

KIC 010163067

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})
010163067-01	OBS	7291.01	25.915191	131.771299	111.0	9.446	9.8	10.3	2.35	6167	2.77	206.06
010163067-02	OBS	No	5.899054	132.684385	15.9	1.312	7.9	2.2	2.35	6167	1.25	1482.63

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010163067-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
010163067-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

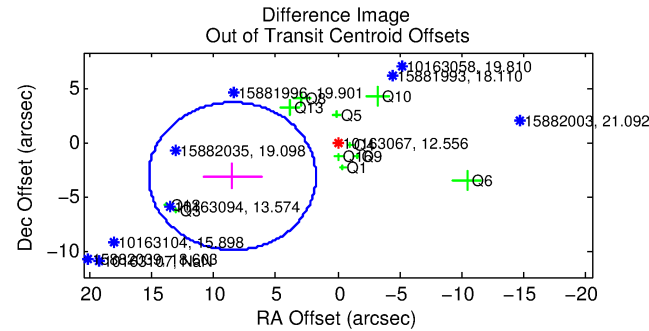
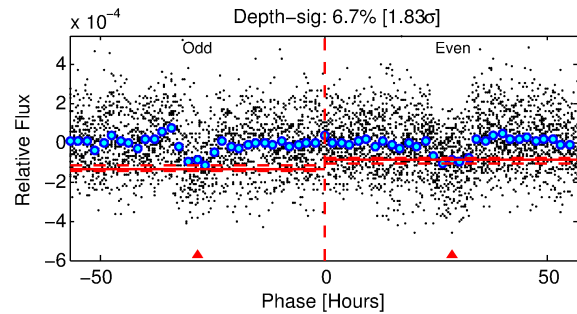
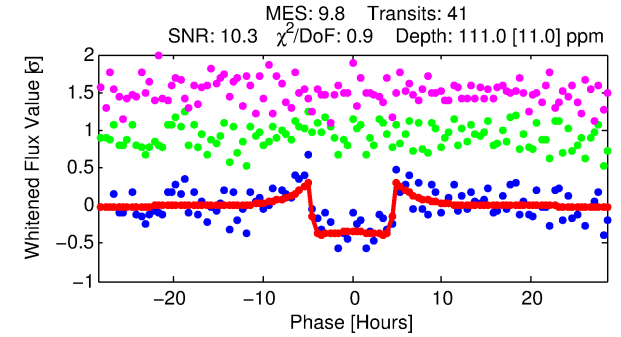
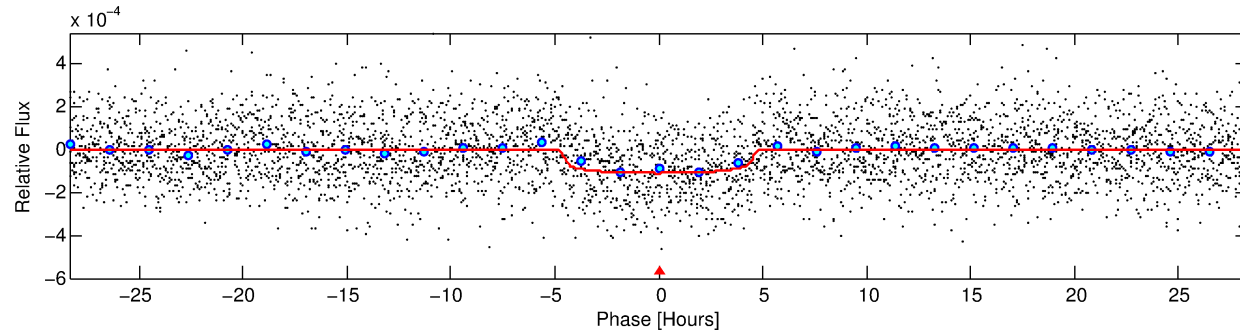
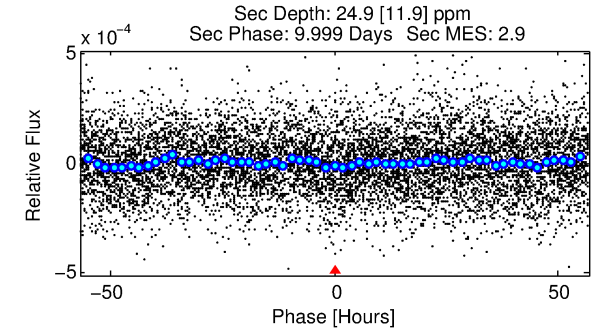
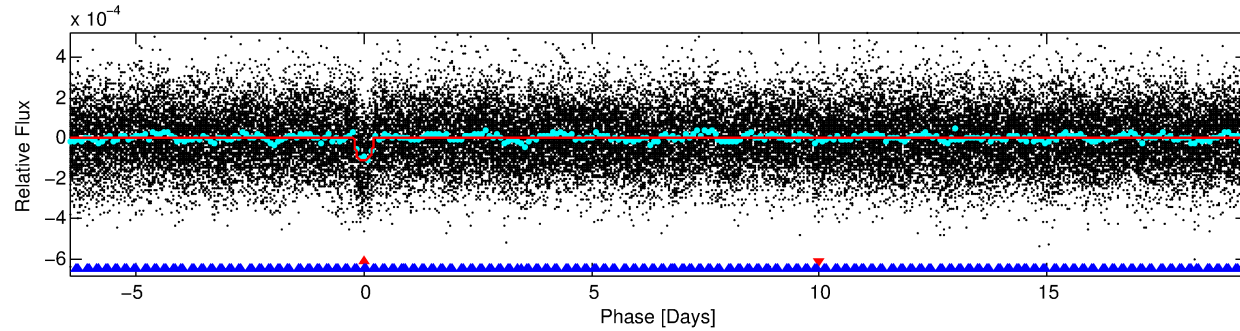
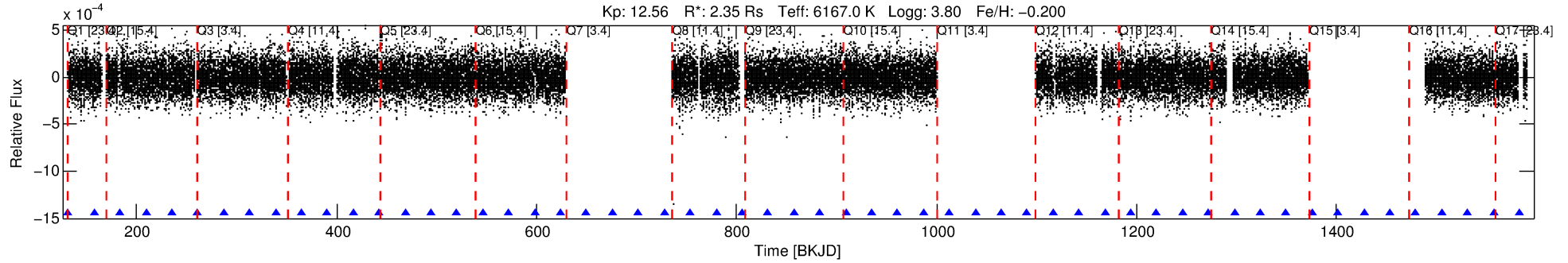
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010163067-01

No Significant Match Found

DV One-Page Summary

KIC: 10163067 Candidate: 1 of 2 Period: 25.915 d
KOI: K07291.01 Corr: 0.971



DV Fit Results:

Period = 25.91519 [0.00024] d
Epoch = 131.7713 [0.0072] BKJD
Rp/R* = 0.0108 [0.0018]
a/R* = 12.06 [9.65]
b = 0.83 [0.30]
Seff = 206.06 [107.98]
Teq = 966 [127] K
Rp = 2.77 [1.10] Re
a = 0.1860 [0.0611] AU
Ag = 61.64 [47.59] [1.27σ]
Teffp = 4185 [620] K [5.08σ]

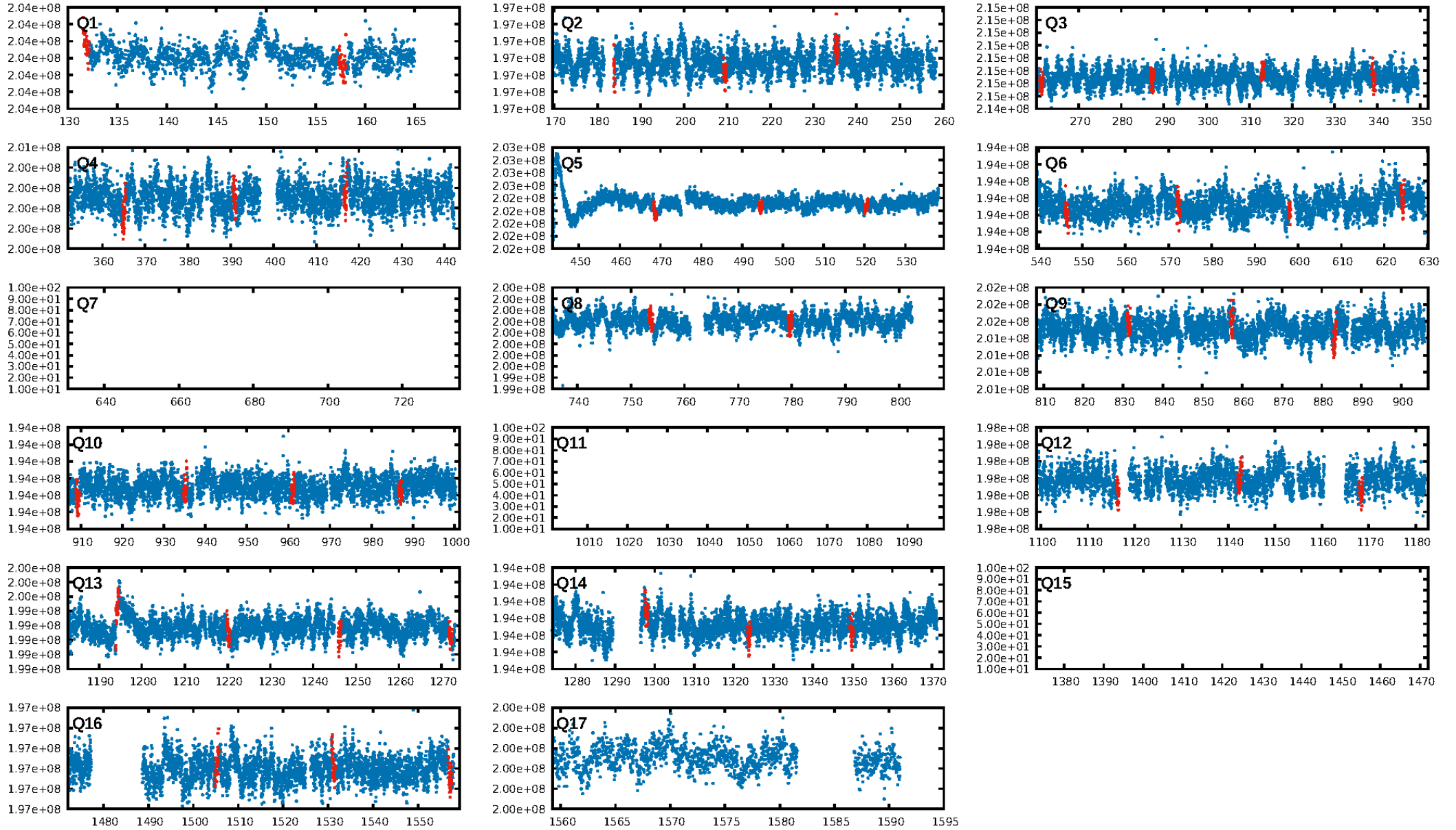
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [50.37σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 66.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.52e-20
RollingBand-fgt: 1.00 [39/39]
GhostDiagnostic-chr: 2.612
Centroid-sig: 78.1%
Centroid-so: 0.562 arcsec [0.70σ]
OotOffset-rm: 9.013 arcsec [4.02σ]
KicOffset-rm: 8.983 arcsec [4.01σ]
OotOffset-st: 2/1/4/4 [11]
KicOffset-st: 2/1/4/4 [11]
DiffImageQuality-fgm: 0.45 [5/11]
DiffImageOverlap-fno: 1.00 [13/13]

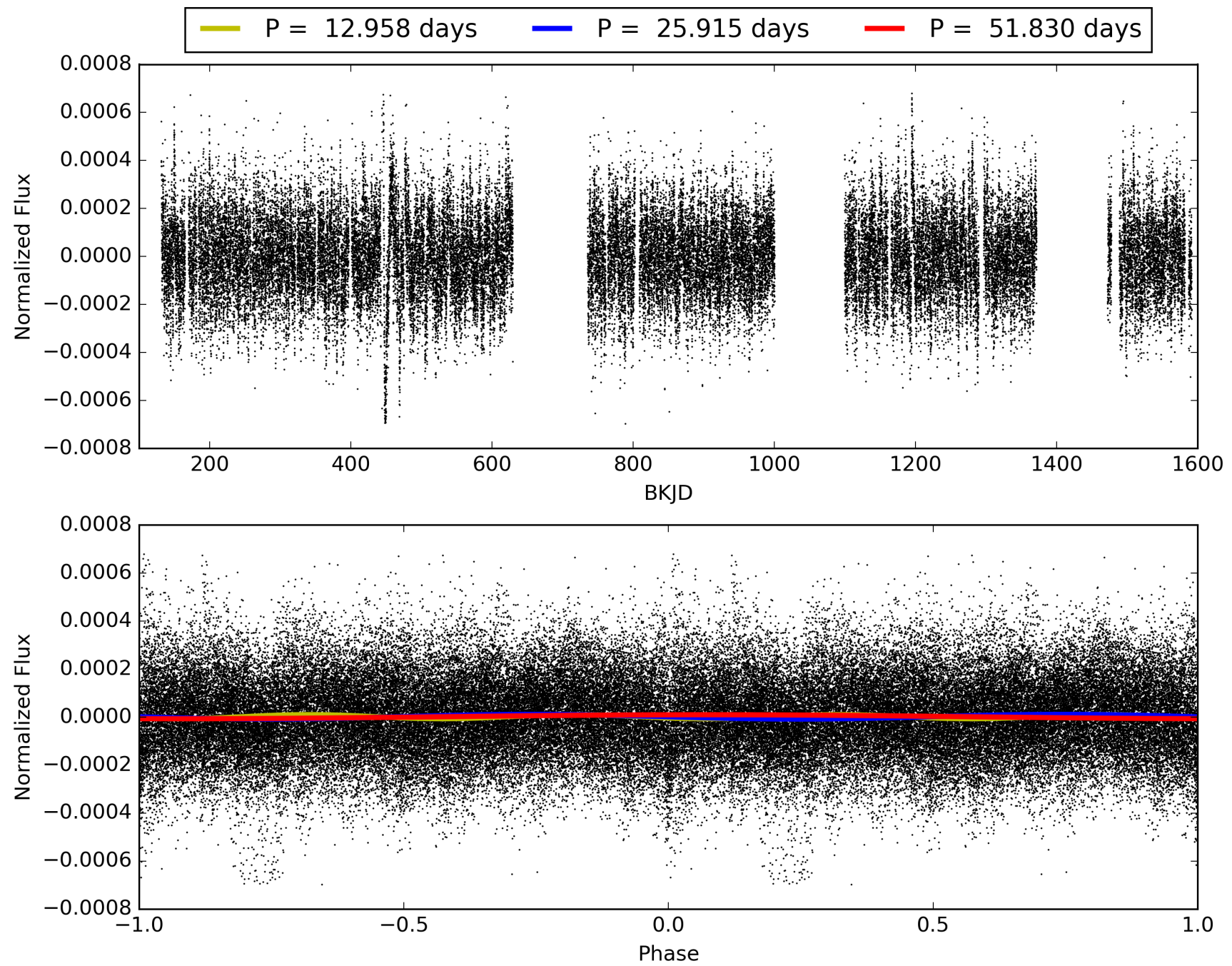
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010163067-01, PDC Light Curves

