

KIC 005308778

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})
005308778-01	OBS	6563.01	20.282634	137.500502	1193.7	14.138	18.8	24.0	3.96	5043	17.67	402.09
005308778-02	OBS	No	20.283050	136.574362	2918.8	13.743	35.9	45.4	3.96	5043	39.14	402.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005308778-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005308778-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—SAME_NTL_PERIOD

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 005308778-01

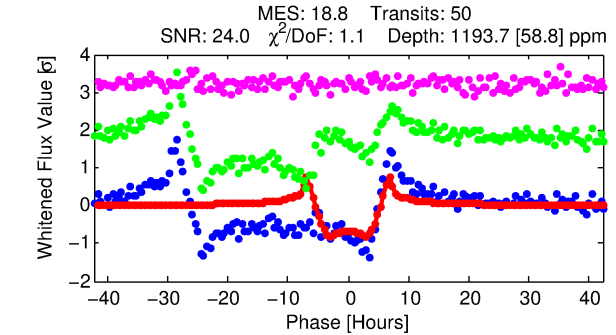
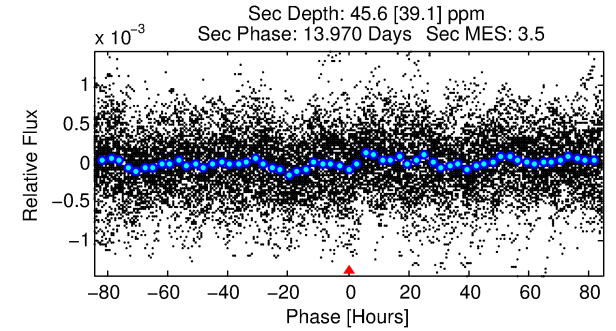
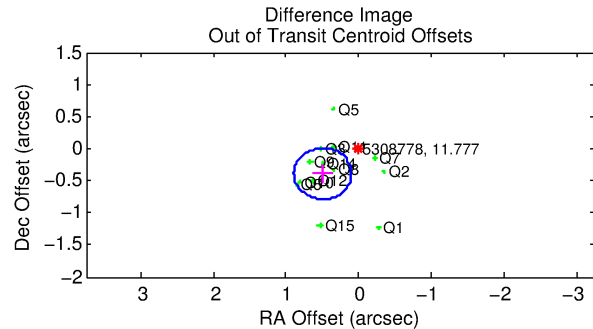
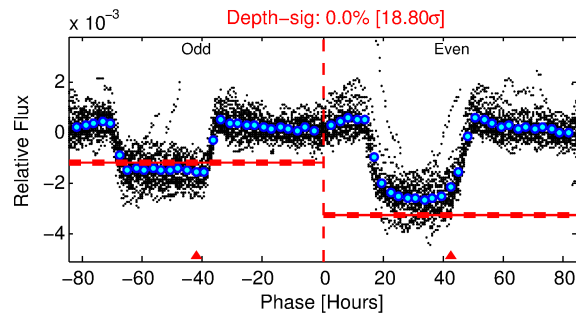
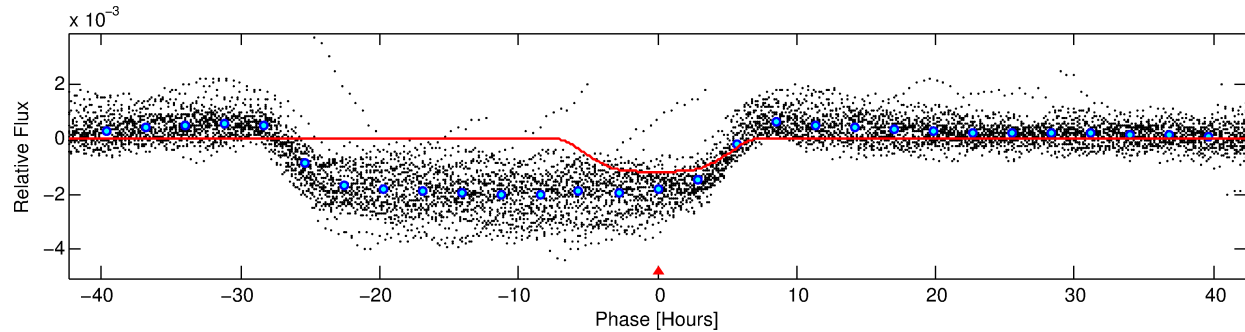
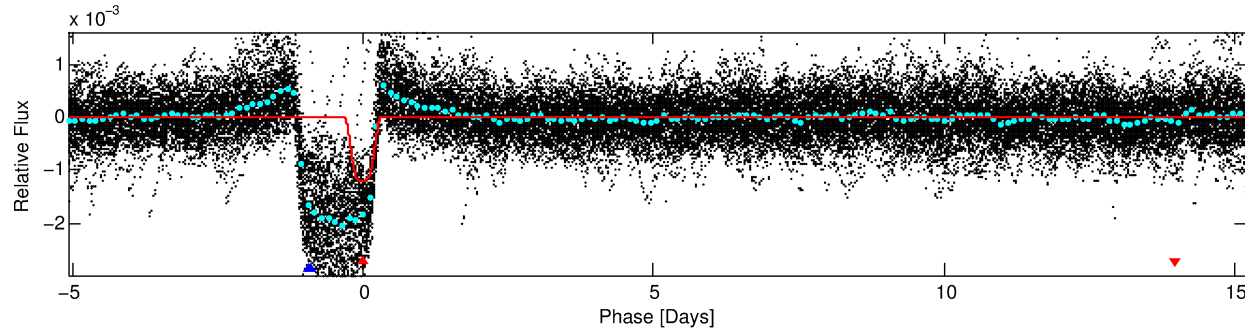
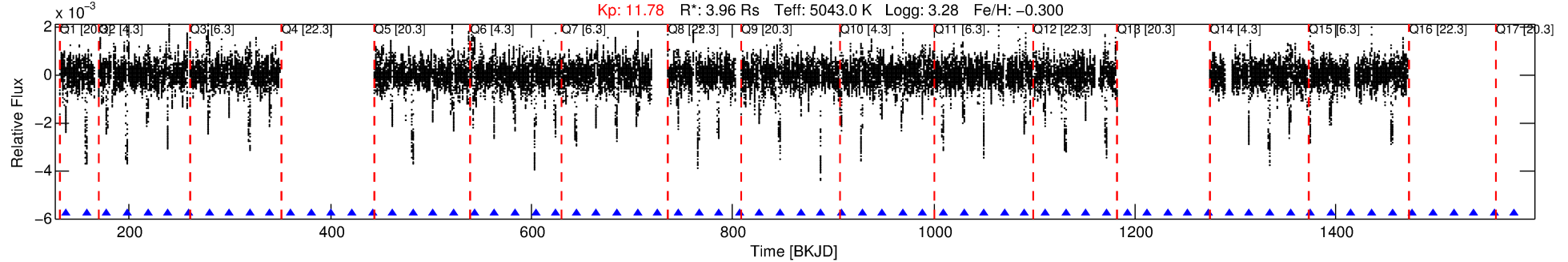
No Significant Match Found

DV One-Page Summary

KIC: 5308778 Candidate: 1 of 2 Period: 20.283 d

KOI: K06563 Corr: No Ephemeris Match

Kp: 11.78 R*: 3.96 Rs Teff: 5043.0 K Logg: 3.28 Fe/H: -0.300



DV Fit Results:

Period = 20.28263 [0.00019] d
Epoch = 137.5005 [0.0067] BKJD
Rp/R* = 0.0409 [0.0011]
a/R* = 4.92 [0.12]
b = 0.94 [0.00]
Seff = 402.09 [111.54]
Teq = 1142 [79] K
Rp = 17.67 [3.62] Re
a = 0.1502 [0.0270] AU
Ag = 1.81 [1.64] [0.50σ]
Teffp = 2049 [441] K [2.03σ]

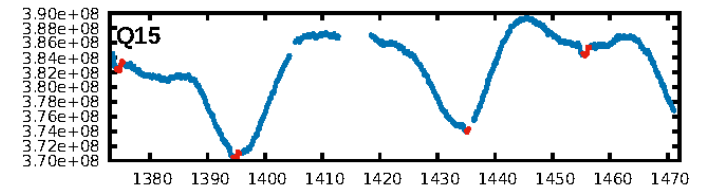
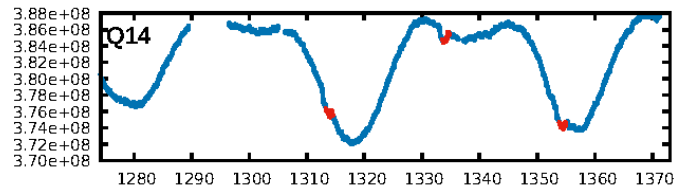
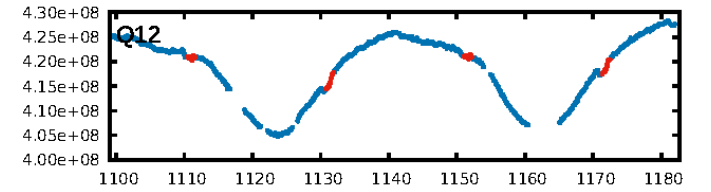
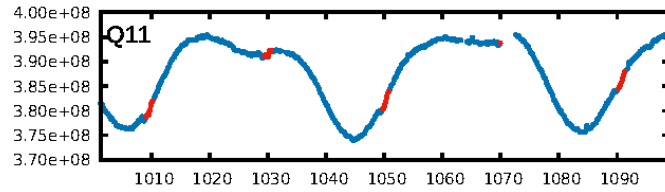
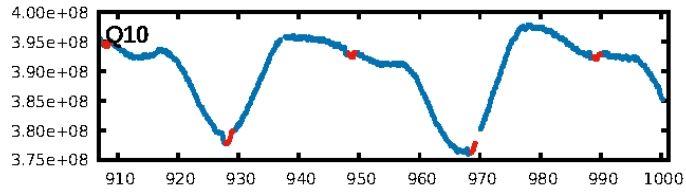
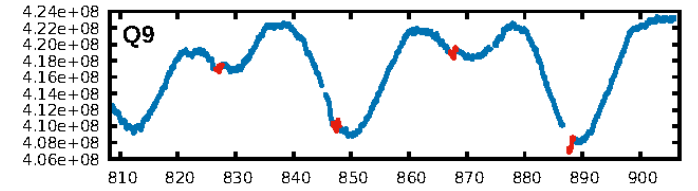
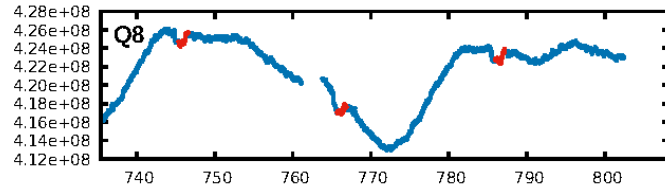
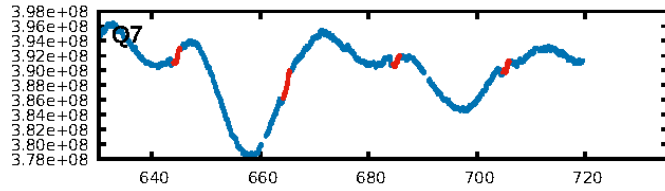
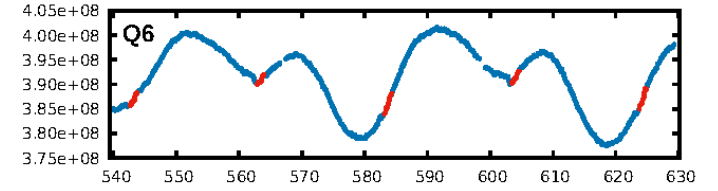
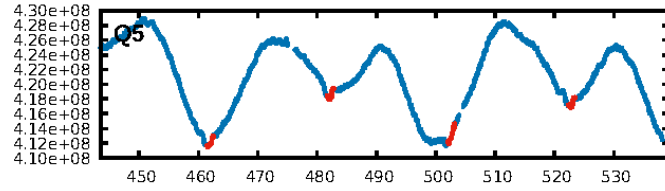
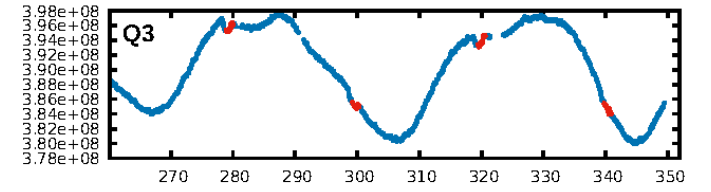
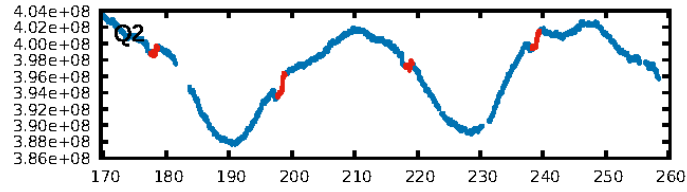
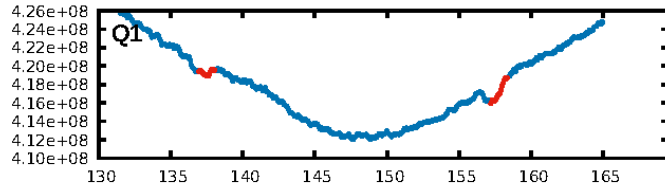
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 28.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.94e-62
RollingBand-fgt: 1.00 [48/48]
GhostDiagnostic-chr: 1.089
Centroid-sig: 22.1%
Centroid-so: 0.347 arcsec [5.62σ]
OotOffset-rm: 0.631 arcsec [4.76σ]
KicOffset-rm: 0.496 arcsec [3.78σ]
OotOffset-st: 4/4/2/3 [13]
KicOffset-st: 4/4/2/3 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 0.00 [0/13]

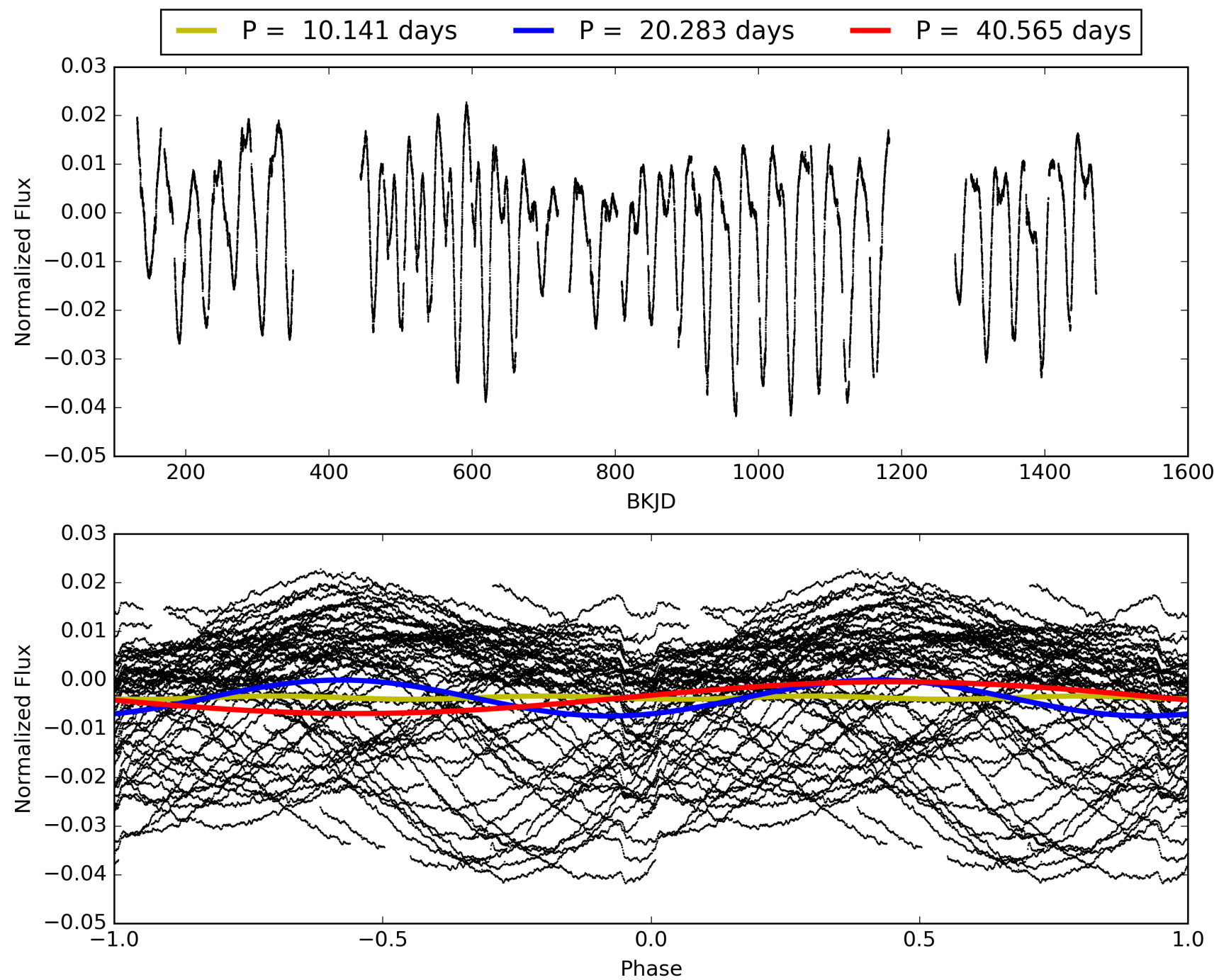
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:19:05 Z

