

KIC 006960377

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})
006960377-01	OBS	No	0.970129	132.460921	12.6	5.147	10.1	12.8	3.11	7872	1.14	54267.82
006960377-02	OBS	No	181.532000	186.345308	331.1	33.678	11.0	6.0	3.11	7872	10.86	50.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006960377-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006960377-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_MEAS

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

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

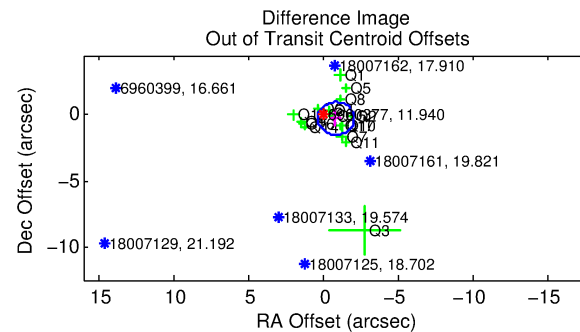
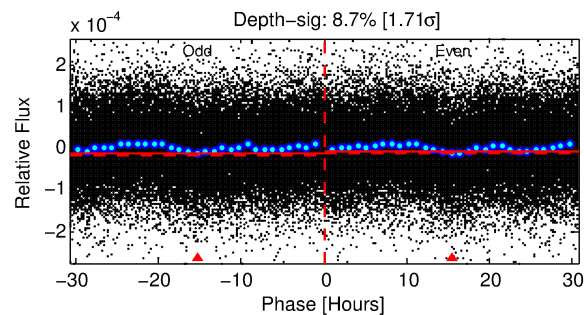
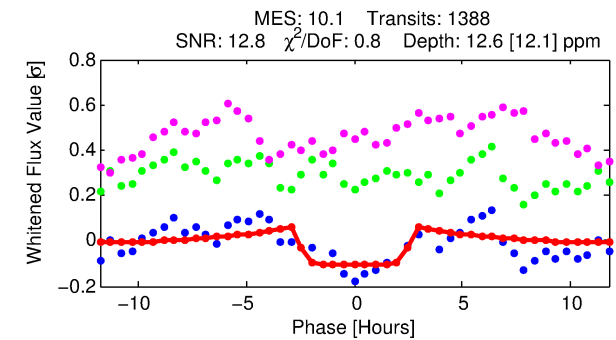
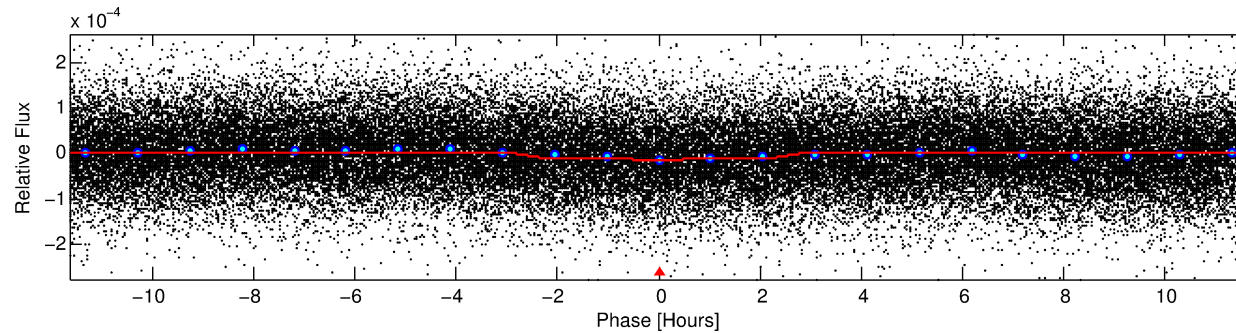
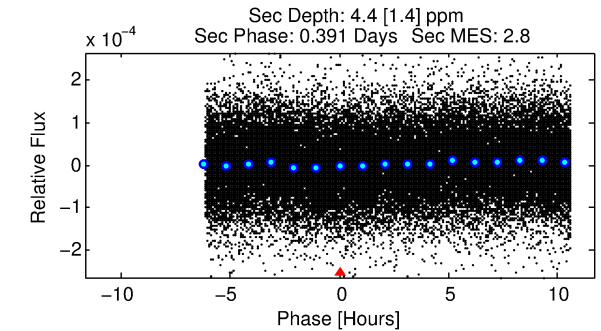
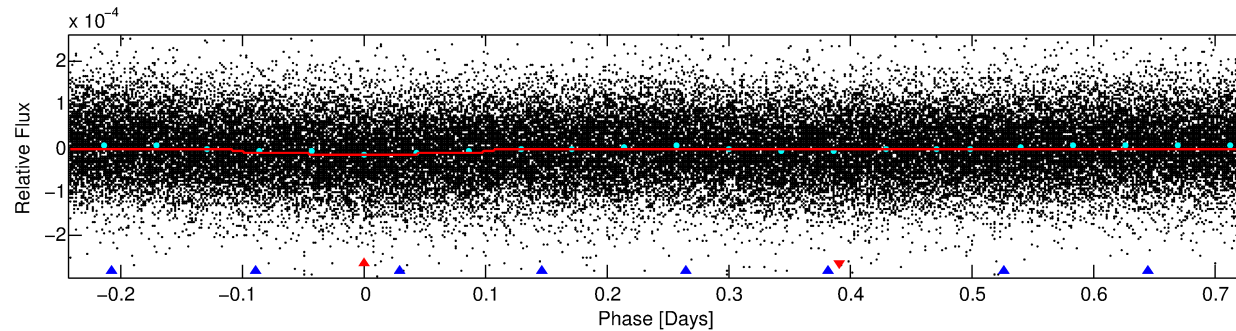
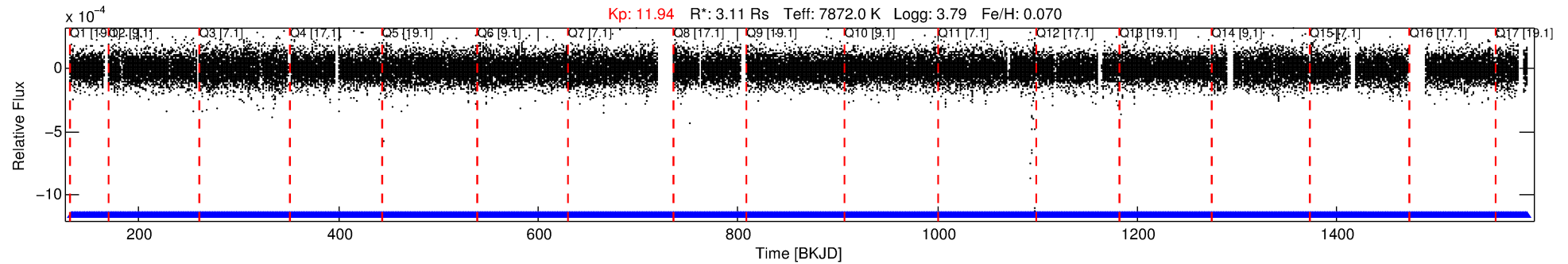
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006960377-01

No Significant Match Found

DV One-Page Summary

KIC: 6960377 Candidate: 1 of 2 Period: 0.970 d



DV Fit Results:

Period = 0.97013 [0.00001] d
Epoch = 132.4609 [0.0028] BKJD
Rp/R* = 0.0034 [0.0013]
a/R* = 1.46 [0.02]
b = 0.48 [0.78]
Seff = 54267.82 [35561.61]
Teff = 3892 [638] K
Rp = 1.14 [0.66] Re
a = 0.0248 [0.0098] AU
Ag = 1.14 [1.21] [0.12σ]
Teffp = 6217 [1361] K [1.55σ]

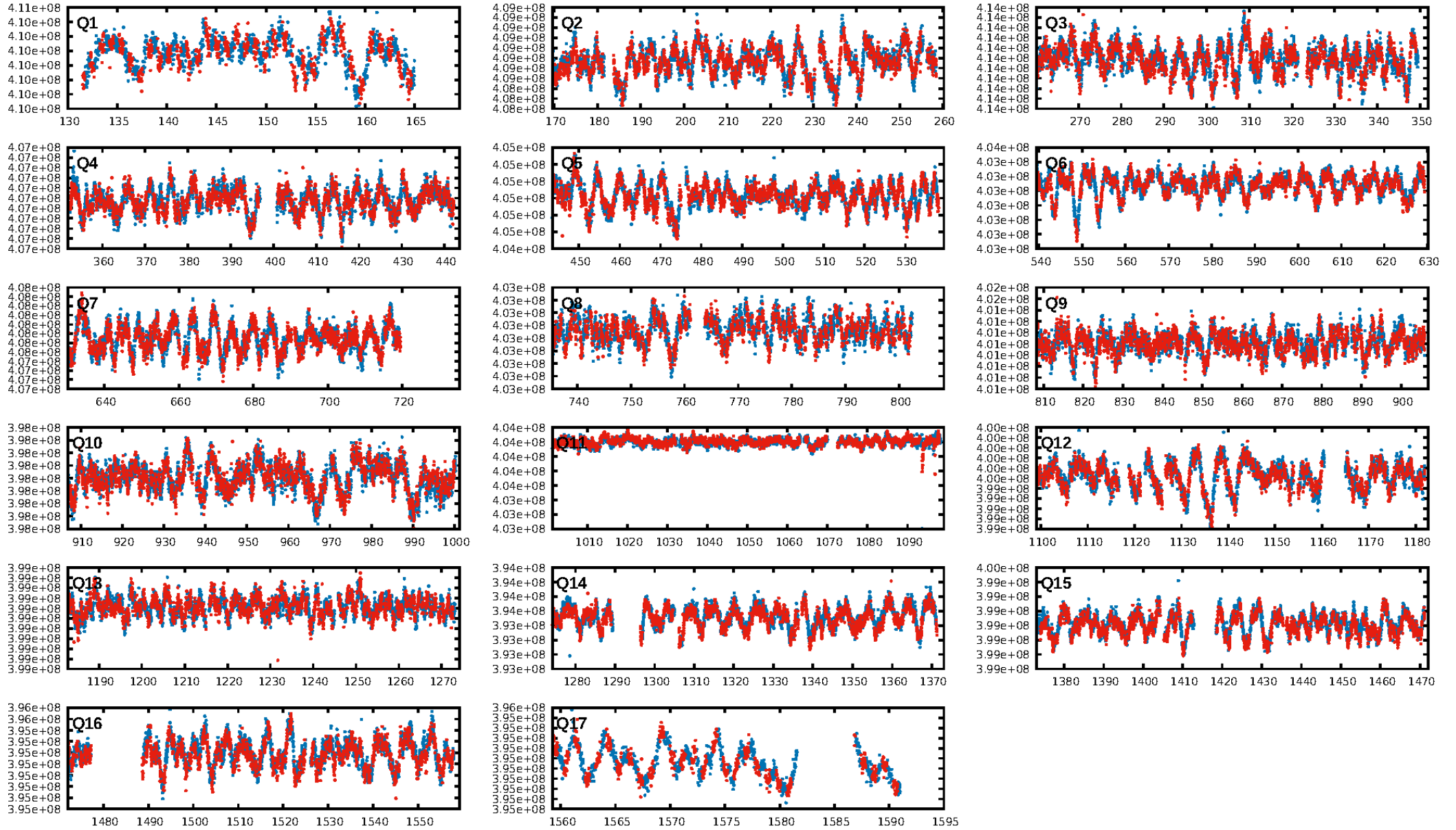
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [127.20σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.65e-16
RollingBand-fgt: 1.00 [1326/1326]
GhostDiagnostic-chr: 5.936
Centroid-sig: 69.3%
Centroid-so: 0.279 arcsec [0.47σ]
OotOffset-rm: 0.911 arcsec [2.21σ]
KicOffset-rm: 0.793 arcsec [1.72σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.81 [13/16]
DiffImageOverlap-fno: 1.00 [17/17]

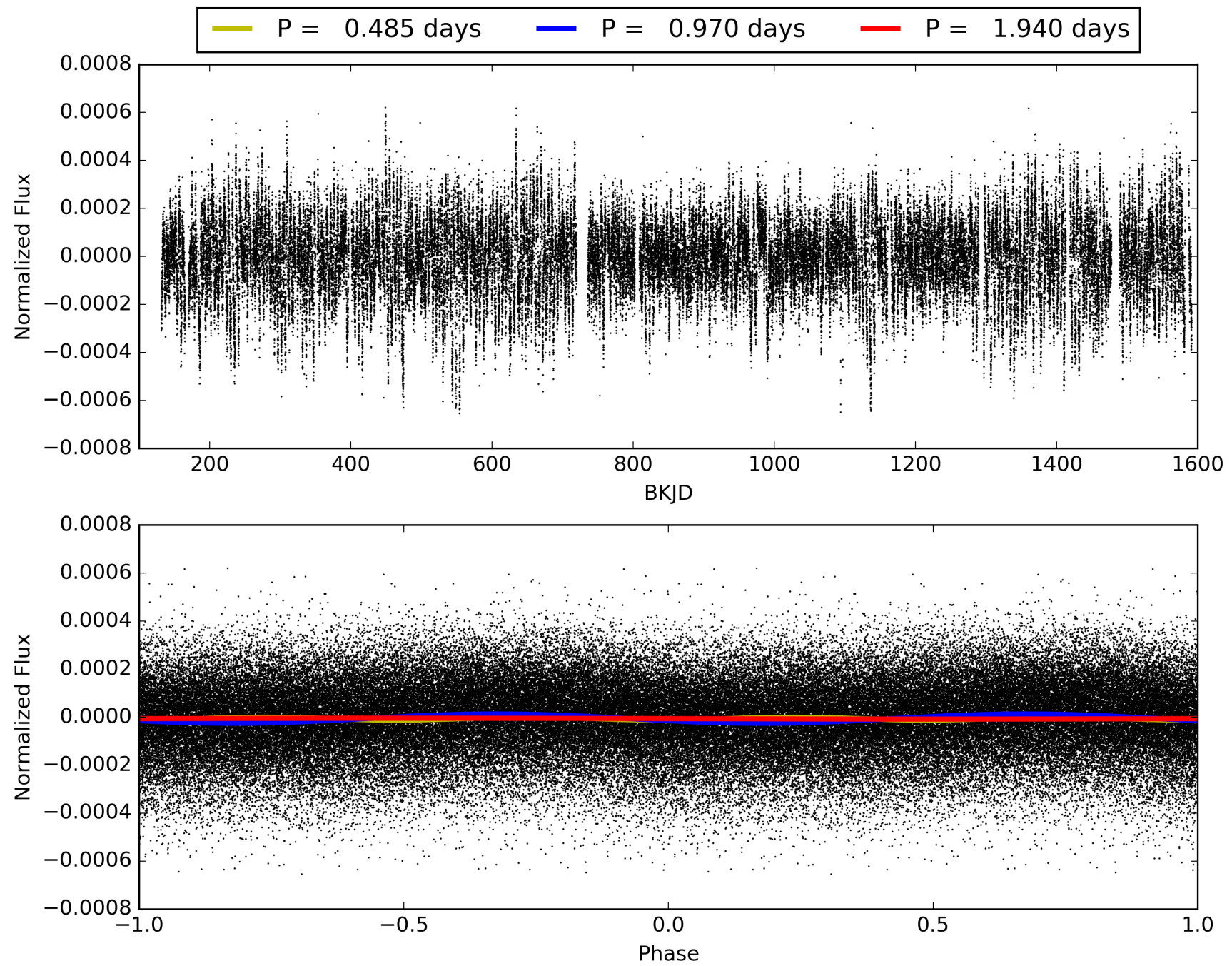
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006960377-01, PDC Light Curves

