

KIC 009042357

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})
009042357-01	OBS	1993.01	16.003559	146.384891	687.4	3.877	29.2	32.3	0.69	5283	3.17	27.89
009042357-02	OBS	No	16.003438	138.344502	203.9	3.887	10.6	12.0	0.69	5283	1.24	27.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009042357-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
009042357-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET

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

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

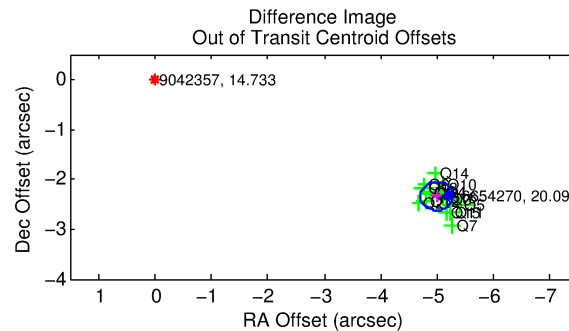
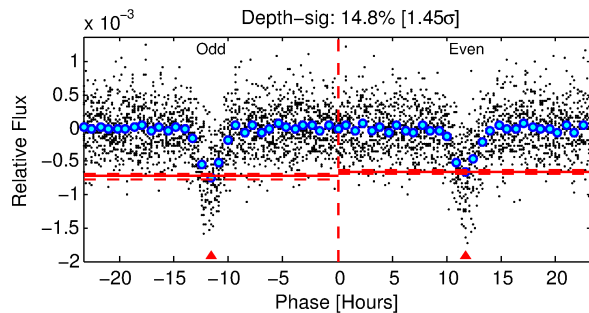
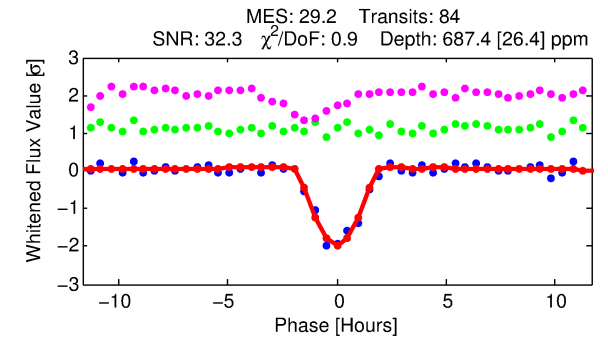
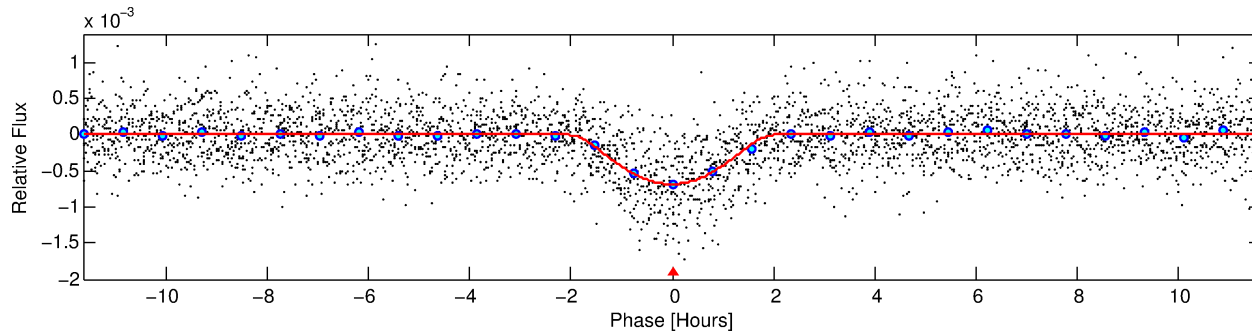
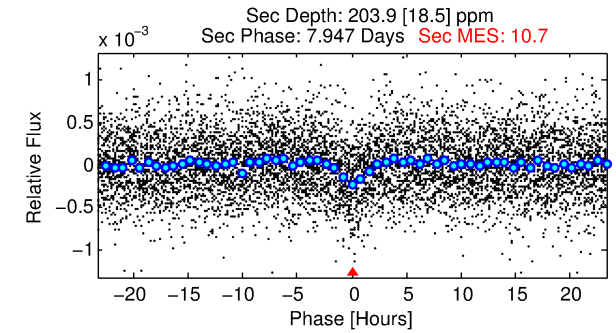
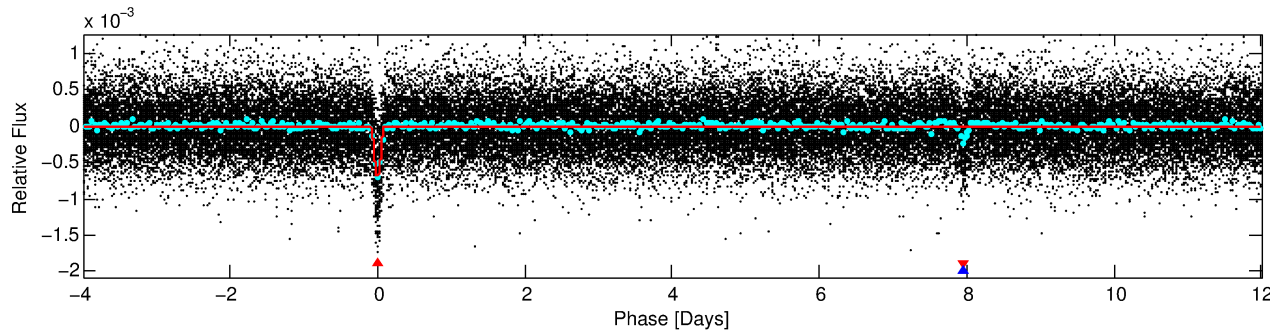
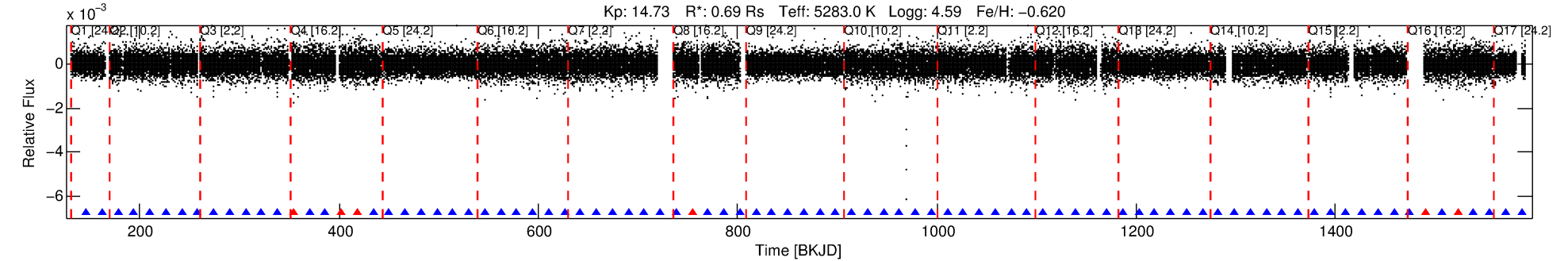
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009042357-01

No Significant Match Found

DV One-Page Summary

KIC: 9042357 Candidate: 1 of 2 Period: 16.004 d
KOI: K01993.01 Corr: 0.974



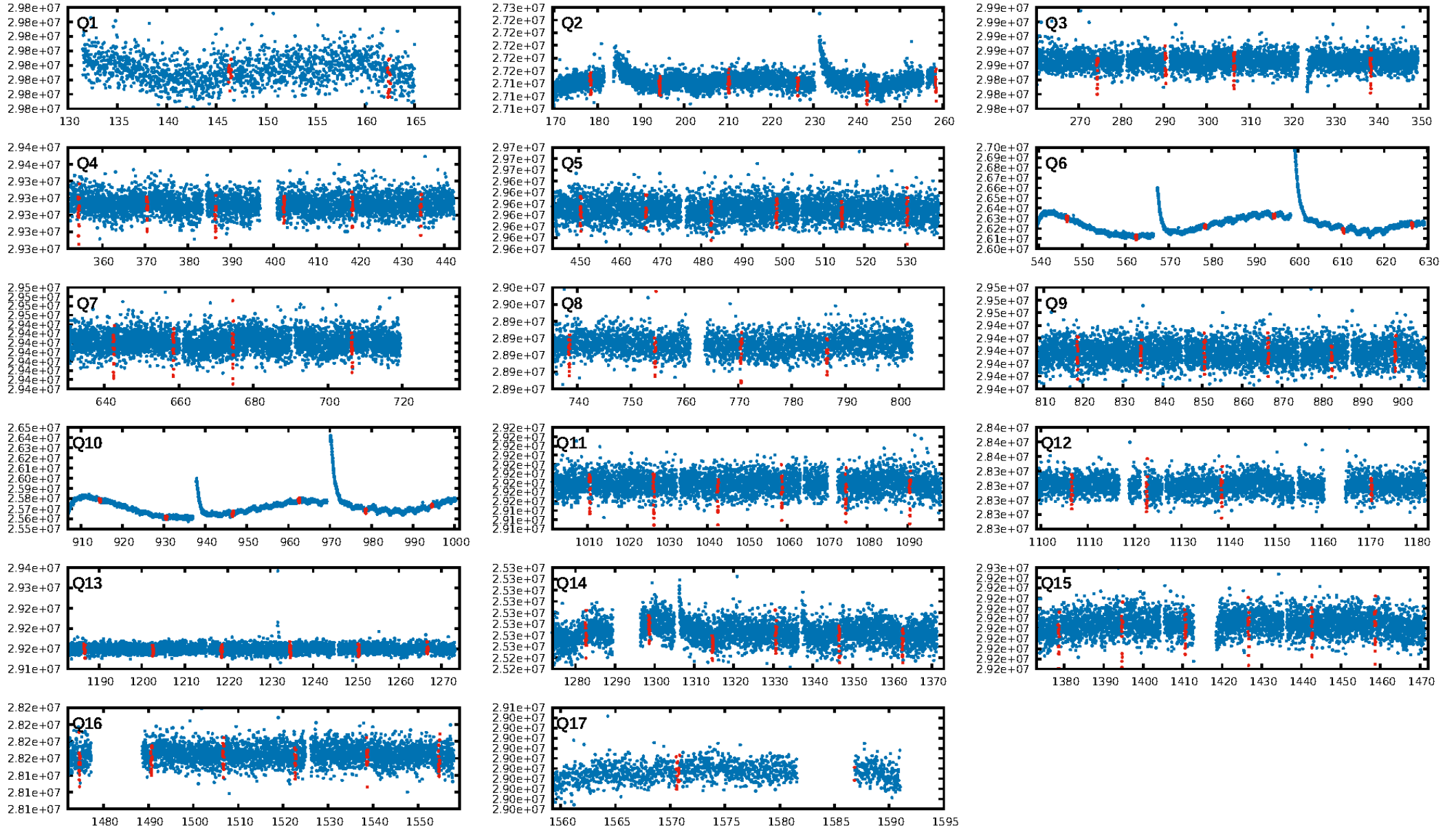
DV Fit Results:

Period = 16.00356 [0.00006] d
Epoch = 146.3849 [0.0029] BKJD
Rp/R* = 0.0418 [0.0328]
a/R* = 10.29 [2.48]
b = 0.99 [0.05]
Seff = 27.89 [4.84]
Teq = 586 [25] K
Rp = 3.17 [2.51] Re
a = 0.1099 [0.0102] AU
Ag = 134.89 [212.67] [0.63σ]
Teffp = 3088 [1217] K [2.06σ]

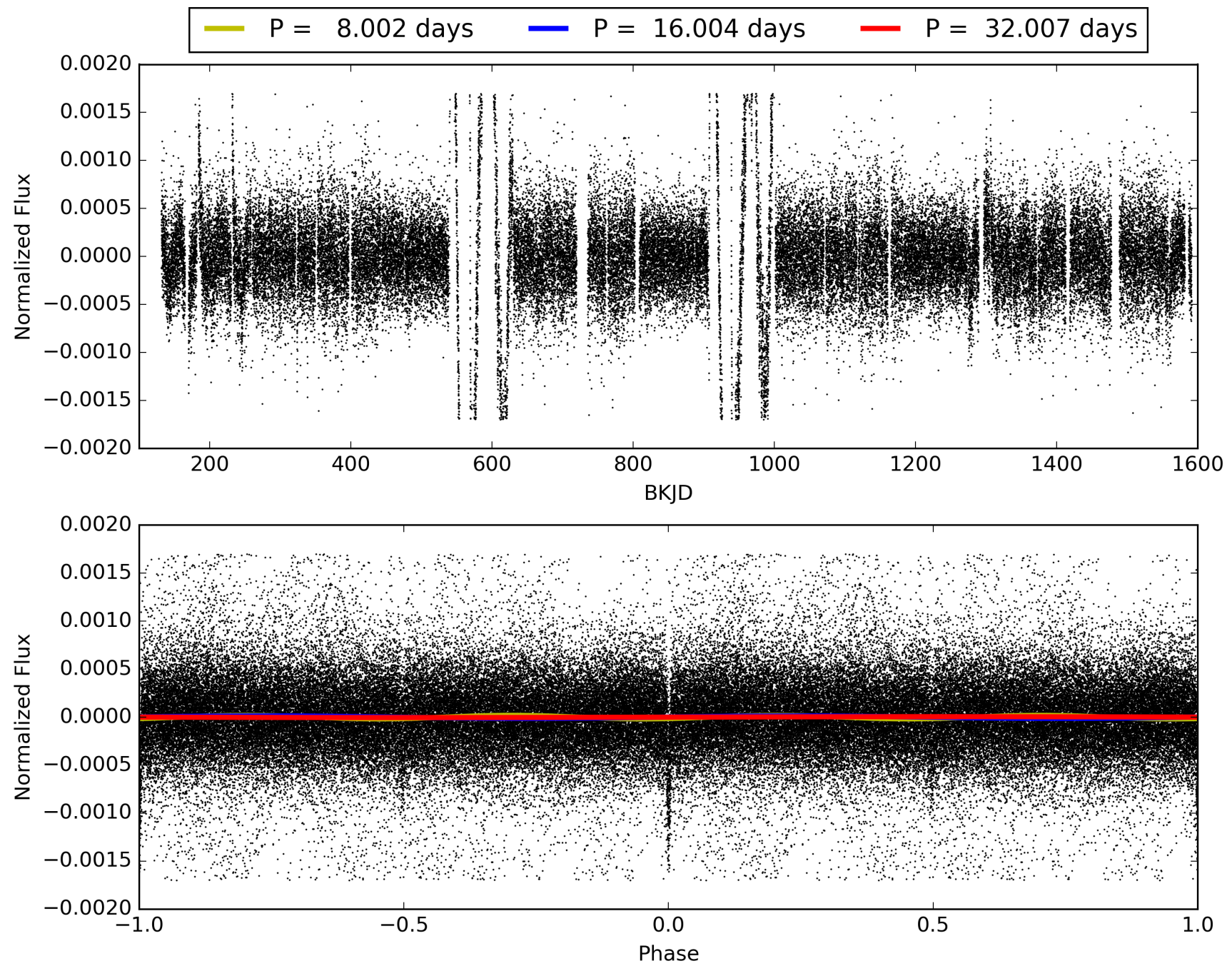
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.18e-180
RollingBand-fgt: 0.93 [75/81]
GhostDiagnostic-chr: 0.3989
Centroid-sig: 0.0%
Centroid-so: 10.480 arcsec [27.05σ]
OotOffset-rm: 5.509 arcsec [57.76σ]
KicOffset-rm: 5.558 arcsec [63.15σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009042357-01, PDC Light Curves