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

TCE 005308778-01, PDC Light Curves

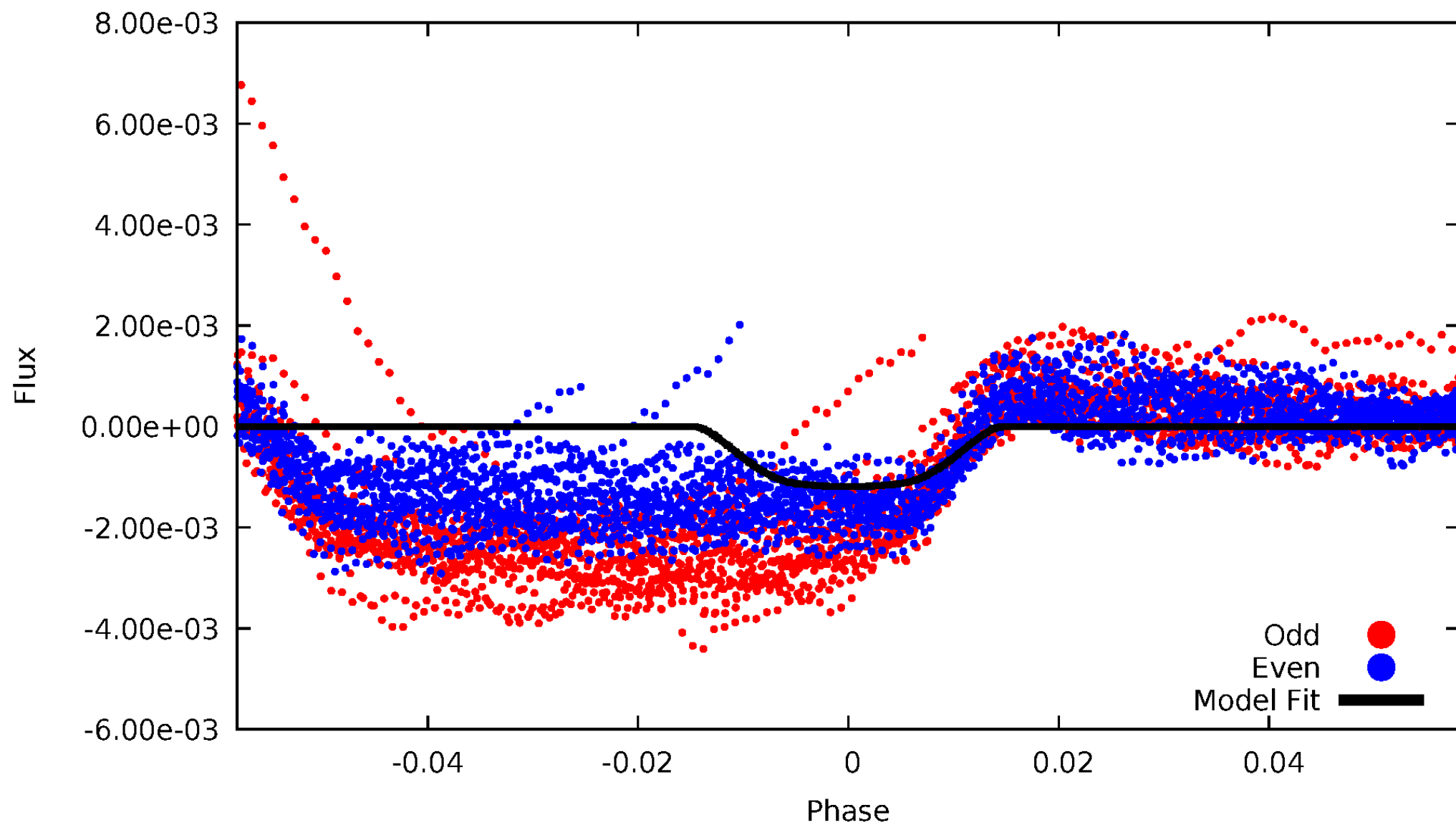


TCE 005308778-01



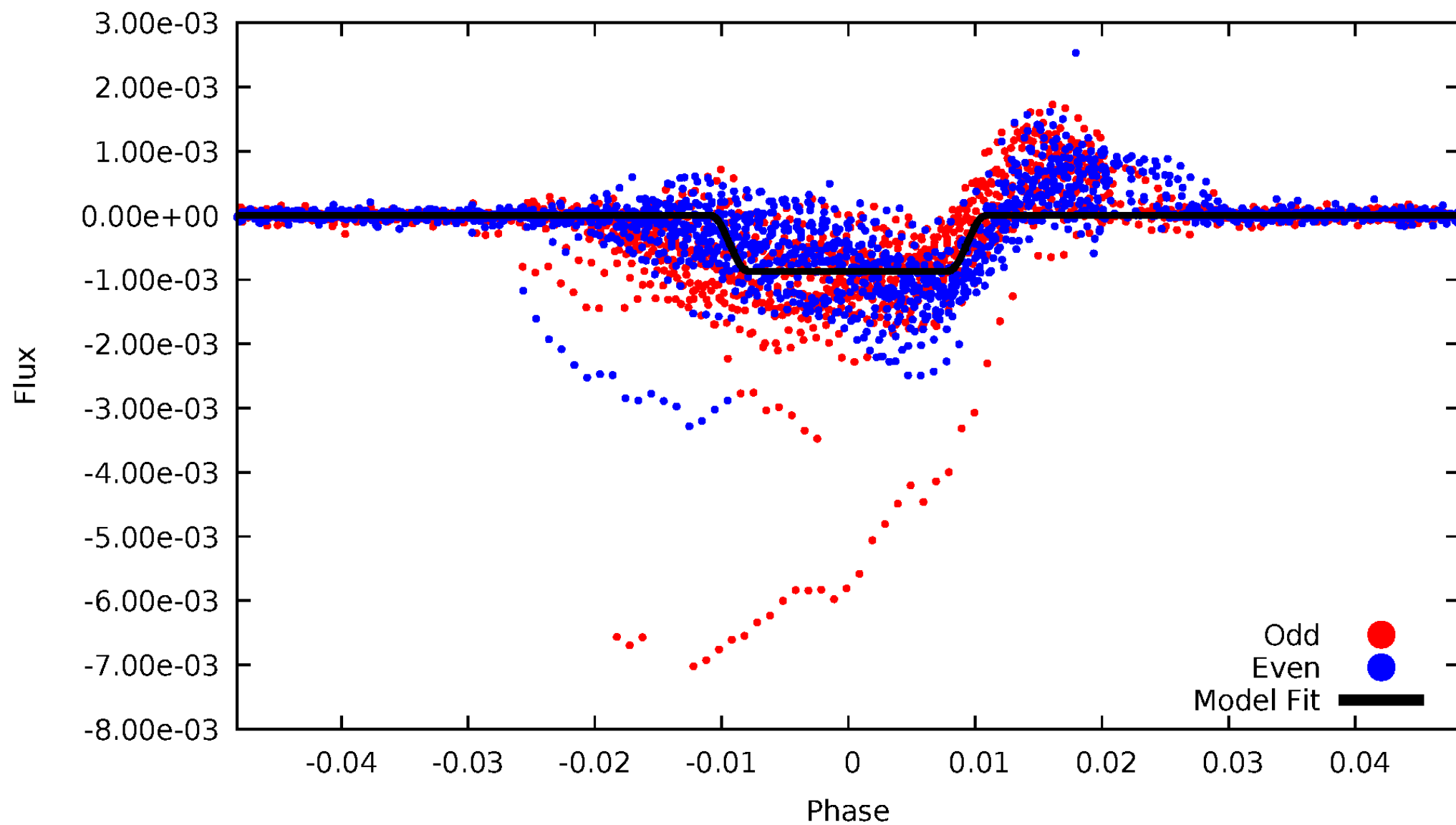
DV Odd/Even

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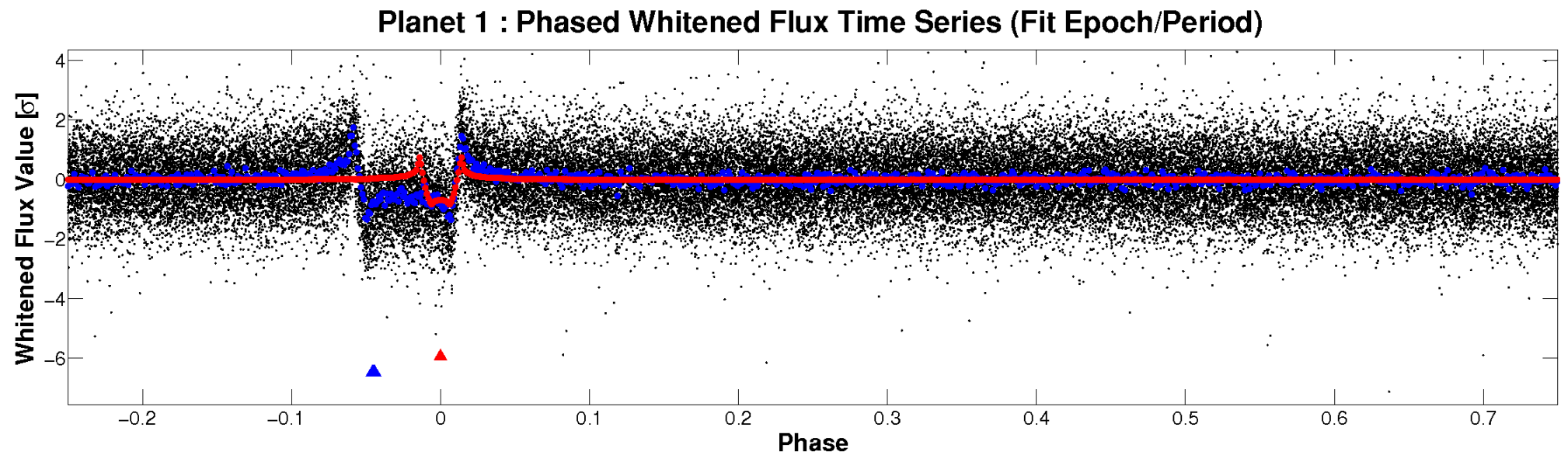
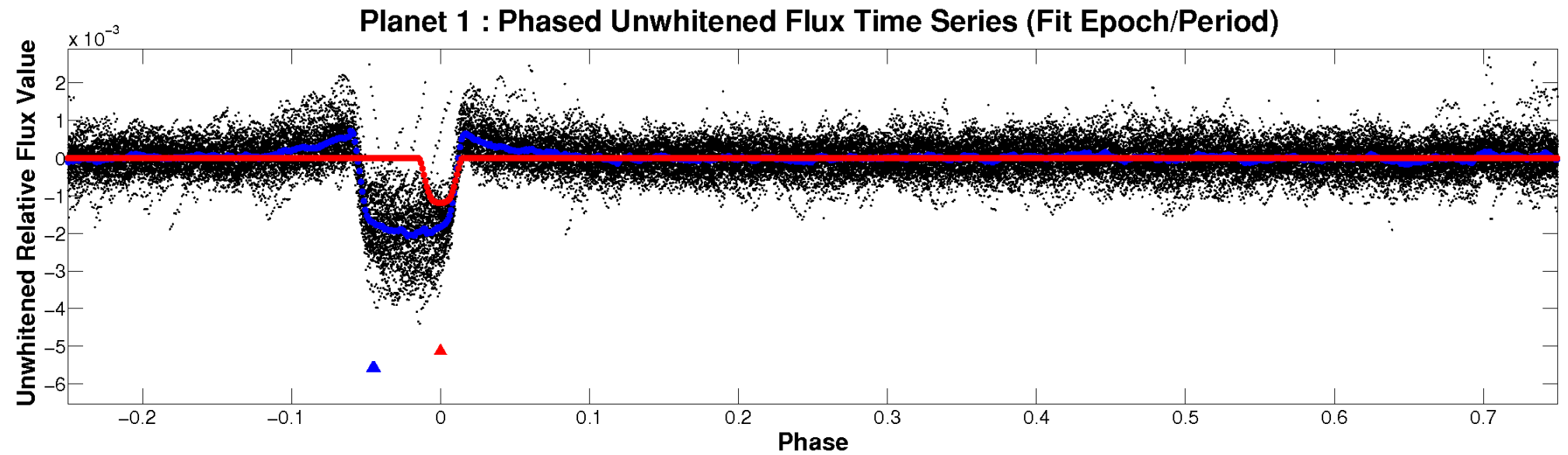


ALT Odd/Even

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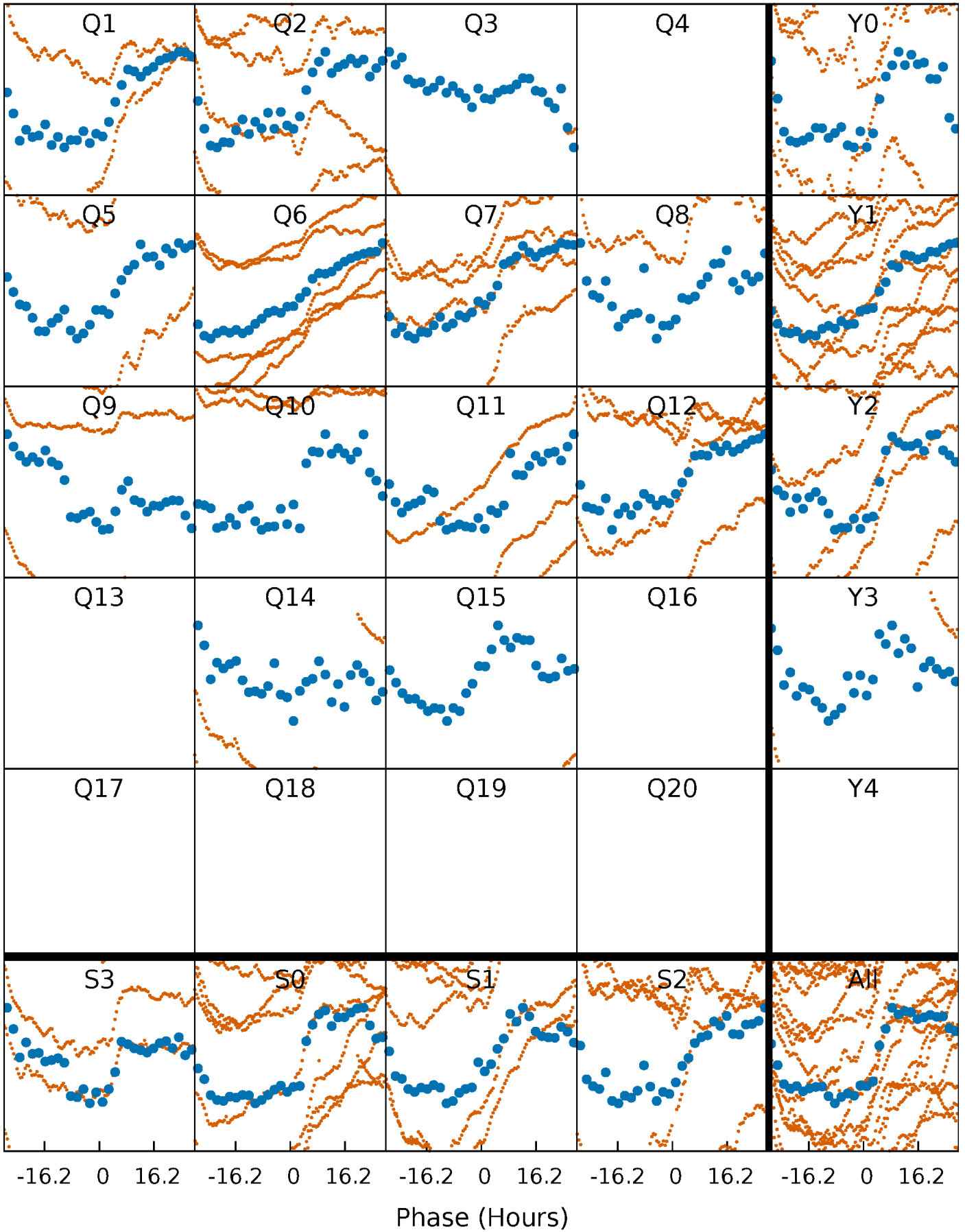


Non-Whitened Vs. Whitened Light Curve



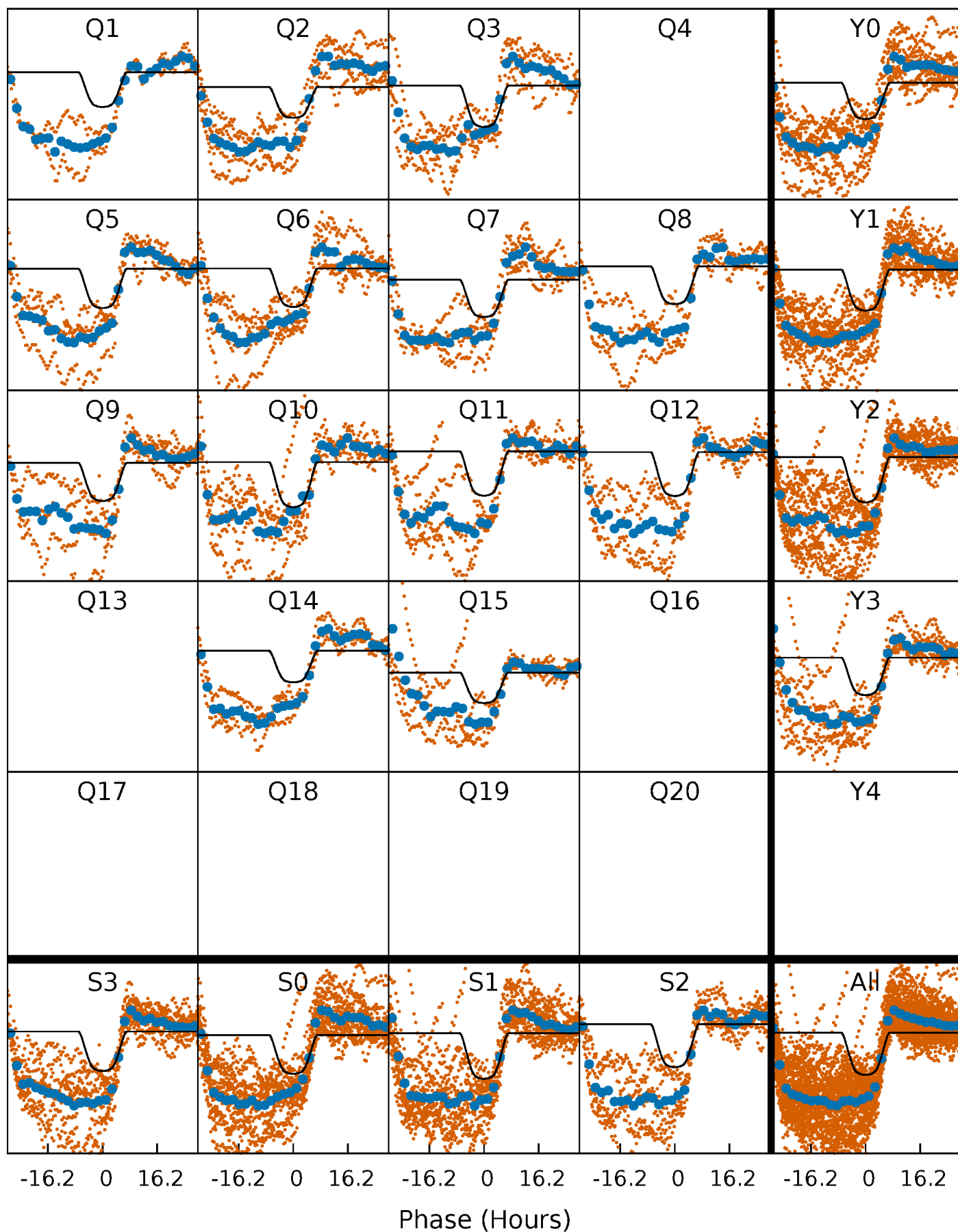
PDC Quarter-Phased Transit Curves

TCE 005308778-01 P= 20.282634 Days $T_0=137.500502$ (BKJD)



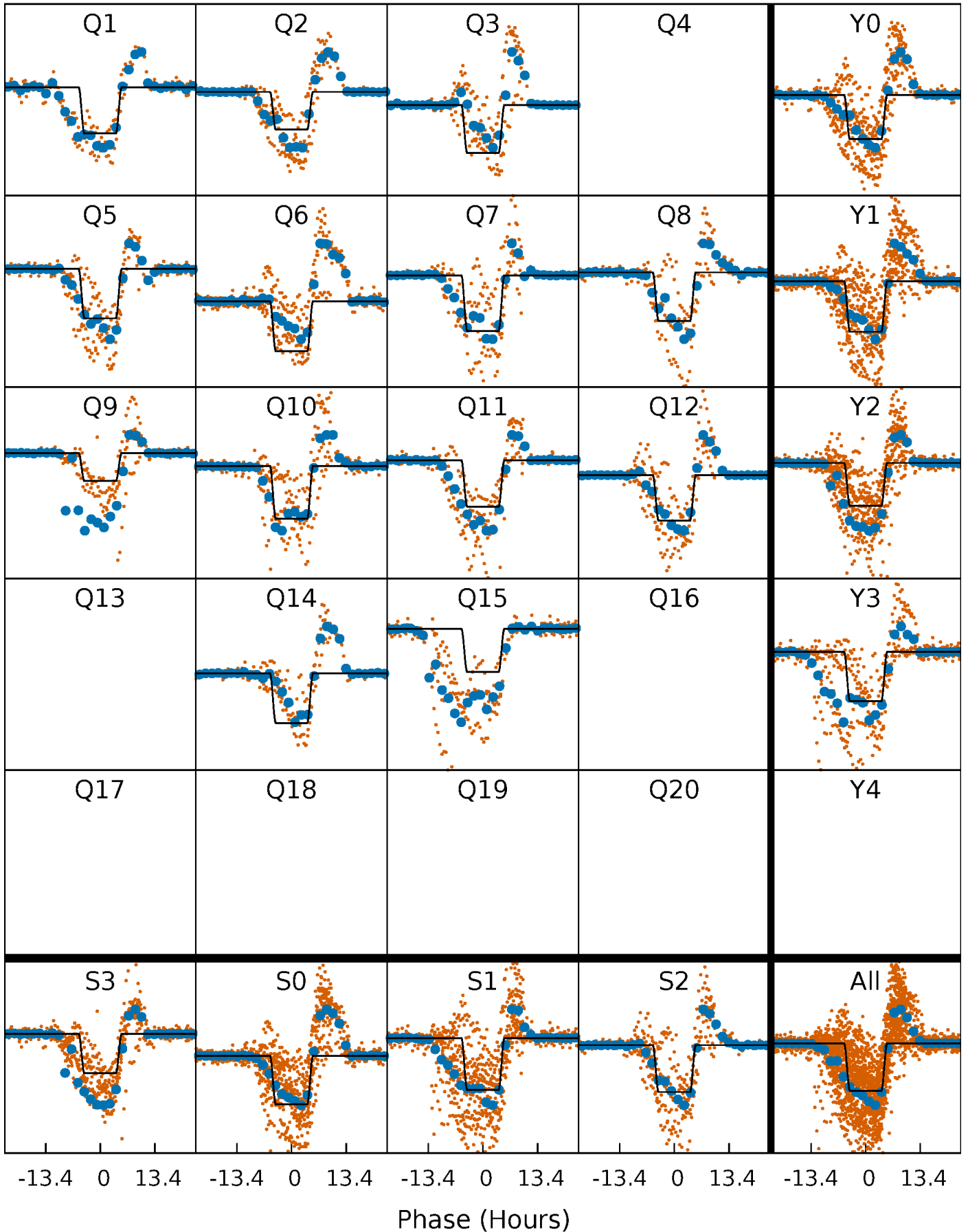
DV Quarter-Phased Transit Curves

TCE 005308778-01 P= 20.282634 Days $T_0=137.500502$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

