

KIC 005177020

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})
005177020-01	OBS	No	499.756213	460.956163	317.4	25.537	8.8	13.3	3.06	7694	5.73	12.77
005177020-02	OBS	No	0.546612	131.560763	12.1	3.417	8.2	7.3	3.06	7694	1.24	113347.55
005177020-03	OBS	No	19.524878	143.793617	111.6	2.902	8.8	8.5	3.06	7694	3.79	963.53
005177020-04	OBS	No	98.595804	145.047428	242.6	2.930	8.1	9.3	3.06	7694	5.43	111.22

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177020-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005177020-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
005177020-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005177020-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

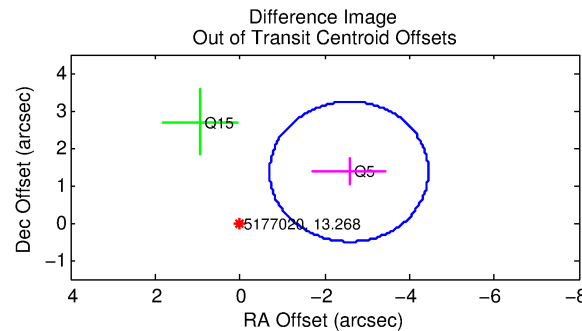
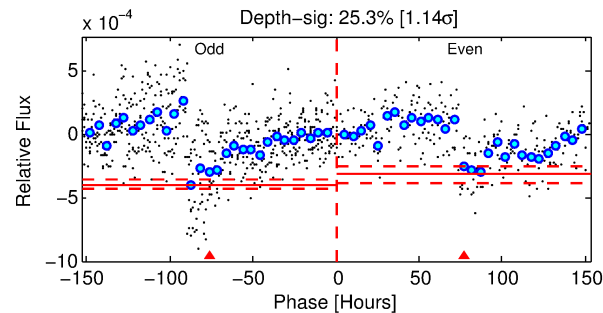
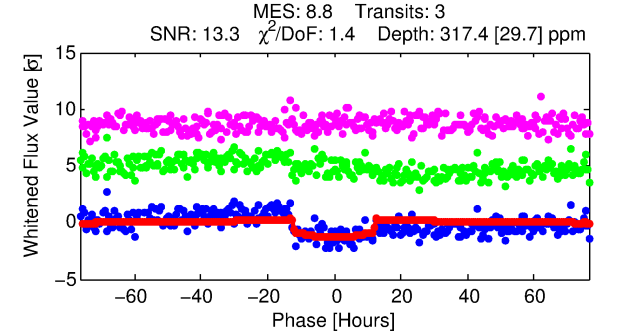
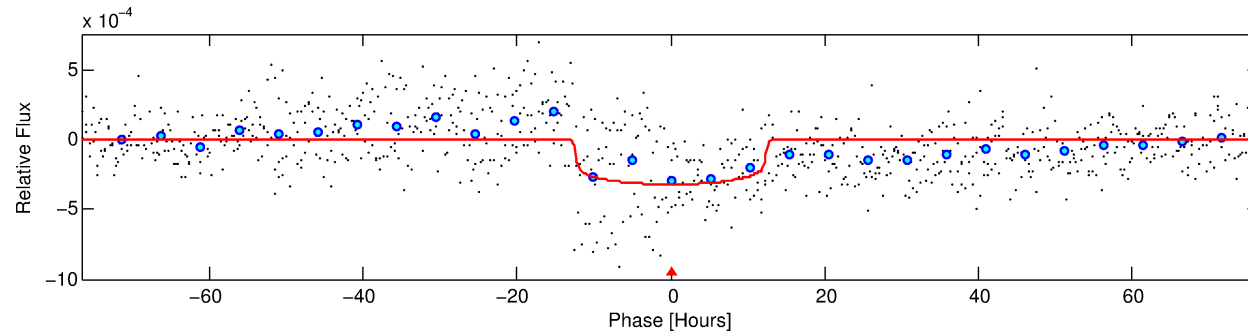
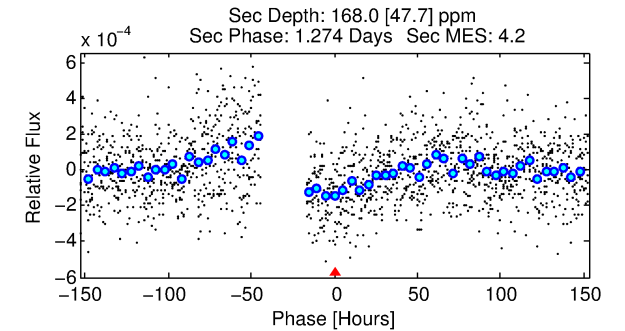
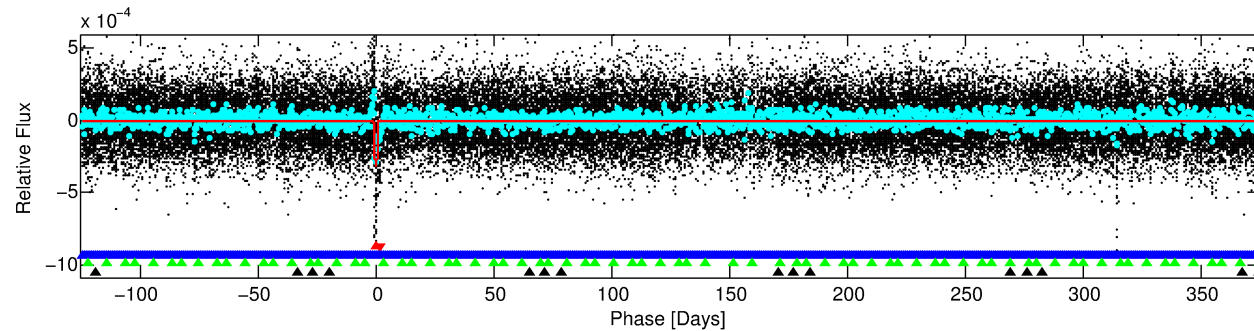
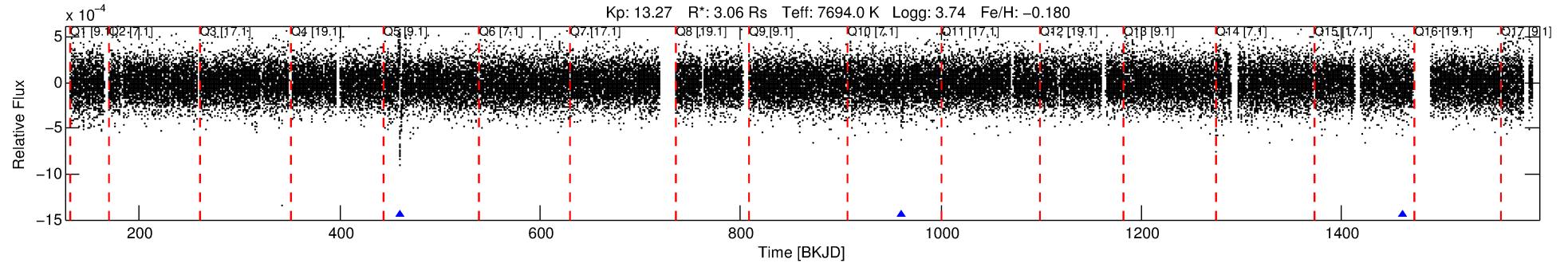
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005177020-01

No Significant Match Found

DV One-Page Summary

KIC: 5177020 Candidate: 1 of 4 Period: 499.756 d



DV Fit Results:

Period = 499.75621 [0.01417] d
Epoch = 460.9562 [0.0187] BKJD
Rp/R* = 0.0172 [0.0027]
a/R* = 120.53 [98.22]
b = 0.62 [0.81]
Seff = 12.77 [9.70]
Teq = 482 [92] K
Rp = 5.73 [2.76] Re
a = 1.5171 [0.6893] AU
Ag = 6474.69 [5539.11] [1.17σ]
Teffp = 6686 [764] K [8.07σ]

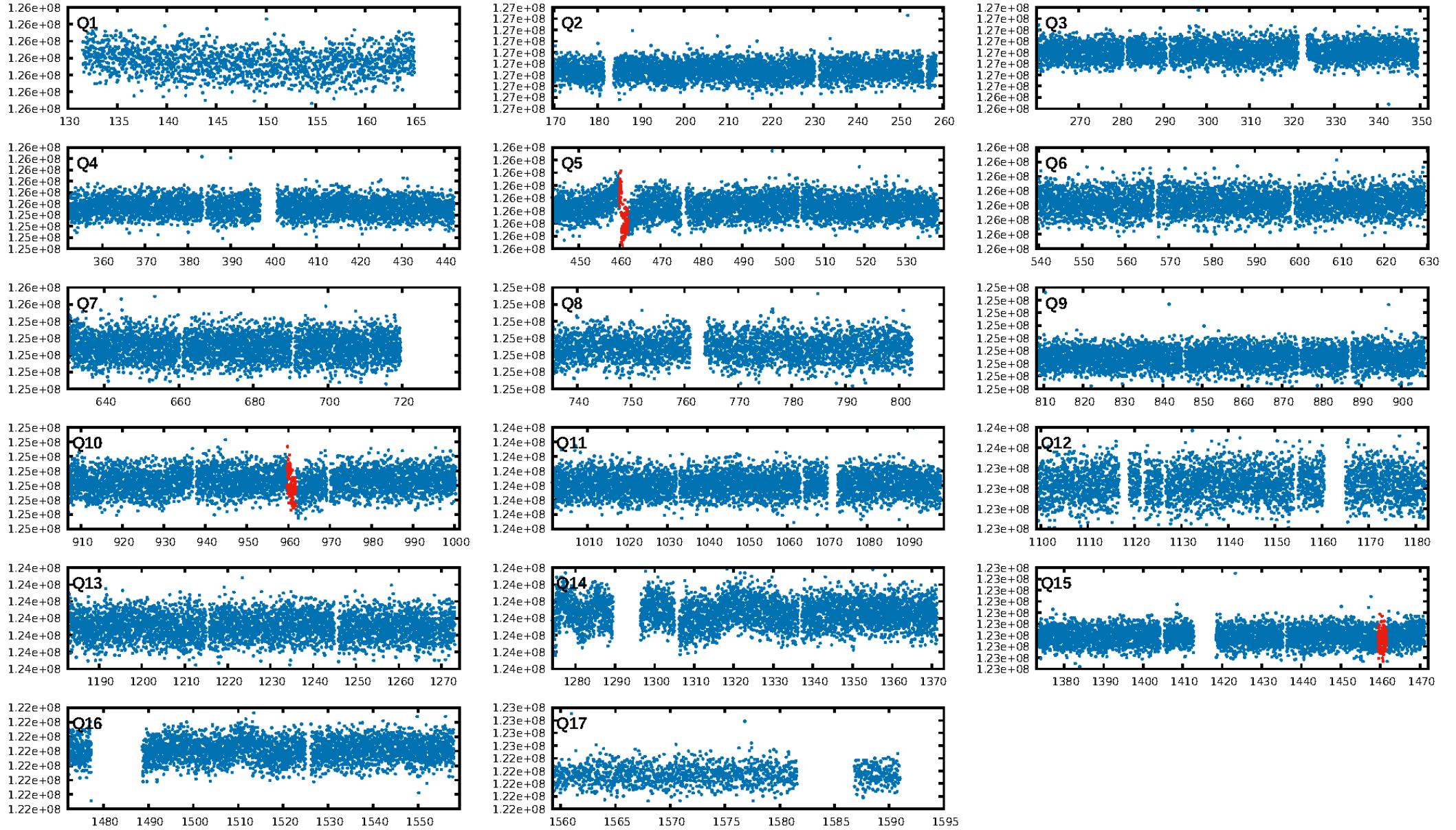
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [374.56σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.7%
Bootstrap-pfa: 3.03e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.902
Centroid-sig: 0.0%
Centroid-so: 1.569 arcsec [2.34σ]
OotOffset-rm: 2.914 arcsec [4.67σ]
KicOffset-rm: 2.961 arcsec [4.65σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 0.00 [0/3]

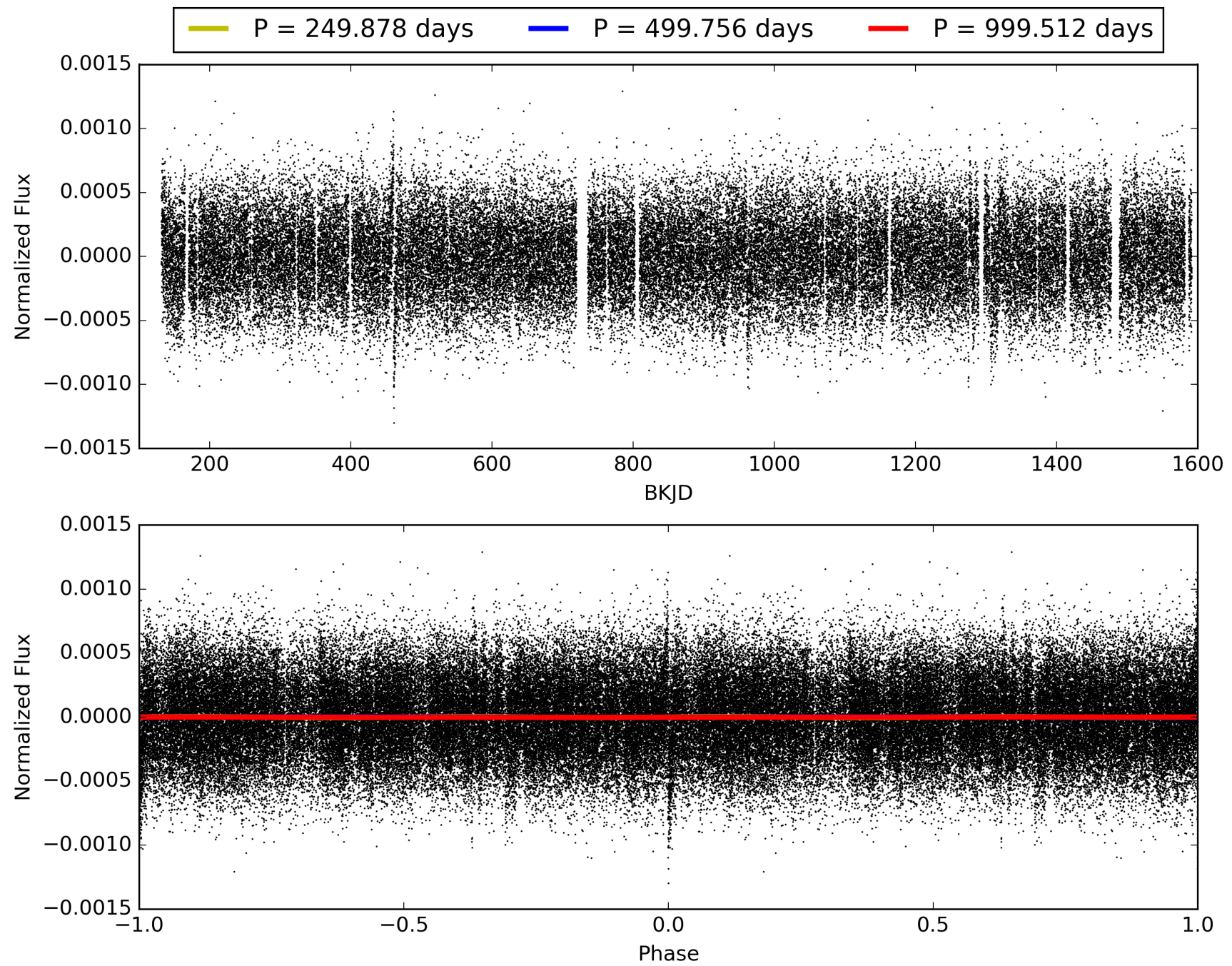
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:02:15 Z

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

TCE 005177020-01, PDC Light Curves

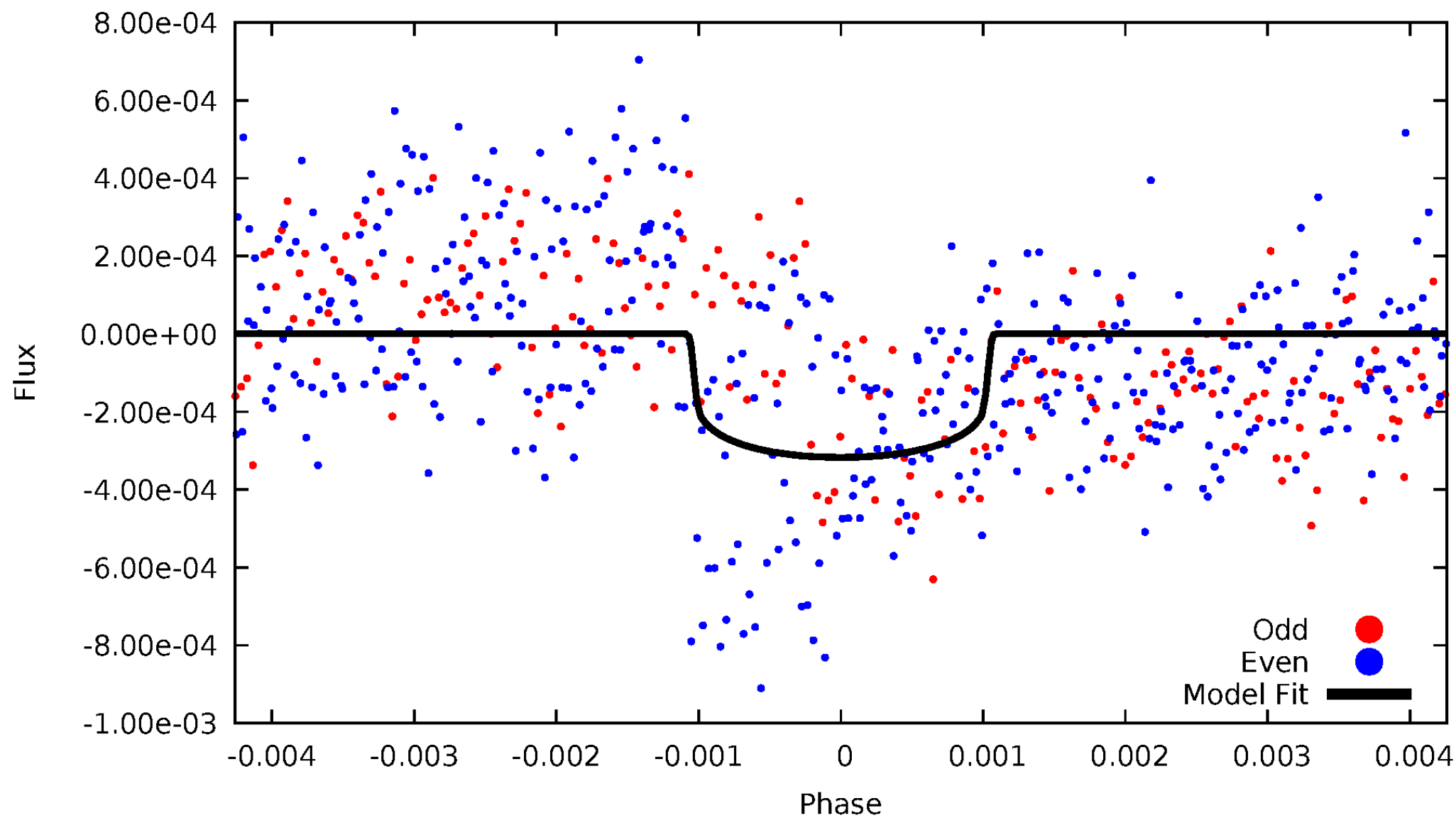


TCE 005177020-01



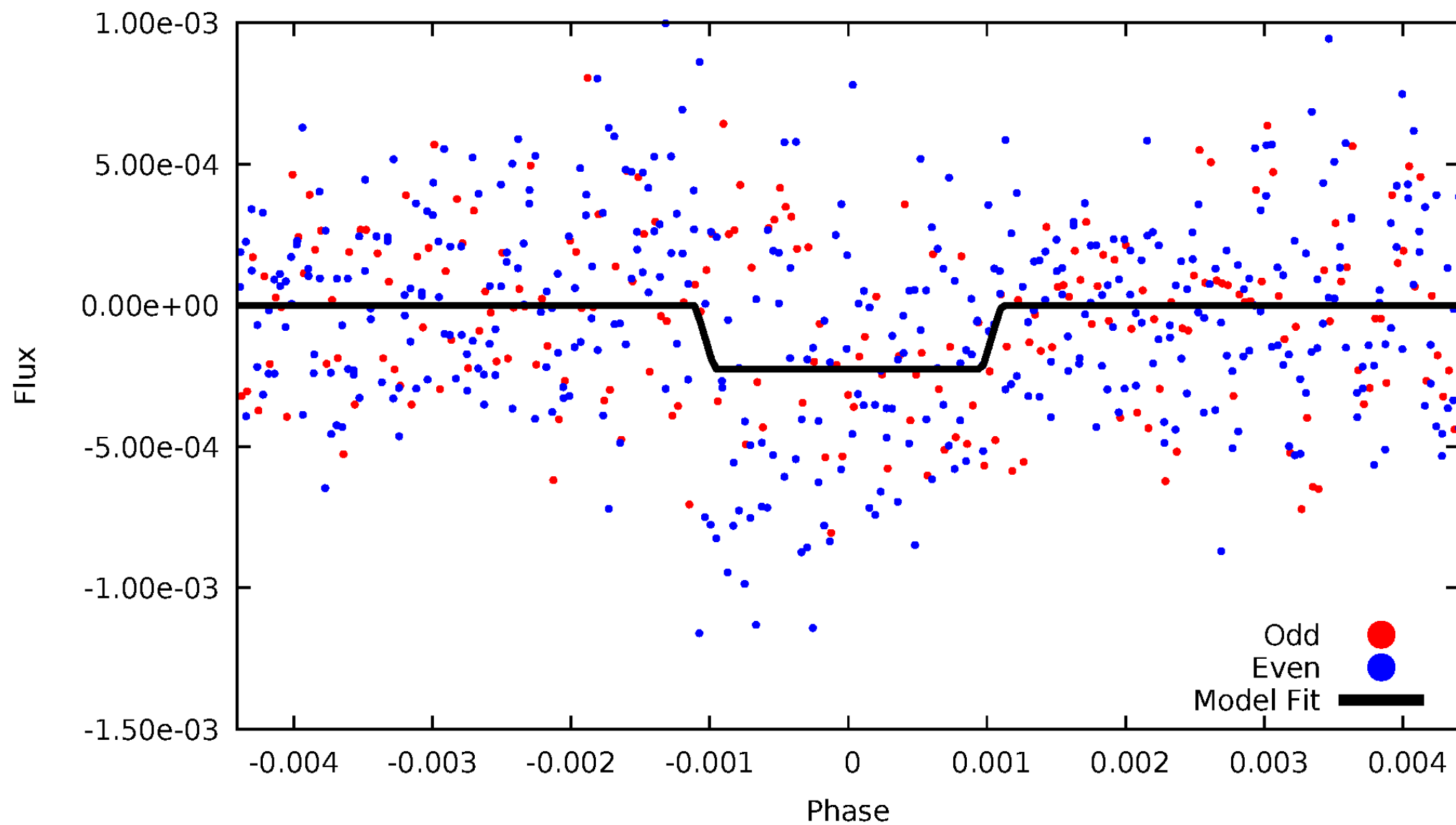
DV Odd/Even

TCE 005177020-01



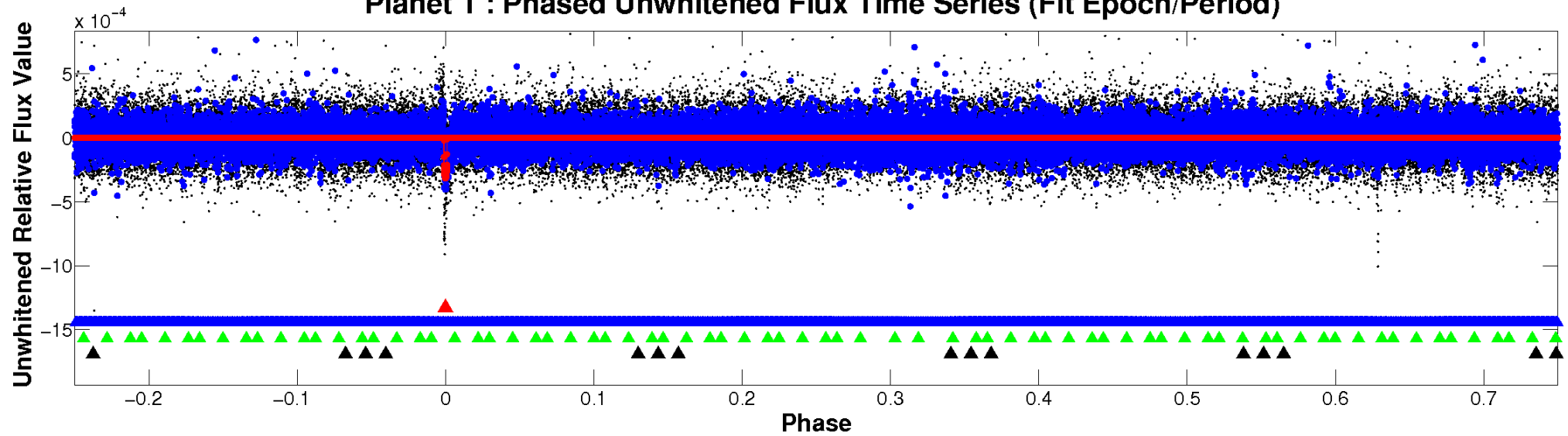
ALT Odd/Even

TCE 005177020-01

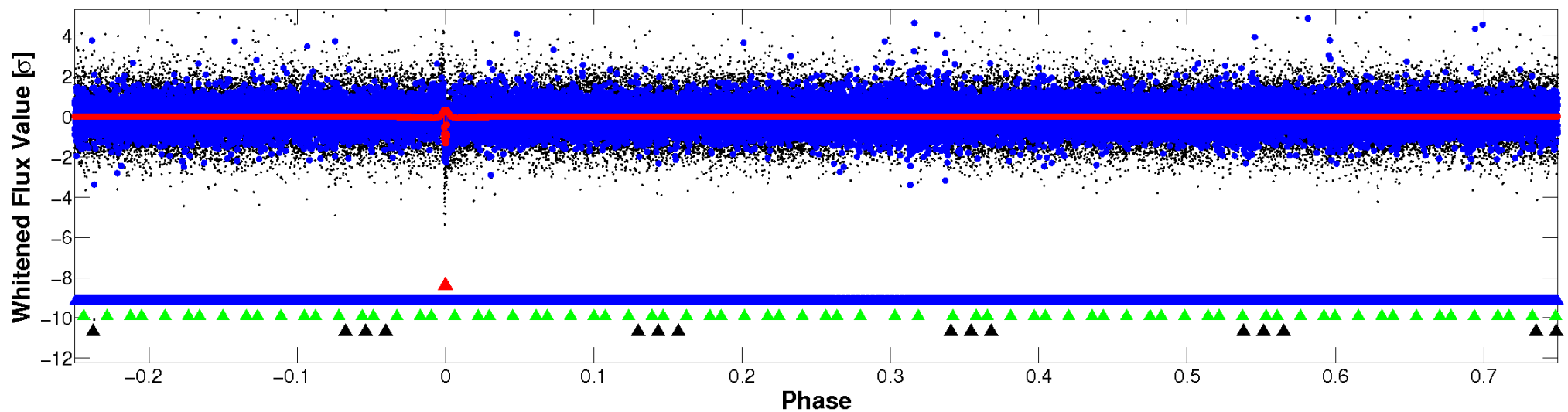


Non-Whitened Vs. Whitened Light Curve

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

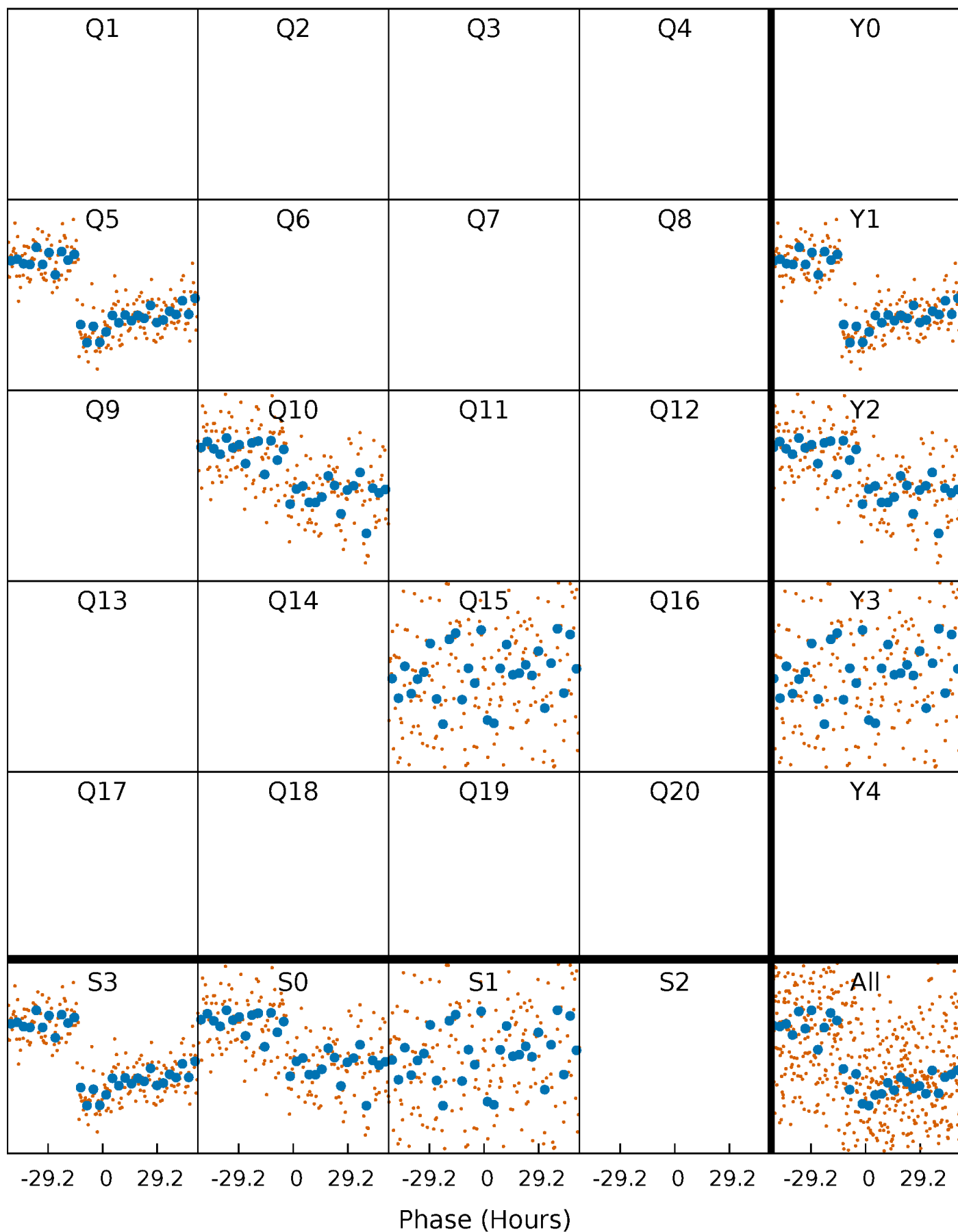


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 005177020-01 P=499.756213 Days $T_0=460.956163$ (BKJD)



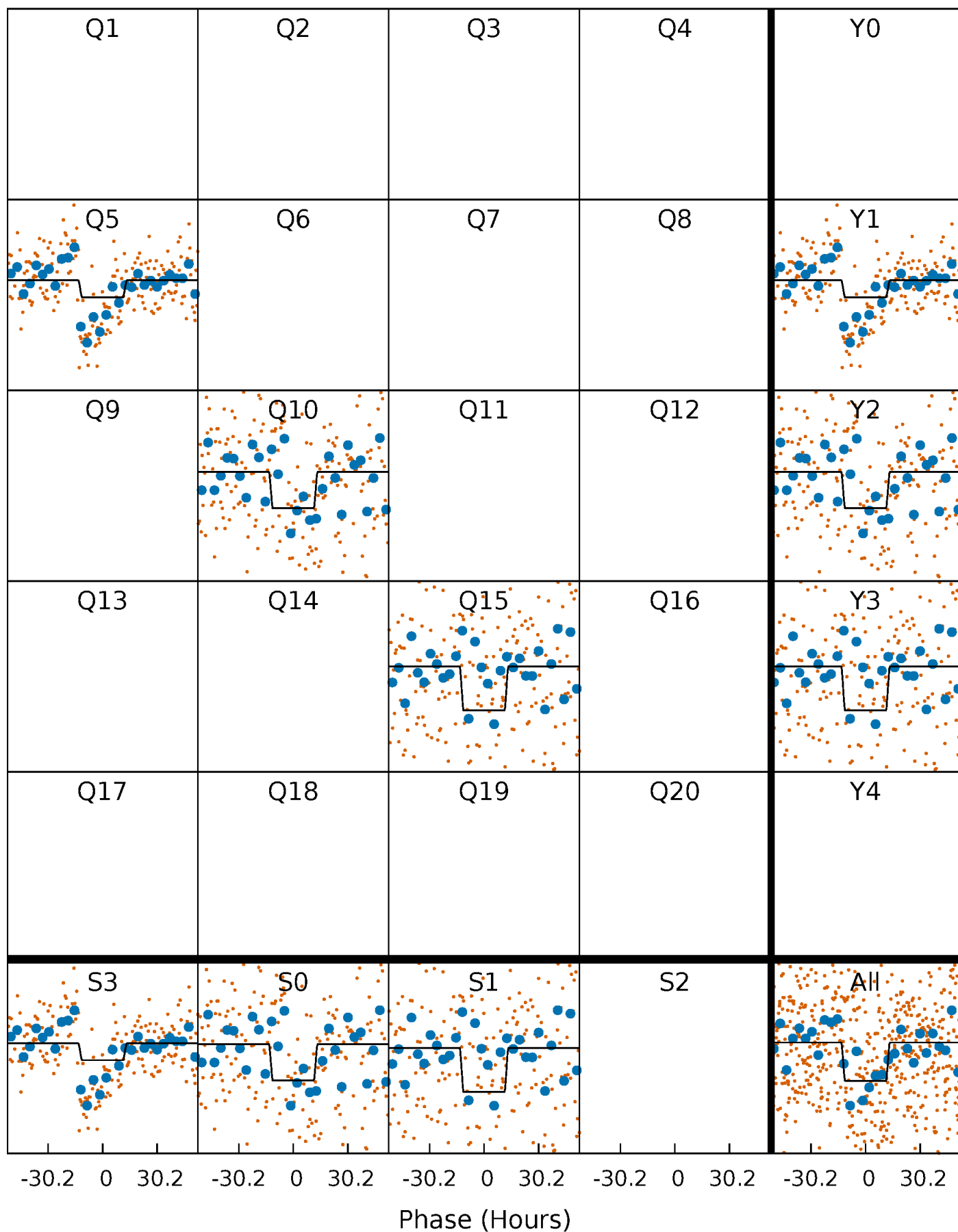
DV Quarter-Phased Transit Curves

TCE 005177020-01 P=499.756213 Days $T_0=460.956163$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

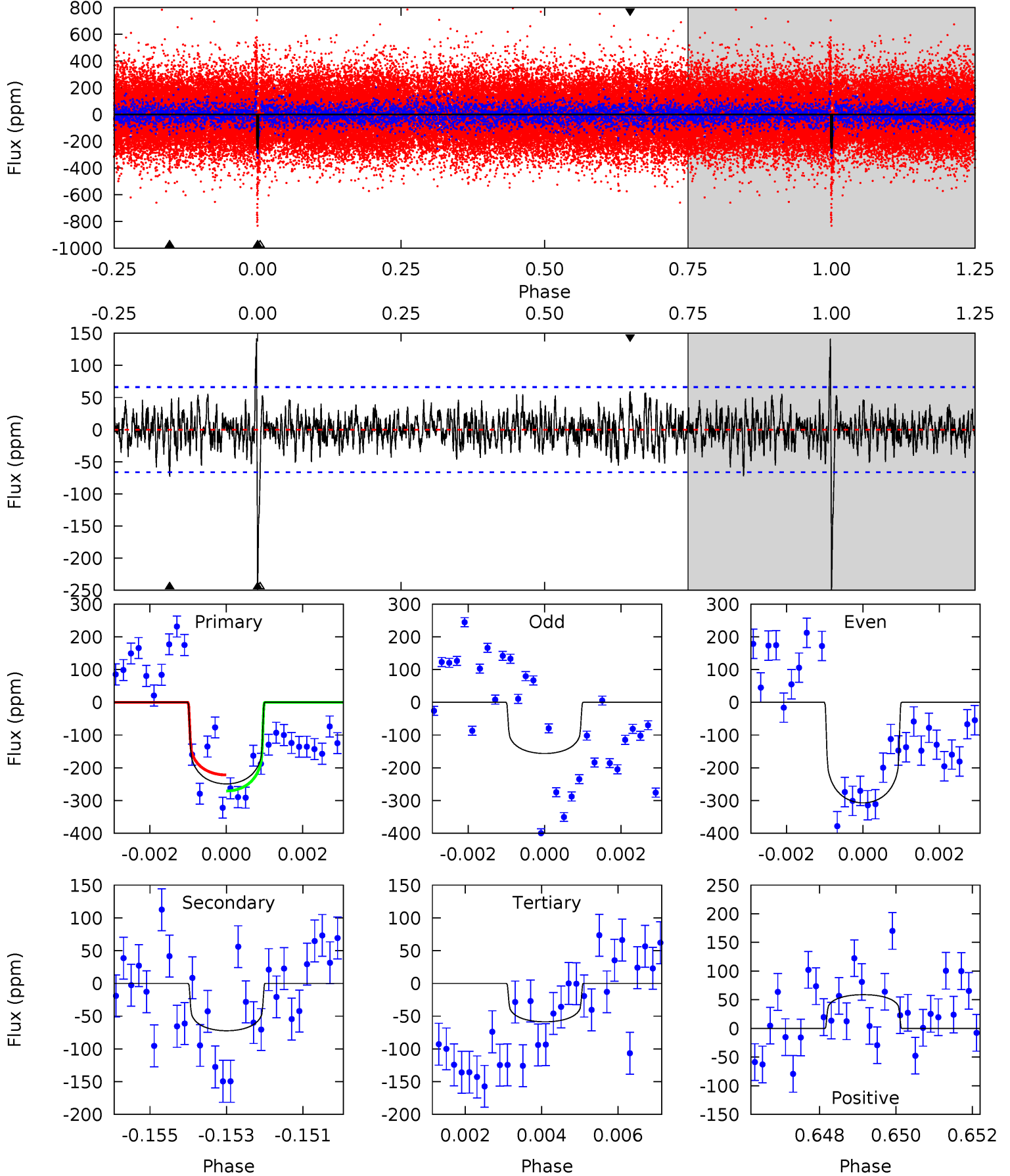
TCE 005177020-01 P=499.723143 Days $T_0=460.967512$ (BKJD)



DV Model-Shift Uniqueness Test

005177020-01, P = 499.756213 Days, E = 460.956163 Days

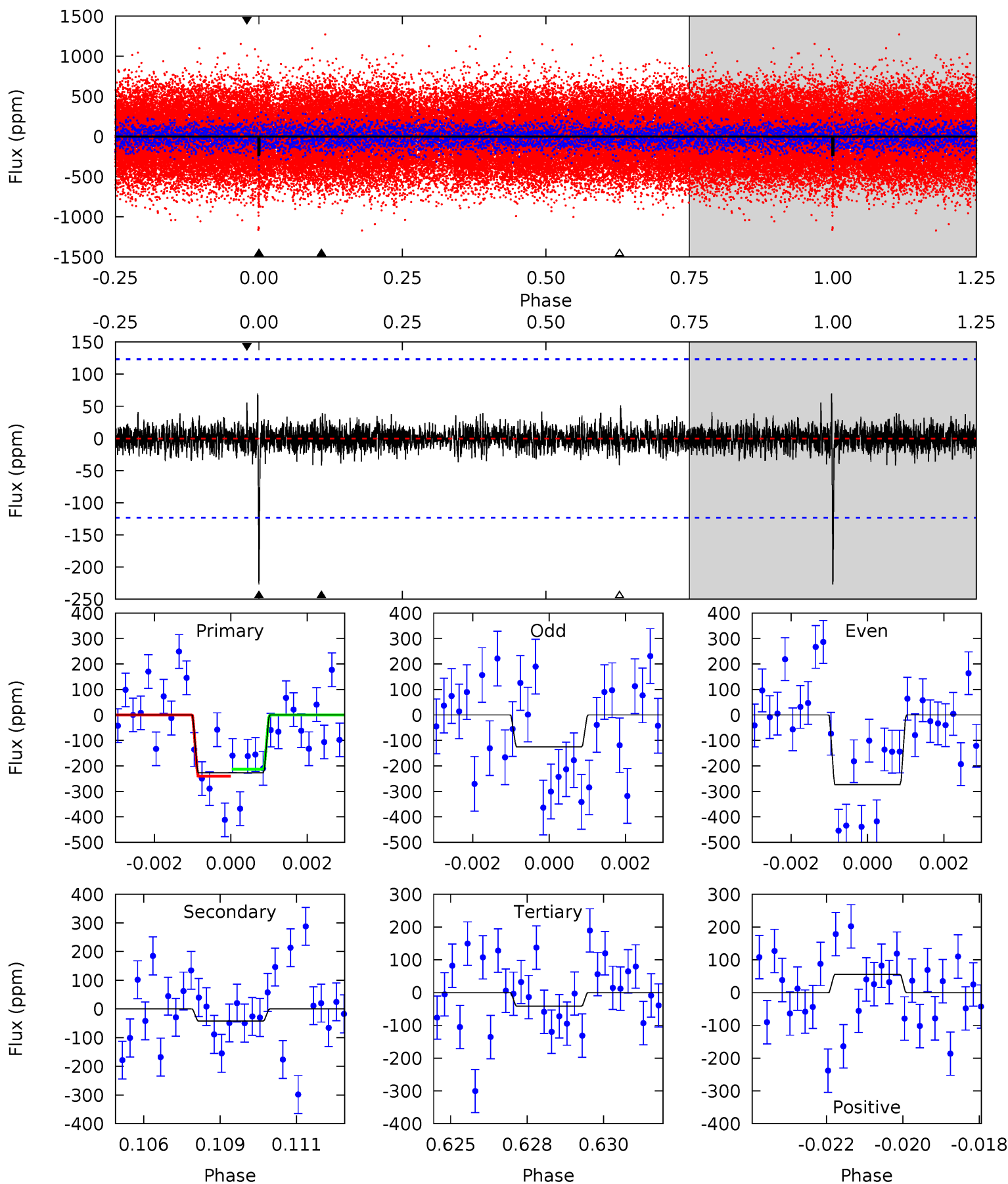
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.0	5.81	4.71	4.73	5.31	3.07	1.66	15.3	15.3	1.10	1.08	5.72	1.66	0.36	1.96



