

KIC 005613330

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})
005613330-01	OBS	0649.01	23.449649	136.024865	320.4	8.999	43.8	47.8	1.52	6188	3.07	98.08
005613330-02	OBS	0649.02	10.208953	140.689920	38.5	6.600	7.4	7.9	1.52	6188	1.10	297.24

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005613330-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005613330-02	OBS	PC	0.62	0	0	0	0	NO_COMMENT

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

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

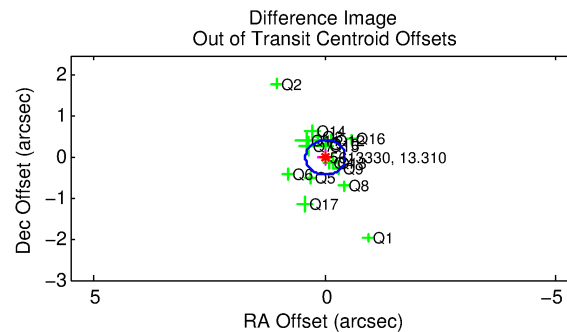
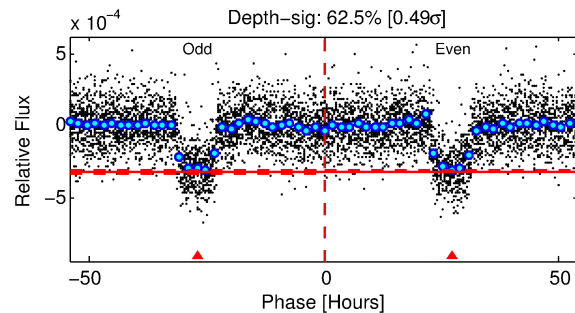
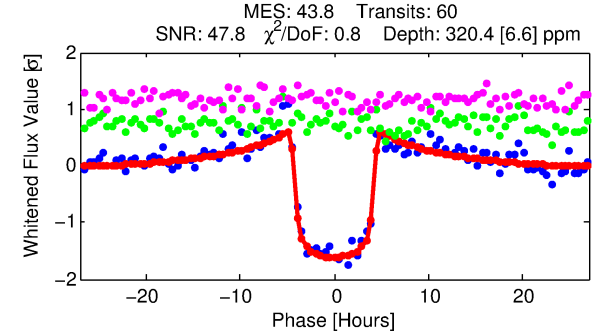
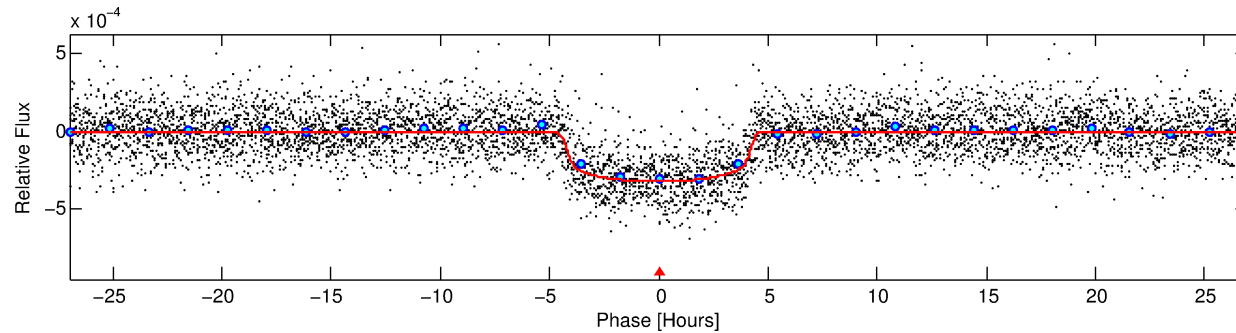
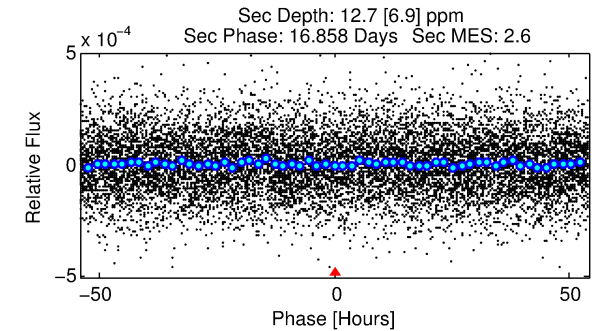
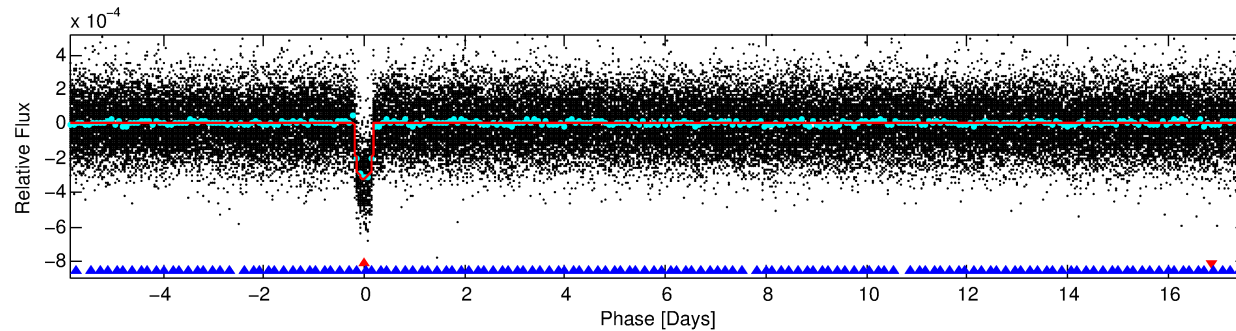
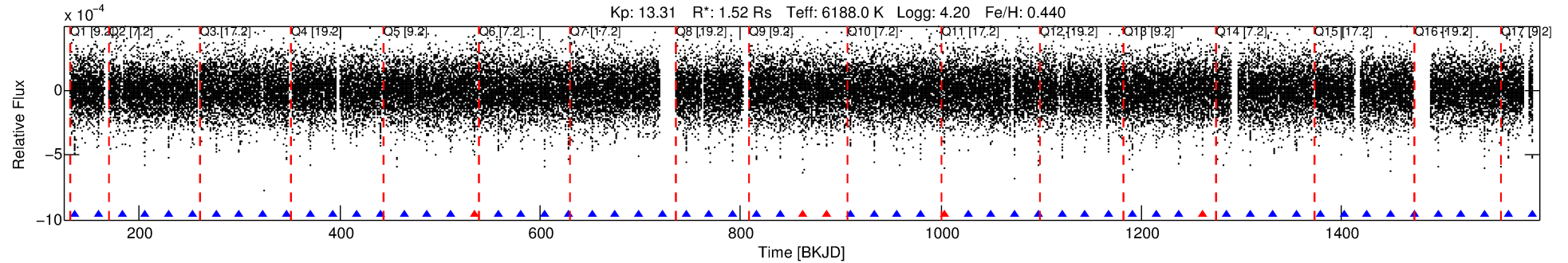
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005613330-01

No Significant Match Found

DV One-Page Summary

KIC: 5613330 Candidate: 1 of 2 Period: 23.450 d
KOI: K00649.01 Corr: 0.981



DV Fit Results:

Period = 23.44965 [0.00007] d
Epoch = 136.0249 [0.0026] BKJD
Rp/R* = 0.0184 [0.0009]
a/R* = 11.81 [2.60]
b = 0.83 [0.08]
Seff = 98.08 [23.99]
Teq = 802 [49] K
Rp = 3.07 [0.58] Re
a = 0.1764 [0.0274] AU
Ag = 23.05 [13.77] [1.60σ]
Teffp = 2719 [380] K [5.01σ]

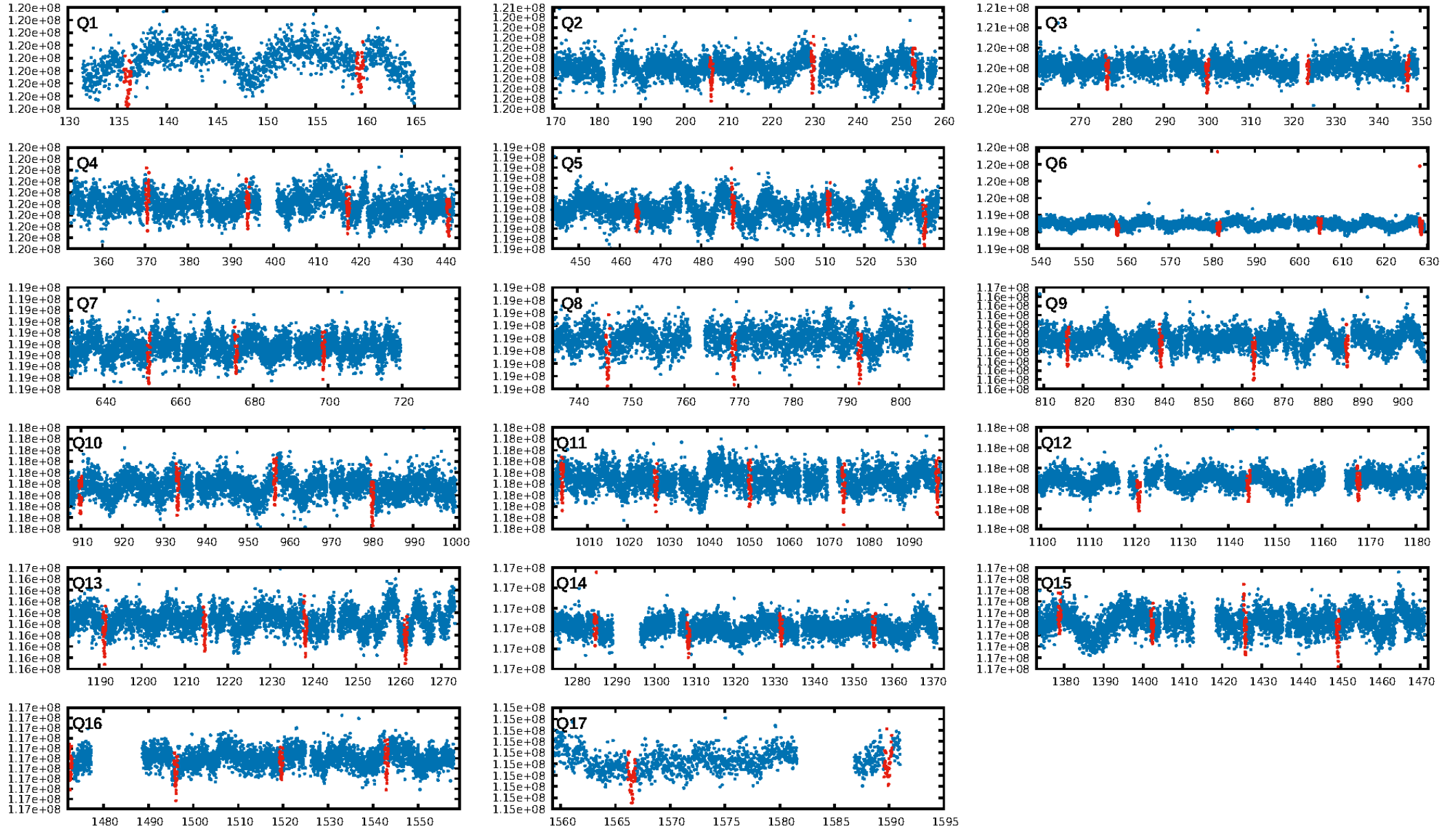
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.47σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 96.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.91 [51/56]
GhostDiagnostic-chr: 7.64
Centroid-sig: 0.0%
Centroid-so: 0.480 arcsec [2.13σ]
OotOffset-rm: 0.012 arcsec [0.09σ]
KicOffset-rm: 0.053 arcsec [0.34σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
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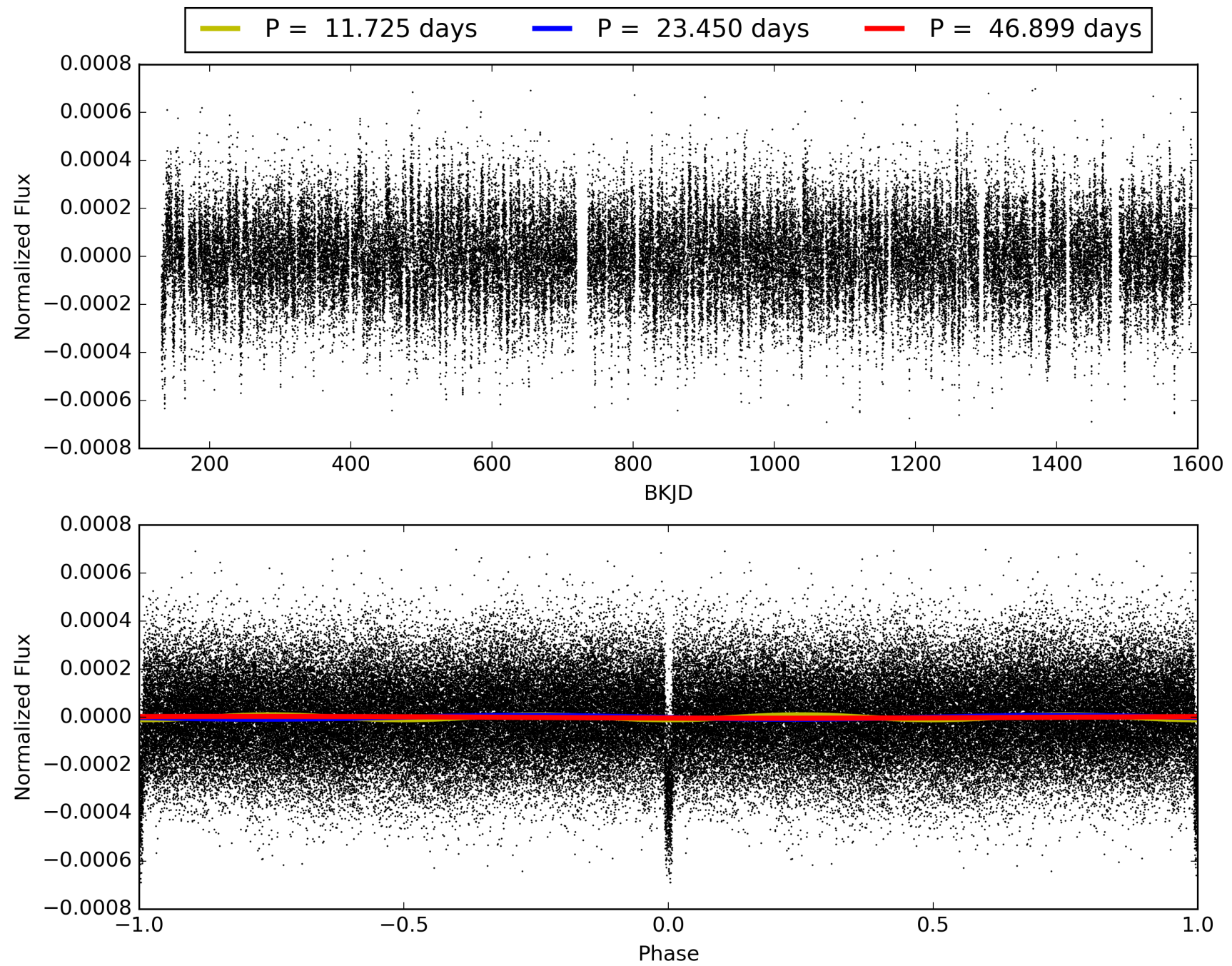
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005613330-01, PDC Light Curves

