

KIC 004367854

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})
004367854-01	OBS	2876.01	5.195204	133.343251	295.6	2.145	13.0	14.8	0.74	5044	1.34	115.50
004367854-02	OBS	2876.02	0.535228	131.747196	68.9	3.403	7.3	12.3	0.74	5044	0.74	2391.37
004367854-03	OBS	No	31.796592	134.850603	937.7	1.964	10.5	7.6	0.74	5044	2.54	10.32
004367854-04	OBS	No	45.192873	150.935771	741.9	1.840	7.9	7.2	0.74	5044	2.07	6.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004367854-01	OBS	FP	0.28	0	0	1	0	CENT_RESOLVED_OFFSET
004367854-02	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
004367854-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
004367854-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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.

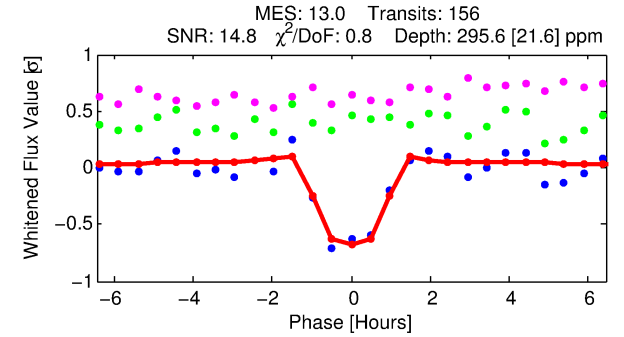
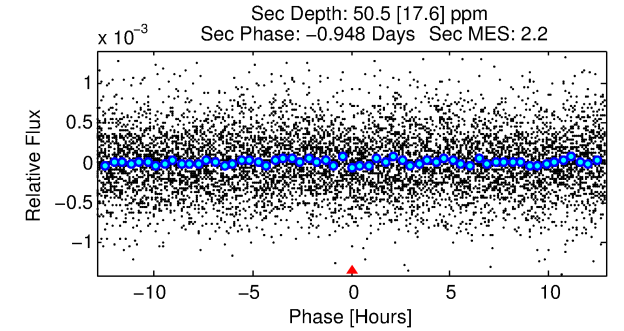
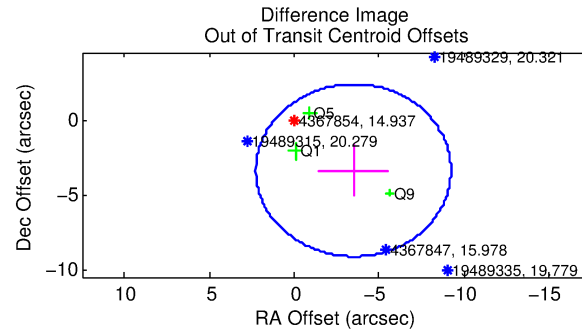
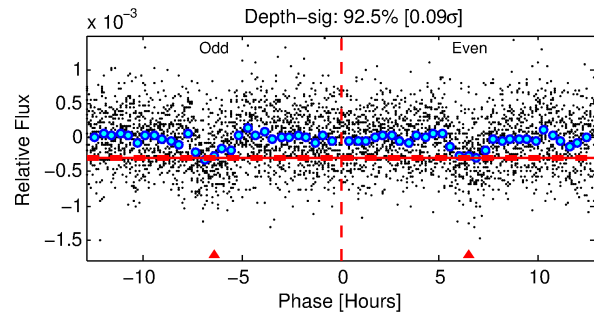
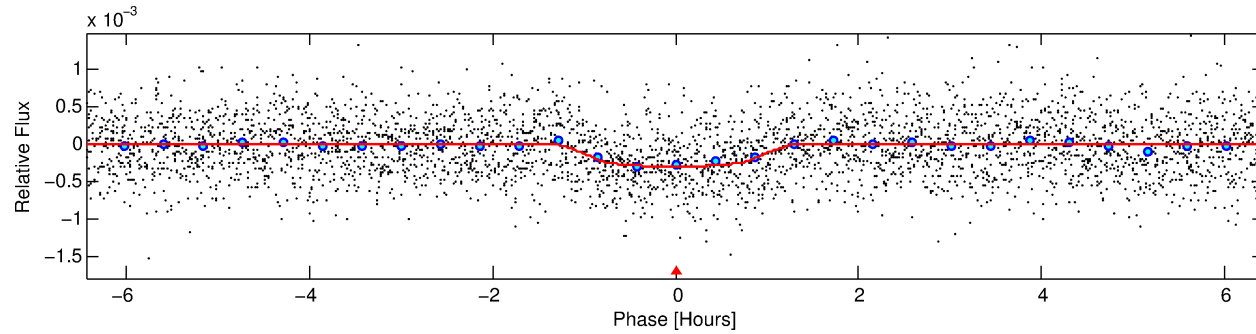
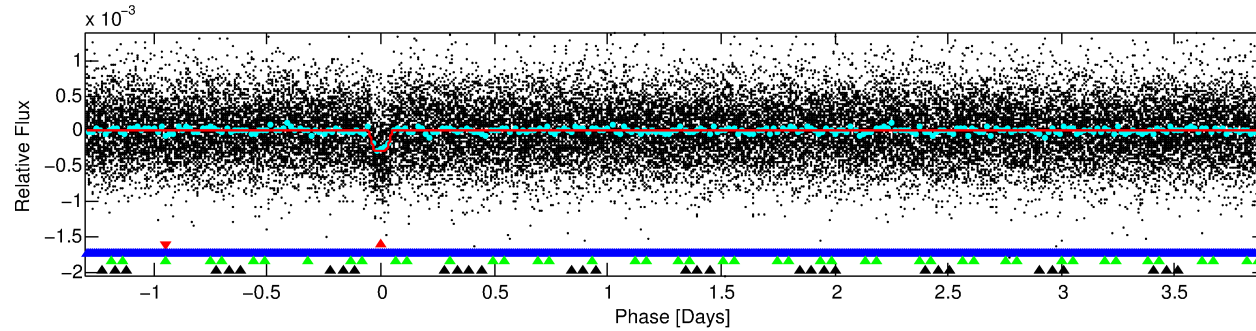
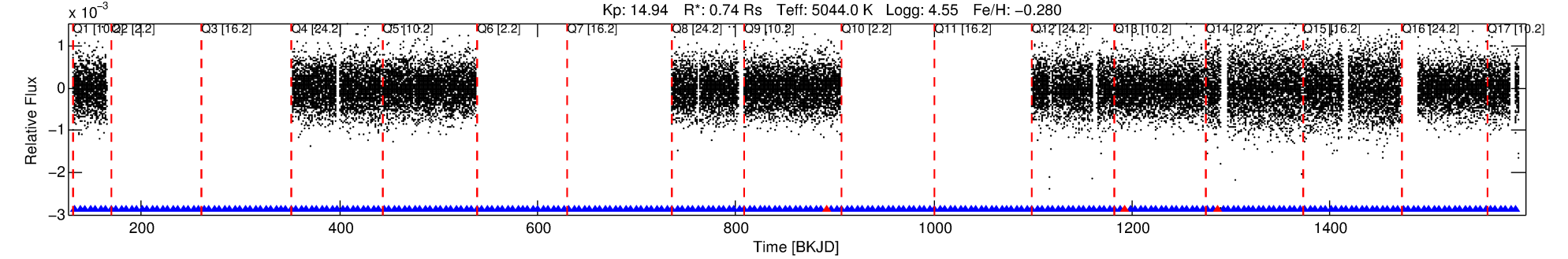
Ephemeris Match Information For 004367854-01

No Significant Match Found

DV One-Page Summary

KIC: 4367854 Candidate: 1 of 4 Period: 5.195 d

KOI: K02876.01 Corr: 0.982



DV Fit Results:

Period = 5.19520 [0.00002] d
Epoch = 133.3433 [0.0027] BKJD
Rp/R* = 0.0166 [0.0159]
a/R* = 14.32 [48.97]
b = 0.66 [3.01]
Seff = 115.49 [21.22]
Teq = 836 [38] K
Rp = 1.34 [1.29] Re
a = 0.0523 [0.0049] AU
Ag = 42.52 [83.10] [0.50 σ]
Teffp = 3300 [1611] K [1.53 σ]

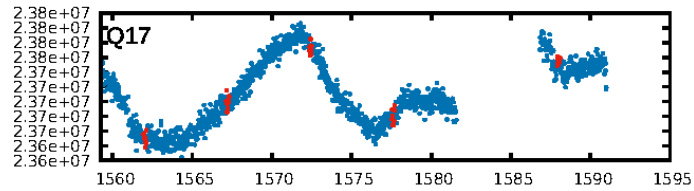
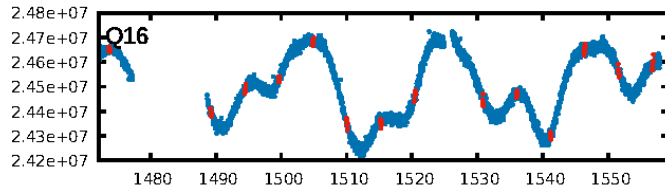
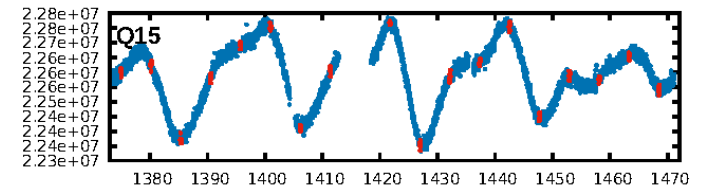
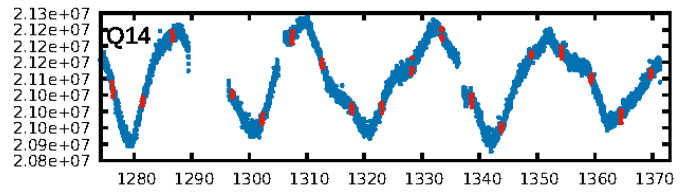
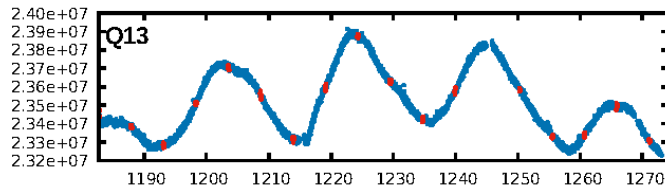
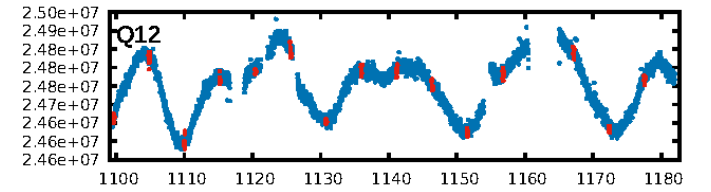
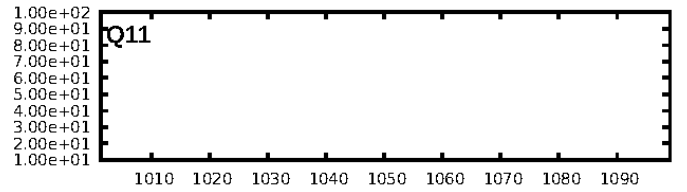
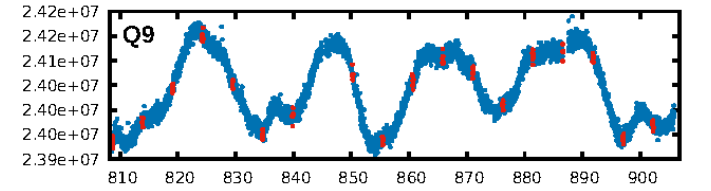
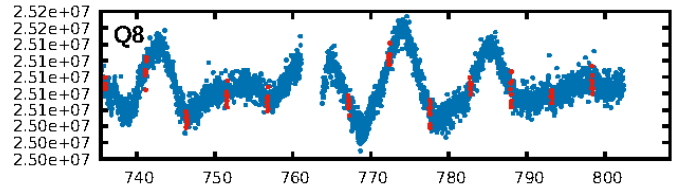
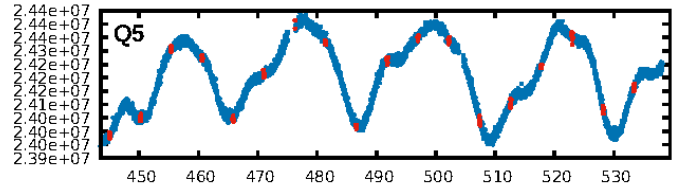
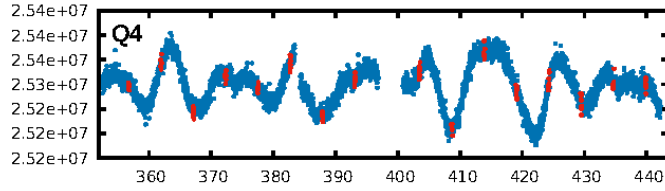
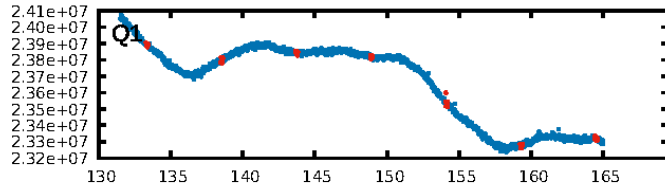
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.80 σ]
LongPeriod-sig: 100.0% [219.50 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.14e-26
RollingBand-fgt: 0.98 [141/144]
GhostDiagnostic-chr: 2.047
Centroid-sig: 19.9%
Centroid-so: 1.264 arcsec [1.39 σ]
OotOffset-rm: 4.870 arcsec [2.54 σ]
KicOffset-rm: 5.067 arcsec [2.62 σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/11]

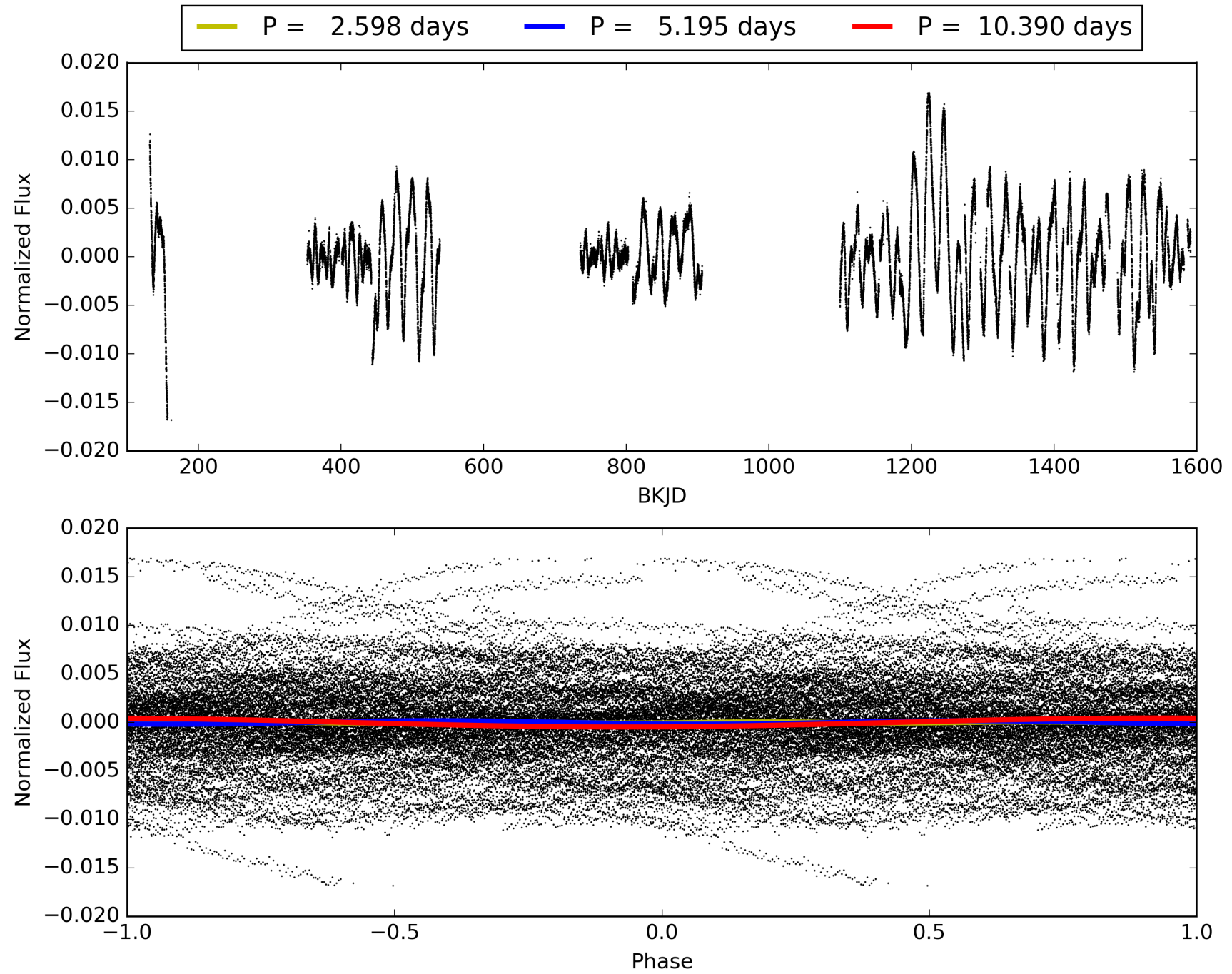
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004367854-01, PDC Light Curves

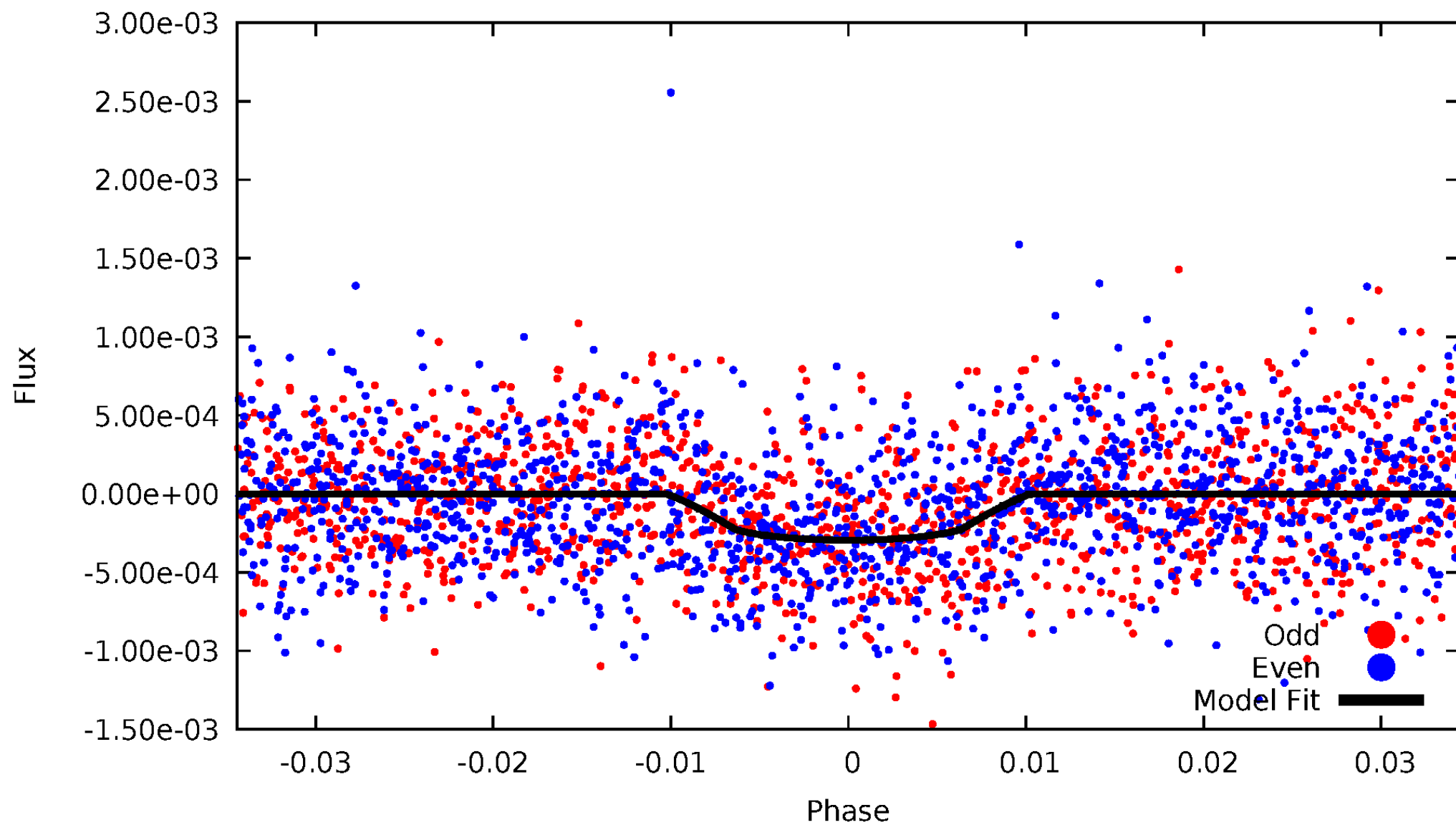


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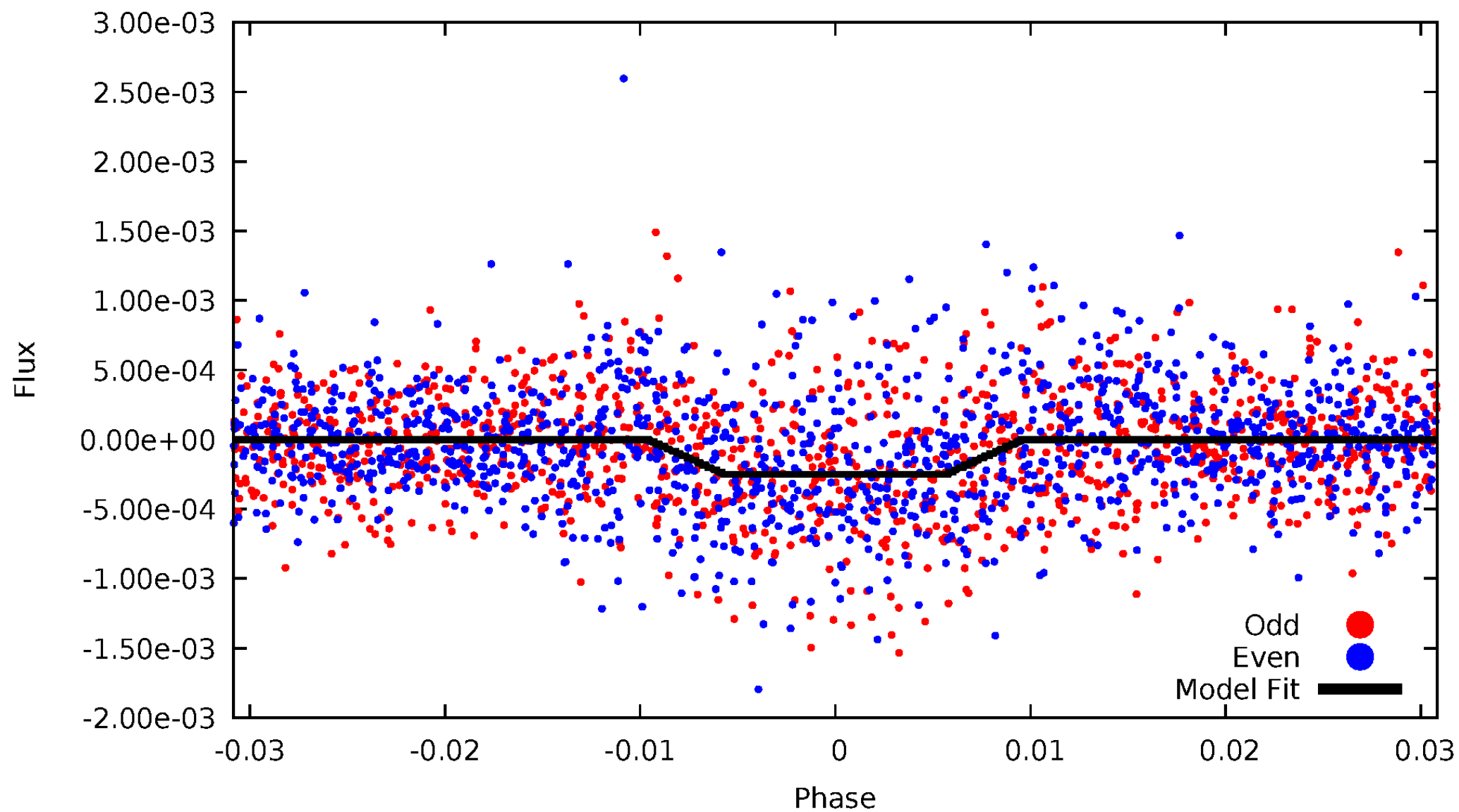
DV Odd/Even

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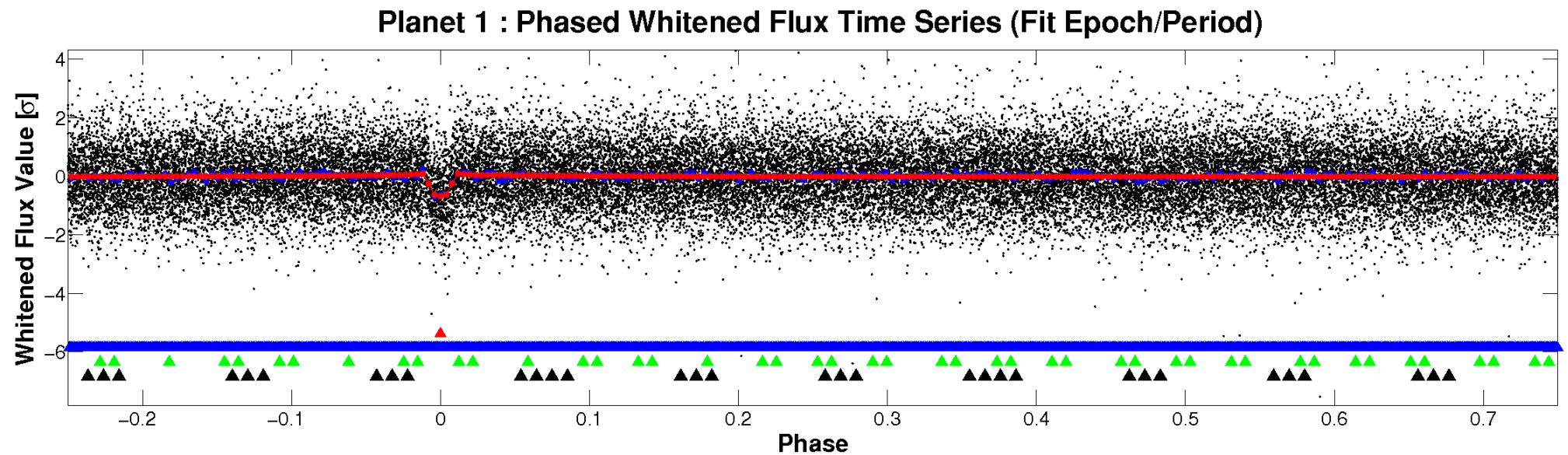
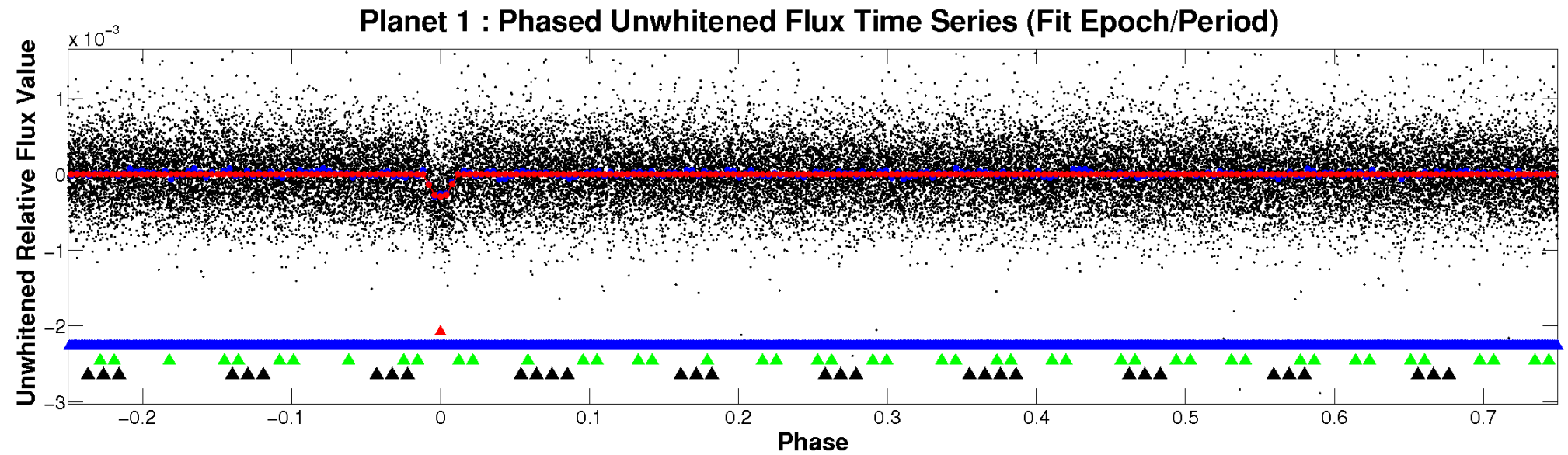


ALT Odd/Even

TCE 004367854-01

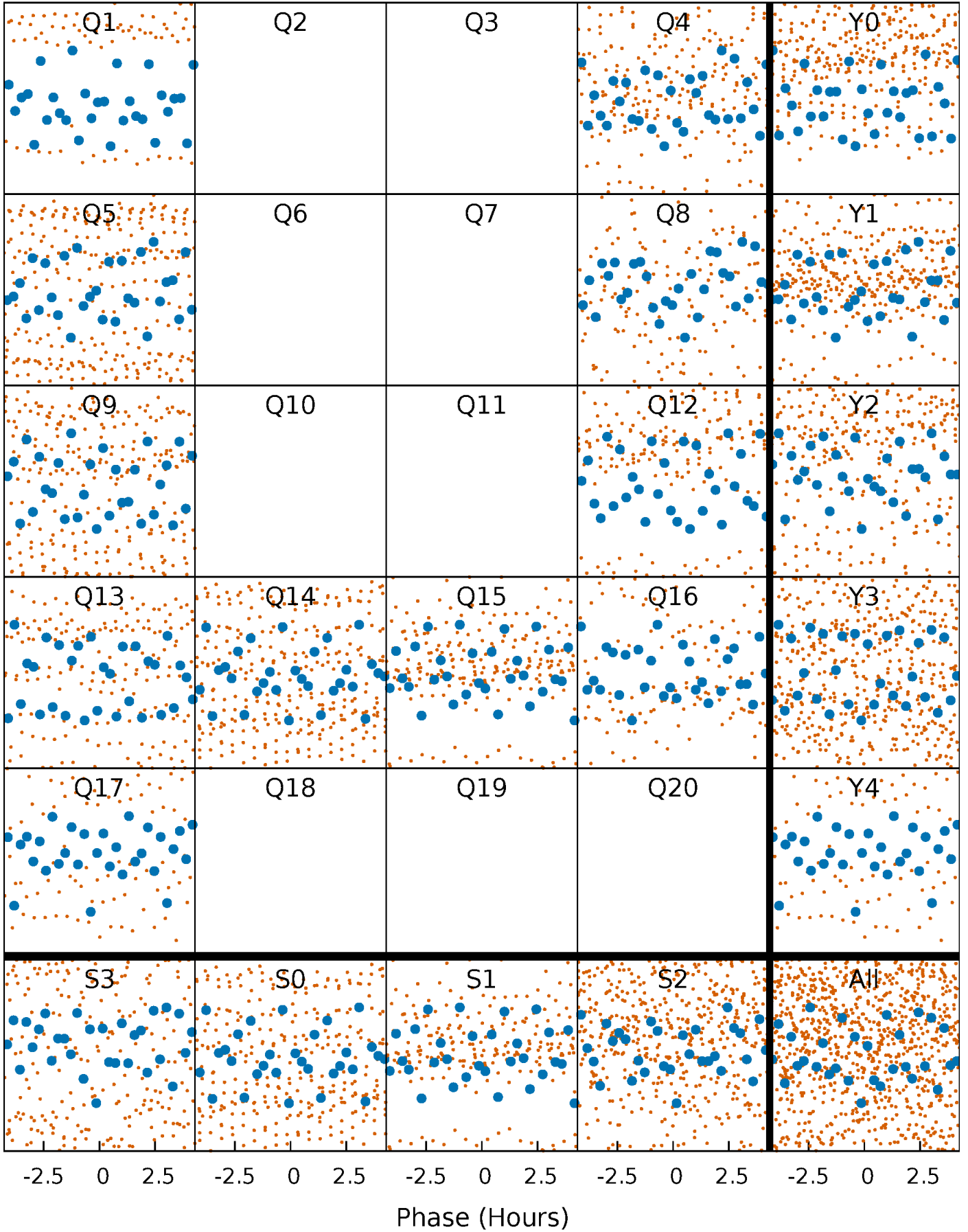


Non-Whitened Vs. Whitened Light Curve



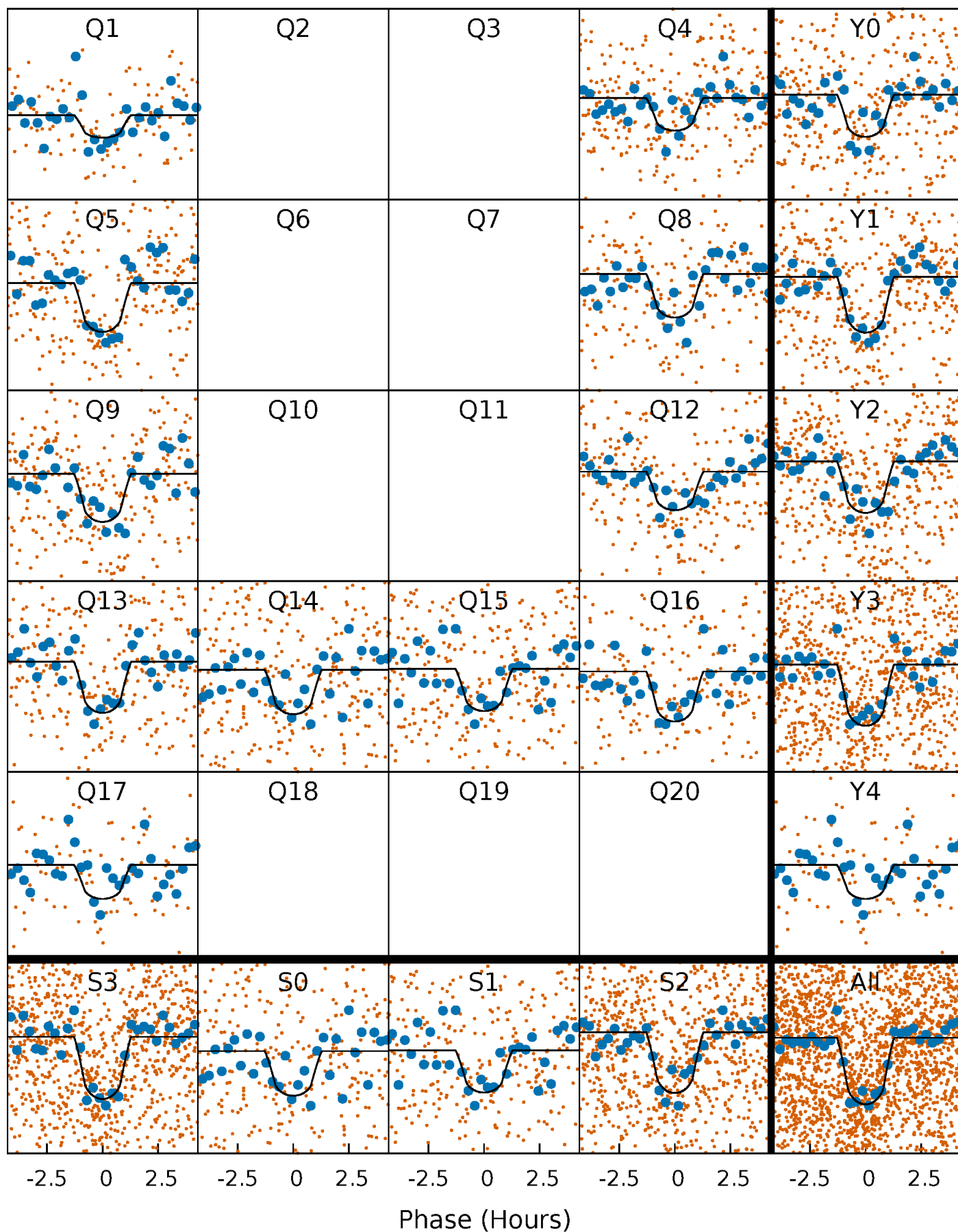
PDC Quarter-Phased Transit Curves

TCE 004367854-01 P= 5.195204 Days $T_0=133.343251$ (BKJD)



