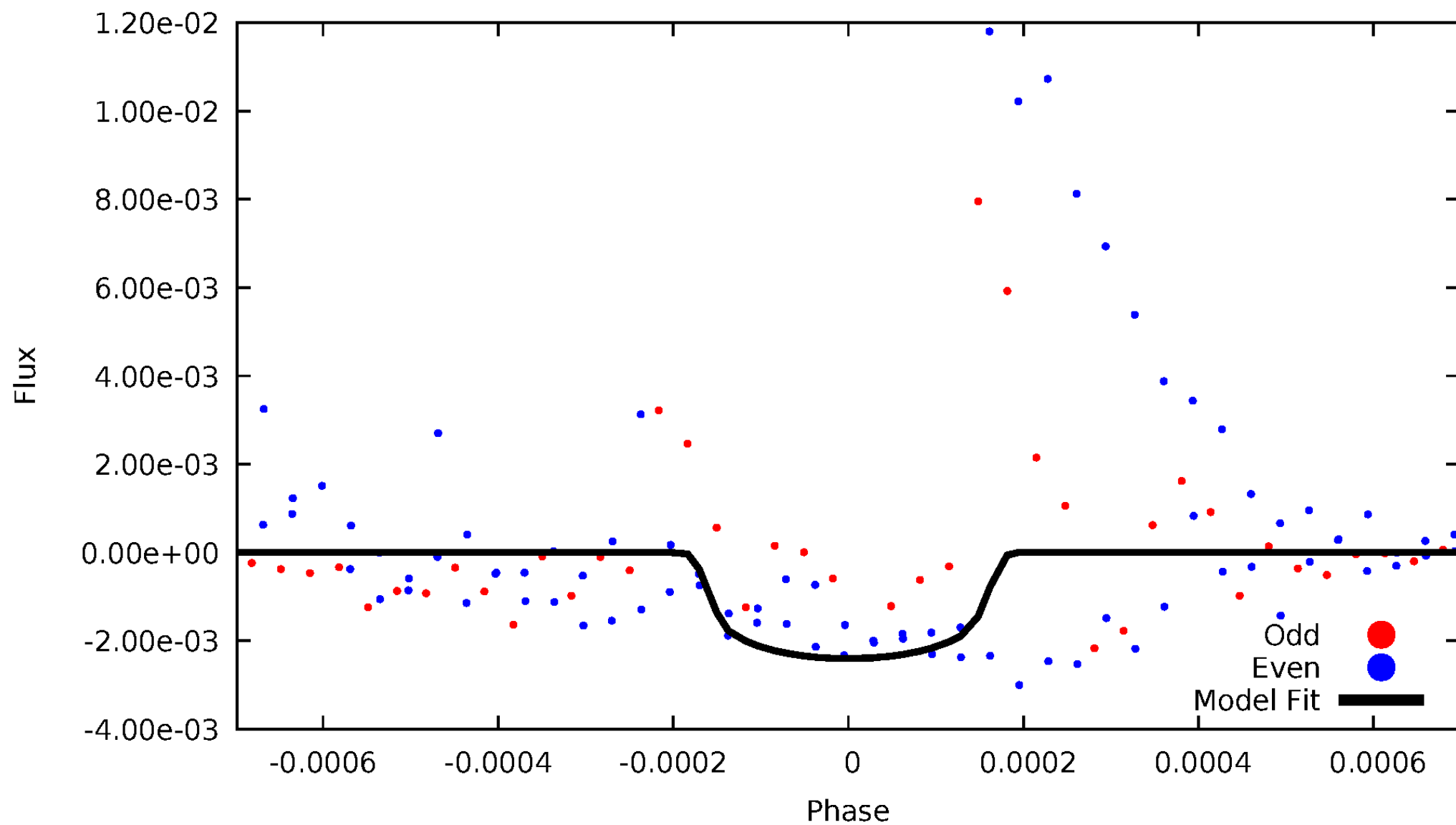


TCE 012258225-01



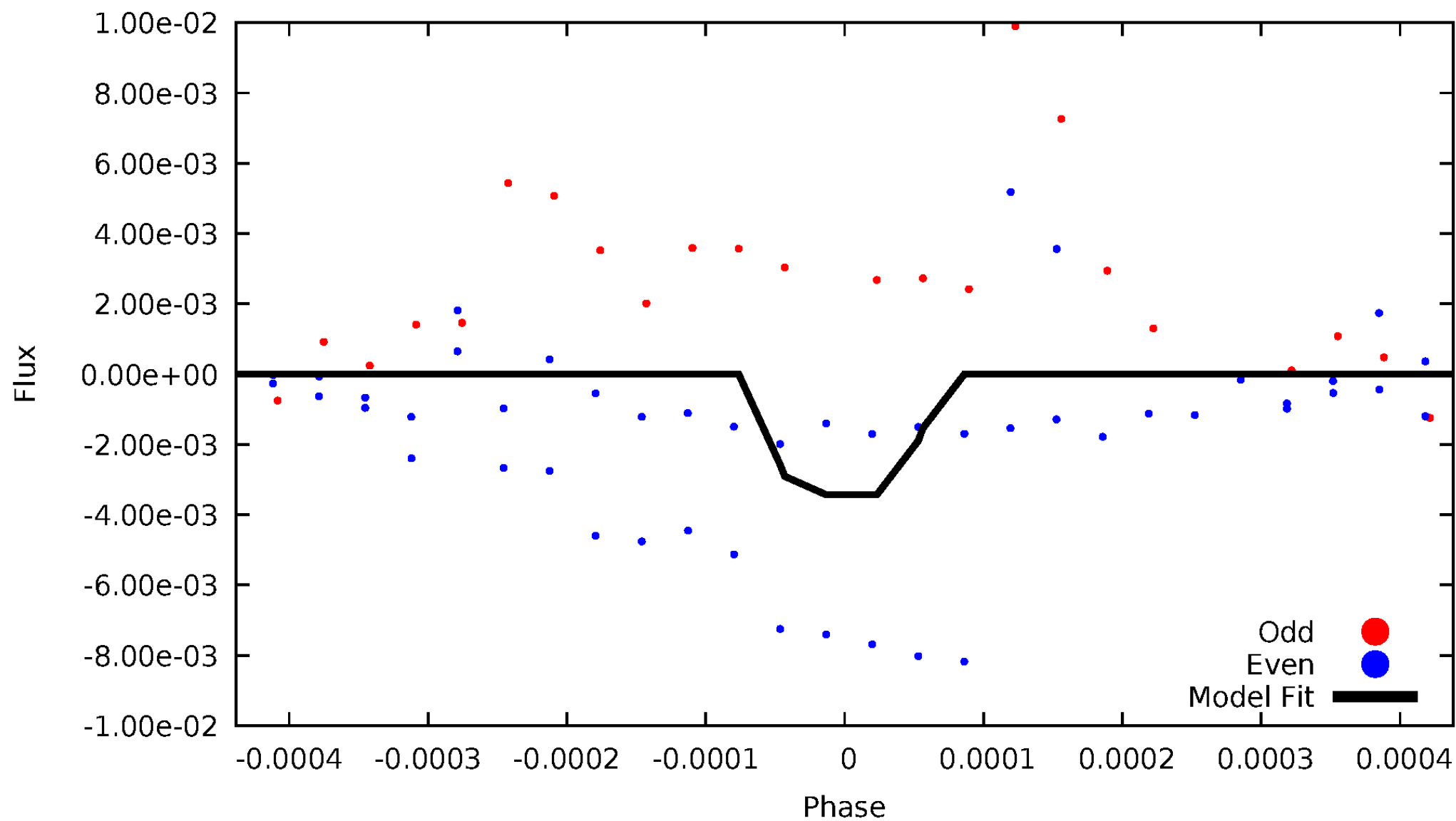
DV Odd/Even

TCE 012258225-01



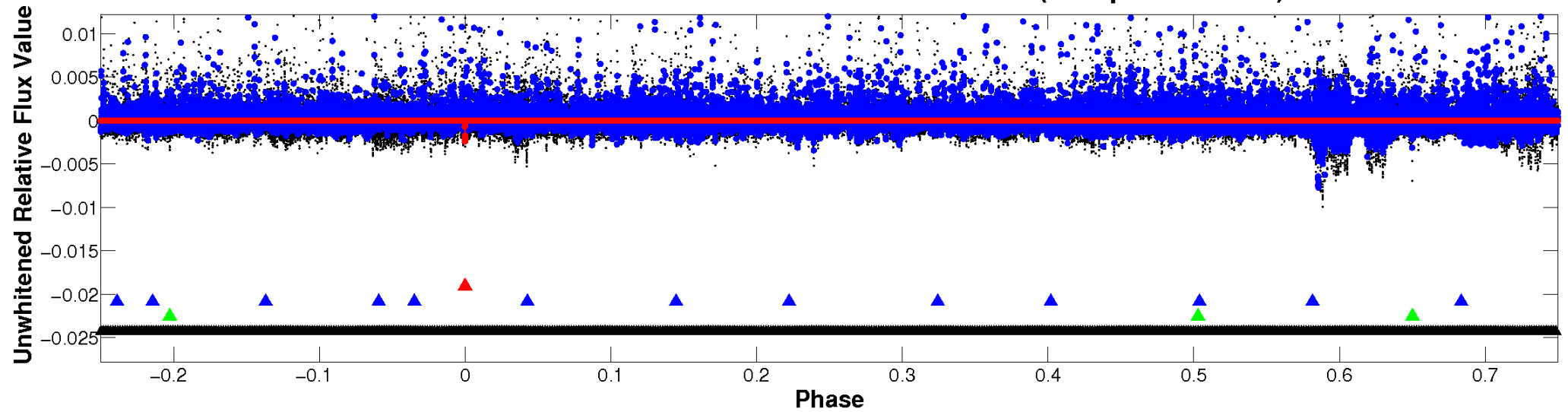
ALT Odd/Even

TCE 012258225-01

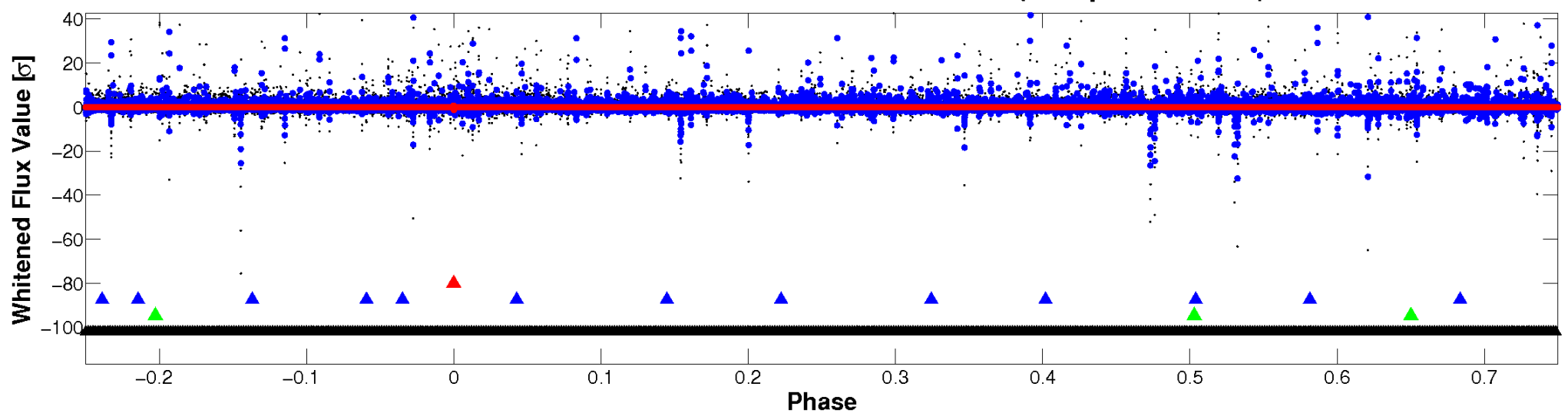


Non-Whitened Vs. Whitened Light Curve

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

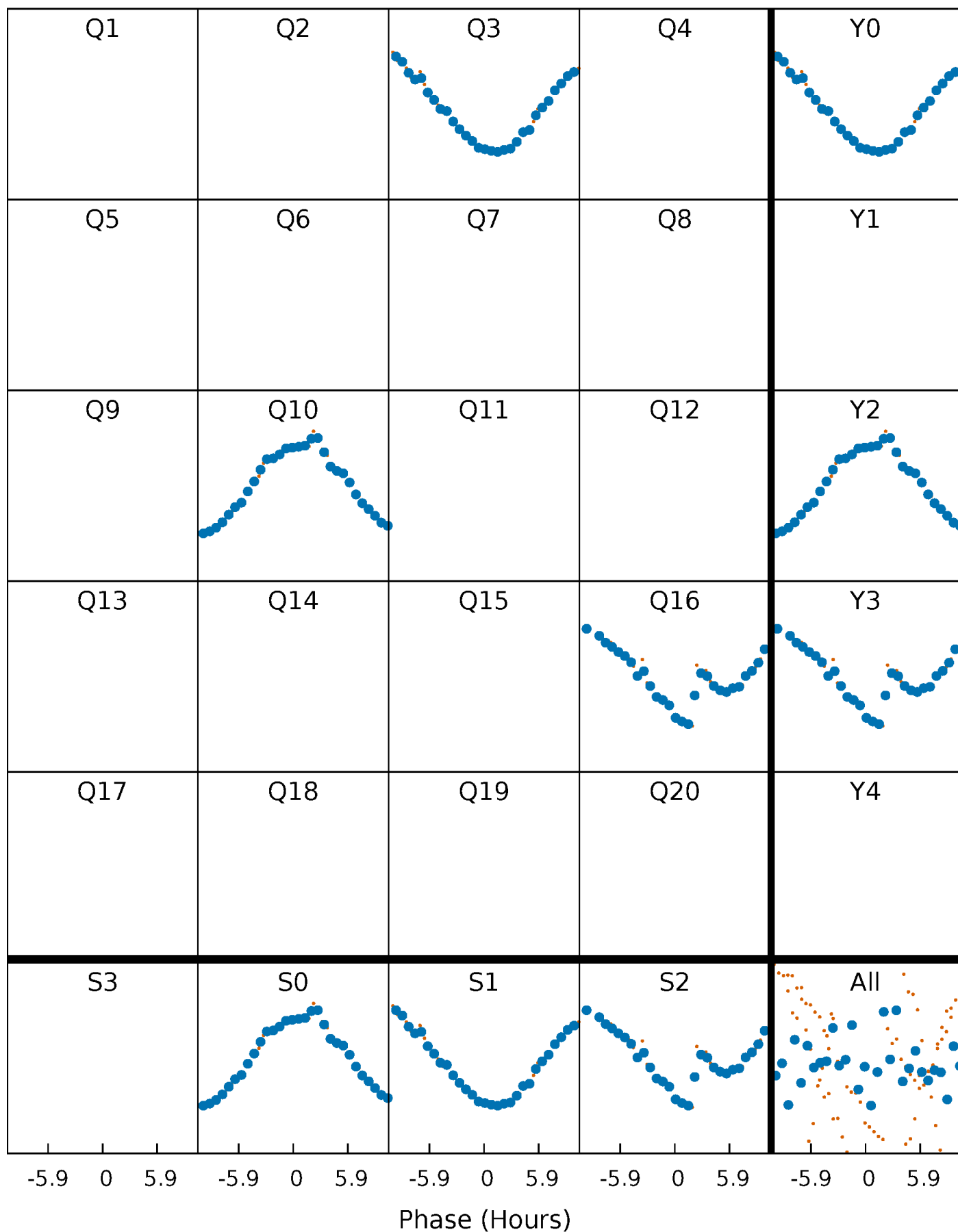


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



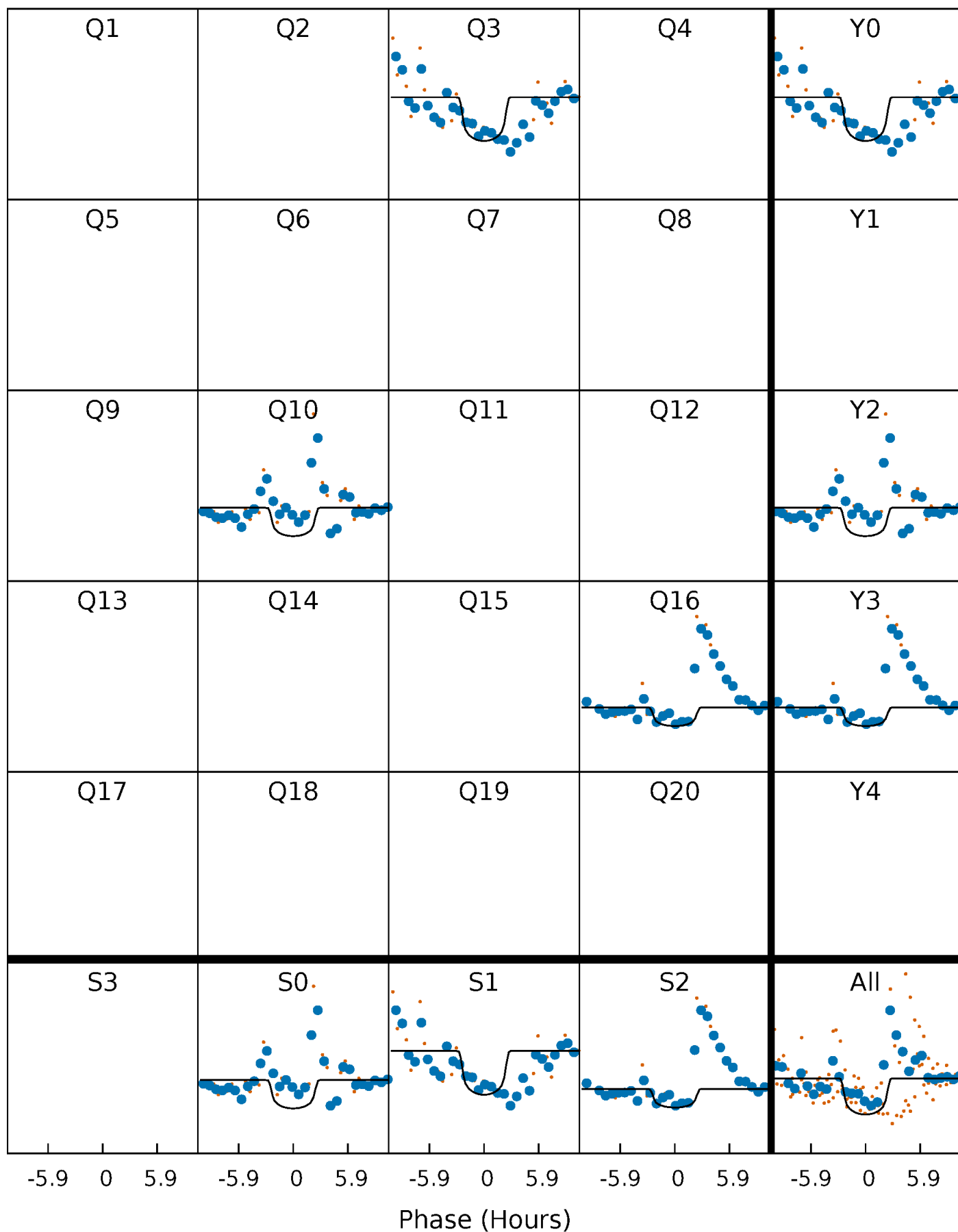
PDC Quarter-Phased Transit Curves

TCE 012258225-01 P=615.694066 Days $T_0=299.907904$ (BKJD)



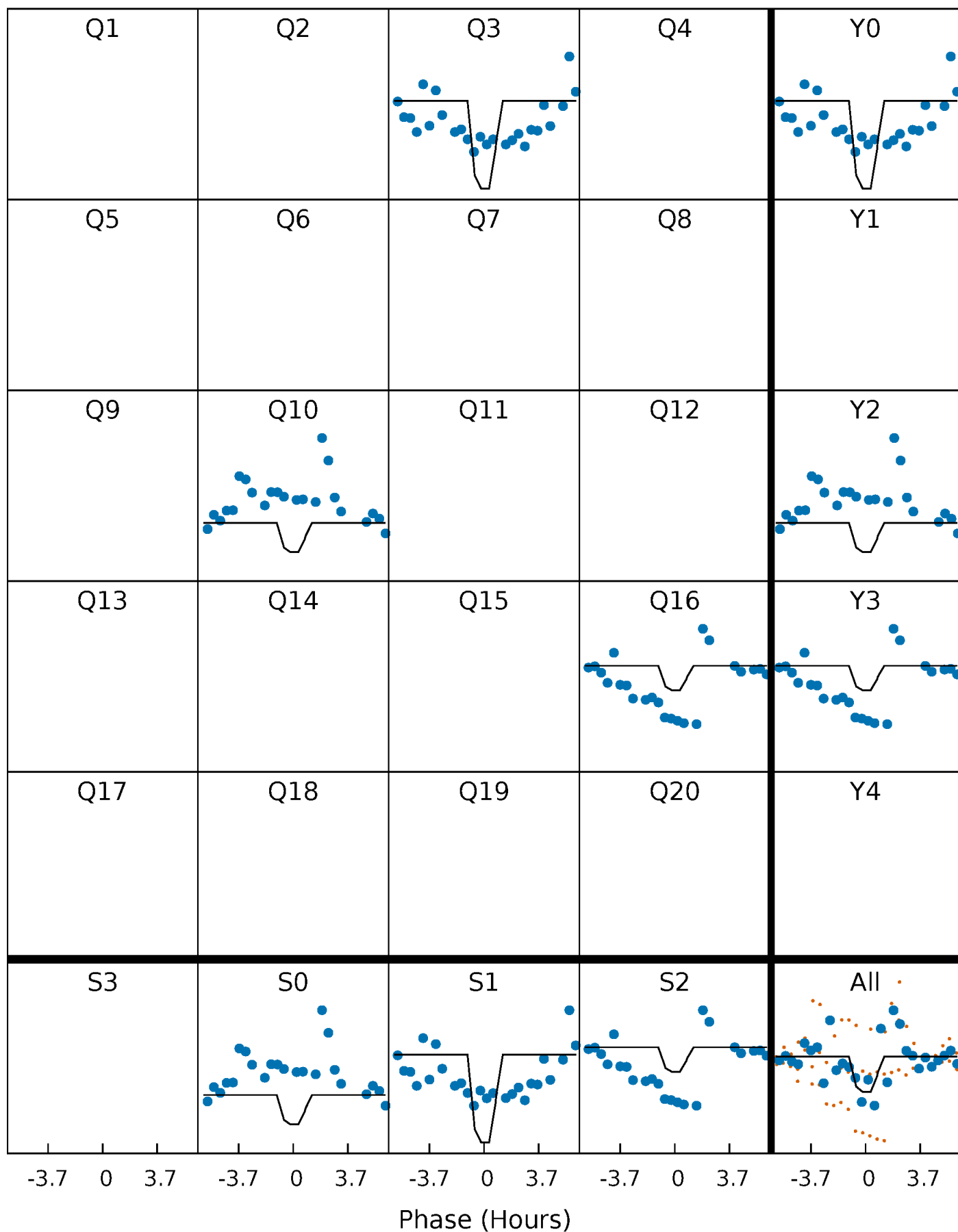
DV Quarter-Phased Transit Curves

TCE 012258225-01 P=615.694066 Days $T_0=299.907904$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

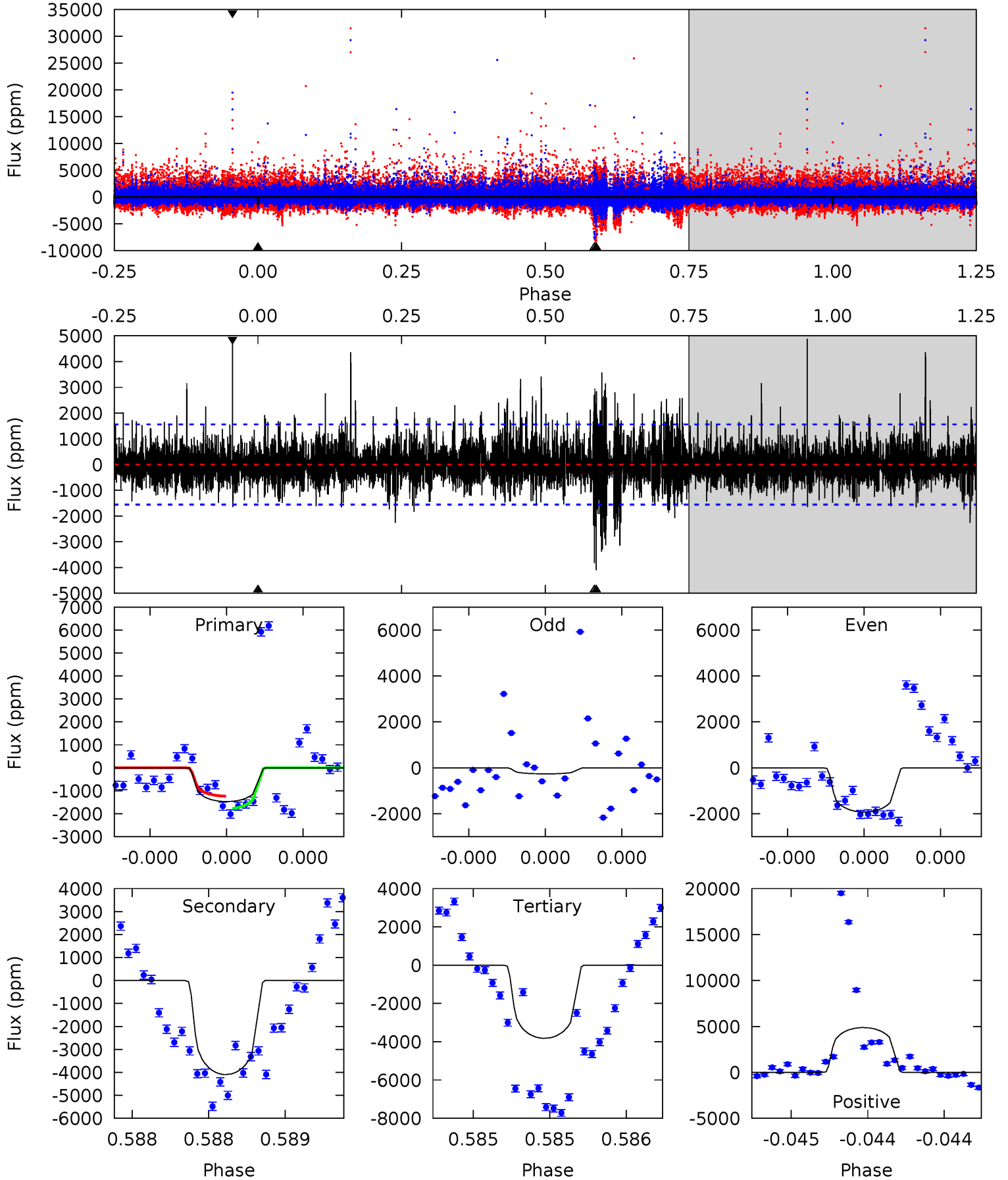
TCE 012258225-01 P=615.704030 Days $T_0=299.913680$ (BKJD)



DV Model-Shift Uniqueness Test

012258225-01, P = 615.694066 Days, E = 299.907904 Days

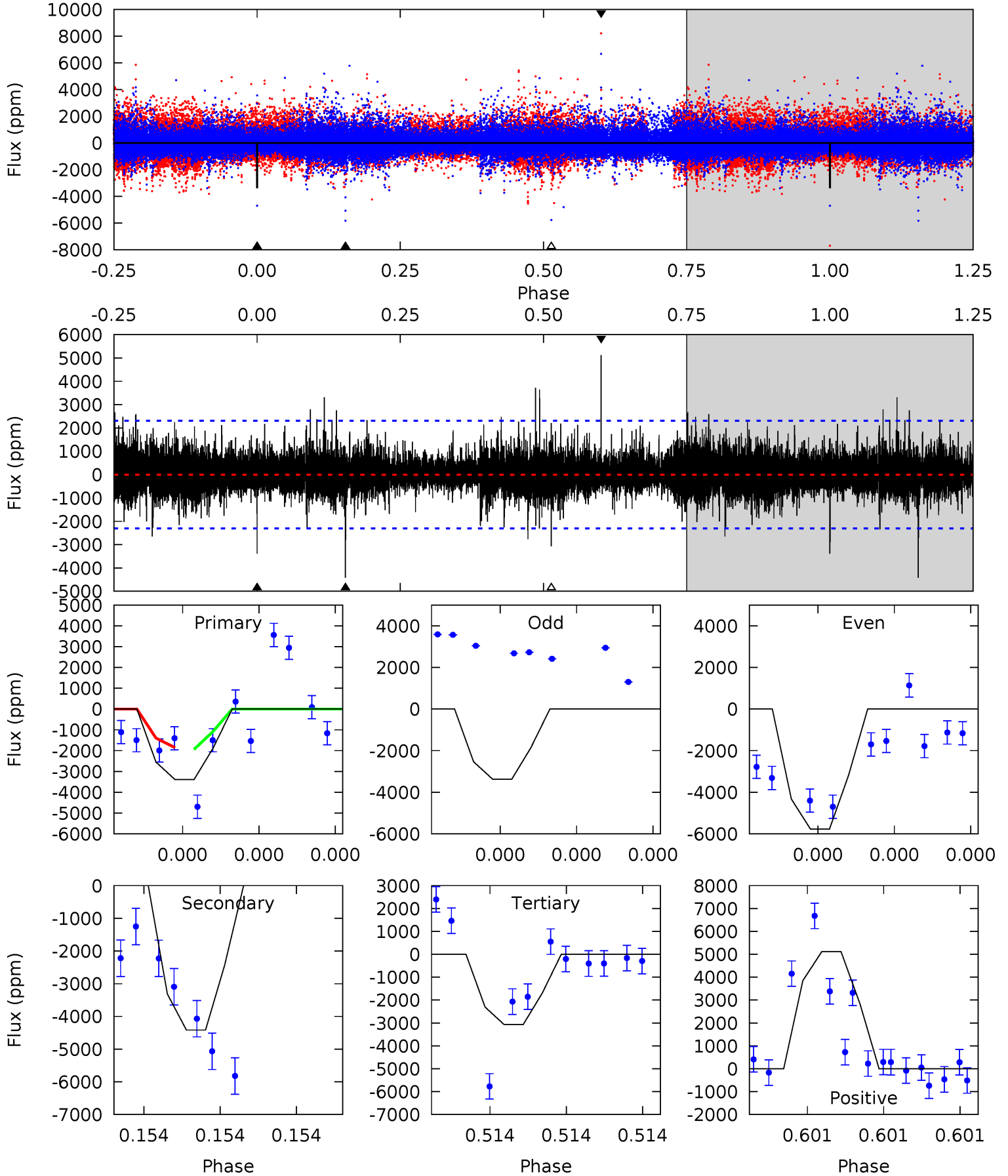
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.31	14.8	13.8	17.6	5.62	3.56	2.43	-8.48	-12.3	1.00	-2.81	2.00	0.84	0.54	0.97



Alt Model-Shift Uniqueness Test

012258225-01, P = 615.704030 Days, E = 299.913680 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.52	11.1	7.71	12.9	5.80	3.82	1.20	0.81	-4.35	3.39	-1.76	4.23	1.27	0.54	0



Stellar Parameters For KIC 012258225

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3849^{+50}_{-50}	$4.703^{+0.032}_{-0.012}$	$0.000^{+0.100}_{-0.100}$	$0.546^{+0.017}_{-0.026}$	$0.549^{+0.025}_{-0.020}$	$4.743^{+0.555}_{-0.297}$
	+1%/-1%	+1%/-0%	+inf%/-inf%	+3%/-5%	+5%/-4%	+12%/-6%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 012258225-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-4099 ± 277	$2.80^{+1.80}_{-1.32}$	162^{+2}_{-3}	4285^{+1360}_{-680}	$390101^{+1022754}_{-247301}$
Alt.	-4418 ± 398	$3.45^{+1.90}_{-1.46}$	162^{+2}_{-3}	4032^{+982}_{-552}	$282493^{+553947}_{-167142}$

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

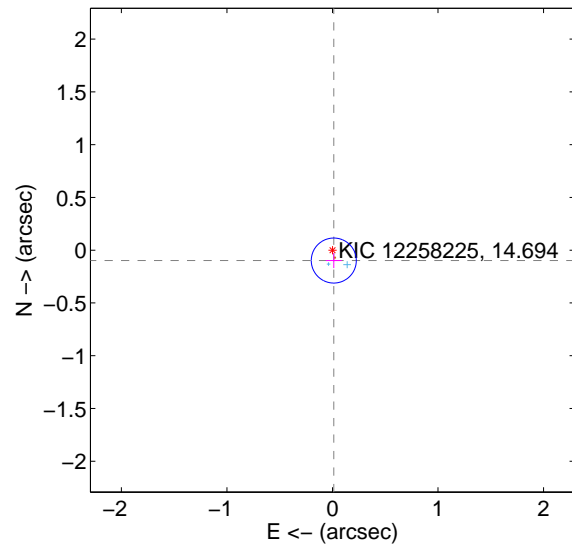
Supplemental centroid analysis for 012258225-01. Kepler magnitude: 14.69. Transit SNR 6.16

There are 2 quarters with good PRF difference image offsets

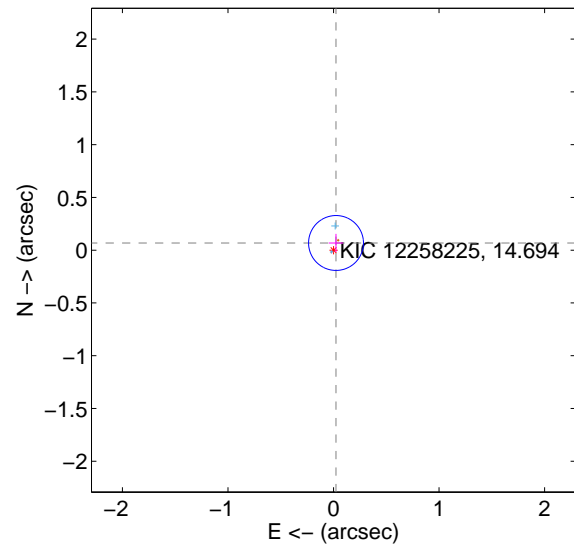
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.099 ± 0.071	1.39	-0.012 ± 0.074	-0.098 ± 0.071
PRF-fit source offset from KIC position	0.072 ± 0.087	0.83	-0.024 ± 0.068	0.068 ± 0.086
photometric centroid source offset	0.55 ± 0.45	1.21	0.09 ± 0.50	0.54 ± 0.45

