

KIC 002158190

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})
002158190-01	OBS	No	0.984438	131.579329	8.7	6.647	9.0	12.3	3.27	8267	0.98	73617.03
002158190-02	OBS	No	56.254496	146.533609	104.8	2.678	9.1	9.8	3.27	8267	3.90	334.47
002158190-03	OBS	No	36.805167	150.450224	56.9	2.827	8.6	9.1	3.27	8267	2.68	588.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002158190-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
002158190-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
002158190-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

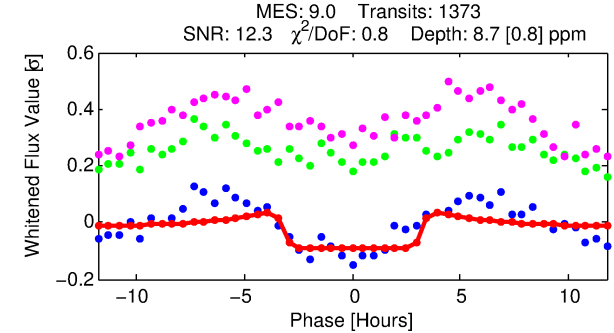
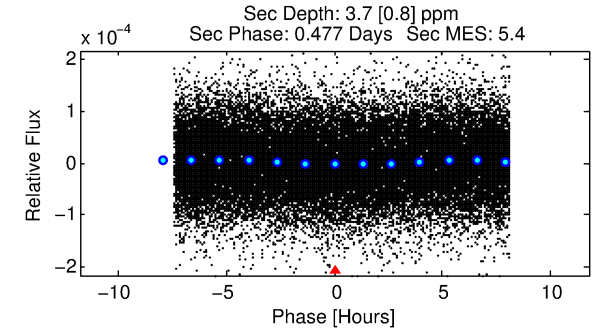
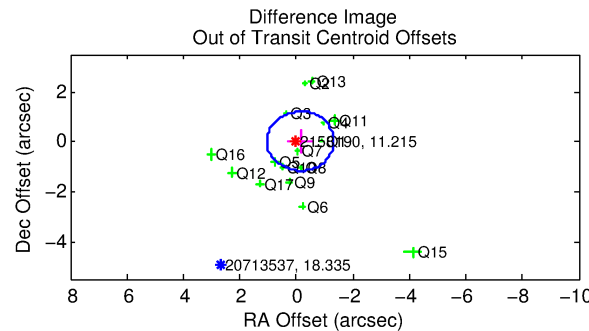
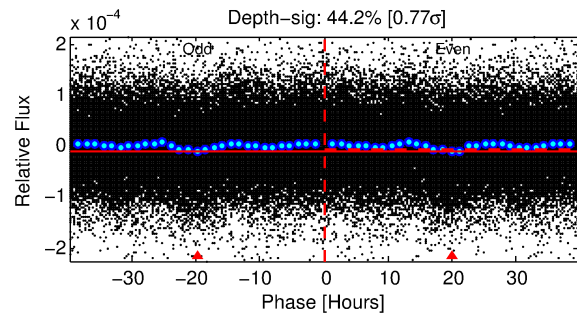
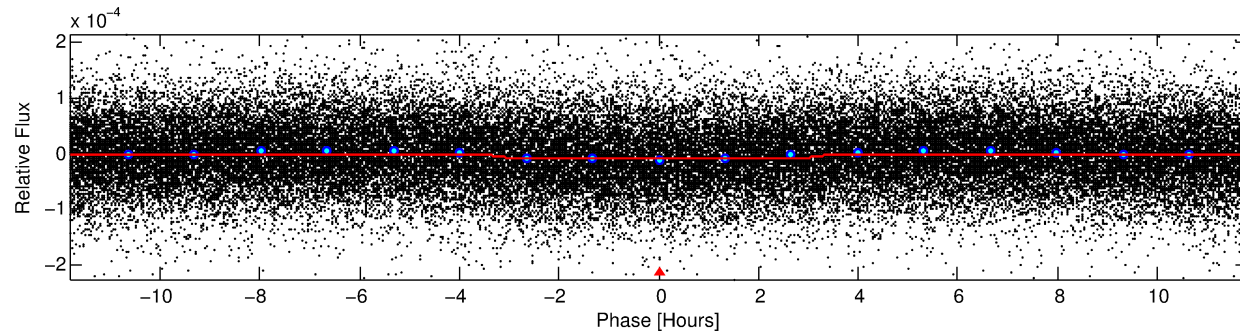
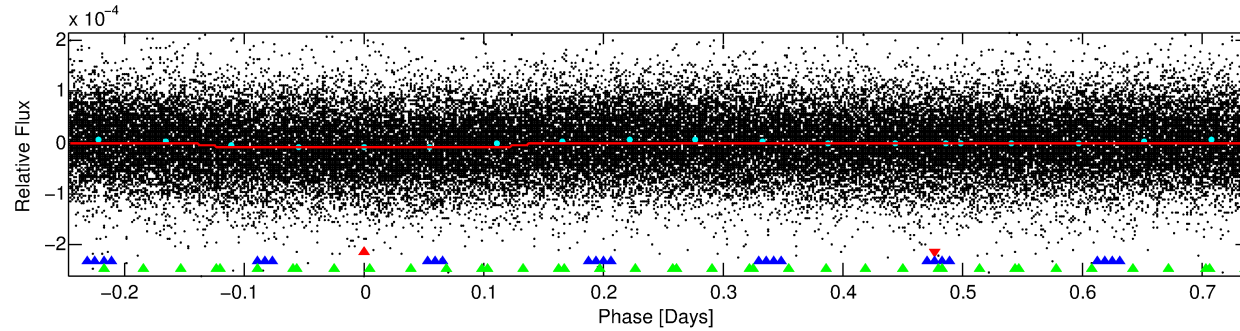
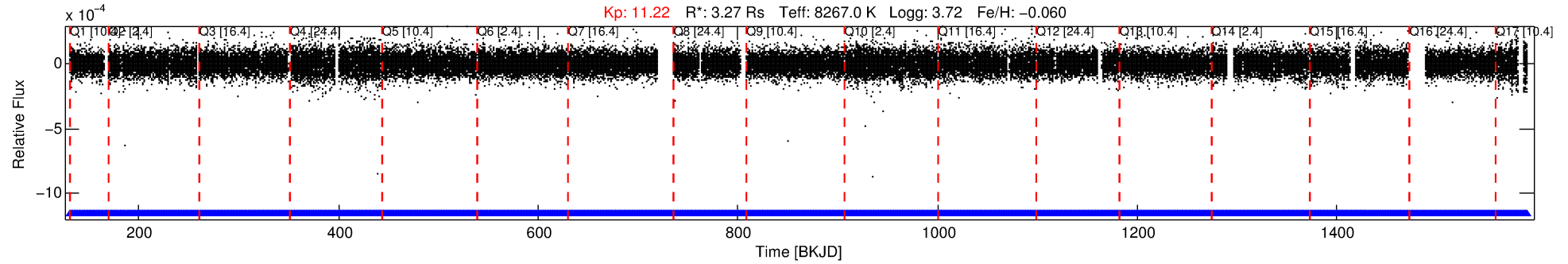
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002158190-01

No Significant Match Found

DV One-Page Summary

KIC: 2158190 Candidate: 1 of 3 Period: 0.984 d



DV Fit Results:

Period = 0.98444 [0.00001] d
Epoch = 131.5793 [0.0036] BKJD
Rp/R* = 0.0027 [0.0015]
a/R* = 1.29 [1.59]
b = 0.21 [14.23]
Seff = 73617.03 [51876.79]
Teq = 4200 [740] K
Rp = 0.98 [0.69] Re
a = 0.0246 [0.0106] AU
Ag = 1.28 [1.67] [0.17 σ]
Teffp = 6904 [1945] K [1.30 σ]

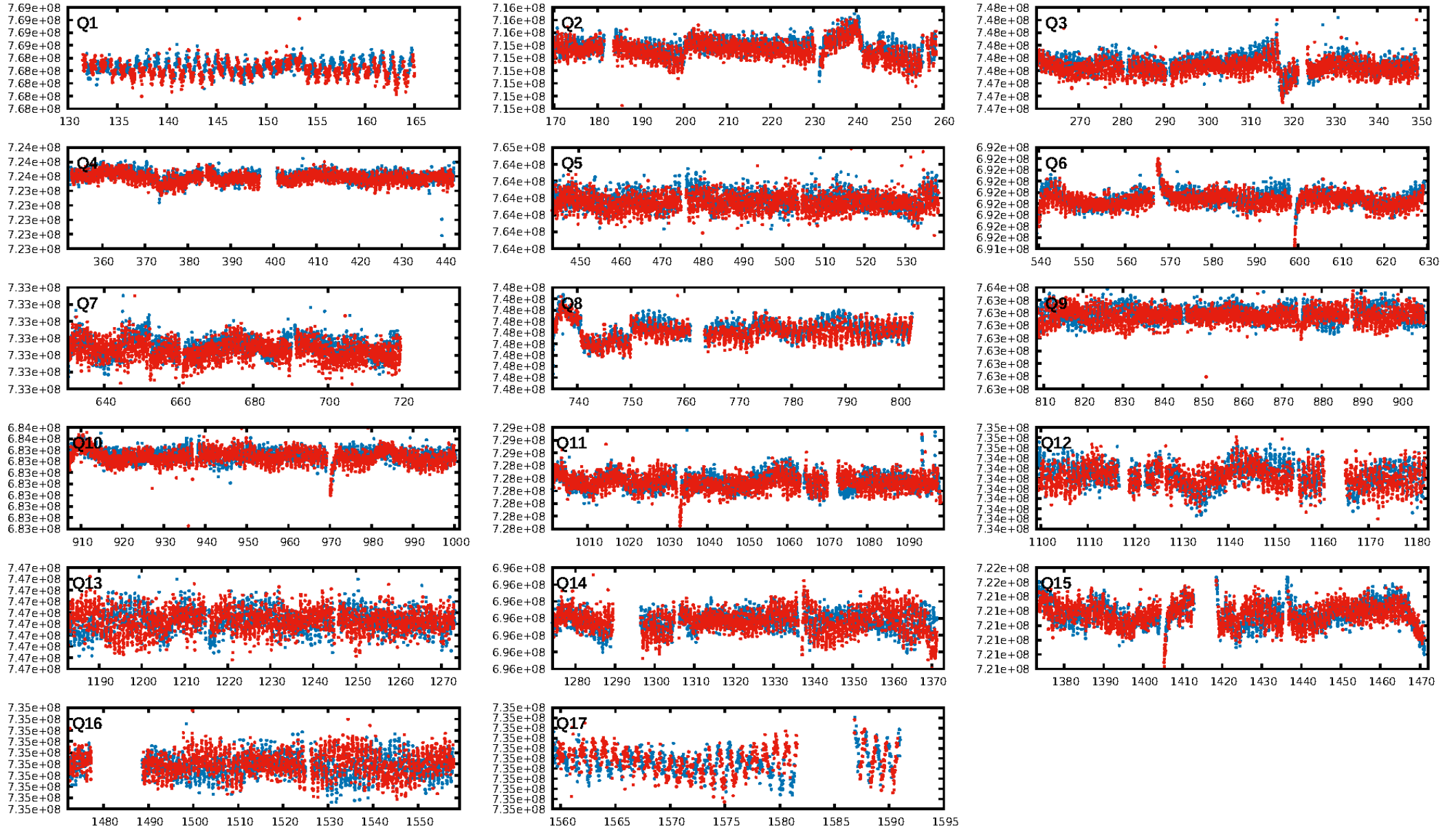
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [119.02 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.63e-11
RollingBand-fgt: 1.00 [1311/1311]
GhostDiagnostic-chr: 1.076
Centroid-sig: 22.9%
Centroid-so: 0.964 arcsec [1.23 σ]
OotOffset-rm: 0.144 arcsec [0.37 σ]
KicOffset-rm: 0.136 arcsec [0.31 σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.81 [13/16]
DiffImageOverlap-fno: 1.00 [17/17]

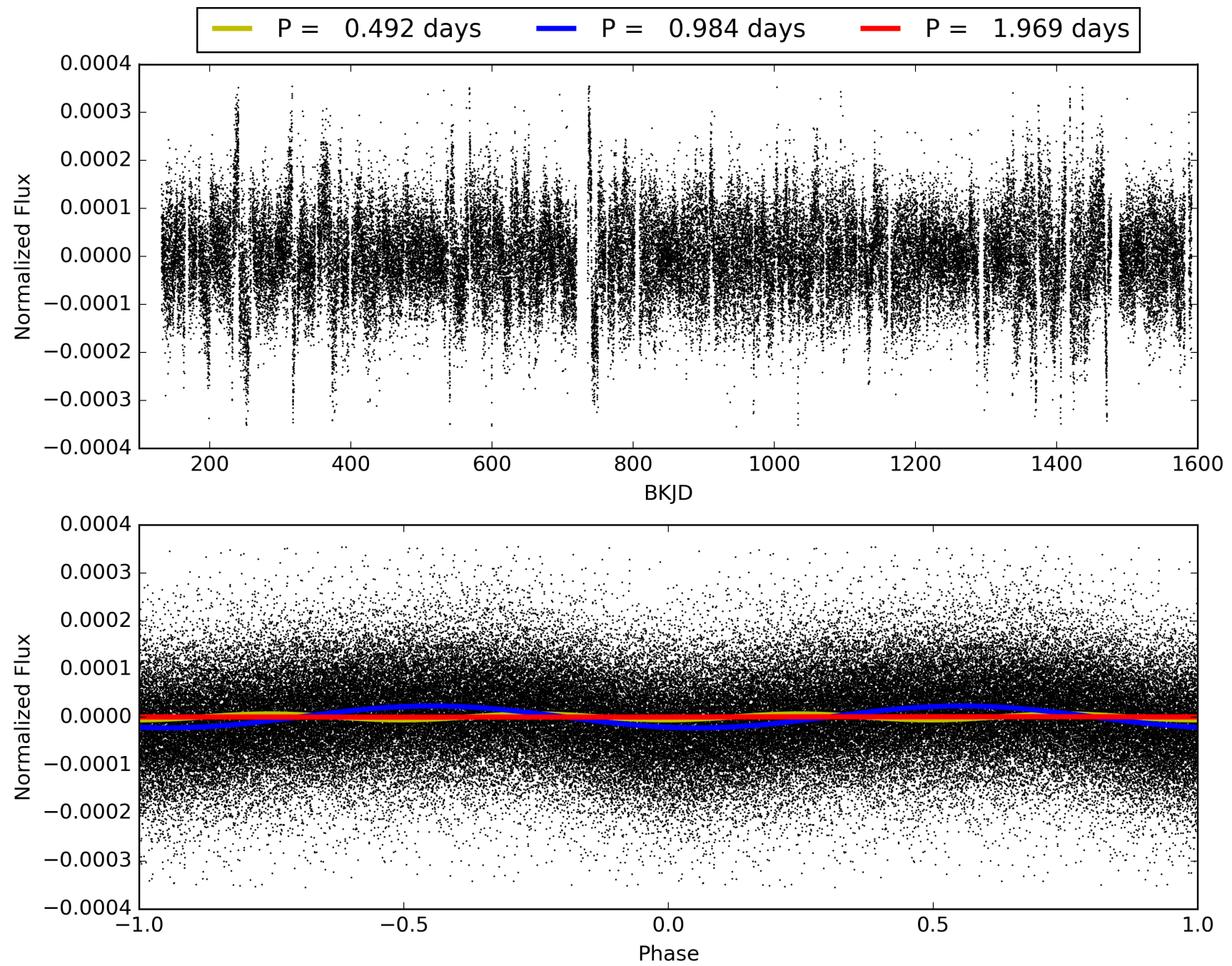
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:20:24 Z

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

TCE 002158190-01, PDC Light Curves

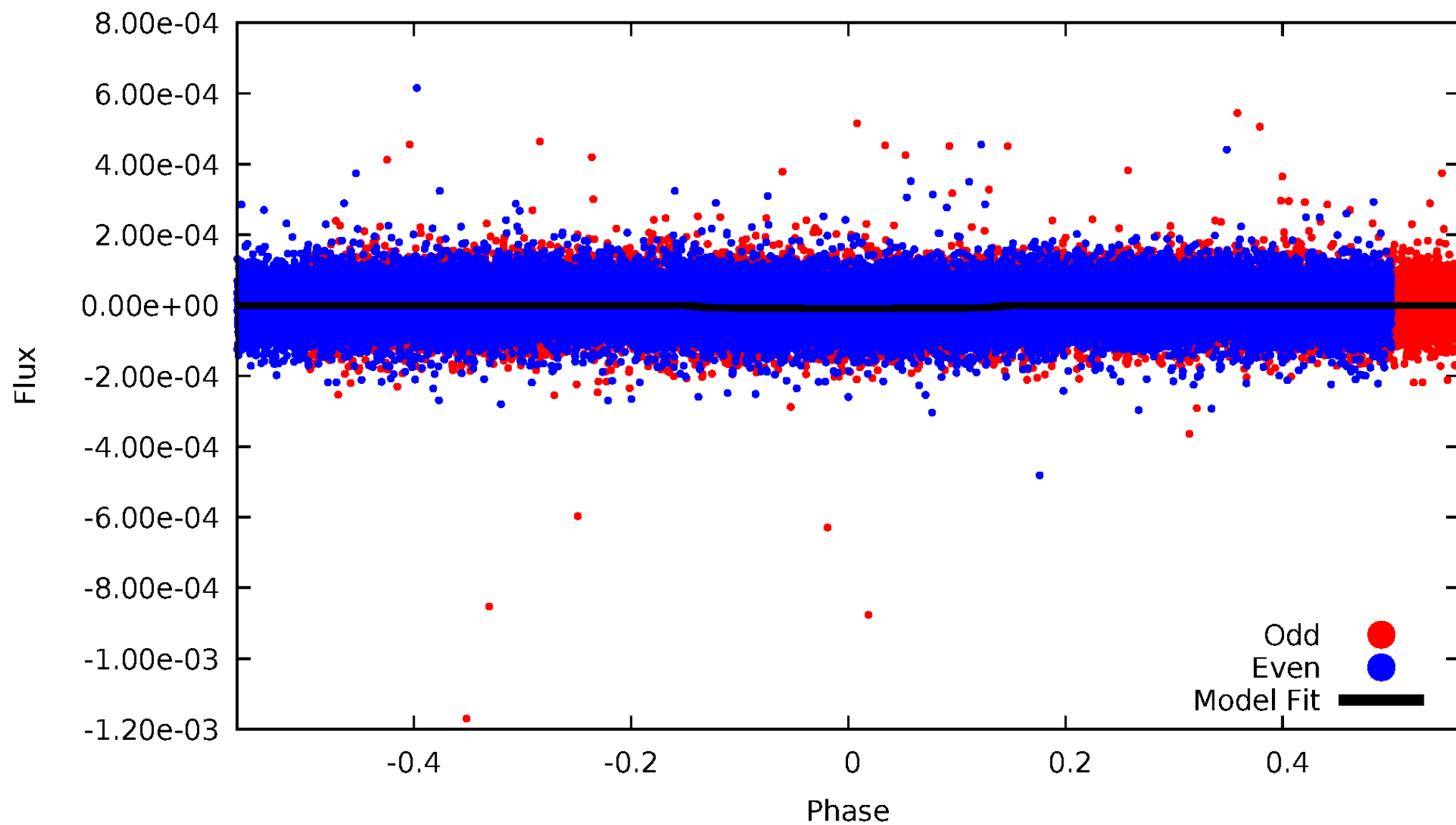


TCE 002158190-01



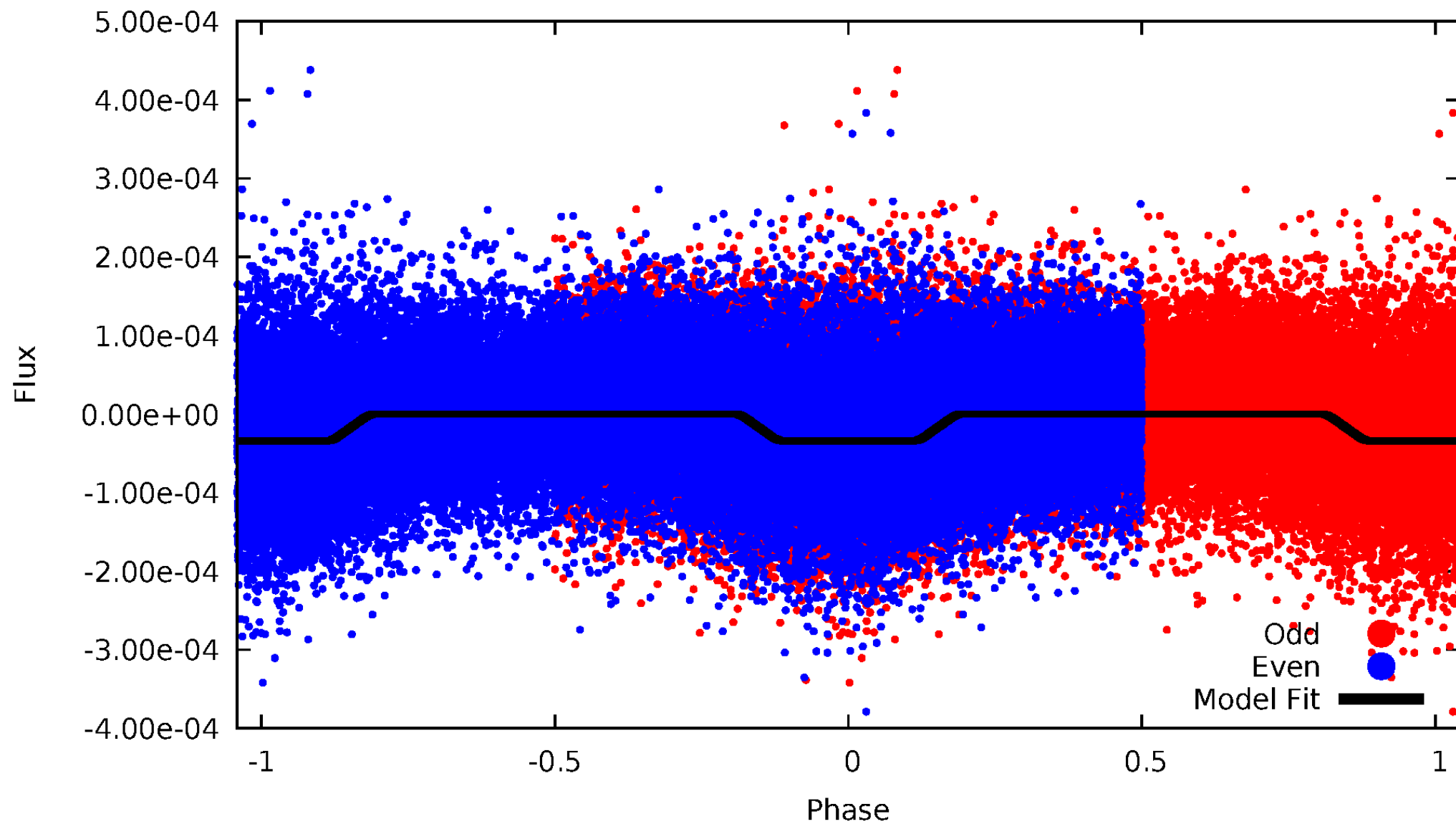
DV Odd/Even

TCE 002158190-01

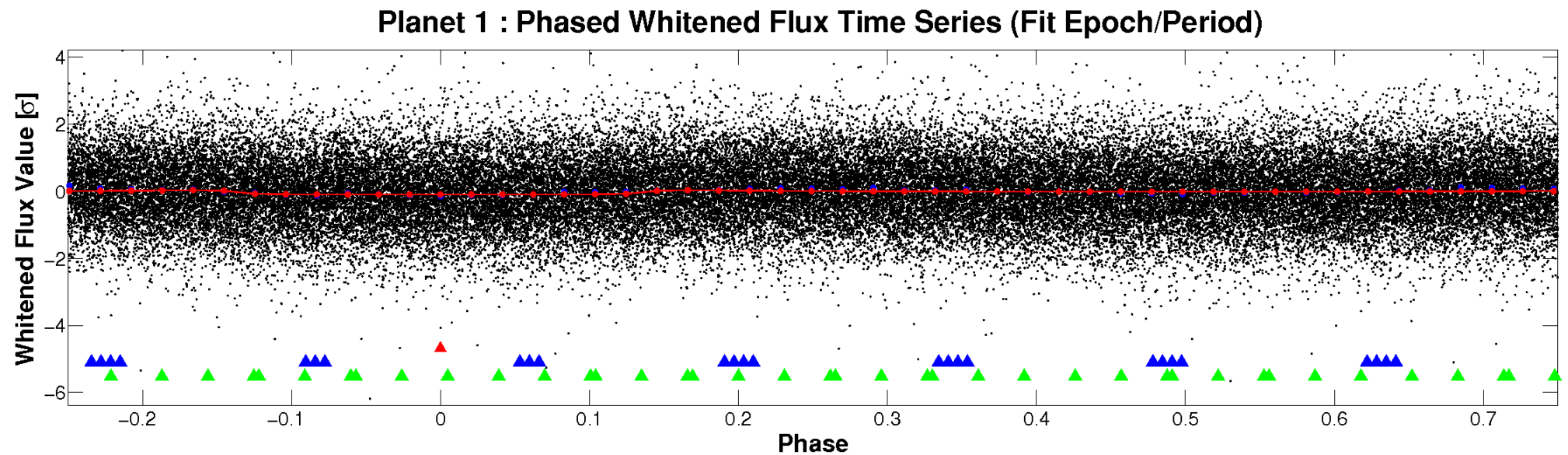
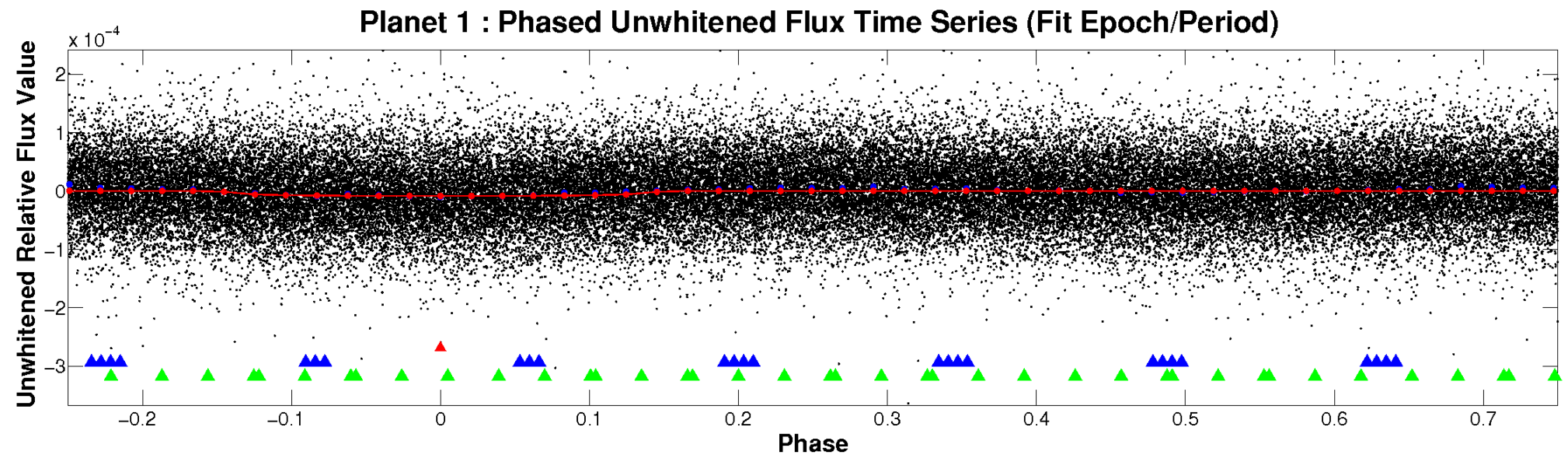


