

KIC 003656121

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})
003656121-01	OBS	0386.01	31.158820	142.744806	953.2	5.265	64.0	61.3	1.16	5951	3.74	39.52
003656121-02	OBS	0386.02	76.732374	200.673374	737.5	6.476	28.2	30.5	1.16	5951	3.51	11.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003656121-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
003656121-02	OBS	PC	0.97	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.

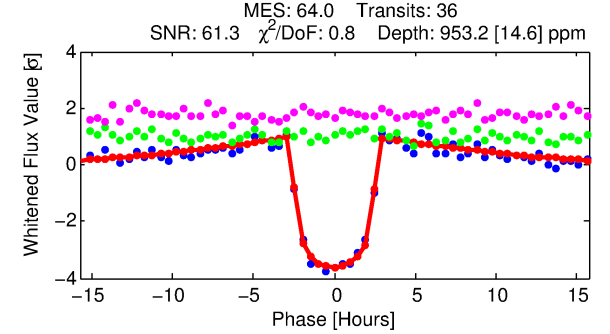
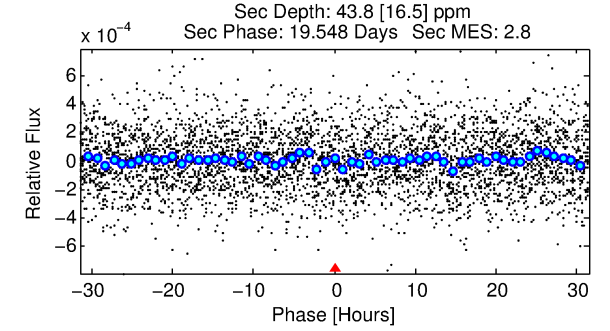
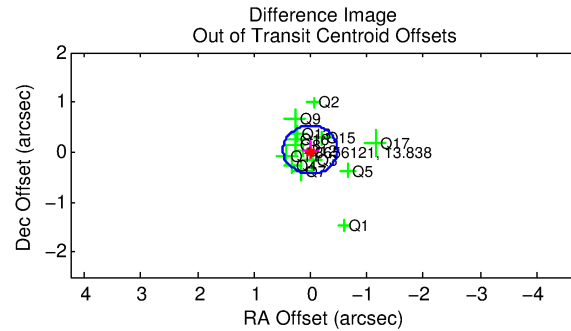
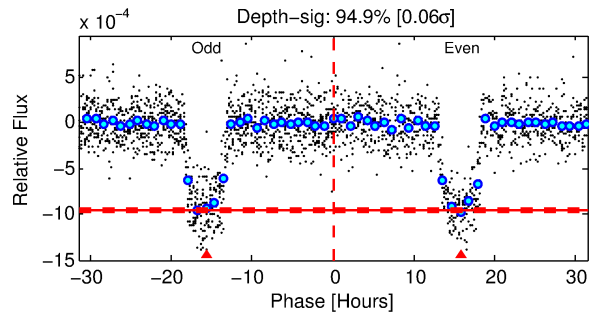
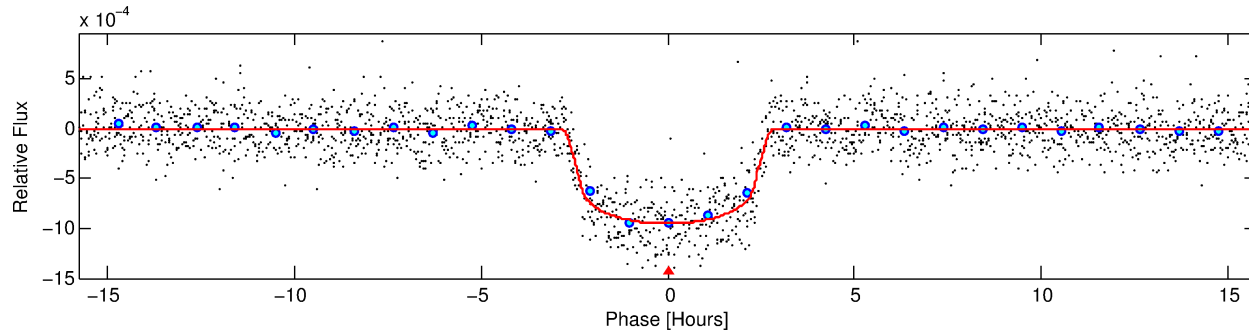
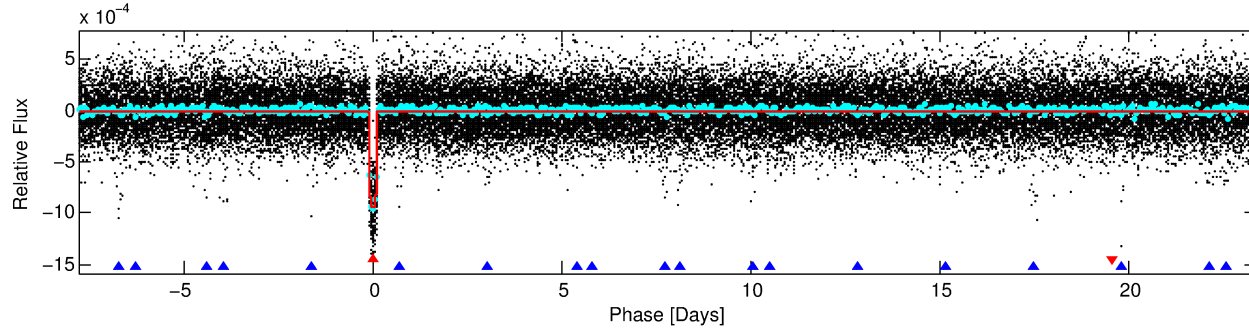
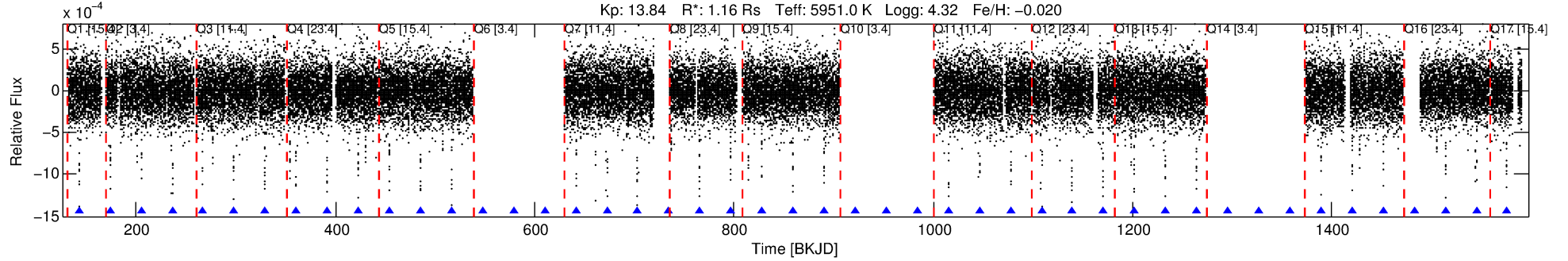
Ephemeris Match Information For 003656121-01

No Significant Match Found

DV One-Page Summary

KIC: 3656121 Candidate: 1 of 2 Period: 31.159 d
KOI: K00386.01 Name: Kepler-146b Corr: 0.992

Kp: 13.84 R*: 1.16 Rs Teff: 5951.0 K Logg: 4.32 Fe/H: -0.020



DV Fit Results:

Period = 31.15882 [0.00005] d
Epoch = 142.7448 [0.0014] BKJD
Rp/R* = 0.0297 [0.0035]
a/R* = 36.85 [19.88]
b = 0.63 [0.52]
Seff = 39.52 [8.98]
Teq = 639 [36] K
Rp = 3.74 [0.74] Re
a = 0.1947 [0.0274] AU
Ag = 65.24 [32.12] [2.00σ]
Teffp = 2809 [317] K [6.80σ]

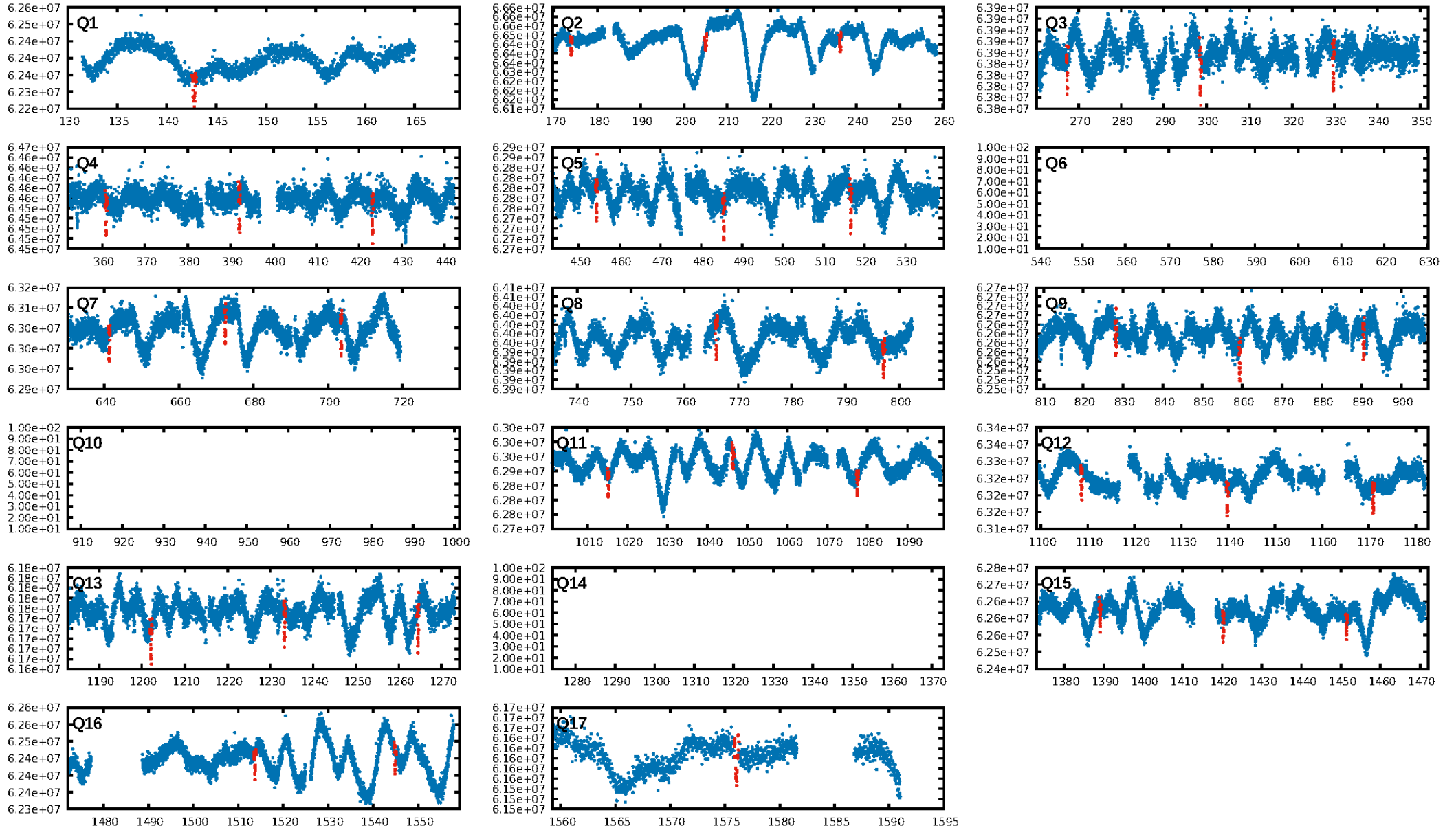
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [131.05σ]
ModelChiSquare2-sig: 92.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [34/34]
GhostDiagnostic-chr: 3.163
Centroid-sig: 0.1%
Centroid-so: 0.451 arcsec [2.30σ]
OotOffset-rm: 0.048 arcsec [0.30σ]
KicOffset-rm: 0.128 arcsec [0.91σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

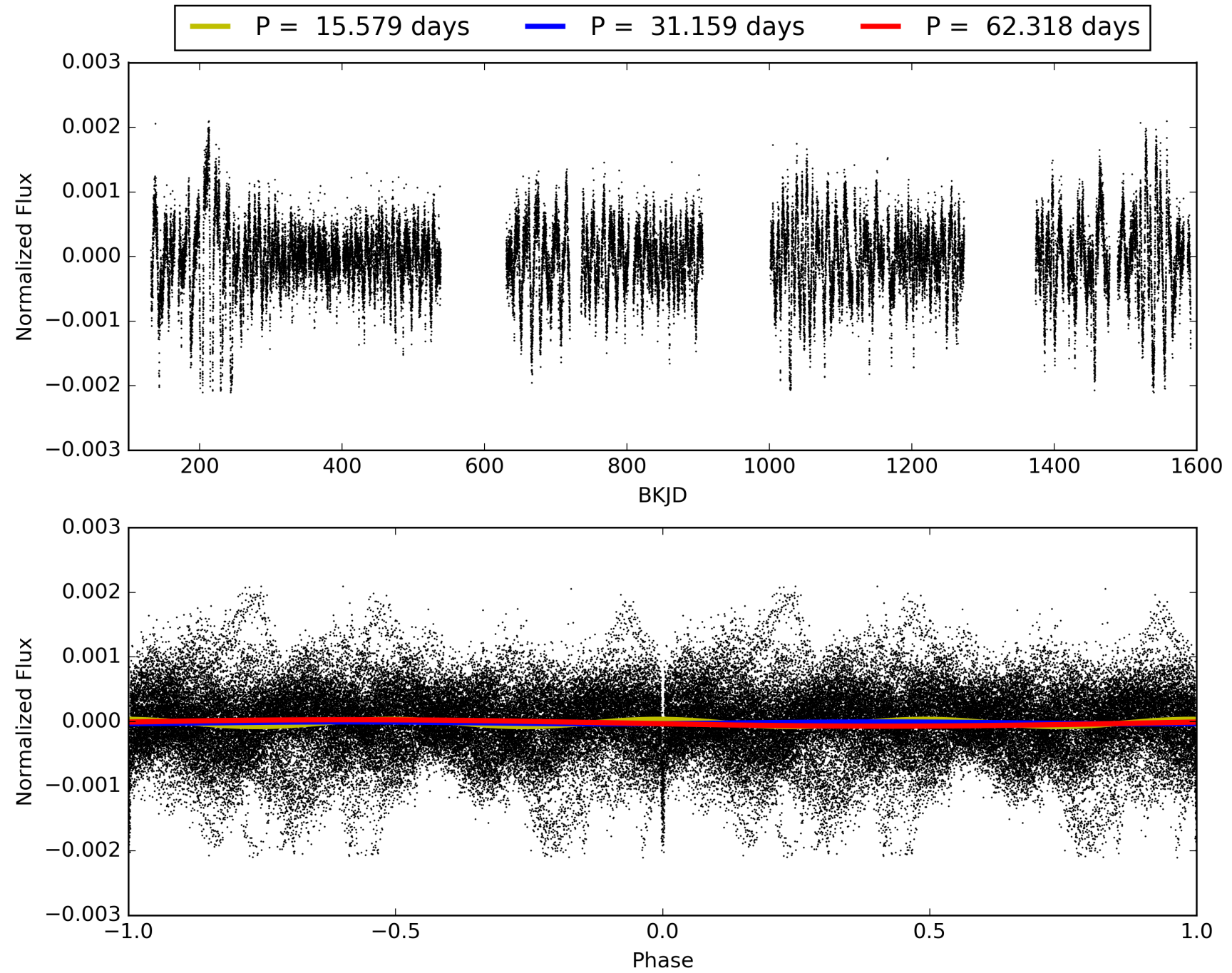
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:26:21 Z