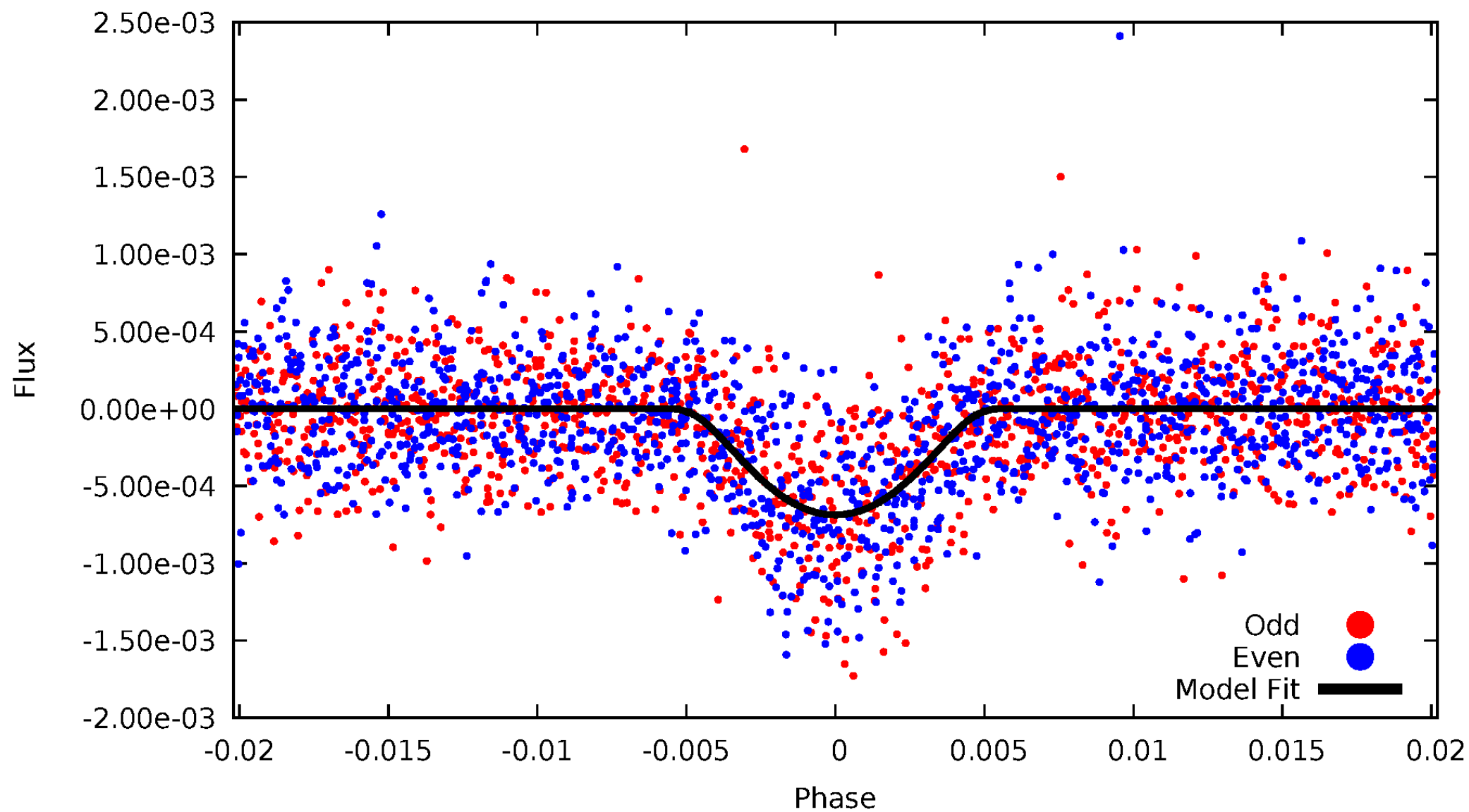


TCE 009042357-01



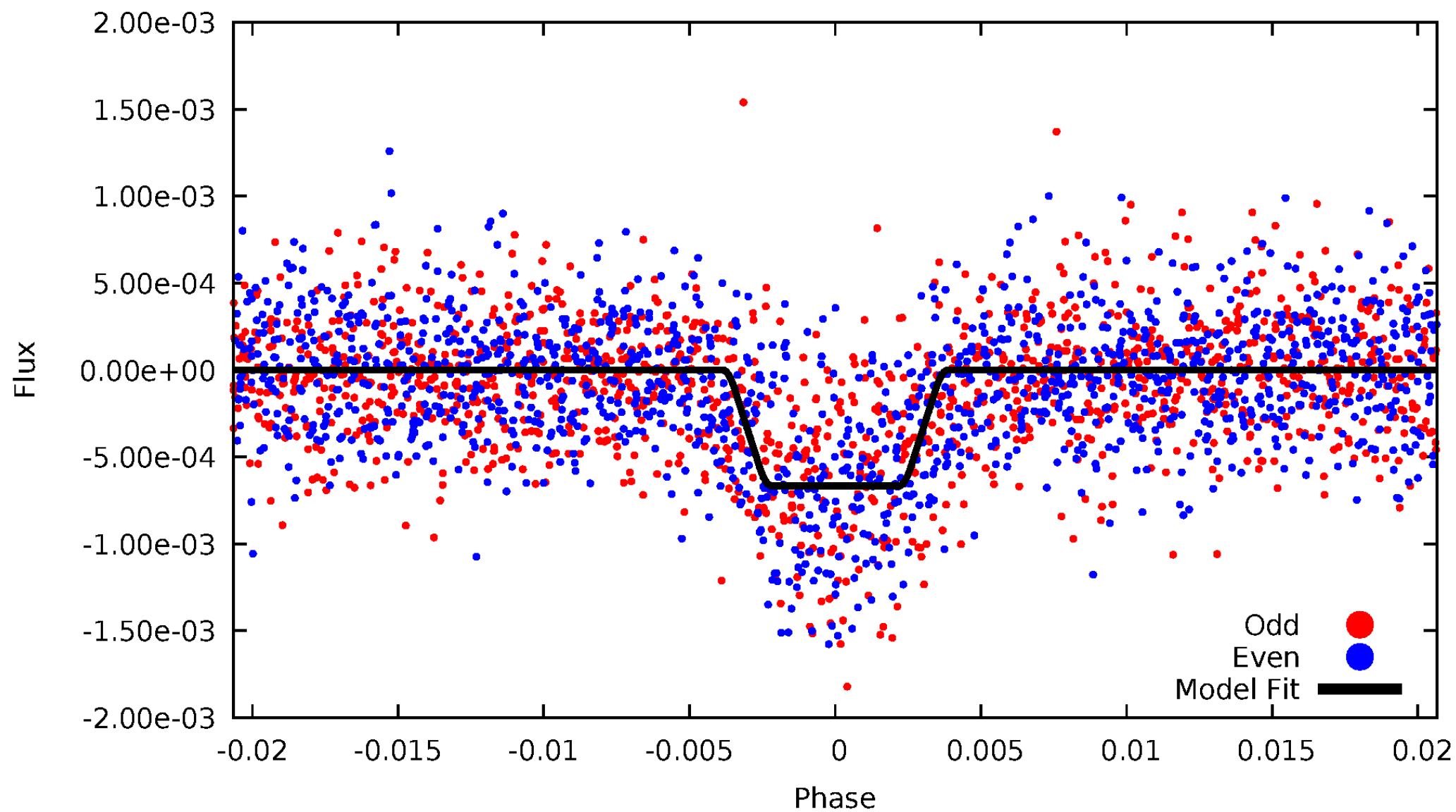
DV Odd/Even

TCE 009042357-01

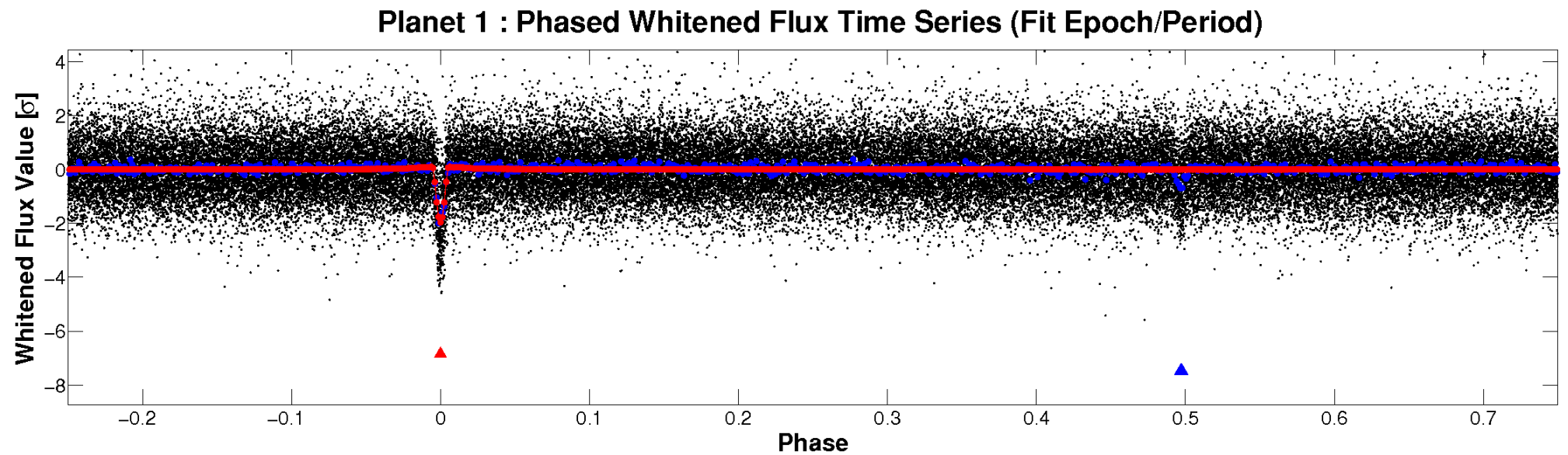
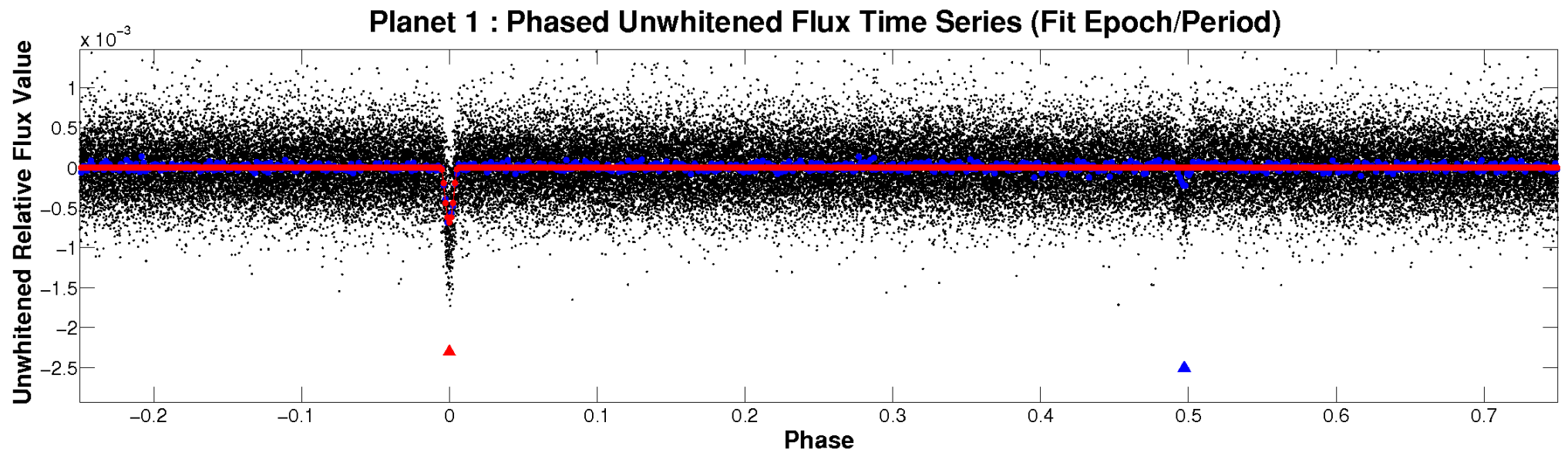


ALT Odd/Even

TCE 009042357-01

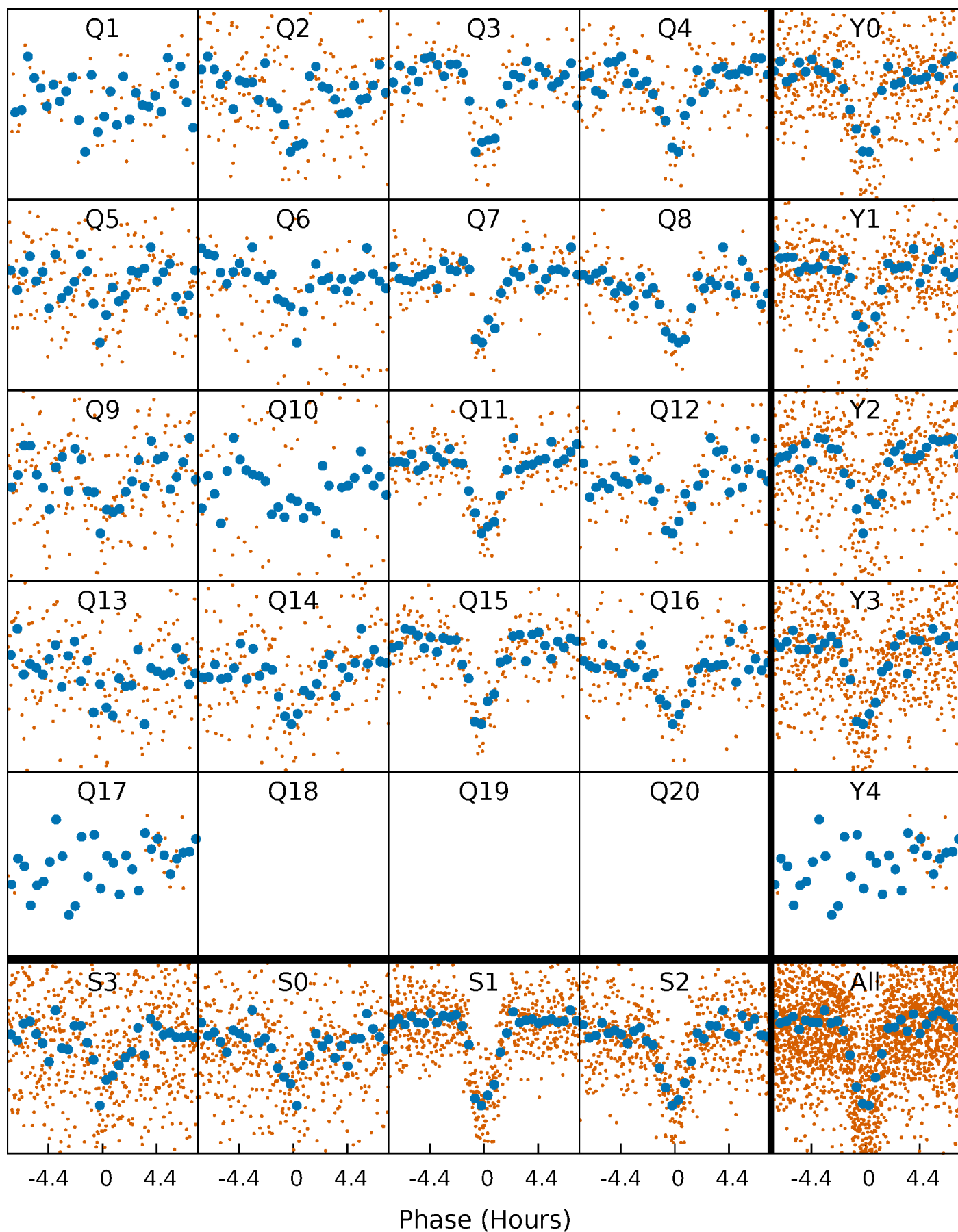


Non-Whitened Vs. Whitened Light Curve



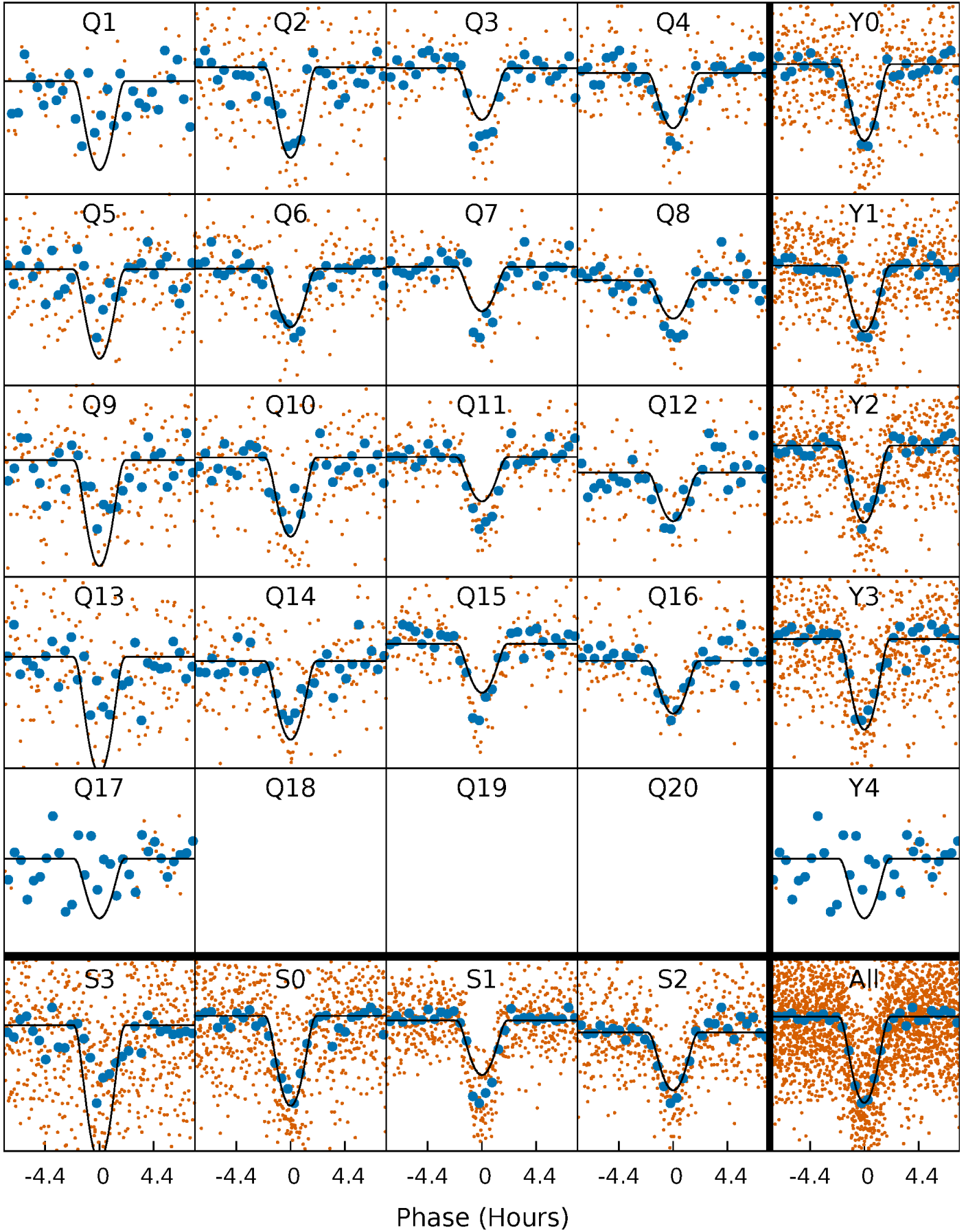
PDC Quarter-Phased Transit Curves

TCE 009042357-01 P= 16.003559 Days $T_0=146.384891$ (BKJD)



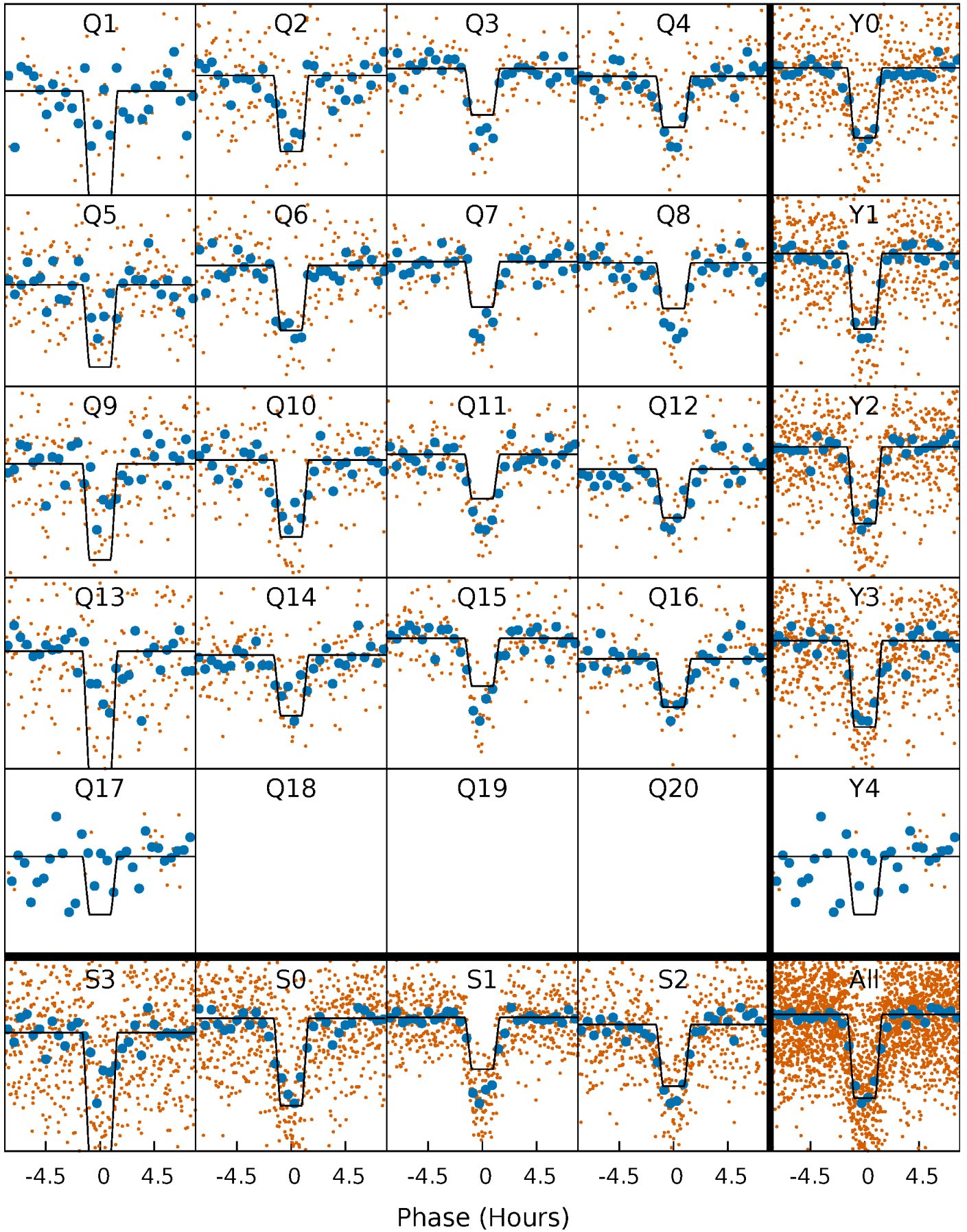
DV Quarter-Phased Transit Curves

TCE 009042357-01 P= 16.003559 Days $T_0=146.384891$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

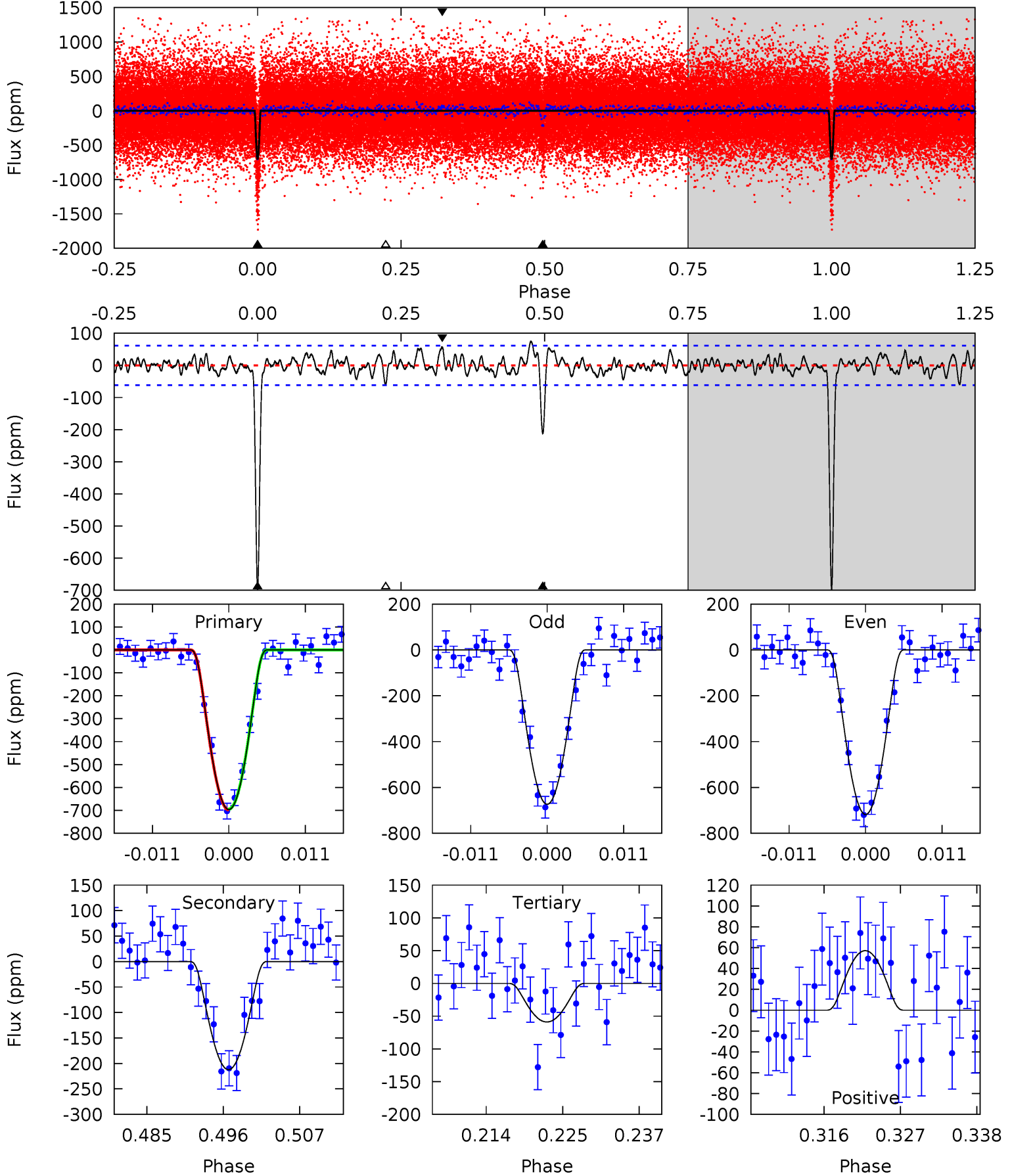
TCE 009042357-01 P= 16.003483 Days $T_0=146.388967$ (BKJD)