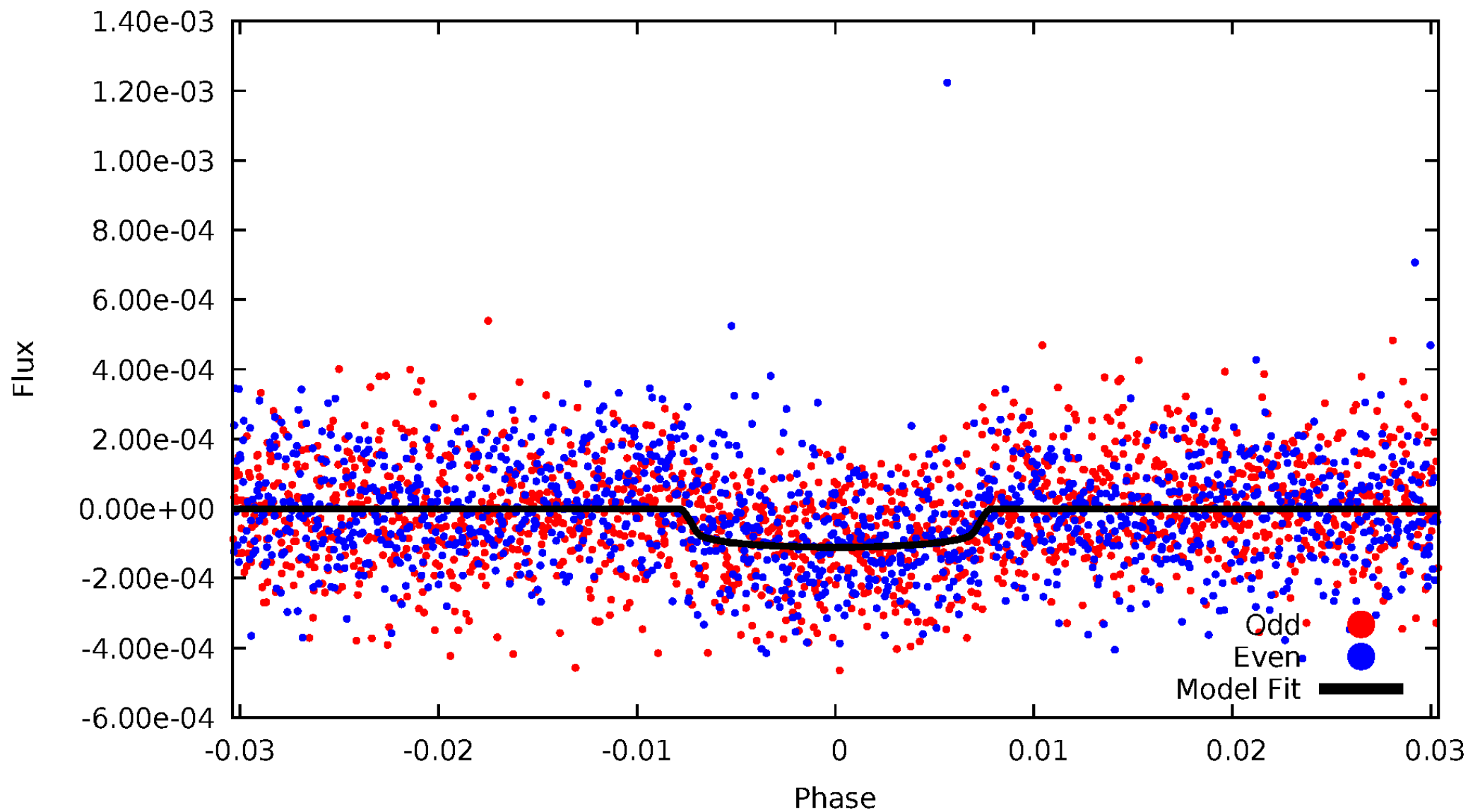


TCE 010163067-01



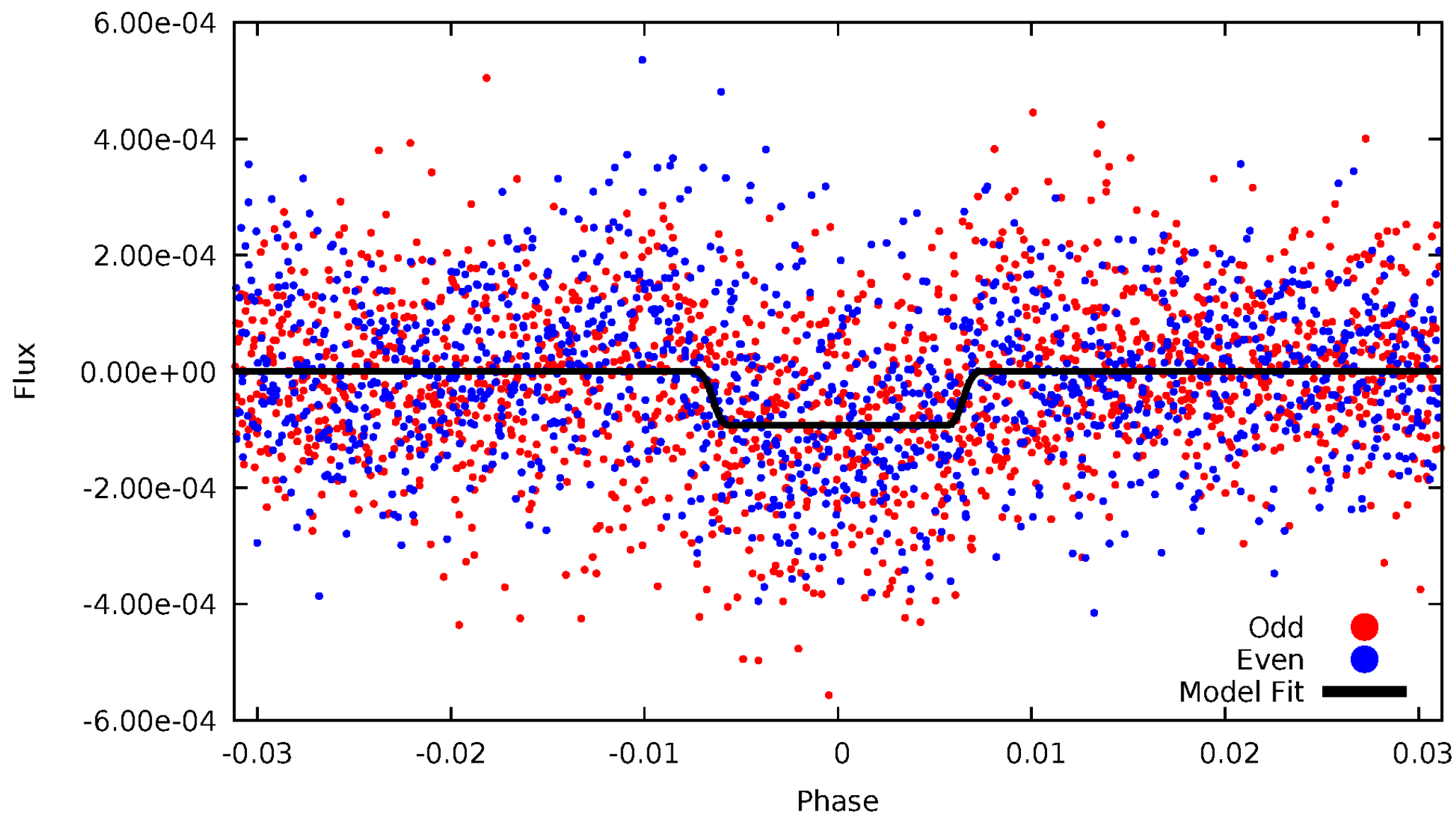
DV Odd/Even

TCE 010163067-01



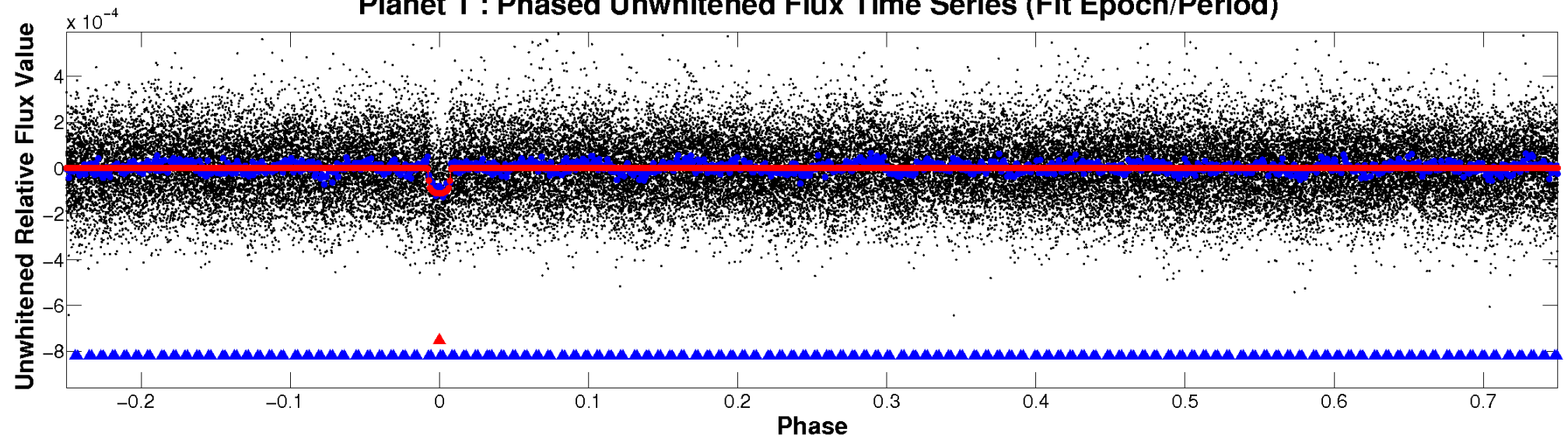
ALT Odd/Even

TCE 010163067-01

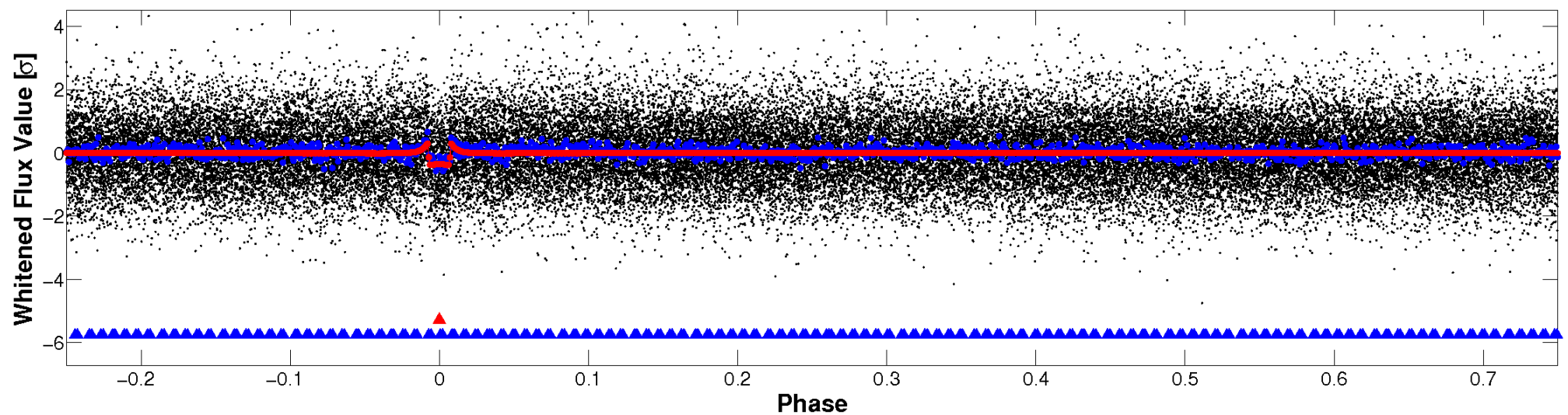


Non-Whitened Vs. Whitened Light Curve

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

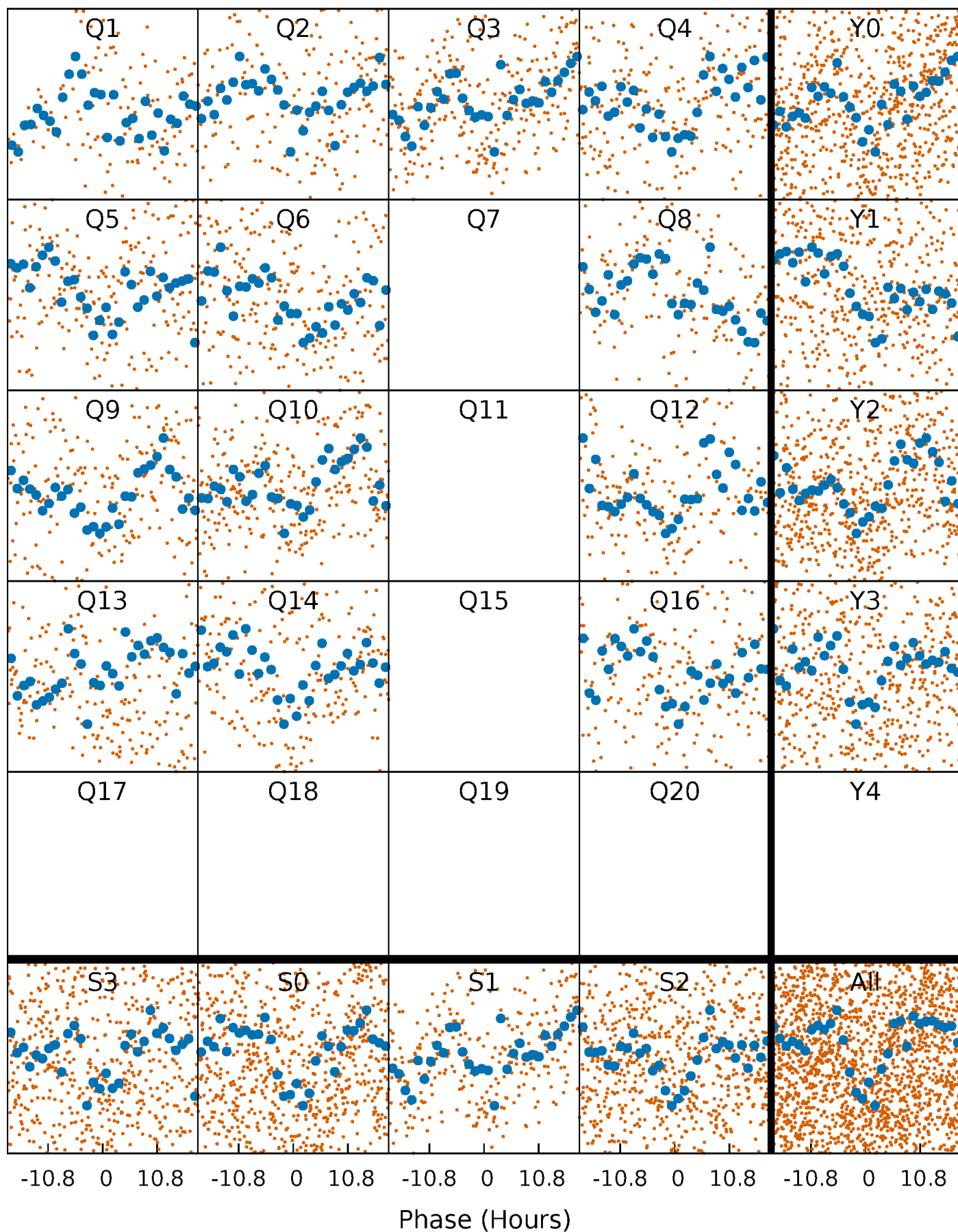


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



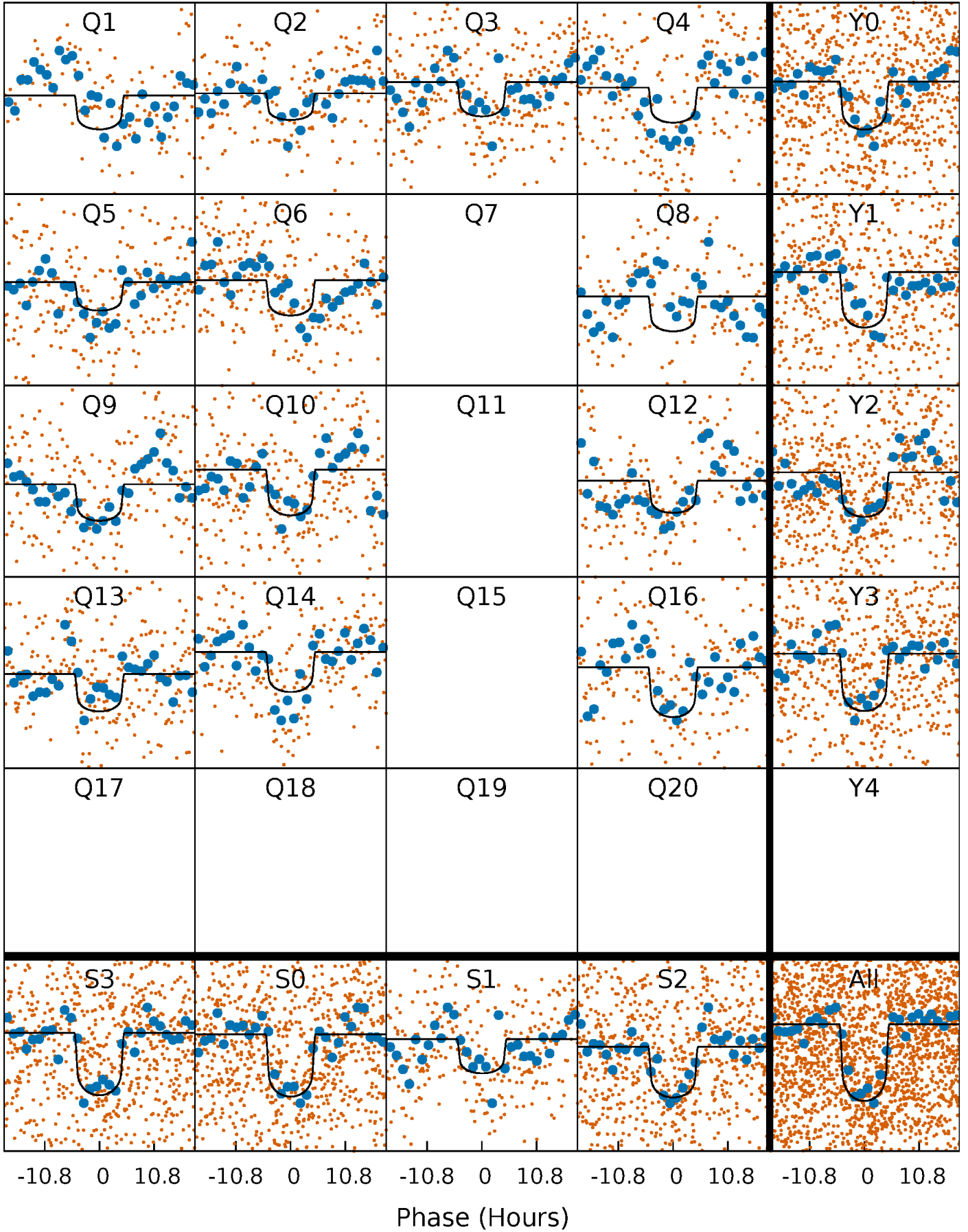
PDC Quarter-Phased Transit Curves

TCE 010163067-01 P= 25.915191 Days $T_0=131.771299$ (BKJD)



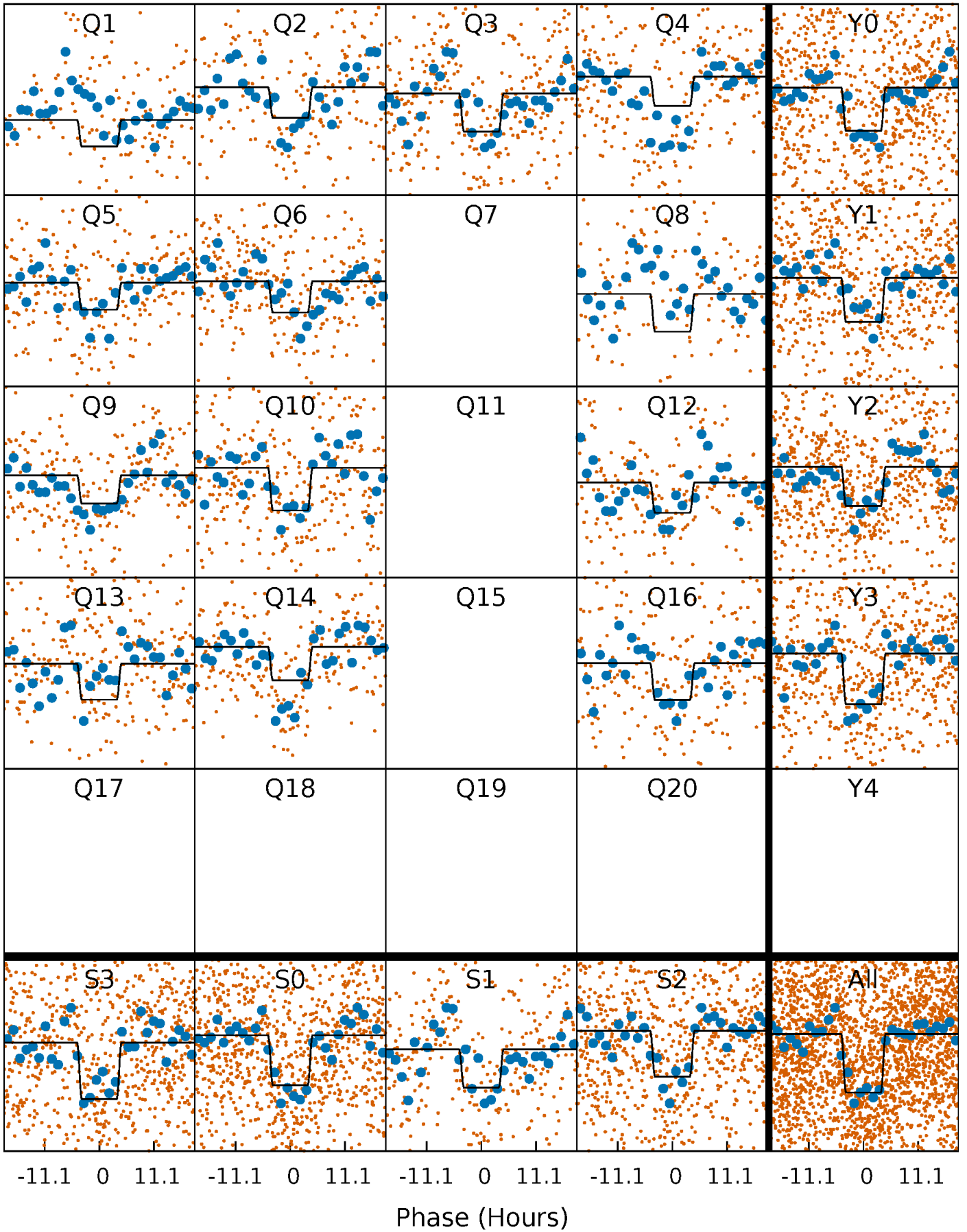
DV Quarter-Phased Transit Curves

TCE 010163067-01 P= 25.915191 Days $T_0=131.771299$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

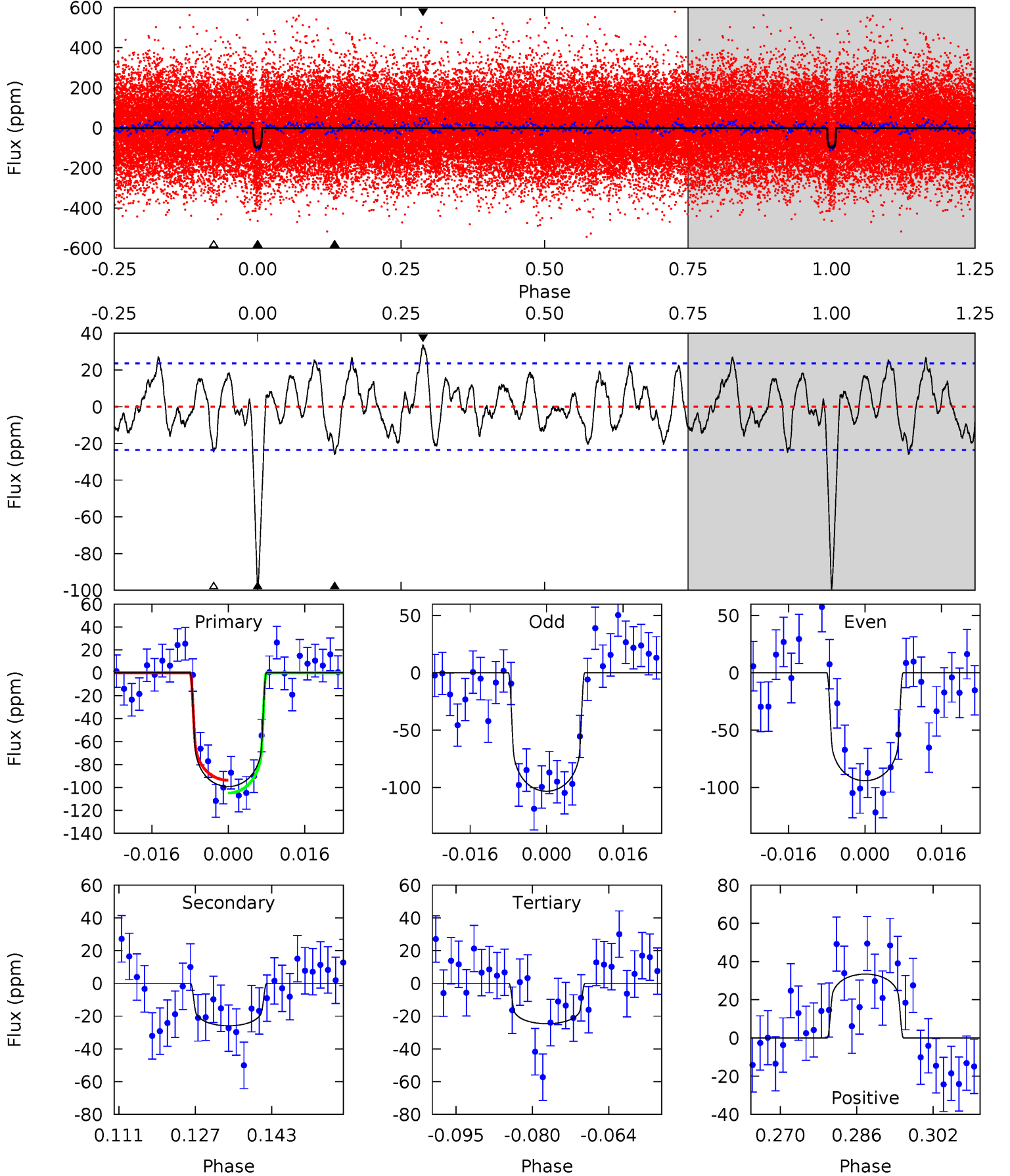
TCE 010163067-01 P= 25.914747 Days $T_0=131.794138$ (BKJD)