Alt Model-Shift Uniqueness Test

005177020-01, P = 499.723143 Days, E = 460.967512 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.78	1.81	1.78	2.40	5.31	3.06	0.50	8.00	7.38	0.02	-0.59	3.00	1.81	0.24	0.59



Stellar Parameters For KIC 005177020

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7694^{+237}_{-316}	$3.737^{+0.441}_{-0.074}$	$-0.180^{+0.200}_{-0.300}$	$3.060^{+0.348}_{-1.391}$	$1.863^{+0.111}_{-0.444}$	$0.092^{+0.357}_{-0.023}$
	+3%/-4%	+12%/-2%	+111%/-167%	+11%/-45%	+6%/-24%	+389%/-25%
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 005177020-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-72 ± 12	$5.16^{+1.30}_{-1.36}$	652^{+44}_{-86}	5340^{+492}_{-420}	3357^{+2774}_{-1297}
Alt.	-42 ± 23	$4.52^{+1.18}_{-1.29}$	649^{+47}_{-75}	5016^{+818}_{-817}	2517^{+2897}_{-1499}

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 $A_{obs} \gg 1.0$

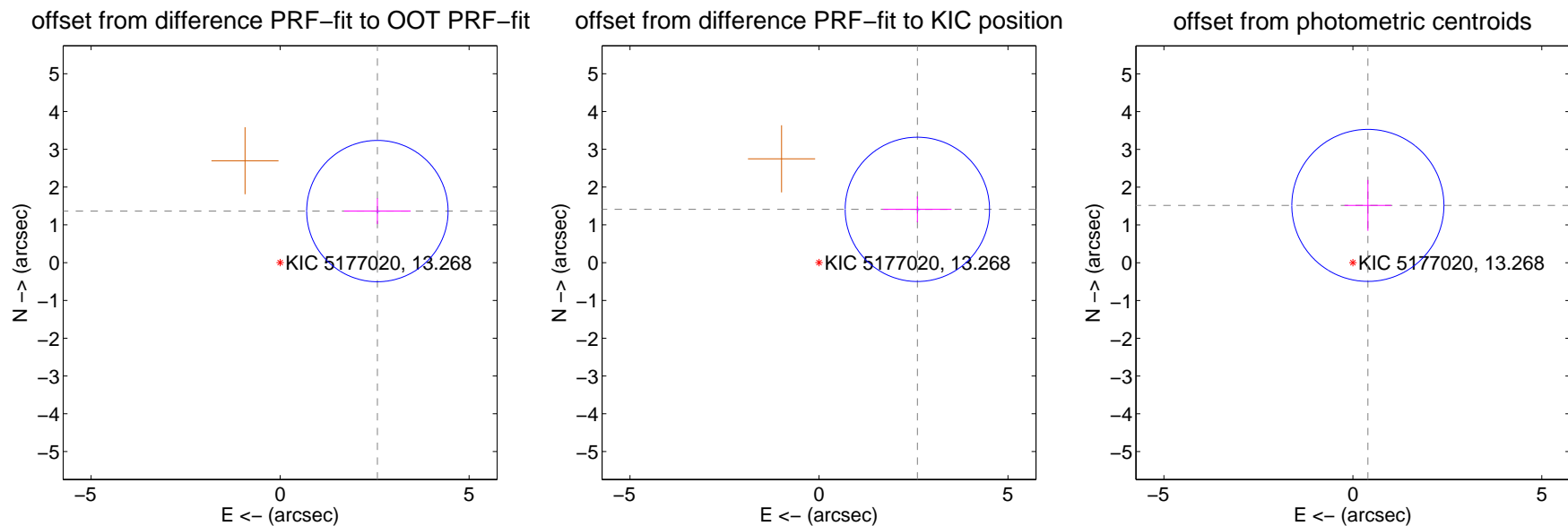
DV Centroid Data

Supplemental centroid analysis for 005177020-01. Kepler magnitude: 13.27. Transit SNR 13.34

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.914 ± 0.624	4.67	-2.574 ± 0.882	1.365 ± 0.341
PRF-fit source offset from KIC position	2.961 ± 0.637	4.65	-2.603 ± 0.905	1.411 ± 0.342
photometric centroid source offset	1.57 ± 0.67	2.34	-0.40 ± 0.62	1.52 ± 0.67

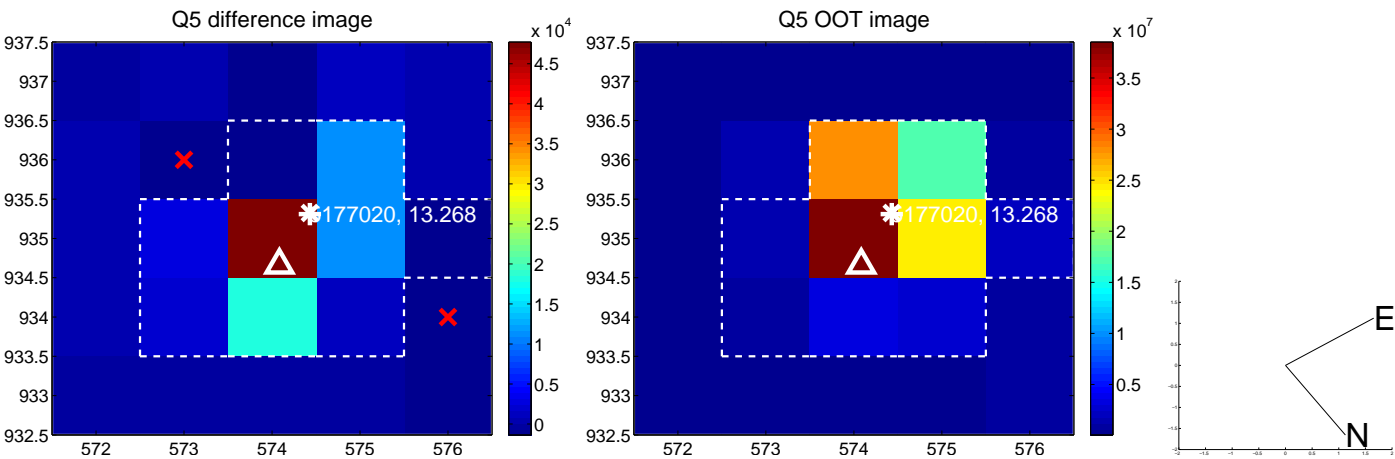


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

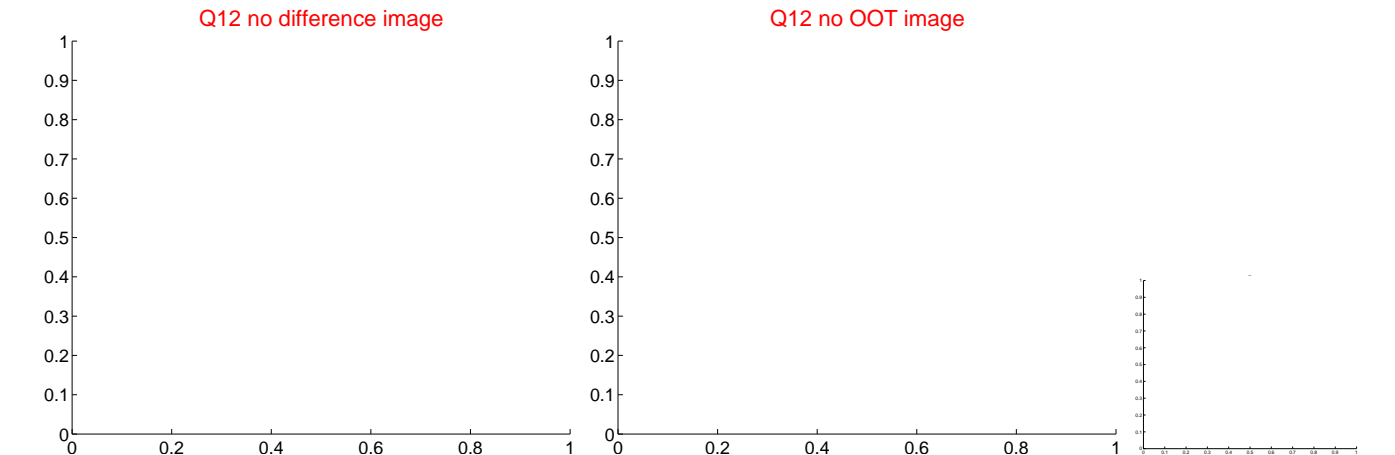
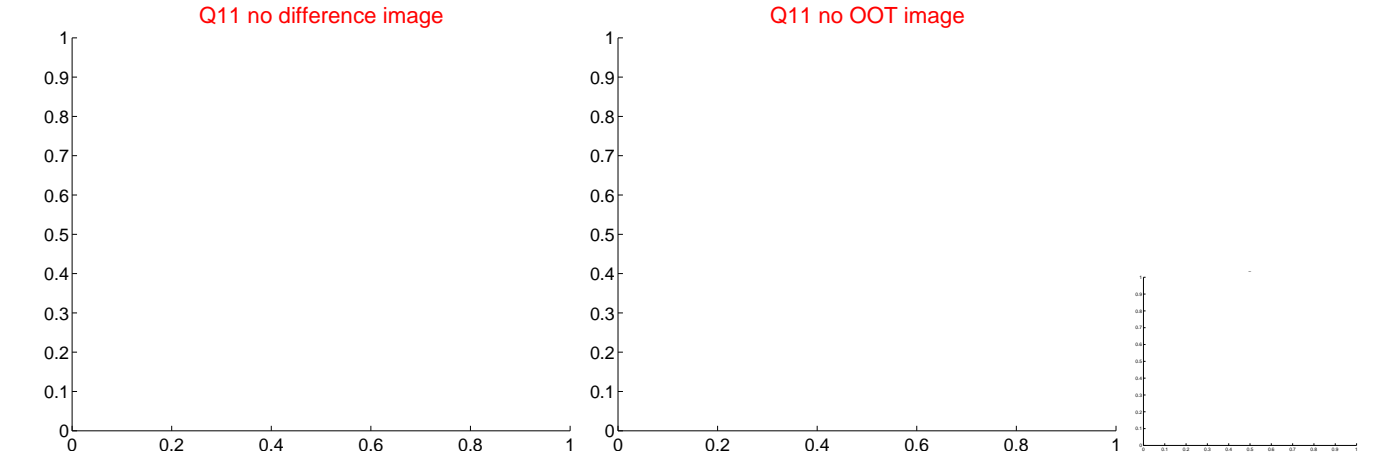
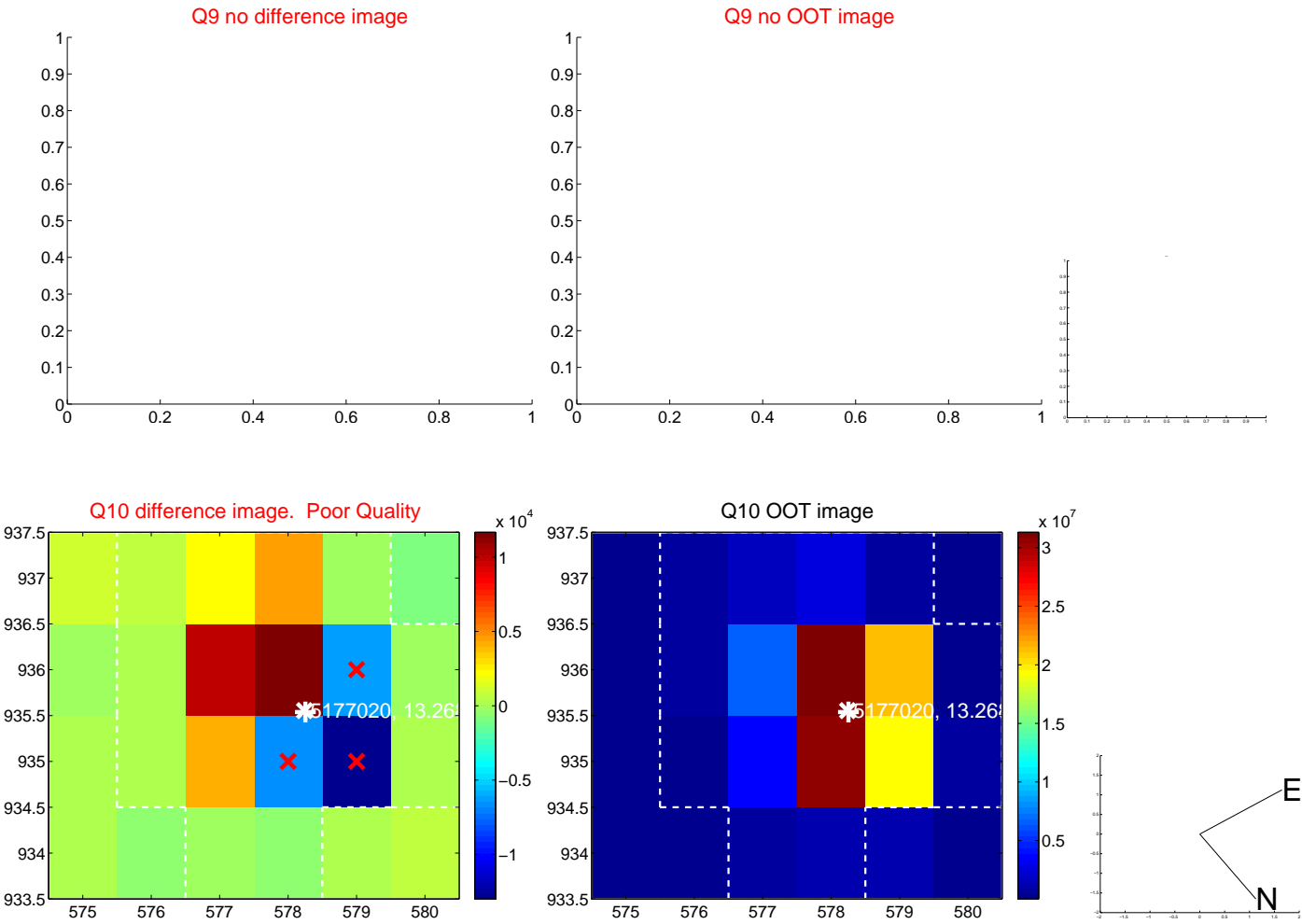
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



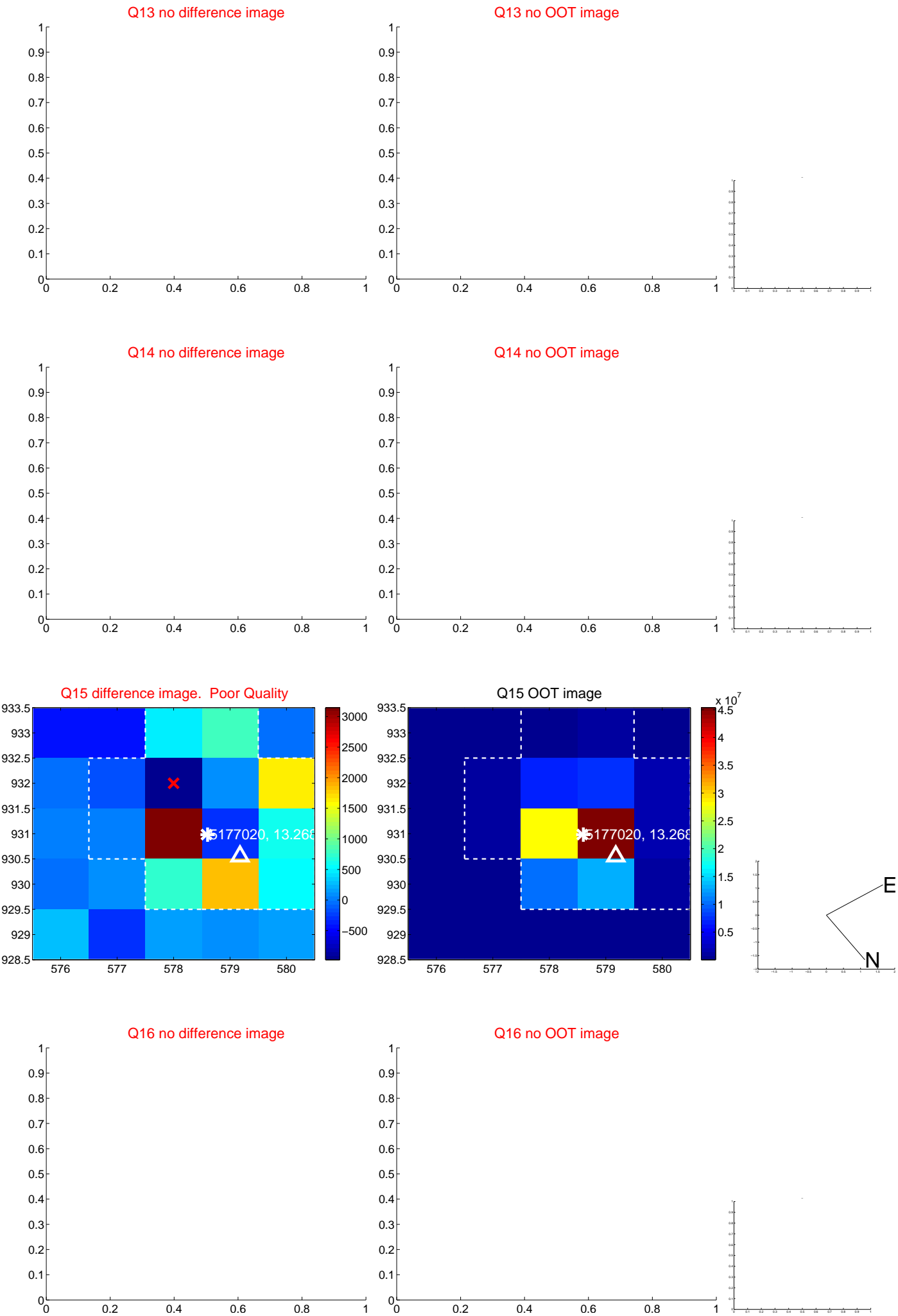
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



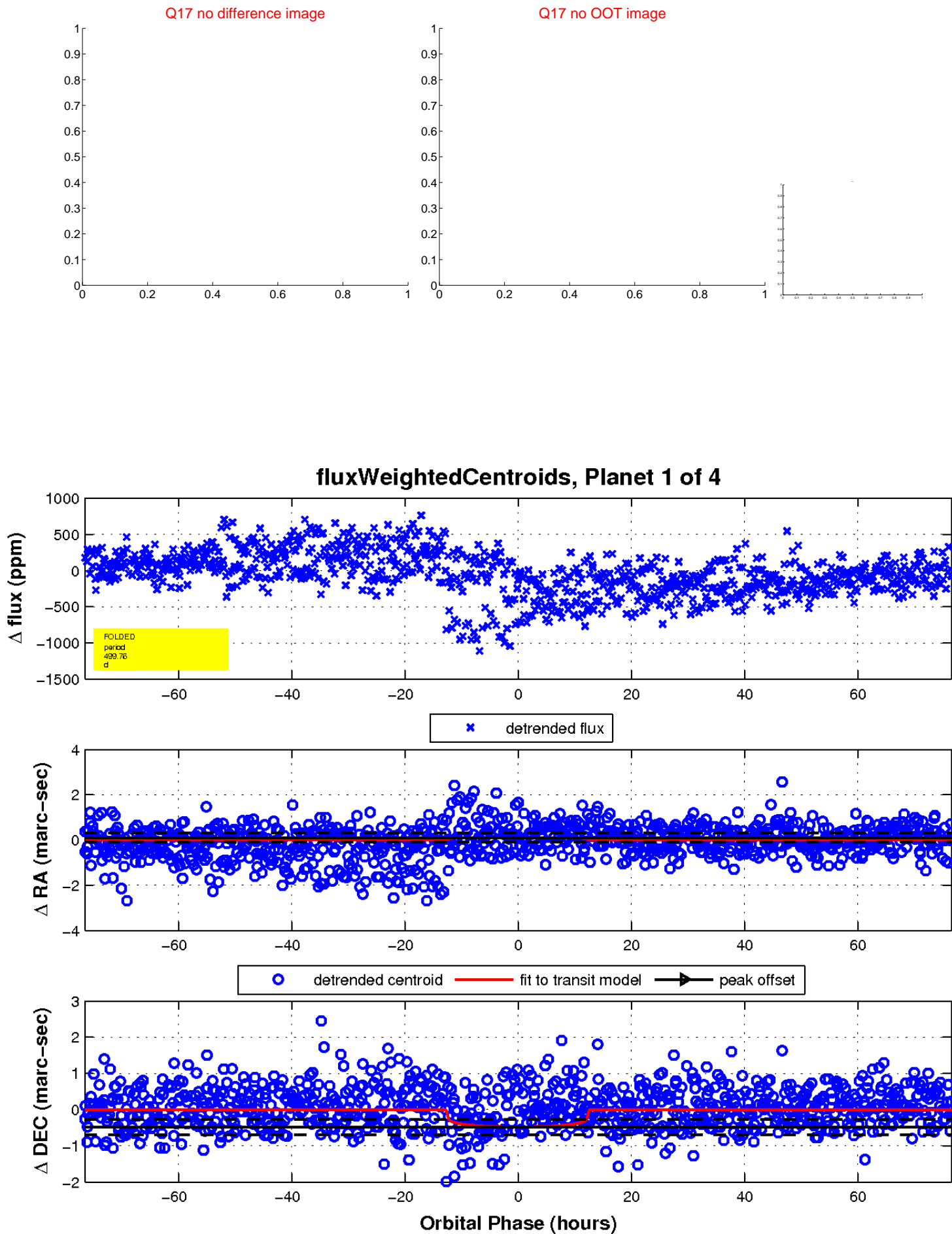
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

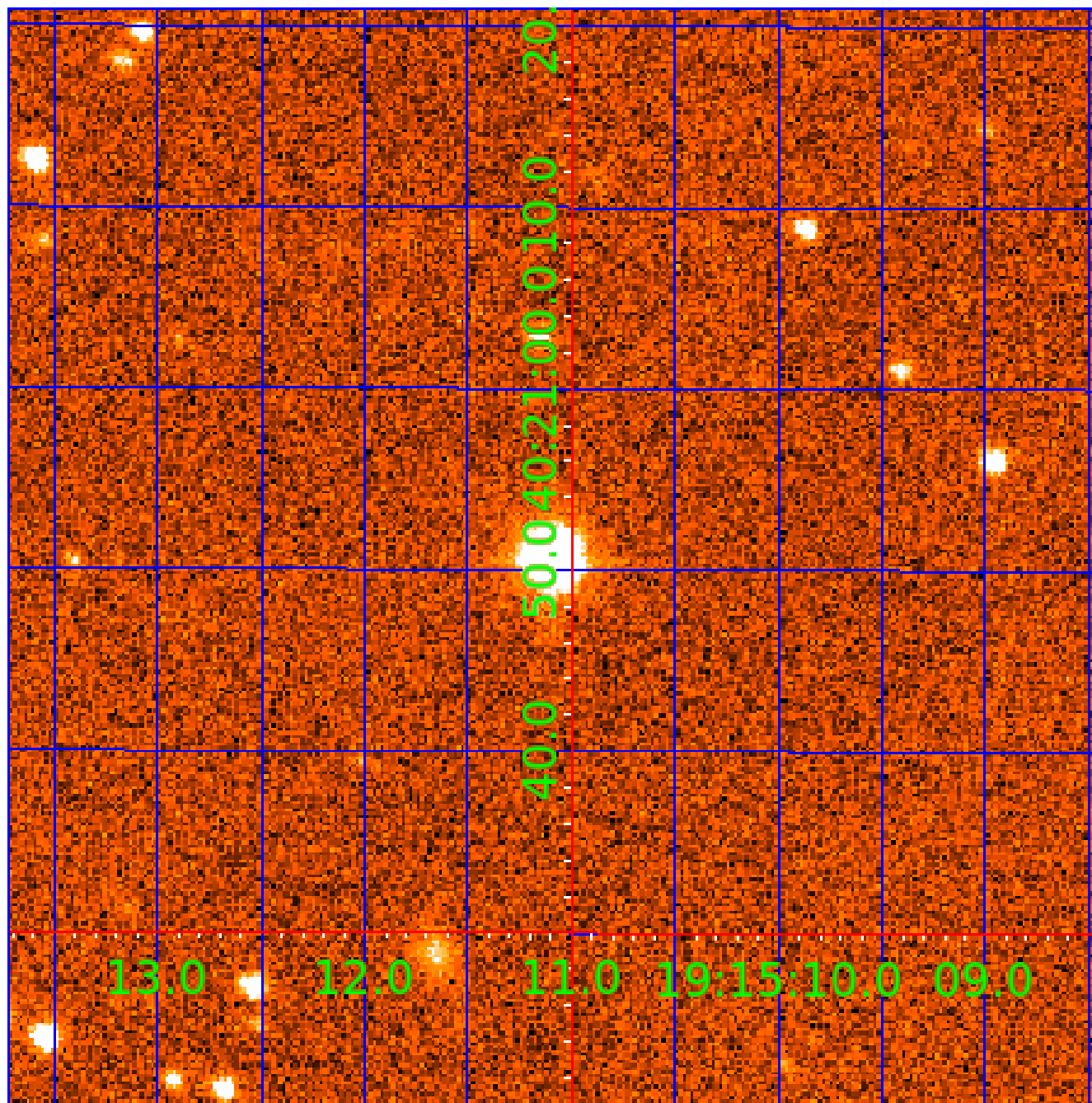


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005177020

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})
005177020-01	OBS	No	499.756213	460.956163	317.4	25.537	8.8	13.3	3.06	7694	5.73	12.77
005177020-02	OBS	No	0.546612	131.560763	12.1	3.417	8.2	7.3	3.06	7694	1.24	113347.55
005177020-03	OBS	No	19.524878	143.793617	111.6	2.902	8.8	8.5	3.06	7694	3.79	963.53
005177020-04	OBS	No	98.595804	145.047428	242.6	2.930	8.1	9.3	3.06	7694	5.43	111.22

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177020-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005177020-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
005177020-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005177020-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

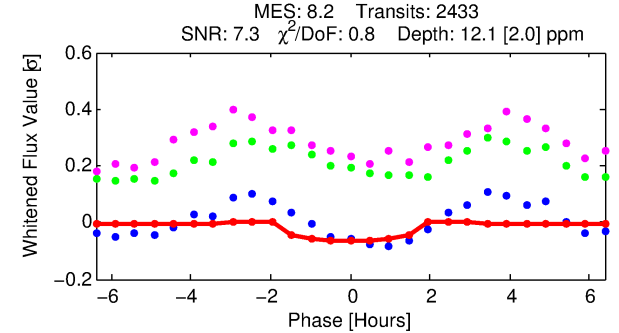
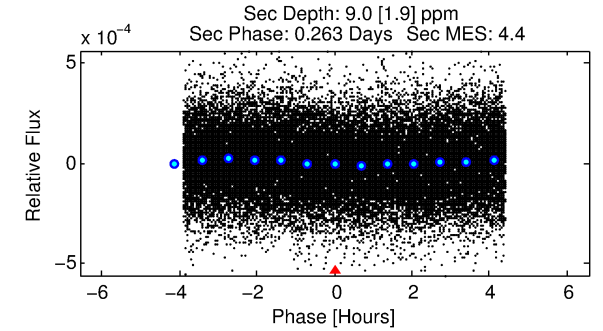
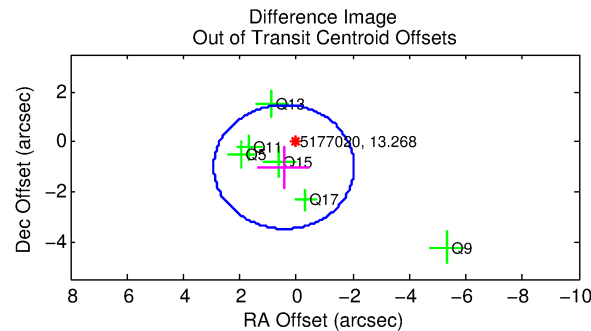
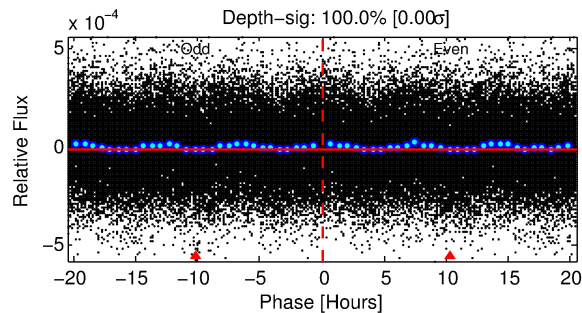
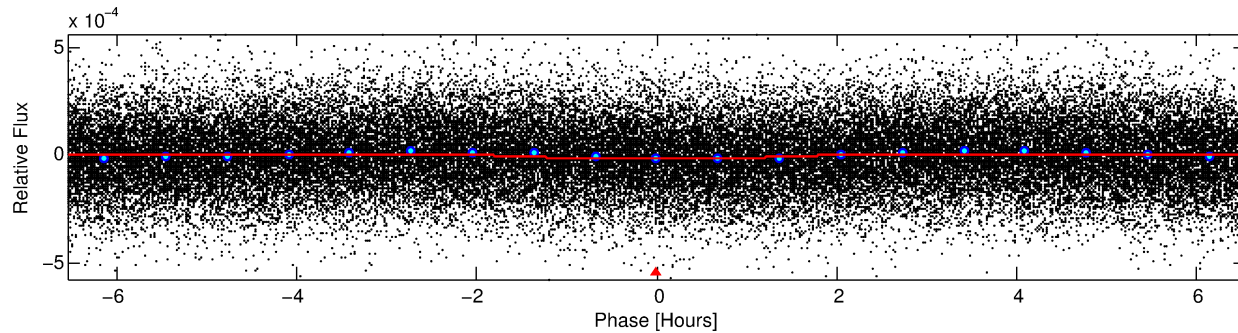
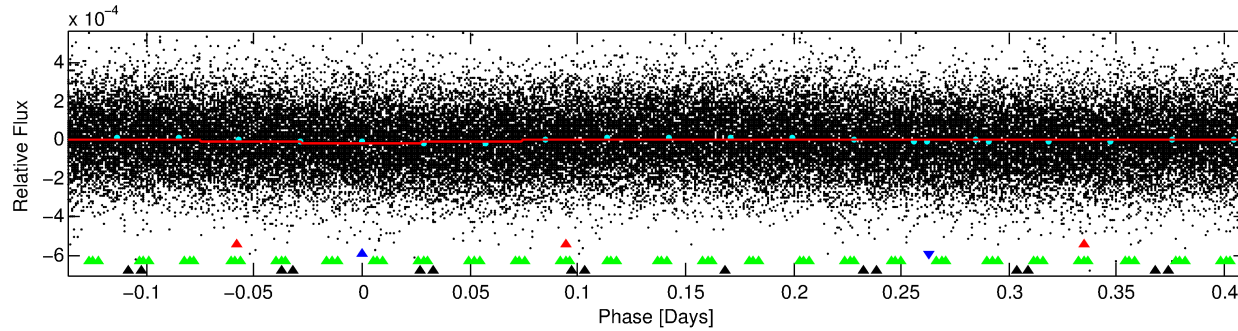
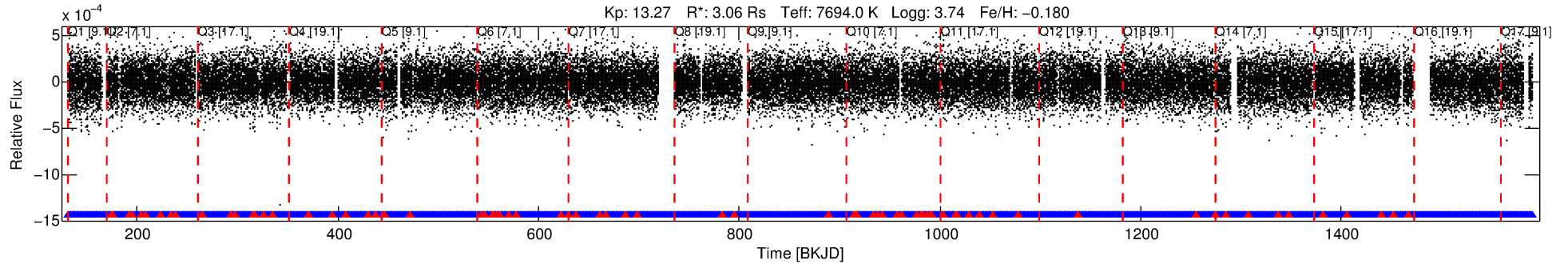
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005177020-02

No Significant Match Found

DV One-Page Summary

KIC: 5177020 Candidate: 2 of 4 Period: 0.547 d



DV Fit Results:

Period = 0.54661 [0.00001] d
Epoch = 131.5608 [0.0045] BKJD
Rp/R* = 0.0037 [0.0018]
a/R* = 1.09 [0.49]
b = 0.90 [0.64]
Seff = 113347.55 [86107.10]
Teq = 4679 [889] K
Rp = 1.24 [0.84] Re
a = 0.0161 [0.0073] AU
Ag = 0.83 [1.04] [-0.17 σ]
Teffp = 6895 [1770] K [1.12 σ]

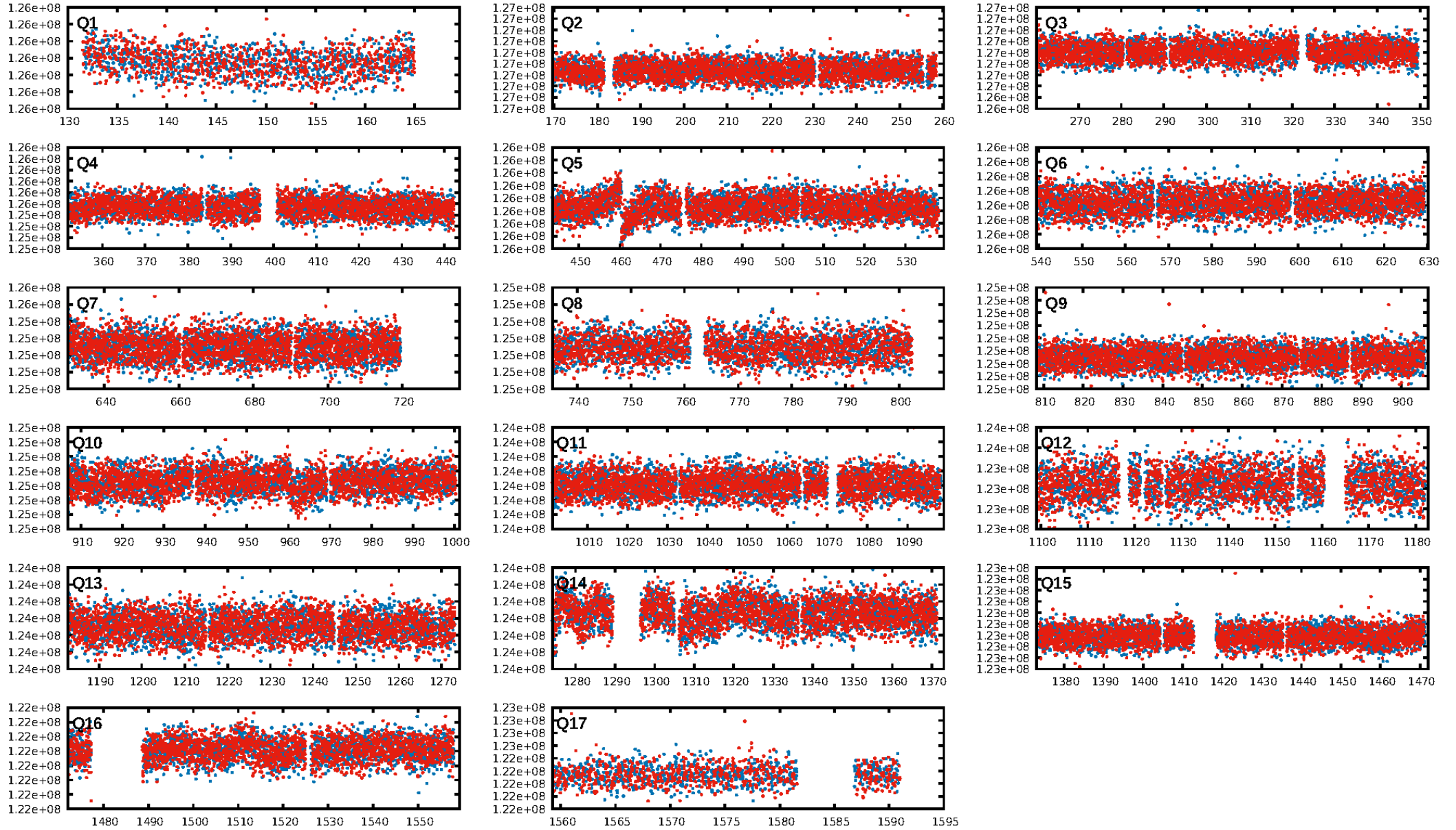
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [101.61 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.87e-12
RollingBand-fgt: 0.97 [2244/2322]
GhostDiagnostic-chr: -66.96
Centroid-sig: 24.0%
Centroid-so: 1.070 arcsec [1.00 σ]
OotOffset-rm: 1.102 arcsec [1.33 σ]
OotOffset-st: 0/2/0/4 [6]
KicOffset-rm: 1.083 arcsec [1.30 σ]
KicOffset-st: 0/2/0/4 [6]
DiffImageQuality-fgm: 0.67 [4/6]
DiffImageOverlap-fno: 1.00 [17/17]

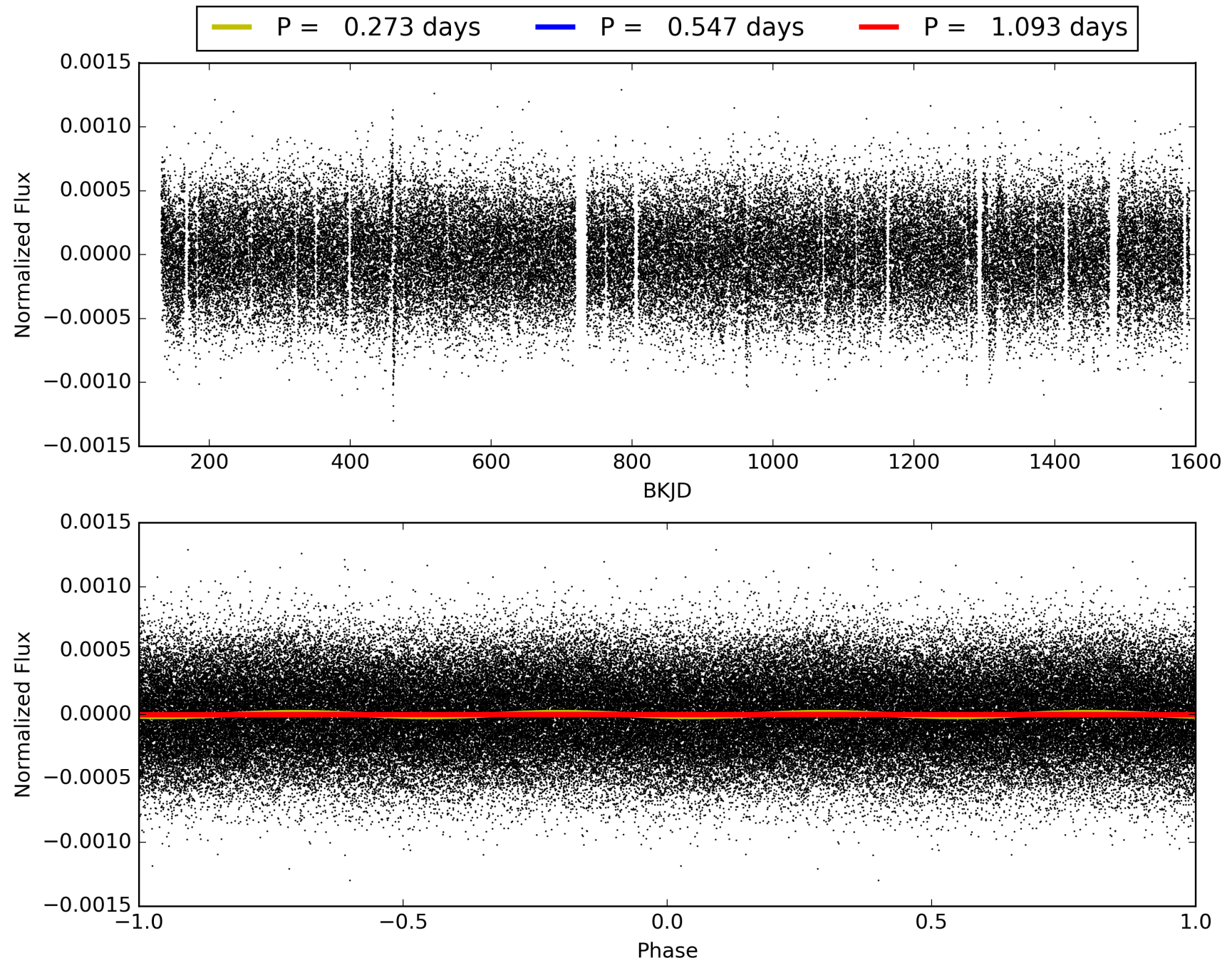
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:02:25 Z