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

TCE 003656121-01, PDC Light Curves

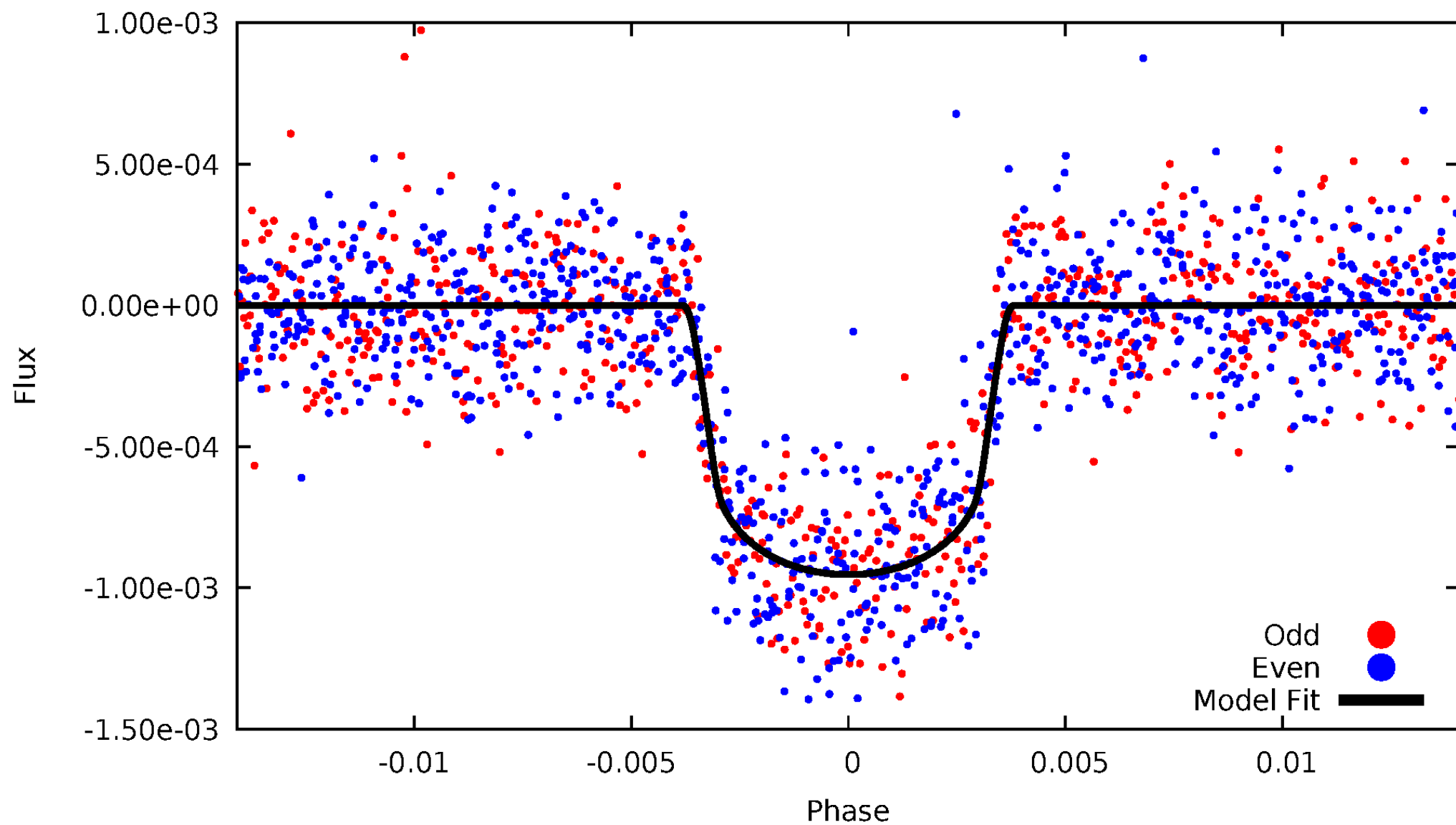


TCE 003656121-01



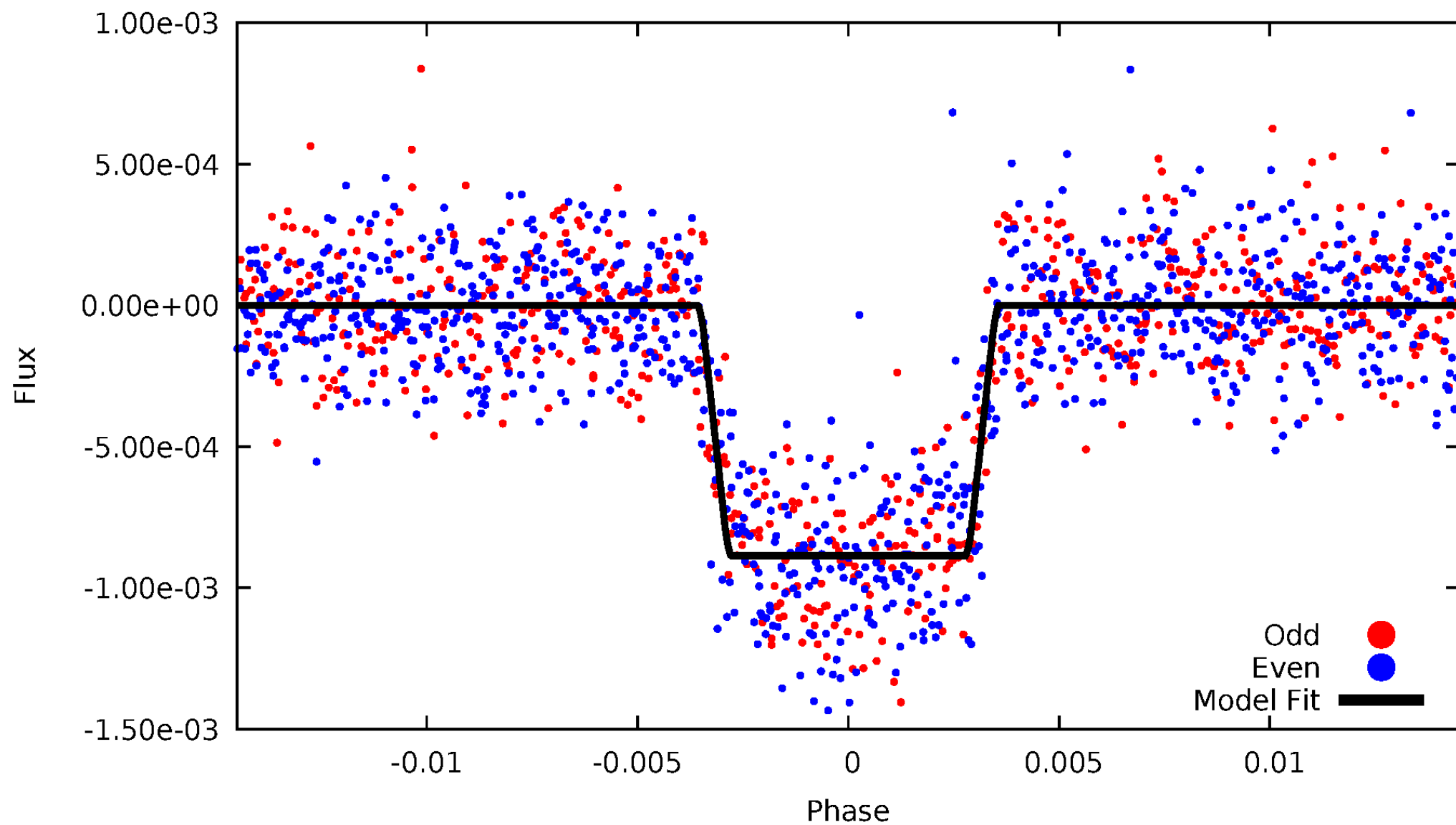
DV Odd/Even

TCE 003656121-01

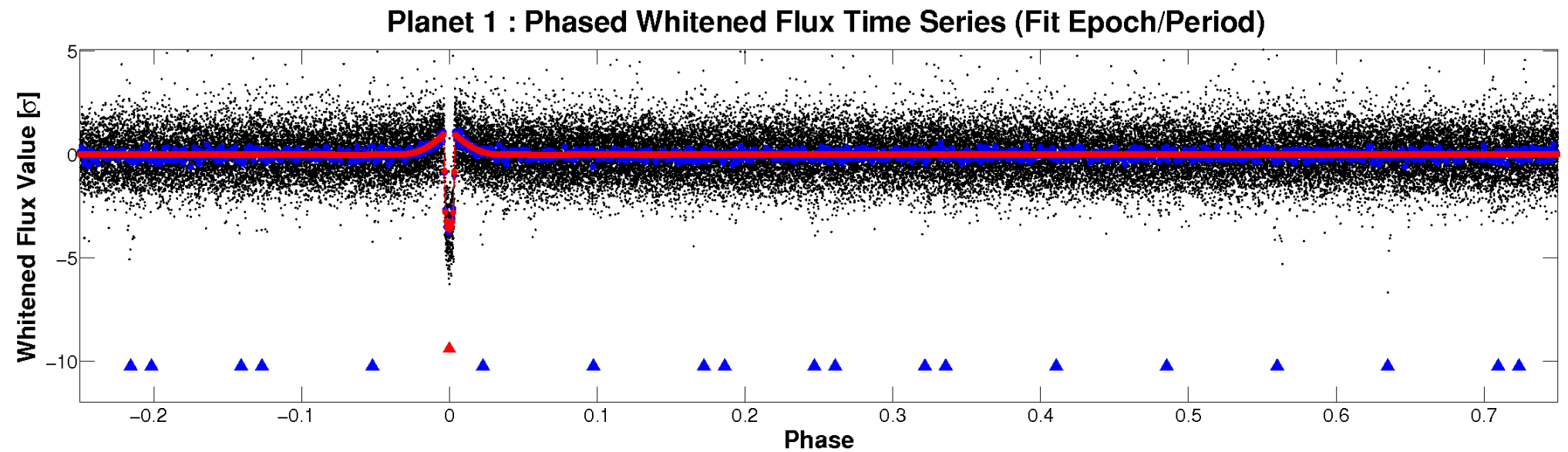
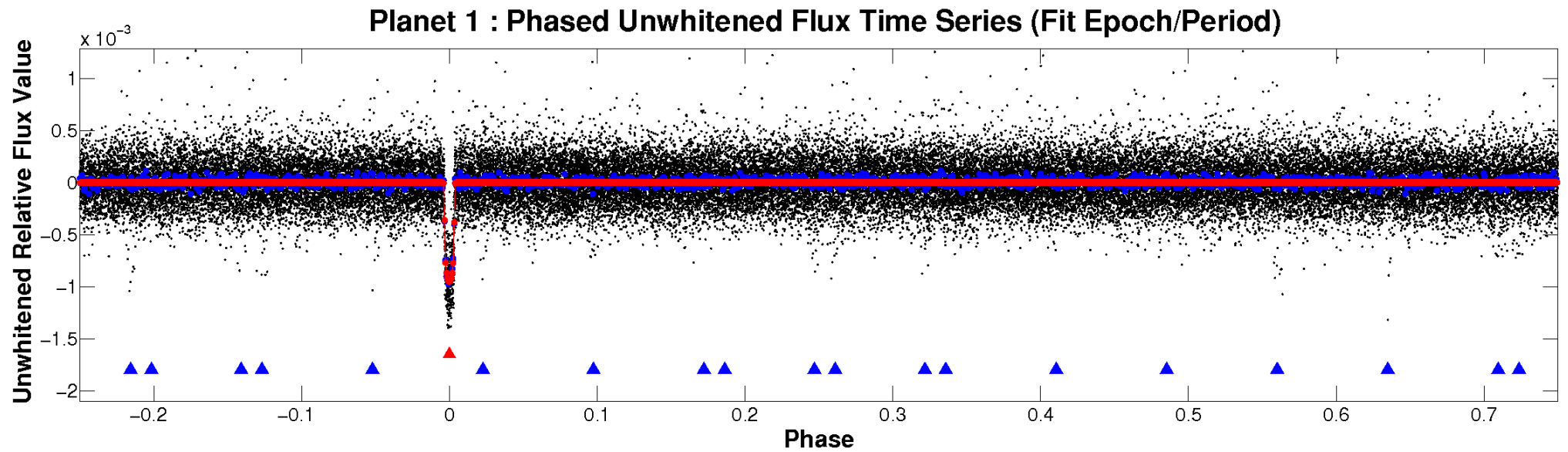


ALT Odd/Even

TCE 003656121-01

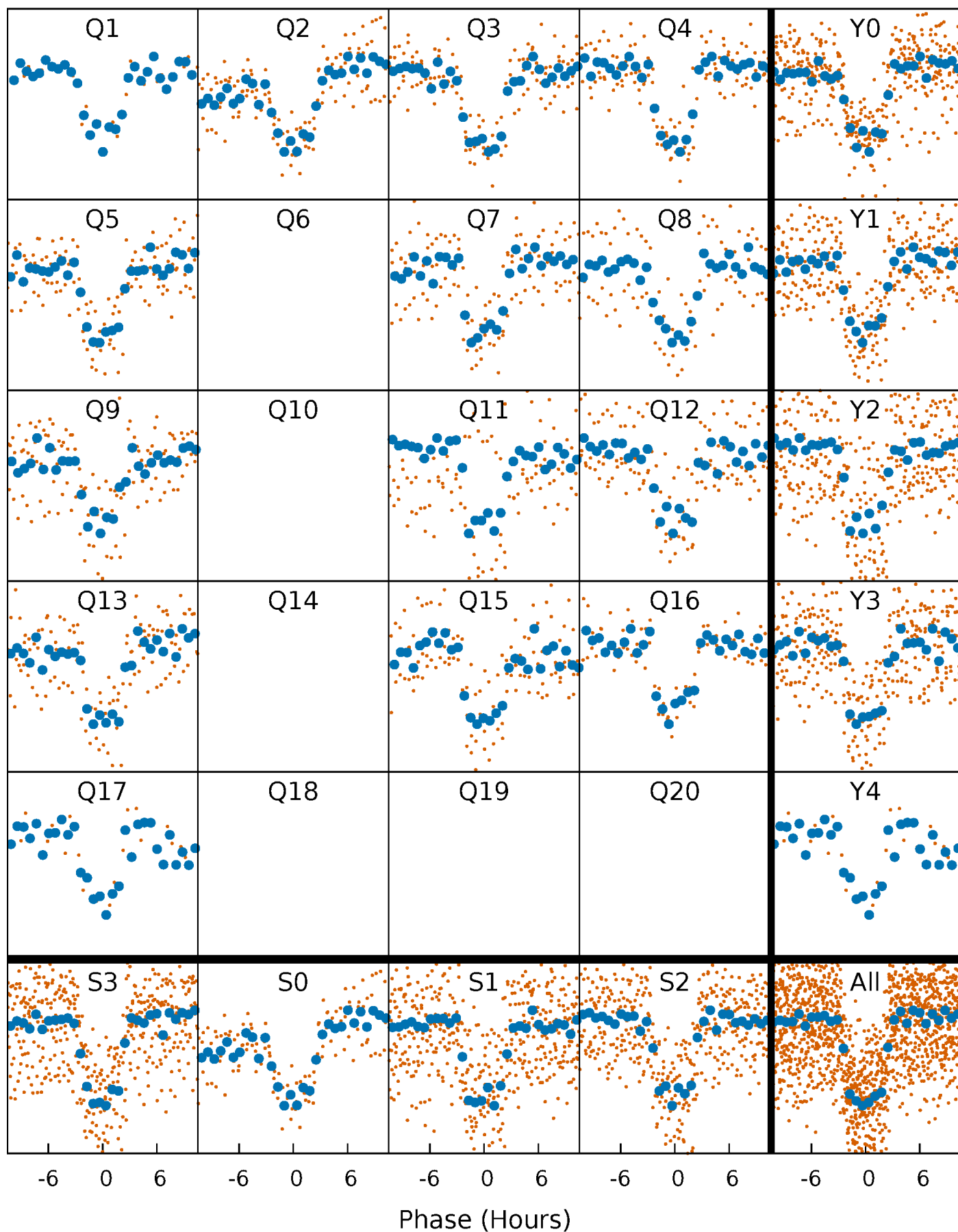


Non-Whitened Vs. Whitened Light Curve



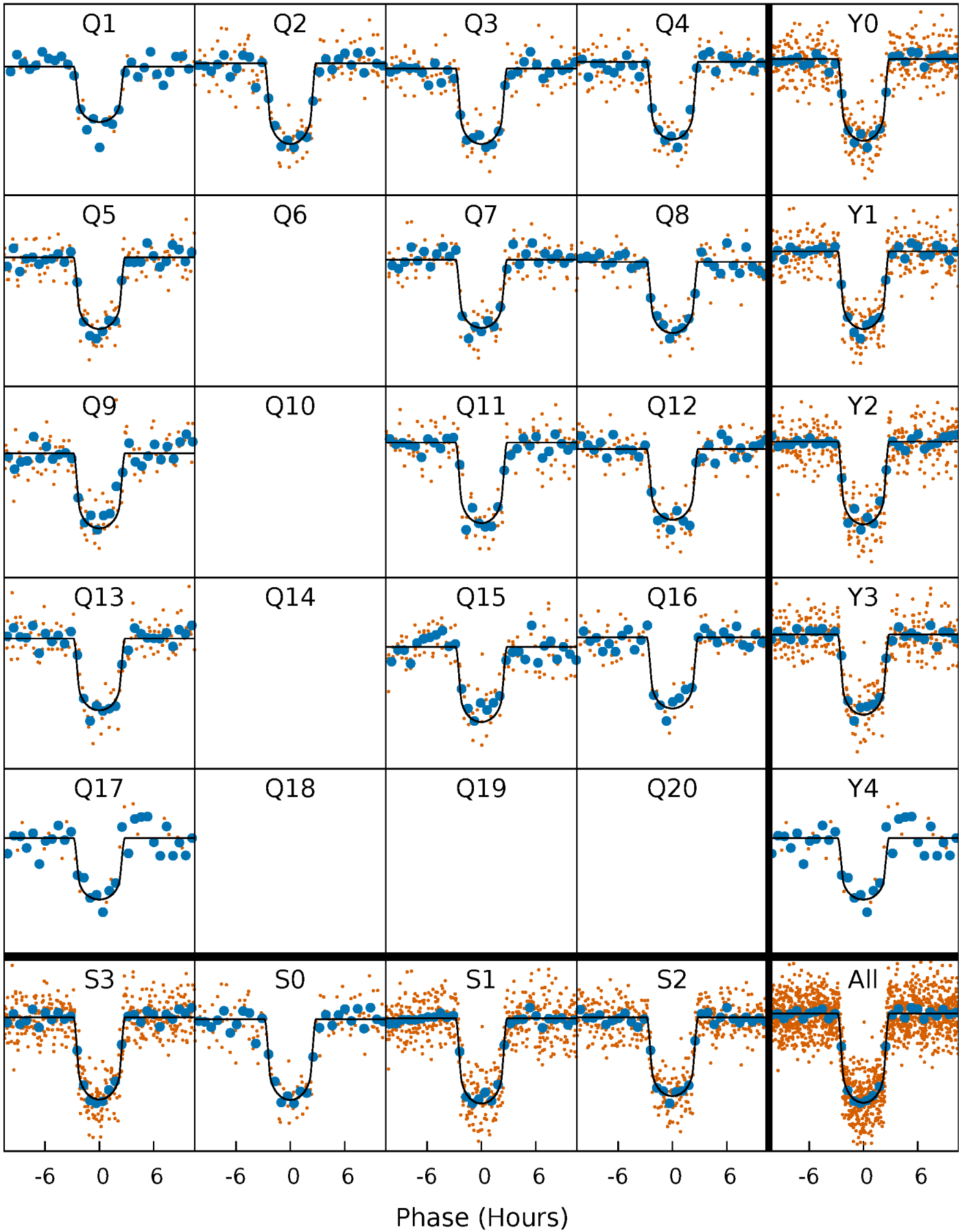
PDC Quarter-Phased Transit Curves

TCE 003656121-01 P= 31.158820 Days $T_0=142.744806$ (BKJD)



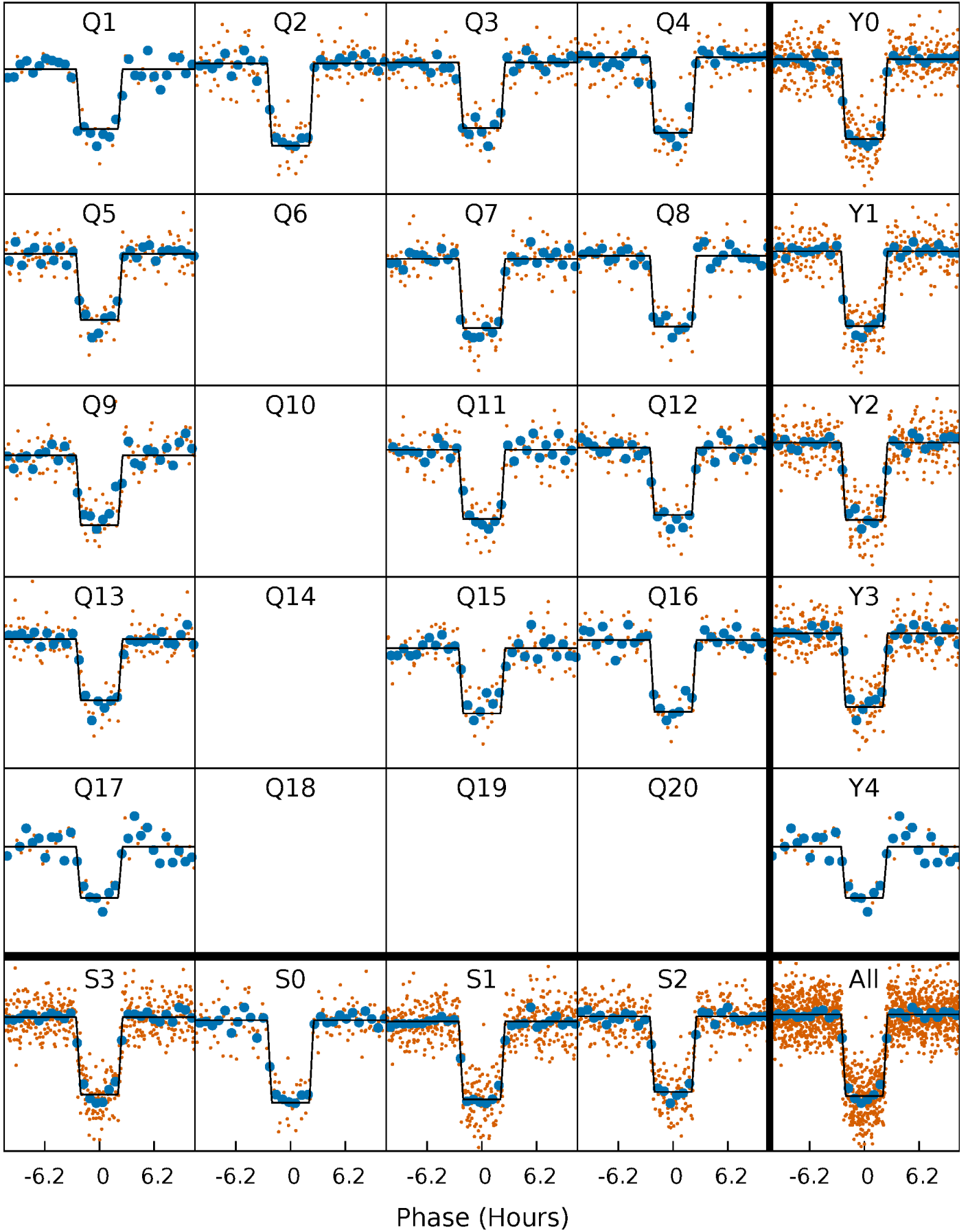
DV Quarter-Phased Transit Curves

TCE 003656121-01 P= 31.158820 Days $T_0=142.744806$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