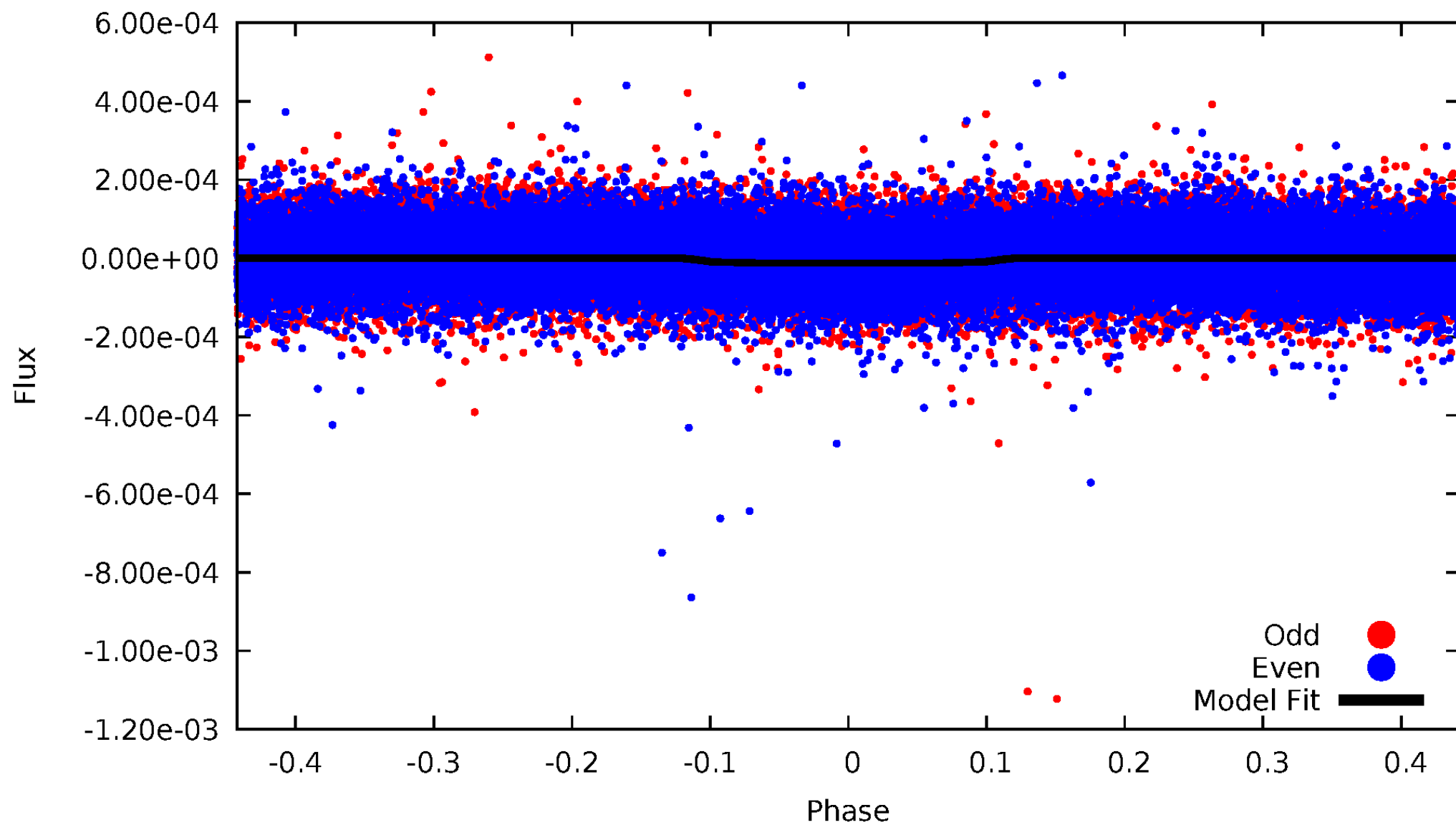


TCE 006960377-01



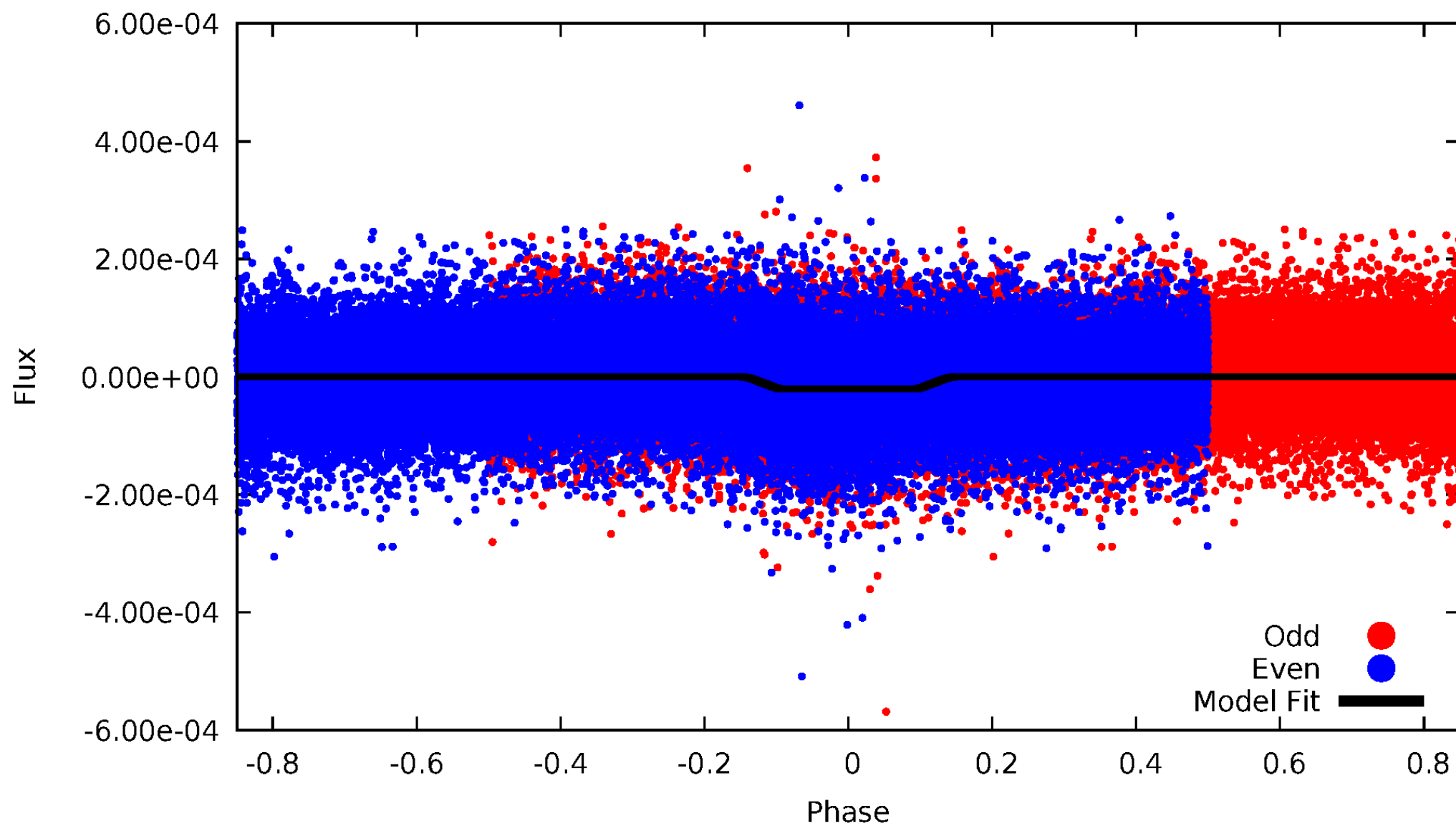
DV Odd/Even

TCE 006960377-01

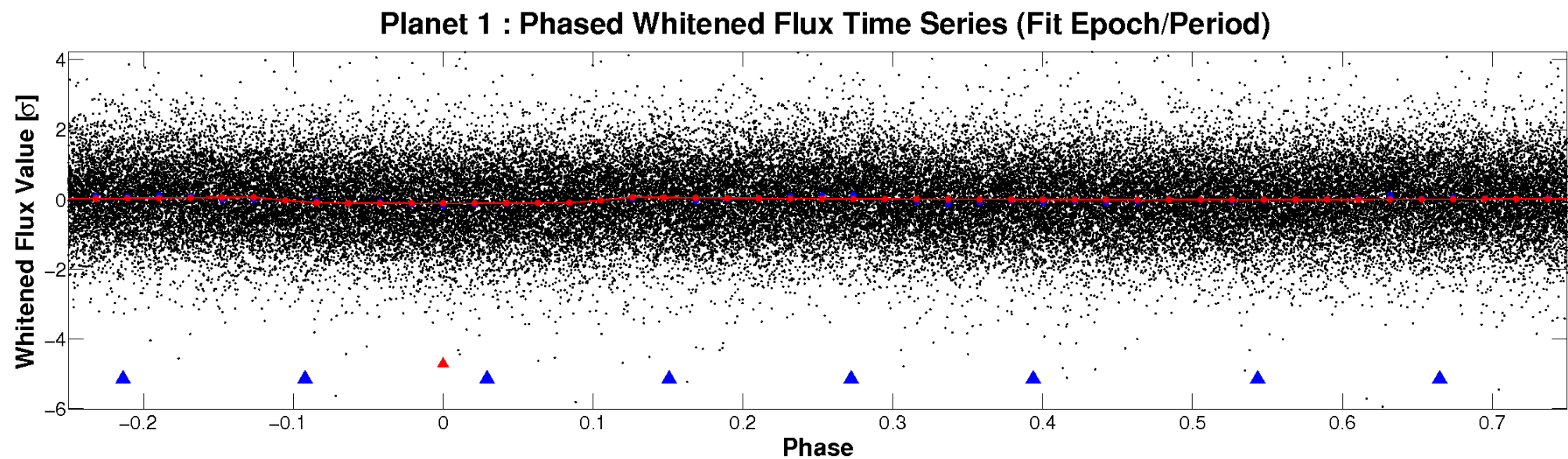
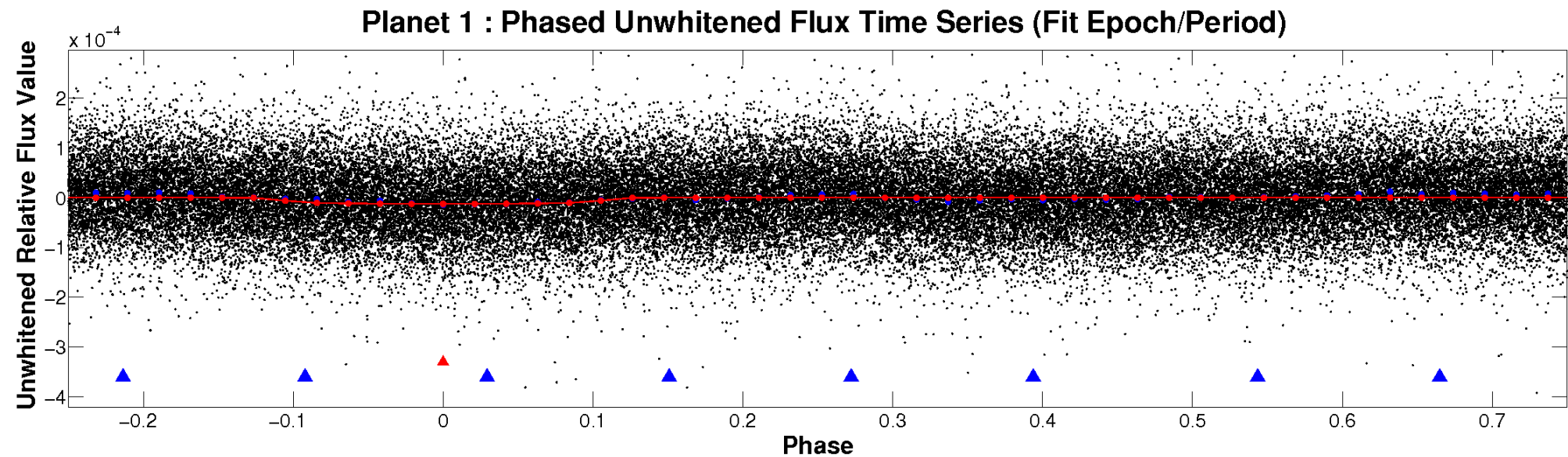


ALT Odd/Even

TCE 006960377-01

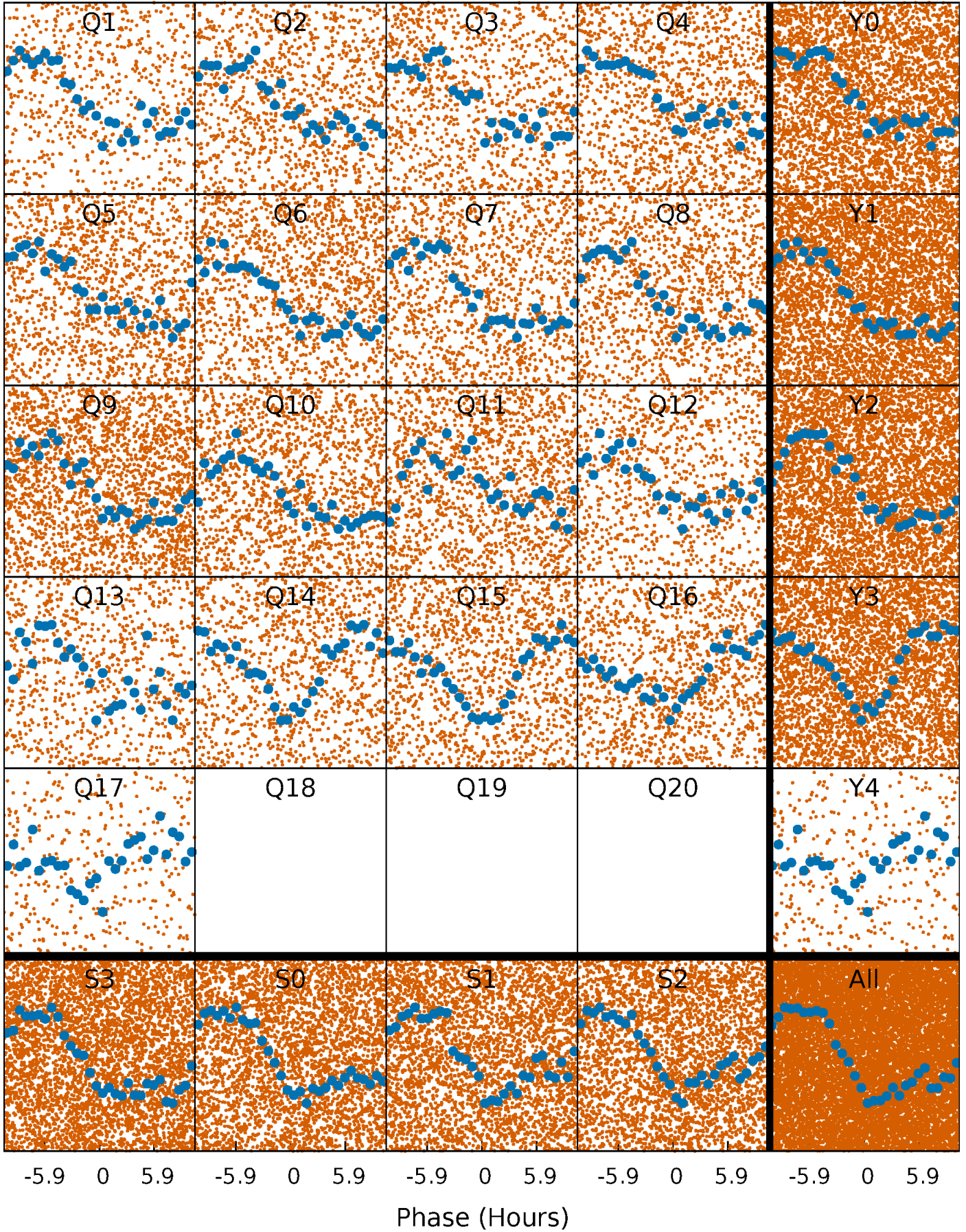


Non-Whitened Vs. Whitened Light Curve



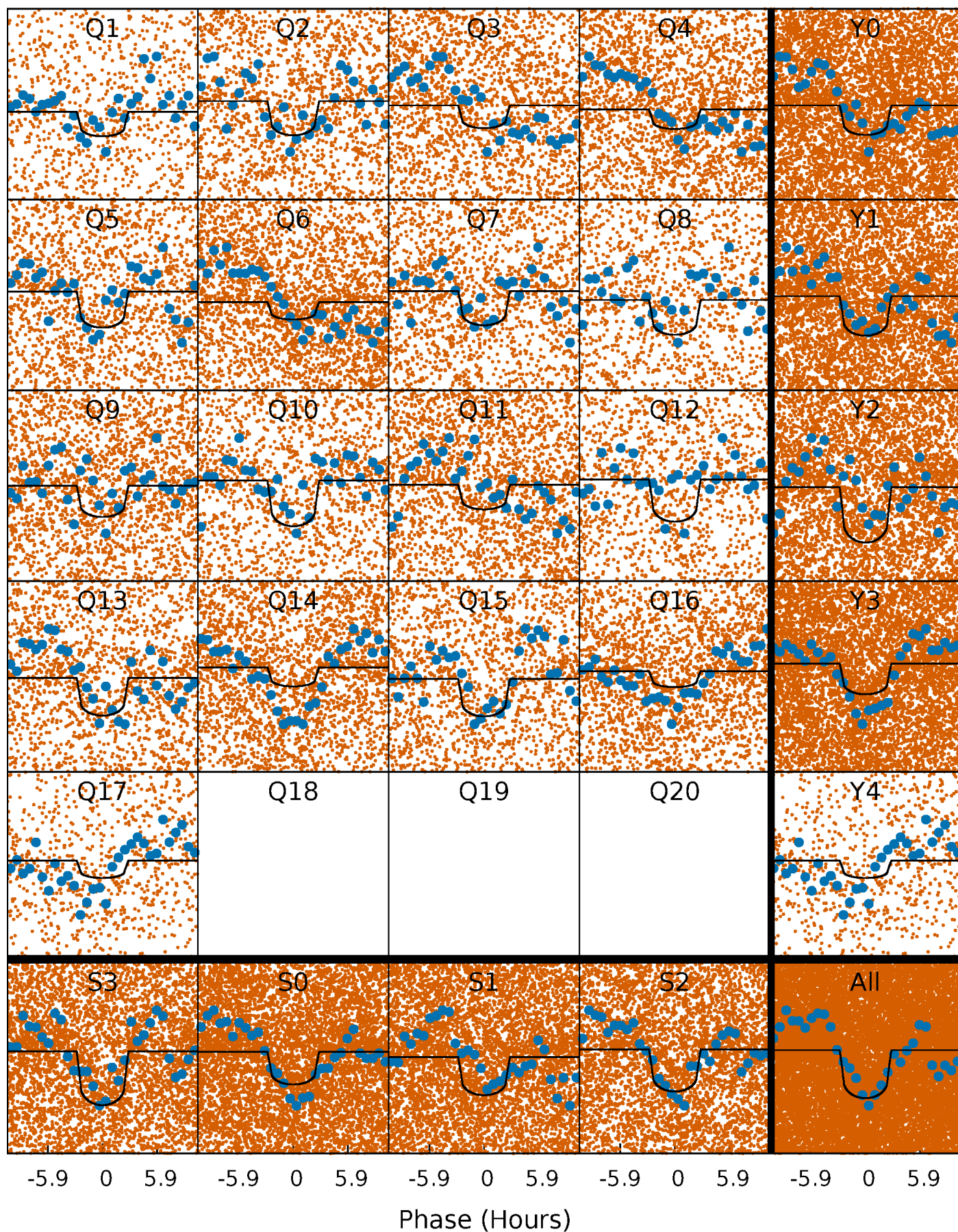
PDC Quarter-Phased Transit Curves

TCE 006960377-01 P= 0.970129 Days $T_0=132.460921$ (BKJD)



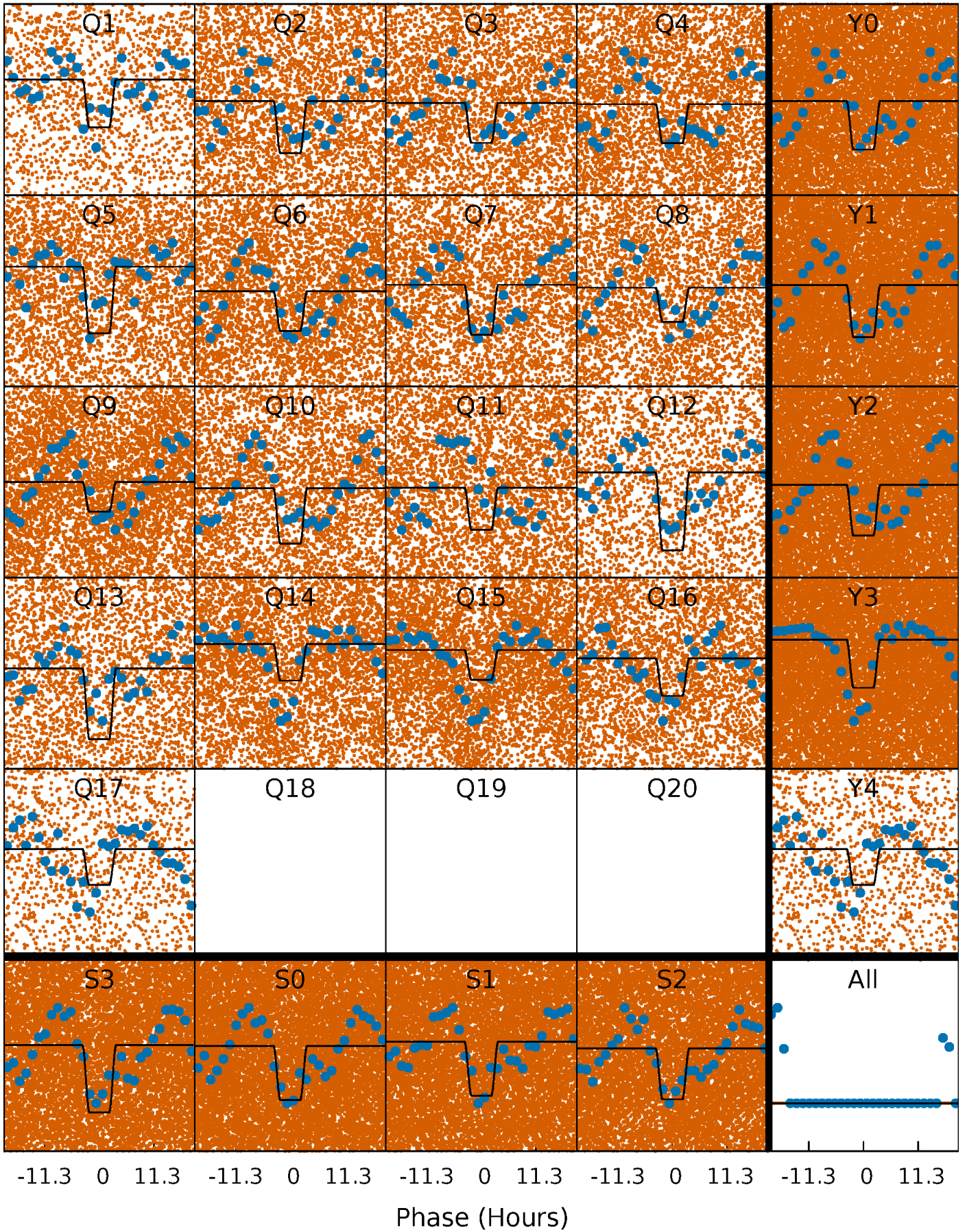
DV Quarter-Phased Transit Curves

TCE 006960377-01 P= 0.970129 Days $T_0=132.460921$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