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

TCE 005177020-02, PDC Light Curves

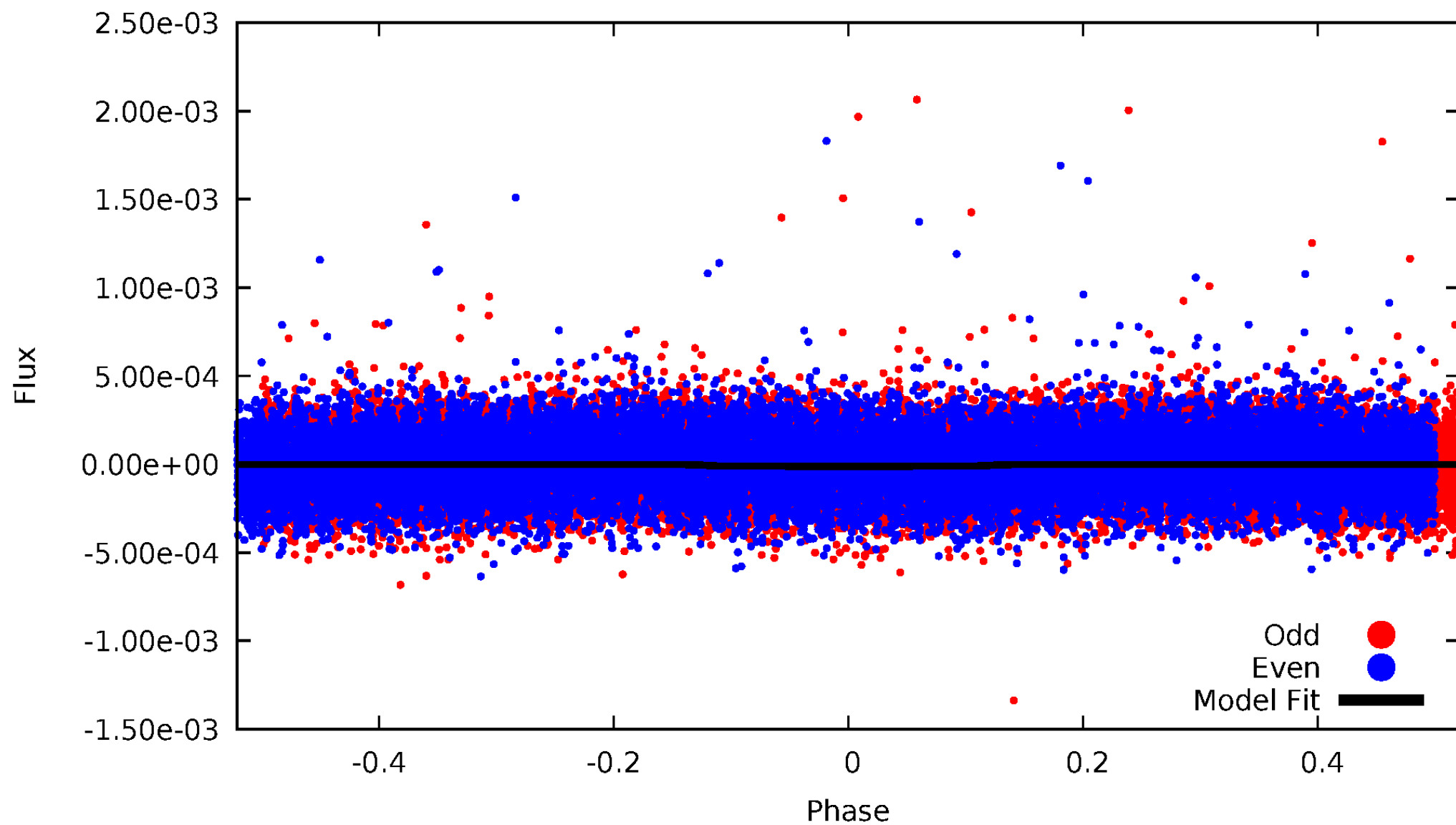


TCE 005177020-02



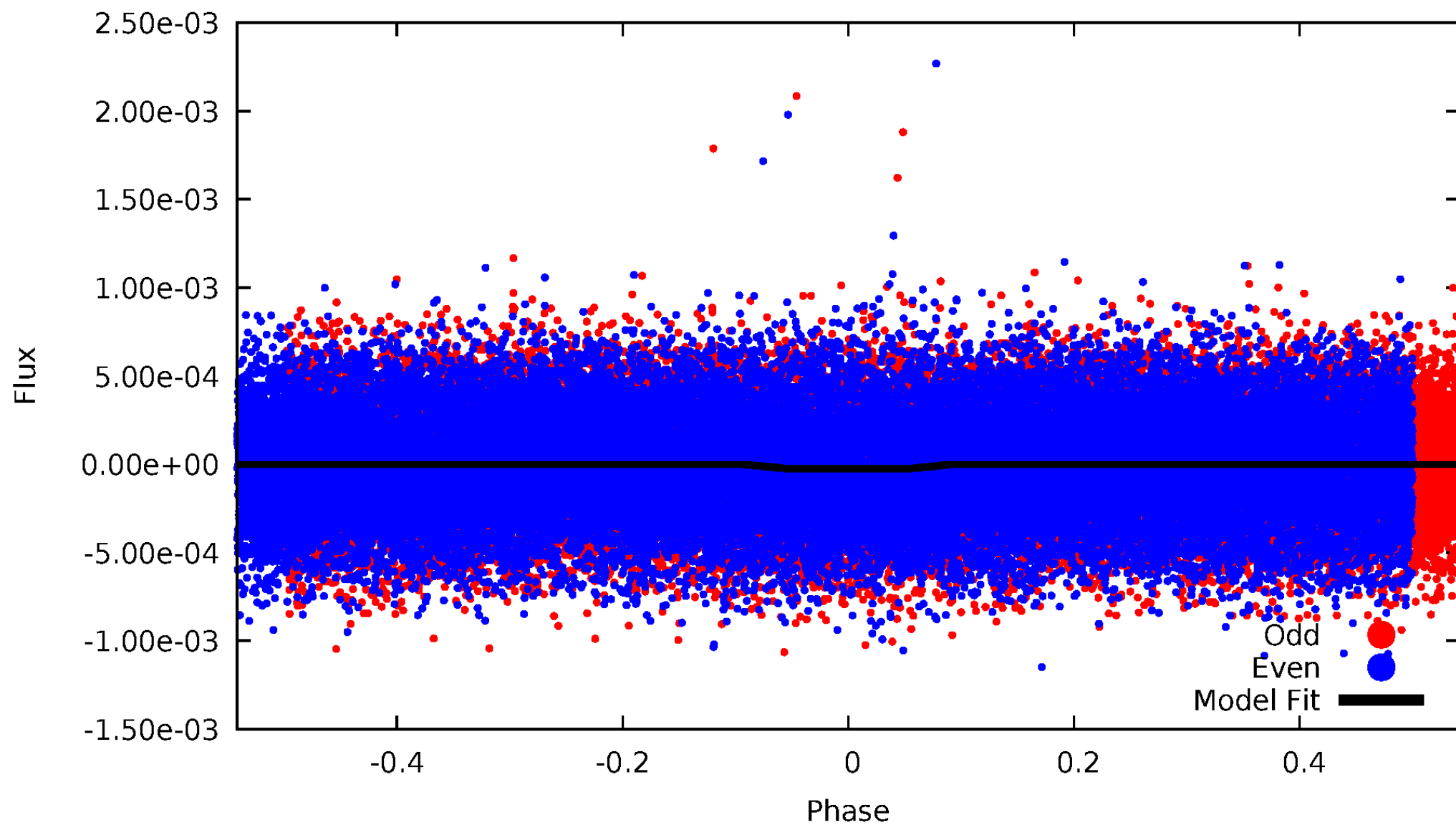
DV Odd/Even

TCE 005177020-02



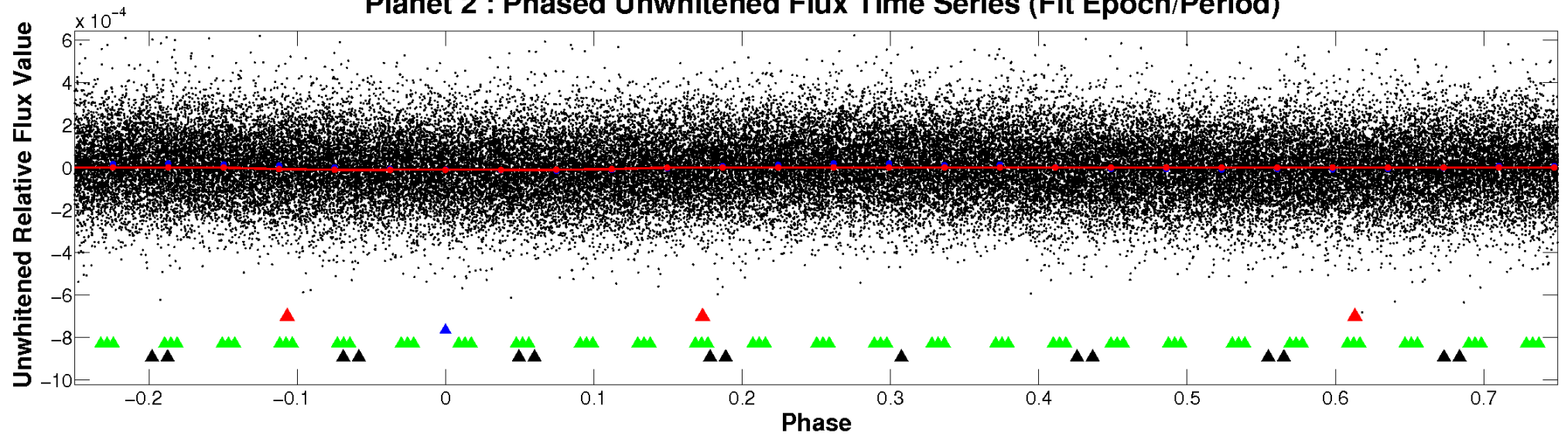
ALT Odd/Even

TCE 005177020-02

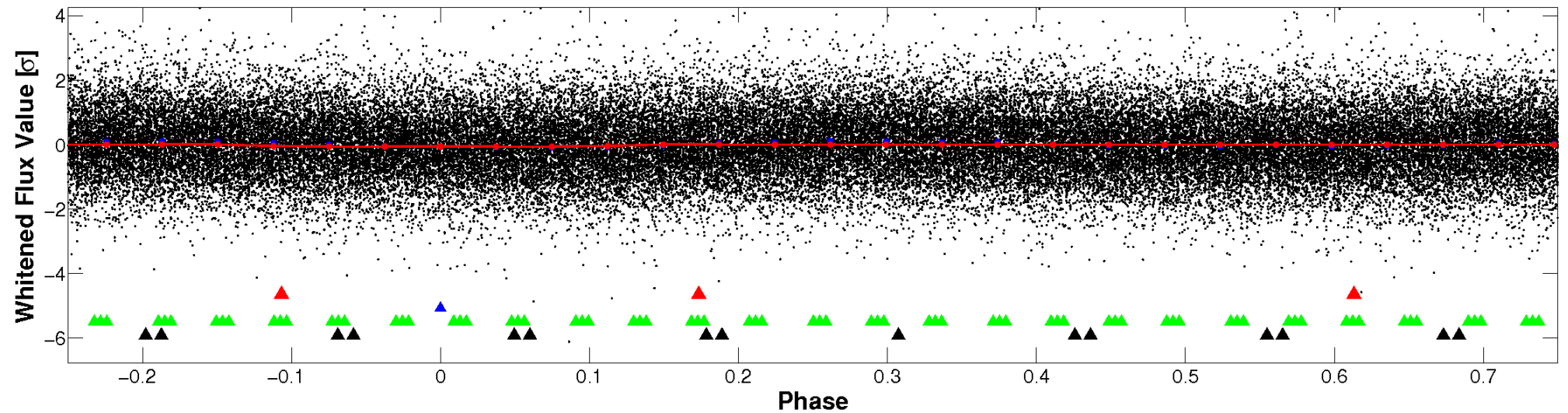


Non-Whitened Vs. Whitened Light Curve

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

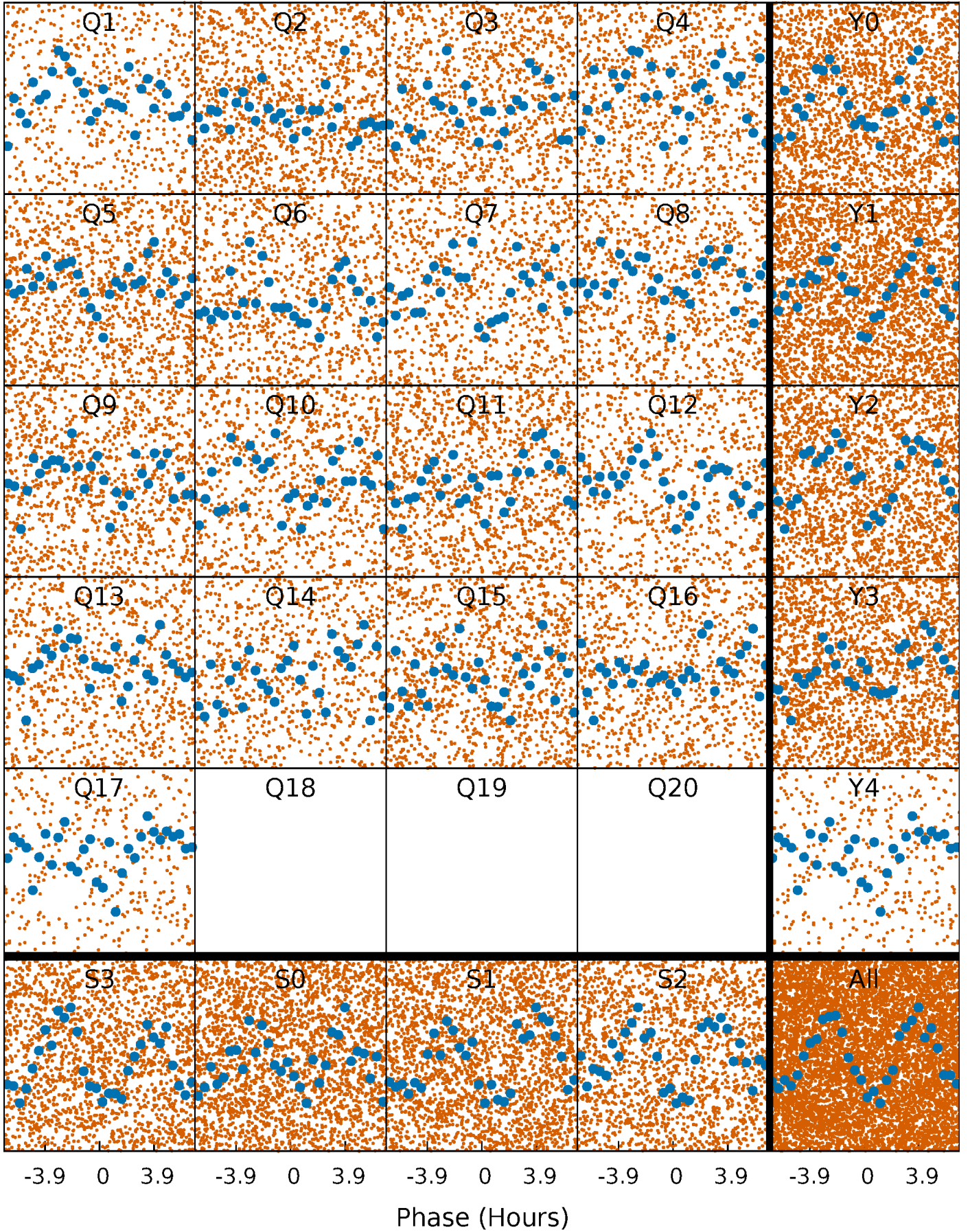


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



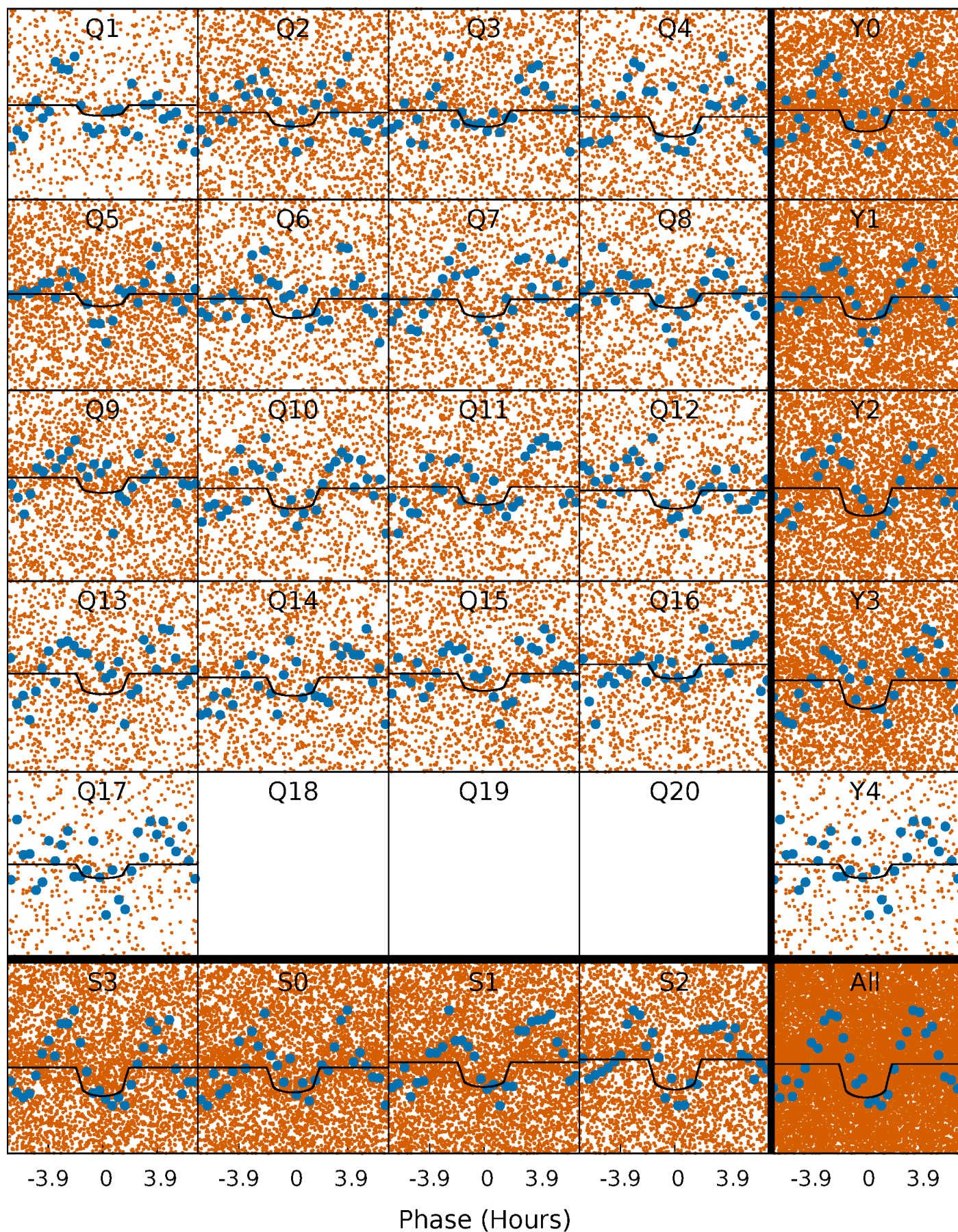
PDC Quarter-Phased Transit Curves

TCE 005177020-02 P= 0.546612 Days $T_0=131.560763$ (BKJD)



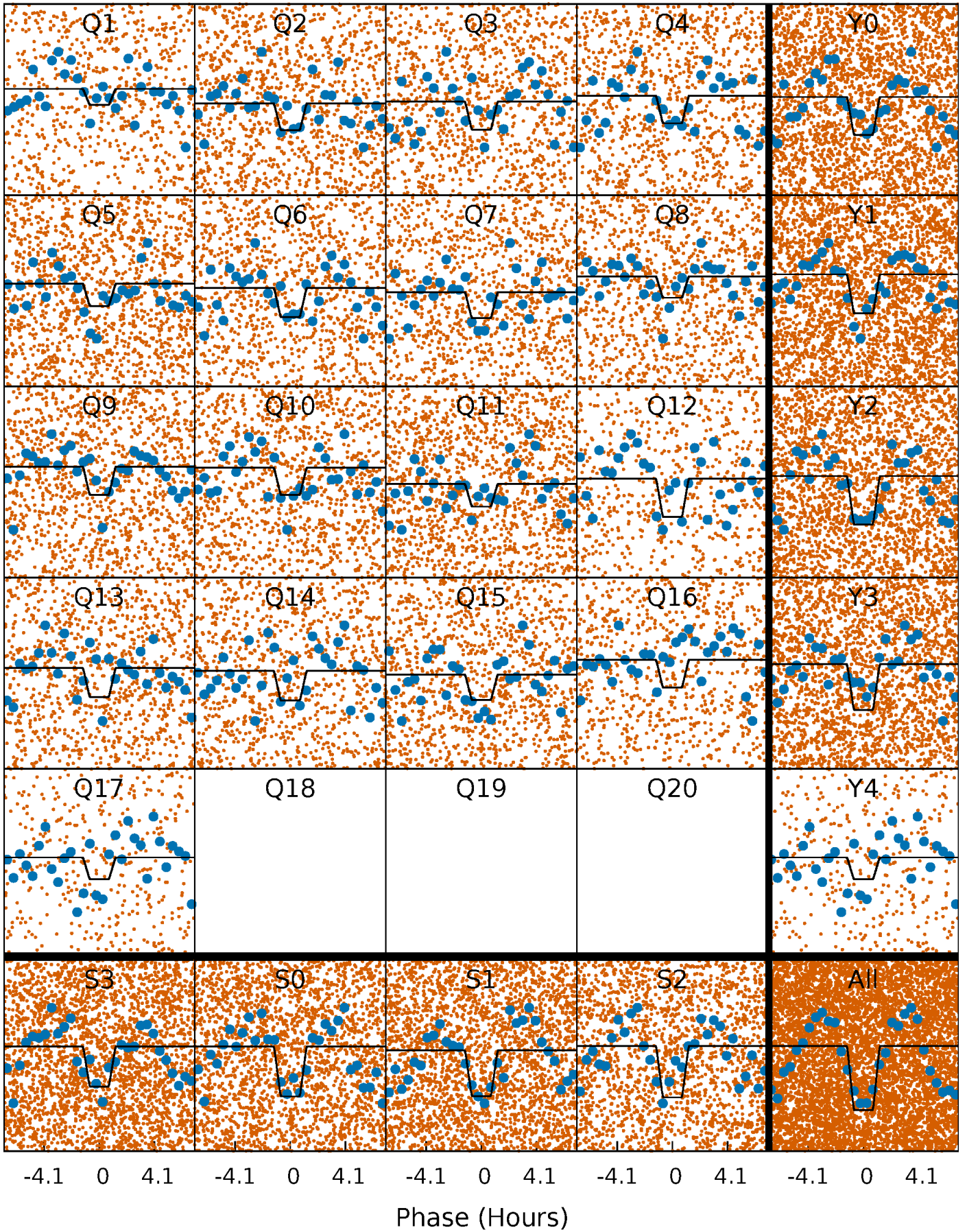
DV Quarter-Phased Transit Curves

TCE 005177020-02 P= 0.546612 Days $T_0=131.560763$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

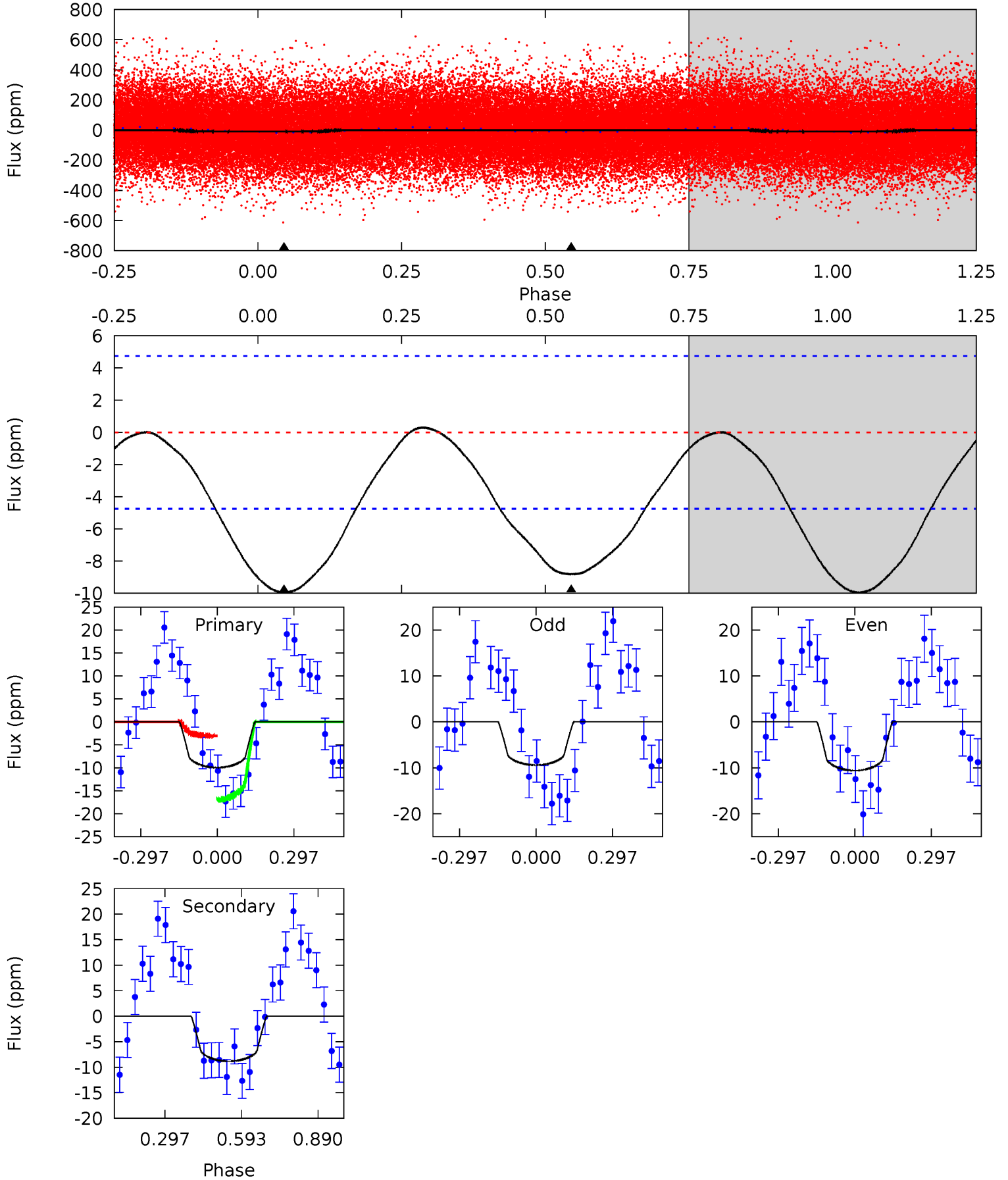
TCE 005177020-02 P= 0.546635 Days $T_0=131.561050$ (BKJD)



DV Model-Shift Uniqueness Test

005177020-02, P = 0.546612 Days, E = 131.014151 Days

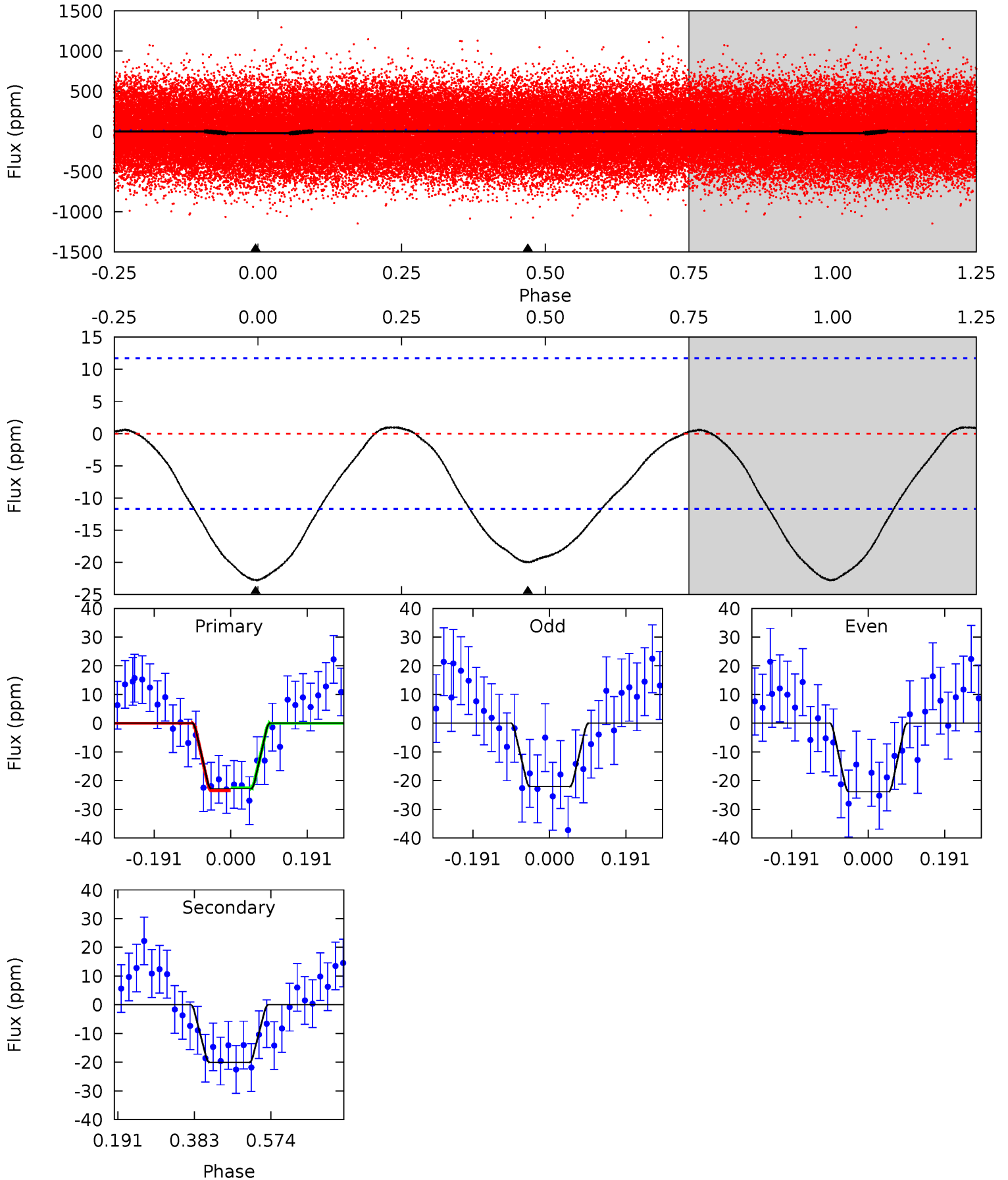
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.08	8.05	0	0	4.33	1.04	0.17	9.08	9.08	8.05	8.05	0.55	0.79	0.03	6.50



Alt Model-Shift Uniqueness Test

005177020-02, P = 0.546635 Days, E = 131.014415 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.64	7.59	0	0	4.43	1.31	0.61	8.64	8.64	7.59	7.59	0.34	0.76	0.04	0.19



Stellar Parameters For KIC 005177020

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7694^{+237}_{-316}	$3.737^{+0.441}_{-0.074}$	$-0.180^{+0.200}_{-0.300}$	$3.060^{+0.348}_{-1.391}$	$1.863^{+0.111}_{-0.444}$	$0.092^{+0.357}_{-0.023}$
	+3%/-4%	+12%/-2%	+111%/-167%	+11%/-45%	+6%/-24%	+389%/-25%
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 005177020-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-9 ± 1	$1.13^{+0.62}_{-0.56}$	6364^{+399}_{-718}	6001^{+3843}_{-1889}	$0.993^{+2.991}_{-0.596}$
Alt.	-20 ± 3	$1.47^{+0.70}_{-0.61}$	6351^{+403}_{-711}	6711^{+2788}_{-1530}	$1.295^{+2.398}_{-0.695}$

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 $A_{obs} \gg 1.0$

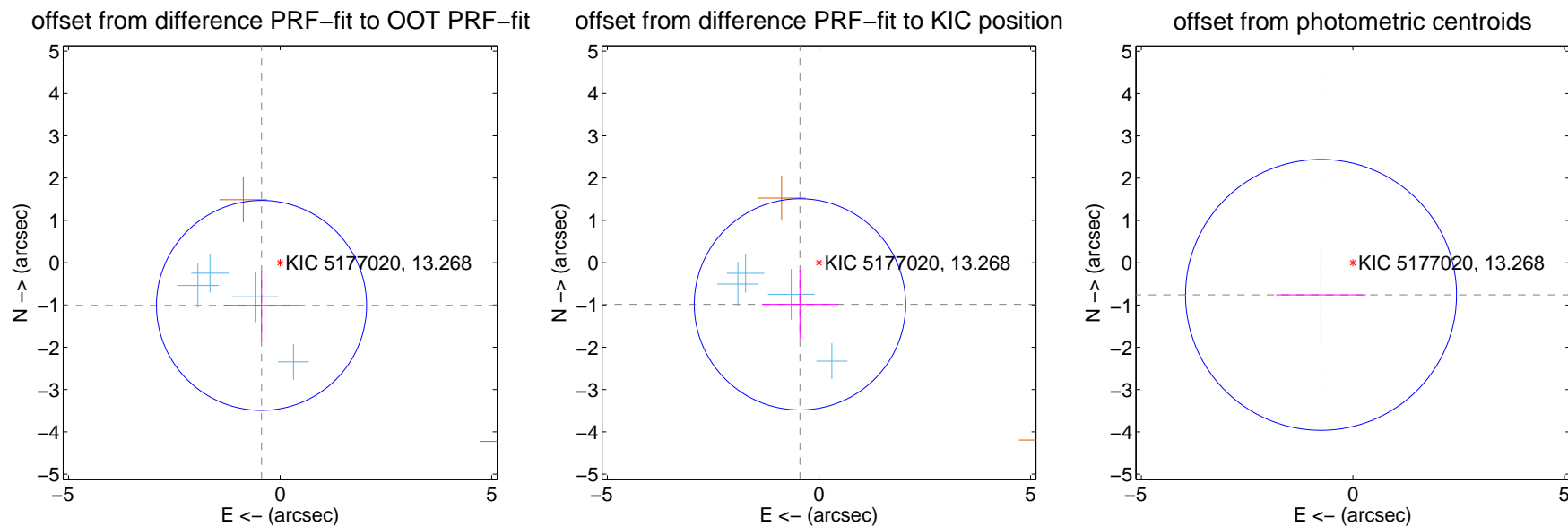
DV Centroid Data

Supplemental centroid analysis for 005177020-02. Kepler magnitude: 13.27. Transit SNR 7.34

There are 4 quarters with good PRF difference image offsets

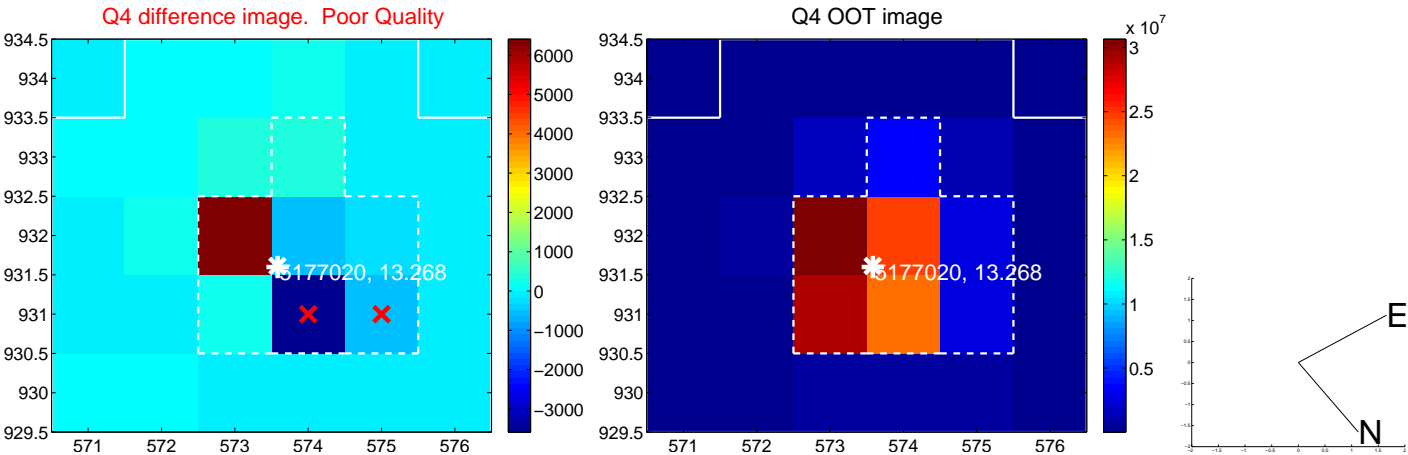
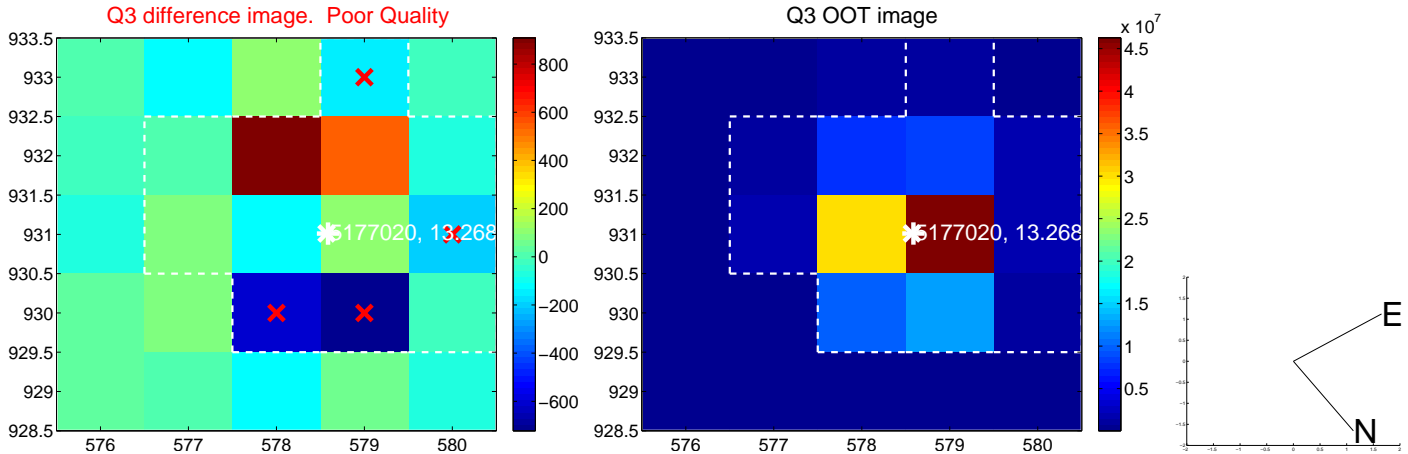
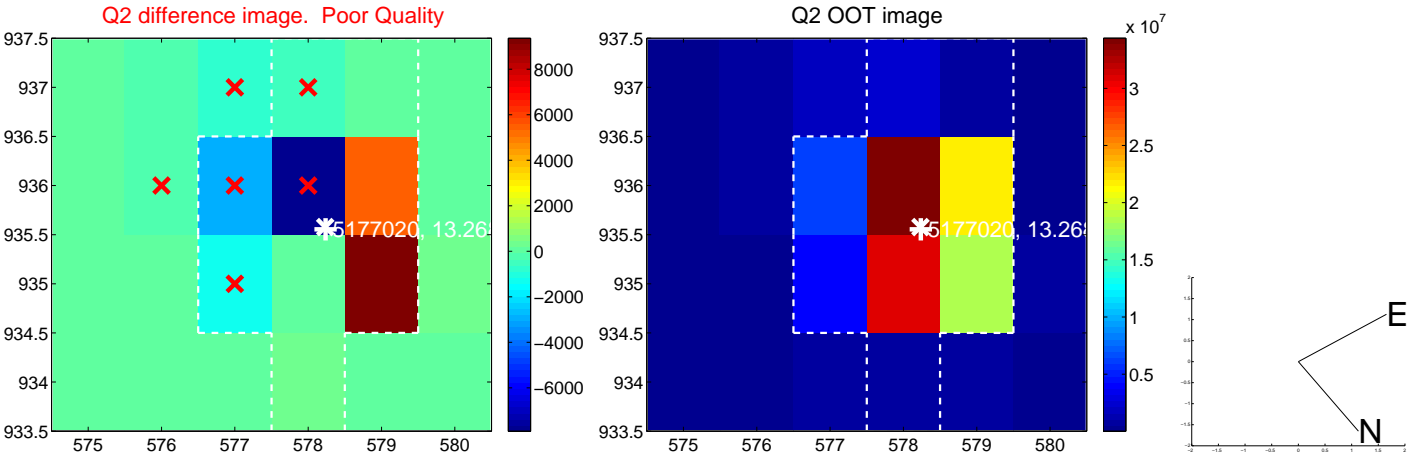
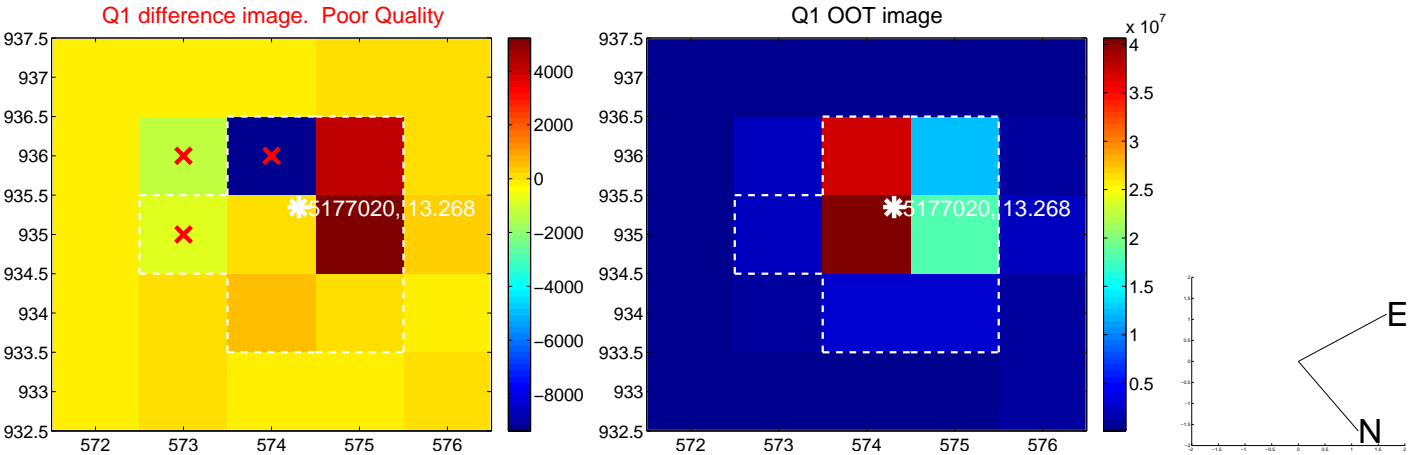
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.102 ± 0.827	1.33	0.439 ± 0.888	-1.011 ± 0.815
PRF-fit source offset from KIC position	1.083 ± 0.832	1.30	0.449 ± 0.898	-0.986 ± 0.818
photometric centroid source offset	1.07 ± 1.07	1.00	0.75 ± 1.06	-0.76 ± 1.07

