

KIC 009899216

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})
009899216-01	OBS	7971.01	1.332585	132.019419	8.9	4.153	11.3	11.4	1.94	8133	0.67	16959.96
009899216-02	OBS	No	611.452974	159.870808	2496.1	44.486	9.4	13.6	1.94	8133	17.48	4.79
009899216-03	OBS	No	614.397896	138.389098	740.0	33.936	7.4	9.9	1.94	8133	9.83	4.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899216-01	OBS	FP	0.00	0	0	0	1	CENT_SATURATED—EPHEM_MATCH
009899216-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
009899216-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

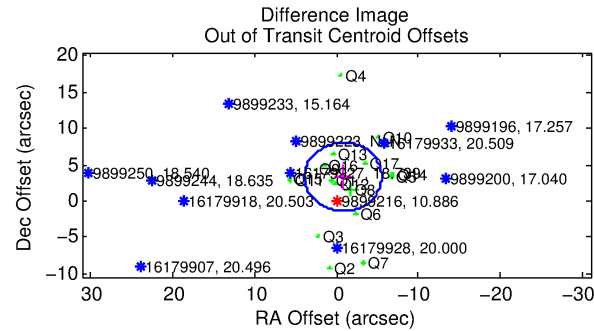
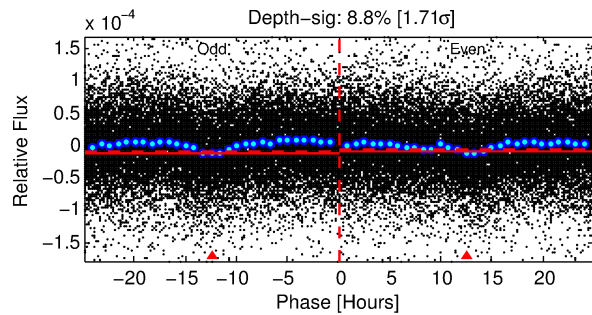
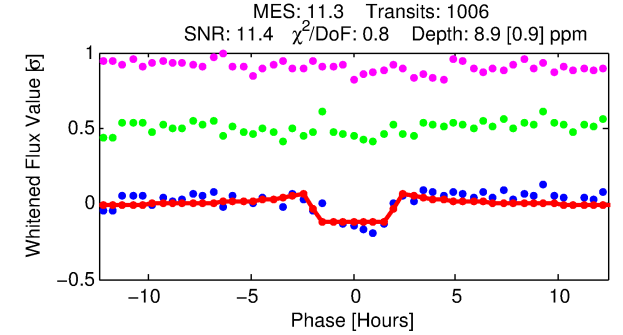
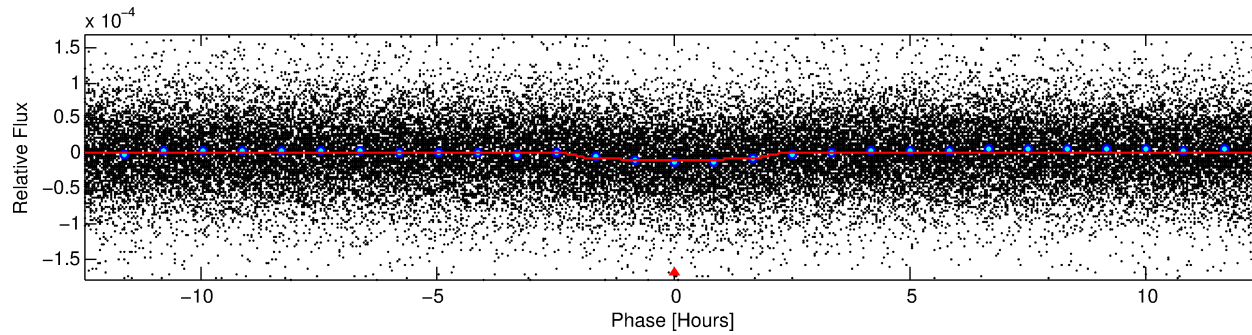
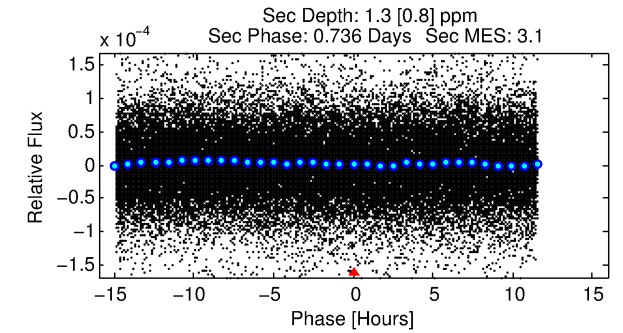
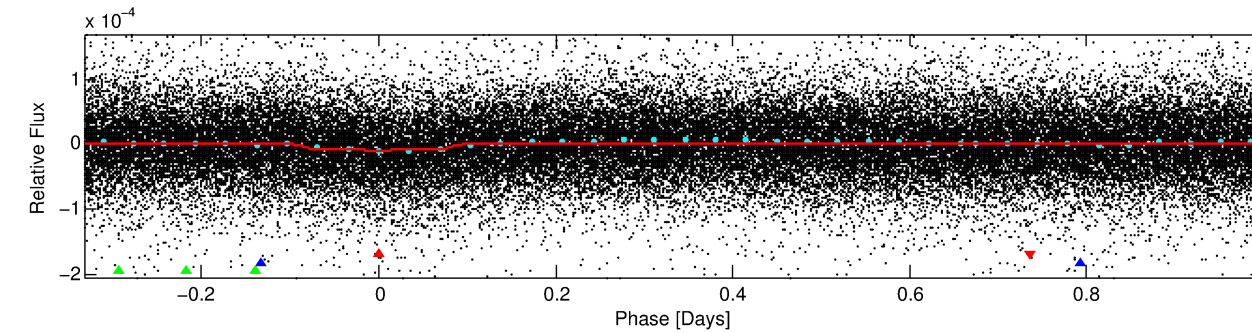
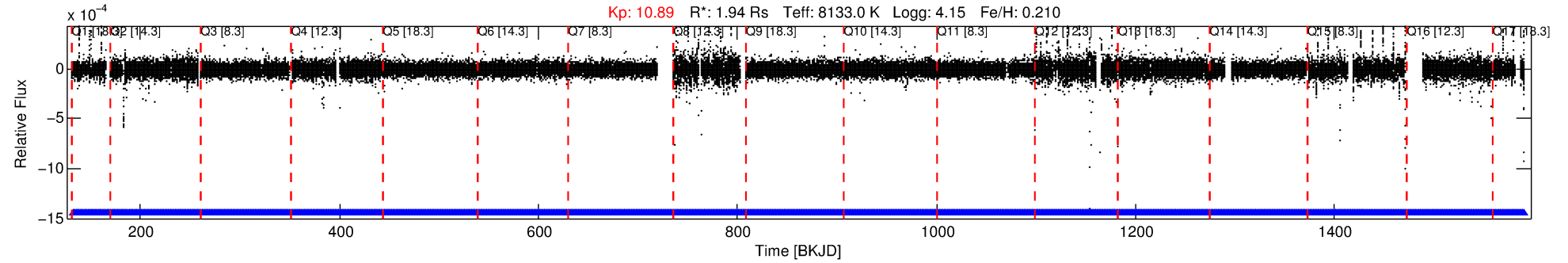
Ephemeris Match Information For 009899216-01

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
009899216-01	9899216	BR-Cyg-pri	9899416	1:1	205.0	51	6	10.03	10.89	74319.00	Direct-PRF	0	1.31	1.99

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: 9899216 Candidate: 1 of 3 Period: 1.333 d



DV Fit Results:

Period = 1.33258 [0.00001] d
Epoch = 132.0194 [0.0027] BKJD
Rp/R* = 0.0032 [0.0004]
a/R* = 1.44 [0.53]
b = 0.90 [0.15]
Seff = 16959.96 [6222.21]
Teff = 2910 [267] K
Rp = 0.67 [0.20] Re
a = 0.0294 [0.0066] AU
Ag = 1.41 [1.00] [0.41σ]
Teffp = 4906 [806] K [2.35σ]

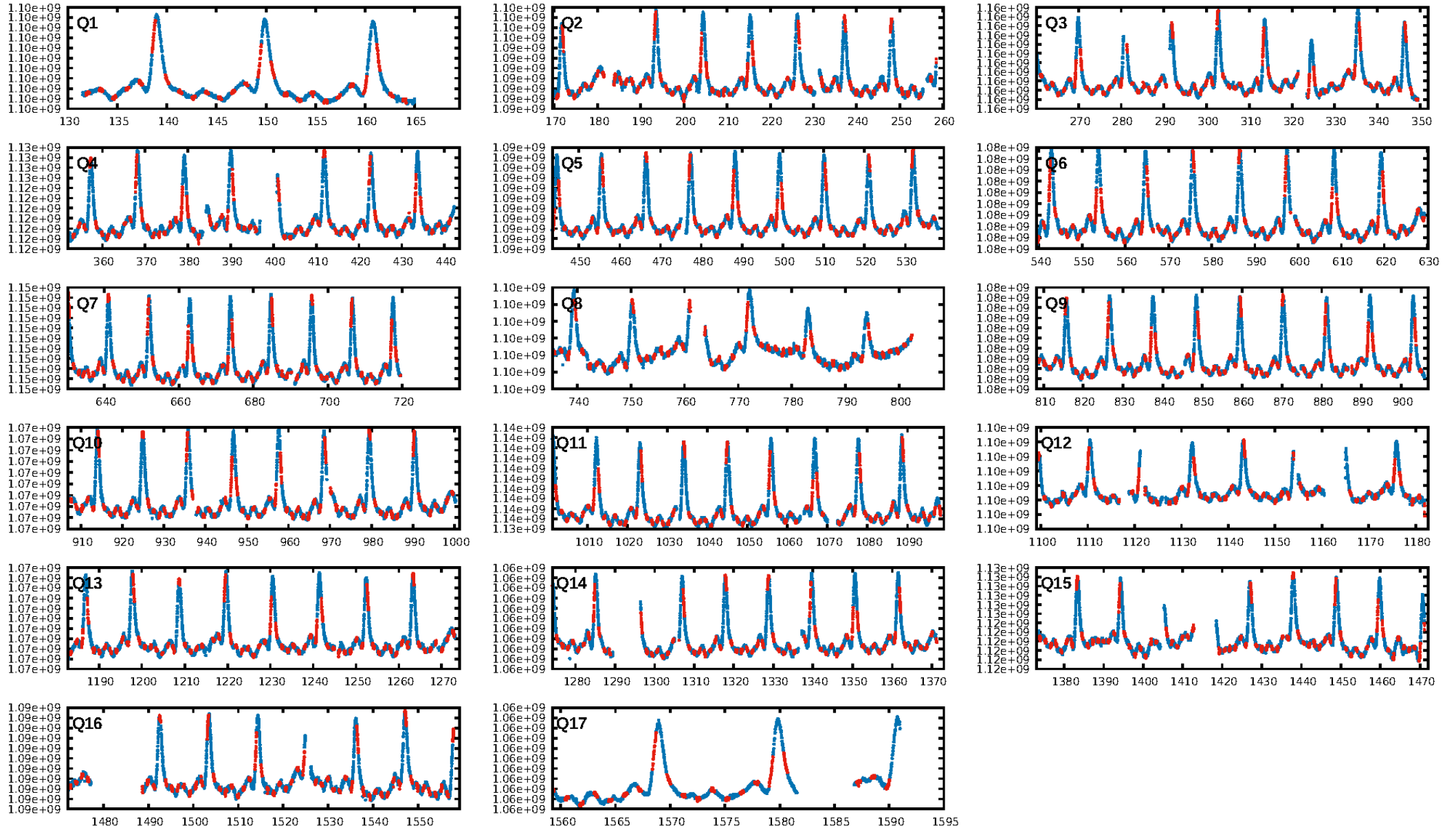
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [327.73σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.17e-25
RollingBand-fgt: 1.00 [961/961]
GhostDiagnostic-chr: 0.2784
Centroid-sig: 1.9%
Centroid-so: 3.116 arcsec [2.10σ]
OotOffset-rm: 3.409 arcsec [2.17σ]
KicOffset-rm: 3.558 arcsec [2.41σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.18 [3/17]
DiffImageOverlap-fno: 1.00 [17/17]

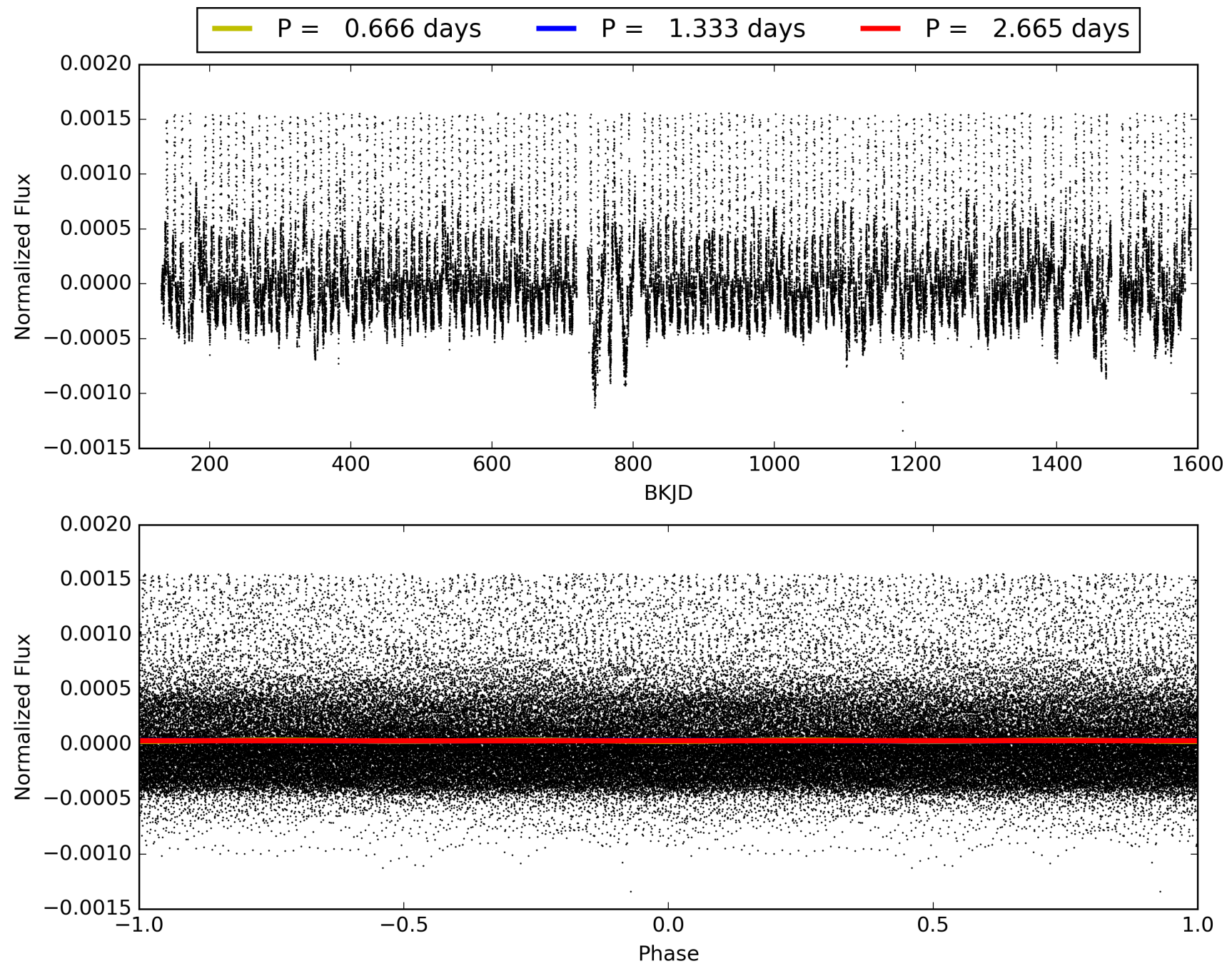
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:34:56 Z

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

TCE 009899216-01, PDC Light Curves

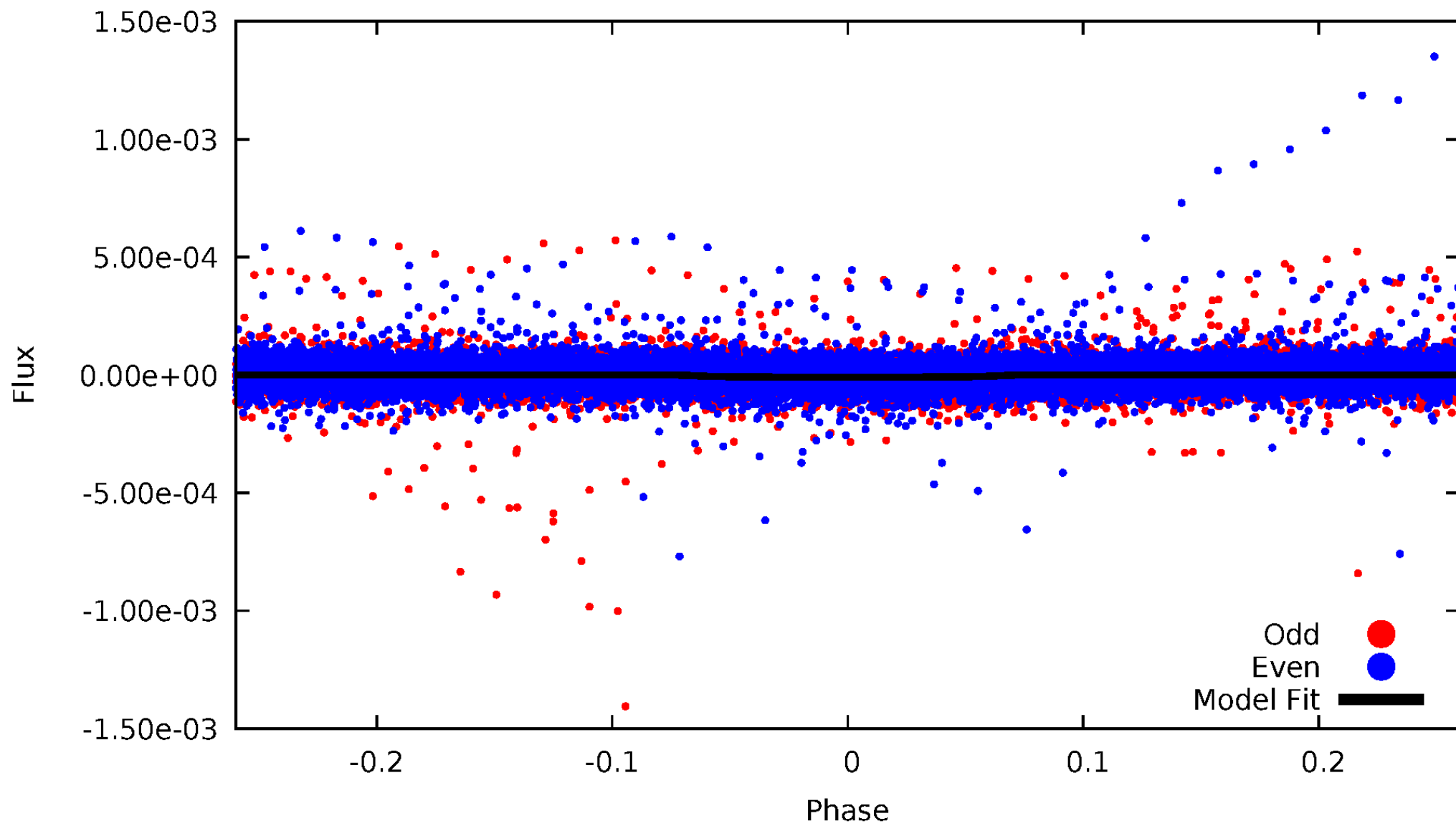


TCE 009899216-01



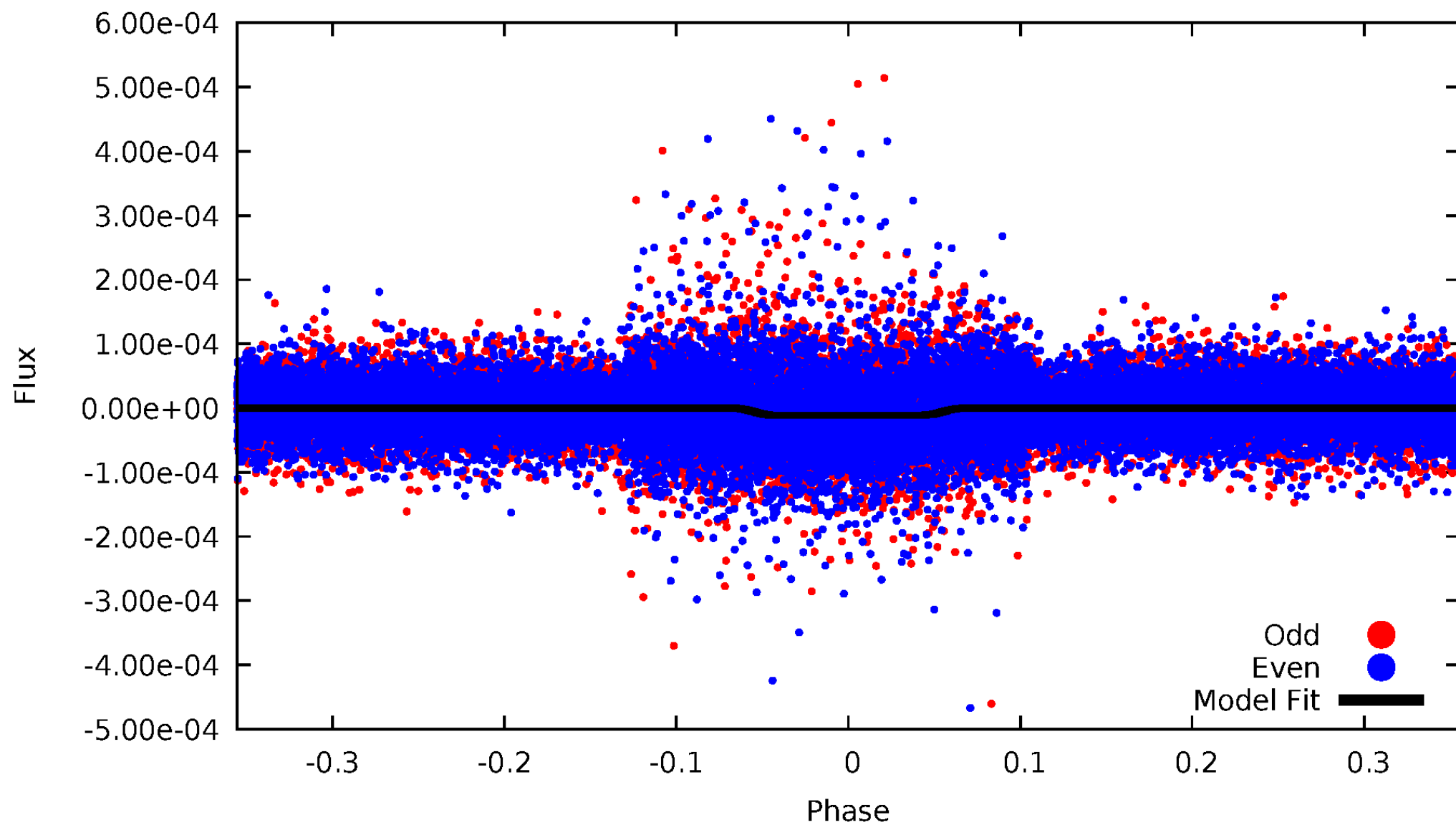
DV Odd/Even

TCE 009899216-01

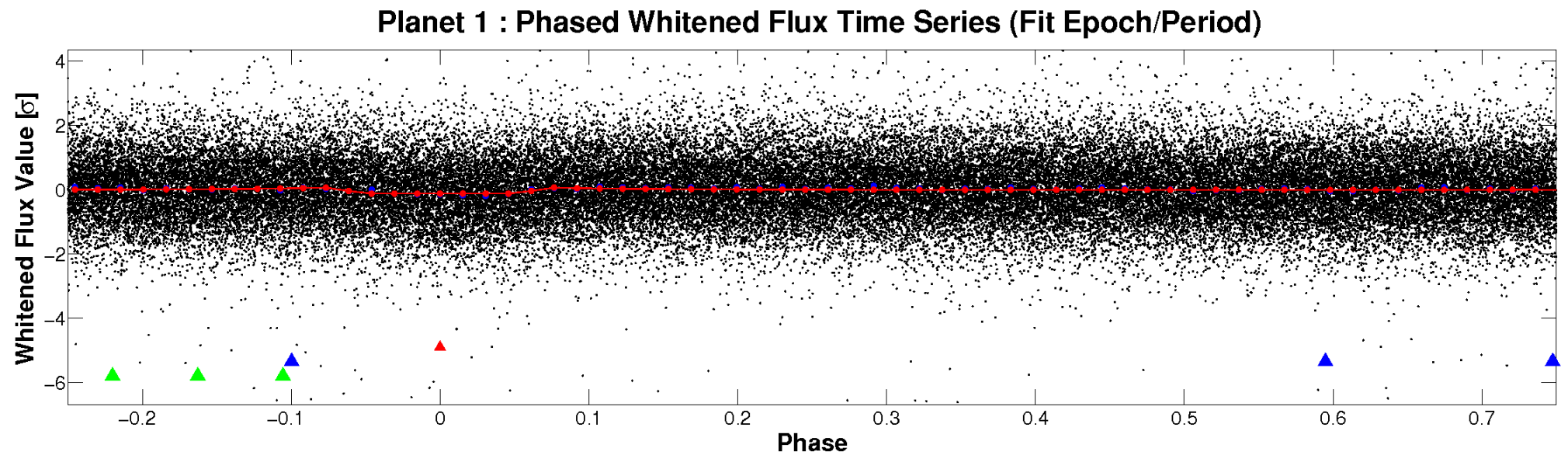
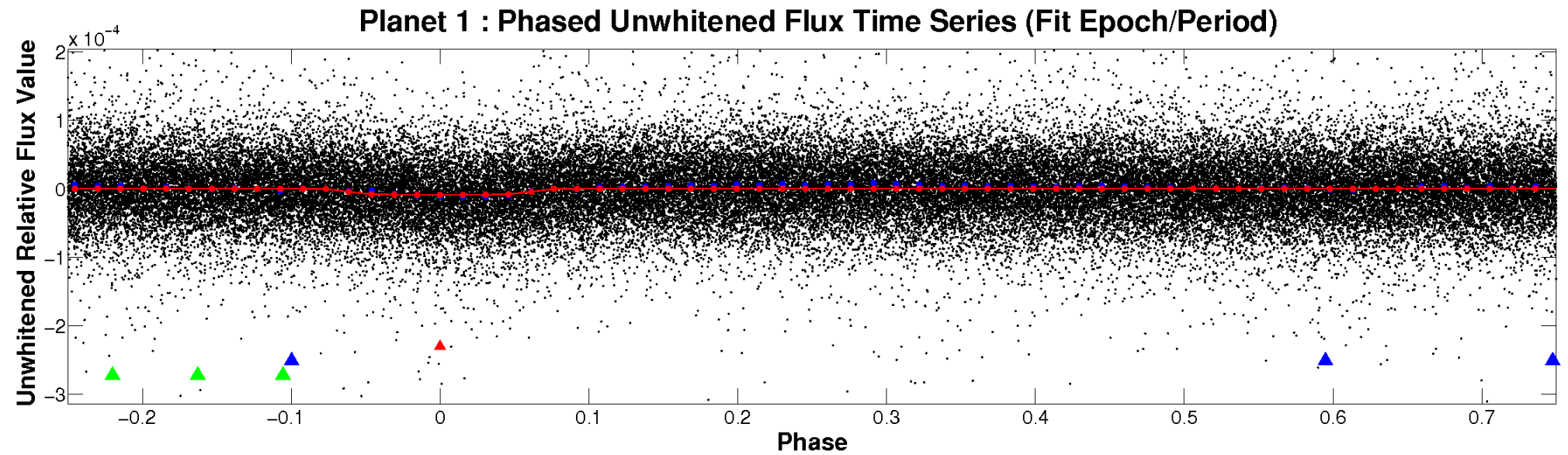