ALT Odd/Even

TCE 002158190-01

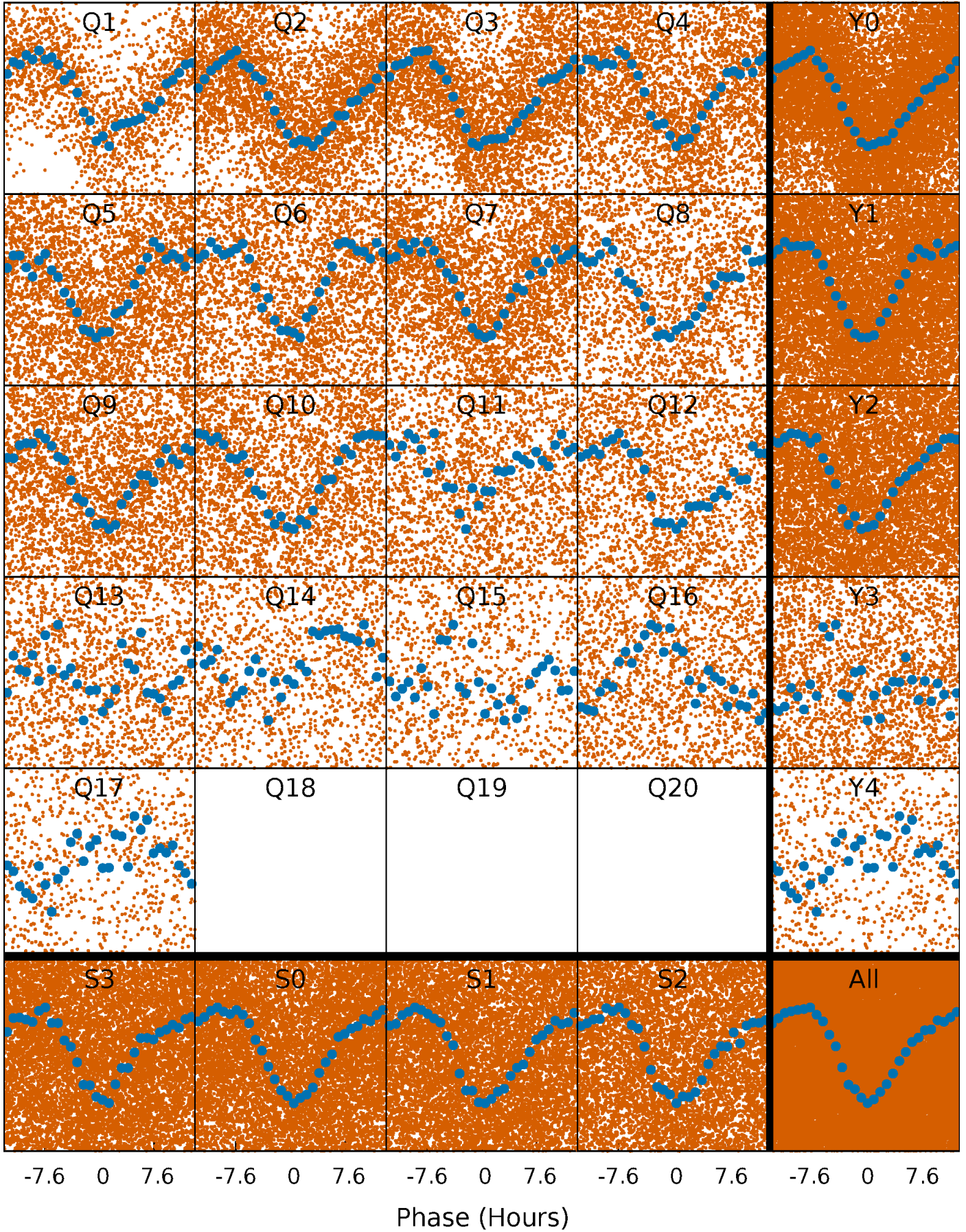


Non-Whitened Vs. Whitened Light Curve



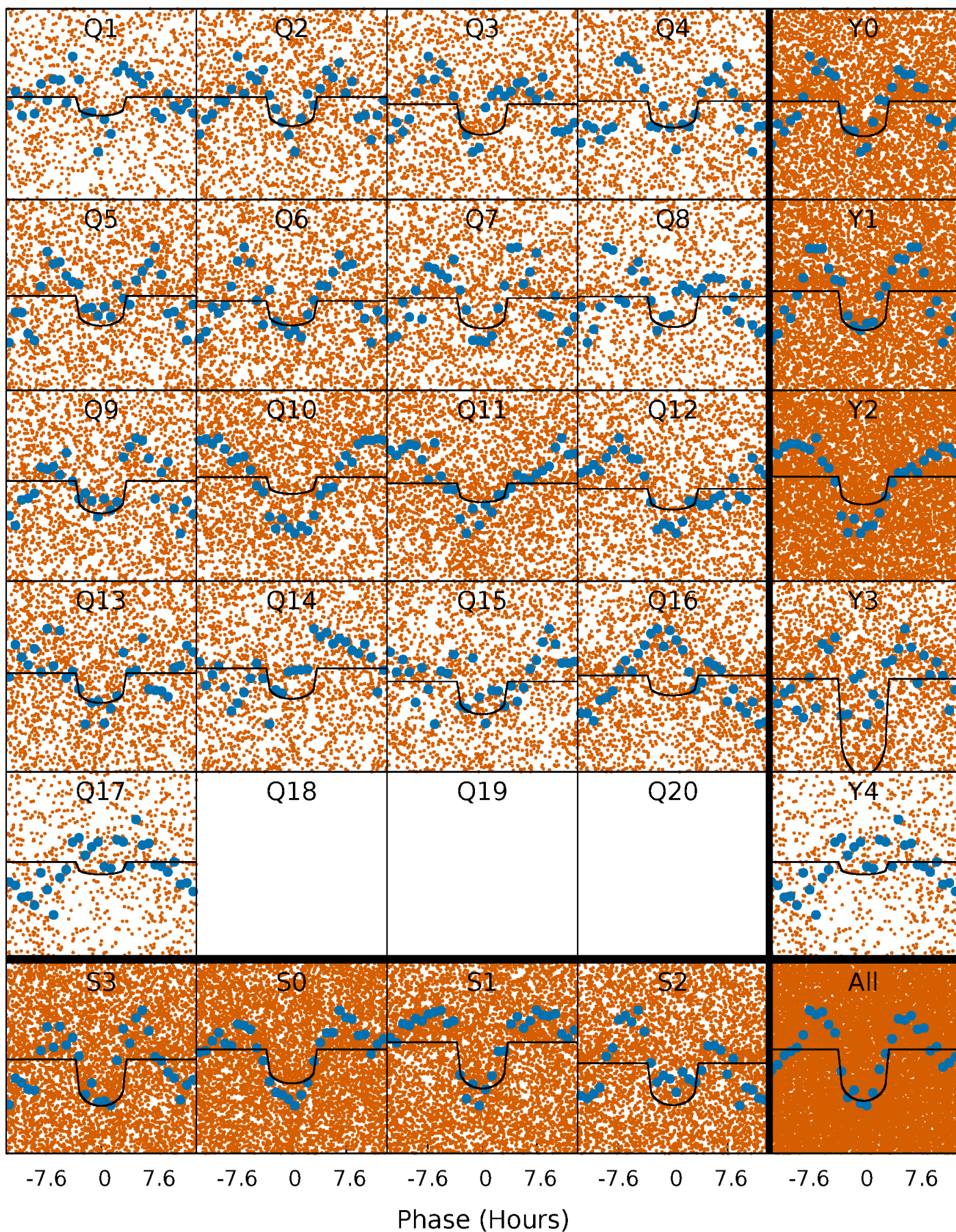
PDC Quarter-Phased Transit Curves

TCE 002158190-01 P= 0.984438 Days $T_0=131.579329$ (BKJD)



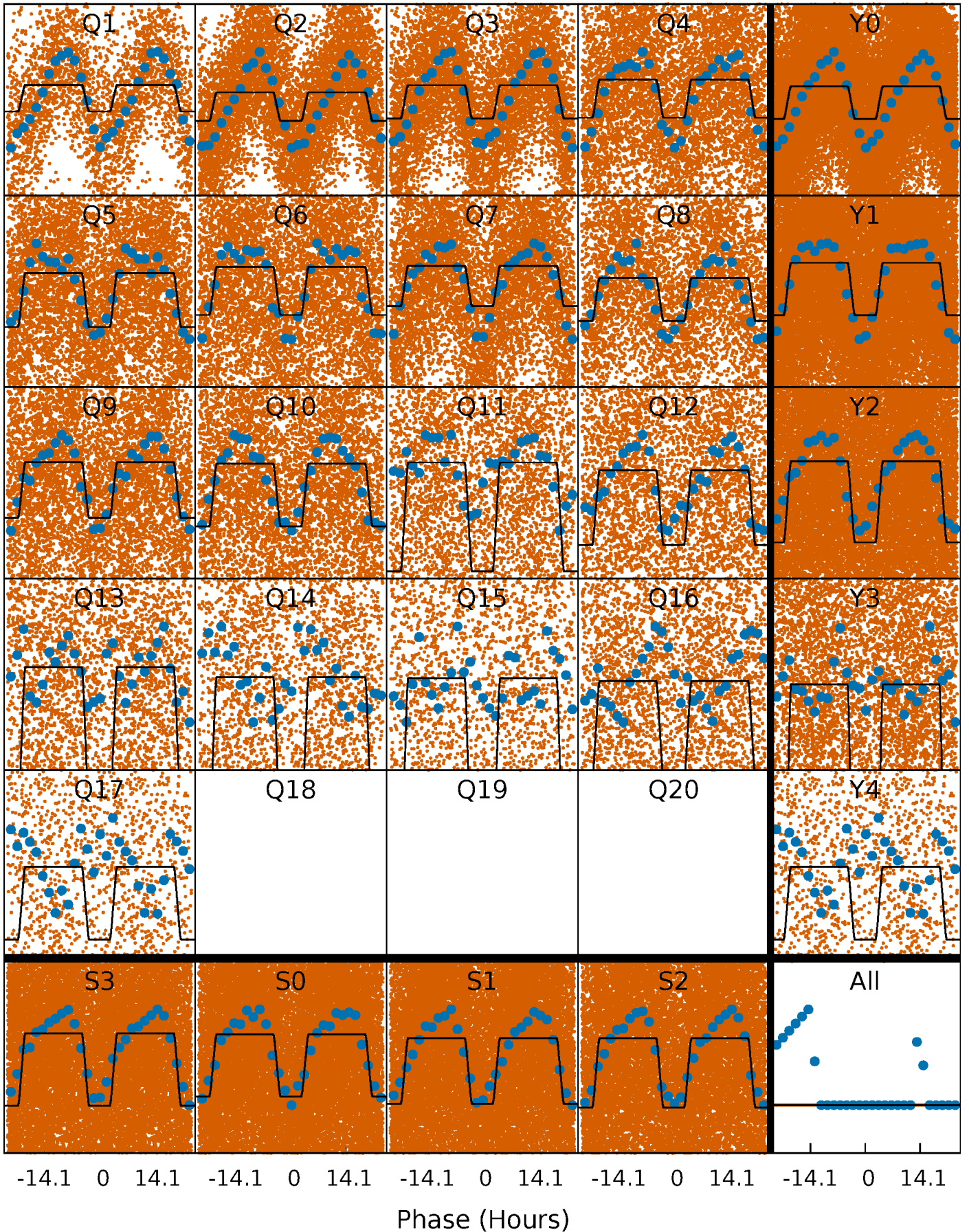
DV Quarter-Phased Transit Curves

TCE 002158190-01 P= 0.984438 Days $T_0=131.579329$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

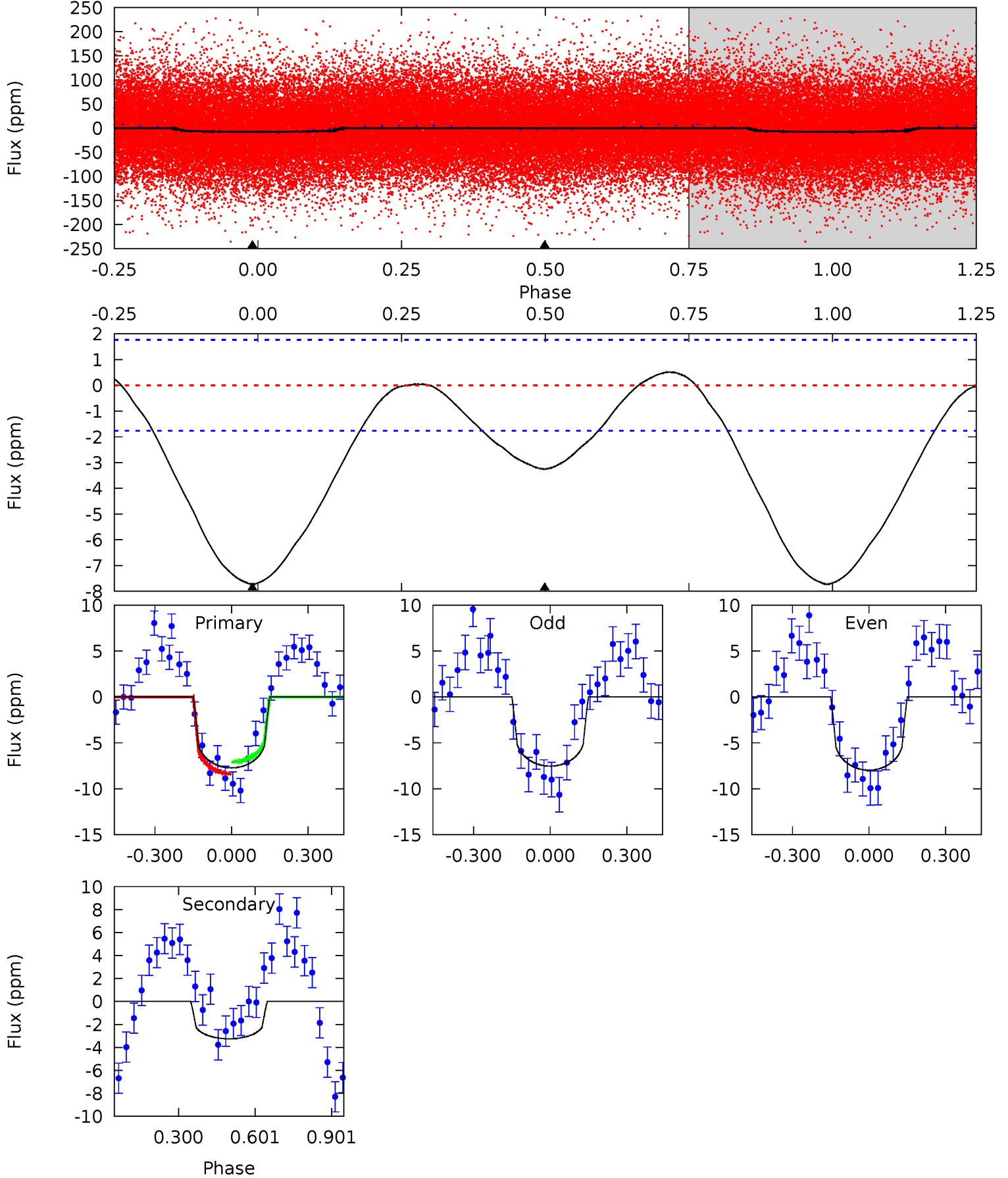
TCE 002158190-01 P= 0.984484 Days $T_0=131.587094$ (BKJD)



DV Model-Shift Uniqueness Test

002158190-01, P = 0.984438 Days, E = 130.594891 Days

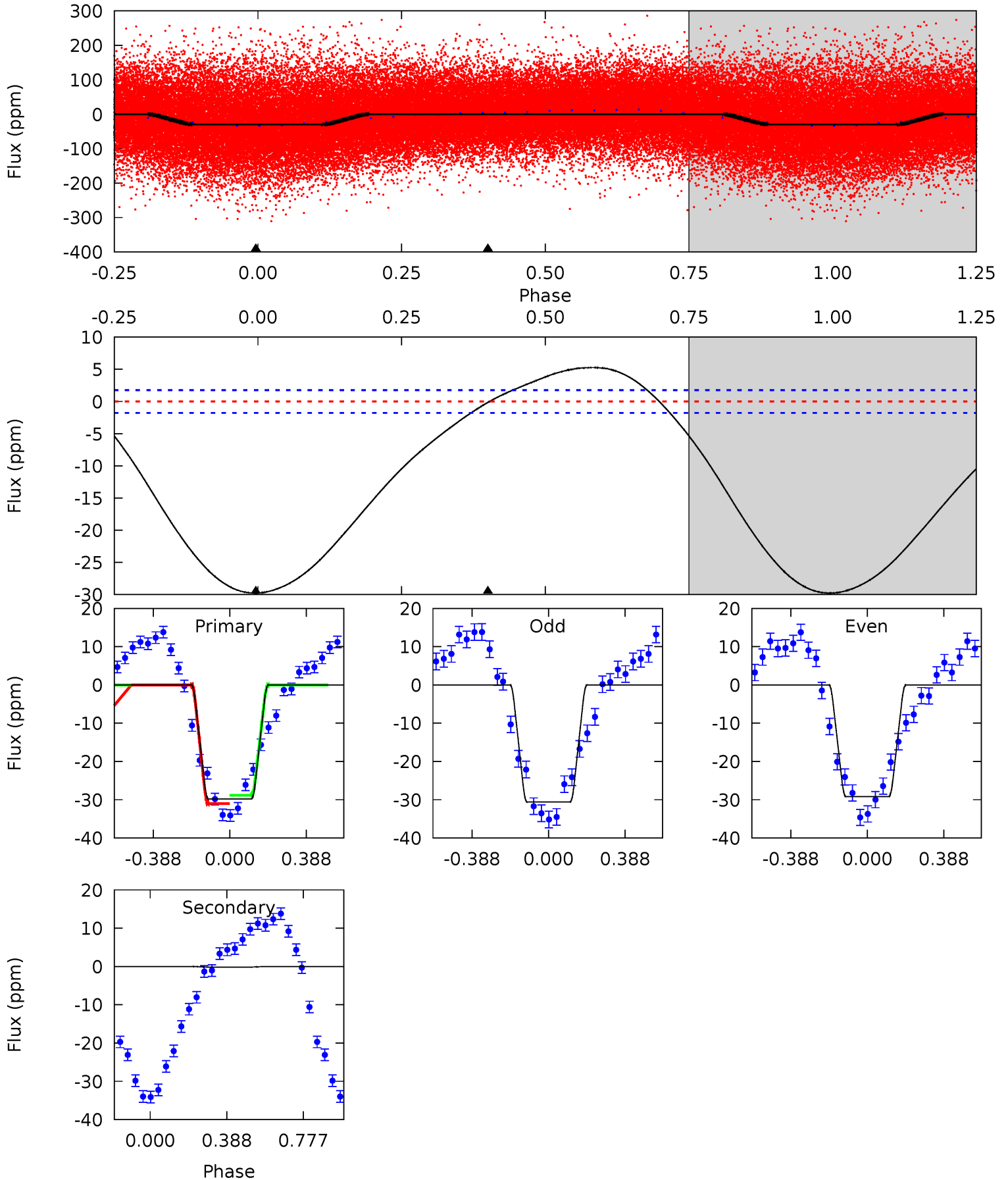
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	7.97	0	0	4.33	1.04	0.67	18.9	18.9	7.97	7.97	0.54	1.05	0.06	1.59



Alt Model-Shift Uniqueness Test

002158190-01, P = 0.984484 Days, E = 130.602610 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
71.7	0.34	0	0	4.27	0.86	6.40	71.7	71.7	0.34	0.34	1.73	0.85	0.15	2.36



Stellar Parameters For KIC 002158190

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8267^{+229}_{-360}	$3.723^{+0.399}_{-0.142}$	$-0.060^{+0.300}_{-0.400}$	$3.269^{+0.987}_{-1.480}$	$2.060^{+0.388}_{-0.474}$	$0.083^{+0.329}_{-0.039}$
	+3%/-4%	+11%/-4%	+500%/-667%	+30%/-45%	+19%/-23%	+396%/-47%
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 002158190-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3 ± 0	$0.91^{+0.52}_{-0.47}$	5690^{+470}_{-694}	5898^{+3647}_{-1476}	$1.310^{+4.221}_{-0.787}$
Alt.	-0 ± 0	$1.98^{+0.67}_{-0.61}$	5717^{+502}_{-638}	-4653^{+481}_{-345}	$0.009^{+0.049}_{-0.034}$

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

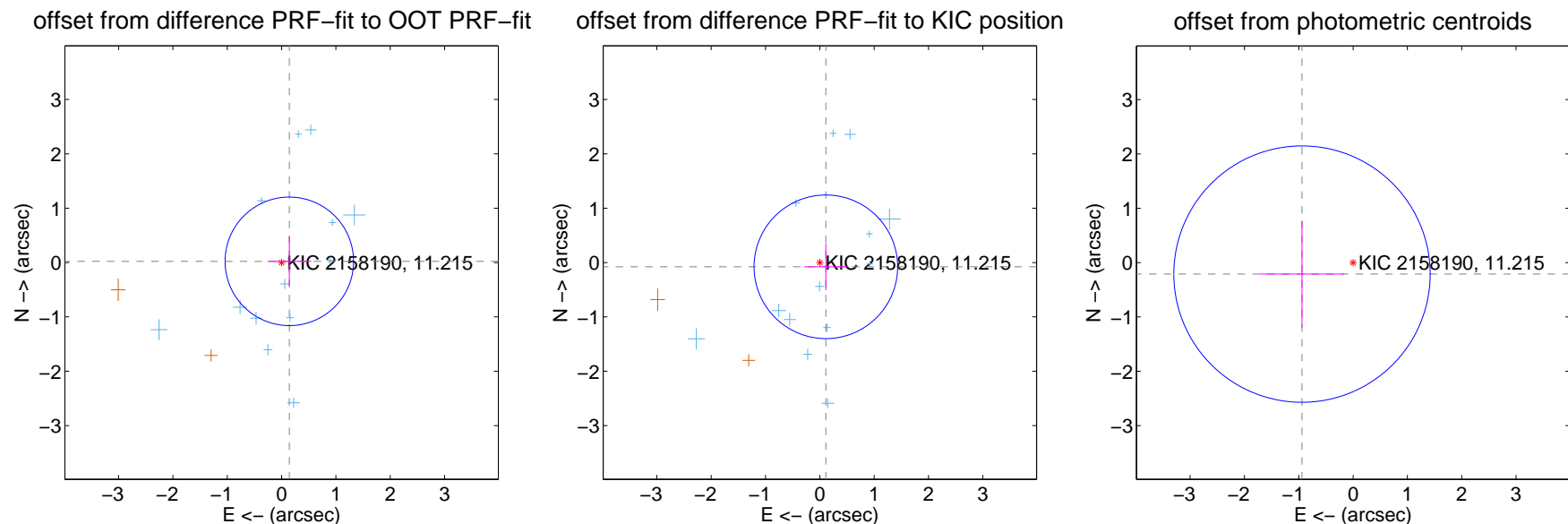
DV Centroid Data

Supplemental centroid analysis for 002158190-01. **Kepler magnitude: 11.21.** Transit SNR 12.26

There are 13 quarters with good PRF difference image offsets

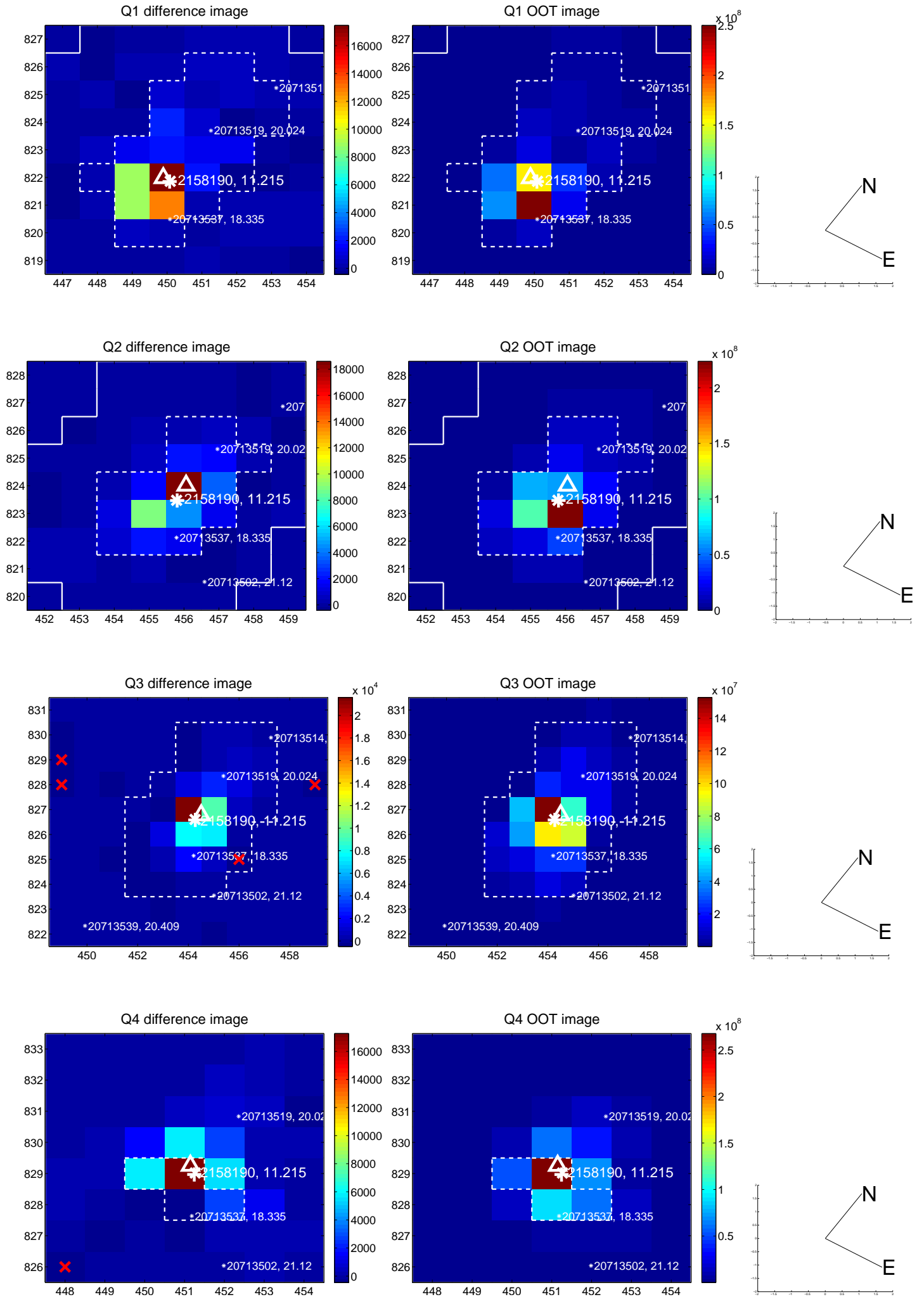
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.144 ± 0.394	0.37	-0.142 ± 0.403	0.022 ± 0.454
PRF-fit source offset from KIC position	0.136 ± 0.440	0.31	-0.110 ± 0.397	-0.079 ± 0.429
photometric centroid source offset	0.96 ± 0.79	1.23	0.94 ± 0.78	-0.21 ± 0.98

