

KIC 004150539

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})
004150539-01	OBS	1330.01	8.653091	136.659534	1061.6	3.680	33.6	36.3	0.69	4641	4.56	37.96
004150539-02	OBS	No	8.653090	134.306505	1003.7	4.414	34.3	37.7	0.69	4641	4.49	37.96
004150539-03	OBS	1330.02	94.222827	196.184606	975.1	27.963	14.3	20.3	0.69	4641	2.62	1.57

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004150539-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
004150539-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
004150539-03	OBS	FP	0.00	0	0	1	1	CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH

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 004150539-01

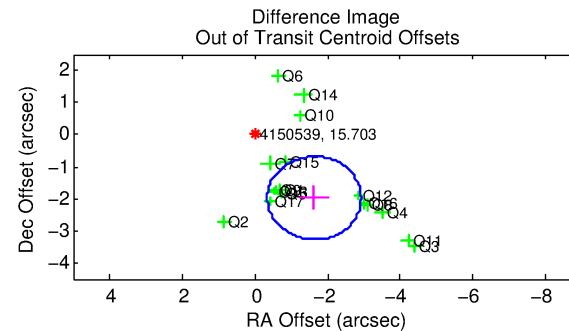
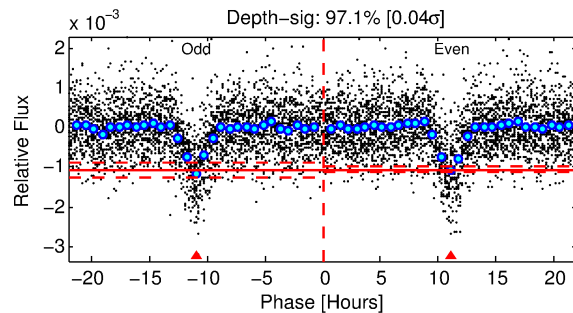
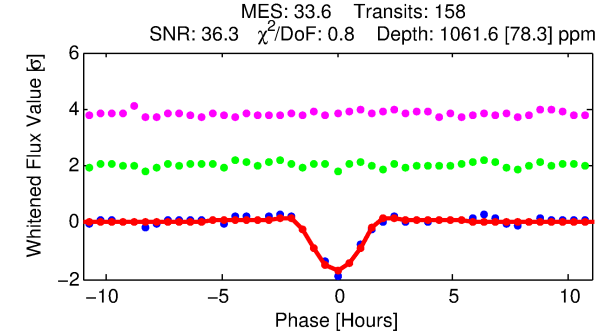
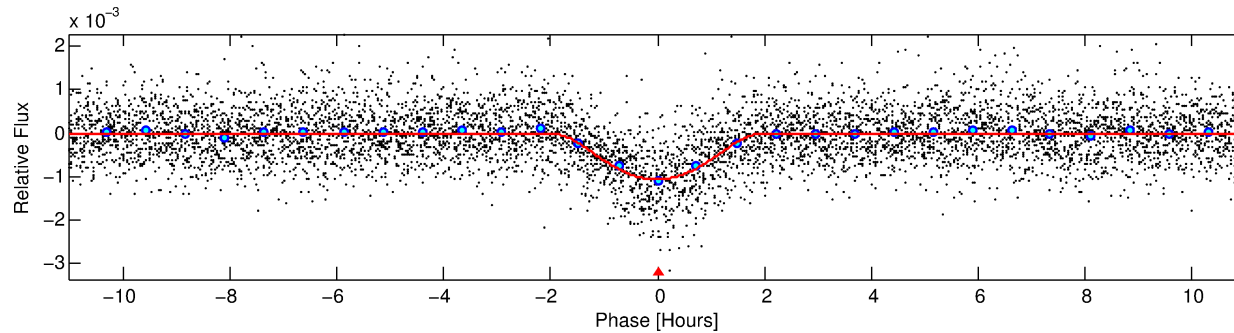
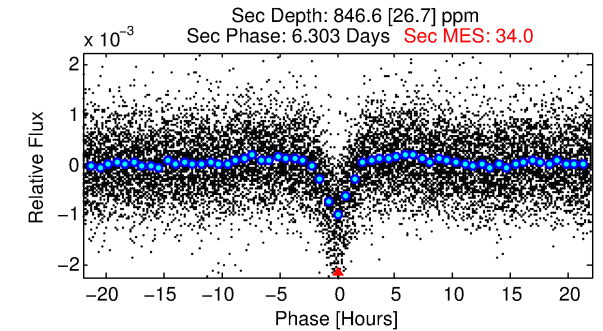
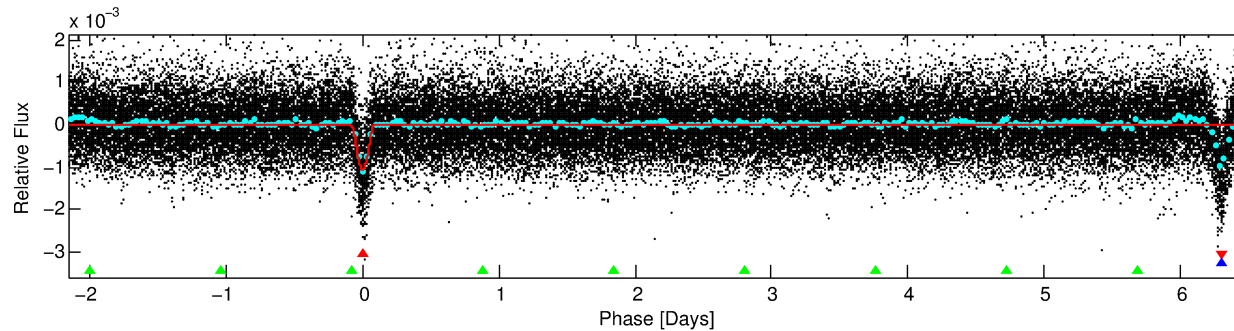
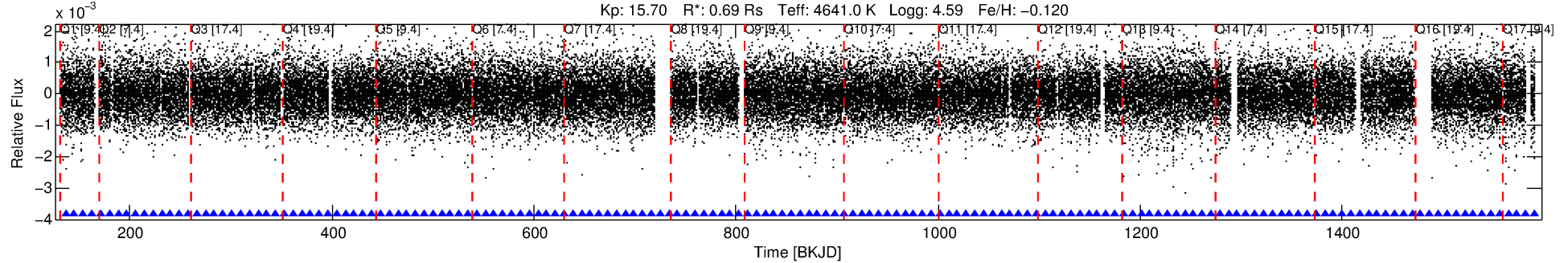
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
004150539-01	4150539	004150611-01	4150611	1:1	50.1	11	-6	7.90	15.70	54.68	Direct-PRF	0	0.20	0.14

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 4150539 Candidate: 1 of 3 Period: 8.653 d
KOI: K01330 Corr: No Ephemeris Match

Kp: 15.70 R*: 0.69 Rs Teff: 4641.0 K Logg: 4.59 Fe/H: -0.120



DV Fit Results:

Period = 8.65309 [0.00002] d
Epoch = 136.6595 [0.0022] BKJD
Rp/R* = 0.0602 [0.0663]
a/R* = 6.52 [1.63]
b = 1.00 [0.10]
Seff = 37.96 [5.96]
Teq = 633 [25] K
Rp = 4.56 [5.04] Re
a = 0.0726 [0.0052] AU
Ag = 118.33 [261.10] [0.45σ]
Teffp = 3228 [1781] K [1.46σ]

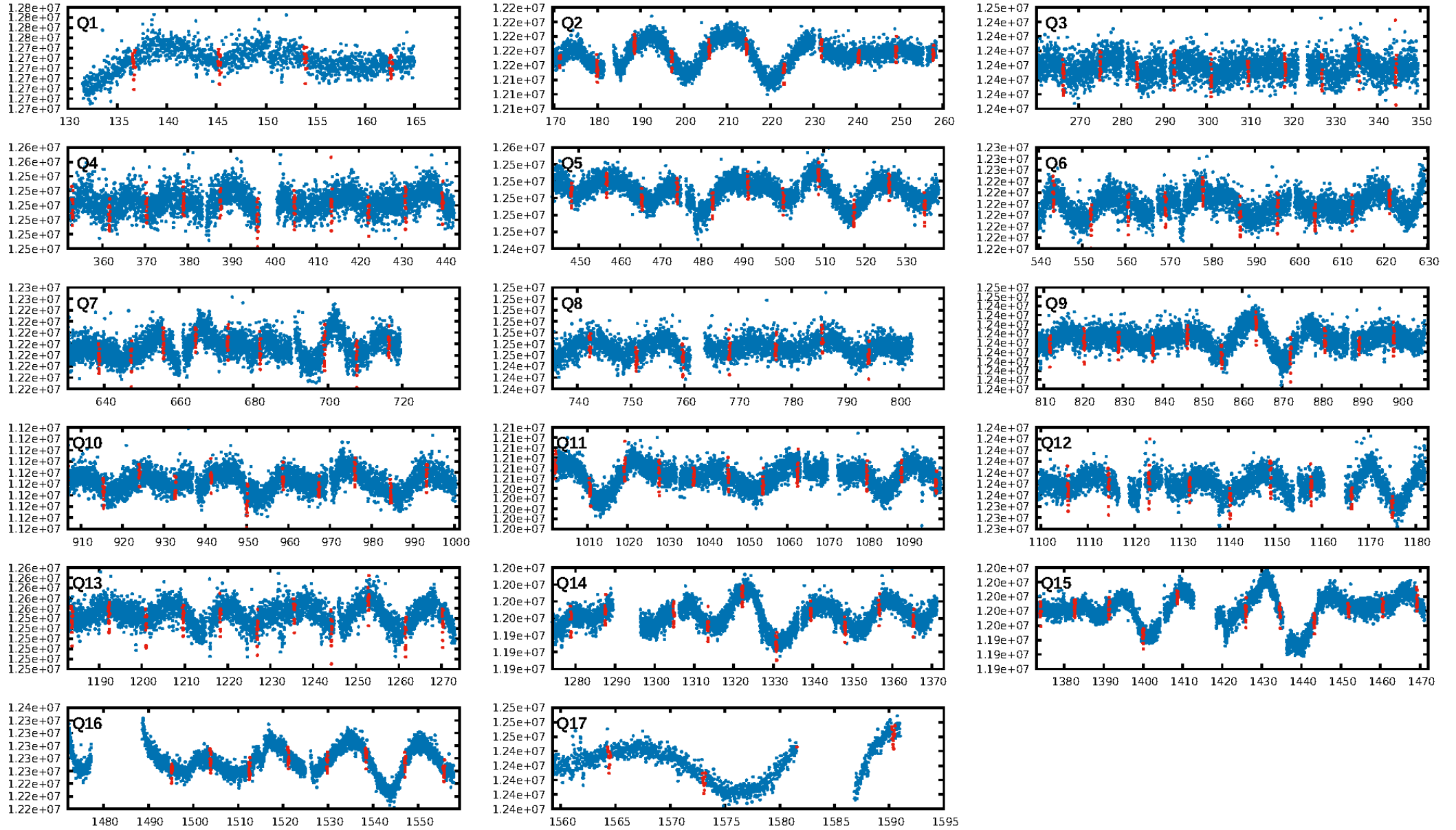
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [72.81σ]
ModelChiSquare2-sig: 52.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.28e-233
RollingBand-fgt: 1.00 [151/151]
GhostDiagnostic-chr: -0.1038
Centroid-sig: 0.0%
Centroid-so: 1.606 arcsec [4.44σ]
OotOffset-rm: 2.569 arcsec [5.96σ]
KicOffset-rm: 2.889 arcsec [6.75σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.00 [0/17]
DiffImageOverlap-fno: 1.00 [17/17]

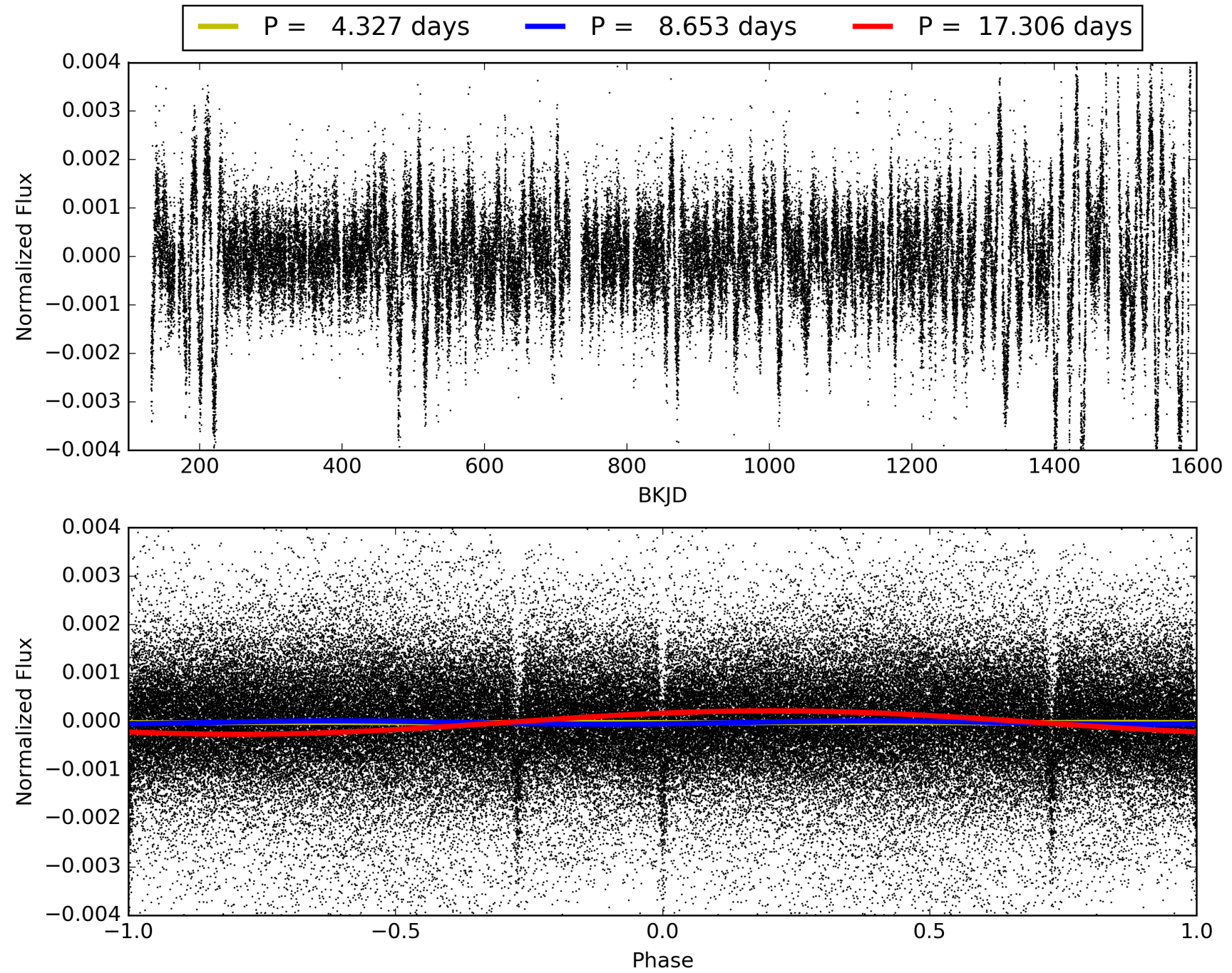
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:03:14 Z

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

TCE 004150539-01, PDC Light Curves

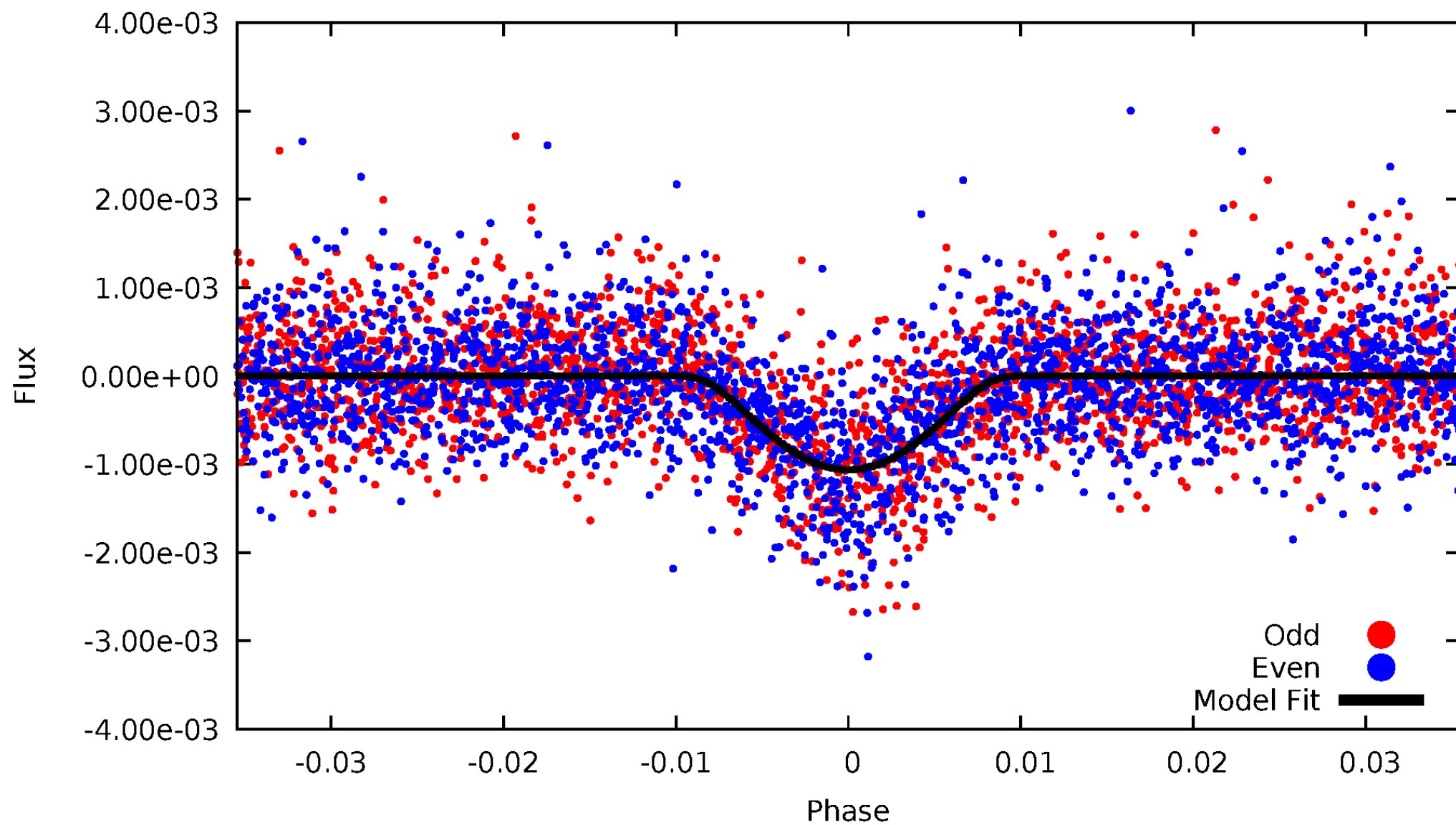


TCE 004150539-01



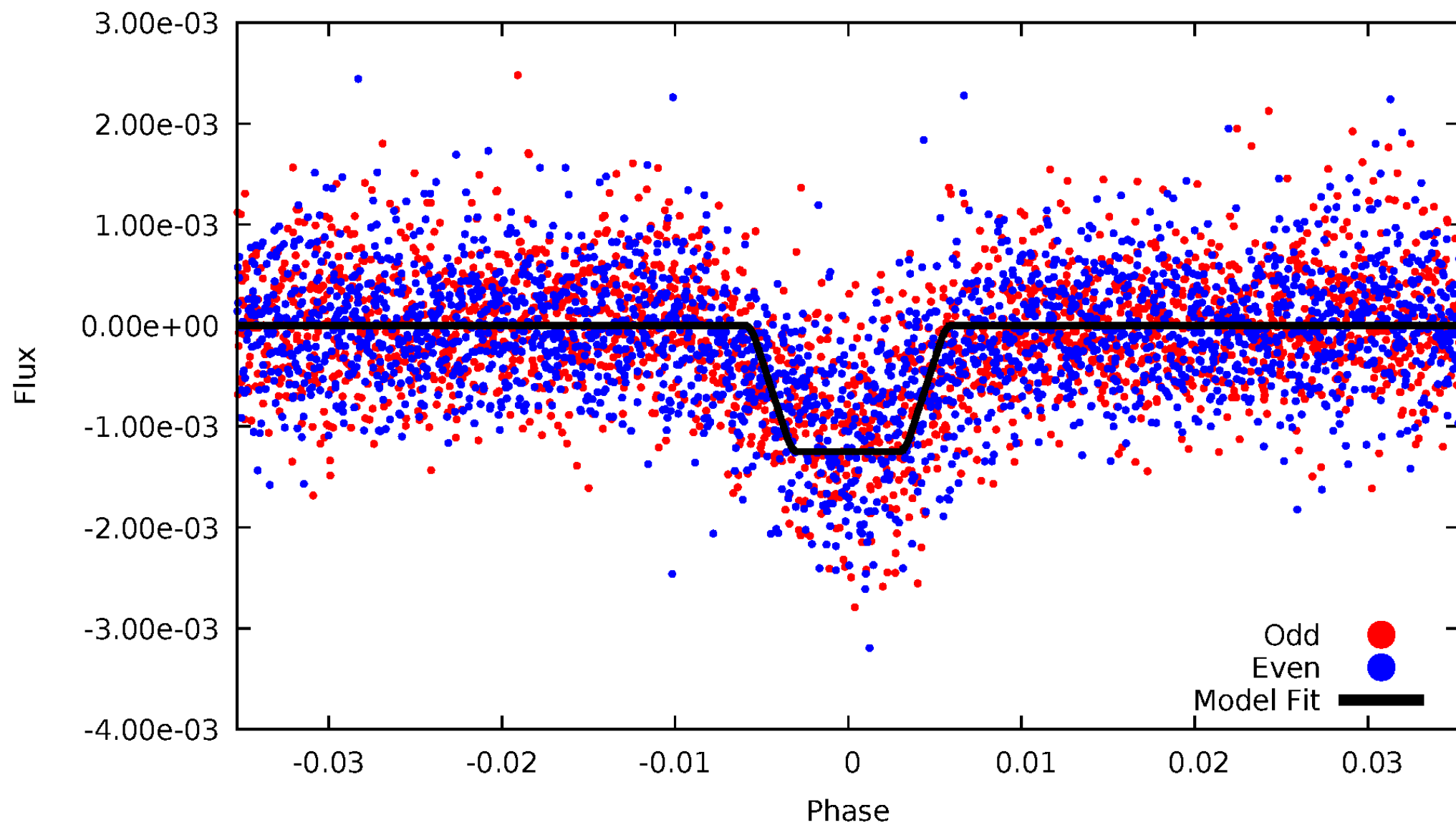
DV Odd/Even

TCE 004150539-01

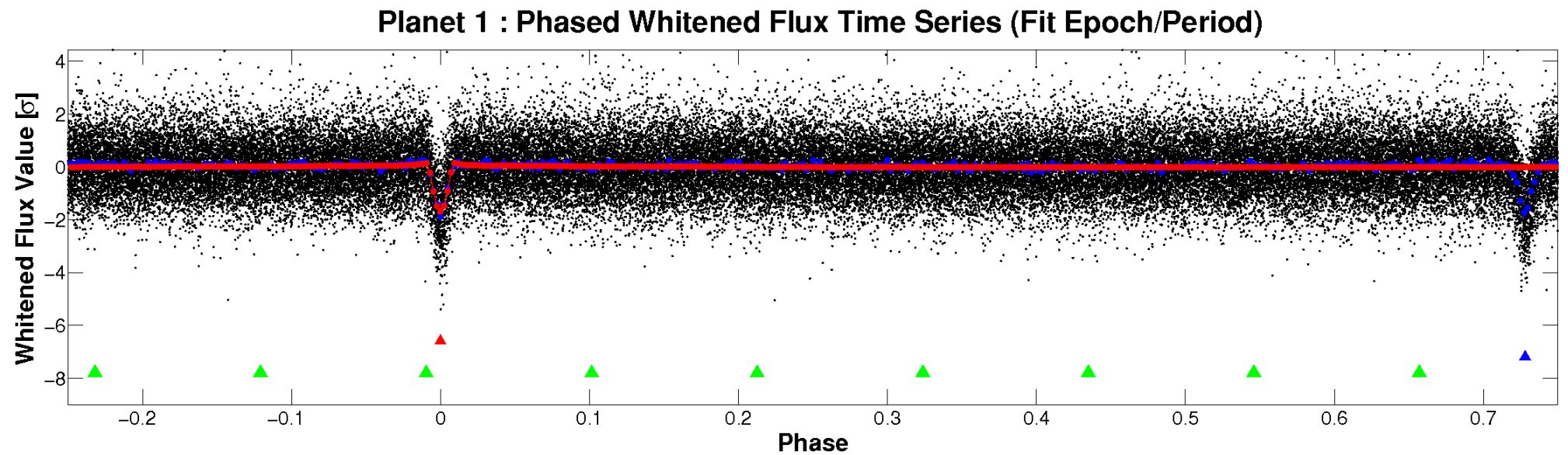
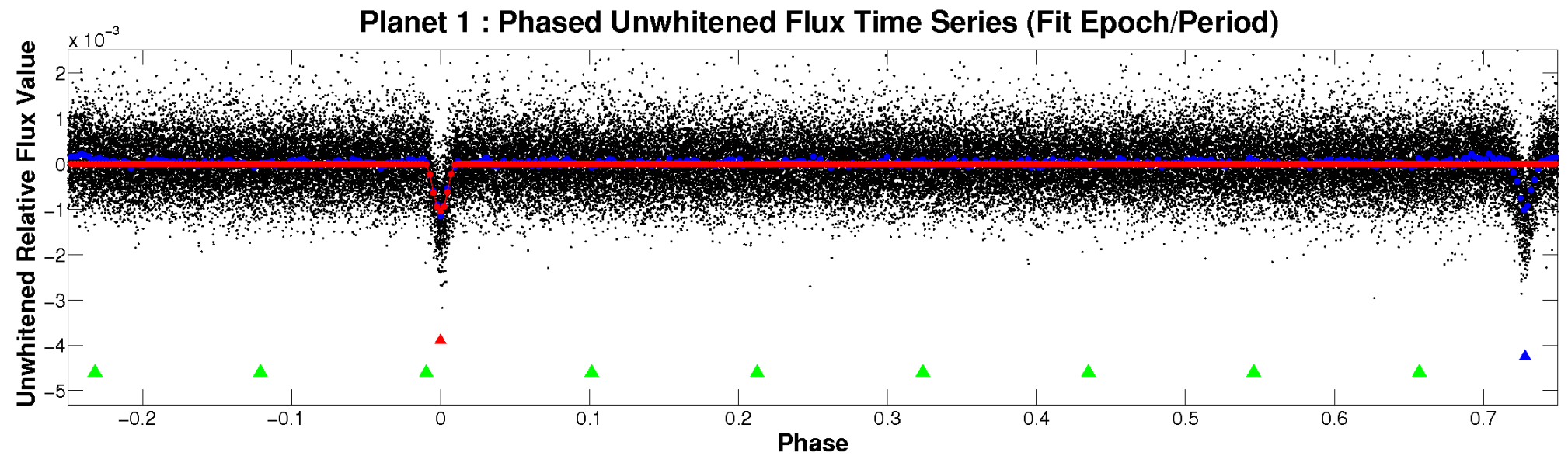


ALT Odd/Even

TCE 004150539-01

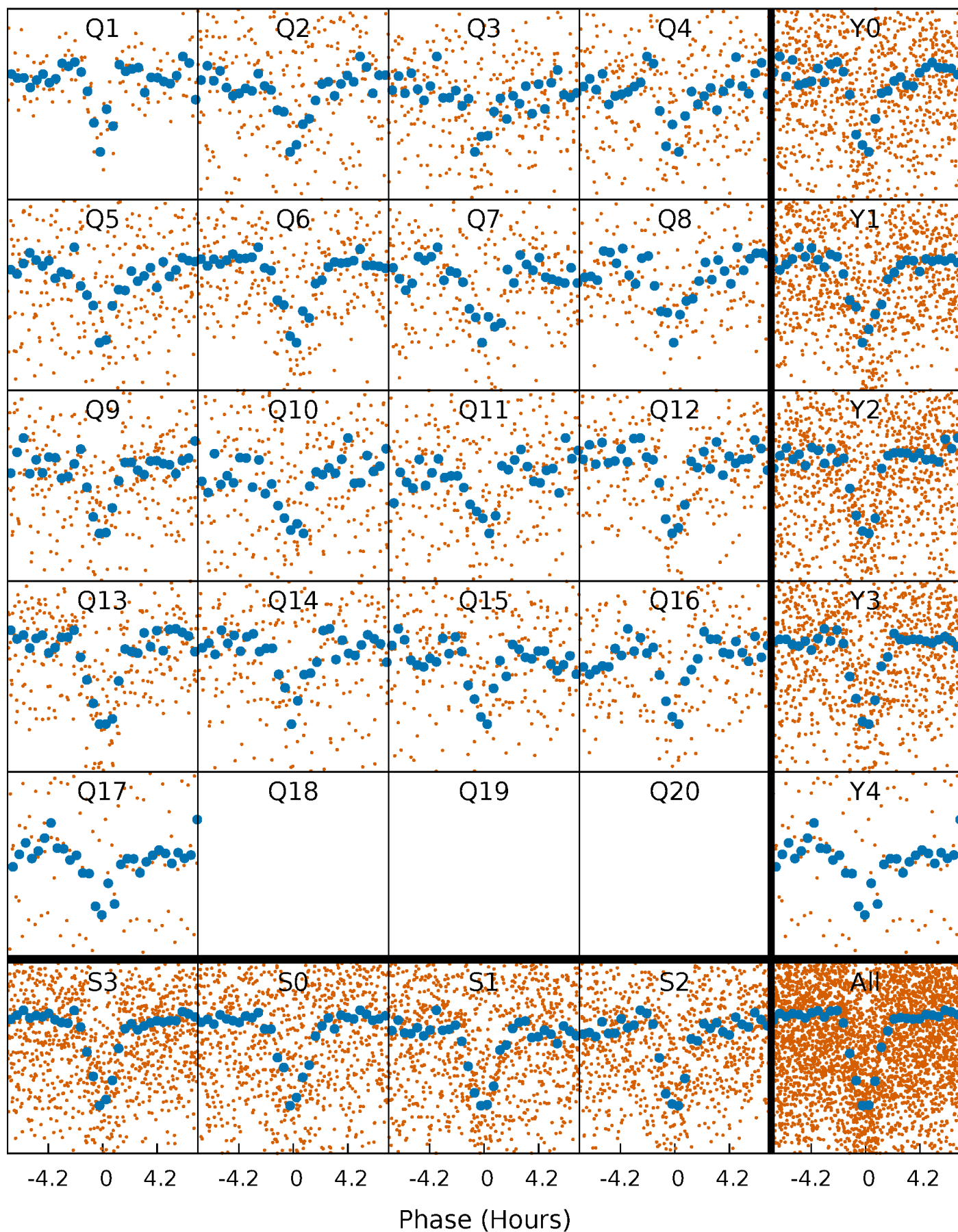


Non-Whitened Vs. Whitened Light Curve



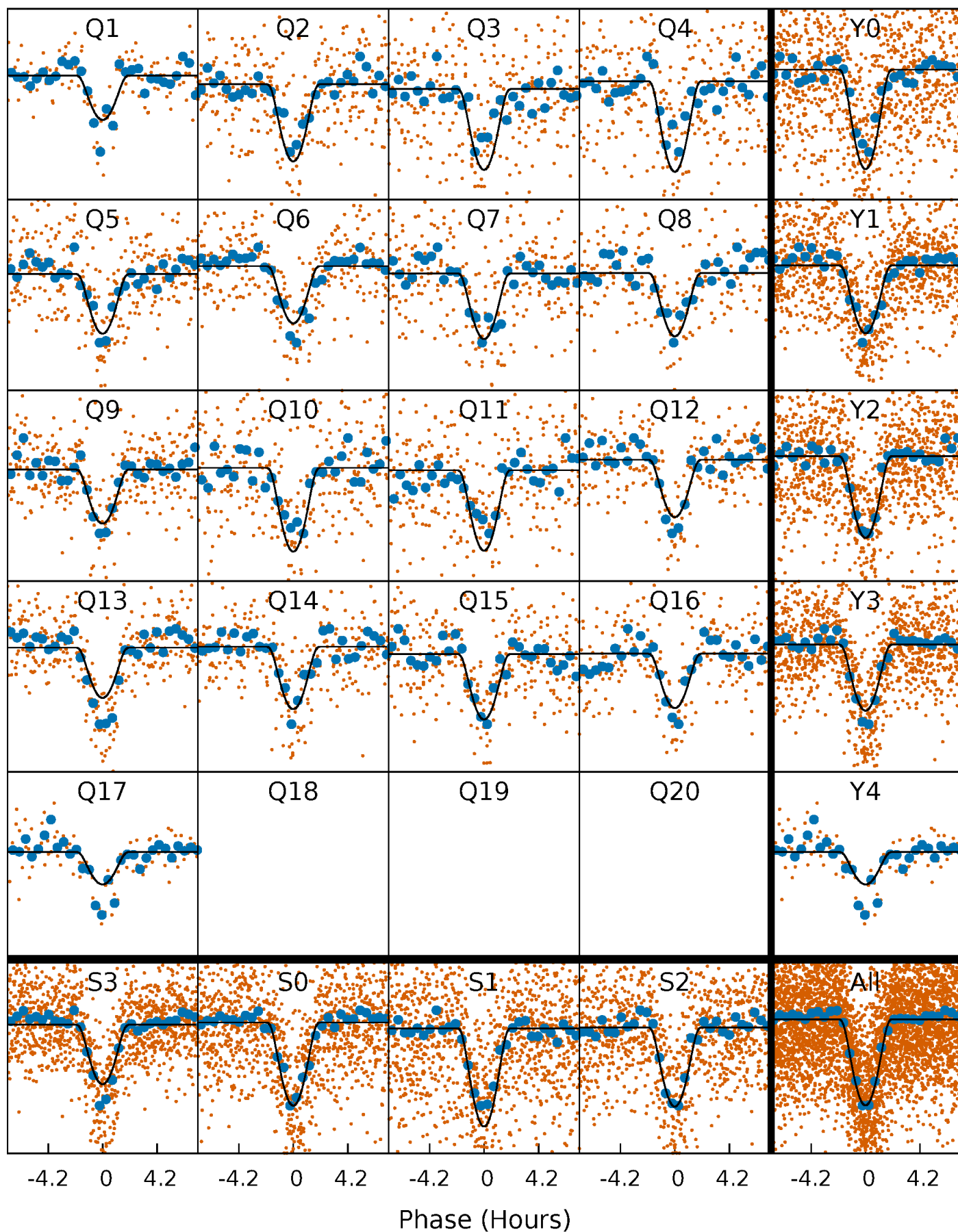
PDC Quarter-Phased Transit Curves

TCE 004150539-01 P= 8.653091 Days $T_0=136.659534$ (BKJD)