ALT Odd/Even

TCE 009899216-01

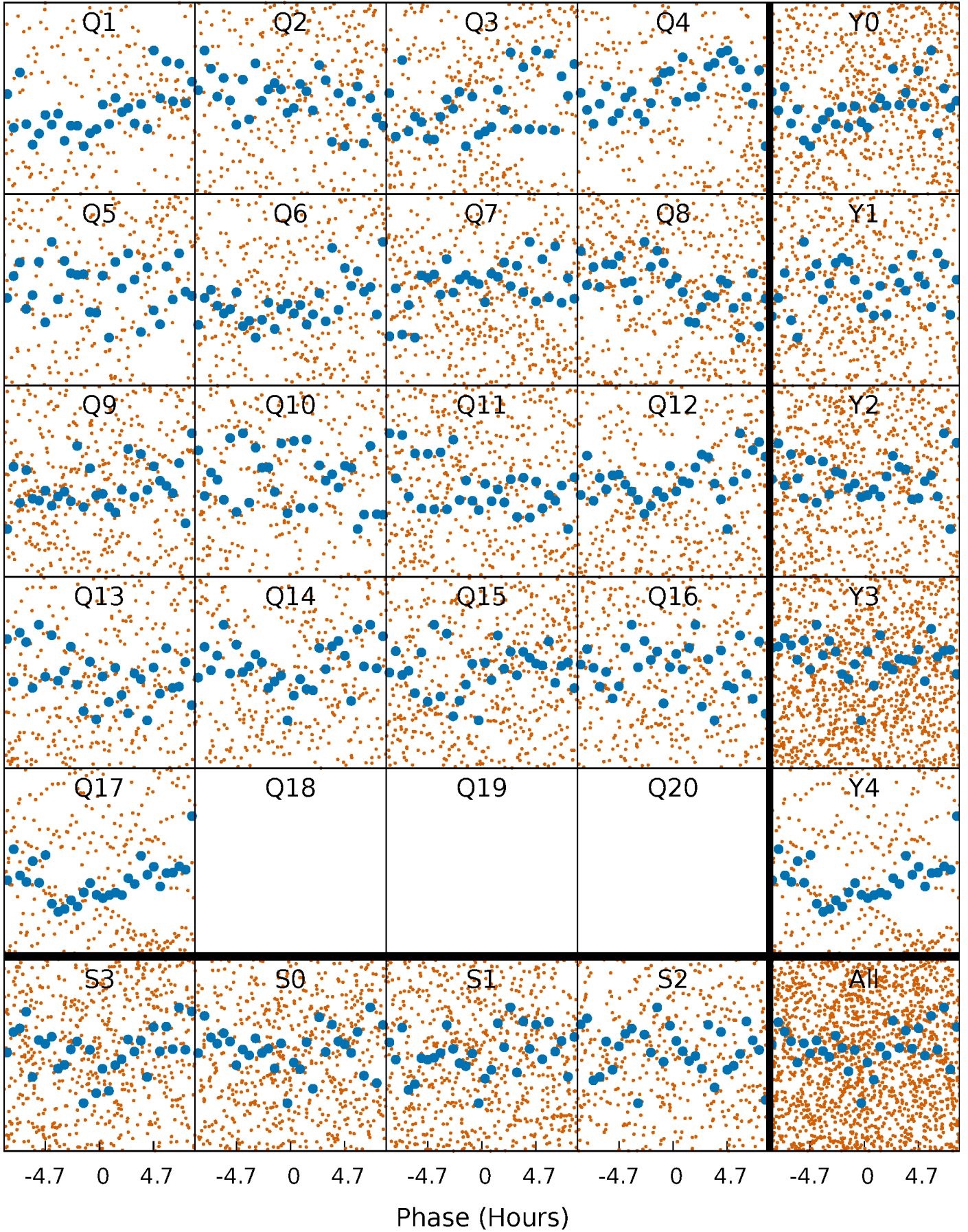


Non-Whitened Vs. Whitened Light Curve



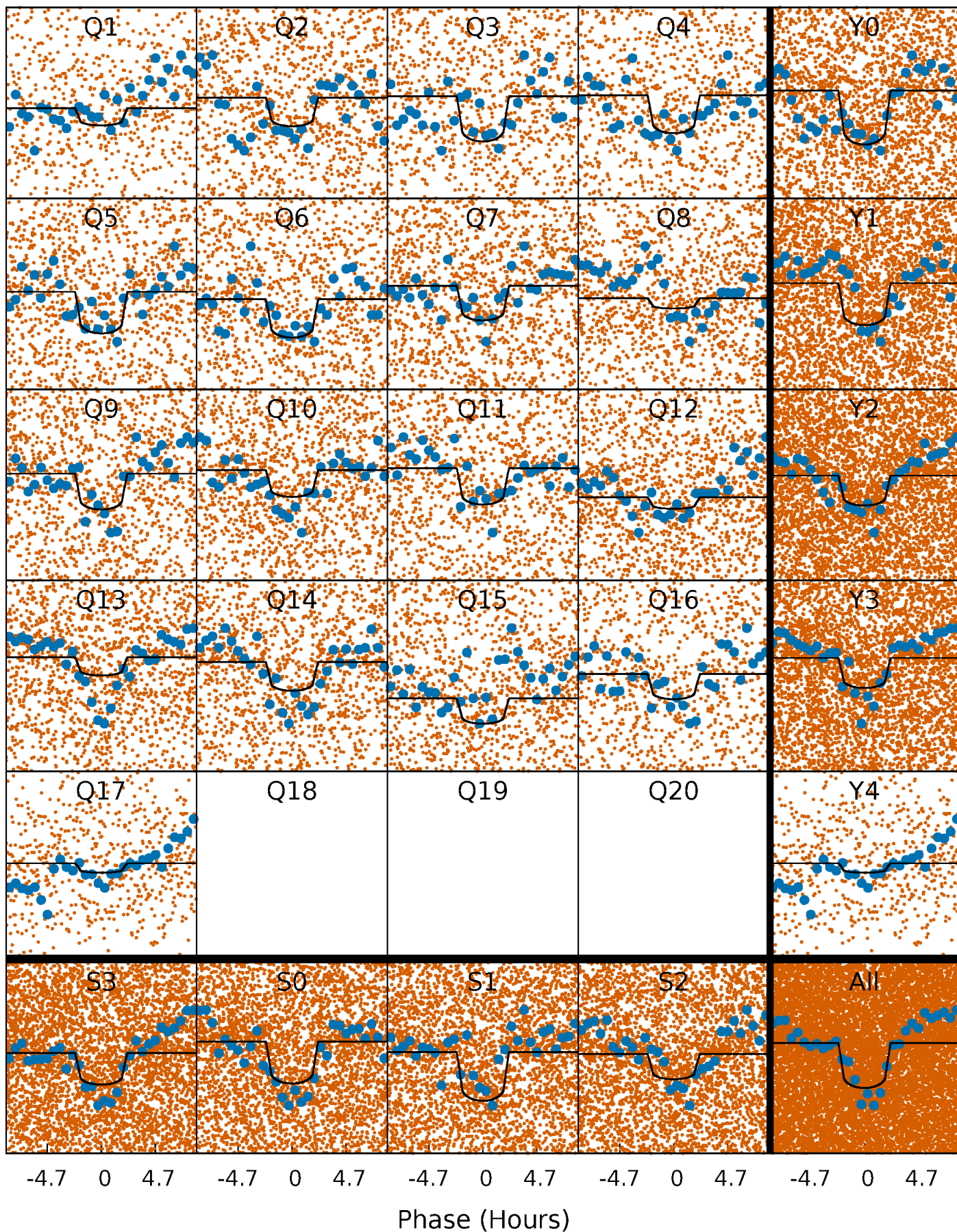
PDC Quarter-Phased Transit Curves

TCE 009899216-01 P= 1.332585 Days $T_0=132.019419$ (BKJD)



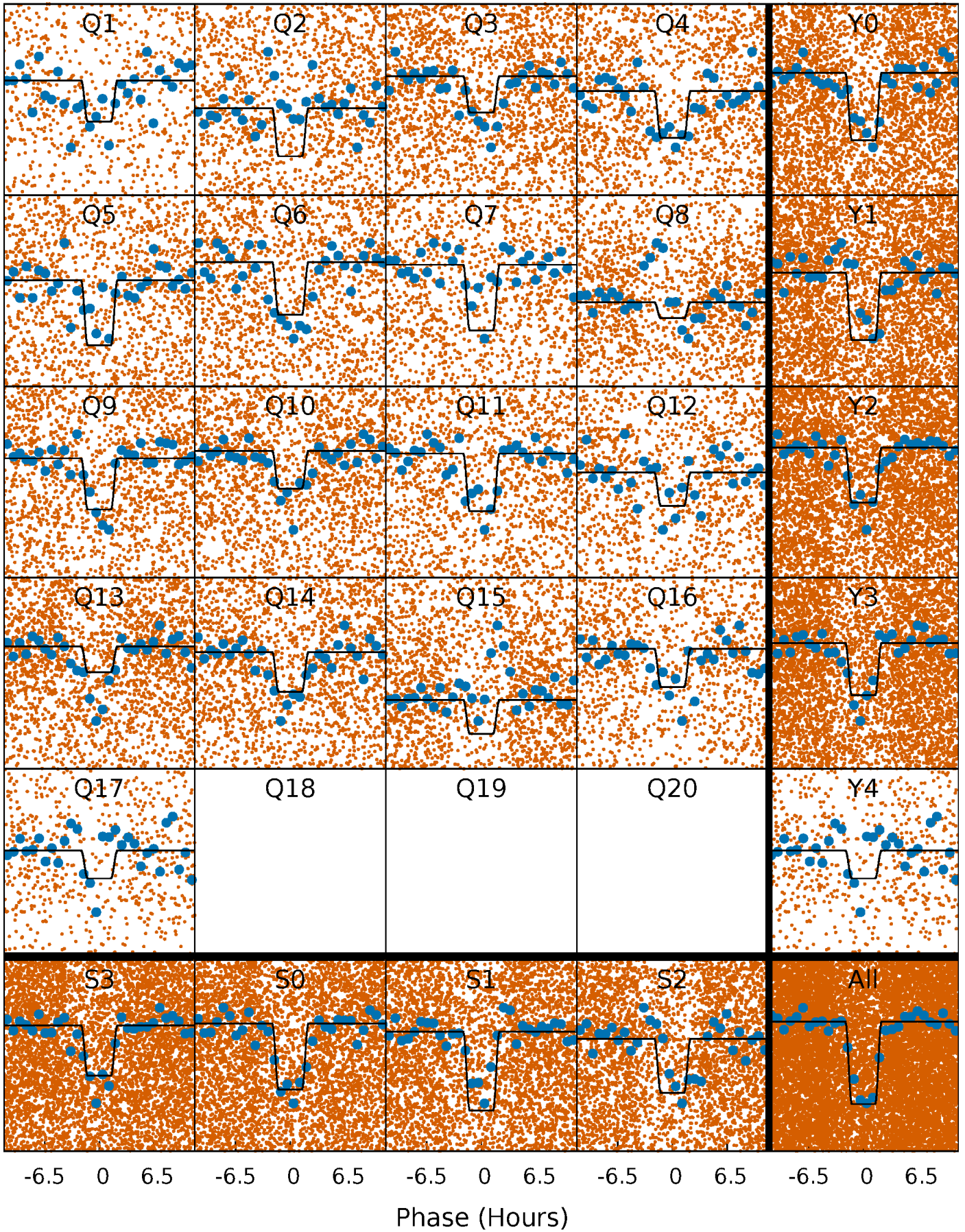
DV Quarter-Phased Transit Curves

TCE 009899216-01 P= 1.332585 Days $T_0=132.019419$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

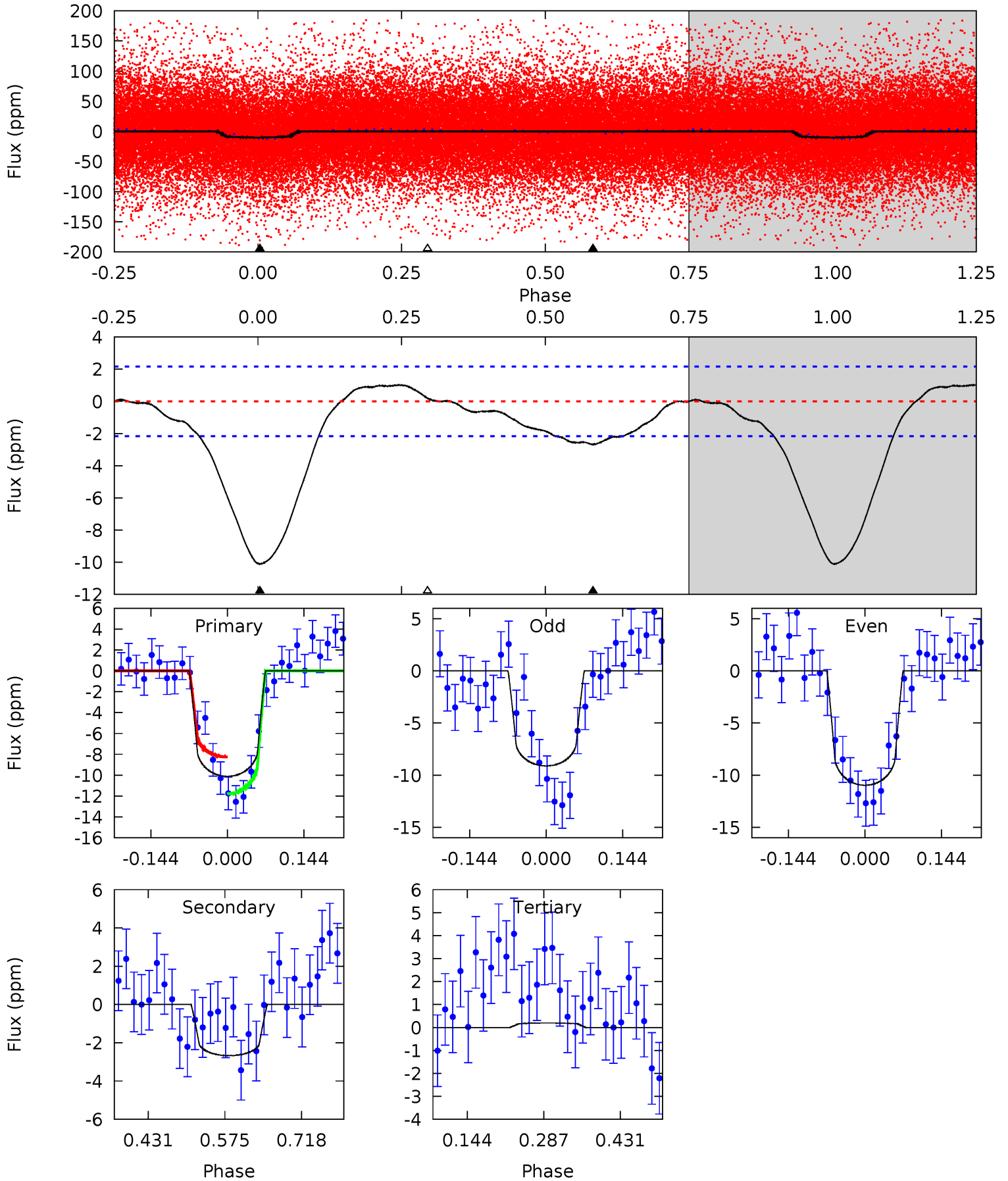
TCE 009899216-01 P= 1.332606 Days $T_0=132.016254$ (BKJD)



DV Model-Shift Uniqueness Test

009899216-01, P = 1.332585 Days, E = 130.686834 Days

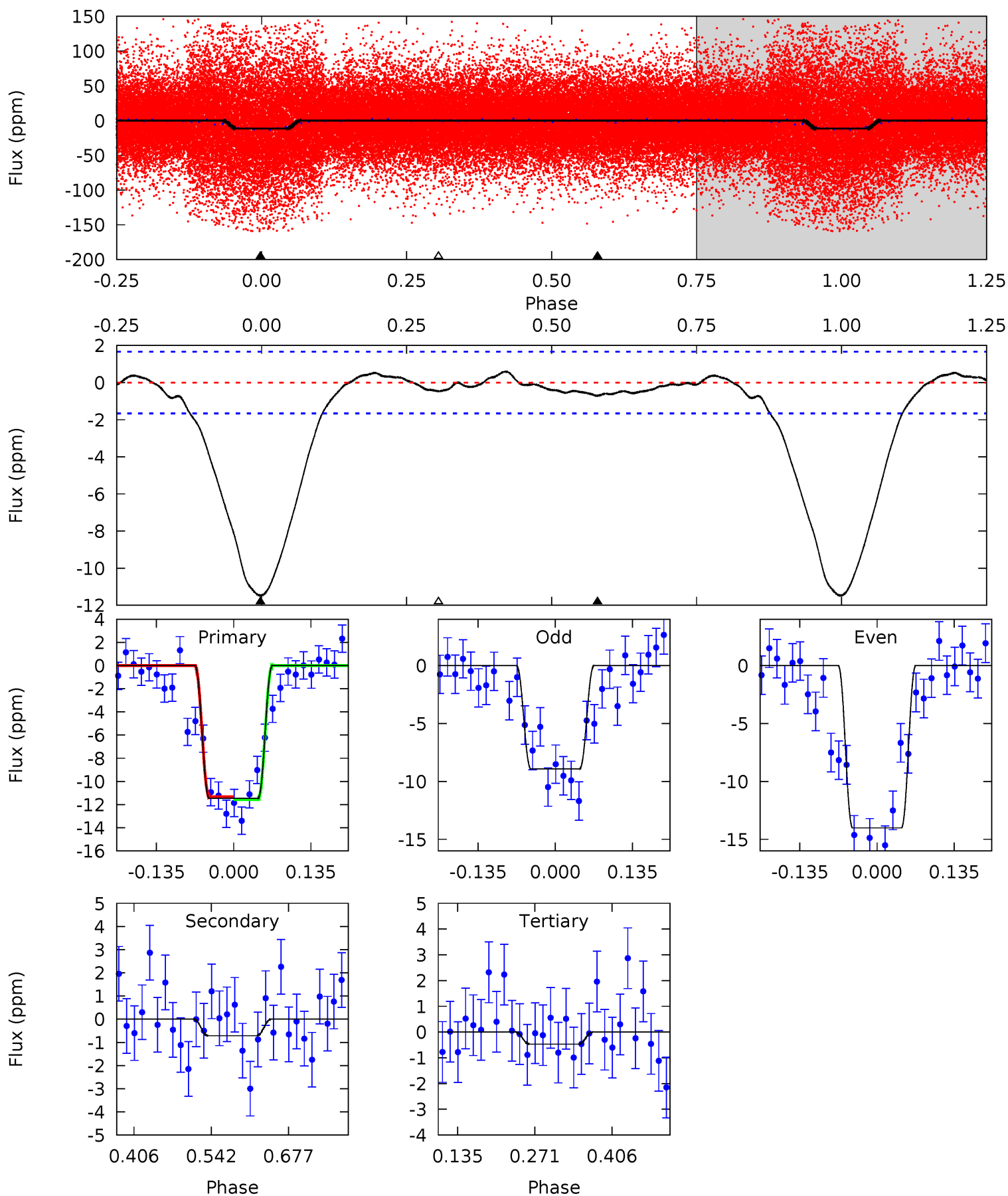
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.0	5.54	-0.40	0	4.49	1.46	1.30	21.4	21.0	5.95	5.54	1.93	1.02	0.09	3.68



Alt Model-Shift Uniqueness Test

009899216-01, P = 1.332606 Days, E = 130.683648 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.1	1.93	1.27	0	4.50	1.49	0.92	29.8	31.1	0.66	1.93	6.95	0.88	0.05	0.33



Stellar Parameters For KIC 009899216

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8133^{+227}_{-357}	$4.146^{+0.081}_{-0.175}$	$0.210^{+0.150}_{-0.500}$	$1.935^{+0.516}_{-0.301}$	$1.910^{+0.278}_{-0.340}$	$0.371^{+0.156}_{-0.177}$
	+3%/-4%	+2%/-4%	+71%/-238%	+27%/-16%	+15%/-18%	+42%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 009899216-01 / KOI 7971.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3 ± 0	$0.68^{+0.13}_{-0.11}$	4120^{+270}_{-234}	5515^{+481}_{-451}	$2.636^{+1.126}_{-0.810}$
Alt.	-1 ± 0	$0.72^{+0.13}_{-0.11}$	4114^{+298}_{-242}	3750^{+588}_{-6106}	$0.636^{+0.457}_{-0.345}$

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

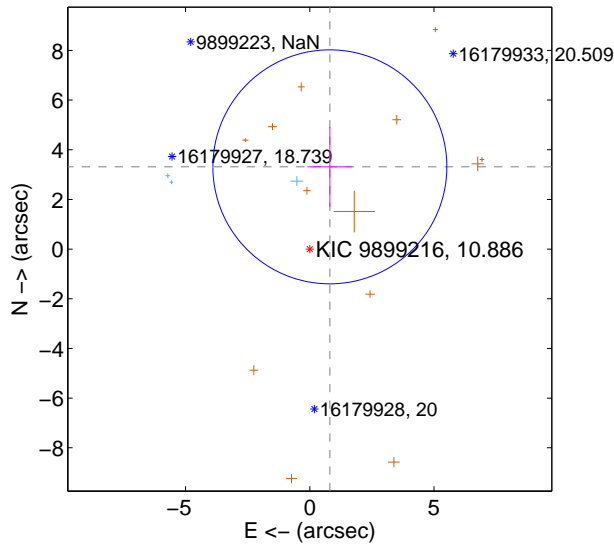
Supplemental centroid analysis for 009899216-01. **Kepler magnitude: 10.89.** Transit SNR 11.41

There are 3 quarters with good PRF difference image offsets

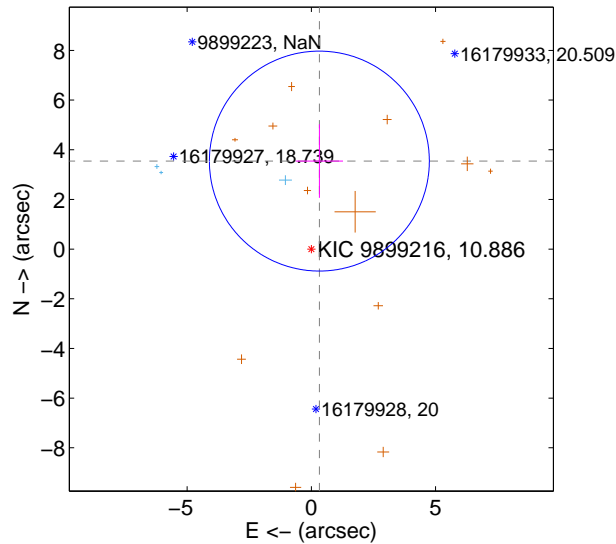
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.409 ± 1.570	2.17	-0.809 ± 0.899	3.312 ± 1.612
PRF-fit source offset from KIC position	3.558 ± 1.476	2.41	-0.323 ± 0.951	3.543 ± 1.480
photometric centroid source offset	3.12 ± 1.48	2.10	-3.07 ± 1.49	0.56 ± 1.23

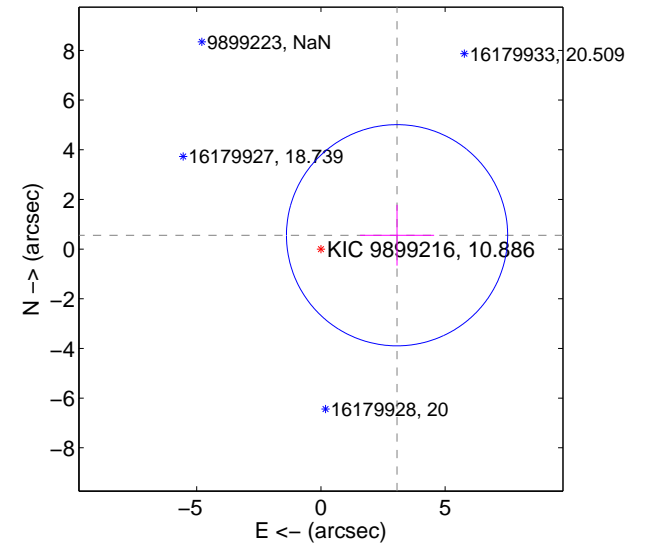
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