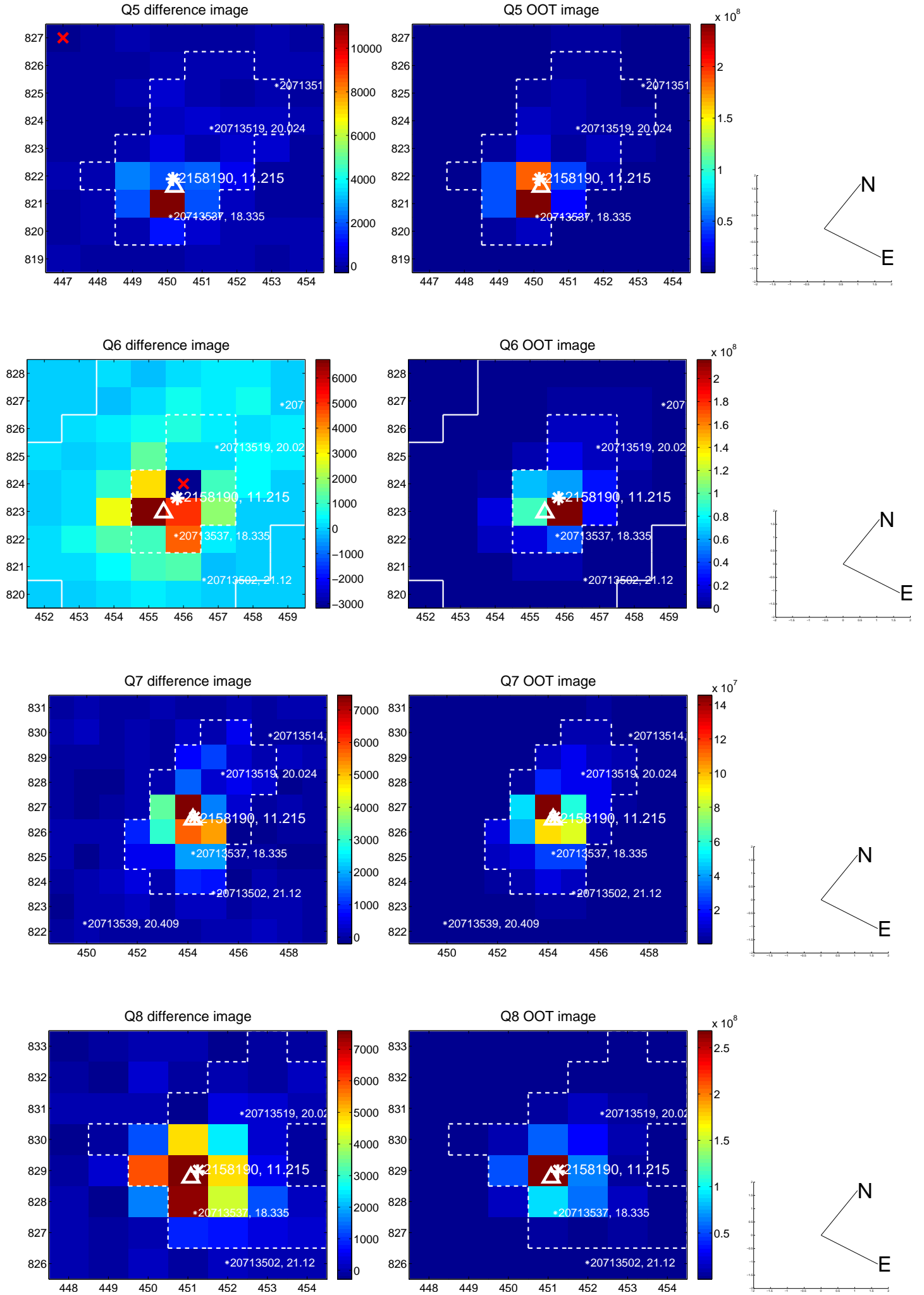


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

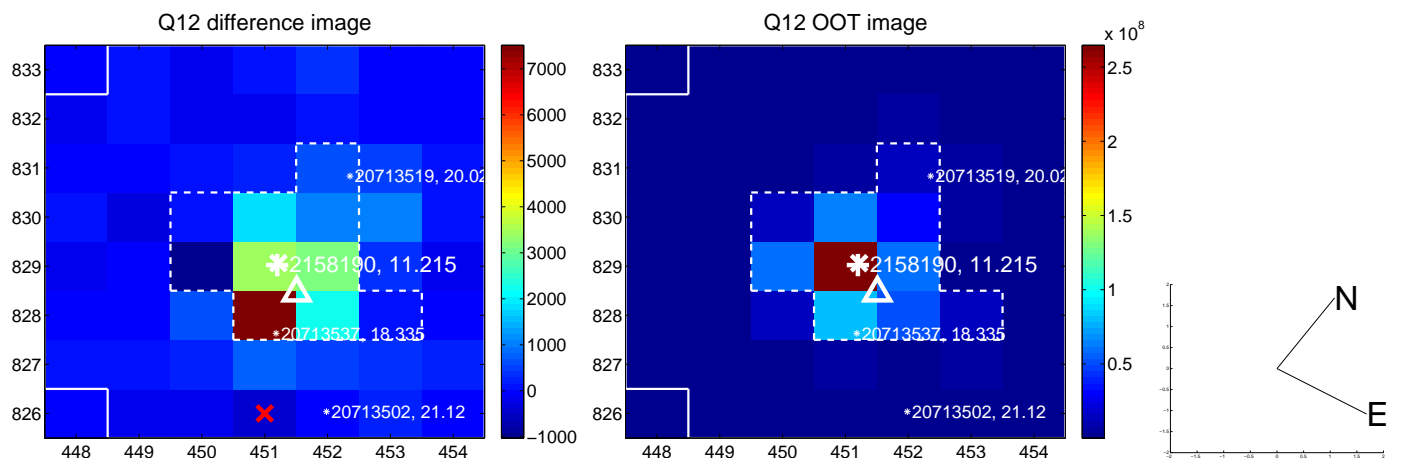
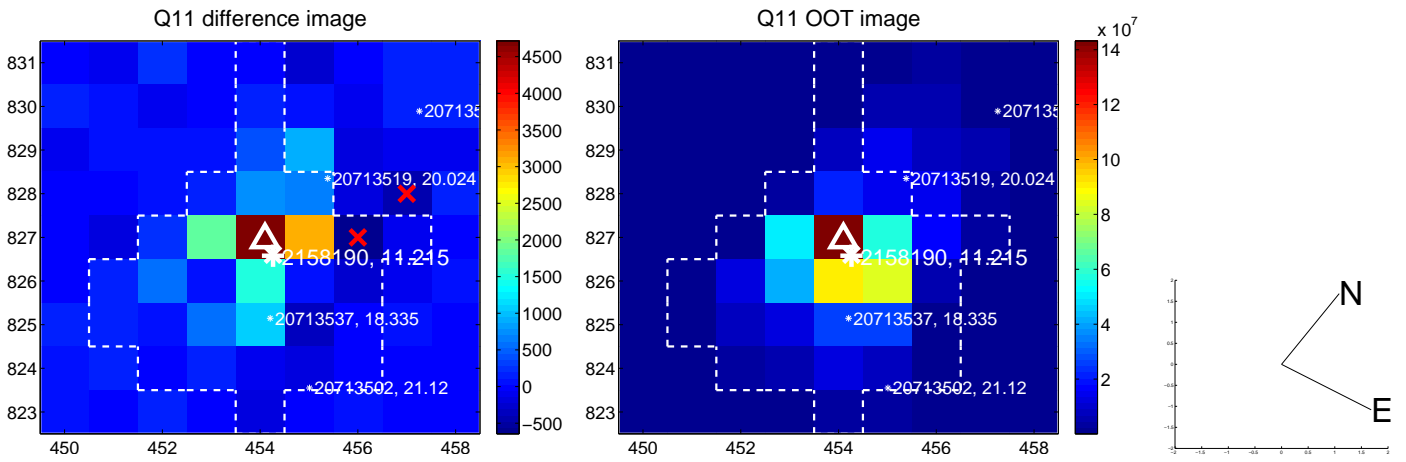
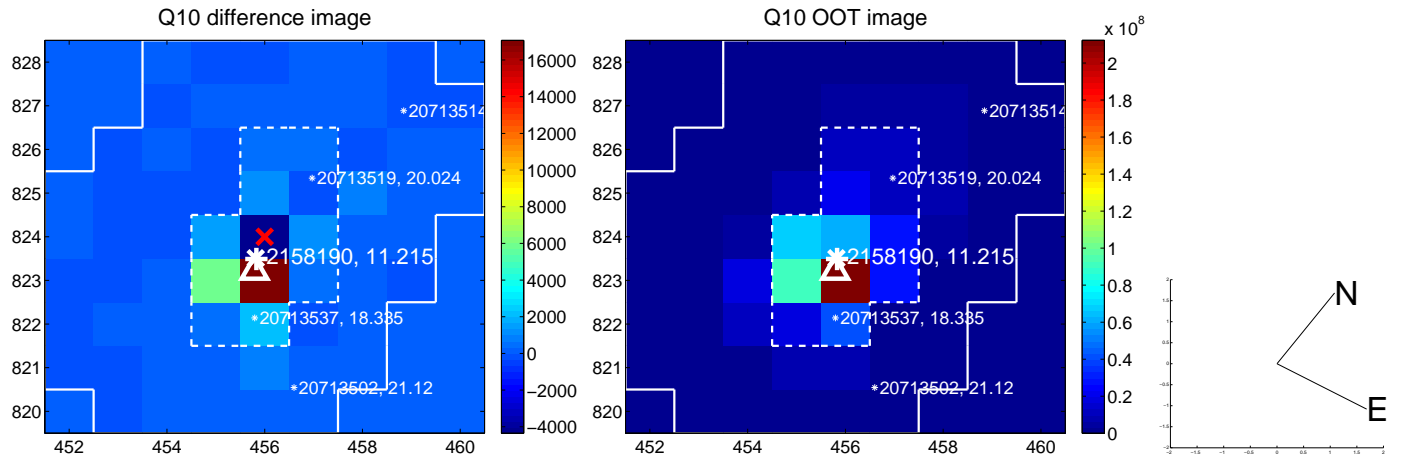
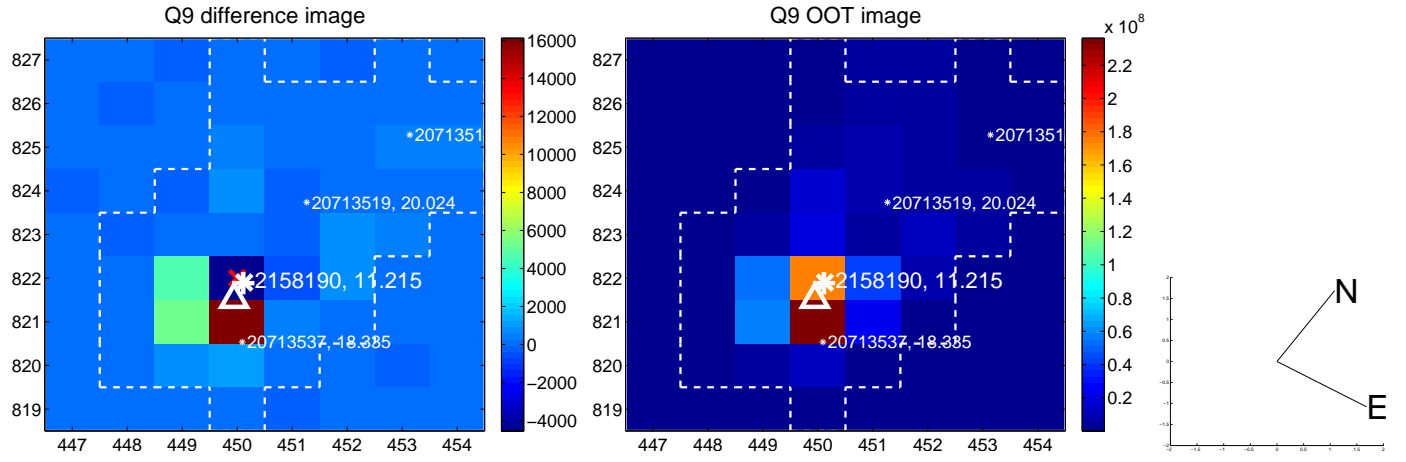
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



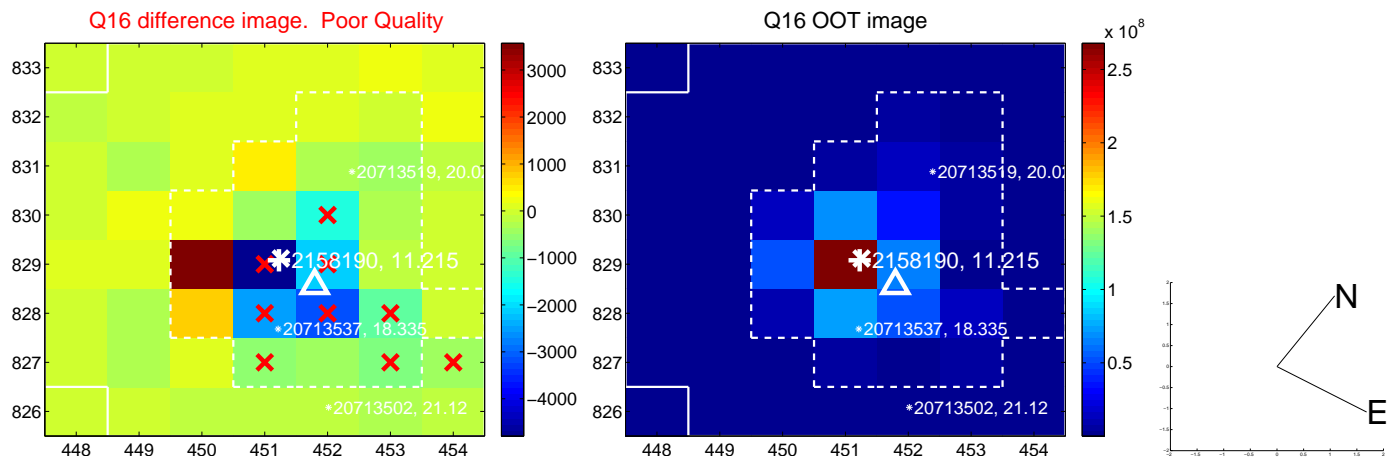
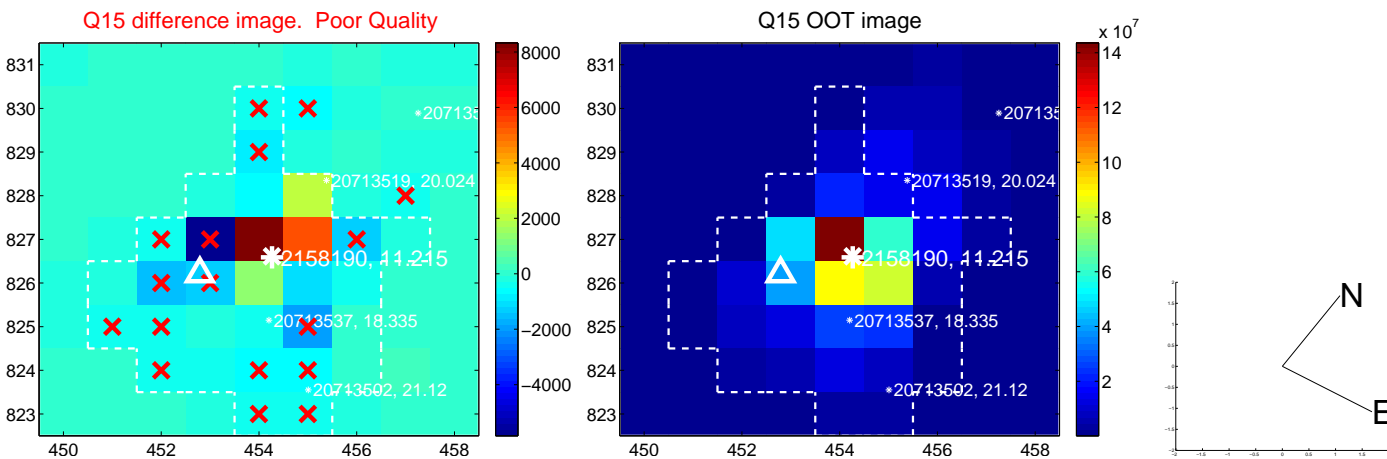
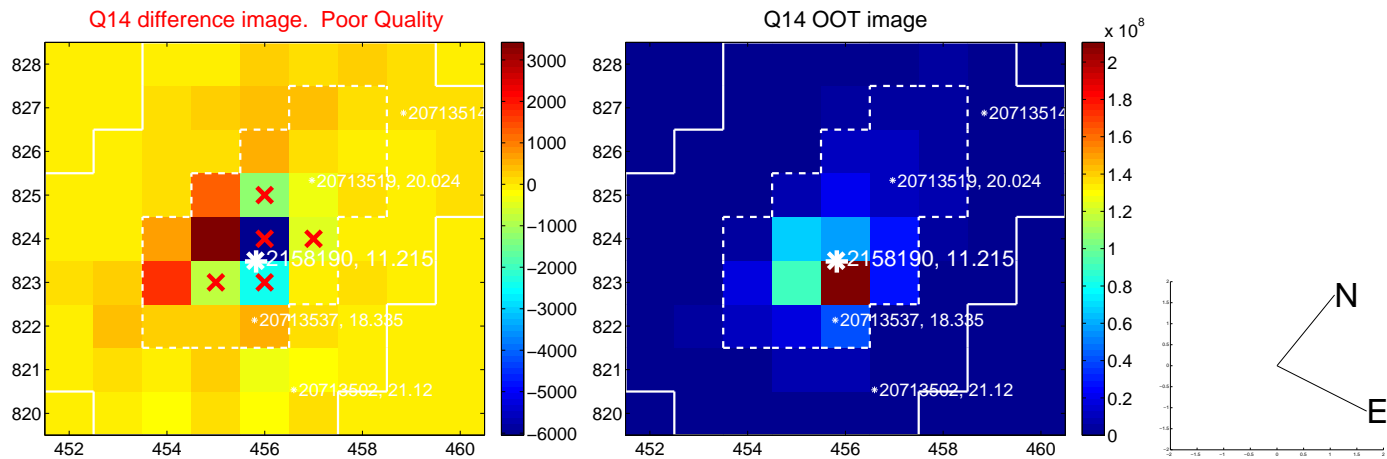
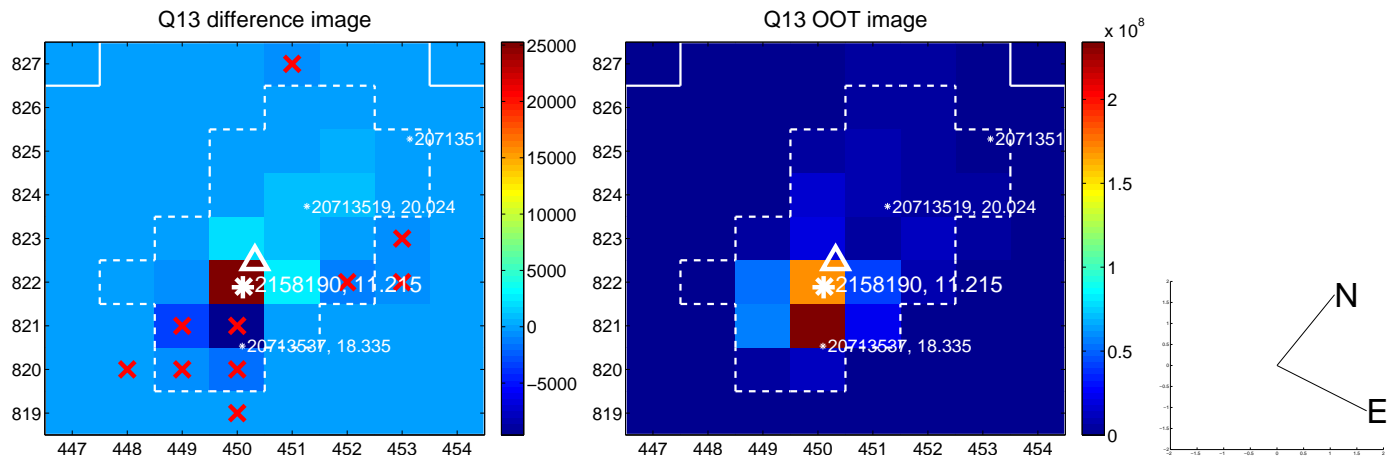
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



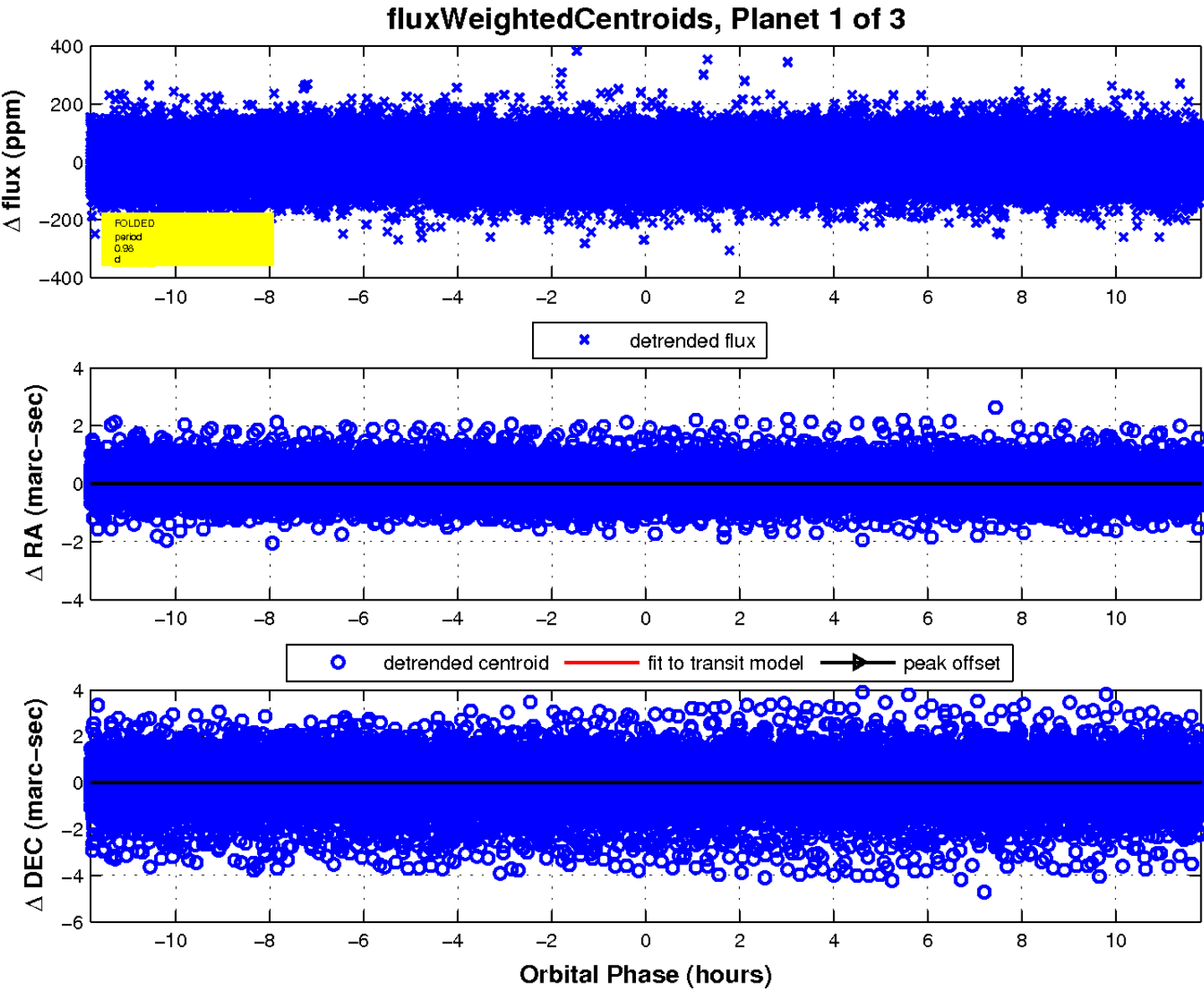
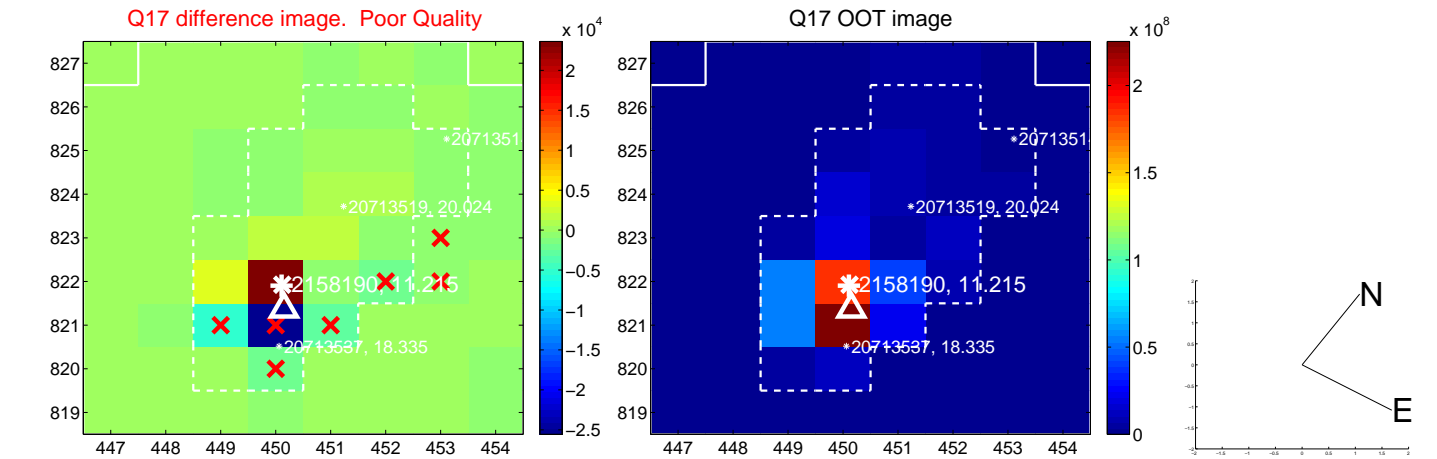
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

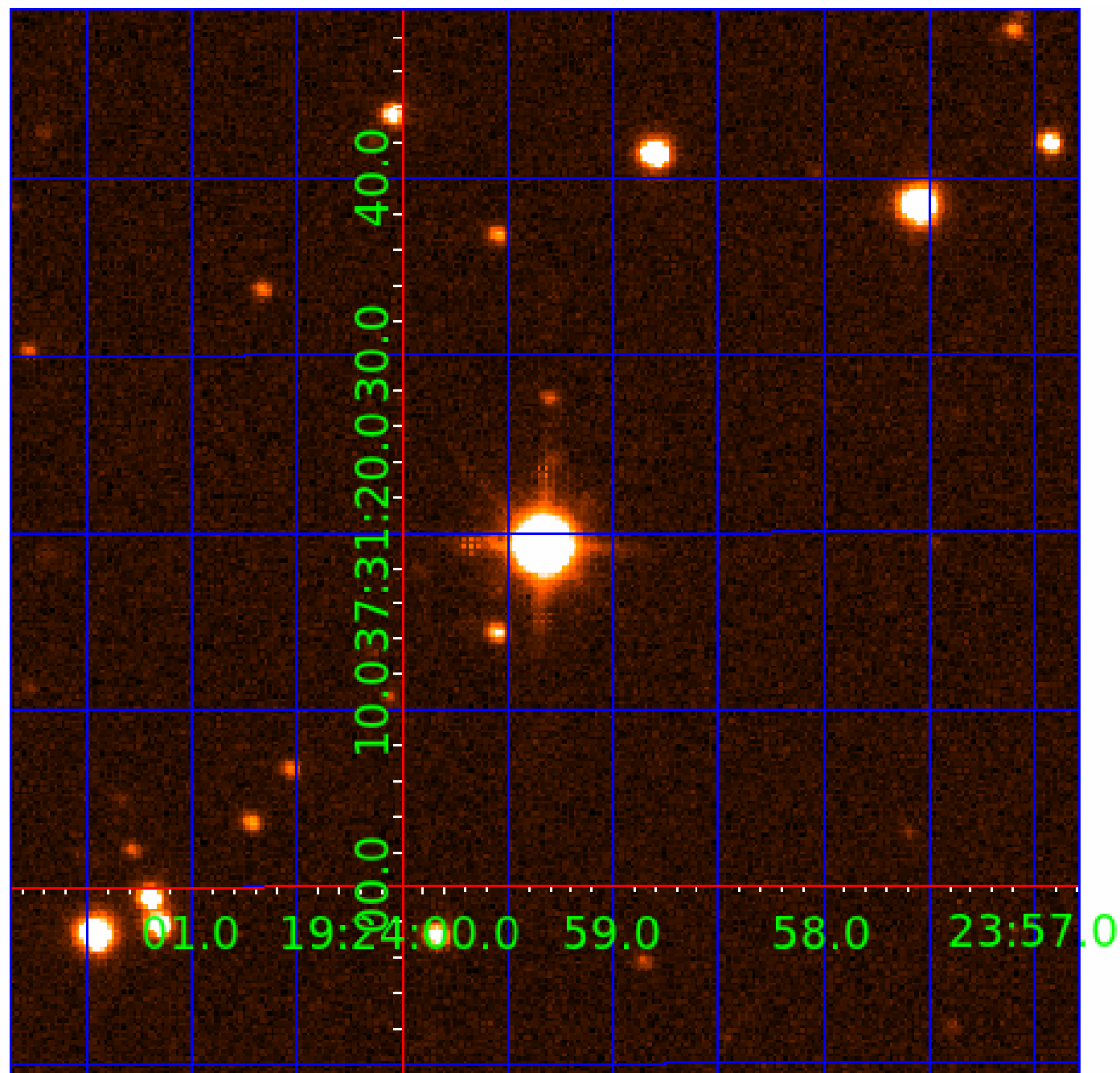


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002158190

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})
002158190-01	OBS	No	0.984438	131.579329	8.7	6.647	9.0	12.3	3.27	8267	0.98	73617.03
002158190-02	OBS	No	56.254496	146.533609	104.8	2.678	9.1	9.8	3.27	8267	3.90	334.47
002158190-03	OBS	No	36.805167	150.450224	56.9	2.827	8.6	9.1	3.27	8267	2.68	588.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002158190-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
002158190-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
002158190-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

