

KIC 010130954

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})
010130954-01	OBS	No	2.246322	132.005918	5.4	8.778	8.2	7.1	2.84	14652	1.18	139550.54
010130954-02	OBS	No	85.346247	182.153003	12.9	4.277	11.4	2.5	2.84	14652	1.07	1092.57
010130954-03	OBS	No	85.267672	181.255839	5.0	8.860	12.1	1.3	2.84	14652	0.72	1093.91
010130954-04	OBS	No	442.482221	223.526686	53.7	3.965	7.9	5.3	2.84	14652	2.36	121.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010130954-01	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_SATURATED—HALO_GHOST
010130954-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
010130954-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010130954-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED

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

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

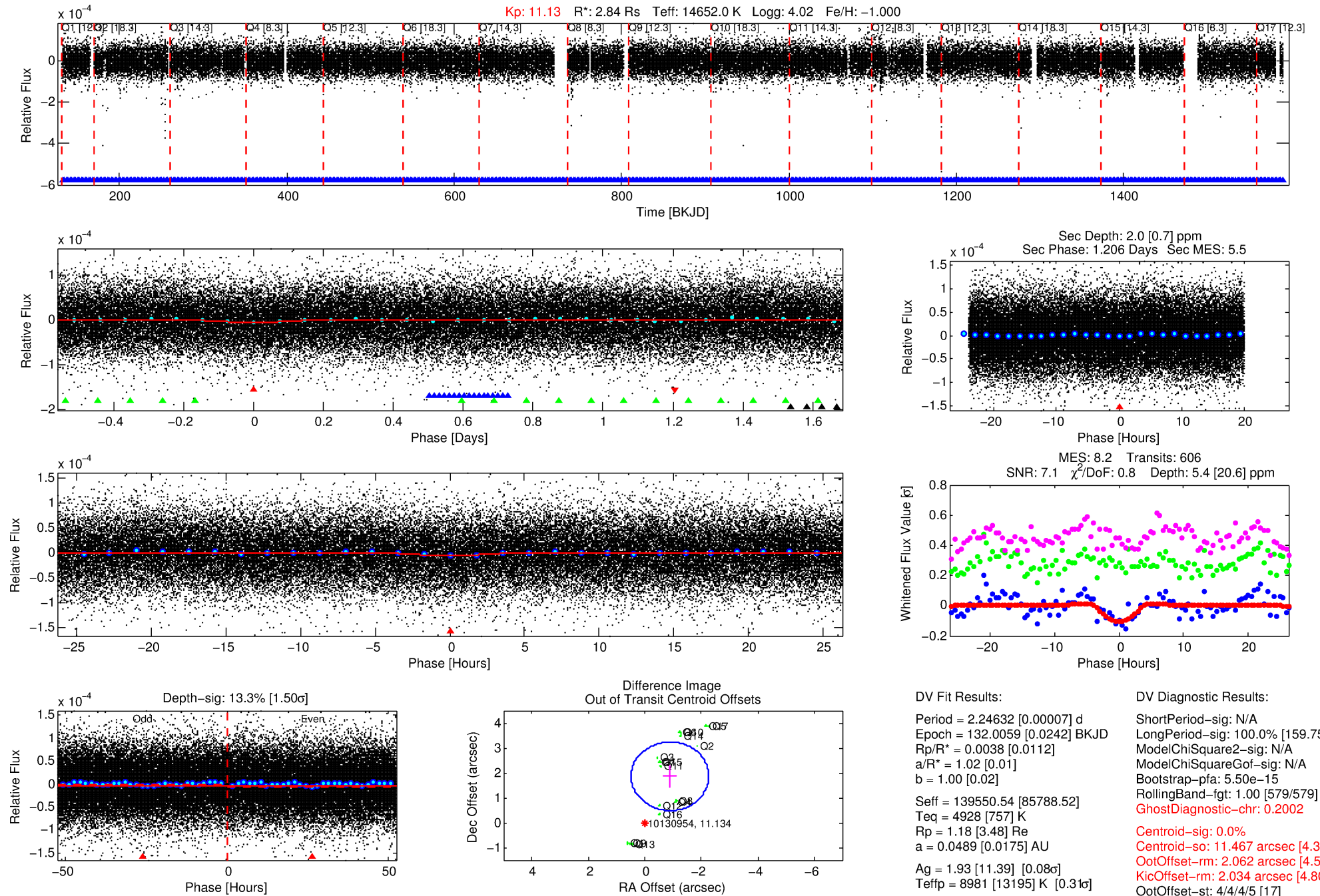
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010130954-01

No Significant Match Found

DV One-Page Summary

KIC: 10130954 Candidate: 1 of 4 Period: 2.246 d



DV Fit Results:

Period = 2.24632 [0.00007] d
Epoch = 132.0059 [0.0242] BKJD
Rp/R* = 0.0038 [0.0112]
a/R* = 1.02 [0.01]
b = 1.00 [0.02]
Seff = 139550.54 [85788.52]
Teff = 4928 [757] K
Rp = 1.18 [3.48] Re
a = 0.0489 [0.0175] AU
Ag = 1.93 [11.39] [0.08 σ]
Teffp = 8981 [13195] K [0.31 σ]

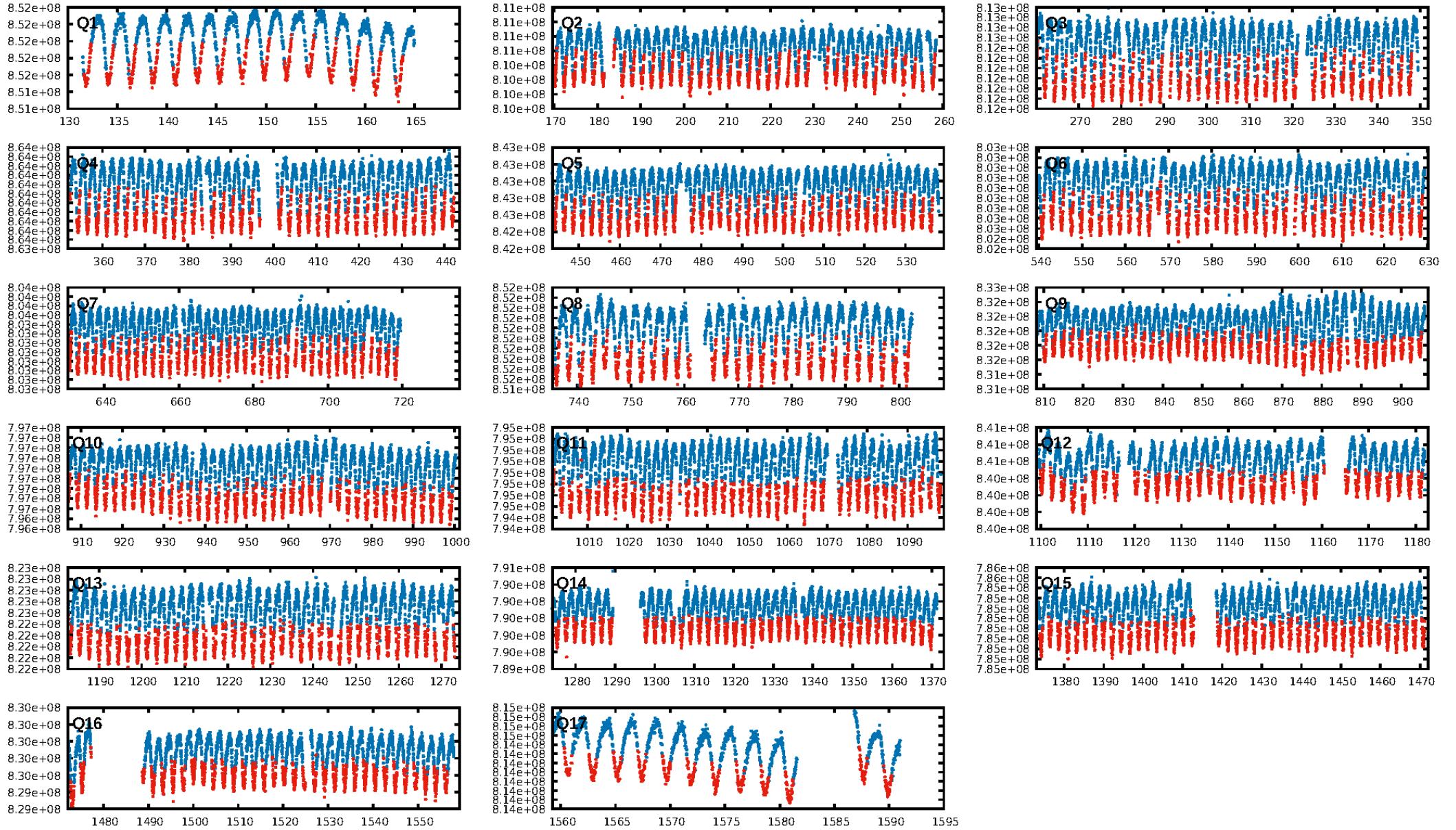
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [159.75 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.50e-15
RollingBand-fgt: 1.00 [579/579]
GhostDiagnostic-chr: 0.2002
Centroid-sig: 0.0%
Centroid-so: 11.467 arcsec [4.30 σ]
OotOffset-rm: 2.062 arcsec [4.50 σ]
KicOffset-rm: 2.034 arcsec [4.80 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.82 [14/17]
DiffImageOverlap-fno: 1.00 [17/17]

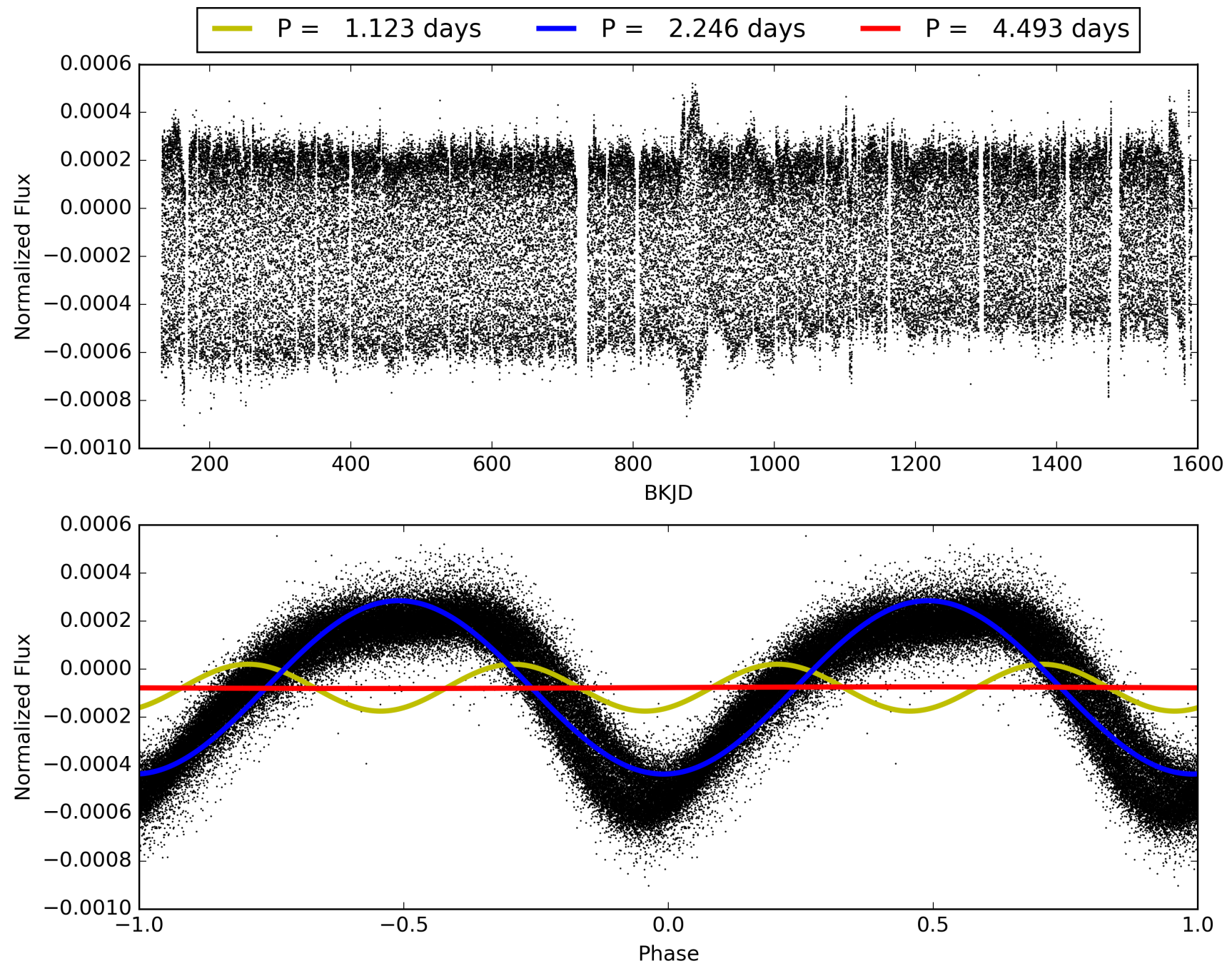
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:47:05 Z

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

TCE 010130954-01, PDC Light Curves

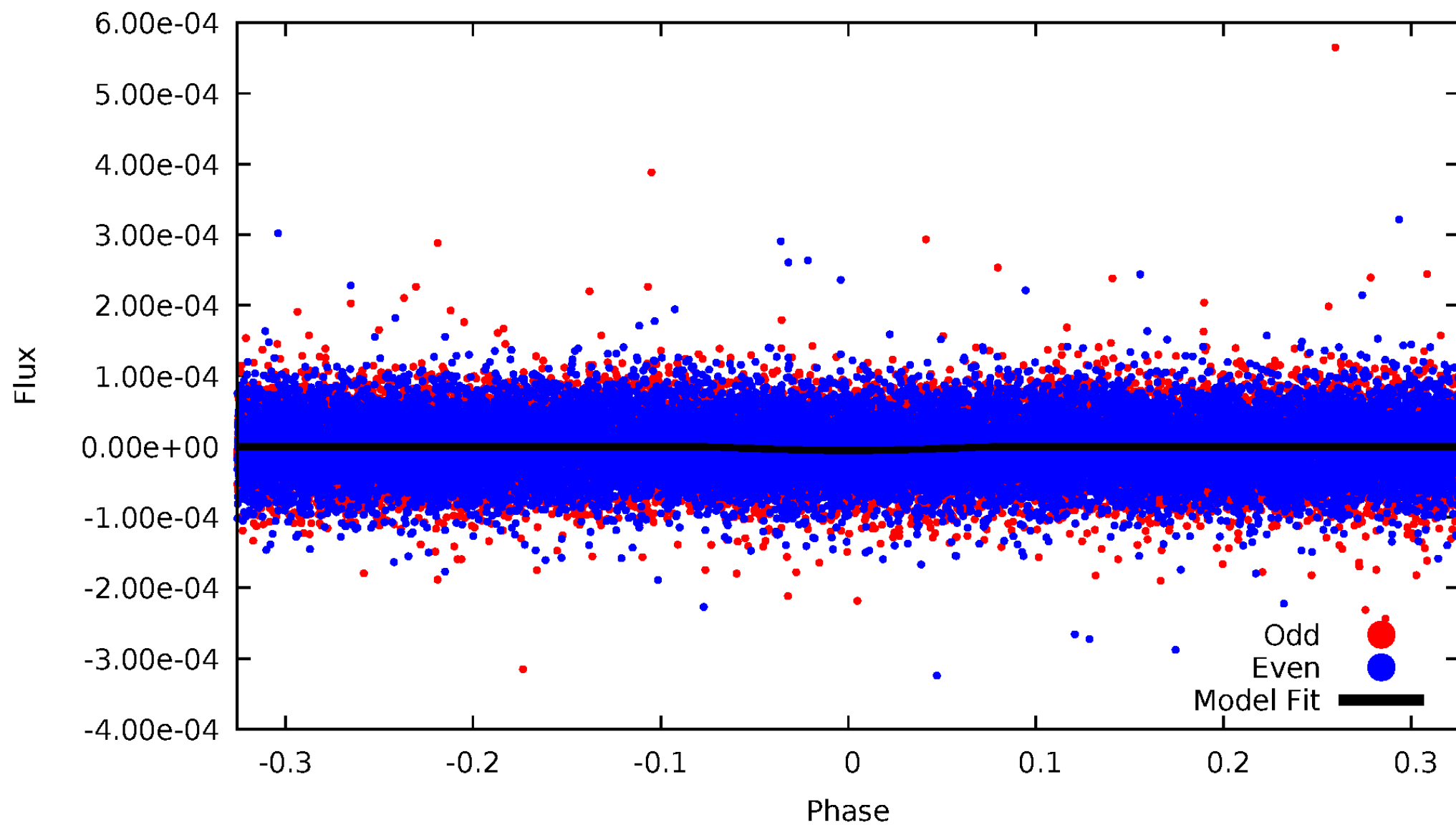


TCE 010130954-01



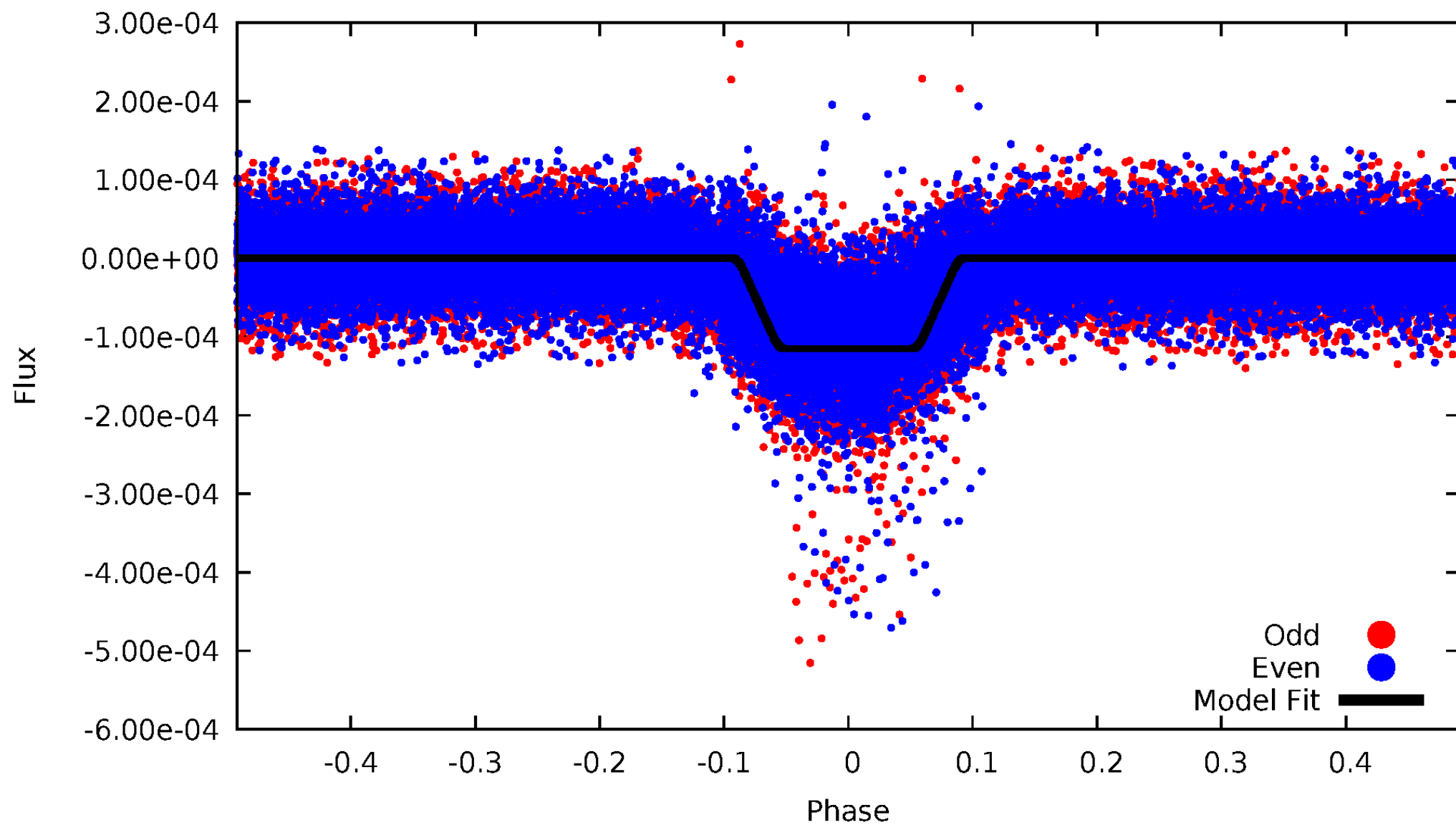
DV Odd/Even

TCE 010130954-01



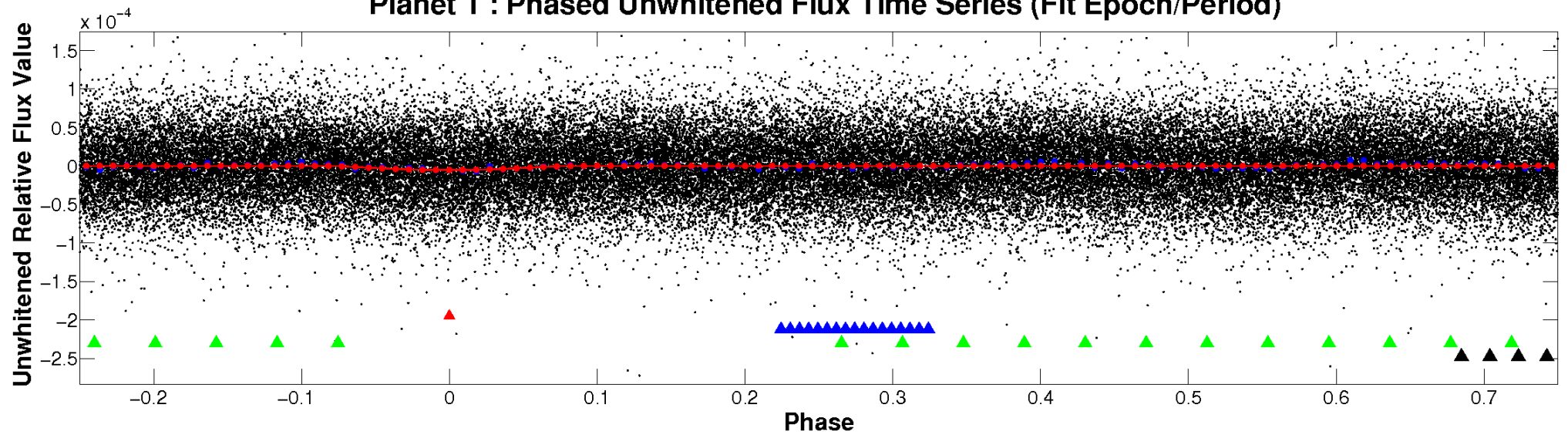
ALT Odd/Even

TCE 010130954-01

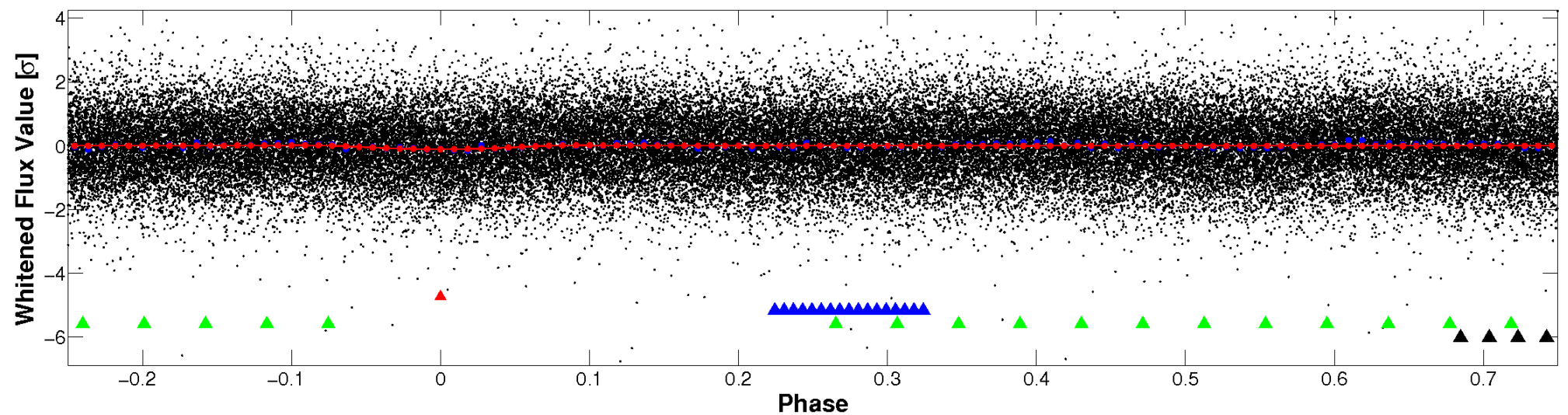


Non-Whitened Vs. Whitened Light Curve

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

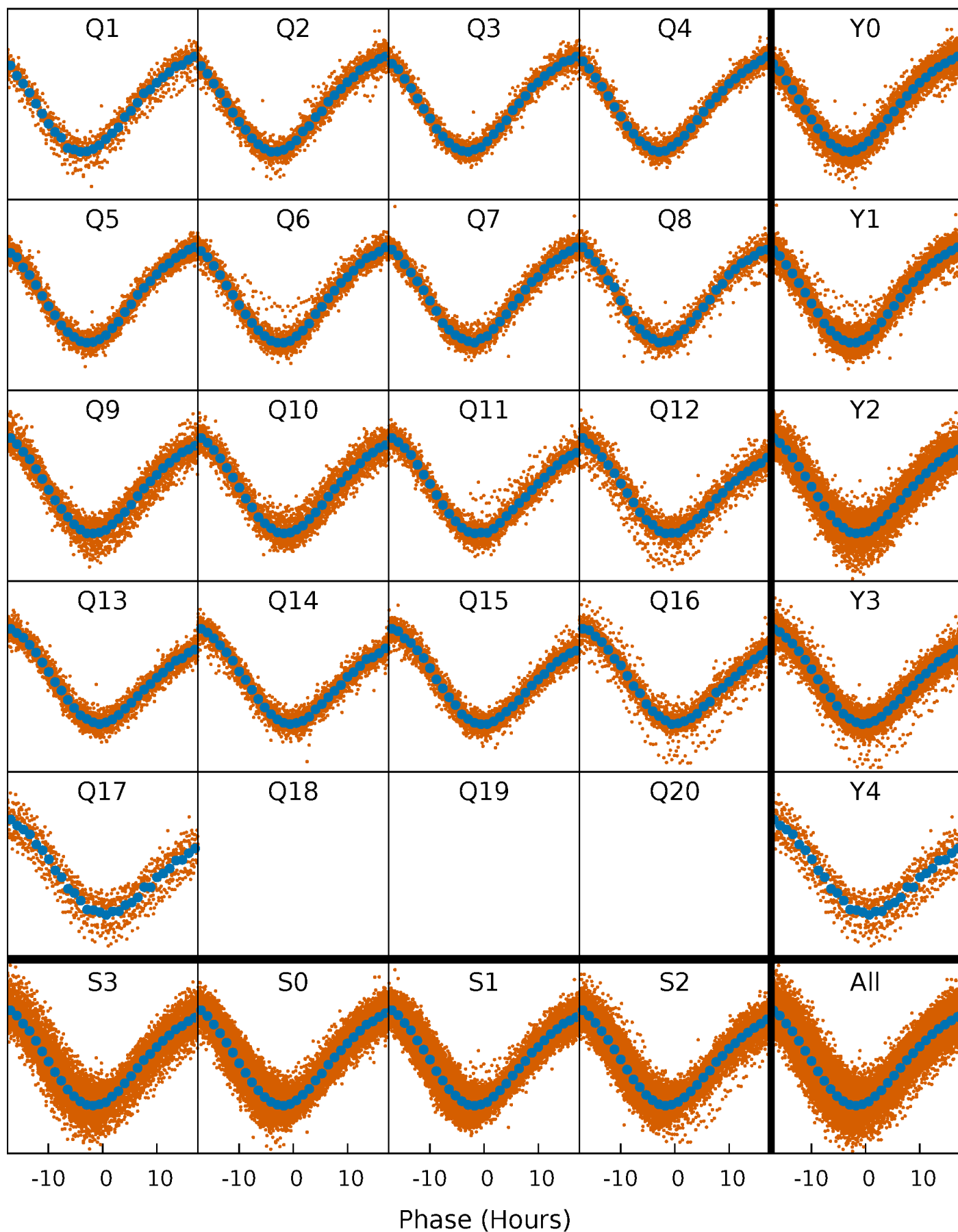


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



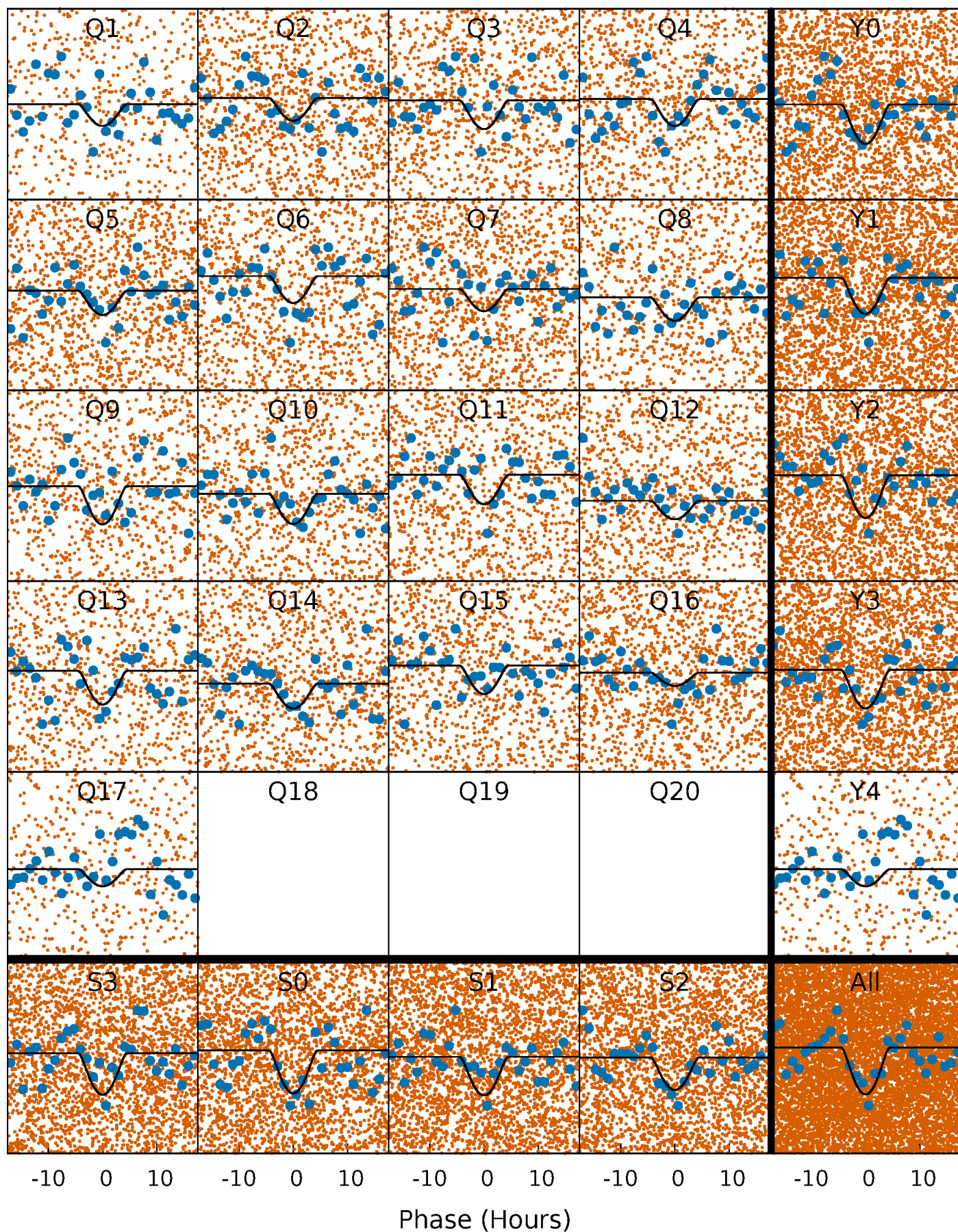
PDC Quarter-Phased Transit Curves

TCE 010130954-01 P= 2.246322 Days $T_0=132.005918$ (BKJD)



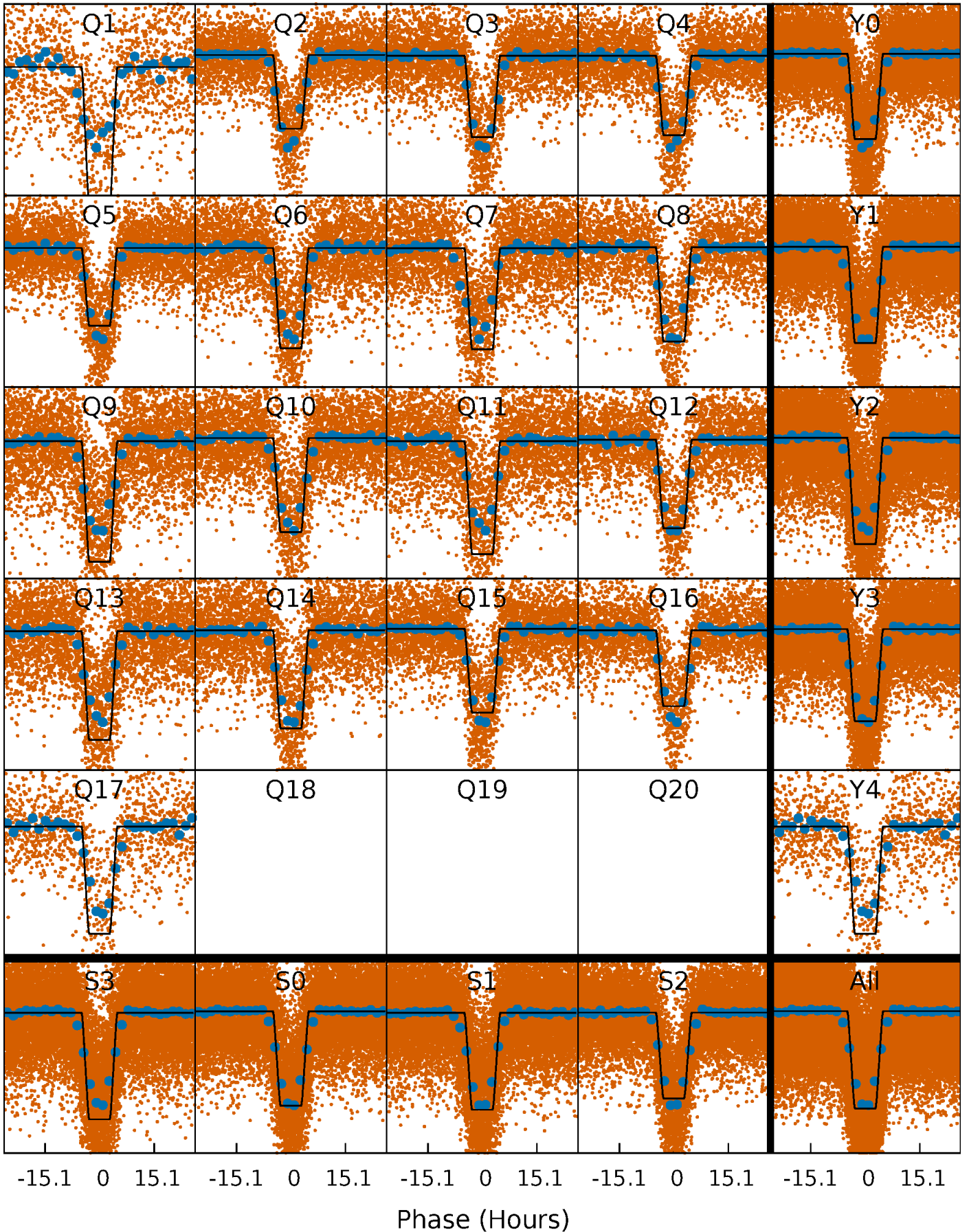
DV Quarter-Phased Transit Curves

TCE 010130954-01 P= 2.246322 Days $T_0=132.005918$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