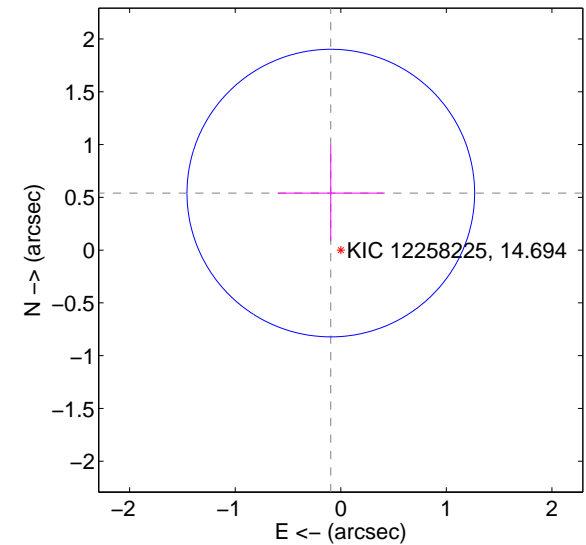
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

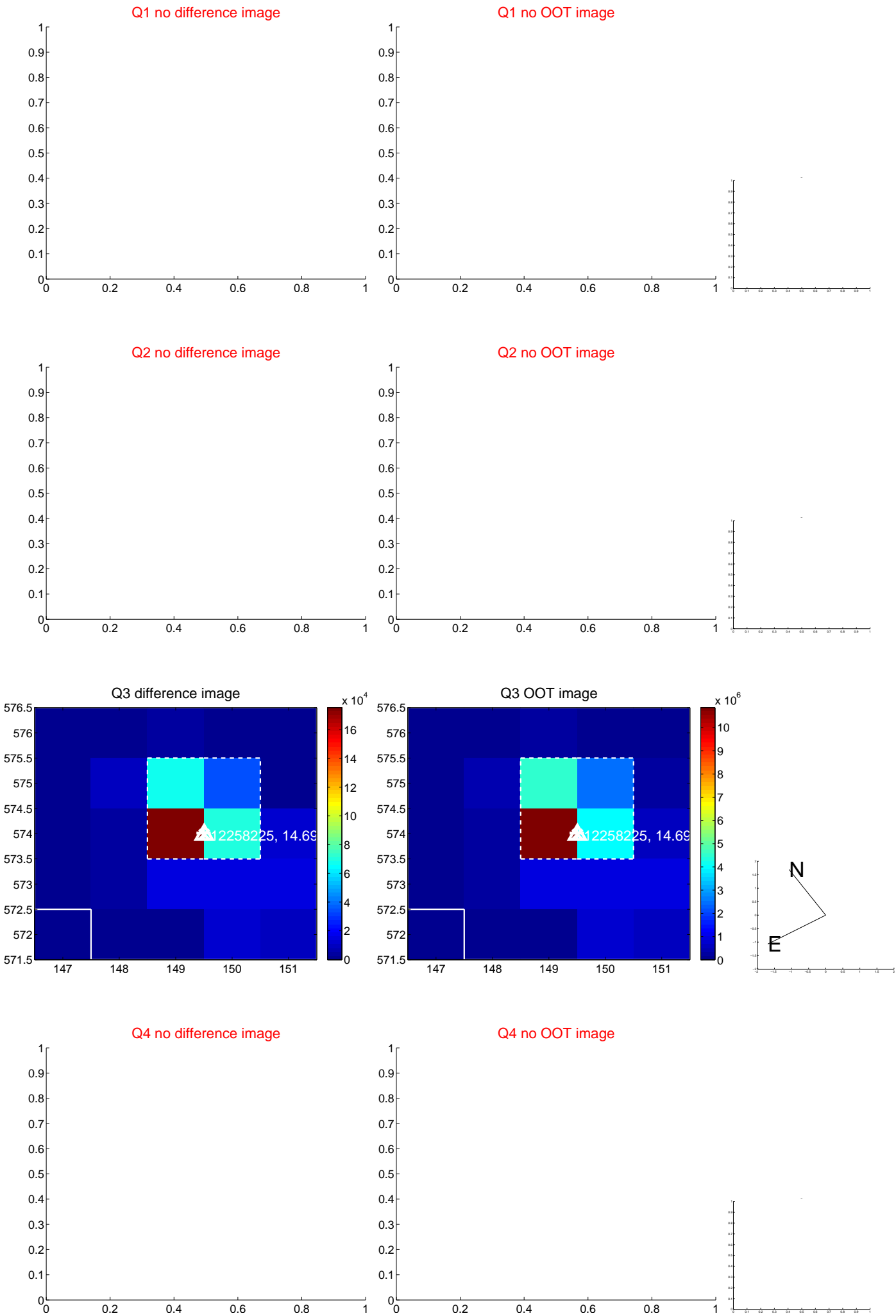


offset from photometric centroids



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.

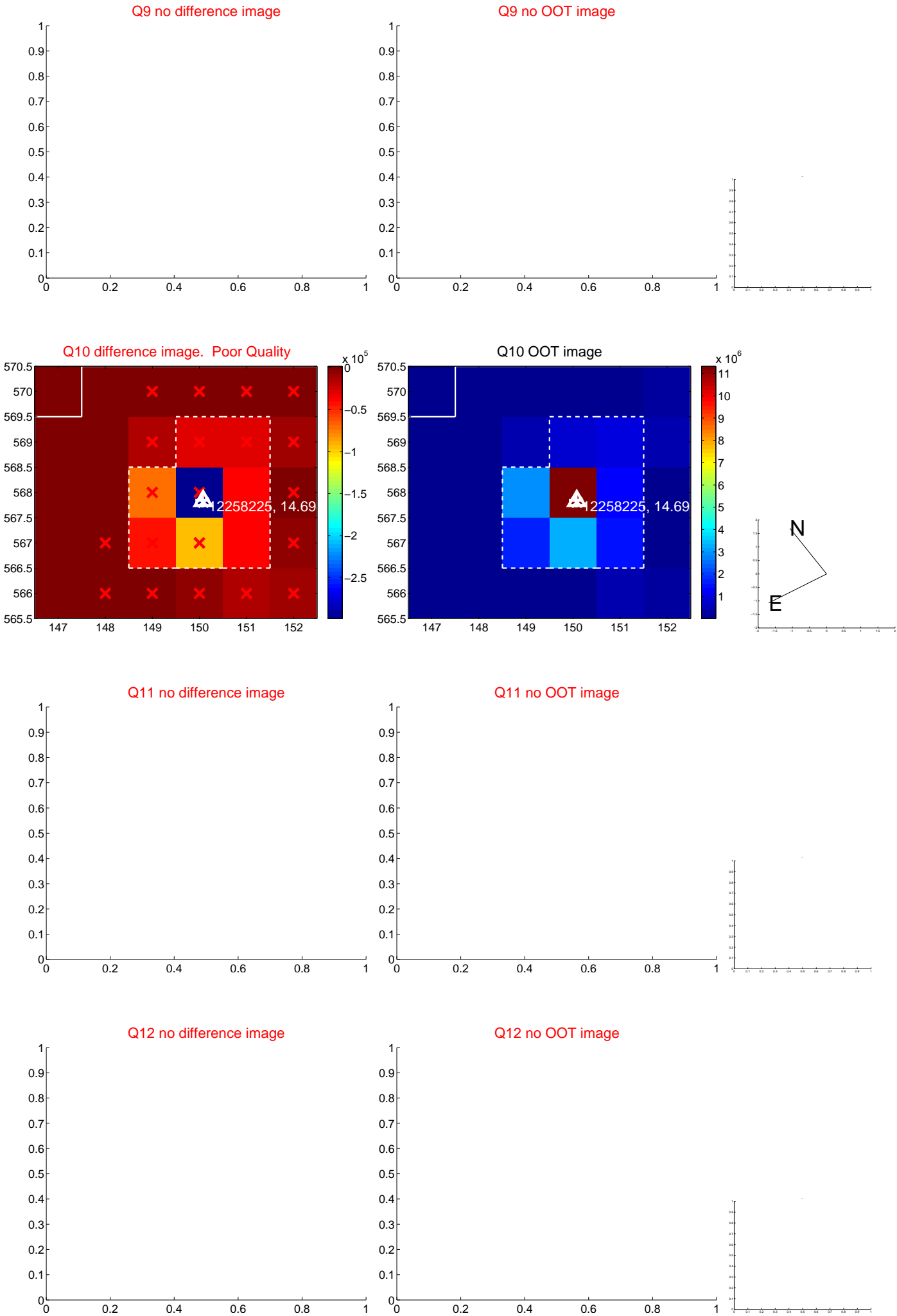
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



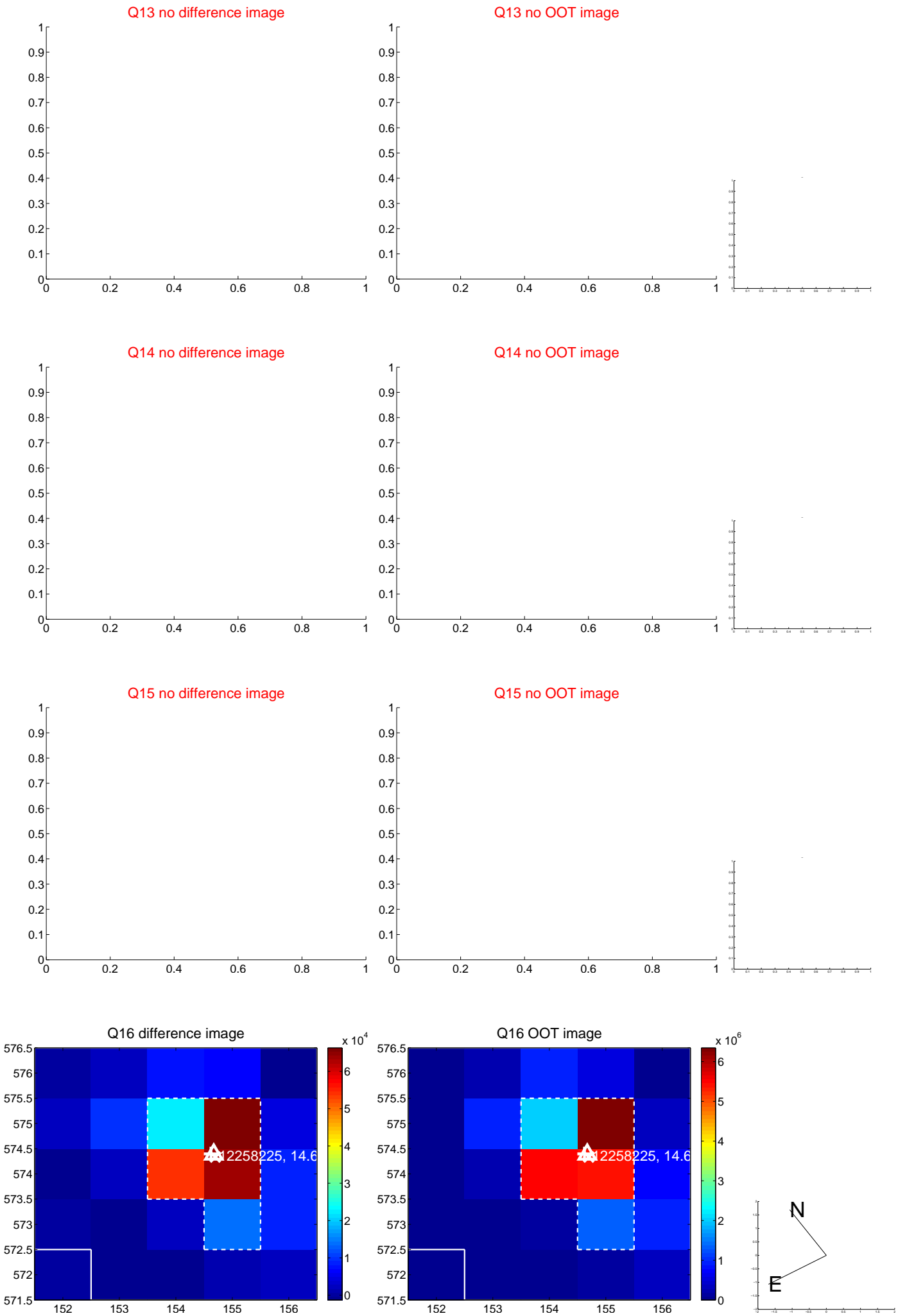
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



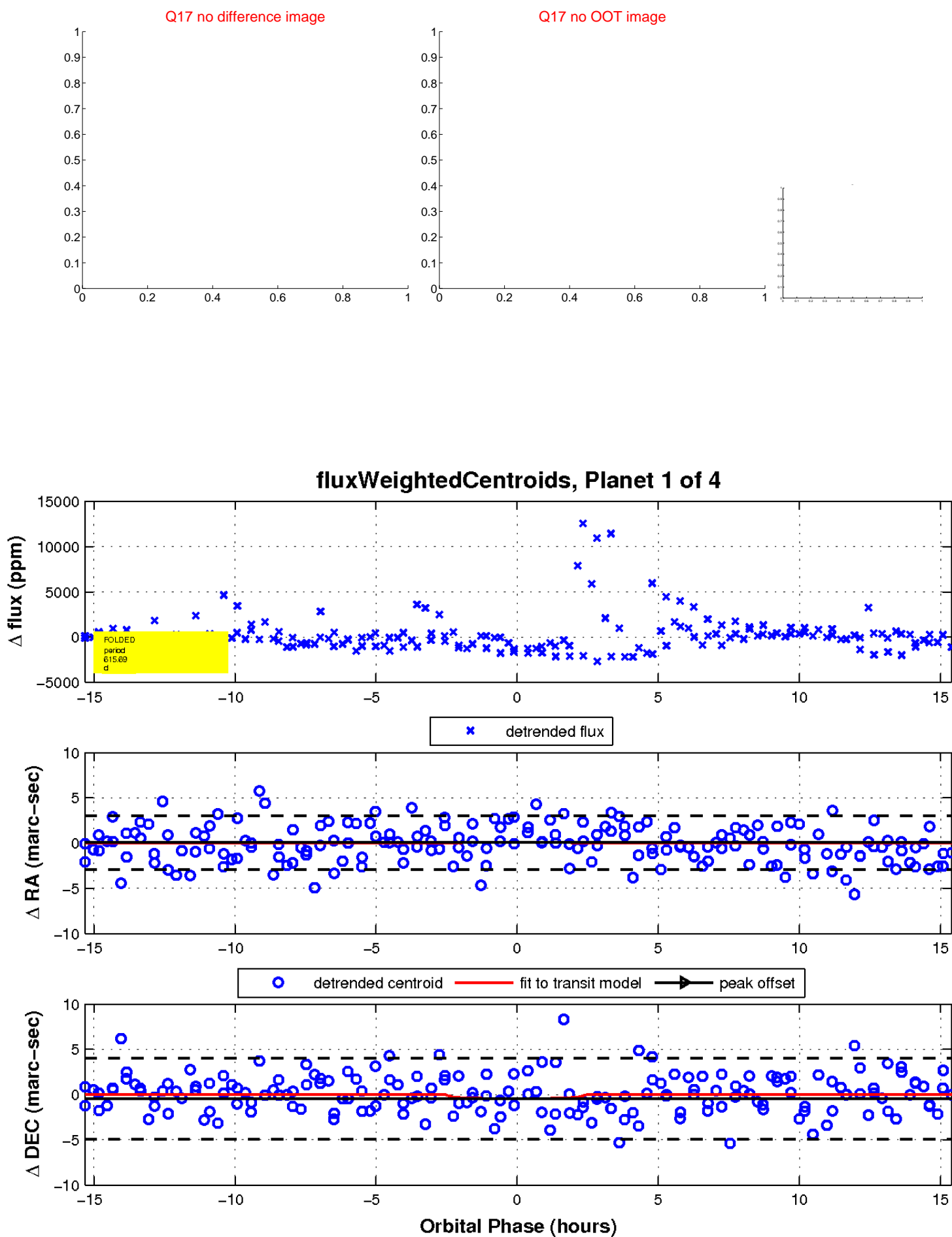
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

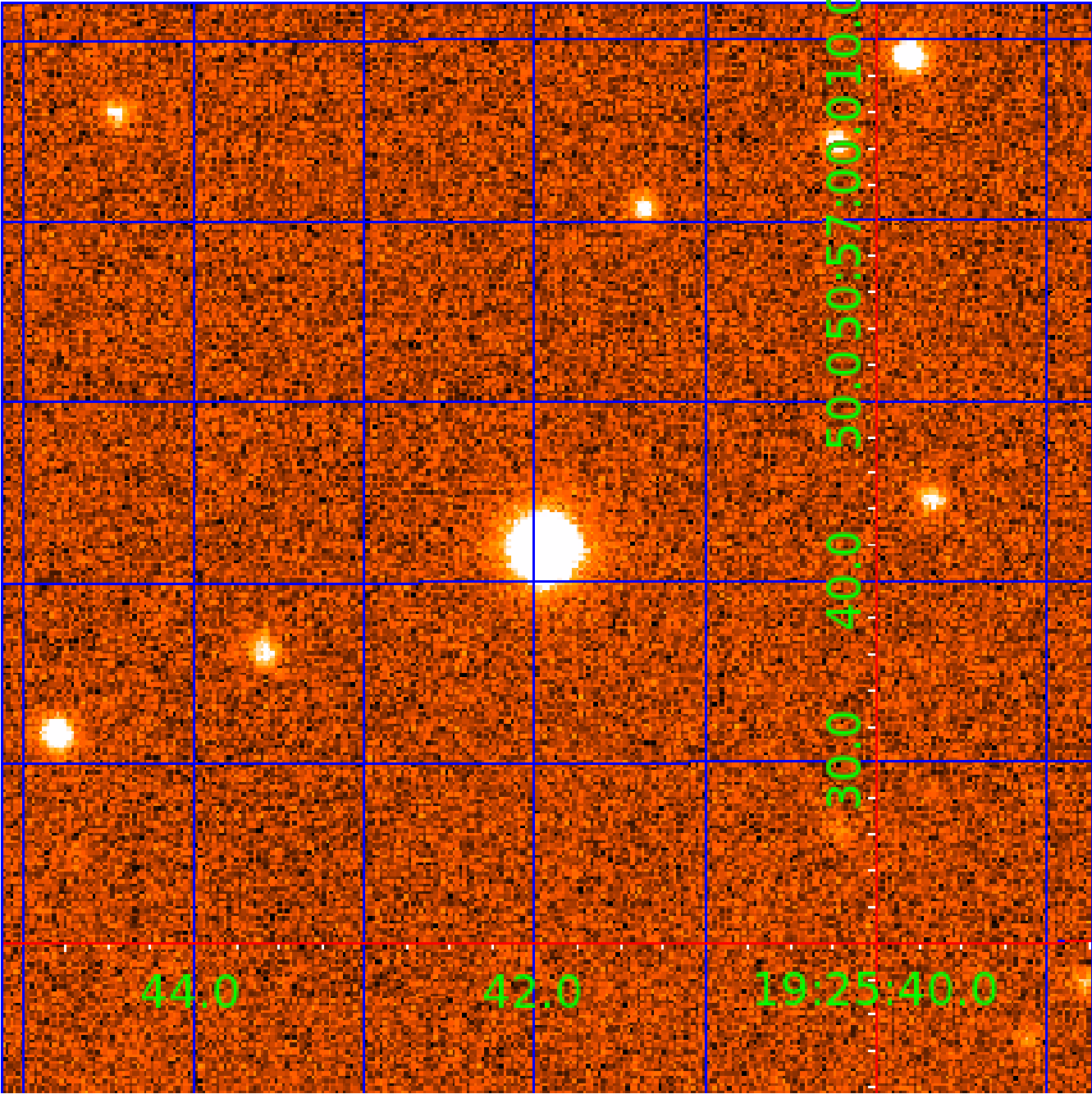


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012258225

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})
012258225-01	OBS	No	615.694066	299.907904	2401.1	5.157	10.9	6.2	0.55	3849	2.75	0.04
012258225-02	OBS	No	110.576544	167.895072	605.2	1.586	11.4	2.9	0.55	3849	1.43	0.43
012258225-03	OBS	No	525.058780	175.155718	3629.1	9.618	14.1	9.1	0.55	3849	3.22	0.05
012258225-04	OBS	No	1.014317	131.850416	175.3	2.009	10.6	9.8	0.55	3849	0.88	223.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258225-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012258225-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
012258225-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
012258225-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_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.

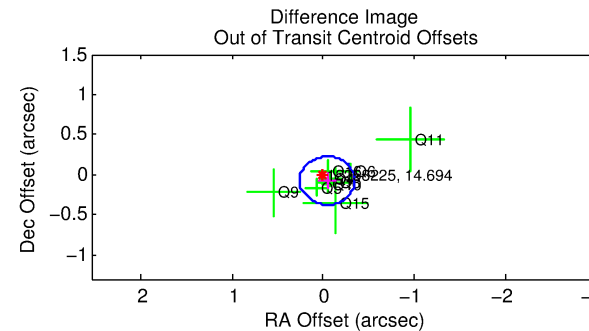
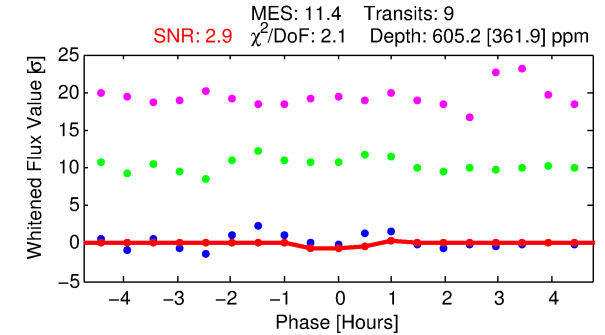
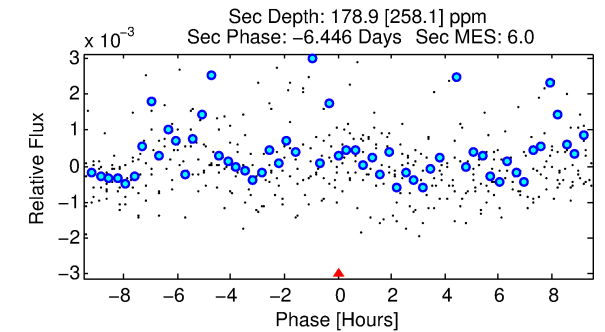
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012258225-02

No Significant Match Found

KIC: 12258225 Candidate: 2 of 4 Period: 110.577 d

KIC: 12258225 Candidate: 2 of 4 Period: 110.577 d



Period = 110.57654 [0.00267] d
Epoch = 167.8951 [0.0200] BKJD
Rp/R* = 0.0240 [0.1848]
a/R* = 408.80 [12645.33]
b = 0.68 [25.00]

Seff = 0.43 [0.03]
Teq = 206 [4] K
Rp = 1.43 [11.01] Re
a = 0.3692 [0.0148] AU

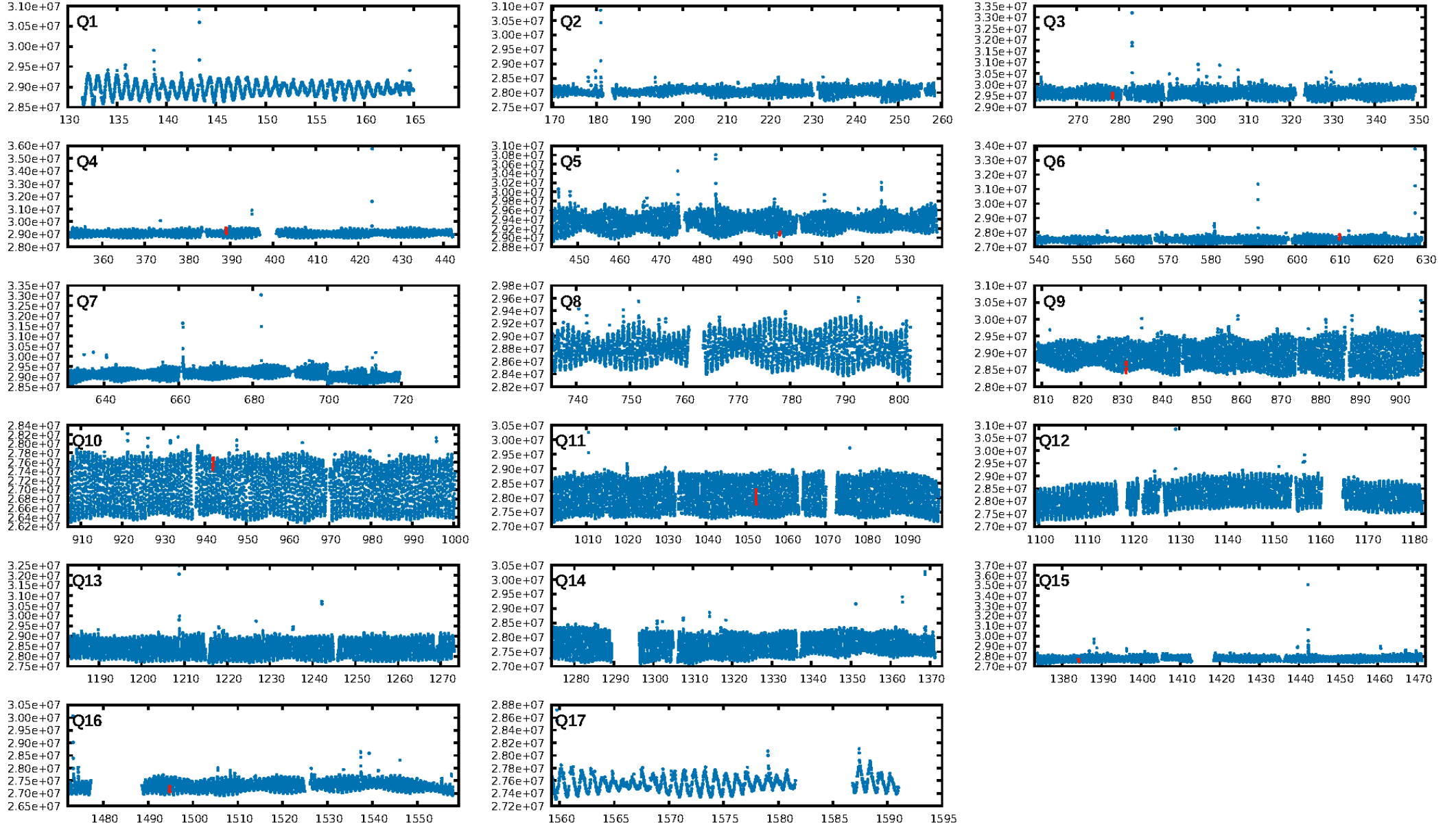
Ag = 6581.71 [101980.97] [0.06σ]
Teffp = 2876 [11139] K [0.24σ]

ShortPeriod-sig: 100.0% [1027.42σ]
 LongPeriod-sig: 100.0% [1020.48σ]
 ModelChiSquare2-sig: 9.7%
 ModelChiSquareGof-sig: 39.1%
 Bootstrap-pfa: N/A
 RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: 0.6715
 Centroid-sig: 14.9%
 Centroid-so: 2.787 arcsec [1.44σ]
 OotOffset-rm: 0.086 arcsec [0.86σ]
 KicOffset-rm: 0.122 arcsec [0.95σ]
 OotOffset-st: 2/3/2/2 [9]
 KicOffset-st: 2/3/2/2 [9]
 DiffImageQuality-fgm: 0.56 [5/9]
 DiffImageOverlap-fno: 0.89 [8/9]

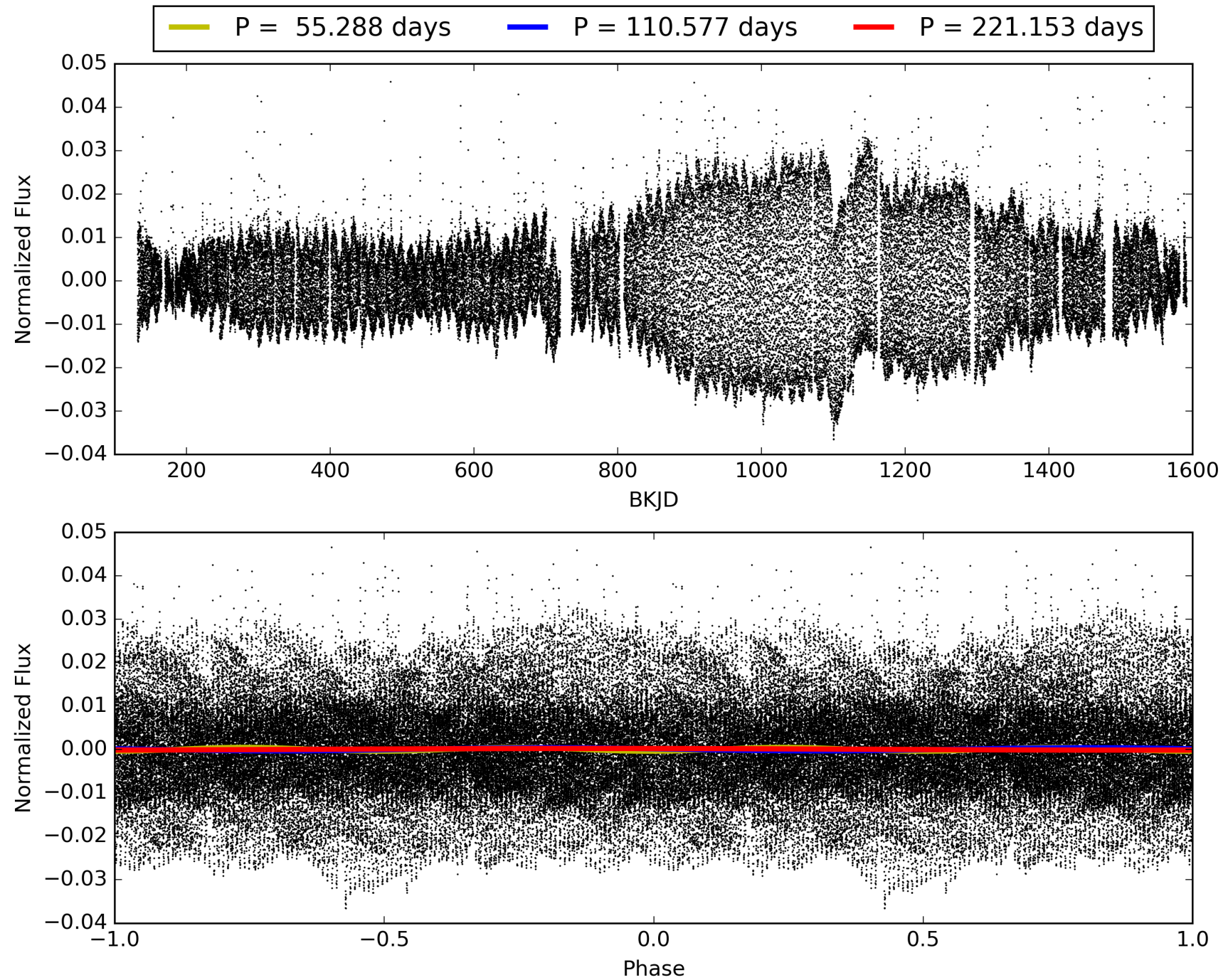
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- **Date Generated:** 30-Jan-2016 06:03:49 Z