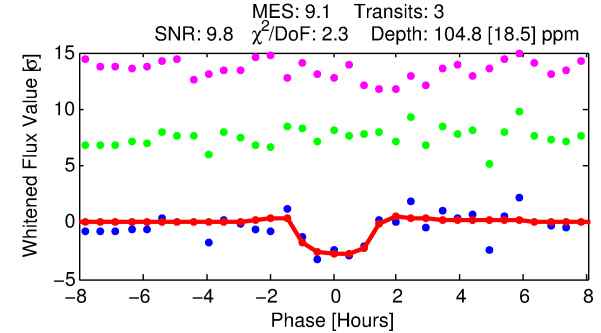
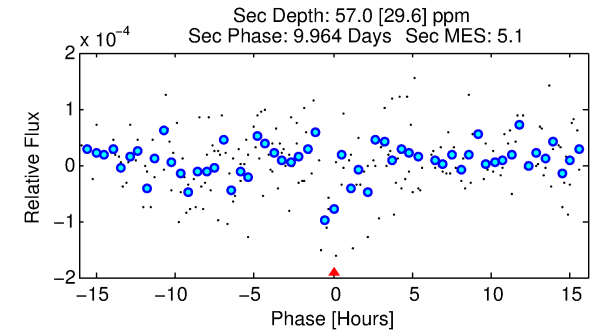
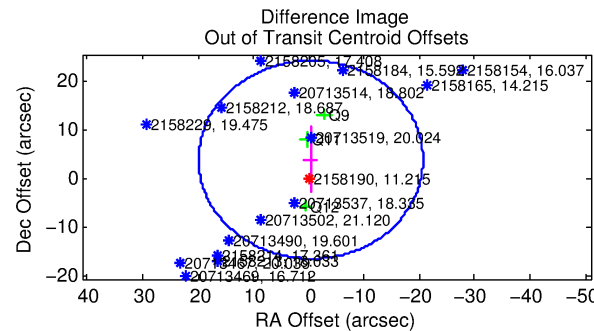
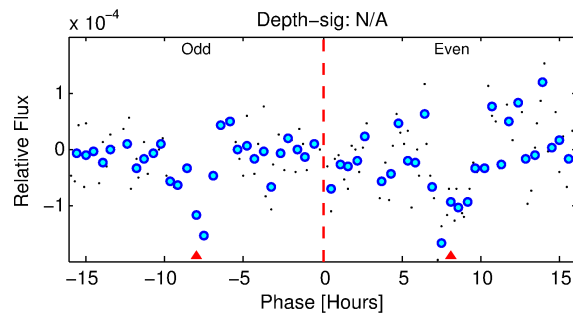
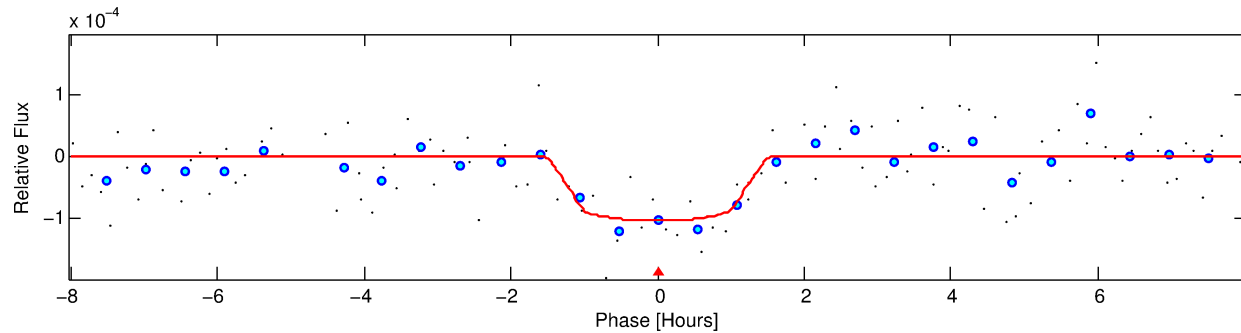
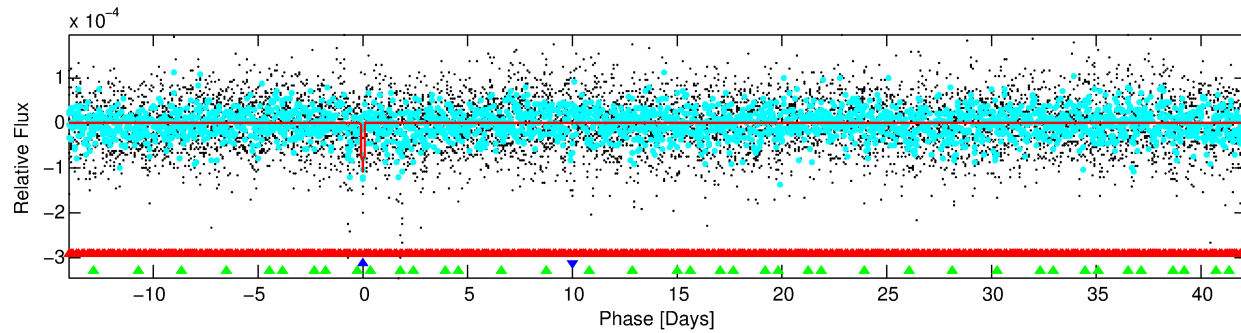
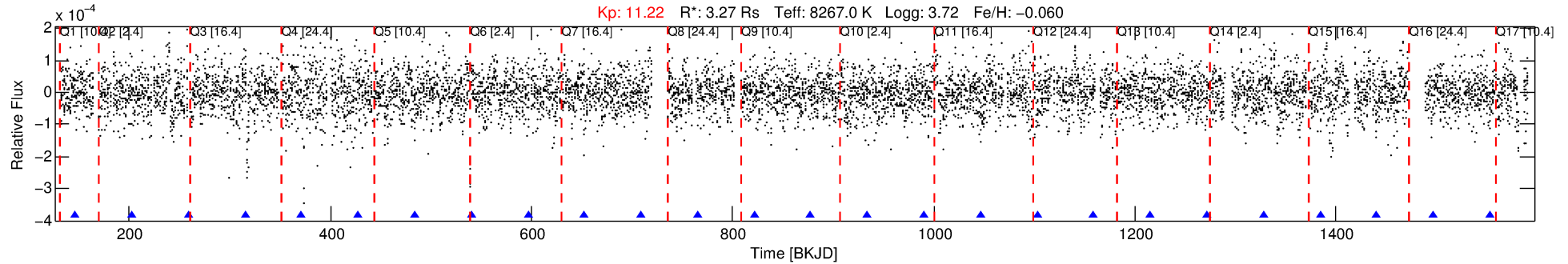
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002158190-02

No Significant Match Found

DV One-Page Summary

KIC: 2158190 Candidate: 2 of 3 Period: 56.254 d



DV Fit Results:

Period = 56.25450 [0.00084] d
Epoch = 146.5336 [0.0137] BKJD
Rp/R* = 0.0109 [0.0126]
a/R* = 73.64 [539.26]
b = 0.90 [1.56]
Seff = 334.47 [235.69]
Teq = 1090 [192] K
Rp = 3.89 [4.84] Re
a = 0.3657 [0.1572] AU
Ag = 276.45 [682.40] [0.40σ]
Teffp = 6875 [4088] K [1.41σ]

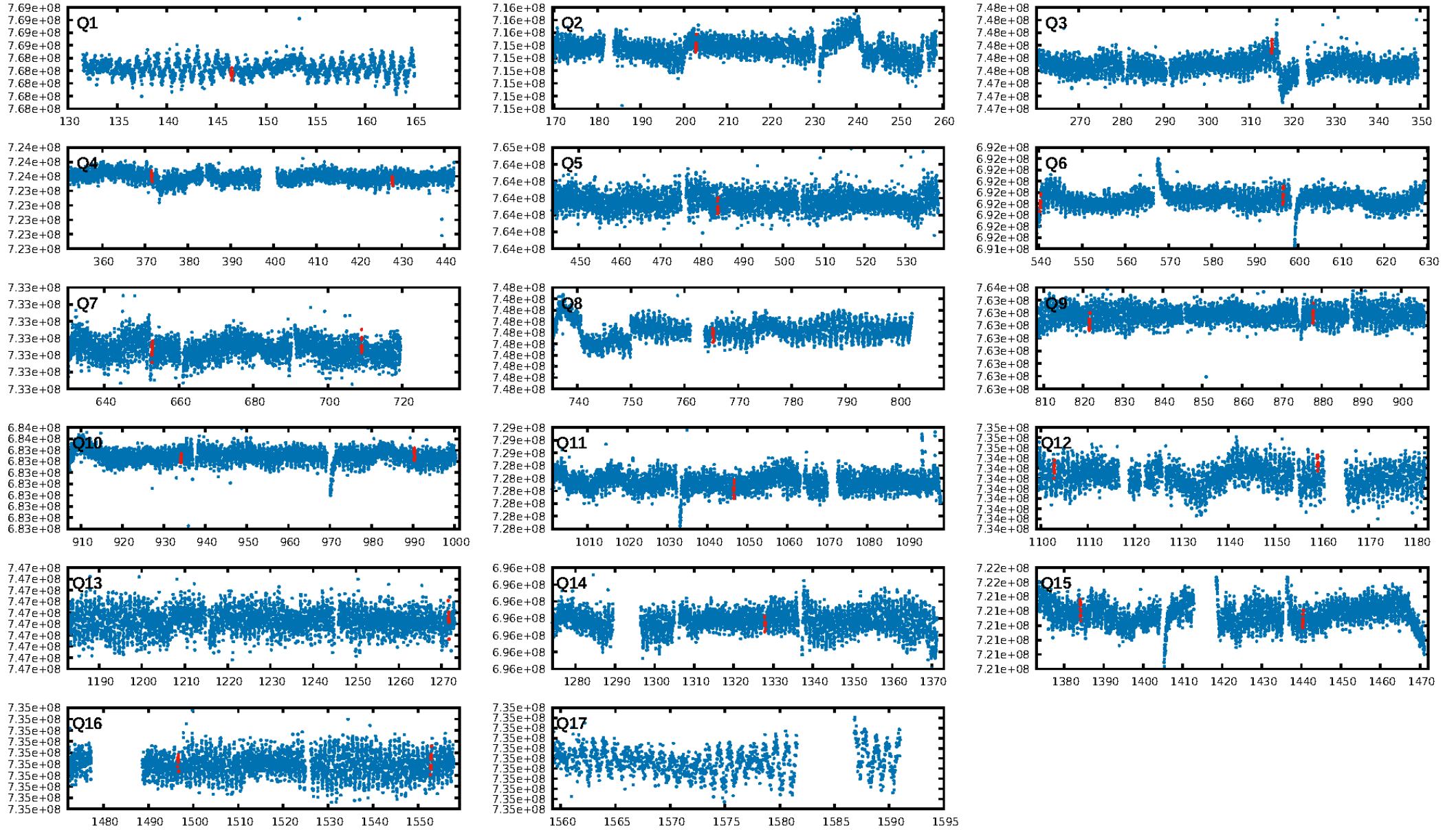
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [119.86σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 11.1%
ModelChiSquareGof-sig: 39.3%
Bootstrap-pfa: 6.64e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.828
Centroid-sig: 7.5%
Centroid-so: 0.993 arcsec [1.12σ]
OotOffset-rm: 3.941 arcsec [0.58σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 3.803 arcsec [0.55σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 0.19 [3/16]

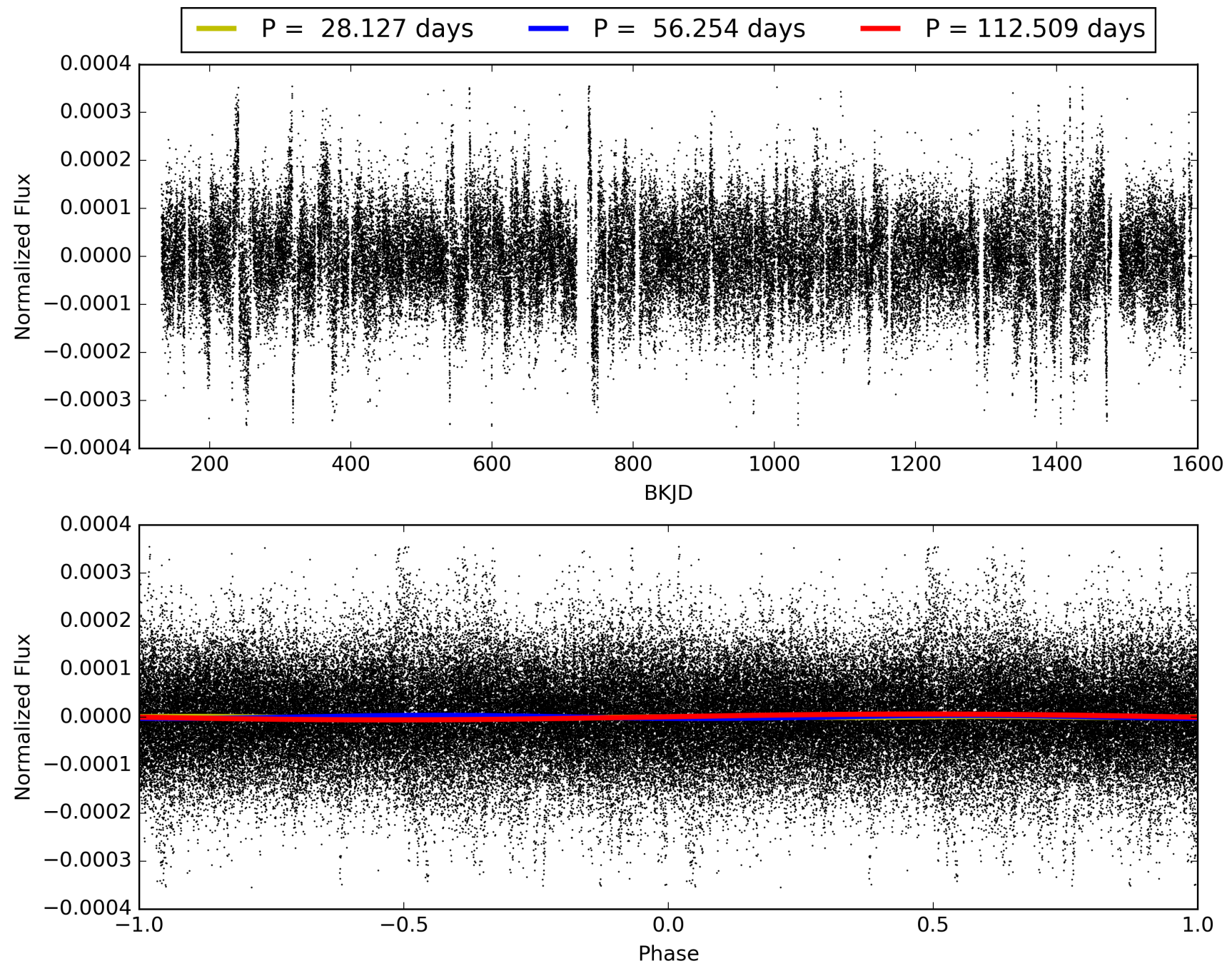
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:20:35 Z