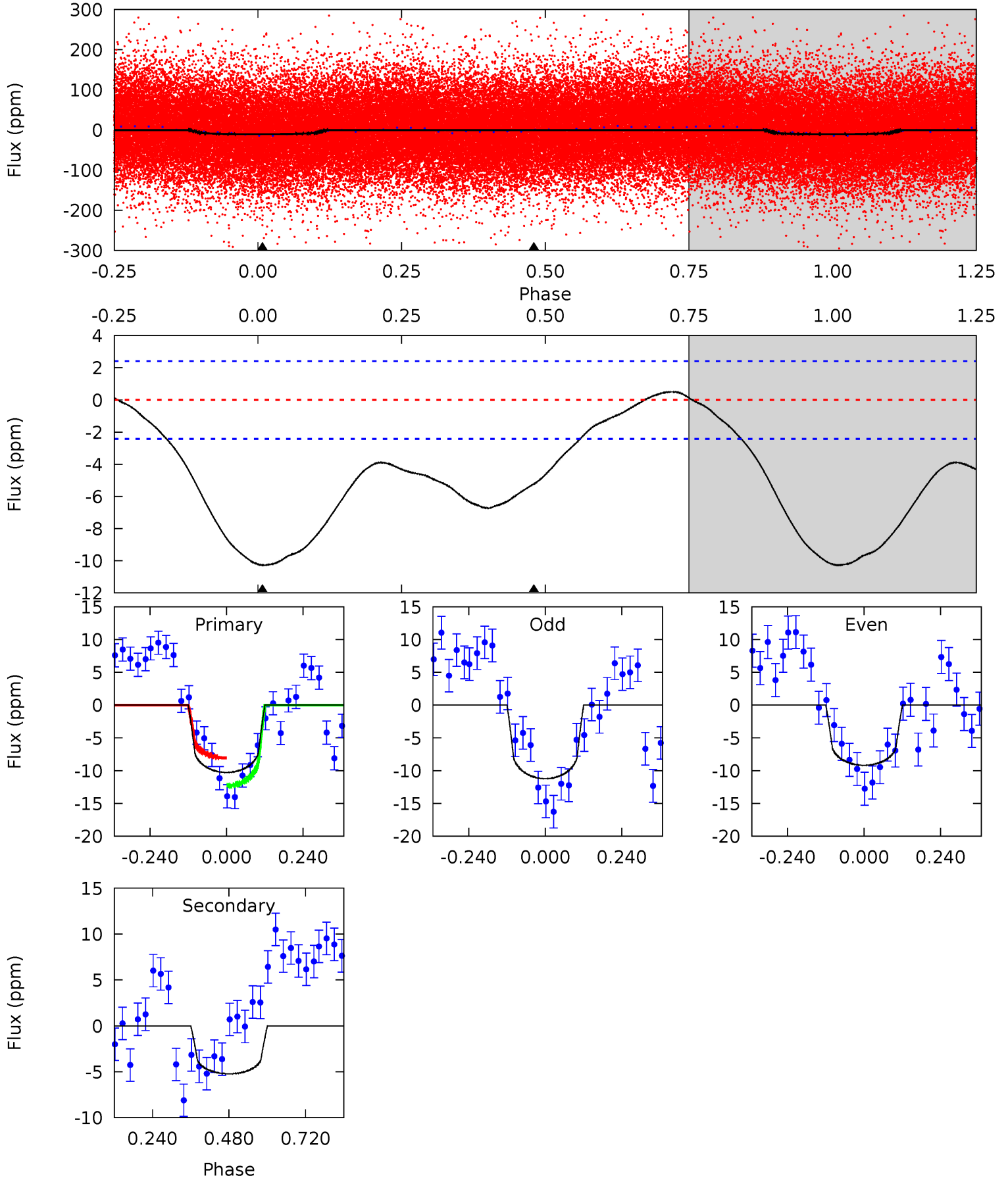
TCE 006960377-01 P= 0.970154 Days $T_0=132.490731$ (BKJD)



DV Model-Shift Uniqueness Test

006960377-01, P = 0.970129 Days, E = 131.490792 Days

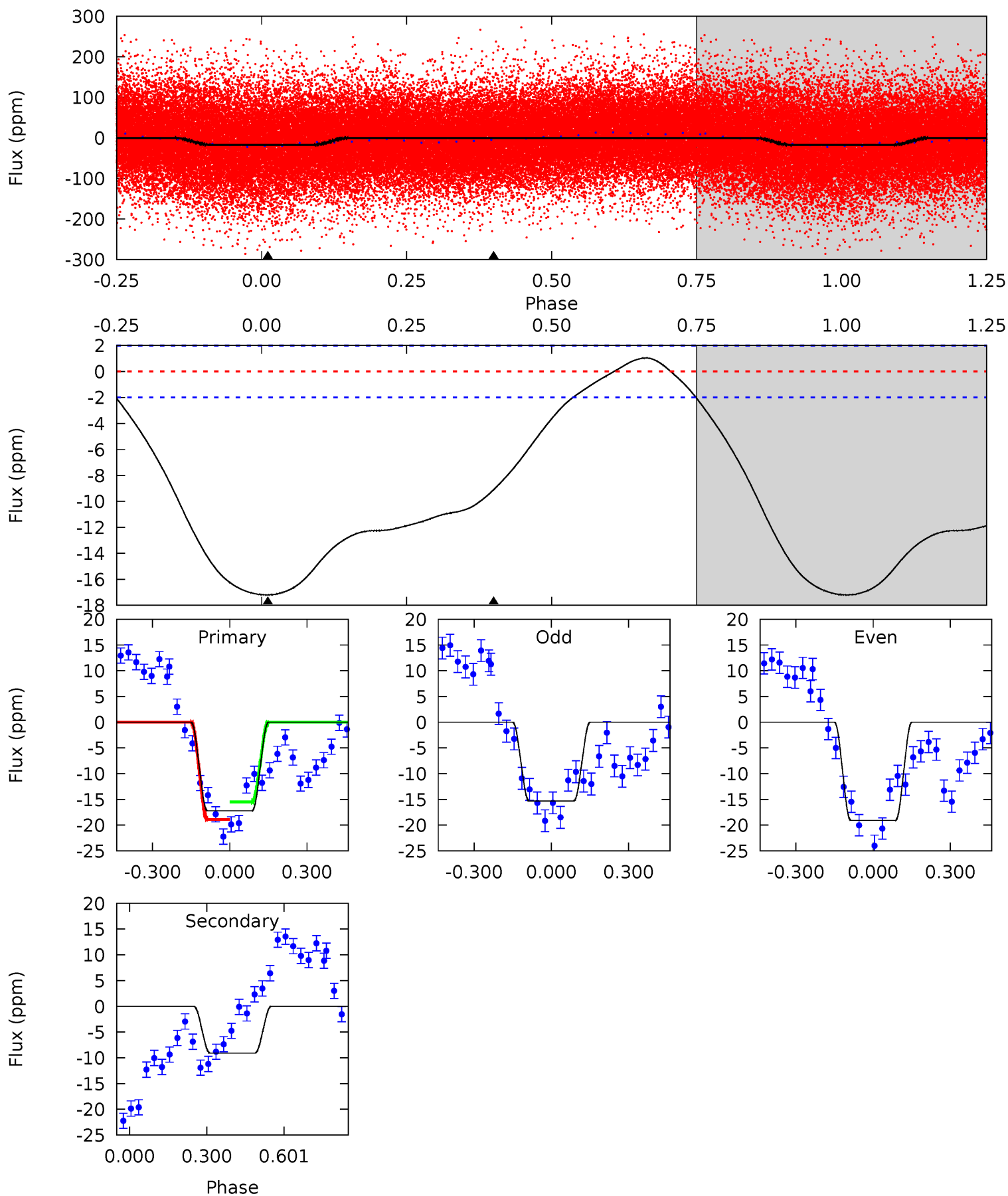
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.6	9.46	0	0	4.38	1.17	3.38	18.6	18.6	9.46	9.46	1.84	1.15	0.05	3.82



Alt Model-Shift Uniqueness Test

006960377-01, P = 0.970154 Days, E = 130.550423 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.3	19.7	0	0	4.33	1.04	2.34	37.3	37.3	19.7	19.7	4.10	0.98	0.06	3.51



Stellar Parameters For KIC 006960377

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	ρ_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7872^{+218}_{-354}	$3.785^{+0.368}_{-0.092}$	$0.070^{+0.200}_{-0.400}$	$3.109^{+0.558}_{-1.302}$	$2.150^{+0.265}_{-0.574}$	$0.101^{+0.310}_{-0.030}$
	+3%/-4%	+10%/-2%	+286%/-571%	+18%/-42%	+12%/-27%	+308%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006960377-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5 ± 1	$1.03^{+0.47}_{-0.45}$	5271^{+366}_{-592}	6006^{+2134}_{-1136}	$1.664^{+3.262}_{-0.887}$
Alt.	-9 ± 0	$1.37^{+0.54}_{-0.45}$	5244^{+378}_{-578}	5908^{+1490}_{-918}	$1.597^{+1.958}_{-0.760}$

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

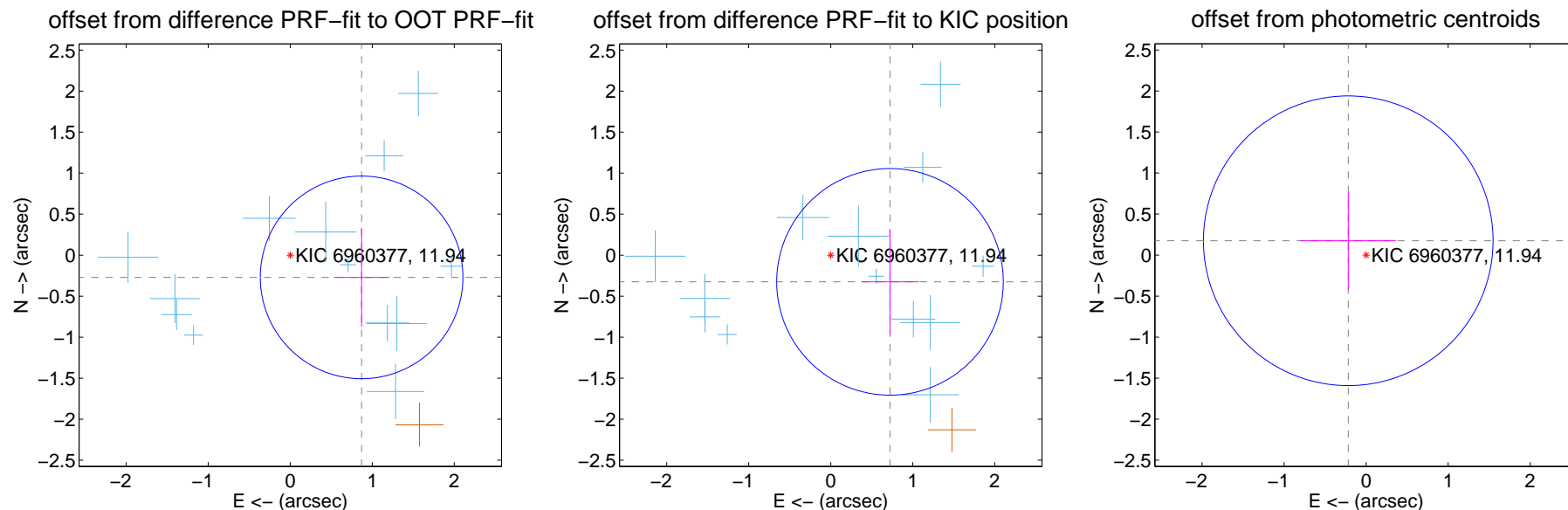
DV Centroid Data

Supplemental centroid analysis for 006960377-01. **Kepler magnitude: 11.94.** Transit SNR 12.77

There are 13 quarters with good PRF difference image offsets

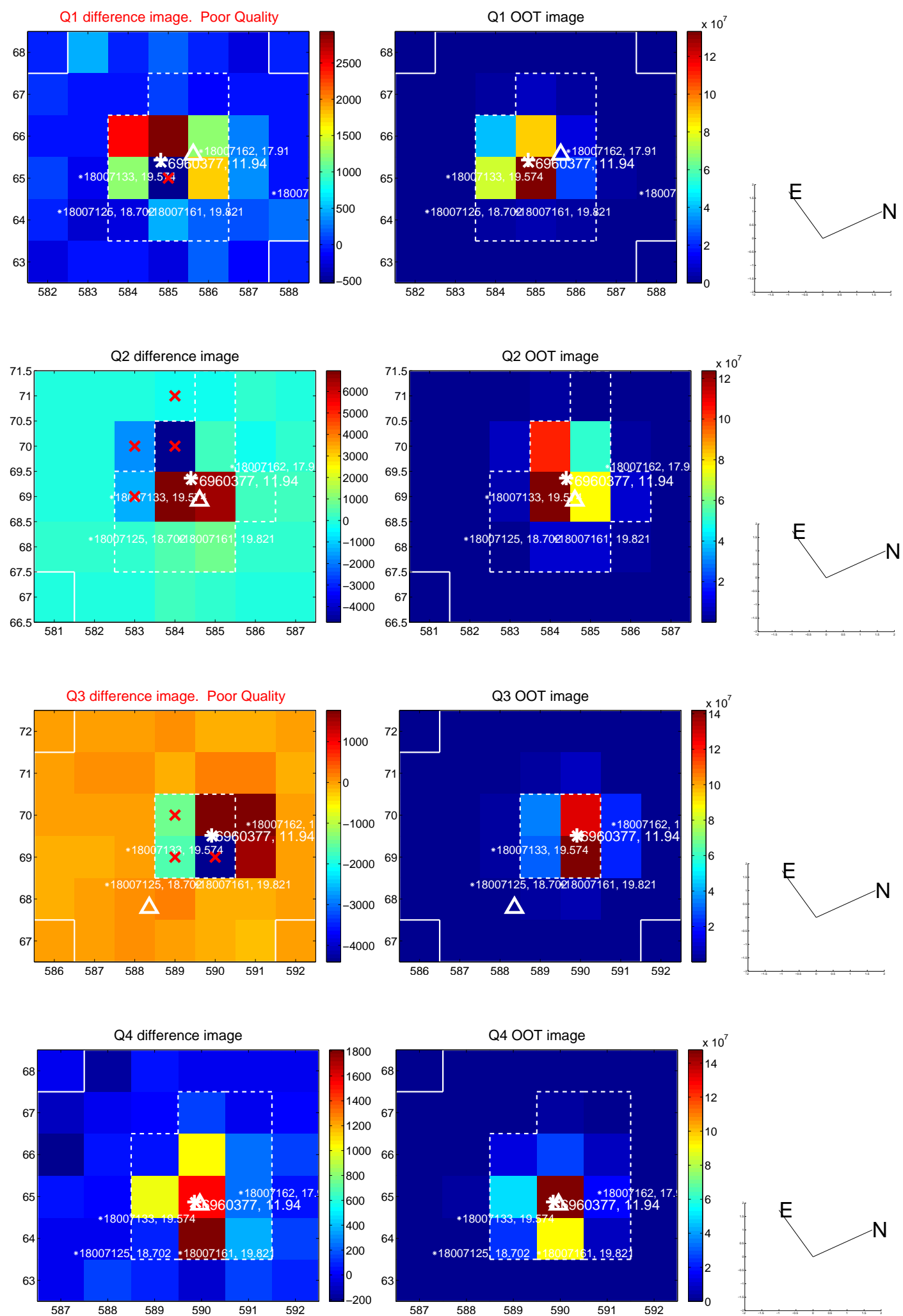
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.911 ± 0.412	2.21	-0.870 ± 0.340	-0.271 ± 0.602
PRF-fit source offset from KIC position	0.793 ± 0.461	1.72	-0.723 ± 0.351	-0.326 ± 0.638
photometric centroid source offset	0.28 ± 0.59	0.47	0.22 ± 0.58	0.17 ± 0.60