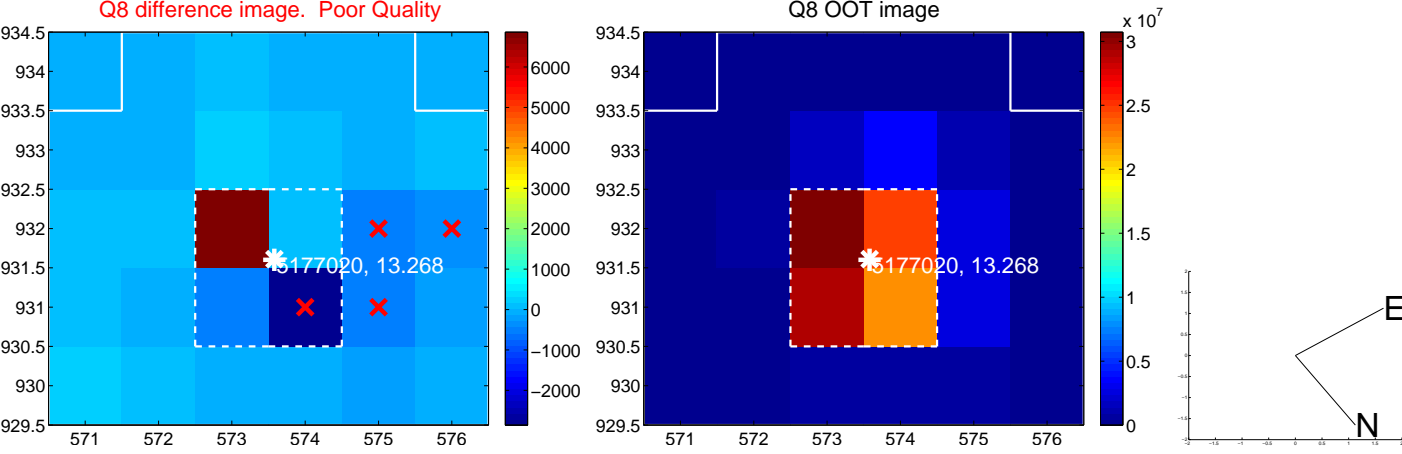
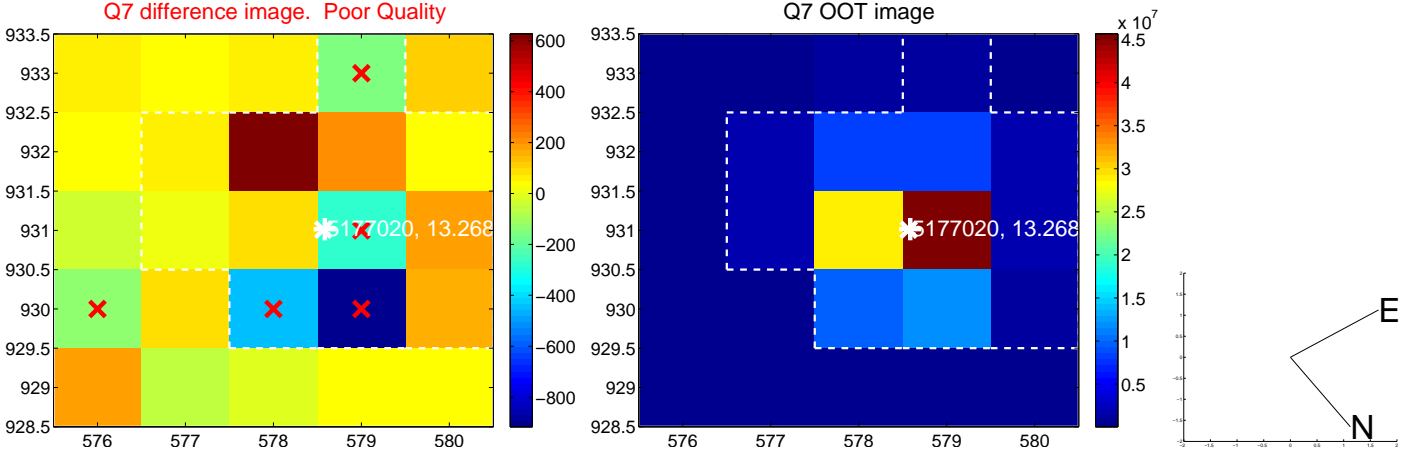
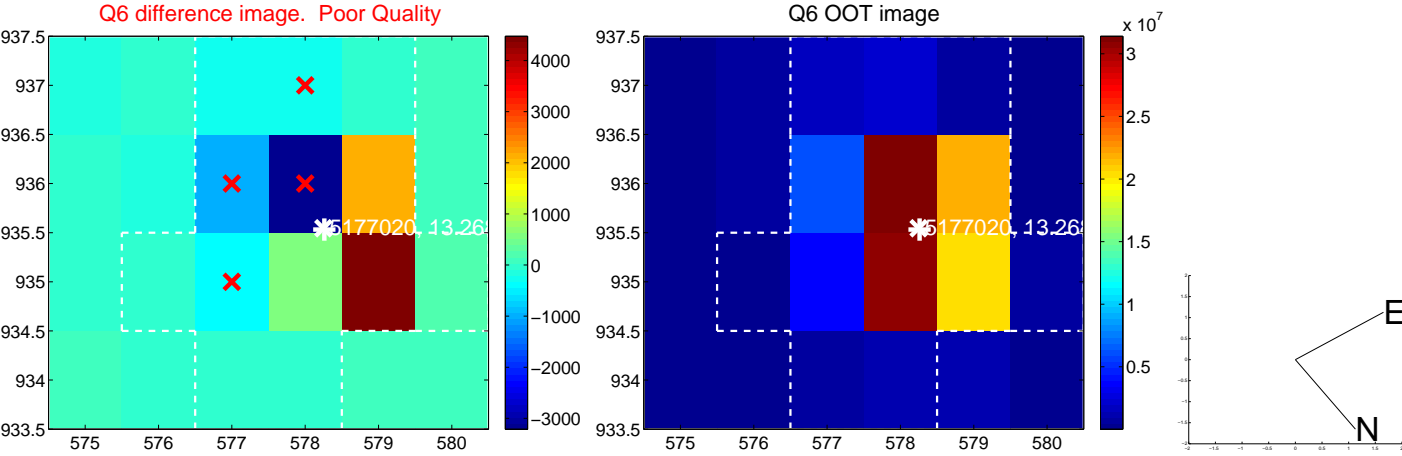
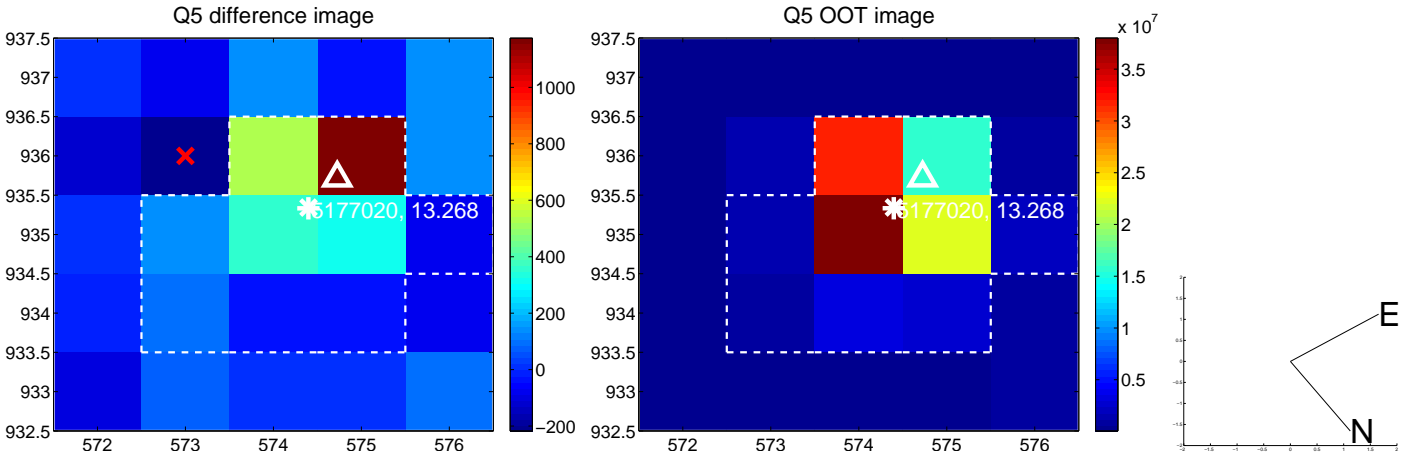


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

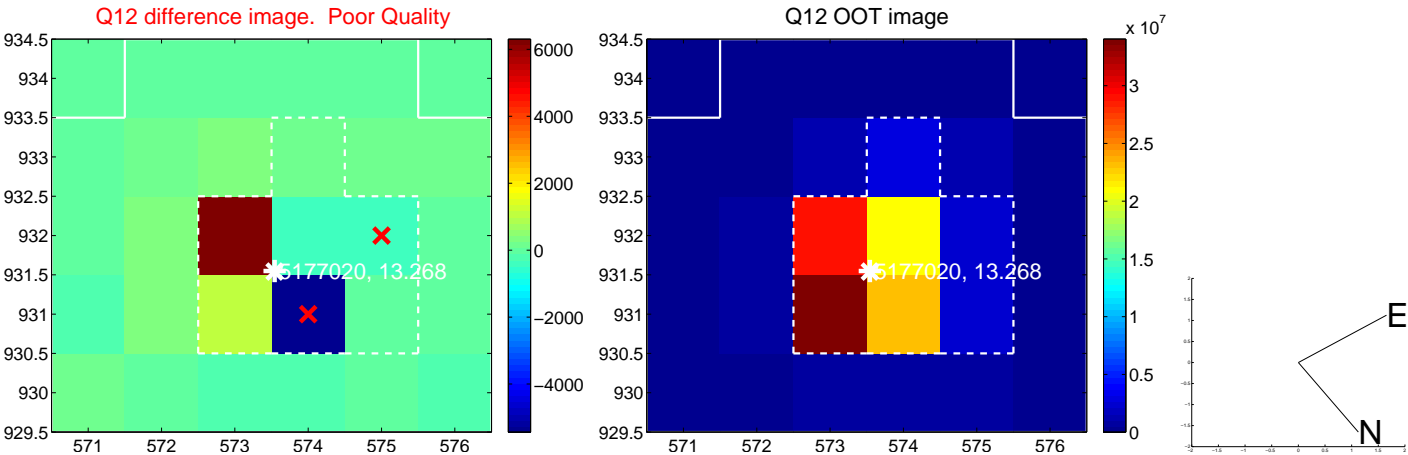
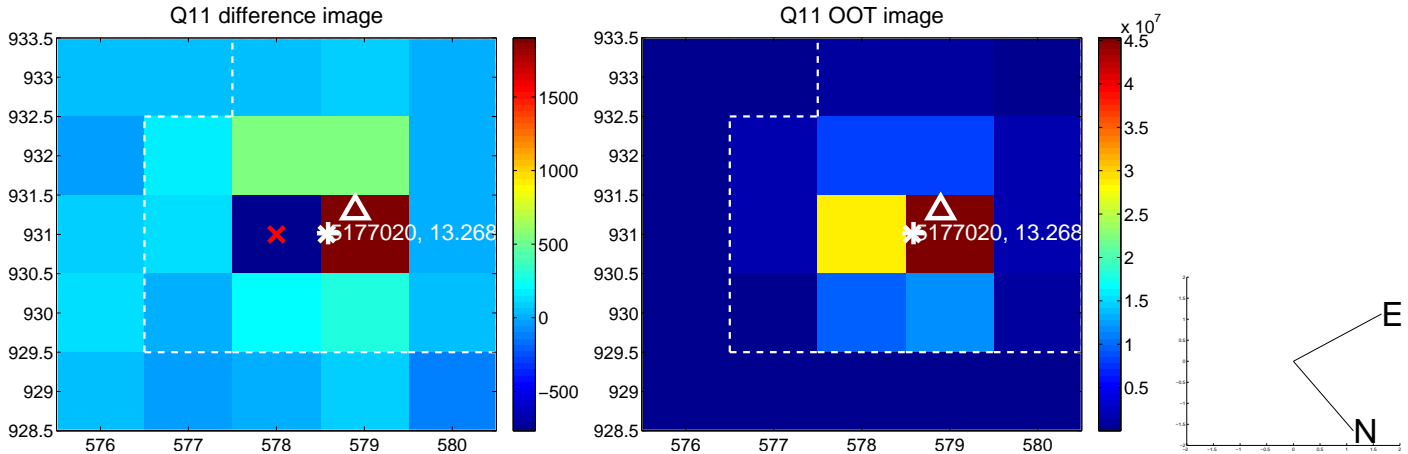
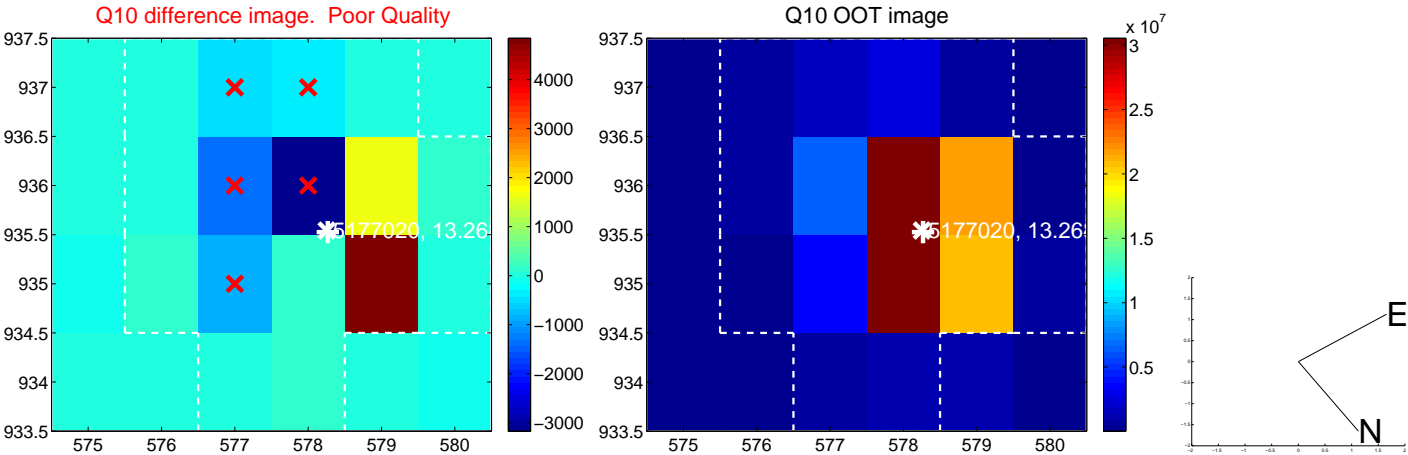
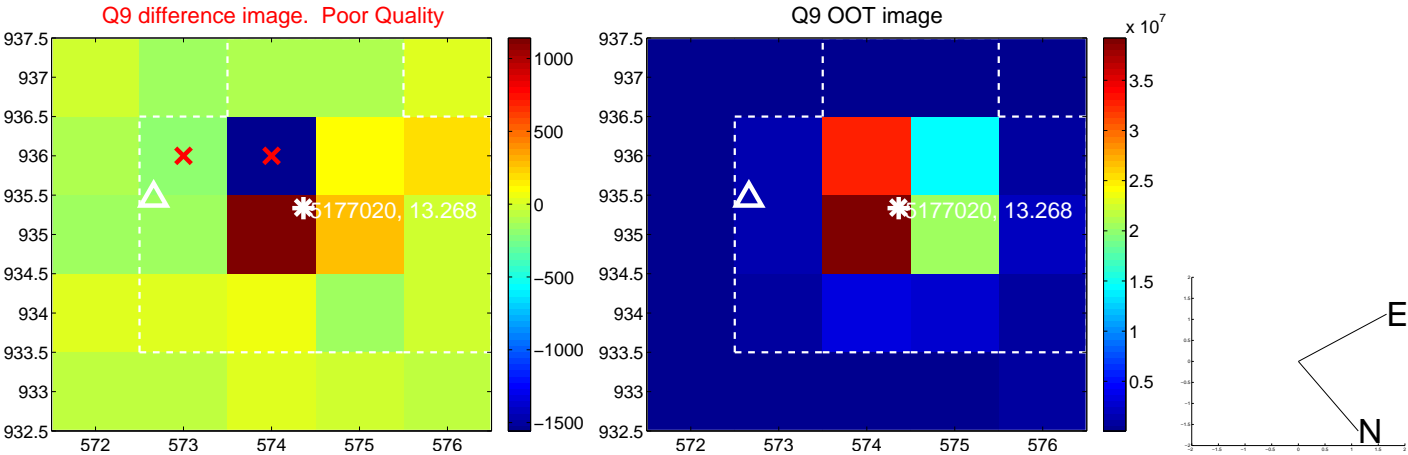
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



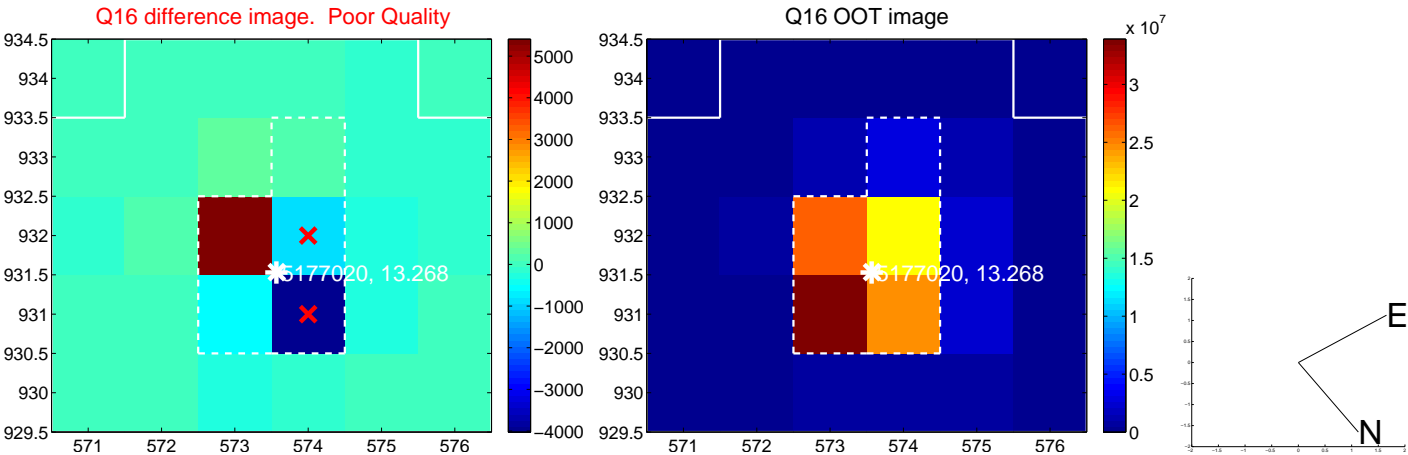
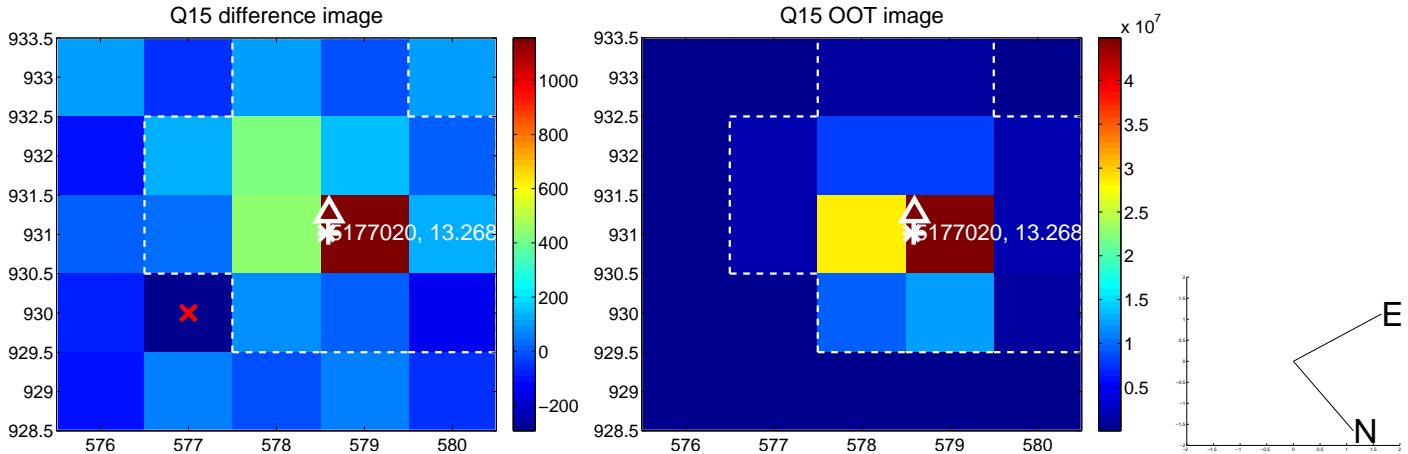
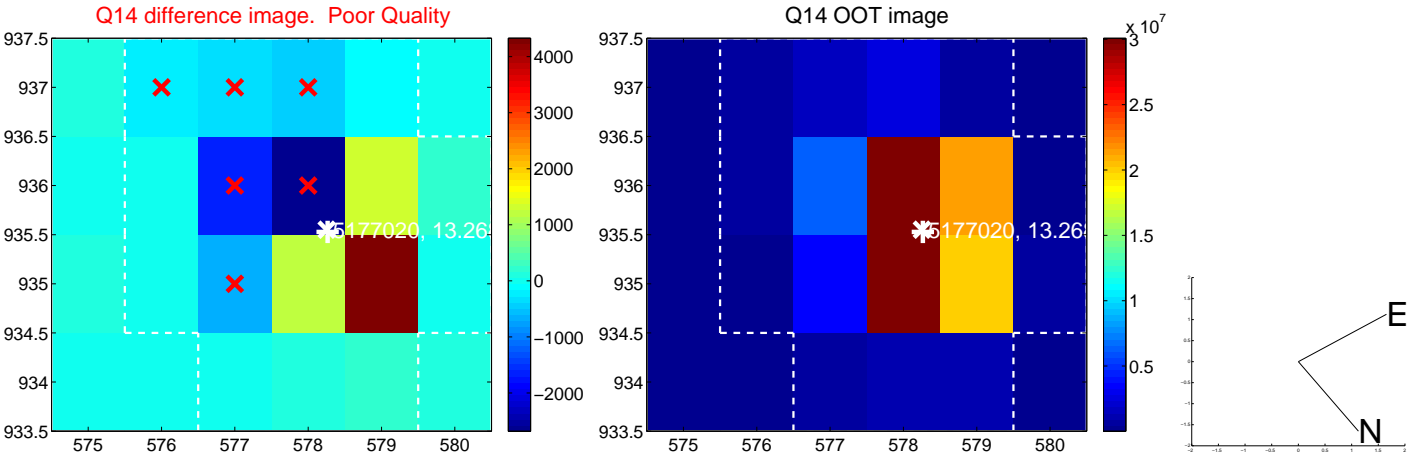
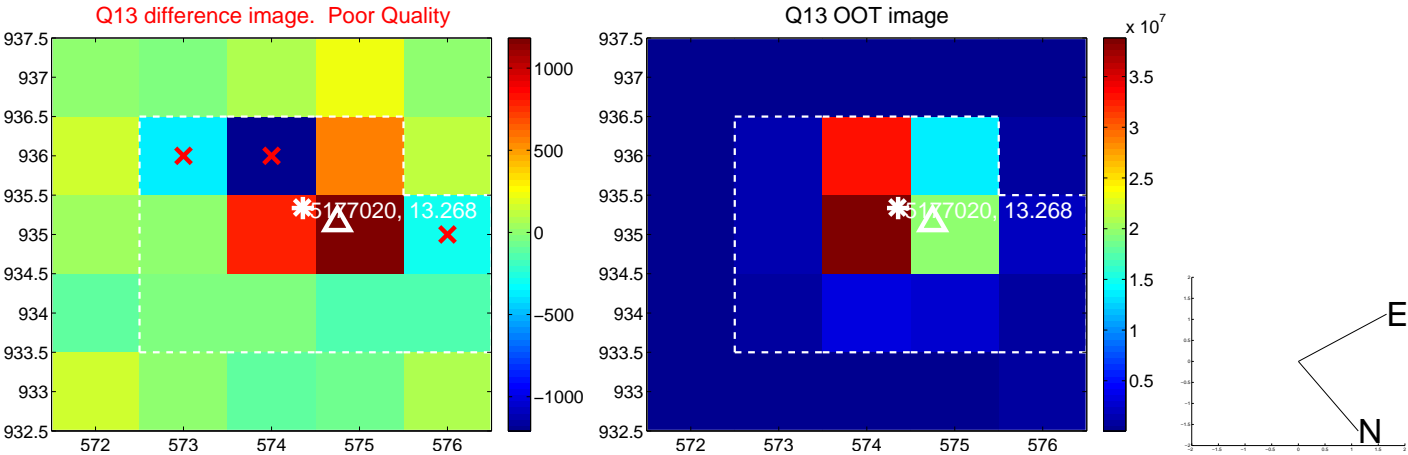
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

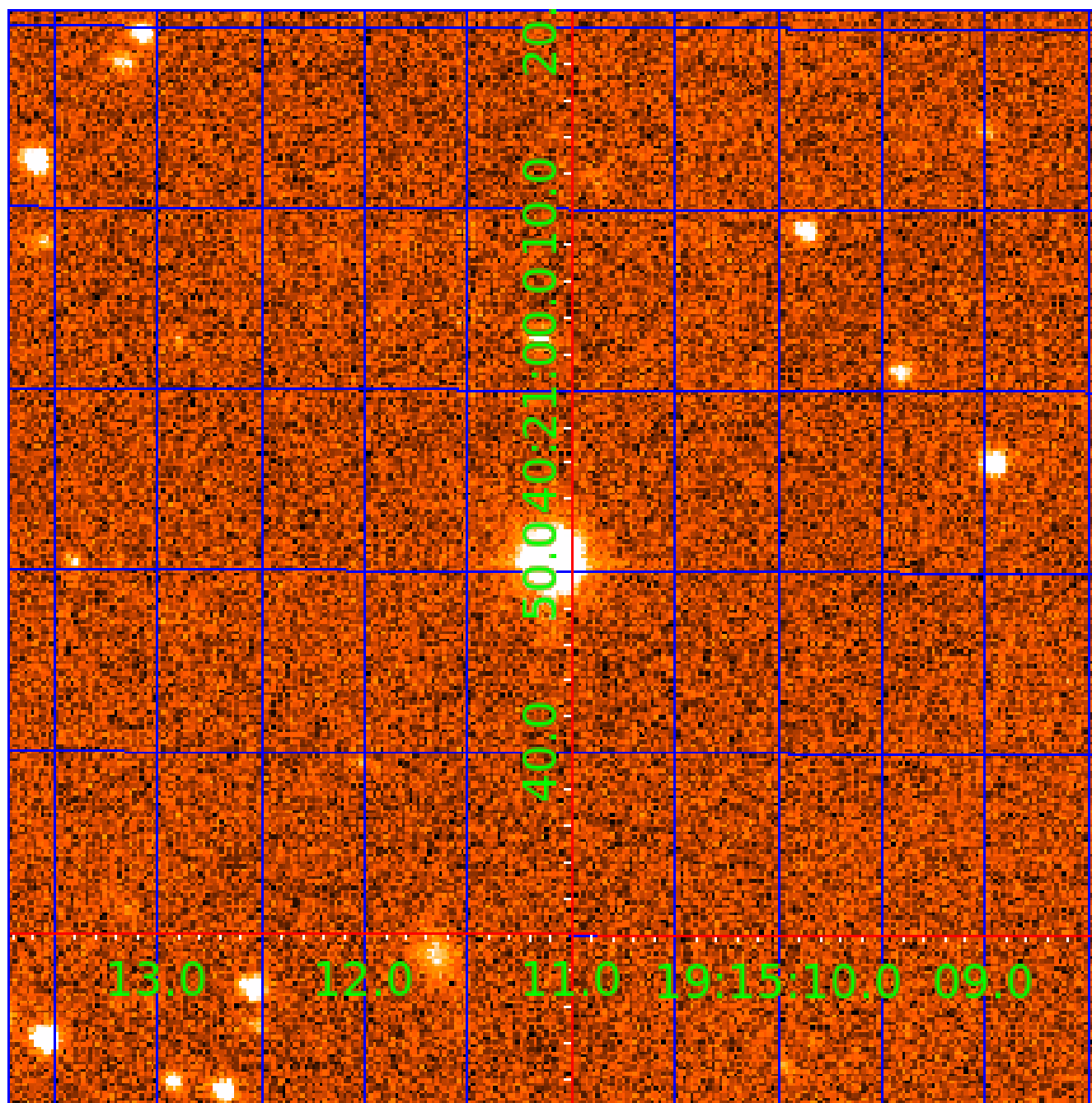


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005177020

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})
005177020-01	OBS	No	499.756213	460.956163	317.4	25.537	8.8	13.3	3.06	7694	5.73	12.77
005177020-02	OBS	No	0.546612	131.560763	12.1	3.417	8.2	7.3	3.06	7694	1.24	113347.55
005177020-03	OBS	No	19.524878	143.793617	111.6	2.902	8.8	8.5	3.06	7694	3.79	963.53
005177020-04	OBS	No	98.595804	145.047428	242.6	2.930	8.1	9.3	3.06	7694	5.43	111.22

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177020-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005177020-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
005177020-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005177020-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

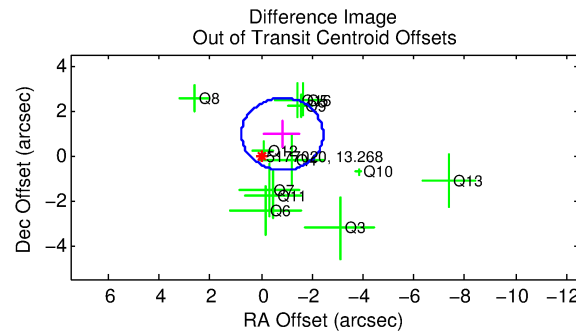
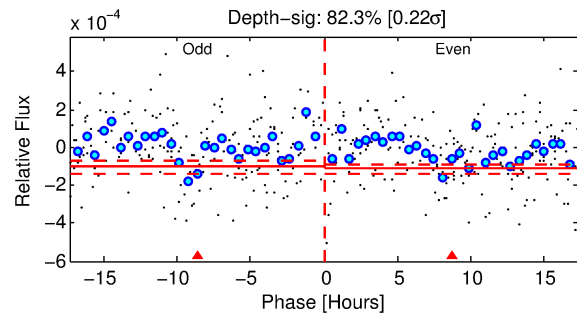
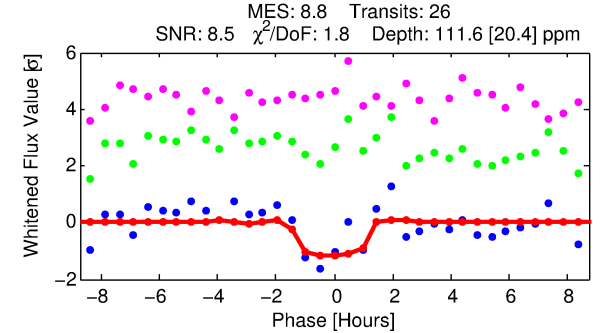
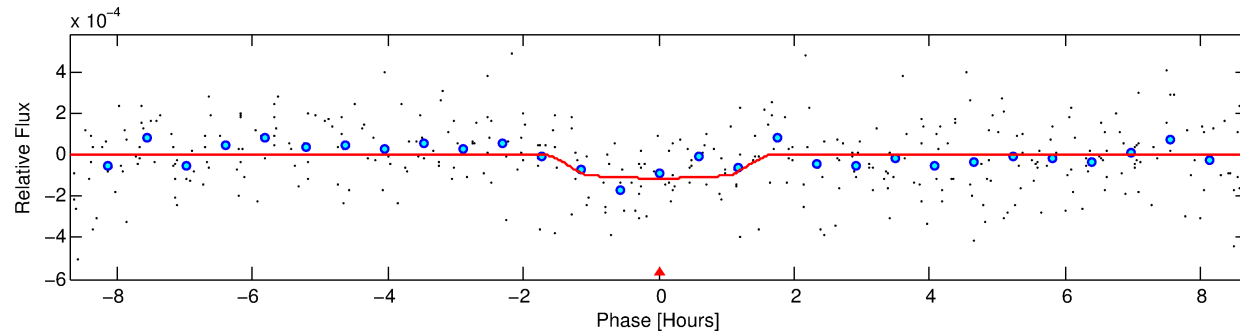
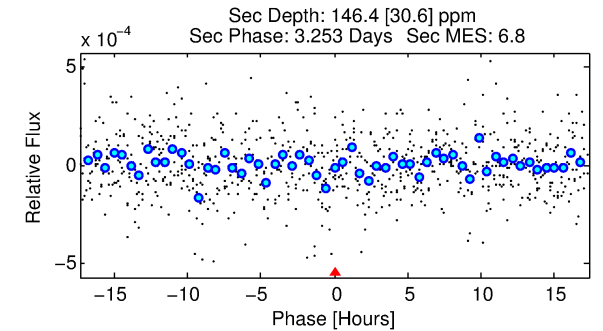
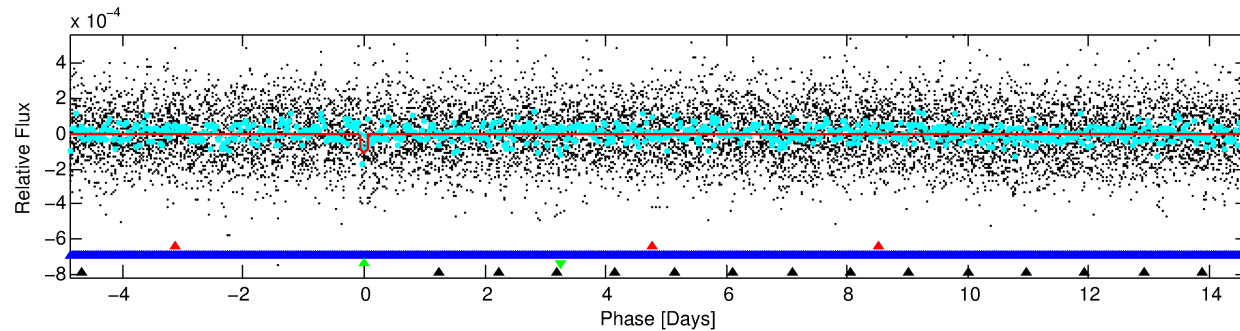
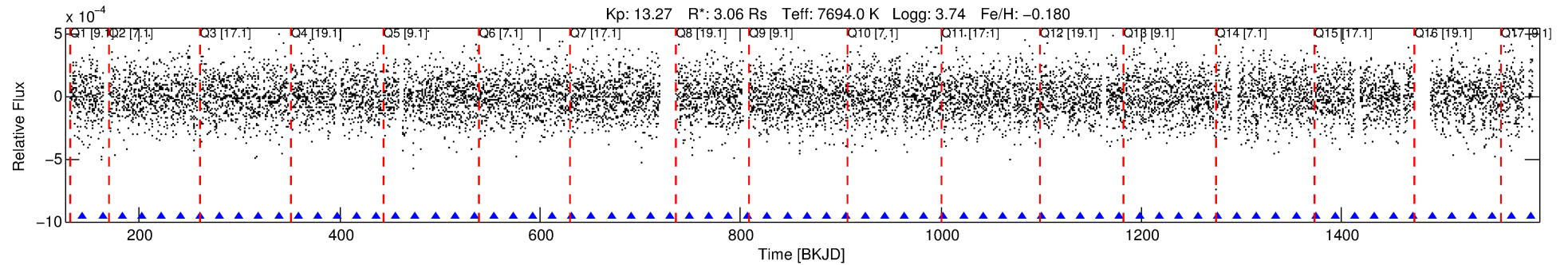
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005177020-03

No Significant Match Found

DV One-Page Summary

KIC: 5177020 Candidate: 3 of 4 Period: 19.525 d



DV Fit Results:

Period = 19.52488 [0.00028] d
Epoch = 143.7936 [0.0116] BKJD
Rp/R* = 0.0114 [0.0117]
a/R* = 23.48 [141.70]
b = 0.90 [1.26]
Seff = 963.53 [731.97]
Teq = 1421 [270] K
Rp = 3.79 [4.27] Re
a = 0.1747 [0.0794] AU
Ag = 170.85 [375.43] [0.45σ]
Teffp = 7941 [4120] K [1.58σ]

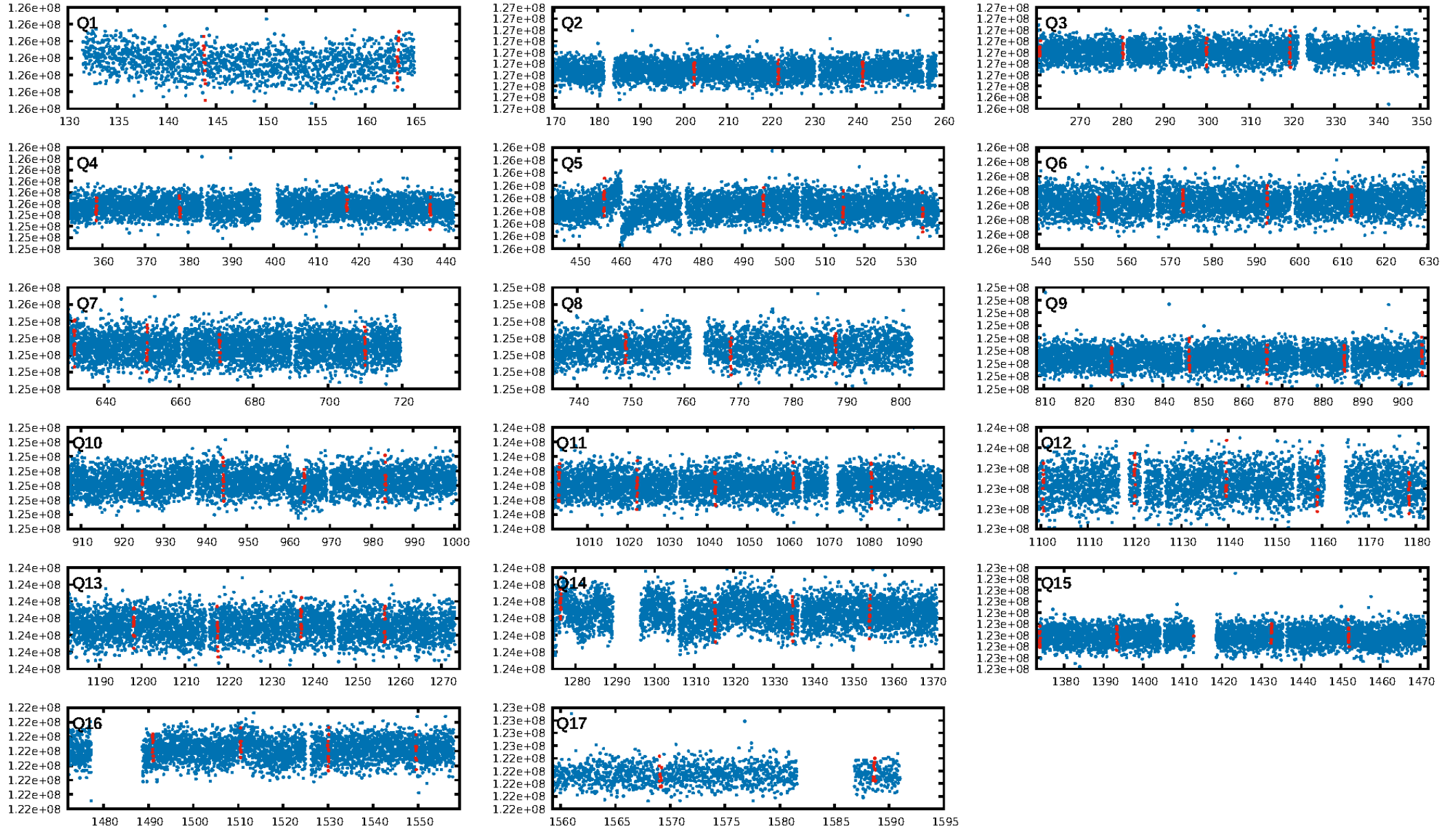
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [101.61σ]
LongPeriod-sig: 100.0% [460.21σ]
ModelChiSquare2-sig: 26.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.30e-09
RollingBand-fgt: 1.00 [24/24]
GhostDiagnostic-chr: 0.7073
Centroid-sig: 4.9%
Centroid-so: 1.359 arcsec [1.77σ]
OotOffset-rm: 1.263 arcsec [2.36σ]
KicOffset-rm: 1.257 arcsec [2.60σ]
OotOffset-st: 2/3/4/3 [12]
KicOffset-st: 2/3/4/3 [12]
DiffImageQuality-fgm: 0.33 [4/12]
DiffImageOverlap-fno: 0.00 [0/17]