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

TCE 002158190-02, PDC Light Curves

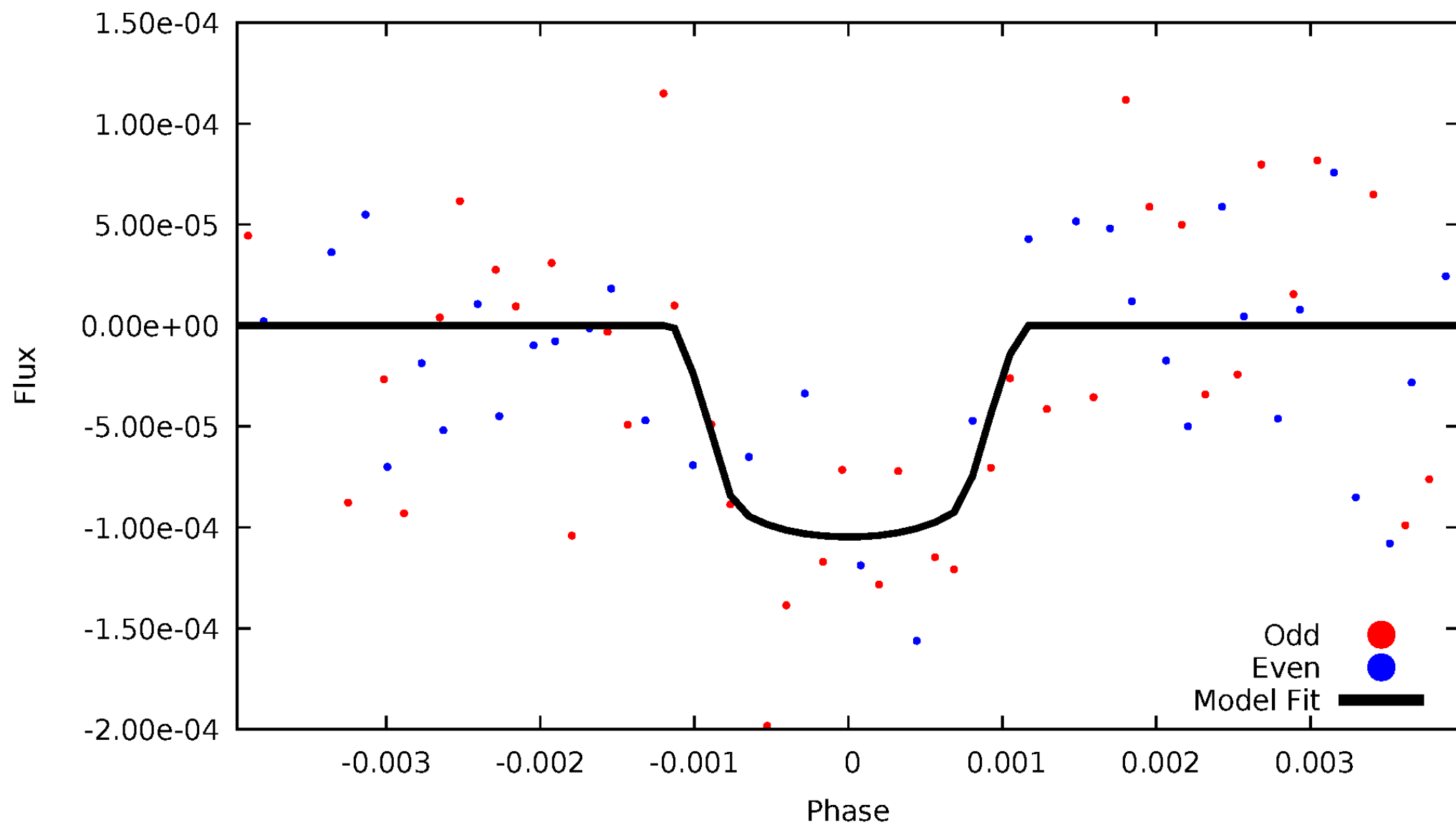


TCE 002158190-02



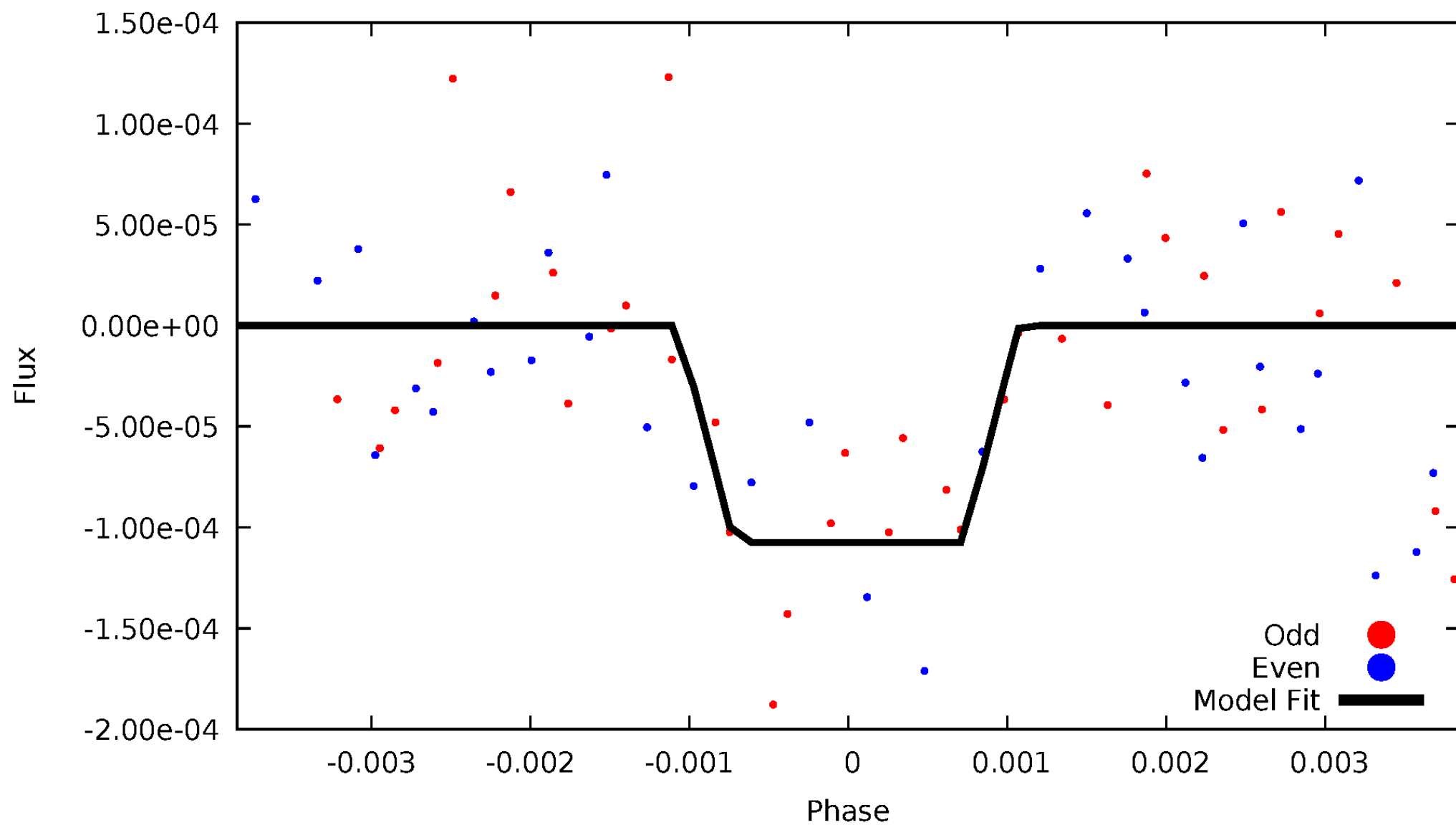
DV Odd/Even

TCE 002158190-02



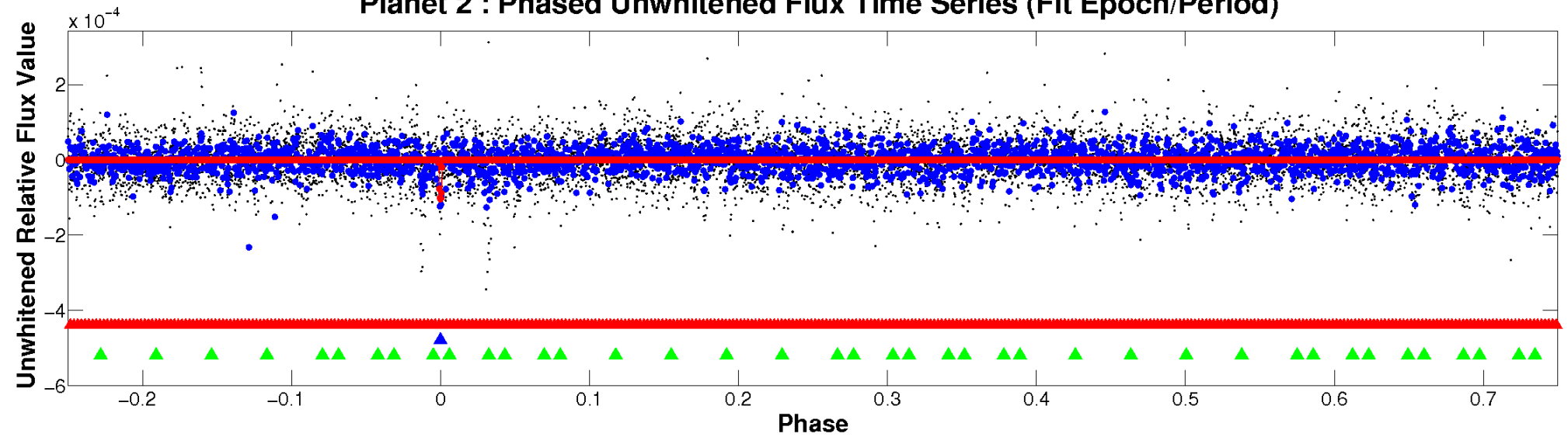
ALT Odd/Even

TCE 002158190-02

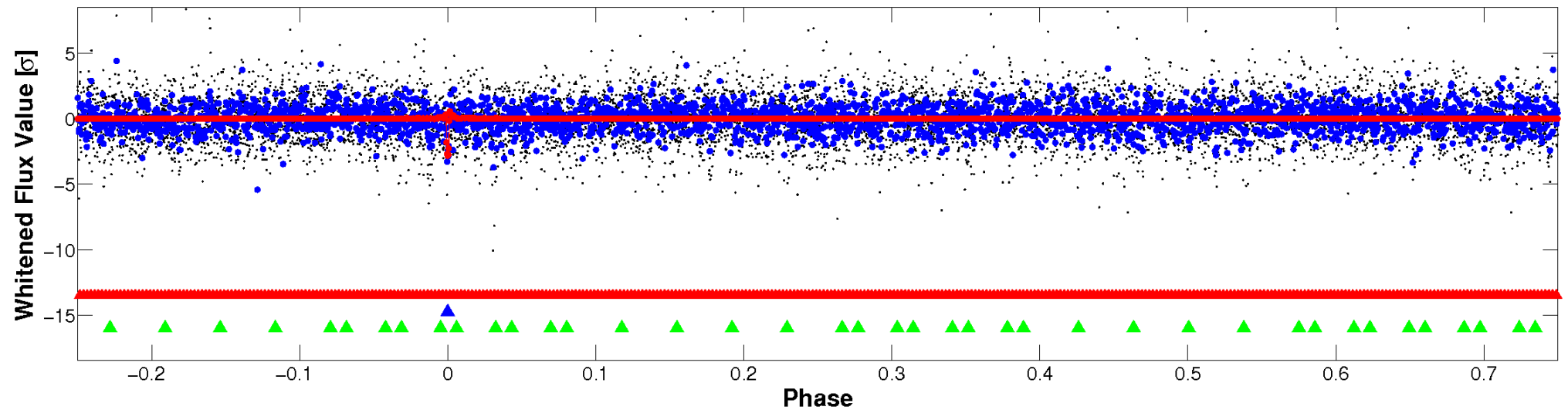


Non-Whitened Vs. Whitened Light Curve

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

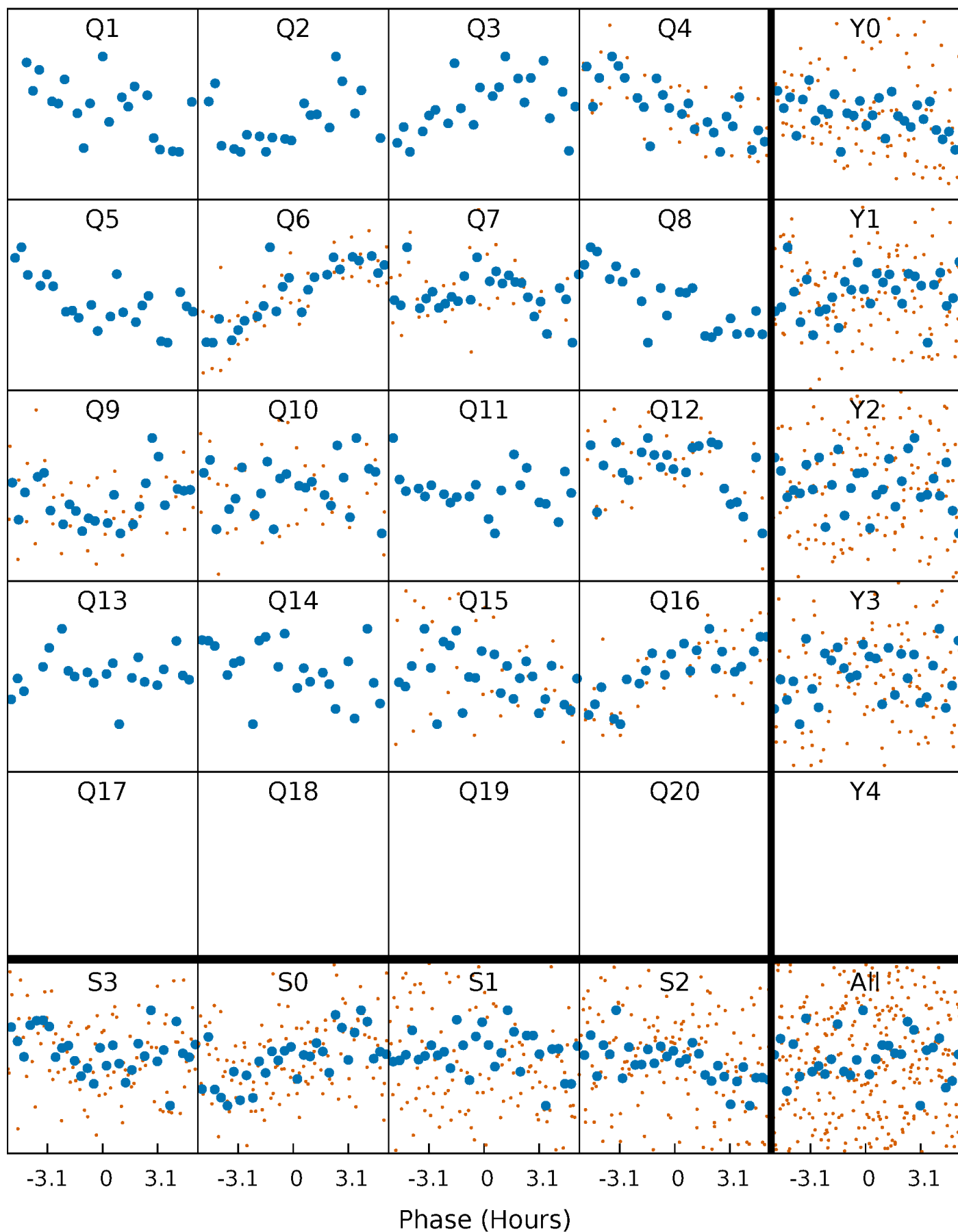


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



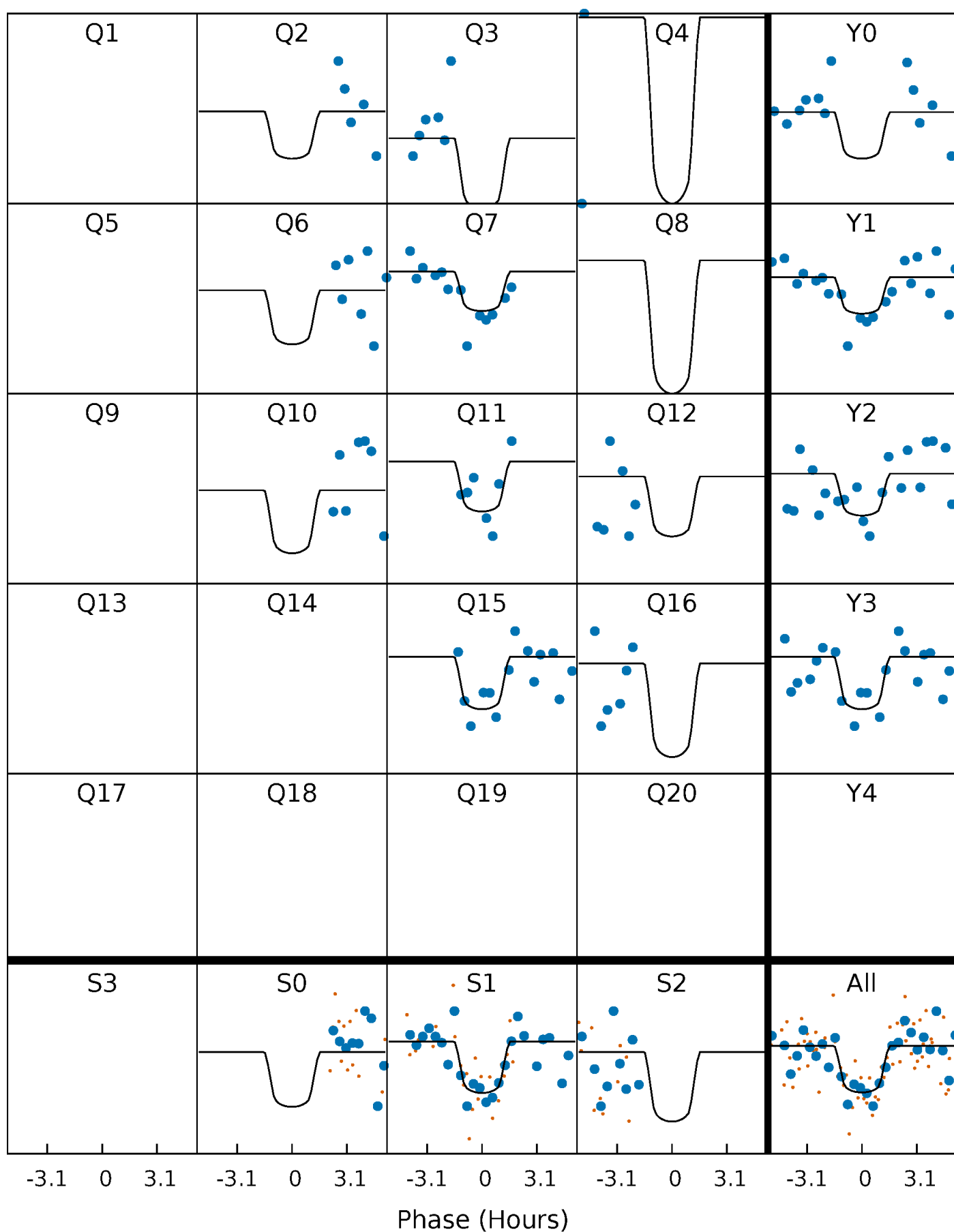
PDC Quarter-Phased Transit Curves

TCE 002158190-02 P= 56.254496 Days $T_0=146.533609$ (BKJD)



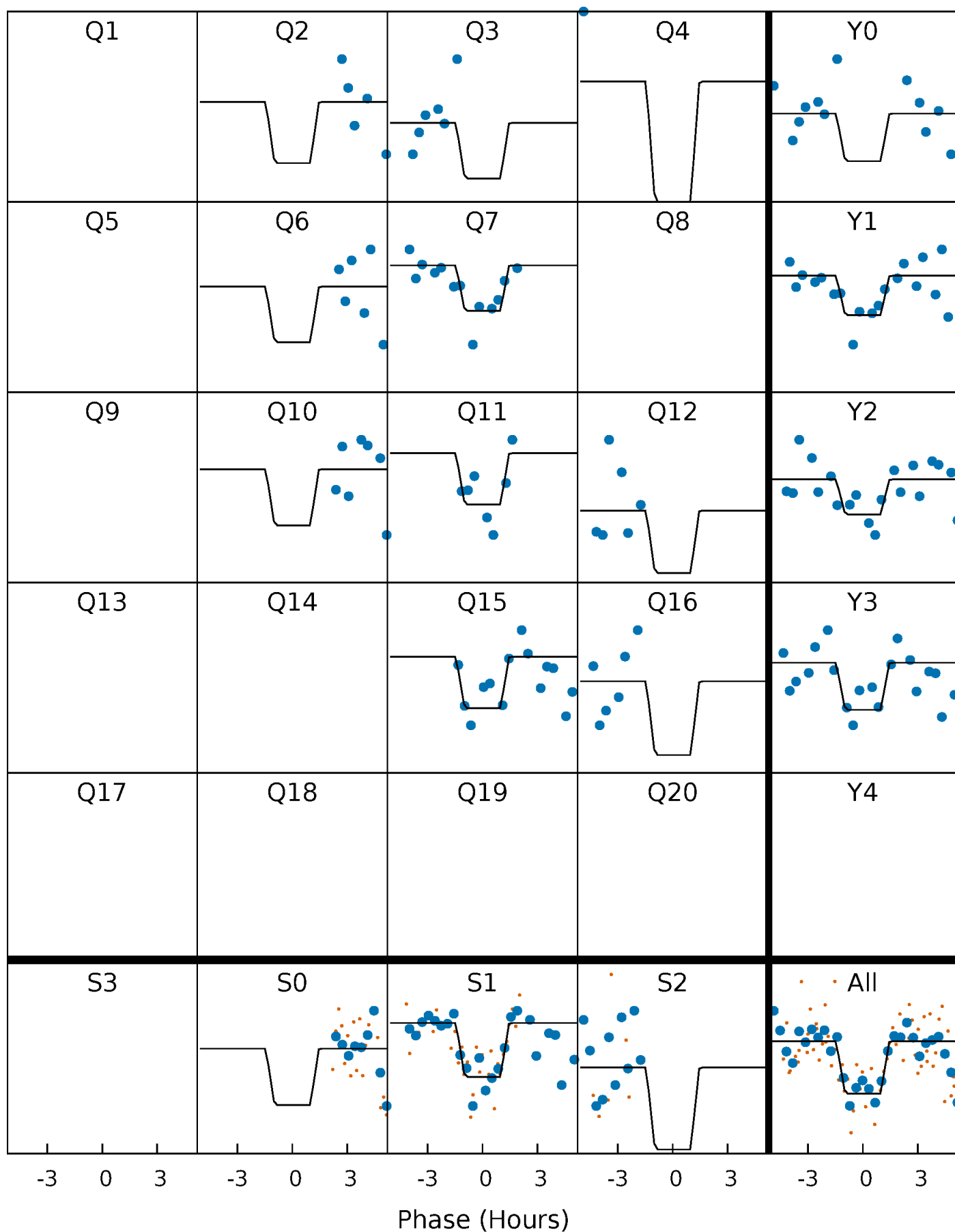
DV Quarter-Phased Transit Curves

TCE 002158190-02 P= 56.254496 Days $T_0=146.533609$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

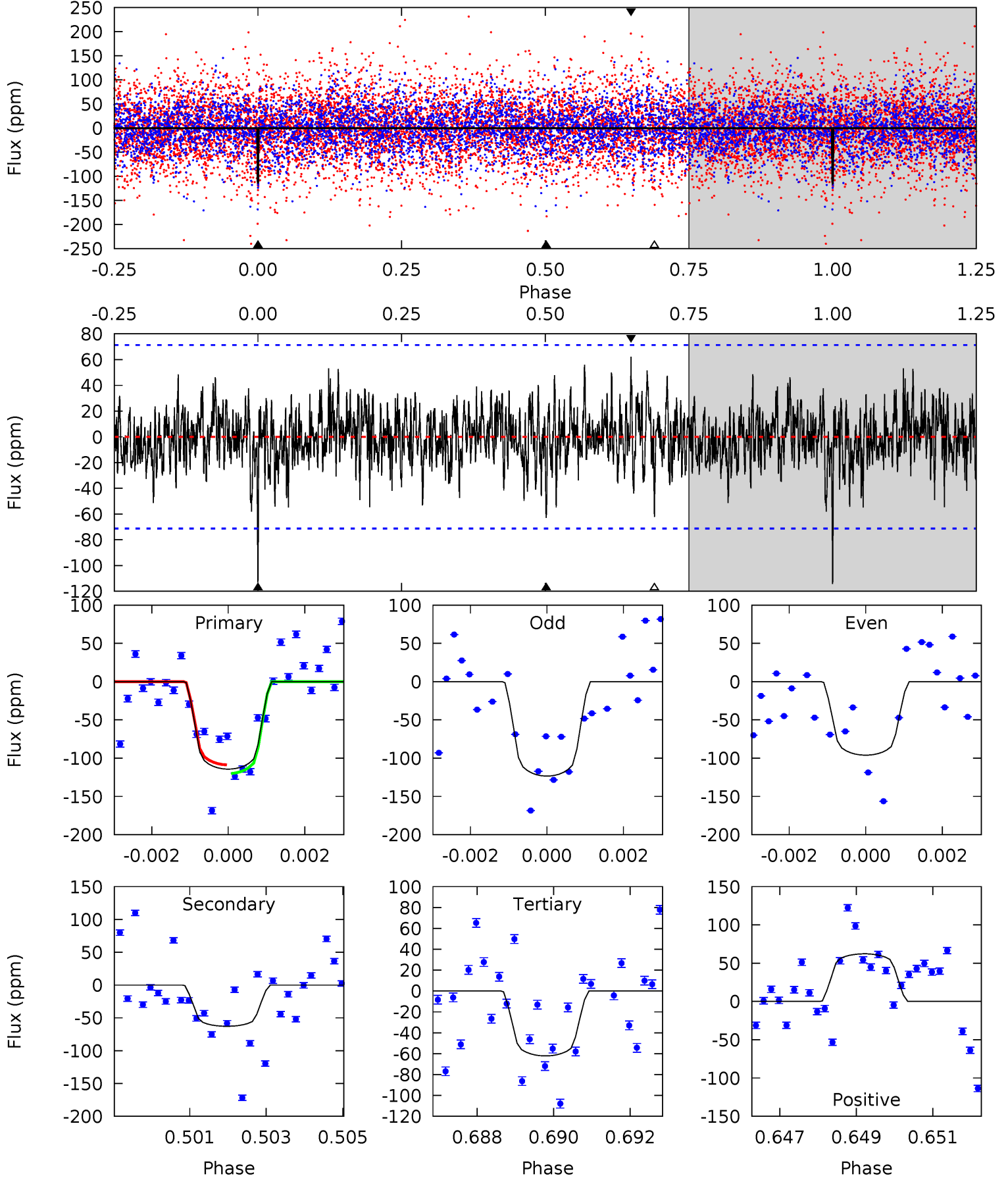
TCE 002158190-02 P= 56.254636 Days $T_0=146.529287$ (BKJD)



DV Model-Shift Uniqueness Test

002158190-02, P = 56.254496 Days, E = 90.279113 Days

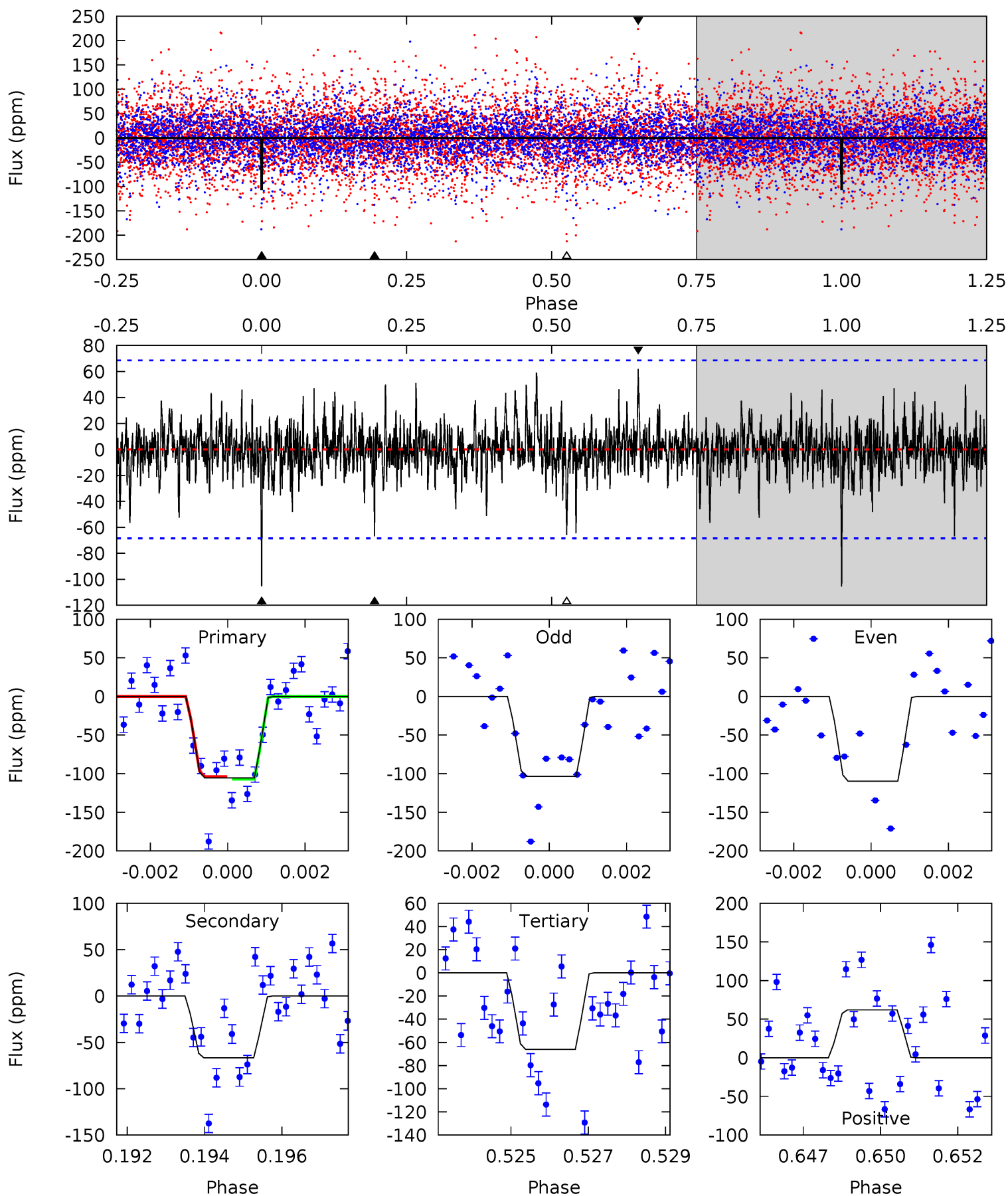
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.54	4.70	4.64	4.65	5.32	3.08	1.32	3.90	3.89	0.06	0.05	0.94	1.09	0.35	0.43



Alt Model-Shift Uniqueness Test

002158190-02, P = 56.254636 Days, E = 90.274651 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.20	5.19	5.13	4.82	5.32	3.08	1.17	3.07	3.38	0.06	0.37	0.22	0.96	0.37	0.13



Stellar Parameters For KIC 002158190

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8267^{+229}_{-360}	$3.723^{+0.399}_{-0.142}$	$-0.060^{+0.300}_{-0.400}$	$3.269^{+0.987}_{-1.480}$	$2.060^{+0.388}_{-0.474}$	$0.083^{+0.329}_{-0.039}$
	+3%/-4%	+11%/-4%	+500%/-667%	+30%/-45%	+19%/-23%	+396%/-47%
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 002158190-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-63 ± 13	$4.51^{+3.82}_{-2.97}$	1479^{+132}_{-170}	5933^{+5735}_{-1301}	217^{+1732}_{-154}
Alt.	-67 ± 13	$4.27^{+4.17}_{-2.71}$	1484^{+135}_{-170}	6189^{+6051}_{-1584}	273^{+1661}_{-204}

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

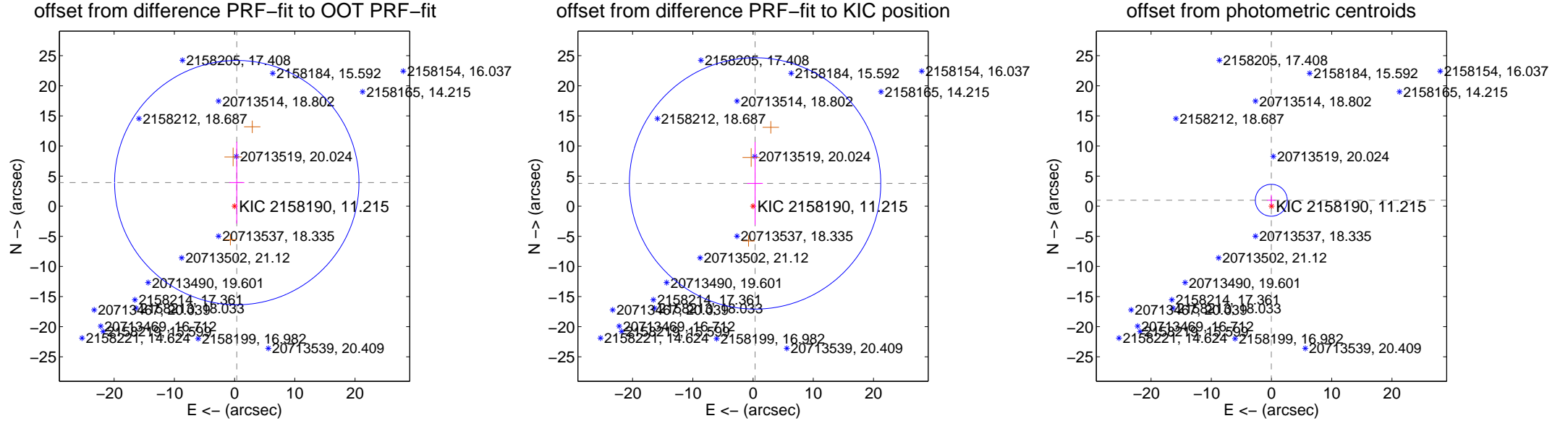
DV Centroid Data

Supplemental centroid analysis for 002158190-02. **Kepler magnitude: 11.21.** Transit SNR 9.82

There are 0 quarters with good PRF difference image offsets

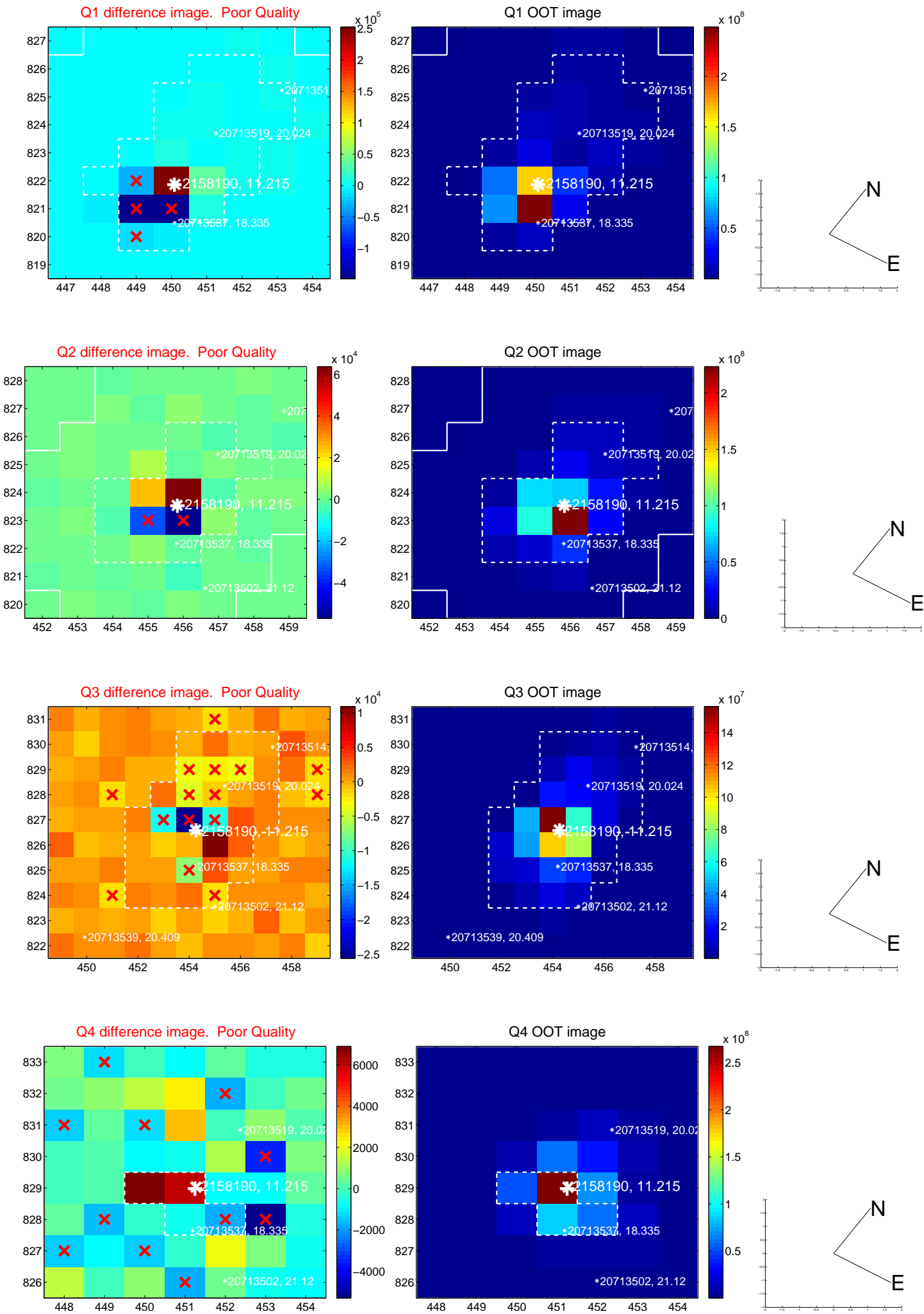
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.941 ± 6.761	0.58	-0.367 ± 1.249	3.924 ± 6.789
PRF-fit source offset from KIC position	3.803 ± 6.955	0.55	-0.332 ± 1.286	3.788 ± 6.879
photometric centroid source offset	0.99 ± 0.88	1.12	0.04 ± 0.72	0.99 ± 0.88

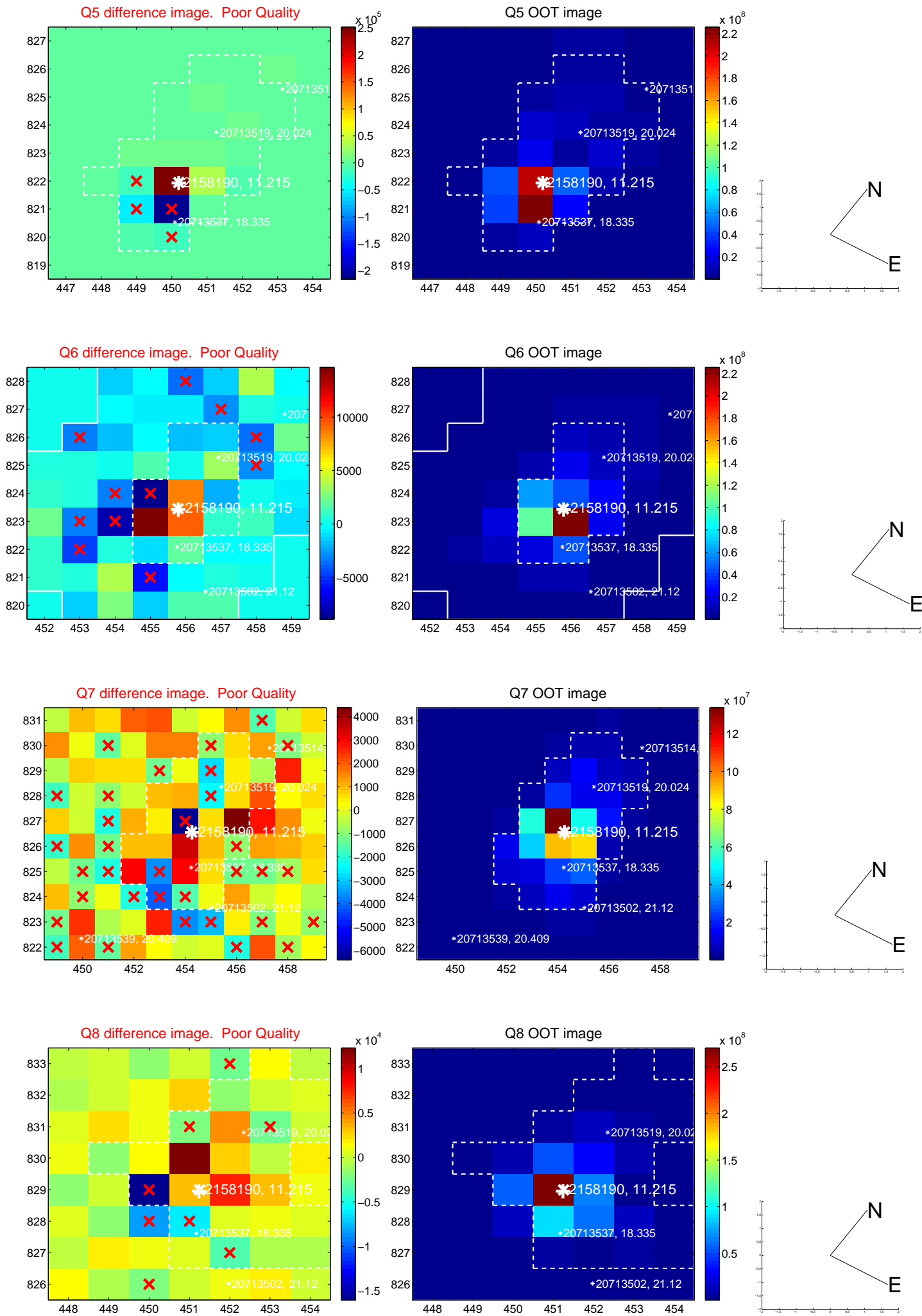


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

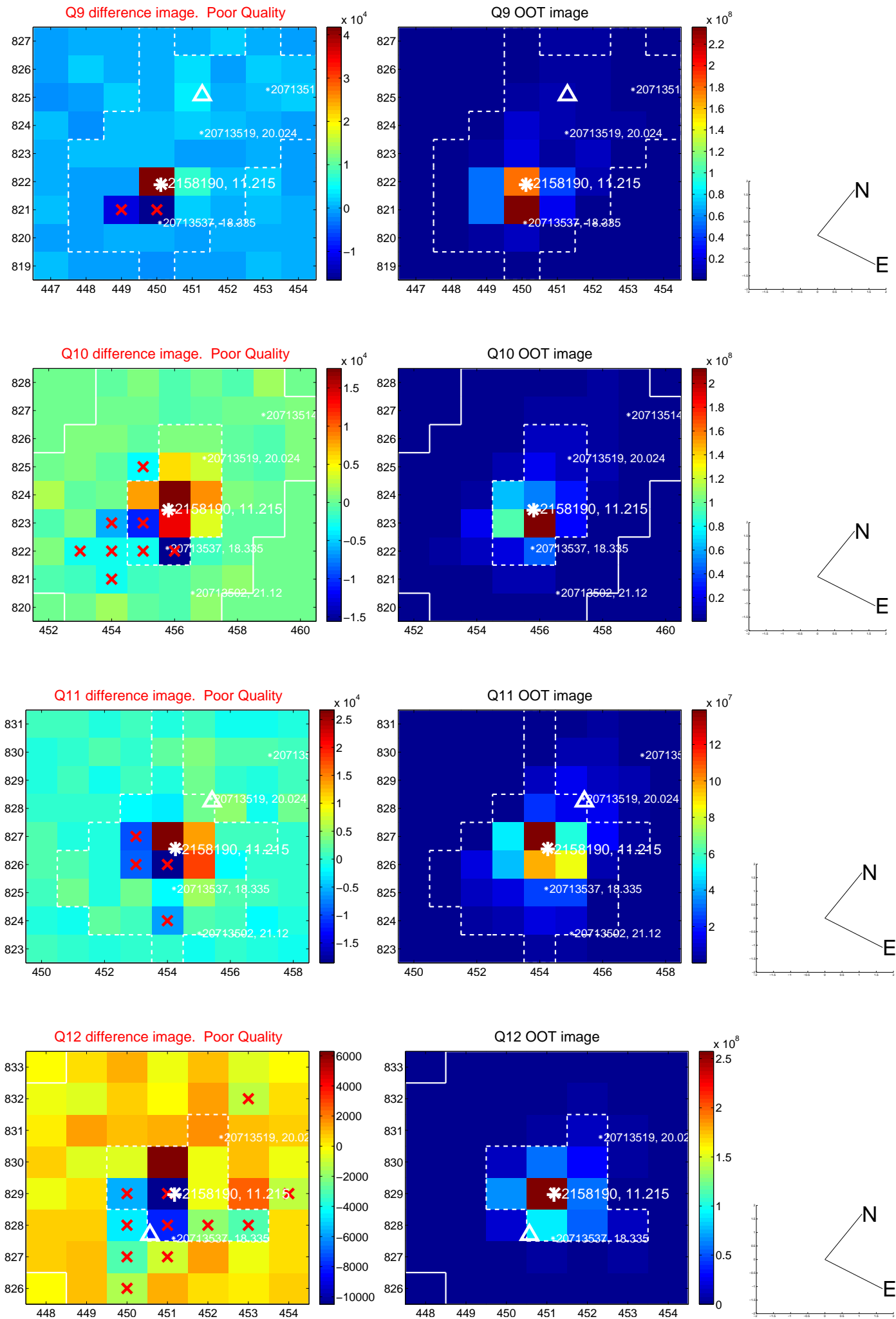
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