DV Model-Shift Uniqueness Test

010163067-01, $P = 25.915191$ Days, $E = 105.856108$ Days

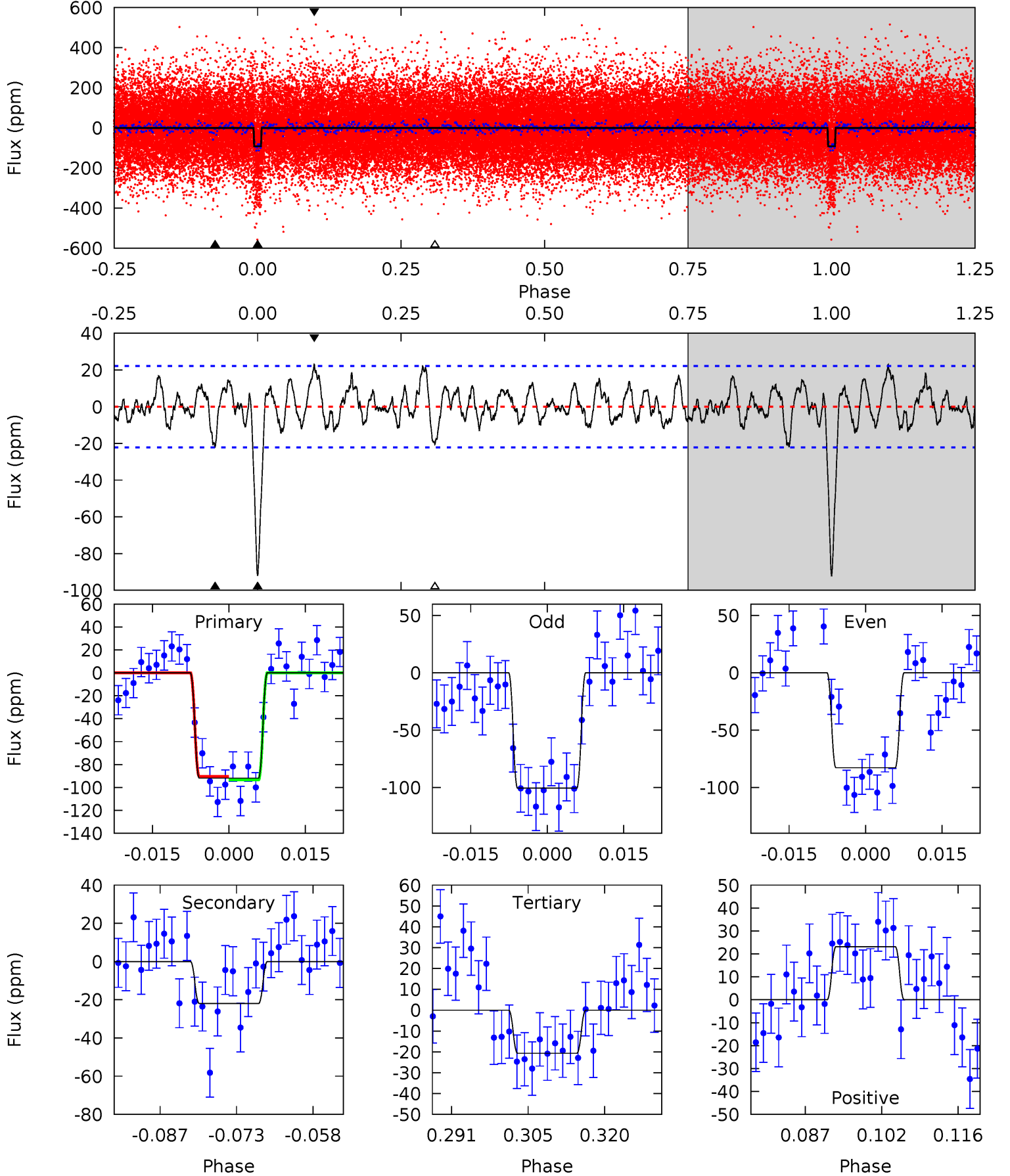
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.8	5.42	5.15	7.00	4.94	2.41	2.35	15.6	13.8	0.27	-1.58	0.95	0.94	0.25	1.18



Alt Model-Shift Uniqueness Test

010163067-01, $P = 25.914747$ Days, $E = 105.879391$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.5	4.90	4.61	5.16	4.95	2.44	1.72	15.9	15.4	0.28	-0.26	1.97	0.86	0.20	0.34



Stellar Parameters For KIC 010163067

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6167^{+189}_{-170}	$3.804^{+0.293}_{-0.098}$	$-0.200^{+0.300}_{-0.250}$	$2.346^{+0.421}_{-0.842}$	$1.279^{+0.235}_{-0.259}$	$0.140^{+0.292}_{-0.044}$
	+3%/-3%	+8%/-3%	+150%/-125%	+18%/-36%	+18%/-20%	+209%/-31%
Source	PHO1	FLK73	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 010163067-01 / KOI 7291.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-26 ± 5	$2.66^{+0.60}_{-0.55}$	1333^{+84}_{-115}	4408^{+364}_{-310}	69^{+41}_{-25}
Alt.	-22 ± 4	$2.37^{+0.62}_{-0.58}$	1335^{+74}_{-126}	4468^{+435}_{-326}	75^{+58}_{-30}

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

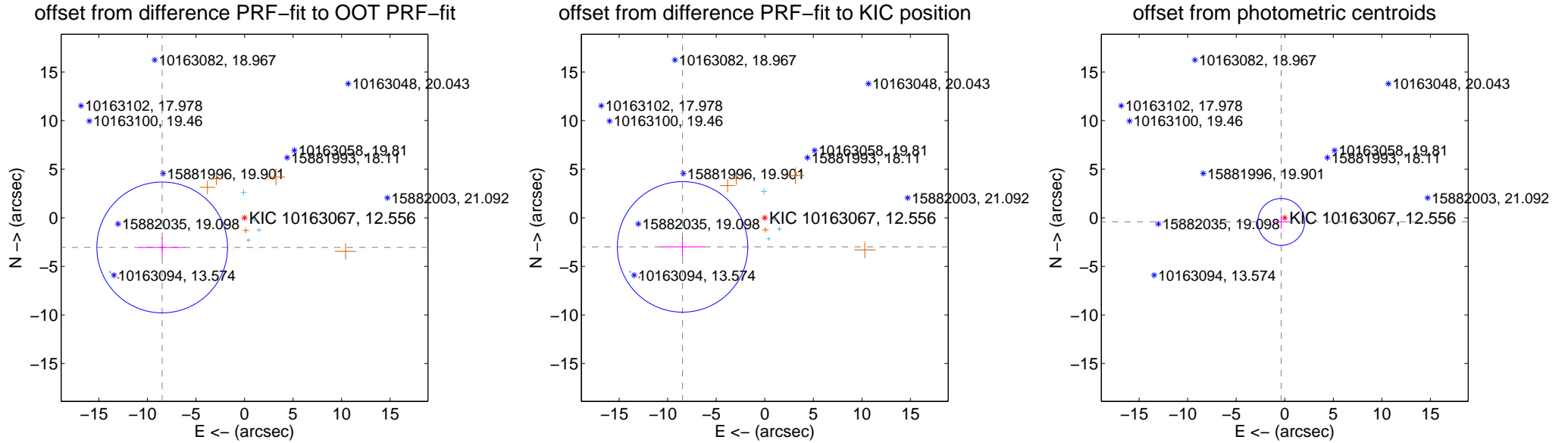
DV Centroid Data

Supplemental centroid analysis for 010163067-01. Kepler magnitude: 12.56. Transit SNR 10.32

There are 5 quarters with good PRF difference image offsets

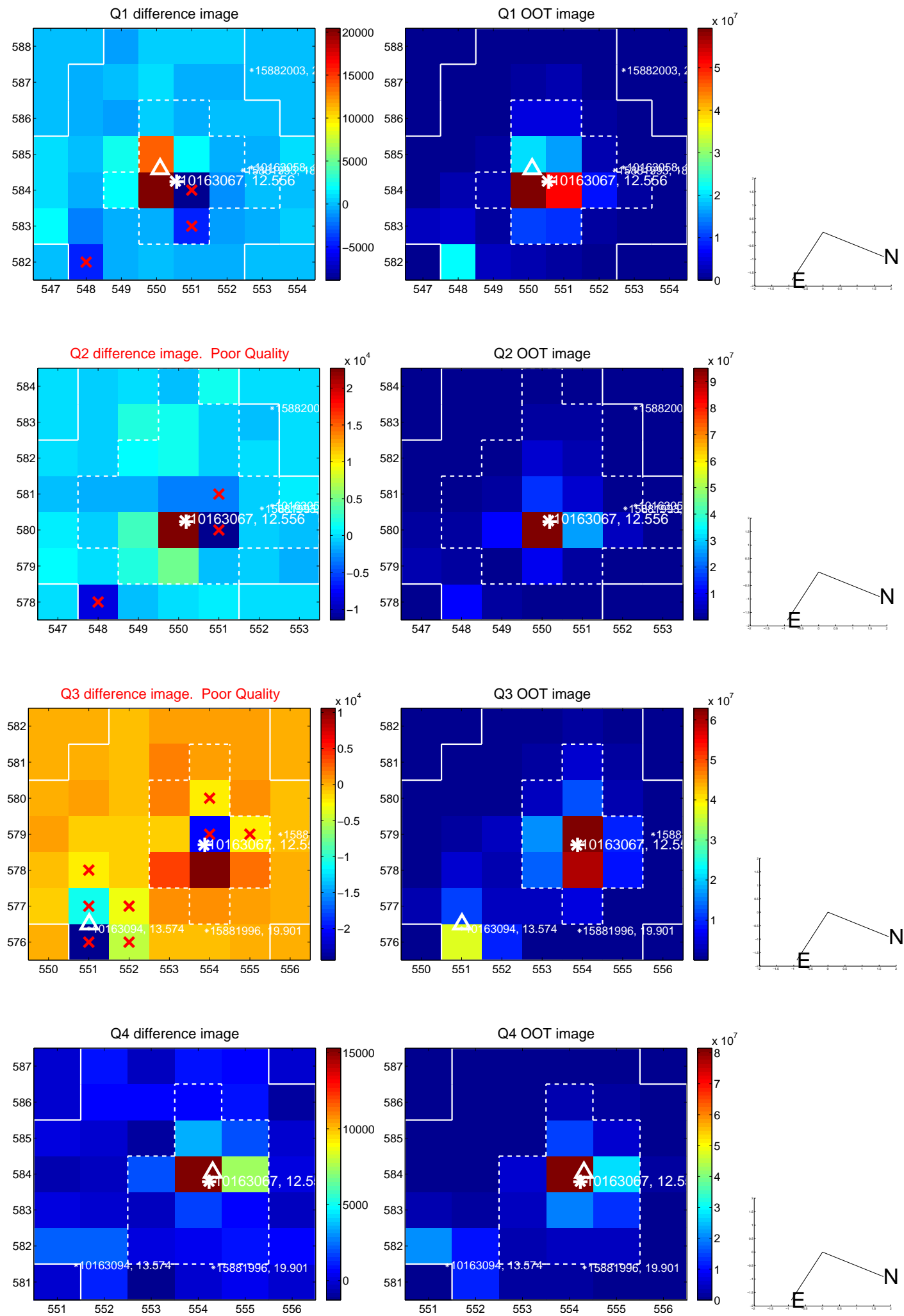
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.013 ± 2.244	4.02	8.480 ± 2.355	-3.053 ± 1.060
PRF-fit source offset from KIC position	8.983 ± 2.239	4.01	8.469 ± 2.345	-2.996 ± 1.064
photometric centroid source offset	0.56 ± 0.80	0.70	0.37 ± 0.90	-0.42 ± 0.72

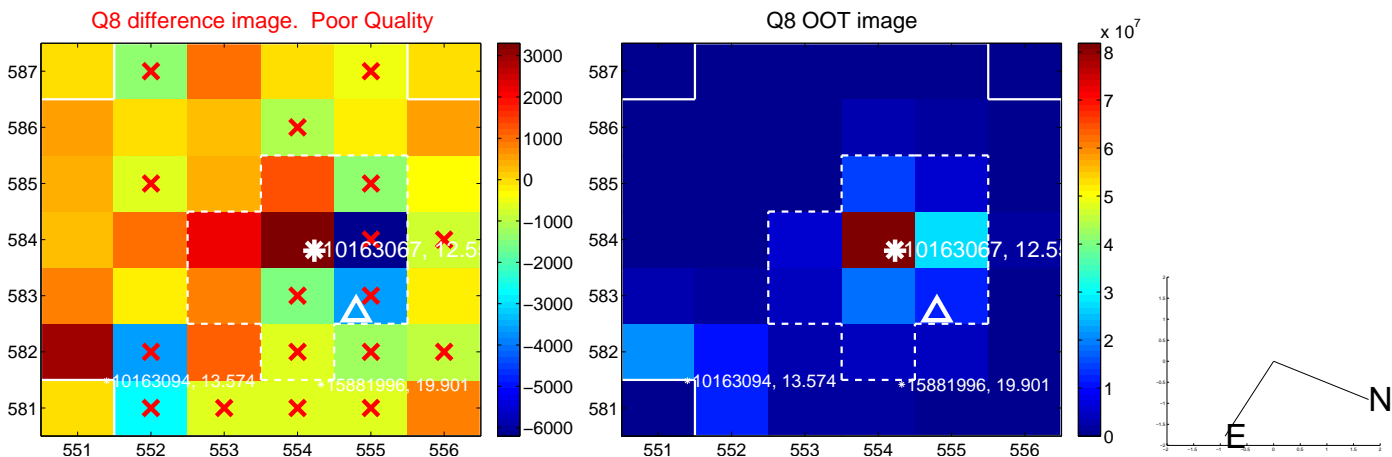
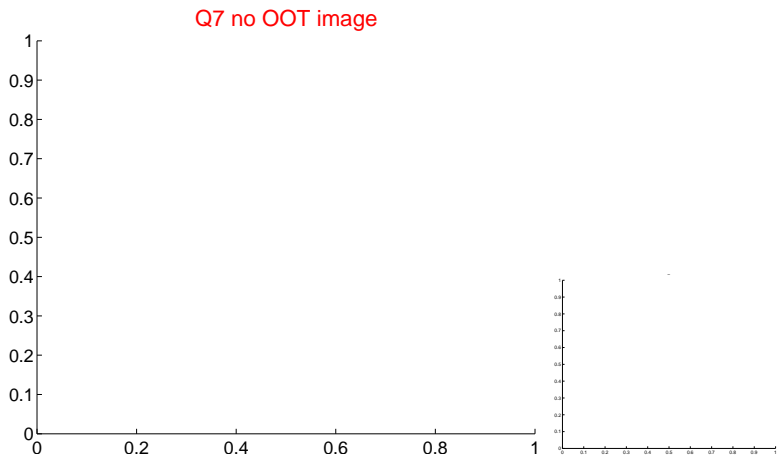
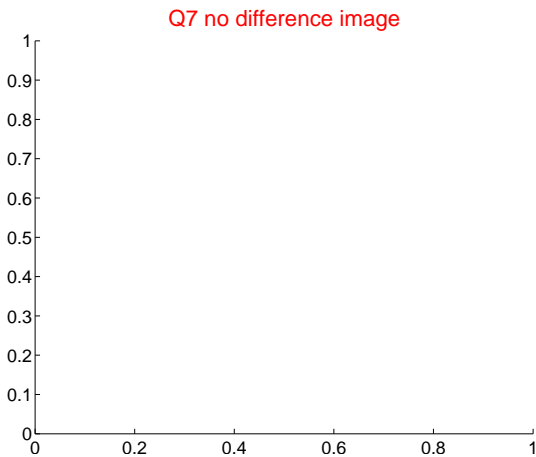
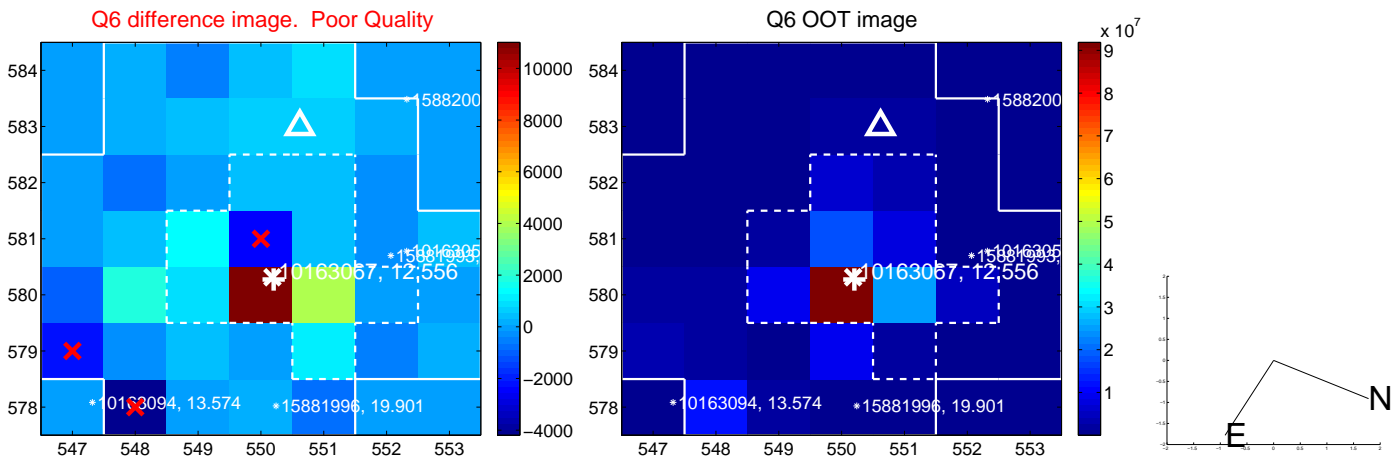
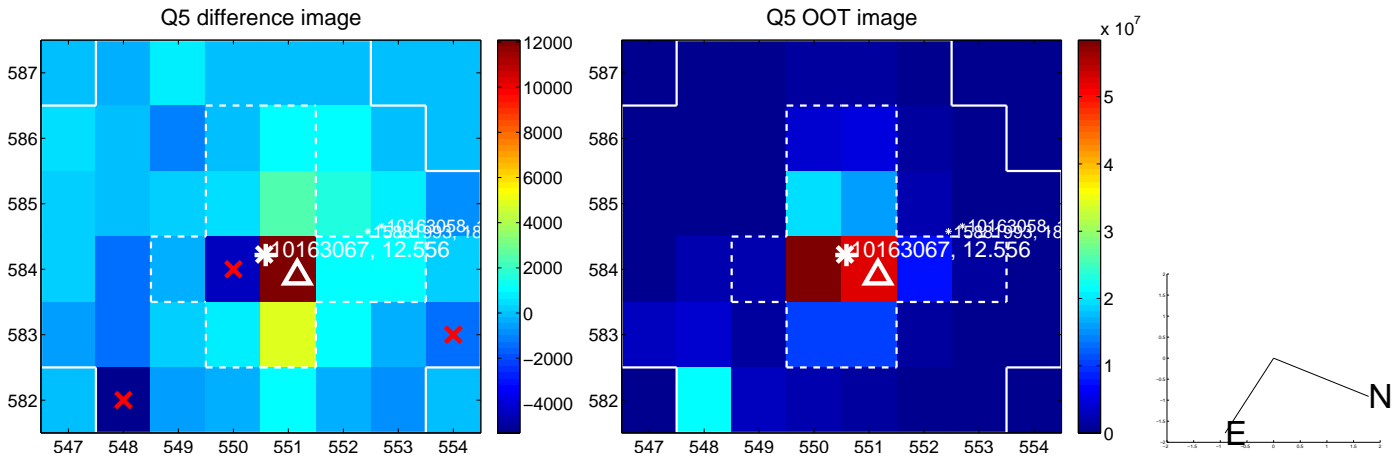


