

KIC 010978948

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})
010978948-01	OBS	No	207.538228	263.711624	116.6	25.898	25.9	3.0	154.87	3269	162.88	0.00
010978948-02	OBS	No	534.448466	162.937868	3508.2	15.508	17.9	8.1	154.87	3269	1041.11	1410.32
010978948-03	OBS	No	365.527455	166.947806	1167.4	29.692	9.6	10.7	154.87	3269	1162.25	2340.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010978948-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010978948-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010978948-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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.

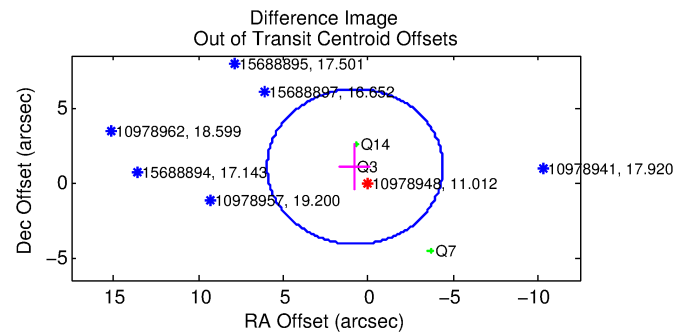
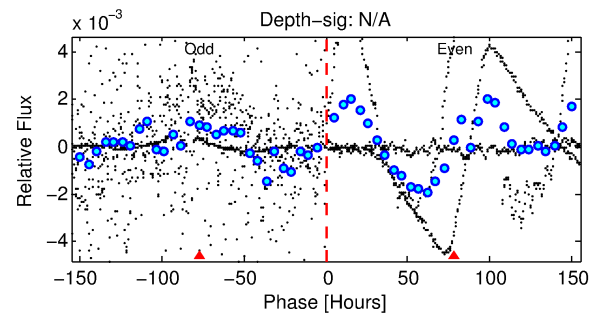
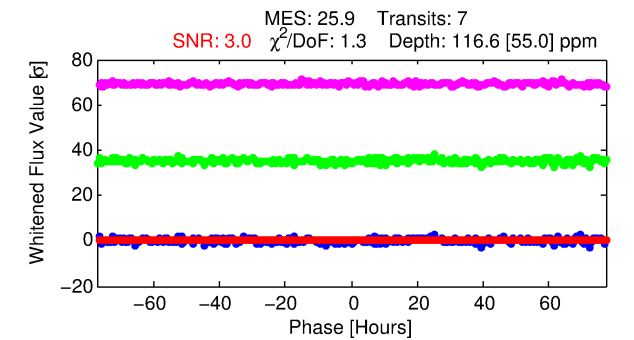
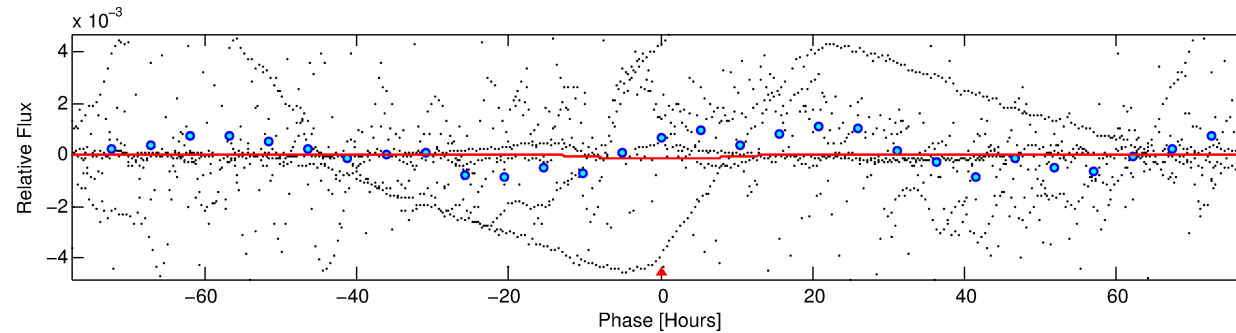
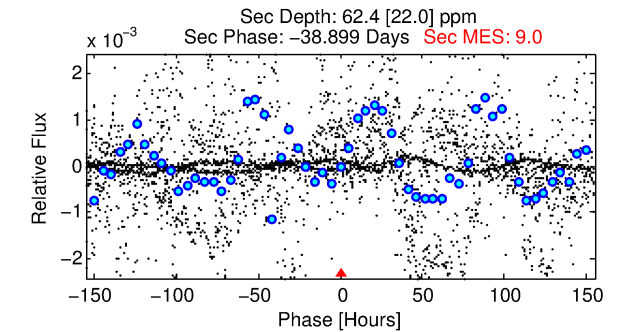
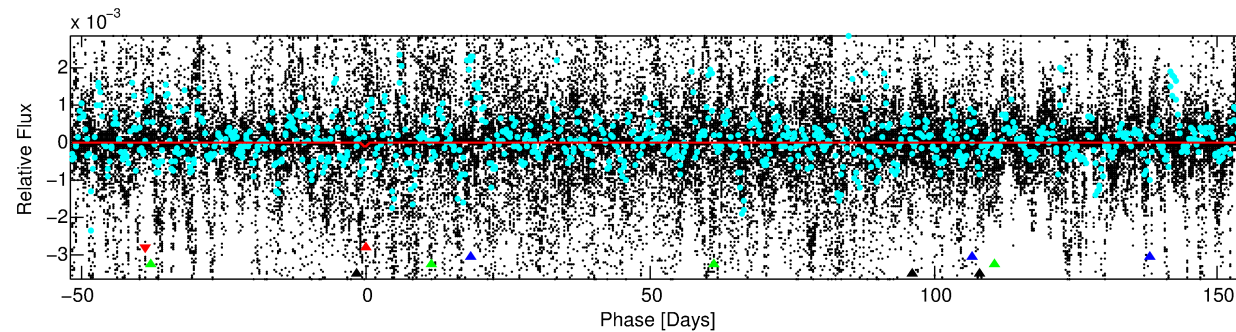
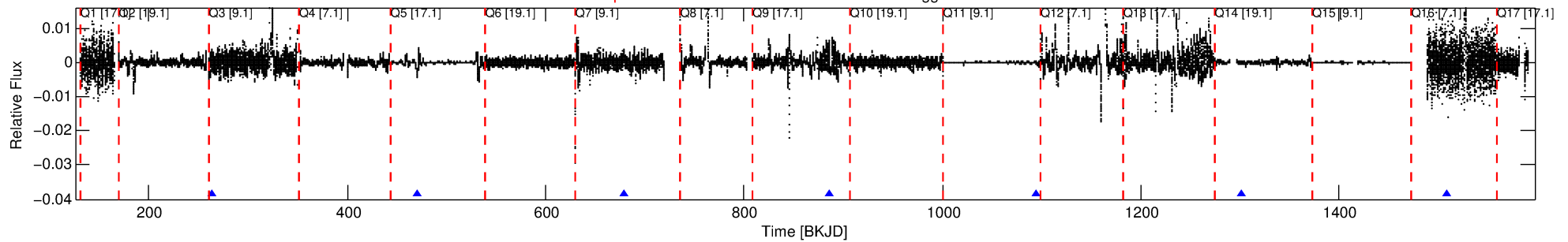
Ephemeris Match Information For 010978948-01

No Significant Match Found

DV One-Page Summary

KIC: 10978948 Candidate: 1 of 4 Period: 207.538 d

Kp: 11.01 R*: 154.87 Rs Teff: 3269.0 K Logg: 0.09 Fe/H: -0.100



DV Fit Results:

Period = 207.53823 [0.01471] d
Epoch = 263.7116 [0.0553] BKJD
Rp/R* = 0.0096 [0.0066]
a/R* = 54.53 [86.65]
b = 0.48 [2.62]
Seff = N/A
Teq = N/A
Rp = 162.87 [115.56] Re
a = N/A
Ag = N/A
Teffp = N/A

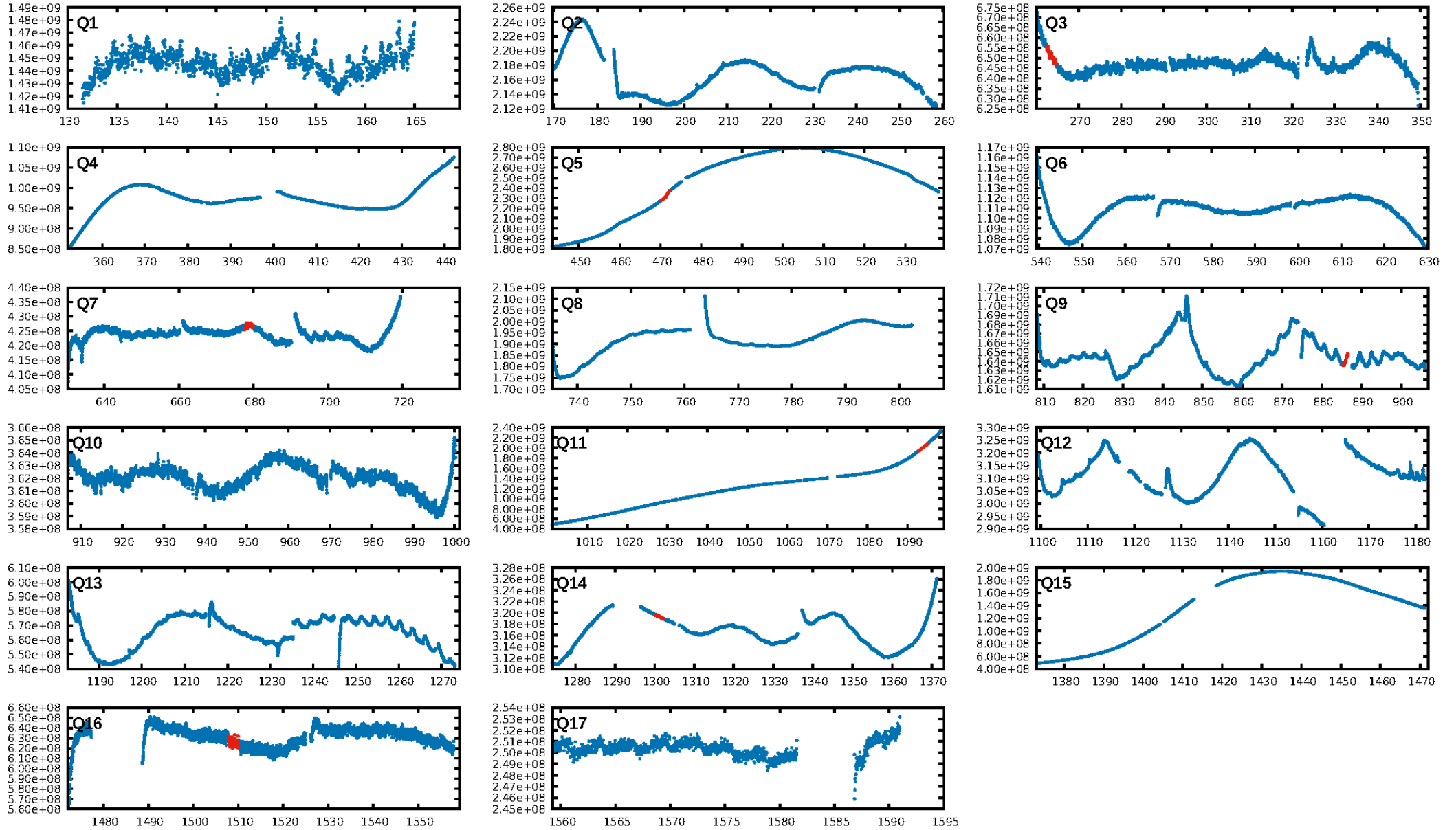
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [96.24σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: -0.4564
Centroid-sig: 18.1%
Centroid-so: 4.158 arcsec [1.37σ]
OotOffset-rm: 1.307 arcsec [0.76σ]
KicOffset-rm: 1.722 arcsec [0.66σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 0.75 [3/4]

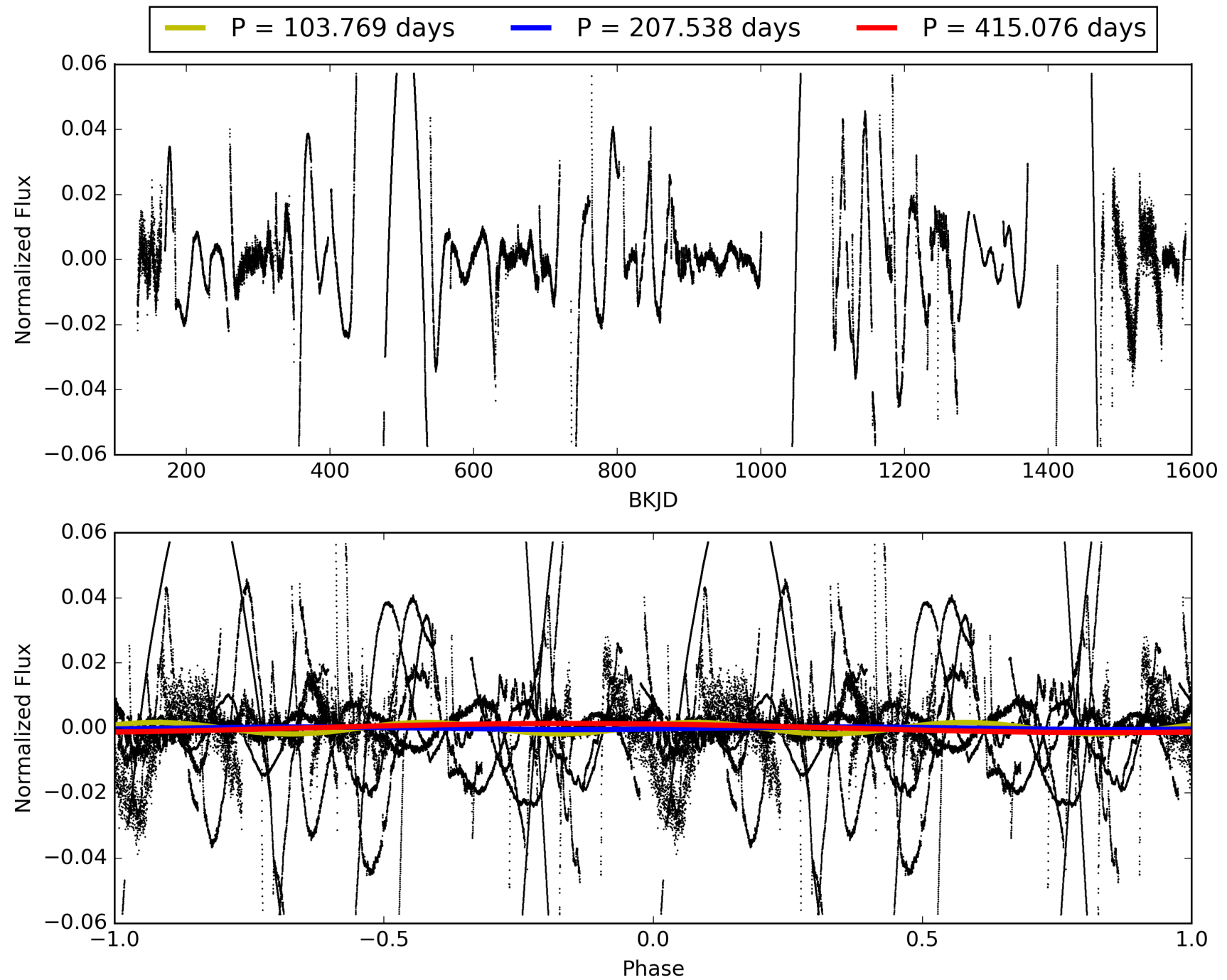
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010978948-01, PDC Light Curves