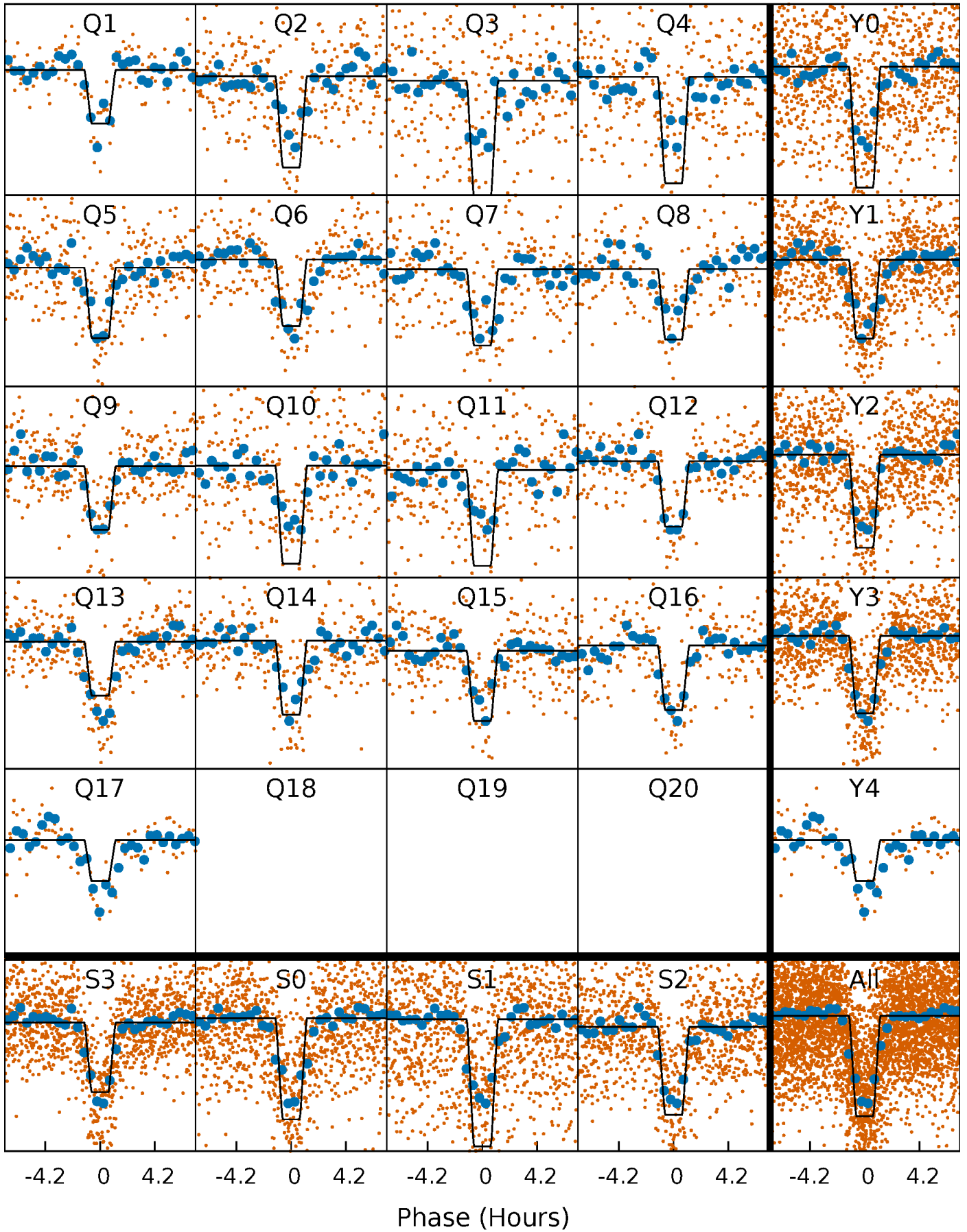
DV Quarter-Phased Transit Curves

TCE 004150539-01 P= 8.653091 Days $T_0=136.659534$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

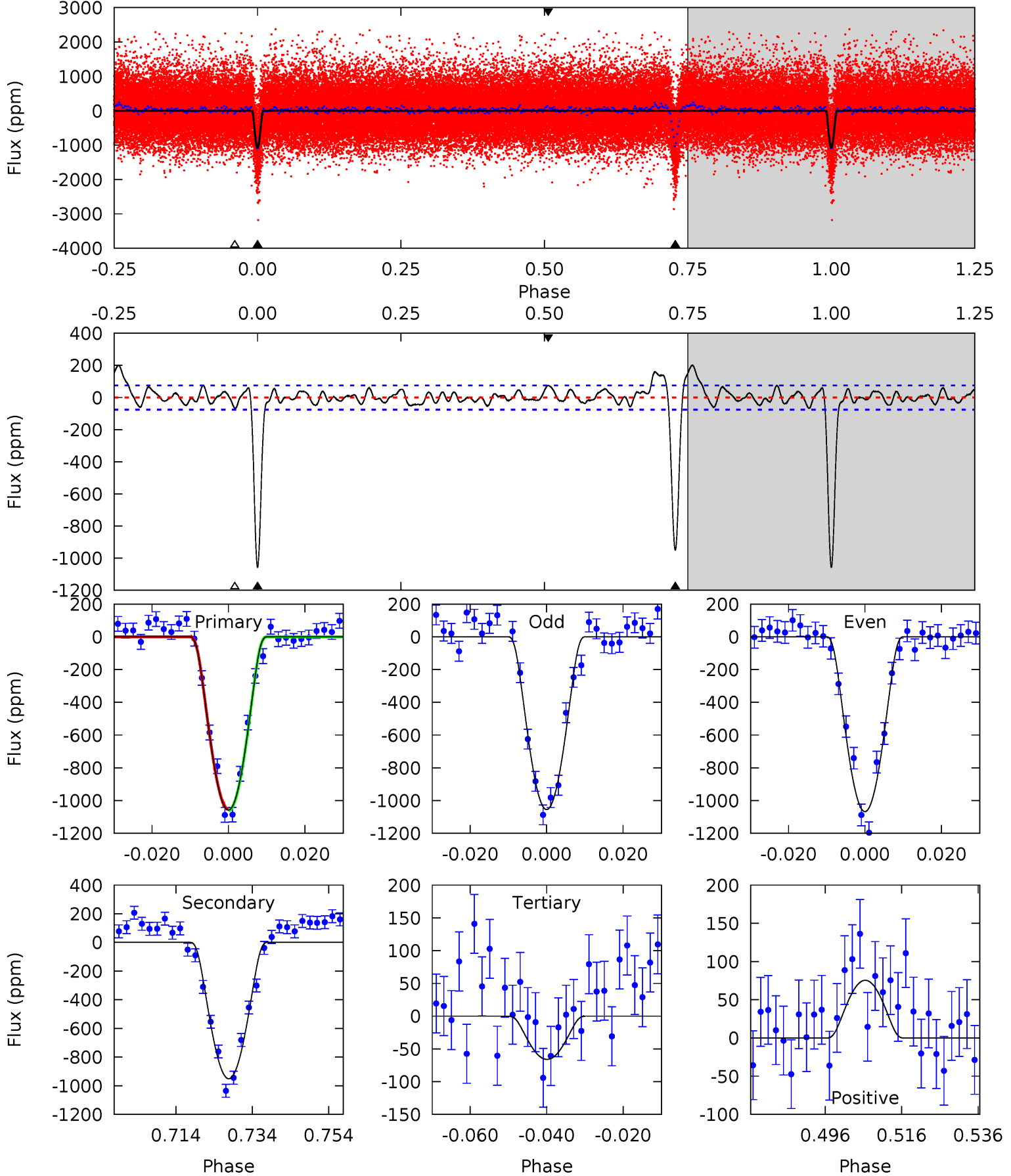
TCE 004150539-01 P= 8.653068 Days $T_0=136.661728$ (BKJD)



DV Model-Shift Uniqueness Test

004150539-01, P = 8.653091 Days, E = 128.006443 Days

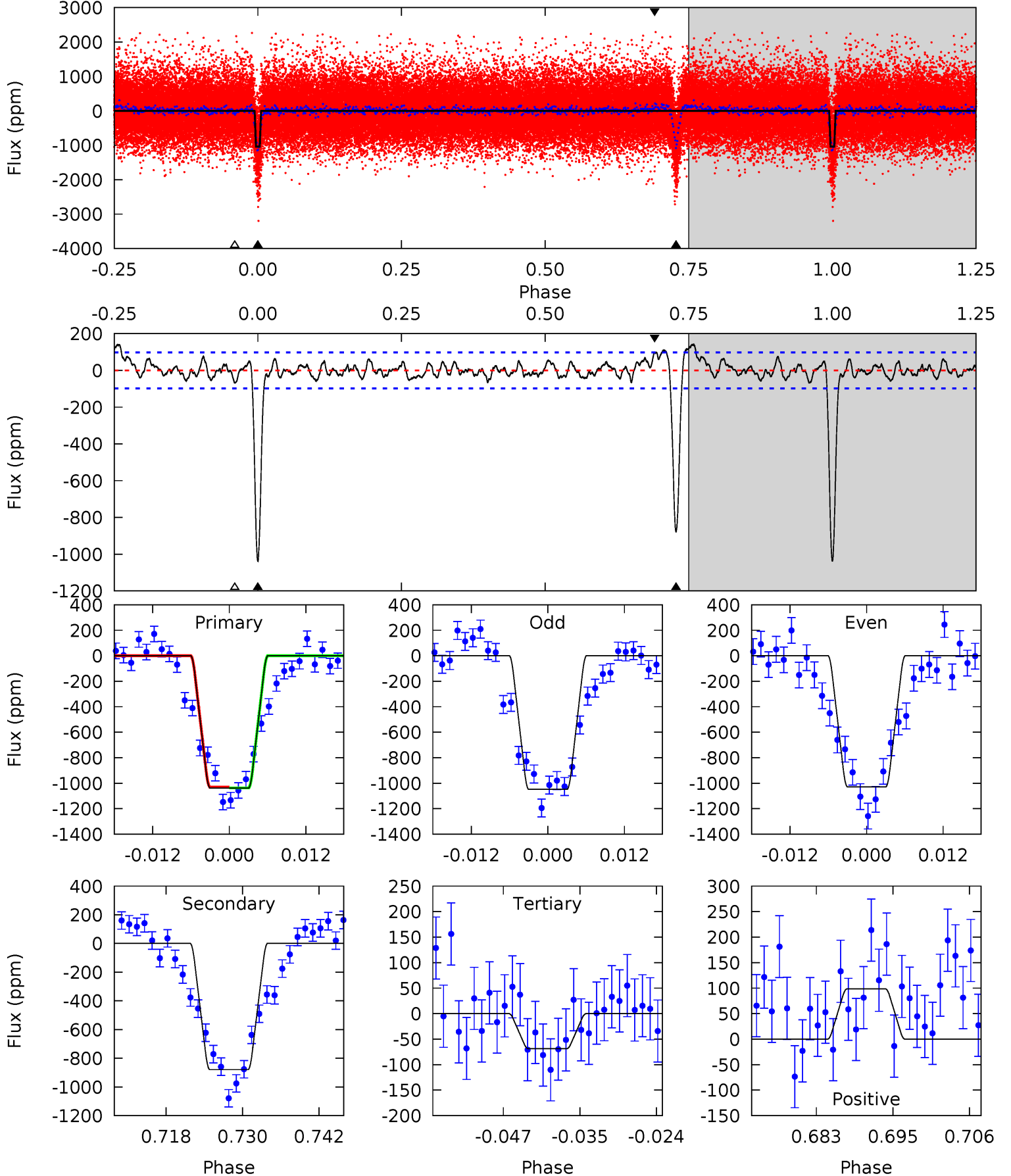
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
69.0	62.0	4.30	4.92	4.89	2.33	2.88	64.7	64.0	57.7	57.1	0.42	1.05	0.16	0.22



Alt Model-Shift Uniqueness Test

004150539-01, P = 8.653068 Days, E = 128.008660 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.2	45.0	3.52	5.05	4.99	2.52	1.90	49.6	48.1	41.5	40.0	0.51	1.06	0.12	0.15



Stellar Parameters For KIC 004150539

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4641^{+139}_{-125}	$4.589^{+0.054}_{-0.027}$	$-0.120^{+0.300}_{-0.300}$	$0.694^{+0.050}_{-0.061}$	$0.682^{+0.076}_{-0.051}$	$2.878^{+0.723}_{-0.305}$
	+3%/-3%	+1%/-1%	+250%/-250%	+7%/-9%	+11%/-7%	+25%/-11%
Source	PHO1	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 004150539-01 / KOI 1330.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-951 ± 15	$5.62^{+4.52}_{-3.56}$	880^{+29}_{-29}	3387^{+1474}_{-521}	89^{+571}_{-62}
Alt.	-879 ± 20	$4.31^{+4.60}_{-2.83}$	879^{+31}_{-27}	3644^{+1895}_{-700}	139^{+1059}_{-105}

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 $A_{obs} \gg 1.0$

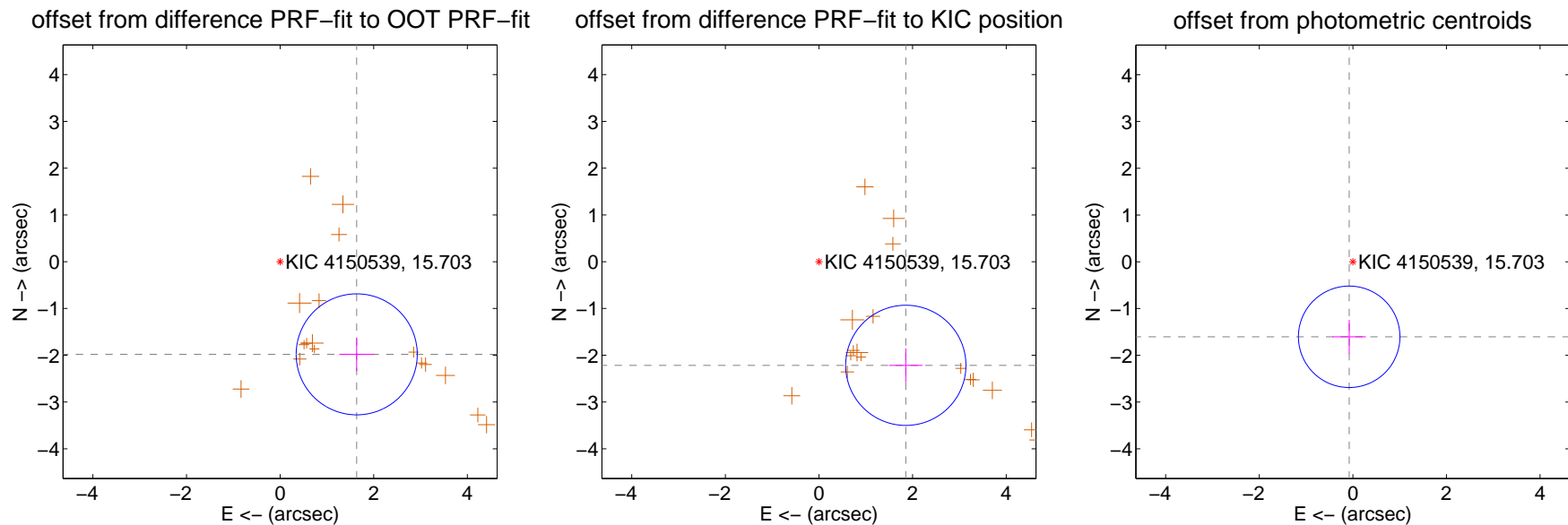
DV Centroid Data

Supplemental centroid analysis for 004150539-01. Kepler magnitude: 15.70. Transit SNR 36.30

There are 0 quarters with good PRF difference image offsets

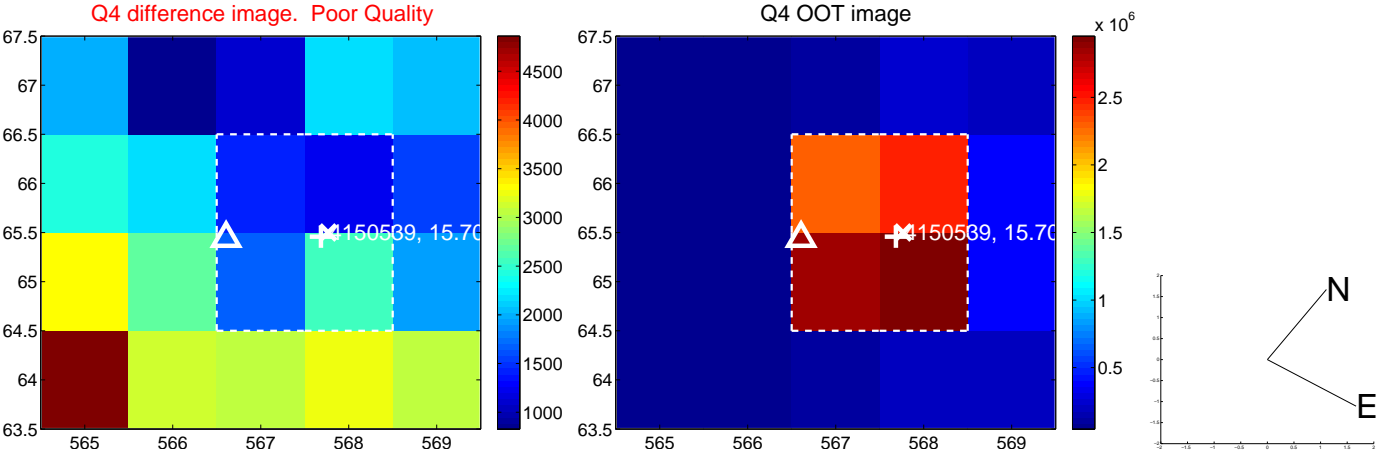
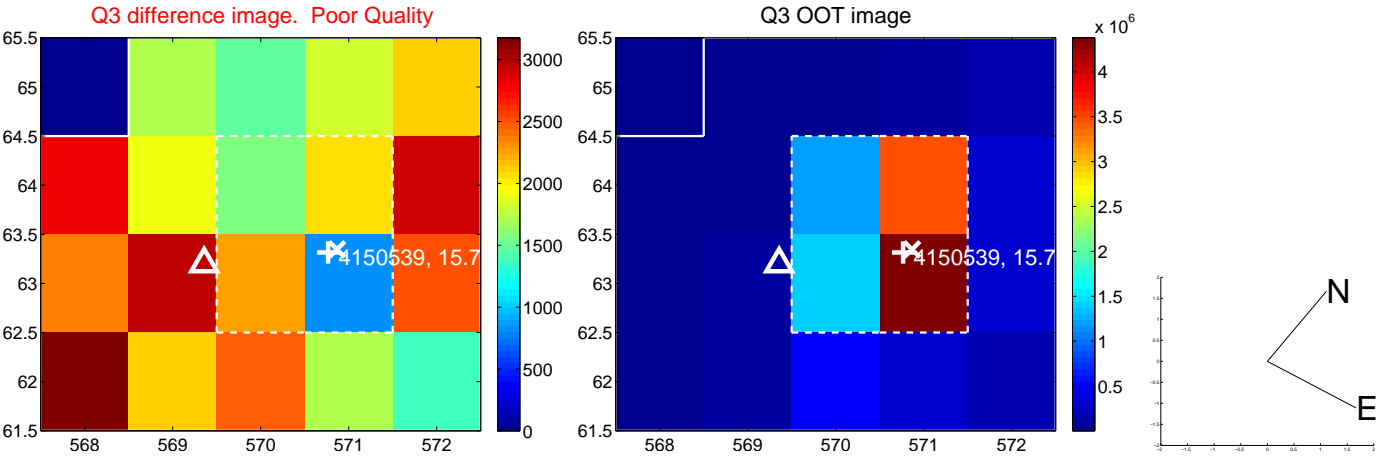
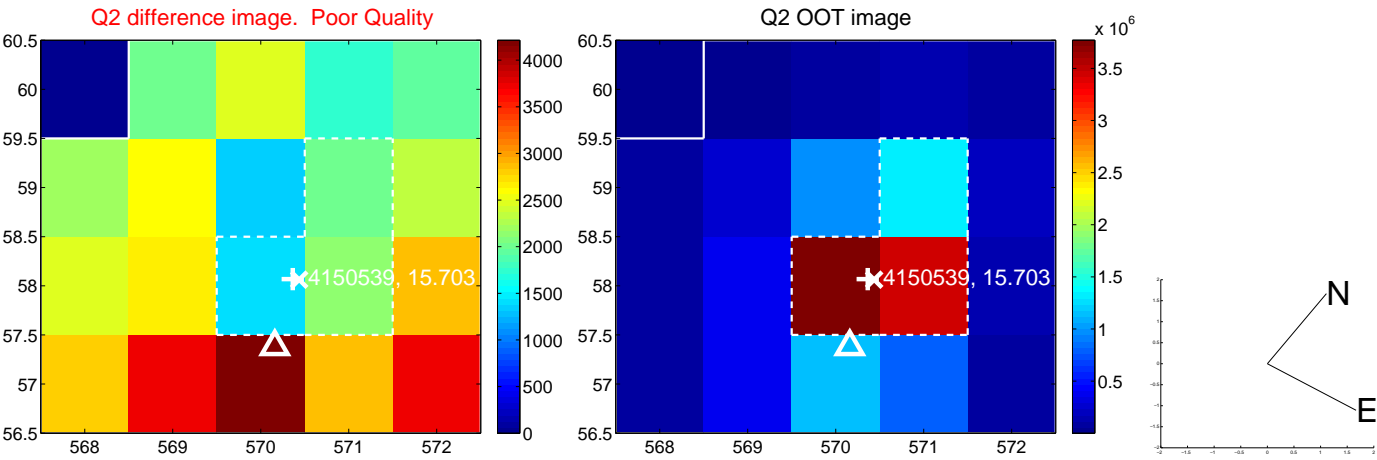
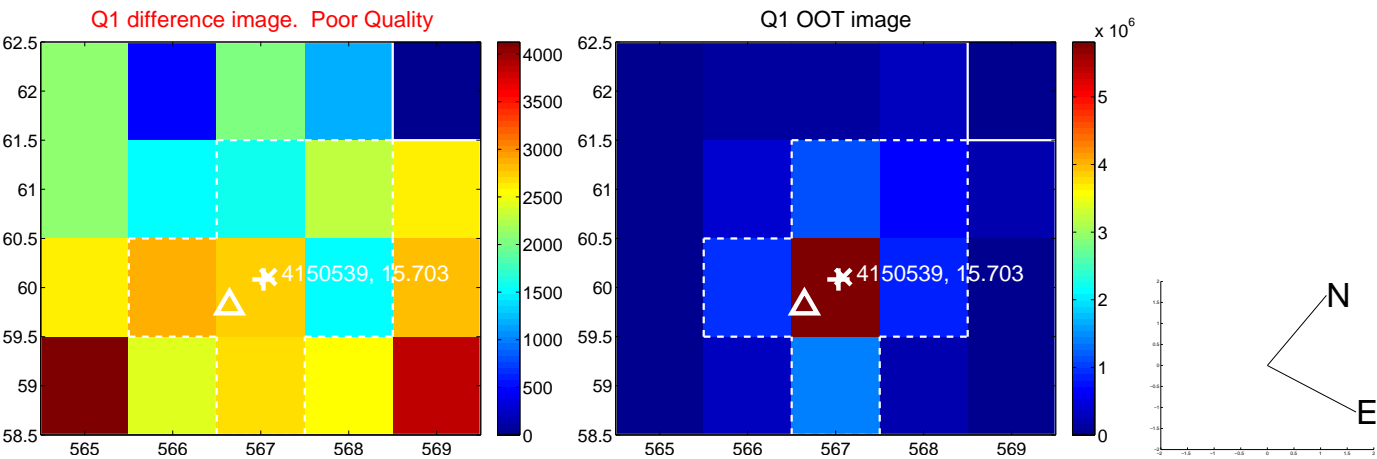
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.569 ± 0.431	5.96	-1.636 ± 0.371	-1.980 ± 0.359
PRF-fit source offset from KIC position	2.889 ± 0.428	6.75	-1.854 ± 0.357	-2.215 ± 0.361
photometric centroid source offset	1.61 ± 0.36	4.44	0.08 ± 0.36	-1.60 ± 0.36

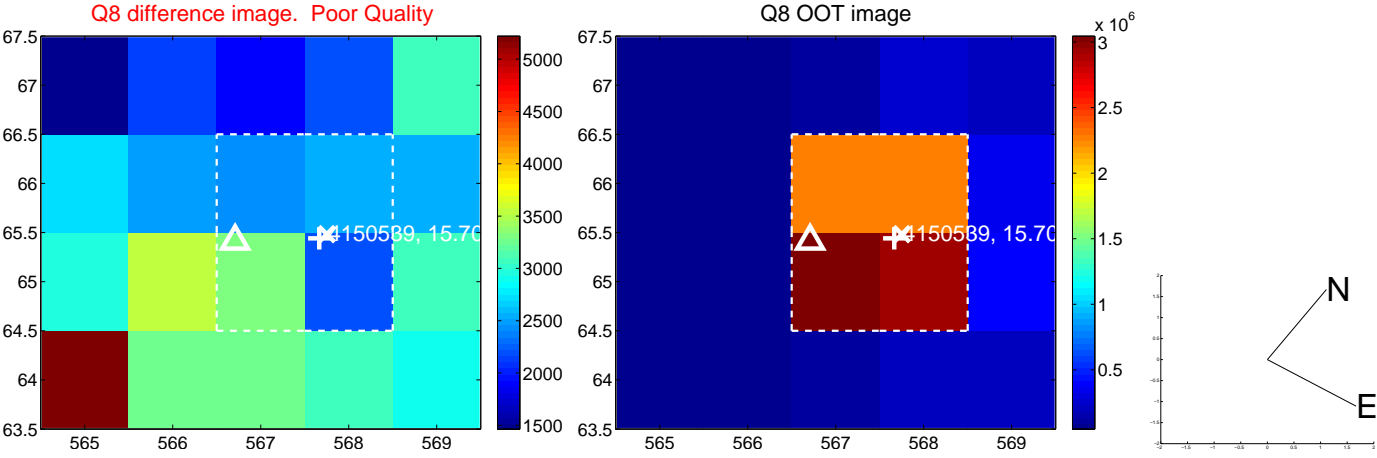
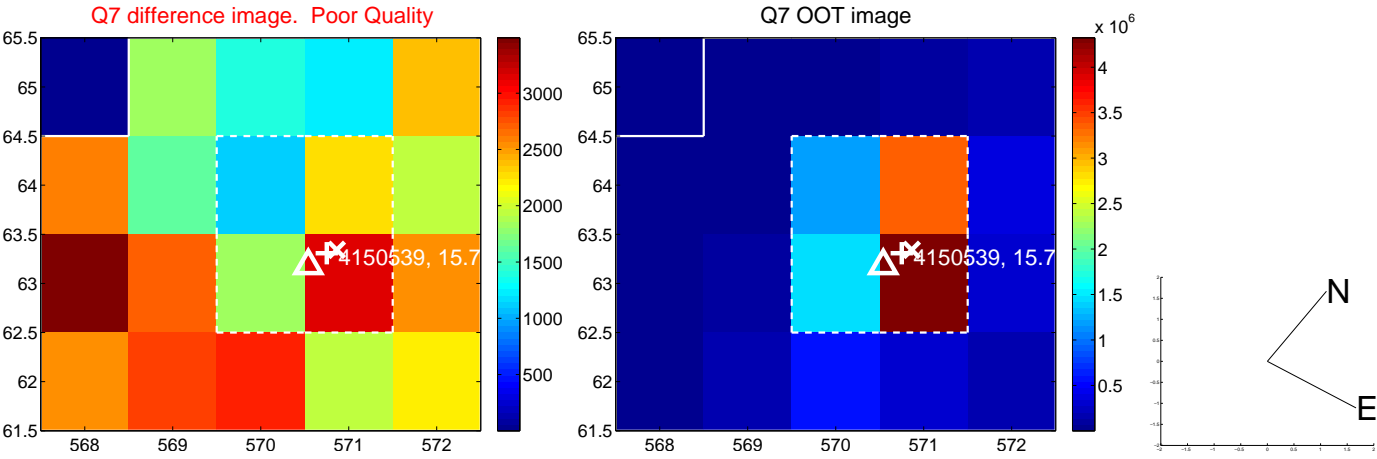
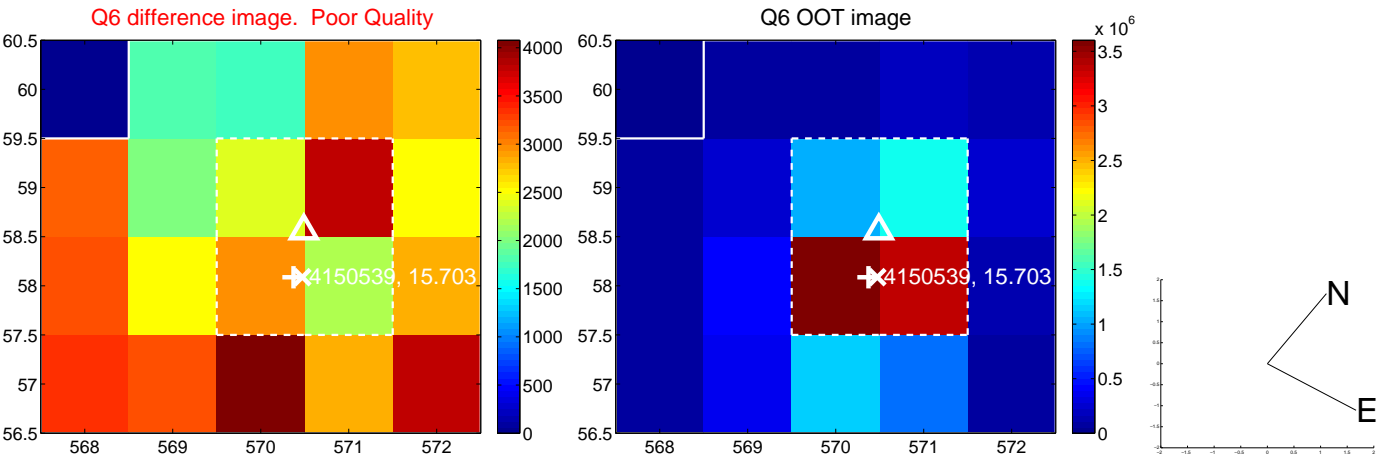
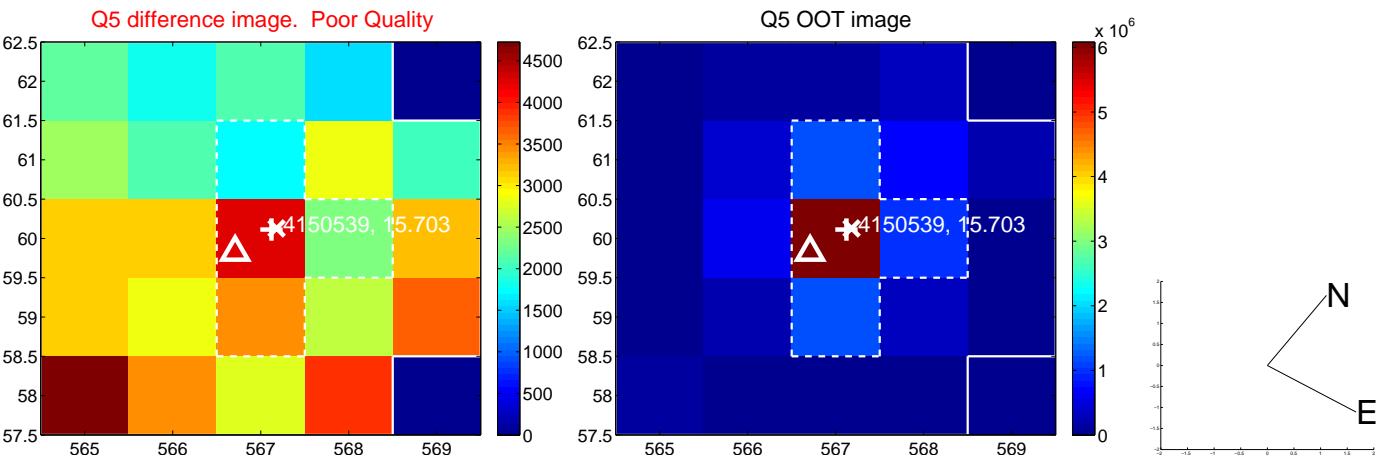