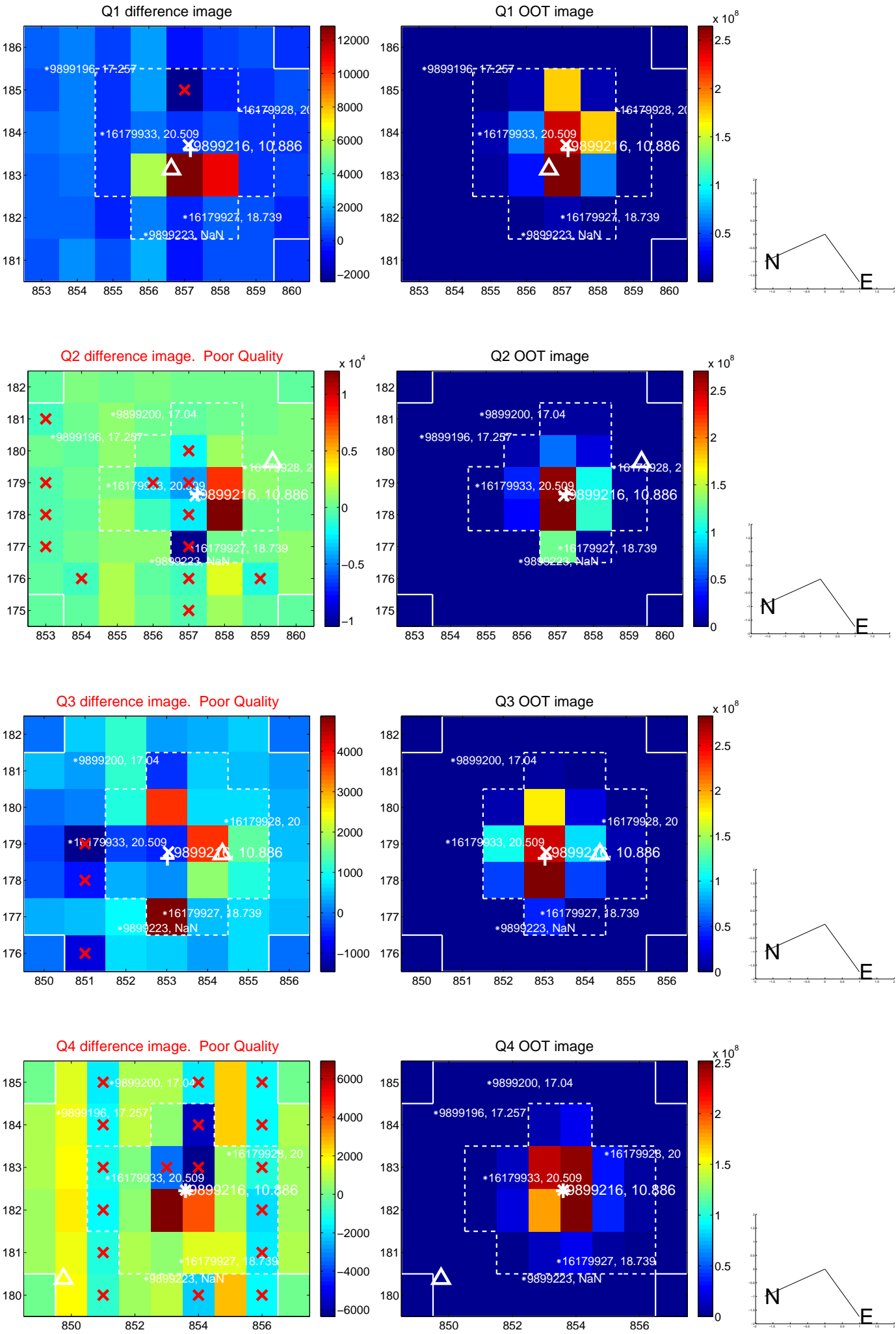


offset from photometric centroids

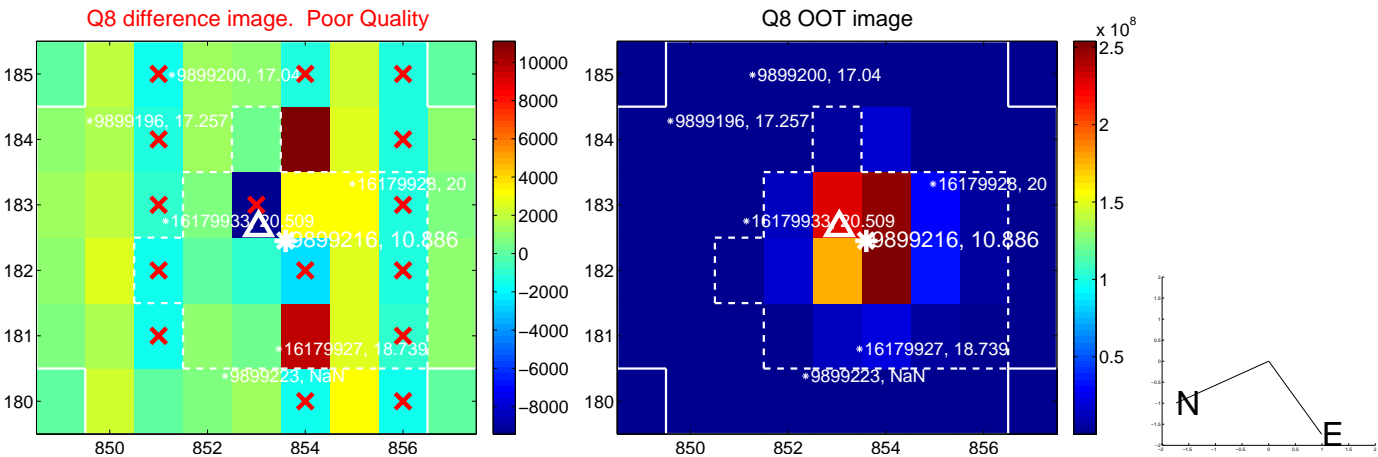
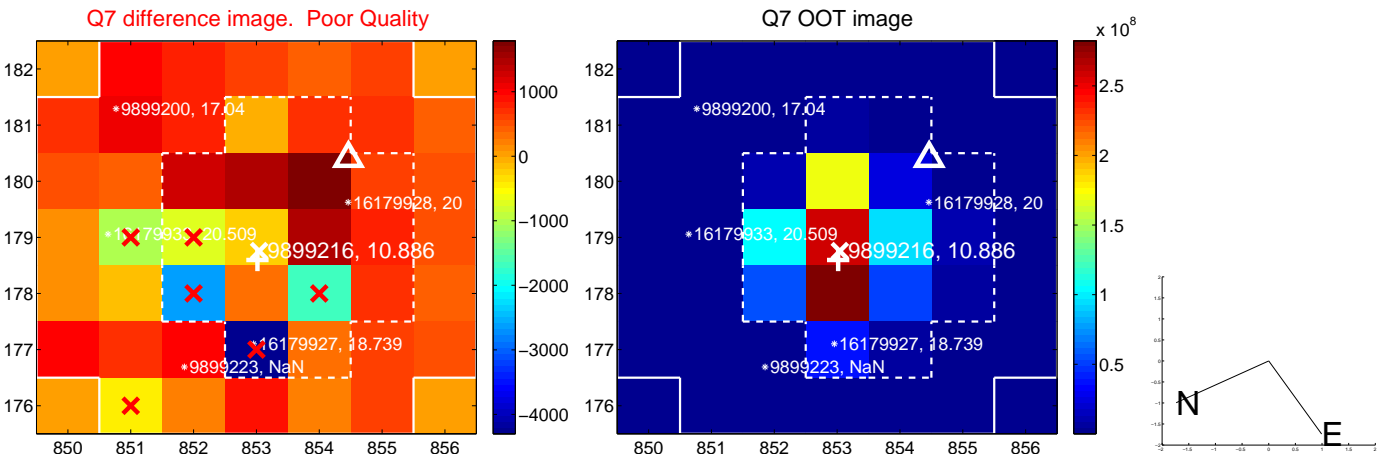
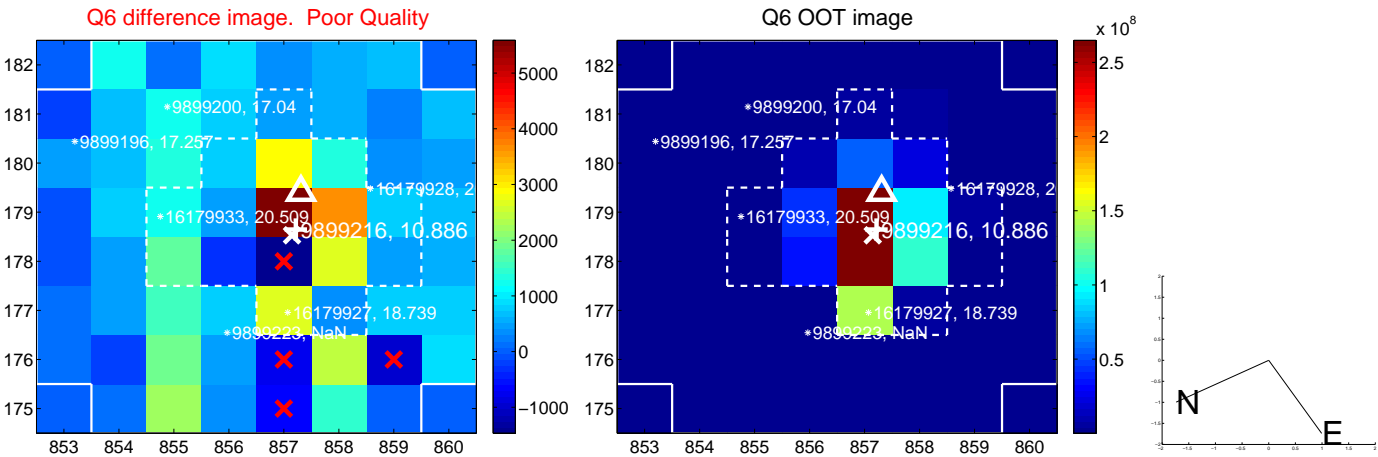
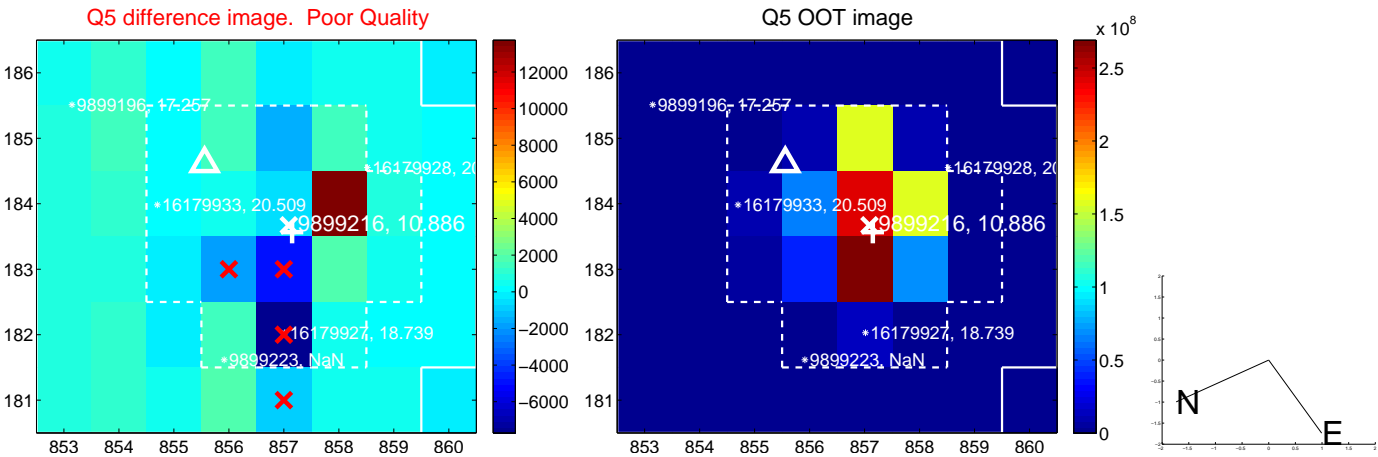


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

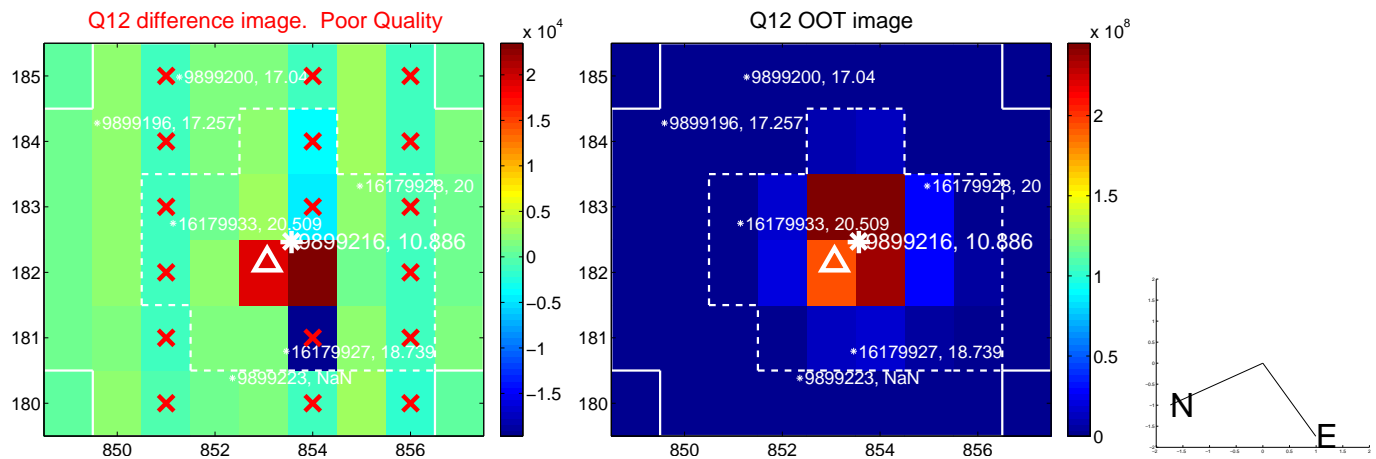
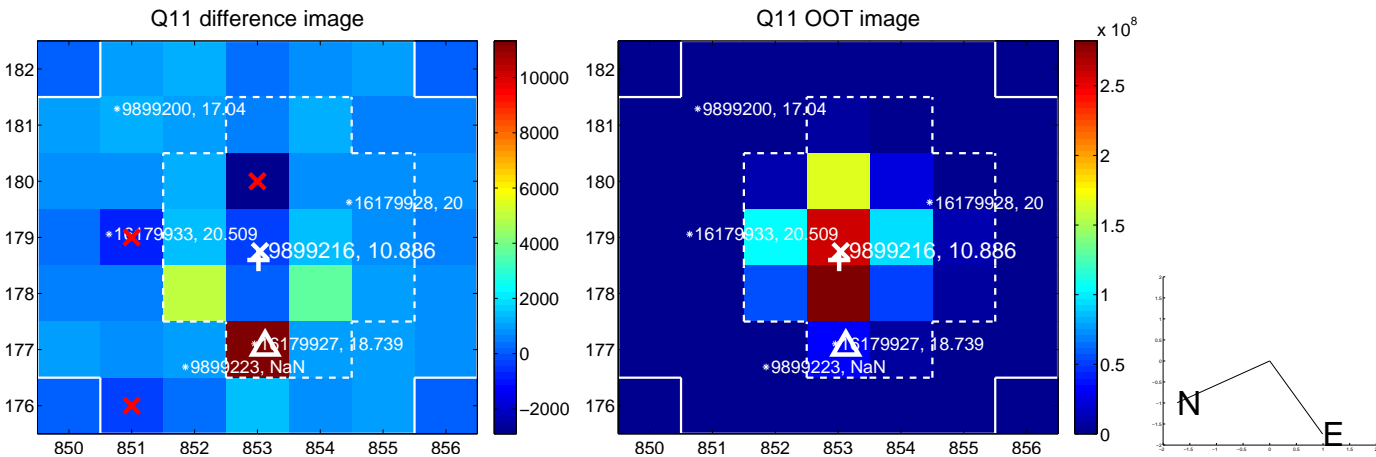
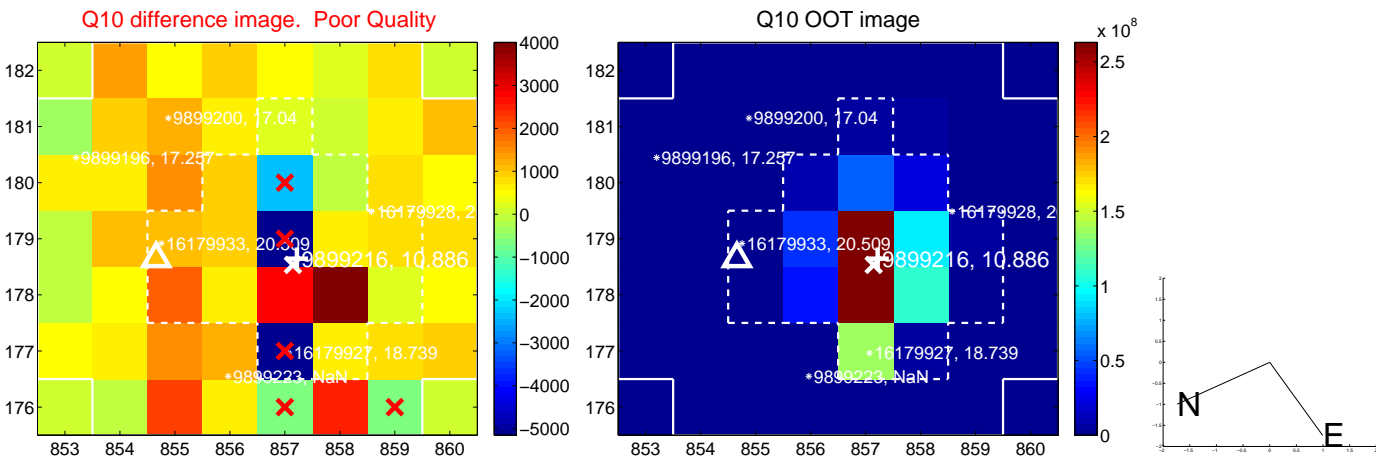
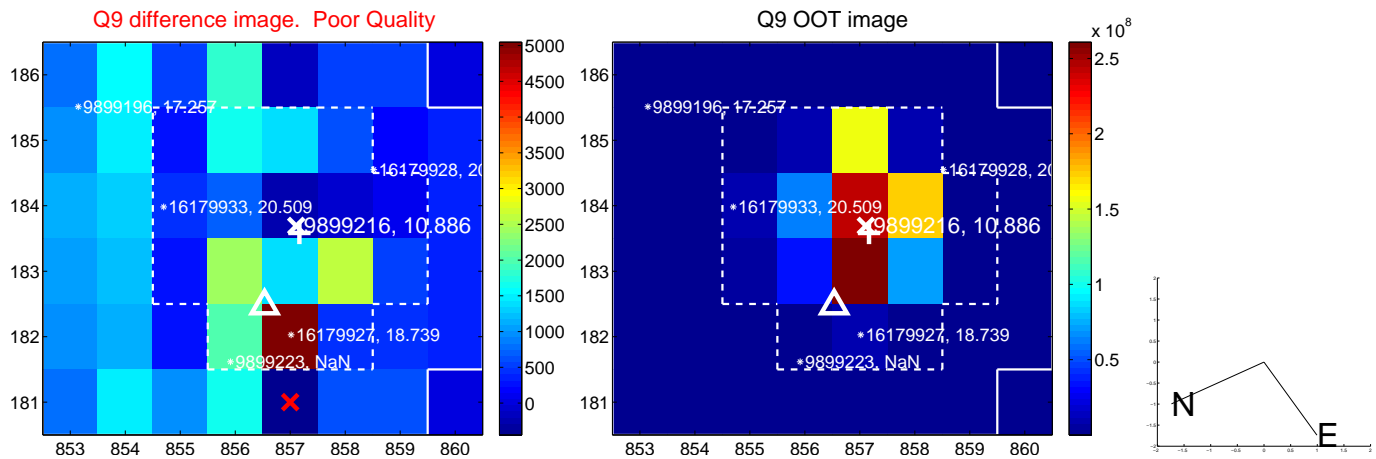
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



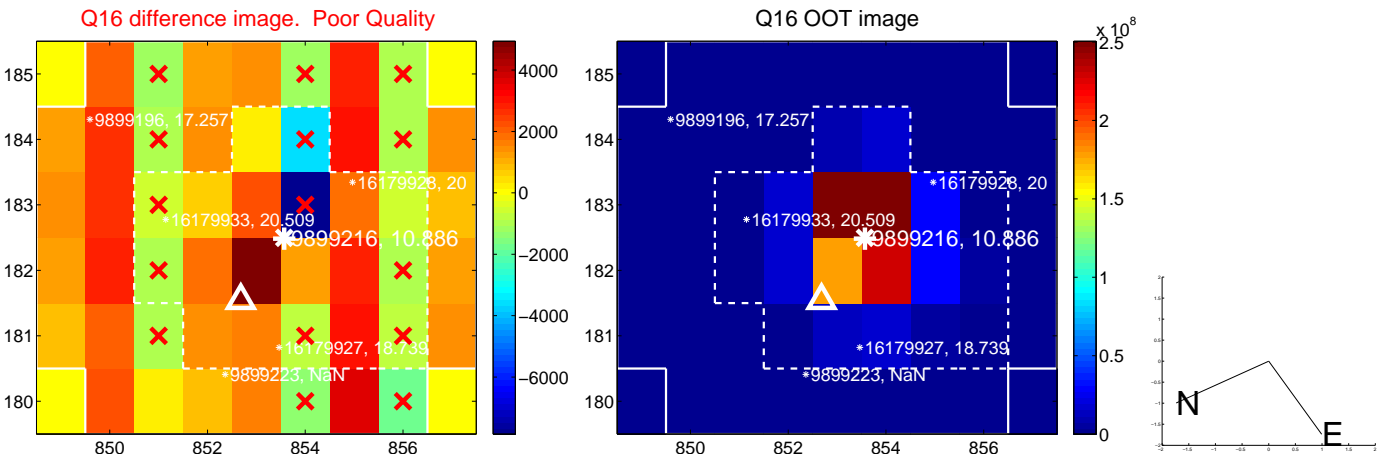
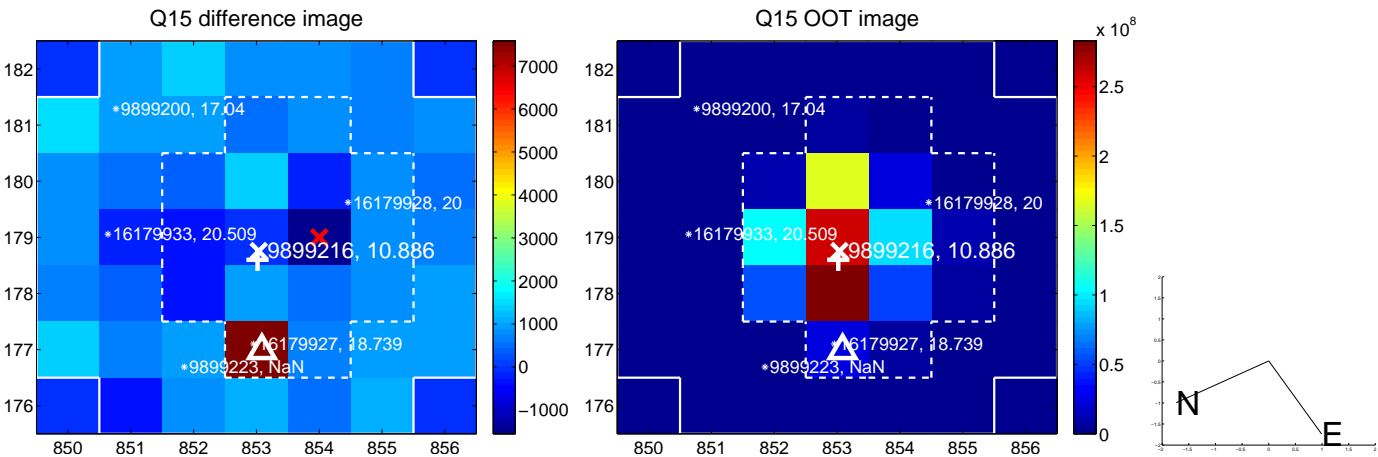
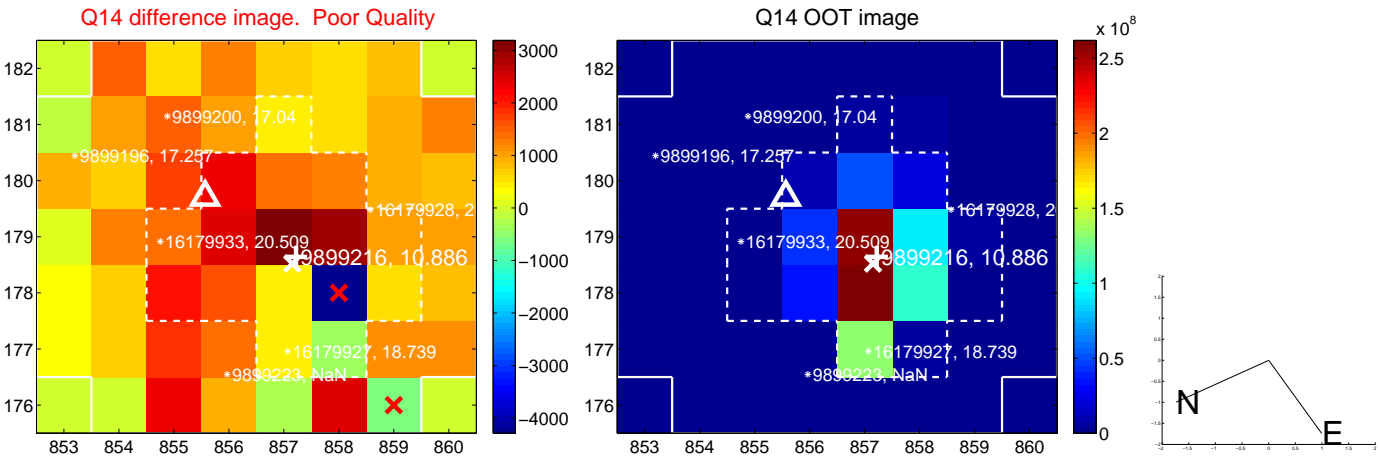
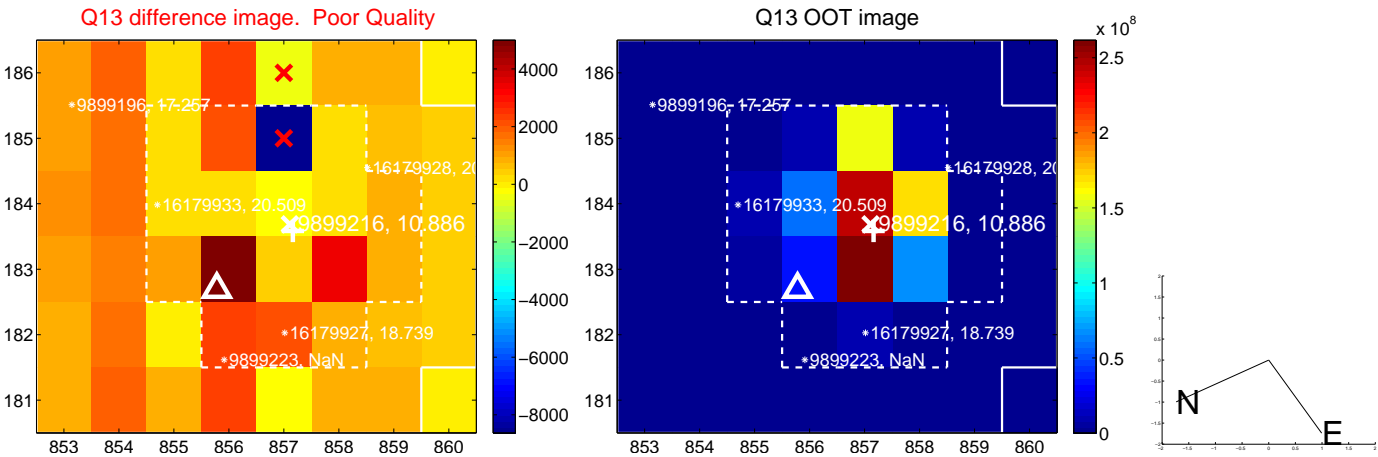
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



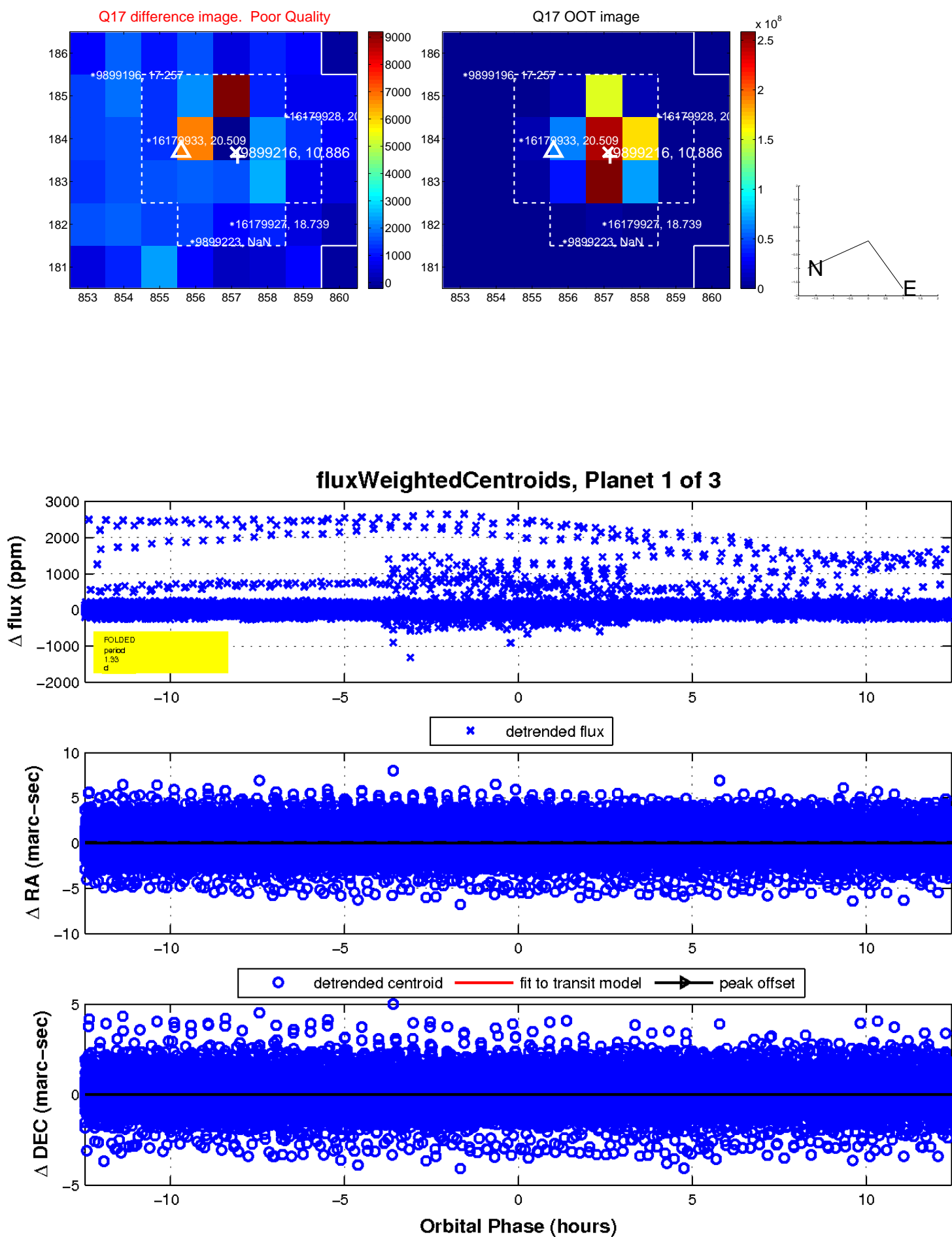
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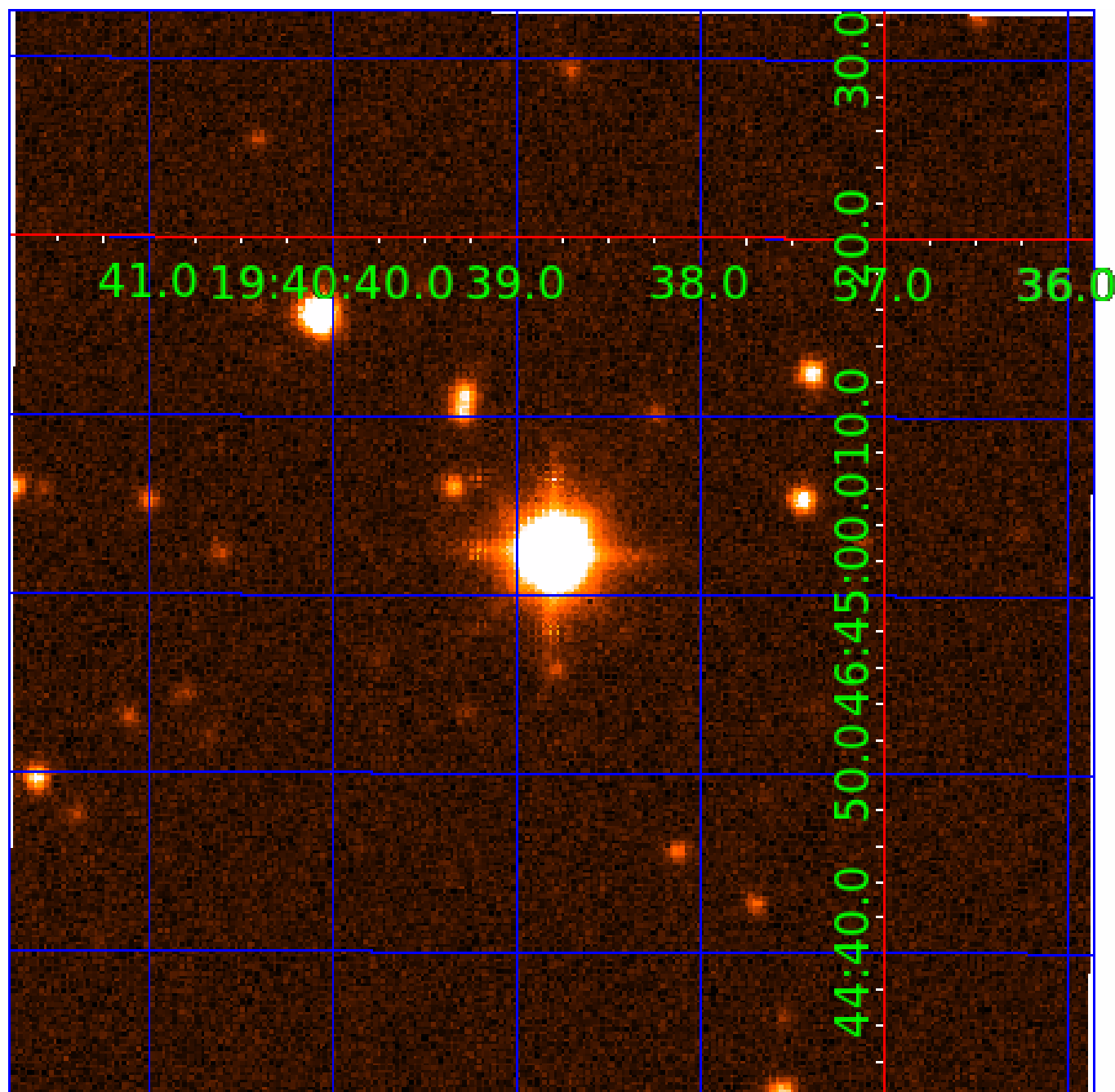