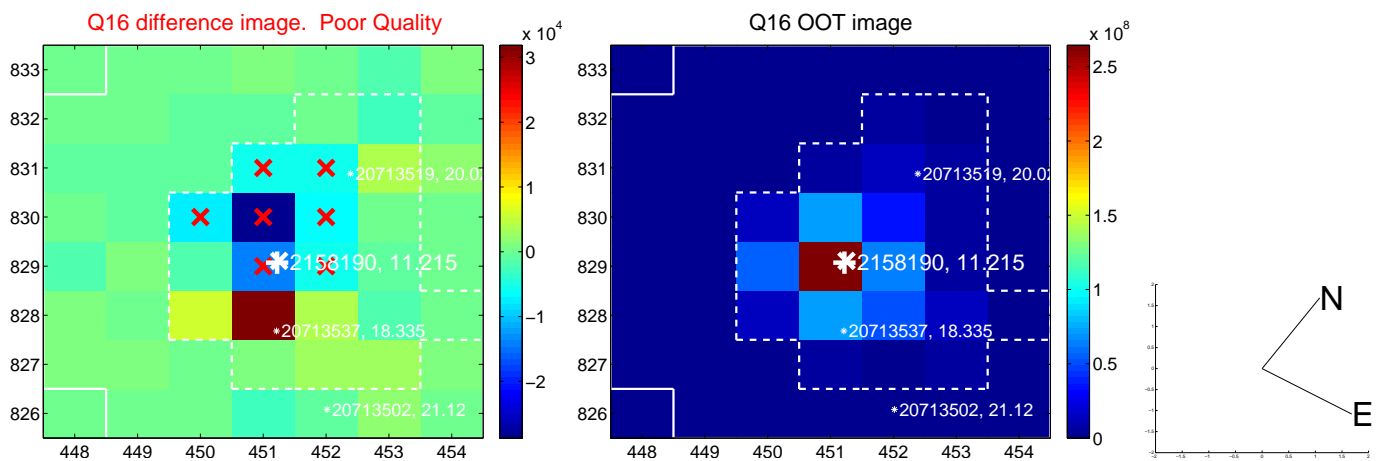
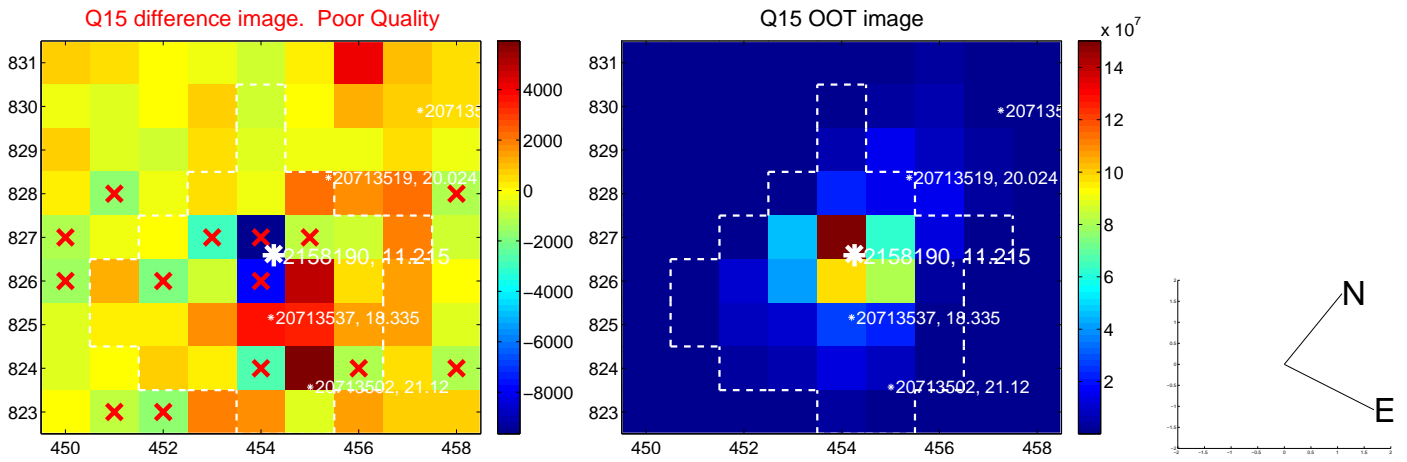
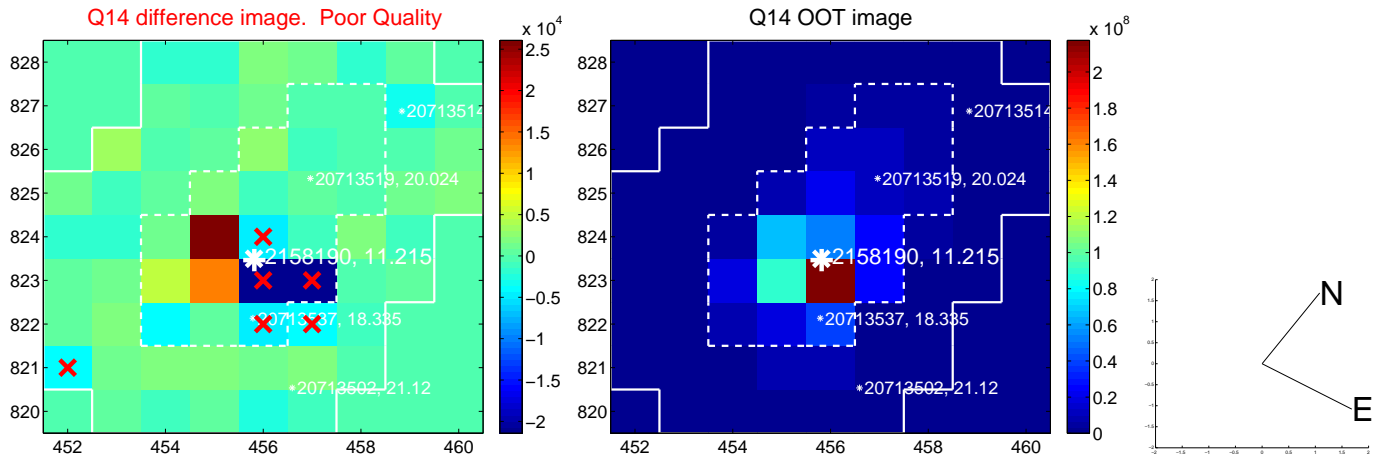
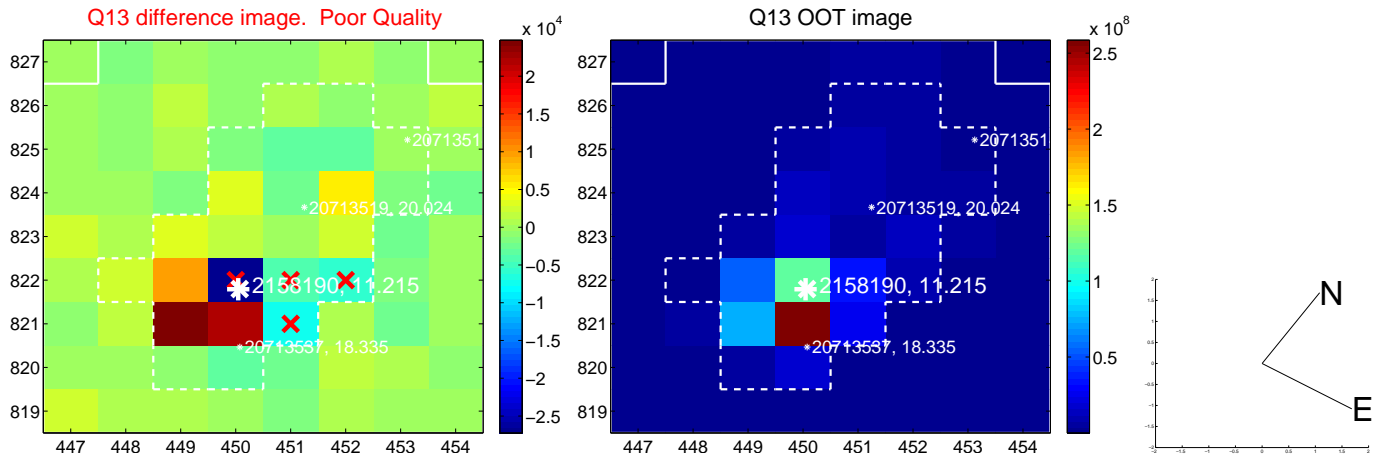
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



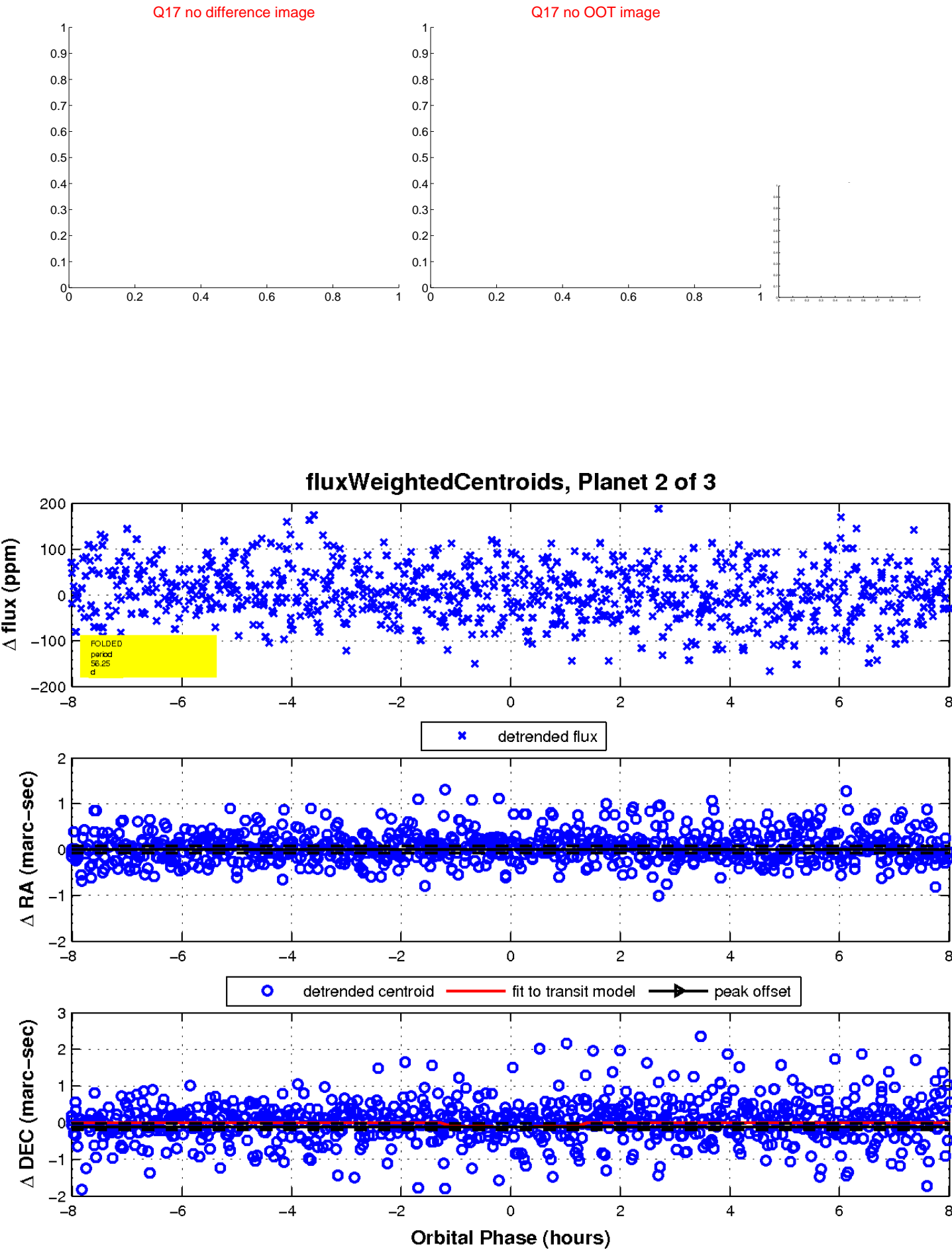
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

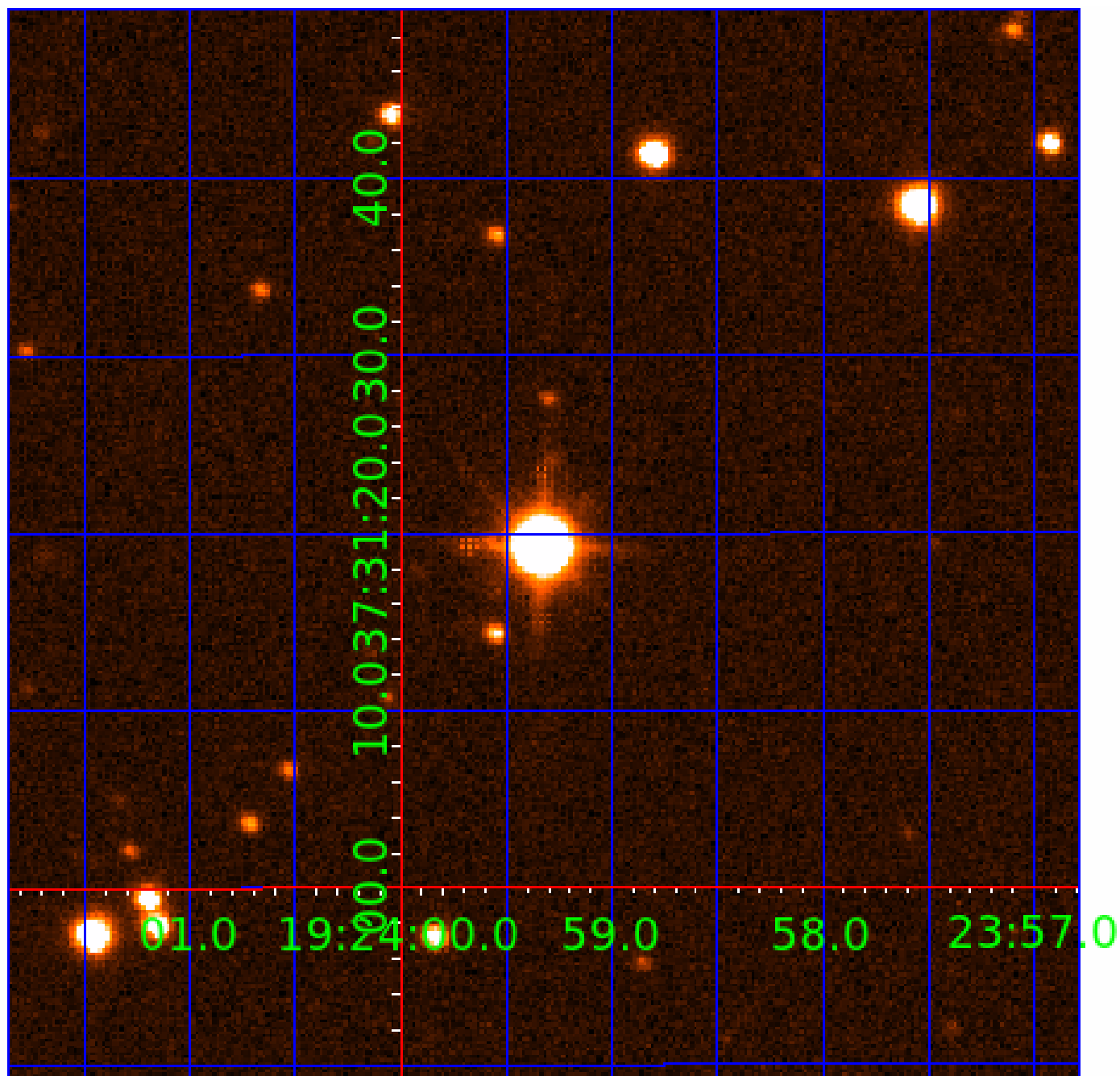


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002158190

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})
002158190-01	OBS	No	0.984438	131.579329	8.7	6.647	9.0	12.3	3.27	8267	0.98	73617.03
002158190-02	OBS	No	56.254496	146.533609	104.8	2.678	9.1	9.8	3.27	8267	3.90	334.47
002158190-03	OBS	No	36.805167	150.450224	56.9	2.827	8.6	9.1	3.27	8267	2.68	588.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002158190-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
002158190-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
002158190-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

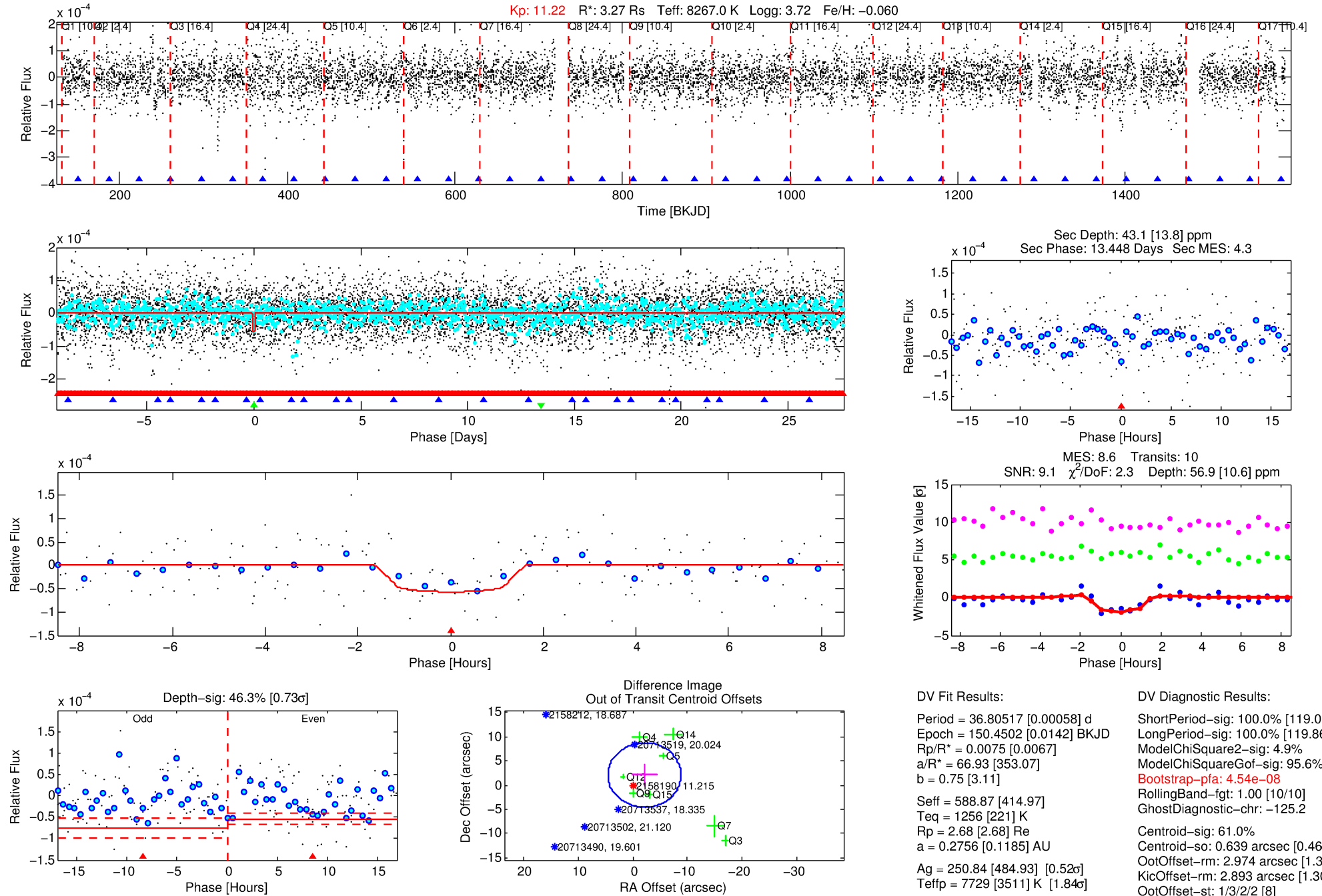
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002158190-03

No Significant Match Found

DV One-Page Summary

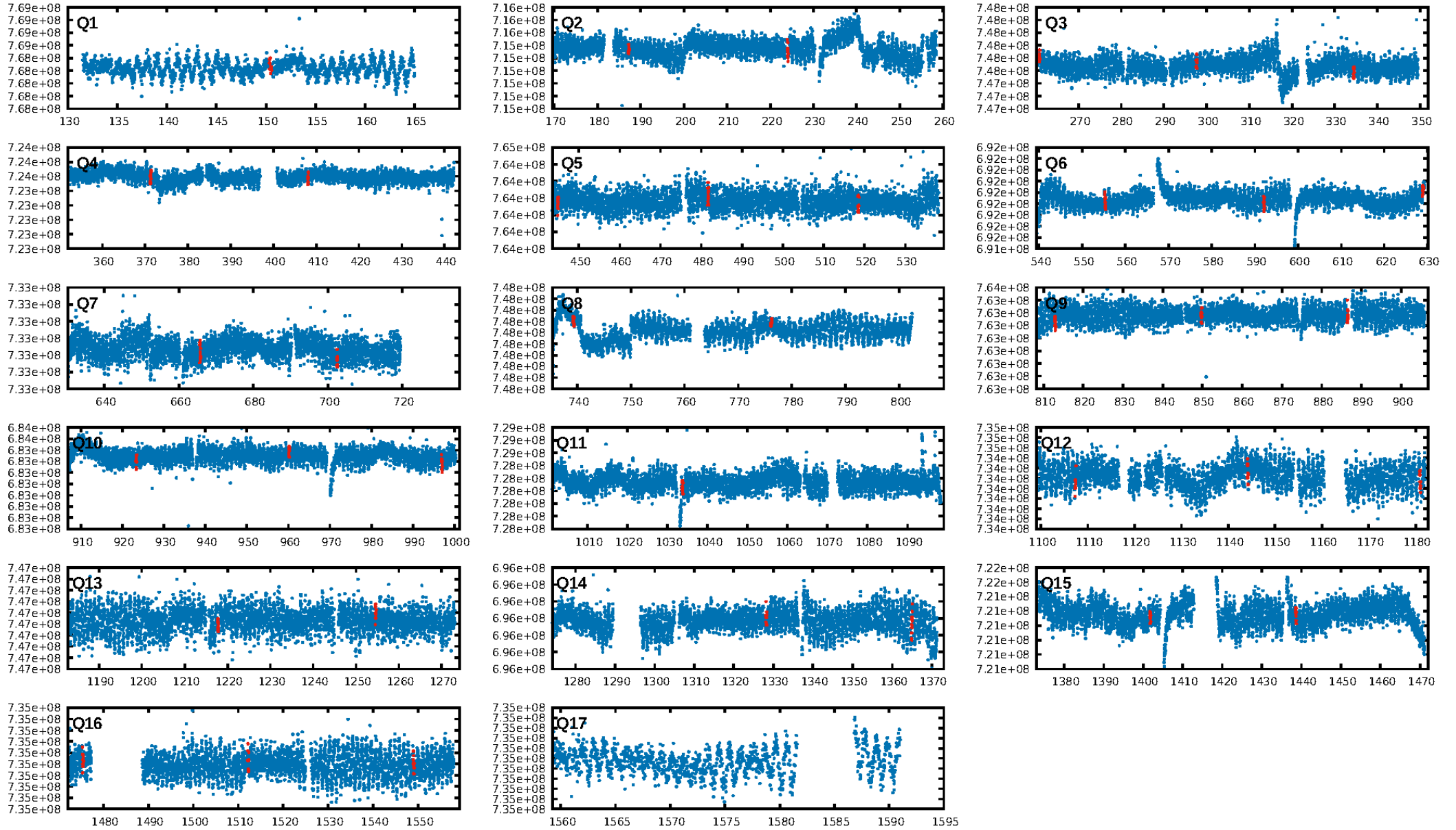
KIC: 2158190 Candidate: 3 of 3 Period: 36.805 d