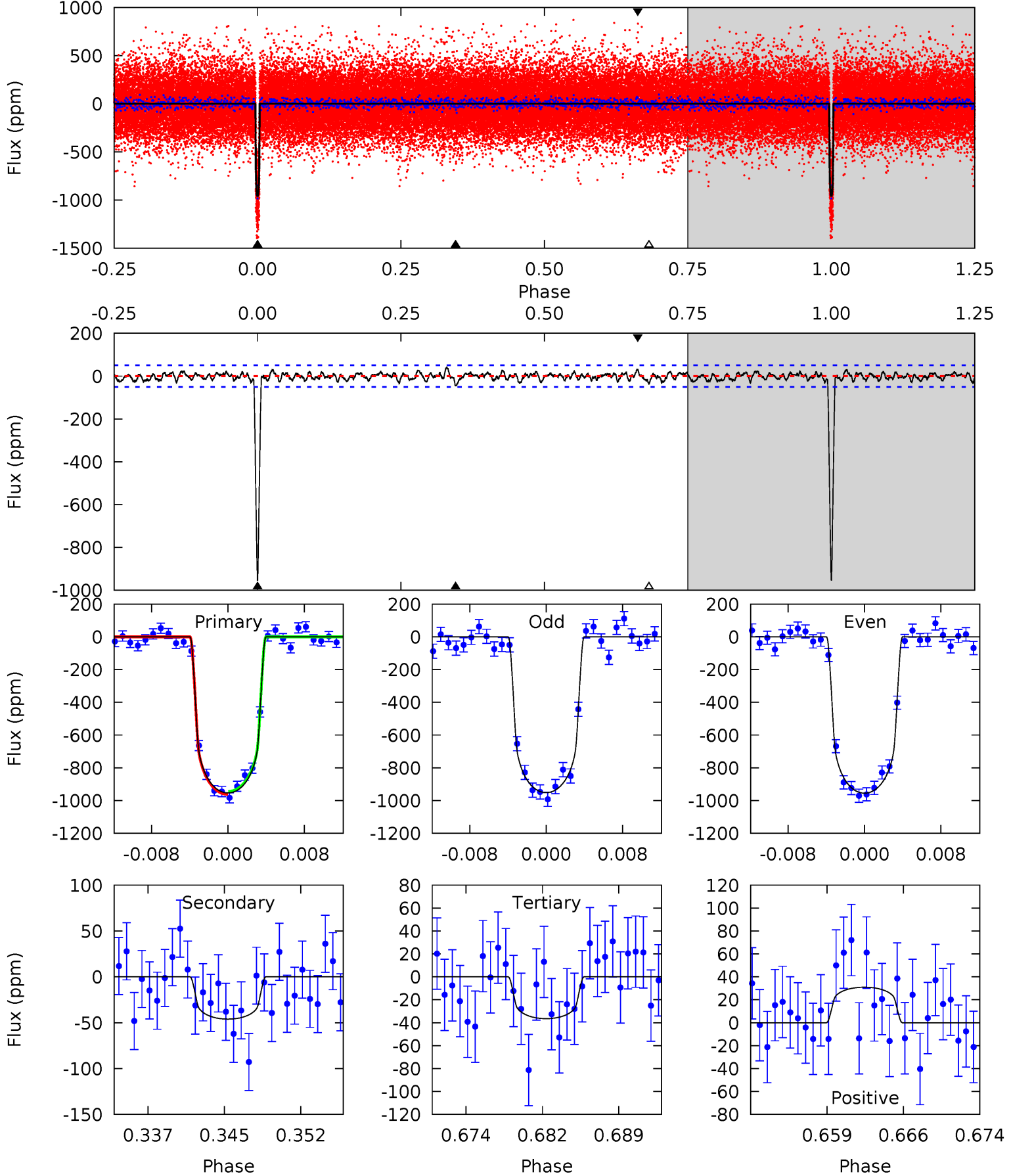
TCE 003656121-01 P= 31.158572 Days $T_0=142.750669$ (BKJD)



DV Model-Shift Uniqueness Test

003656121-01, P = 31.158820 Days, E = 111.585986 Days

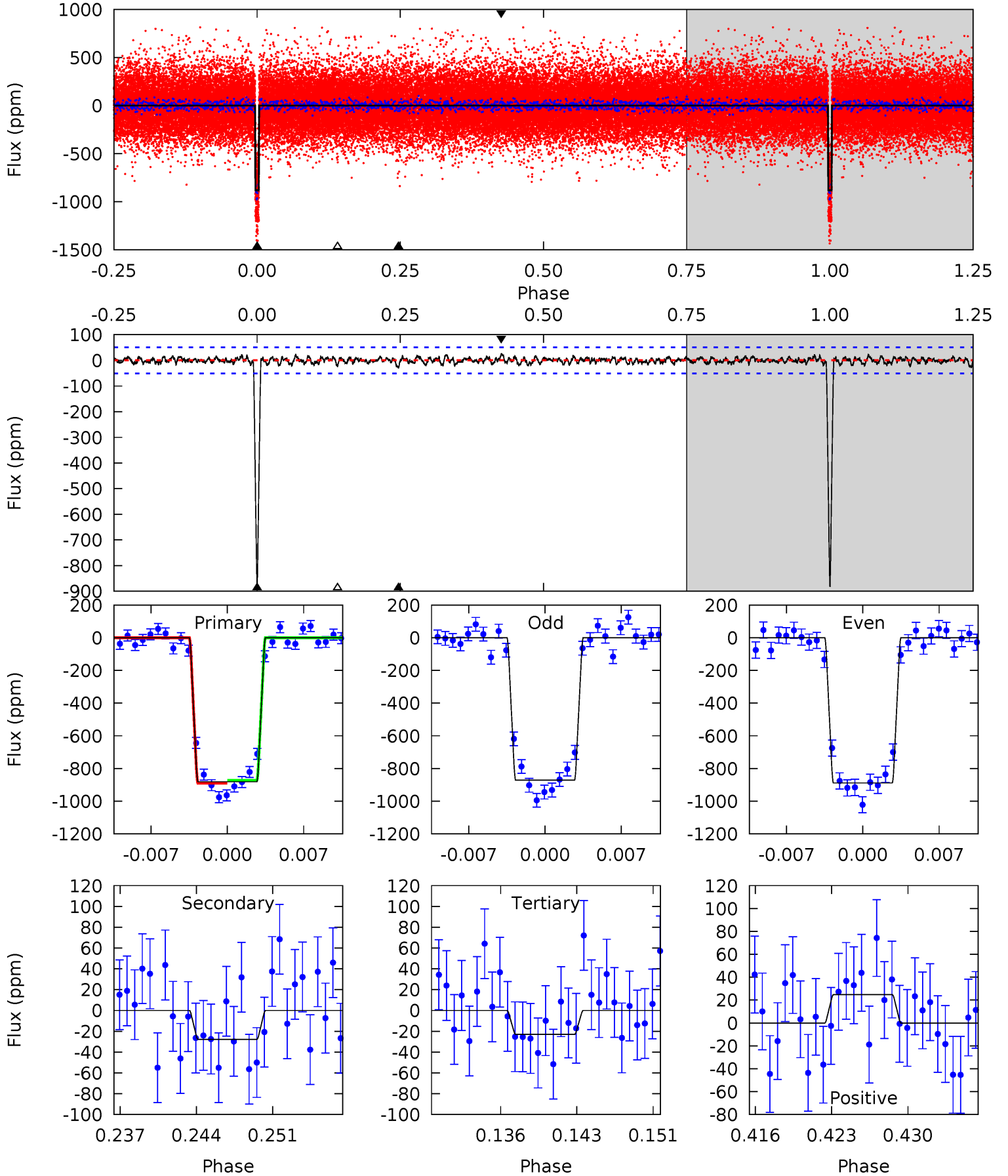
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
94.9	4.59	3.63	3.08	5.08	2.67	1.27	91.3	91.9	0.96	1.51	0.17	0.99	0.04	0.88



Alt Model-Shift Uniqueness Test

003656121-01, $P = 31.158572$ Days, $E = 111.592097$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
88.2	2.78	2.31	2.47	5.09	2.69	0.84	85.9	85.7	0.47	0.30	0.81	1.00	0.03	0.86



Stellar Parameters For KIC 003656121

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5951^{+107}_{-119}	$4.319^{+0.120}_{-0.120}$	$-0.020^{+0.150}_{-0.150}$	$1.155^{+0.184}_{-0.151}$	$1.015^{+0.088}_{-0.066}$	$0.927^{+0.484}_{-0.320}$
	+2%/-2%	+3%/-3%	+750%/-750%	+16%/-13%	+9%/-7%	+52%/-34%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 003656121-01 / KOI 0386.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-46 ± 10	$3.74^{+0.56}_{-0.50}$	892^{+42}_{-38}	3372^{+182}_{-160}	69^{+28}_{-21}
Alt.	-28 ± 10	$3.74^{+0.58}_{-0.57}$	894^{+44}_{-39}	3133^{+192}_{-220}	41^{+22}_{-17}

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 $A_{obs} \gg 1.0$

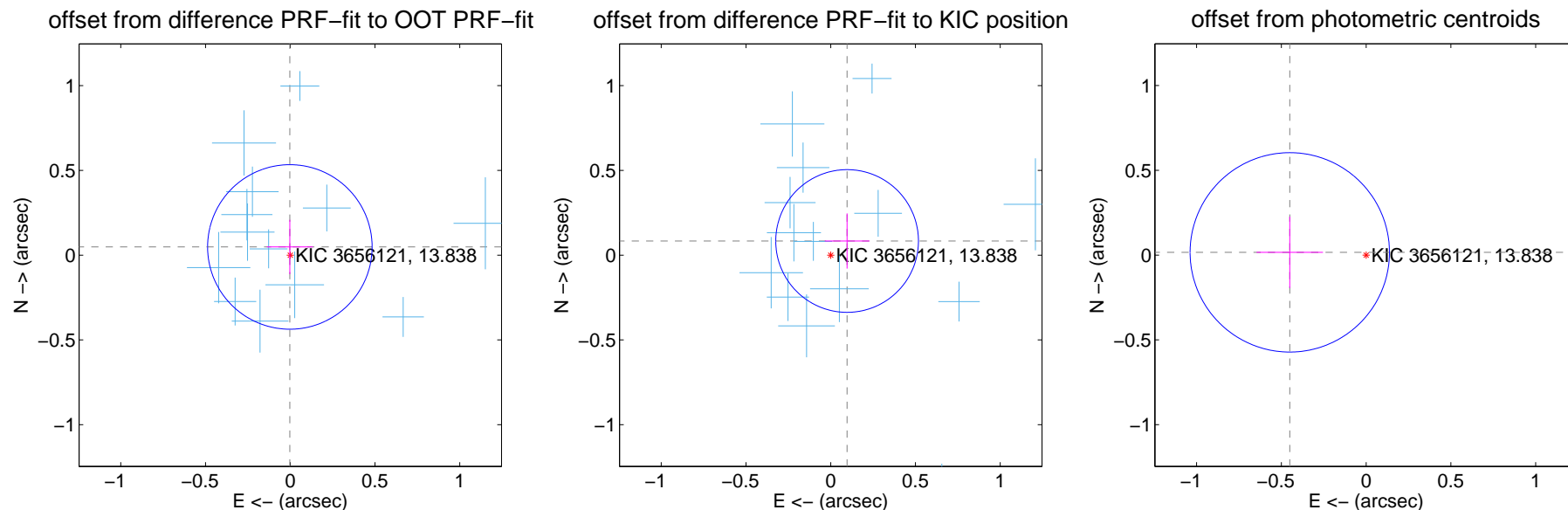
DV Centroid Data

Supplemental centroid analysis for 003656121-01. Kepler magnitude: 13.84. Transit SNR 61.28

There are 14 quarters with good PRF difference image offsets

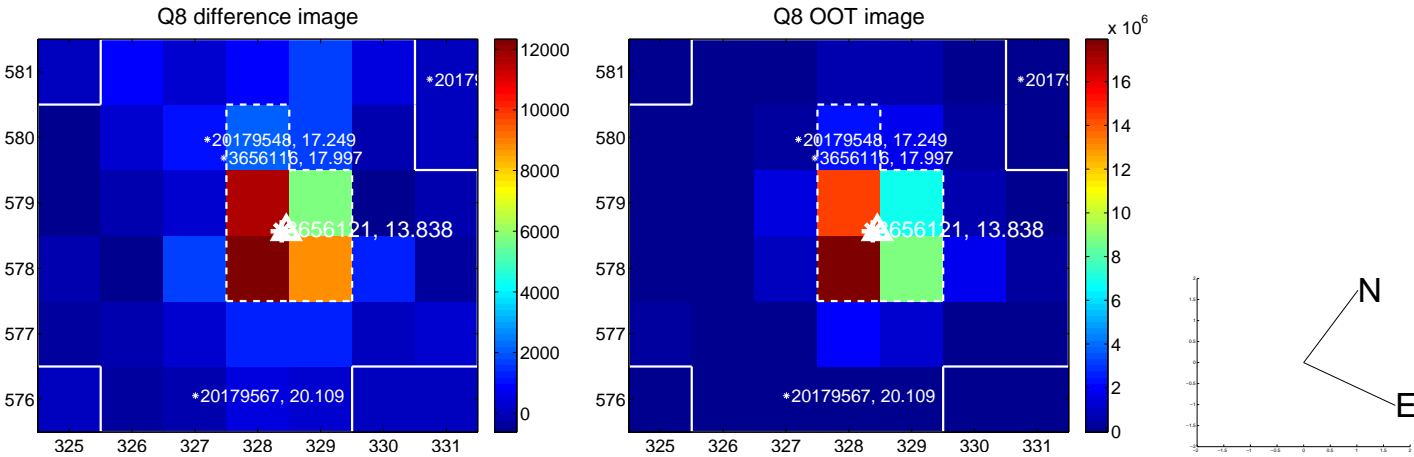
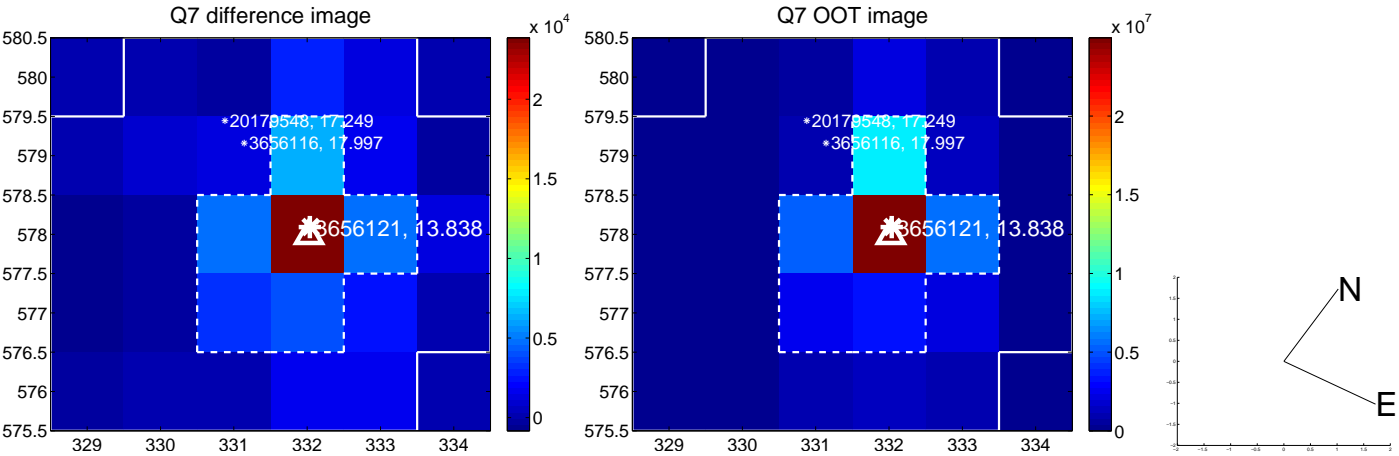
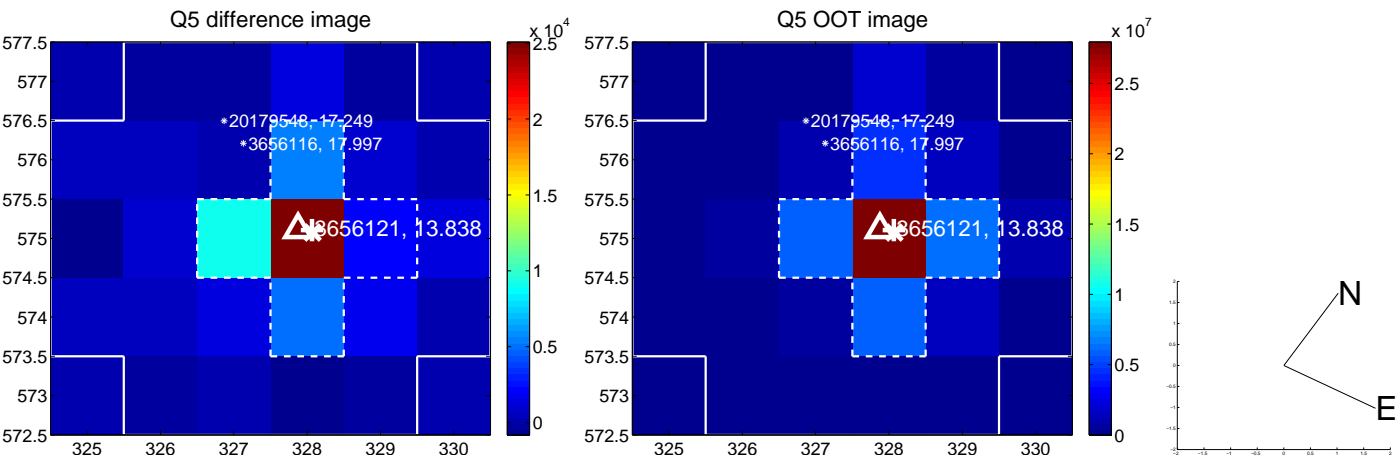
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.048 ± 0.162	0.30	0.002 ± 0.136	0.048 ± 0.160
PRF-fit source offset from KIC position	0.128 ± 0.140	0.91	-0.097 ± 0.132	0.083 ± 0.163
photometric centroid source offset	0.45 ± 0.20	2.30	0.45 ± 0.20	0.02 ± 0.21

