

KIC 009018449

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})
009018449-01	OBS	No	268.447200	195.640107	1805.1	12.011	16.9	6.0	0.56	4422	2.33	0.24
009018449-02	OBS	No	487.480212	603.119357	1752.9	4.992	16.2	6.3	0.56	4422	2.38	0.11
009018449-03	OBS	No	229.987866	333.678601	1700.4	2.869	15.7	8.8	0.56	4422	2.34	0.30
009018449-04	OBS	No	351.273184	198.500793	2903.0	3.000	15.5	-1.0	0.56	4422	2.96	0.17
009018449-05	OBS	No	518.174954	425.928371	1217.1	2.723	12.2	4.6	0.56	4422	2.09	0.10
009018449-06	OBS	No	476.094534	239.001268	1637.2	3.893	13.6	6.9	0.56	4422	2.24	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018449-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009018449-02	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—INCONSISTENT_TRANS
009018449-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009018449-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009018449-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009018449-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

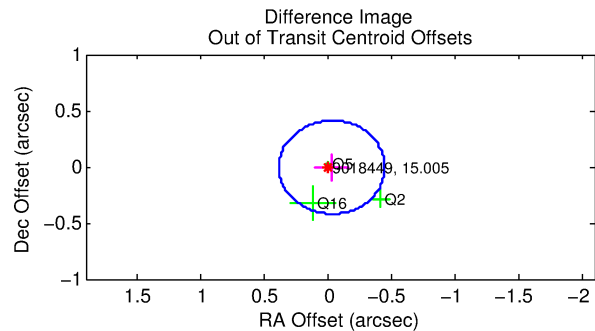
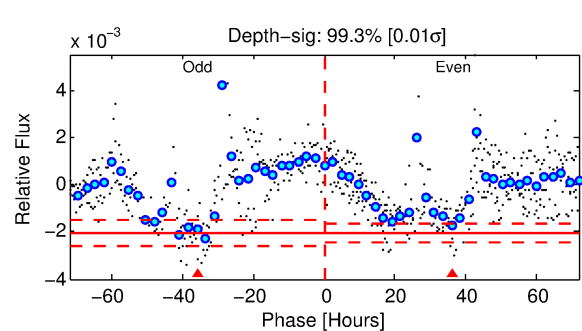
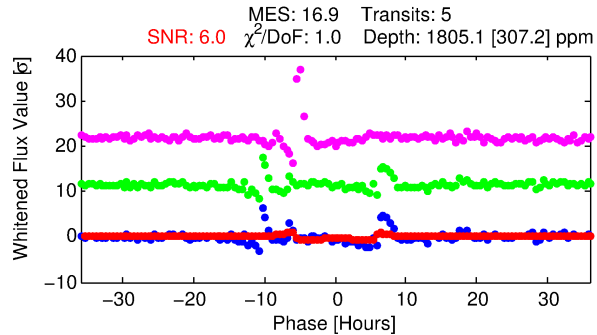
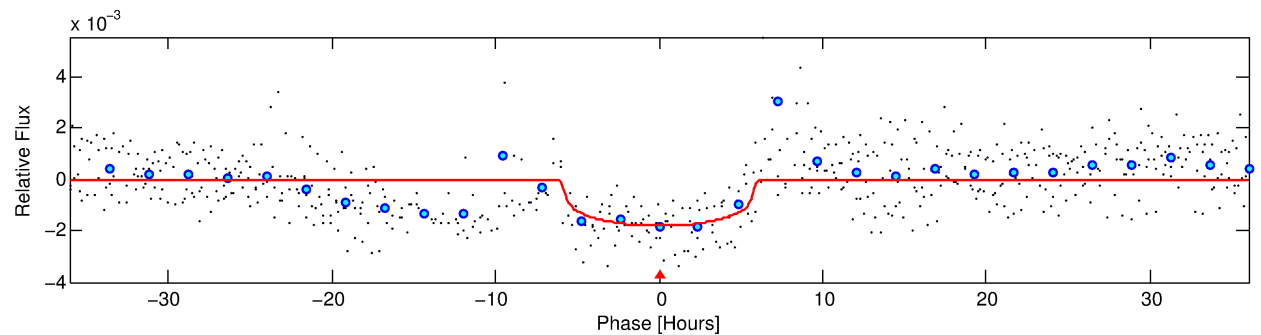
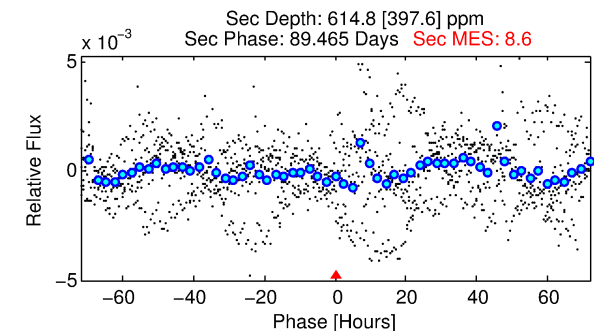
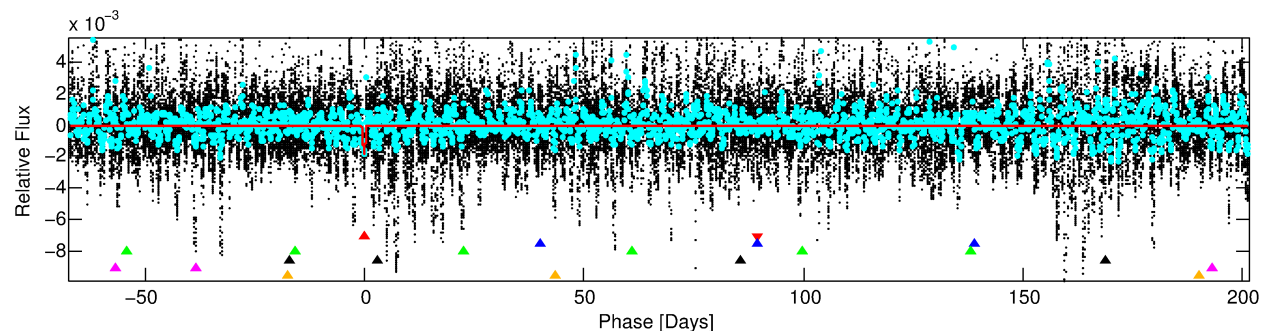
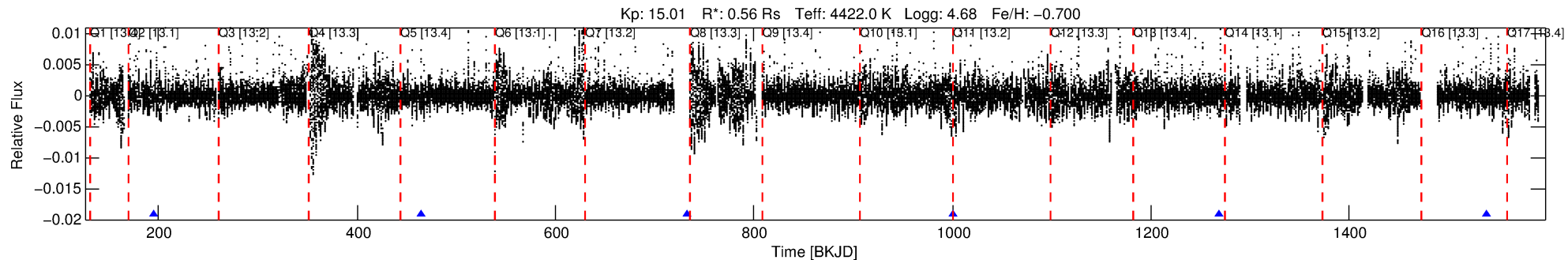
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018449-01

No Significant Match Found

DV One-Page Summary

KIC: 9018449 Candidate: 1 of 6 Period: 268.447 d



DV Fit Results:

Period = 268.44720 [0.00272] d
Epoch = 195.6401 [0.0083] BKJD
Rp/R* = 0.0377 [0.0173]
a/R* = 176.89 [273.71]
b = 0.06 [25.74]
Seff = 0.24 [0.04]
Teq = 179 [7] K
Rp = 2.33 [1.09] Re
a = 0.6688 [0.0491] AU
Ag = 27956.17 [31543.69] [0.89σ]
Teff = 3585 [1012] K [3.36σ]

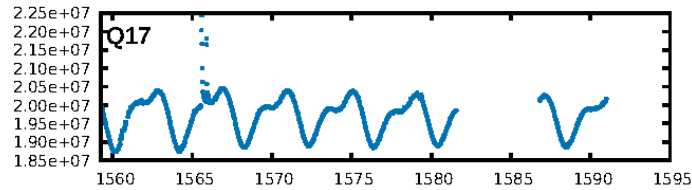
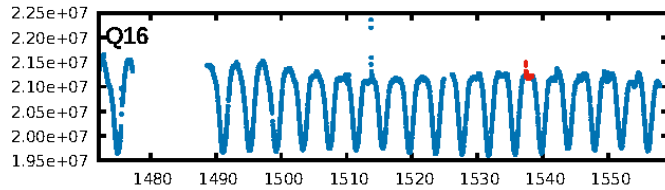
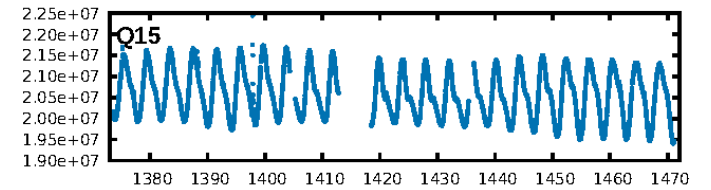
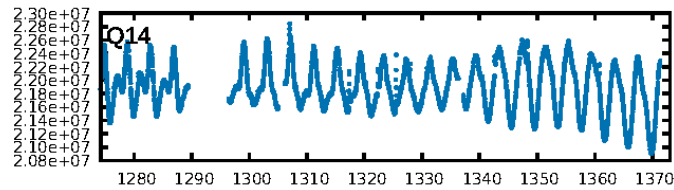
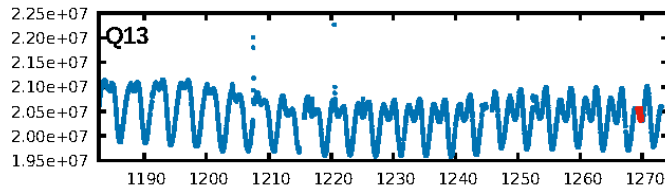
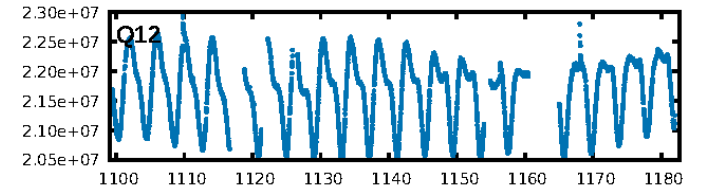
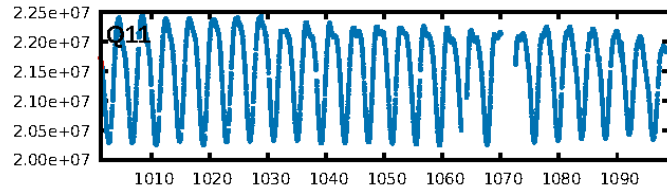
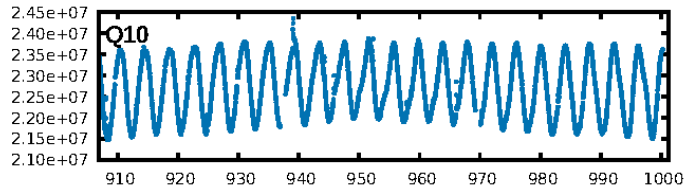
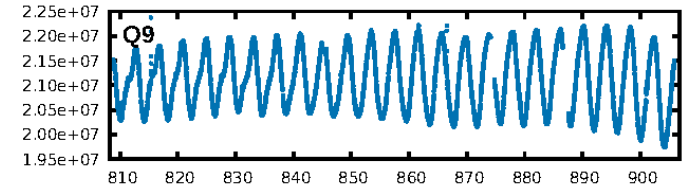
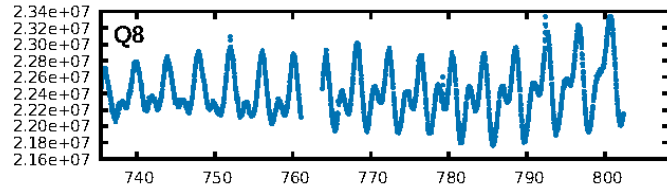
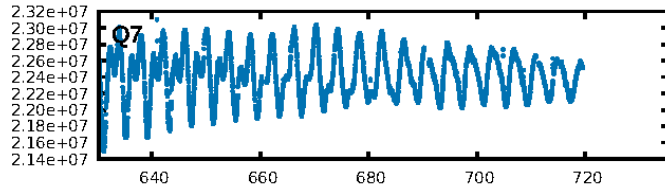
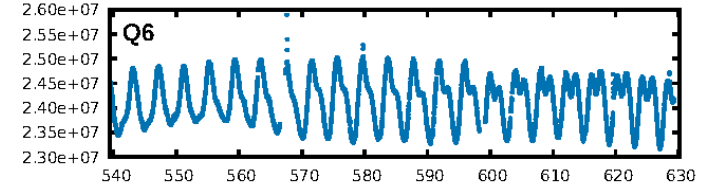
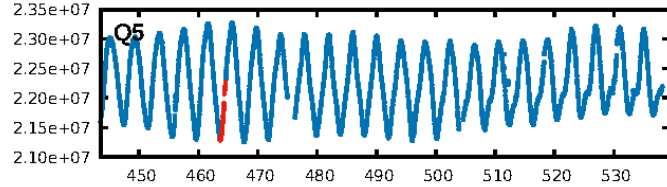
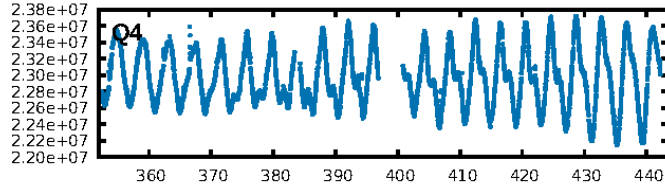
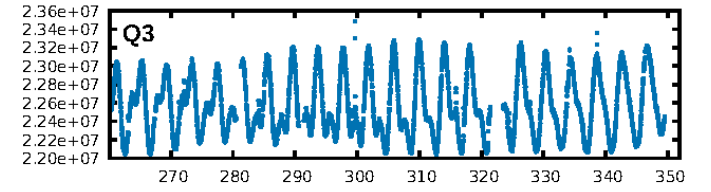
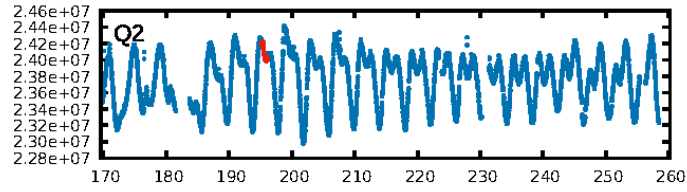
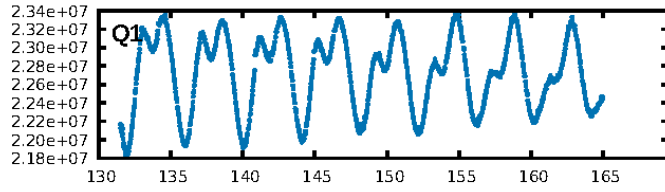
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [74.75σ]
LongPeriod-sig: 100.0% [160.57σ]
ModelChiSquare2-sig: 54.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.03e-16
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.2691
Centroid-sig: 59.6%
Centroid-so: 0.217 arcsec [0.47σ]
OotOffset-rm: 0.035 arcsec [0.25σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 0.074 arcsec [0.66σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

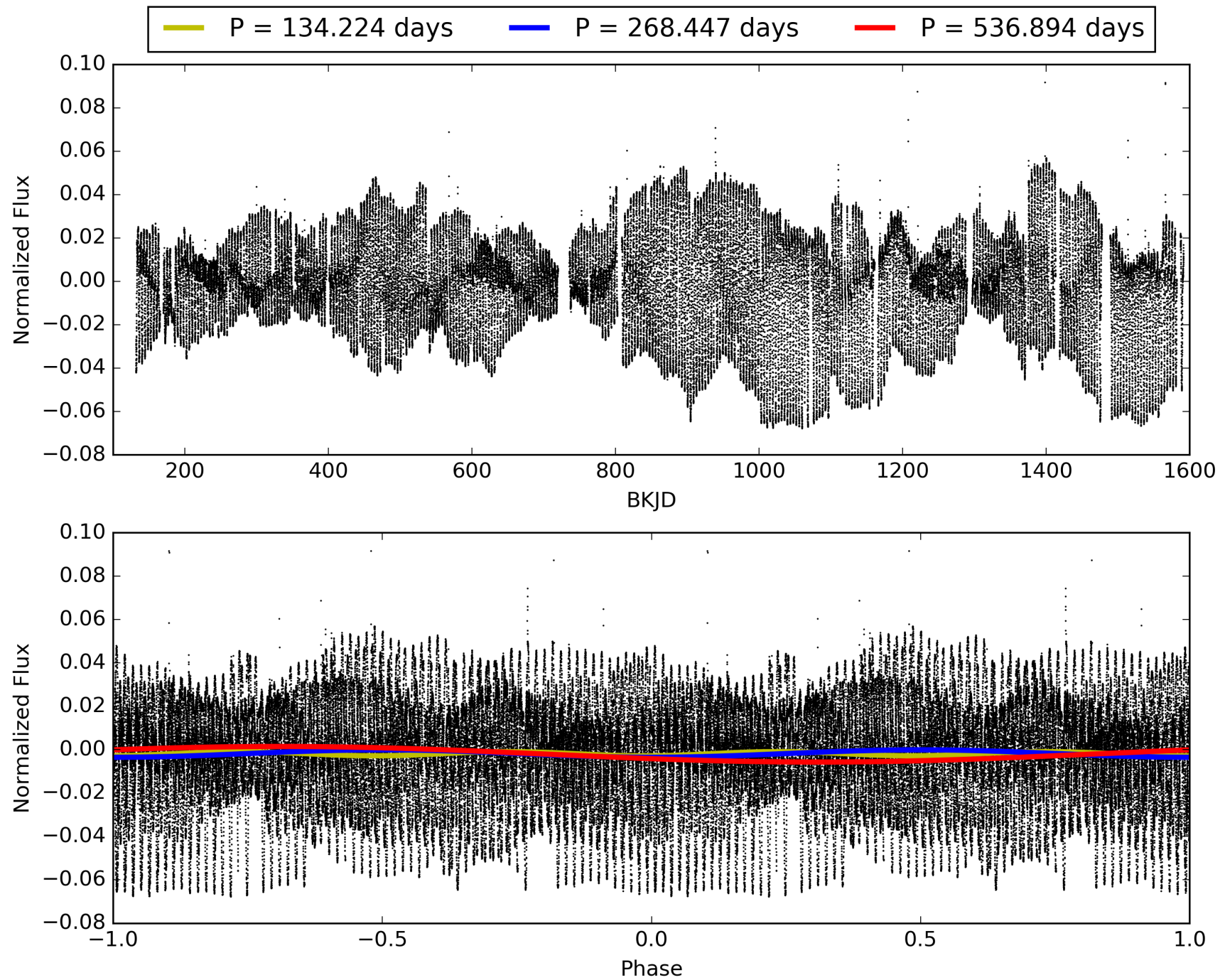
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:28:28 Z

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

TCE 009018449-01, PDC Light Curves

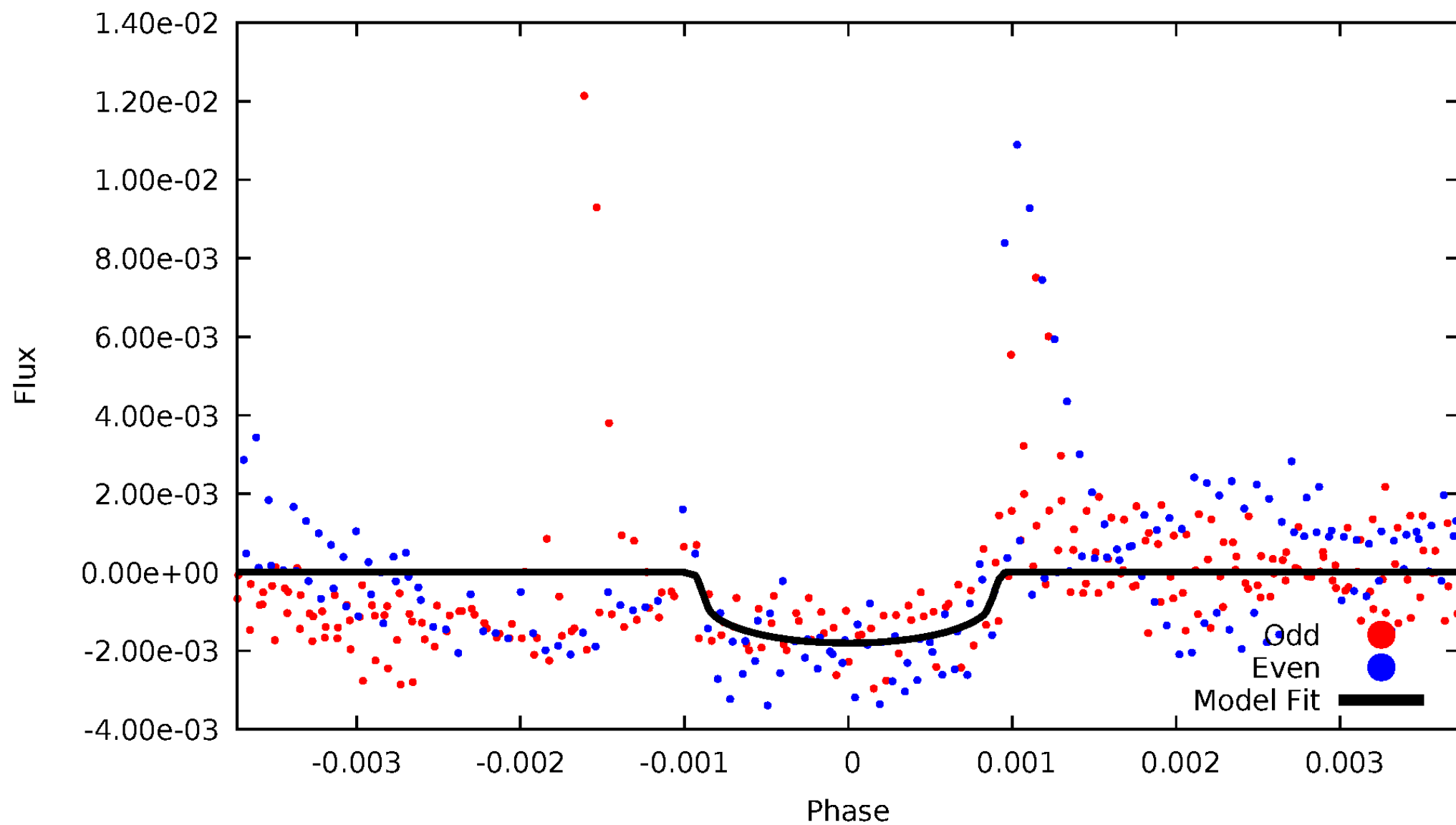


TCE 009018449-01



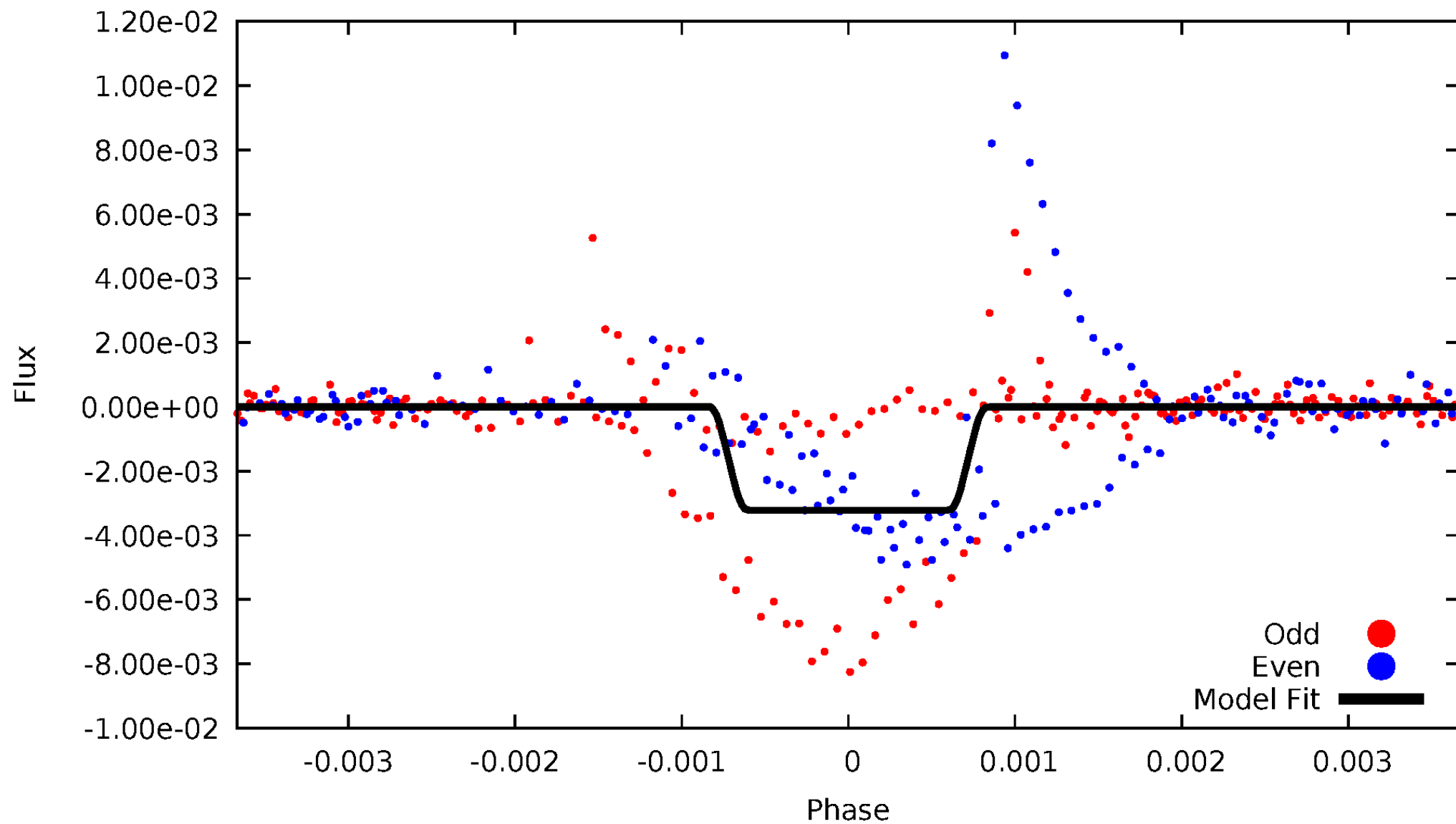
DV Odd/Even

TCE 009018449-01



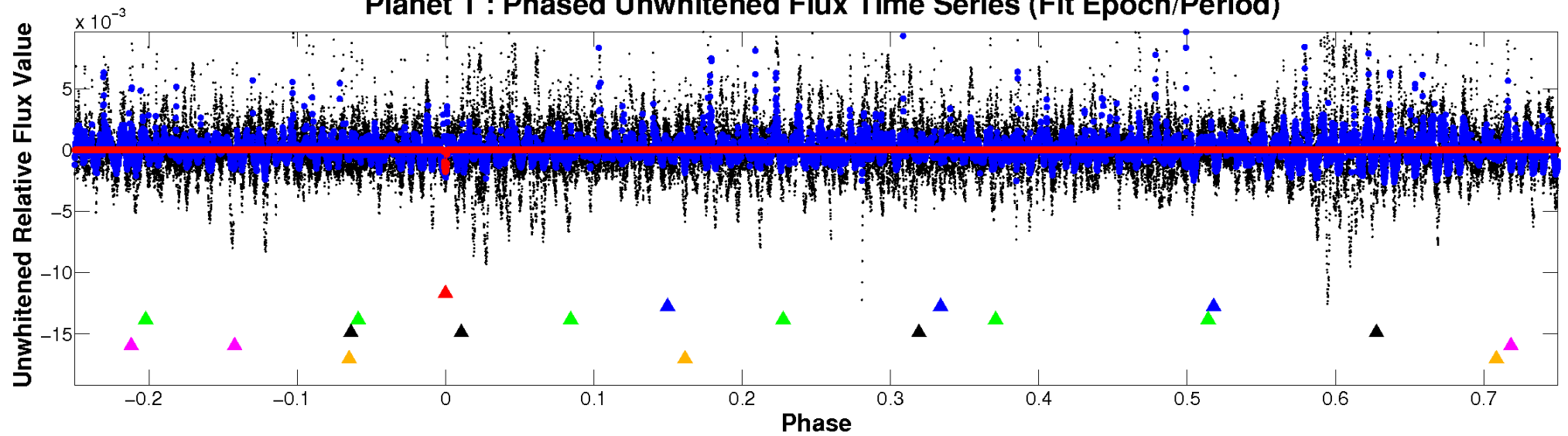
ALT Odd/Even

TCE 009018449-01

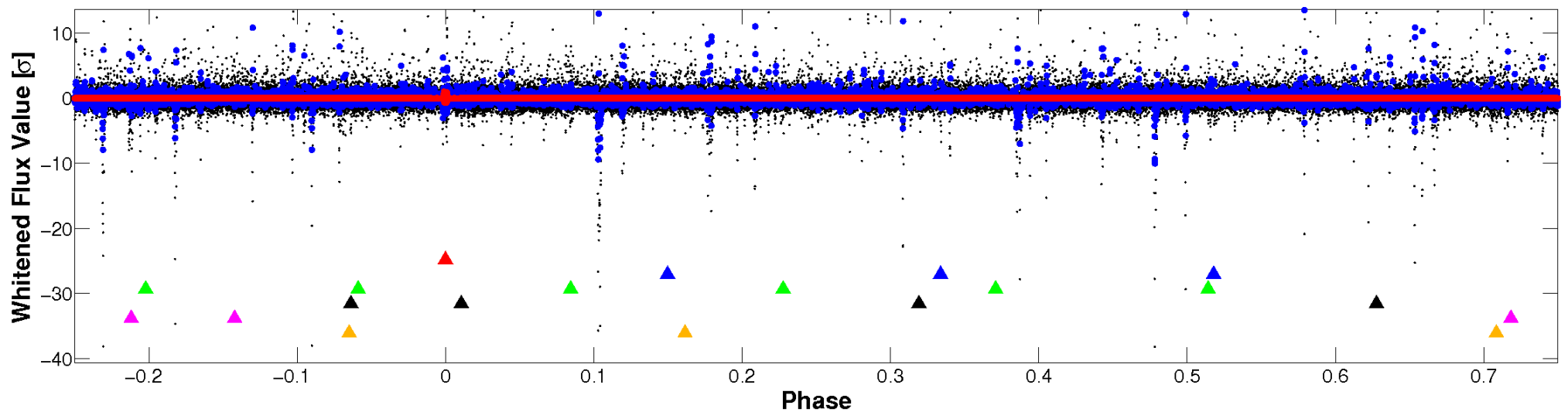


Non-Whitened Vs. Whitened Light Curve

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

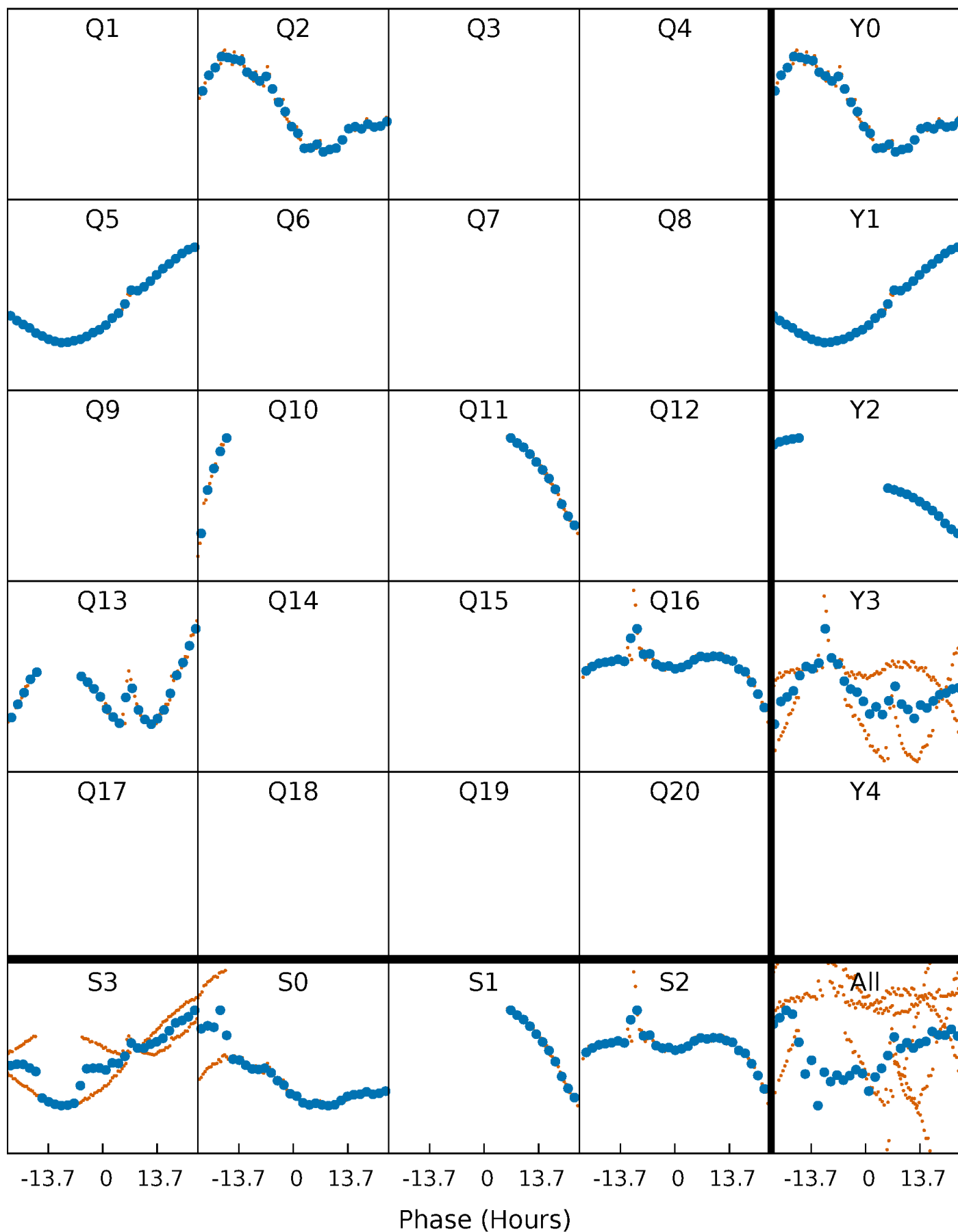


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



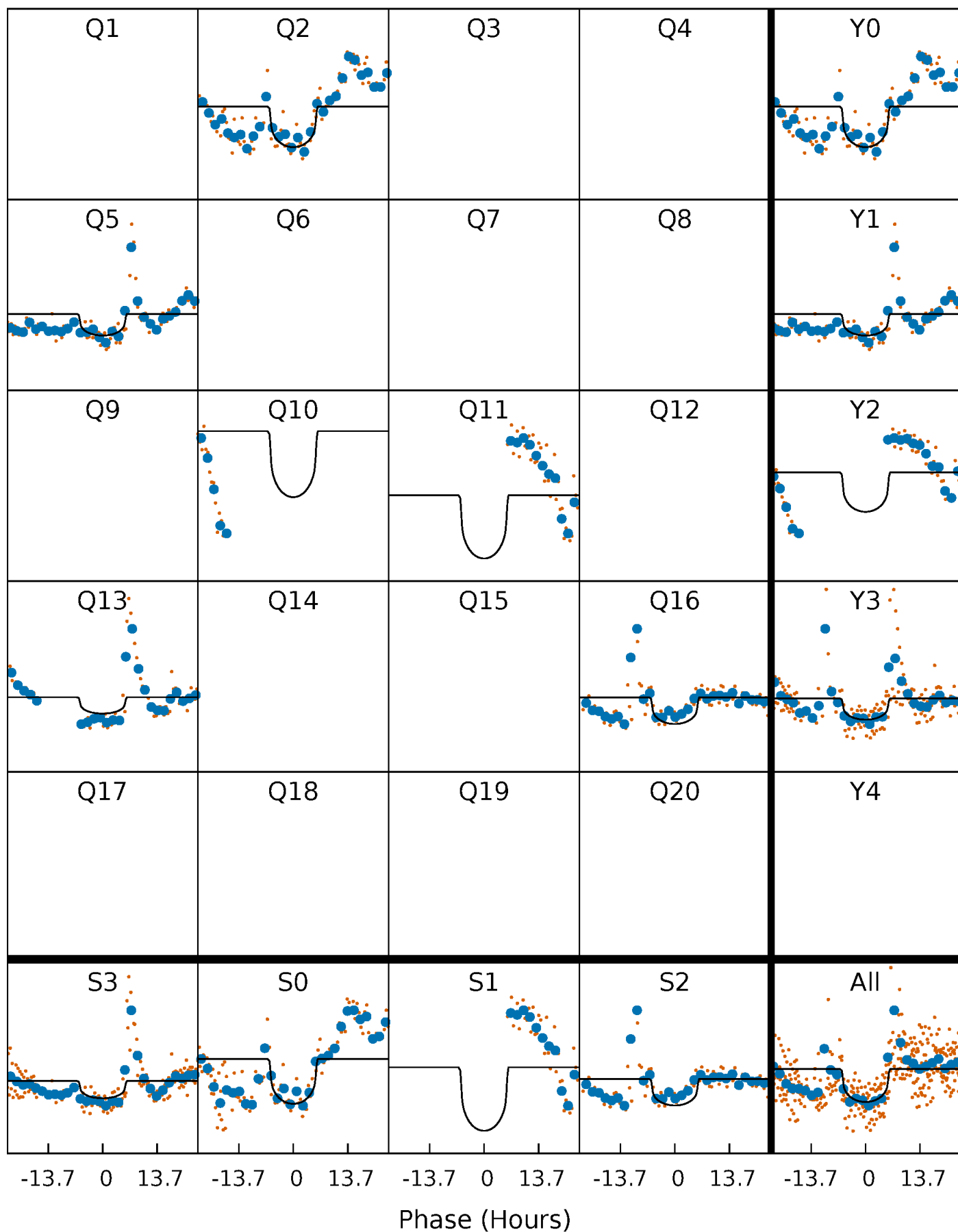
PDC Quarter-Phased Transit Curves

TCE 009018449-01 P=268.447200 Days $T_0=195.640107$ (BKJD)



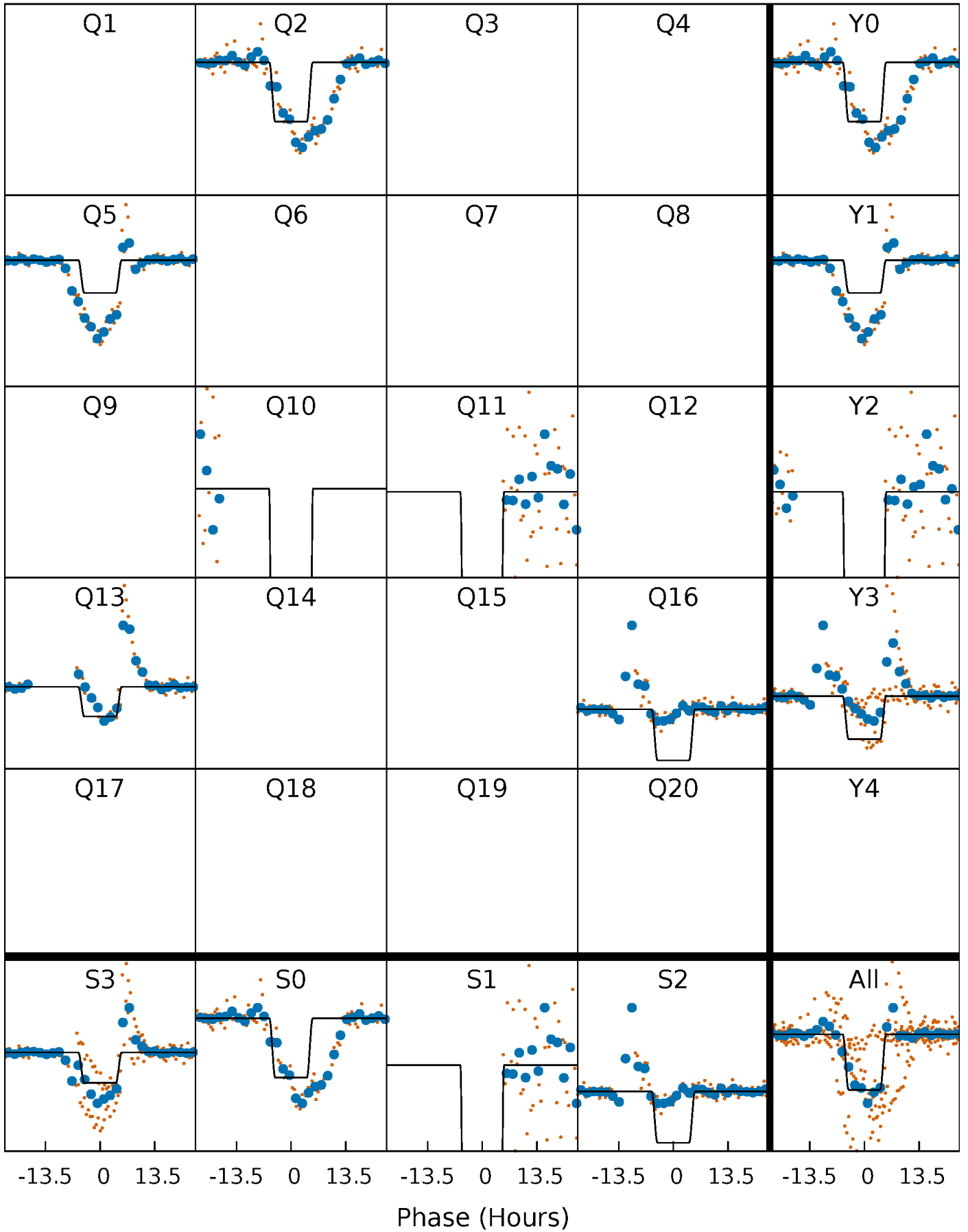
DV Quarter-Phased Transit Curves

TCE 009018449-01 $P=268.447200$ Days $T_0=195.640107$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

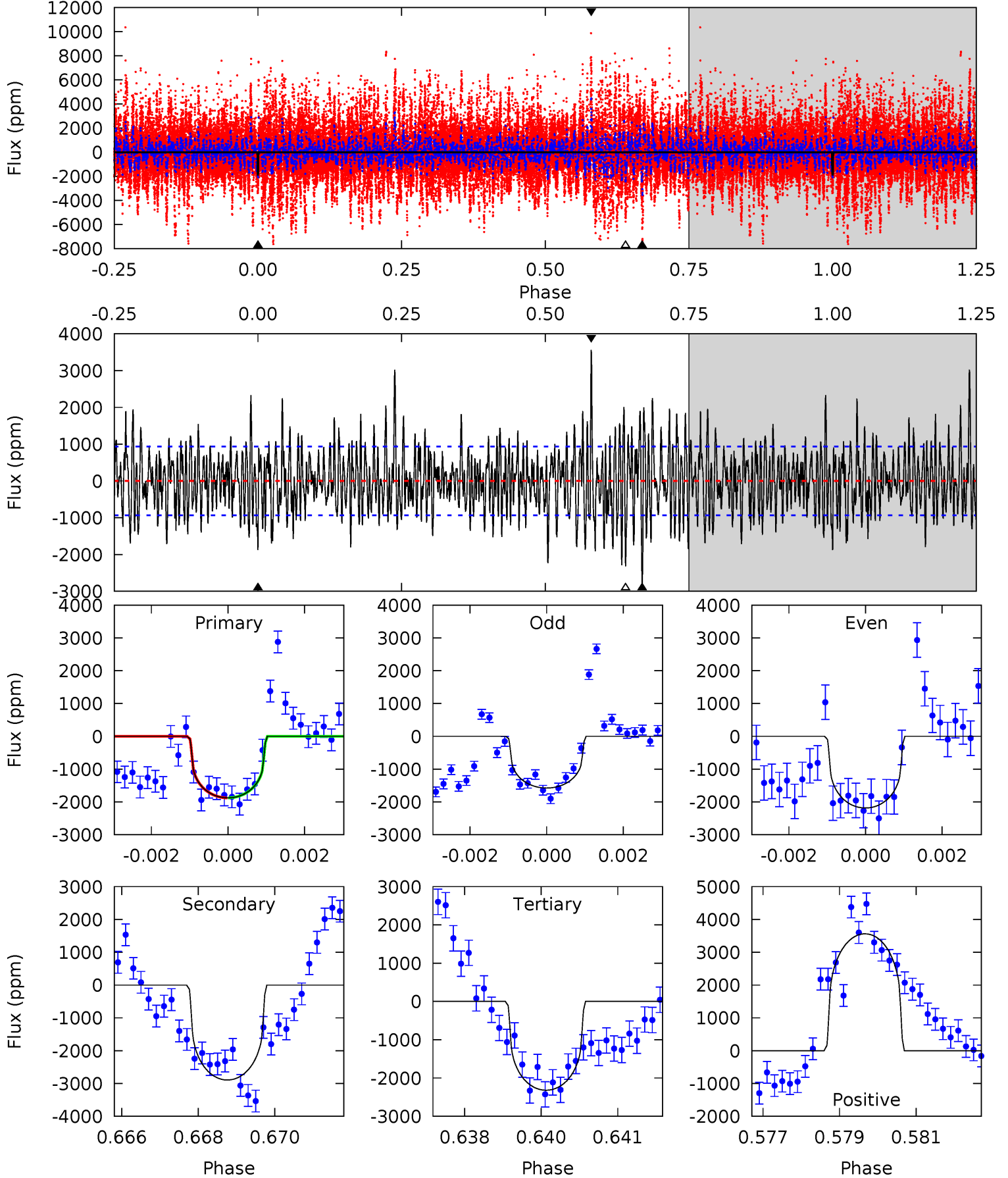
TCE 009018449-01 P=268.442489 Days $T_0=195.683914$ (BKJD)



DV Model-Shift Uniqueness Test

009018449-01, P = 268.447200 Days, E = 195.640107 Days

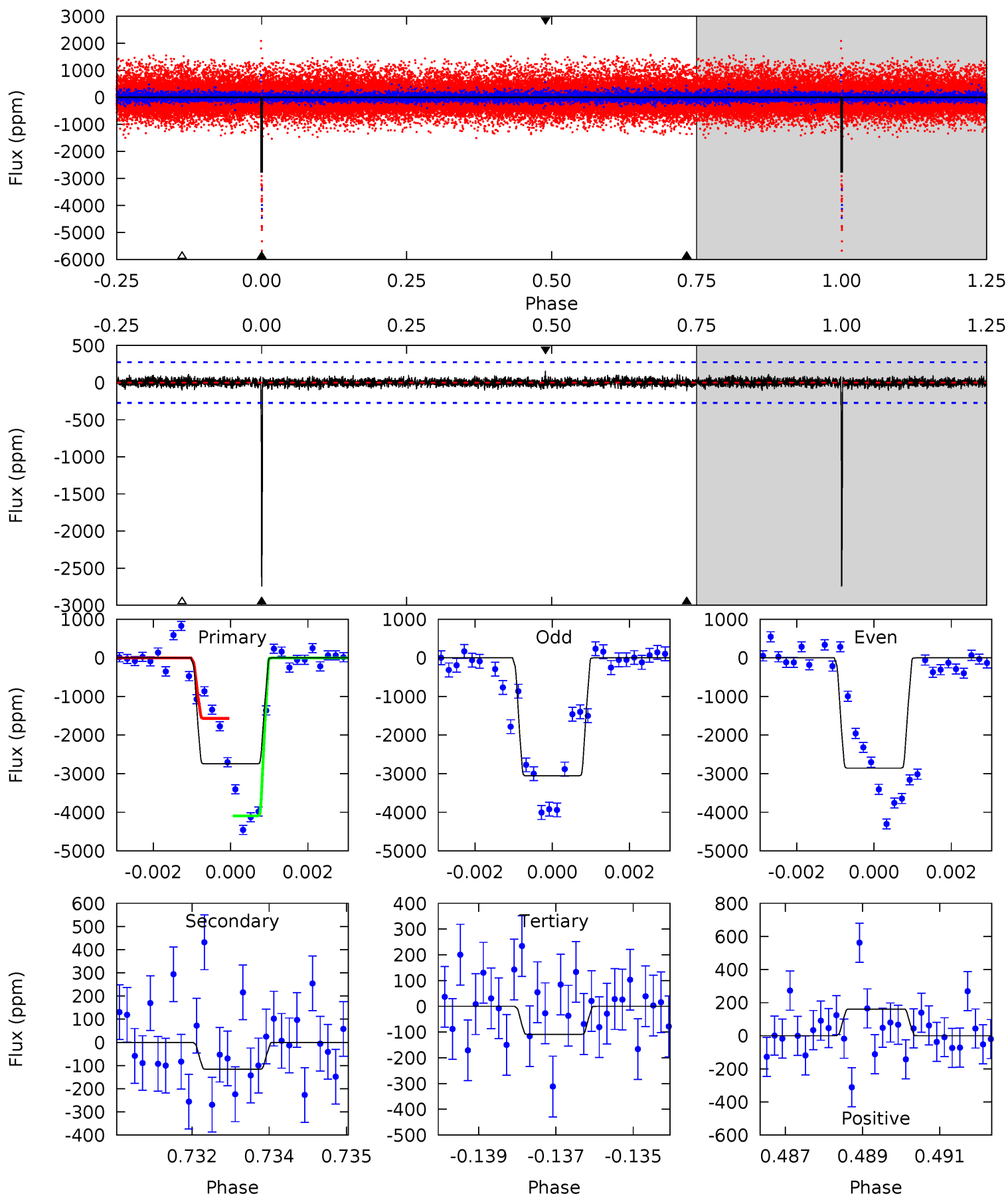
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	16.5	13.2	20.3	5.34	3.11	4.39	-2.52	-9.62	3.28	-3.81	1.66	1.05	0.55	0.01



Alt Model-Shift Uniqueness Test

009018449-01, P = 268.442489 Days, E = 195.683914 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.6	2.26	2.12	3.14	5.36	3.15	0.55	51.4	50.4	0.14	-0.88	2.38	1.12	0.06	0



Stellar Parameters For KIC 009018449

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4422^{+132}_{-132}	$4.677^{+0.059}_{-0.027}$	$-0.700^{+0.300}_{-0.300}$	$0.565^{+0.045}_{-0.049}$	$0.554^{+0.056}_{-0.033}$	$4.317^{+1.061}_{-0.588}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
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 009018449-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2894 ± 175	$2.37^{+0.97}_{-1.04}$	249^{+9}_{-8}	5060^{+1638}_{-690}	$127047^{+280970}_{-63710}$
Alt.	-116 ± 51	$3.44^{+1.06}_{-1.05}$	249^{+9}_{-9}	2651^{+302}_{-246}	2448^{+3095}_{-1350}

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

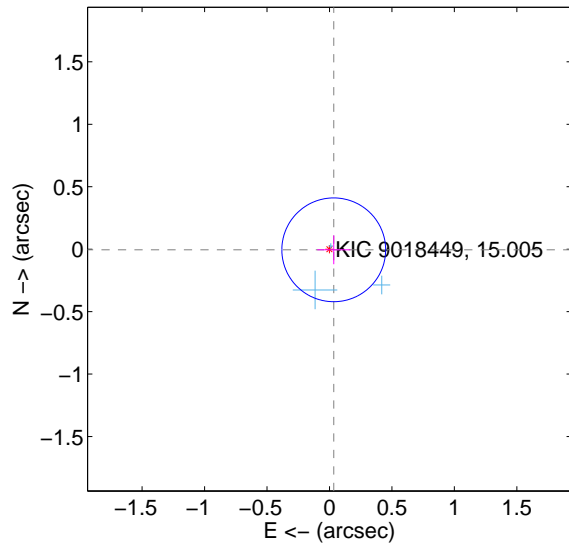
Supplemental centroid analysis for 009018449-01. Kepler magnitude: 15.01. Transit SNR 5.96

There are 3 quarters with good PRF difference image offsets

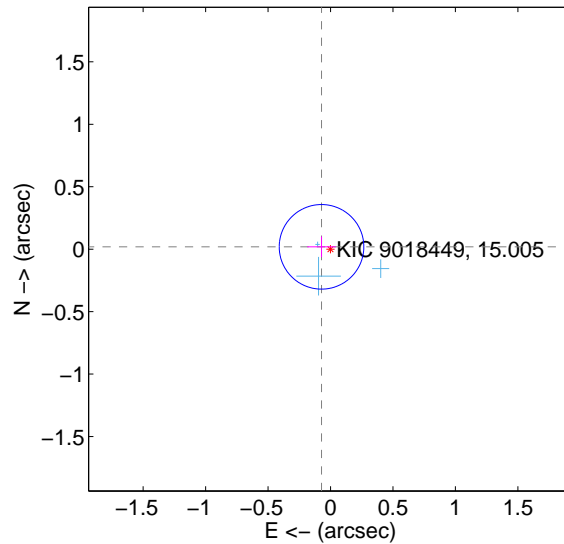
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.035 ± 0.139	0.25	-0.034 ± 0.133	-0.005 ± 0.115
PRF-fit source offset from KIC position	0.074 ± 0.113	0.66	0.072 ± 0.115	0.019 ± 0.083
photometric centroid source offset	0.22 ± 0.47	0.47	0.20 ± 0.47	-0.07 ± 0.46

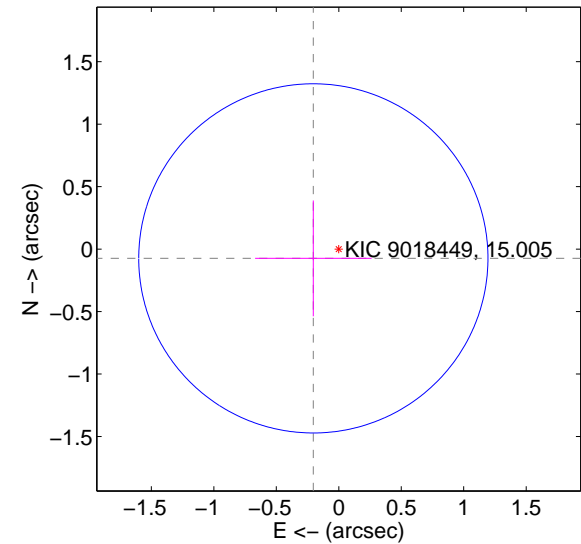
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



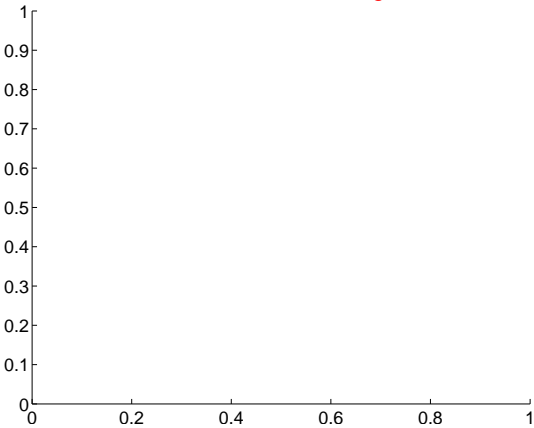
offset from photometric centroids



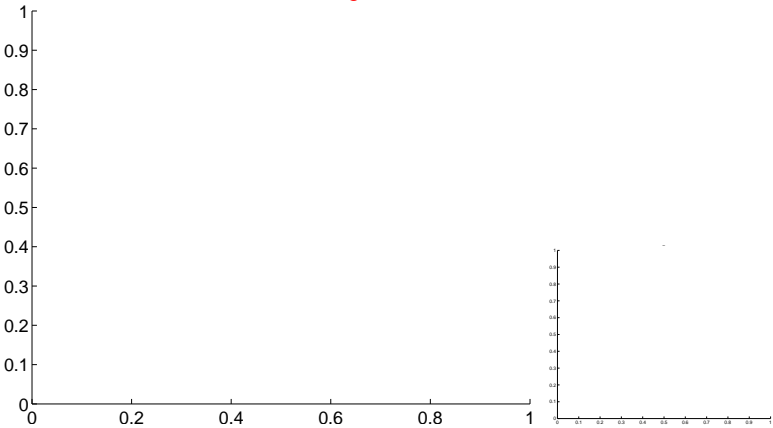
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