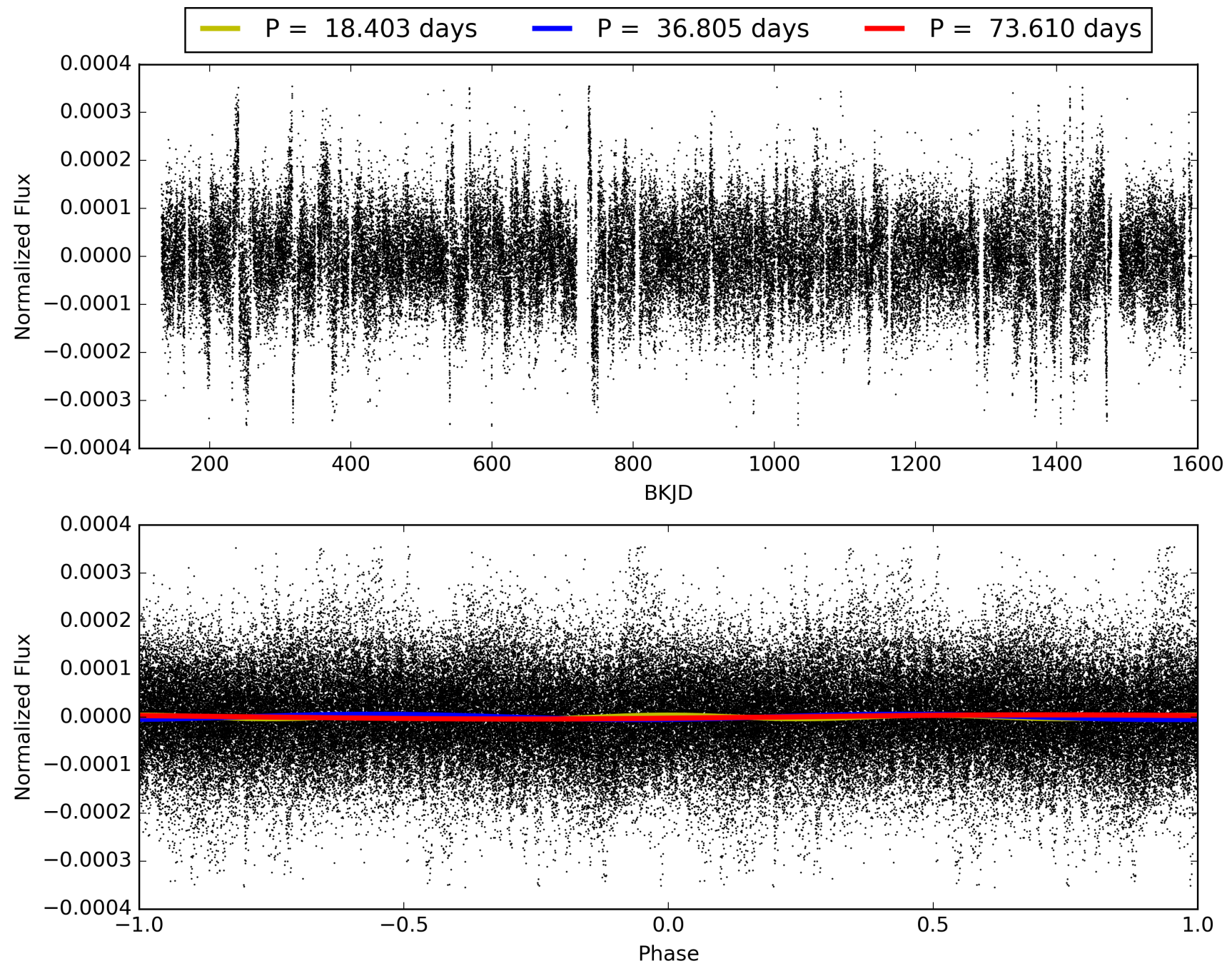
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:20:38 Z

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

TCE 002158190-03, PDC Light Curves

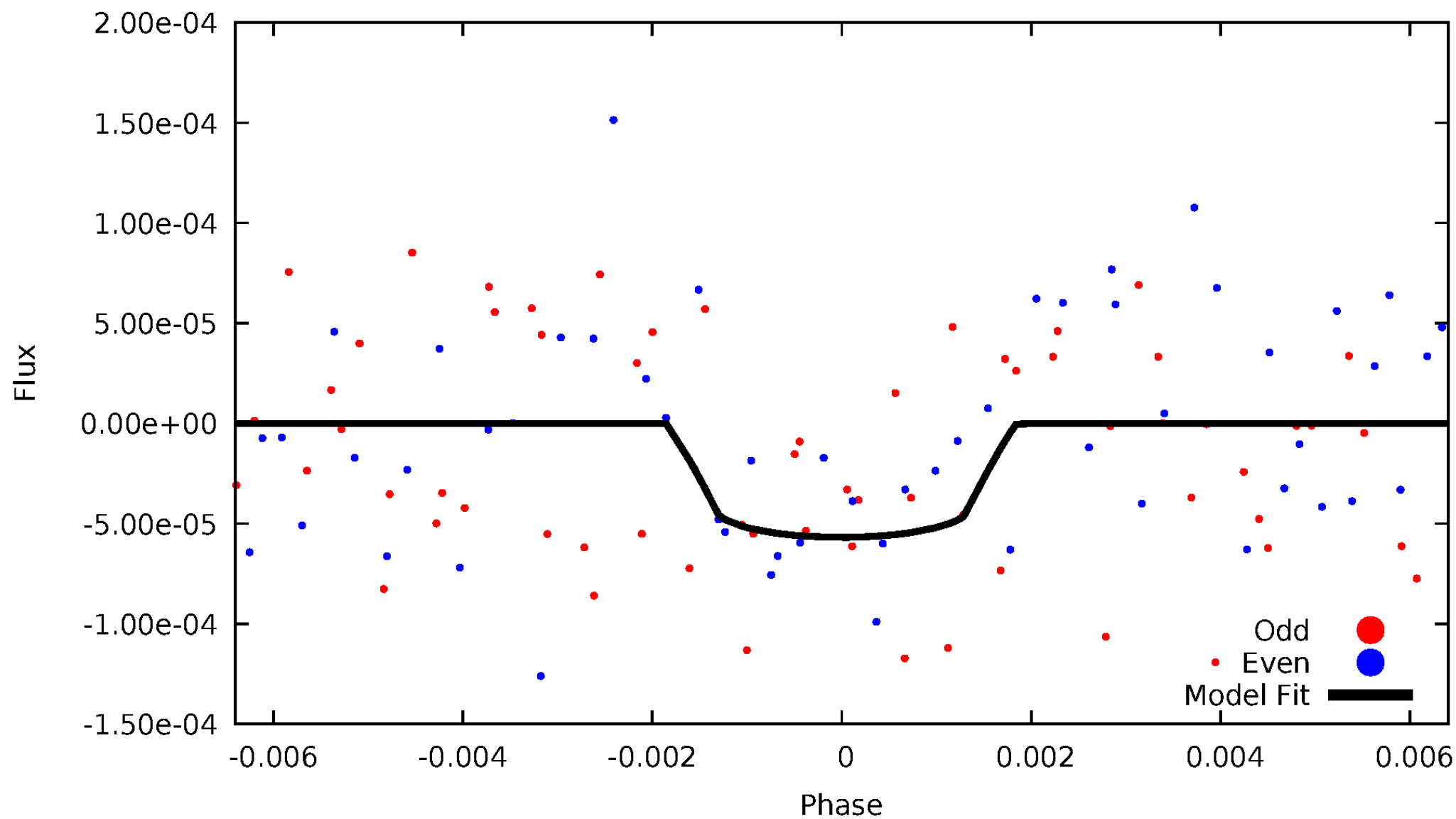


TCE 002158190-03



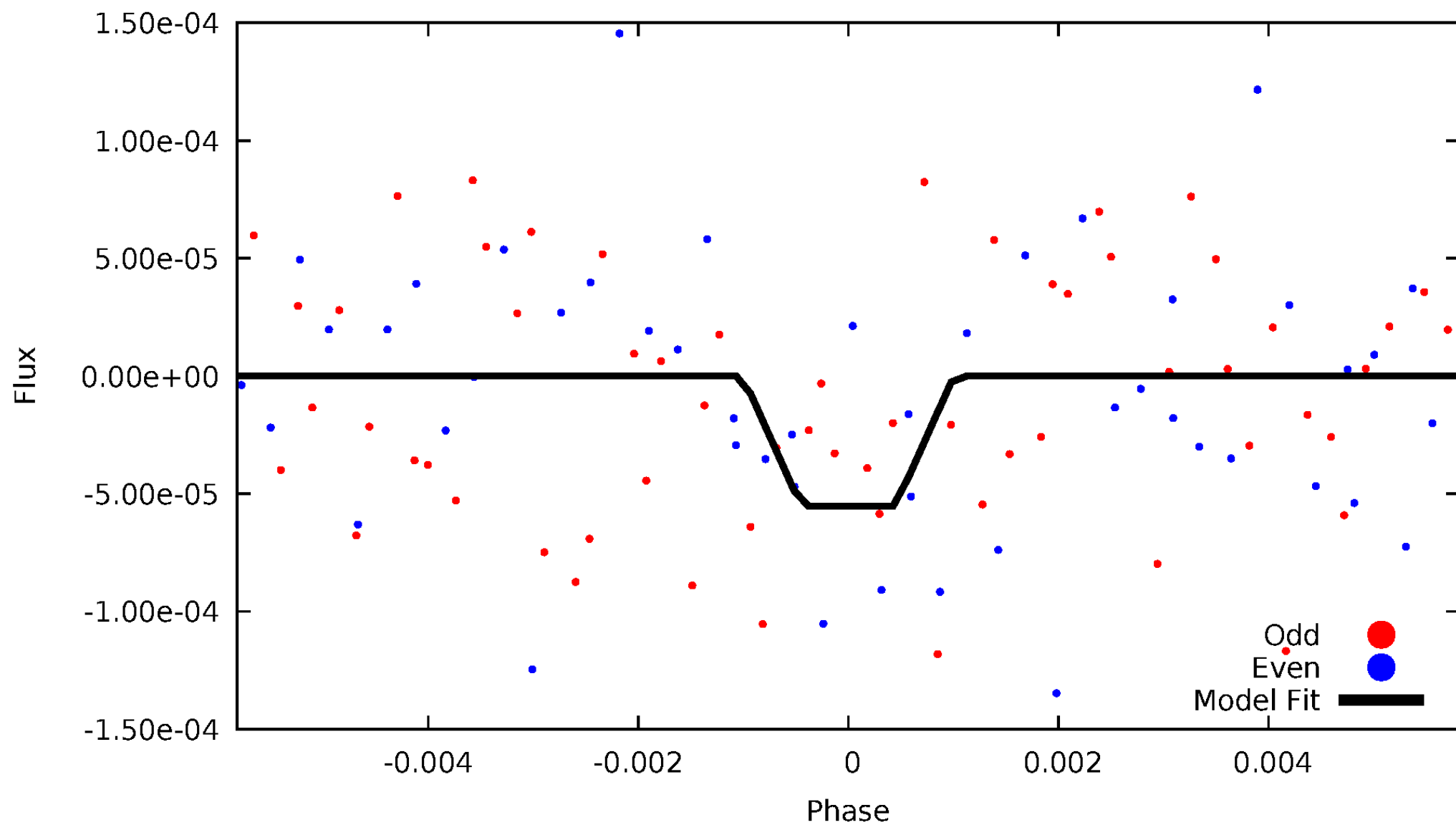
DV Odd/Even

TCE 002158190-03



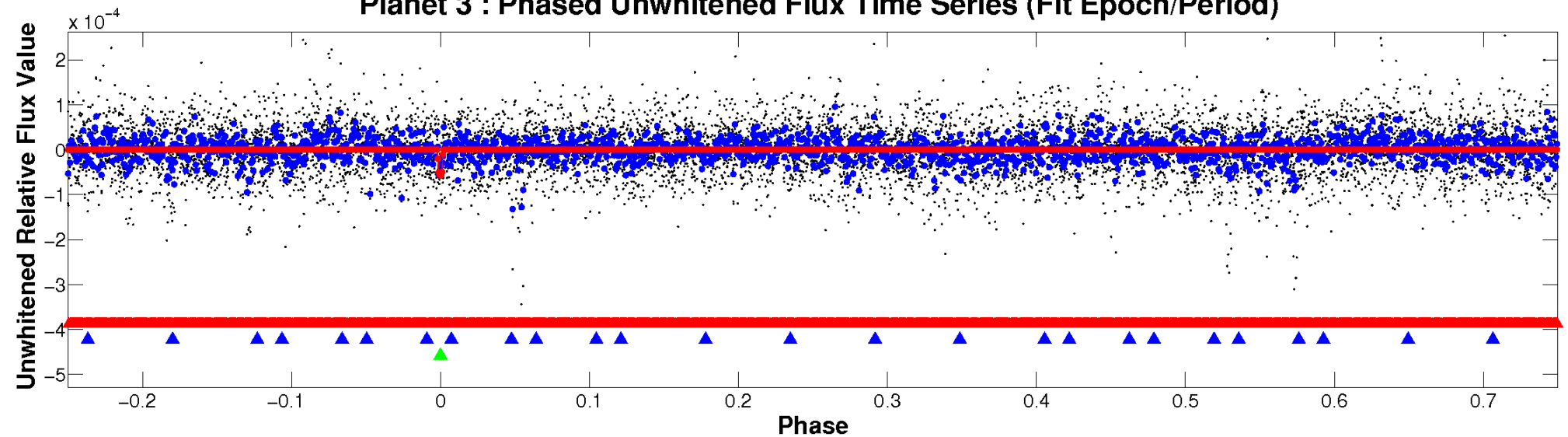
ALT Odd/Even

TCE 002158190-03

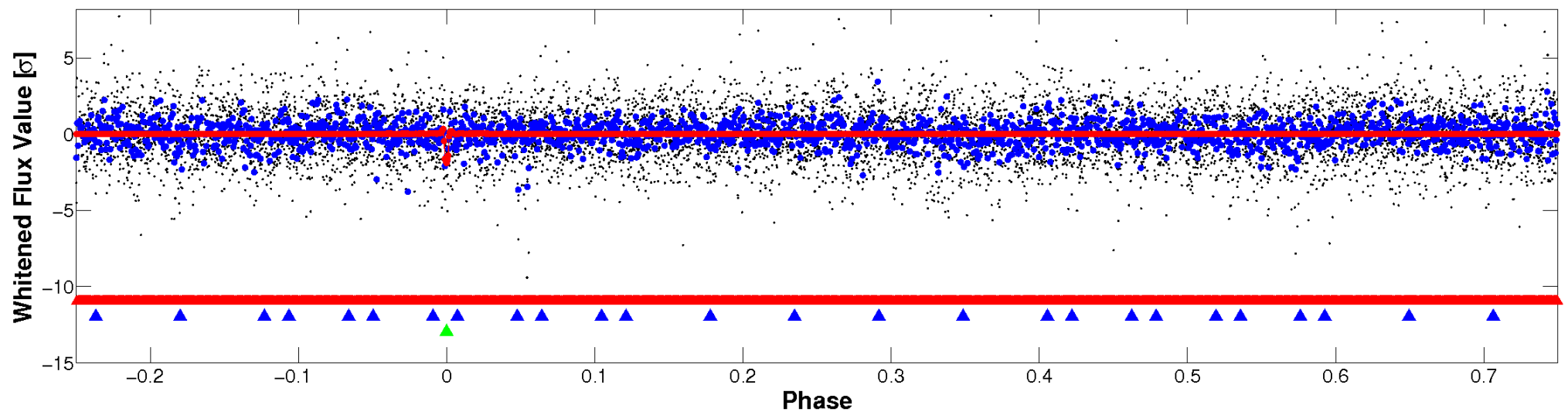


Non-Whitened Vs. Whitened Light Curve

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

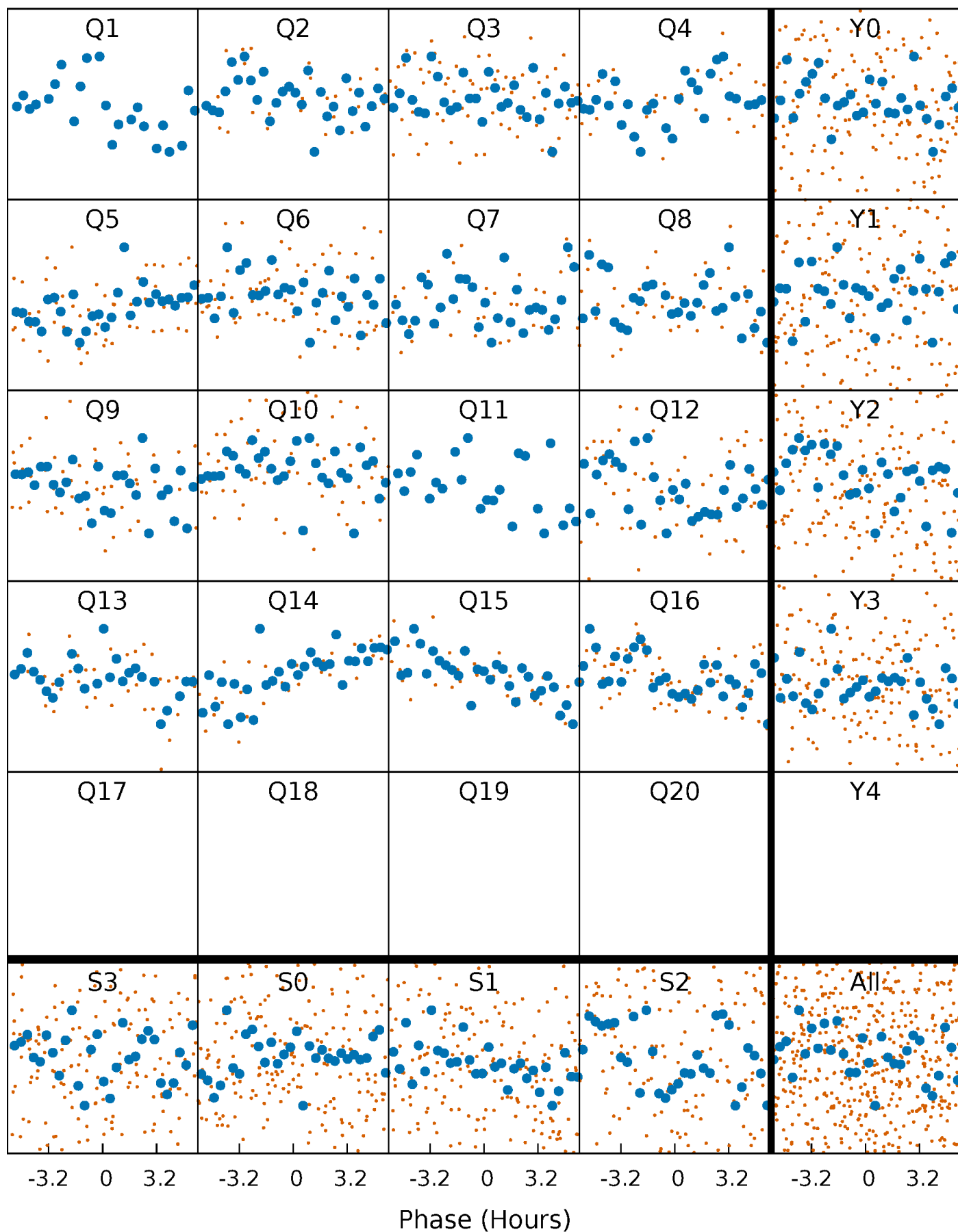


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



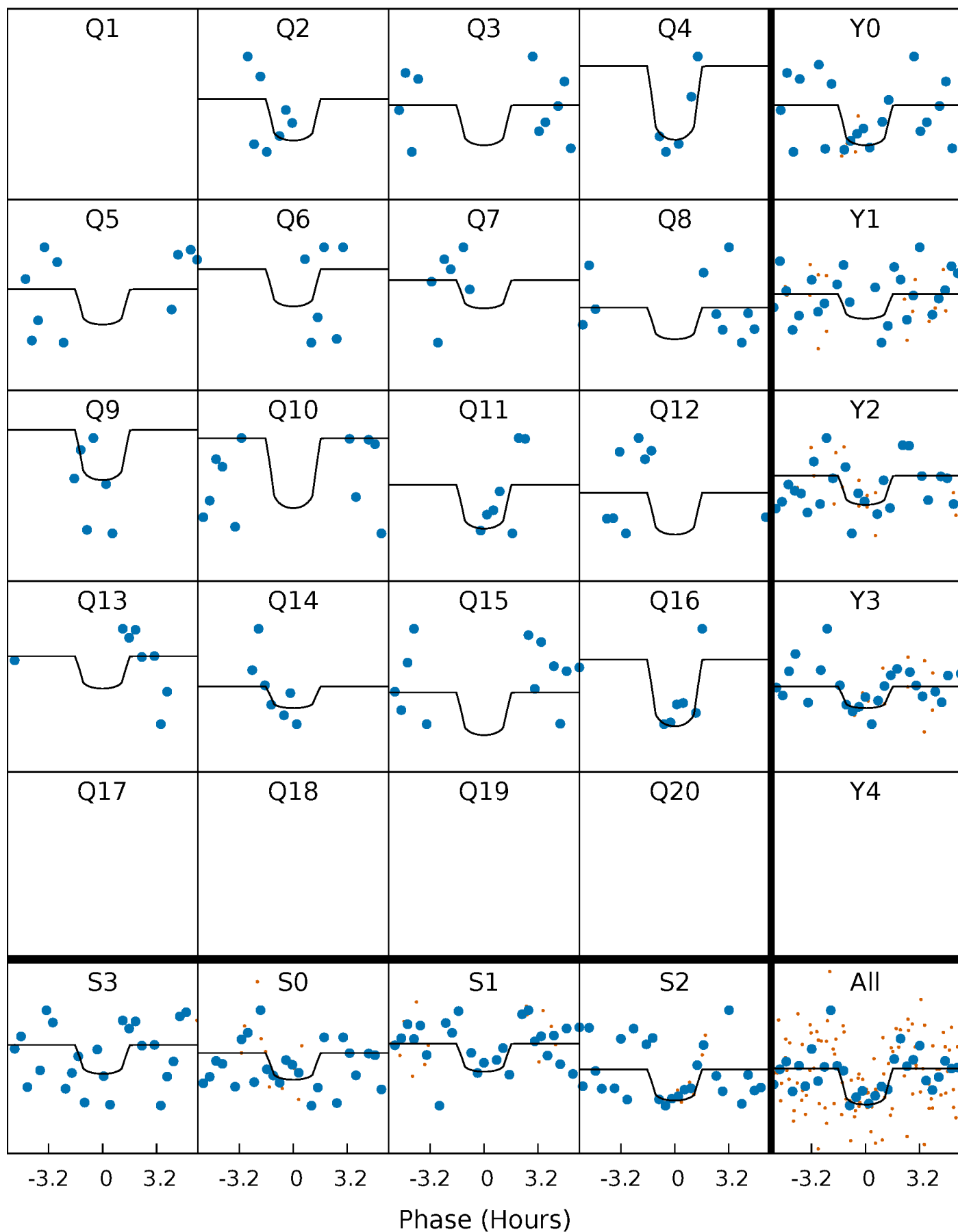
PDC Quarter-Phased Transit Curves

TCE 002158190-03 P= 36.805167 Days $T_0=150.450224$ (BKJD)



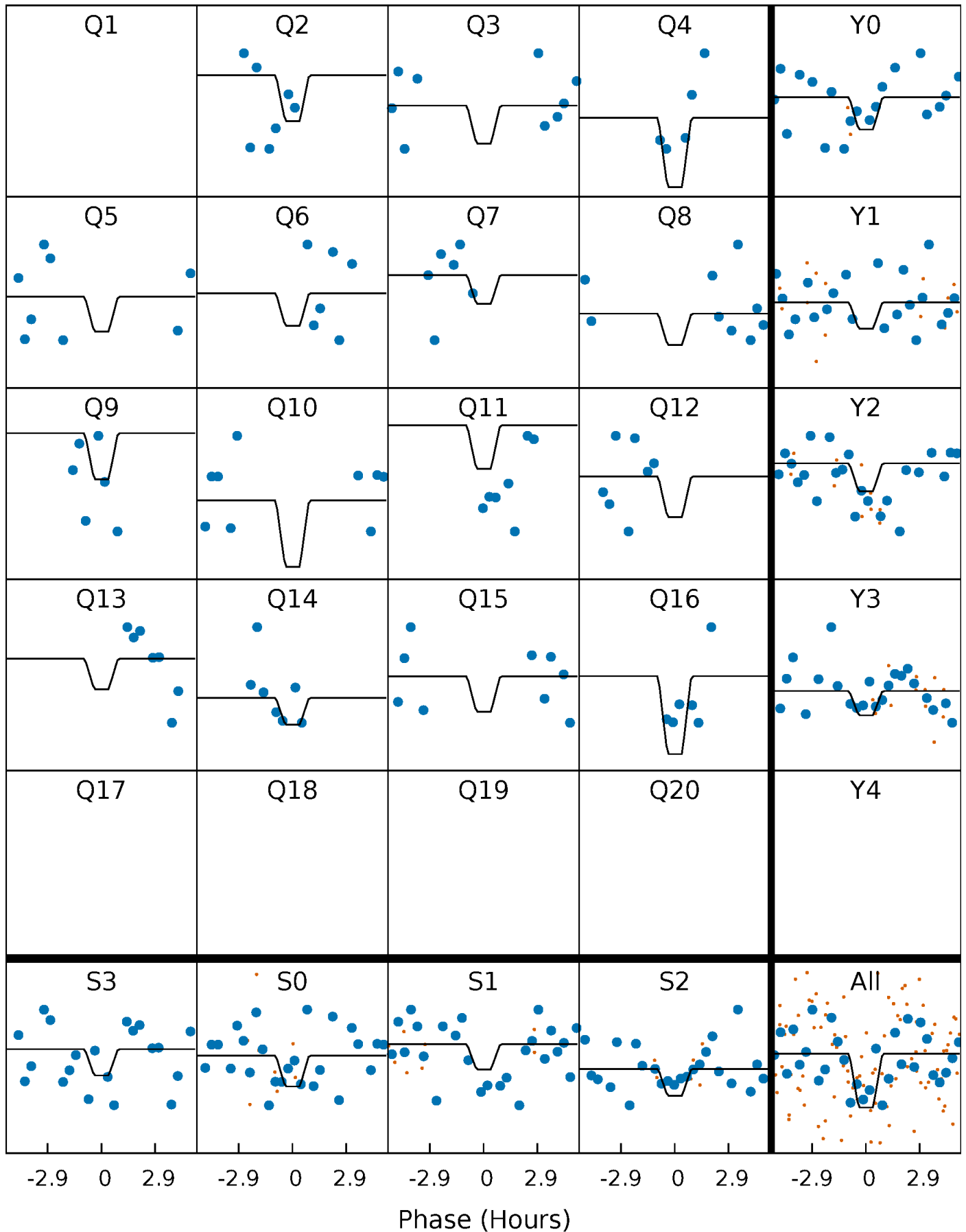
DV Quarter-Phased Transit Curves

TCE 002158190-03 P= 36.805167 Days $T_0=150.450224$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

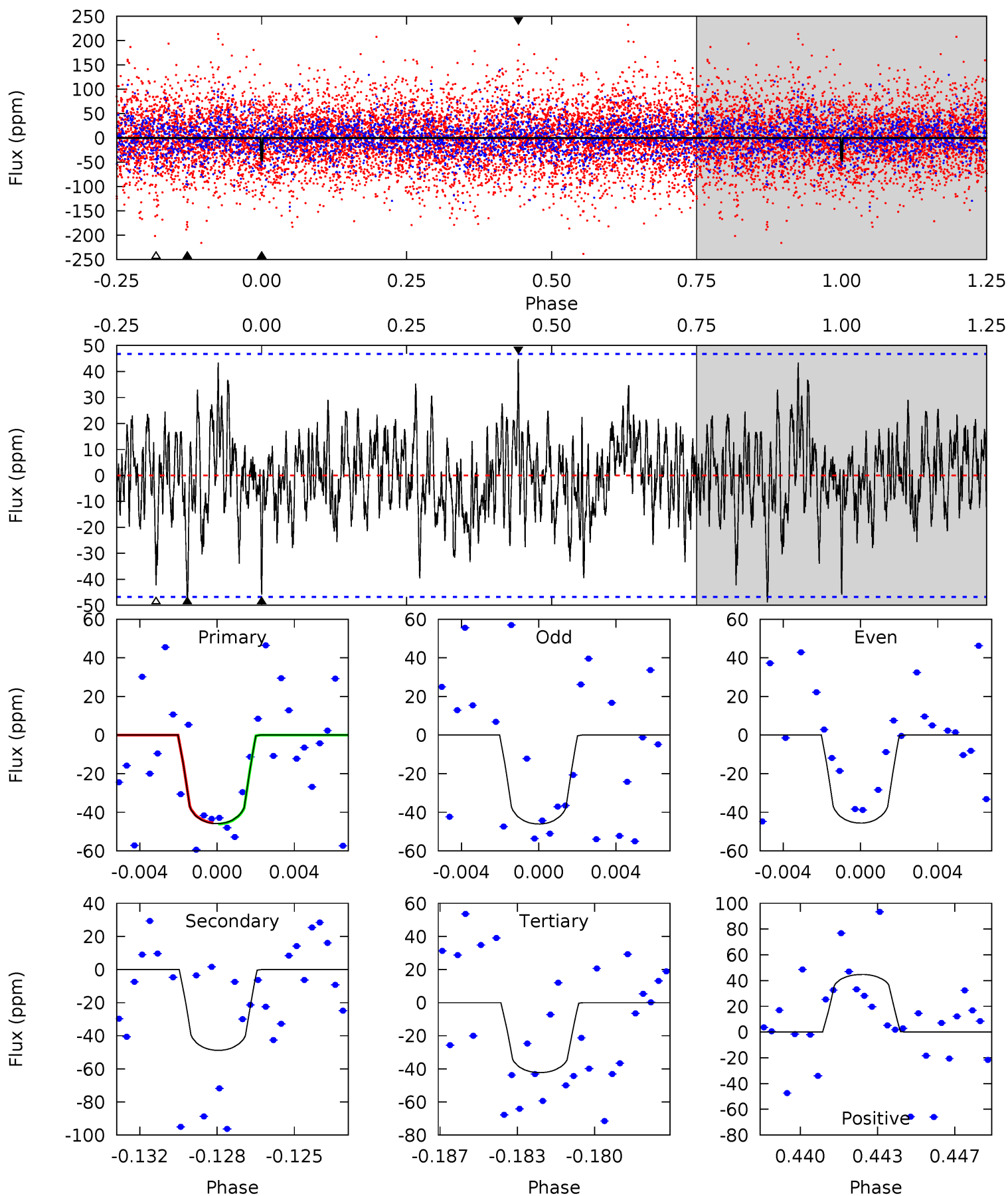
TCE 002158190-03 P= 36.805036 Days $T_0=150.445877$ (BKJD)