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009899216

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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009899216-02	OBS	No	611.452974	159.870808	2496.1	44.486	9.4	13.6	1.94	8133	17.48	4.79
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009899216-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
009899216-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

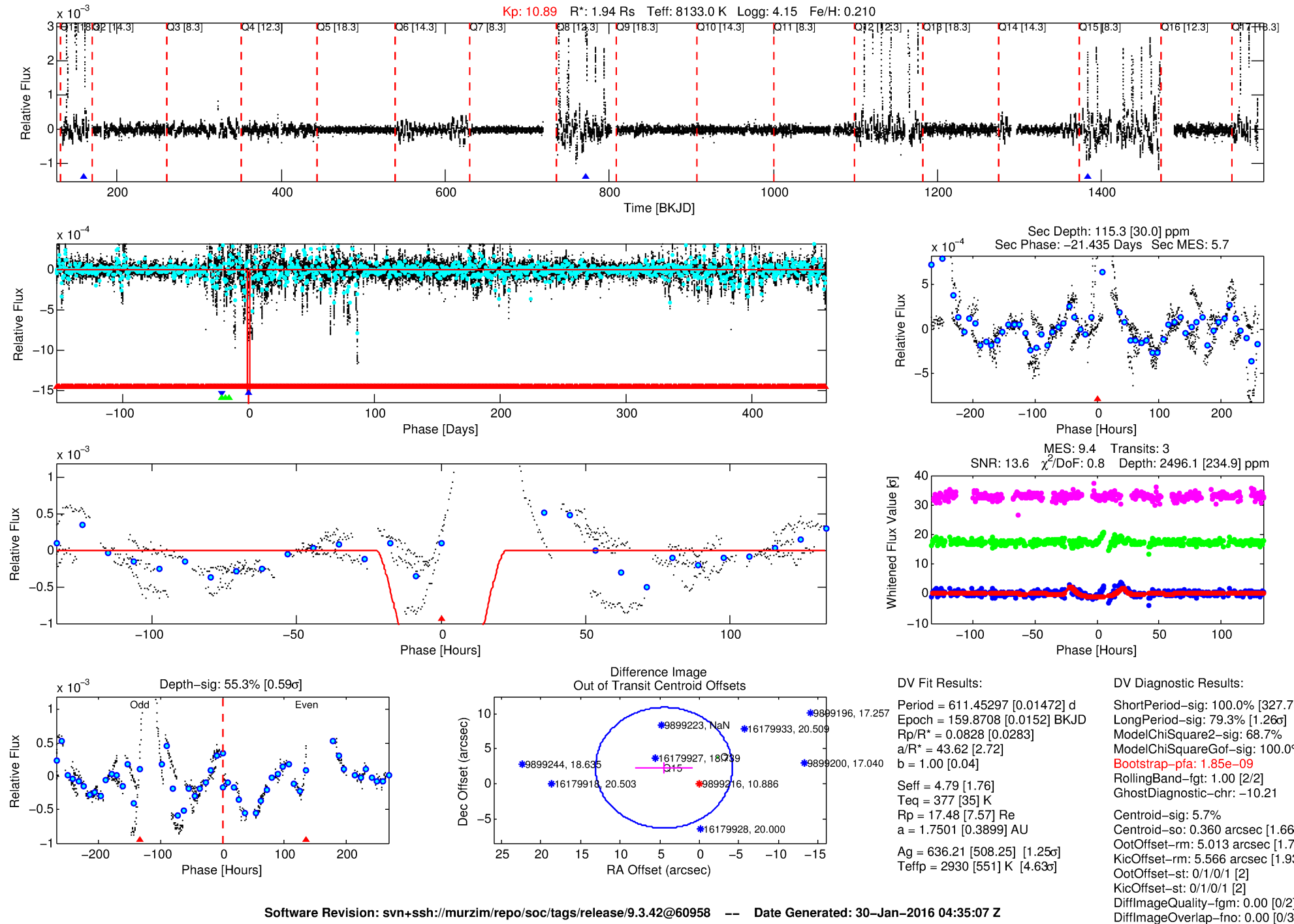
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009899216-02

No Significant Match Found

DV One-Page Summary

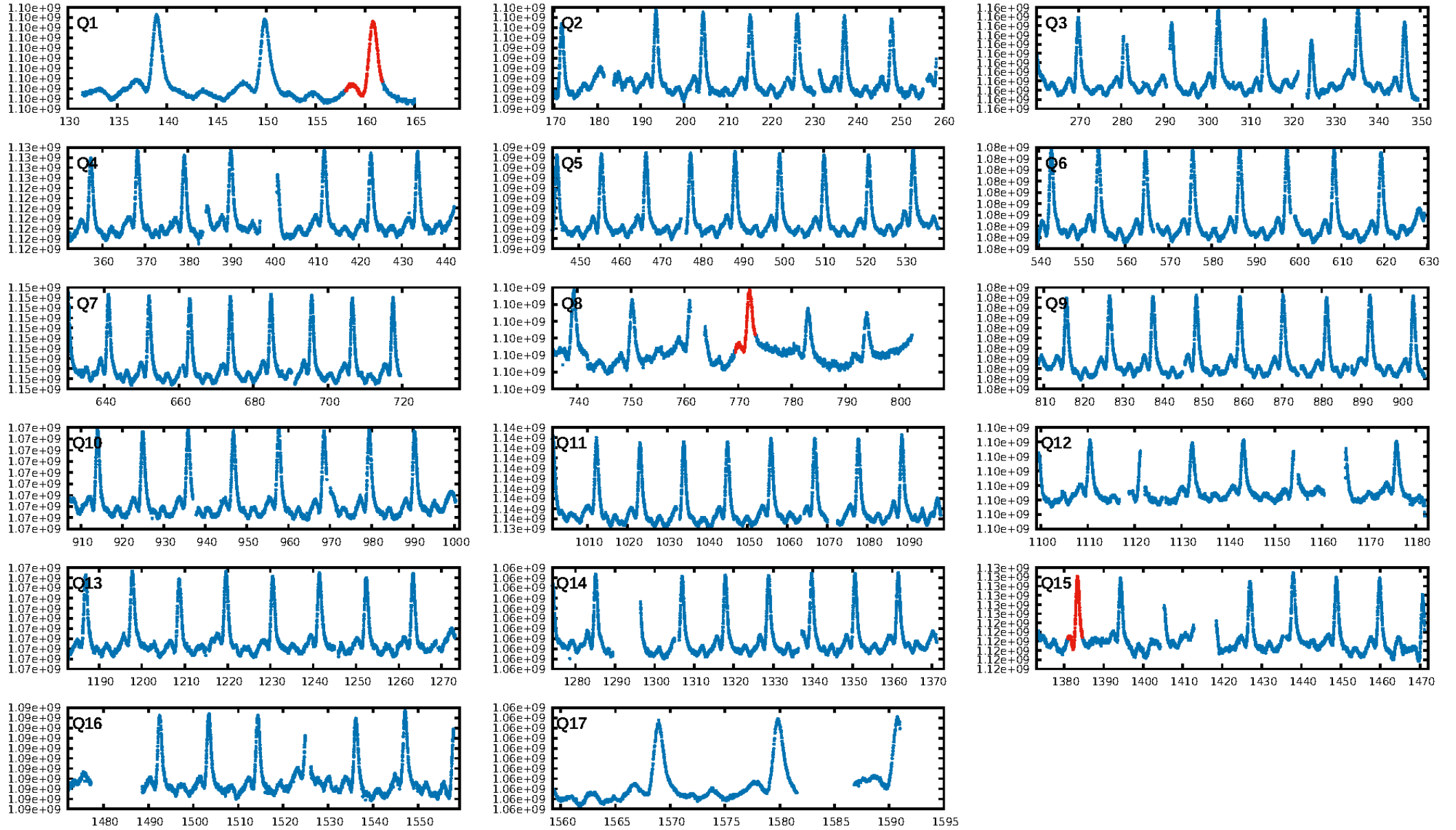
KIC: 9899216 Candidate: 2 of 3 Period: 611.453 d



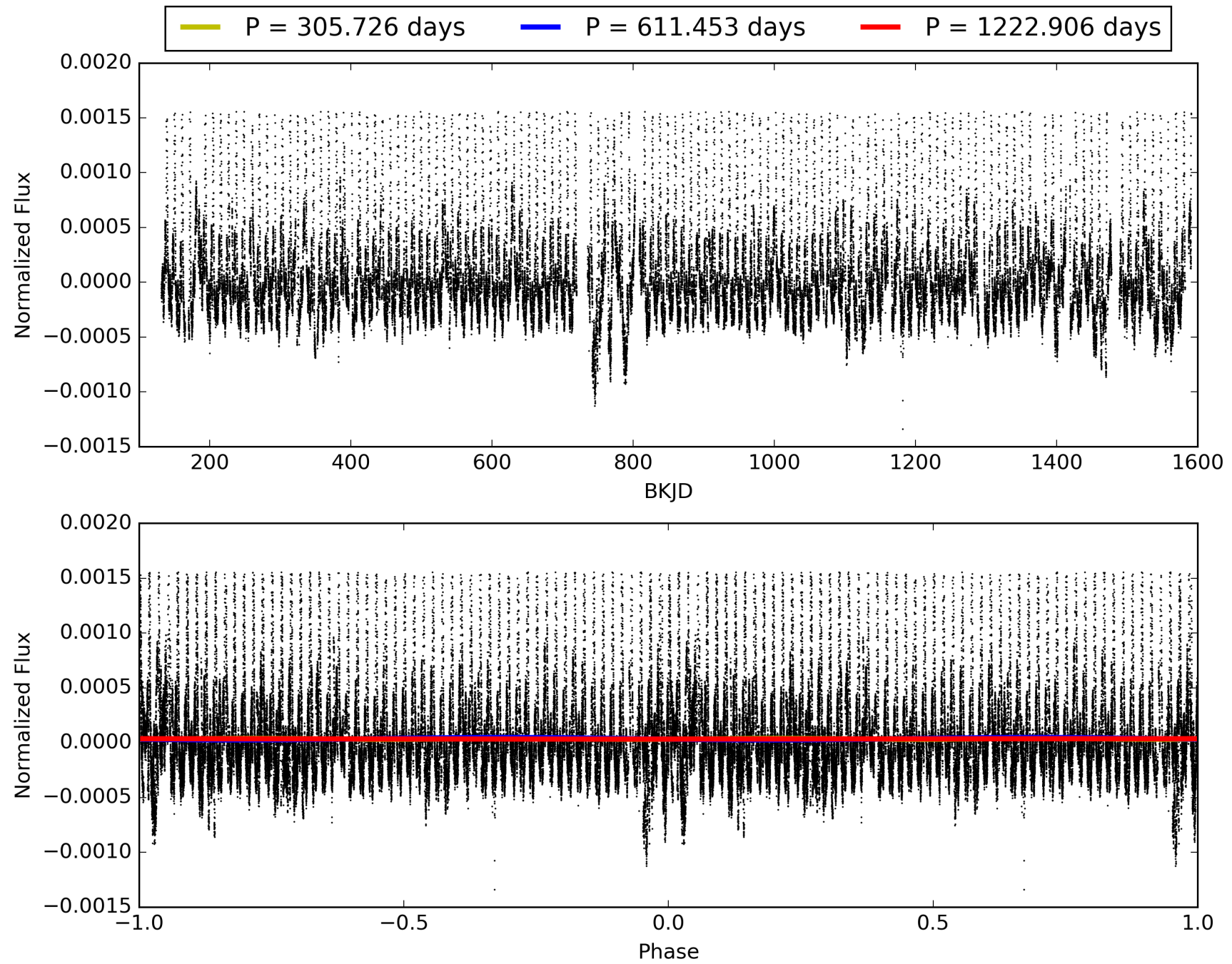
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009899216-02, PDC Light Curves

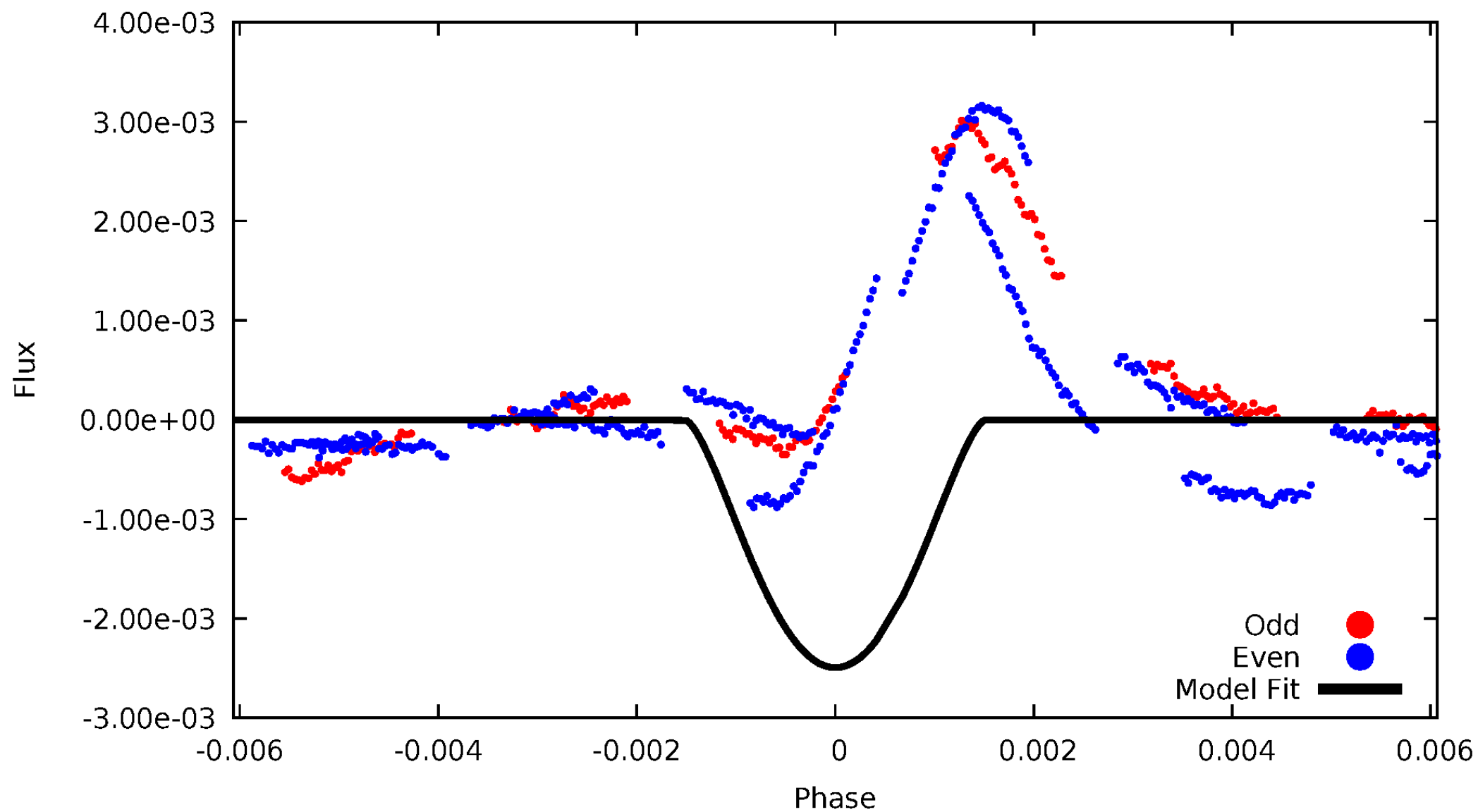


TCE 009899216-02



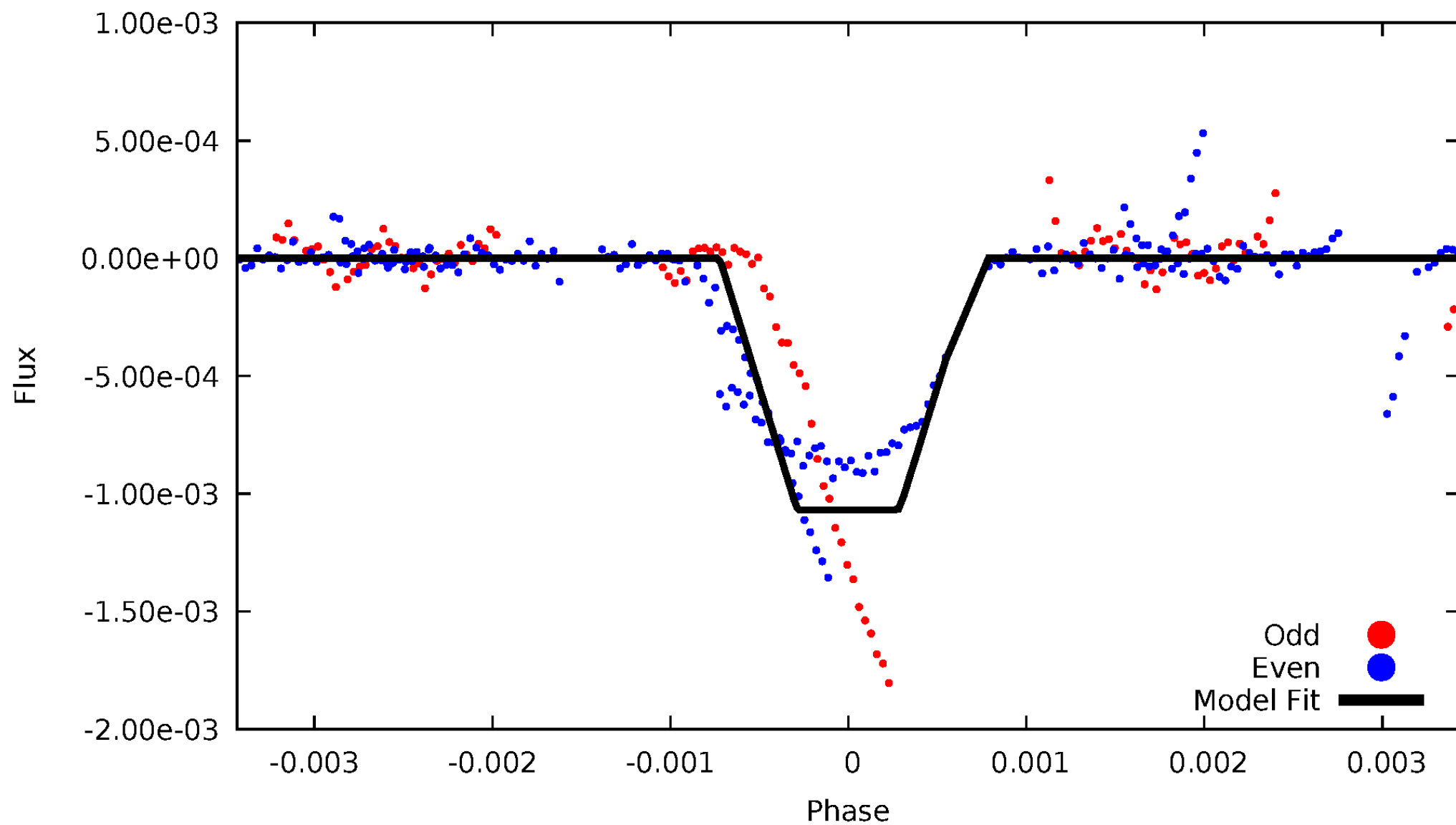
DV Odd/Even

TCE 009899216-02



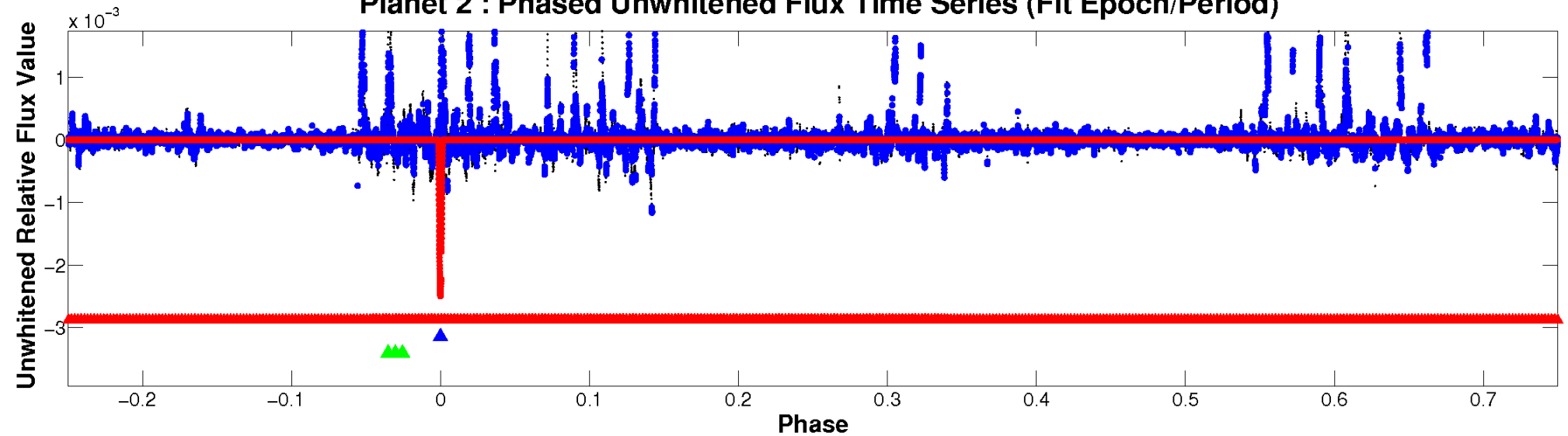
ALT Odd/Even

TCE 009899216-02

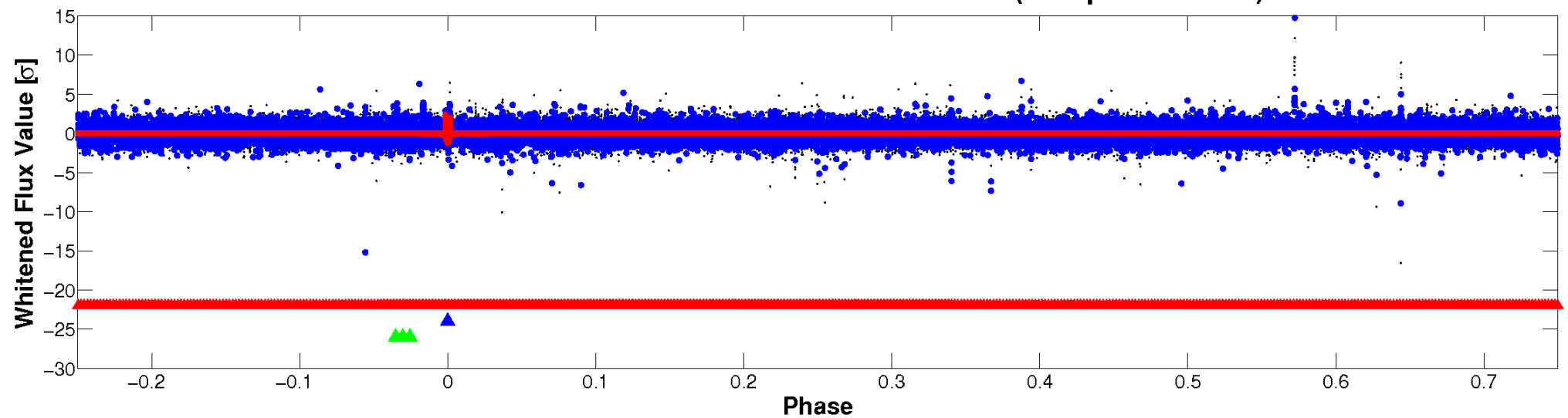


Non-Whitened Vs. Whitened Light Curve

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

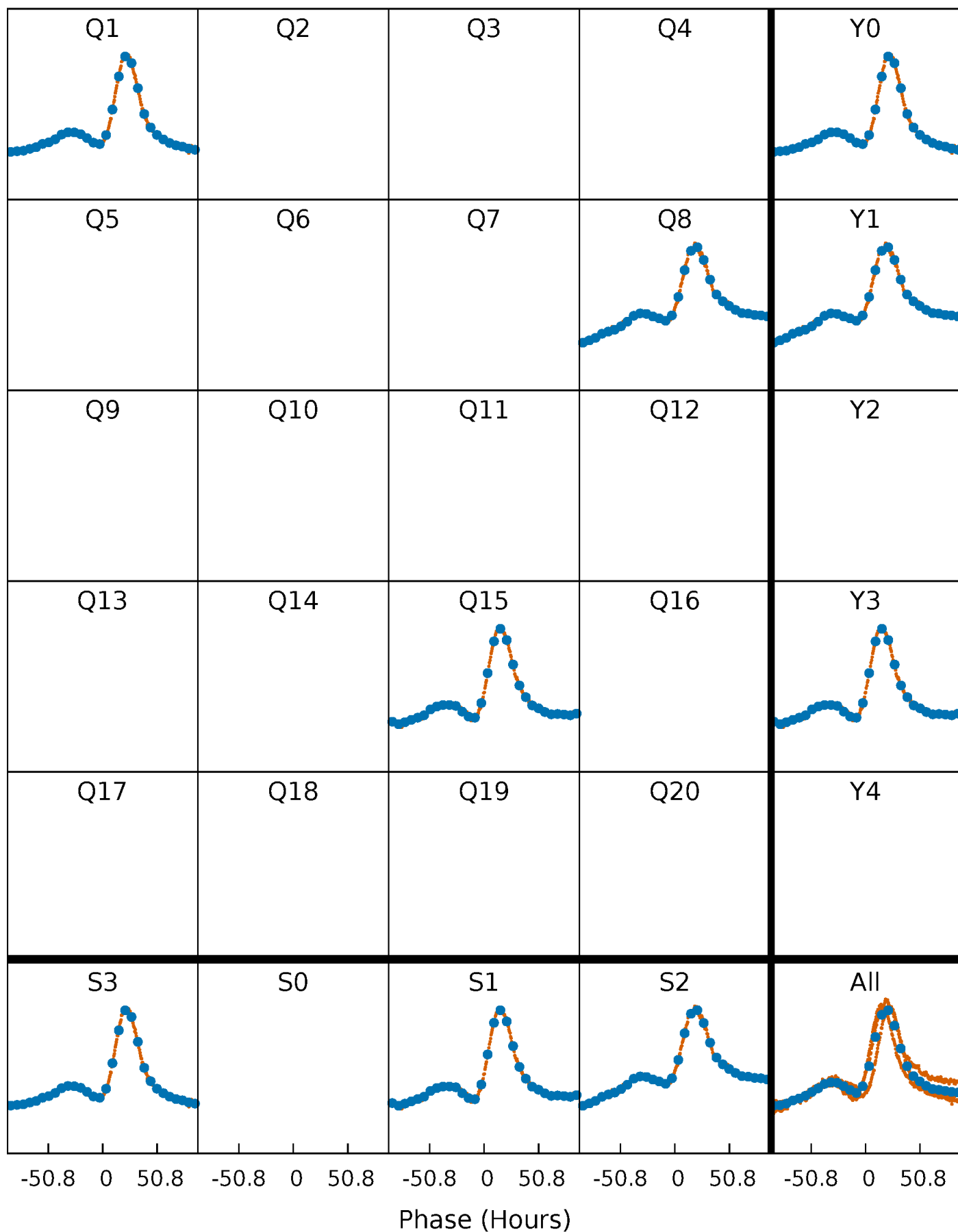


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



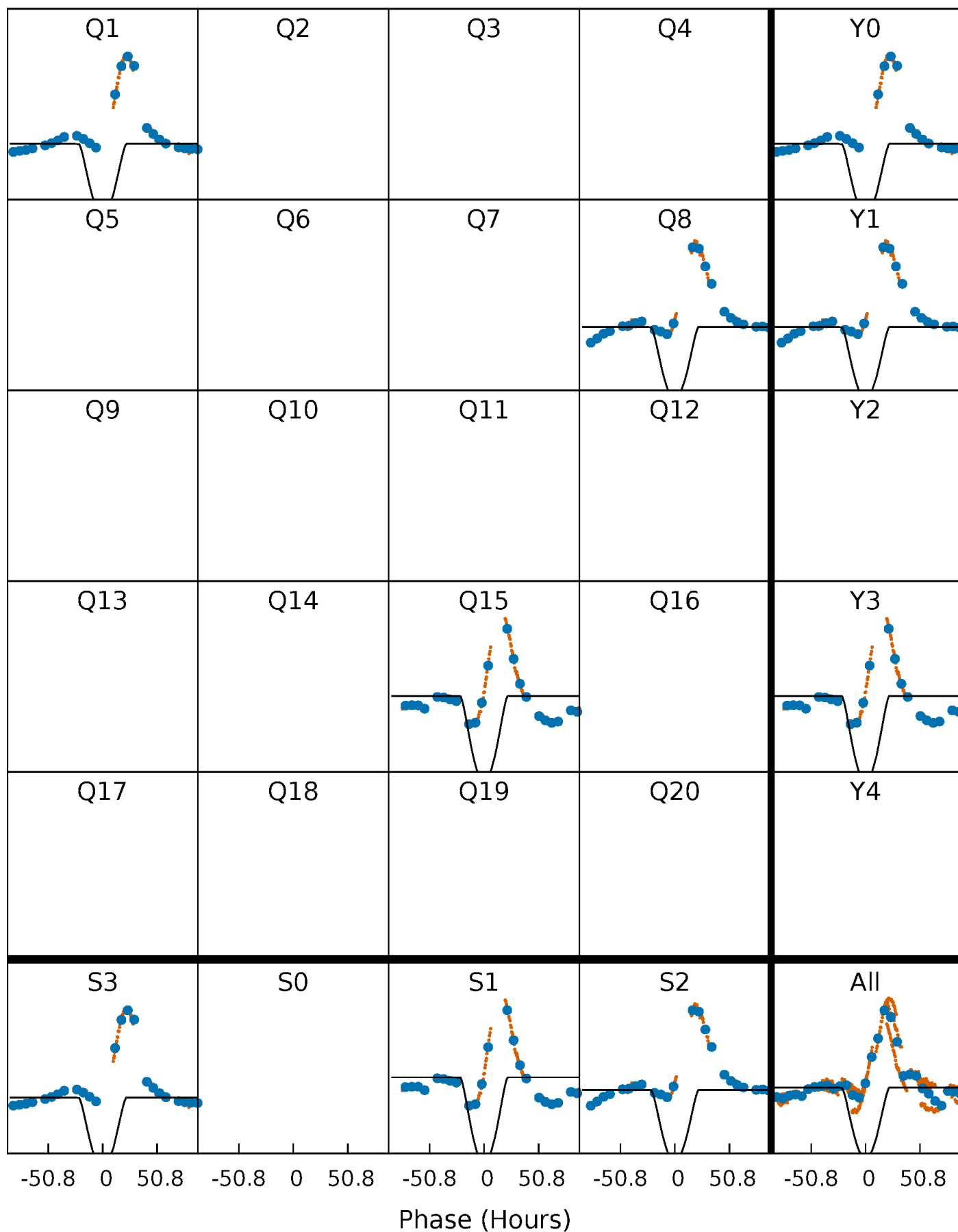
PDC Quarter-Phased Transit Curves

TCE 009899216-02 P=611.452974 Days $T_0=159.870808$ (BKJD)