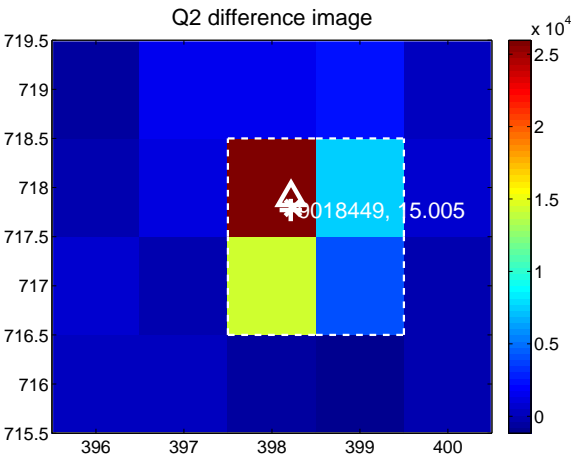
Q1 no difference image



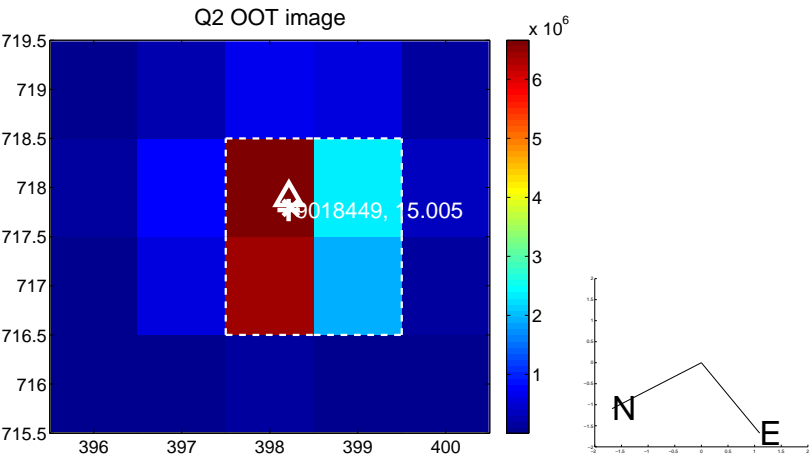
Q1 no OOT image



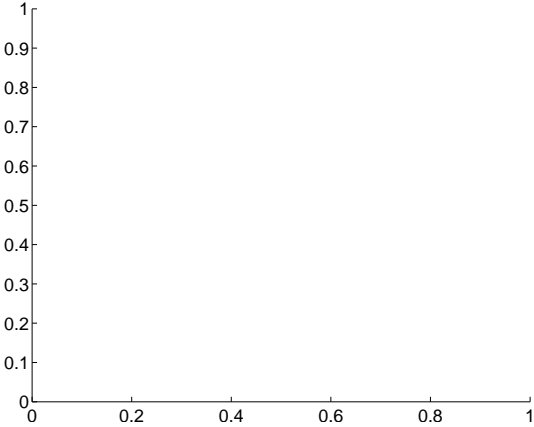
Q2 difference image



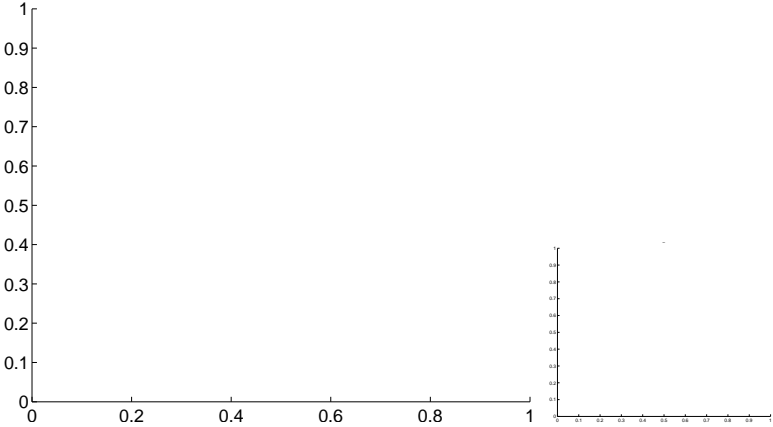
Q2 OOT image



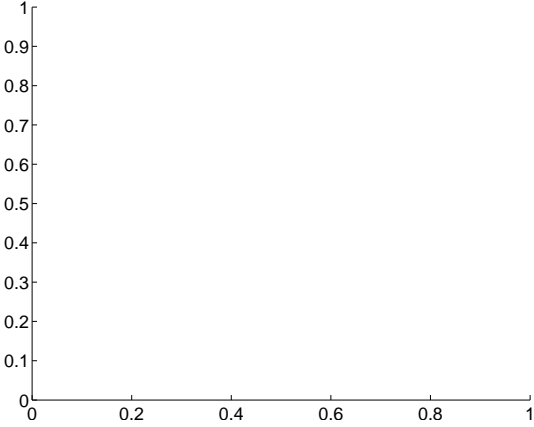
Q3 no difference image



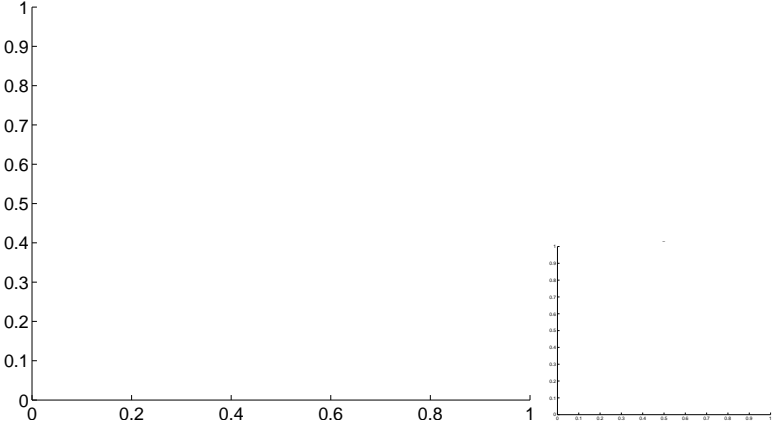
Q3 no OOT image



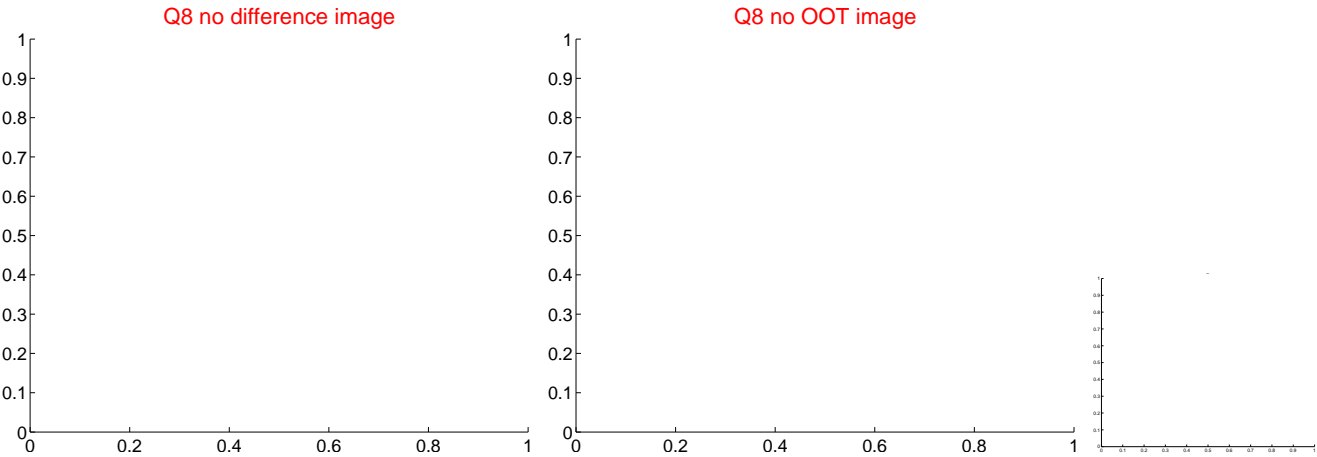
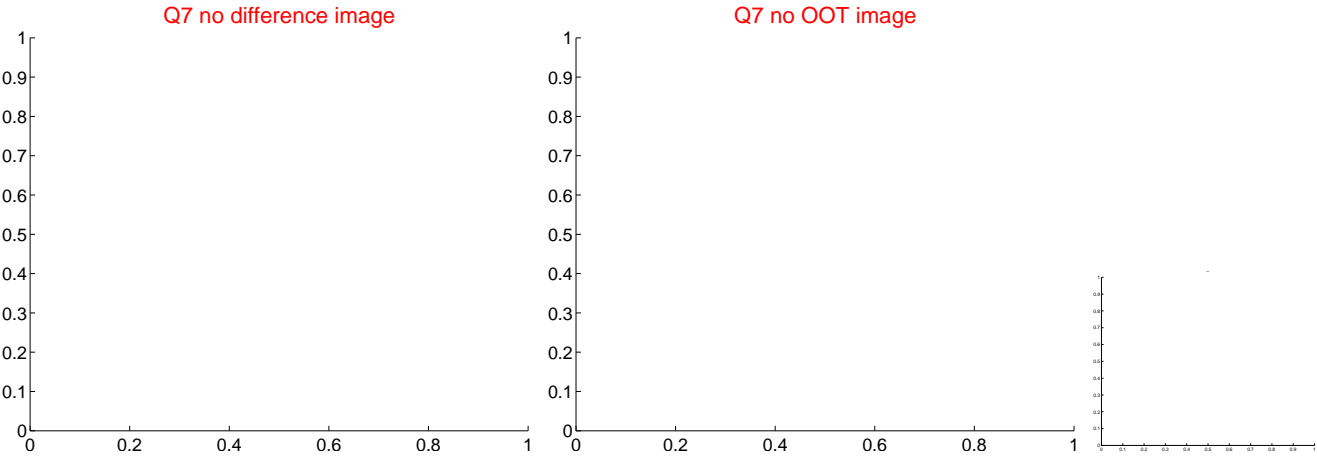
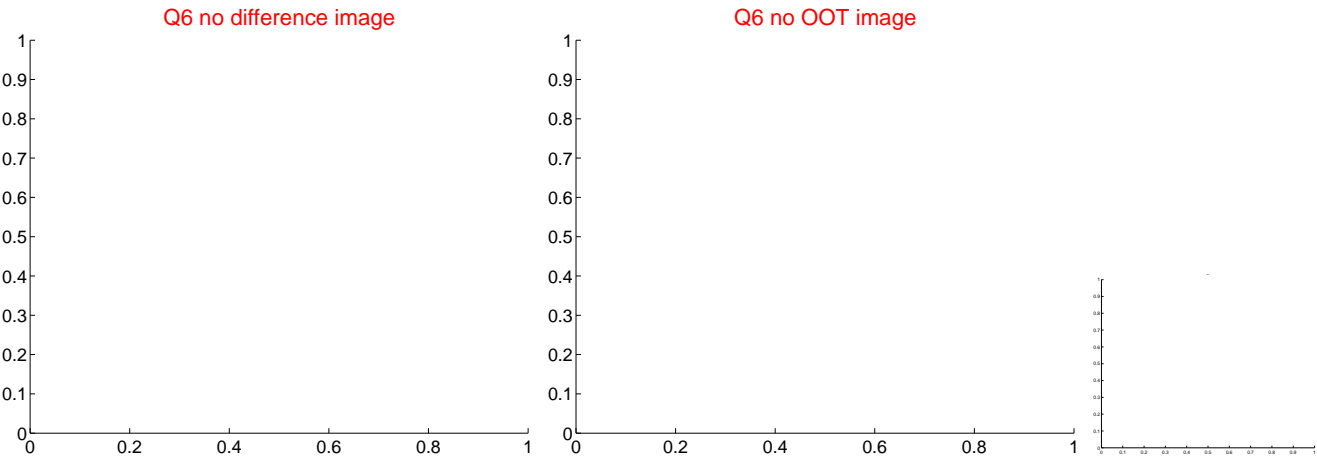
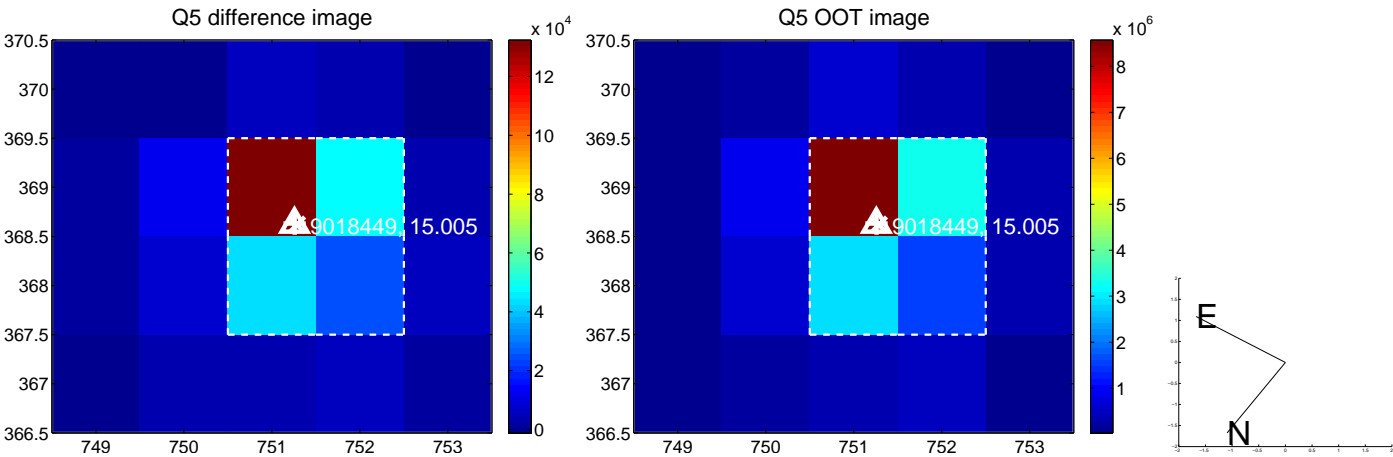
Q4 no difference image



Q4 no OOT image



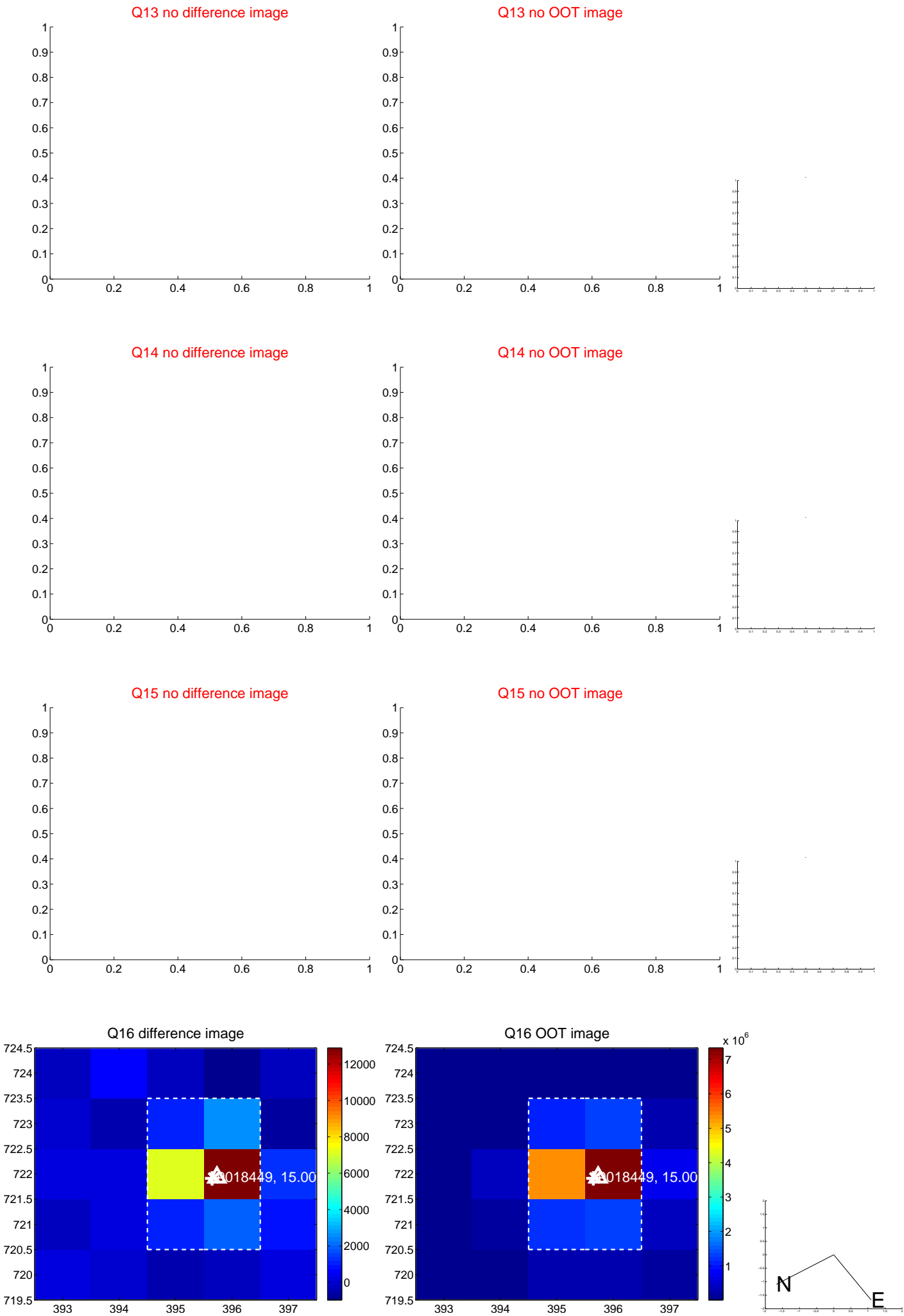
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



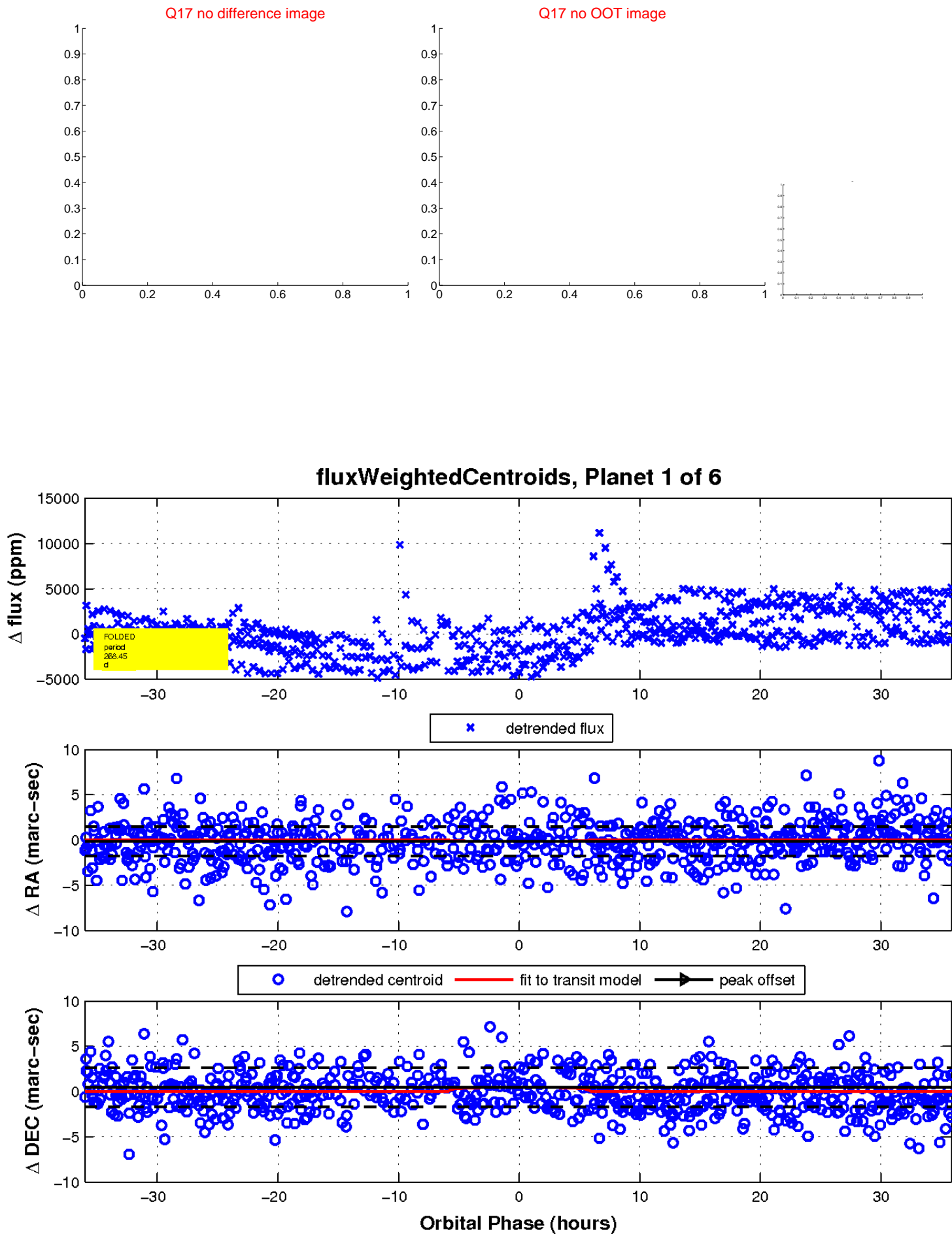
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

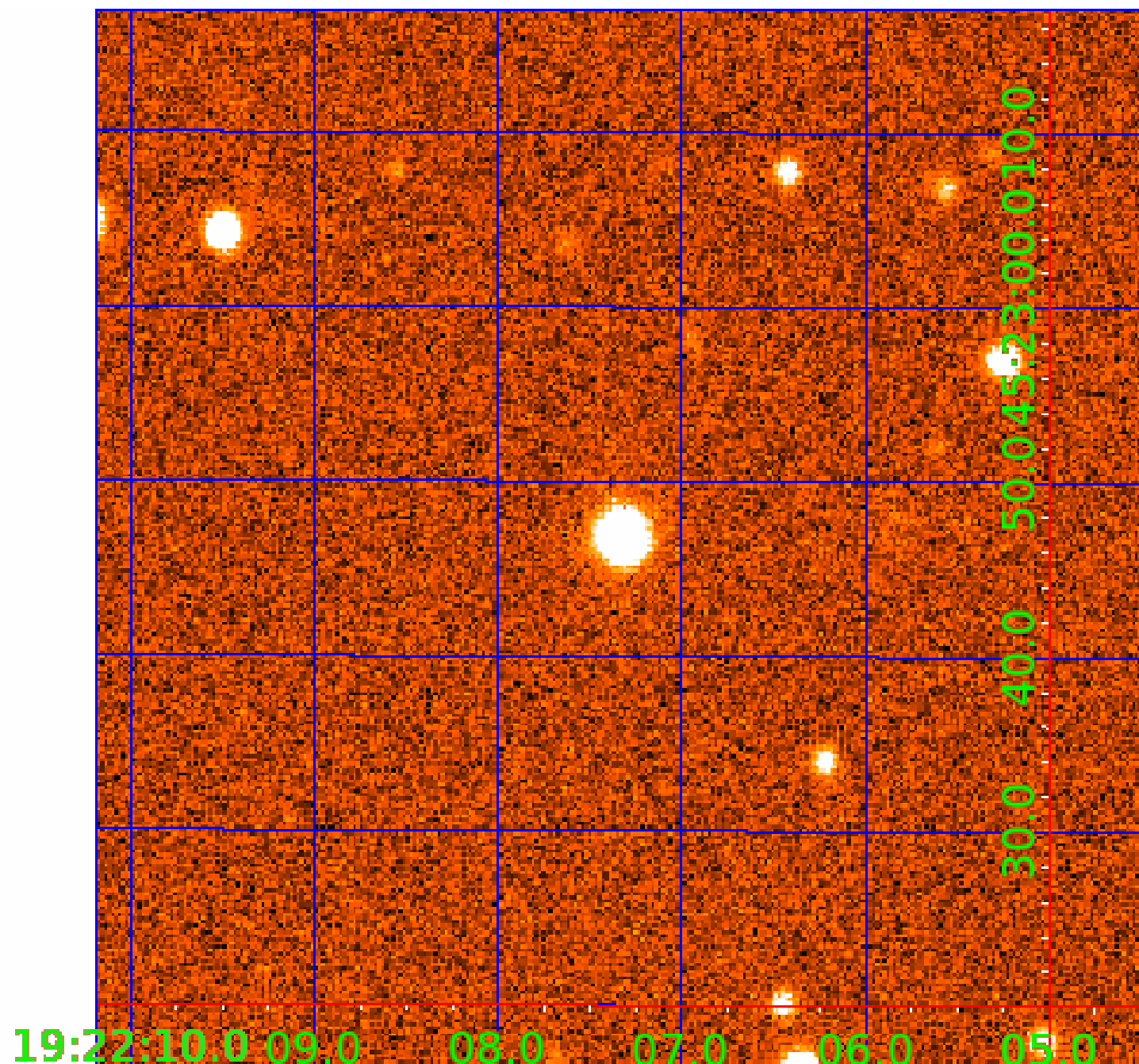


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009018449

Q1-17 DR25 TCE Parameters

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009018449-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009018449-02	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—INCONSISTENT_TRANS
009018449-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009018449-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009018449-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009018449-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

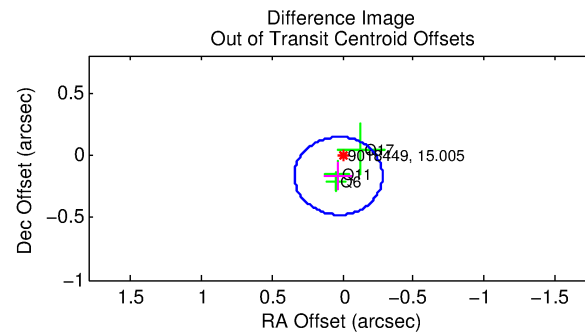
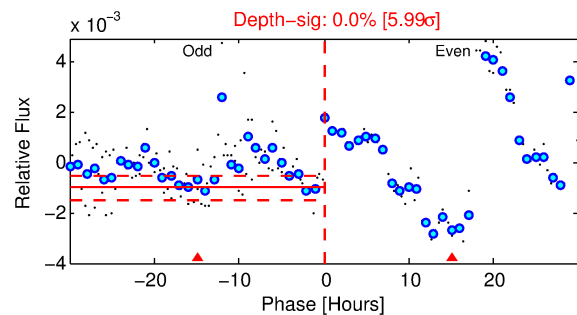
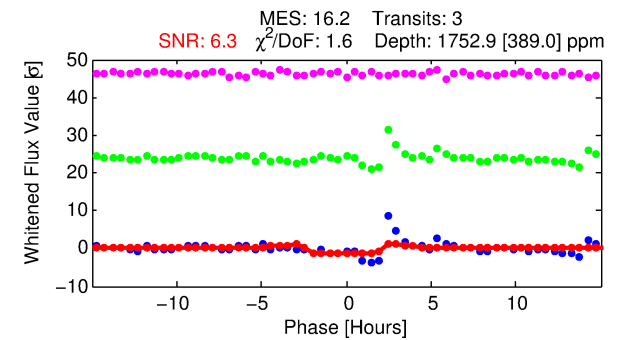
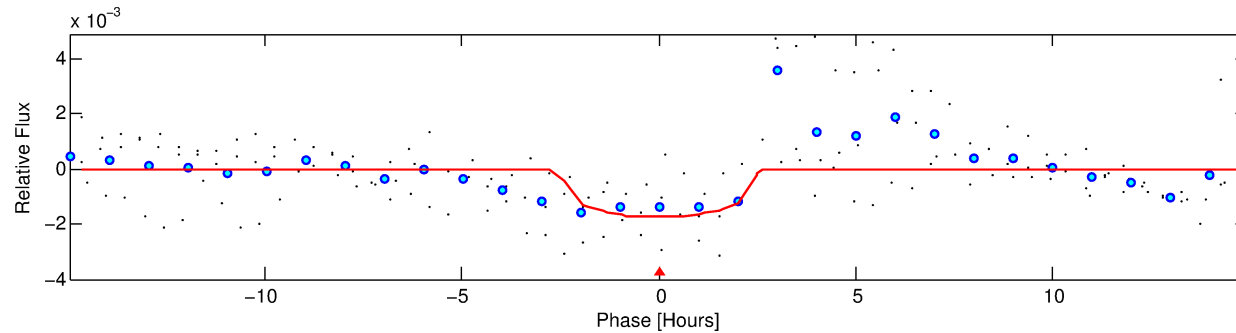
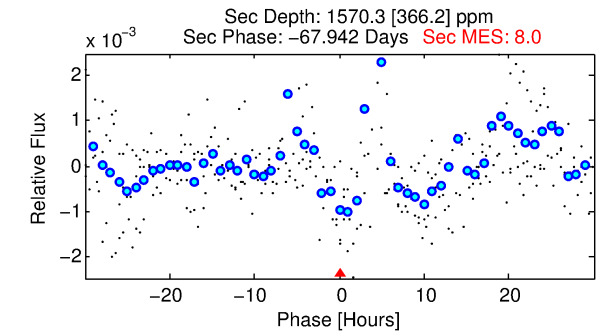
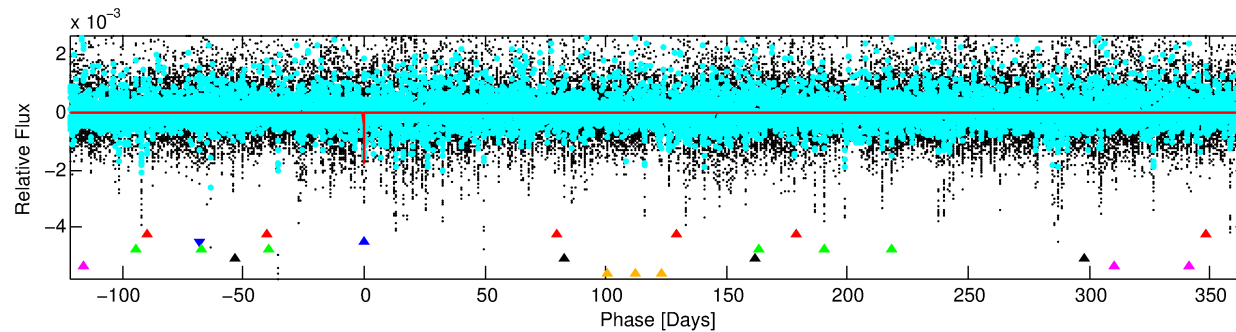
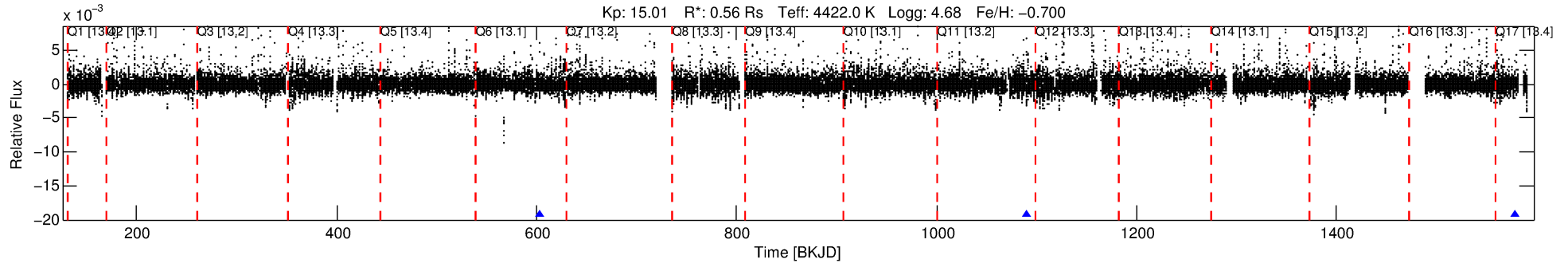
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018449-02

No Significant Match Found

DV One-Page Summary

KIC: 9018449 Candidate: 2 of 6 Period: 487.480 d



DV Fit Results:

Period = 487.48021 [0.00679] d
Epoch = 603.1194 [0.0091] BKJD
Rp/R* = 0.0386 [0.0439]
a/R* = 686.53 [2698.60]
b = 0.48 [6.36]
Seff = 0.11 [0.02]
Teq = 147 [6] K
Rp = 2.38 [2.72] Re
a = 0.9955 [0.0731] AU
Ag = 150797.05 [345038.65] [0.44%]
Teffp = 4478 [2562] K [1.69%]

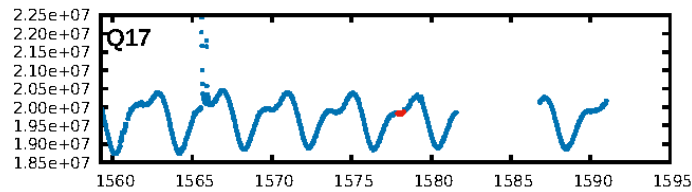
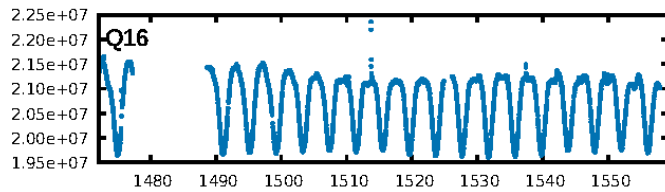
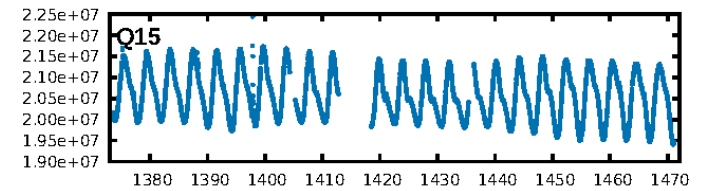
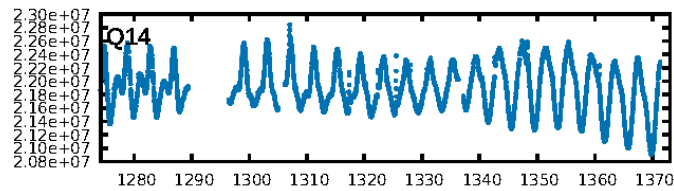
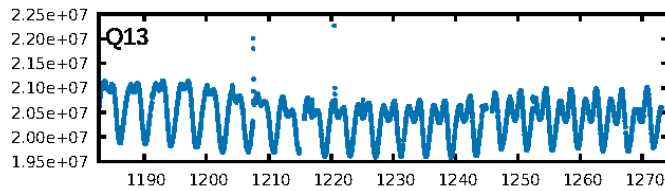
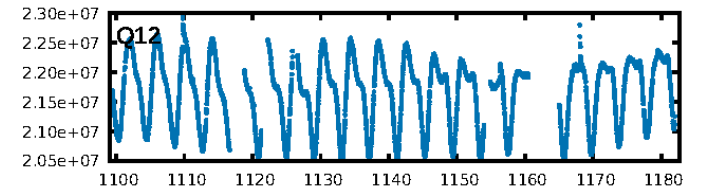
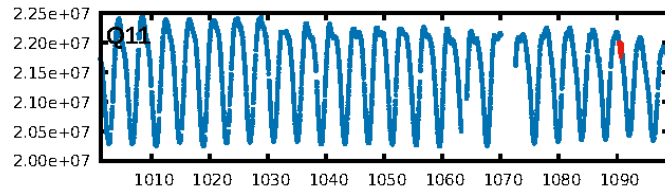
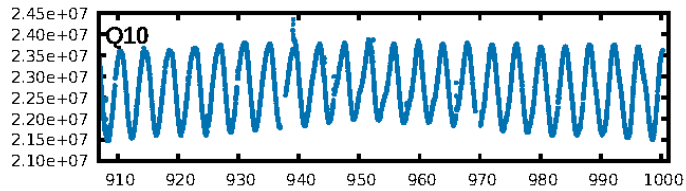
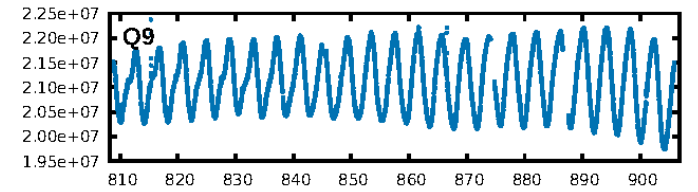
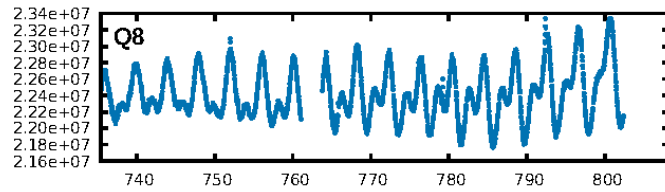
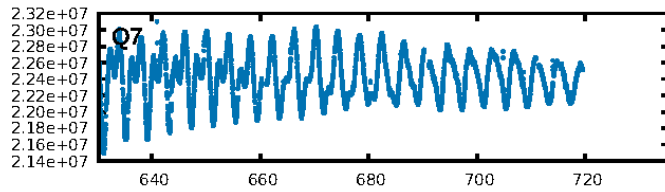
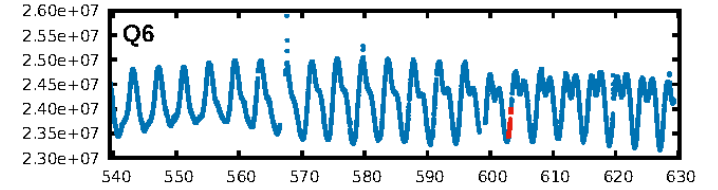
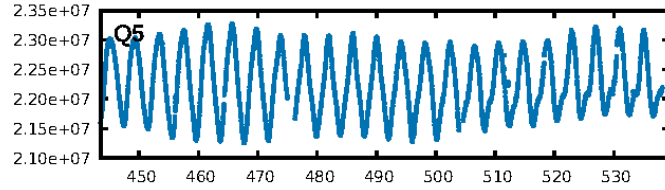
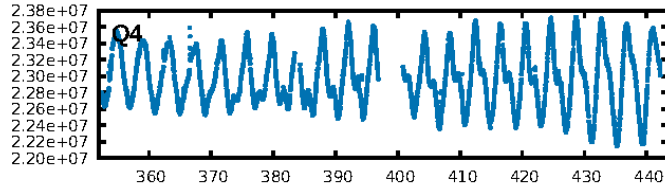
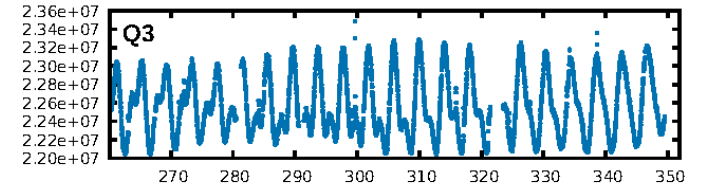
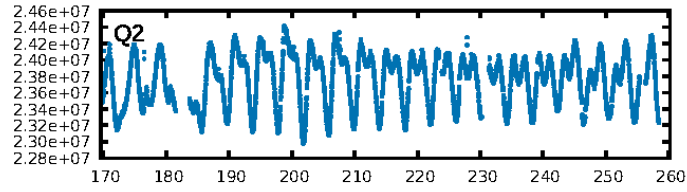
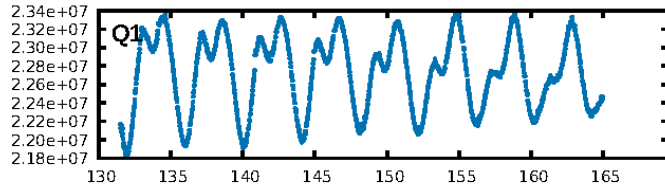
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [43.17%]
LongPeriod-sig: 100.0% [129.56%]
ModelChiSquare2-sig: 4.9%
ModelChiSquareGof-sig: 53.4%
Bootstrap-pfa: 6.90e-13
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.8215
Centroid-sig: 21.8%
Centroid-so: 0.939 arcsec [1.16%]
OotOffset-rm: 0.169 arcsec [1.63%]
KicOffset-rm: 0.061 arcsec [0.65%]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

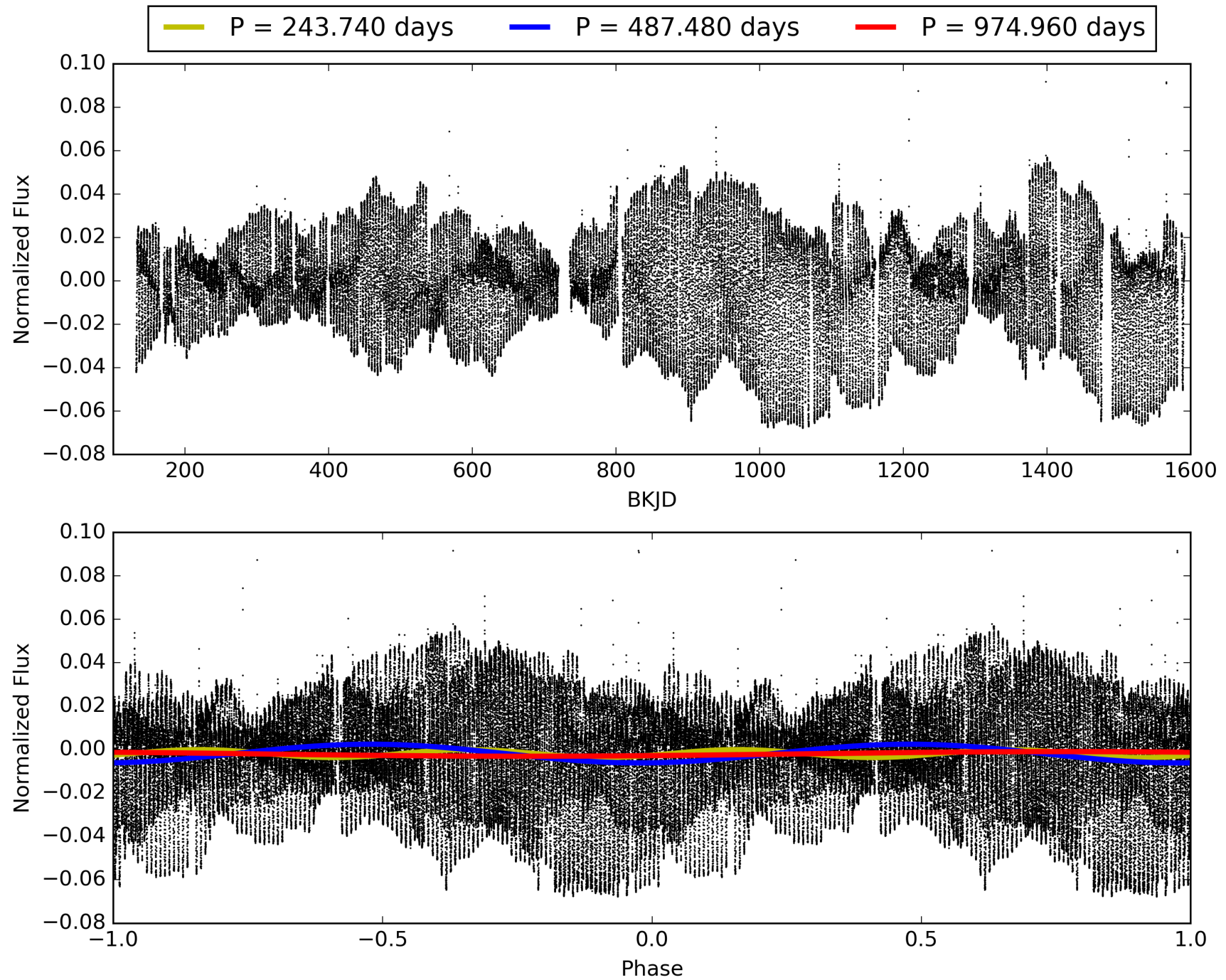
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:28:44 Z

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

TCE 009018449-02, PDC Light Curves

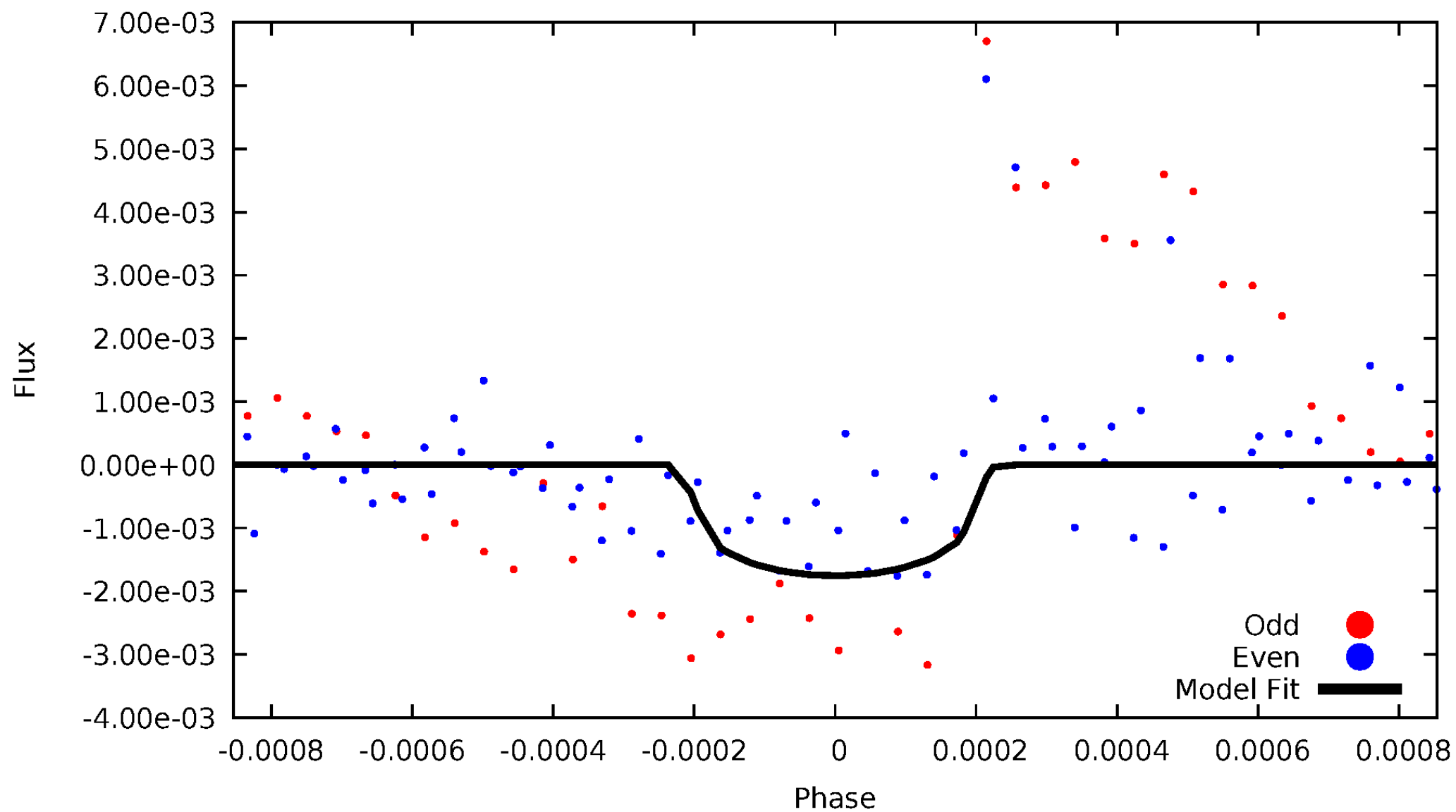


TCE 009018449-02



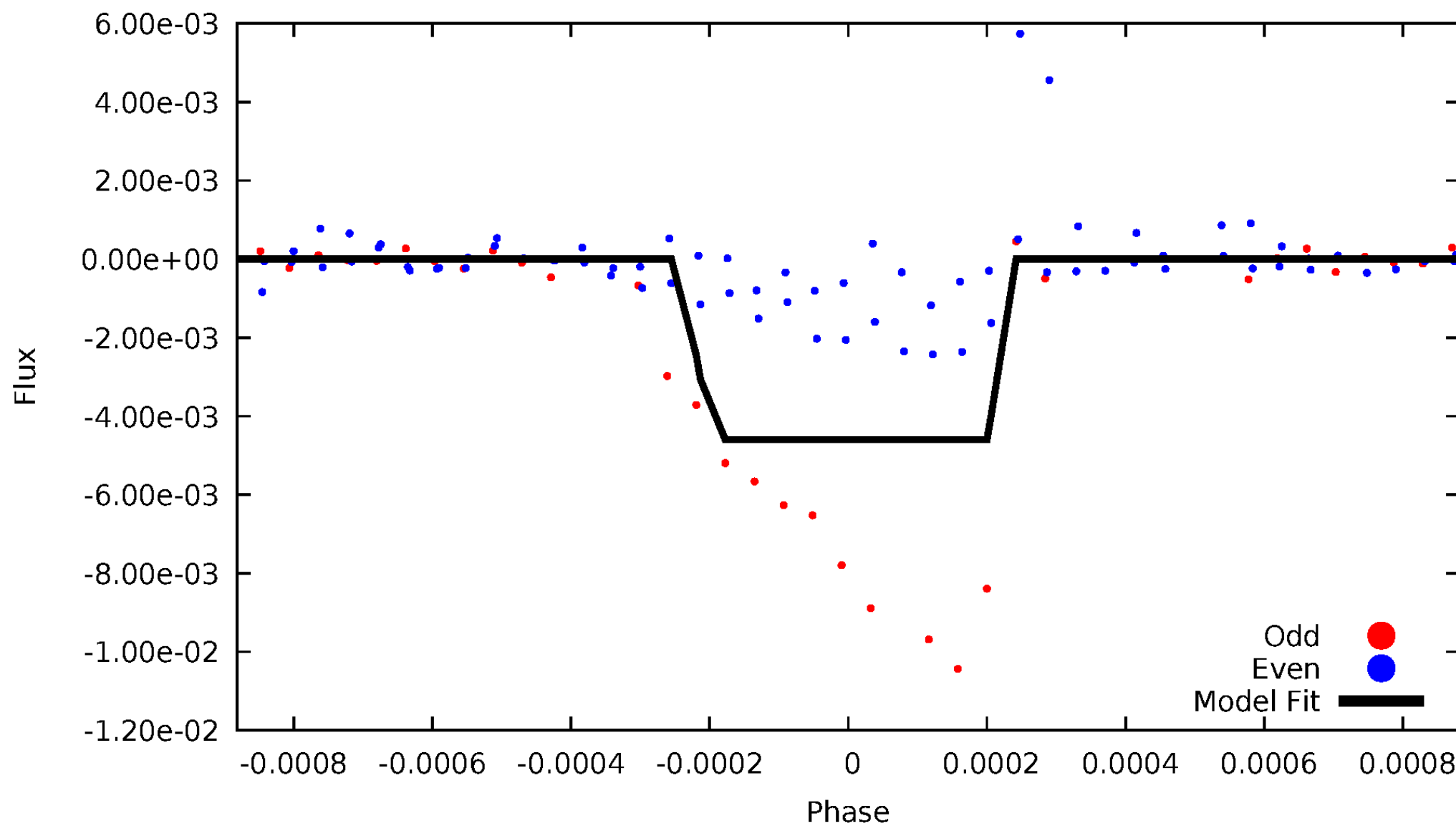
DV Odd/Even

TCE 009018449-02



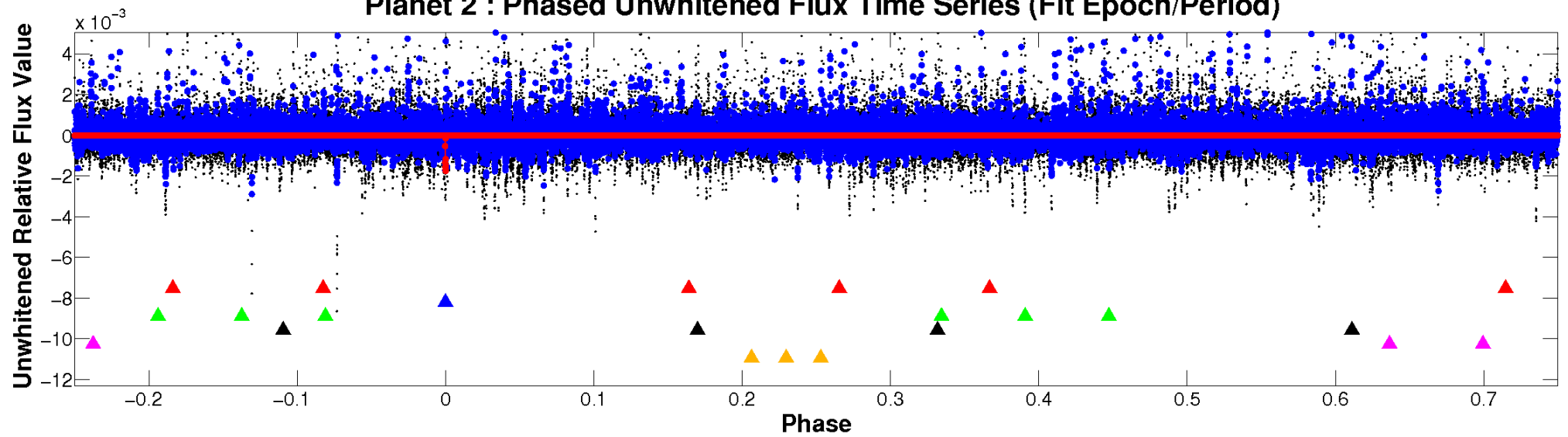
ALT Odd/Even

TCE 009018449-02

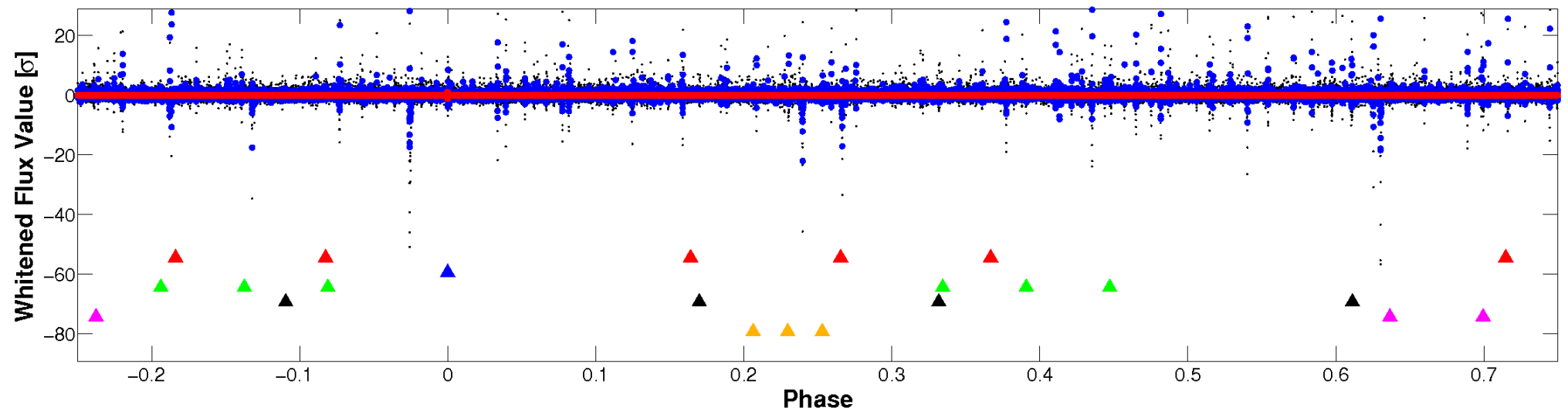


Non-Whitened Vs. Whitened Light Curve

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

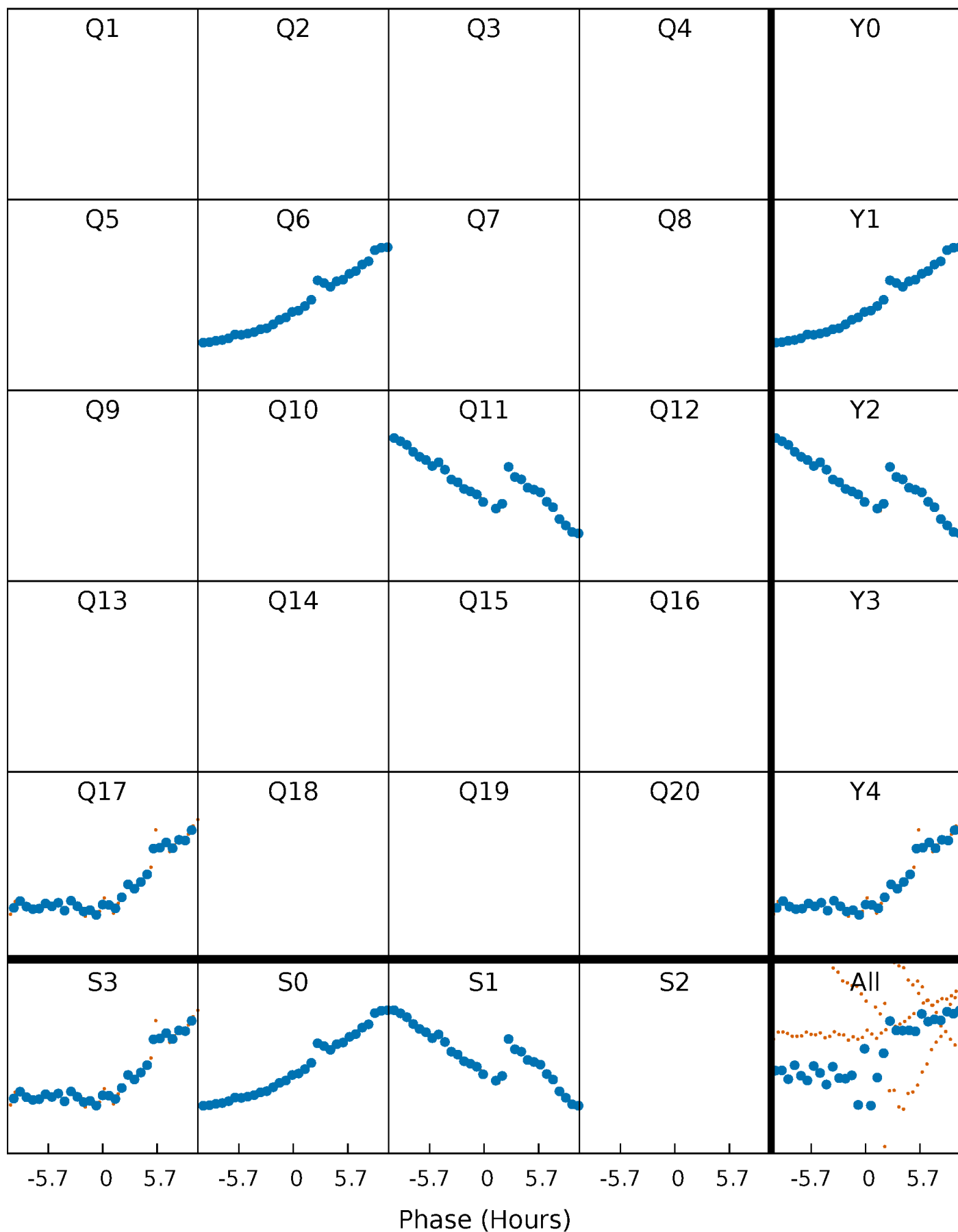


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



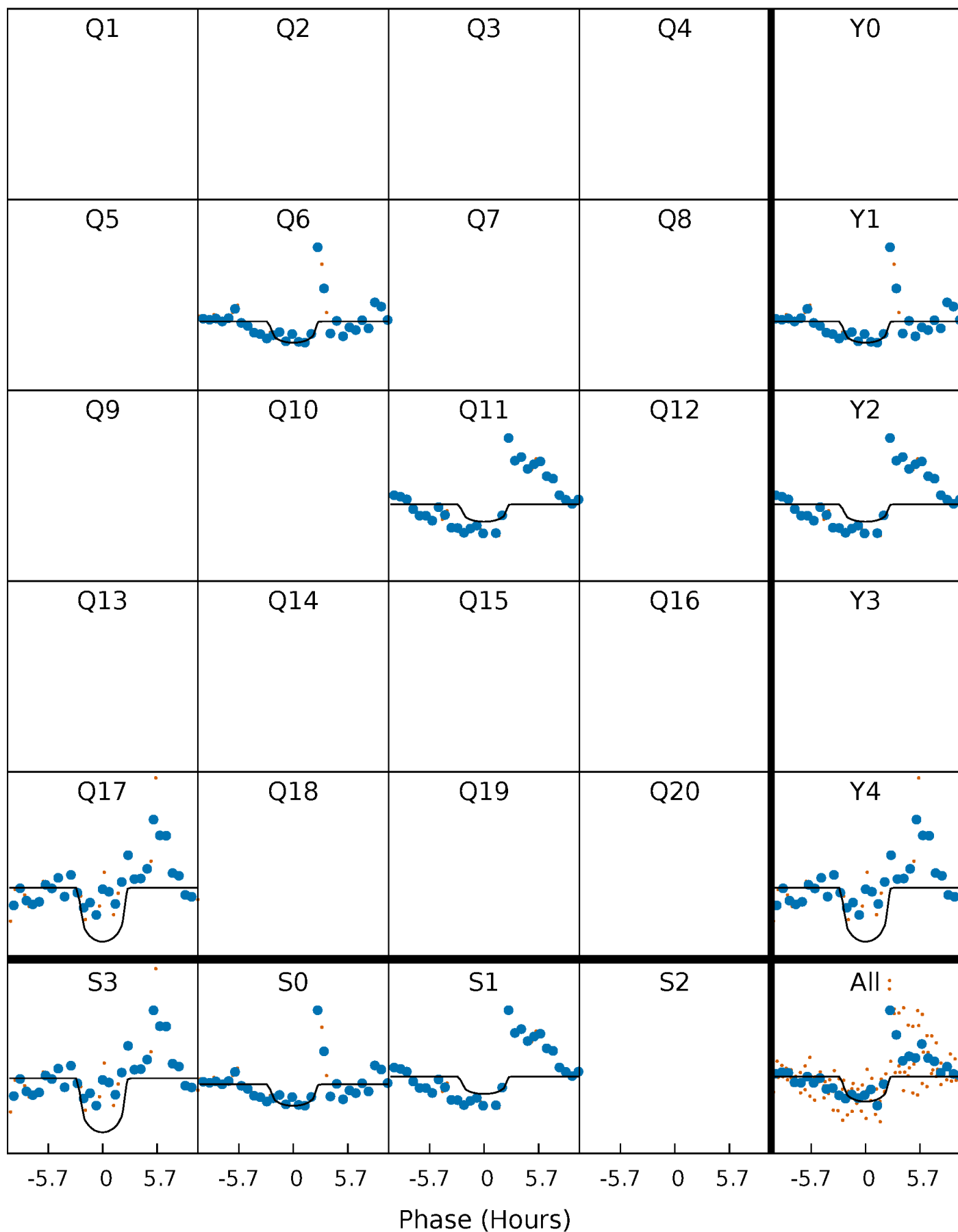
PDC Quarter-Phased Transit Curves

TCE 009018449-02 P=487.480212 Days $T_0=603.119357$ (BKJD)



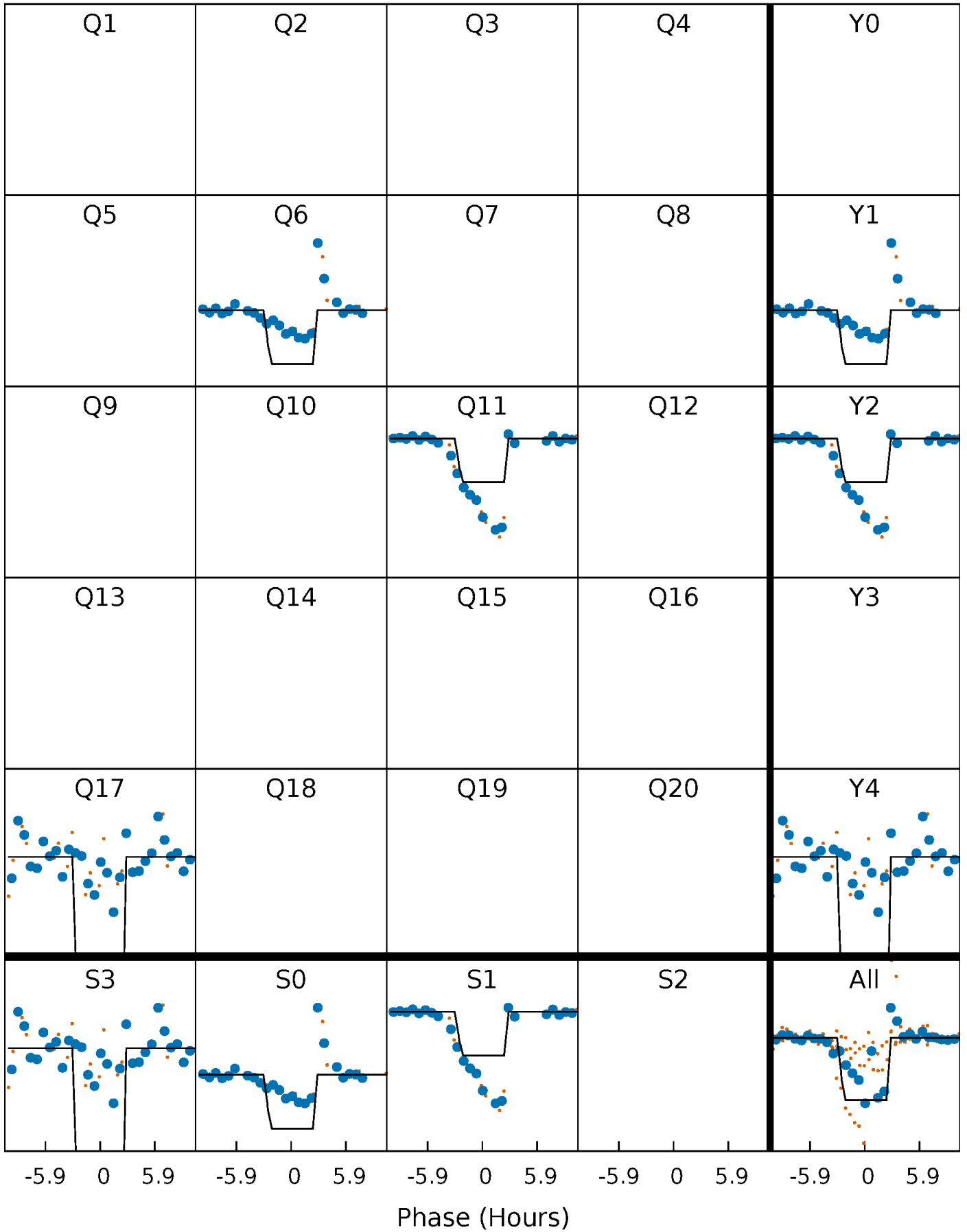
DV Quarter-Phased Transit Curves

TCE 009018449-02 $P=487.480212$ Days $T_0=603.119357$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

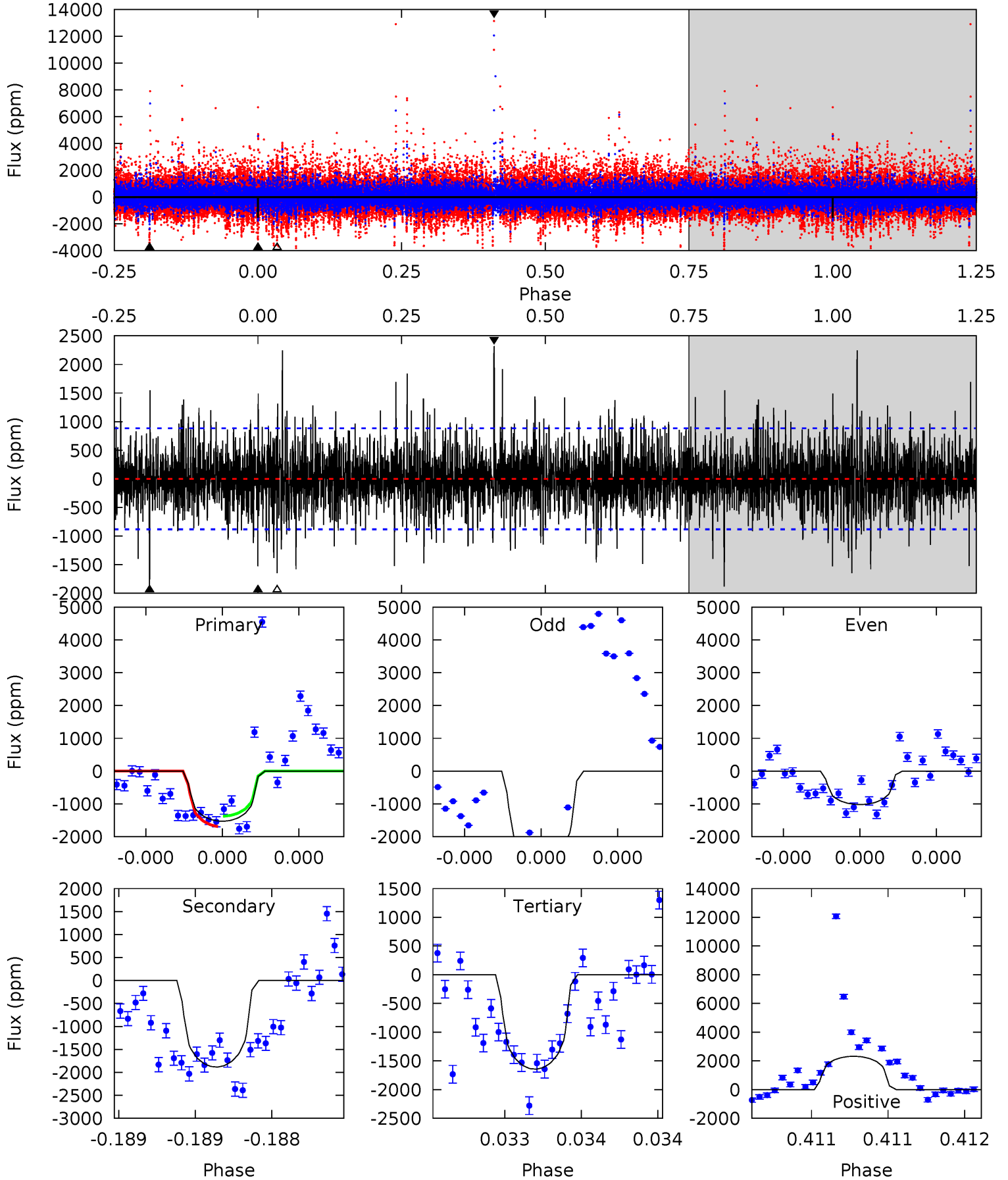
TCE 009018449-02 P=487.483441 Days $T_0=603.102869$ (BKJD)