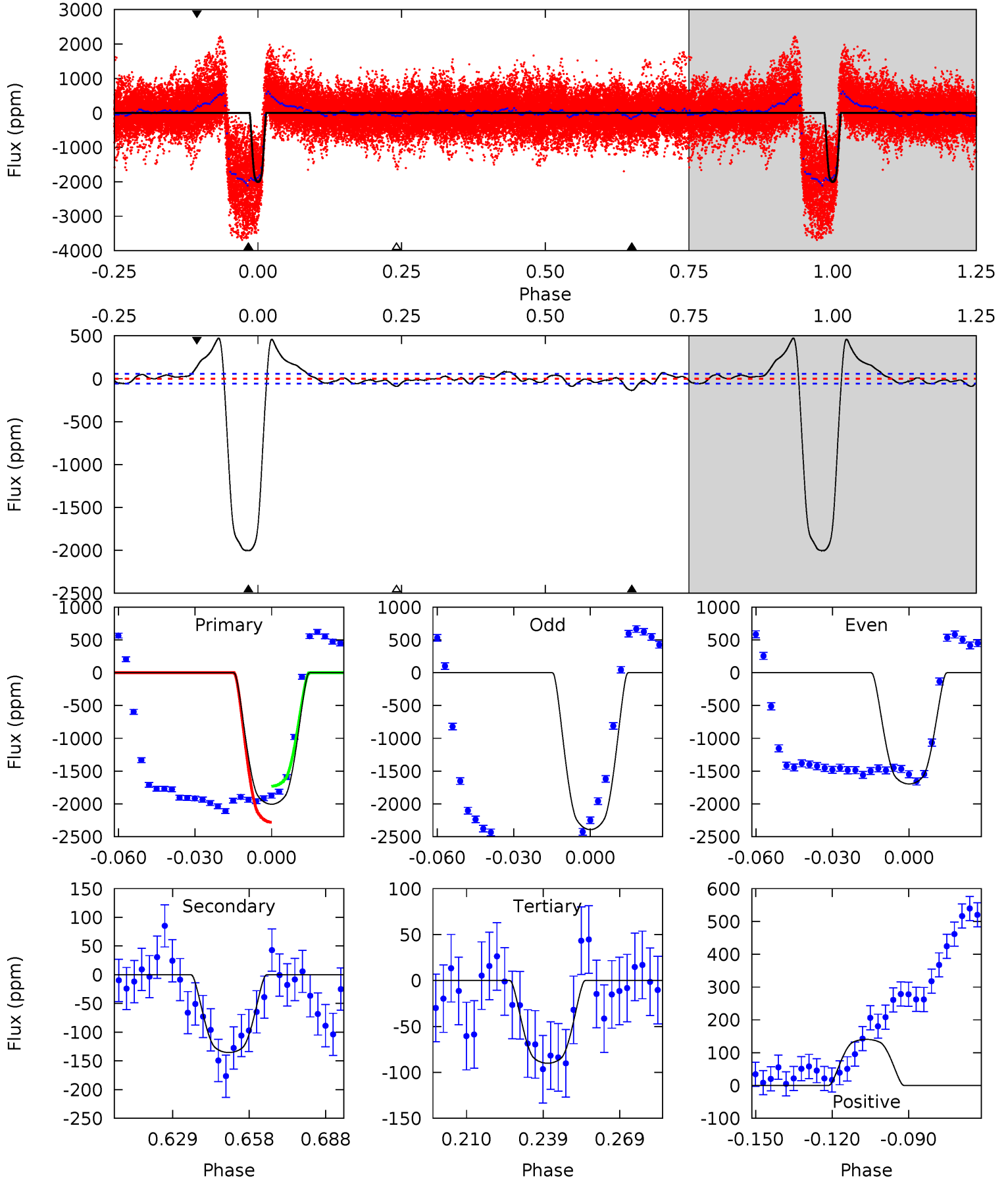
TCE 005308778-01 P= 20.282447 Days $T_0=137.496086$ (BKJD)



DV Model-Shift Uniqueness Test

005308778-01, P = 20.282634 Days, E = 117.217868 Days

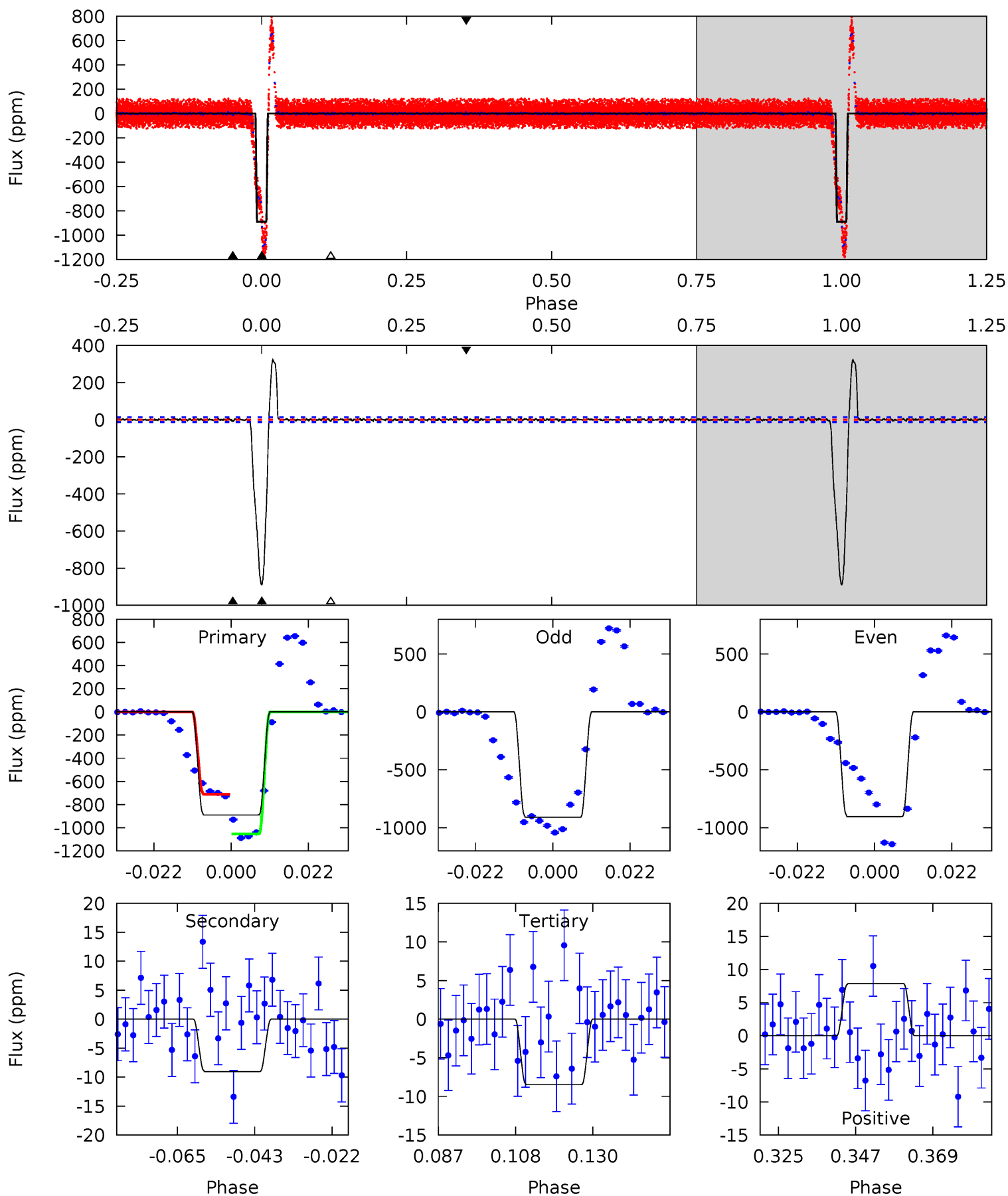
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
168.6	11.4	7.58	11.8	4.81	2.17	12.1	161.0	156.8	3.82	-0.41	28.5	0.94	0.19	23.3



Alt Model-Shift Uniqueness Test

005308778-01, P = 20.282447 Days, E = 117.213639 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
325.6	3.31	3.10	2.88	4.88	2.30	3.11	322.5	322.8	0.21	0.42	1.07	1.26	0.27	0



Stellar Parameters For KIC 005308778

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5043^{+65}_{-65}	$3.284^{+0.154}_{-0.126}$	$-0.300^{+0.150}_{-0.100}$	$3.956^{+0.805}_{-0.805}$	$1.098^{+0.221}_{-0.147}$	$0.025^{+0.018}_{-0.009}$
	+1%/-1%	+5%/-4%	+50%/-33%	+20%/-20%	+20%/-13%	+73%/-36%
Source	SPE74	SPE74	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 005308778-01 / KOI 6563.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-136 ± 12	$17.74^{+2.28}_{-2.08}$	1596^{+79}_{-86}	3202^{+58}_{-58}	$5.423^{+1.413}_{-1.116}$
Alt.	-9 ± 3	$12.73^{+1.67}_{-1.53}$	1592^{+88}_{-89}	2297^{+122}_{-186}	$0.695^{+0.291}_{-0.225}$

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

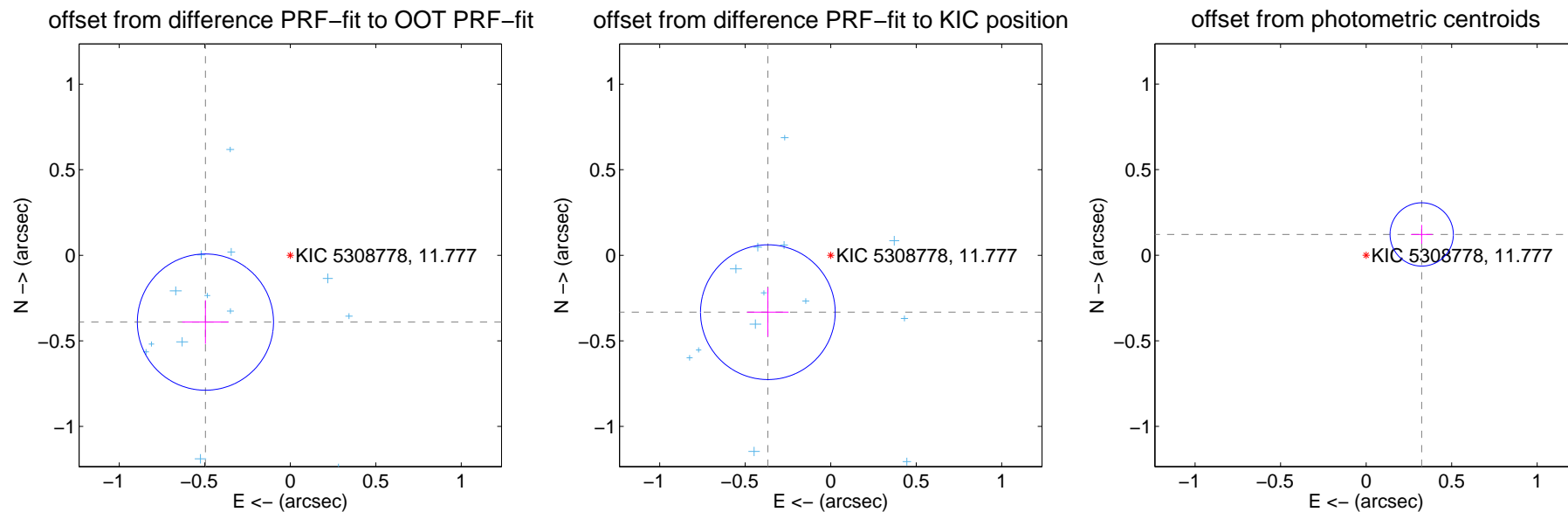
DV Centroid Data

Supplemental centroid analysis for 005308778-01. **Kepler magnitude: 11.78.** Transit SNR 24.03

There are 13 quarters with good PRF difference image offsets

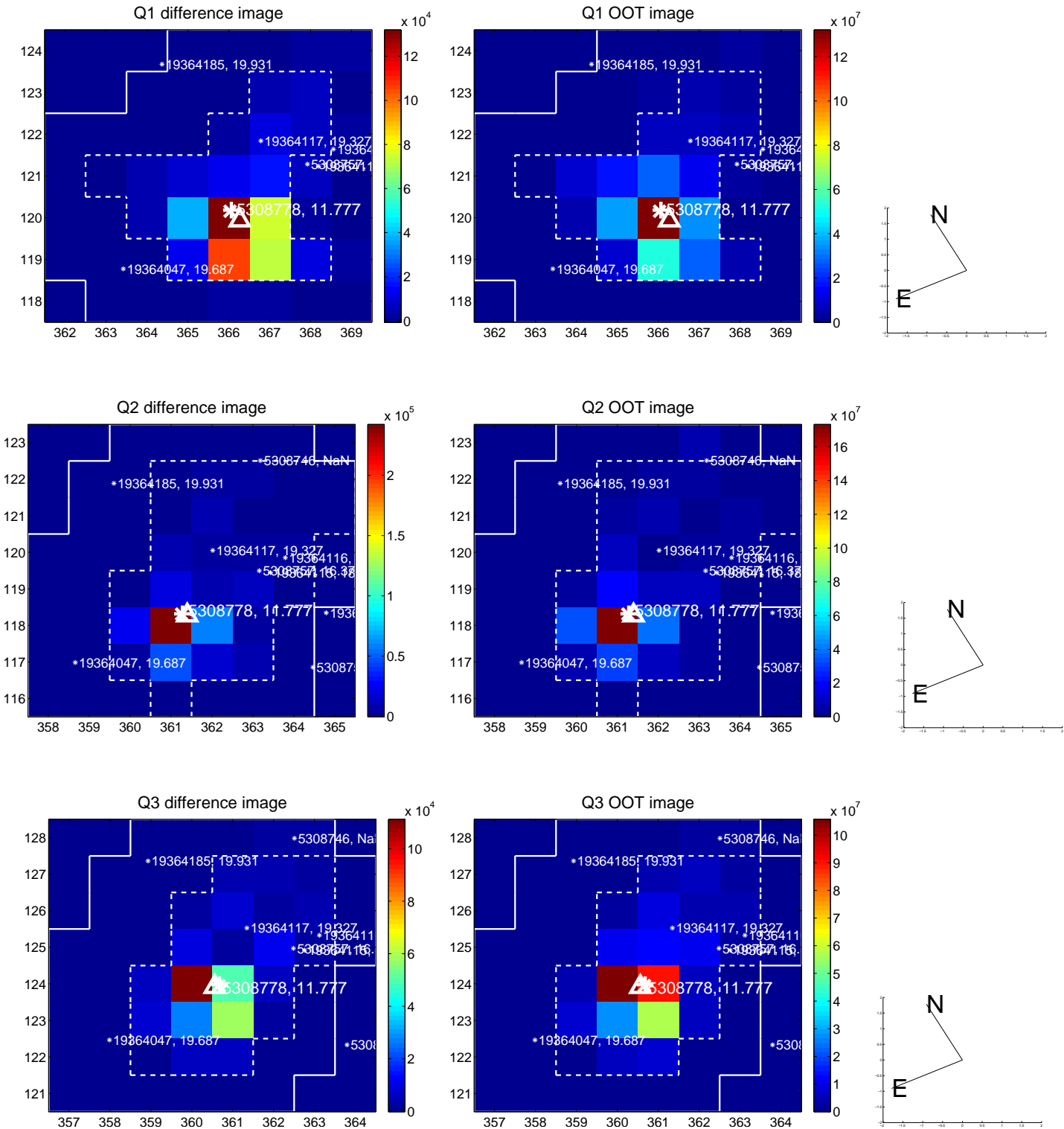
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.631 ± 0.133	4.76	0.496 ± 0.136	-0.391 ± 0.128
PRF-fit source offset from KIC position	0.496 ± 0.131	3.78	0.368 ± 0.121	-0.333 ± 0.143
photometric centroid source offset	0.35 ± 0.06	5.62	-0.32 ± 0.06	0.12 ± 0.06

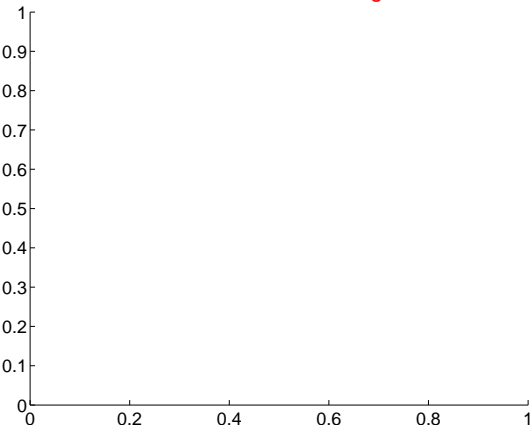


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

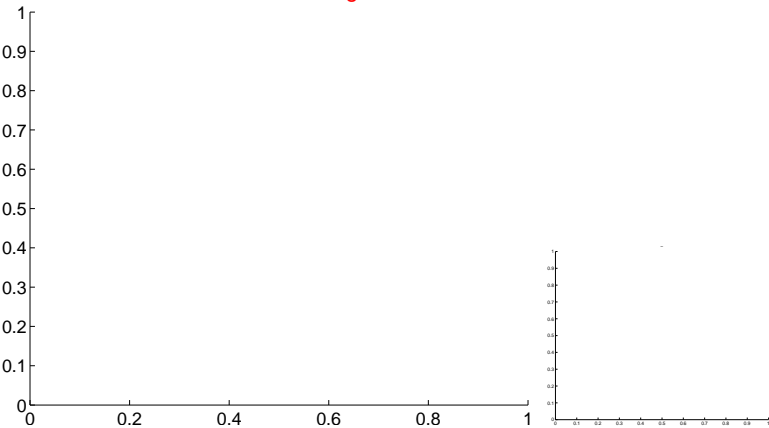
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