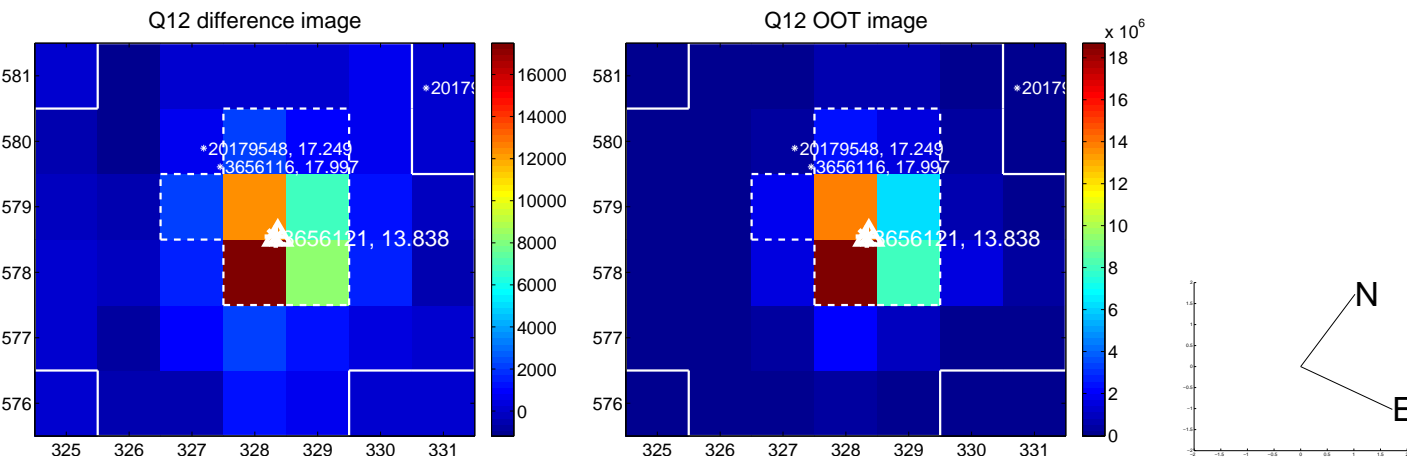
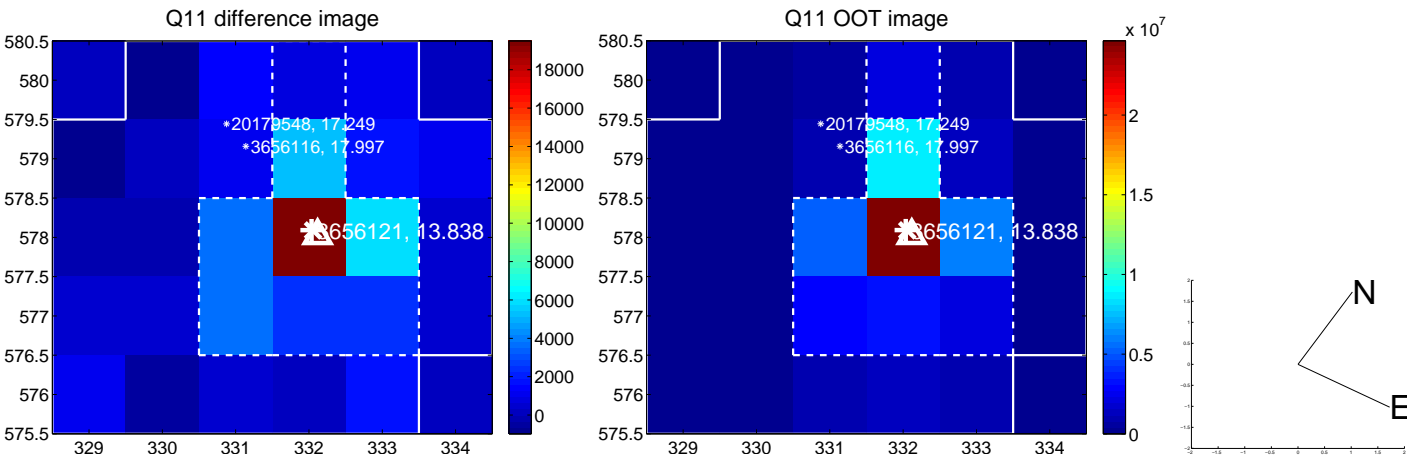
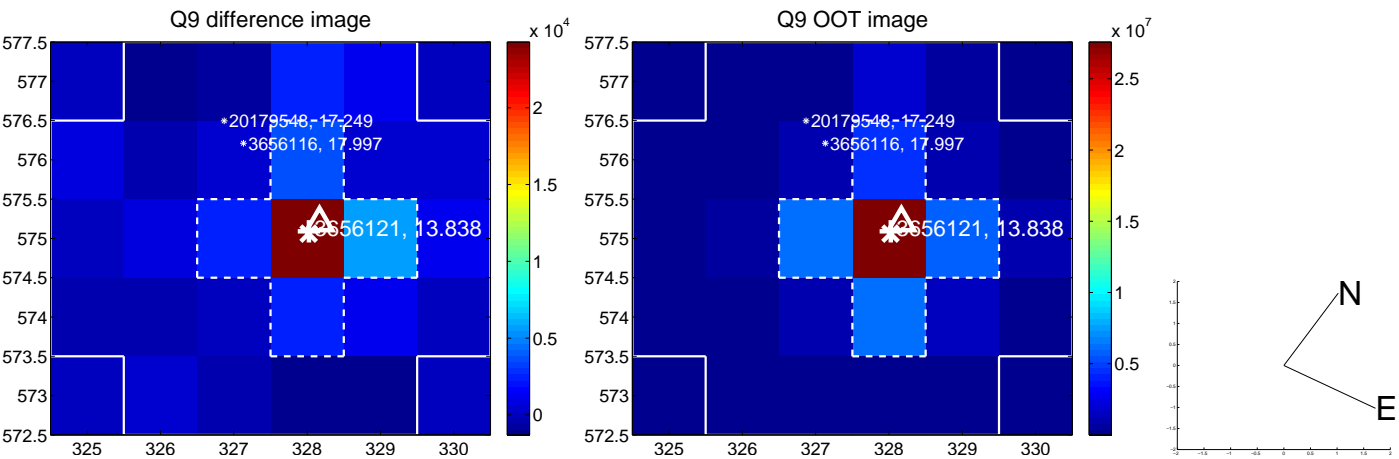


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

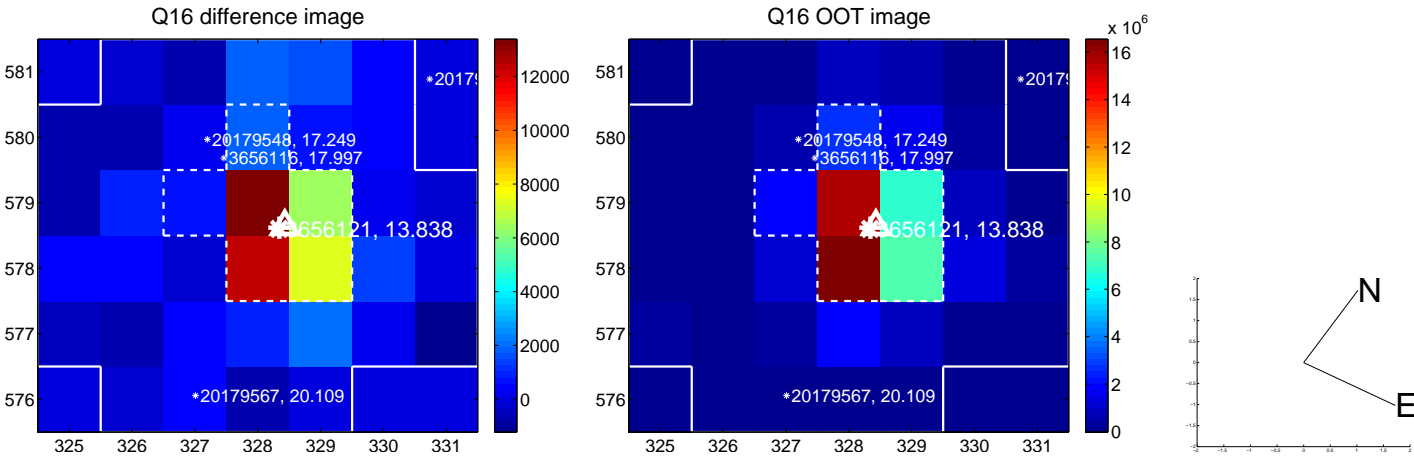
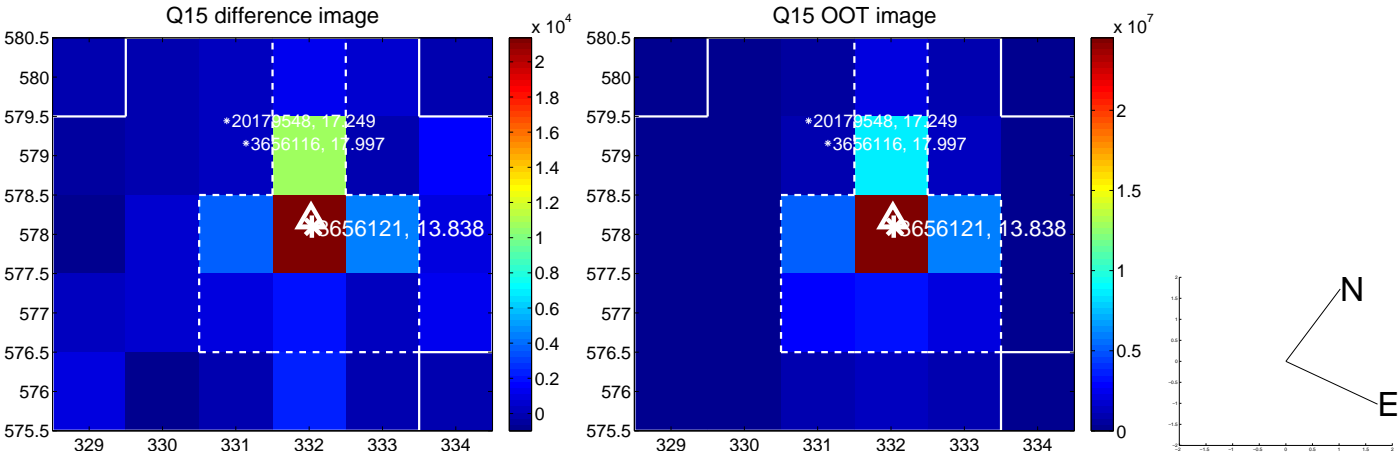
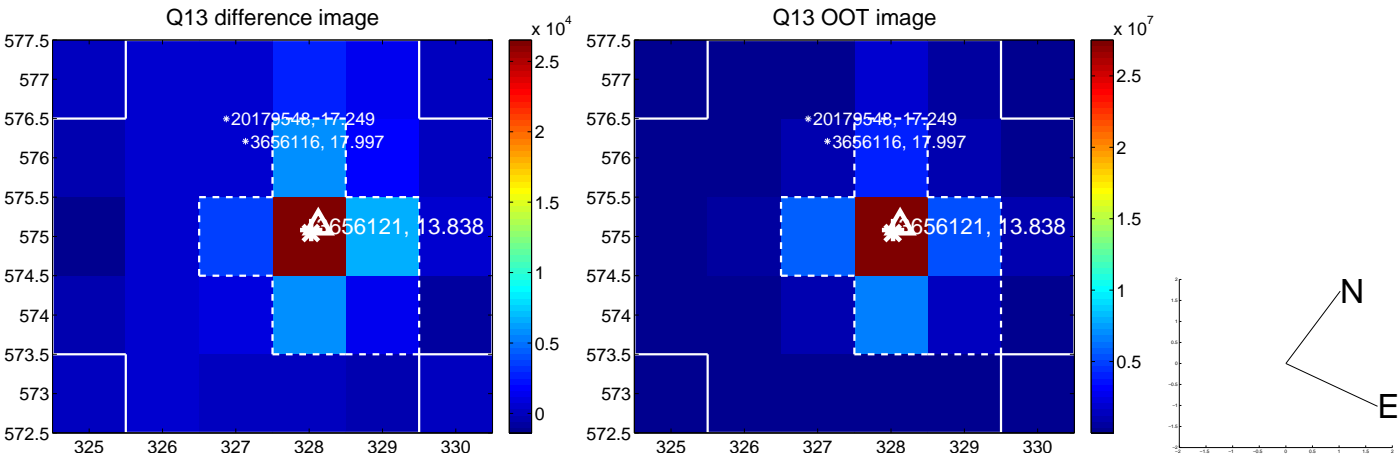
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



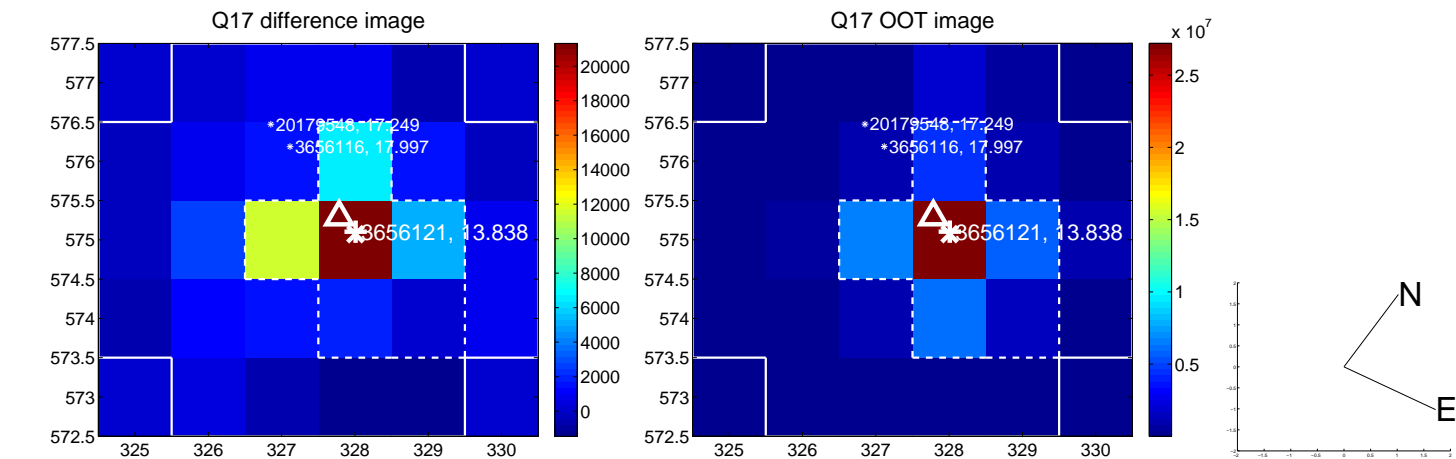
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



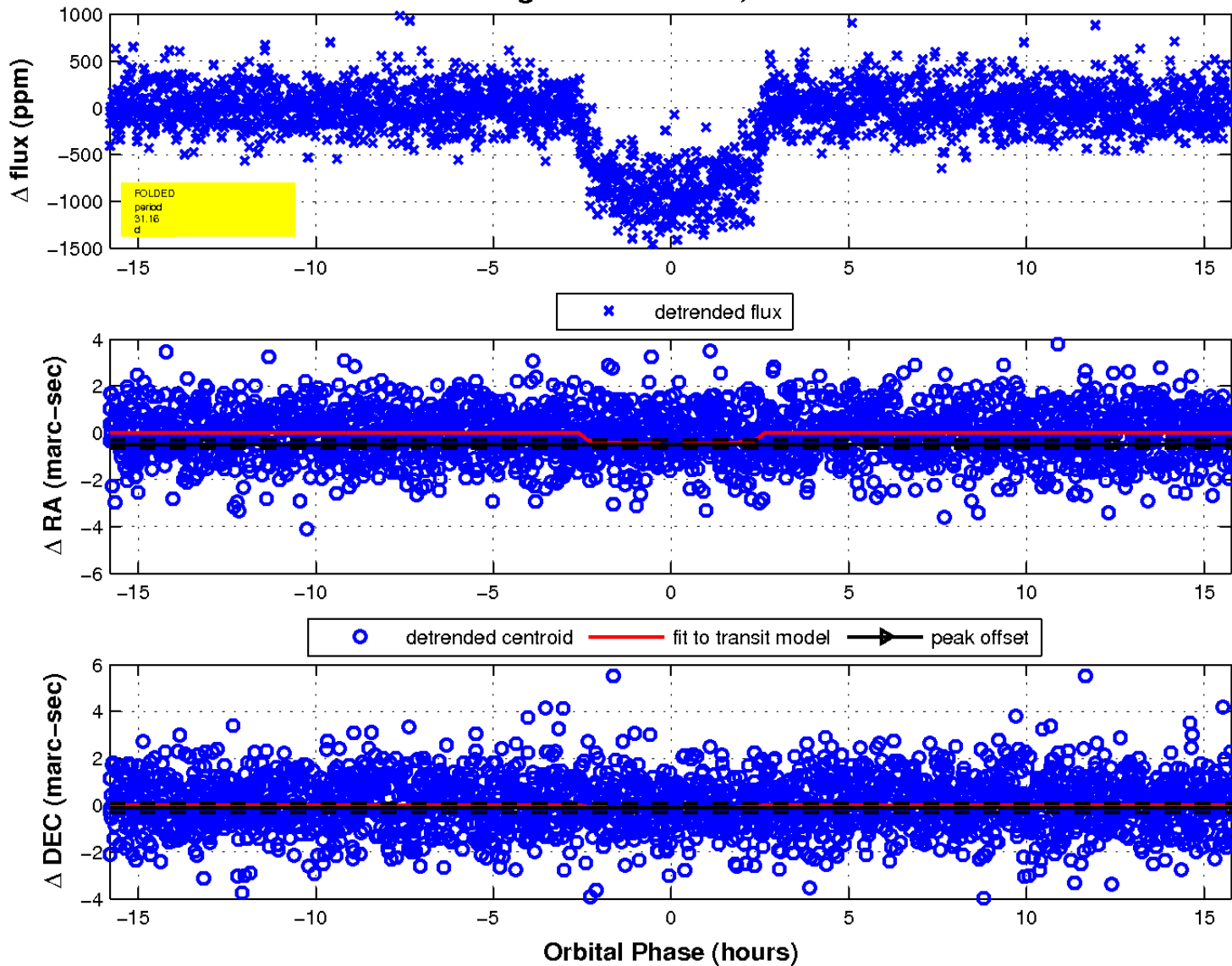
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