DV Model-Shift Uniqueness Test

009018449-02, P = 487.480212 Days, E = 115.639145 Days

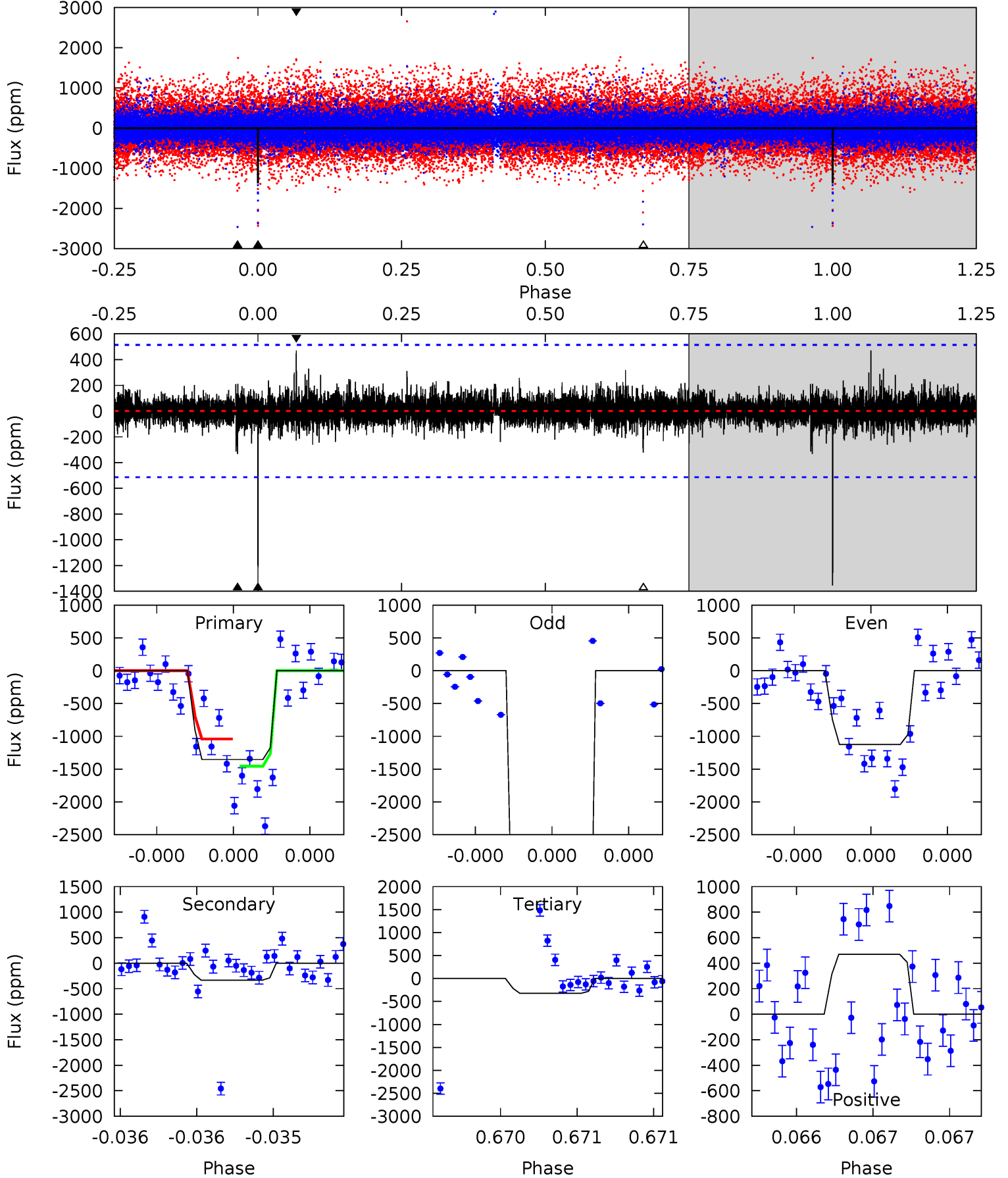
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.67	11.9	10.4	14.7	5.59	3.50	2.50	-0.73	-5.00	1.51	-2.76	3.74	1.03	0.55	1.00



Alt Model-Shift Uniqueness Test

009018449-02, P = 487.483441 Days, E = 115.619428 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	3.63	3.52	5.12	5.60	3.52	0.63	11.2	9.66	0.11	-1.48	44.0	1.82	0.26	2.32



Stellar Parameters For KIC 009018449

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4422^{+132}_{-132}	$4.677^{+0.059}_{-0.027}$	$-0.700^{+0.300}_{-0.300}$	$0.565^{+0.045}_{-0.049}$	$0.554^{+0.056}_{-0.033}$	$4.317^{+1.061}_{-0.588}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
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 009018449-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1883 ± 158	$3.03^{+2.52}_{-1.87}$	204^{+7}_{-7}	4245^{+2214}_{-829}	$116132^{+664751}_{-82195}$
Alt.	-333 ± 92	$4.20^{+2.77}_{-2.25}$	204^{+7}_{-7}	2882^{+753}_{-361}	10065^{+39070}_{-6454}

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

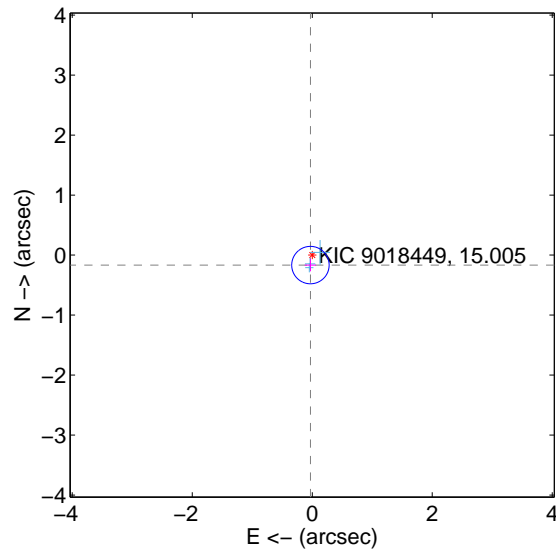
Supplemental centroid analysis for 009018449-02. Kepler magnitude: 15.01. Transit SNR 6.34

There are 3 quarters with good PRF difference image offsets

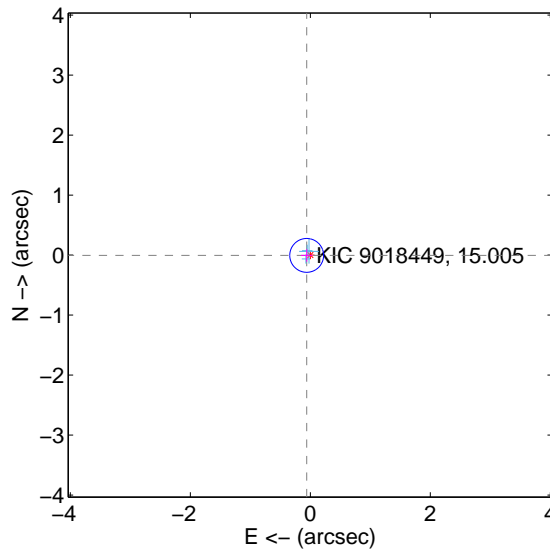
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.169 ± 0.104	1.63	0.030 ± 0.094	-0.166 ± 0.104
PRF-fit source offset from KIC position	0.061 ± 0.094	0.65	0.061 ± 0.094	-0.005 ± 0.104
photometric centroid source offset	0.94 ± 0.81	1.16	-0.32 ± 0.75	0.88 ± 0.81

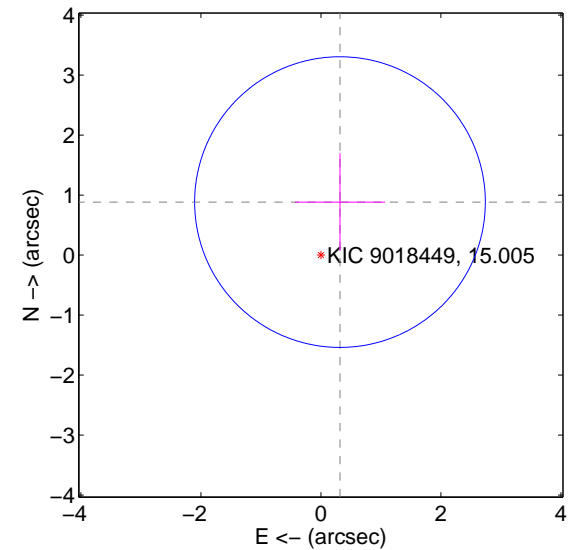
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

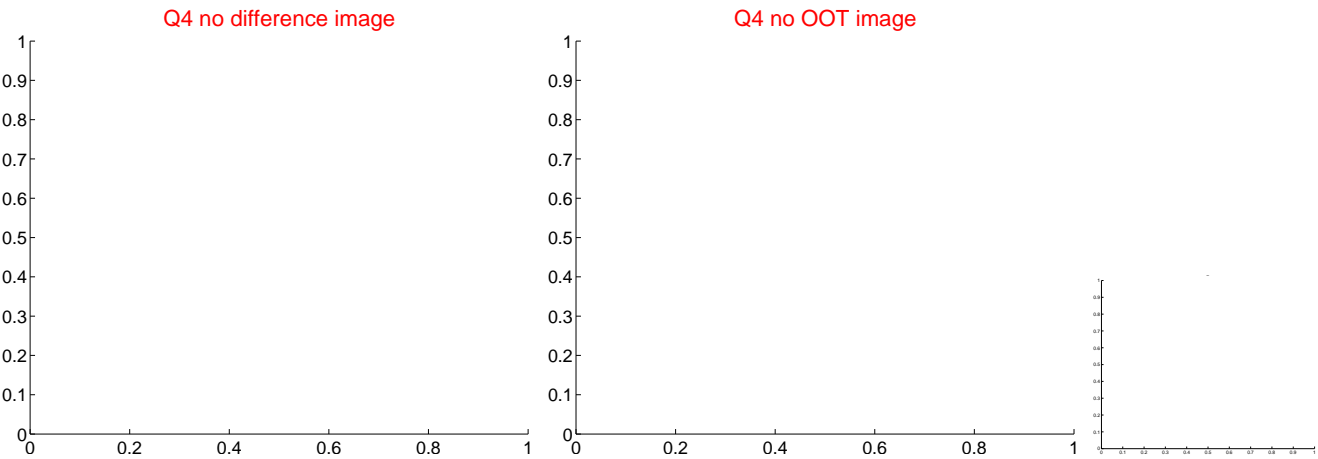
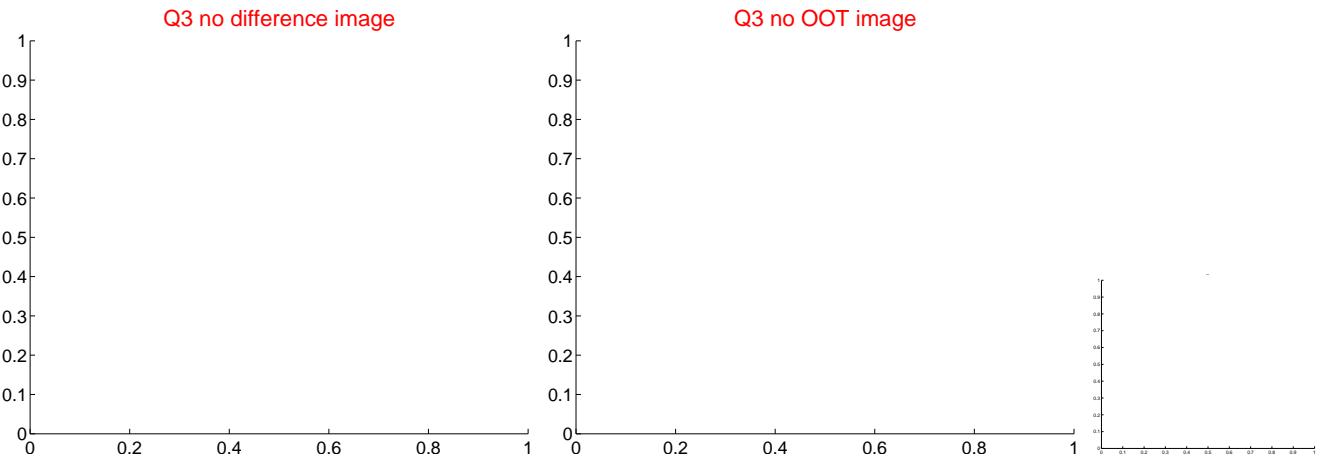
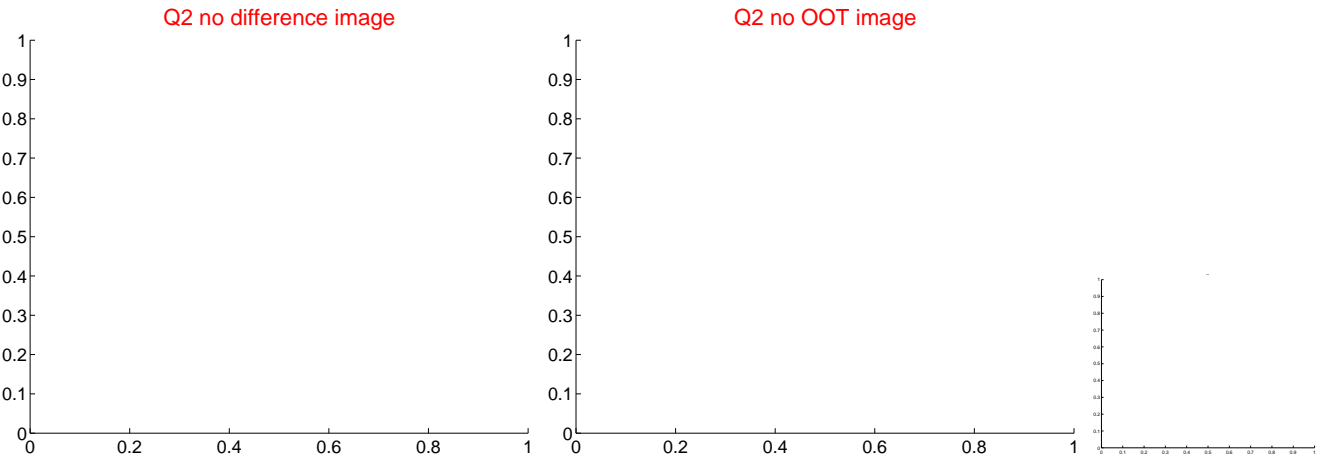
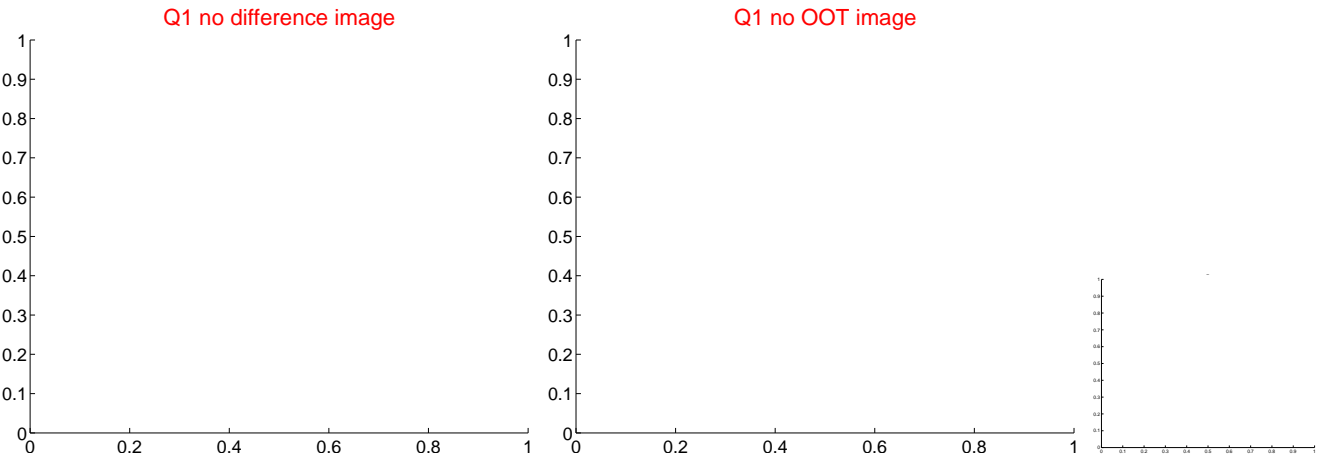


offset from photometric centroids



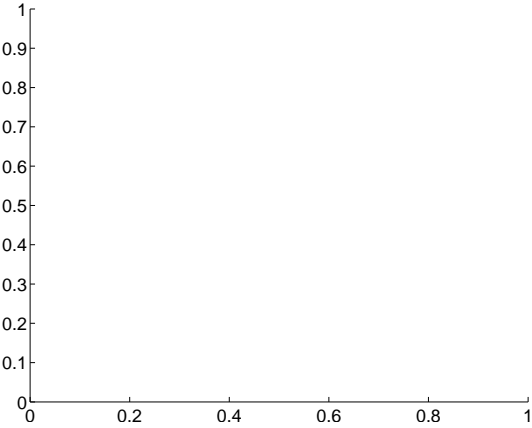
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

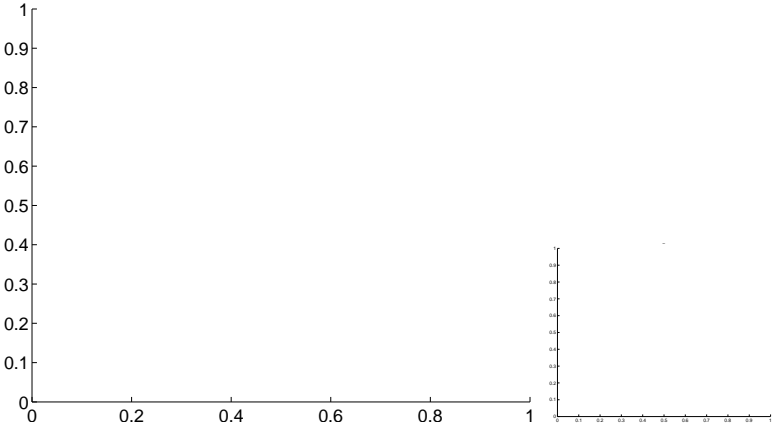


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

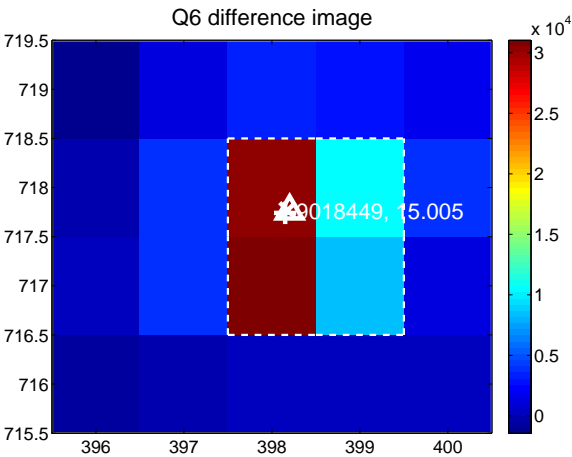
Q5 no difference image



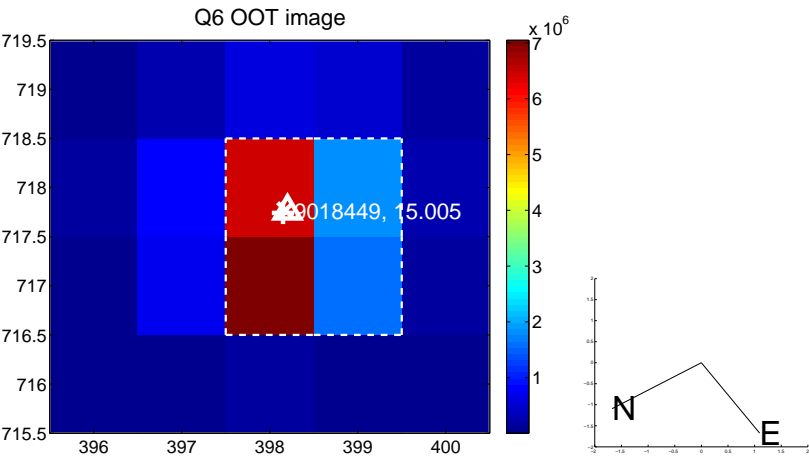
Q5 no OOT image



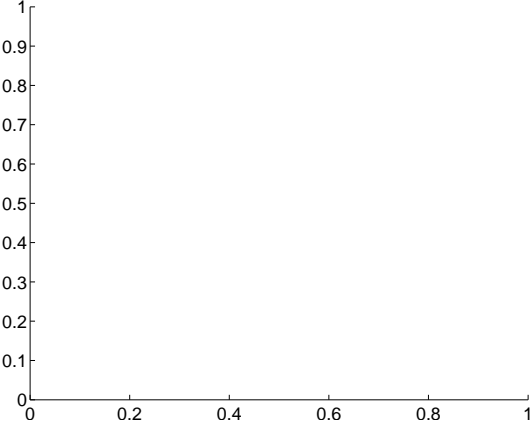
Q6 difference image



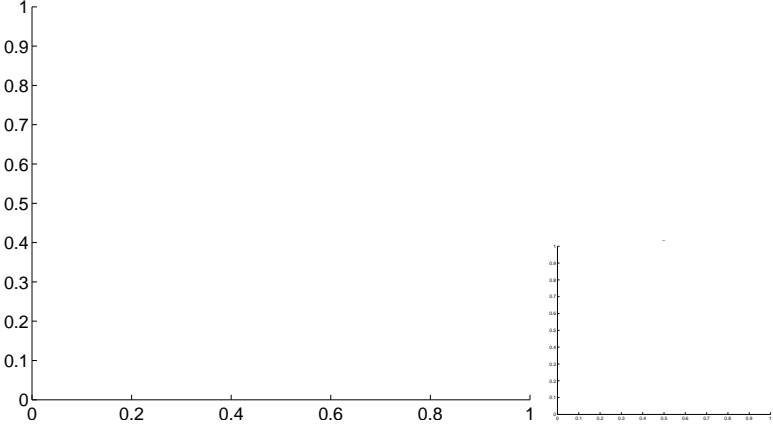
Q6 OOT image



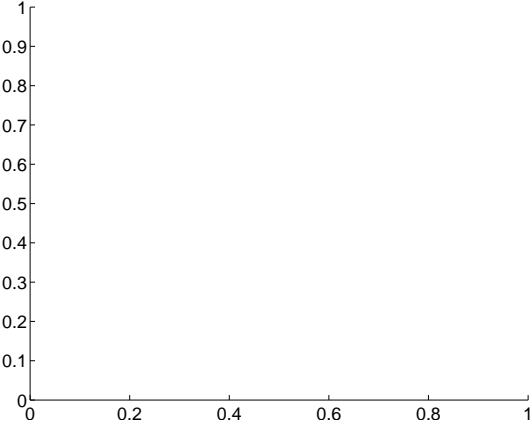
Q7 no difference image



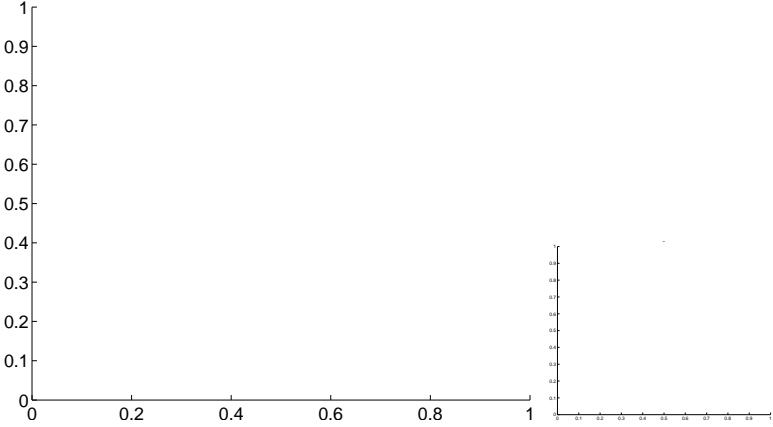
Q7 no OOT image



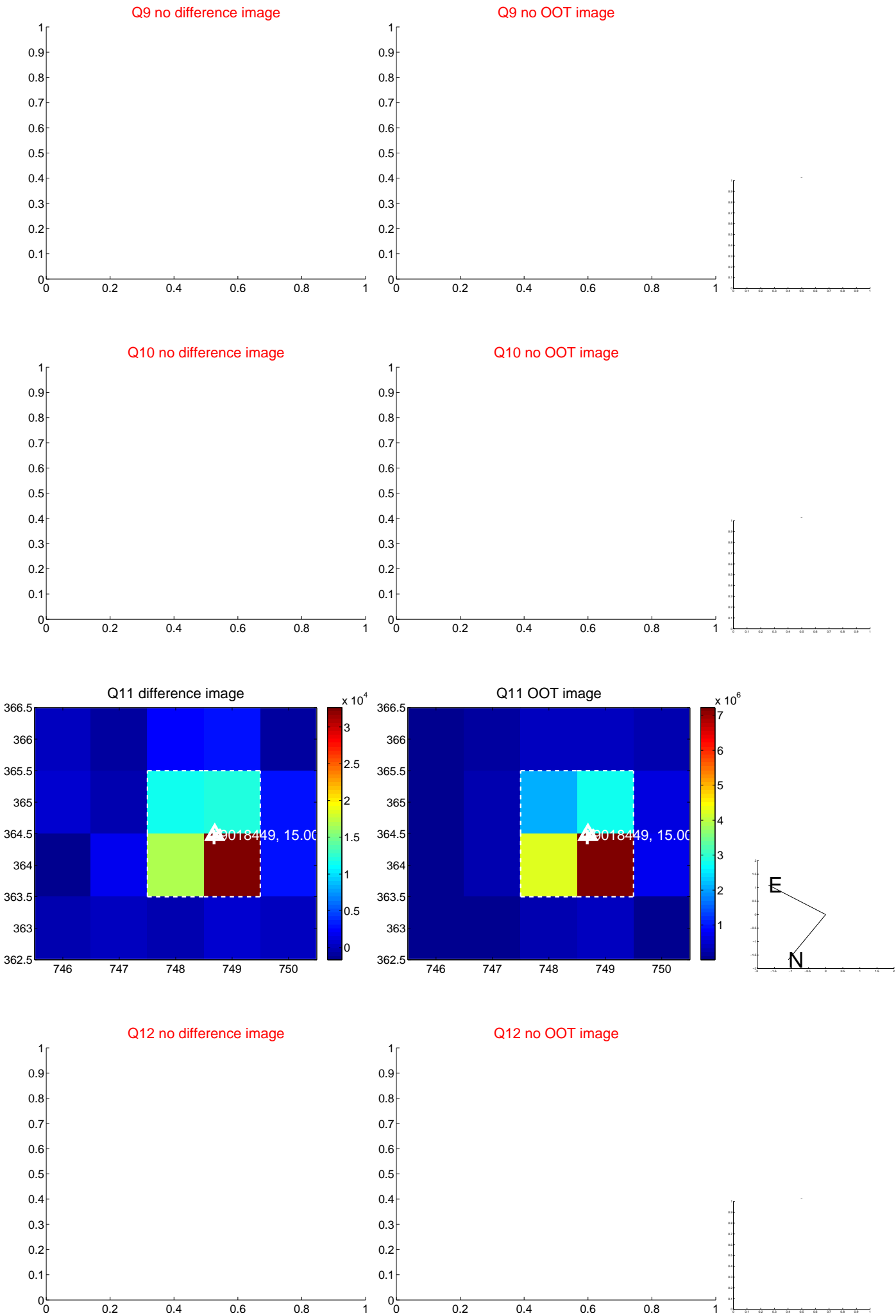
Q8 no difference image



Q8 no OOT image



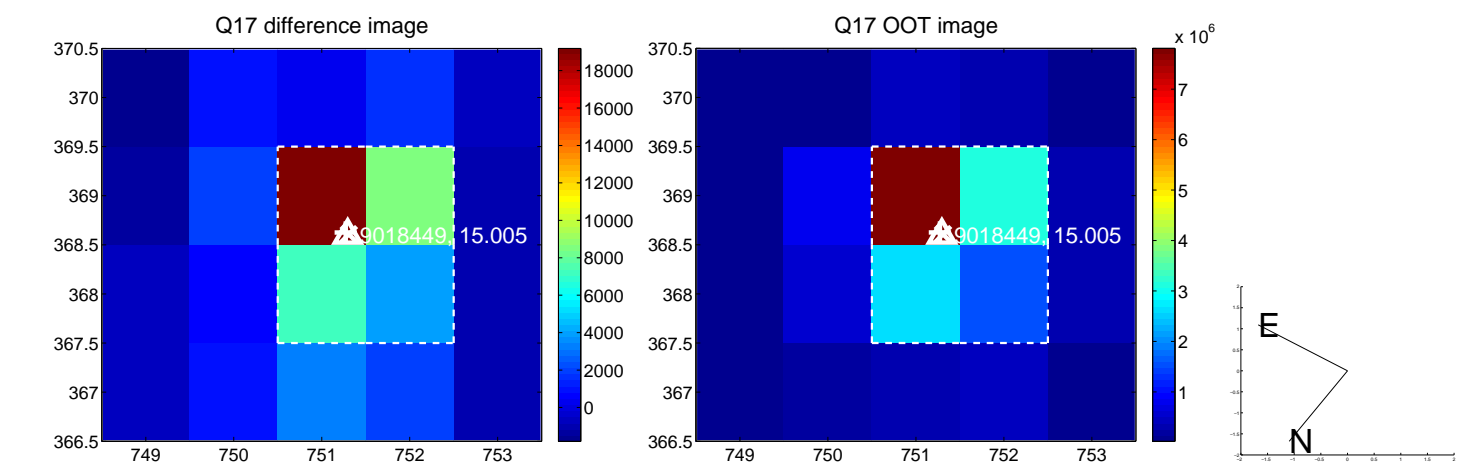
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



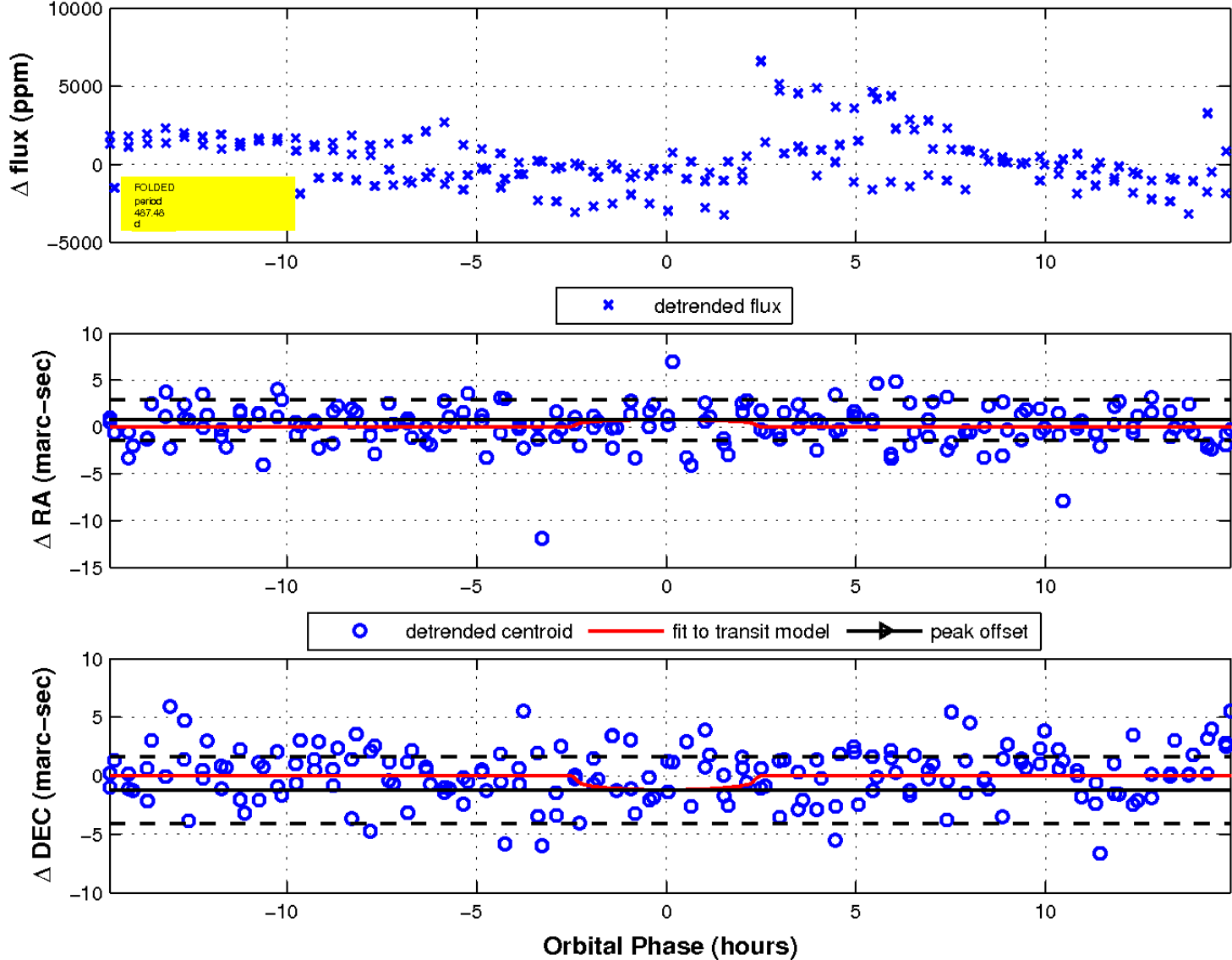
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

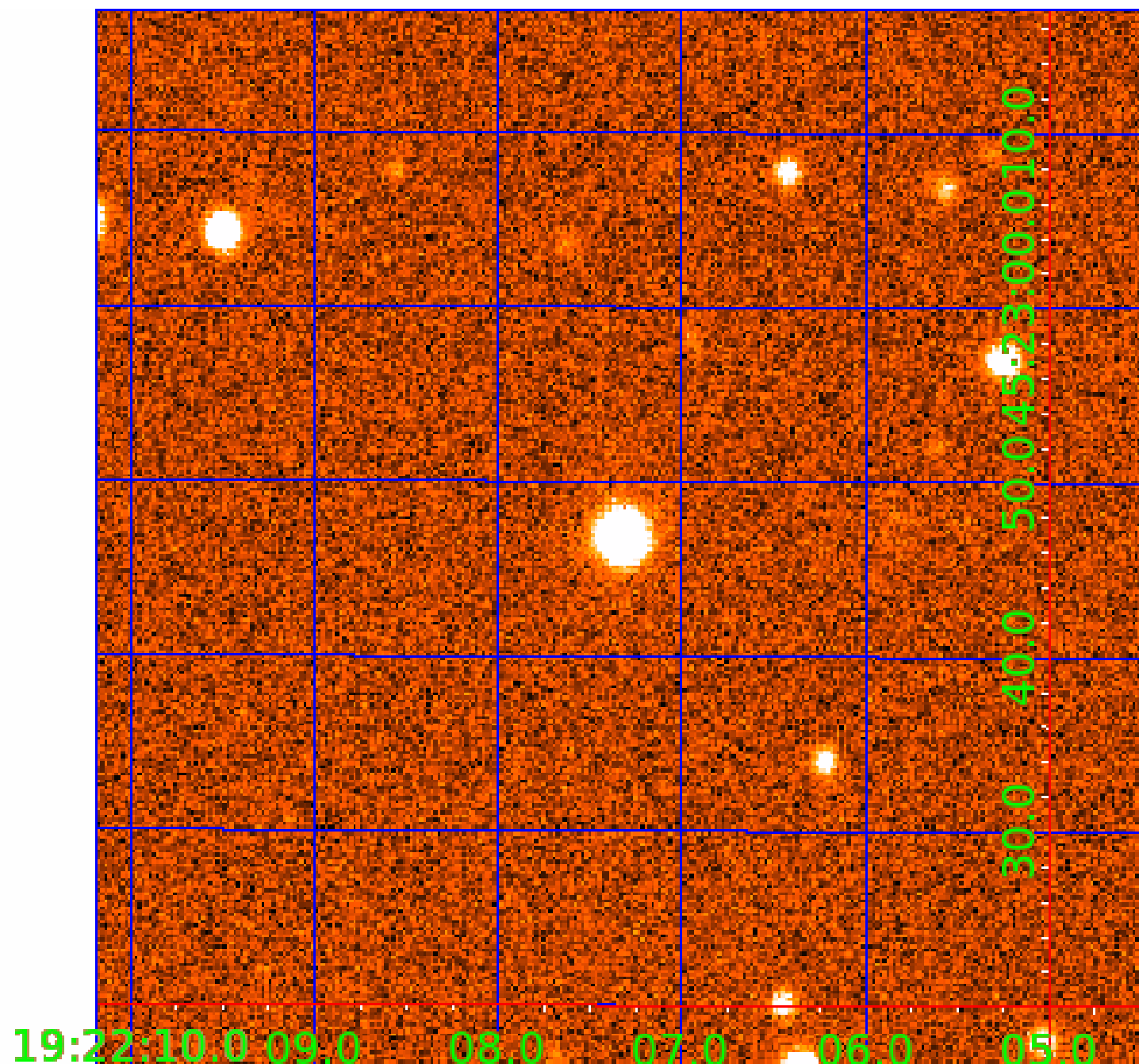


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



KIC 009018449

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})
009018449-01	OBS	No	268.447200	195.640107	1805.1	12.011	16.9	6.0	0.56	4422	2.33	0.24
009018449-02	OBS	No	487.480212	603.119357	1752.9	4.992	16.2	6.3	0.56	4422	2.38	0.11
009018449-03	OBS	No	229.987866	333.678601	1700.4	2.869	15.7	8.8	0.56	4422	2.34	0.30
009018449-04	OBS	No	351.273184	198.500793	2903.0	3.000	15.5	-1.0	0.56	4422	2.96	0.17
009018449-05	OBS	No	518.174954	425.928371	1217.1	2.723	12.2	4.6	0.56	4422	2.09	0.10
009018449-06	OBS	No	476.094534	239.001268	1637.2	3.893	13.6	6.9	0.56	4422	2.24	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018449-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009018449-02	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—INCONSISTENT_TRANS
009018449-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009018449-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009018449-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009018449-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

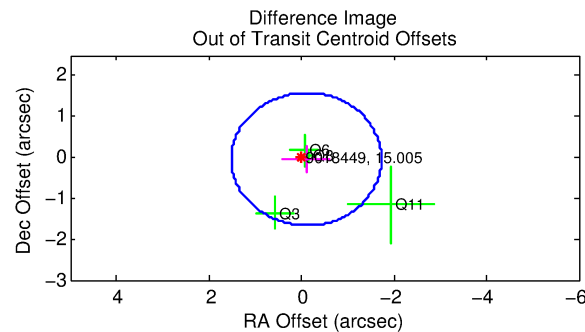
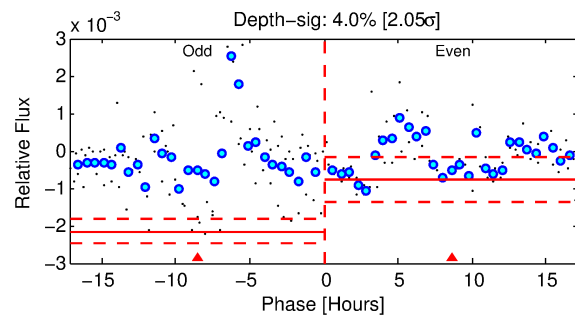
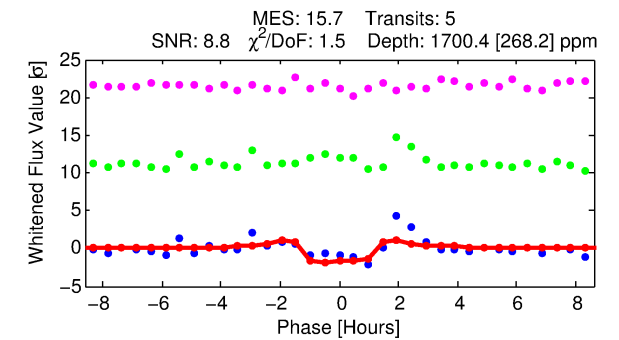
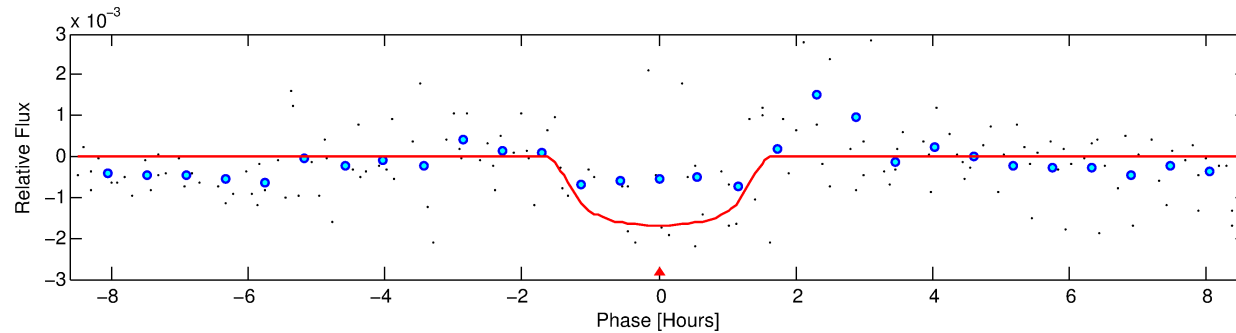
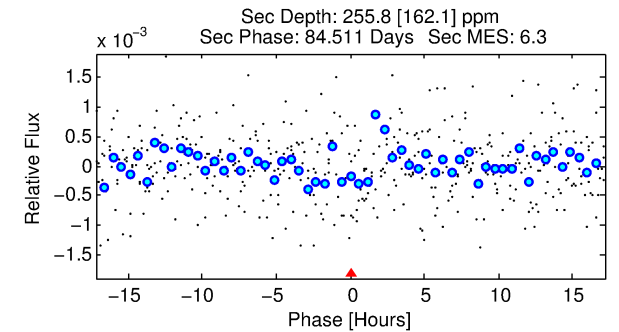
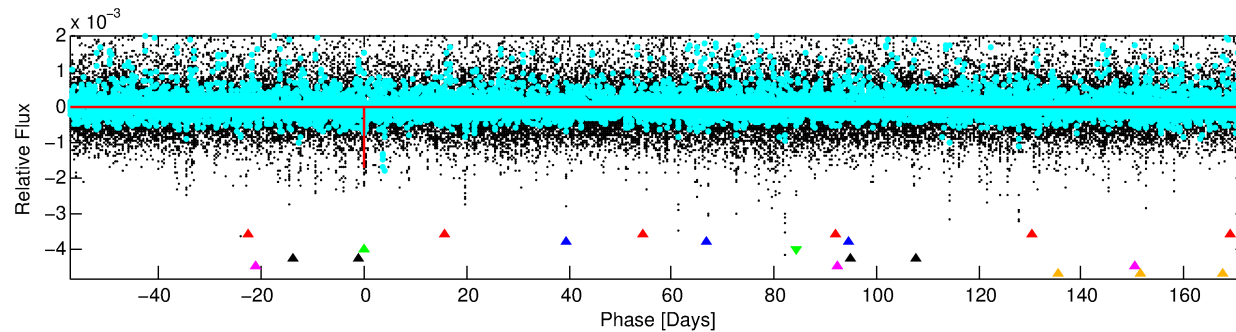
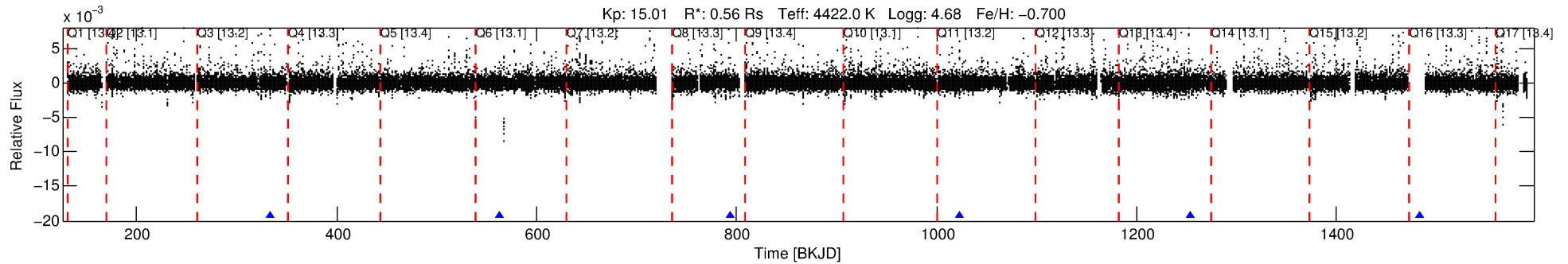
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018449-03

No Significant Match Found

DV One-Page Summary

KIC: 9018449 Candidate: 3 of 6 Period: 229.988 d



DV Fit Results:

Period = 229.98787 [0.00269] d
Epoch = 333.6786 [0.0057] BKJD
Rp/R* = 0.0380 [0.0544]
a/R* = 568.80 [2787.74]
b = 0.46 [8.49]
Seff = 0.30 [0.05]
Teq = 189 [8] K
Rp = 2.34 [3.36] Re
a = 0.6033 [0.0443] AU
Ag = 9339.15 [27441.22] [0.34σ]
Teffp = 2869 [2108] K [1.27σ]

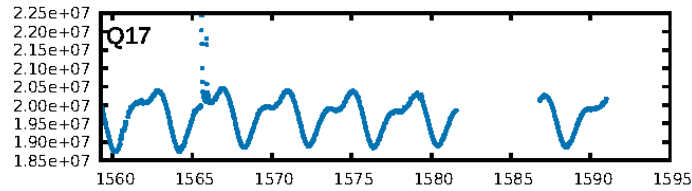
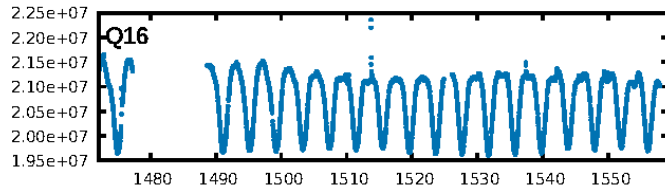
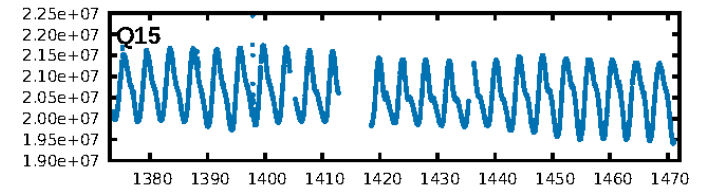
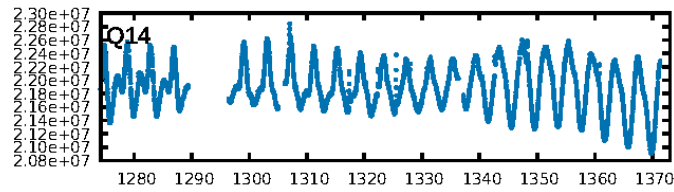
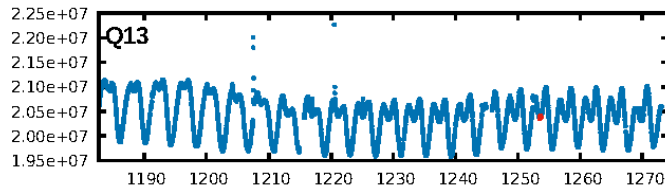
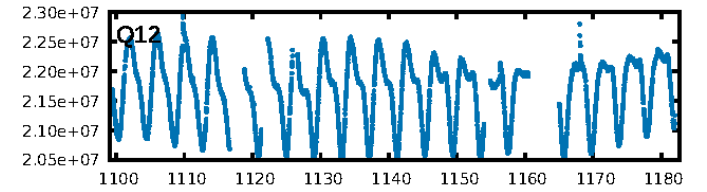
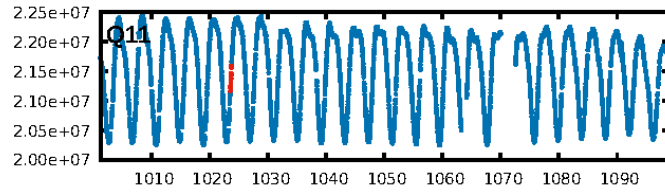
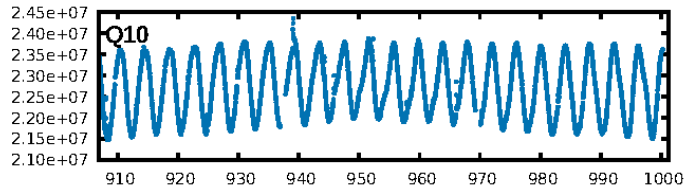
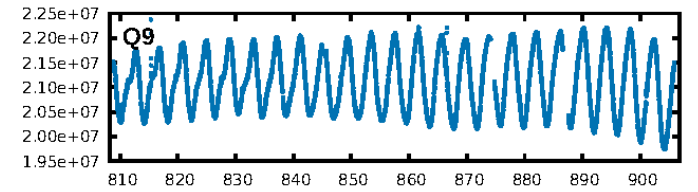
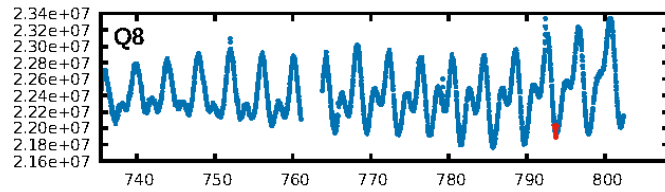
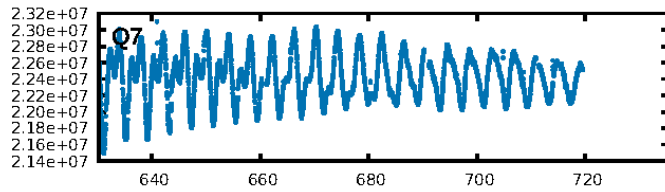
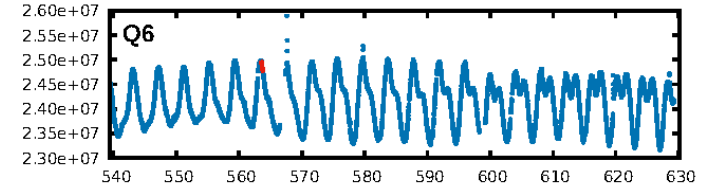
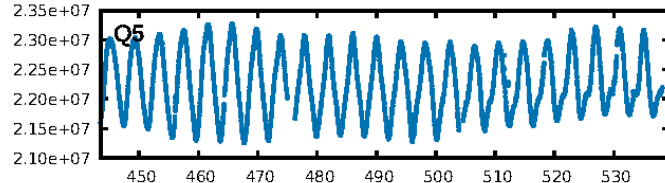
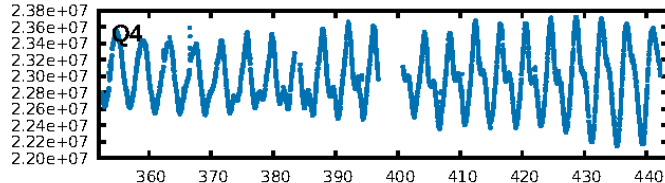
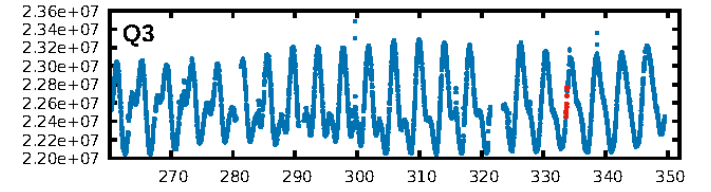
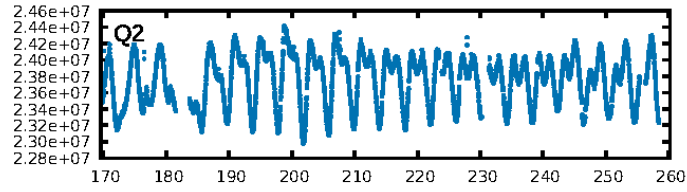
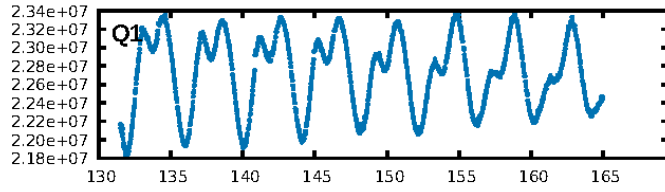
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [74.75σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 29.7%
Bootstrap-pfa: 9.60e-14
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.2635
Centroid-sig: 81.3%
Centroid-so: 0.288 arcsec [0.41σ]
OotOffset-rm: 0.113 arcsec [0.21σ]
OotOffset-st: 1/2/1/0 [4]
KicOffset-rm: 0.120 arcsec [0.29σ]
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 1.00 [5/5]

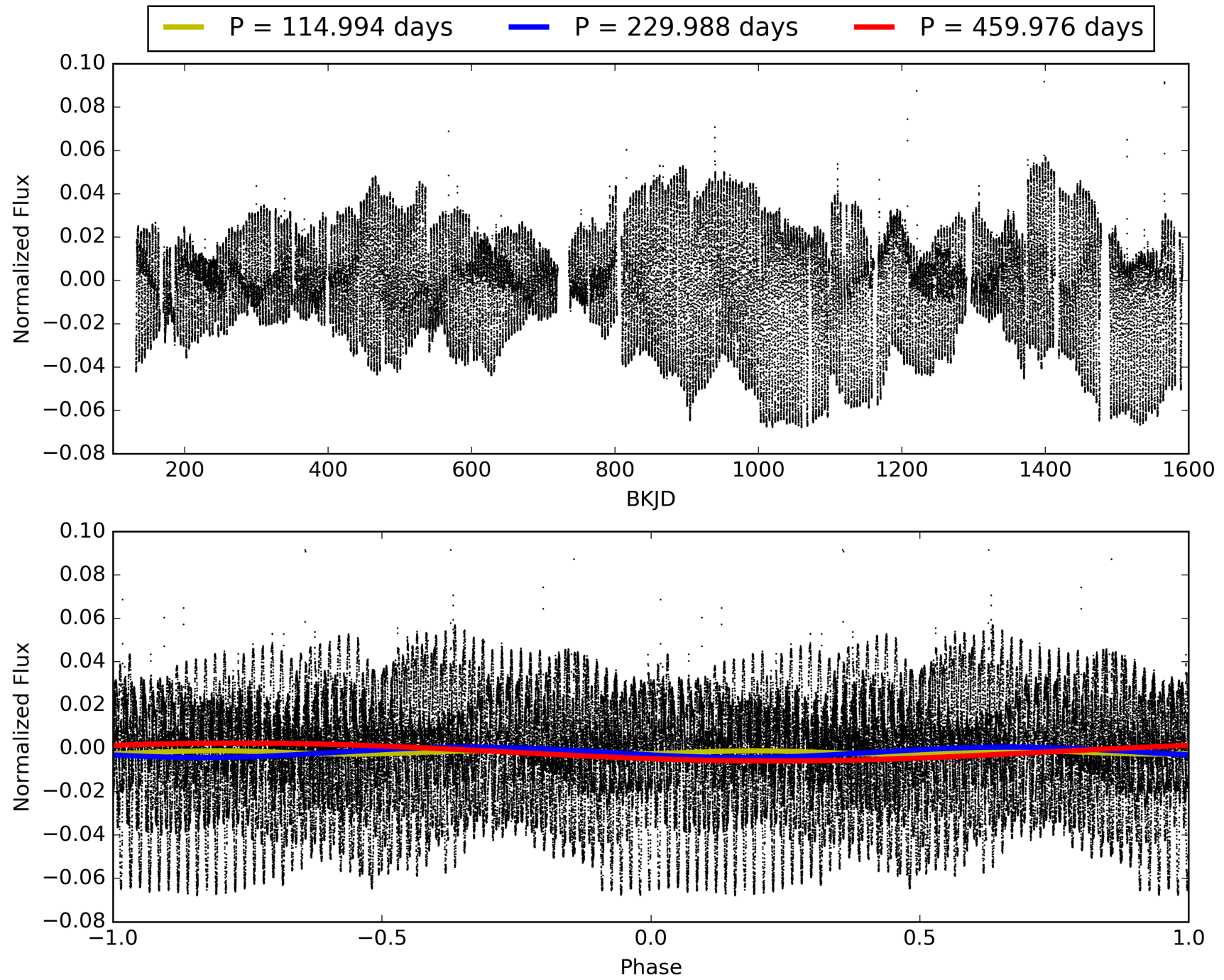
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:28:58 Z