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

TCE 012258225-02, PDC Light Curves

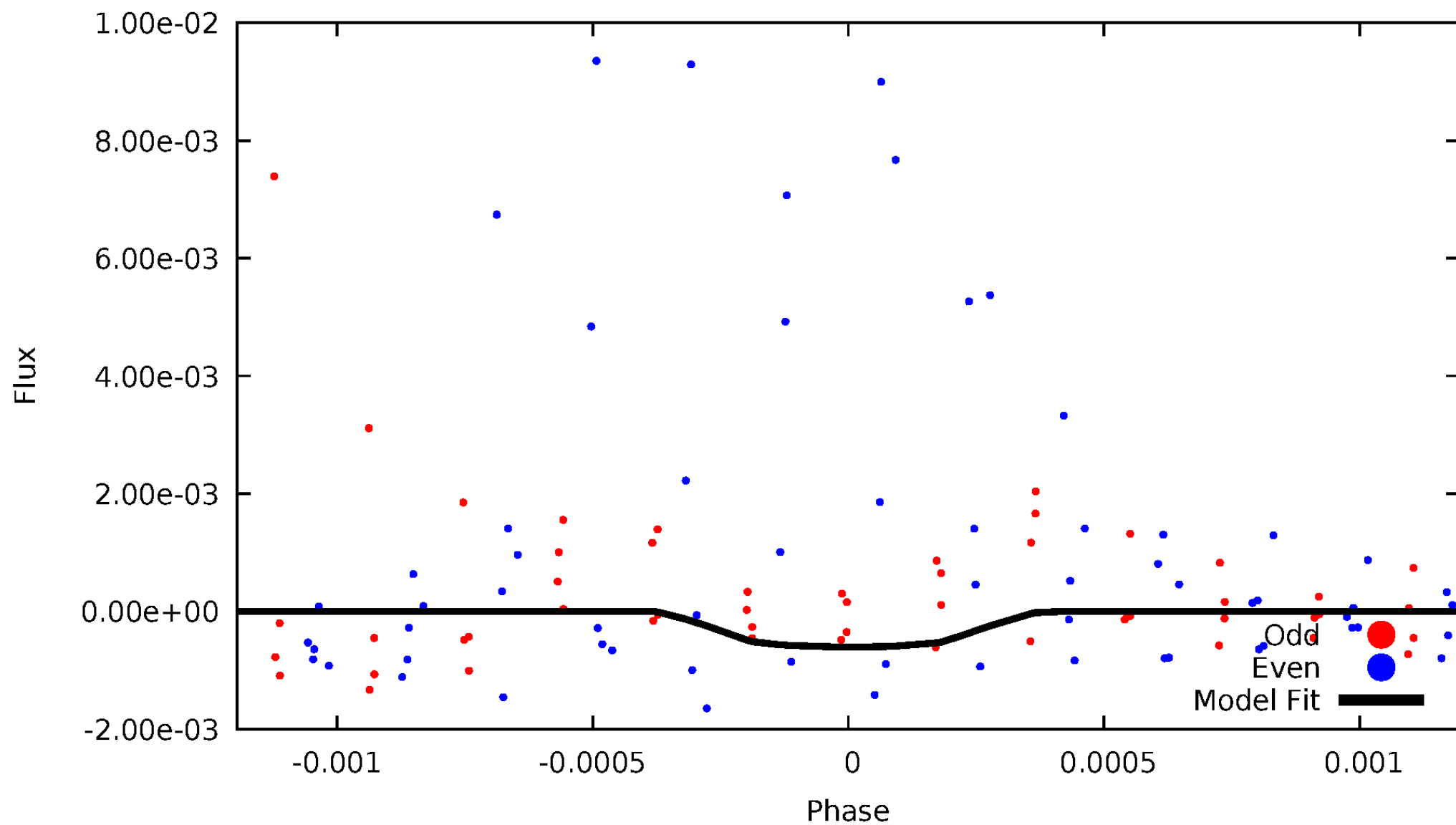


TCE 012258225-02



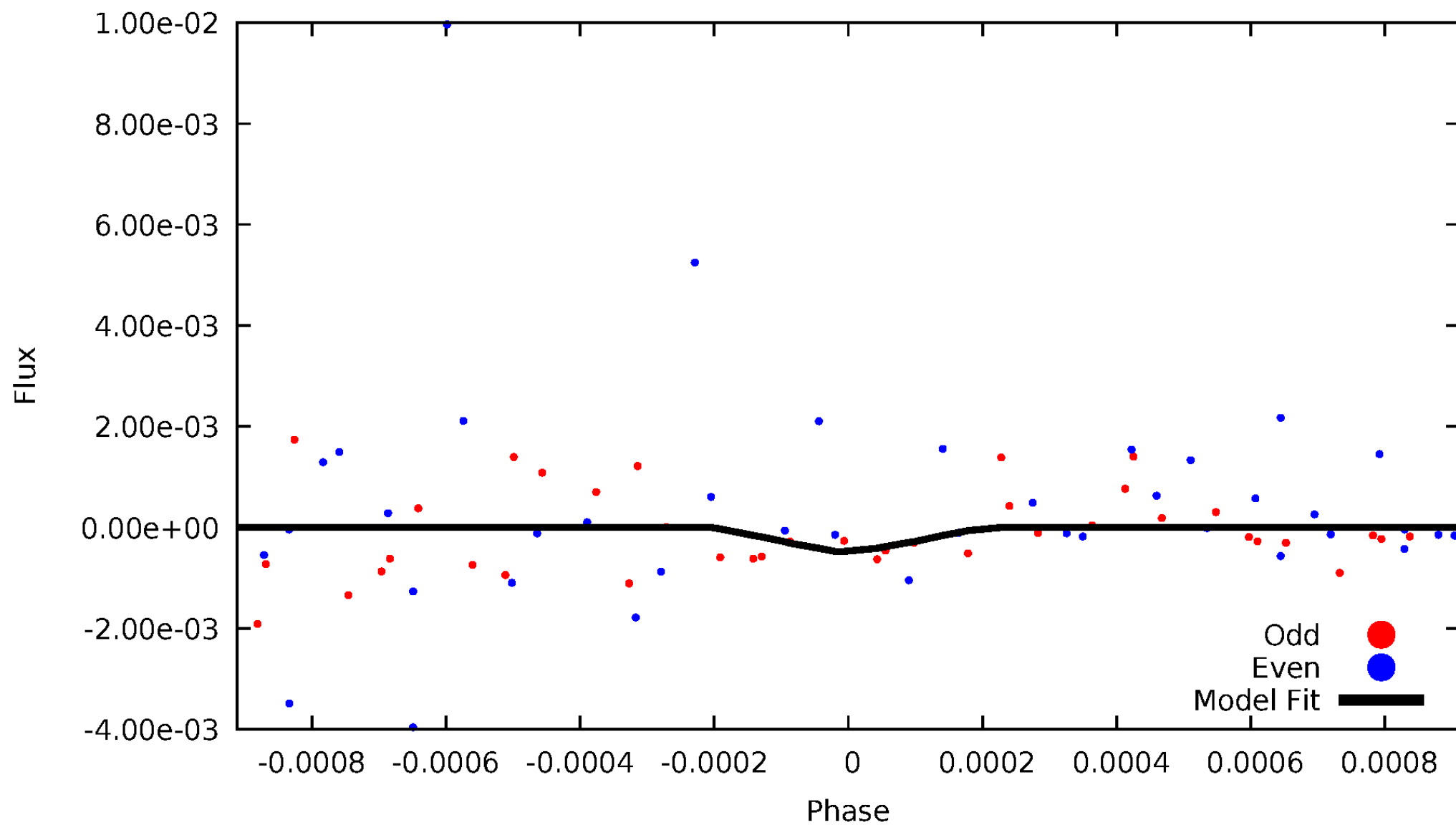
DV Odd/Even

TCE 012258225-02



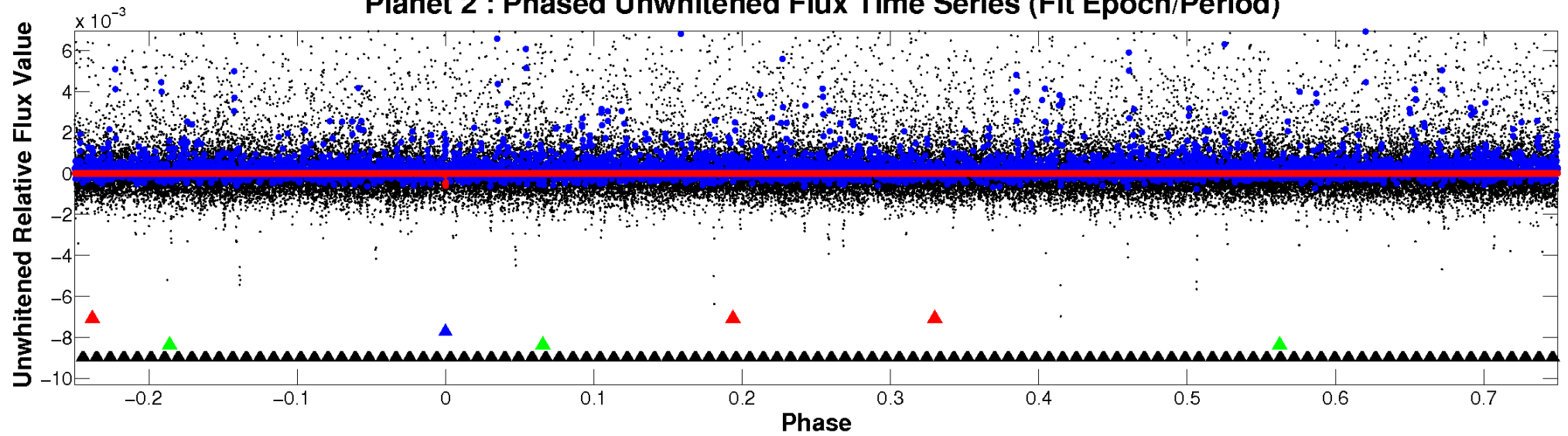
ALT Odd/Even

TCE 012258225-02

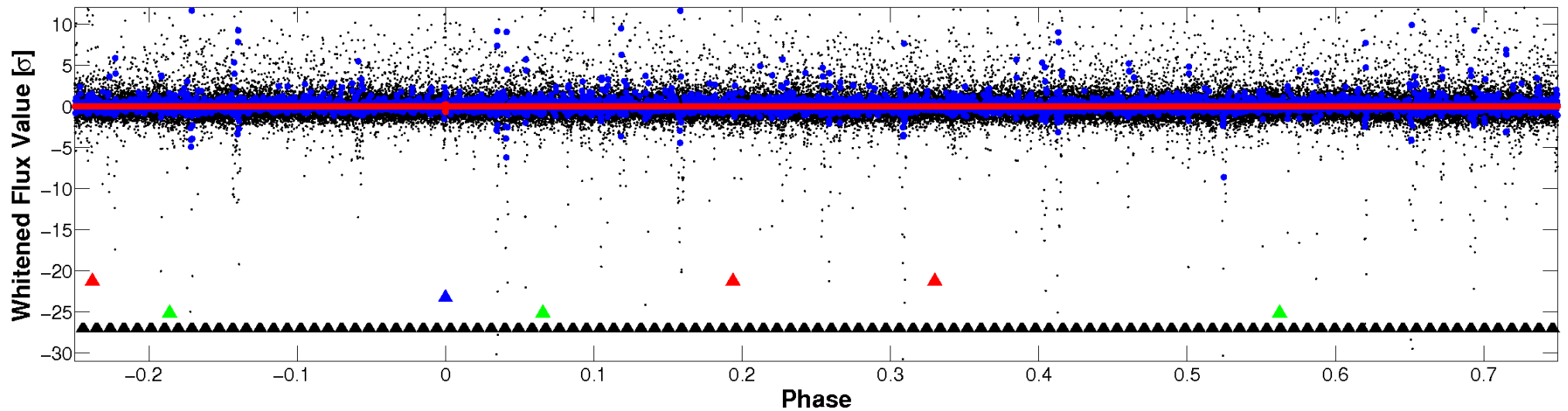


Non-Whitened Vs. Whitened Light Curve

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

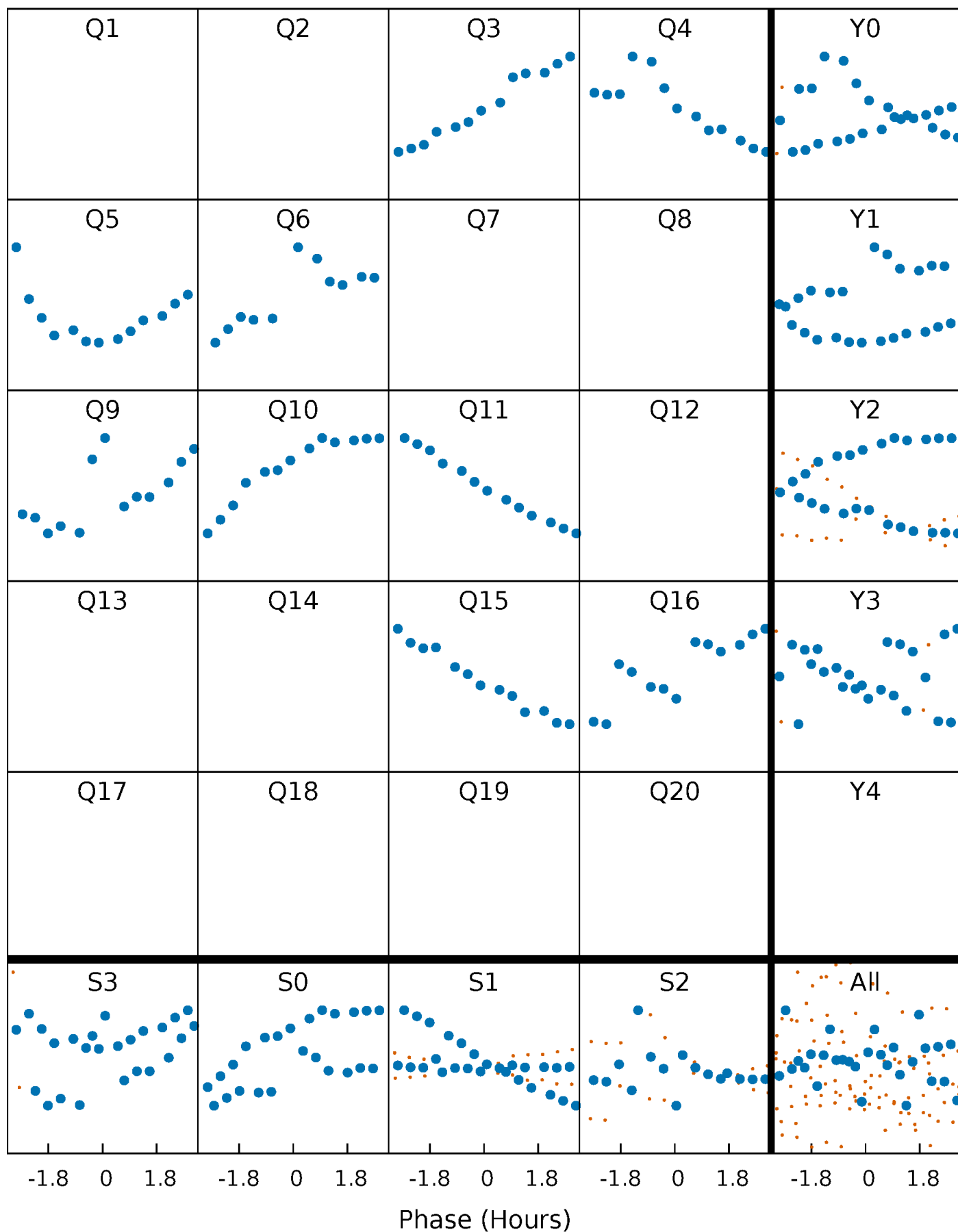


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



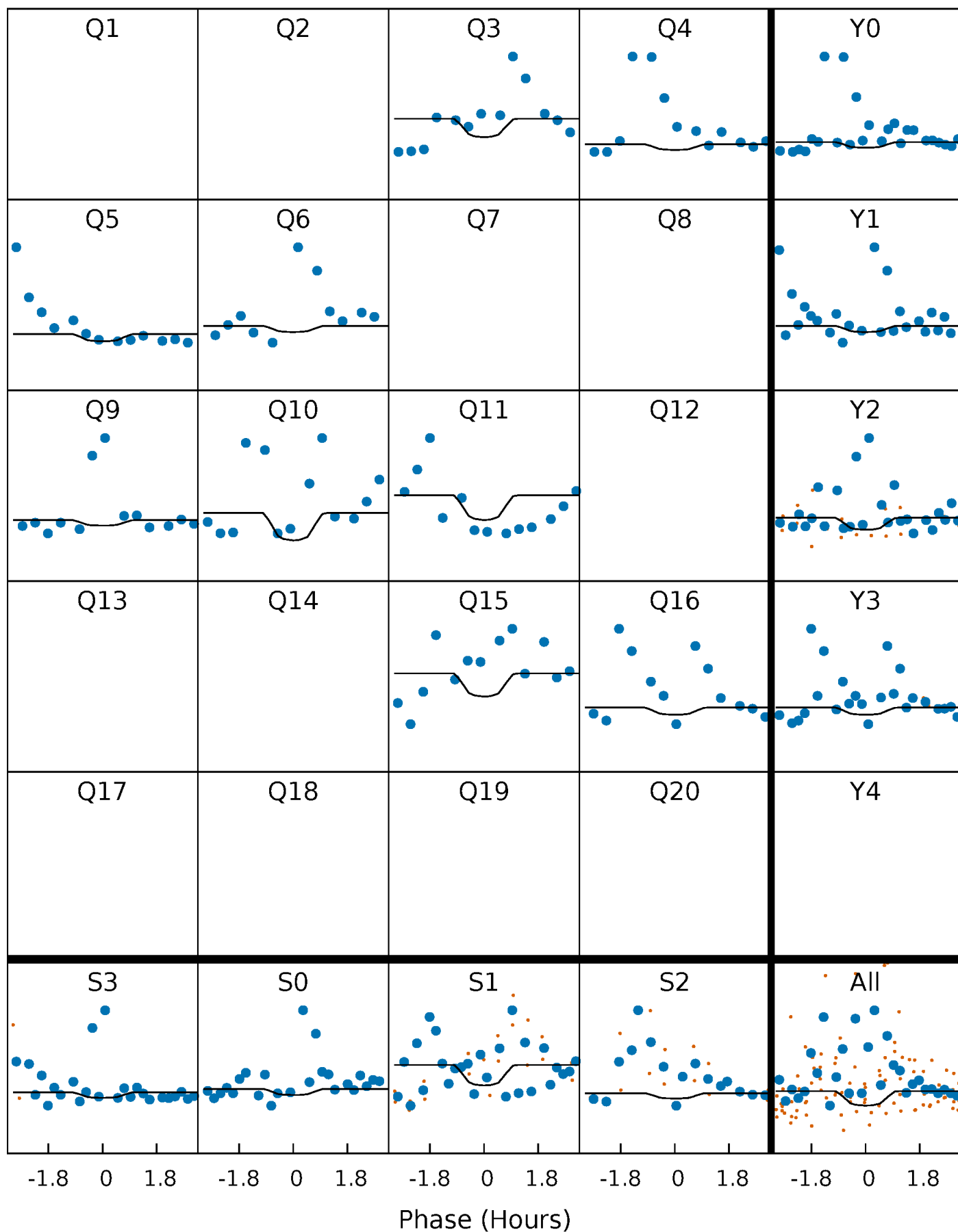
PDC Quarter-Phased Transit Curves

TCE 012258225-02 P=110.576544 Days $T_0=167.895072$ (BKJD)



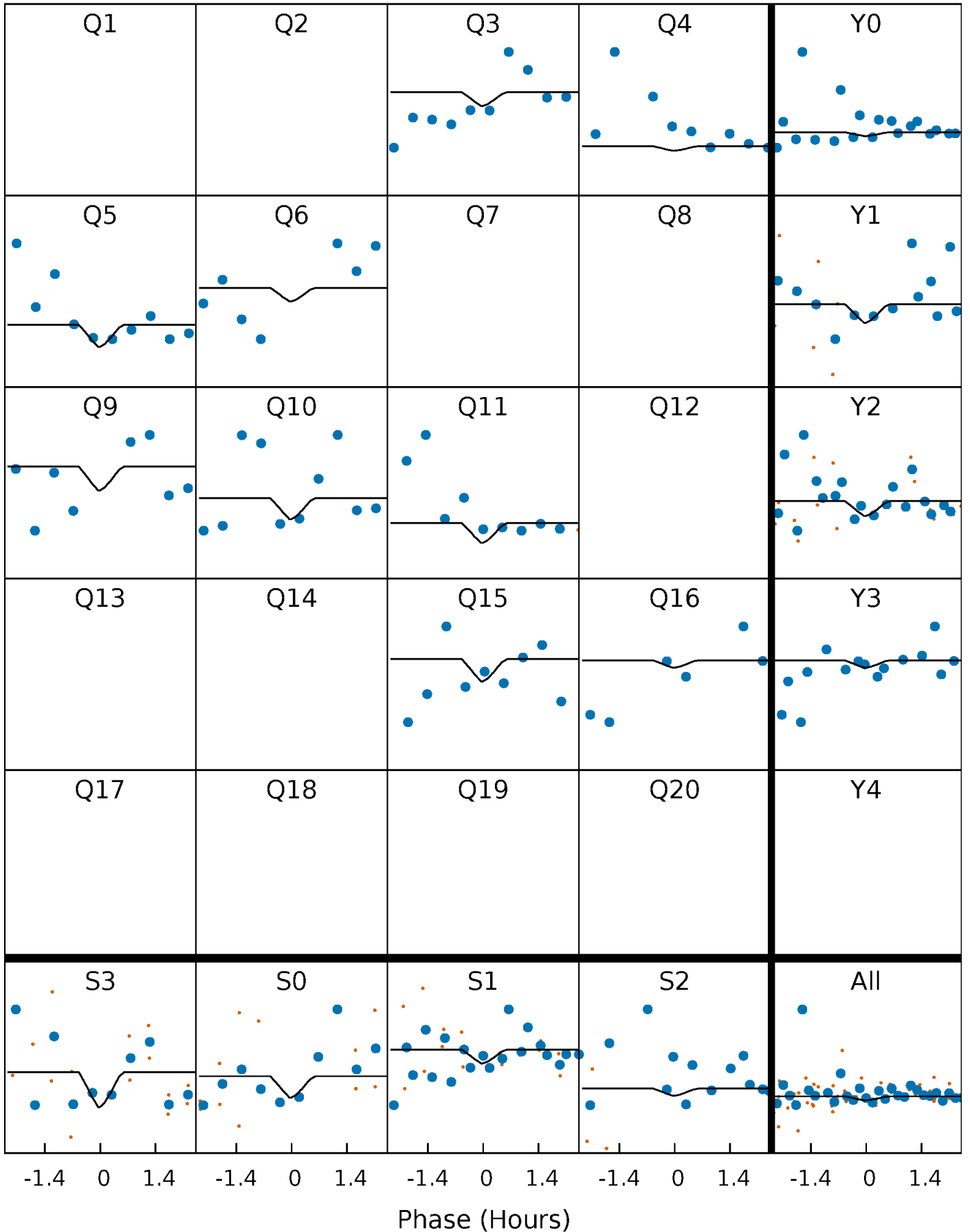
DV Quarter-Phased Transit Curves

TCE 012258225-02 $P=110.576544$ Days $T_0=167.895072$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

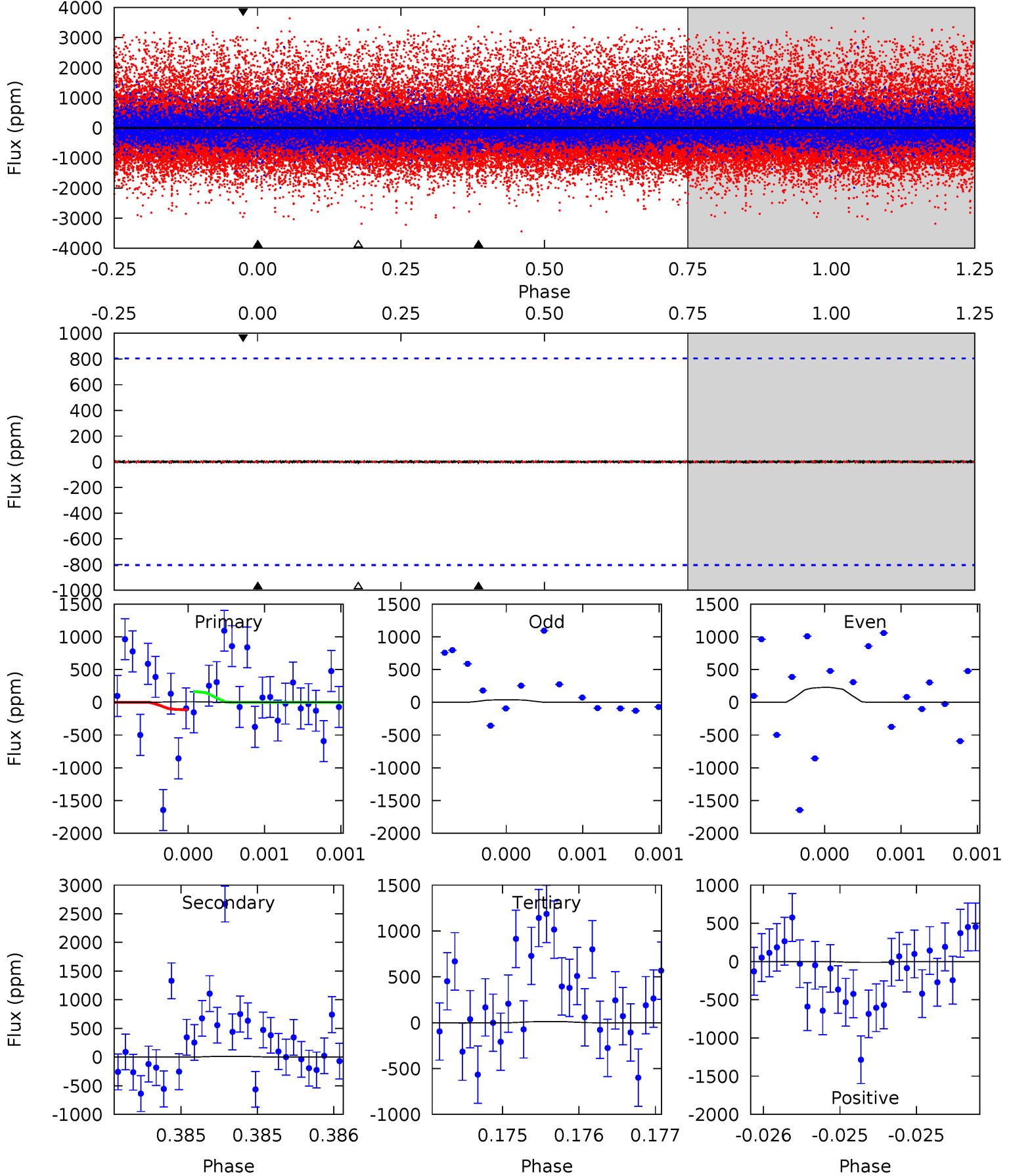
TCE 012258225-02 $P=110.572902$ Days $T_0=167.914052$ (BKJD)



DV Model-Shift Uniqueness Test

012258225-02, P = 110.576544 Days, E = 57.318528 Days

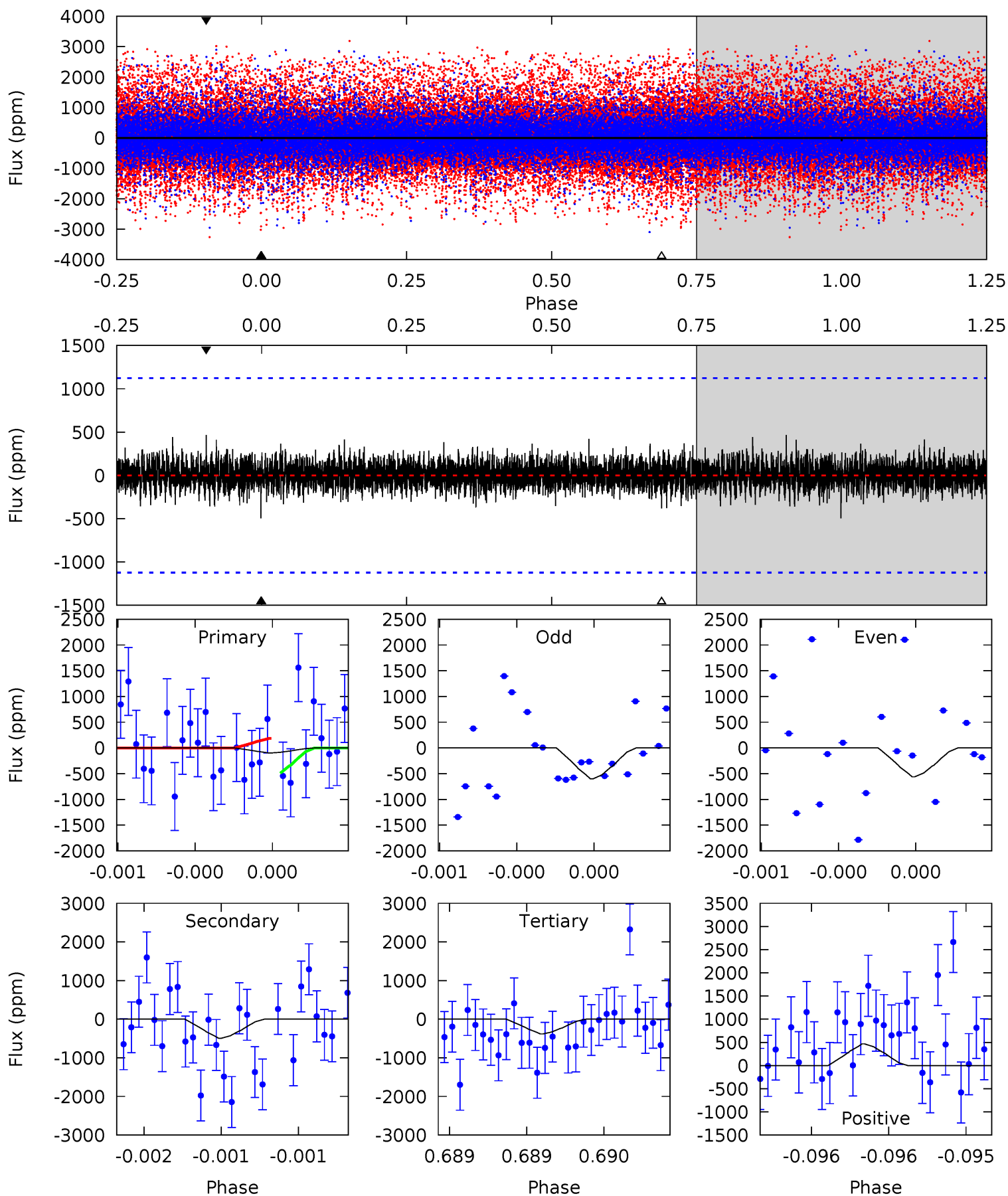
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.05	0.08	0.08	0.07	5.50	3.37	0.02	-0.03	-0.02	0.00	0.01	0.62	3.63	0.46	0.18



Alt Model-Shift Uniqueness Test

012258225-02, P = 110.572902 Days, E = 57.341150 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.49	2.47	1.90	2.33	5.60	3.53	0.51	-1.41	-1.84	0.57	0.14	0.10	0.25	0.49	0.77



Stellar Parameters For KIC 012258225

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3849^{+50}_{-50}	$4.703^{+0.032}_{-0.012}$	$0.000^{+0.100}_{-0.100}$	$0.546^{+0.017}_{-0.026}$	$0.549^{+0.025}_{-0.020}$	$4.743^{+0.555}_{-0.297}$
	+1%/-1%	+1%/-0%	+inf%/-inf%	+3%/-5%	+5%/-4%	+12%/-6%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 012258225-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-12 ± 146	$7.94^{+8.21}_{-5.56}$	287^{+4}_{-5}	1495^{+705}_{-3647}	$6.068^{+340.959}_{-293.715}$
Alt.	-496 ± 200	$7.41^{+9.16}_{-4.98}$	287^{+4}_{-5}	2346^{+833}_{-382}	629^{+5642}_{-509}

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 $A_{obs} \gg 1.0$

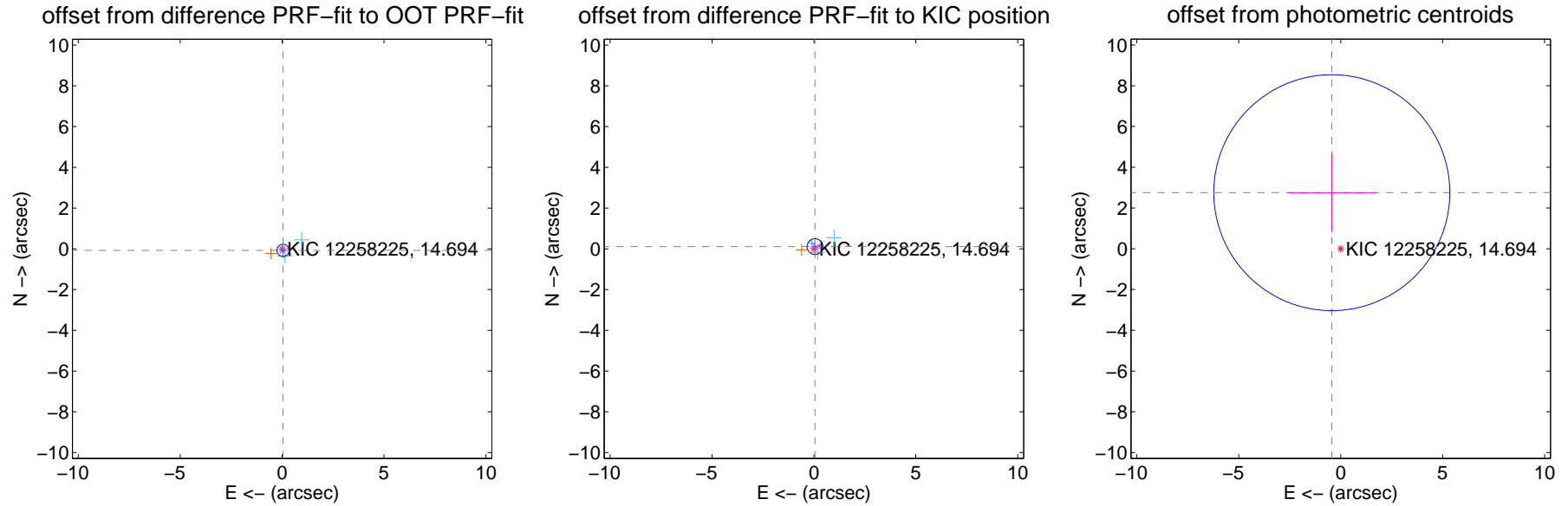
DV Centroid Data

Supplemental centroid analysis for 012258225-02. Kepler magnitude: 14.69. Transit SNR 2.90