DV Model-Shift Uniqueness Test

009042357-01, P = 16.003559 Days, E = 130.381332 Days

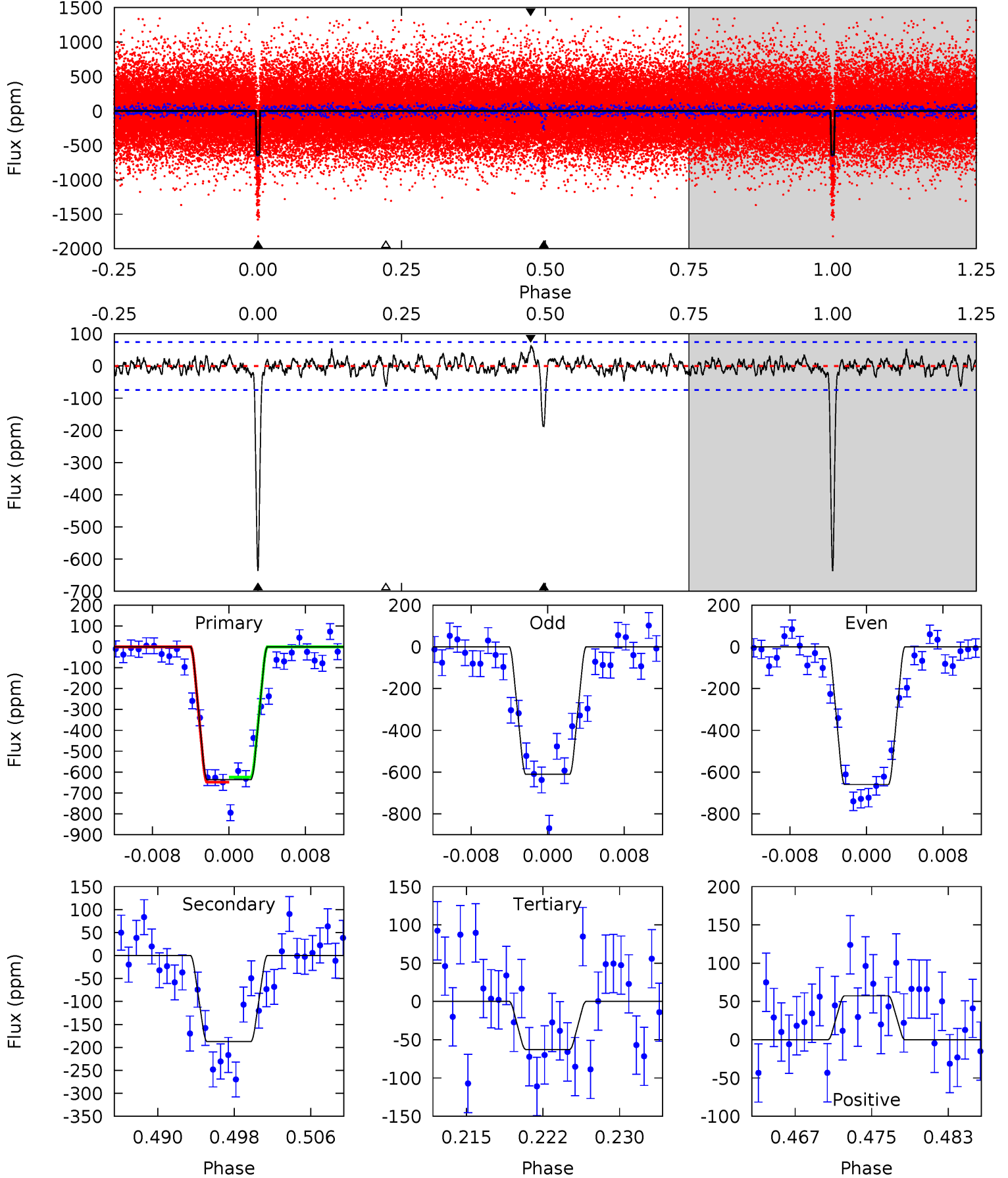
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
56.7	17.3	4.79	4.65	5.00	2.53	1.61	51.9	52.0	12.5	12.6	1.82	1.02	0.10	0.16



Alt Model-Shift Uniqueness Test

009042357-01, P = 16.003483 Days, E = 130.385484 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.4	12.8	4.28	3.91	5.08	2.67	1.11	39.1	39.5	8.49	8.85	1.67	0.98	0.09	0.80



Stellar Parameters For KIC 009042357

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5283^{+157}_{-157}	$4.594^{+0.065}_{-0.058}$	$-0.620^{+0.350}_{-0.300}$	$0.695^{+0.081}_{-0.066}$	$0.691^{+0.076}_{-0.044}$	$2.903^{+0.757}_{-0.601}$
	+3%/-3%	+1%/-1%	+56%/-48%	+12%/-9%	+11%/-6%	+26%/-21%
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 009042357-01 / KOI 1993.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-212 ± 12	$3.44^{+2.59}_{-2.06}$	816^{+33}_{-30}	3499^{+1266}_{-554}	122^{+604}_{-82}
Alt.	-187 ± 15	$2.70^{+2.26}_{-1.72}$	818^{+31}_{-30}	3712^{+1715}_{-669}	174^{+1076}_{-124}

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 $A_{obs} \gg 1.0$

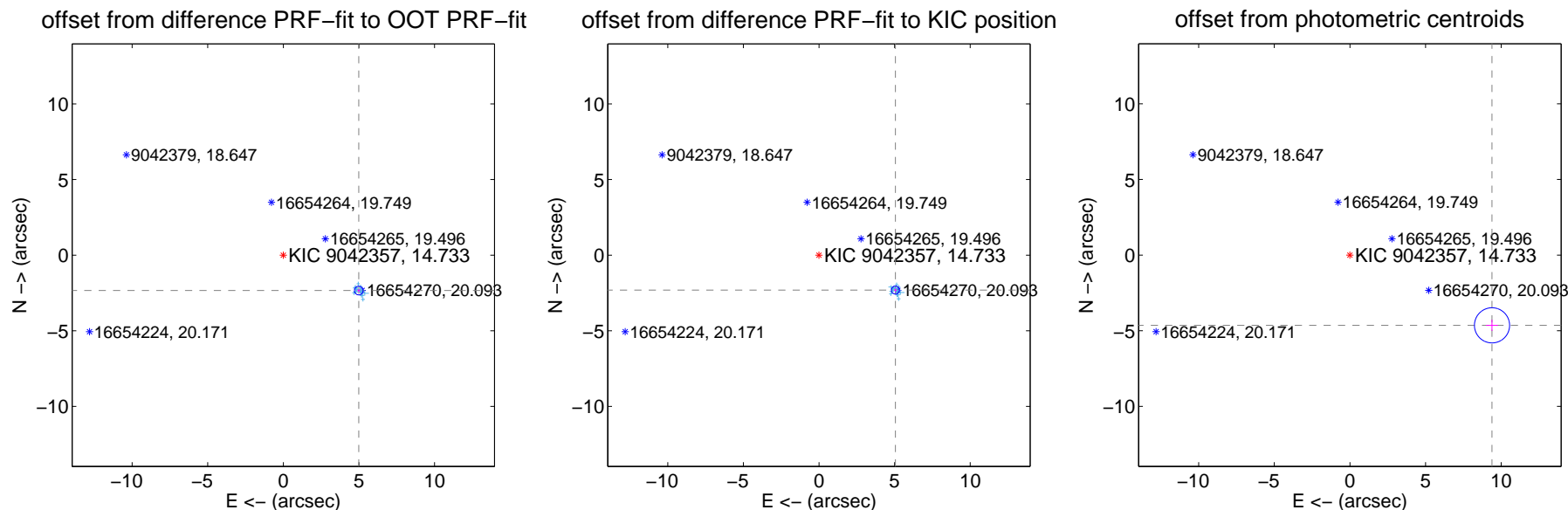
DV Centroid Data

Supplemental centroid analysis for 009042357-01. Kepler magnitude: 14.73. Transit SNR 32.28

There are 15 quarters with good PRF difference image offsets

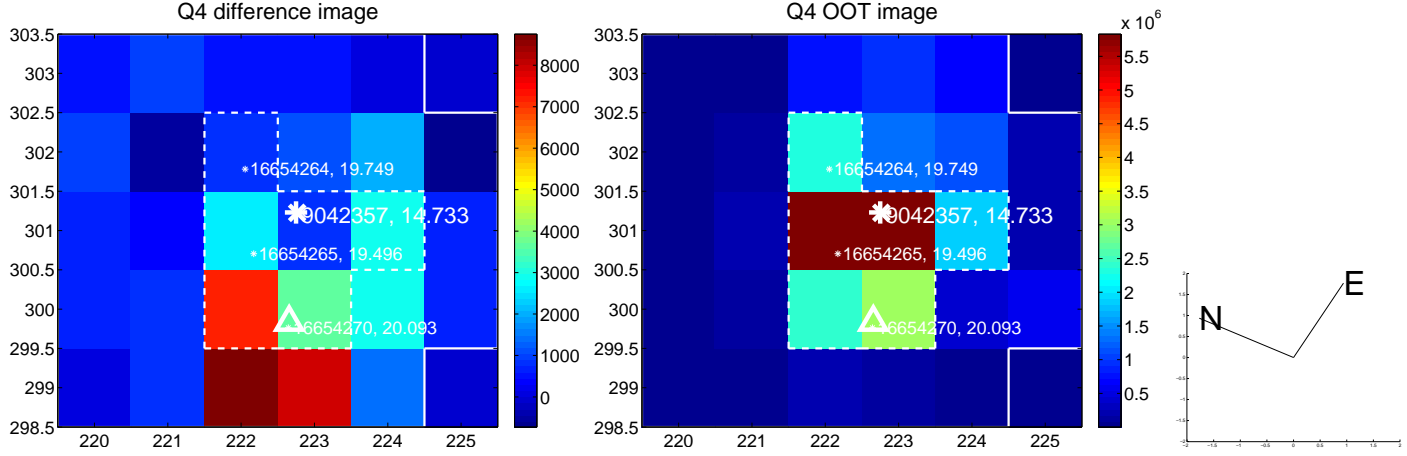
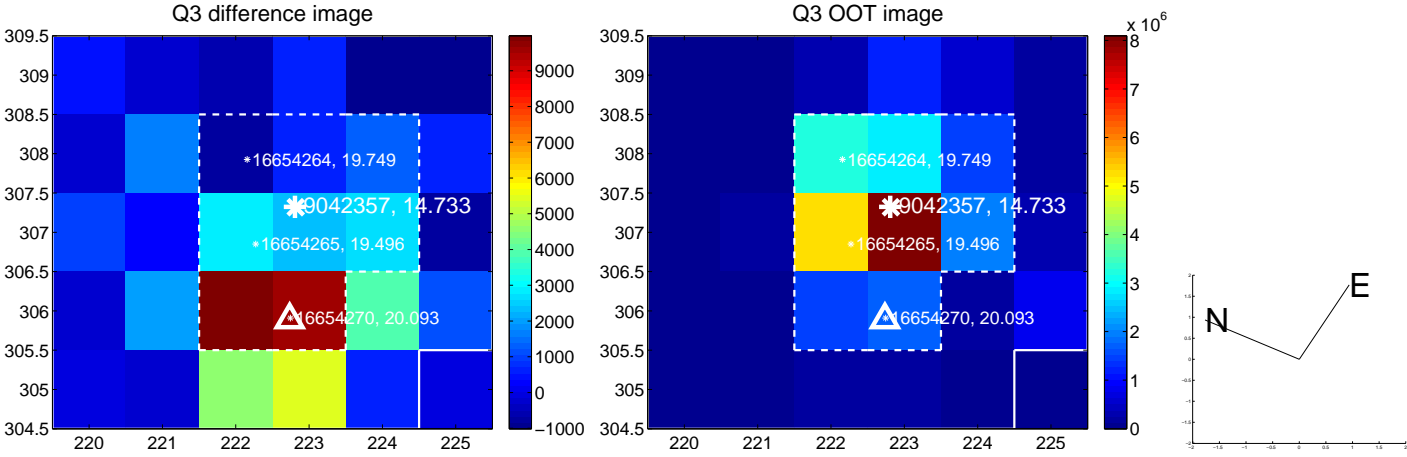
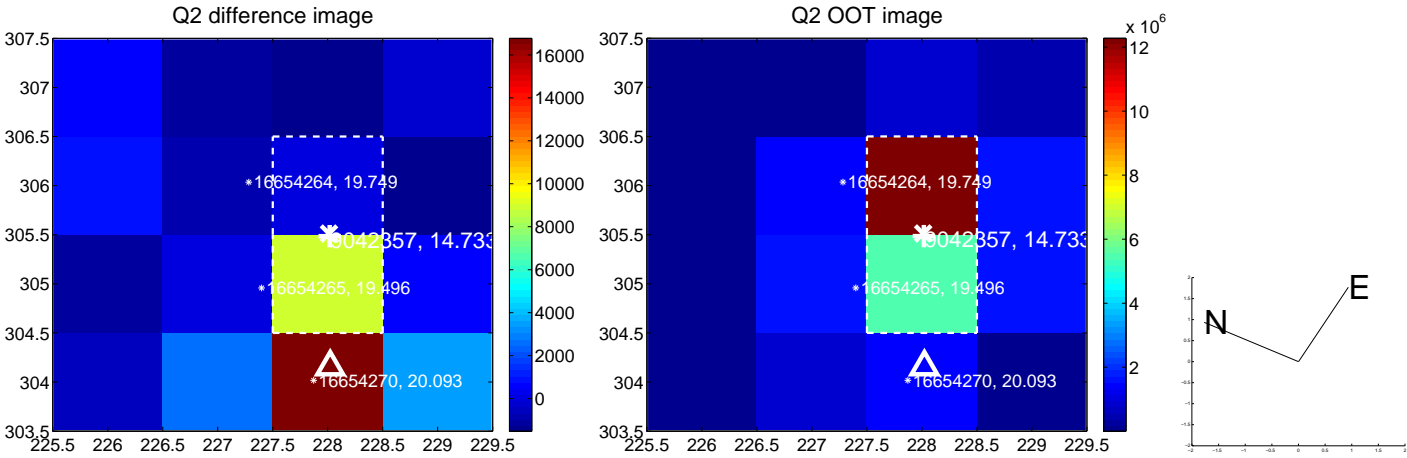
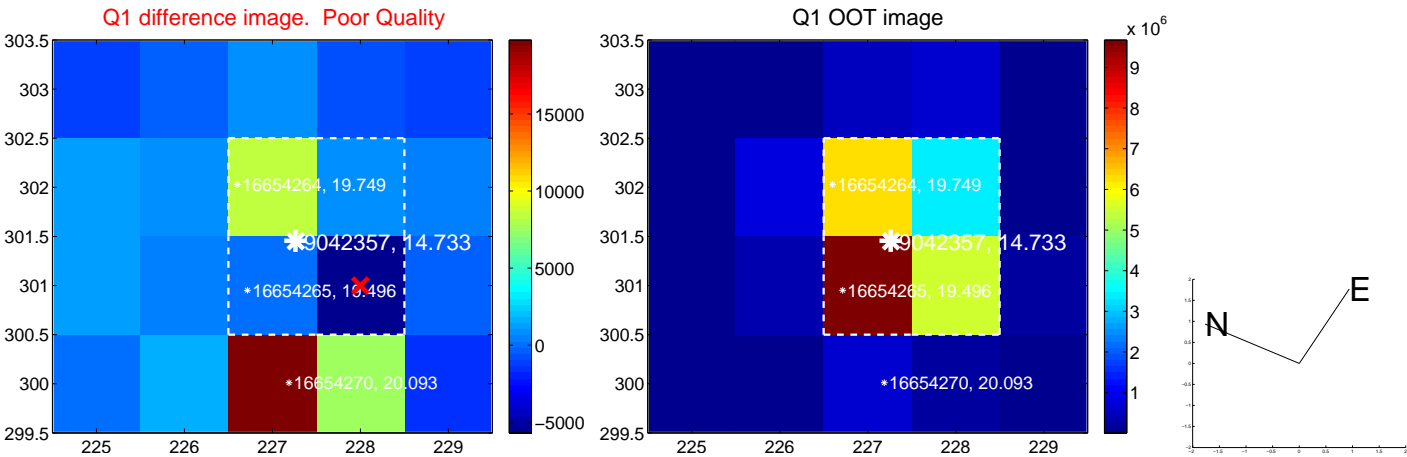
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.509 ± 0.095	57.76	-4.987 ± 0.087	-2.340 ± 0.093
PRF-fit source offset from KIC position	5.558 ± 0.088	63.15	-5.056 ± 0.082	-2.308 ± 0.091
photometric centroid source offset	10.48 ± 0.39	27.05	-9.40 ± 0.39	-4.64 ± 0.37