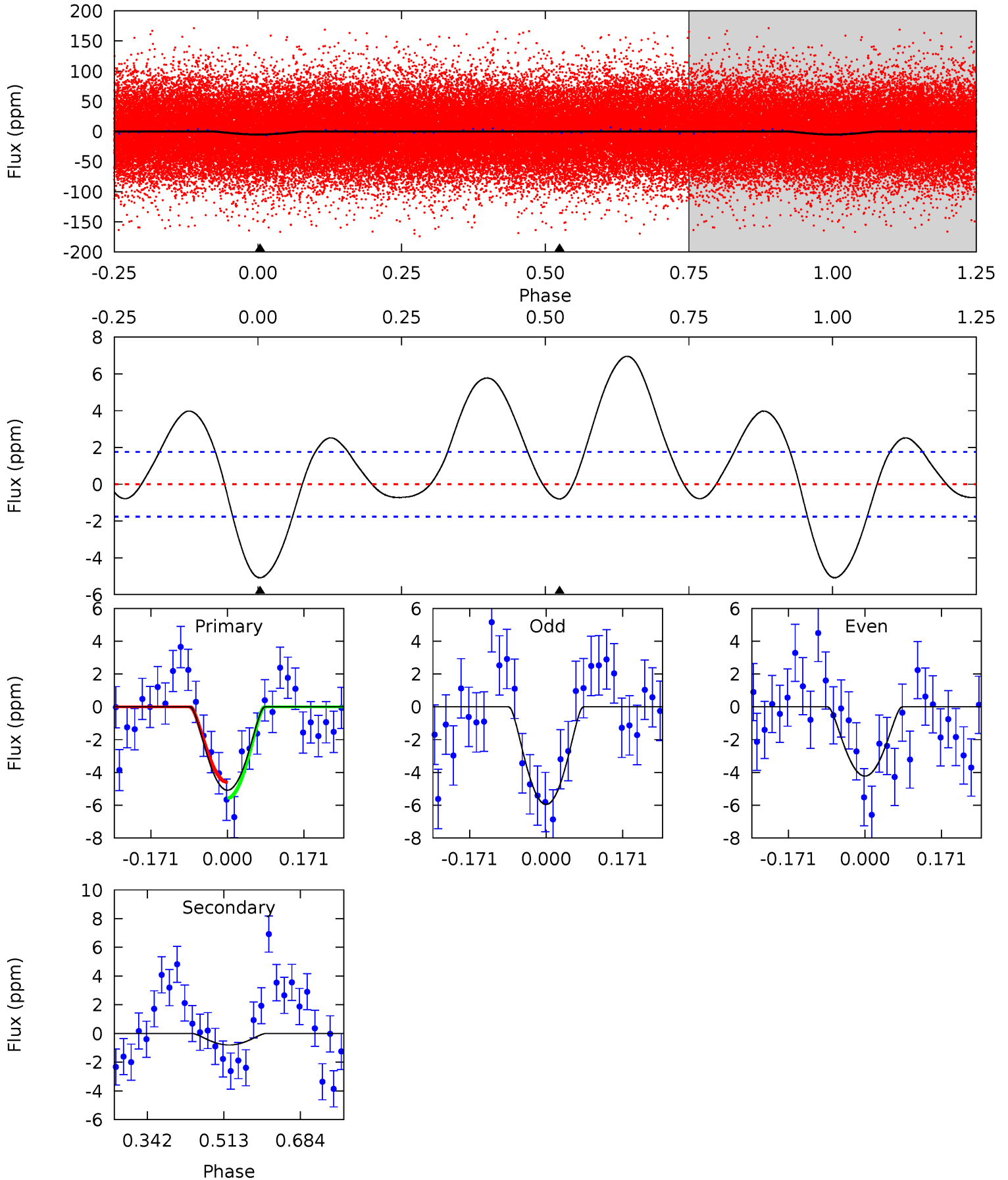
TCE 010130954-01 P= 2.246367 Days $T_0=131.963863$ (BKJD)



DV Model-Shift Uniqueness Test

010130954-01, P = 2.246322 Days, E = 129.759596 Days

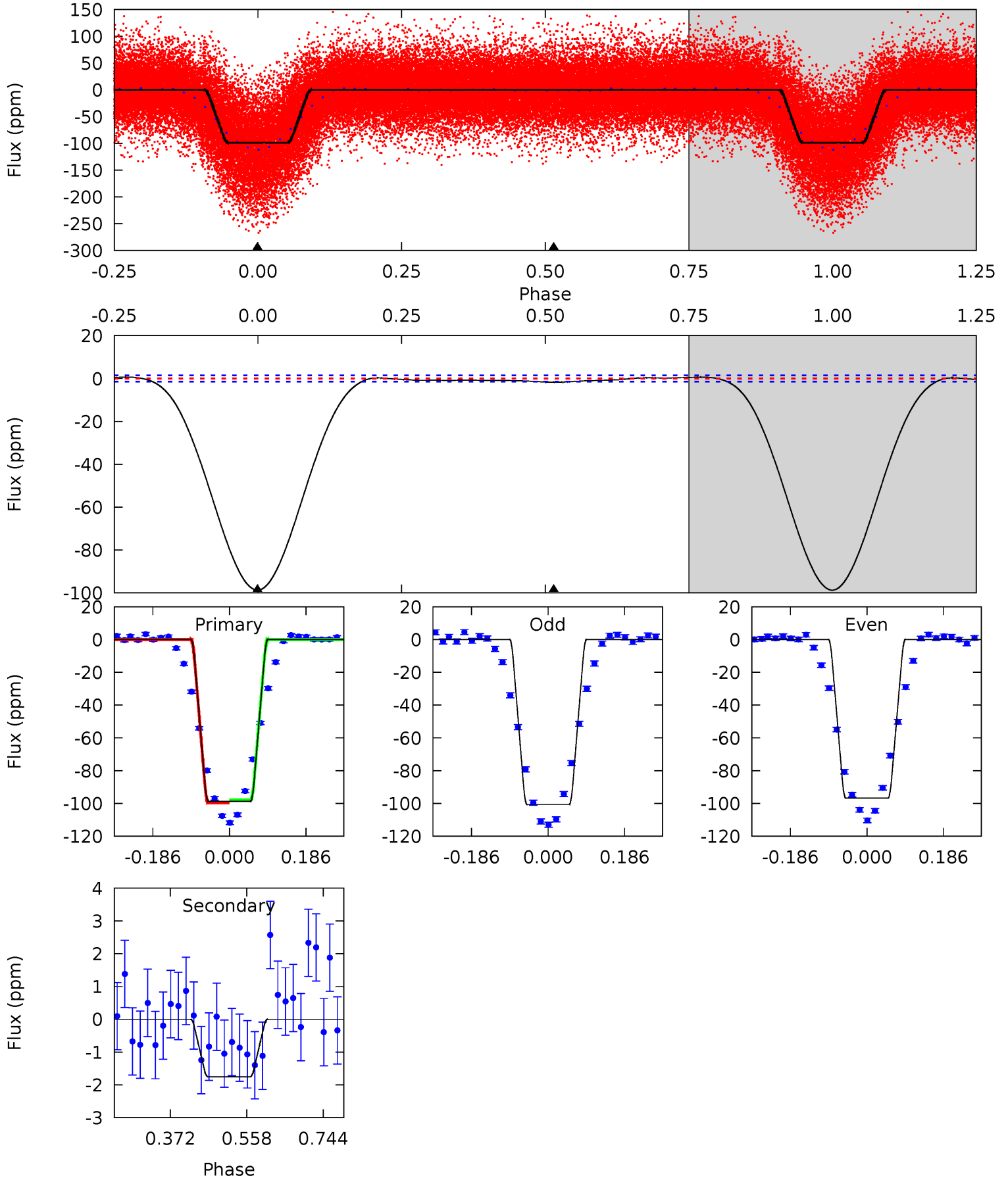
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	2.02	0	0	4.45	1.37	2.98	12.9	12.9	2.02	2.02	2.18	1.01	0.58	1.23



Alt Model-Shift Uniqueness Test

010130954-01, P = 2.246367 Days, E = 129.717496 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
301.3	5.35	0	0	4.43	1.32	1.63	301.3	301.3	5.35	5.35	5.85	1.04	0.01	2.82



Stellar Parameters For KIC 010130954

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	14652^{+344}_{-774}	$4.020^{+0.340}_{-0.013}$	$-1.000^{+0.300}_{-0.300}$	$2.840^{+0.041}_{-1.051}$	$3.080^{+-1.000}_{-0.467}$	$0.189^{+0.468}_{-0.008}$
	+2%/-5%	+8%/-0%	+30%/-30%	+1%/-37%	+32%/-15%	+247%/-4%
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 010130954-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1 ± 0	$2.56^{+2.35}_{-1.79}$	6615^{+362}_{-600}	-3868^{+9791}_{-576}	$0.149^{+1.295}_{-0.122}$
Alt.	-2 ± 0	$3.66^{+3.01}_{-2.35}$	6593^{+373}_{-609}	-3719^{+9279}_{-661}	$0.169^{+1.154}_{-0.118}$

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 $A_{obs} \gg 1.0$

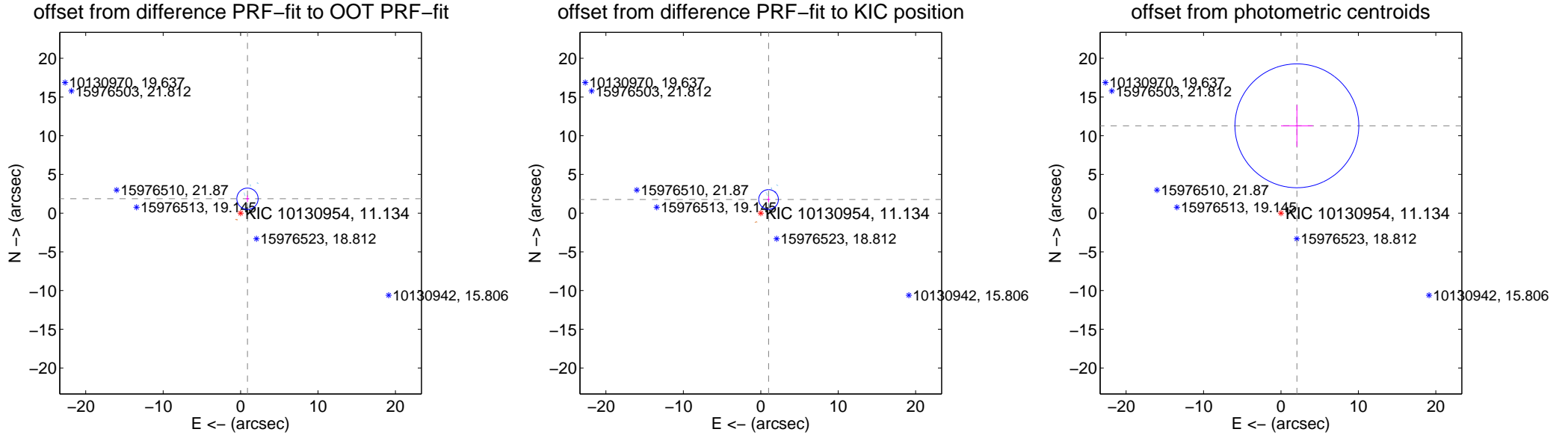
DV Centroid Data

Supplemental centroid analysis for 010130954-01. **Kepler magnitude: 11.13.** Transit SNR 7.12

There are 14 quarters with good PRF difference image offsets

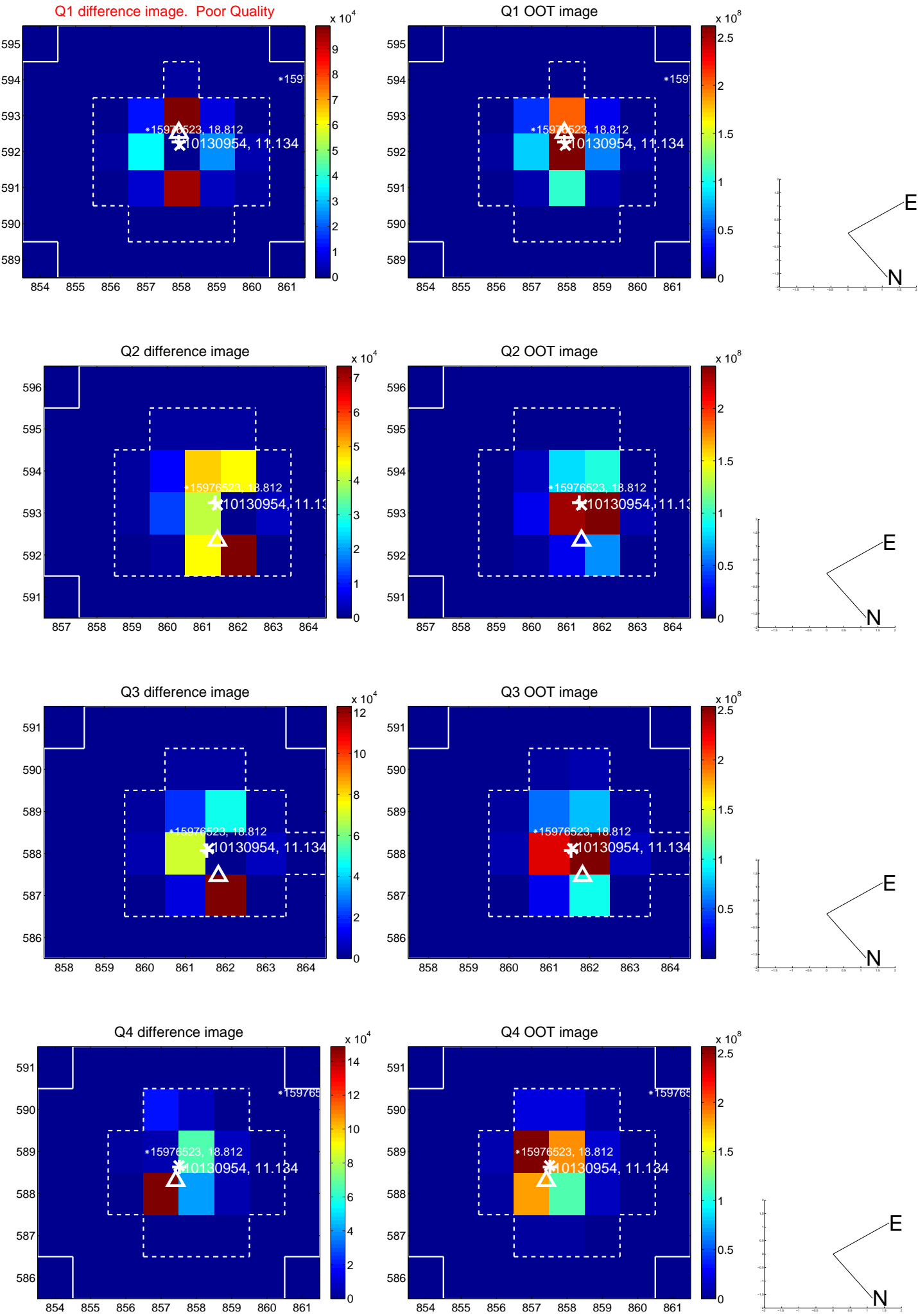
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.062 ± 0.459	4.50	-0.892 ± 0.215	1.859 ± 0.424
PRF-fit source offset from KIC position	2.034 ± 0.424	4.80	-1.006 ± 0.209	1.768 ± 0.386
photometric centroid source offset	11.47 ± 2.67	4.30	-2.06 ± 2.05	11.28 ± 2.68

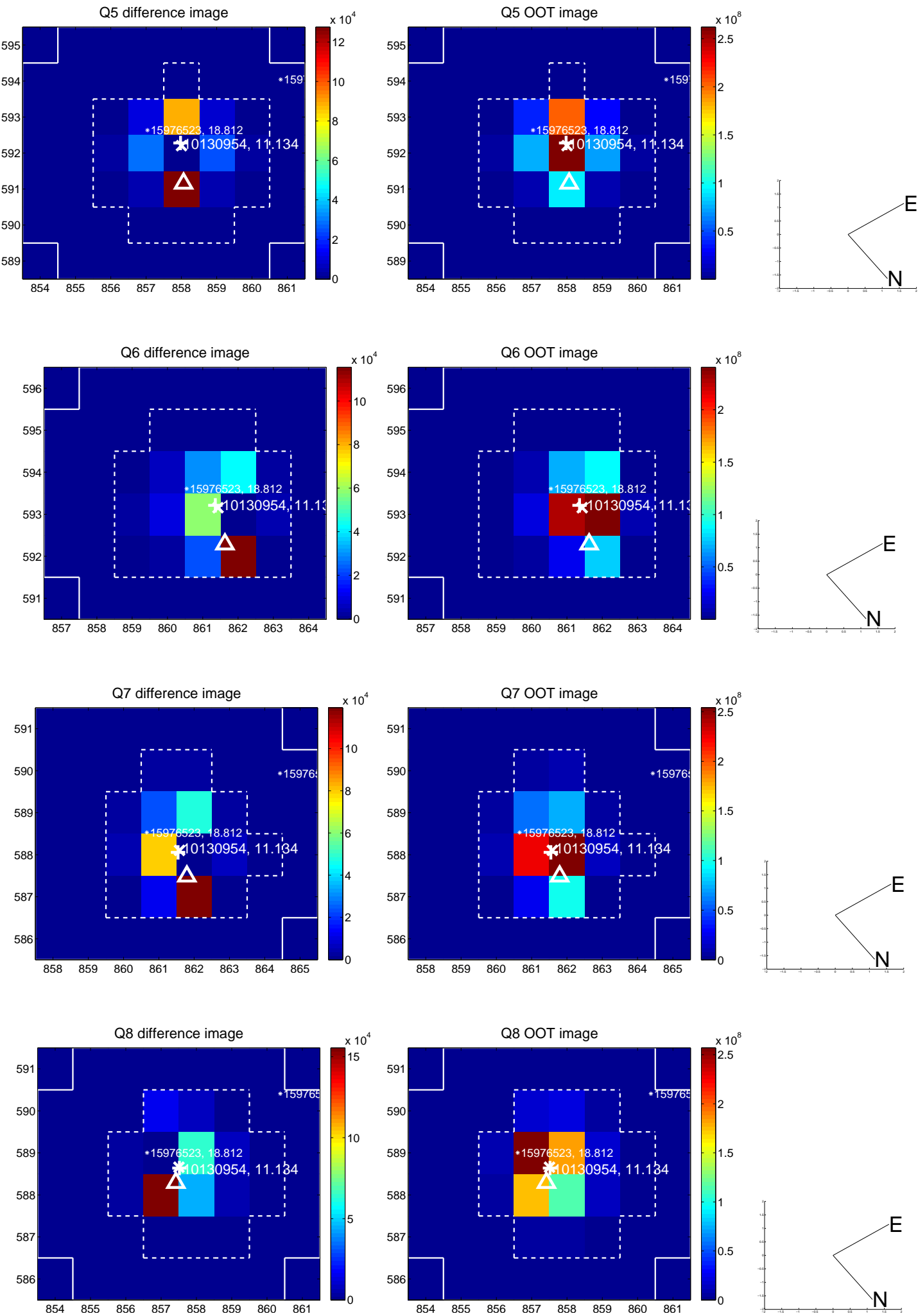


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

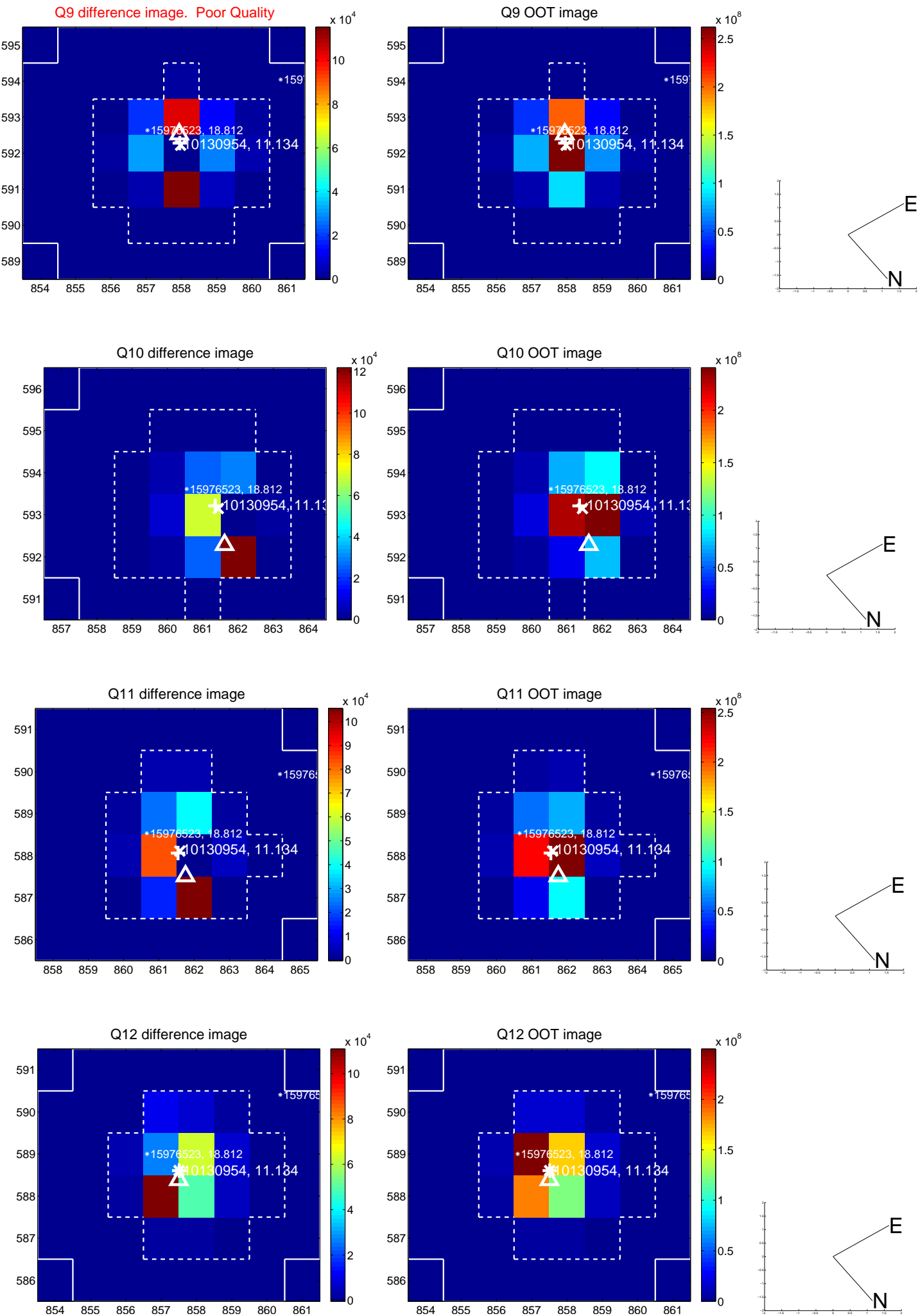
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



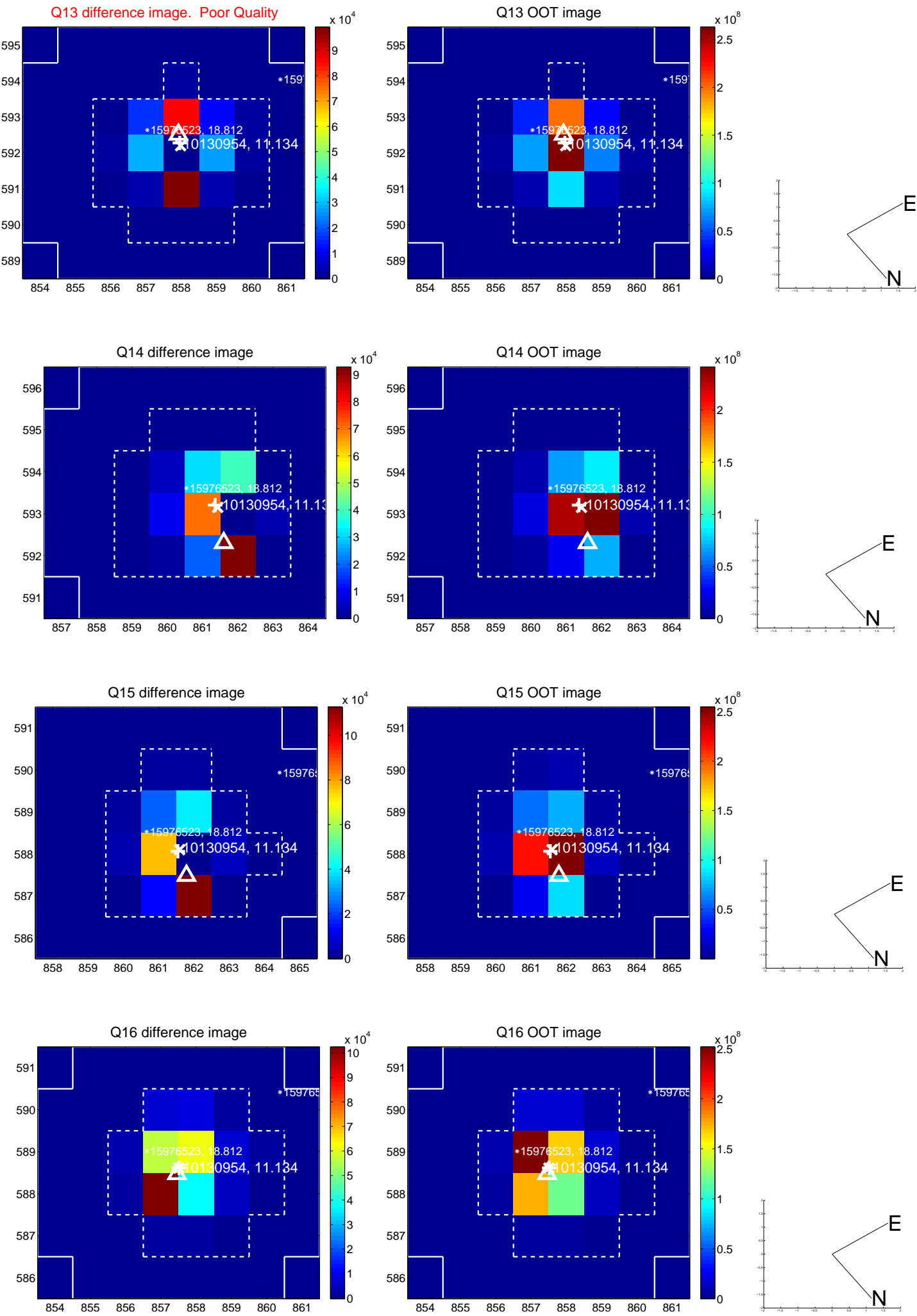
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



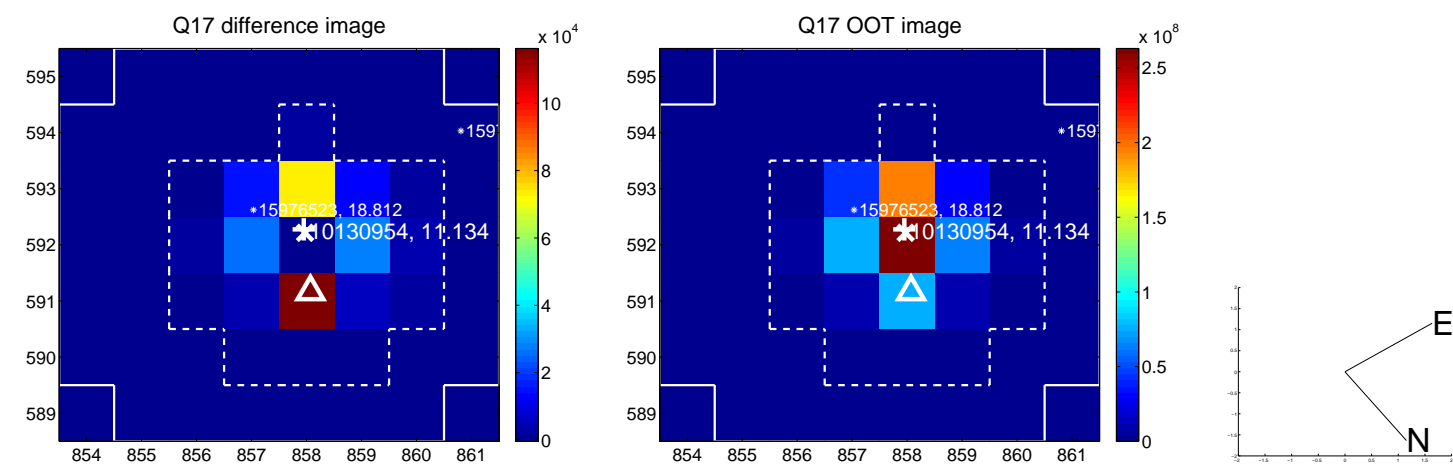
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



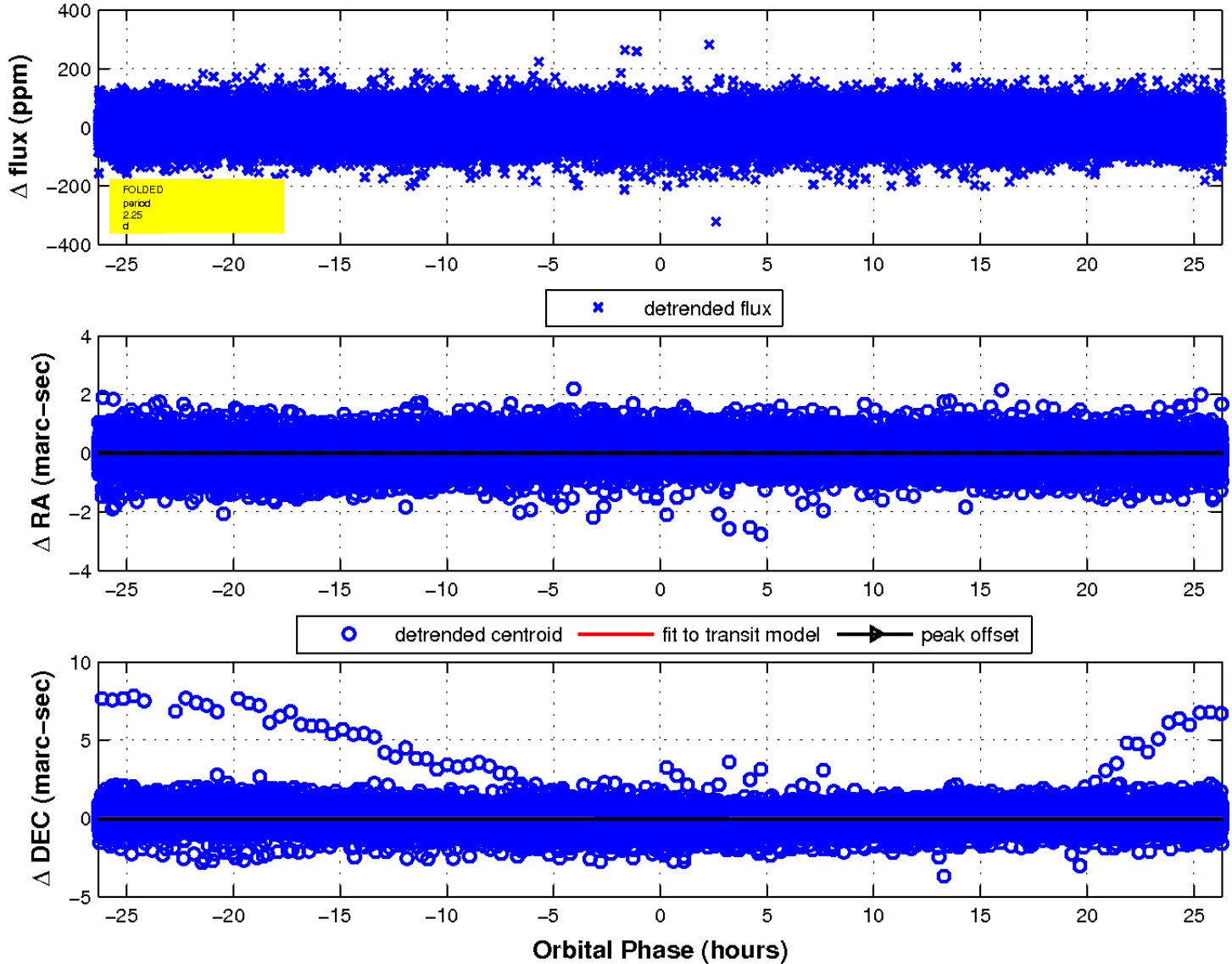
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

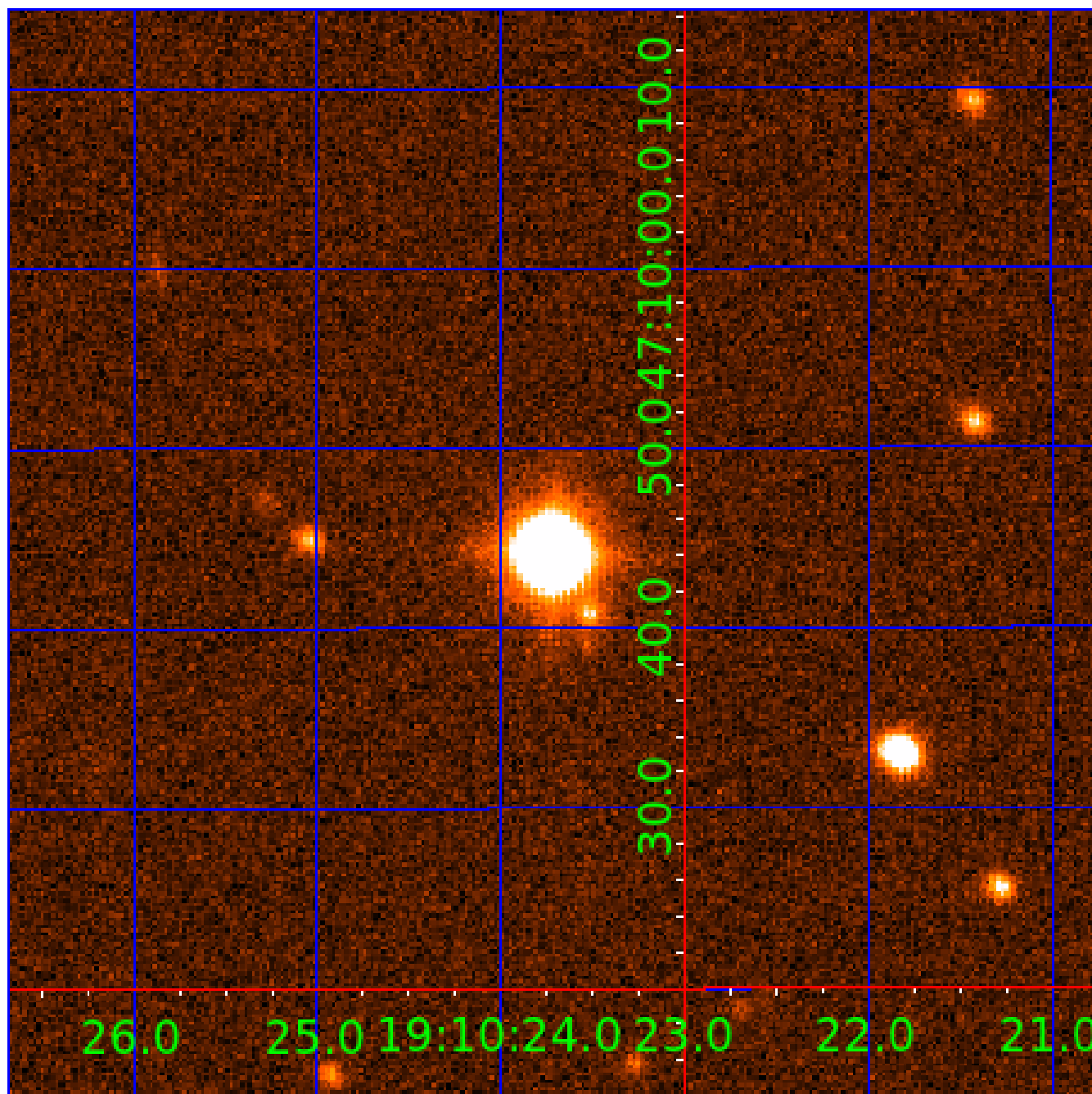


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 010130954

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})
010130954-01	OBS	No	2.246322	132.005918	5.4	8.778	8.2	7.1	2.84	14652	1.18	139550.54
010130954-02	OBS	No	85.346247	182.153003	12.9	4.277	11.4	2.5	2.84	14652	1.07	1092.57
010130954-03	OBS	No	85.267672	181.255839	5.0	8.860	12.1	1.3	2.84	14652	0.72	1093.91
010130954-04	OBS	No	442.482221	223.526686	53.7	3.965	7.9	5.3	2.84	14652	2.36	121.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010130954-01	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_SATURATED—HALO_GHOST
010130954-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
010130954-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010130954-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED