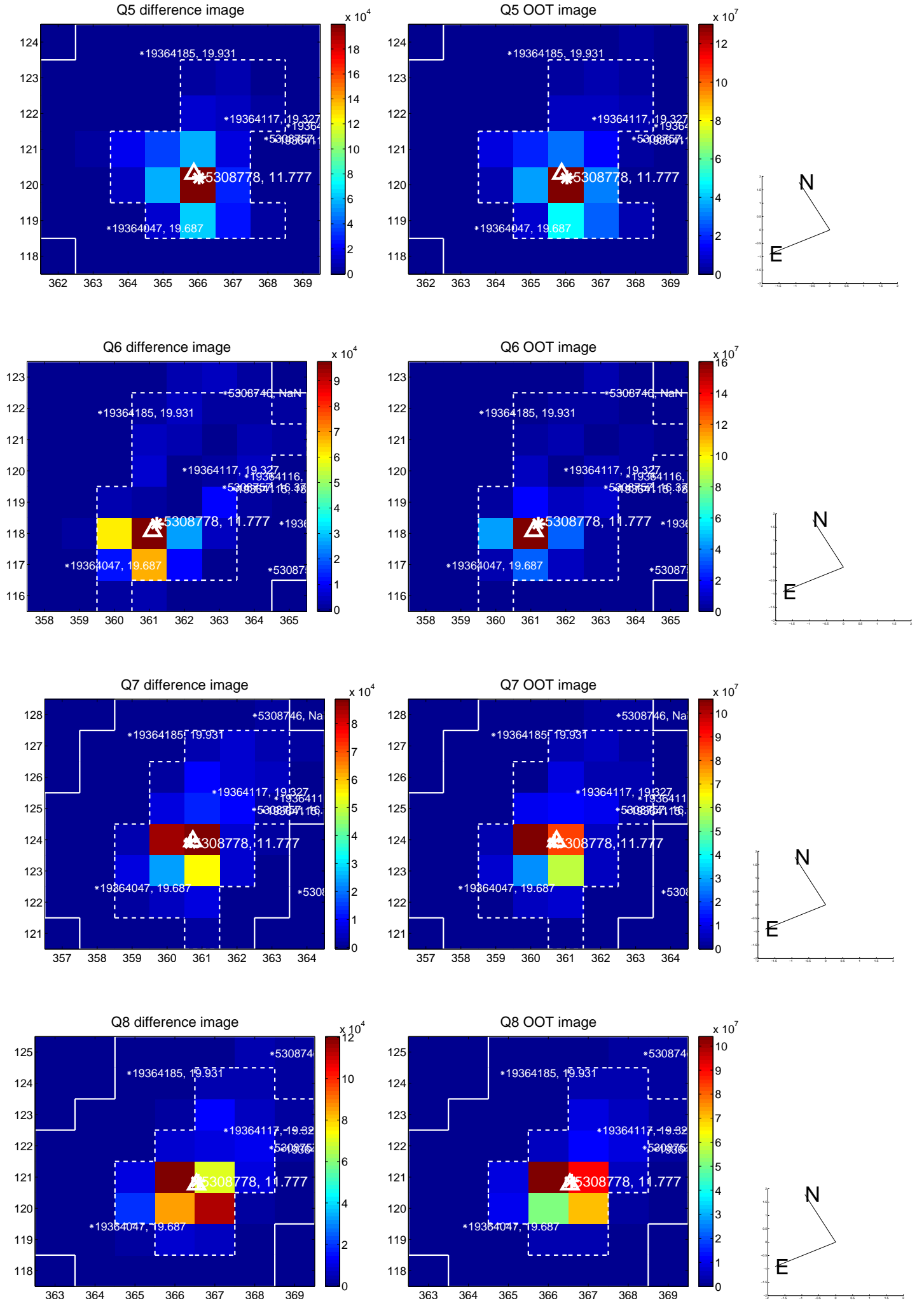
Q4 no difference image



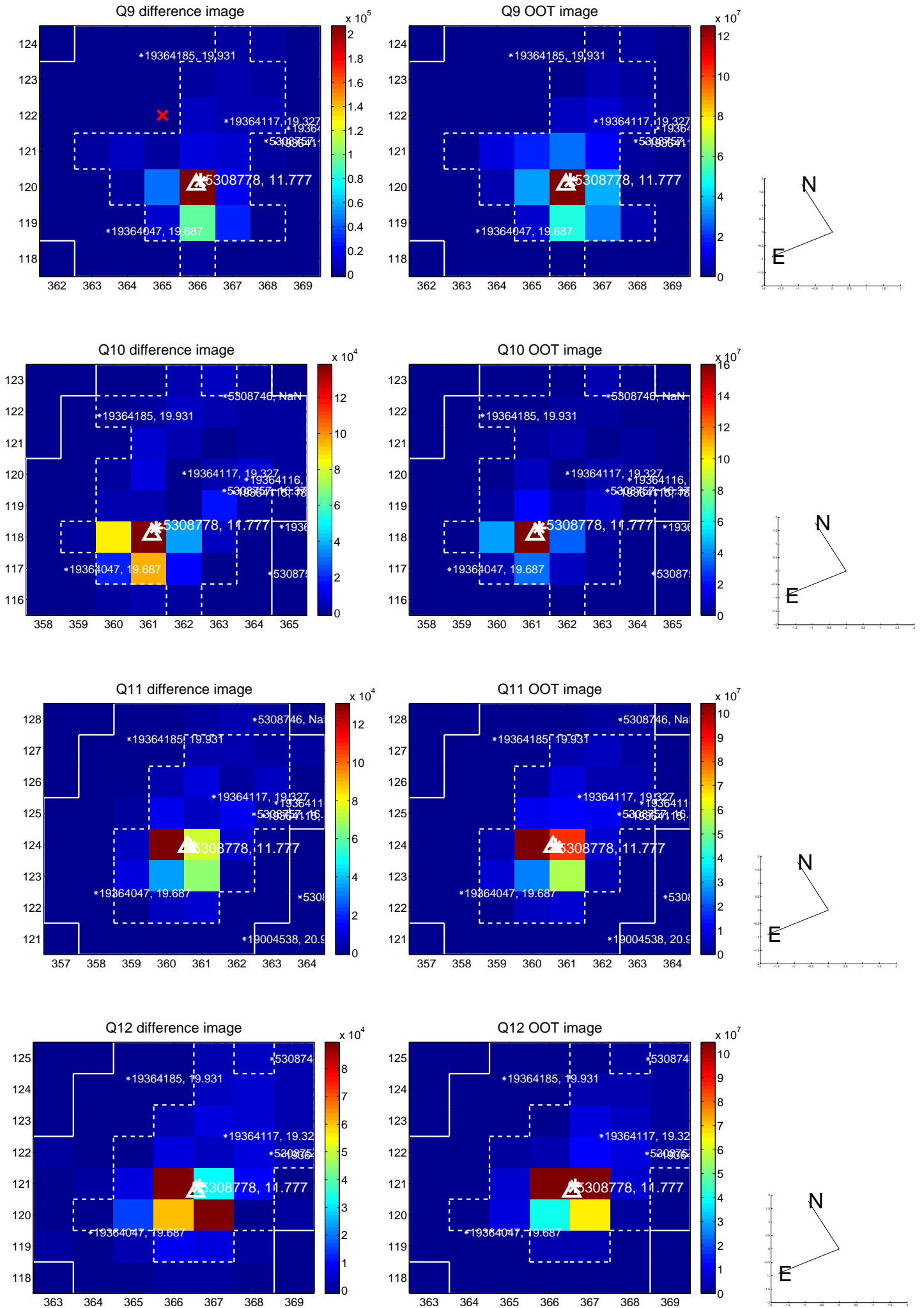
Q4 no OOT image



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

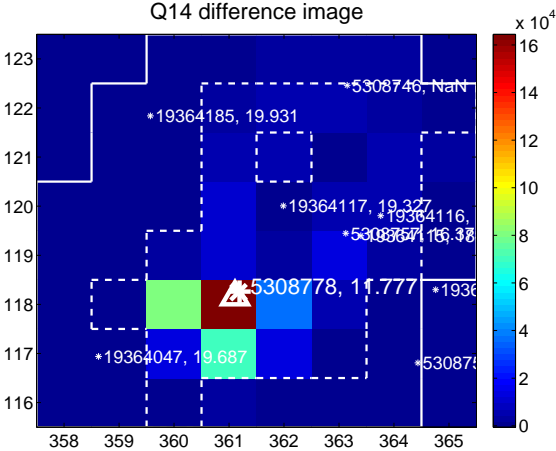
Q13 no difference image



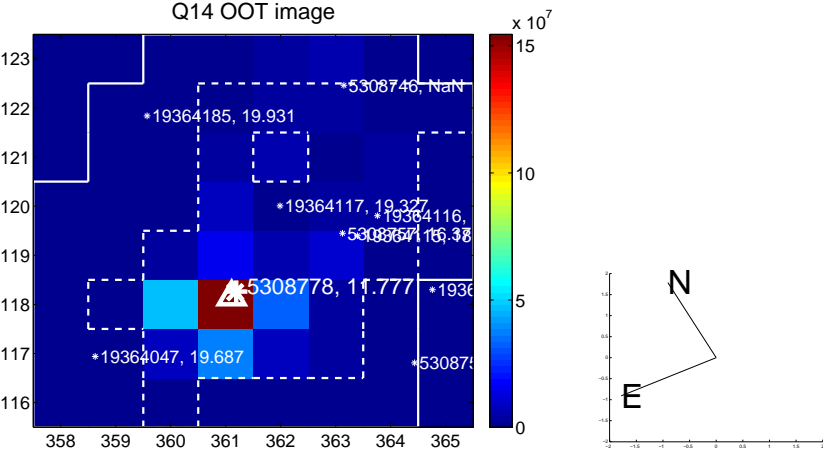
Q13 no OOT image



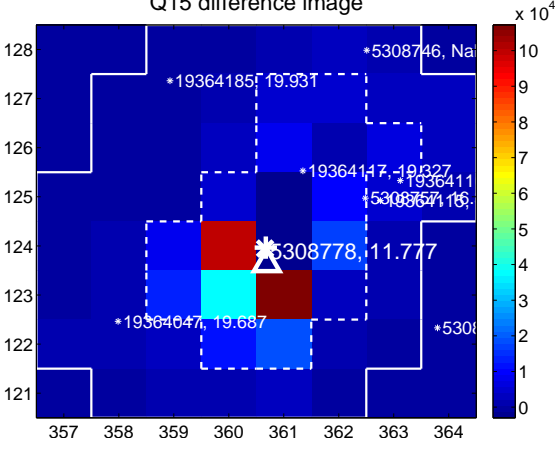
Q14 difference image



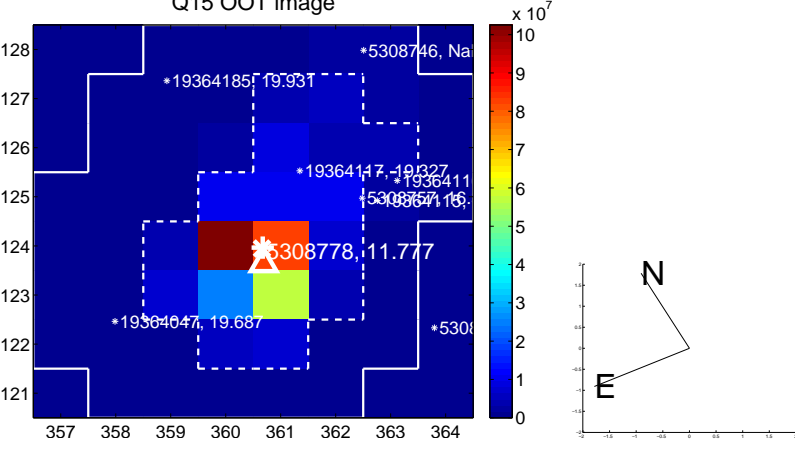
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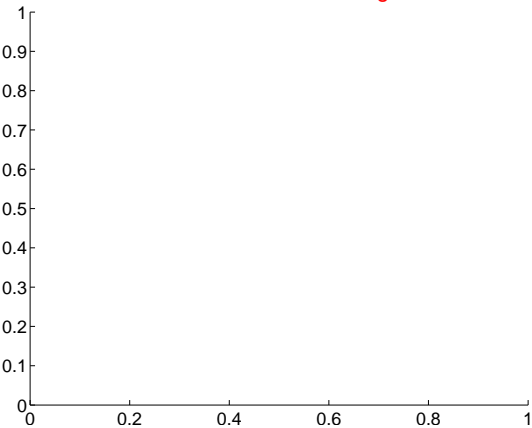
Q15 difference image



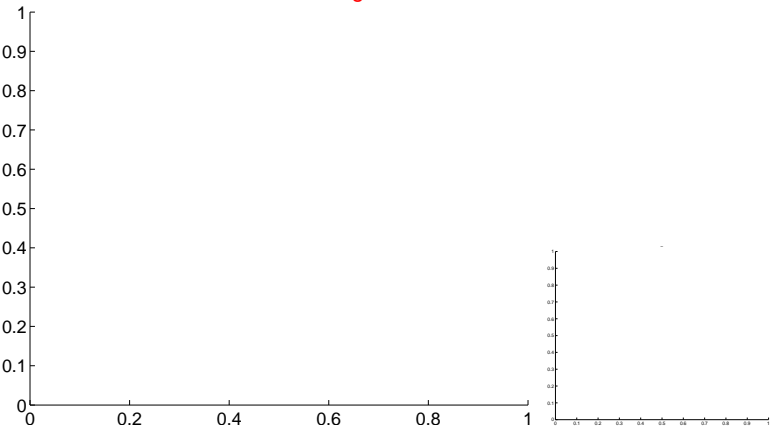
Q15 OOT image



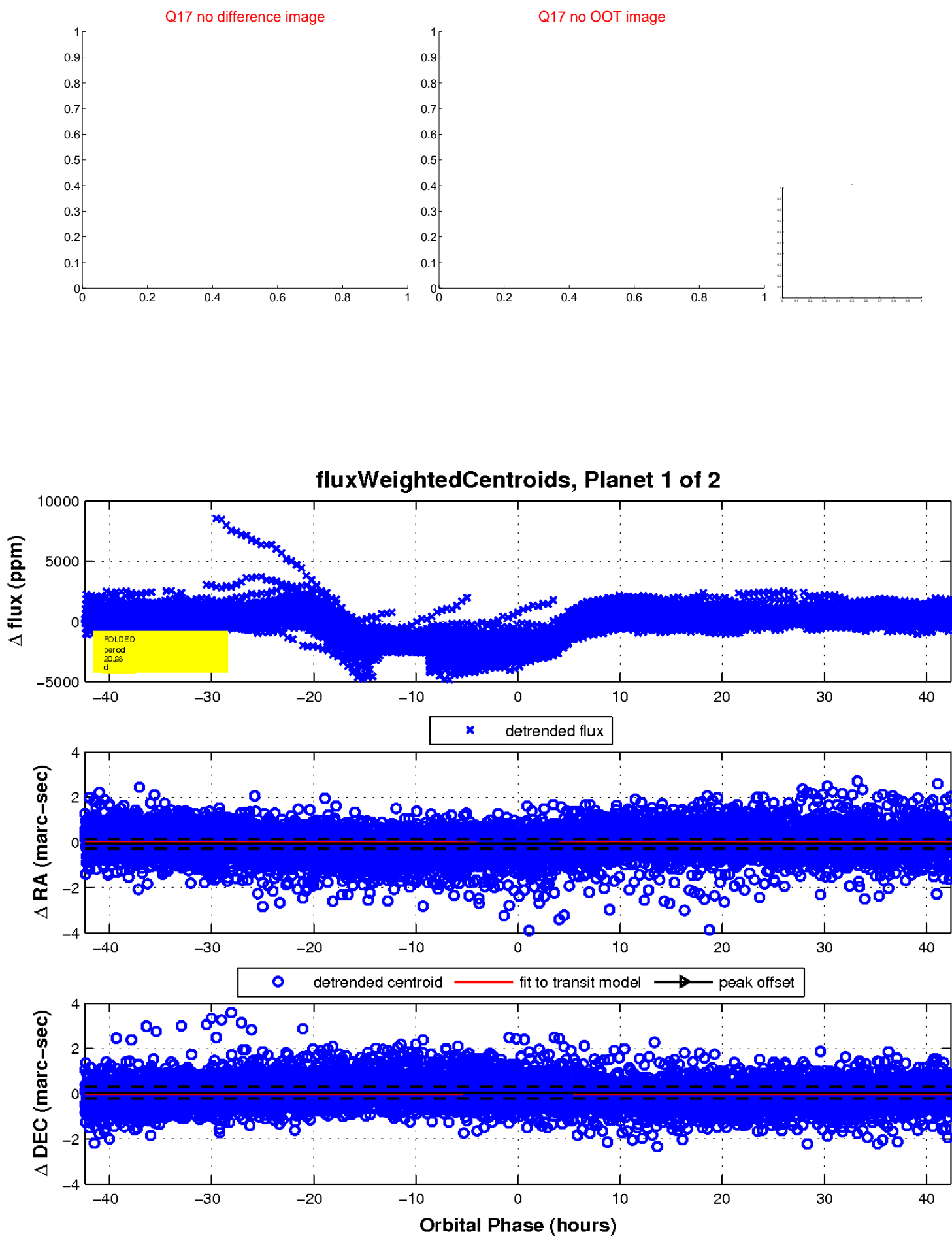
Q16 no difference image



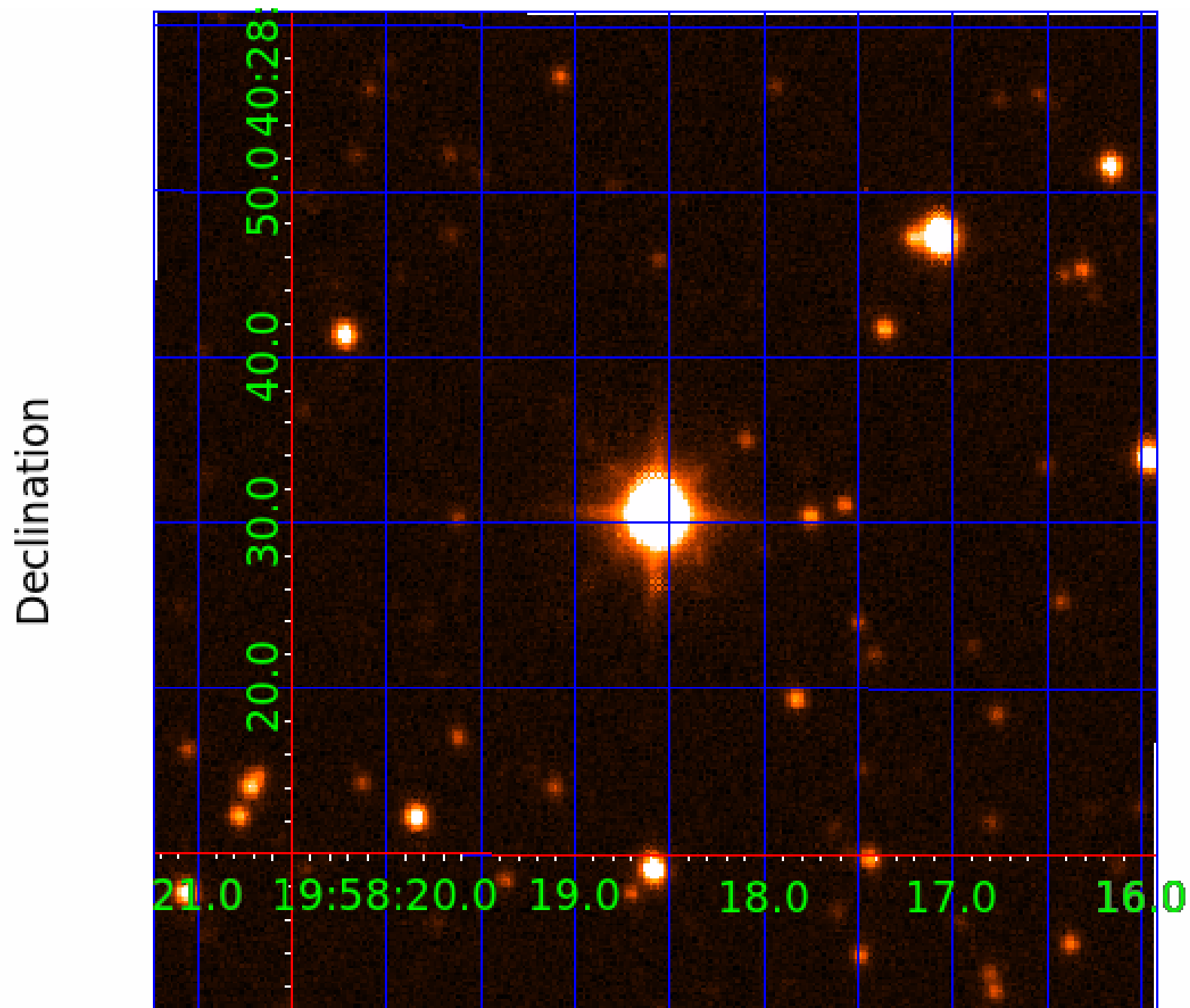
Q16 no OOT image



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



UKIRT Image



KIC 005308778

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})
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005308778-02	OBS	No	20.283050	136.574362	2918.8	13.743	35.9	45.4	3.96	5043	39.14	402.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005308778-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005308778-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—SAME_NTL_PERIOD

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.