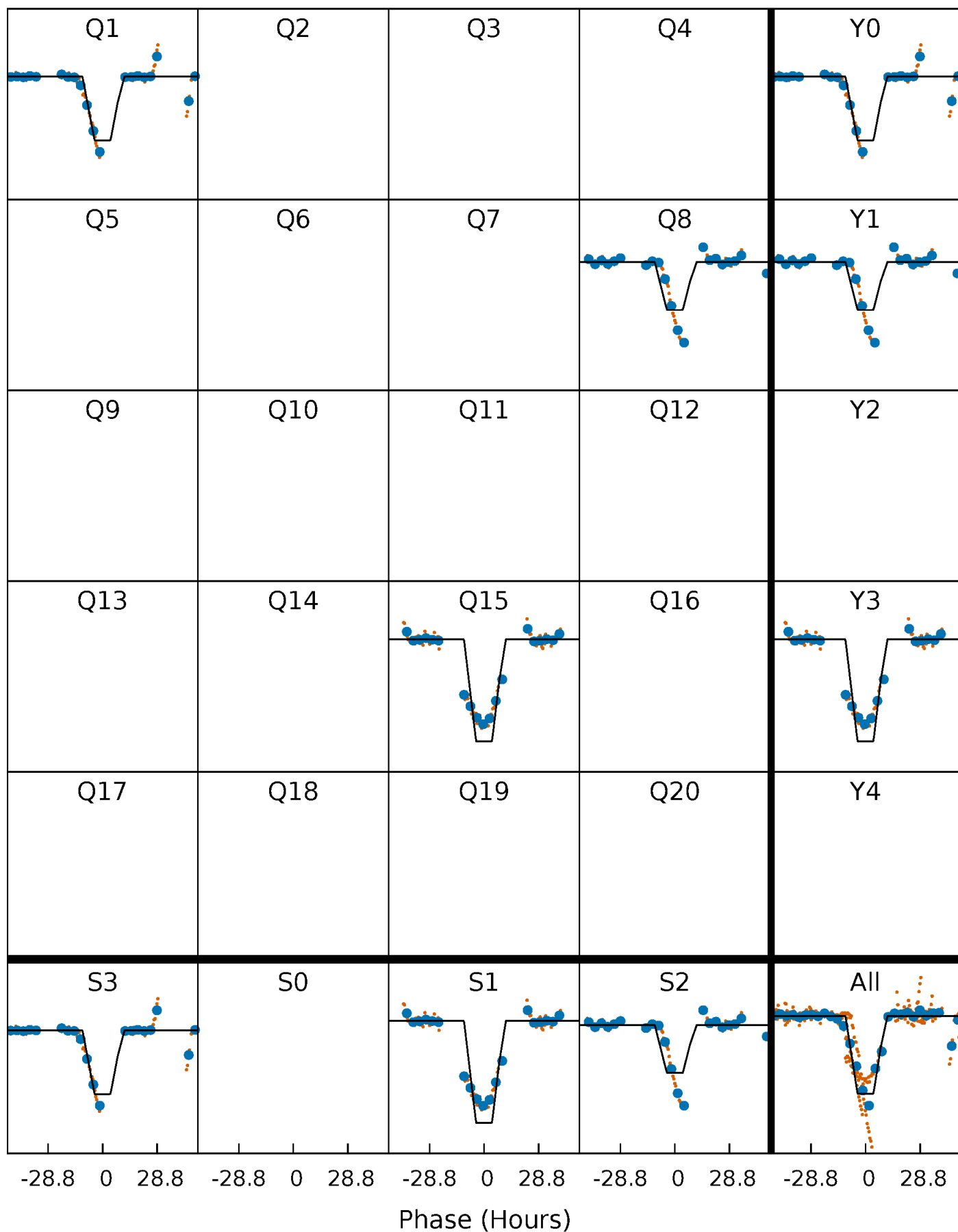
DV Quarter-Phased Transit Curves

TCE 009899216-02 P=611.452974 Days $T_0=159.870808$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

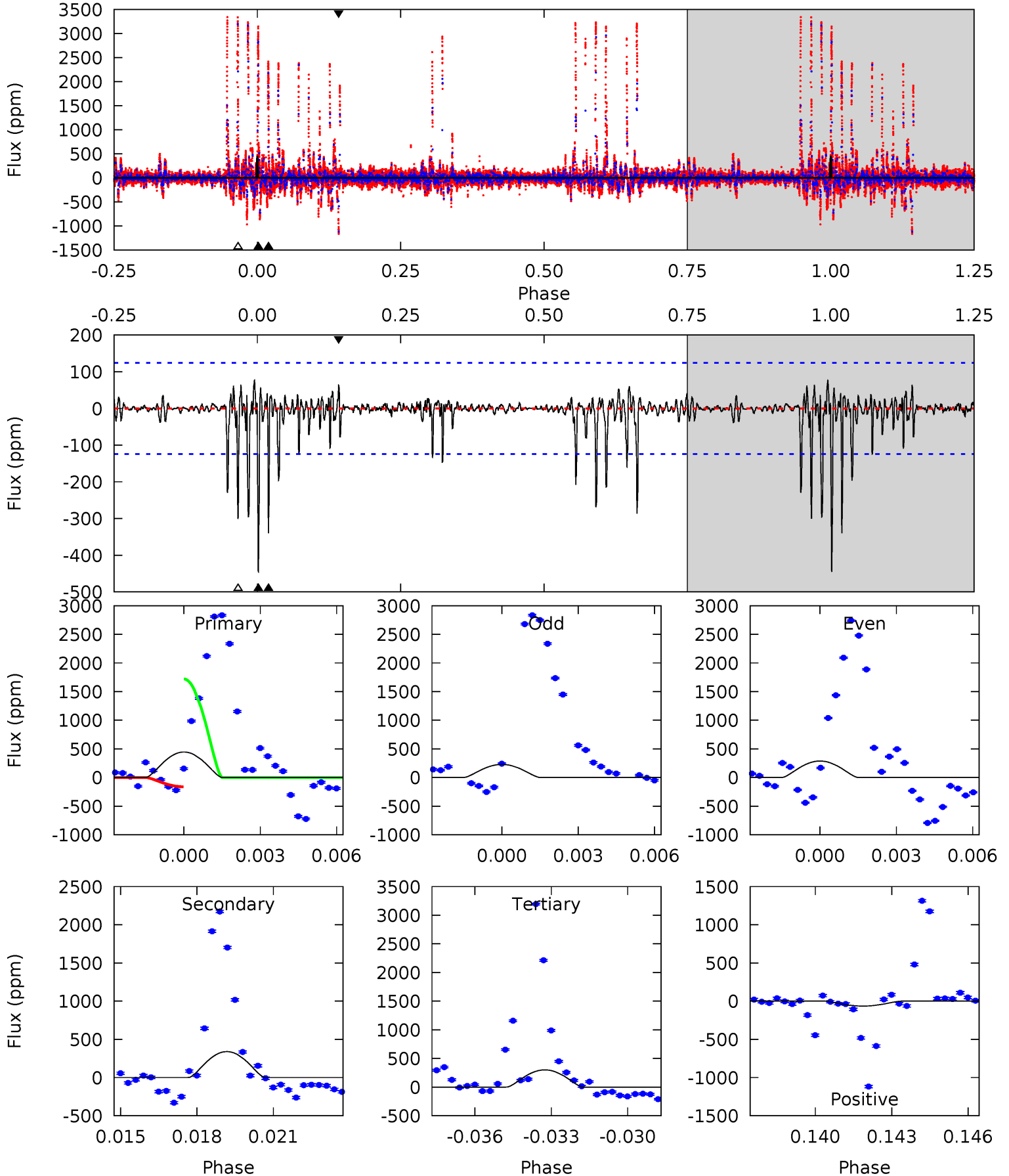
TCE 009899216-02 P=611.447038 Days $T_0=159.801191$ (BKJD)



DV Model-Shift Uniqueness Test

009899216-02, P = 611.452974 Days, E = 159.870808 Days

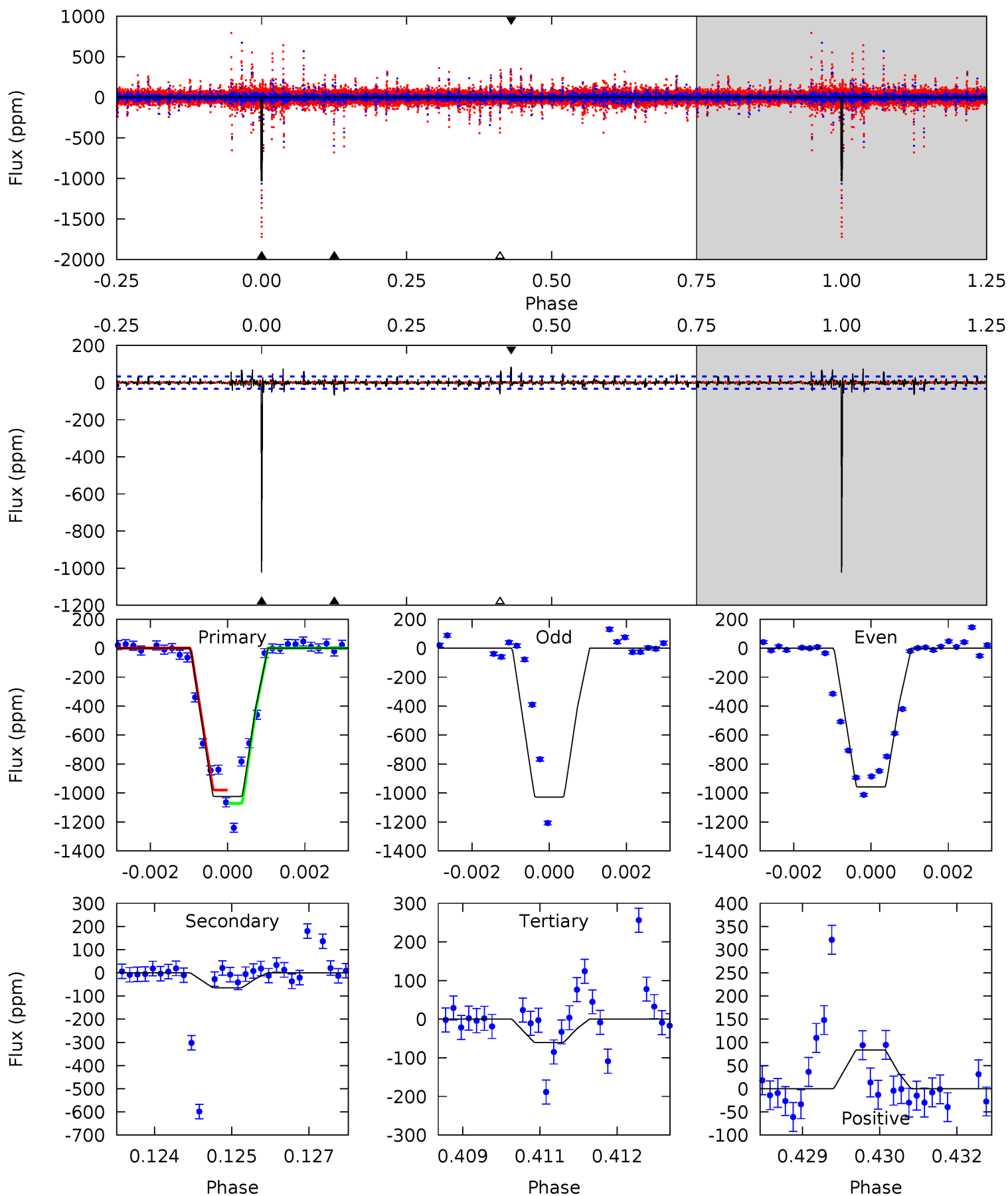
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.8	14.3	12.7	2.71	5.25	2.96	1.56	6.11	16.1	1.65	11.6	1.36	1.52	0.15	34.6



Alt Model-Shift Uniqueness Test

009899216-02, P = 611.447038 Days, E = 159.801191 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
166.3	10.4	9.80	13.6	5.38	3.17	1.40	156.5	152.7	0.63	-3.19	5.96	1.00	0.08	7.15



Stellar Parameters For KIC 009899216

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8133^{+227}_{-357}	$4.146^{+0.081}_{-0.175}$	$0.210^{+0.150}_{-0.500}$	$1.935^{+0.516}_{-0.301}$	$1.910^{+0.278}_{-0.340}$	$0.371^{+0.156}_{-0.177}$
	+3%/-4%	+2%/-4%	+71%/-238%	+27%/-16%	+15%/-18%	+42%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 009899216-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-340 ± 24	$17.93^{+6.38}_{-6.09}$	534^{+34}_{-32}	4016^{+673}_{-388}	1753^{+2305}_{-824}
Alt.	-64 ± 6	$7.77^{+5.86}_{-4.54}$	534^{+35}_{-30}	4031^{+1774}_{-665}	1795^{+8365}_{-1225}

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

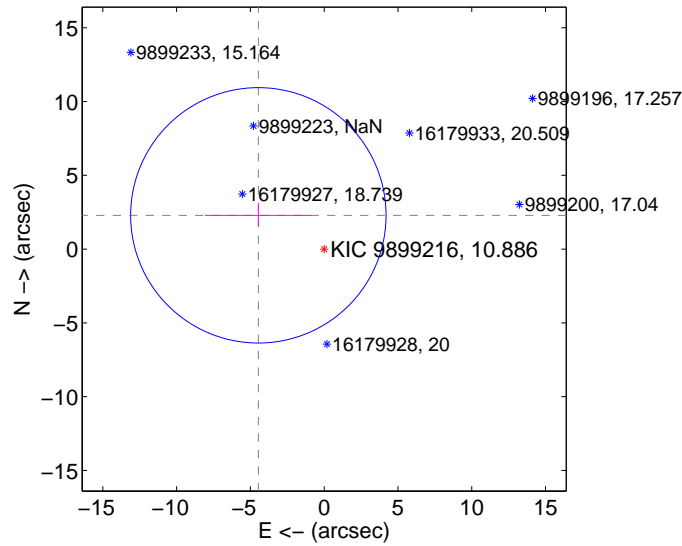
Supplemental centroid analysis for 009899216-02. **Kepler magnitude: 10.89.** Transit SNR 13.61

There are 0 quarters with good PRF difference image offsets

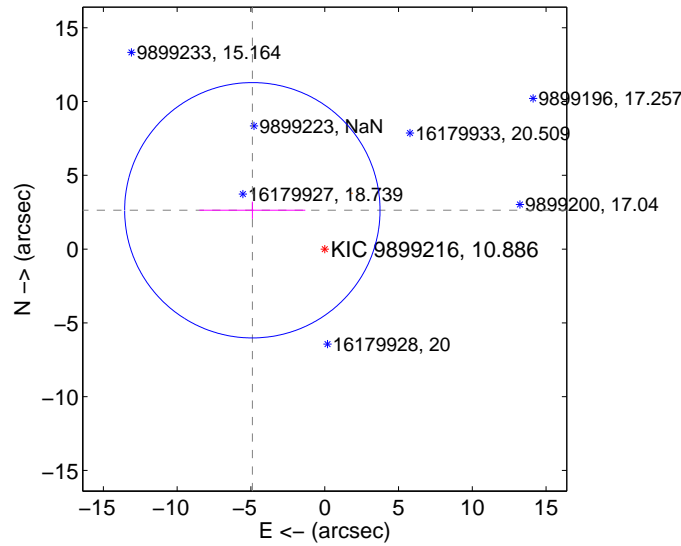
The direct PRF centroid is offset from the target star catalog position by about 0.56 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.013 ± 2.884	1.74	4.461 ± 3.623	2.288 ± 0.747
PRF-fit source offset from KIC position	5.566 ± 2.884	1.93	4.905 ± 3.586	2.632 ± 0.588
photometric centroid source offset	0.36 ± 0.22	1.66	0.36 ± 0.22	-0.05 ± 0.05

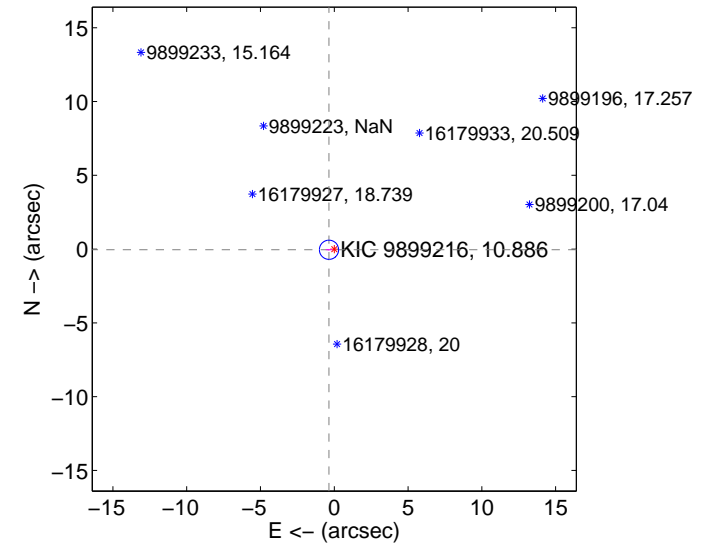
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

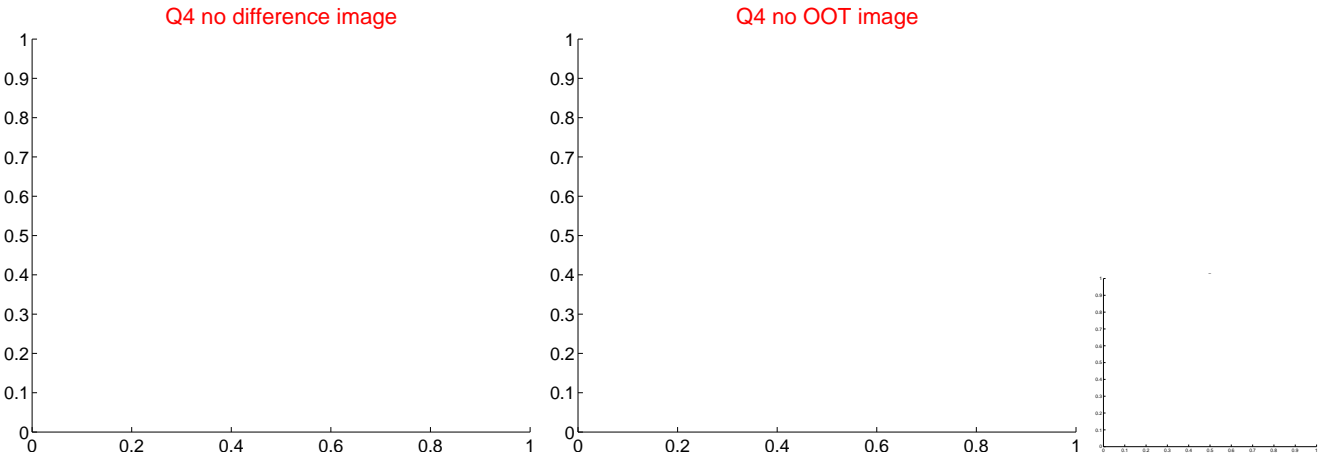
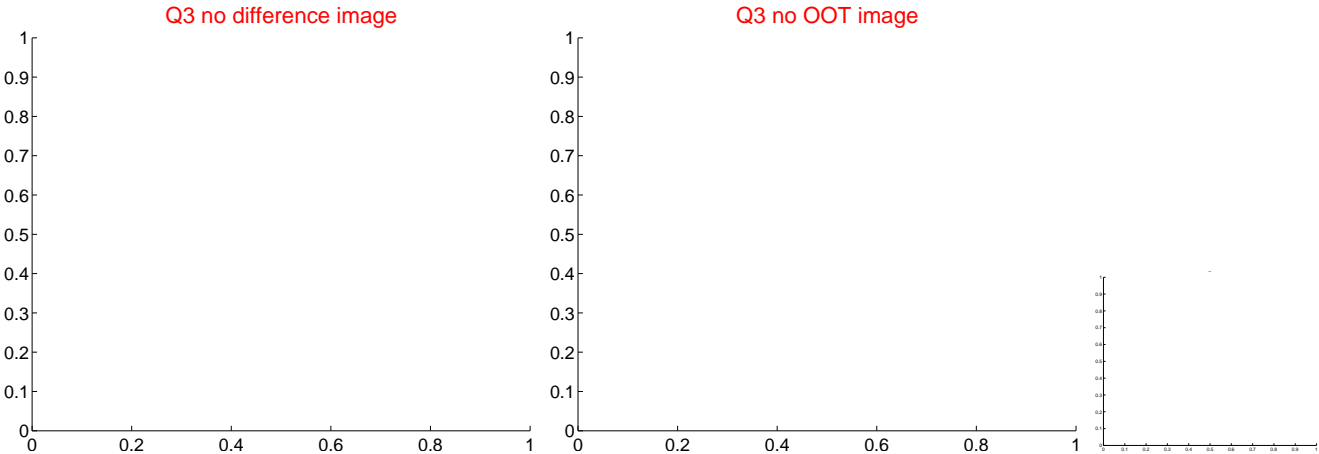
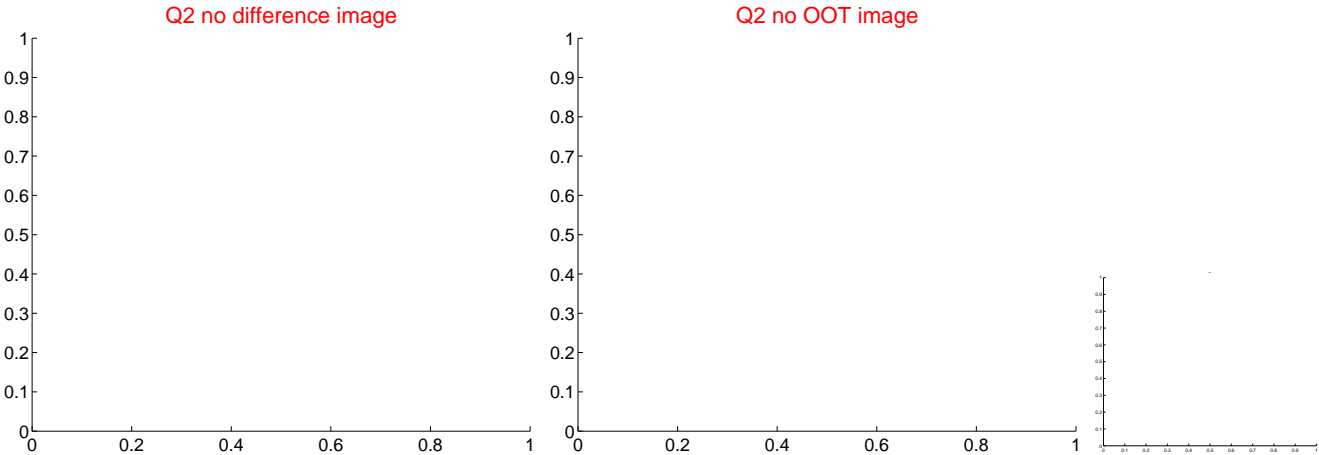
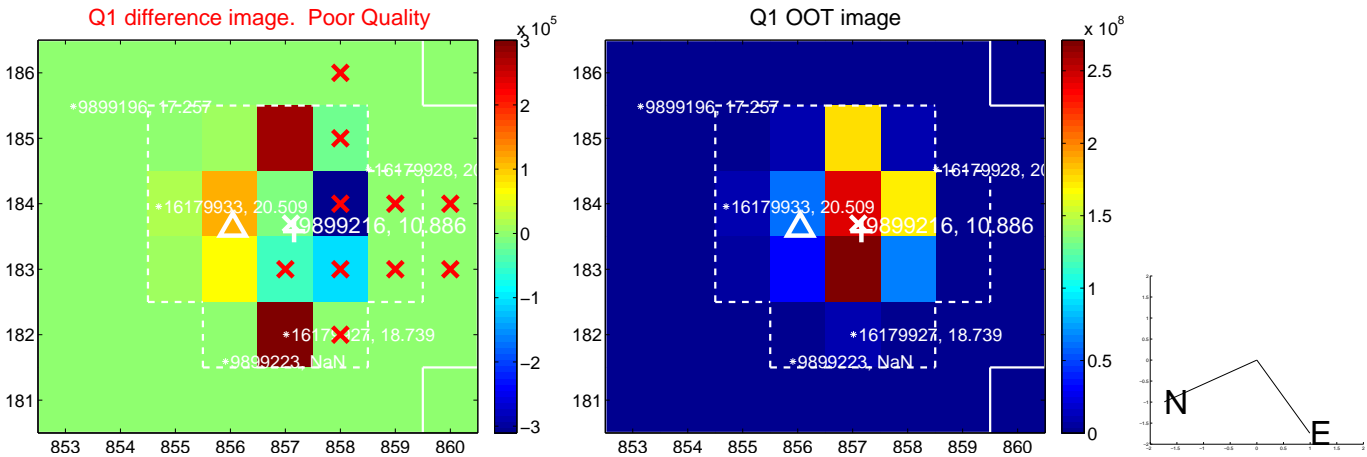