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

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

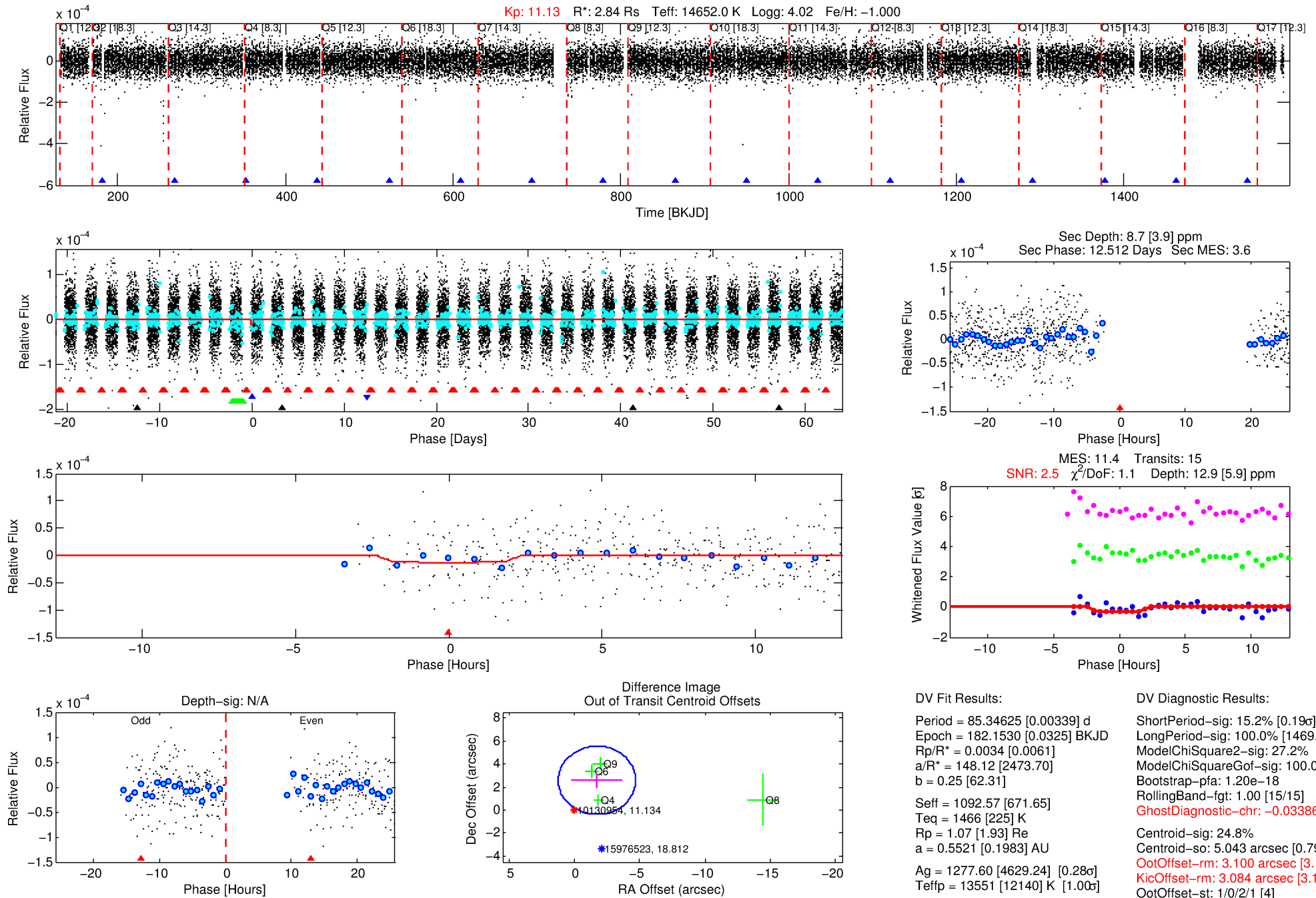
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010130954-02

No Significant Match Found

DV One-Page Summary

KIC: 10130954 Candidate: 2 of 4 Period: 85.346 d



DV Fit Results:

Period = 85.34625 [0.00339] d
Epoch = 182.1530 [0.0325] BKJD
Rp/R* = 0.0034 [0.0061]
a/R* = 148.12 [2473.70]
b = 0.25 [62.31]
Seff = 1092.57 [671.65]
Teq = 1466 [225] K
Rp = 1.07 [1.93] Re
a = 0.5521 [0.1983] AU
Ag = 1277.60 [4629.24] [0.28] σ
Teffp = 13551 [12140] K [1.00] σ

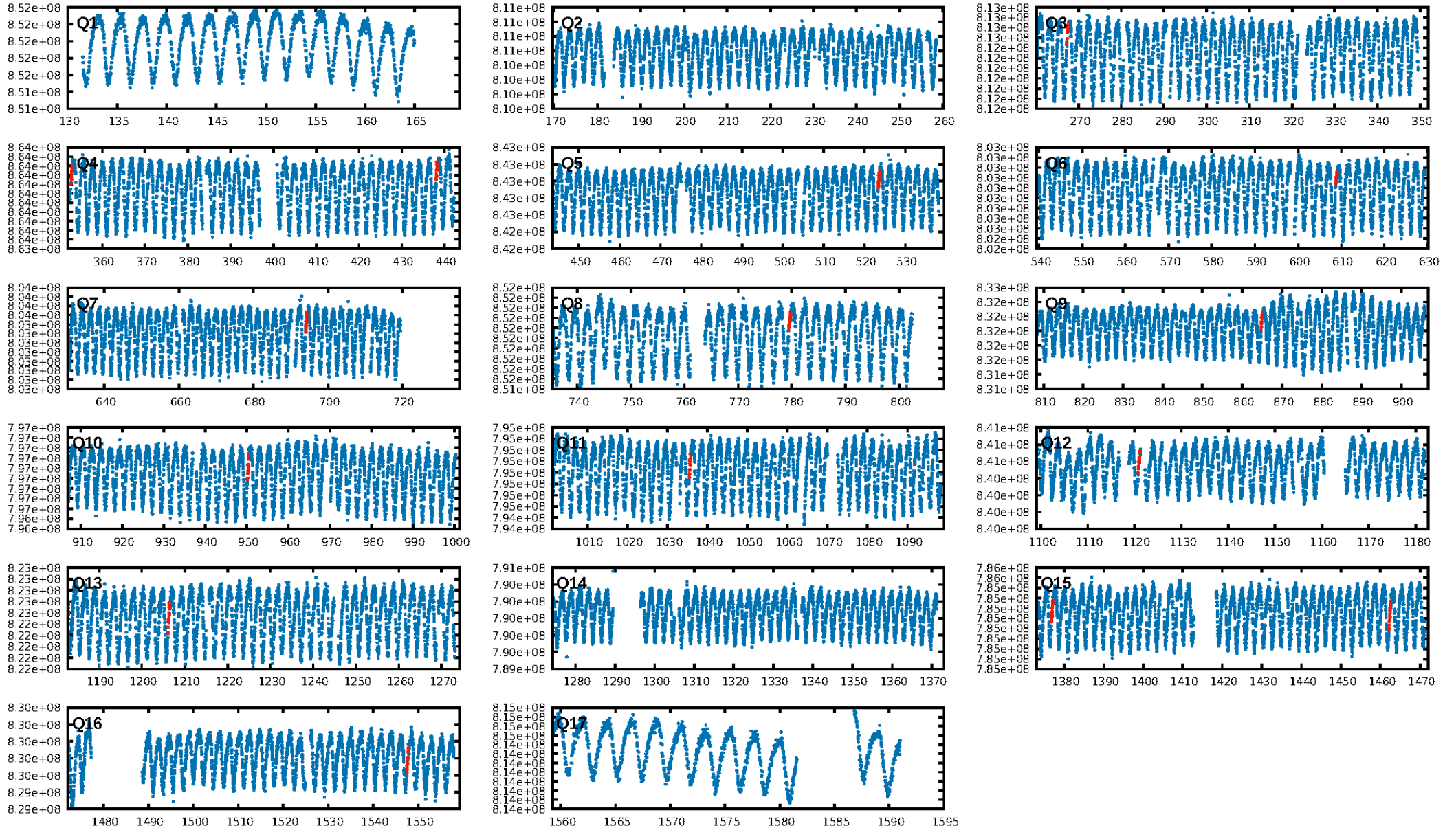
DV Diagnostic Results:

ShortPeriod-sig: 15.2% [0.19] σ
LongPeriod-sig: 100.0% [1469.75] σ
ModelChiSquare2-sig: 27.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.20e-18
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: -0.03386
Centroid-sig: 24.8%
Centroid-so: 5.043 arcsec [0.79] σ
OotOffset-rm: 3.100 arcsec [3.14] σ
KicOffset-rm: 3.084 arcsec [3.18] σ
OotOffset-st: 1/0/2/1 [4]
KicOffset-st: 1/0/2/1 [4]
DiffImageQuality-fgm: 0.00 [0/4]
DiffImageOverlap-fno: 0.80 [8/10]

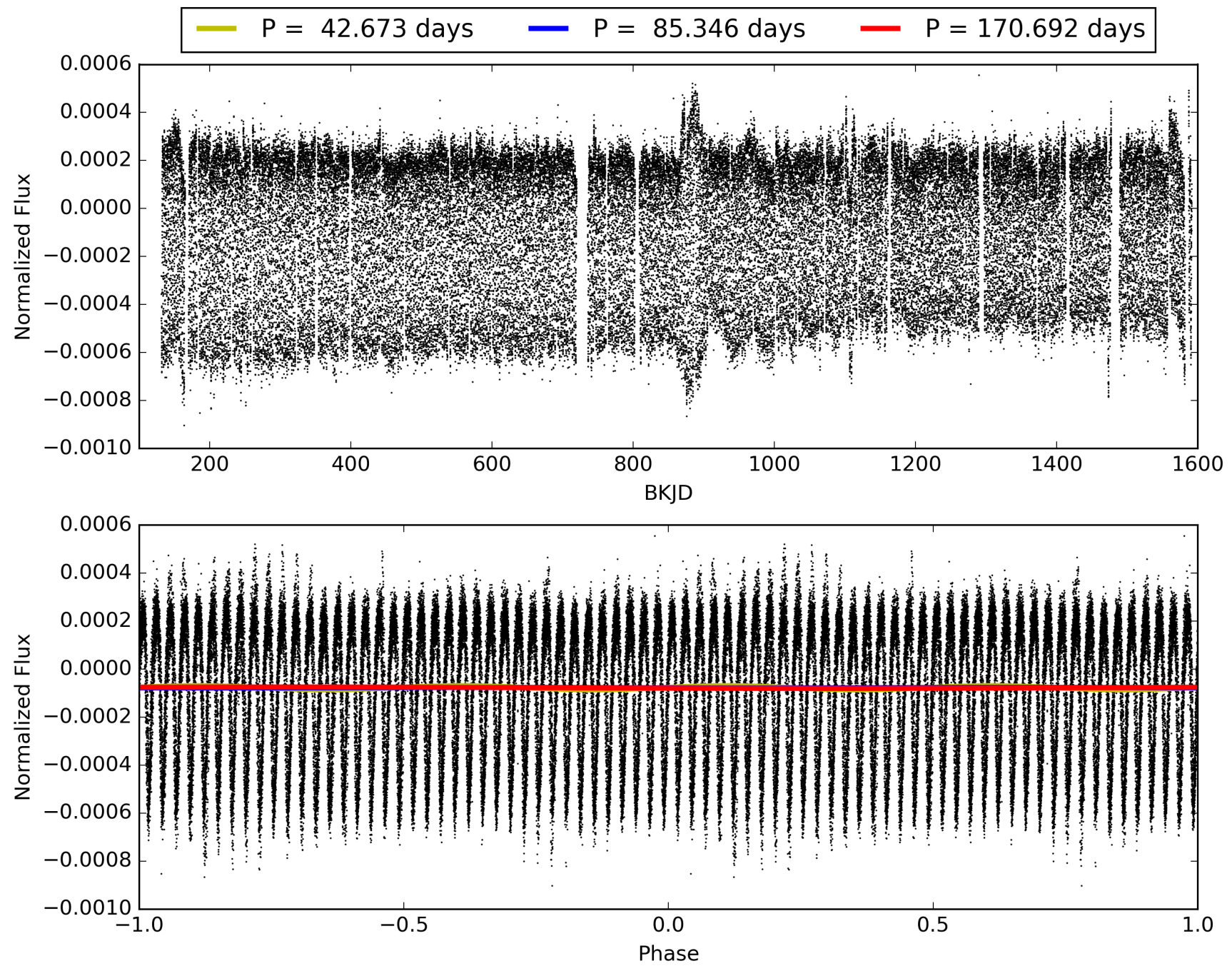
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:47:16 Z

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

TCE 010130954-02, PDC Light Curves

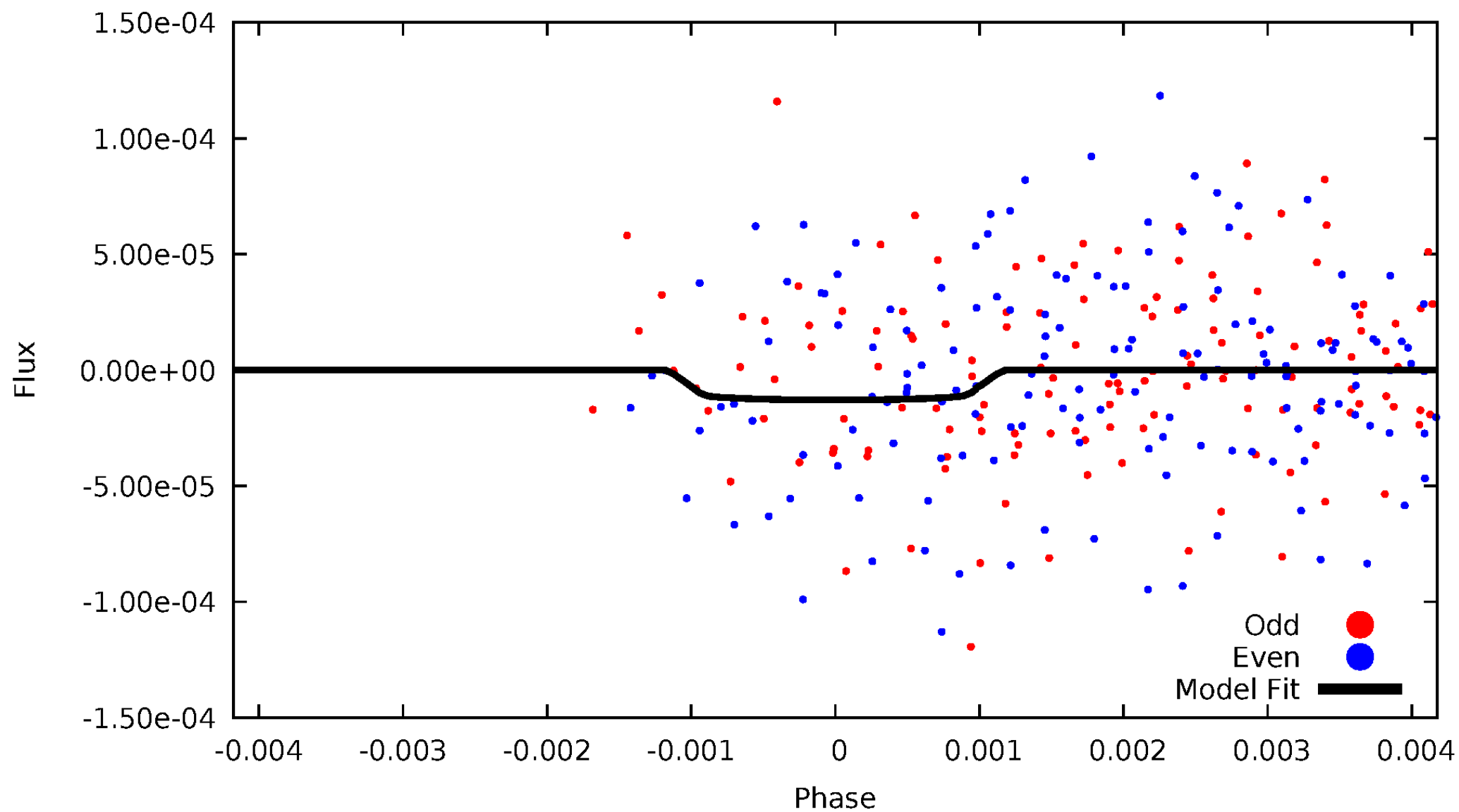


TCE 010130954-02



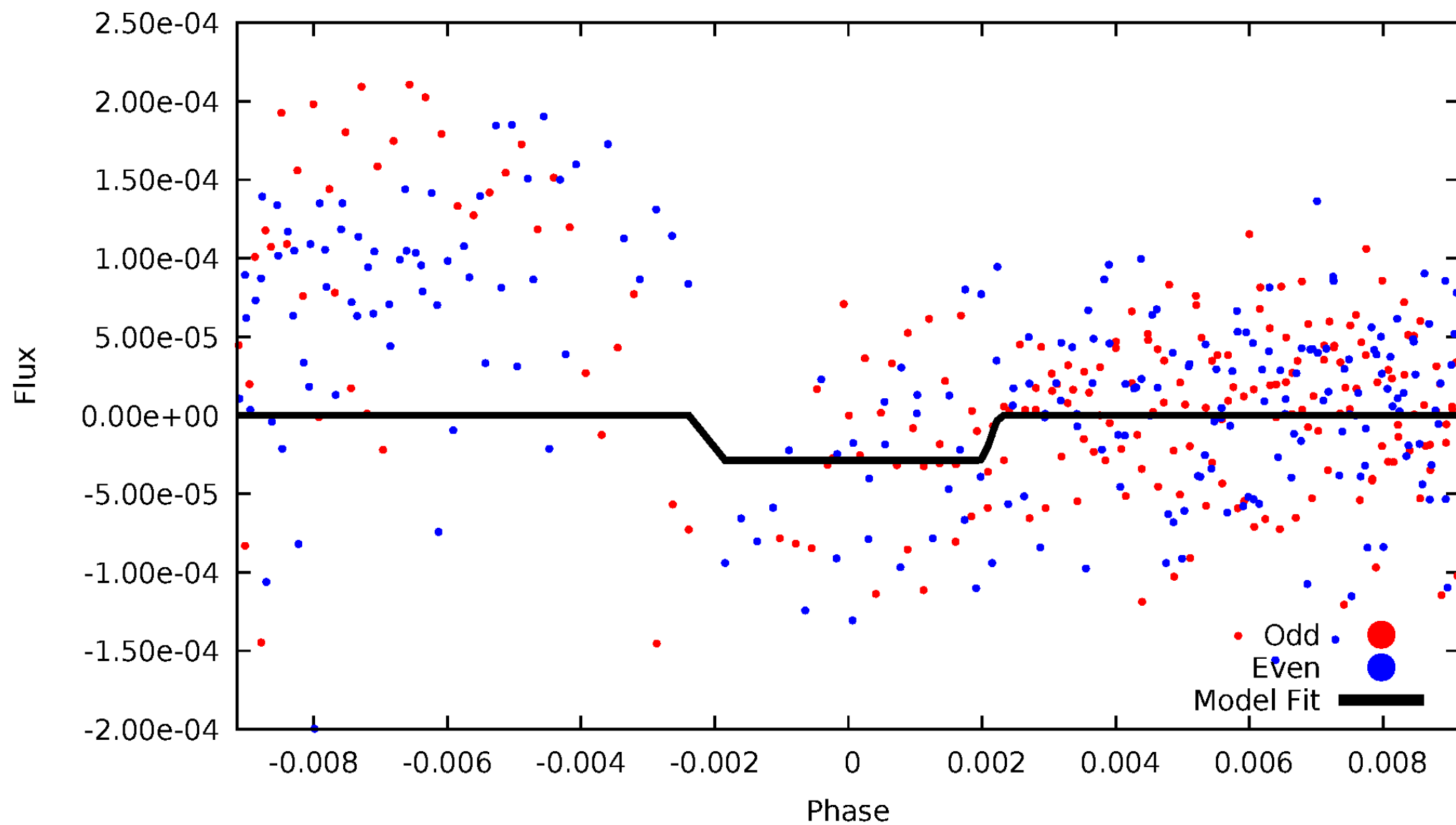
DV Odd/Even

TCE 010130954-02



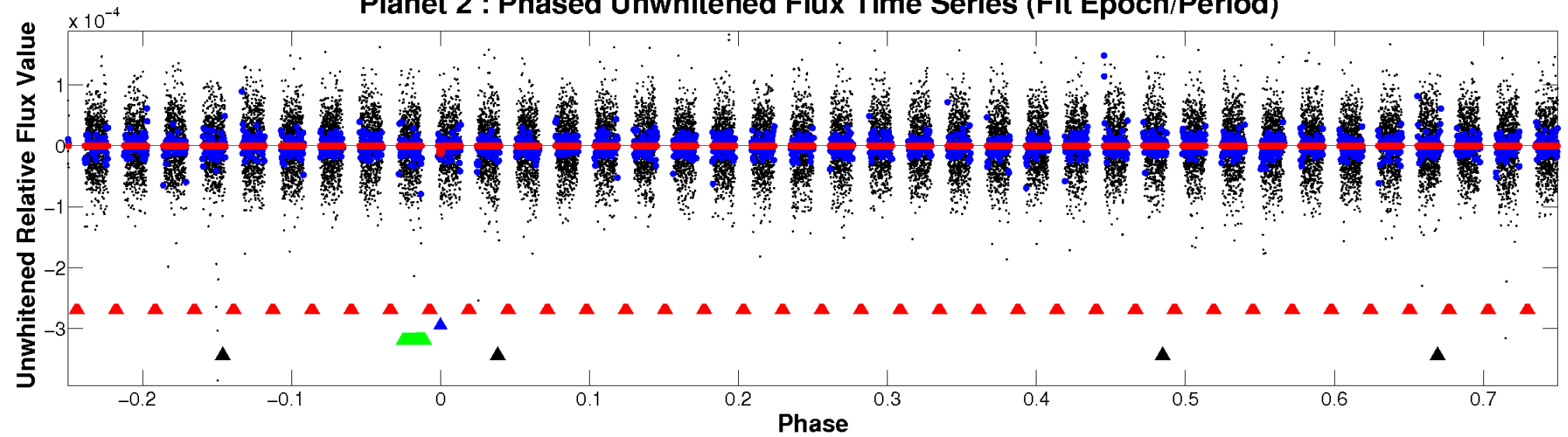
ALT Odd/Even

TCE 010130954-02

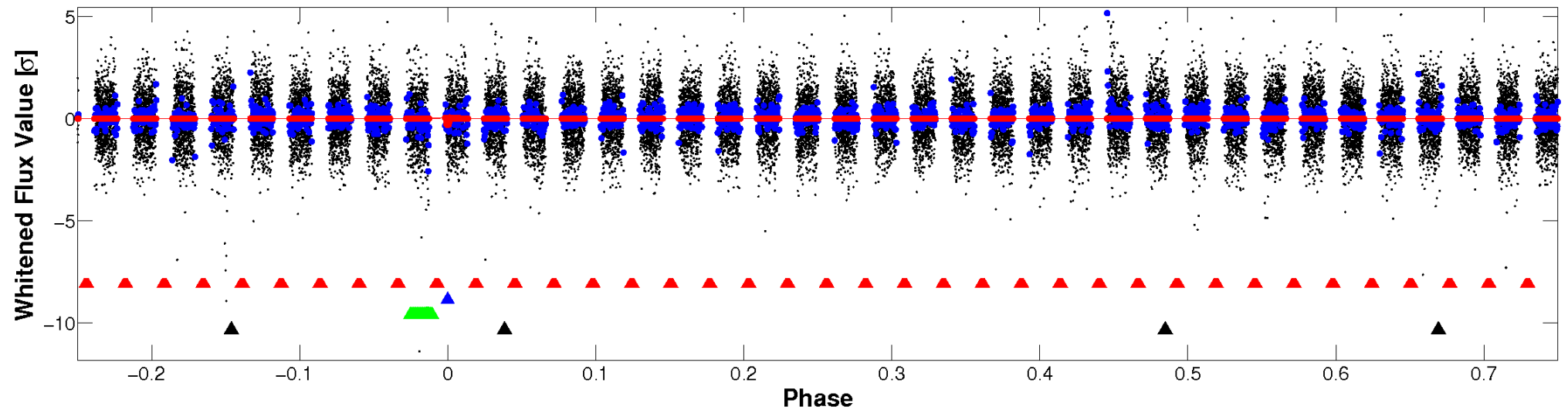


Non-Whitened Vs. Whitened Light Curve

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

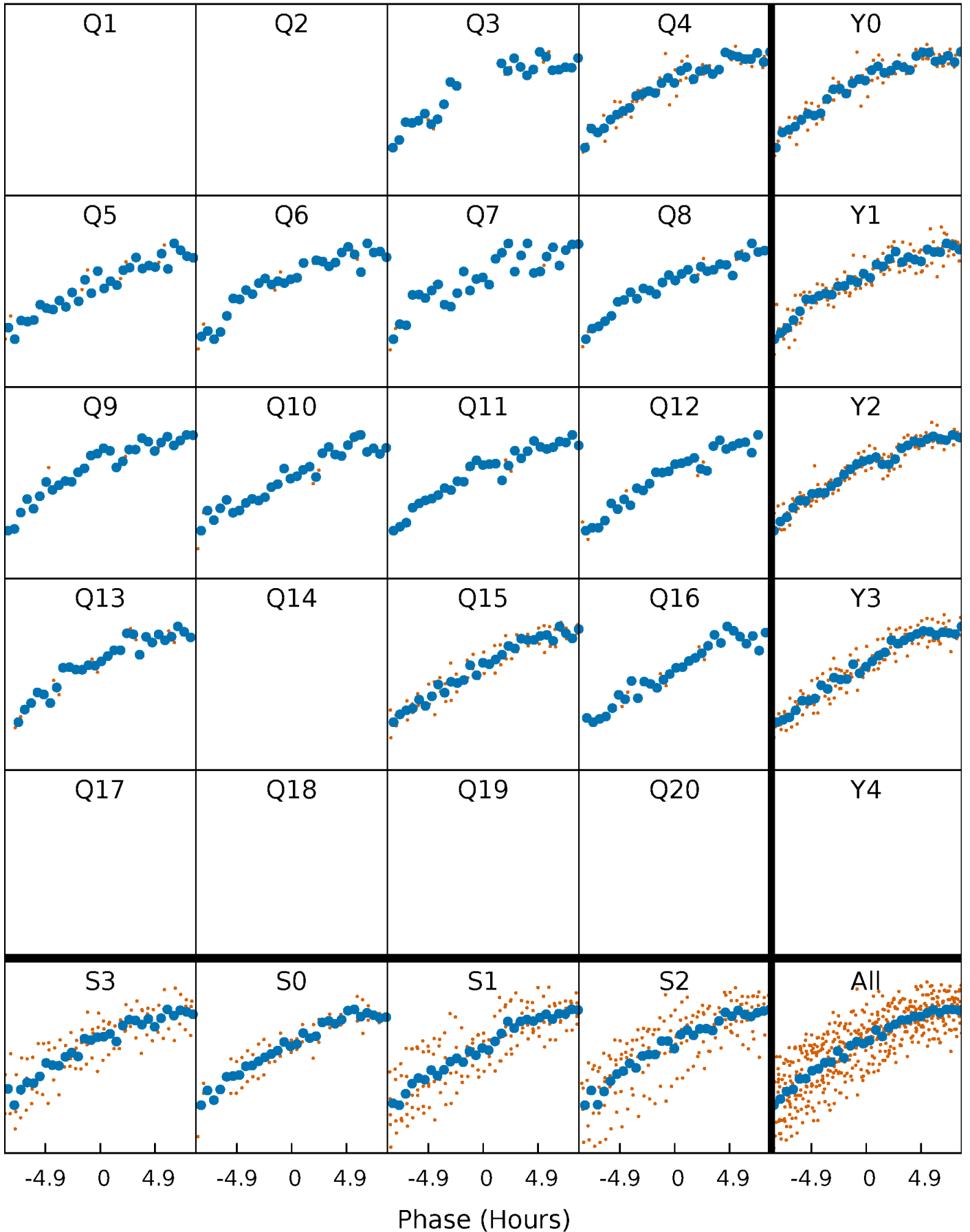


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



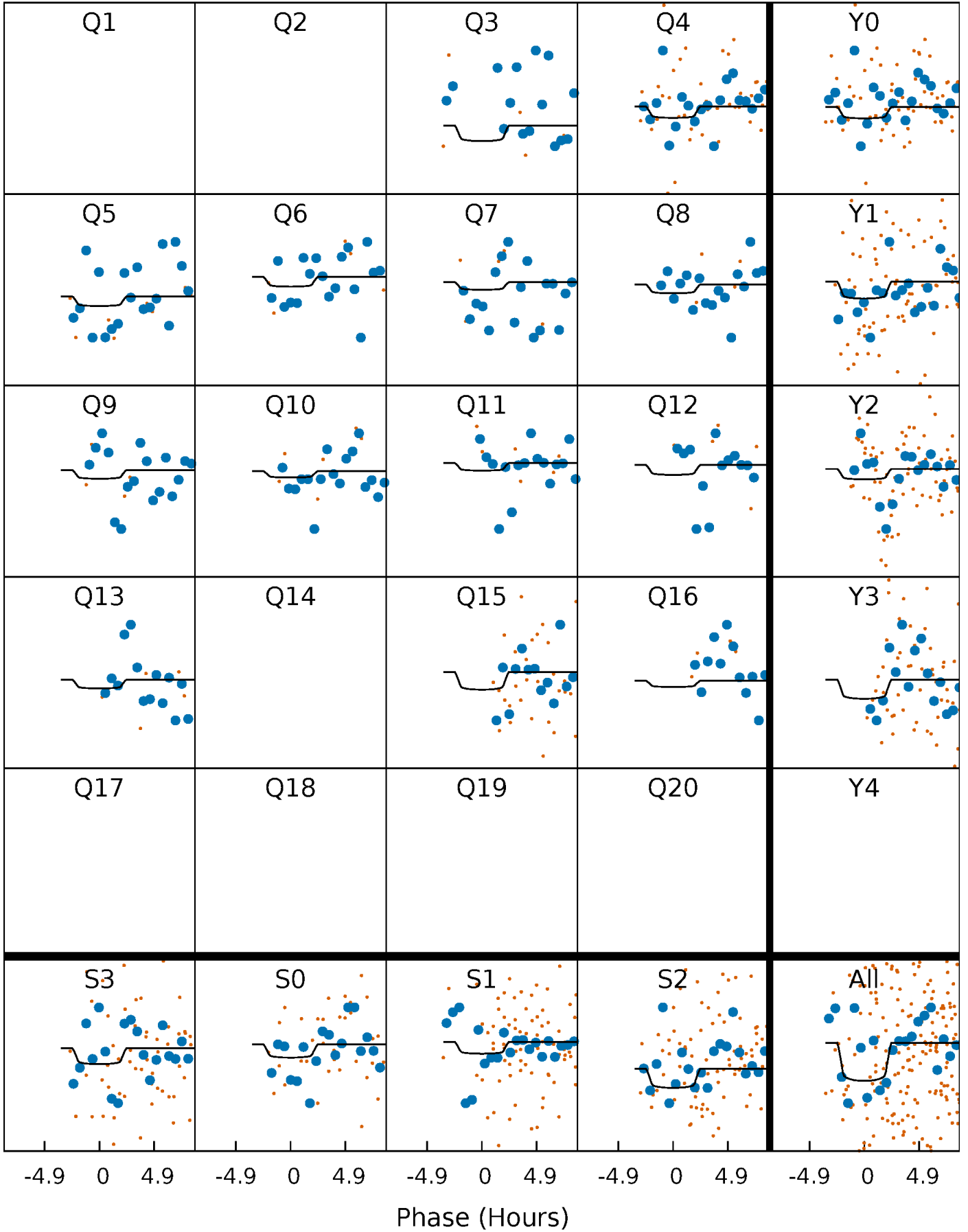
PDC Quarter-Phased Transit Curves

TCE 010130954-02 P= 85.346247 Days $T_0=182.153003$ (BKJD)



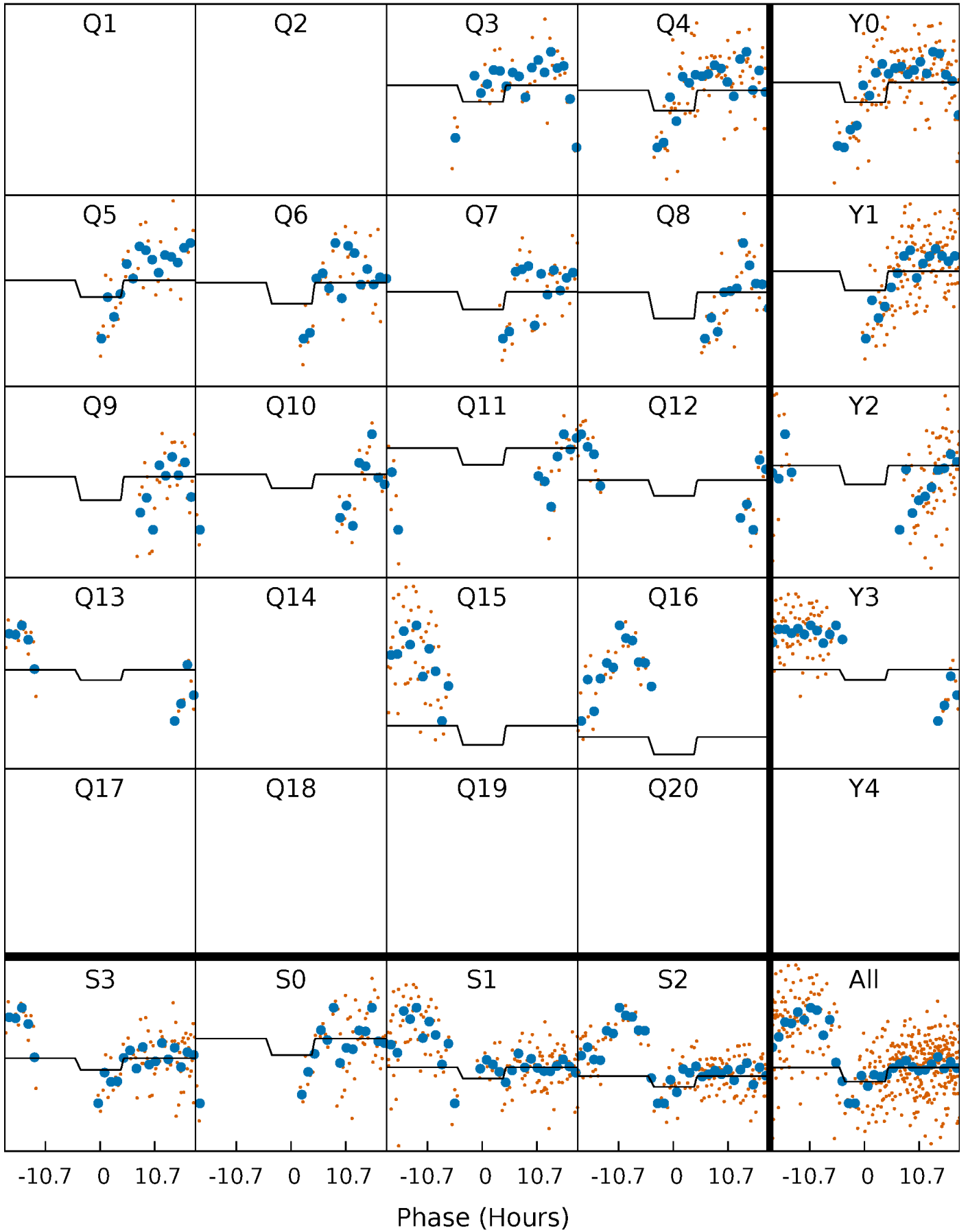
DV Quarter-Phased Transit Curves

TCE 010130954-02 $P = 85.346247$ Days $T_0 = 182.153003$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

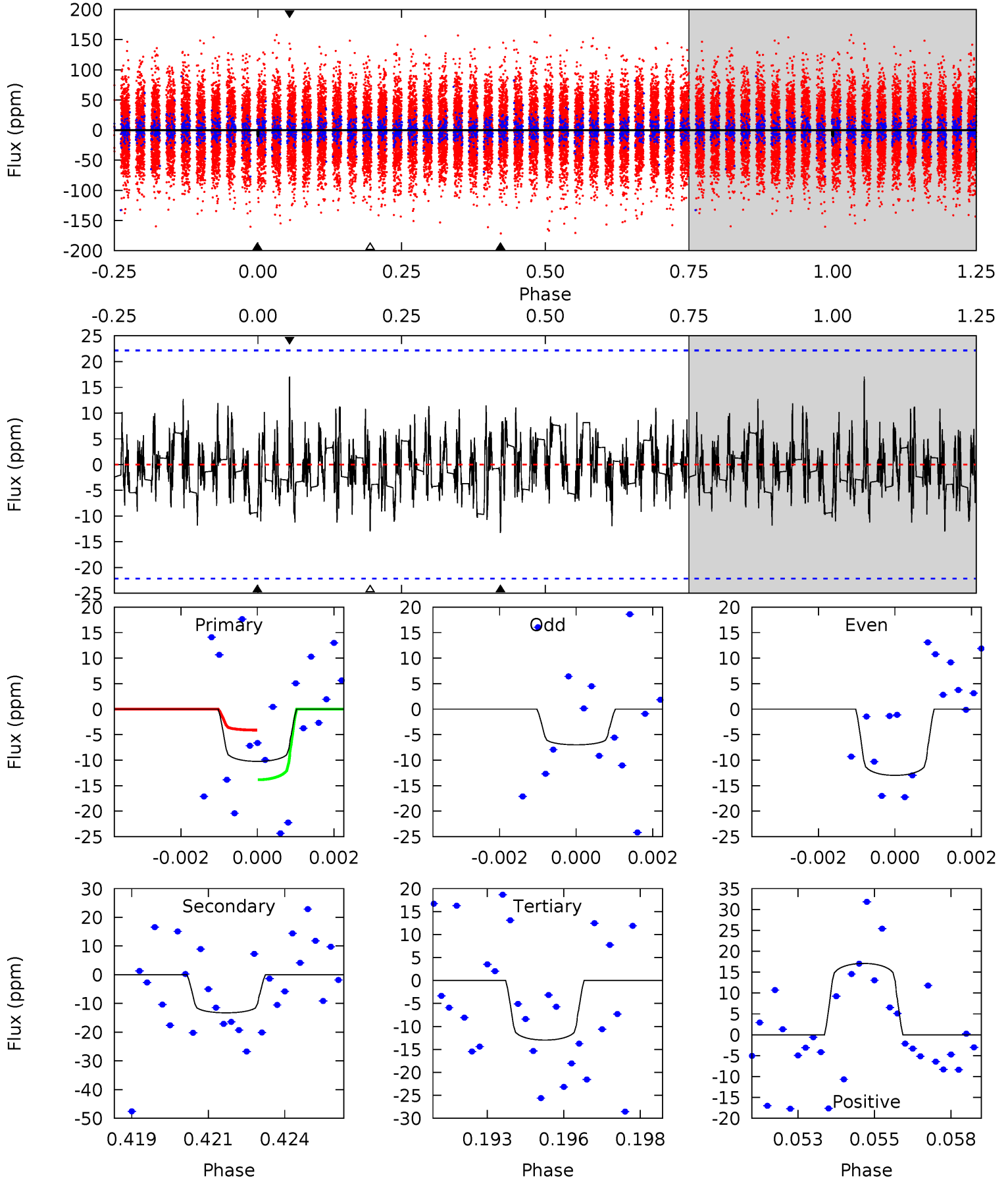
TCE 010130954-02 $P = 85.281529$ Days $T_0 = 182.318466$ (BKJD)