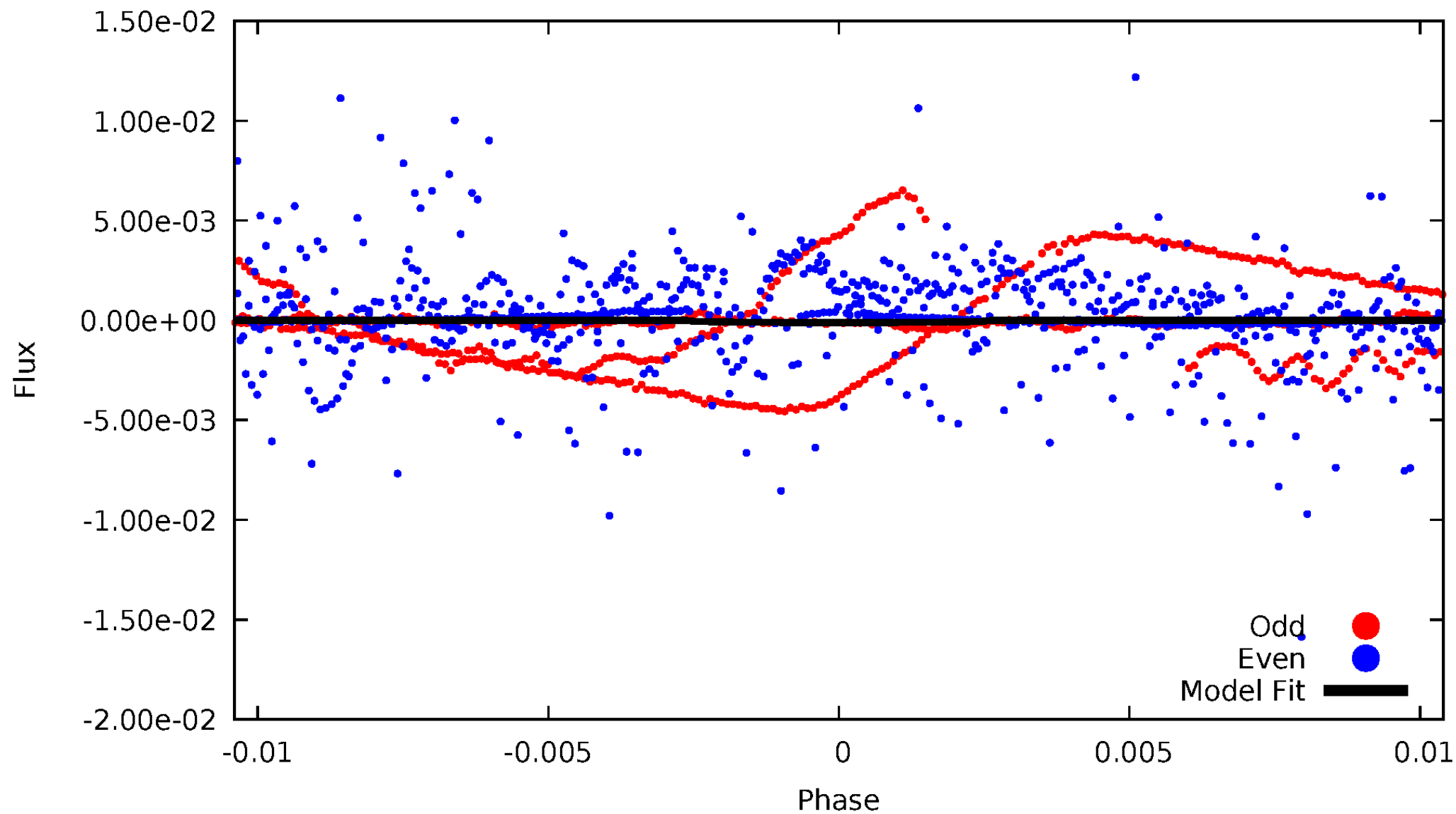


TCE 010978948-01



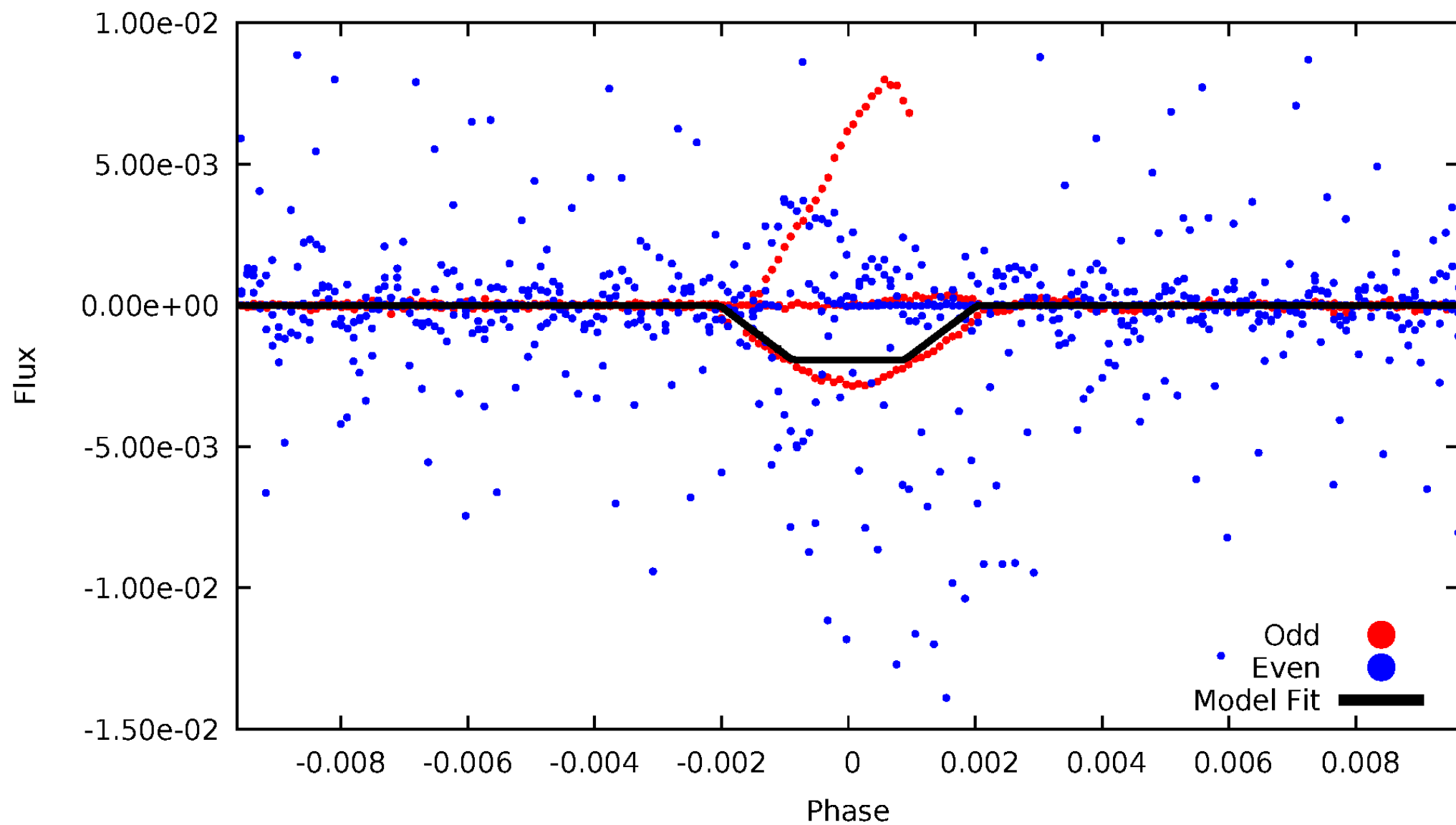
DV Odd/Even

TCE 010978948-01



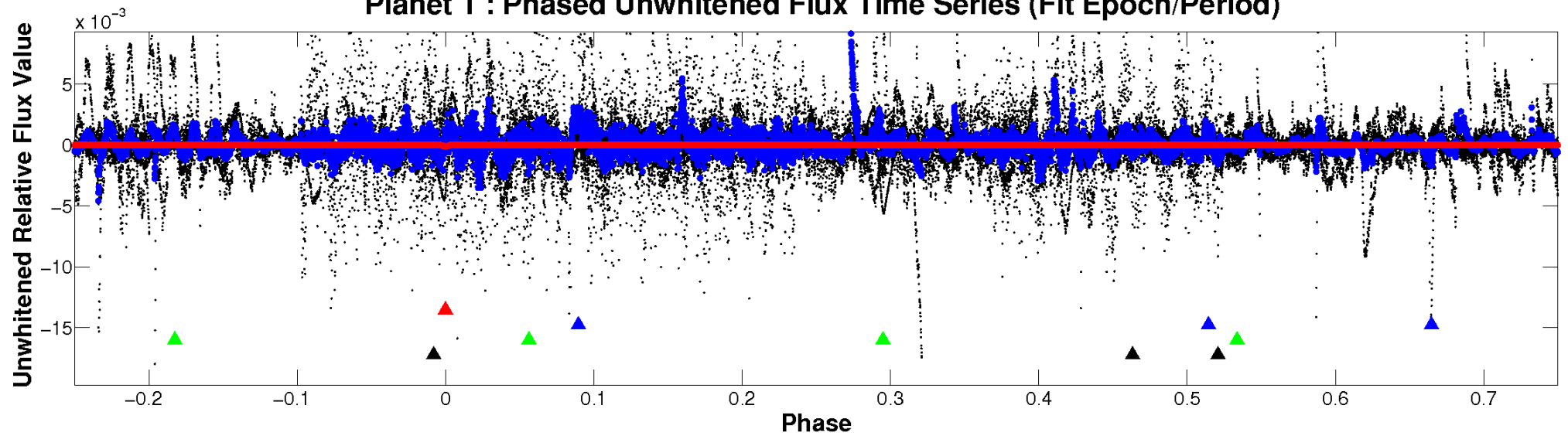
ALT Odd/Even

TCE 010978948-01

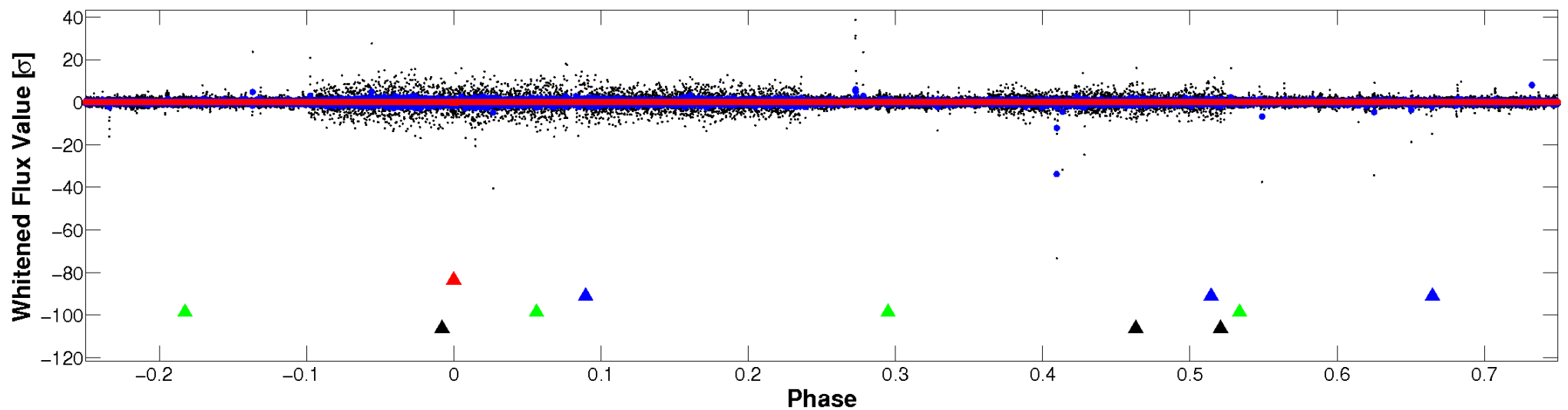


Non-Whitened Vs. Whitened Light Curve

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

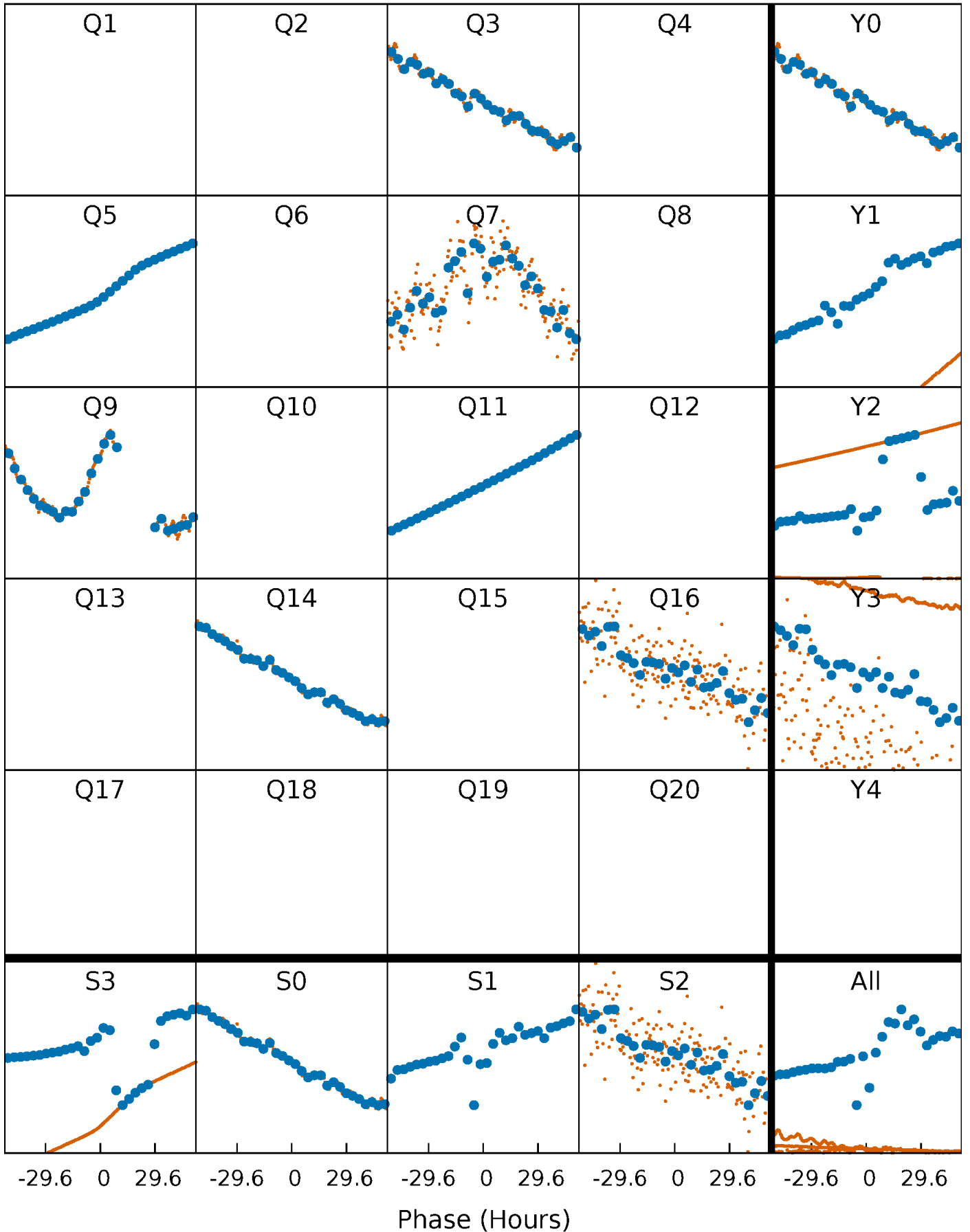


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



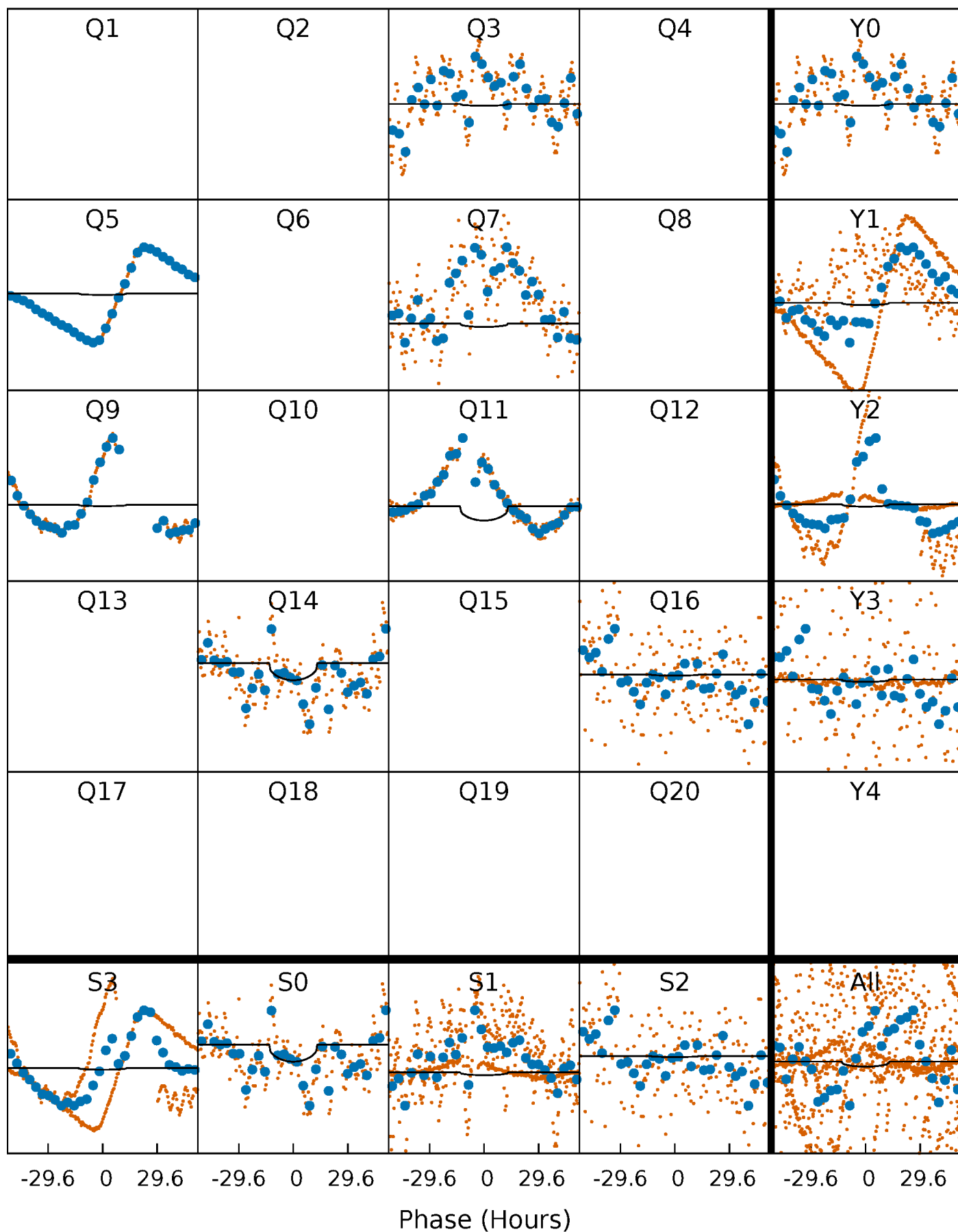
PDC Quarter-Phased Transit Curves

TCE 010978948-01 P=207.538228 Days $T_0=263.711624$ (BKJD)



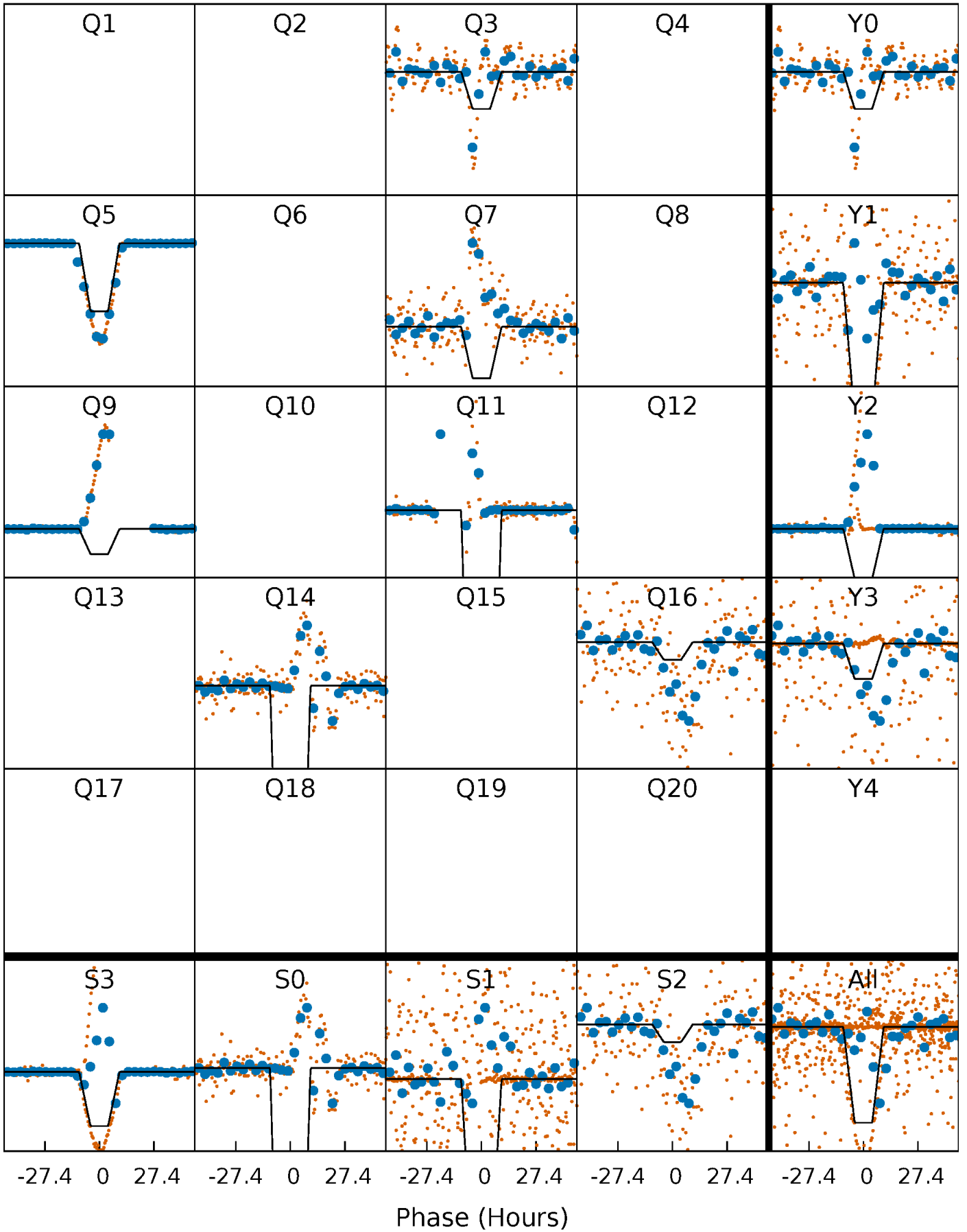
DV Quarter-Phased Transit Curves

TCE 010978948-01 P=207.538228 Days $T_0=263.711624$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

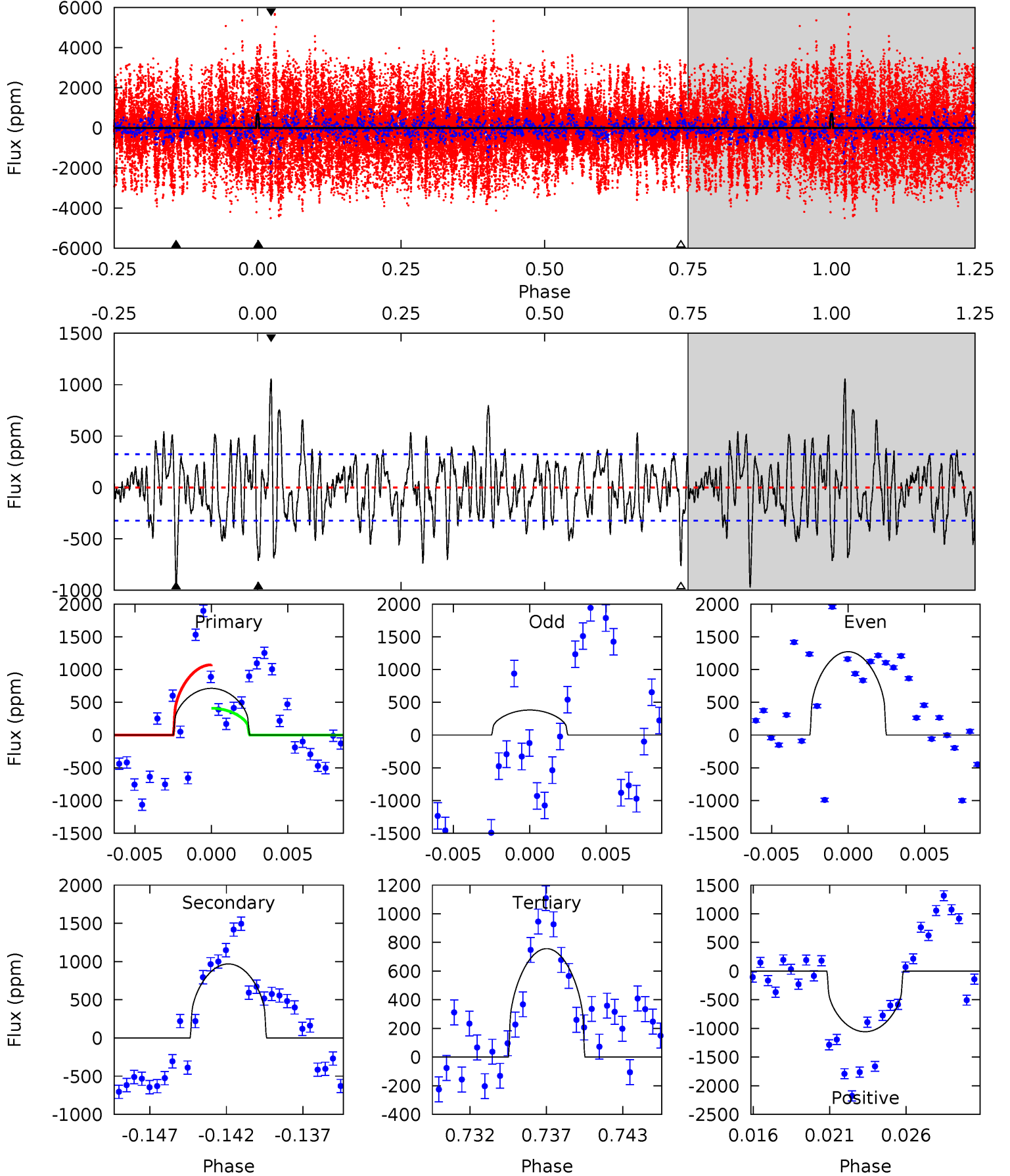
TCE 010978948-01 P=207.645837 Days $T_0=263.498678$ (BKJD)



DV Model-Shift Uniqueness Test

010978948-01, P = 207.538228 Days, E = 56.173396 Days

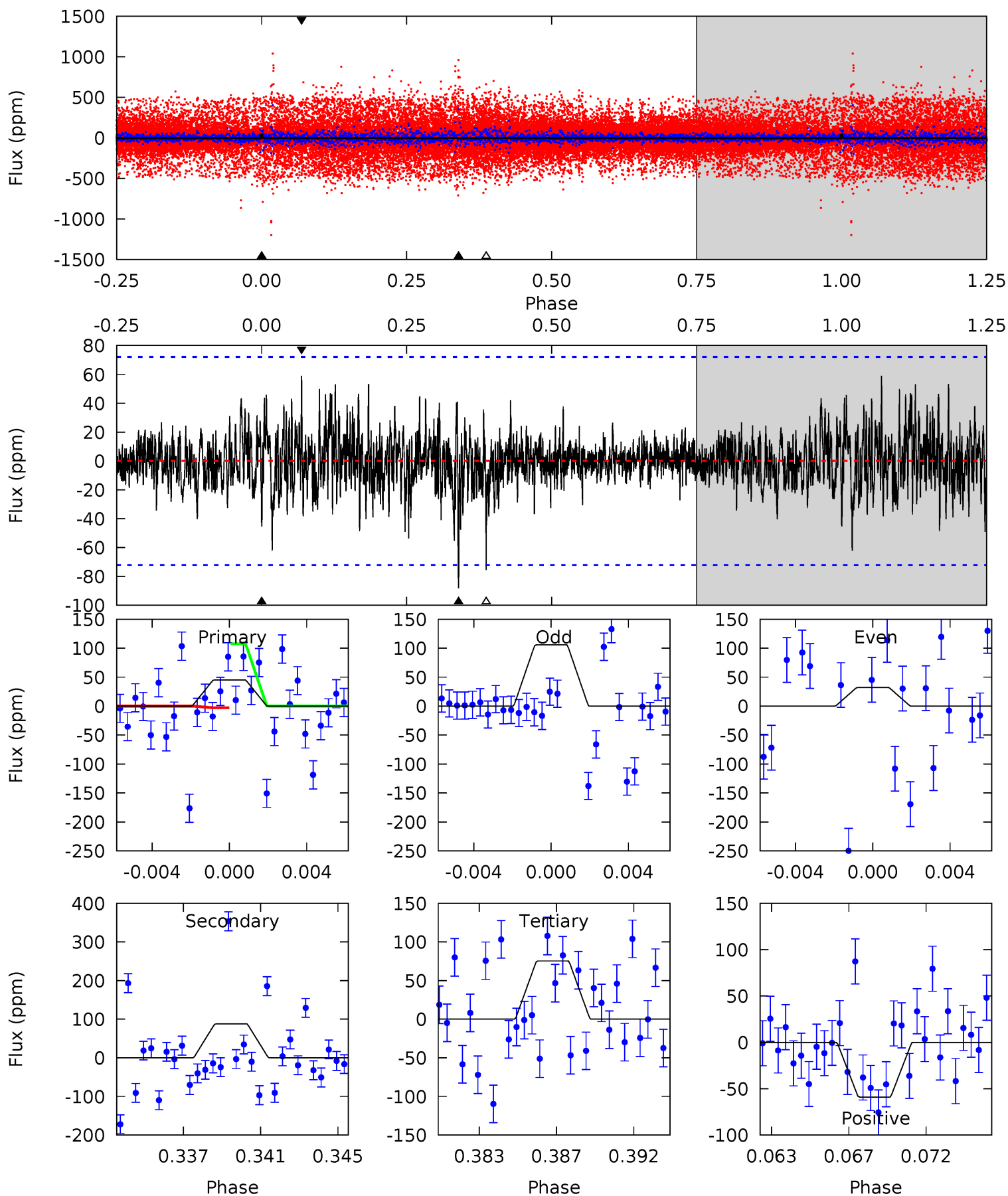
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	15.4	12.1	16.9	5.15	2.79	4.02	-0.70	-5.50	3.38	-1.42	6.42	1.98	0.52	5.26



Alt Model-Shift Uniqueness Test

010978948-01, P = 207.645837 Days, E = 55.852841 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.26	6.35	5.43	4.25	5.19	2.86	0.98	-2.17	-0.99	0.91	2.09	2.02	-3.06	0.40	3.34



Stellar Parameters For KIC 010978948

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3269^{+117}_{-78}	$0.088^{+0.202}_{-0.067}$	$-0.100^{+0.250}_{-0.100}$	$154.866^{+9.192}_{-25.737}$	$1.073^{+0.223}_{-0.096}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+230%/-76%	+250%/-100%	+6%/-17%	+21%/-9%	+87%/-14%
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 010978948-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-969 ± 63	$171.26^{+111.78}_{-96.71}$	2950^{+139}_{-149}	4772^{+2405}_{-861}	$9.362^{+40.159}_{-6.043}$
Alt.	-88 ± 14	$716.55^{+126.28}_{-120.92}$	2942^{+142}_{-158}	-2688^{+104}_{-97}	$0.047^{+0.023}_{-0.014}$

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 $A_{obs} \gg 1.0$

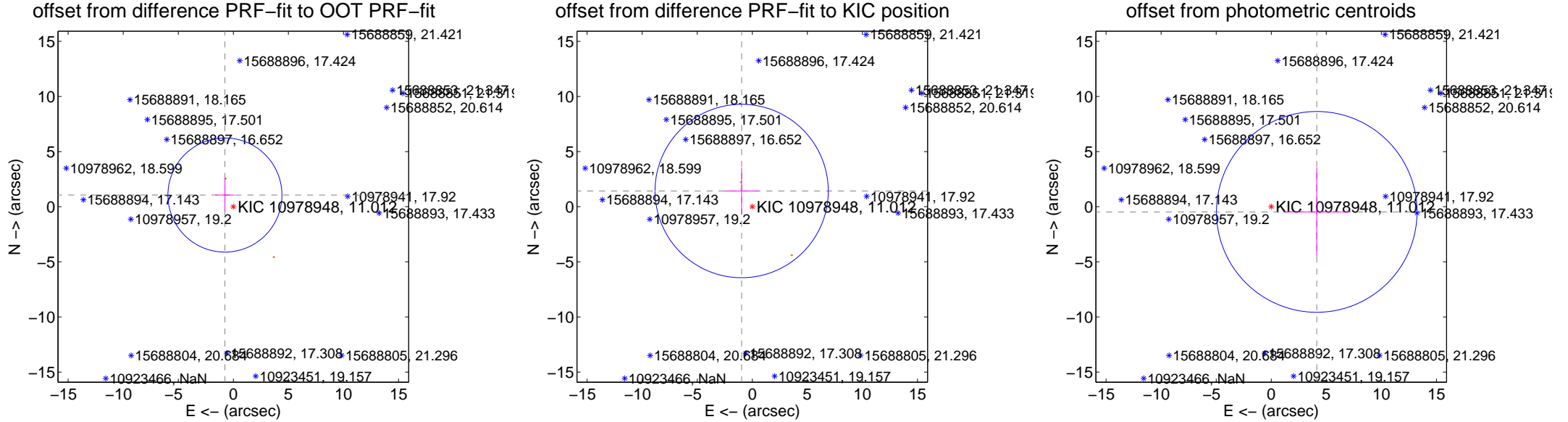
DV Centroid Data

Supplemental centroid analysis for 010978948-01. **Kepler magnitude: 11.01.** Transit SNR 2.95

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.307 ± 1.725	0.76	0.764 ± 0.877	1.060 ± 1.505
PRF-fit source offset from KIC position	1.722 ± 2.621	0.66	0.966 ± 1.564	1.425 ± 2.109
photometric centroid source offset	4.16 ± 3.03	1.37	-4.13 ± 3.02	-0.47 ± 4.04



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.