There are 5 quarters with good PRF difference image offsets

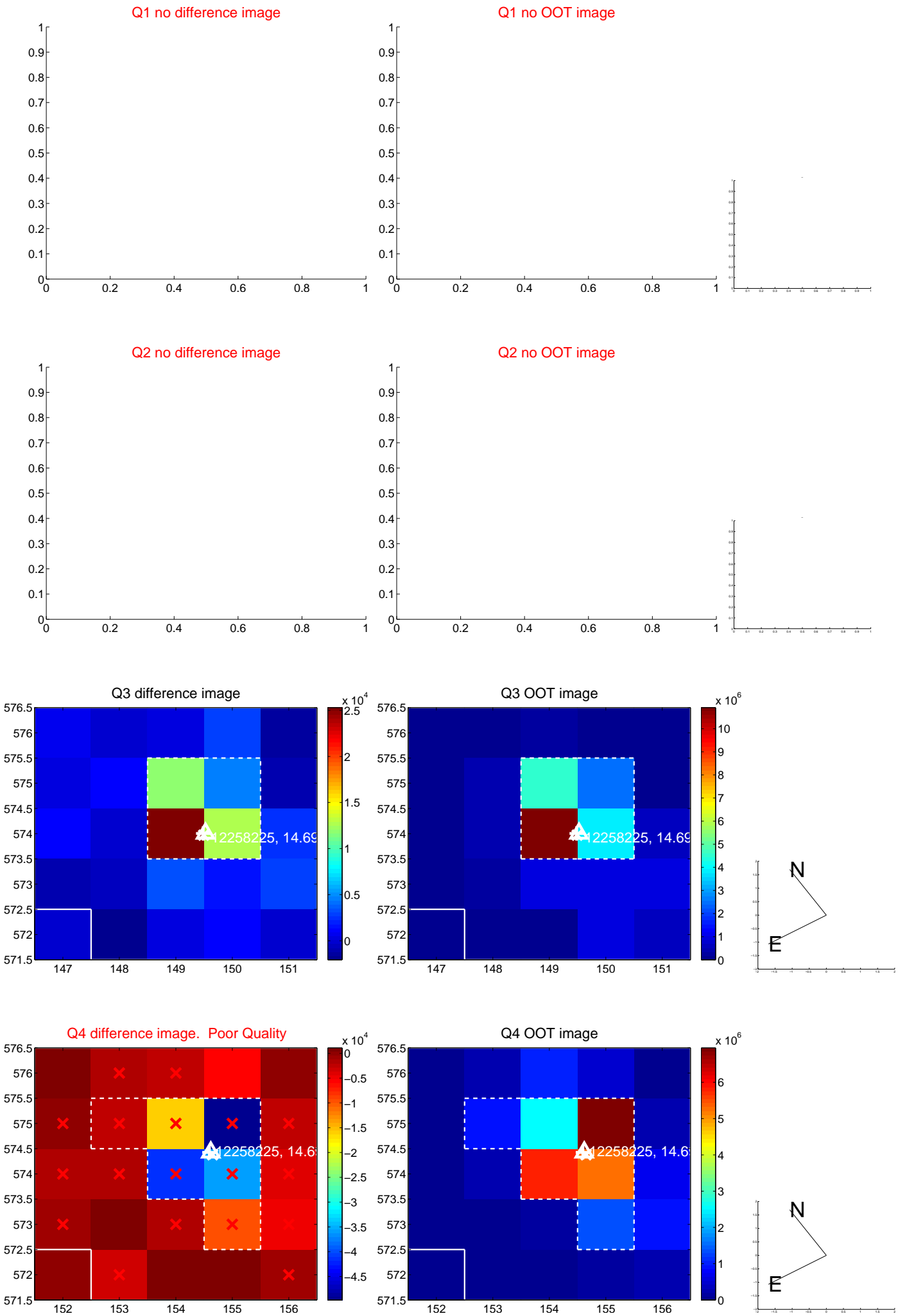
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.086 ± 0.100	0.86	-0.044 ± 0.099	-0.074 ± 0.101
PRF-fit source offset from KIC position	0.122 ± 0.129	0.95	-0.053 ± 0.143	0.110 ± 0.100
photometric centroid source offset	2.79 ± 1.93	1.44	0.44 ± 2.17	2.75 ± 1.92

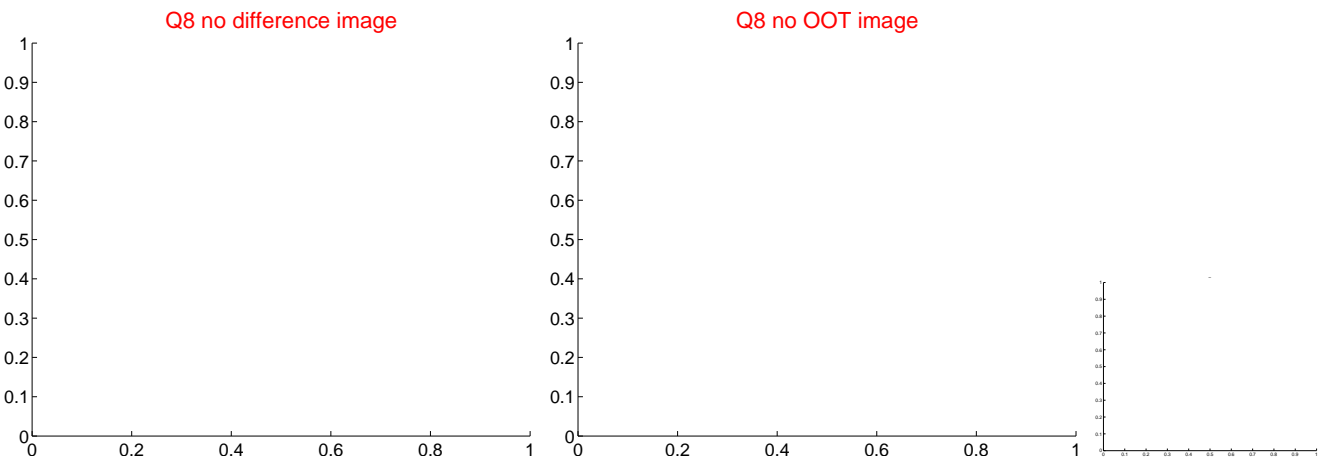
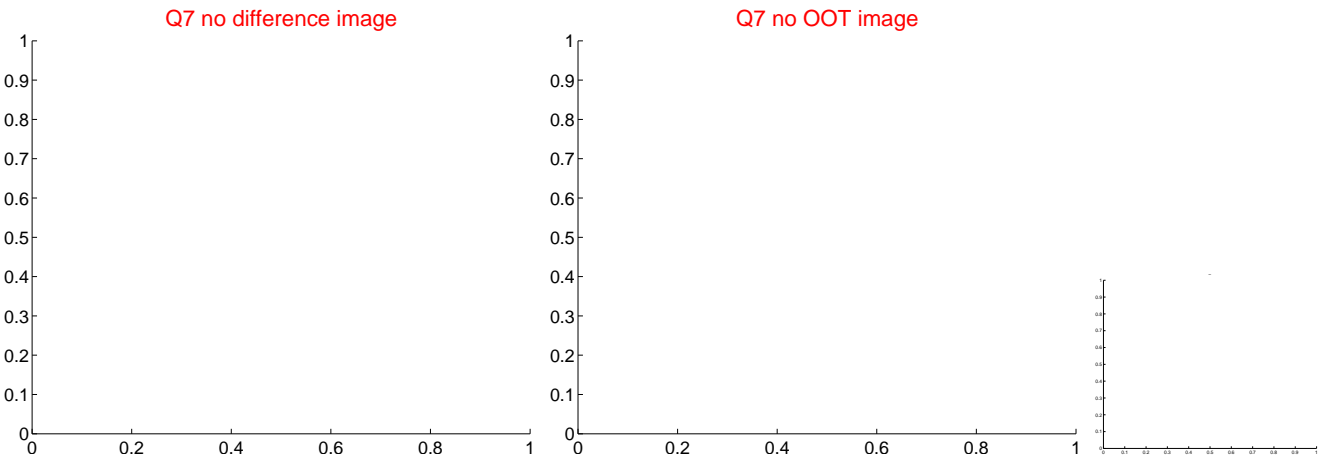
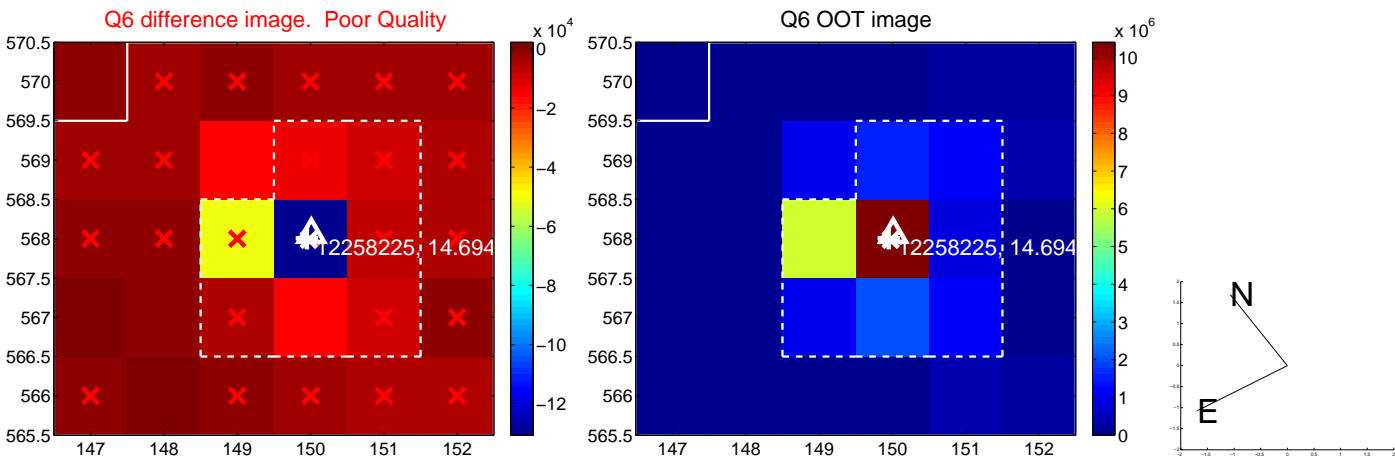
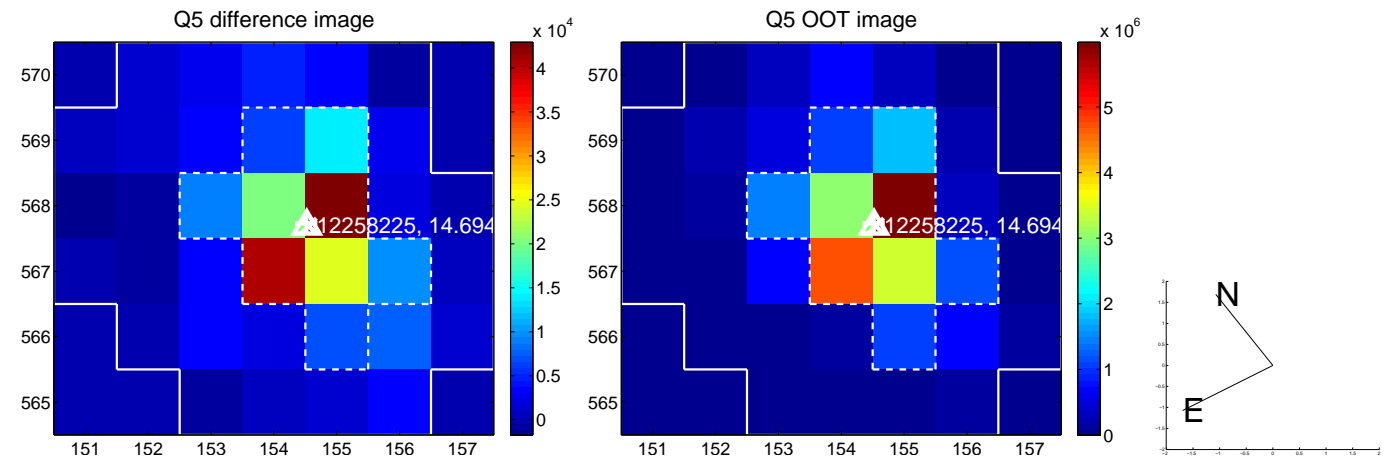


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- 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.

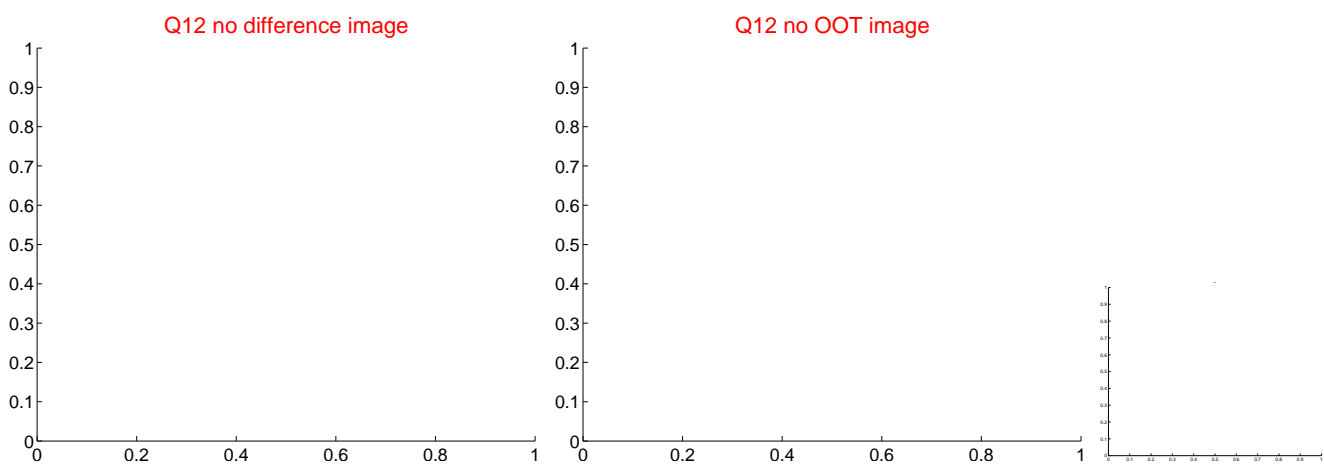
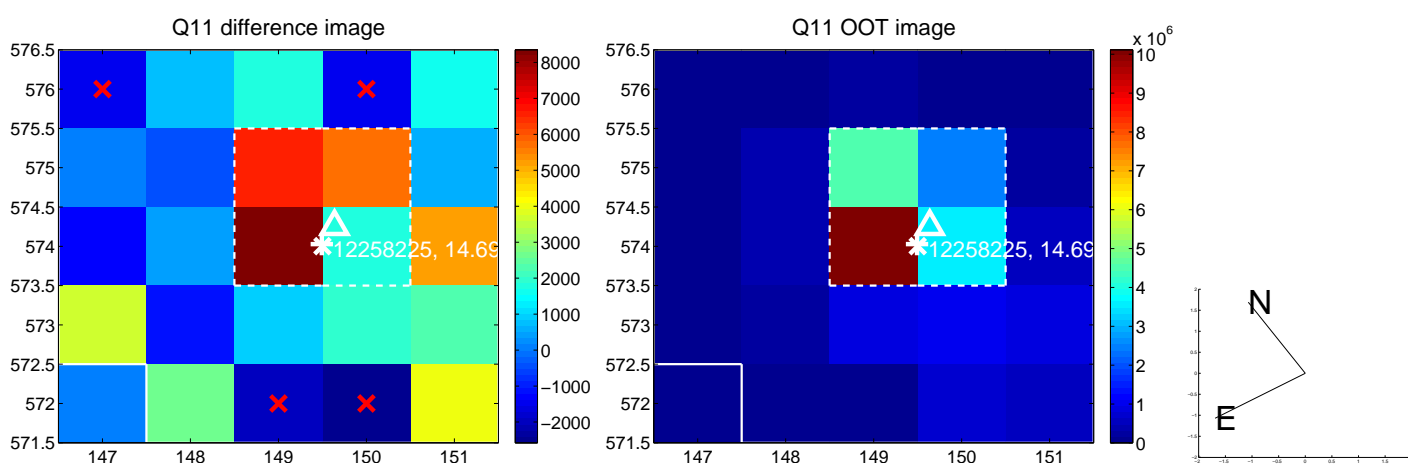
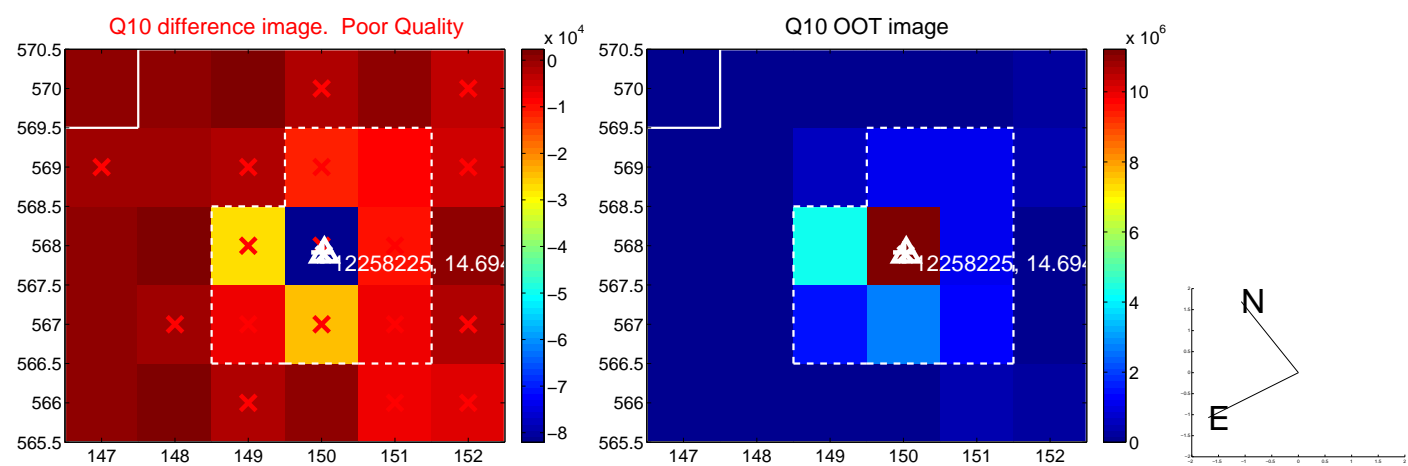
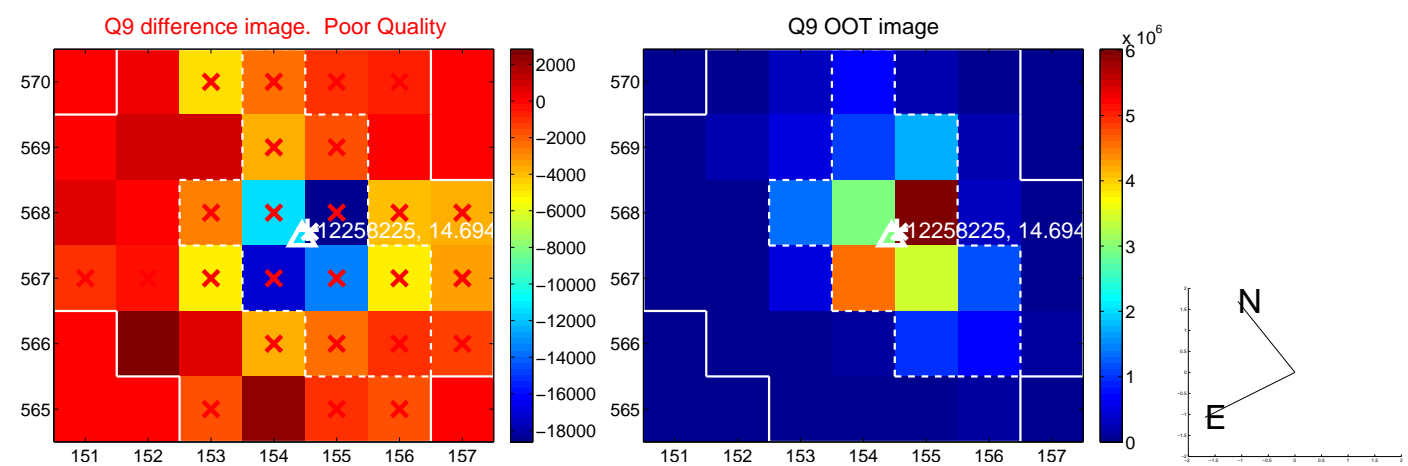
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



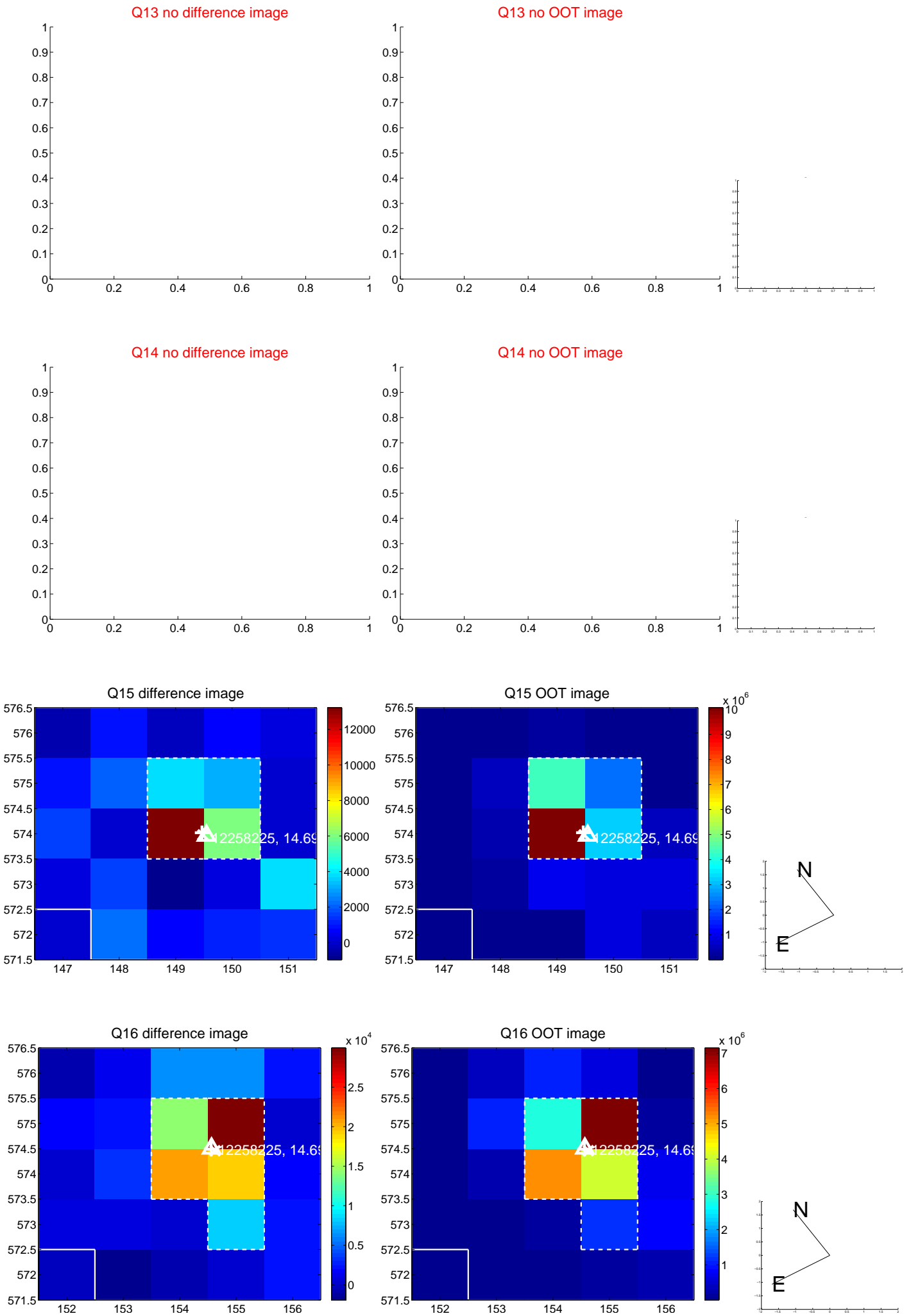
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



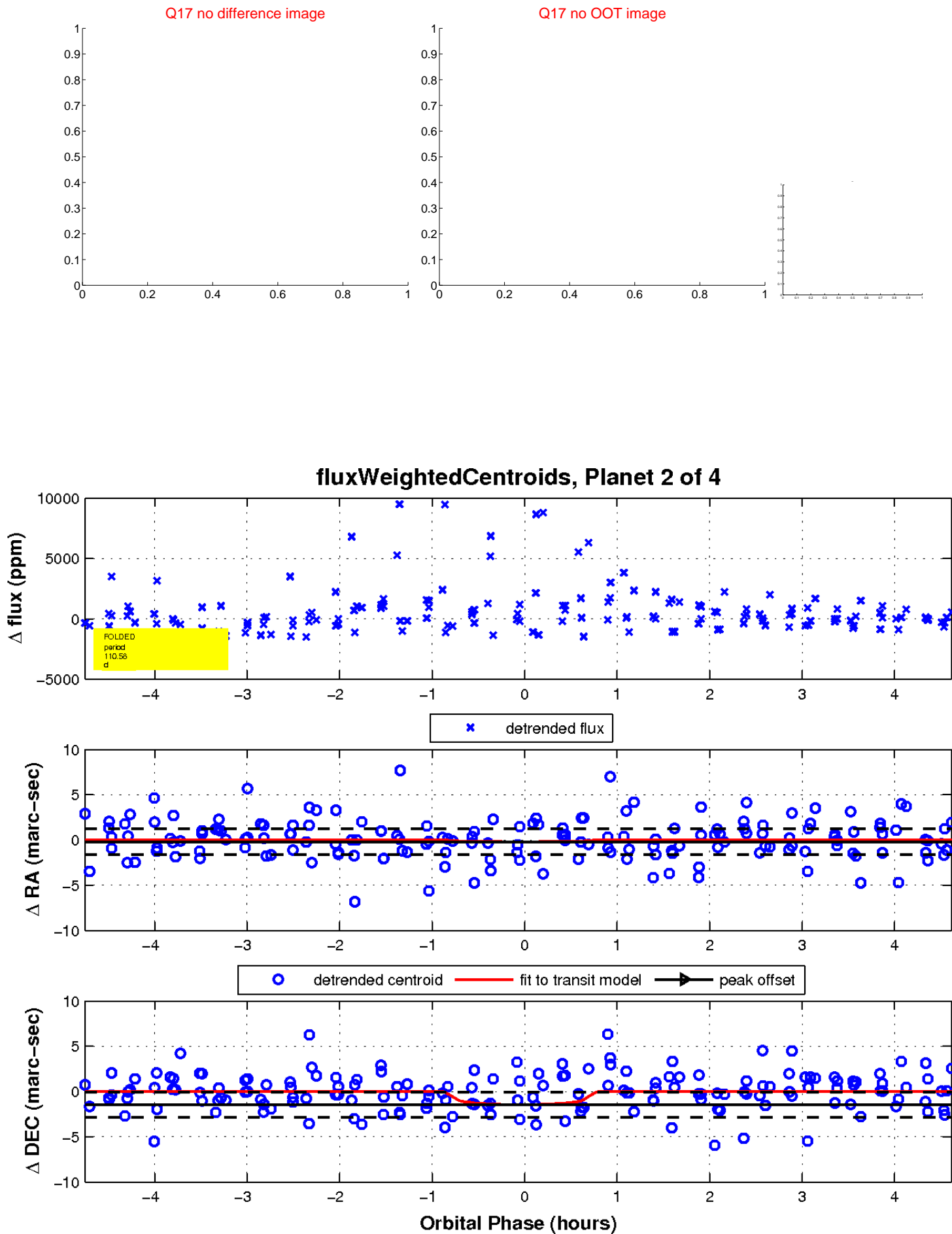
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

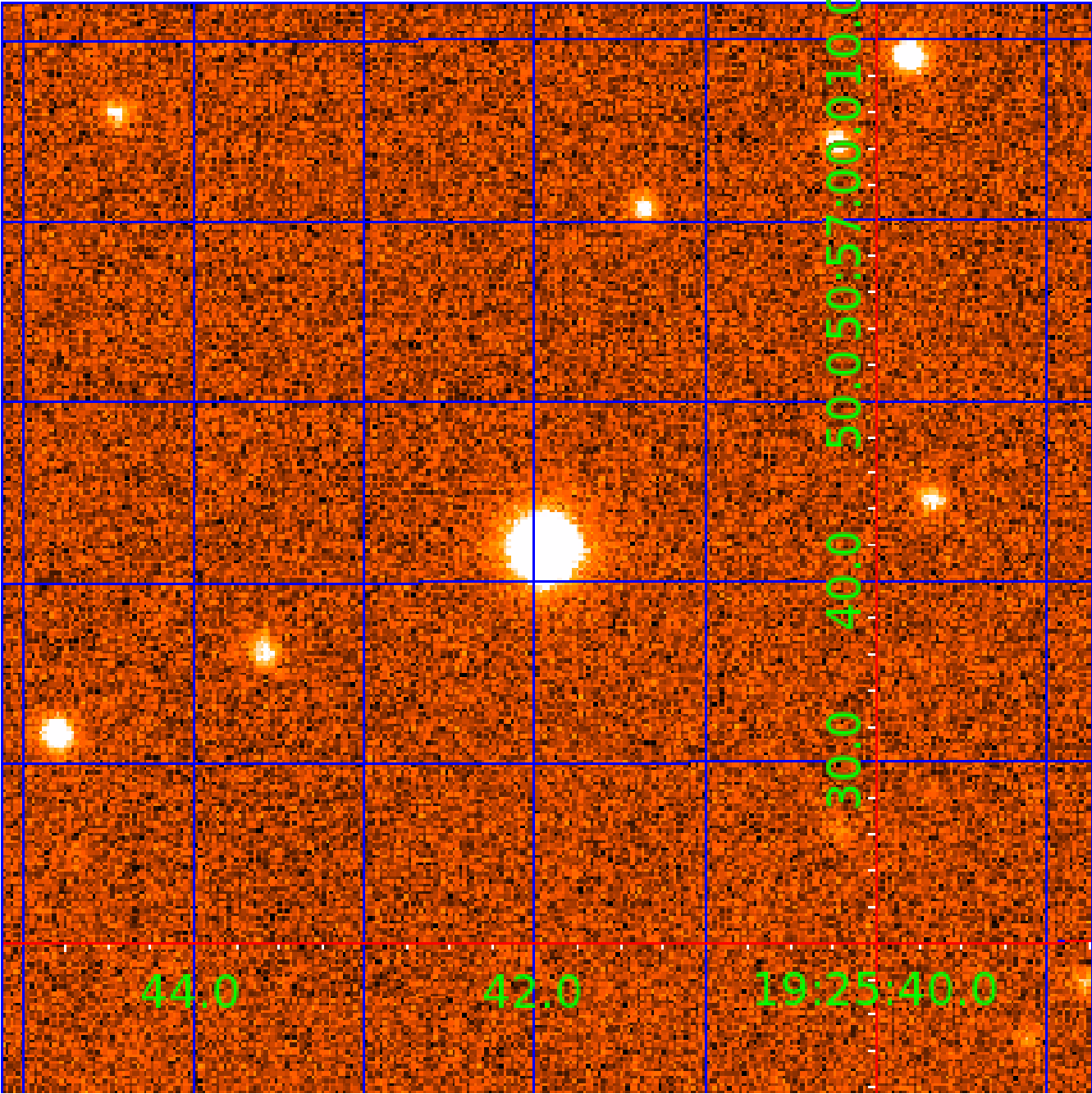


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012258225

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})
012258225-01	OBS	No	615.694066	299.907904	2401.1	5.157	10.9	6.2	0.55	3849	2.75	0.04
012258225-02	OBS	No	110.576544	167.895072	605.2	1.586	11.4	2.9	0.55	3849	1.43	0.43
012258225-03	OBS	No	525.058780	175.155718	3629.1	9.618	14.1	9.1	0.55	3849	3.22	0.05
012258225-04	OBS	No	1.014317	131.850416	175.3	2.009	10.6	9.8	0.55	3849	0.88	223.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258225-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012258225-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
012258225-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
012258225-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_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.