DV Model-Shift Uniqueness Test

002158190-03, P = 36.805167 Days, E = 113.645057 Days

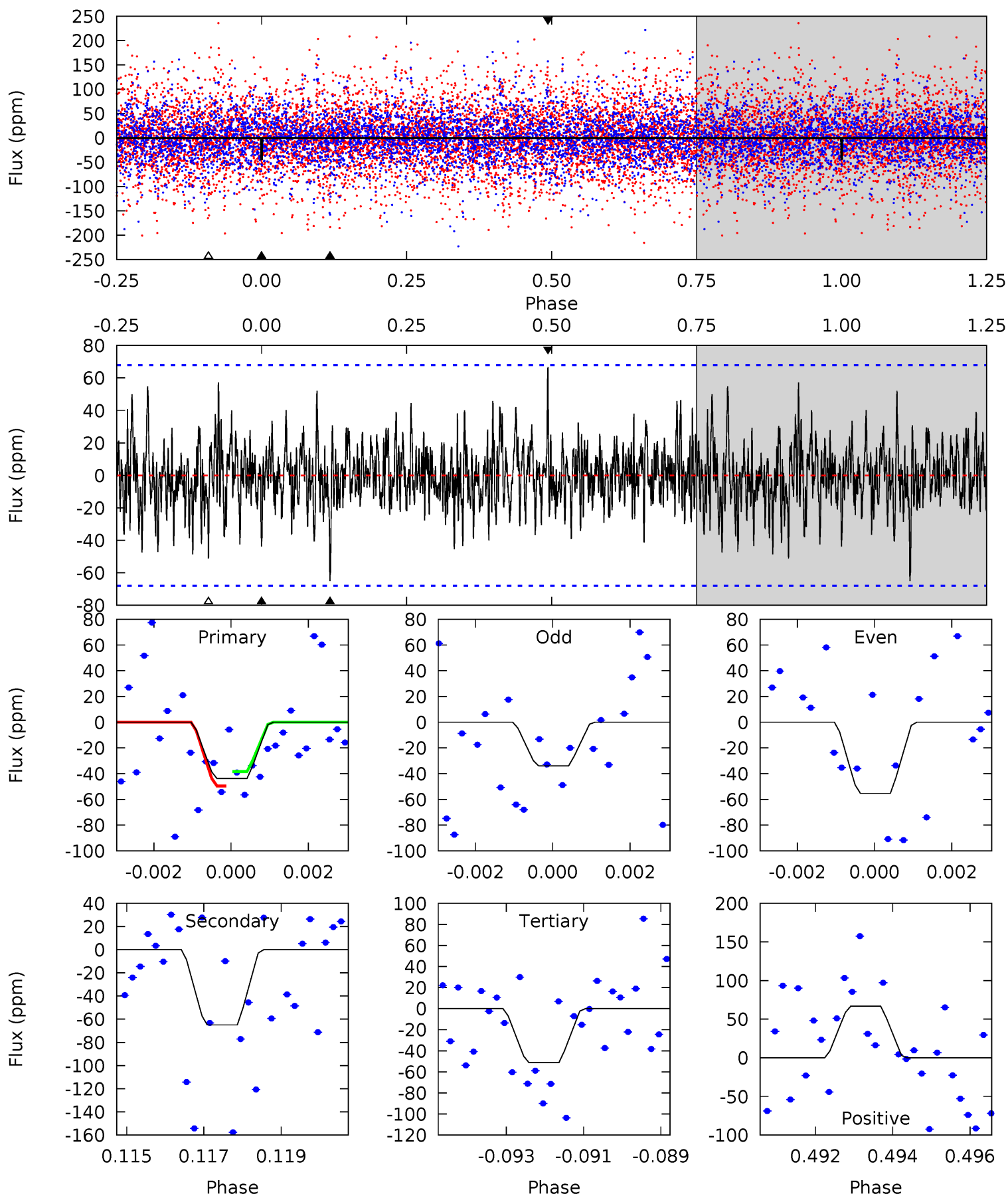
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.12	5.45	4.72	4.99	5.22	2.91	1.47	0.40	0.13	0.73	0.46	0.03	0.69	0.48	0.03



Alt Model-Shift Uniqueness Test

002158190-03, P = 36.805036 Days, E = 113.640841 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.43	5.09	4.01	5.22	5.32	3.08	1.26	-0.58	-1.79	1.08	-0.13	0.85	1.43	0.51	0.44



Stellar Parameters For KIC 002158190

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8267^{+229}_{-360}	$3.723^{+0.399}_{-0.142}$	$-0.060^{+0.300}_{-0.400}$	$3.269^{+0.987}_{-1.480}$	$2.060^{+0.388}_{-0.474}$	$0.083^{+0.329}_{-0.039}$
	+3%/-4%	+11%/-4%	+500%/-667%	+30%/-45%	+19%/-23%	+396%/-47%
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 002158190-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-49 ± 9	$2.96^{+2.33}_{-1.82}$	1707^{+147}_{-191}	6933^{+6316}_{-1580}	231^{+1271}_{-160}
Alt.	-65 ± 13	$2.82^{+2.33}_{-1.71}$	1708^{+147}_{-194}	7794^{+9888}_{-1930}	341^{+2027}_{-237}

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

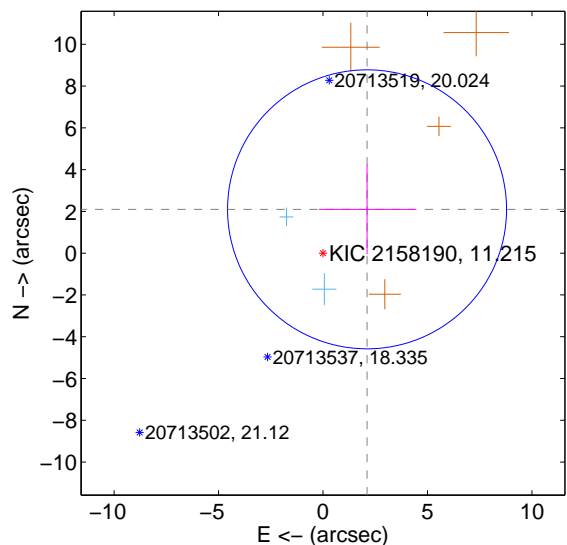
Supplemental centroid analysis for 002158190-03. **Kepler magnitude: 11.21.** Transit SNR 9.06

There are 2 quarters with good PRF difference image offsets

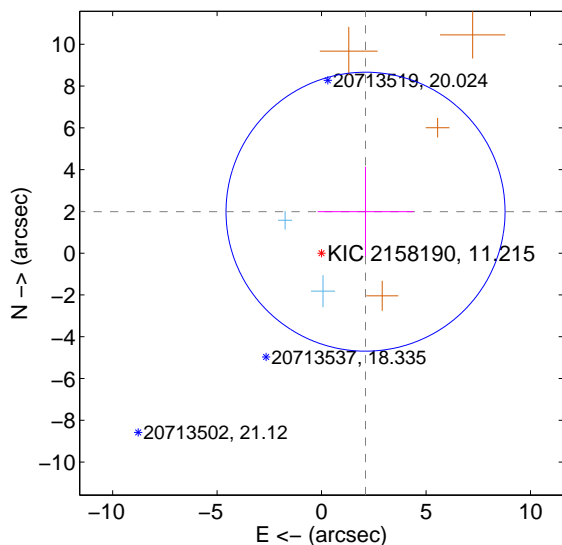
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.974 ± 2.226	1.34	-2.107 ± 2.301	2.099 ± 2.148
PRF-fit source offset from KIC position	2.893 ± 2.226	1.30	-2.104 ± 2.292	1.986 ± 2.149
photometric centroid source offset	0.64 ± 1.38	0.46	-0.13 ± 1.07	0.63 ± 1.39

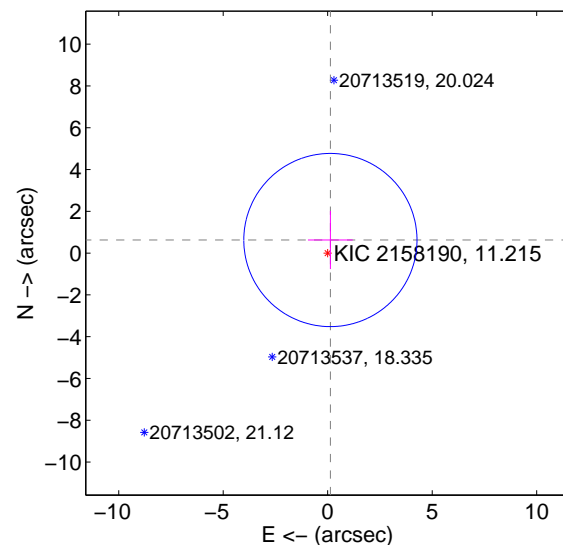
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

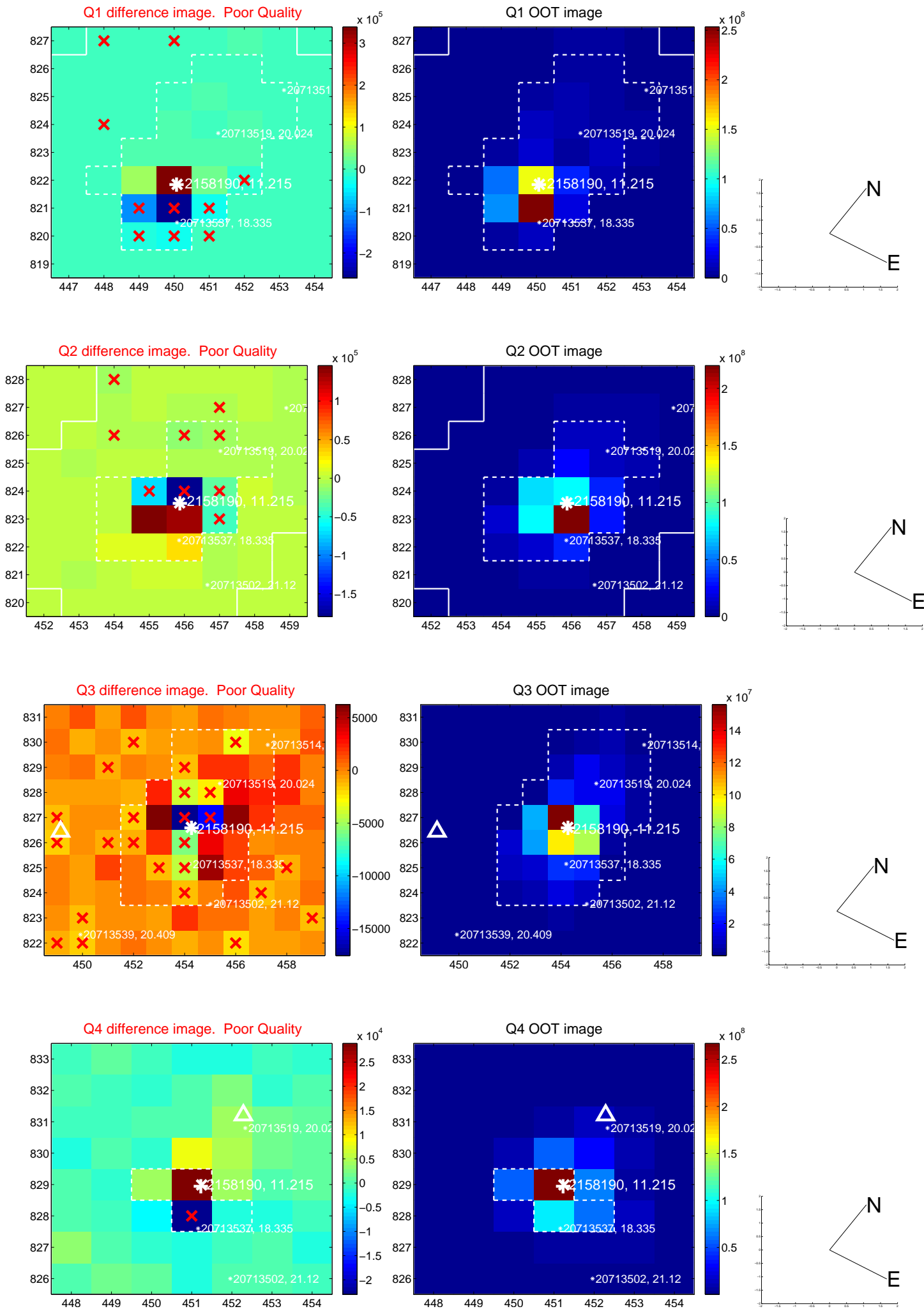


offset from photometric centroids

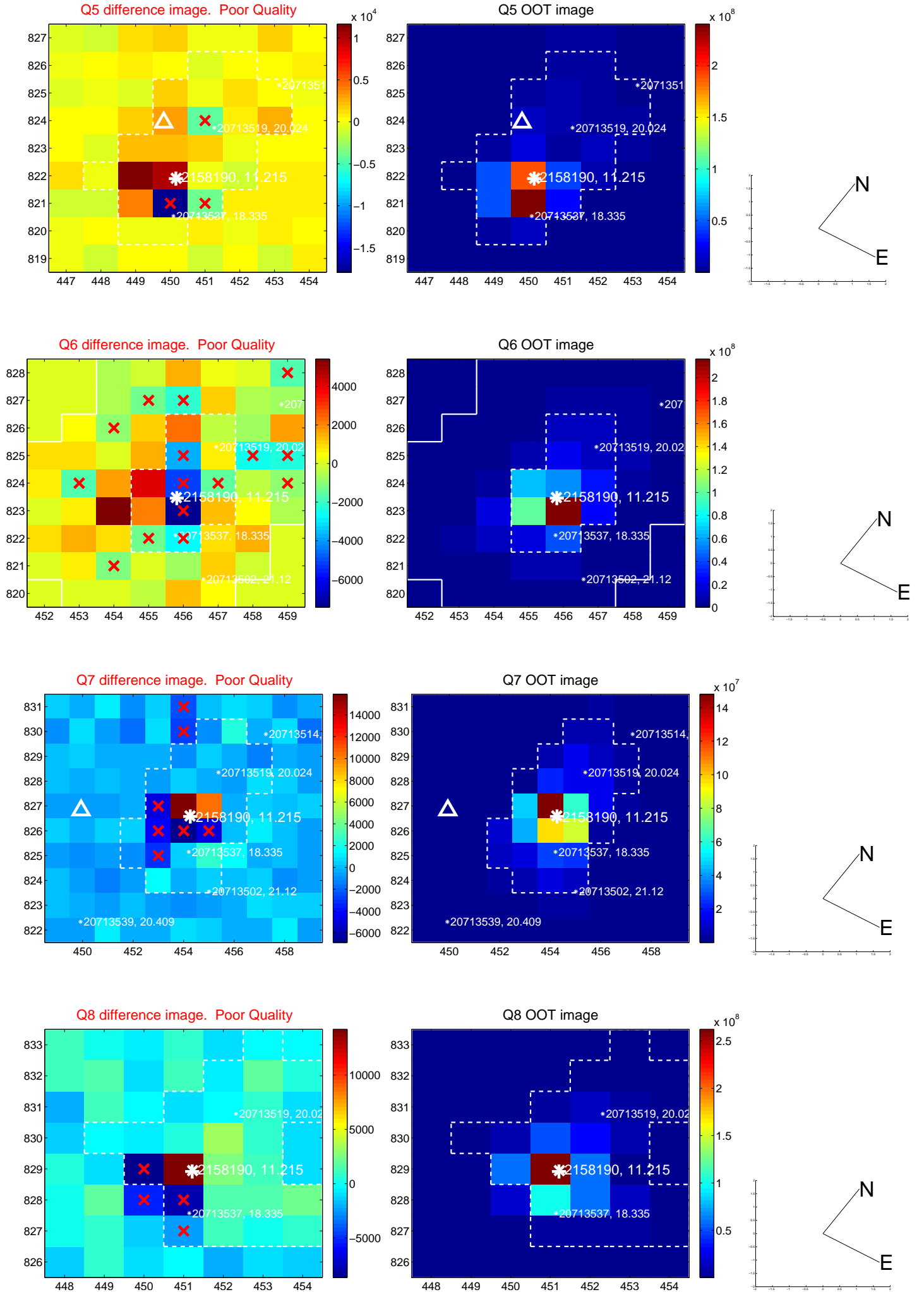


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

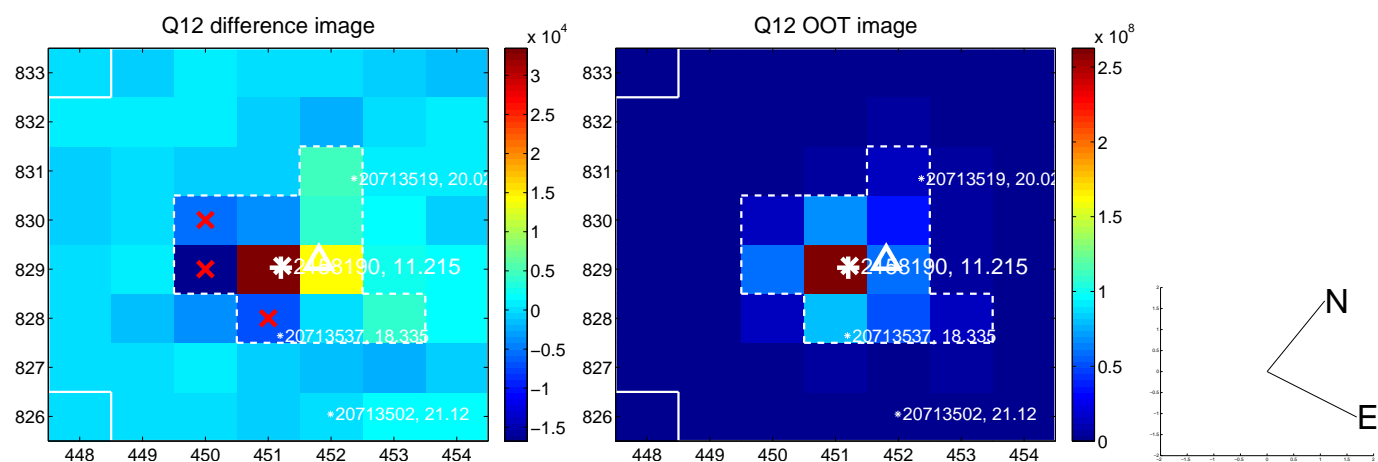
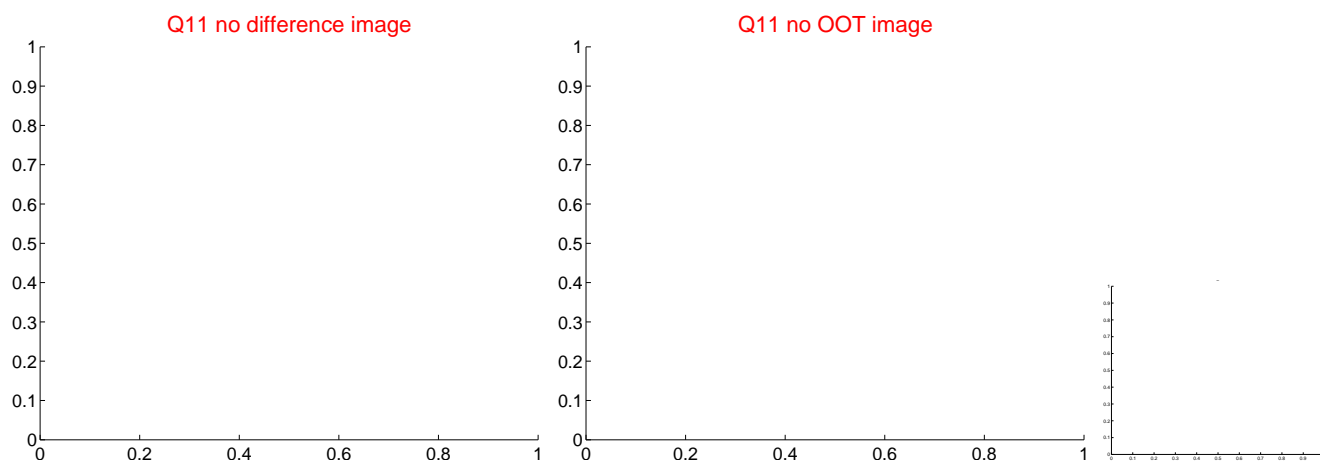
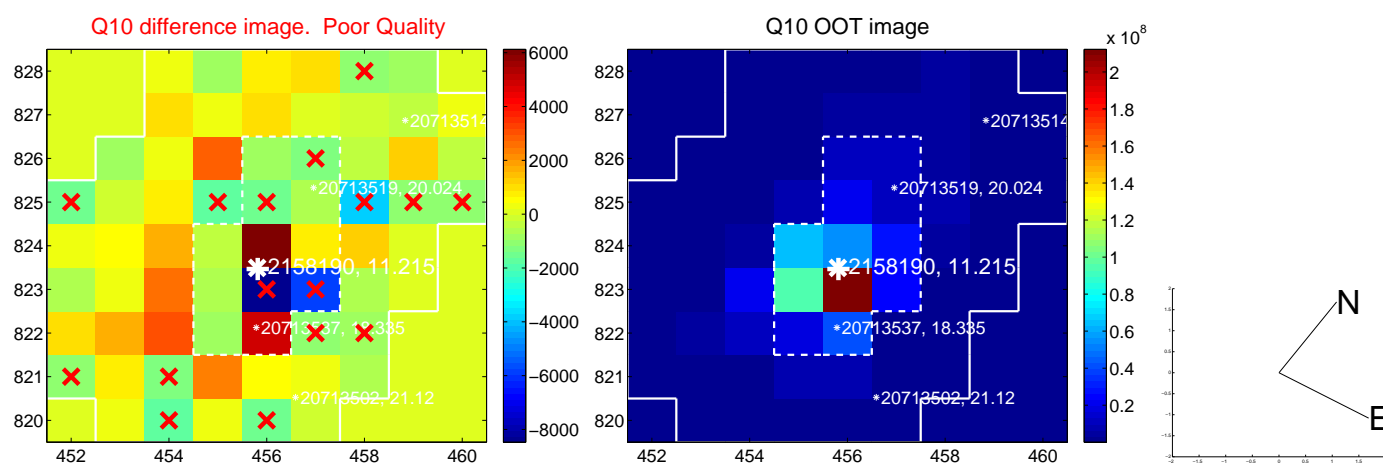
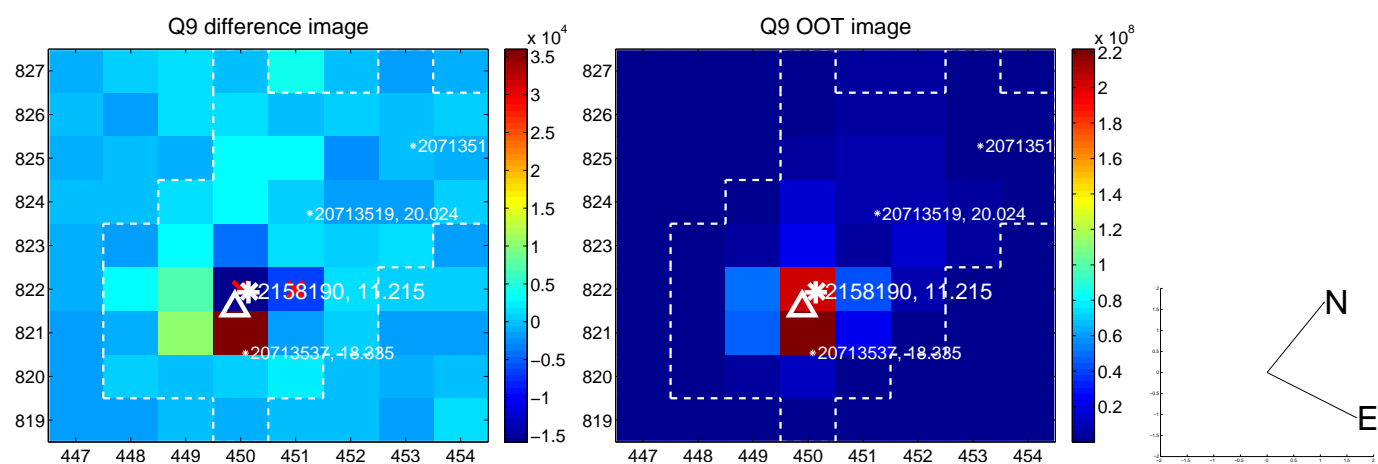
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



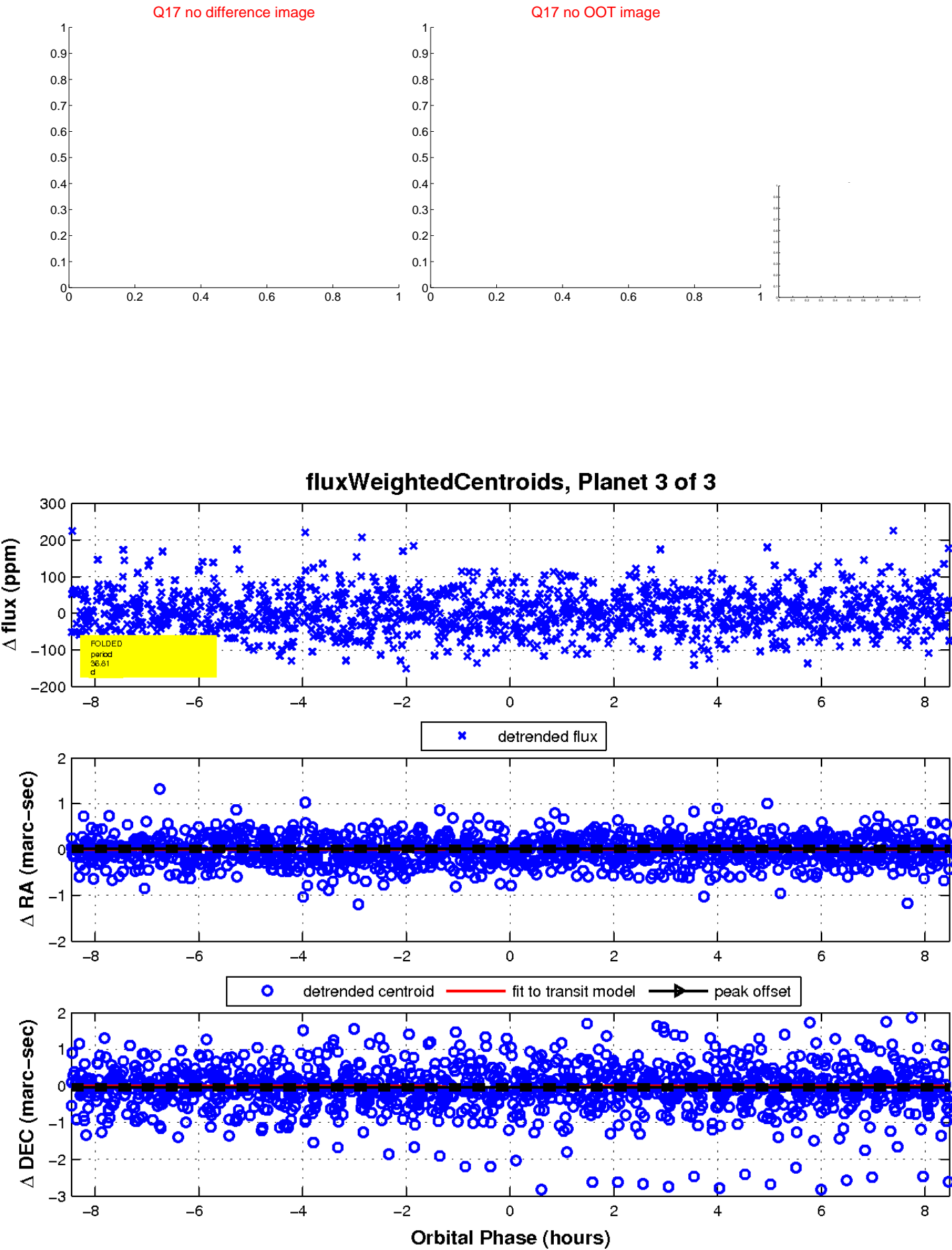
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