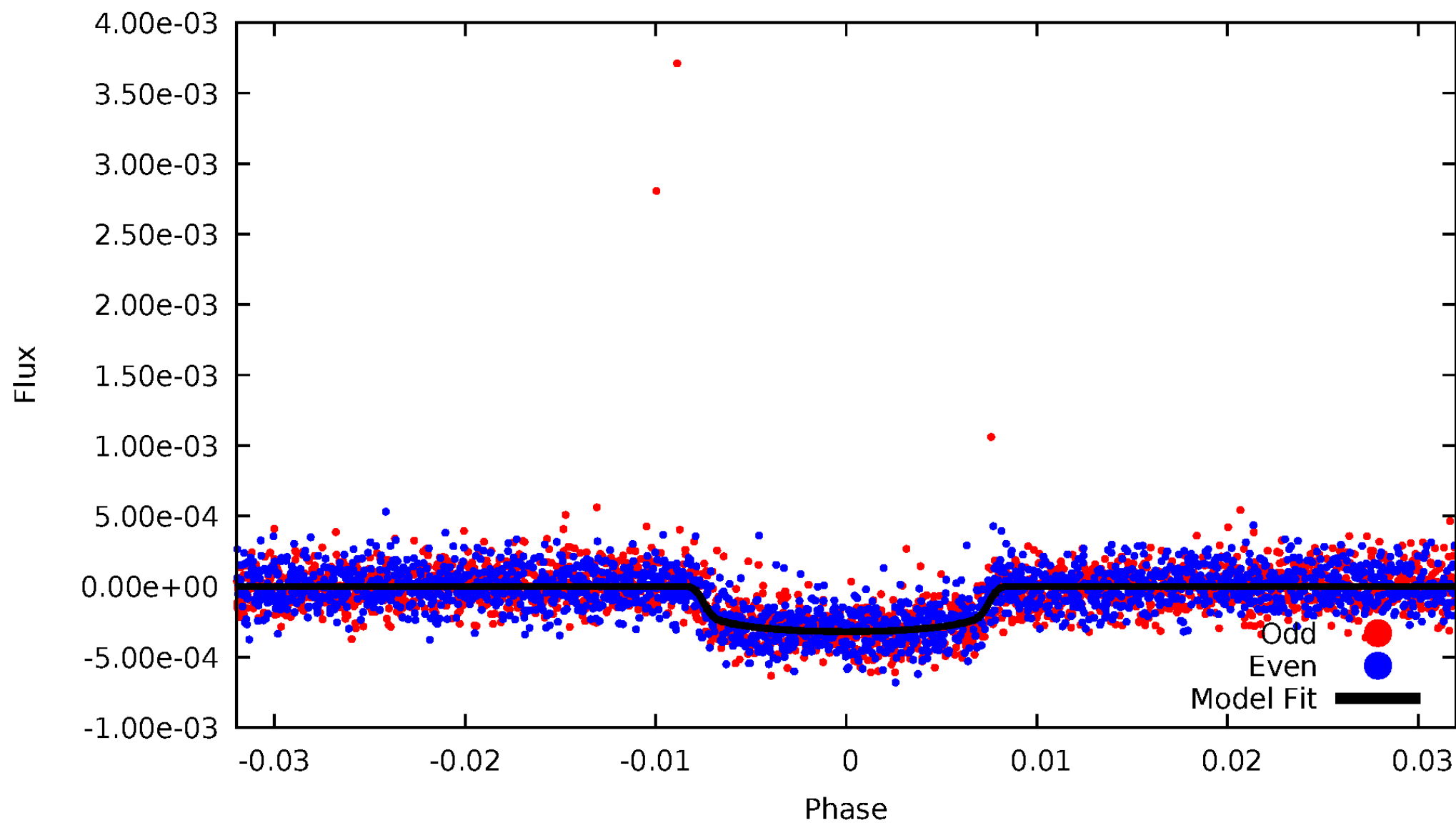


TCE 005613330-01



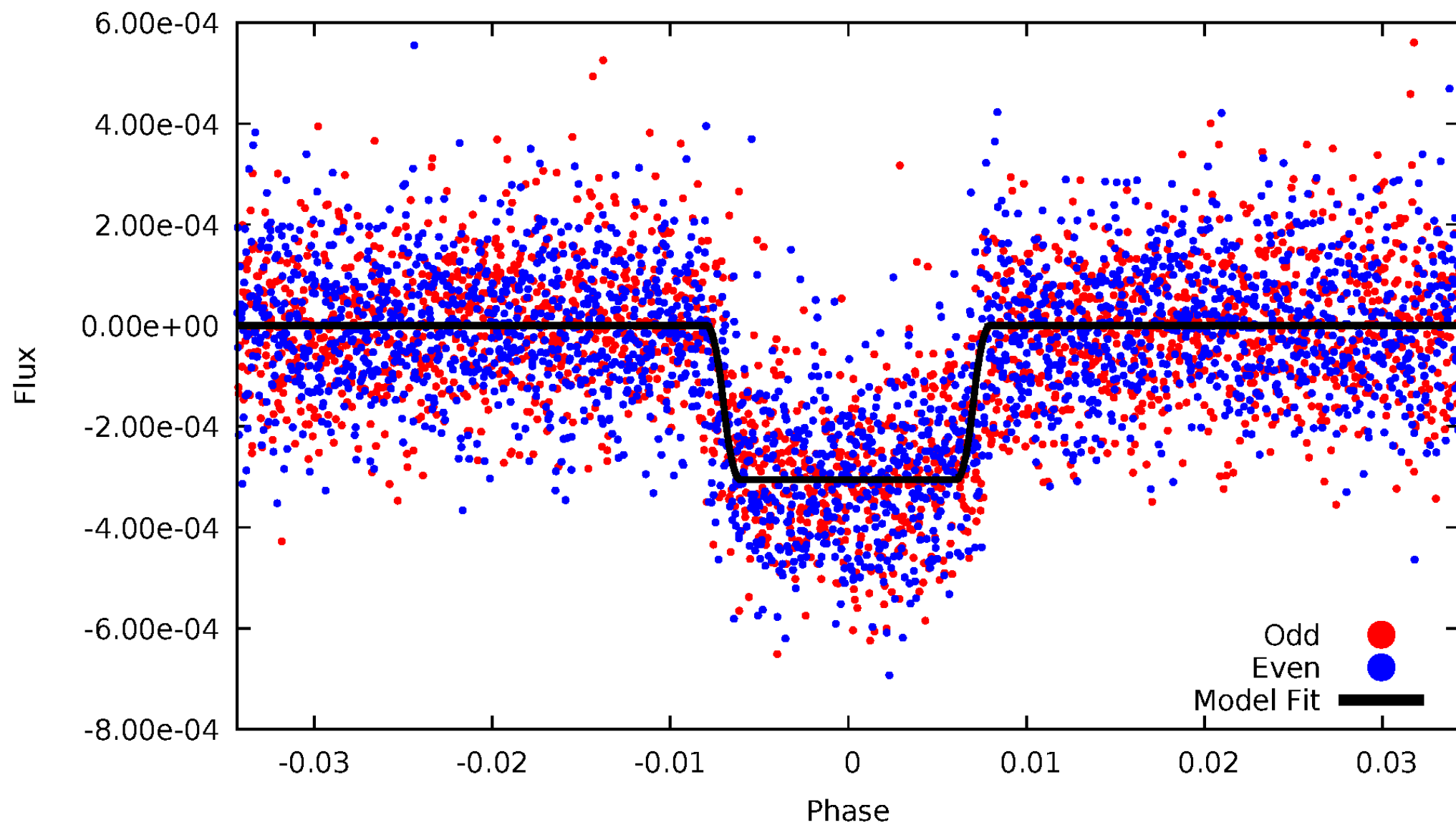
DV Odd/Even

TCE 005613330-01



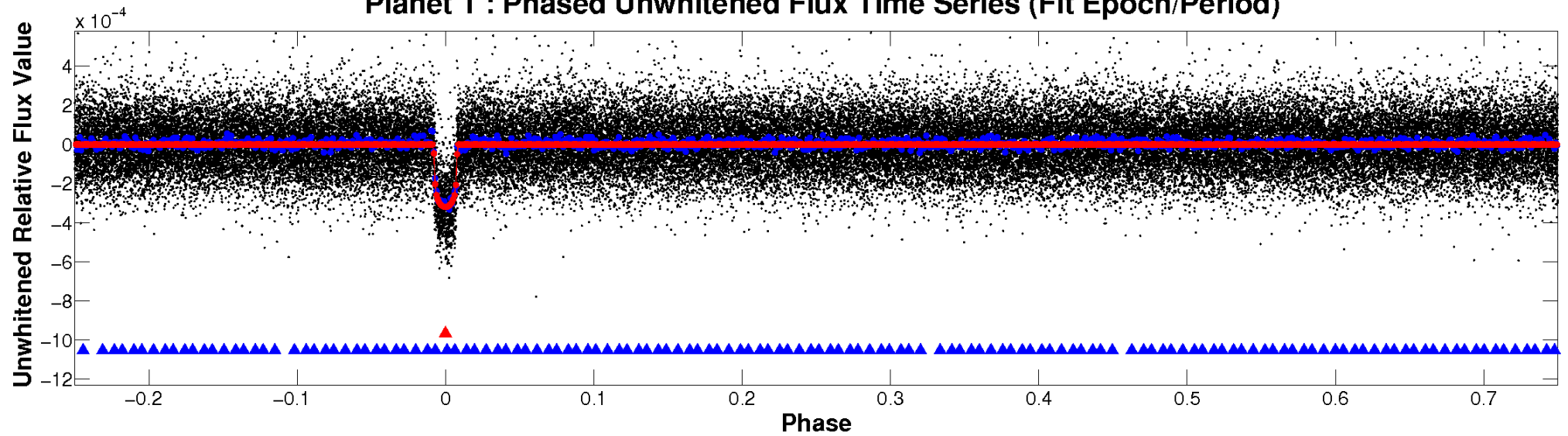
ALT Odd/Even

TCE 005613330-01

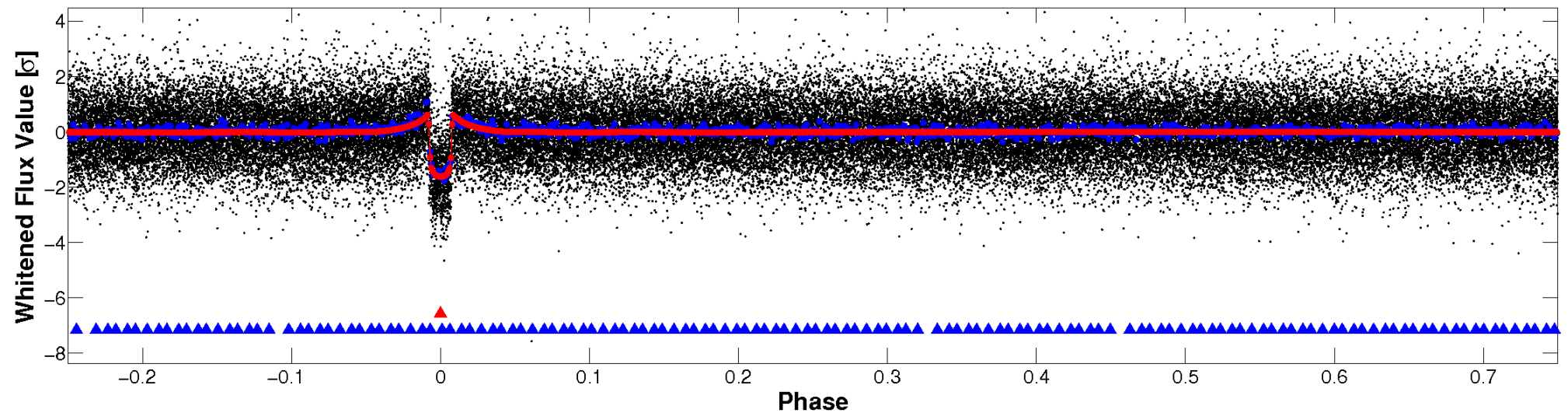


Non-Whitened Vs. Whitened Light Curve

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

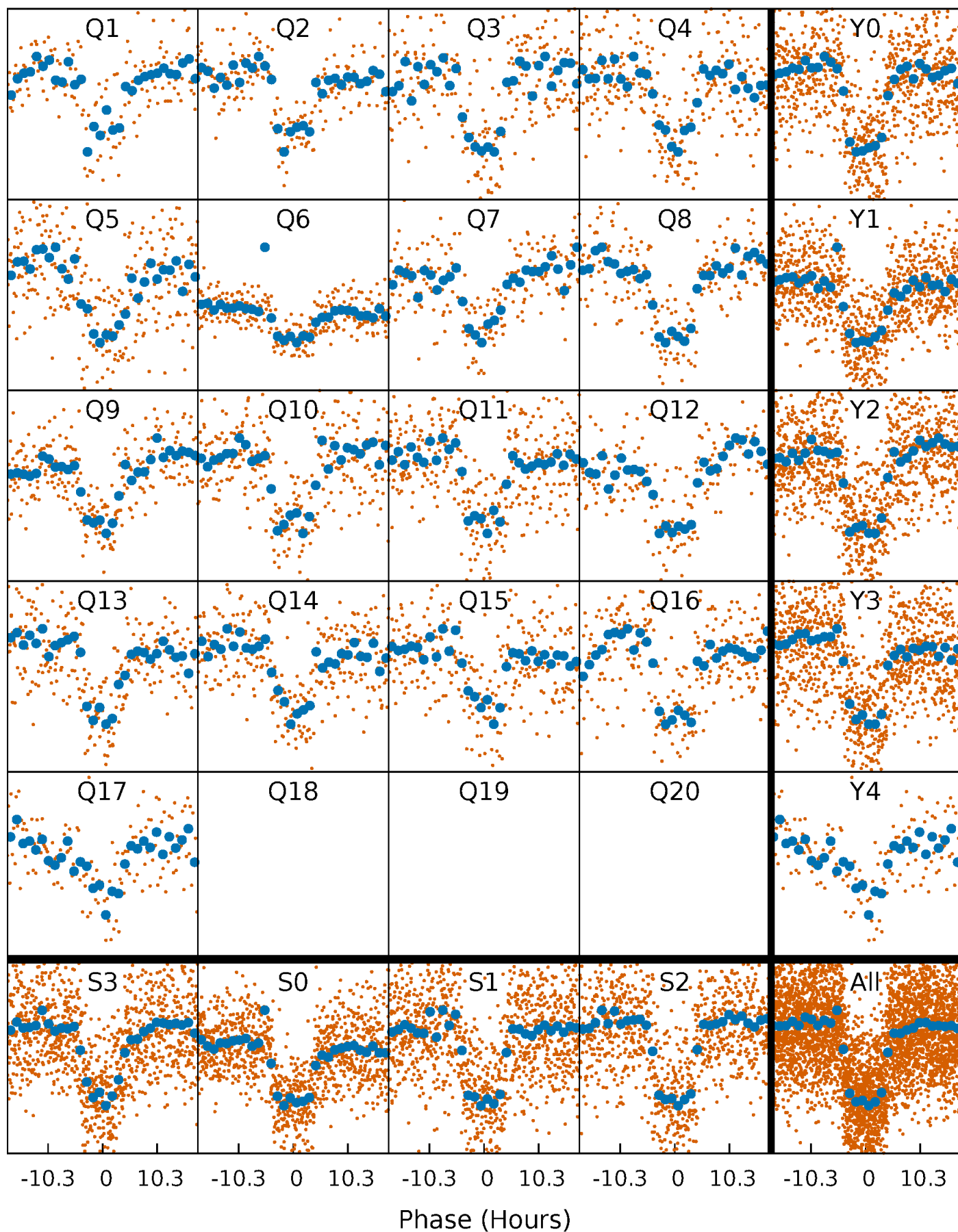


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



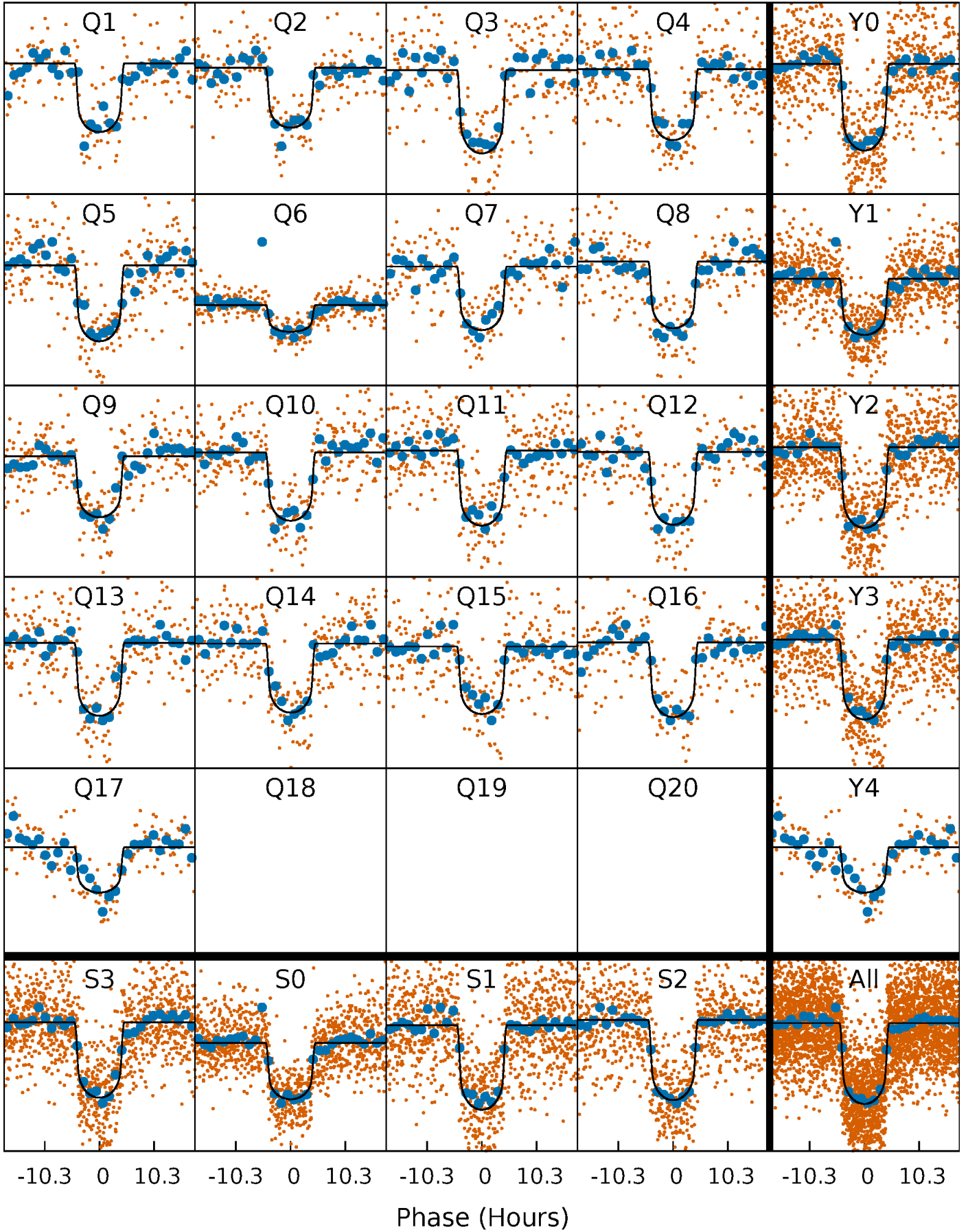
PDC Quarter-Phased Transit Curves

TCE 005613330-01 P= 23.449649 Days $T_0=136.024865$ (BKJD)



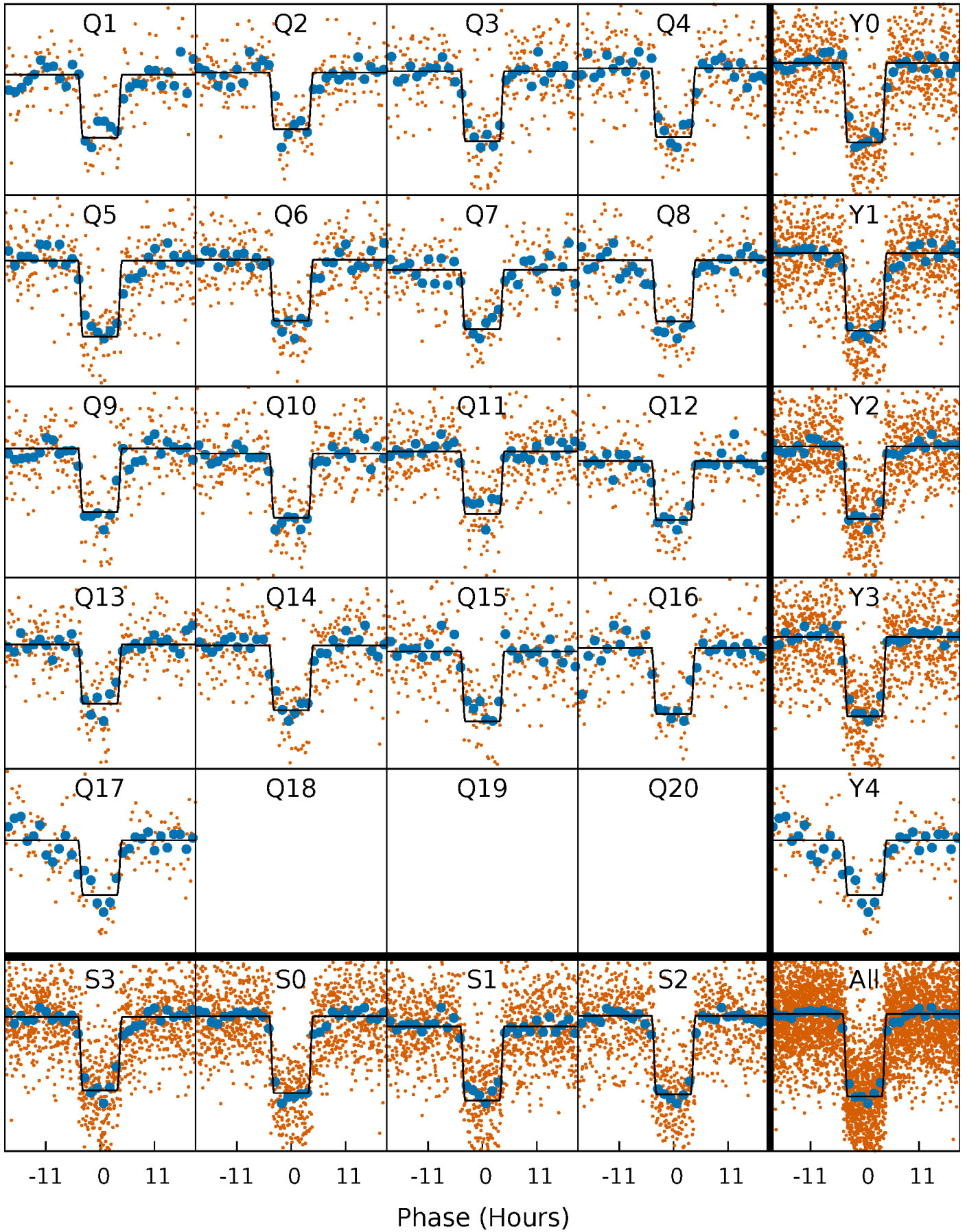
DV Quarter-Phased Transit Curves

TCE 005613330-01 P= 23.449649 Days $T_0=136.024865$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

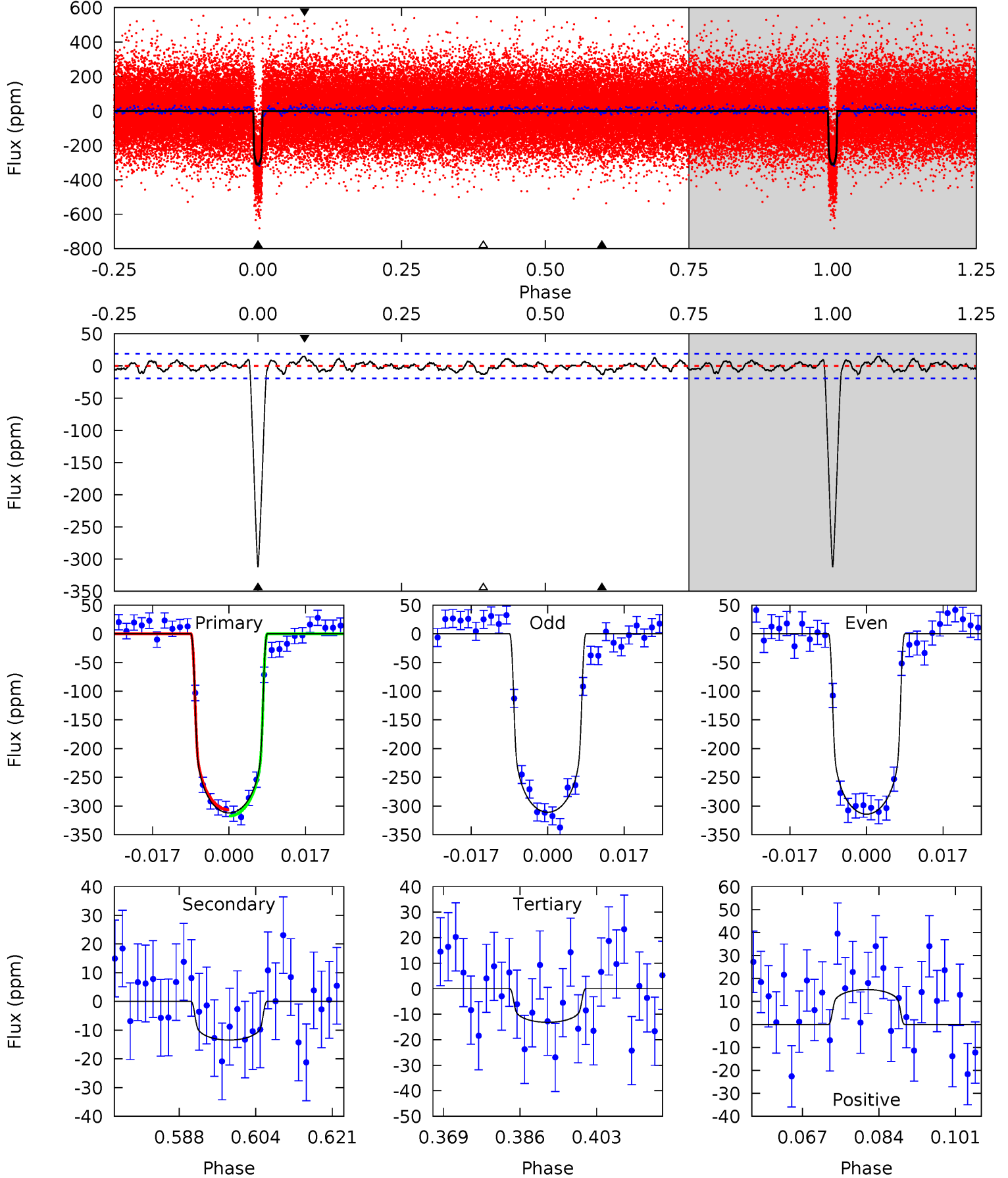
TCE 005613330-01 P= 23.450265 Days $T_0=136.006942$ (BKJD)



DV Model-Shift Uniqueness Test

005613330-01, $P = 23.449649$ Days, $E = 112.575216$ Days

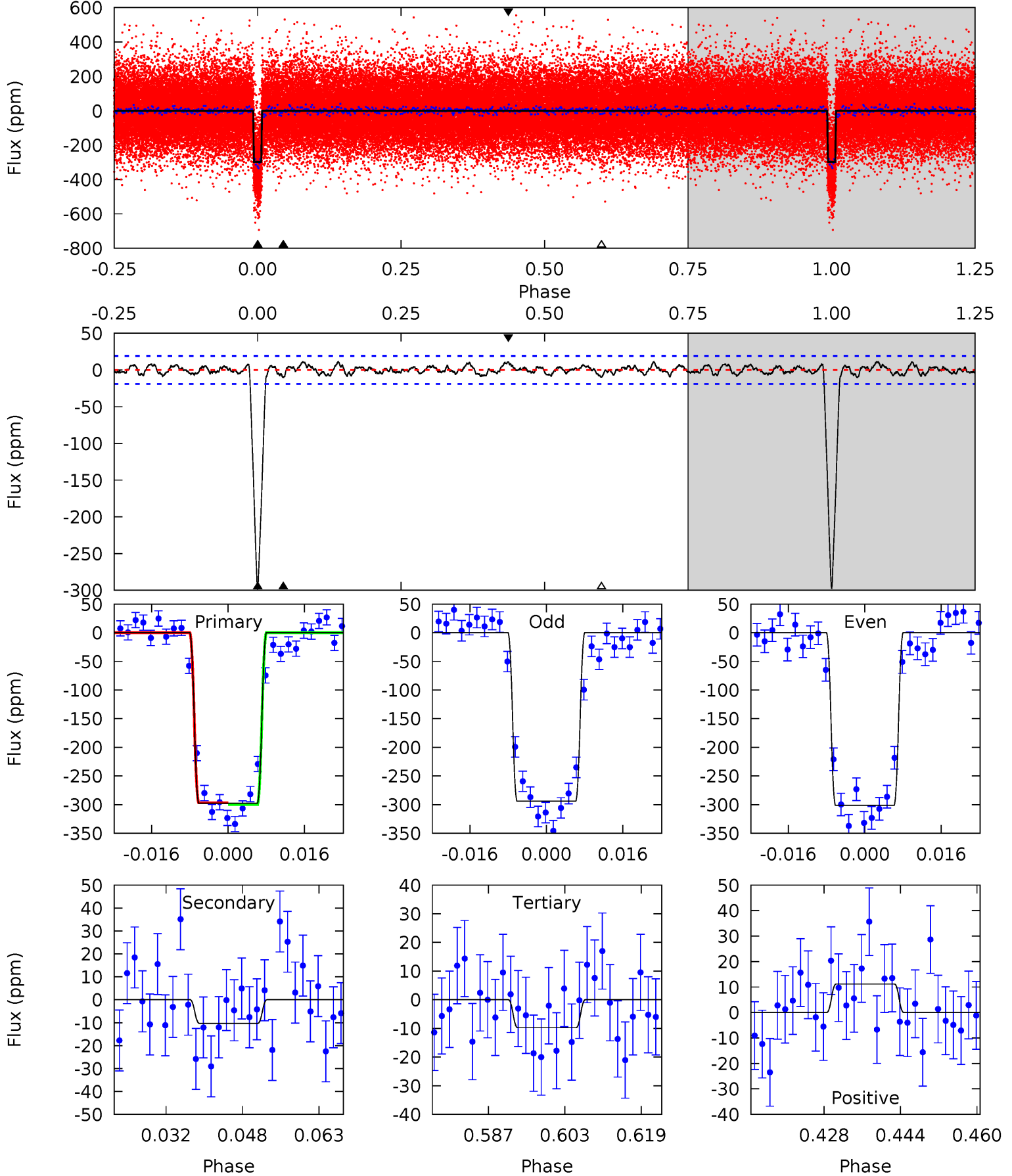
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
80.4	3.47	3.40	3.91	4.93	2.39	1.40	77.1	76.5	0.07	-0.45	0.43	0.94	0.05	1.39