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

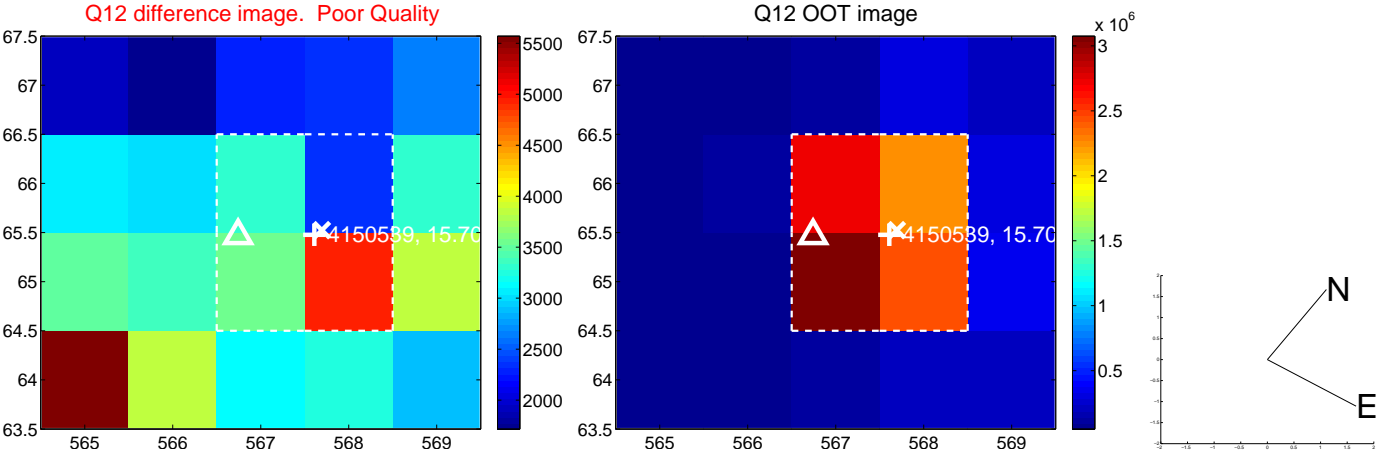
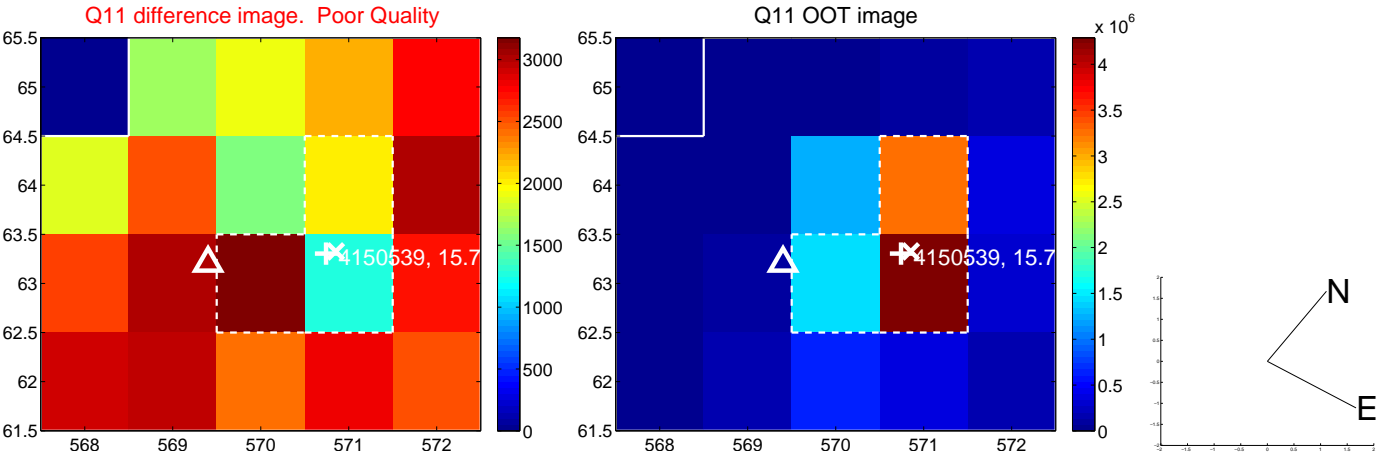
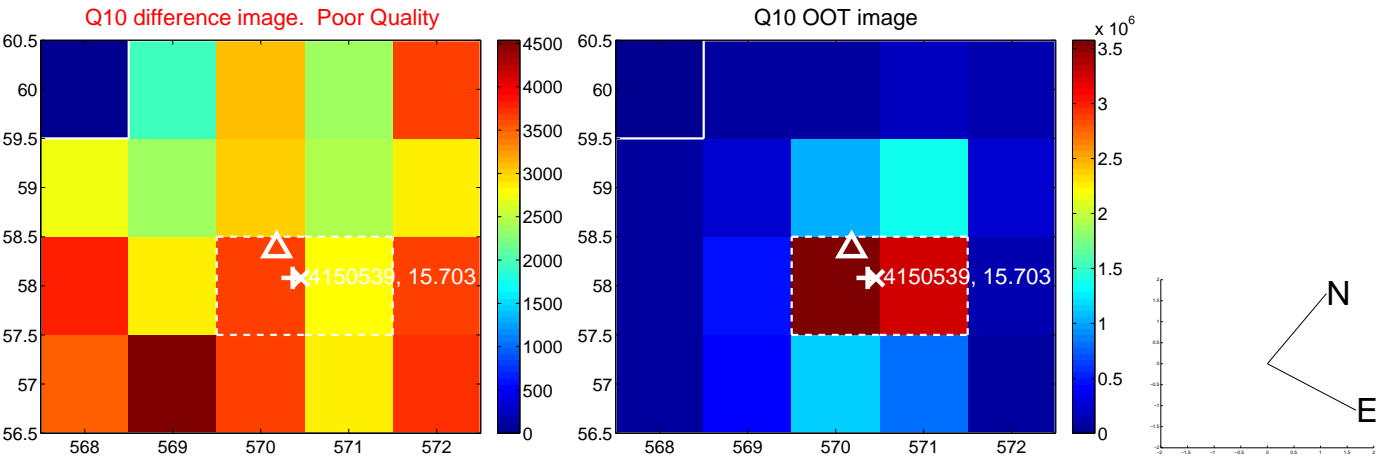
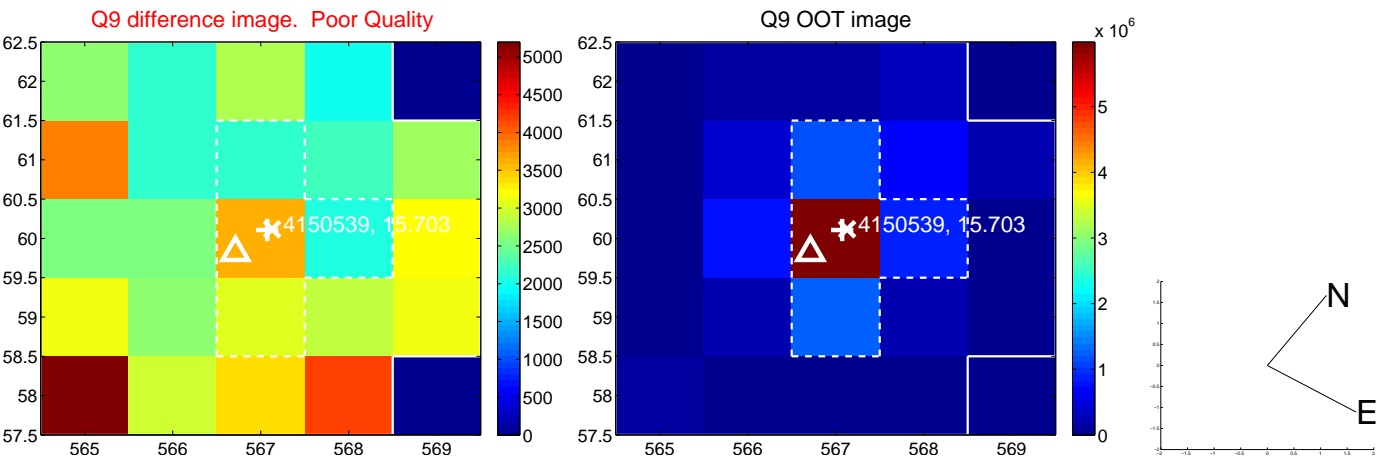
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



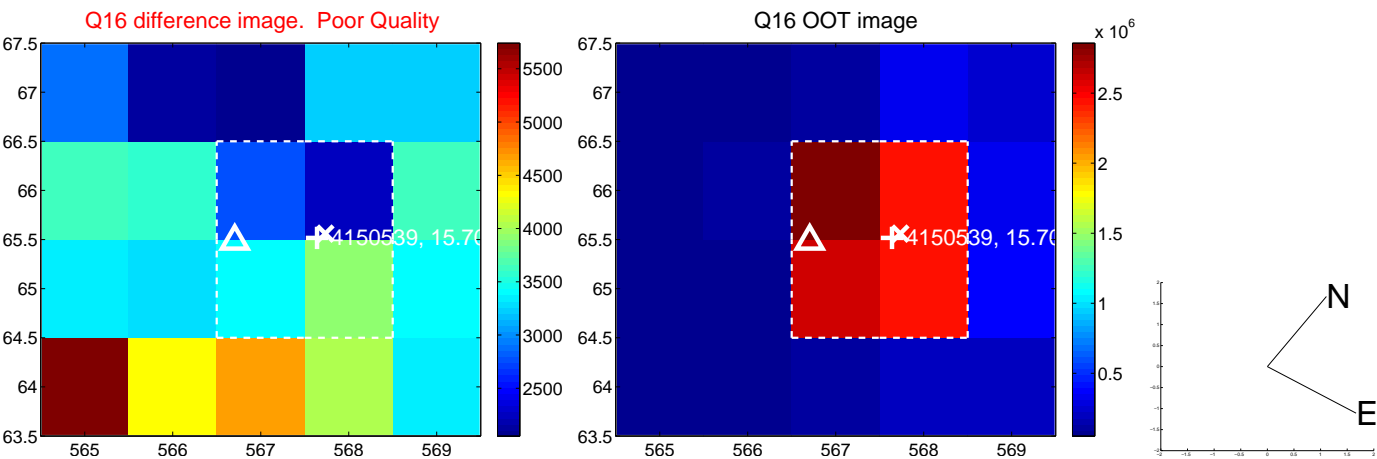
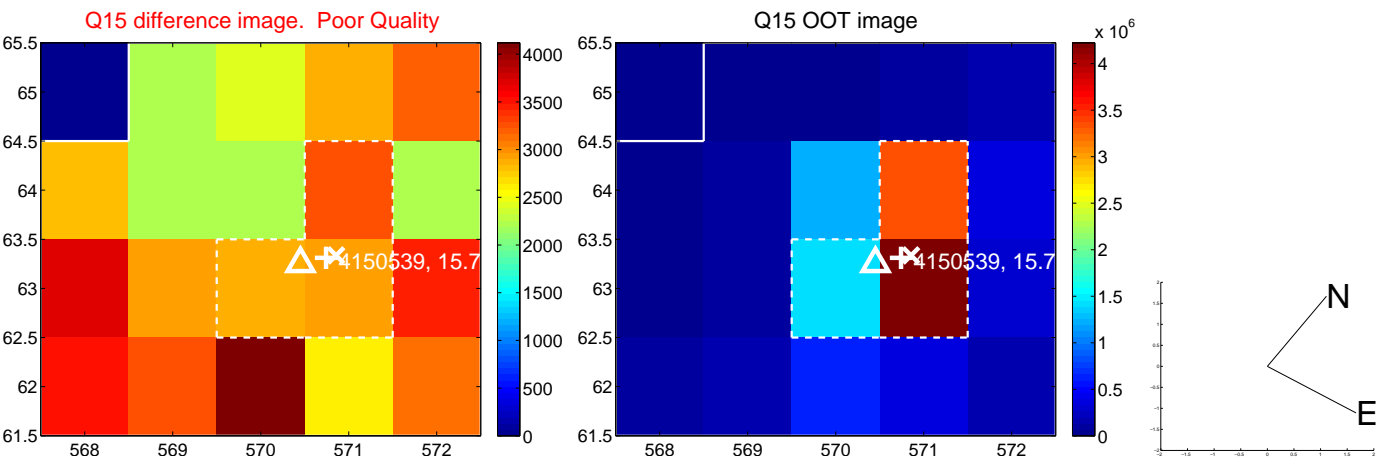
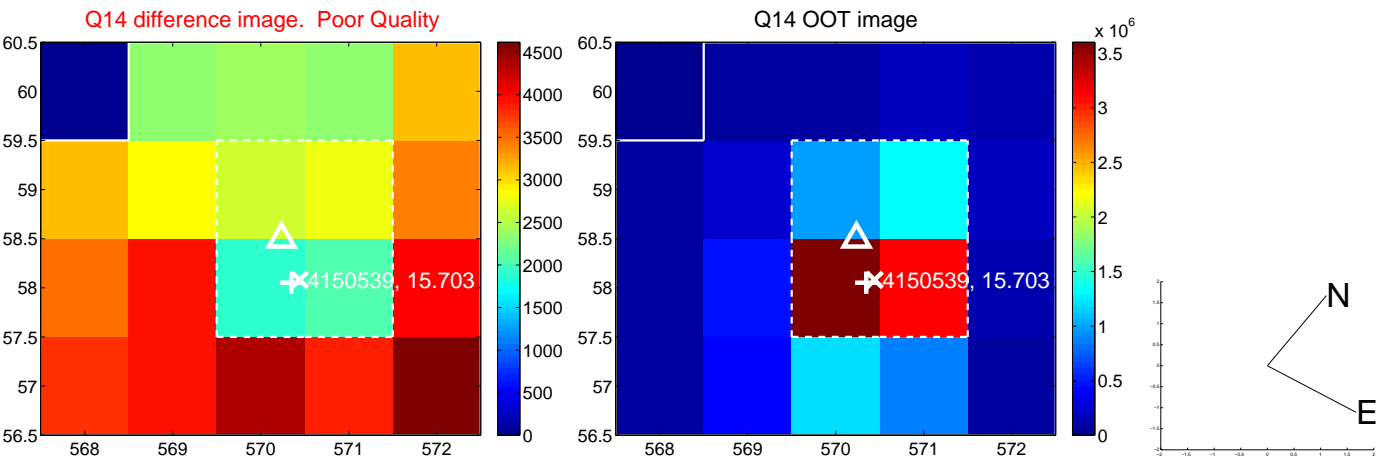
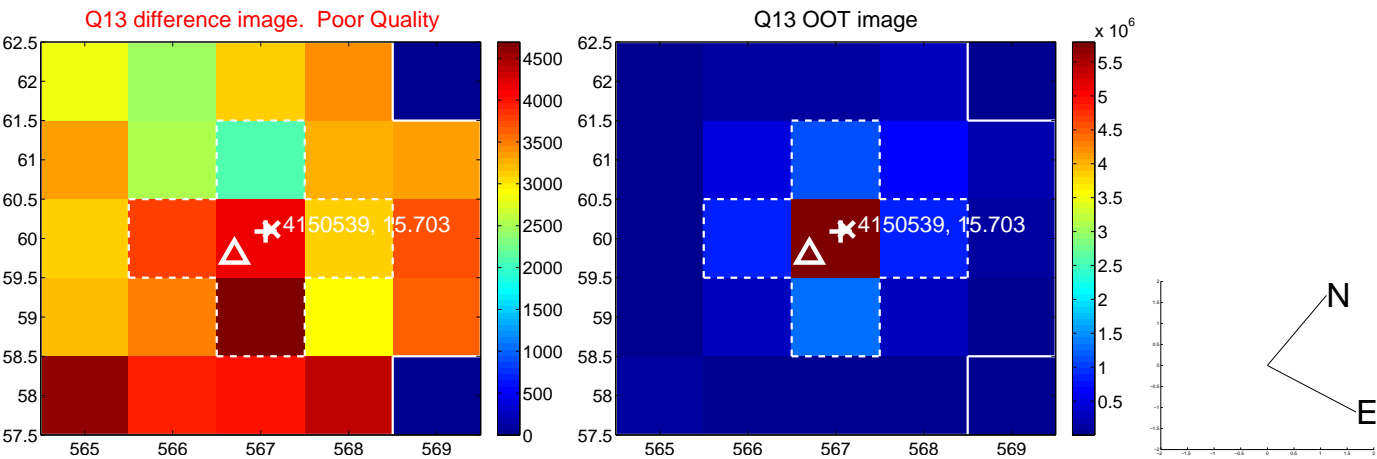
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



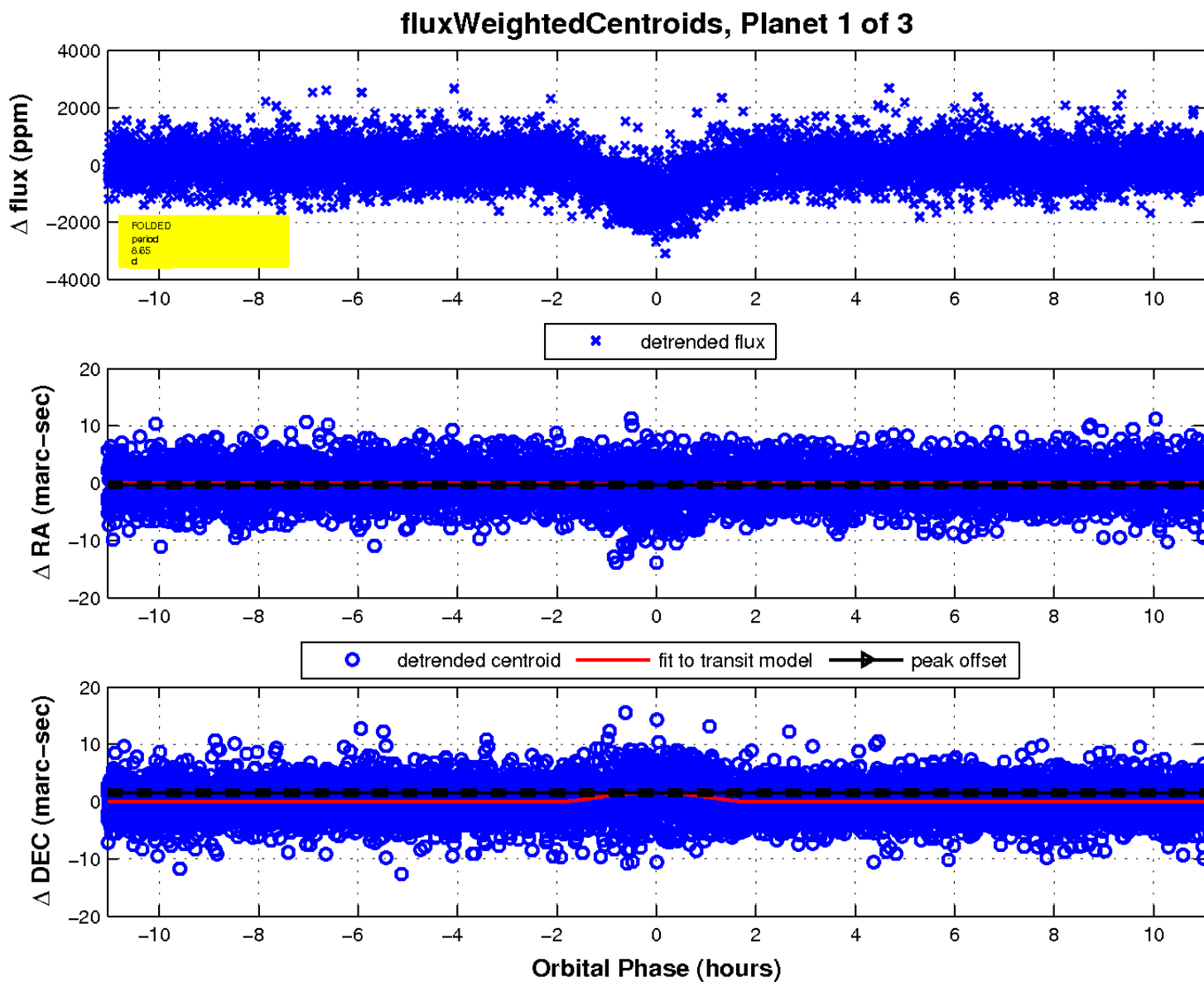
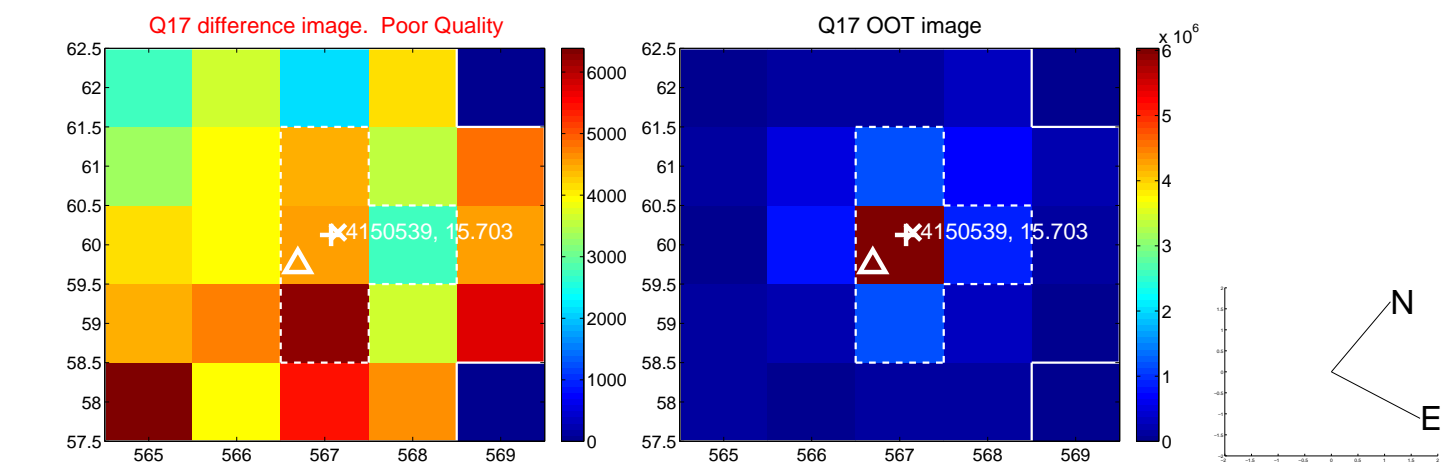
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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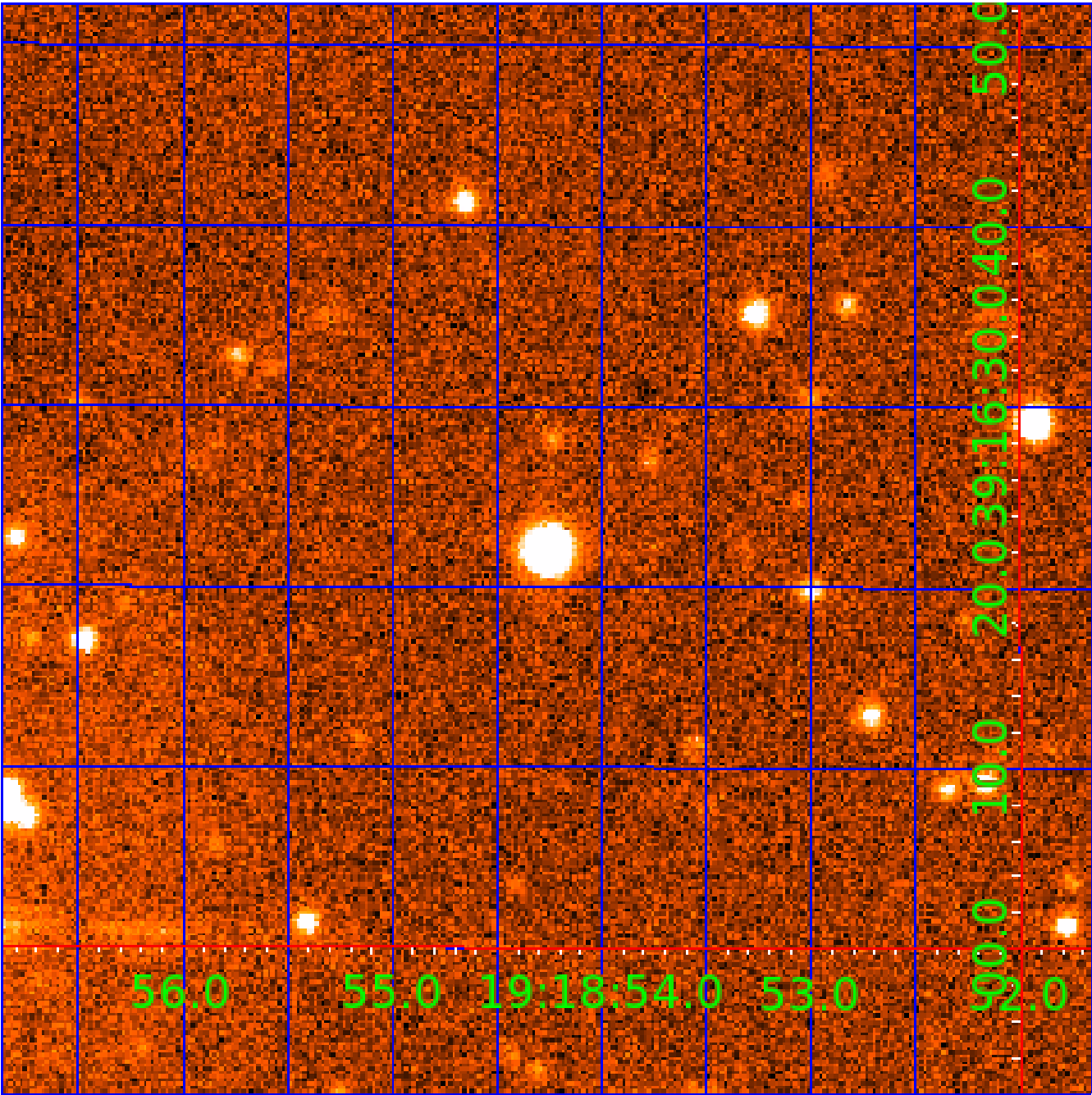


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004150539

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})
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004150539-02	OBS	No	8.653090	134.306505	1003.7	4.414	34.3	37.7	0.69	4641	4.49	37.96
004150539-03	OBS	1330.02	94.222827	196.184606	975.1	27.963	14.3	20.3	0.69	4641	2.62	1.57

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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004150539-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
004150539-03	OBS	FP	0.00	0	0	1	1	CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH

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 004150539-02

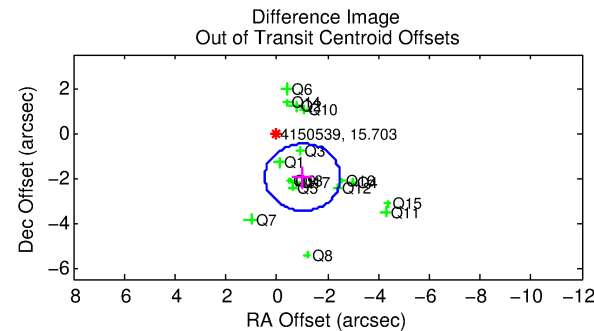
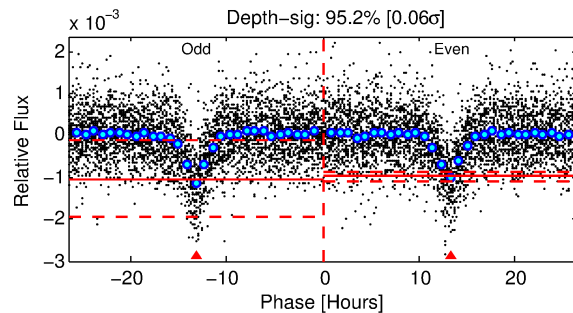
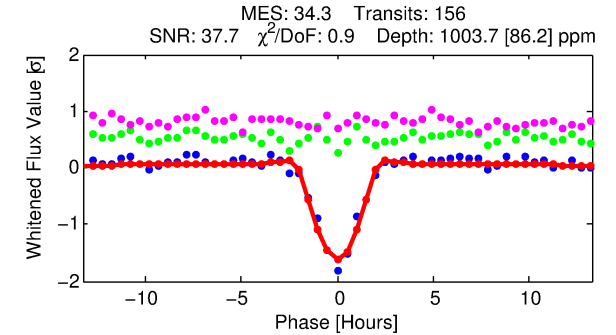
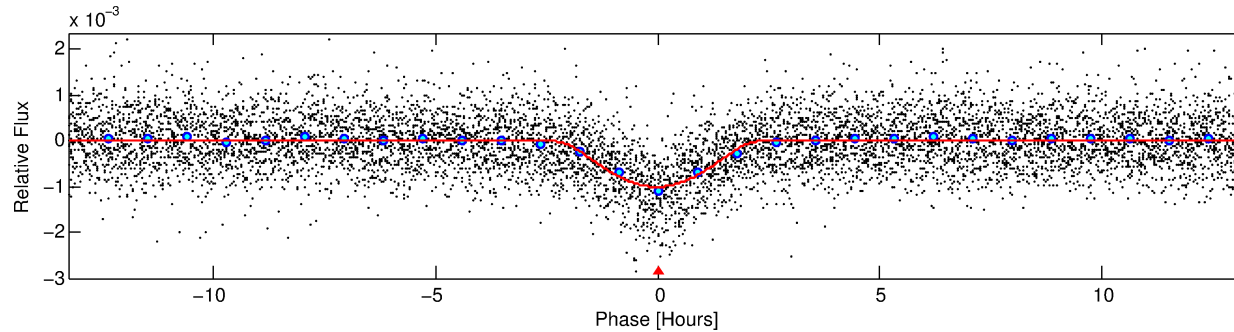
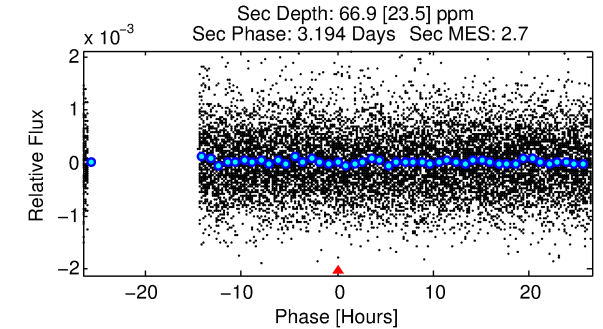
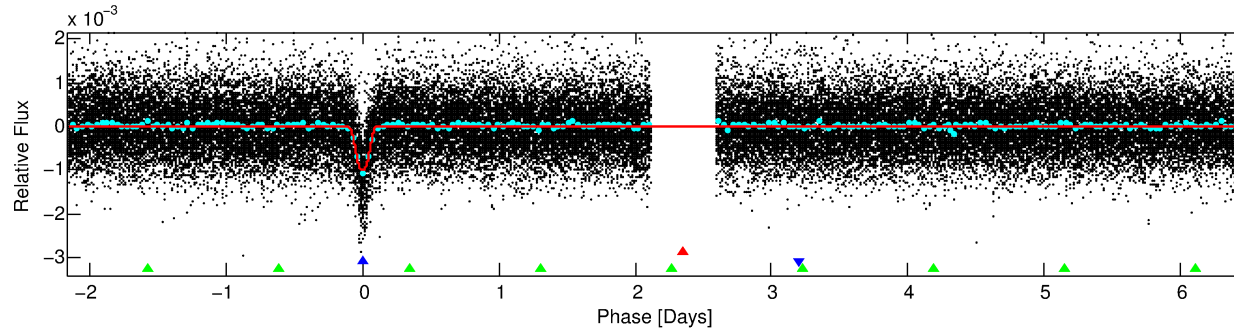
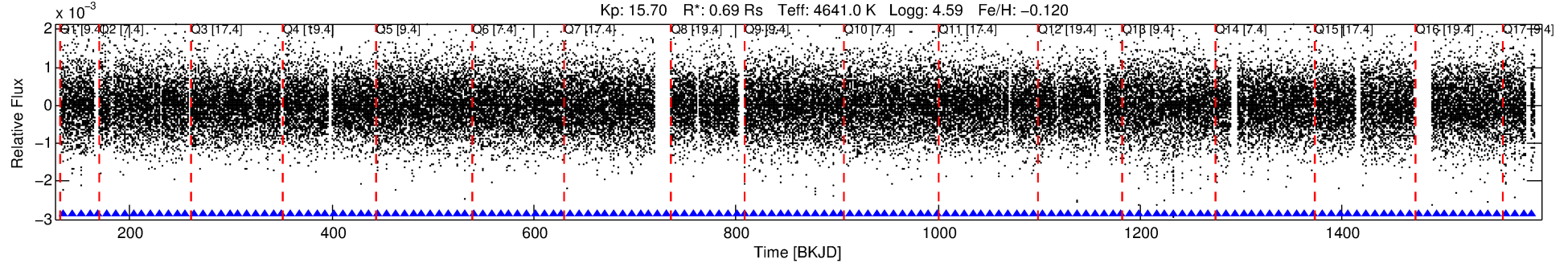
TCE (1)	KIC	Parent (2)	Parent KIC	P ₁ :P ₂	Dist (μ)	Δ Row	Δ Col	m ₂	m ₁	D ₂ /D ₁	Mechanism	Flag	σ_P	σ_T
004150539-02	4150539	004150611-02	4150611	1:1	50.1	11	-6	7.90	15.70	53.93	Direct-PRF	0	0.10	0.13