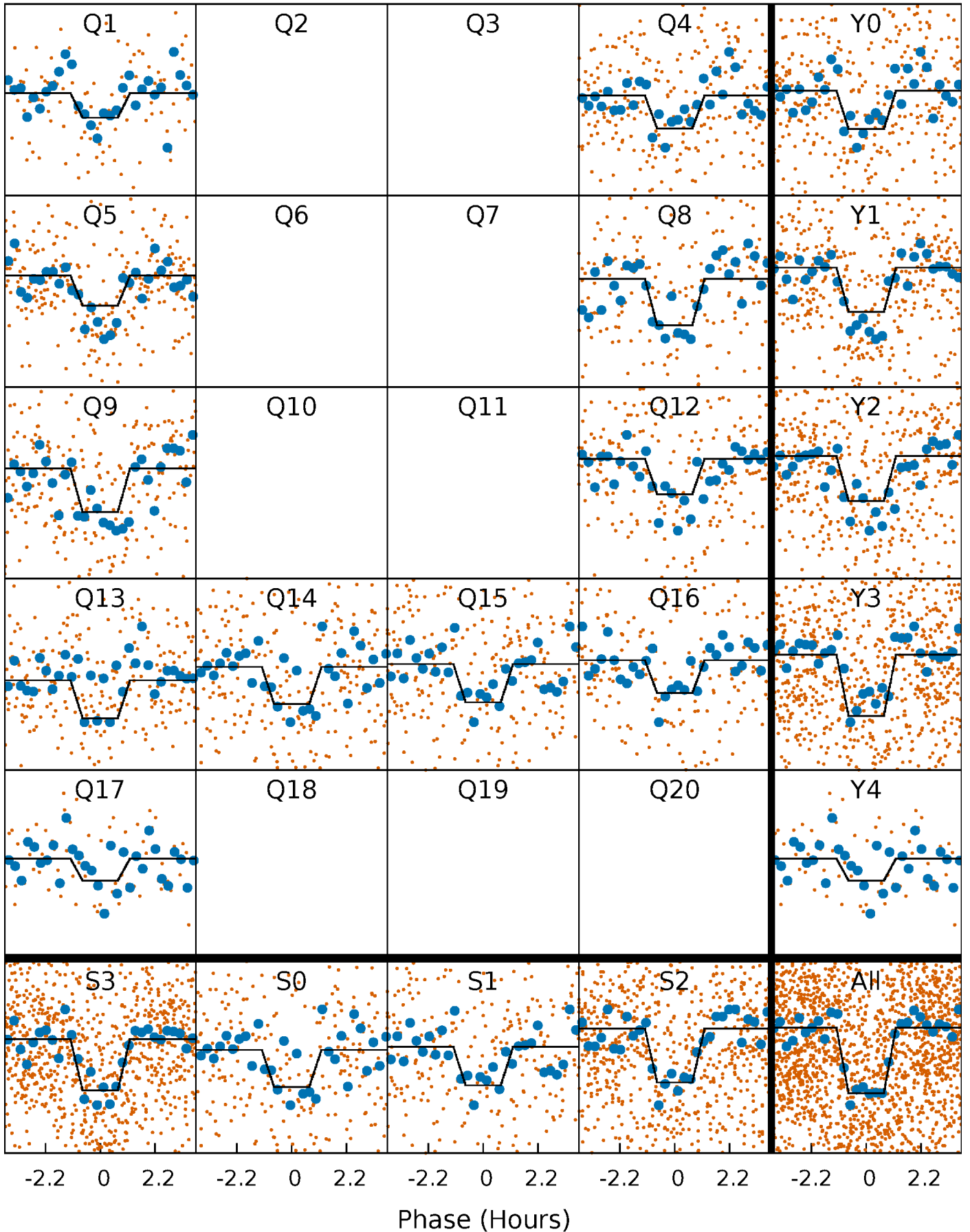
DV Quarter-Phased Transit Curves

TCE 004367854-01 P= 5.195204 Days $T_0=133.343251$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

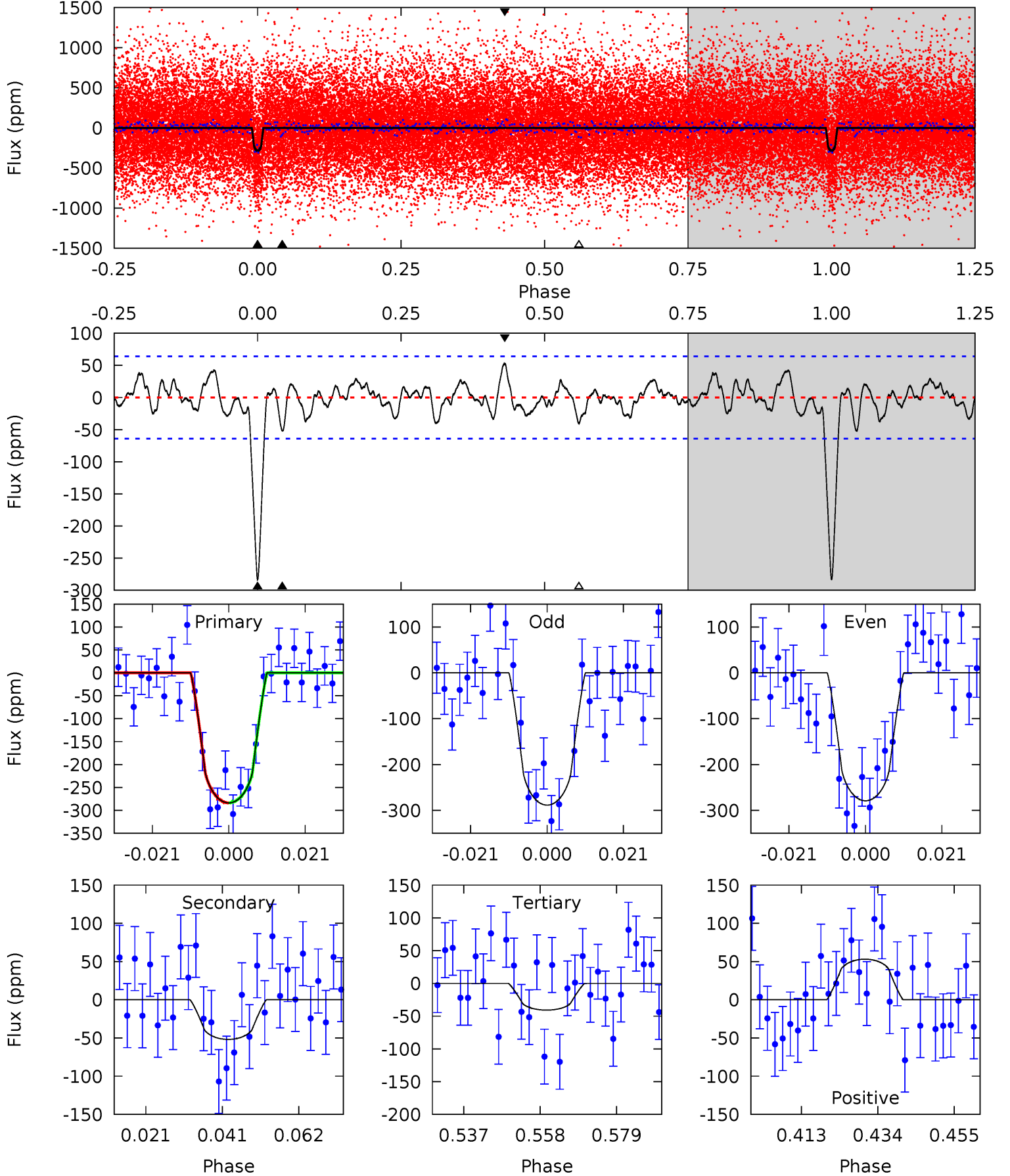
TCE 004367854-01 P= 5.195172 Days $T_0=133.347786$ (BKJD)



DV Model-Shift Uniqueness Test

004367854-01, P = 5.195204 Days, E = 128.148047 Days

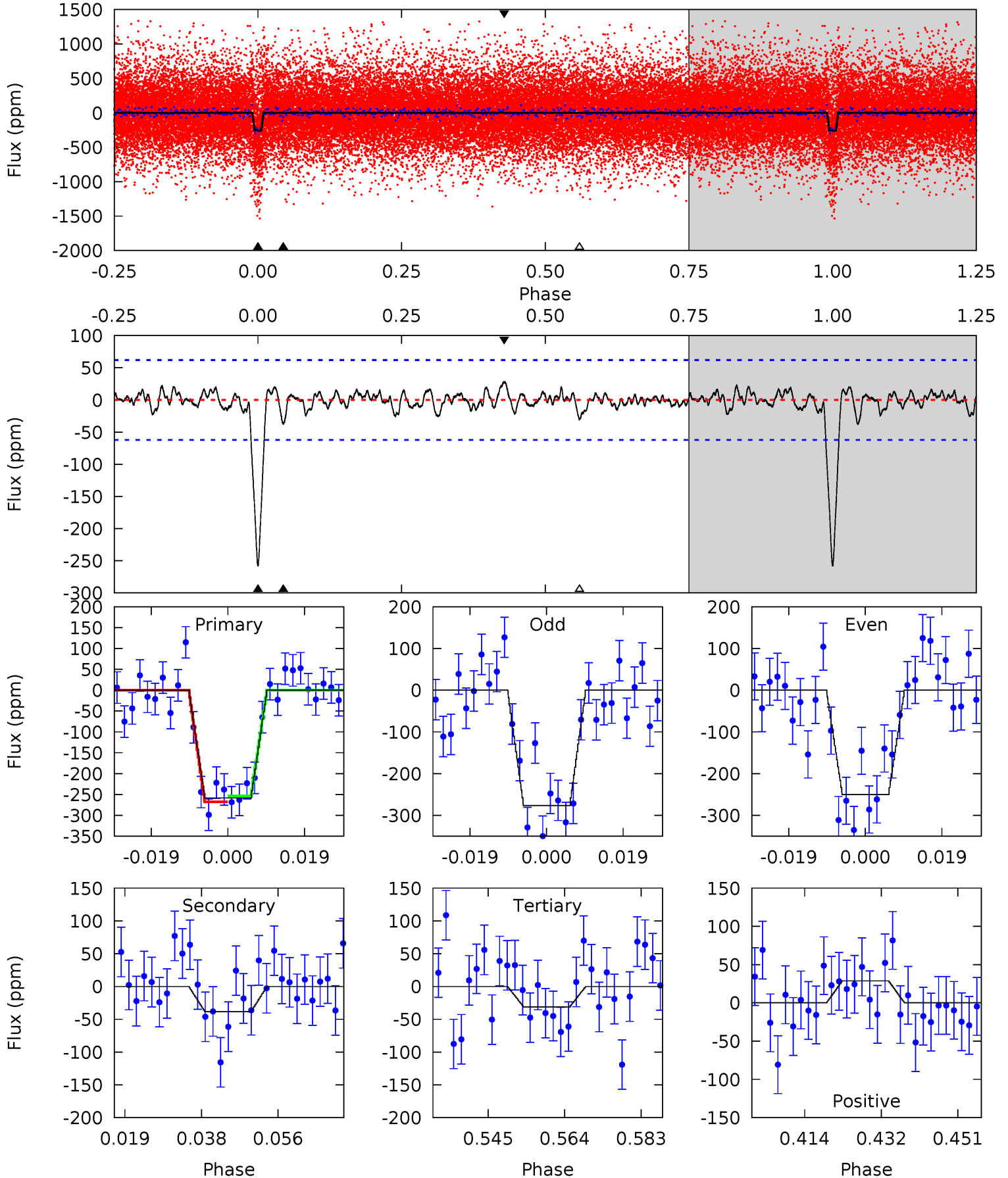
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.7	3.96	3.11	4.05	4.89	2.31	1.33	18.5	17.6	0.85	-0.09	0.36	0.98	0.16	0.02



Alt Model-Shift Uniqueness Test

004367854-01, P = 5.195172 Days, E = 128.152614 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.4	3.03	2.45	2.27	4.90	2.35	0.78	18.0	18.1	0.58	0.76	1.05	0.90	0.10	0.54



Stellar Parameters For KIC 004367854

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5044^{+151}_{-136}	$4.551^{+0.078}_{-0.048}$	$-0.280^{+0.300}_{-0.300}$	$0.738^{+0.072}_{-0.079}$	$0.708^{+0.100}_{-0.050}$	$2.475^{+0.794}_{-0.419}$
	+3%/-3%	+2%/-1%	+107%/-107%	+10%/-11%	+14%/-7%	+32%/-17%
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 004367854-01 / KOI 2876.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-52 ± 13	$1.60^{+1.25}_{-0.99}$	1163^{+45}_{-44}	3485^{+1345}_{-586}	31^{+170}_{-22}
Alt.	-38 ± 13	$1.41^{+1.25}_{-0.91}$	1162^{+47}_{-42}	3429^{+1662}_{-616}	29^{+212}_{-21}

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 $A_{obs} \gg 1.0$

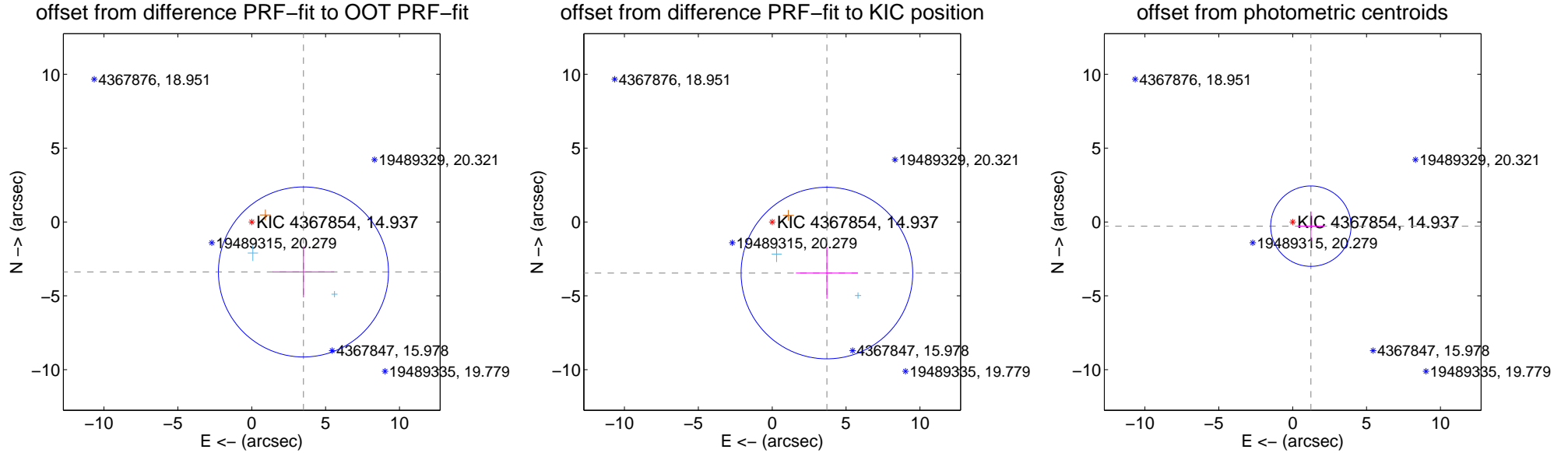
DV Centroid Data

Supplemental centroid analysis for 004367854-01. Kepler magnitude: 14.94. Transit SNR 14.76

There are 2 quarters with good PRF difference image offsets

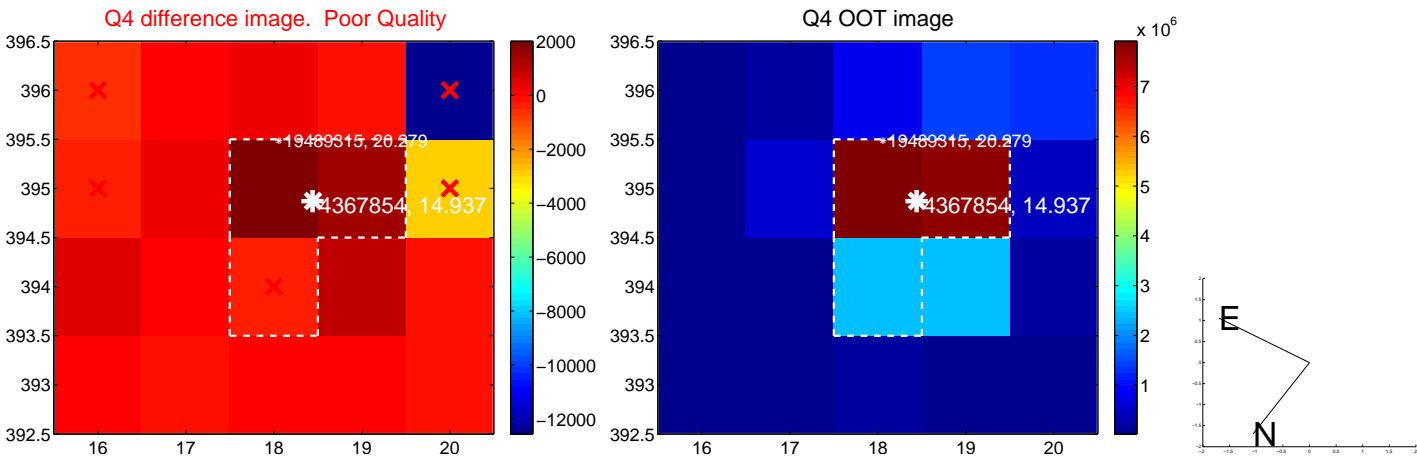
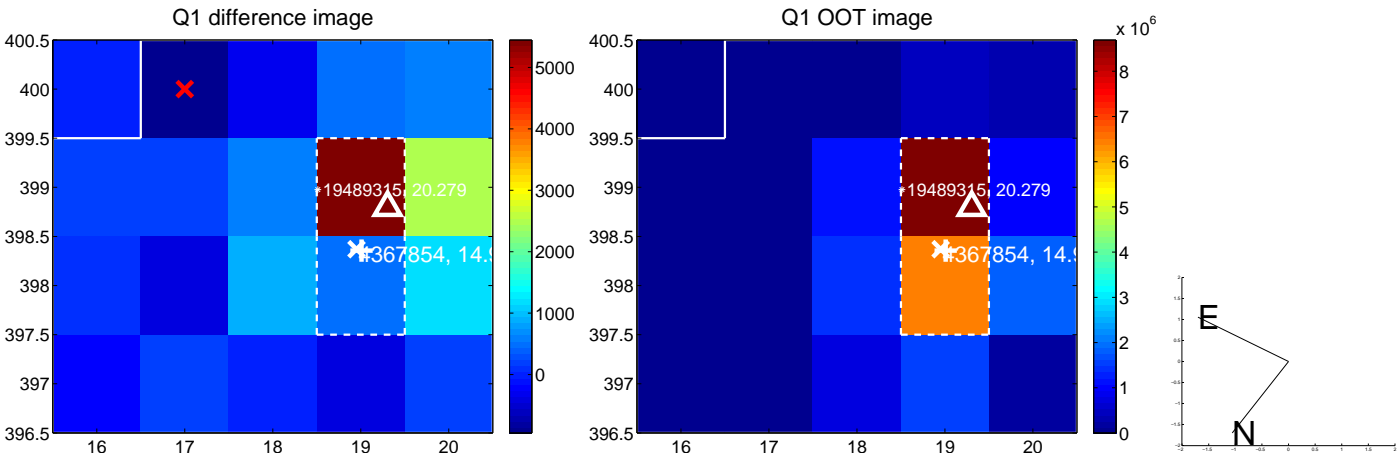
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.870 ± 1.918	2.54	-3.501 ± 2.085	-3.385 ± 1.722
PRF-fit source offset from KIC position	5.067 ± 1.936	2.62	-3.703 ± 2.092	-3.459 ± 1.740
photometric centroid source offset	1.26 ± 0.91	1.39	-1.23 ± 0.90	-0.28 ± 0.98

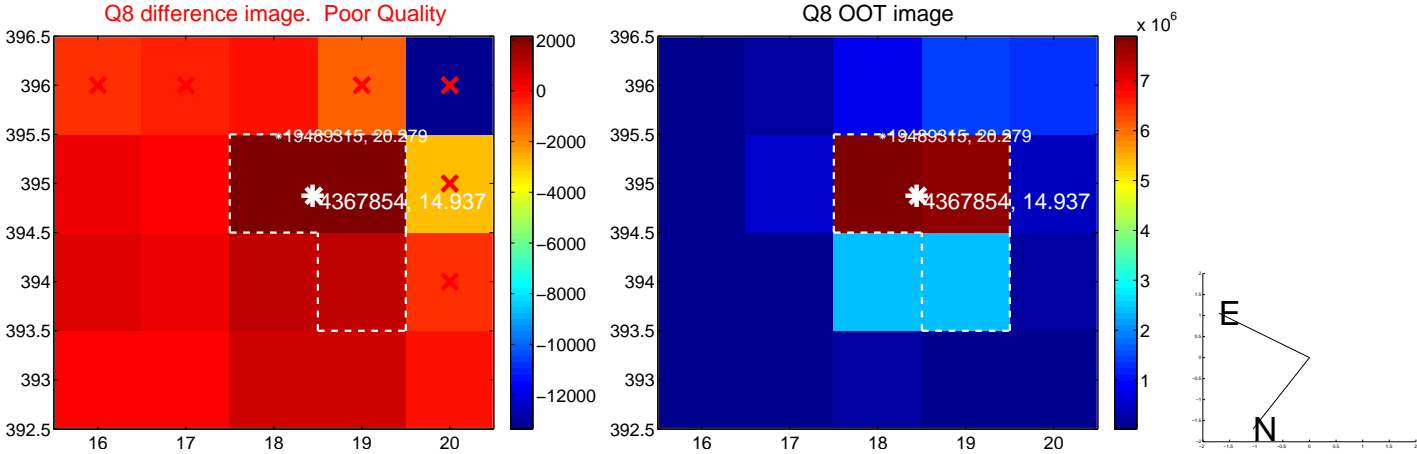
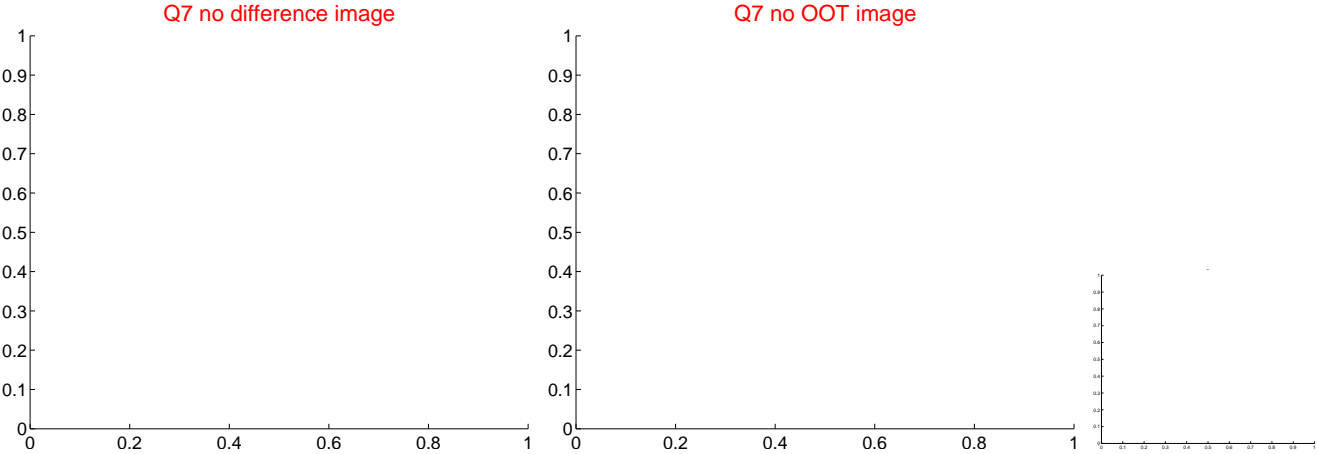
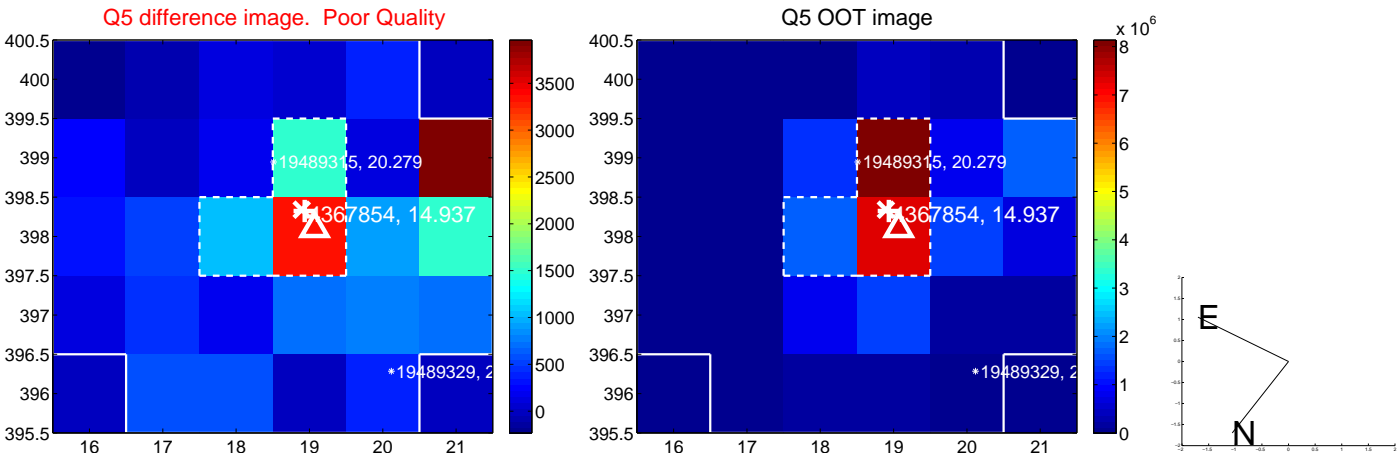


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

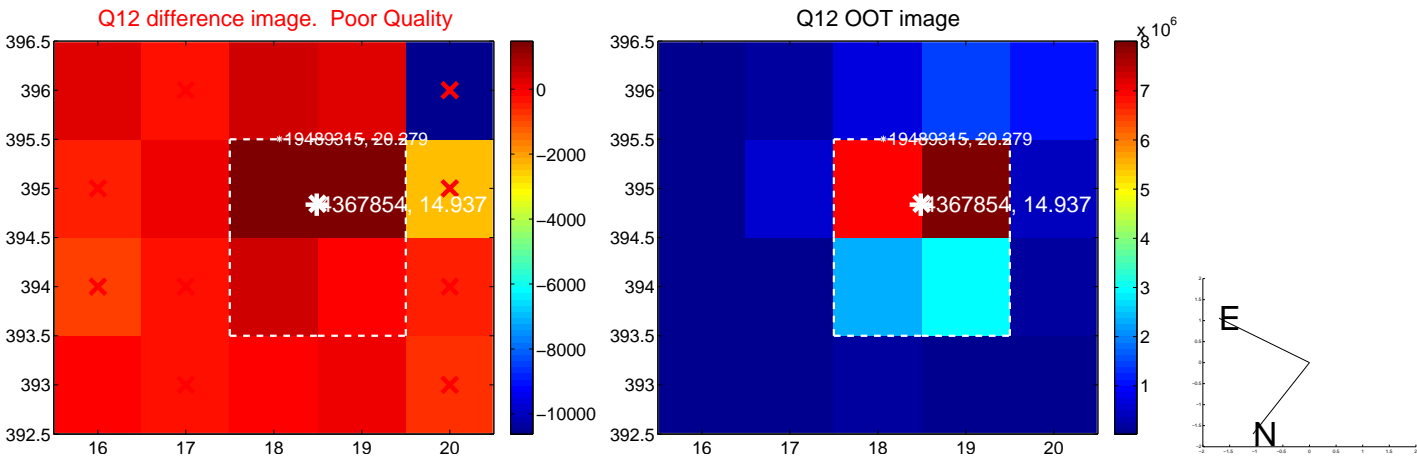
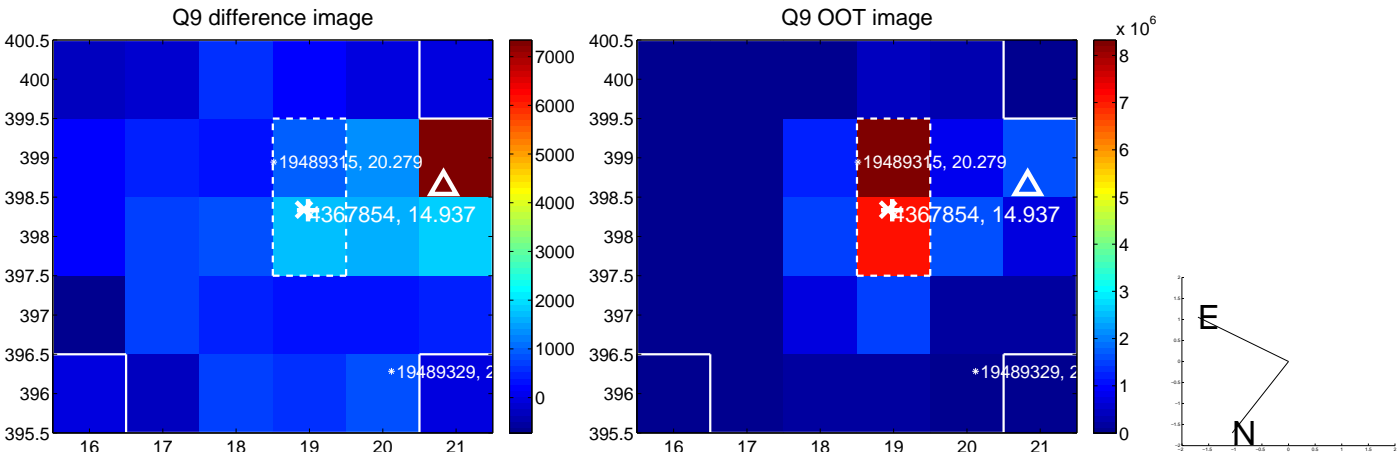
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