Alt Model-Shift Uniqueness Test

005613330-01, $P = 23.450265$ Days, $E = 112.556677$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
76.8	2.65	2.52	2.88	4.94	2.41	1.12	74.3	73.9	0.14	-0.23	0.93	0.93	0.04	0.38



Stellar Parameters For KIC 005613330

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6188^{+110}_{-135}	$4.196^{+0.115}_{-0.126}$	$0.440^{+0.050}_{-0.150}$	$1.524^{+0.278}_{-0.228}$	$1.330^{+0.100}_{-0.100}$	$0.529^{+0.289}_{-0.186}$
	+2%/-2%	+3%/-3%	+11%/-34%	+18%/-15%	+8%/-8%	+55%/-35%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 005613330-01 / KOI 0649.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-13 ± 4	$3.06^{+0.33}_{-0.30}$	1122^{+59}_{-54}	3309^{+146}_{-176}	24^{+10}_{-8}
Alt.	-10 ± 4	$2.92^{+0.34}_{-0.27}$	1122^{+57}_{-48}	3211^{+175}_{-232}	20^{+9}_{-8}

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

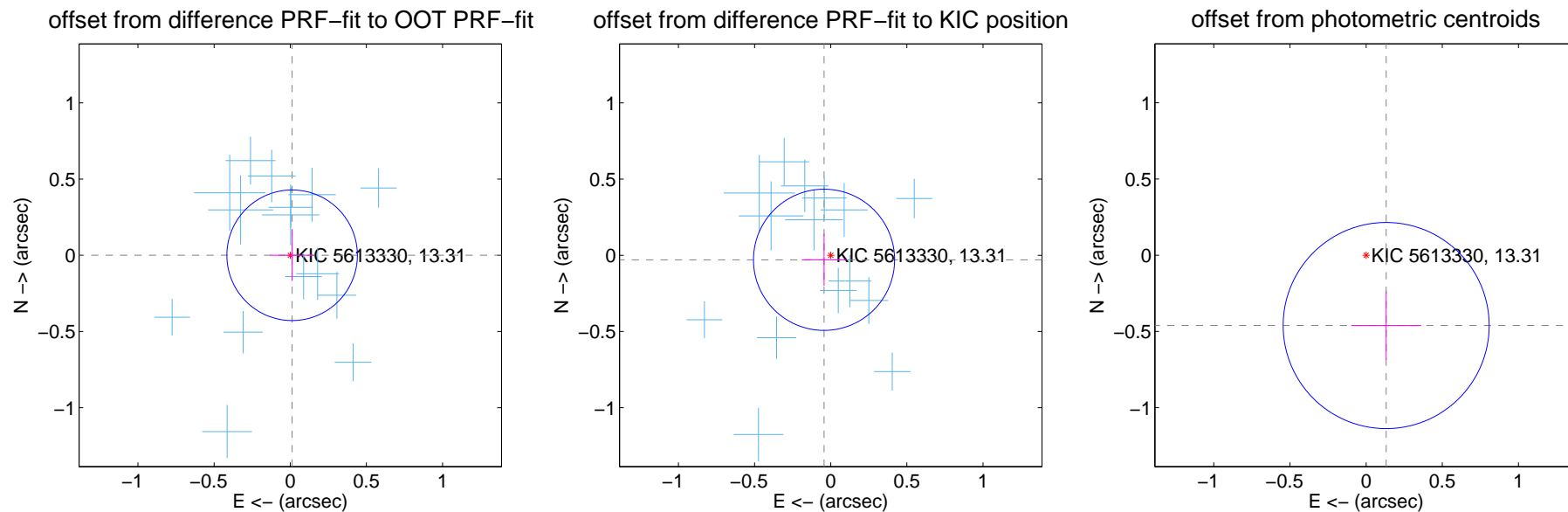
DV Centroid Data

Supplemental centroid analysis for 005613330-01. Kepler magnitude: 13.31. Transit SNR 47.78

There are 17 quarters with good PRF difference image offsets

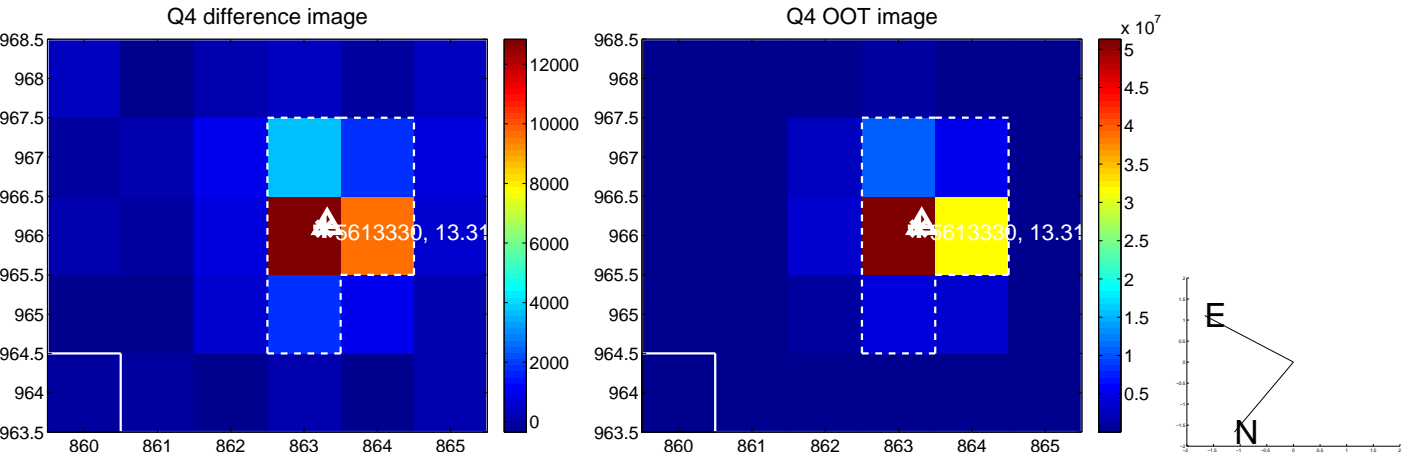
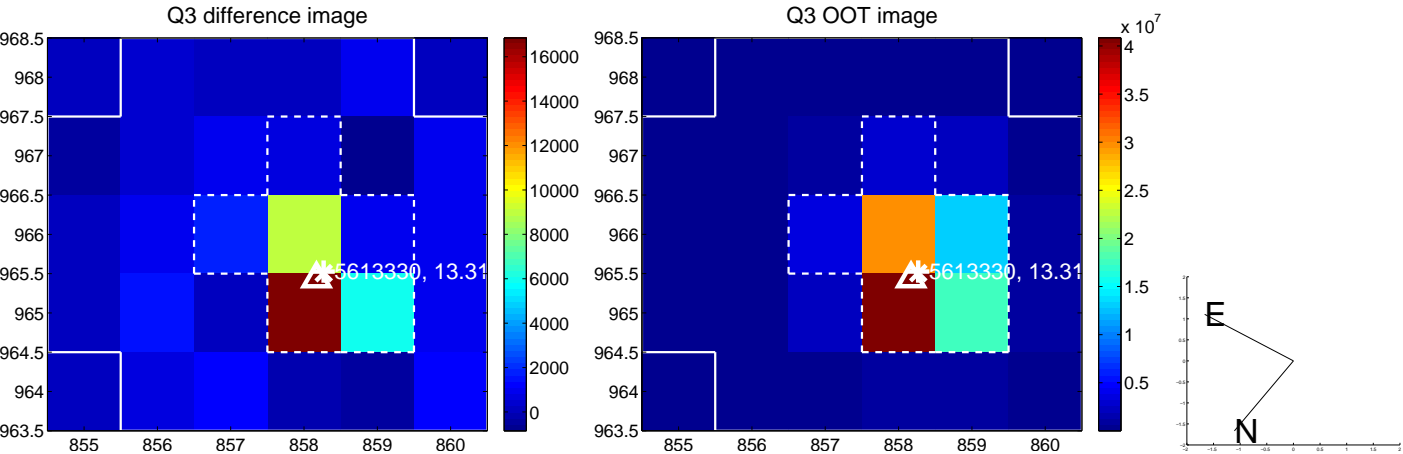
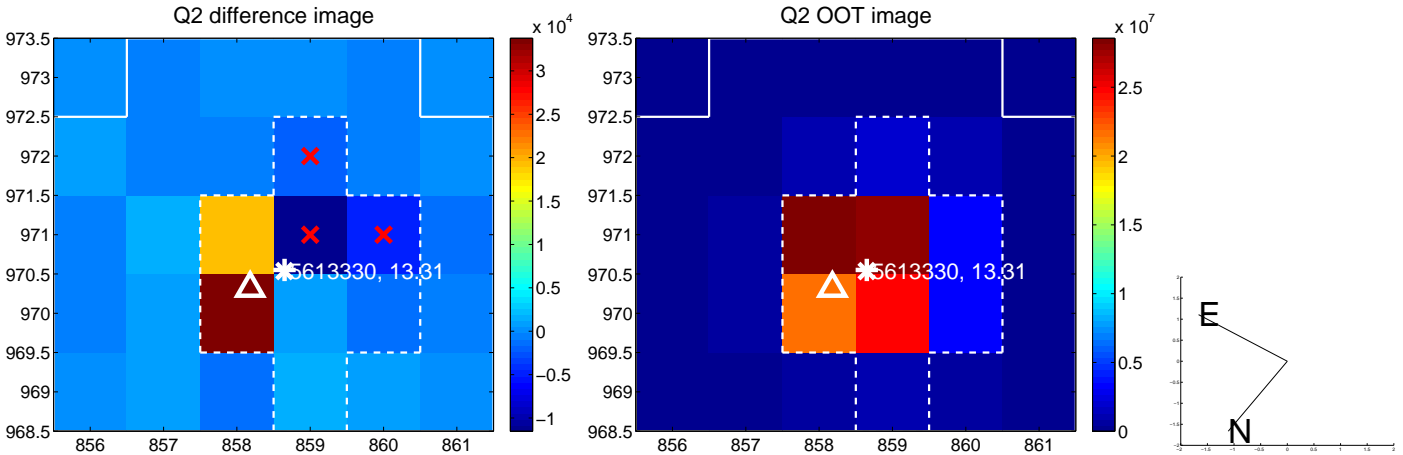
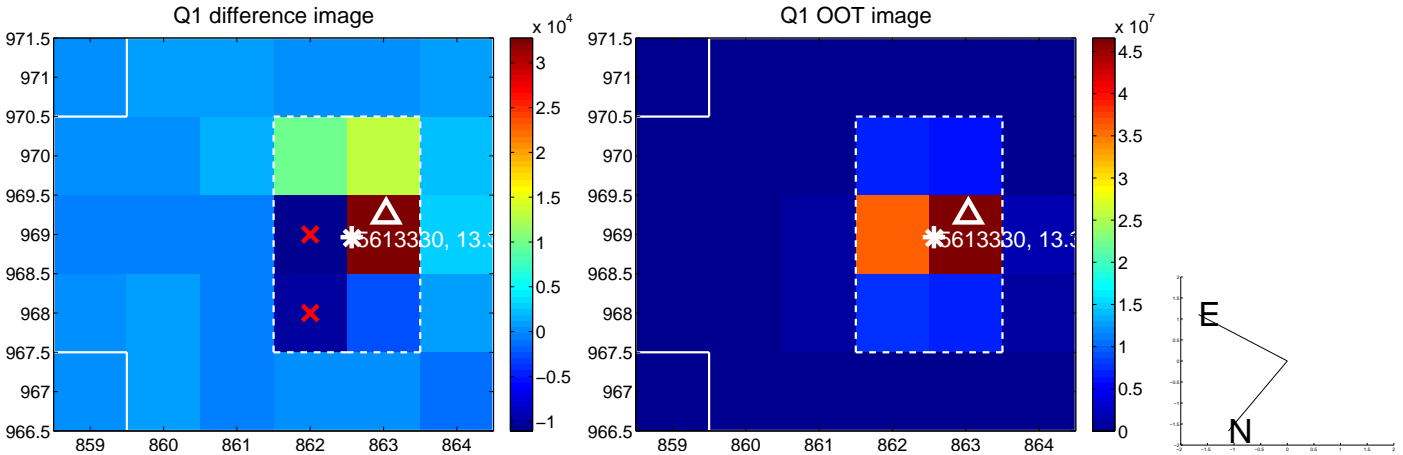
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.012 ± 0.143	0.09	-0.012 ± 0.143	0.000 ± 0.169
PRF-fit source offset from KIC position	0.053 ± 0.154	0.34	0.044 ± 0.146	-0.030 ± 0.171
photometric centroid source offset	0.48 ± 0.23	2.13	-0.13 ± 0.23	-0.46 ± 0.22

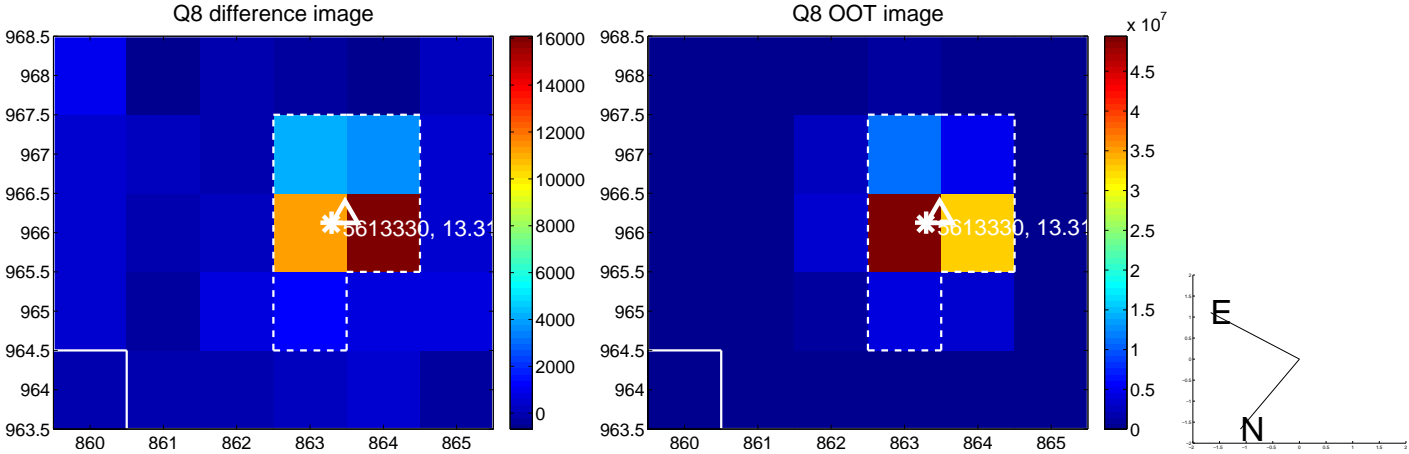
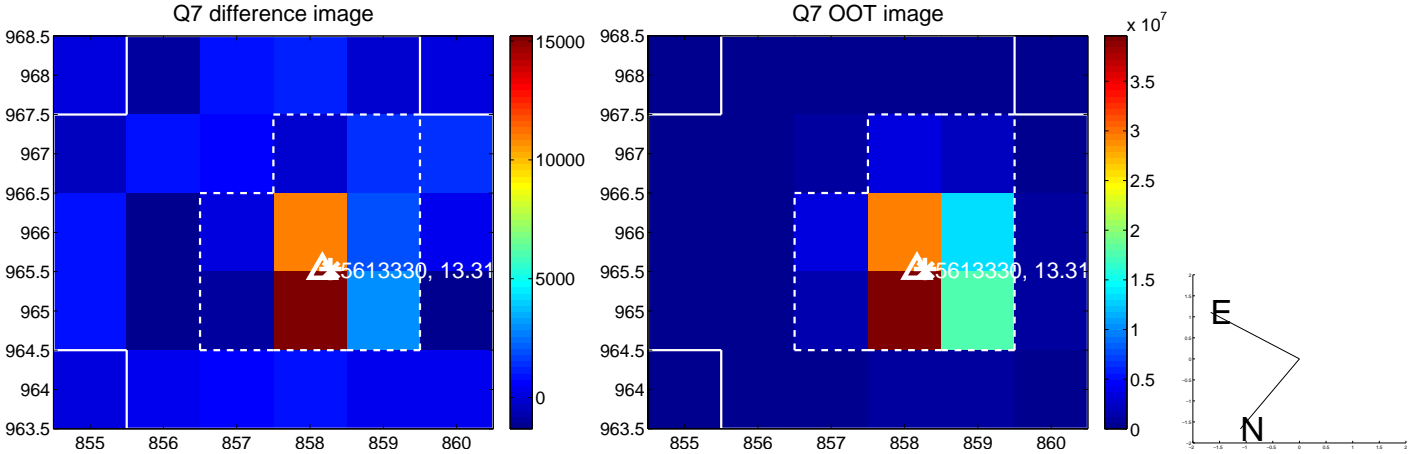
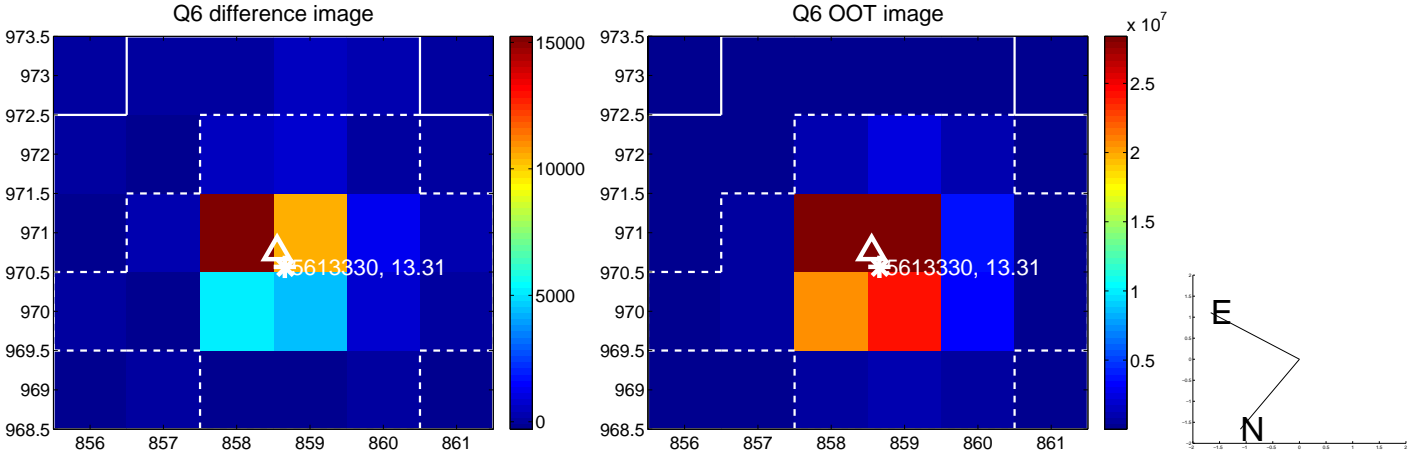
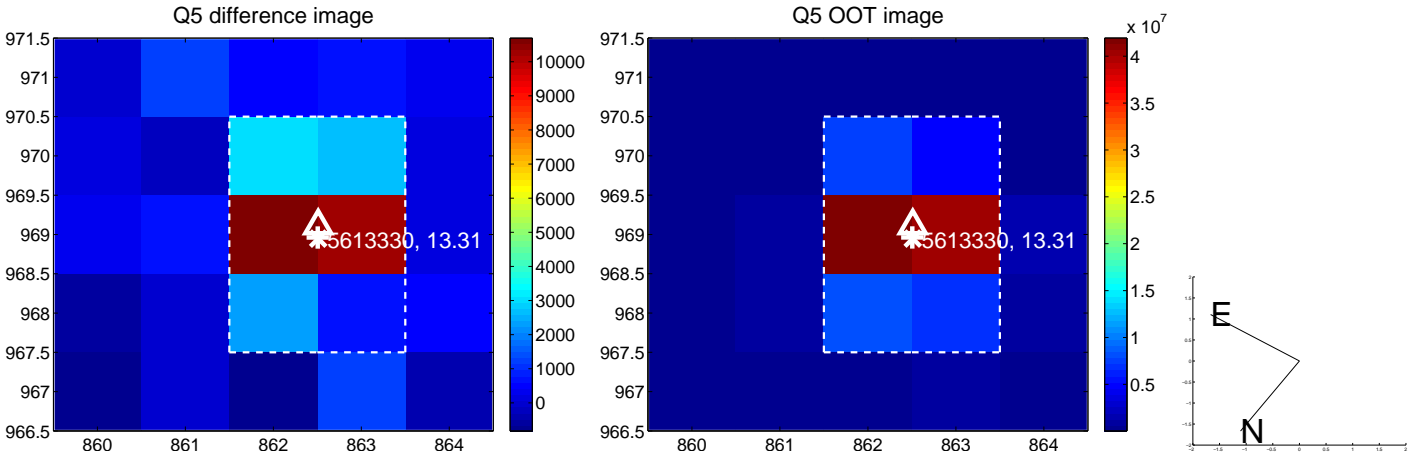