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 4150539 Candidate: 2 of 3 Period: 8.653 d
KOI: K01330.01 Corr: 0.856

Kp: 15.70 R*: 0.69 Rs Teff: 4641.0 K Logg: 4.59 Fe/H: -0.120



DV Fit Results:

Period = 8.65309 [0.00003] d
Epoch = 134.3065 [0.0026] BKJD
Rp/R* = 0.0593 [0.0632]
a/R* = 5.38 [1.26]
b = 1.00 [0.09]
Seff = 37.96 [5.96]
Teq = 633 [25] K
Rp = 4.49 [4.80] Re
a = 0.0726 [0.0052] AU
Ag = 9.63 [20.86] [0.41σ]
Teffp = 1724 [934] K [1.17σ]

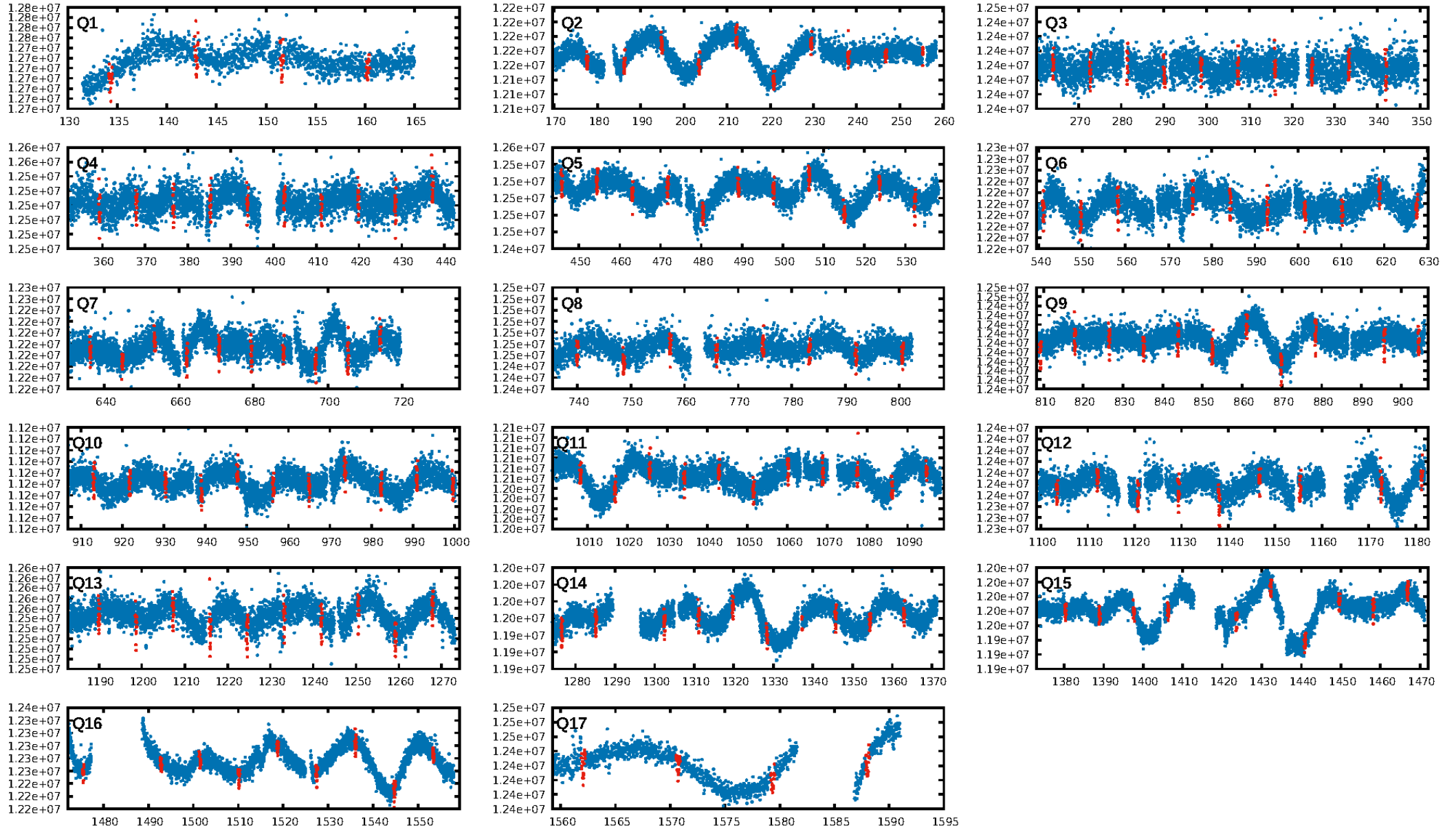
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 2.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.39e-242
RollingBand-fgt: 1.00 [148/148]
GhostDiagnostic-chr: -0.02619
Centroid-sig: 0.0%
Centroid-so: 1.099 arcsec [3.12σ]
OotOffset-rm: 2.222 arcsec [4.48σ]
KicOffset-rm: 2.649 arcsec [5.57σ]
OotOffset-st: 4/4/4/5 [17]
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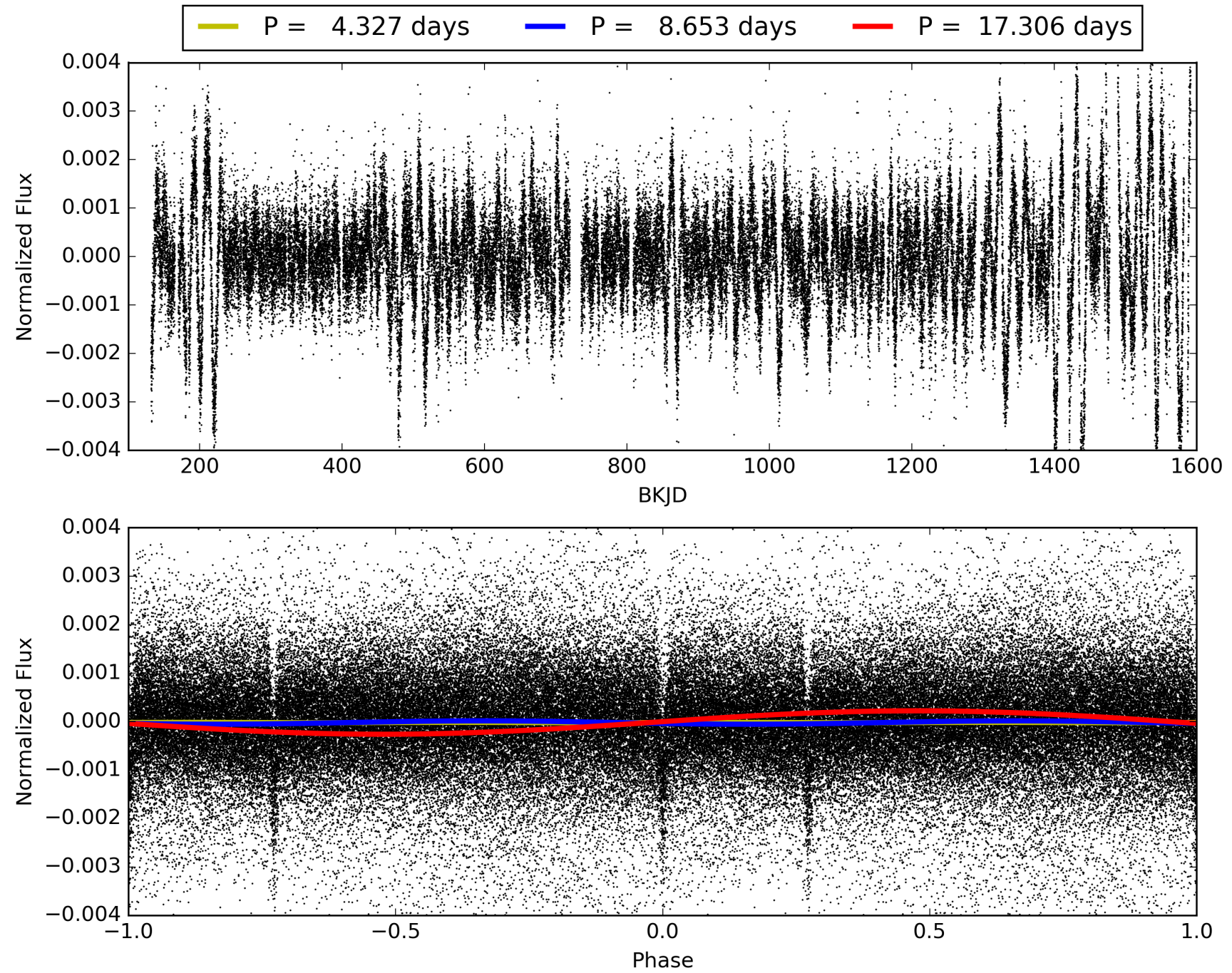
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:03:20 Z

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

TCE 004150539-02, PDC Light Curves

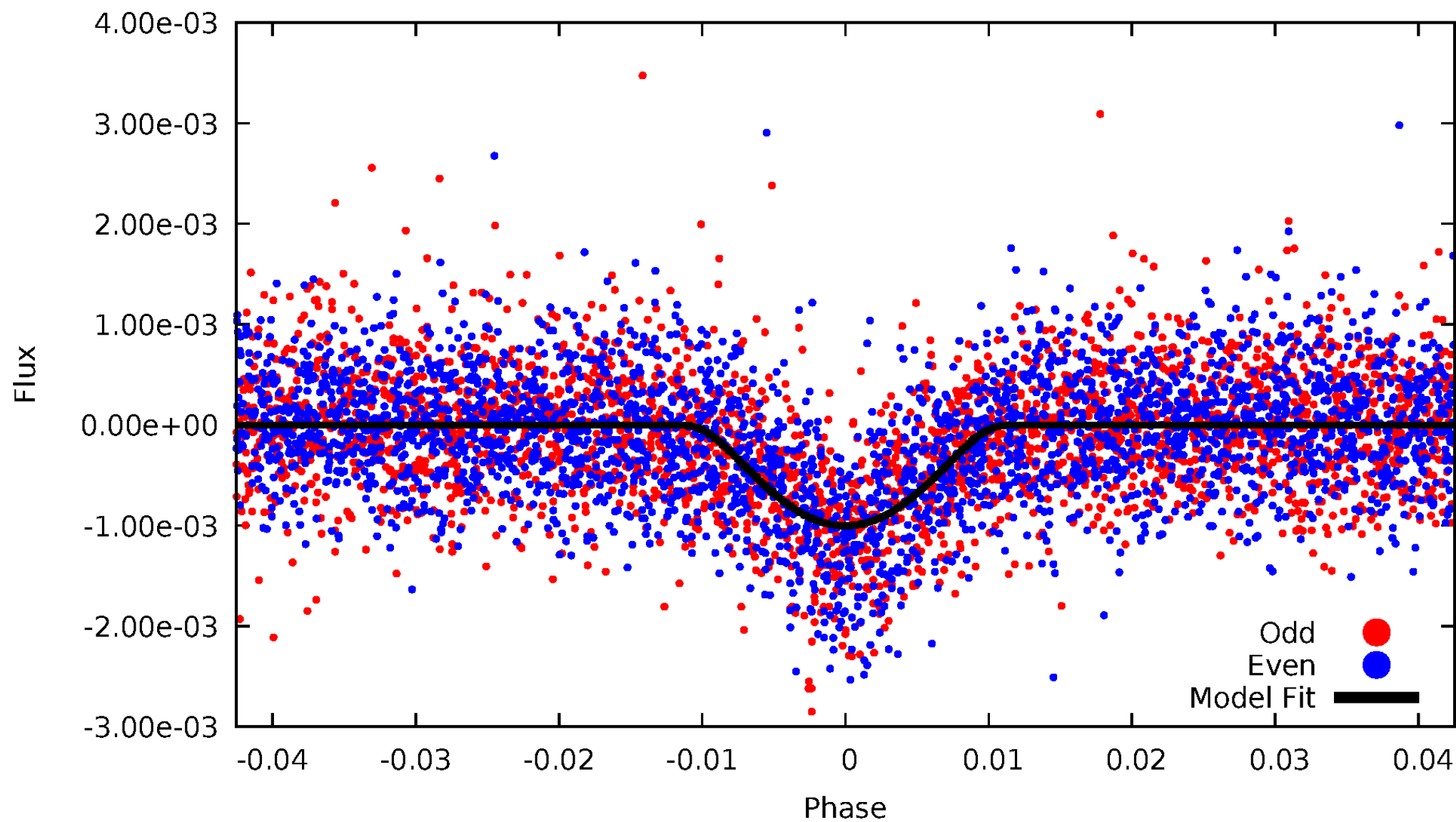


TCE 004150539-02



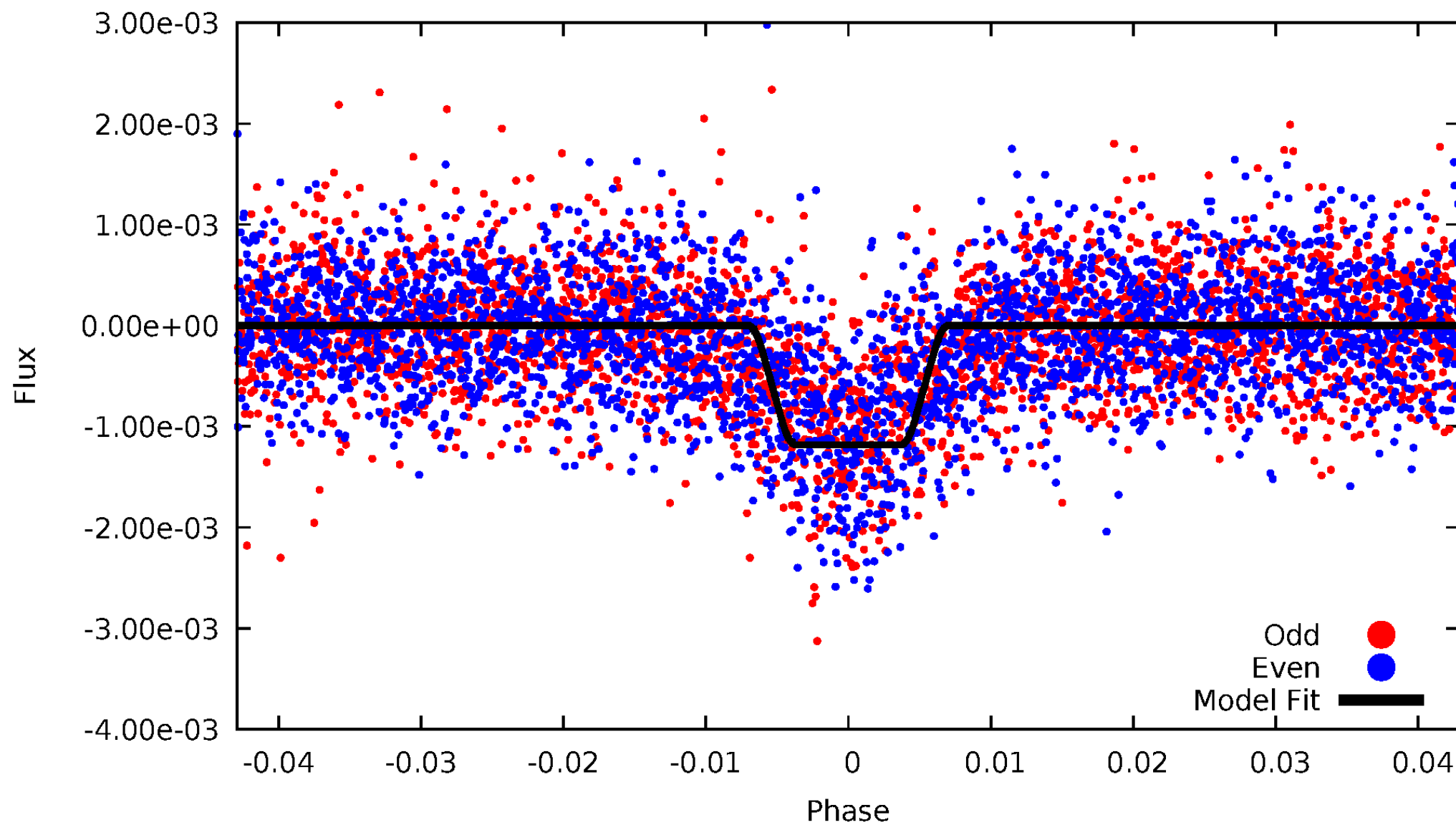
DV Odd/Even

TCE 004150539-02



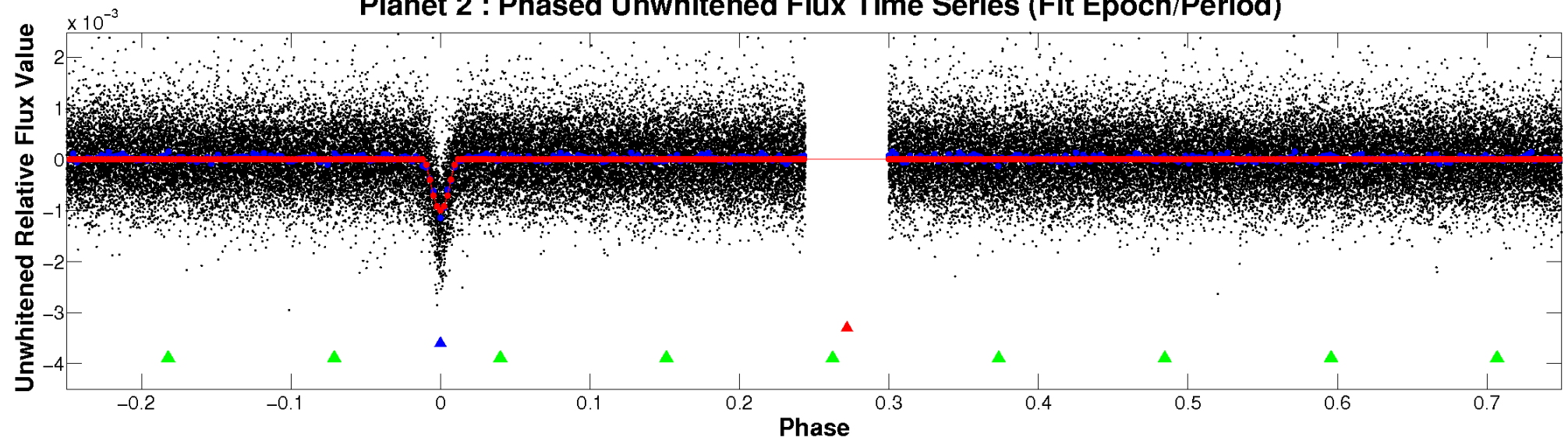
ALT Odd/Even

TCE 004150539-02

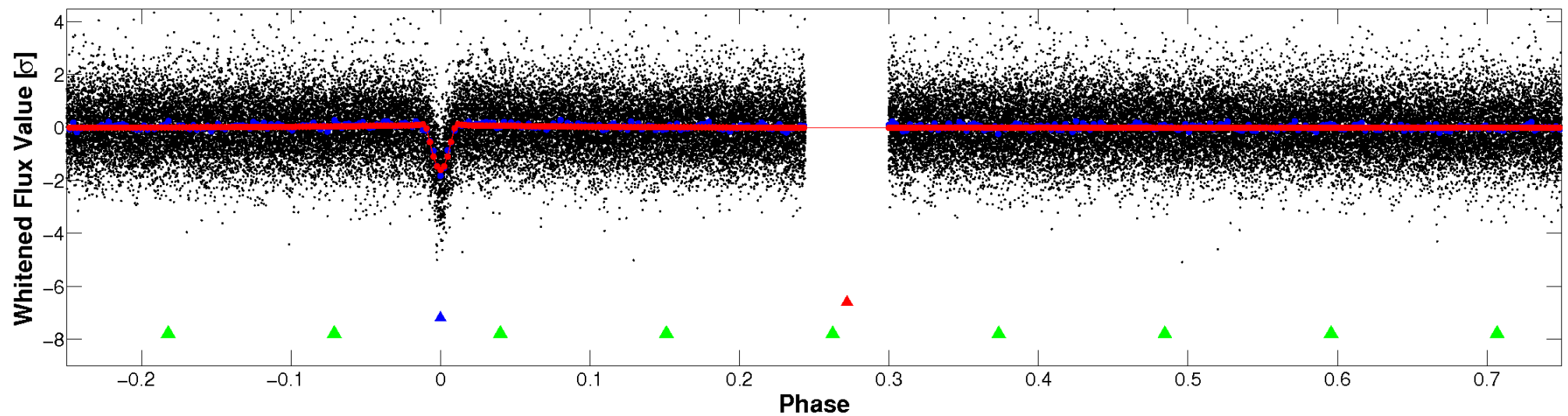


Non-Whitened Vs. Whitened Light Curve

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

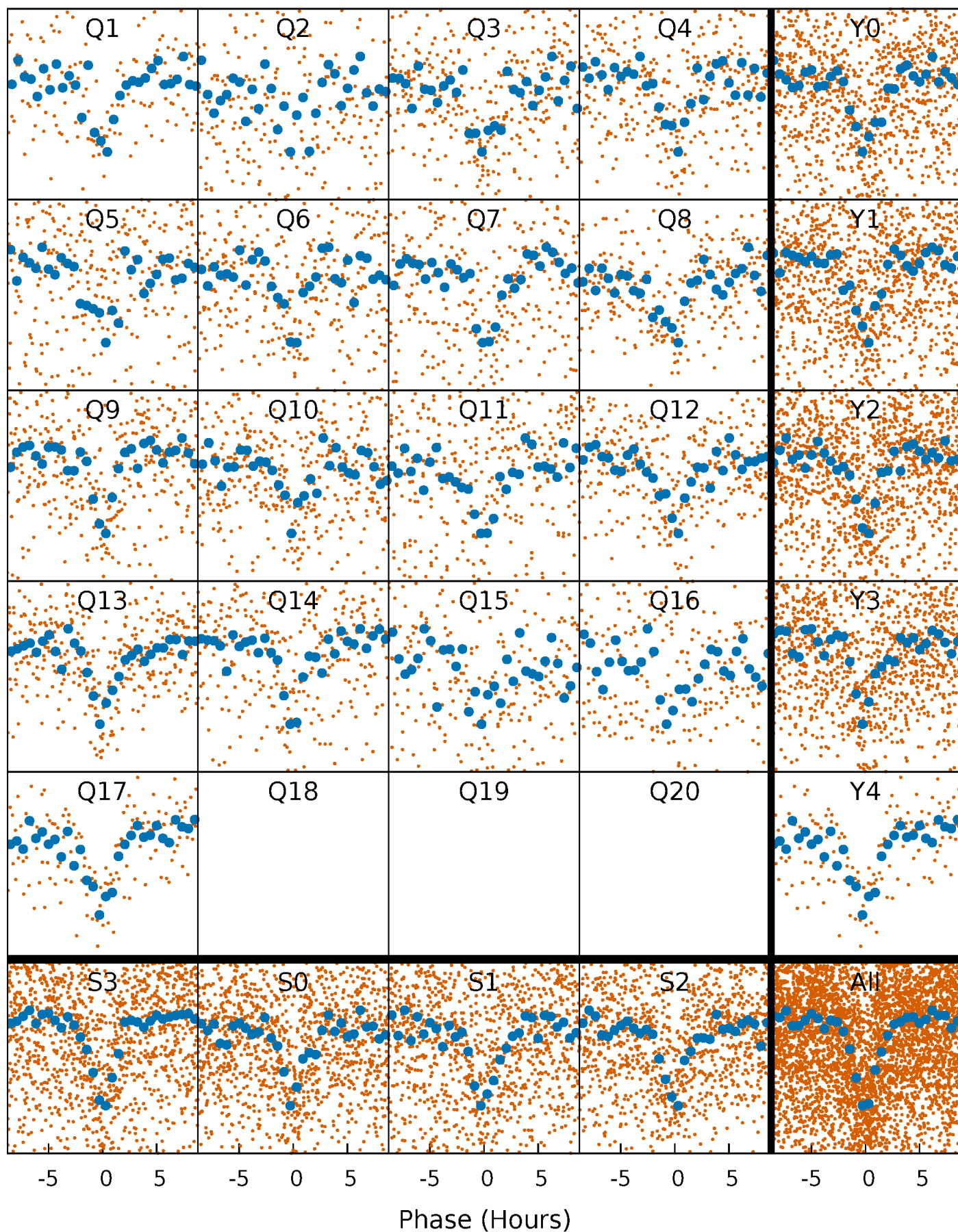


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



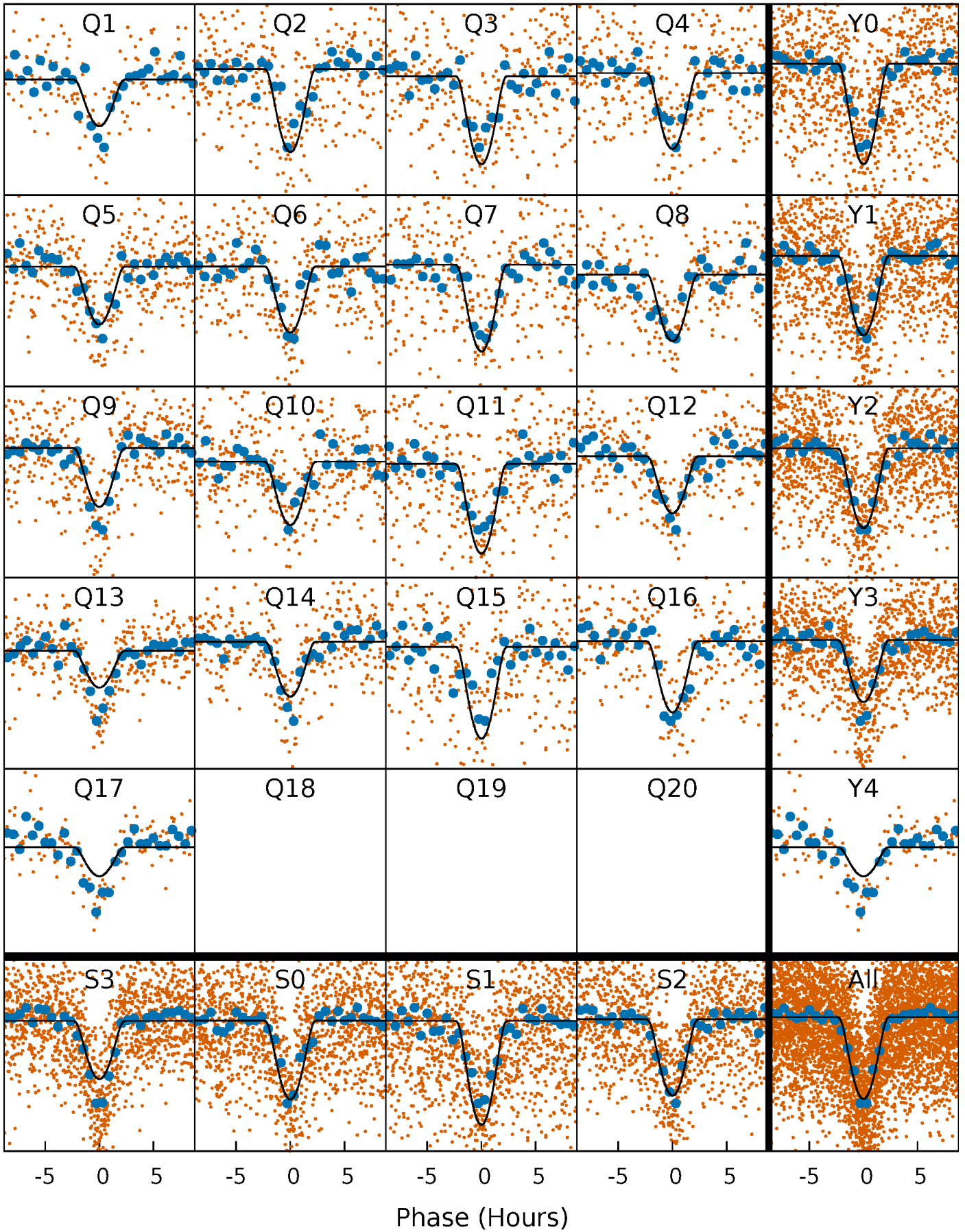
PDC Quarter-Phased Transit Curves

TCE 004150539-02 P= 8.653090 Days $T_0=134.306505$ (BKJD)



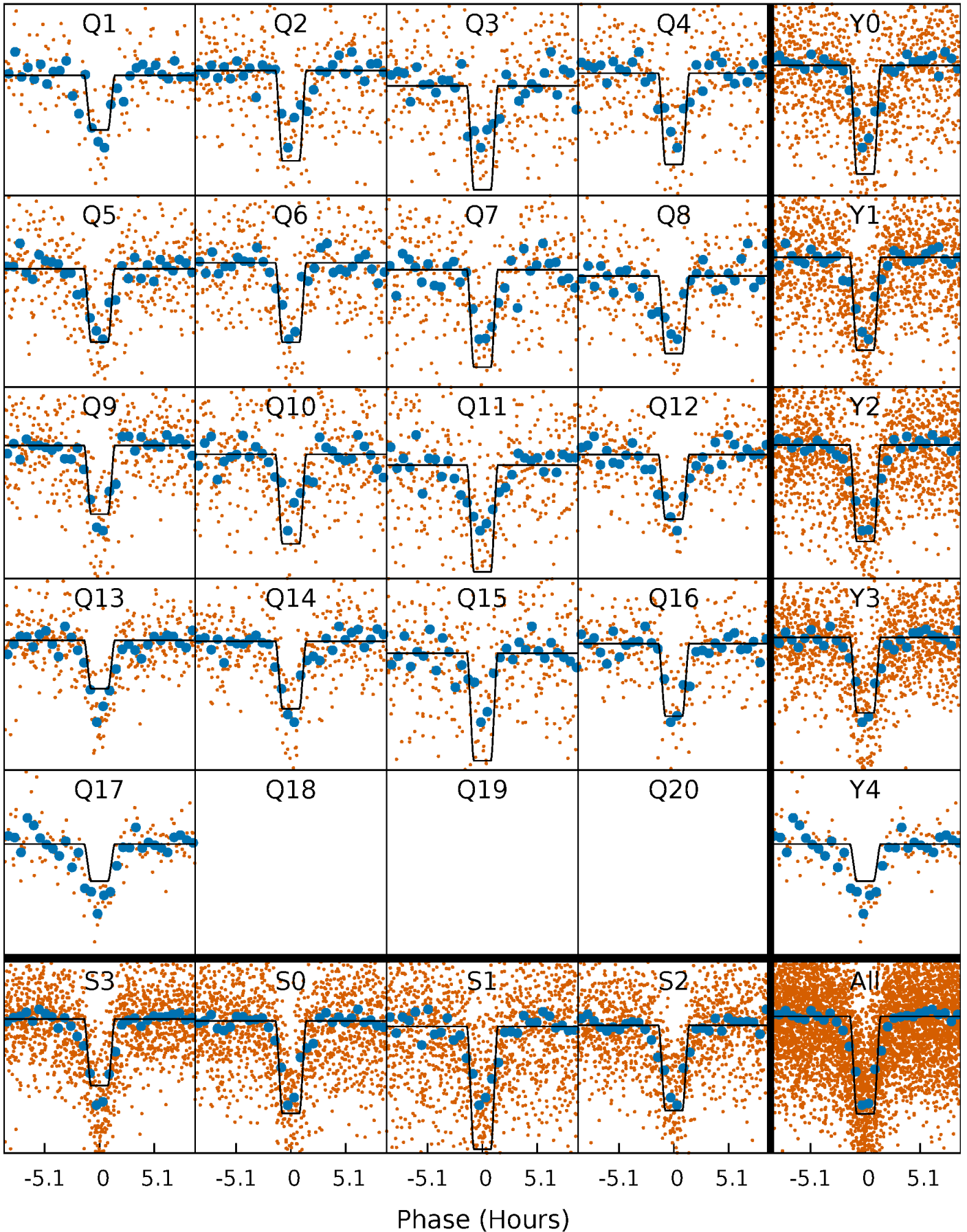
DV Quarter-Phased Transit Curves

TCE 004150539-02 P= 8.653090 Days $T_0=134.306505$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