Q1 no difference image



Q1 no OOT image



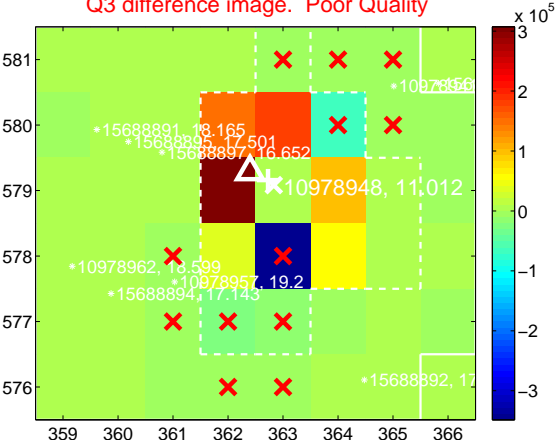
Q2 no difference image



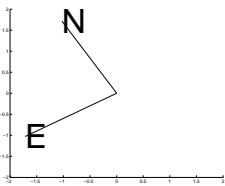
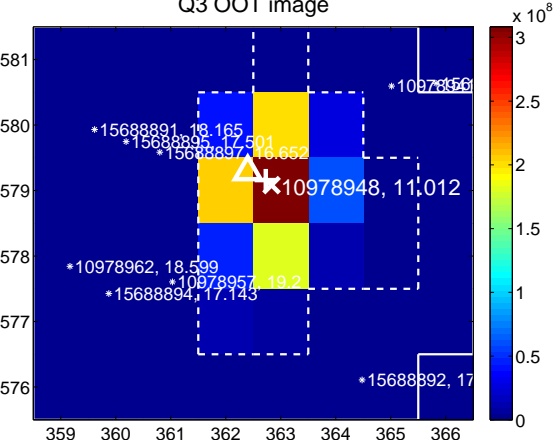
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



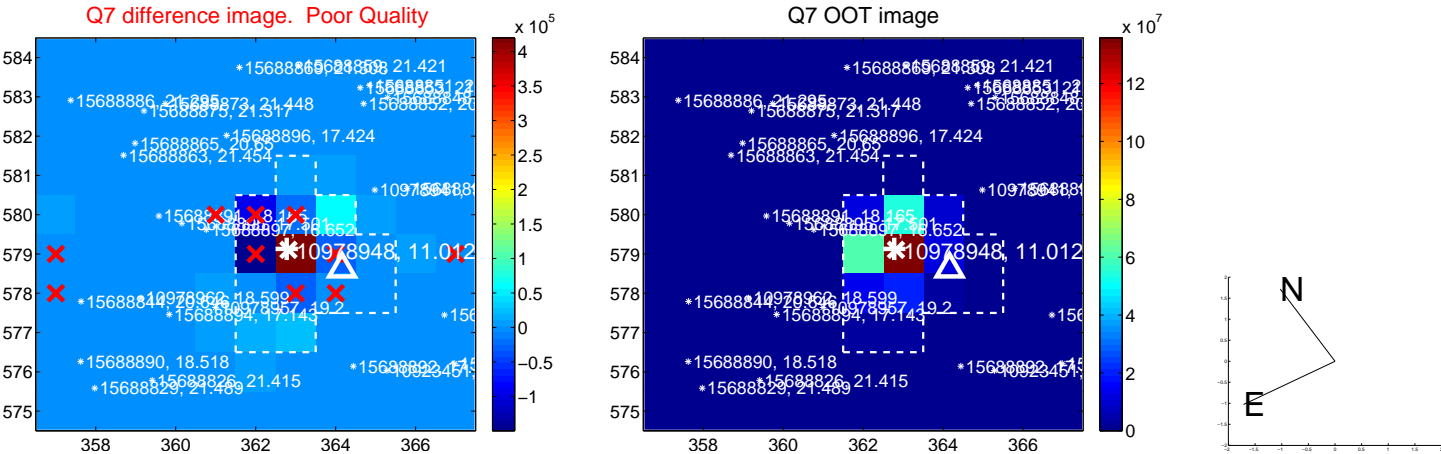
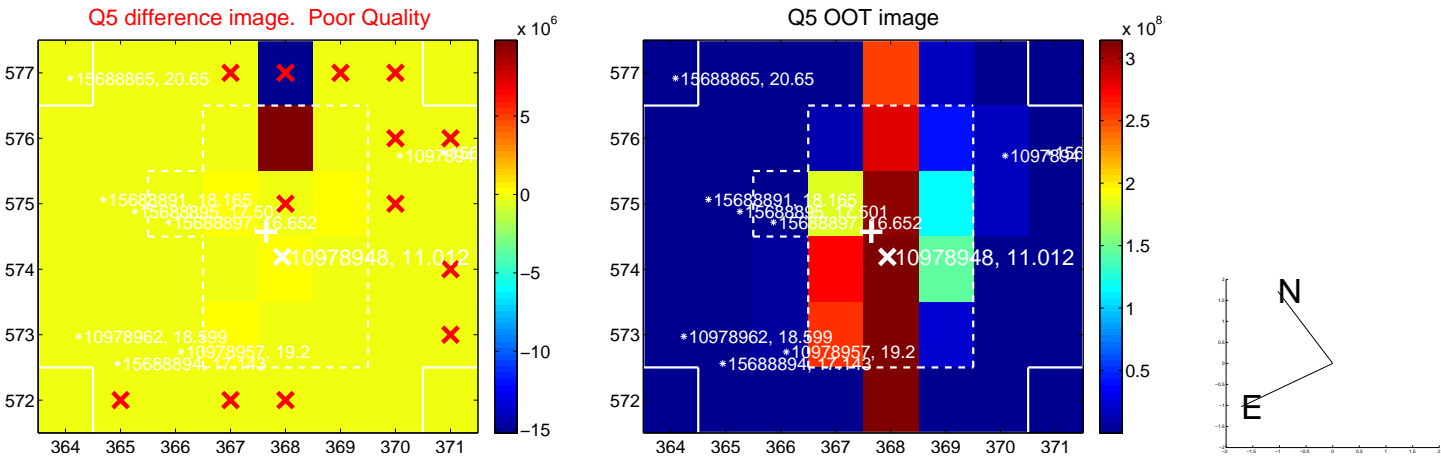
Q4 no difference image



Q4 no OOT image



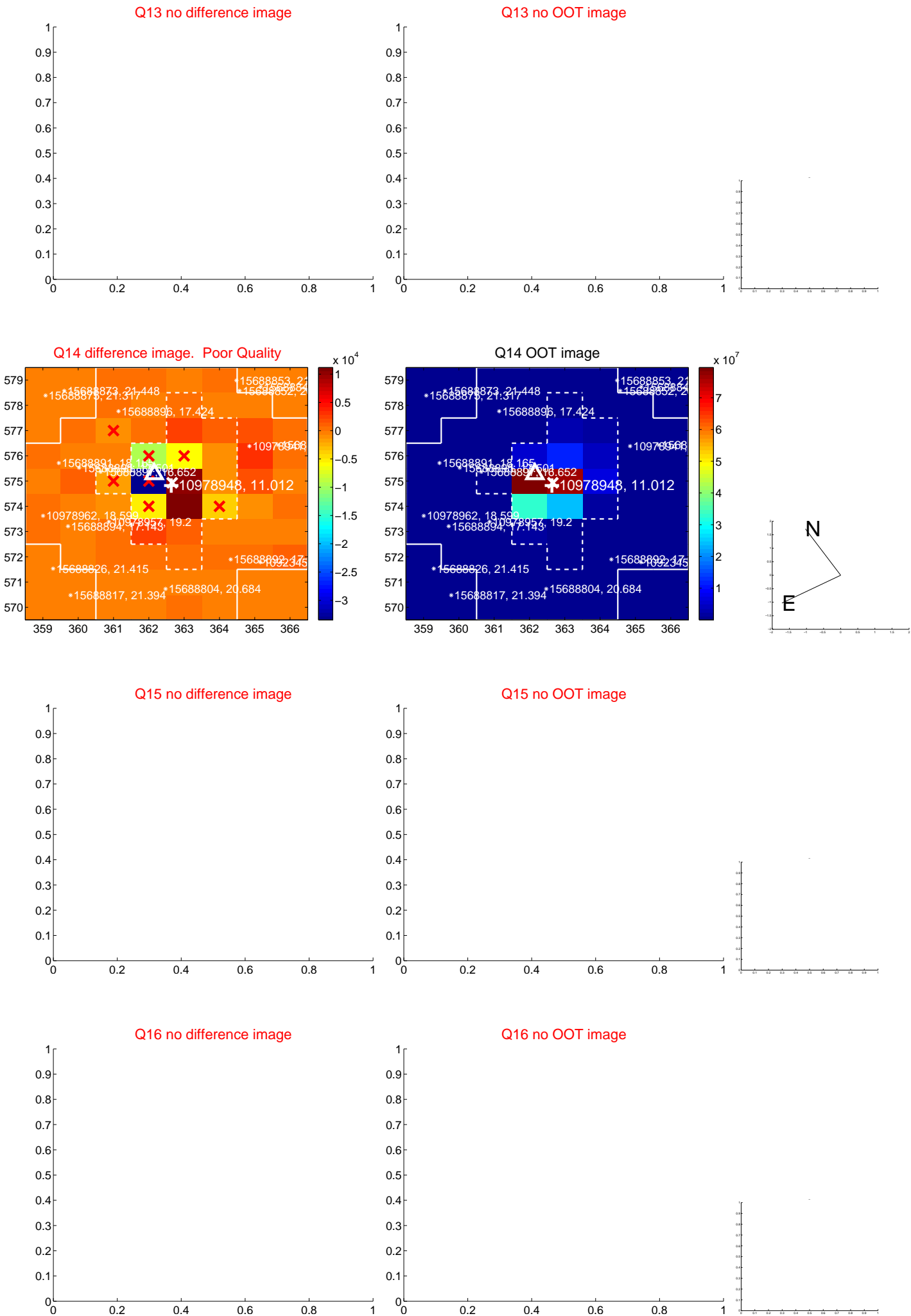
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



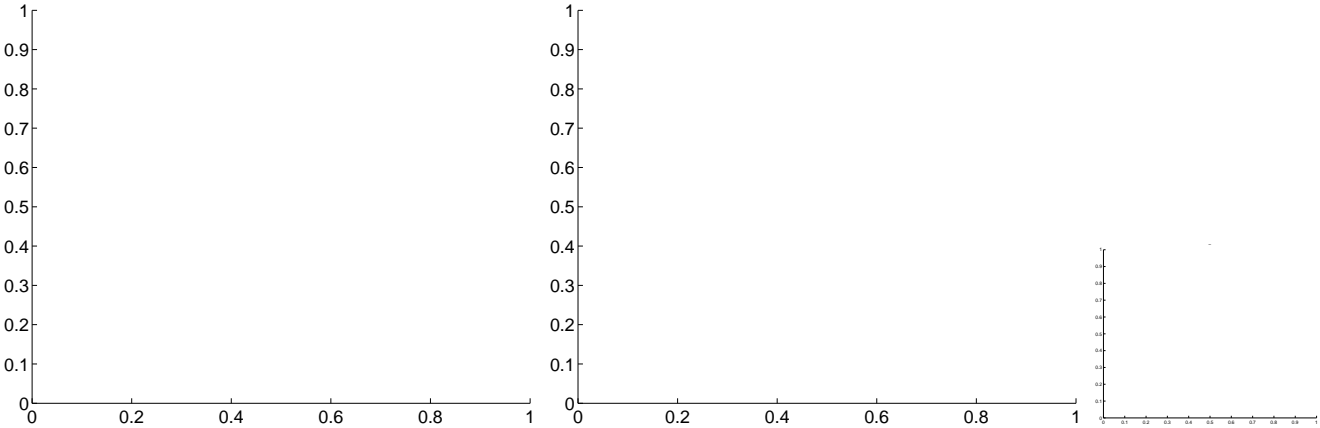
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



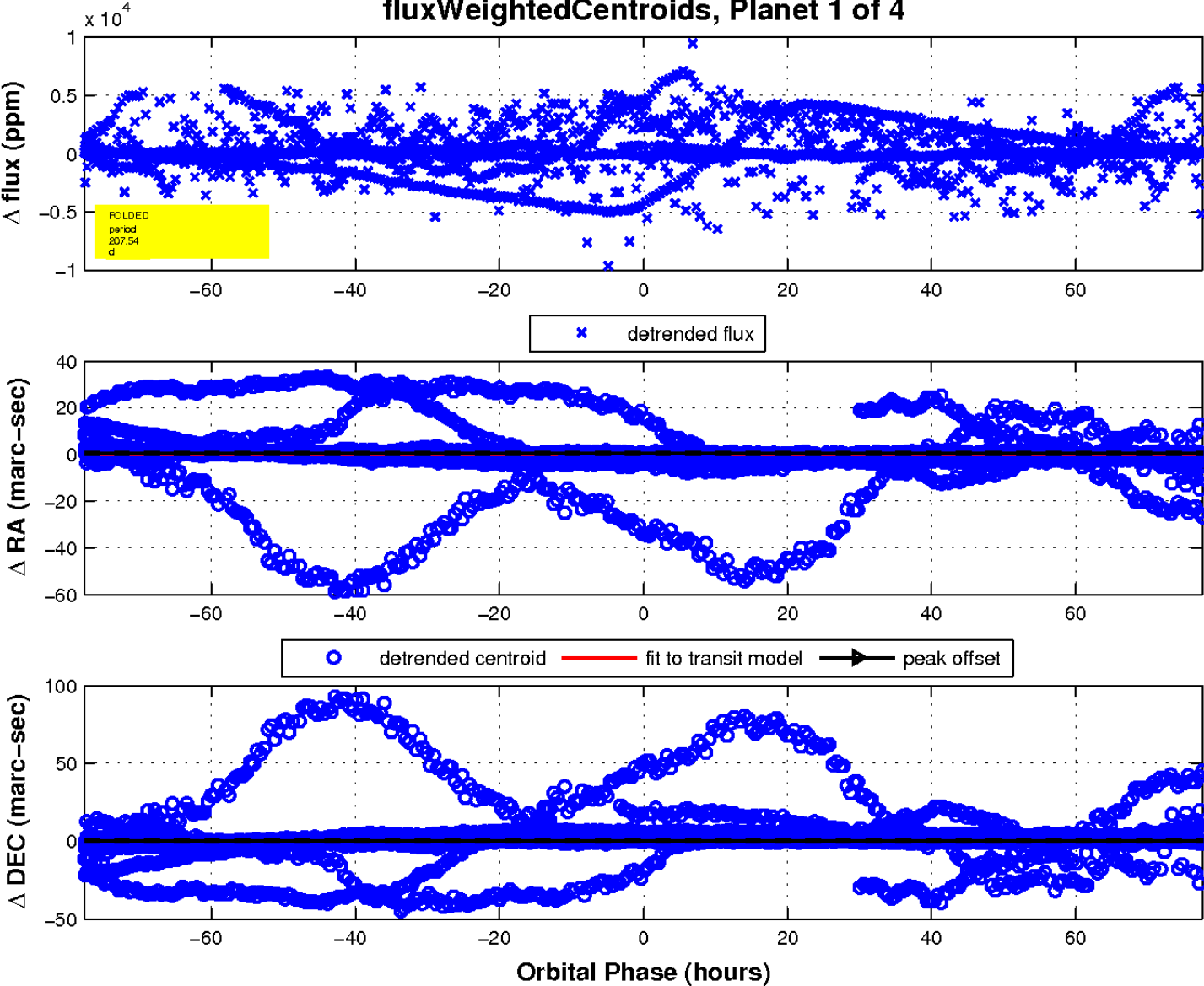
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

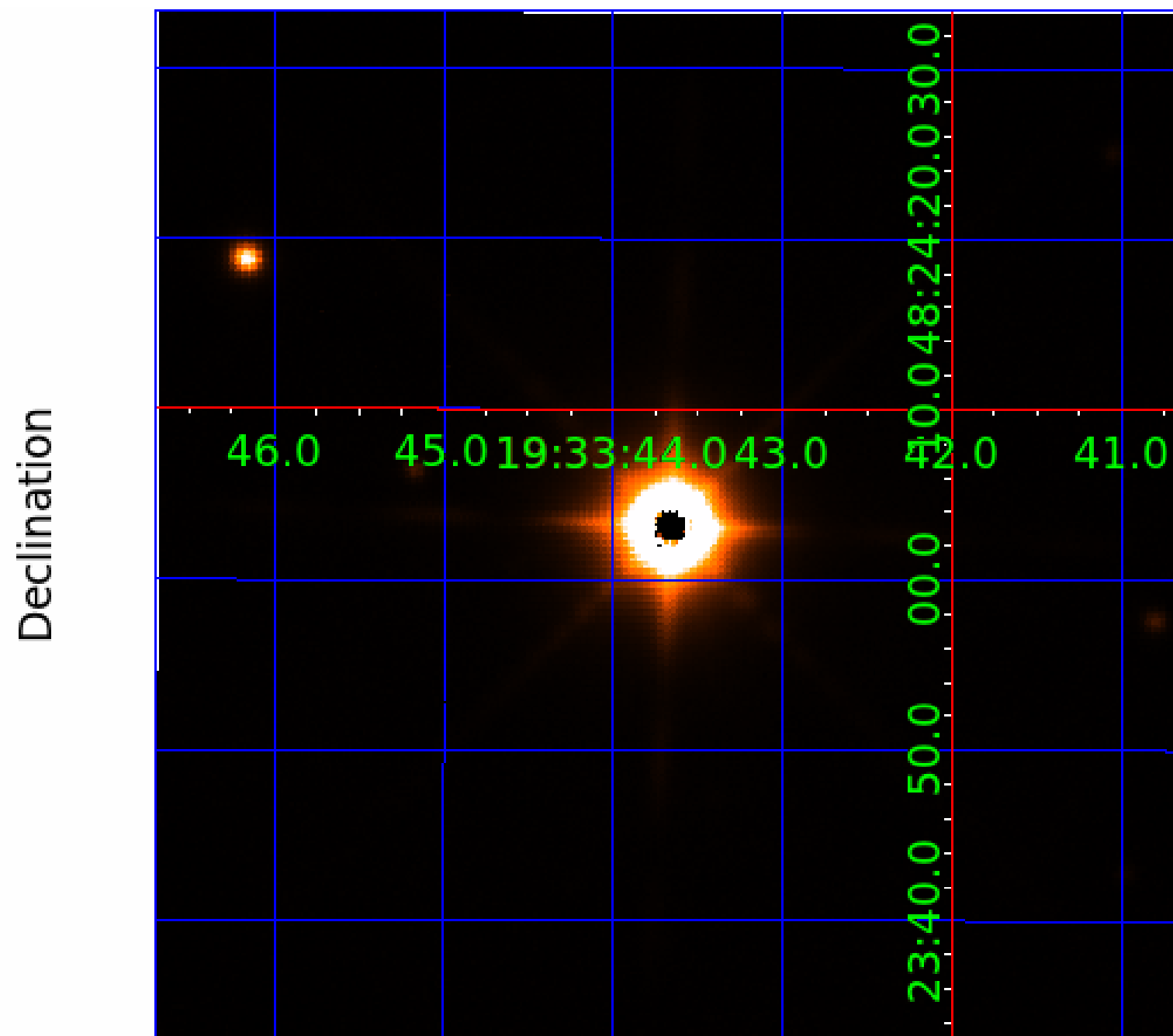
Q17 no OOT image



fluxWeightedCentroids, Planet 1 of 4



UKIRT Image



KIC 010978948

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})
010978948-01	OBS	No	207.538228	263.711624	116.6	25.898	25.9	3.0	154.87	3269	162.88	0.00
010978948-02	OBS	No	534.448466	162.937868	3508.2	15.508	17.9	8.1	154.87	3269	1041.11	1410.32
010978948-03	OBS	No	365.527455	166.947806	1167.4	29.692	9.6	10.7	154.87	3269	1162.25	2340.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010978948-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010978948-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010978948-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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.

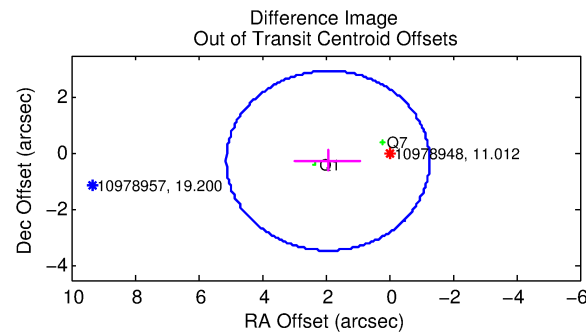
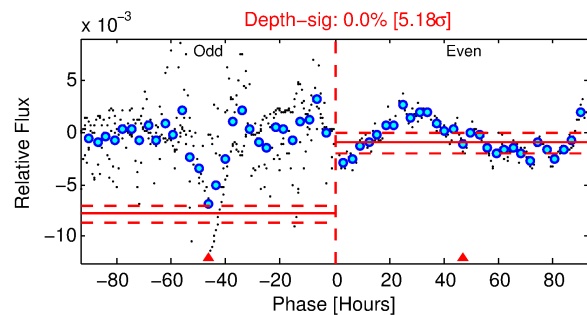
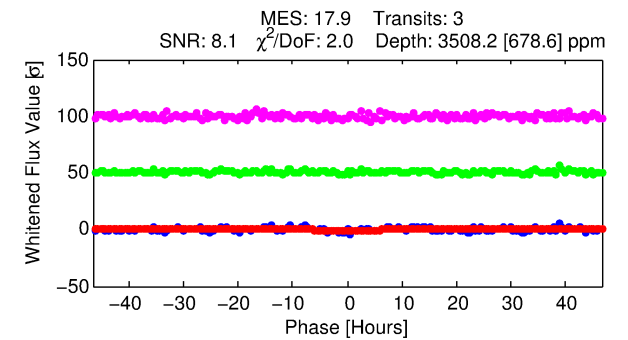
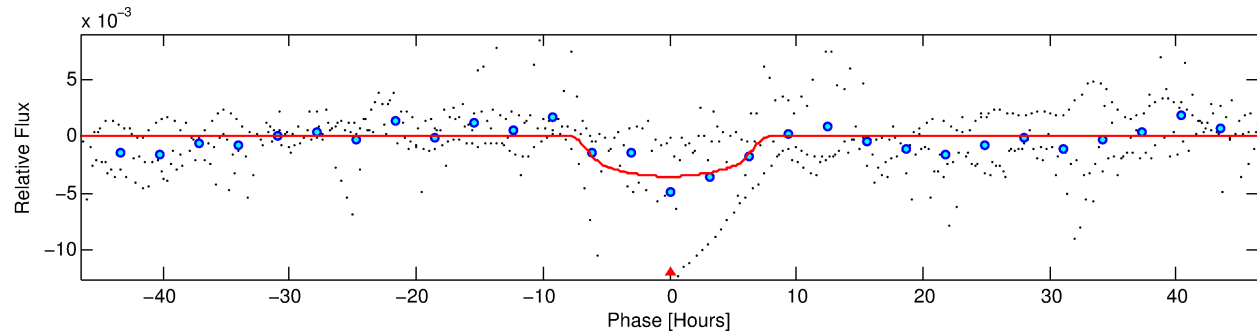
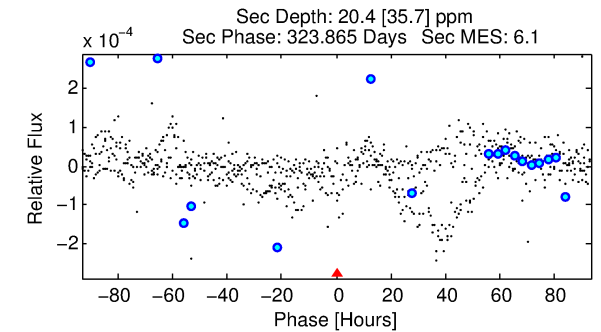
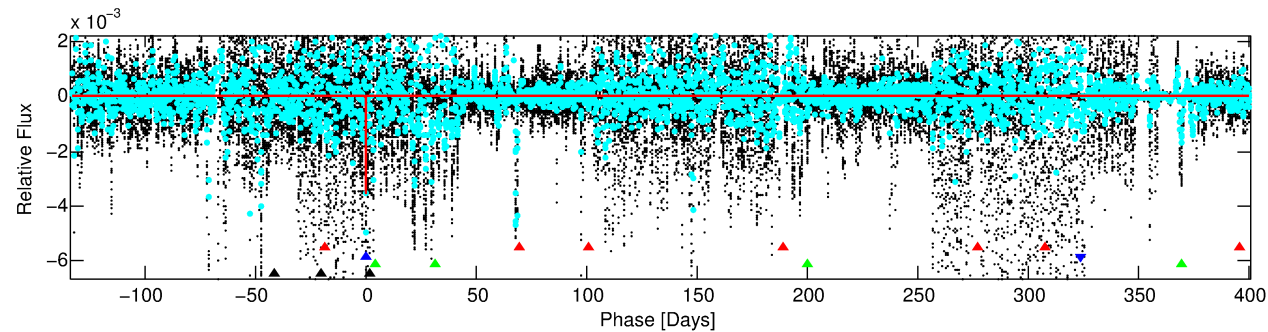
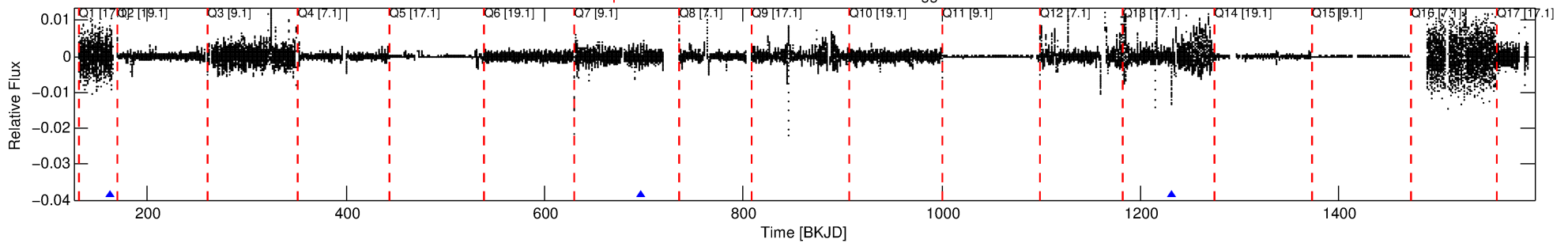
Ephemeris Match Information For 010978948-02

No Significant Match Found

DV One-Page Summary

KIC: 10978948 Candidate: 2 of 4 Period: 534.448 d

Kp: 11.01 R*: 154.87 Rs Teff: 3269.0 K Logg: 0.09 Fe/H: -0.100



DV Fit Results:

Period = 534.44847 [0.01645] d
Epoch = 162.9379 [0.0225] BKJD
Rp/R* = 0.0616 [0.0075]
a/R* = 188.13 [34.21]
b = 0.79 [0.09]
Seff = 1410.32 [506.38]
Teq = 1563 [140] K
Rp = 1041.11 [214.41] Re
a = 1.3191 [0.2514] AU
Ag = 0.02 [0.03] [-30.29σ]
Teffp = 886 [392] K [-1.63σ]