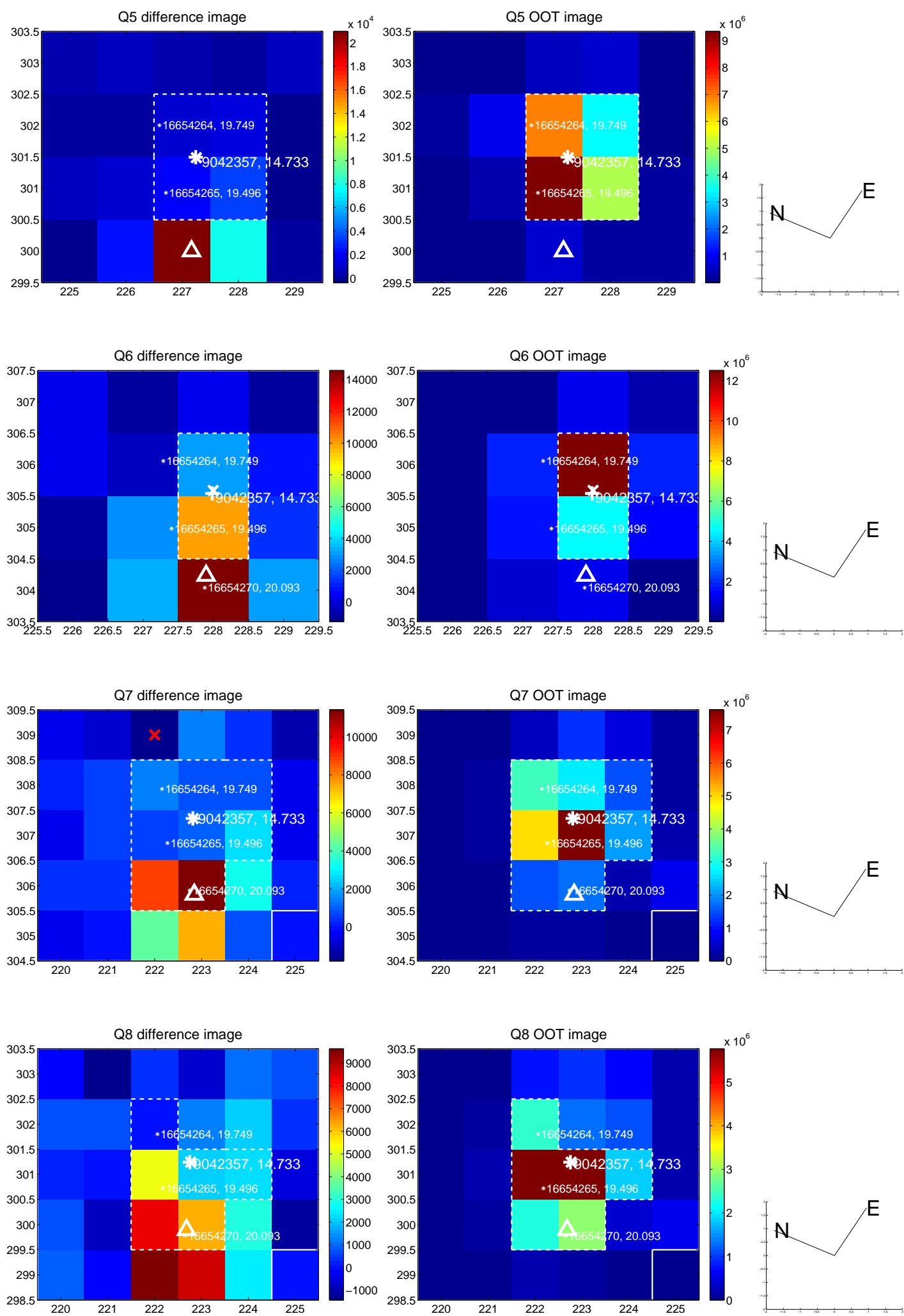


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

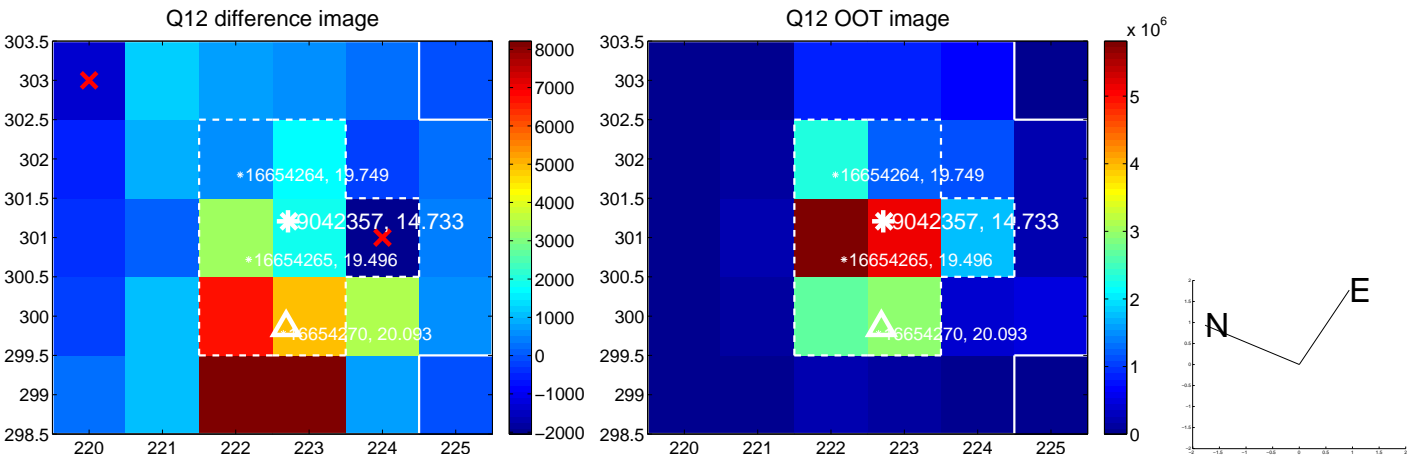
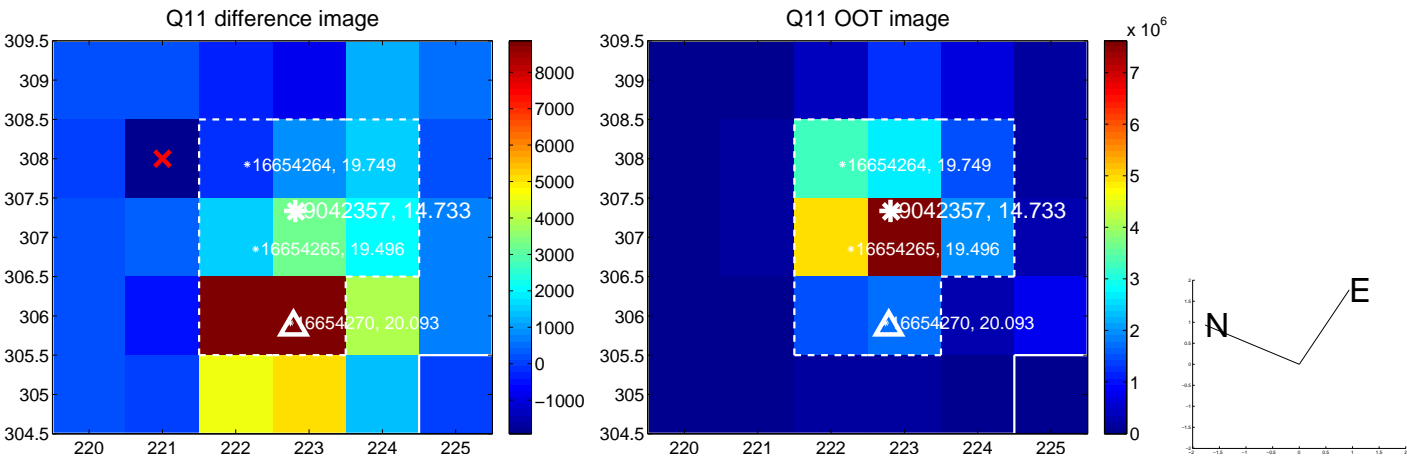
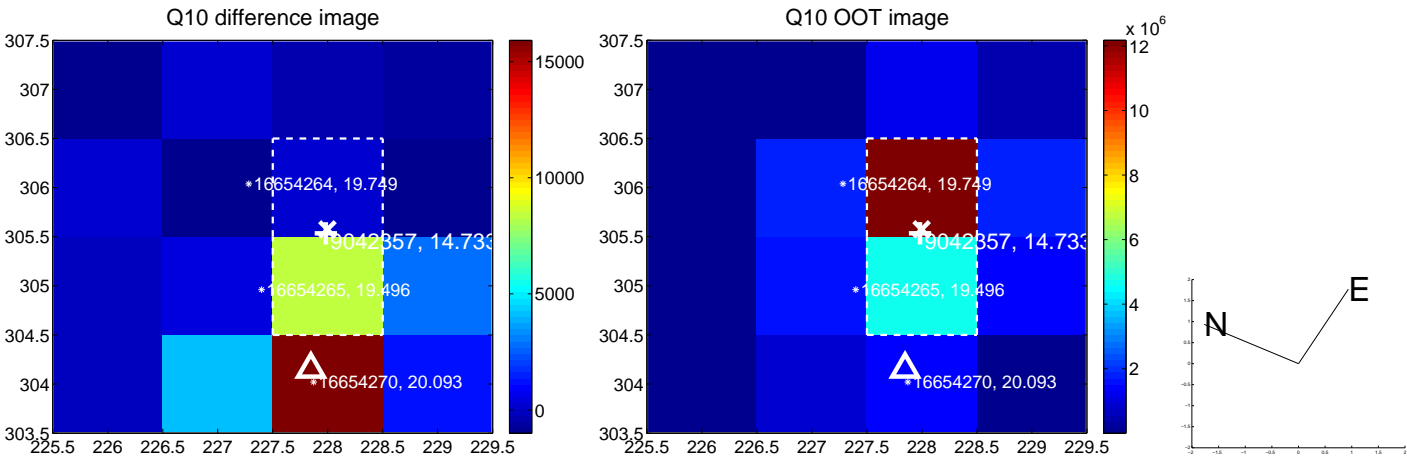
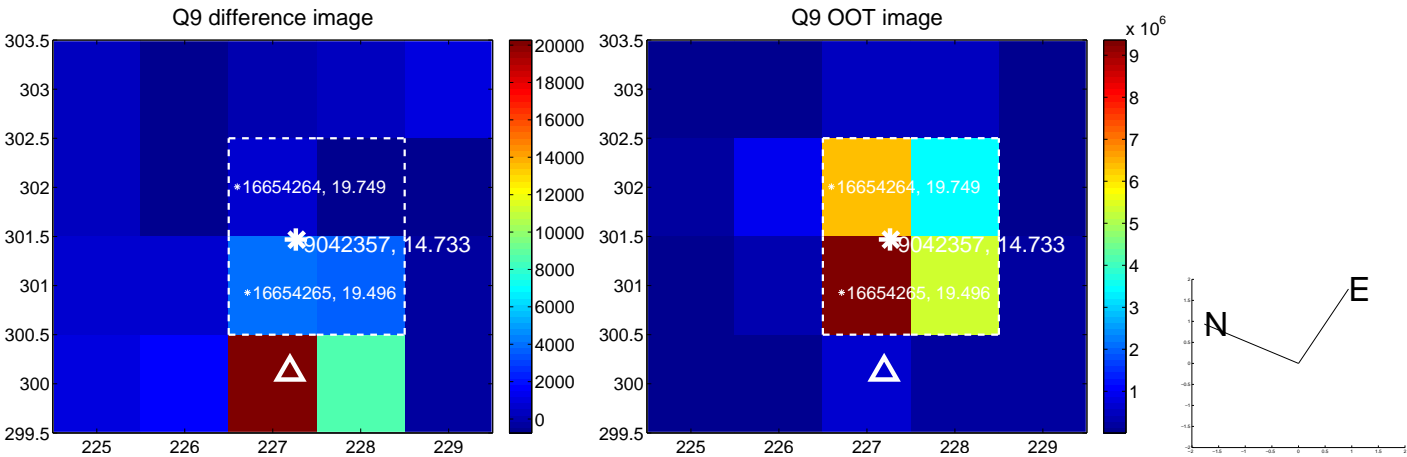
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



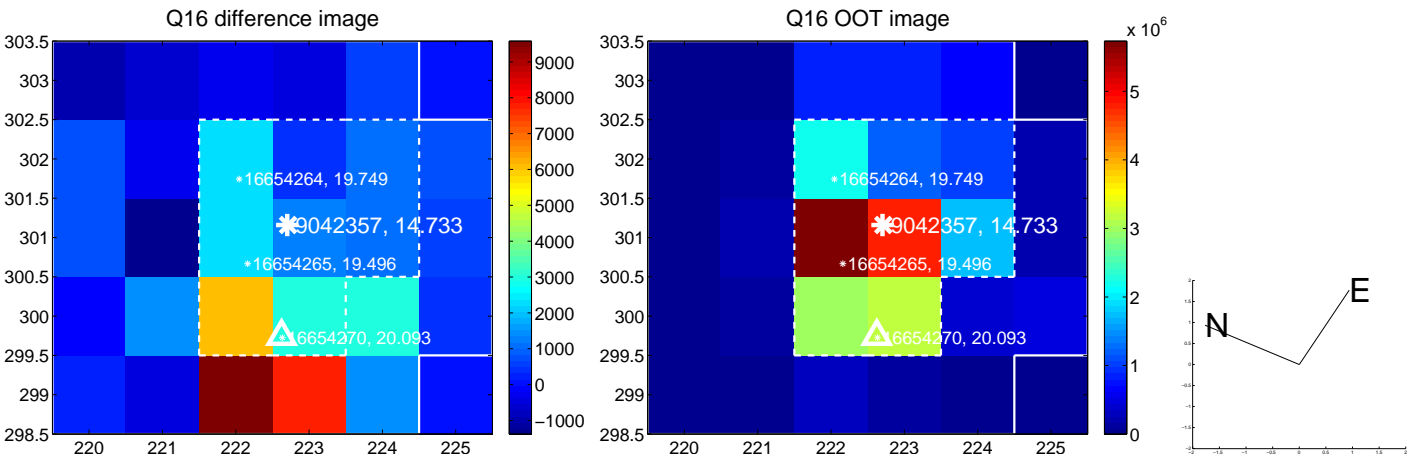
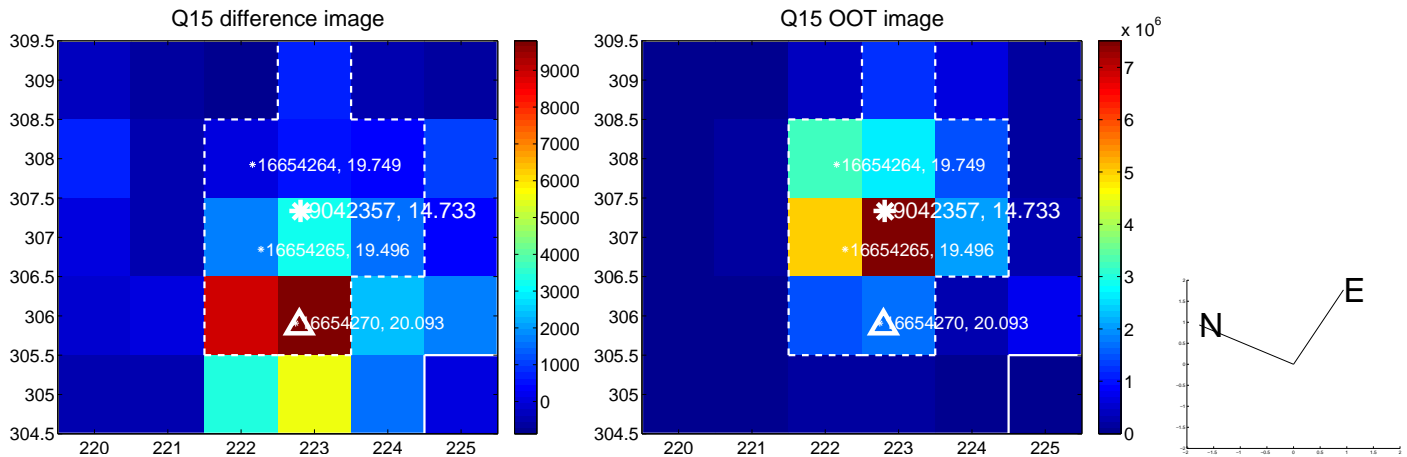
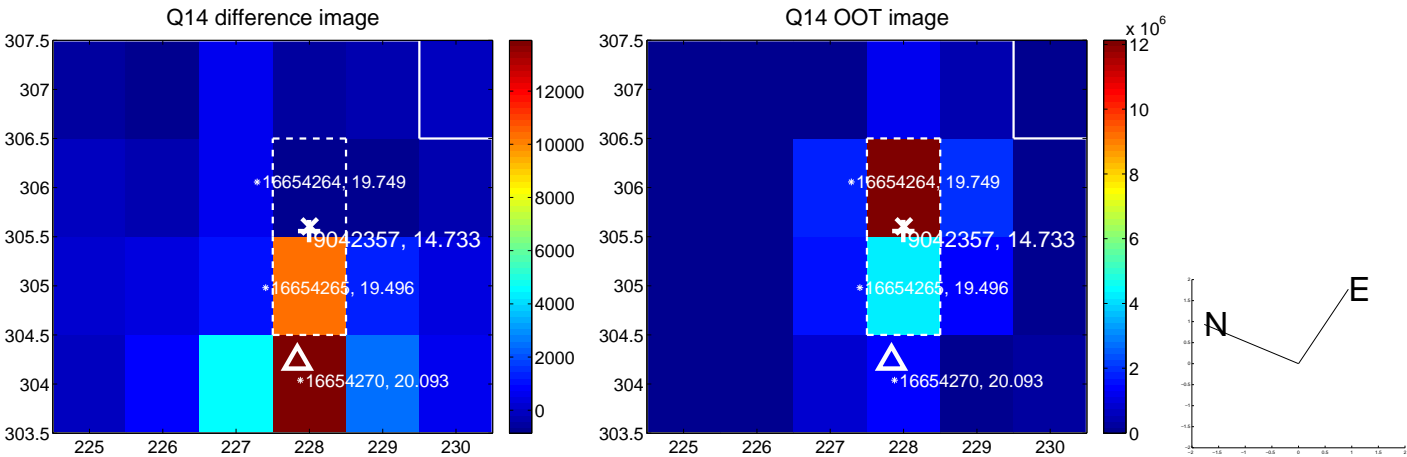
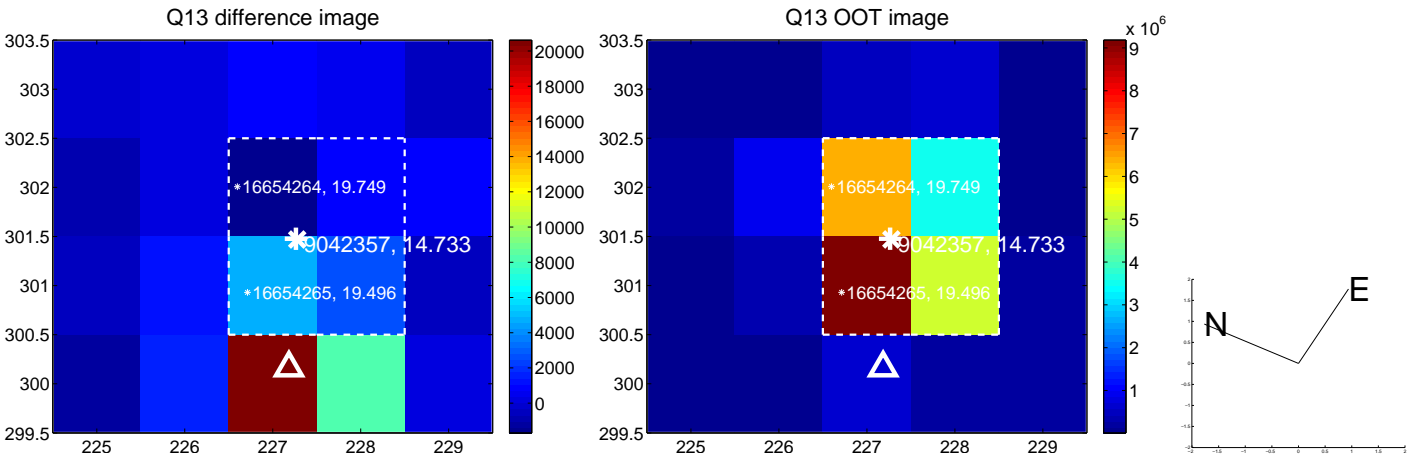
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



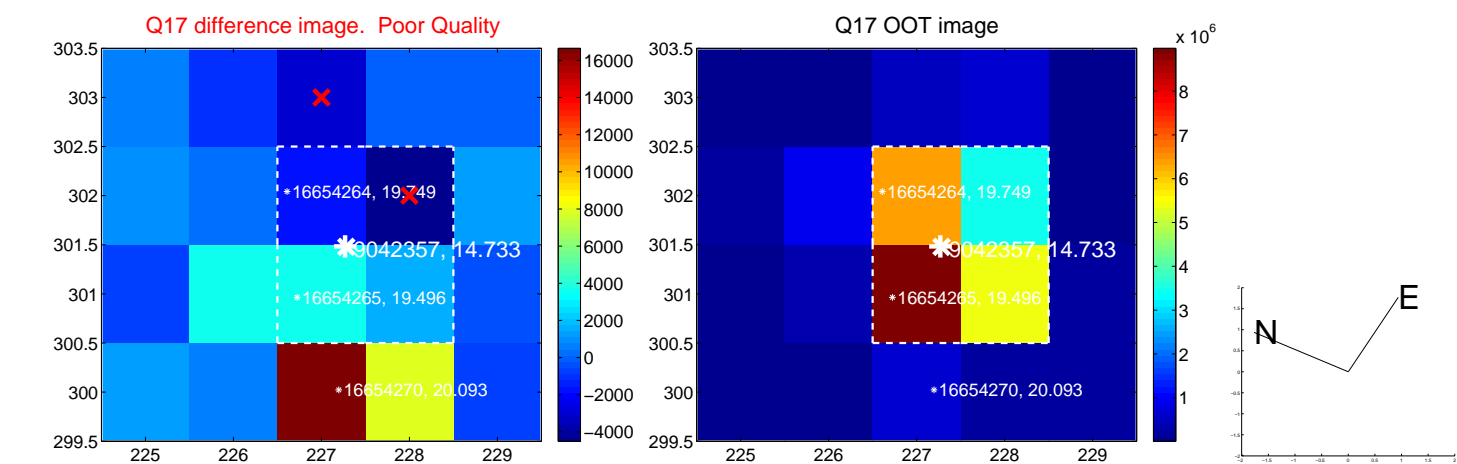
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



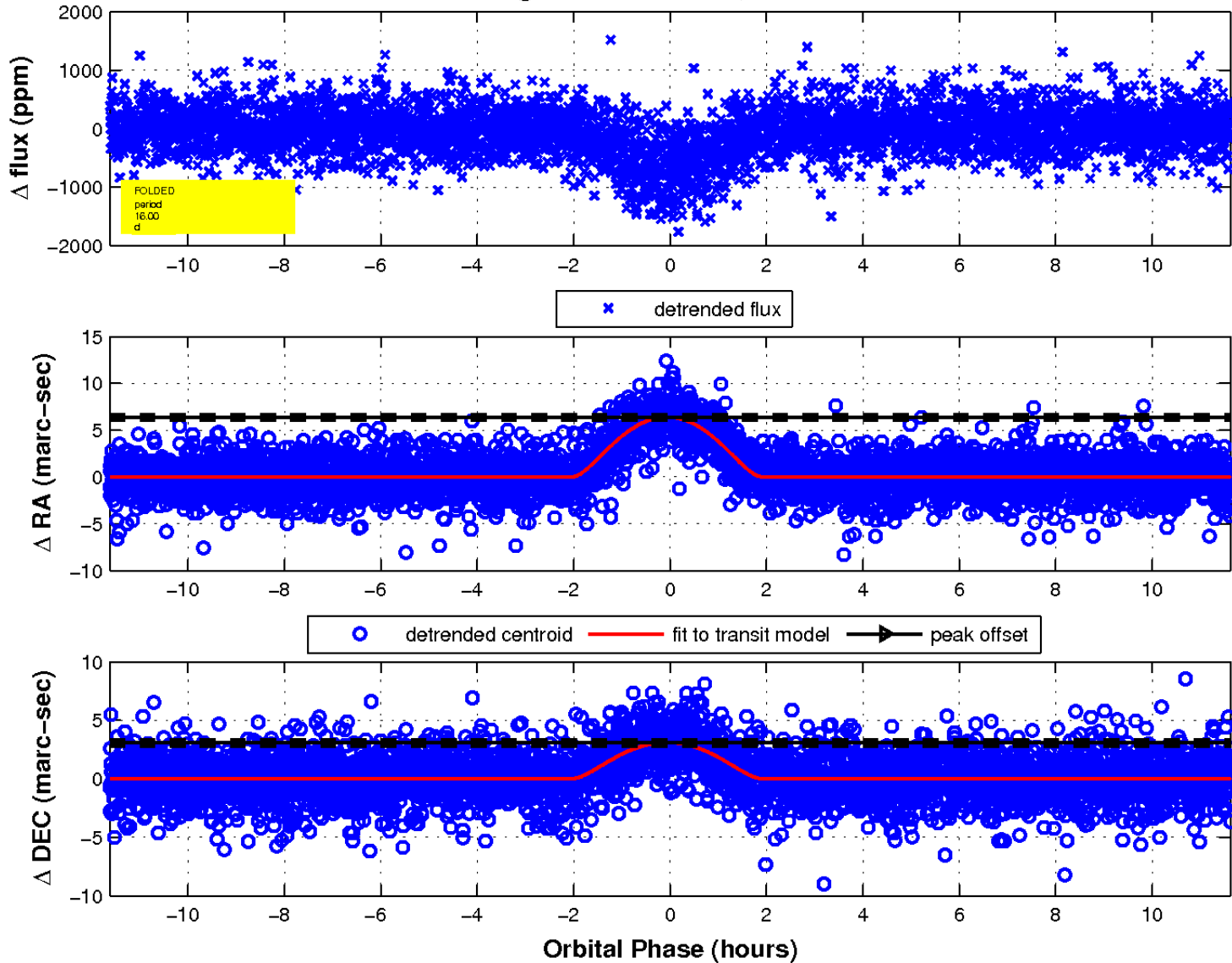
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