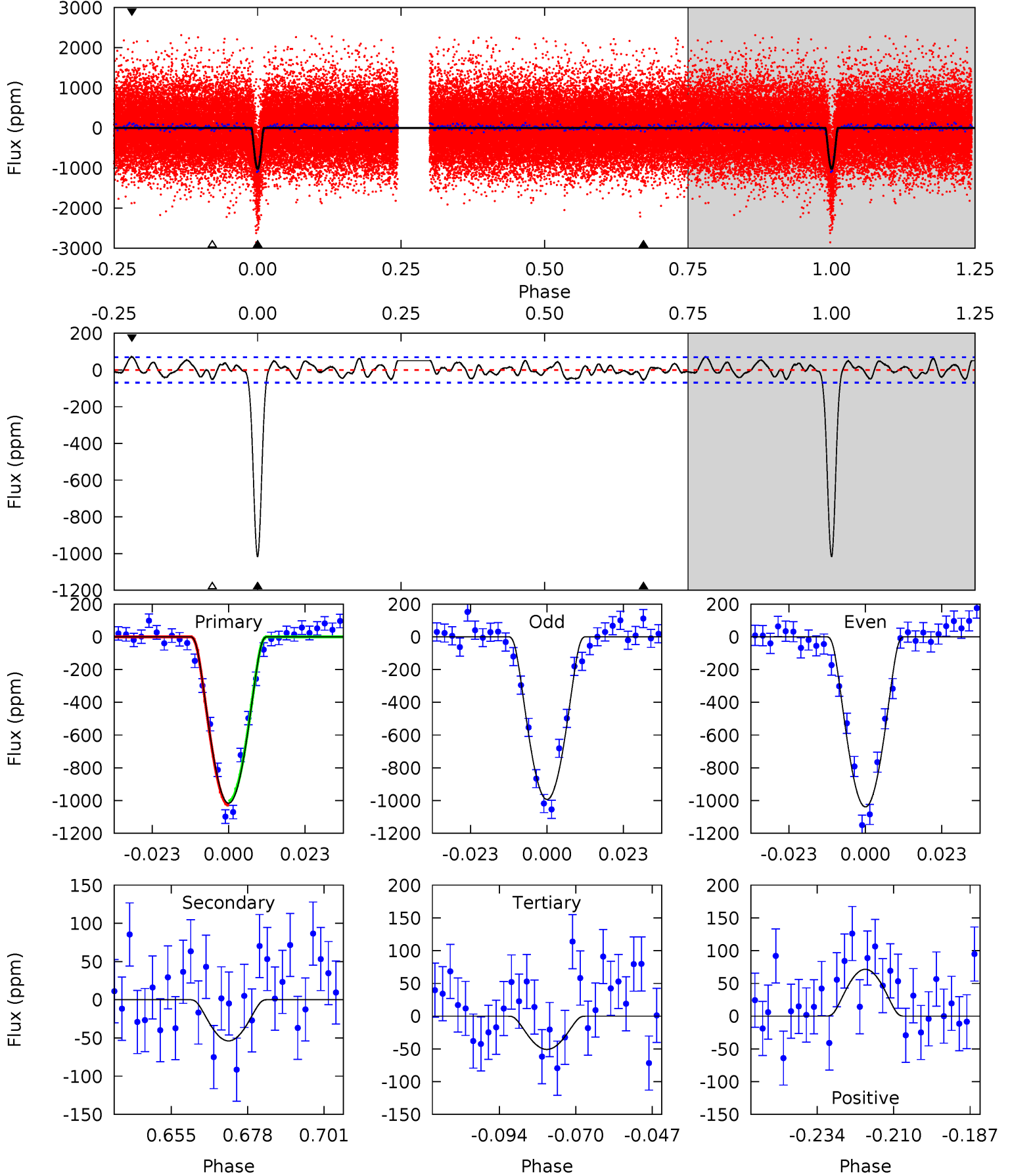
TCE 004150539-02 P= 8.653068 Days $T_0=134.308601$ (BKJD)



DV Model-Shift Uniqueness Test

004150539-02, P = 8.653090 Days, E = 125.653415 Days

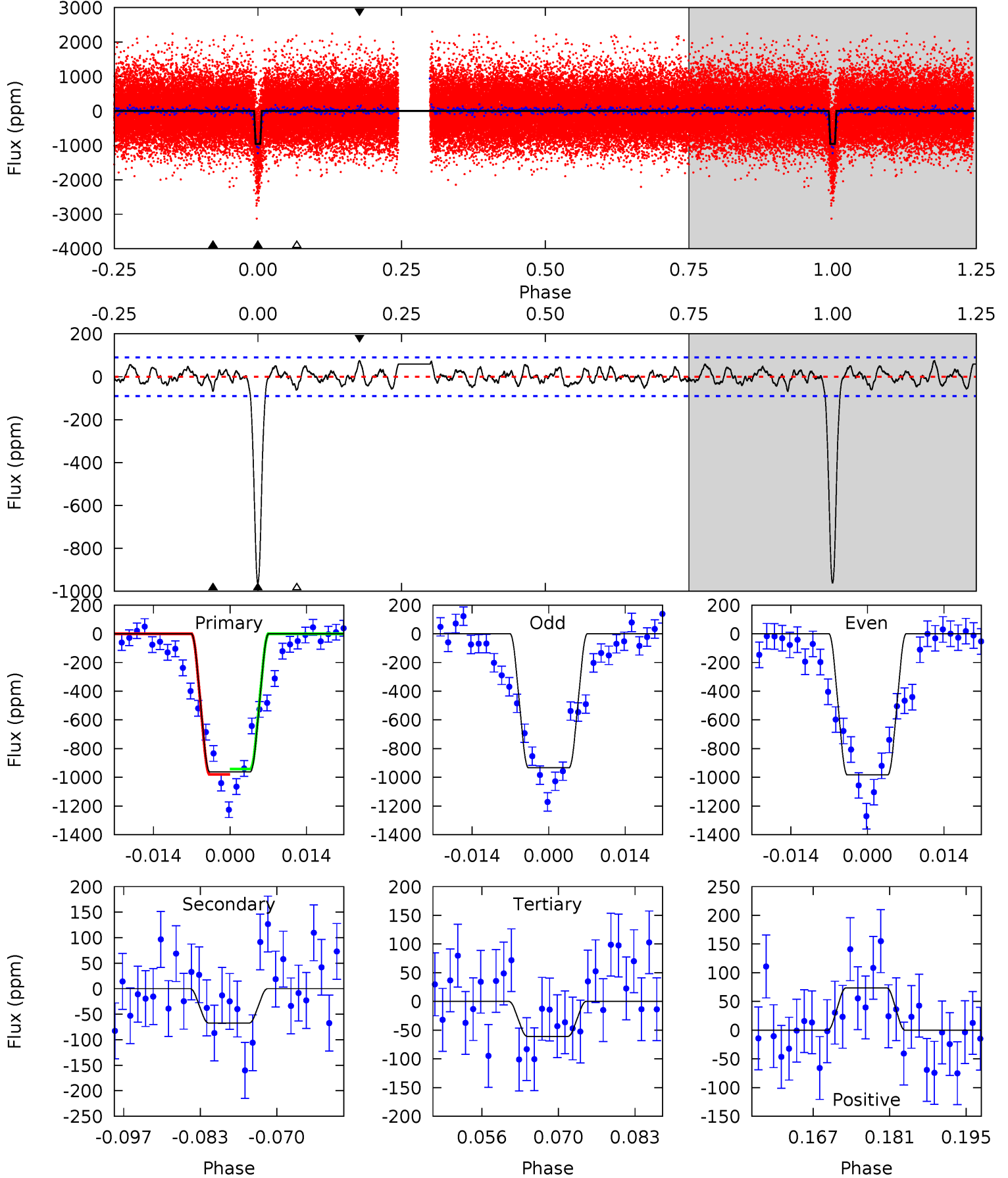
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
71.1	3.76	3.55	5.00	4.86	2.27	1.86	67.5	66.1	0.21	-1.23	1.60	1.06	0.07	0.81



Alt Model-Shift Uniqueness Test

004150539-02, P = 8.653068 Days, E = 125.655533 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.9	3.70	3.35	4.05	4.96	2.46	1.39	49.5	48.8	0.35	-0.35	1.34	1.08	0.07	0.99



Stellar Parameters For KIC 004150539

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4641^{+139}_{-125}	$4.589^{+0.054}_{-0.027}$	$-0.120^{+0.300}_{-0.300}$	$0.694^{+0.050}_{-0.061}$	$0.682^{+0.076}_{-0.051}$	$2.878^{+0.723}_{-0.305}$
	+3%/-3%	+1%/-1%	+250%/-250%	+7%/-9%	+11%/-7%	+25%/-11%
Source	PHO1	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 004150539-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-54 ± 14	$5.52^{+4.33}_{-3.48}$	881^{+26}_{-28}	2305^{+735}_{-300}	$4.987^{+36.648}_{-3.402}$
Alt.	-67 ± 18	$4.13^{+4.62}_{-2.89}$	878^{+30}_{-28}	2550^{+1037}_{-431}	11^{+111}_{-9}

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 $A_{obs} \gg 1.0$

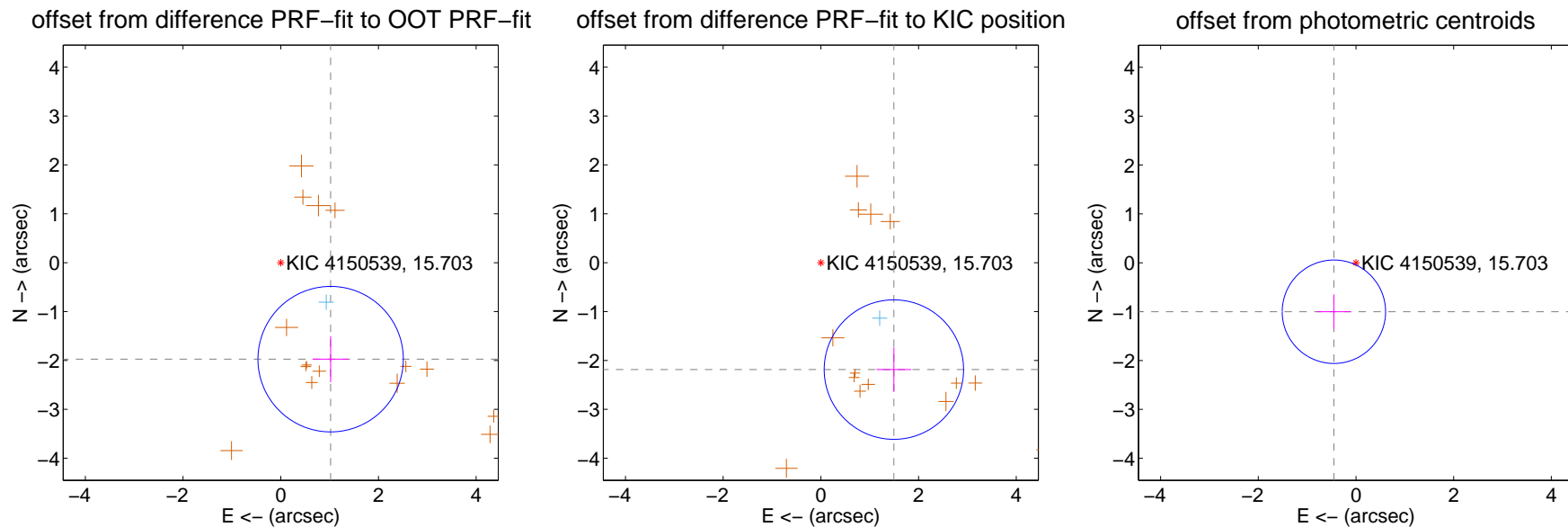
DV Centroid Data

Supplemental centroid analysis for 004150539-02. Kepler magnitude: 15.70. Transit SNR 37.72

There are 1 quarters with good PRF difference image offsets

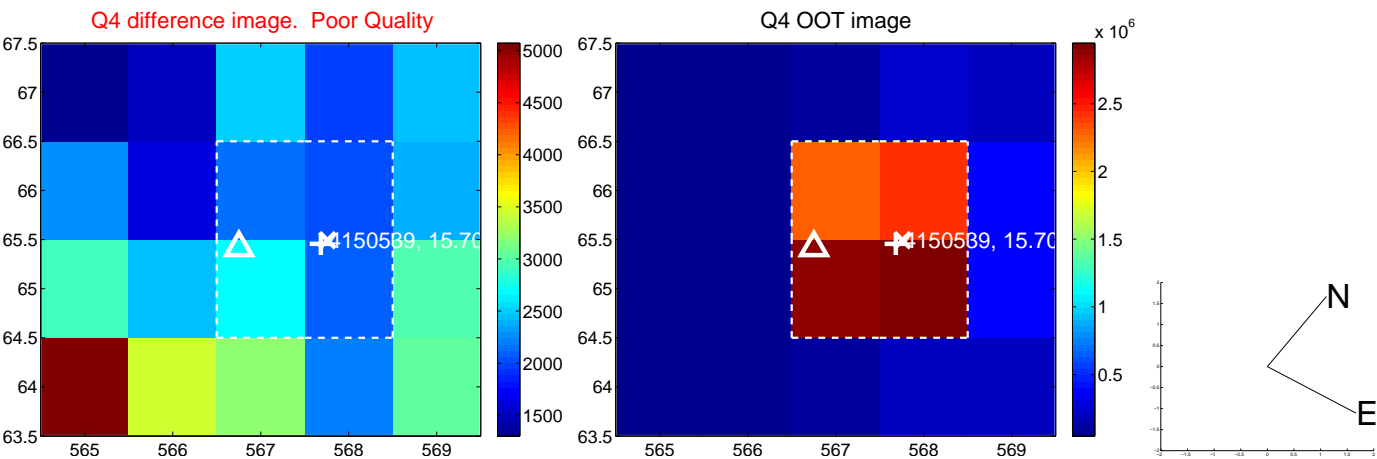
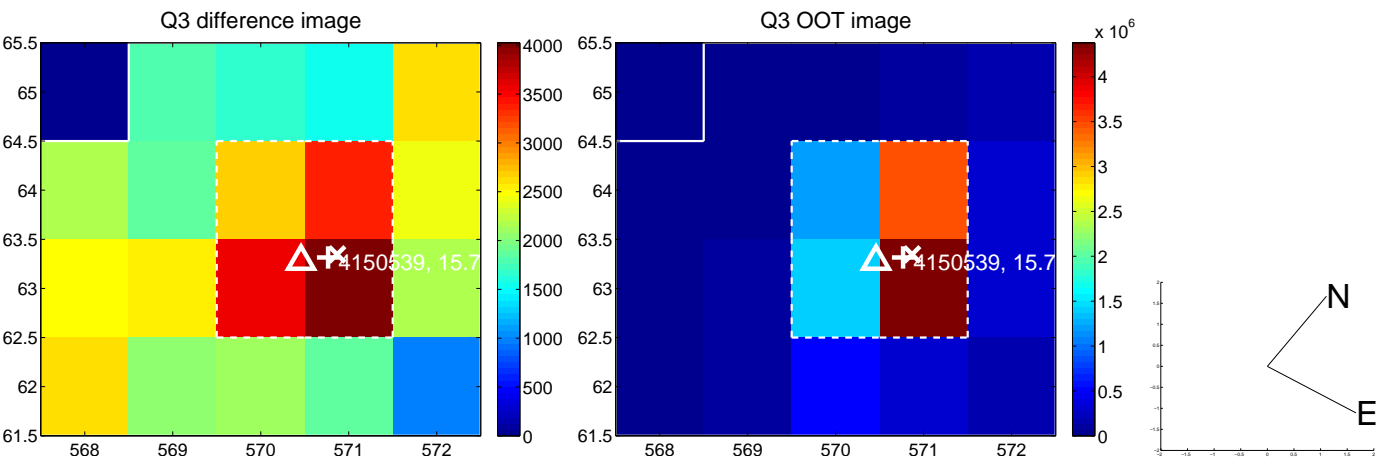
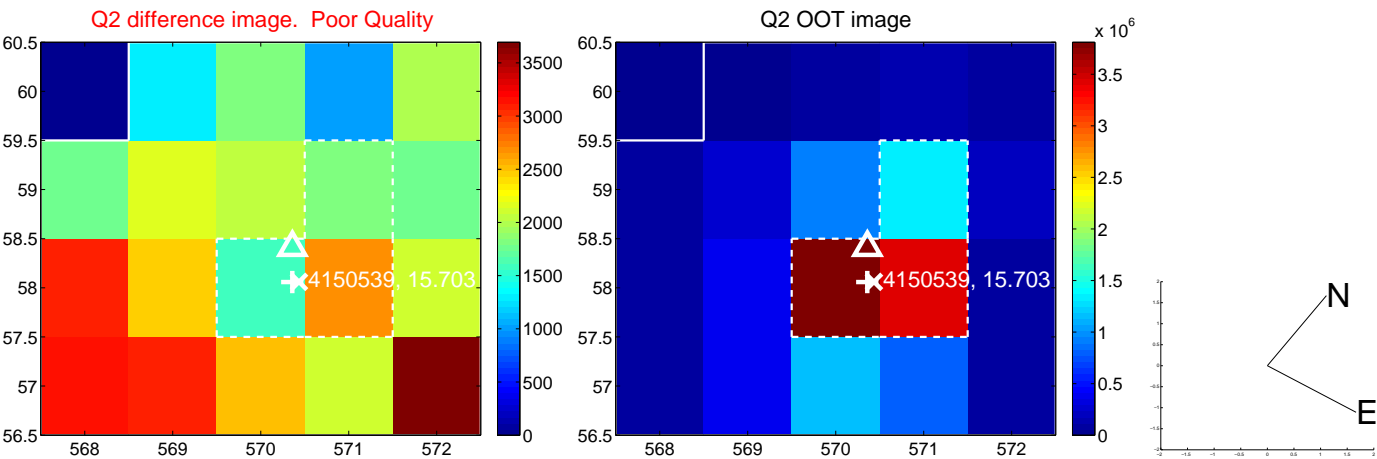
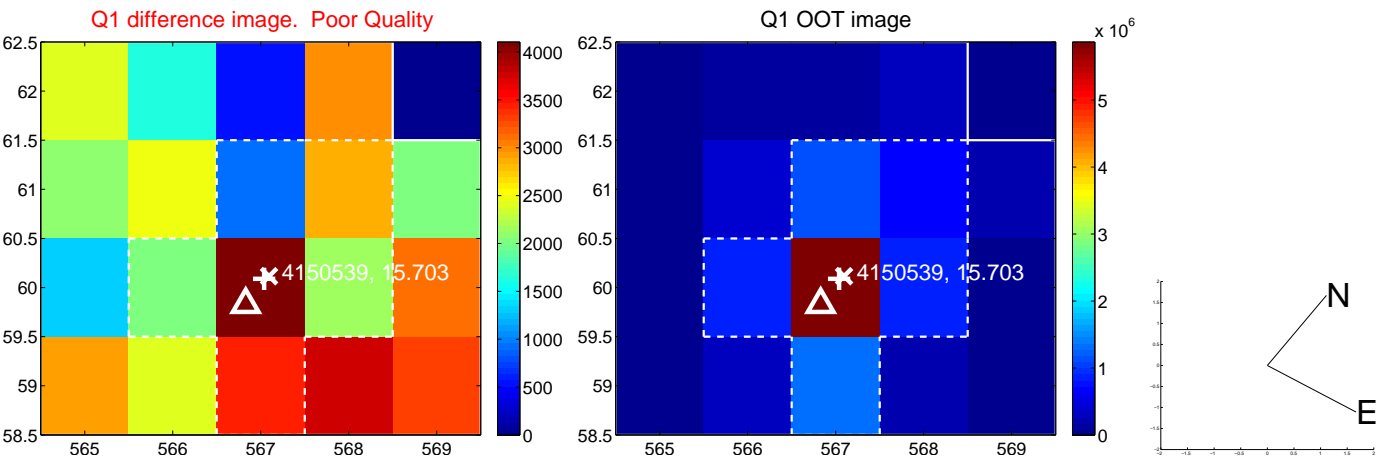
The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.222 ± 0.496	4.48	-1.022 ± 0.371	-1.973 ± 0.472
PRF-fit source offset from KIC position	2.649 ± 0.476	5.57	-1.495 ± 0.357	-2.187 ± 0.453
photometric centroid source offset	1.10 ± 0.35	3.12	0.45 ± 0.35	-1.00 ± 0.35

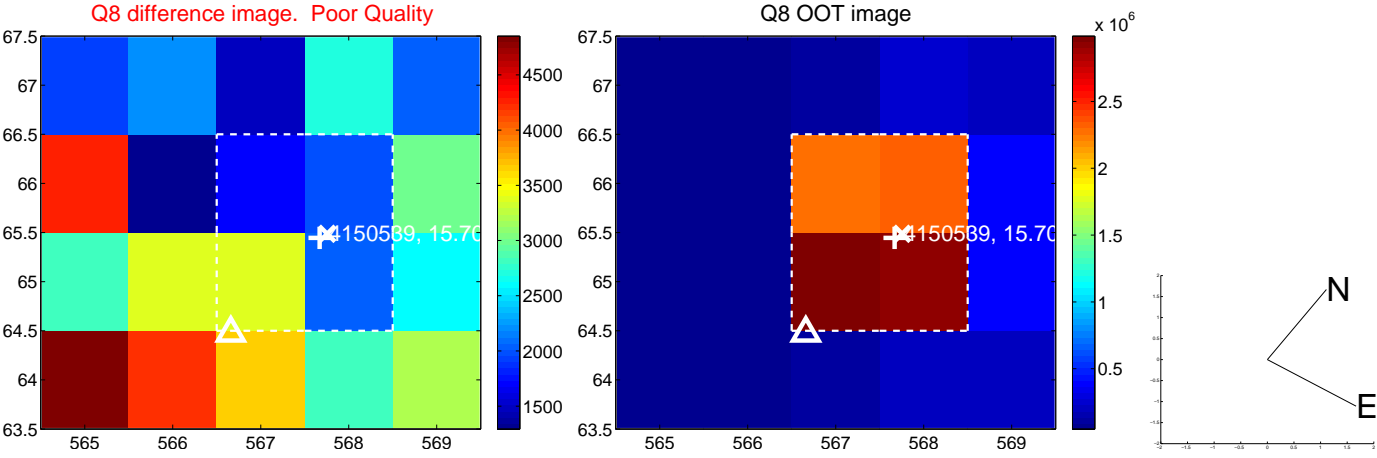
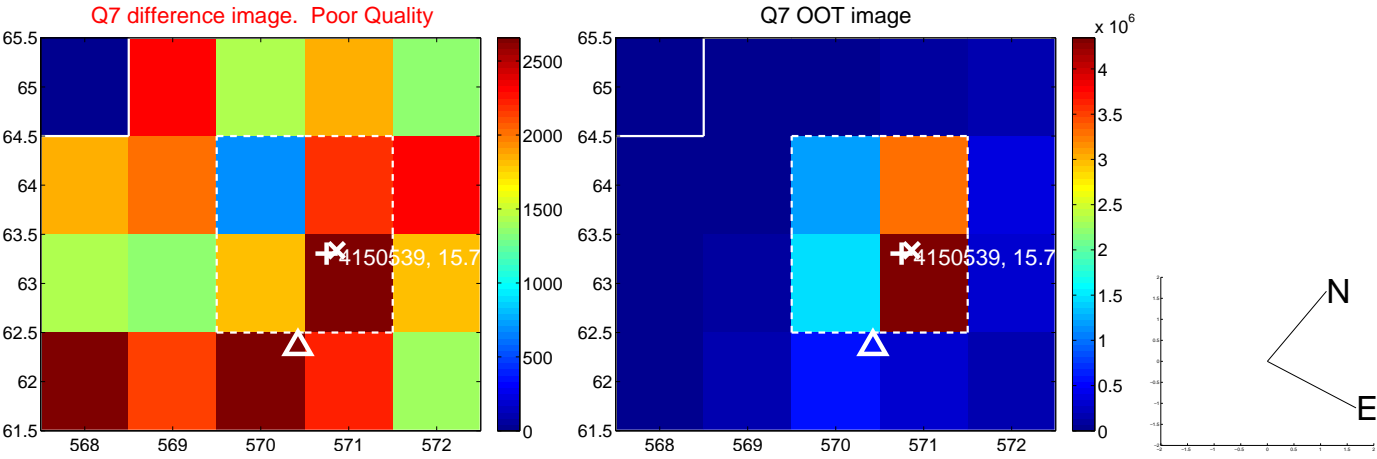
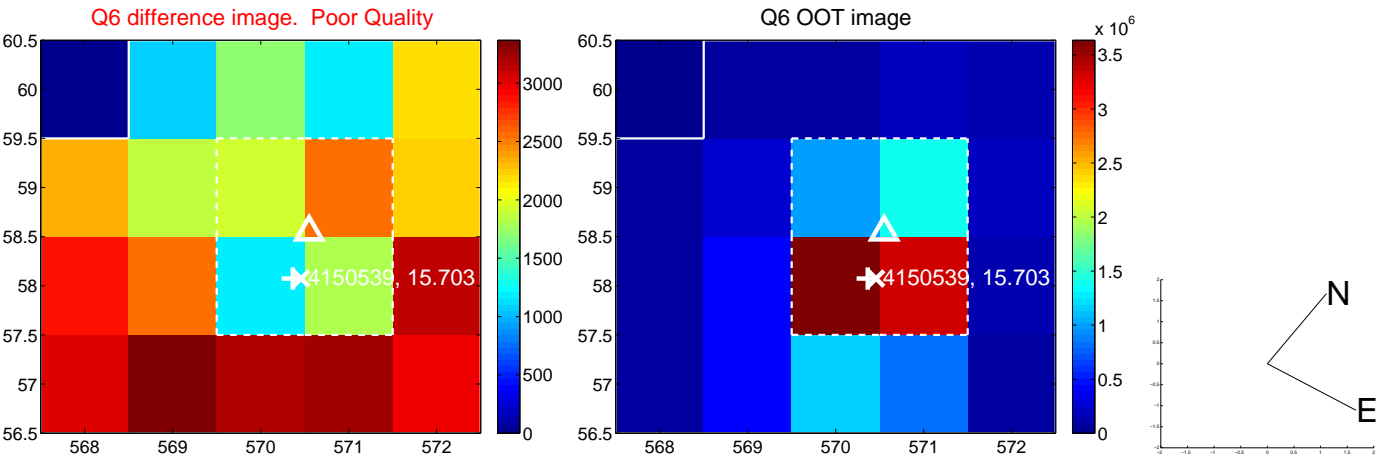
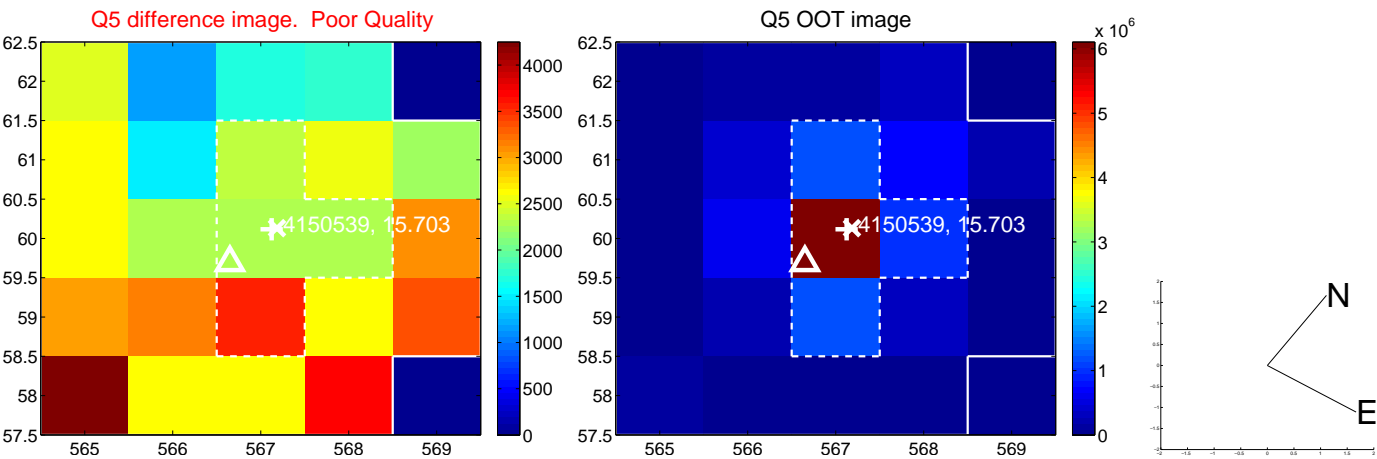