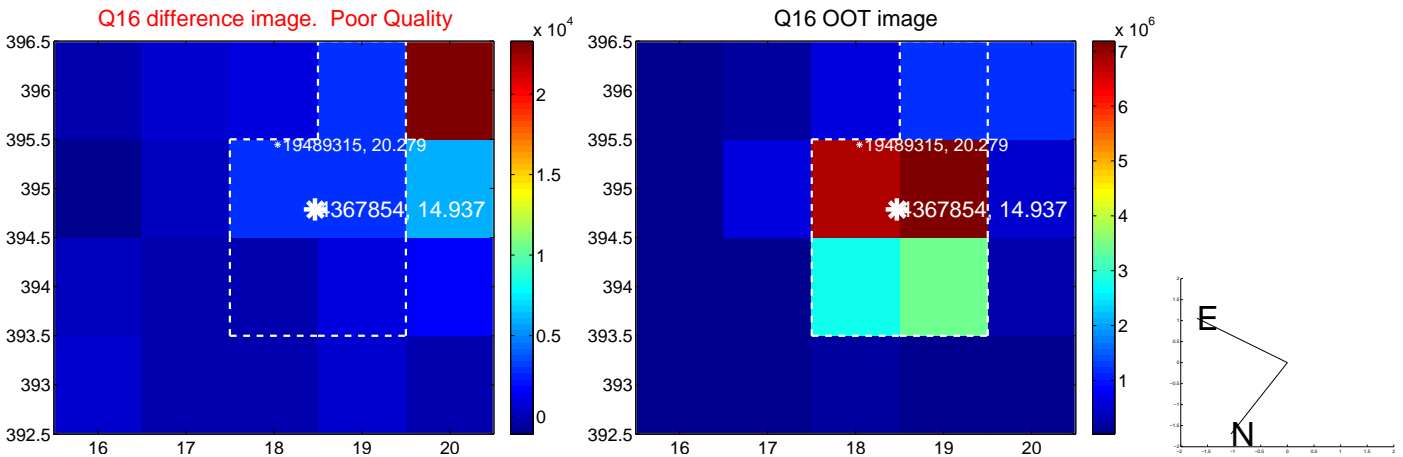
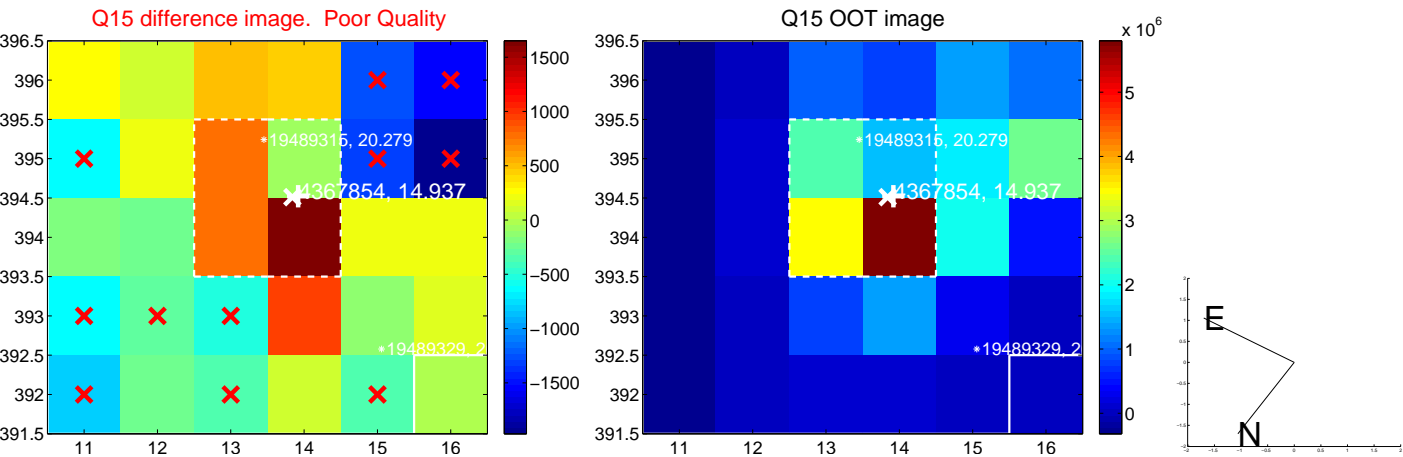
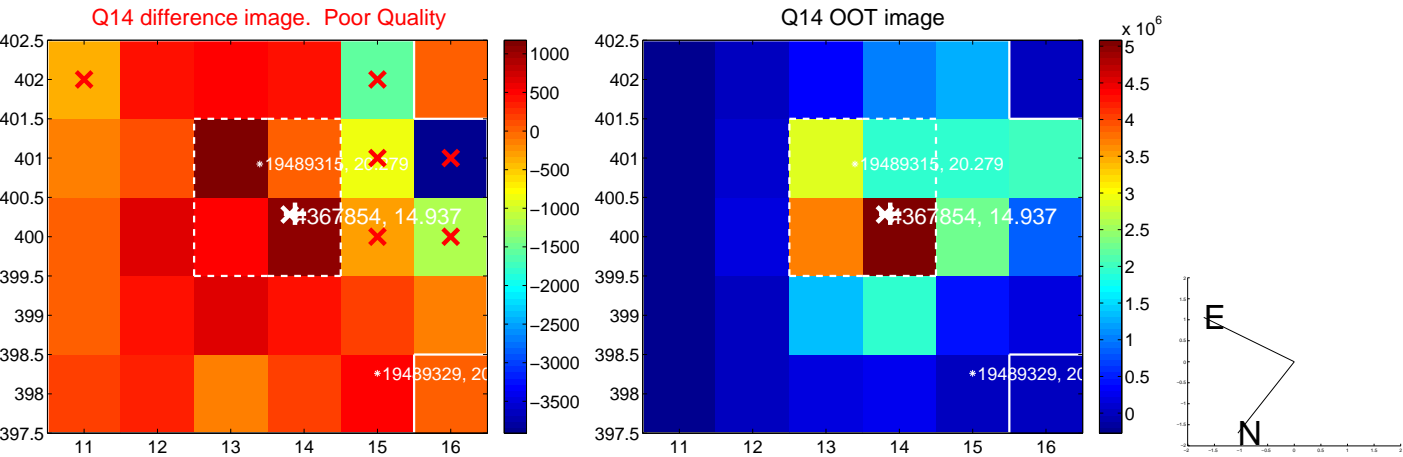
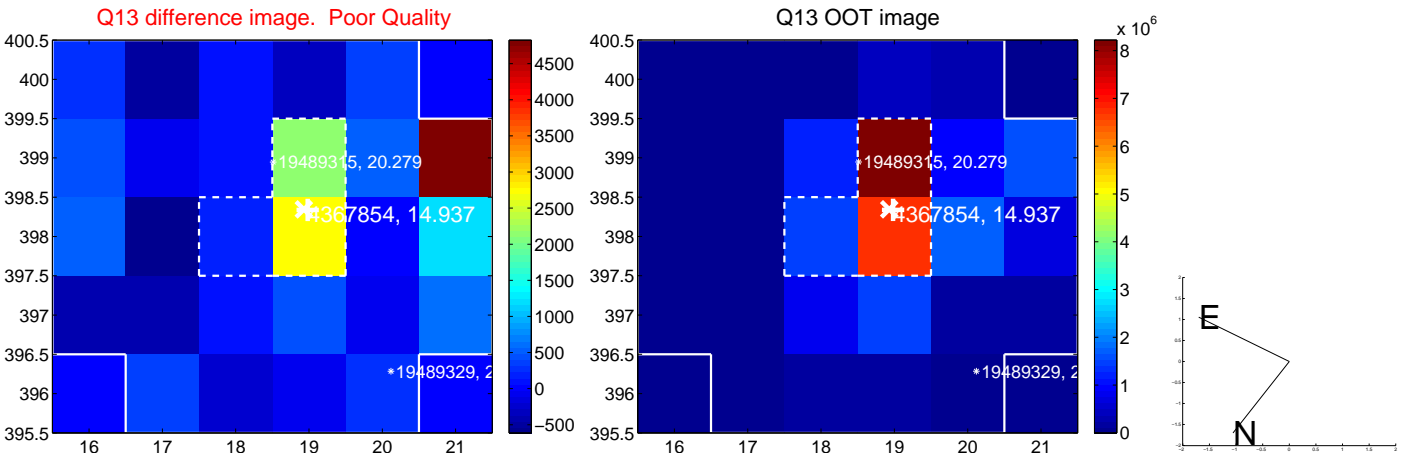
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



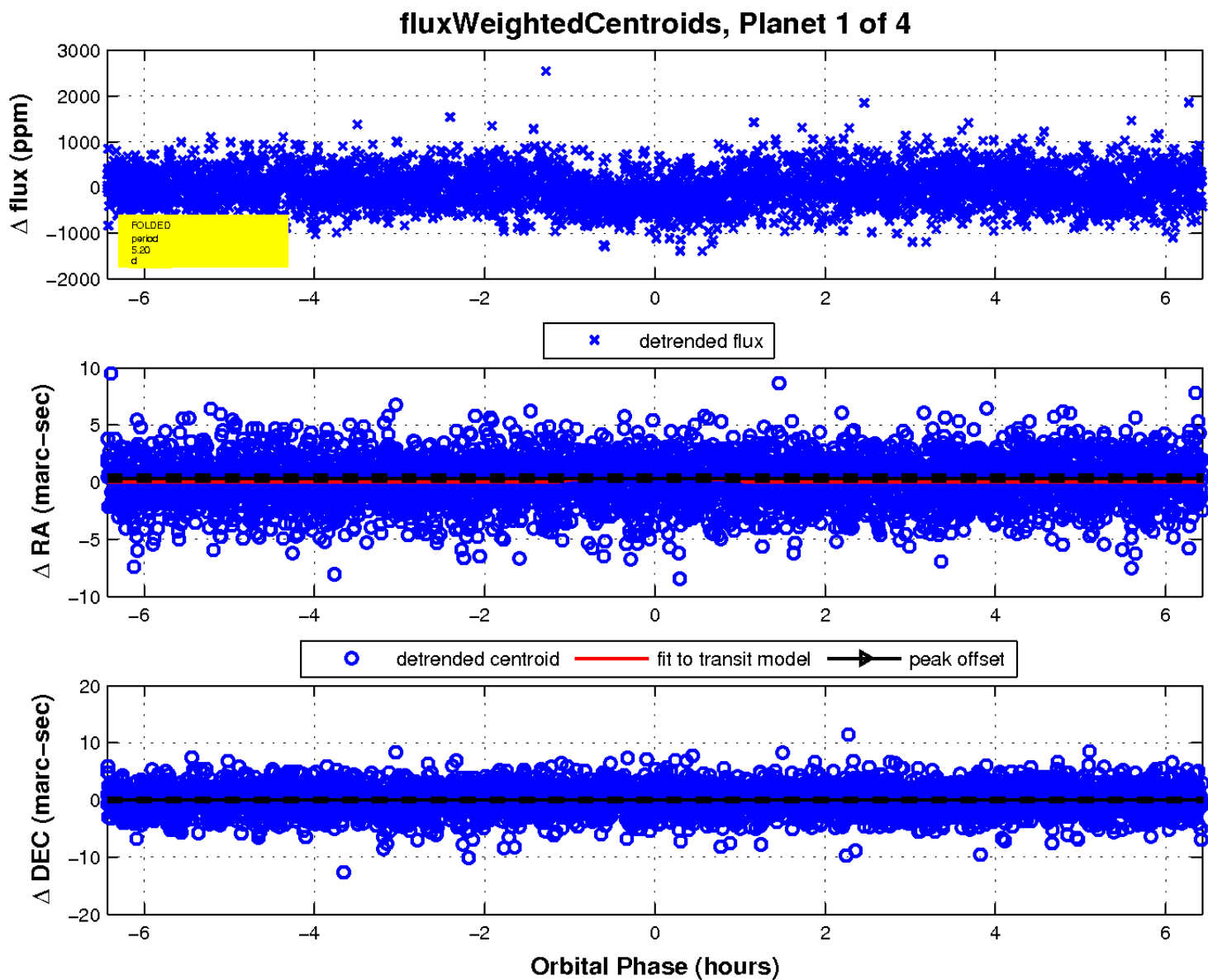
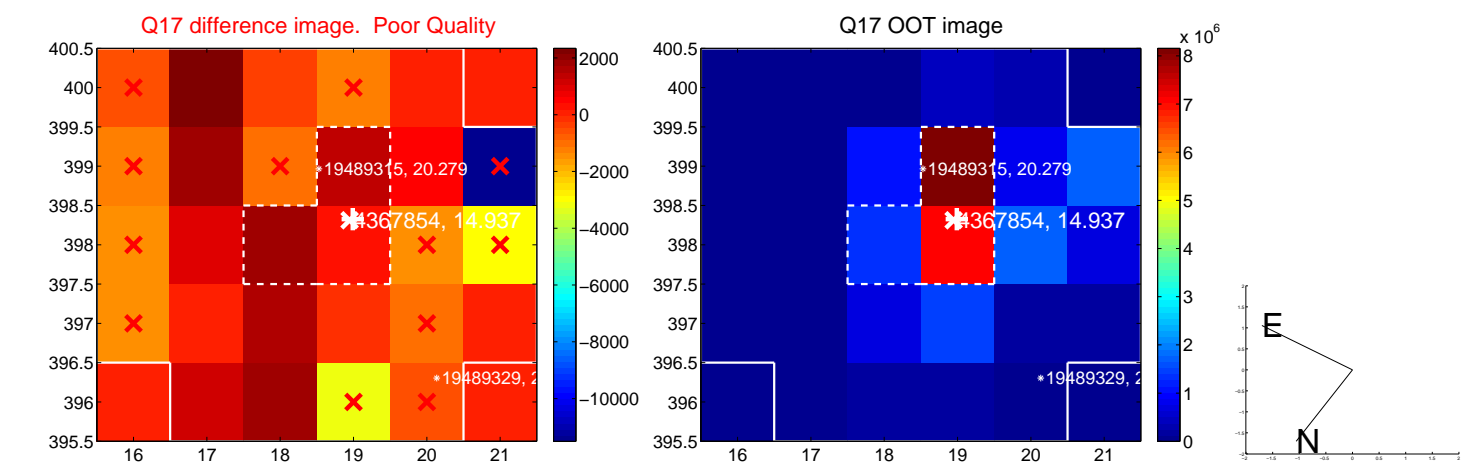
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

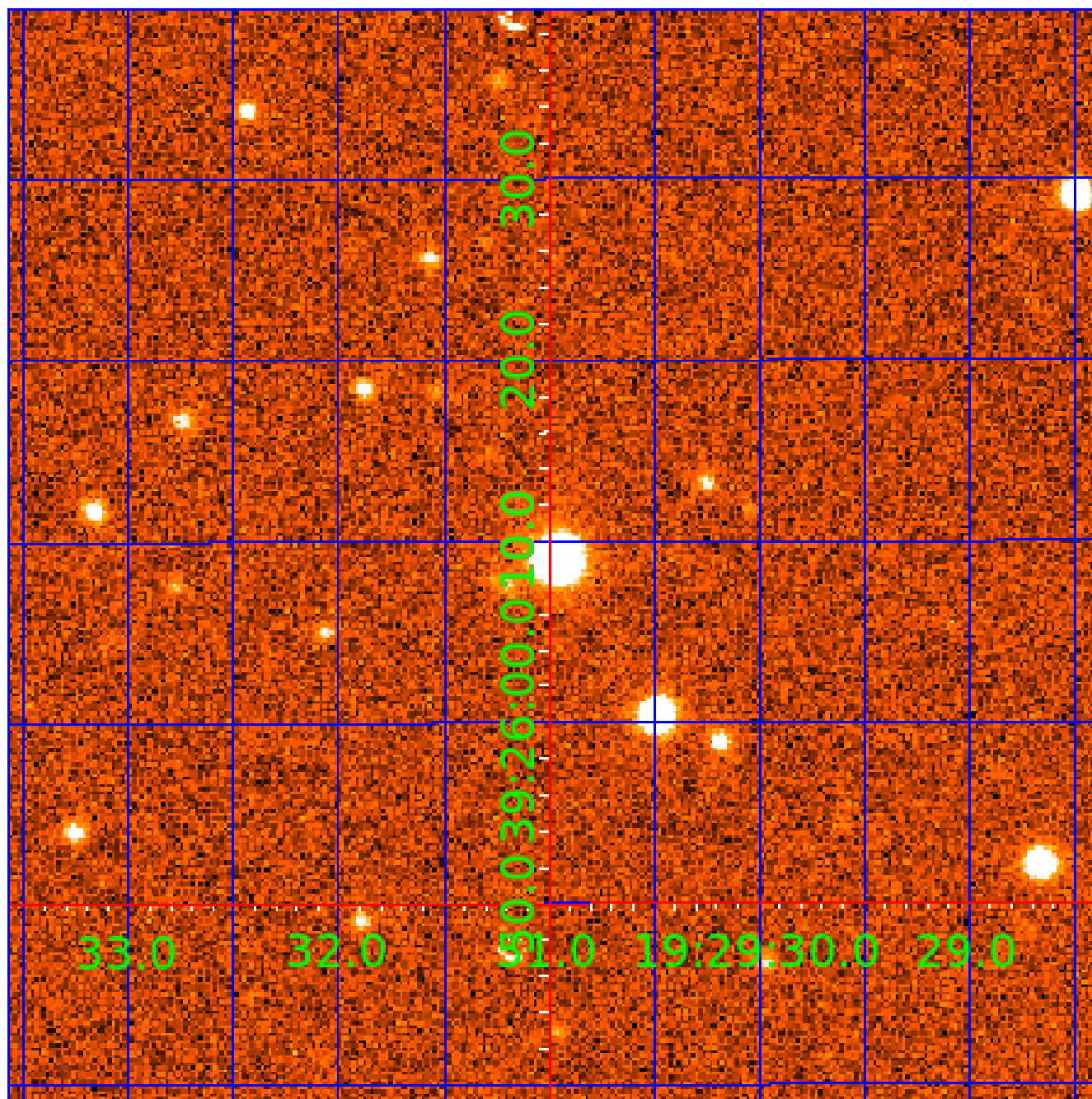


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004367854

Q1-17 DR25 TCE Parameters

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004367854-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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.

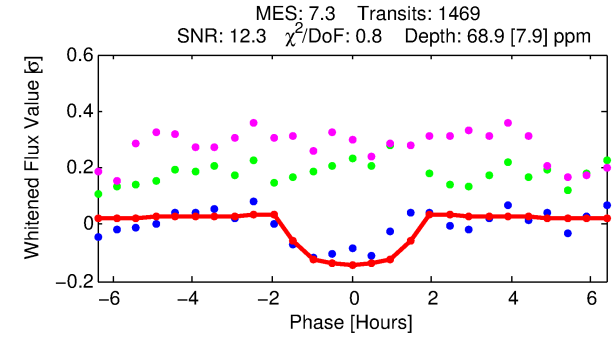
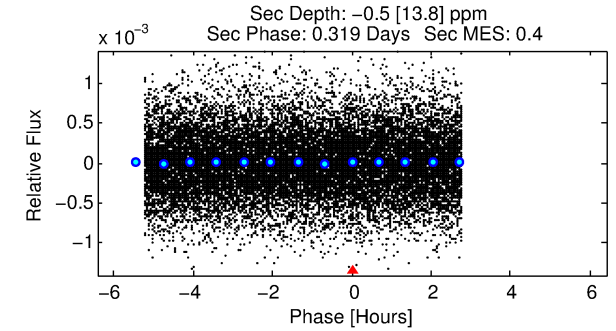
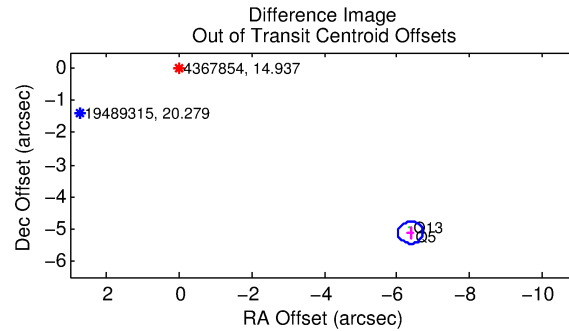
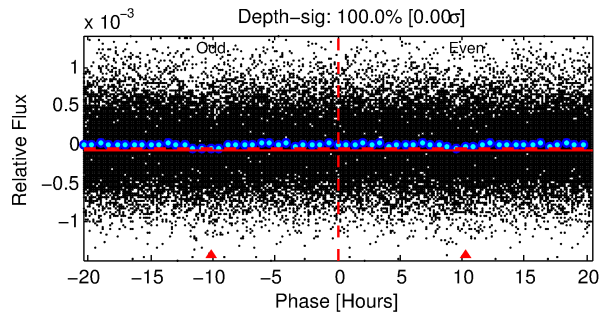
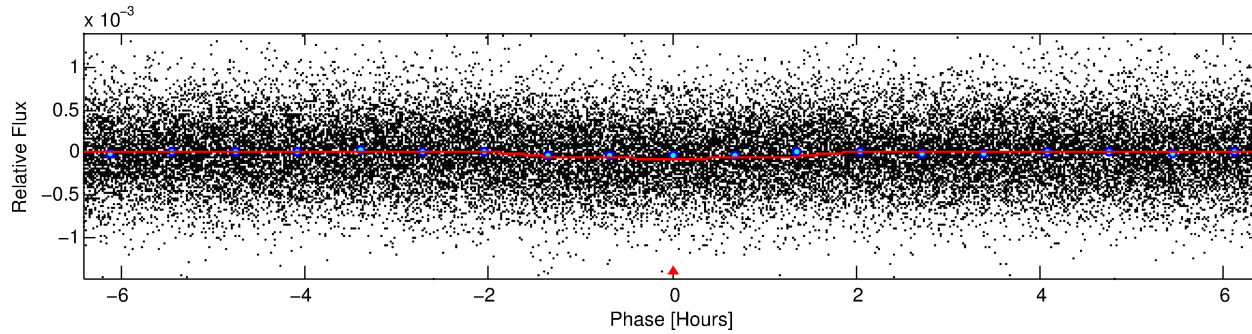
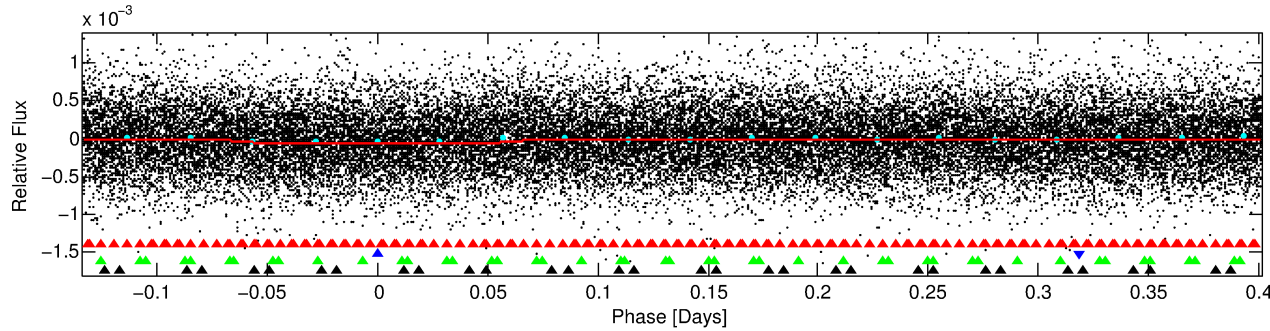
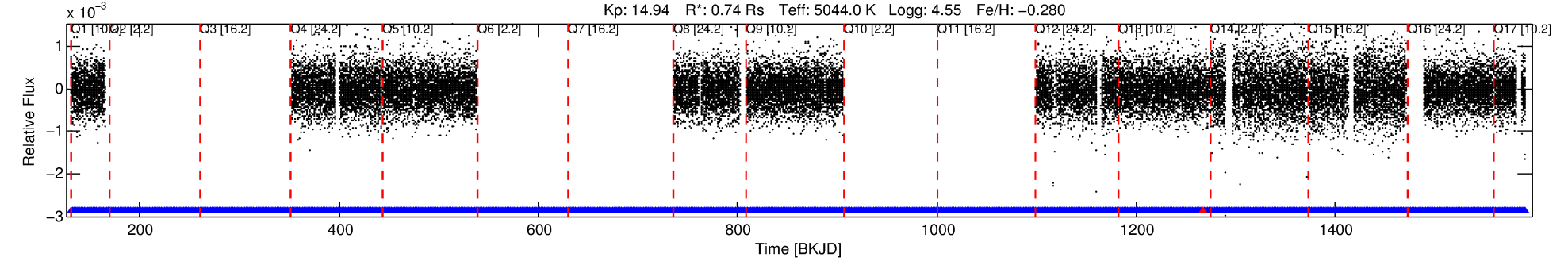
Ephemeris Match Information For 004367854-02

No Significant Match Found

DV One-Page Summary

KIC: 4367854 Candidate: 2 of 4 Period: 0.535 d
KOI: K02876 Corr: No Ephemeris Match

Kp: 14.94 R*: 0.74 Rs Teff: 5044.0 K Logg: 4.55 Fe/H: -0.280



DV Fit Results:

Period = 0.53523 [0.00001] d
Epoch = 131.7472 [0.0028] BKJD
Rp/R* = 0.0092 [0.0050]
a/R* = 1.09 [0.39]
b = 0.90 [0.49]
Seff = 2391.37 [439.44]
Teff = 1783 [82] K
Rp = 0.74 [0.41] Re
a = 0.0115 [0.0011] AU
Ag = N/A
Teffp = N/A

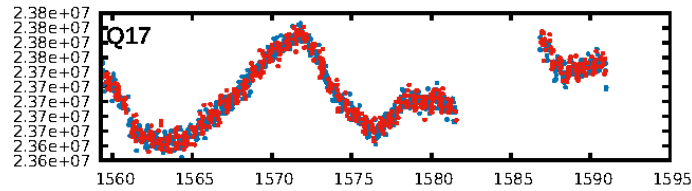
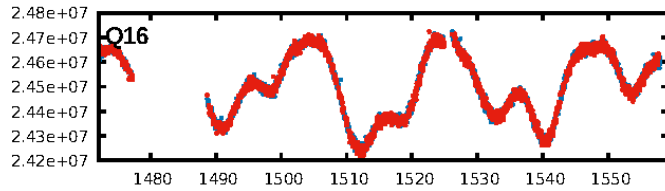
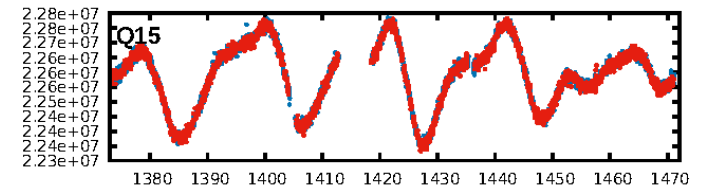
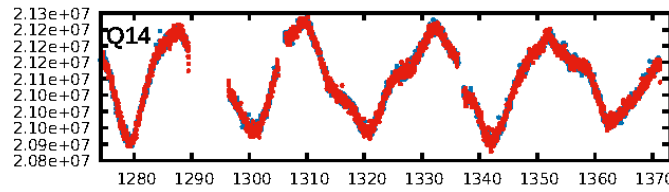
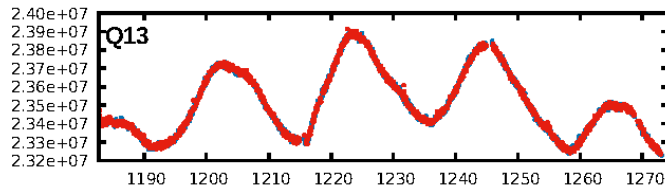
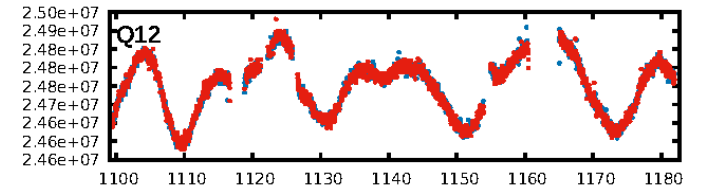
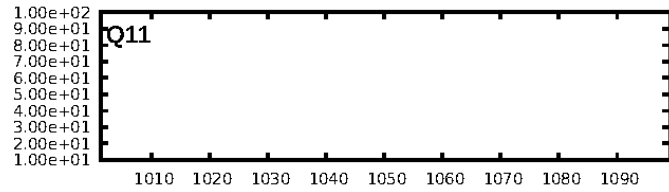
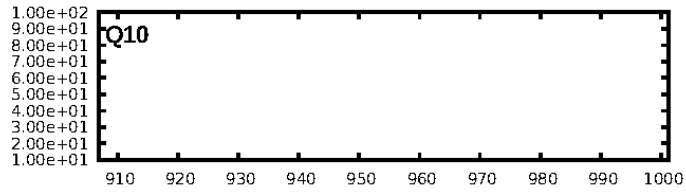
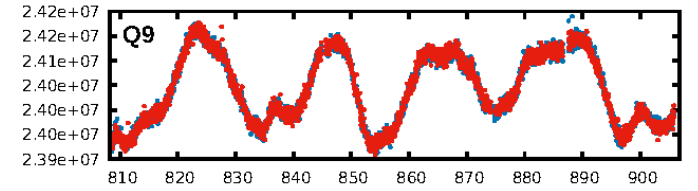
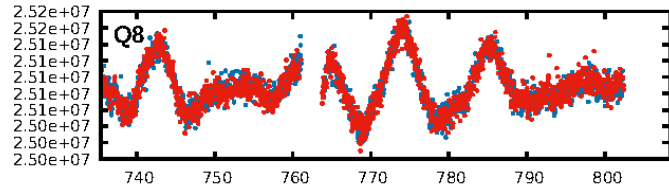
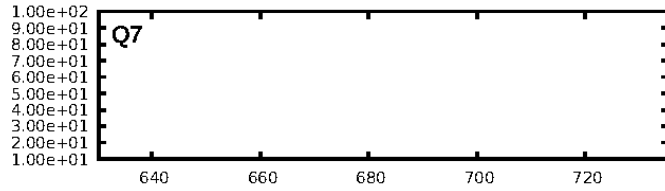
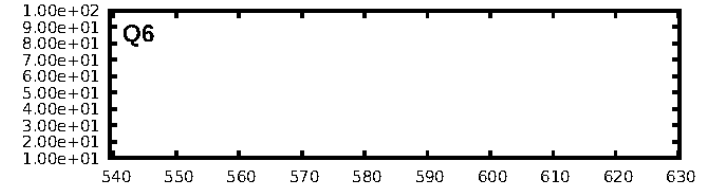
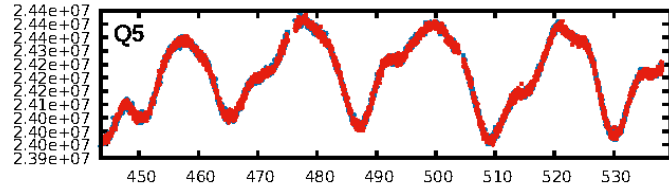
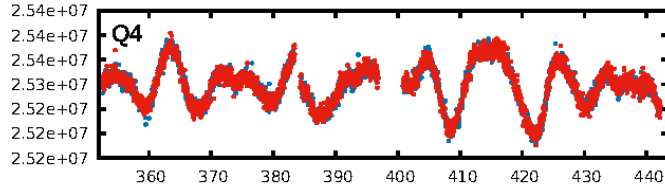
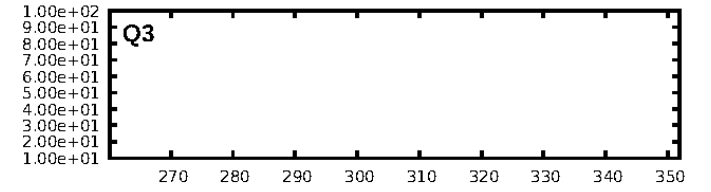
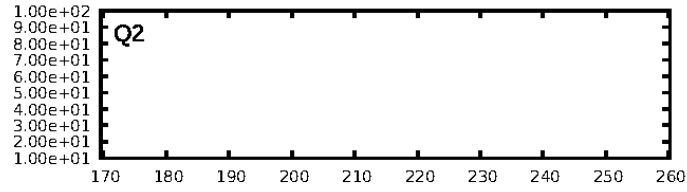
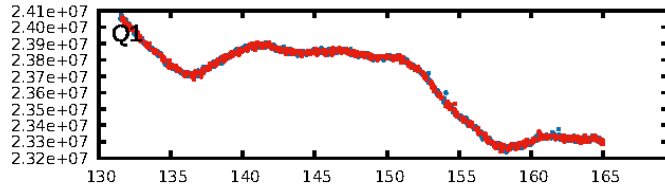
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [27.80σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.87e-11
RollingBand-fgt: 1.00 [1358/1359]
GhostDiagnostic-chr: -2.88
Centroid-sig: 21.5%
Centroid-so: 1.460 arcsec [1.35σ]
OotOffset-rm: 8.174 arcsec [72.46σ]
KicOffset-rm: 8.345 arcsec [85.52σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [11/11]

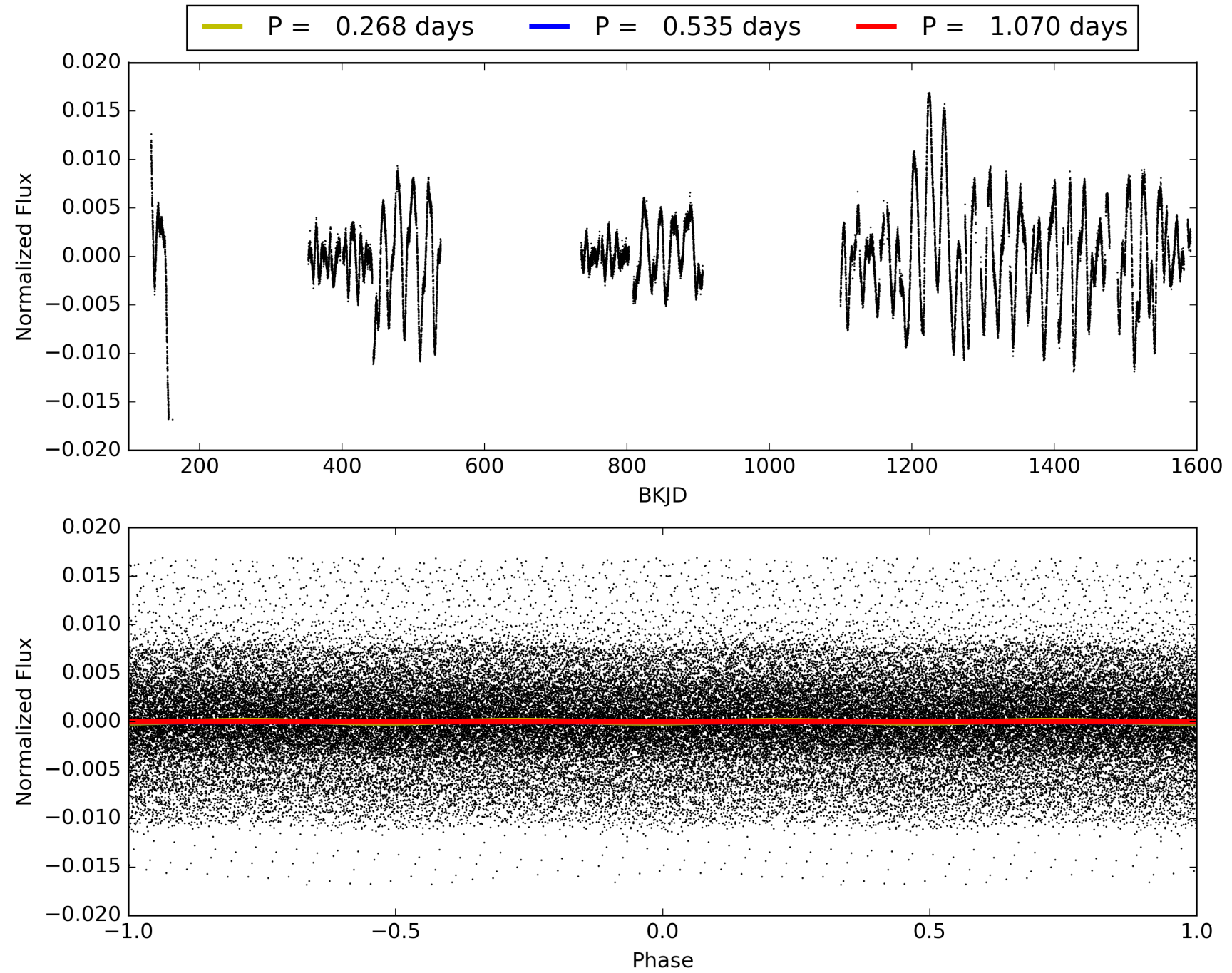
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:16:03 Z