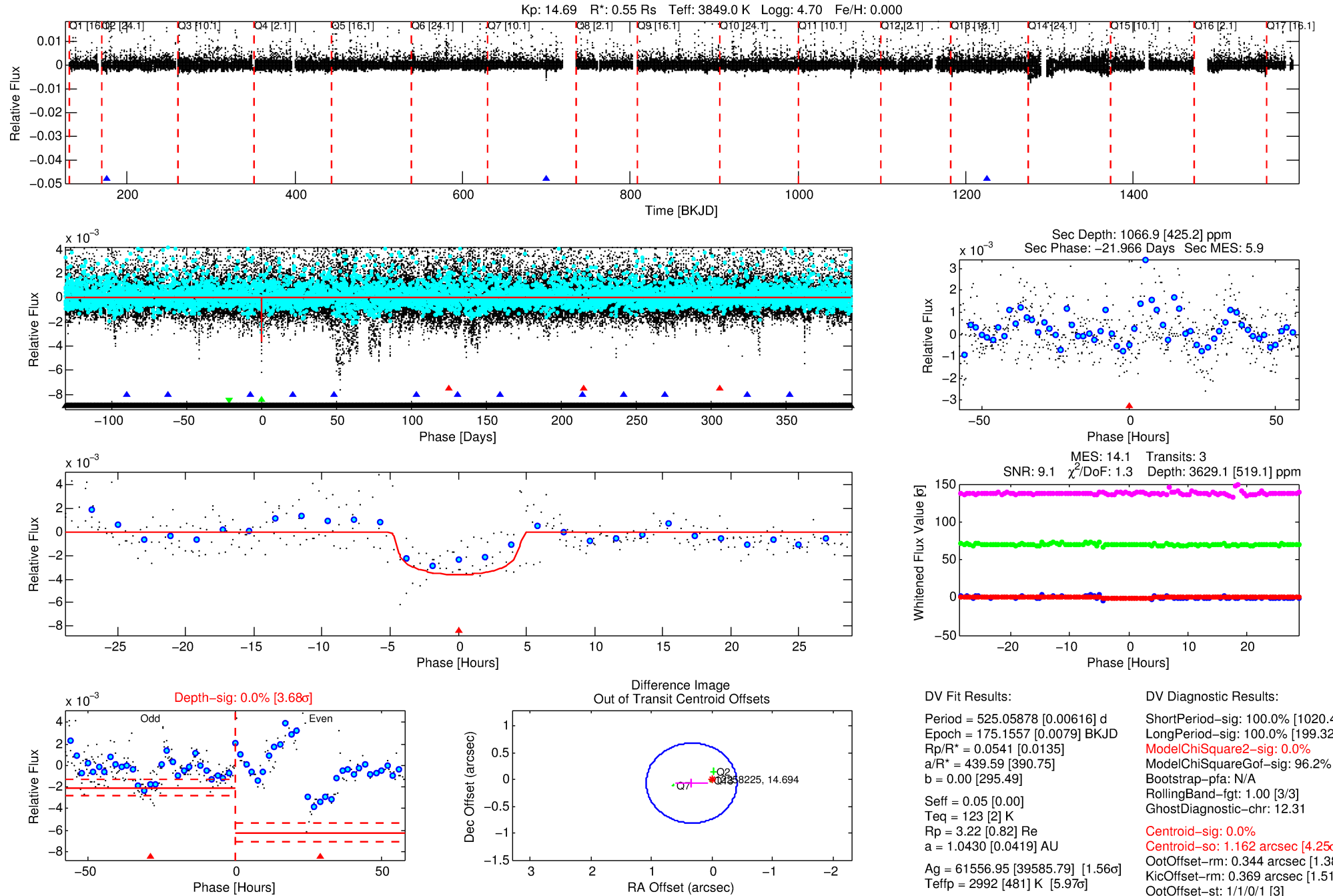
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012258225-03

No Significant Match Found

DV One-Page Summary

KIC: 12258225 Candidate: 3 of 4 Period: 525.059 d



DV Fit Results:

Period = 525.05878 [0.00616] d
Epoch = 175.1557 [0.0079] BKJD
Rp/R* = 0.0541 [0.0135]
a/R* = 439.59 [390.75]
b = 0.00 [295.49]
Seff = 0.05 [0.00]
Teq = 123 [2] K
Rp = 3.22 [0.82] Re
a = 1.0430 [0.0419] AU
Ag = 61556.95 [39585.79] [1.56 σ]
Teffp = 2992 [481] K [5.97 σ]

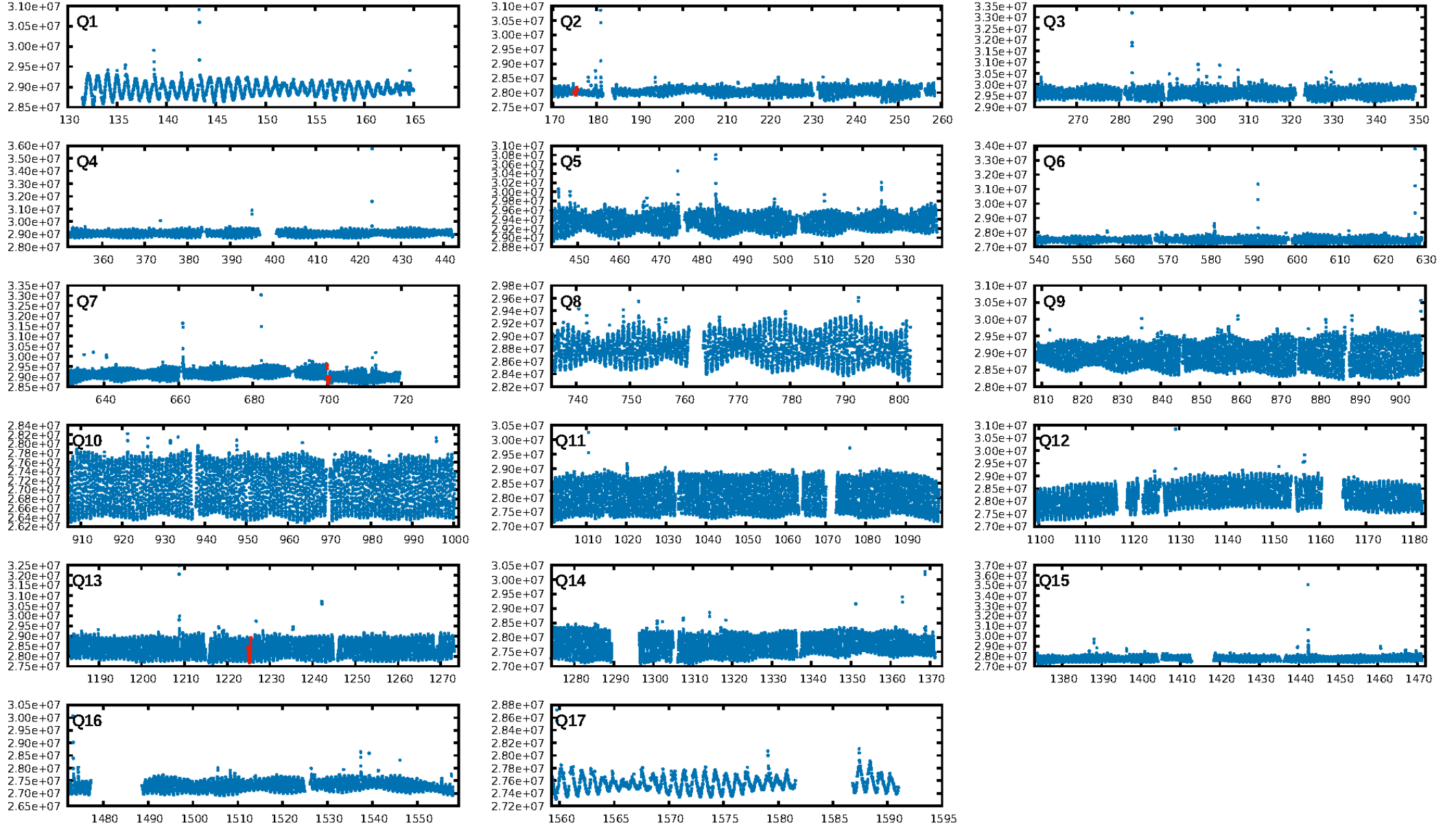
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1020.48 σ]
LongPeriod-sig: 100.0% [199.32 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGoF-sig: 96.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 12.31
Centroid-sig: 0.0%
Centroid-so: 1.162 arcsec [4.25 σ]
OotOffset-rm: 0.344 arcsec [1.38 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-rm: 0.369 arcsec [1.51 σ]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.00 [0/3]

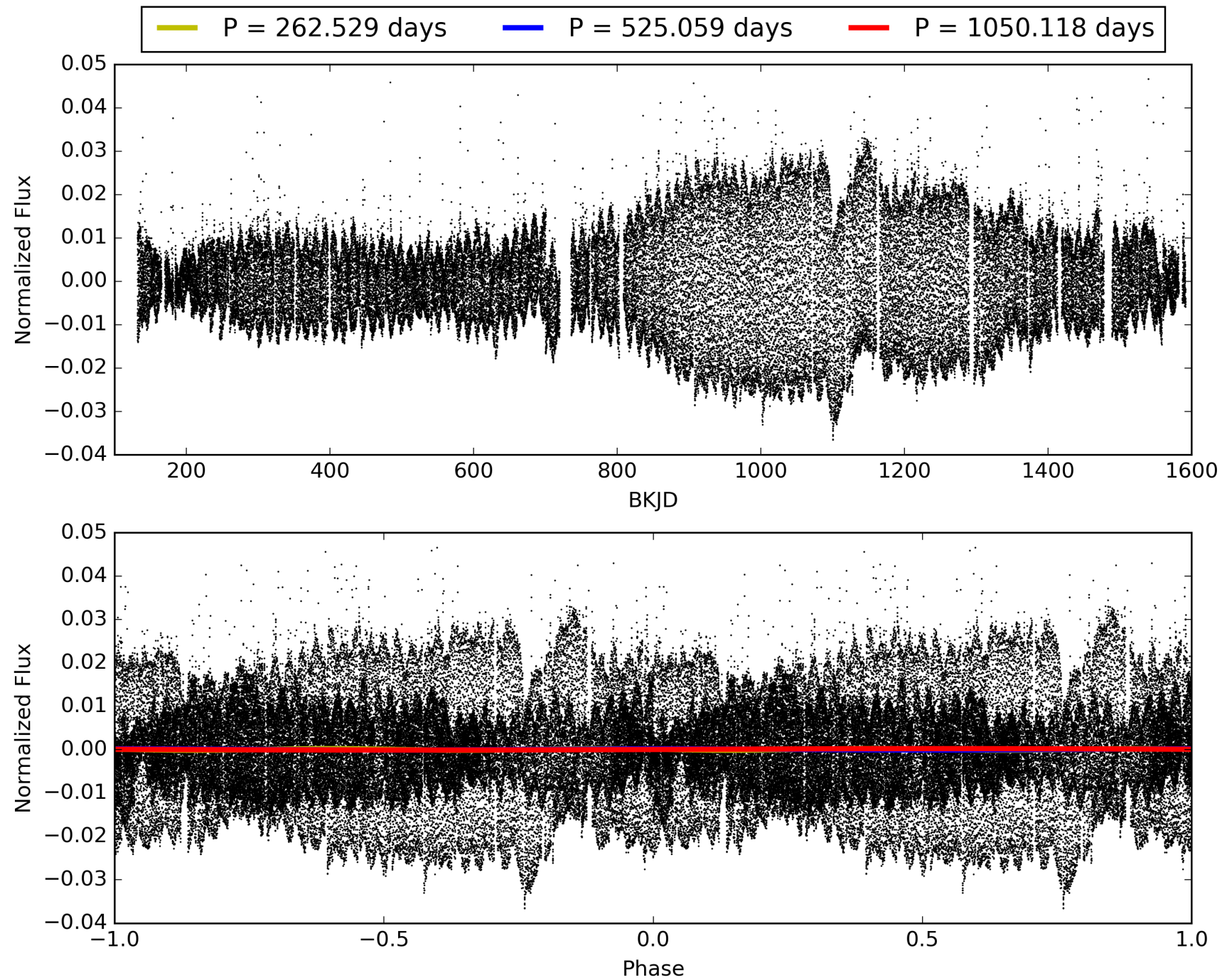
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:04:00 Z

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

TCE 012258225-03, PDC Light Curves

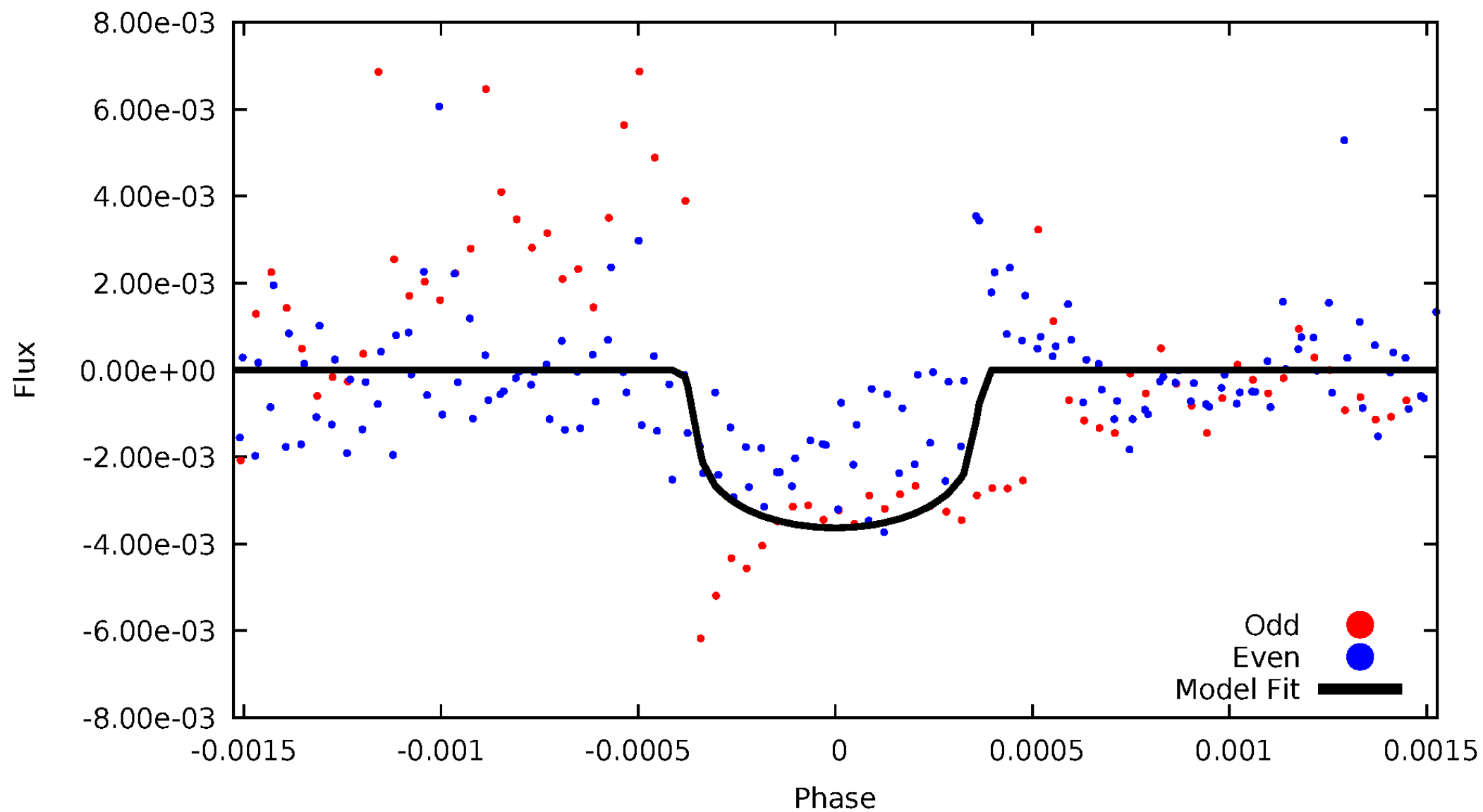


TCE 012258225-03



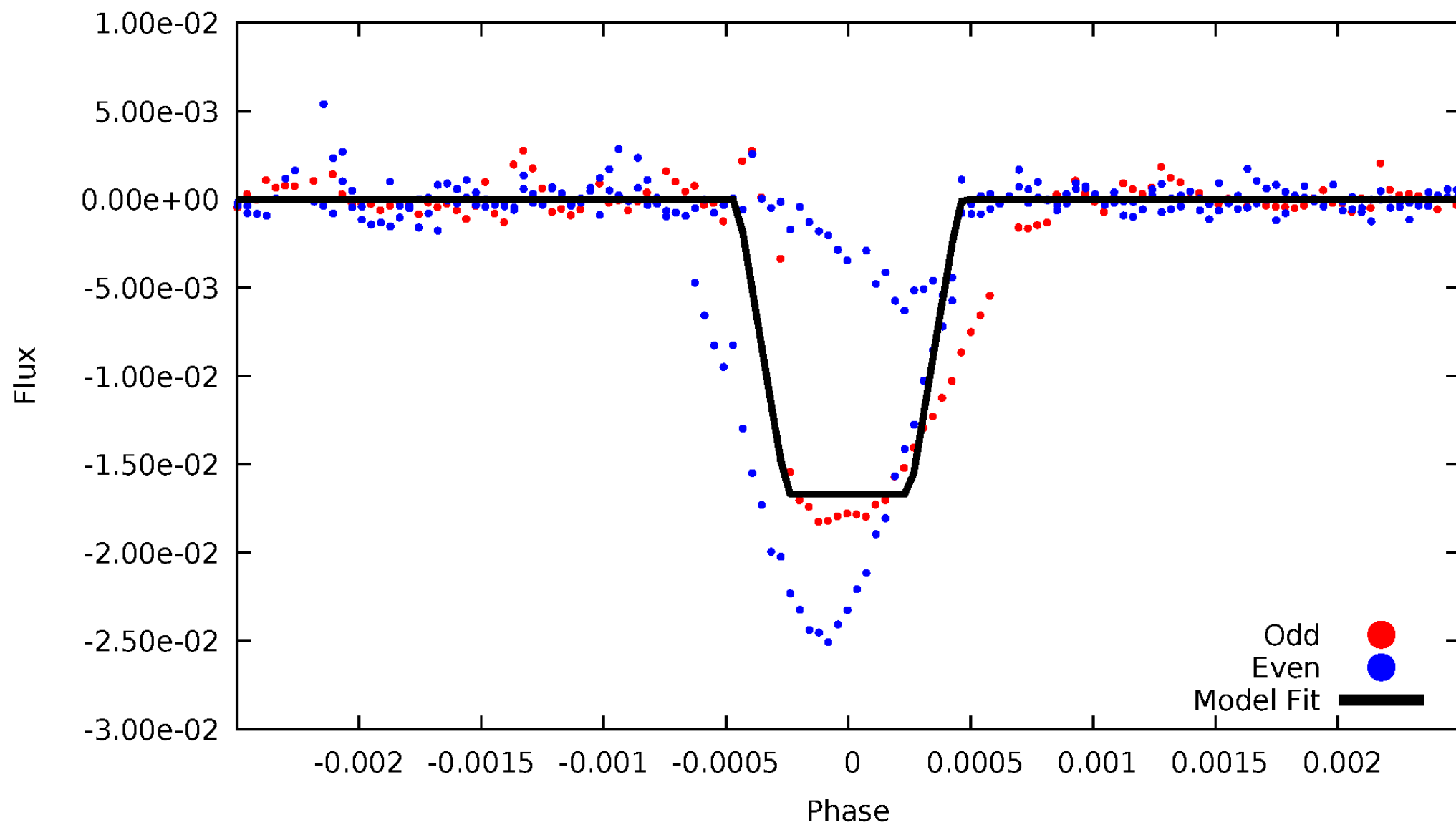
DV Odd/Even

TCE 012258225-03



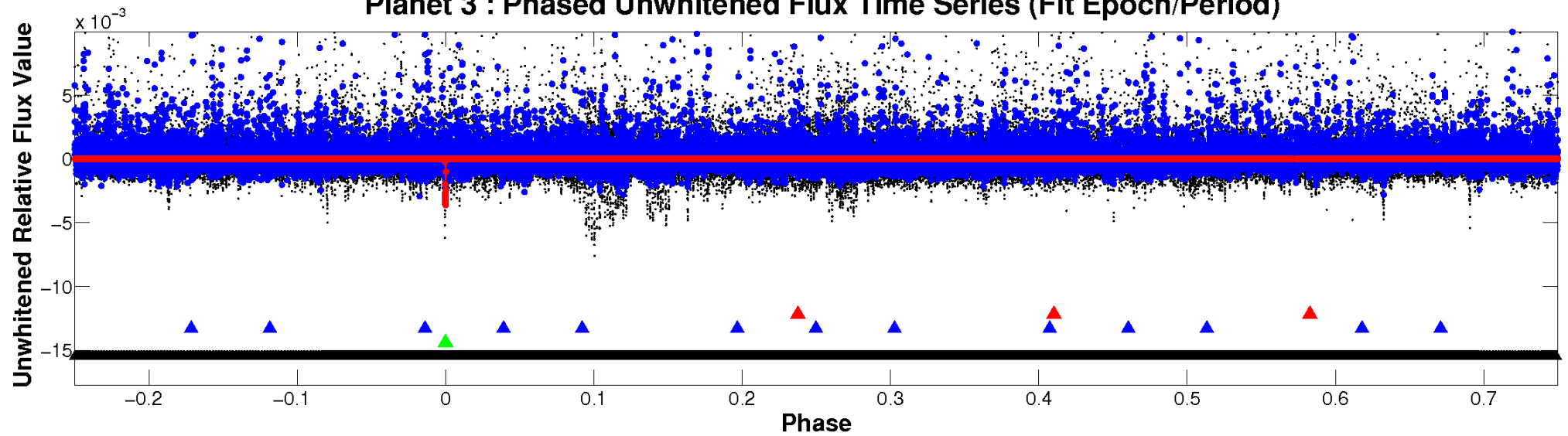
ALT Odd/Even

TCE 012258225-03

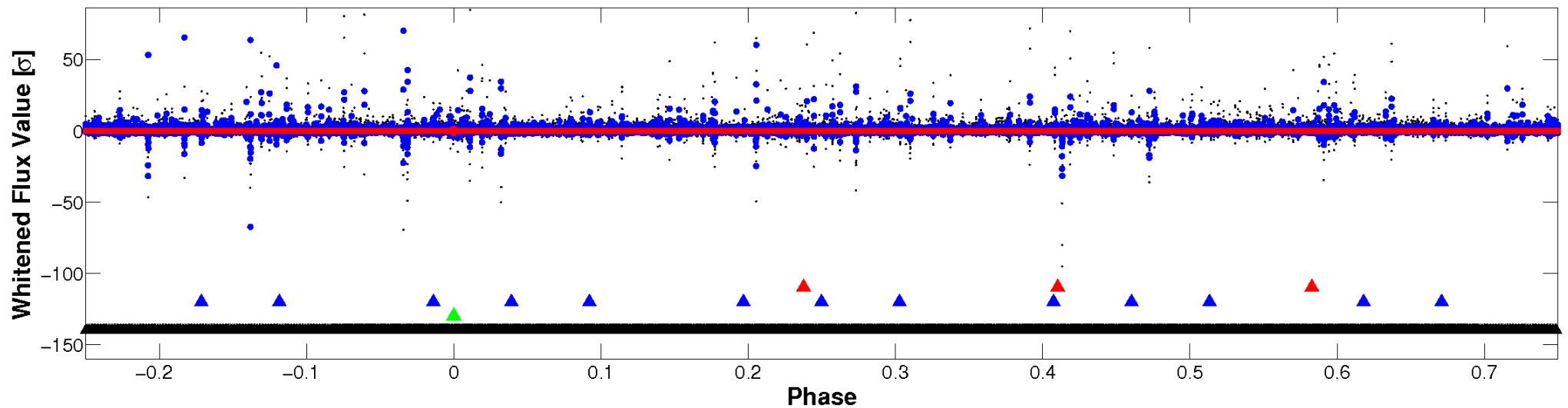


Non-Whitened Vs. Whitened Light Curve

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

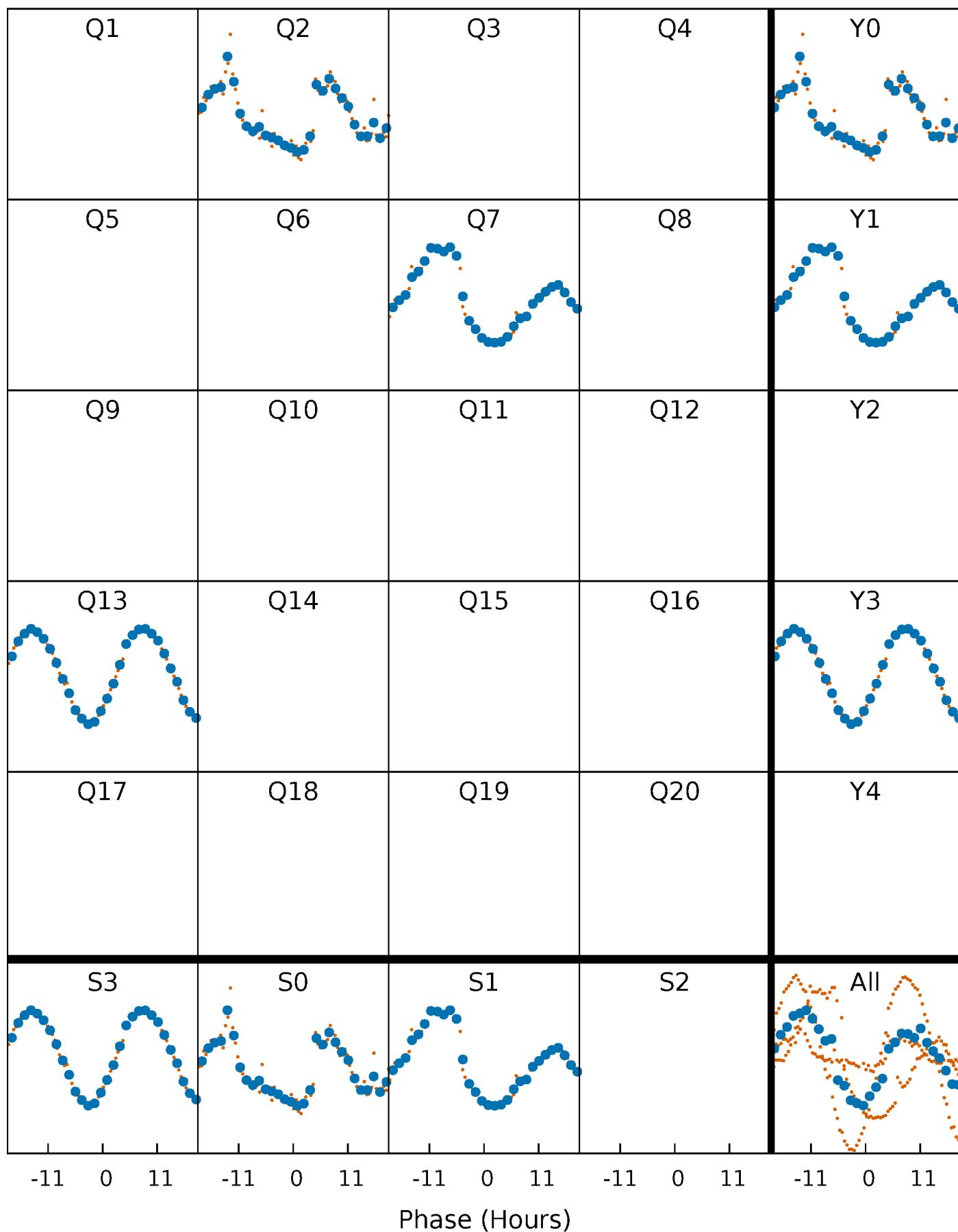


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



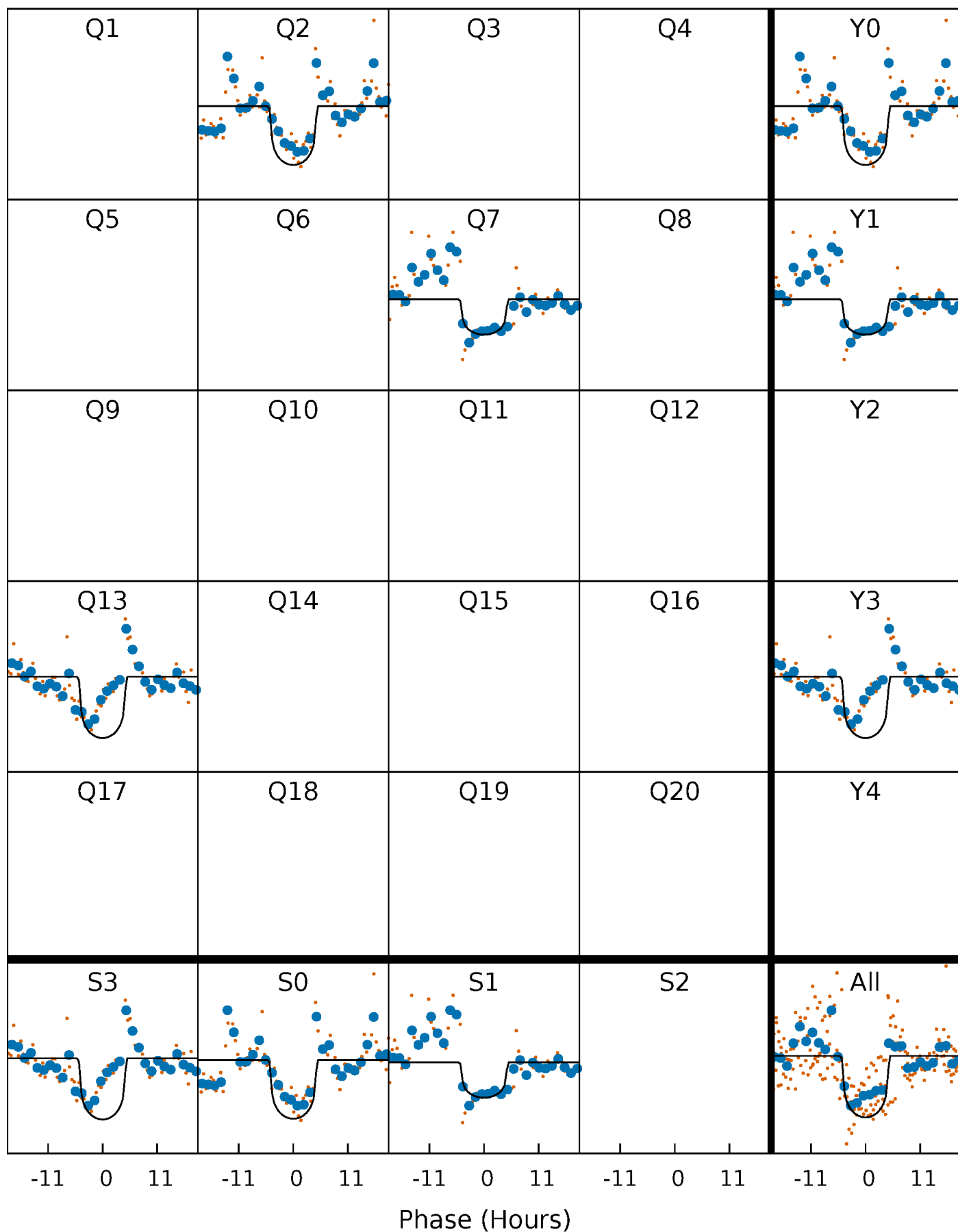
PDC Quarter-Phased Transit Curves

TCE 012258225-03 P=525.058780 Days $T_0=175.155718$ (BKJD)



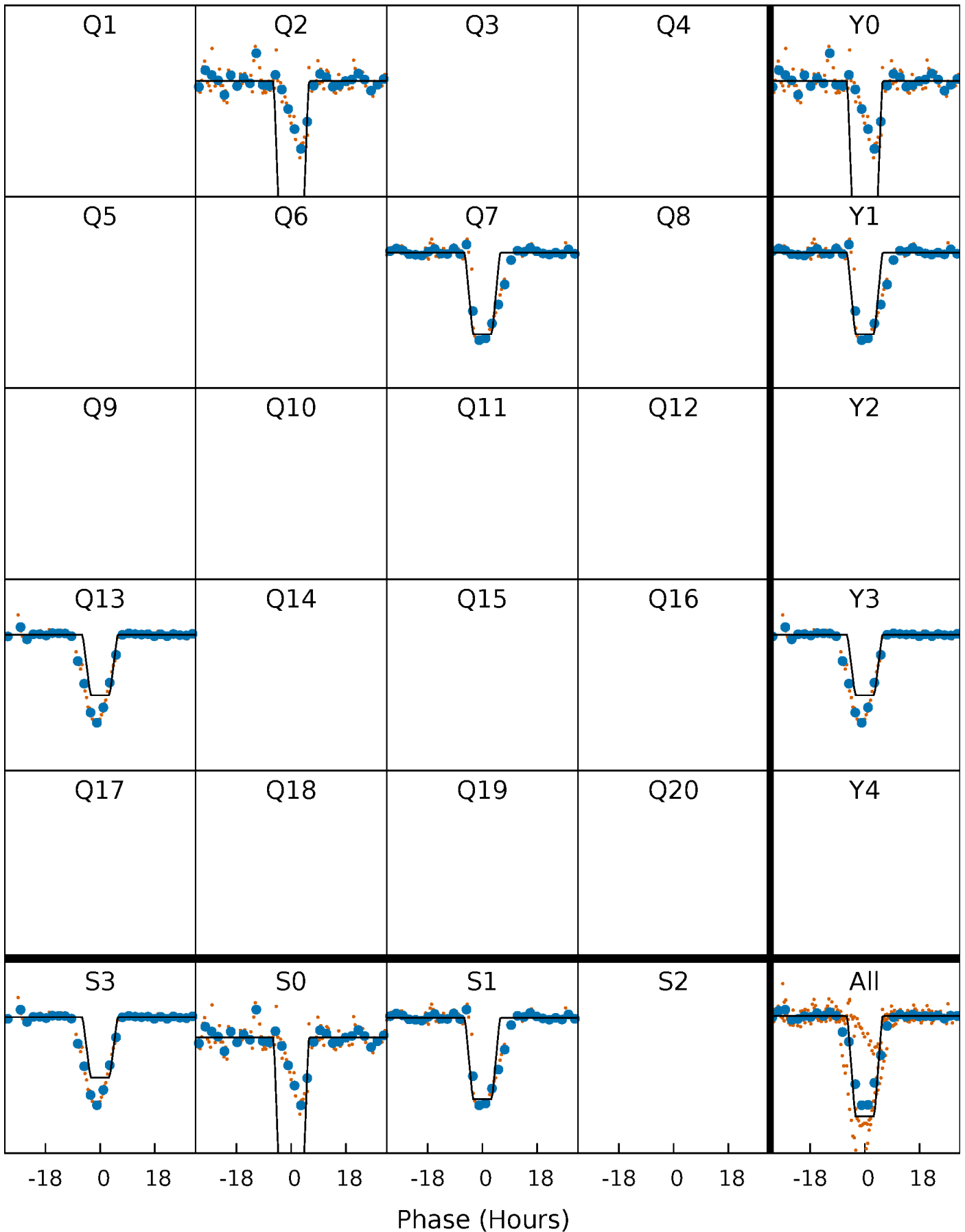
DV Quarter-Phased Transit Curves

TCE 012258225-03 P=525.058780 Days $T_0=175.155718$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