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

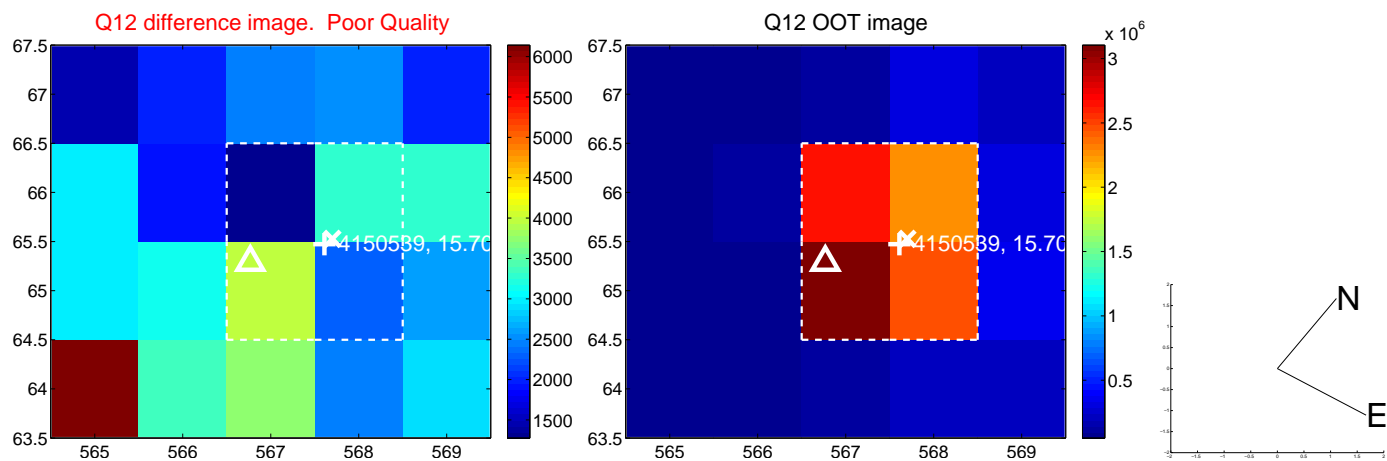
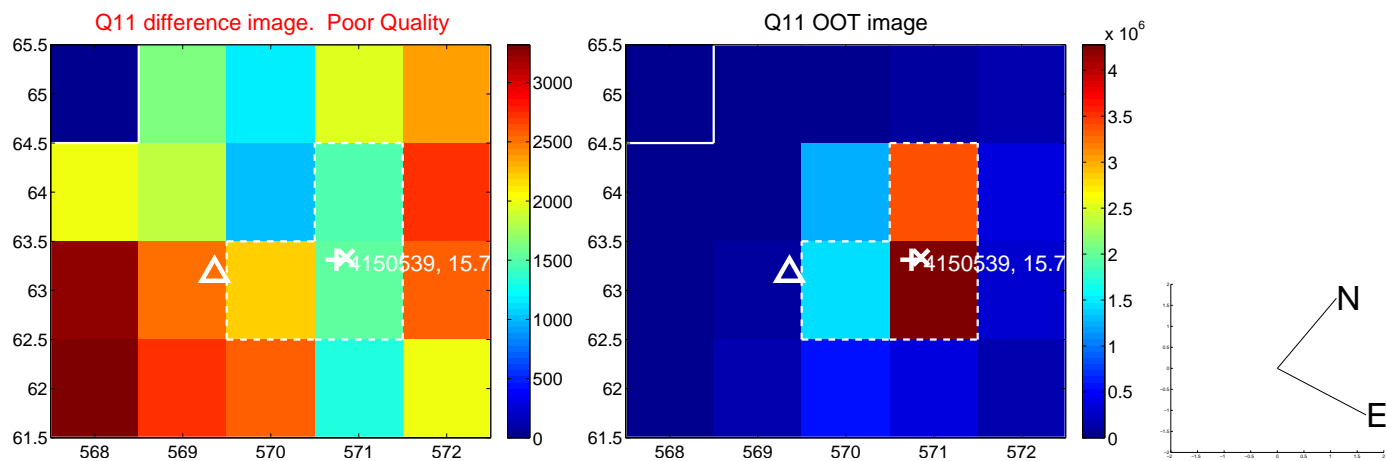
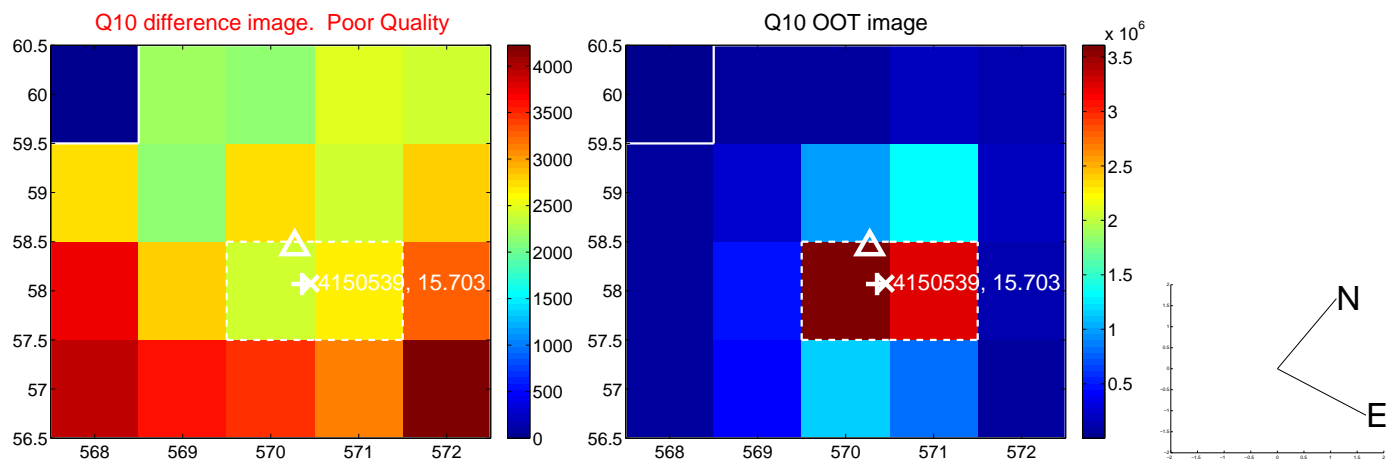
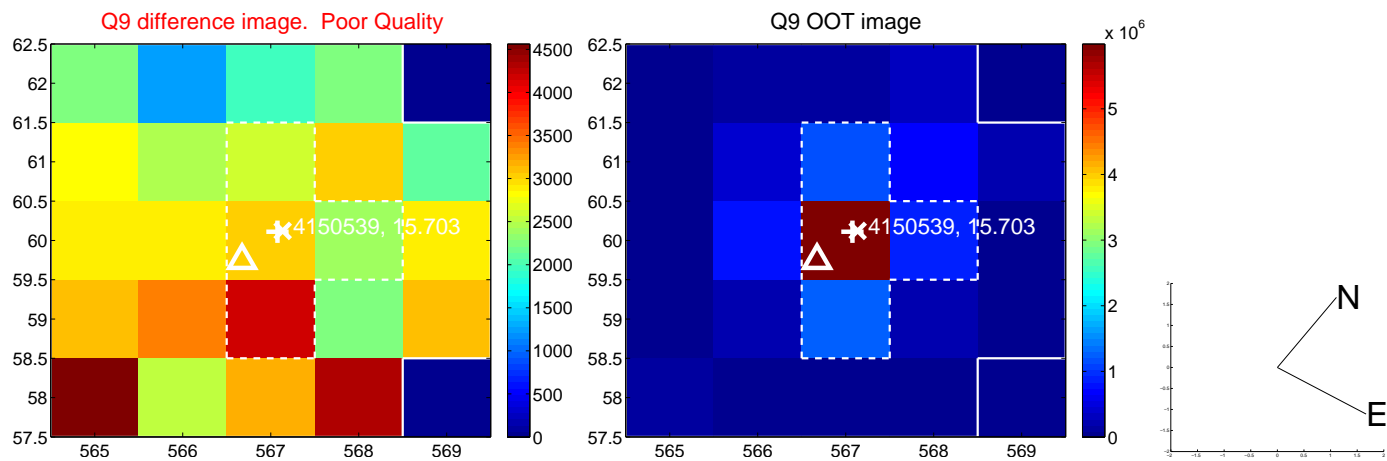
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



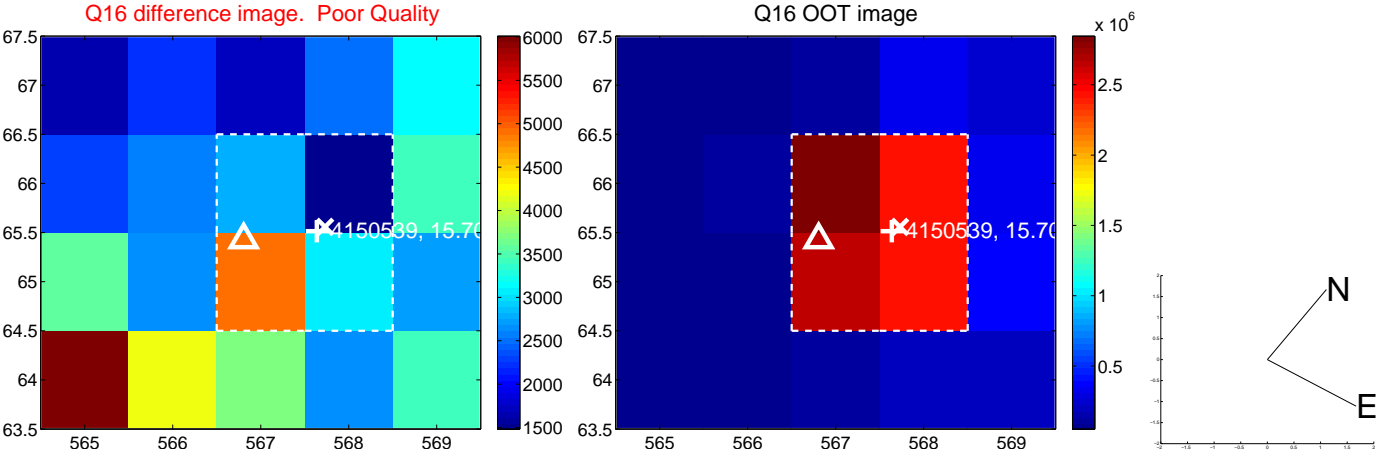
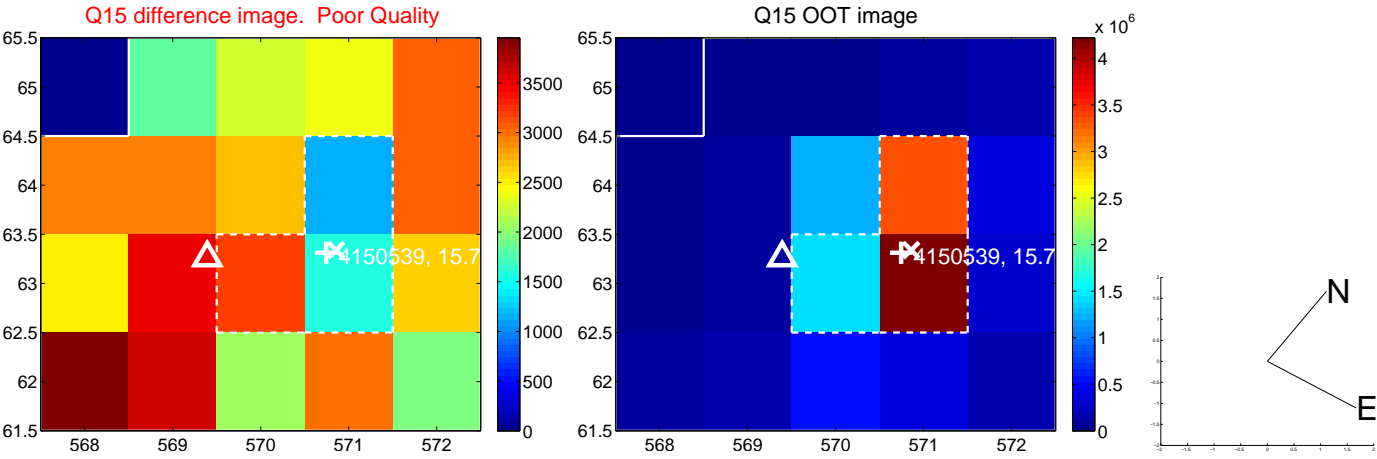
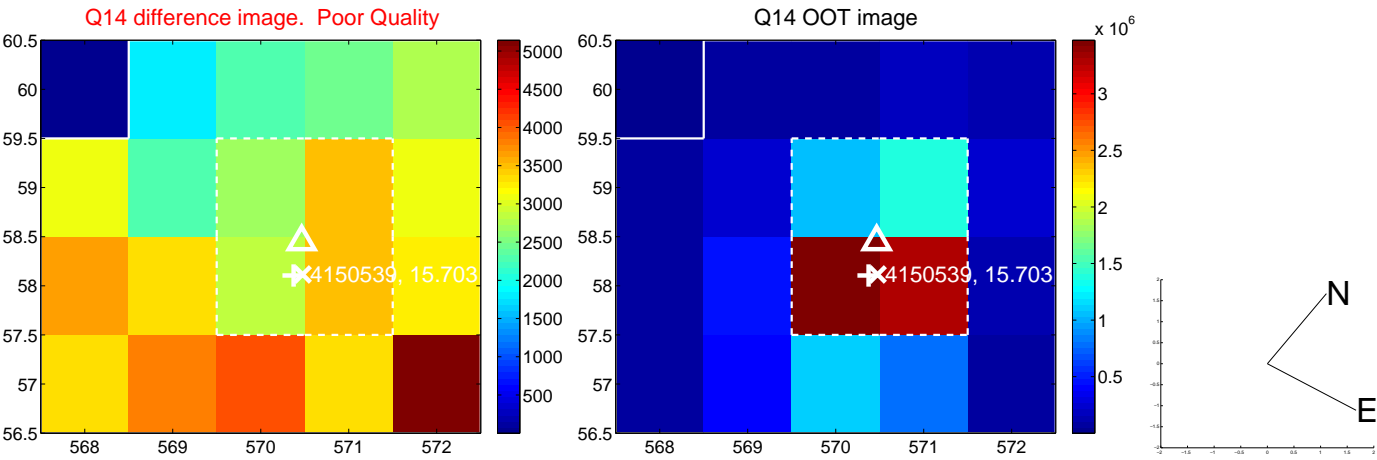
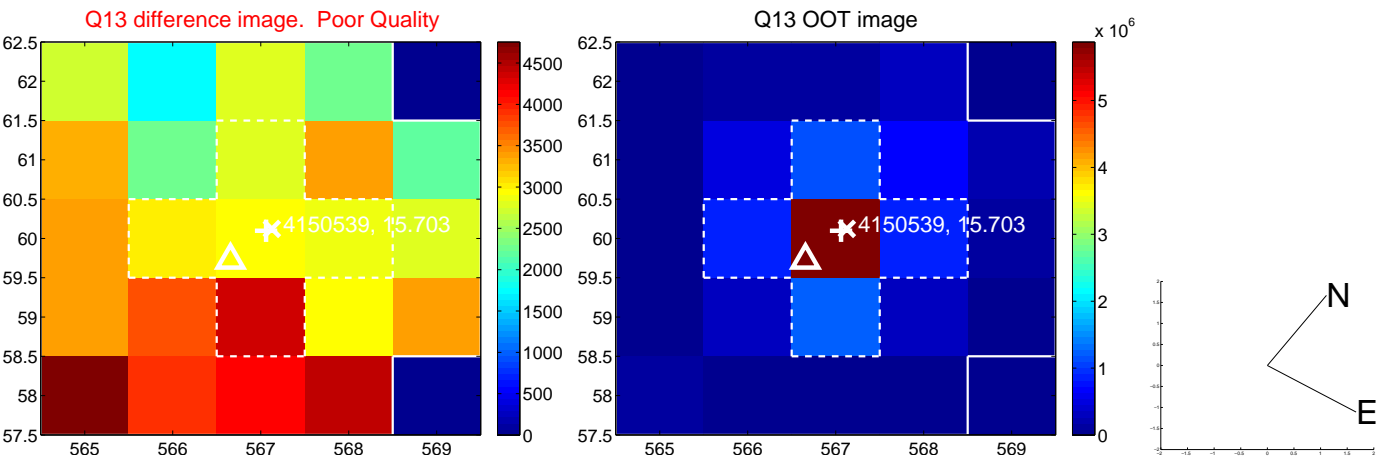
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



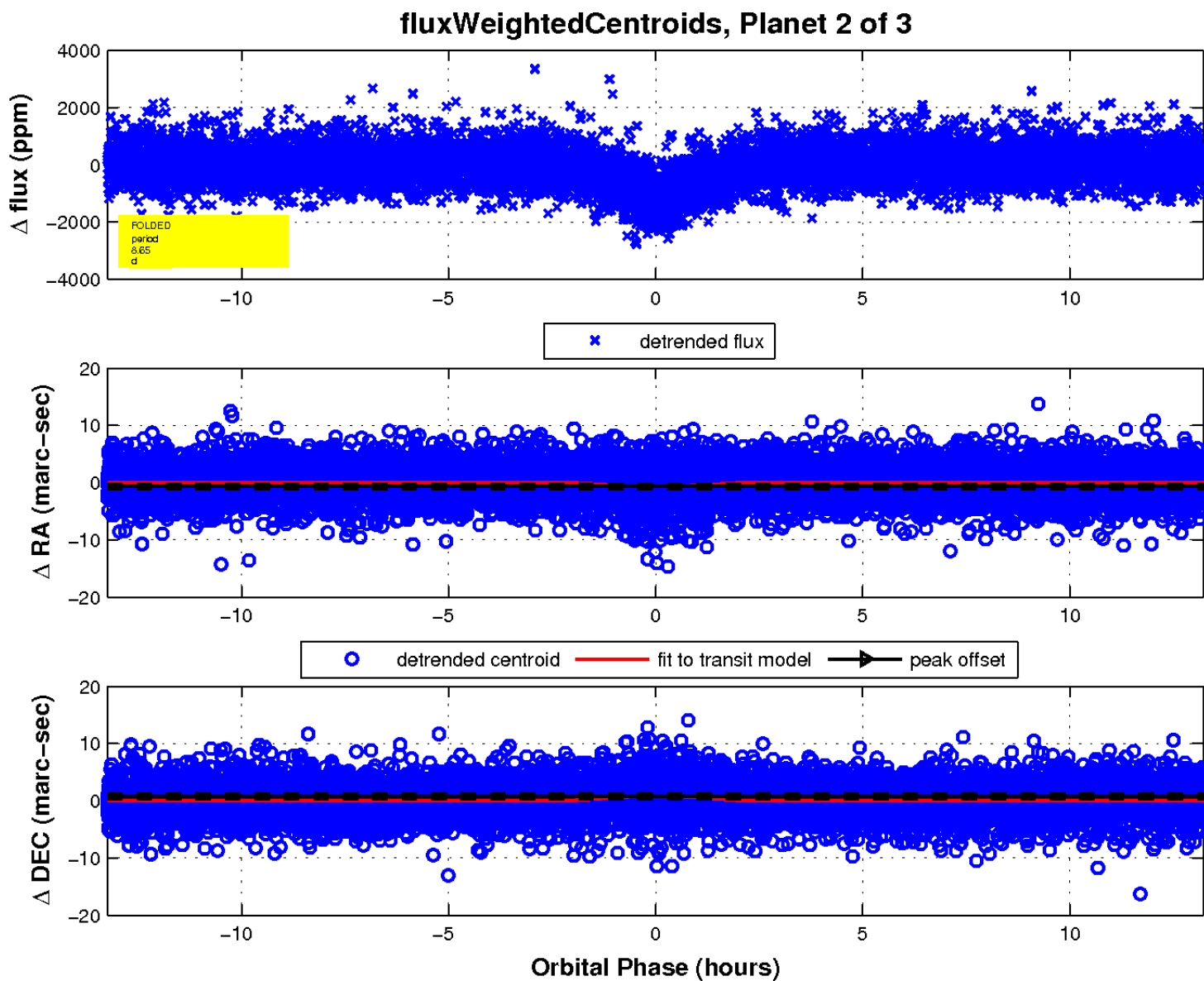
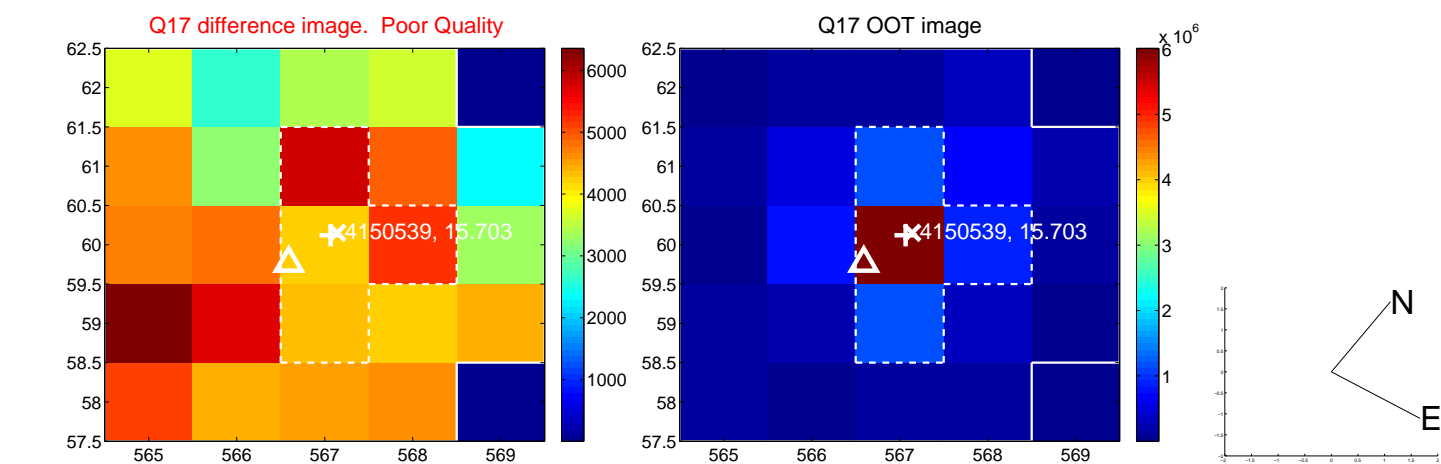
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

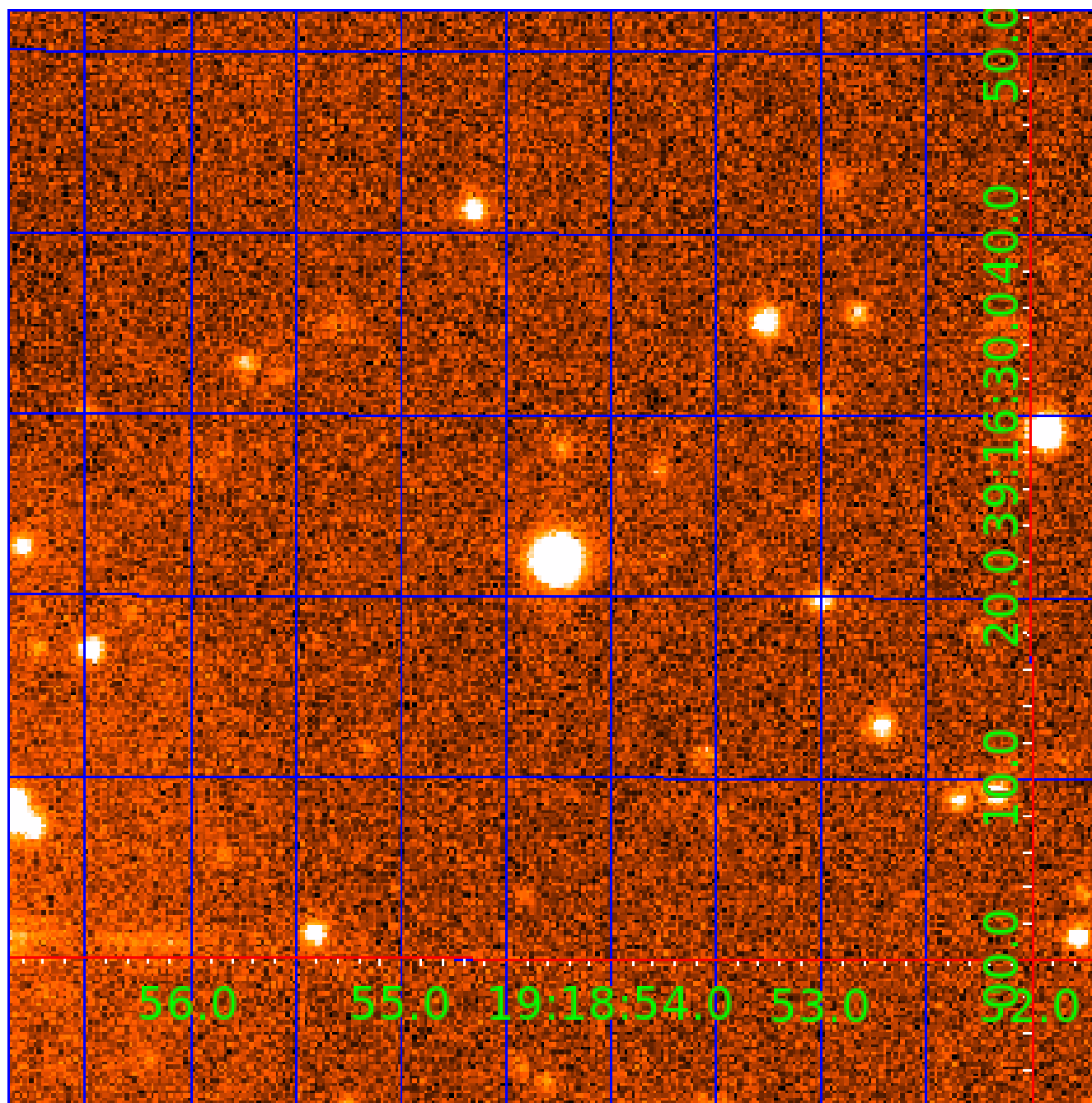


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004150539

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})
004150539-01	OBS	1330.01	8.653091	136.659534	1061.6	3.680	33.6	36.3	0.69	4641	4.56	37.96
004150539-02	OBS	No	8.653090	134.306505	1003.7	4.414	34.3	37.7	0.69	4641	4.49	37.96
004150539-03	OBS	1330.02	94.222827	196.184606	975.1	27.963	14.3	20.3	0.69	4641	2.62	1.57

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004150539-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
004150539-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
004150539-03	OBS	FP	0.00	0	0	1	1	CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH

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 004150539-03

TCE (1)	KIC	Parent (2)	Parent KIC	P ₁ :P ₂	Dist (μ)	Δ Row	Δ Col	m ₂	m ₁	D ₂ /D ₁	Mechanism	Flag	σ_P	σ_T
004150539-03	4150539	3156.04	4150611	1:1	50.1	11	-6	7.90	15.70	50.11	Direct-PRF	0	0.30	0.15

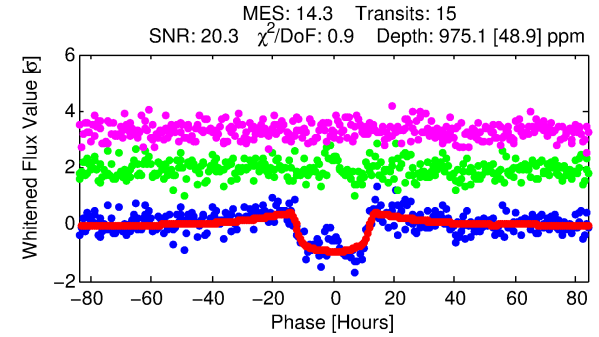
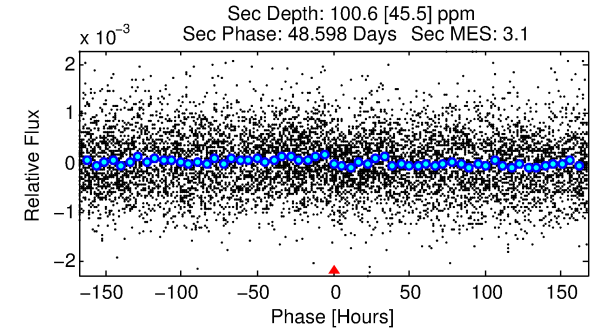
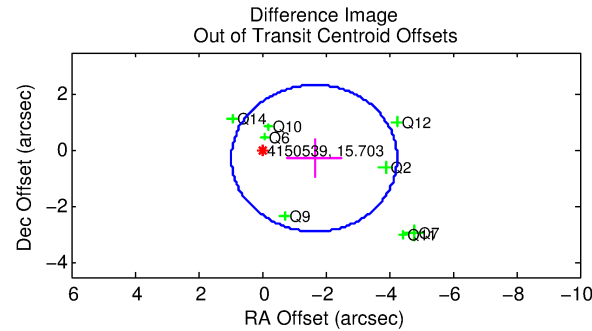
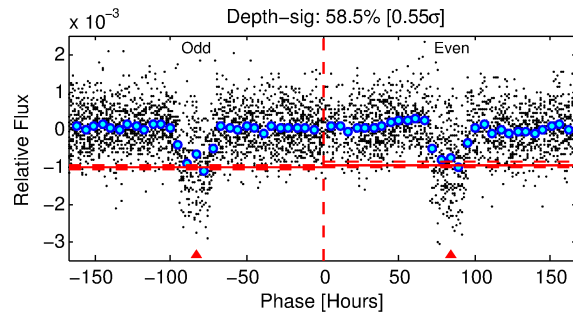
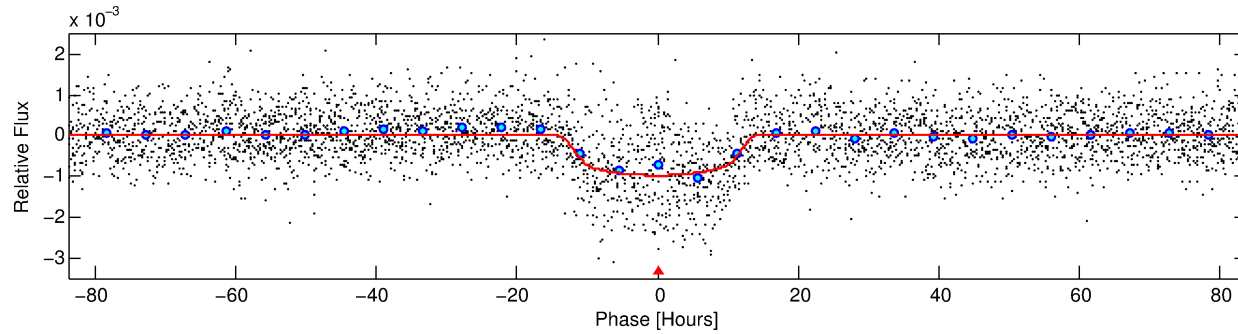
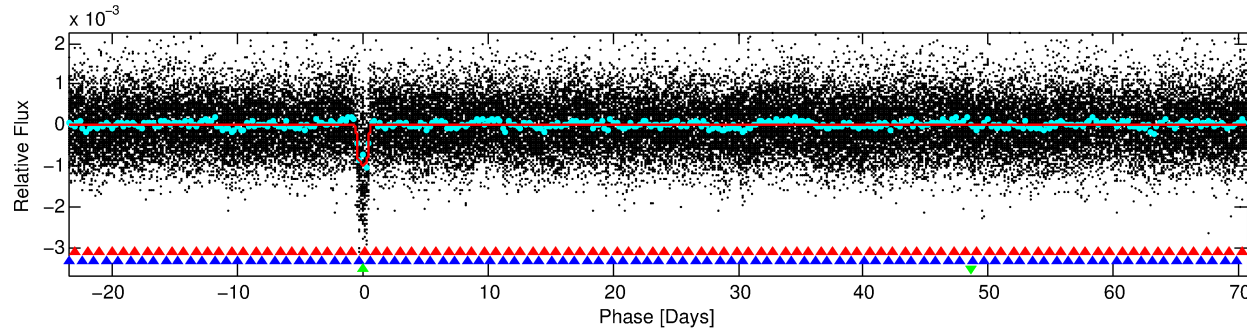
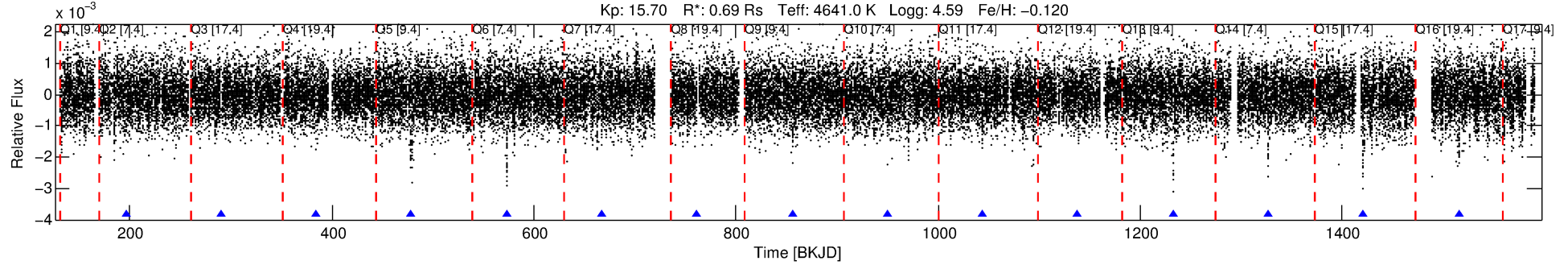
Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 4150539 Candidate: 3 of 3 Period: 94.223 d

KOI: K01330.02 Corr: 0.991

Kp: 15.70 R*: 0.69 Rs Teff: 4641.0 K Logg: 4.59 Fe/H: -0.120



DV Fit Results:

Period = 94.22283 [0.00273] d
Epoch = 196.1846 [0.0236] BKJD
Rp/R* = 0.0346 [0.0018]
a/R* = 13.76 [2.16]
b = 0.89 [0.04]
Seff = 1.57 [0.25]
Teq = 286 [11] K
Rp = 2.62 [0.27] Re
a = 0.3568 [0.0256] AU
Ag = 1022.75 [486.50] [2.10σ]
Teffp = 2497 [300] K [7.38σ]