offset from photometric centroids

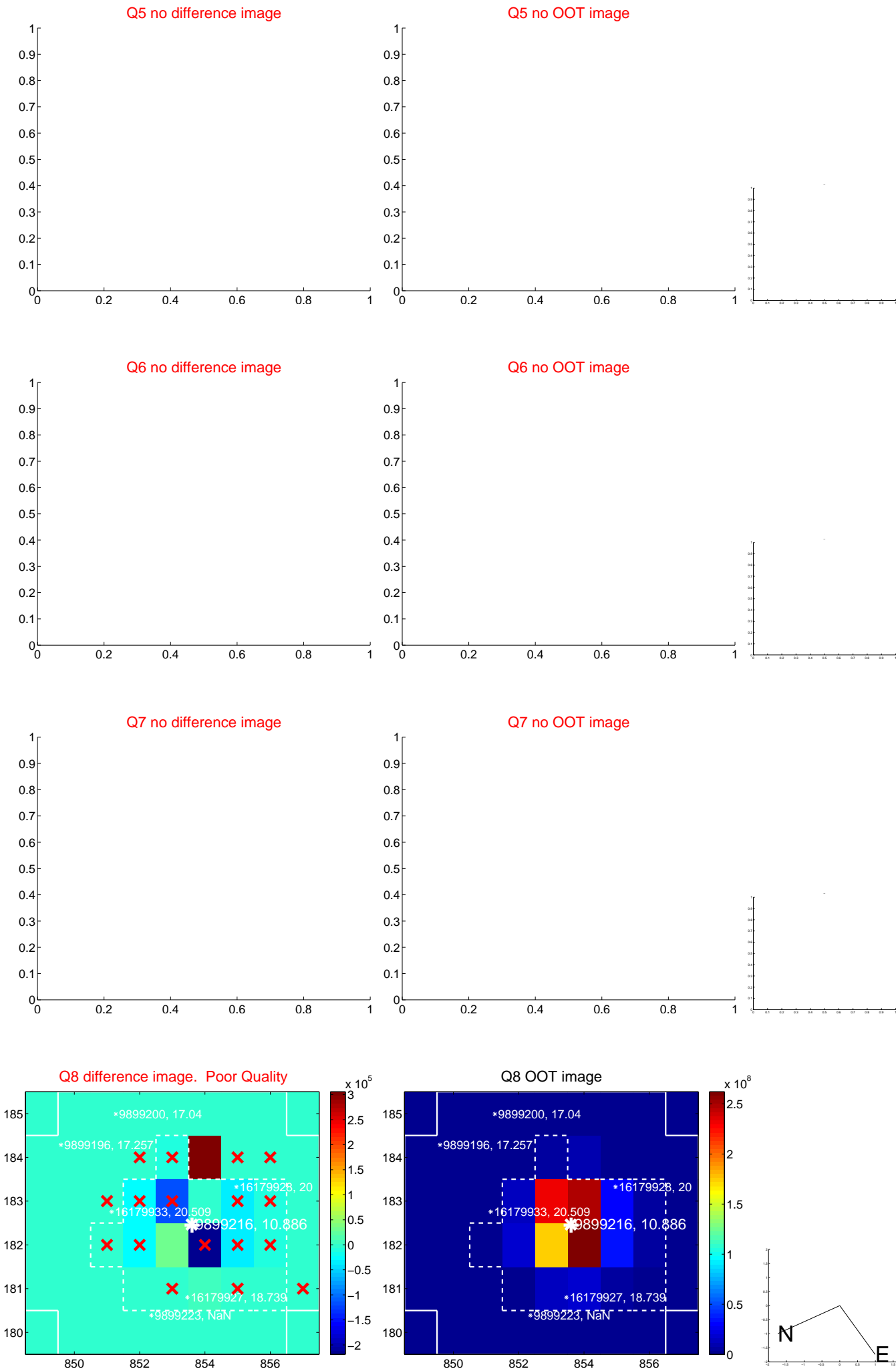


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



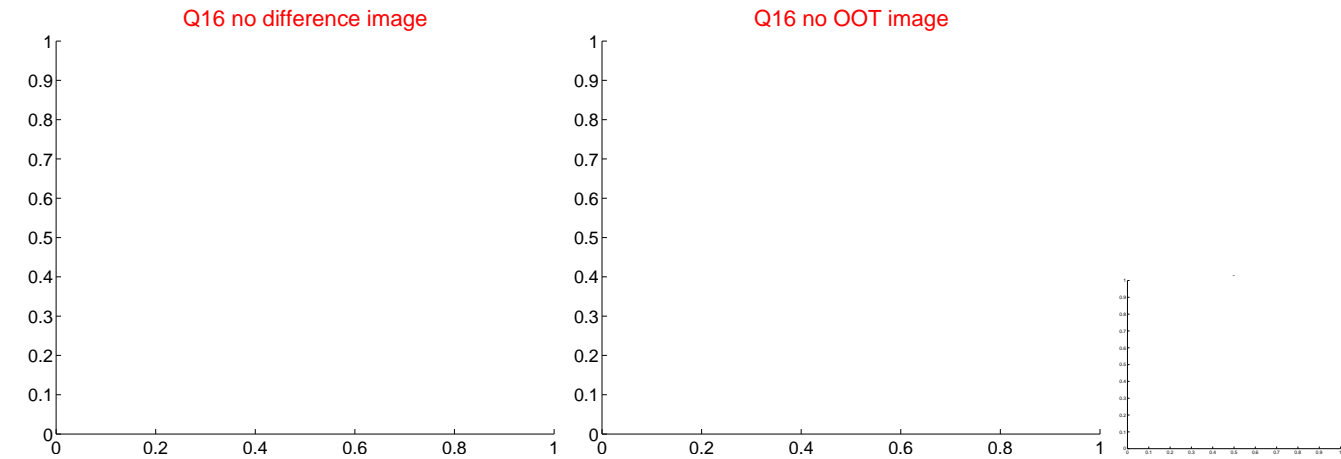
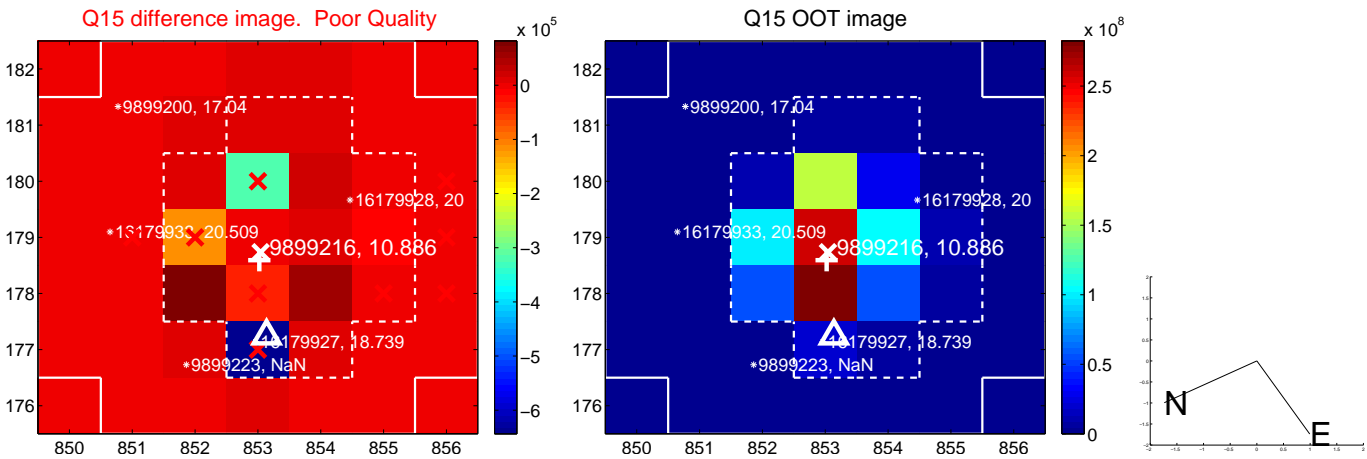
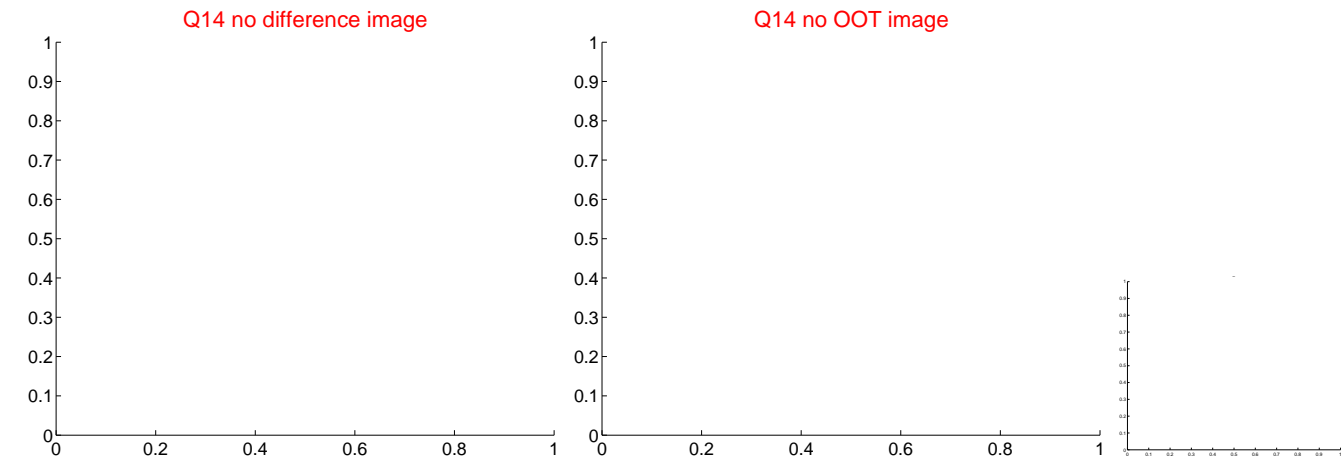
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



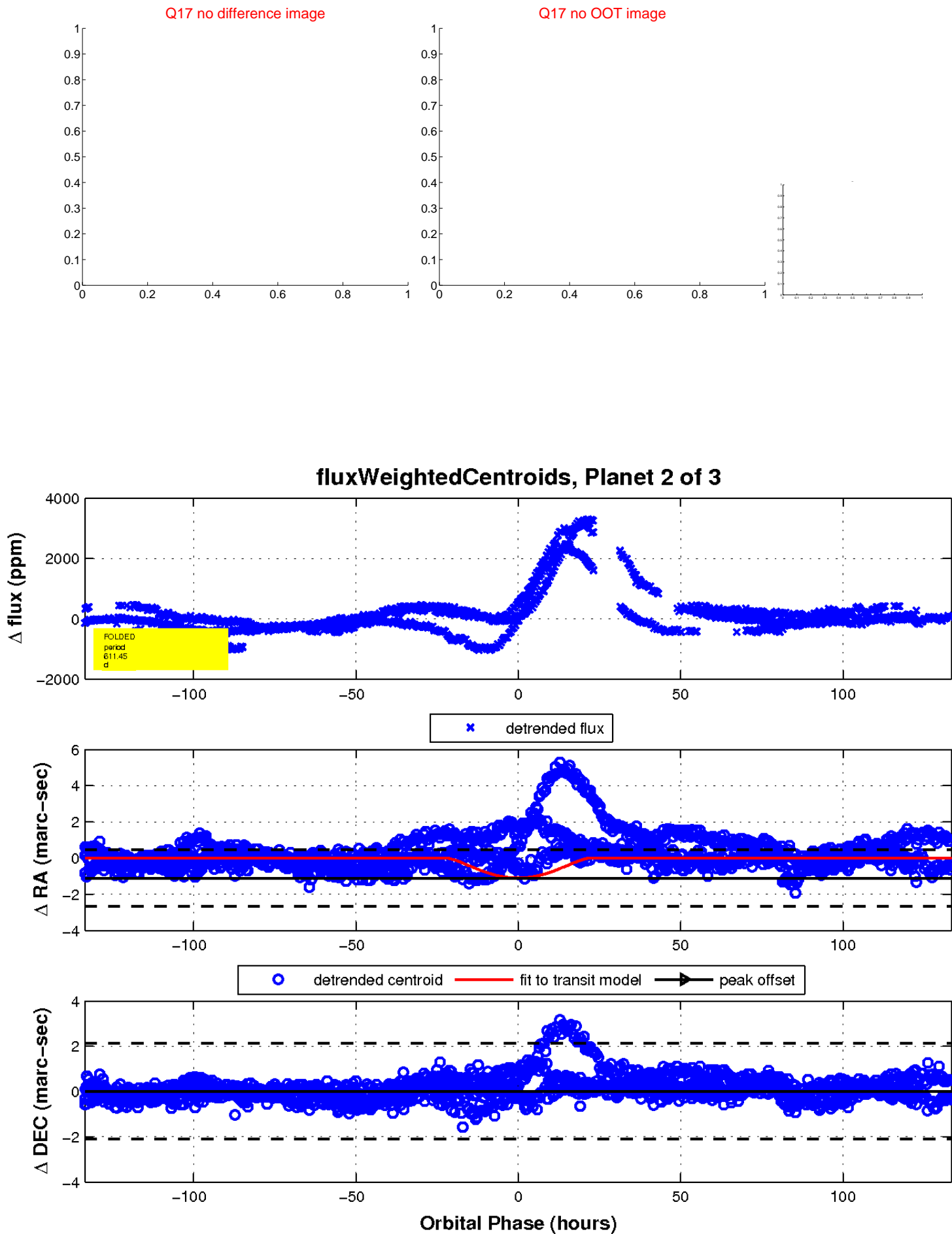
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

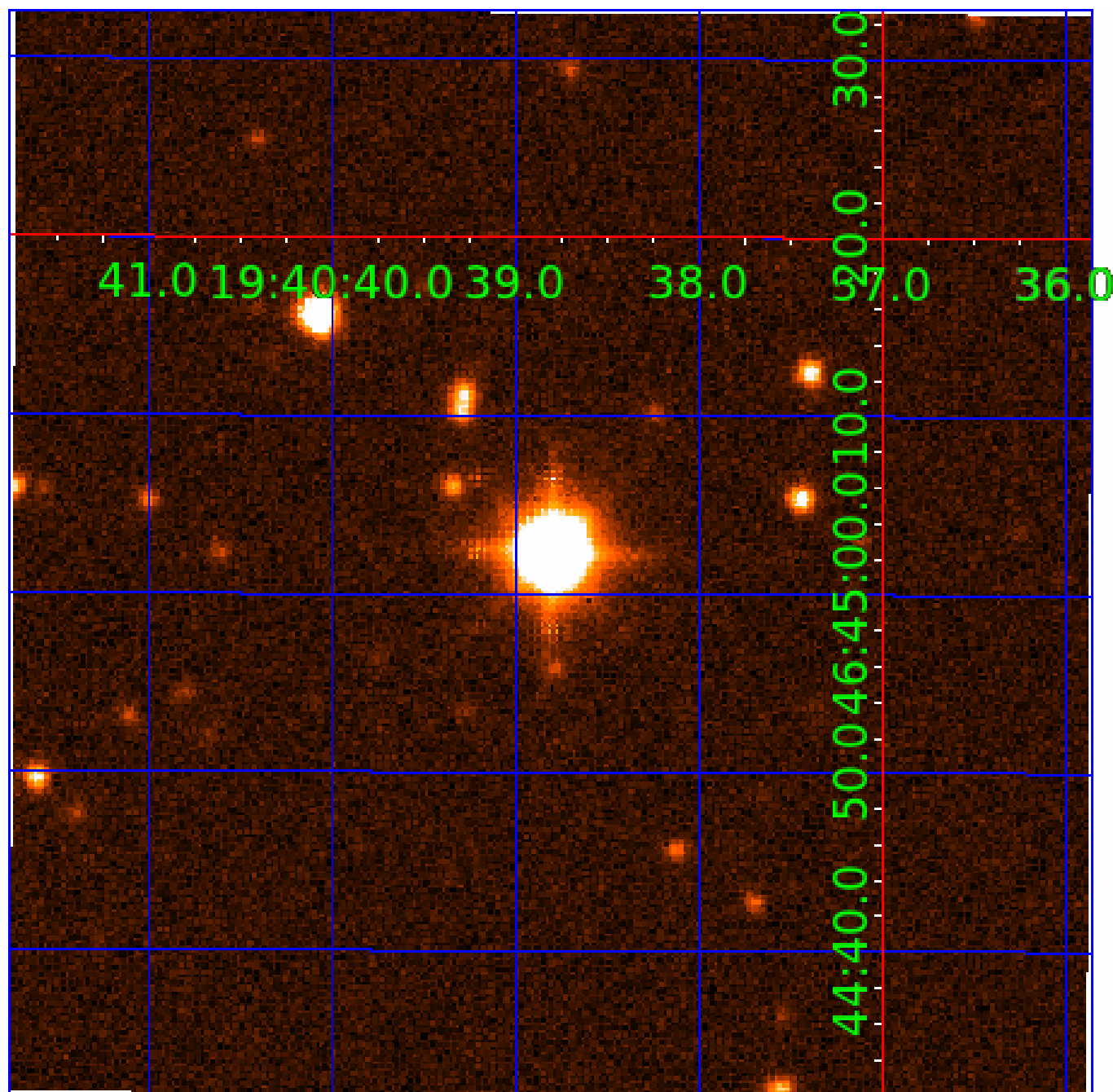


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009899216

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})
009899216-01	OBS	7971.01	1.332585	132.019419	8.9	4.153	11.3	11.4	1.94	8133	0.67	16959.96
009899216-02	OBS	No	611.452974	159.870808	2496.1	44.486	9.4	13.6	1.94	8133	17.48	4.79
009899216-03	OBS	No	614.397896	138.389098	740.0	33.936	7.4	9.9	1.94	8133	9.83	4.76

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899216-01	OBS	FP	0.00	0	0	0	1	CENT_SATURATED—EPHEM_MATCH
009899216-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
009899216-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

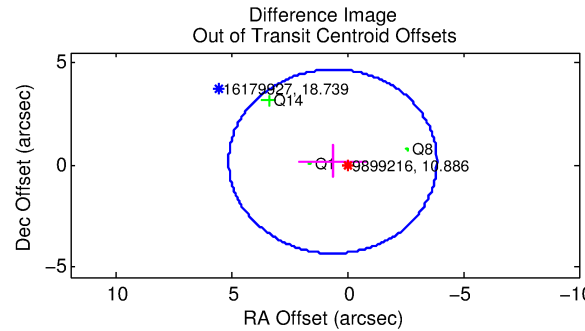
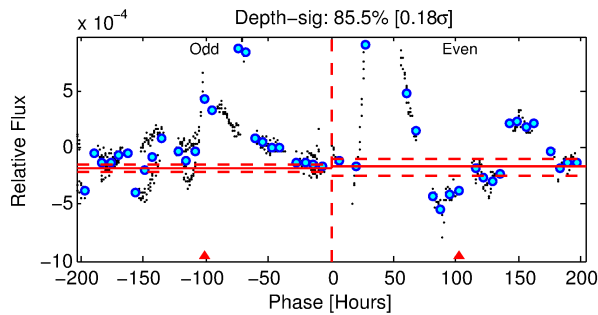
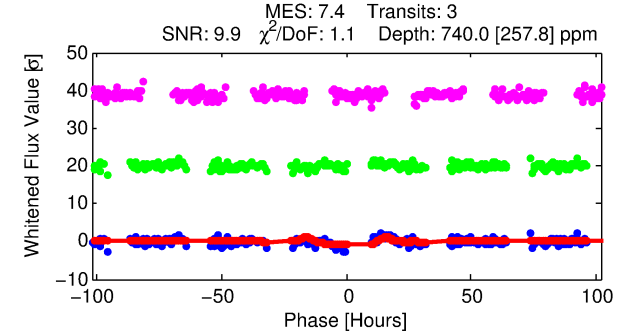
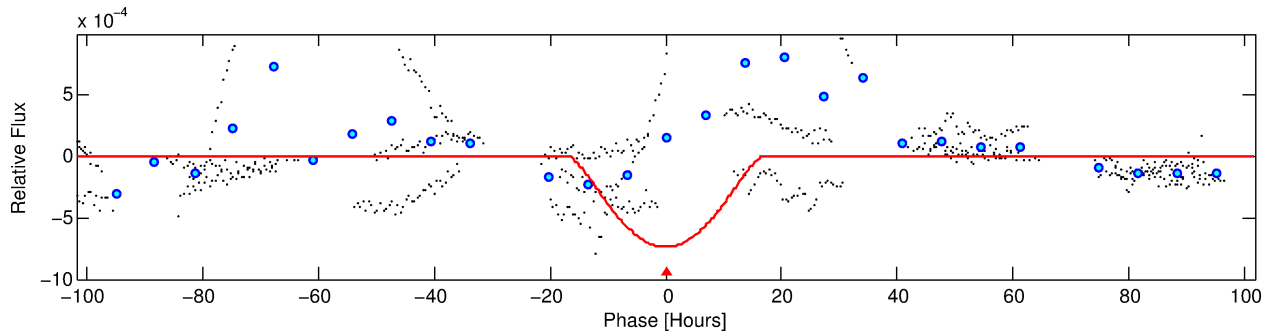
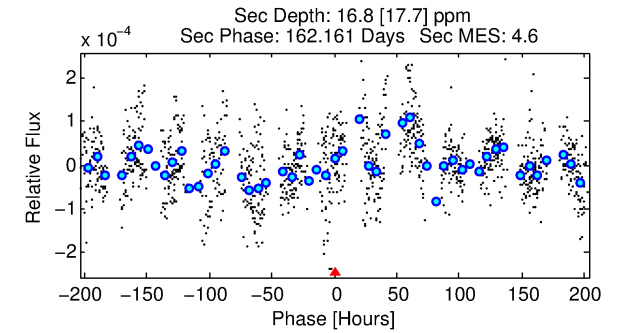
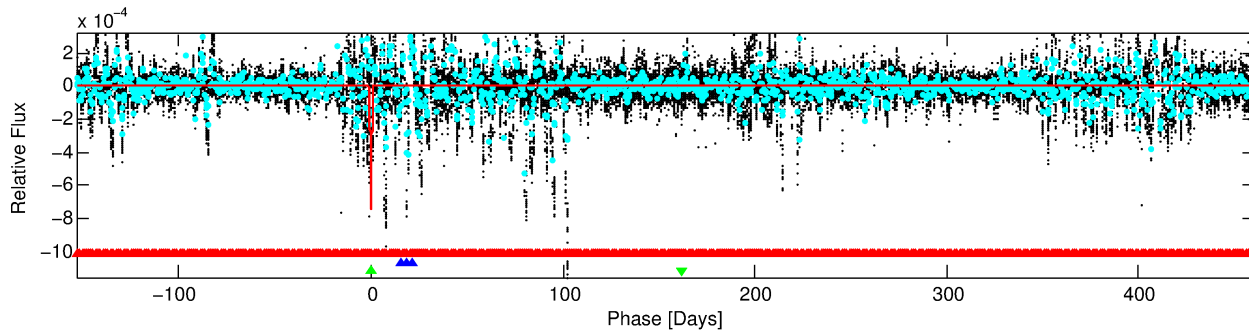
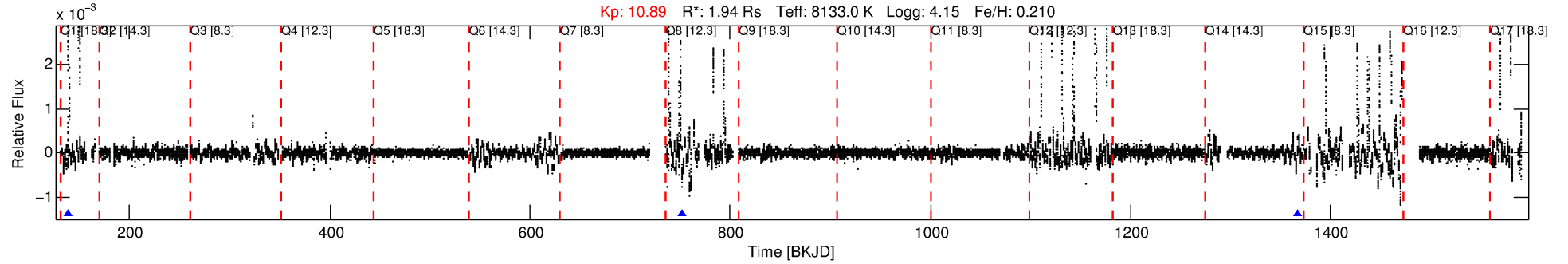
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009899216-03

No Significant Match Found

DV One-Page Summary

KIC: 9899216 Candidate: 3 of 3 Period: 614.398 d



DV Fit Results:

Period = 614.39790 [0.01572] d
Epoch = 138.3891 [0.0225] BKJD
Rp/R* = 0.0465 [0.0353]
a/R* = 42.70 [6.73]
b = 1.00 [0.04]
Seff = 4.76 [1.75]
Teq = 377 [35] K
Rp = 9.83 [7.90] Re
a = 1.7557 [0.3912] AU
Ag = 295.68 [554.32] [0.53σ]
Teffp = 2415 [1120] K [1.82σ]

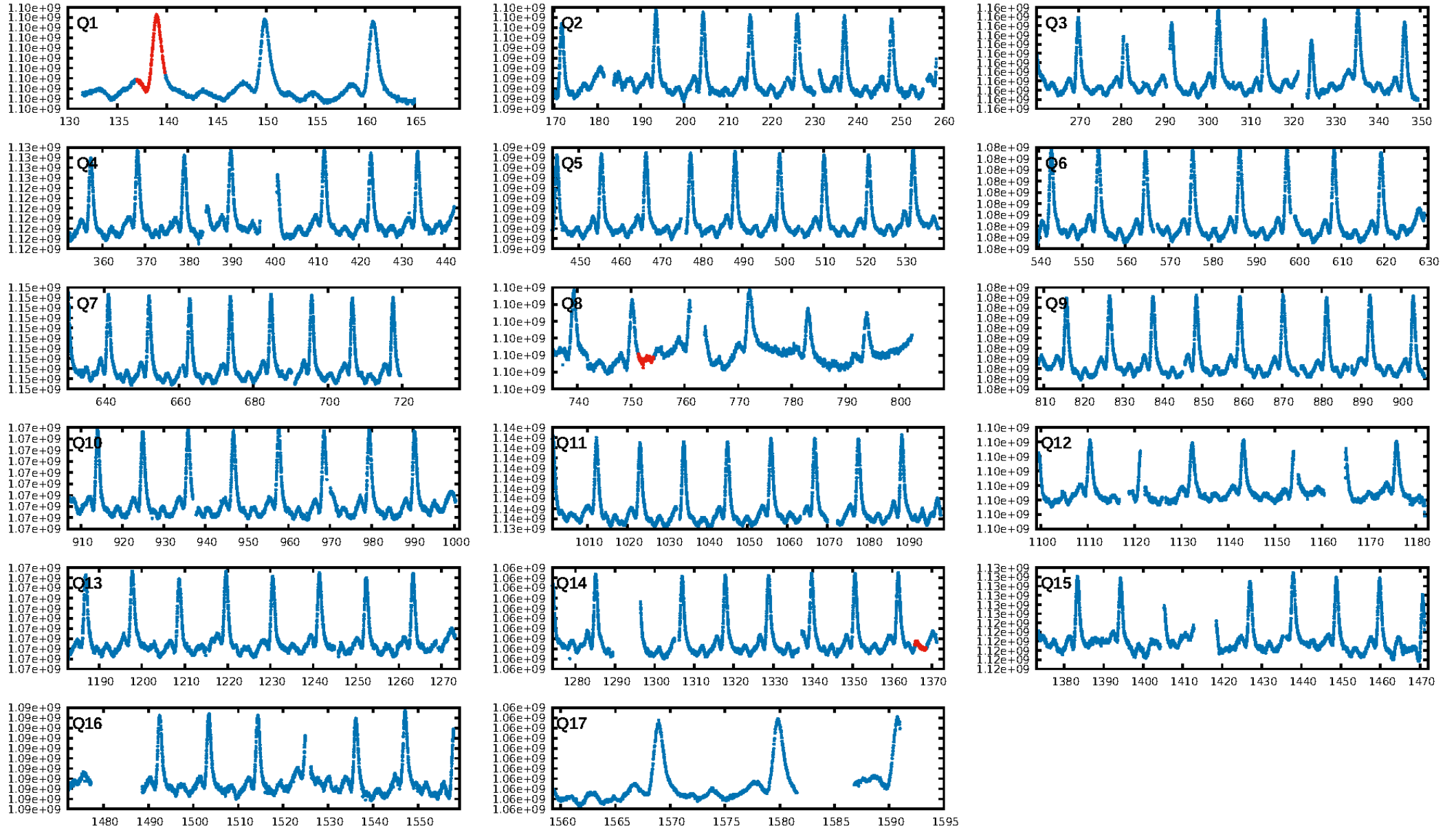
DV Diagnostic Results:

ShortPeriod-sig: 79.3% [1.26σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.94e-07
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 3.134
Centroid-sig: 0.0%
Centroid-so: 1.827 arcsec [2.61σ]
OotOffset-rm: 0.660 arcsec [0.44σ]
KicOffset-rm: 1.048 arcsec [0.67σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.00 [0/3]