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

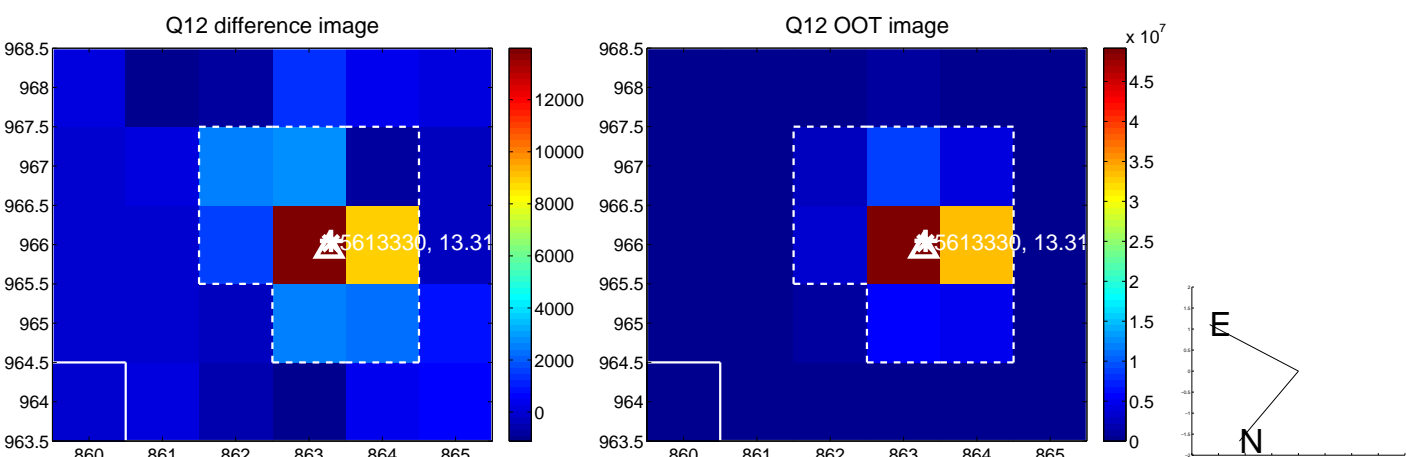
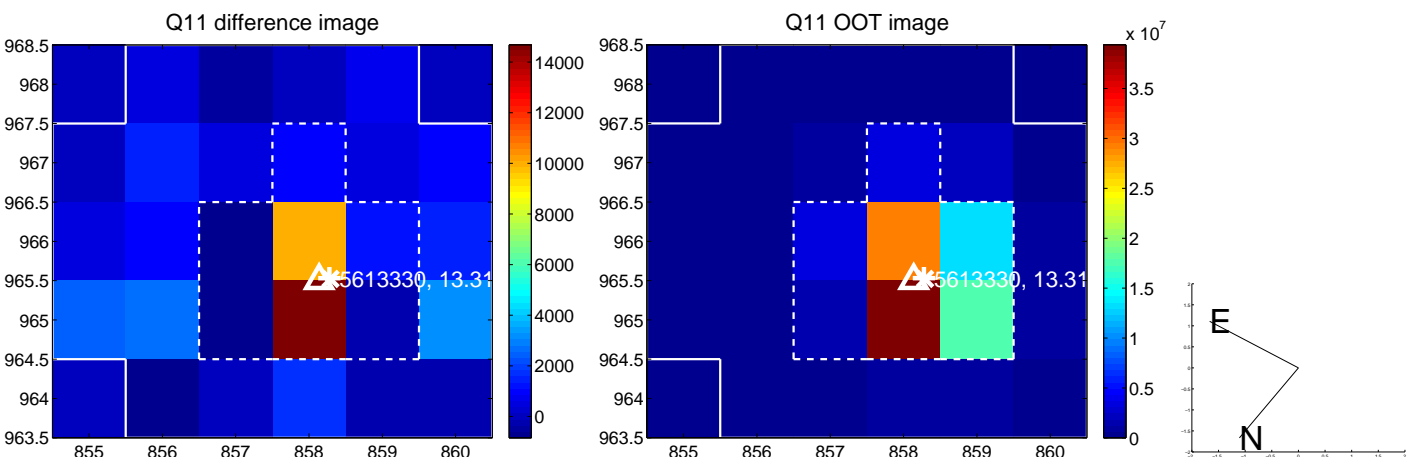
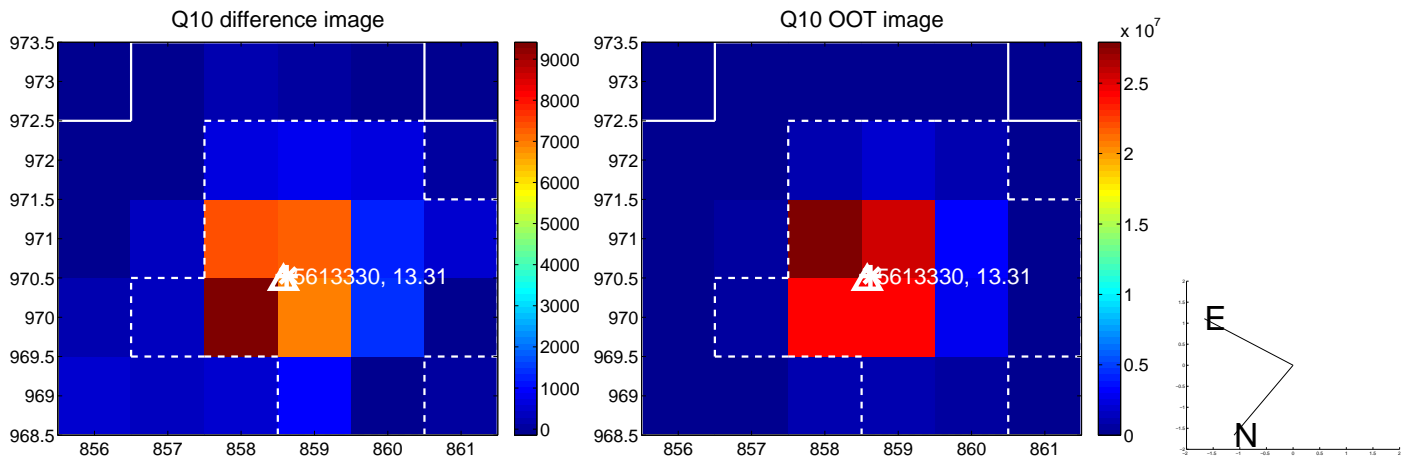
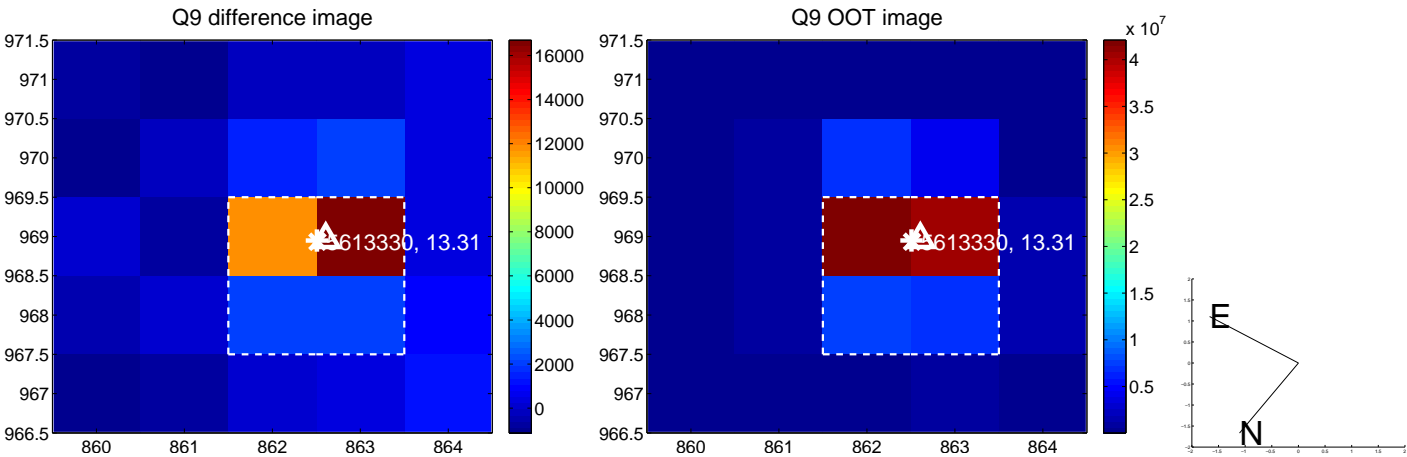
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



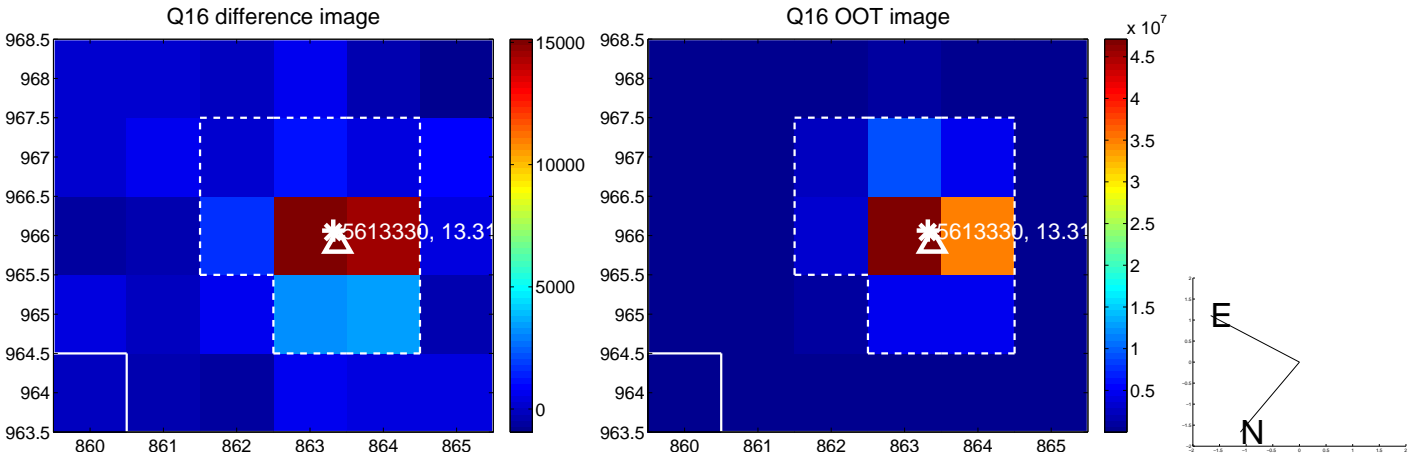
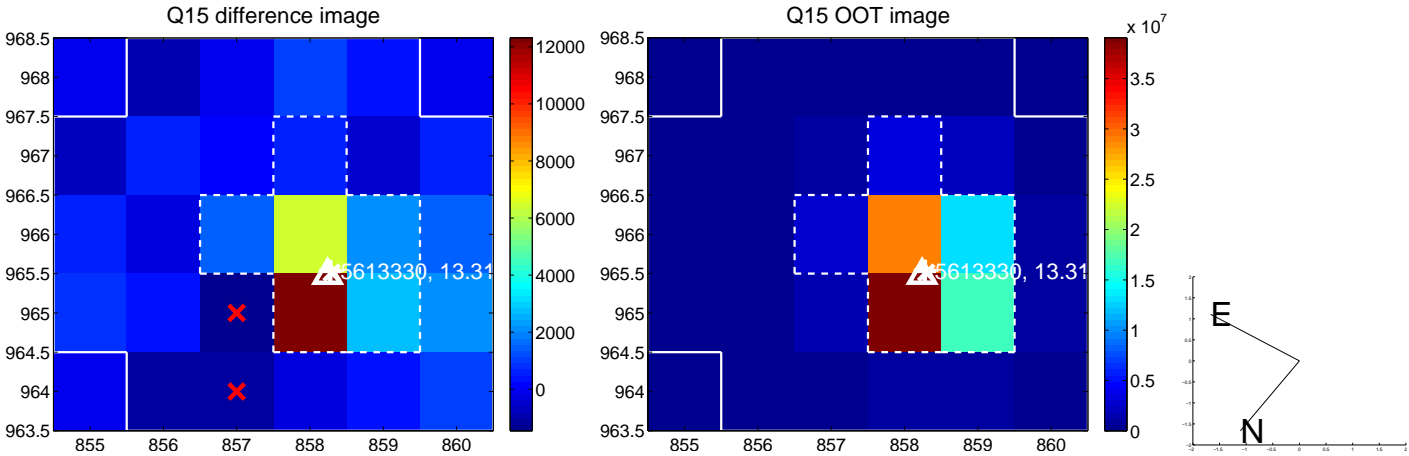
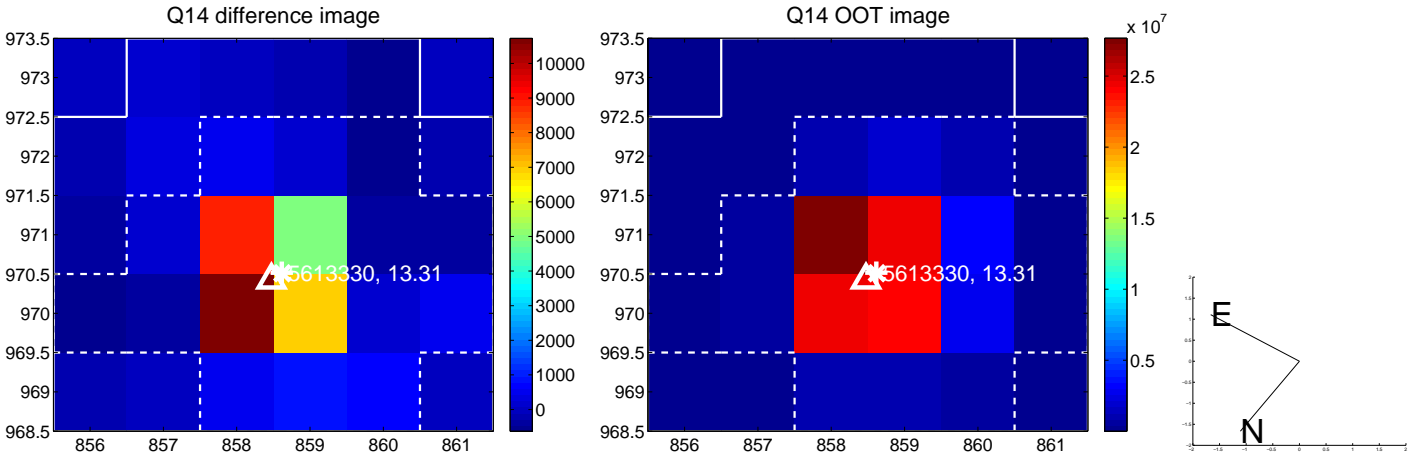
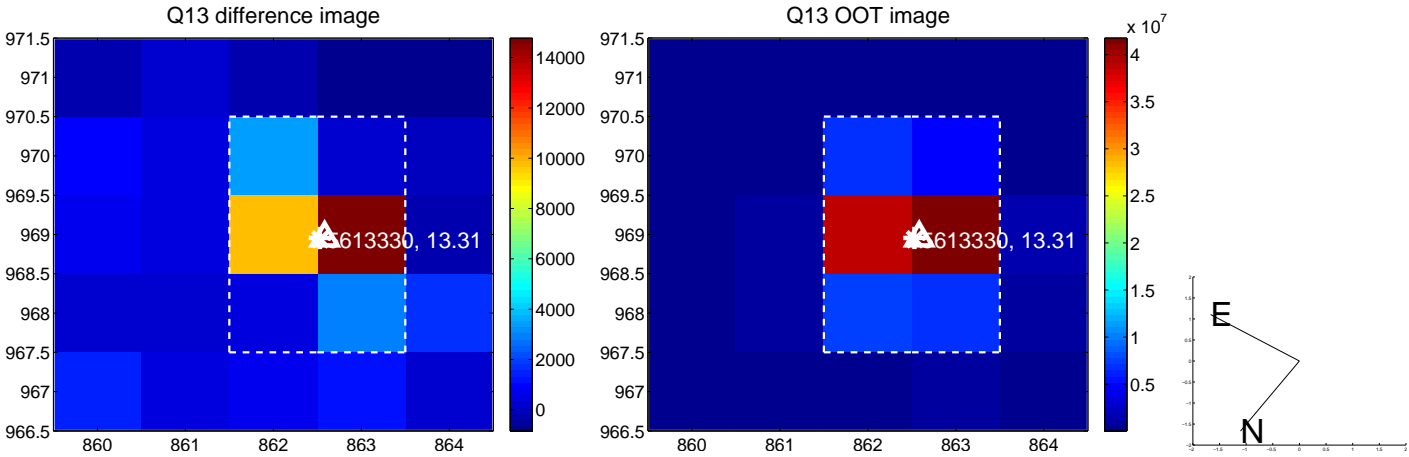
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



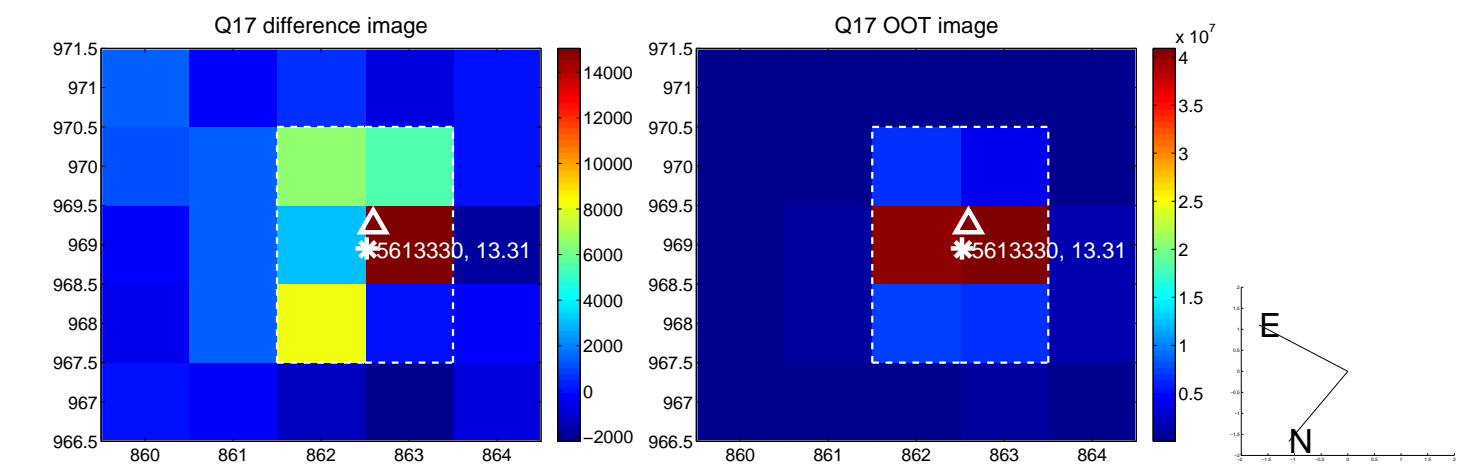
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



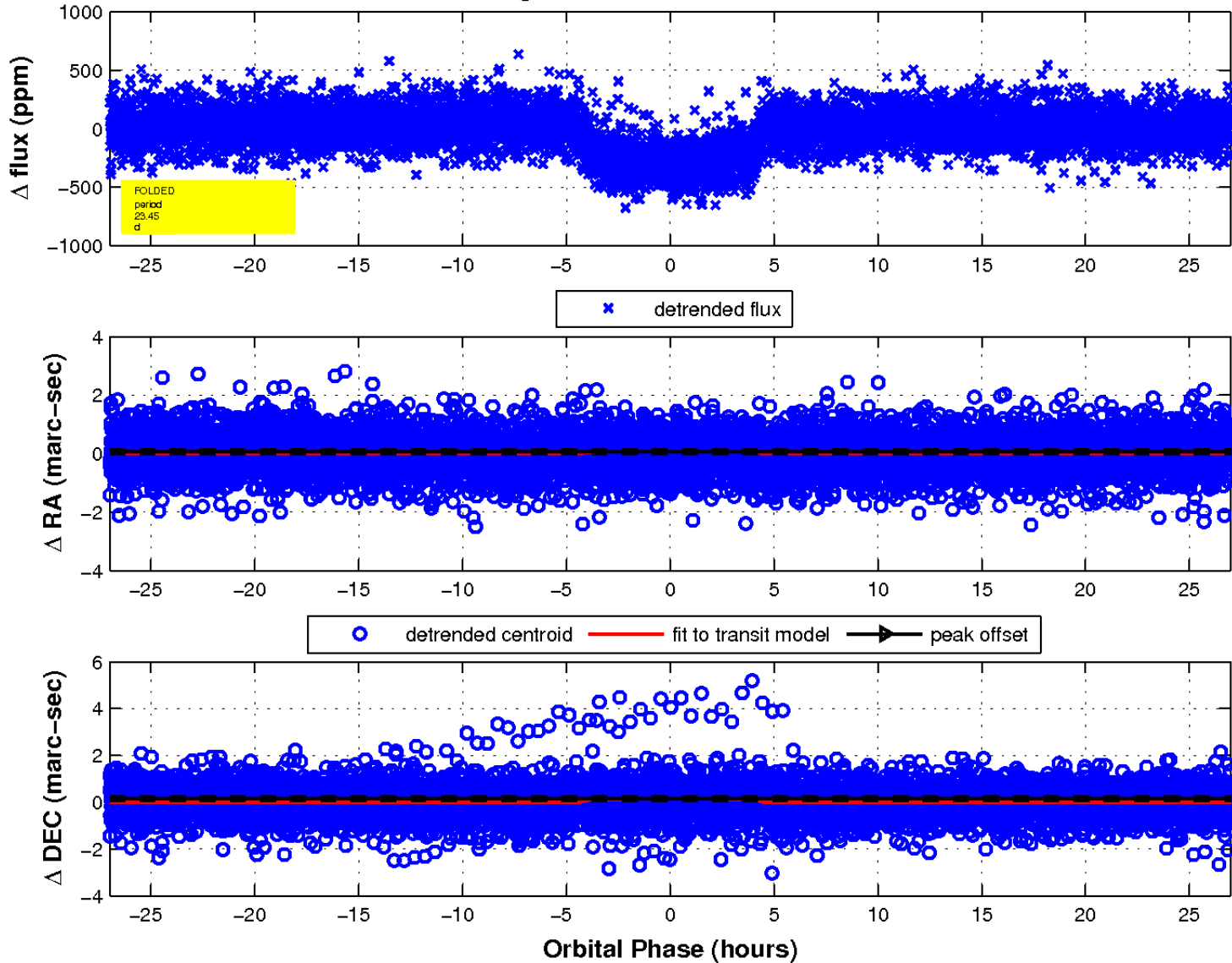
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