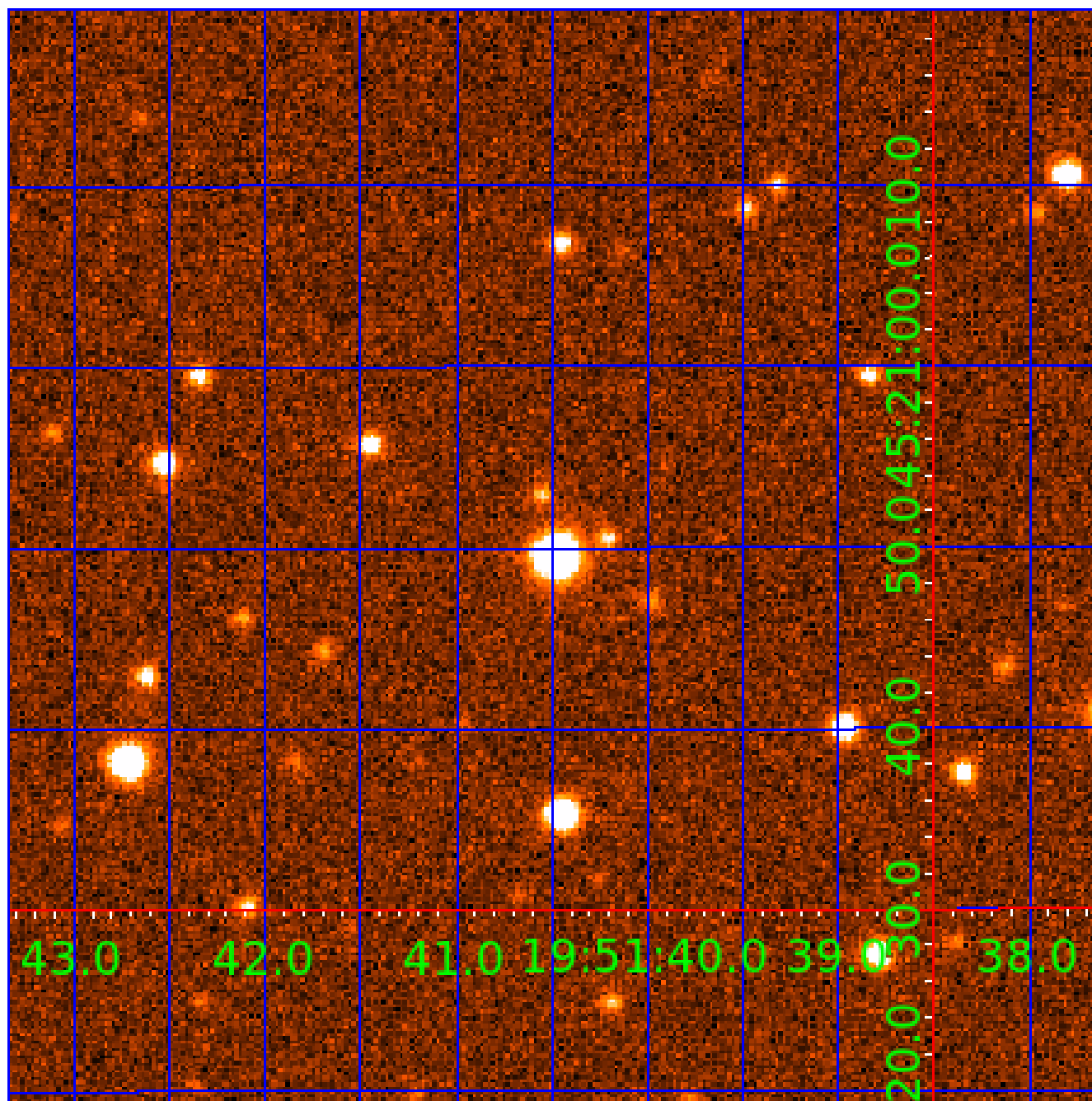


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009042357

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})
009042357-01	OBS	1993.01	16.003559	146.384891	687.4	3.877	29.2	32.3	0.69	5283	3.17	27.89
009042357-02	OBS	No	16.003438	138.344502	203.9	3.887	10.6	12.0	0.69	5283	1.24	27.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009042357-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
009042357-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET

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 009042357-02

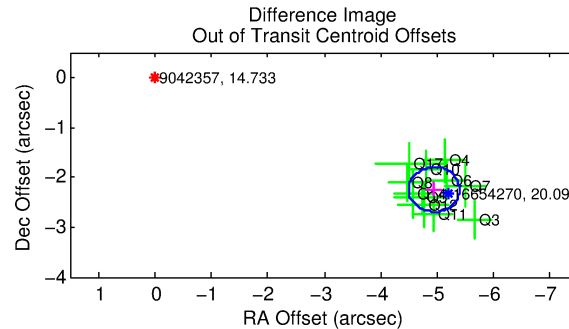
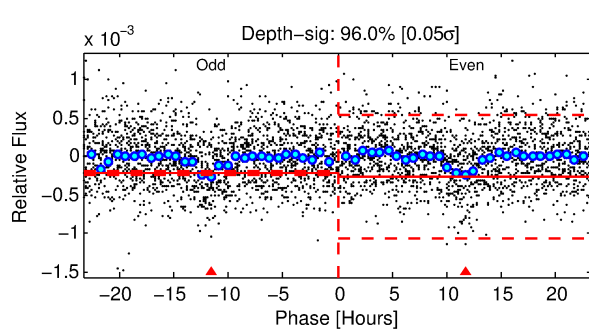
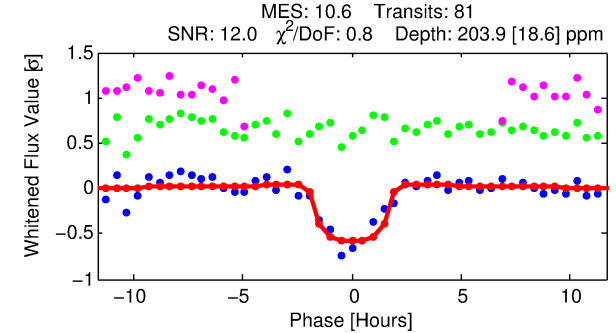
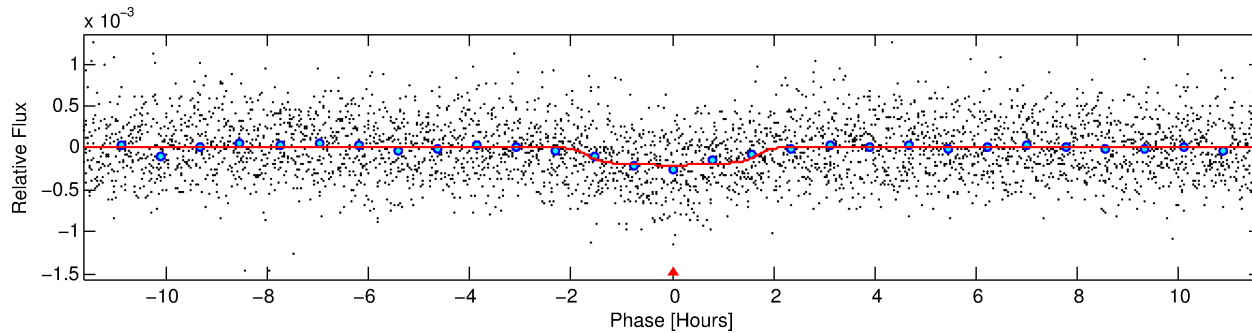
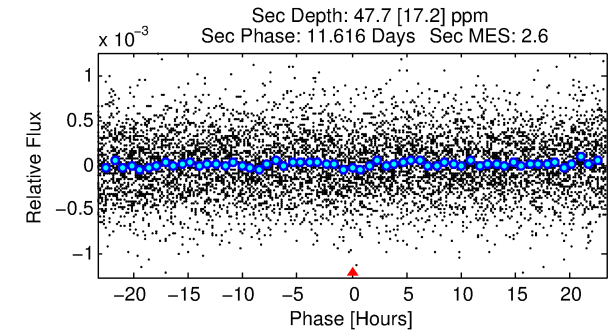
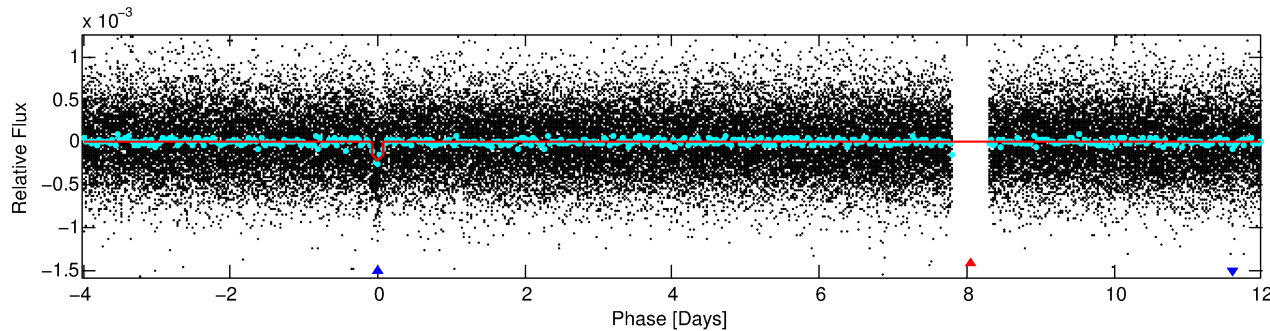
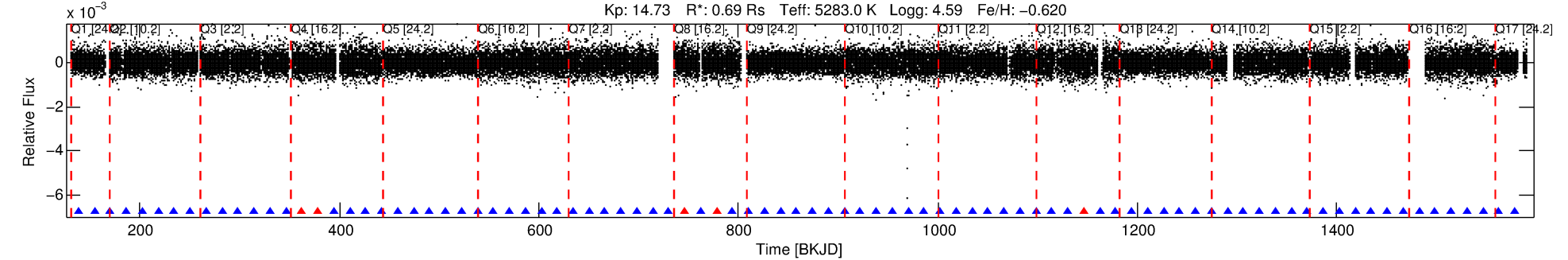
No Significant Match Found

DV One-Page Summary

KIC: 9042357 Candidate: 2 of 2 Period: 16.003 d

KOI: K01993 Corr: No Ephemeris Match

Kp: 14.73 R*: 0.69 Rs Teff: 5283.0 K Logg: 4.59 Fe/H: -0.620



DV Fit Results:

Period = 16.00344 [0.00014] d
Epoch = 138.3445 [0.0069] BKJD
Rp/R* = 0.0164 [0.0035]
a/R* = 12.55 [12.07]
b = 0.94 [0.13]
Seff = 27.89 [4.84]
Teq = 586 [25] K
Rp = 1.24 [0.30] Re
a = 0.1099 [0.0102] AU
Ag = 206.32 [118.68] [1.73σ]
Teffp = 3434 [492] K [5.78σ]

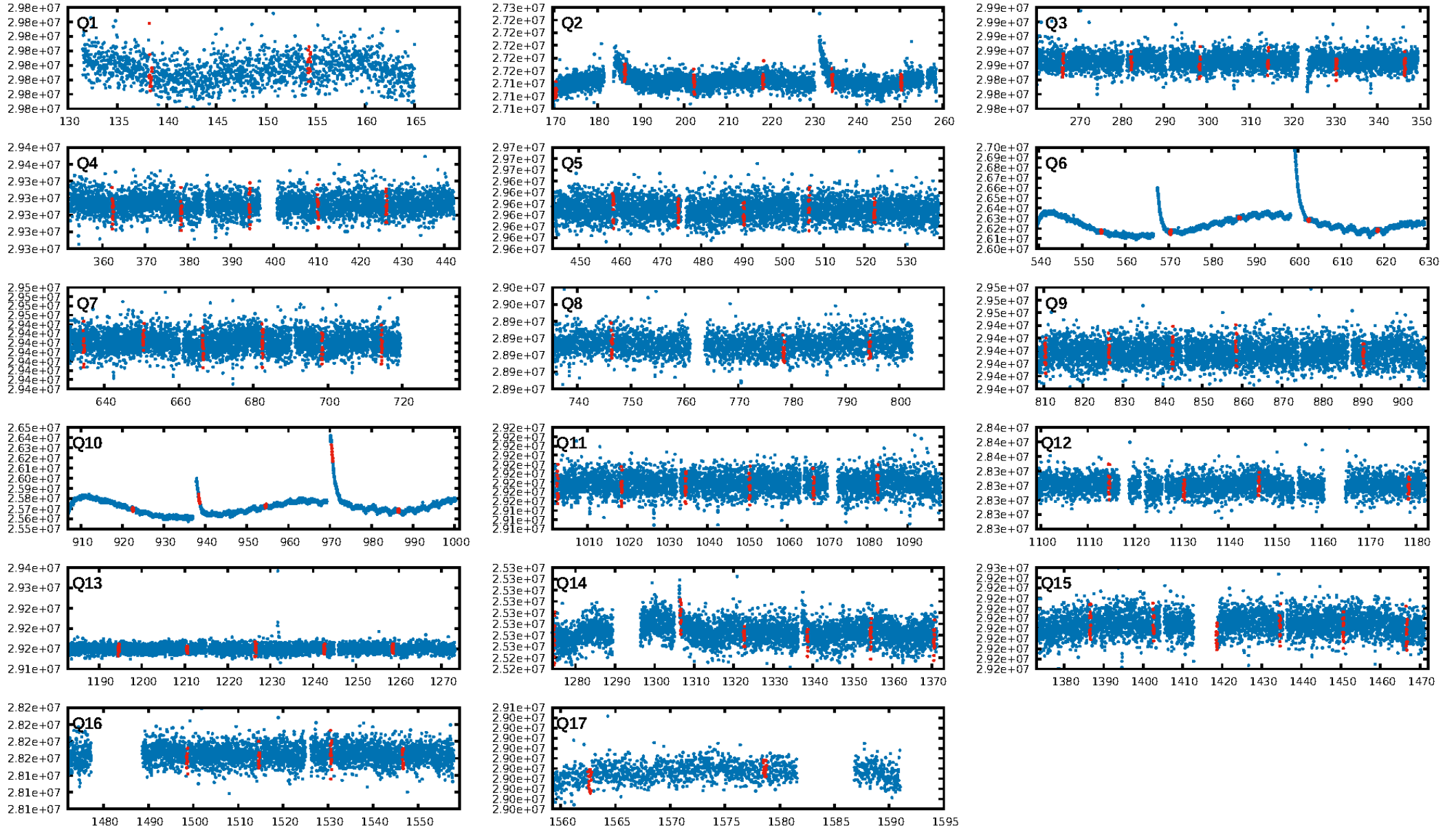
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 26.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.37e-26
RollingBand-fgt: 0.94 [72/77]
GhostDiagnostic-chr: 0.8638
Centroid-sig: 0.0%
Centroid-so: 8.393 arcsec [7.77σ]
OotOffset-rm: 5.428 arcsec [36.34σ]
KicOffset-rm: 5.493 arcsec [37.94σ]
OotOffset-st: 3/3/3/2 [11]
KicOffset-st: 3/3/3/2 [11]
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DiffImageOverlap-fno: 1.00 [17/17]

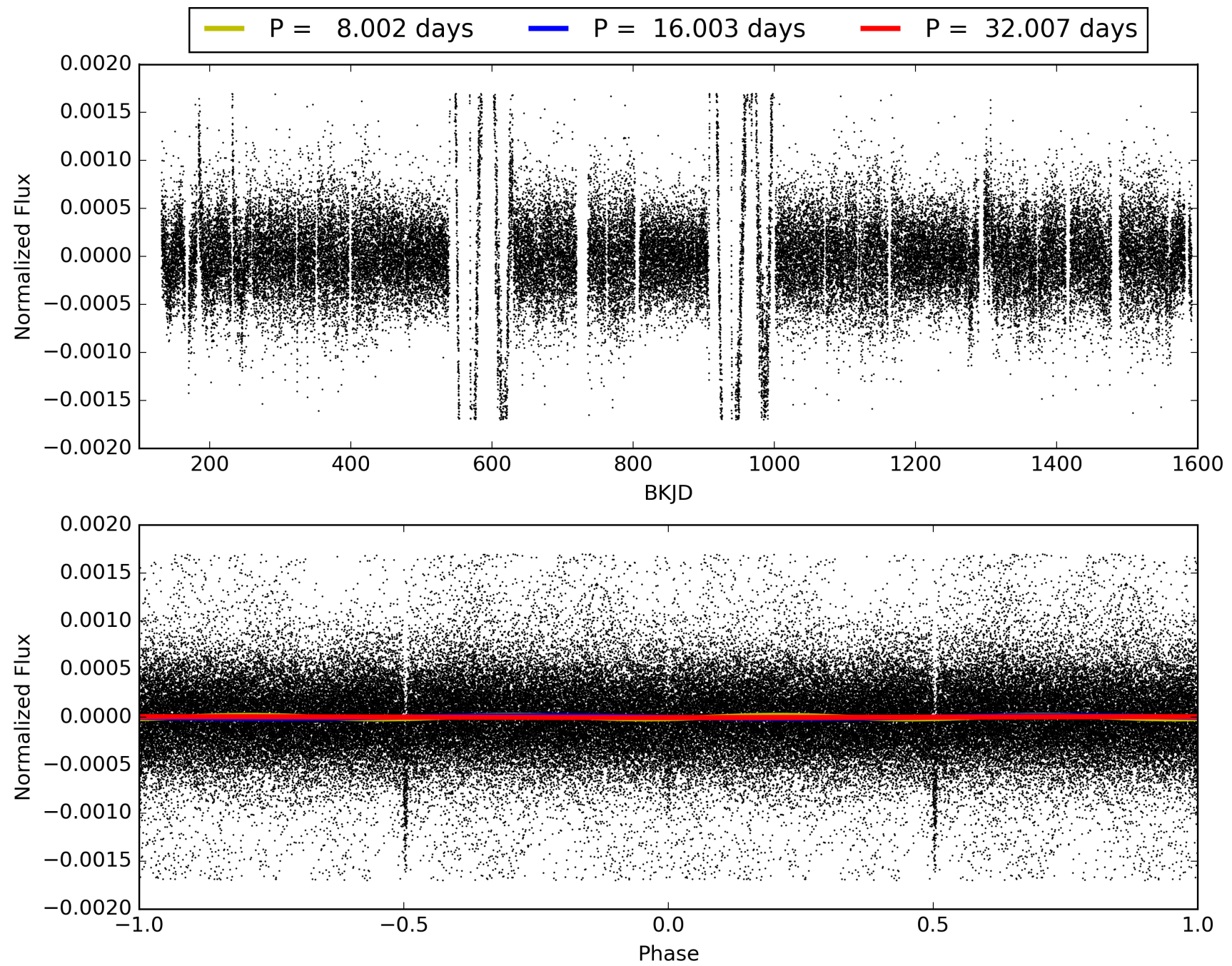
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:25:59 Z