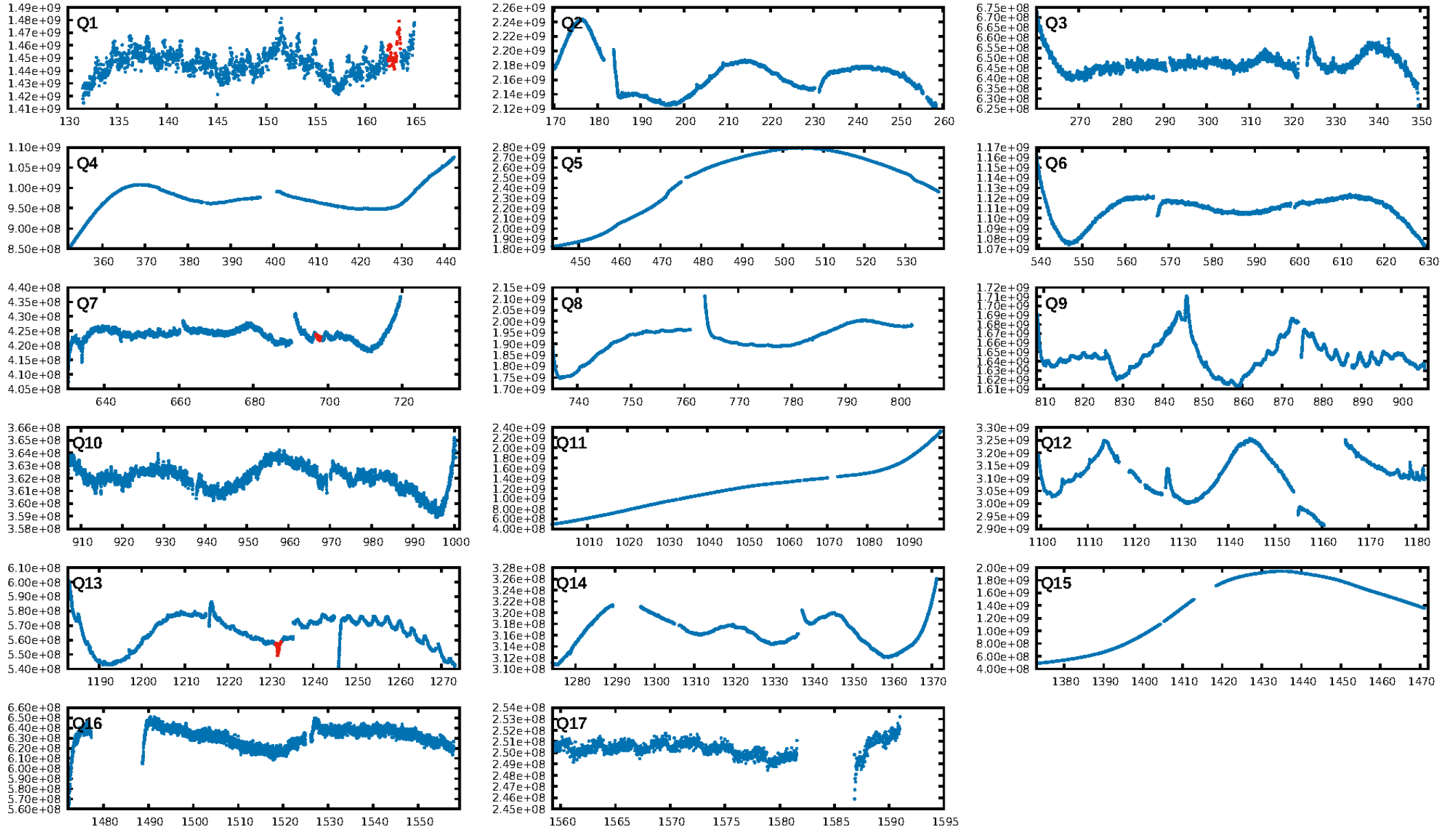
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.07σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 2.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.4584
Centroid-sig: 46.1%
Centroid-so: 0.344 arcsec [1.04σ]
OotOffset-rm: 1.941 arcsec [1.82σ]
KicOffset-rm: 3.424 arcsec [2.03σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-st: 0/1/0/1 [2]
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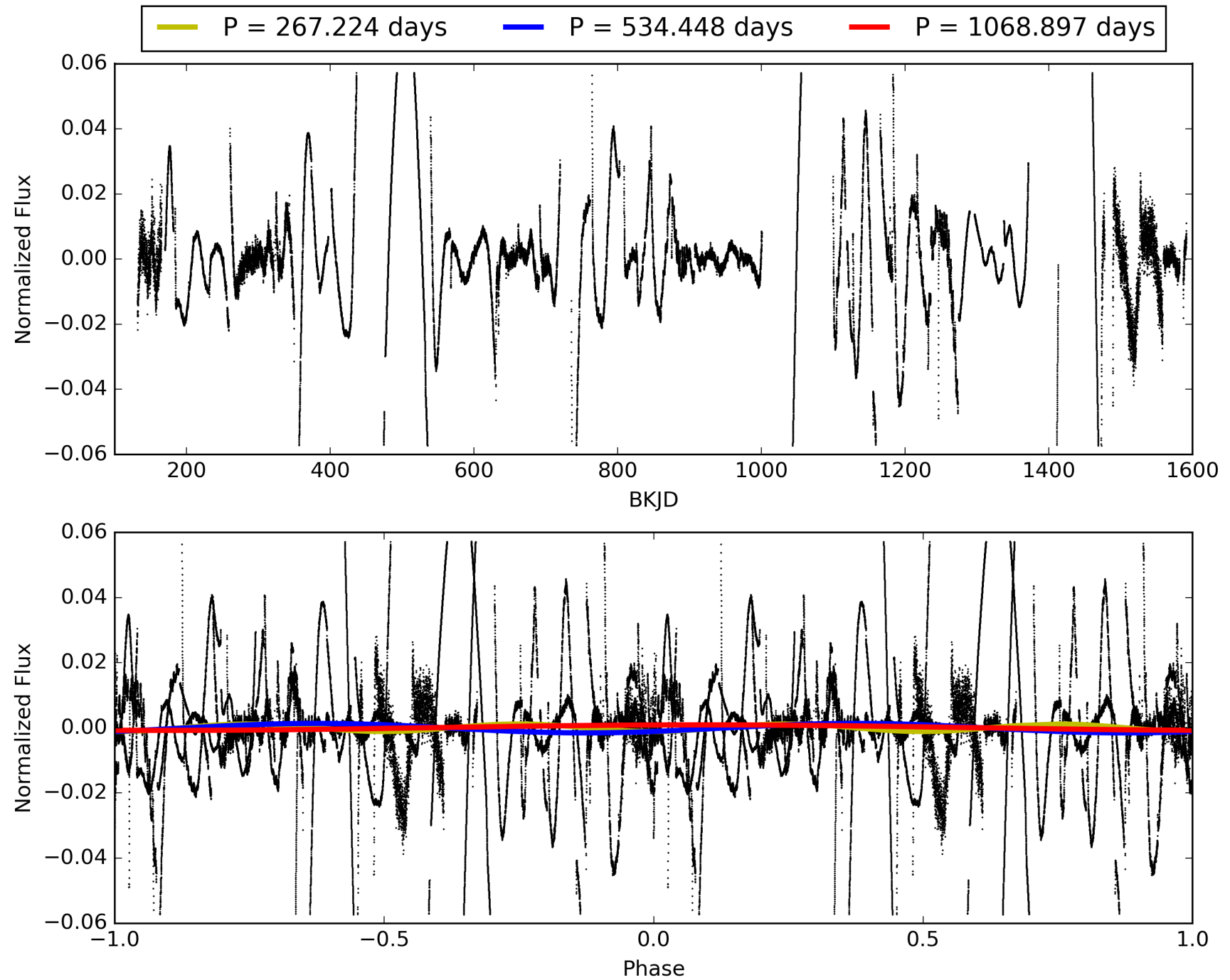
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:45:13 Z

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

TCE 010978948-02, PDC Light Curves

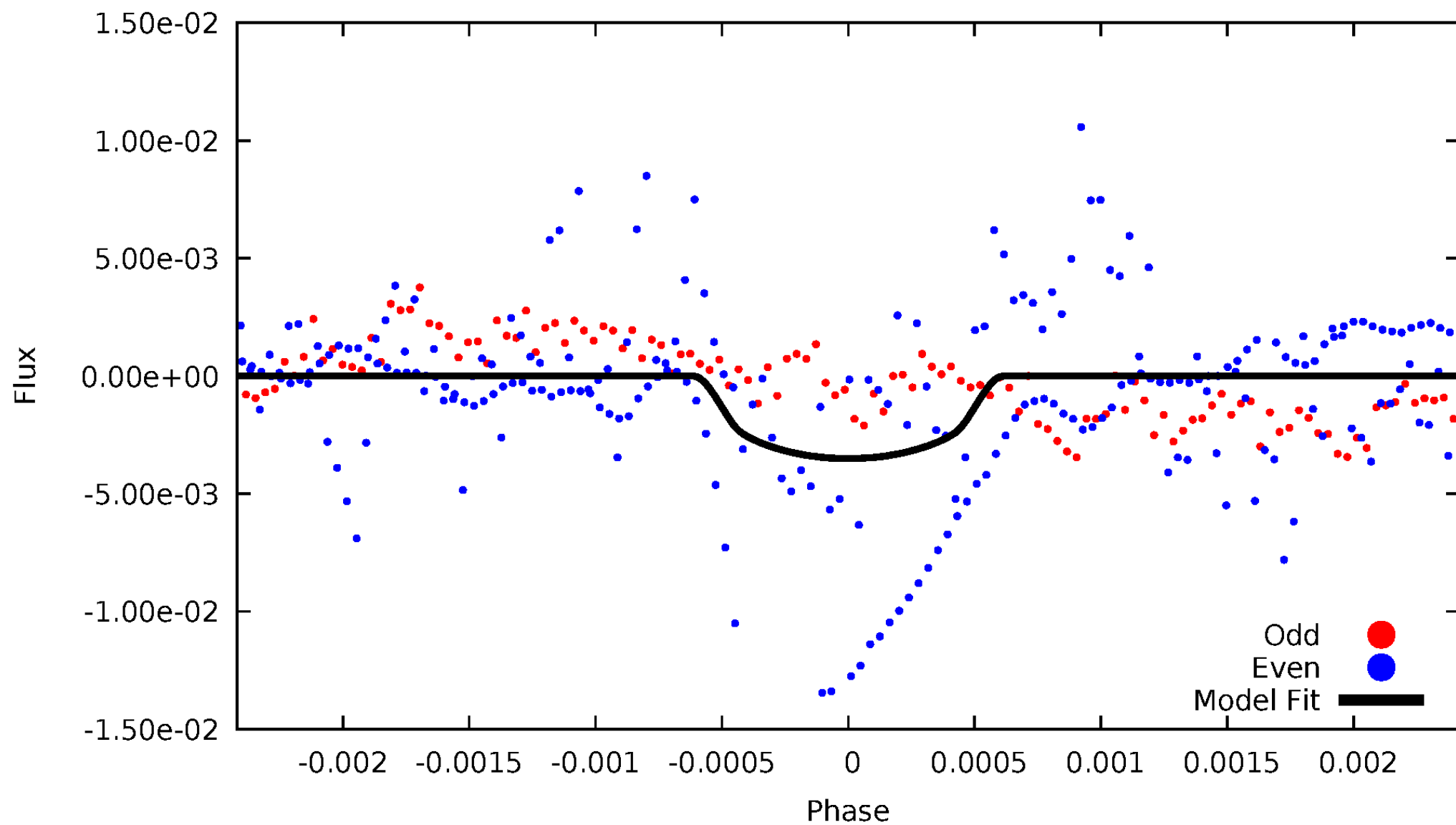


TCE 010978948-02



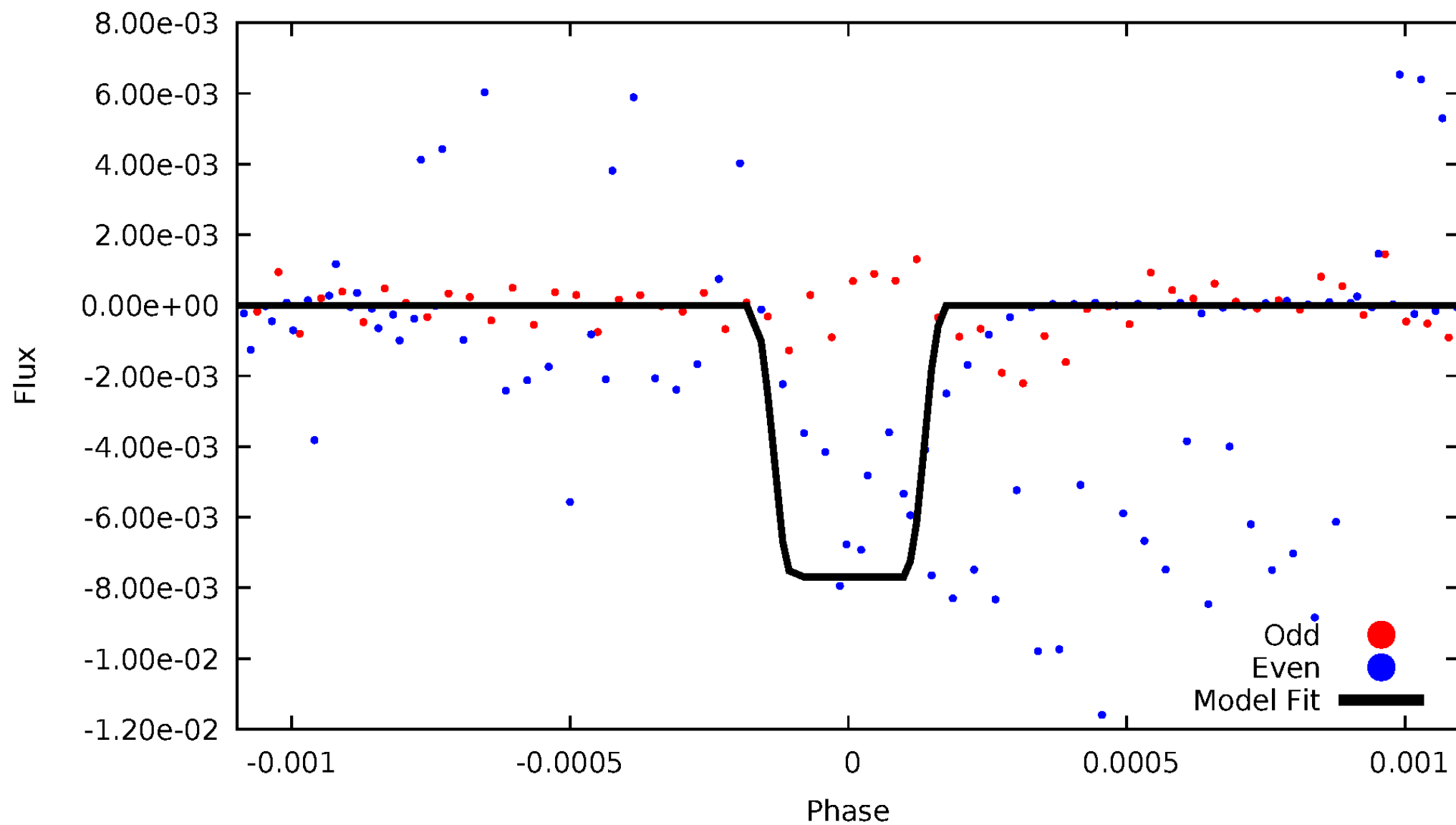
DV Odd/Even

TCE 010978948-02



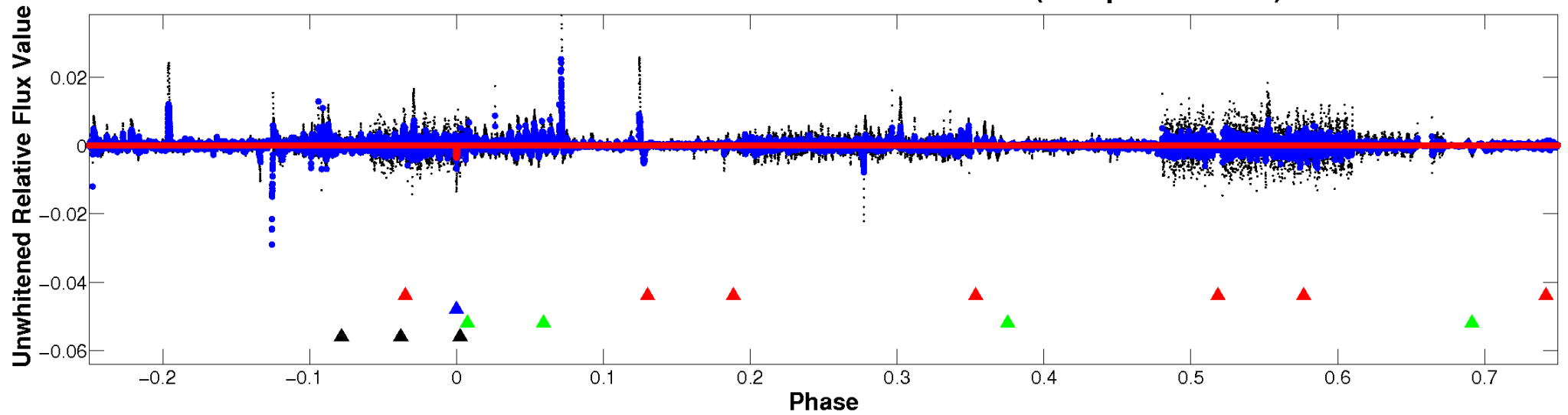
ALT Odd/Even

TCE 010978948-02

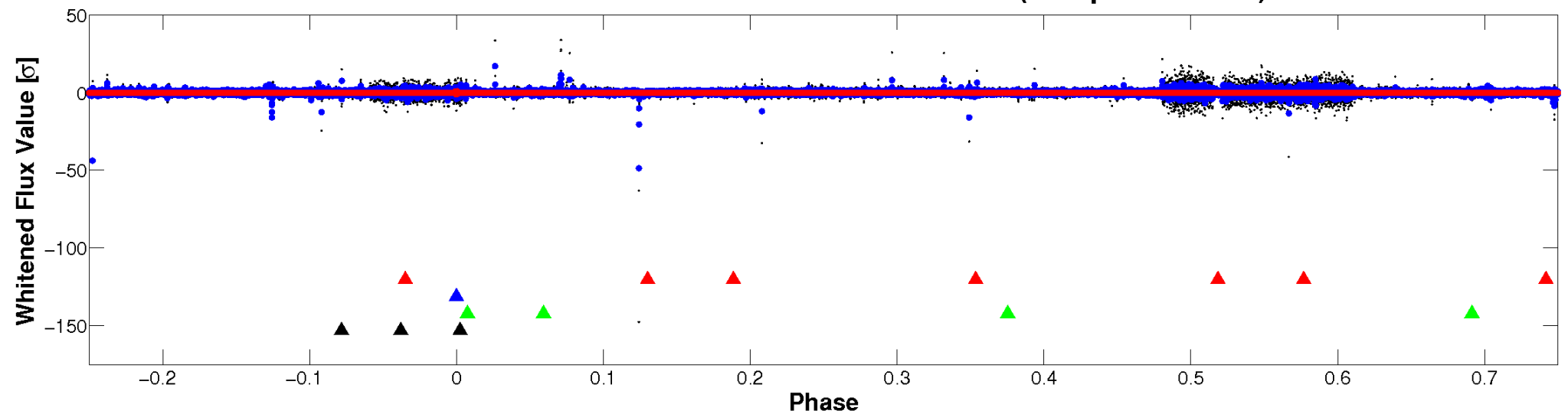


Non-Whitened Vs. Whitened Light Curve

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

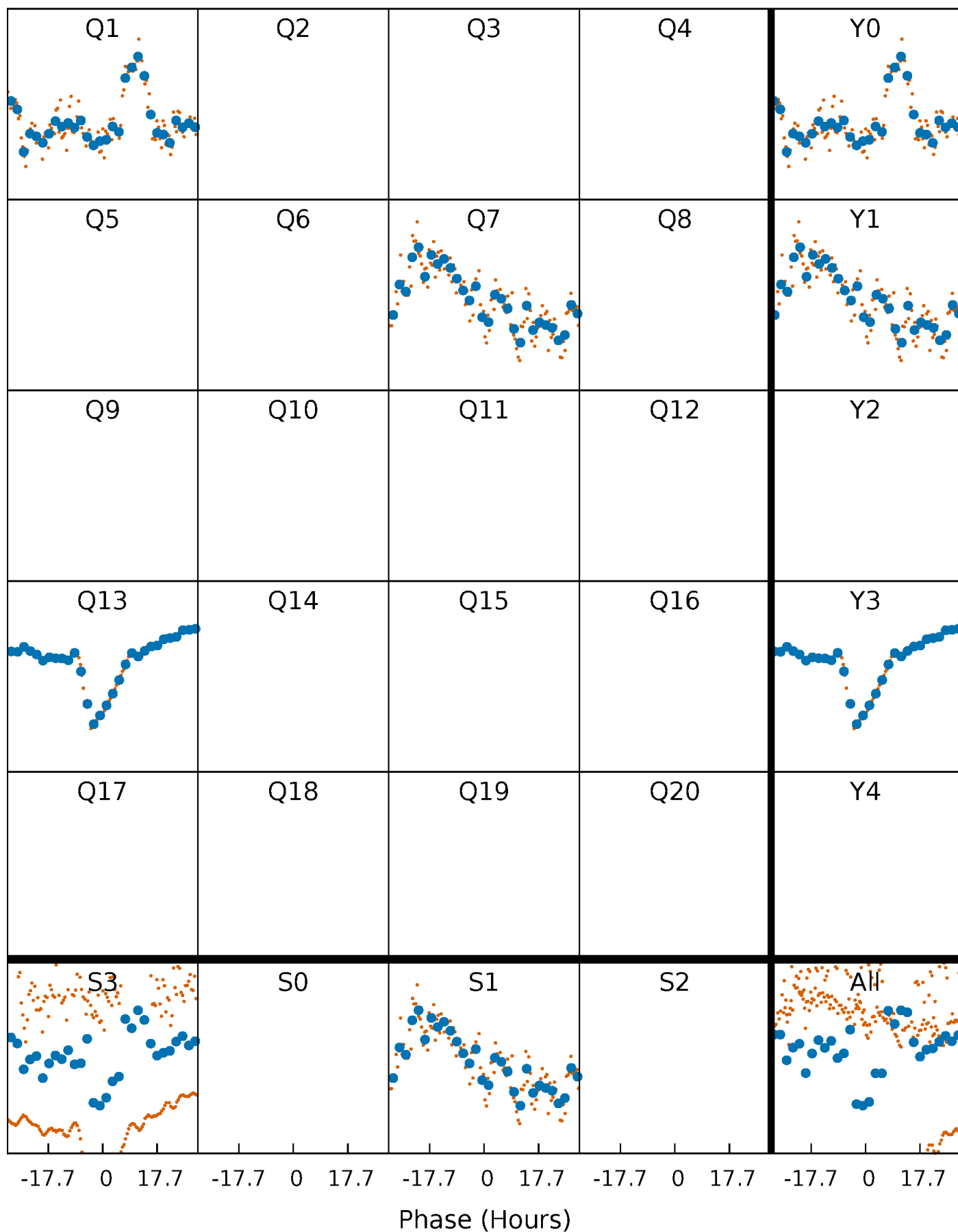


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



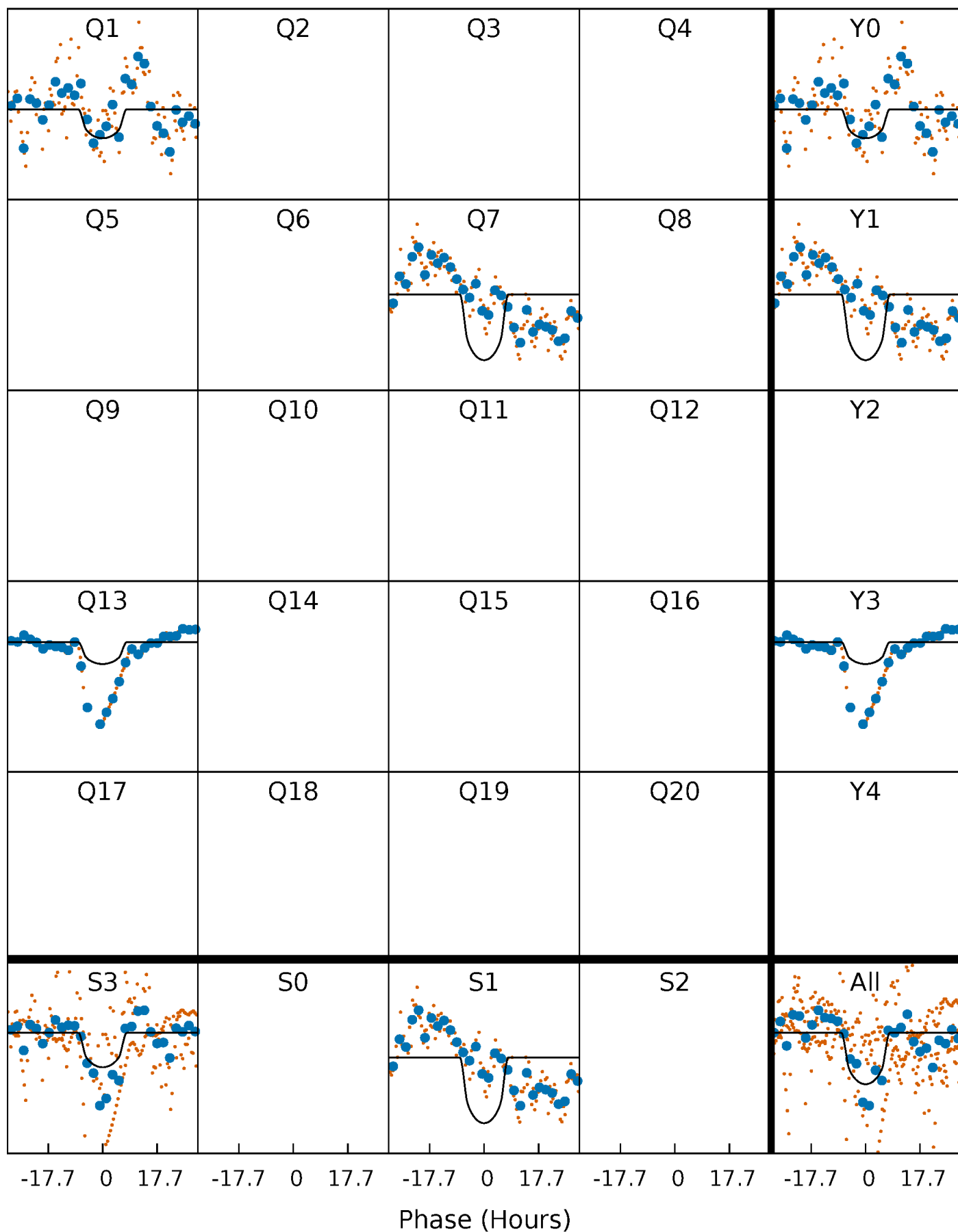
PDC Quarter-Phased Transit Curves

TCE 010978948-02 $P=534.448466$ Days $T_0=162.937869$ (BKJD)