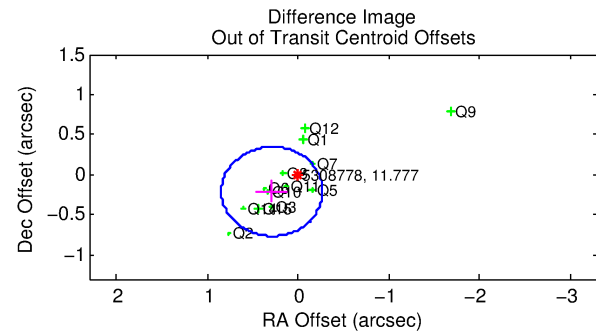
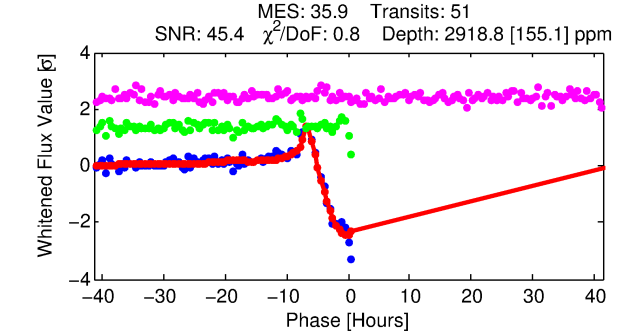
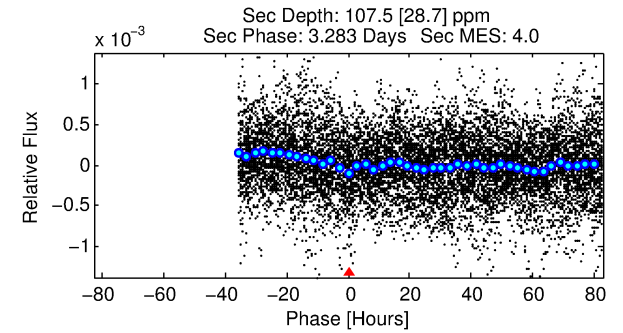
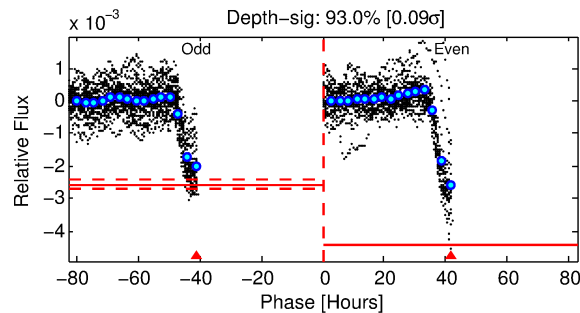
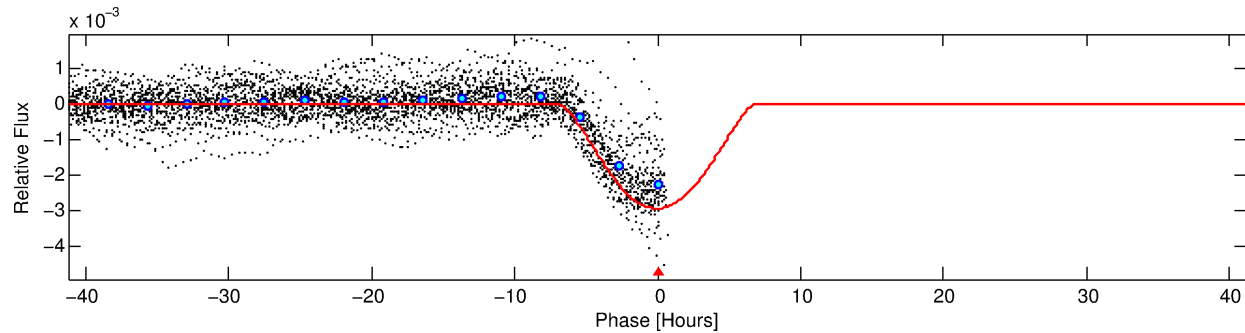
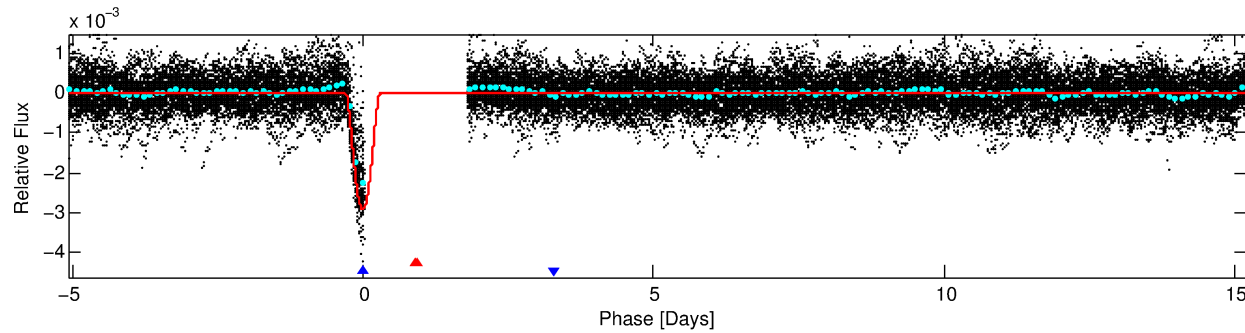
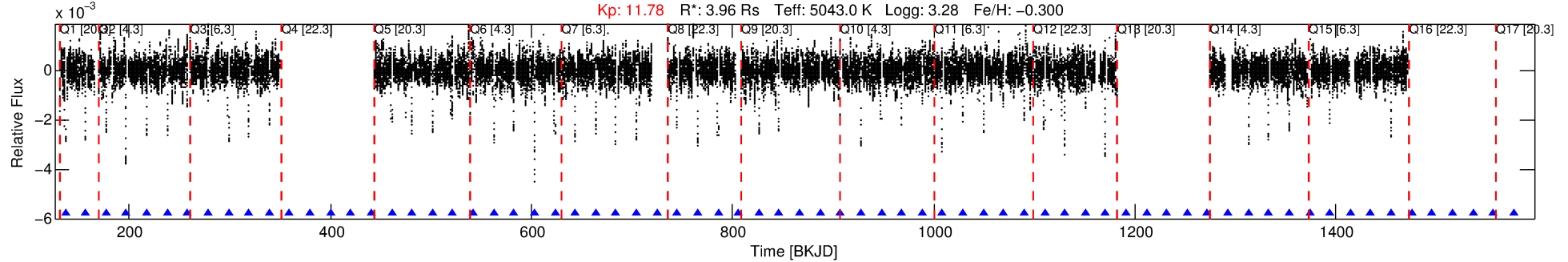
Ephemeris Match Information For 005308778-02

No Significant Match Found

DV One-Page Summary

KIC: 5308778 Candidate: 2 of 2 Period: 20.283 d
KOI: K06563 Corr: No Ephemeris Match

Kp: 11.78 R*: 3.96 Rs Teff: 5043.0 K Logg: 3.28 Fe/H: -0.300



DV Fit Results:

Period = 20.28305 [0.00011] d
Epoch = 136.5744 [0.0099] BKJD
Rp/R* = 0.0907 [0.0247]
a/R* = 5.20 [0.23]
b = 0.99 [0.04]
Seff = 402.08 [111.53]
Teq = 1142 [79] K
Rp = 39.14 [13.33] Re
a = 0.1502 [0.0270] AU
Ag = 0.87 [0.58] [-0.22σ]
Teff = 1705 [260] K [2.07σ]

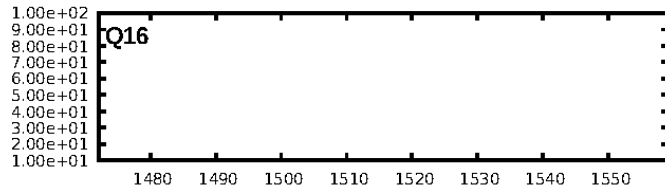
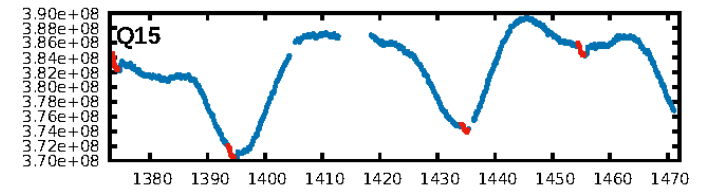
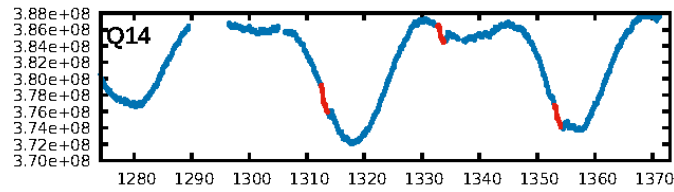
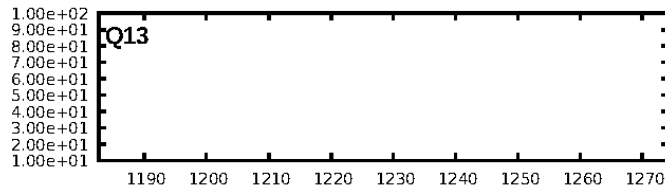
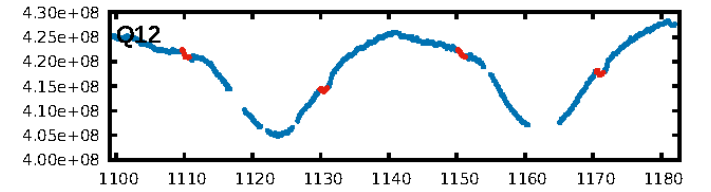
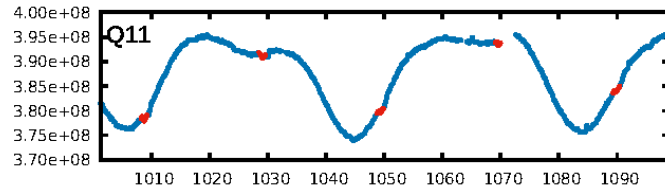
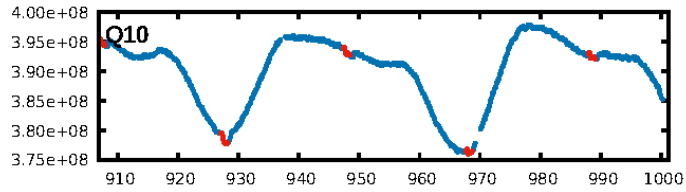
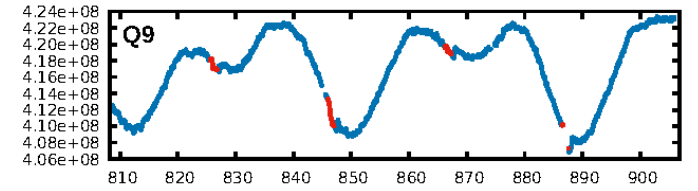
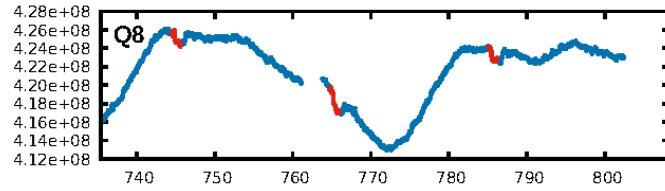
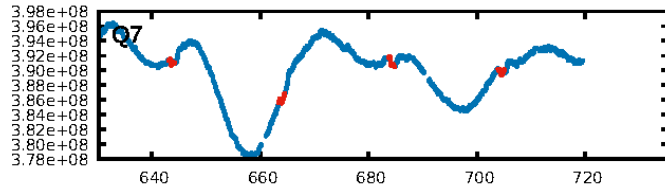
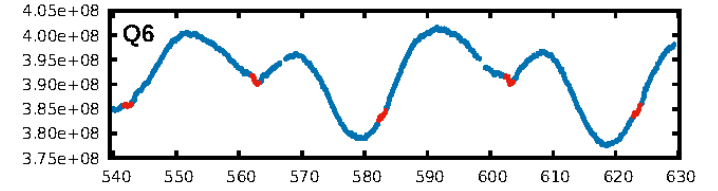
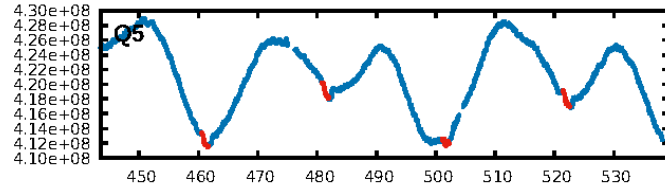
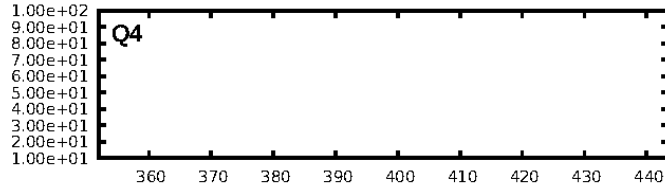
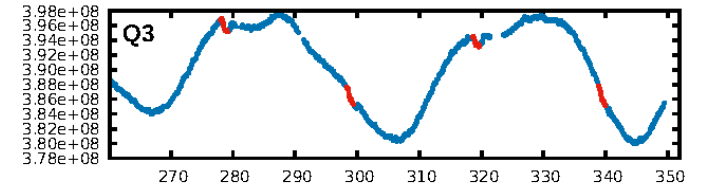
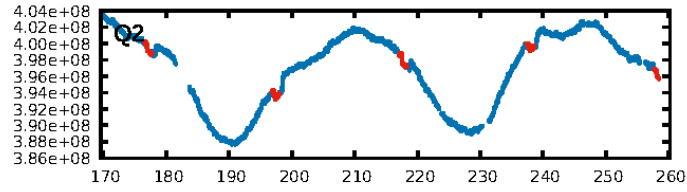
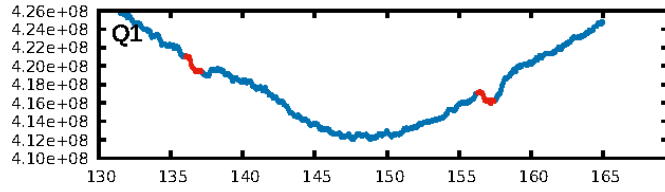
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.36e-219
RollingBand-fgt: 1.00 [49/49]
GhostDiagnostic-chr: 1.288
Centroid-sig: 0.0%
Centroid-so: 0.324 arcsec [11.81σ]
OotOffset-rm: 0.356 arcsec [1.92σ]
KicOffset-rm: 0.289 arcsec [1.33σ]
OotOffset-st: 4/4/2/3 [13]
KicOffset-st: 4/4/2/3 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 0.00 [0/13]

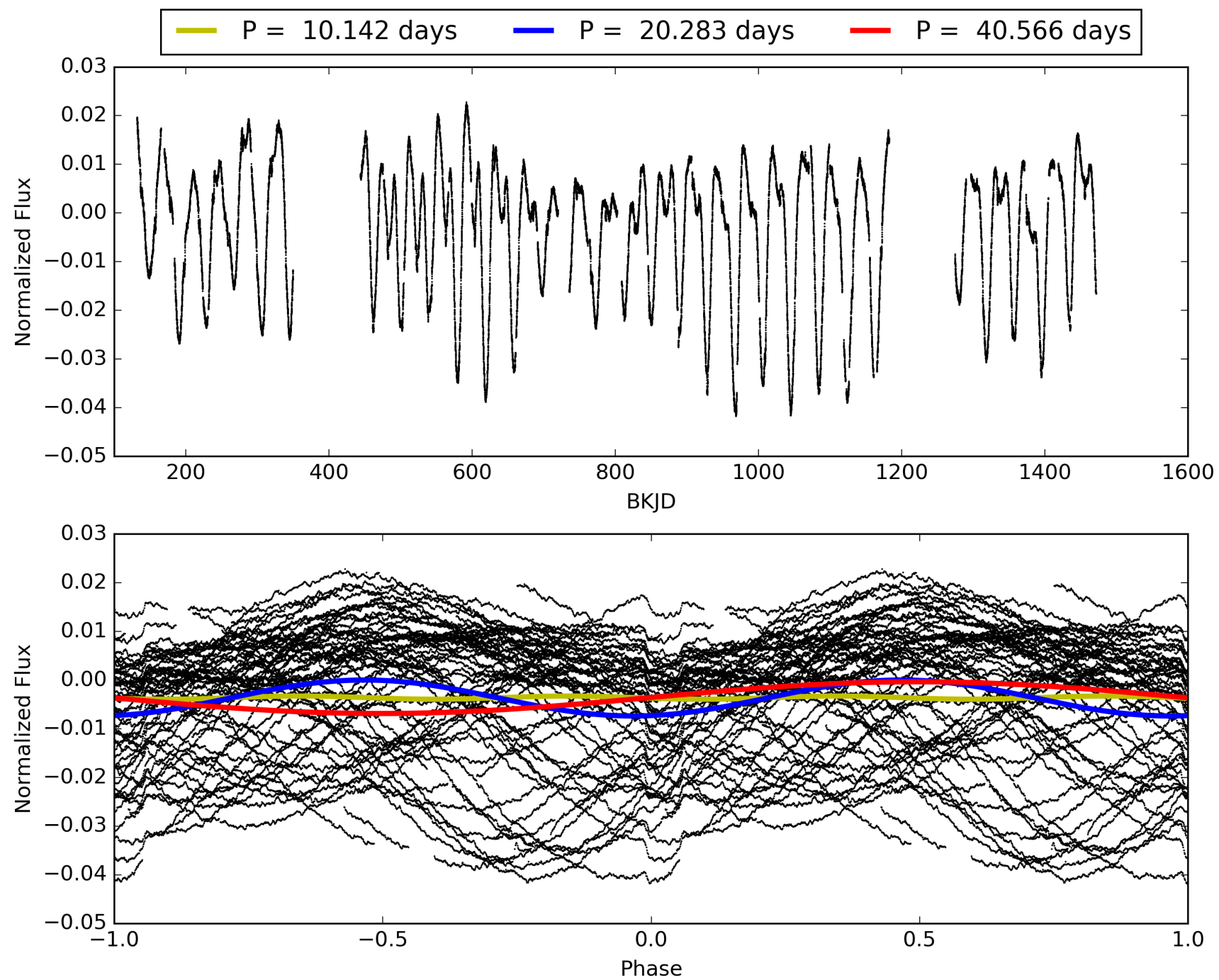
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:19:12 Z