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

TCE 009042357-02, PDC Light Curves

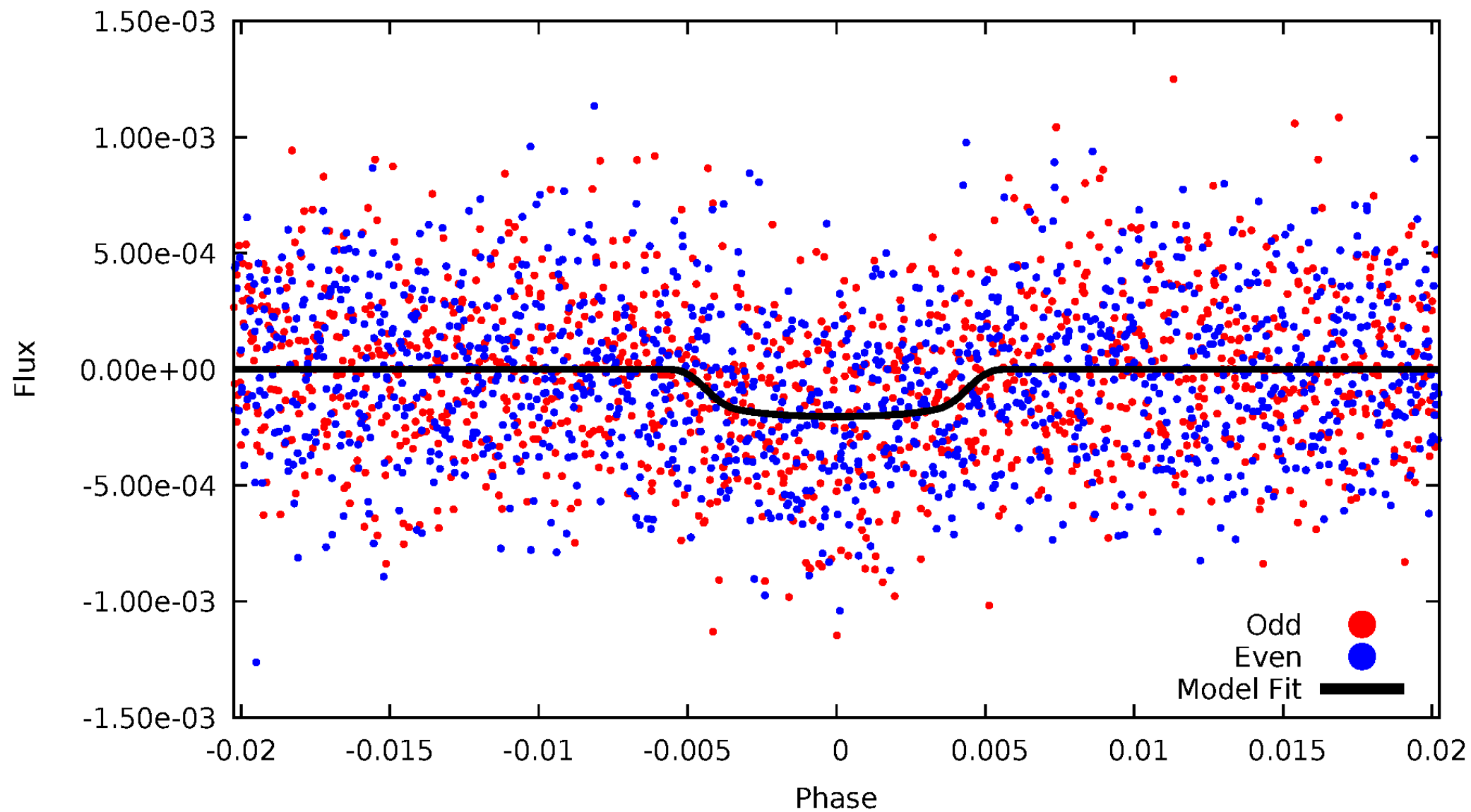


TCE 009042357-02



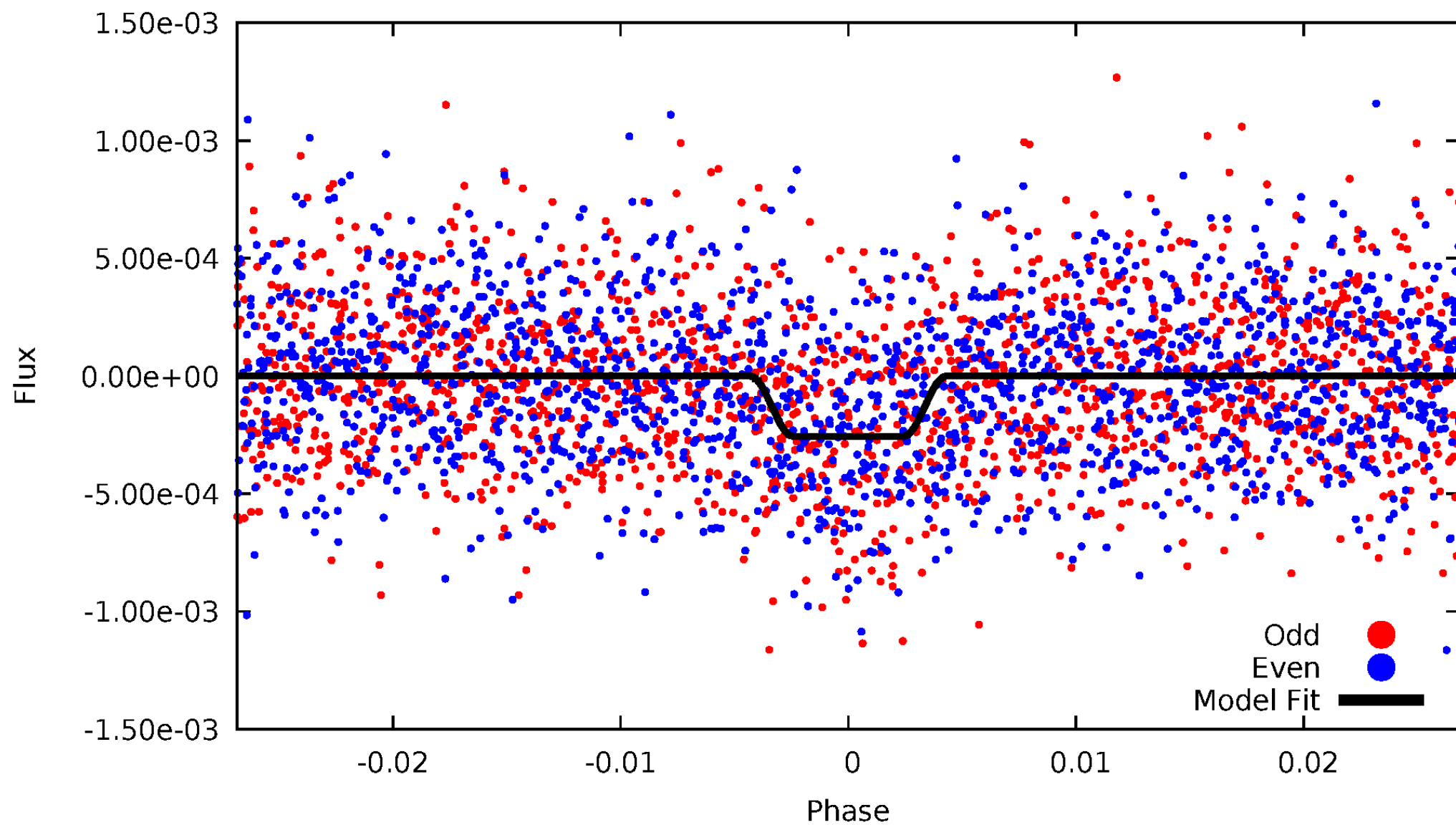
DV Odd/Even

TCE 009042357-02



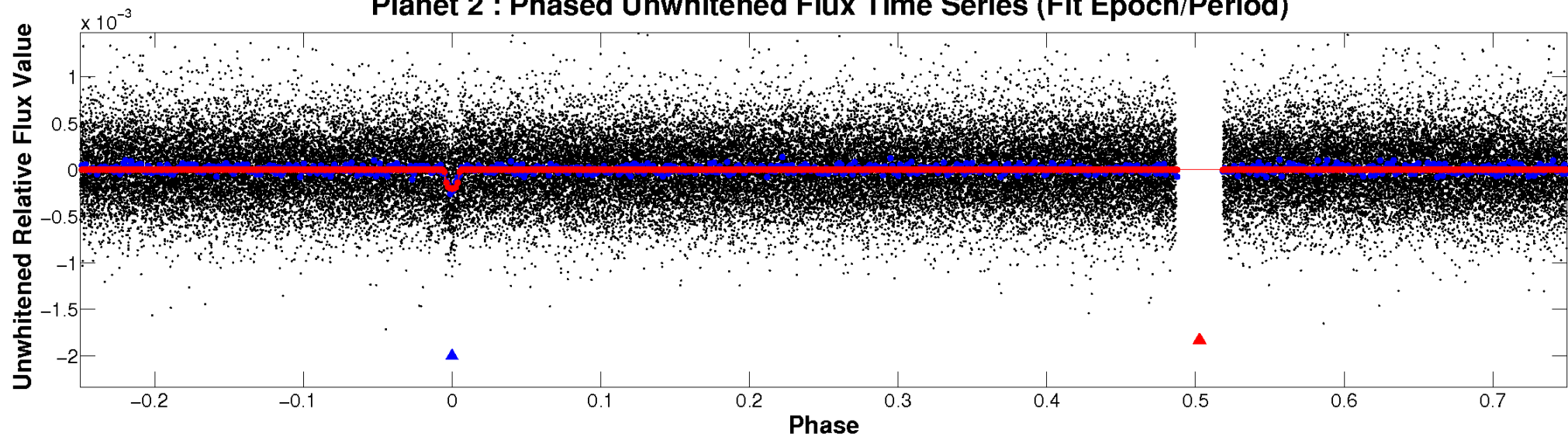
ALT Odd/Even

TCE 009042357-02

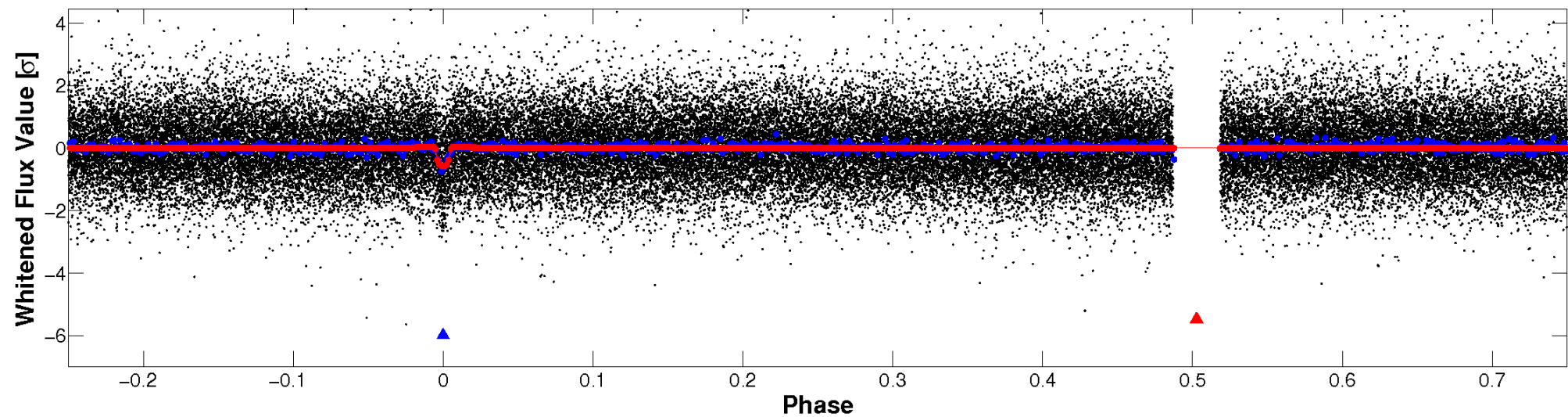


Non-Whitened Vs. Whitened Light Curve

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

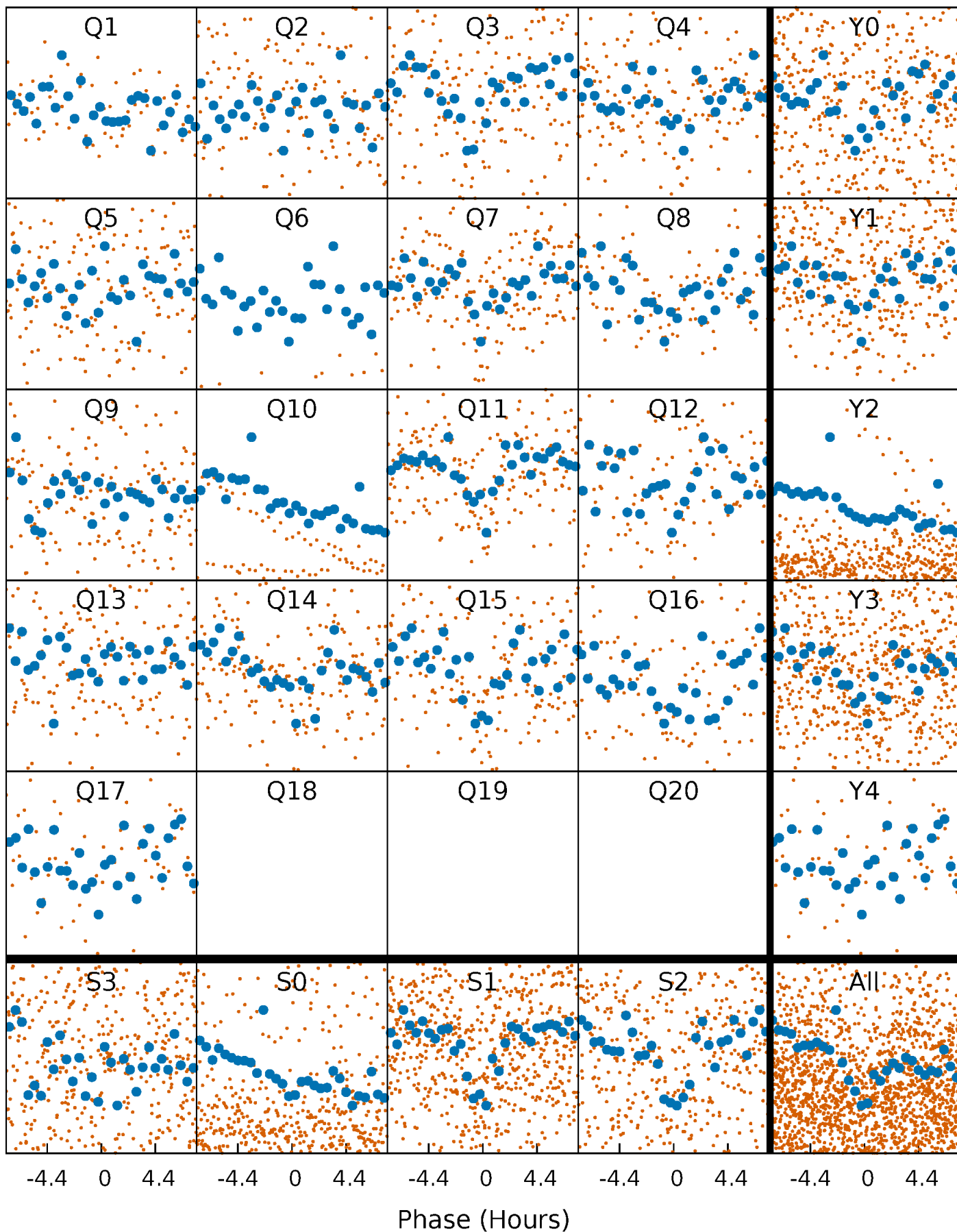


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



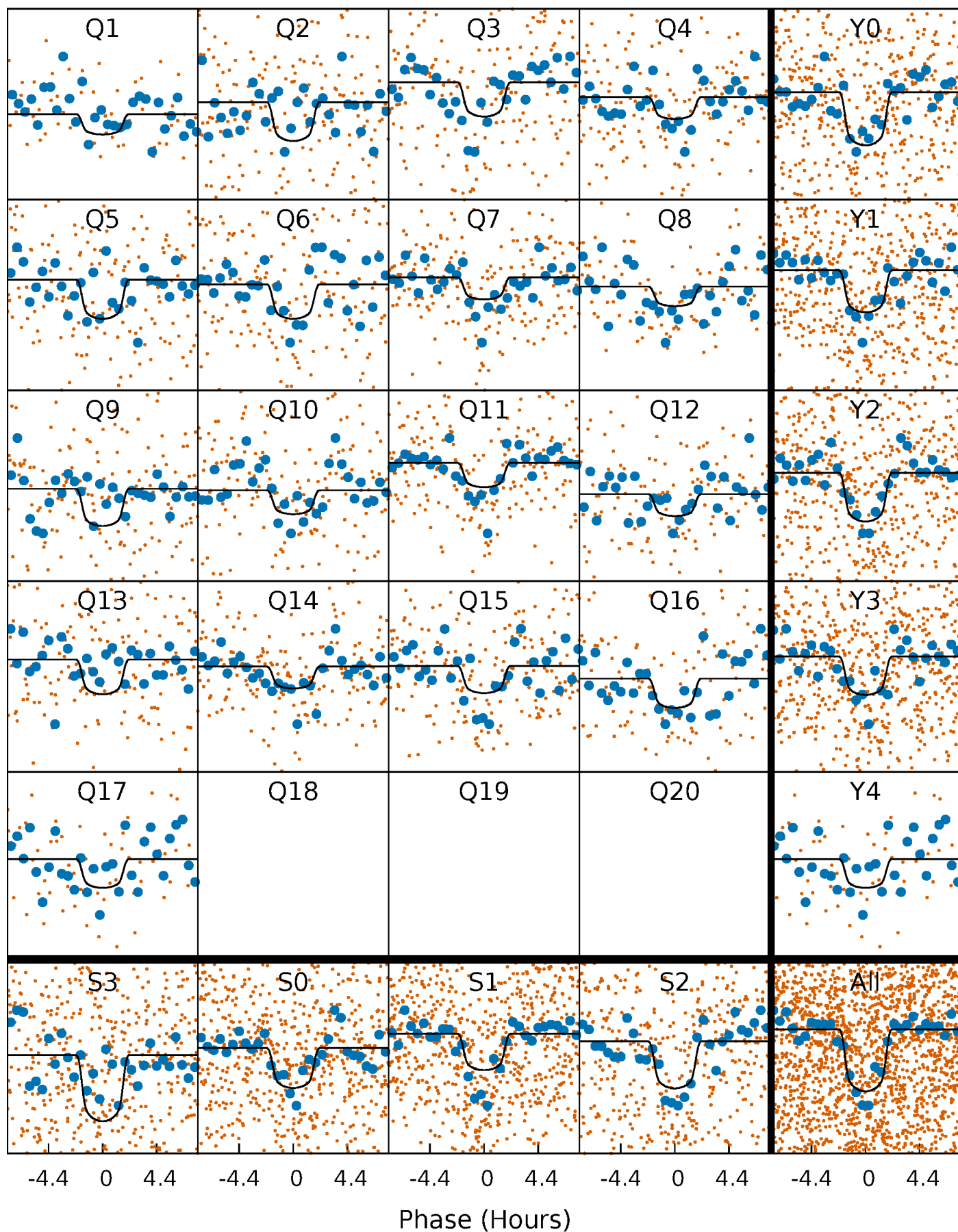
PDC Quarter-Phased Transit Curves

TCE 009042357-02 P= 16.003438 Days $T_0=138.344502$ (BKJD)



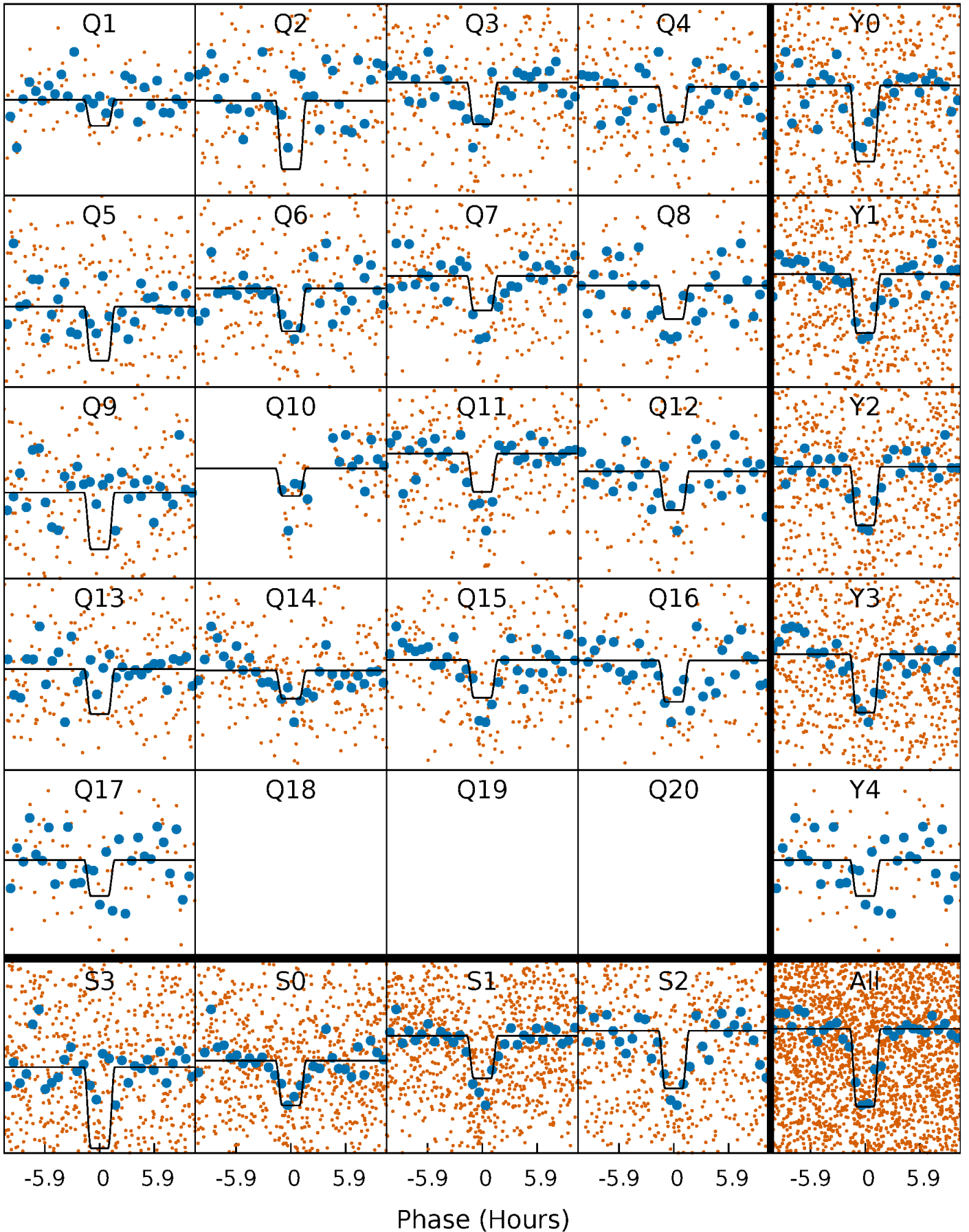
DV Quarter-Phased Transit Curves

TCE 009042357-02 P= 16.003438 Days $T_0=138.344502$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