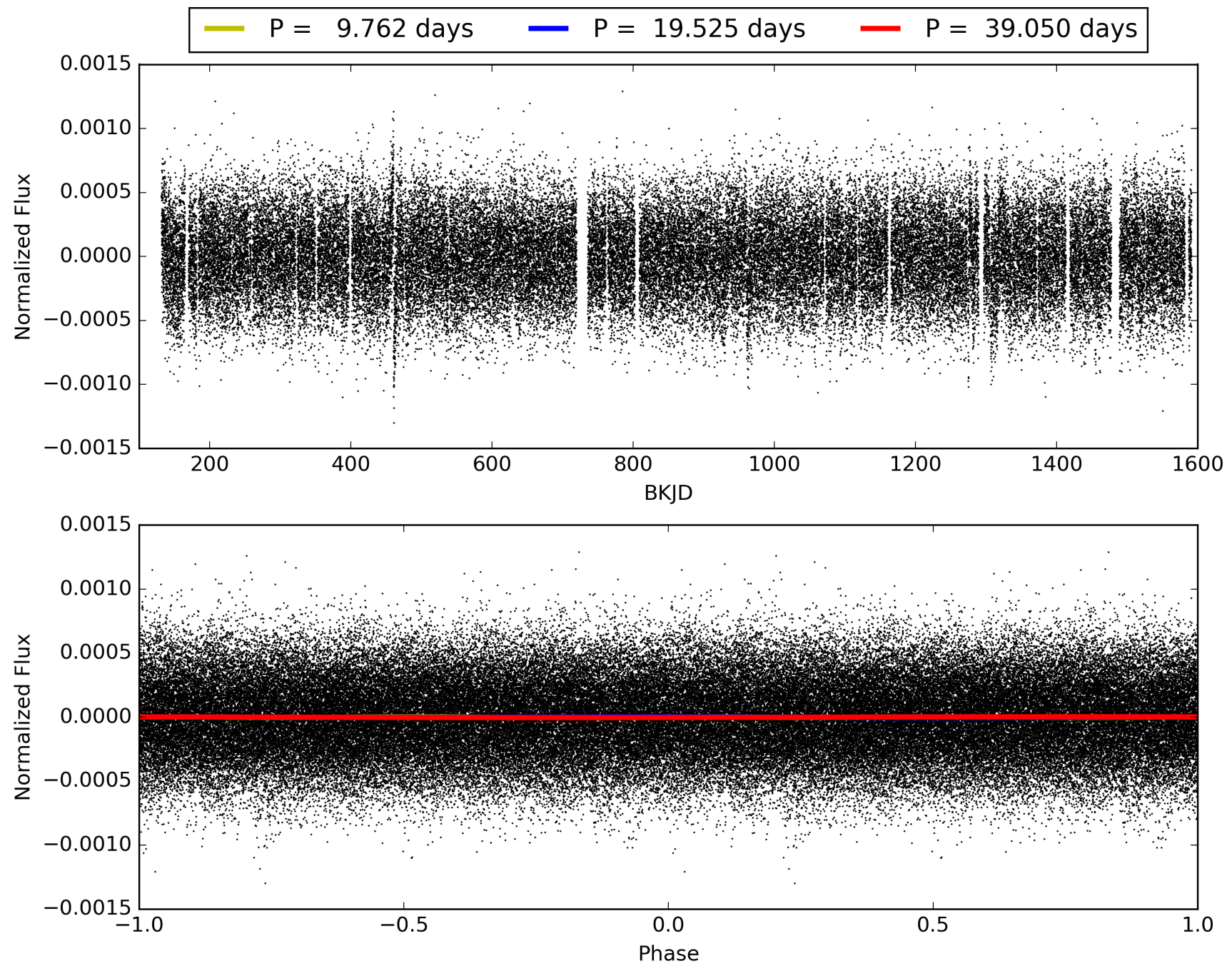
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:02:36 Z

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

TCE 005177020-03, PDC Light Curves

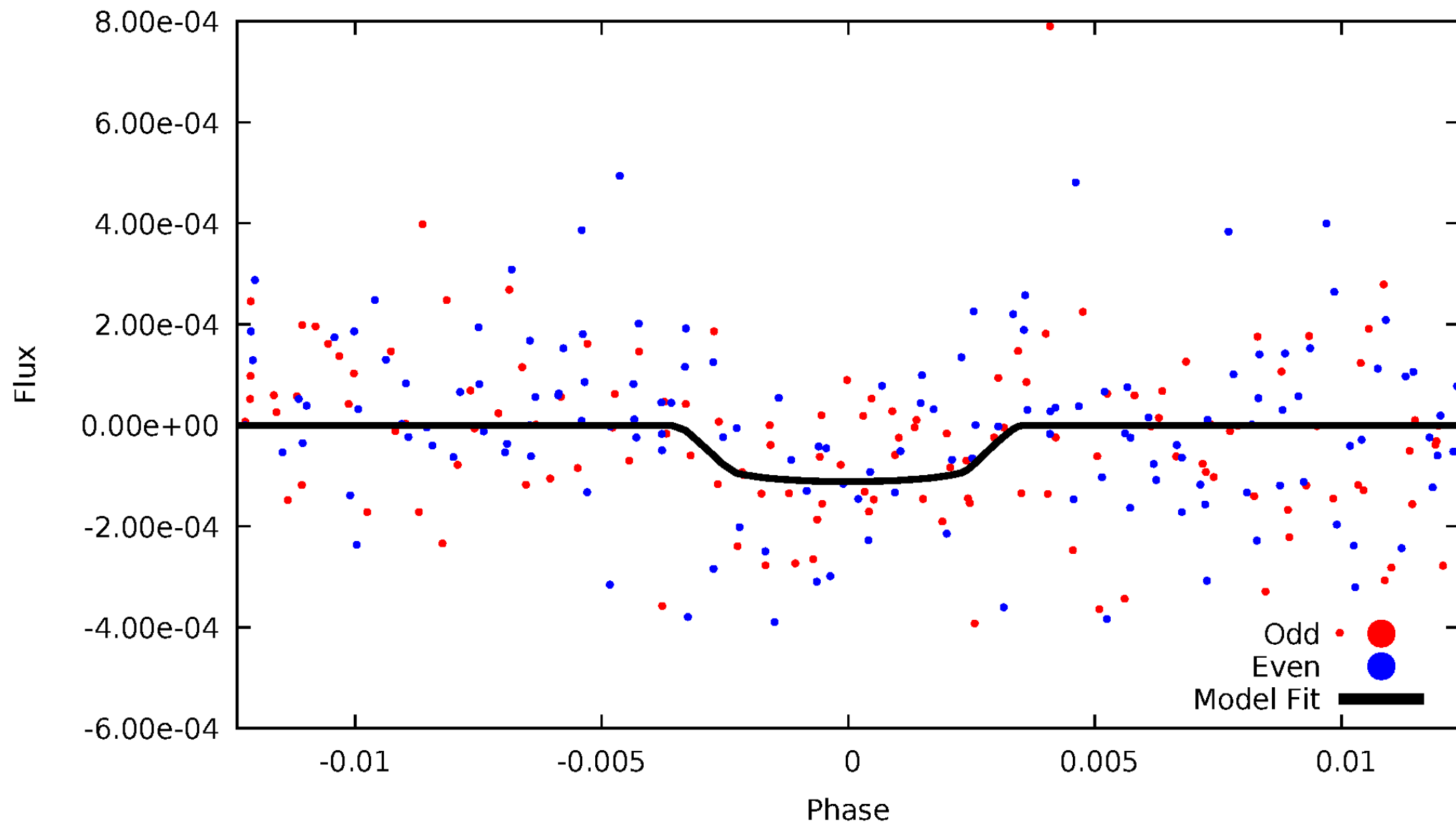


TCE 005177020-03



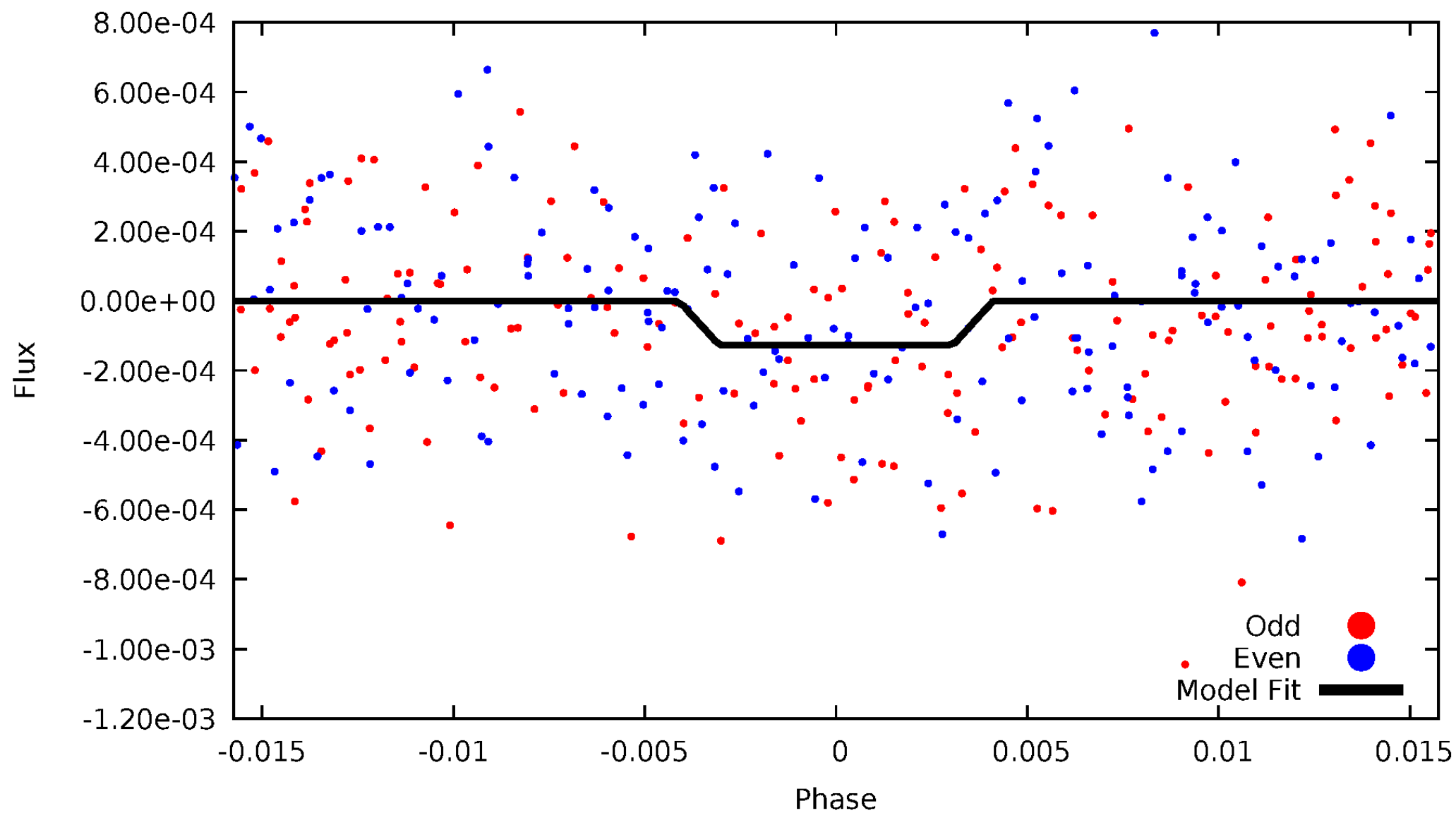
DV Odd/Even

TCE 005177020-03



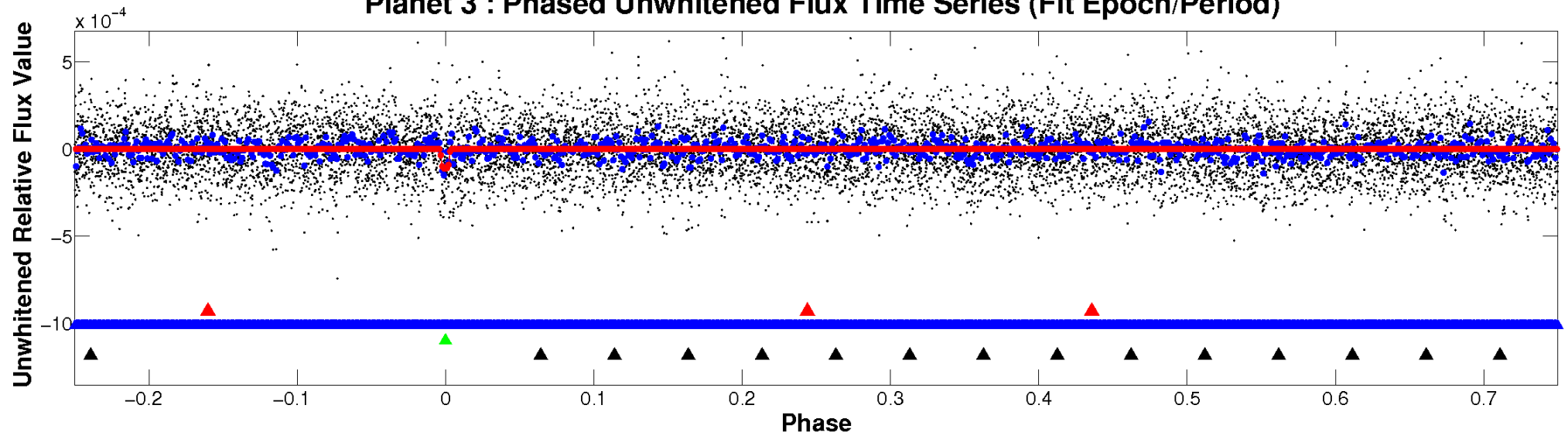
ALT Odd/Even

TCE 005177020-03

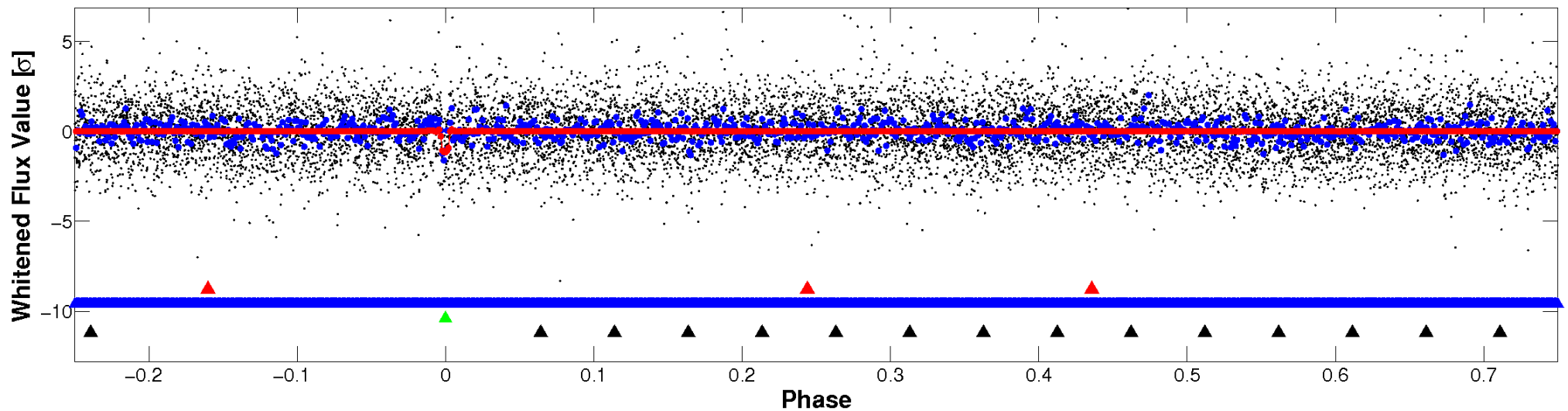


Non-Whitened Vs. Whitened Light Curve

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

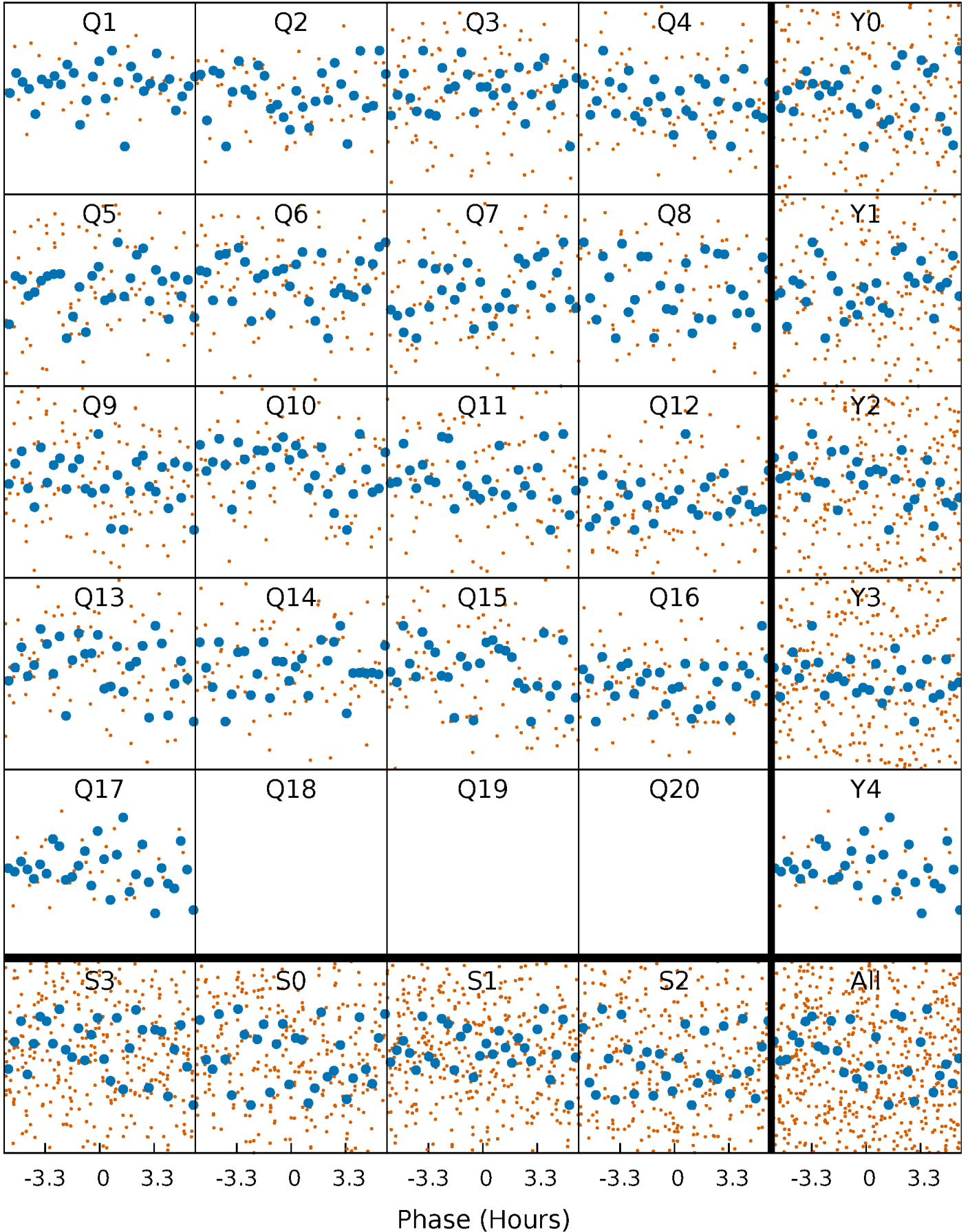


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



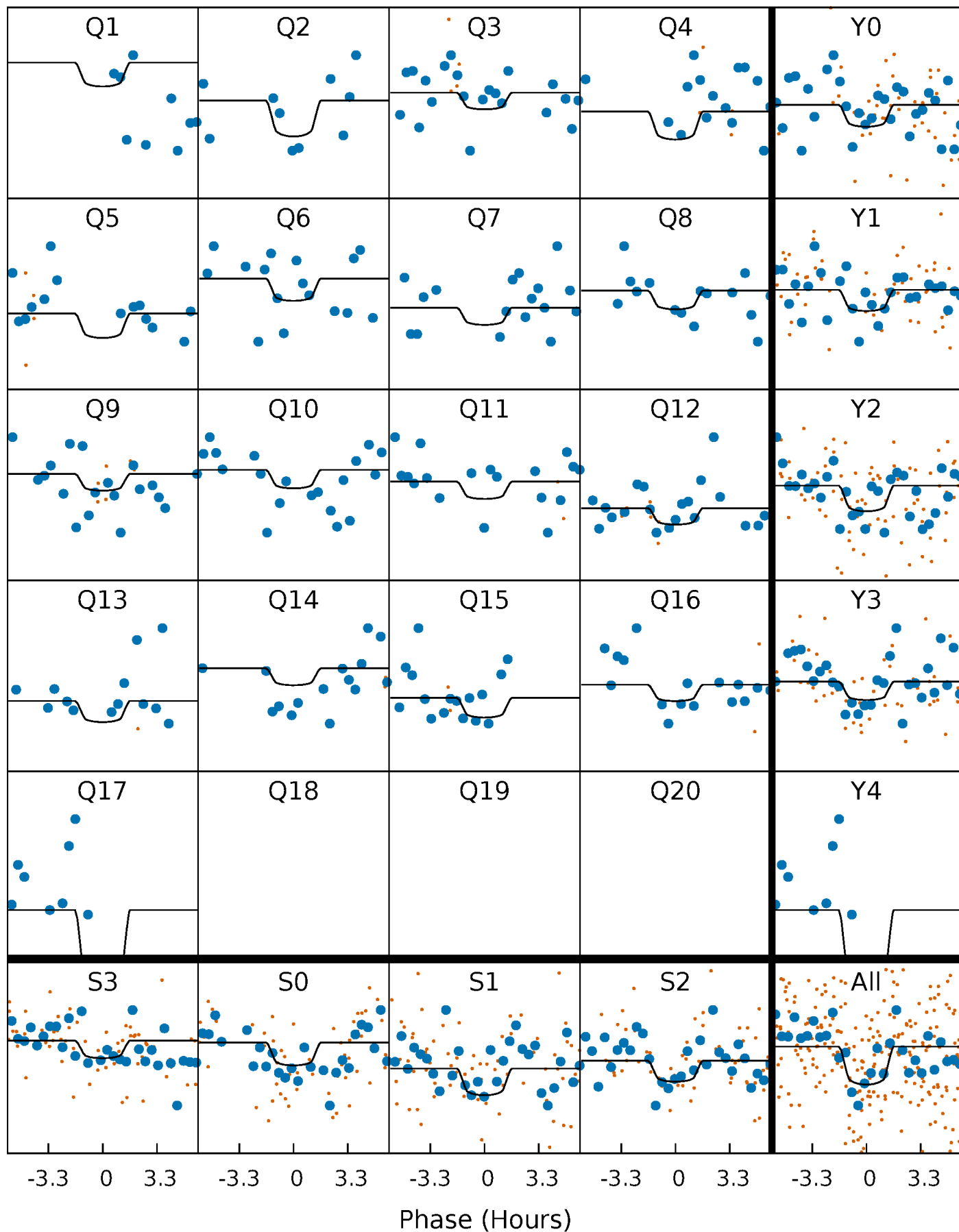
PDC Quarter-Phased Transit Curves

TCE 005177020-03 P= 19.524878 Days $T_0=143.793617$ (BKJD)



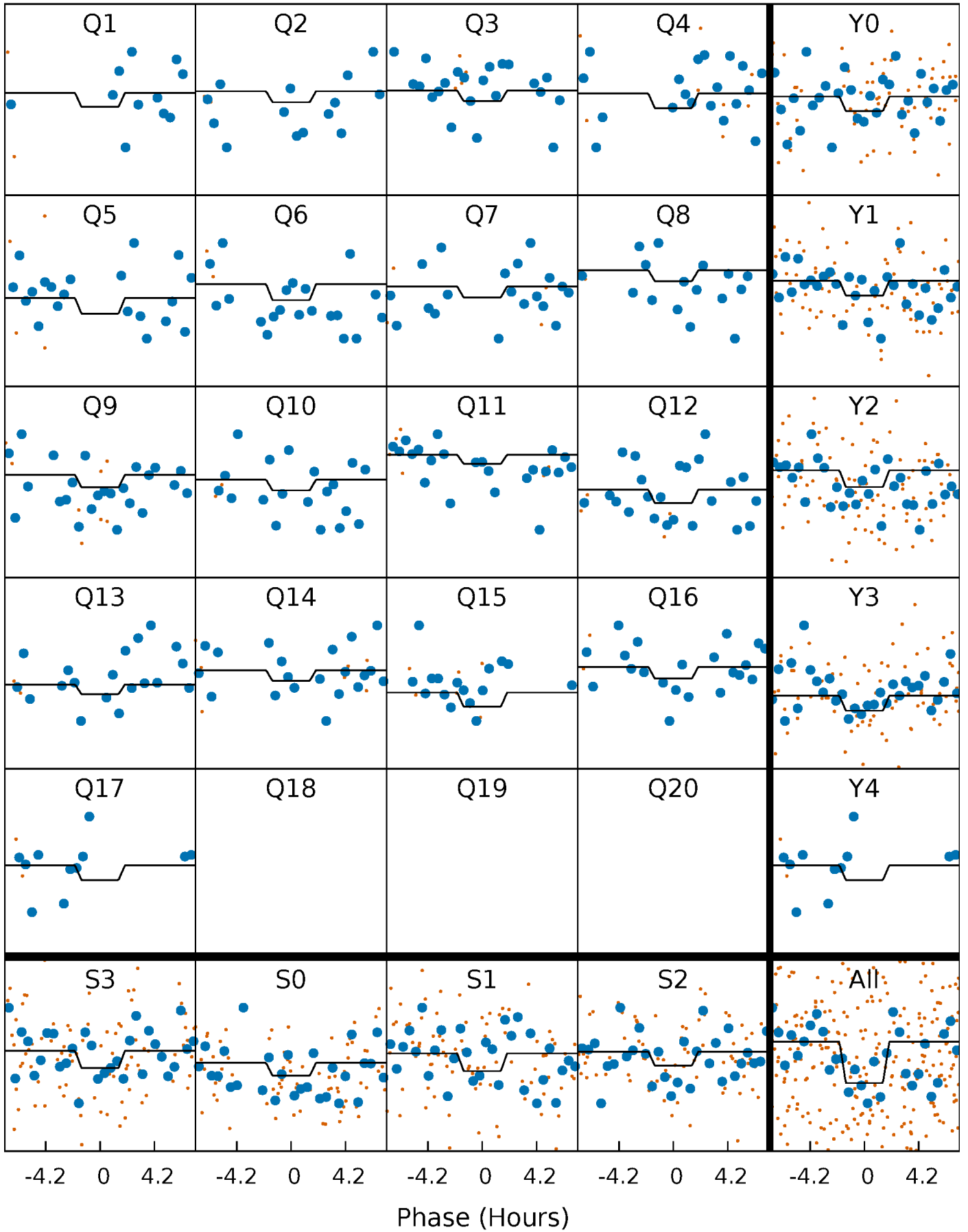
DV Quarter-Phased Transit Curves

TCE 005177020-03 P= 19.524878 Days $T_0=143.793617$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

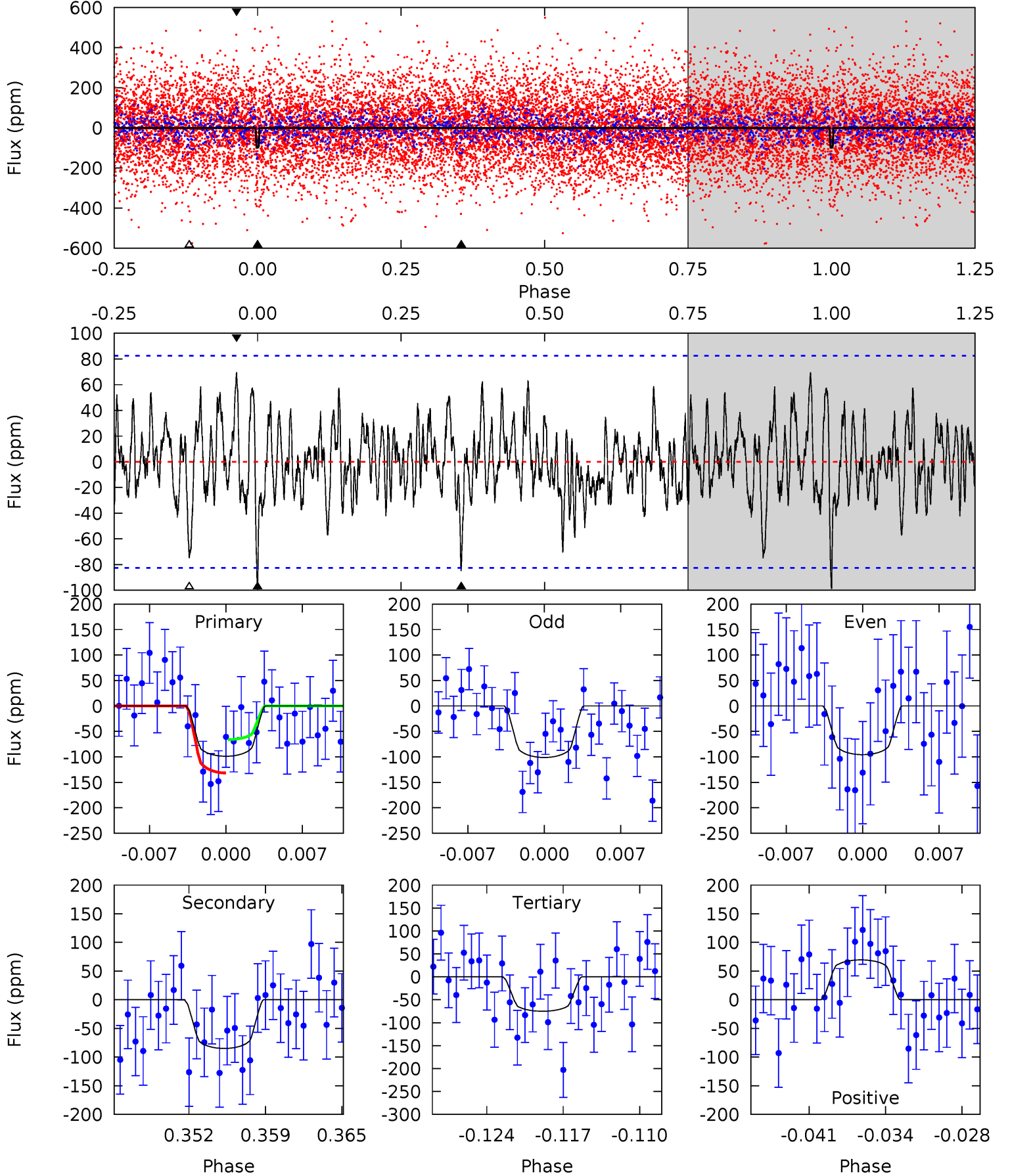
TCE 005177020-03 P= 19.525021 Days $T_0=143.773693$ (BKJD)



DV Model-Shift Uniqueness Test

005177020-03, P = 19.524878 Days, E = 124.268739 Days

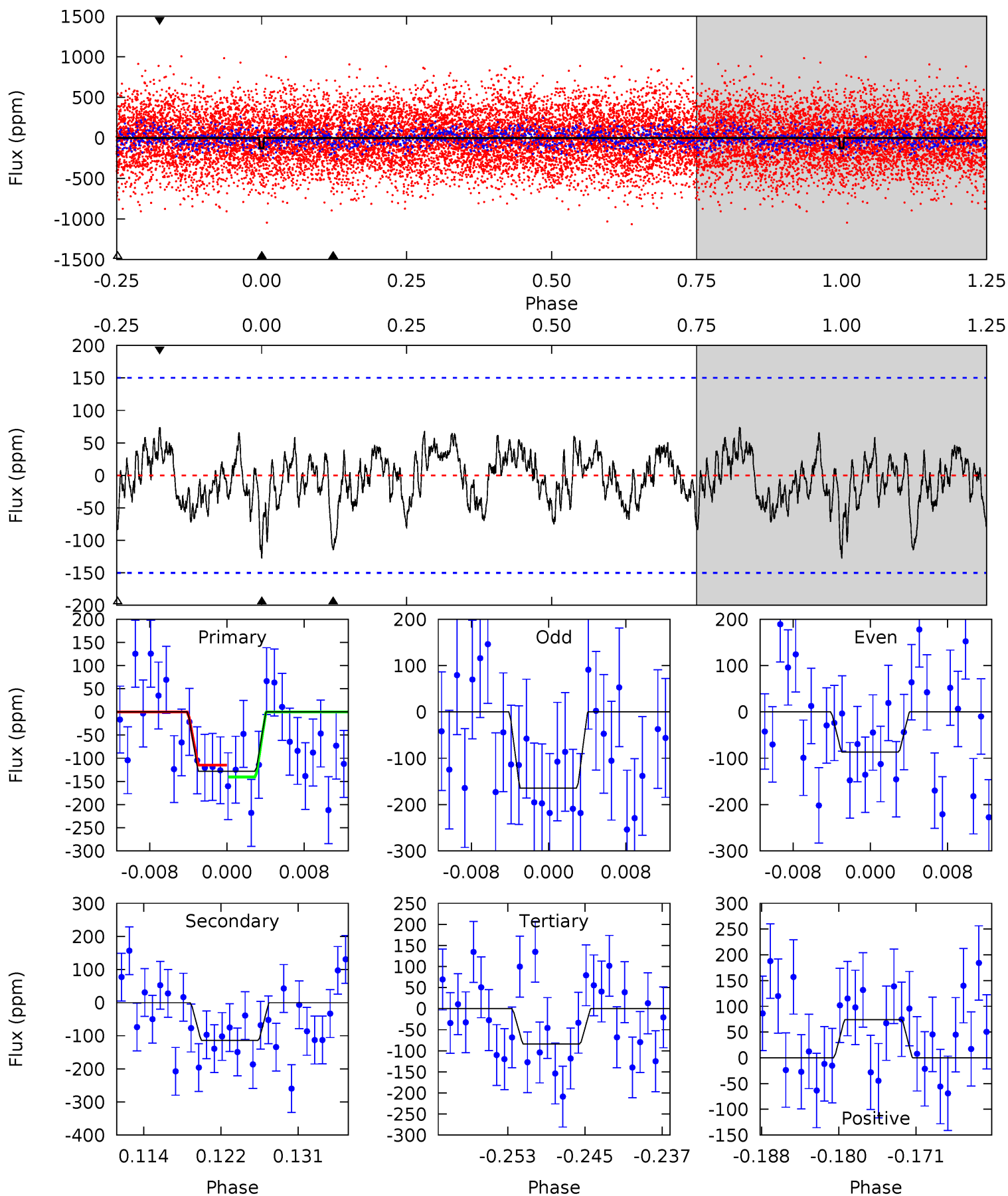
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.10	5.24	4.63	4.29	5.10	2.70	1.45	1.47	1.81	0.61	0.95	0.17	0.98	0.41	2.02



Alt Model-Shift Uniqueness Test

005177020-03, P = 19.525021 Days, E = 124.248672 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.32	3.86	2.83	2.50	5.07	2.65	1.11	1.49	1.81	1.03	1.35	1.31	1.23	0.37	0.43



Stellar Parameters For KIC 005177020

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7694^{+237}_{-316}	$3.737^{+0.441}_{-0.074}$	$-0.180^{+0.200}_{-0.300}$	$3.060^{+0.348}_{-1.391}$	$1.863^{+0.111}_{-0.444}$	$0.092^{+0.357}_{-0.023}$
	+3%/-4%	+12%/-2%	+111%/-167%	+11%/-45%	+6%/-24%	+389%/-25%
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 005177020-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-85 ± 16	$4.13^{+3.36}_{-2.79}$	1908^{+141}_{-230}	5982^{+5755}_{-1262}	81^{+646}_{-56}
Alt.	-114 ± 30	$4.07^{+3.45}_{-2.58}$	1926^{+133}_{-214}	6690^{+6363}_{-1675}	114^{+704}_{-83}

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 $A_{obs} \gg 1.0$

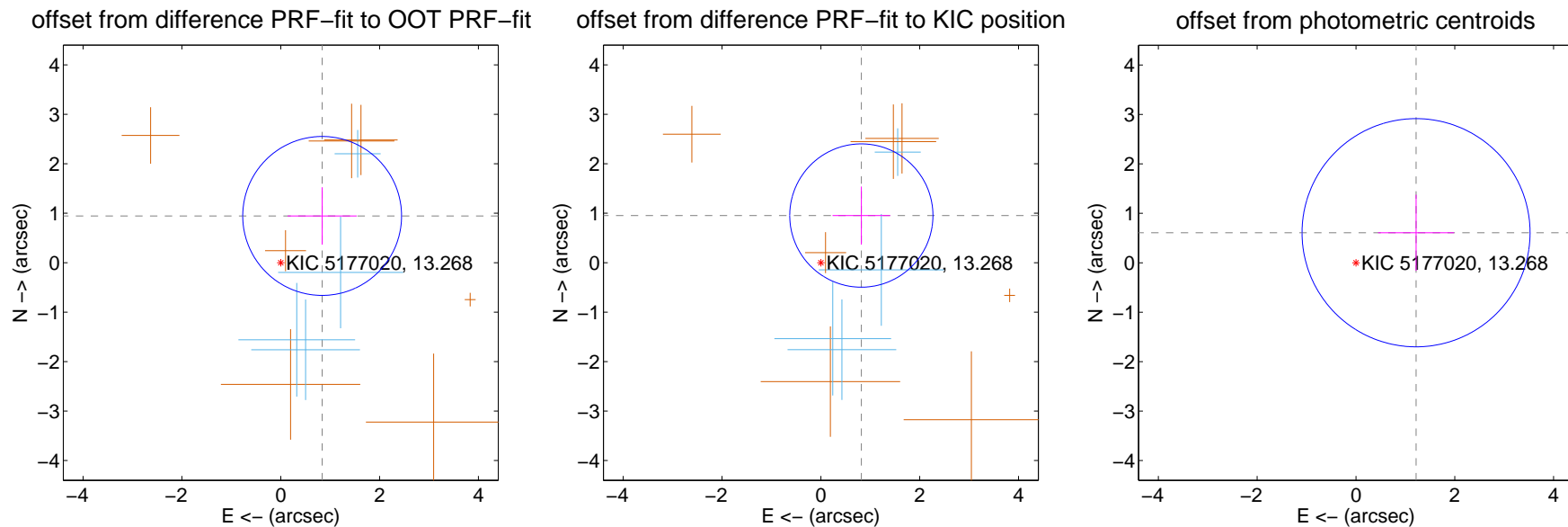
DV Centroid Data

Supplemental centroid analysis for 005177020-03. Kepler magnitude: 13.27. Transit SNR 8.52