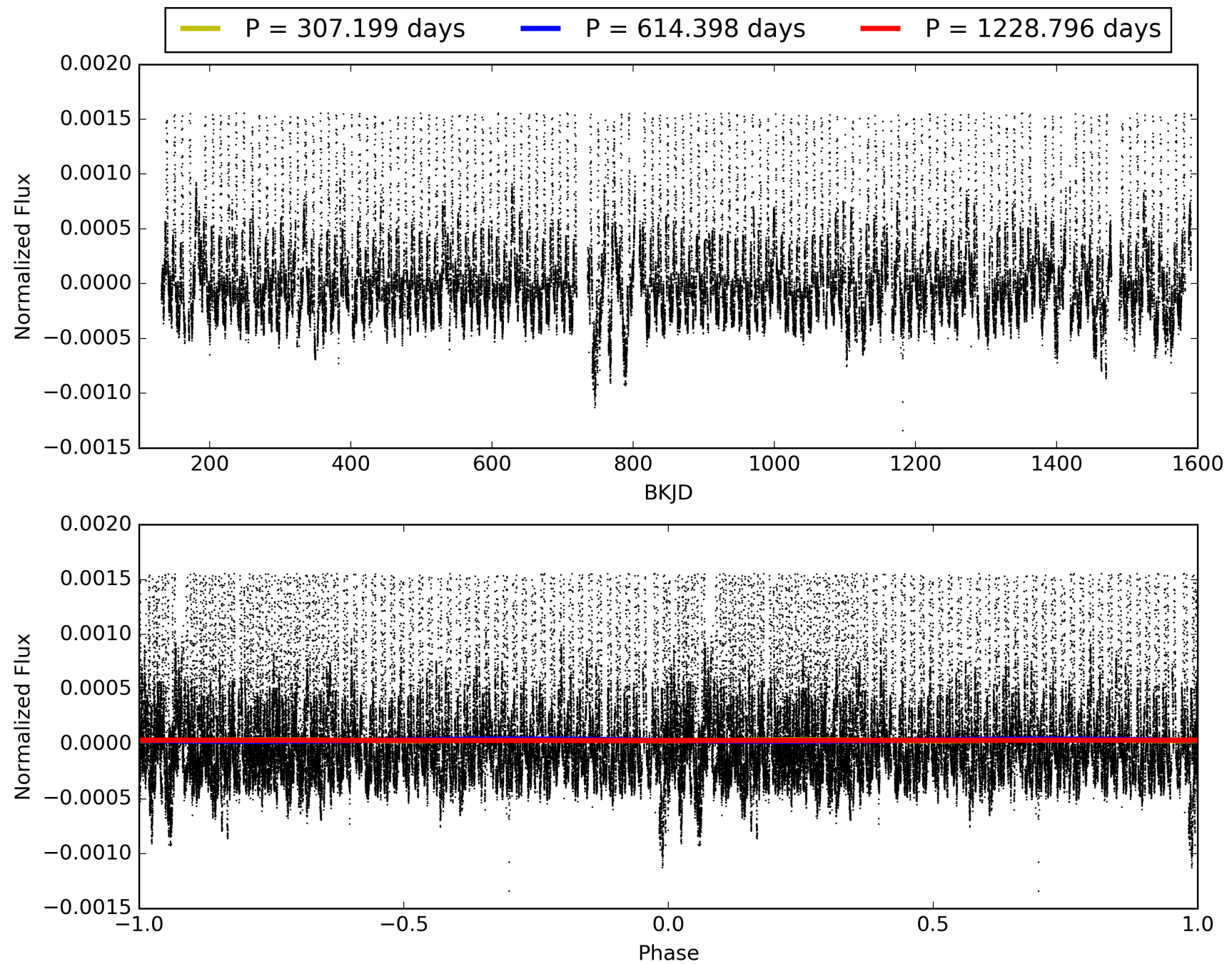
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:35:14 Z

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

TCE 009899216-03, PDC Light Curves

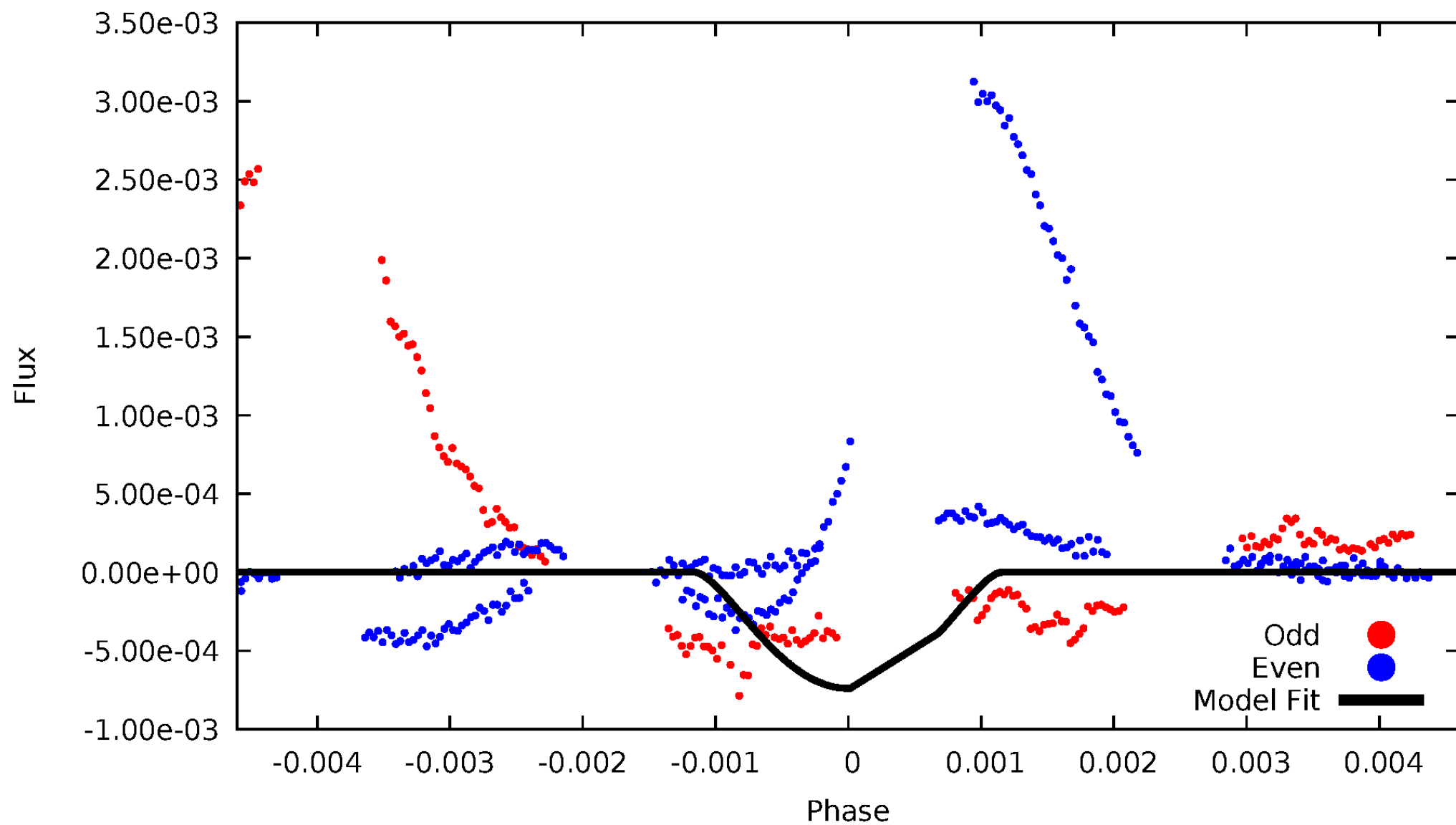


TCE 009899216-03



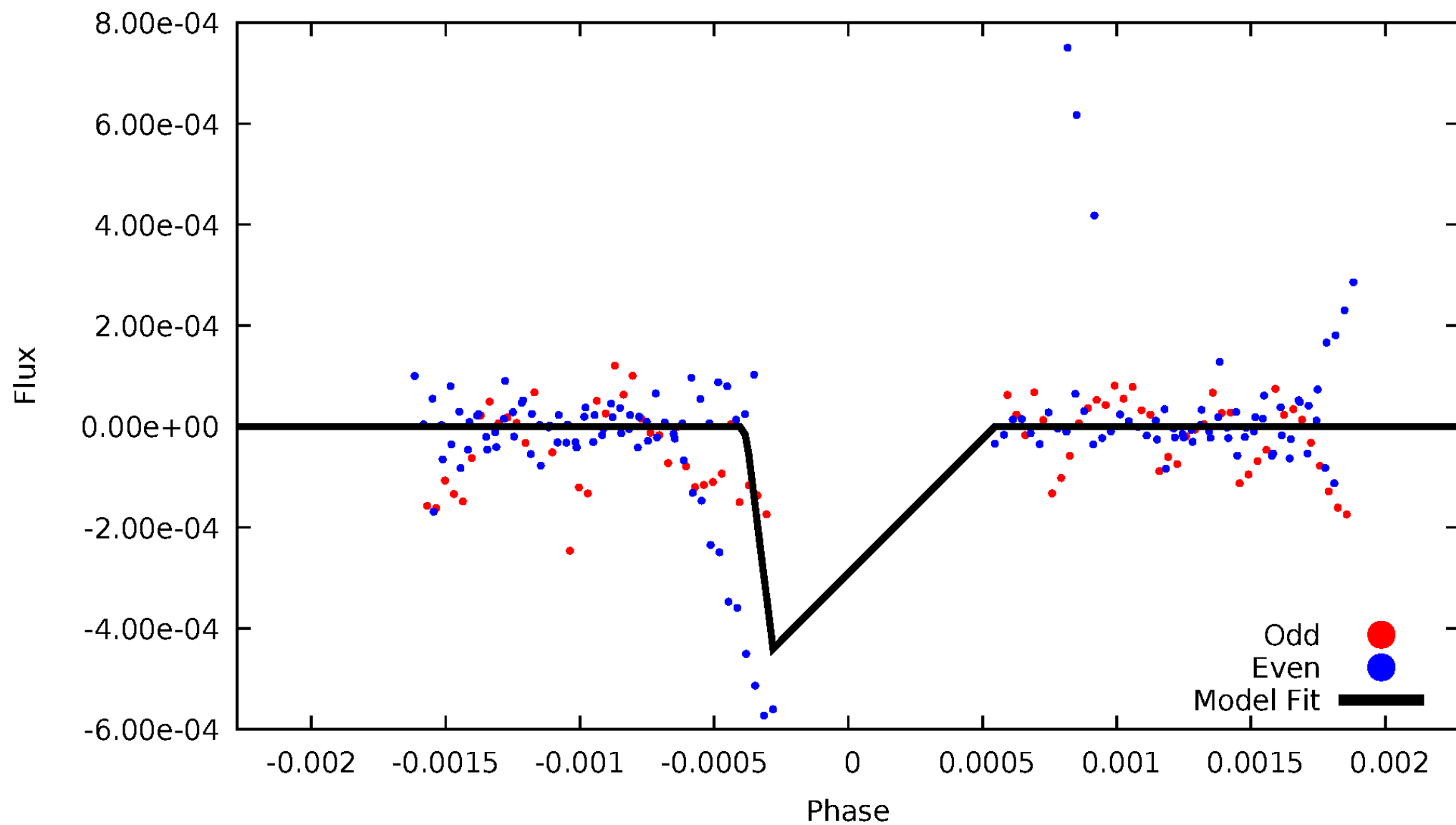
DV Odd/Even

TCE 009899216-03



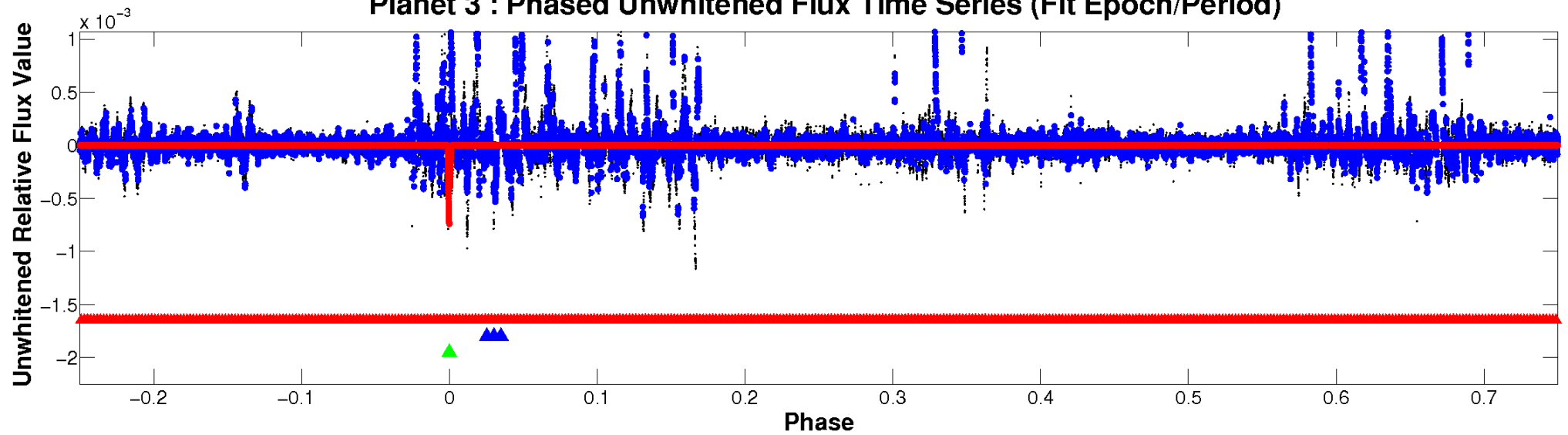
ALT Odd/Even

TCE 009899216-03

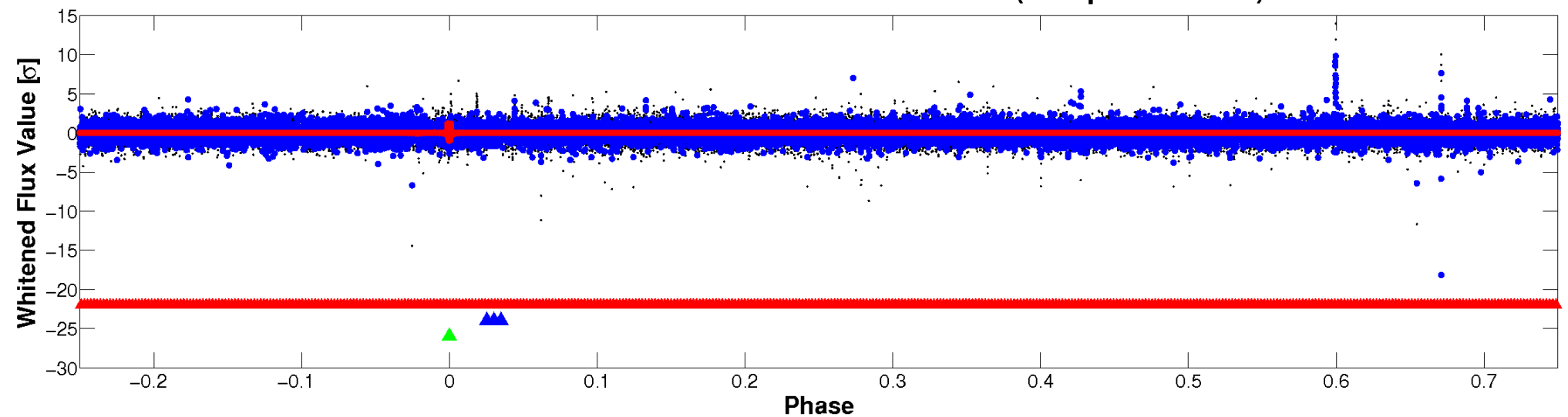


Non-Whitened Vs. Whitened Light Curve

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

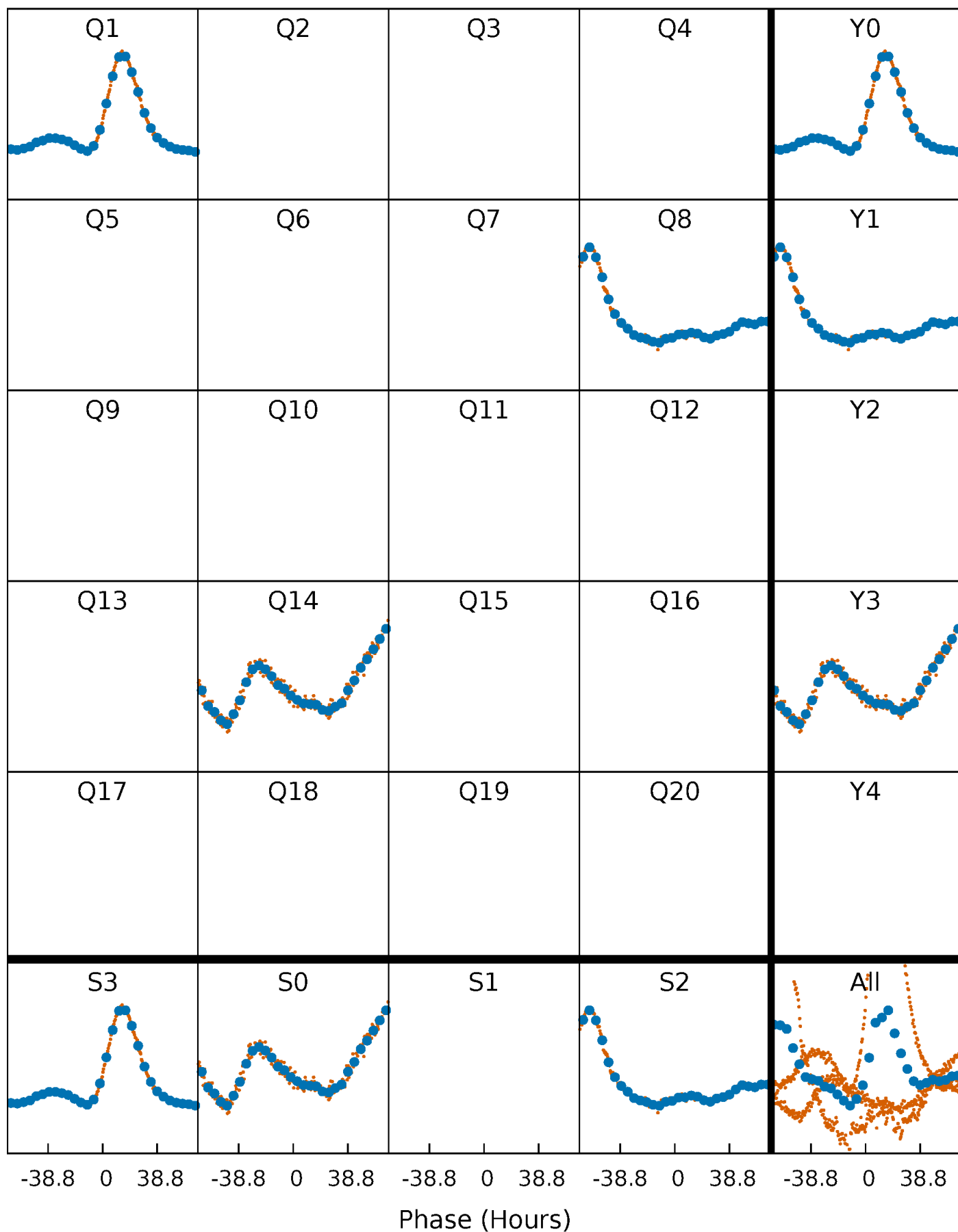


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



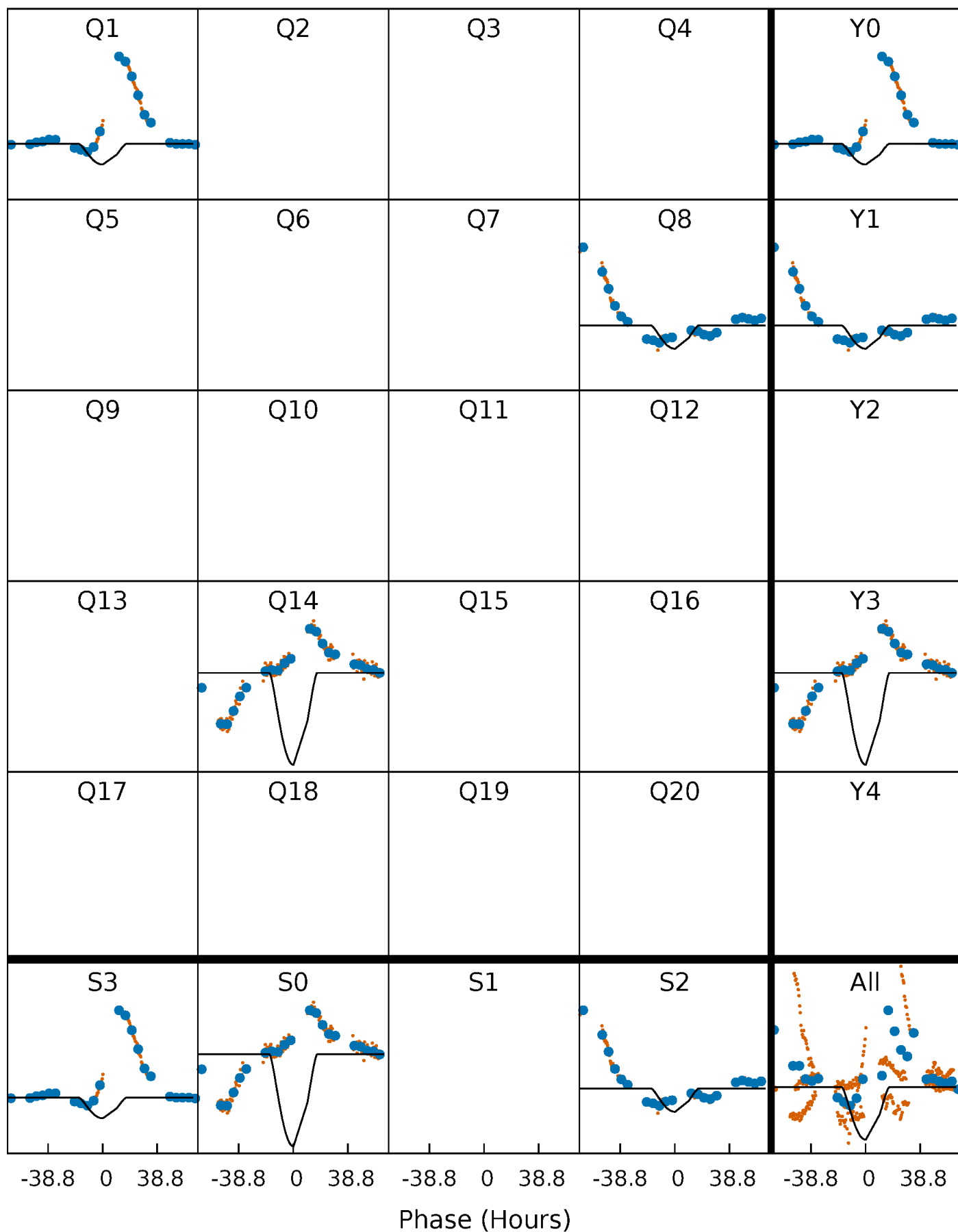
PDC Quarter-Phased Transit Curves

TCE 009899216-03 $P=614.397896$ Days $T_0=138.389098$ (BKJD)



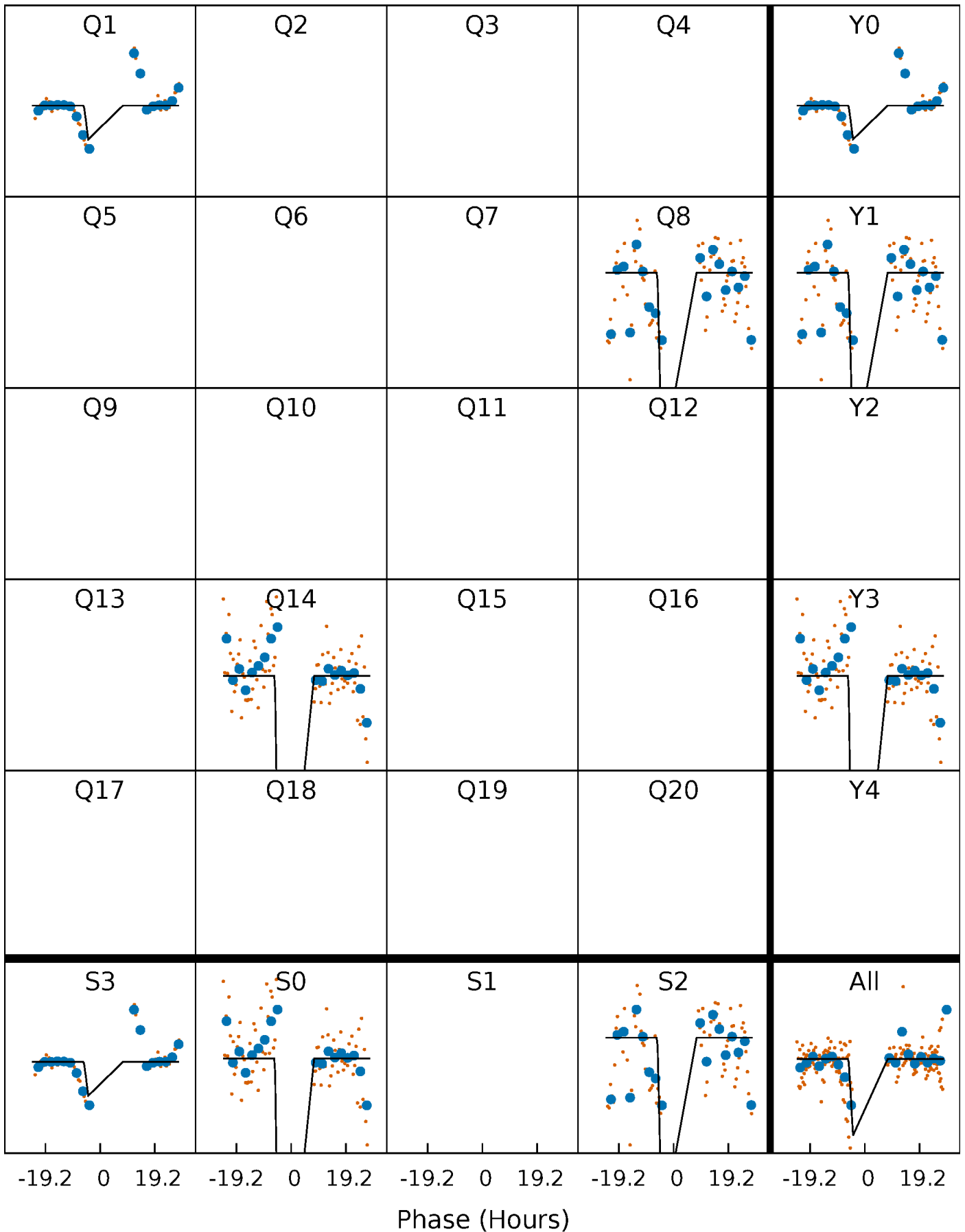
DV Quarter-Phased Transit Curves

TCE 009899216-03 $P=614.397896$ Days $T_0=138.389098$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

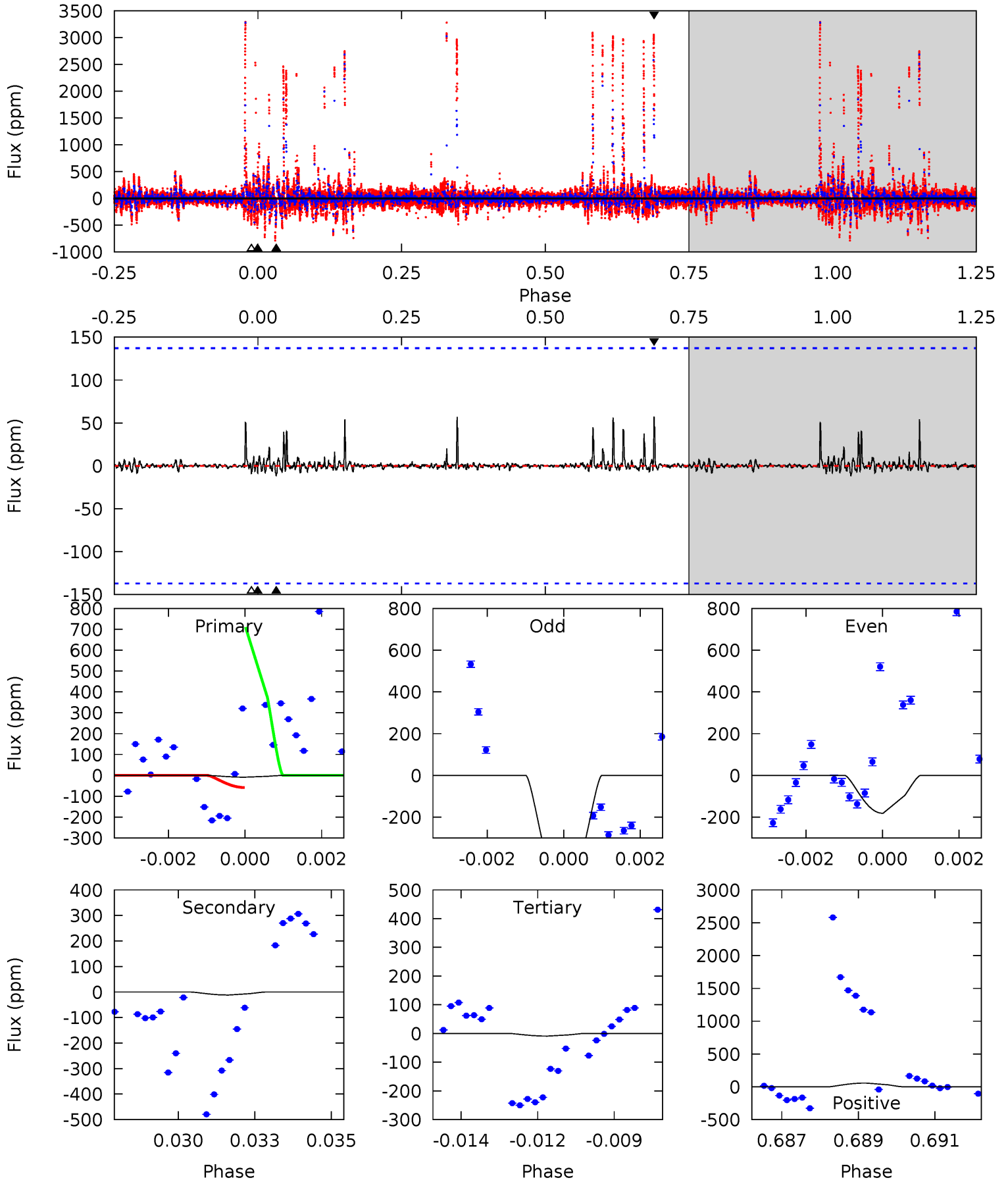
TCE 009899216-03 P=614.348604 Days $T_0=138.570702$ (BKJD)