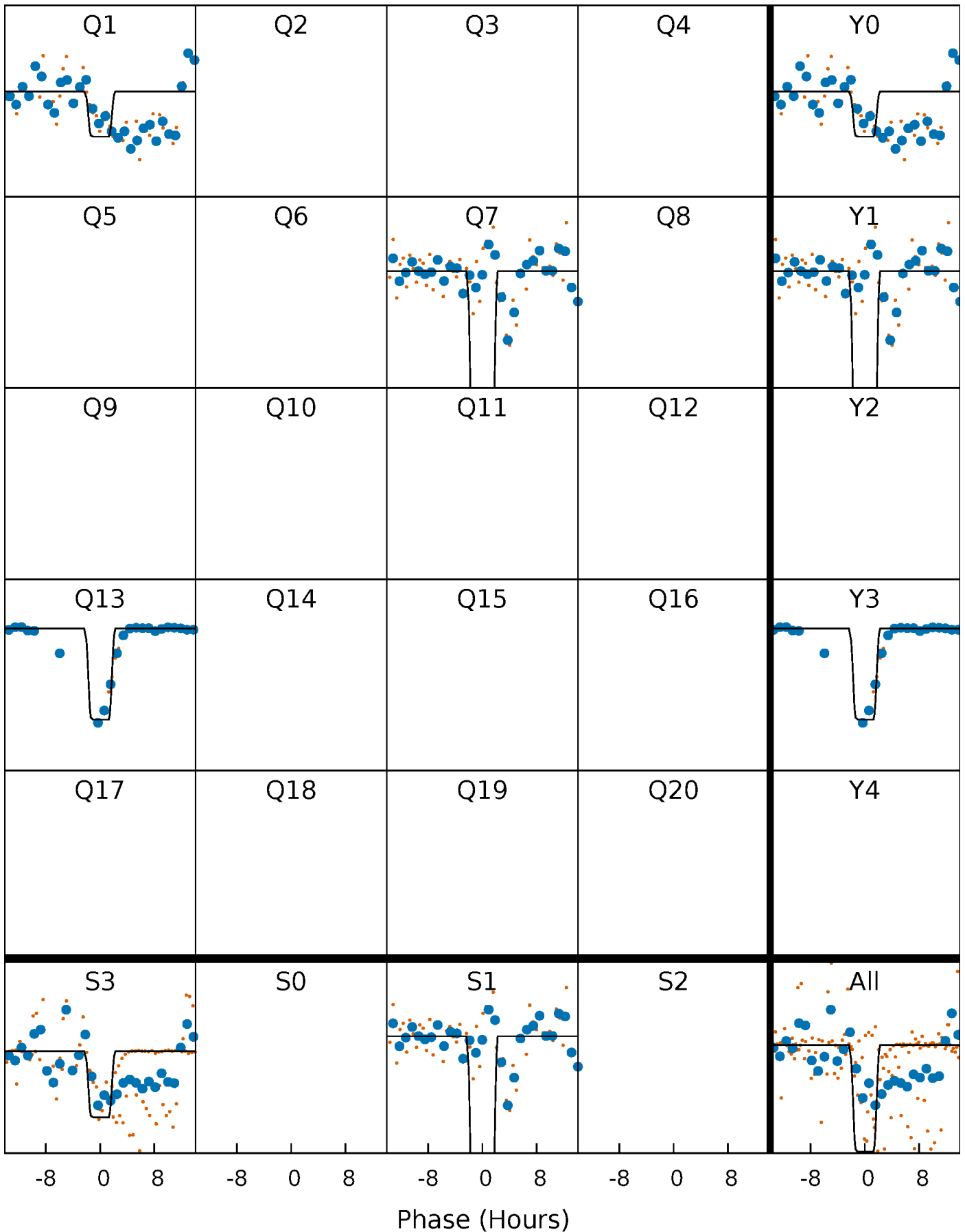
DV Quarter-Phased Transit Curves

TCE 010978948-02 $P=534.448466$ Days $T_0=162.937869$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

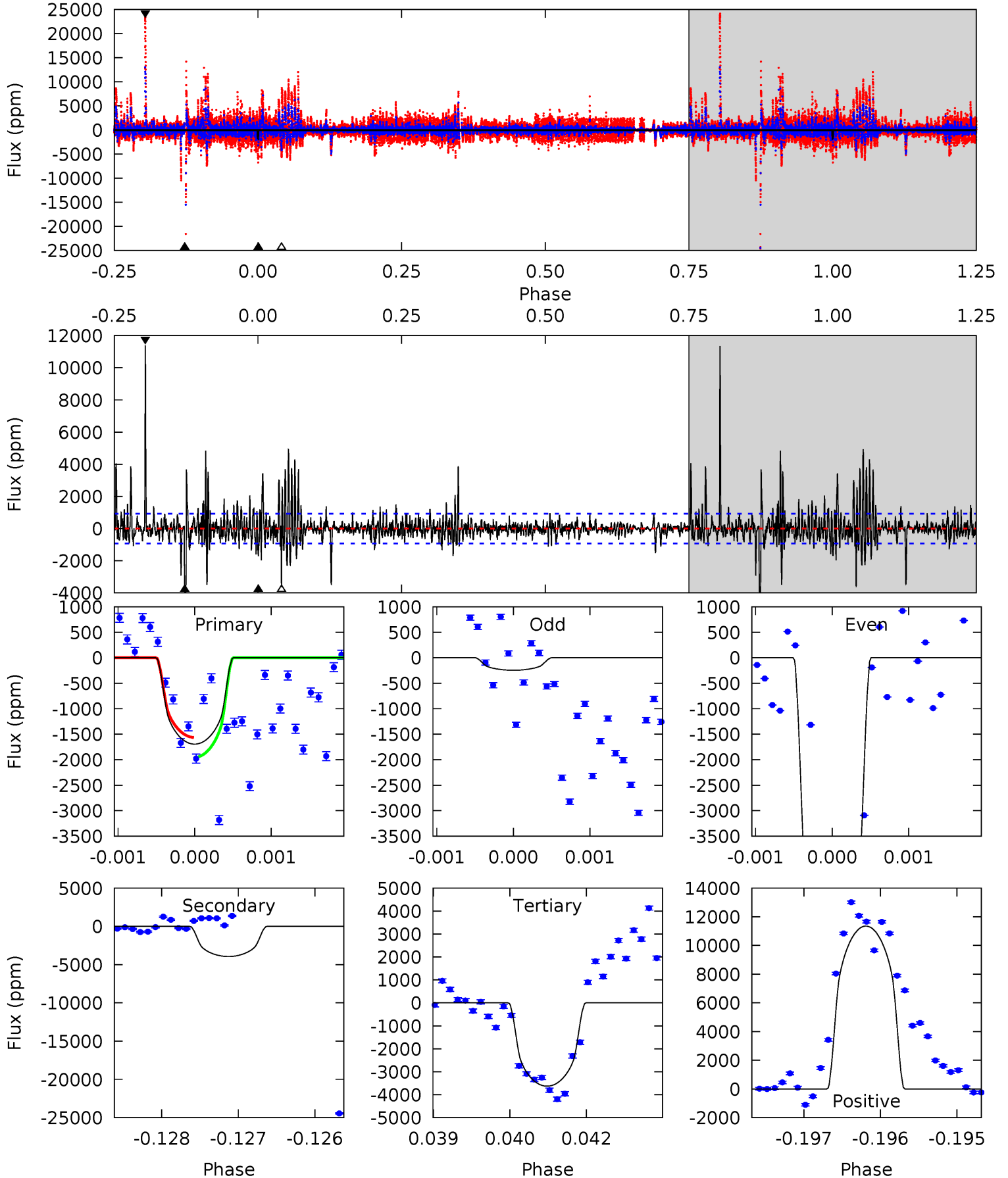
TCE 010978948-02 P=534.535118 Days $T_0=162.716866$ (BKJD)



DV Model-Shift Uniqueness Test

010978948-02, P = 534.448466 Days, E = 162.937869 Days

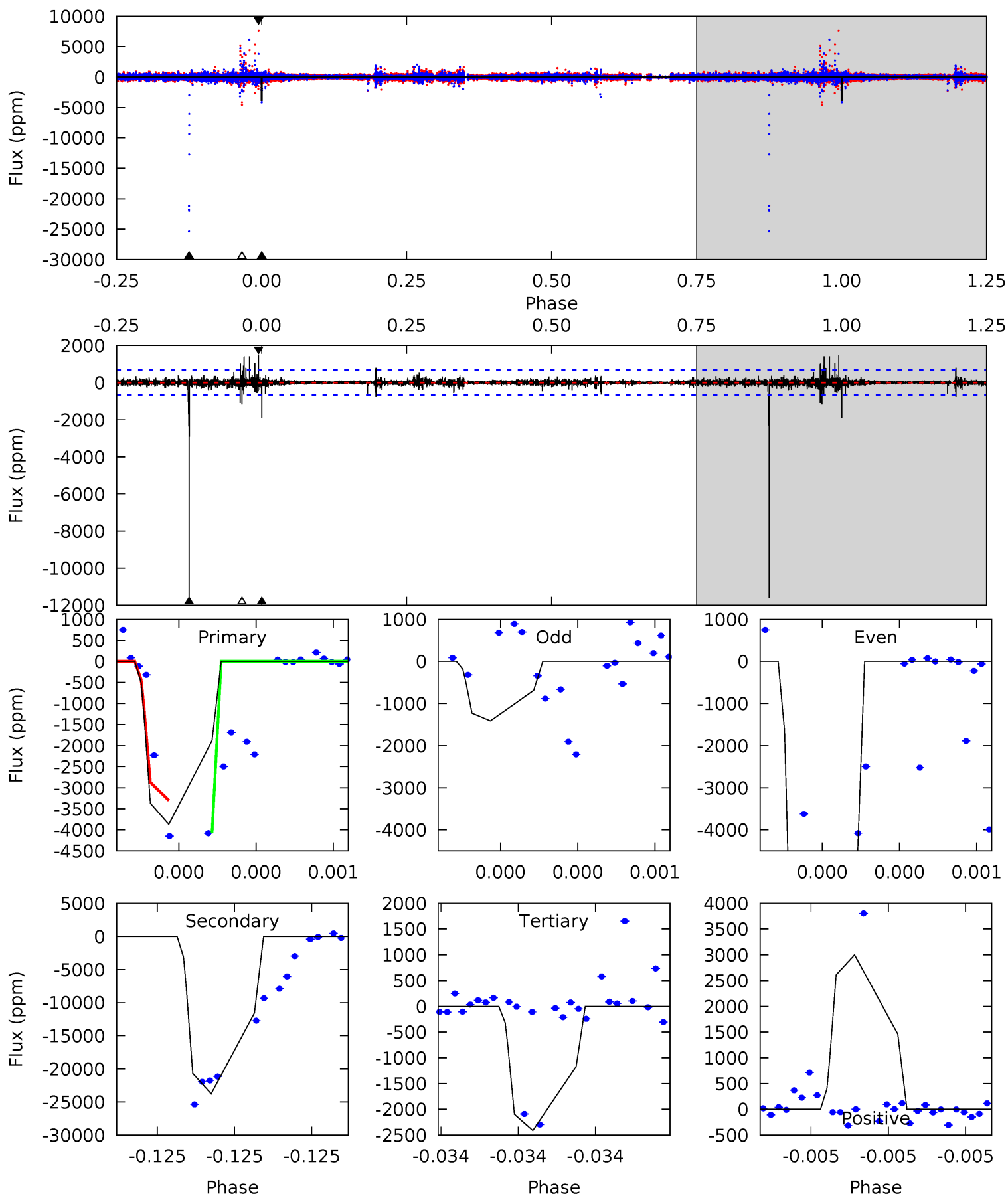
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.86	22.9	21.1	66.1	5.42	3.23	4.26	-11.3	-56.2	1.82	-43.1	14.7	1.96	0.74	1.10



Alt Model-Shift Uniqueness Test

010978948-02, P = 534.535118 Days, E = 162.716866 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	98.1	9.94	12.4	5.65	3.60	0.60	6.02	3.59	88.1	85.7	15.7	0.79	0.11	0



Stellar Parameters For KIC 010978948

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3269^{+117}_{-78}	$0.088^{+0.202}_{-0.067}$	$-0.100^{+0.250}_{-0.100}$	$154.866^{+9.192}_{-25.737}$	$1.073^{+0.223}_{-0.096}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+230%/-76%	+250%/-100%	+6%/-17%	+21%/-9%	+87%/-14%
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 010978948-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3938 ± 172	$1011.01^{+156.87}_{-142.59}$	2153^{+102}_{-115}	3263^{+186}_{-160}	$3.797^{+1.467}_{-0.937}$
Alt.	-11578 ± 118	$1461.37^{+162.46}_{-179.52}$	2159^{+99}_{-107}	3471^{+166}_{-137}	$5.487^{+1.504}_{-1.080}$

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

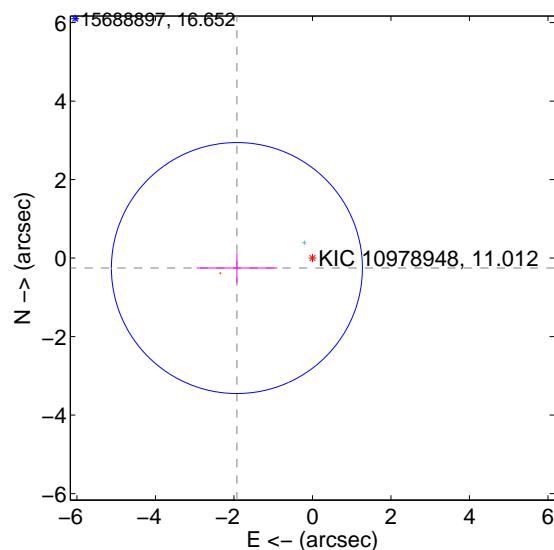
Supplemental centroid analysis for 010978948-02. **Kepler magnitude: 11.01.** Transit SNR 8.07

There are 1 quarters with good PRF difference image offsets

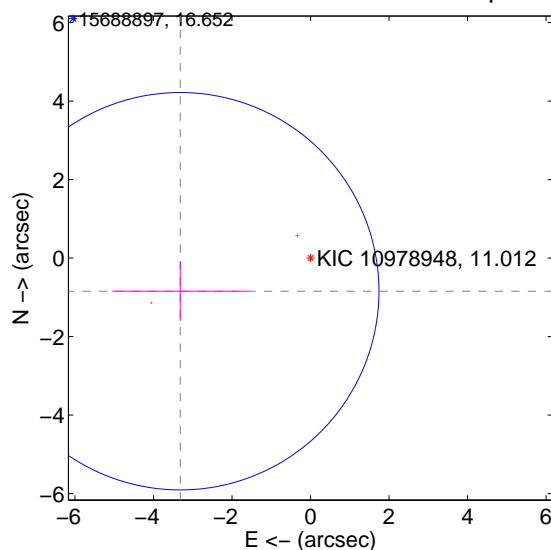
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.941 ± 1.066	1.82	1.924 ± 1.026	-0.253 ± 0.379
PRF-fit source offset from KIC position	3.424 ± 1.687	2.03	3.319 ± 1.730	-0.844 ± 0.755
photometric centroid source offset	0.34 ± 0.33	1.04	0.32 ± 0.32	0.12 ± 0.43

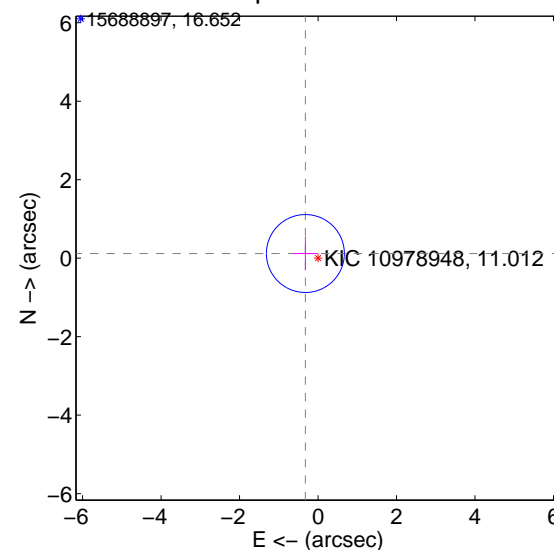
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

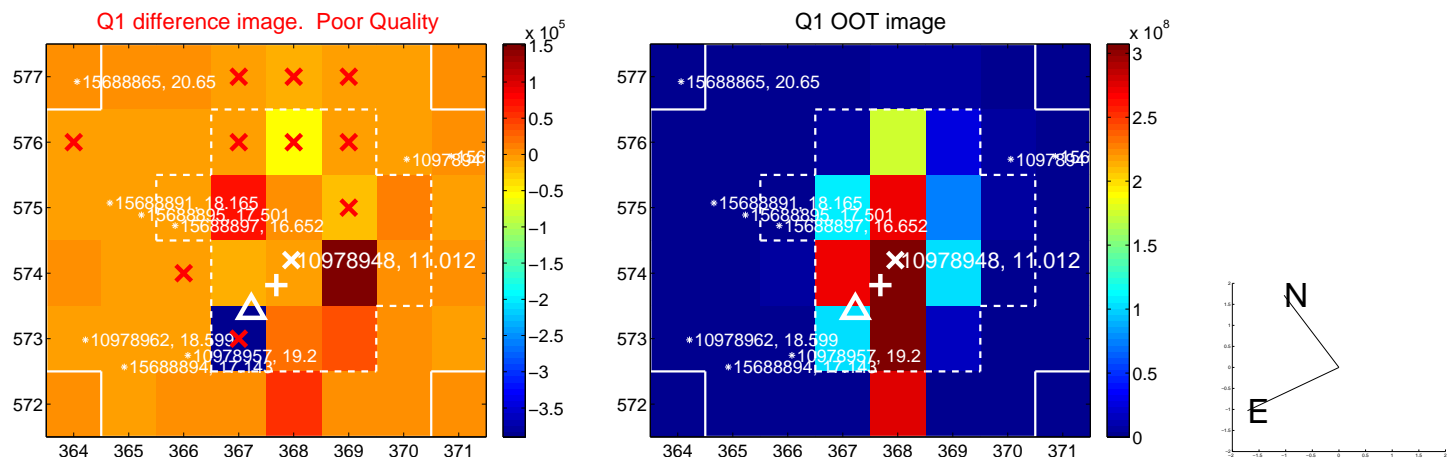


offset from photometric centroids



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.



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

Q5 no difference image



Q5 no OOT image



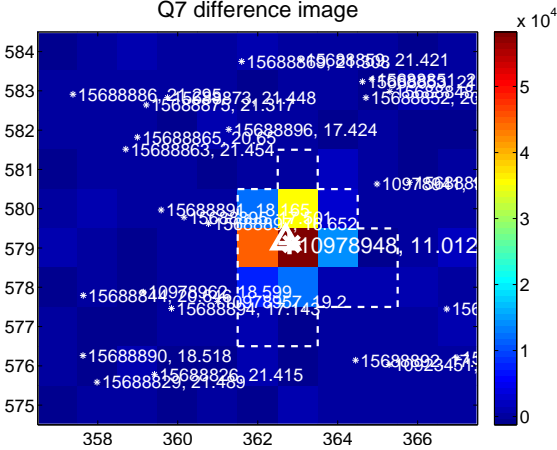
Q6 no difference image



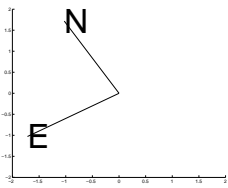
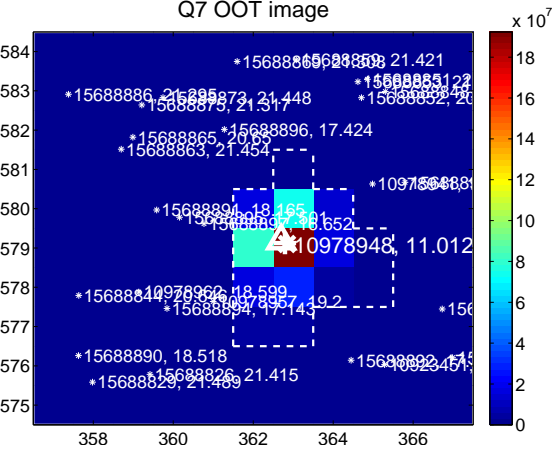
Q6 no OOT image



Q7 difference image



Q7 OOT image



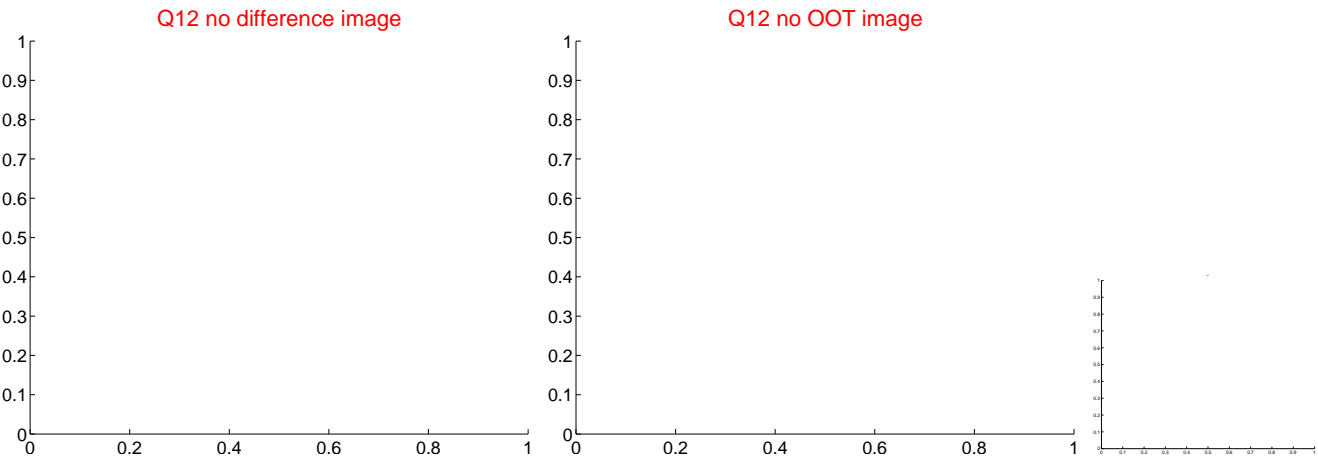
Q8 no difference image



Q8 no OOT image



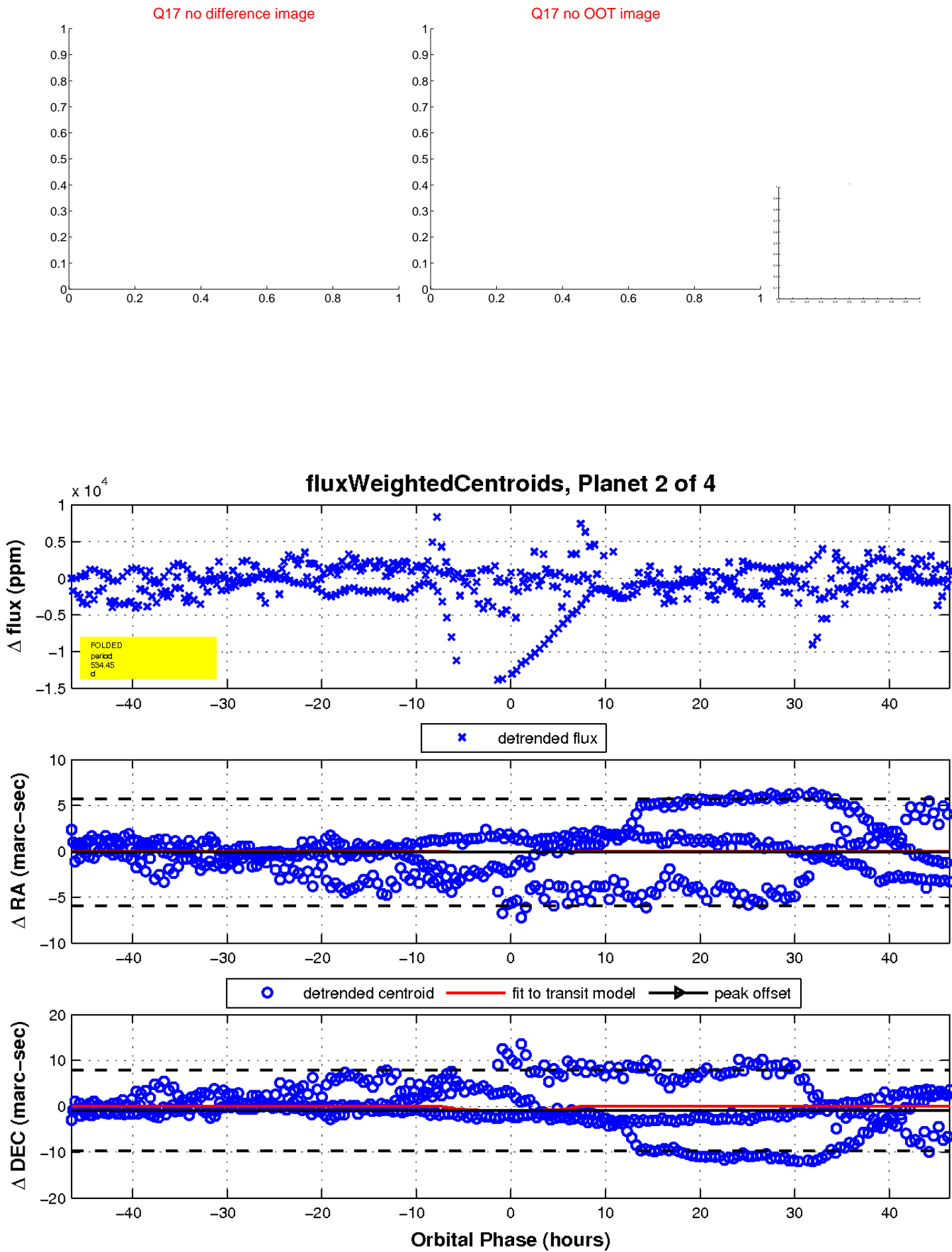
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