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

TCE 004367854-02, PDC Light Curves

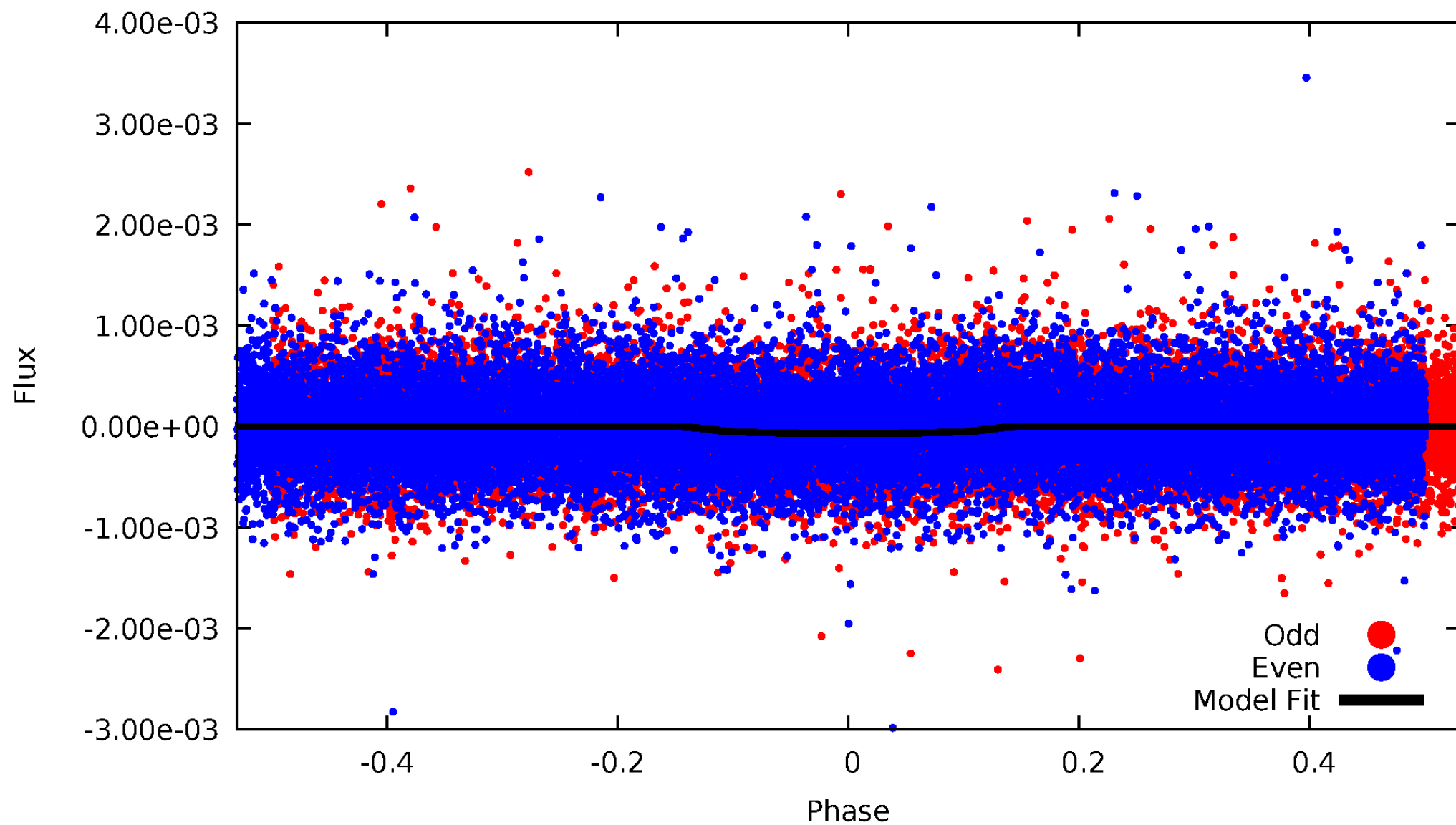


TCE 004367854-02



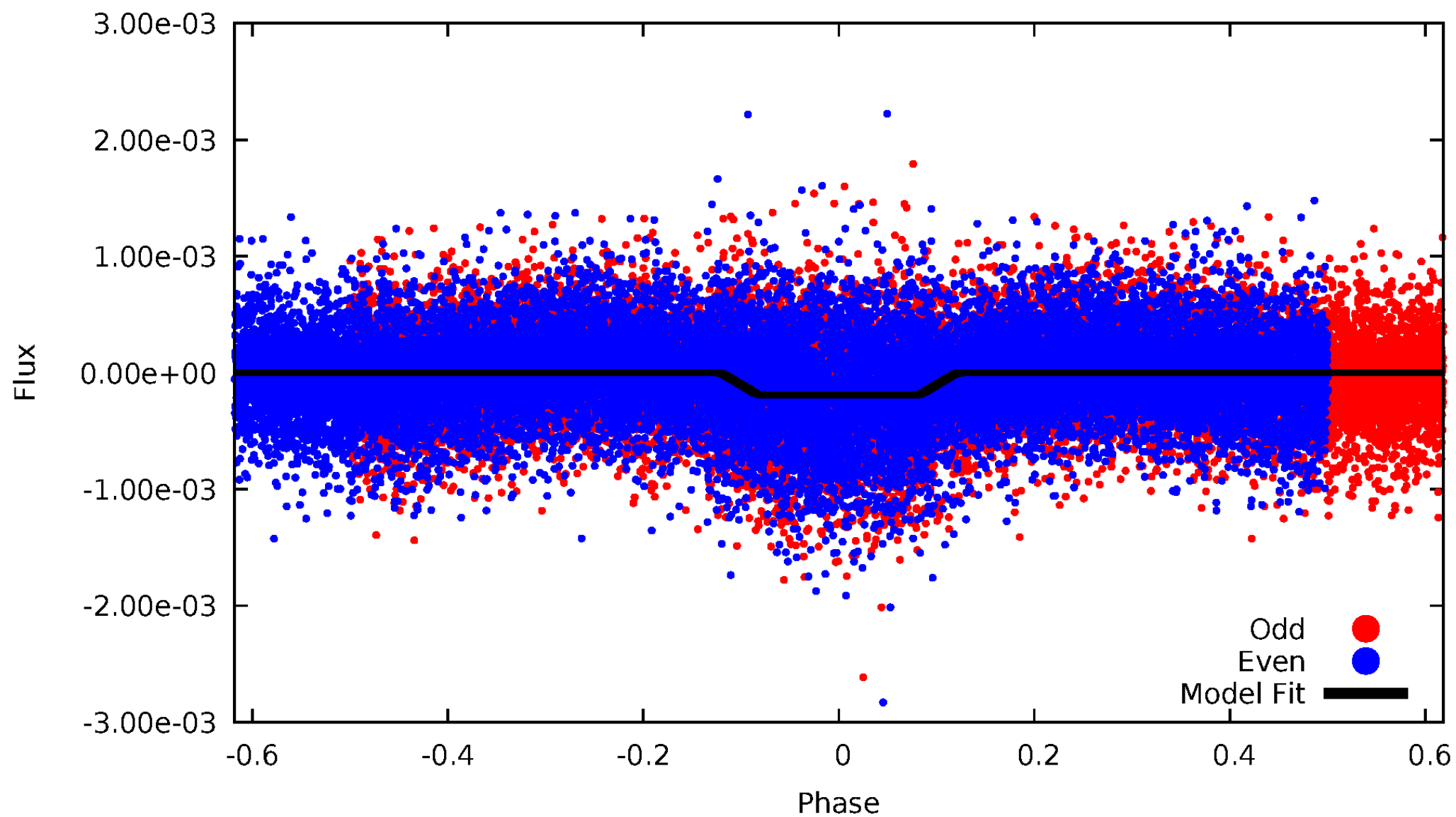
DV Odd/Even

TCE 004367854-02



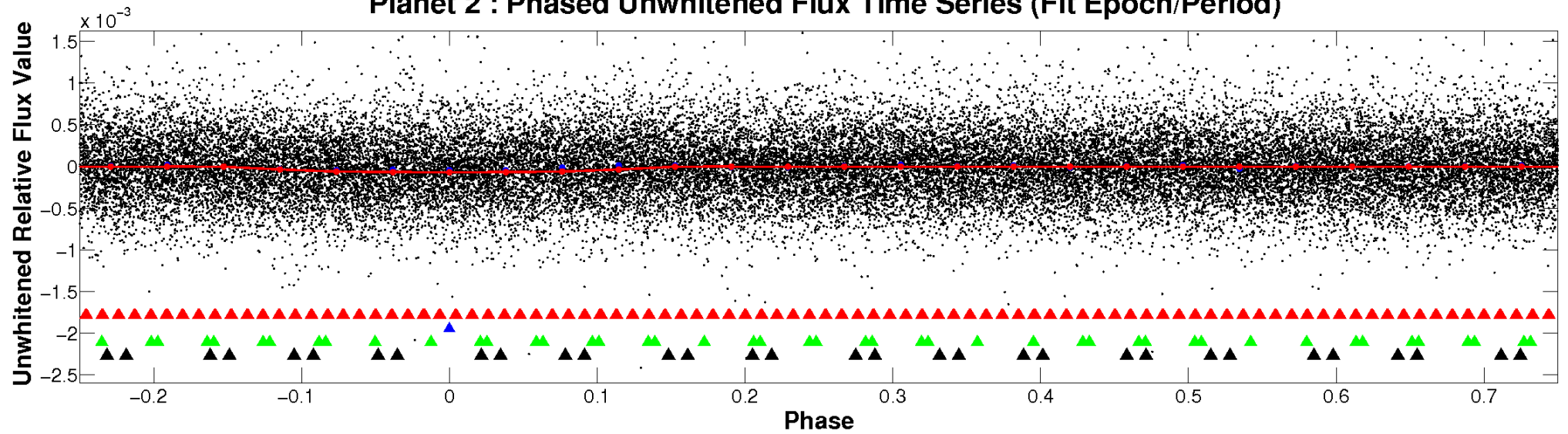
ALT Odd/Even

TCE 004367854-02

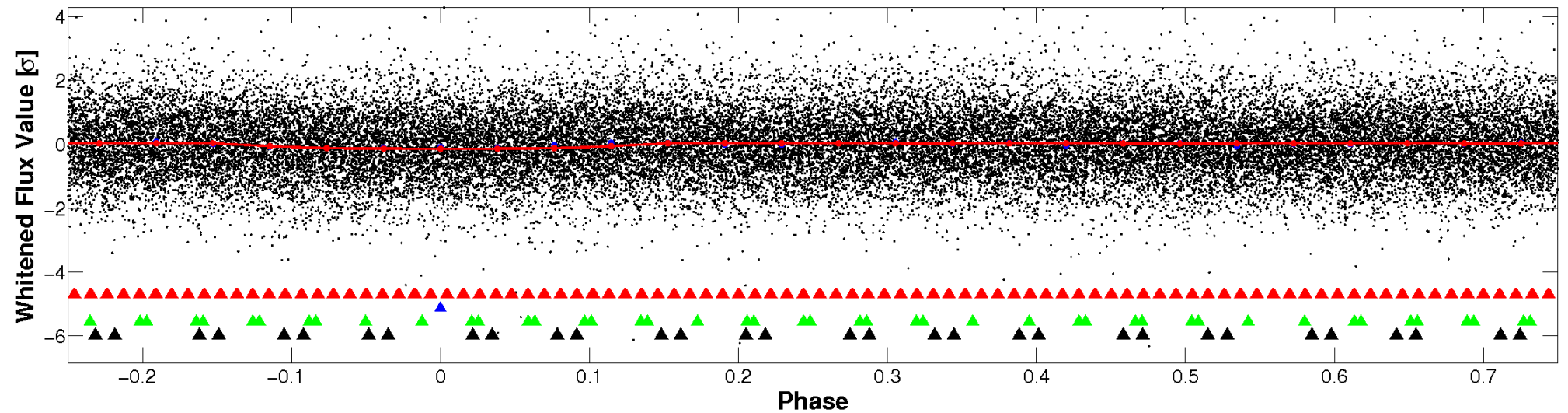


Non-Whitened Vs. Whitened Light Curve

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

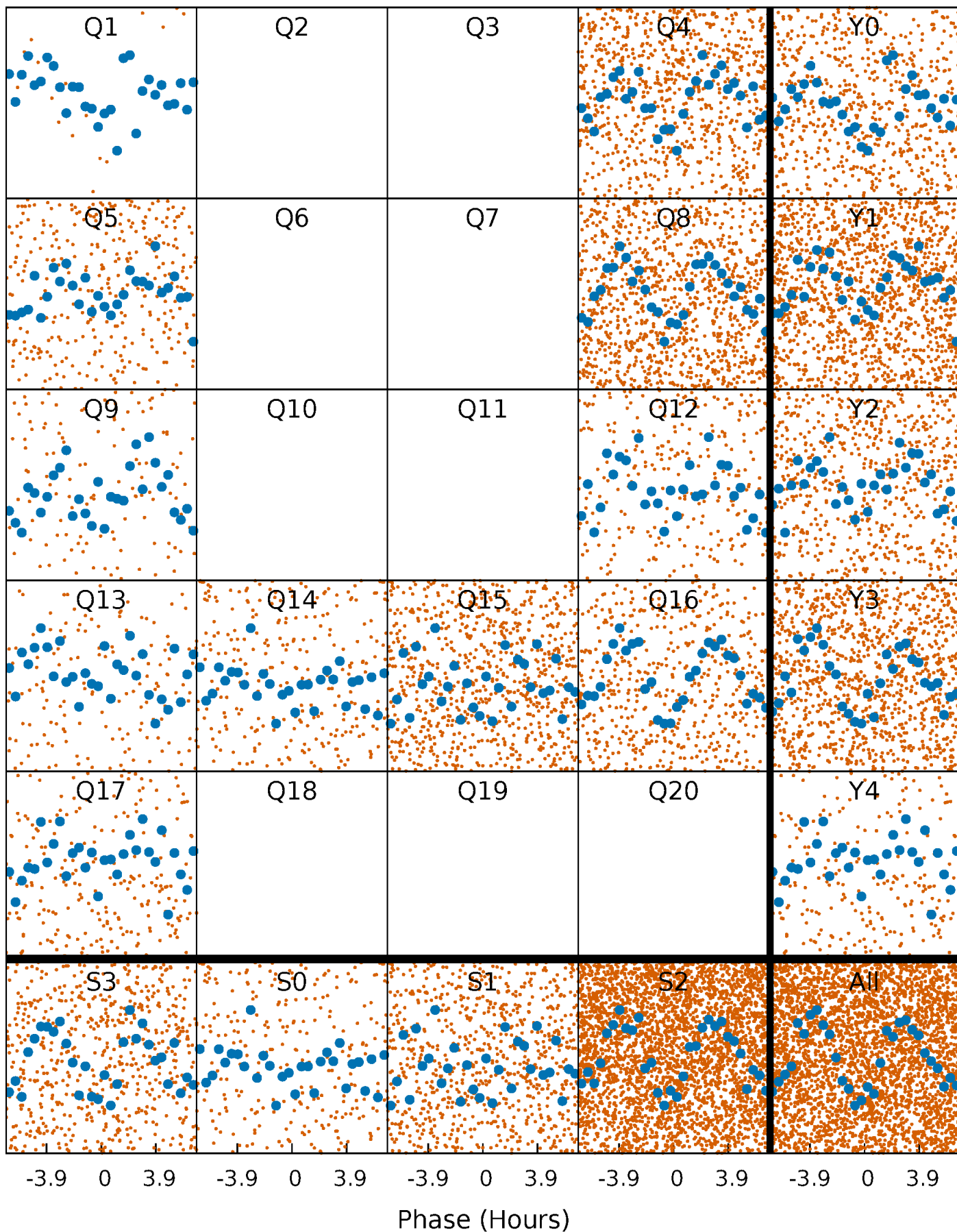


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



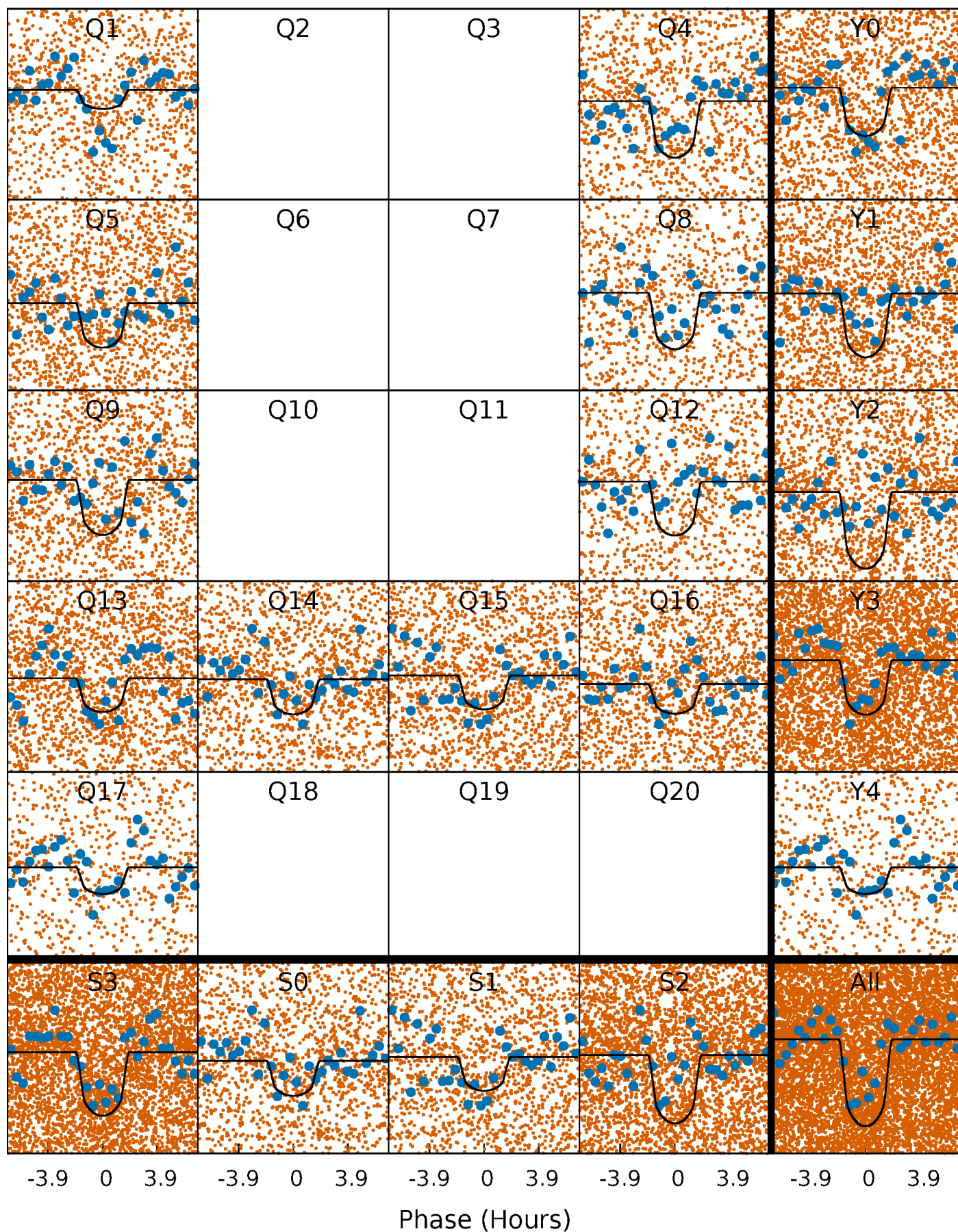
PDC Quarter-Phased Transit Curves

TCE 004367854-02 P= 0.535228 Days $T_0=131.747196$ (BKJD)



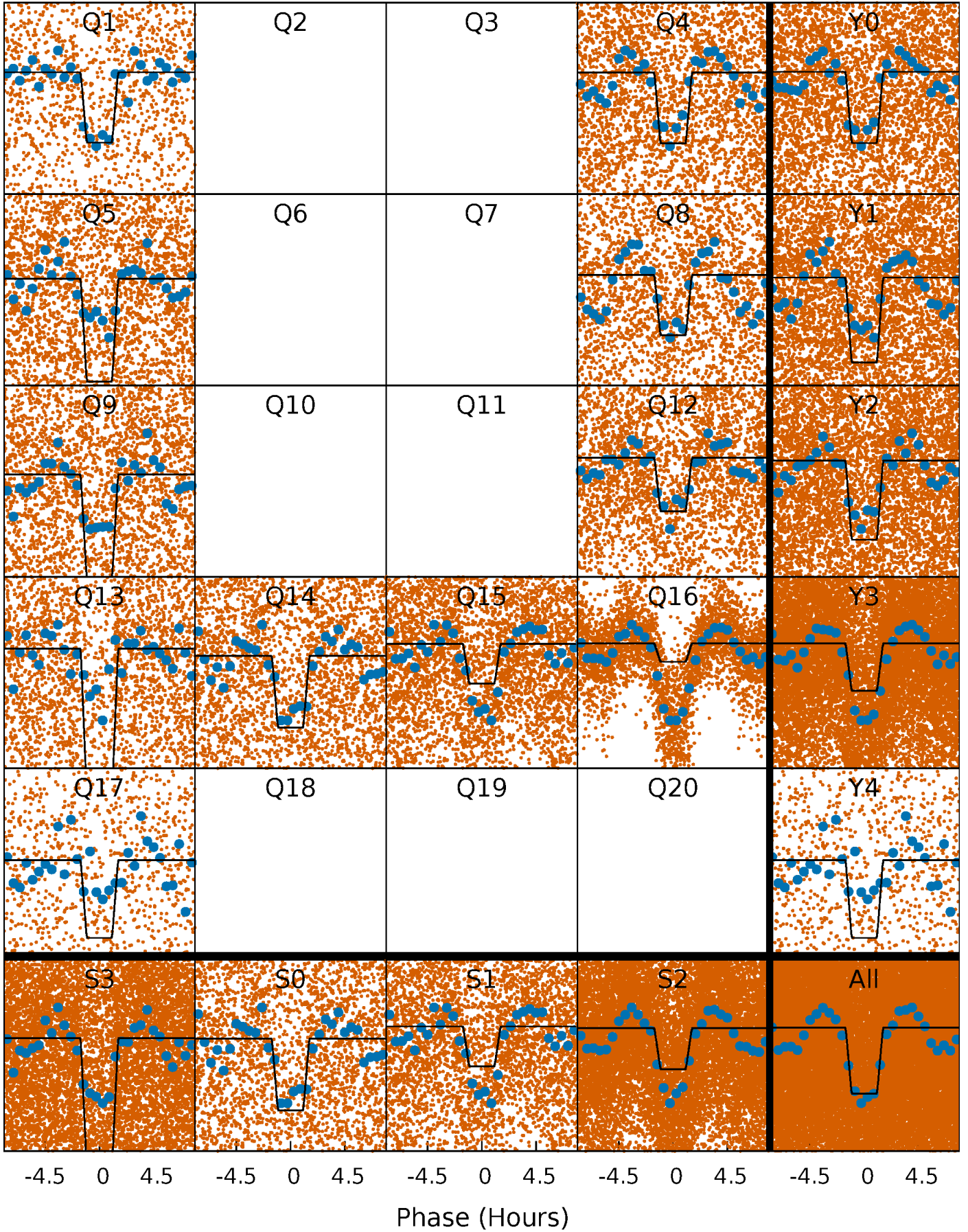
DV Quarter-Phased Transit Curves

TCE 004367854-02 P= 0.535228 Days $T_0=131.747196$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

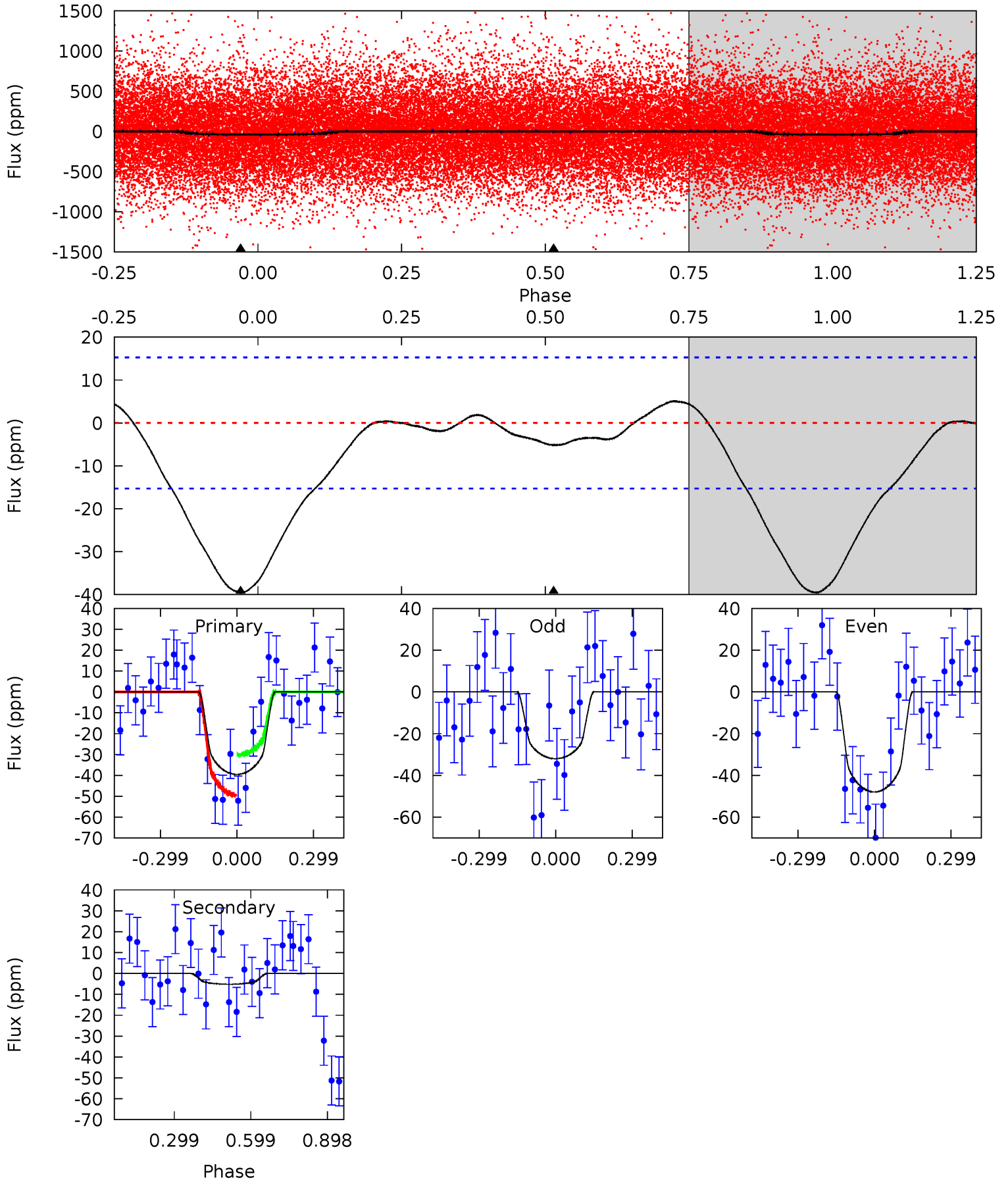
TCE 004367854-02 P= 0.535217 Days $T_0=131.747427$ (BKJD)



DV Model-Shift Uniqueness Test

004367854-02, P = 0.535228 Days, E = 131.211968 Days

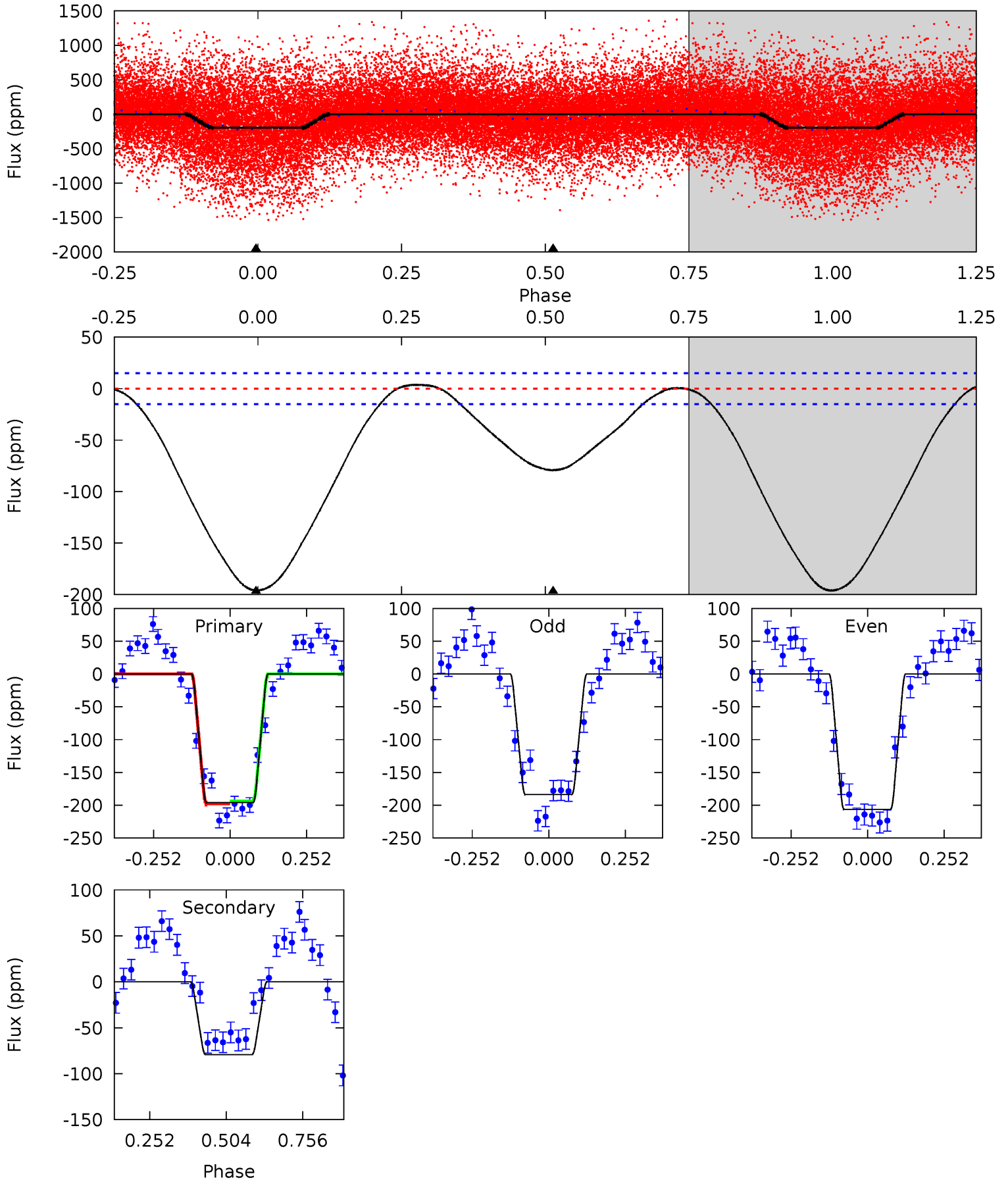
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	1.47	0	0	4.33	1.04	0.35	11.2	11.2	1.47	1.47	2.26	0.91	0.11	0



Alt Model-Shift Uniqueness Test

004367854-02, P = 0.535217 Days, E = 131.212210 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.1	23.1	0	0	4.37	1.15	1.03	57.1	57.1	23.1	23.1	3.30	1.23	0.02	0.58



Stellar Parameters For KIC 004367854

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5044^{+151}_{-136}	$4.551^{+0.078}_{-0.048}$	$-0.280^{+0.300}_{-0.300}$	$0.738^{+0.072}_{-0.079}$	$0.708^{+0.100}_{-0.050}$	$2.475^{+0.794}_{-0.419}$
	+3%/-3%	+2%/-1%	+107%/-107%	+10%/-11%	+14%/-7%	+32%/-17%
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 004367854-02 / KOI 2876.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-5 ± 4	$0.76^{+0.39}_{-0.36}$	2485^{+92}_{-90}	2740^{+917}_{-5240}	$0.585^{+1.701}_{-0.421}$
Alt.	-79 ± 3	$1.11^{+0.40}_{-0.43}$	2482^{+87}_{-96}	4174^{+958}_{-454}	$4.679^{+8.174}_{-2.155}$

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 $A_{obs} \gg 1.0$

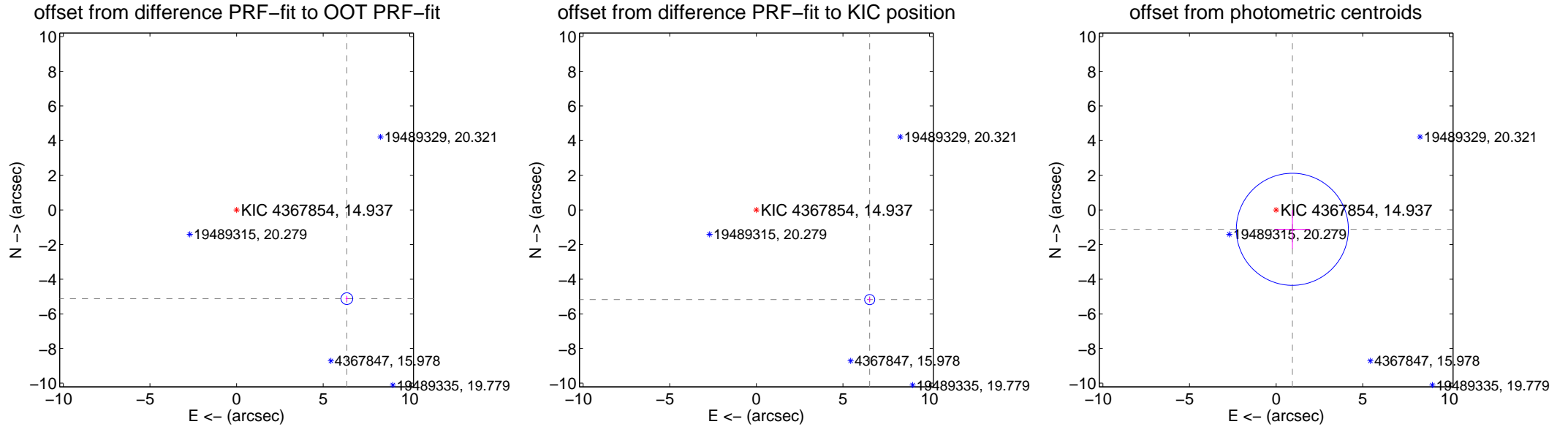
DV Centroid Data

Supplemental centroid analysis for 004367854-02. Kepler magnitude: 14.94. Transit SNR 12.31