There are 4 quarters with good PRF difference image offsets

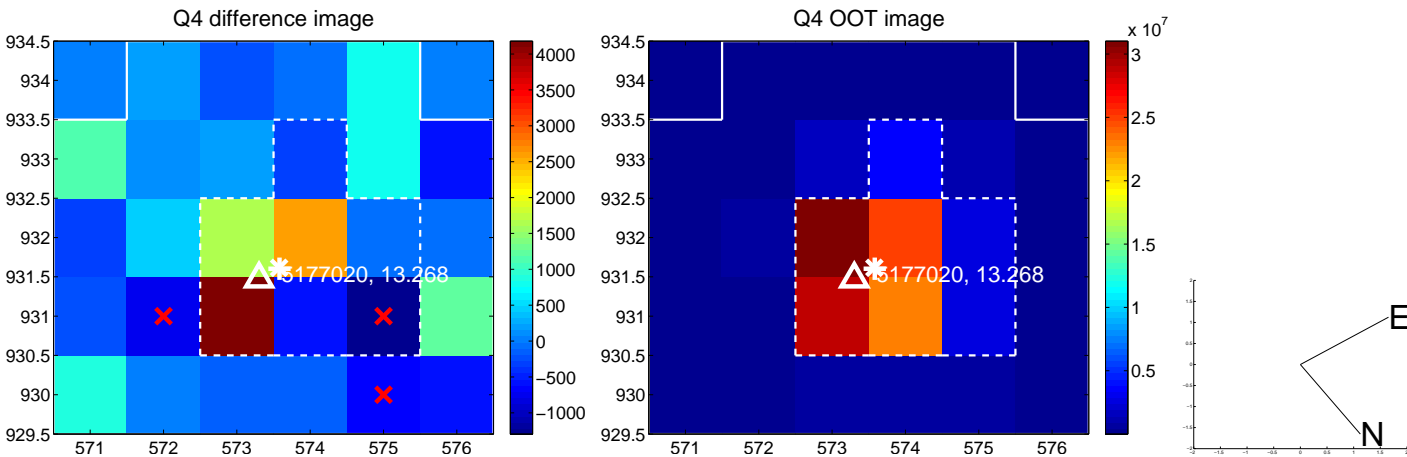
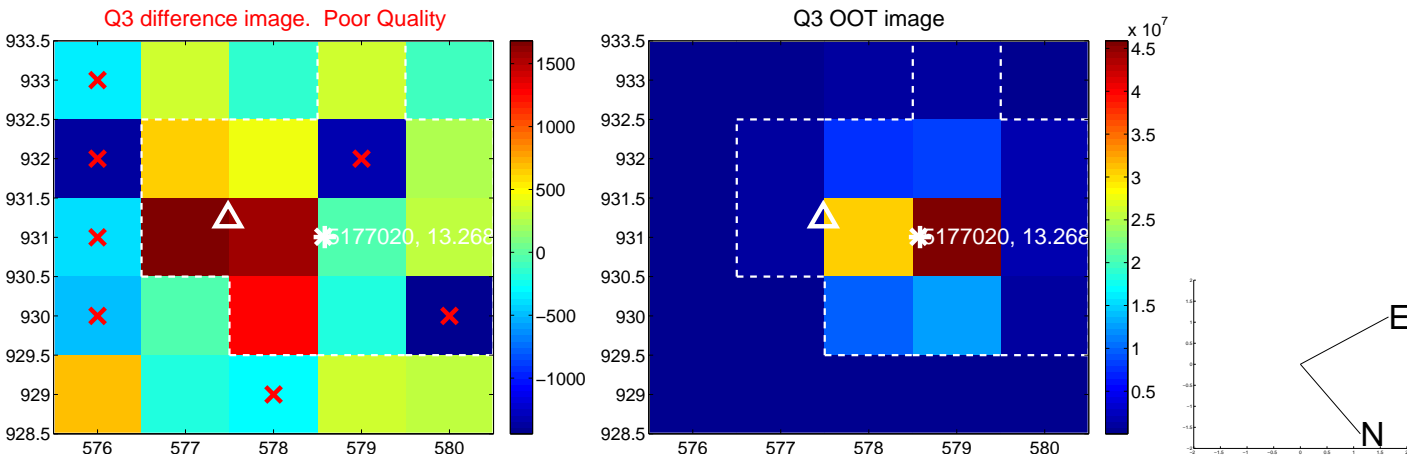
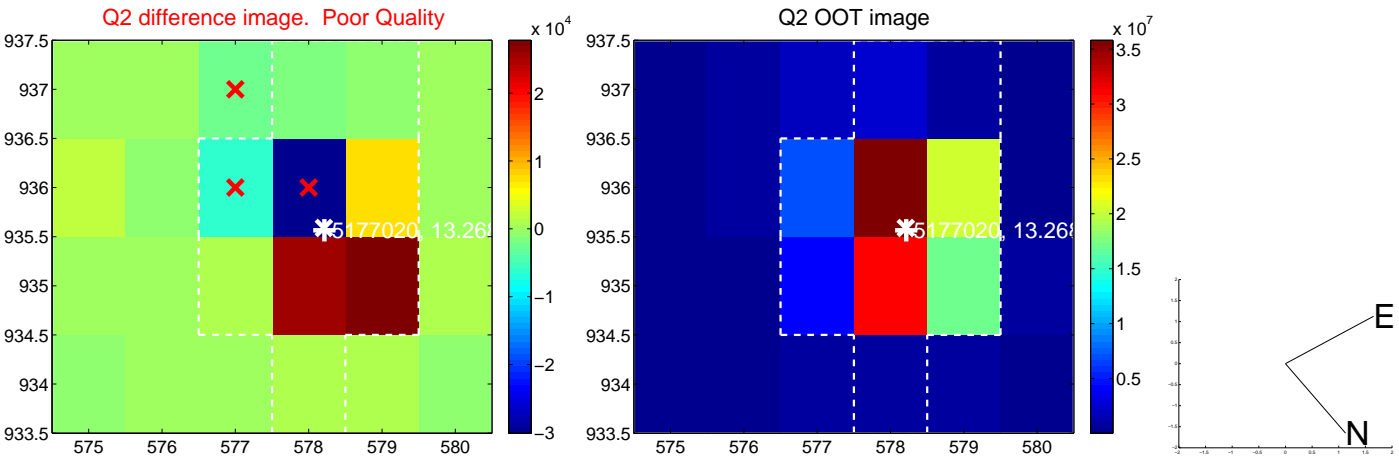
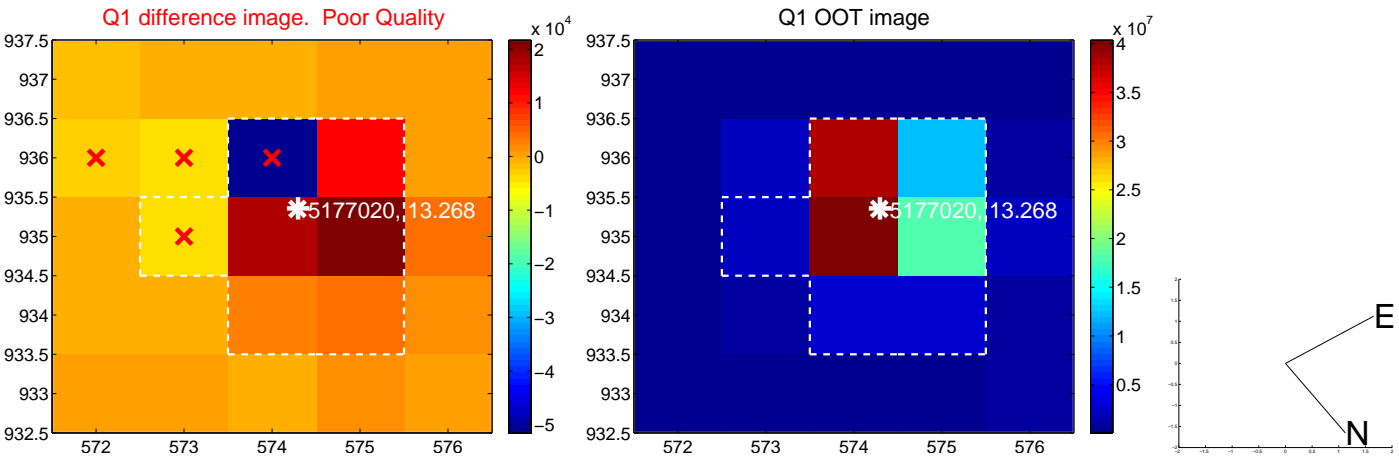
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.263 ± 0.536	2.36	-0.838 ± 0.700	0.945 ± 0.579
PRF-fit source offset from KIC position	1.257 ± 0.483	2.60	-0.819 ± 0.584	0.953 ± 0.587
photometric centroid source offset	1.36 ± 0.77	1.77	-1.22 ± 0.77	0.61 ± 0.77

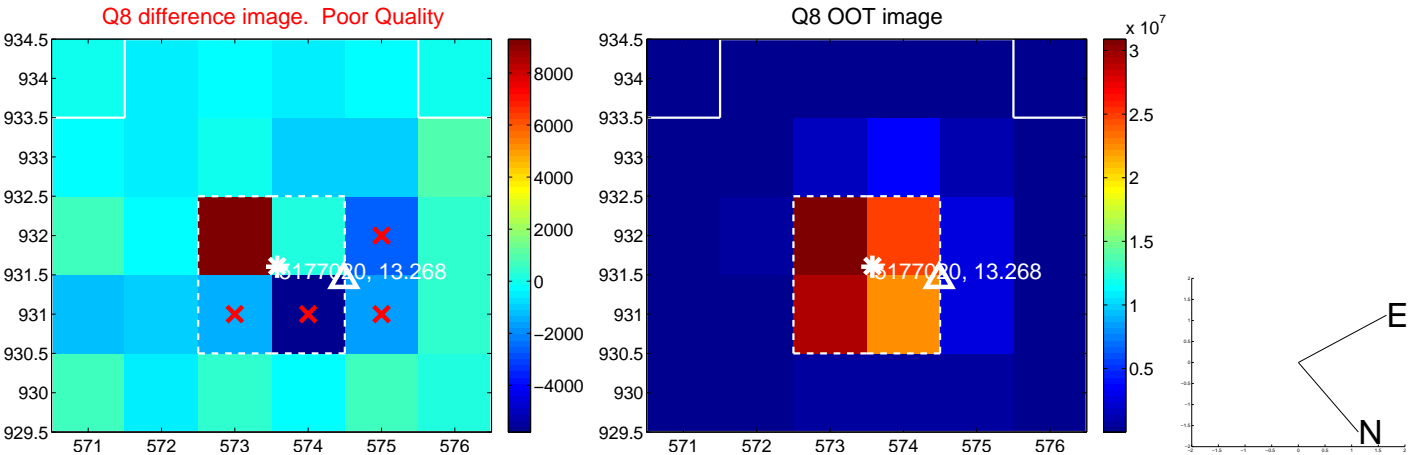
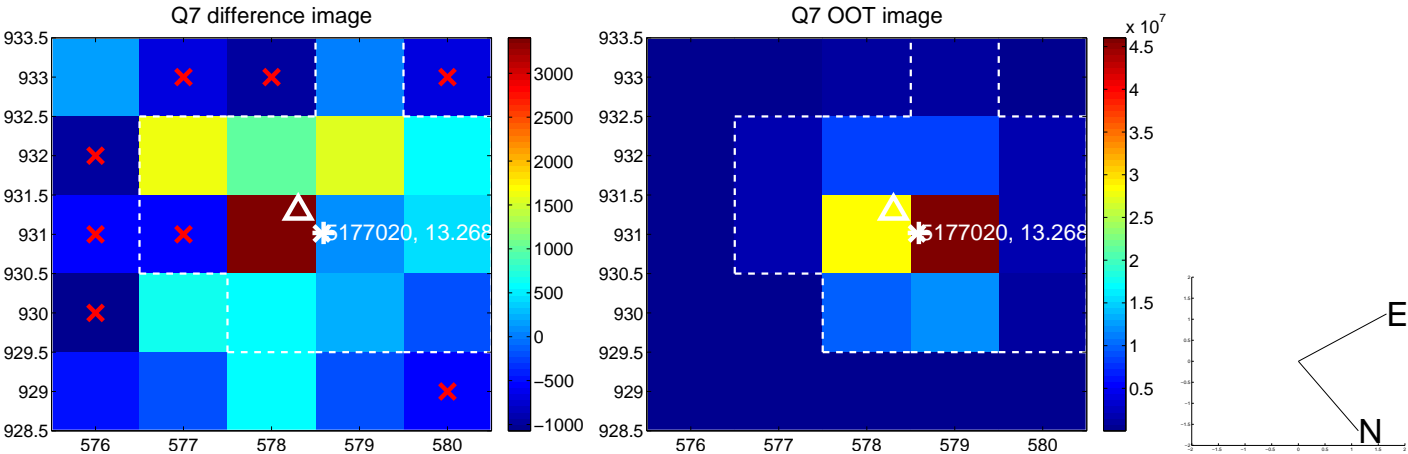
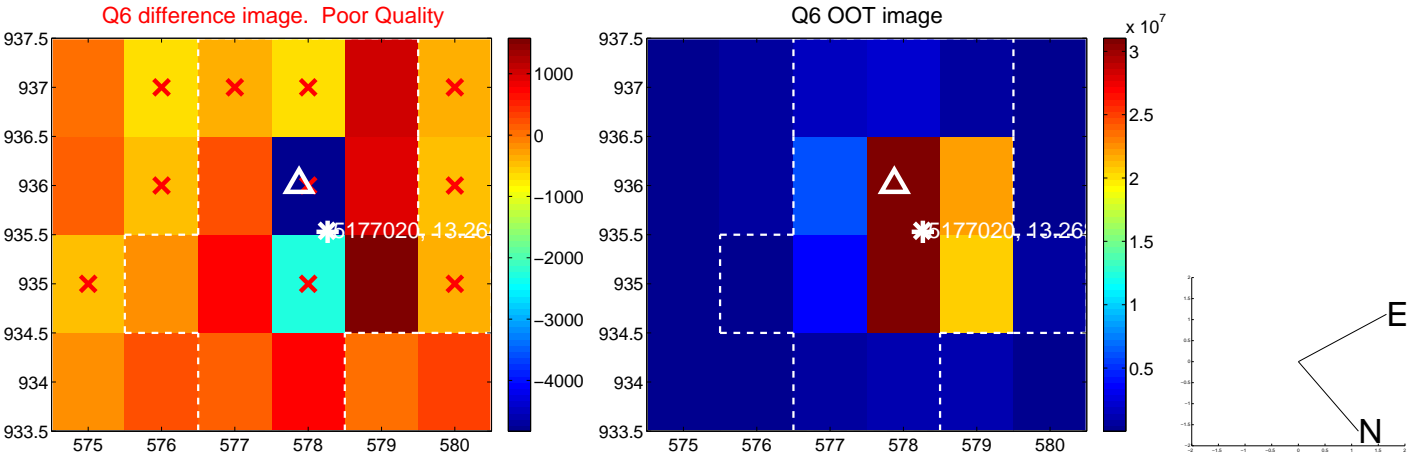
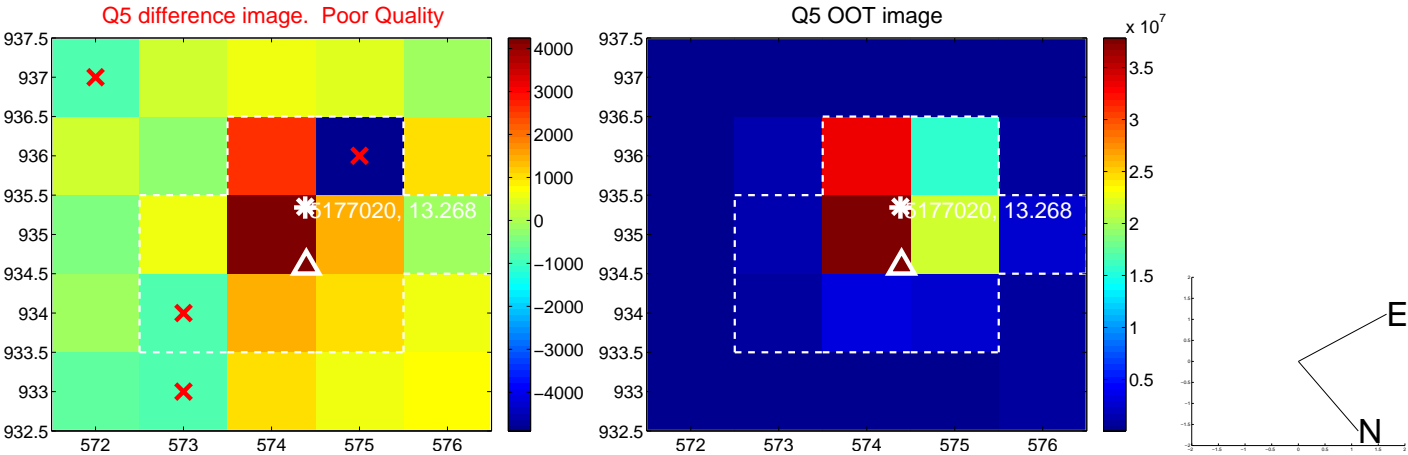


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

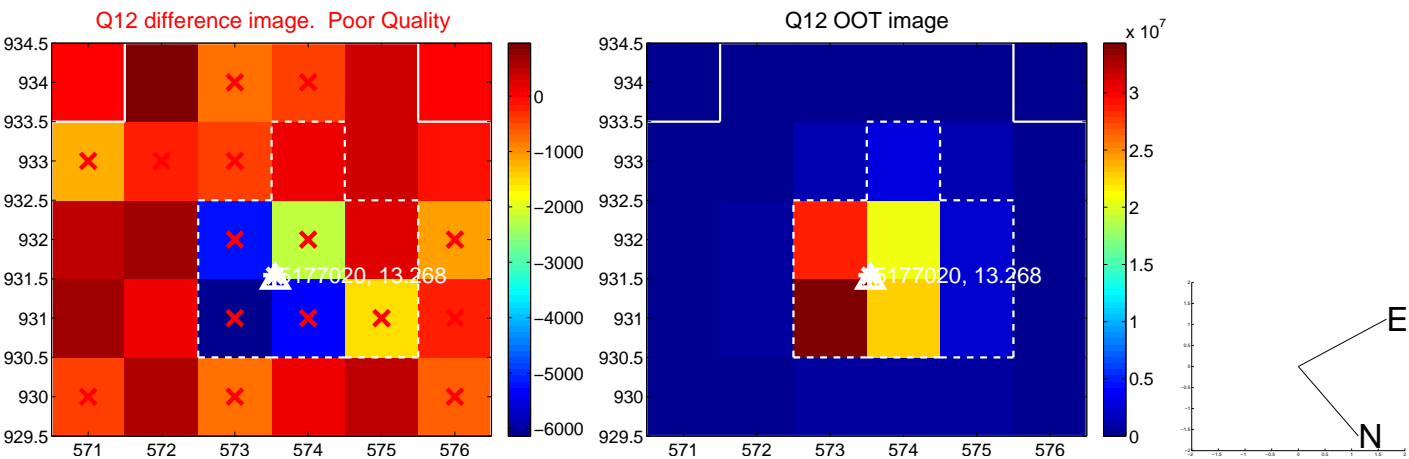
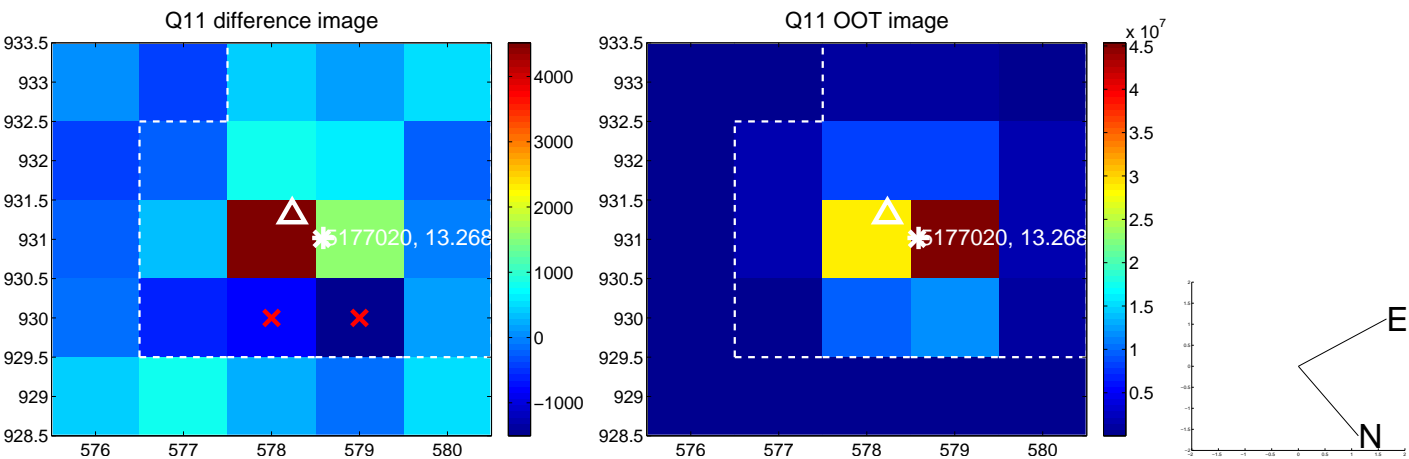
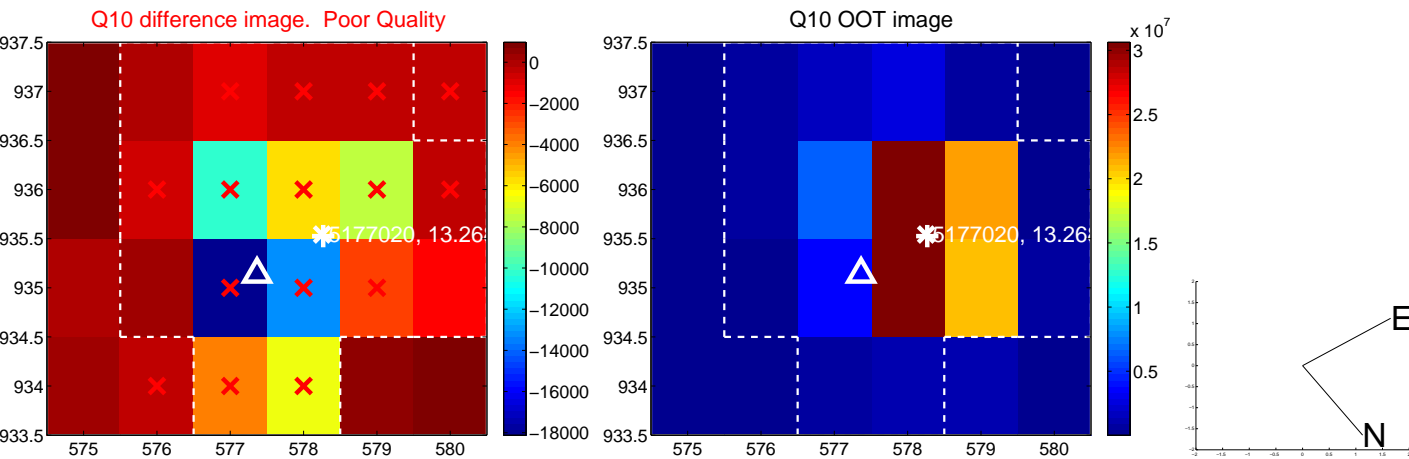
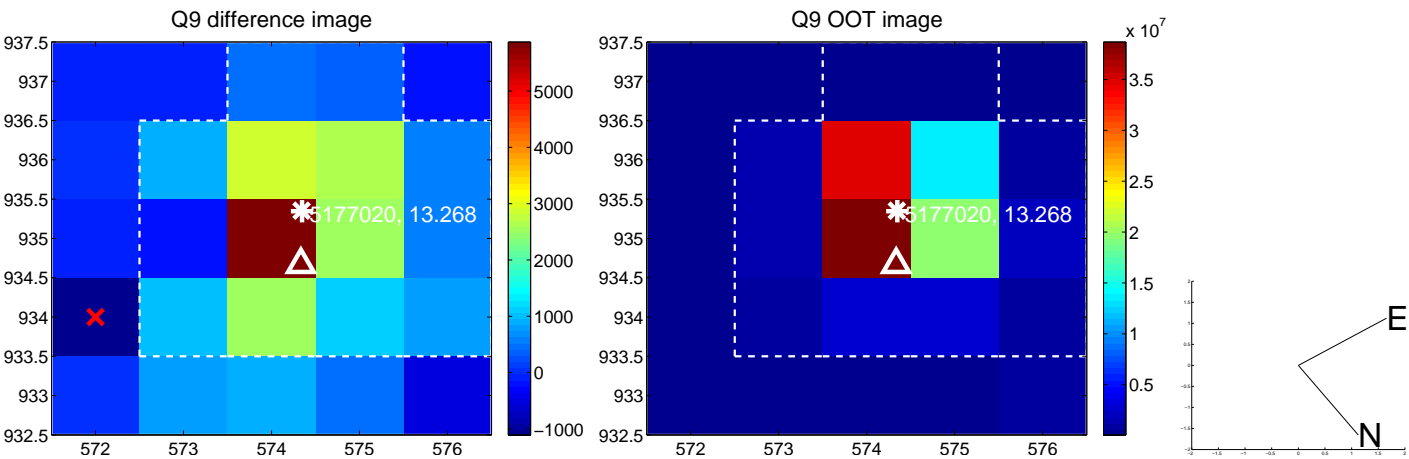
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



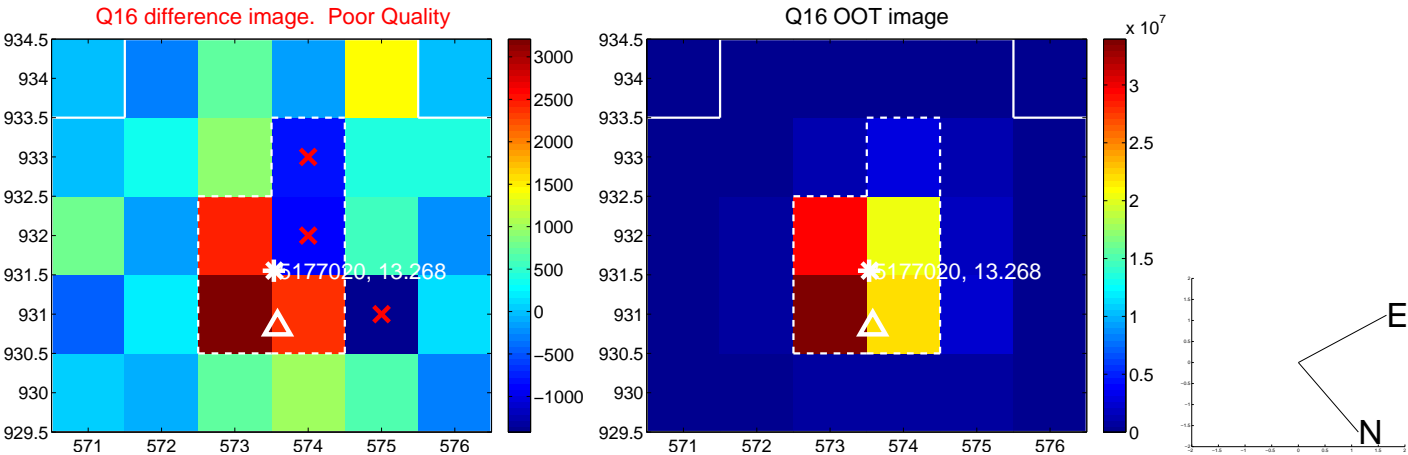
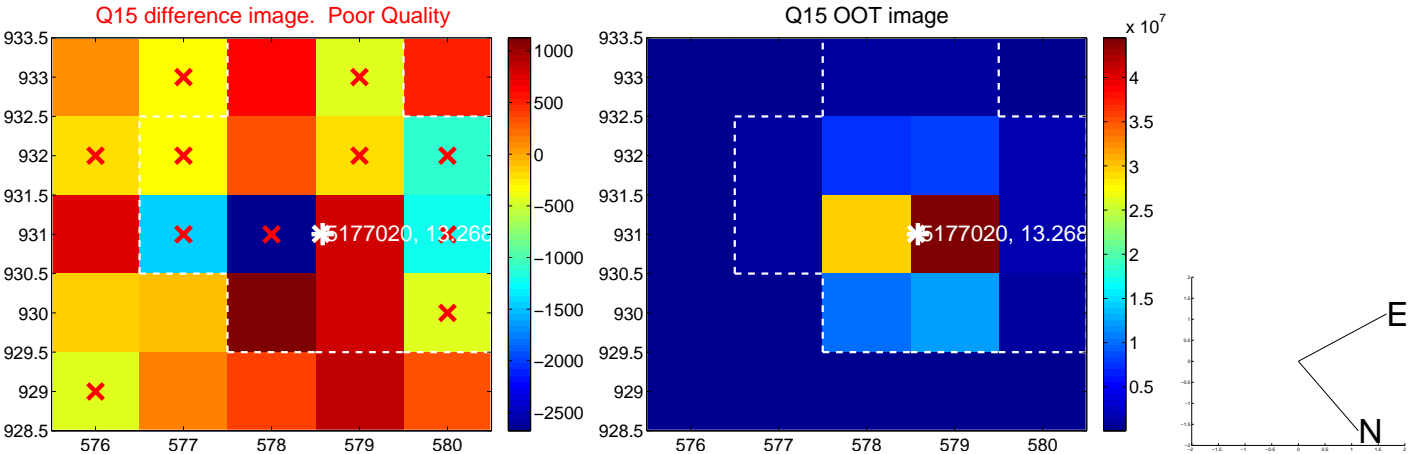
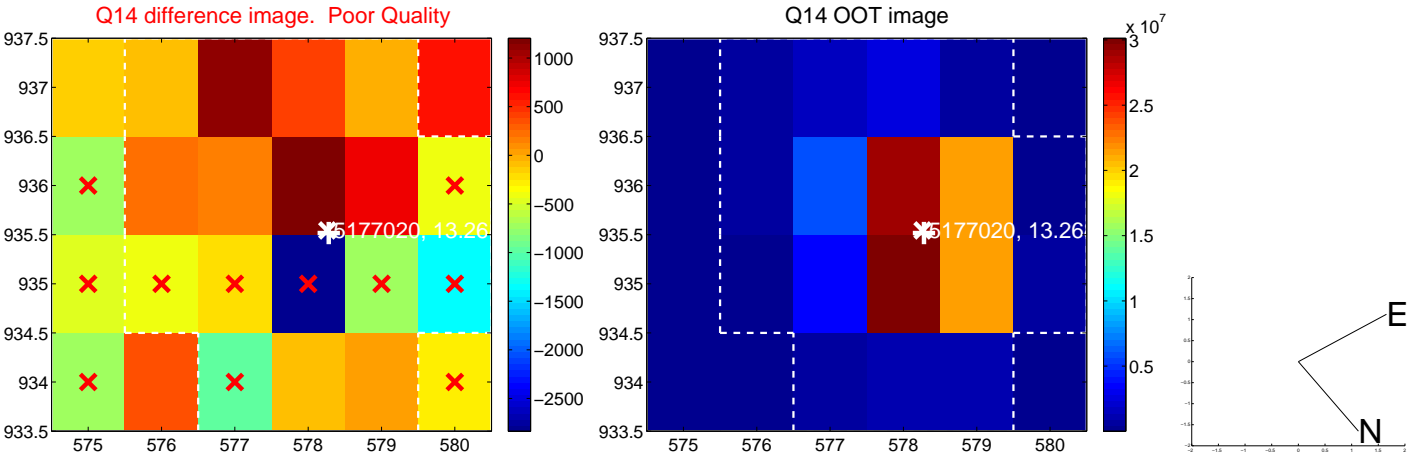
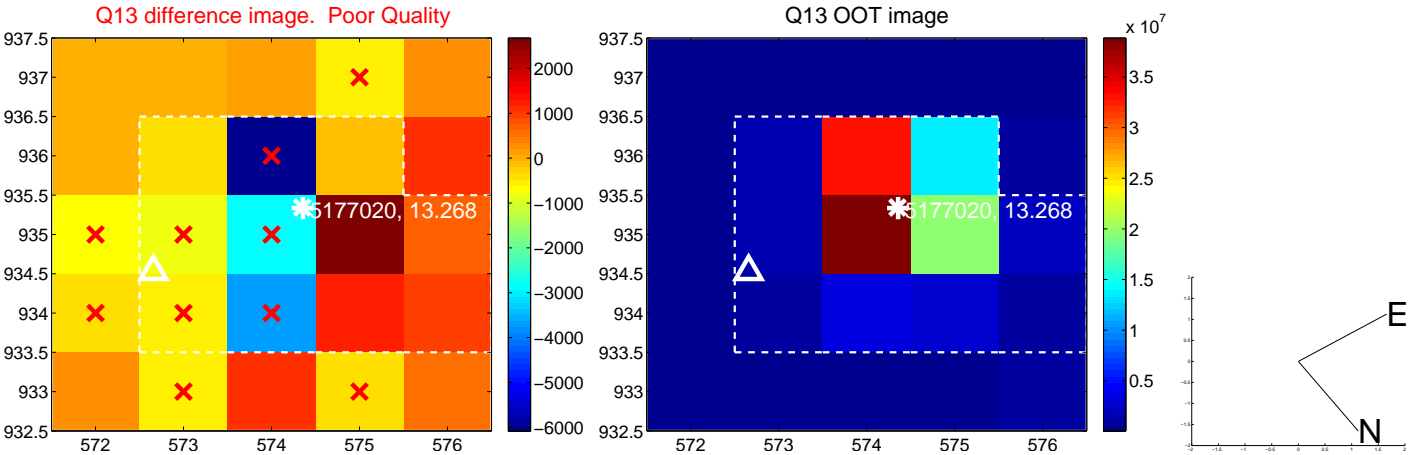
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



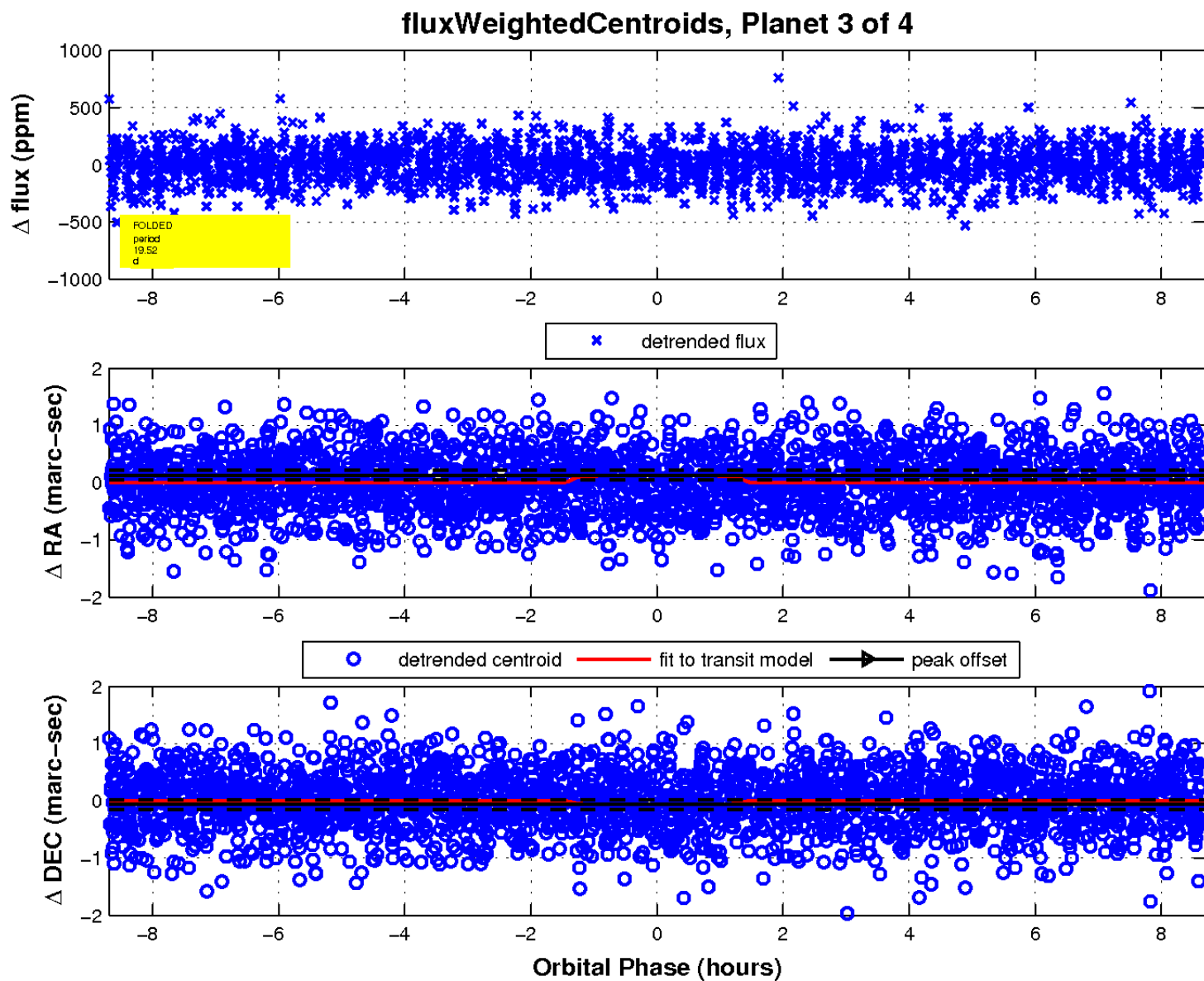
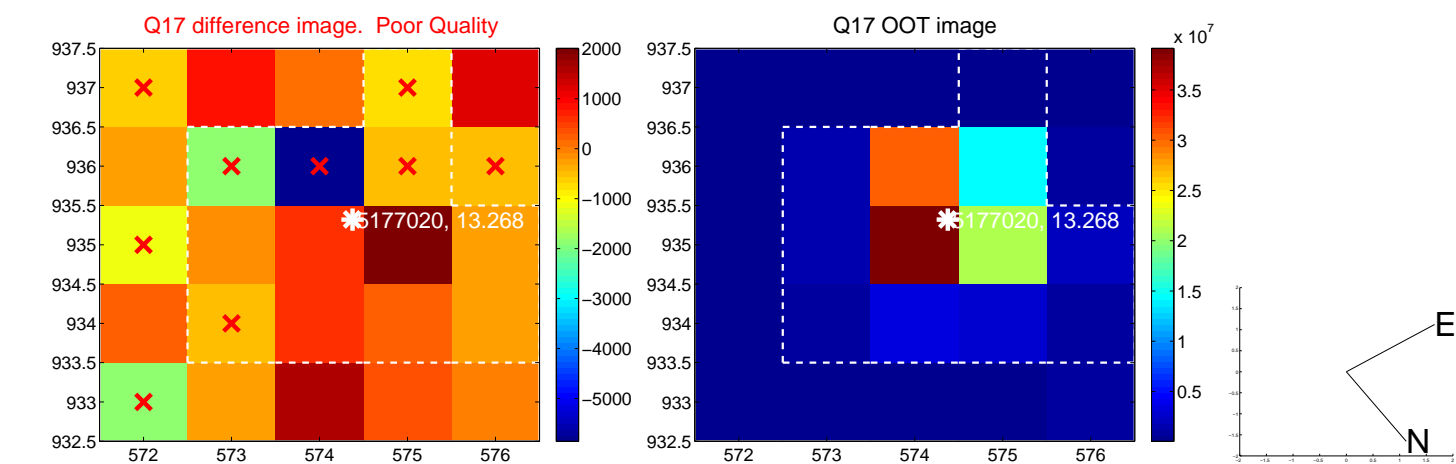
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

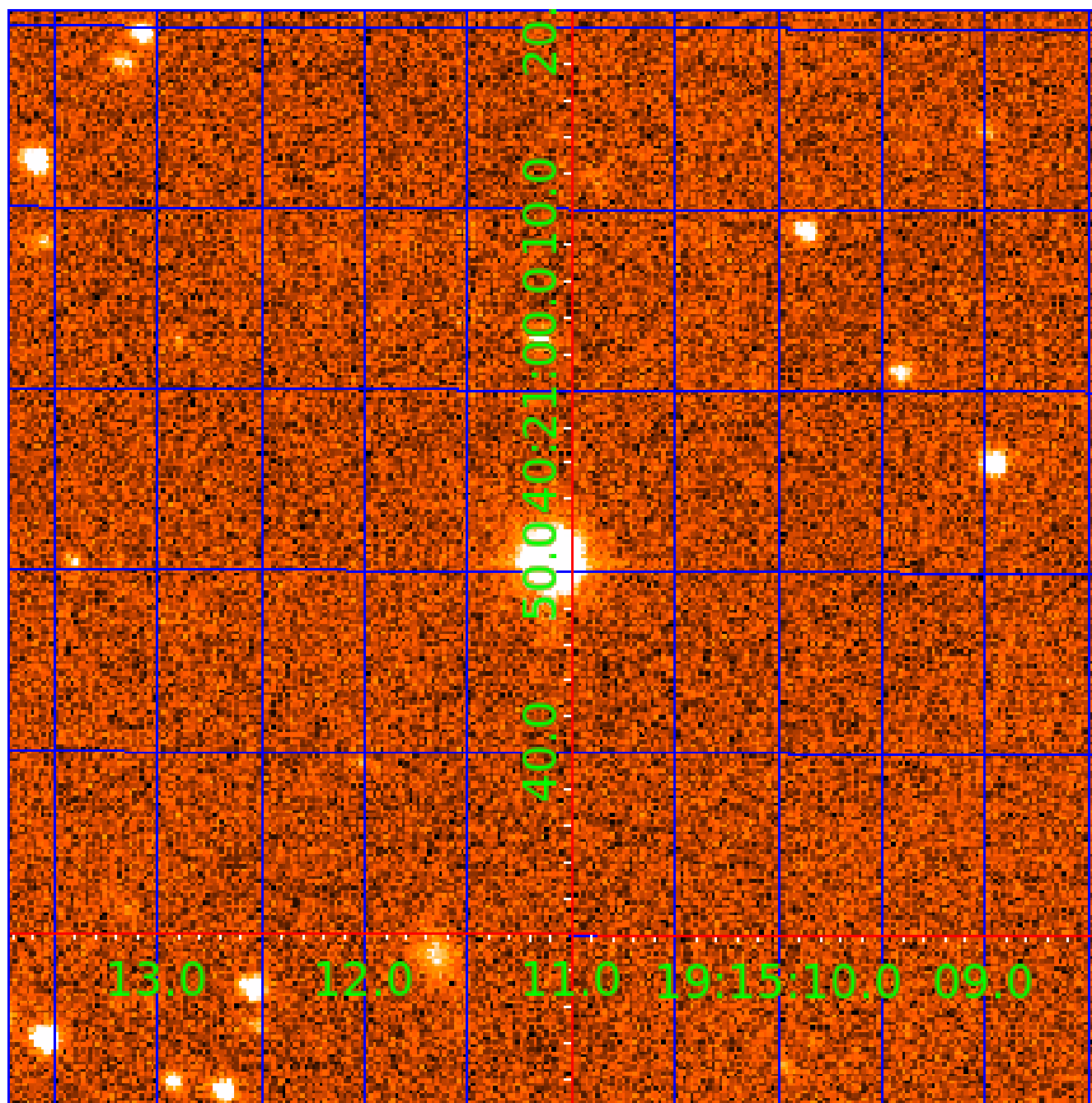


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005177020

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})
005177020-01	OBS	No	499.756213	460.956163	317.4	25.537	8.8	13.3	3.06	7694	5.73	12.77
005177020-02	OBS	No	0.546612	131.560763	12.1	3.417	8.2	7.3	3.06	7694	1.24	113347.55
005177020-03	OBS	No	19.524878	143.793617	111.6	2.902	8.8	8.5	3.06	7694	3.79	963.53
005177020-04	OBS	No	98.595804	145.047428	242.6	2.930	8.1	9.3	3.06	7694	5.43	111.22