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

TCE 009018449-03, PDC Light Curves

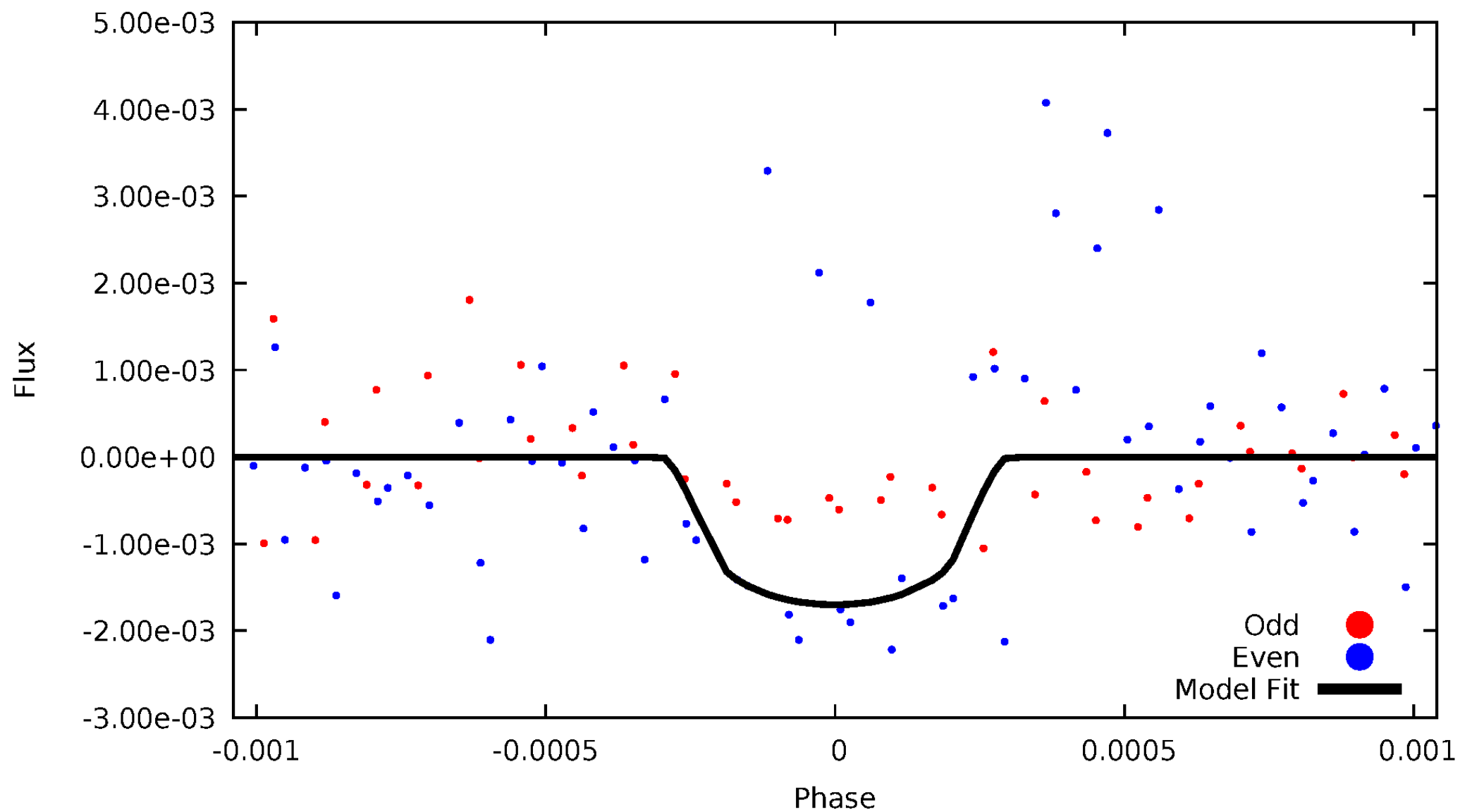


TCE 009018449-03



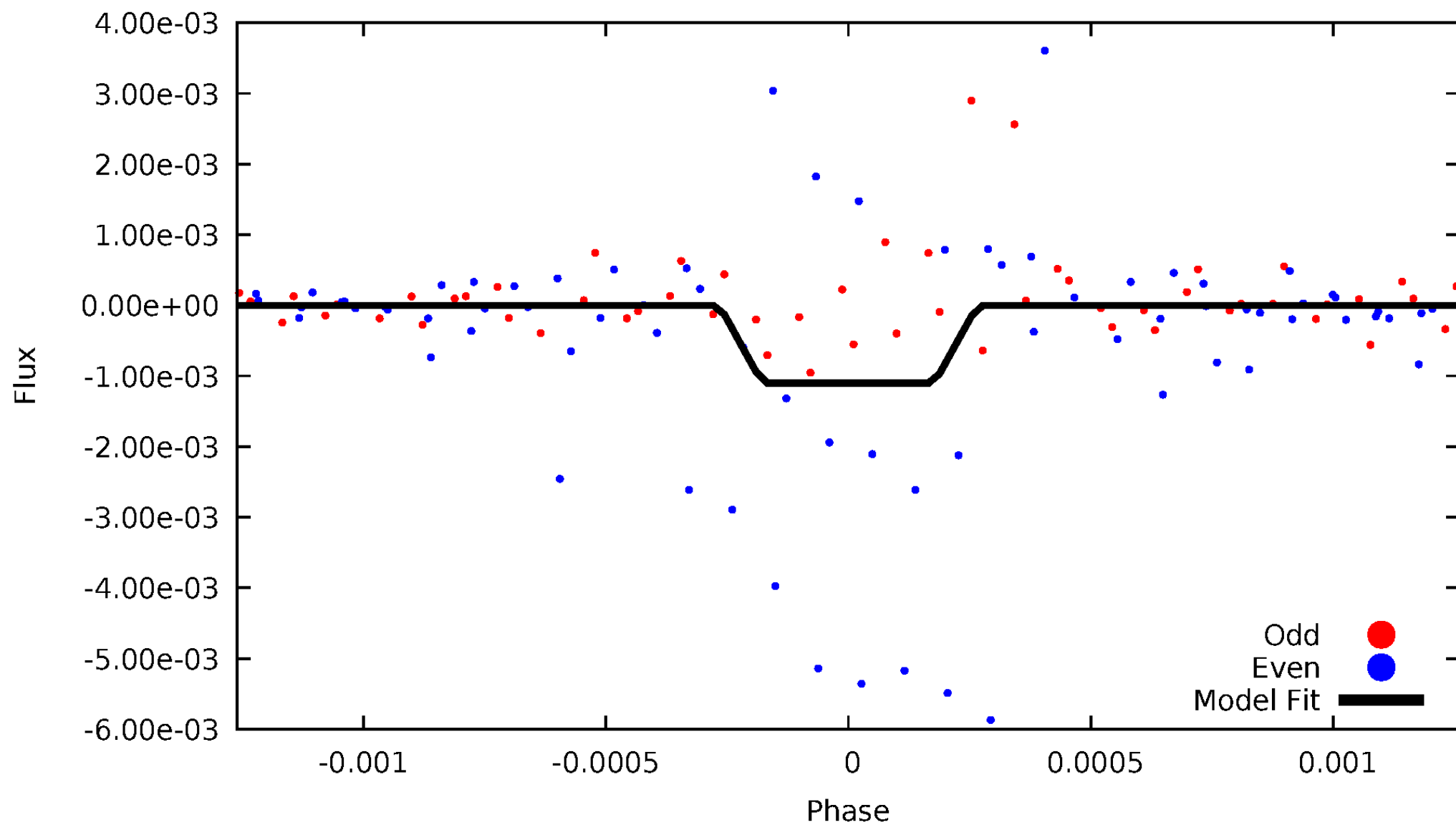
DV Odd/Even

TCE 009018449-03



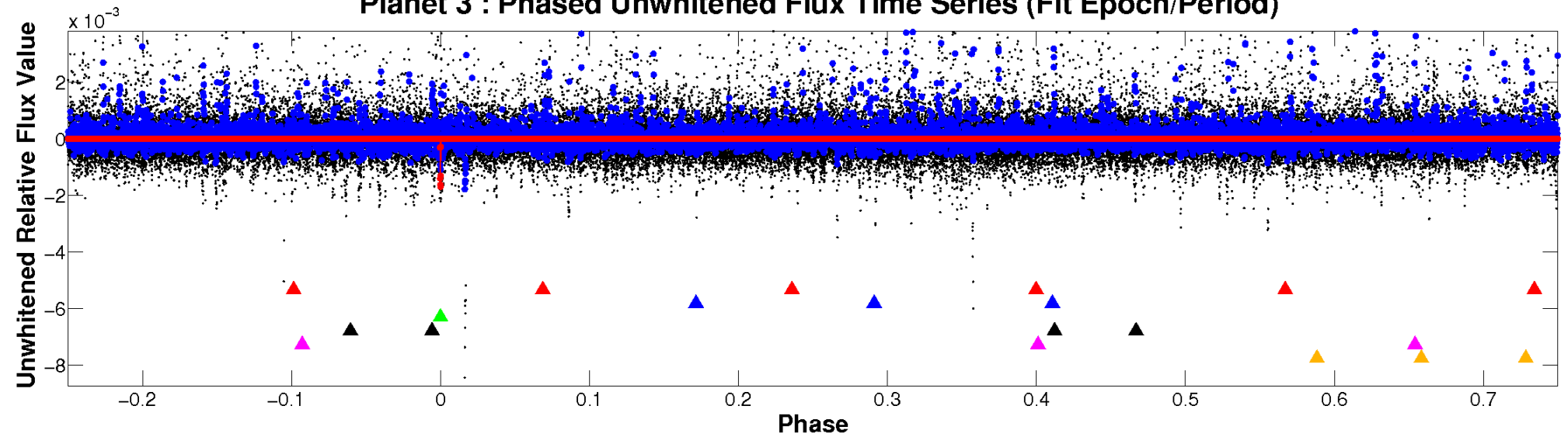
ALT Odd/Even

TCE 009018449-03

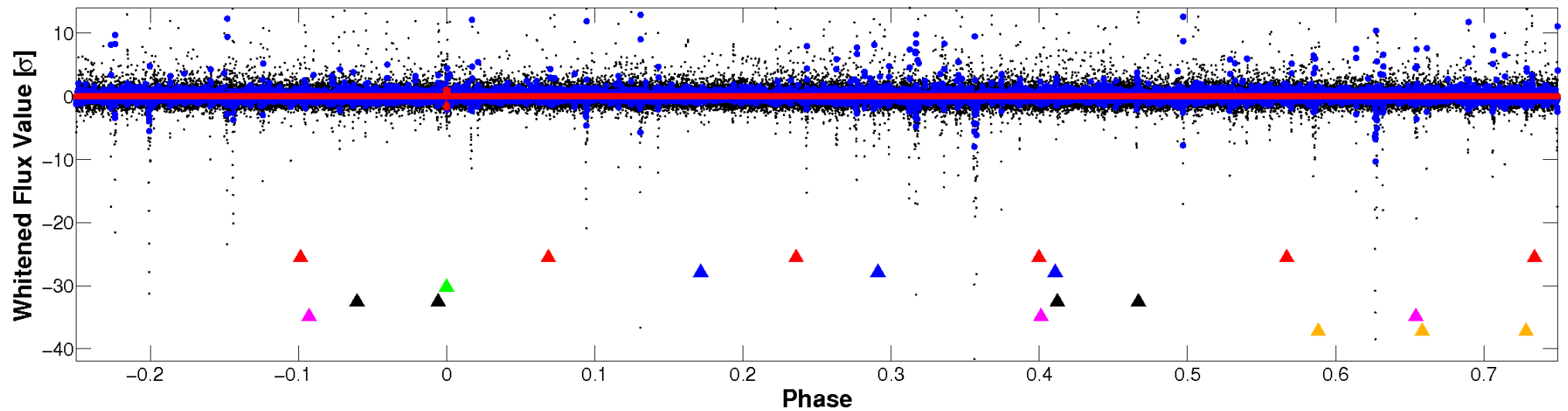


Non-Whitened Vs. Whitened Light Curve

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

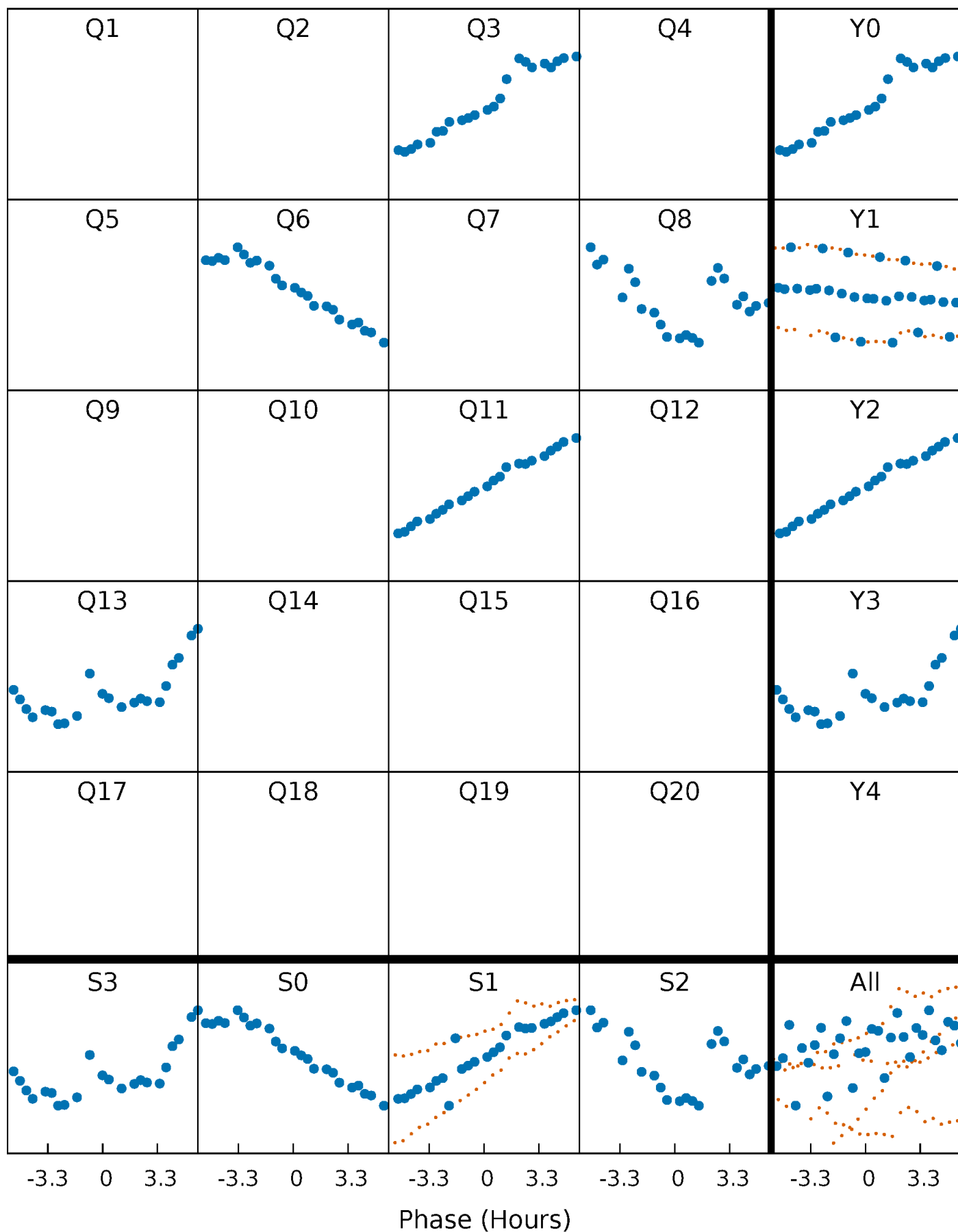


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



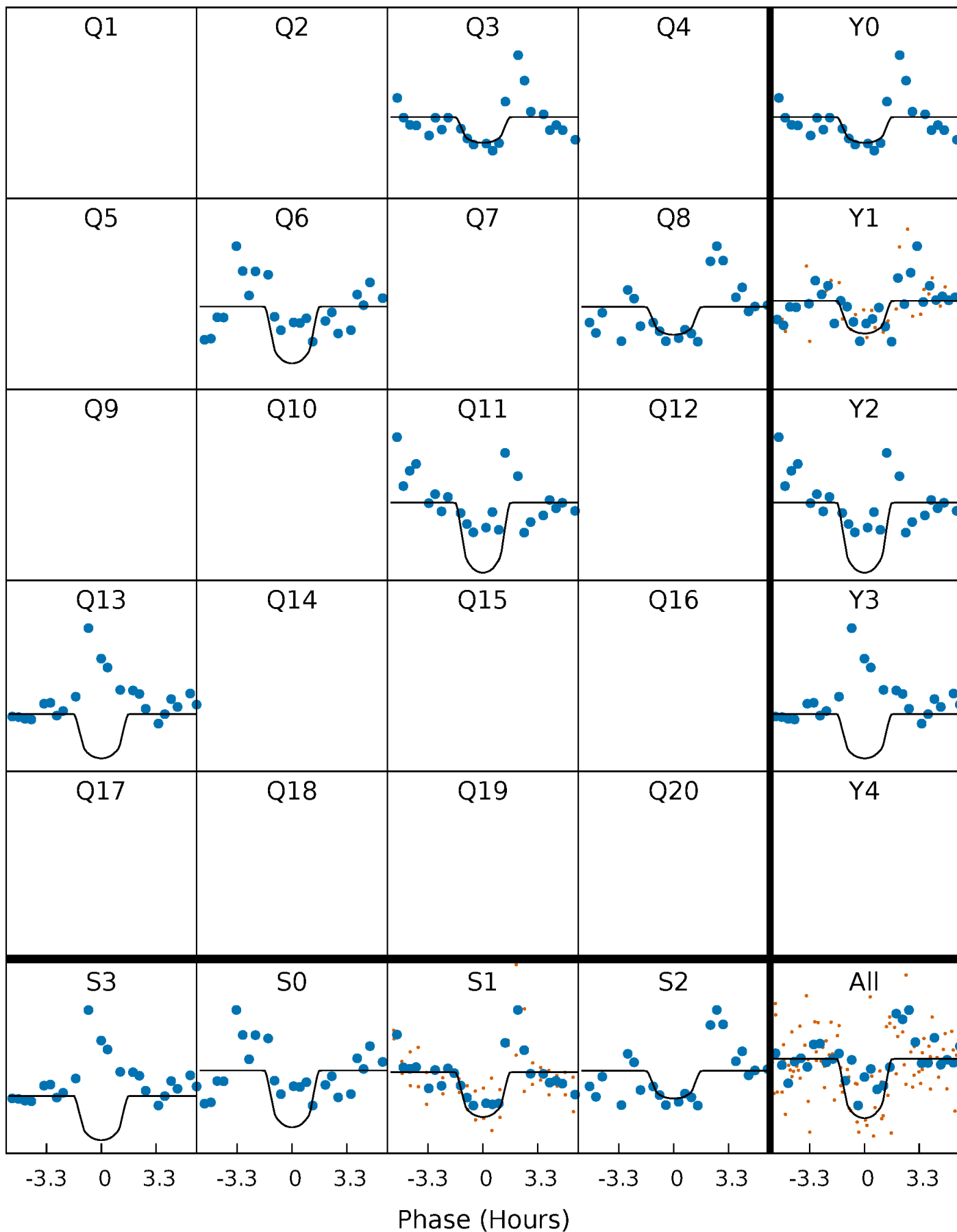
PDC Quarter-Phased Transit Curves

TCE 009018449-03 P=229.987866 Days $T_0=333.678601$ (BKJD)



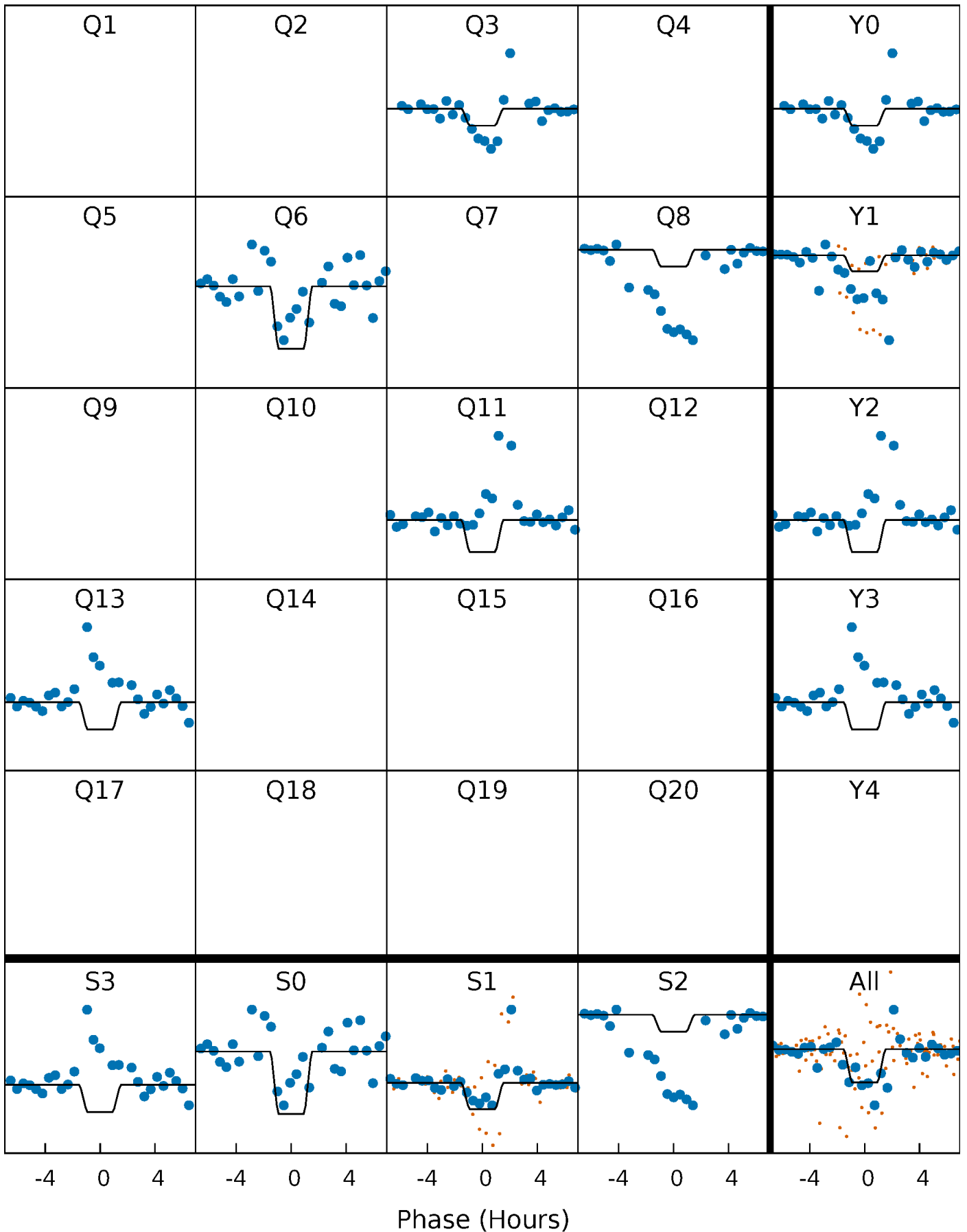
DV Quarter-Phased Transit Curves

TCE 009018449-03 $P=229.987866$ Days $T_0=333.678601$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

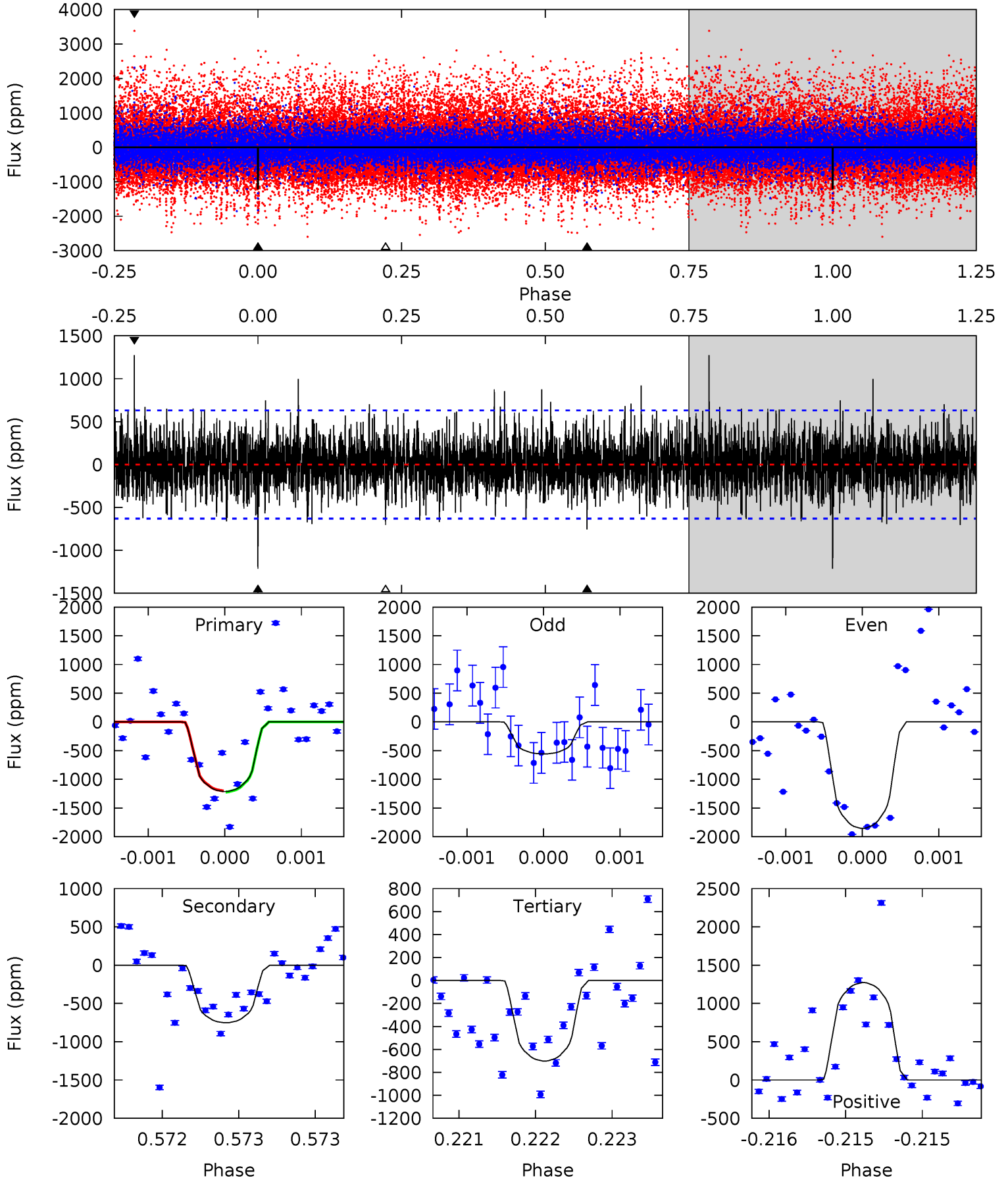
TCE 009018449-03 P=229.992440 Days $T_0=333.669304$ (BKJD)



DV Model-Shift Uniqueness Test

009018449-03, P = 229.987866 Days, E = 103.690735 Days

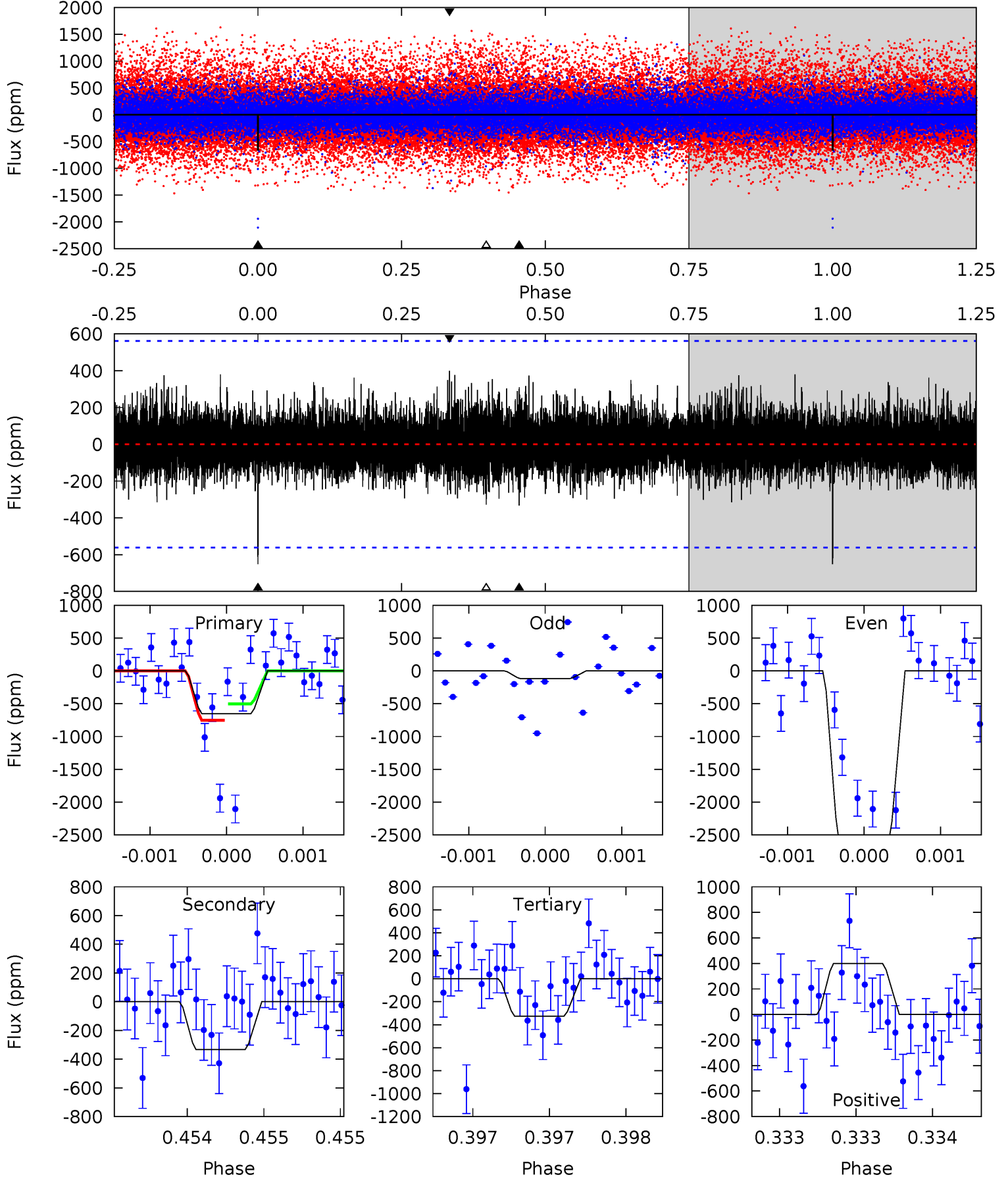
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	6.63	6.18	11.2	5.55	3.45	1.84	4.51	-0.52	0.45	-4.58	5.52	0.89	0.51	0.09



Alt Model-Shift Uniqueness Test

009018449-03, P = 229.992440 Days, E = 103.676864 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.46	3.30	3.24	3.95	5.57	3.47	0.87	3.22	2.51	0.06	-0.65	13.8	2.02	0.38	1.22



Stellar Parameters For KIC 009018449

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4422^{+132}_{-132}	$4.677^{+0.059}_{-0.027}$	$-0.700^{+0.300}_{-0.300}$	$0.565^{+0.045}_{-0.049}$	$0.554^{+0.056}_{-0.033}$	$4.317^{+1.061}_{-0.588}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
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 009018449-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-753 ± 114	$3.42^{+2.89}_{-2.23}$	263^{+9}_{-9}	3463^{+1689}_{-562}	12659^{+94778}_{-8845}
Alt.	-333 ± 101	$3.16^{+2.98}_{-2.12}$	262^{+9}_{-9}	3109^{+1423}_{-522}	6596^{+52939}_{-4939}

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 $A_{obs} \gg 1.0$

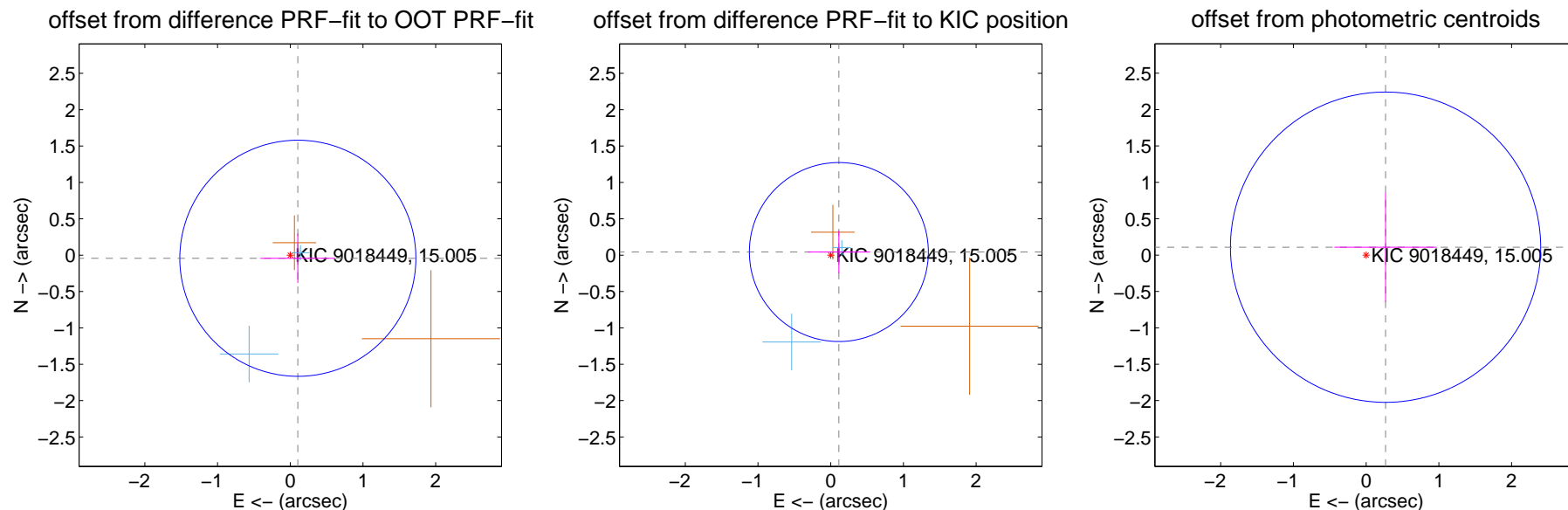
DV Centroid Data

Supplemental centroid analysis for 009018449-03. Kepler magnitude: 15.01. Transit SNR 8.84

There are 2 quarters with good PRF difference image offsets

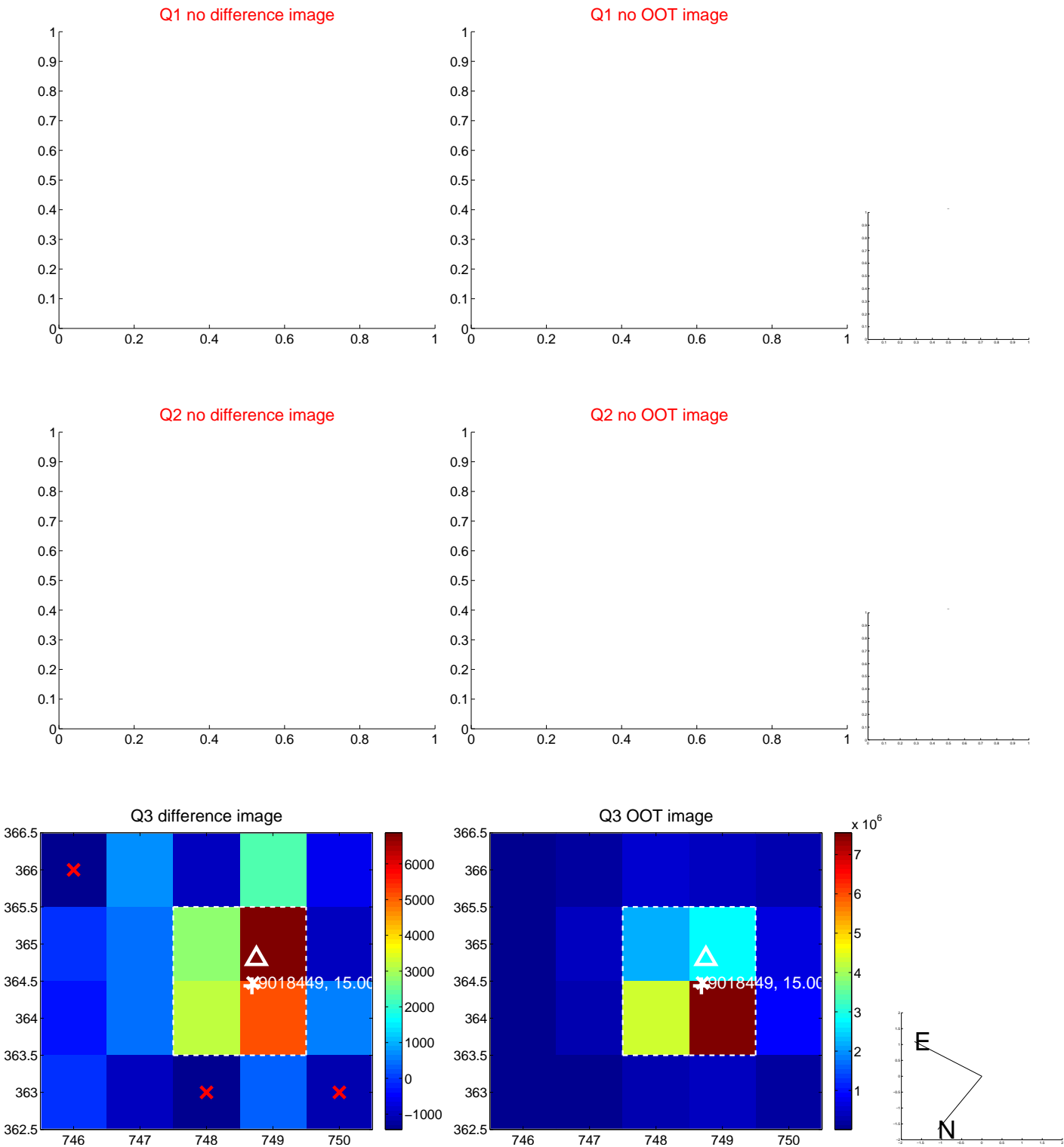
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.113 ± 0.541	0.21	-0.104 ± 0.517	-0.043 ± 0.340
PRF-fit source offset from KIC position	0.120 ± 0.410	0.29	-0.112 ± 0.430	0.043 ± 0.290
photometric centroid source offset	0.29 ± 0.71	0.41	-0.27 ± 0.70	0.11 ± 0.75



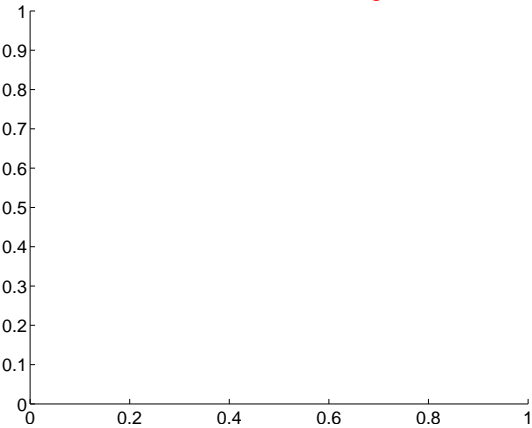
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

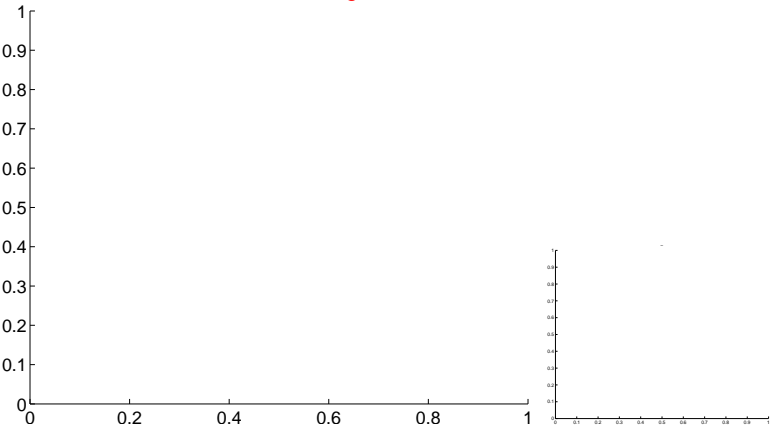


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

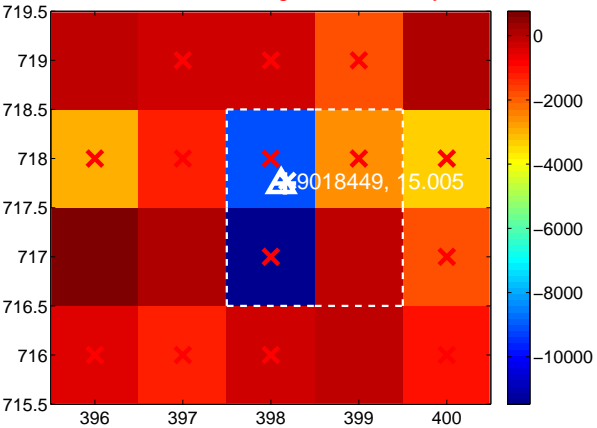
Q5 no difference image



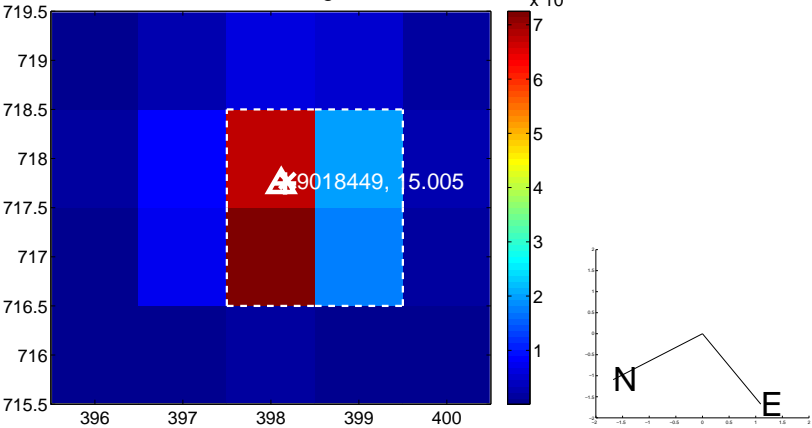
Q5 no OOT image



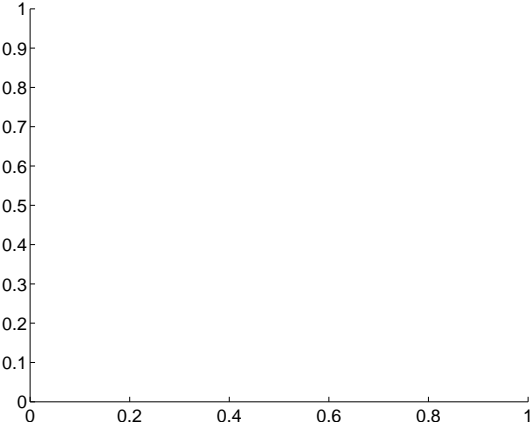
Q6 difference image. Poor Quality



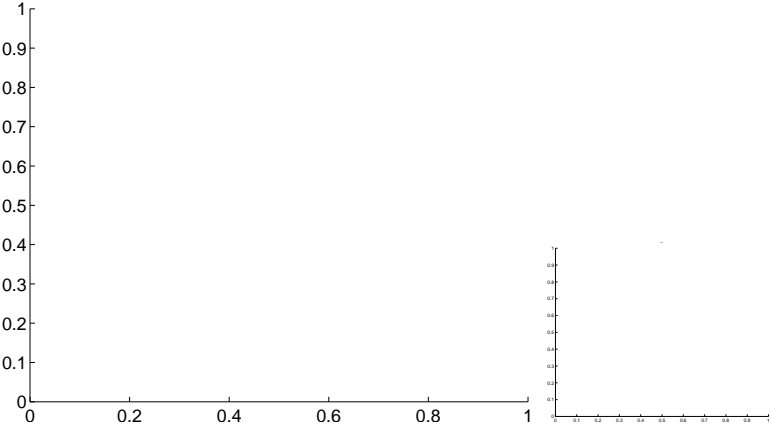
Q6 OOT image



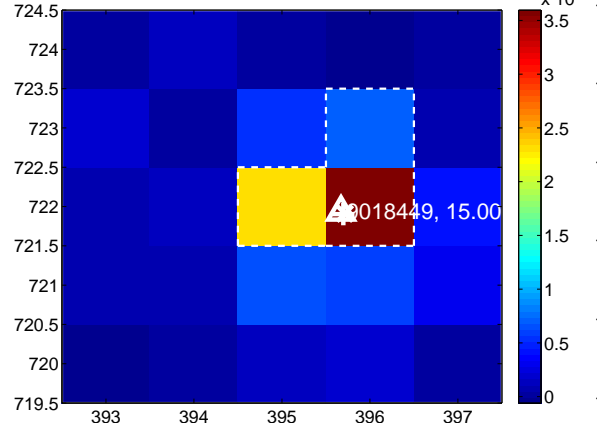
Q7 no difference image



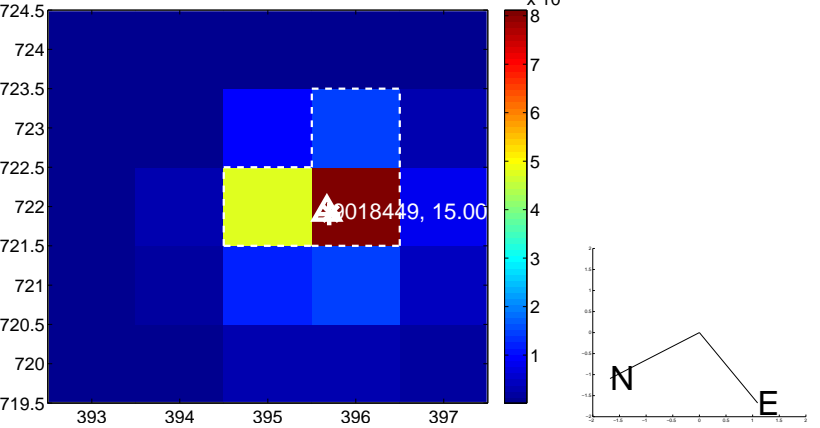
Q7 no OOT image



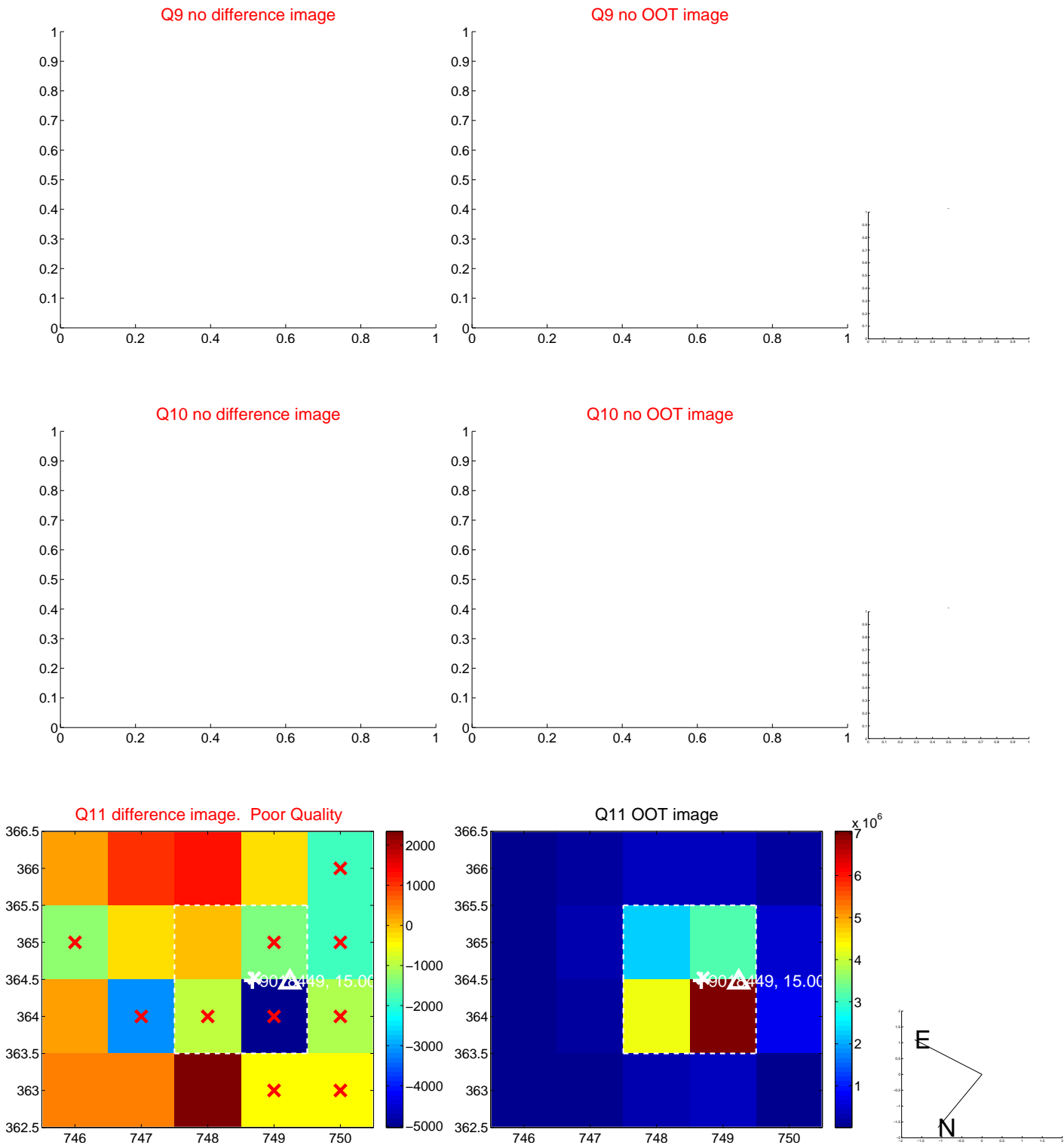
Q8 difference image



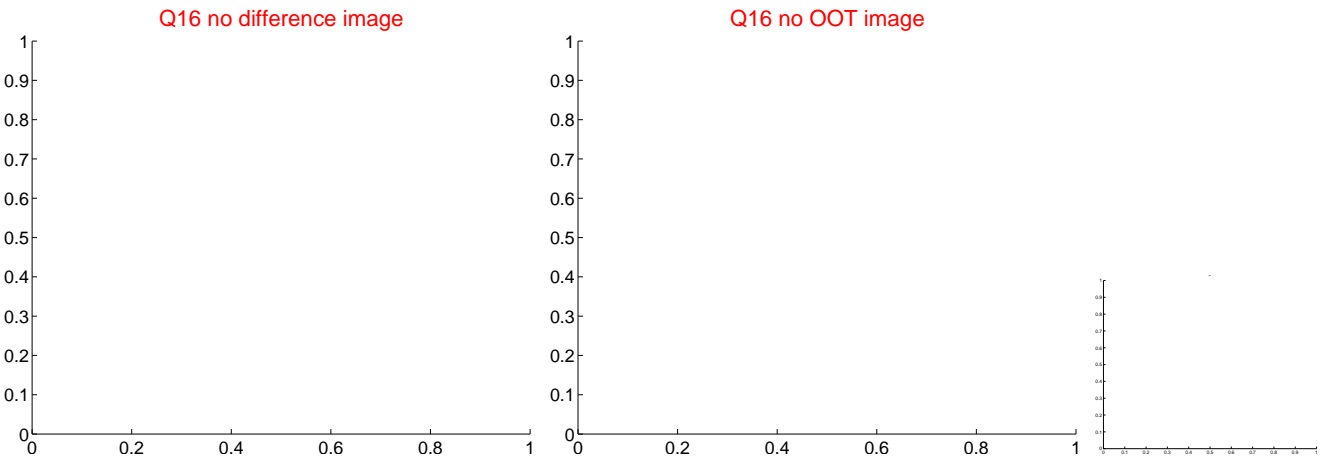
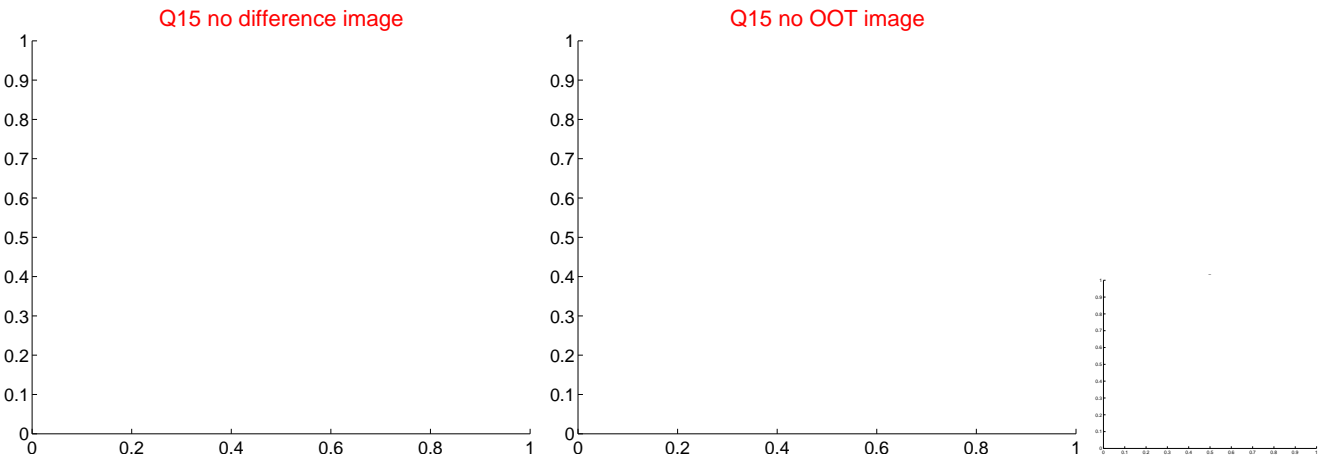
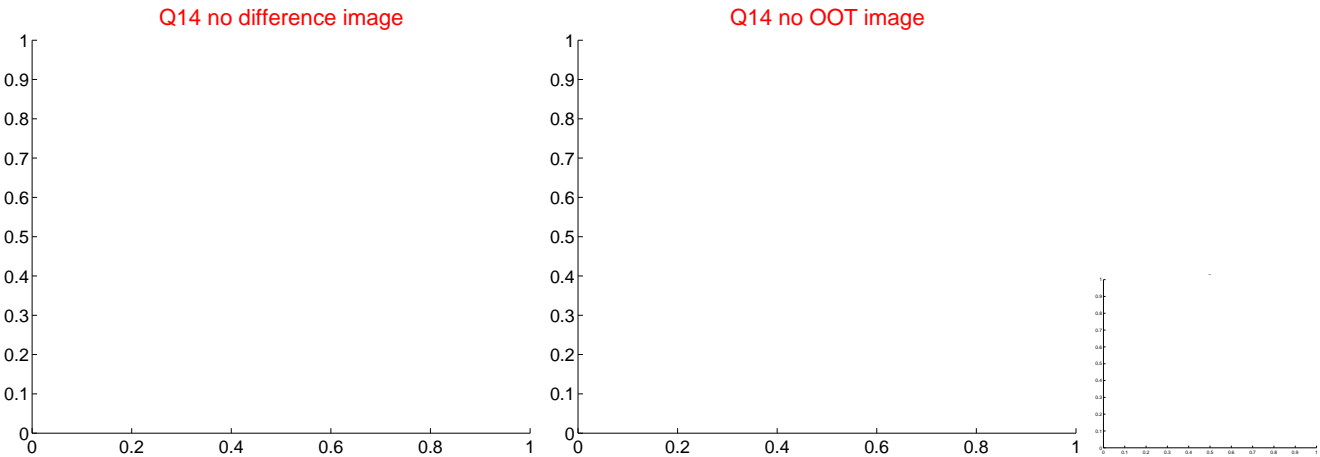
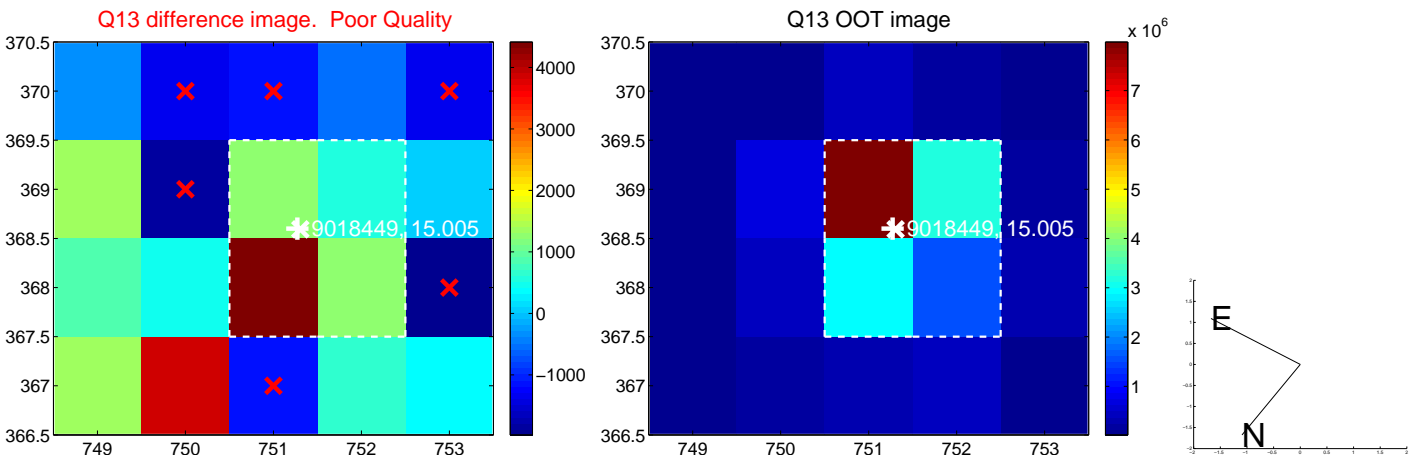
Q8 OOT image



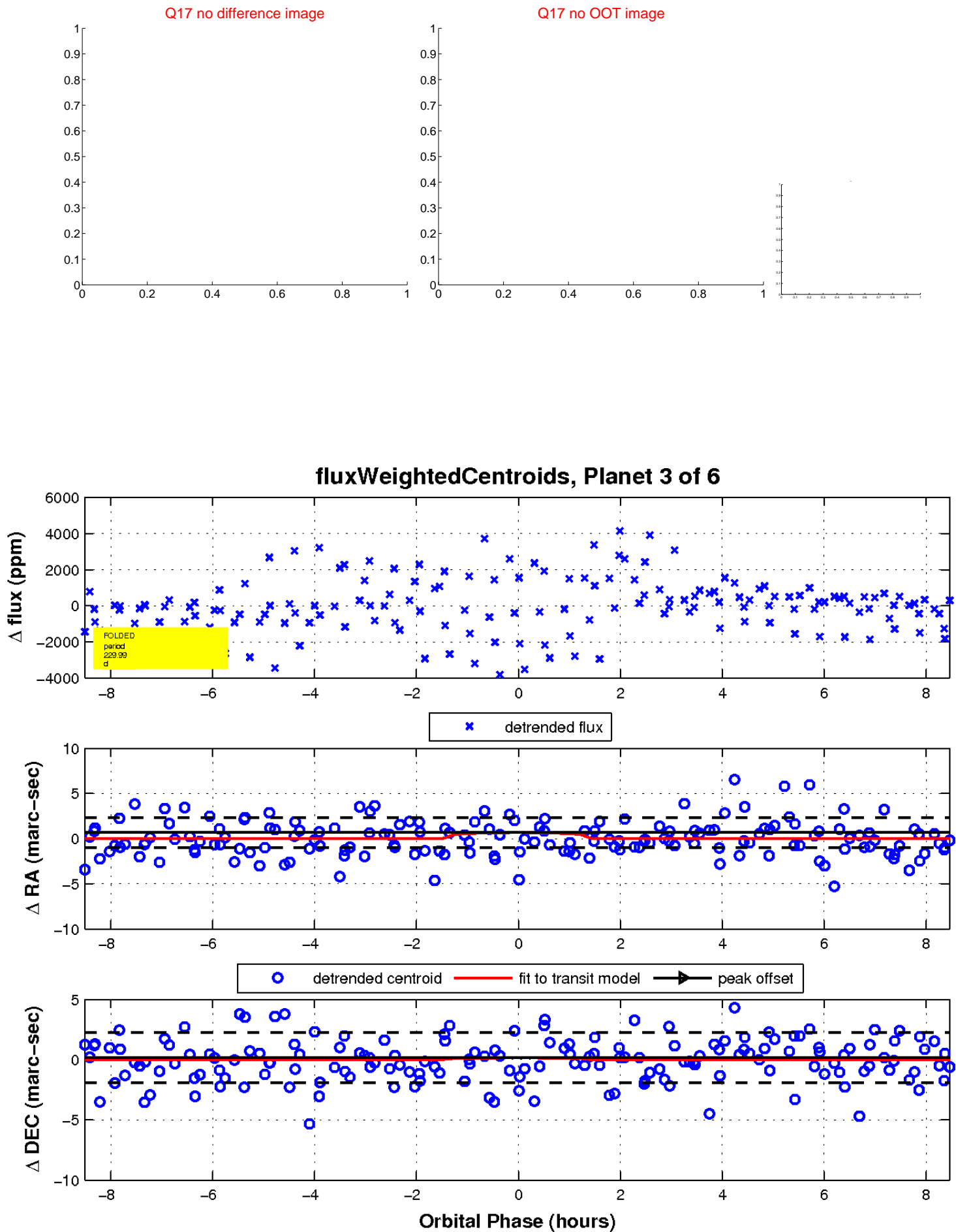
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

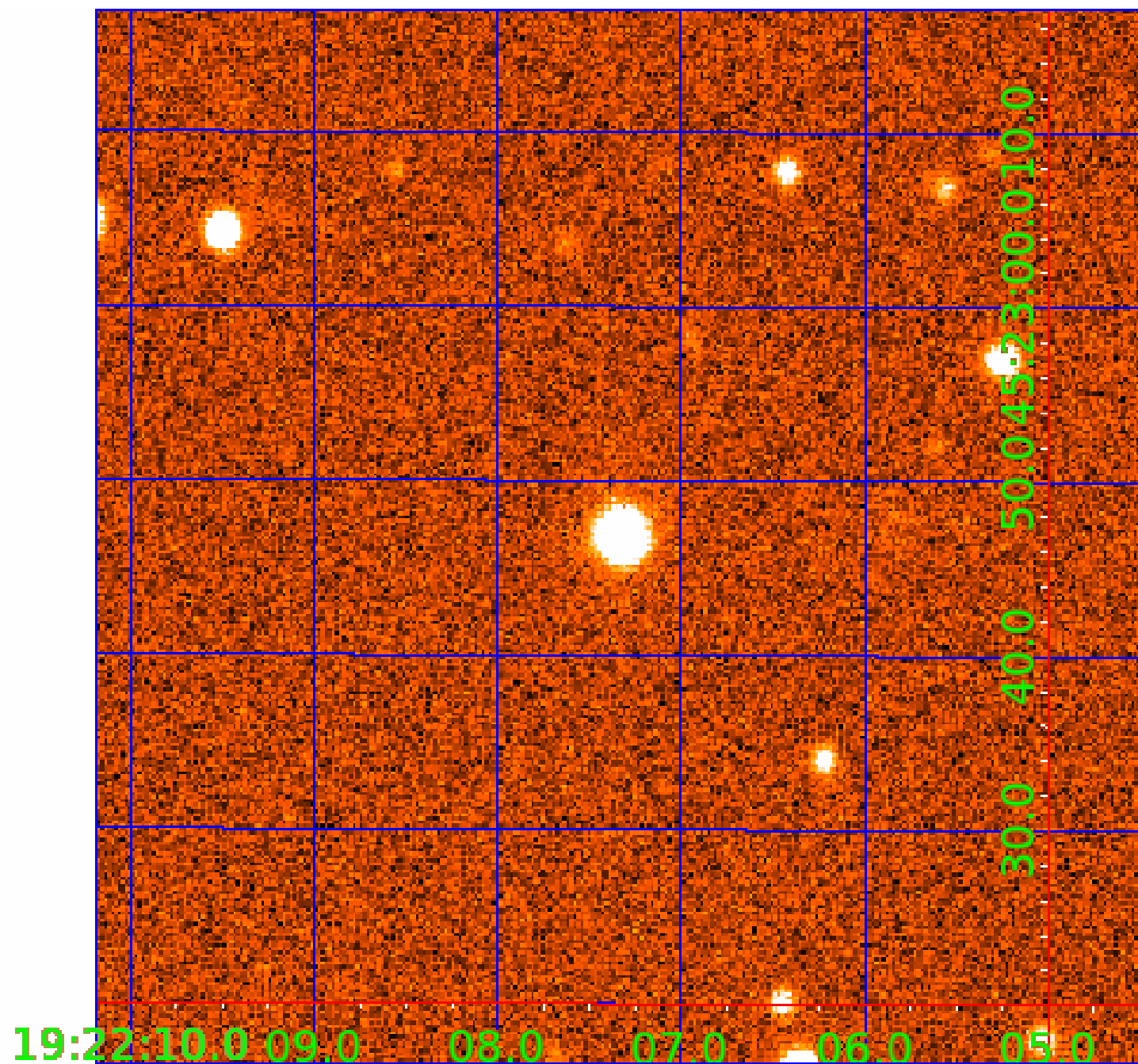


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009018449

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})
009018449-01	OBS	No	268.447200	195.640107	1805.1	12.011	16.9	6.0	0.56	4422	2.33	0.24
009018449-02	OBS	No	487.480212	603.119357	1752.9	4.992	16.2	6.3	0.56	4422	2.38	0.11
009018449-03	OBS	No	229.987866	333.678601	1700.4	2.869	15.7	8.8	0.56	4422	2.34	0.30
009018449-04	OBS	No	351.273184	198.500793	2903.0	3.000	15.5	-1.0	0.56	4422	2.96	0.17
009018449-05	OBS	No	518.174954	425.928371	1217.1	2.723	12.2	4.6	0.56	4422	2.09	0.10
009018449-06	OBS	No	476.094534	239.001268	1637.2	3.893	13.6	6.9	0.56	4422	2.24	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018449-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009018449-02	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—INCONSISTENT_TRANS
009018449-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009018449-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009018449-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009018449-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