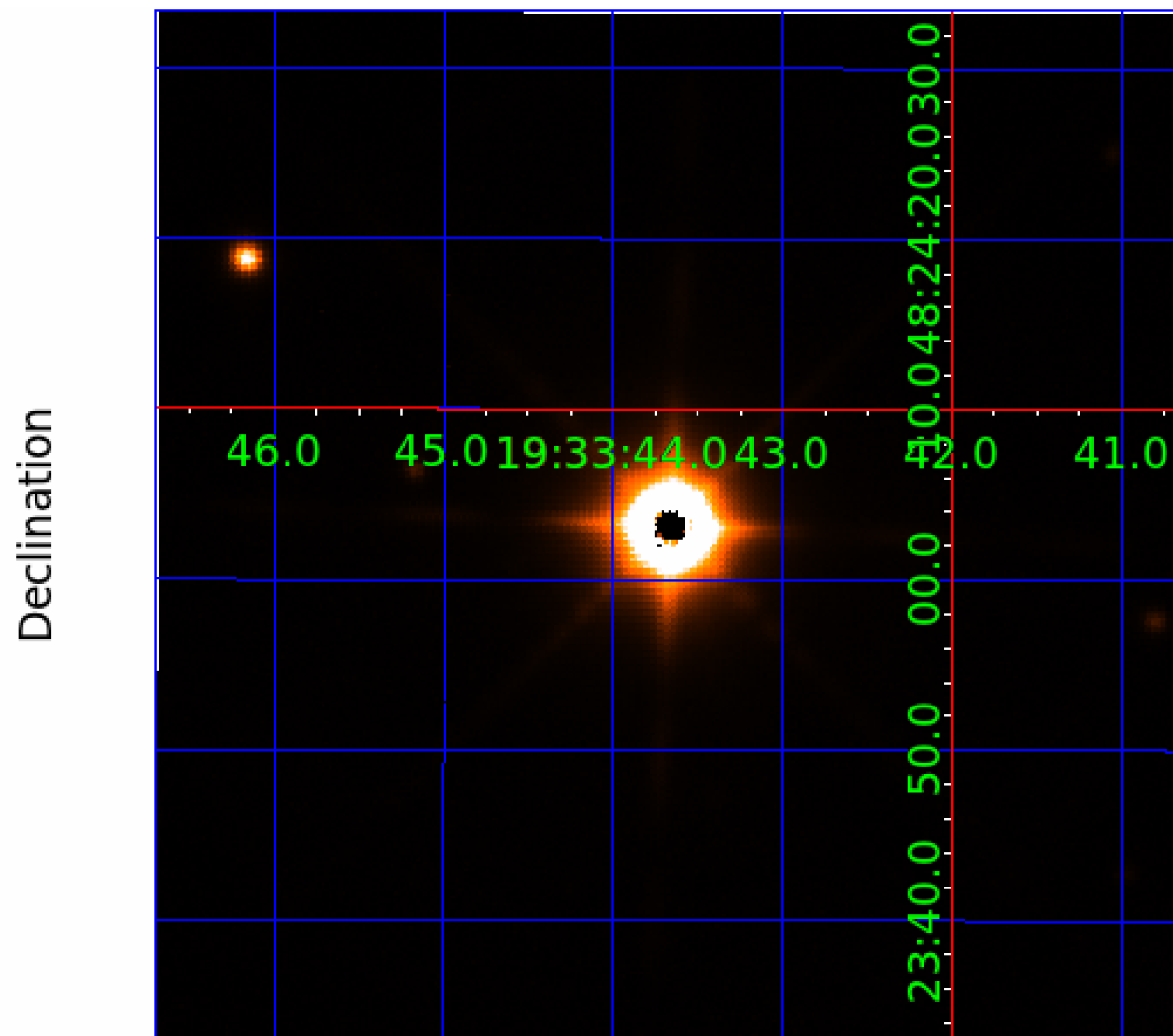
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 010978948

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})
010978948-01	OBS	No	207.538228	263.711624	116.6	25.898	25.9	3.0	154.87	3269	162.88	0.00
010978948-02	OBS	No	534.448466	162.937868	3508.2	15.508	17.9	8.1	154.87	3269	1041.11	1410.32
010978948-03	OBS	No	365.527455	166.947806	1167.4	29.692	9.6	10.7	154.87	3269	1162.25	2340.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010978948-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
010978948-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
010978948-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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.

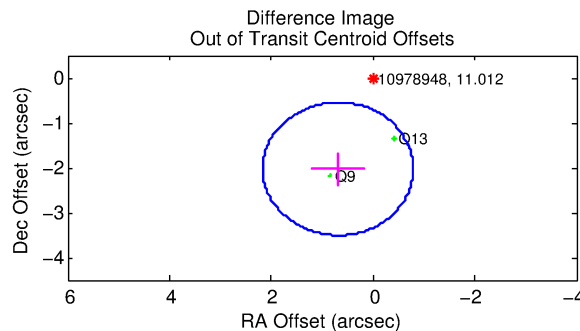
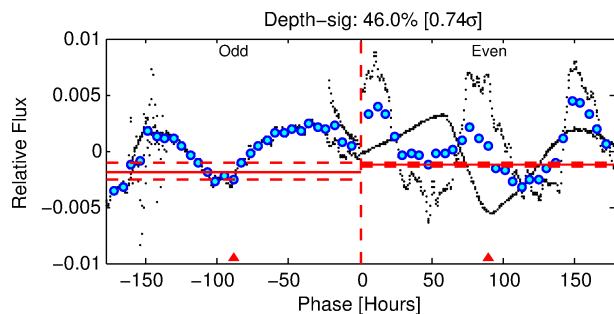
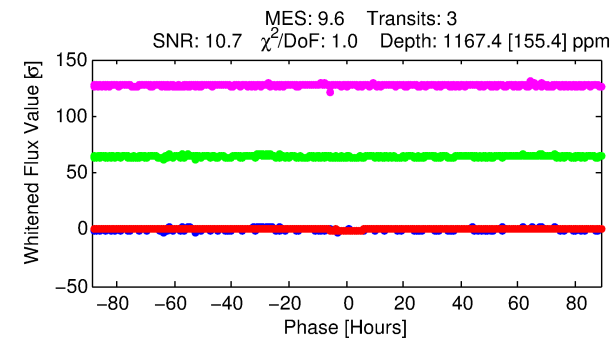
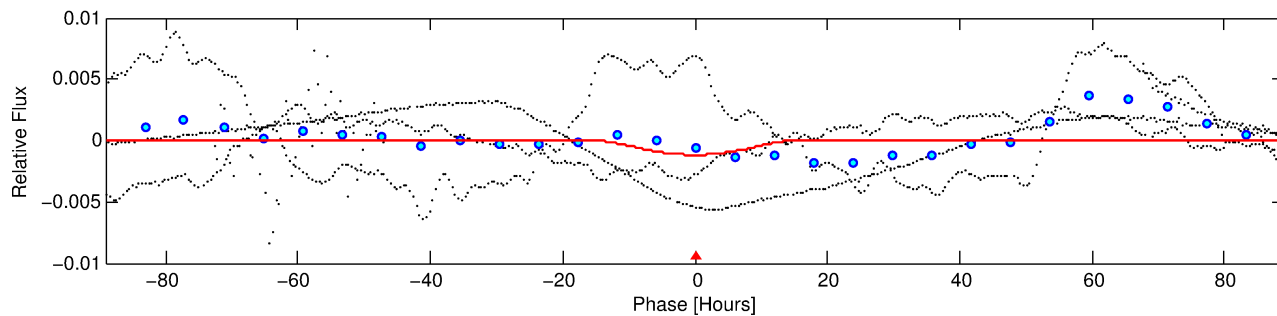
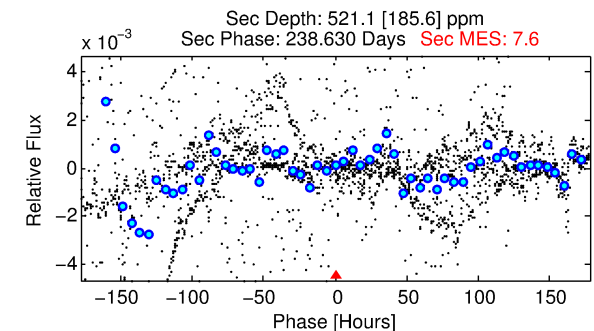
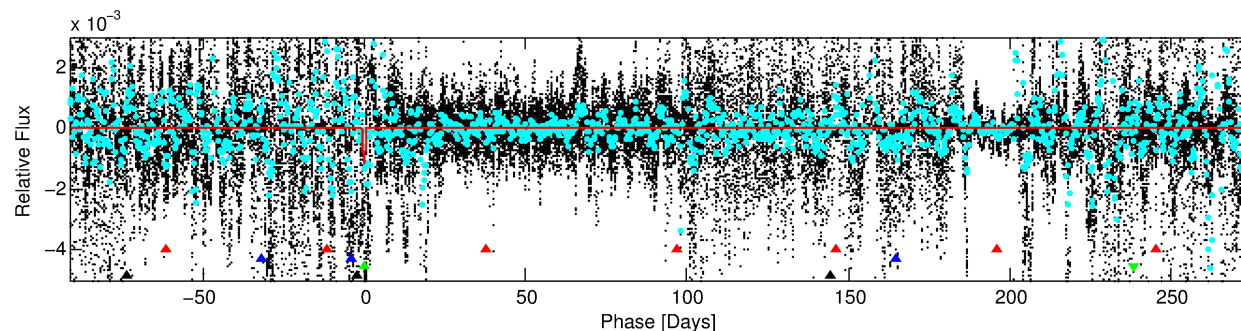
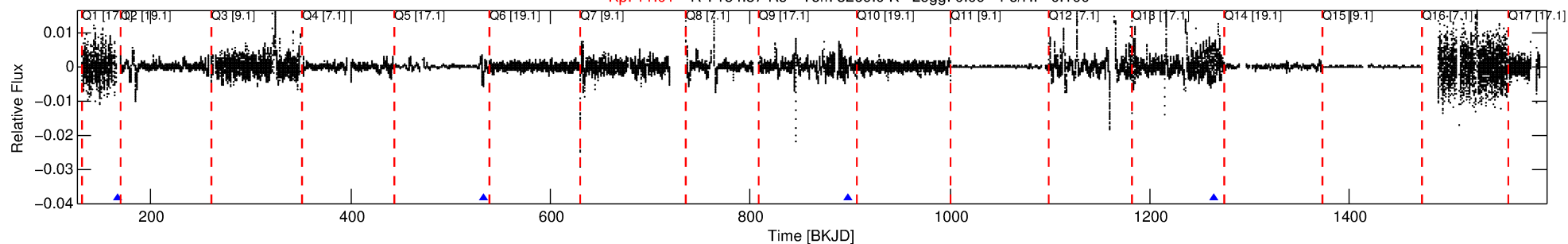
Ephemeris Match Information For 010978948-03

No Significant Match Found

DV One-Page Summary

KIC: 10978948 Candidate: 3 of 4 Period: 365.527 d

Kp: 11.01 R*: 154.87 Rs Teff: 3269.0 K Logg: 0.09 Fe/H: -0.100



DV Fit Results:

Period = 365.52746 [0.08876] d
Epoch = 166.9478 [0.0916] BKJD
Rp/R* = 0.0688 [0.0628]
a/R* = 35.51 [6.49]
b = 1.00 [0.08]
Seff = 2340.44 [840.35]
Teq = 1774 [159] K
Rp = 1162.25 [1079.43] Re
a = 1.0240 [0.1951] AU
Ag = 0.22 [0.42] [-1.85σ]
Teff = 1883 [879] K [0.12σ]

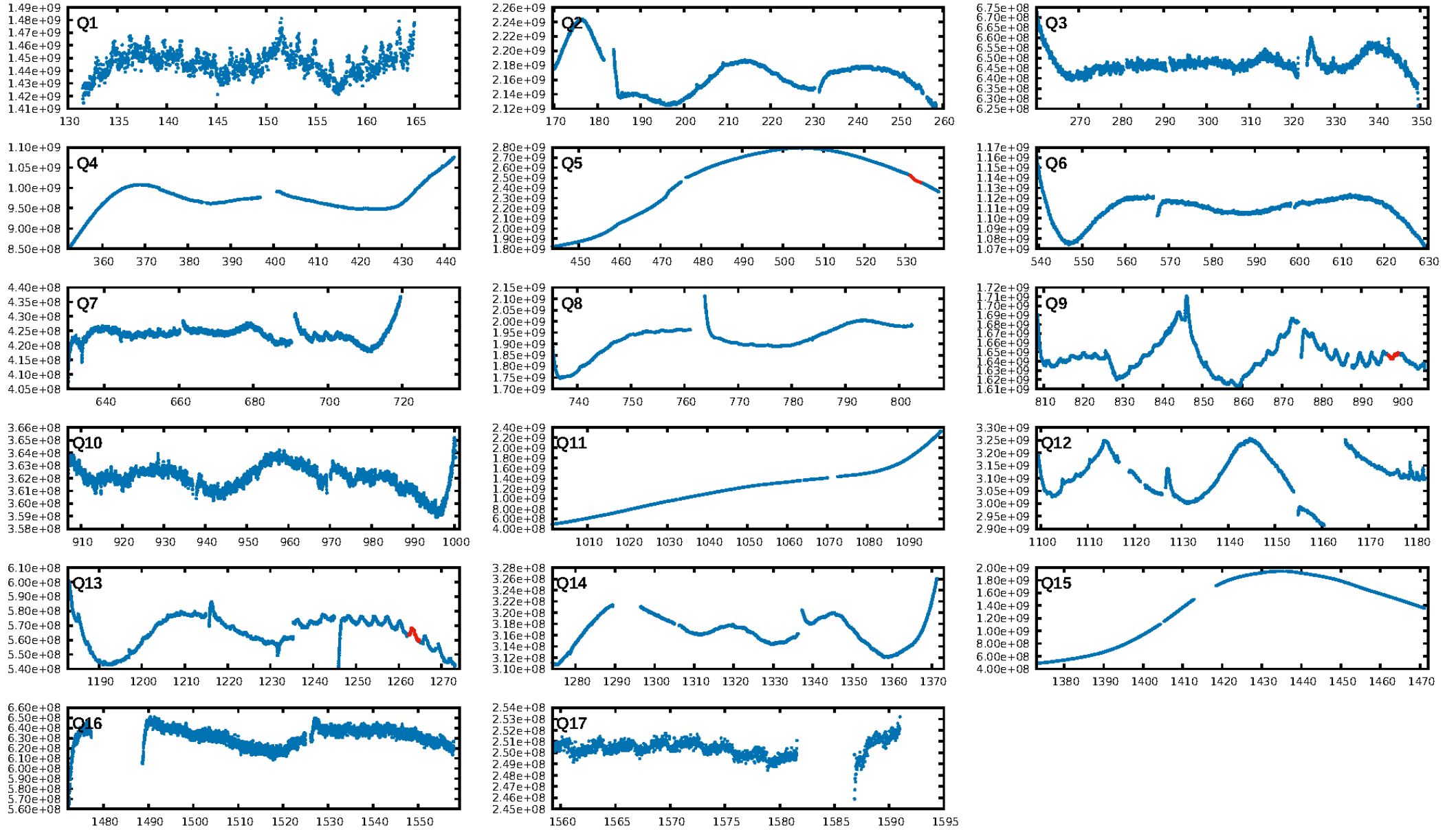
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [96.24σ]
LongPeriod-sig: 100.0% [117.75σ]
ModelChiSquare2-sig: 68.7%
ModelChiSquareGof-sig: 97.8%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.01698
Centroid-sig: 14.5%
Centroid-so: 9.656 arcsec [1.10σ]
OotOffset-rm: 2.143 arcsec [4.35σ]
KicOffset-rm: 2.515 arcsec [2.89σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

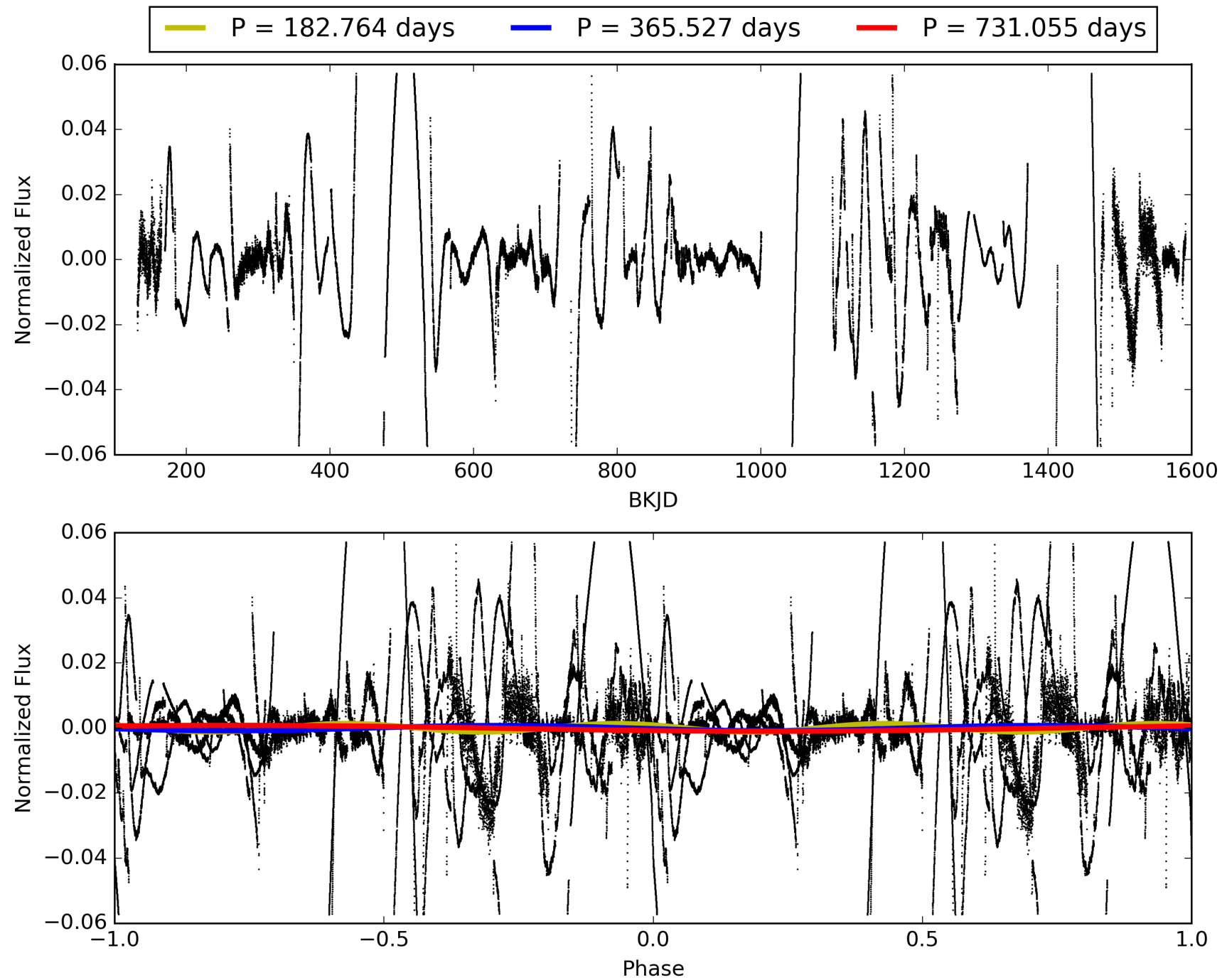
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:45:19 Z