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

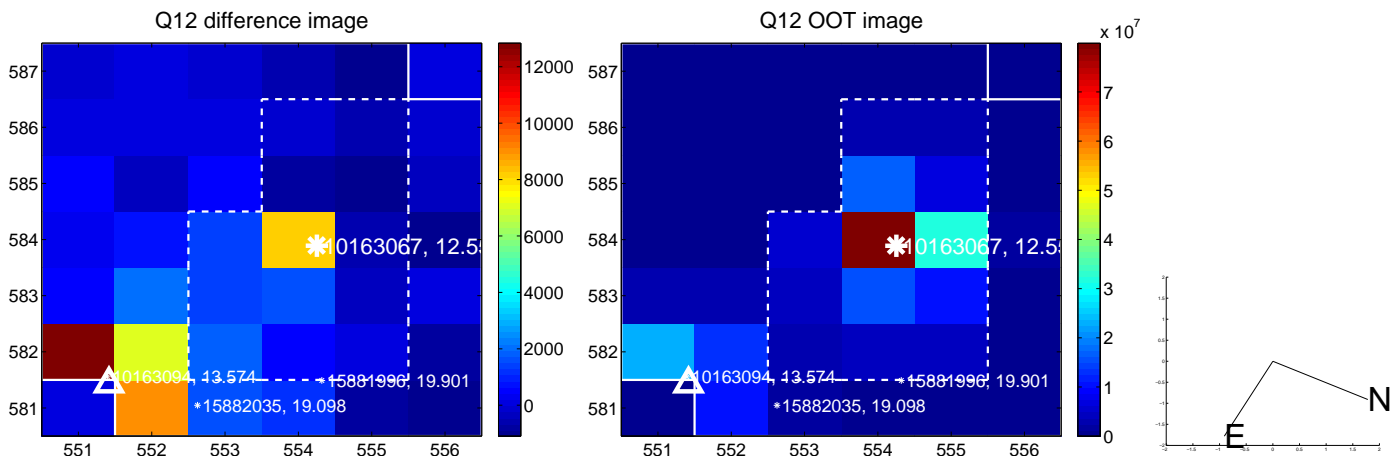
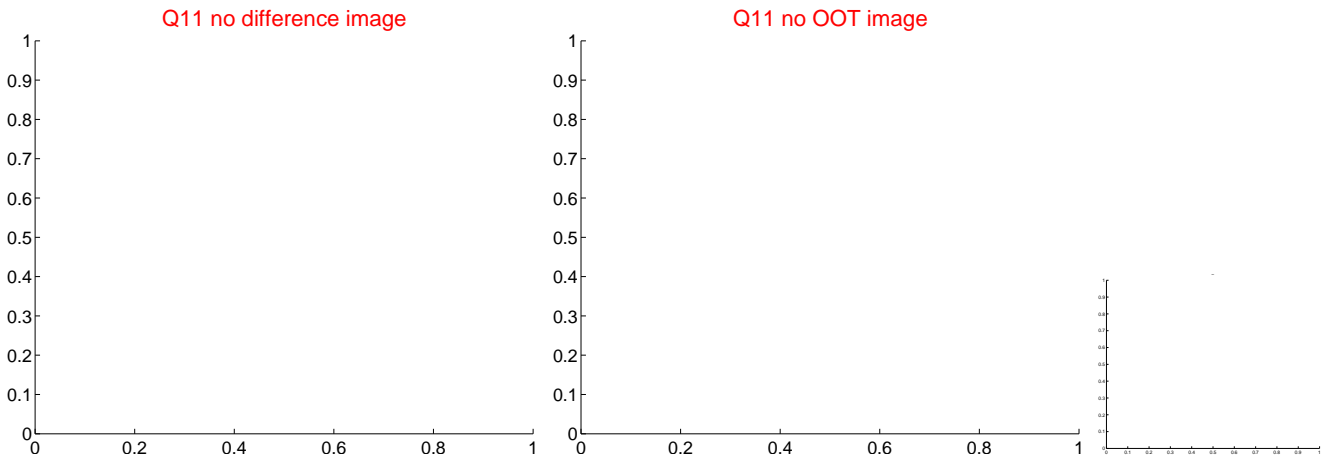
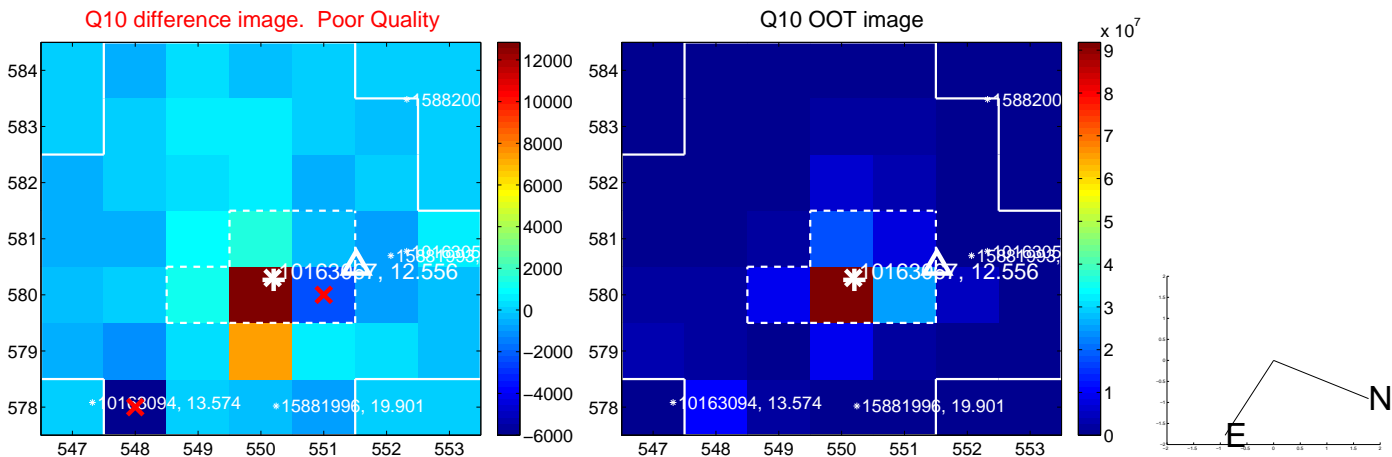
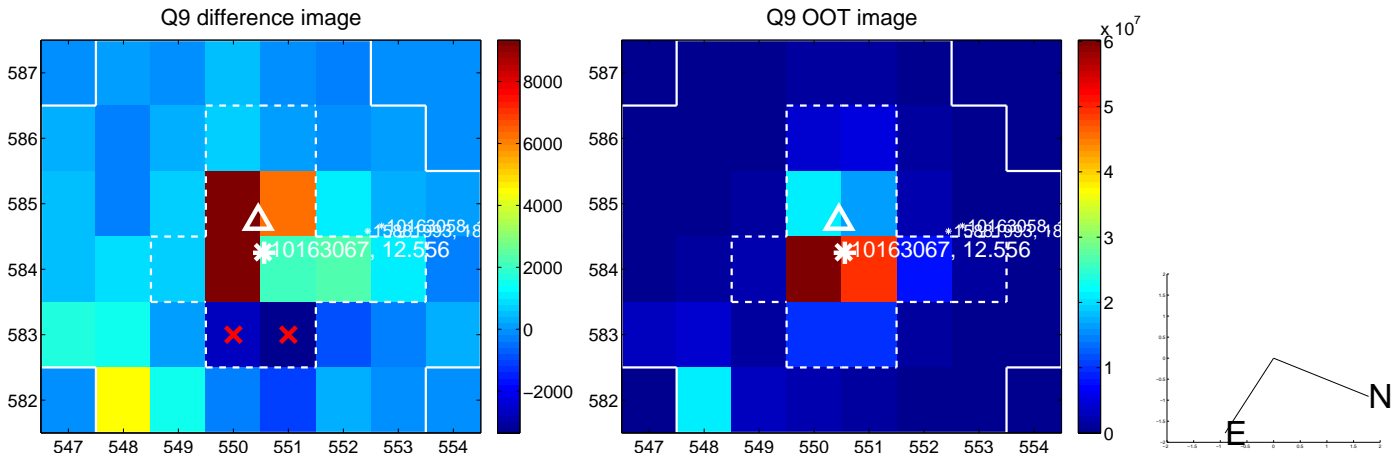
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



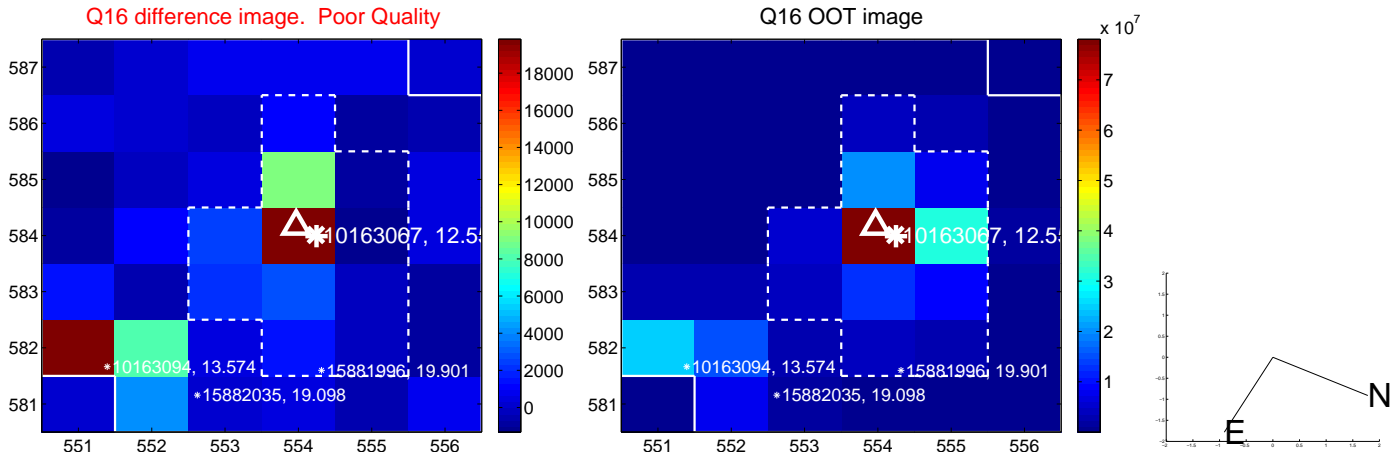
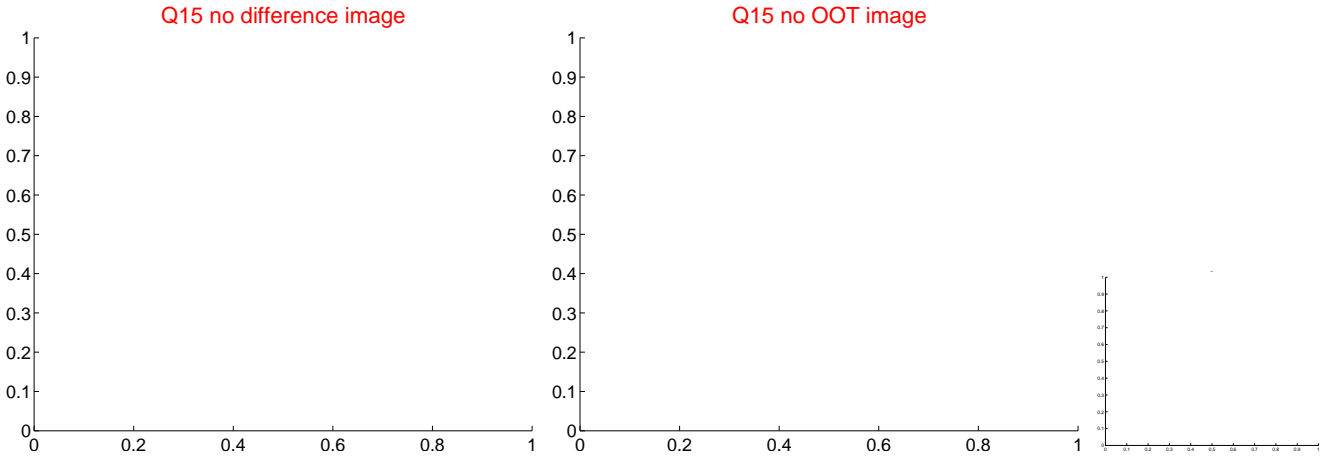
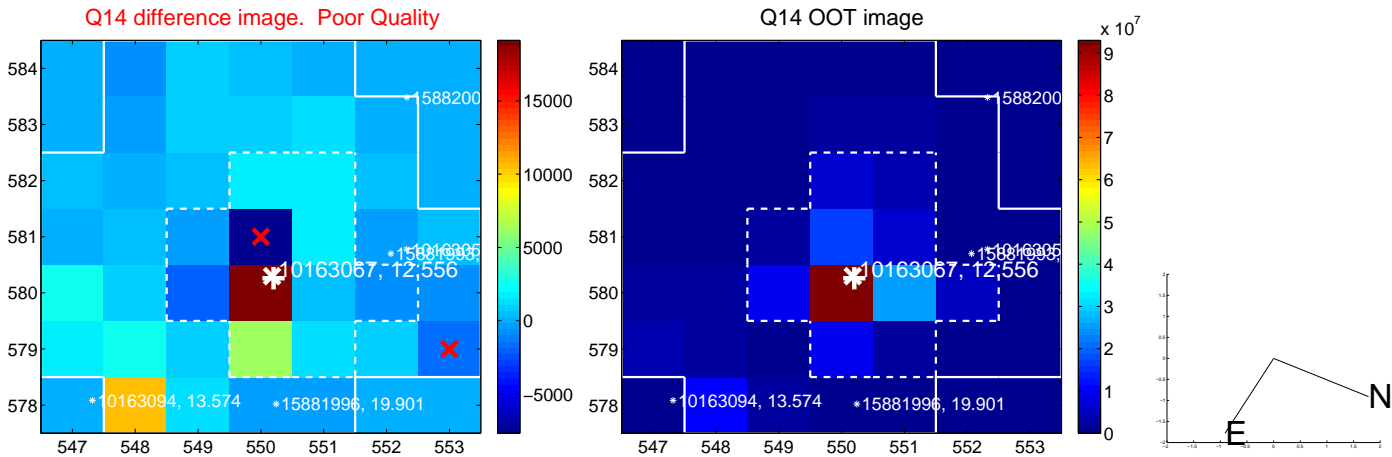
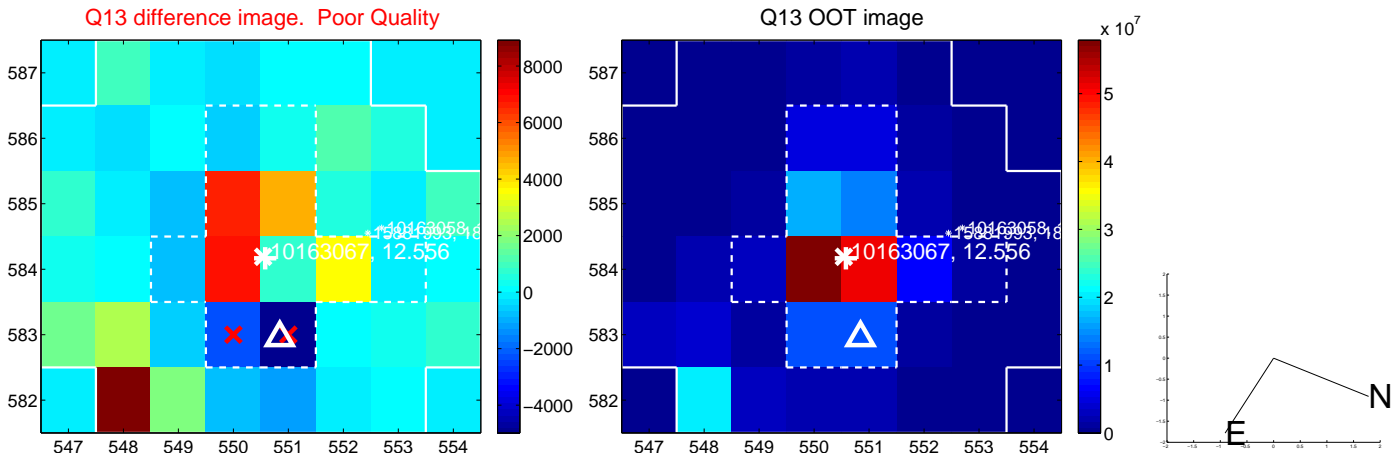
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



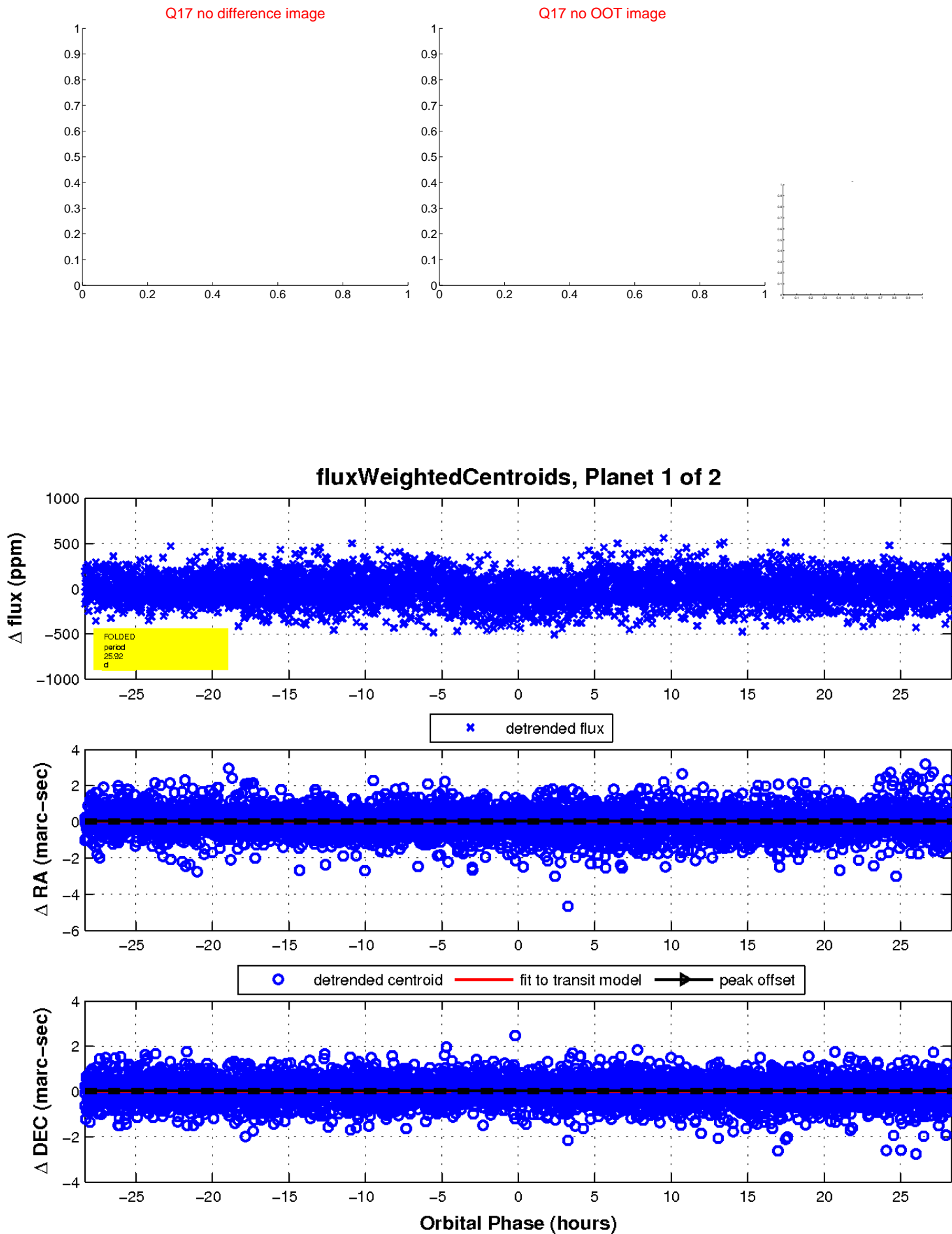
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



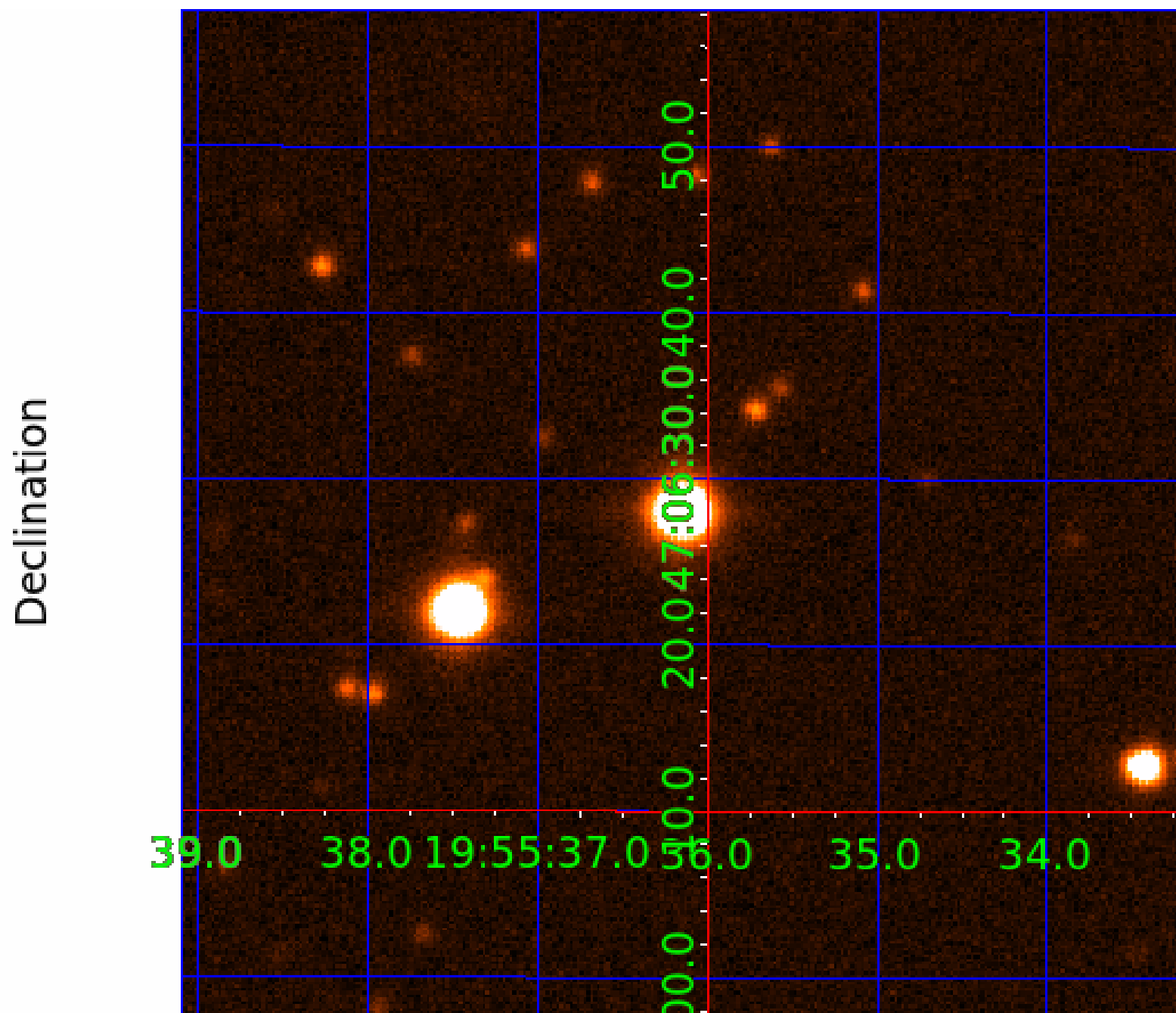
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



KIC 010163067

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})
010163067-01	OBS	7291.01	25.915191	131.771299	111.0	9.446	9.8	10.3	2.35	6167	2.77	206.06
010163067-02	OBS	No	5.899054	132.684385	15.9	1.312	7.9	2.2	2.35	6167	1.25	1482.63

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010163067-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
010163067-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