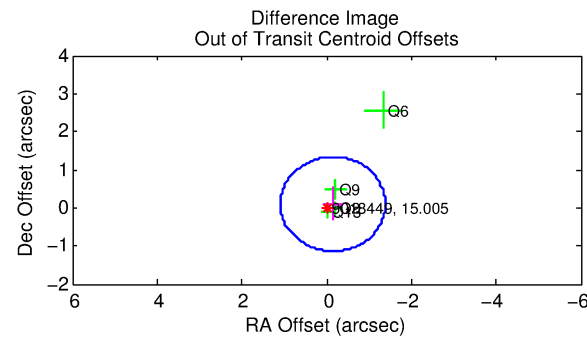
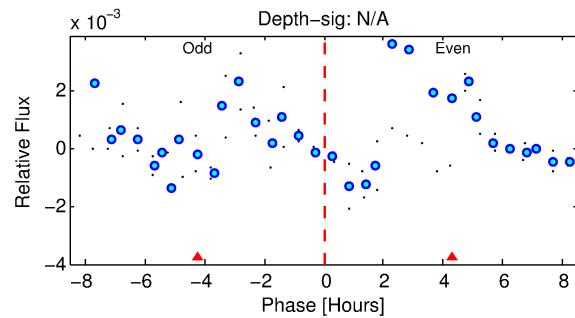
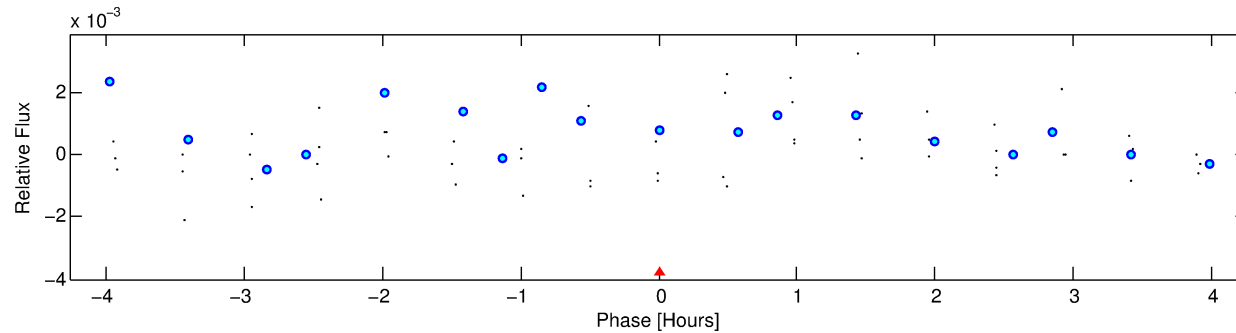
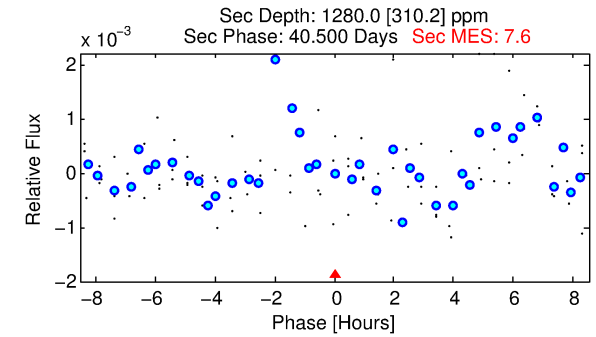
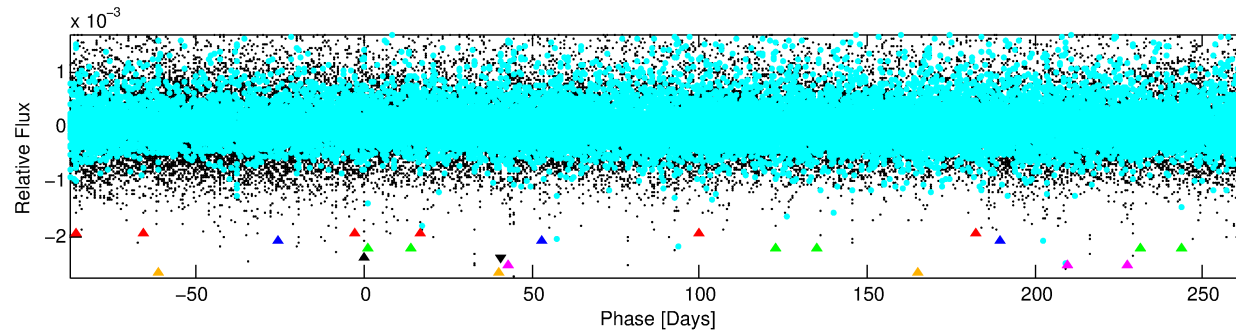
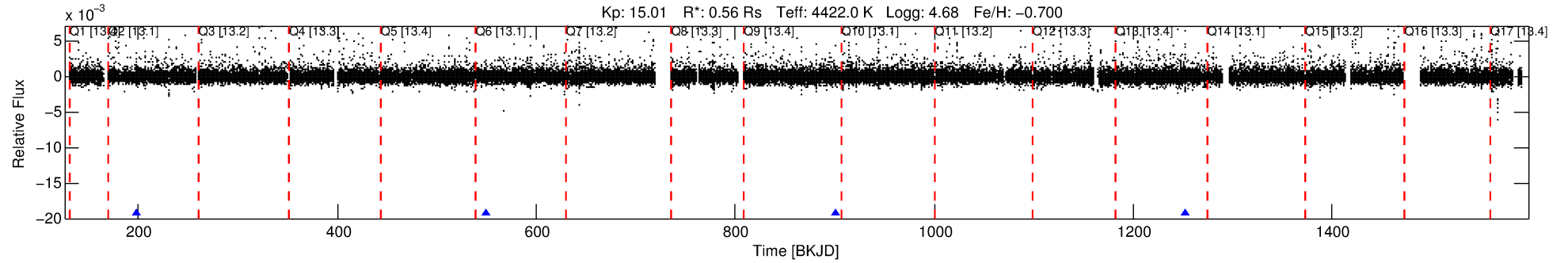
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018449-04

No Significant Match Found

DV One-Page Summary

KIC: 9018449 Candidate: 4 of 6 Period: 351.273 d



TPS TCE Results:

Period = 351.27318 d
Epoch = 198.5008 BKJD

DV fit results are unavailable

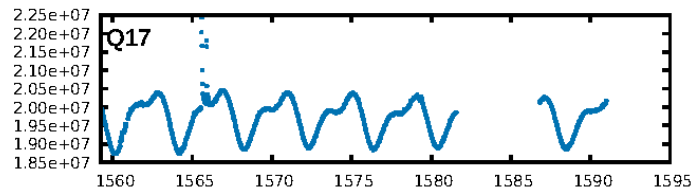
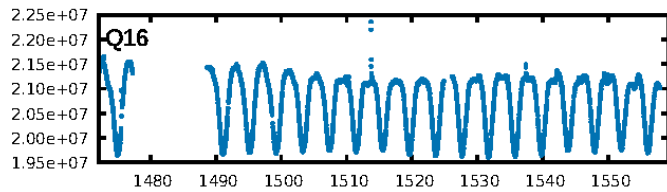
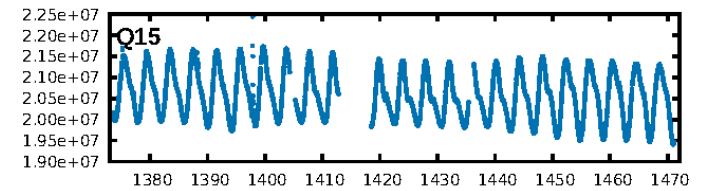
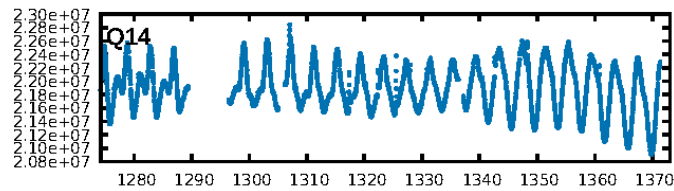
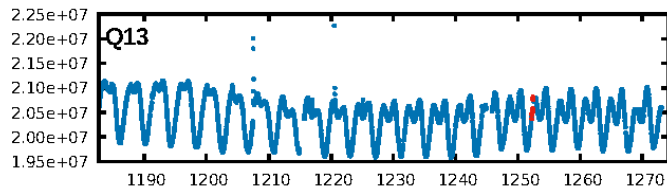
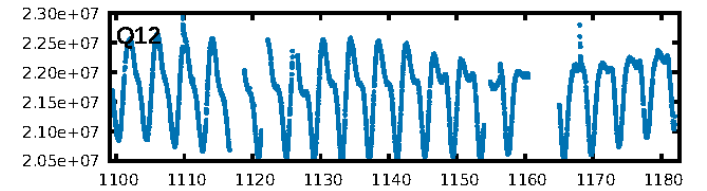
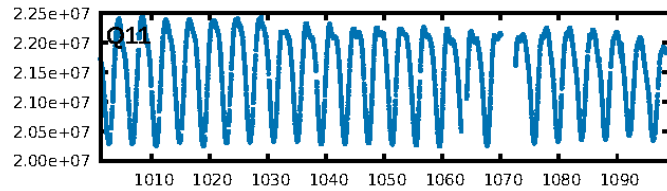
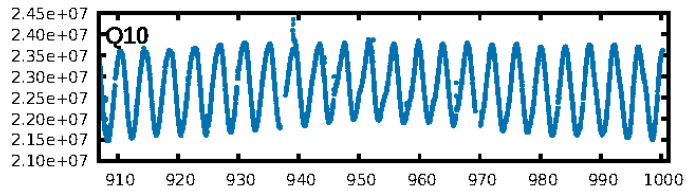
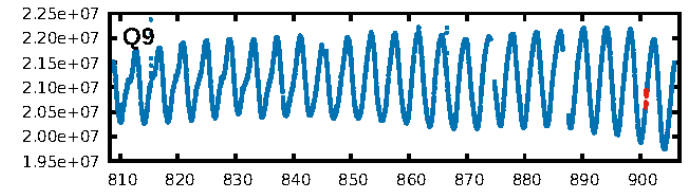
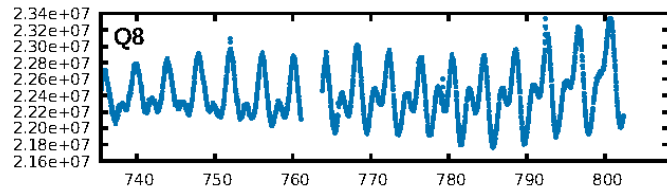
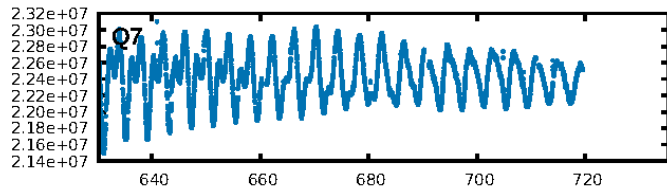
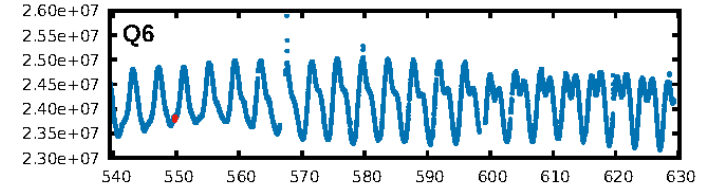
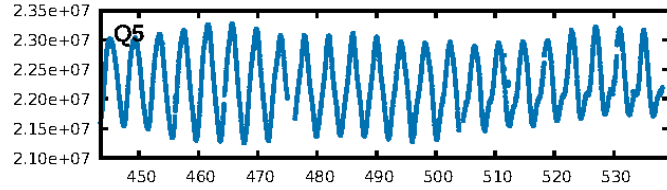
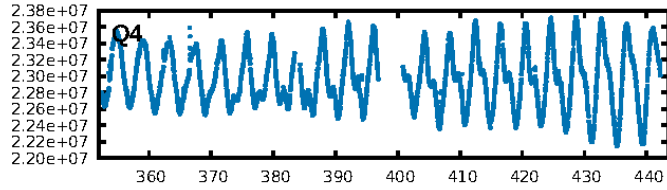
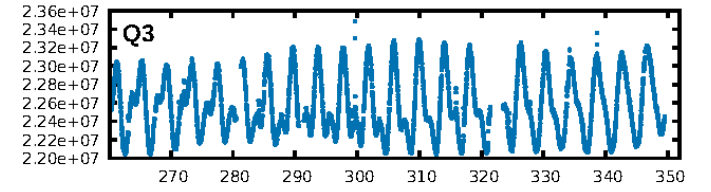
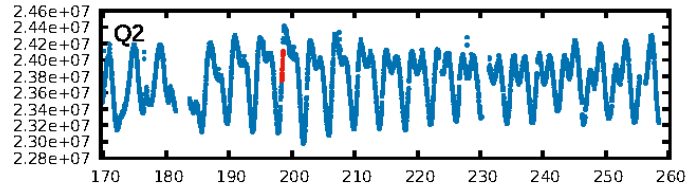
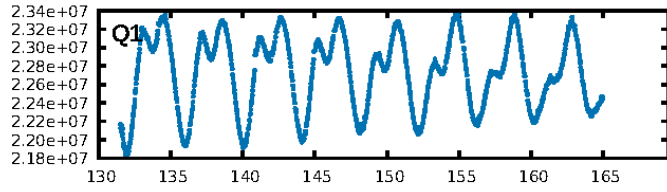
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [160.57 σ]
LongPeriod-sig: 100.0% [609.51 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.33e-12
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.222
Centroid-sig: 65.8%
Centroid-so: 3.103 arcsec [0.62 σ]
OotOffset-rm: 0.174 arcsec [0.42 σ]
KicOffset-rm: 0.196 arcsec [0.25 σ]
OotOffset-st: 2/0/0/2 [4]
KicOffset-st: 2/0/0/2 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [4/4]

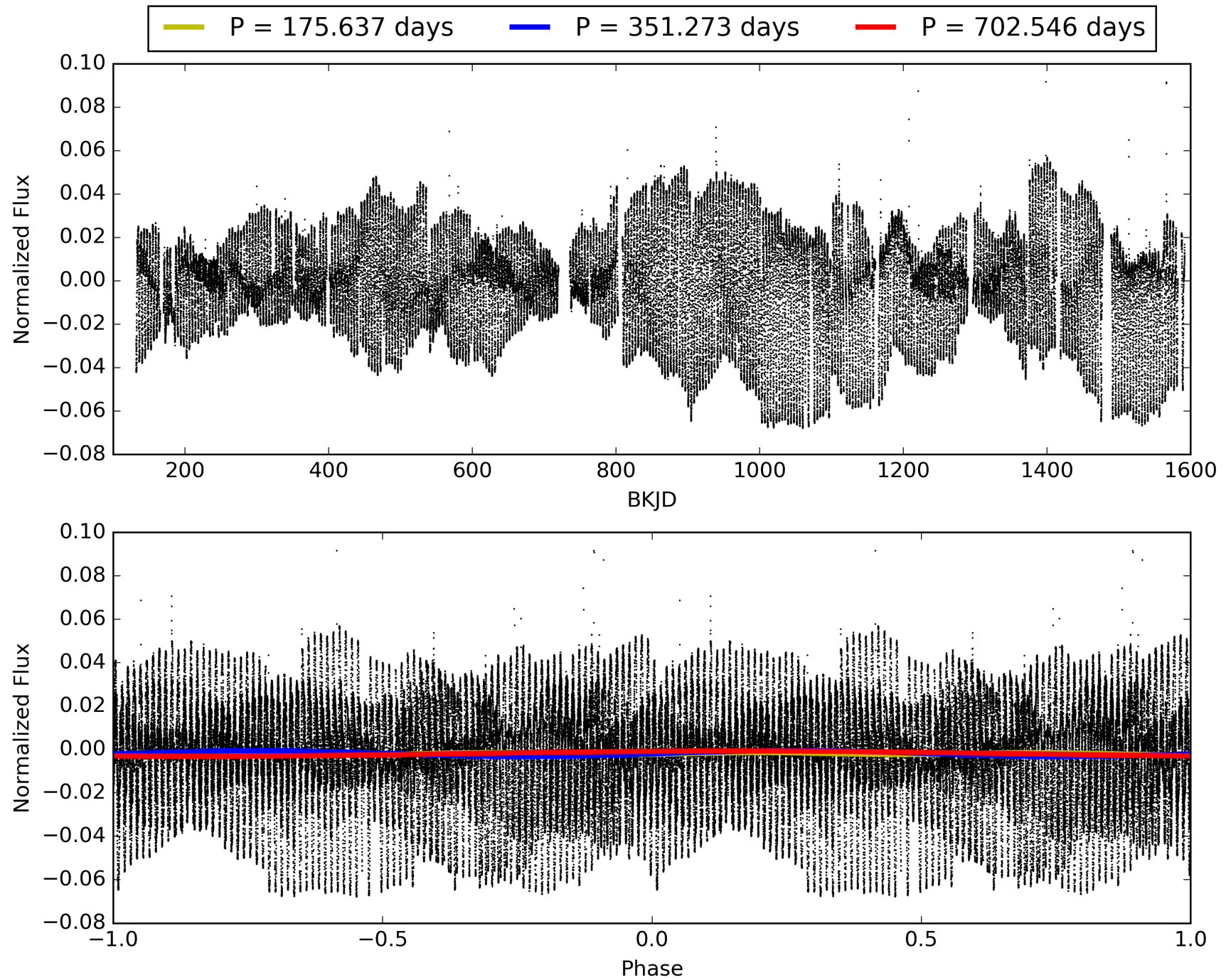
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:29:27 Z

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

TCE 009018449-04, PDC Light Curves

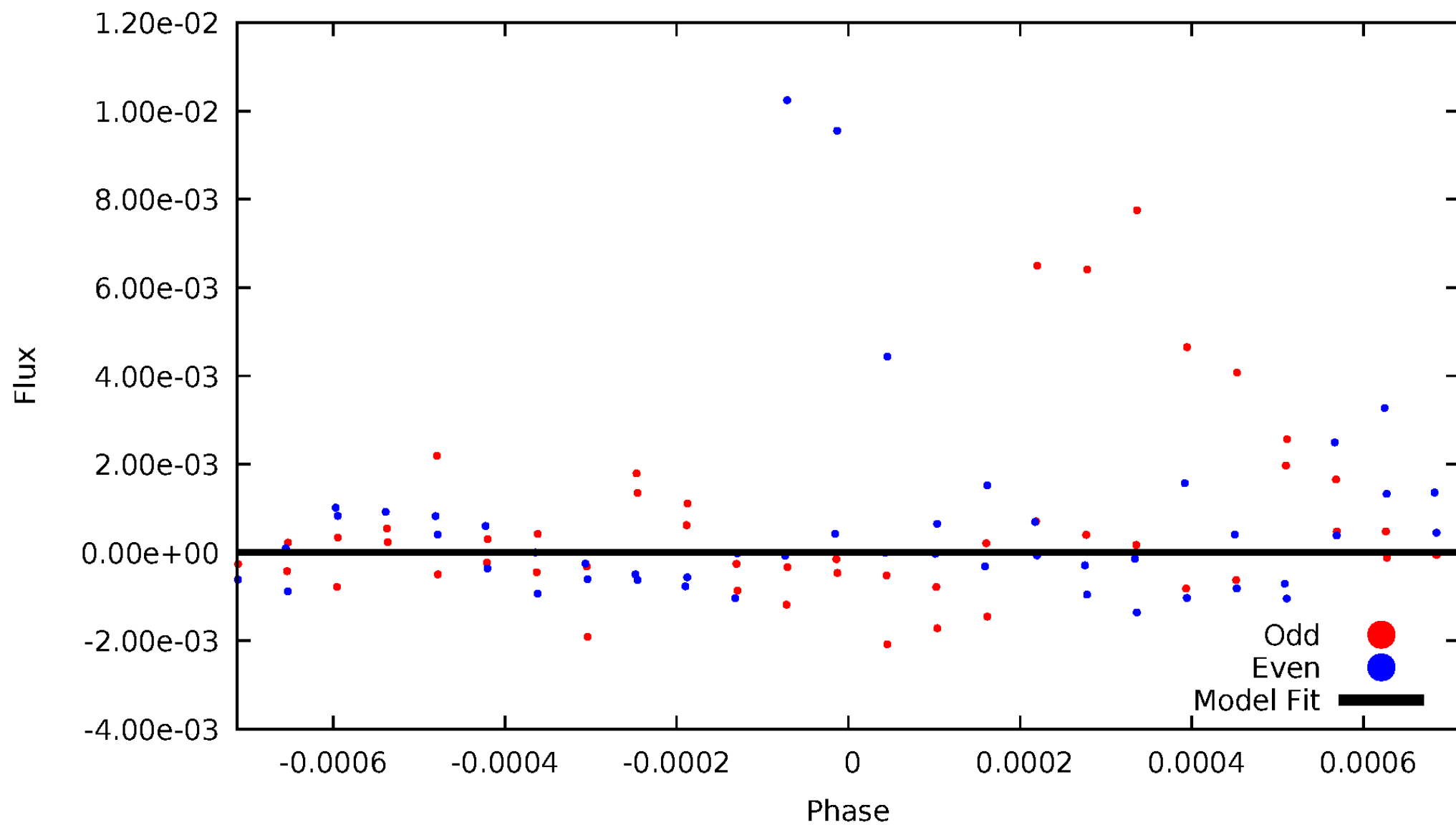


TCE 009018449-04



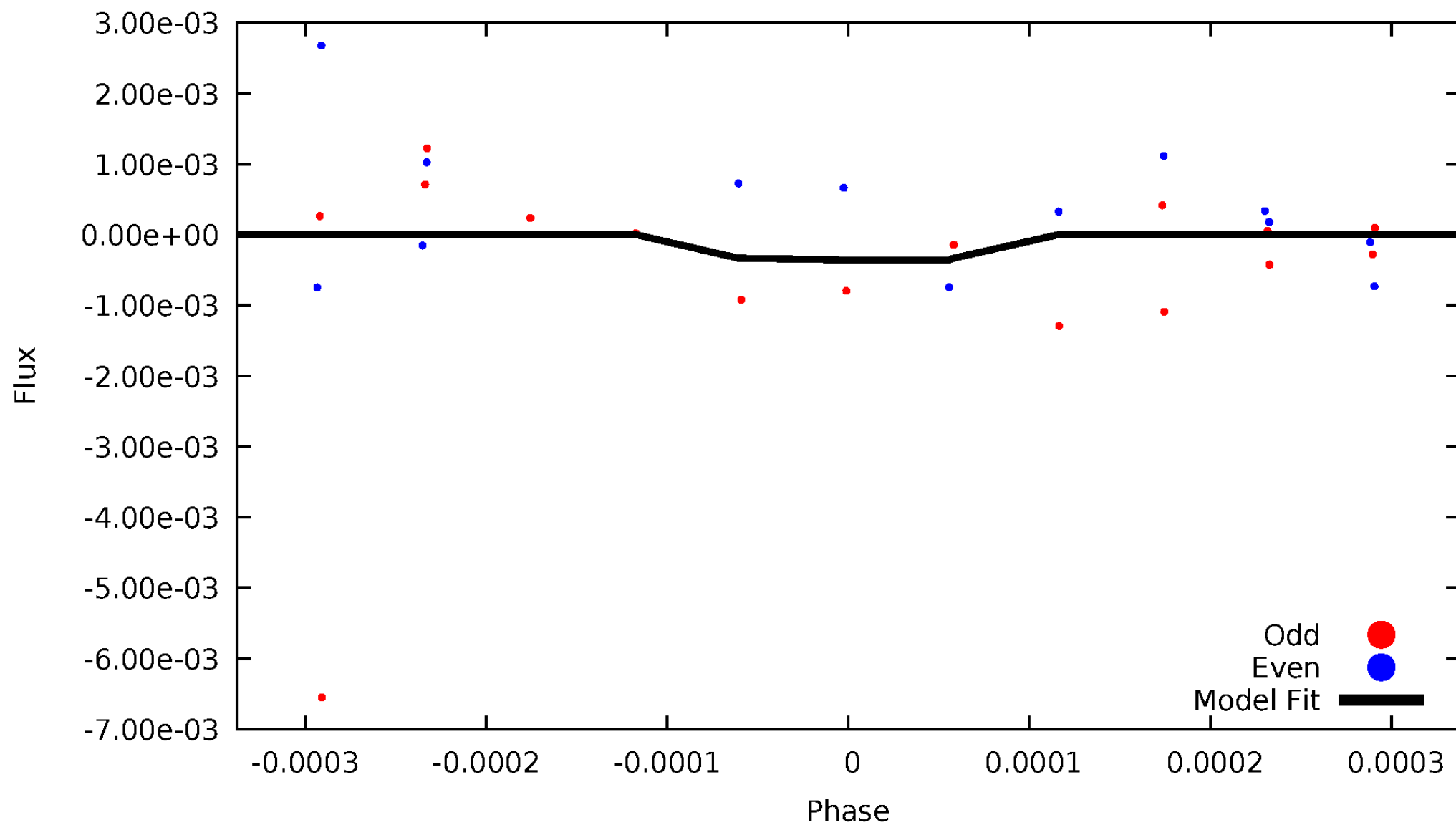
DV Odd/Even

TCE 009018449-04

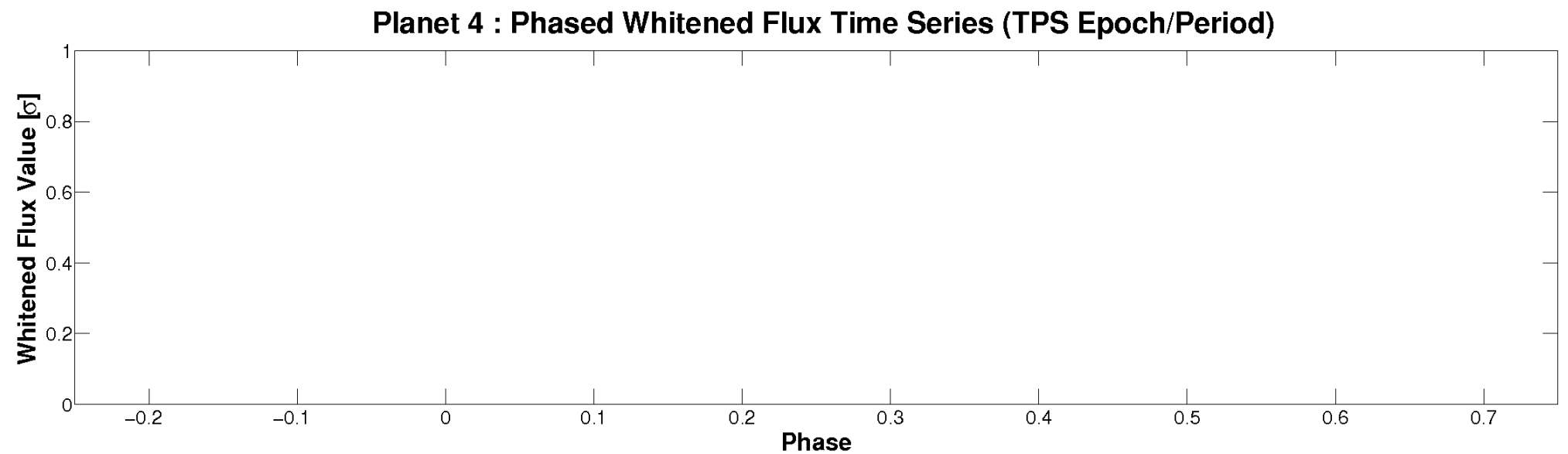
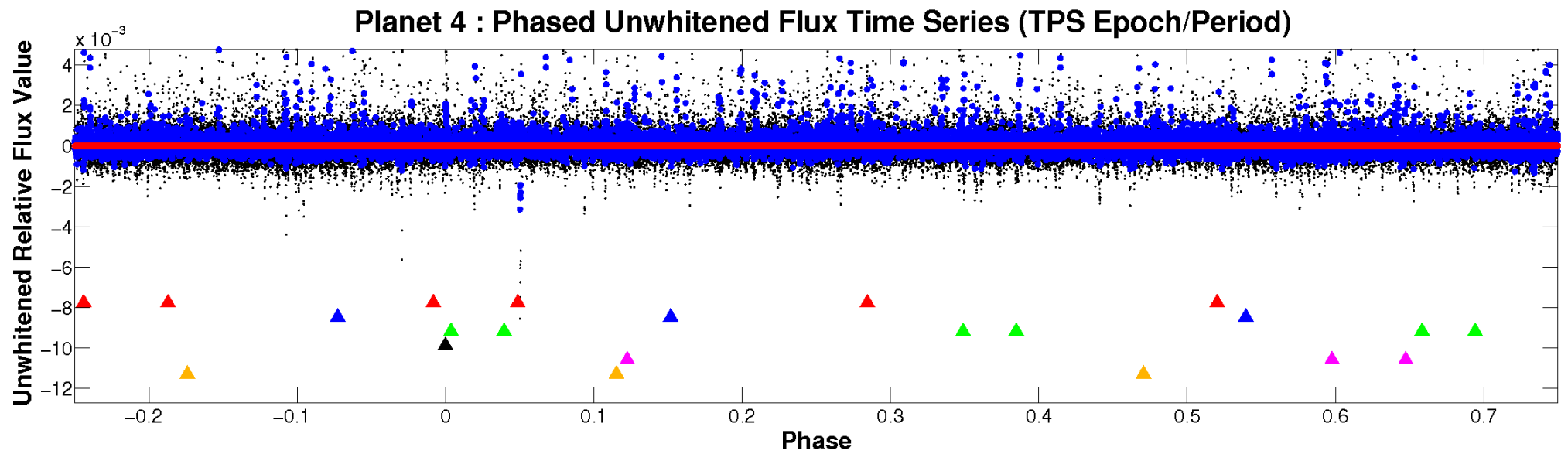


ALT Odd/Even

TCE 009018449-04

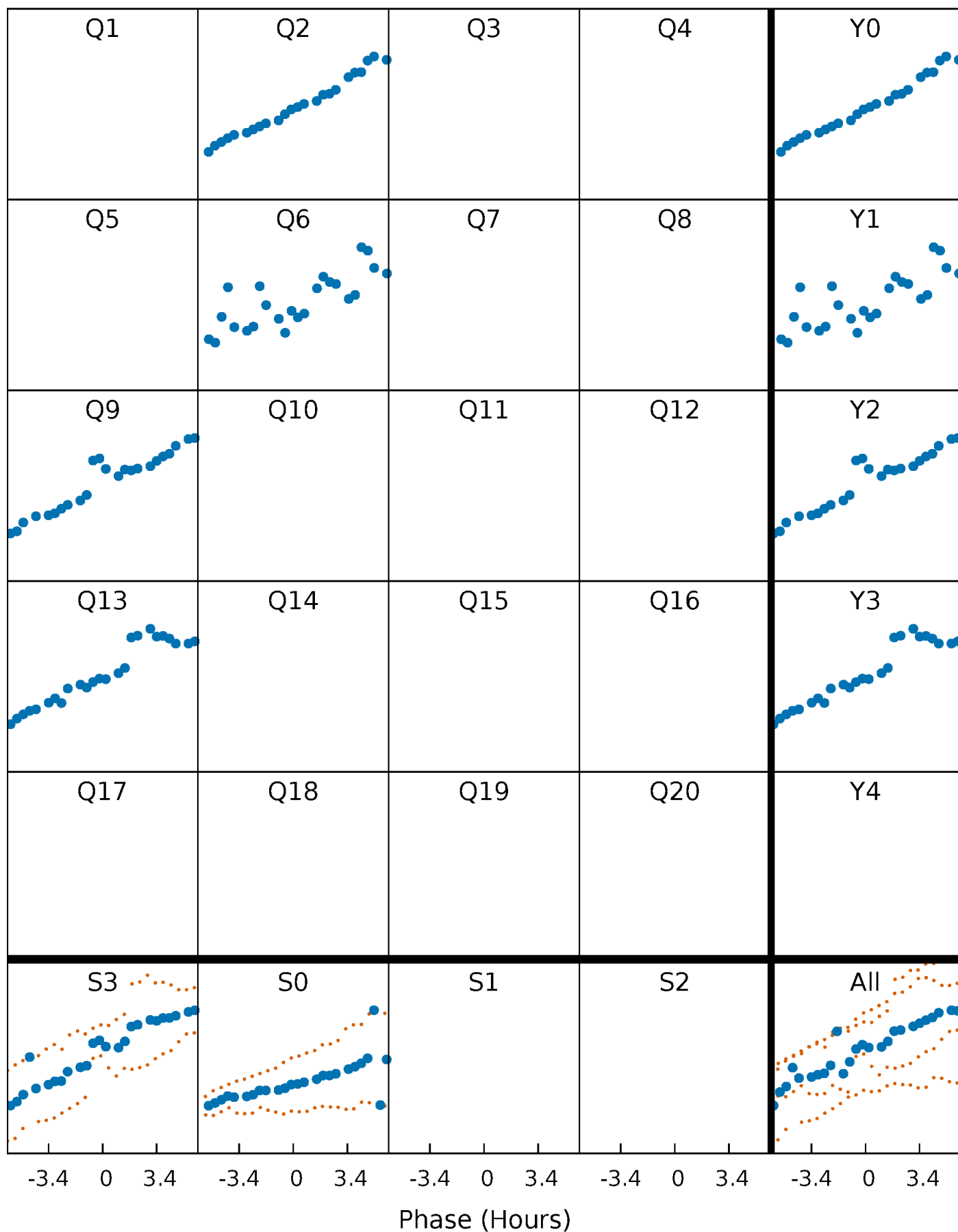


Non-Whitened Vs. Whitened Light Curve



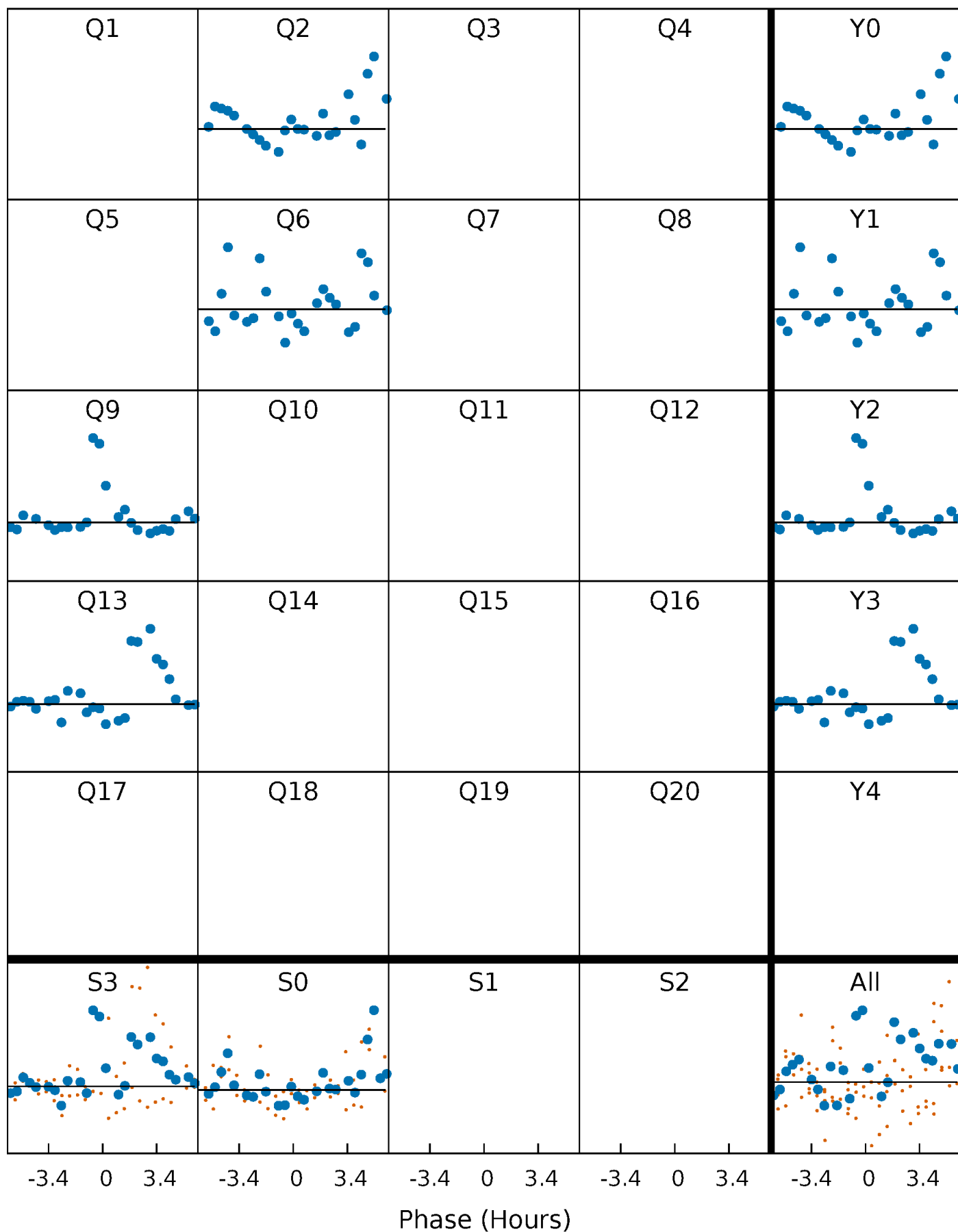
PDC Quarter-Phased Transit Curves

TCE 009018449-04 P=351.273184 Days $T_0=198.500793$ (BKJD)



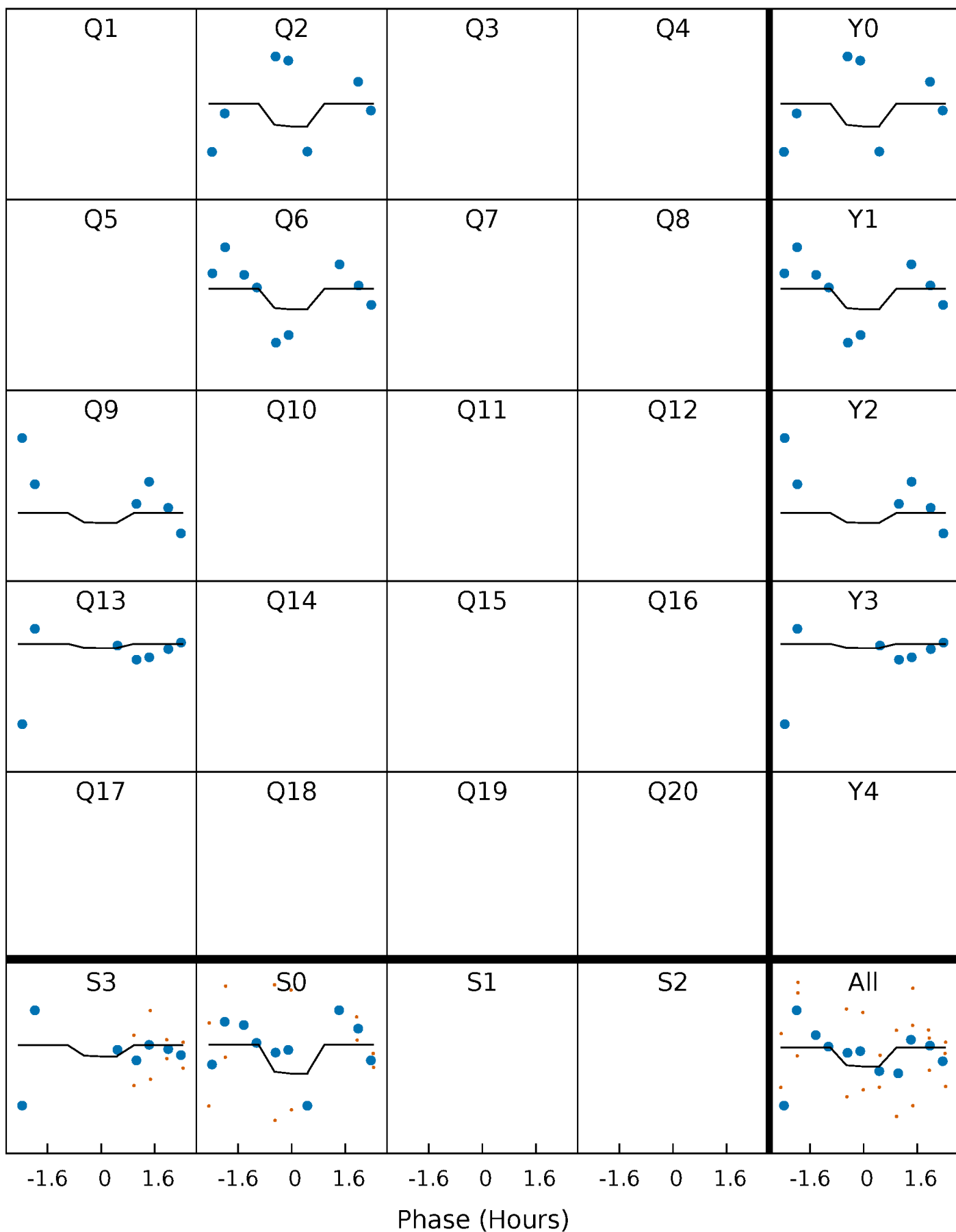
DV Quarter-Phased Transit Curves

TCE 009018449-04 $P=351.273184$ Days $T_0=198.500793$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

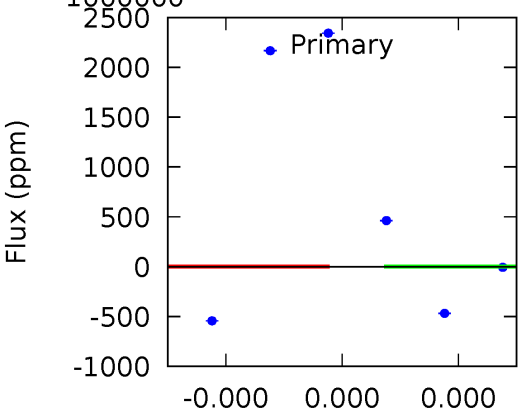
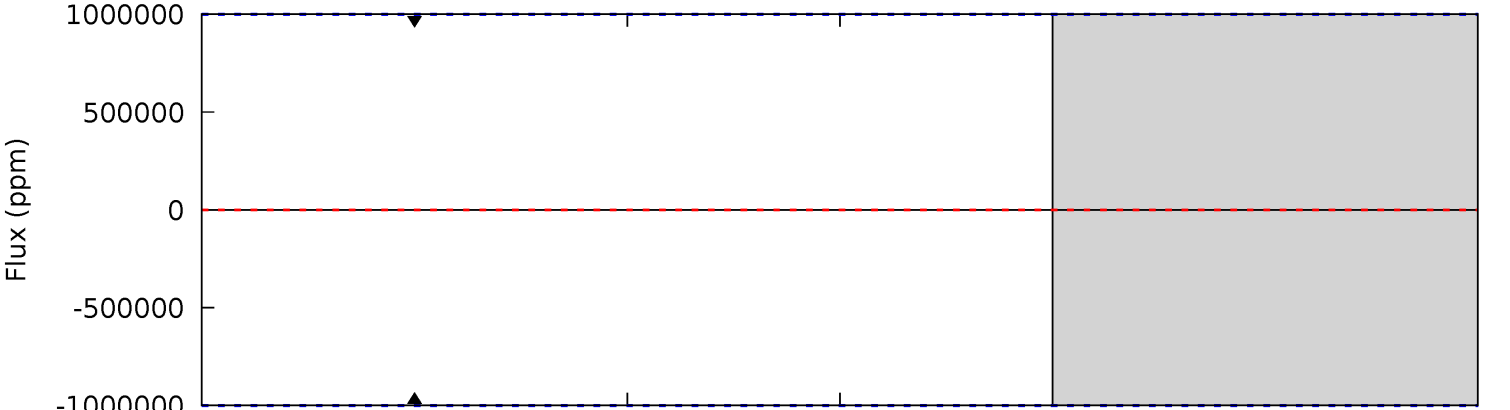
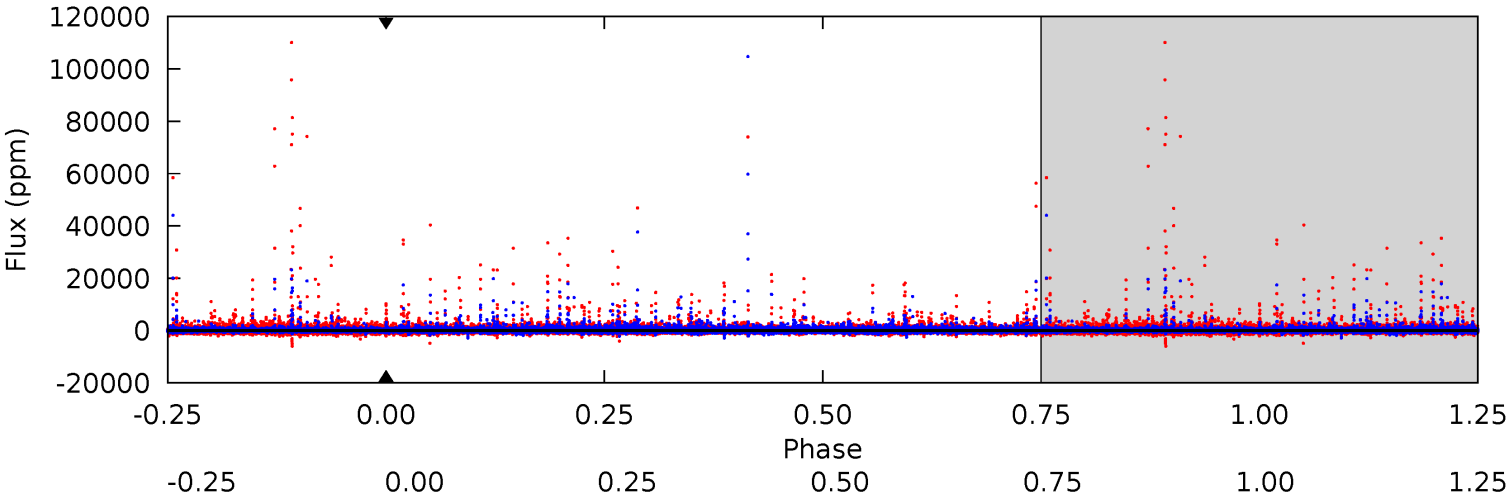
TCE 009018449-04 P=351.273184 Days $T_0=198.659786$ (BKJD)



DV Model-Shift Uniqueness Test

009018449-04, P = 351.273184 Days, E = 198.500793 Days

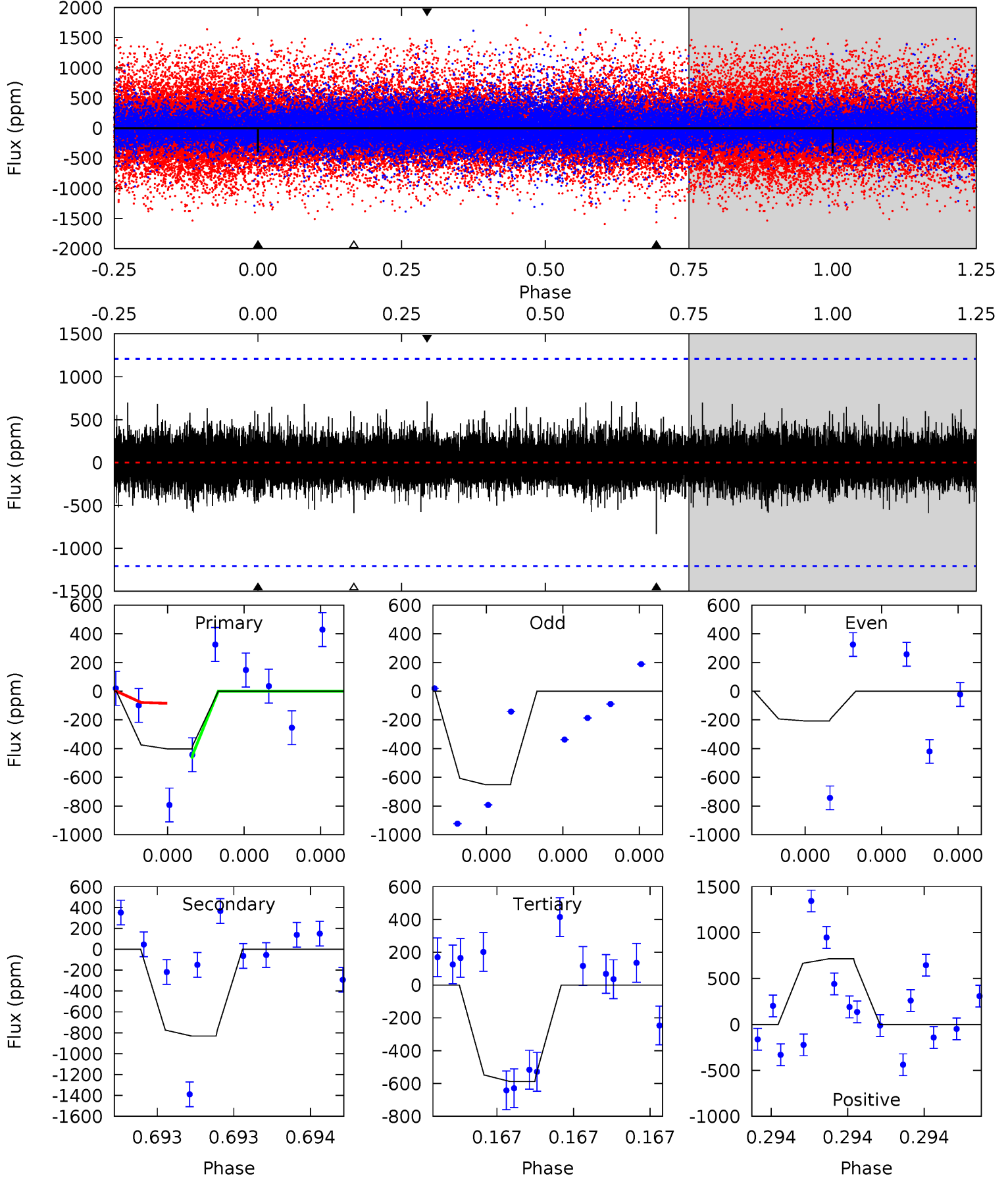
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009018449-04, P = 351.273184 Days, E = 198.659786 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.91	3.96	2.80	3.40	5.75	3.75	0.67	-0.89	-1.49	1.16	0.56	1.21	1.00	0.46	1.06



Stellar Parameters For KIC 009018449

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4422^{+132}_{-132}	$4.677^{+0.059}_{-0.027}$	$-0.700^{+0.300}_{-0.300}$	$0.565^{+0.045}_{-0.049}$	$0.554^{+0.056}_{-0.033}$	$4.317^{+1.061}_{-0.588}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
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 009018449-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$5.47^{+5.10}_{-3.69}$	227^{+8}_{-8}	3079^{+8253}_{-11834}	$10890^{+2895490}_{-1509367}$
Alt.	-831 ± 210	$4.30^{+4.61}_{-2.91}$	227^{+8}_{-8}	3254^{+1700}_{-604}	$15430^{+148151}_{-11922}$

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 $A_{obs} \gg 1.0$

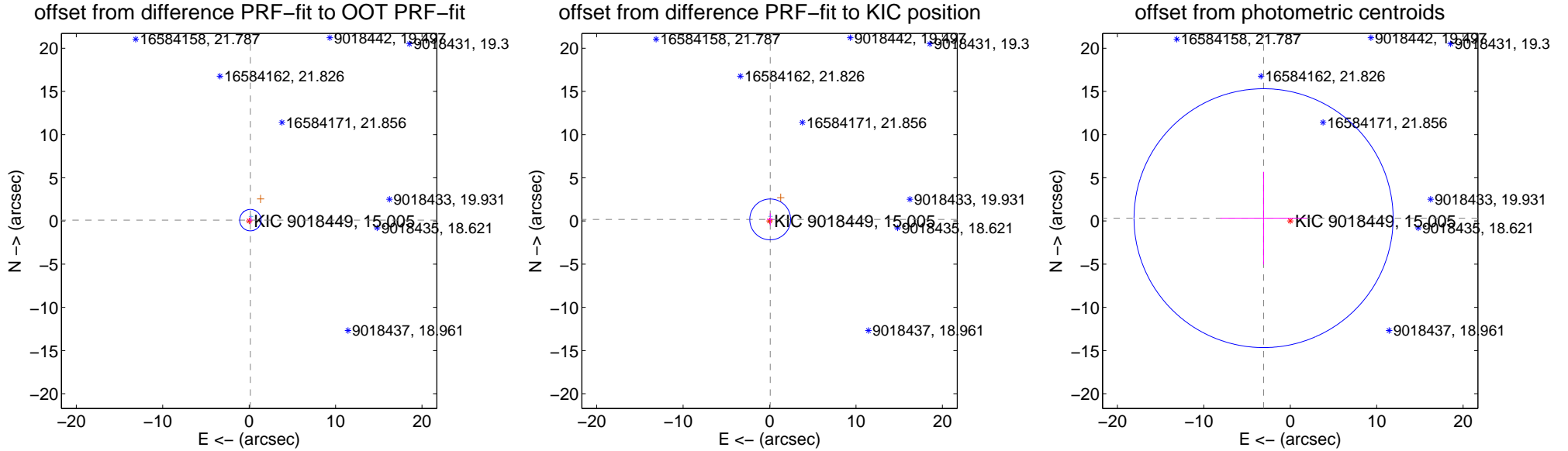
DV Centroid Data

Supplemental centroid analysis for 009018449-04. Kepler magnitude: 15.01. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

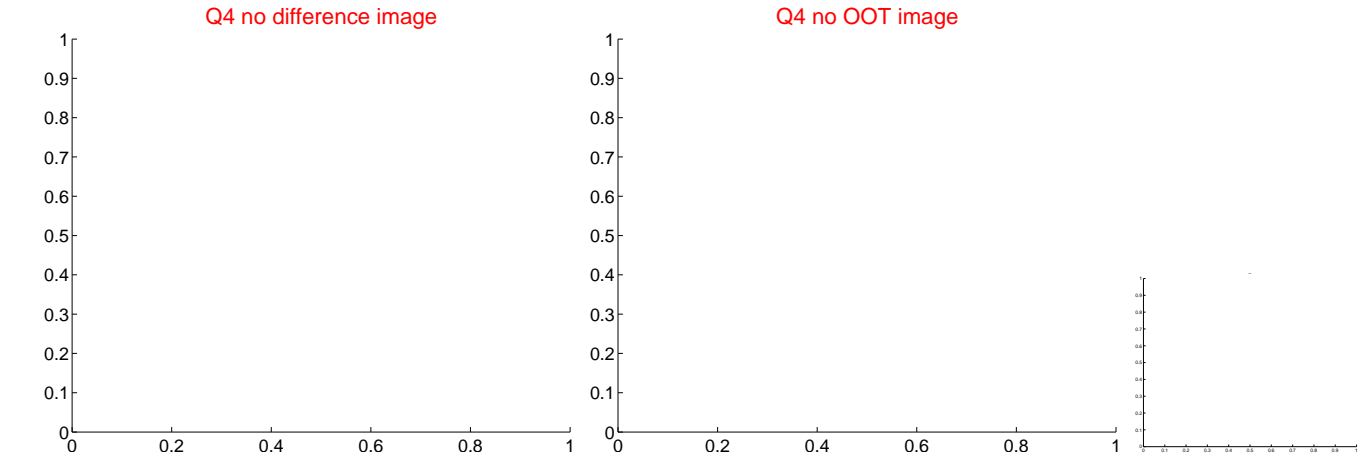
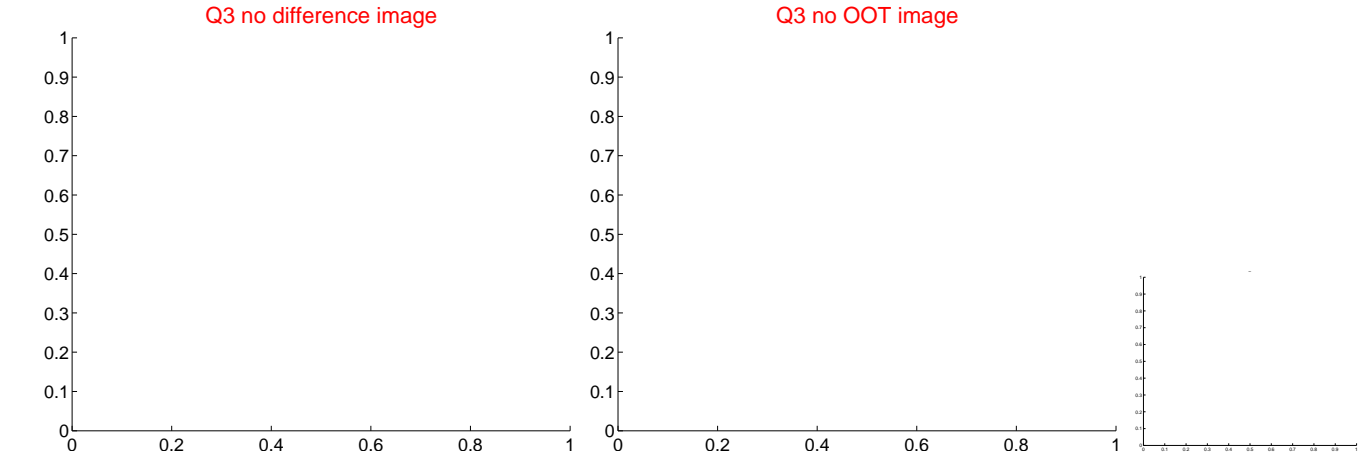
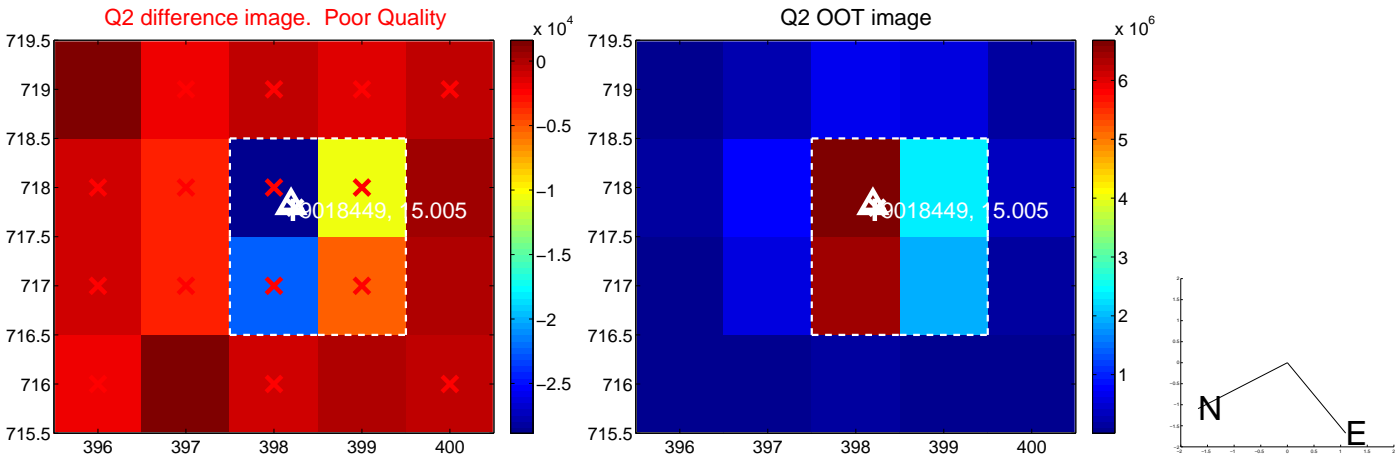
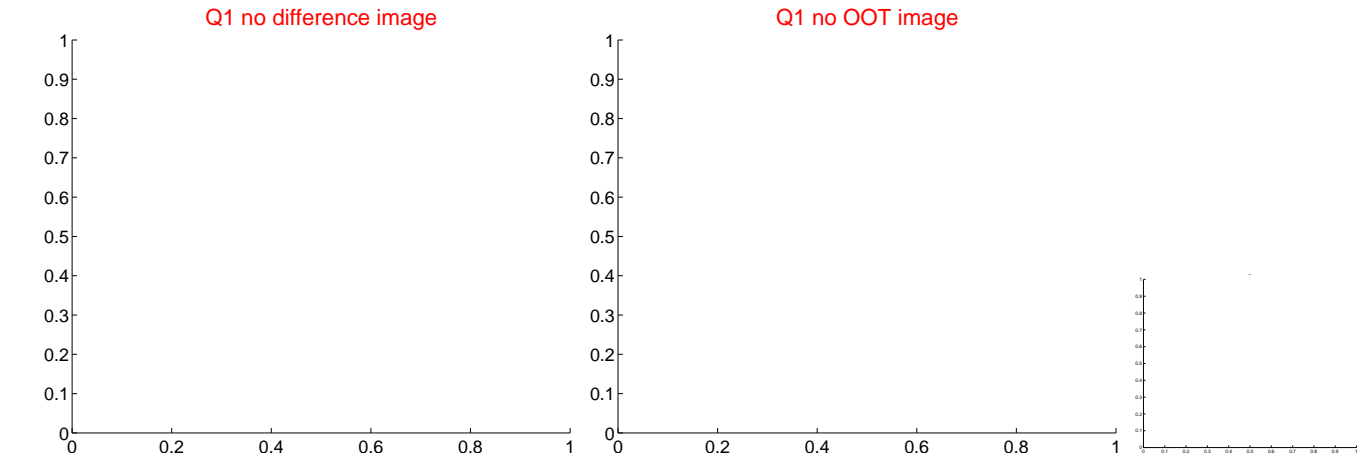
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.174 ± 0.413	0.42	-0.144 ± 0.227	0.099 ± 0.414
PRF-fit source offset from KIC position	0.196 ± 0.788	0.25	-0.073 ± 0.353	0.182 ± 0.710
photometric centroid source offset	3.10 ± 5.00	0.62	3.09 ± 4.99	0.33 ± 5.37