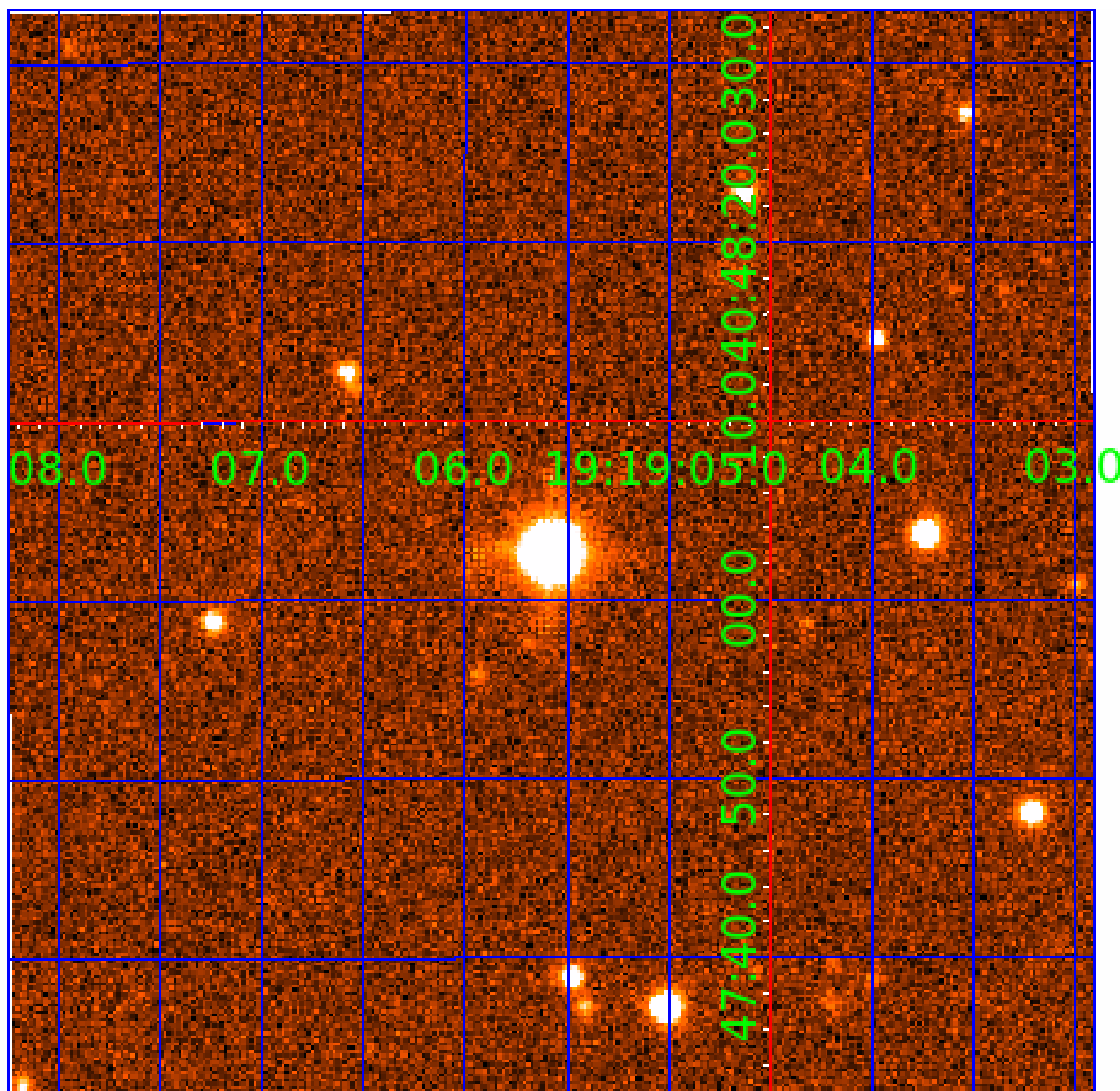


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 005613330

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})
005613330-01	OBS	0649.01	23.449649	136.024865	320.4	8.999	43.8	47.8	1.52	6188	3.07	98.08
005613330-02	OBS	0649.02	10.208953	140.689920	38.5	6.600	7.4	7.9	1.52	6188	1.10	297.24

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005613330-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
005613330-02	OBS	PC	0.62	0	0	0	0	NO_COMMENT

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

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

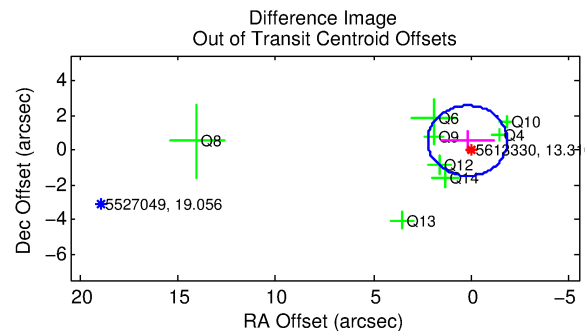
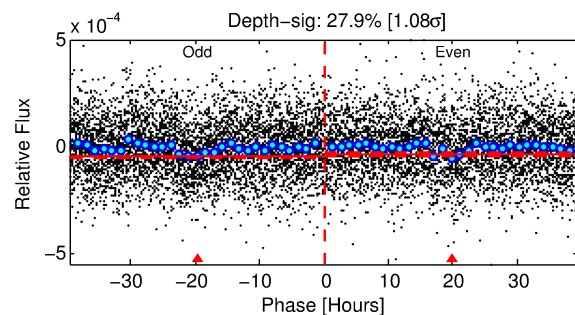
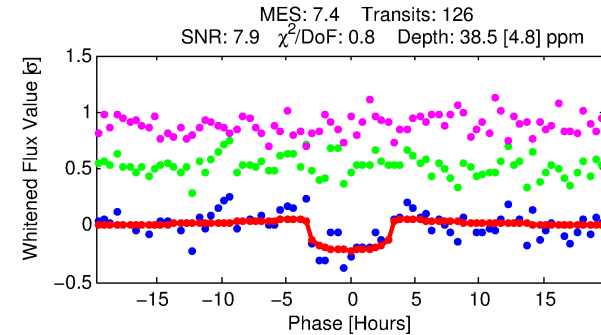
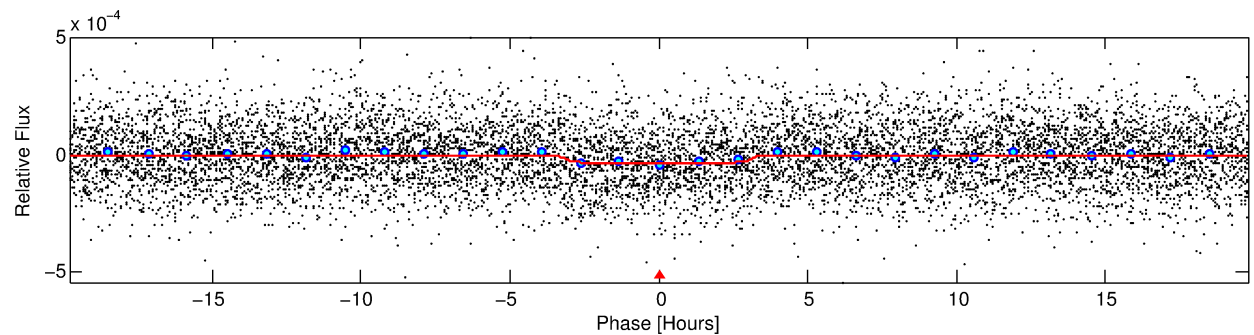
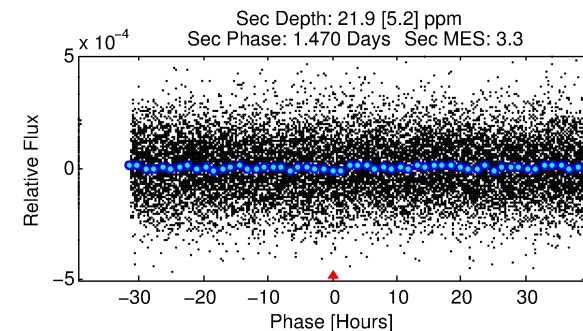
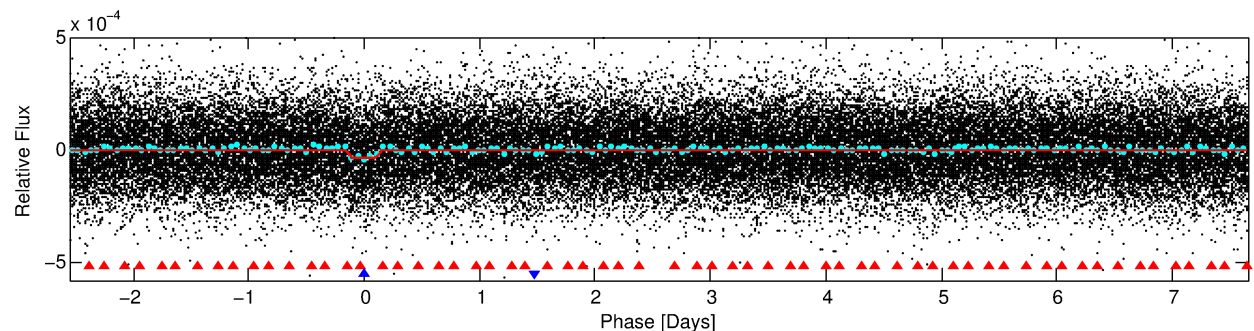
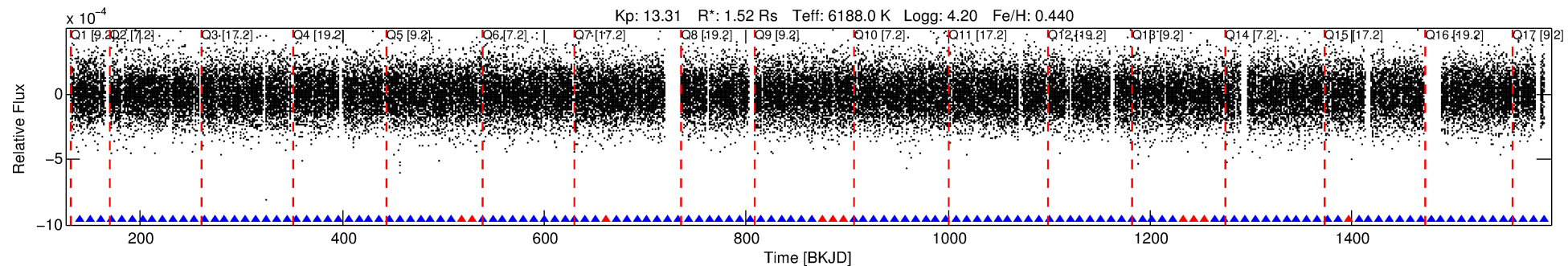
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005613330-02

No Significant Match Found

DV One-Page Summary

KIC: 5613330 Candidate: 2 of 2 Period: 10.209 d
KOI: K00649.02 Corr: 0.906



DV Fit Results:

Period = 10.20895 [0.00015] d
Epoch = 140.6899 [0.0114] BKJD
Rp/R* = 0.0066 [0.0030]
a/R* = 5.88 [12.94]
b = 0.88 [0.60]
Seff = 297.24 [72.70]
Teq = 1059 [65] K
Rp = 1.10 [0.54] Re
a = 0.1013 [0.0157] AU
Ag = 102.67 [99.55] [1.02σ]
Teffp = 5211 [1233] K [3.36σ]

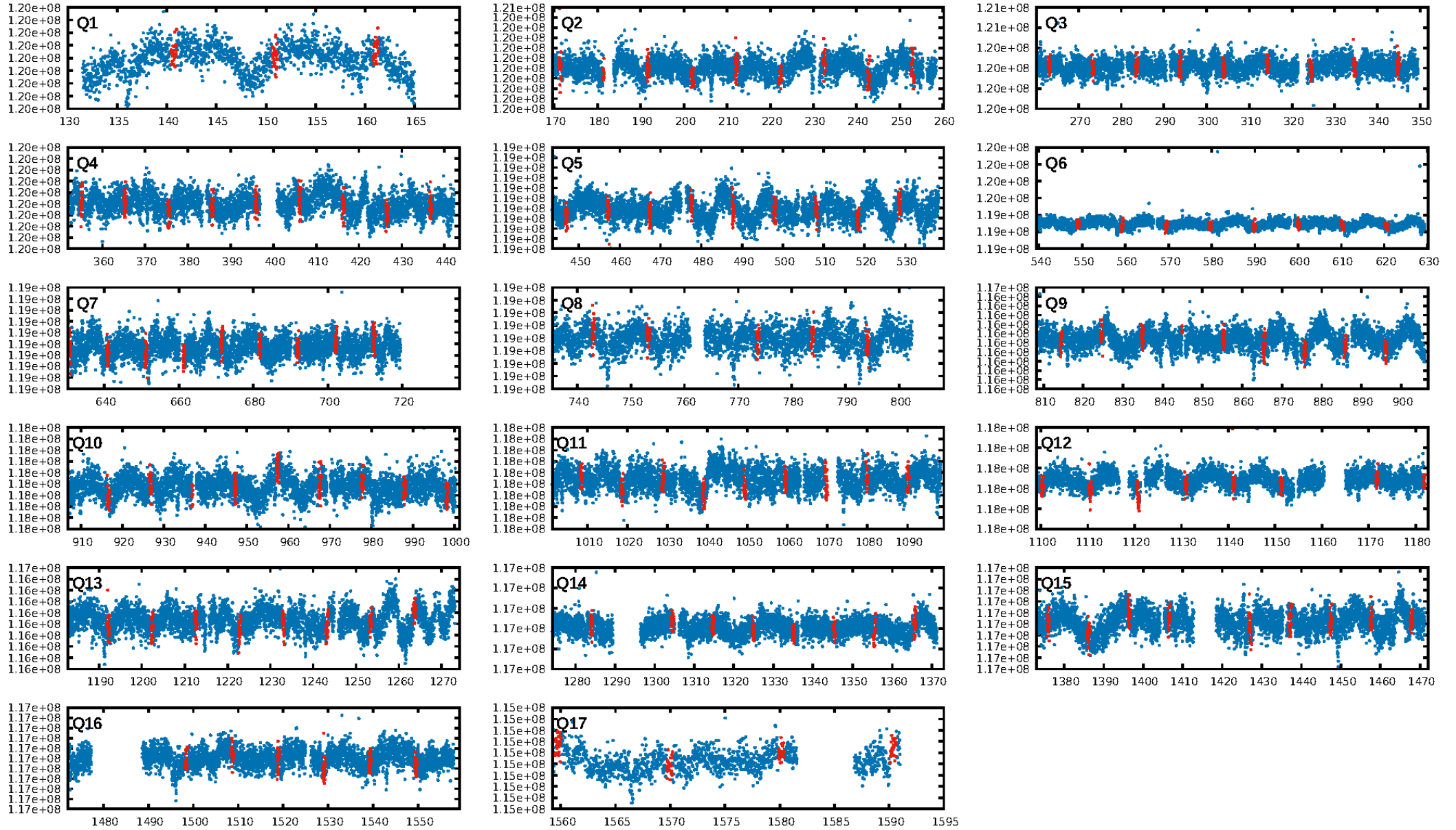
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [28.47σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.14e-13
RollingBand-fgt: 0.92 [109/119]
GhostDiagnostic-chr: 1.579
Centroid-sig: 0.0%
Centroid-so: 4.260 arcsec [2.97σ]
OotOffset-rm: 0.592 arcsec [0.87σ]
KicOffset-rm: 0.552 arcsec [0.62σ]
OotOffset-st: 3/0/3/2 [8]
KicOffset-st: 3/0/3/2 [8]
DiffImageQuality-fgm: 0.62 [5/8]
DiffImageOverlap-fno: 1.00 [17/17]

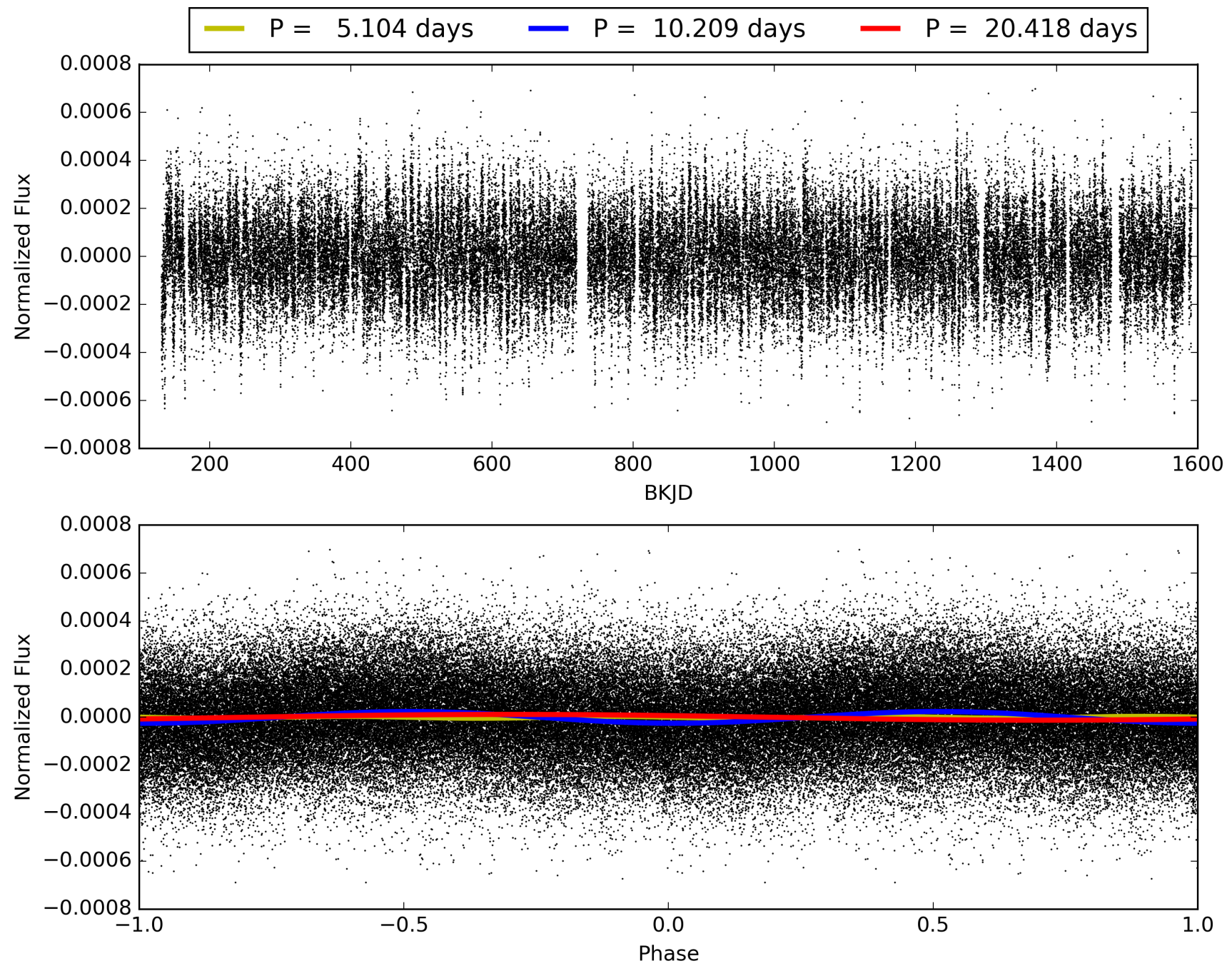
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:38:08 Z