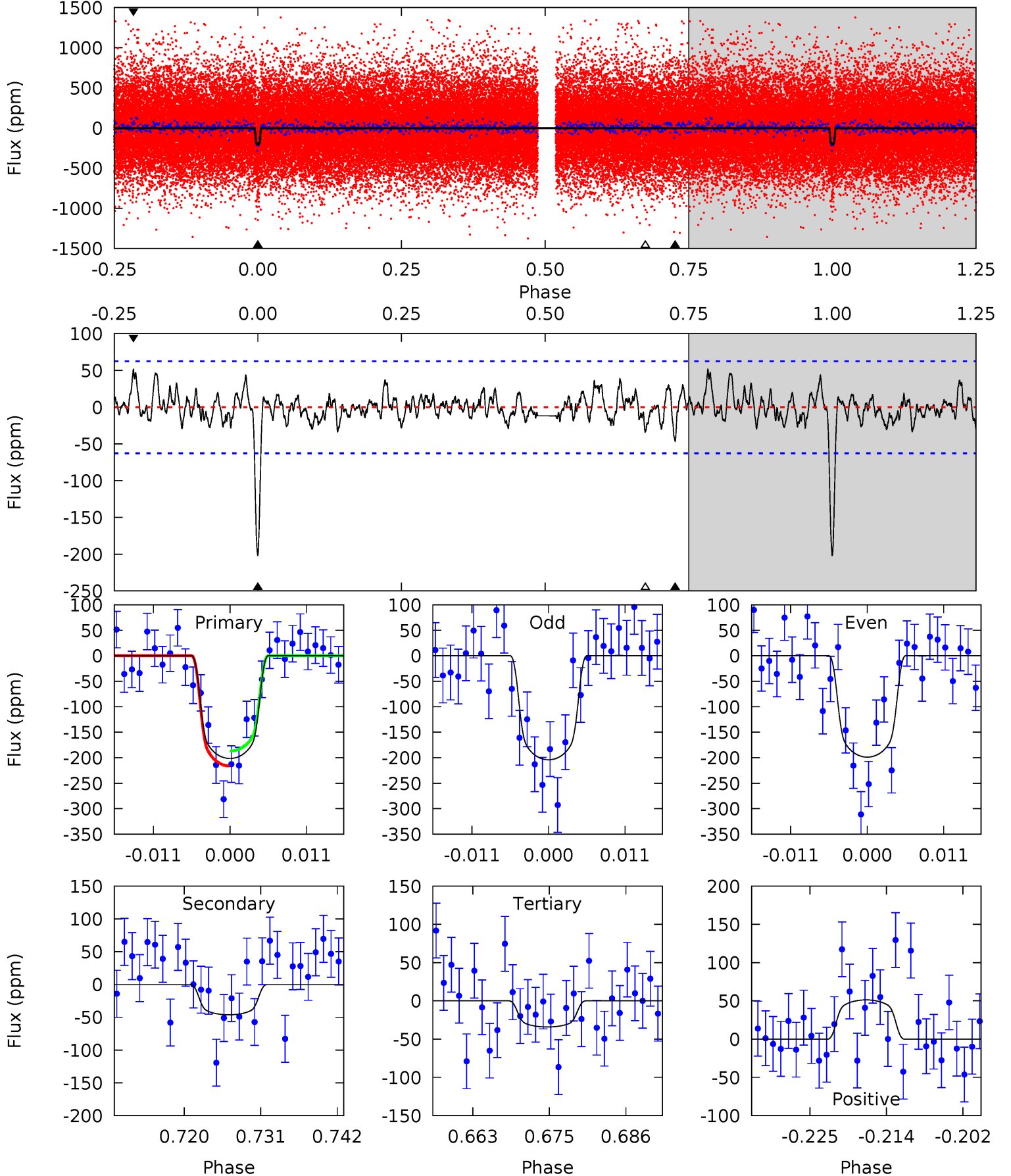
TCE 009042357-02 P= 16.003375 Days $T_0=138.339239$ (BKJD)



DV Model-Shift Uniqueness Test

009042357-02, $P = 16.003438$ Days, $E = 122.341064$ Days

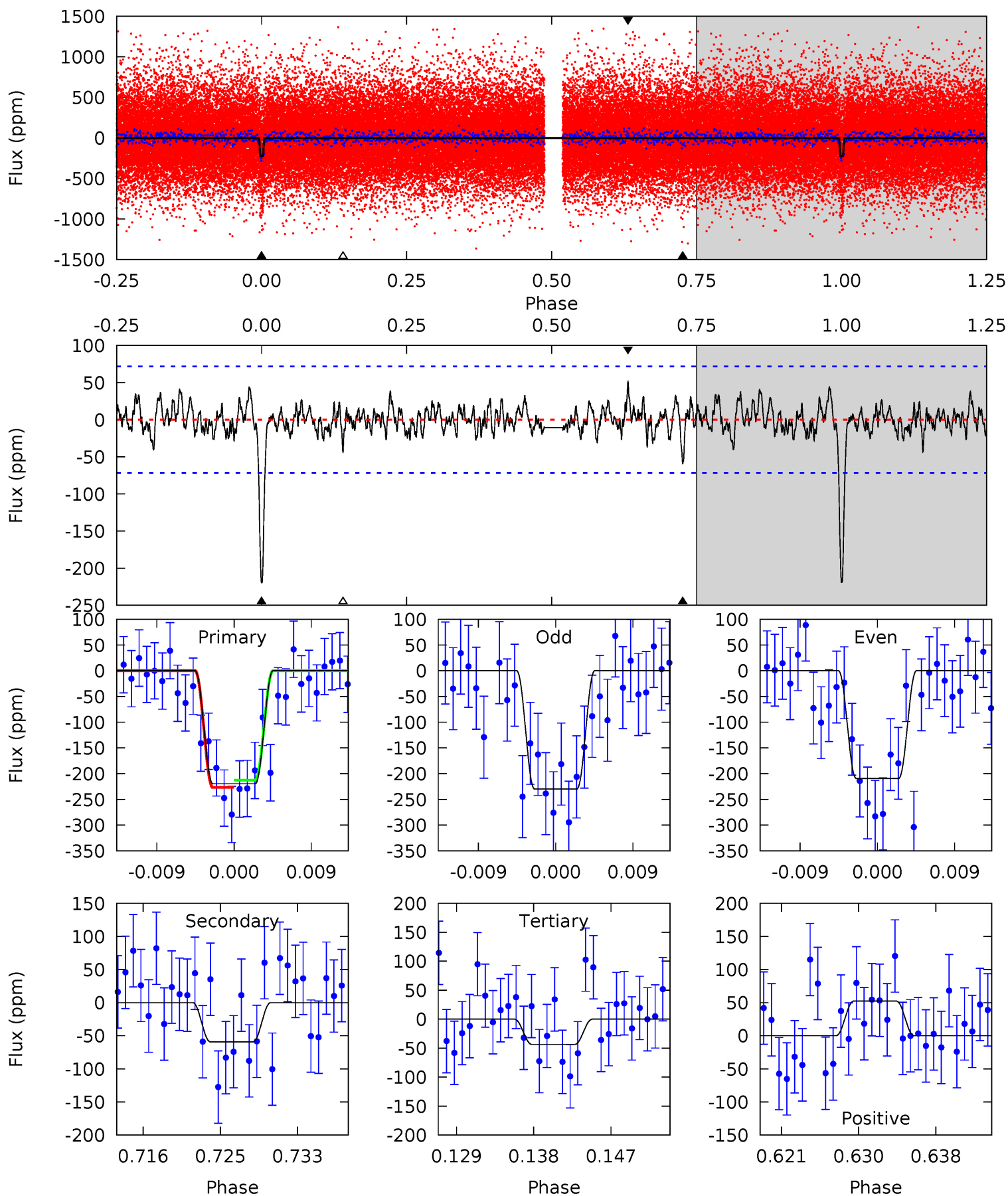
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	3.70	2.73	4.09	5.00	2.53	1.18	13.4	12.0	0.97	-0.40	0.21	0.91	0.20	1.18



Alt Model-Shift Uniqueness Test

009042357-02, P = 16.003375 Days, E = 122.335864 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.5	4.17	3.08	3.68	5.05	2.63	1.02	12.4	11.8	1.09	0.49	0.71	0.90	0.19	0.51



Stellar Parameters For KIC 009042357

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5283^{+157}_{-157}	$4.594^{+0.065}_{-0.058}$	$-0.620^{+0.350}_{-0.300}$	$0.695^{+0.081}_{-0.066}$	$0.691^{+0.076}_{-0.044}$	$2.903^{+0.757}_{-0.601}$
	+3%/-3%	+1%/-1%	+56%/-48%	+12%/-9%	+11%/-6%	+26%/-21%
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 009042357-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-46 ± 13	$1.24^{+0.28}_{-0.26}$	820^{+30}_{-30}	3767^{+409}_{-335}	198^{+152}_{-81}
Alt.	-59 ± 14	$1.21^{+0.27}_{-0.27}$	819^{+30}_{-33}	3972^{+418}_{-334}	272^{+206}_{-108}

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 $A_{obs} \gg 1.0$

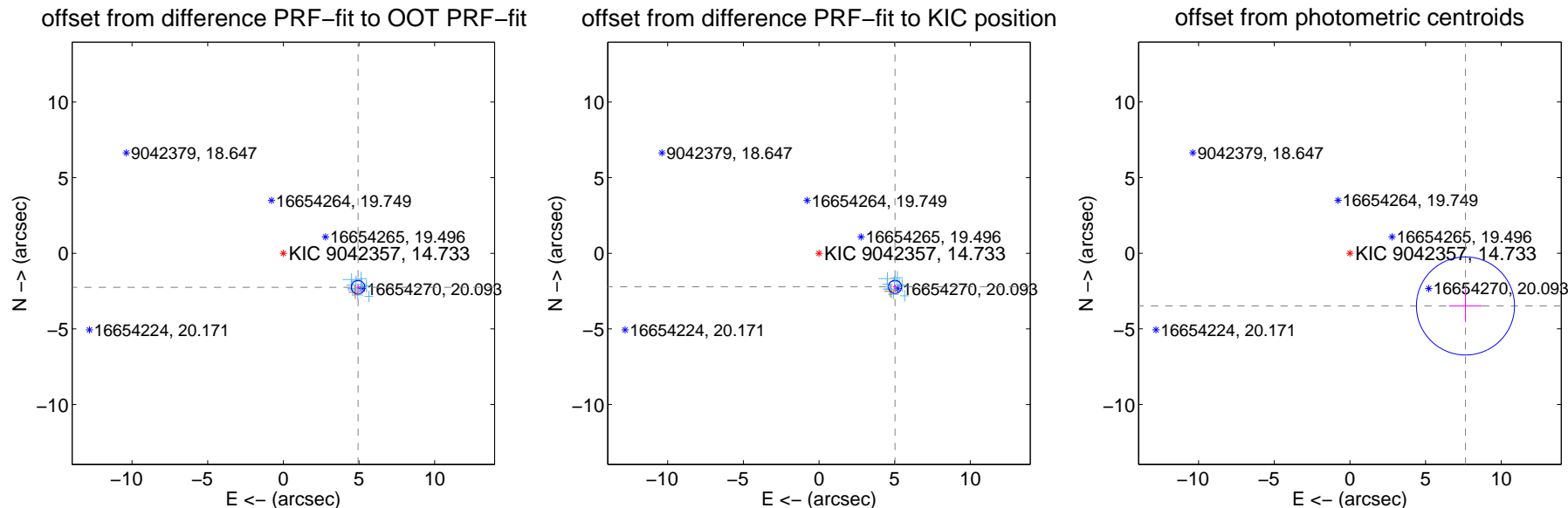
DV Centroid Data

Supplemental centroid analysis for 009042357-02. Kepler magnitude: 14.73. Transit SNR 11.96

There are 10 quarters with good PRF difference image offsets

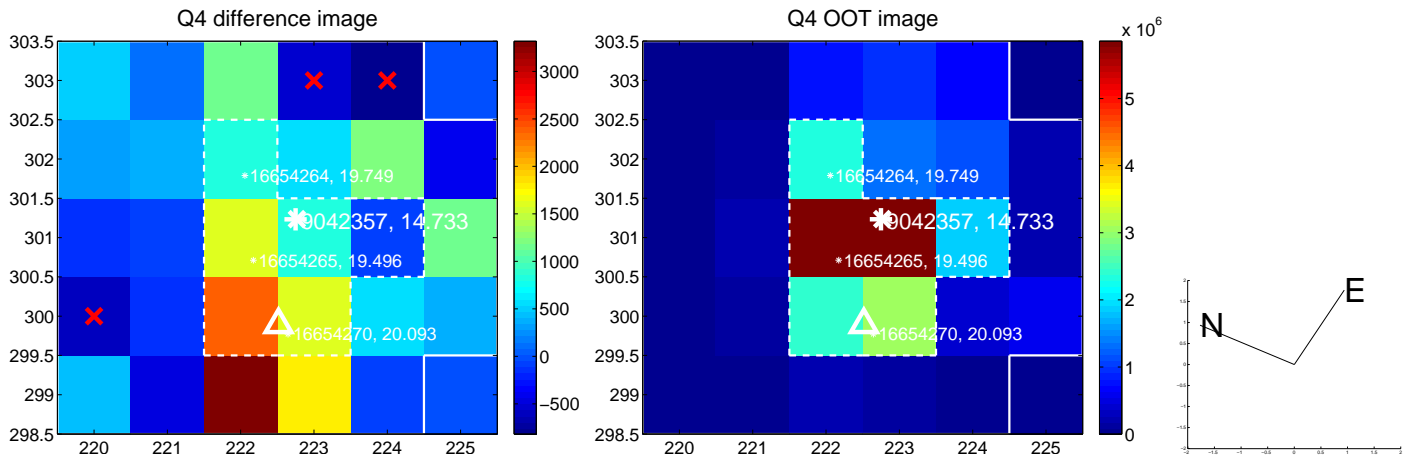
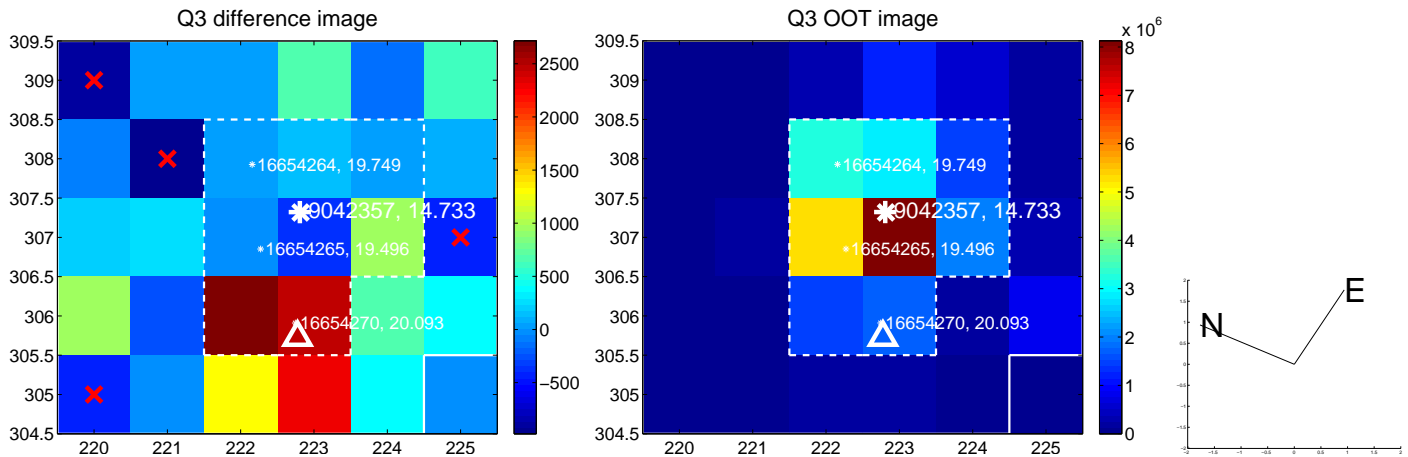
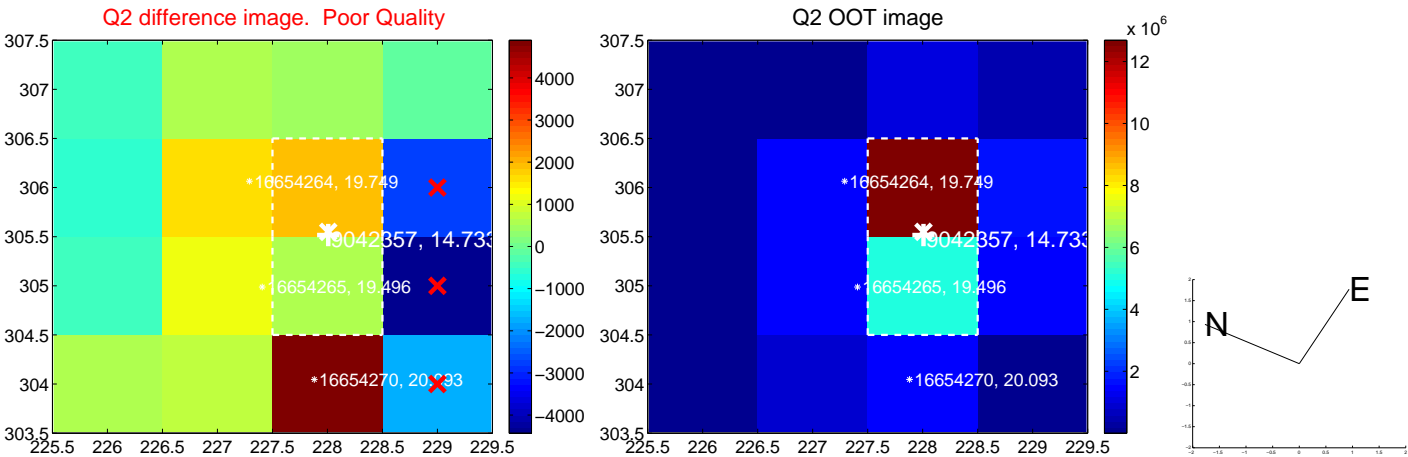
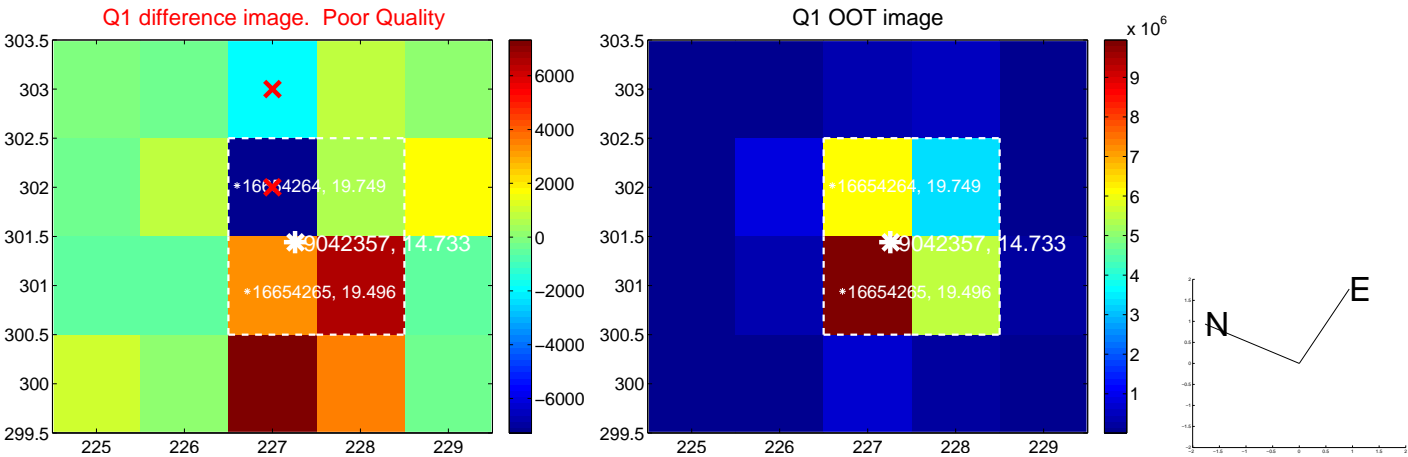
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.428 ± 0.149	36.34	-4.941 ± 0.140	-2.247 ± 0.137
PRF-fit source offset from KIC position	5.493 ± 0.145	37.94	-5.025 ± 0.143	-2.219 ± 0.153
photometric centroid source offset	8.39 ± 1.08	7.77	-7.63 ± 1.09	-3.49 ± 1.06