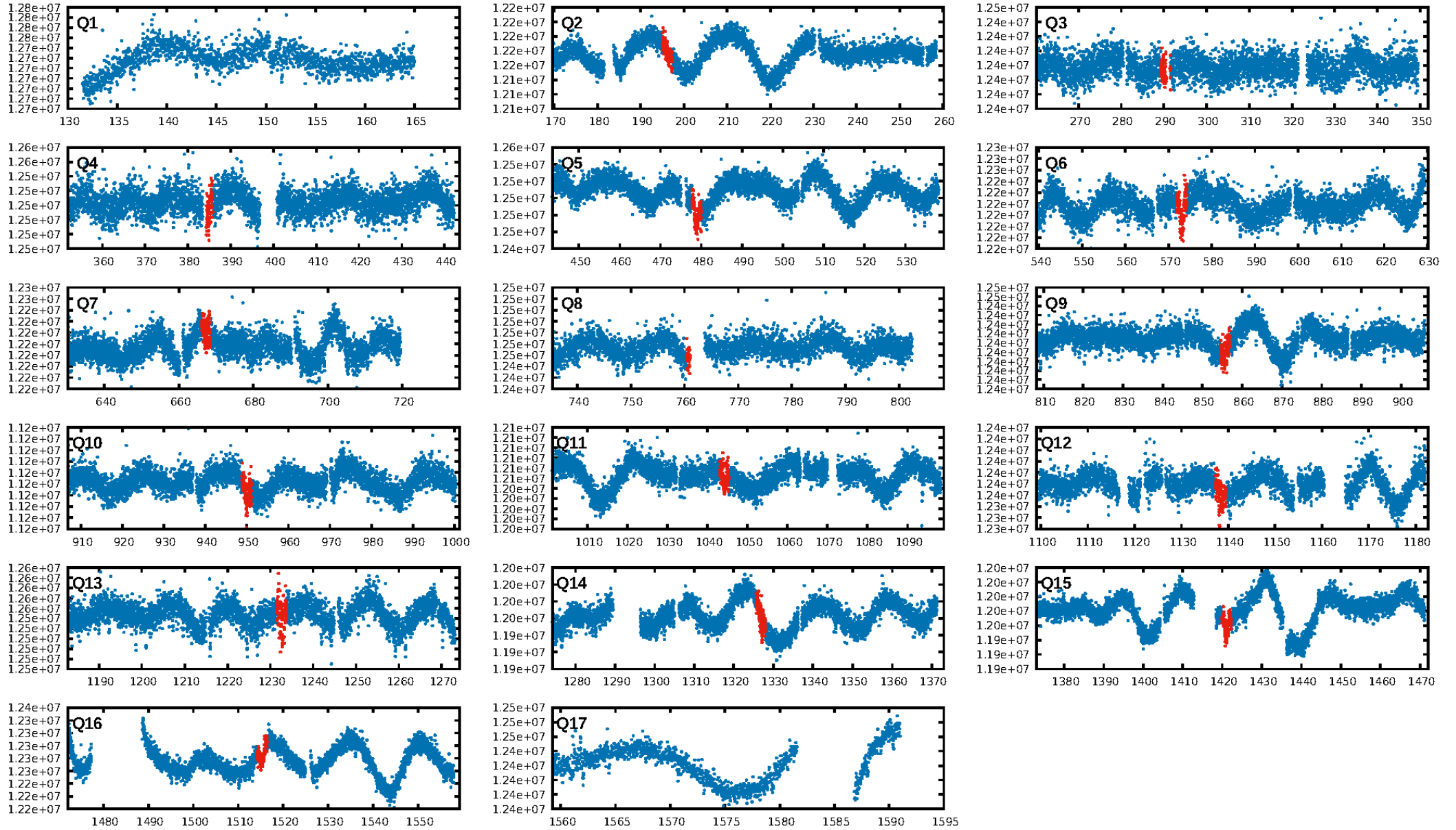
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [72.81σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.83e-33
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: 0.006447
Centroid-sig: 0.0%
Centroid-so: 1.802 arcsec [4.49σ]
OotOffset-rm: 1.670 arcsec [1.92σ]
KicOffset-rm: 1.997 arcsec [2.34σ]
OotOffset-st: 4/2/1/1 [8]
KicOffset-st: 4/2/1/1 [8]
DiffImageQuality-fgm: 0.25 [2/8]
DiffImageOverlap-fno: 0.25 [2/8]

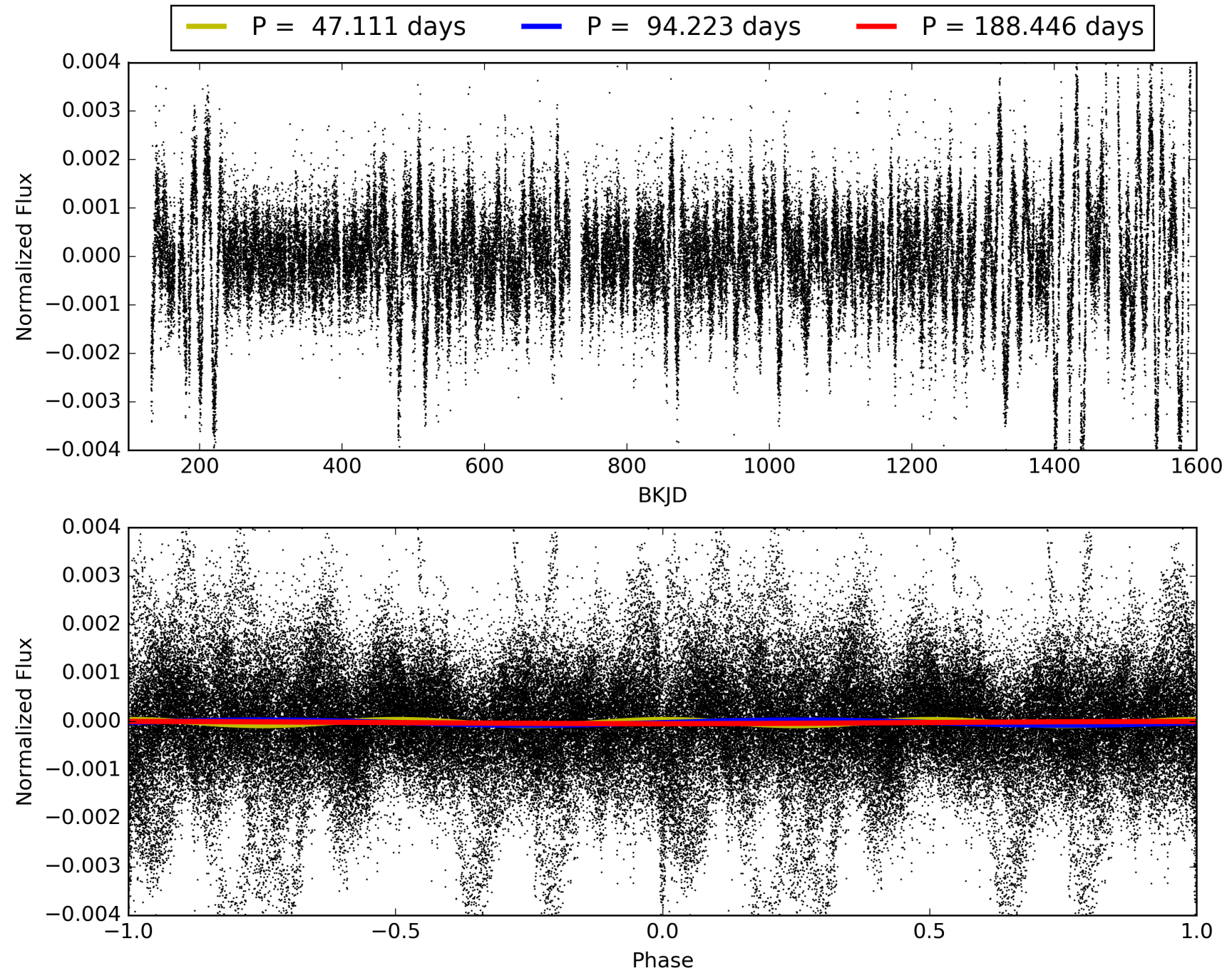
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:03:29 Z

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

TCE 004150539-03, PDC Light Curves

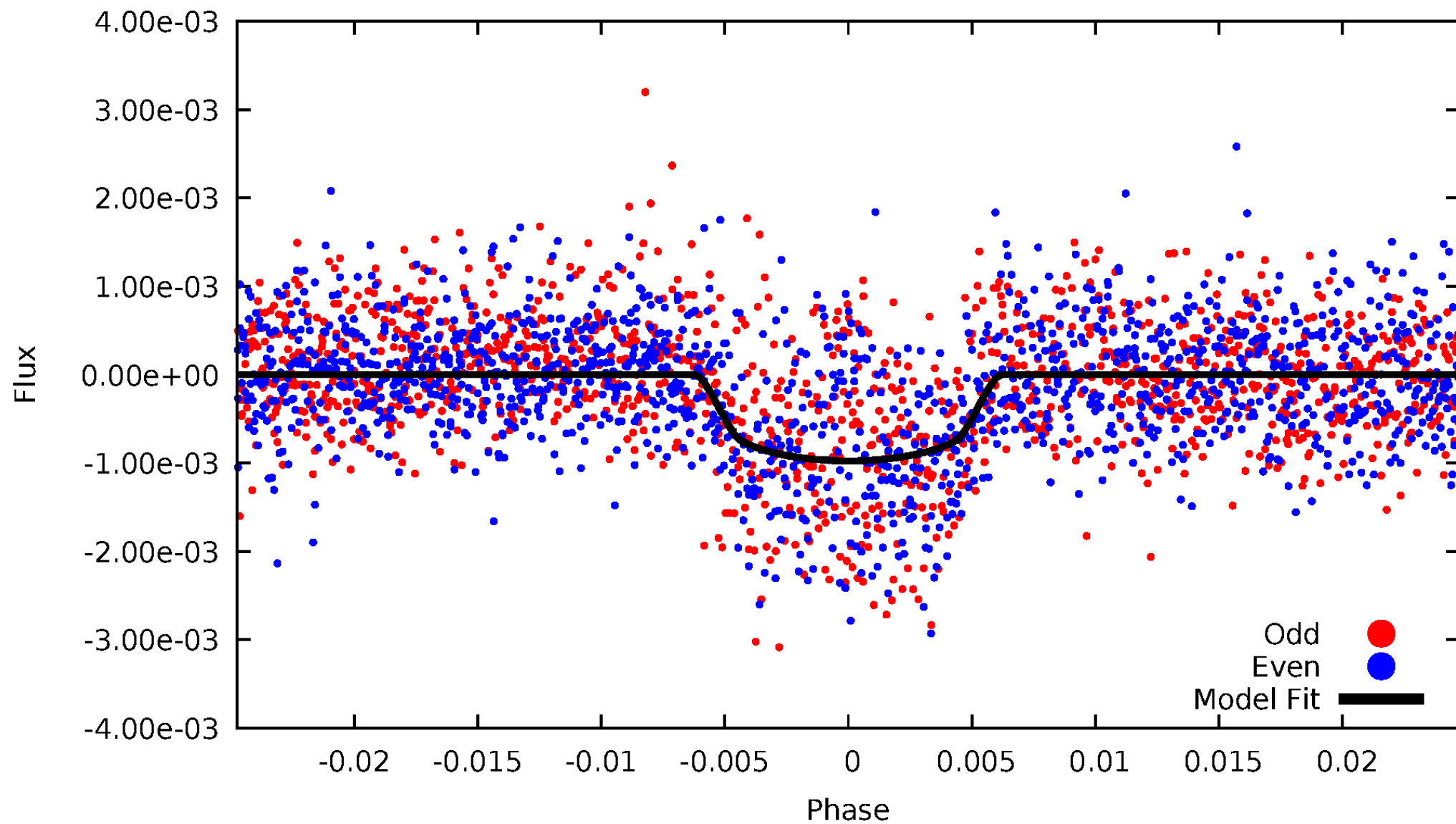


TCE 004150539-03



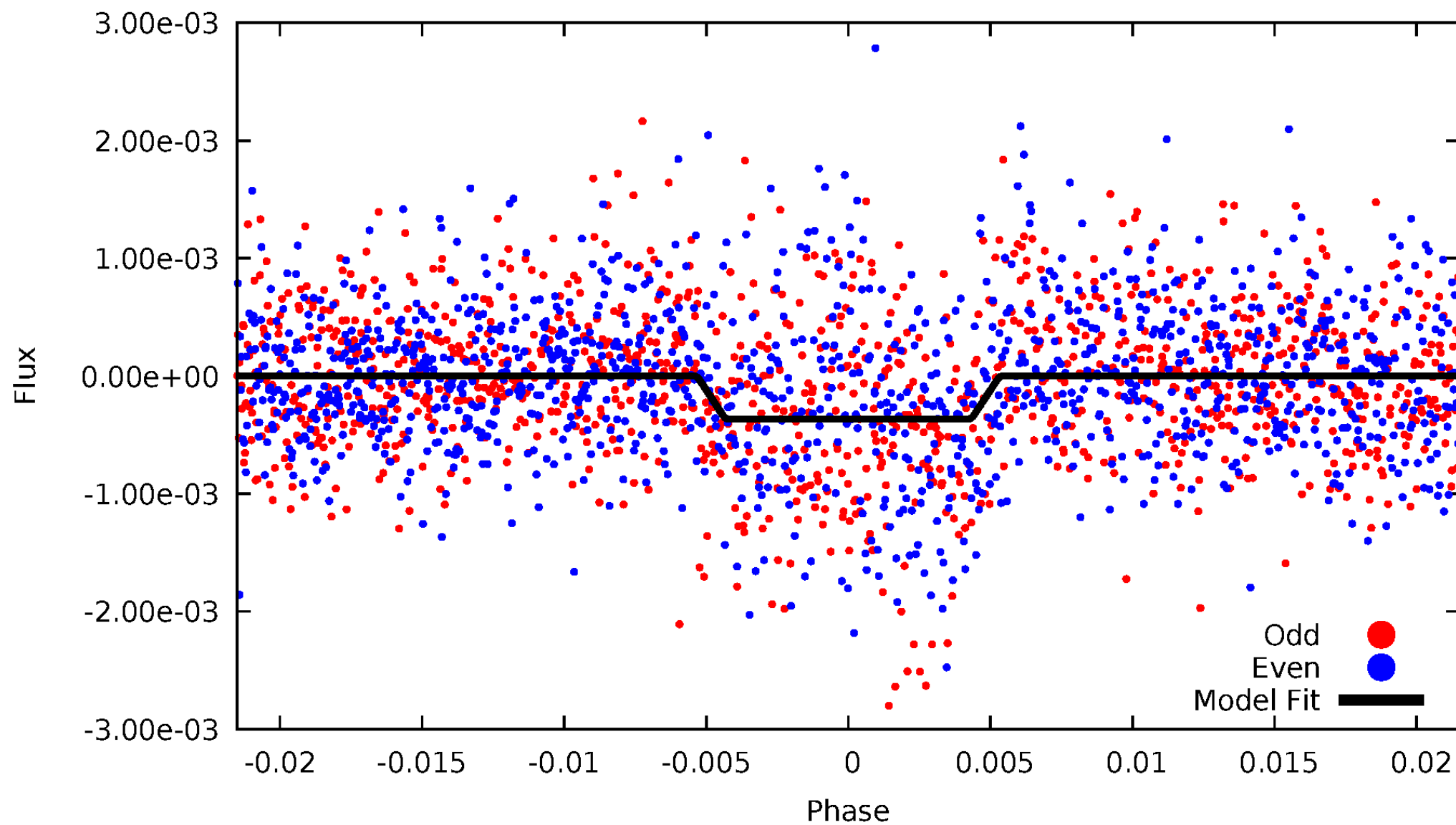
DV Odd/Even

TCE 004150539-03



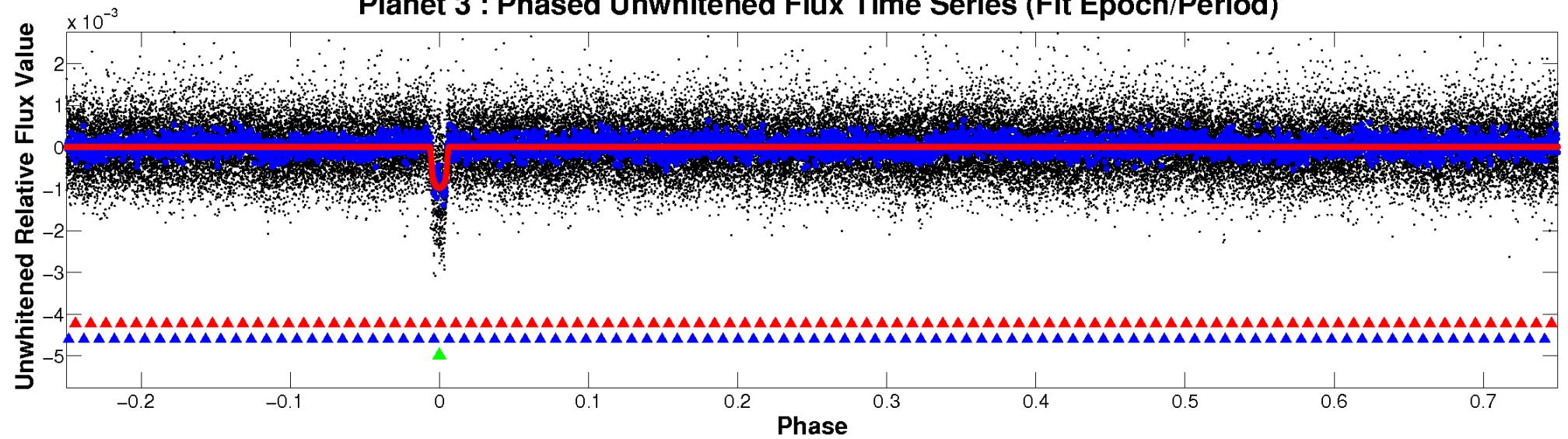
ALT Odd/Even

TCE 004150539-03

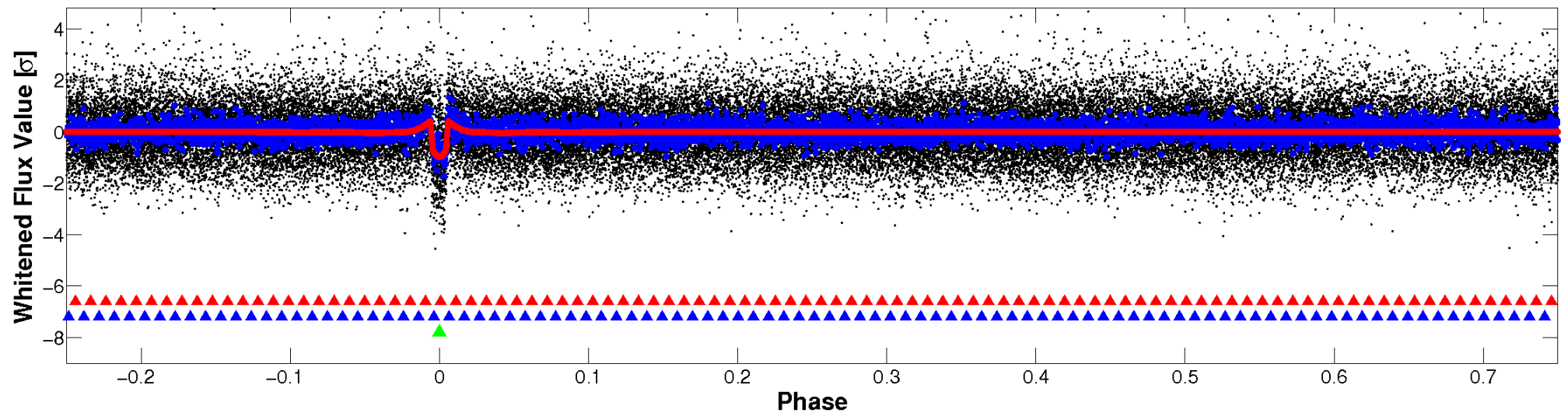


Non-Whitened Vs. Whitened Light Curve

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

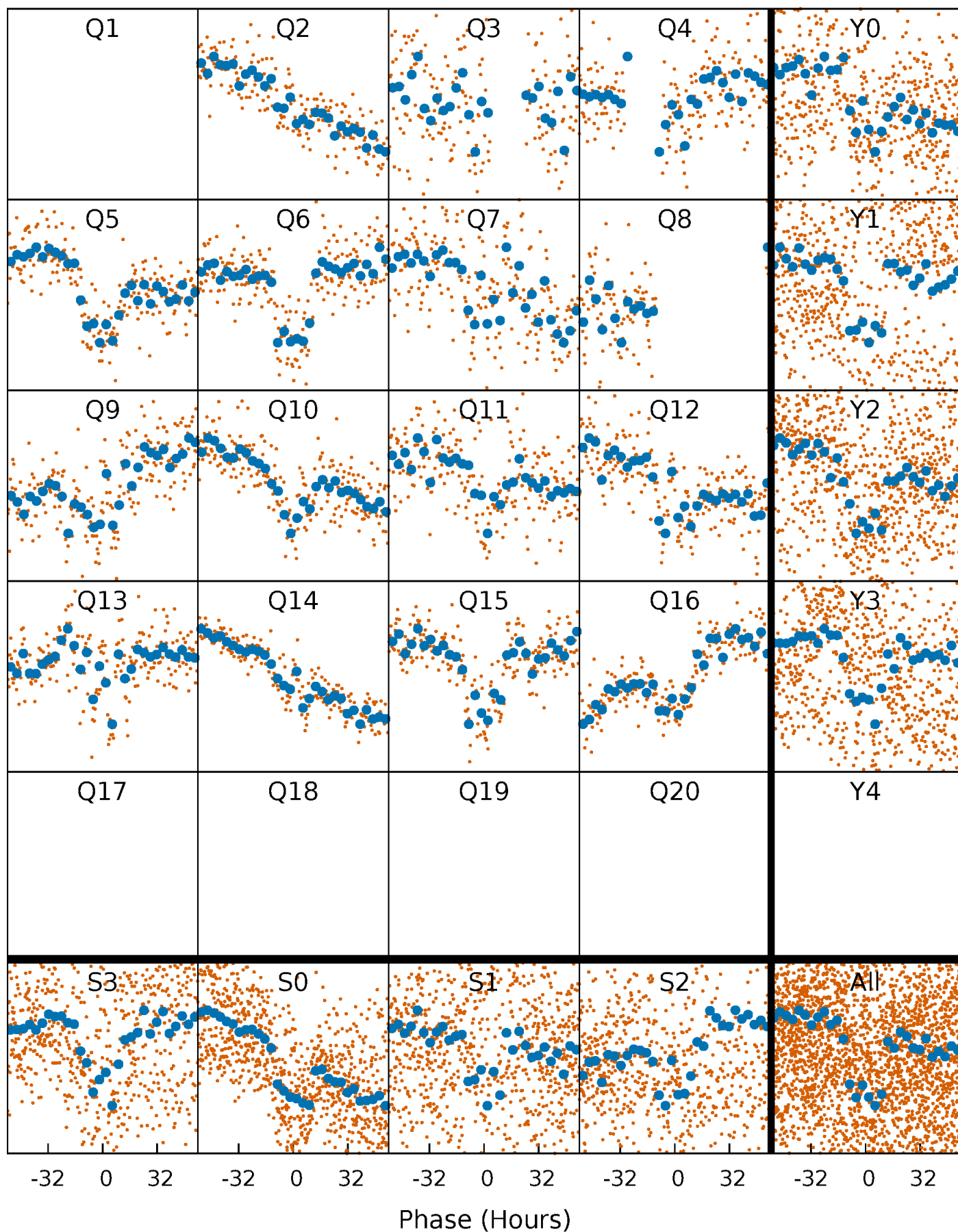


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



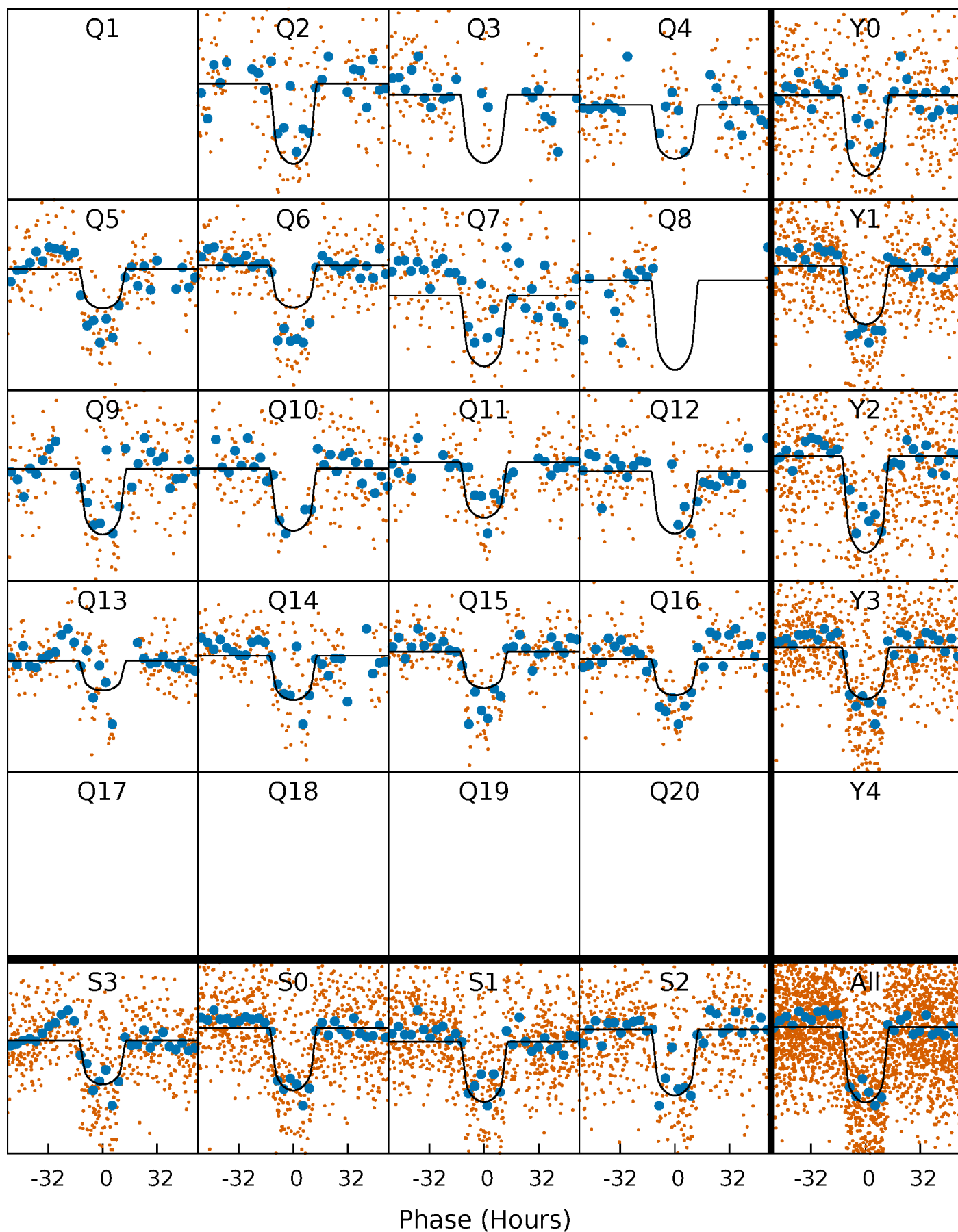
PDC Quarter-Phased Transit Curves

TCE 004150539-03 P= 94.222827 Days $T_0=196.184606$ (BKJD)



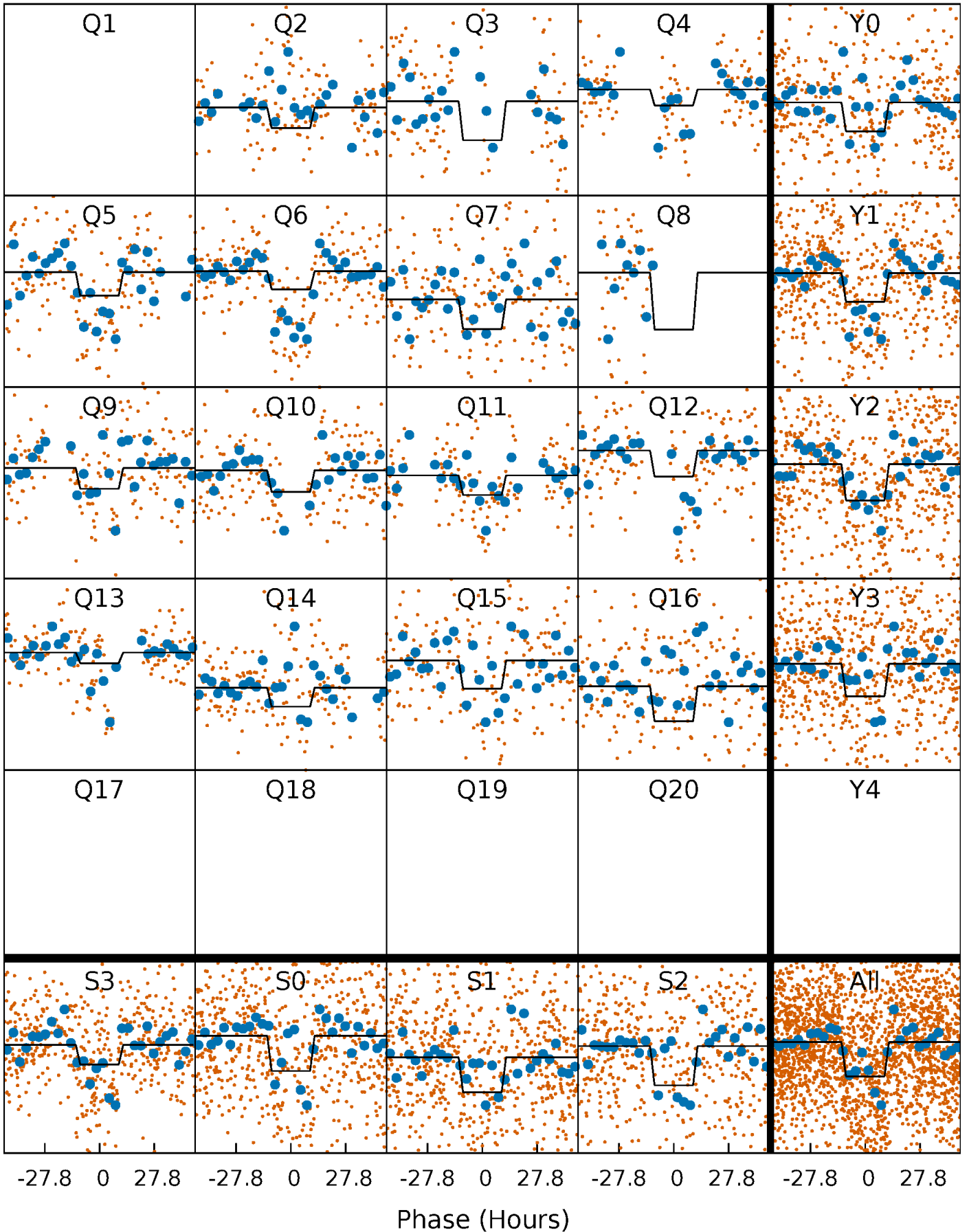
DV Quarter-Phased Transit Curves

TCE 004150539-03 P= 94.222827 Days $T_0=196.184606$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

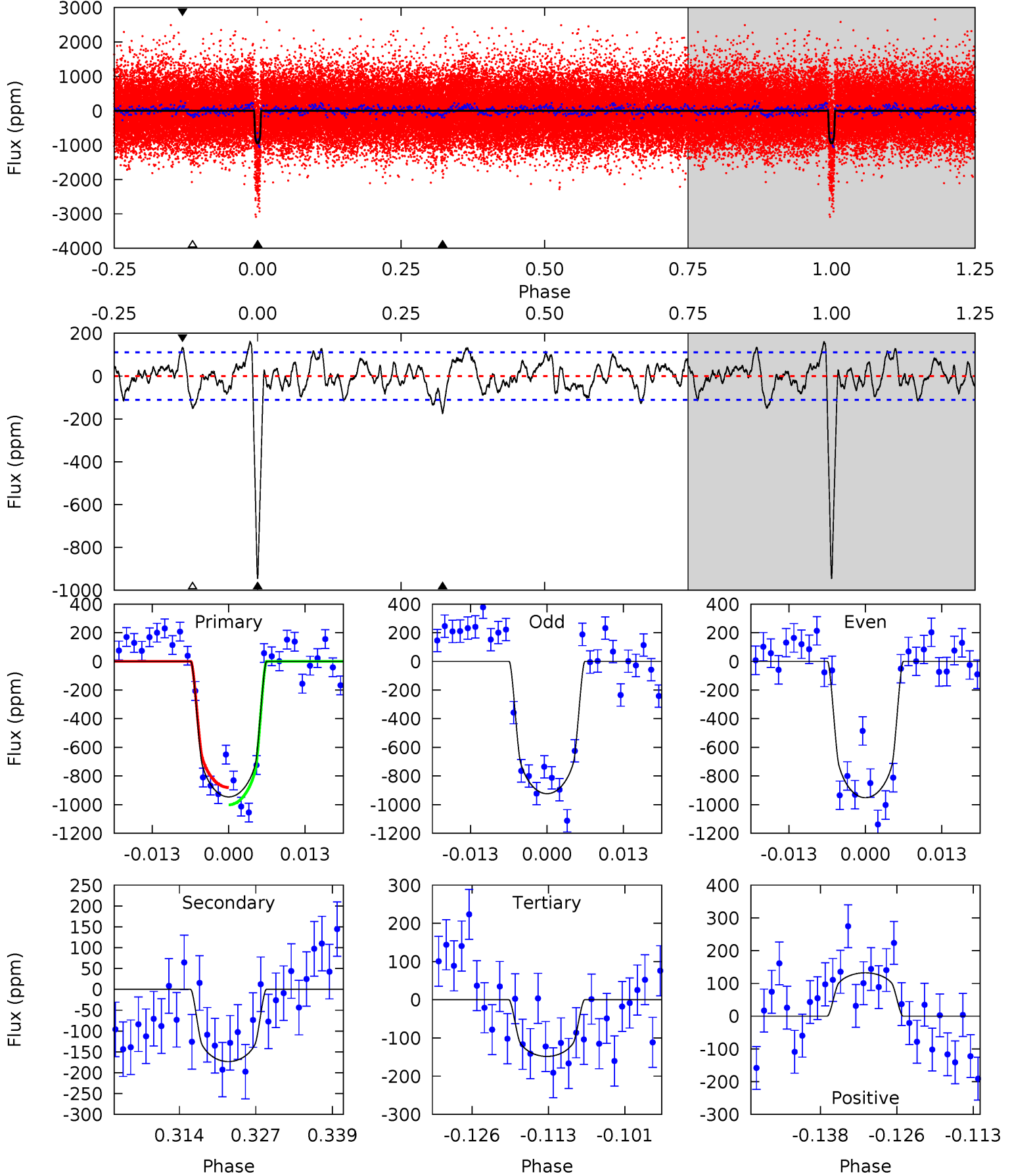
TCE 004150539-03 P= 94.225825 Days $T_0=196.161938$ (BKJD)