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

TCE 005613330-02, PDC Light Curves

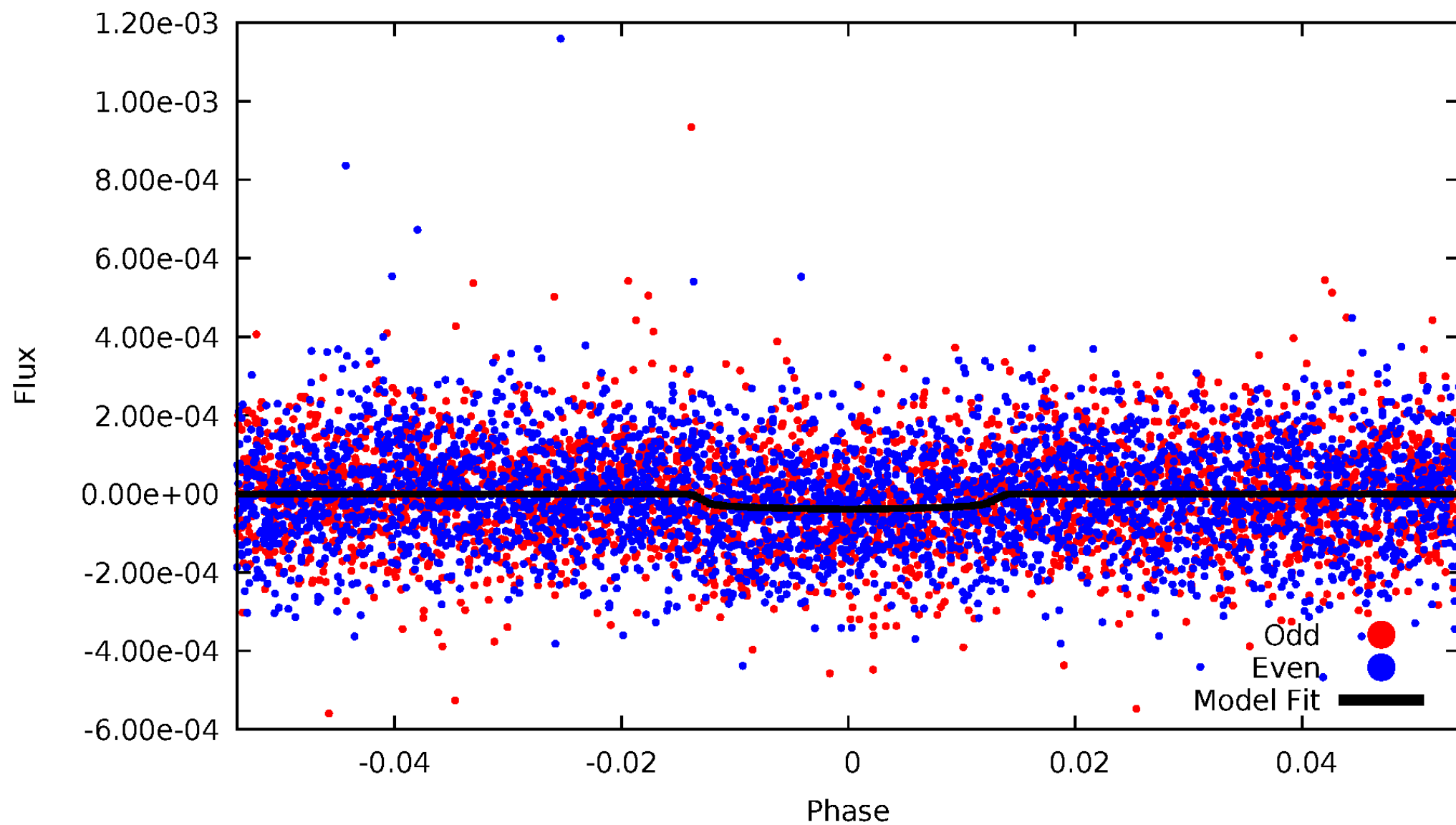


TCE 005613330-02



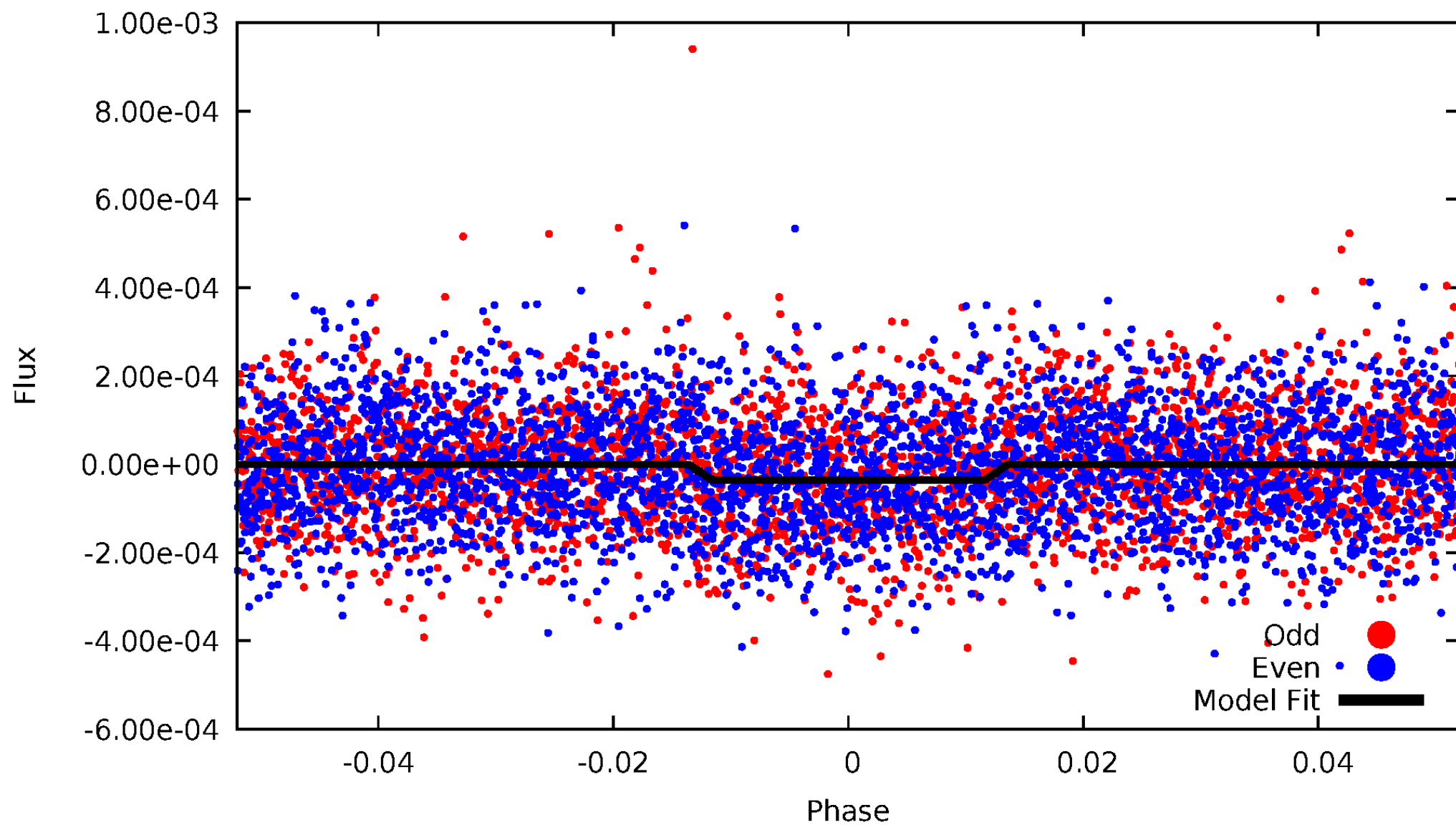
DV Odd/Even

TCE 005613330-02



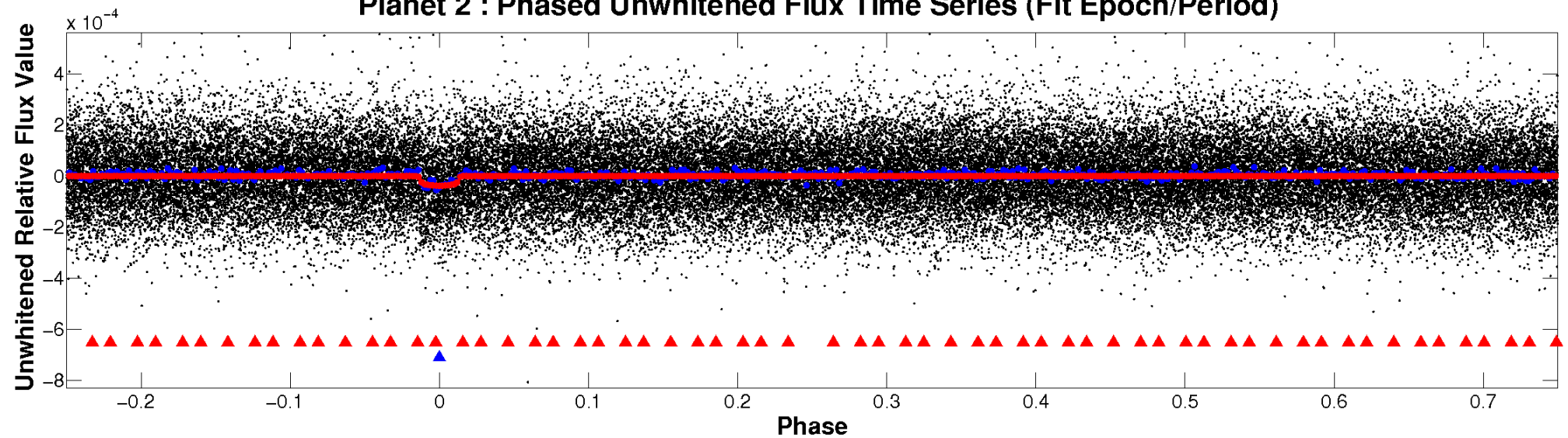
ALT Odd/Even

TCE 005613330-02

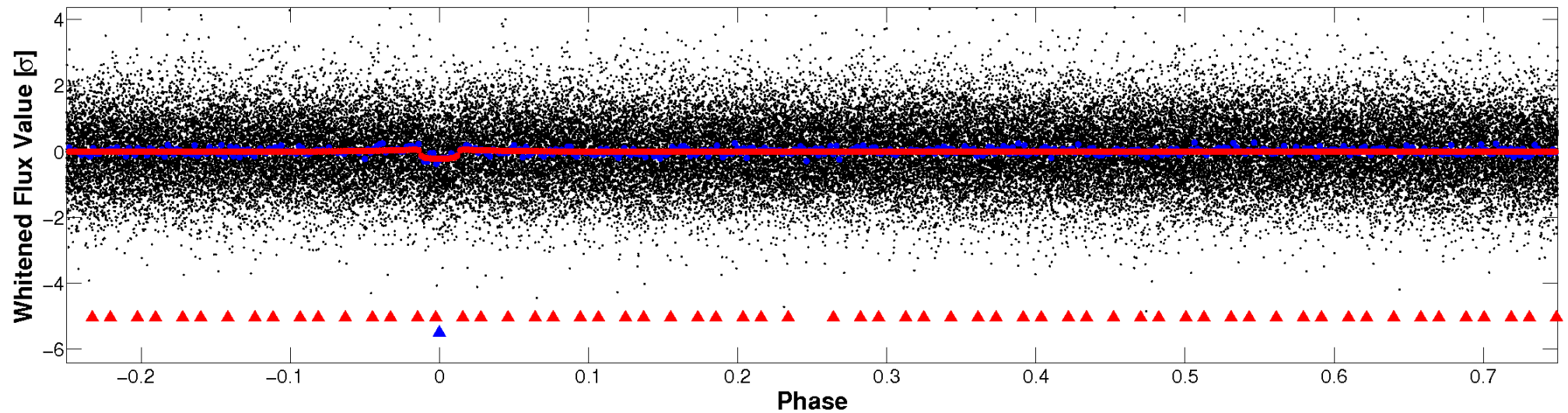


Non-Whitened Vs. Whitened Light Curve

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

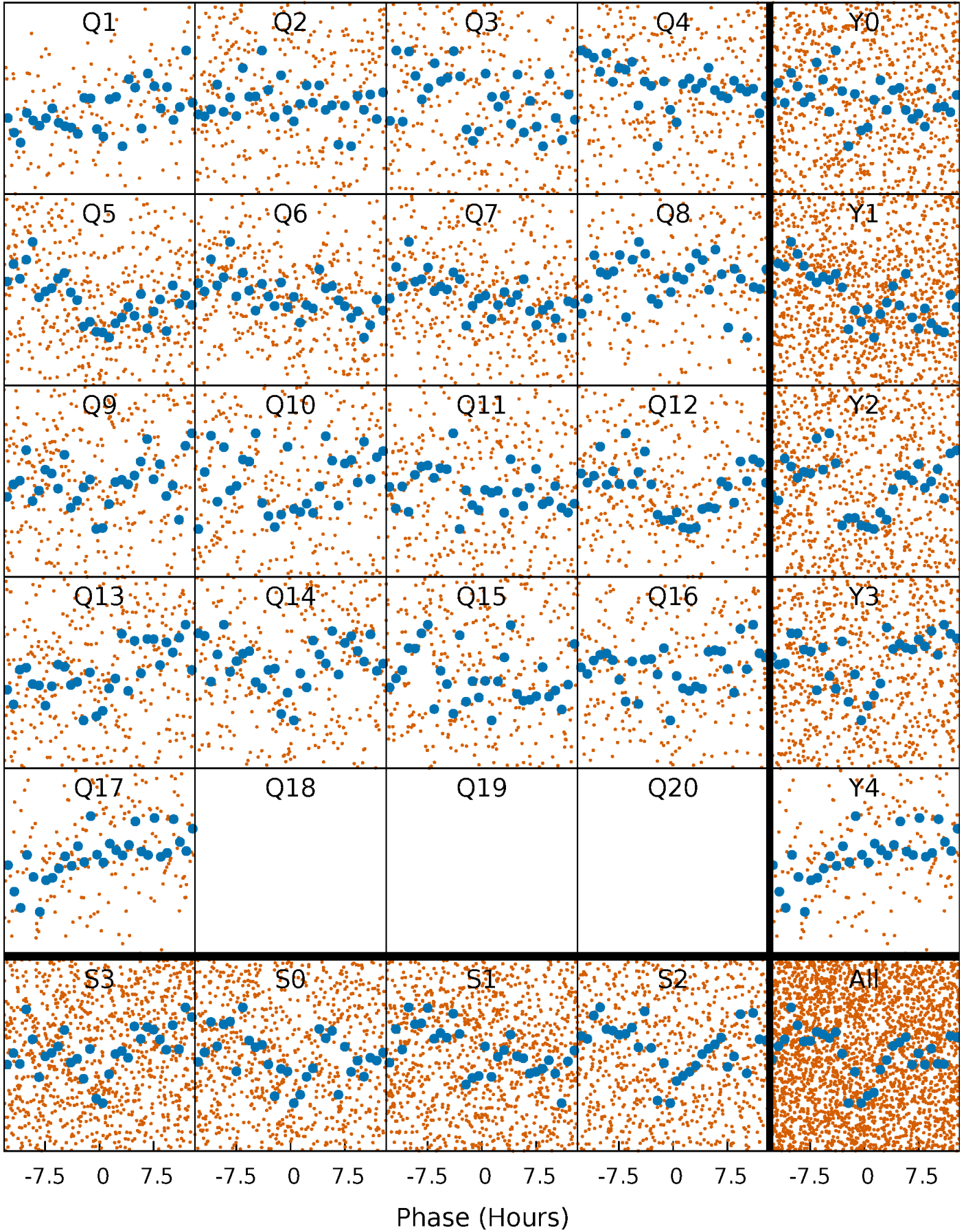


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



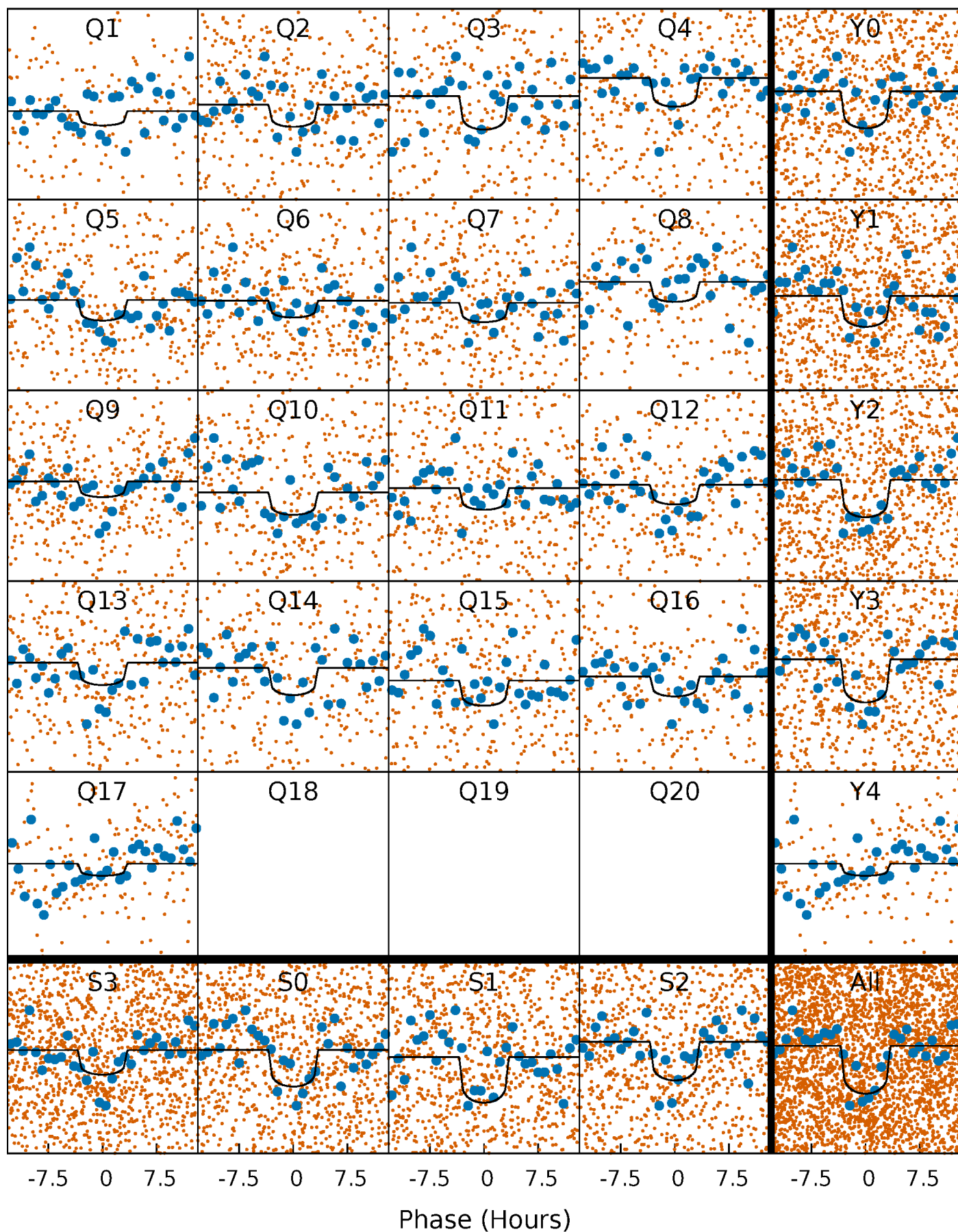
PDC Quarter-Phased Transit Curves

TCE 005613330-02 P= 10.208953 Days $T_0=140.689920$ (BKJD)



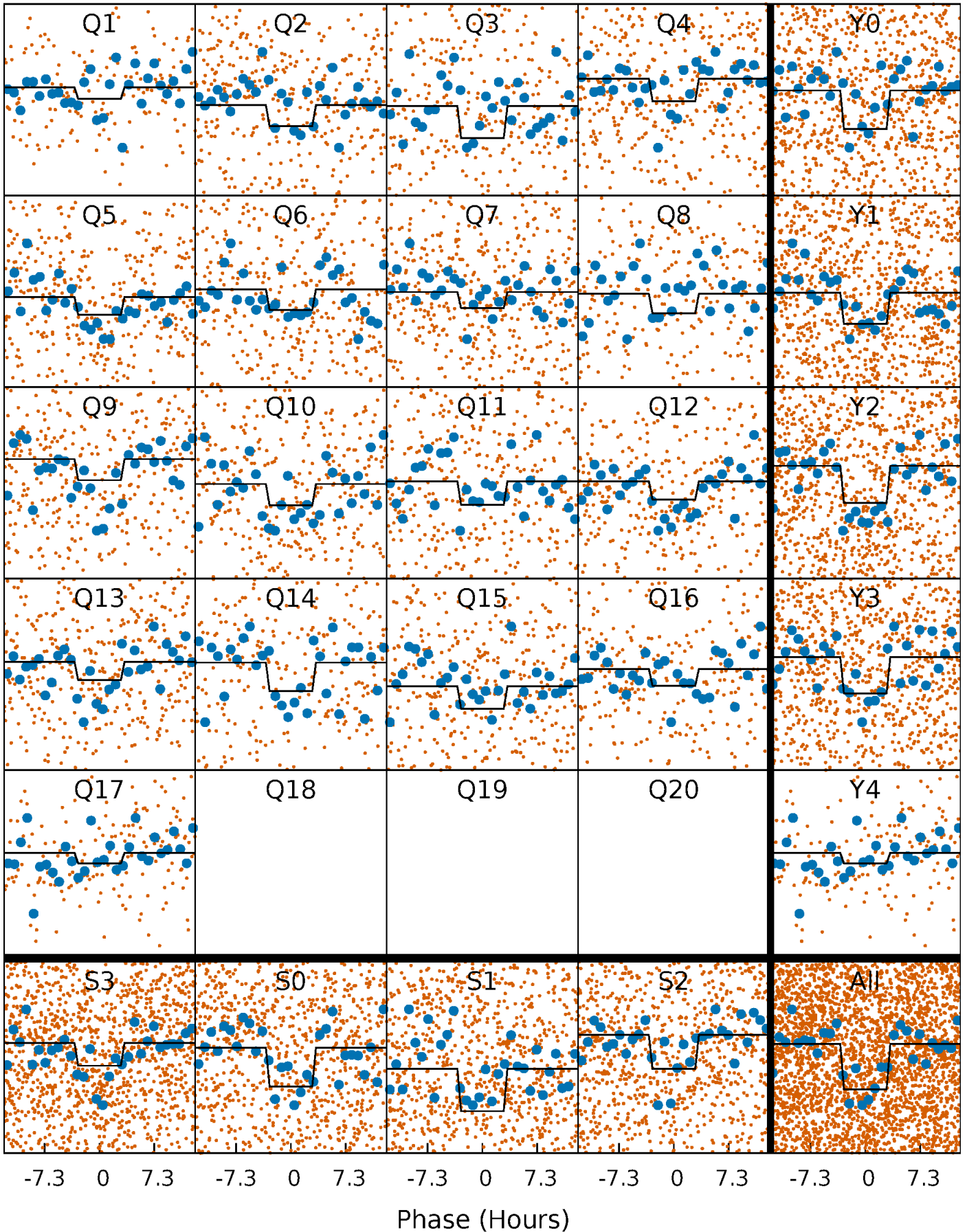
DV Quarter-Phased Transit Curves

TCE 005613330-02 P= 10.208953 Days $T_0=140.689920$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

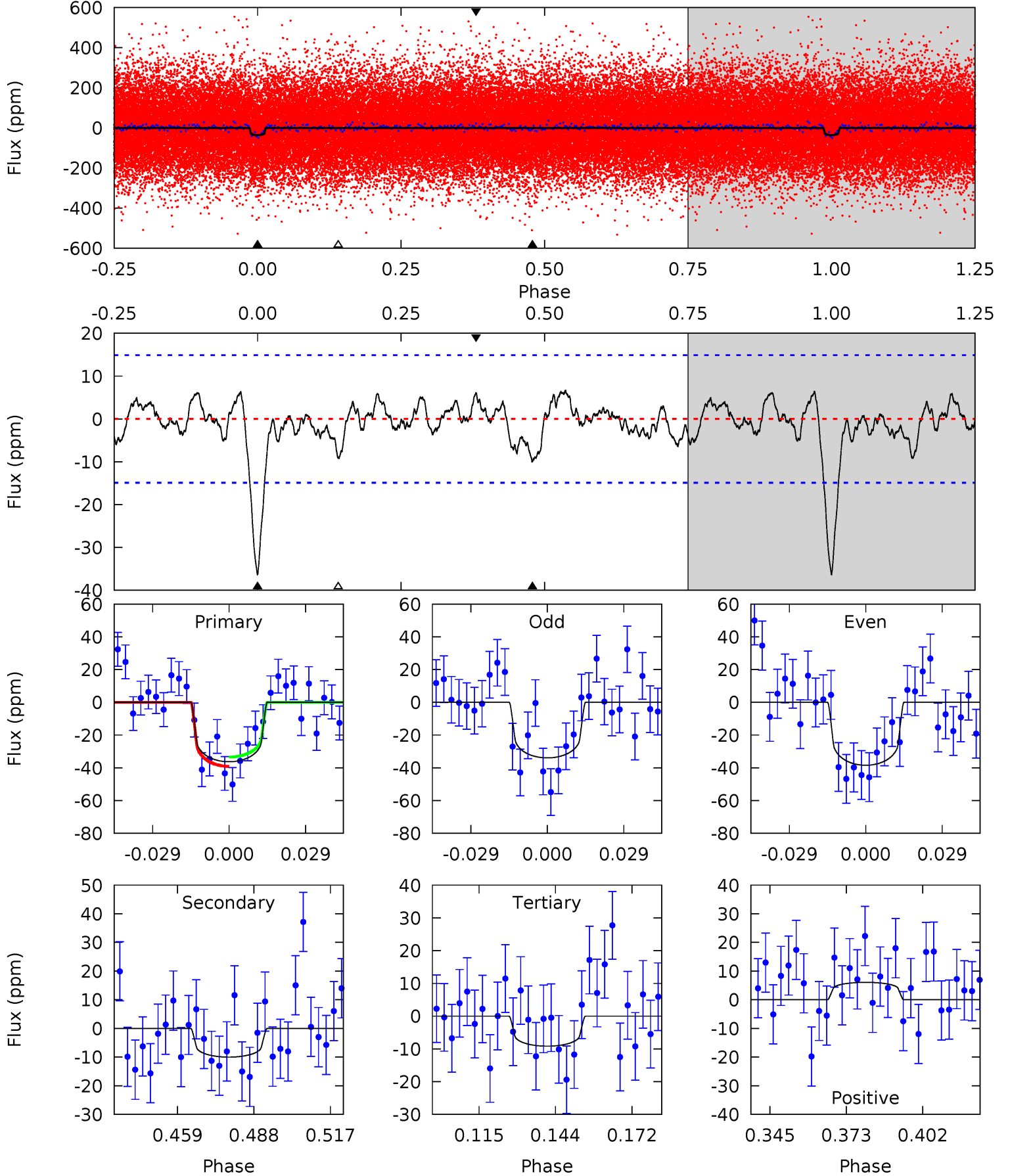
TCE 005613330-02 $P = 10.209027$ Days $T_0 = 140.683953$ (BKJD)