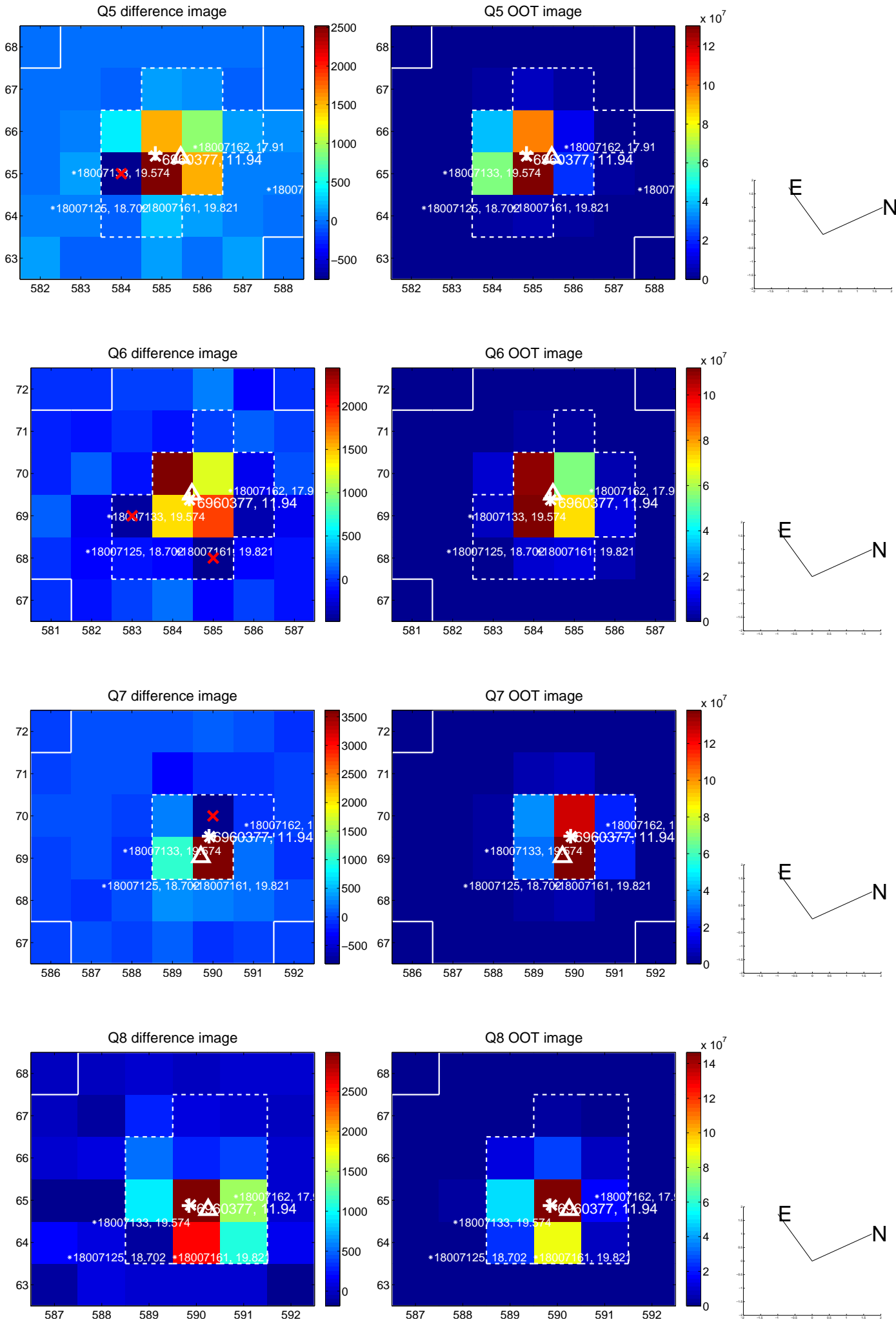


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

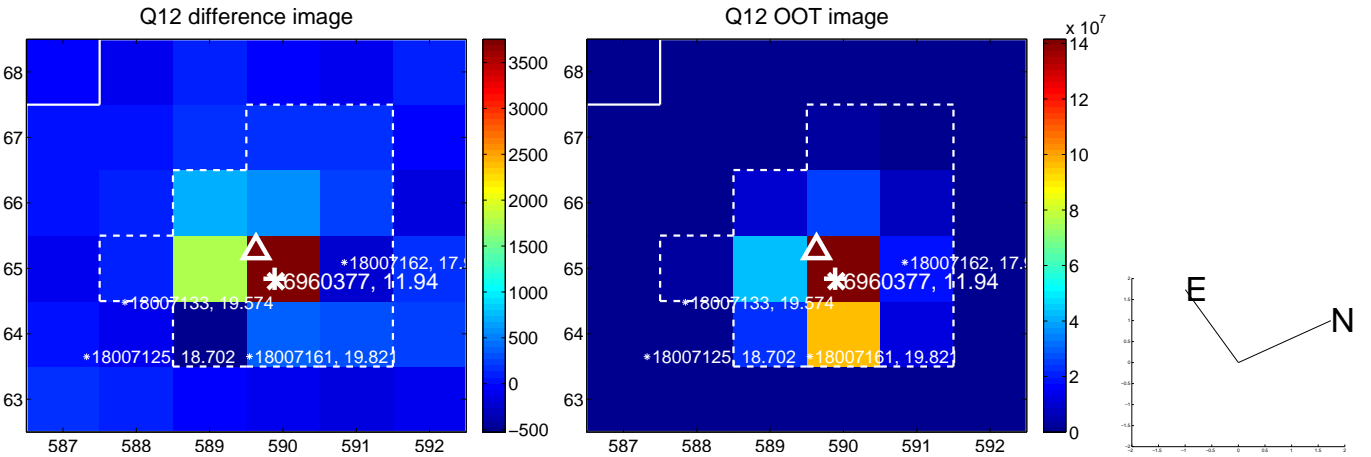
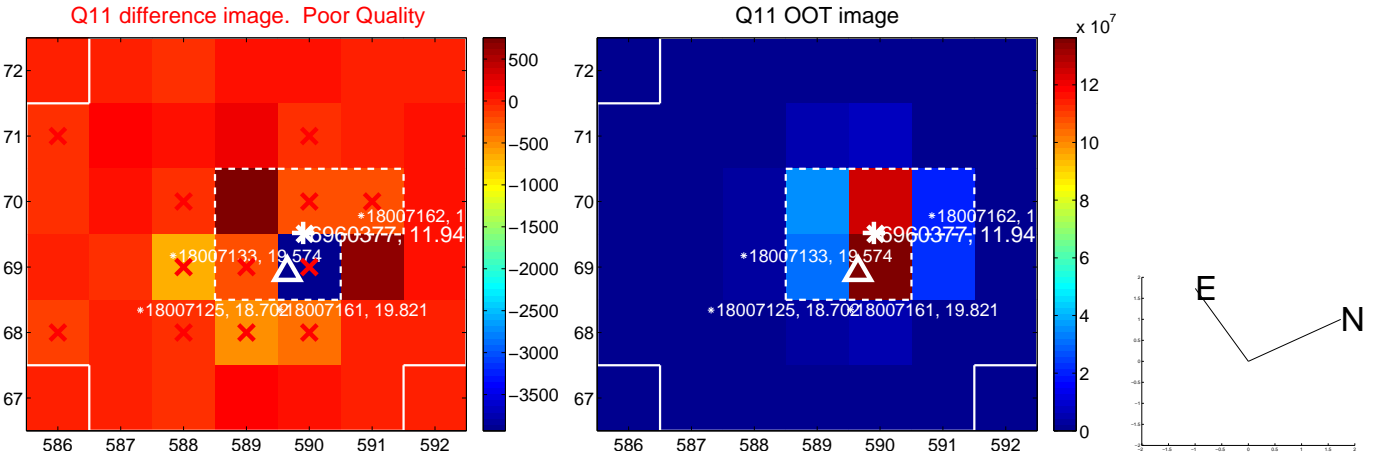
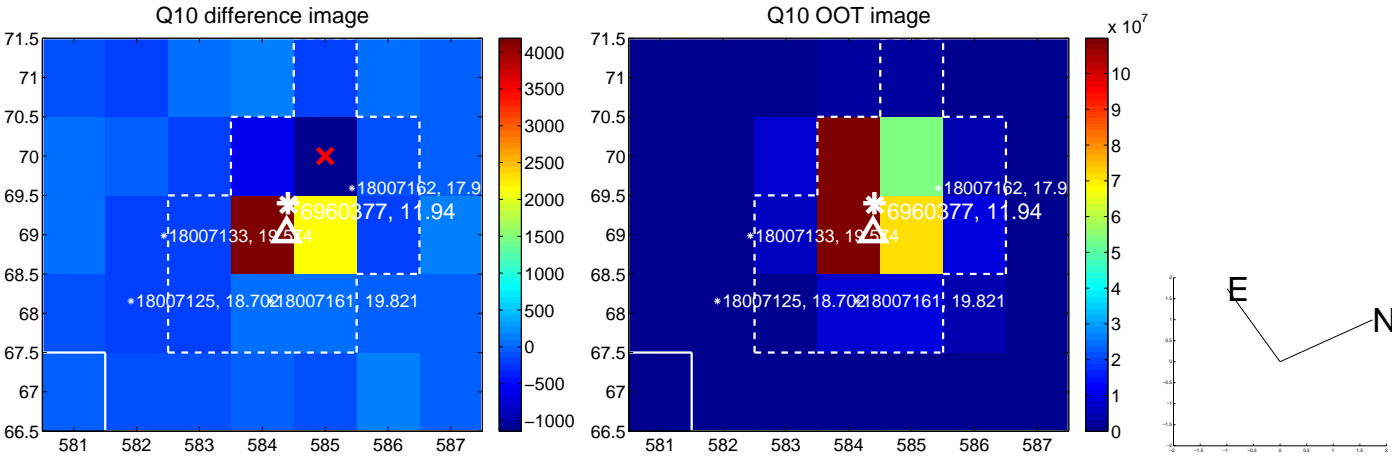
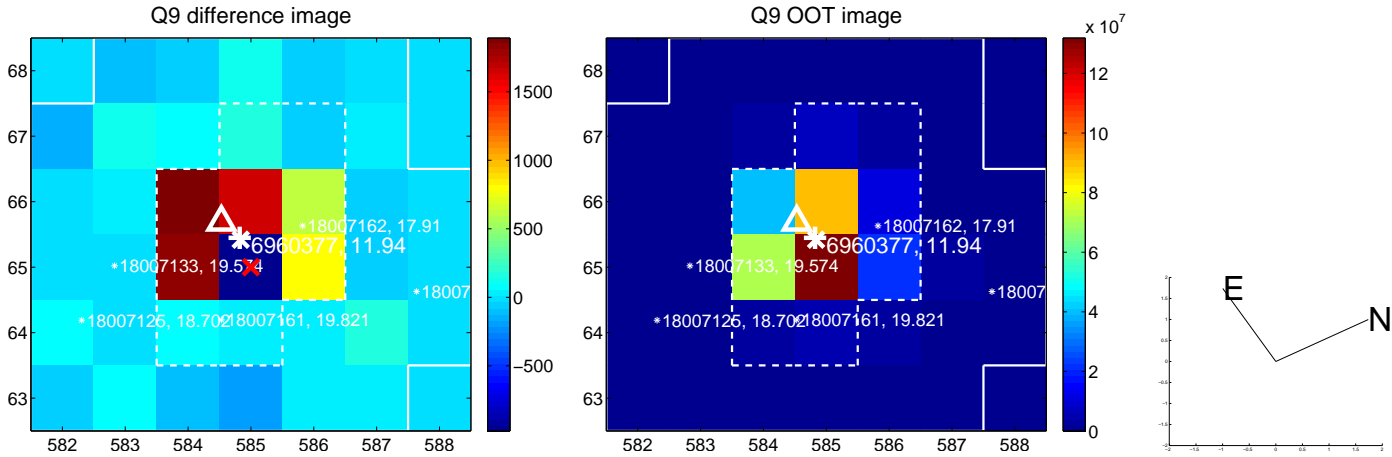
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



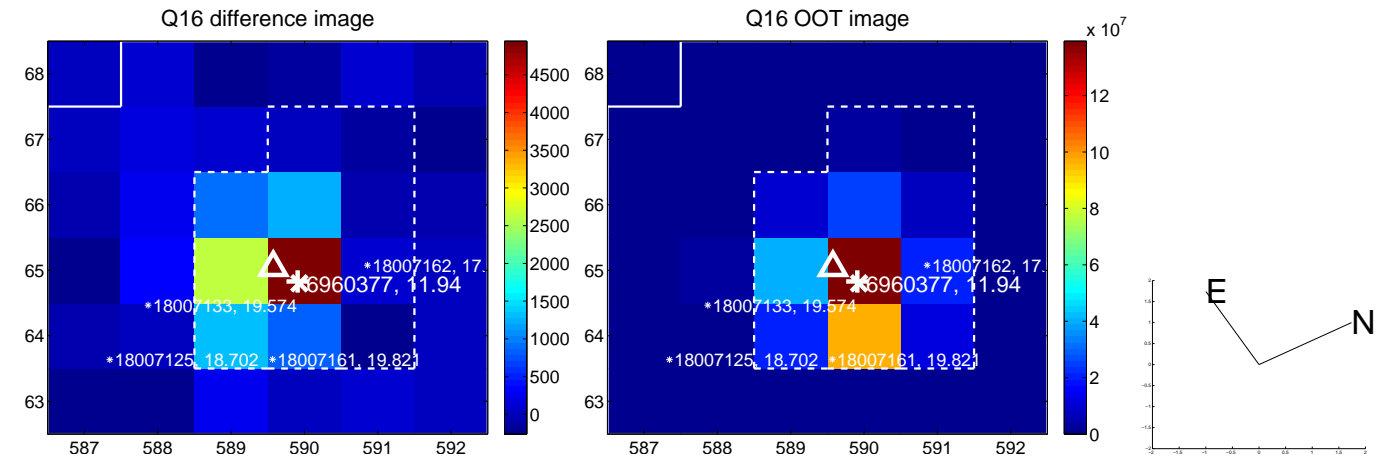
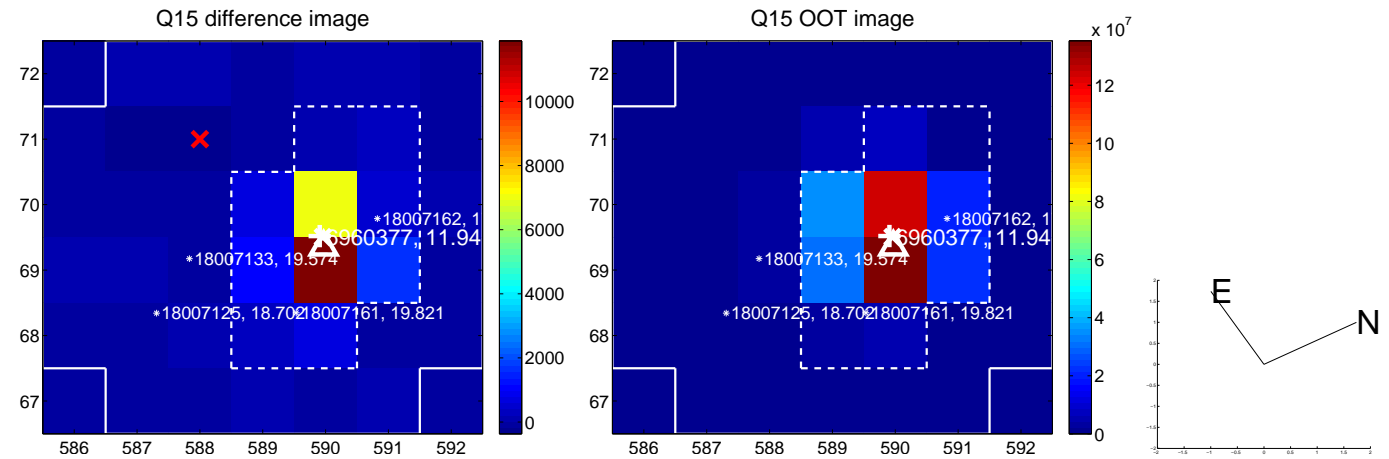
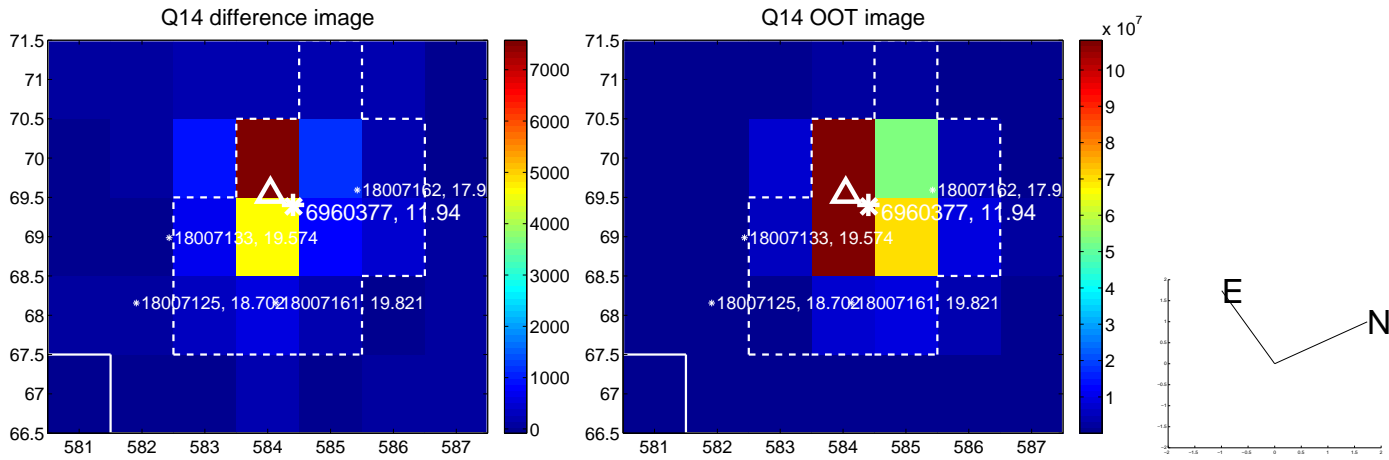
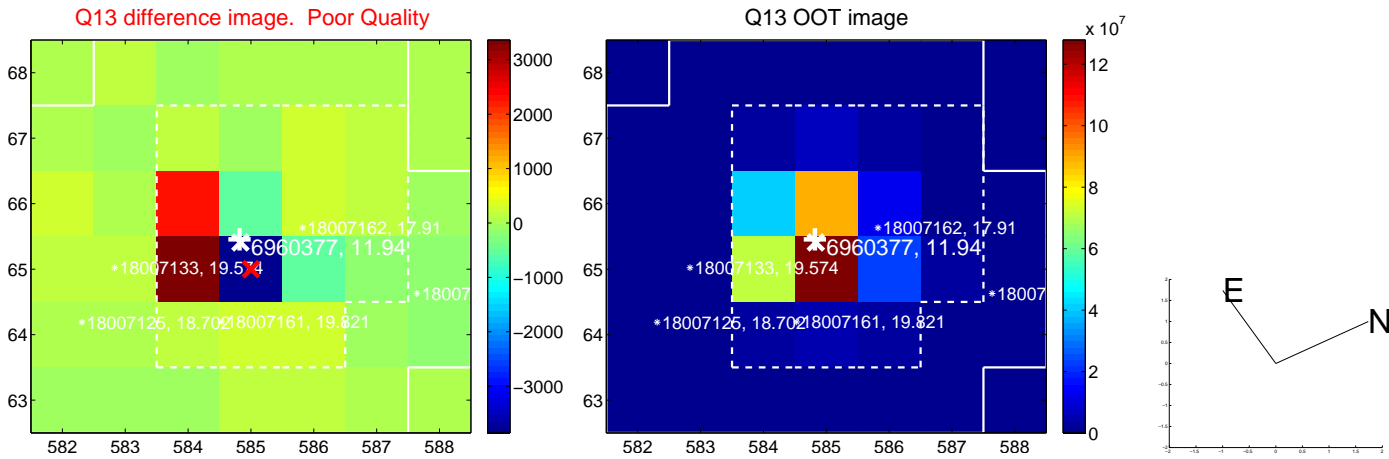
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