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177020-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005177020-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
005177020-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005177020-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

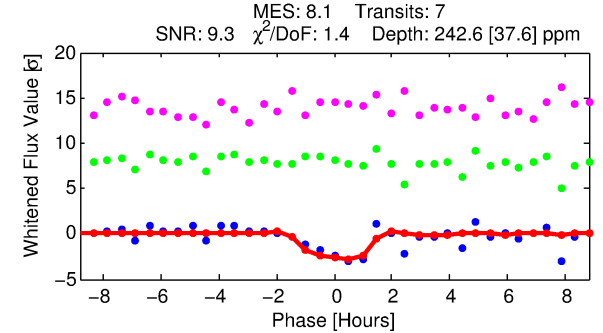
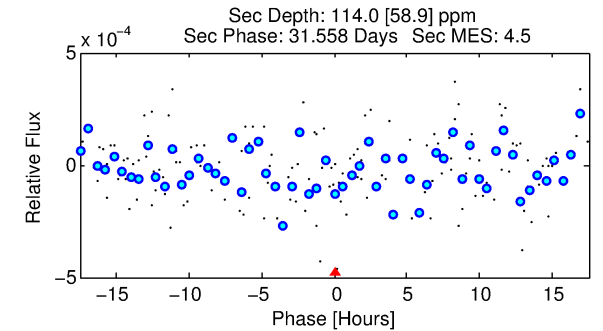
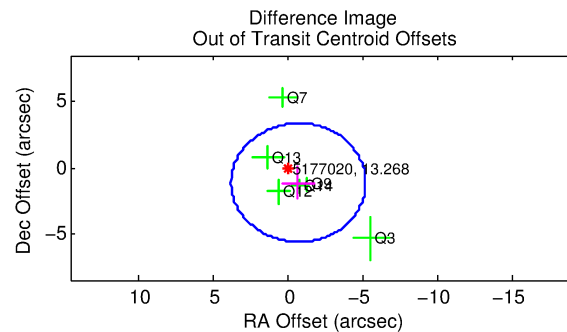
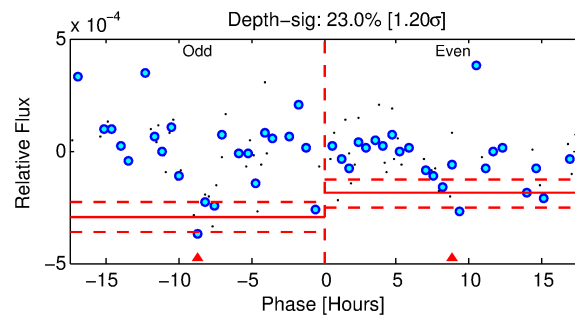
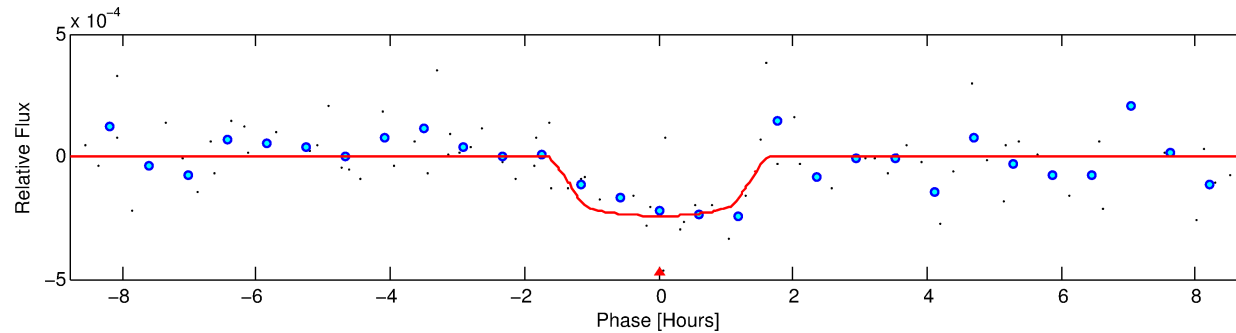
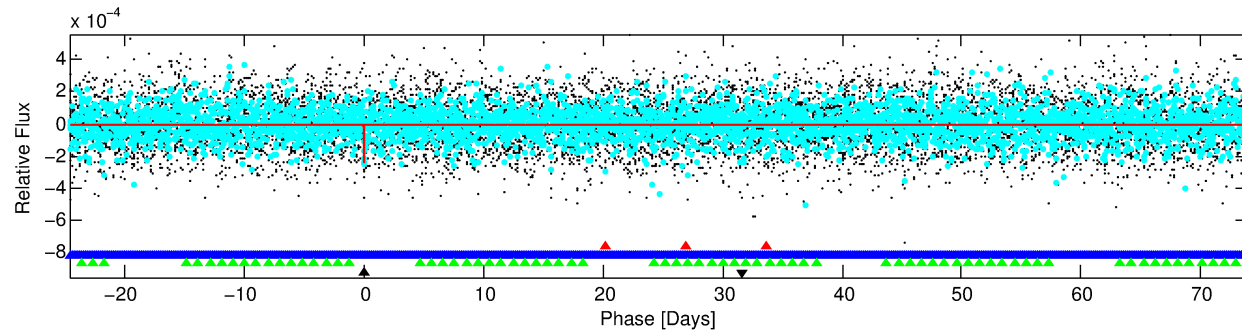
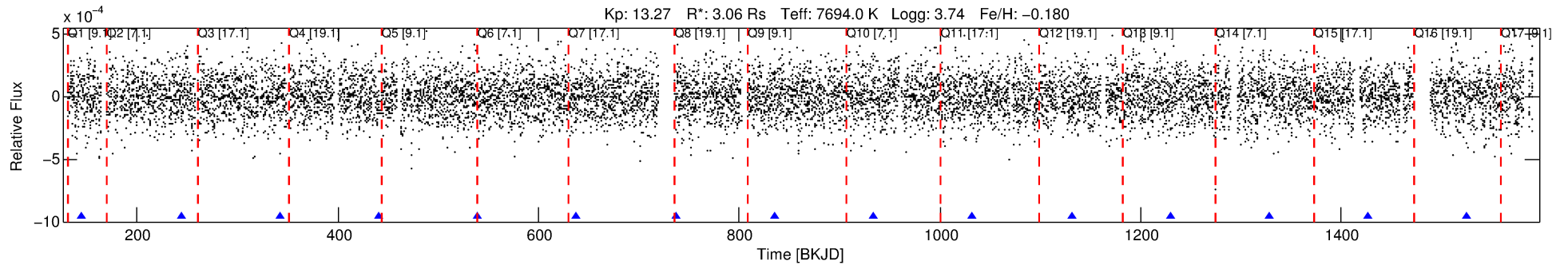
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005177020-04

No Significant Match Found

DV One-Page Summary

KIC: 5177020 Candidate: 4 of 4 Period: 98.596 d



DV Fit Results:

Period = 98.59580 [0.00137] d
Epoch = 145.0474 [0.0106] BKJD
Rp/R* = 0.0163 [0.0124]
a/R* = 139.16 [585.56]
b = 0.86 [1.30]
Seff = 111.22 [84.49]
Teq = 828 [157] K
Rp = 5.43 [4.82] Re
a = 0.5141 [0.2336] AU
Ag = 562.30 [997.07] [0.56 σ]
Teffp = 6235 [2523] K [2.14 σ]

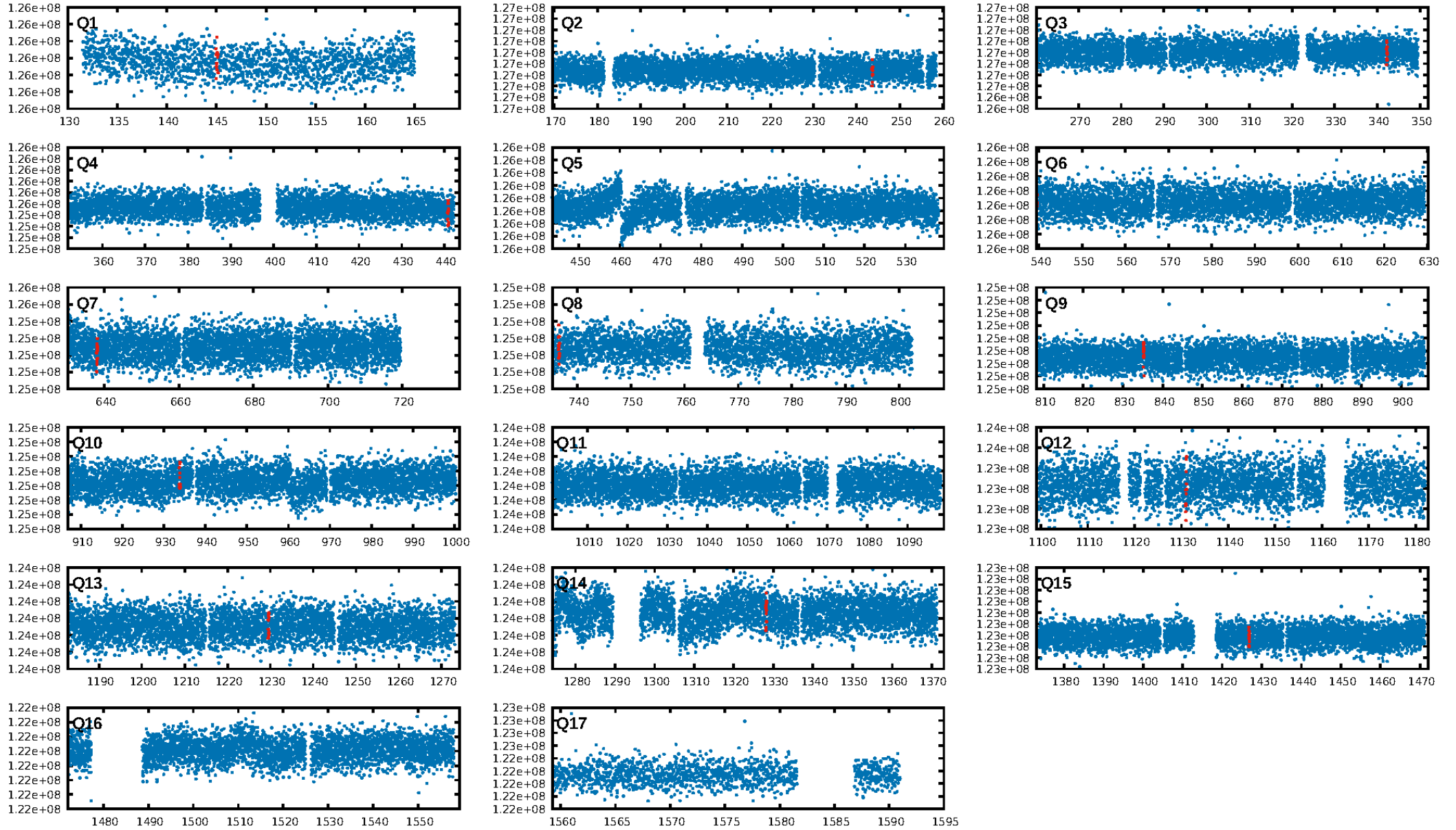
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [460.21 σ]
LongPeriod-sig: 100.0% [374.56 σ]
ModelChiSquare2-sig: 54.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.02e-08
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 5.33
Centroid-sig: 92.2%
Centroid-so: 0.190 arcsec [0.24 σ]
OotOffset-rm: 1.360 arcsec [0.91 σ]
OotOffset-st: 1/2/1/2 [6]
KicOffset-rm: 1.291 arcsec [0.96 σ]
KicOffset-st: 1/2/1/2 [6]
DiffImageQuality-fgm: 0.17 [1/6]
DiffImageOverlap-fno: 0.00 [0/12]

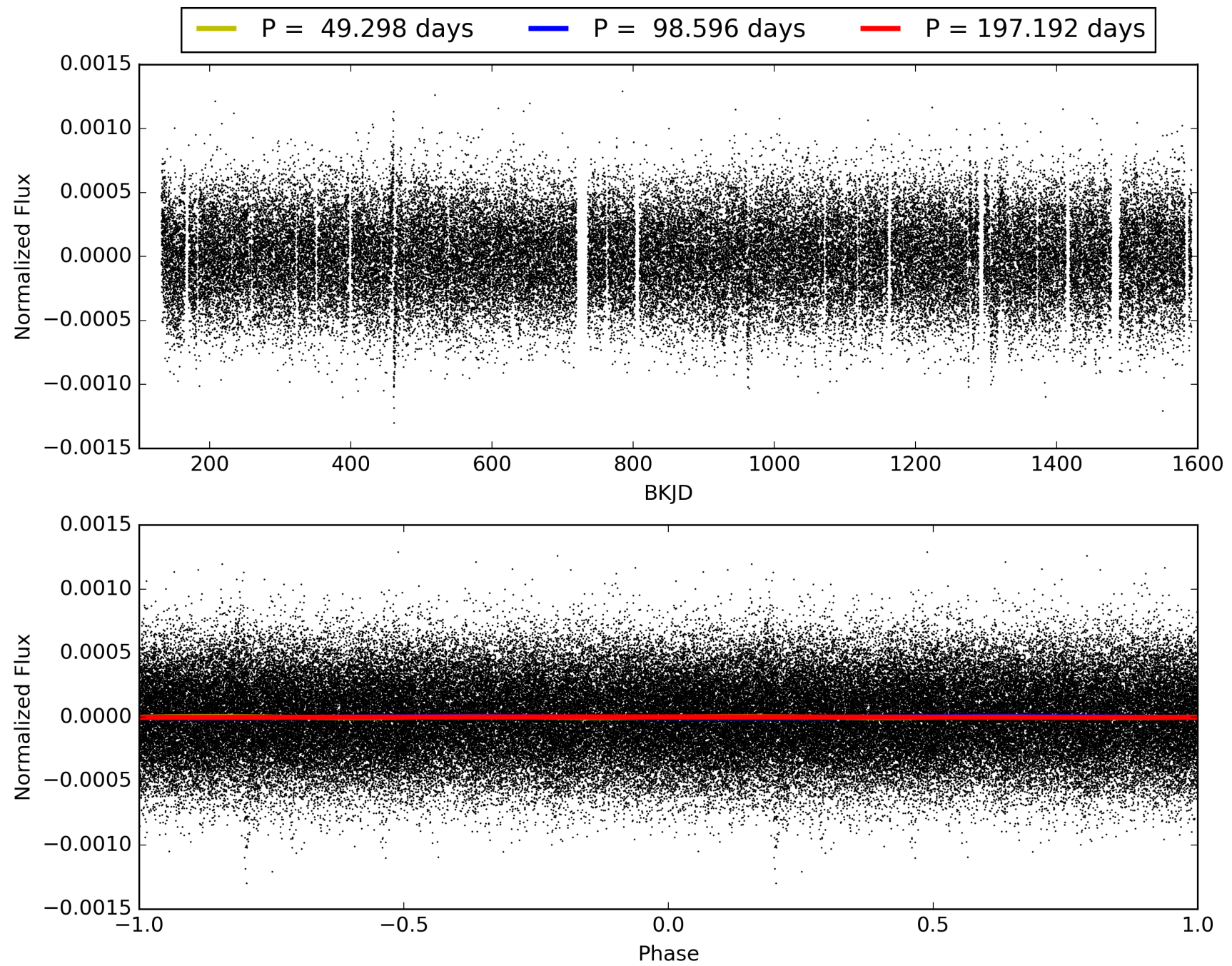
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:02:40 Z

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

TCE 005177020-04, PDC Light Curves

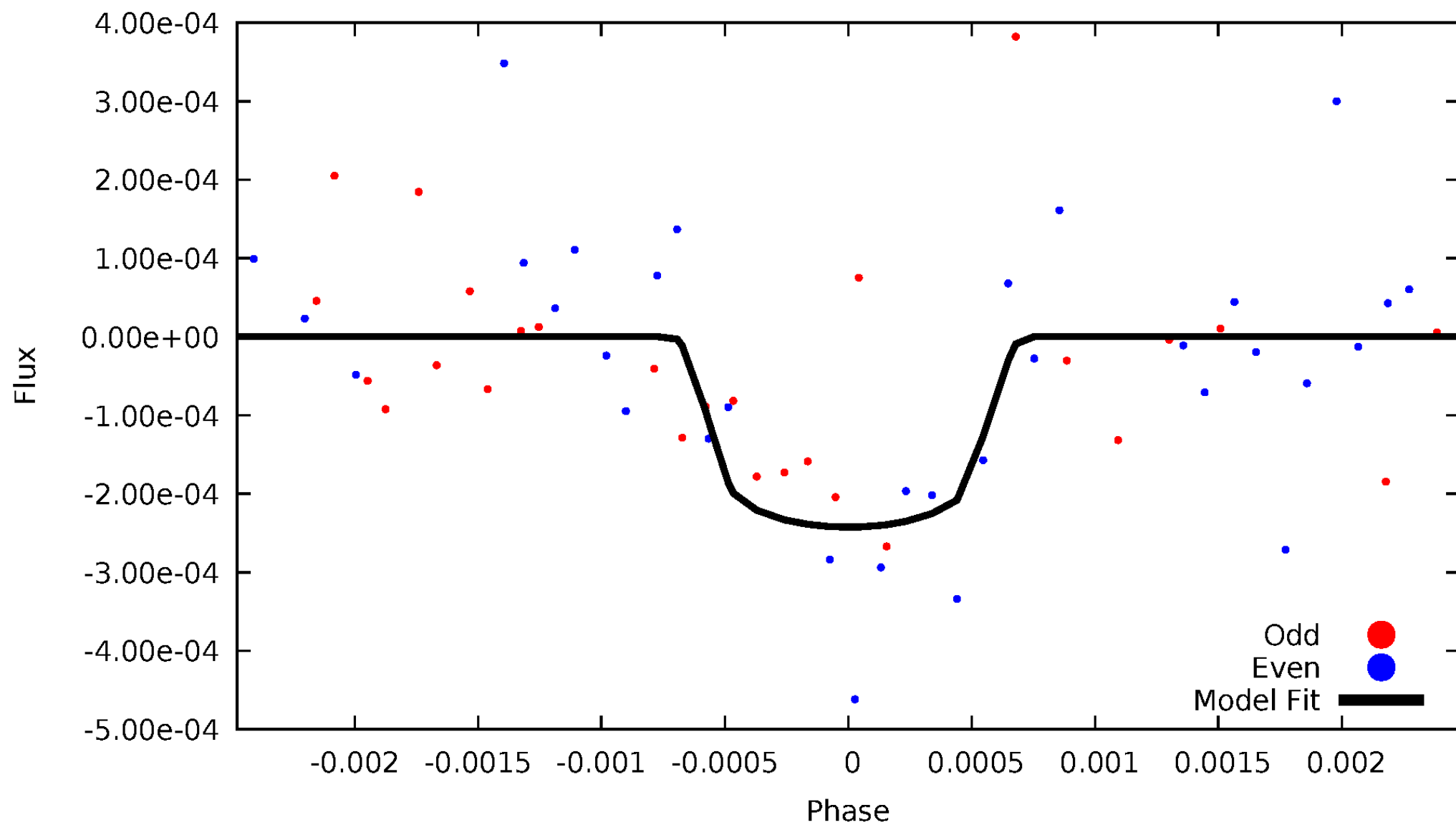


TCE 005177020-04



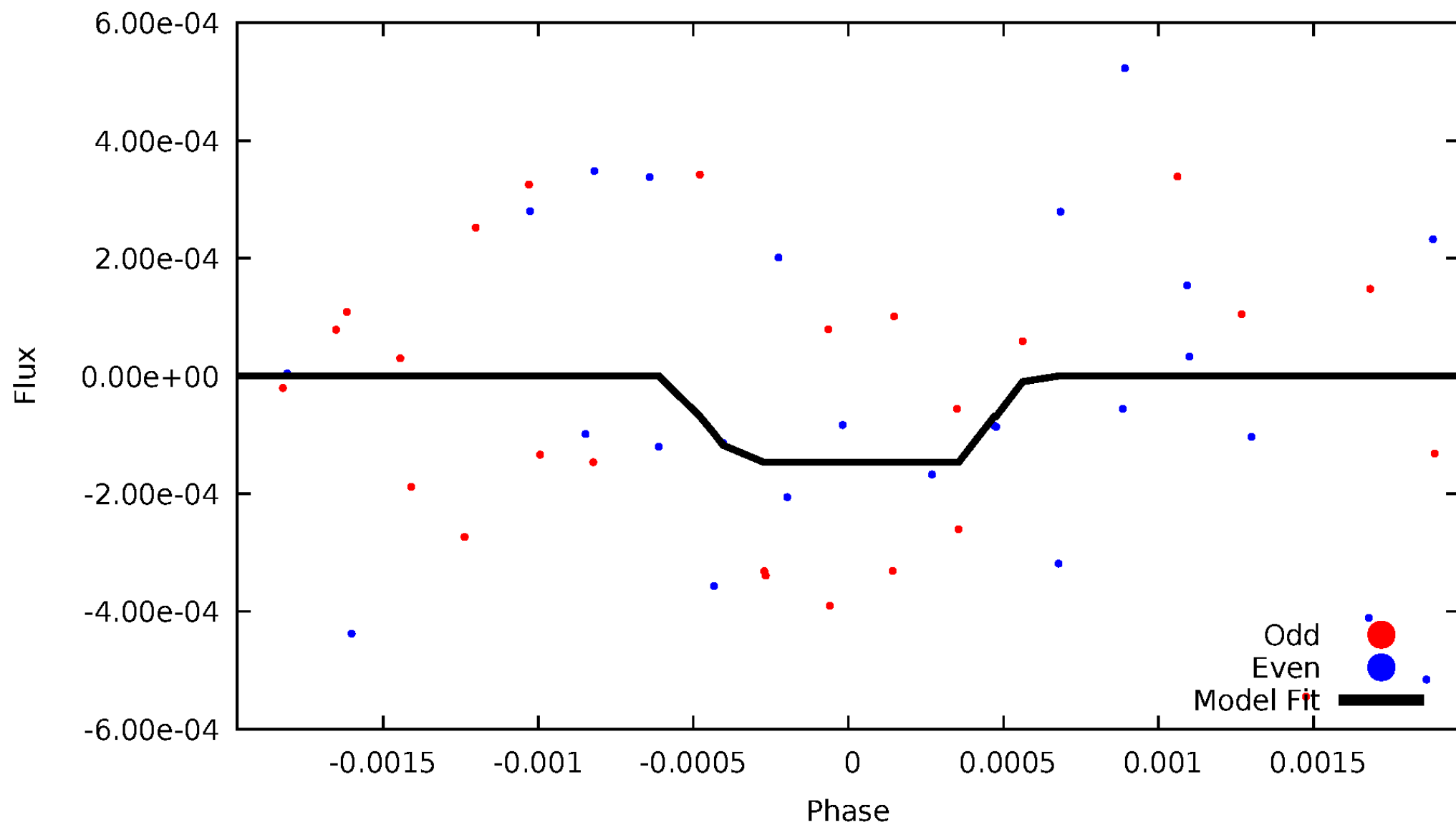
DV Odd/Even

TCE 005177020-04



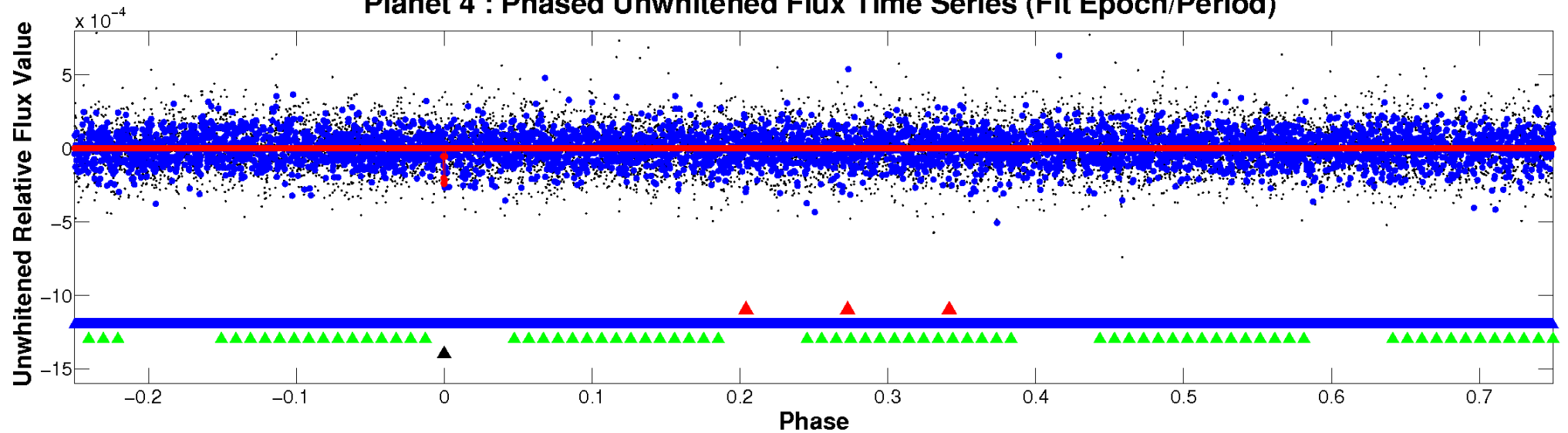
ALT Odd/Even

TCE 005177020-04

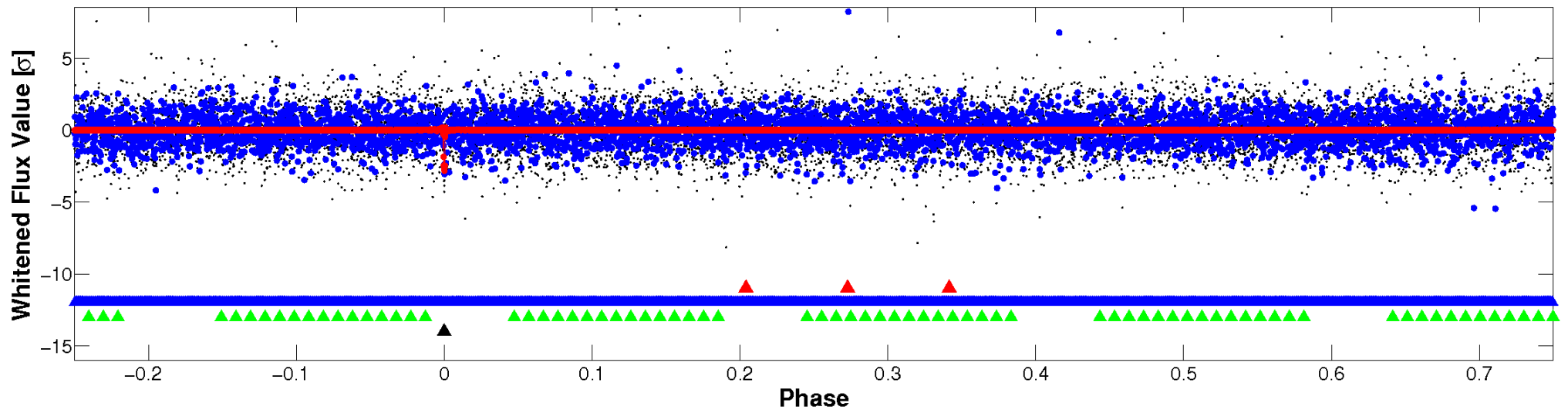


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

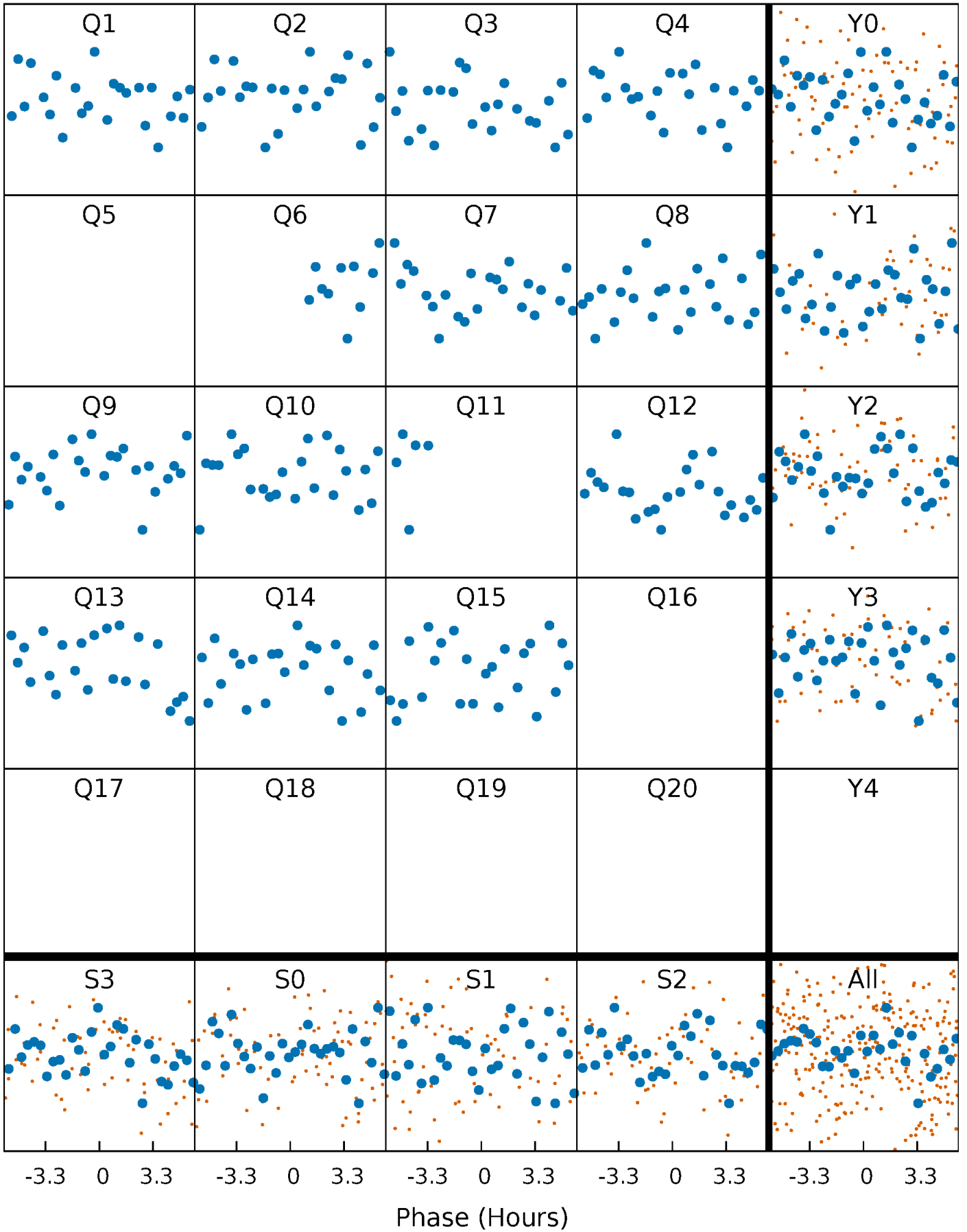


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



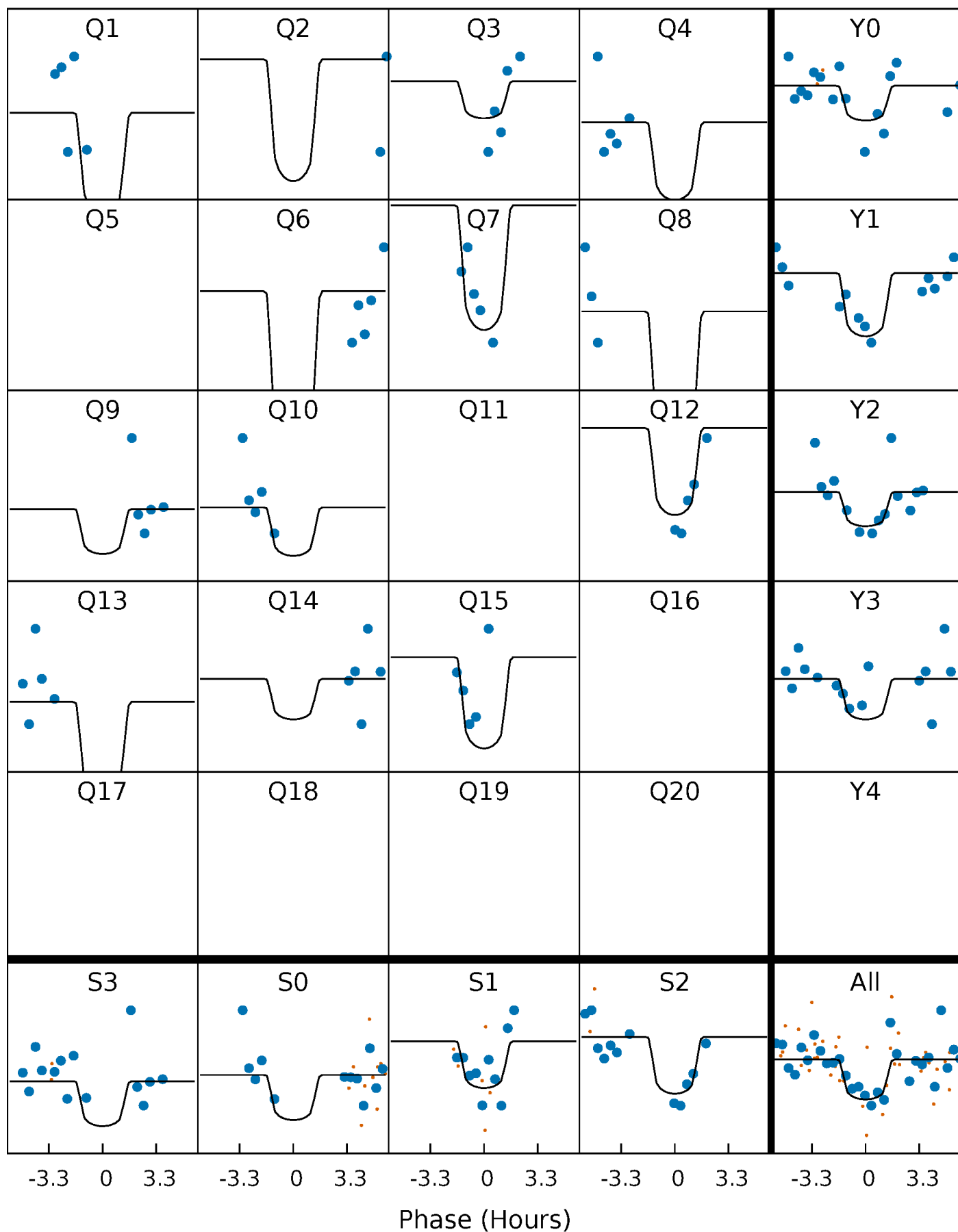
PDC Quarter-Phased Transit Curves

TCE 005177020-04 P= 98.595804 Days $T_0=145.047428$ (BKJD)



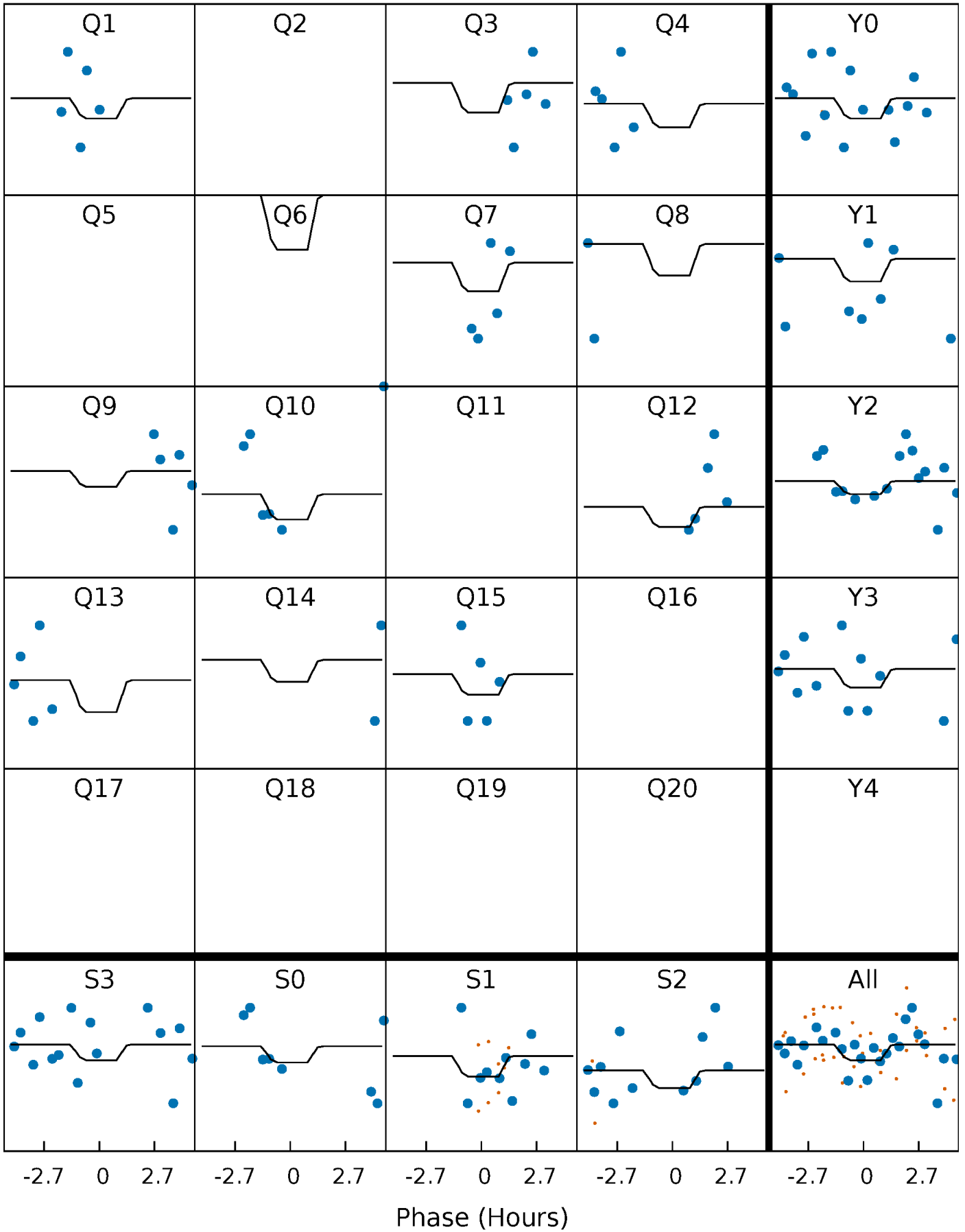
DV Quarter-Phased Transit Curves

TCE 005177020-04 P= 98.595804 Days $T_0=145.047428$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

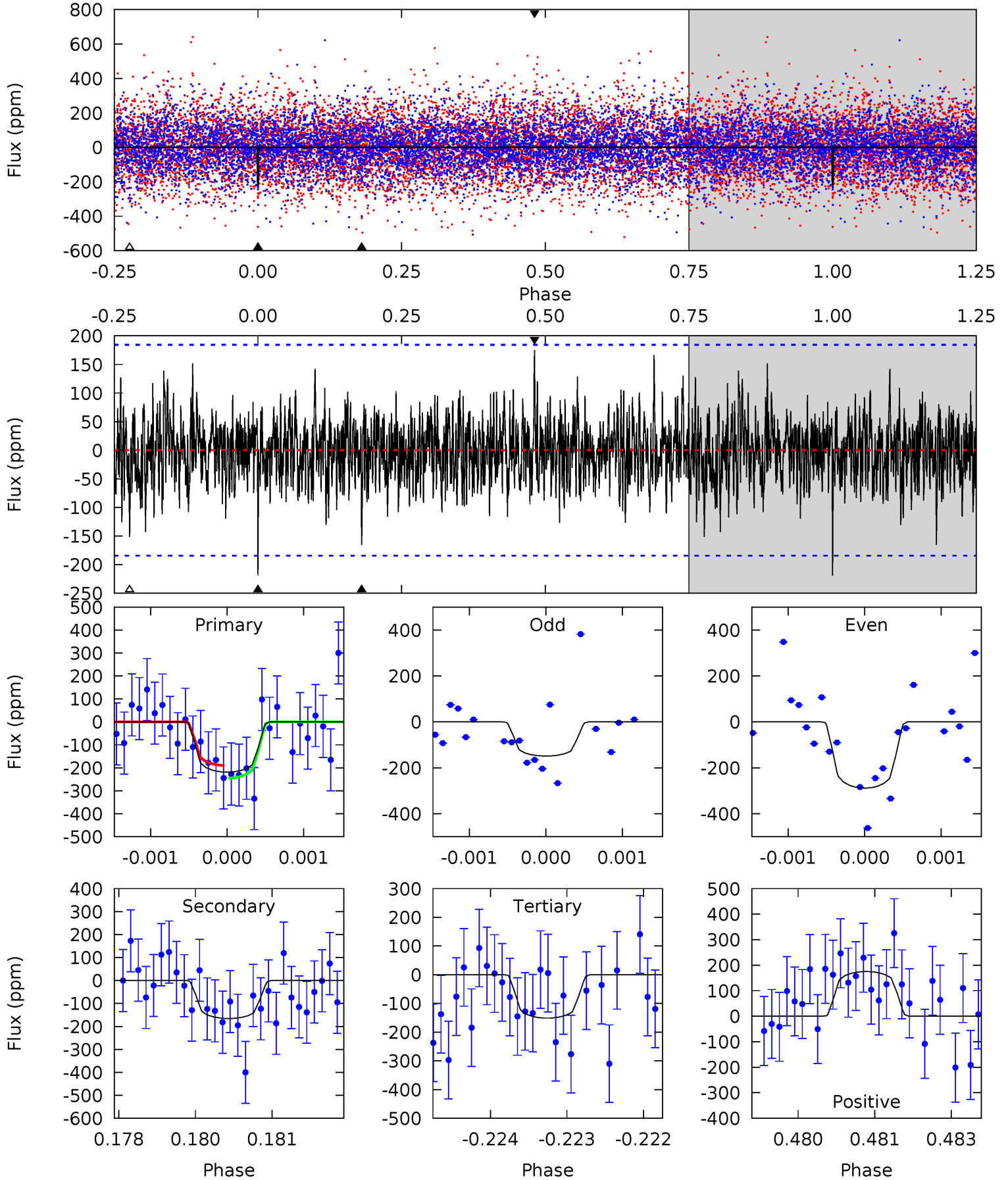
TCE 005177020-04 $P = 98.597026$ Days $T_0 = 145.001212$ (BKJD)