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

TCE 005308778-02, PDC Light Curves

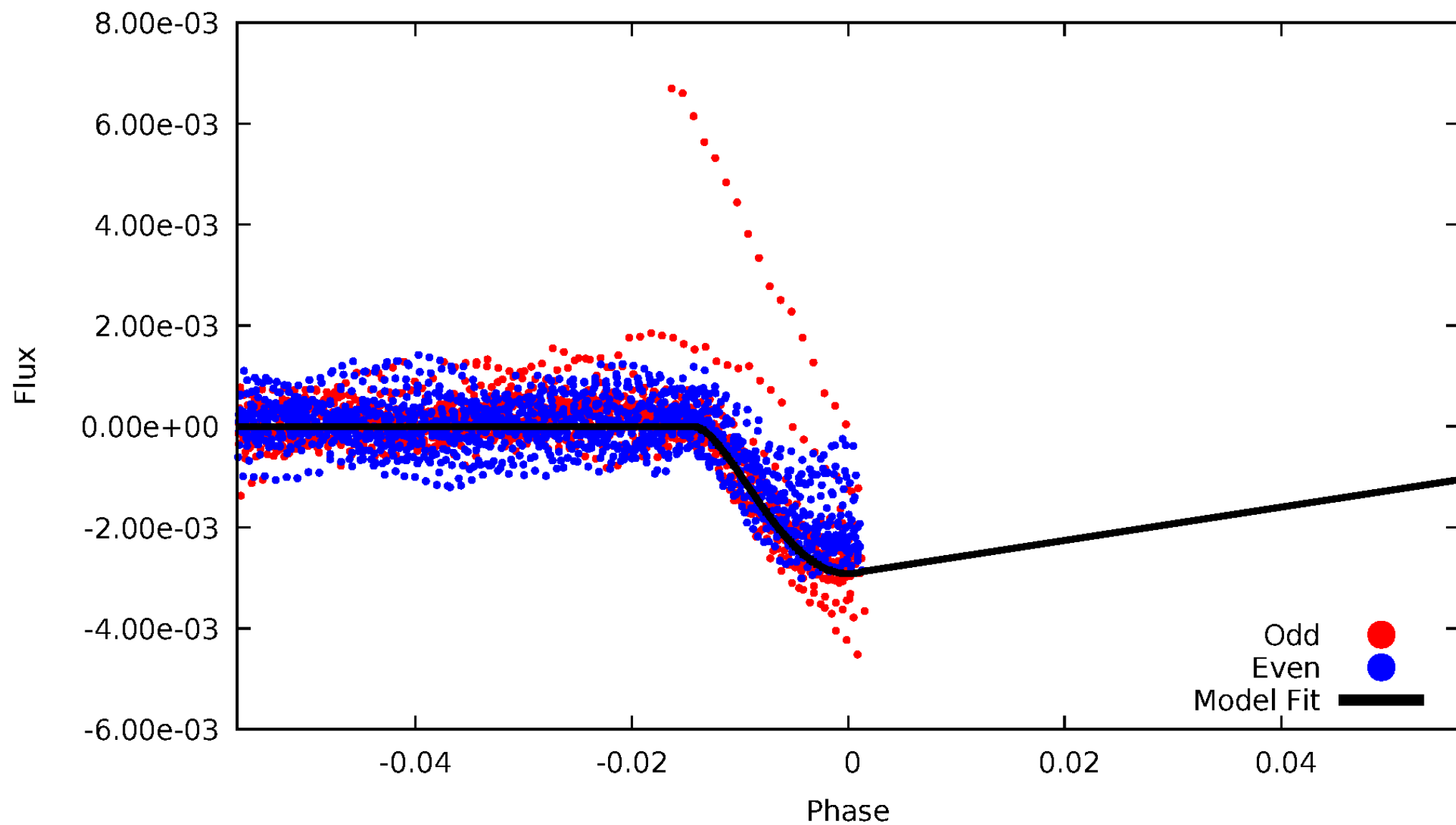


TCE 005308778-02



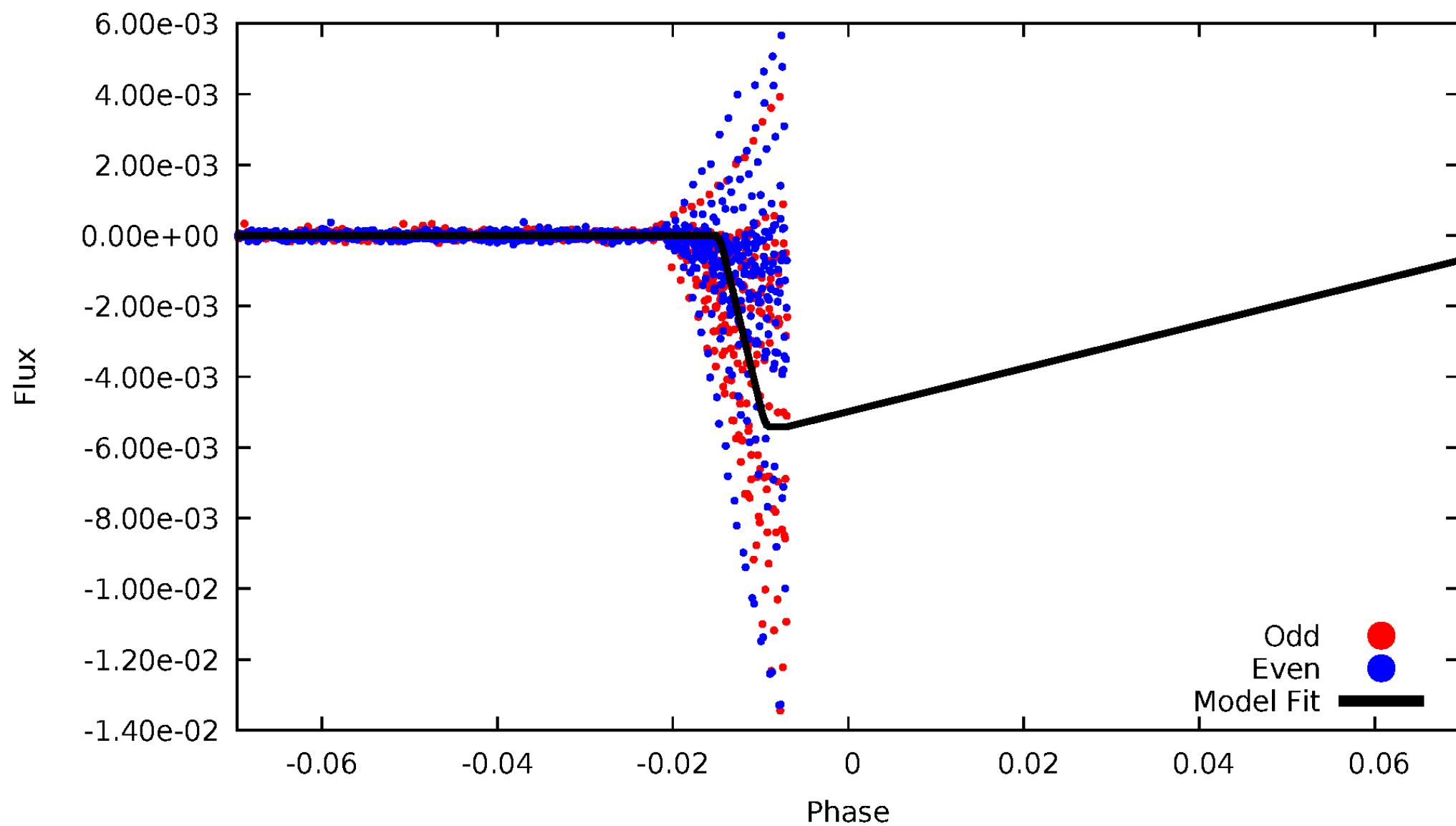
DV Odd/Even

TCE 005308778-02



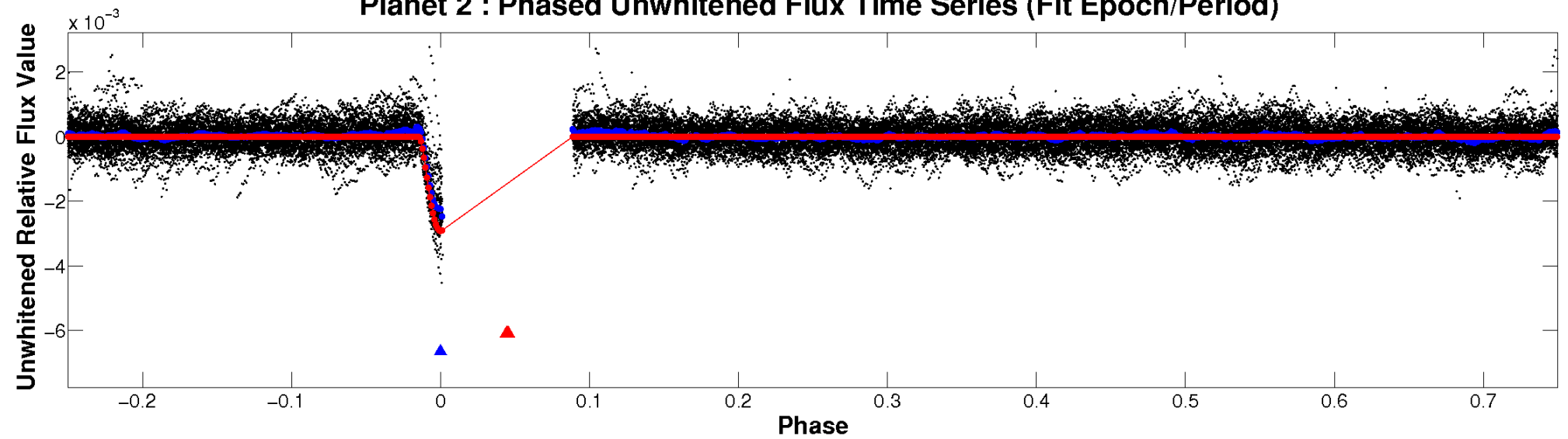
ALT Odd/Even

TCE 005308778-02

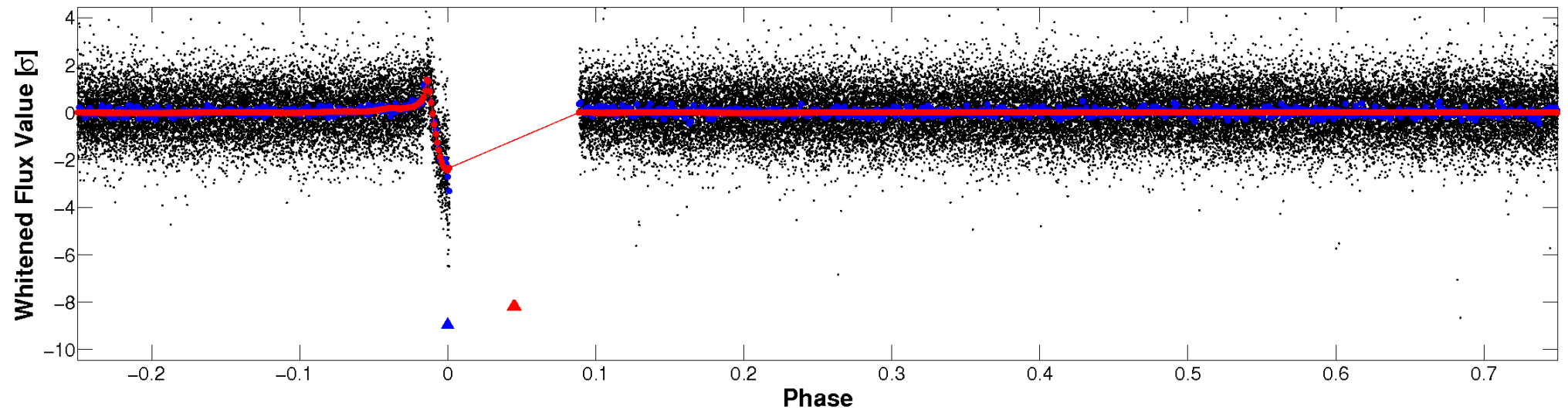


Non-Whitened Vs. Whitened Light Curve

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

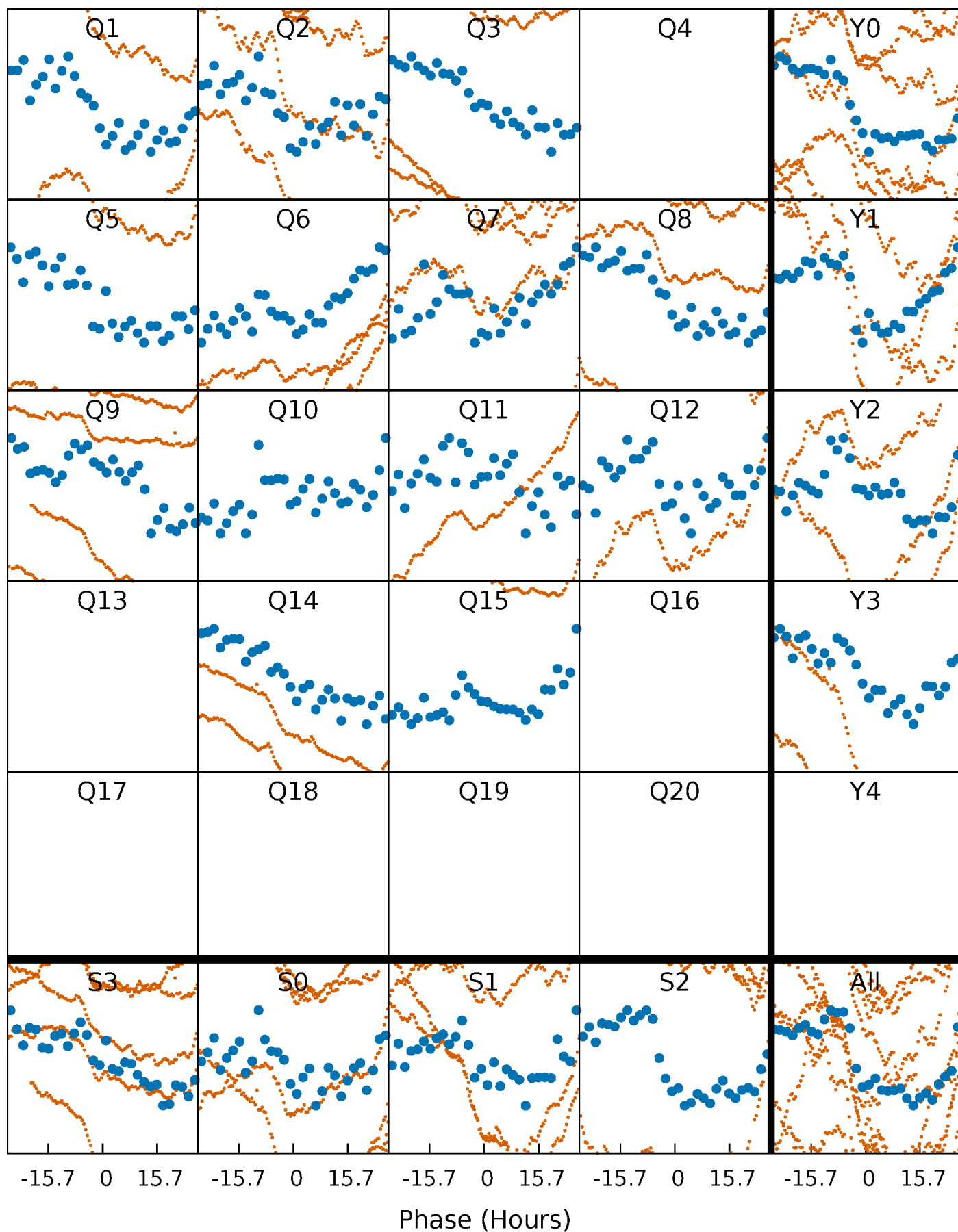


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



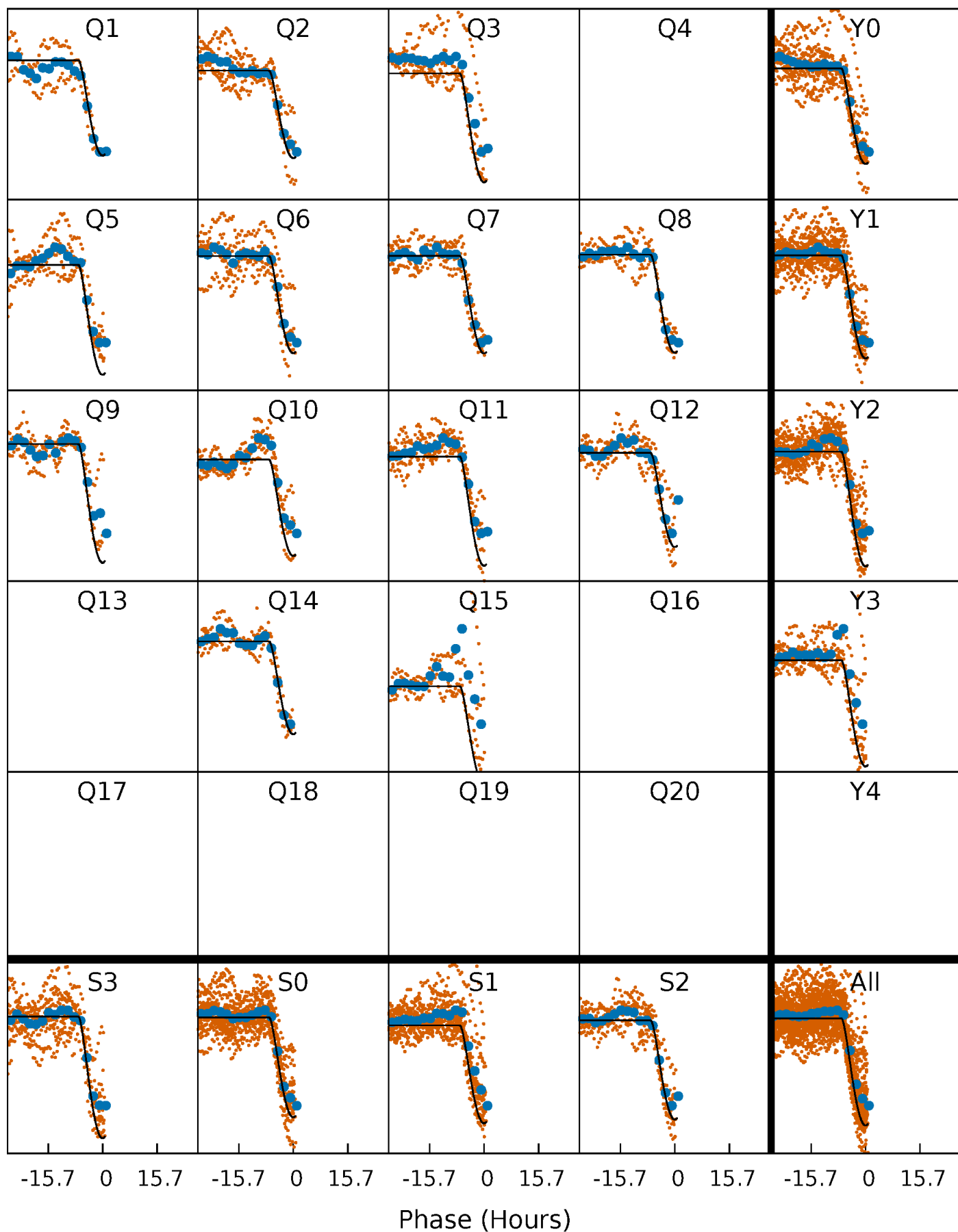
PDC Quarter-Phased Transit Curves

TCE 005308778-02 P= 20.283050 Days $T_0=136.574362$ (BKJD)