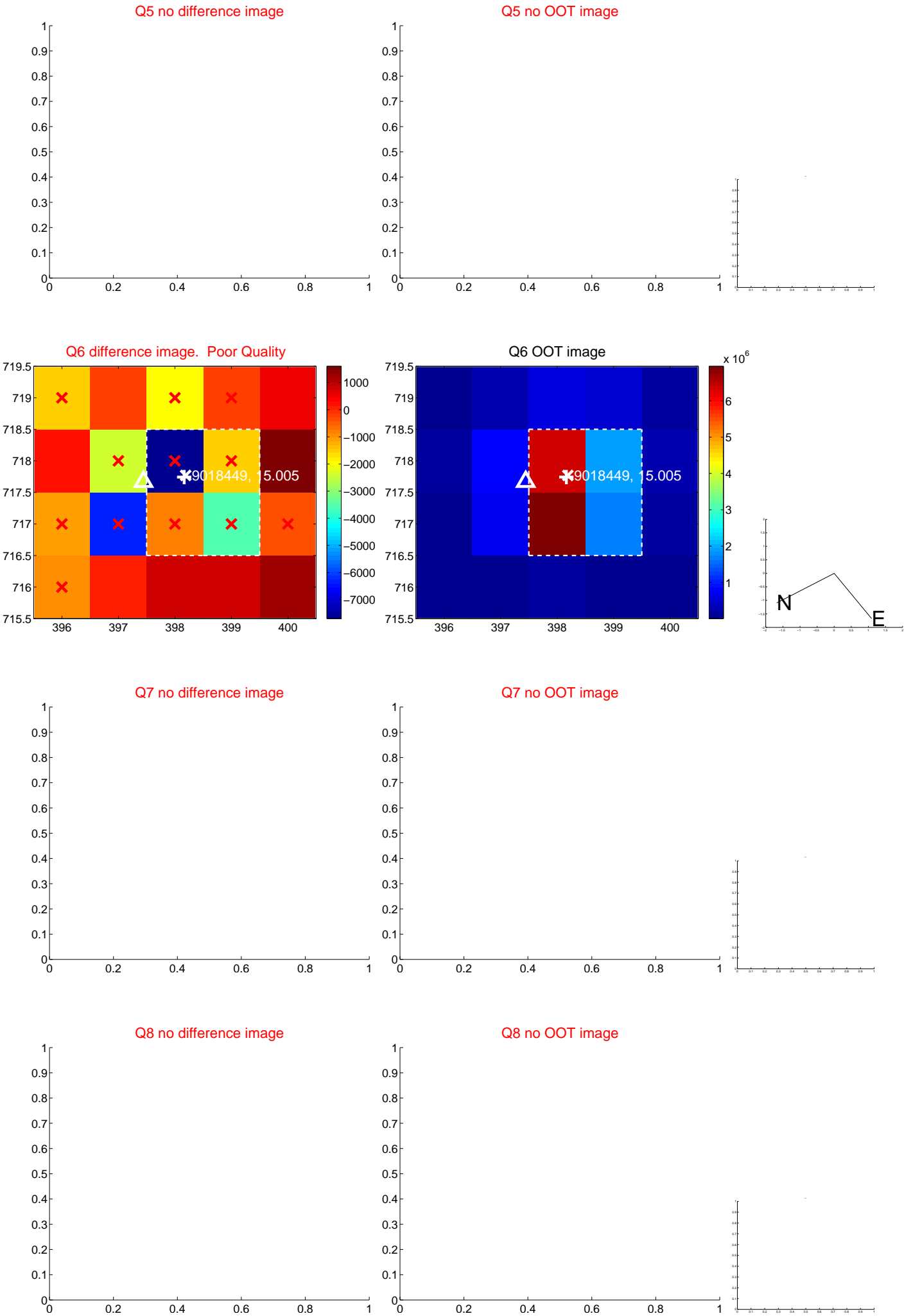


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

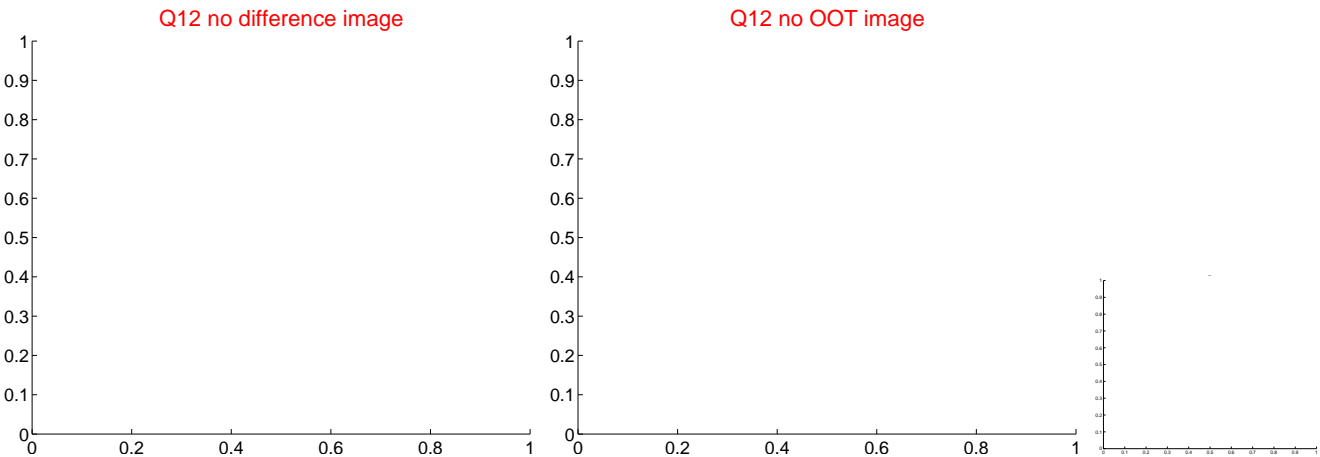
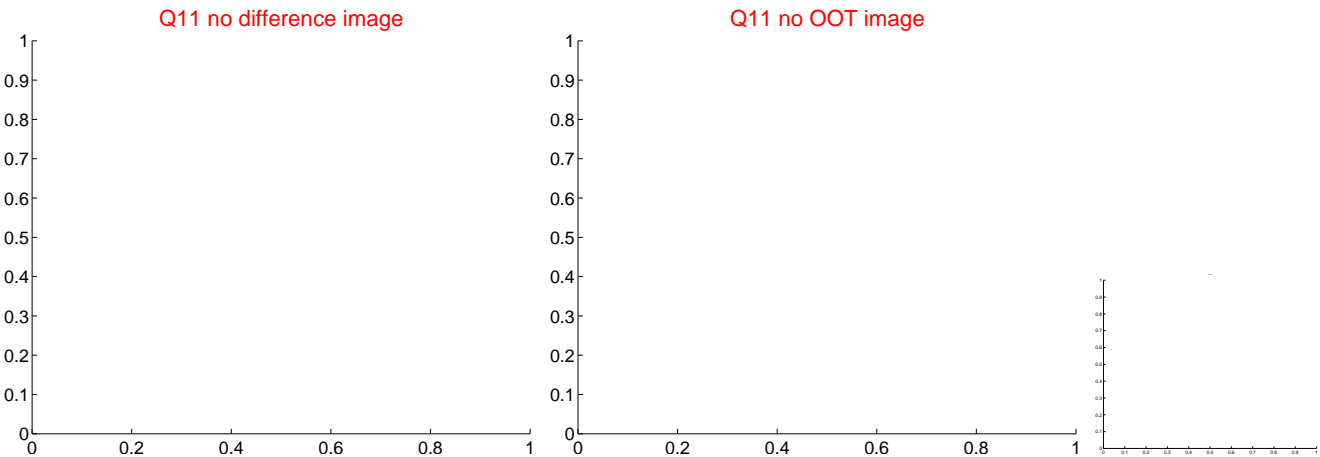
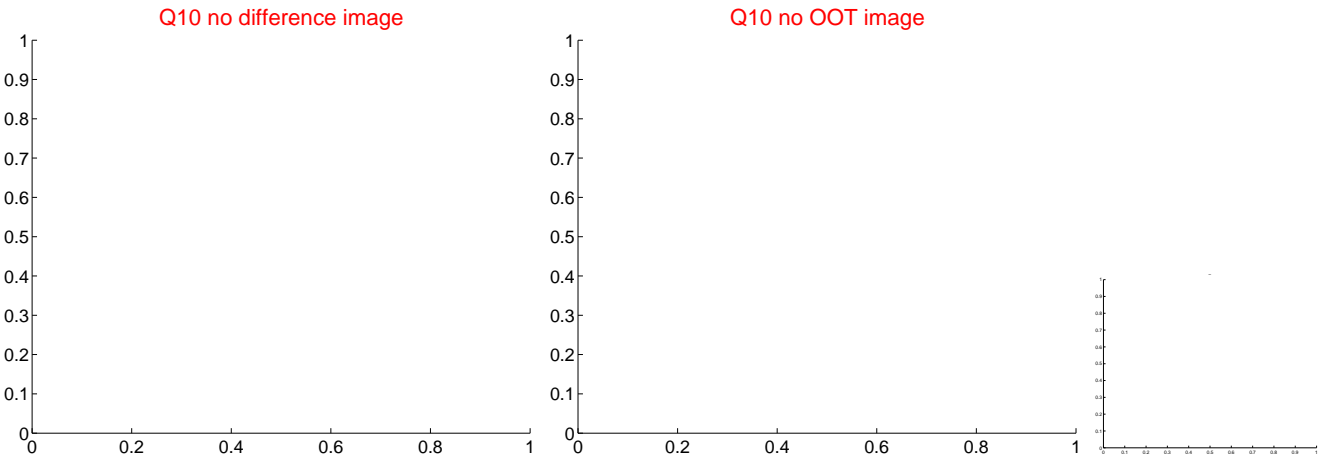
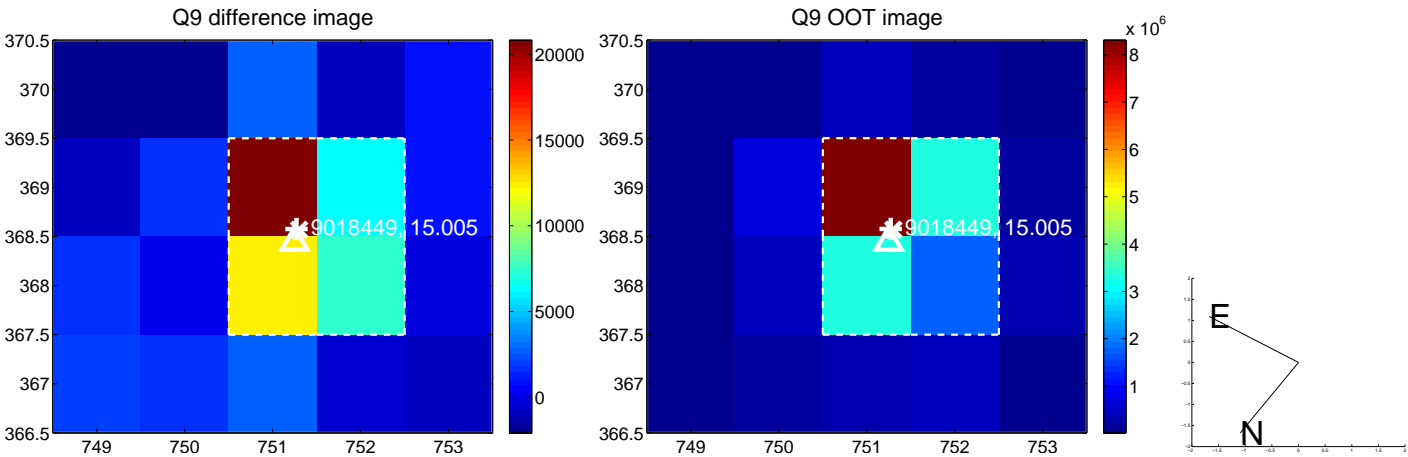
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



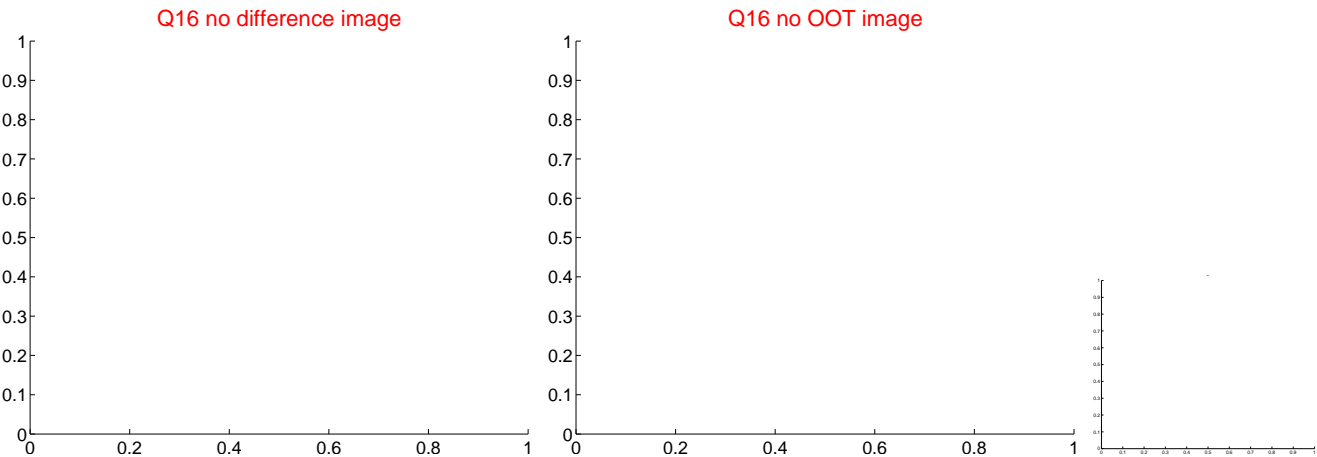
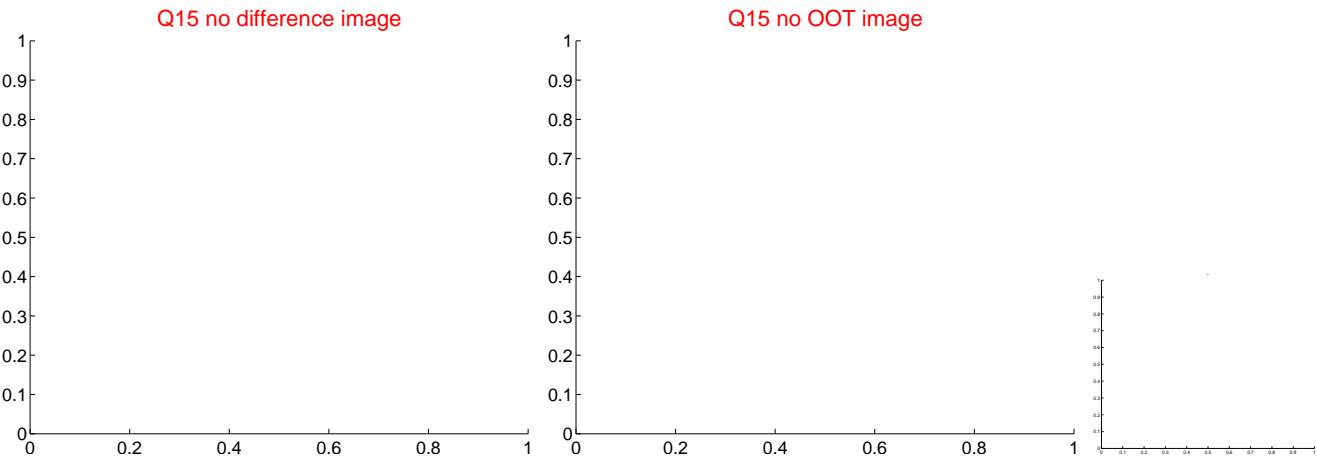
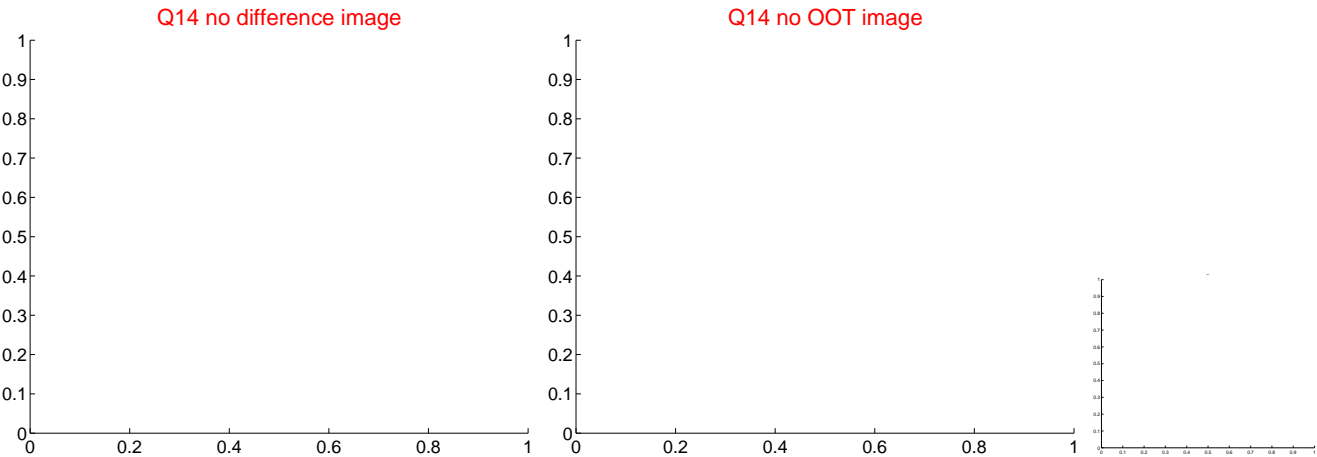
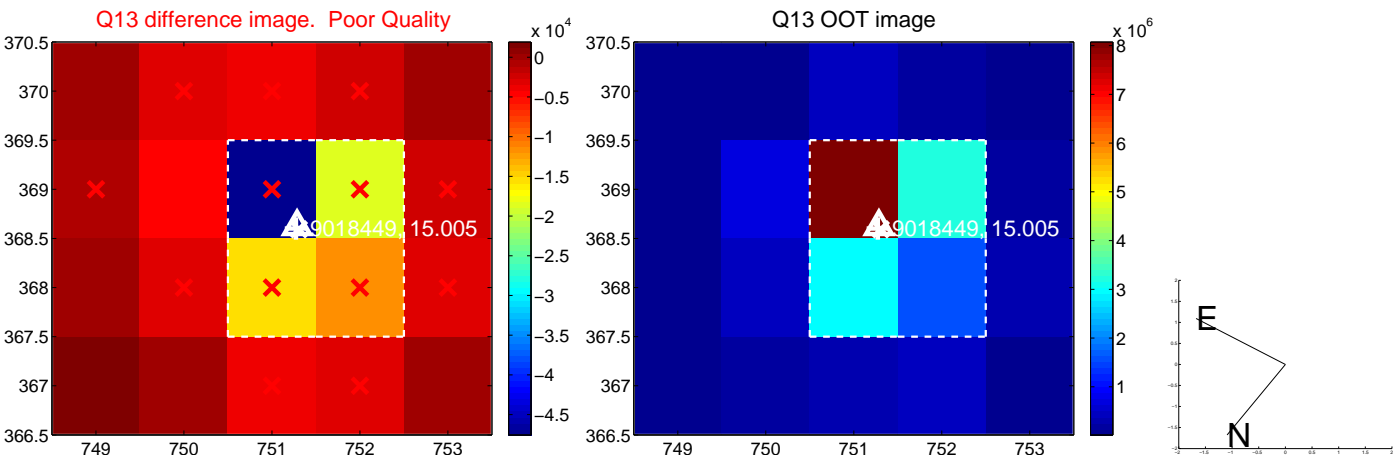
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



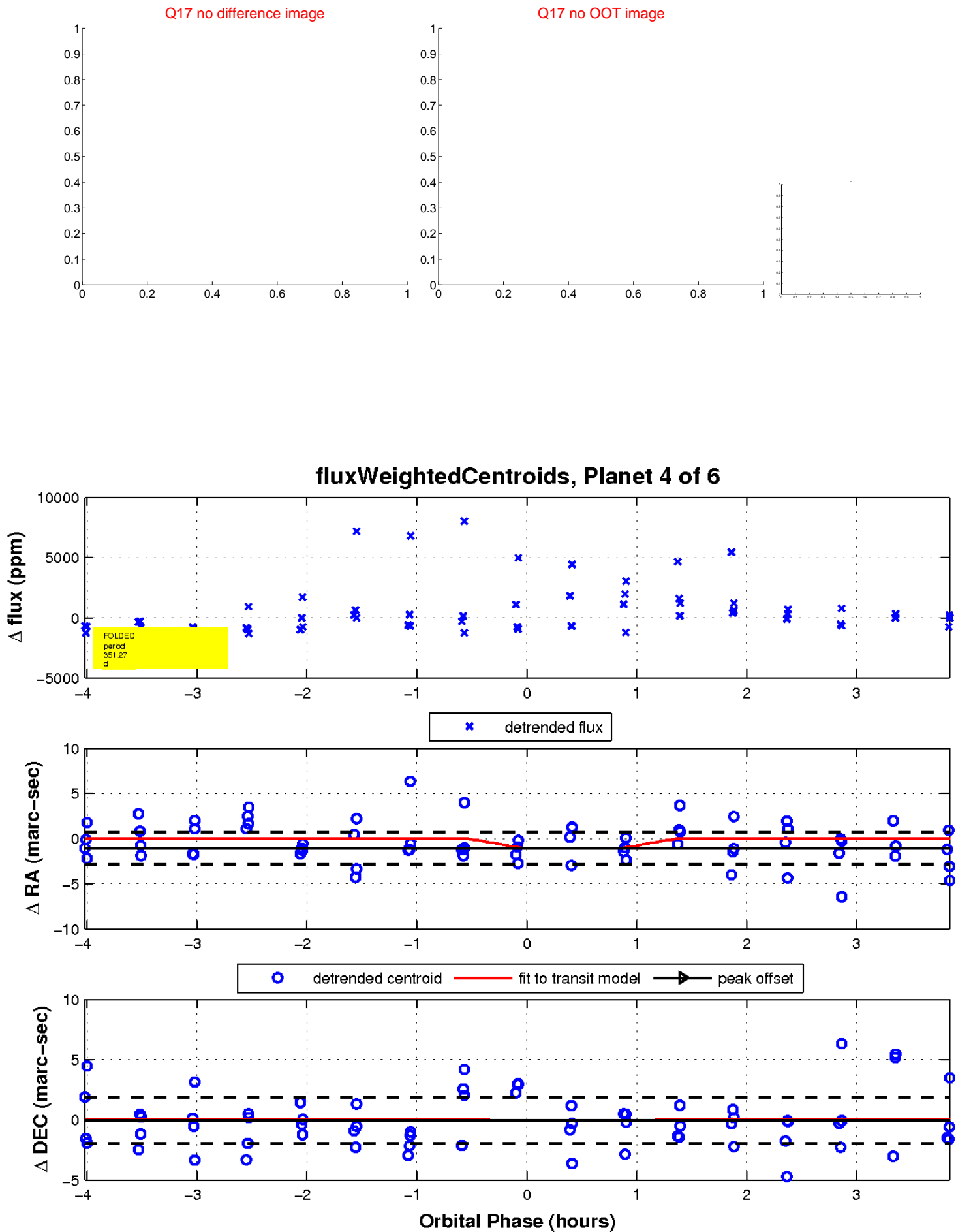
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

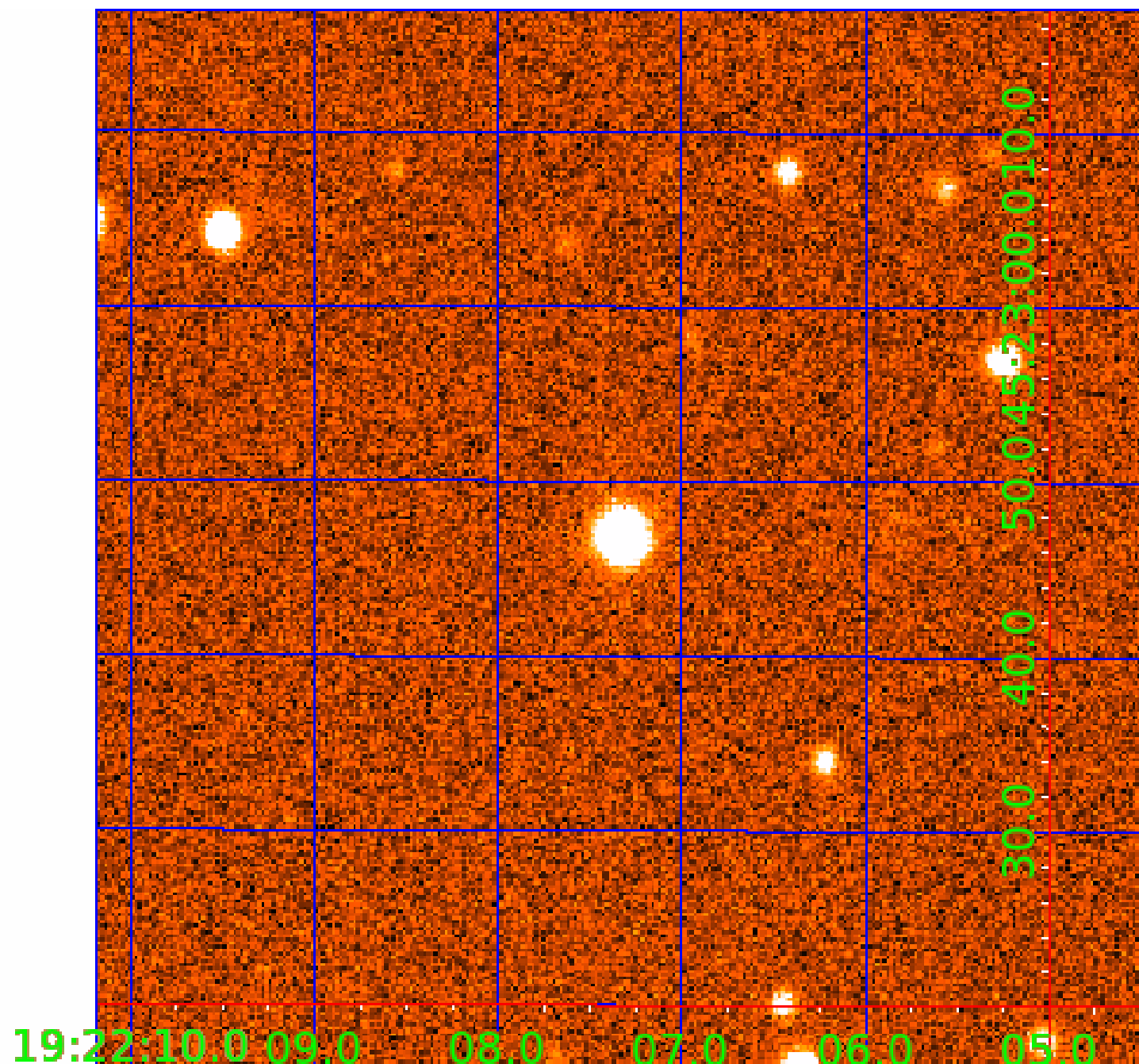


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009018449

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})
009018449-01	OBS	No	268.447200	195.640107	1805.1	12.011	16.9	6.0	0.56	4422	2.33	0.24
009018449-02	OBS	No	487.480212	603.119357	1752.9	4.992	16.2	6.3	0.56	4422	2.38	0.11
009018449-03	OBS	No	229.987866	333.678601	1700.4	2.869	15.7	8.8	0.56	4422	2.34	0.30
009018449-04	OBS	No	351.273184	198.500793	2903.0	3.000	15.5	-1.0	0.56	4422	2.96	0.17
009018449-05	OBS	No	518.174954	425.928371	1217.1	2.723	12.2	4.6	0.56	4422	2.09	0.10
009018449-06	OBS	No	476.094534	239.001268	1637.2	3.893	13.6	6.9	0.56	4422	2.24	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018449-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009018449-02	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—INCONSISTENT_TRANS
009018449-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009018449-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009018449-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009018449-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

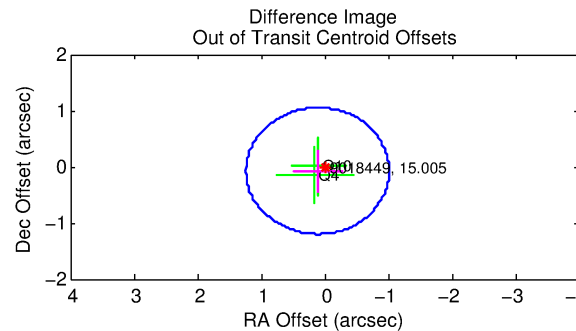
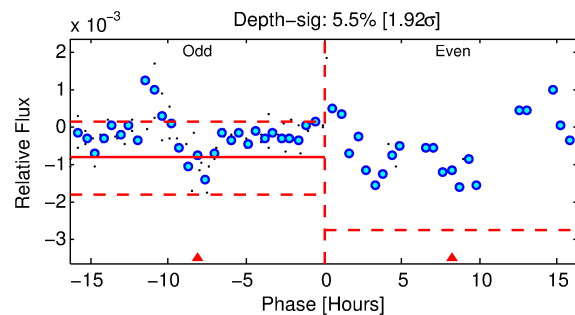
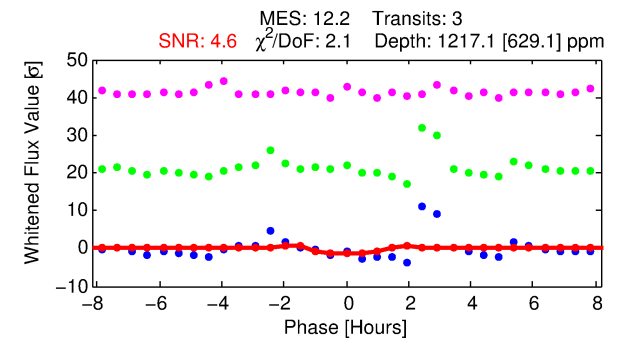
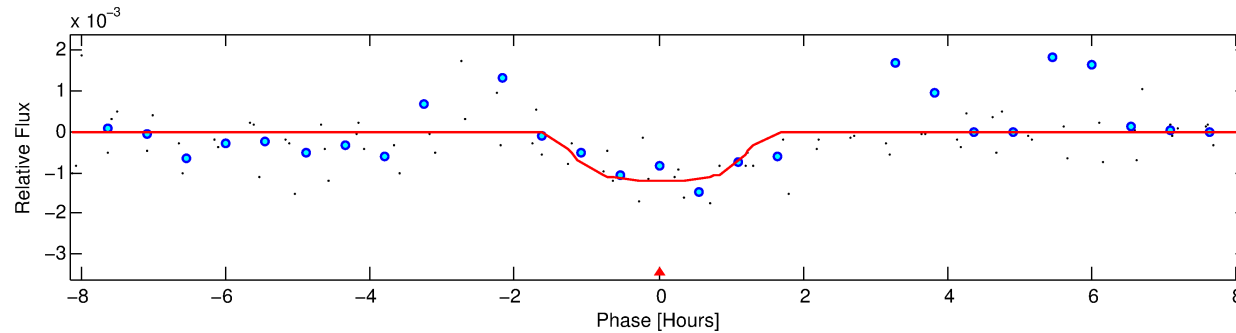
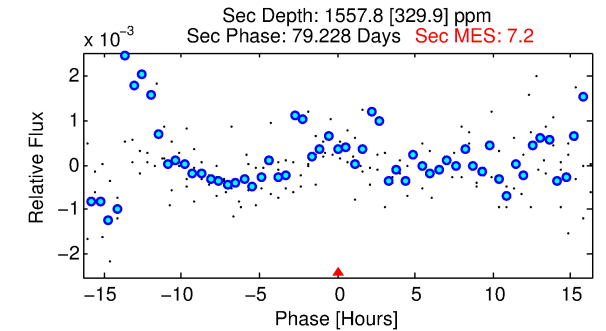
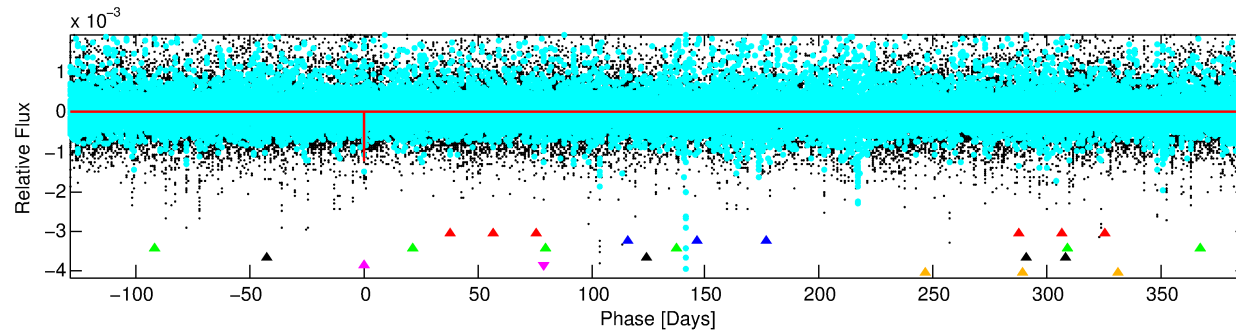
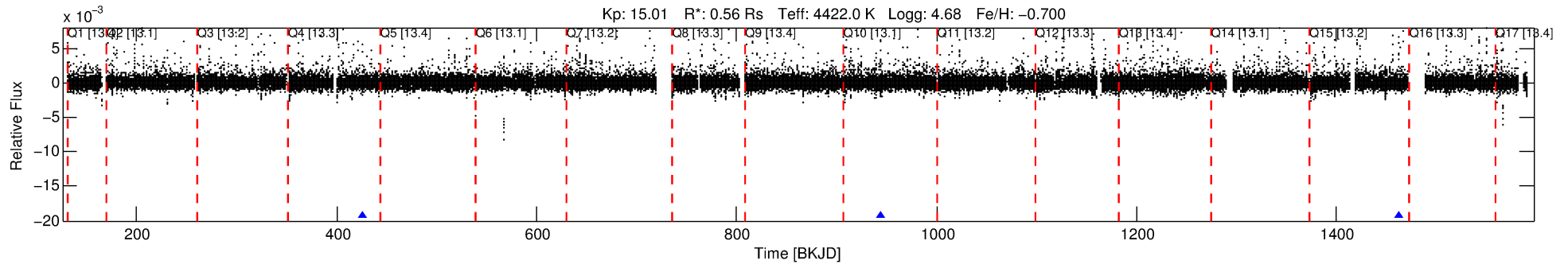
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018449-05

No Significant Match Found

DV One-Page Summary

KIC: 9018449 Candidate: 5 of 6 Period: 518.175 d



DV Fit Results:

Period = 518.17495 [0.01192] d
Epoch = 425.9284 [0.0156] BKJD
Rp/R* = 0.0339 [0.2329]
a/R* = 1137.87 [27703.54]
b = 0.68 [20.12]
Seff = 0.10 [0.02]
Teq = 144 [6] K
Rp = 2.09 [14.36] Re
a = 1.0368 [0.0761] AU
Ag = 210482.92 [2889680.17] [0.07 σ]
Teffp = 4769 [16368] K [0.28 σ]

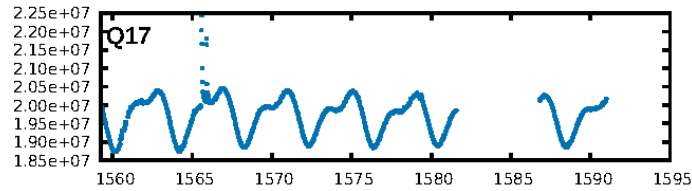
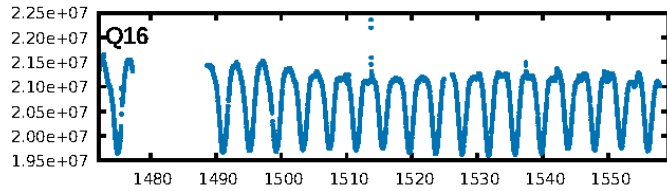
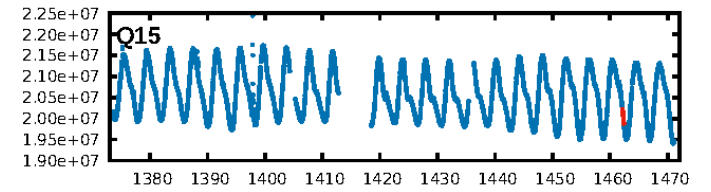
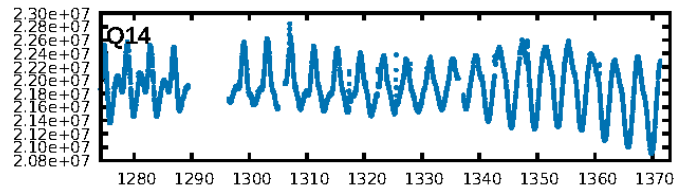
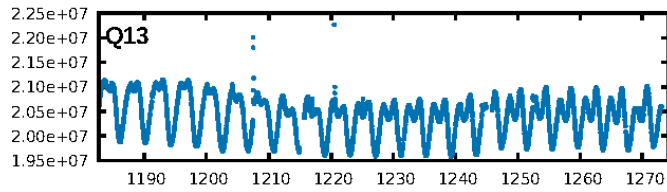
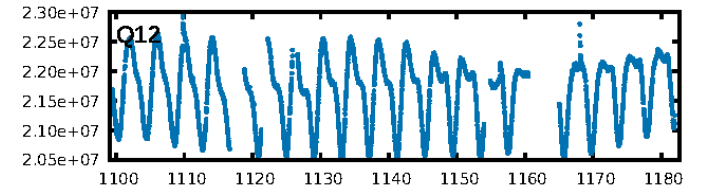
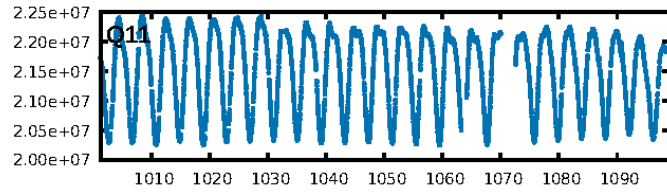
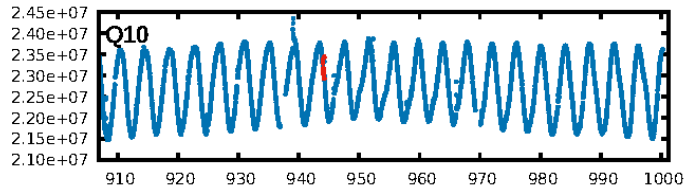
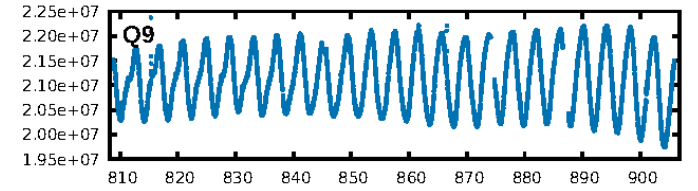
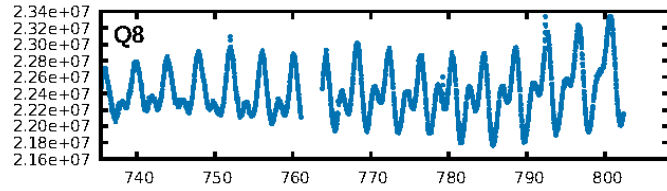
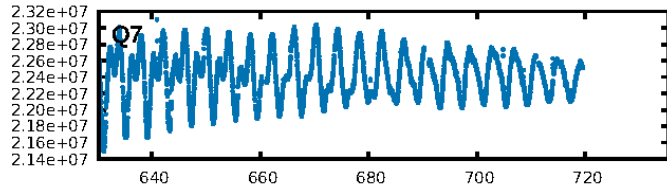
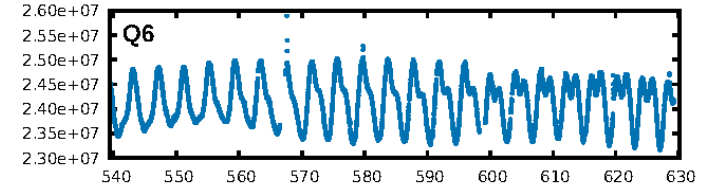
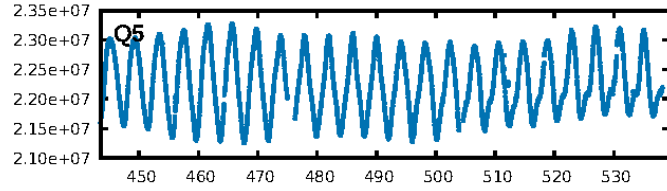
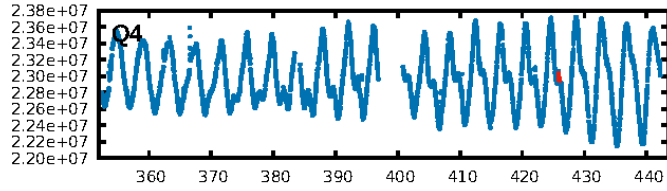
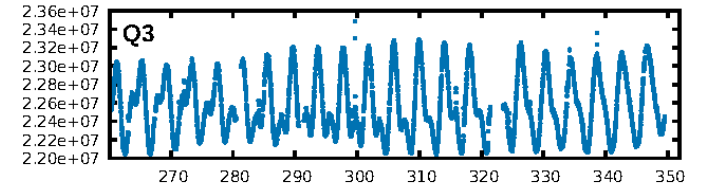
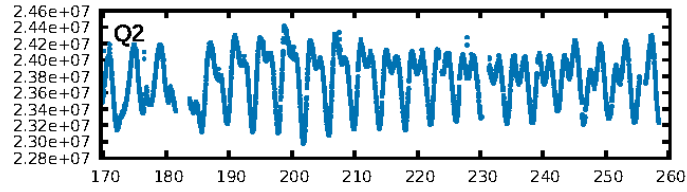
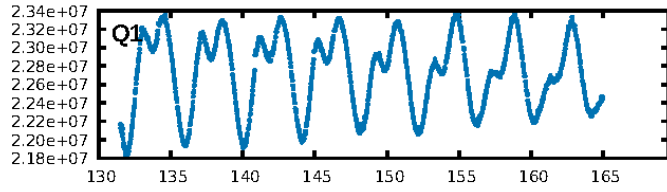
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [129.56 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 36.3%
Bootstrap-pfa: 5.51e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.7911
Centroid-sig: 79.1%
Centroid-so: 0.560 arcsec [0.42 σ]
OotOffset-rm: 0.135 arcsec [0.36 σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-rm: 0.108 arcsec [0.29 σ]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

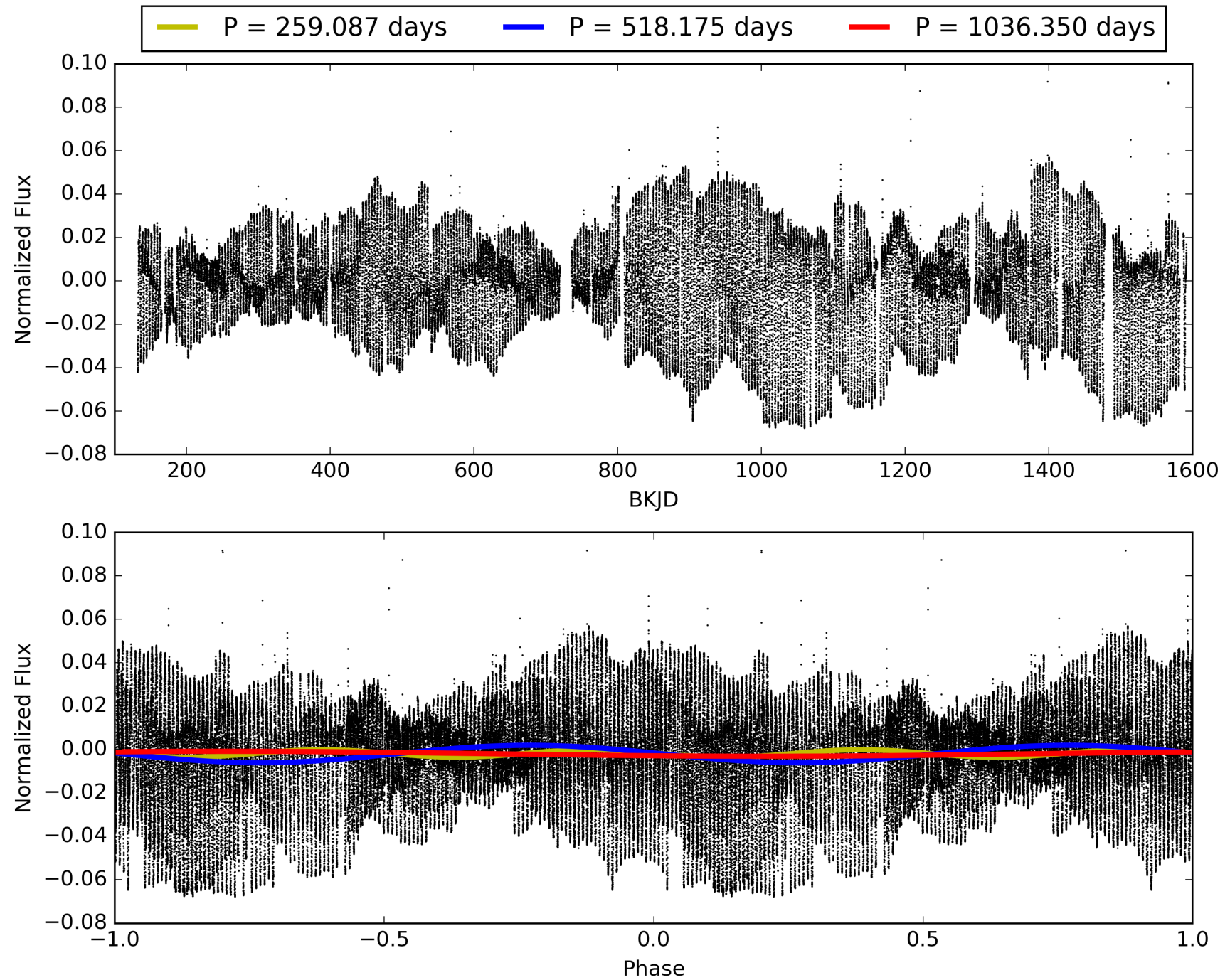
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:29:52 Z

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

TCE 009018449-05, PDC Light Curves

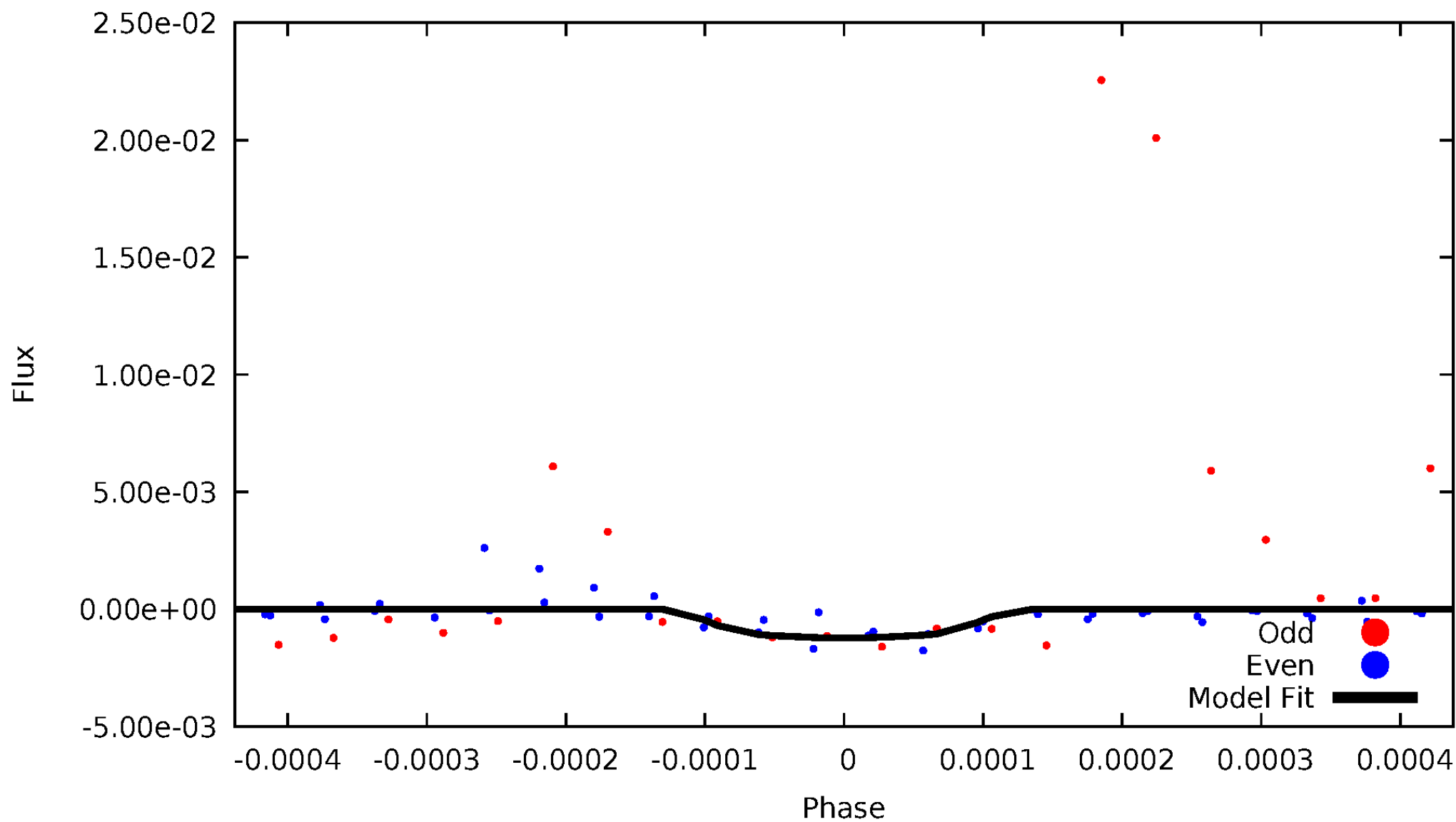


TCE 009018449-05



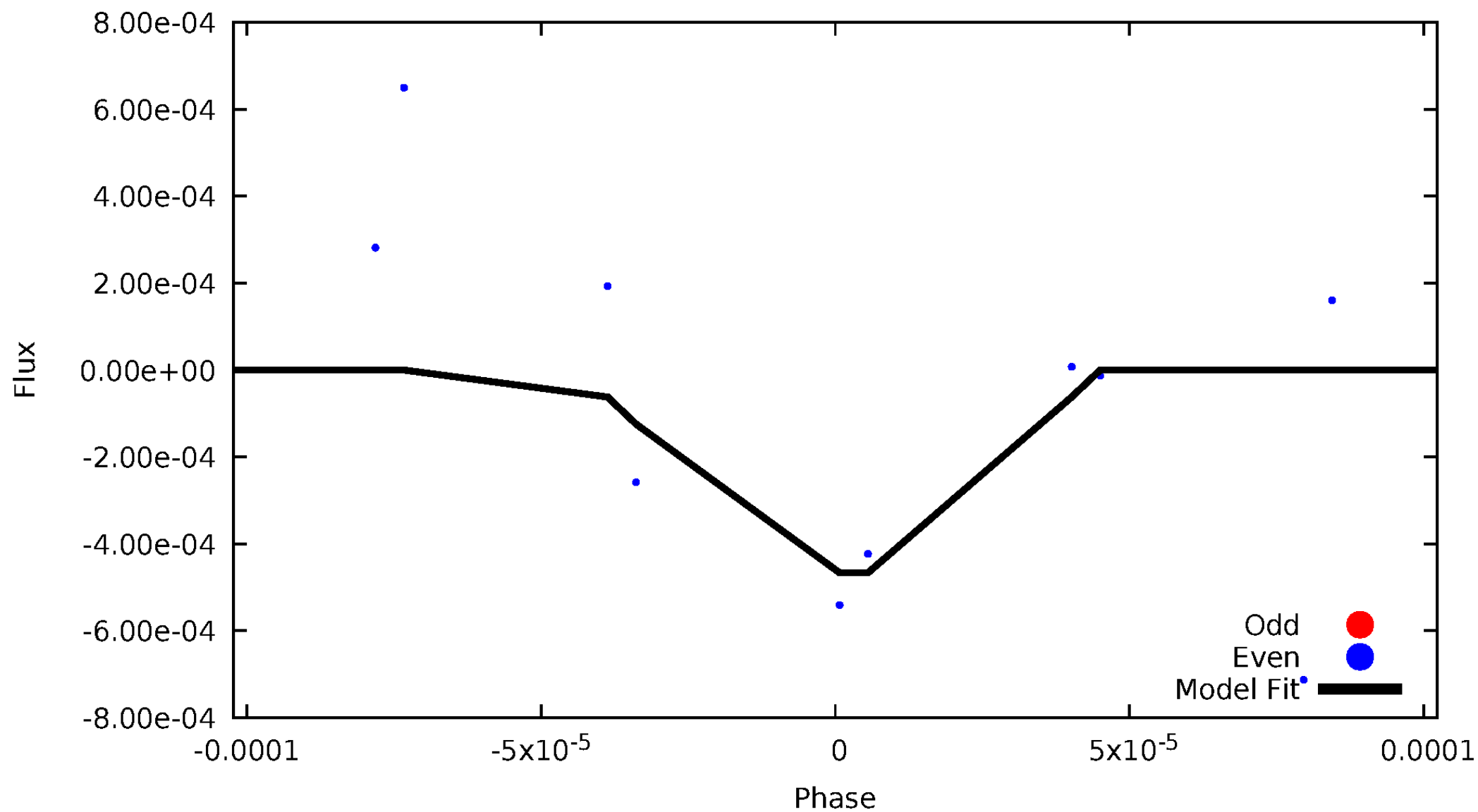
DV Odd/Even

TCE 009018449-05



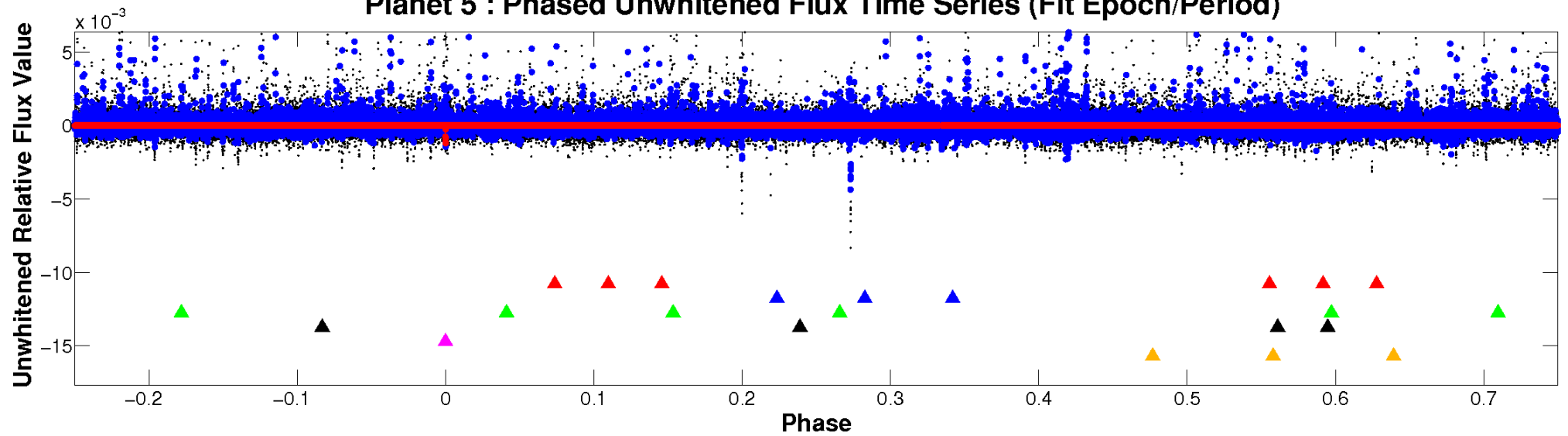
ALT Odd/Even

TCE 009018449-05

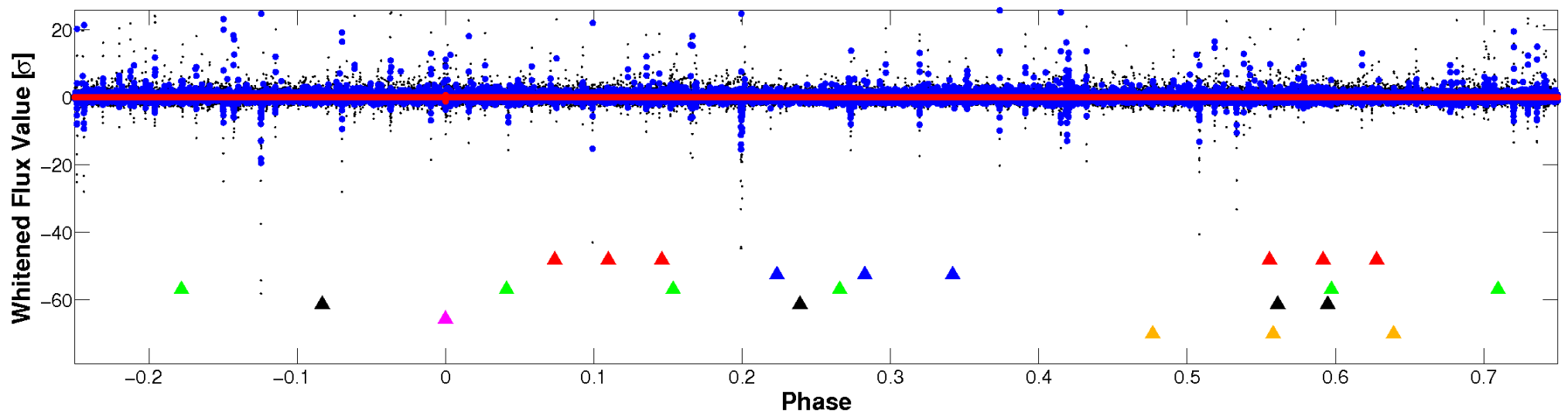


Non-Whitened Vs. Whitened Light Curve

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

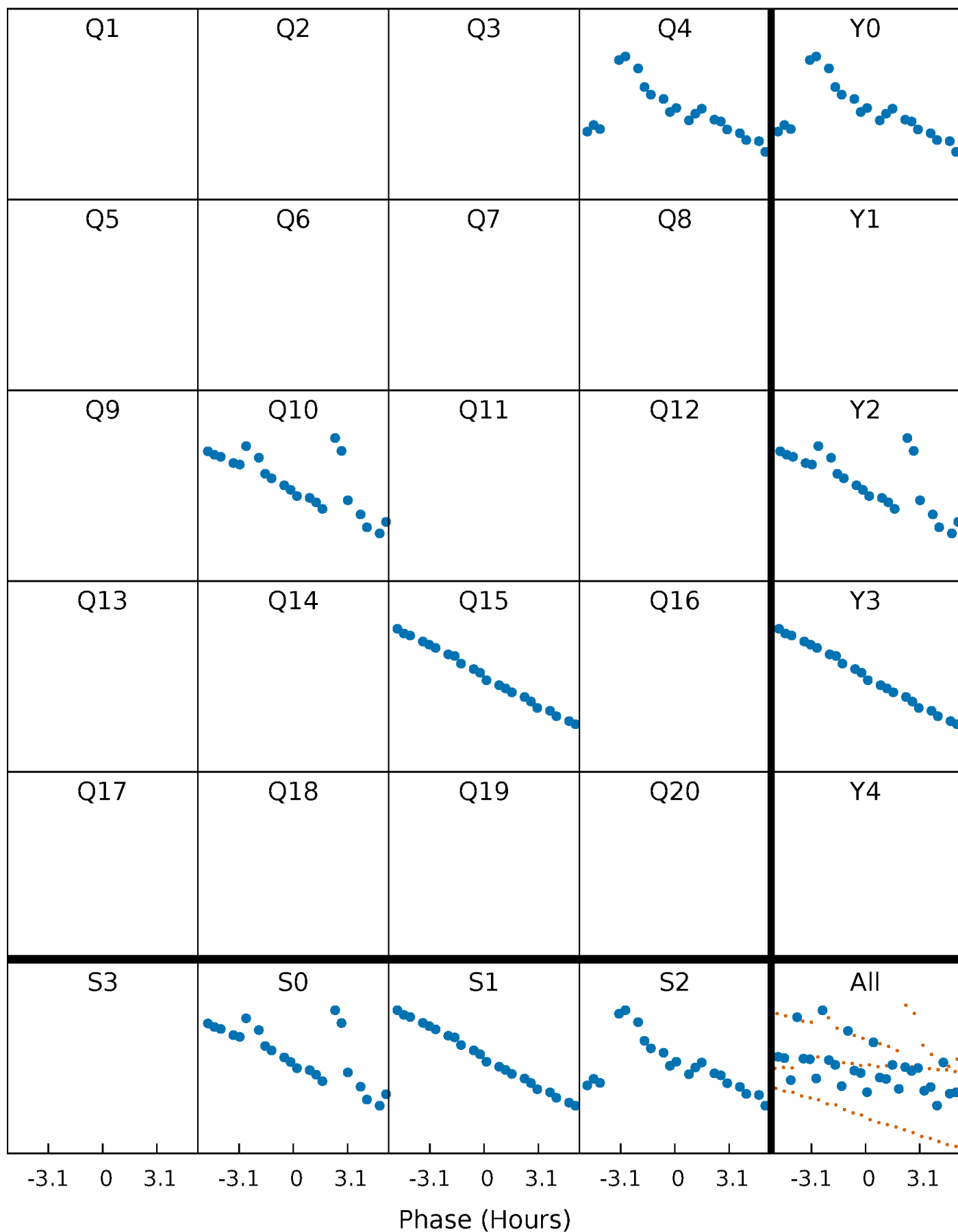


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



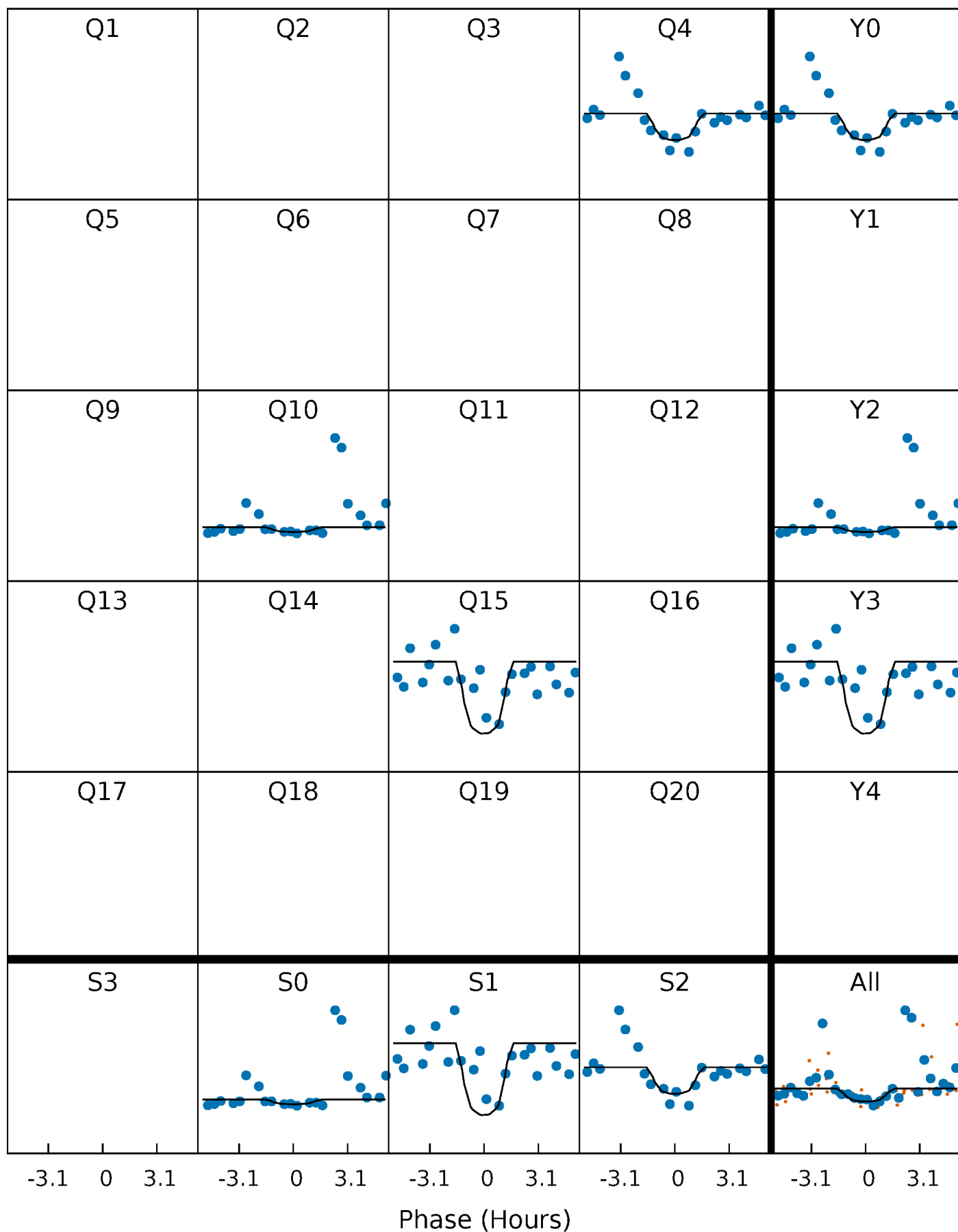
PDC Quarter-Phased Transit Curves

TCE 009018449-05 $P=518.174954$ Days $T_0=425.928371$ (BKJD)