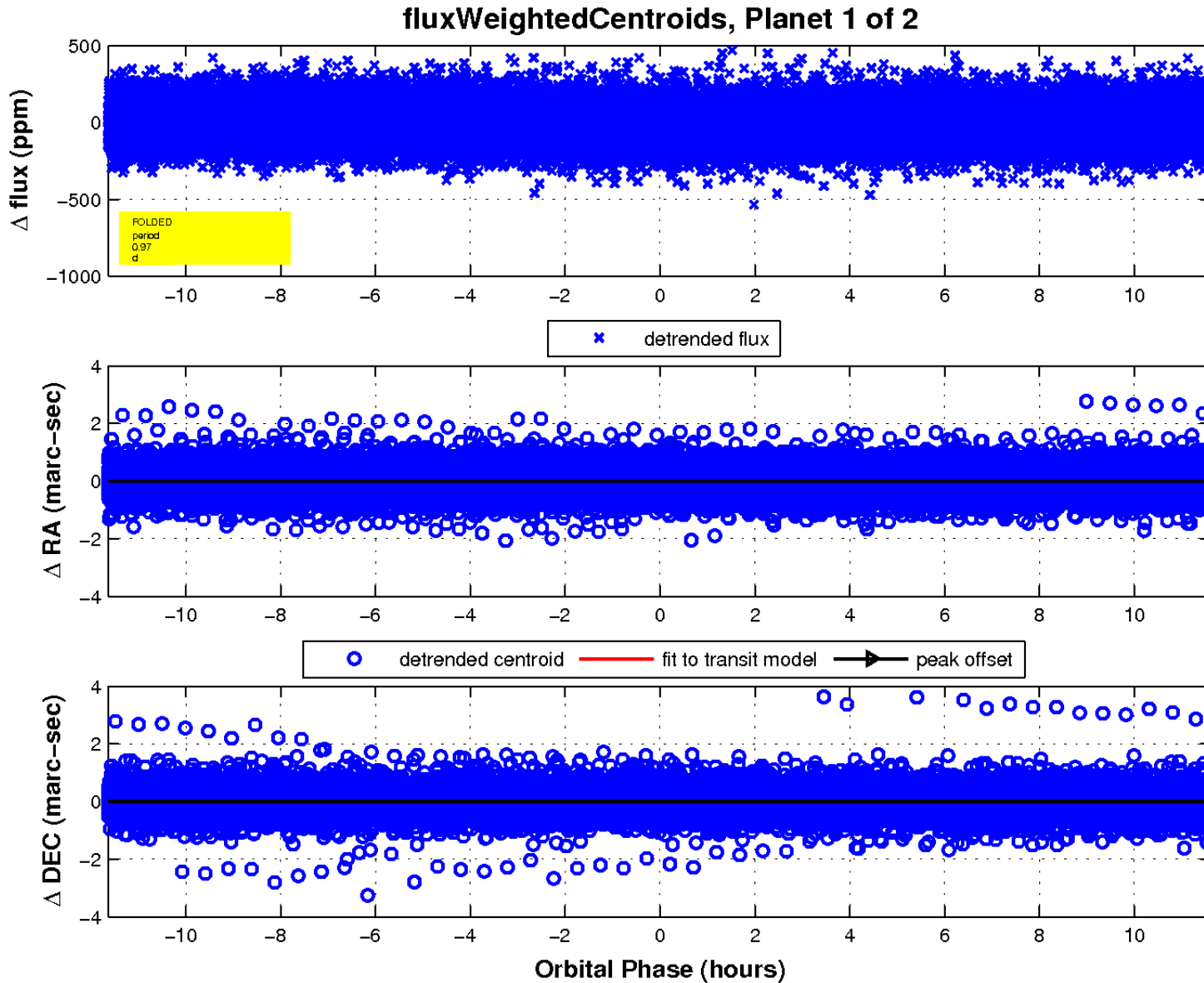
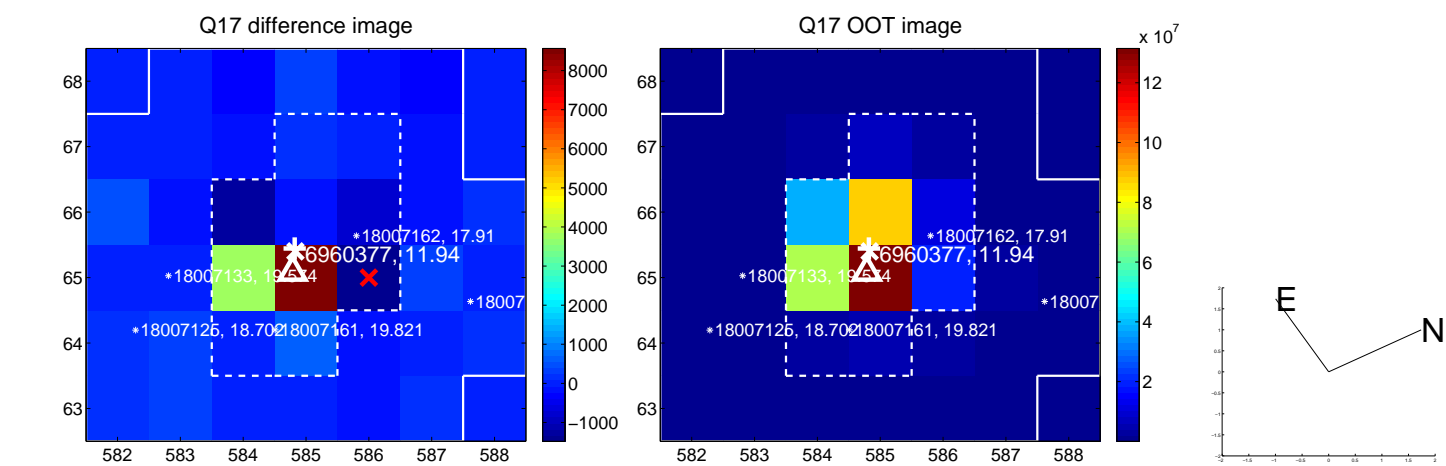
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

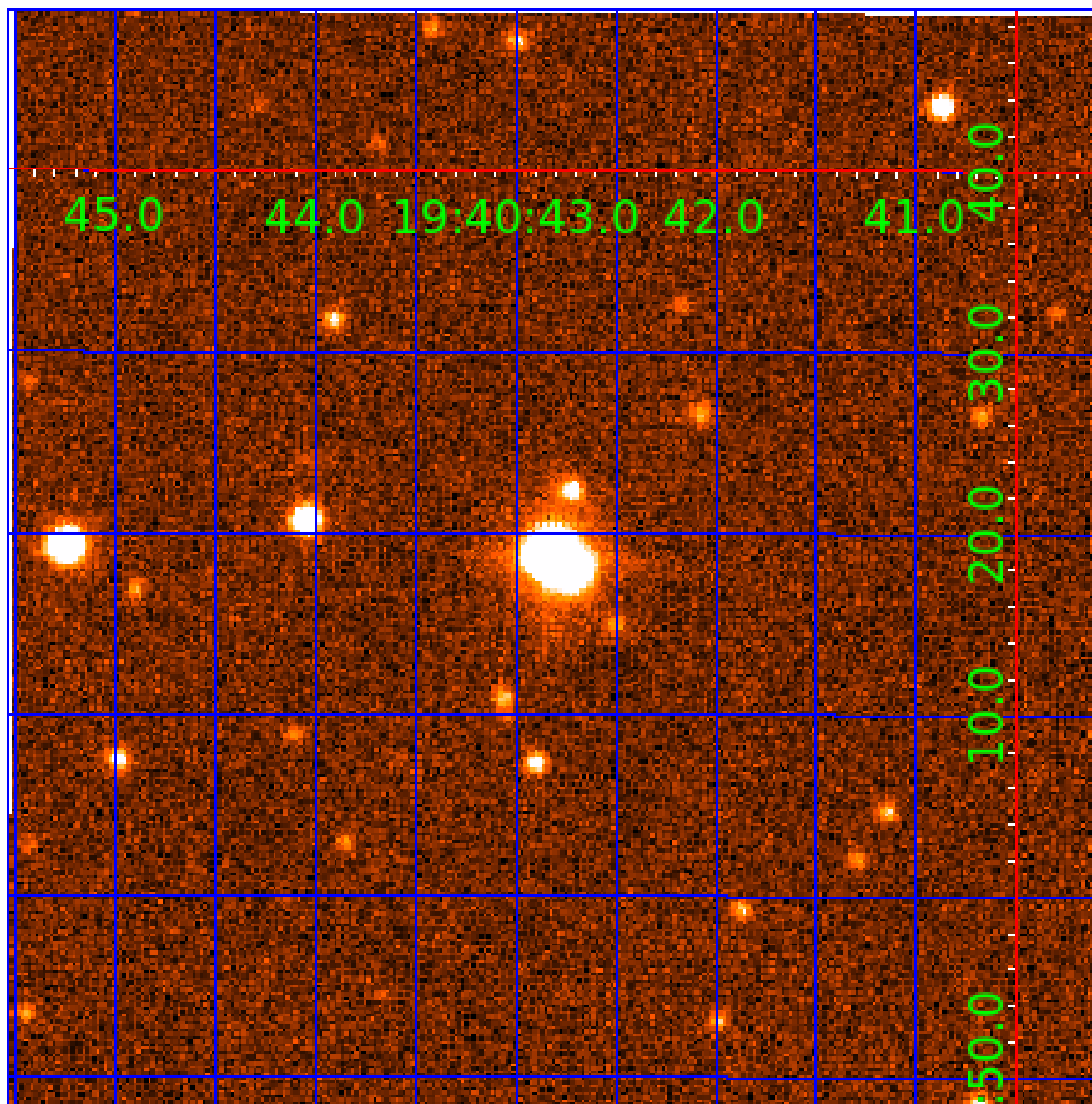


white \times : KIC target position; $+$: OOT centroid; Δ : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006960377

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})
006960377-01	OBS	No	0.970129	132.460921	12.6	5.147	10.1	12.8	3.11	7872	1.14	54267.82
006960377-02	OBS	No	181.532000	186.345308	331.1	33.678	11.0	6.0	3.11	7872	10.86	50.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006960377-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
006960377-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_MEAS

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

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

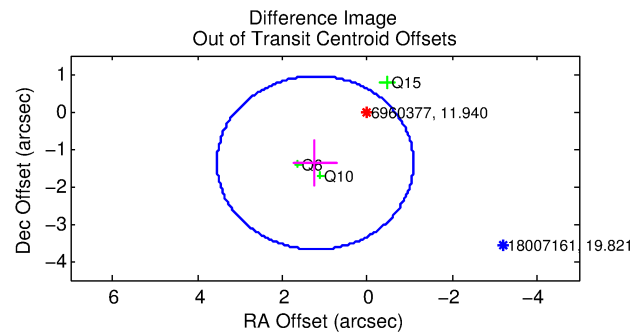
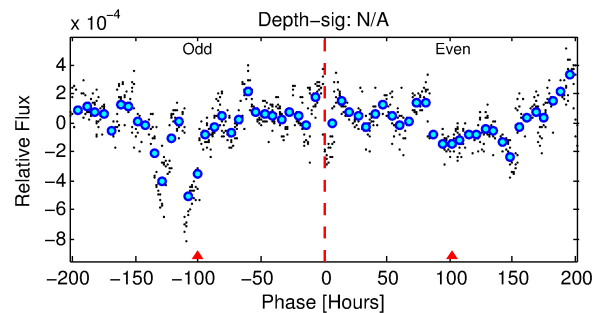
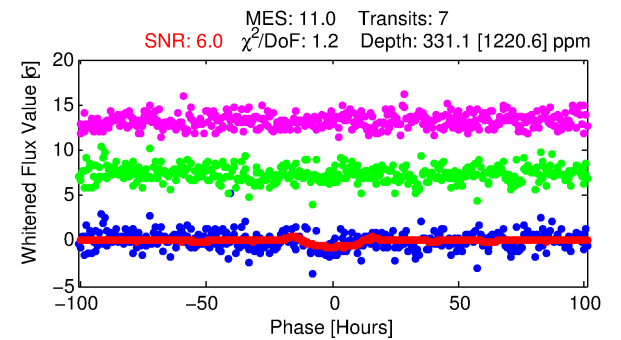
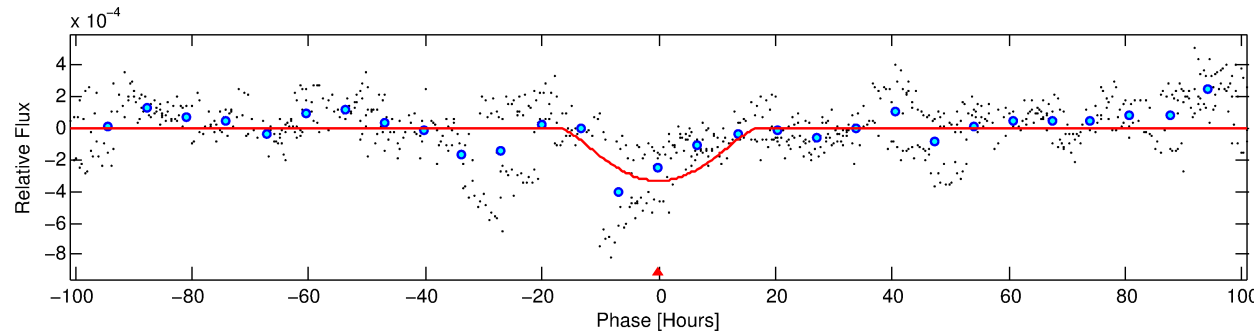
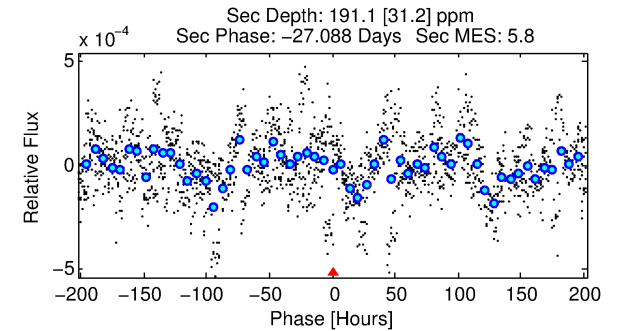
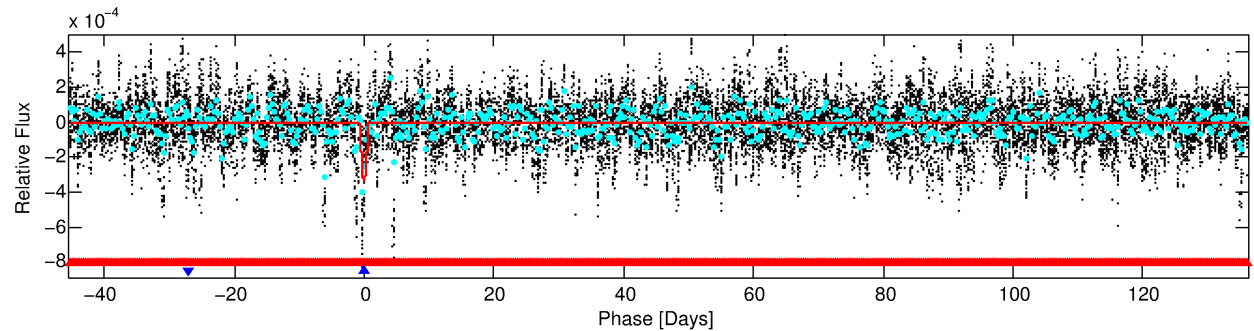
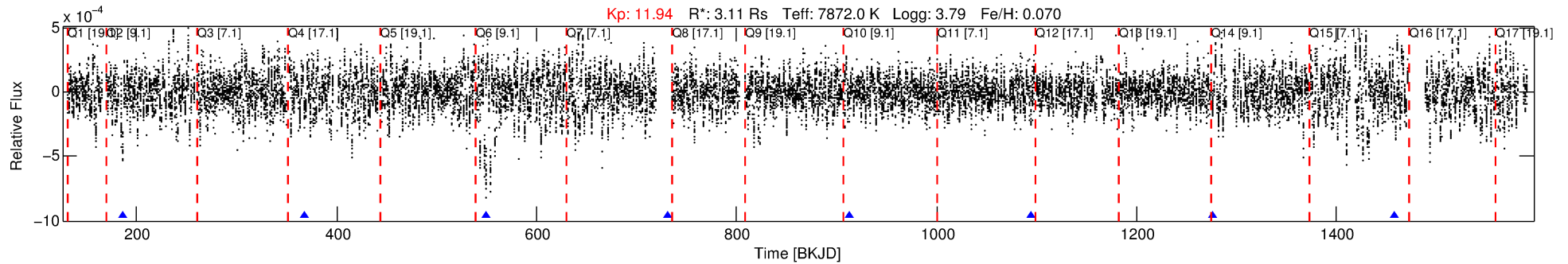
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006960377-02

No Significant Match Found

DV One-Page Summary

KIC: 6960377 Candidate: 2 of 2 Period: 181.532 d



DV Fit Results:

Period = 181.53200 [0.03904] d
Epoch = 186.3453 [0.1548] BKJD
Rp/R* = 0.0320 [0.0643]
a/R* = 10.55 [5.60]
b = 1.00 [0.18]
Seff = 50.70 [33.23]
Teq = 680 [111] K
Rp = 10.86 [22.27] Re
a = 0.8099 [0.3216] AU
Ag = 585.16 [2381.52] [0.25σ]
Teffp = 5174 [5206] K [0.86σ]