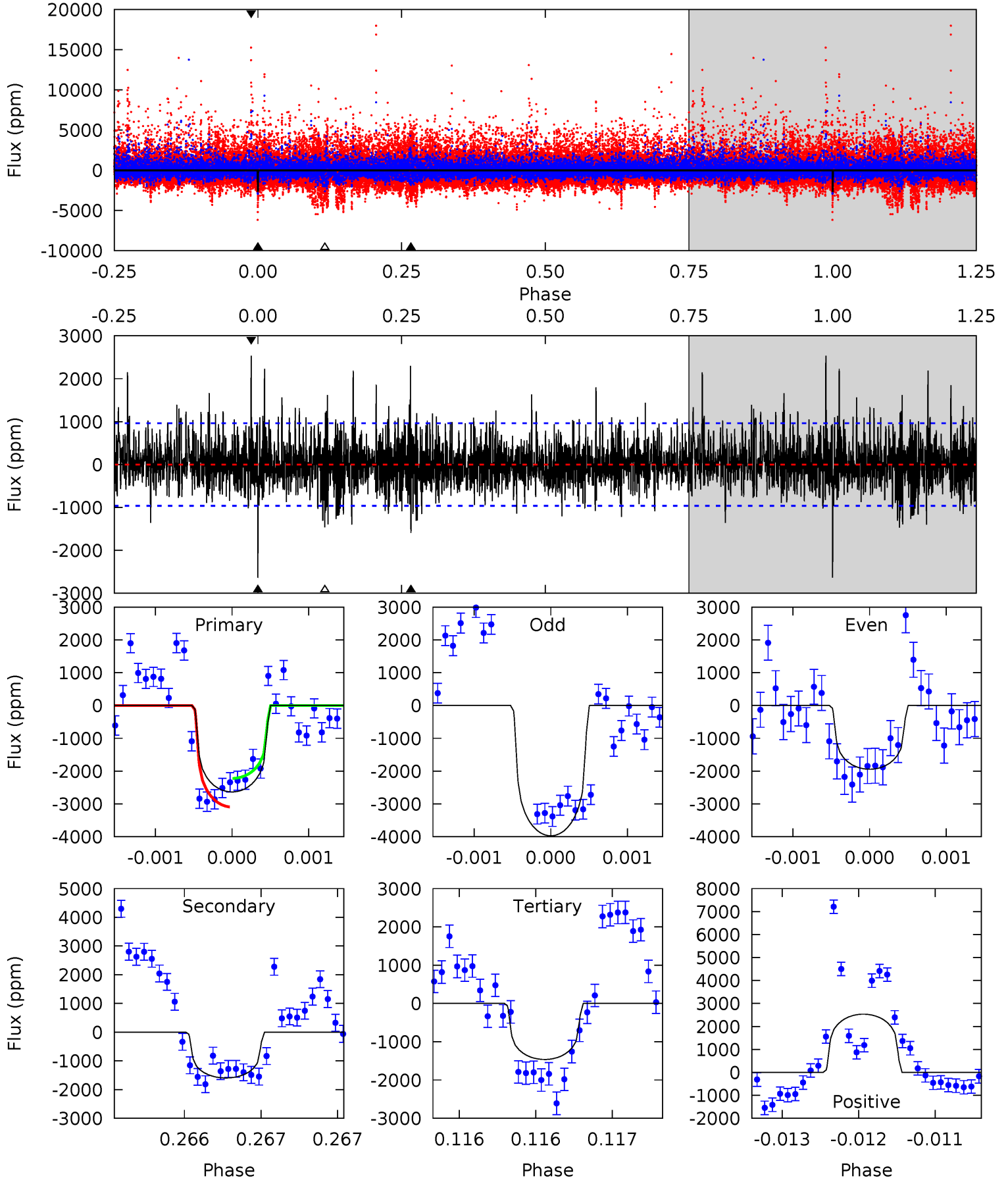
TCE 012258225-03 $P=525.060758$ Days $T_0=175.100037$ (BKJD)



DV Model-Shift Uniqueness Test

012258225-03, P = 525.058780 Days, E = 175.155718 Days

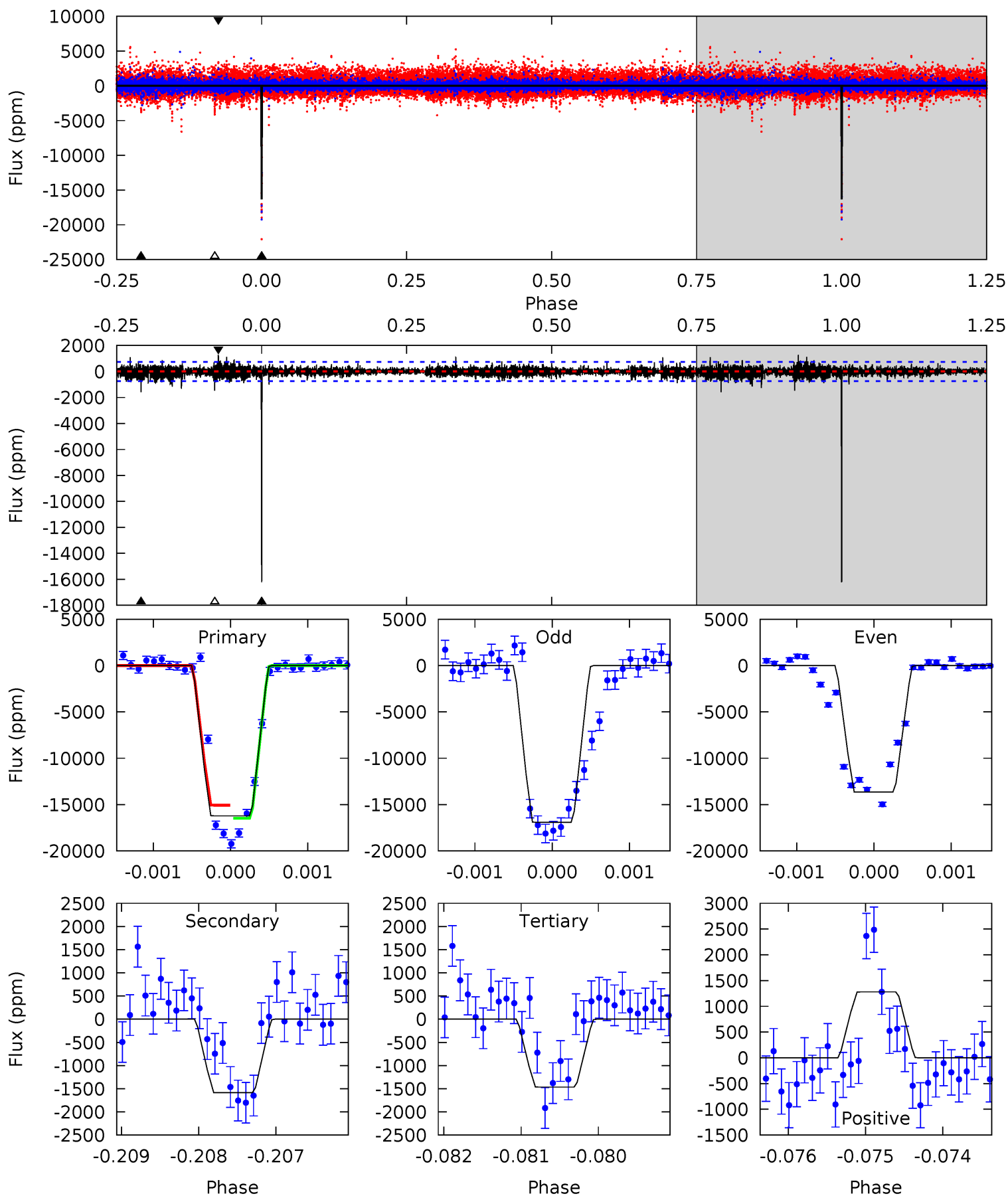
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	9.09	8.34	14.4	5.49	3.36	2.51	6.67	0.58	0.75	-5.34	3.51	1.10	0.49	2.50



Alt Model-Shift Uniqueness Test

012258225-03, P = 525.060758 Days, E = 175.100037 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
119.6	11.7	10.8	9.43	5.46	3.31	1.68	108.8	110.2	0.89	2.26	15.3	0.84	0.07	0



Stellar Parameters For KIC 012258225

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3849^{+50}_{-50}	$4.703^{+0.032}_{-0.012}$	$0.000^{+0.100}_{-0.100}$	$0.546^{+0.017}_{-0.026}$	$0.549^{+0.025}_{-0.020}$	$4.743^{+0.555}_{-0.297}$
	+1%/-1%	+1%/-0%	+inf%/-inf%	+3%/-5%	+5%/-4%	+12%/-6%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 012258225-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1596 ± 176	$3.20^{+0.88}_{-0.83}$	171^{+3}_{-3}	3493^{+355}_{-265}	95764^{+73880}_{-39366}
Alt.	-1586 ± 136	$7.65^{+0.83}_{-0.84}$	171^{+3}_{-3}	2714^{+93}_{-84}	16393^{+4748}_{-3352}

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

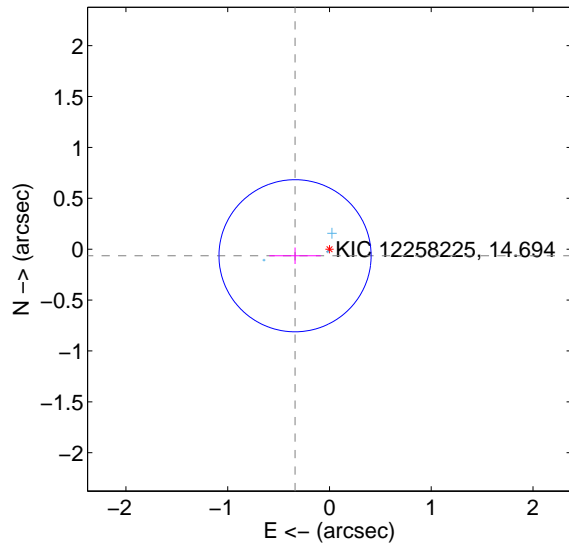
Supplemental centroid analysis for 012258225-03. Kepler magnitude: 14.69. Transit SNR 9.14

There are 3 quarters with good PRF difference image offsets

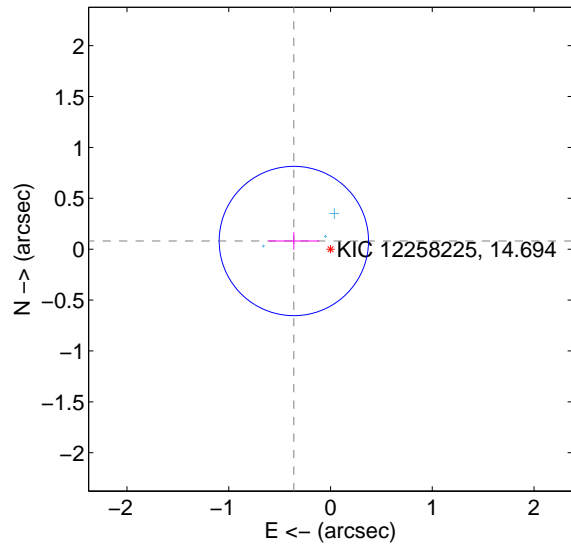
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.344 ± 0.249	1.38	0.338 ± 0.253	-0.065 ± 0.081
PRF-fit source offset from KIC position	0.369 ± 0.245	1.51	0.360 ± 0.250	0.080 ± 0.086
photometric centroid source offset	1.16 ± 0.27	4.25	0.75 ± 0.30	0.89 ± 0.25

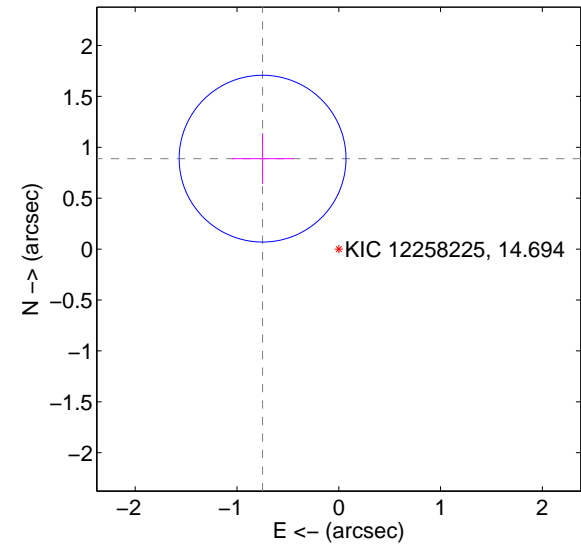
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

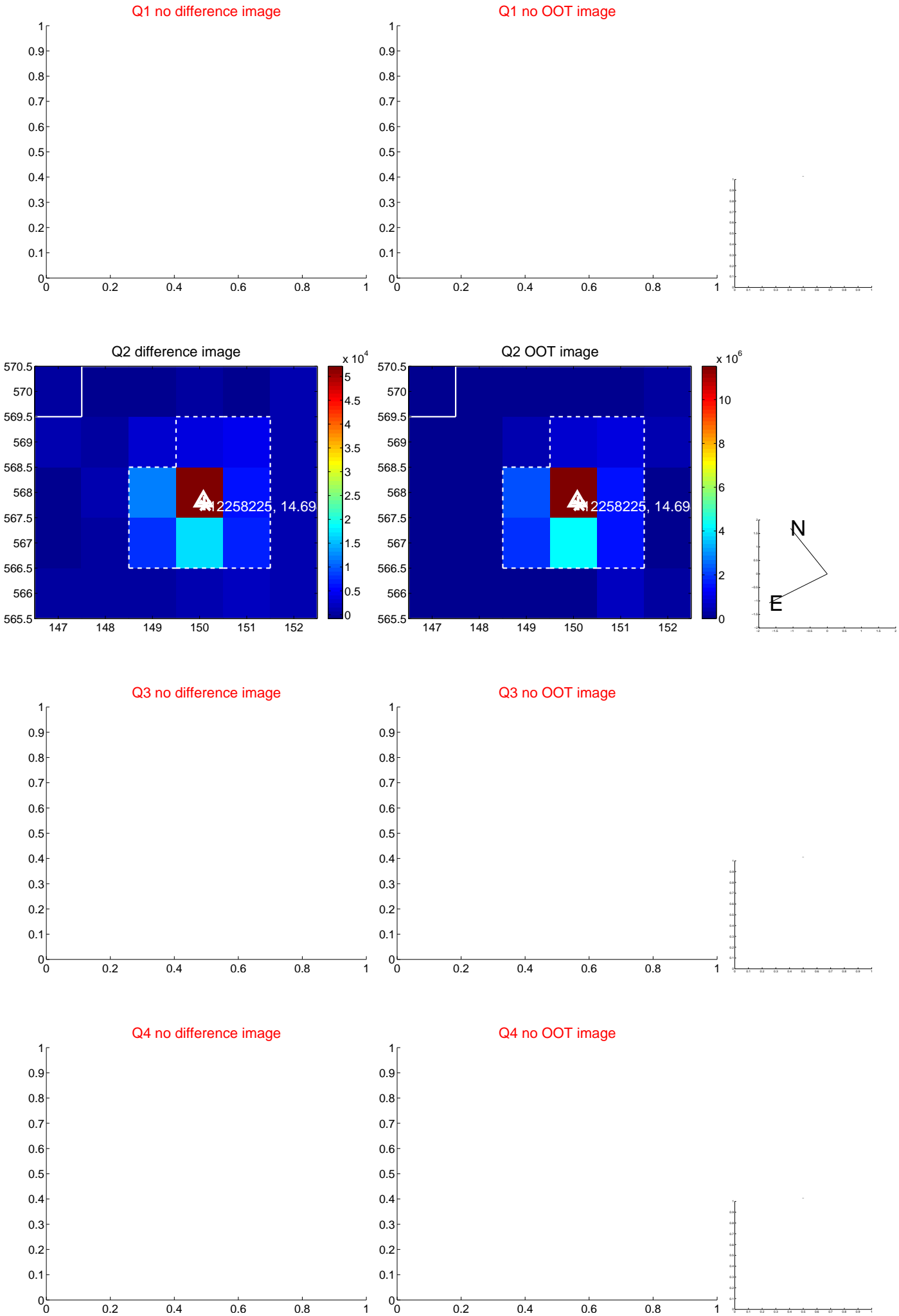


offset from photometric centroids



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



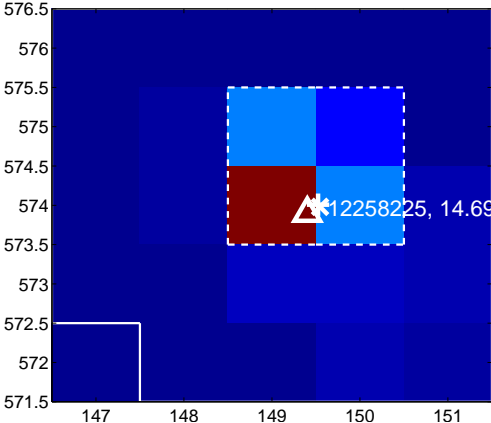
Q6 no difference image



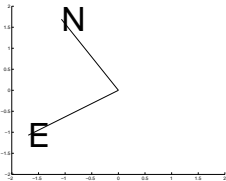
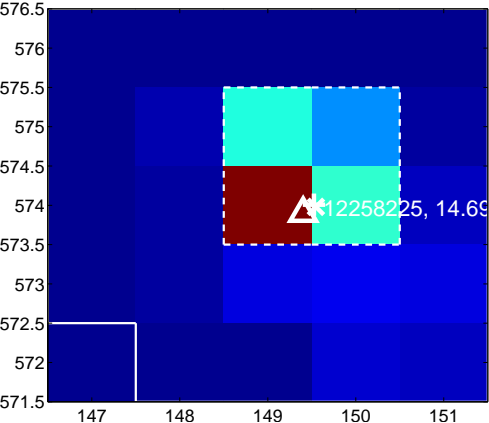
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image



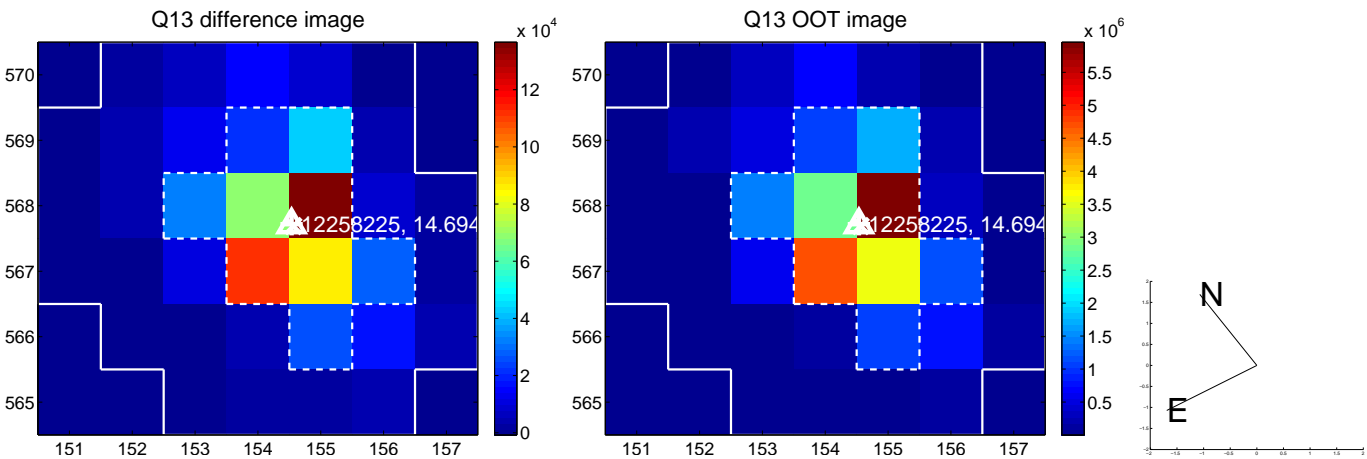
Q8 no OOT image



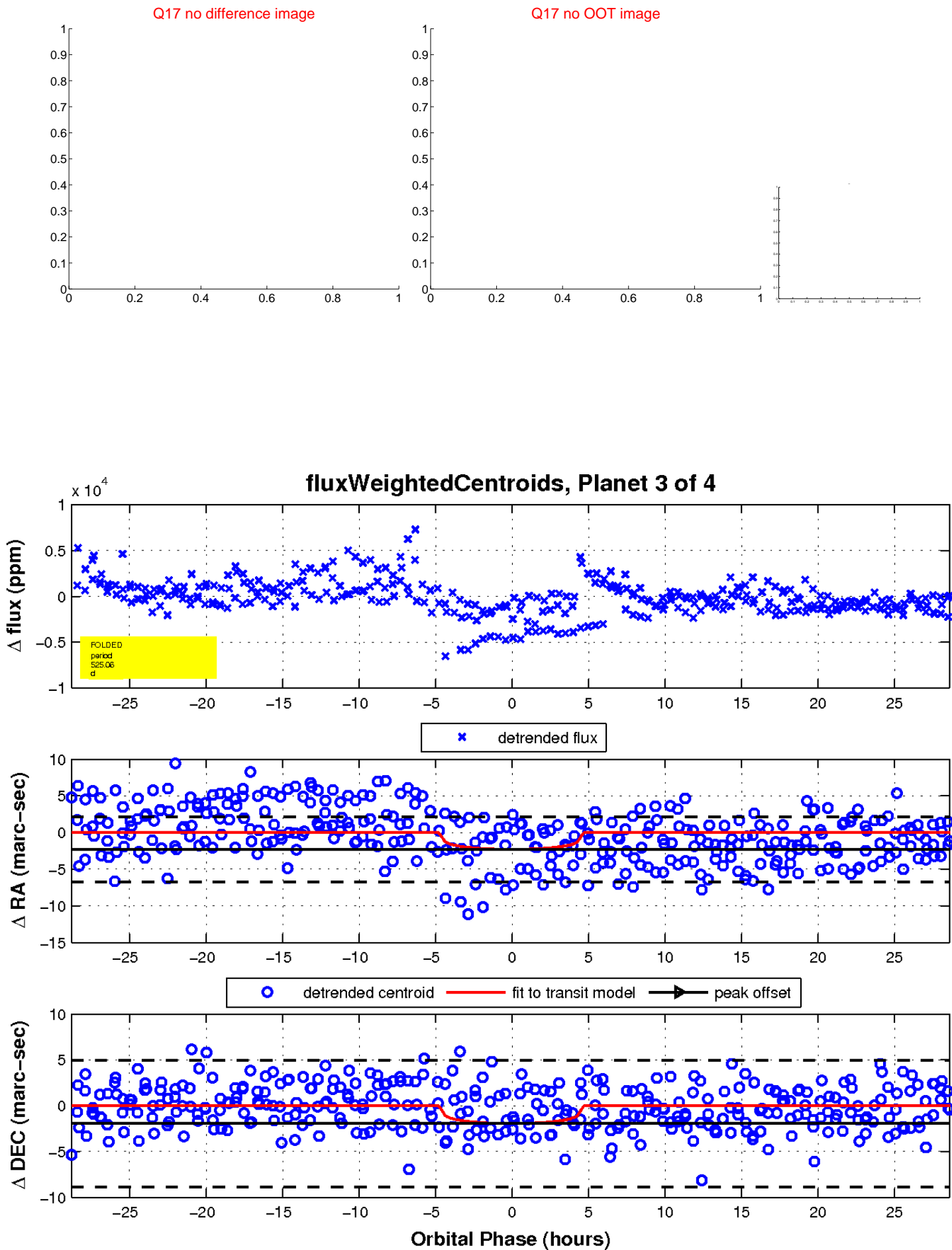
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

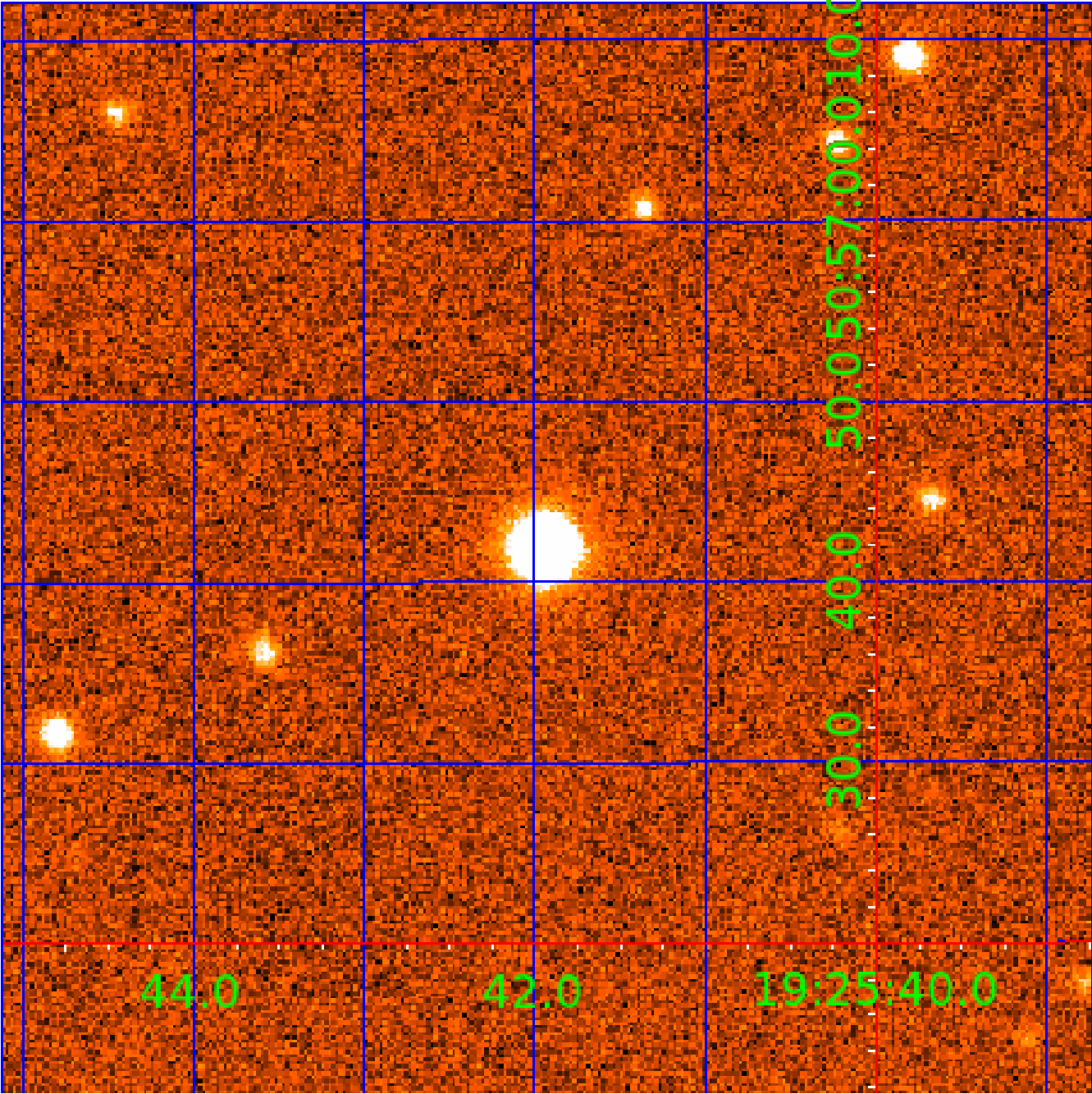


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 012258225

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})
012258225-01	OBS	No	615.694066	299.907904	2401.1	5.157	10.9	6.2	0.55	3849	2.75	0.04
012258225-02	OBS	No	110.576544	167.895072	605.2	1.586	11.4	2.9	0.55	3849	1.43	0.43
012258225-03	OBS	No	525.058780	175.155718	3629.1	9.618	14.1	9.1	0.55	3849	3.22	0.05
012258225-04	OBS	No	1.014317	131.850416	175.3	2.009	10.6	9.8	0.55	3849	0.88	223.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258225-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
012258225-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
012258225-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
012258225-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_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.

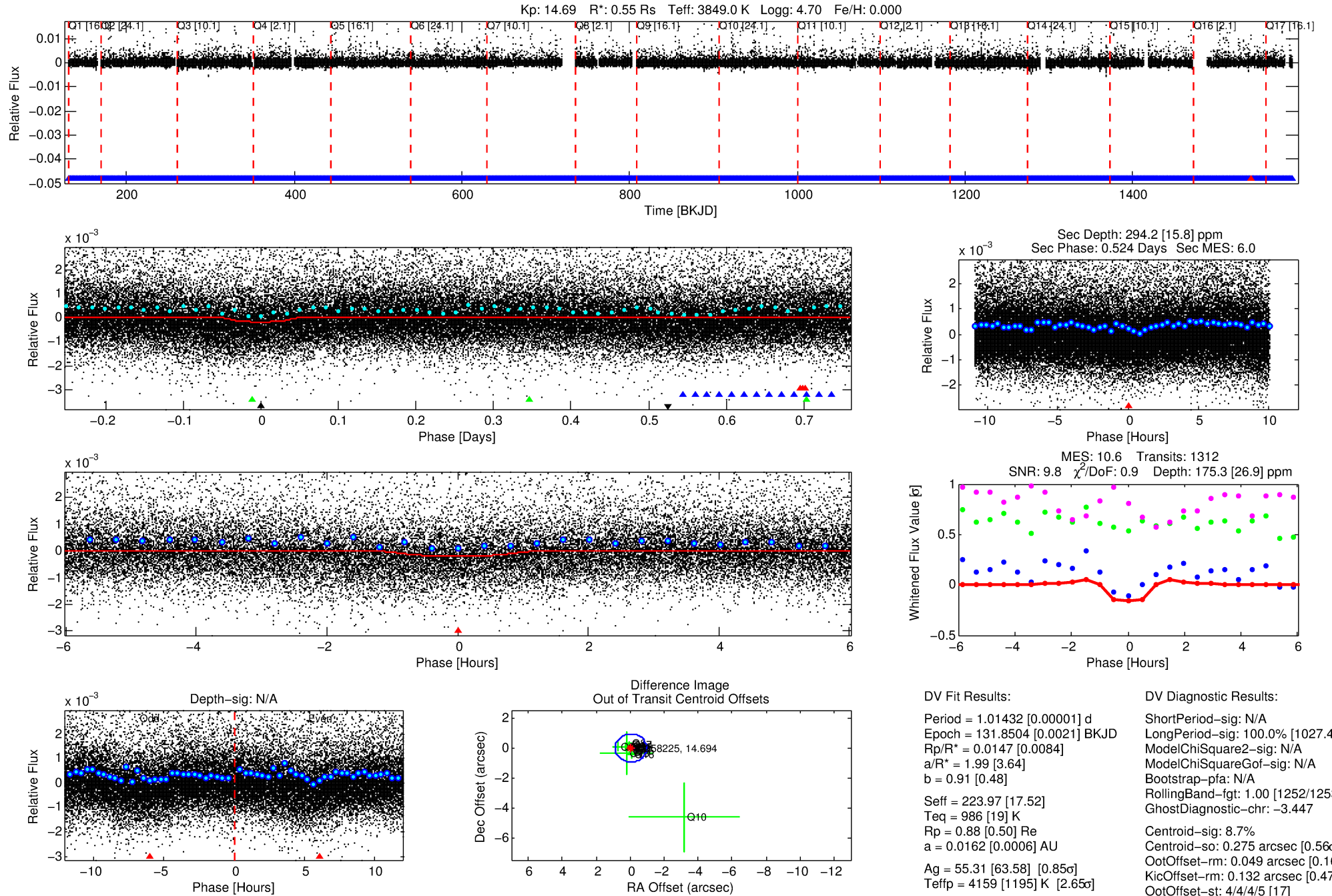
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012258225-04

No Significant Match Found

DV One-Page Summary

KIC: 12258225 Candidate: 4 of 4 Period: 1.014 d



DV Fit Results:

Period = 1.01432 [0.00001] d
Epoch = 131.8504 [0.0021] BKJD
Rp/R* = 0.0147 [0.0084]
a/R* = 1.99 [3.64]
b = 0.91 [0.48]
Seff = 223.97 [17.52]
Teff = 986 [19] K
Rp = 0.88 [0.50] Re
a = 0.0162 [0.0006] AU
Ag = 55.31 [63.58] [0.85σ]
Teffp = 4159 [1195] K [2.65σ]

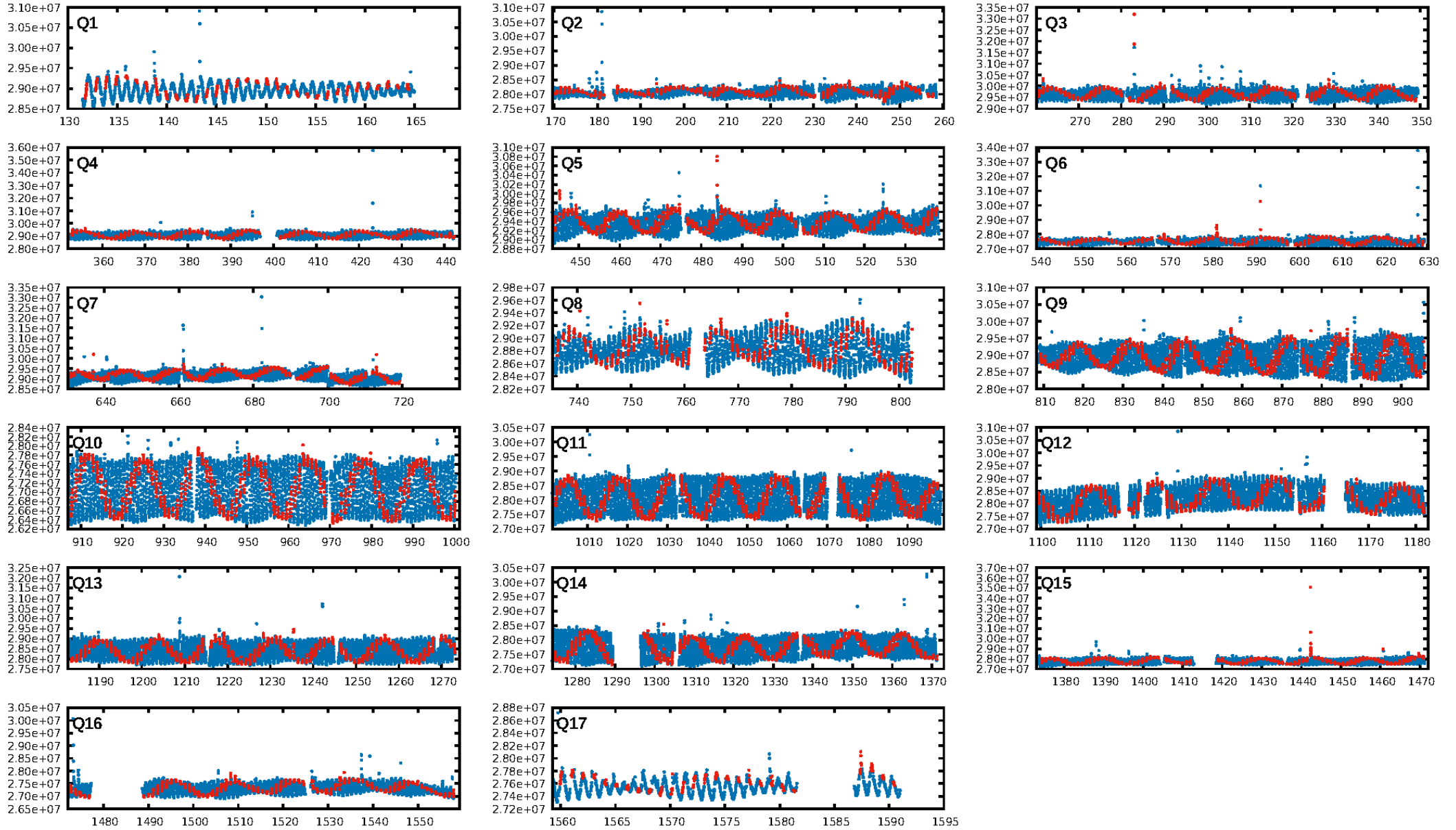
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1027.42σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1252/1253]
GhostDiagnostic-chr: -3.447
Centroid-sig: 8.7%
Centroid-so: 0.275 arcsec [0.56σ]
OotOffset-rm: 0.049 arcsec [0.16σ]
KicOffset-rm: 0.132 arcsec [0.47σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.24 [4/17]
DiffImageOverlap-fno: 1.00 [17/17]