There are 2 quarters with good PRF difference image offsets

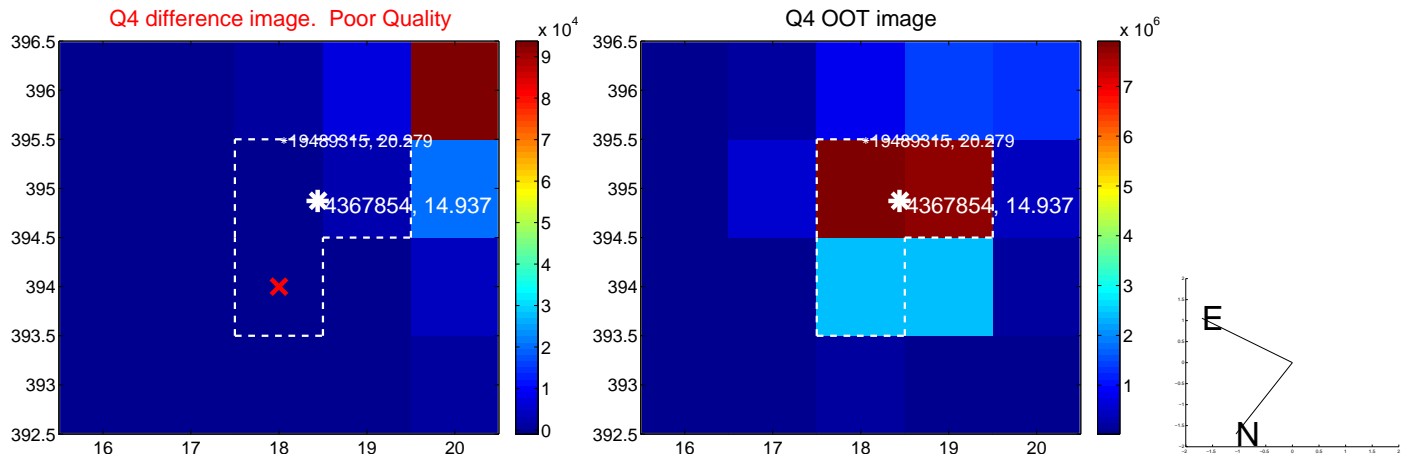
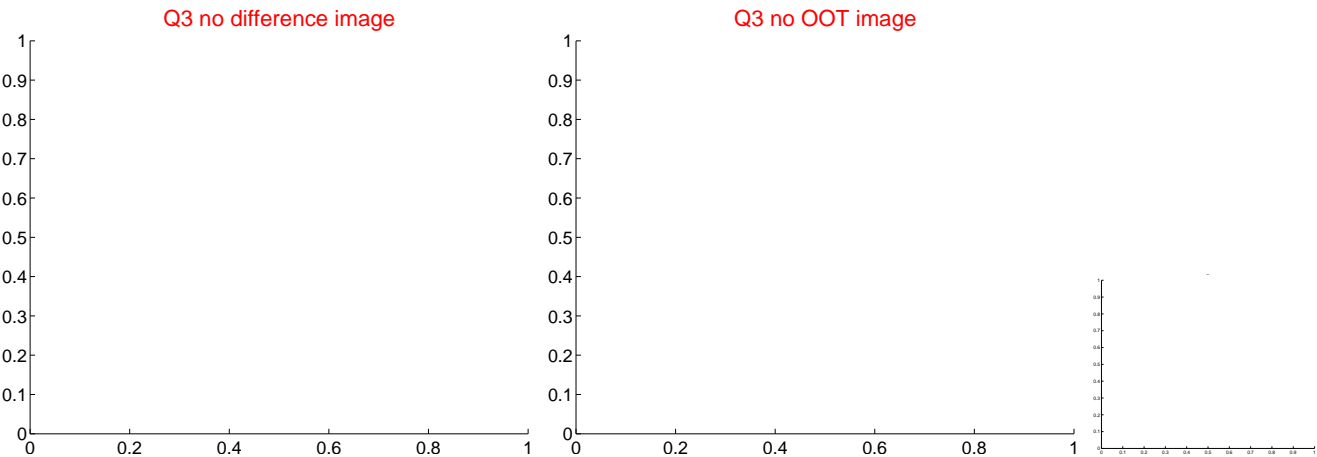
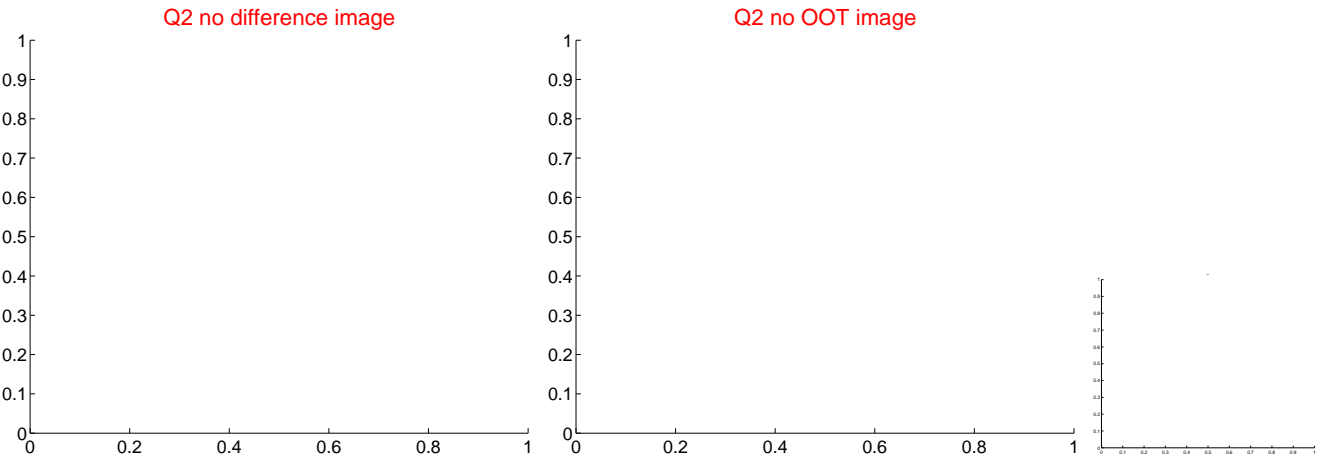
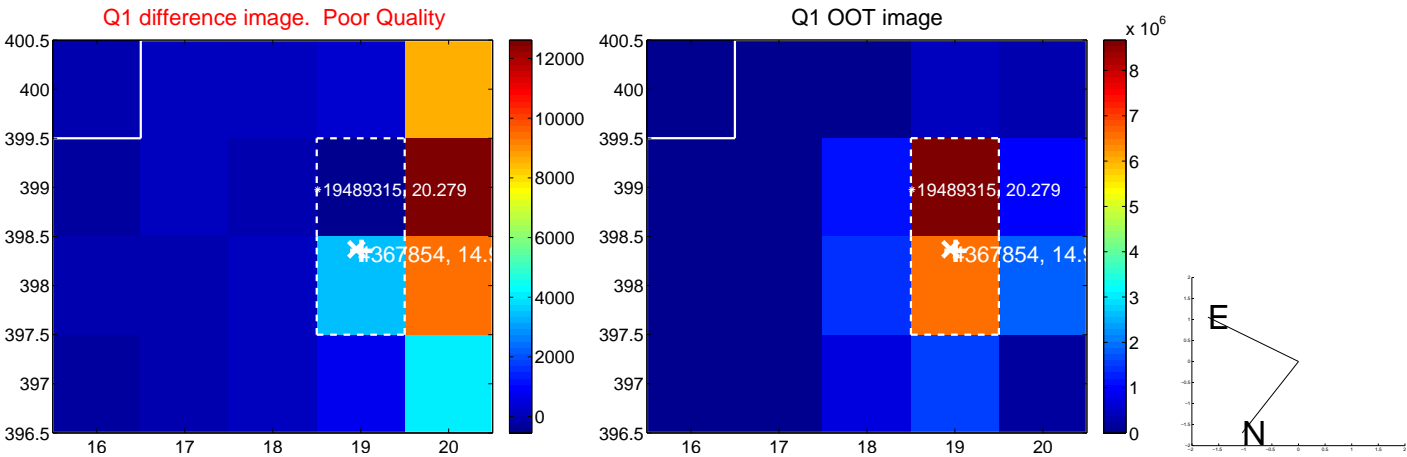
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.174 ± 0.113	72.46	-6.369 ± 0.071	-5.123 ± 0.157
PRF-fit source offset from KIC position	8.345 ± 0.098	85.52	-6.544 ± 0.067	-5.177 ± 0.132
photometric centroid source offset	1.46 ± 1.08	1.35	-0.94 ± 1.03	-1.12 ± 1.11

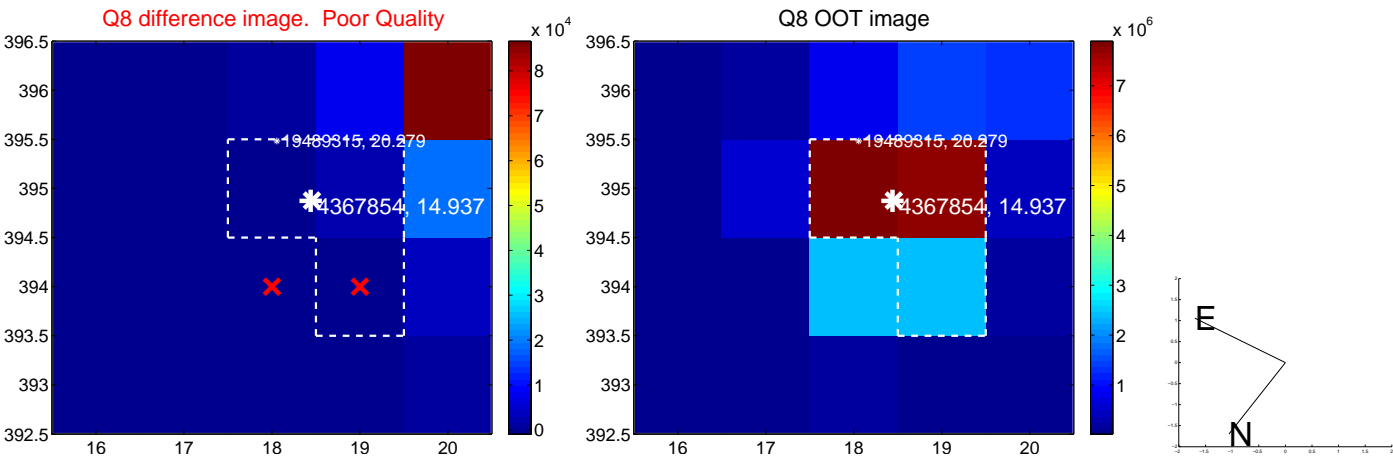
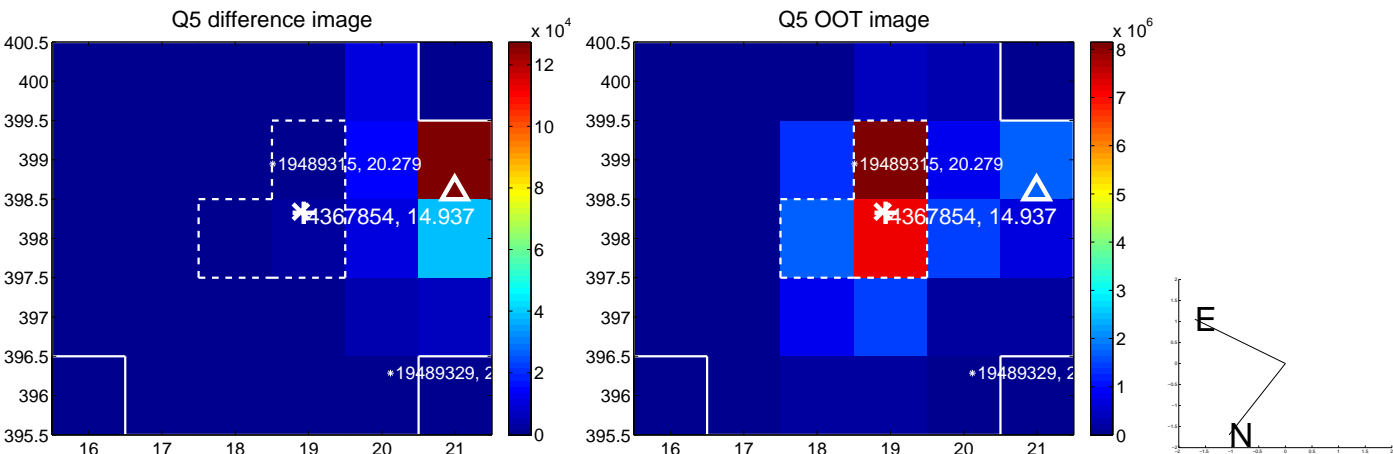


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

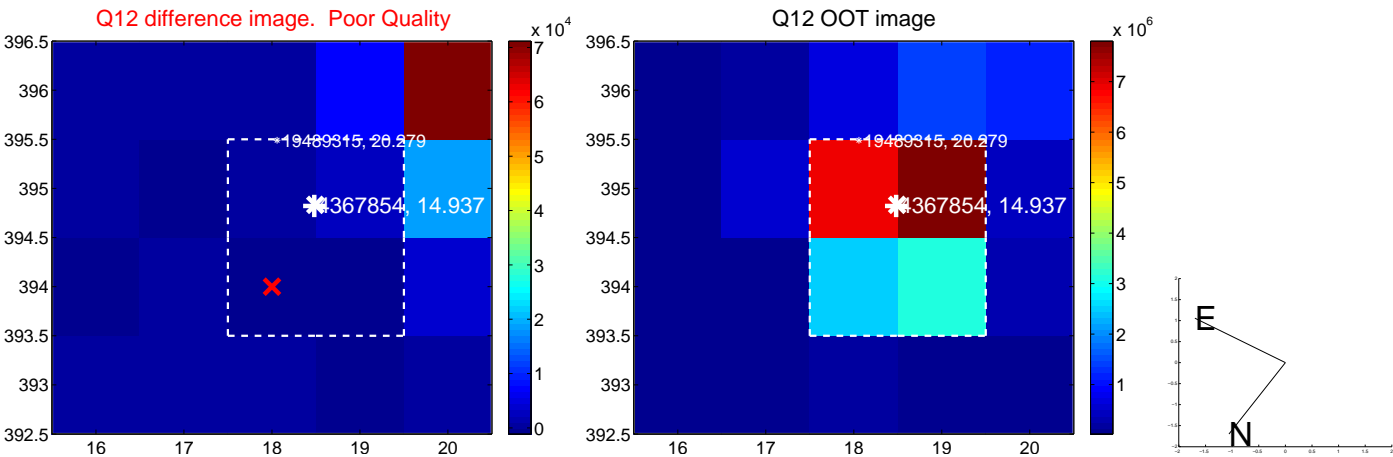
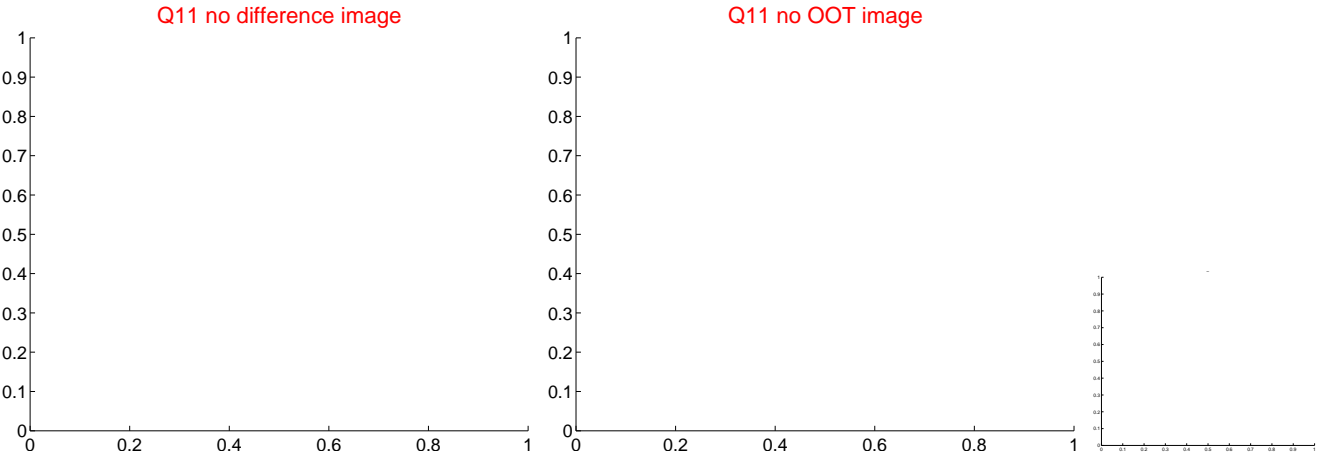
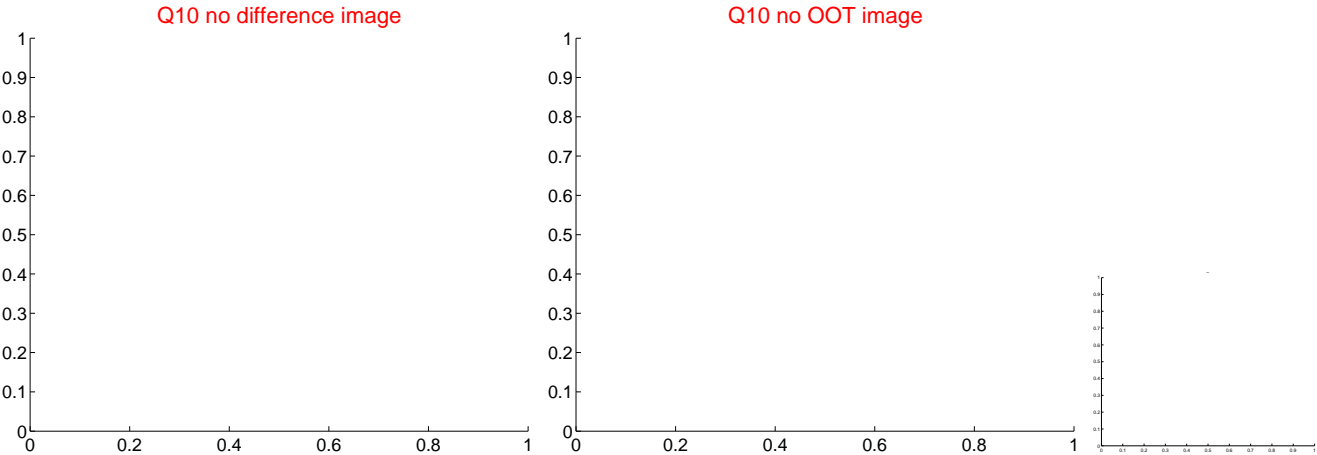
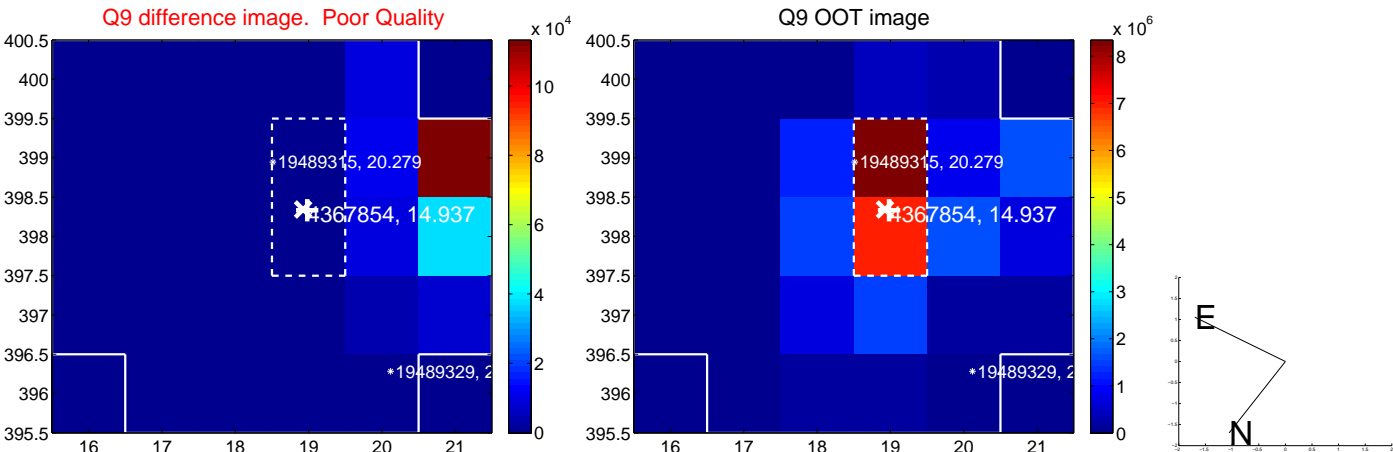
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



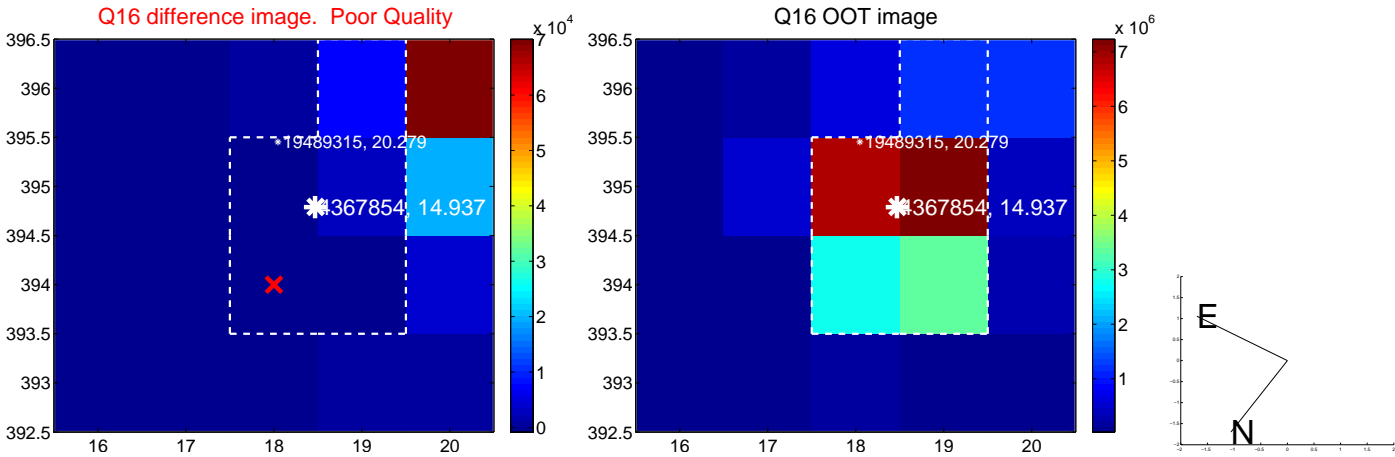
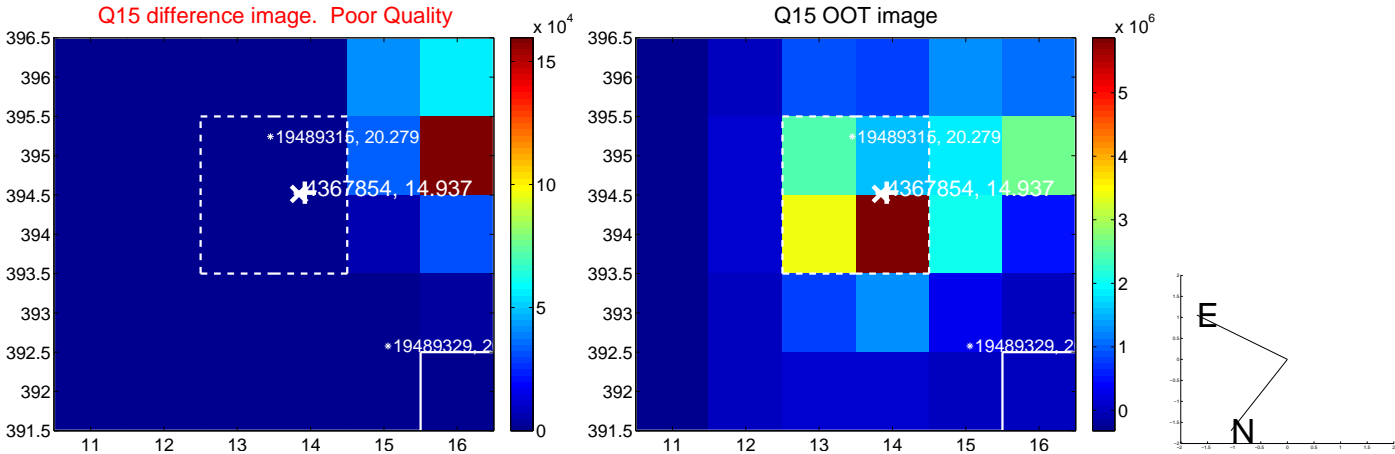
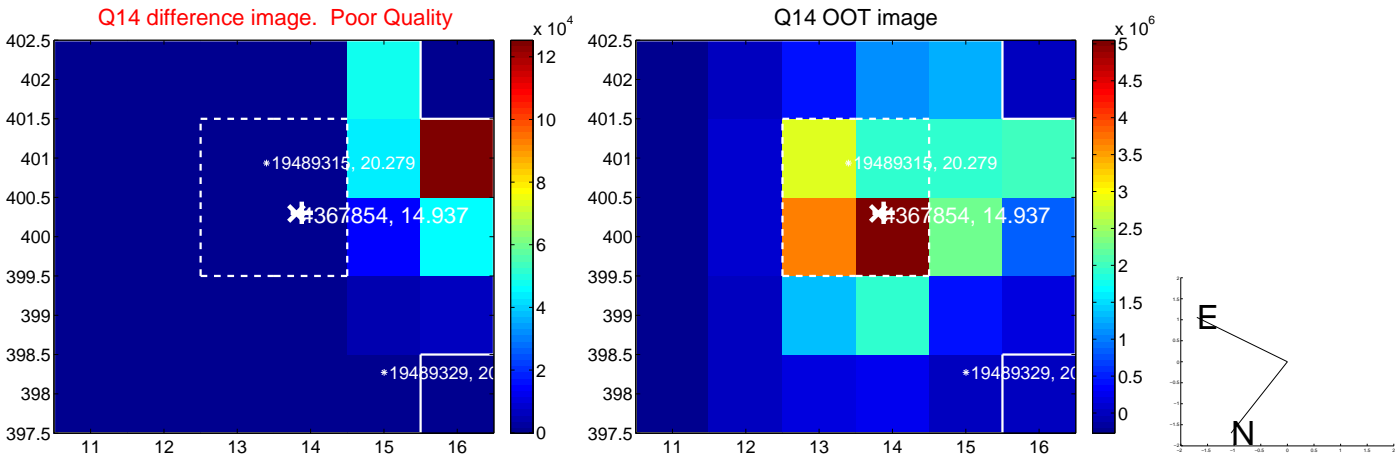
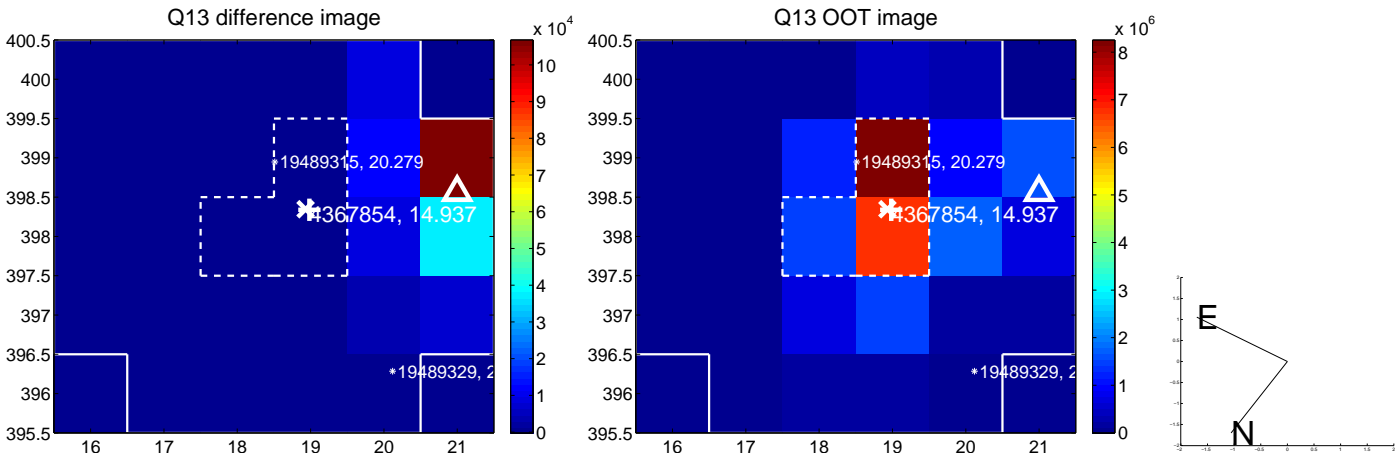
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



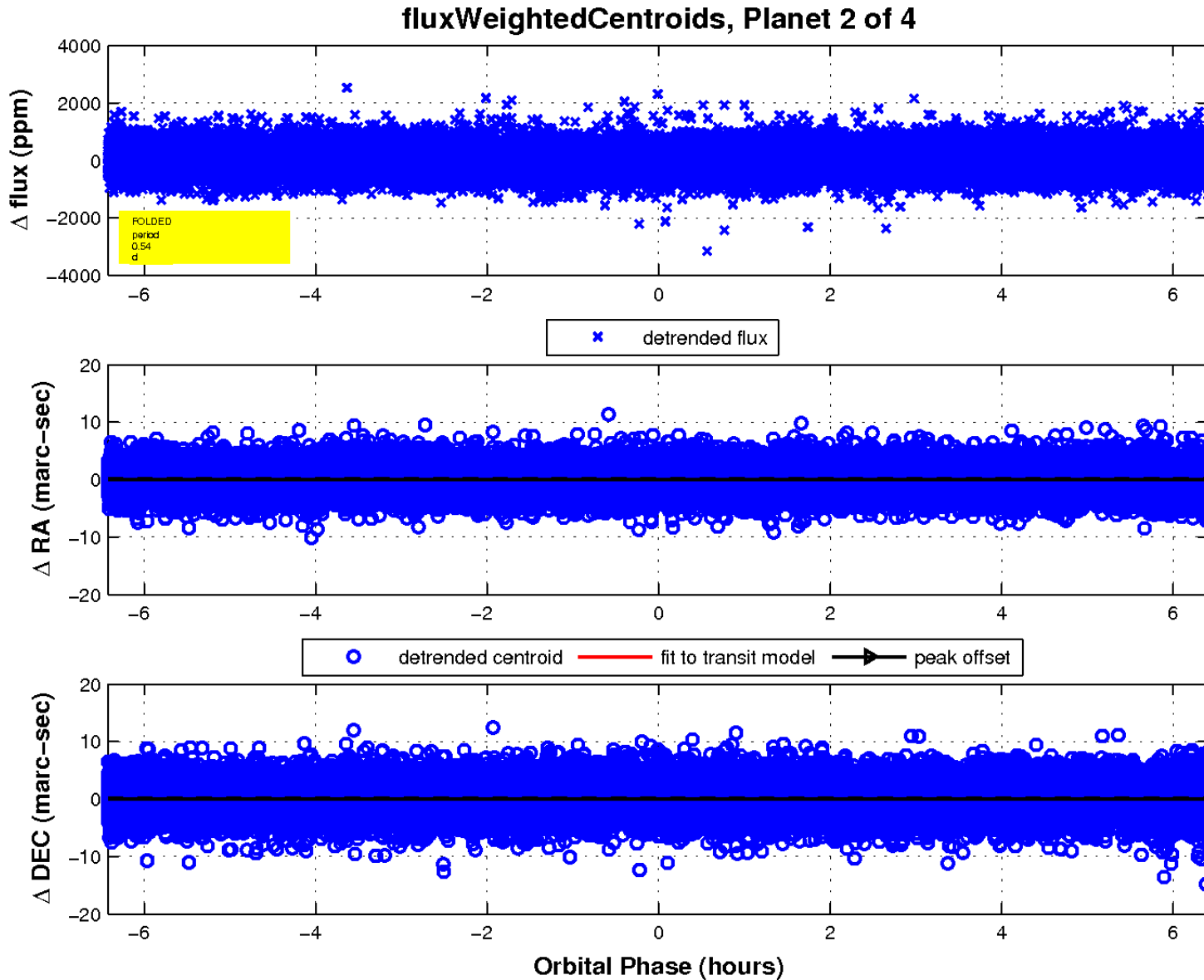
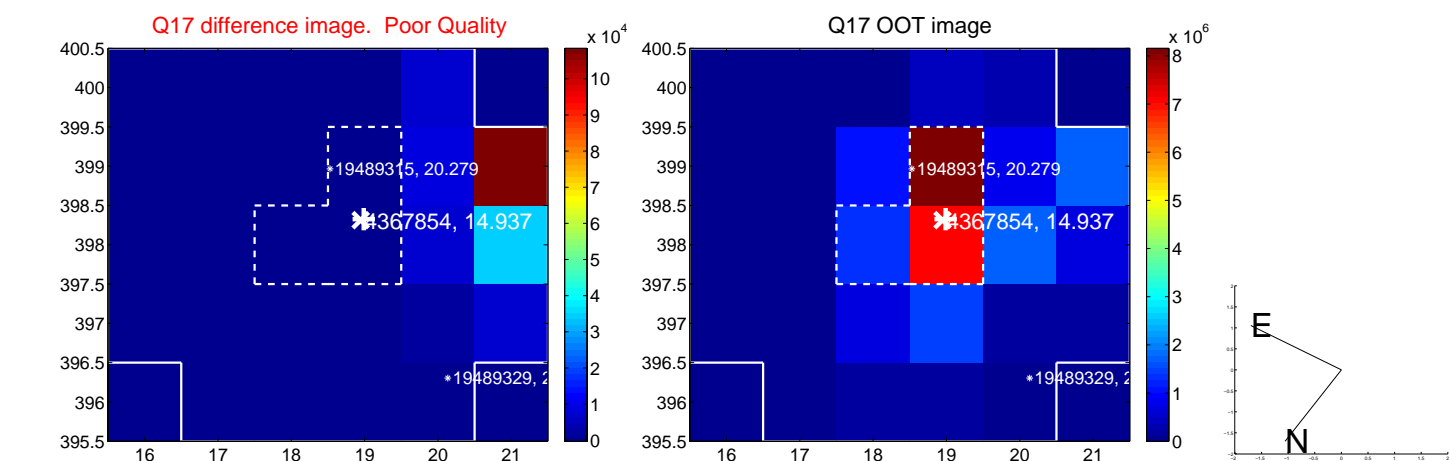
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

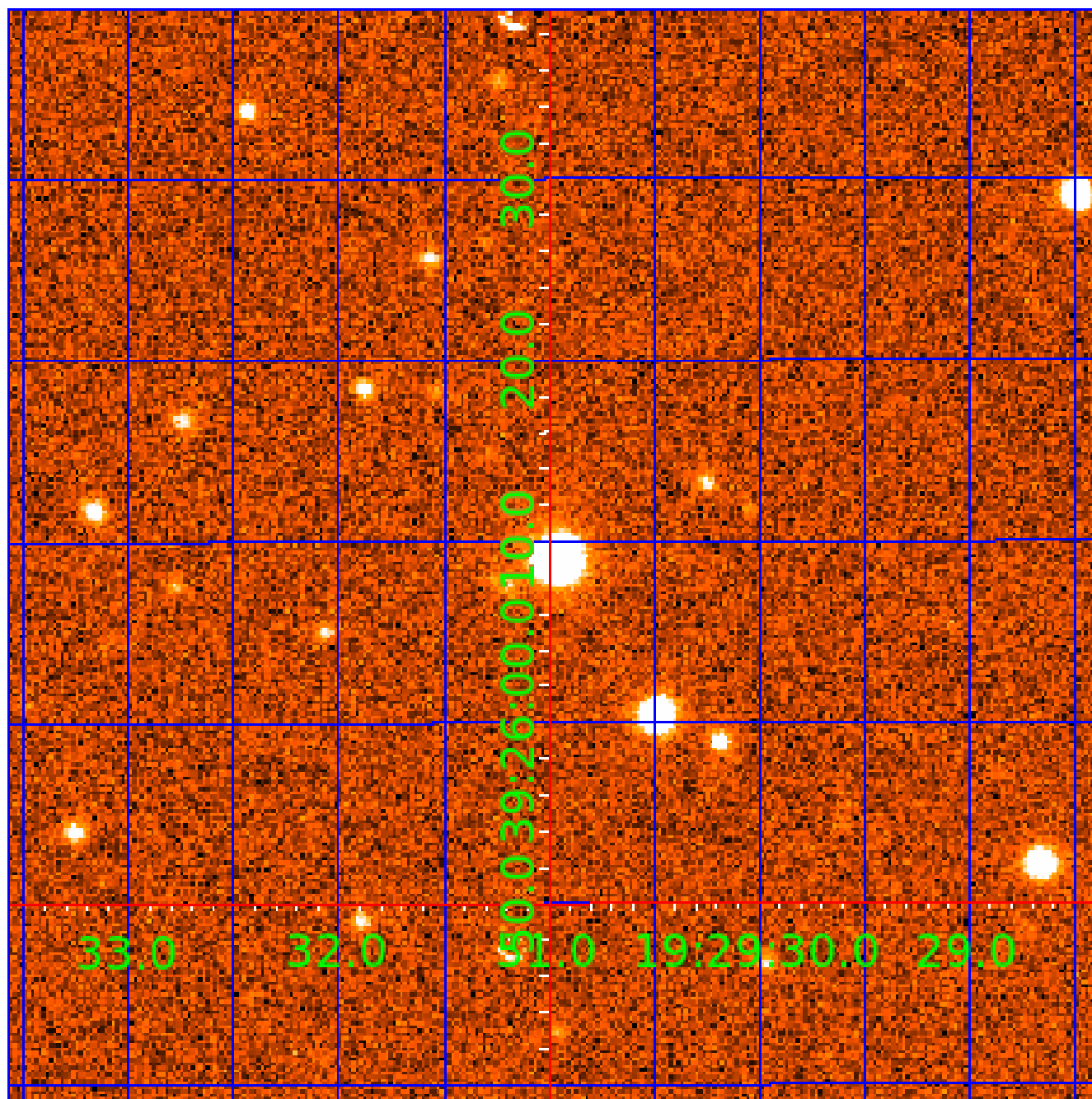


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004367854

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})
004367854-01	OBS	2876.01	5.195204	133.343251	295.6	2.145	13.0	14.8	0.74	5044	1.34	115.50
004367854-02	OBS	2876.02	0.535228	131.747196	68.9	3.403	7.3	12.3	0.74	5044	0.74	2391.37
004367854-03	OBS	No	31.796592	134.850603	937.7	1.964	10.5	7.6	0.74	5044	2.54	10.32
004367854-04	OBS	No	45.192873	150.935771	741.9	1.840	7.9	7.2	0.74	5044	2.07	6.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004367854-01	OBS	FP	0.28	0	0	1	0	CENT_RESOLVED_OFFSET
004367854-02	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
004367854-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
004367854-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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.