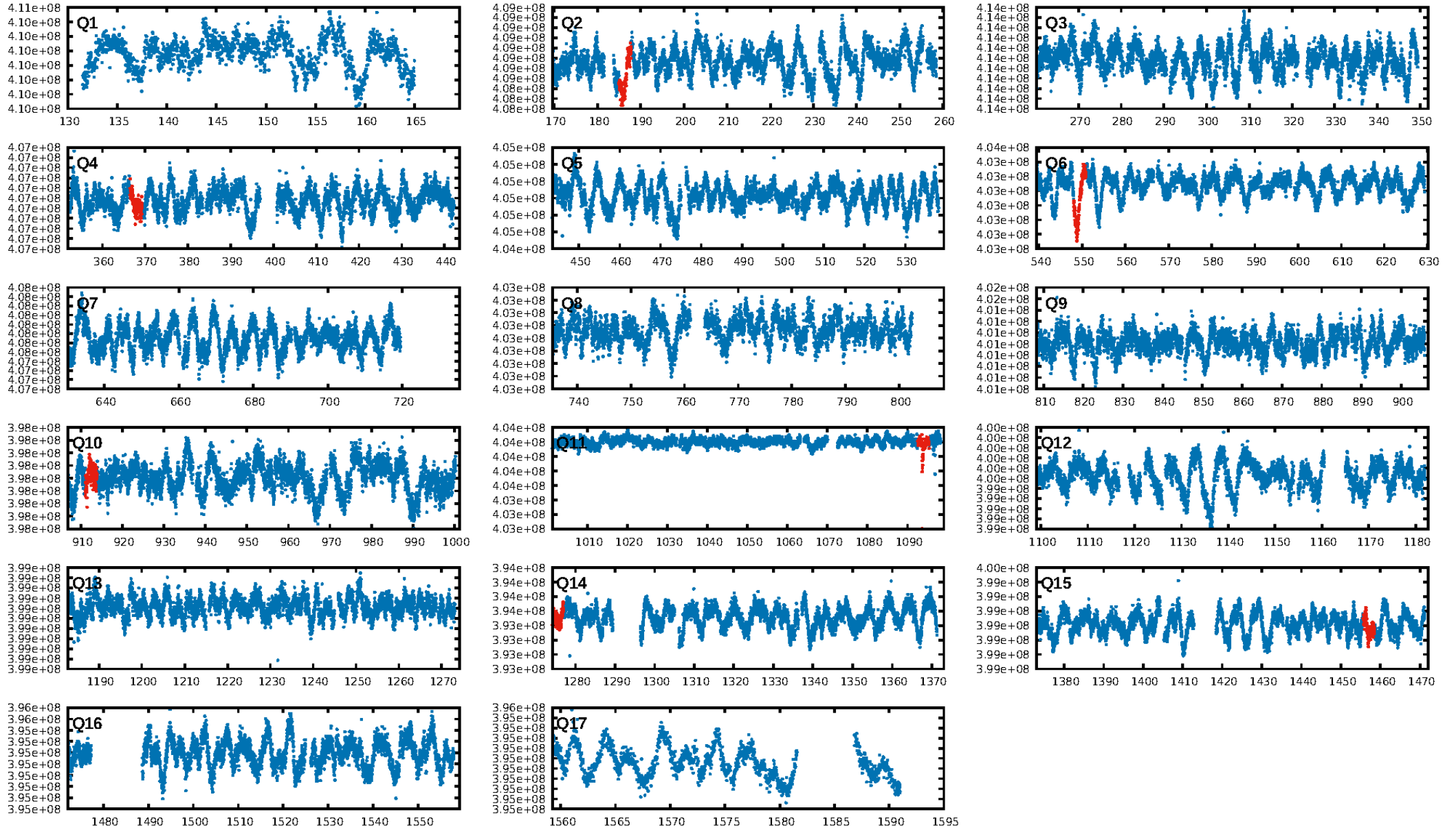
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [127.20σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.96e-14
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: 0.8248
Centroid-sig: 5.9%
Centroid-so: 0.515 arcsec [1.42σ]
OotOffset-rm: 1.835 arcsec [2.38σ]
KicOffset-rm: 1.946 arcsec [3.99σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-st: 2/1/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
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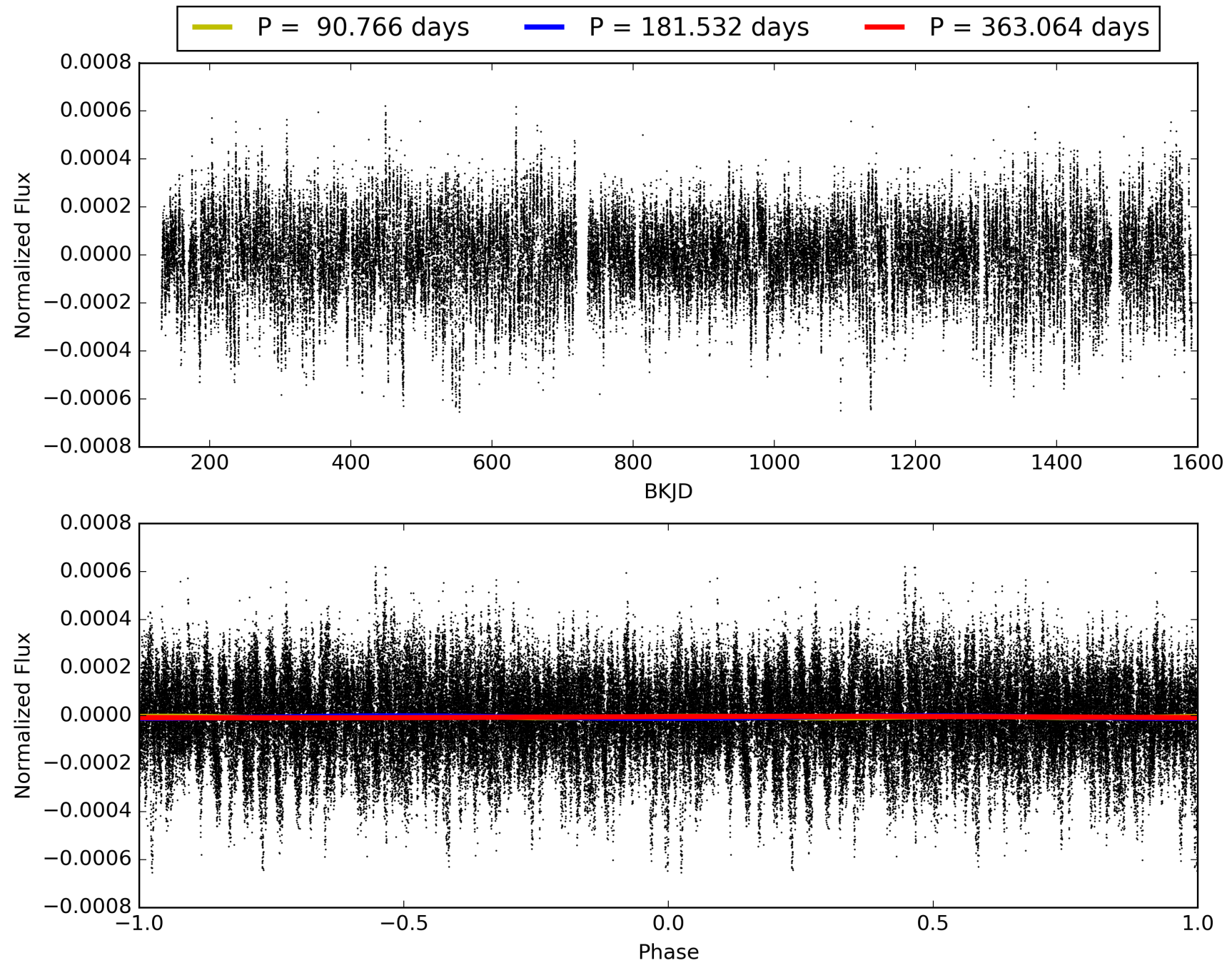
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006960377-02, PDC Light Curves