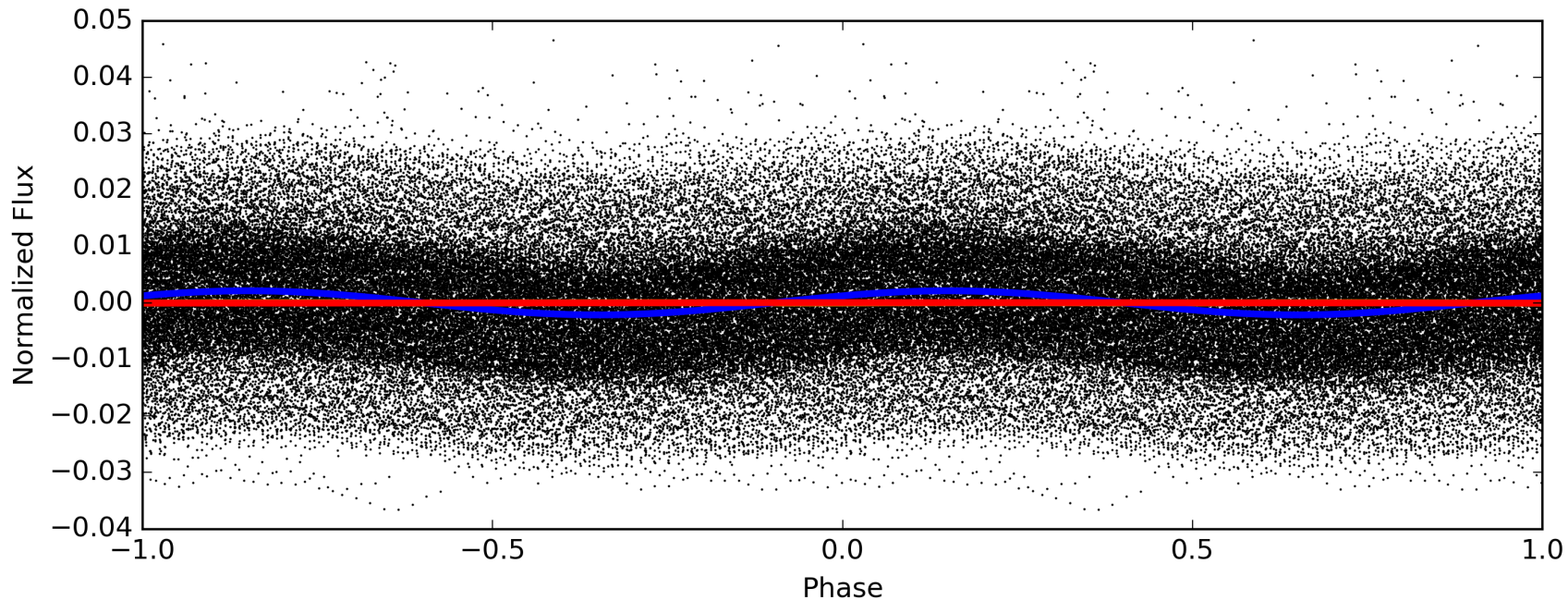
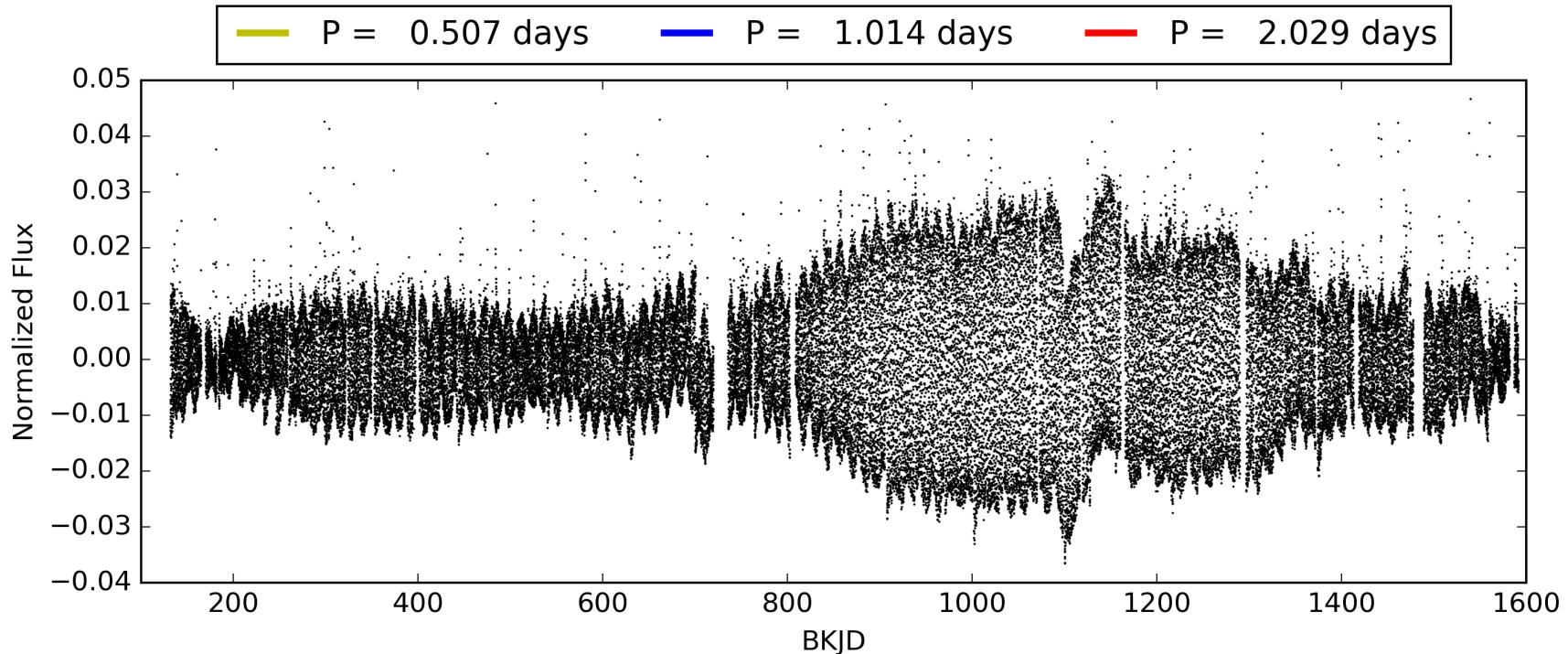
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 012258225-04, PDC Light Curves

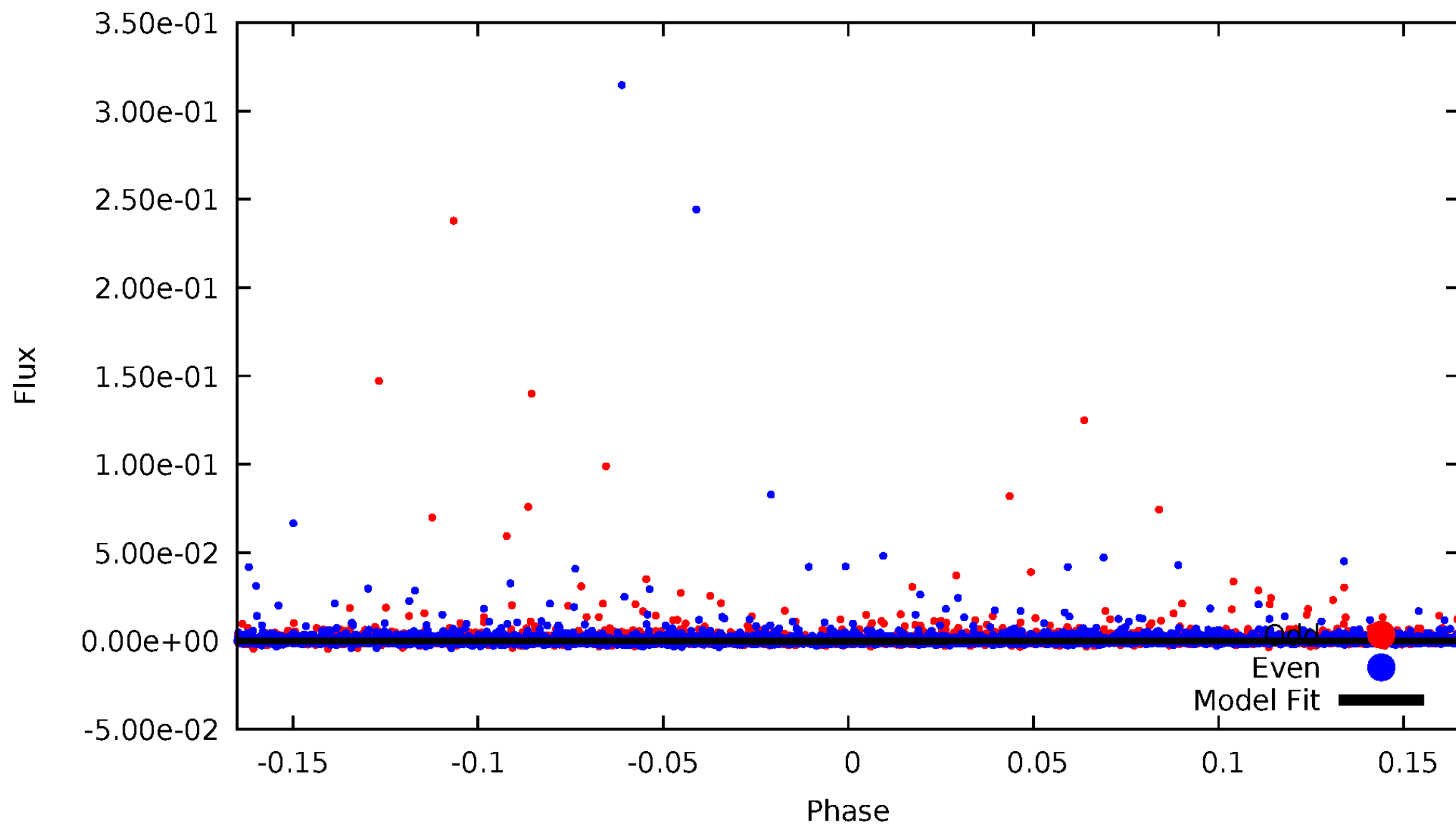


TCE 012258225-04



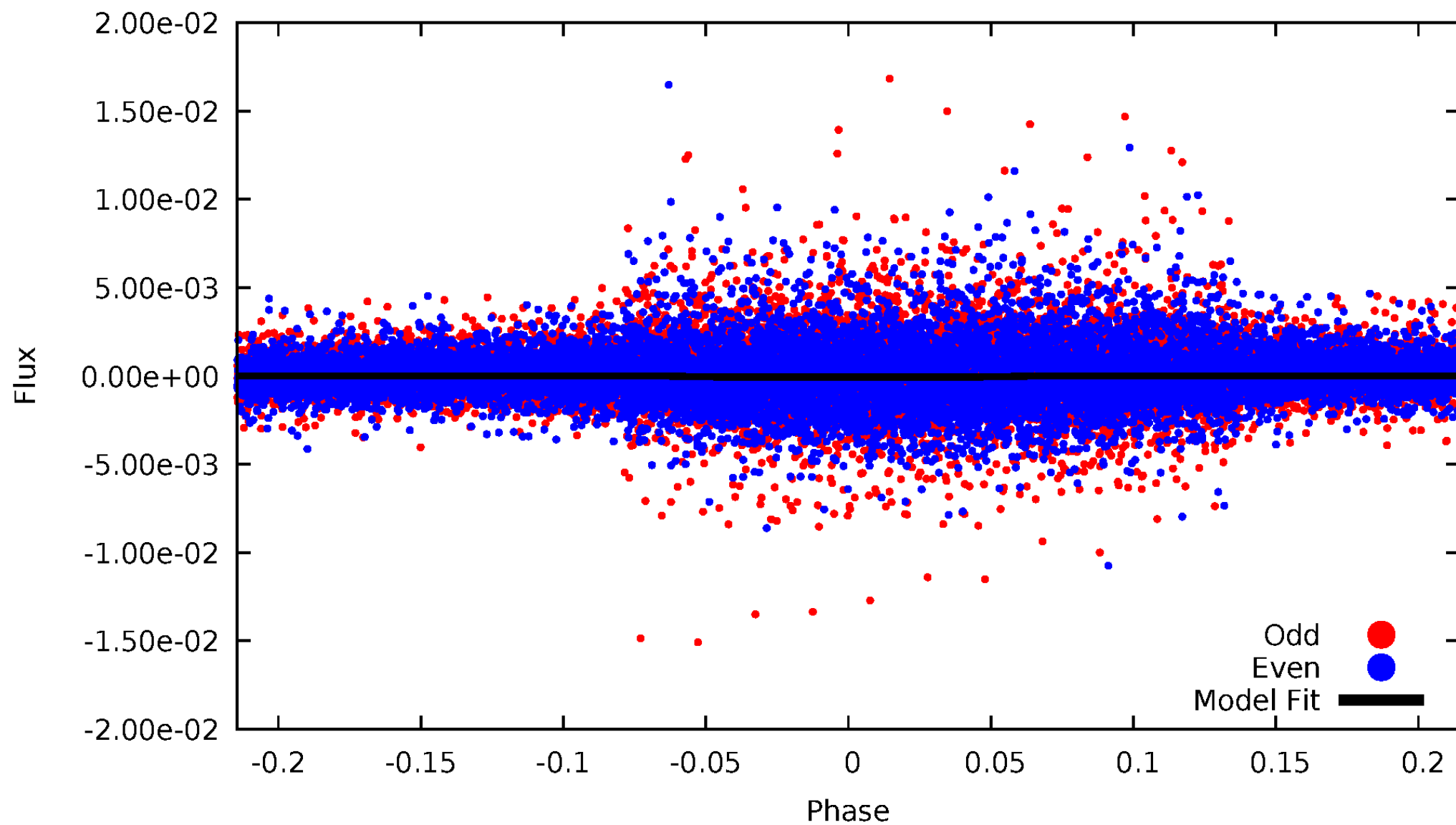
DV Odd/Even

TCE 012258225-04



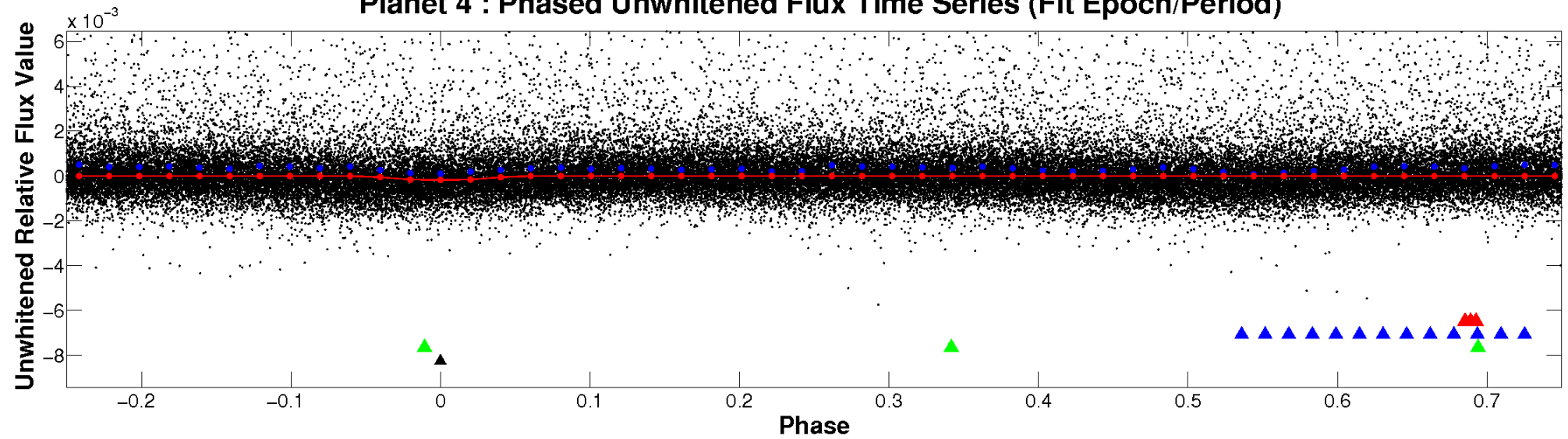
ALT Odd/Even

TCE 012258225-04

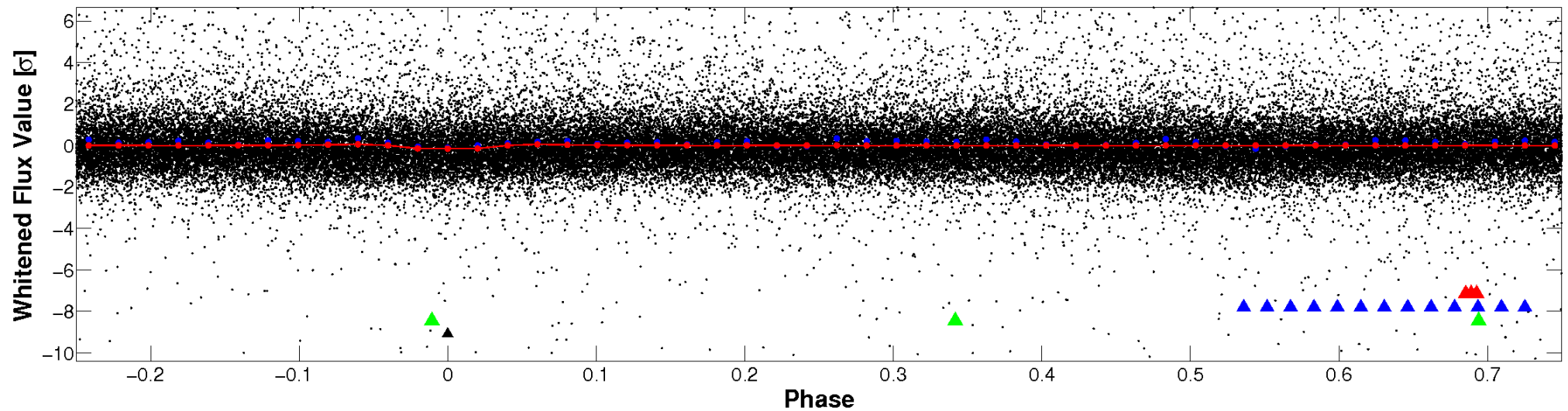


Non-Whitened Vs. Whitened Light Curve

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

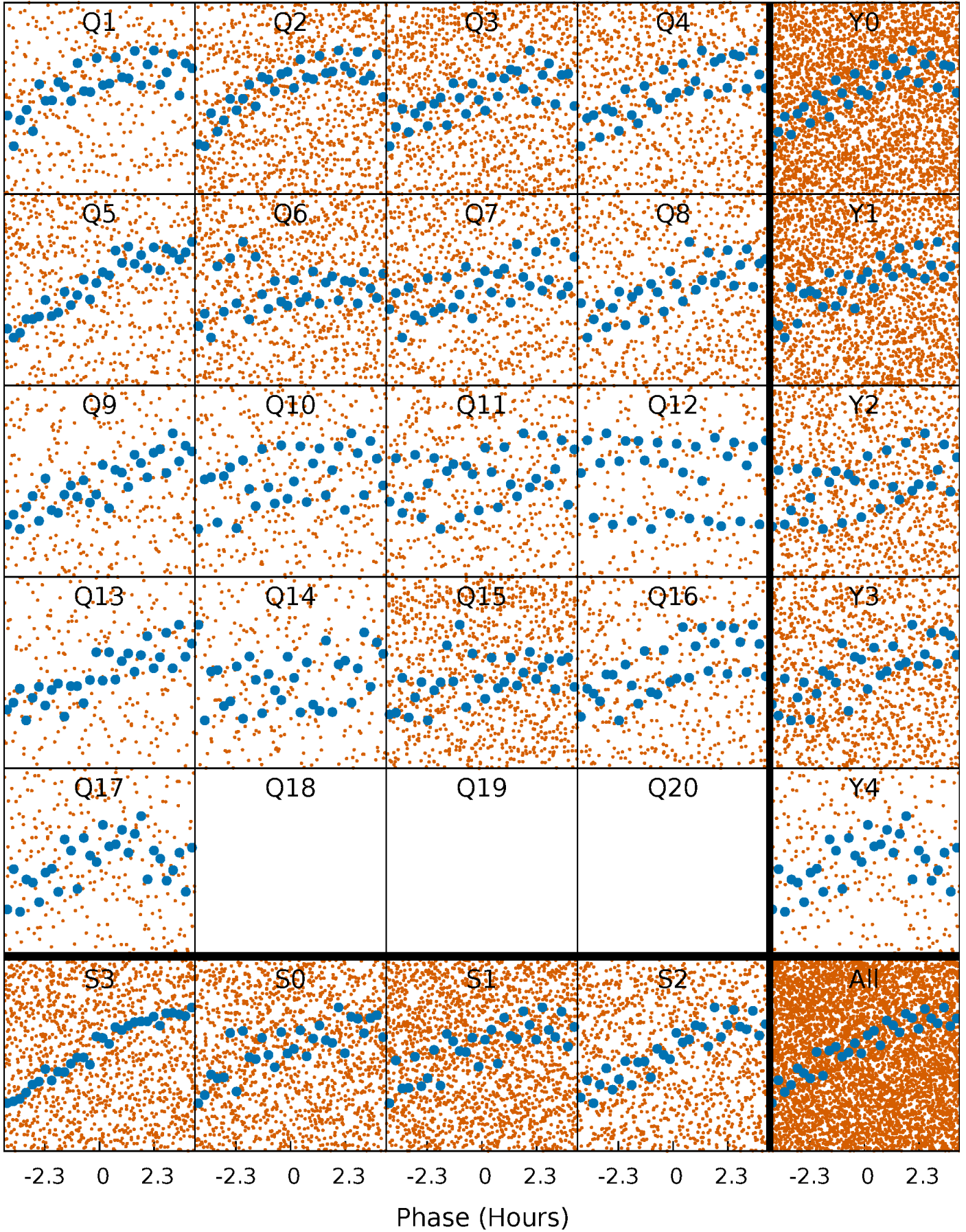


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



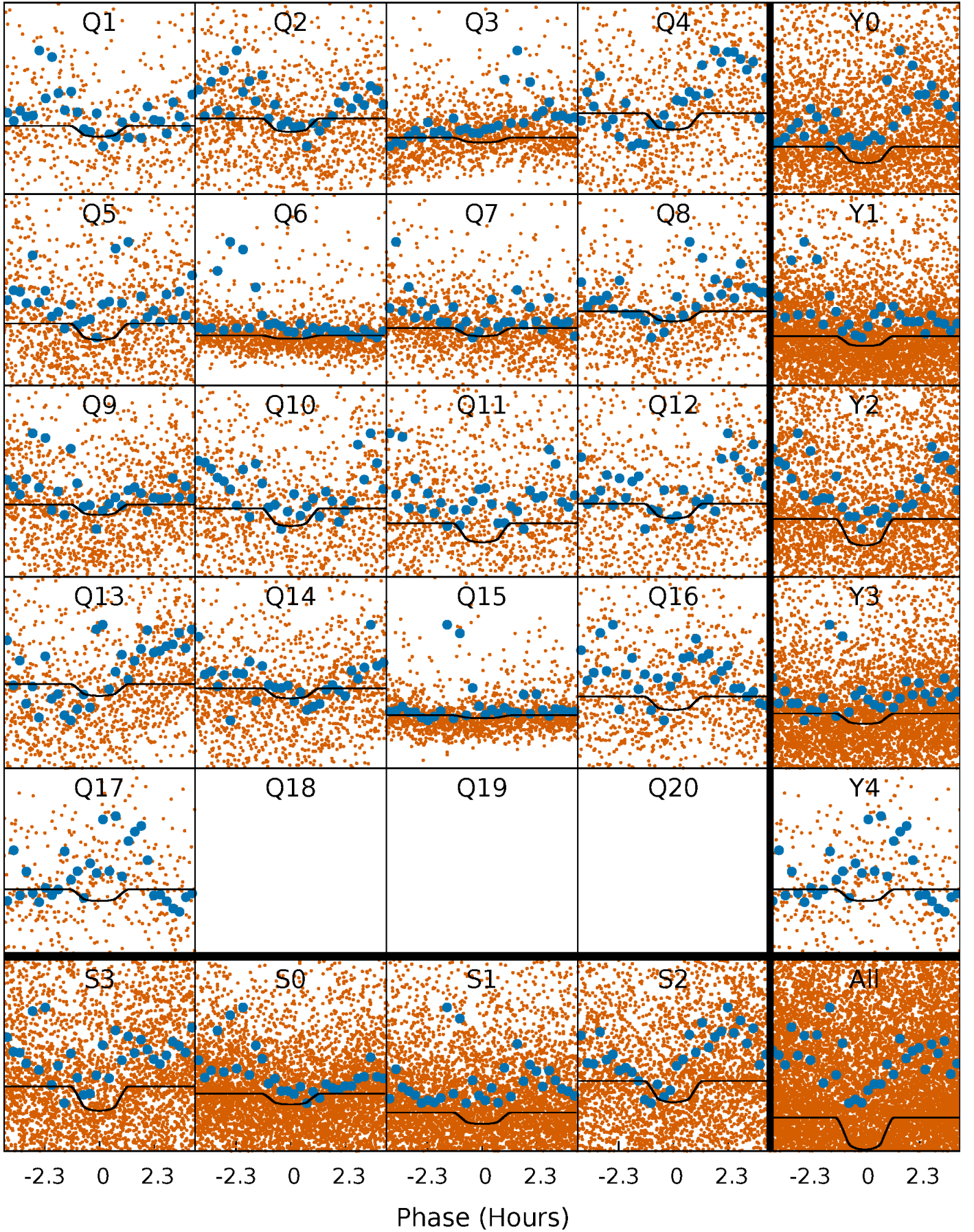
PDC Quarter-Phased Transit Curves

TCE 012258225-04 P= 1.014317 Days $T_0=131.850416$ (BKJD)



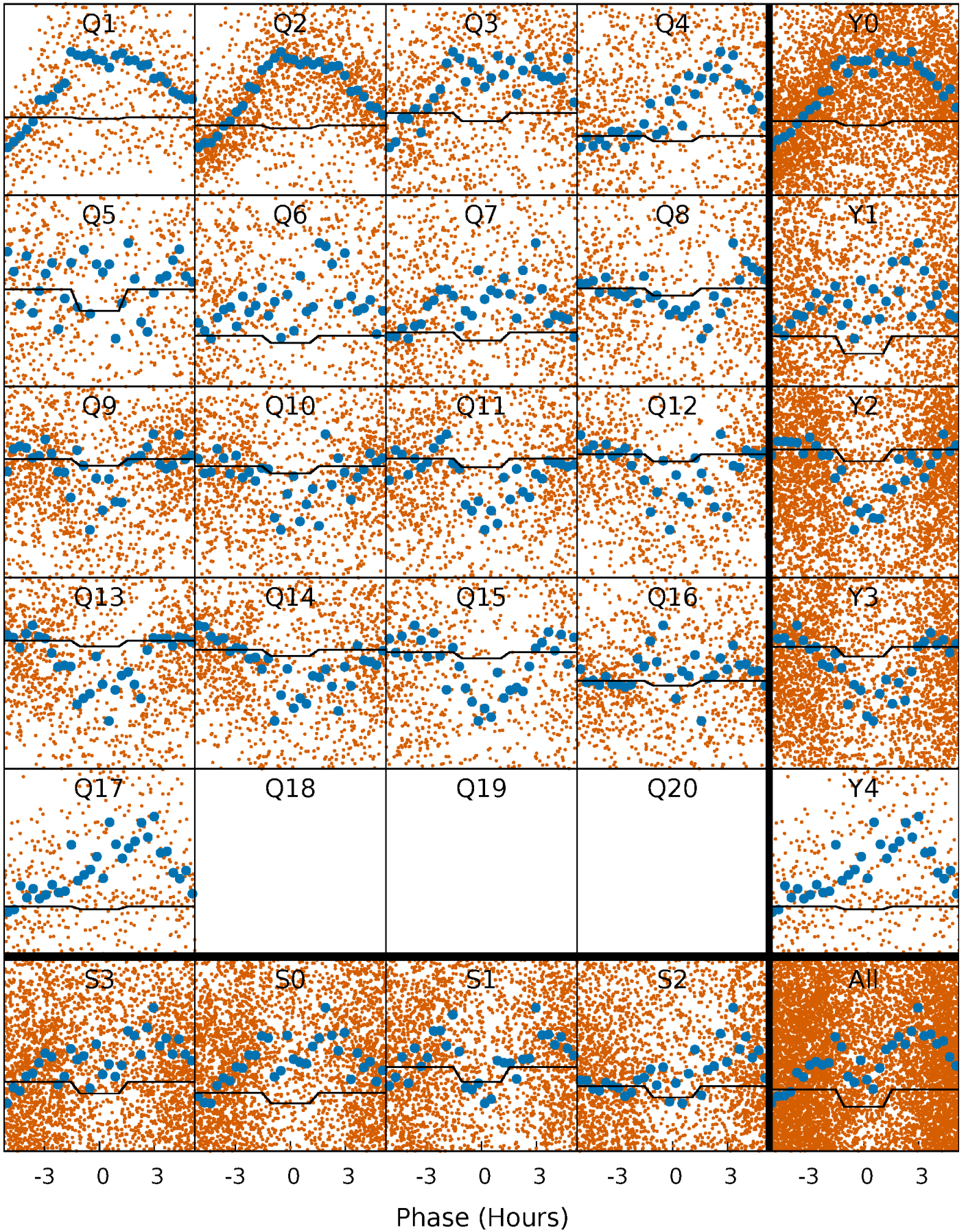
DV Quarter-Phased Transit Curves

TCE 012258225-04 P= 1.014317 Days $T_0=131.850416$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

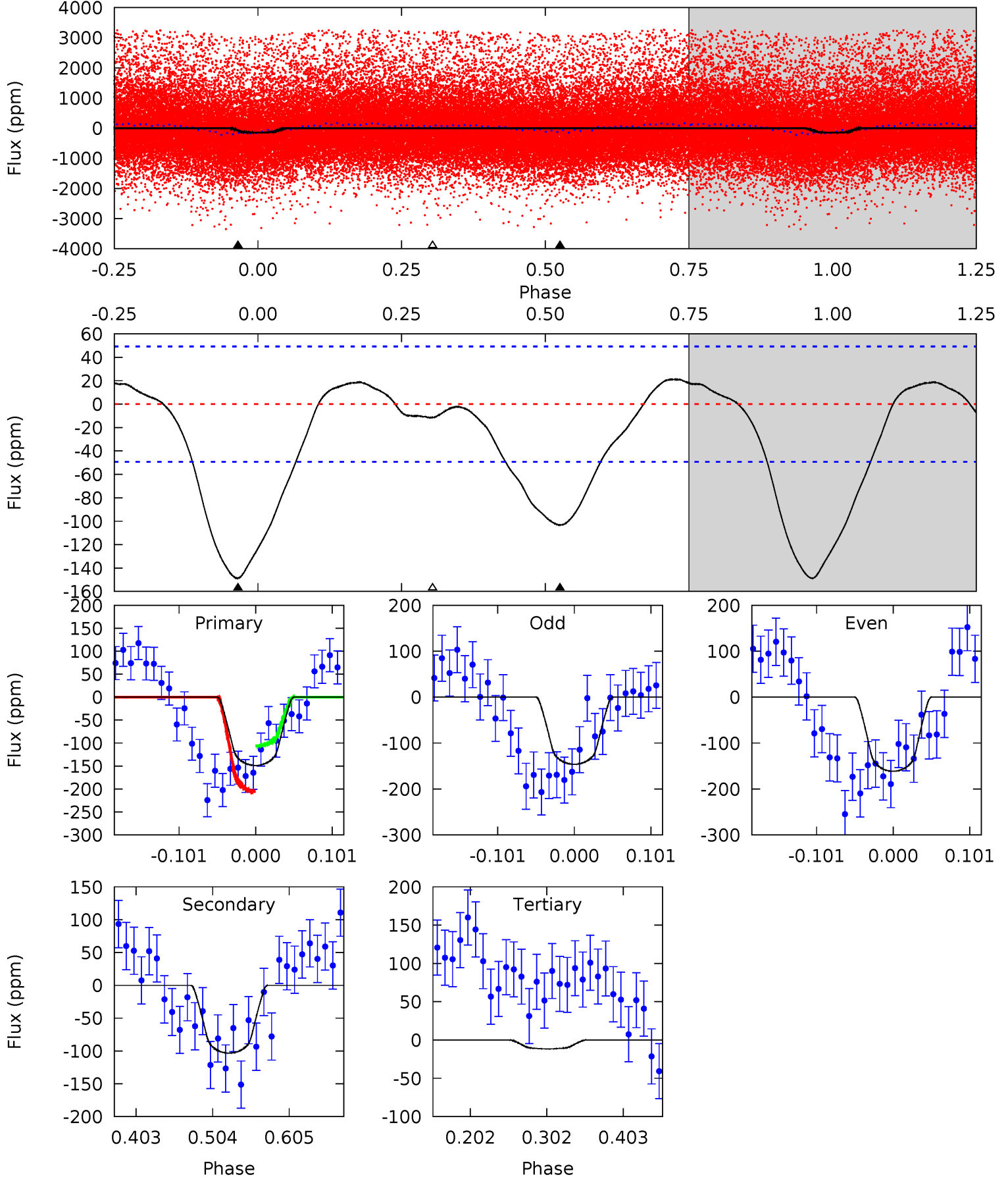
TCE 012258225-04 P= 1.014269 Days $T_0=131.830425$ (BKJD)