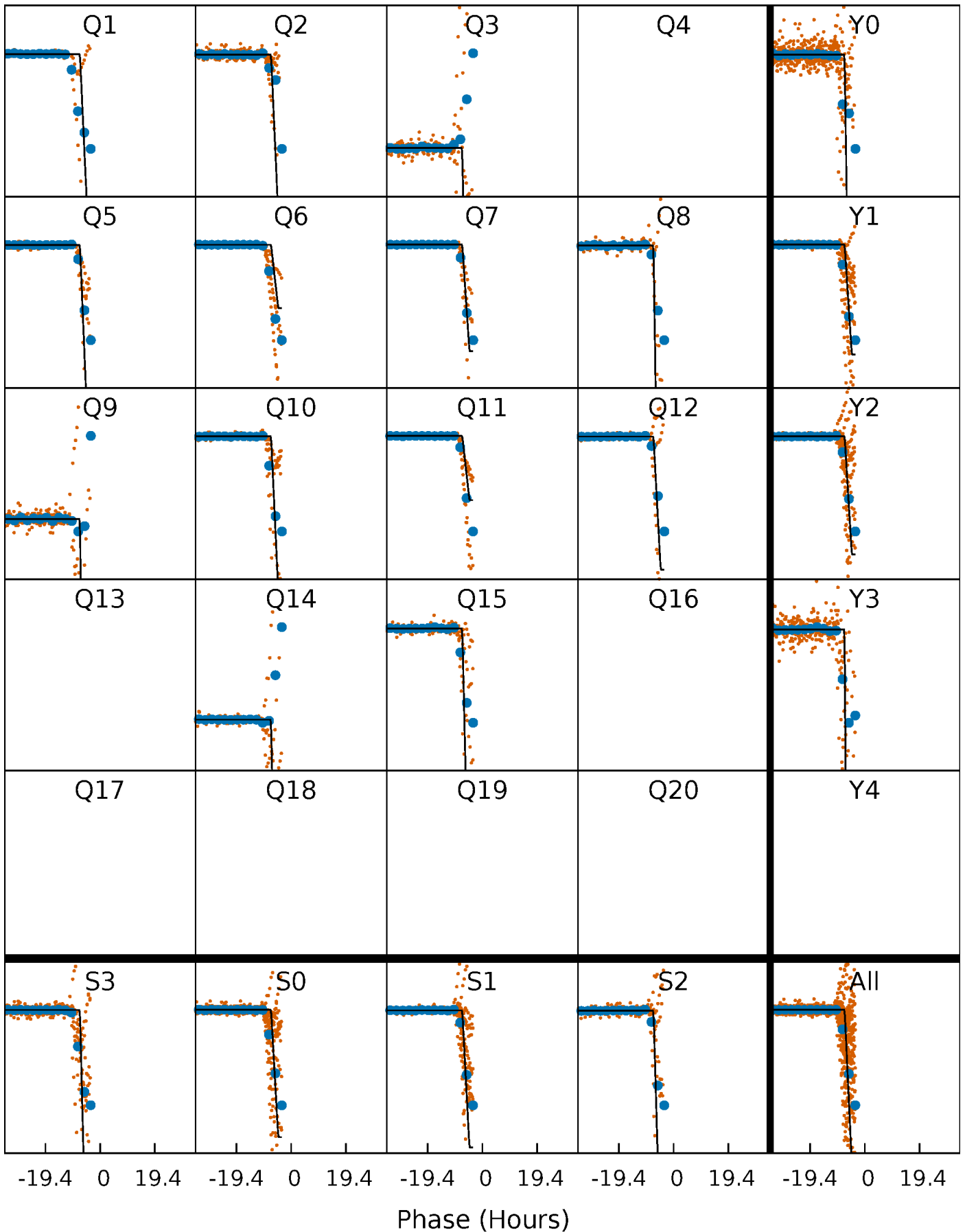
DV Quarter-Phased Transit Curves

TCE 005308778-02 P= 20.283050 Days $T_0=136.574362$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

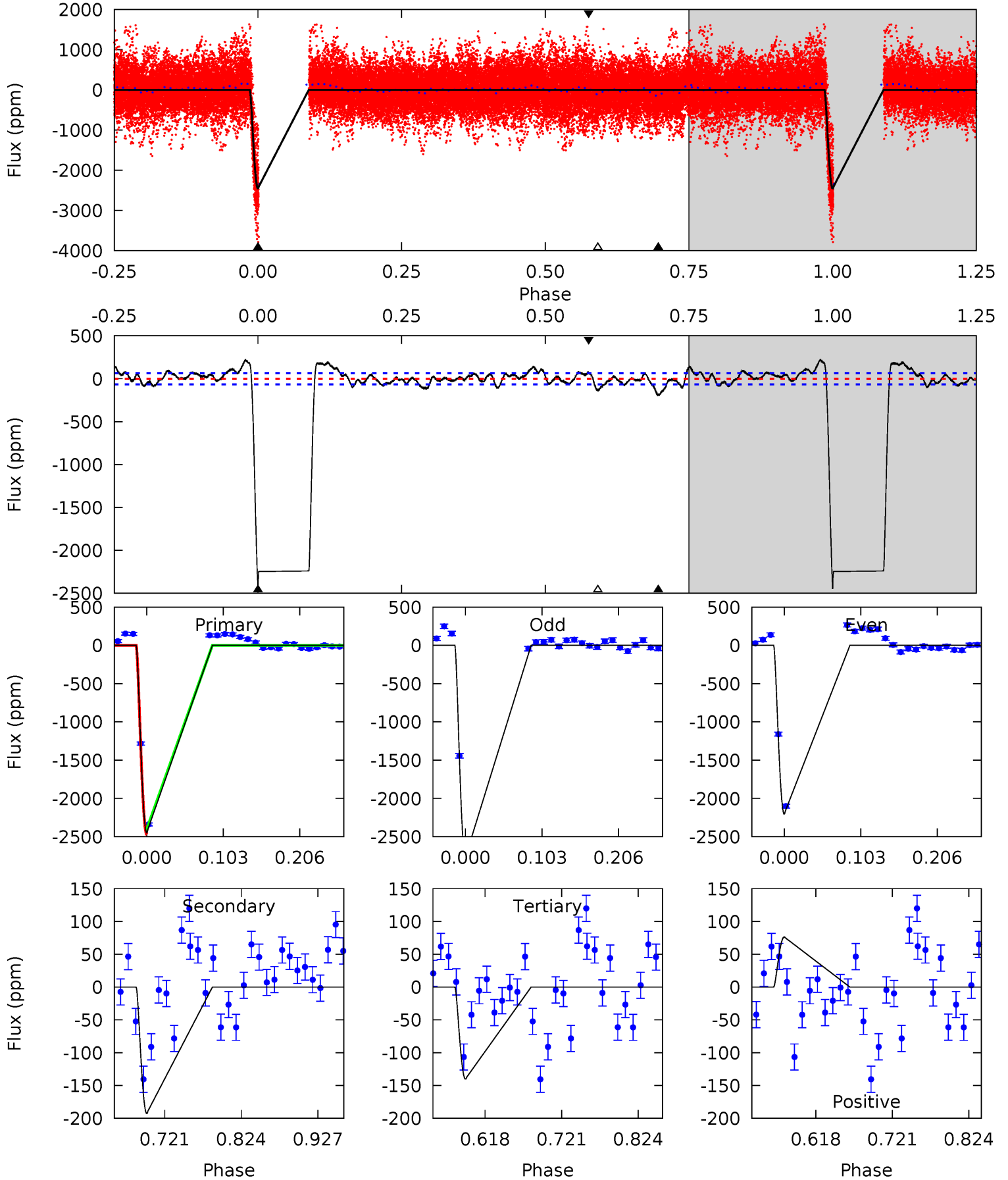
TCE 005308778-02 $P = 20.282524$ Days $T_0 = 136.751655$ (BKJD)



DV Model-Shift Uniqueness Test

005308778-02, P = 20.283050 Days, E = 116.291312 Days

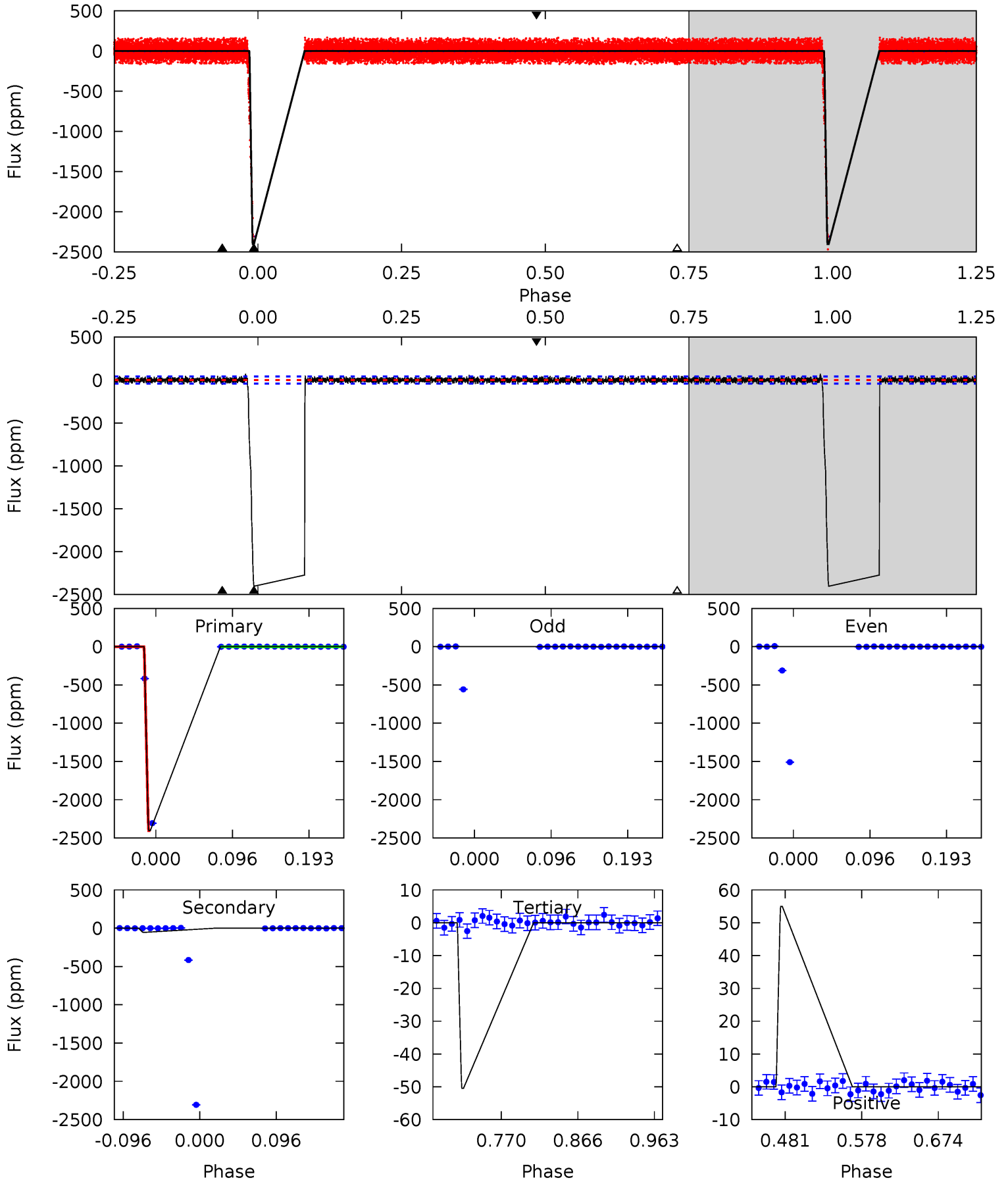
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
169.0	13.3	9.67	5.27	4.56	1.63	3.63	159.3	163.7	3.62	8.03	19.4	0.90	0.08	1.05



Alt Model-Shift Uniqueness Test

005308778-02, P = 20.282524 Days, E = 116.469131 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
260.1	5.88	5.47	5.95	4.57	1.66	1.51	254.7	254.2	0.42	-0.07	0	0	0.03	0



Stellar Parameters For KIC 005308778

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5043^{+65}_{-65}	$3.284^{+0.154}_{-0.126}$	$-0.300^{+0.150}_{-0.100}$	$3.956^{+0.805}_{-0.805}$	$1.098^{+0.221}_{-0.147}$	$0.025^{+0.018}_{-0.009}$
	+1%/-1%	+5%/-4%	+50%/-33%	+20%/-20%	+20%/-13%	+73%/-36%
Source	SPE74	SPE74	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 005308778-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-193 ± 14	$38.59^{+12.47}_{-11.22}$	1592^{+89}_{-85}	2657^{+278}_{-217}	$1.606^{+1.645}_{-0.678}$
Alt.	-54 ± 9	$30.85^{+10.78}_{-10.60}$	1591^{+85}_{-81}	2302^{+359}_{-392}	$0.698^{+0.927}_{-0.325}$

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

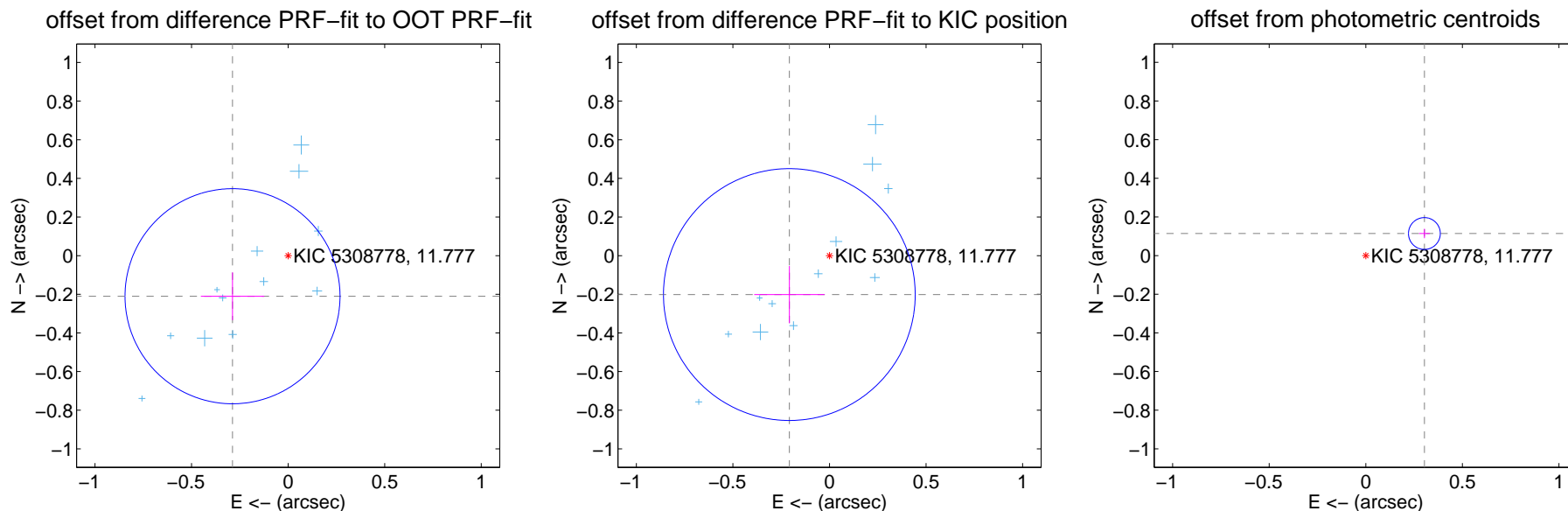
DV Centroid Data

Supplemental centroid analysis for 005308778-02. **Kepler magnitude: 11.78.** Transit SNR 45.37

There are 13 quarters with good PRF difference image offsets

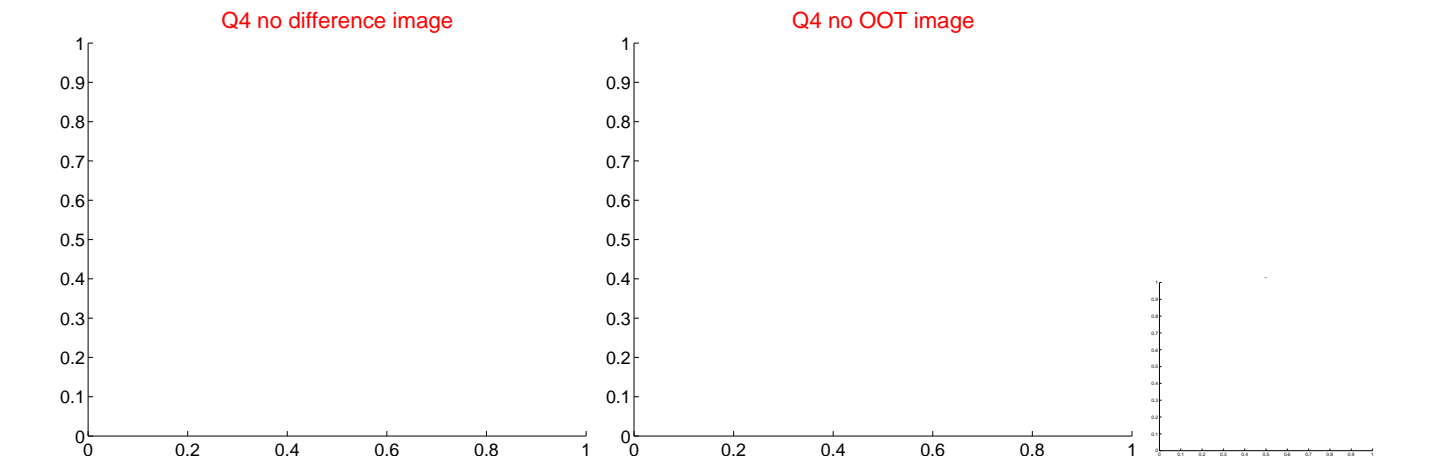
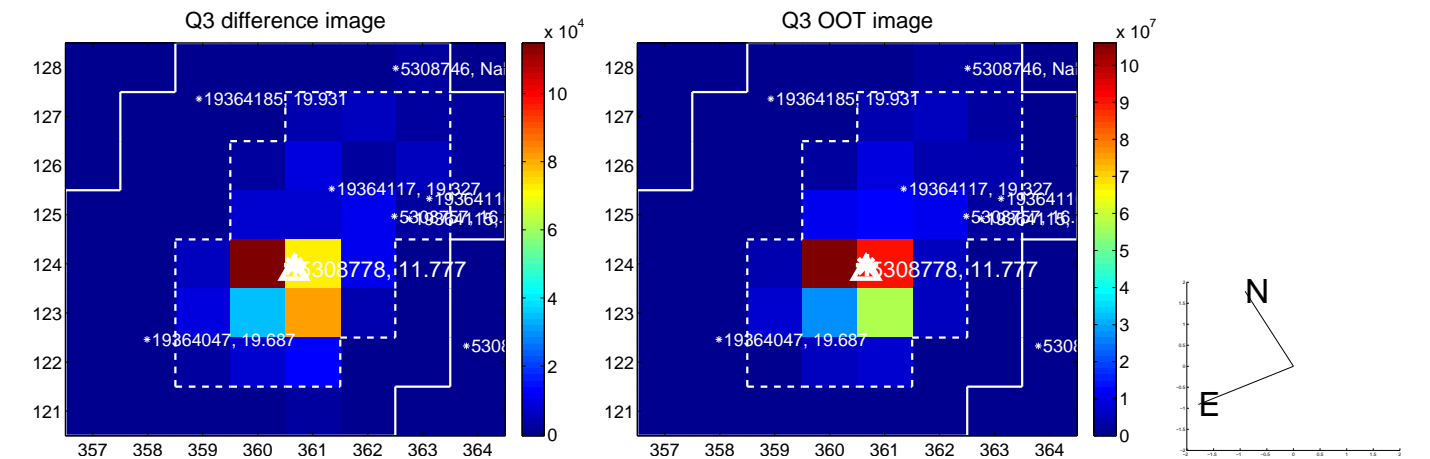
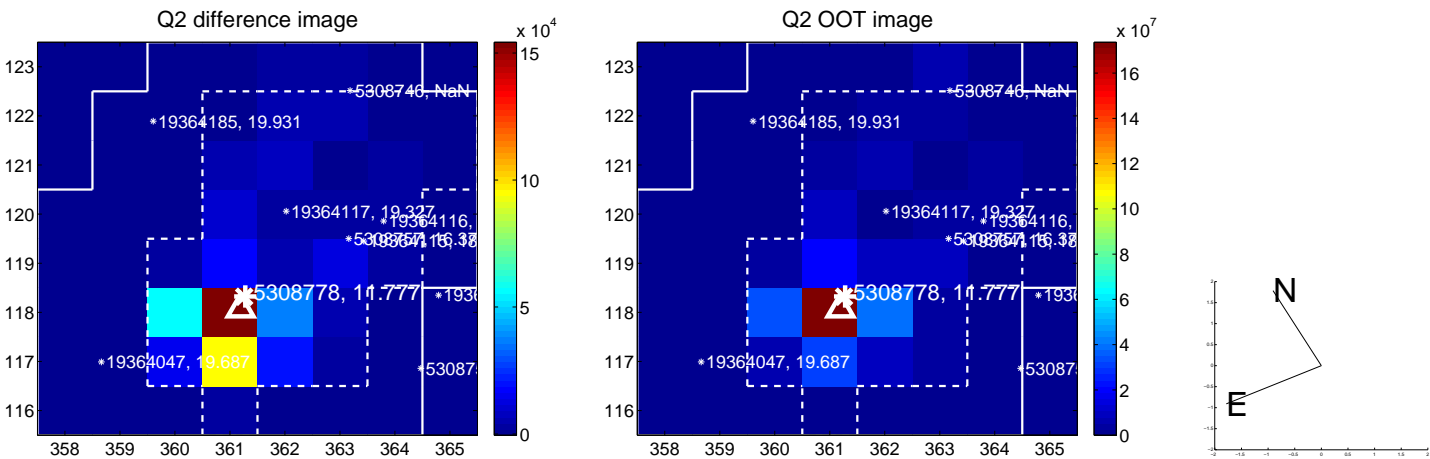
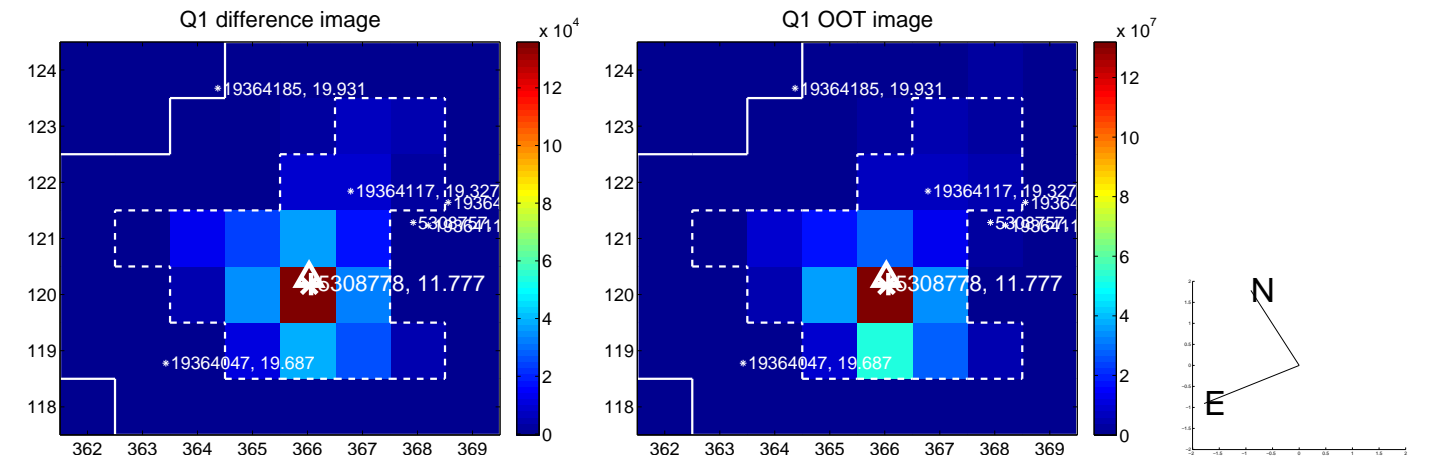
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.356 ± 0.186	1.92	0.288 ± 0.164	-0.210 ± 0.124
PRF-fit source offset from KIC position	0.289 ± 0.217	1.33	0.208 ± 0.182	-0.201 ± 0.148
photometric centroid source offset	0.32 ± 0.03	11.81	-0.30 ± 0.03	0.11 ± 0.02