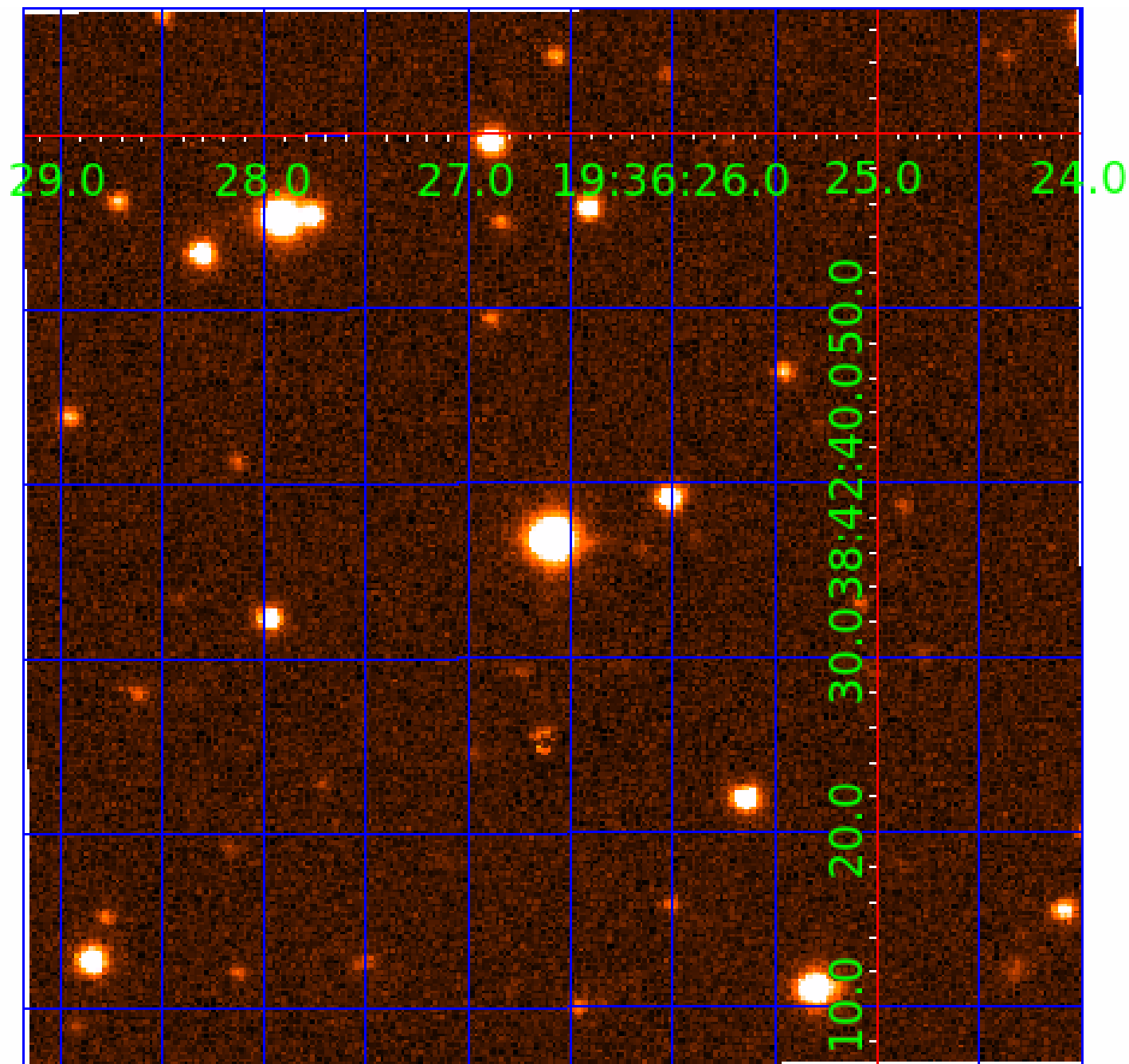


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 003656121

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})
003656121-01	OBS	0386.01	31.158820	142.744806	953.2	5.265	64.0	61.3	1.16	5951	3.74	39.52
003656121-02	OBS	0386.02	76.732374	200.673374	737.5	6.476	28.2	30.5	1.16	5951	3.51	11.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003656121-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
003656121-02	OBS	PC	0.97	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.

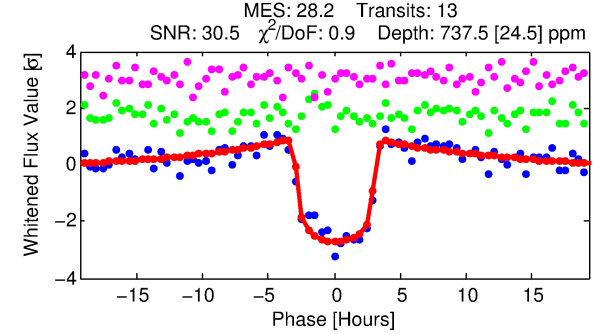
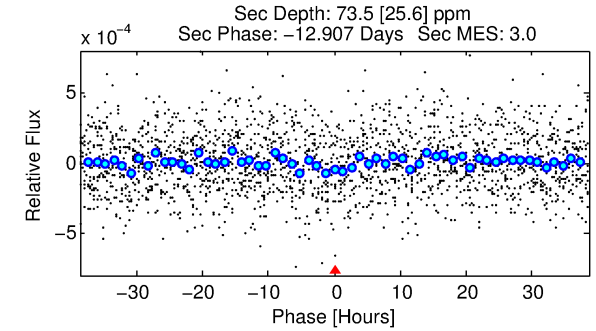
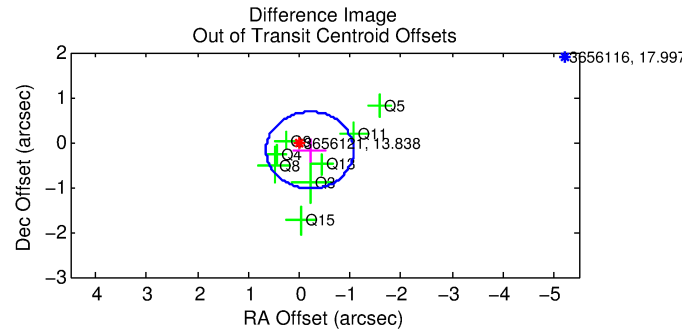
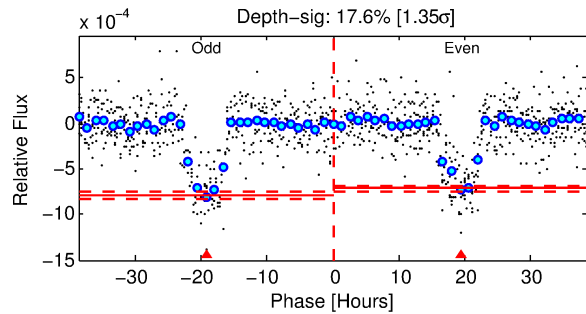
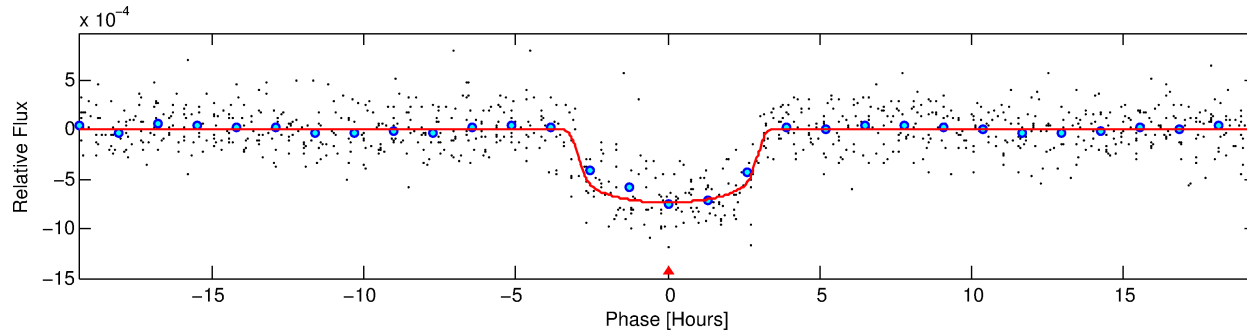
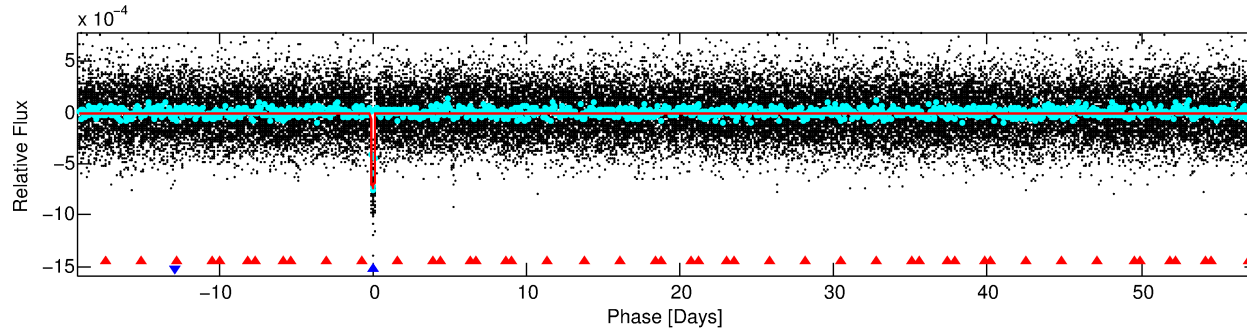
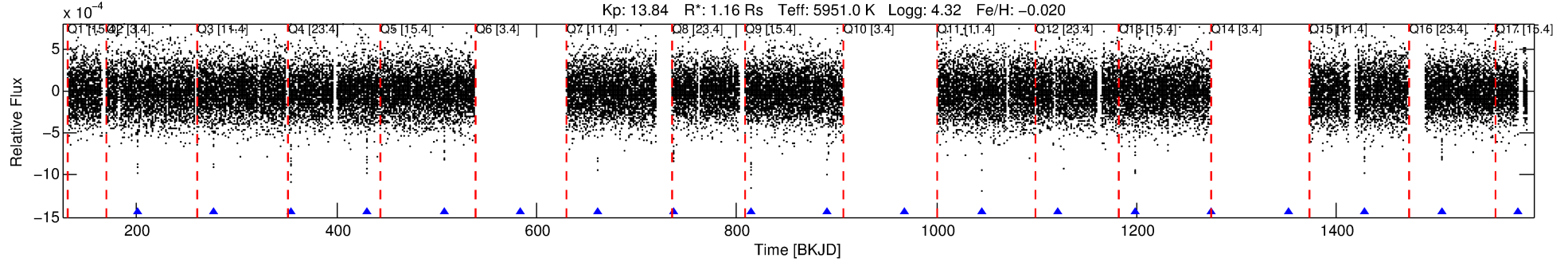
Ephemeris Match Information For 003656121-02

No Significant Match Found

DV One-Page Summary

KIC: 3656121 Candidate: 2 of 2 Period: 76.732 d
KOI: K00386.02 Name: Kepler-146c Corr: 0.980

Kp: 13.84 R*: 1.16 Rs Teff: 5951.0 K Logg: 4.32 Fe/H: -0.020



DV Fit Results:

Period = 76.73237 [0.00035] d
Epoch = 200.6734 [0.0032] BKJD
Rp/R* = 0.0279 [0.0020]
a/R* = 55.98 [17.85]
b = 0.82 [0.13]
Seff = 11.89 [2.70]
Teq = 473 [27] K
Rp = 3.51 [0.61] Re
a = 0.3551 [0.0499] AU
Ag = 413.43 [178.61] [2.31σ]
Teffp = 3301 [317] K [8.88σ]

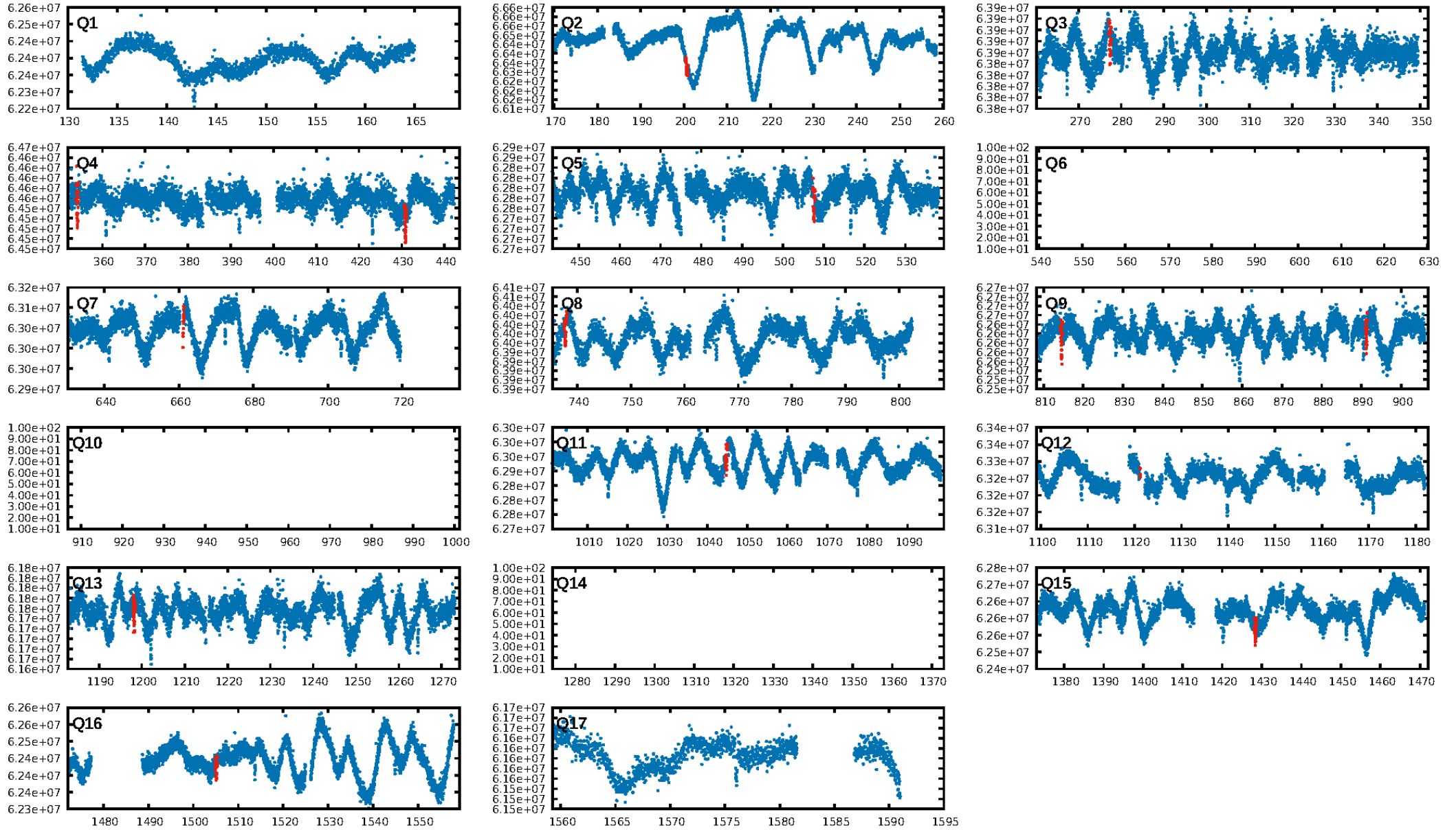
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [131.05σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 83.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.32e-151
RollingBand-fgt: 1.00 [13/13]
GhostDiagnostic-chr: 3.206
Centroid-sig: 0.0%
Centroid-so: 1.030 arcsec [2.48σ]
OotOffset-rm: 0.275 arcsec [0.96σ]
KicOffset-rm: 0.301 arcsec [1.01σ]
OotOffset-st: 0/3/2/3 [8]
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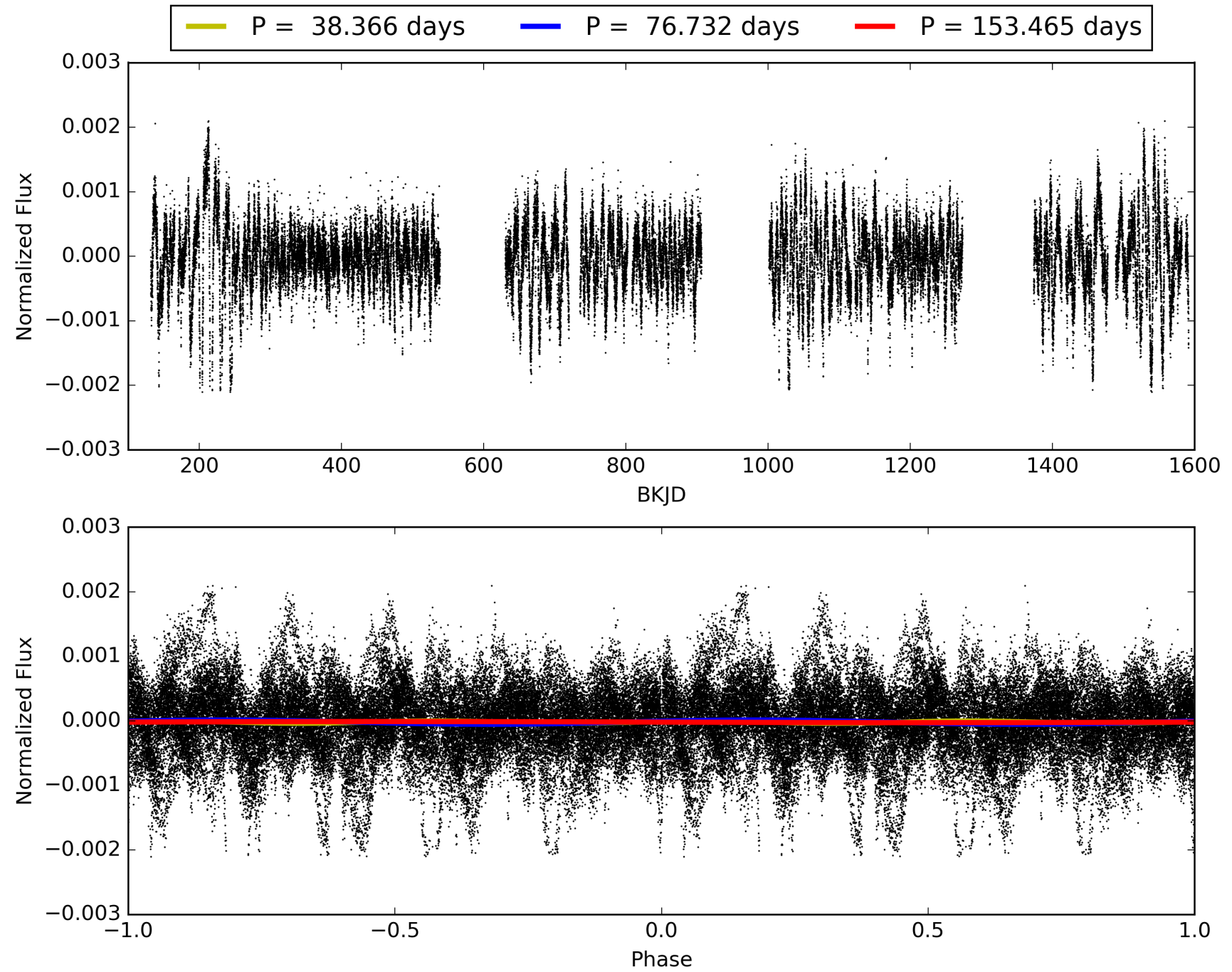
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:26:27 Z