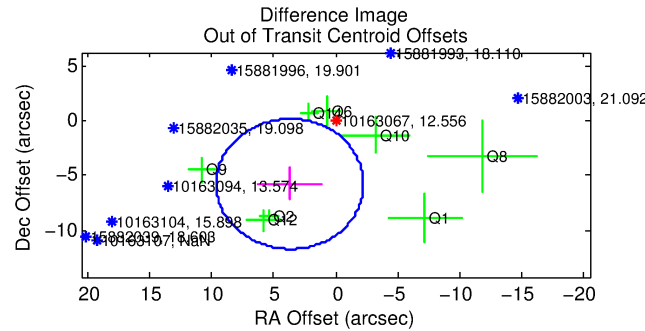
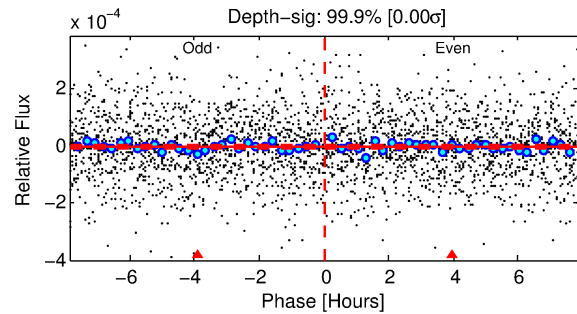
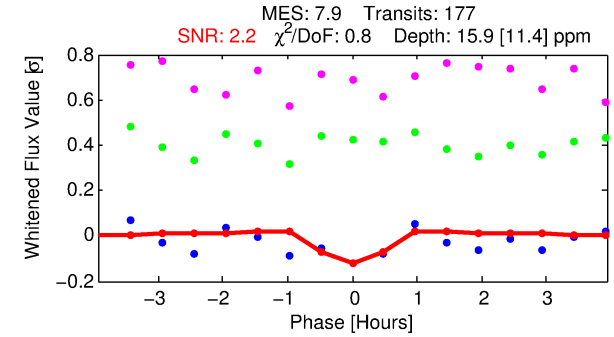
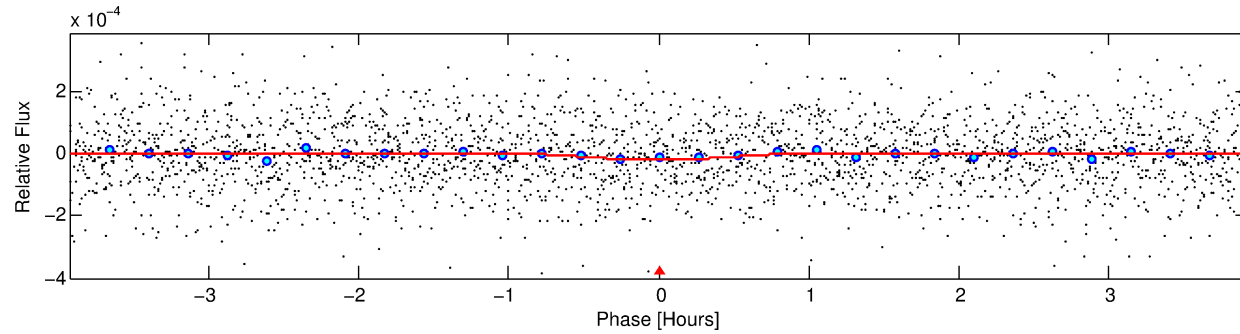
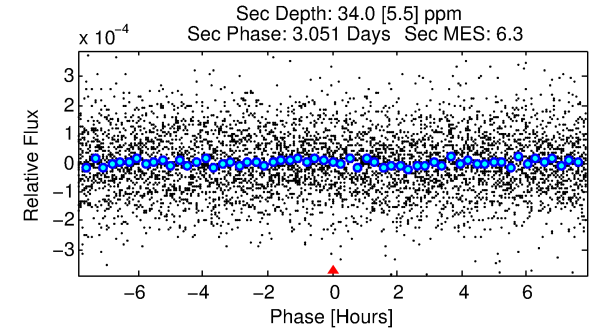
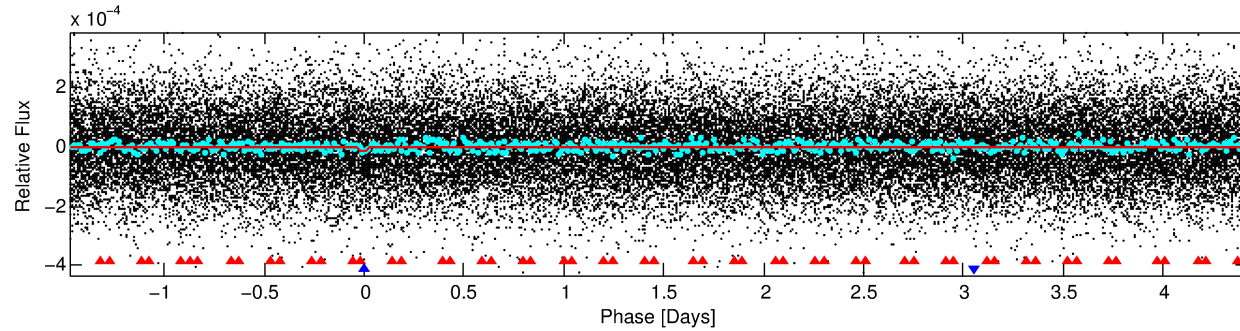
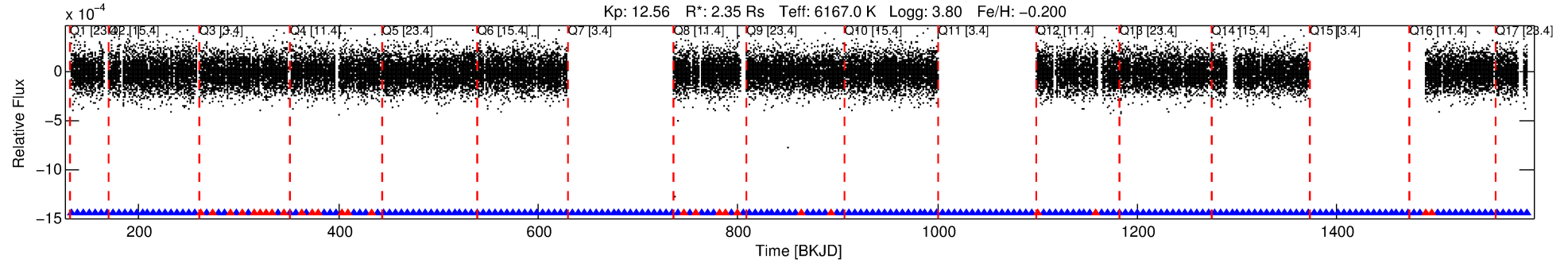
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010163067-02

No Significant Match Found

DV One-Page Summary

KIC: 10163067 Candidate: 2 of 2 Period: 5.899 d
KOI: K07291 Corr: No Ephemeris Match



DV Fit Results:

Period = 5.89905 [0.00011] d
Epoch = 132.6844 [0.0124] BKJD
Rp/R* = 0.0049 [0.0074]
a/R* = 7.97 [73.76]
b = 0.98 [0.43]
Seff = 1482.63 [776.89]
Teq = 1582 [207] K
Rp = 1.25 [1.95] Re
a = 0.0694 [0.0228] AU
Ag = 57.97 [178.85] [0.32σ]
Teffp = 6750 [5139] K [1.00σ]

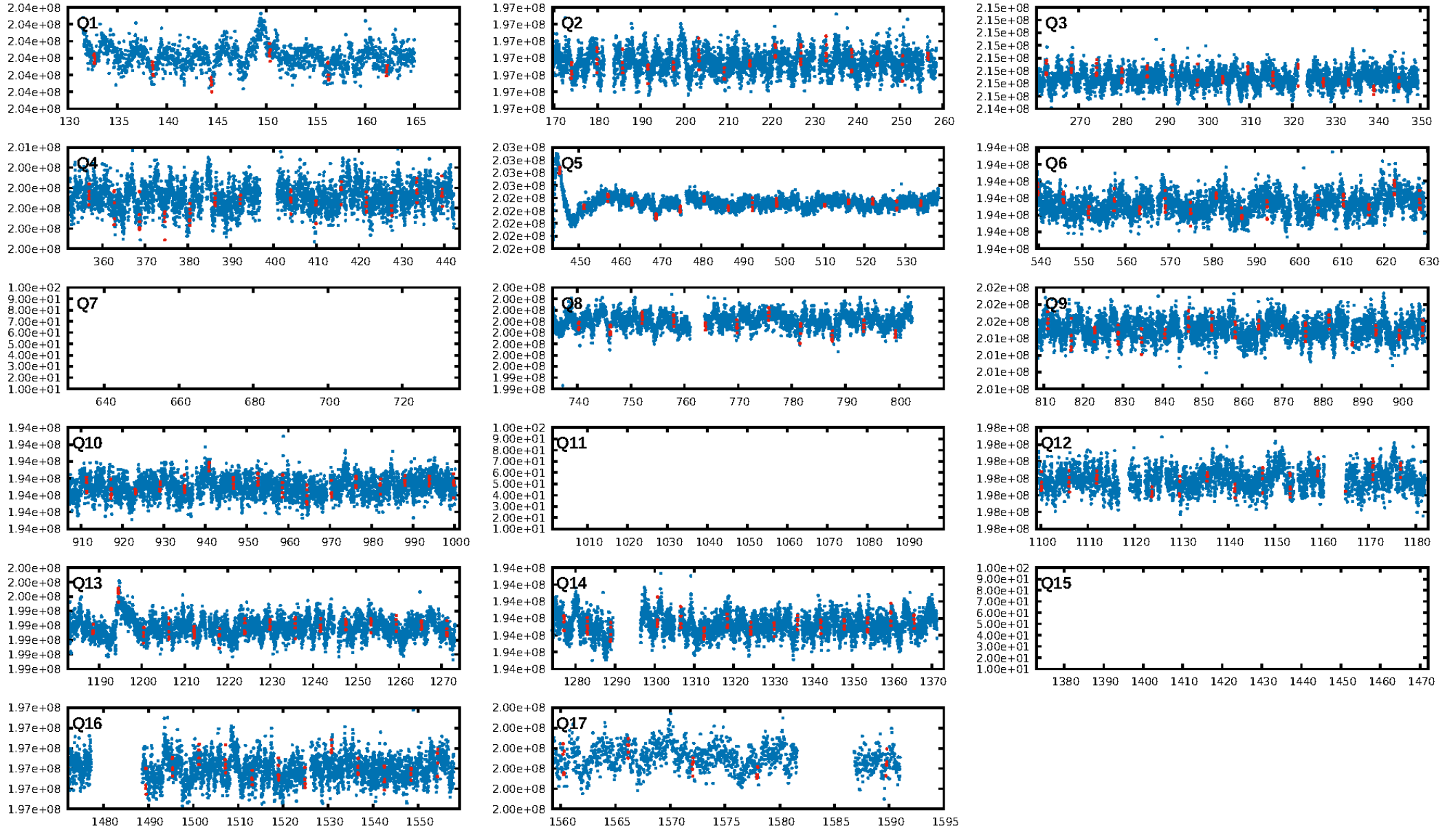
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [50.37σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.30e-13
RollingBand-fgt: 0.84 [140/166]
GhostDiagnostic-chr: -6.127
Centroid-sig: 43.3%
Centroid-so: 4.177 arcsec [0.75σ]
OotOffset-rm: 6.843 arcsec [3.46σ]
KicOffset-rm: 6.787 arcsec [3.31σ]
OotOffset-st: 4/0/2/2 [8]
KicOffset-st: 4/0/2/2 [8]
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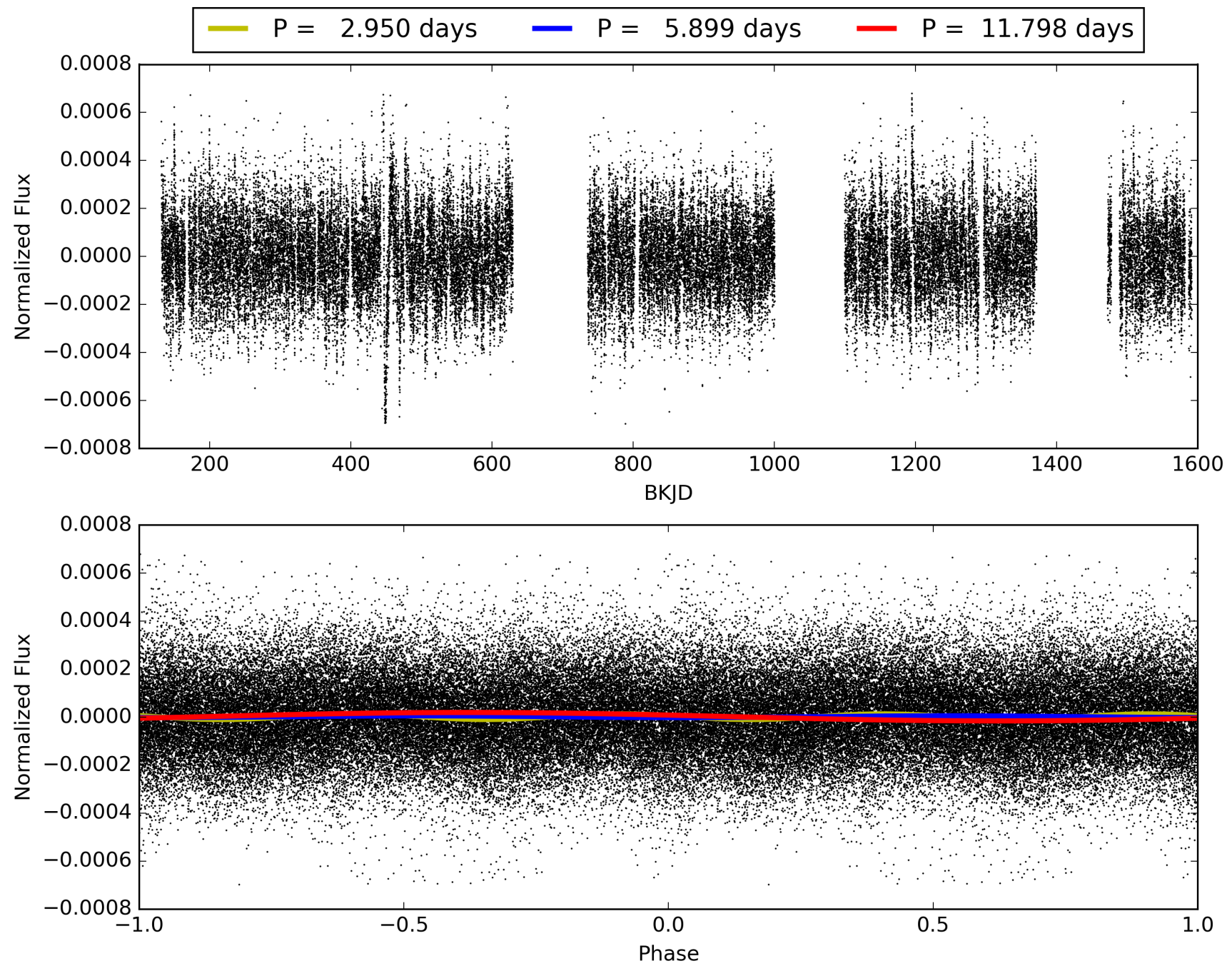
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 11:15:18 Z