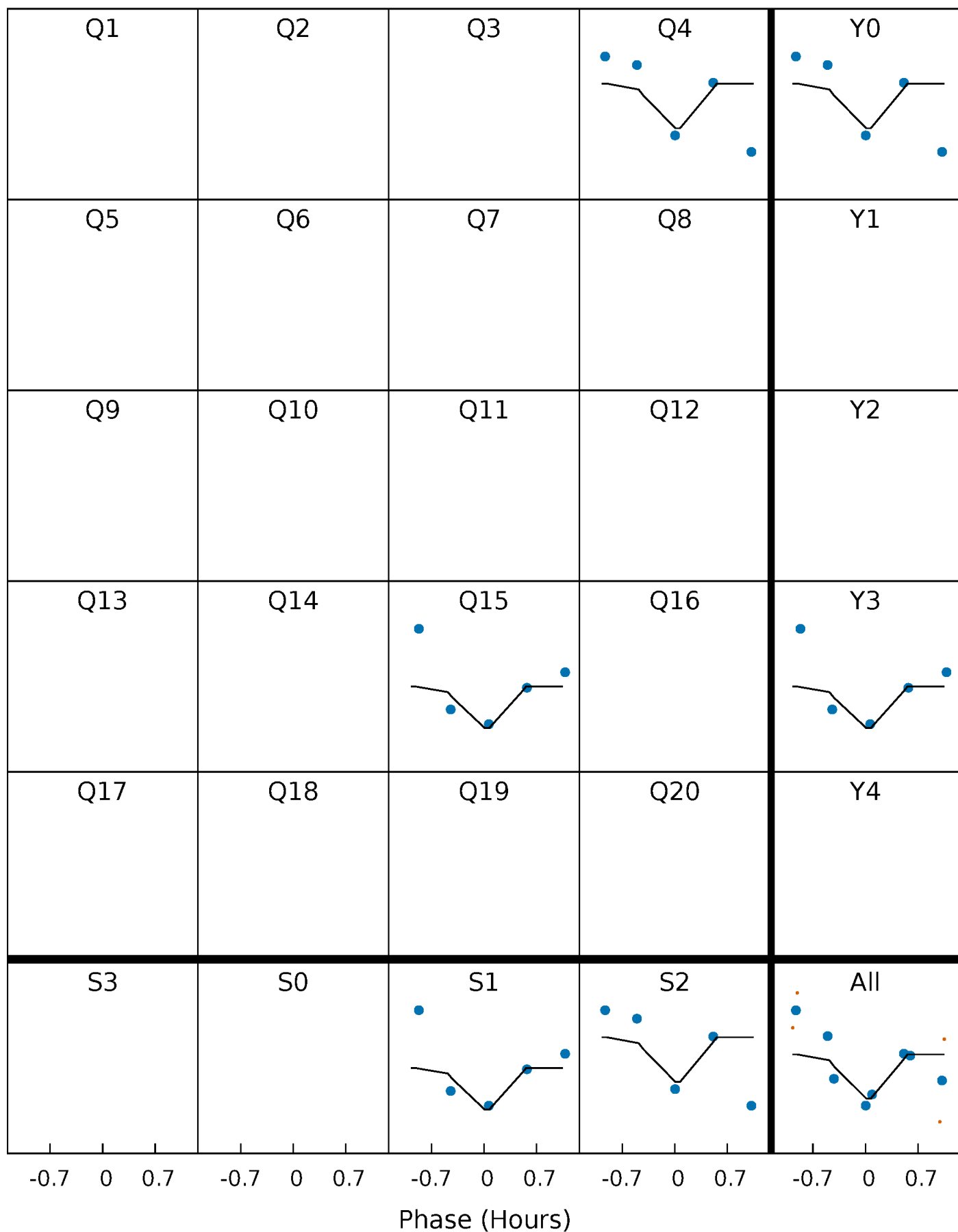
DV Quarter-Phased Transit Curves

TCE 009018449-05 $P=518.174954$ Days $T_0=425.928371$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

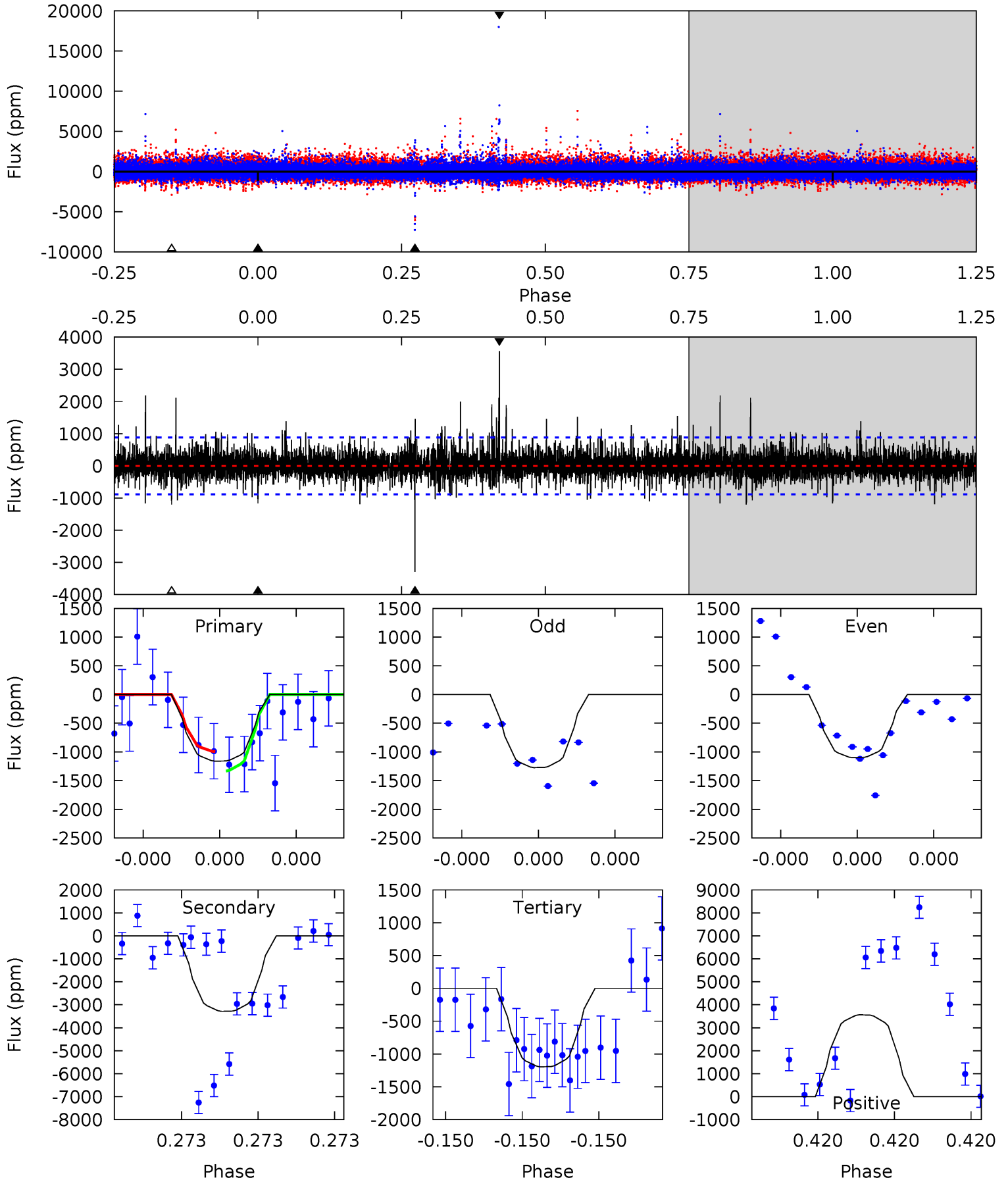
TCE 009018449-05 P=518.195082 Days $T_0=425.916616$ (BKJD)



DV Model-Shift Uniqueness Test

009018449-05, P = 518.174954 Days, E = 425.928371 Days

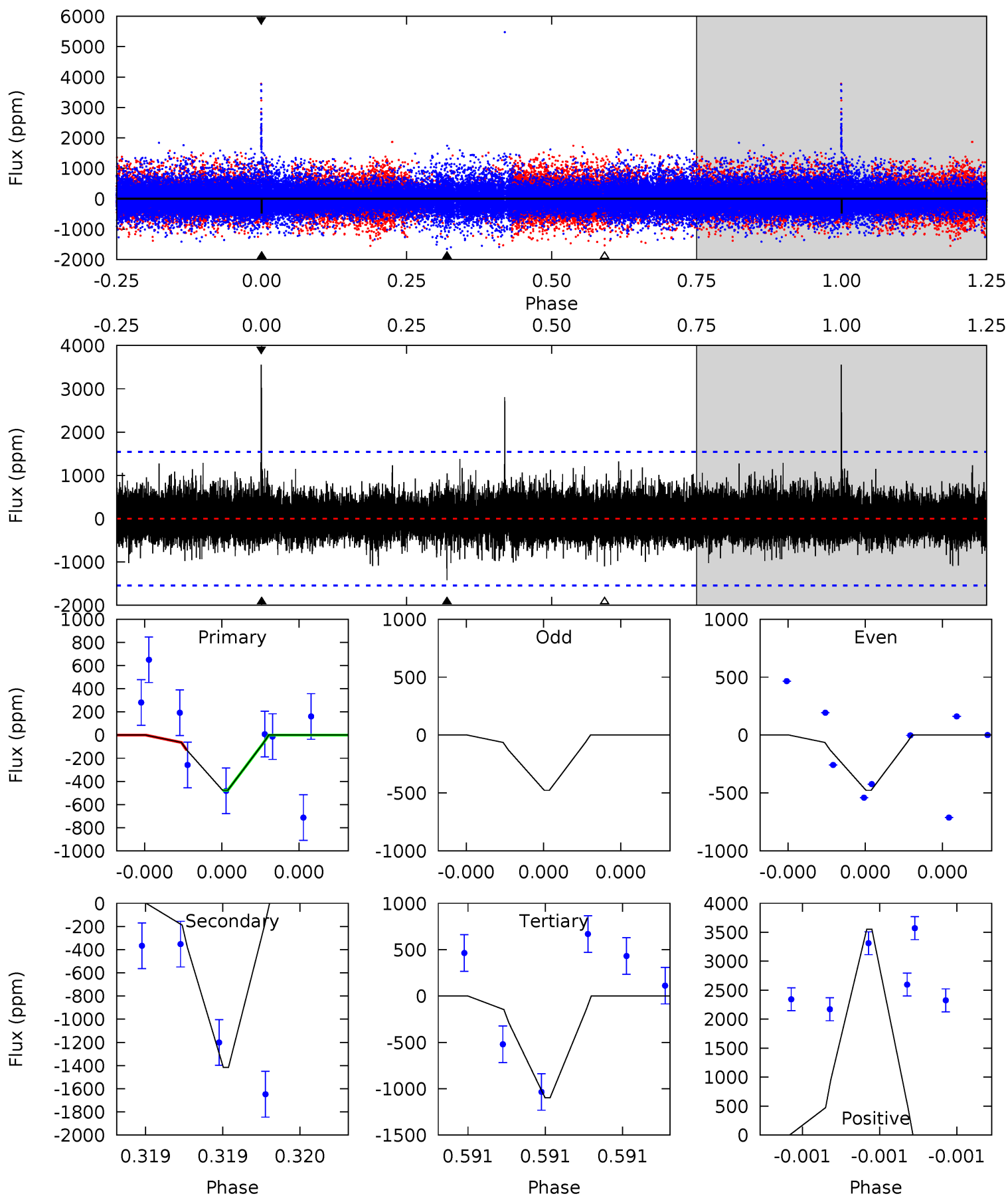
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.53	21.3	7.75	23.1	5.72	3.71	1.82	-0.22	-15.6	13.6	-1.80	0.36	0.91	0.52	1.10



Alt Model-Shift Uniqueness Test

009018449-05, P = 518.195082 Days, E = 425.916616 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.82	5.41	4.19	13.6	5.90	3.96	0.98	-2.37	-11.8	1.22	-8.17	0.00	1.00	0.71	0.00



Stellar Parameters For KIC 009018449

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4422^{+132}_{-132}	$4.677^{+0.059}_{-0.027}$	$-0.700^{+0.300}_{-0.300}$	$0.565^{+0.045}_{-0.049}$	$0.554^{+0.056}_{-0.033}$	$4.317^{+1.061}_{-0.588}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
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 009018449-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3288 ± 154	$10.75^{+11.65}_{-7.18}$	200^{+7}_{-7}	3084^{+1358}_{-578}	$17274^{+139892}_{-13271}$
Alt.	-1417 ± 262	$10.51^{+10.64}_{-7.82}$	200^{+7}_{-7}	2737^{+1391}_{-431}	$7702^{+103534}_{-5864}$

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

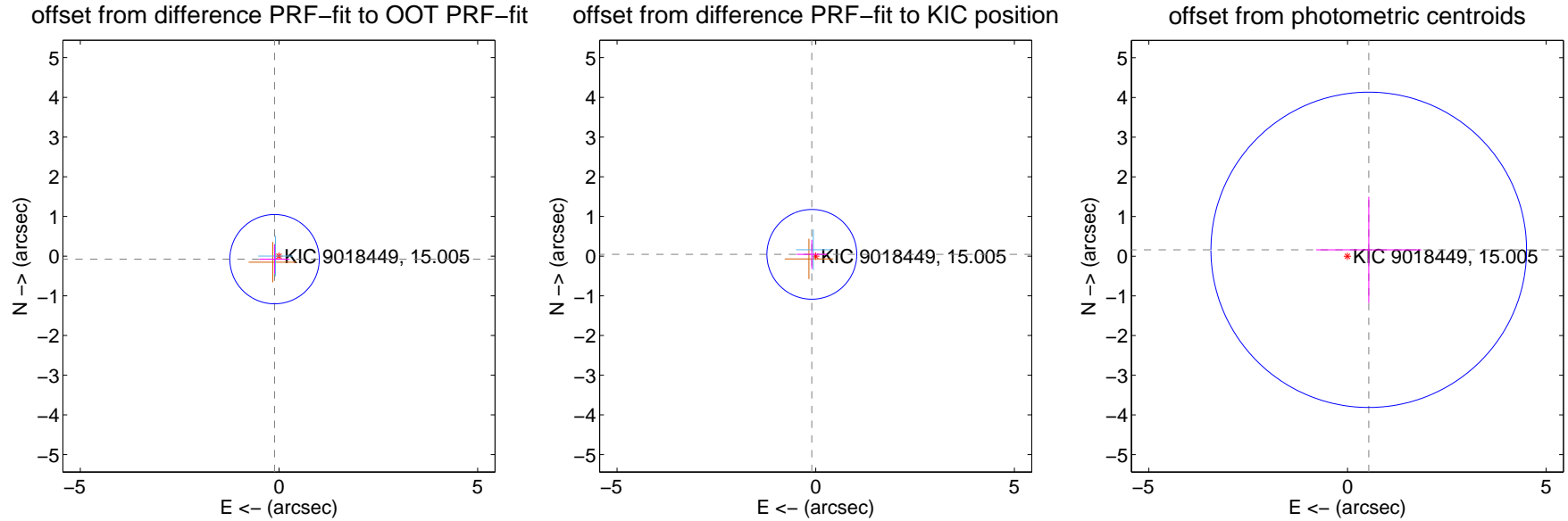
DV Centroid Data

Supplemental centroid analysis for 009018449-05. Kepler magnitude: 15.01. Transit SNR 4.55

There are 1 quarters with good PRF difference image offsets

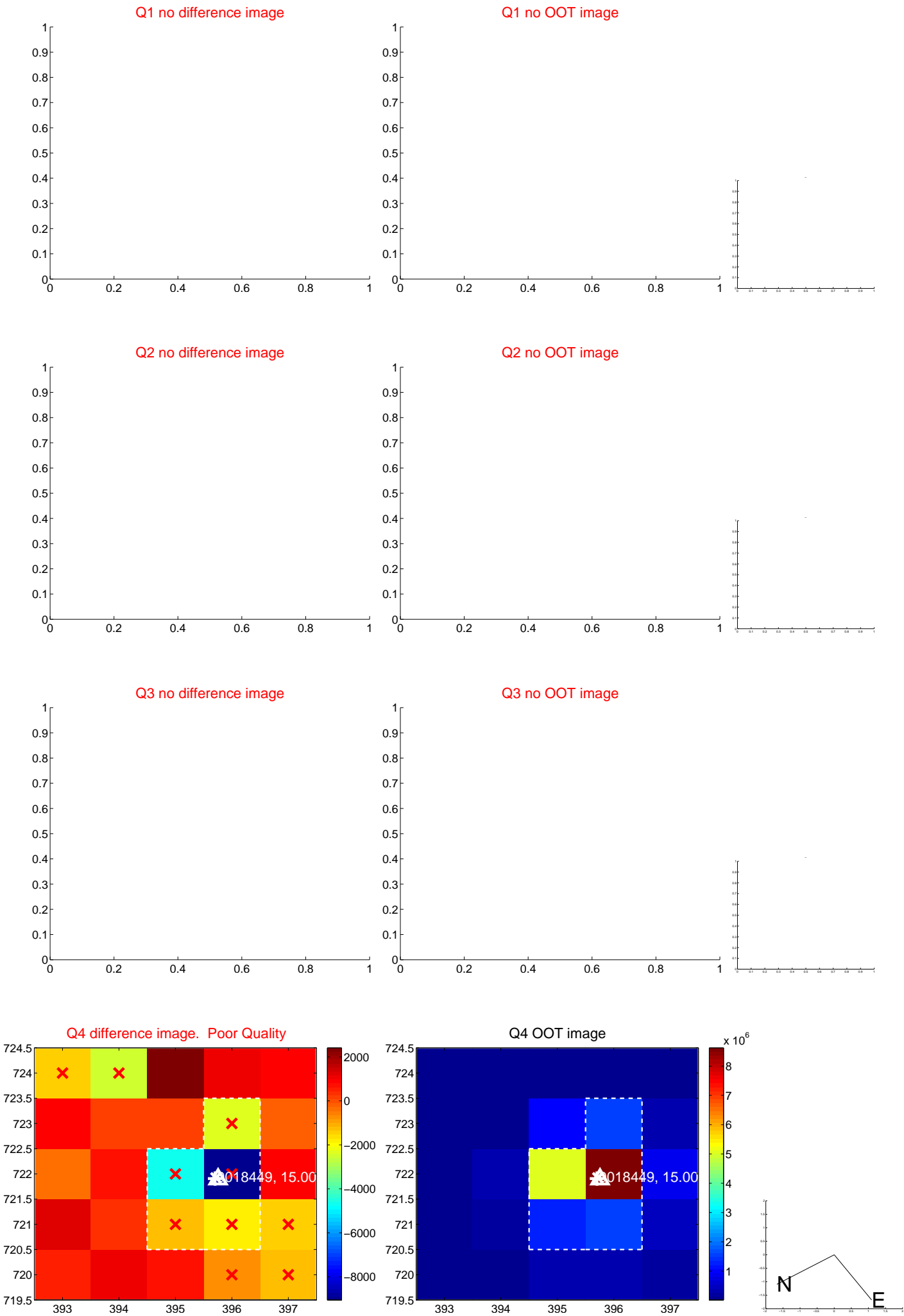
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.135 ± 0.375	0.36	0.112 ± 0.379	-0.076 ± 0.366
PRF-fit source offset from KIC position	0.108 ± 0.377	0.29	0.098 ± 0.379	0.045 ± 0.366
photometric centroid source offset	0.56 ± 1.32	0.42	-0.54 ± 1.32	0.16 ± 1.34

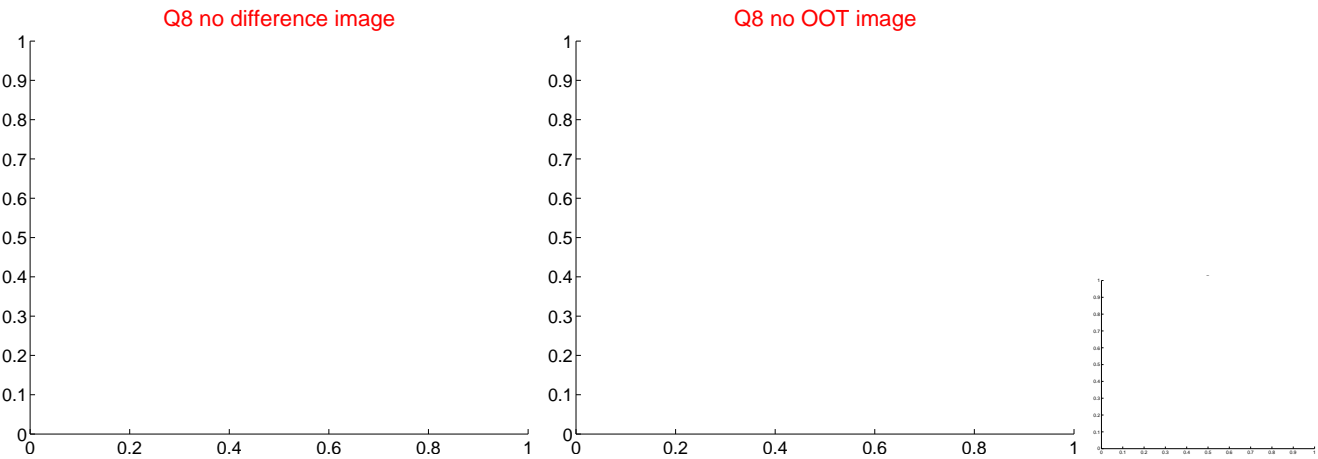
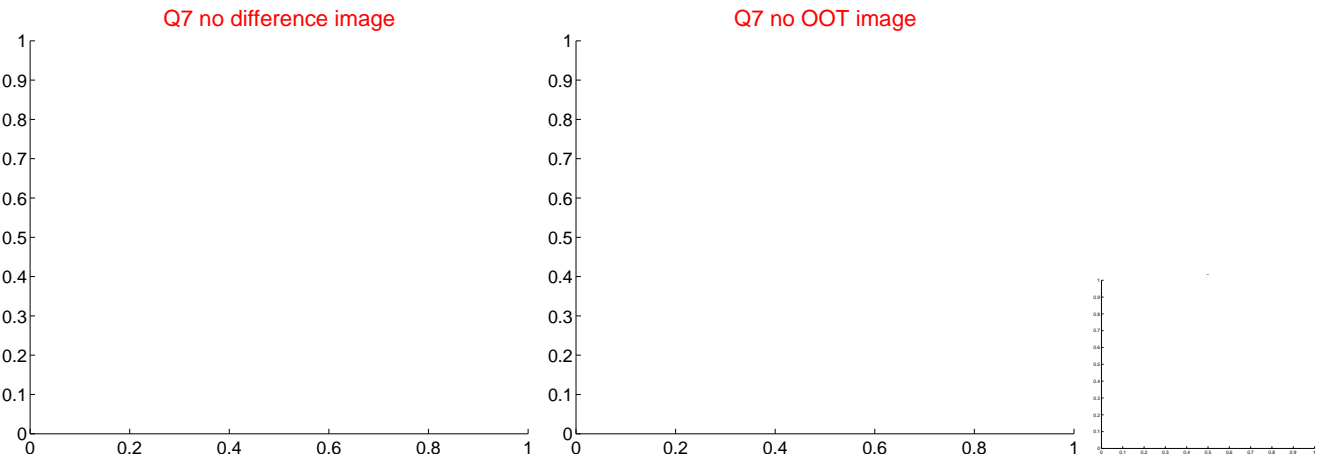
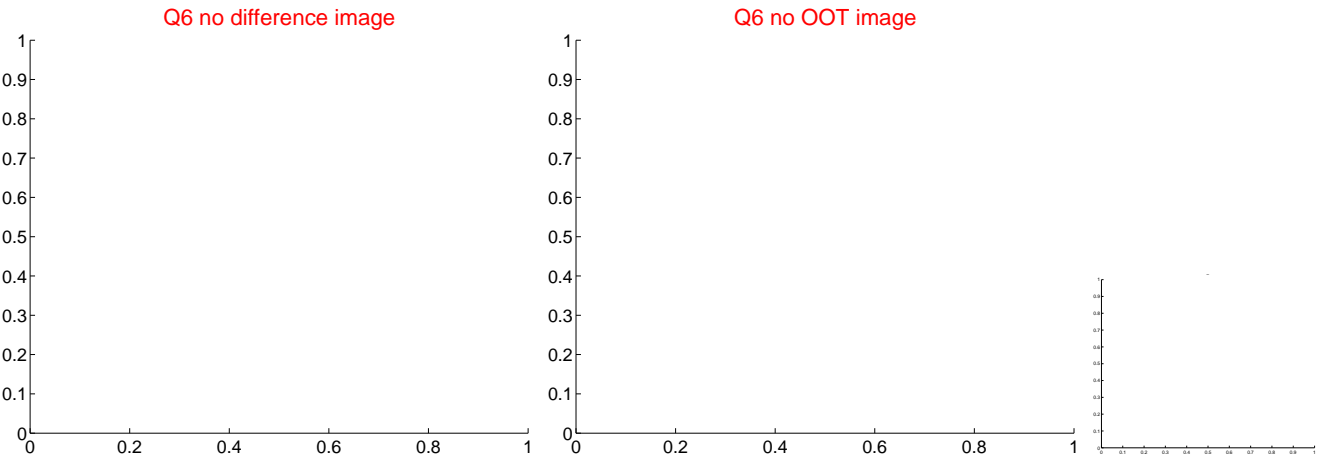
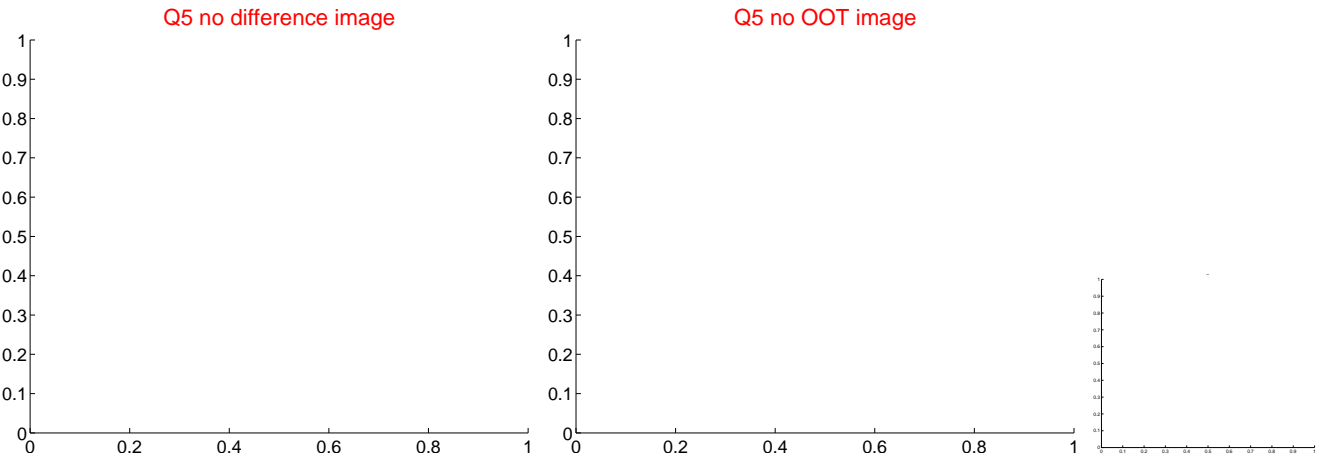


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

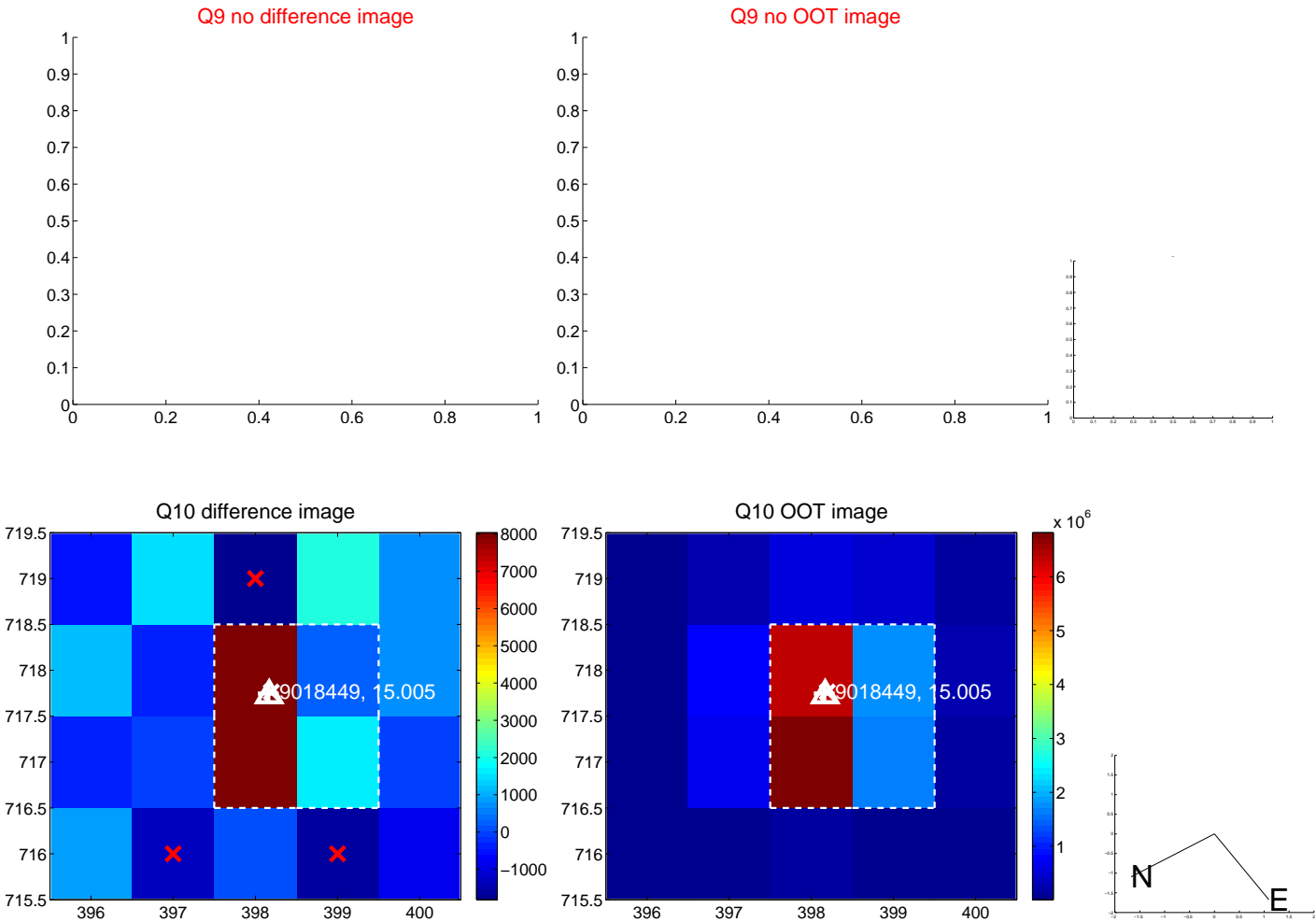
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



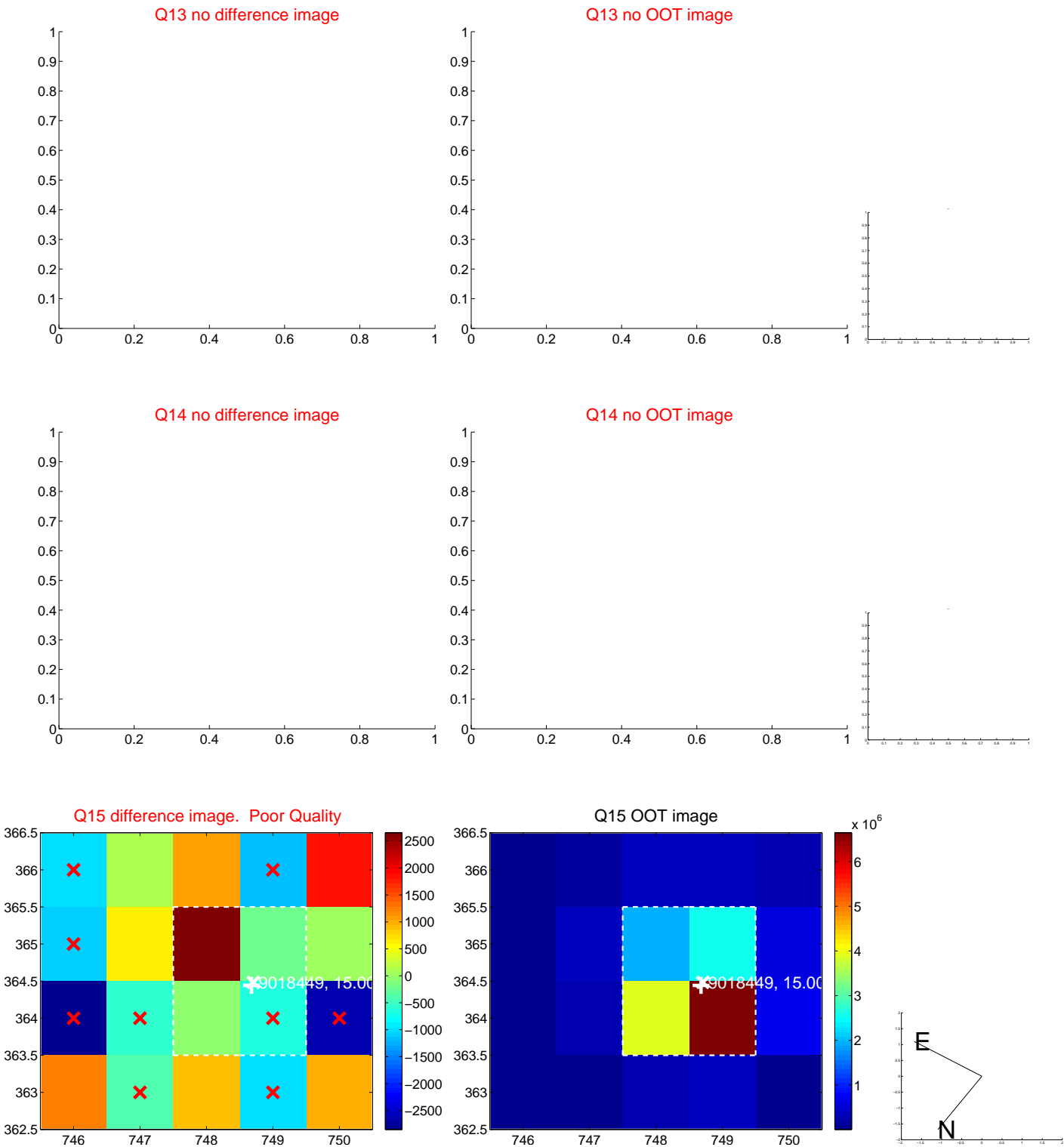
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



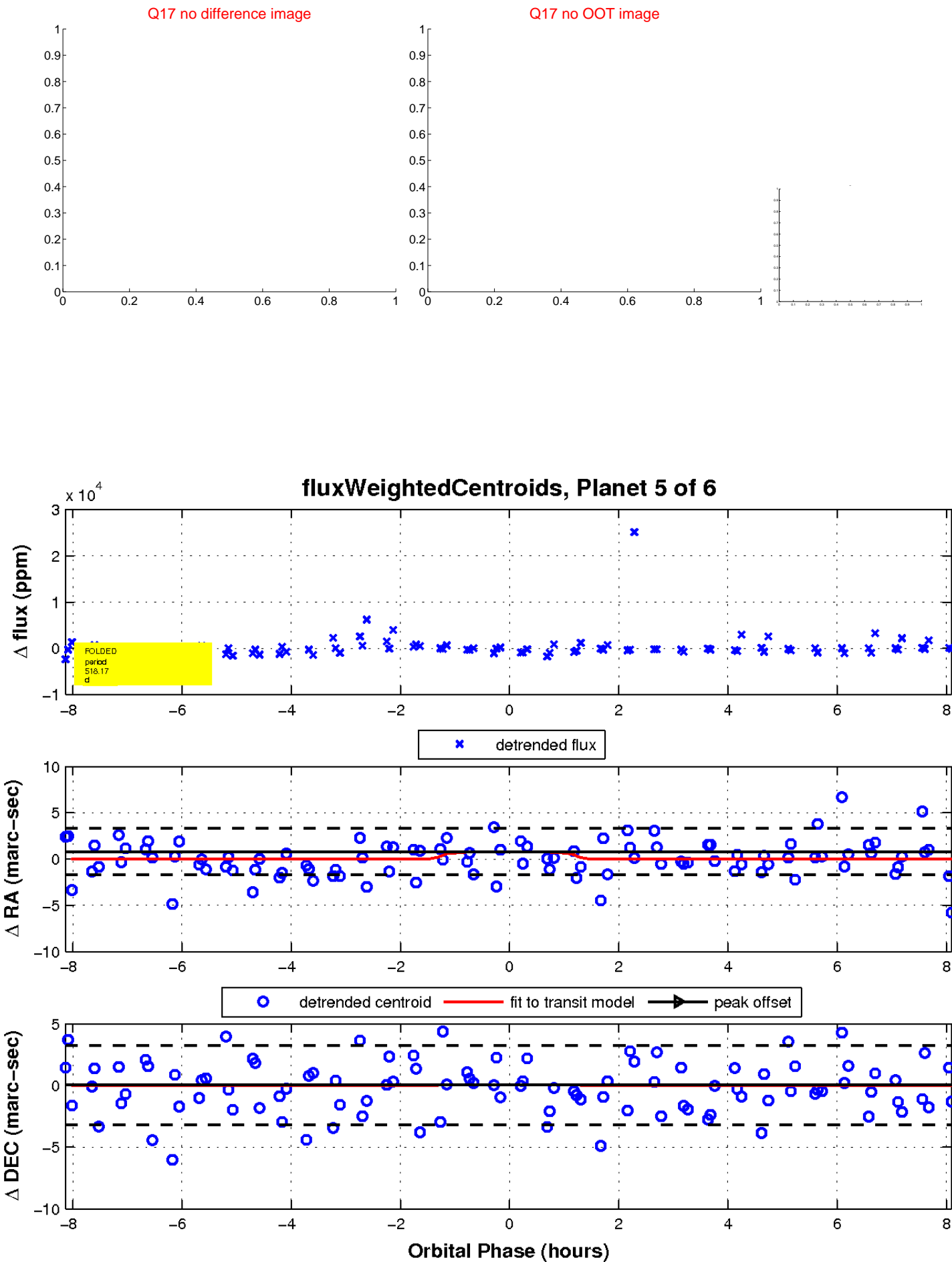
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



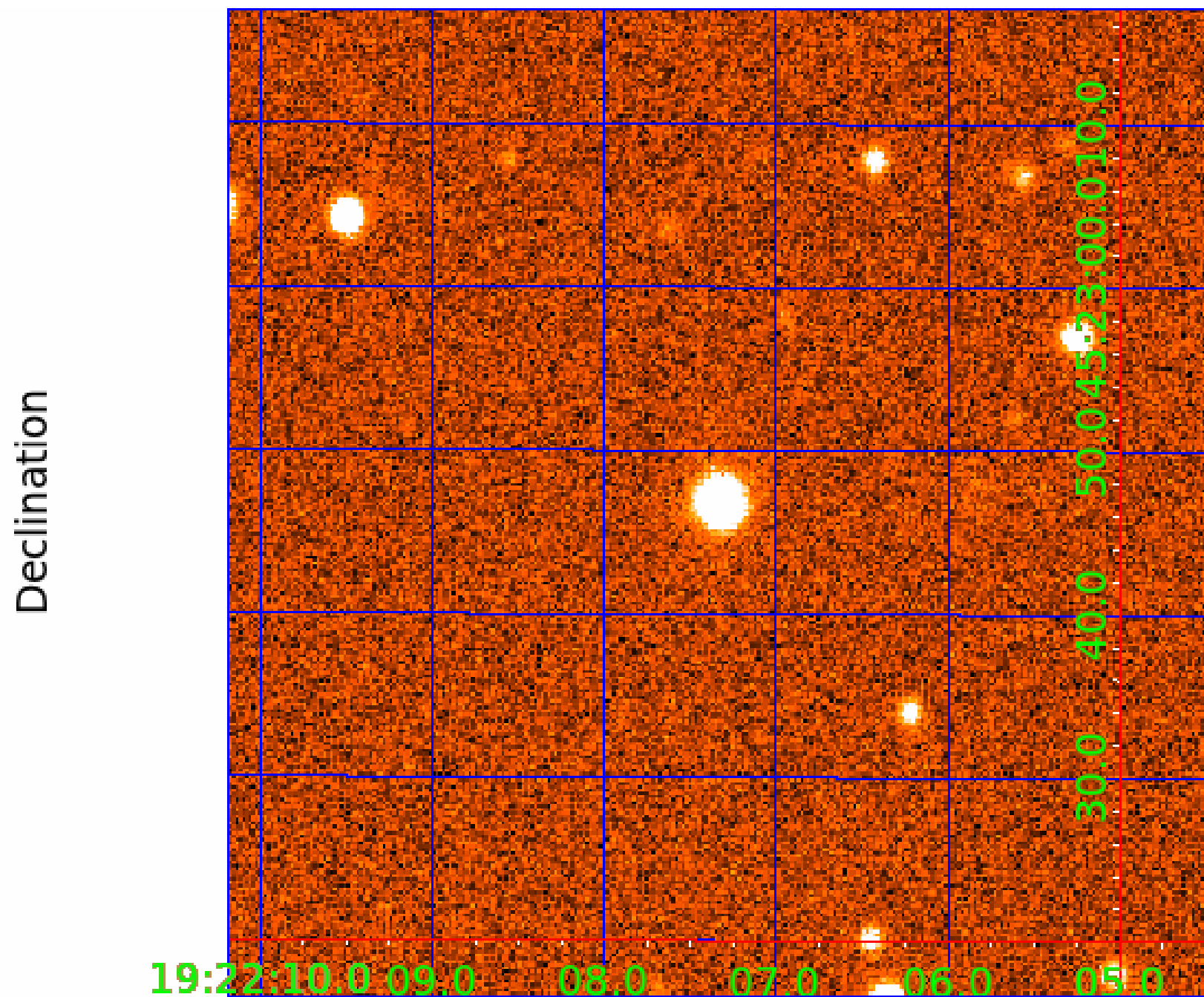
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



KIC 009018449

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})
009018449-01	OBS	No	268.447200	195.640107	1805.1	12.011	16.9	6.0	0.56	4422	2.33	0.24
009018449-02	OBS	No	487.480212	603.119357	1752.9	4.992	16.2	6.3	0.56	4422	2.38	0.11
009018449-03	OBS	No	229.987866	333.678601	1700.4	2.869	15.7	8.8	0.56	4422	2.34	0.30
009018449-04	OBS	No	351.273184	198.500793	2903.0	3.000	15.5	-1.0	0.56	4422	2.96	0.17
009018449-05	OBS	No	518.174954	425.928371	1217.1	2.723	12.2	4.6	0.56	4422	2.09	0.10
009018449-06	OBS	No	476.094534	239.001268	1637.2	3.893	13.6	6.9	0.56	4422	2.24	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018449-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009018449-02	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—INCONSISTENT_TRANS
009018449-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009018449-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009018449-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009018449-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

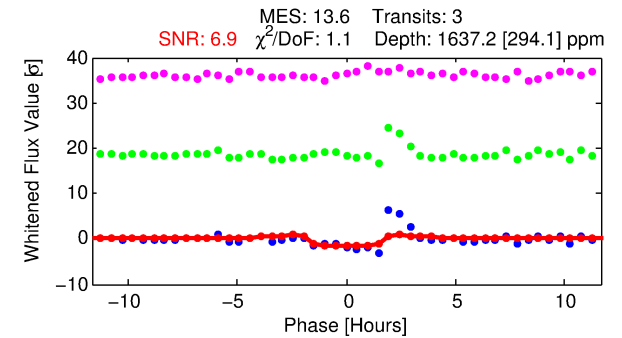
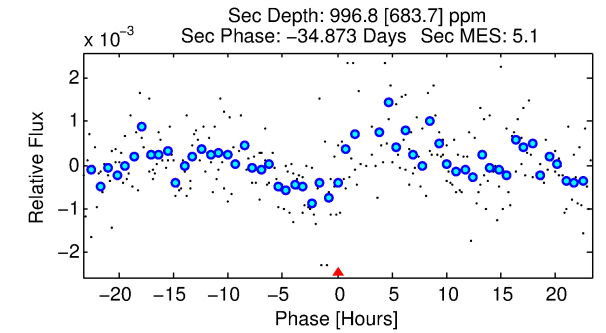
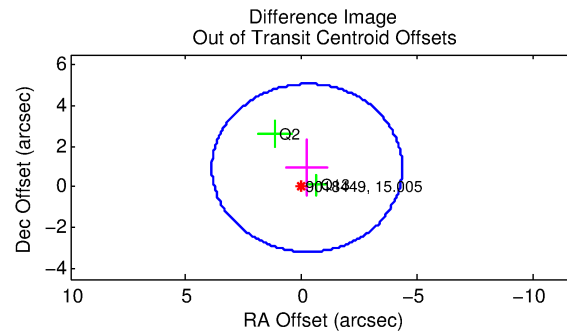
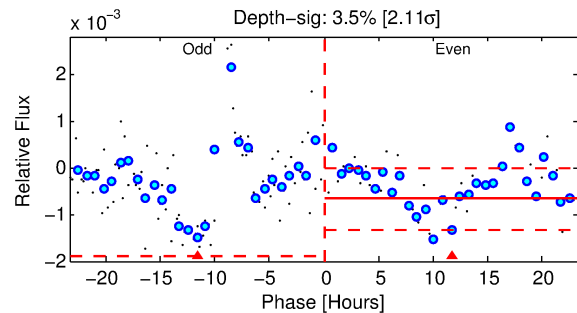
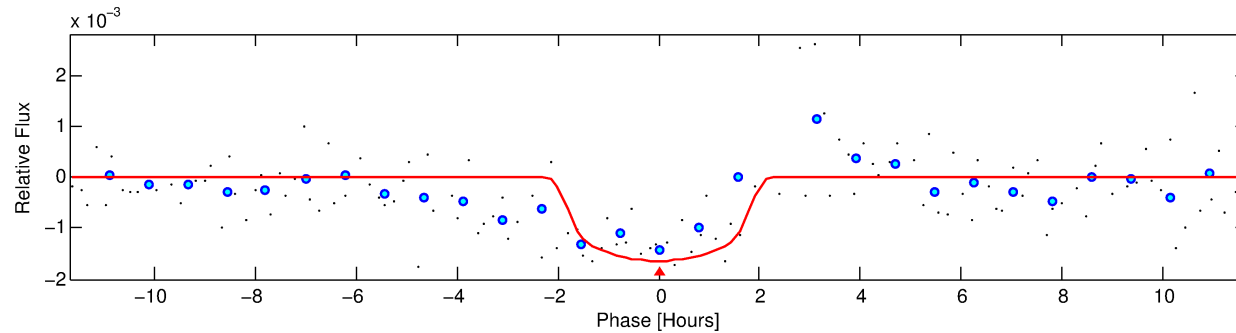
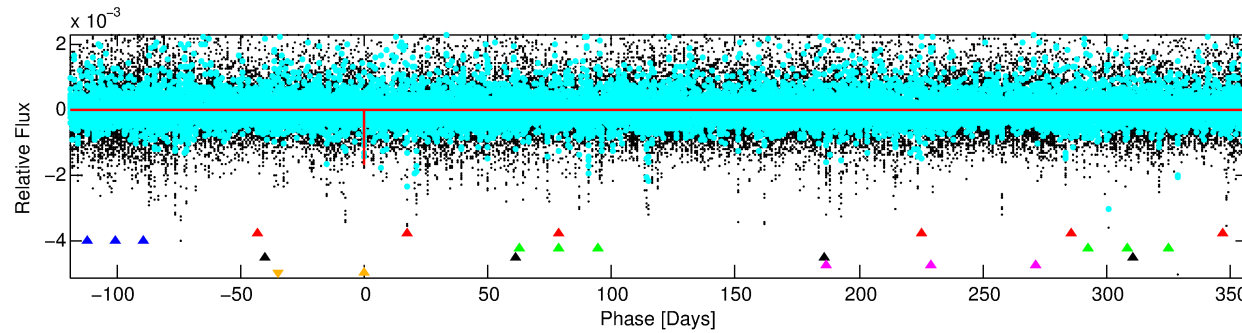
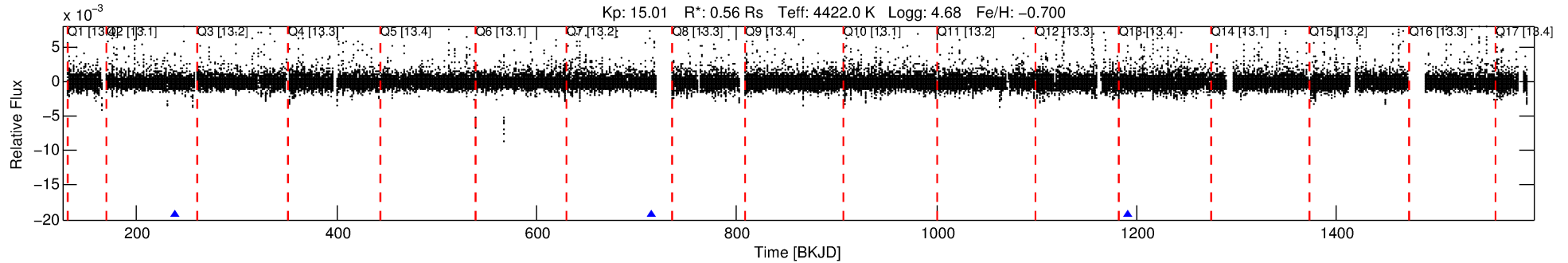
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018449-06

No Significant Match Found

DV One-Page Summary

KIC: 9018449 Candidate: 6 of 6 Period: 476.095 d



DV Fit Results:

Period = 476.09453 [0.00552] d
Epoch = 239.0013 [0.0073] BKJD
Rp/R* = 0.0363 [0.0611]
a/R* = 935.75 [5310.36]
b = 0.27 [20.16]
Seff = 0.11 [0.02]
Teq = 148 [6] K
Rp = 2.24 [3.77] Re
a = 0.9799 [0.0720] AU
Ag = 104926.31 [360285.46] [0.29 σ]
Teffp = 4122 [3539] K [1.12 σ]

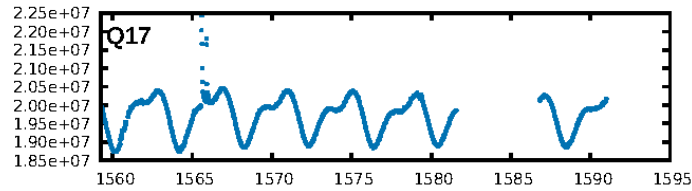
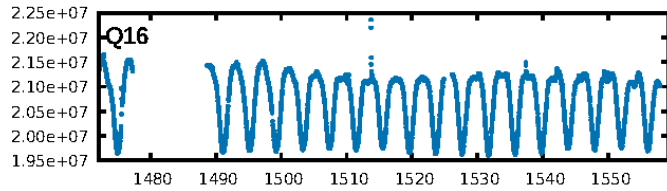
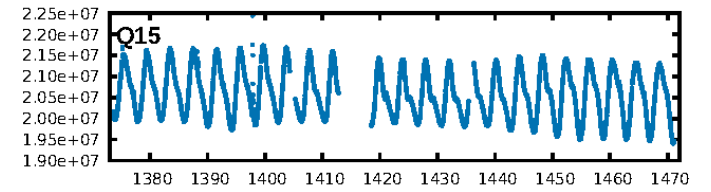
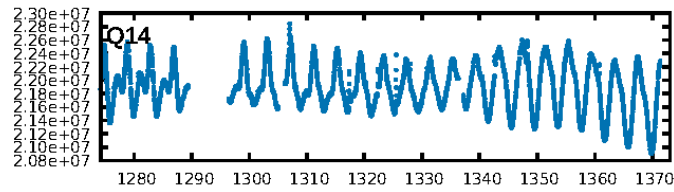
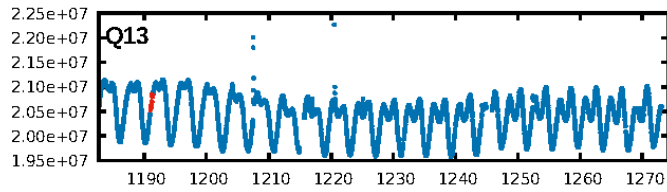
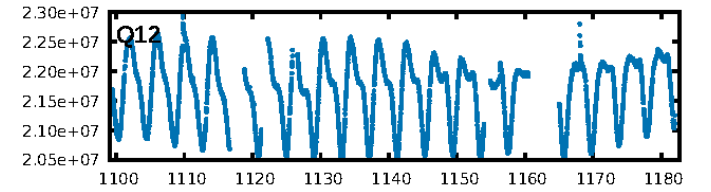
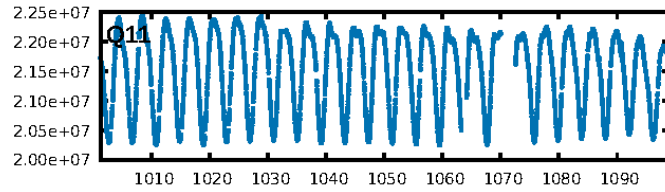
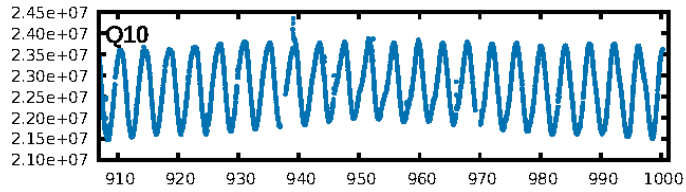
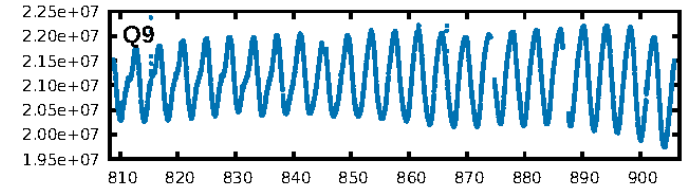
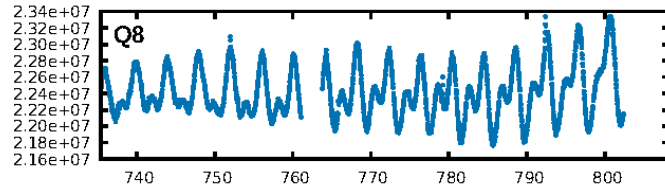
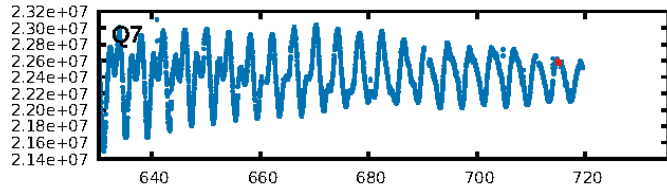
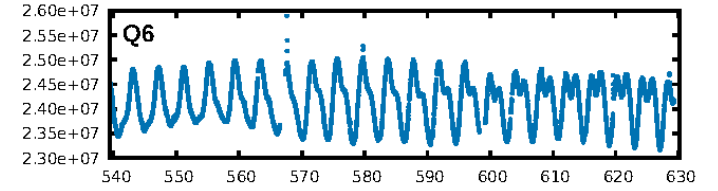
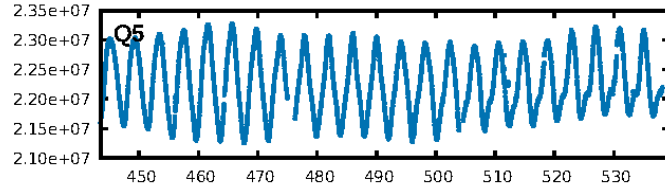
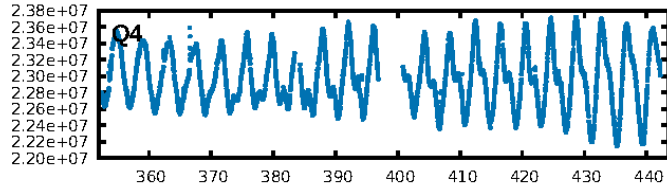
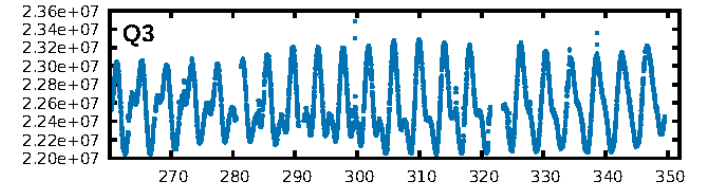
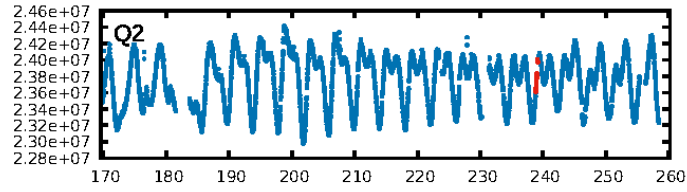
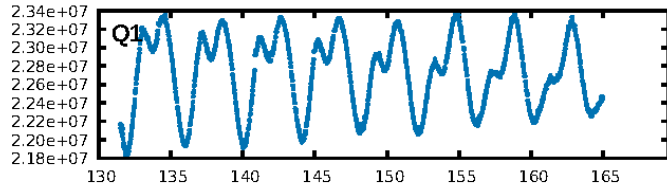
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [609.51 σ]
LongPeriod-sig: 100.0% [43.17 σ]
ModelChiSquare2-sig: 3.2%
ModelChiSquareGof-sig: 90.1%
Bootstrap-pfa: 3.19e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -4.759
Centroid-sig: 48.8%
Centroid-so: 0.902 arcsec [1.09 σ]
OotOffset-rm: 0.969 arcsec [0.71 σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-rm: 1.006 arcsec [0.70 σ]
KicOffset-st: 1/0/0/1 [2]
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DiffImageOverlap-fno: 1.00 [3/3]

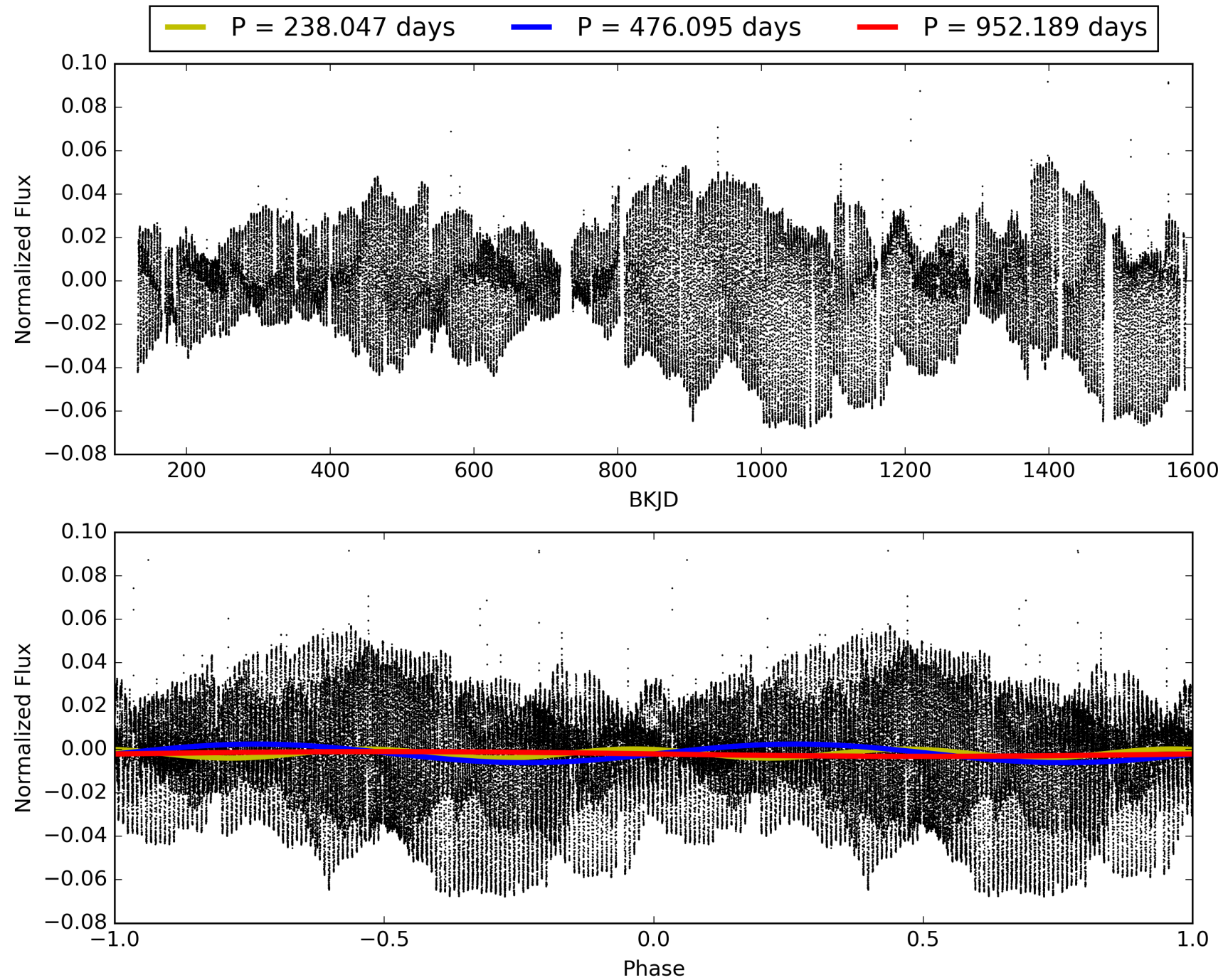
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:30:11 Z