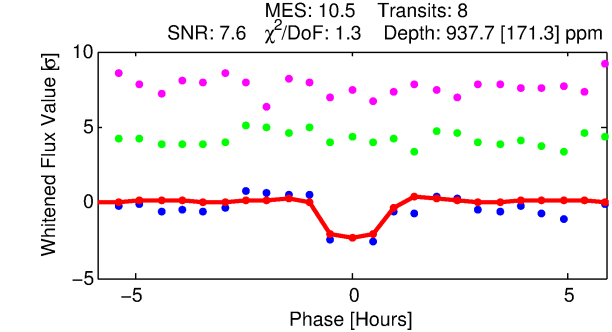
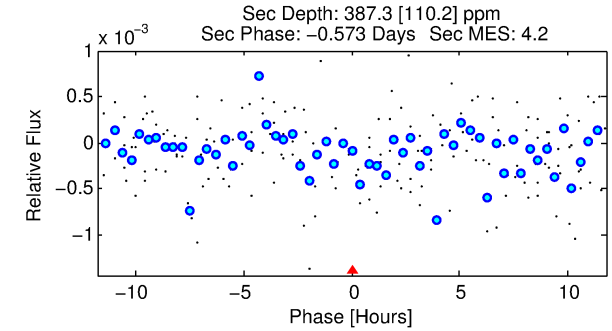
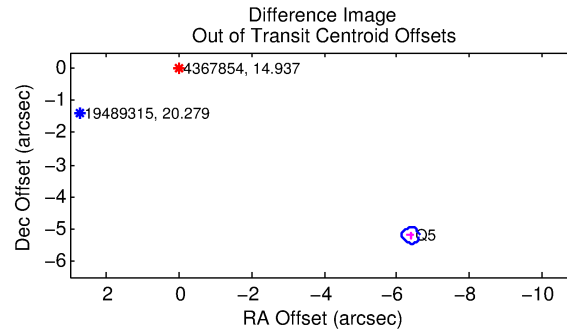
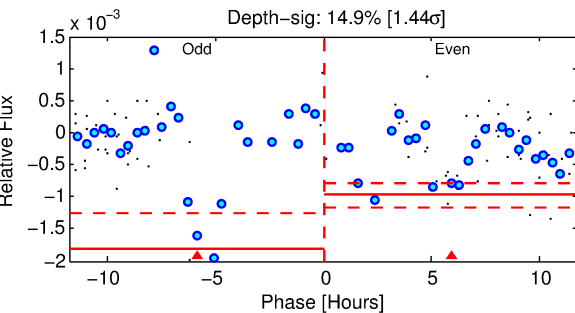
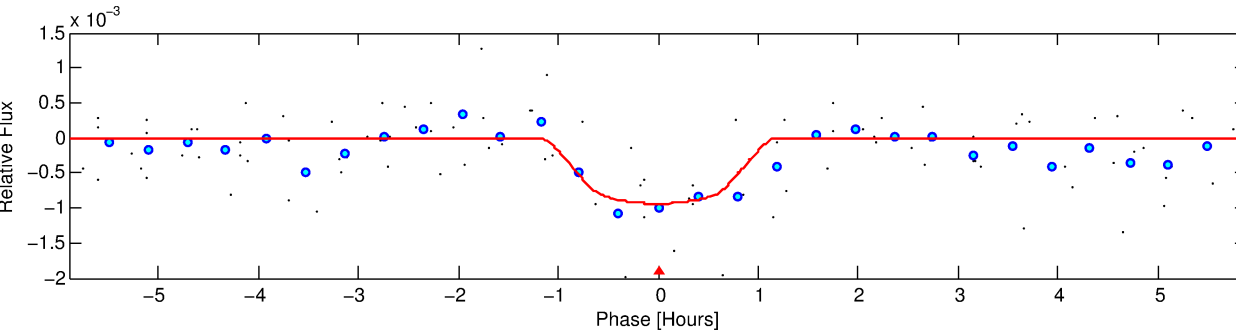
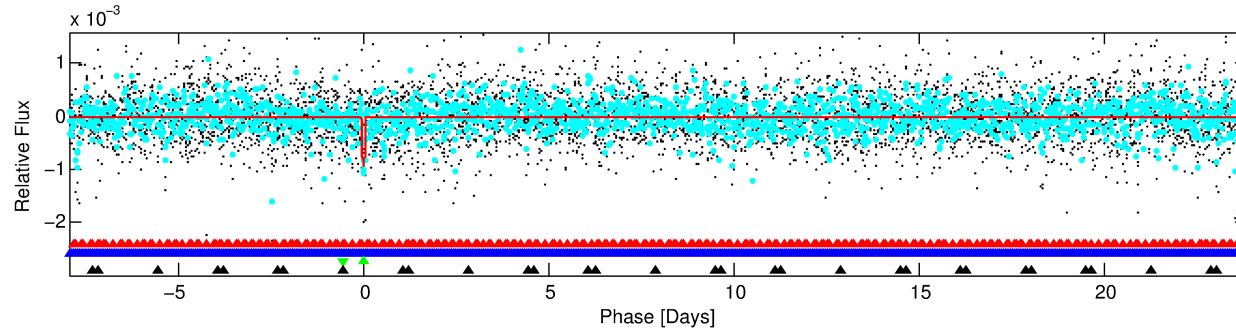
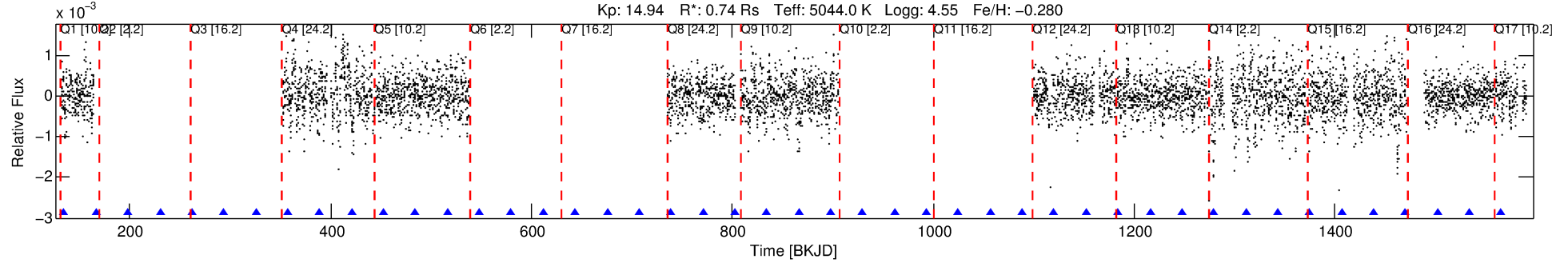
Ephemeris Match Information For 004367854-03

No Significant Match Found

DV One-Page Summary

KIC: 4367854 Candidate: 3 of 4 Period: 31.797 d
KOI: K02876 Corr: No Ephemeris Match

Kp: 14.94 R*: 0.74 Rs Teff: 5044.0 K Logg: 4.55 Fe/H: -0.280



DV Fit Results:

Period = 31.79659 [0.00032] d
Epoch = 134.8506 [0.0100] BKJD
Rp/R* = 0.0315 [0.0474]
a/R* = 80.00 [434.63]
b = 0.80 [2.48]
Seff = 10.32 [1.90]
Teq = 457 [21] K
Rp = 2.54 [3.83] Re
a = 0.1750 [0.0163] AU
Ag = 1012.13 [3061.21] [0.33σ]
Teffp = 3985 [3013] K [1.17σ]

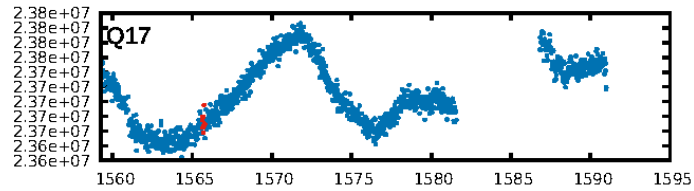
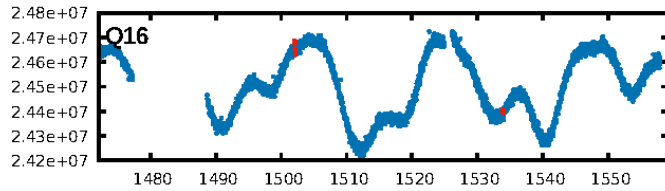
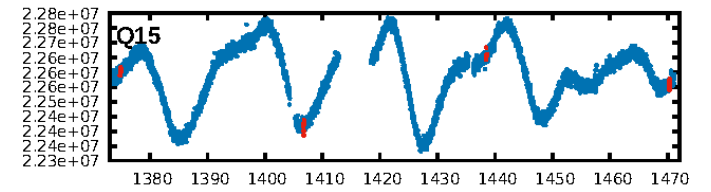
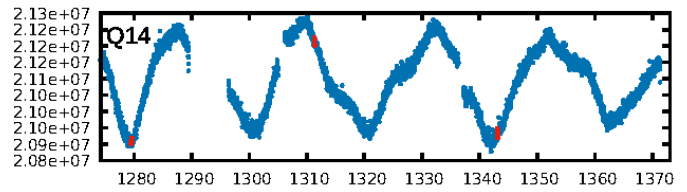
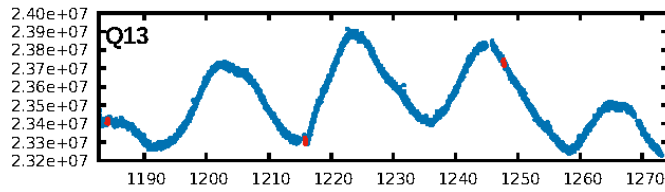
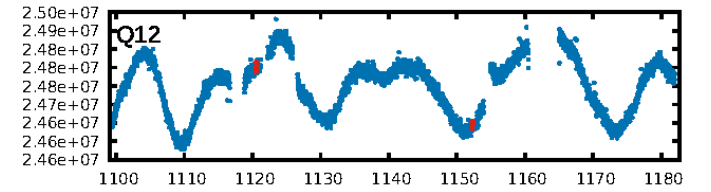
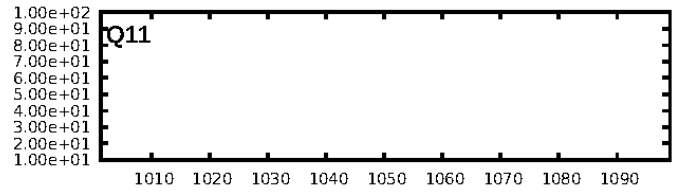
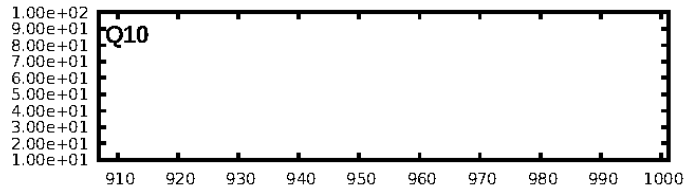
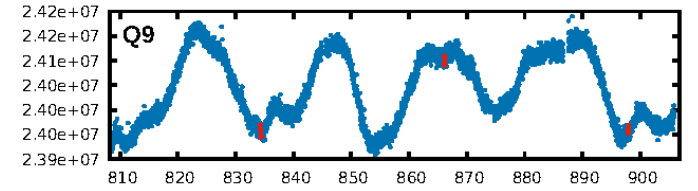
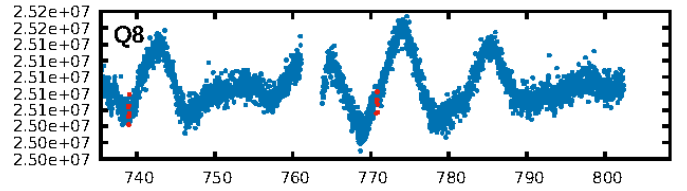
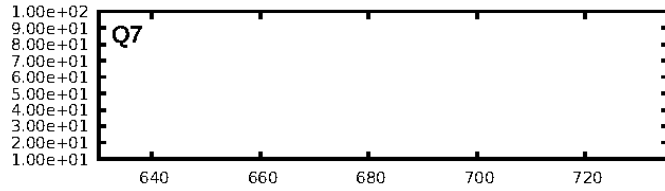
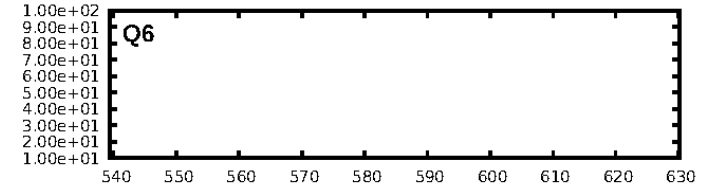
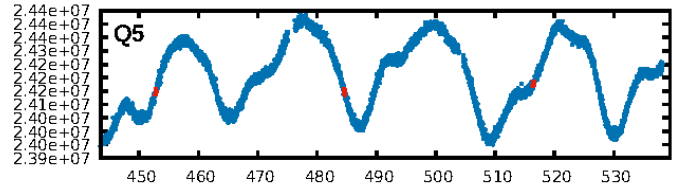
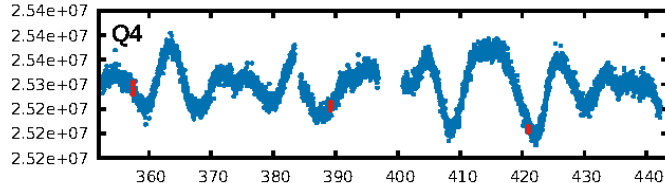
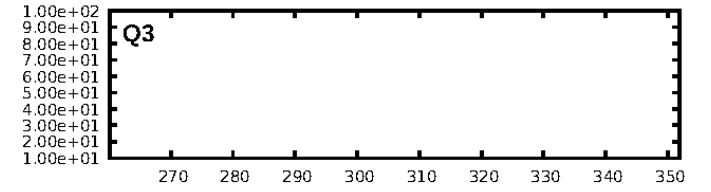
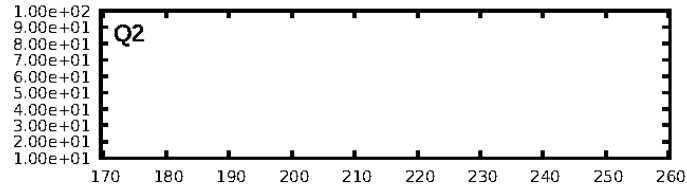
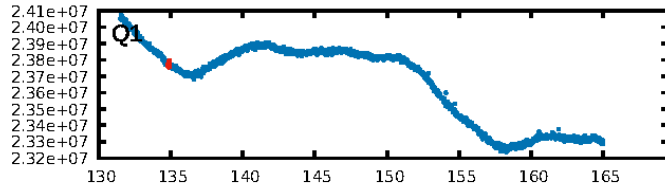
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [219.50σ]
LongPeriod-sig: 100.0% [119.47σ]
ModelChiSquare2-sig: 7.4%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 2.46e-16
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 2.504
Centroid-sig: 0.4%
Centroid-so: 1.666 arcsec [2.16σ]
OotOffset-rm: 8.238 arcsec [100.08σ]
KicOffset-rm: 8.389 arcsec [101.86σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.00 [0/11]

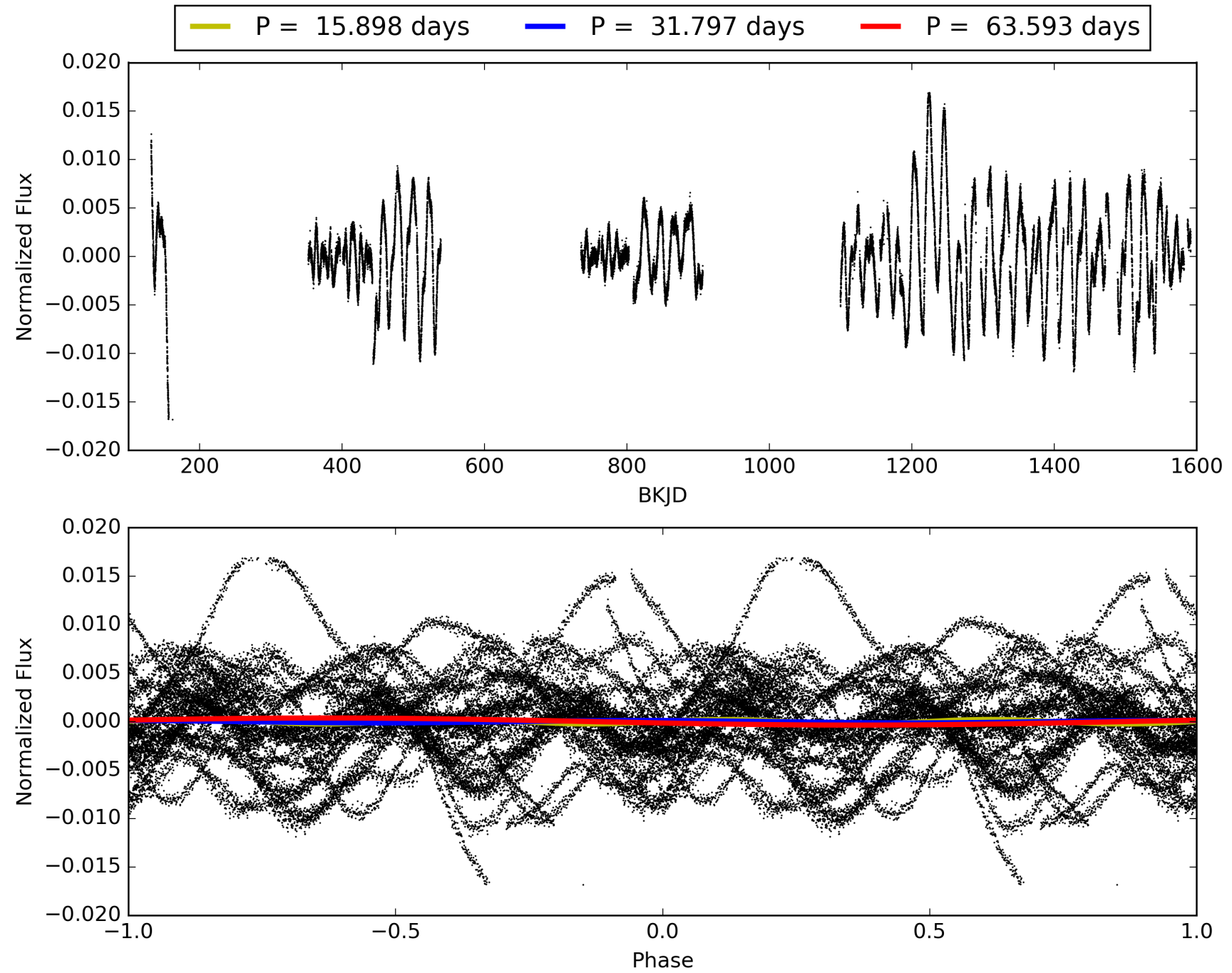
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:16:11 Z