DV Model-Shift Uniqueness Test

012258225-04, P = 1.014317 Days, E = 130.836099 Days

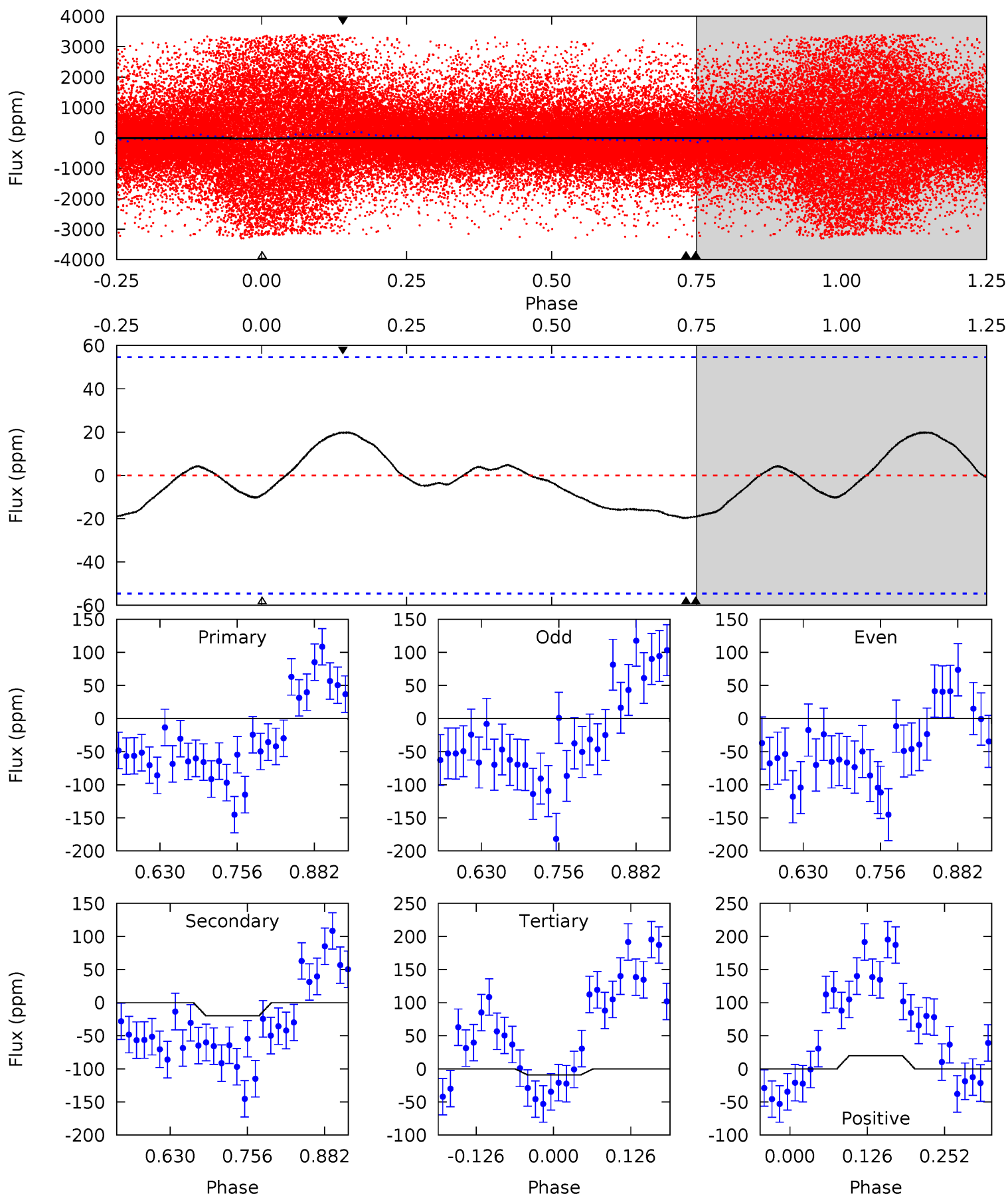
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	9.58	1.07	0	4.56	1.64	1.48	12.7	13.8	8.51	9.58	0.71	-1.37	0.12	4.67



Alt Model-Shift Uniqueness Test

012258225-04, P = 1.014269 Days, E = 130.816156 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.58	1.63	0.75	1.64	4.52	1.53	0.74	0.83	-0.06	0.88	-0.01	2.17	1.23	0.50	1.63



Stellar Parameters For KIC 012258225

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3849^{+50}_{-50}	$4.703^{+0.032}_{-0.012}$	$0.000^{+0.100}_{-0.100}$	$0.546^{+0.017}_{-0.026}$	$0.549^{+0.025}_{-0.020}$	$4.743^{+0.555}_{-0.297}$
	+1%/-1%	+1%/-0%	+inf%/-inf%	+3%/-5%	+5%/-4%	+12%/-6%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 012258225-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-103 ± 11	$0.89^{+0.51}_{-0.46}$	1371^{+22}_{-21}	3374^{+911}_{-427}	19^{+59}_{-11}
Alt.	-20 ± 12	$0.59^{+0.47}_{-0.36}$	1374^{+20}_{-23}	2919^{+1055}_{-518}	$6.893^{+44.424}_{-5.103}$

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 $A_{\text{obs}} \gg 1.0$

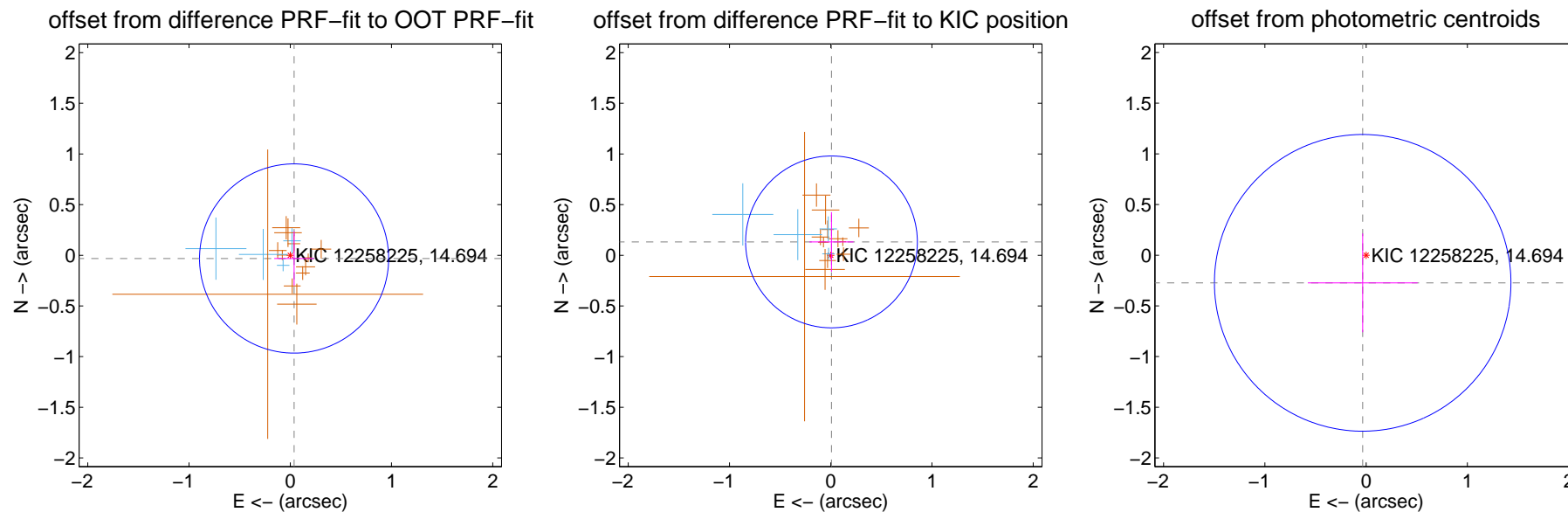
DV Centroid Data

Supplemental centroid analysis for 012258225-04. Kepler magnitude: 14.69. Transit SNR 9.76

There are 4 quarters with good PRF difference image offsets

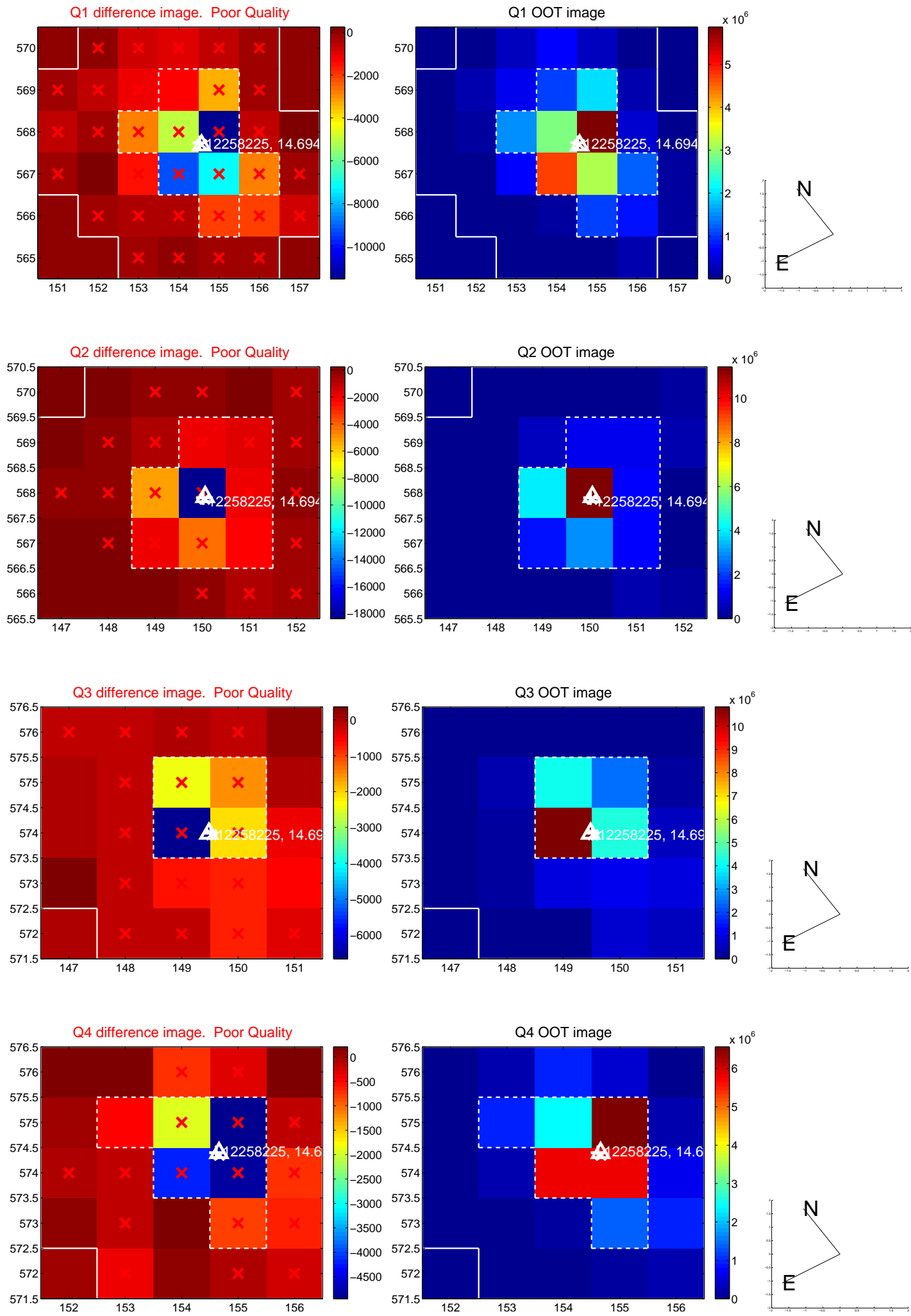
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.049 ± 0.311	0.16	-0.038 ± 0.196	-0.032 ± 0.267
PRF-fit source offset from KIC position	0.132 ± 0.283	0.47	-0.008 ± 0.218	0.132 ± 0.294
photometric centroid source offset	0.27 ± 0.49	0.56	0.03 ± 0.54	-0.27 ± 0.49

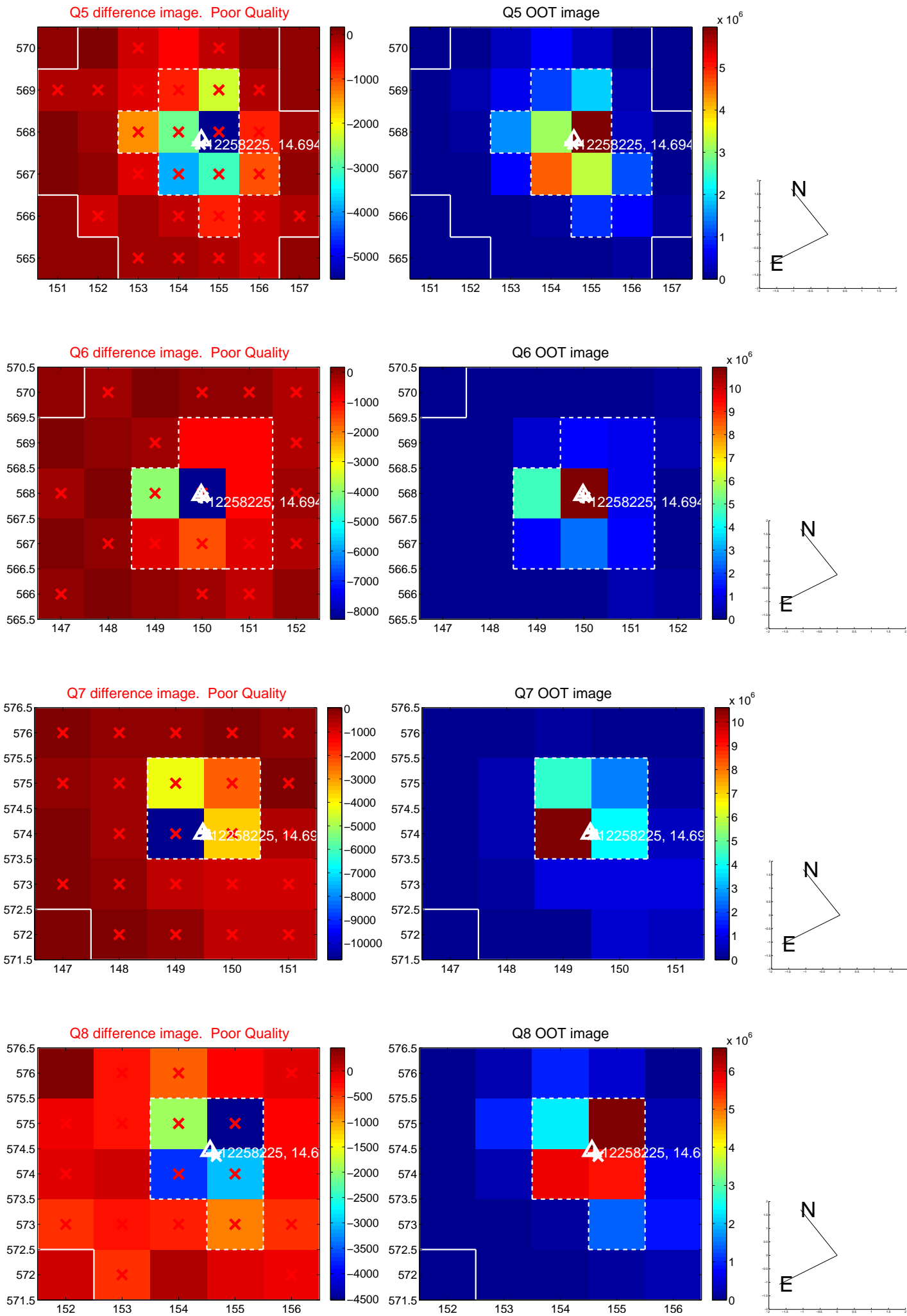


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- 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.

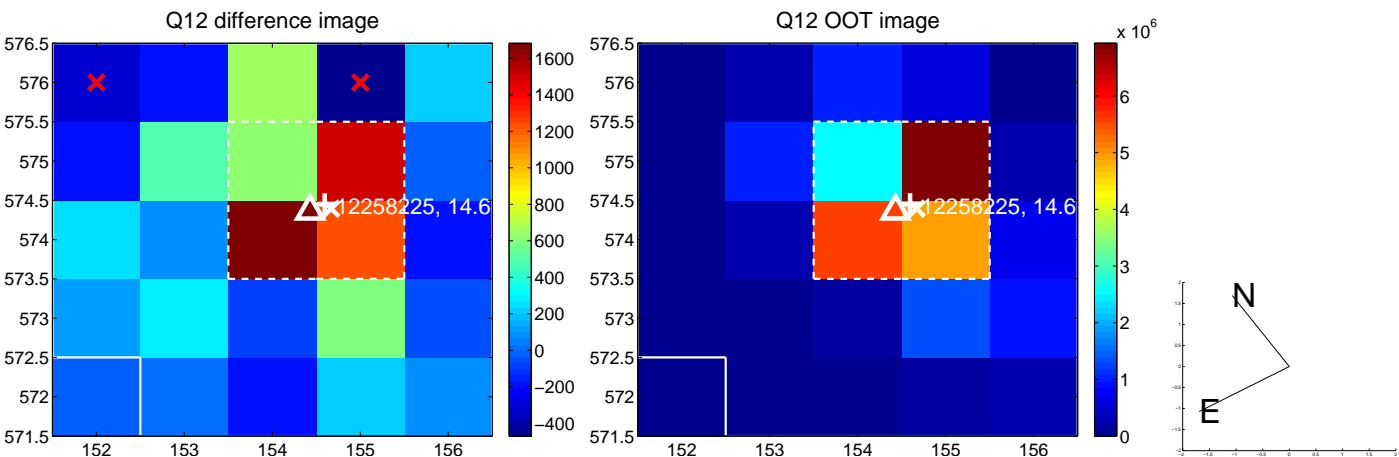
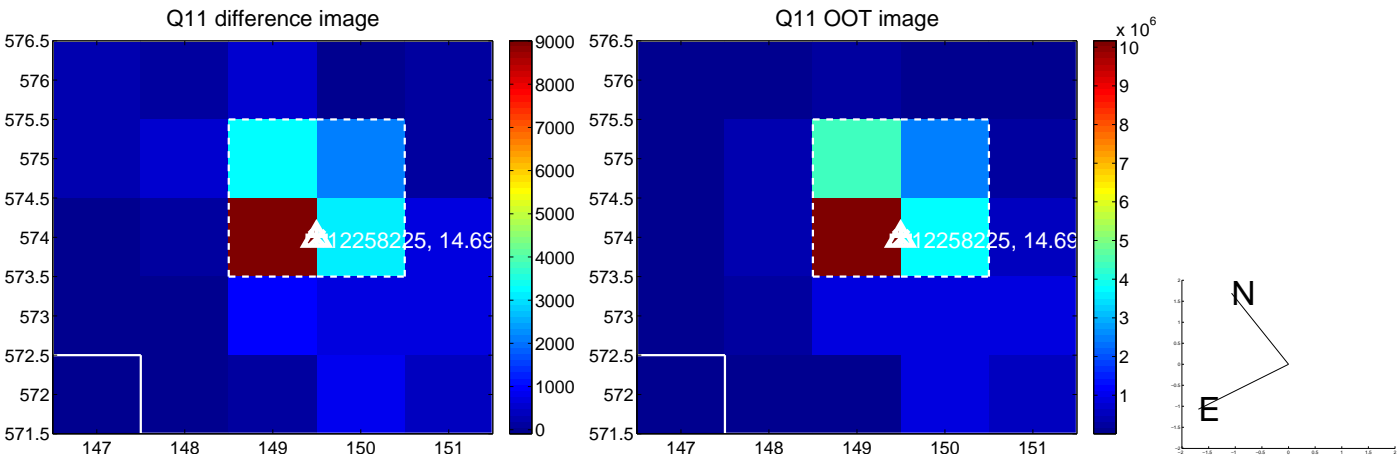
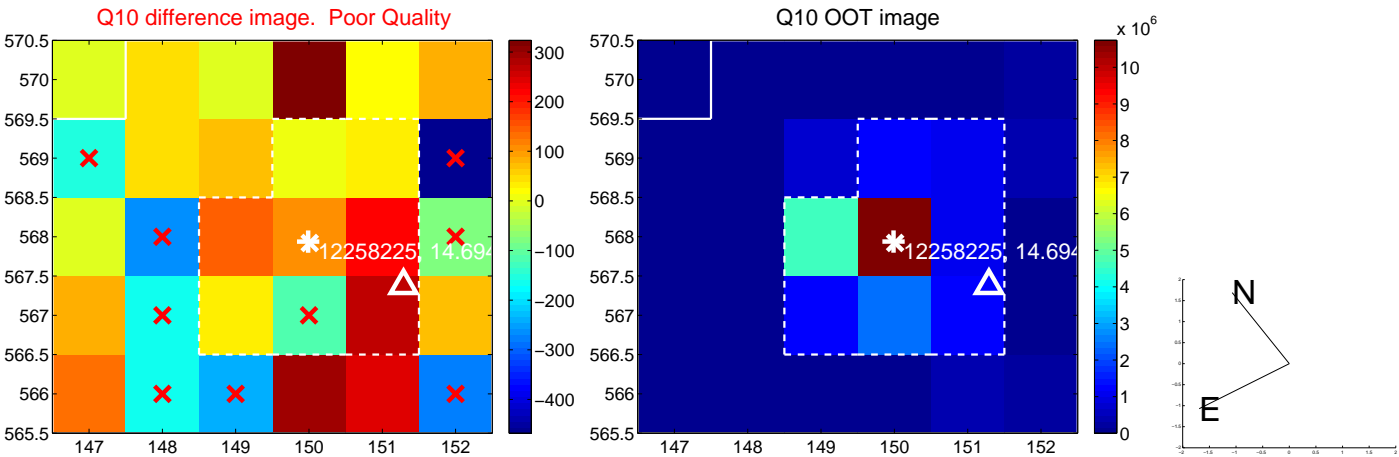
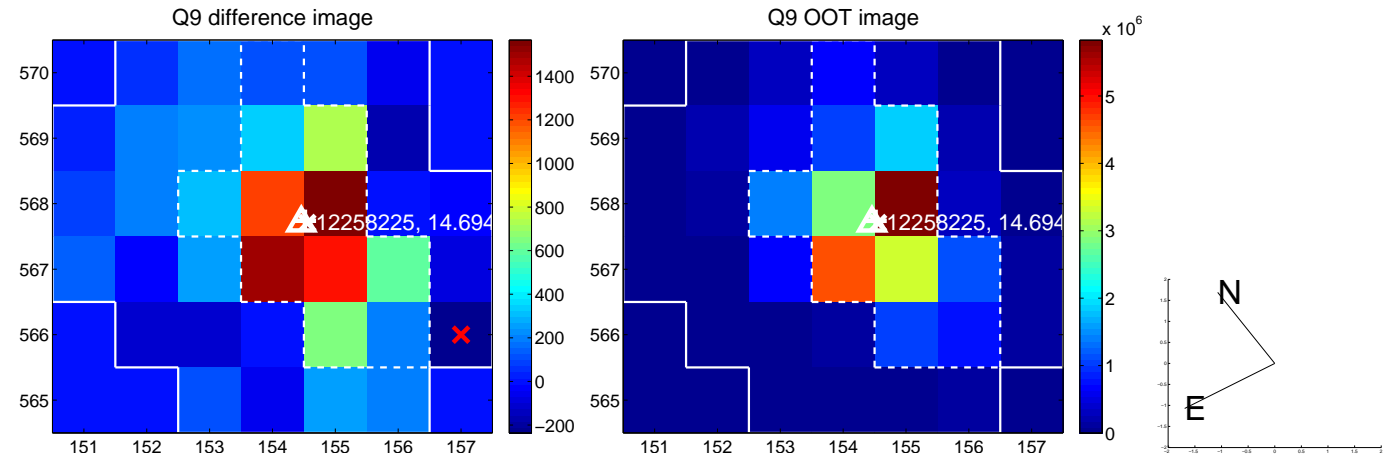
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



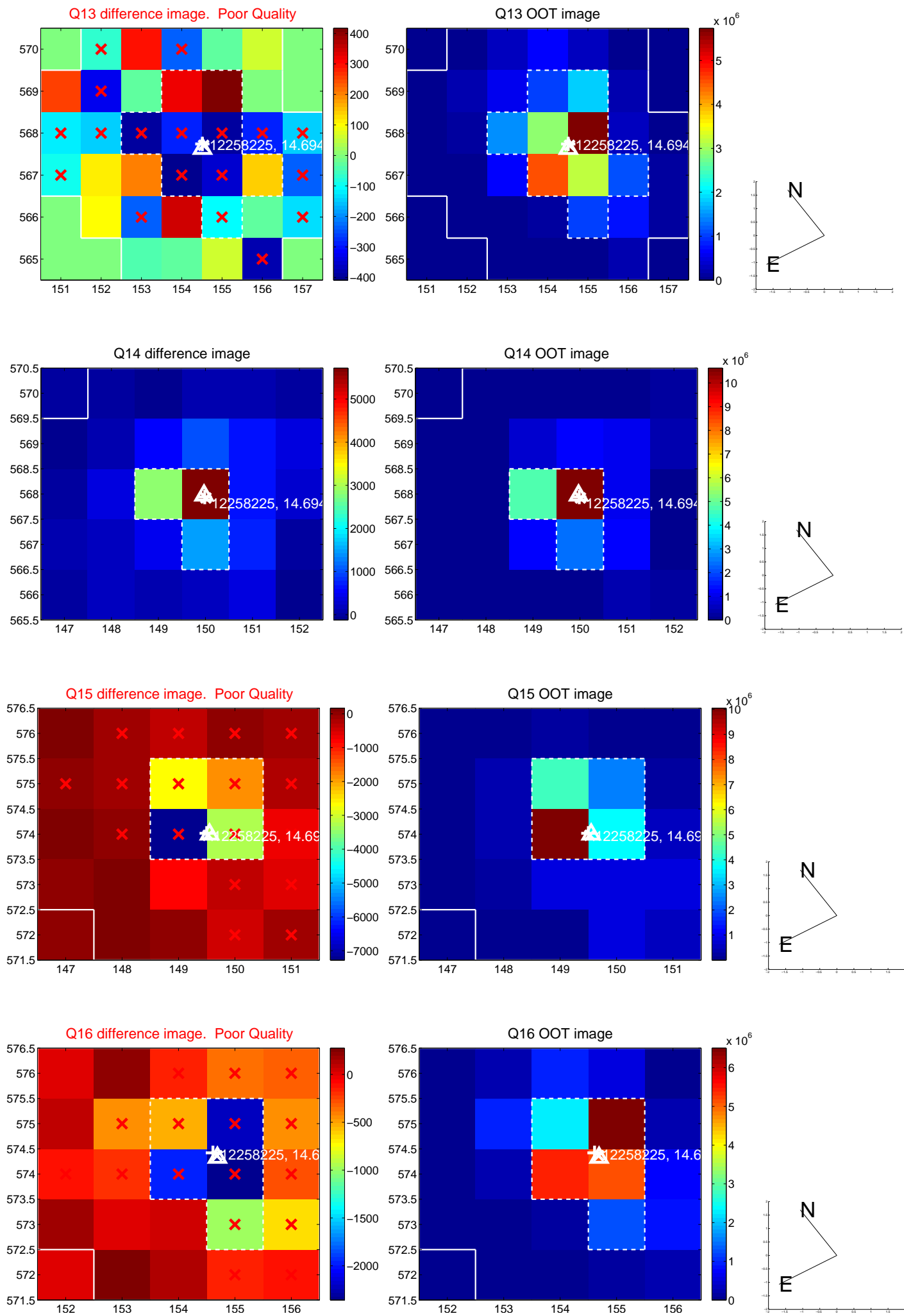
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



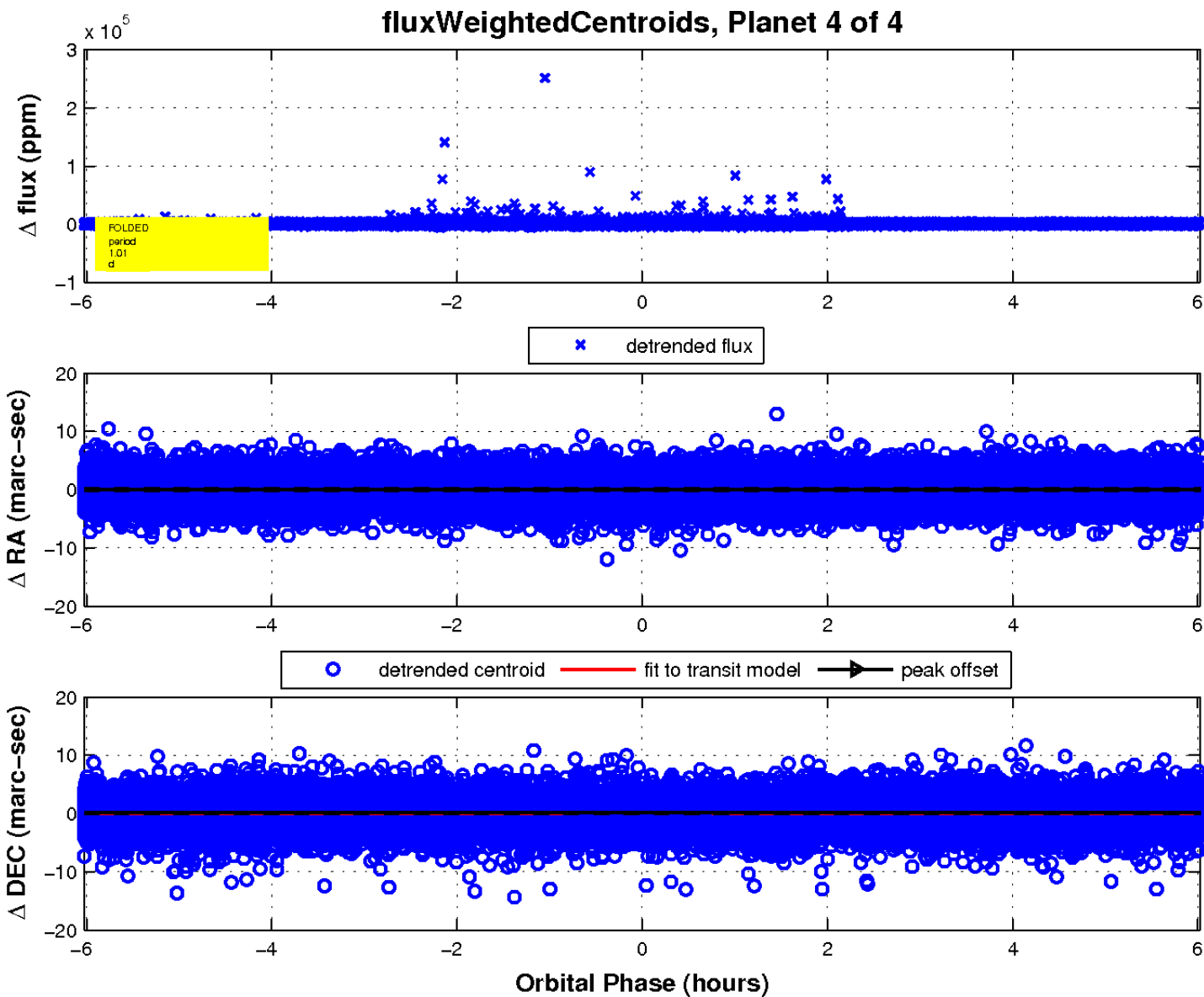
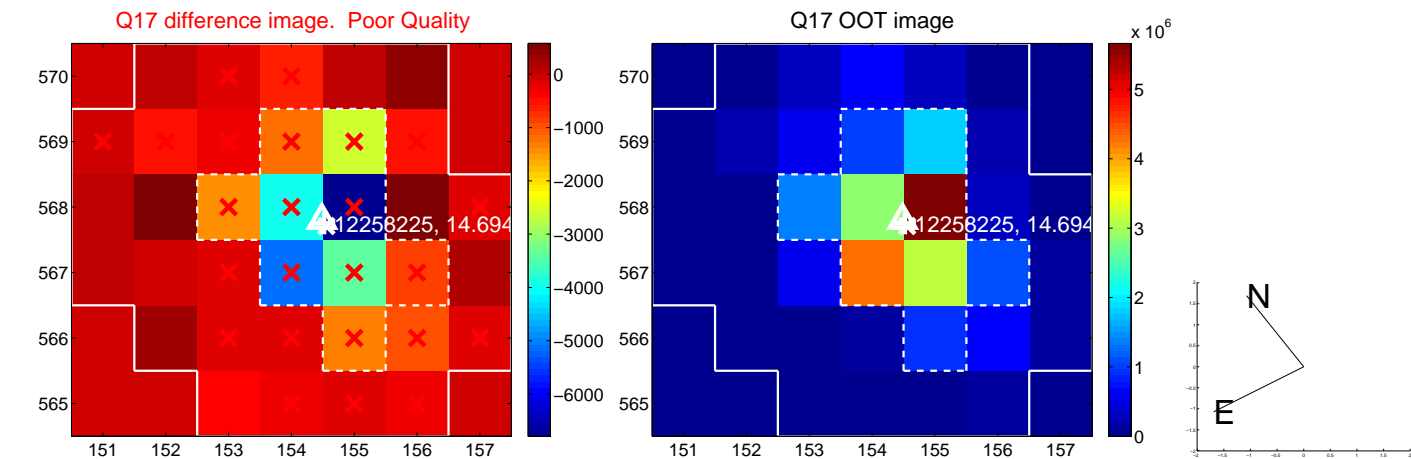
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

Declination