DV Model-Shift Uniqueness Test

010130954-02, P = 85.346247 Days, E = 96.806756 Days

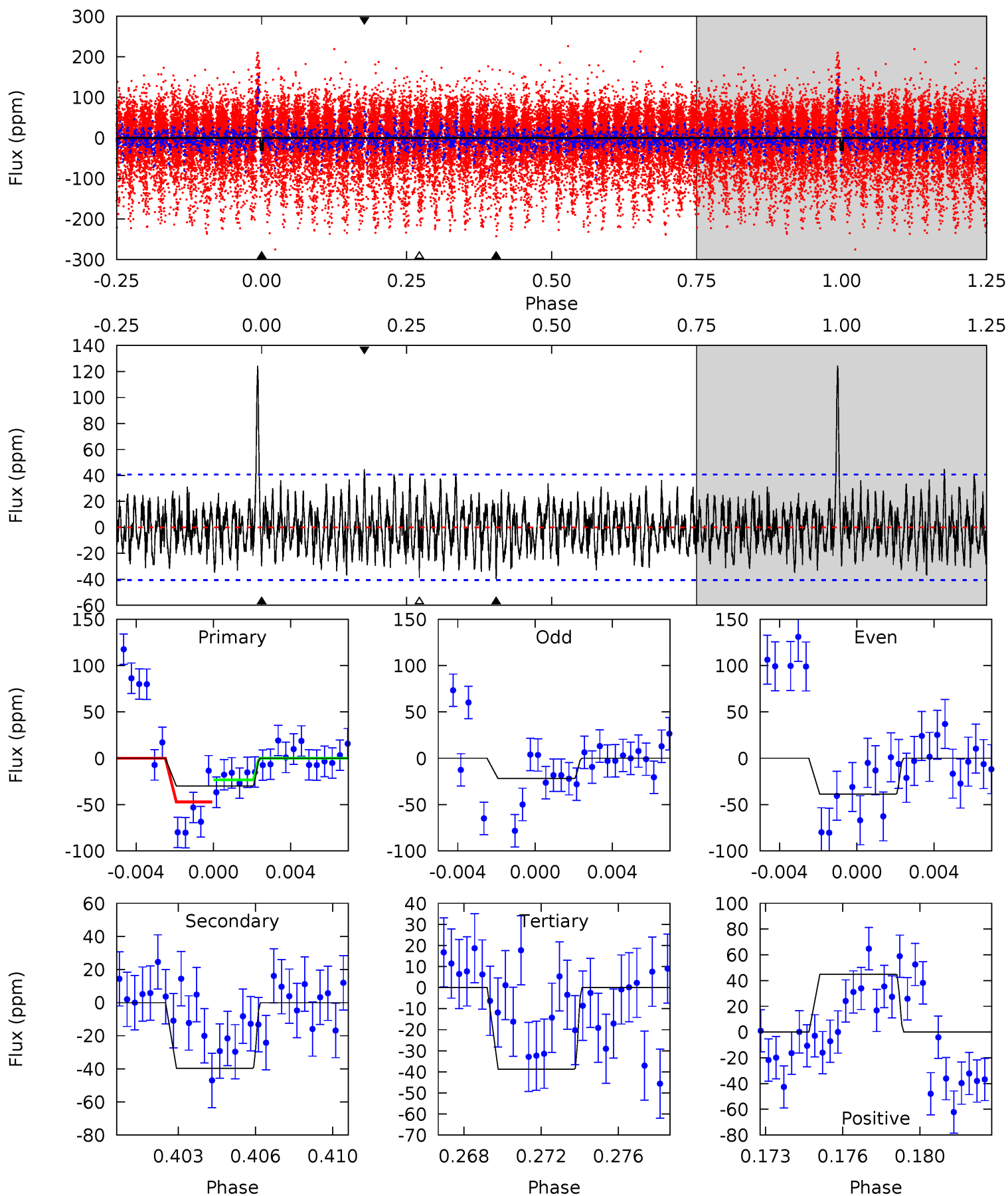
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.45	3.17	3.10	4.09	5.30	3.05	1.03	-0.65	-1.64	0.07	-0.91	0.71	1.30	0.56	1.10



Alt Model-Shift Uniqueness Test

010130954-02, P = 85.281529 Days, E = 97.036937 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.83	5.08	4.96	5.75	5.21	2.89	1.80	-1.12	-1.92	0.12	-0.67	1.09	0.95	0.76	1.31



Stellar Parameters For KIC 010130954

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	14652^{+344}_{-774}	$4.020^{+0.340}_{-0.013}$	$-1.000^{+0.300}_{-0.300}$	$2.840^{+0.041}_{-1.051}$	$3.080^{+-1.000}_{-0.467}$	$0.189^{+0.468}_{-0.008}$
	+2%/-5%	+8%/-0%	+30%/-30%	+1%/-37%	+32%/-15%	+247%/-4%
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 010130954-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-13 ± 4	$1.66^{+1.46}_{-1.05}$	1976^{+104}_{-159}	9896^{+16520}_{-3357}	808^{+5491}_{-603}
Alt.	-40 ± 8	$1.92^{+1.66}_{-1.30}$	1977^{+101}_{-195}	13239^{+37294}_{-4825}	1830^{+14390}_{-1318}

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 $A_{obs} \gg 1.0$

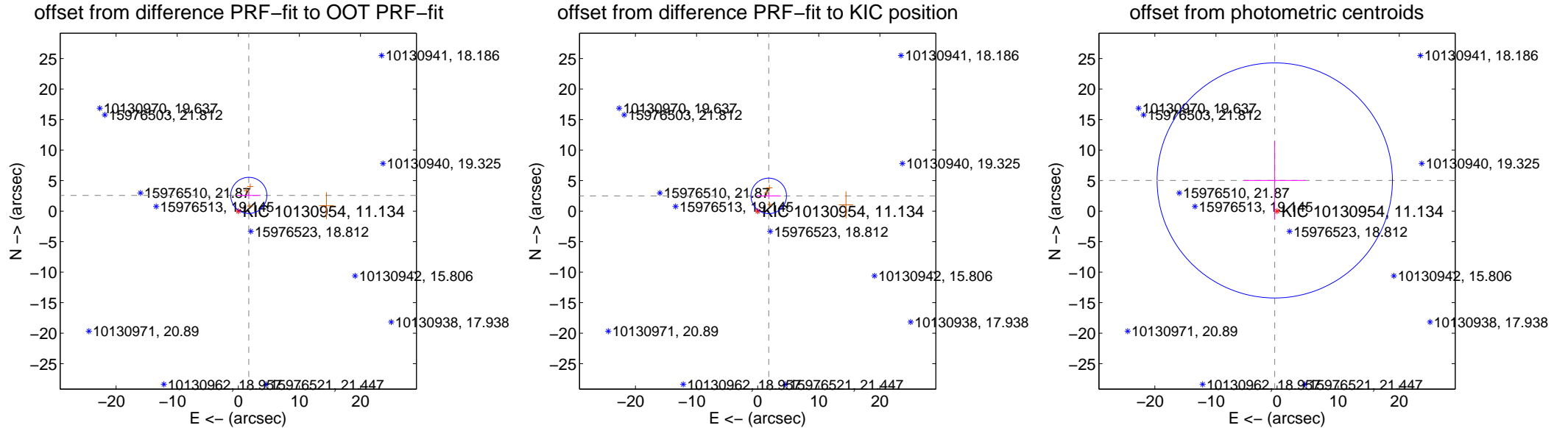
DV Centroid Data

Supplemental centroid analysis for 010130954-02. **Kepler magnitude: 11.13.** Transit SNR 2.53

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.100 ± 0.987	3.14	-1.722 ± 1.933	2.578 ± 0.607
PRF-fit source offset from KIC position	3.084 ± 0.969	3.18	-1.811 ± 1.982	2.497 ± 0.518
photometric centroid source offset	5.04 ± 6.42	0.79	0.37 ± 5.06	5.03 ± 6.43



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



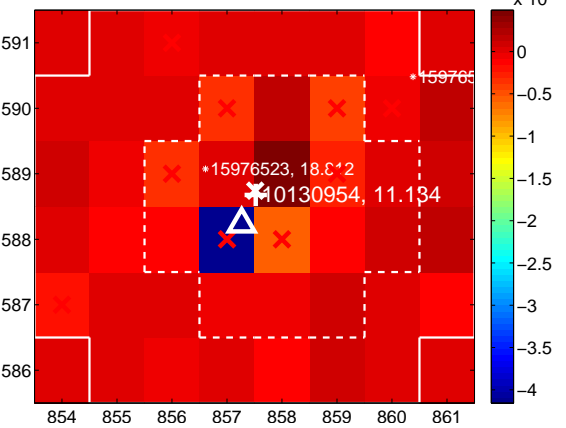
Q3 no difference image



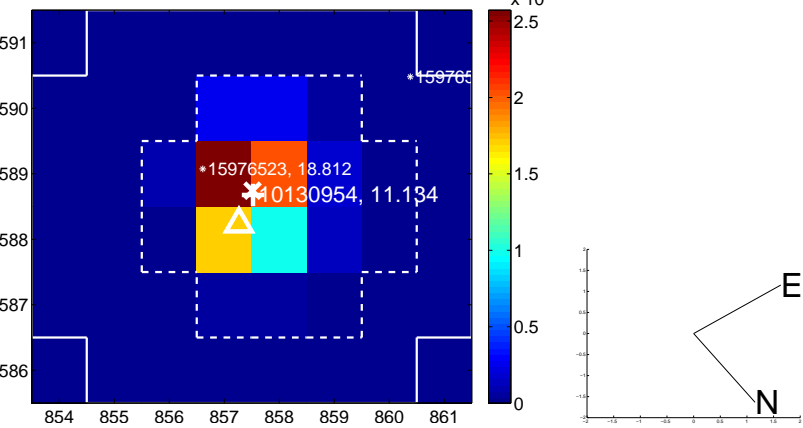
Q3 no OOT image



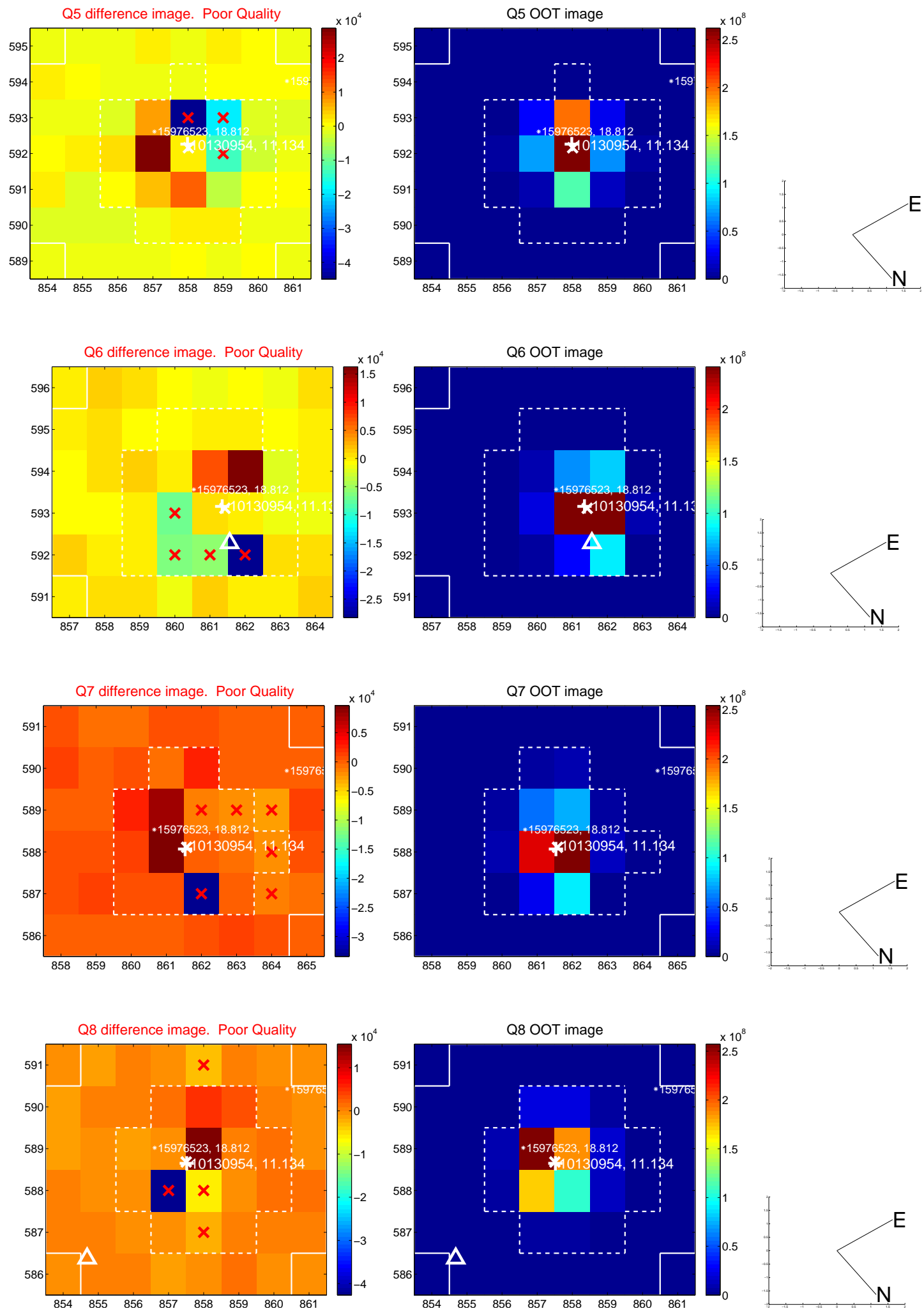
Q4 difference image. Poor Quality



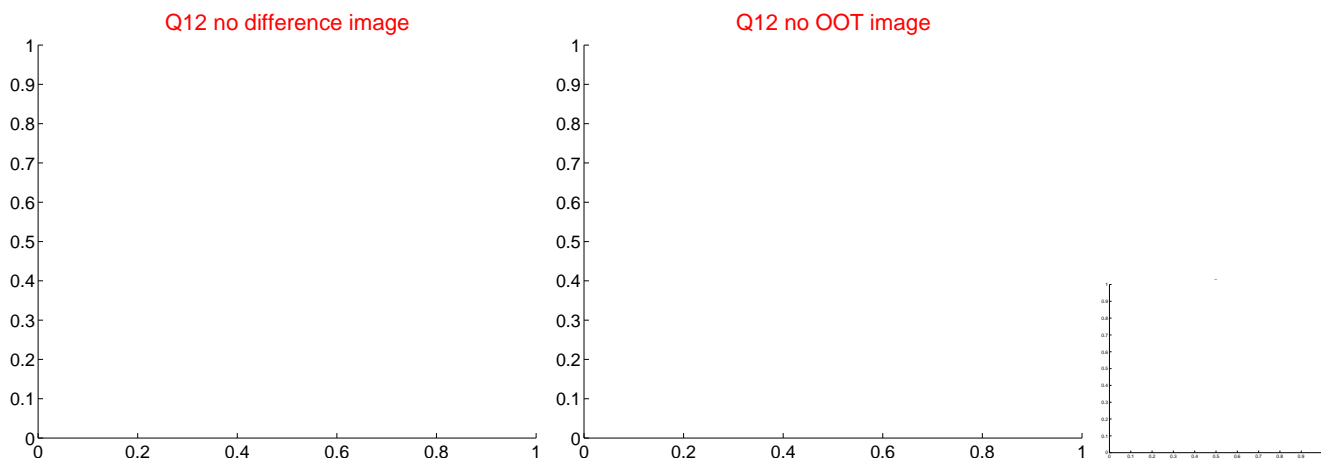
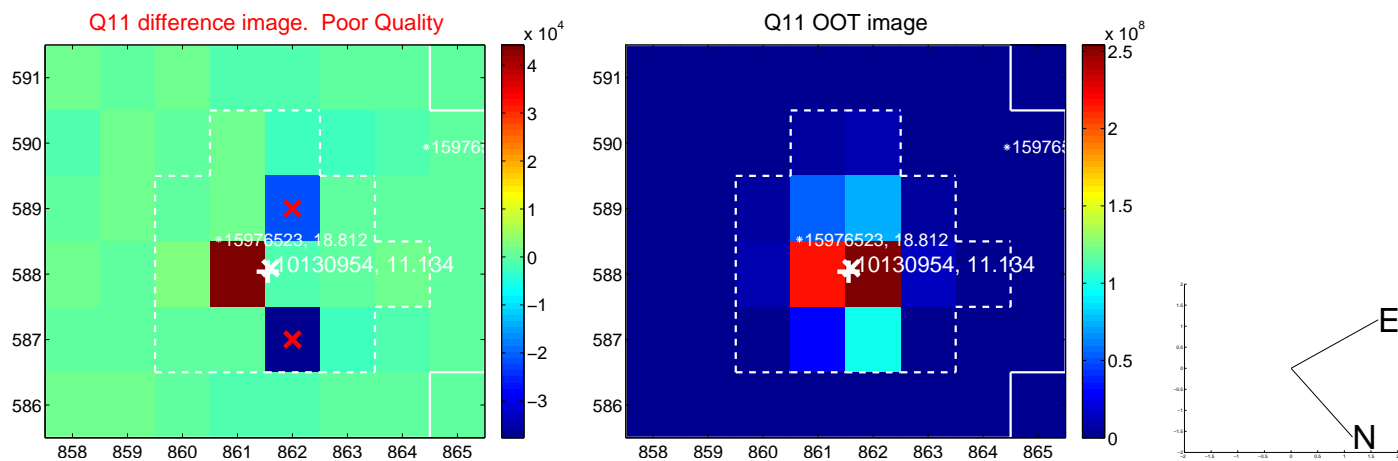
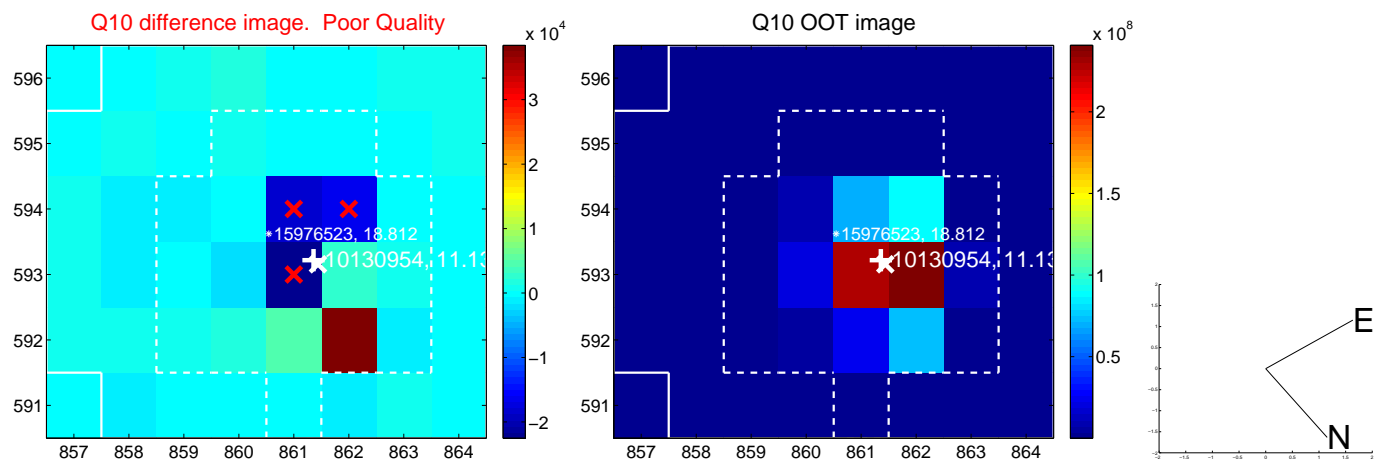
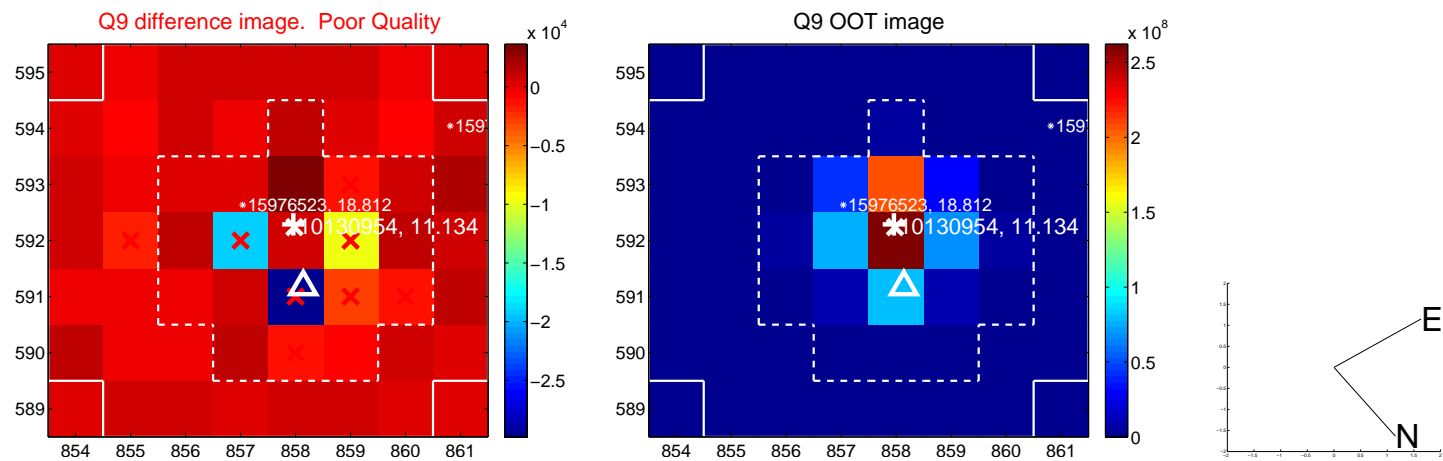
Q4 OOT image



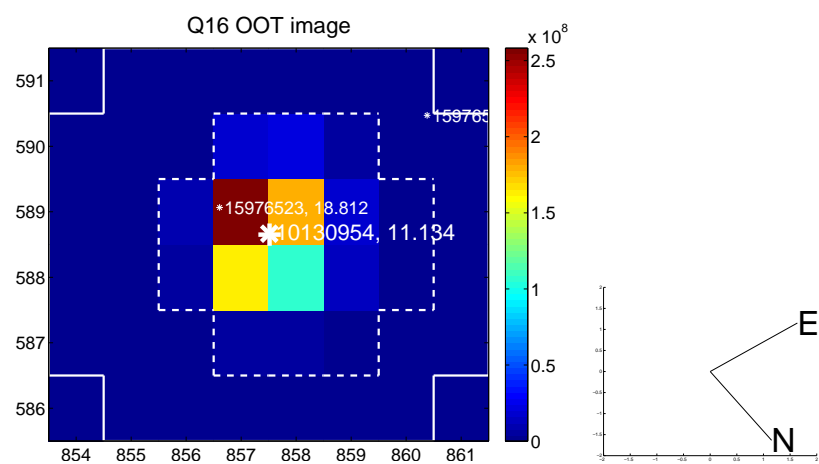
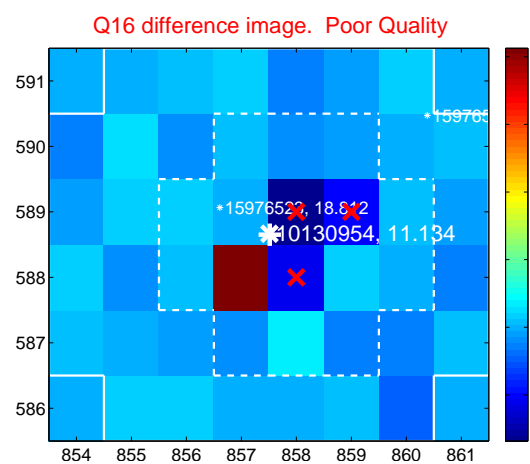
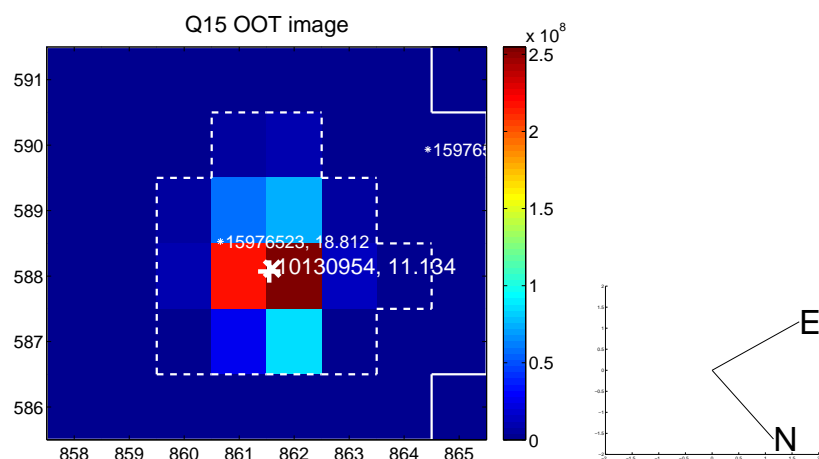
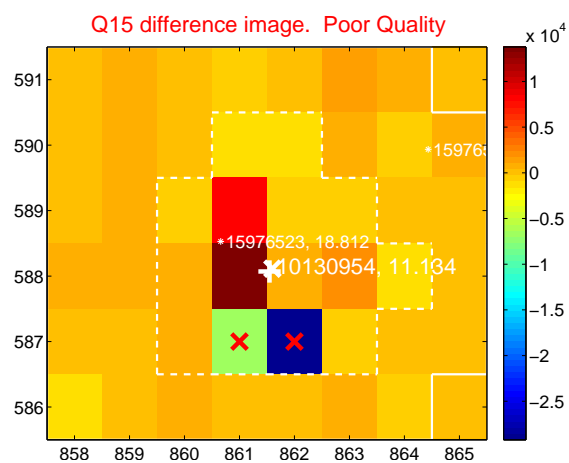
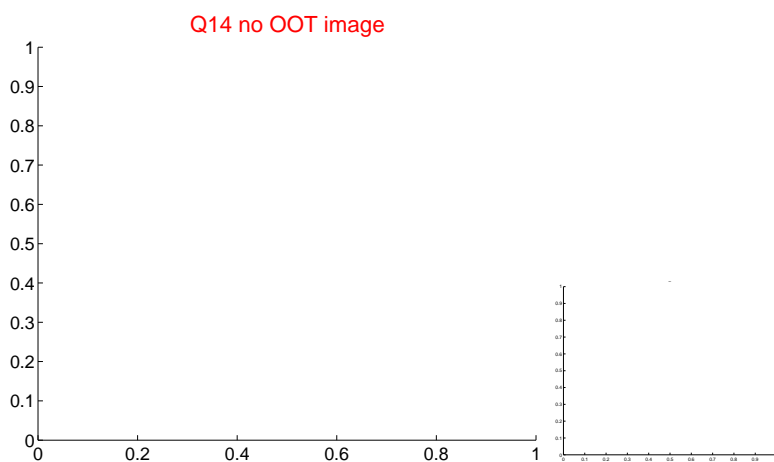
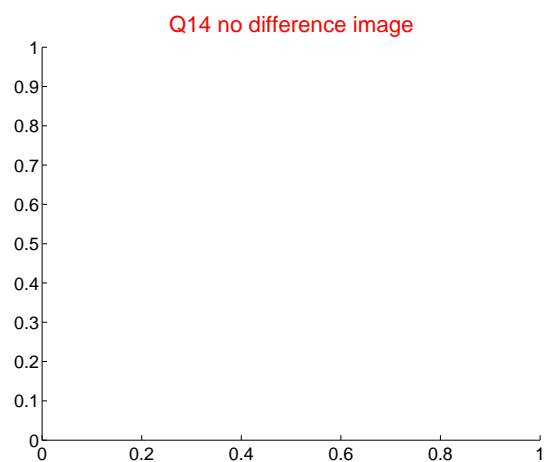
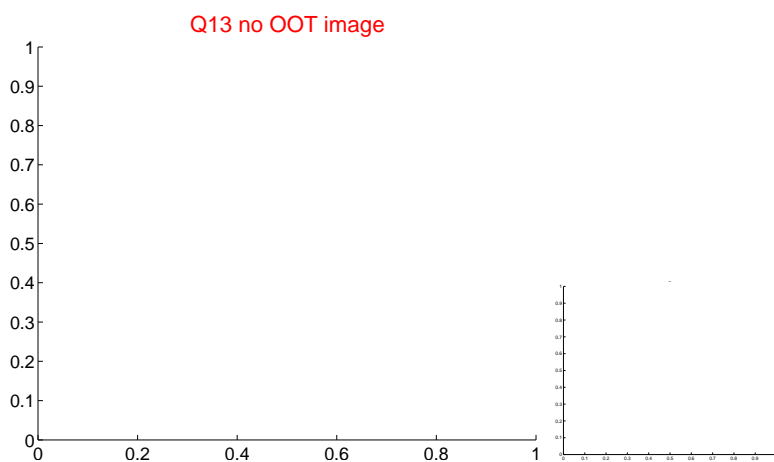
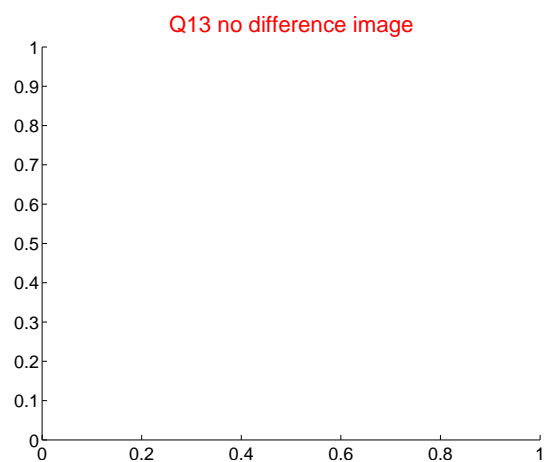
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



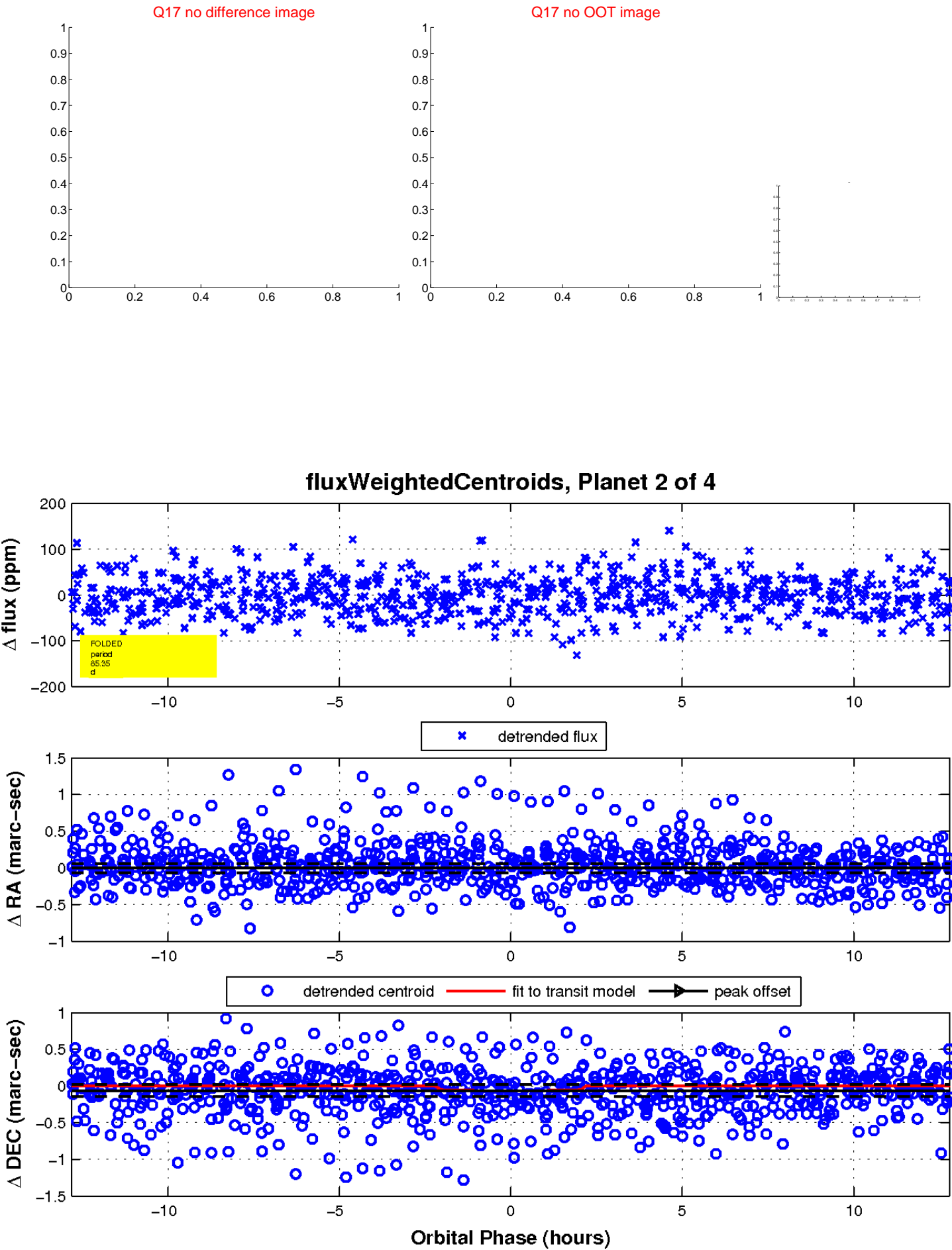
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