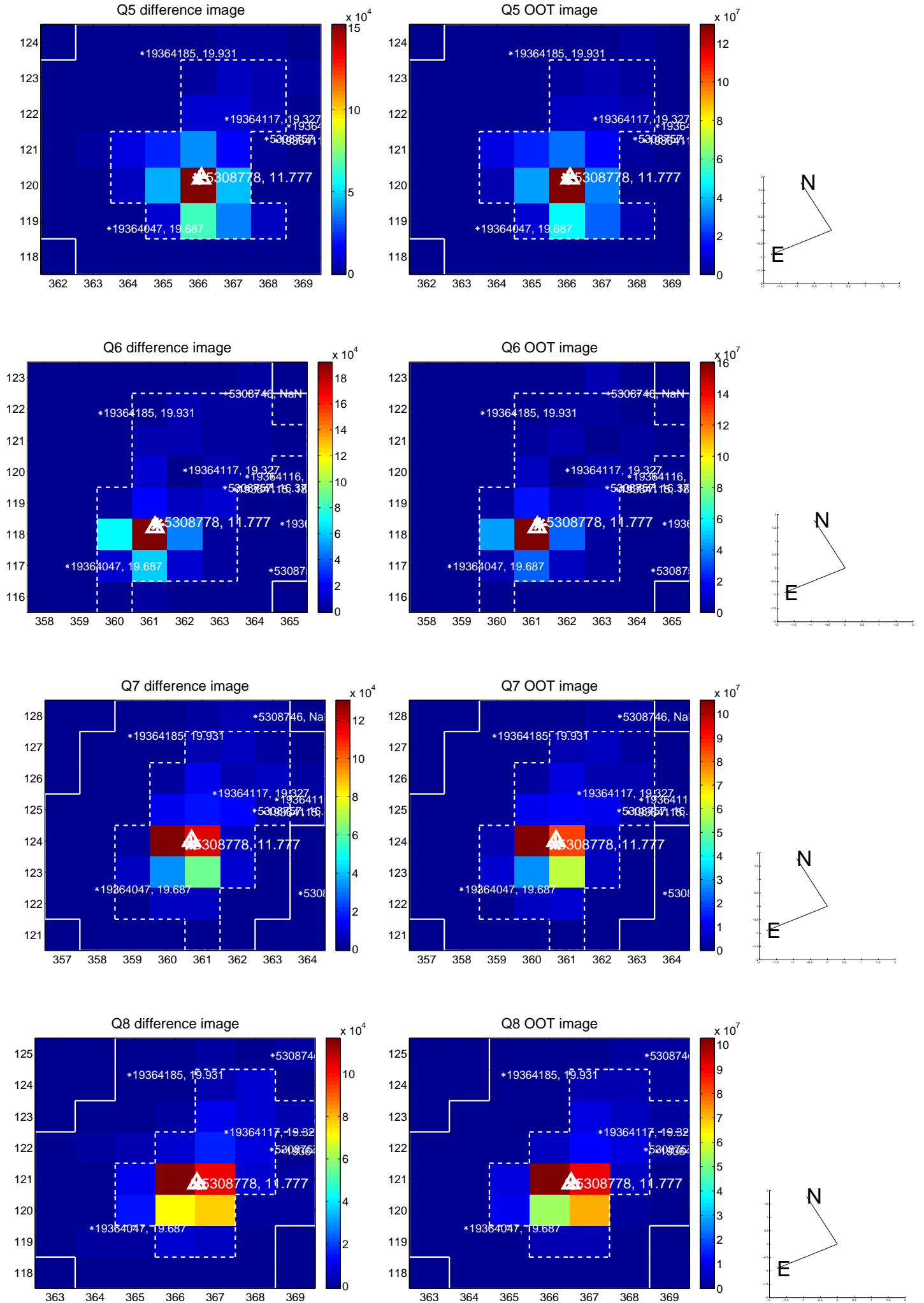


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

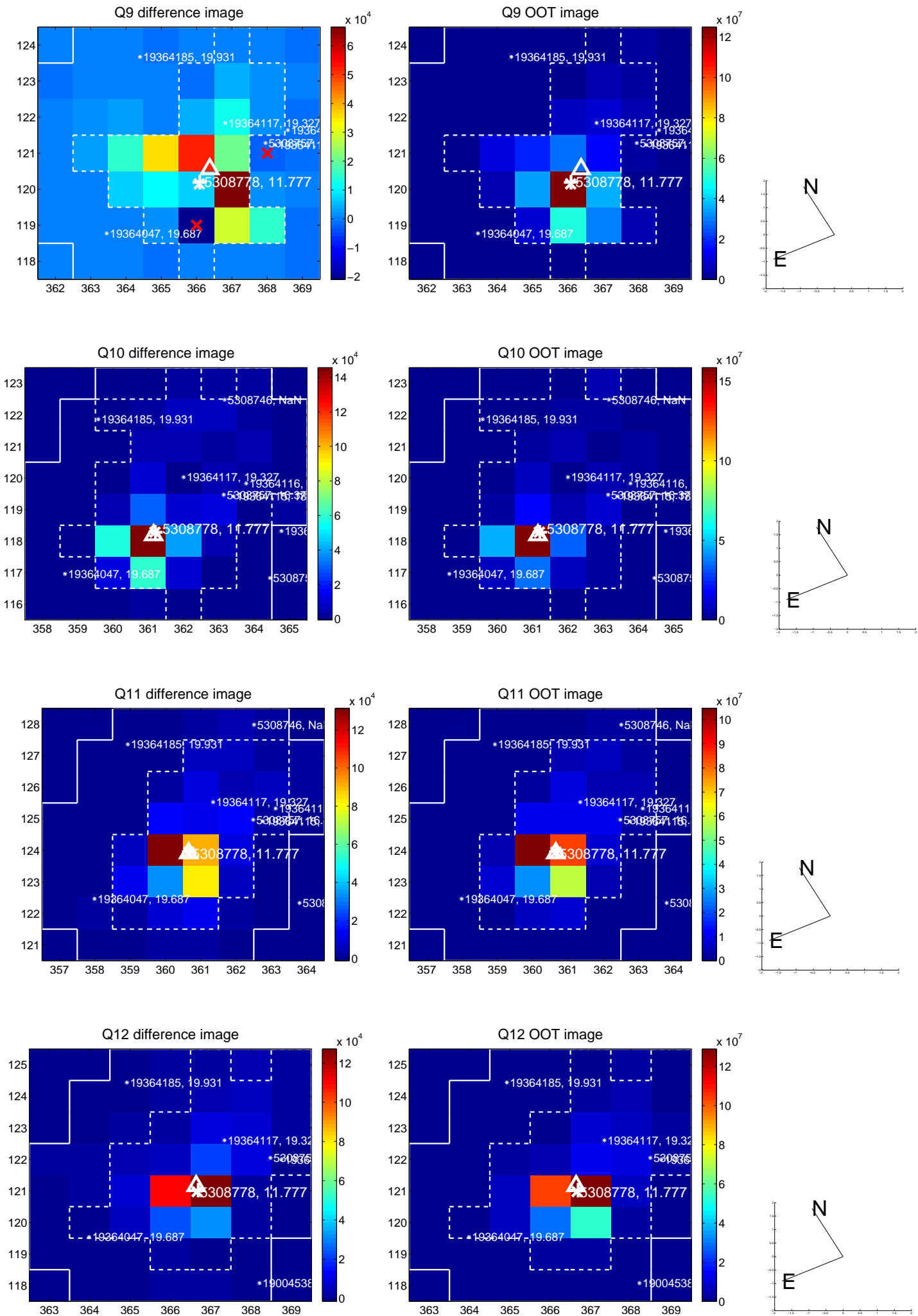
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

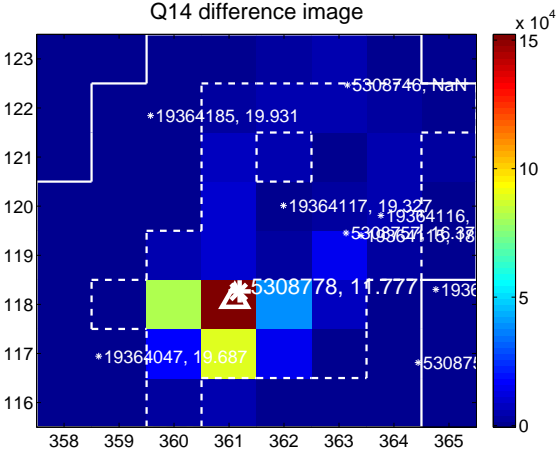
Q13 no difference image



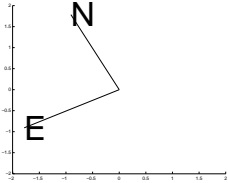
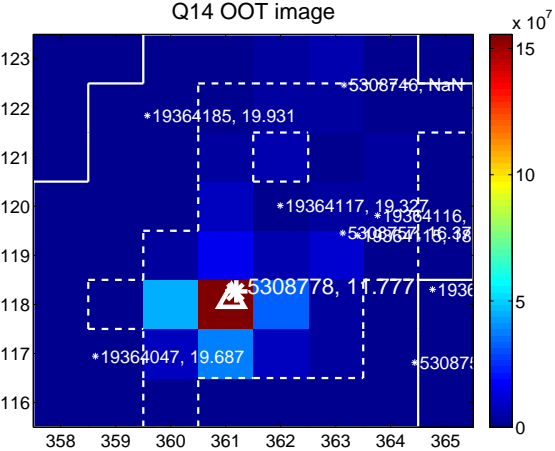
Q13 no OOT image



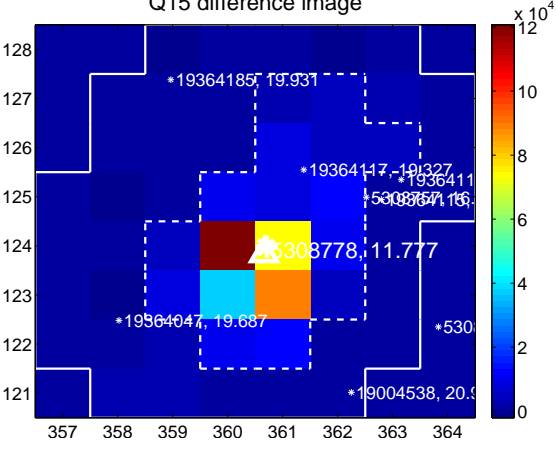
Q14 difference image



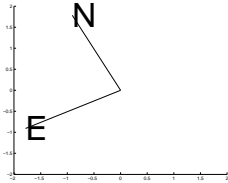
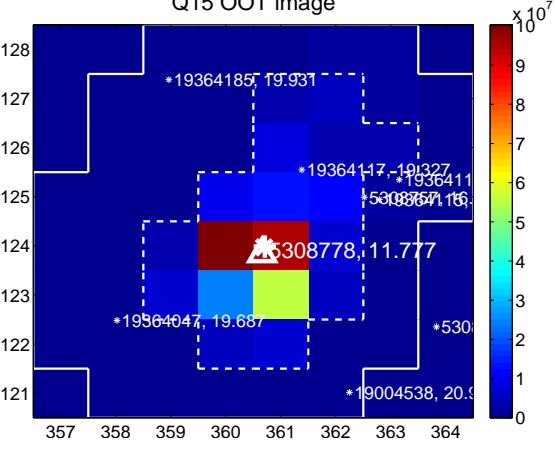
Q14 OOT image



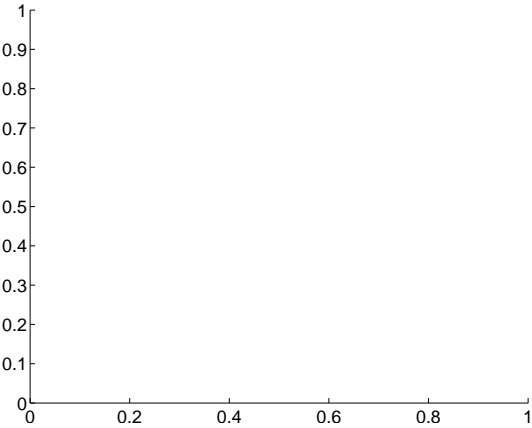
Q15 difference image



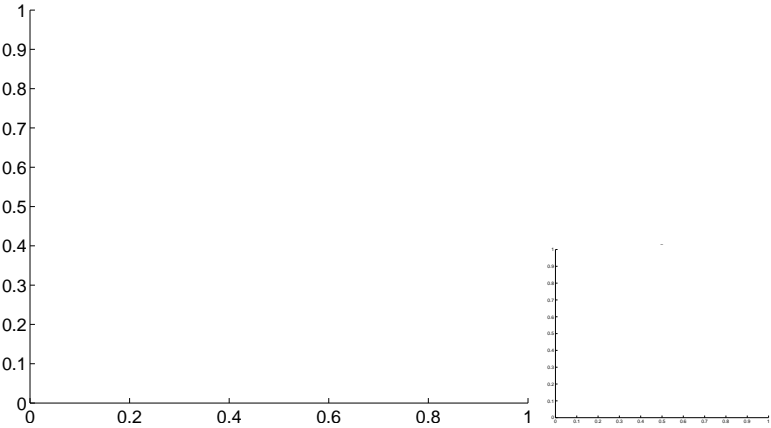
Q15 OOT image



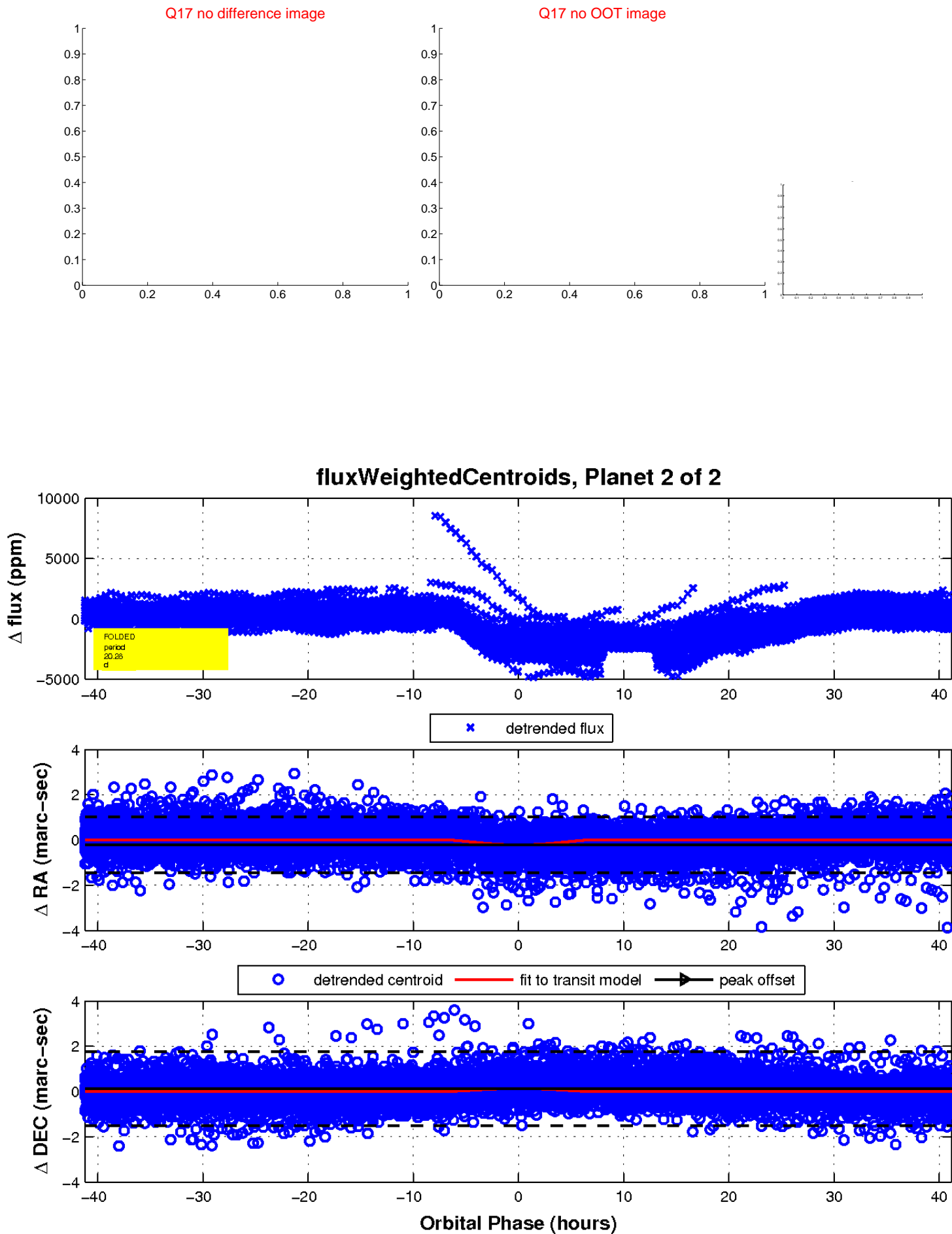
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