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

TCE 003656121-02, PDC Light Curves

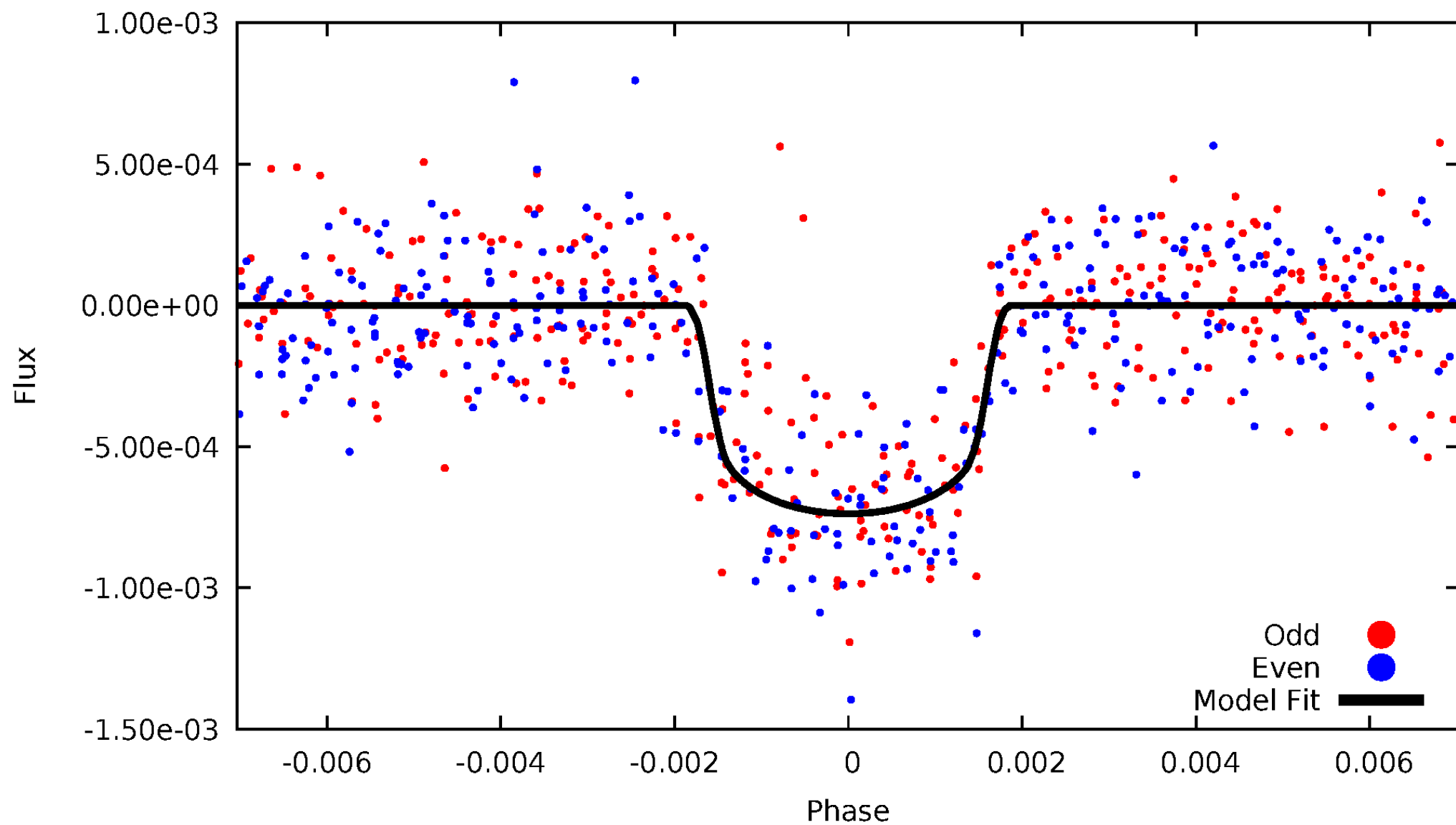


TCE 003656121-02



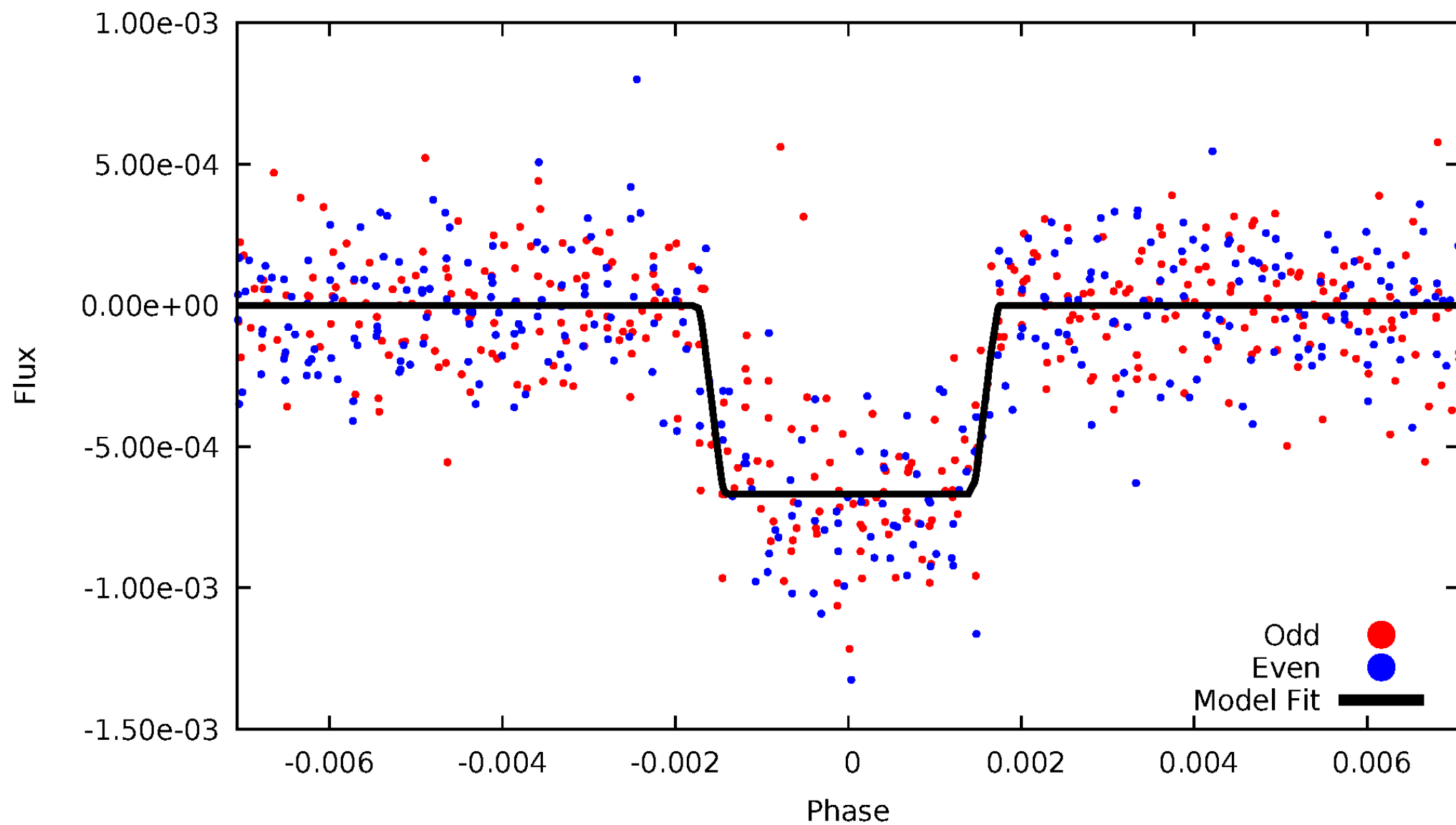
DV Odd/Even

TCE 003656121-02



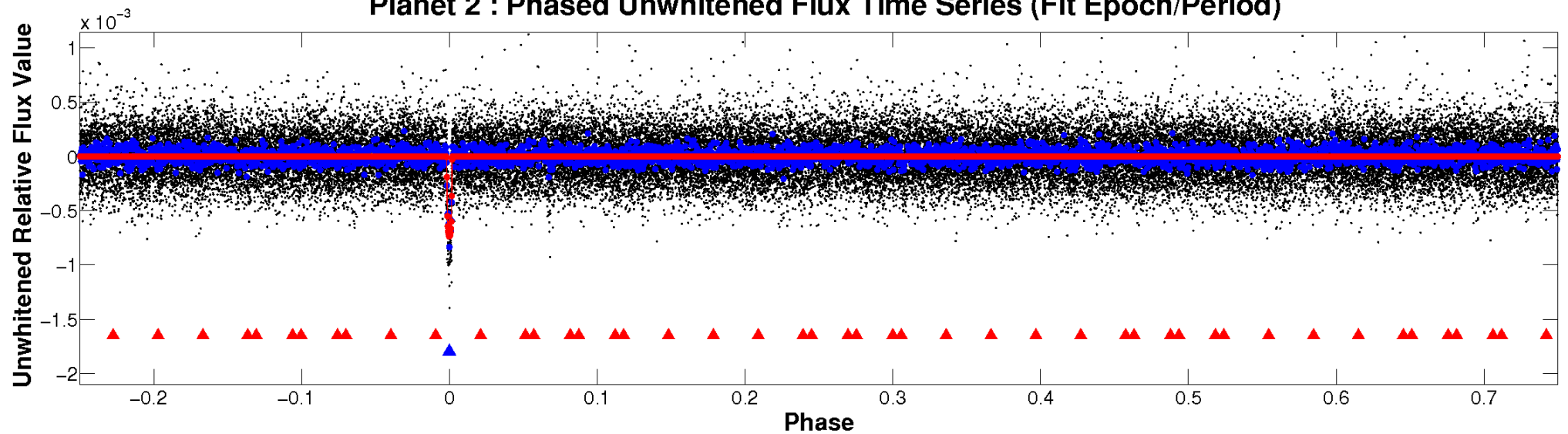
ALT Odd/Even

TCE 003656121-02

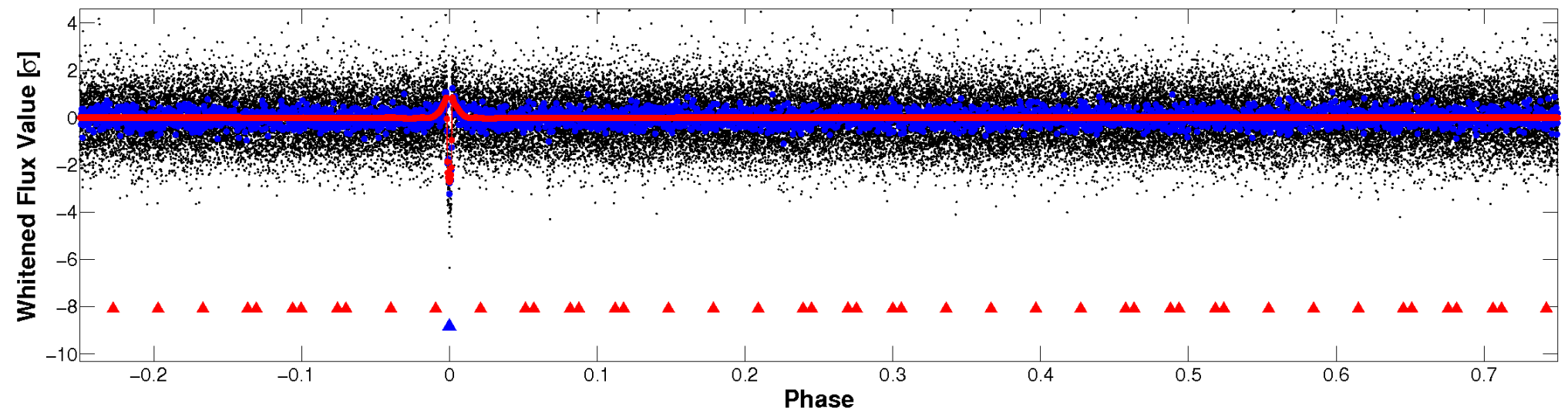


Non-Whitened Vs. Whitened Light Curve

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

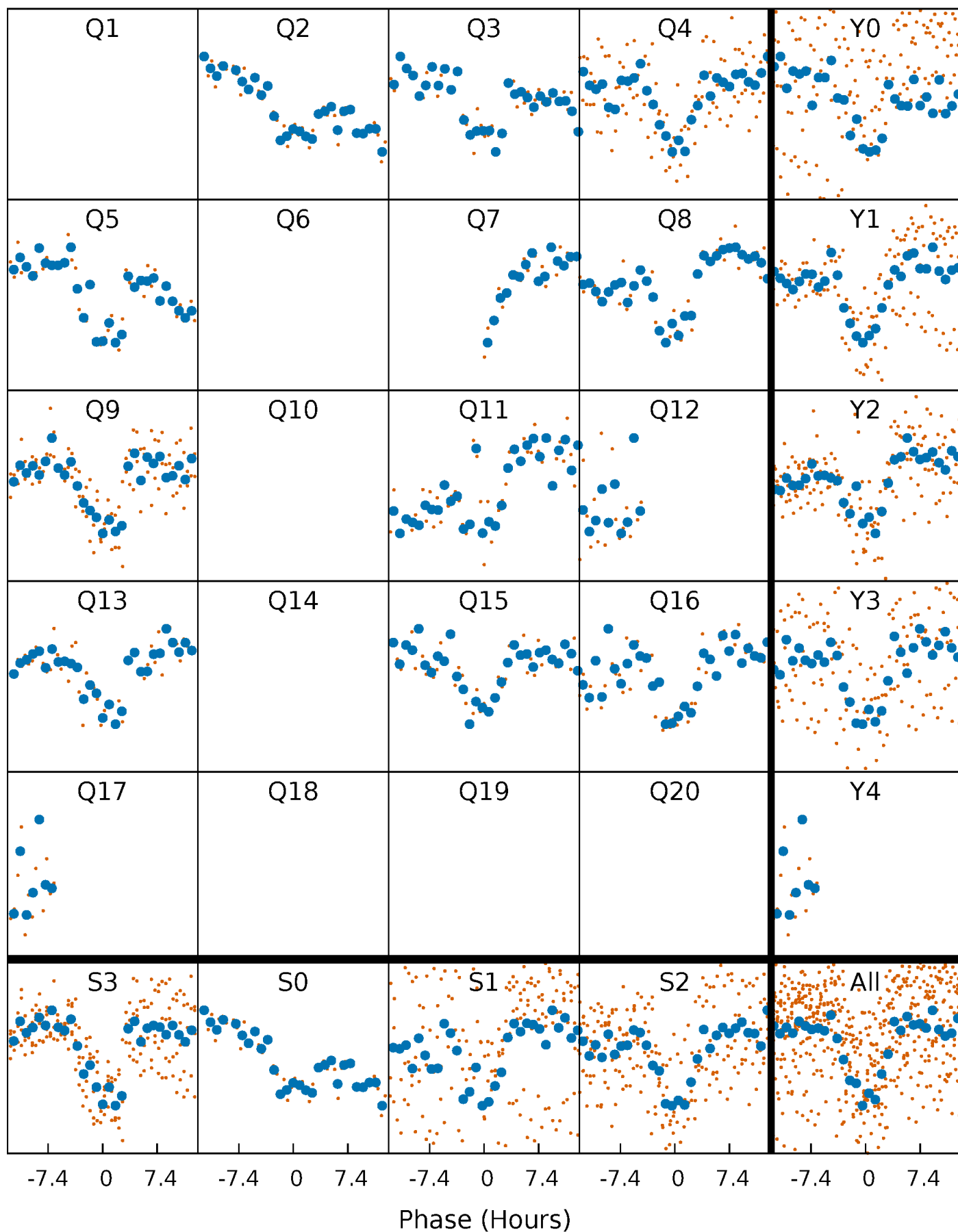


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



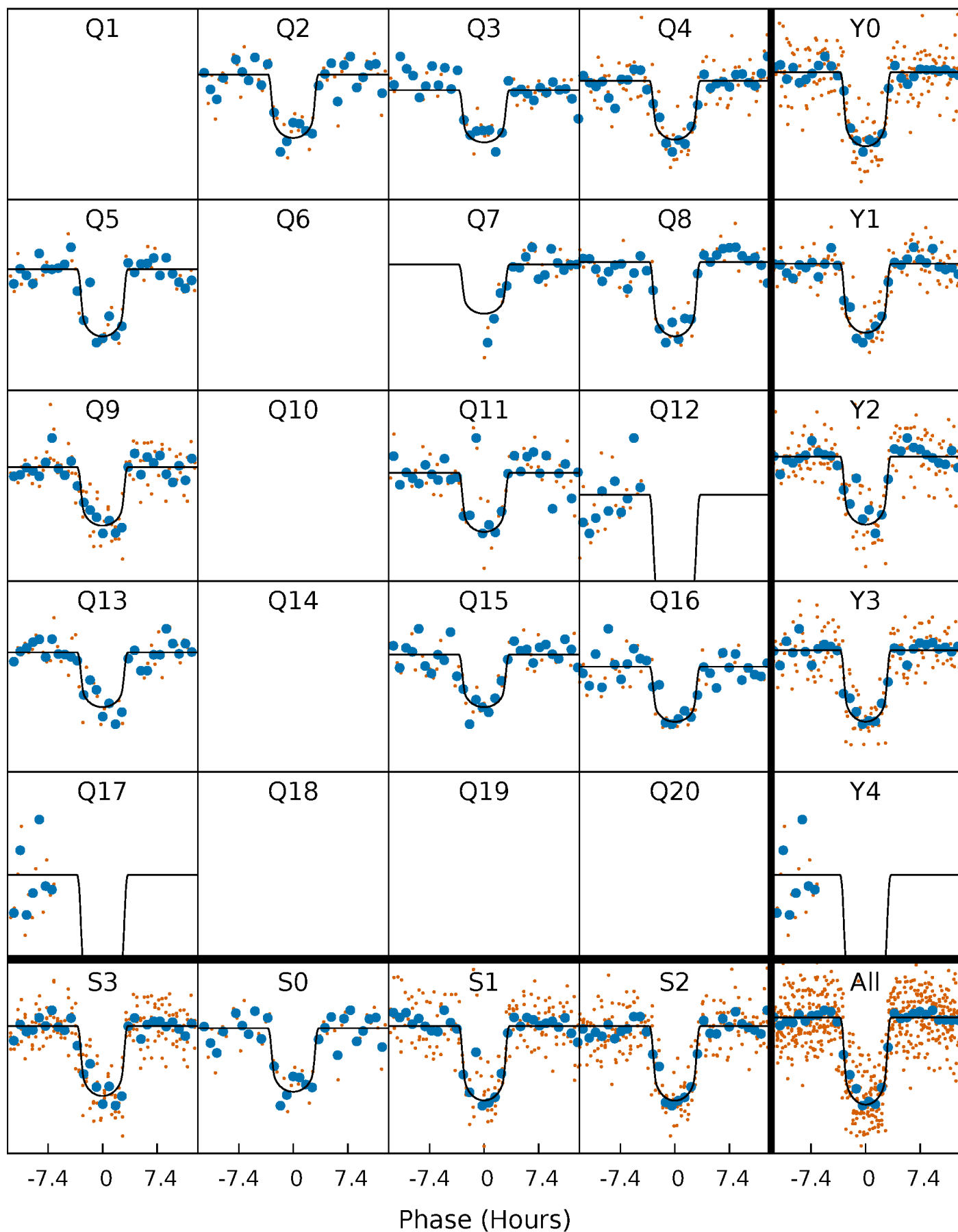
PDC Quarter-Phased Transit Curves

TCE 003656121-02 P= 76.732374 Days $T_0=200.673373$ (BKJD)