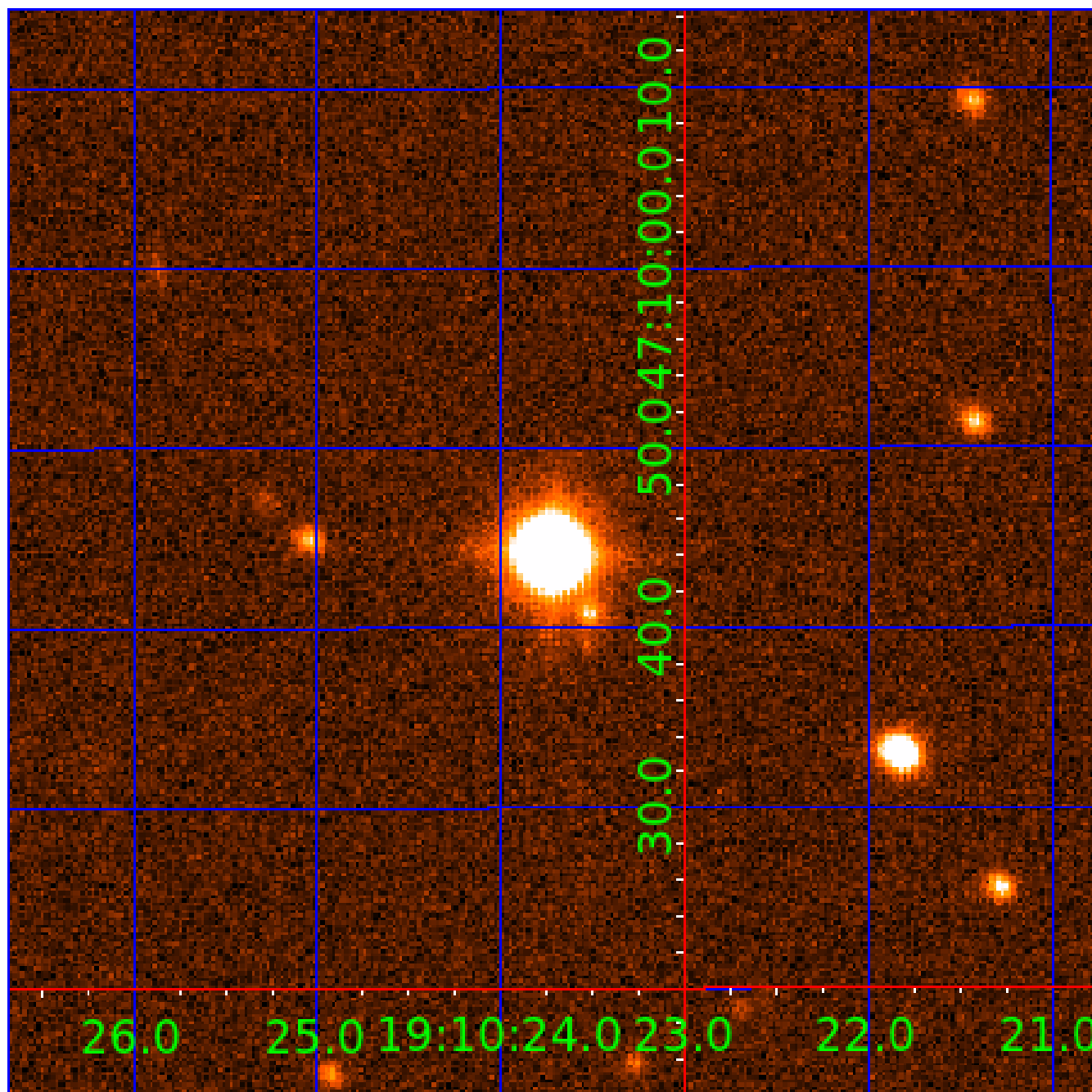


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010130954

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})
010130954-01	OBS	No	2.246322	132.005918	5.4	8.778	8.2	7.1	2.84	14652	1.18	139550.54
010130954-02	OBS	No	85.346247	182.153003	12.9	4.277	11.4	2.5	2.84	14652	1.07	1092.57
010130954-03	OBS	No	85.267672	181.255839	5.0	8.860	12.1	1.3	2.84	14652	0.72	1093.91
010130954-04	OBS	No	442.482221	223.526686	53.7	3.965	7.9	5.3	2.84	14652	2.36	121.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010130954-01	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_SATURATED—HALO_GHOST
010130954-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
010130954-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010130954-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED

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

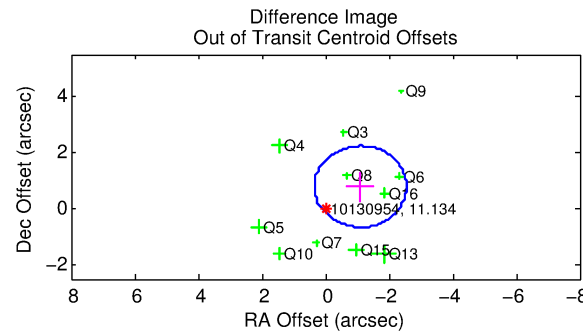
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

Ephemeris Match Information For 010130954-03

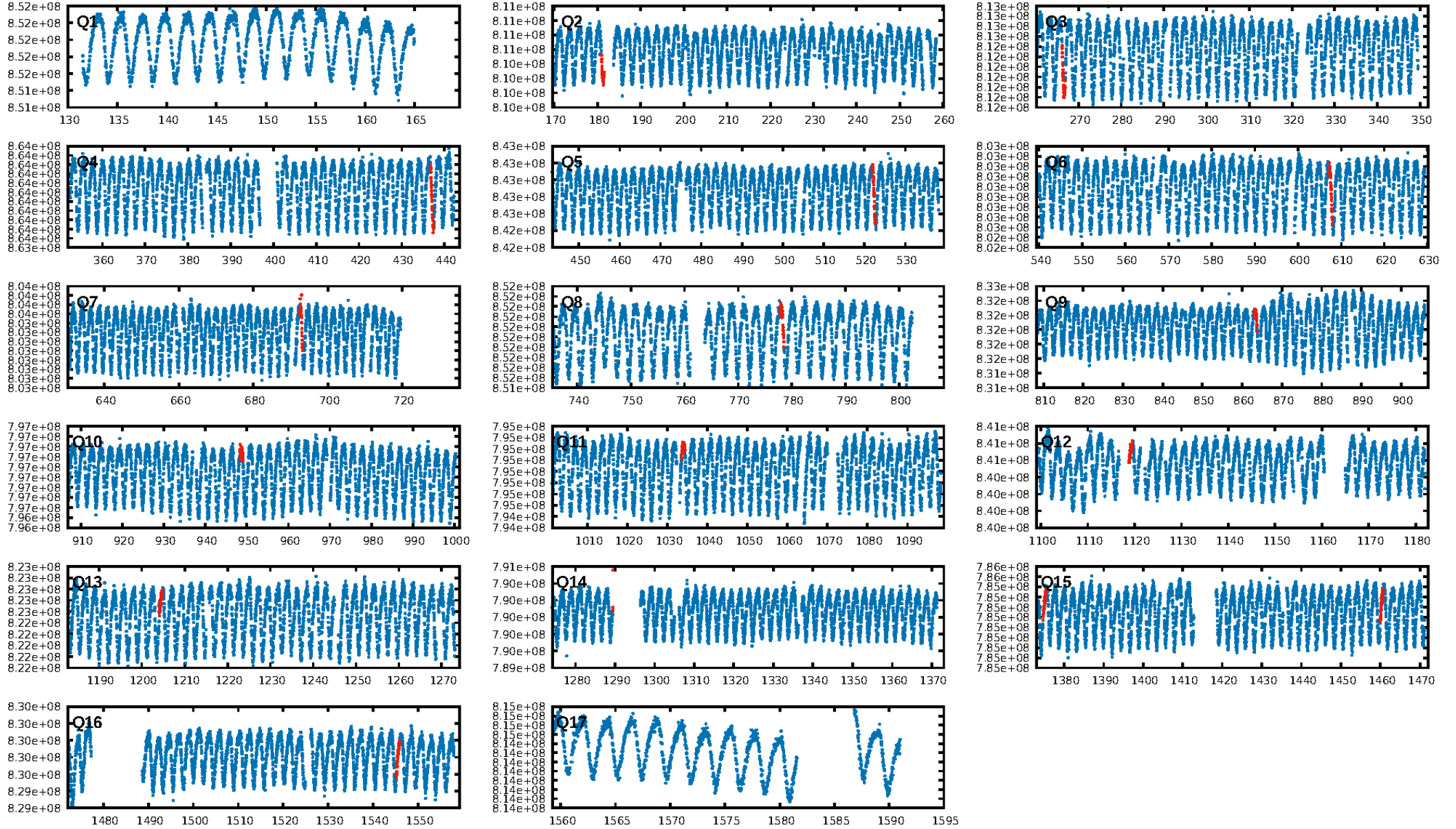
No Significant Match Found

KIC: 10130954 Candidate: 3 of 4 Period: 85.268 d

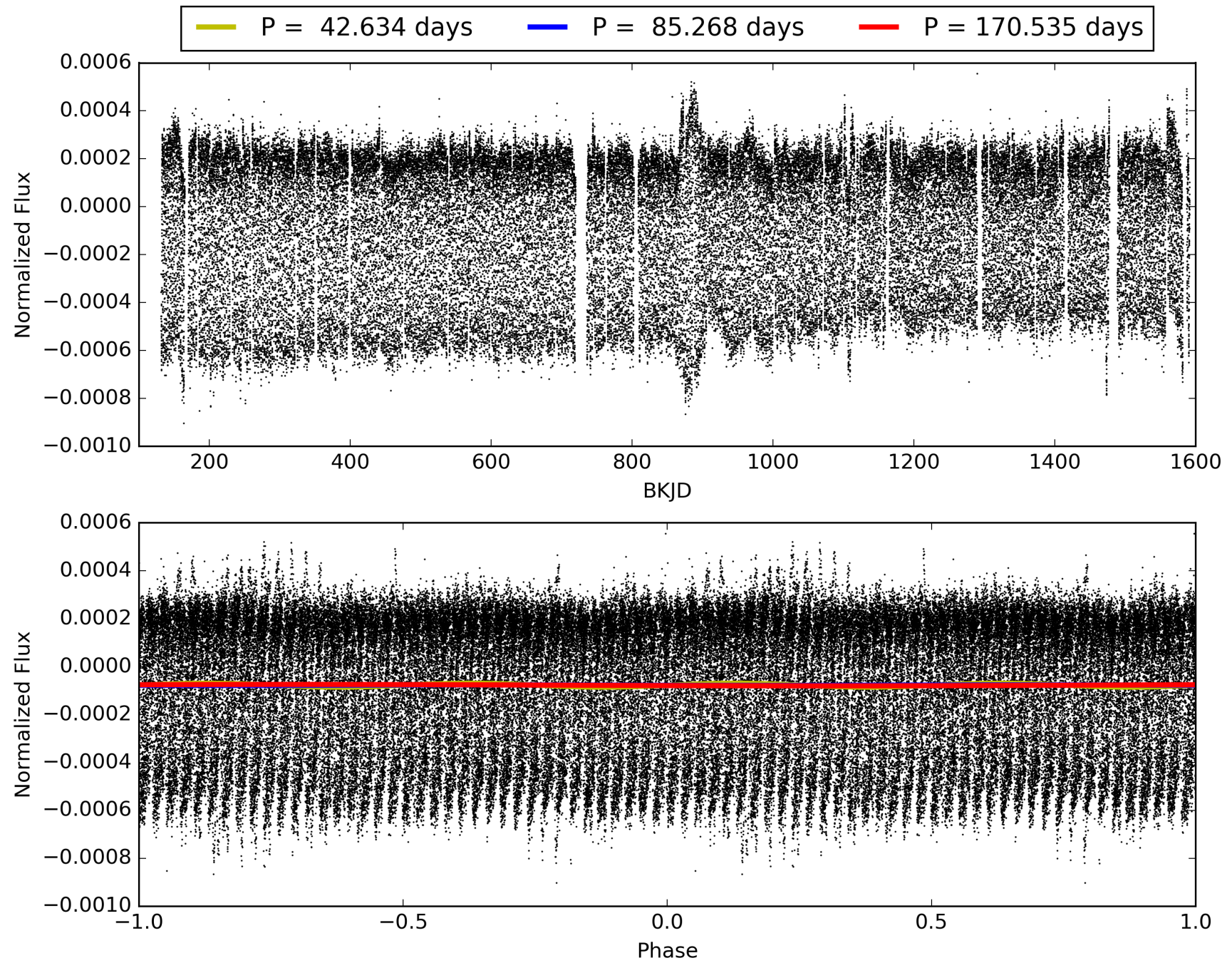


ShortPeriod-sig: 100.0% [159.75s]
LongPeriod-sig: 15.2% [0.19s]
ModelChiSquare2-sig: 57.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.45e-20
RollingBand-fgt: 1.00 [13/13]
GhostDiagnostic-chr: -1.268
Centroid-sig: 0.0%
Centroid-so: 39.766 arcsec [2.67s]
OotOffset-rm: 1.351 arcsec [2.80s]
KicOffset-rm: 1.458 arcsec [2.48s]
OotOffset-st: 2/3/3/3 [11]
KicOffset-st: 2/3/3/3 [11]
DiffImageQuality-fgm: 0.18 [2/11]
DiffImageOverlap-fno: 0.27 [3/11]

TCE 010130954-03, PDC Light Curves

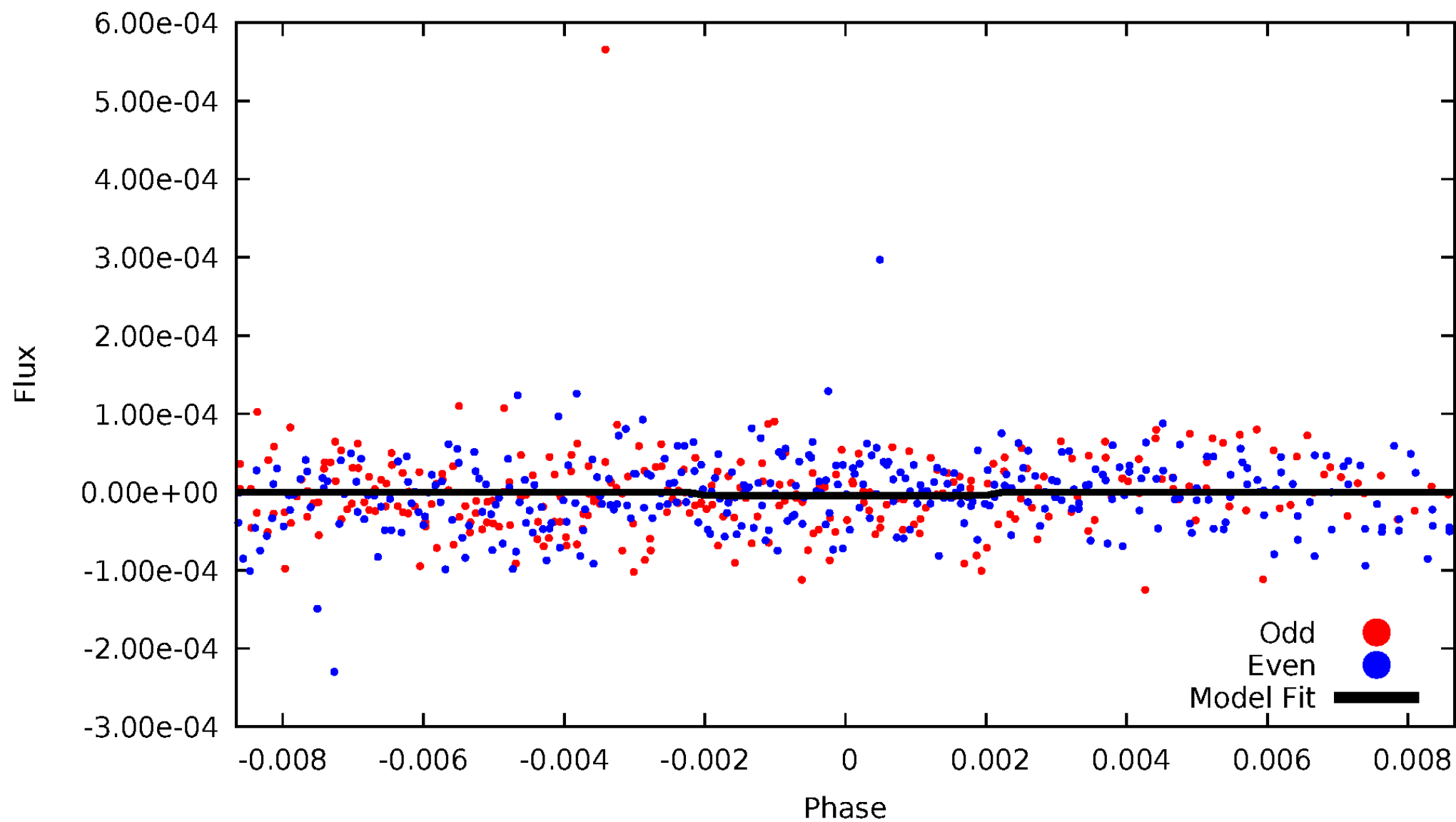


TCE 010130954-03



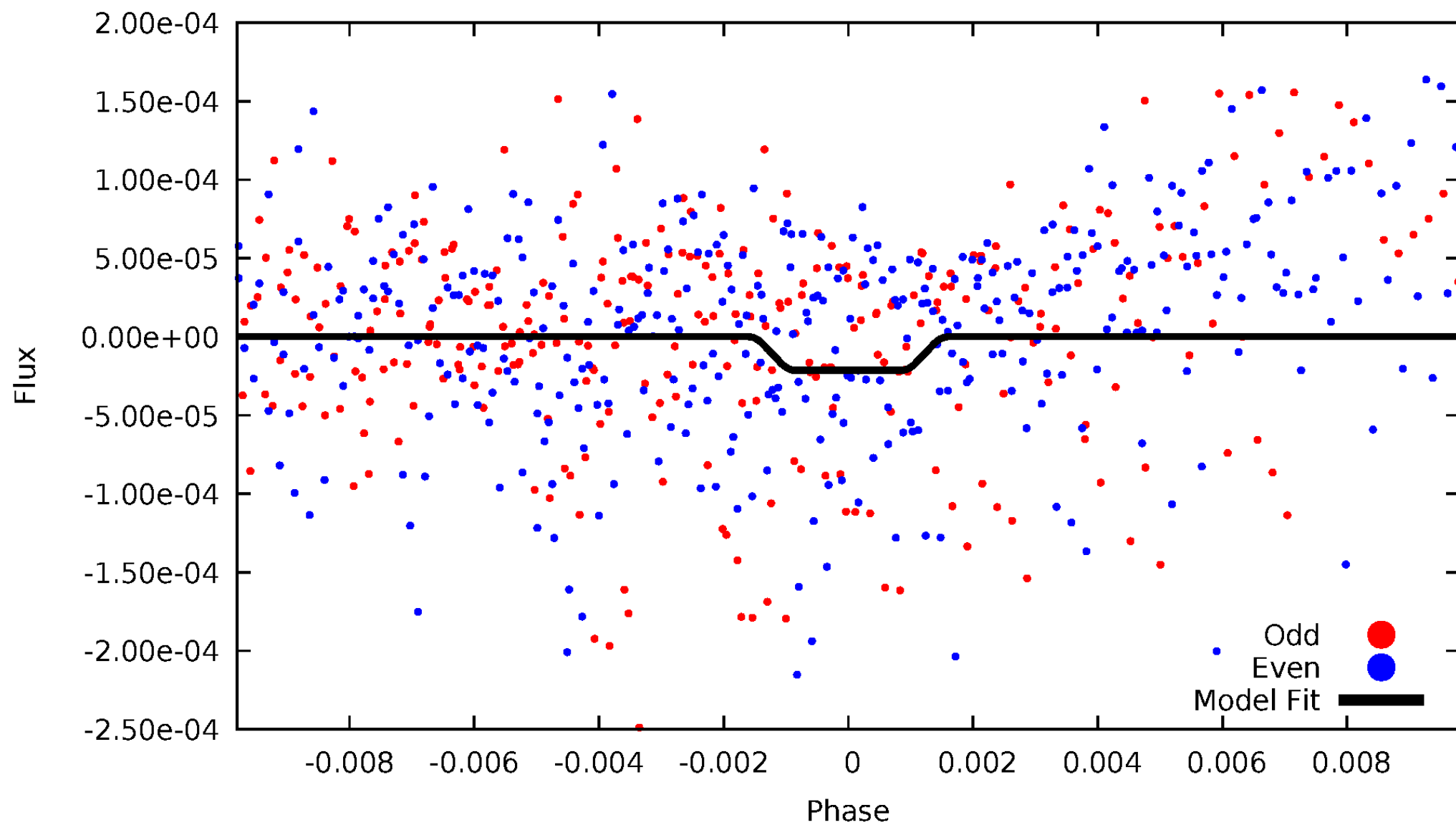
DV Odd/Even

TCE 010130954-03



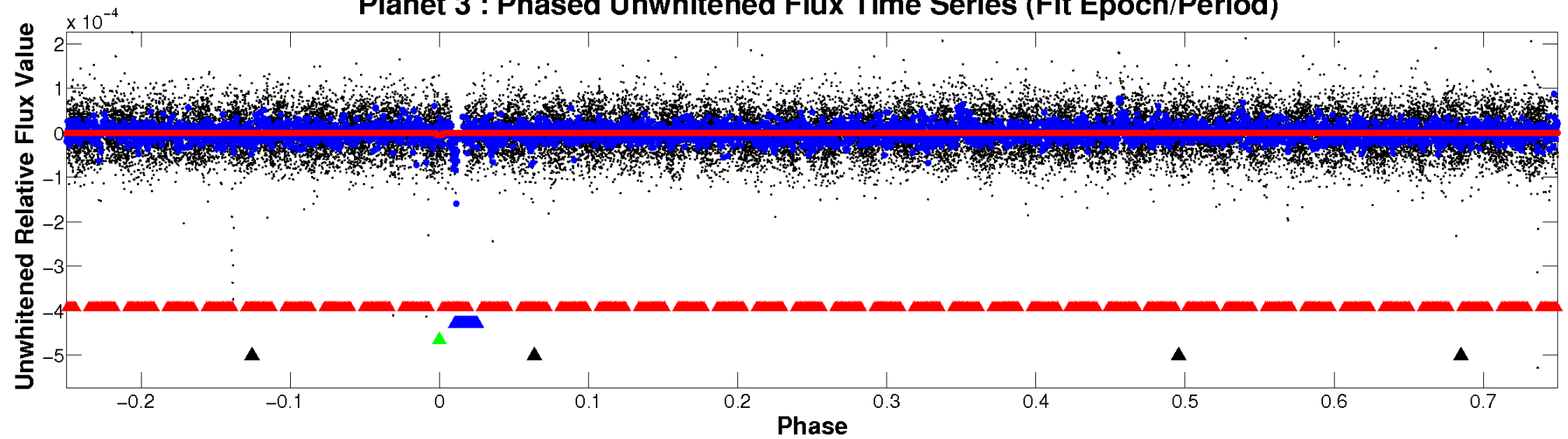
ALT Odd/Even

TCE 010130954-03

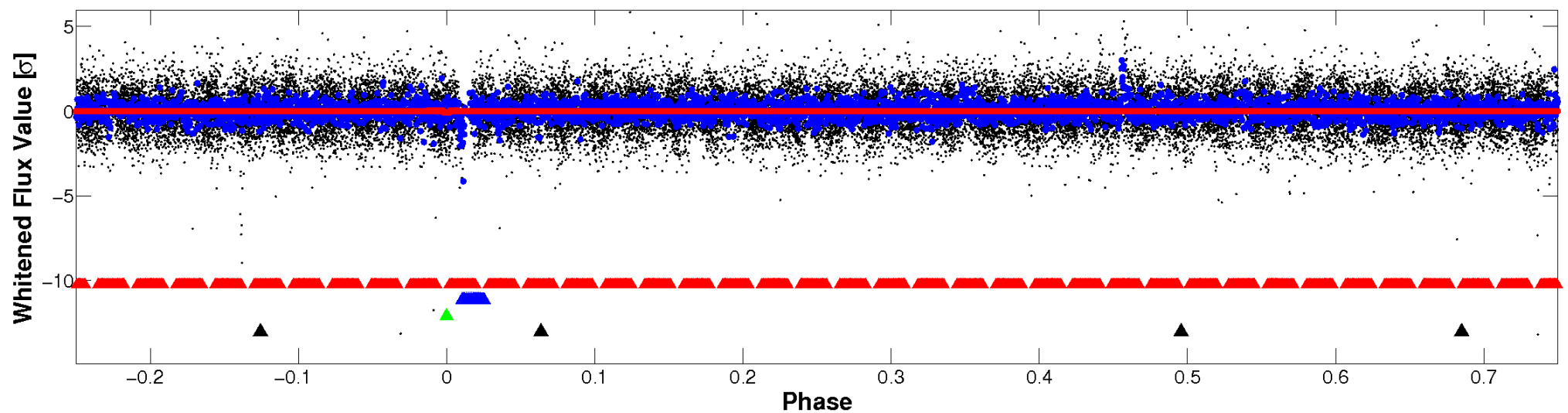


Non-Whitened Vs. Whitened Light Curve

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

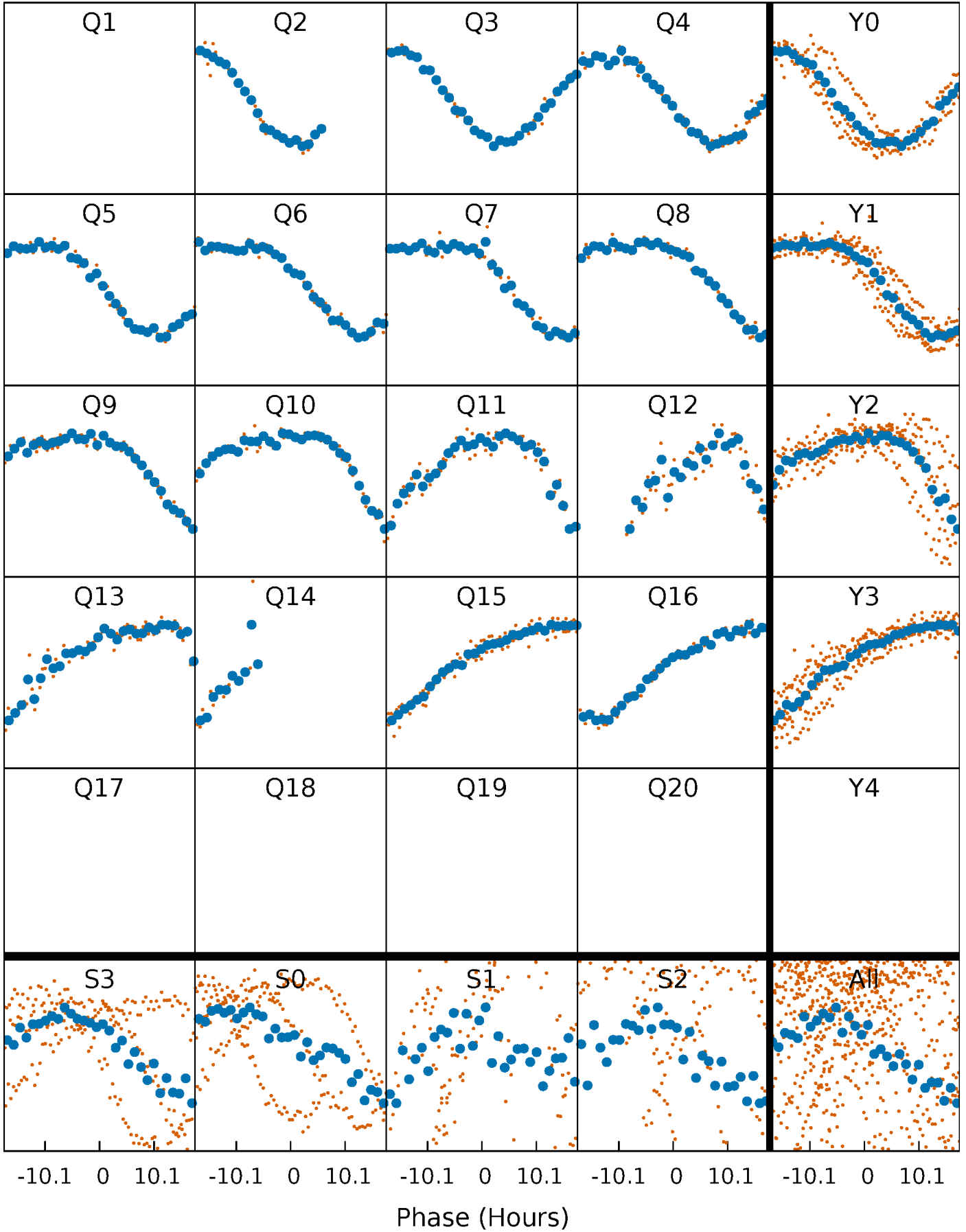


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



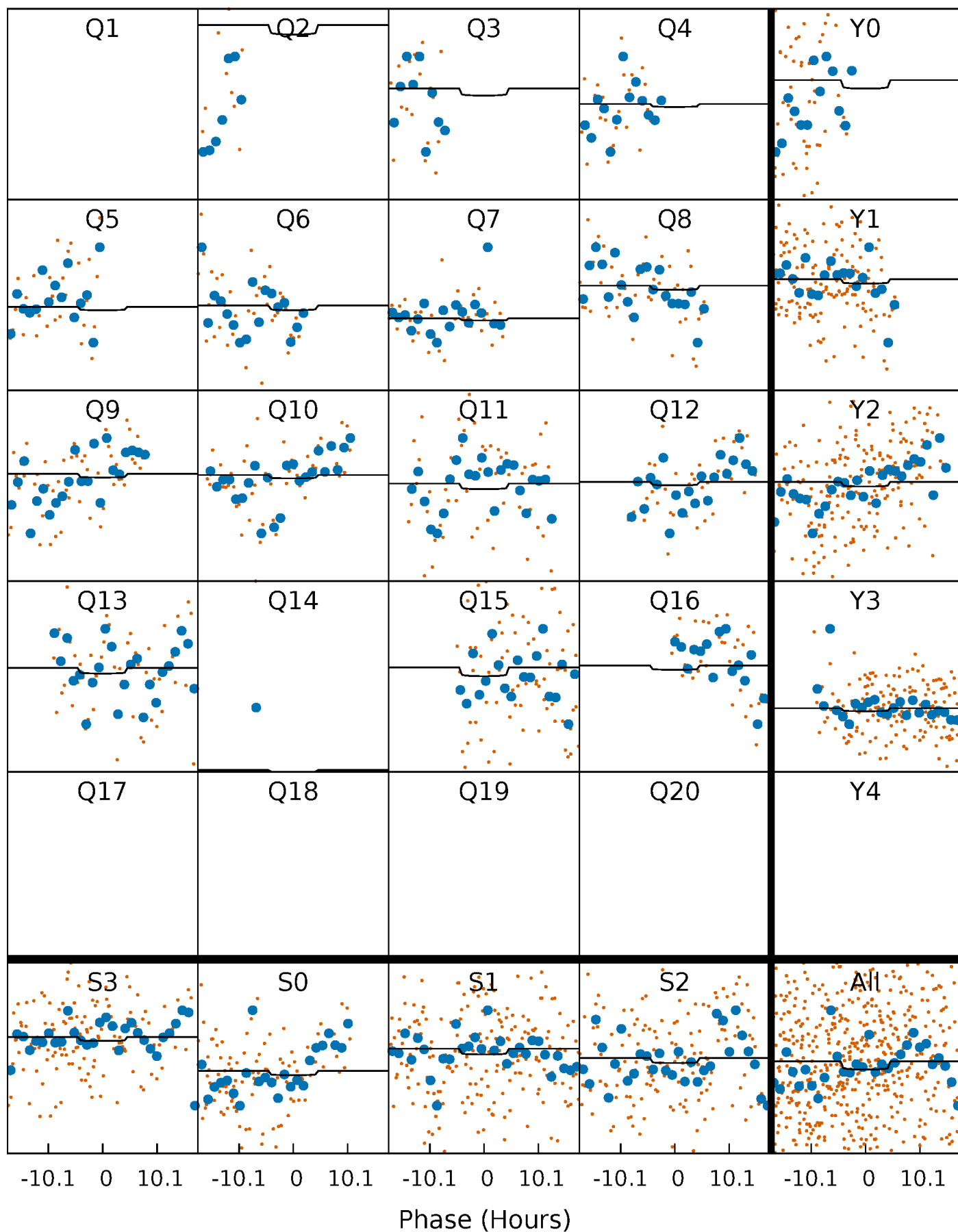
PDC Quarter-Phased Transit Curves

TCE 010130954-03 P= 85.267672 Days $T_0=181.255839$ (BKJD)



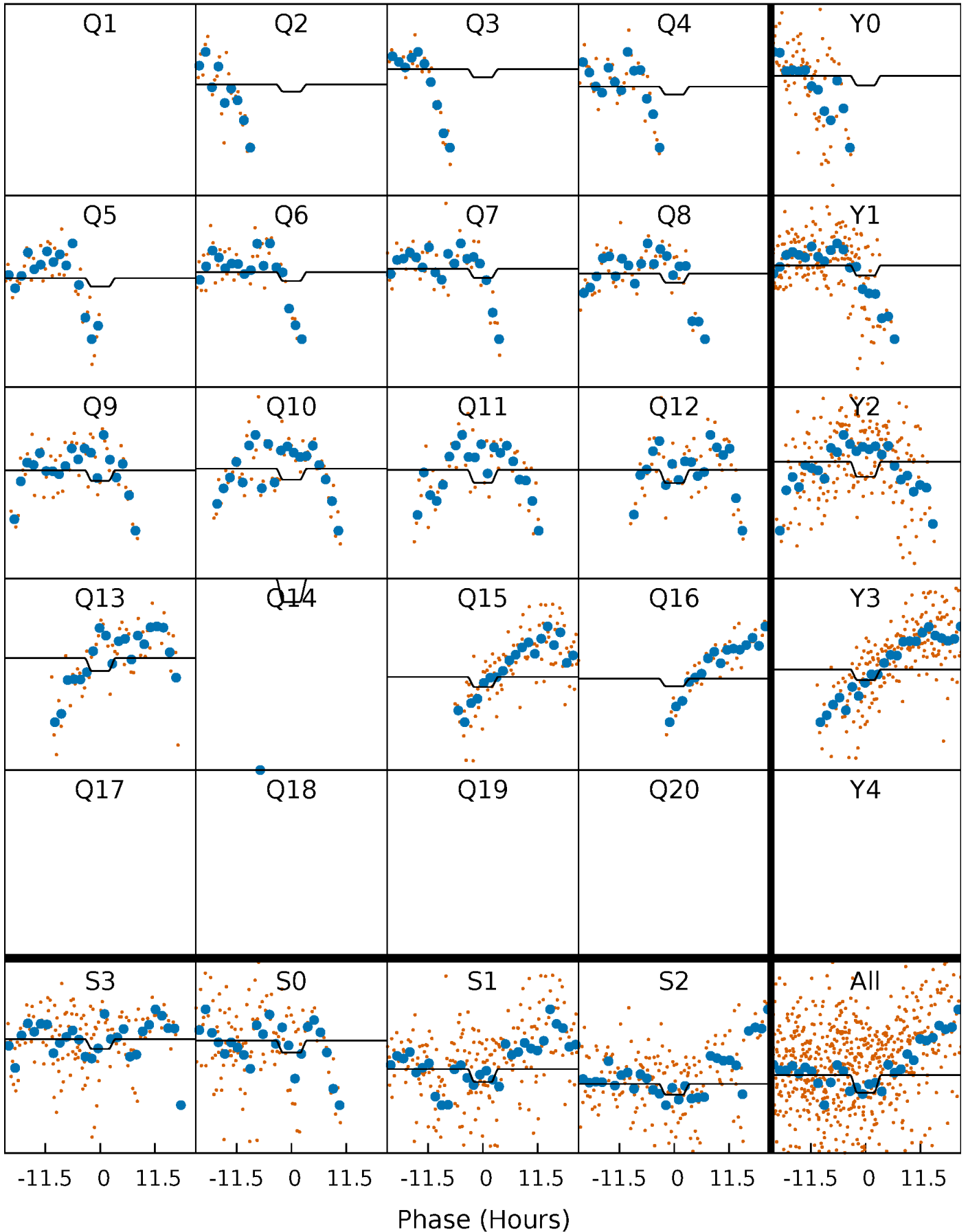
DV Quarter-Phased Transit Curves

TCE 010130954-03 $P = 85.267672$ Days $T_0 = 181.255839$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

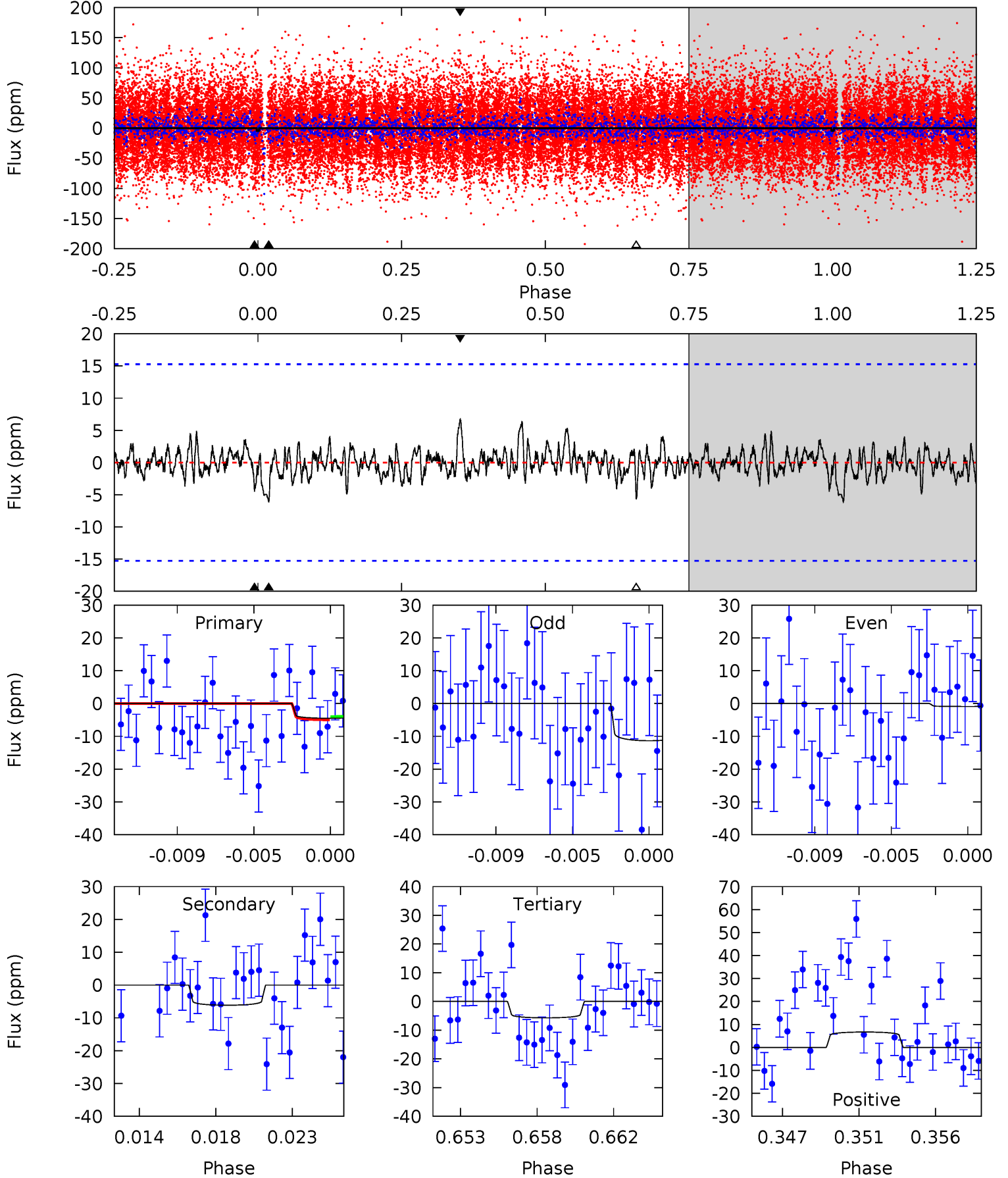
TCE 010130954-03 $P = 85.272383$ Days $T_0 = 181.224851$ (BKJD)