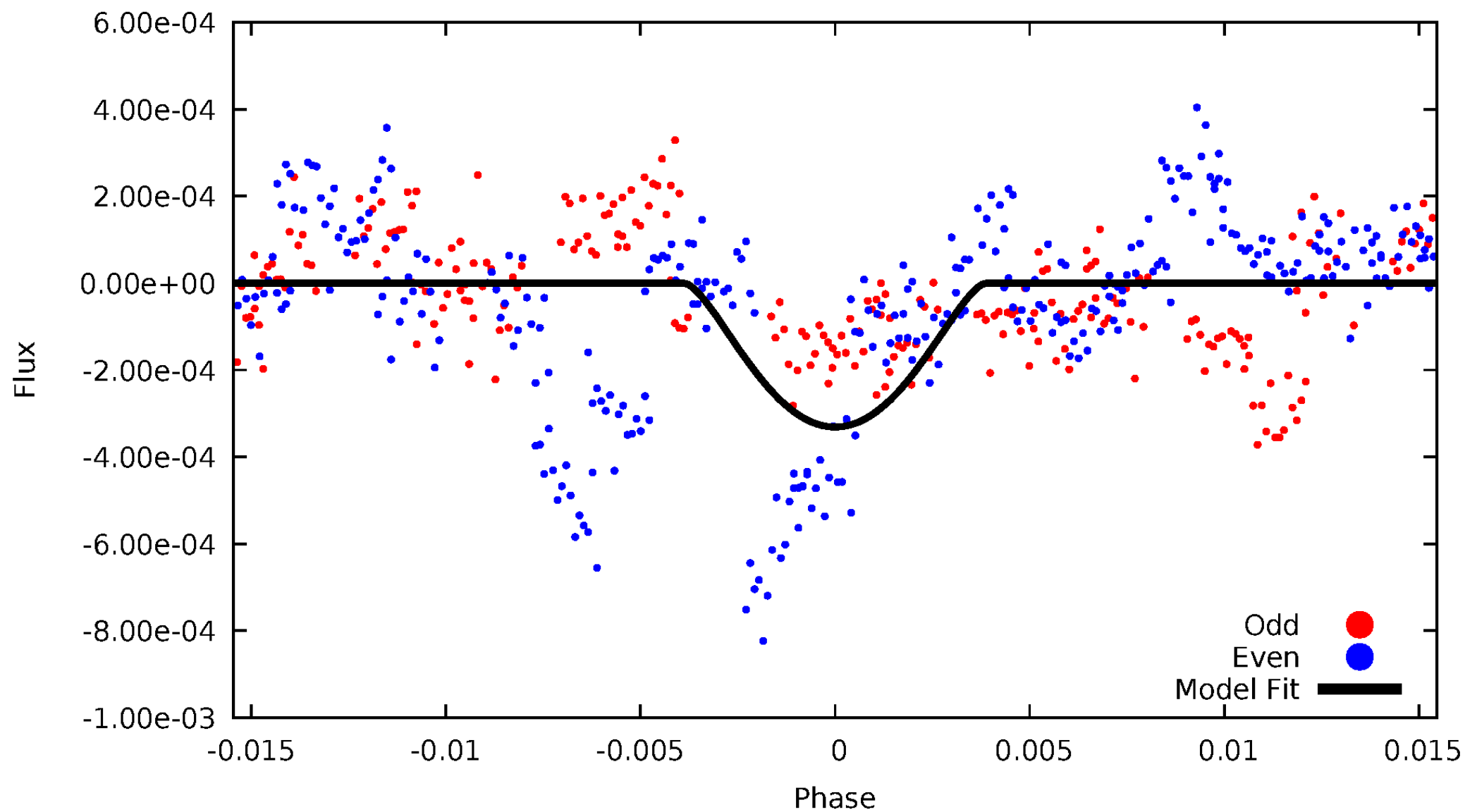


TCE 006960377-02



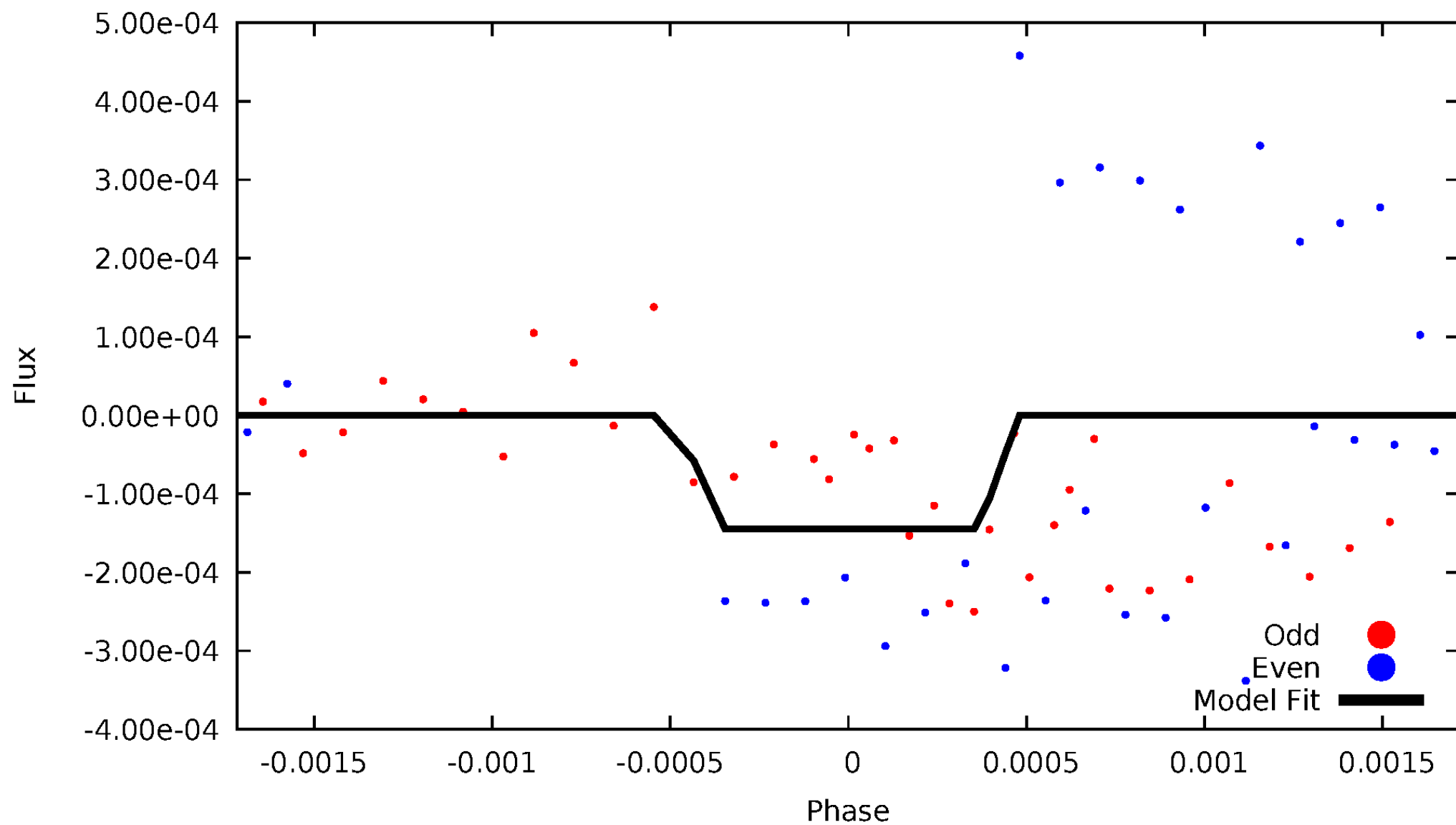
DV Odd/Even

TCE 006960377-02



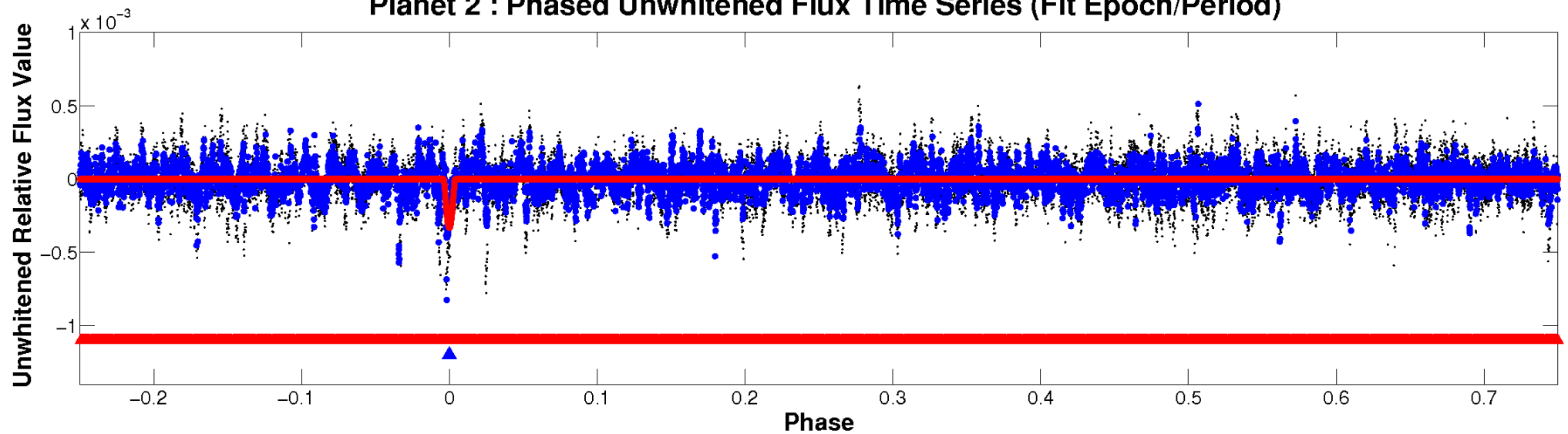
ALT Odd/Even

TCE 006960377-02

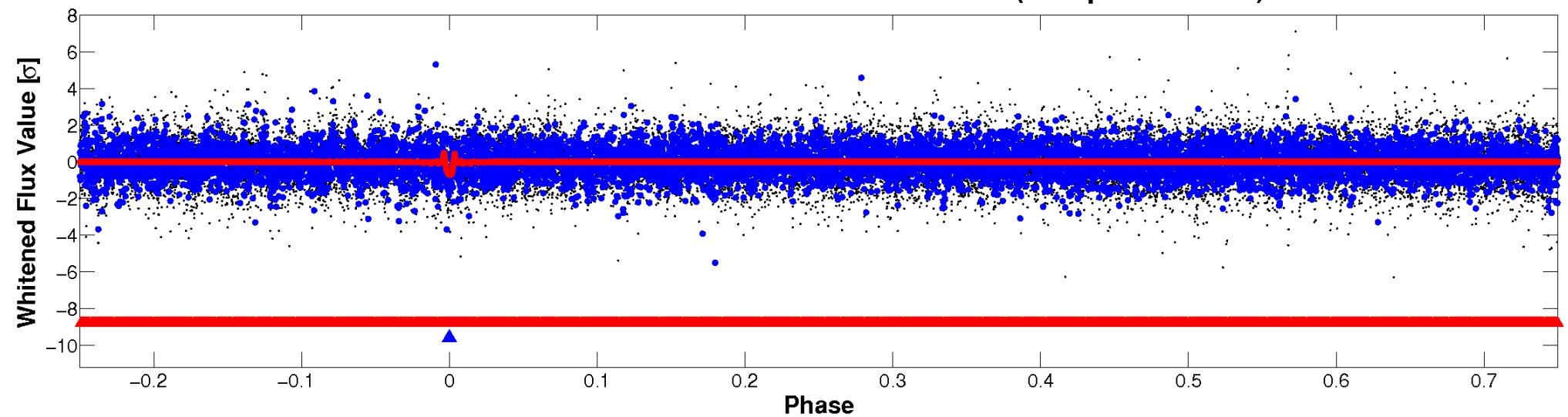


Non-Whitened Vs. Whitened Light Curve

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

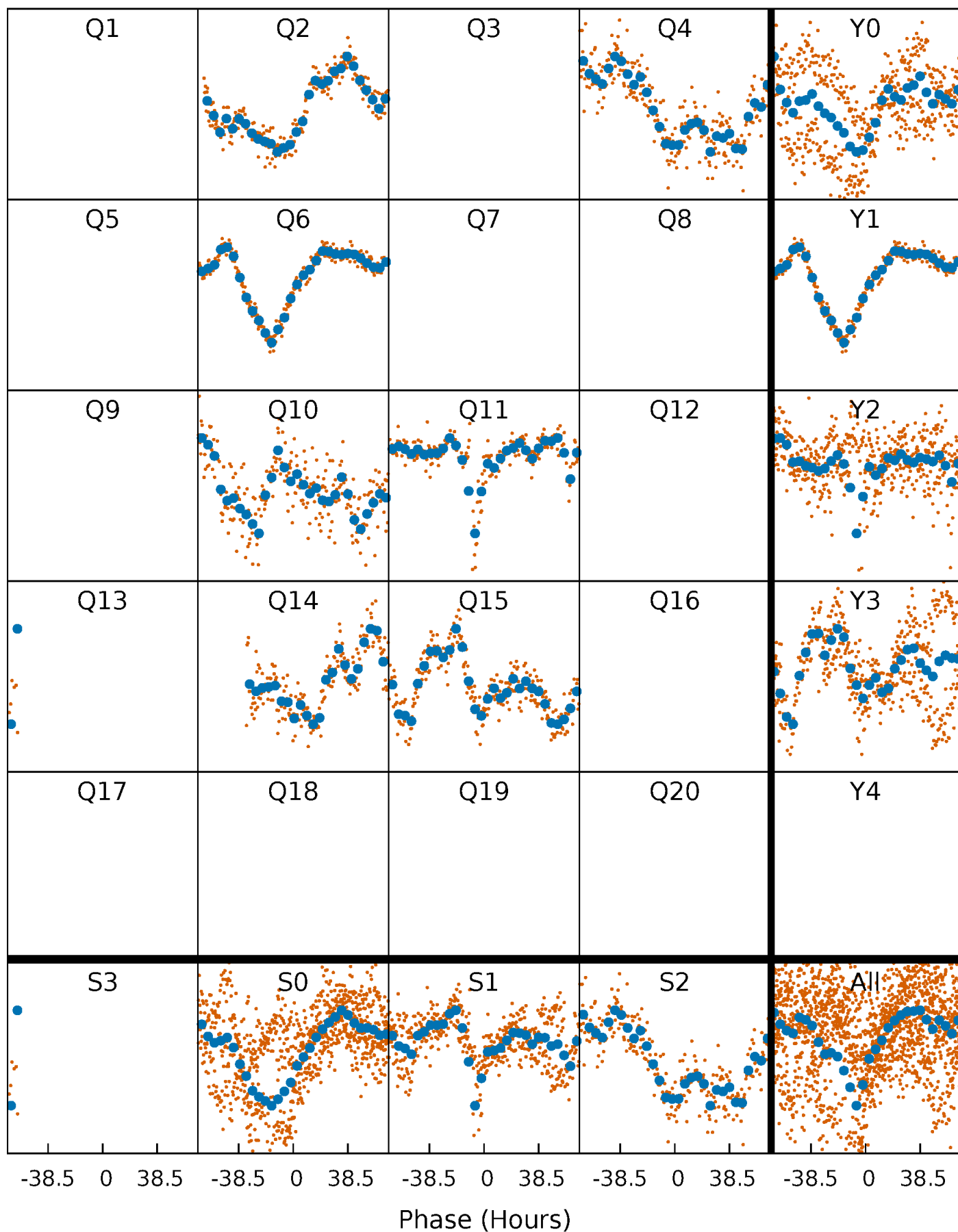


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



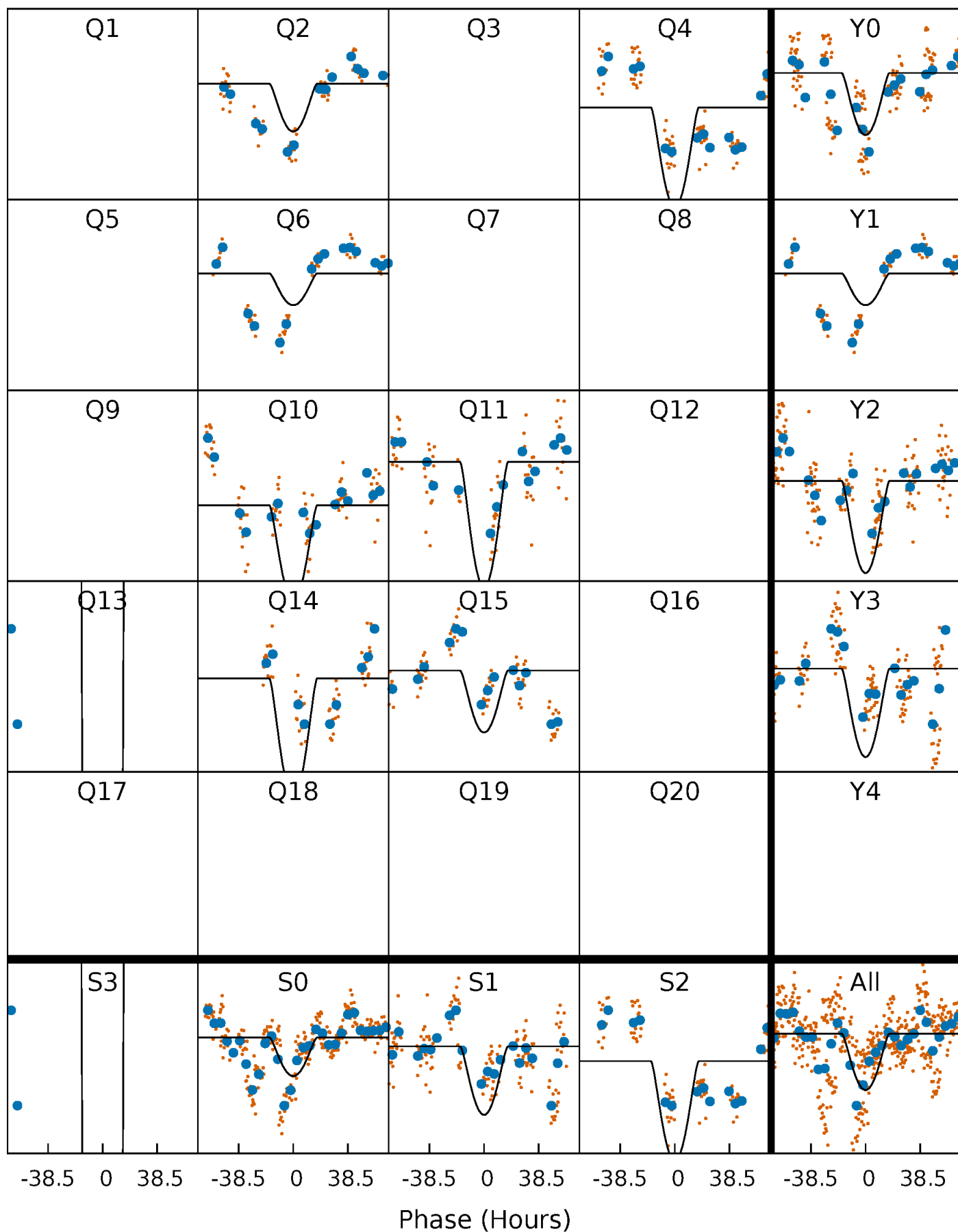
PDC Quarter-Phased Transit Curves

TCE 006960377-02 P=181.532000 Days $T_0=186.345308$ (BKJD)



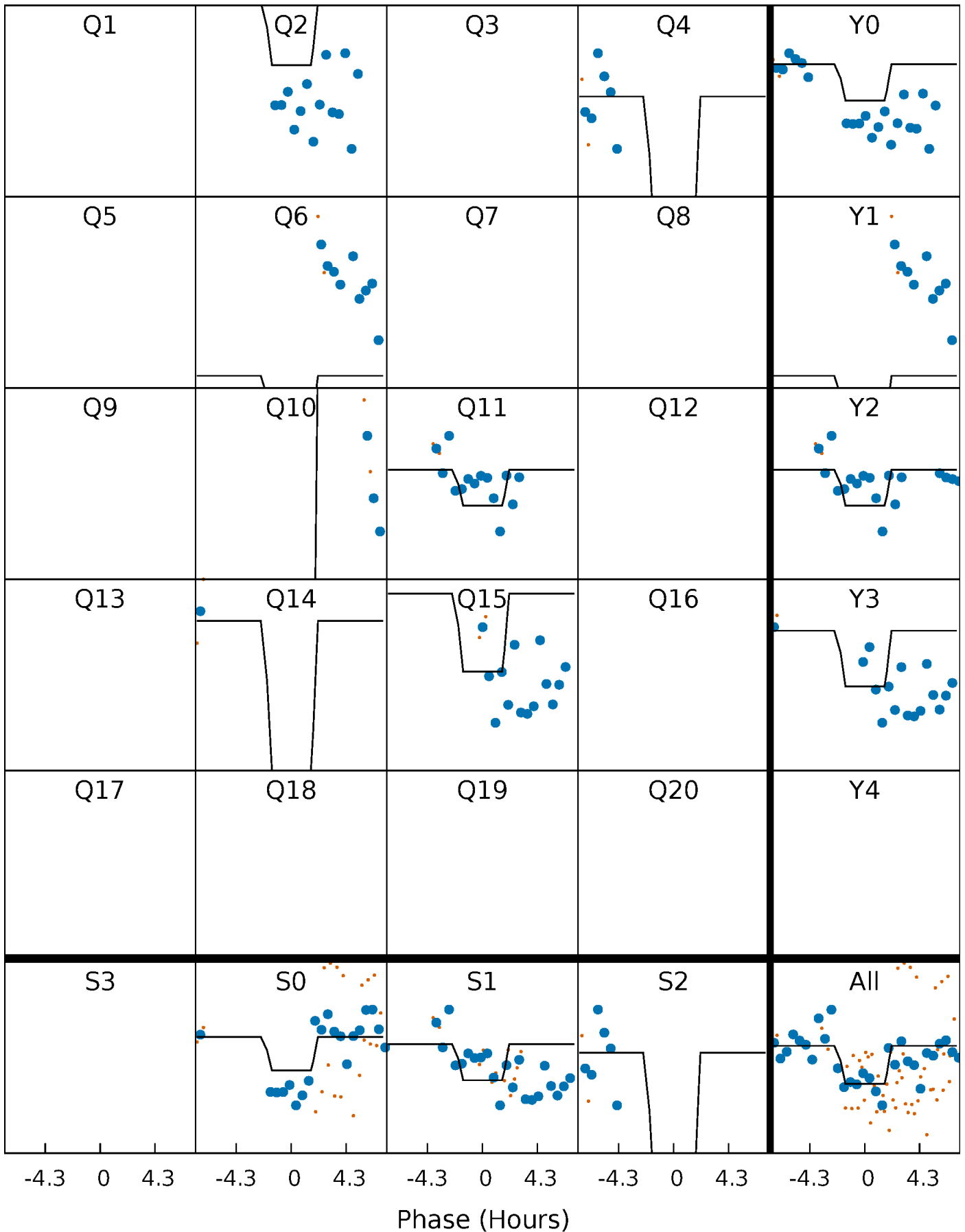
DV Quarter-Phased Transit Curves

TCE 006960377-02 P=181.532000 Days $T_0=186.345308$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

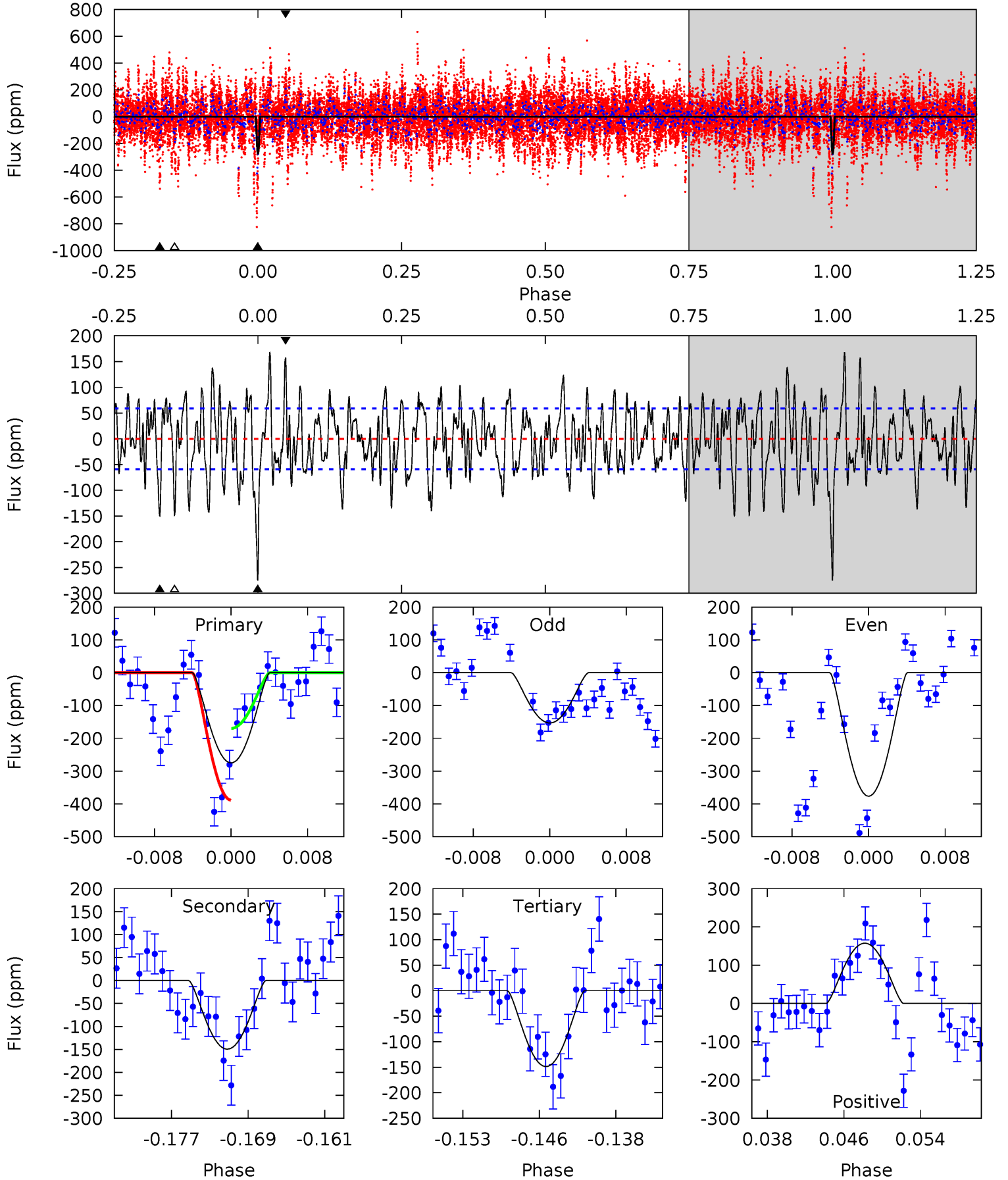
TCE 006960377-02 P=181.824628 Days $T_0=186.216428$ (BKJD)



DV Model-Shift Uniqueness Test

006960377-02, P = 181.532000 Days, E = 4.813308 Days

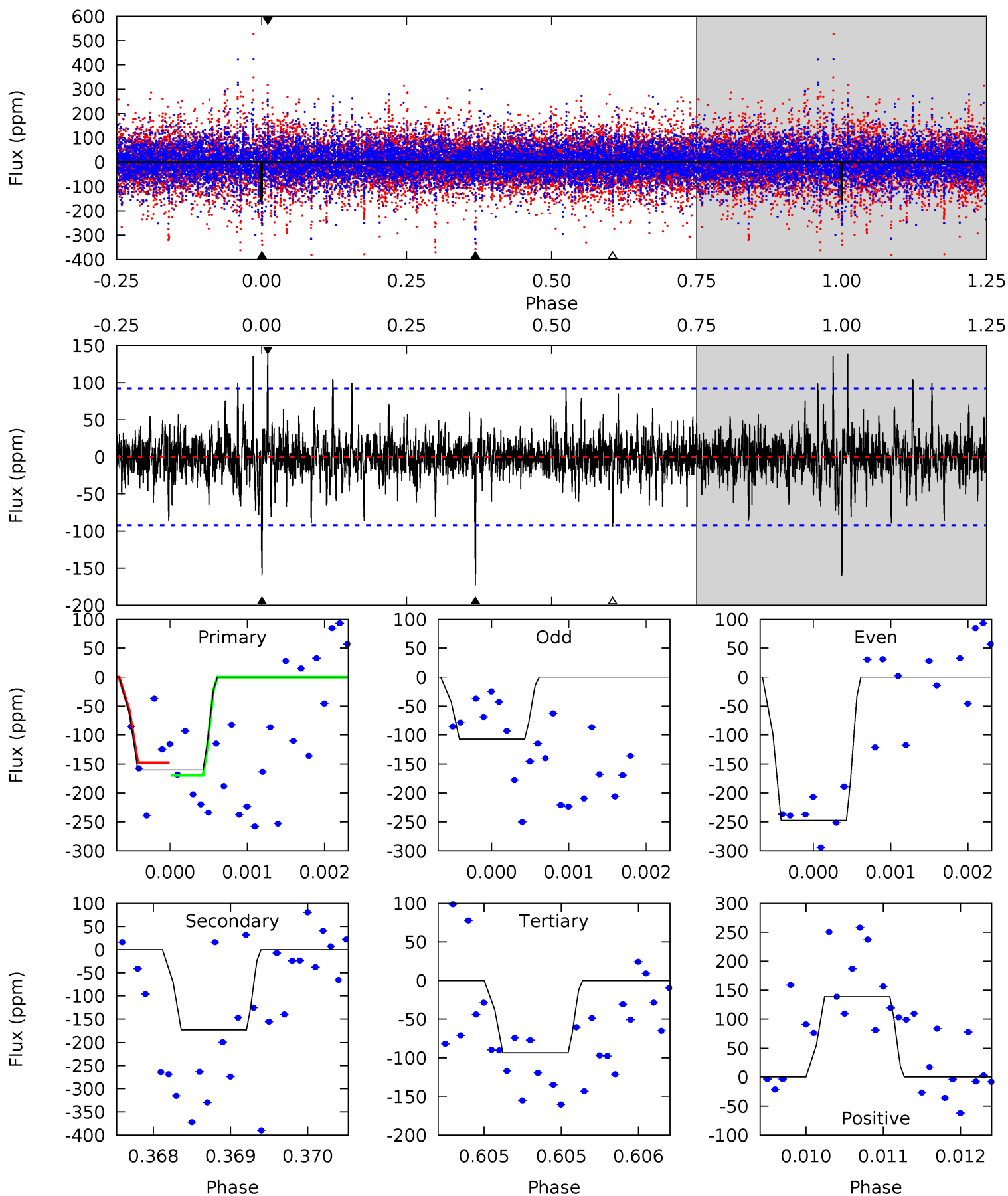
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.7	12.9	12.8	13.5	5.08	2.67	4.72	10.9	10.1	0.07	-0.68	9.13	1.68	0.38	9.44



Alt Model-Shift Uniqueness Test

006960377-02, P = 181.824628 Days, E = 4.391800 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.54	10.3	5.56	8.25	5.48	3.34	1.34	3.98	1.29	4.74	2.05	4.05	1.15	0.44	0.62



Stellar Parameters For KIC 006960377

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7872^{+218}_{-354}	$3.785^{+0.368}_{-0.092}$	$0.070^{+0.200}_{-0.400}$	$3.109^{+0.558}_{-1.302}$	$2.150^{+0.265}_{-0.574}$	$0.101^{+0.310}_{-0.030}$
	+3%/-4%	+10%/-2%	+286%/-571%	+18%/-42%	+12%/-27%	+308%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006960377-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-149 ± 12	$17.00^{+17.39}_{-11.70}$	919^{+65}_{-98}	3914^{+2395}_{-755}	191^{+1588}_{-145}
Alt.	-173 ± 17	$15.58^{+15.89}_{-10.90}$	923^{+64}_{-94}	4229^{+2999}_{-912}	258^{+2567}_{-195}