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

TCE 010163067-02, PDC Light Curves

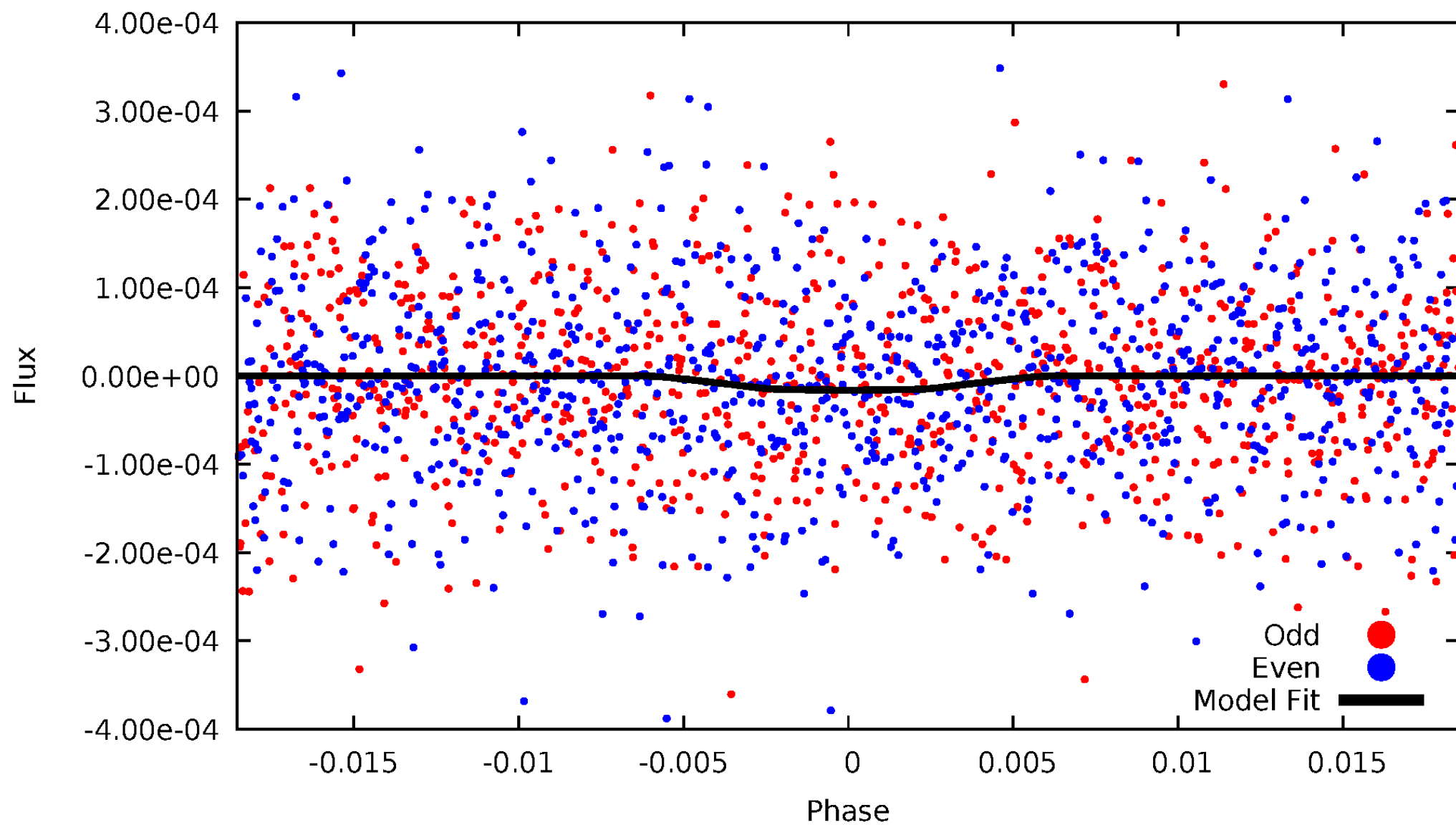


TCE 010163067-02



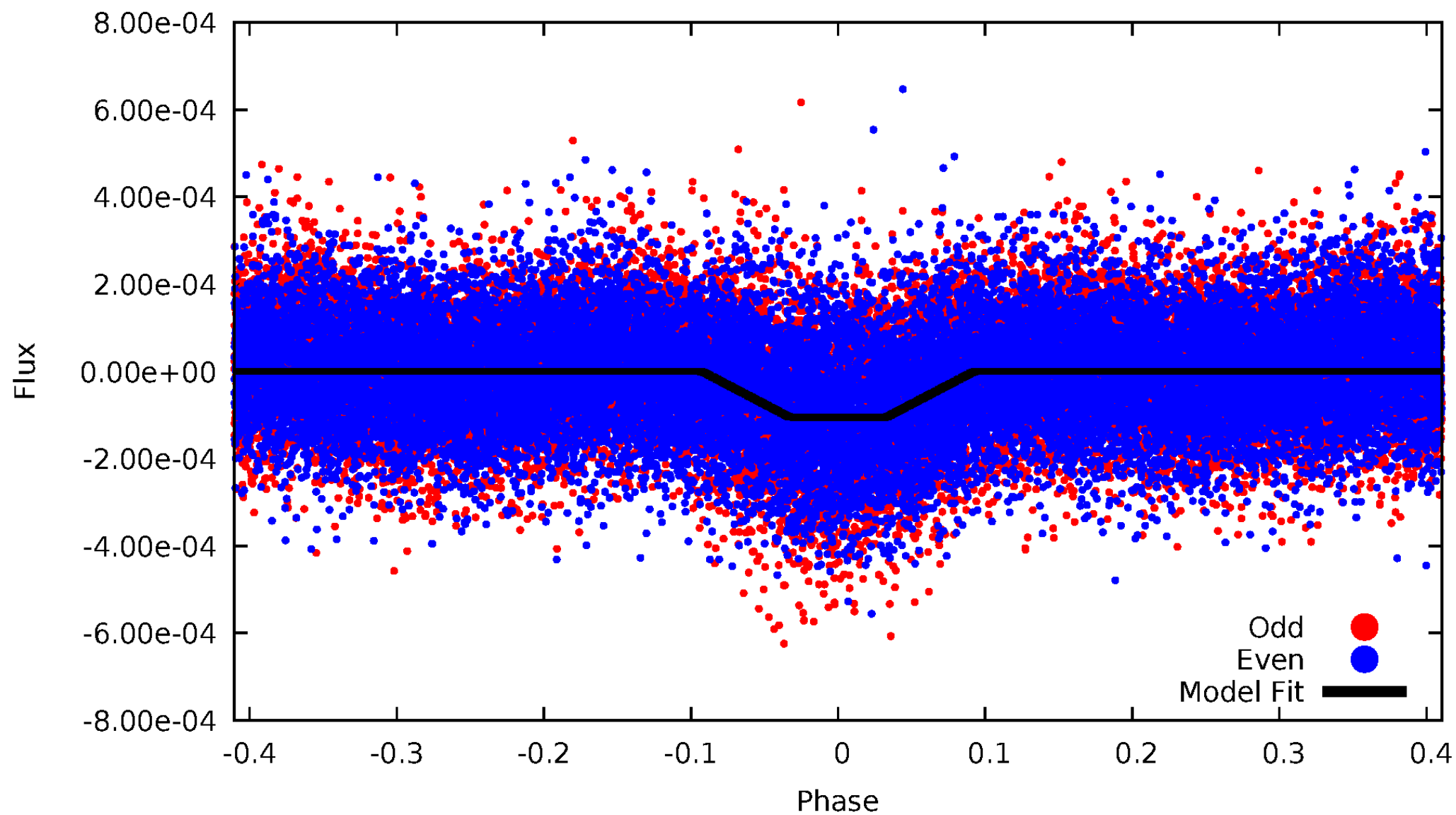
DV Odd/Even

TCE 010163067-02



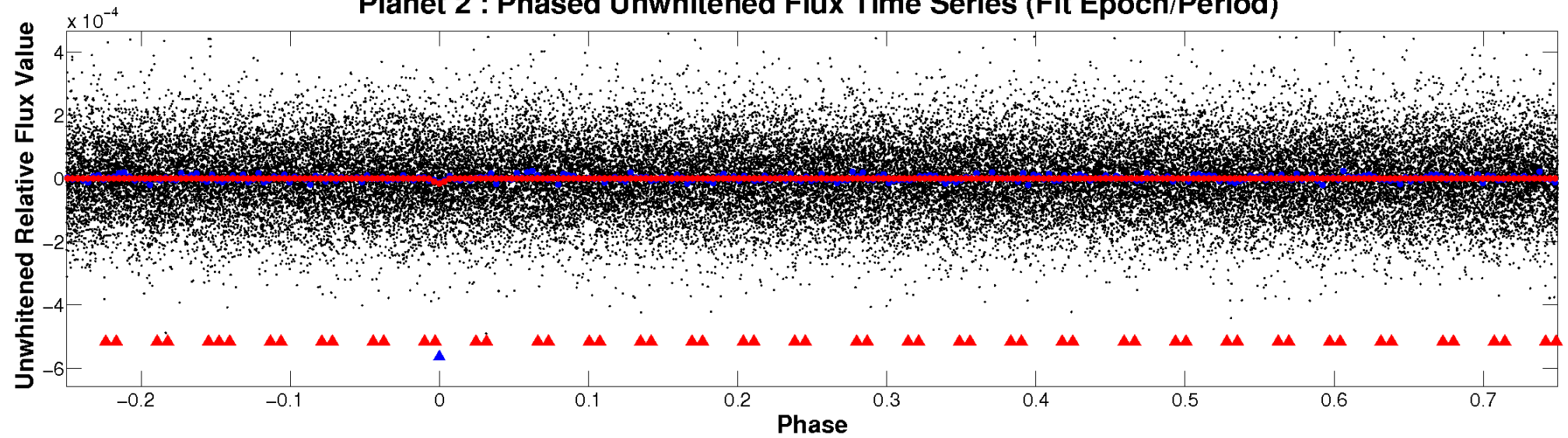
ALT Odd/Even

TCE 010163067-02

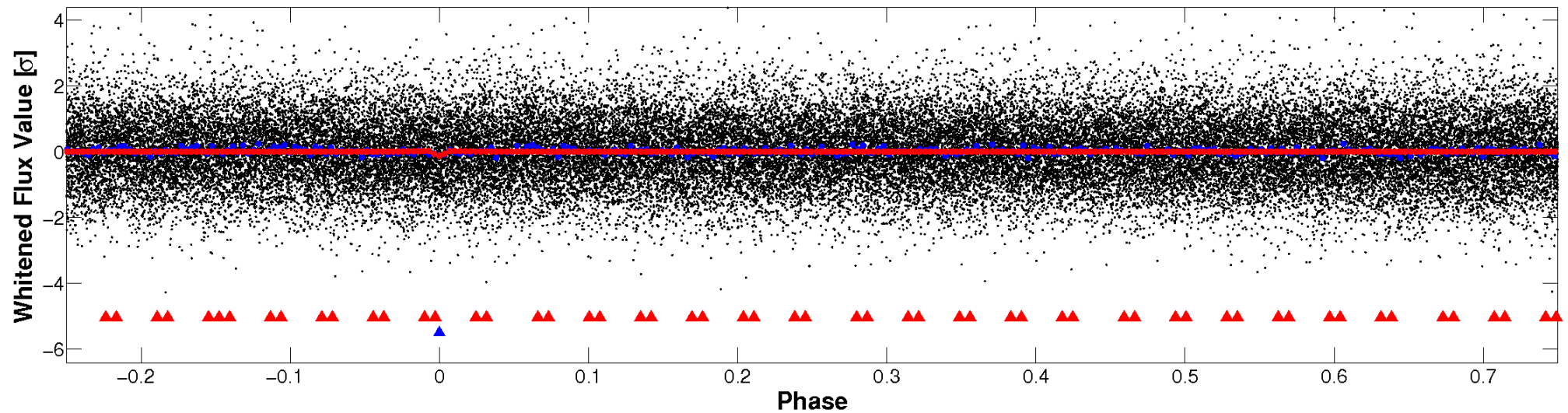


Non-Whitened Vs. Whitened Light Curve

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

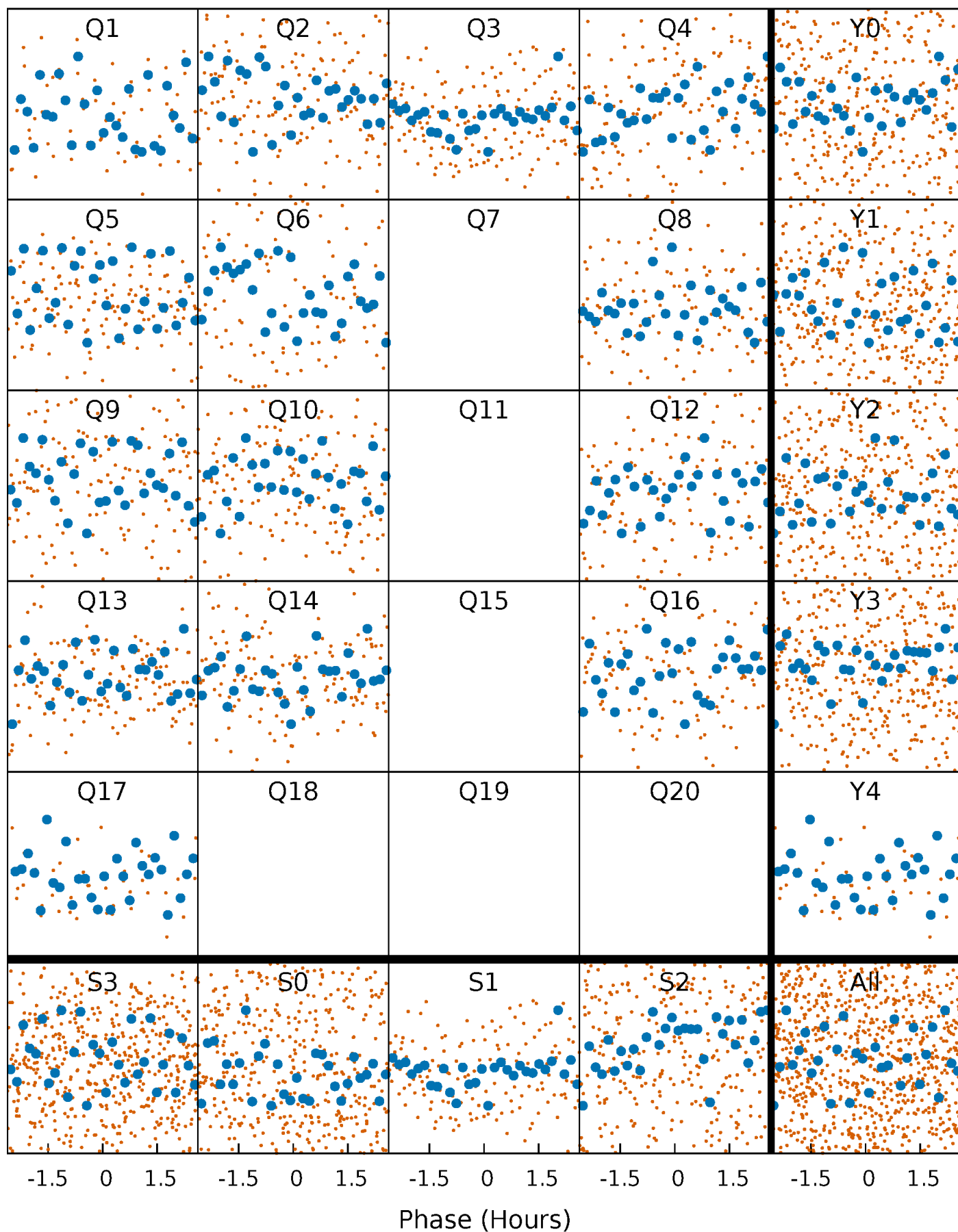


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



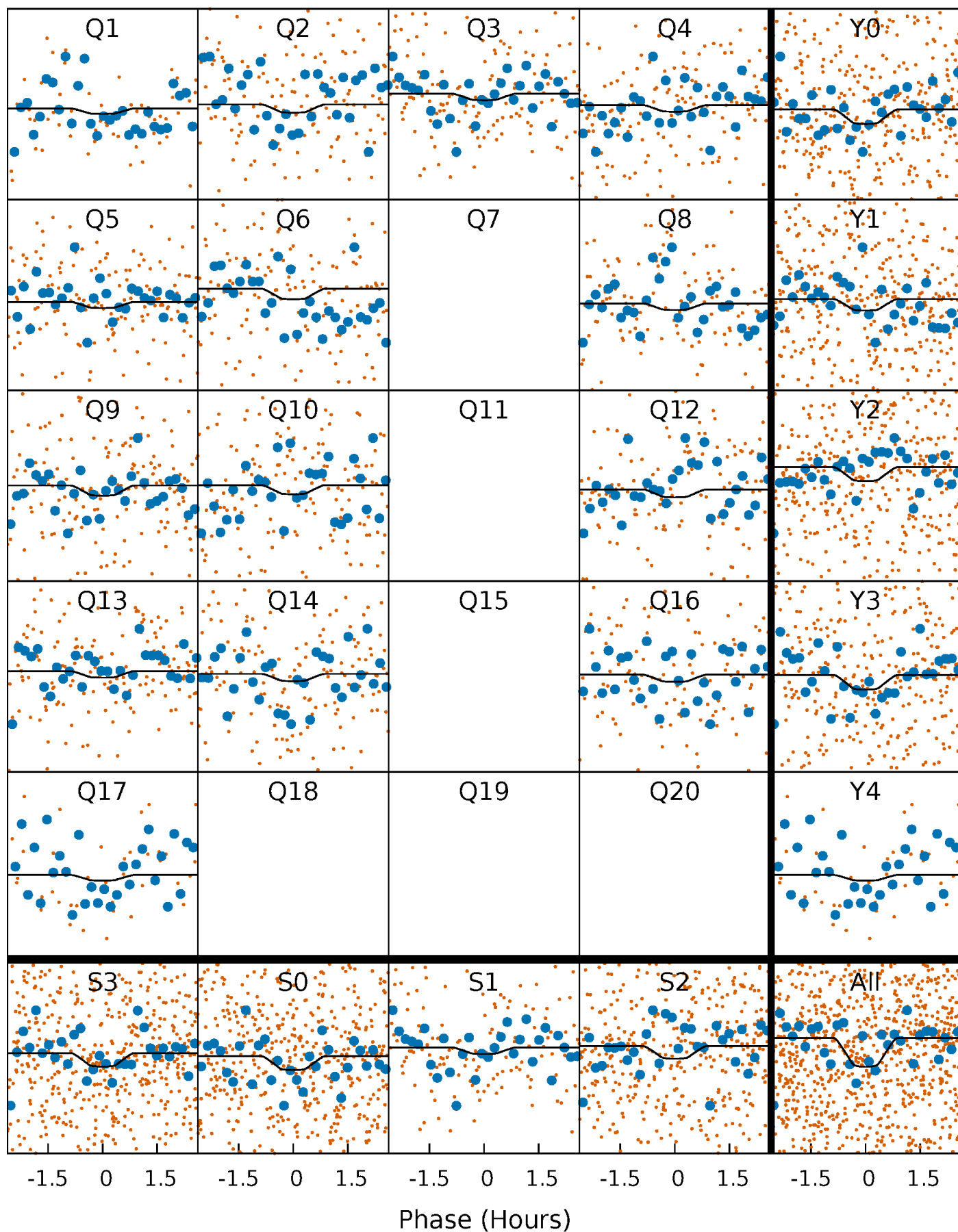
PDC Quarter-Phased Transit Curves

TCE 010163067-02 P= 5.899054 Days $T_0=132.684385$ (BKJD)



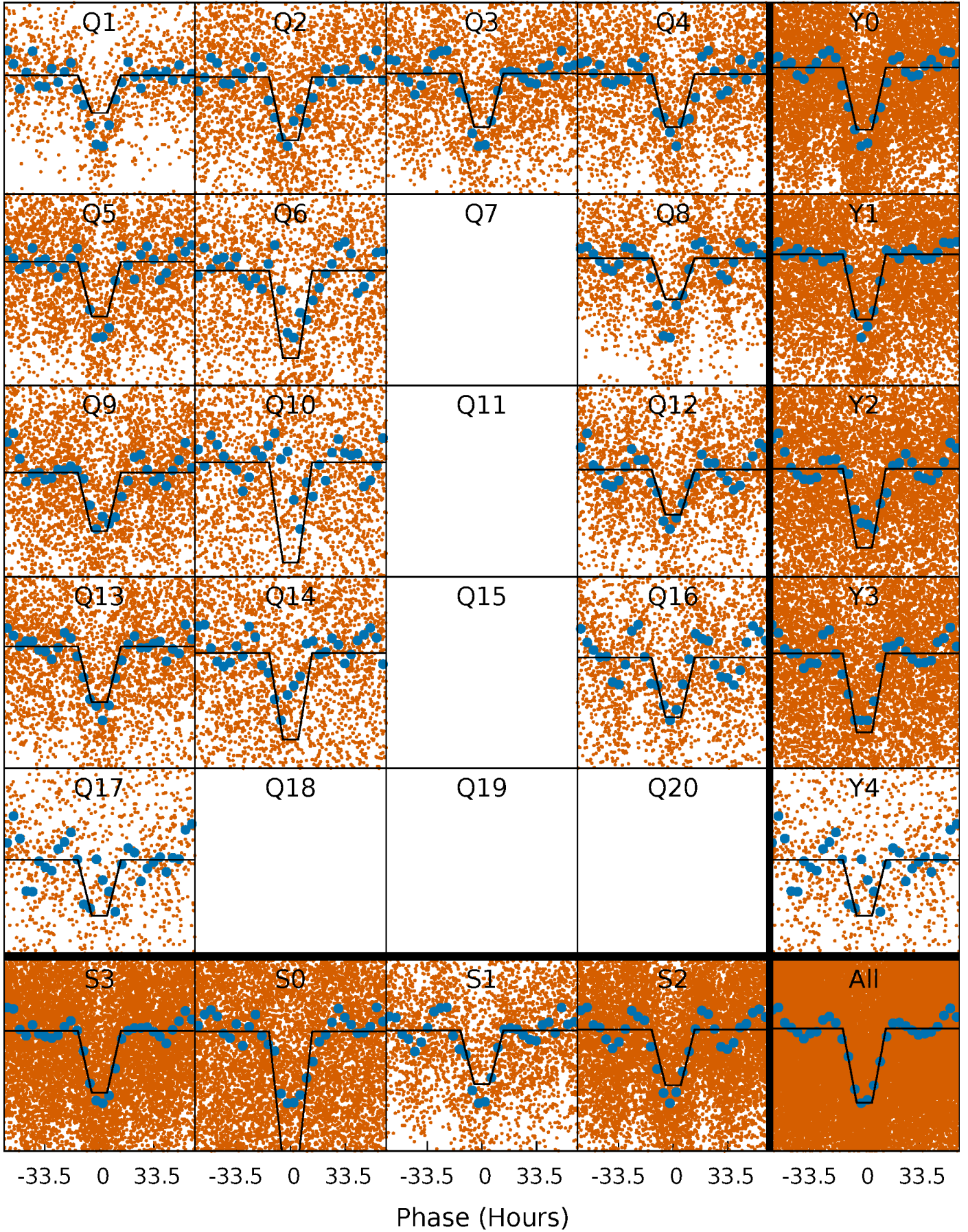
DV Quarter-Phased Transit Curves

TCE 010163067-02 P= 5.899054 Days $T_0=132.684385$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

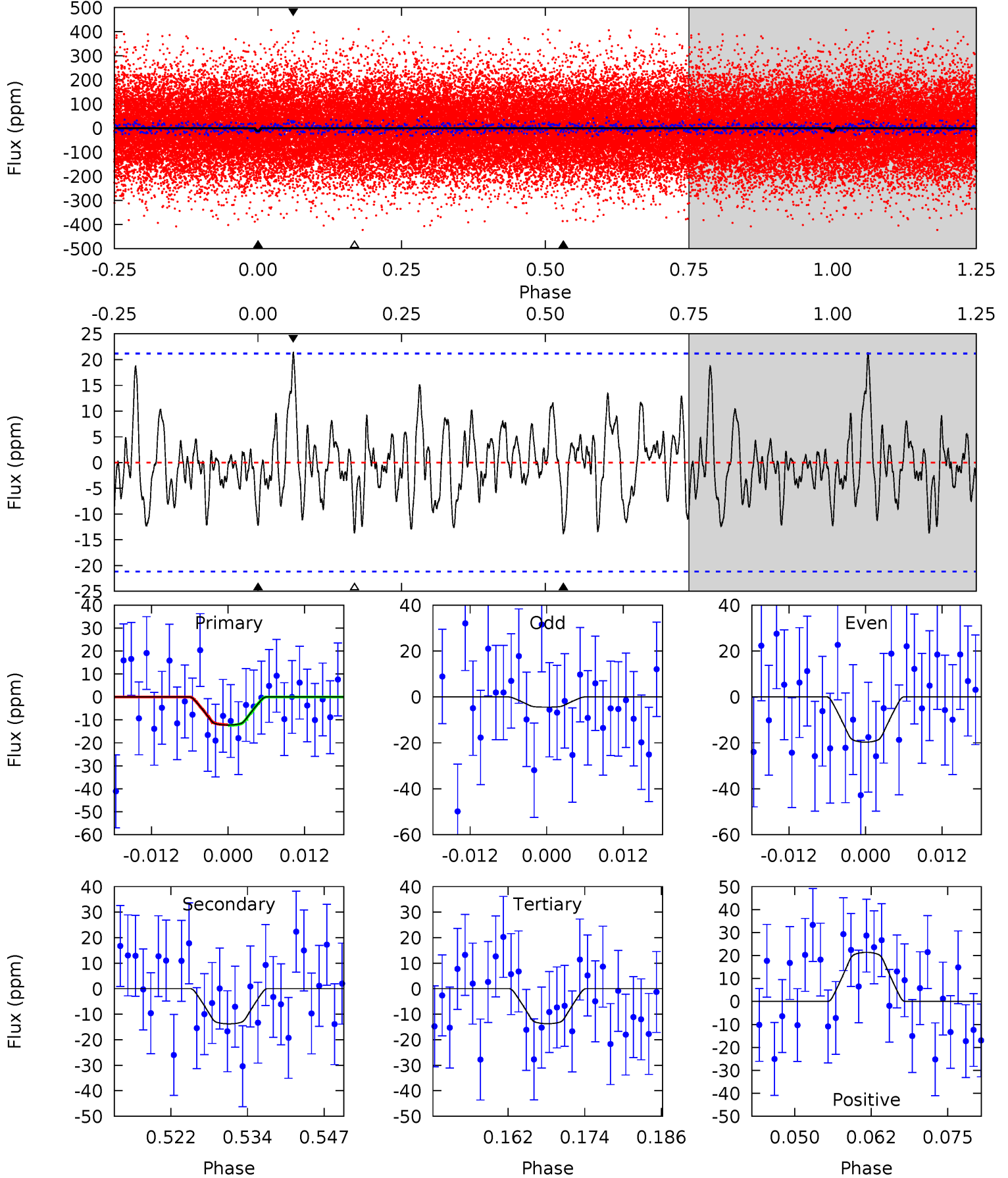
TCE 010163067-02 P= 5.954152 Days $T_0=132.579465$ (BKJD)



DV Model-Shift Uniqueness Test

010163067-02, P = 5.899054 Days, E = 126.785331 Days

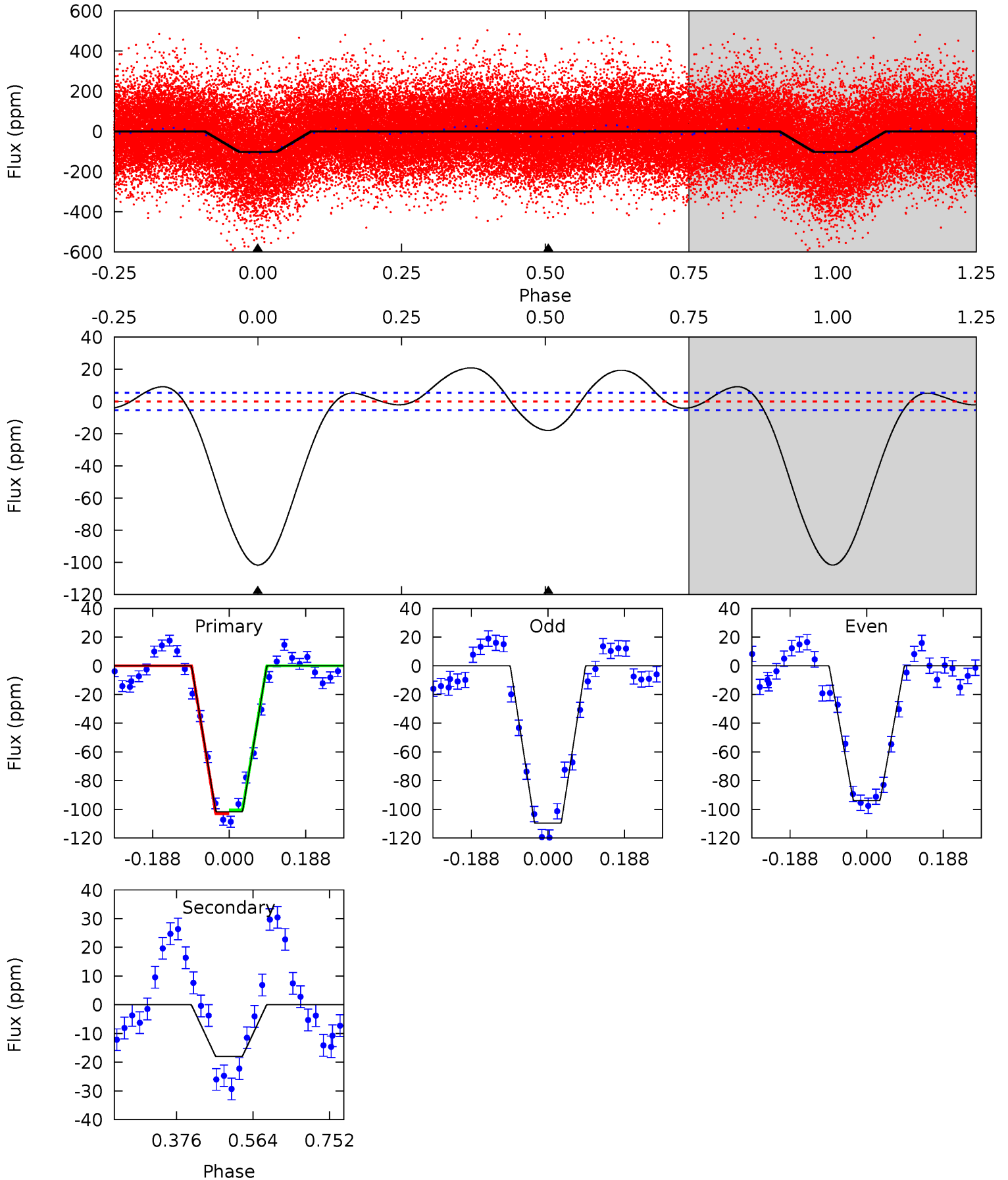
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.88	3.24	3.23	5.03	4.98	2.50	1.40	-0.35	-2.15	0.01	-1.79	1.80	0.84	0.61	0.03