DV Model-Shift Uniqueness Test

010130954-03, P = 85.267672 Days, E = 95.988167 Days

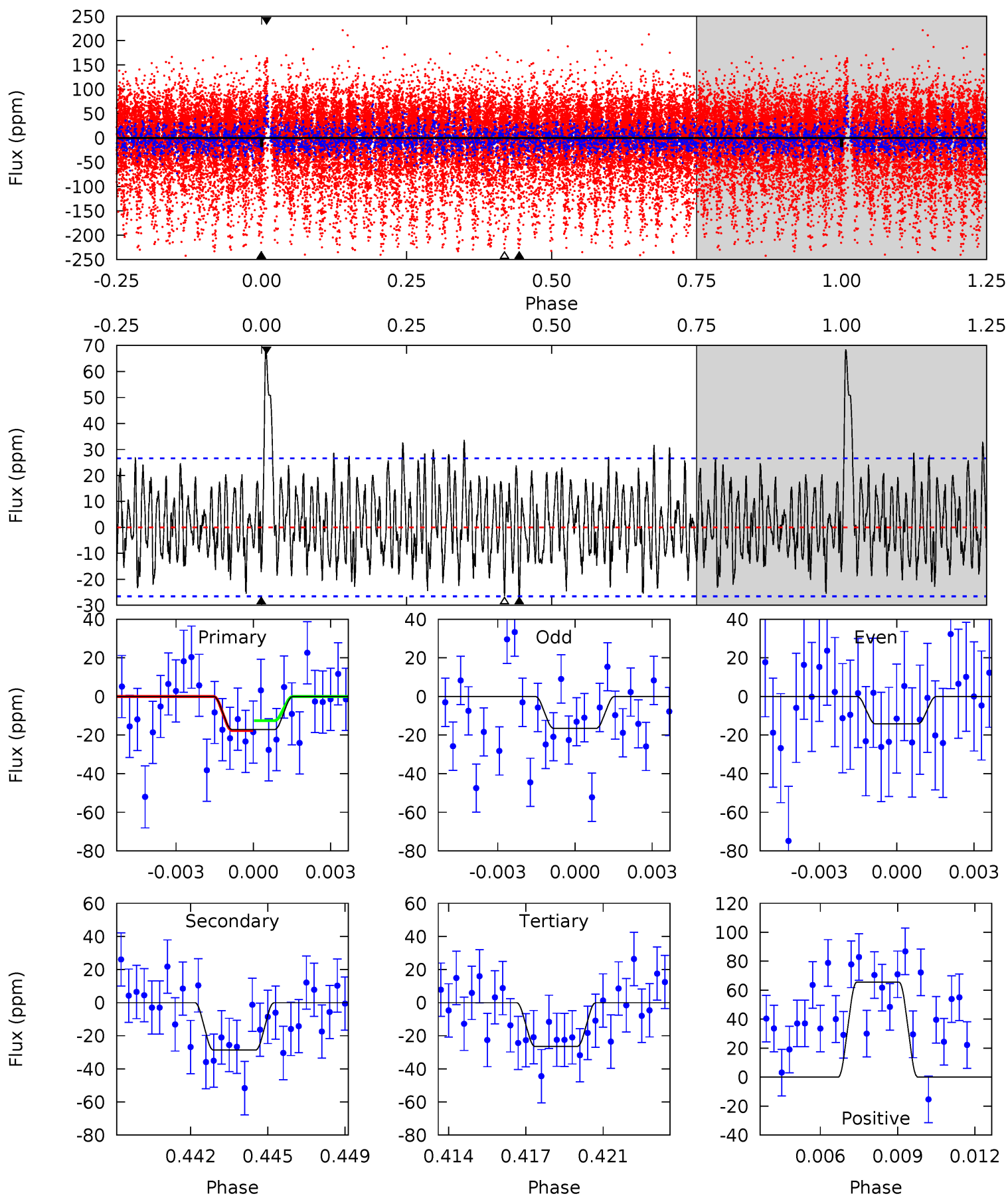
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.53	2.09	1.93	2.27	5.18	2.84	0.58	-0.41	-0.74	0.15	-0.18	1.76	0.44	0.52	0.16



Alt Model-Shift Uniqueness Test

010130954-03, P = 85.272383 Days, E = 95.952468 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.39	5.66	5.22	13.0	5.25	2.96	2.49	-1.83	-9.56	0.43	-7.30	0.23	26.3	0.71	0.50



Stellar Parameters For KIC 010130954

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	14652^{+344}_{-774}	$4.020^{+0.340}_{-0.013}$	$-1.000^{+0.300}_{-0.300}$	$2.840^{+0.041}_{-1.051}$	$3.080^{+-1.000}_{-0.467}$	$0.189^{+0.468}_{-0.008}$
	+2%/-5%	+8%/-0%	+30%/-30%	+1%/-37%	+32%/-15%	+247%/-4%
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 010130954-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-6 ± 3	$0.72^{+0.51}_{-0.45}$	1977^{+101}_{-186}	13808^{+30725}_{-5328}	1857^{+11050}_{-1357}
Alt.	-29 ± 5	$1.32^{+0.53}_{-0.55}$	1965^{+104}_{-180}	16692^{+12782}_{-4616}	2758^{+5155}_{-1426}

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 $A_{obs} \gg 1.0$

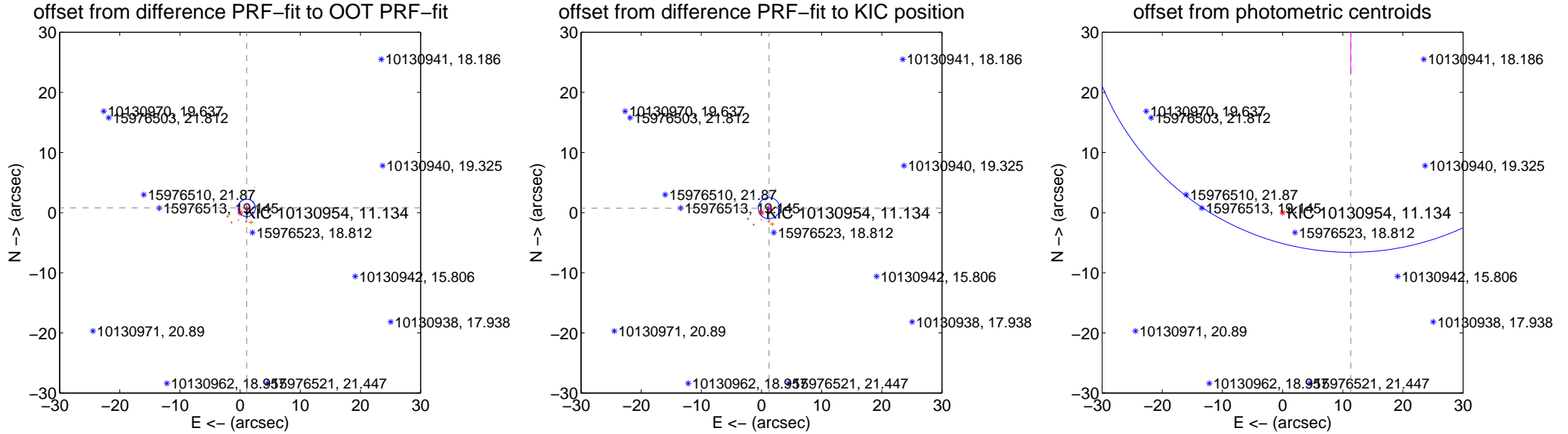
DV Centroid Data

Supplemental centroid analysis for 010130954-03. **Kepler magnitude: 11.13.** Transit SNR 1.26

There are 2 quarters with good PRF difference image offsets

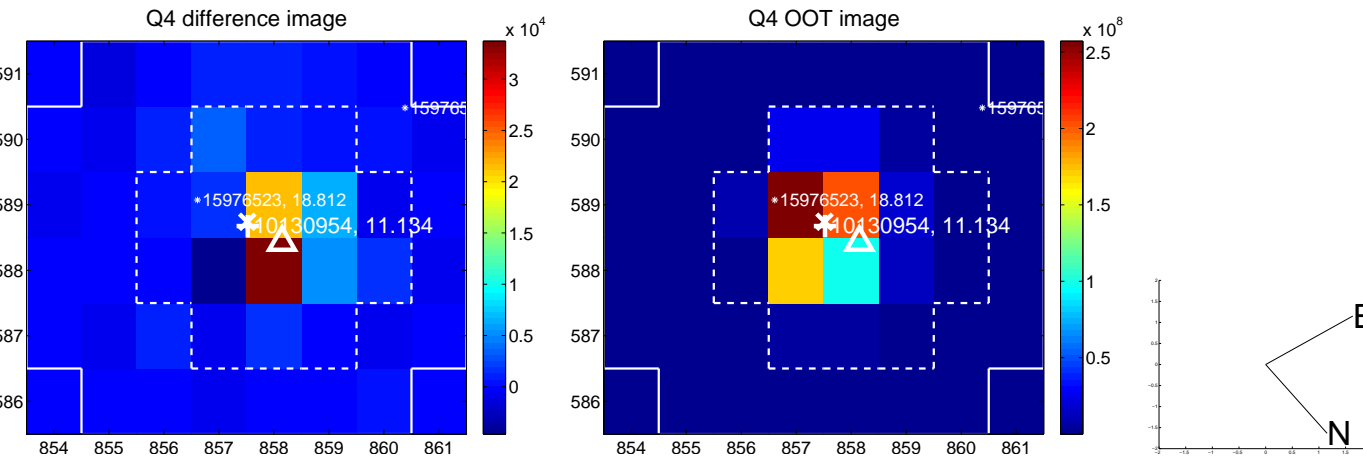
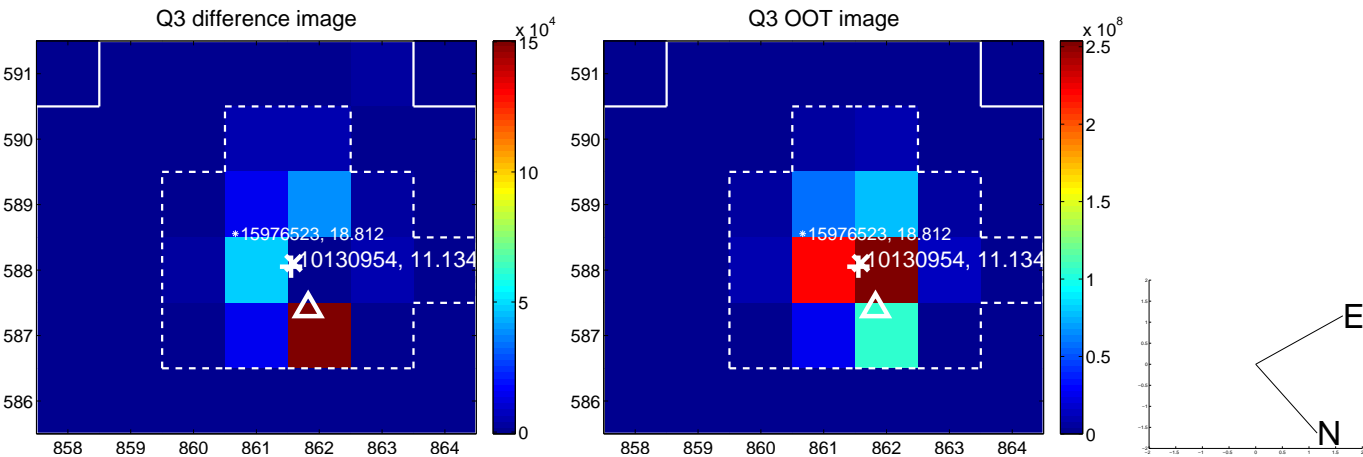
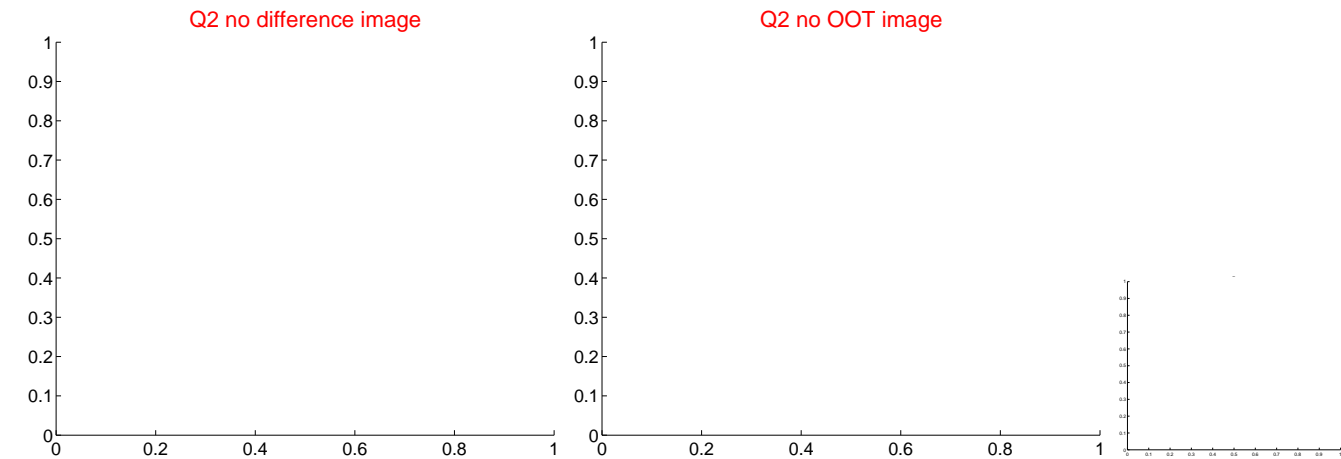
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.351 ± 0.482	2.80	-1.096 ± 0.403	0.789 ± 0.503
PRF-fit source offset from KIC position	1.458 ± 0.588	2.48	-1.251 ± 0.461	0.748 ± 0.612
photometric centroid source offset	39.77 ± 14.90	2.67	-11.34 ± 11.20	38.12 ± 15.19

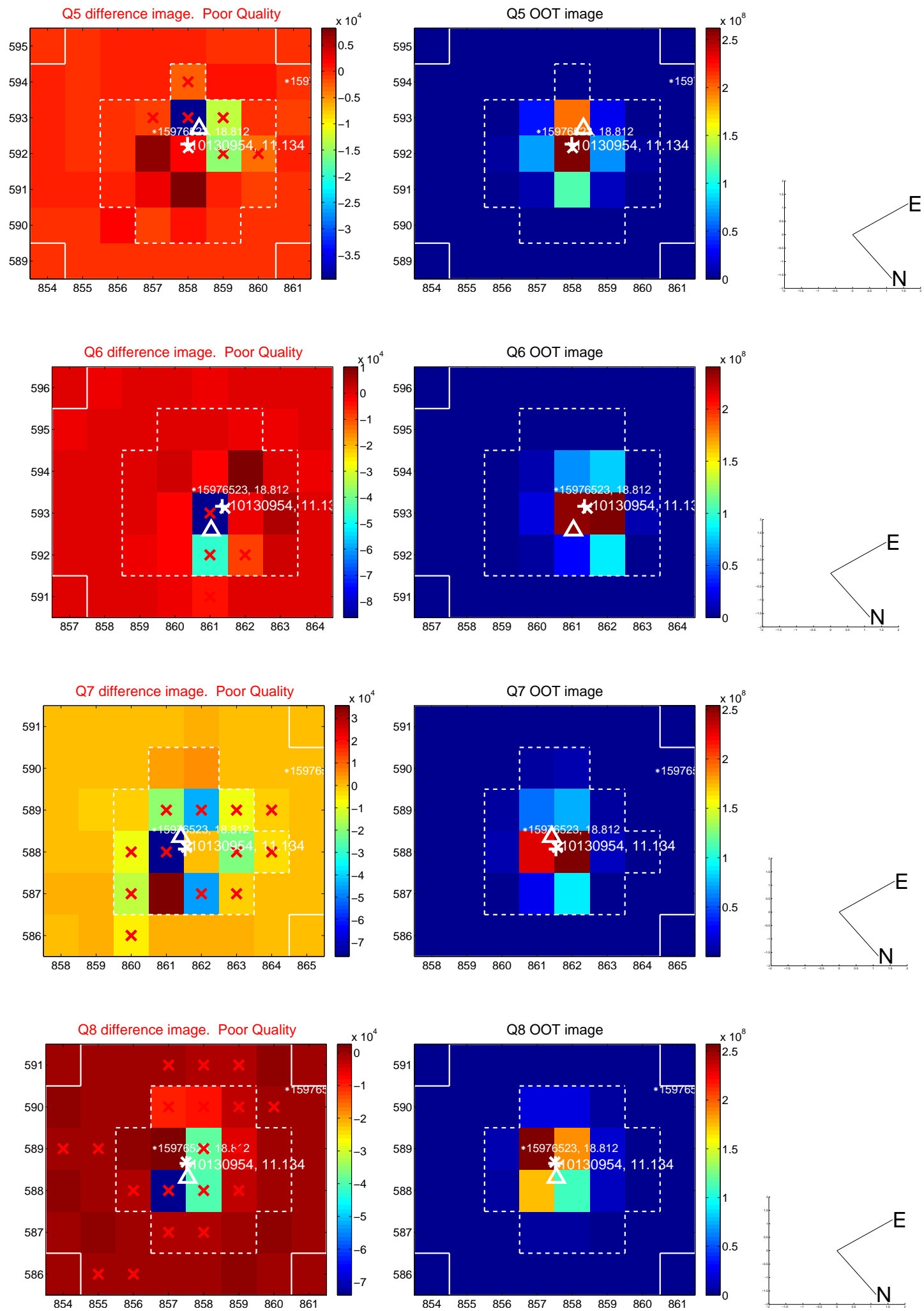


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

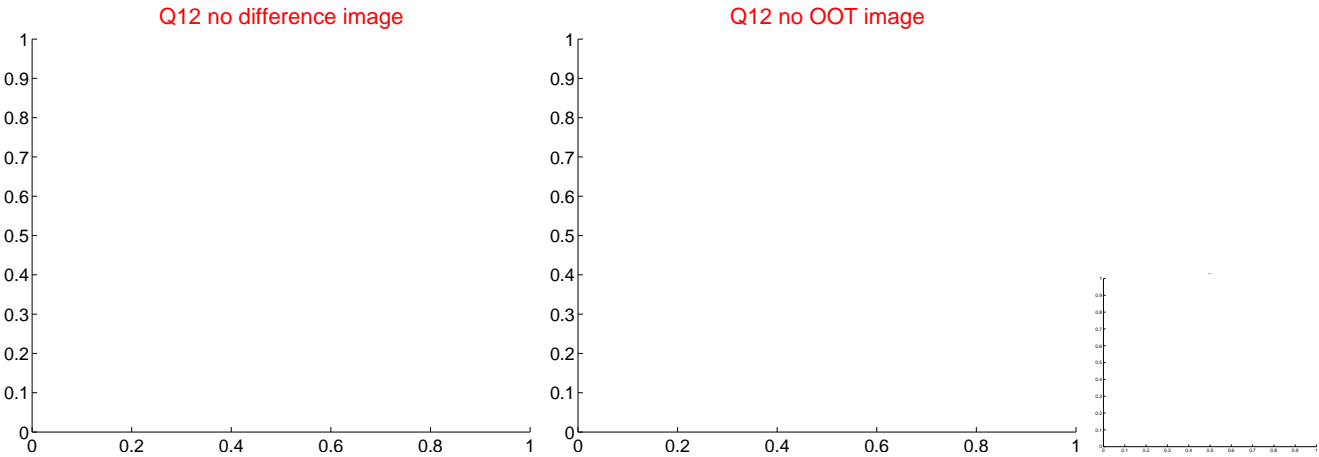
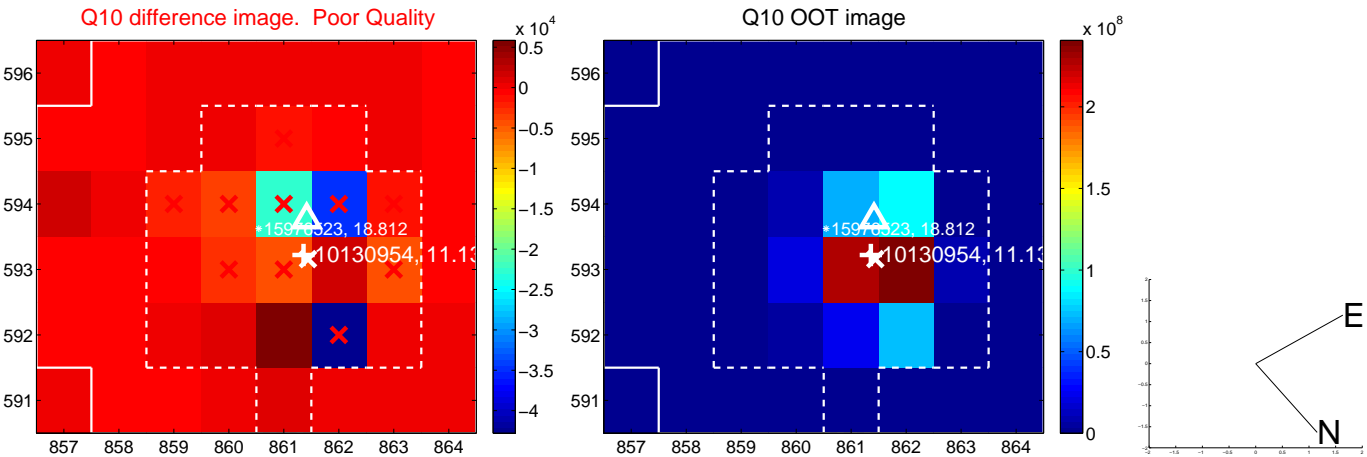
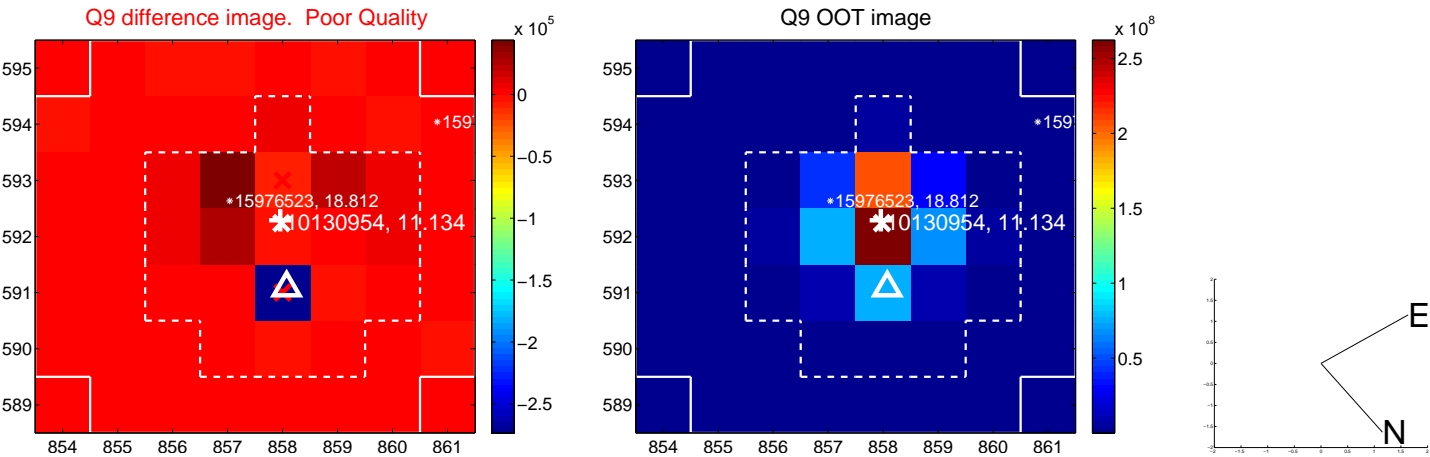
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



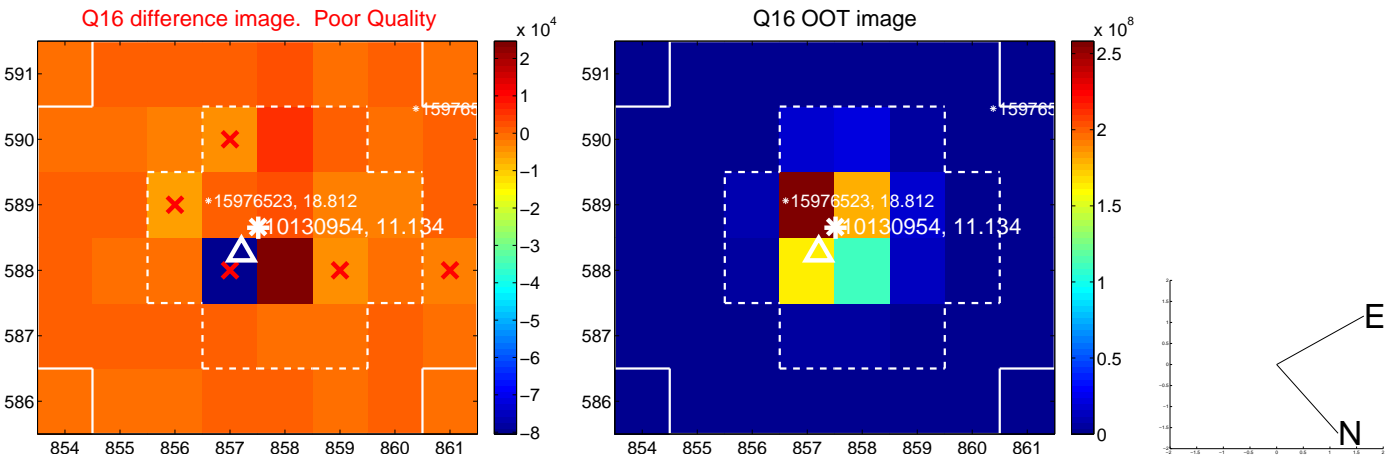
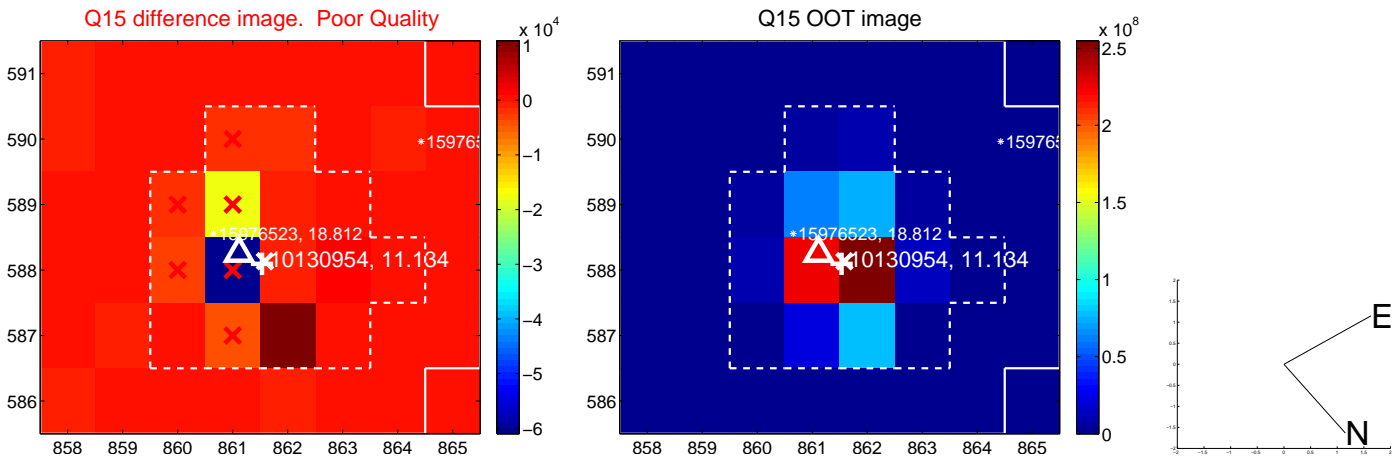
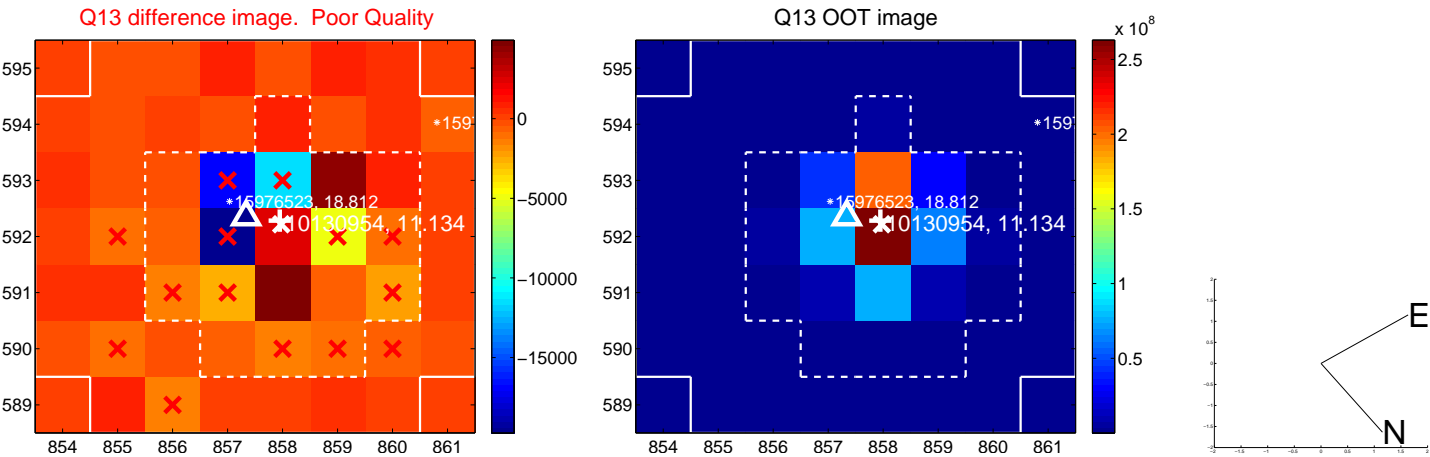
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



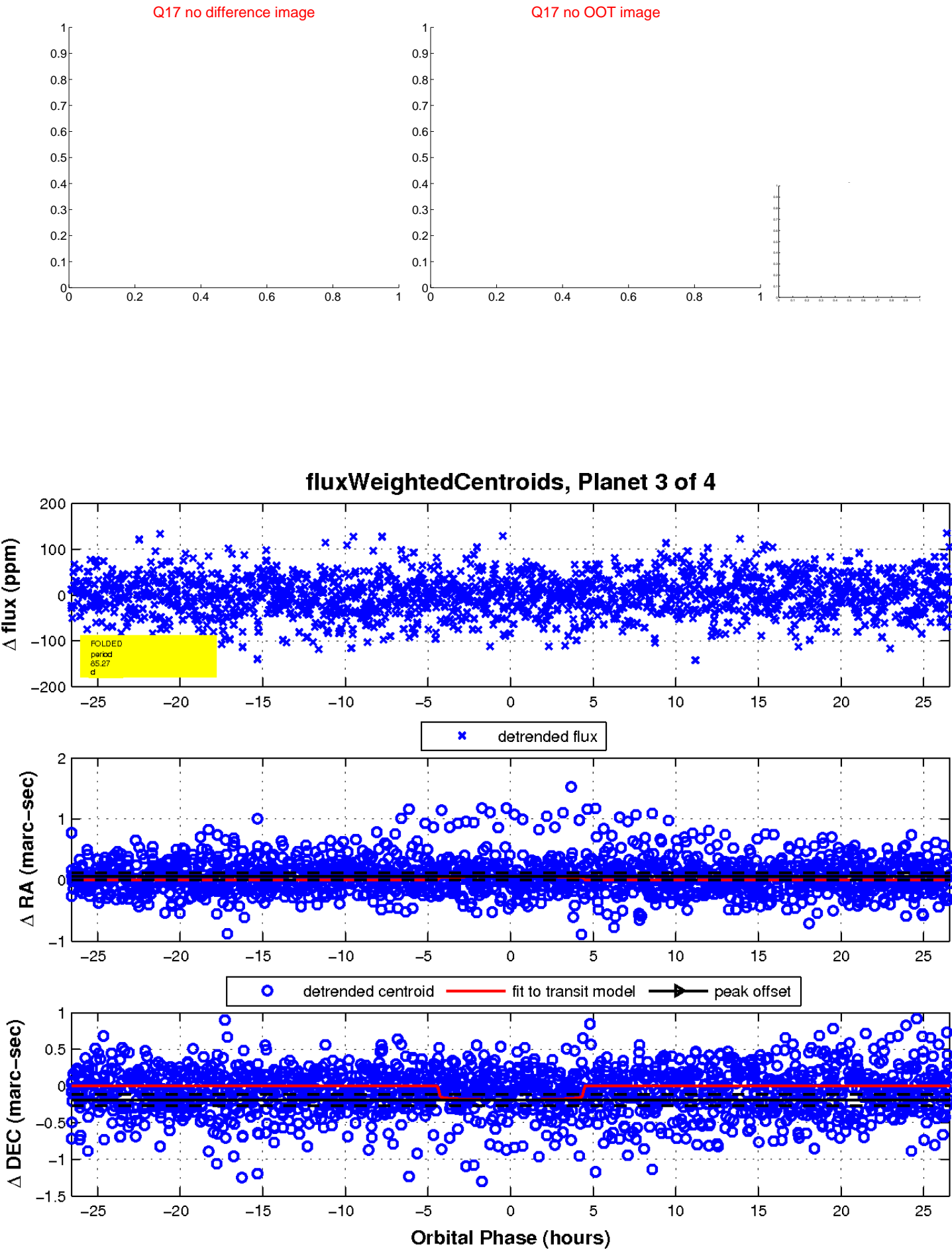
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