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

TCE 009018449-06, PDC Light Curves

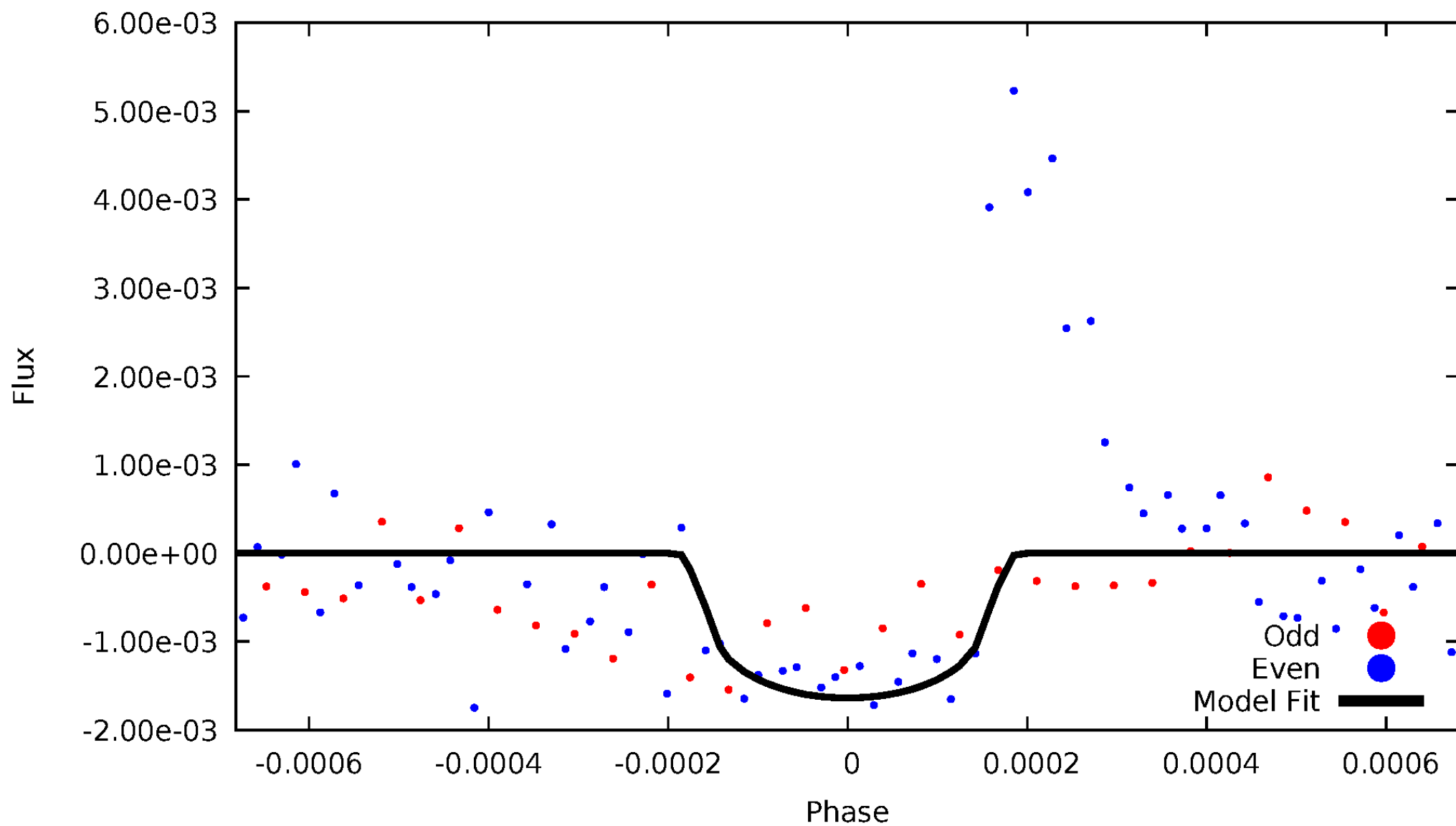


TCE 009018449-06



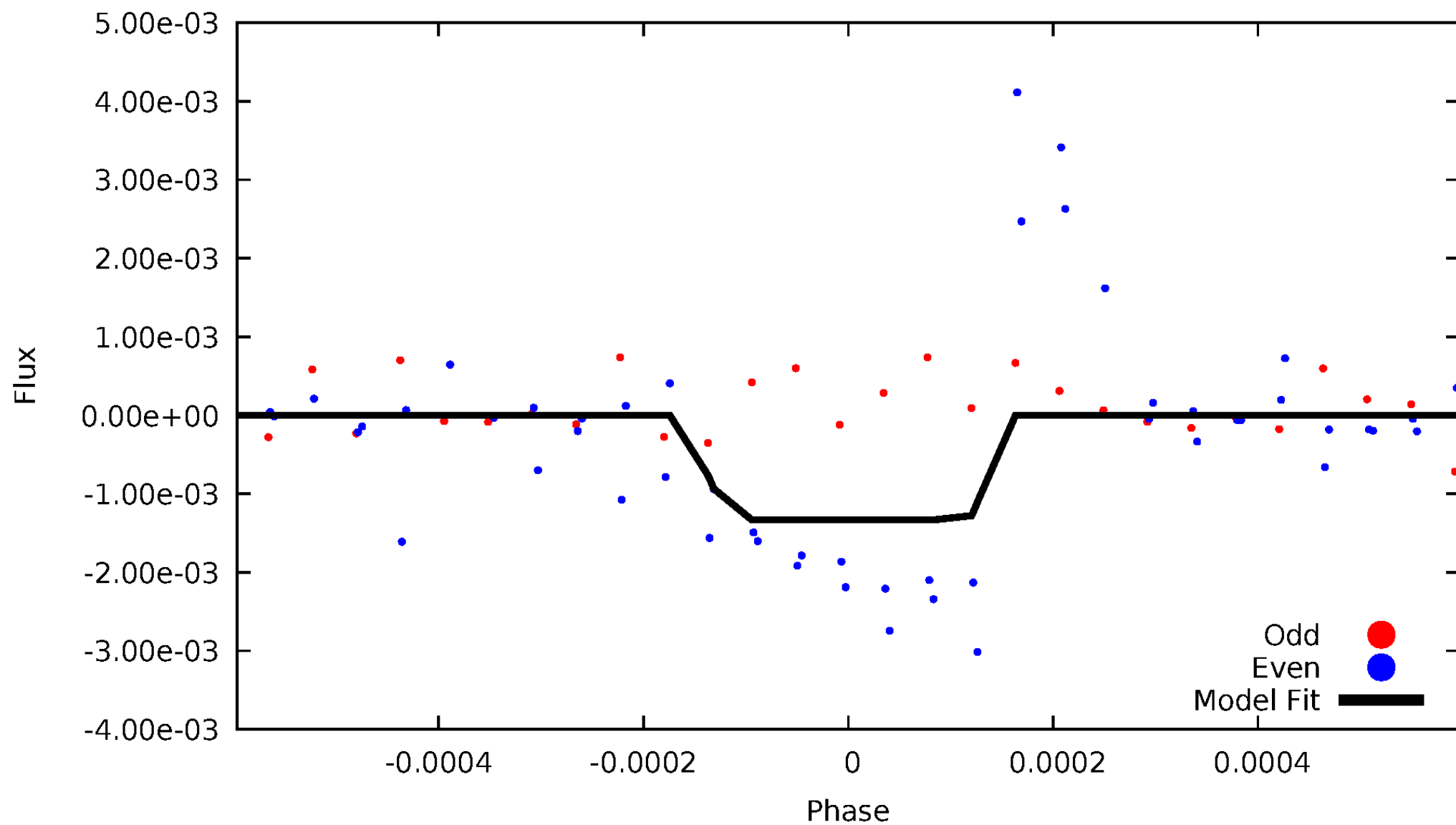
DV Odd/Even

TCE 009018449-06



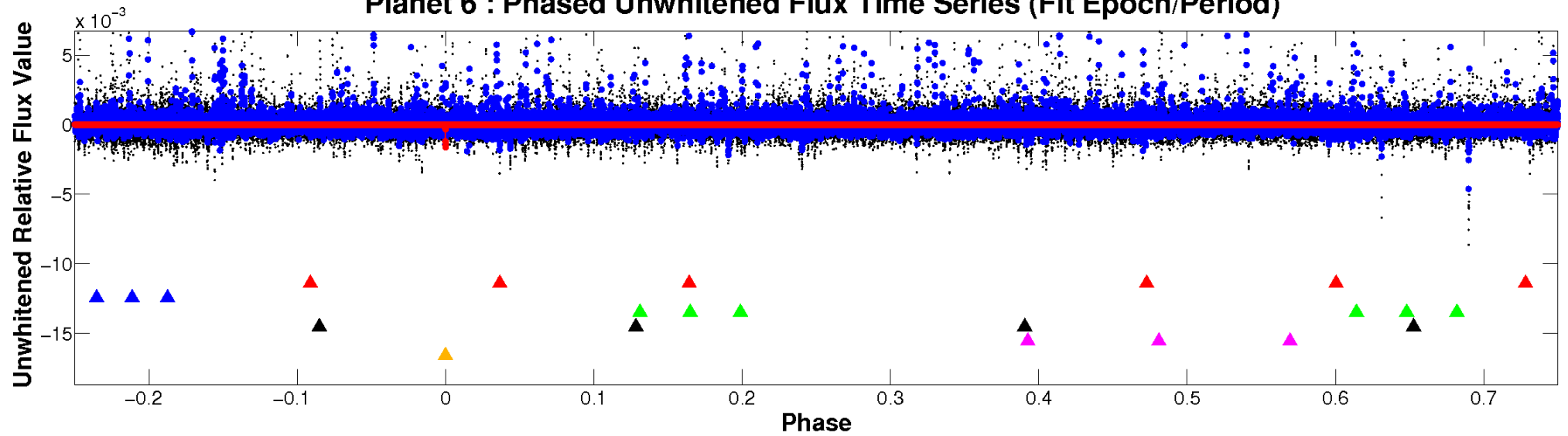
ALT Odd/Even

TCE 009018449-06

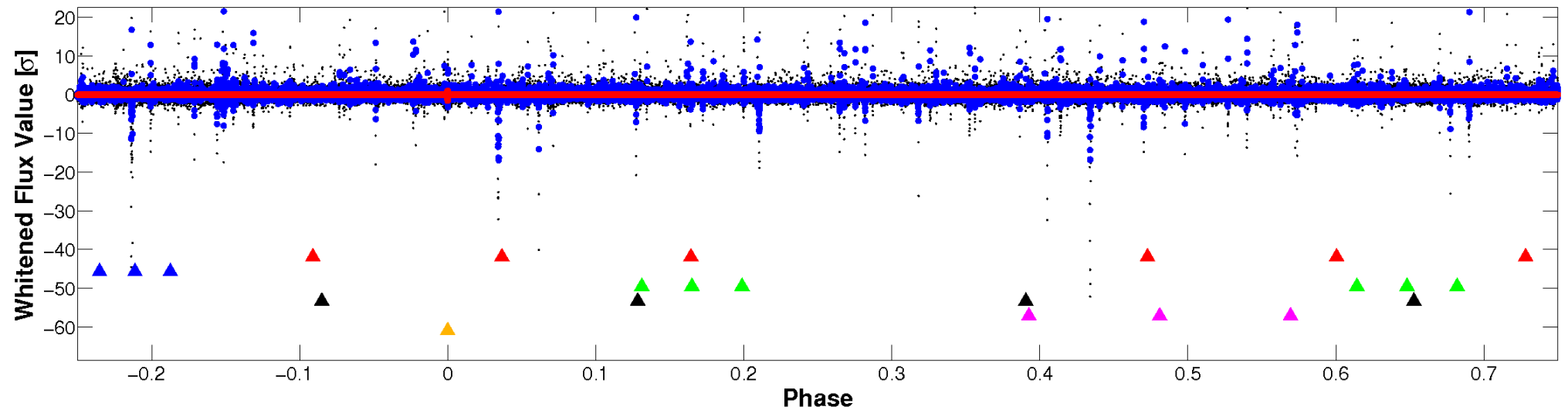


Non-Whitened Vs. Whitened Light Curve

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

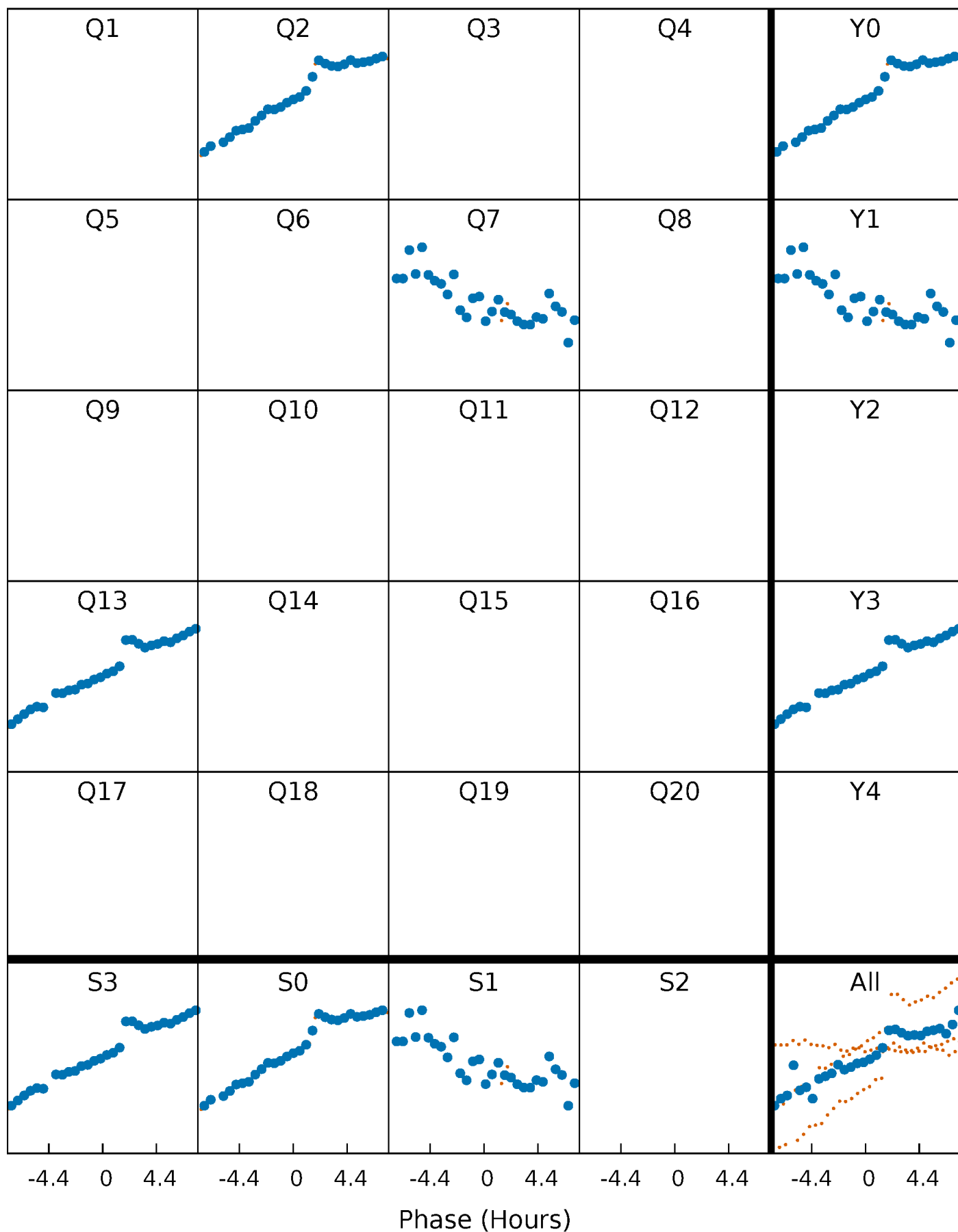


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



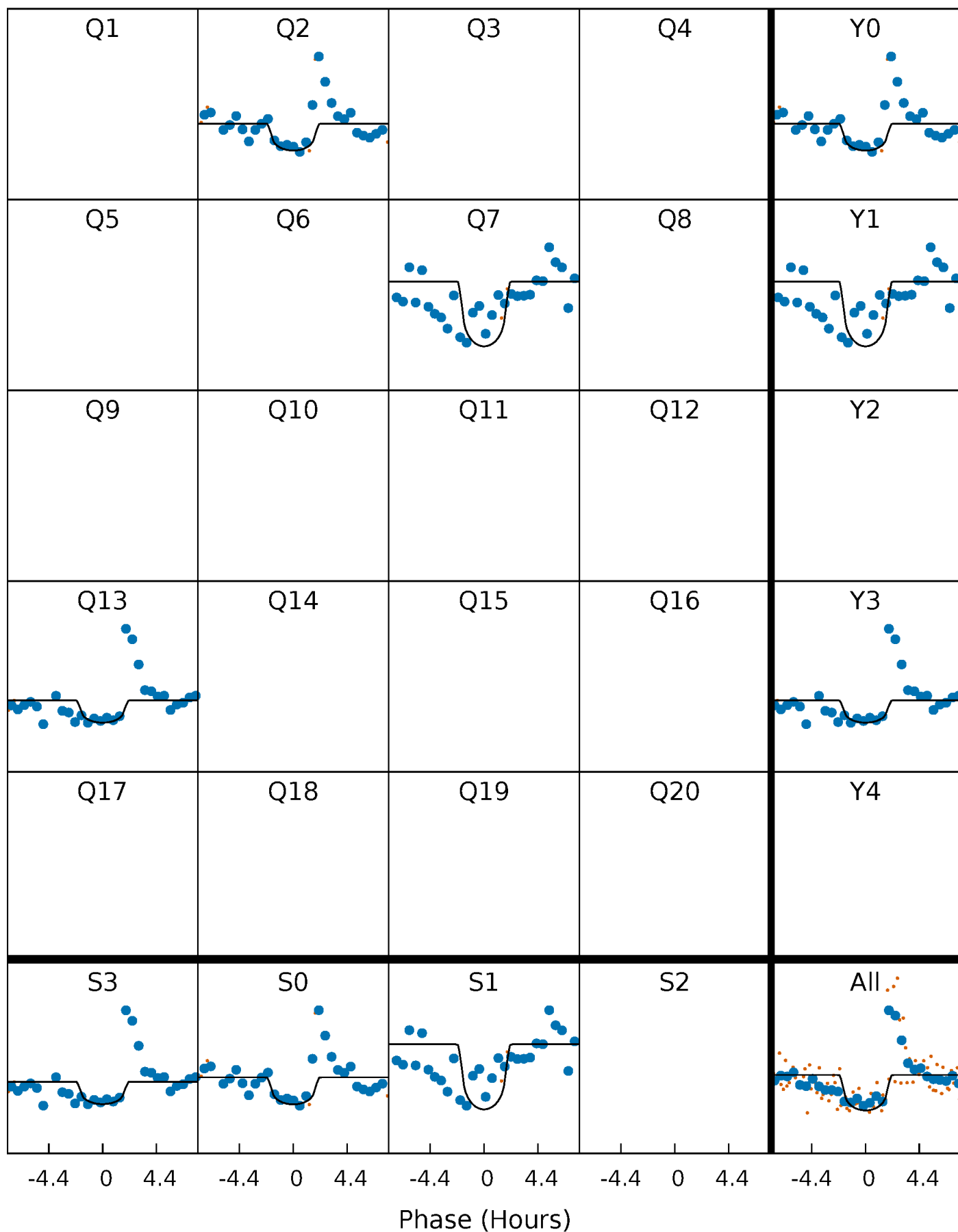
PDC Quarter-Phased Transit Curves

TCE 009018449-06 P=476.094534 Days $T_0=239.001268$ (BKJD)



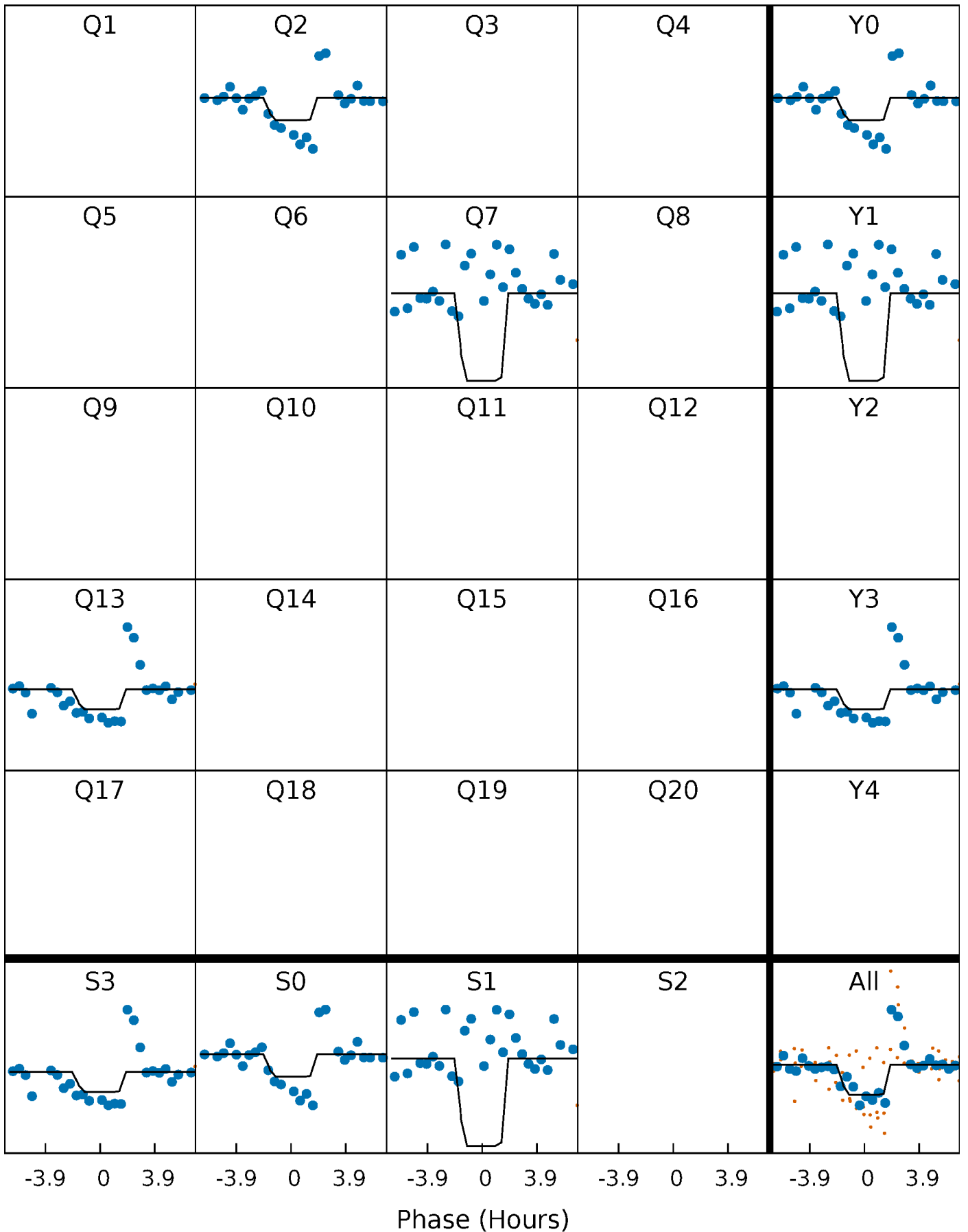
DV Quarter-Phased Transit Curves

TCE 009018449-06 P=476.094534 Days $T_0=239.001268$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

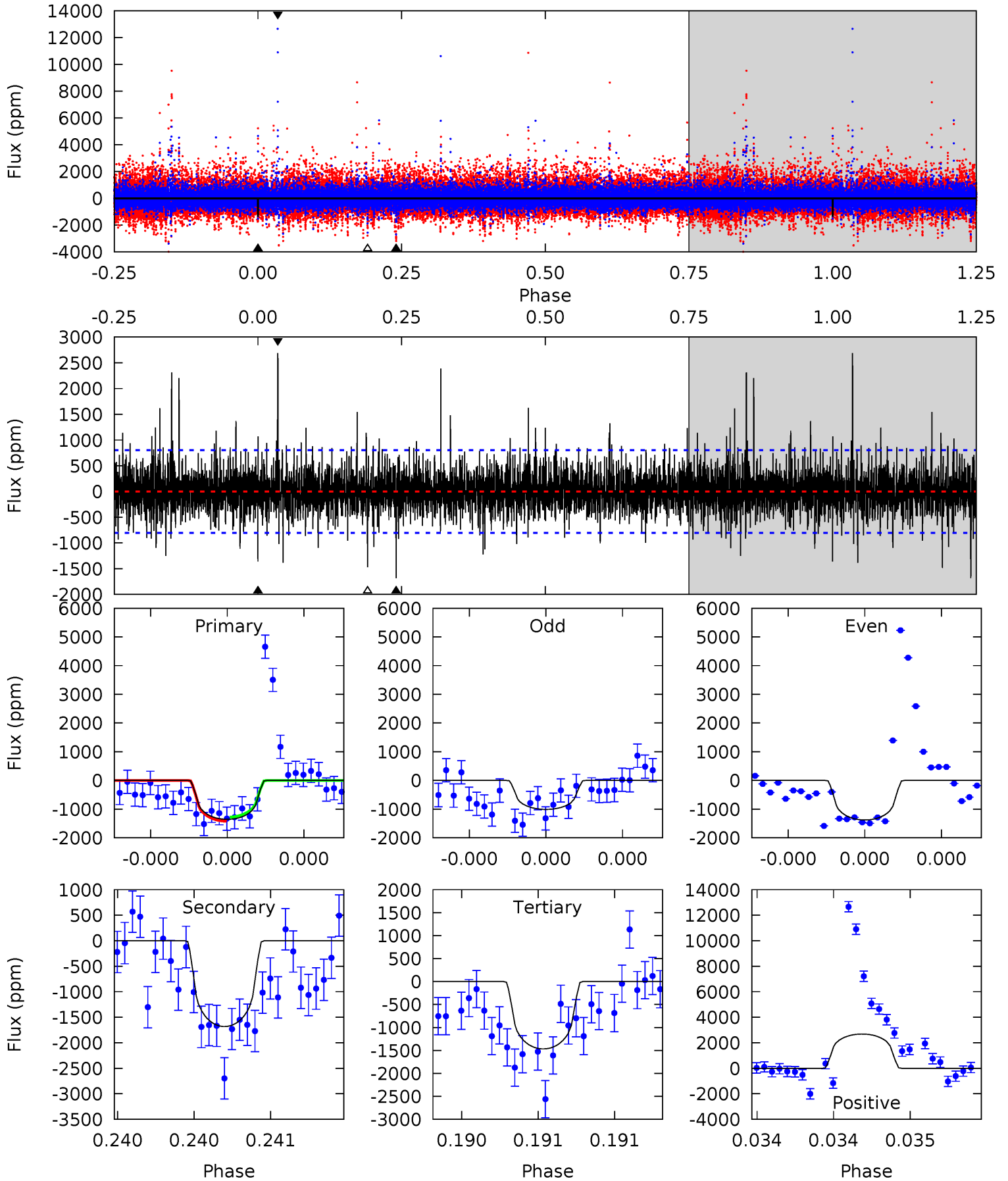
TCE 009018449-06 P=476.101948 Days $T_0=238.995969$ (BKJD)



DV Model-Shift Uniqueness Test

009018449-06, P = 476.094534 Days, E = 239.001268 Days

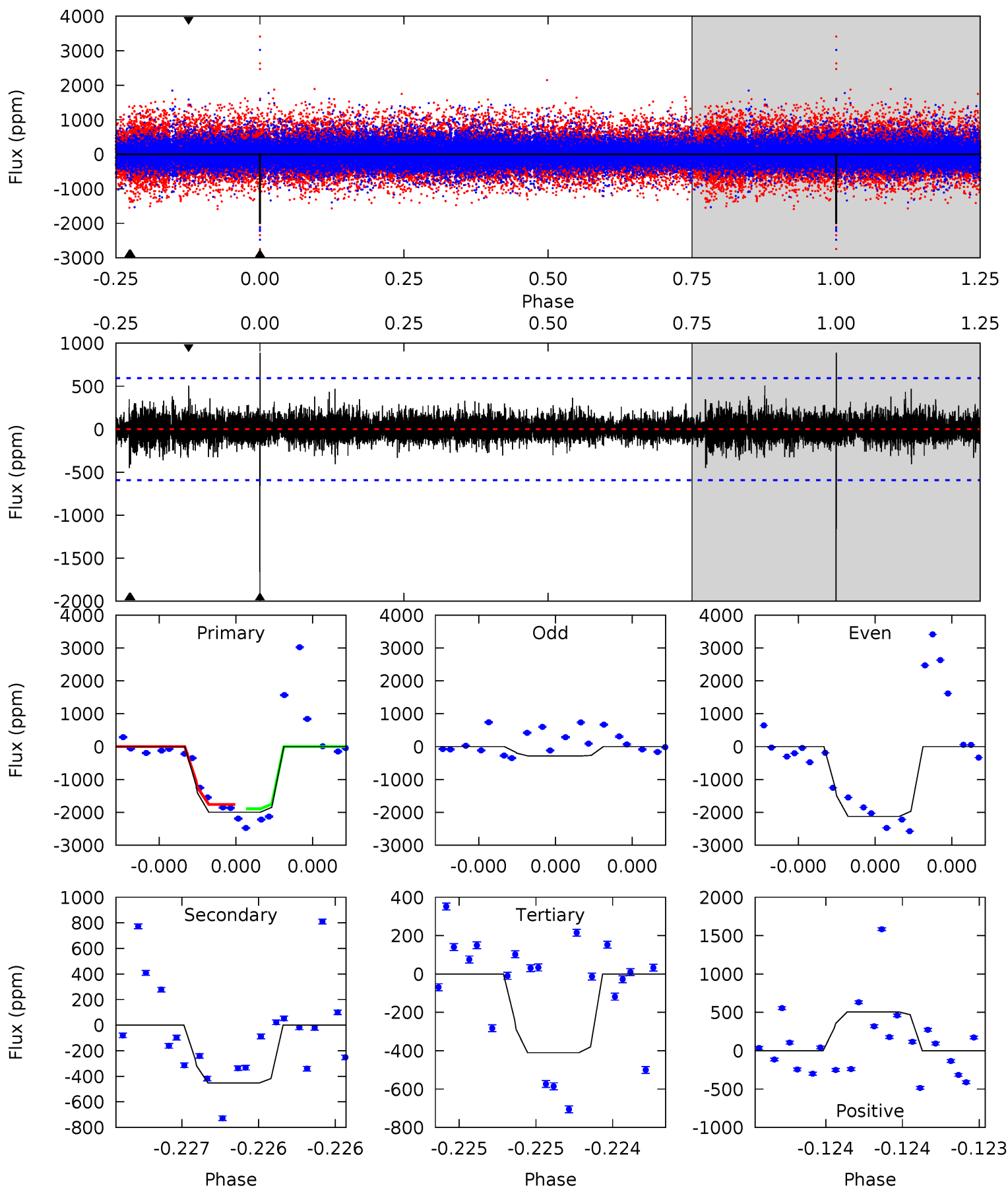
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.49	11.8	10.3	18.8	5.62	3.55	2.19	-0.77	-9.30	1.51	-7.03	0.93	1.02	0.61	0.50



Alt Model-Shift Uniqueness Test

009018449-06, P = 476.101948 Days, E = 238.995969 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	4.32	3.92	4.85	5.69	3.65	0.76	15.2	14.3	0.40	-0.53	10.1	0.66	0.31	0.65



Stellar Parameters For KIC 009018449

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4422^{+132}_{-132}	$4.677^{+0.059}_{-0.027}$	$-0.700^{+0.300}_{-0.300}$	$0.565^{+0.045}_{-0.049}$	$0.554^{+0.056}_{-0.033}$	$4.317^{+1.061}_{-0.588}$
	+3%/-3%	+1%/-1%	+43%/-43%	+8%/-9%	+10%/-6%	+25%/-14%
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 009018449-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1683 ± 143	$3.26^{+3.39}_{-2.18}$	206^{+7}_{-7}	4021^{+2344}_{-850}	$84143^{+675002}_{-64025}$
Alt.	-451 ± 104	$3.57^{+3.07}_{-2.26}$	206^{+7}_{-7}	3171^{+1249}_{-524}	$19191^{+121809}_{-13895}$

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

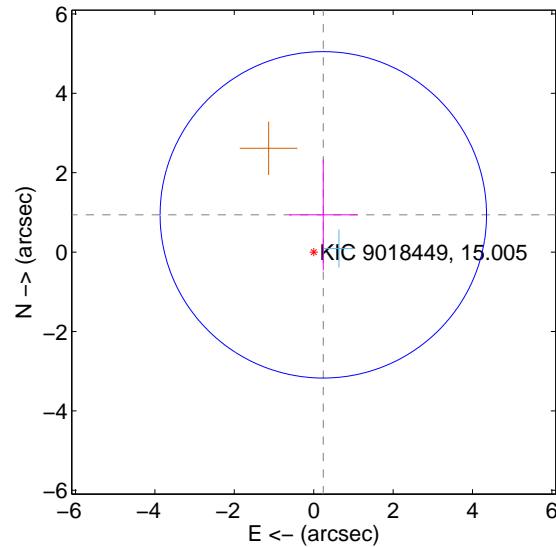
Supplemental centroid analysis for 009018449-06. Kepler magnitude: 15.01. Transit SNR 6.93

There are 1 quarters with good PRF difference image offsets

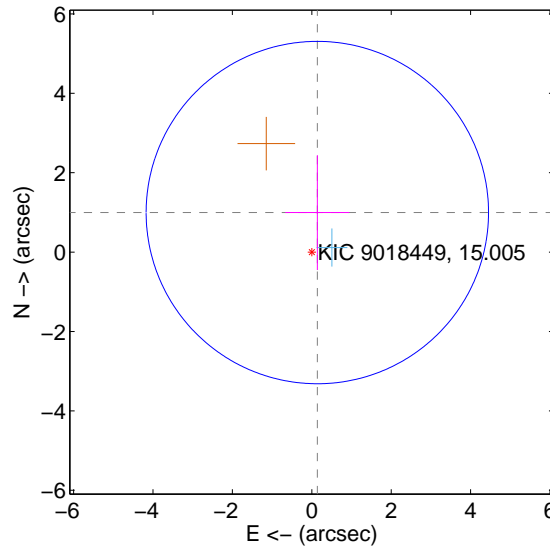
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.969 ± 1.370	0.71	-0.242 ± 0.864	0.938 ± 1.397
PRF-fit source offset from KIC position	1.006 ± 1.437	0.70	-0.140 ± 0.806	0.996 ± 1.447
photometric centroid source offset	0.90 ± 0.83	1.09	0.90 ± 0.82	0.10 ± 0.91

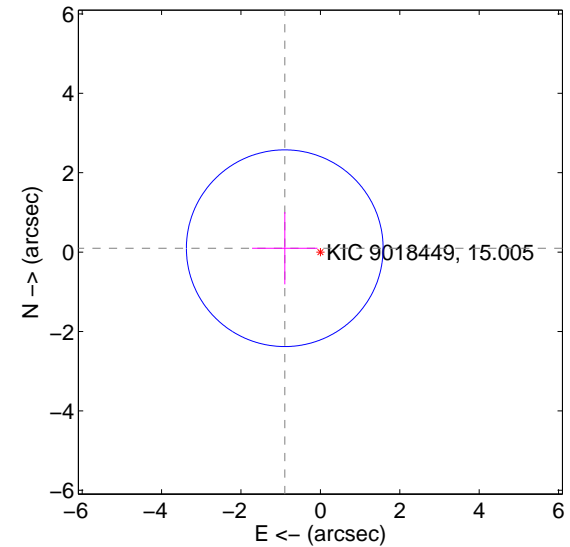
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

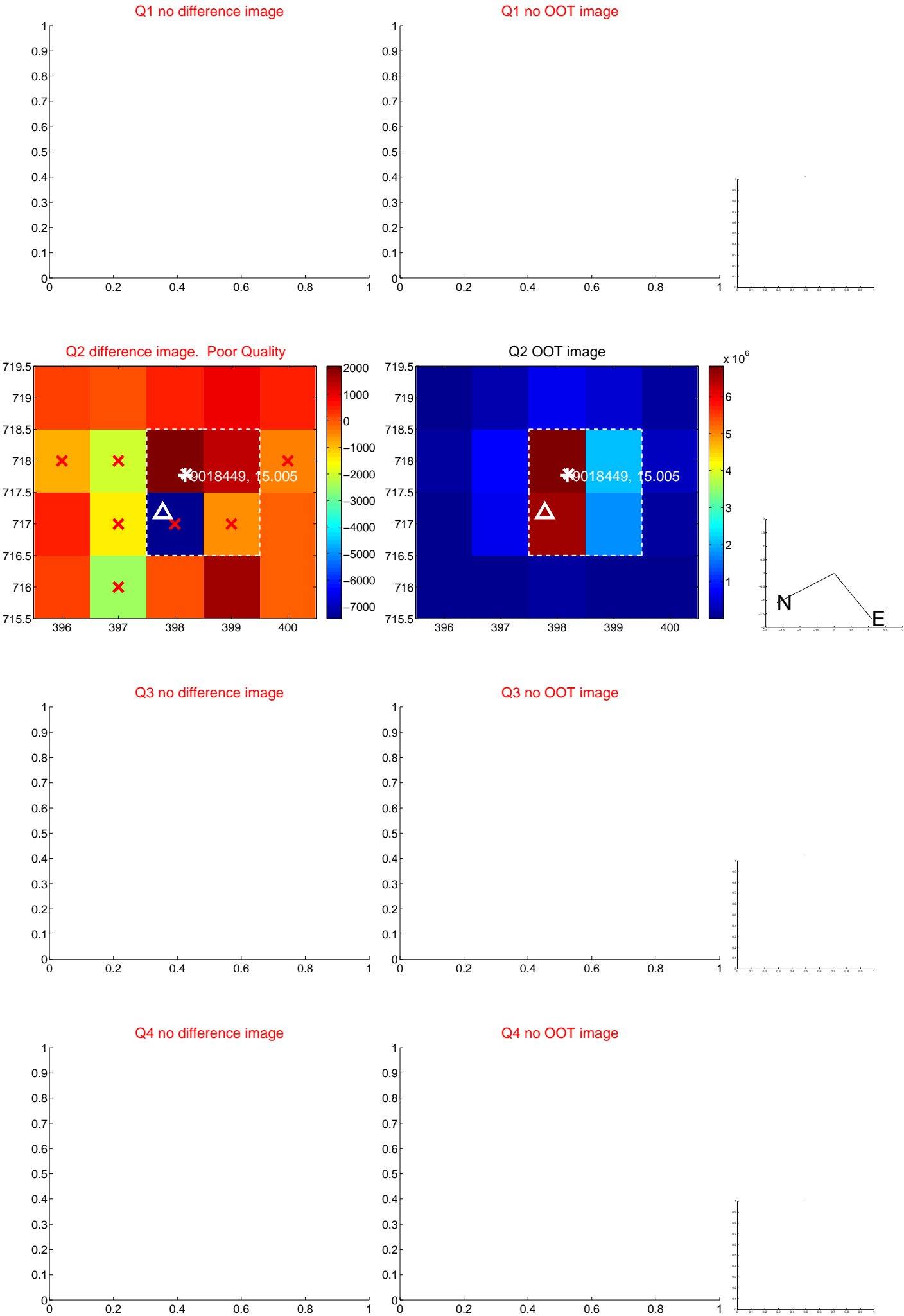


offset from photometric centroids

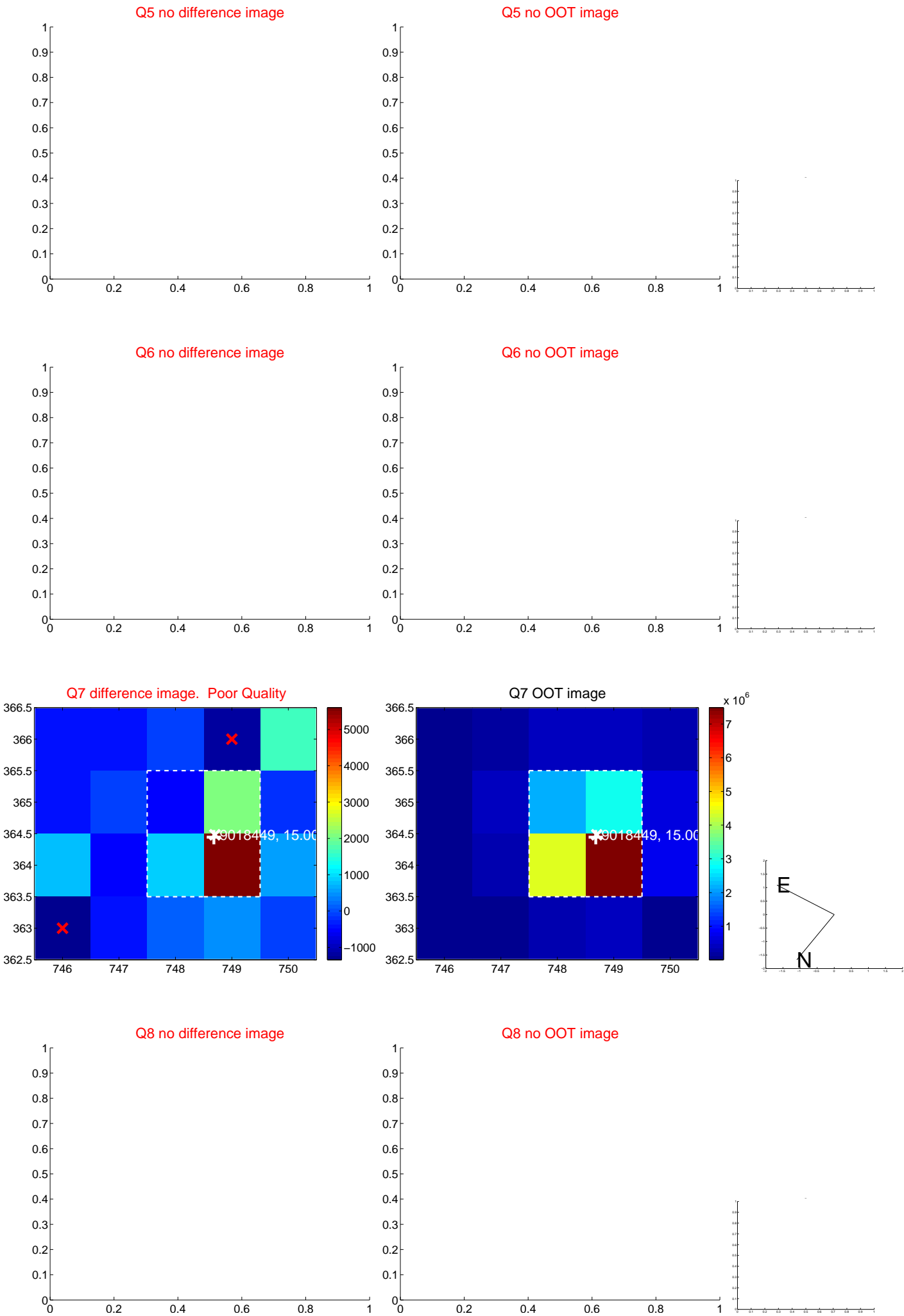


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

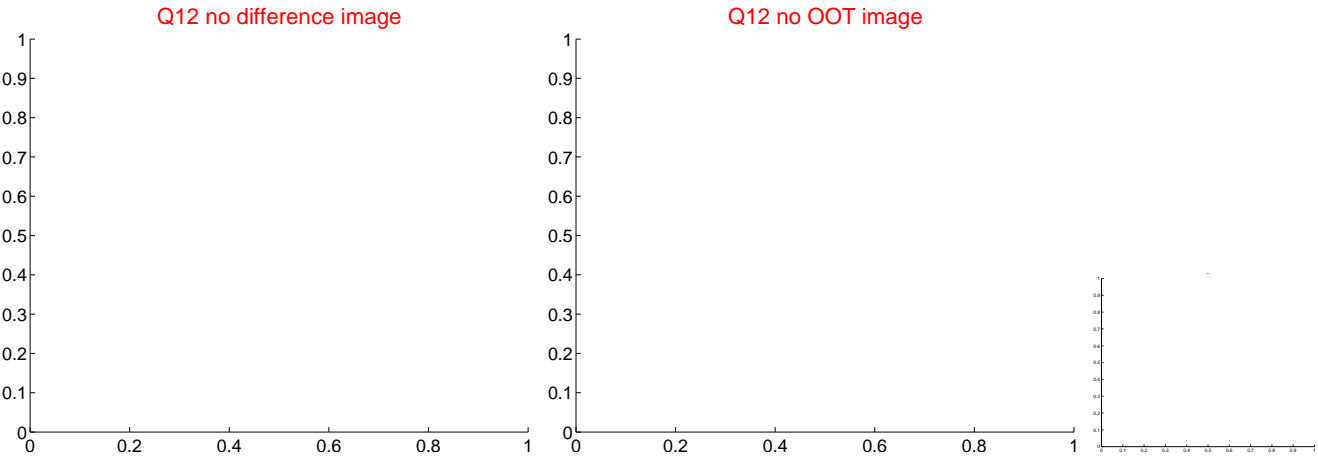
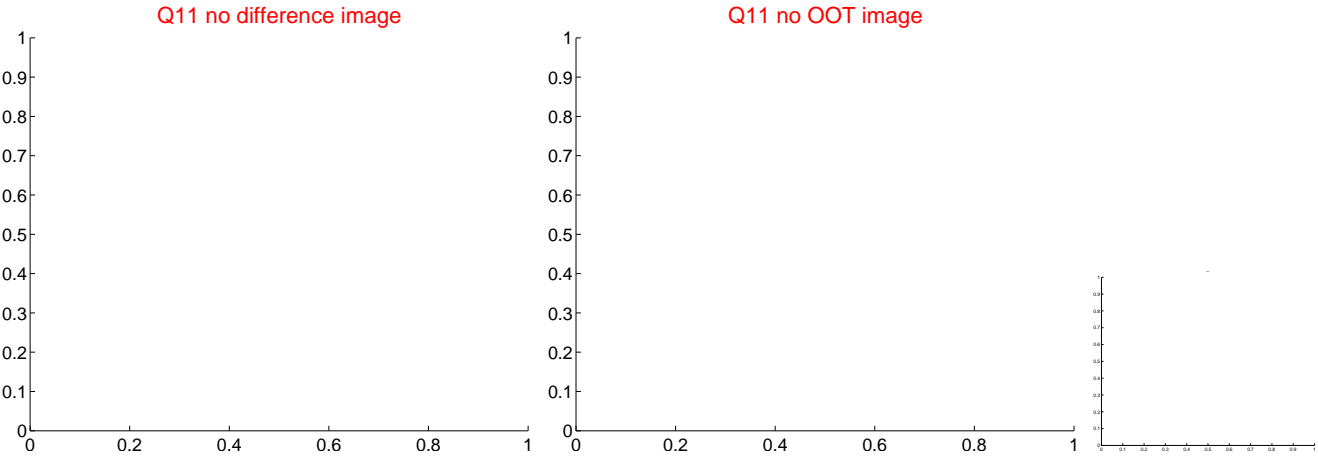
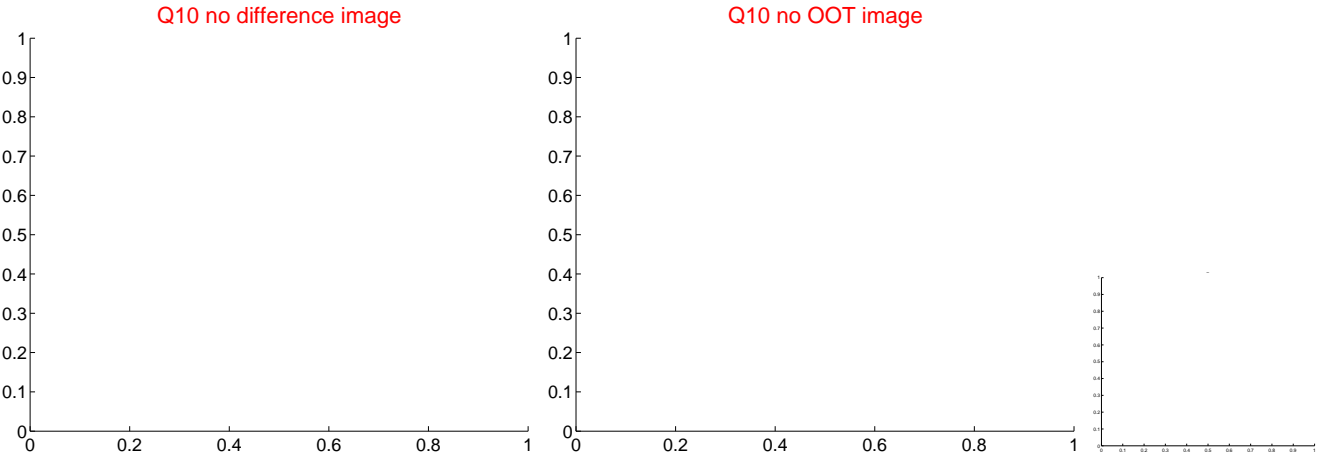
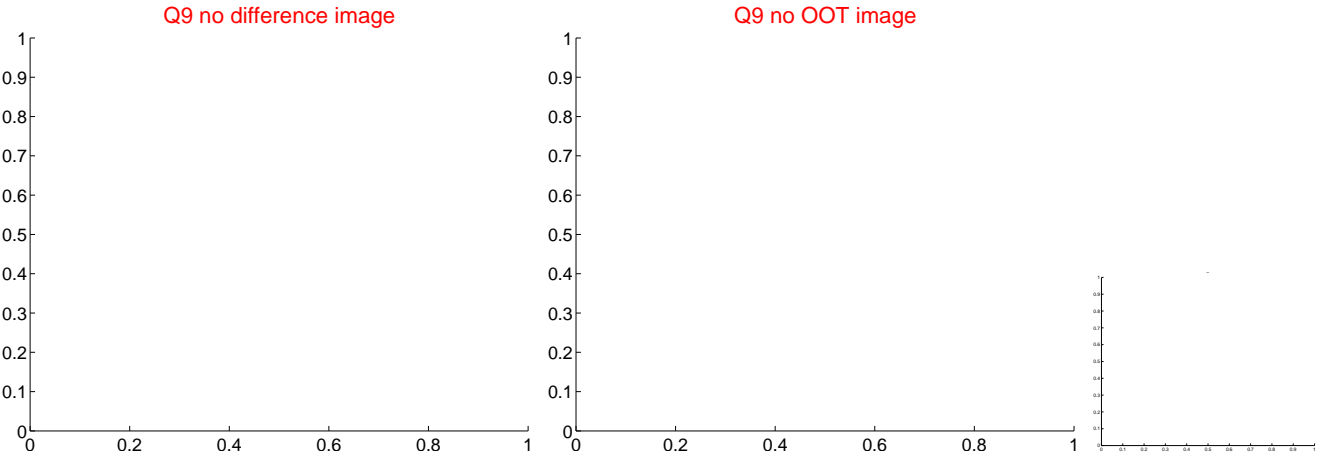
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



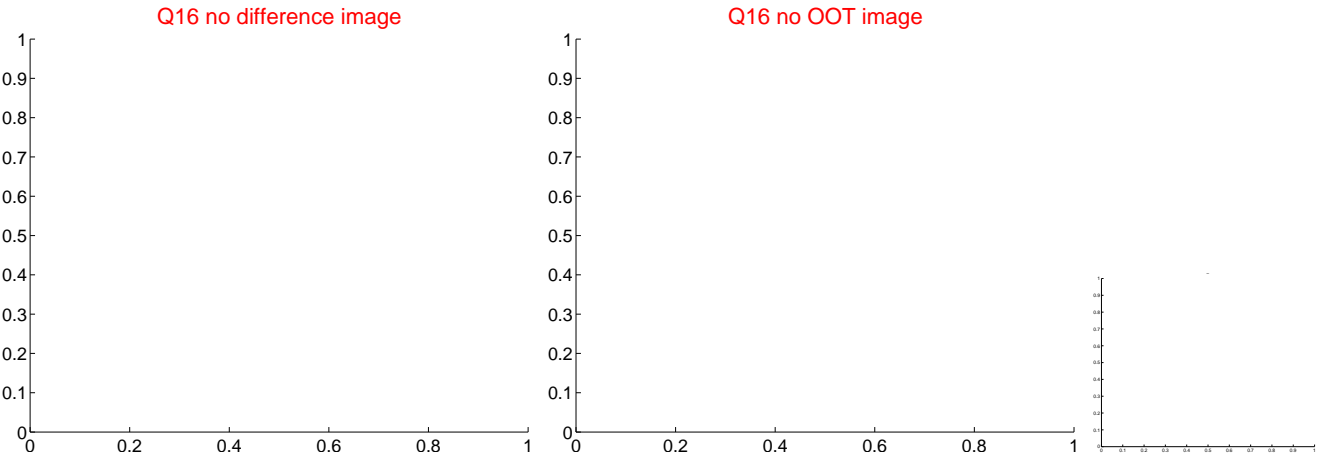
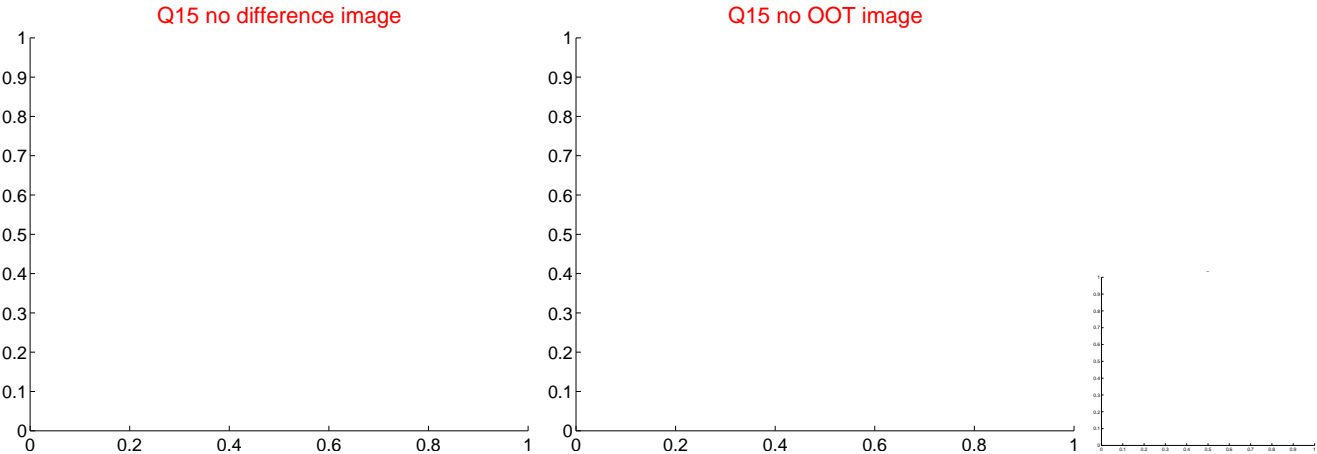
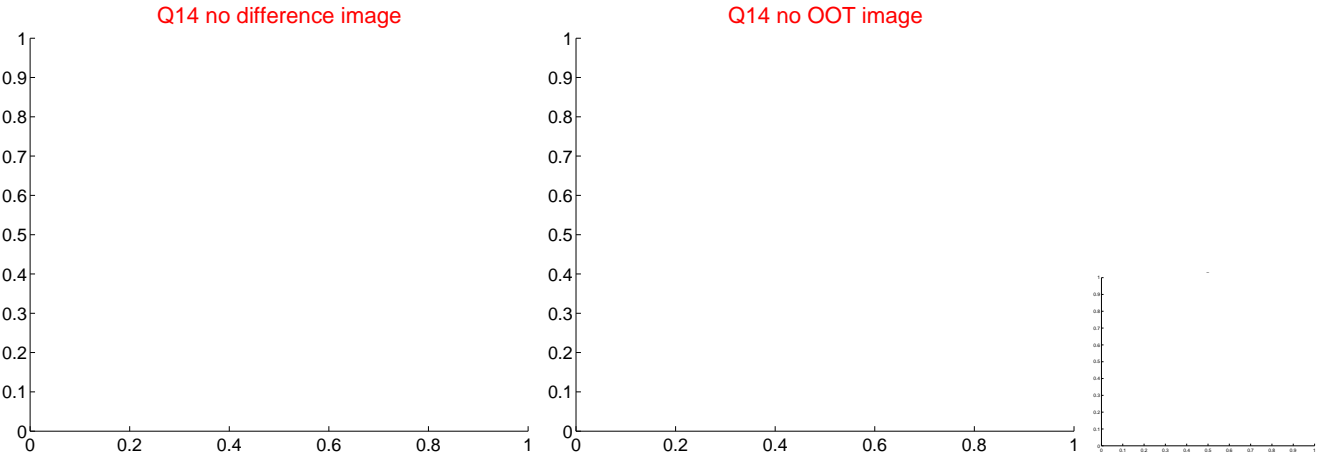
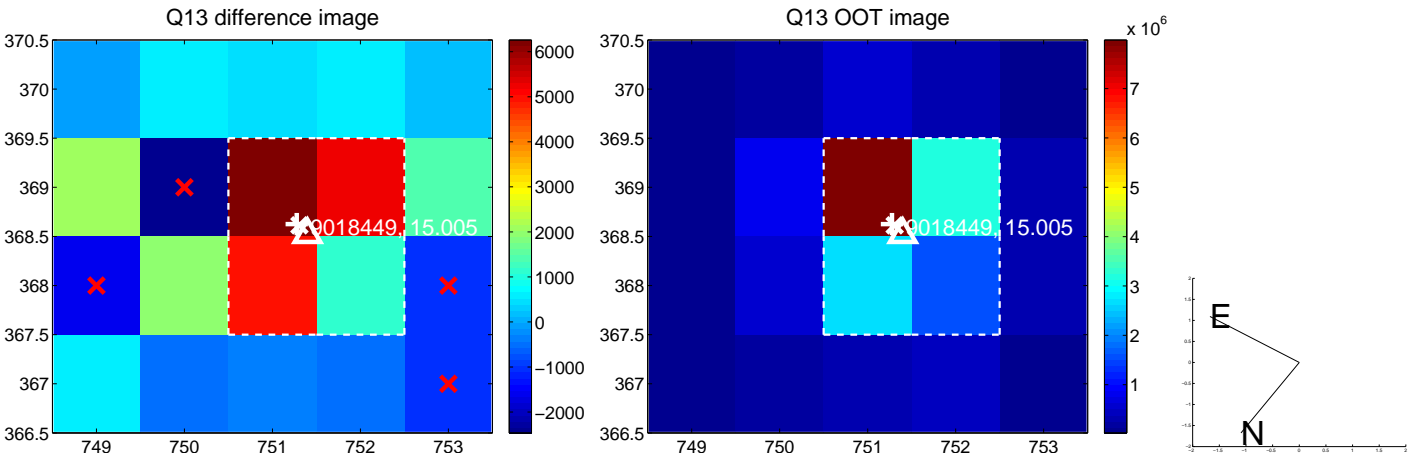
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



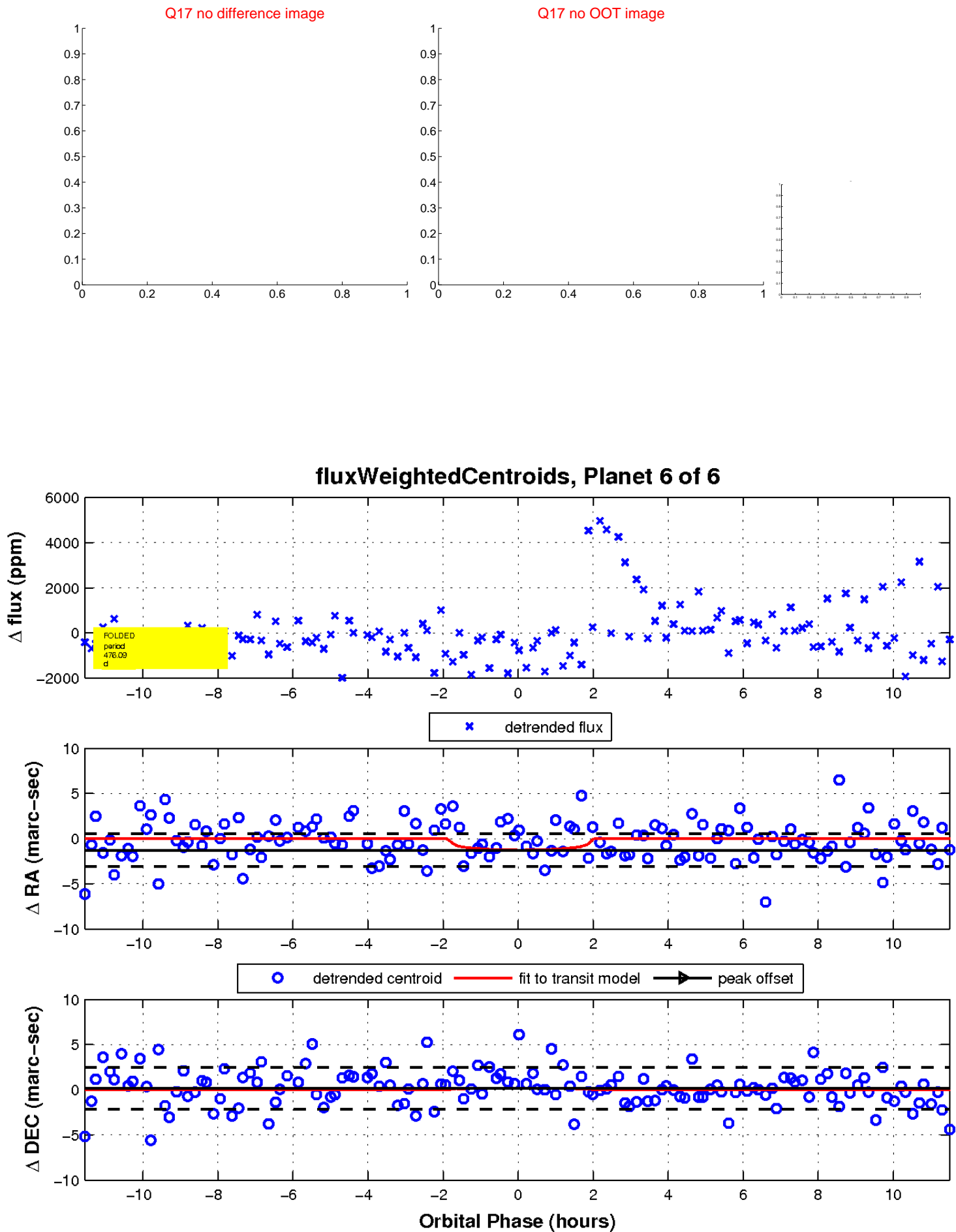
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