Alt Model-Shift Uniqueness Test

010163067-02, P = 5.954152 Days, E = 126.625313 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.7	14.7	0	0	4.43	1.32	3.14	82.7	82.7	14.7	14.7	6.39	1.00	0.17	1.06



Stellar Parameters For KIC 010163067

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6167^{+189}_{-170}	$3.804^{+0.293}_{-0.098}$	$-0.200^{+0.300}_{-0.250}$	$2.346^{+0.421}_{-0.842}$	$1.279^{+0.235}_{-0.259}$	$0.140^{+0.292}_{-0.044}$
	+3%/-3%	+8%/-3%	+150%/-125%	+18%/-36%	+18%/-20%	+209%/-31%
Source	PHO1	FLK73	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 010163067-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-14 ± 4	$1.83^{+1.63}_{-1.25}$	2175^{+139}_{-180}	4431^{+3108}_{-935}	11^{+88}_{-8}
Alt.	-18 ± 1	$2.69^{+1.70}_{-1.45}$	2164^{+139}_{-177}	4073^{+1528}_{-652}	$6.814^{+26.573}_{-4.256}$

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

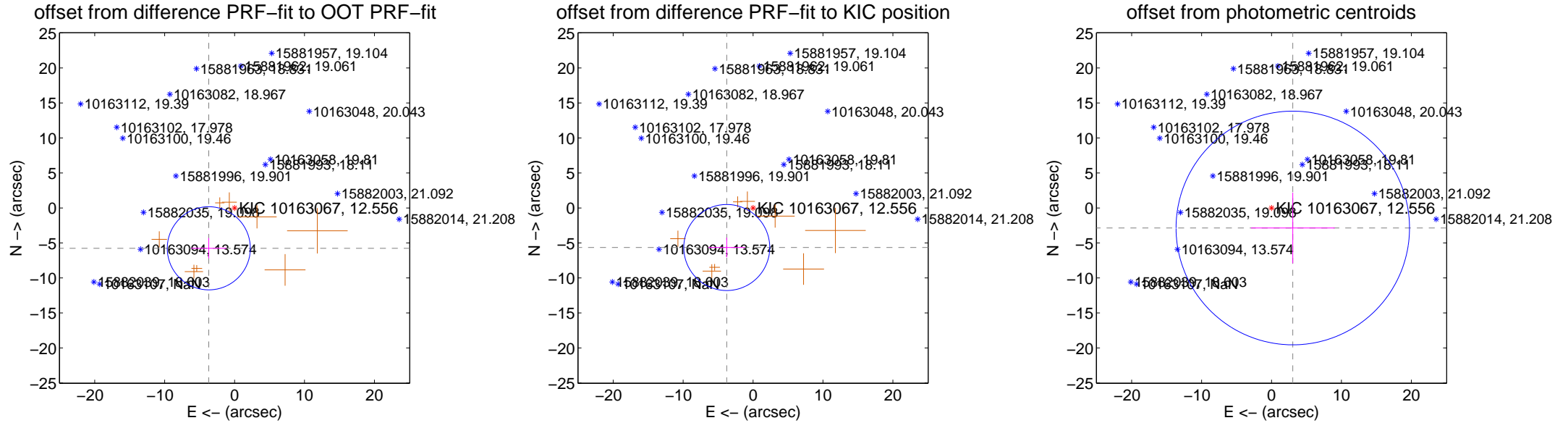
DV Centroid Data

Supplemental centroid analysis for 010163067-02. Kepler magnitude: 12.56. Transit SNR 2.20

There are 0 quarters with good PRF difference image offsets

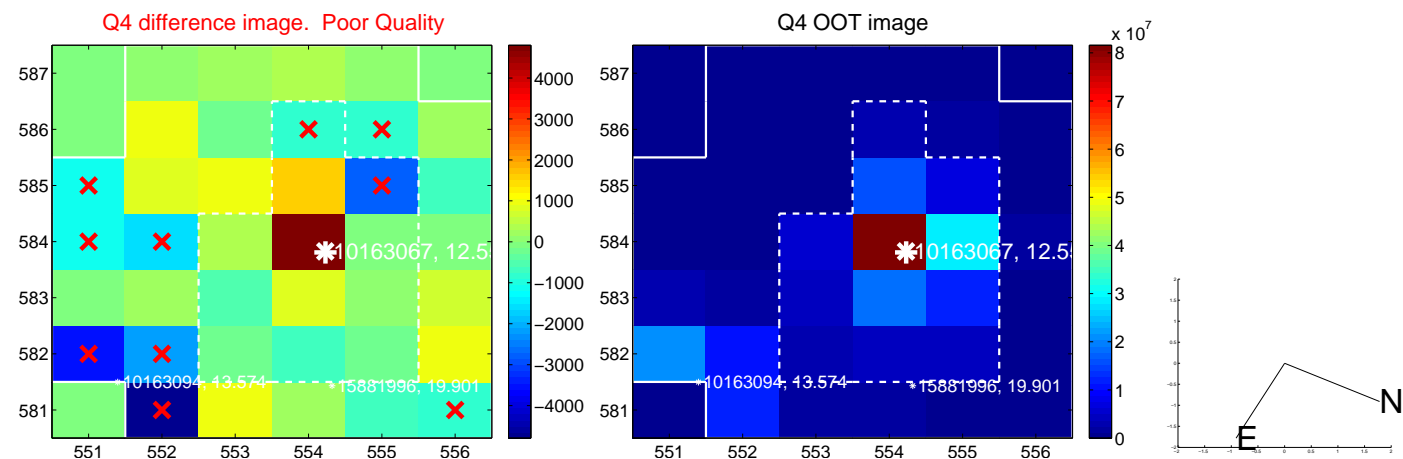
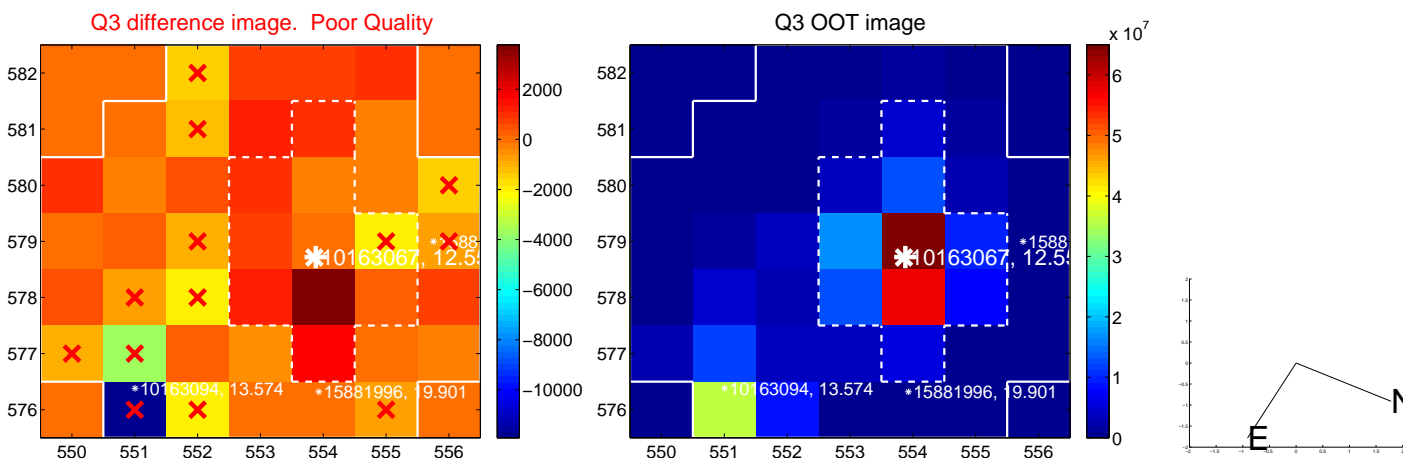
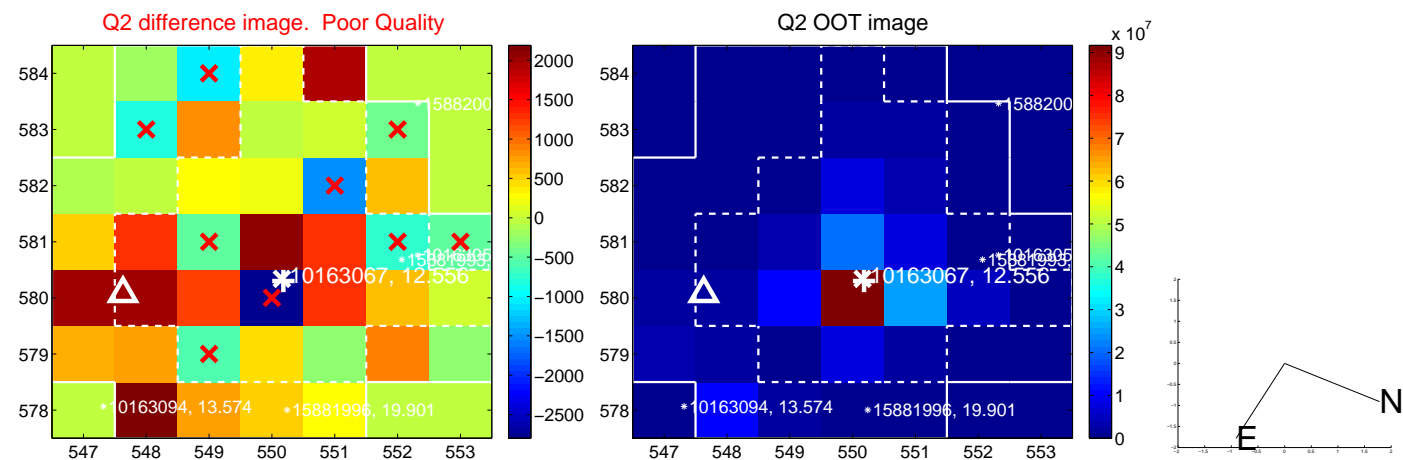
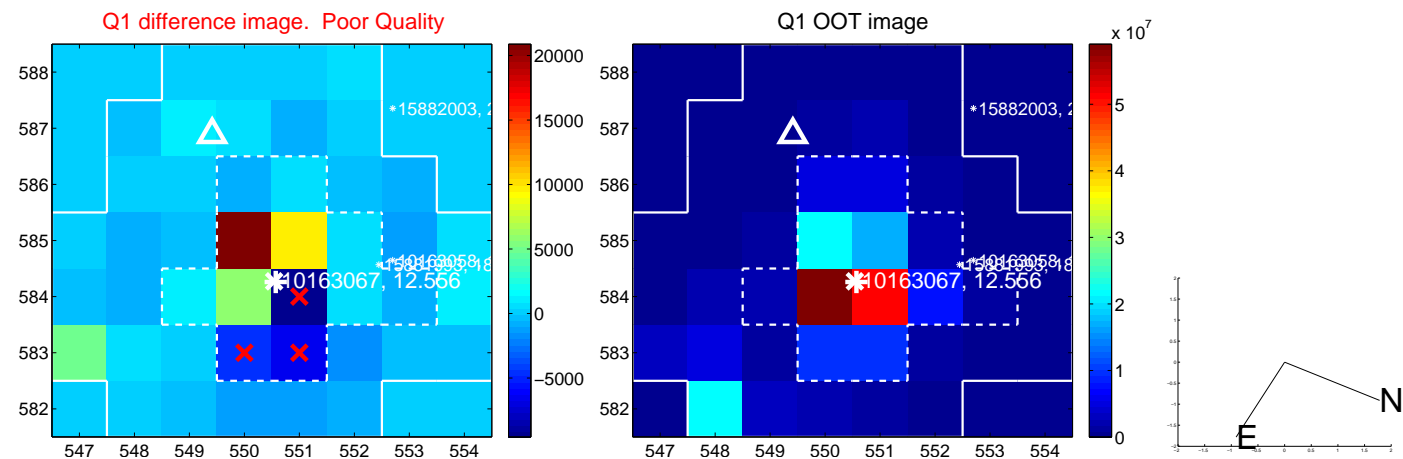
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.843 ± 1.980	3.46	3.688 ± 2.522	-5.764 ± 1.462
PRF-fit source offset from KIC position	6.787 ± 2.049	3.31	3.759 ± 2.625	-5.651 ± 1.411
photometric centroid source offset	4.18 ± 5.56	0.75	-3.04 ± 5.99	-2.86 ± 5.04

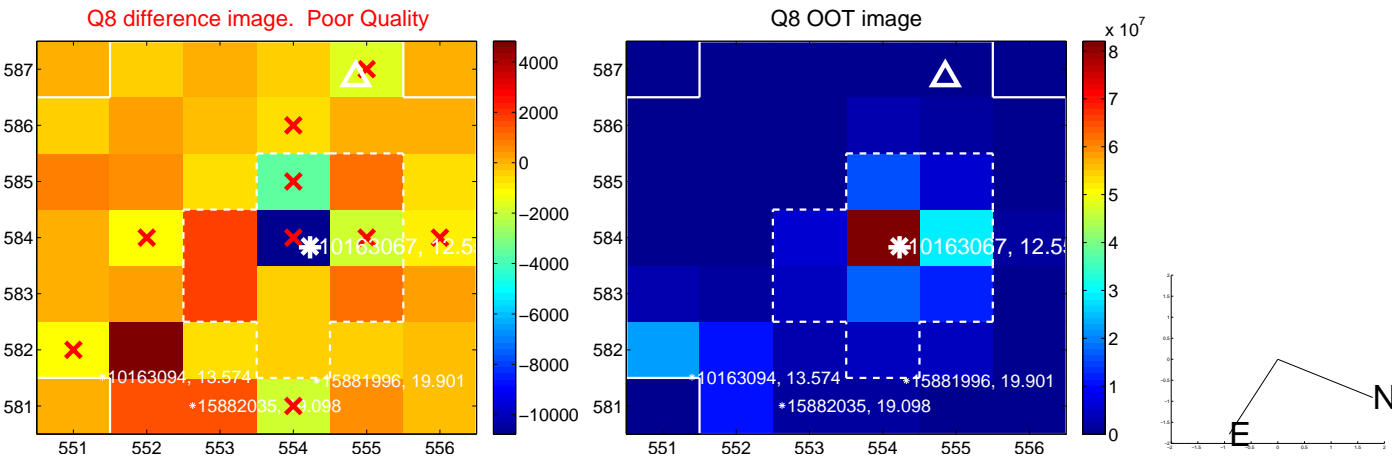
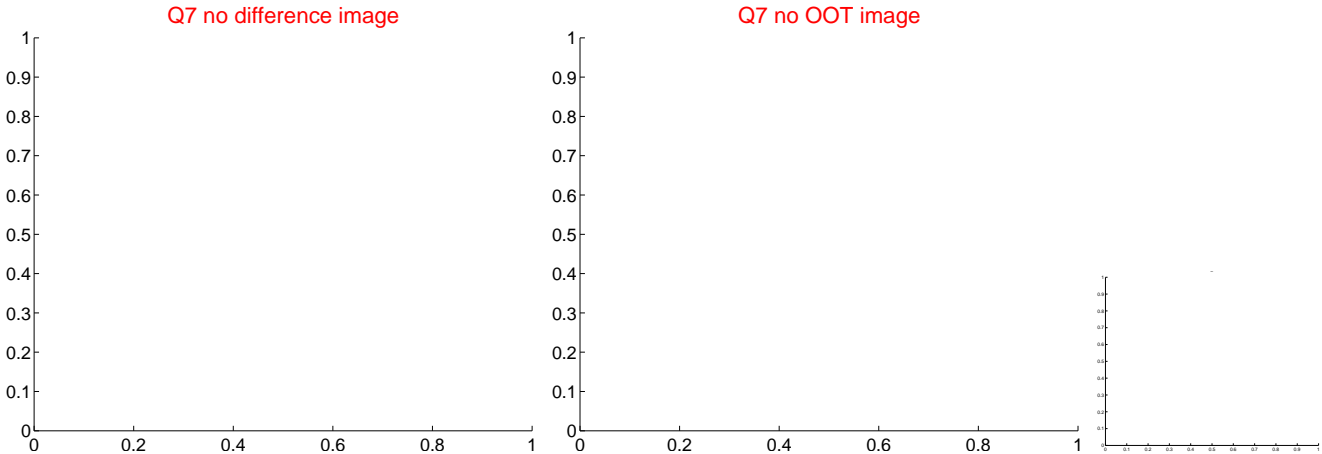
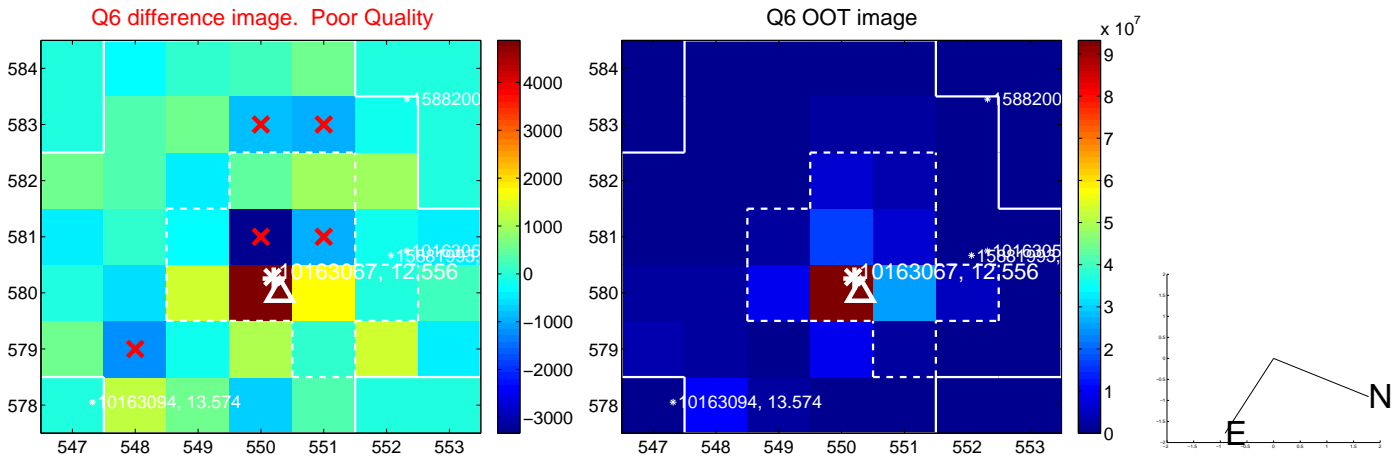
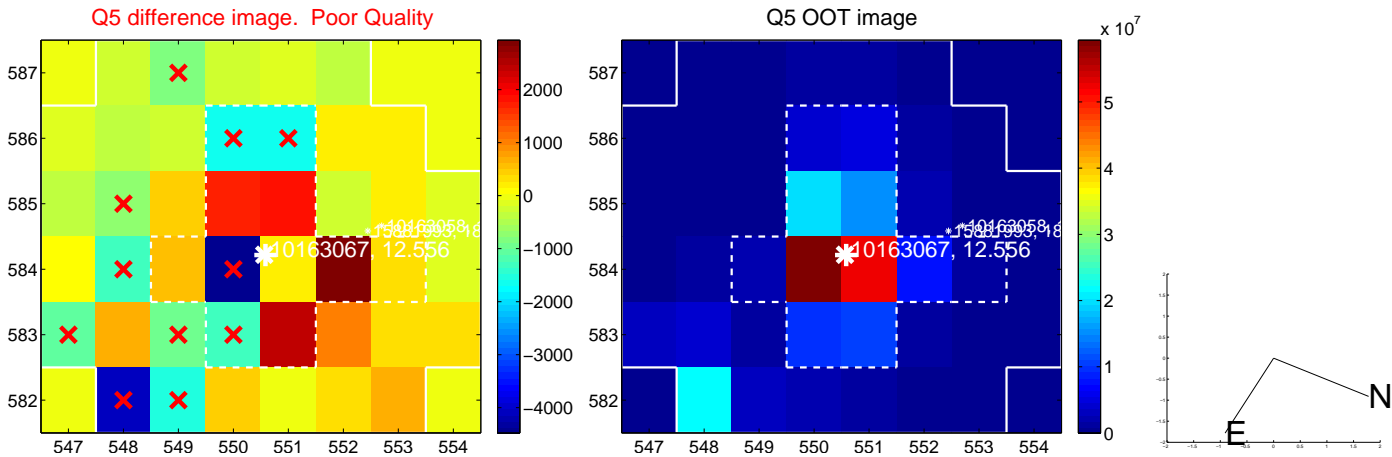