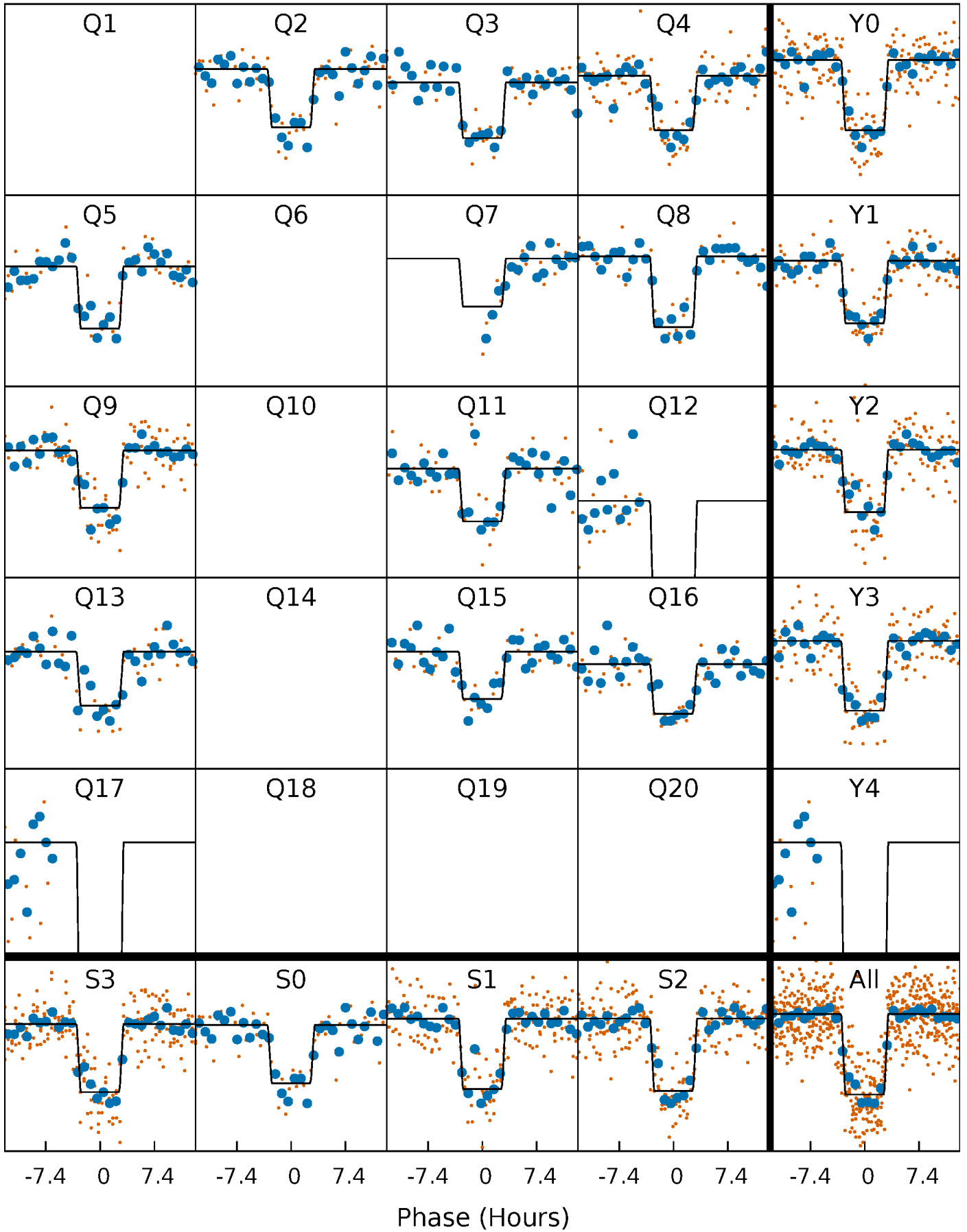
DV Quarter-Phased Transit Curves

TCE 003656121-02 P= 76.732374 Days $T_0=200.673373$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

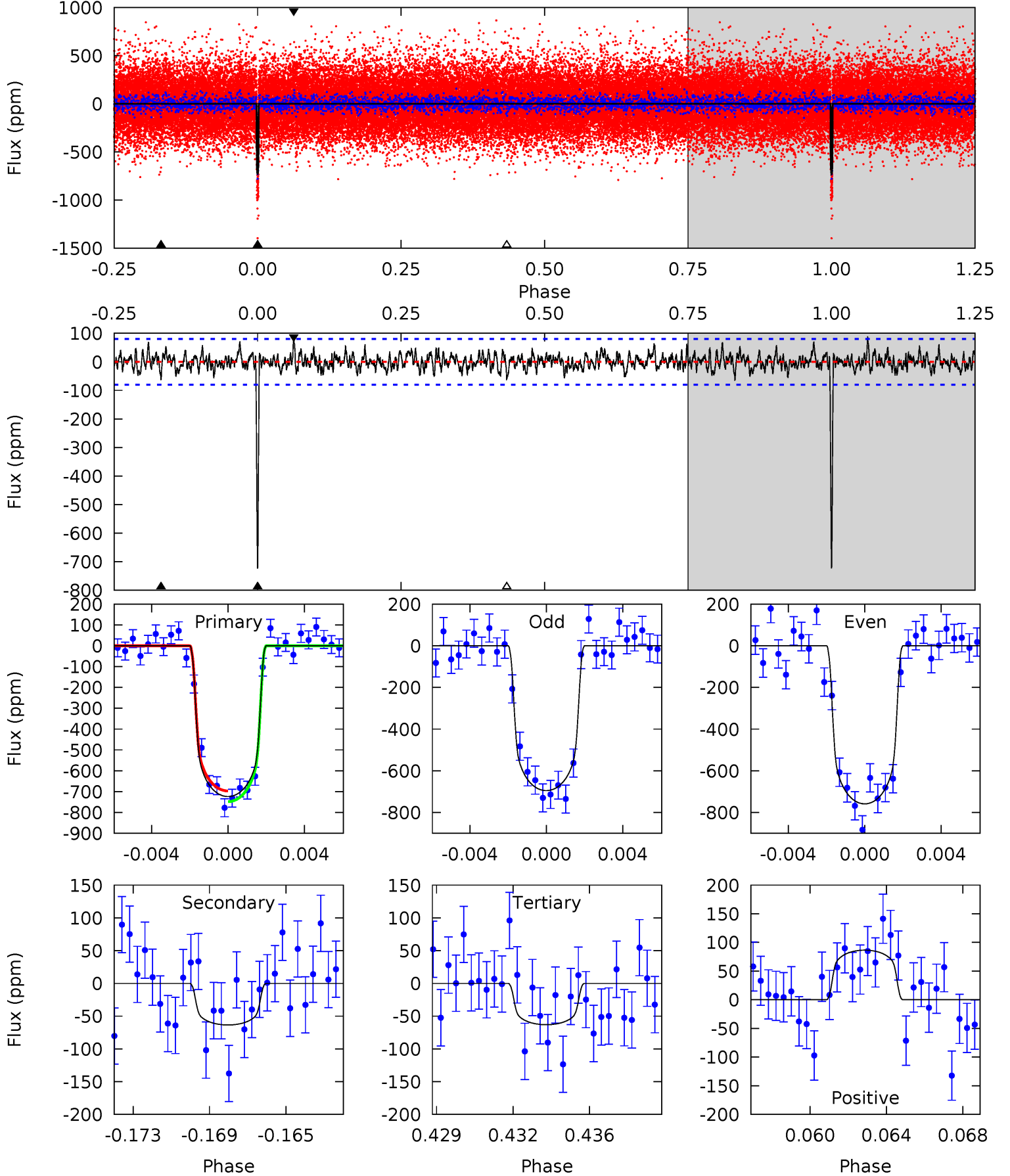
TCE 003656121-02 P= 76.732458 Days $T_0=200.672431$ (BKJD)



DV Model-Shift Uniqueness Test

003656121-02, $P = 76.732374$ Days, $E = 123.940999$ Days

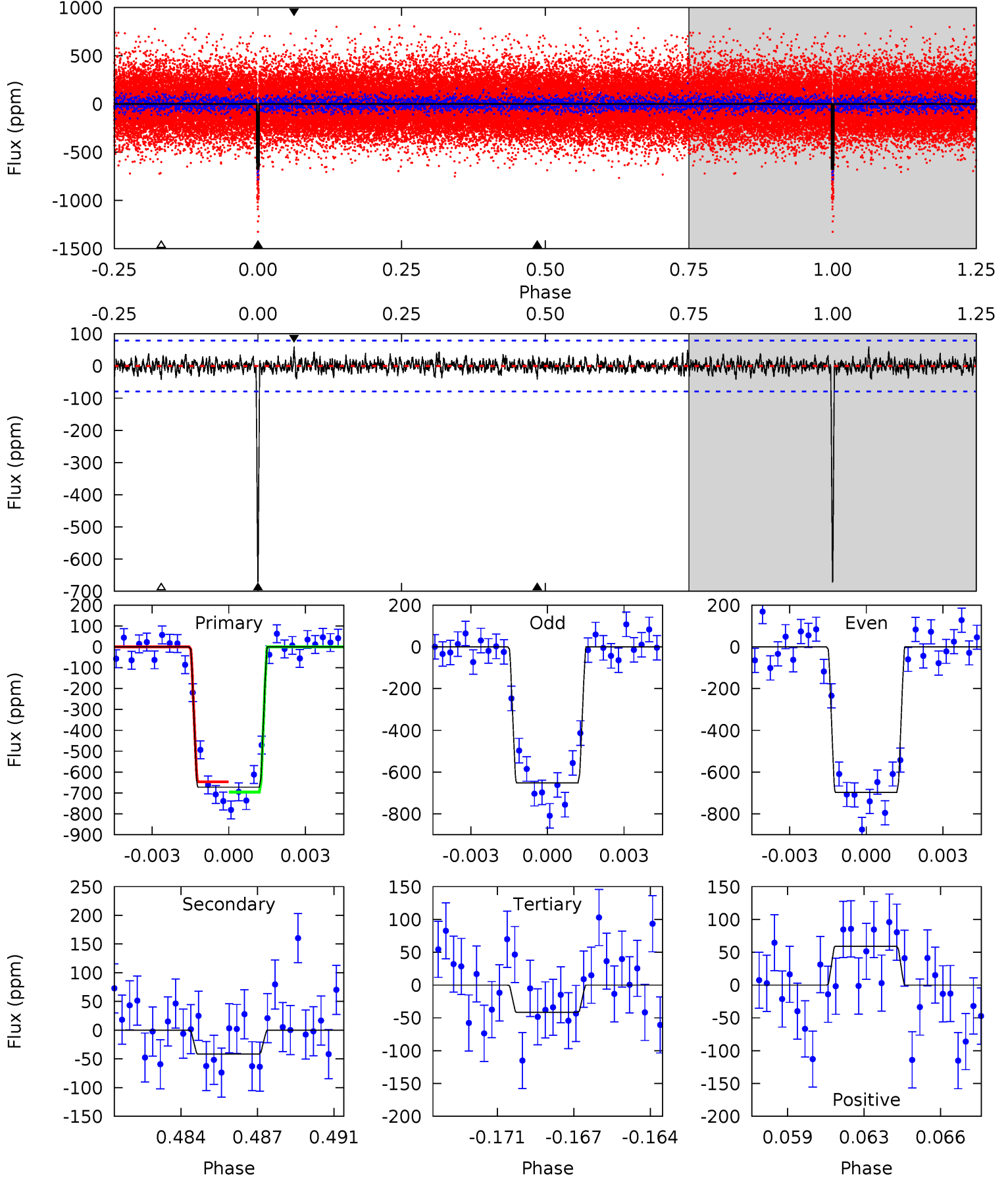
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.0	4.12	4.10	5.62	5.21	2.90	1.38	42.9	41.4	0.03	-1.50	2.05	1.01	0.11	1.66



Alt Model-Shift Uniqueness Test

003656121-02, P = 76.732458 Days, E = 123.939973 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
44.4	2.75	2.75	3.91	5.23	2.92	0.85	41.6	40.5	0.01	-1.16	1.49	1.00	0.08	1.64



Stellar Parameters For KIC 003656121

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5951^{+107}_{-119}	$4.319^{+0.120}_{-0.120}$	$-0.020^{+0.150}_{-0.150}$	$1.155^{+0.184}_{-0.151}$	$1.015^{+0.088}_{-0.066}$	$0.927^{+0.484}_{-0.320}$
	+2%/-2%	+3%/-3%	+750%/-750%	+16%/-13%	+9%/-7%	+52%/-34%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 003656121-02 / KOI 0386.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-63 ± 15	$3.51^{+0.43}_{-0.38}$	659^{+30}_{-27}	3614^{+165}_{-174}	351^{+129}_{-101}
Alt.	-42 ± 15	$3.29^{+0.40}_{-0.36}$	663^{+31}_{-29}	3462^{+208}_{-252}	263^{+132}_{-104}

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 $A_{obs} \gg 1.0$

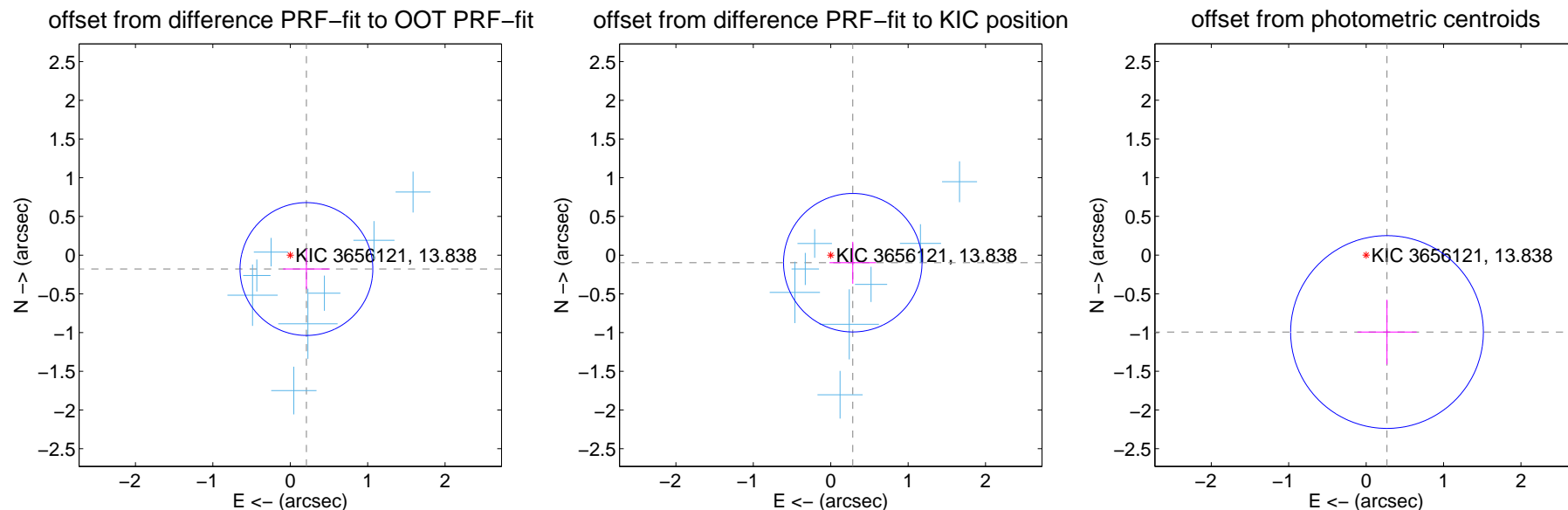
DV Centroid Data

Supplemental centroid analysis for 003656121-02. Kepler magnitude: 13.84. Transit SNR 30.47

There are 8 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.275 ± 0.286	0.96	-0.209 ± 0.302	-0.179 ± 0.262
PRF-fit source offset from KIC position	0.301 ± 0.298	1.01	-0.285 ± 0.301	-0.098 ± 0.271
photometric centroid source offset	1.03 ± 0.42	2.48	-0.27 ± 0.38	-0.99 ± 0.42