DV Model-Shift Uniqueness Test

004150539-03, P = 94.222827 Days, E = 101.961779 Days

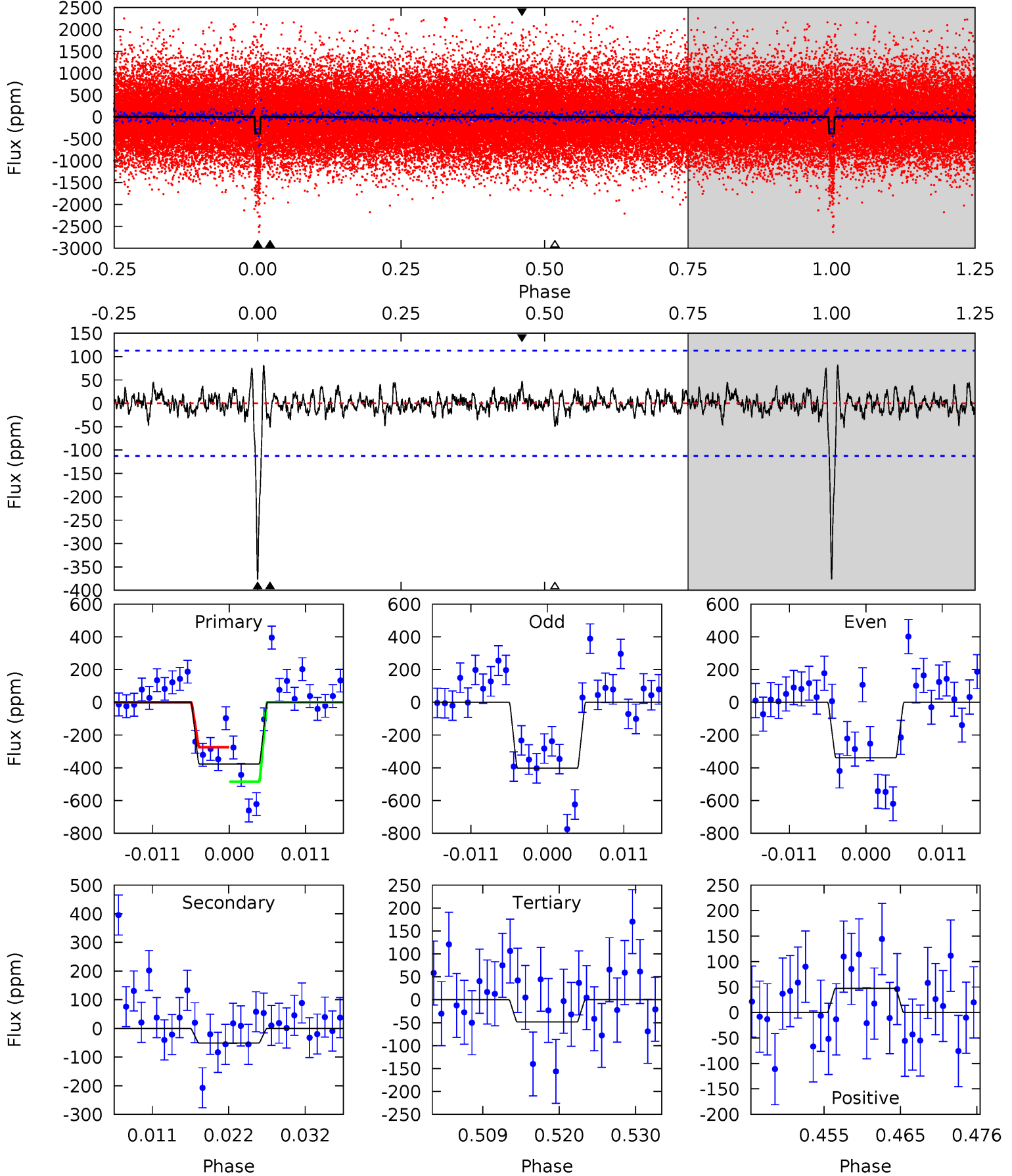
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.4	7.77	6.65	5.93	4.98	2.50	2.52	35.8	36.5	1.12	1.84	0.63	1.11	0.14	2.72



Alt Model-Shift Uniqueness Test

004150539-03, P = 94.225825 Days, E = 101.936113 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.7	2.27	2.16	2.12	5.01	2.55	0.68	14.6	14.6	0.11	0.15	1.42	1.02	0.18	4.67



Stellar Parameters For KIC 004150539

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} \text{ (g}\cdot\text{cm}^{-3}\text{)}$
	4641^{+139}_{-125}	$4.589^{+0.054}_{-0.027}$	$-0.120^{+0.300}_{-0.300}$	$0.694^{+0.050}_{-0.061}$	$0.682^{+0.076}_{-0.051}$	$2.878^{+0.723}_{-0.305}$
	+3%/-3%	+1%/-1%	+250%/-250%	+7%/-9%	+11%/-7%	+25%/-11%
Source	PHO1	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 004150539-03 / KOI 1330.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-173 ± 22	$2.61^{+0.18}_{-0.18}$	397^{+13}_{-13}	3315^{+122}_{-114}	1796^{+382}_{-302}
Alt.	-51 ± 22	$1.44^{+0.16}_{-0.15}$	398^{+14}_{-13}	3315^{+237}_{-306}	1754^{+944}_{-789}

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

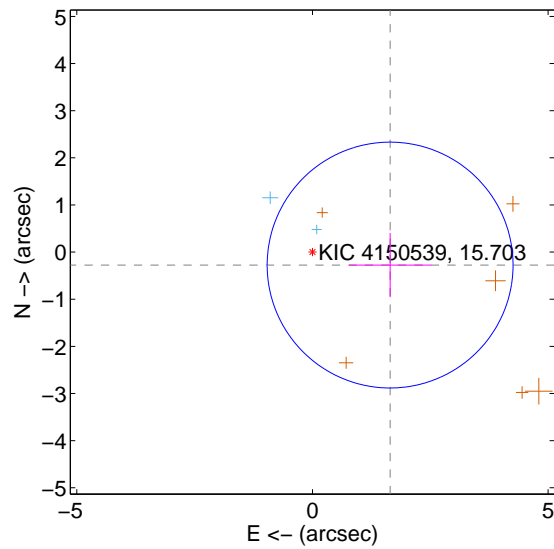
Supplemental centroid analysis for 004150539-03. Kepler magnitude: 15.70. Transit SNR 20.32

There are 2 quarters with good PRF difference image offsets

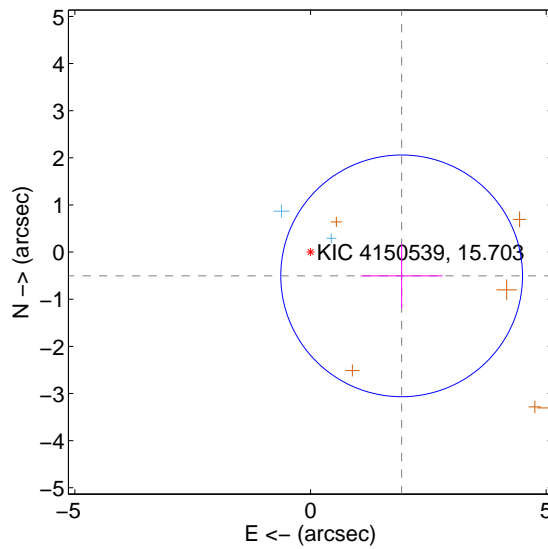
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.670 ± 0.869	1.92	-1.648 ± 0.874	-0.275 ± 0.680
PRF-fit source offset from KIC position	1.997 ± 0.855	2.34	-1.933 ± 0.865	-0.504 ± 0.683
photometric centroid source offset	1.80 ± 0.40	4.49	0.34 ± 0.40	-1.77 ± 0.40

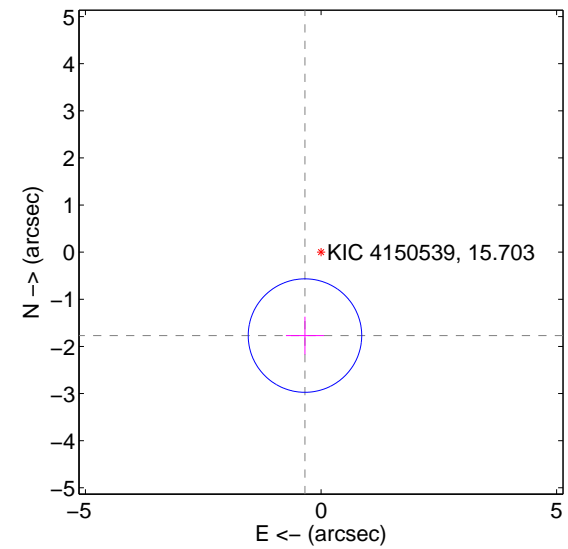
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

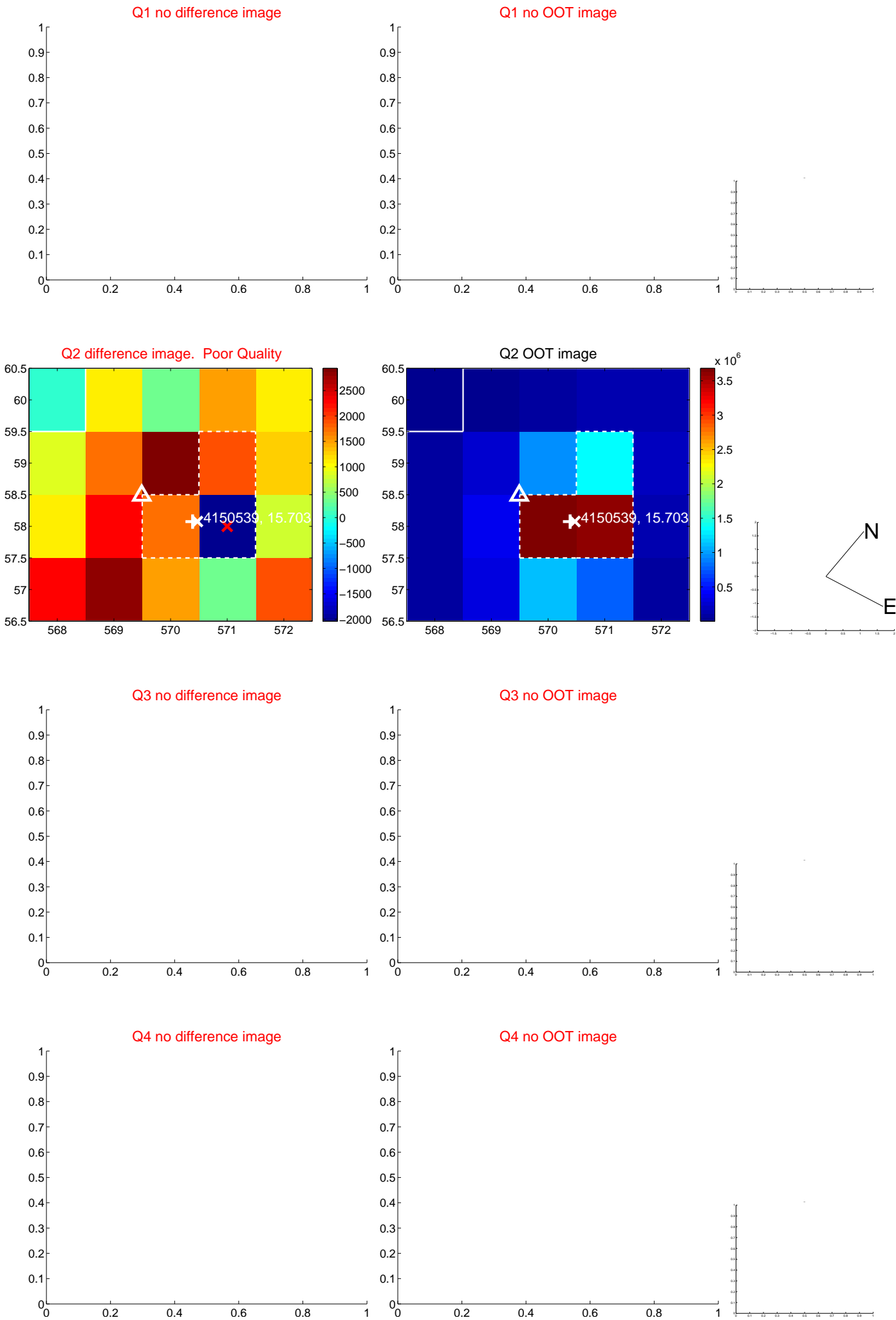


offset from photometric centroids

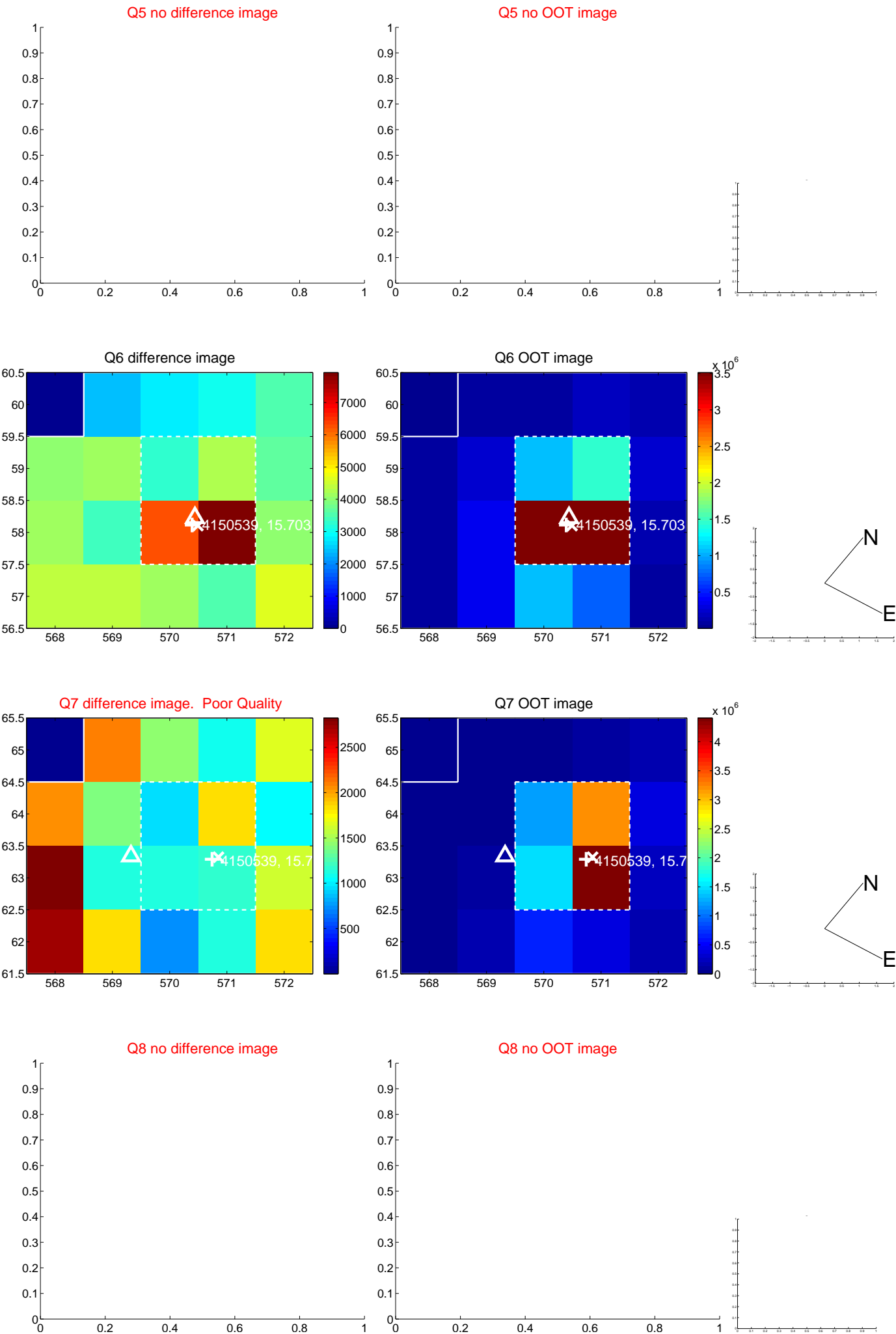


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

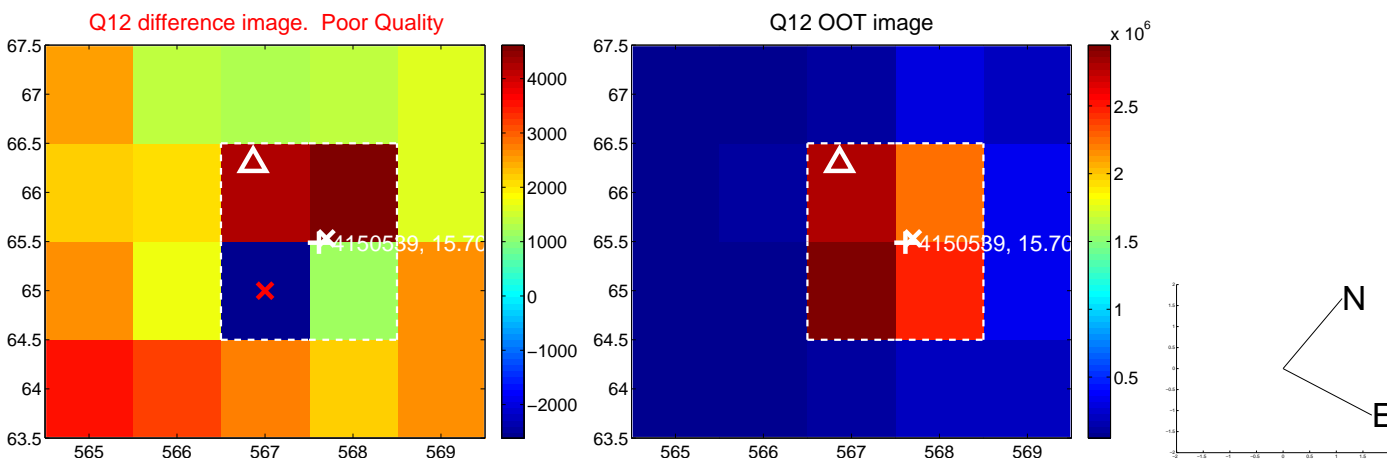
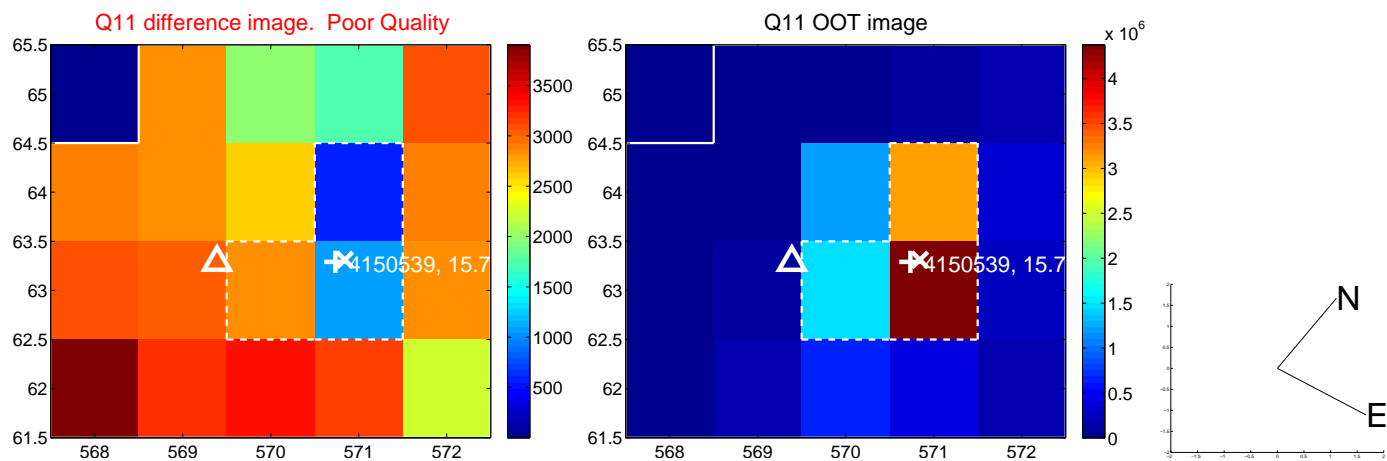
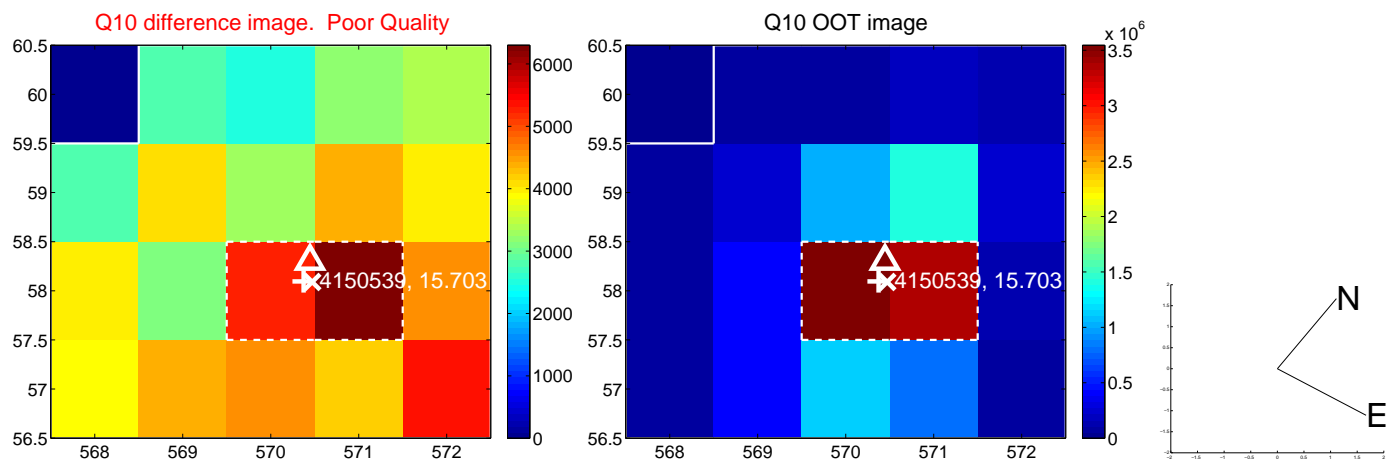
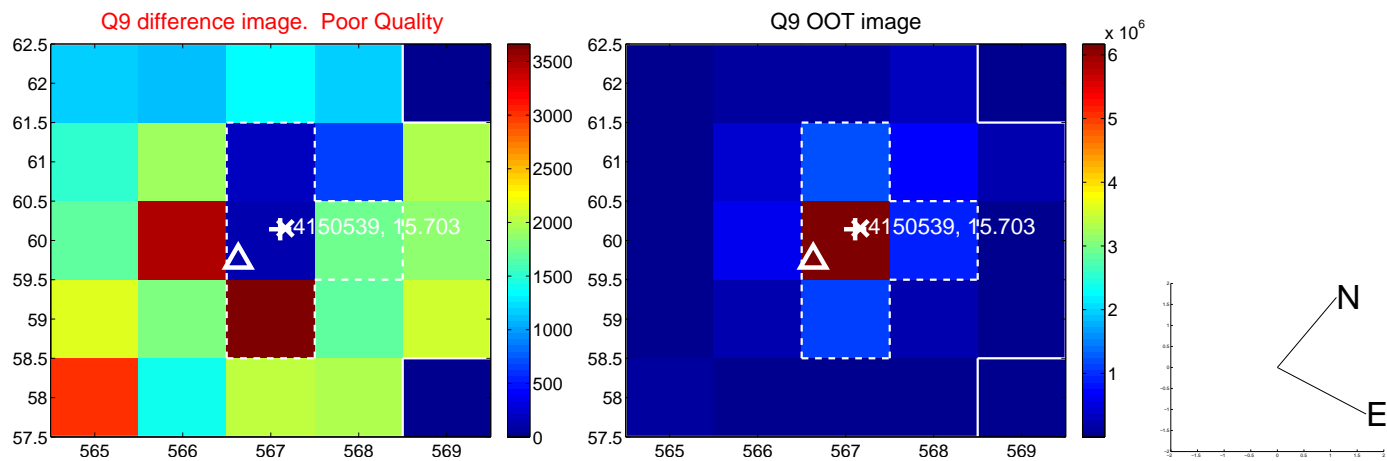
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



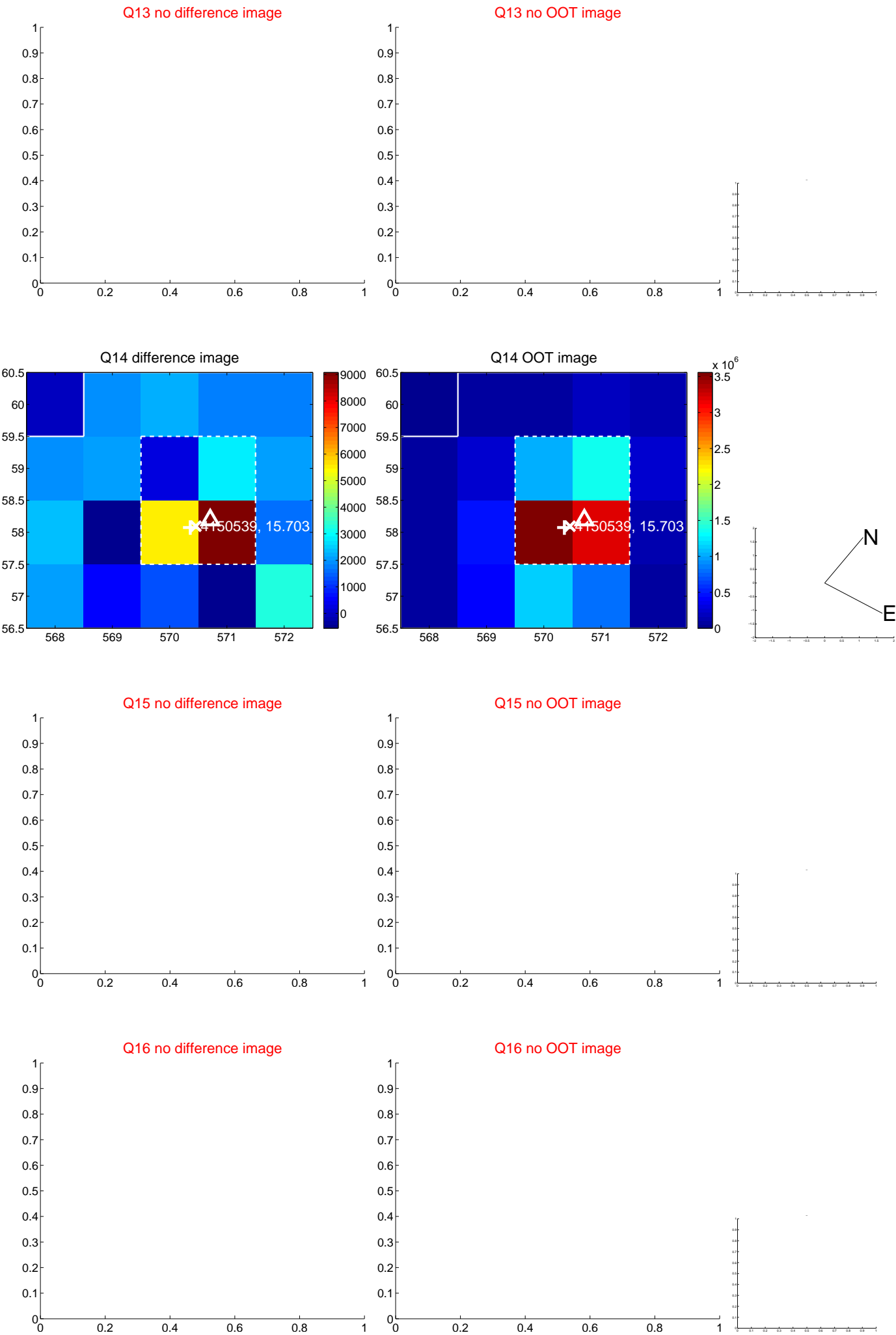
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



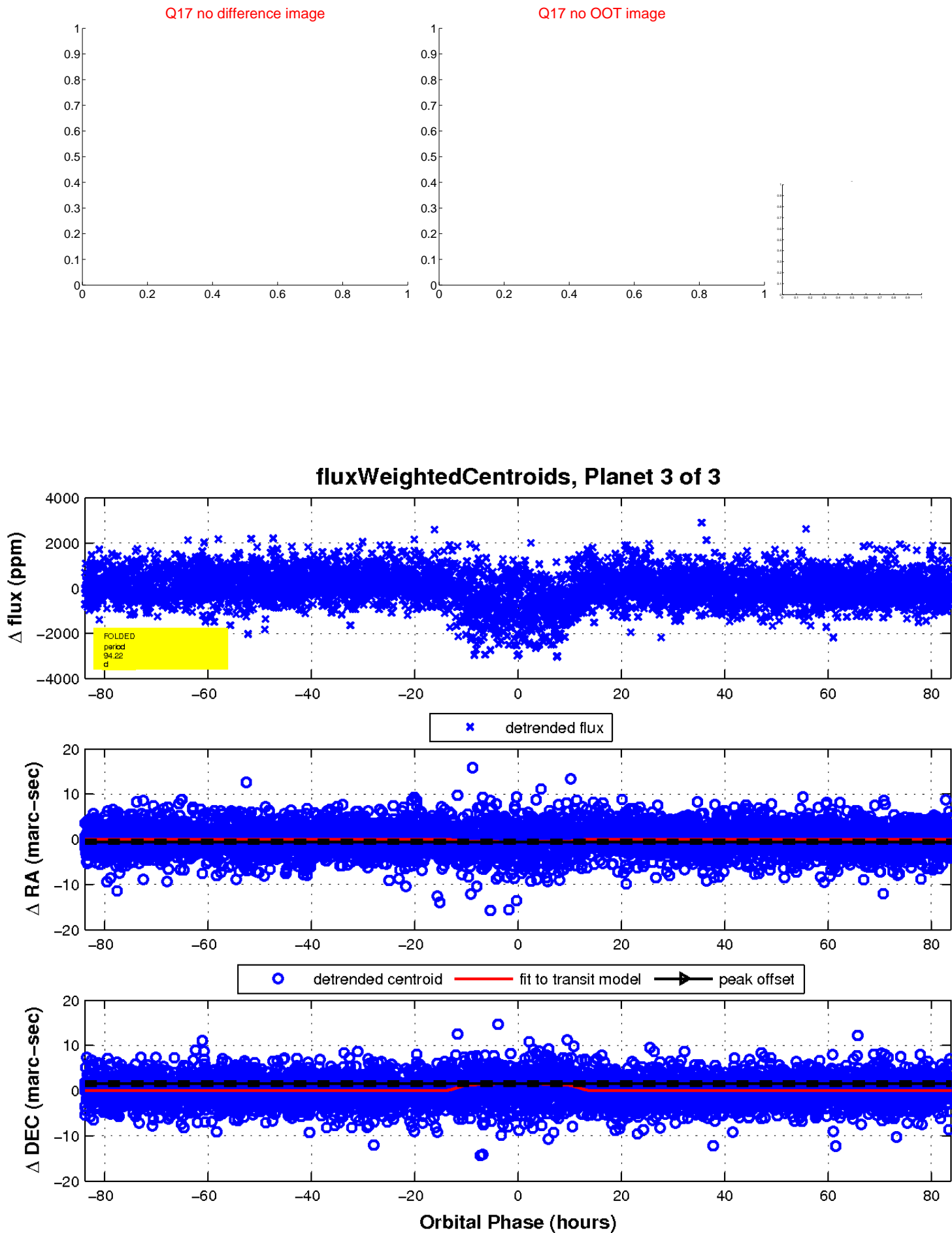
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