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

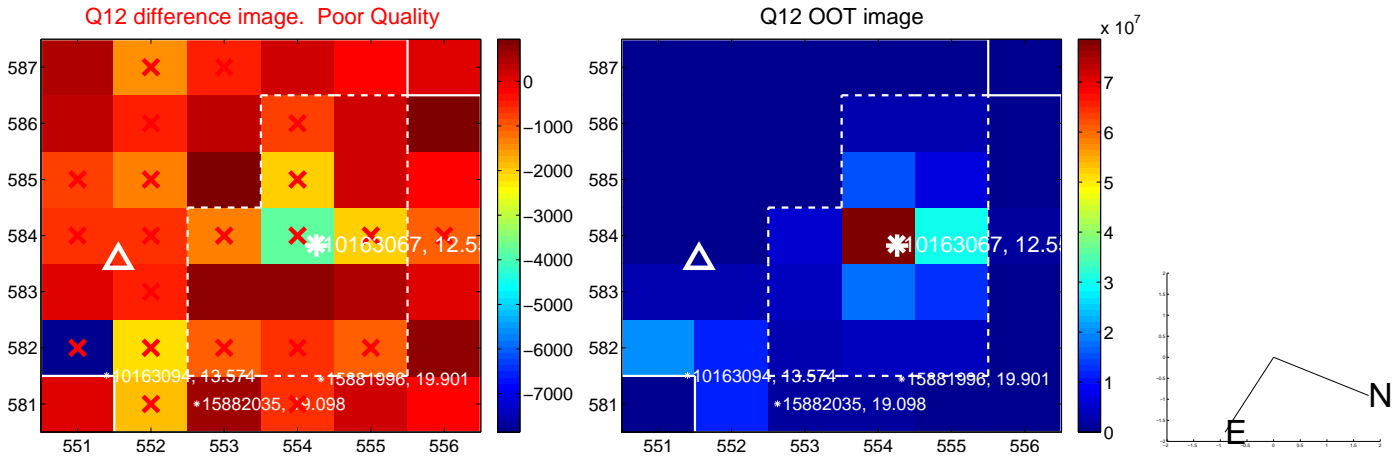
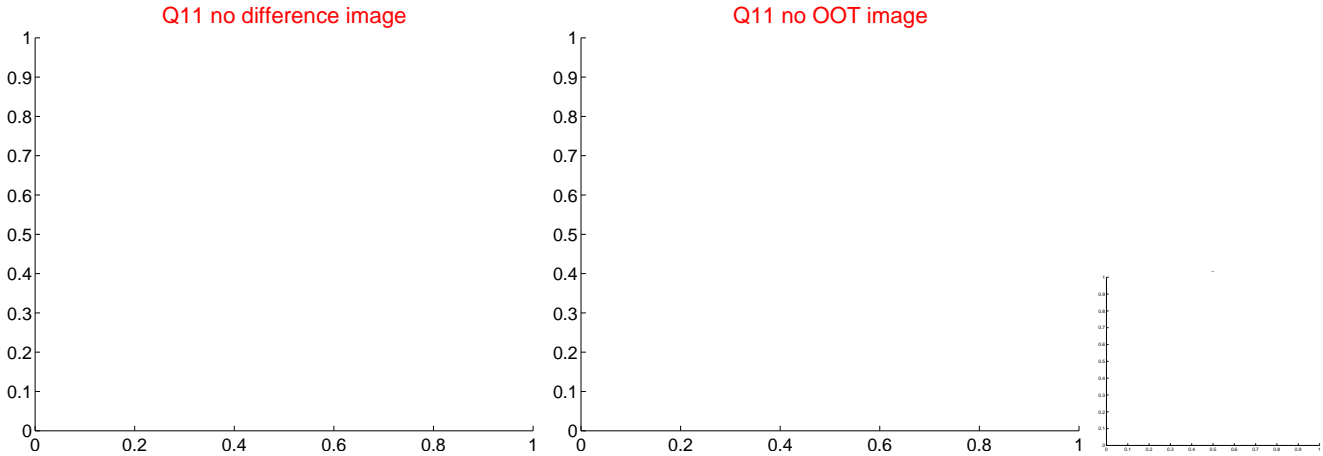
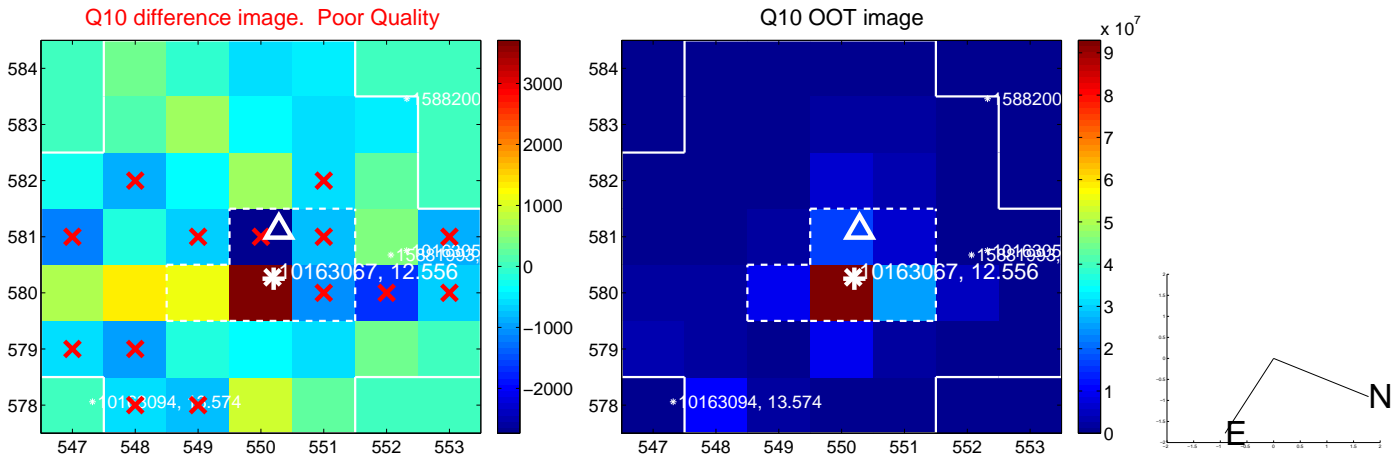
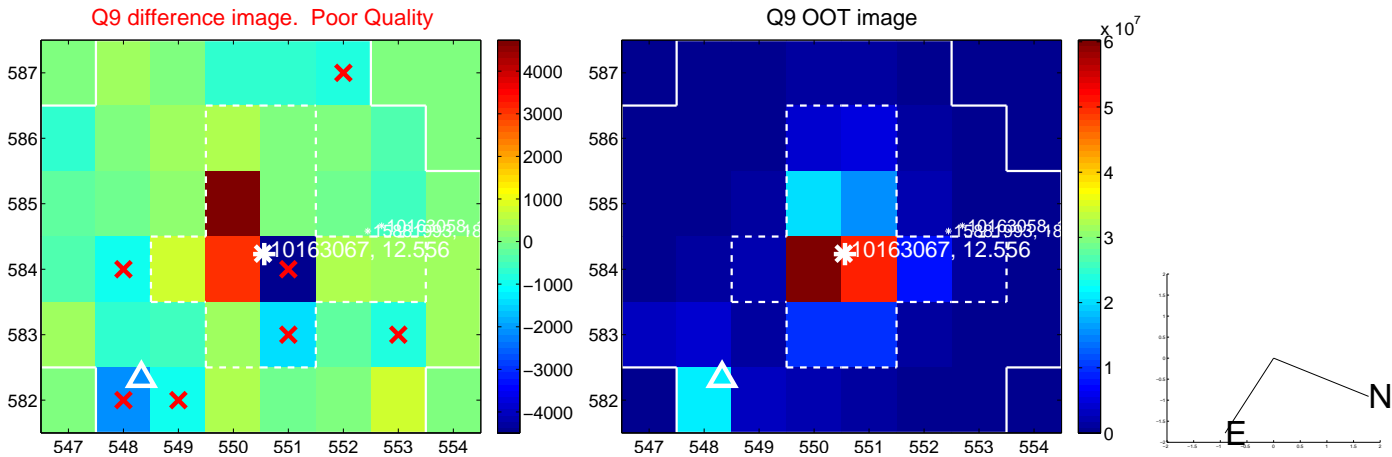
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



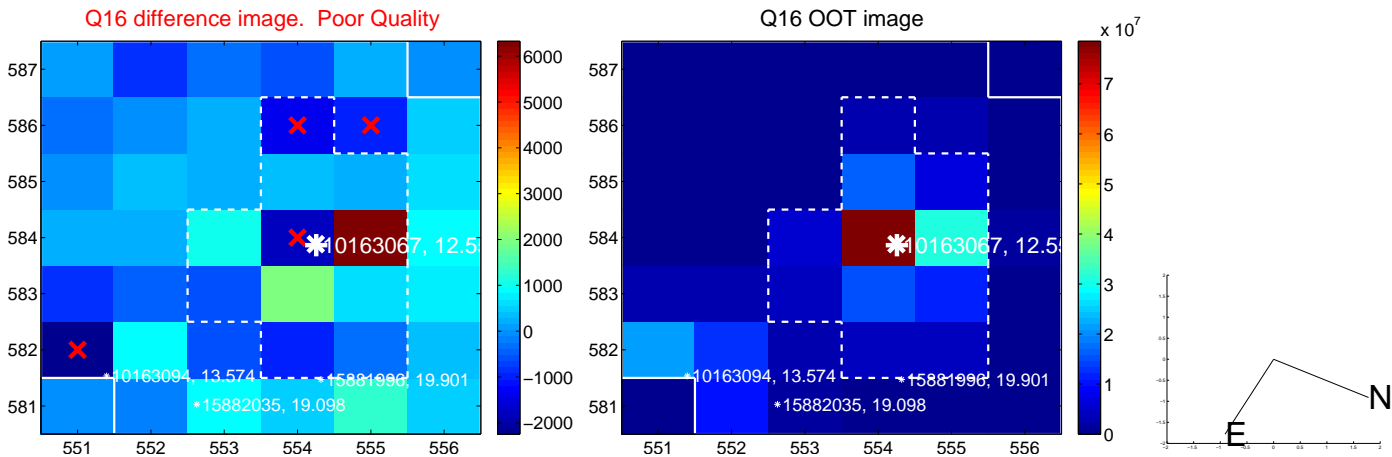
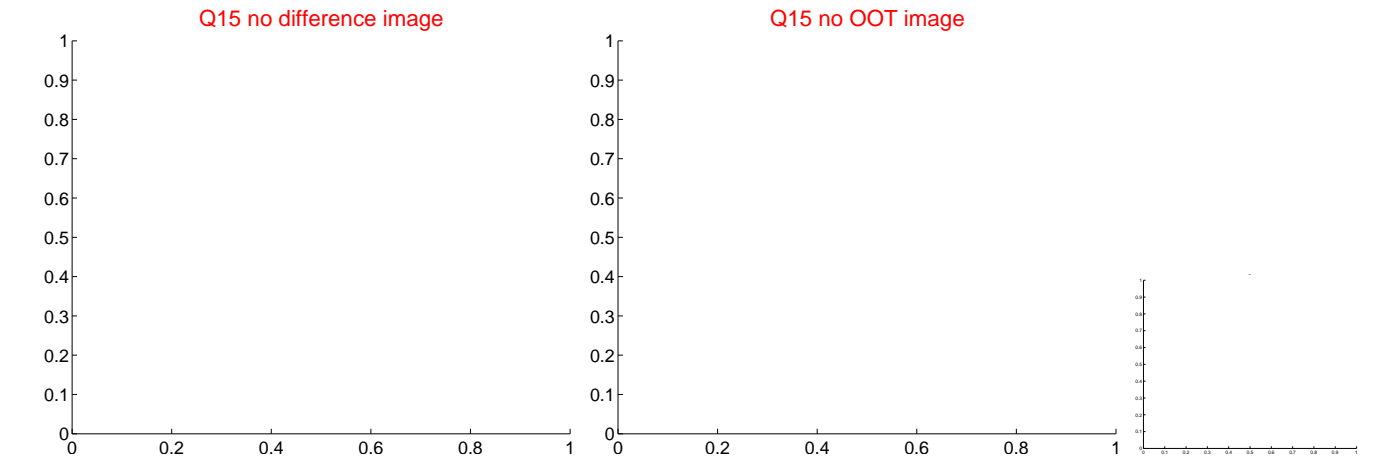
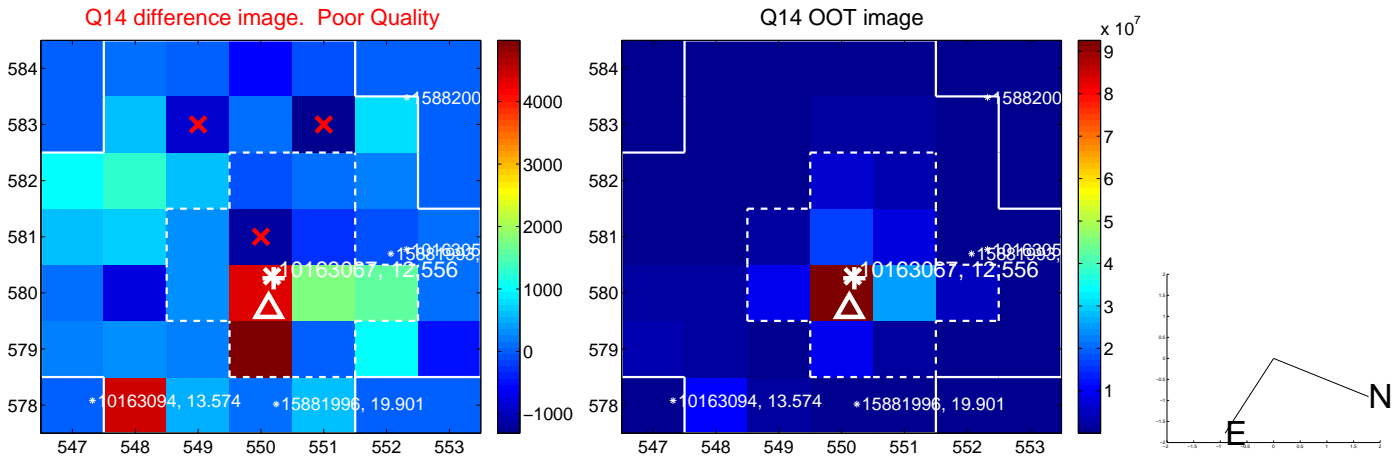
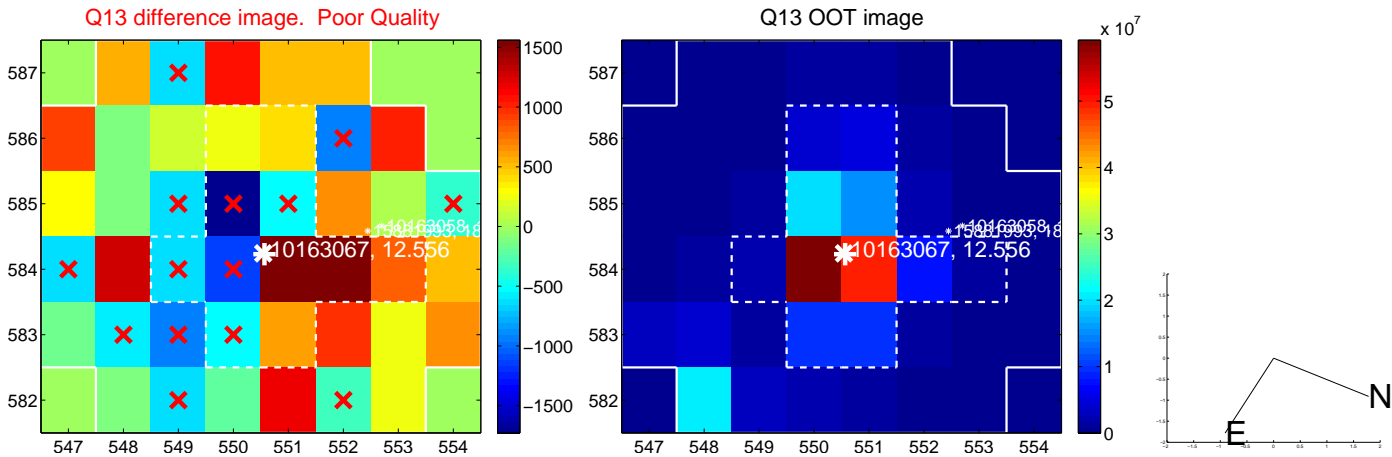
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



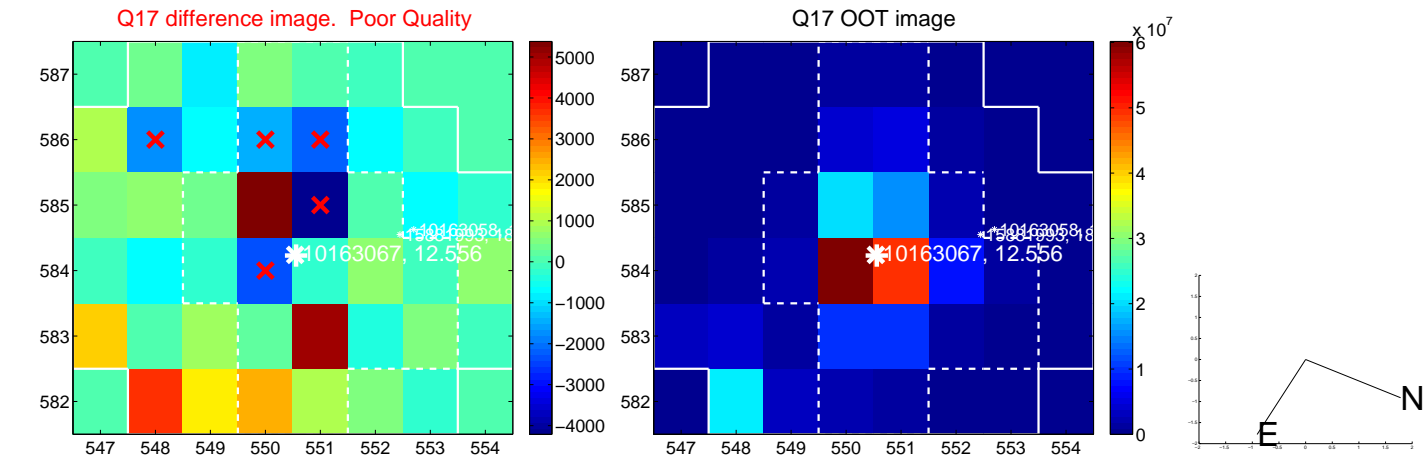
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



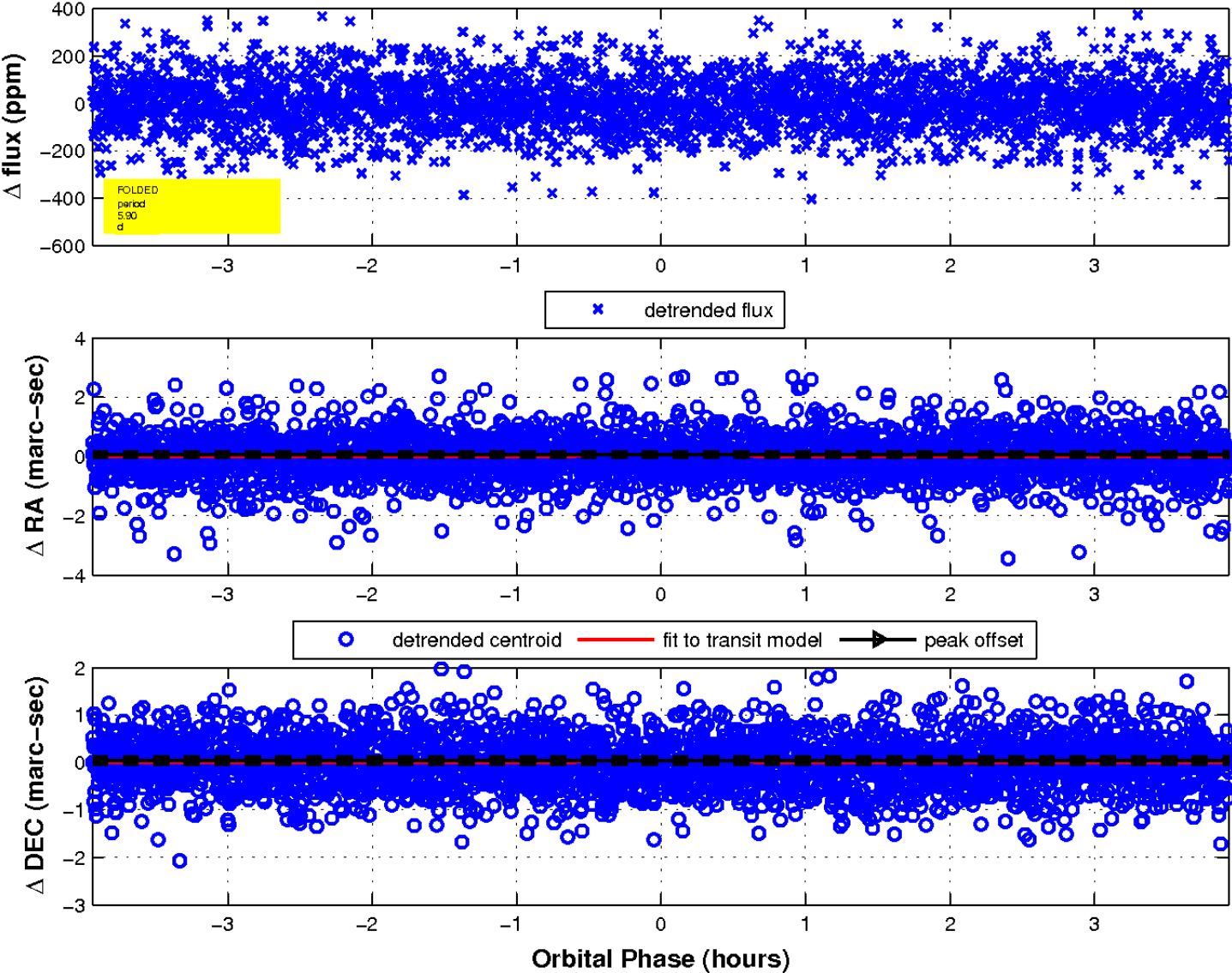
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