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



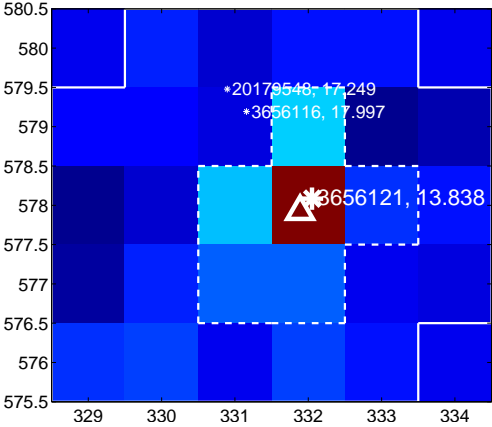
Q2 no difference image



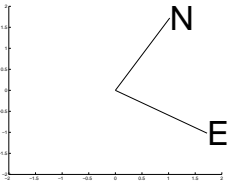
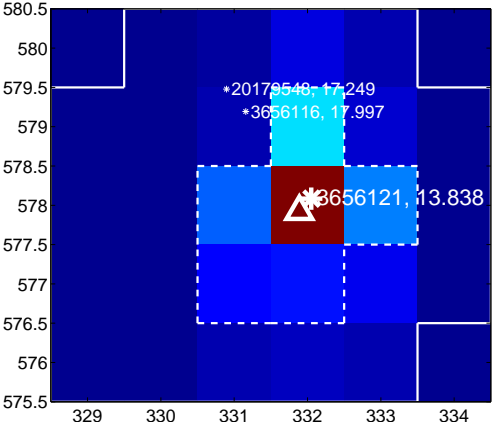
Q2 no OOT image



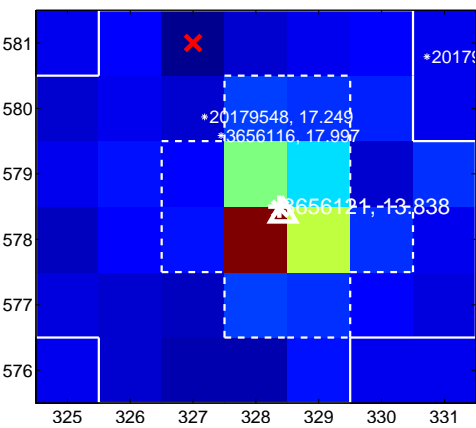
Q3 difference image



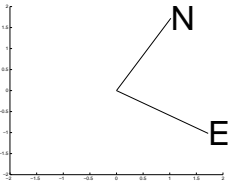
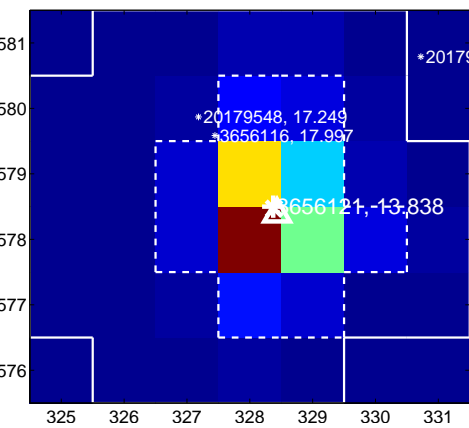
Q3 OOT image



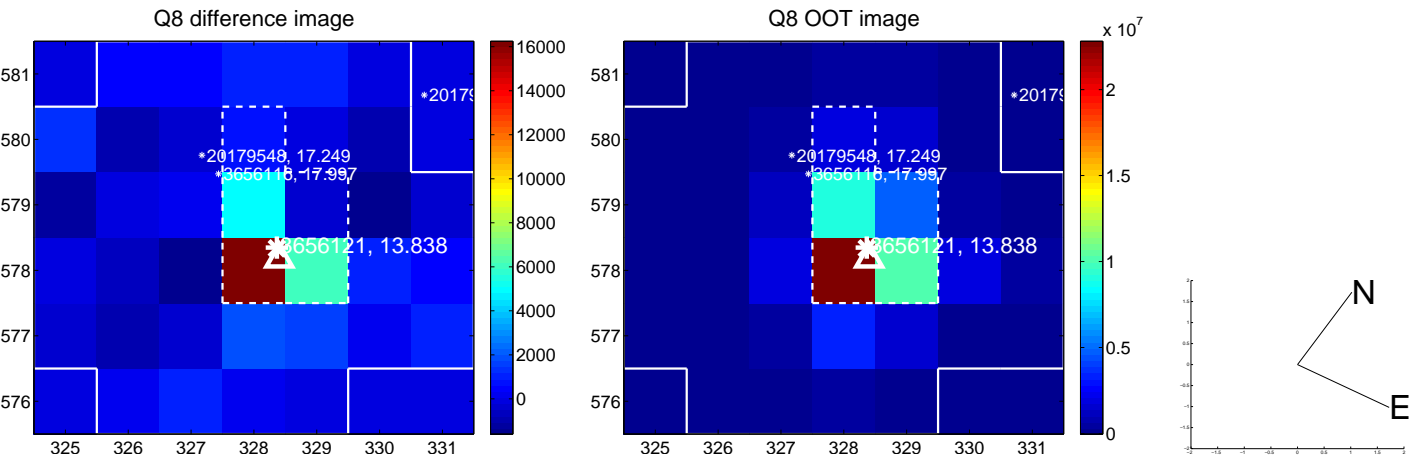
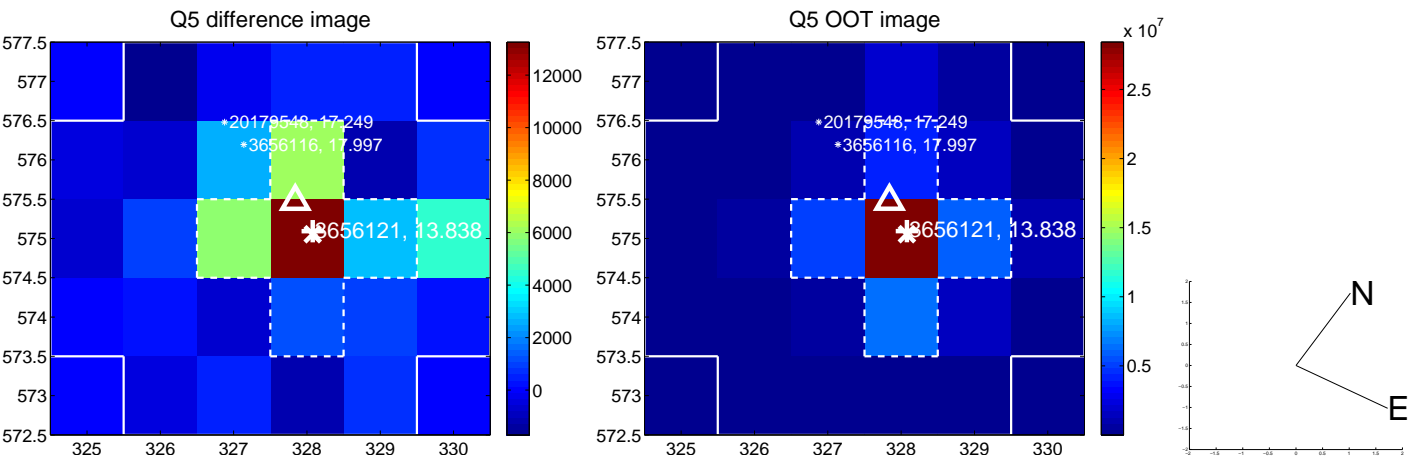
Q4 difference image



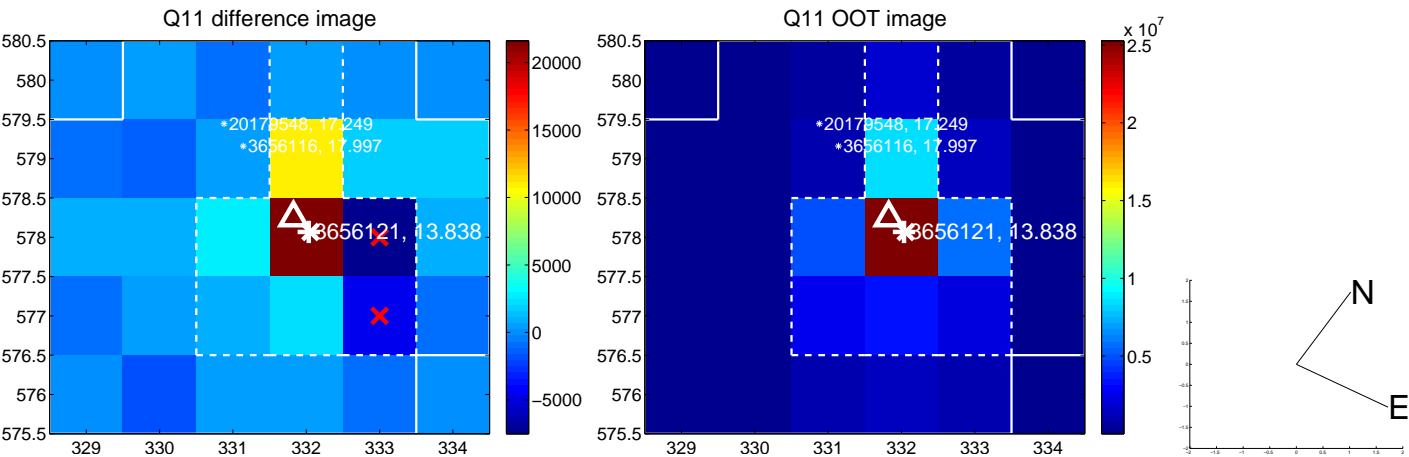
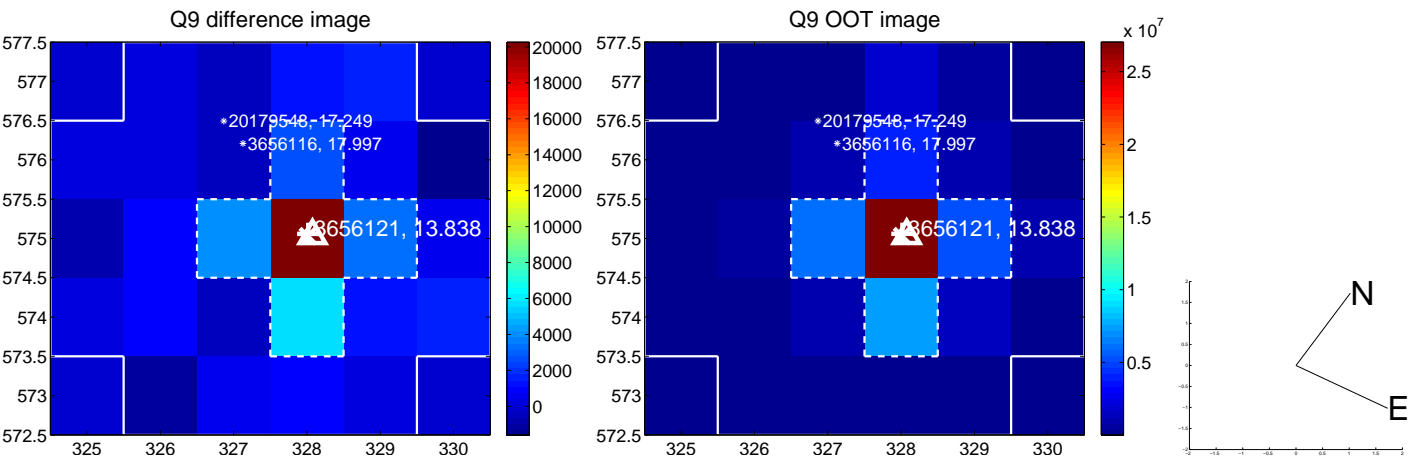
Q4 OOT image



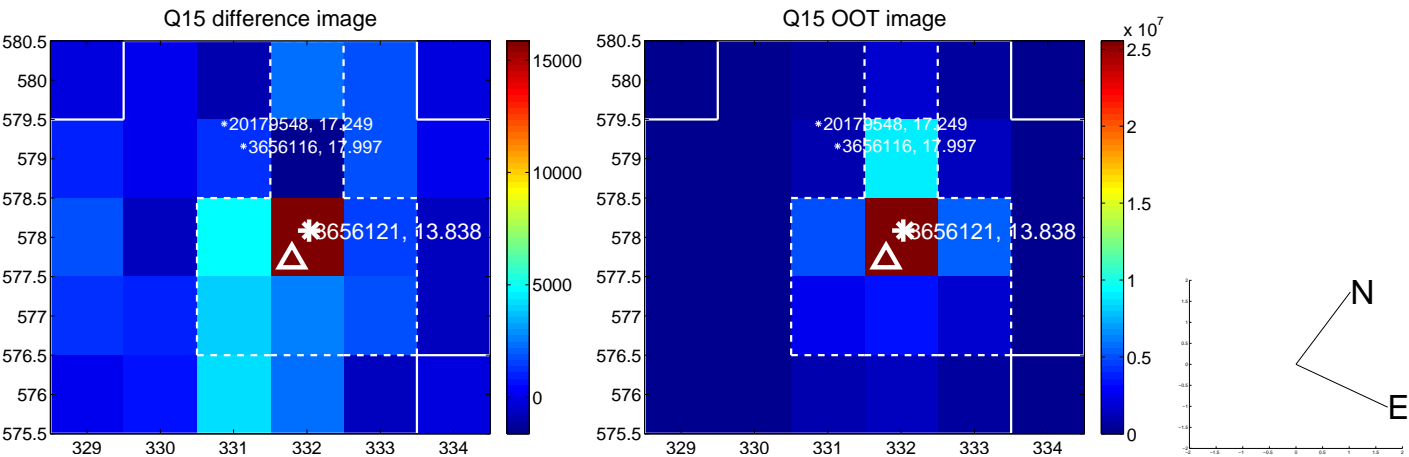
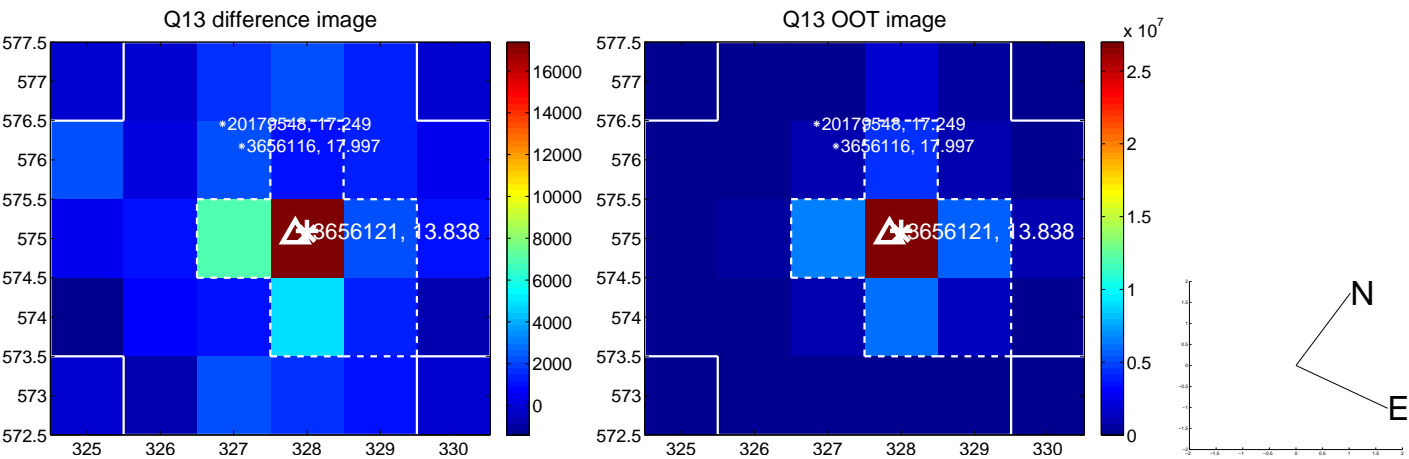
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



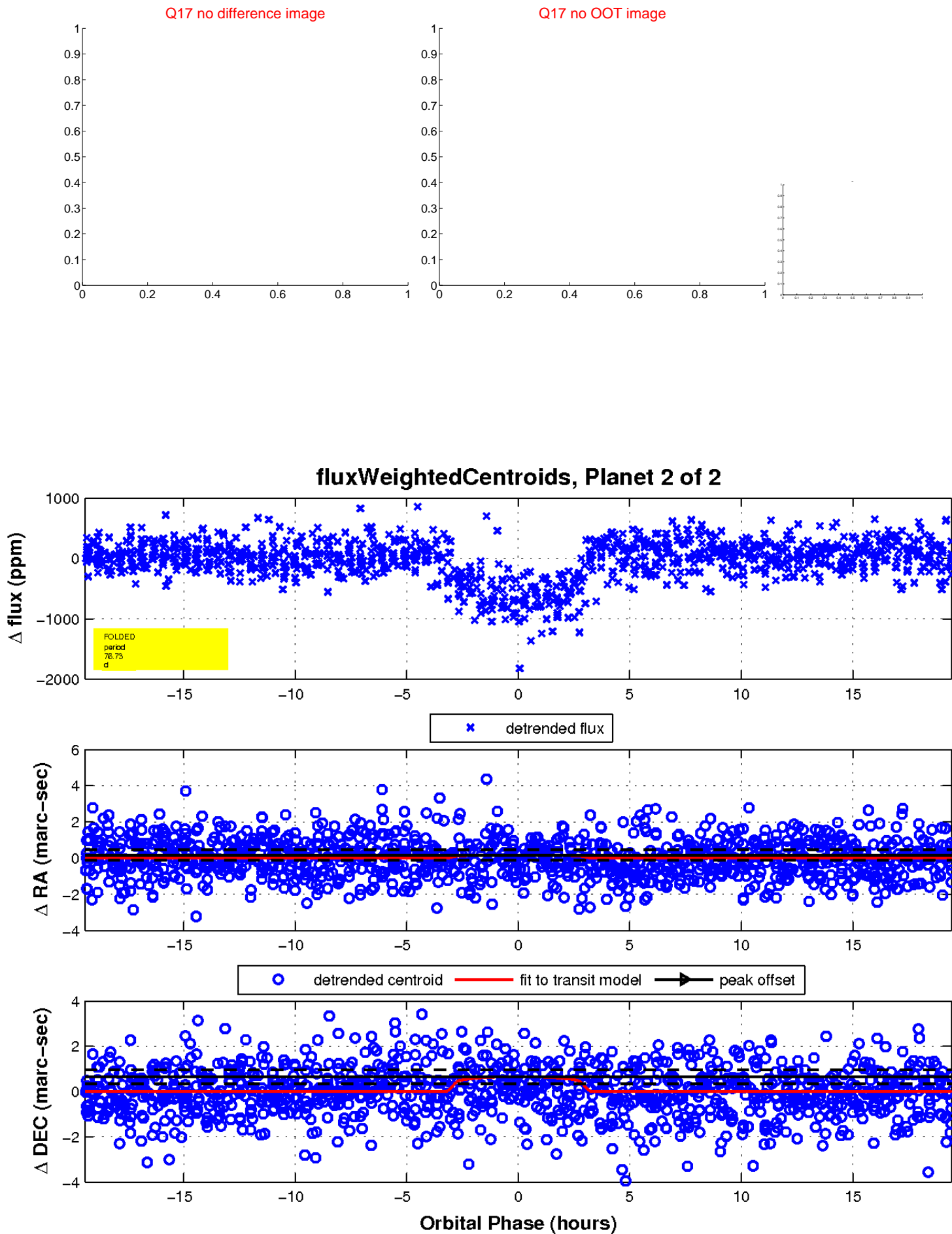
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



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



UKIRT Image

Declination