DV Model-Shift Uniqueness Test

005613330-02, $P = 10.208953$ Days, $E = 130.480967$ Days

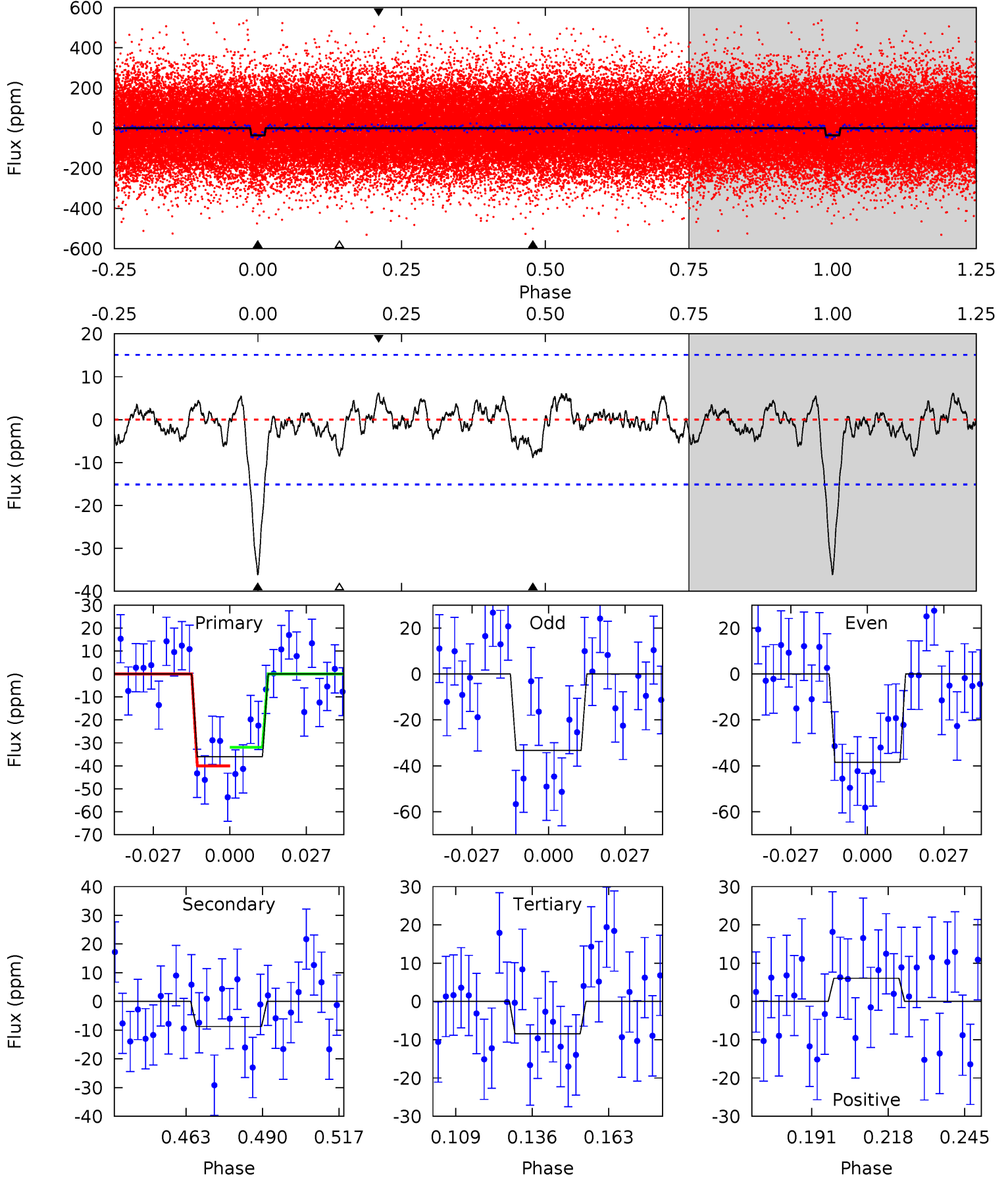
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	3.24	2.97	1.97	4.82	2.19	1.01	8.79	9.78	0.27	1.27	0.73	0.85	0.15	0.92



Alt Model-Shift Uniqueness Test

005613330-02, P = 10.209027 Days, E = 130.474926 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	2.79	2.70	1.93	4.83	2.21	0.87	8.83	9.60	0.09	0.86	0.84	1.03	0.14	1.29



Stellar Parameters For KIC 005613330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6188^{+110}_{-135}	$4.196^{+0.115}_{-0.126}$	$0.440^{+0.050}_{-0.150}$	$1.524^{+0.278}_{-0.228}$	$1.330^{+0.100}_{-0.100}$	$0.529^{+0.289}_{-0.186}$
	+2%/-2%	+3%/-3%	+11%/-34%	+18%/-15%	+8%/-8%	+55%/-35%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 005613330-02 / KOI 0649.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-10 ± 3	$1.12^{+0.54}_{-0.52}$	1476^{+78}_{-61}	4385^{+1409}_{-599}	42^{+120}_{-23}
Alt.	-9 ± 3	$1.02^{+0.52}_{-0.47}$	1479^{+81}_{-65}	4414^{+1285}_{-658}	45^{+107}_{-27}

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 $A_{obs} \gg 1.0$

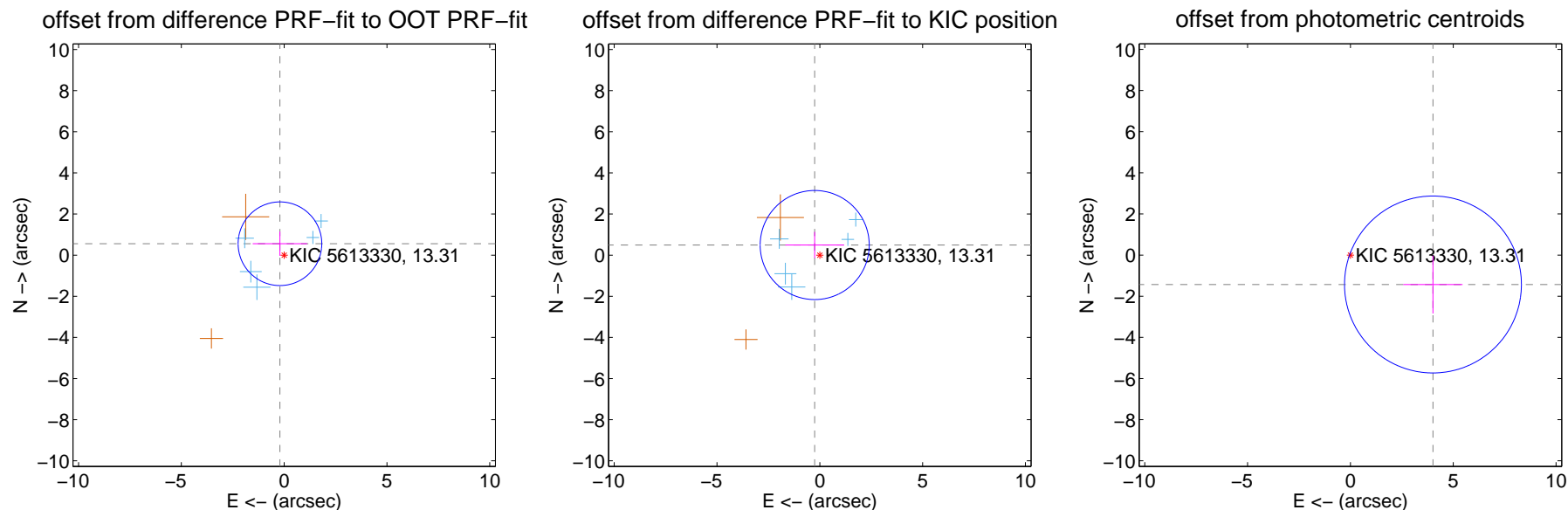
DV Centroid Data

Supplemental centroid analysis for 005613330-02. Kepler magnitude: 13.31. Transit SNR 7.92

There are 5 quarters with good PRF difference image offsets

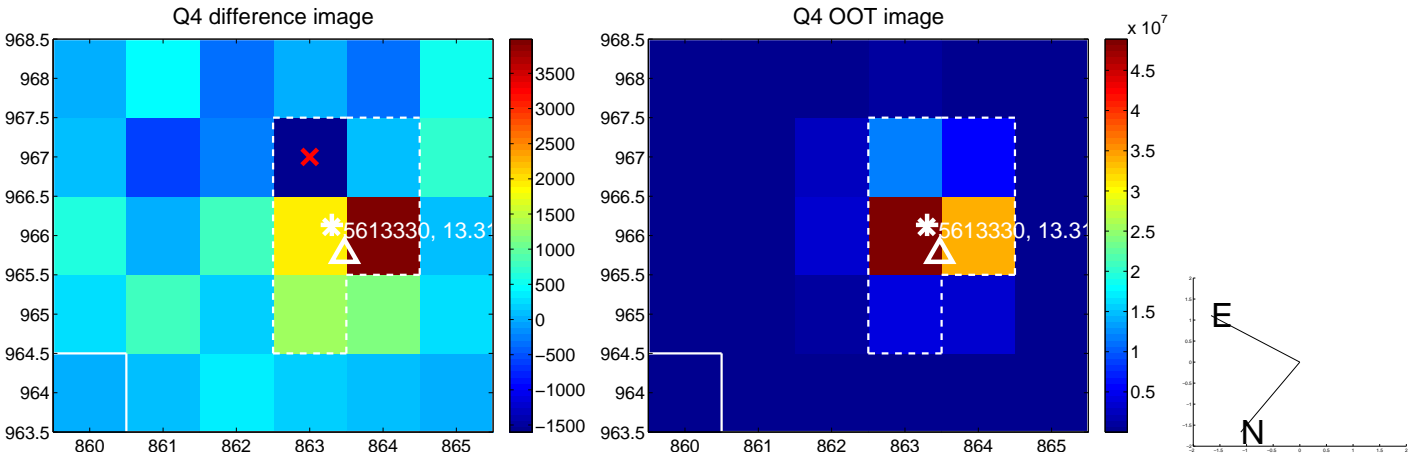
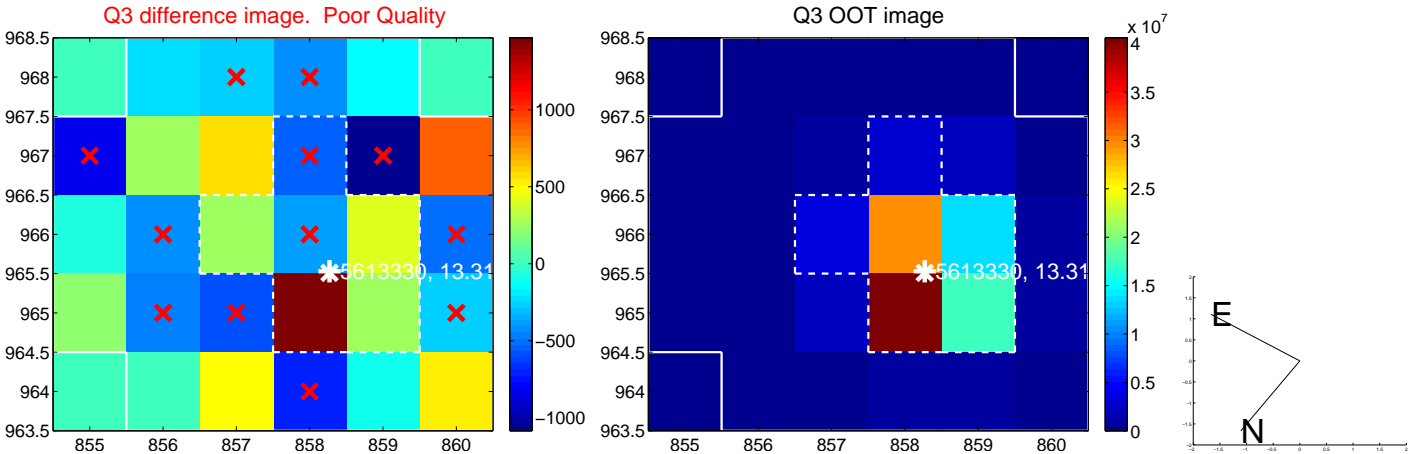
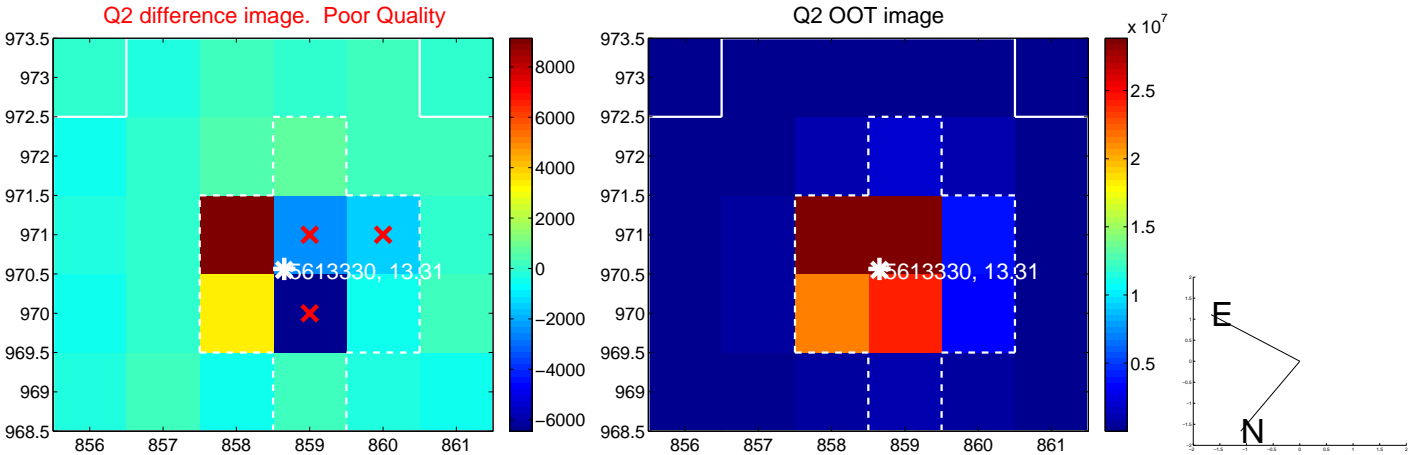
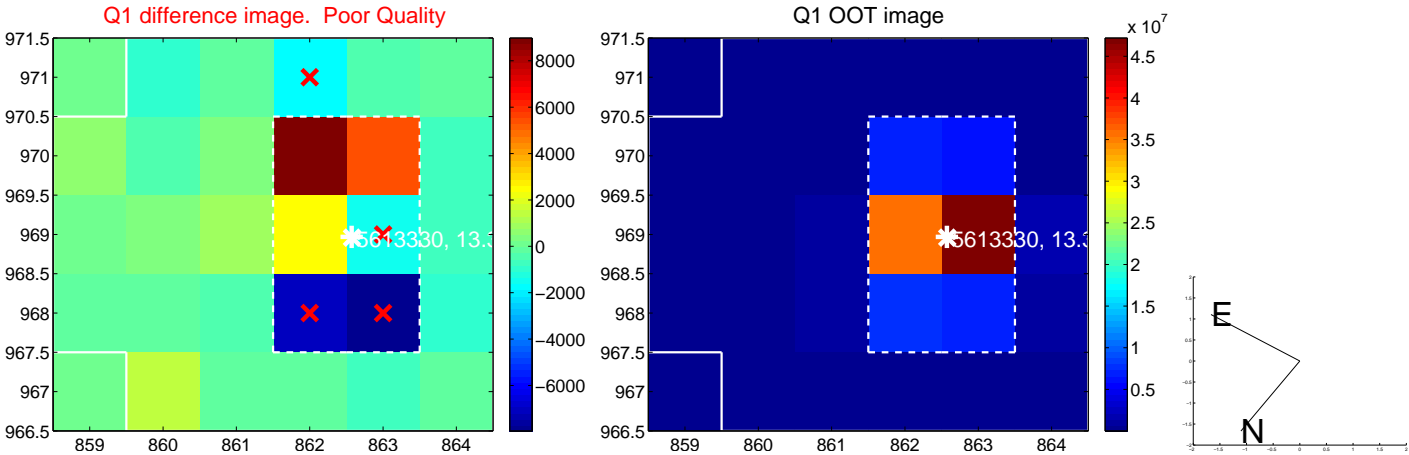
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.592 ± 0.678	0.87	0.204 ± 1.325	0.556 ± 0.589
PRF-fit source offset from KIC position	0.552 ± 0.884	0.62	0.249 ± 1.428	0.492 ± 0.636
photometric centroid source offset	4.26 ± 1.43	2.97	-4.01 ± 1.44	-1.43 ± 1.40

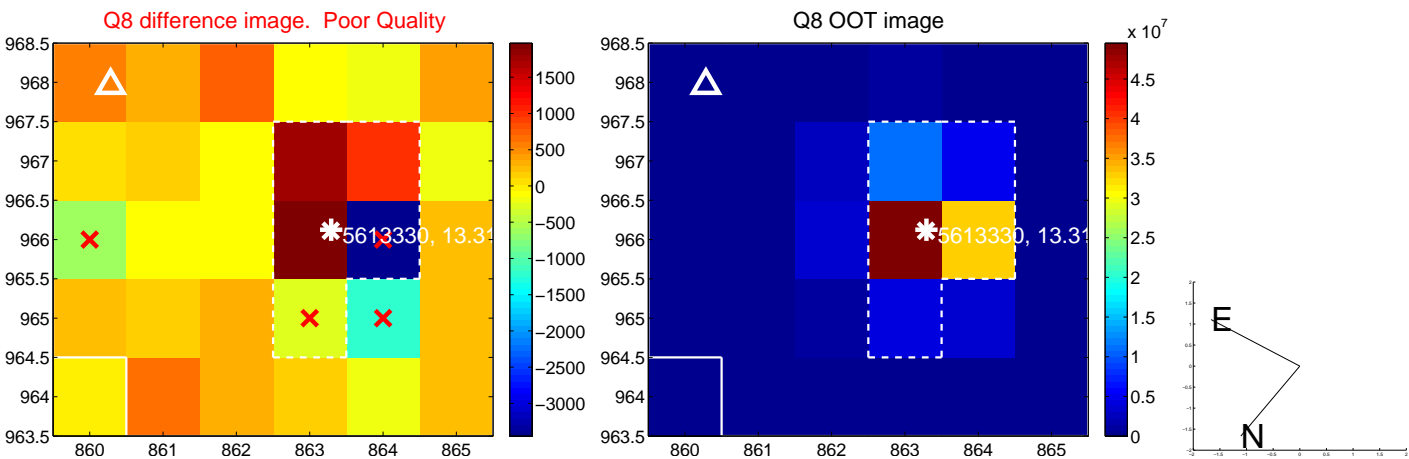
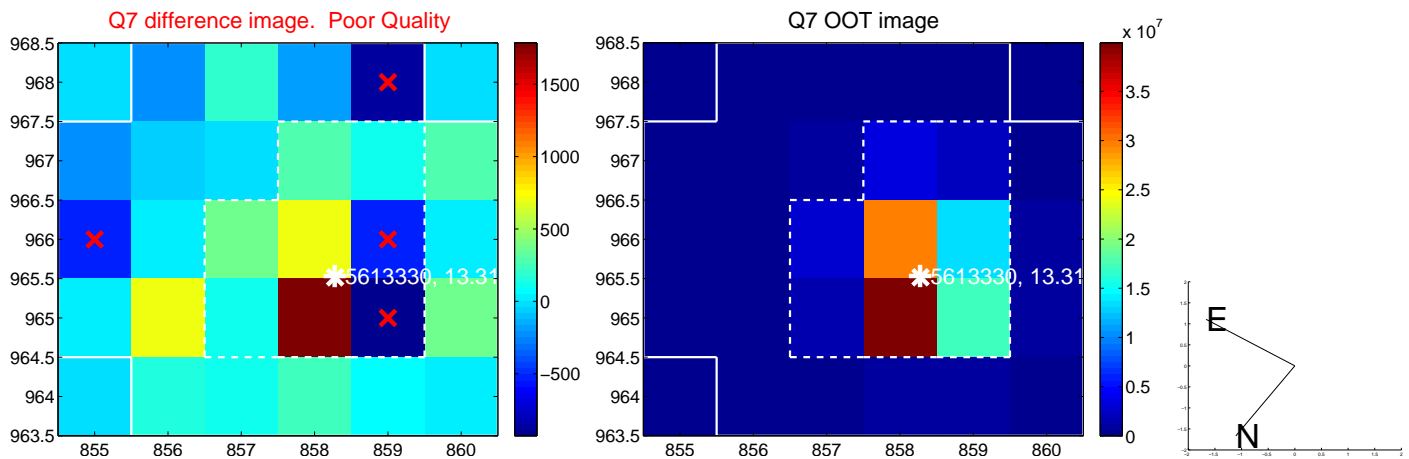
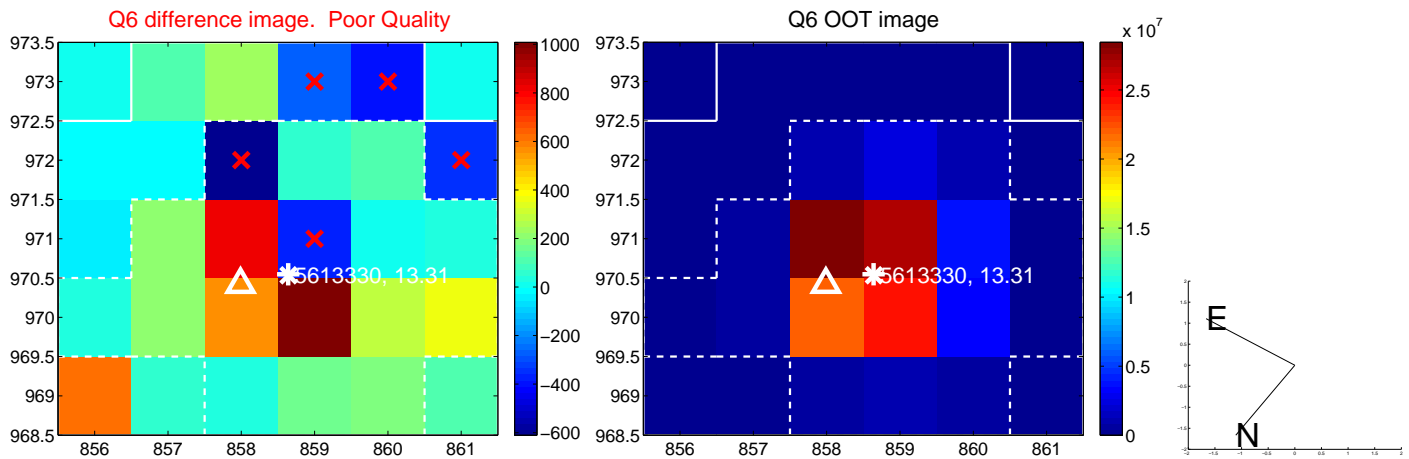
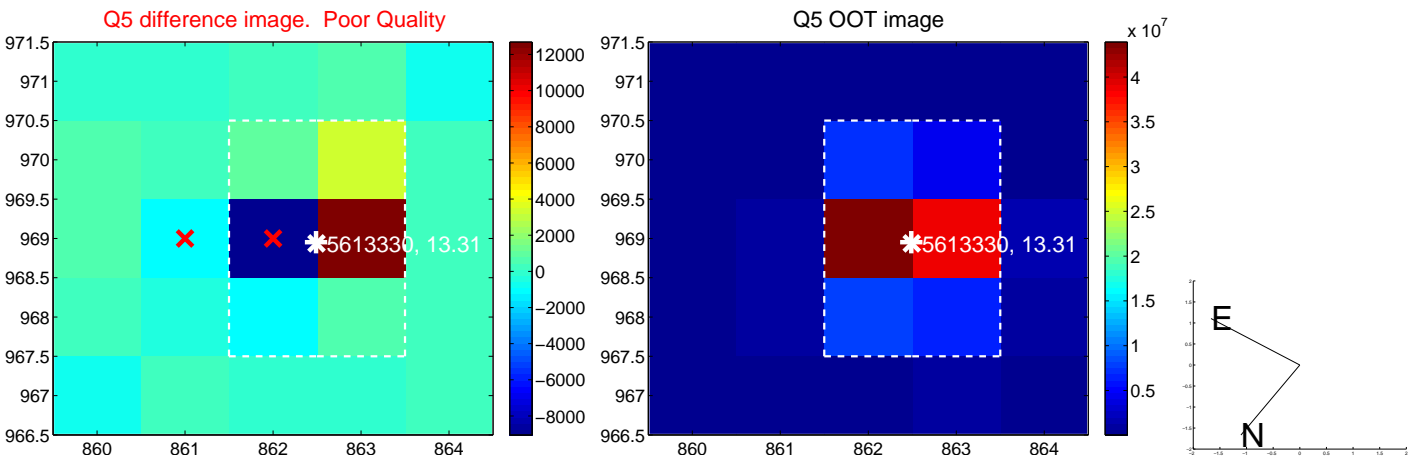