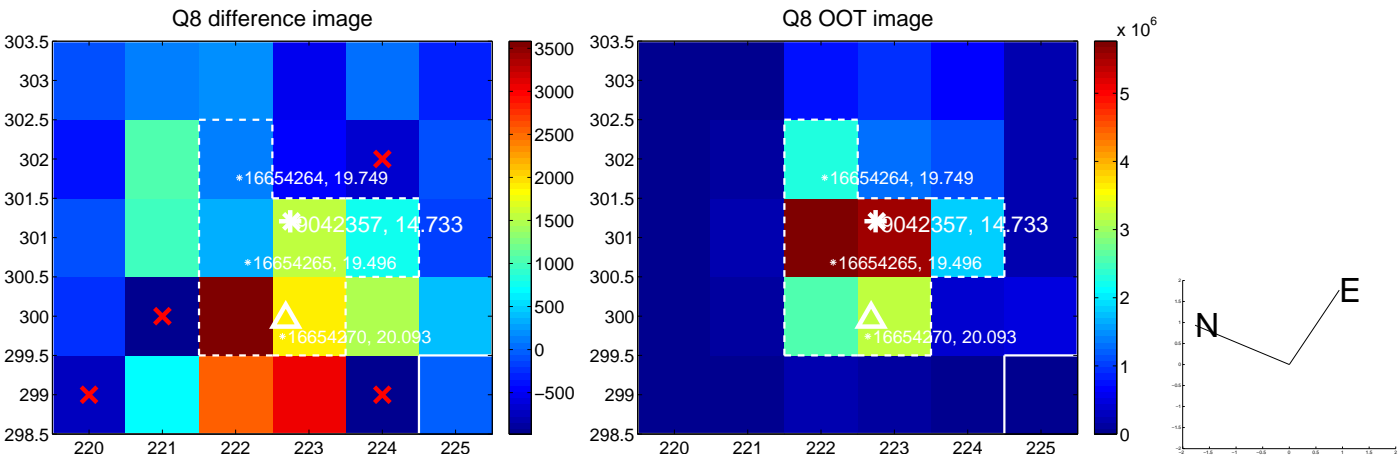
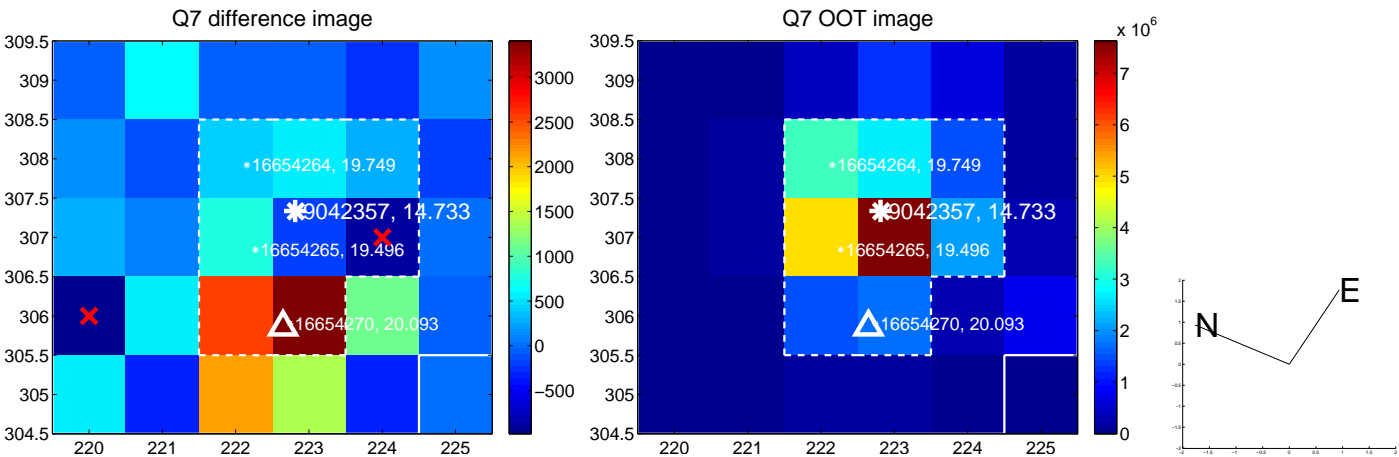
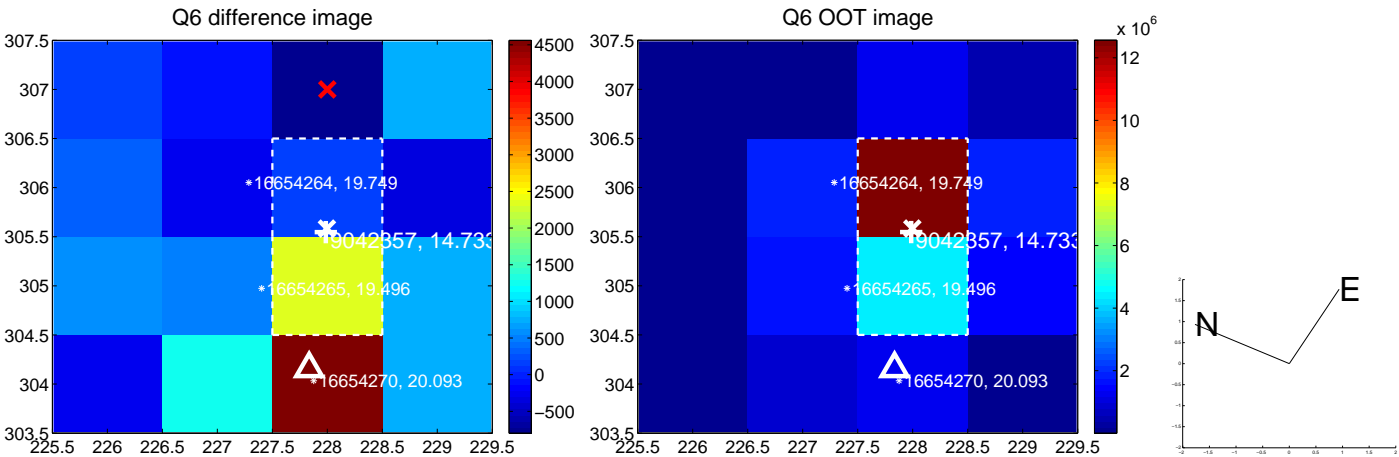
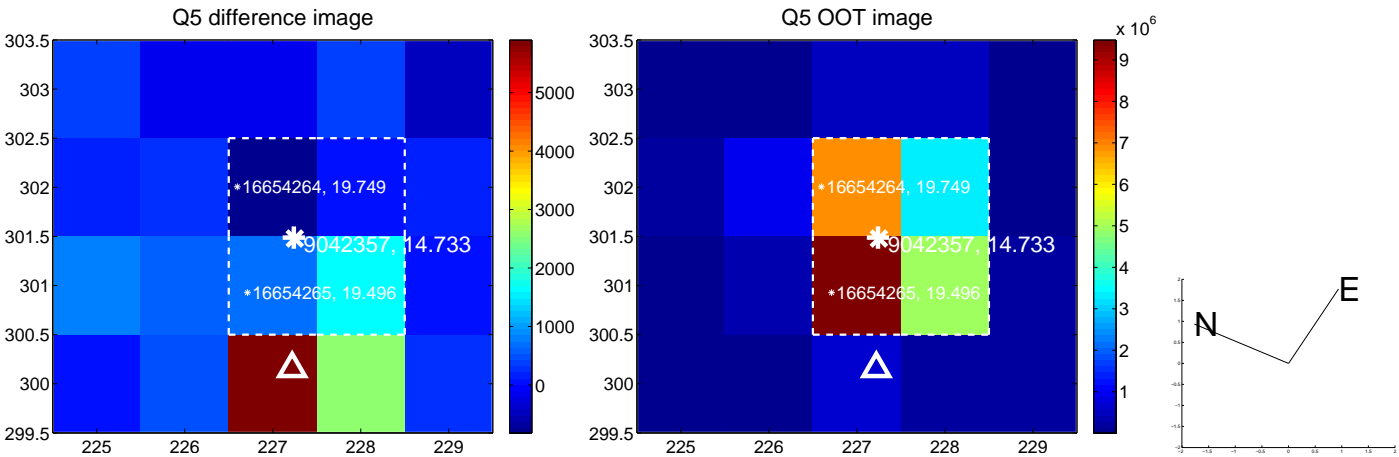


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

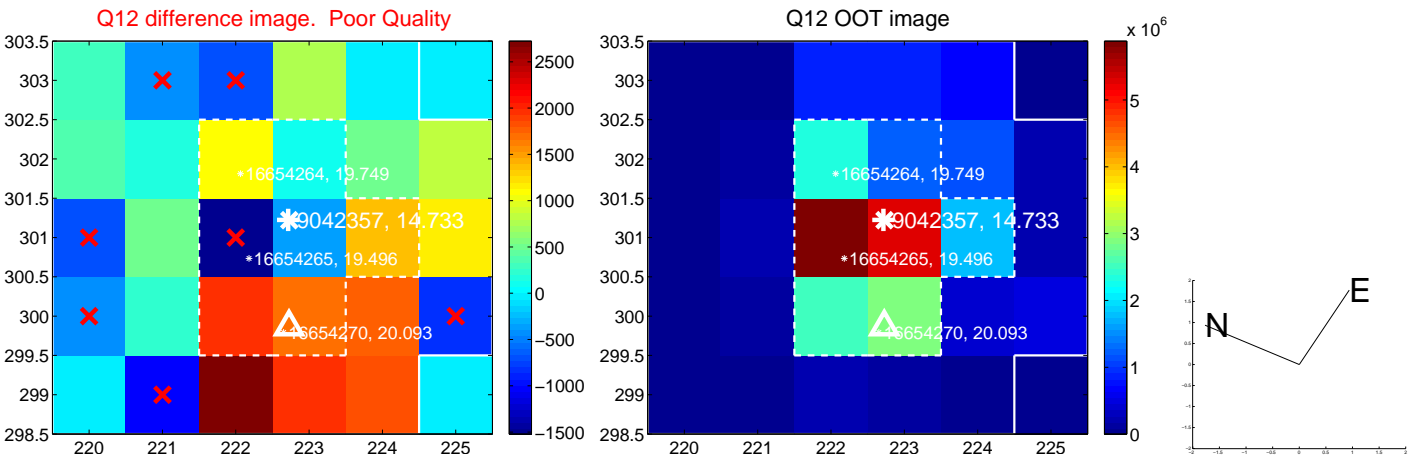
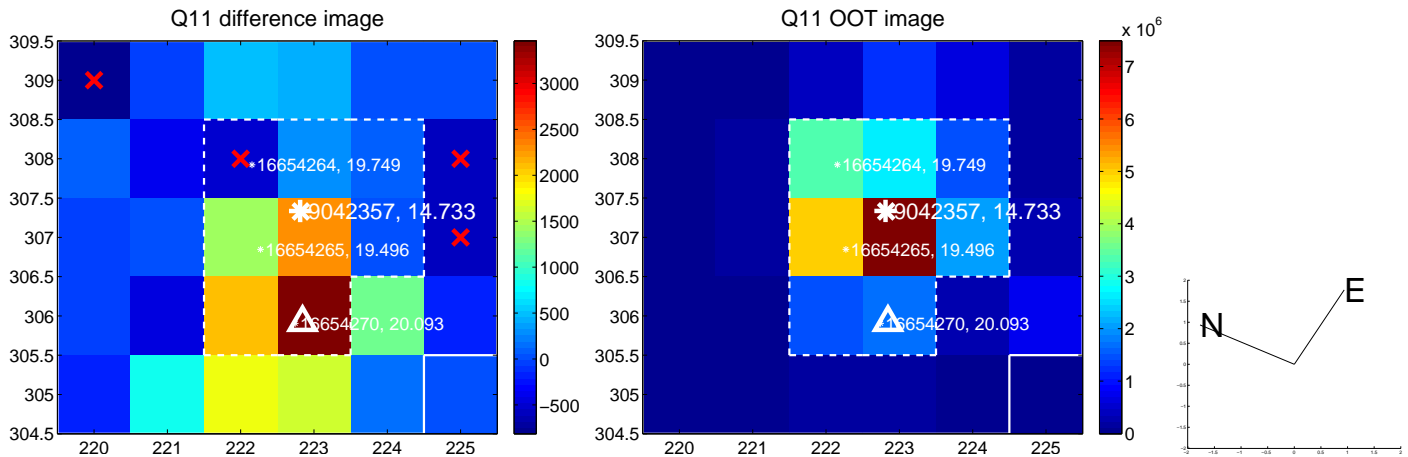
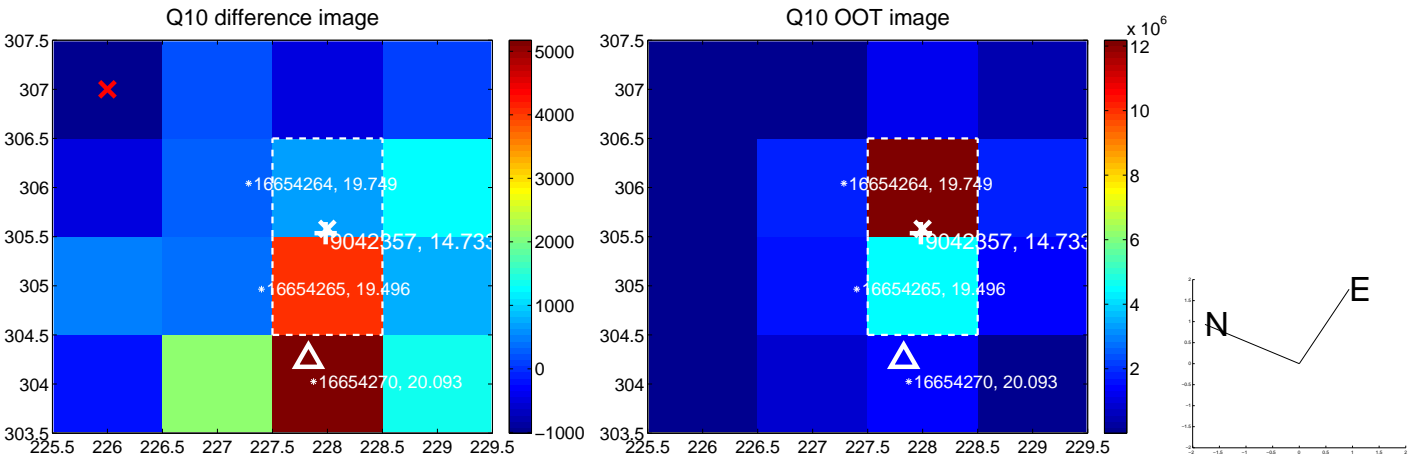
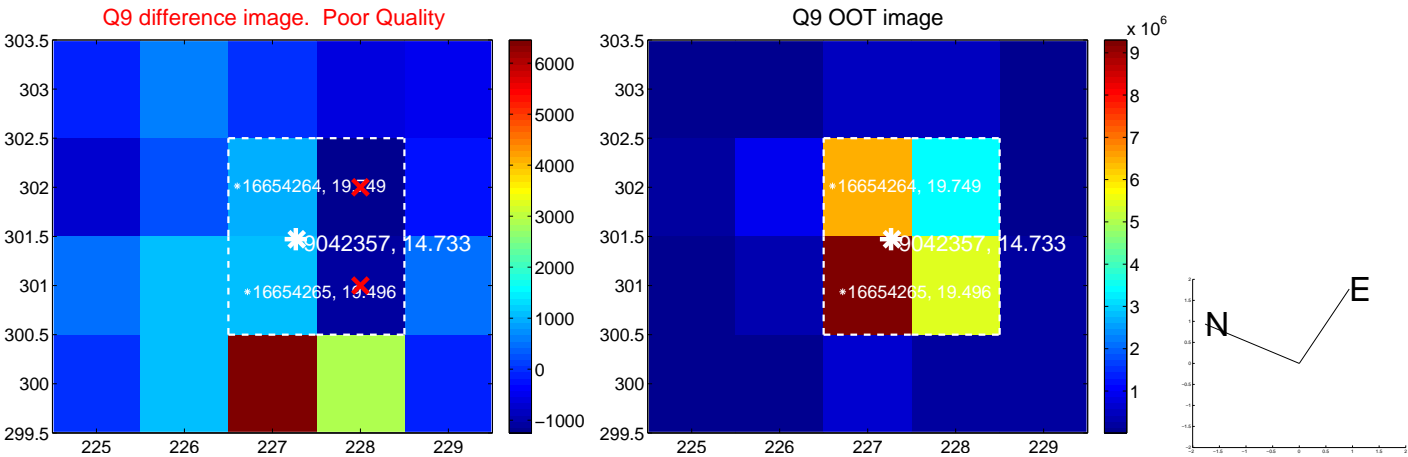
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



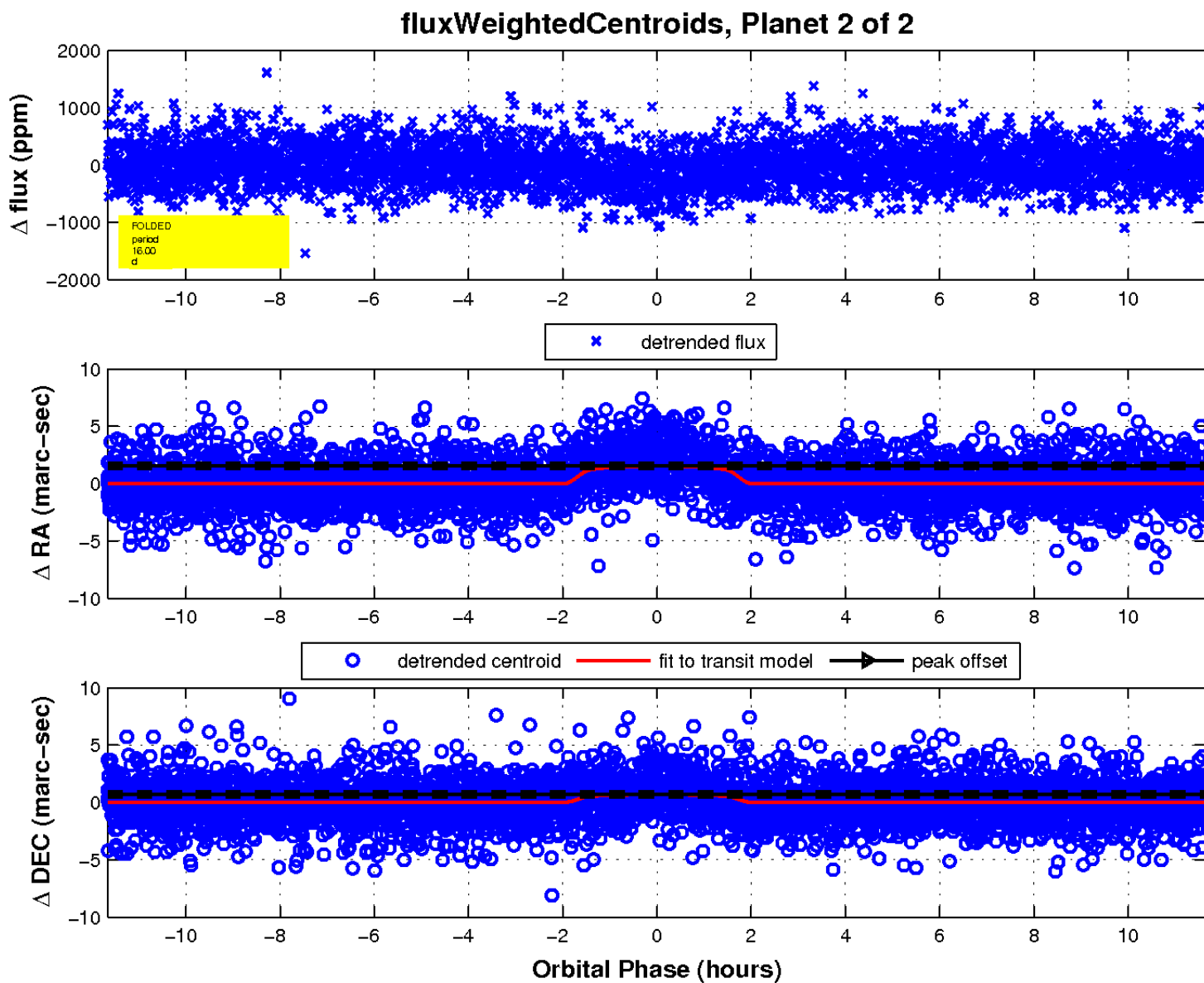
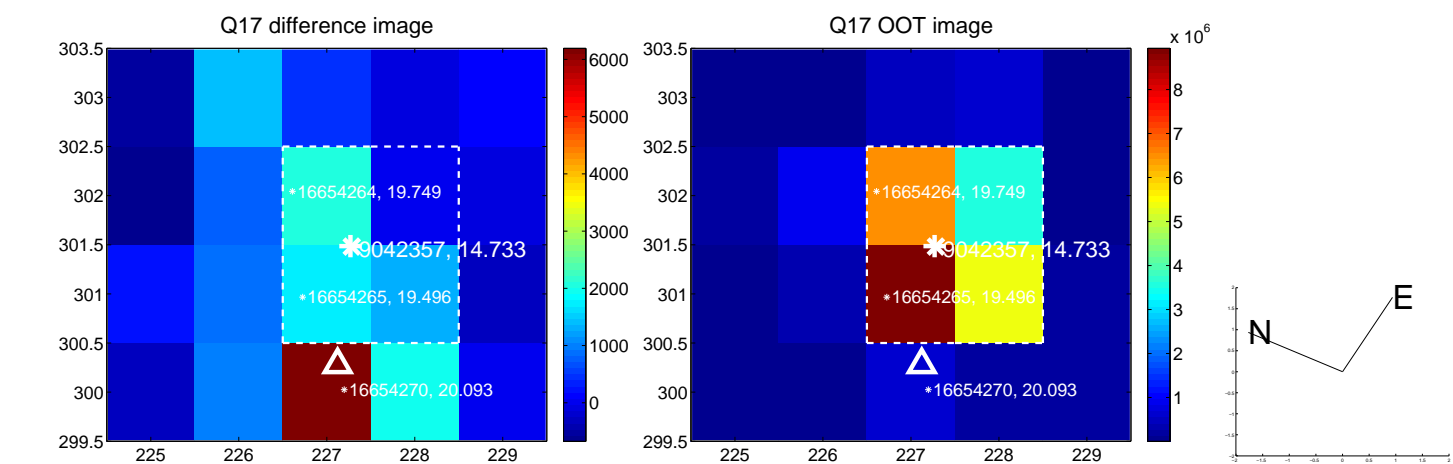
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