DV Model-Shift Uniqueness Test

009899216-03, P = 614.397896 Days, E = 138.389098 Days

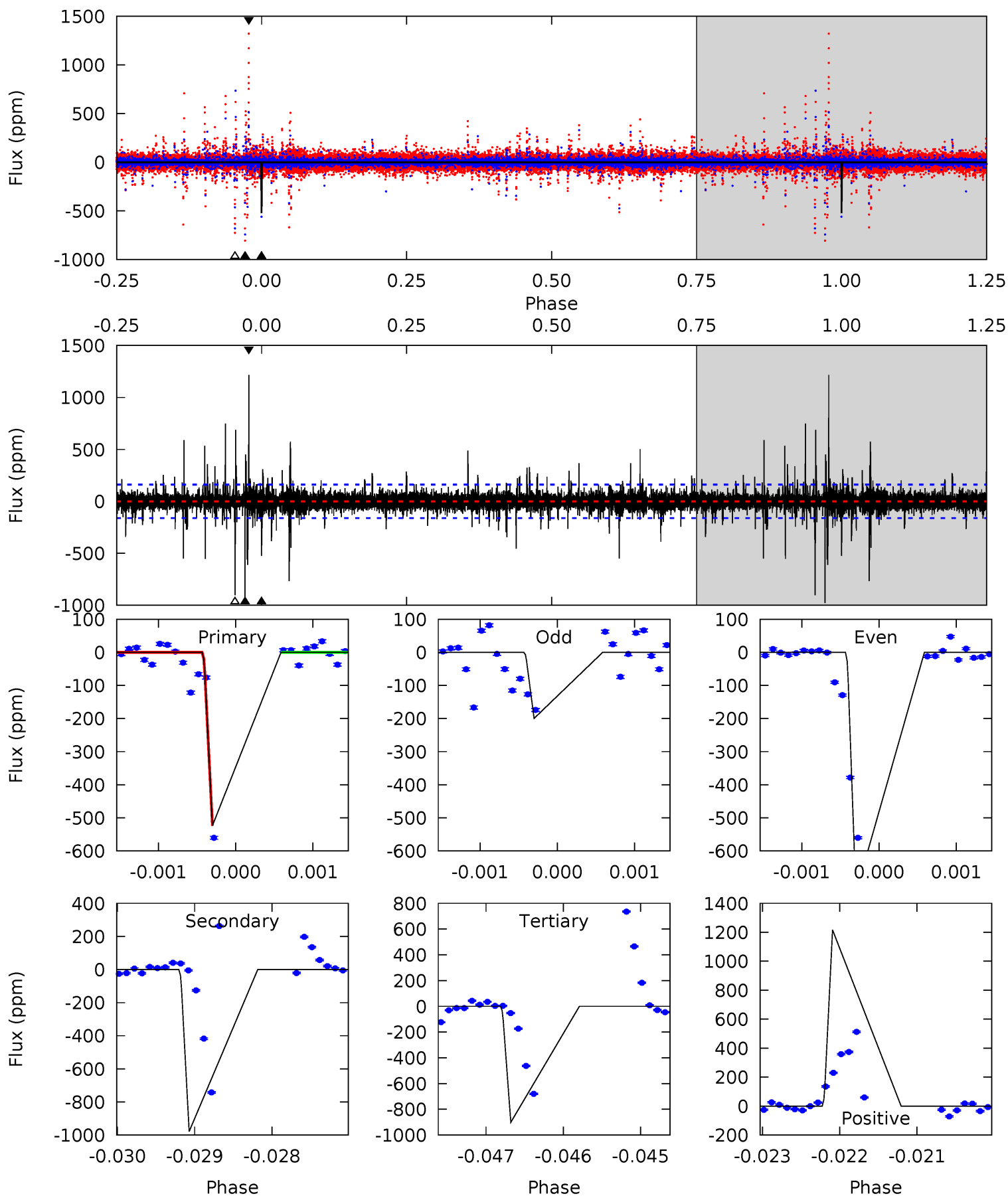
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.33	0.45	0.35	2.21	5.30	3.04	0.24	-0.02	-1.88	0.10	-1.76	7.58	-0.29	0.83	11.3



Alt Model-Shift Uniqueness Test

009899216-03, P = 614.348604 Days, E = 138.570702 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.8	33.2	30.6	41.3	5.46	3.31	1.69	-12.8	-23.5	2.63	-8.09	12.3	0	0.55	0



Stellar Parameters For KIC 009899216

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8133^{+227}_{-357}	$4.146^{+0.081}_{-0.175}$	$0.210^{+0.150}_{-0.500}$	$1.935^{+0.516}_{-0.301}$	$1.910^{+0.278}_{-0.340}$	$0.371^{+0.156}_{-0.177}$
	+3%/-4%	+2%/-4%	+71%/-238%	+27%/-16%	+15%/-18%	+42%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 009899216-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-12 ± 26	$10.86^{+7.39}_{-6.55}$	532^{+40}_{-29}	2672^{+1108}_{-5525}	113^{+1050}_{-298}
Alt.	-978 ± 29	$7.82^{+7.23}_{-4.84}$	530^{+37}_{-29}	7303^{+7858}_{-1949}	$26094^{+153720}_{-18947}$

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 $A_{obs} \gg 1.0$

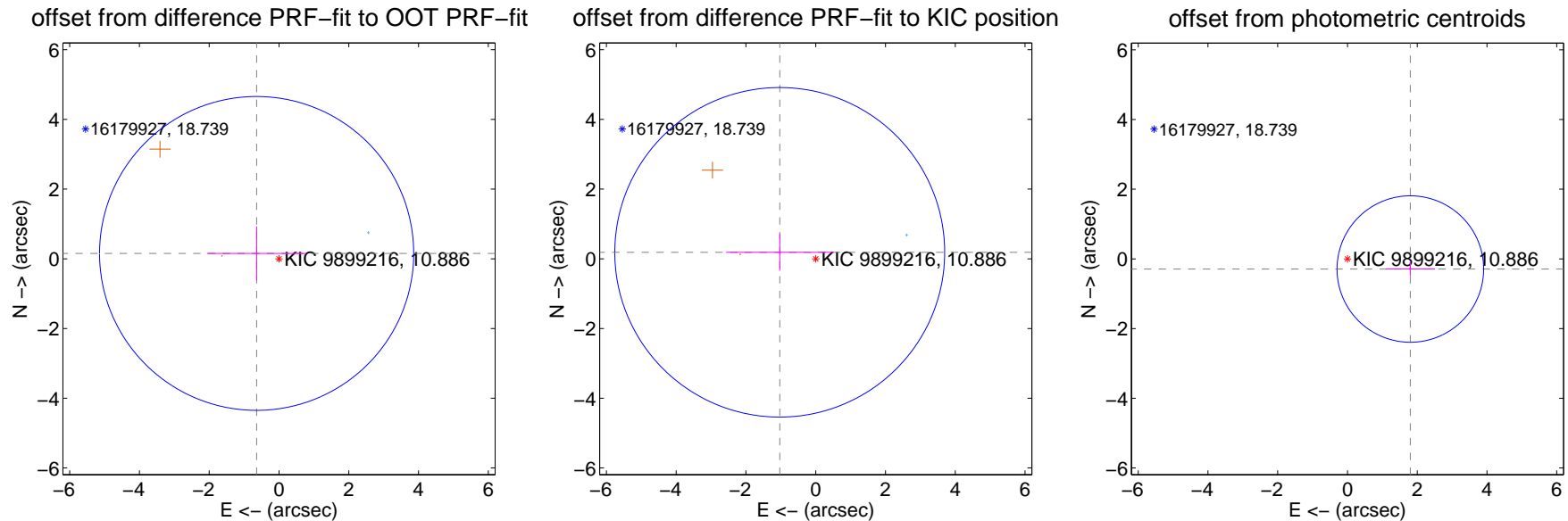
DV Centroid Data

Supplemental centroid analysis for 009899216-03. **Kepler magnitude: 10.89.** Transit SNR 9.87

There are 1 quarters with good PRF difference image offsets

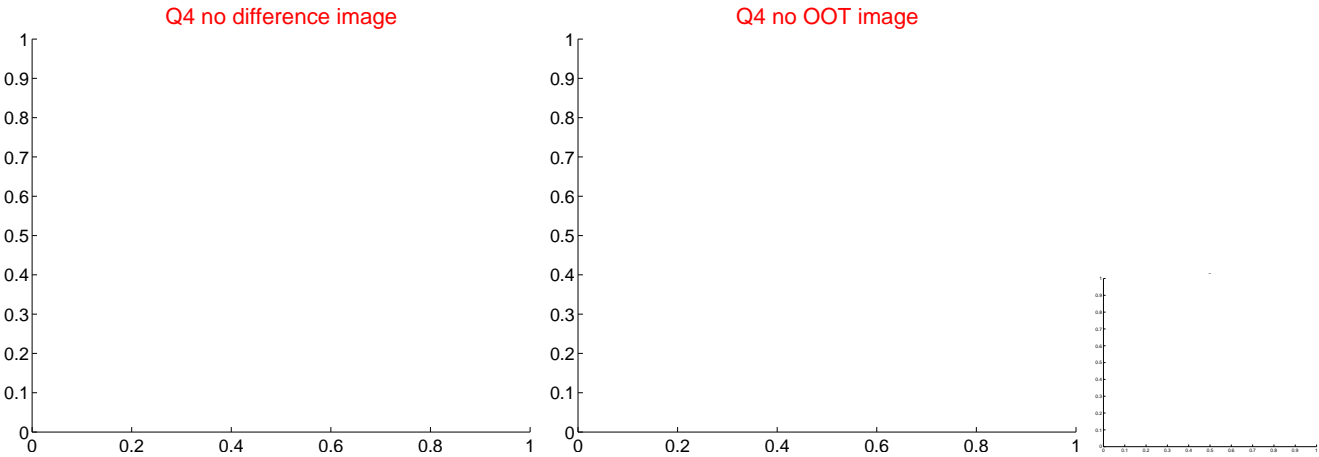
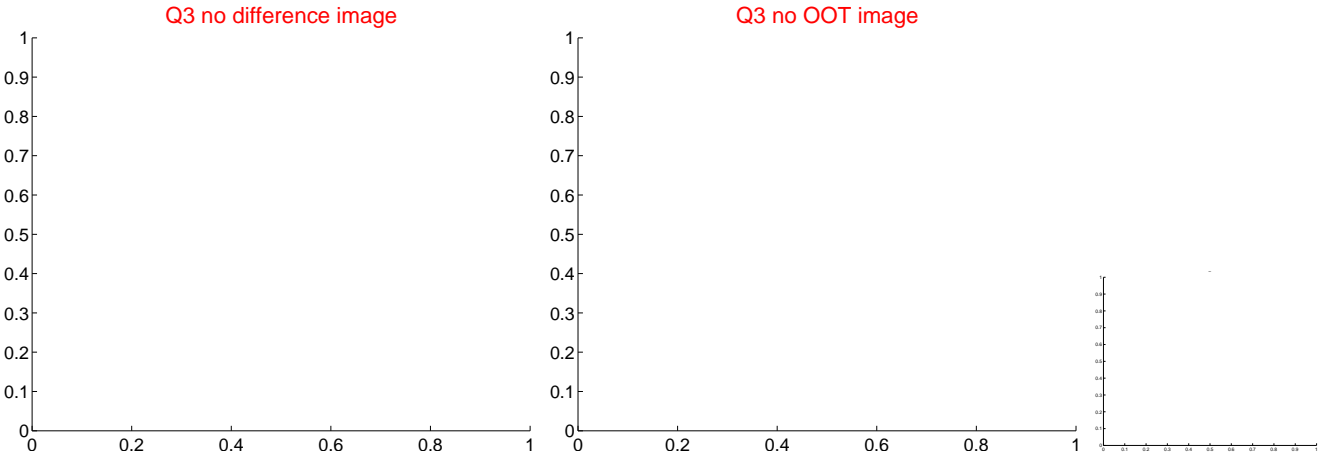
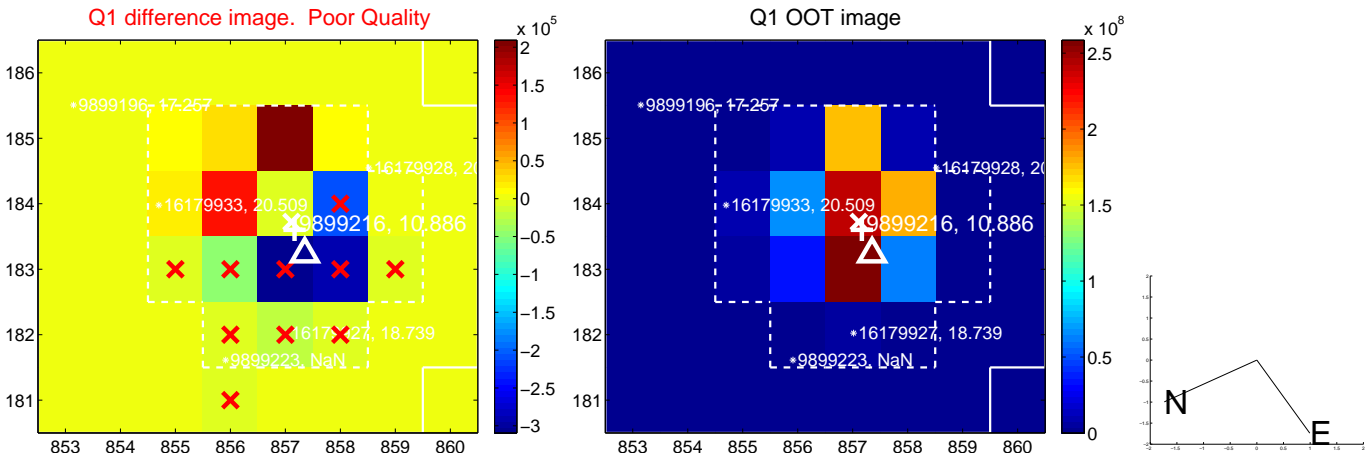
The direct PRF centroid is offset from the target star catalog position by about 0.75 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.660 ± 1.501	0.44	0.642 ± 1.422	0.154 ± 0.776
PRF-fit source offset from KIC position	1.048 ± 1.576	0.67	1.032 ± 1.539	0.186 ± 0.527
photometric centroid source offset	1.83 ± 0.70	2.61	-1.80 ± 0.71	-0.29 ± 0.20

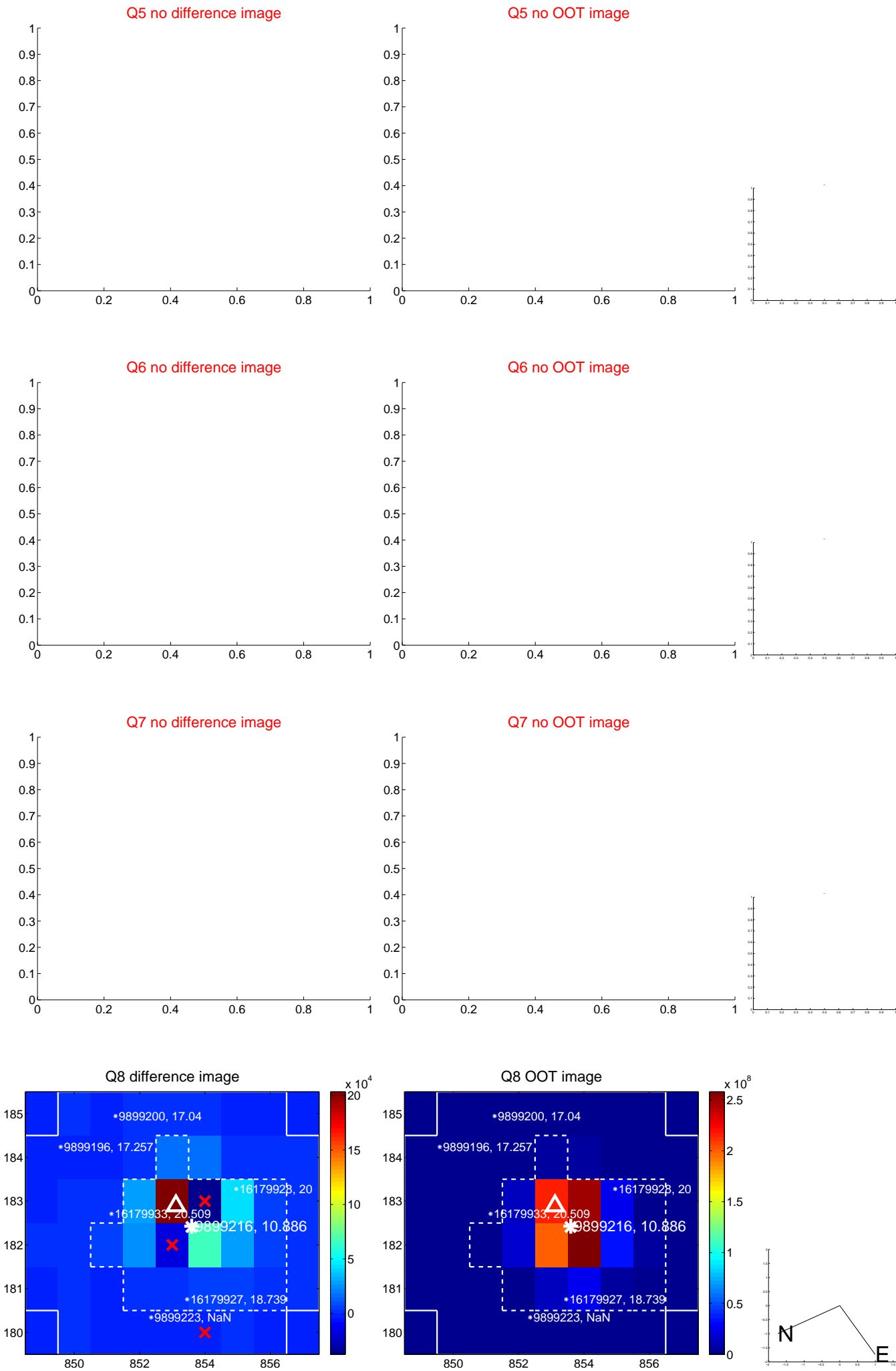


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



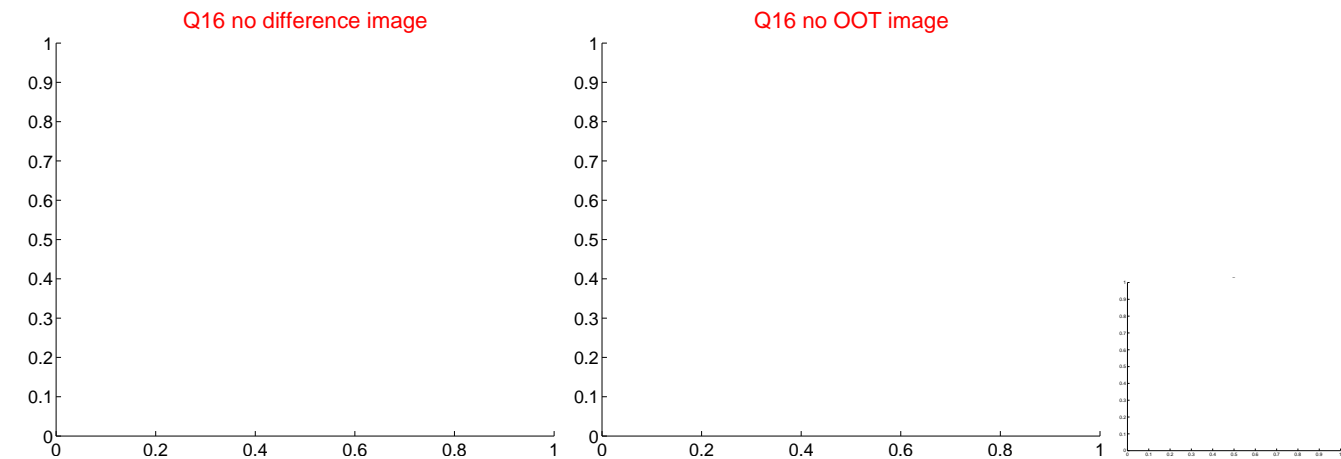
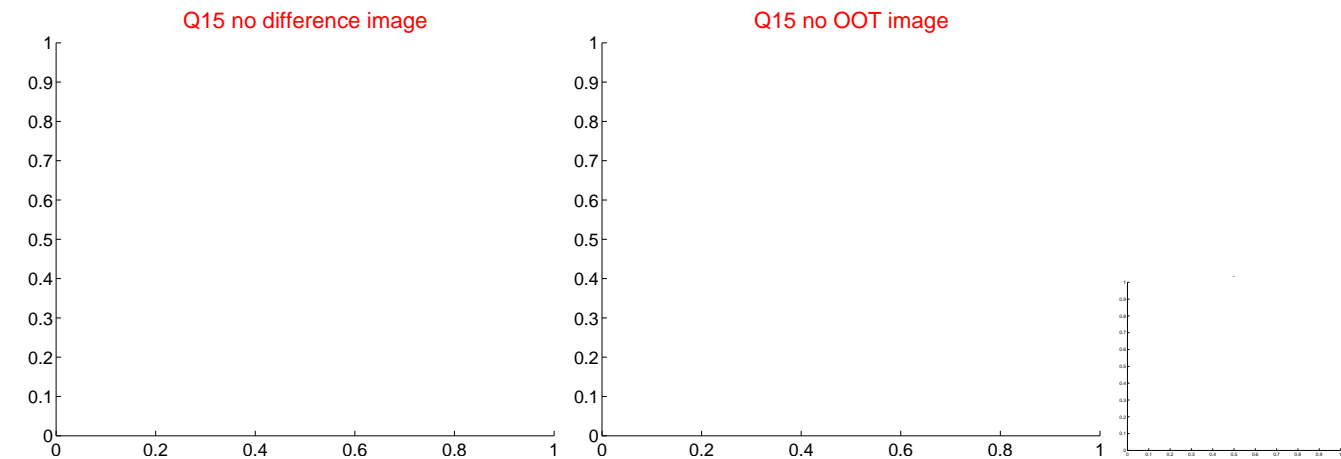
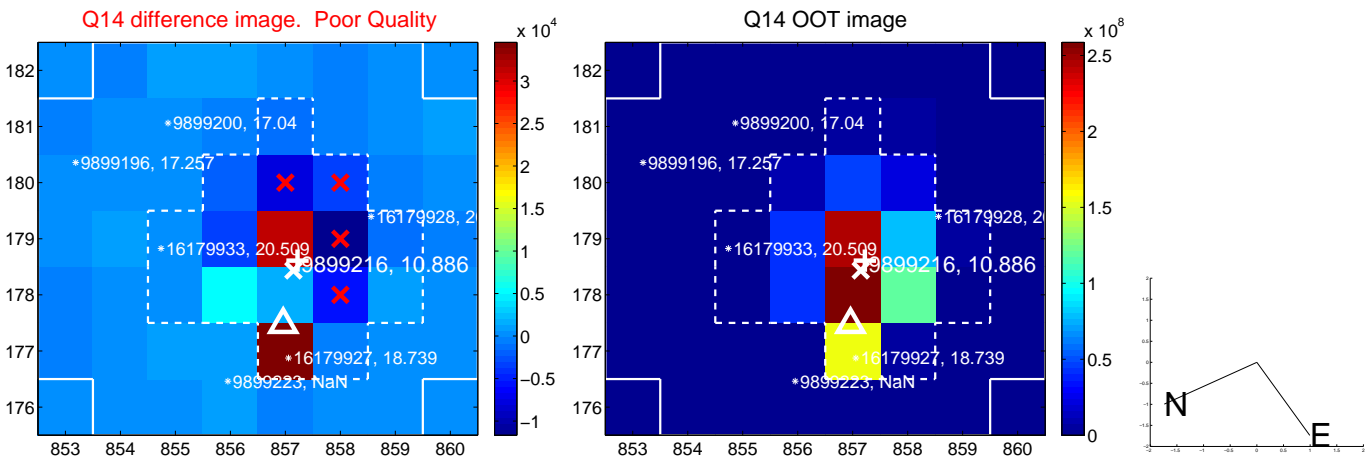
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



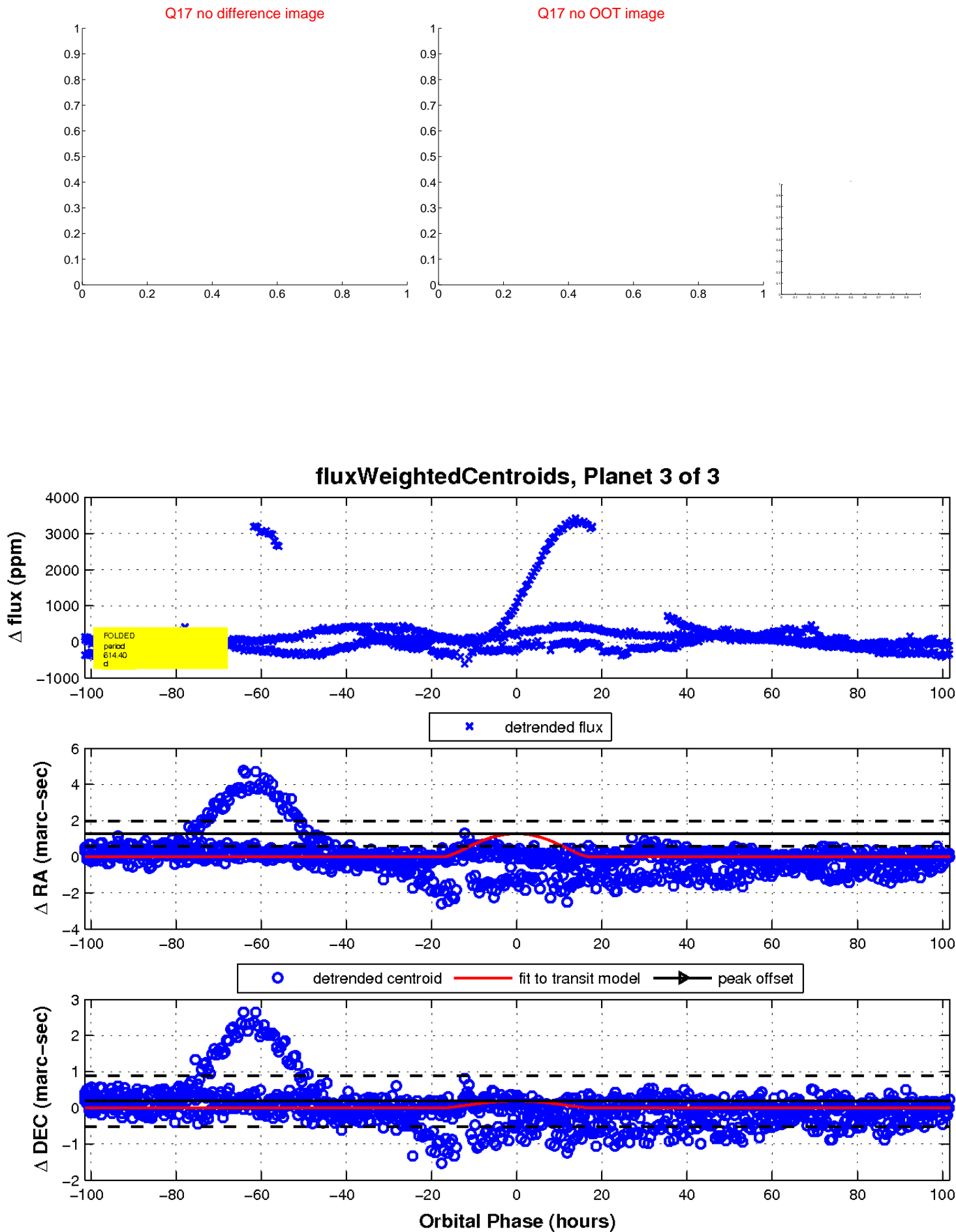
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