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

TCE 010978948-03, PDC Light Curves

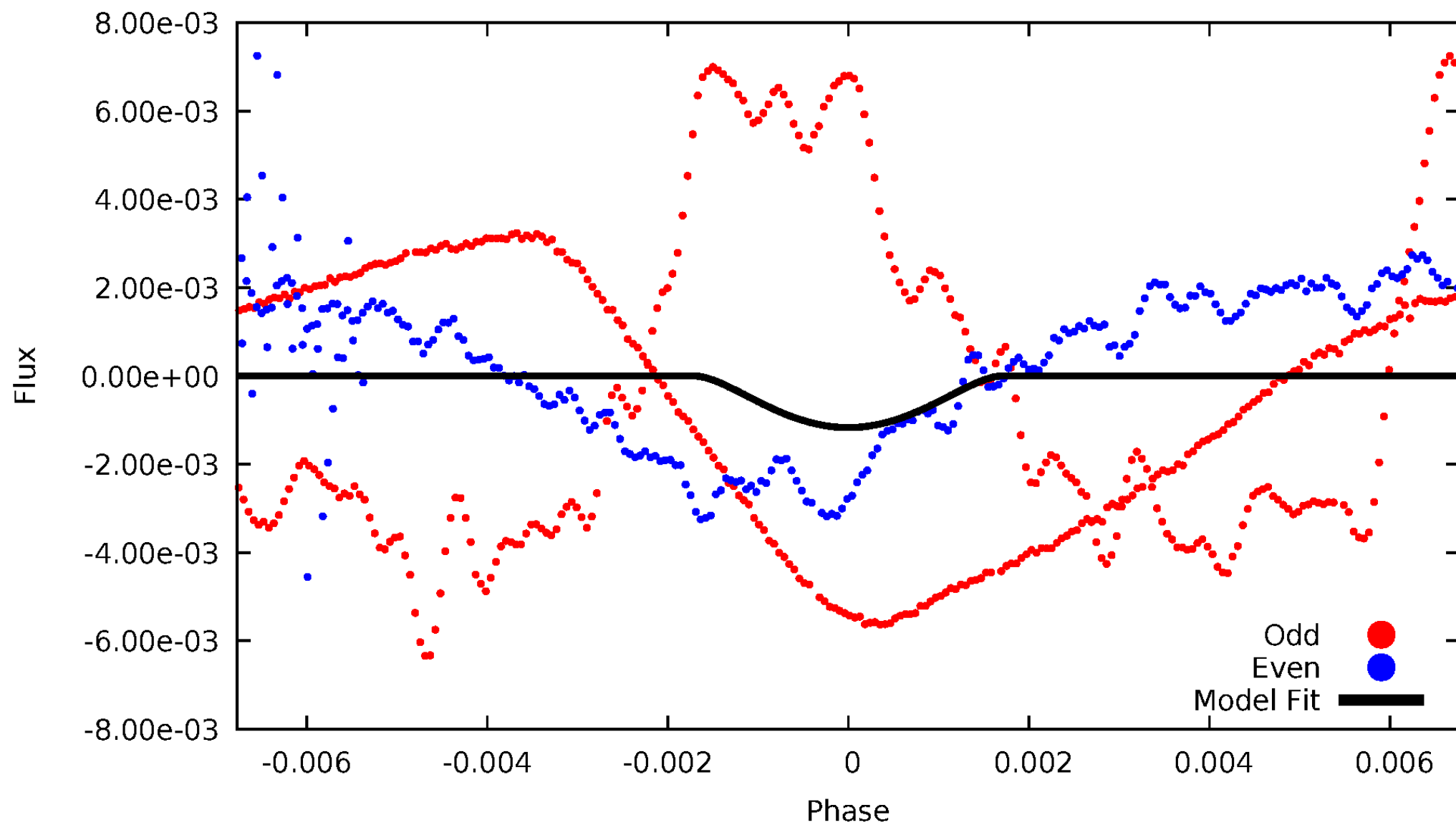


TCE 010978948-03



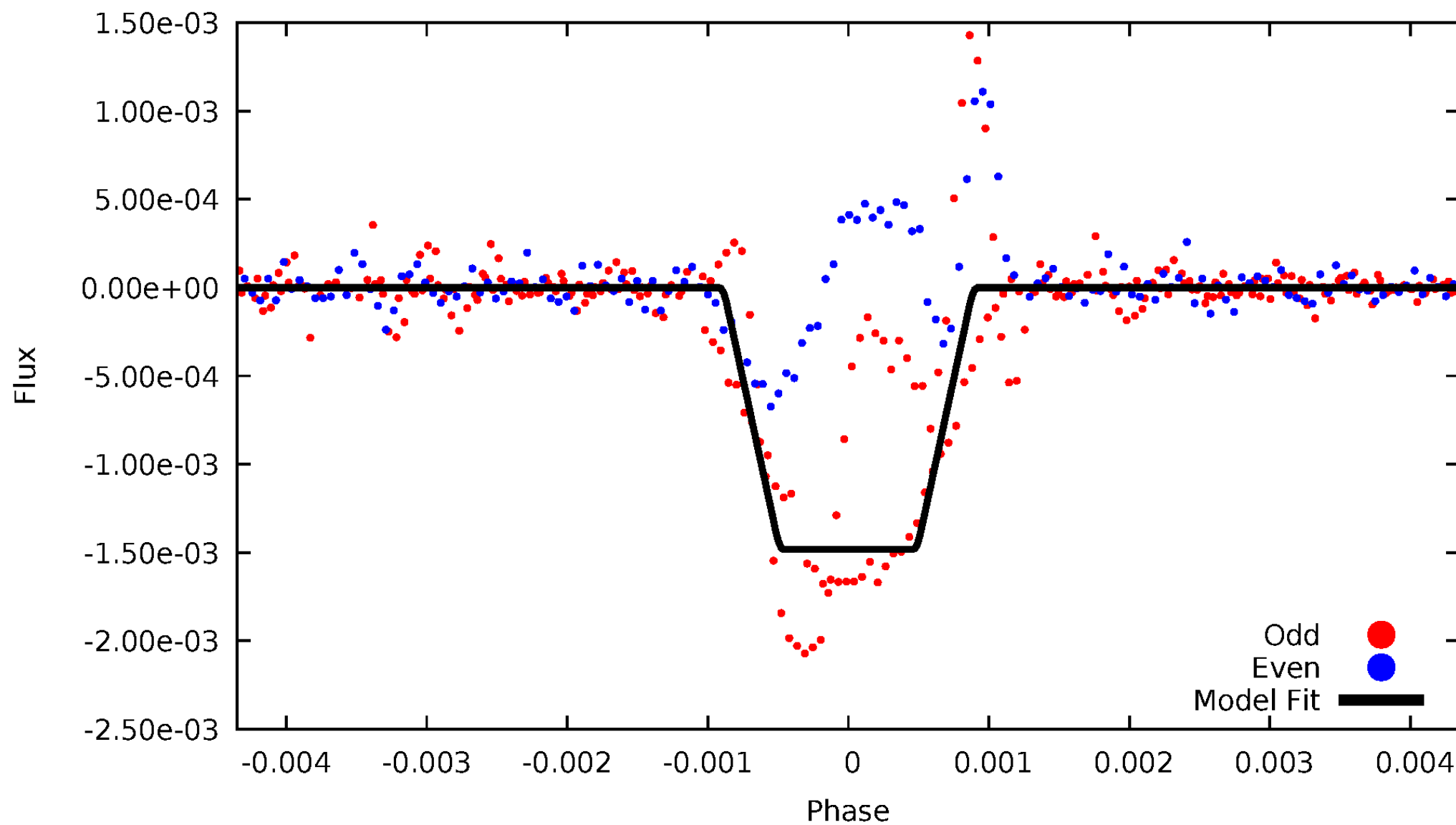
DV Odd/Even

TCE 010978948-03



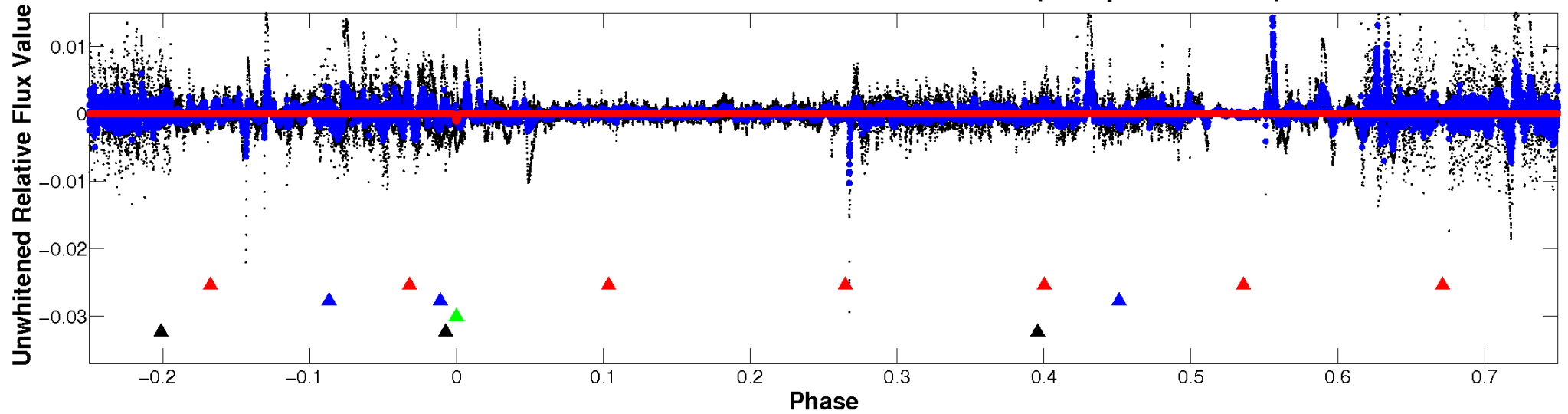
ALT Odd/Even

TCE 010978948-03

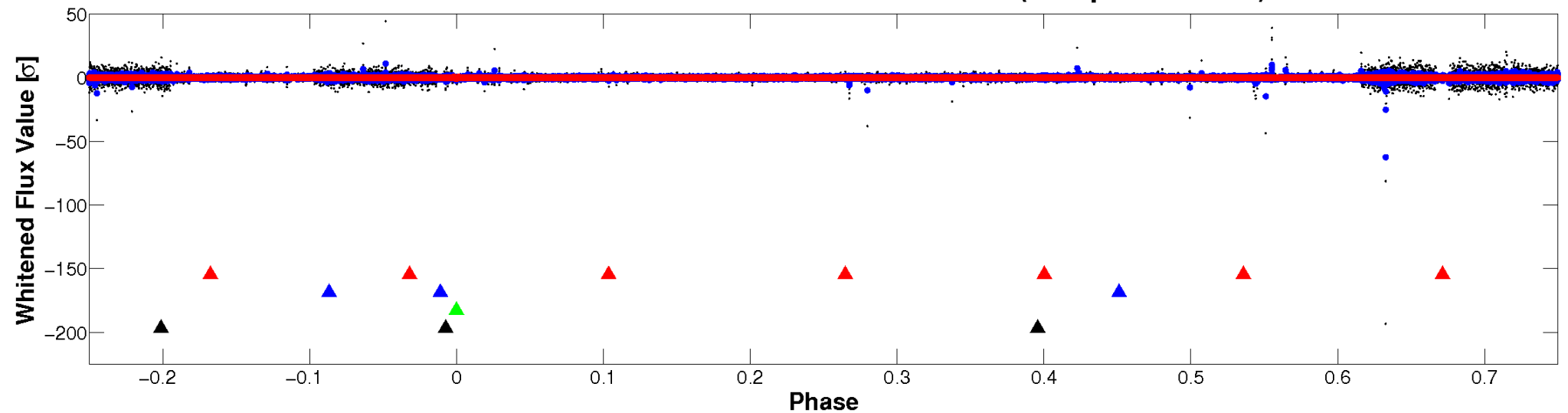


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

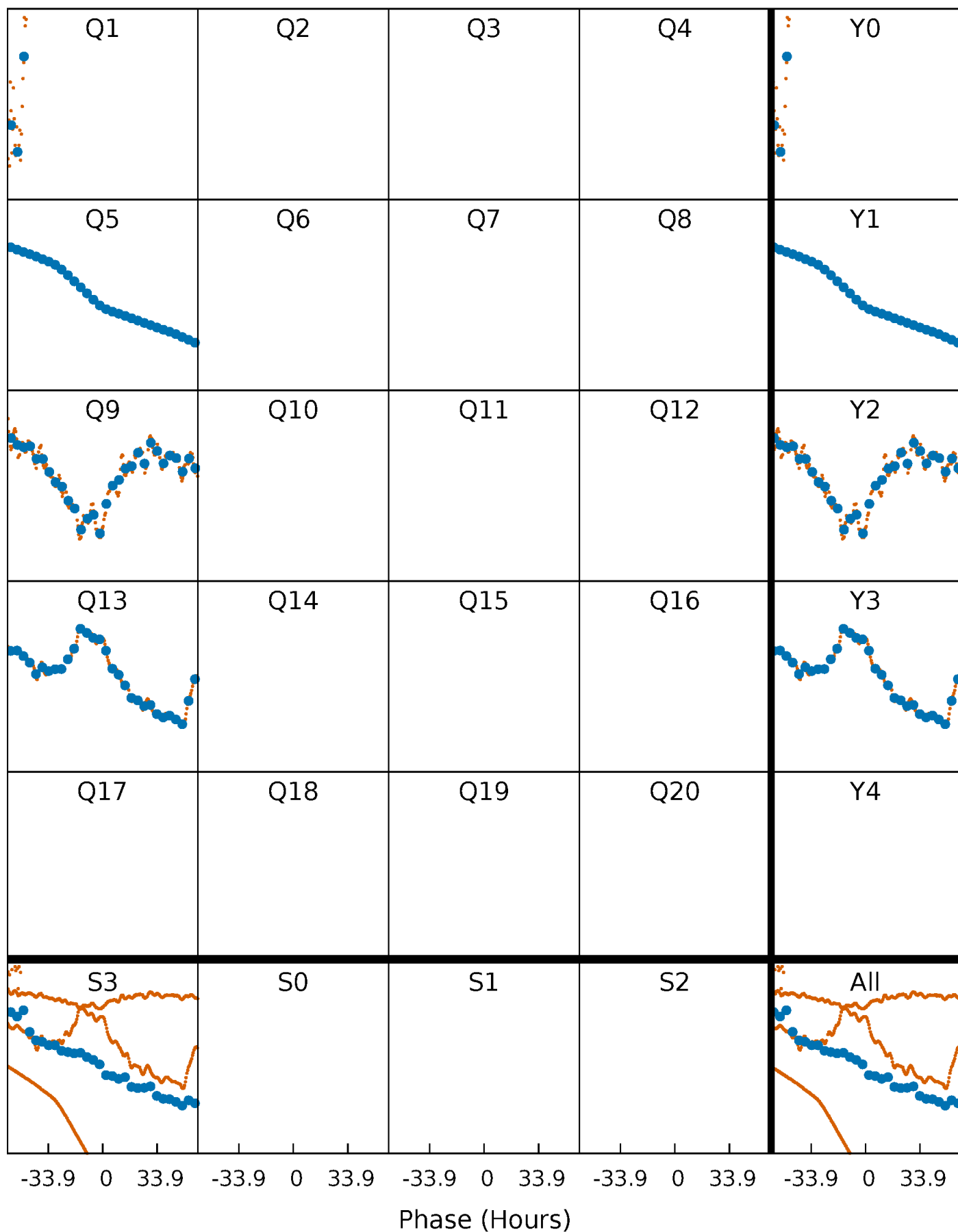


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



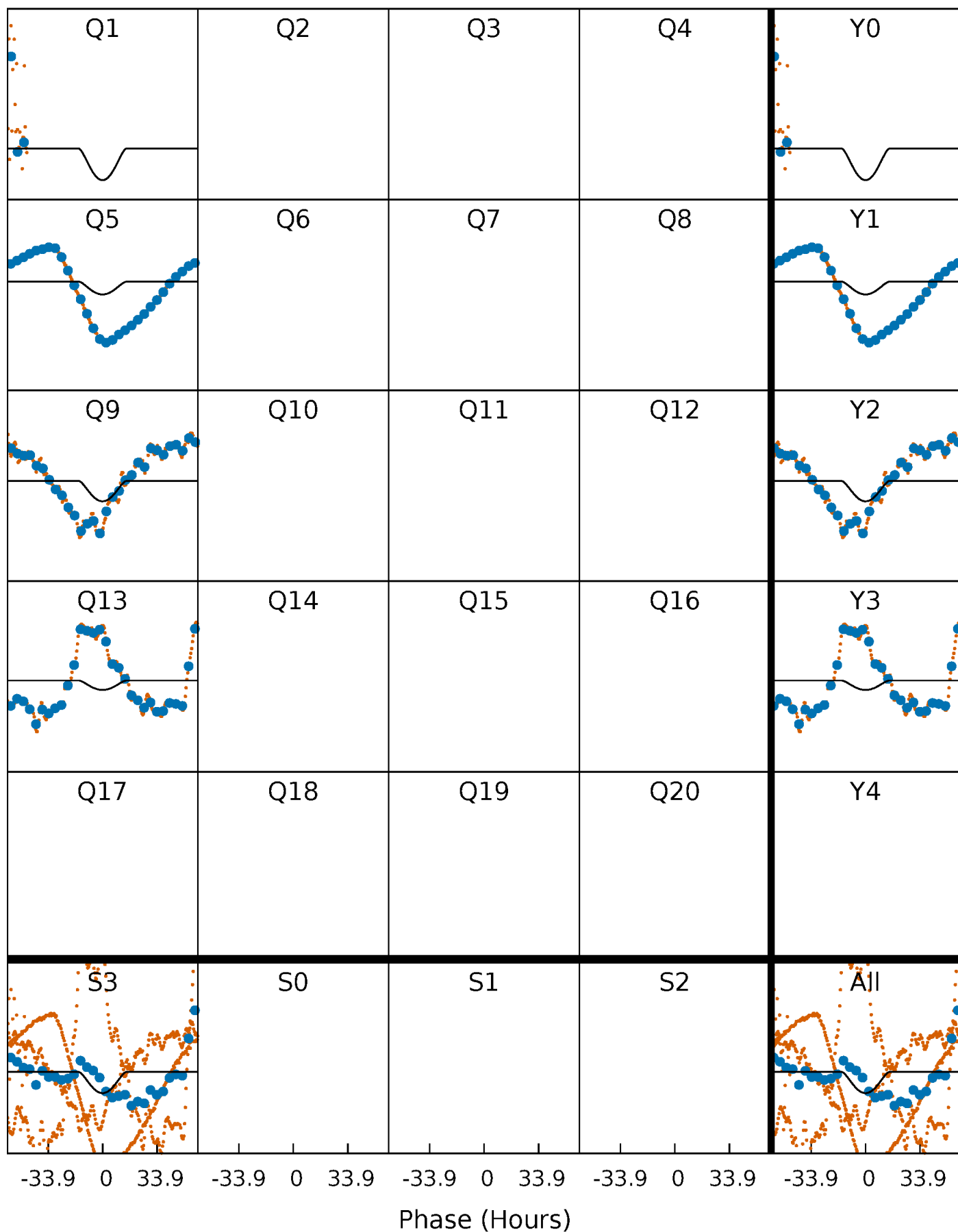
PDC Quarter-Phased Transit Curves

TCE 010978948-03 $P=365.527455$ Days $T_0=166.947806$ (BKJD)



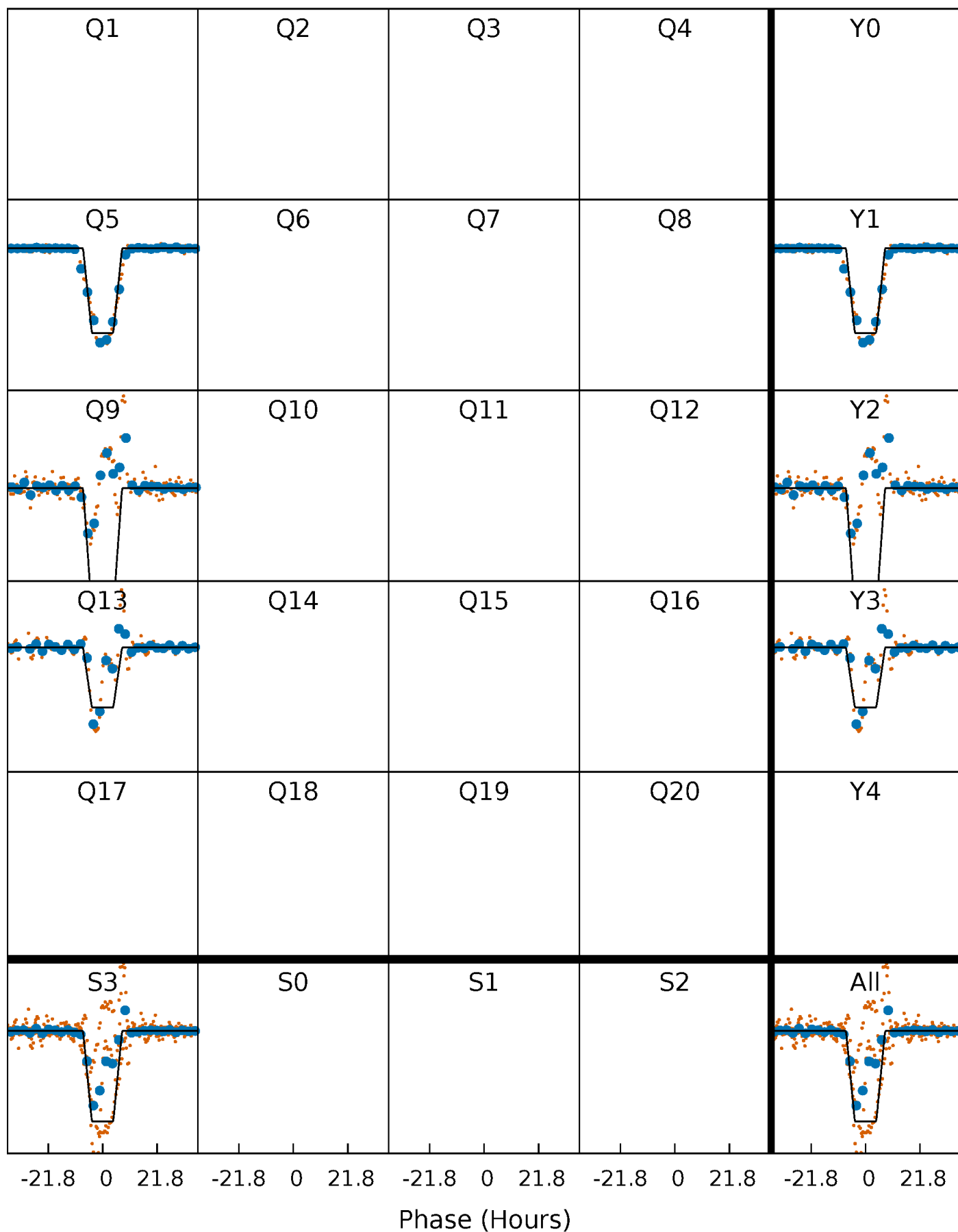
DV Quarter-Phased Transit Curves

TCE 010978948-03 $P=365.527455$ Days $T_0=166.947806$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

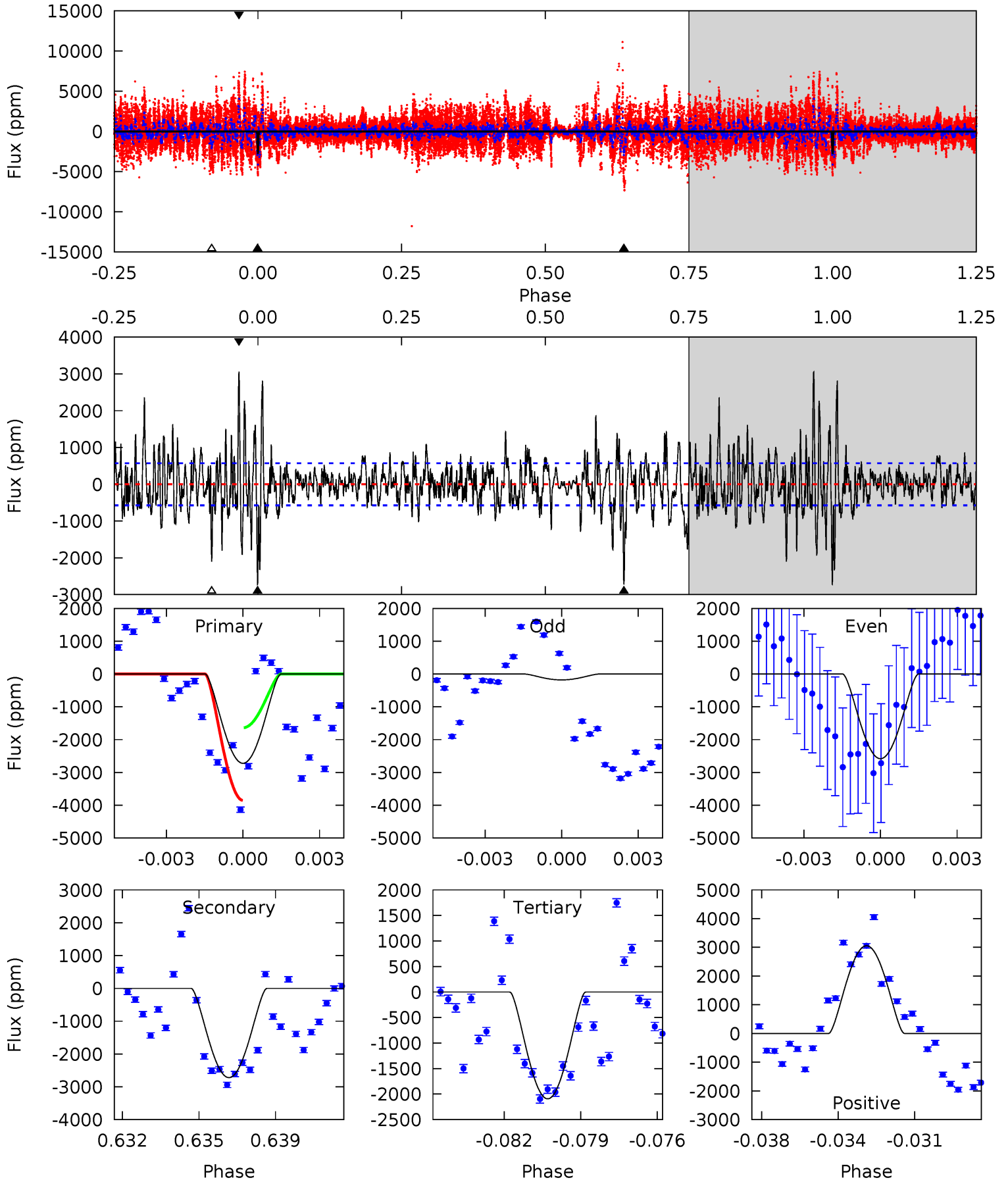
TCE 010978948-03 $P=365.692612$ Days $T_0=166.773596$ (BKJD)



DV Model-Shift Uniqueness Test

010978948-03, P = 365.527455 Days, E = 166.947806 Days

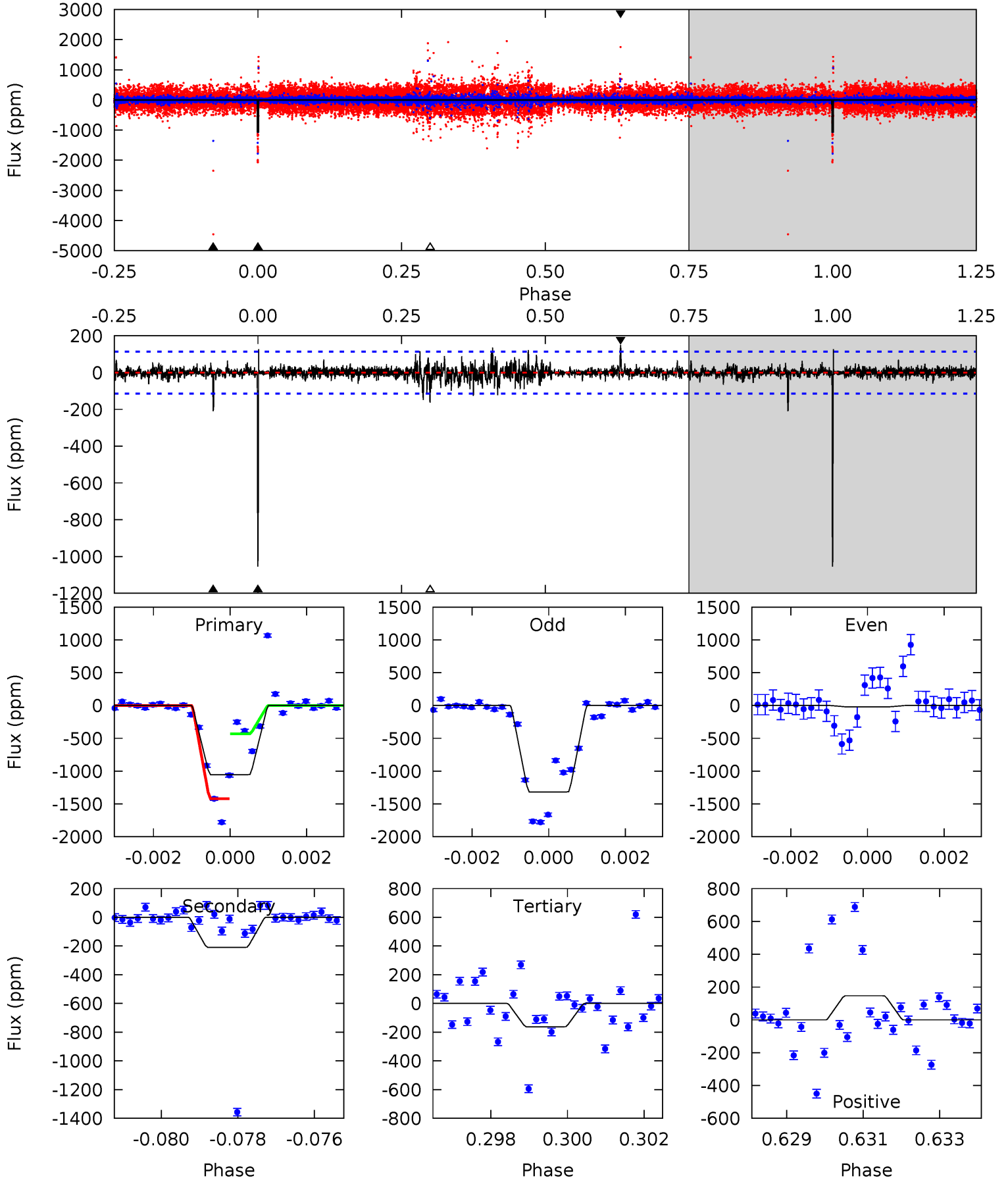
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.8	24.8	19.1	27.9	5.23	2.93	5.13	5.75	-3.04	5.73	-3.05	6.72	0.36	0.53	9.08