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

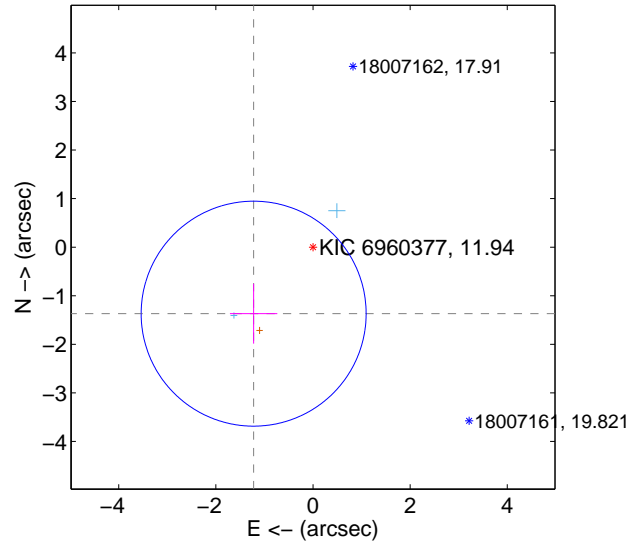
Supplemental centroid analysis for 006960377-02. **Kepler magnitude: 11.94.** Transit SNR 6.02

There are 2 quarters with good PRF difference image offsets

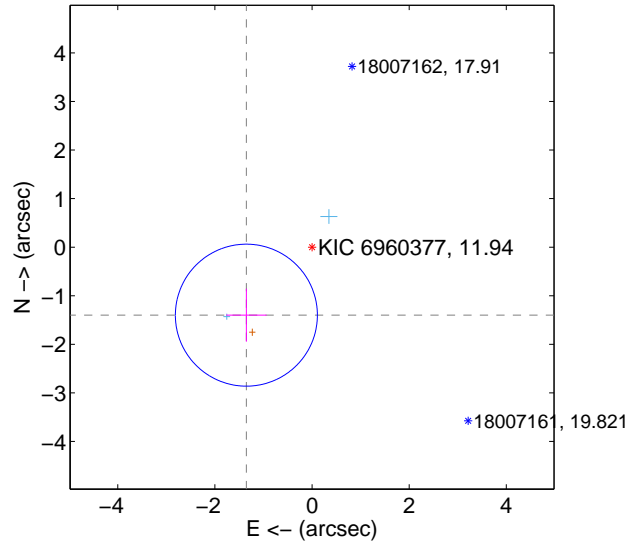
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.835 ± 0.772	2.38	1.222 ± 0.489	-1.369 ± 0.617
PRF-fit source offset from KIC position	1.946 ± 0.487	3.99	1.352 ± 0.415	-1.400 ± 0.546
photometric centroid source offset	0.52 ± 0.36	1.42	-0.31 ± 0.40	-0.41 ± 0.34

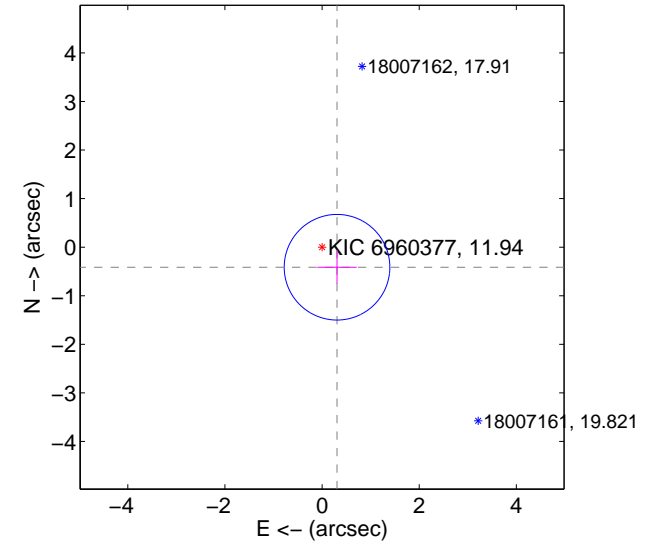
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

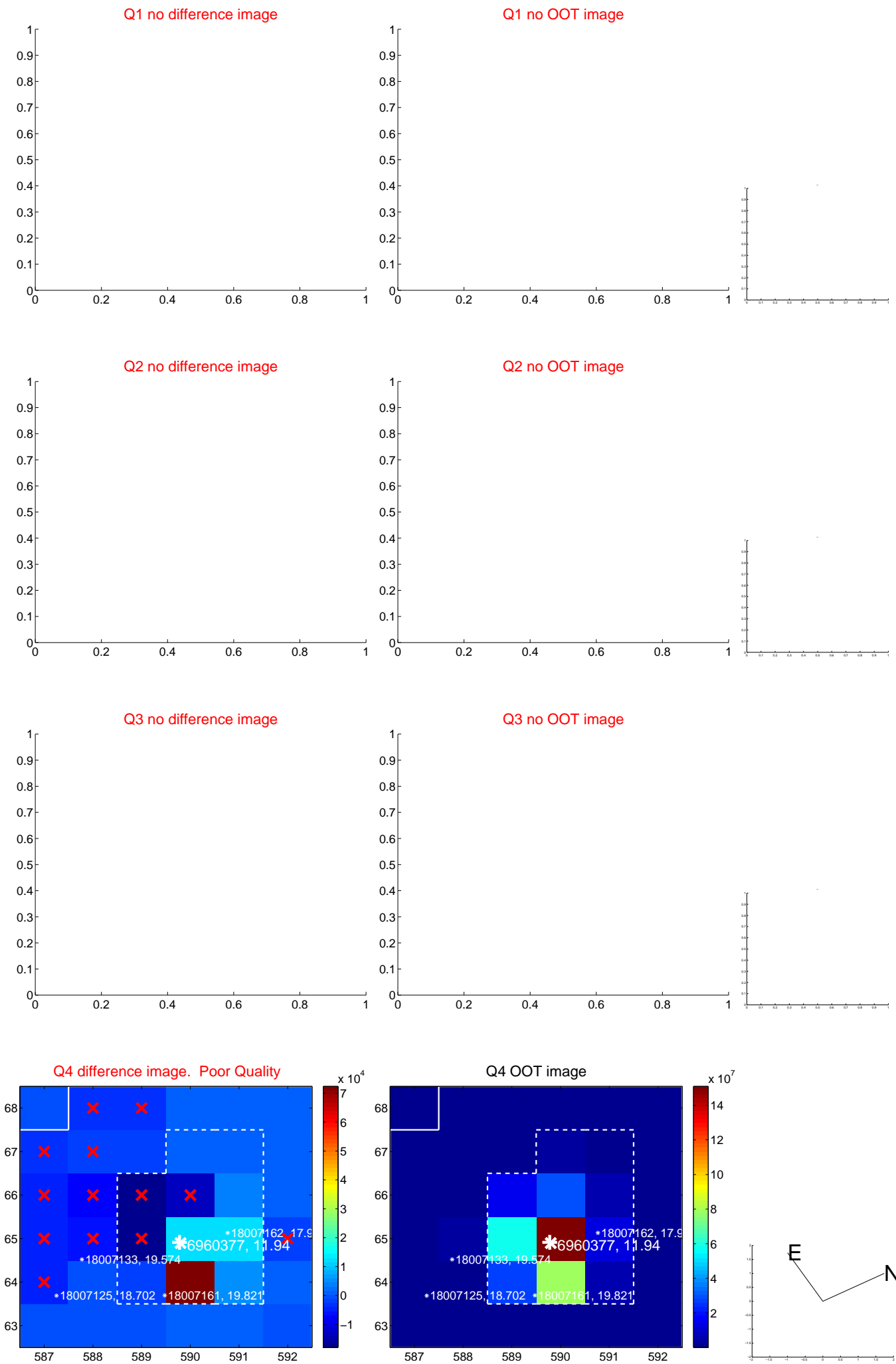


offset from photometric centroids

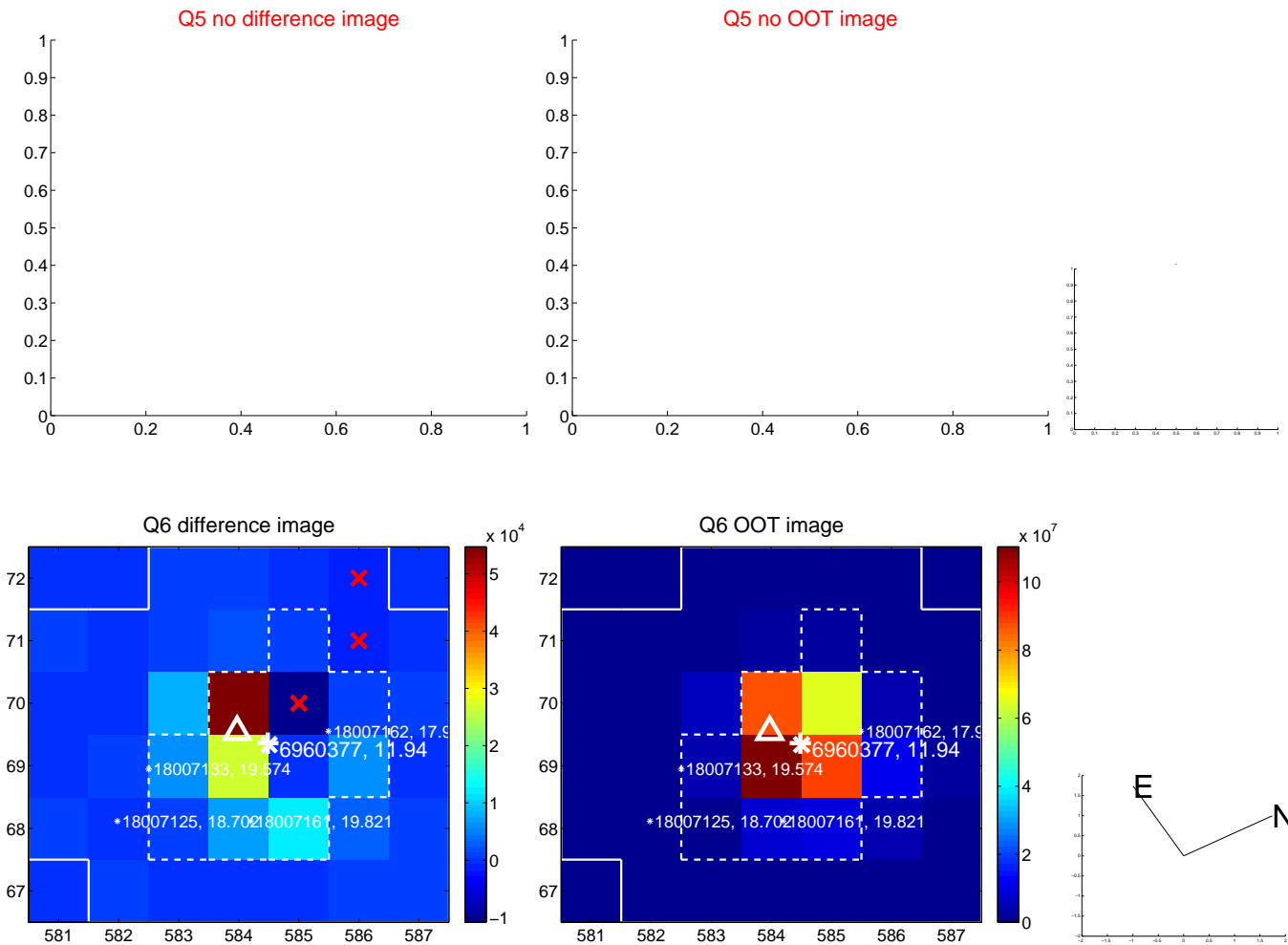


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



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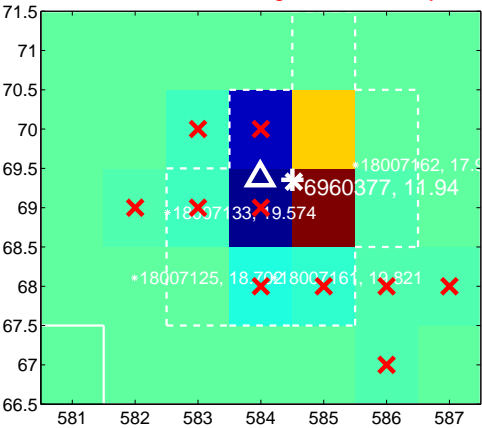
Q9 no difference image



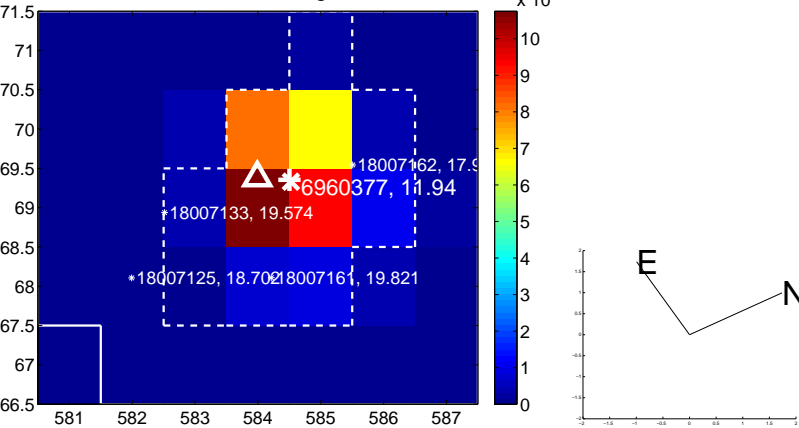
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



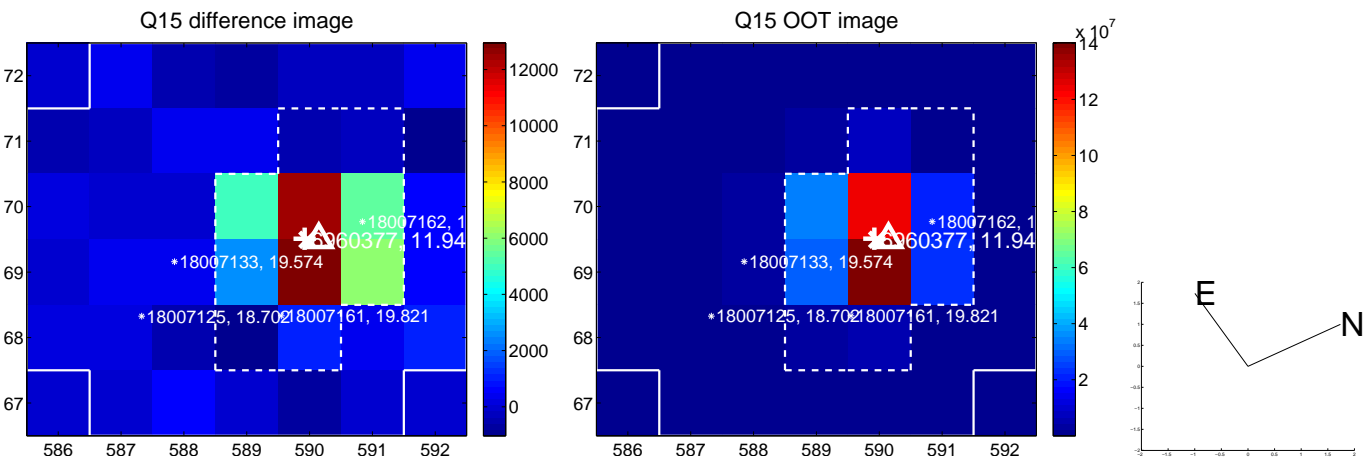
Q12 no difference image



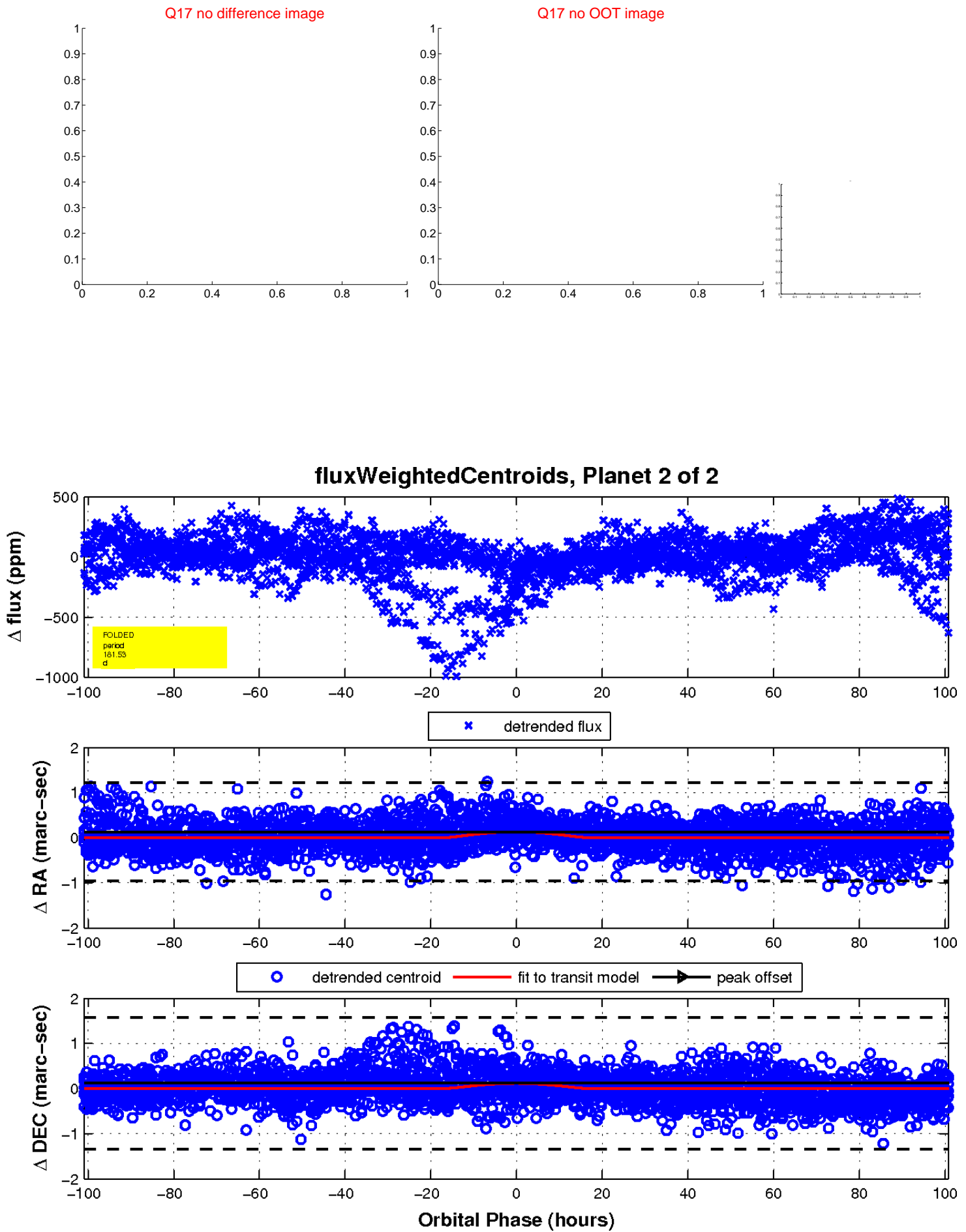
Q12 no OOT image



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

Declination