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

TCE 004367854-03, PDC Light Curves

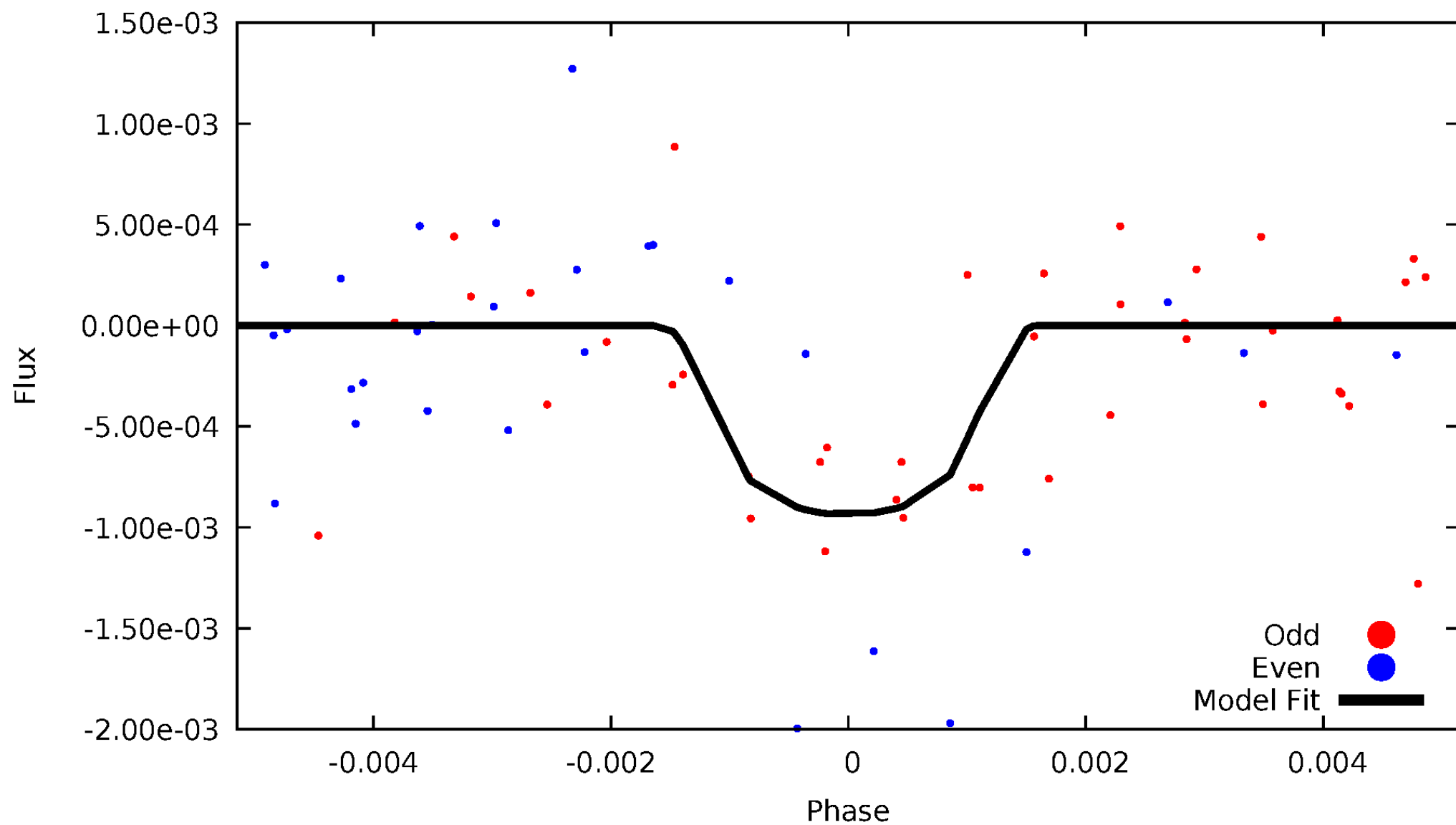


TCE 004367854-03



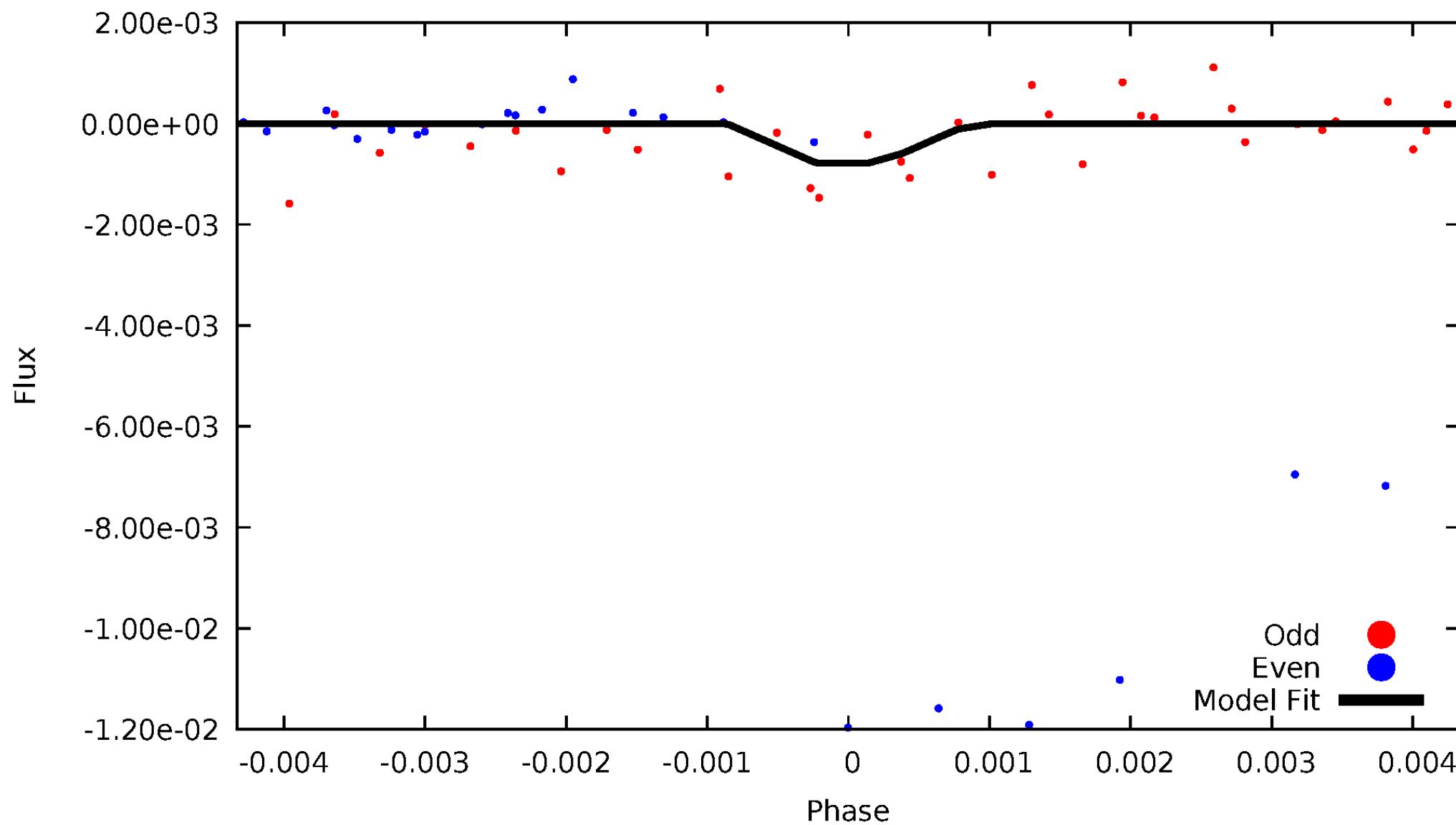
DV Odd/Even

TCE 004367854-03



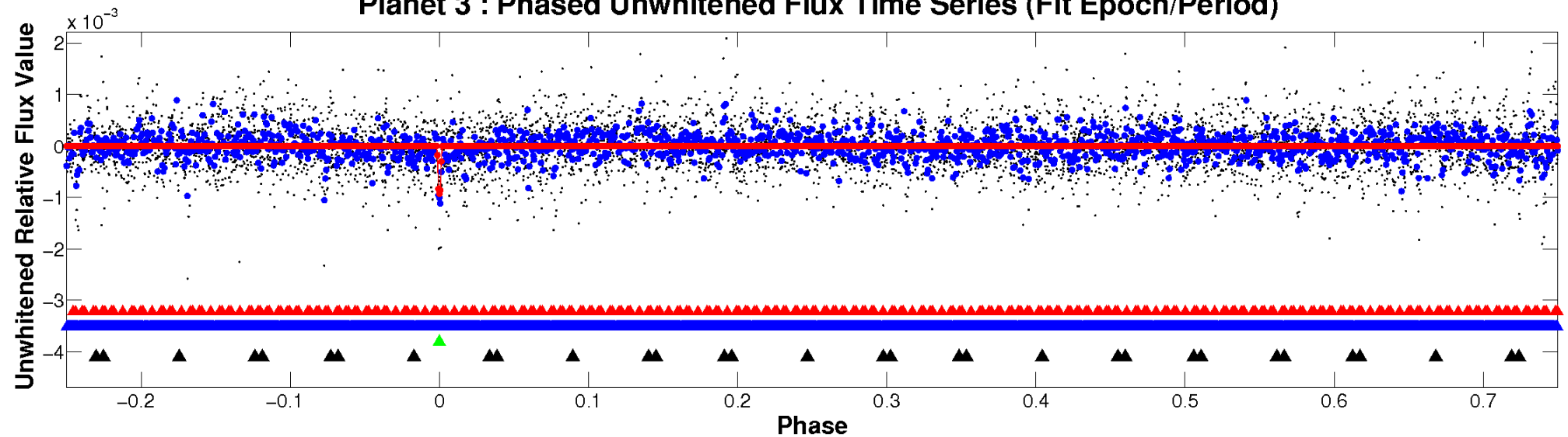
ALT Odd/Even

TCE 004367854-03

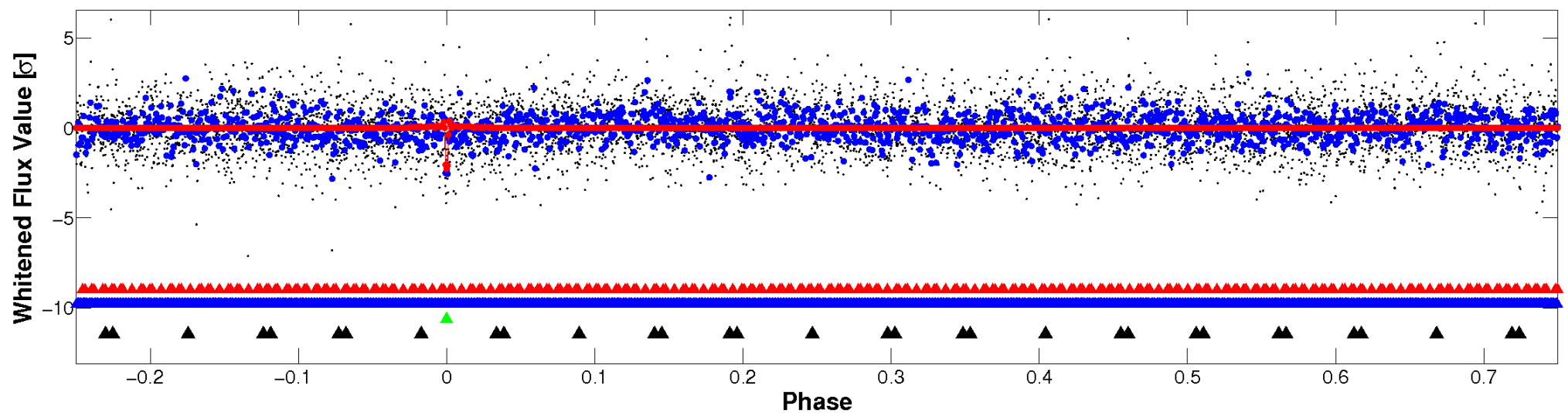


Non-Whitened Vs. Whitened Light Curve

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

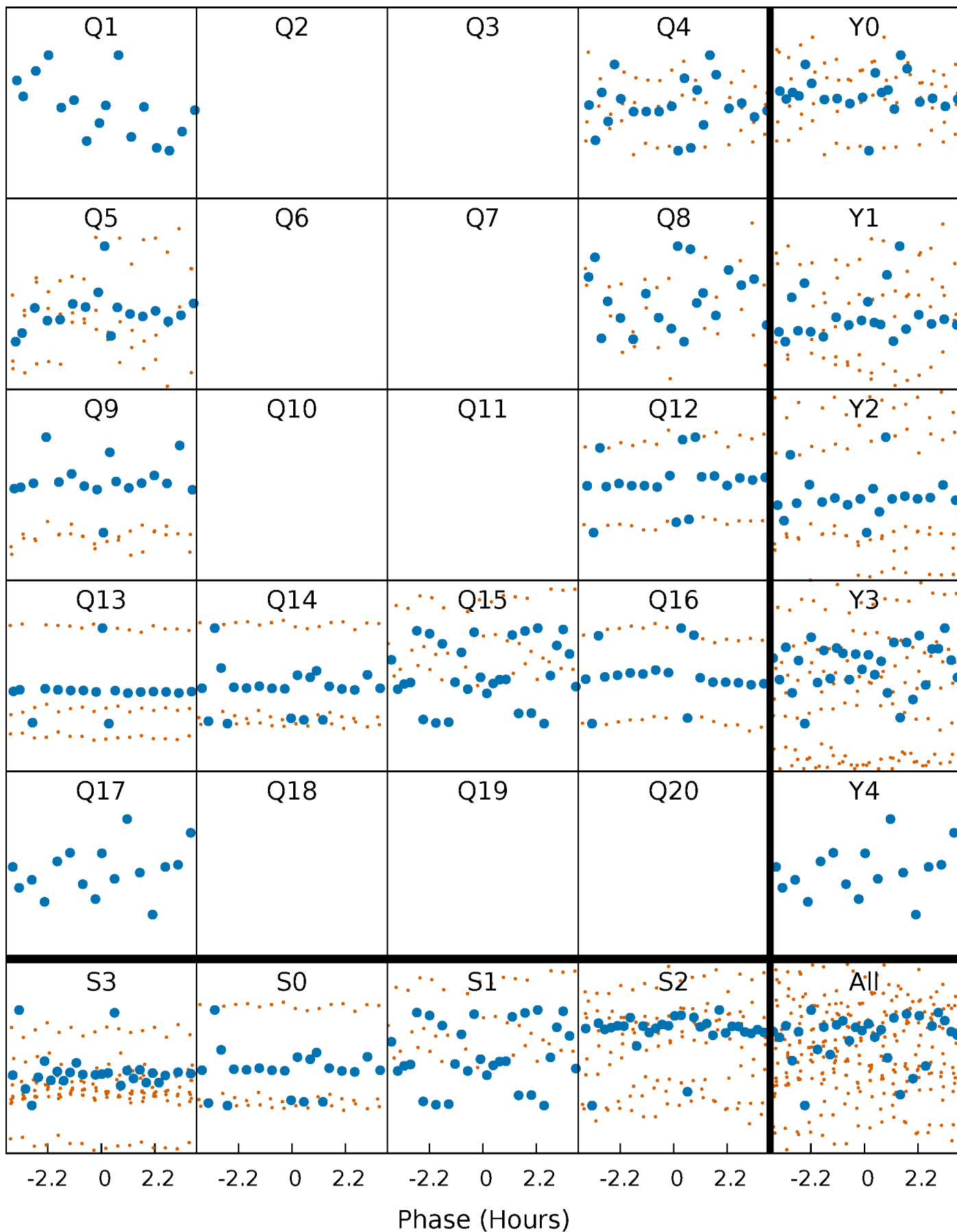


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



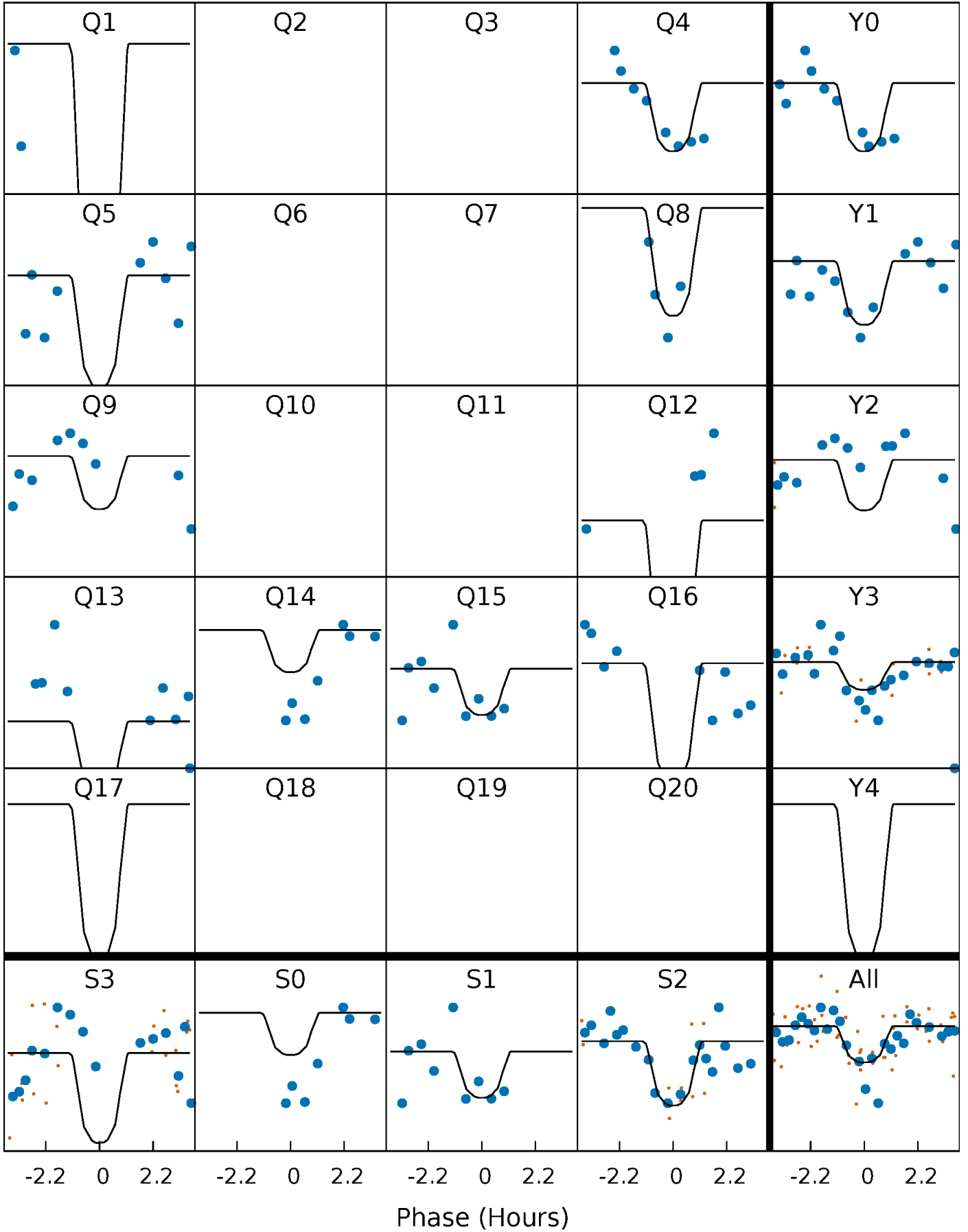
PDC Quarter-Phased Transit Curves

TCE 004367854-03 P= 31.796592 Days $T_0=134.850603$ (BKJD)



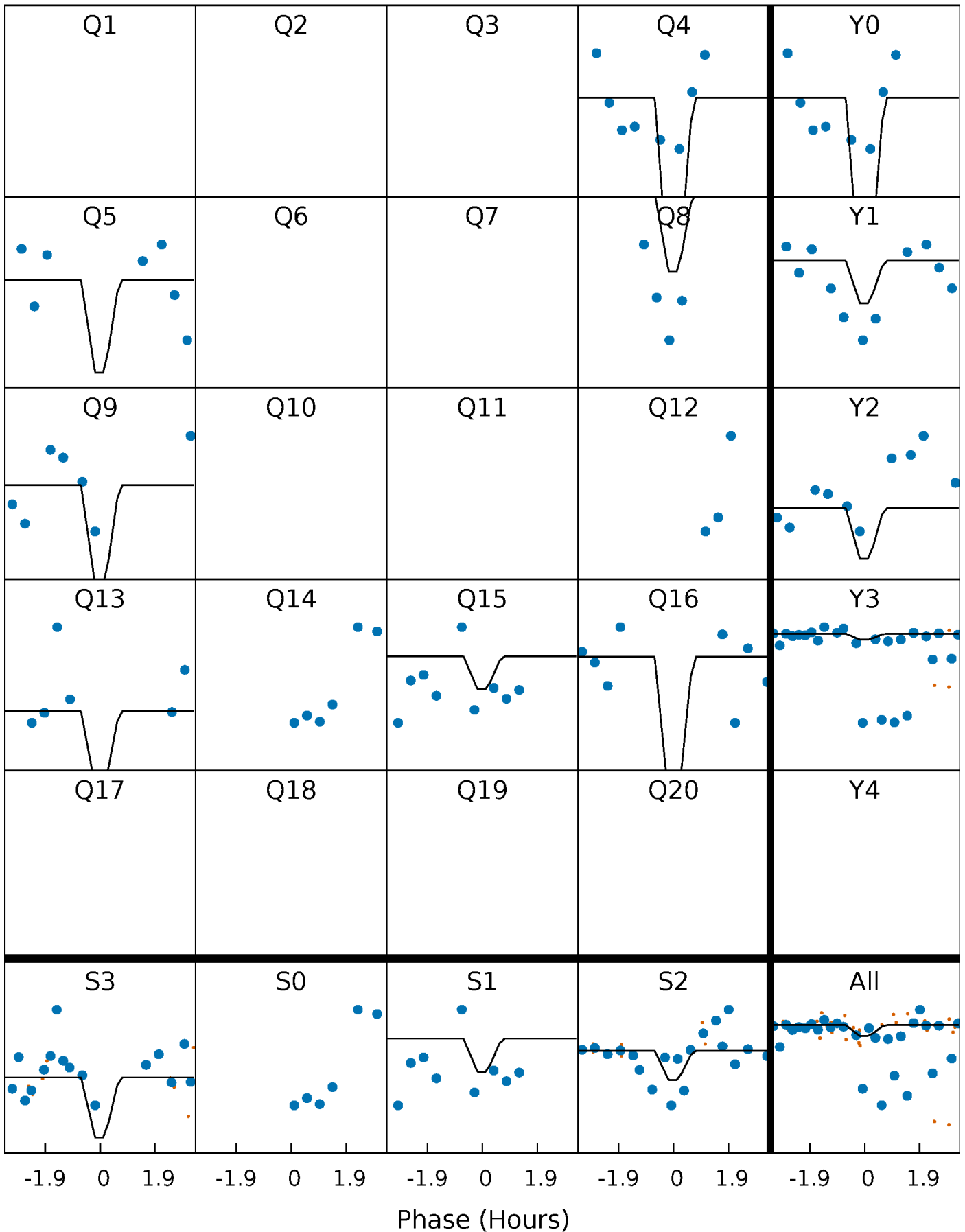
DV Quarter-Phased Transit Curves

TCE 004367854-03 P= 31.796592 Days $T_0=134.850603$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

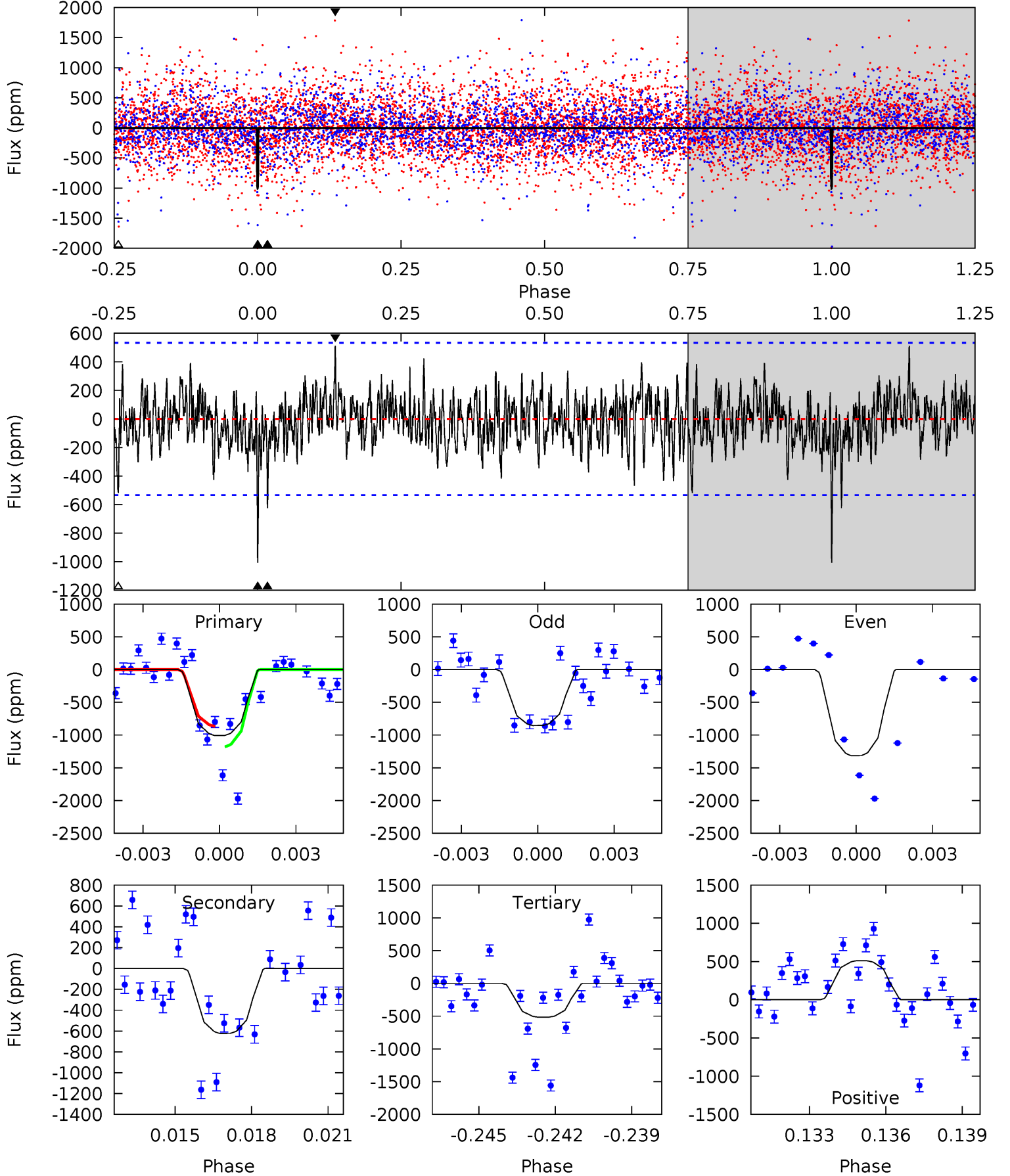
TCE 004367854-03 $P = 31.795776$ Days $T_0 = 134.866484$ (BKJD)



DV Model-Shift Uniqueness Test

004367854-03, P = 31.796592 Days, E = 103.054011 Days

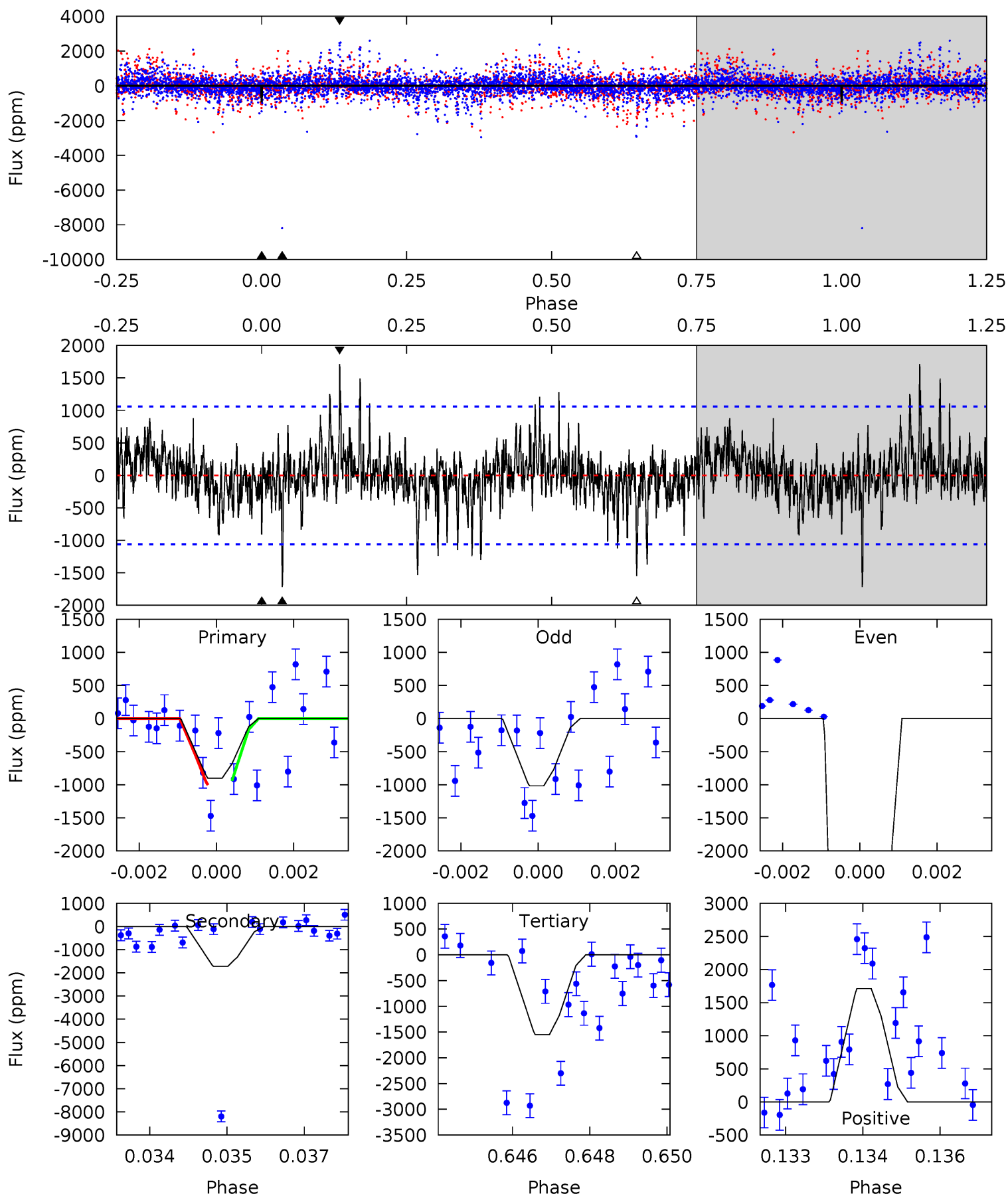
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.91	6.14	5.09	5.03	5.25	2.96	1.43	4.83	4.89	1.05	1.11	2.15	1.03	0.34	1.55



Alt Model-Shift Uniqueness Test

004367854-03, P = 31.795776 Days, E = 103.070708 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.54	8.65	7.79	8.61	5.34	3.11	1.70	-3.26	-4.08	0.86	0.04	10.4	3.14	0.50	0



Stellar Parameters For KIC 004367854

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5044^{+151}_{-136}	$4.551^{+0.078}_{-0.048}$	$-0.280^{+0.300}_{-0.300}$	$0.738^{+0.072}_{-0.079}$	$0.708^{+0.100}_{-0.050}$	$2.475^{+0.794}_{-0.419}$
	+3%/-3%	+2%/-1%	+107%/-107%	+10%/-11%	+14%/-7%	+32%/-17%
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 004367854-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-624 ± 102	$3.64^{+3.46}_{-2.47}$	637^{+23}_{-24}	4027^{+2460}_{-792}	820^{+7213}_{-612}
Alt.	-1720 ± 199	$3.56^{+3.13}_{-2.41}$	634^{+24}_{-24}	4928^{+3926}_{-1096}	2392^{+21460}_{-1763}

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 $A_{obs} \gg 1.0$

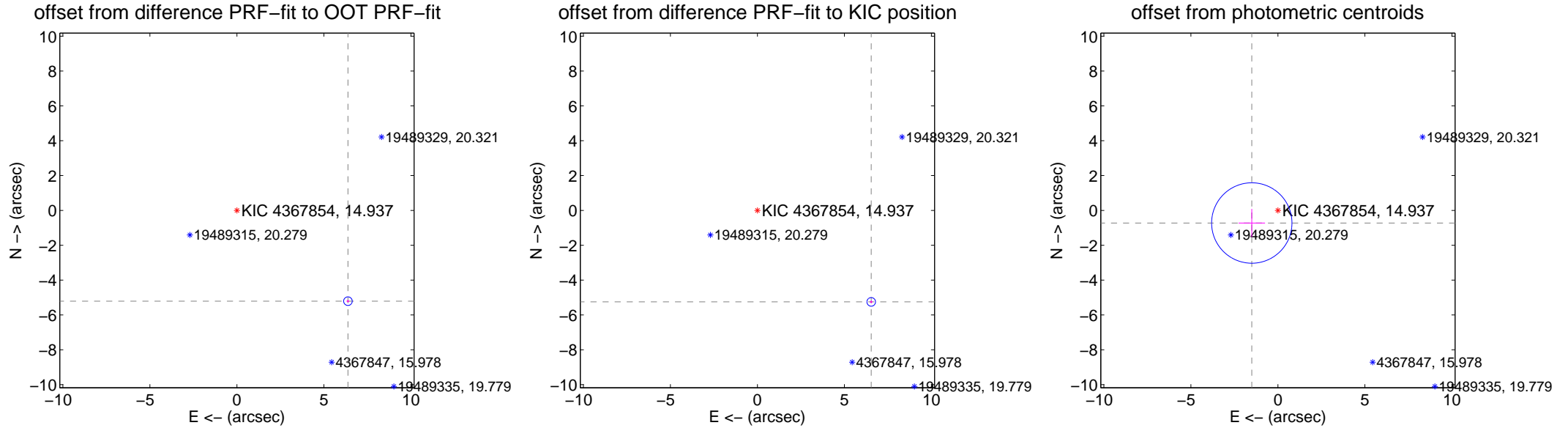
DV Centroid Data

Supplemental centroid analysis for 004367854-03. Kepler magnitude: 14.94. Transit SNR 7.59

There are 0 quarters with good PRF difference image offsets

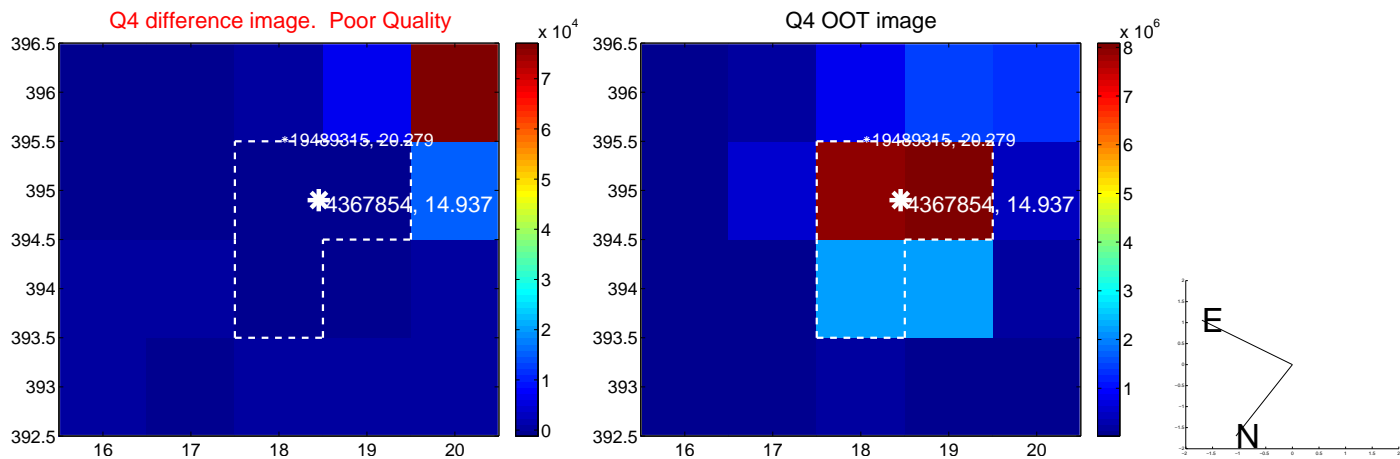
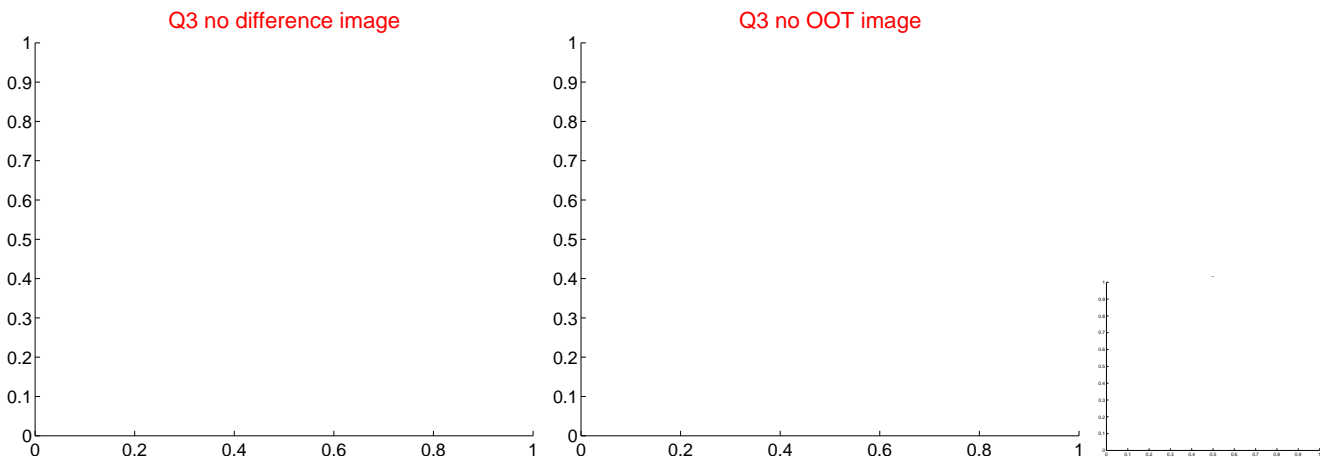
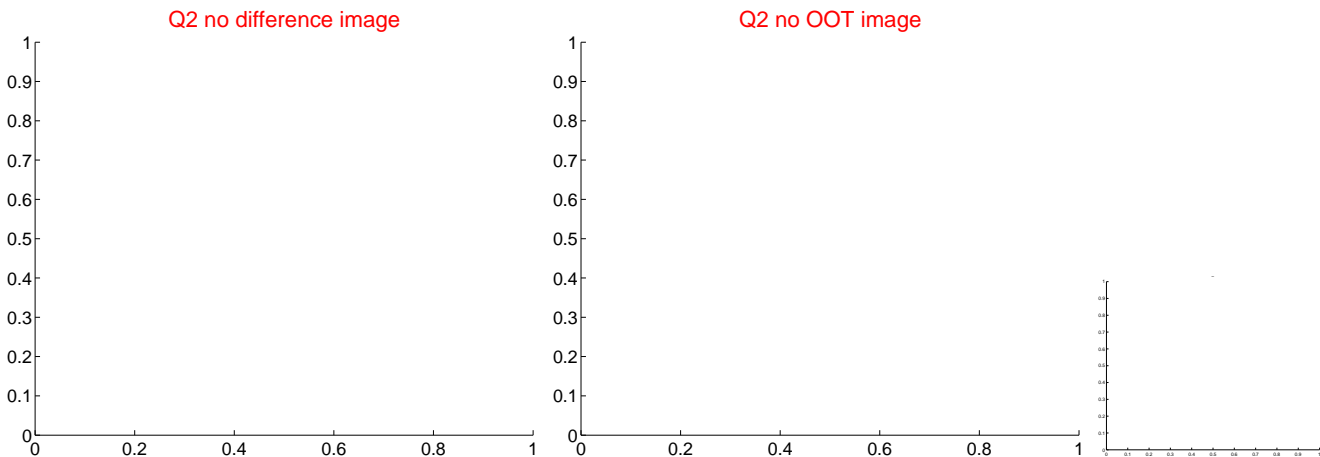
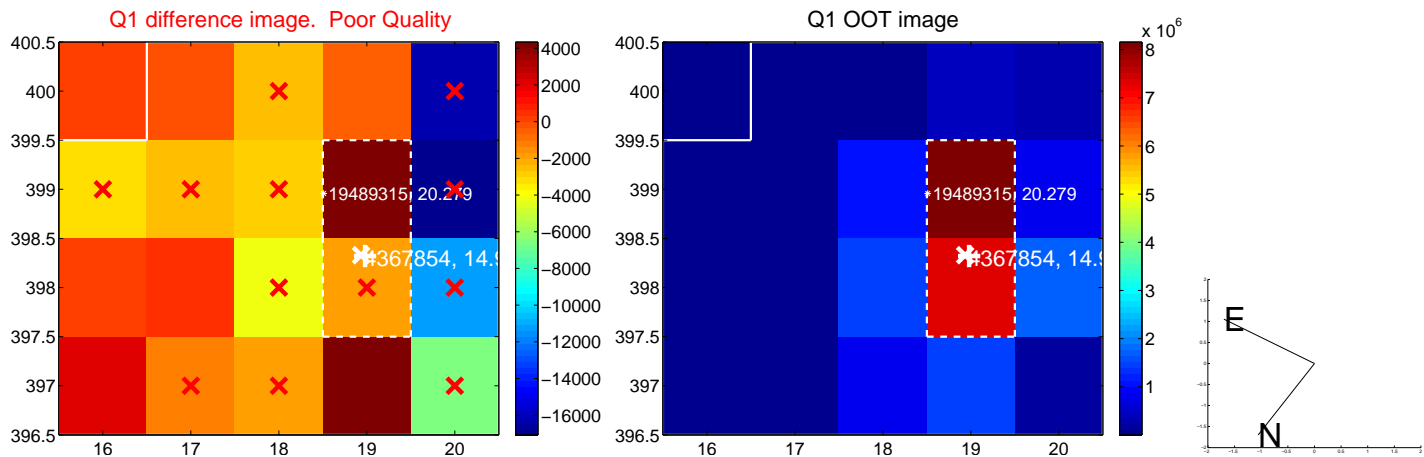
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.238 ± 0.082	100.08	-6.382 ± 0.085	-5.209 ± 0.079
PRF-fit source offset from KIC position	8.389 ± 0.082	101.86	-6.541 ± 0.085	-5.252 ± 0.079
photometric centroid source offset	1.67 ± 0.77	2.16	1.50 ± 0.76	-0.72 ± 0.81

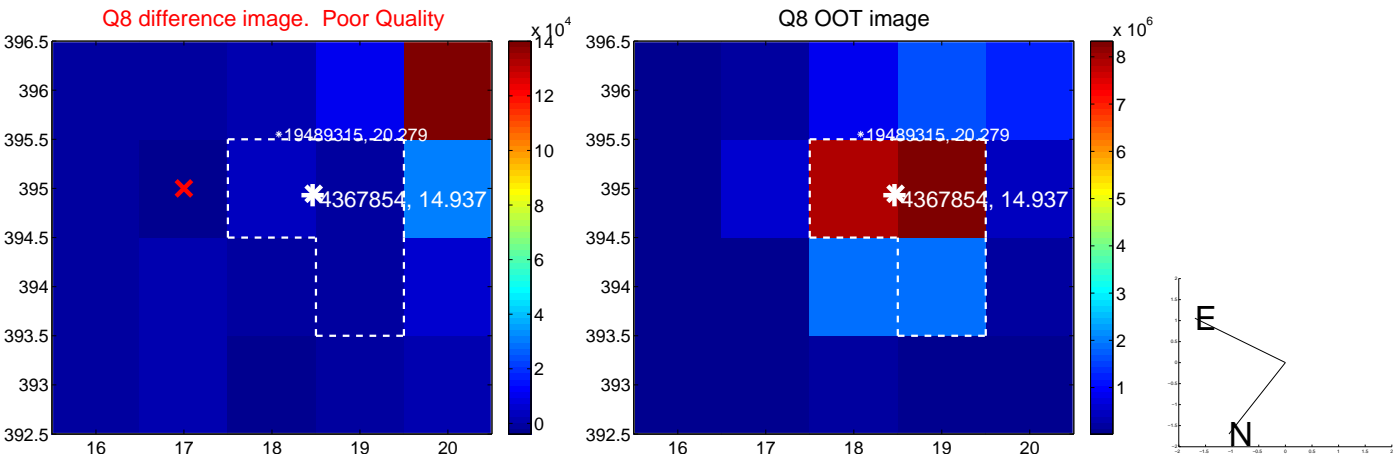
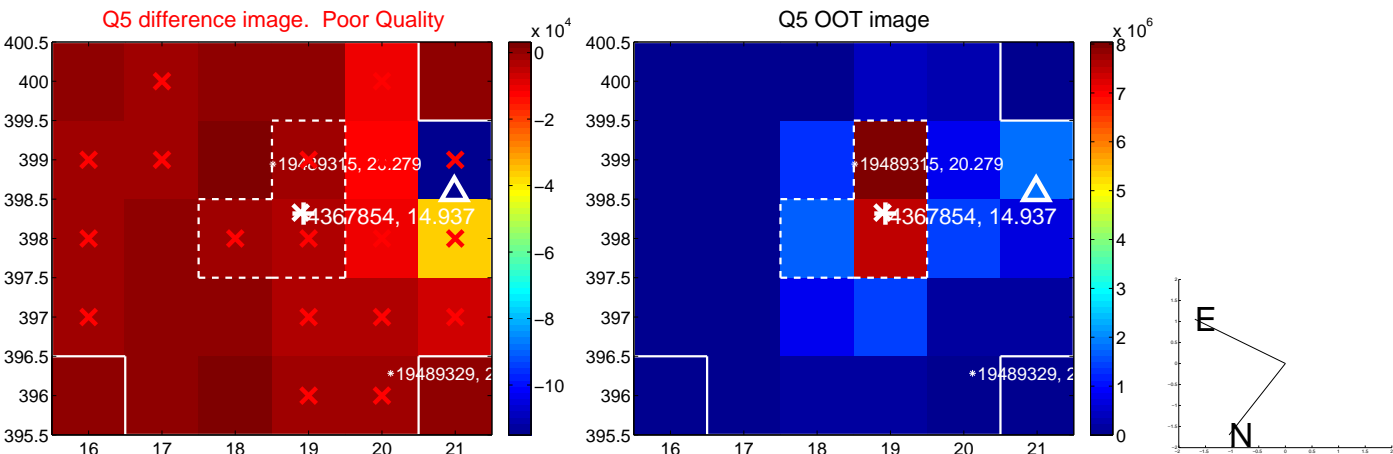