Alt Model-Shift Uniqueness Test

010978948-03, P = 365.692612 Days, E = 166.773596 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.5	9.81	7.62	6.89	5.35	3.12	1.04	41.9	42.6	2.19	2.93	16.1	0.83	0.12	23.0



Stellar Parameters For KIC 010978948

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3269^{+117}_{-78}	$0.088^{+0.202}_{-0.067}$	$-0.100^{+0.250}_{-0.100}$	$154.866^{+9.192}_{-25.737}$	$1.073^{+0.223}_{-0.096}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+230%/-76%	+250%/-100%	+6%/-17%	+21%/-9%	+87%/-14%
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 010978948-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2720 ± 110	$1267.33^{+962.51}_{-729.06}$	2439^{+114}_{-129}	2787^{+999}_{-971}	$1.025^{+4.736}_{-0.710}$
Alt.	-209 ± 21	$992.74^{+847.83}_{-663.77}$	2444^{+119}_{-131}	-2326^{+5183}_{-163}	$0.126^{+1.040}_{-0.089}$

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 $A_{obs} \gg 1.0$

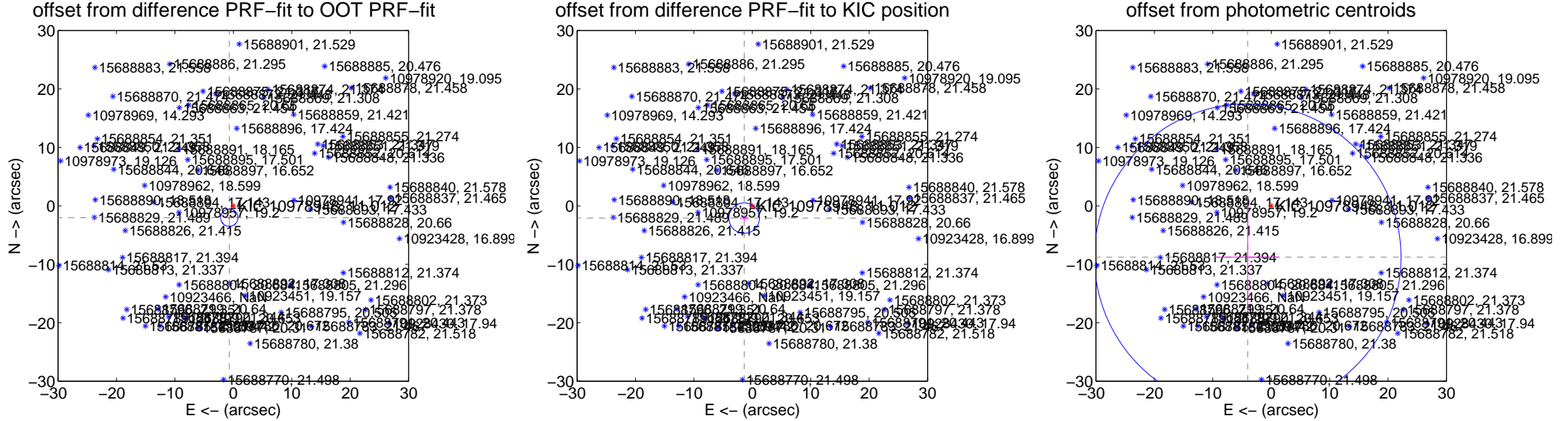
DV Centroid Data

Supplemental centroid analysis for 010978948-03. **Kepler magnitude: 11.01.** Transit SNR 10.67

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.143 \pm 0.493	4.35	0.693 \pm 0.517	-2.028 \pm 0.348
PRF-fit source offset from KIC position	2.515 \pm 0.870	2.89	1.389 \pm 0.751	-2.096 \pm 0.549
photometric centroid source offset	9.66 \pm 8.74	1.10	4.02 \pm 5.38	-8.78 \pm 9.30

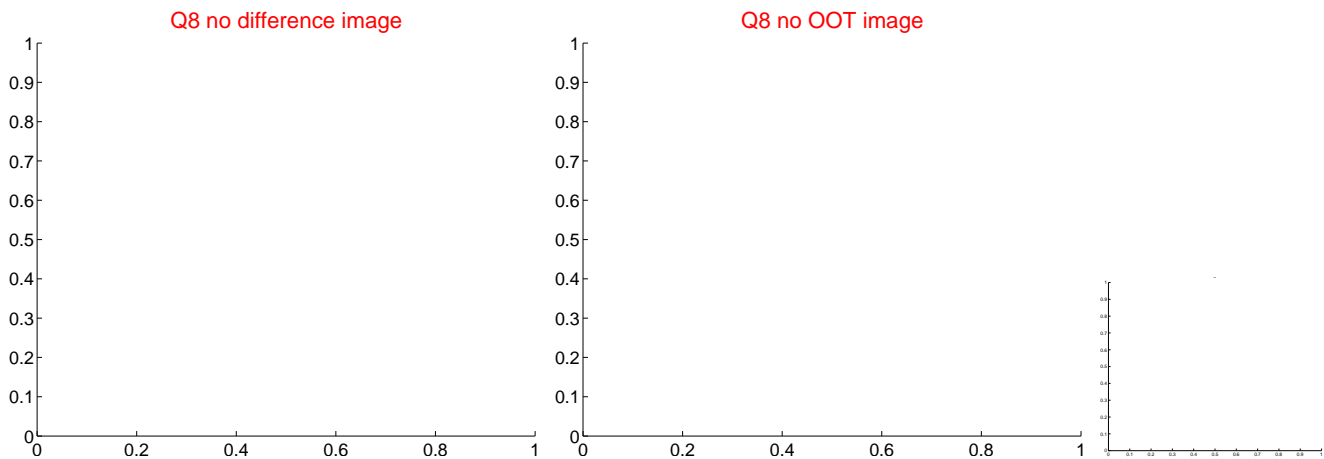
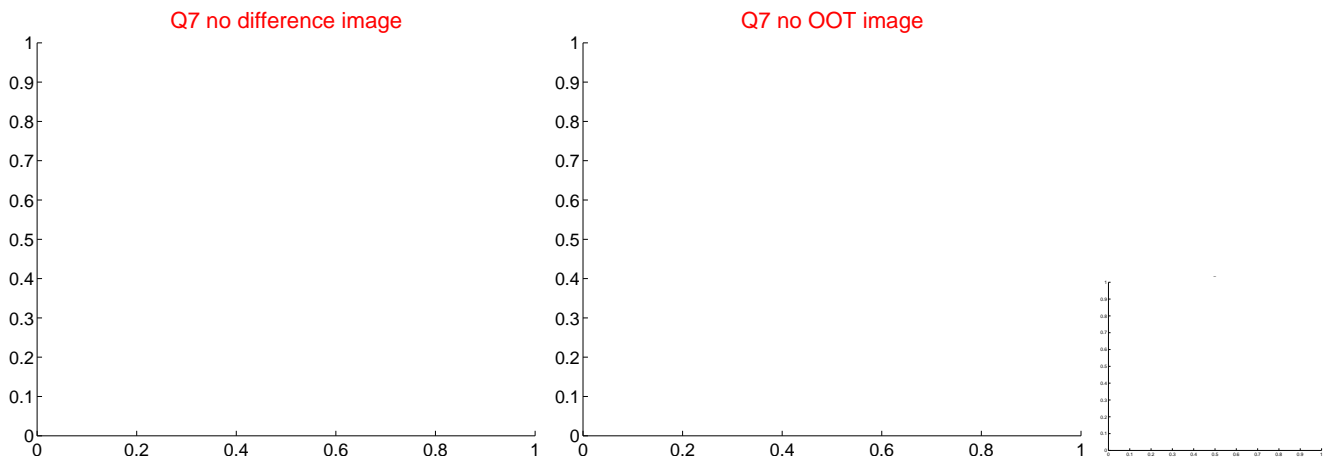
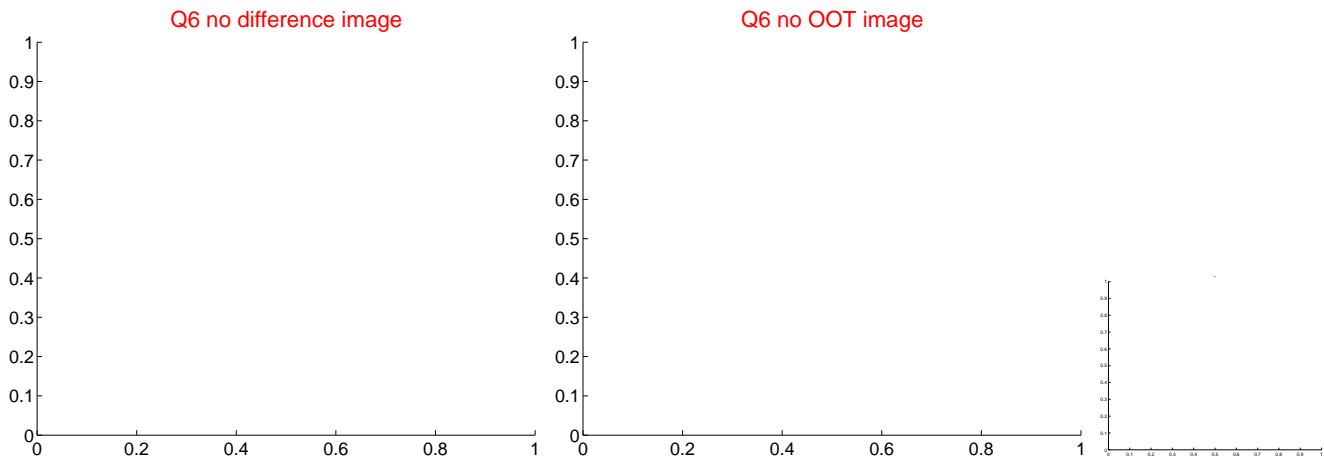
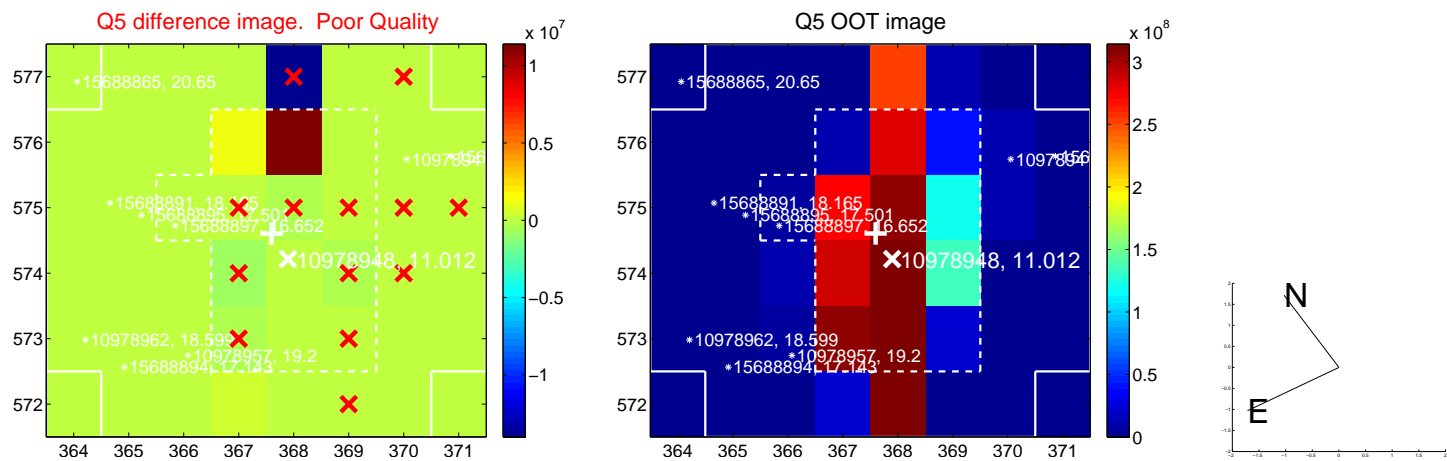


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

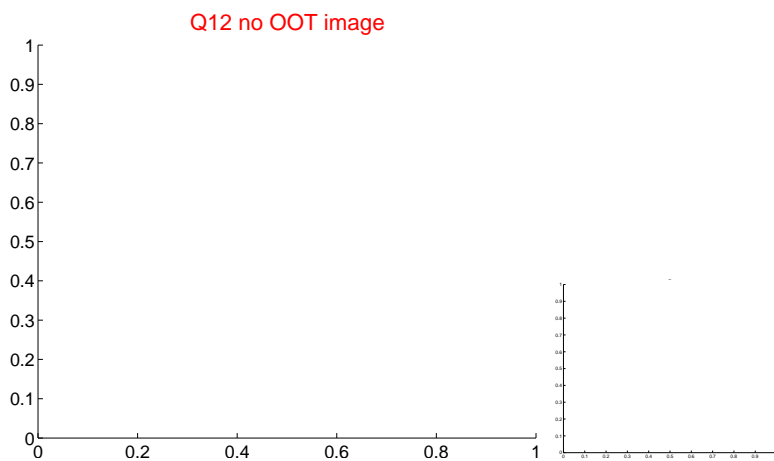
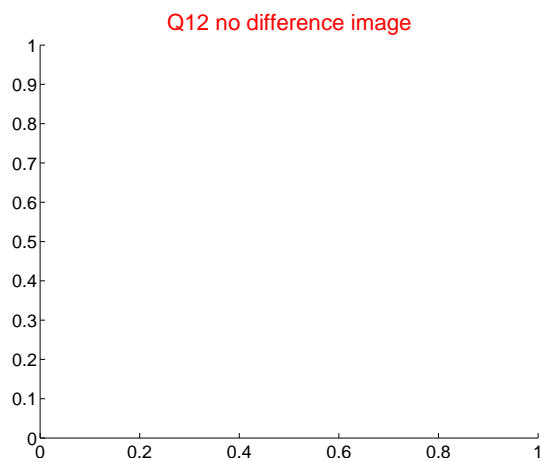
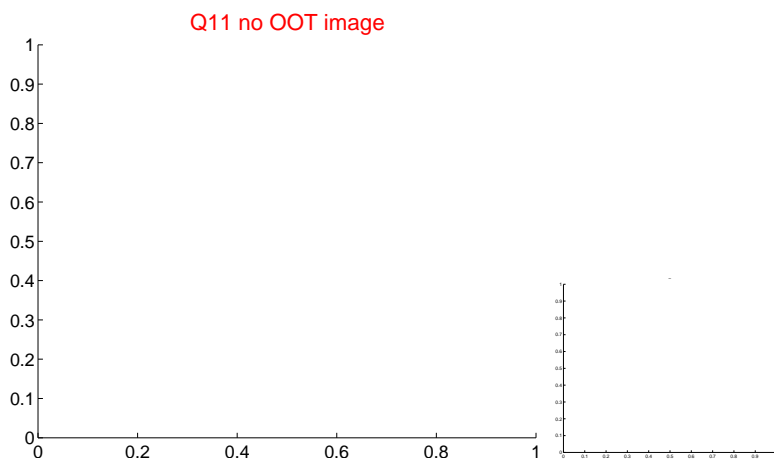
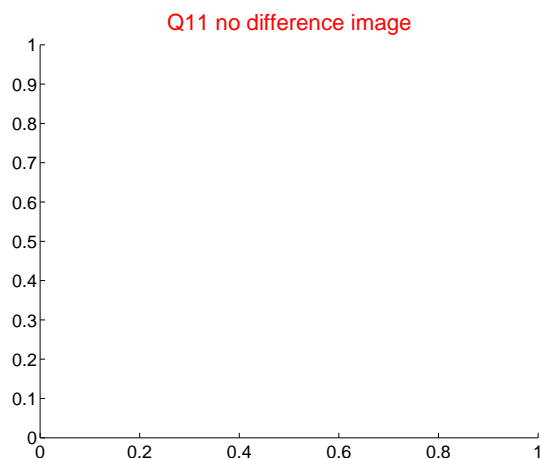
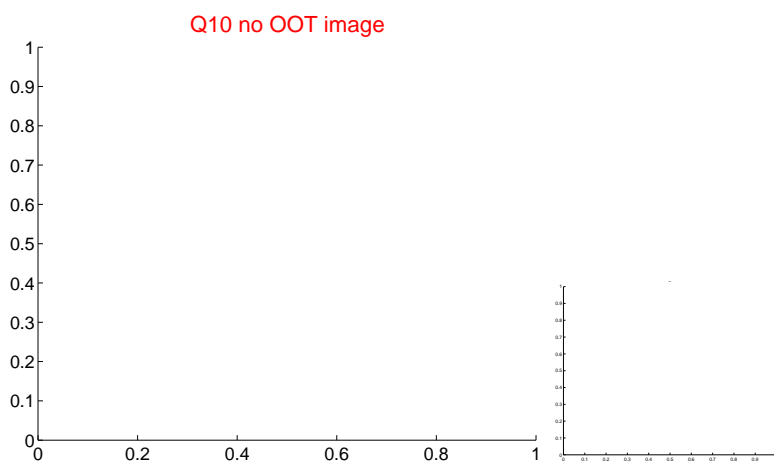
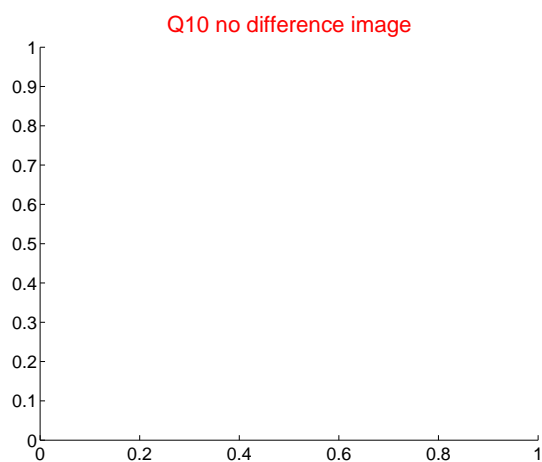
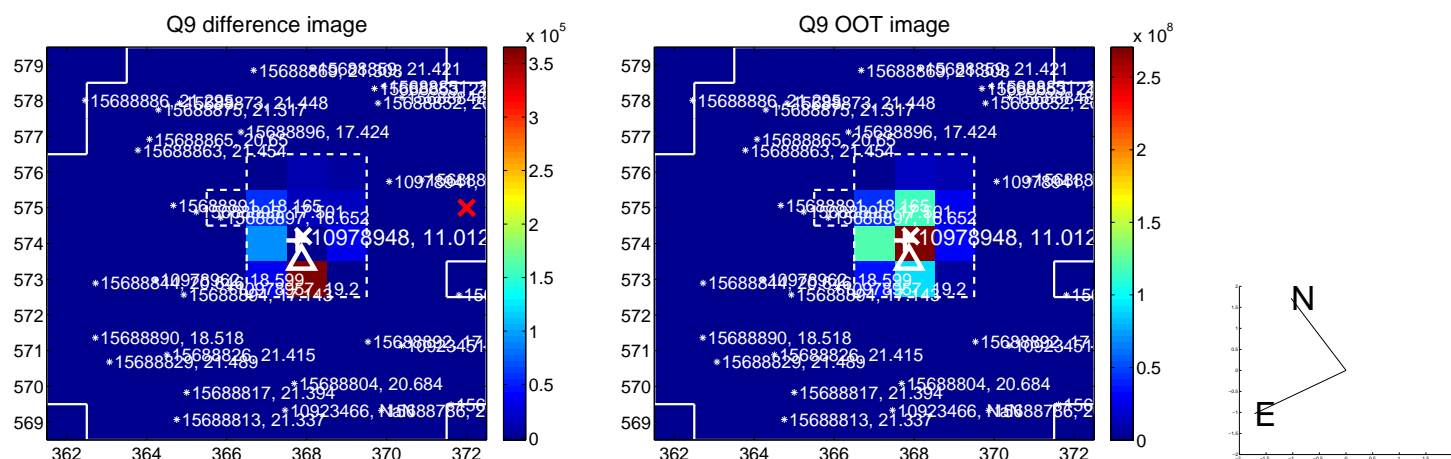
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



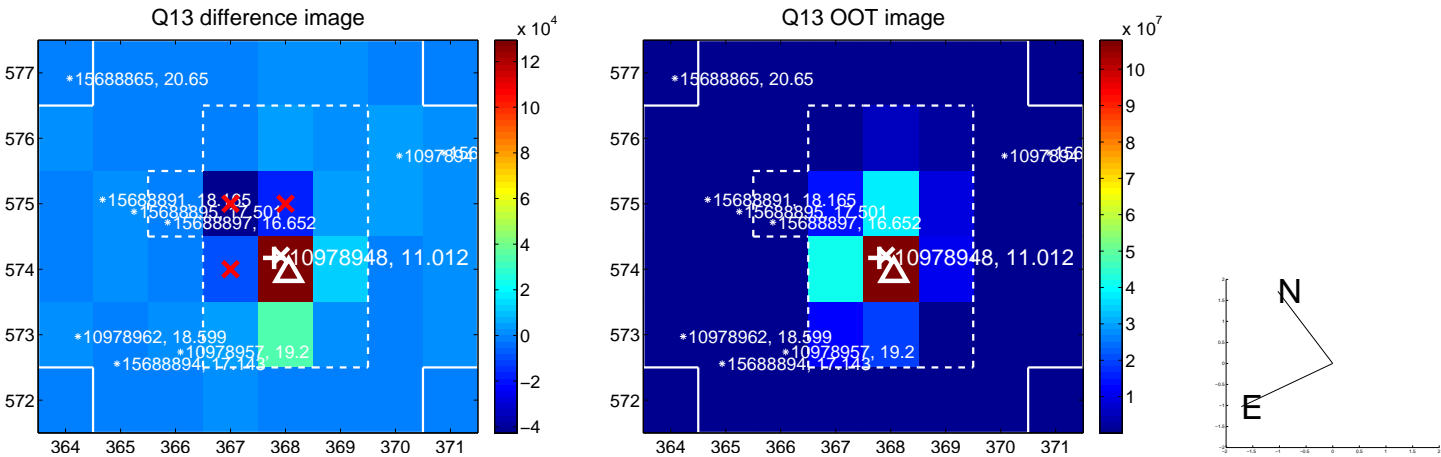
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



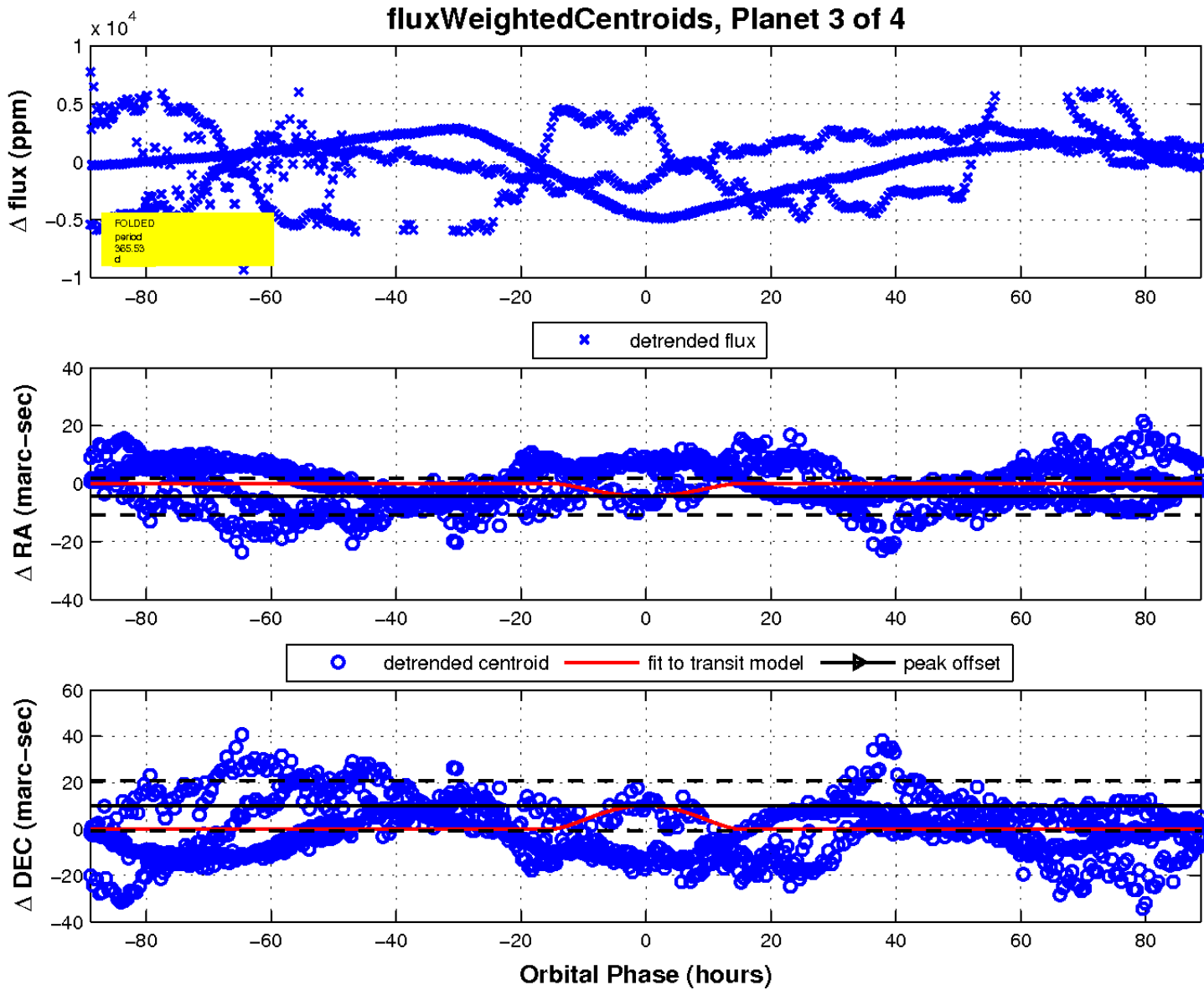
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

Q17 no difference image

Q17 no OOT image



UKIRT Image