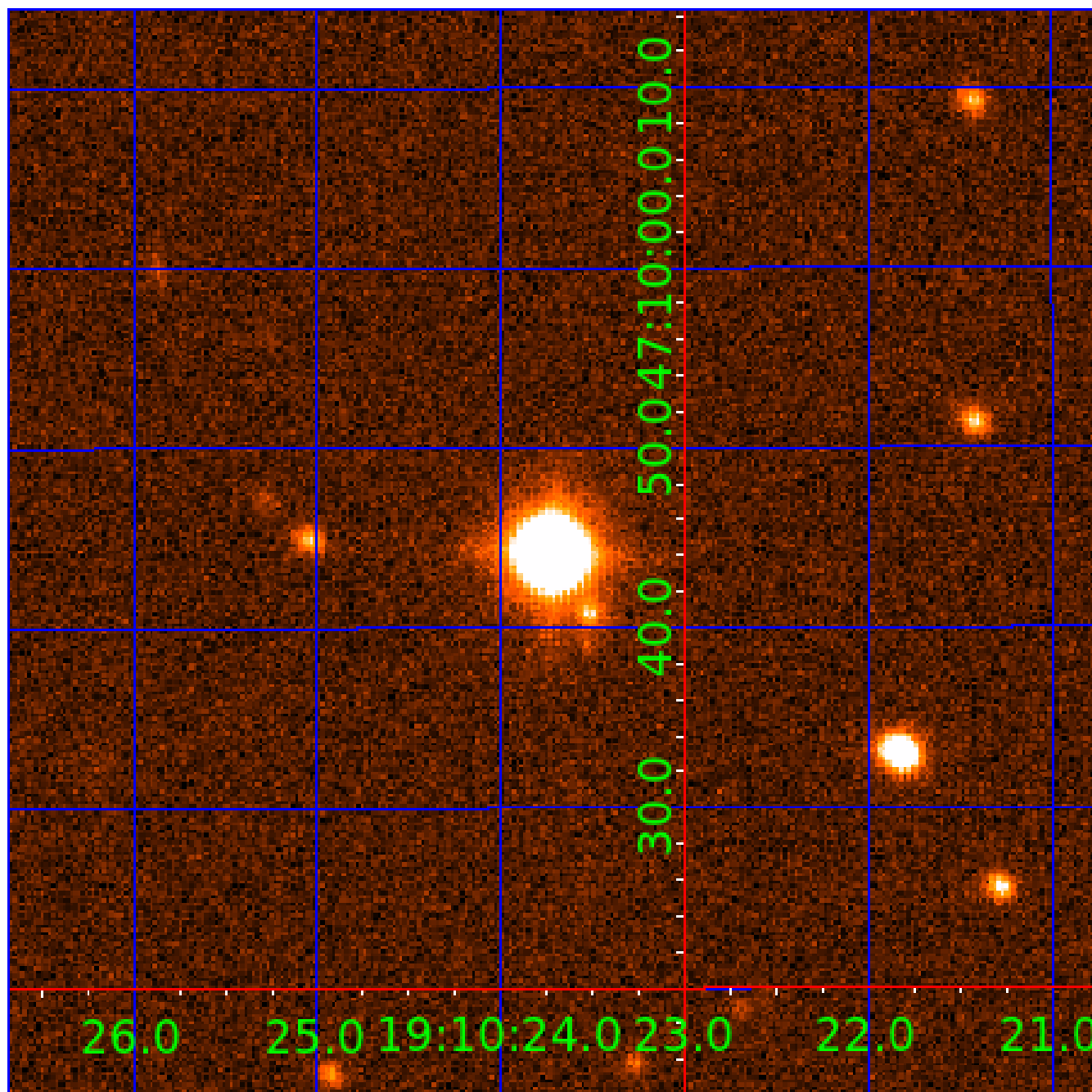


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010130954

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})
010130954-01	OBS	No	2.246322	132.005918	5.4	8.778	8.2	7.1	2.84	14652	1.18	139550.54
010130954-02	OBS	No	85.346247	182.153003	12.9	4.277	11.4	2.5	2.84	14652	1.07	1092.57
010130954-03	OBS	No	85.267672	181.255839	5.0	8.860	12.1	1.3	2.84	14652	0.72	1093.91
010130954-04	OBS	No	442.482221	223.526686	53.7	3.965	7.9	5.3	2.84	14652	2.36	121.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010130954-01	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_SATURATED—HALO_GHOST
010130954-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
010130954-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010130954-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED

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

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

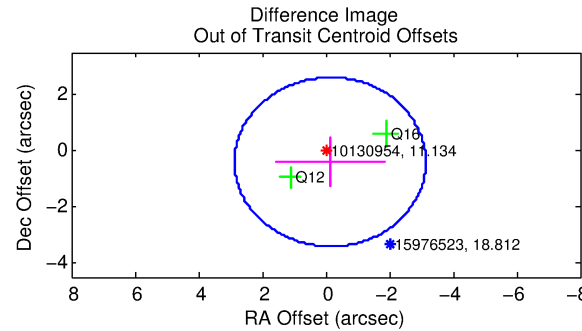
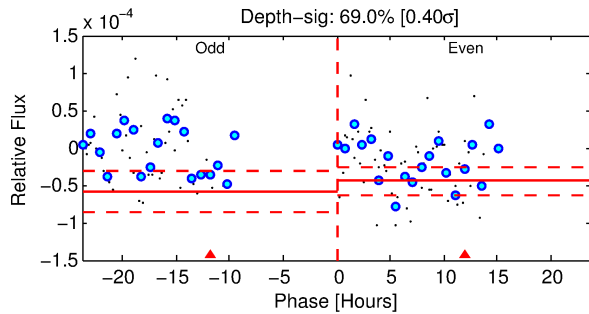
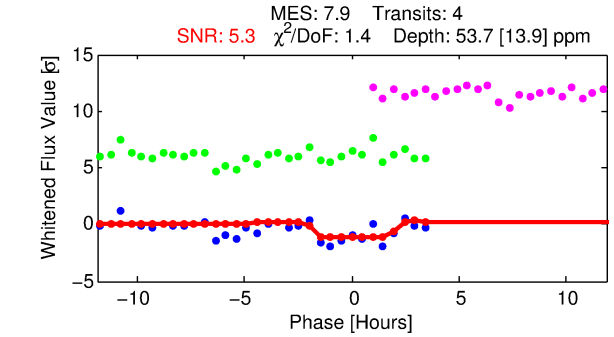
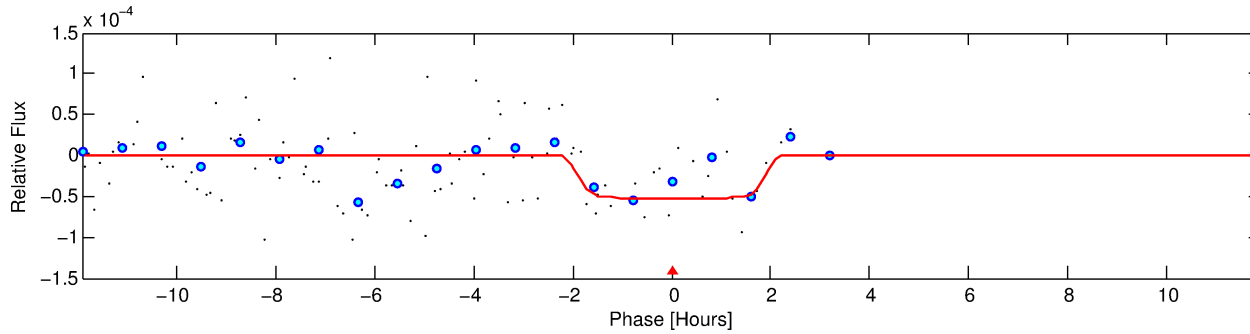
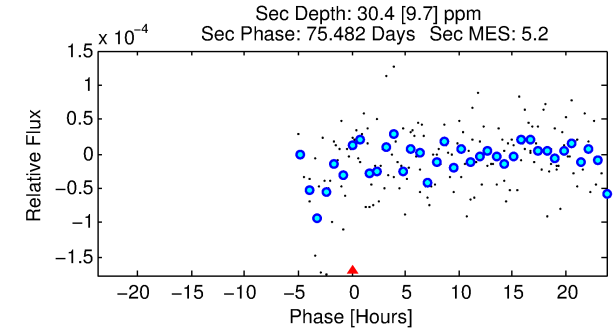
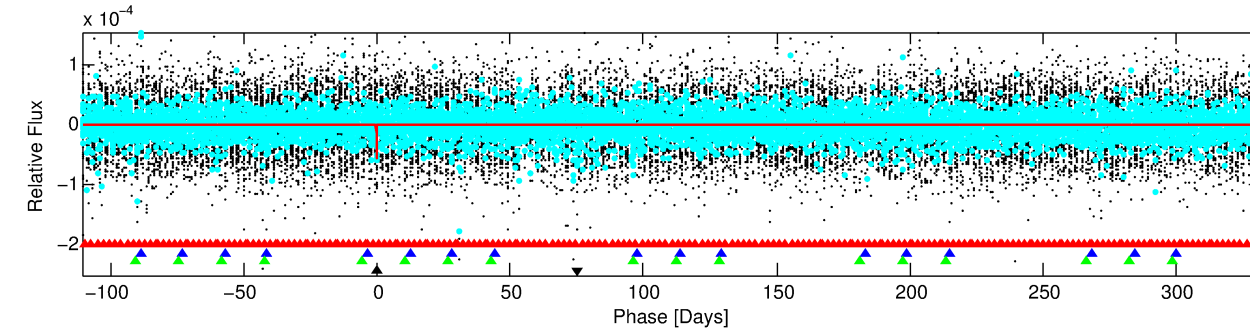
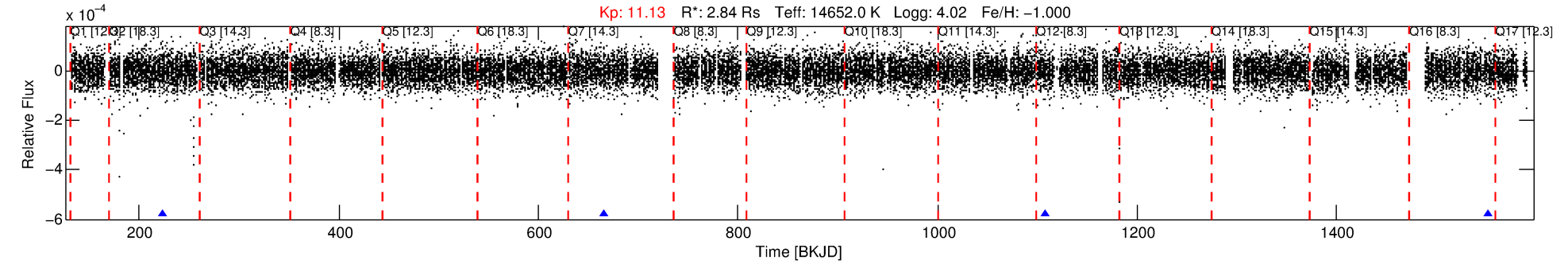
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010130954-04

No Significant Match Found

DV One-Page Summary

KIC: 10130954 Candidate: 4 of 4 Period: 442.482 d



DV Fit Results:

Period = 442.48222 [0.00950] d
Epoch = 223.5267 [0.0224] BKJD
Rp/R* = 0.0076 [0.0039]
a/R* = 376.71 [2064.24]
b = 0.91 [1.10]
Seff = 121.76 [74.85]
Teq = 847 [130] K
Rp = 2.36 [1.50] Re
a = 1.6539 [0.5939] AU
Ag = 8211.40 [10044.83] [0.82σ]
Teffp = 12467 [3425] K [3.39σ]

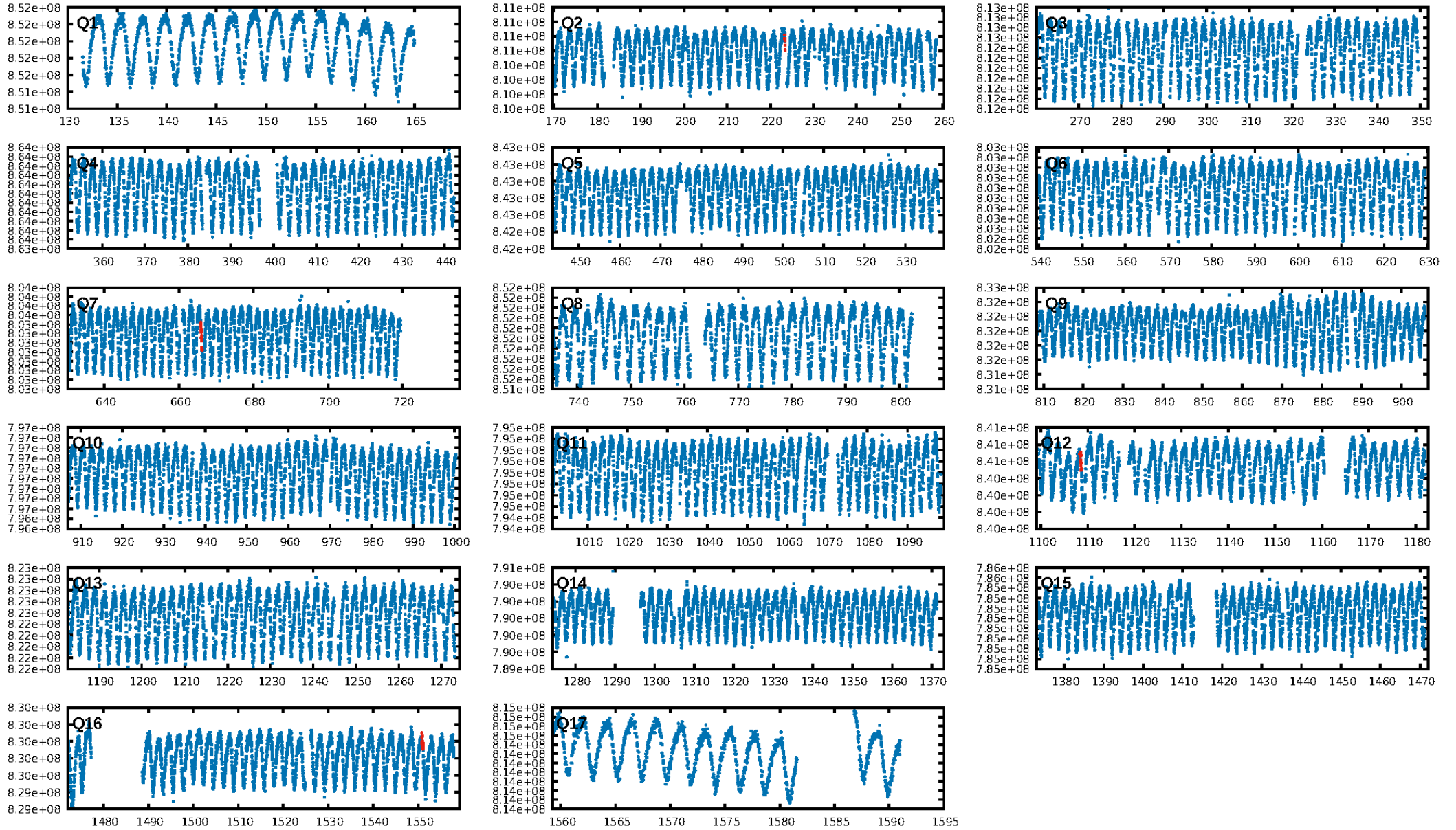
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1469.75σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.51e-08
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.032
Centroid-sig: 24.9%
Centroid-so: 3.267 arcsec [1.17σ]
OotOffset-rm: 0.428 arcsec [0.43σ]
OotOffset-st: 0/0/2/0 [2]
KicOffset-rm: 0.436 arcsec [0.42σ]
KicOffset-st: 0/0/2/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [3/3]

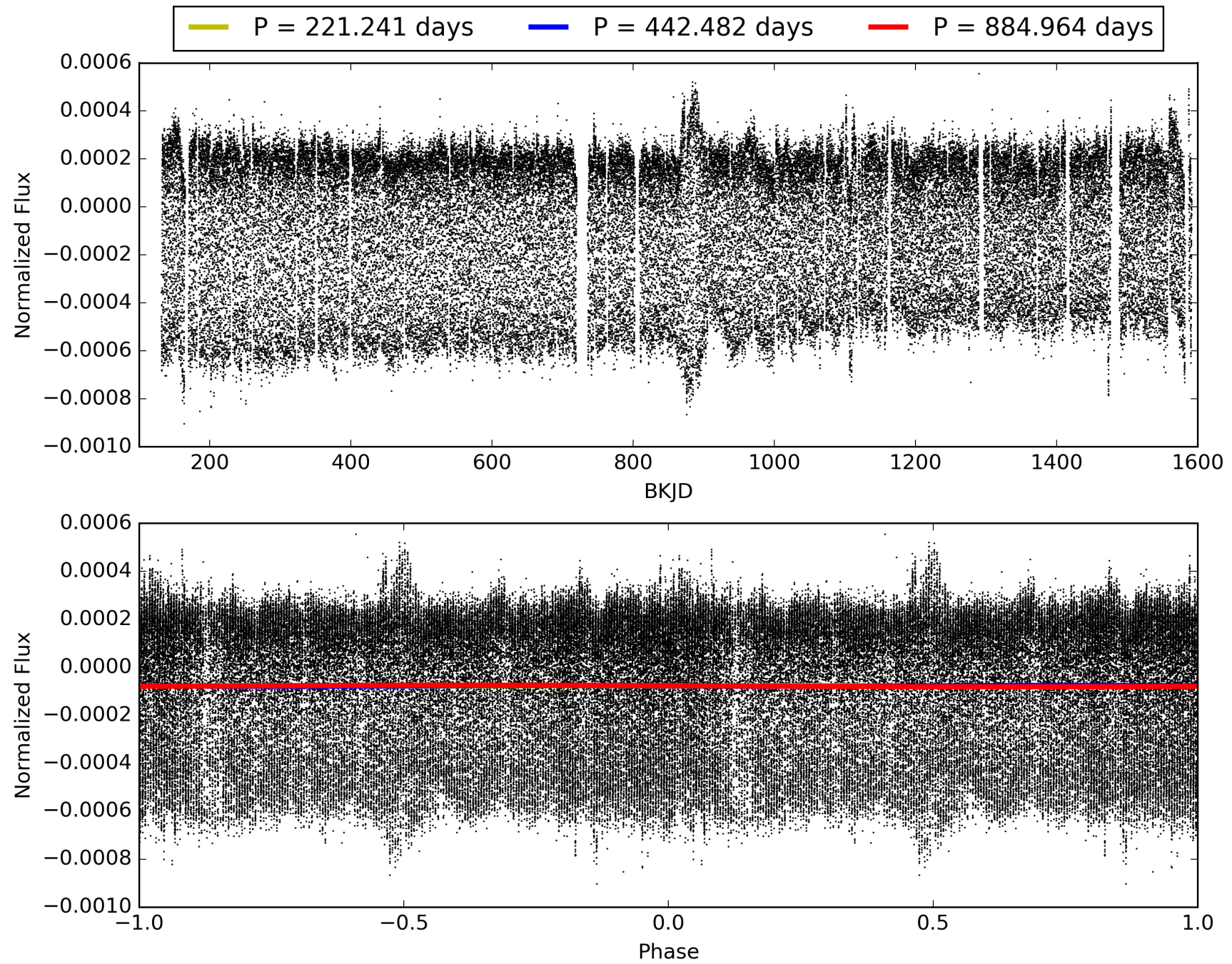
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:47:30 Z

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

TCE 010130954-04, PDC Light Curves

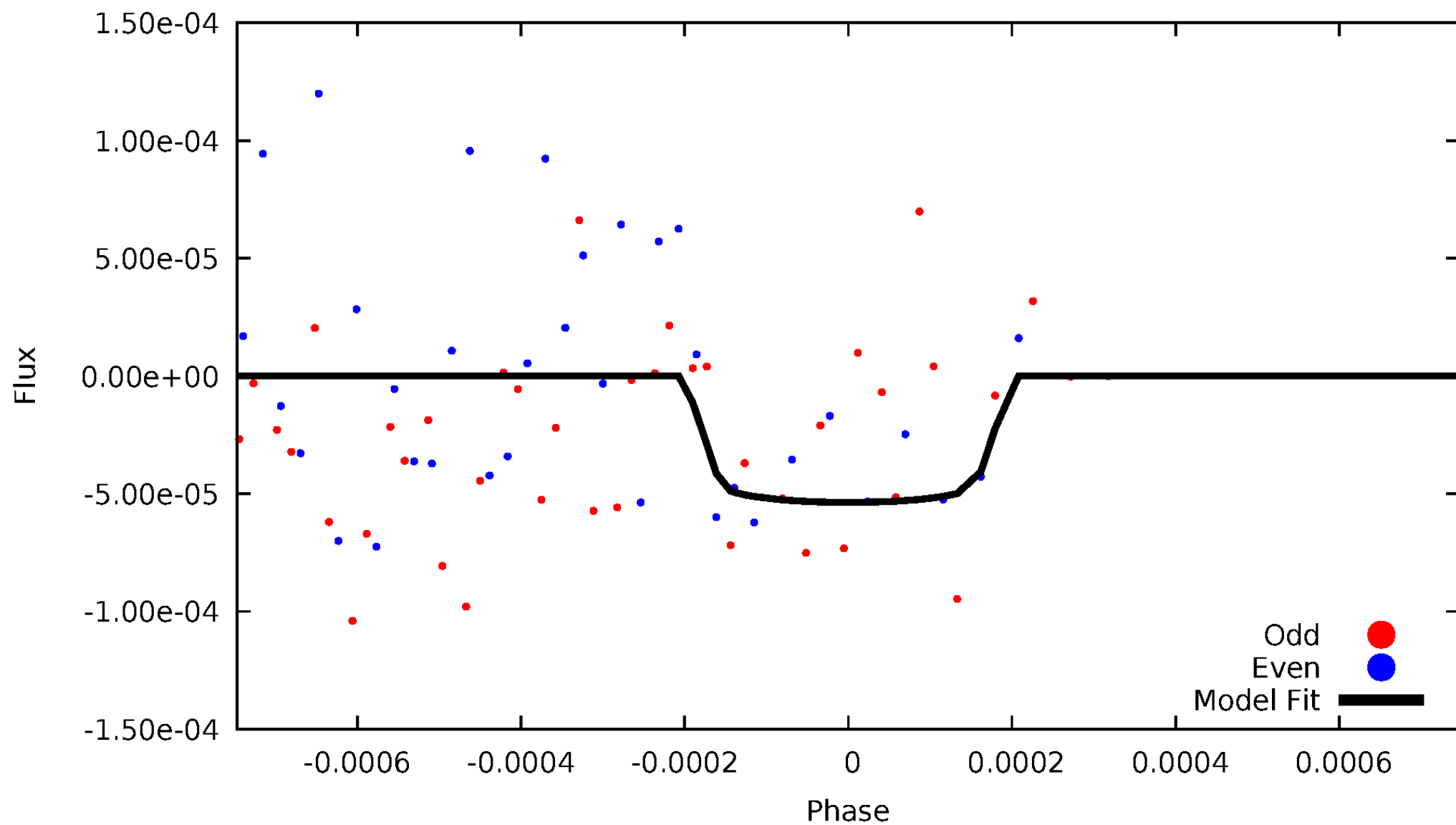


TCE 010130954-04



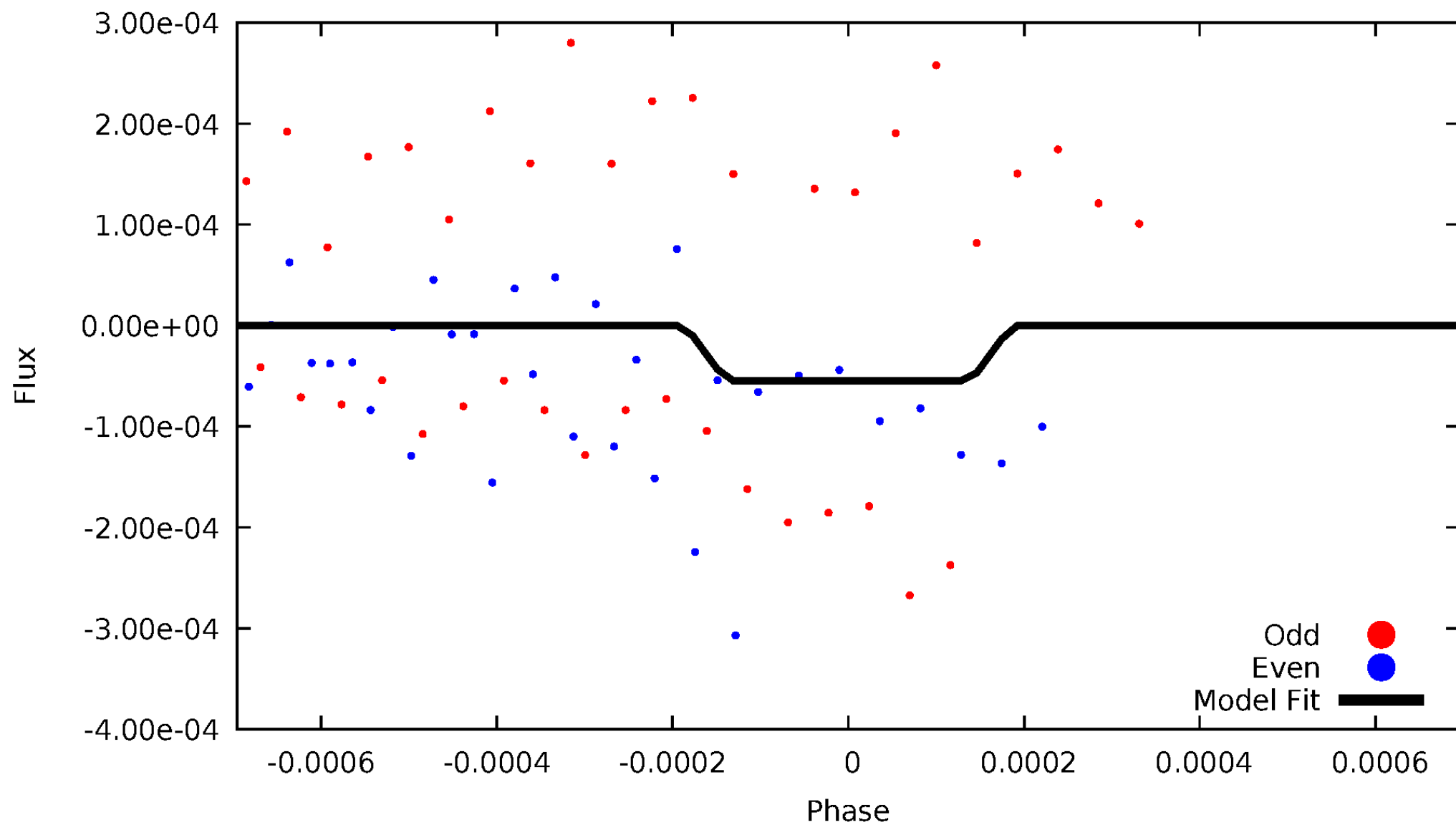
DV Odd/Even

TCE 010130954-04



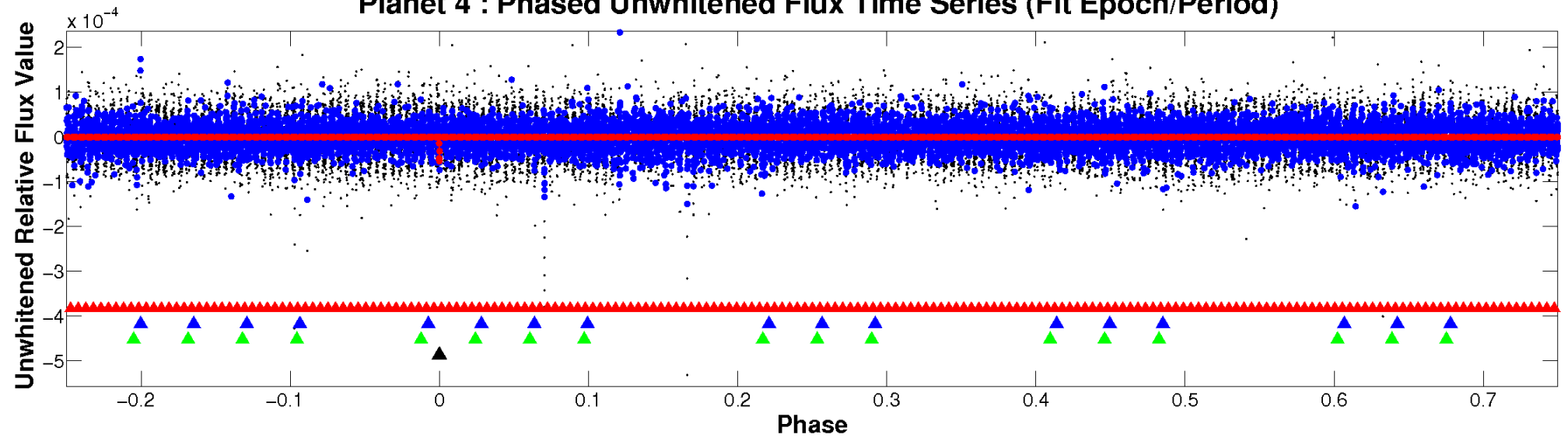
ALT Odd/Even

TCE 010130954-04

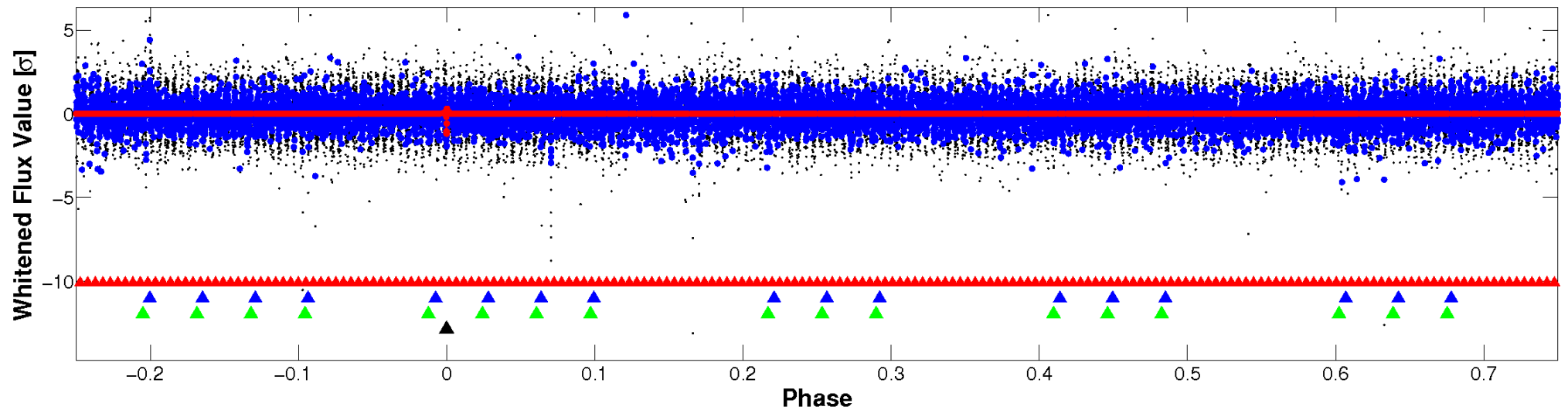


Non-Whitened Vs. Whitened Light Curve

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

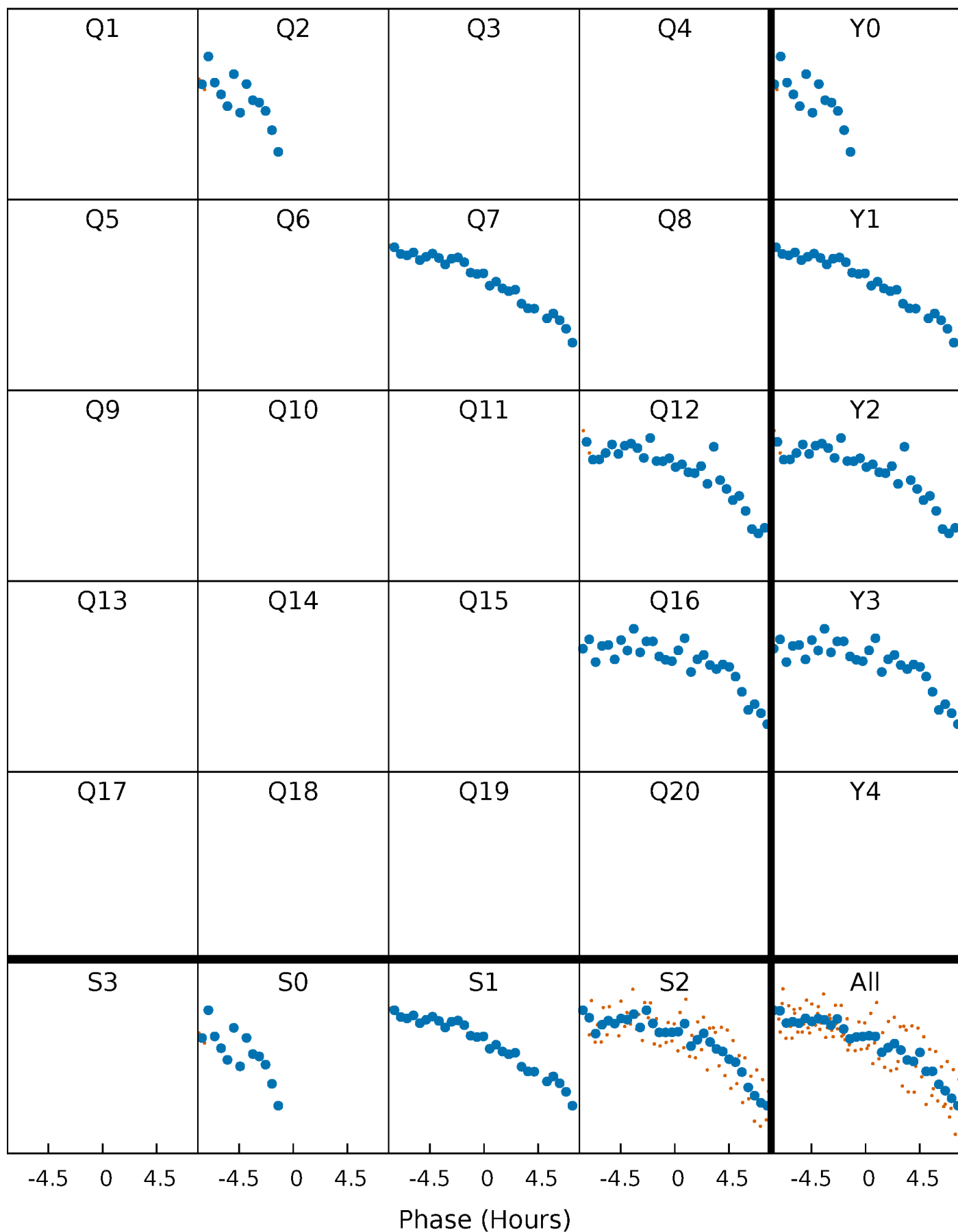


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



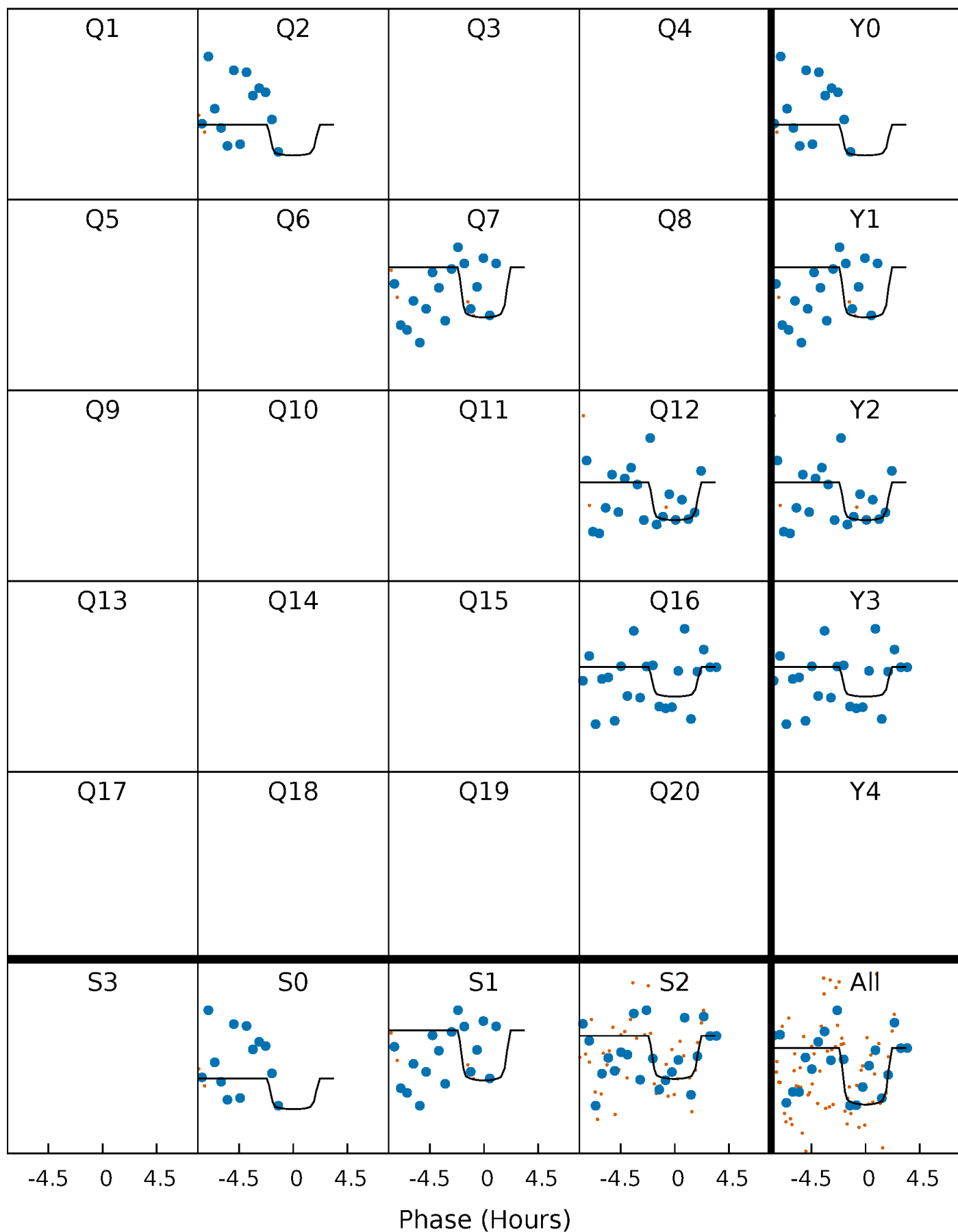
PDC Quarter-Phased Transit Curves

TCE 010130954-04 $P=442.482221$ Days $T_0=223.526686$ (BKJD)