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

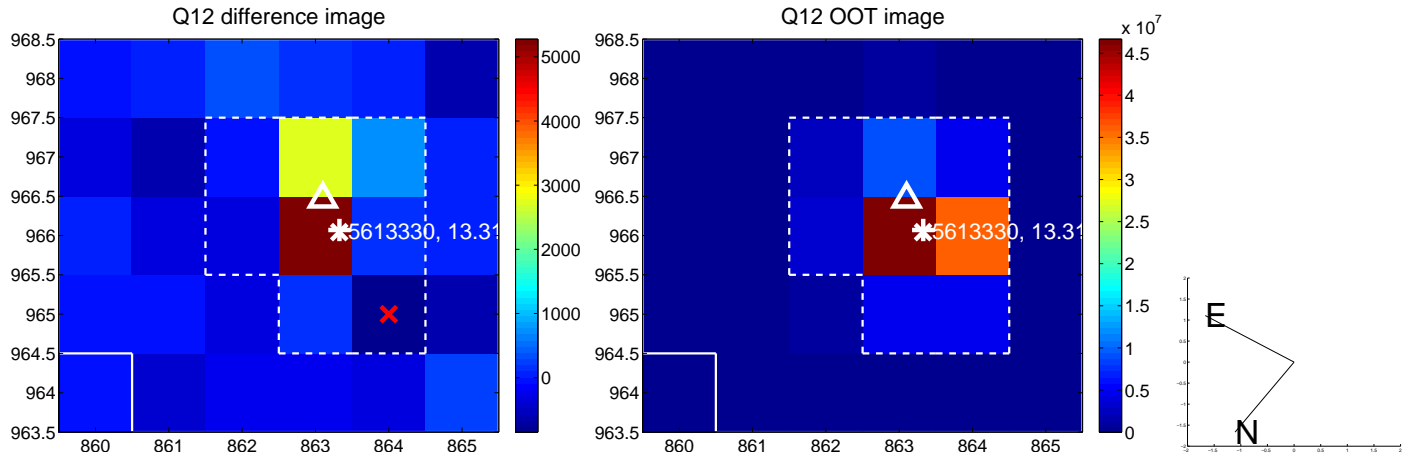
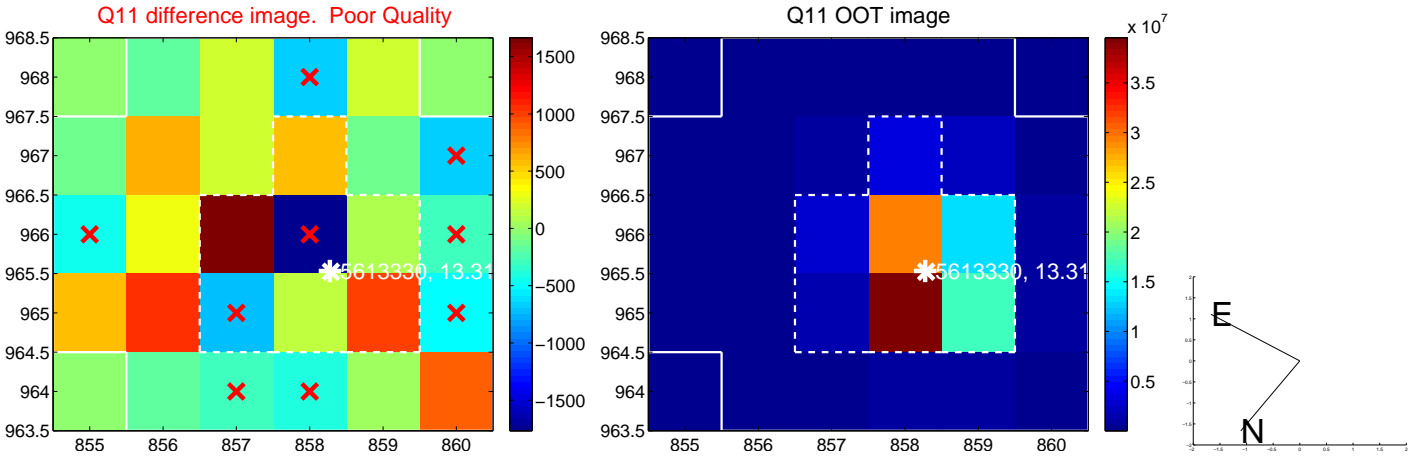
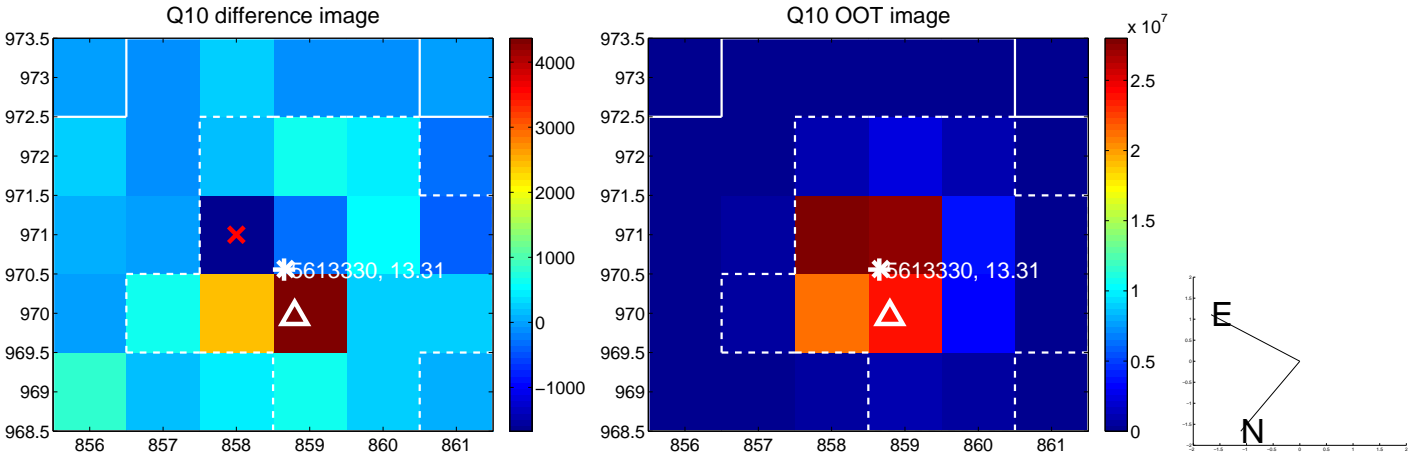
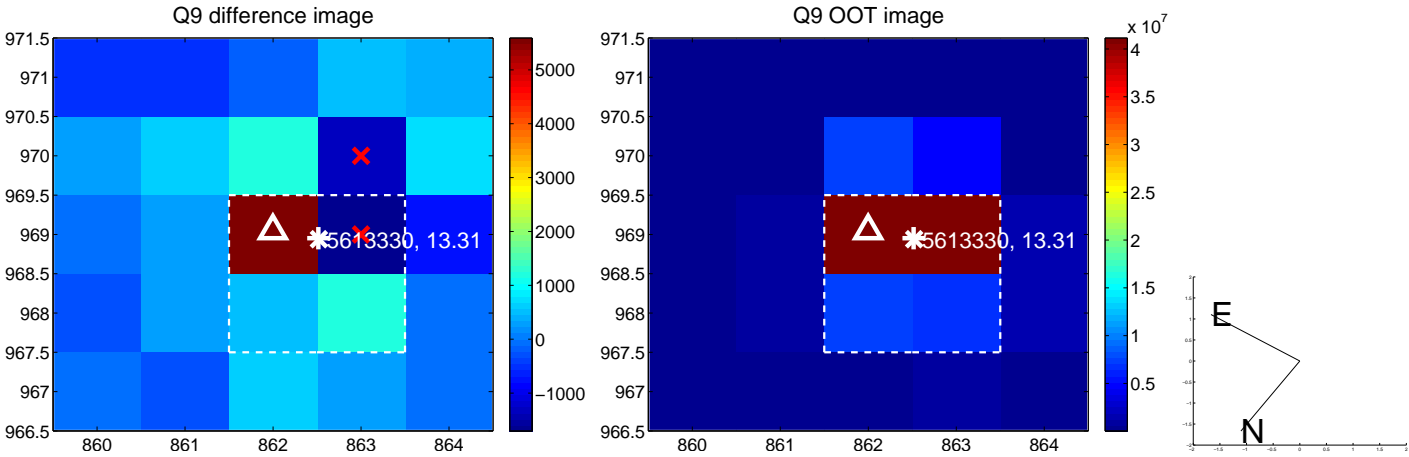
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



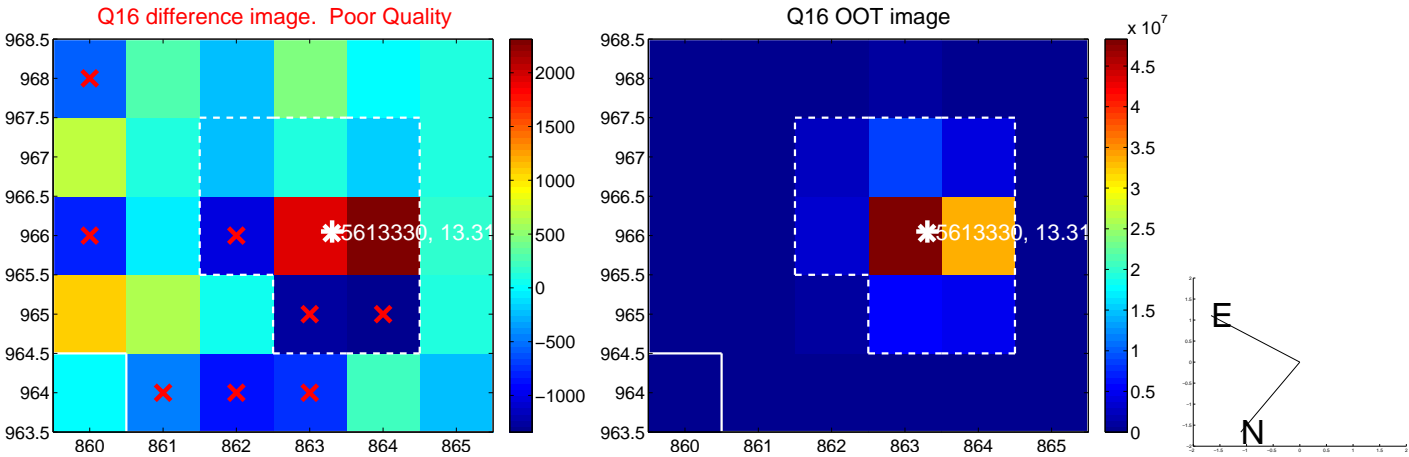
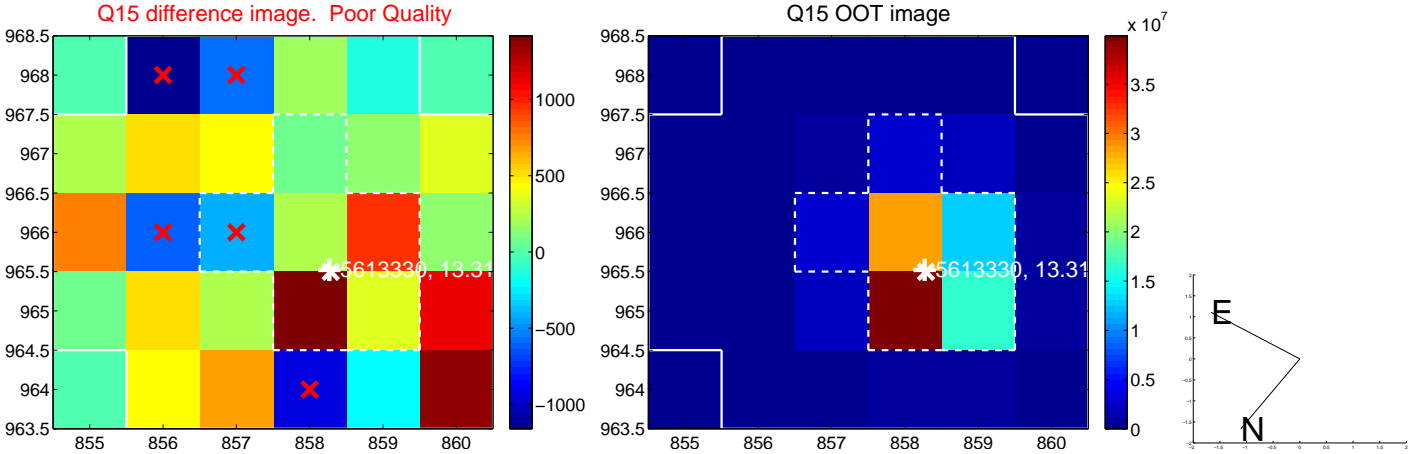
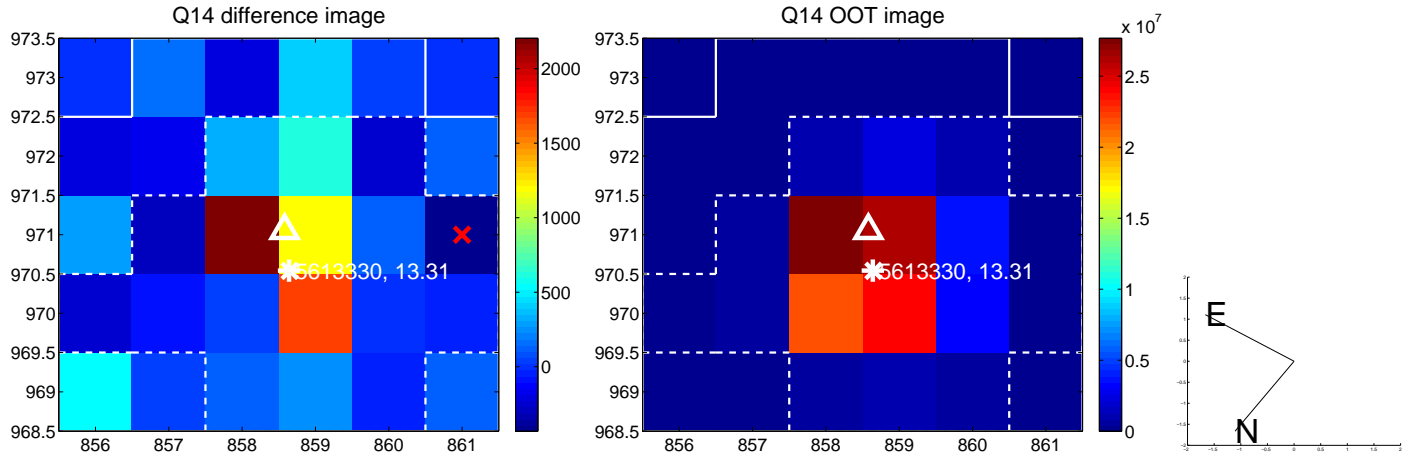
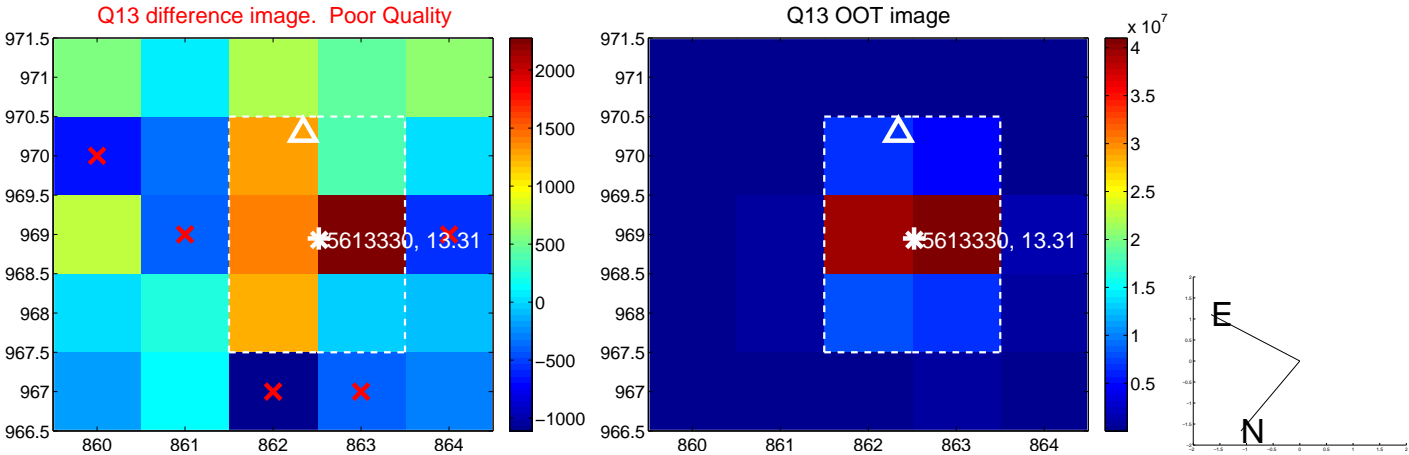
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



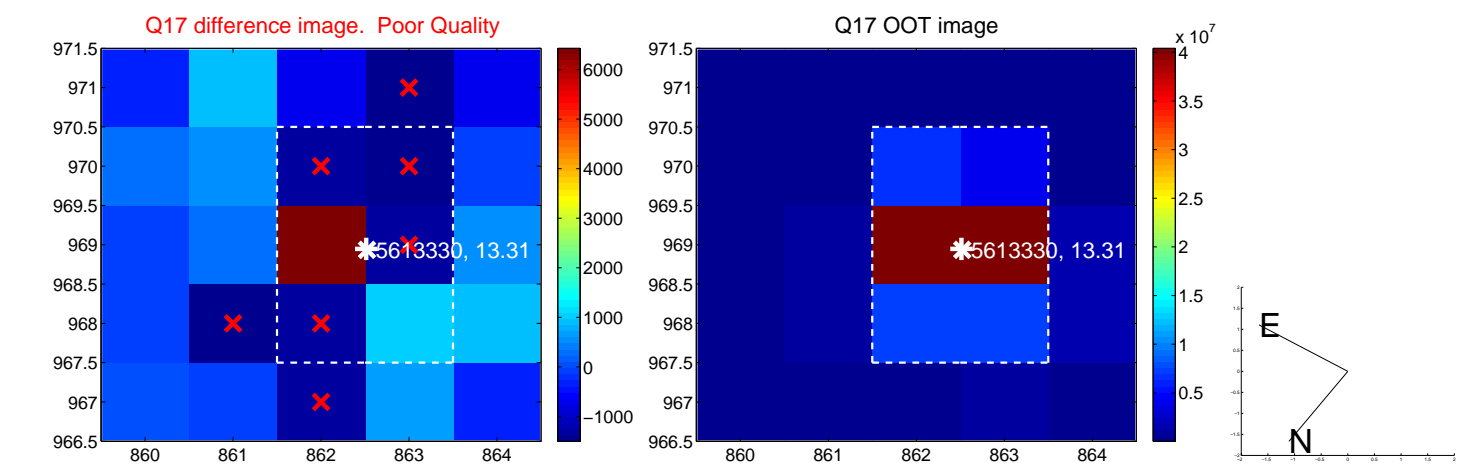
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



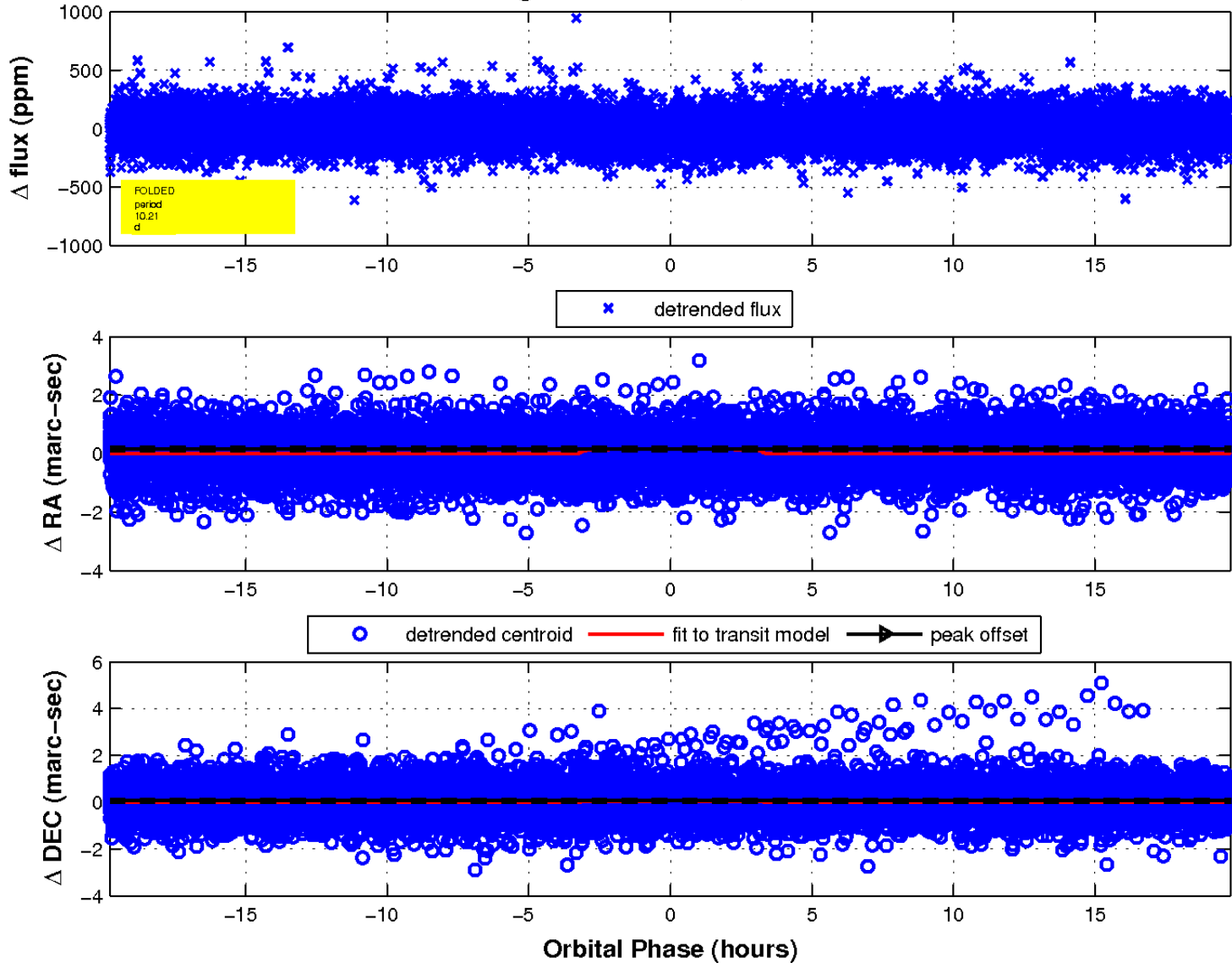
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