DV Model-Shift Uniqueness Test

005177020-04, P = 98.595804 Days, E = 46.451624 Days

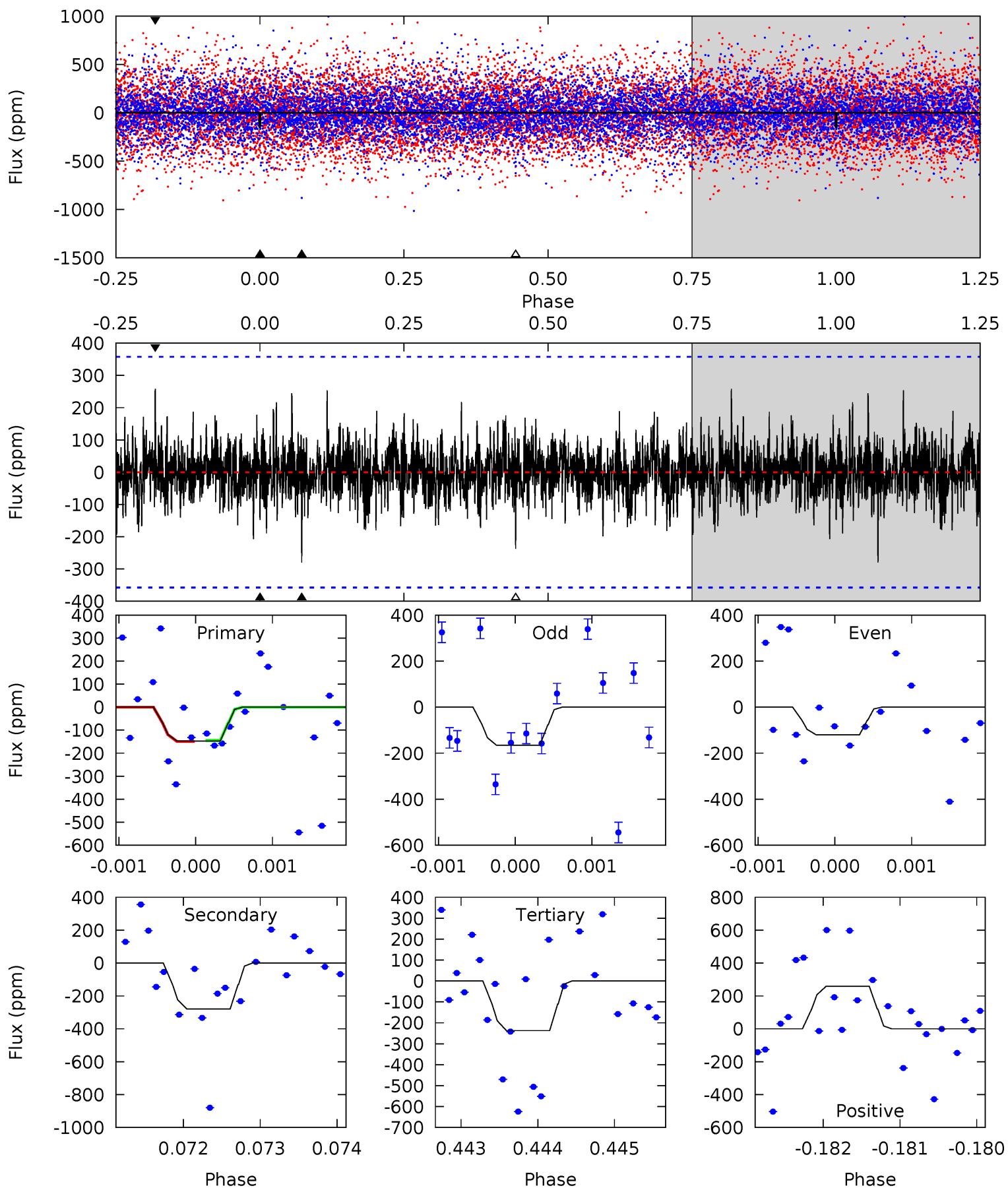
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.41	4.84	4.42	5.12	5.40	3.20	1.34	1.99	1.29	0.42	-0.28	2.03	1.03	0.44	0.81



Alt Model-Shift Uniqueness Test

005177020-04, P = 98.597026 Days, E = 46.404186 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.24	4.25	3.60	3.92	5.43	3.26	0.95	-1.36	-1.68	0.65	0.33	0.34	0.86	0.48	0.03



Stellar Parameters For KIC 005177020

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7694^{+237}_{-316}	$3.737^{+0.441}_{-0.074}$	$-0.180^{+0.200}_{-0.300}$	$3.060^{+0.348}_{-1.391}$	$1.863^{+0.111}_{-0.444}$	$0.092^{+0.357}_{-0.023}$
	+3%/-4%	+12%/-2%	+111%/-167%	+11%/-45%	+6%/-24%	+389%/-25%
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 005177020-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-165 ± 34	$5.22^{+3.56}_{-3.25}$	1123^{+73}_{-132}	6485^{+5193}_{-1441}	883^{+4906}_{-600}
Alt.	-280 ± 66	$4.28^{+3.70}_{-2.86}$	1117^{+77}_{-138}	8209^{+12666}_{-2307}	2145^{+17326}_{-1576}

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 $A_{obs} \gg 1.0$

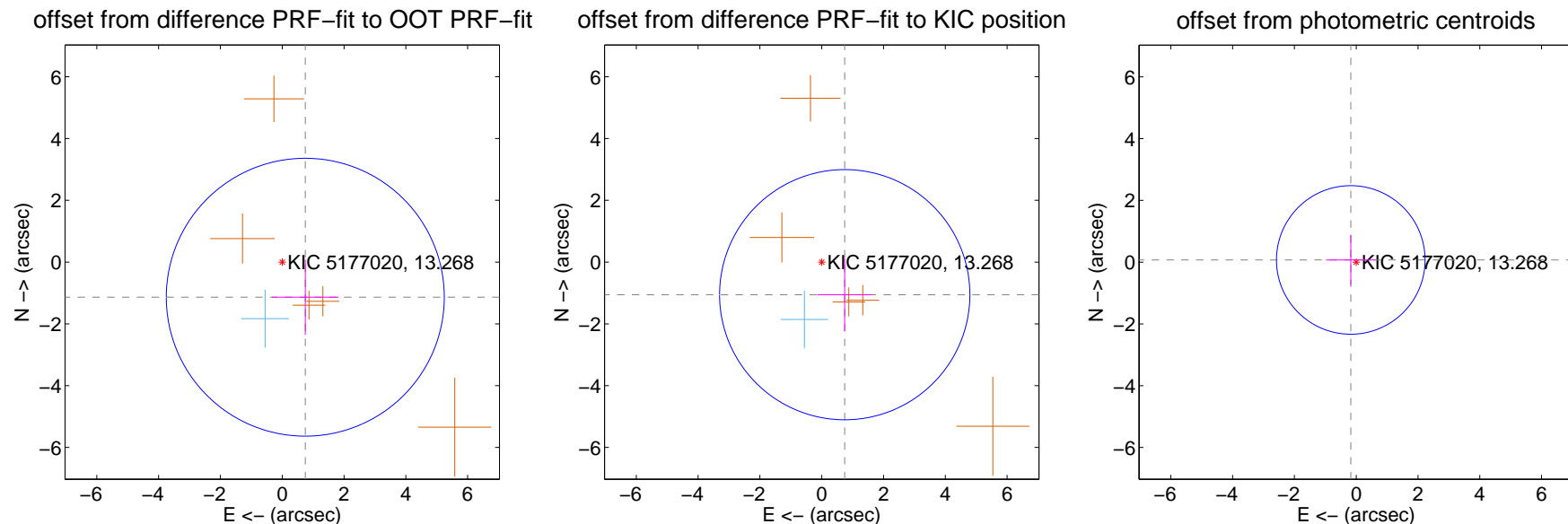
DV Centroid Data

Supplemental centroid analysis for 005177020-04. Kepler magnitude: 13.27. Transit SNR 9.32

There are 1 quarters with good PRF difference image offsets

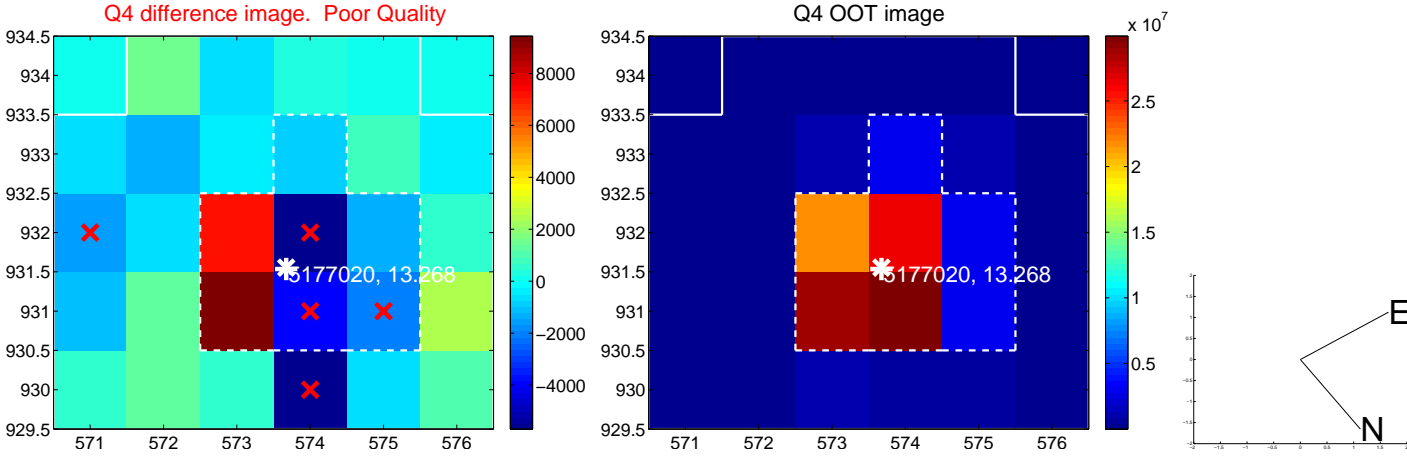
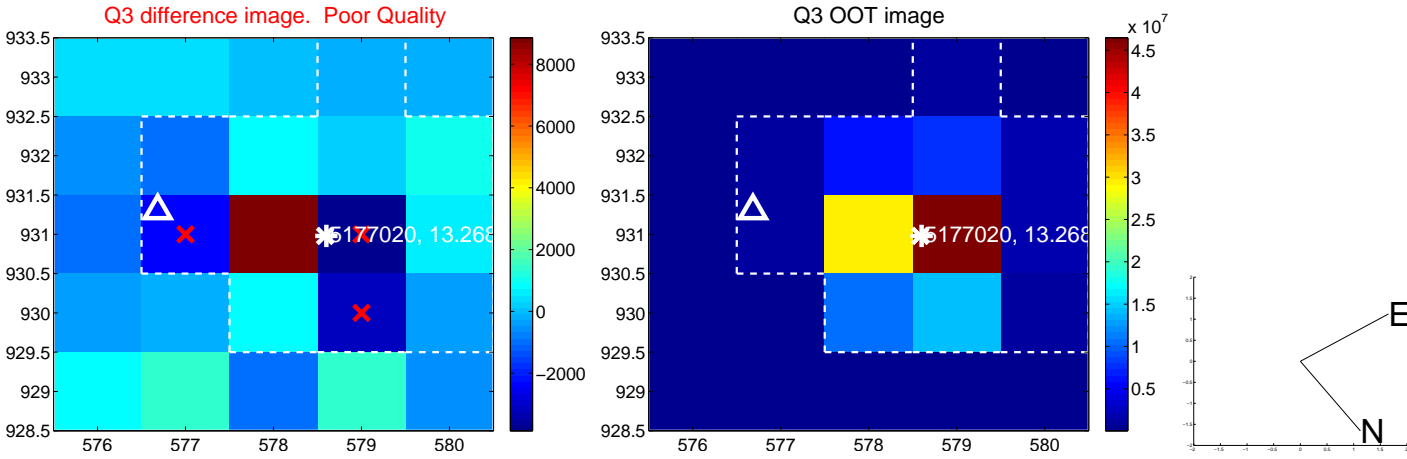
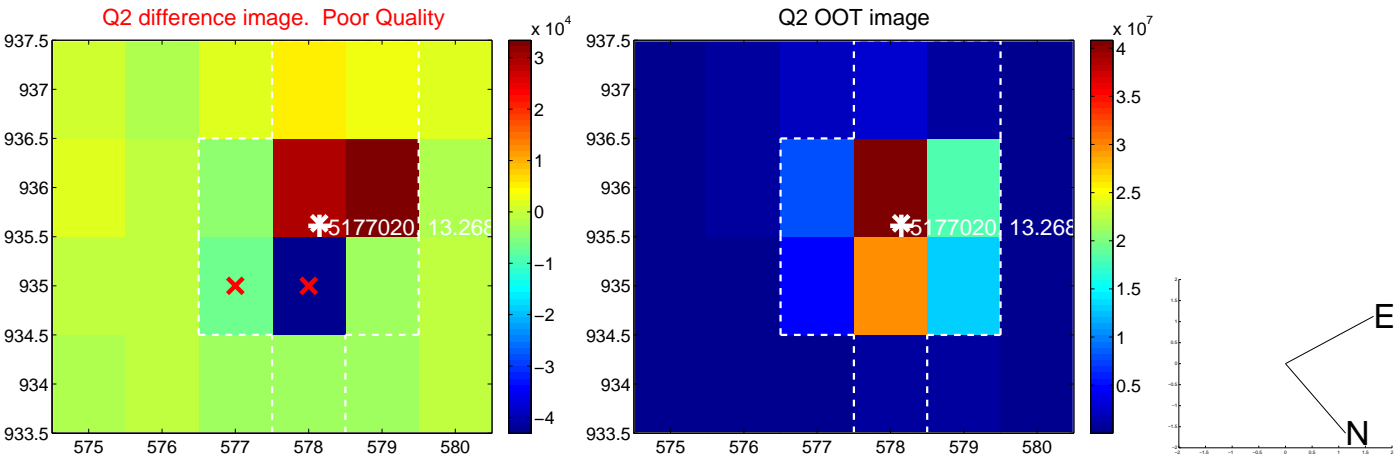
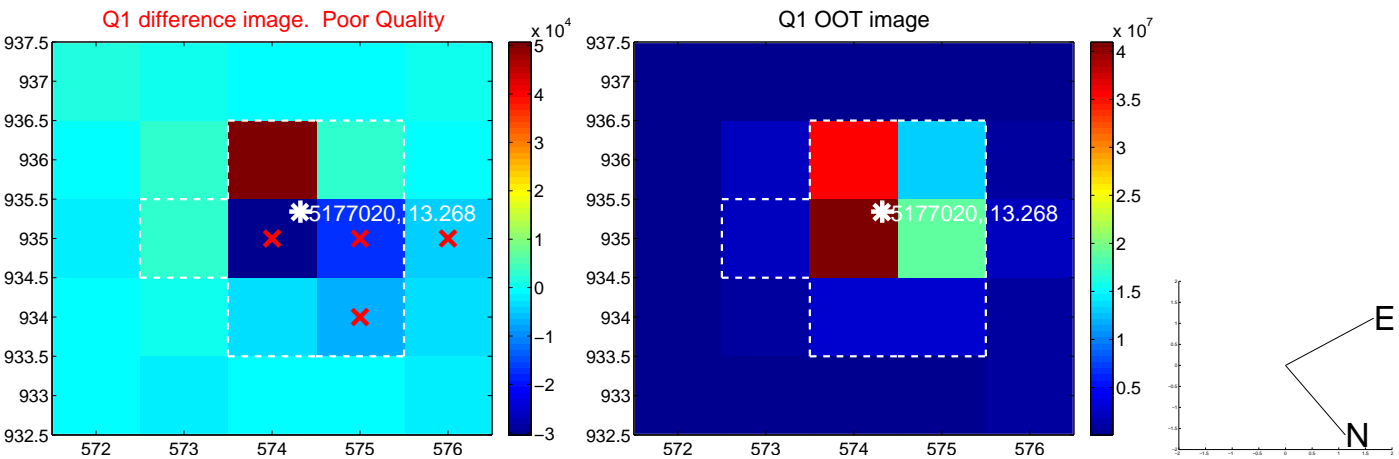
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.360 ± 1.499	0.91	-0.746 ± 1.077	-1.137 ± 1.219
PRF-fit source offset from KIC position	1.291 ± 1.350	0.96	-0.744 ± 0.881	-1.055 ± 1.184
photometric centroid source offset	0.19 ± 0.80	0.24	0.18 ± 0.80	0.07 ± 0.81

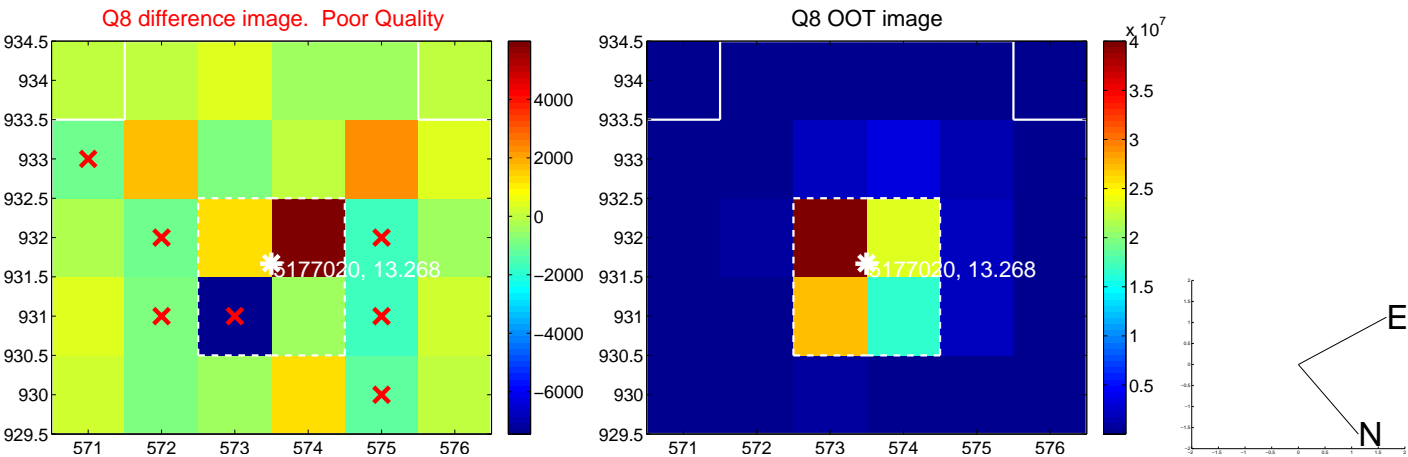
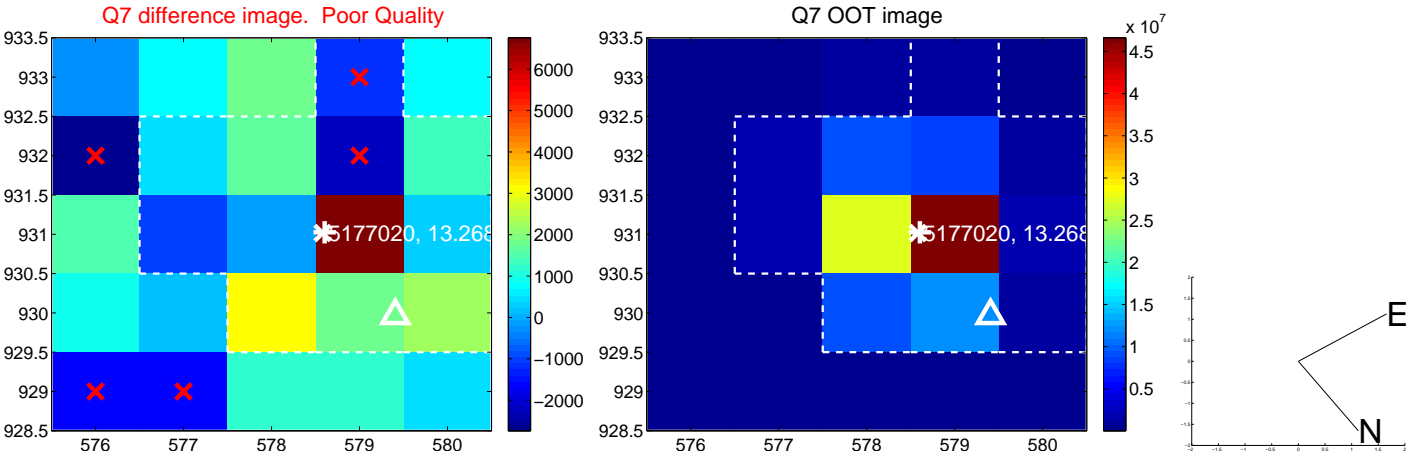


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

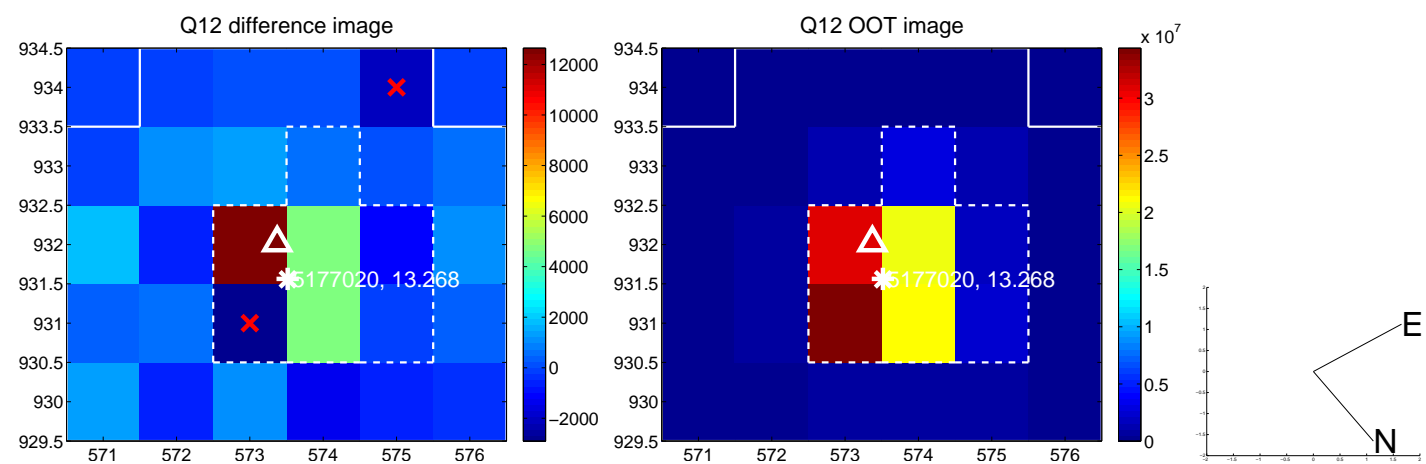
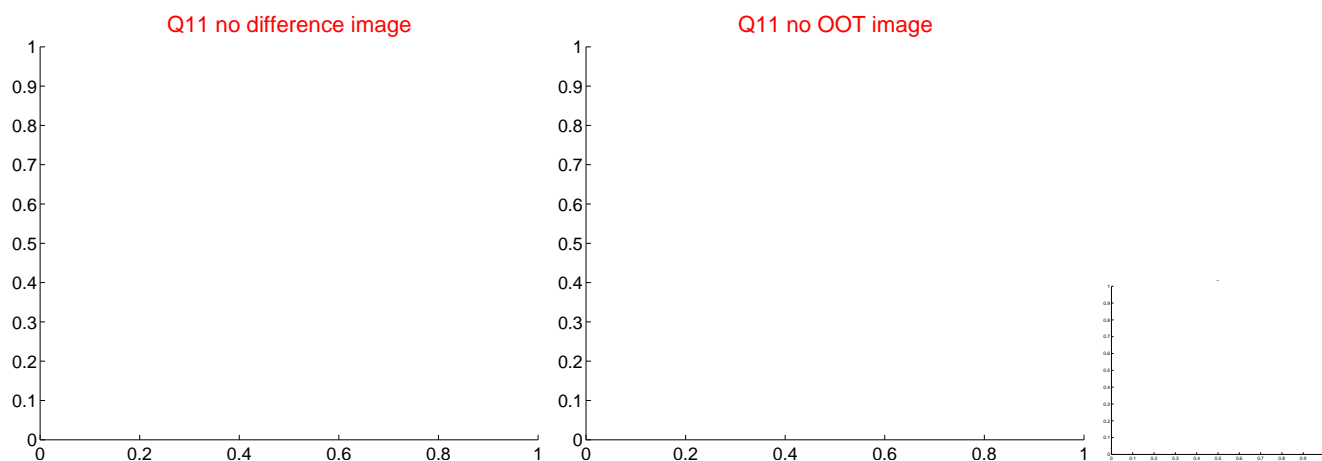
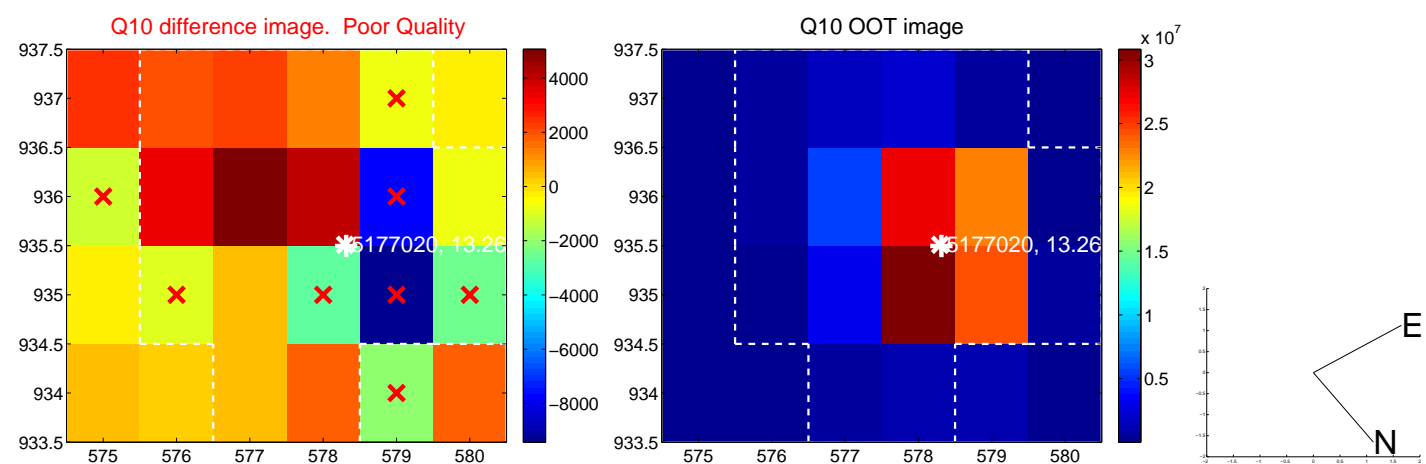
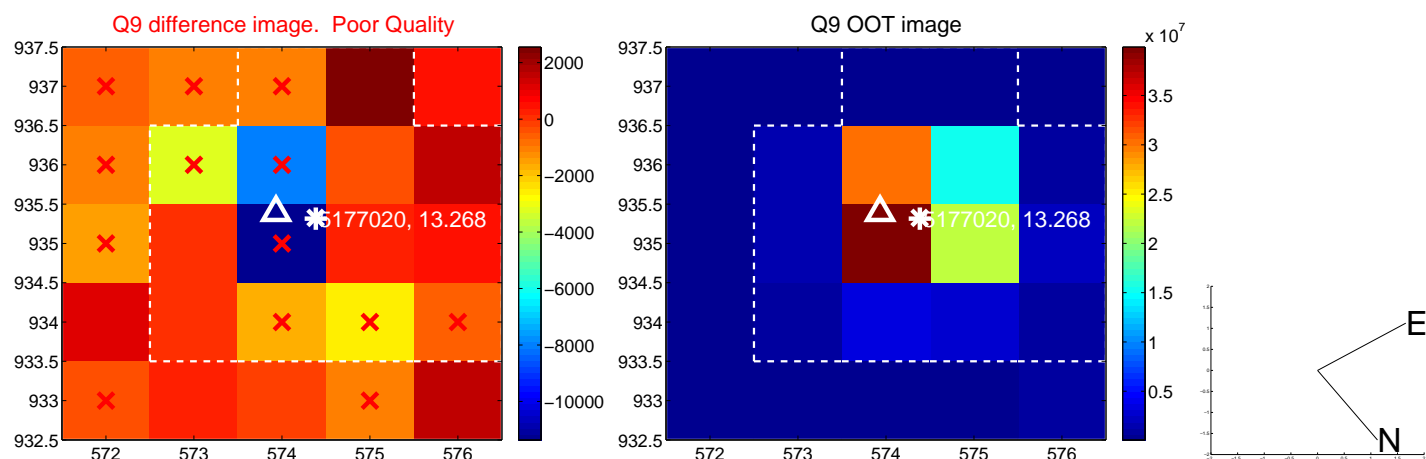
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



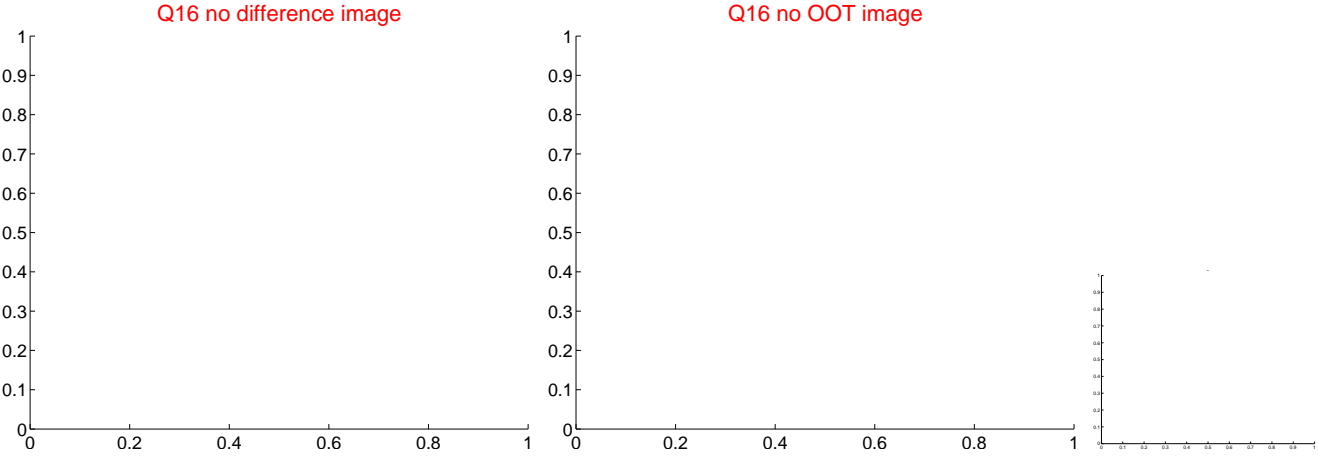
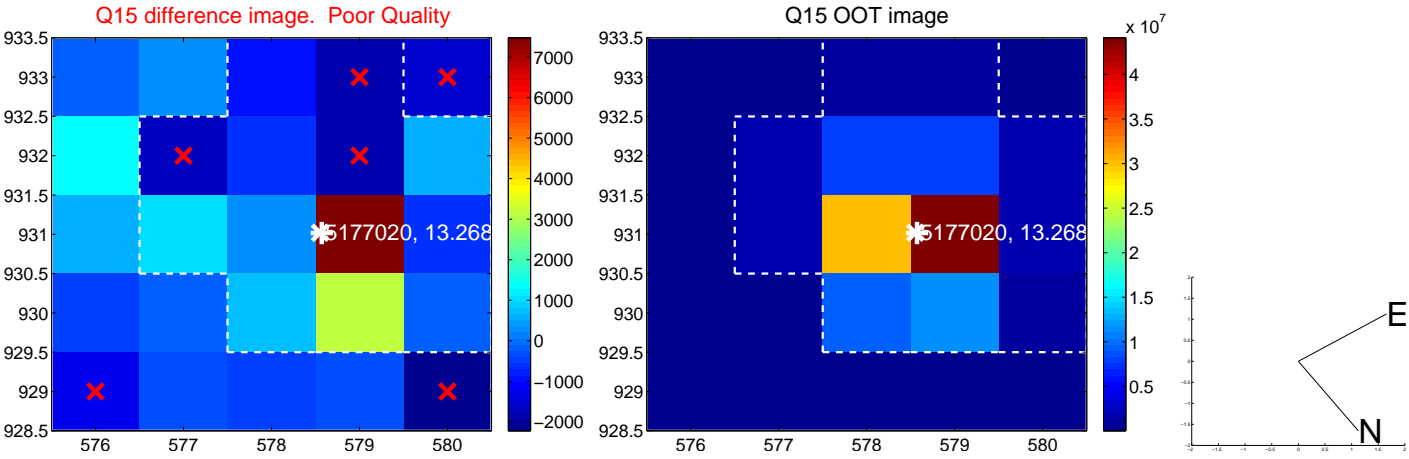
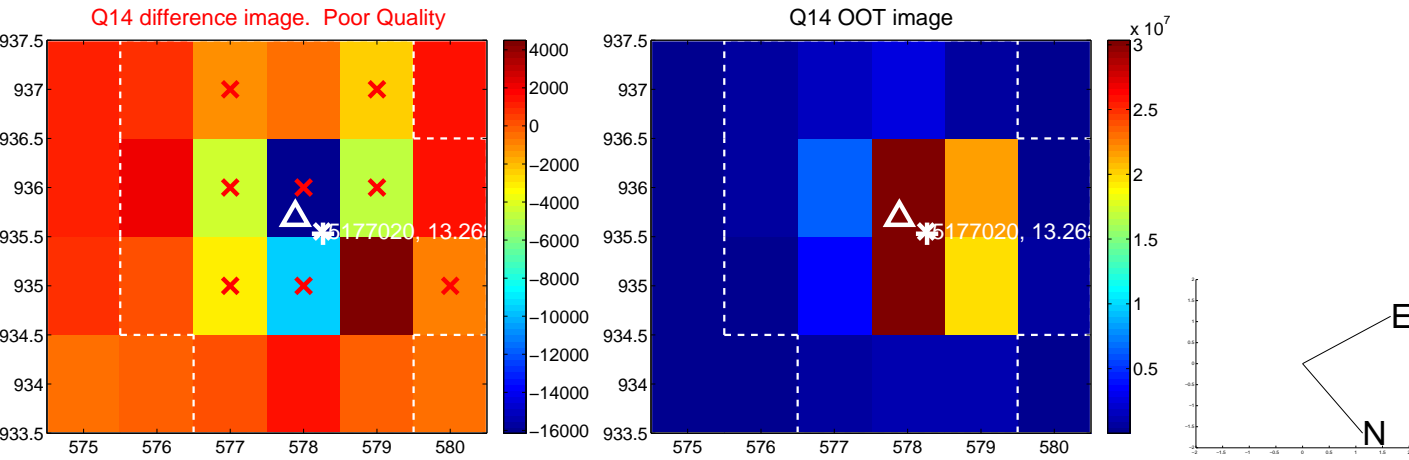
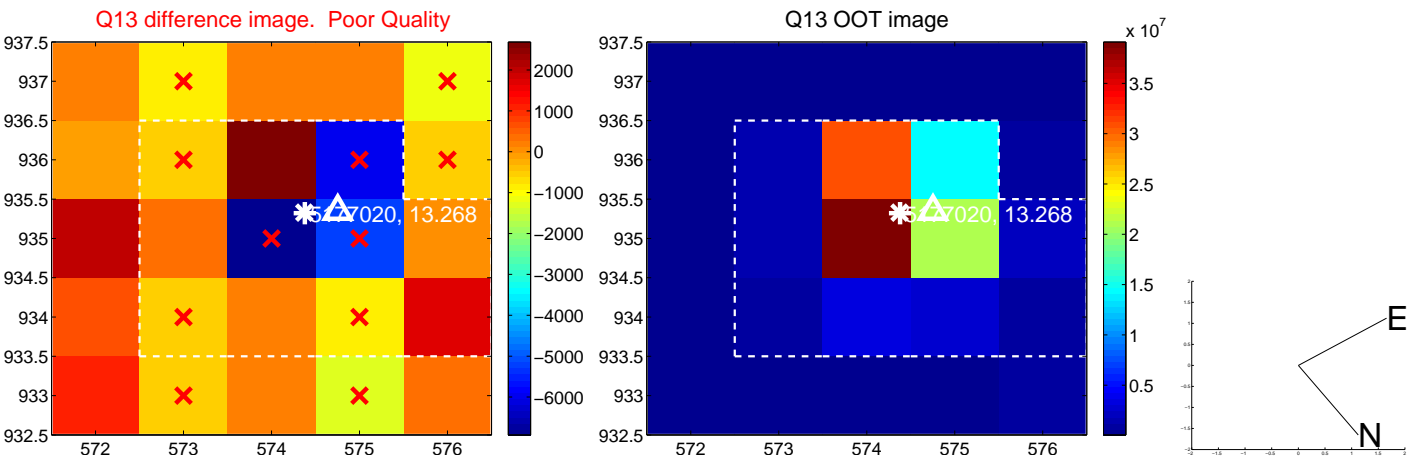
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



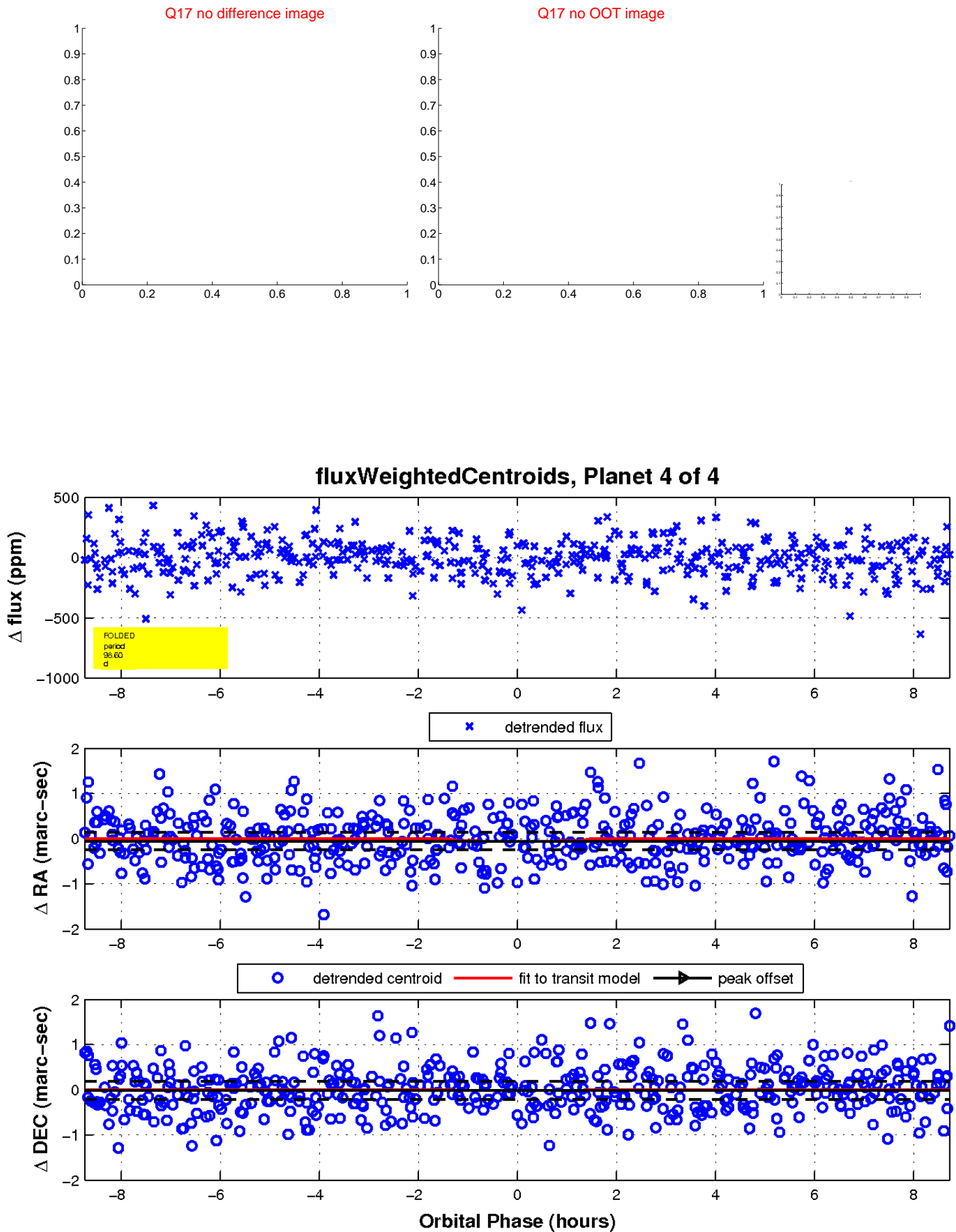
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