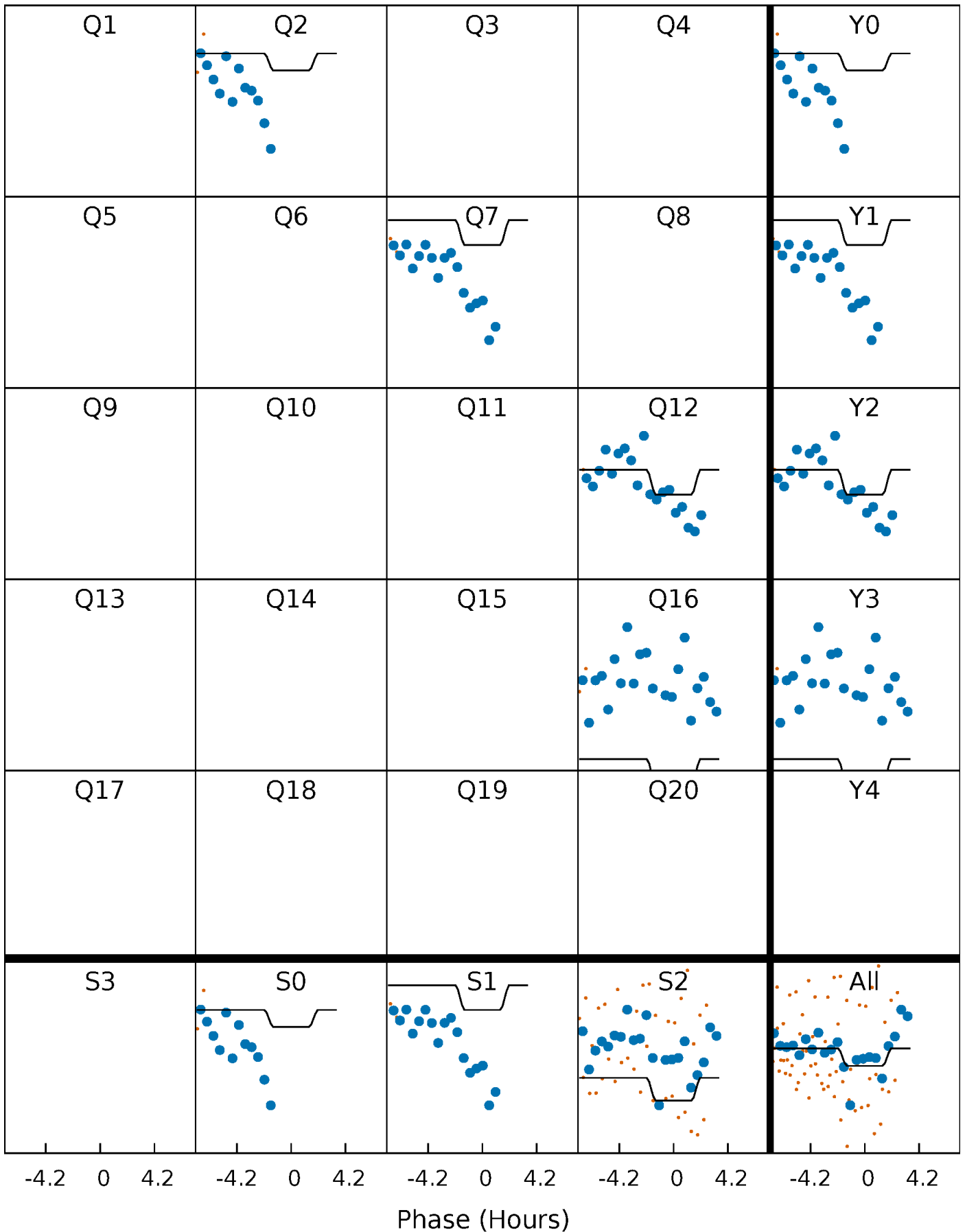
DV Quarter-Phased Transit Curves

TCE 010130954-04 P=442.482221 Days $T_0=223.526686$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

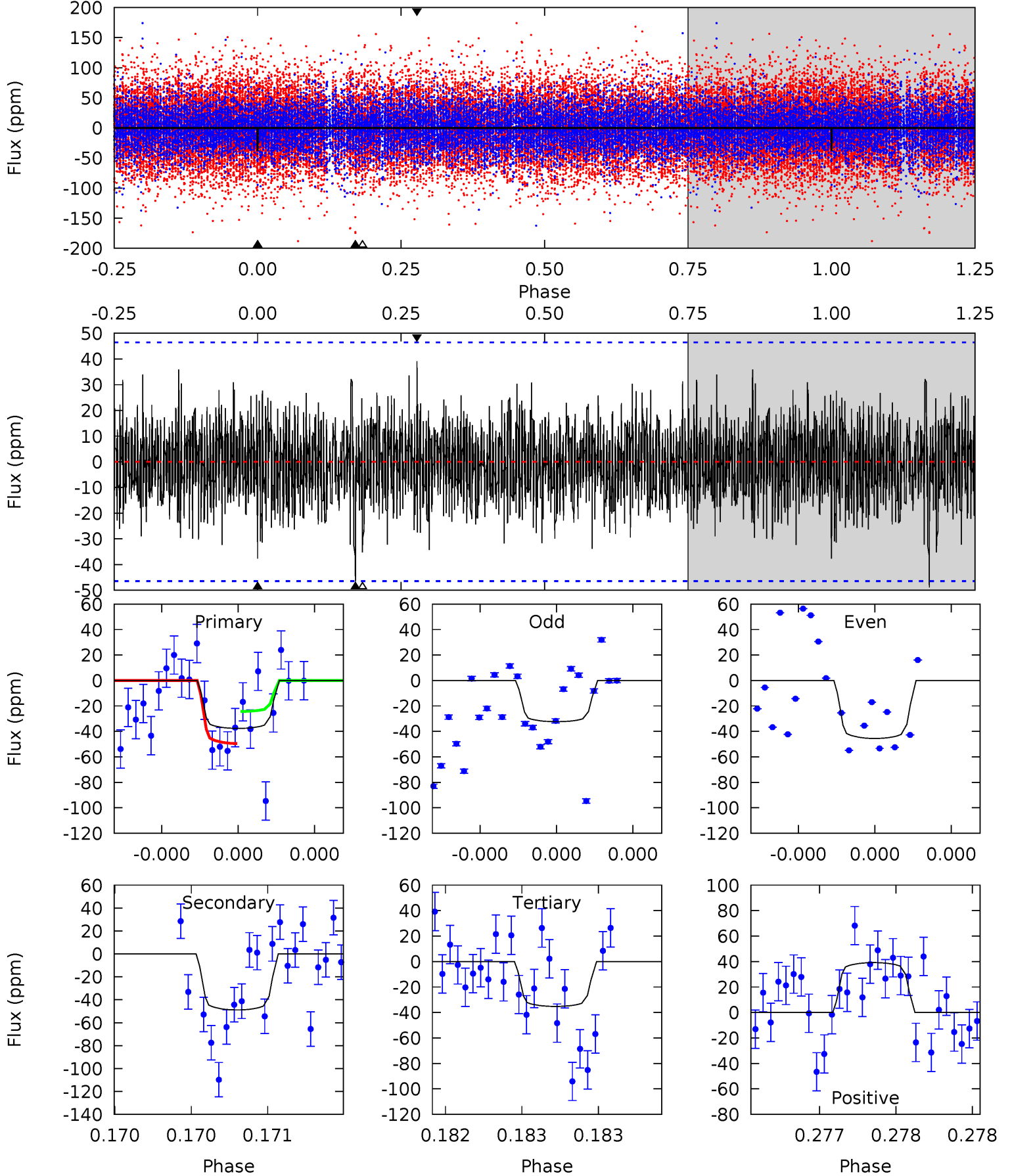
TCE 010130954-04 $P=442.481931$ Days $T_0=223.521792$ (BKJD)



DV Model-Shift Uniqueness Test

010130954-04, P = 442.482221 Days, E = 223.526686 Days

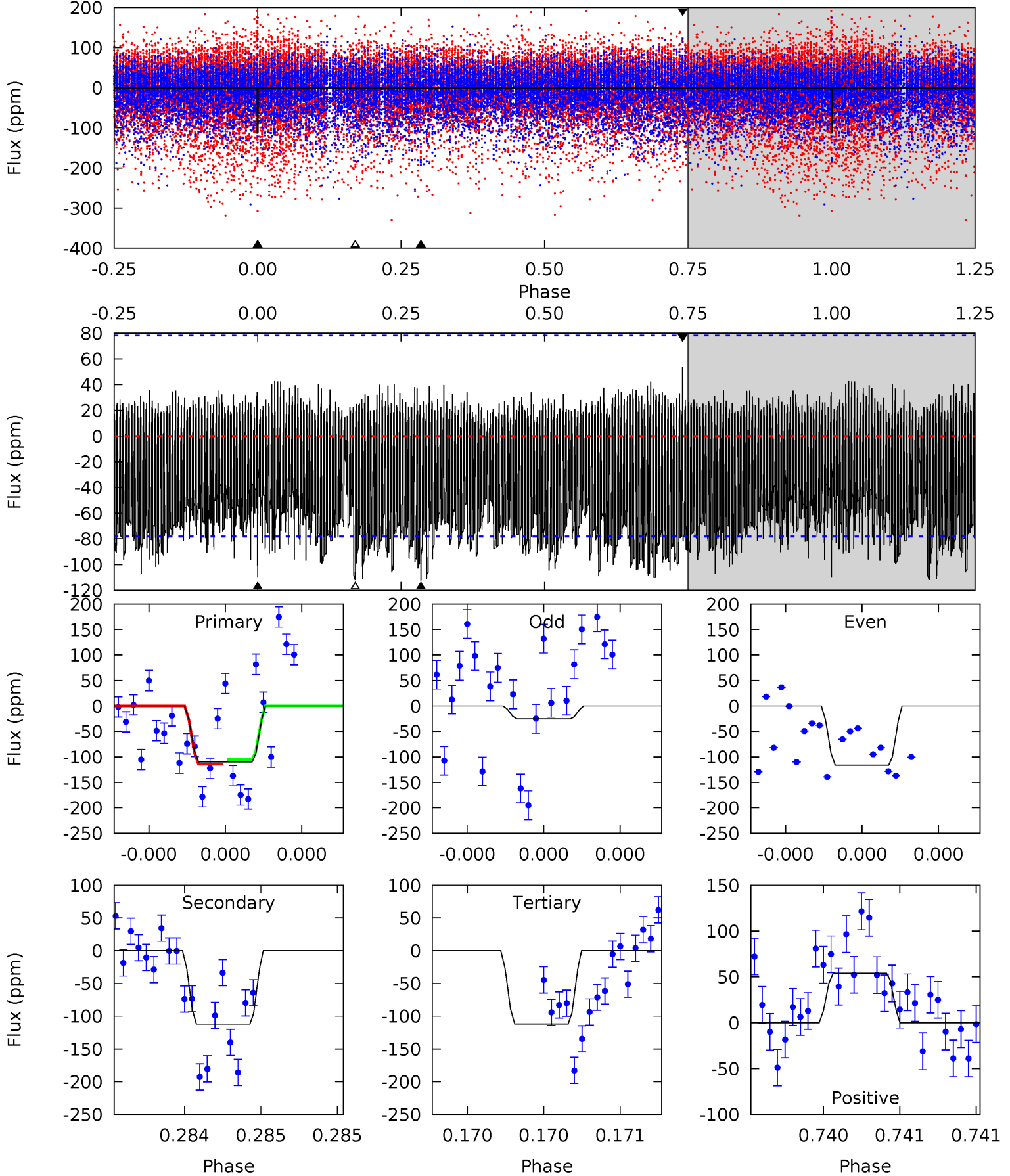
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.55	5.91	4.26	4.74	5.62	3.55	1.20	0.29	-0.18	1.65	1.18	0.79	0.91	0.44	1.51



Alt Model-Shift Uniqueness Test

010130954-04, P = 442.481931 Days, E = 223.521792 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.92	8.07	8.05	3.88	5.63	3.56	2.30	-0.13	4.04	0.03	4.20	3.41	0.80	0.32	0.33



Stellar Parameters For KIC 010130954

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	14652^{+344}_{-774}	$4.020^{+0.340}_{-0.013}$	$-1.000^{+0.300}_{-0.300}$	$2.840^{+0.041}_{-1.051}$	$3.080^{+-1.000}_{-0.467}$	$0.189^{+0.468}_{-0.008}$
	+2%/-5%	+8%/-0%	+30%/-30%	+1%/-37%	+32%/-15%	+247%/-4%
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 010130954-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-49 ± 8	$2.15^{+1.19}_{-1.12}$	1136^{+62}_{-111}	13262^{+14424}_{-3693}	15984^{+53970}_{-9470}
Alt.	-112 ± 14	$2.12^{+1.14}_{-1.01}$	1143^{+58}_{-98}	20979^{+28940}_{-7304}	37180^{+99927}_{-21247}

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

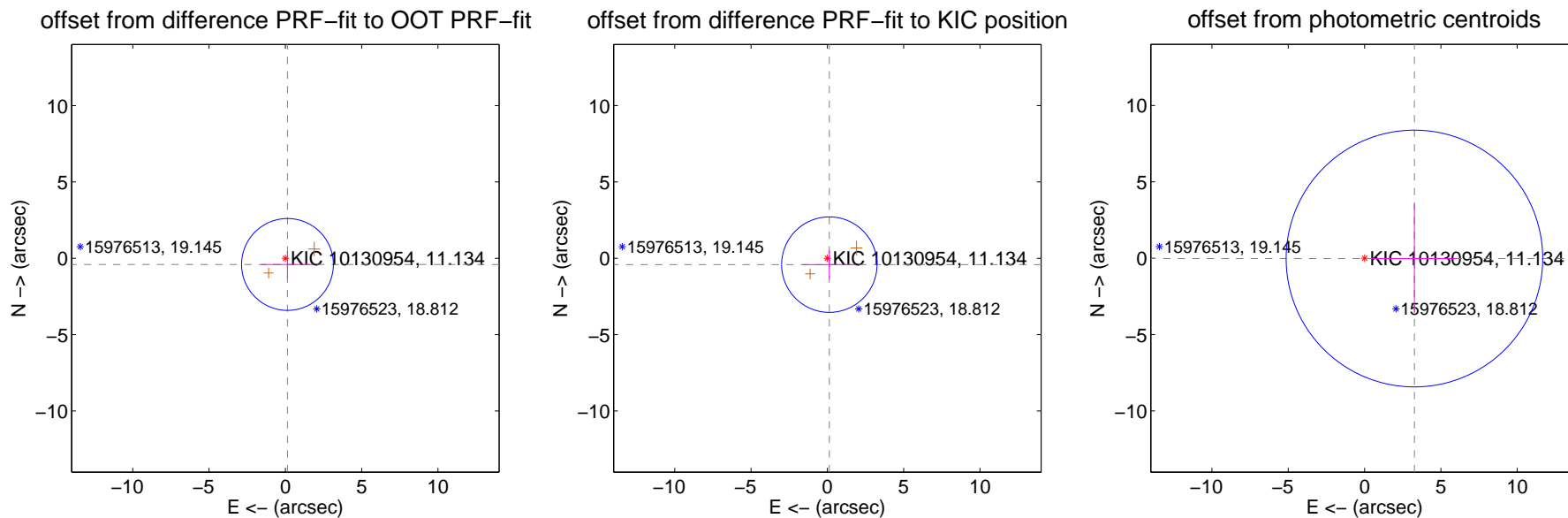
DV Centroid Data

Supplemental centroid analysis for 010130954-04. **Kepler magnitude: 11.13.** Transit SNR 5.25

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.428 ± 1.003	0.43	-0.138 ± 1.723	-0.405 ± 0.882
PRF-fit source offset from KIC position	0.436 ± 1.042	0.42	-0.129 ± 1.752	-0.416 ± 0.947
photometric centroid source offset	3.27 ± 2.80	1.17	-3.27 ± 2.80	-0.02 ± 3.57

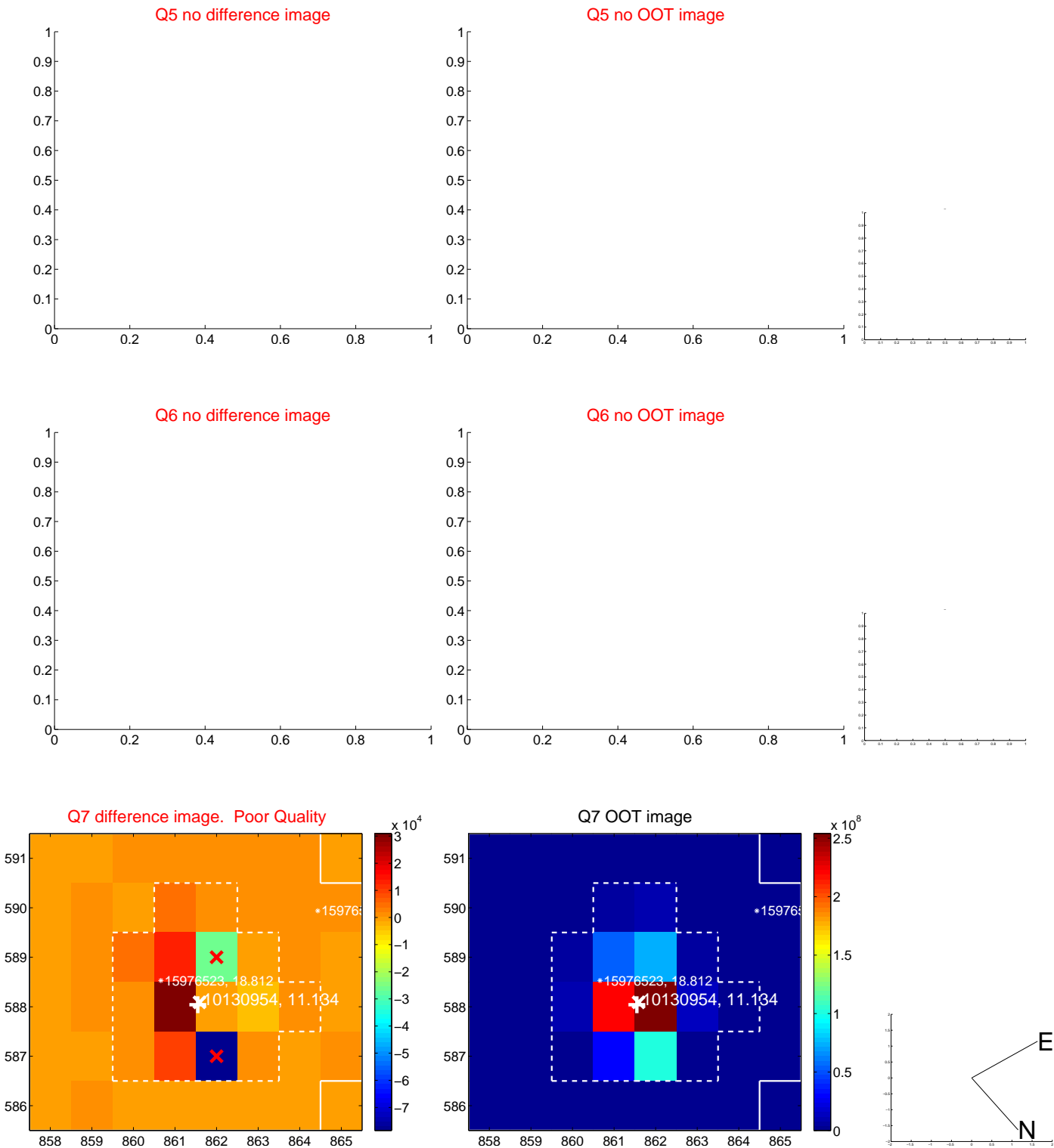


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

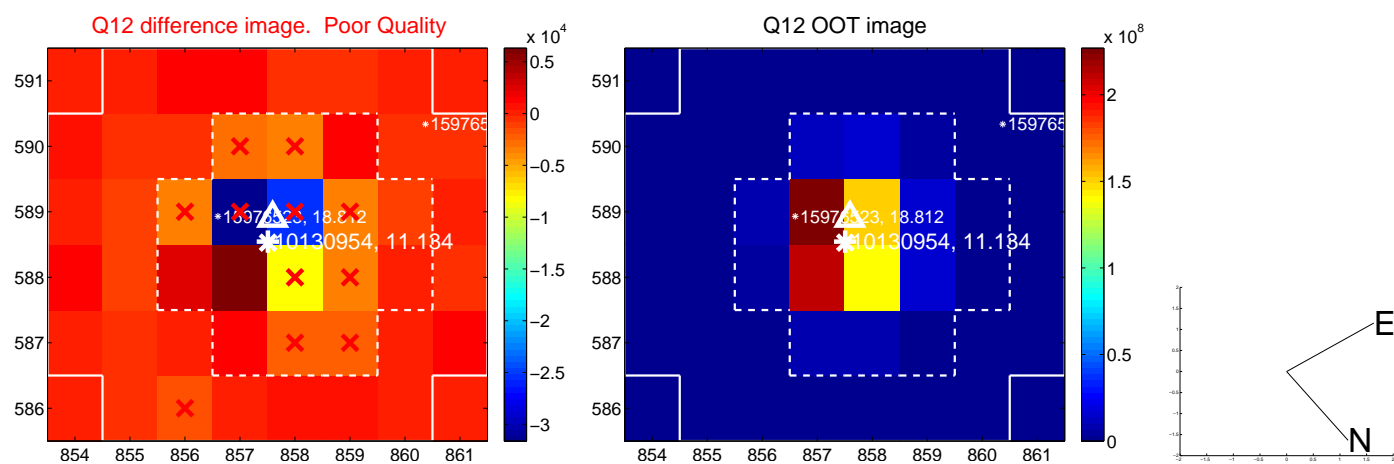
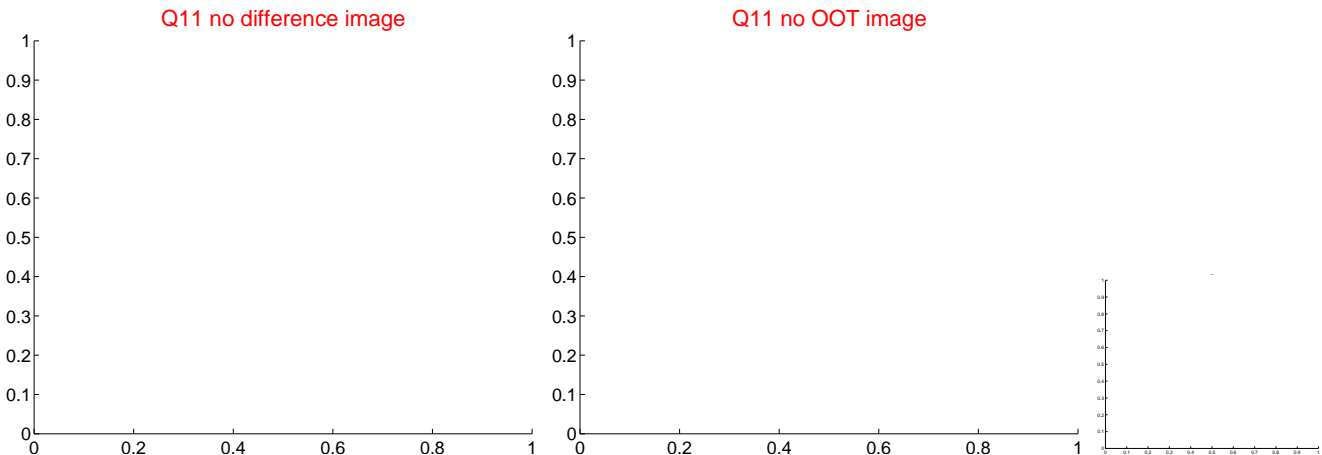
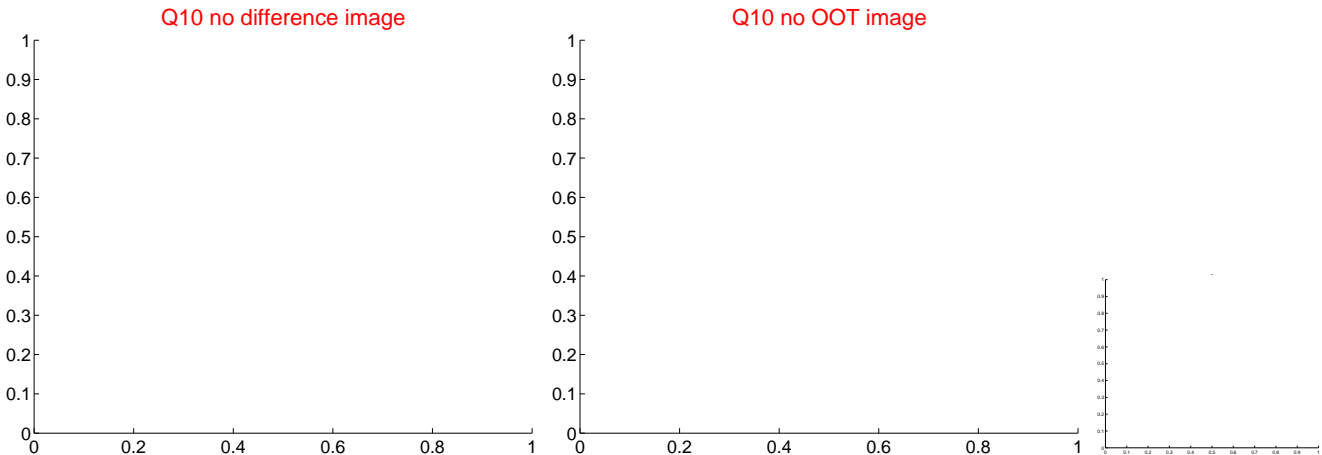
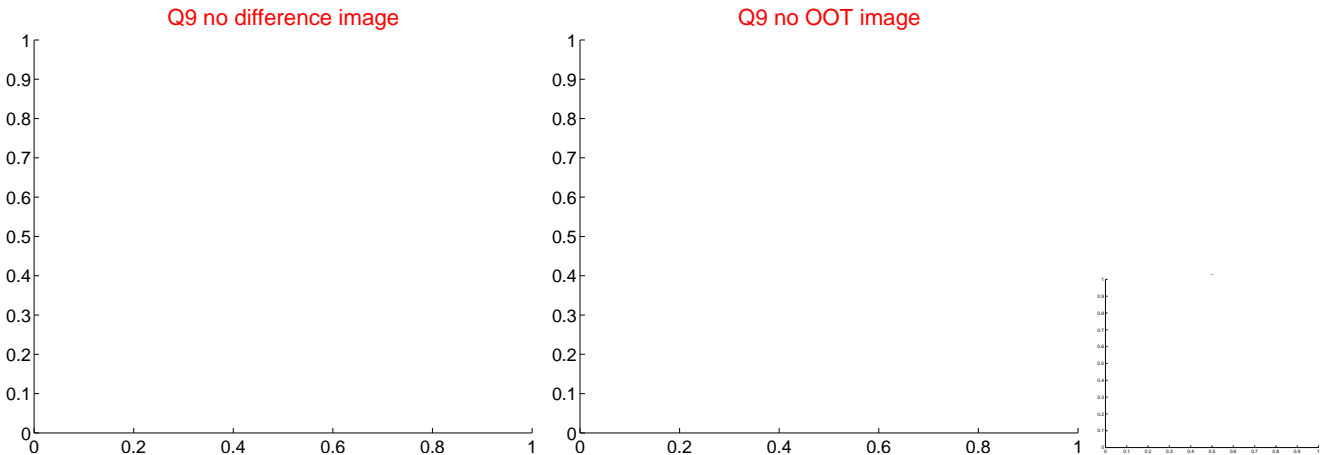
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



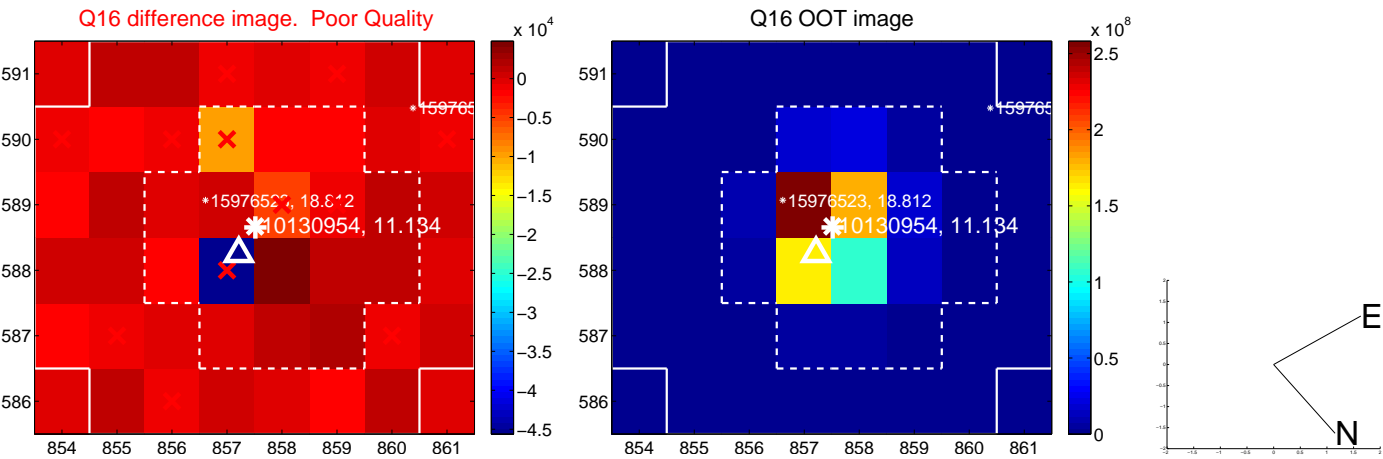
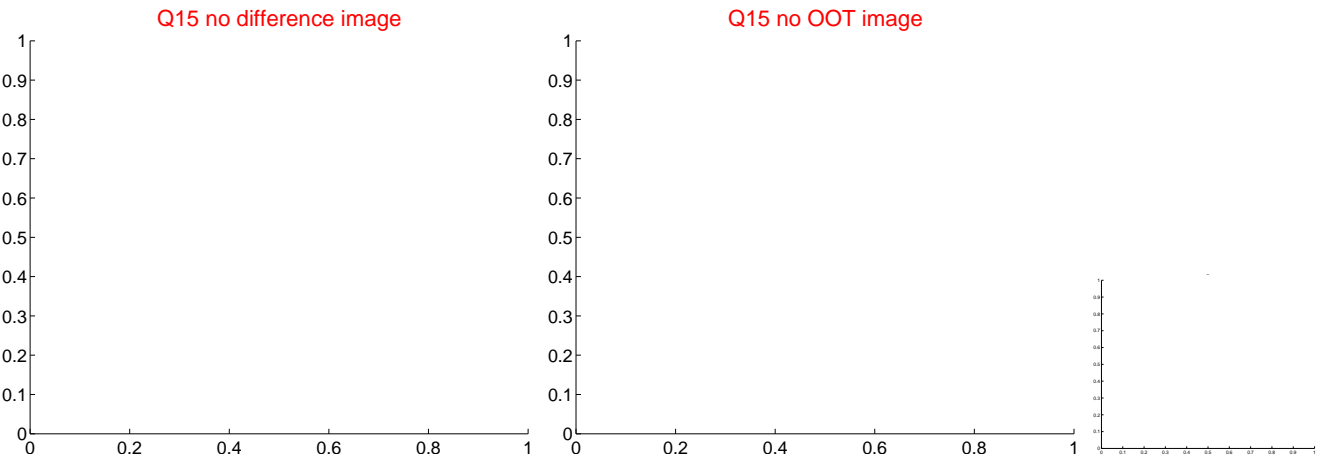
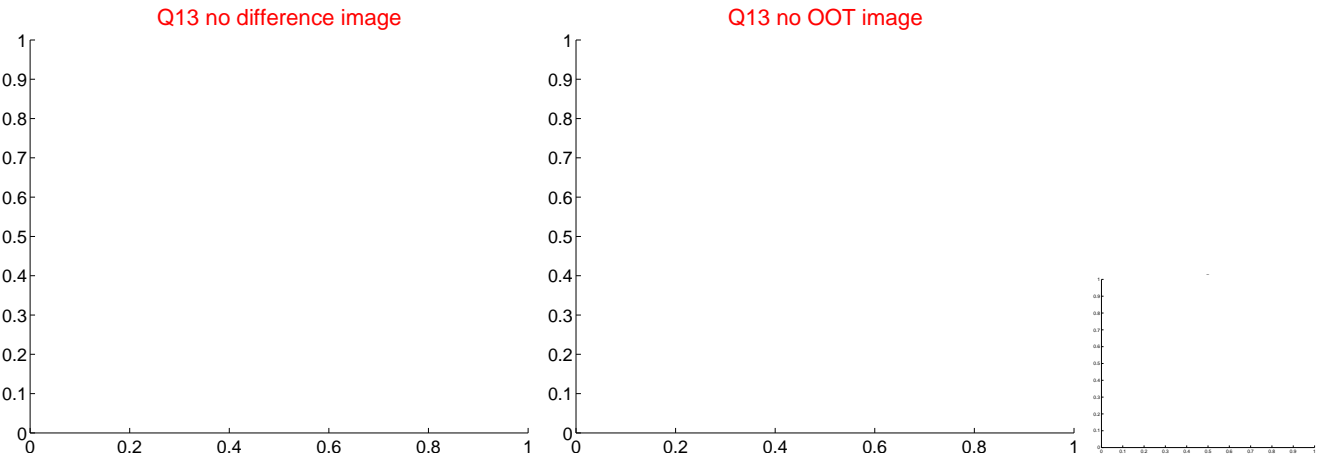
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



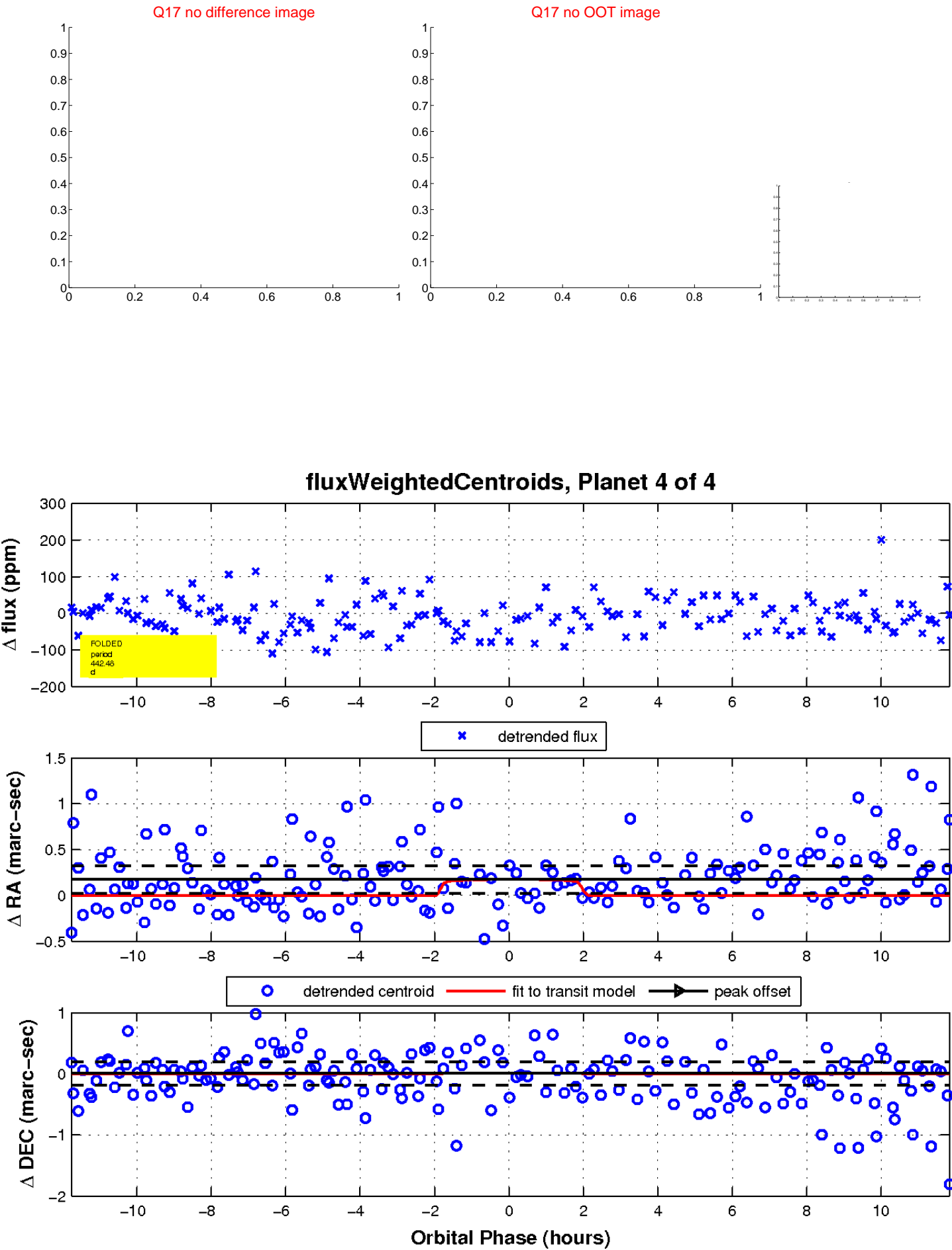
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