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

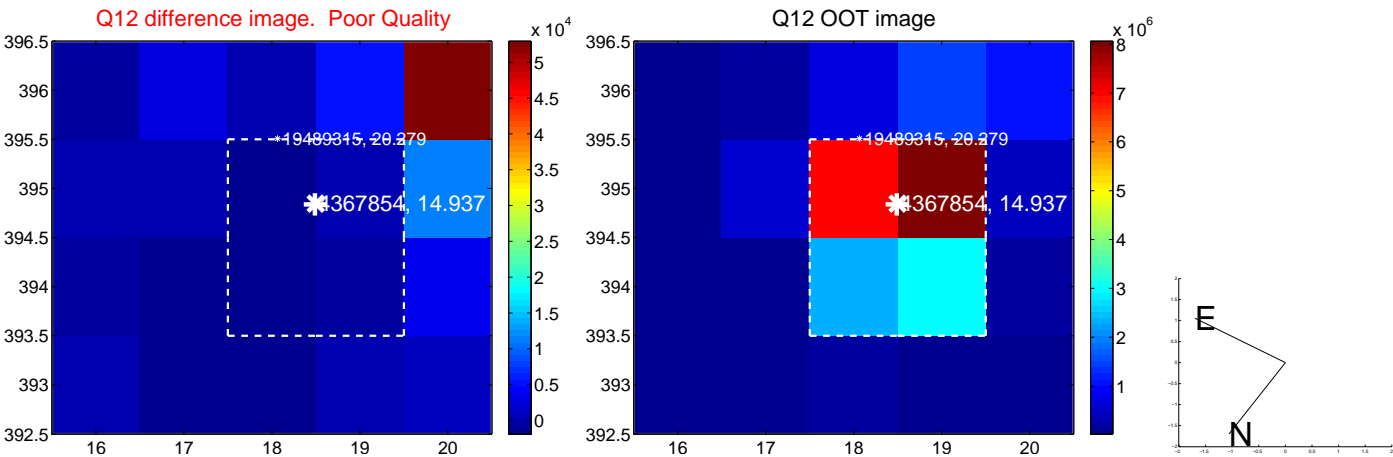
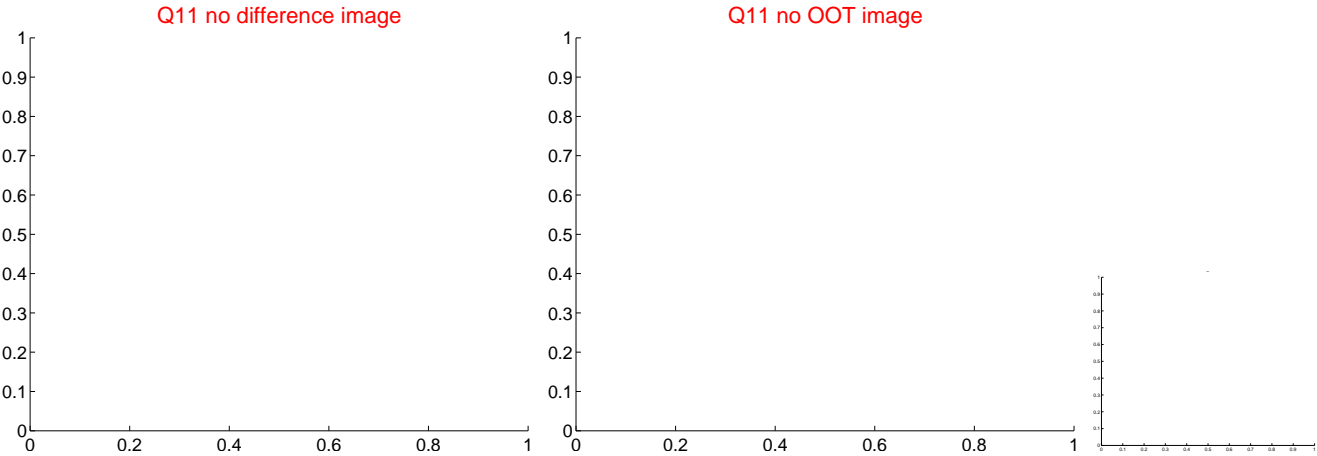
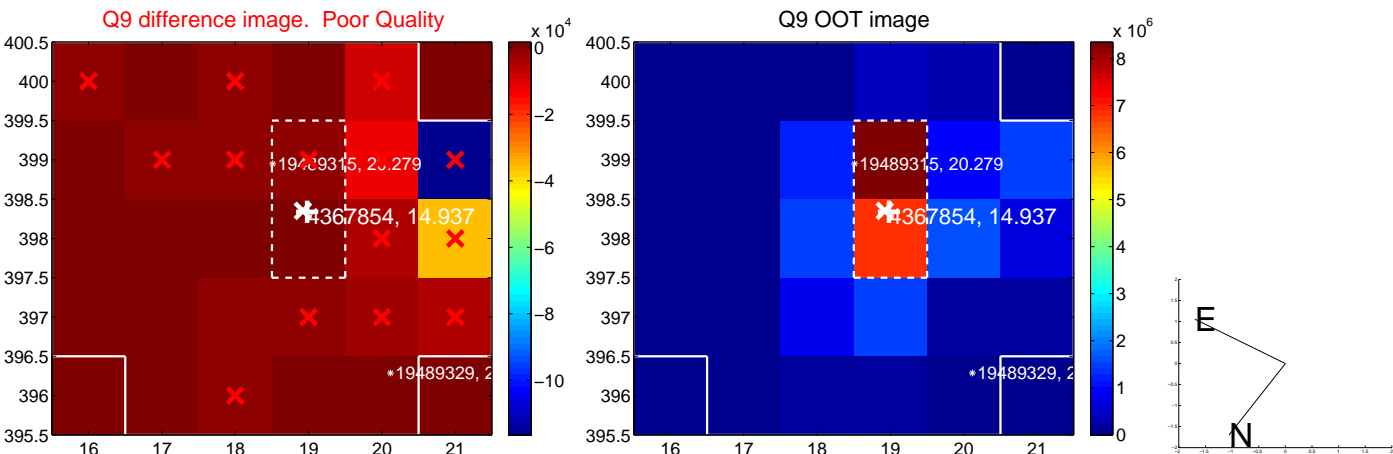
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



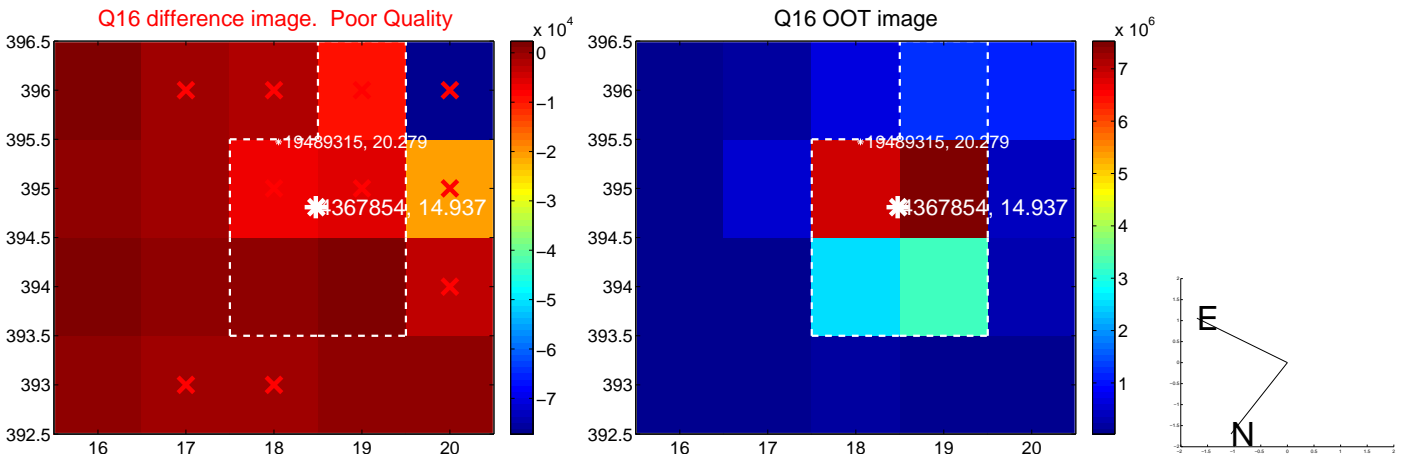
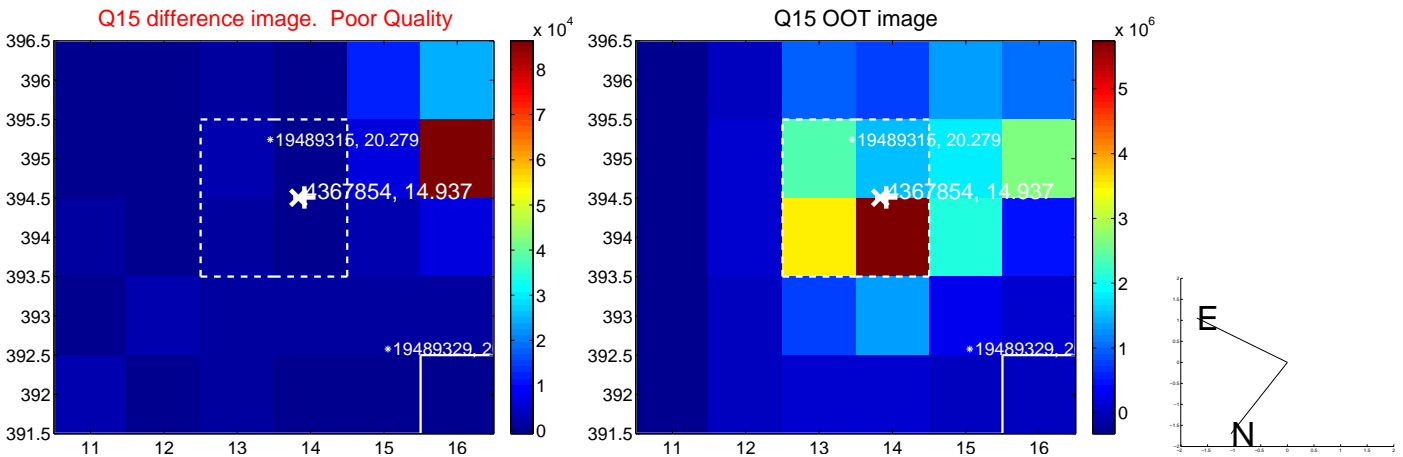
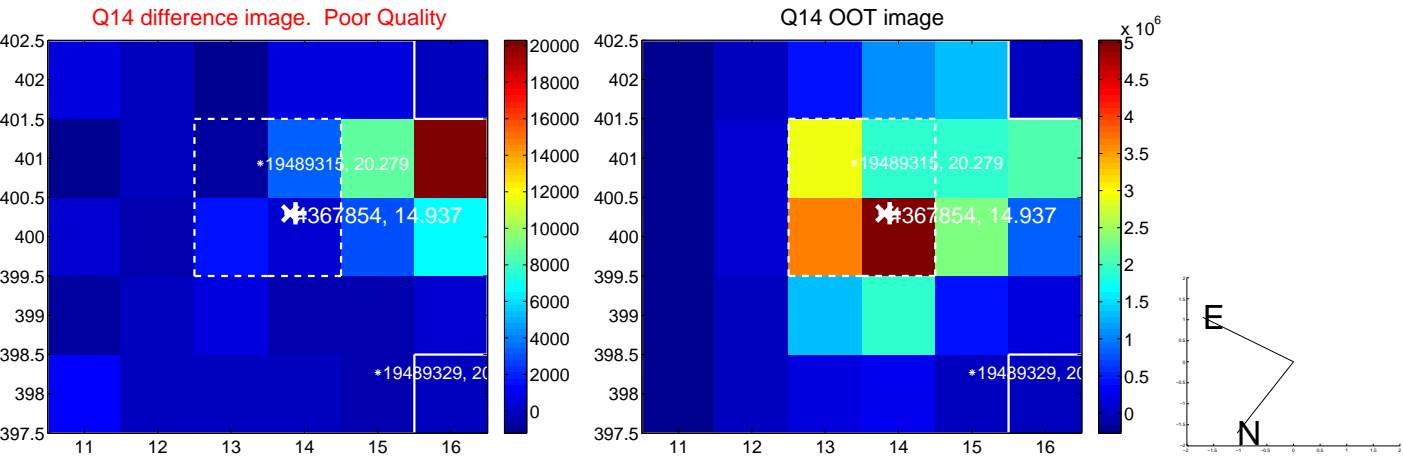
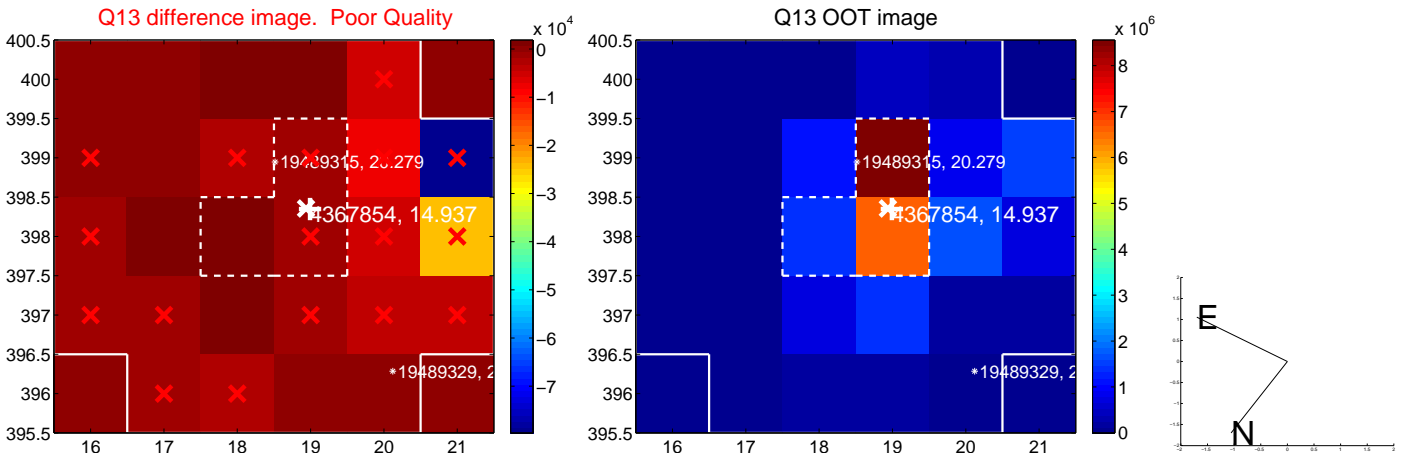
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



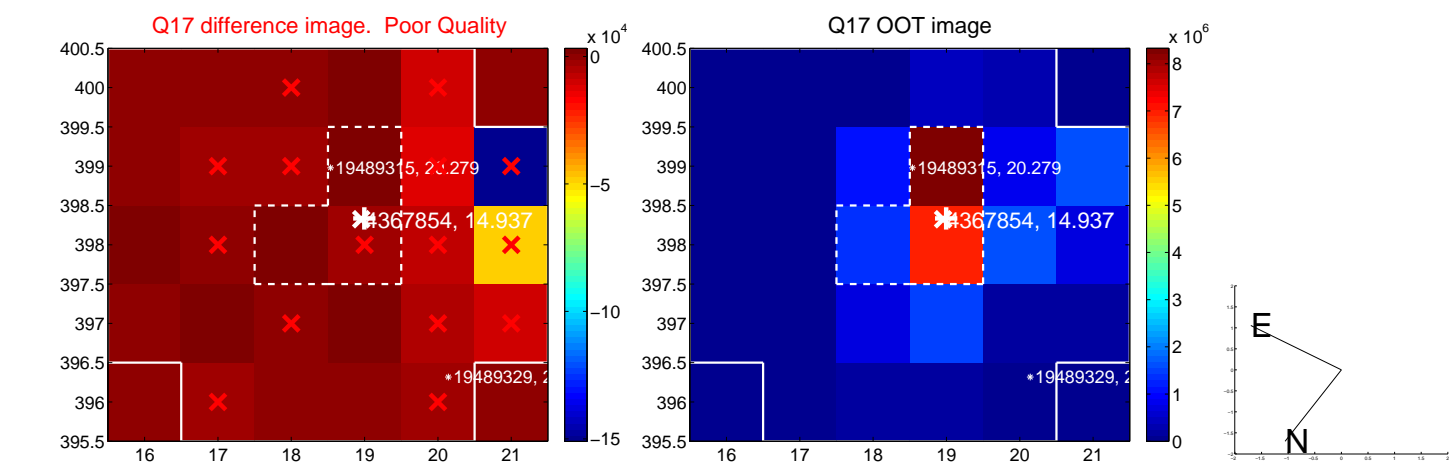
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



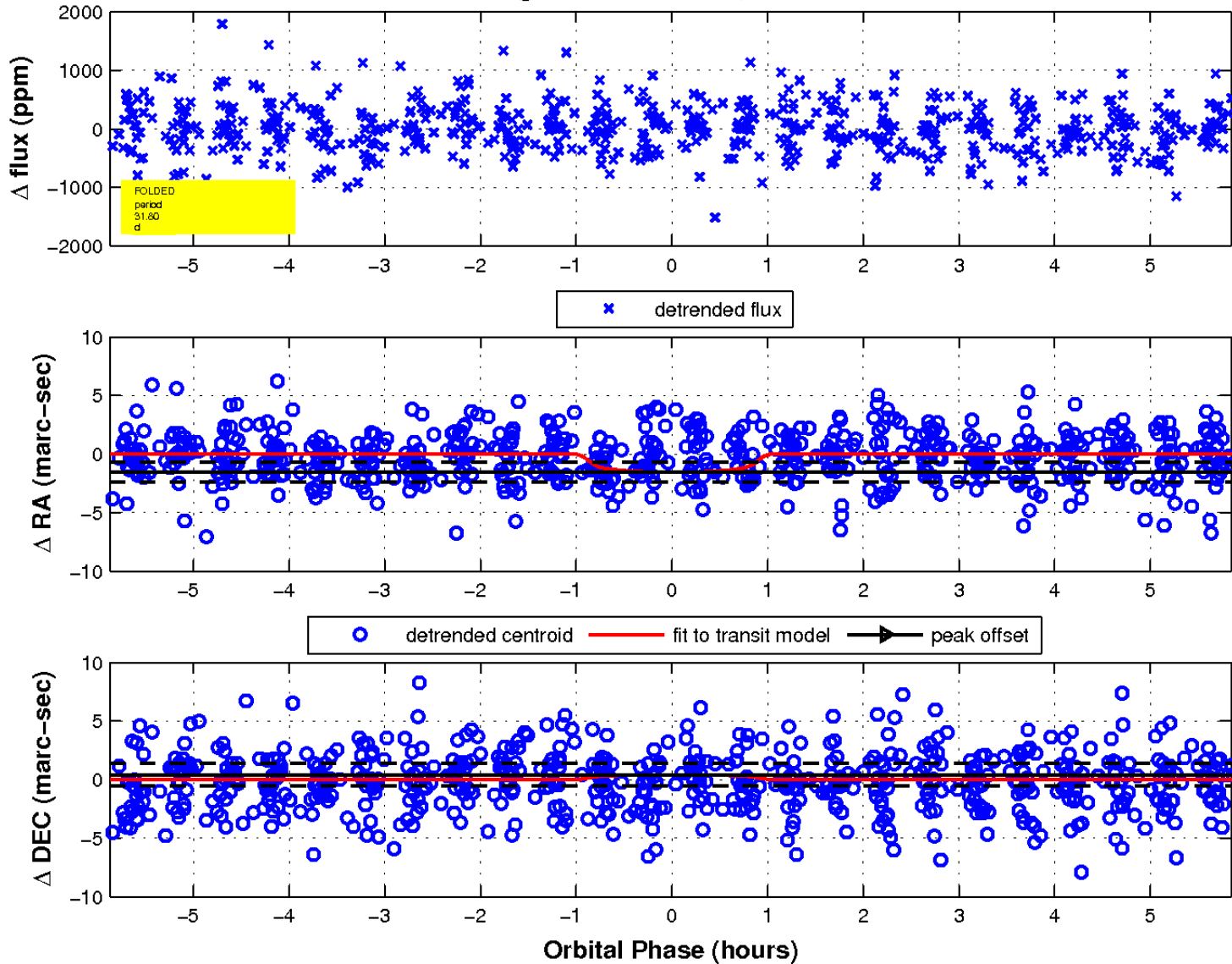
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

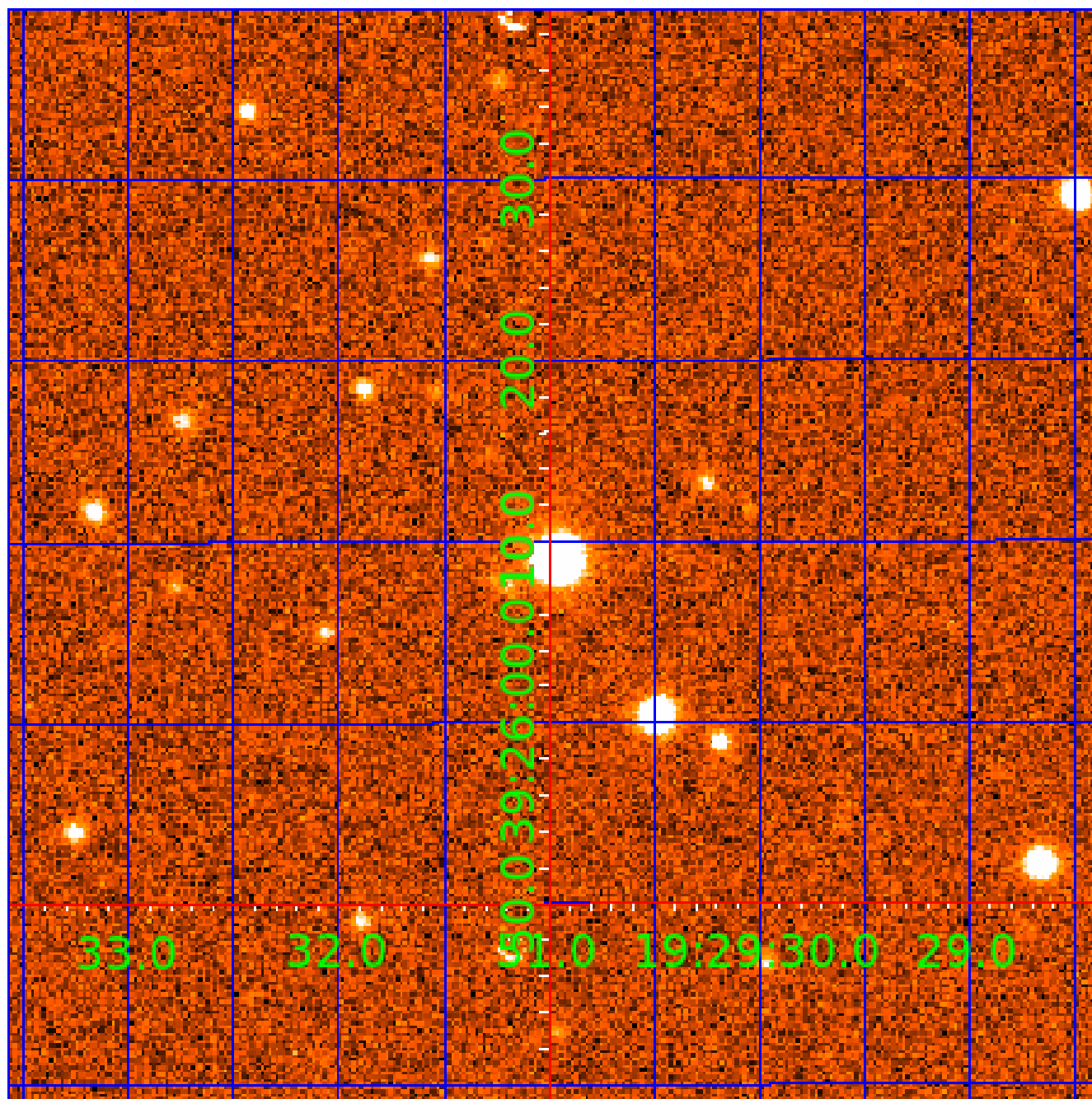


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 004367854

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})
004367854-01	OBS	2876.01	5.195204	133.343251	295.6	2.145	13.0	14.8	0.74	5044	1.34	115.50
004367854-02	OBS	2876.02	0.535228	131.747196	68.9	3.403	7.3	12.3	0.74	5044	0.74	2391.37
004367854-03	OBS	No	31.796592	134.850603	937.7	1.964	10.5	7.6	0.74	5044	2.54	10.32
004367854-04	OBS	No	45.192873	150.935771	741.9	1.840	7.9	7.2	0.74	5044	2.07	6.46

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004367854-01	OBS	FP	0.28	0	0	1	0	CENT_RESOLVED_OFFSET
004367854-02	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
004367854-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
004367854-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

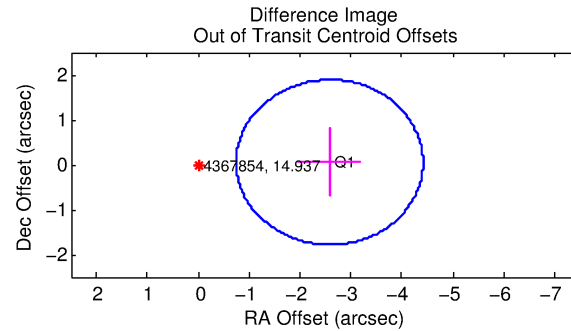
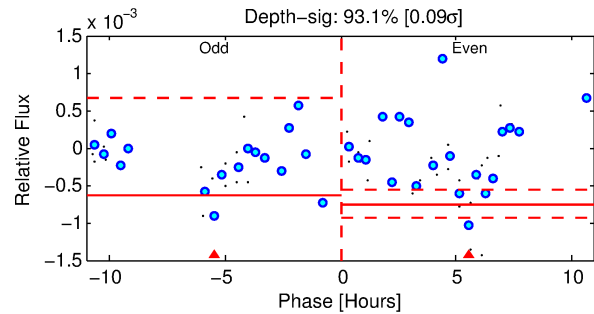
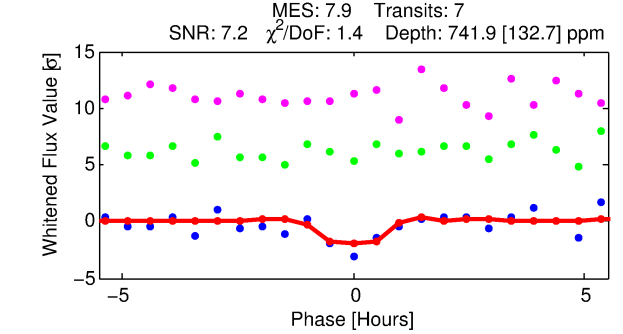
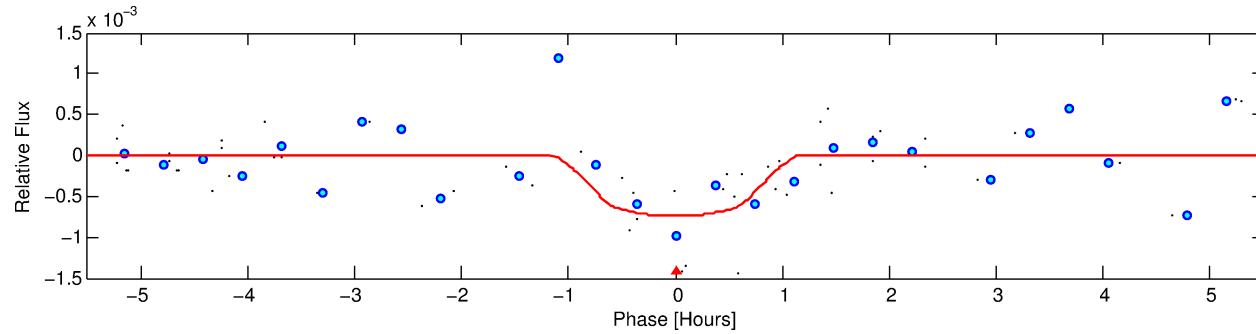
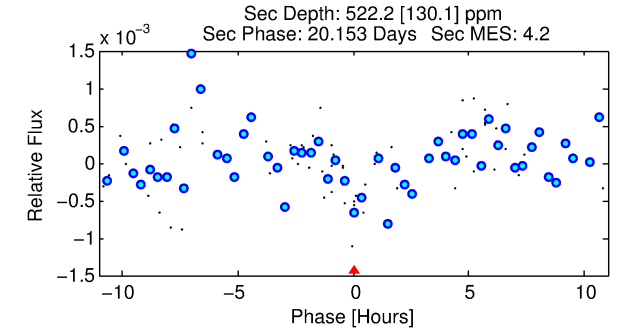
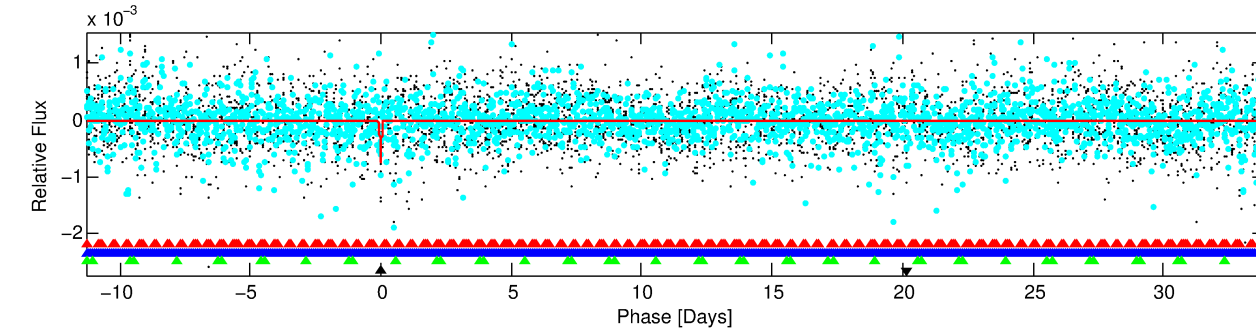
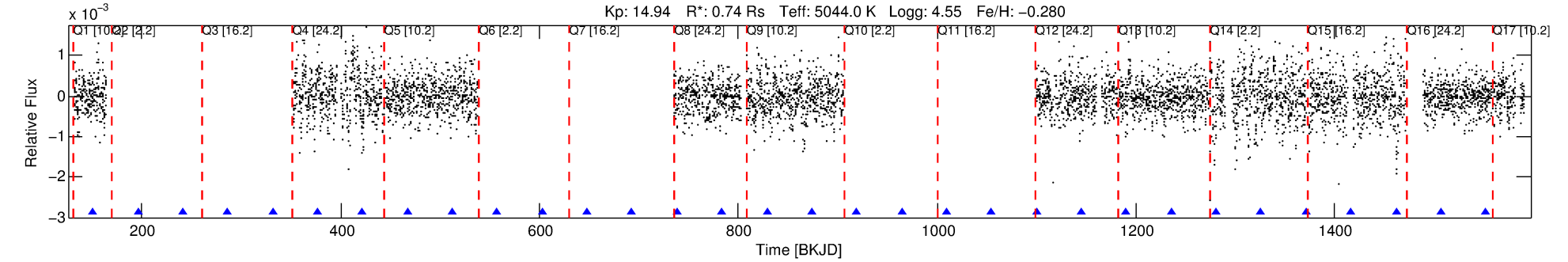
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004367854-04

No Significant Match Found

DV One-Page Summary

KIC: 4367854 Candidate: 4 of 4 Period: 45.193 d
KOI: K02876 Corr: No Ephemeris Match



DV Fit Results:

Period = 45.19287 [0.00053] d
Epoch = 150.9358 [0.0117] BKJD
Rp/R* = 0.0257 [0.1273]
a/R* = 160.18 [2822.37]
b = 0.57 [21.44]
Seff = 6.46 [1.19]
Teq = 406 [19] K
Rp = 2.07 [10.26] Re
a = 0.2212 [0.0206] AU
Ag = 3286.99 [32612.44] [0.10 σ]
Teffp = 4758 [11802] K [0.37 σ]

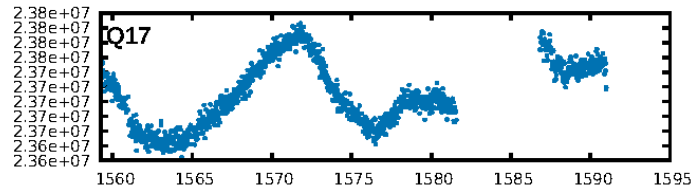
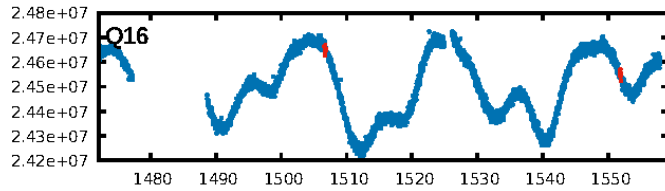
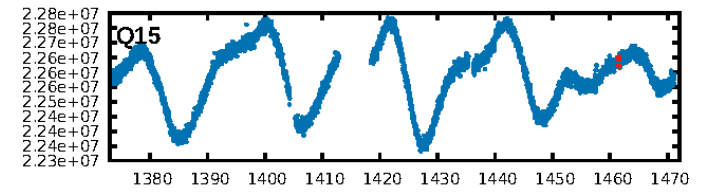
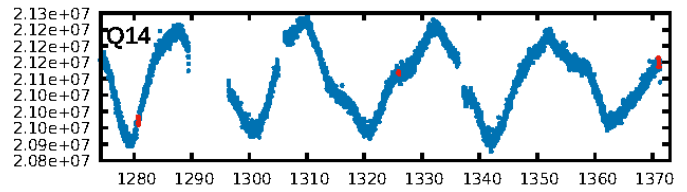
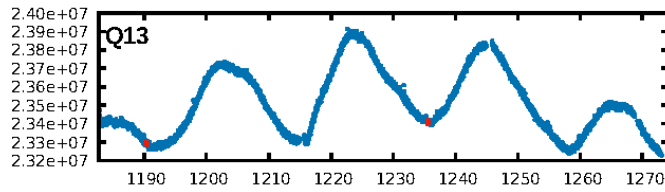
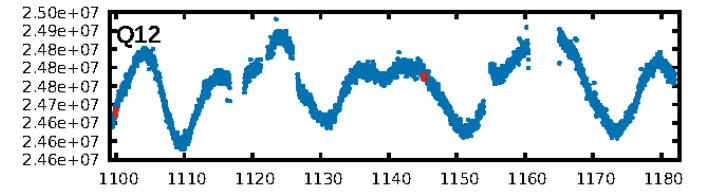
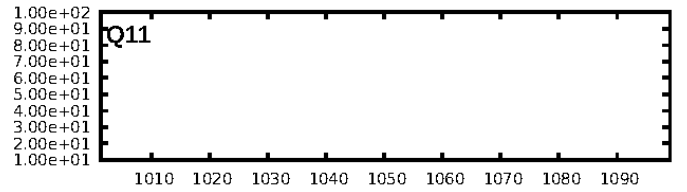
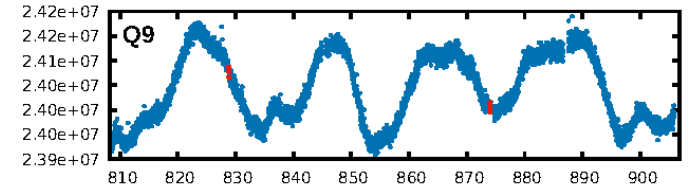
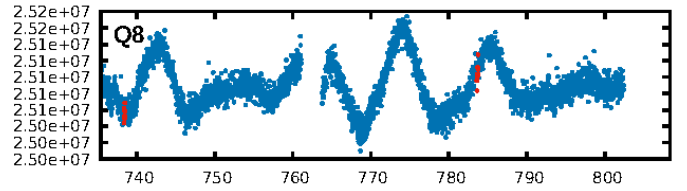
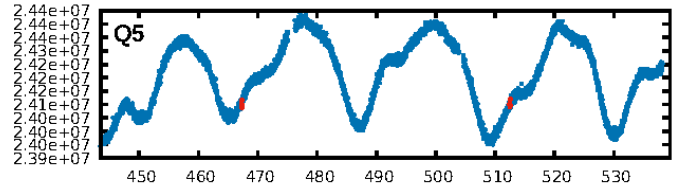
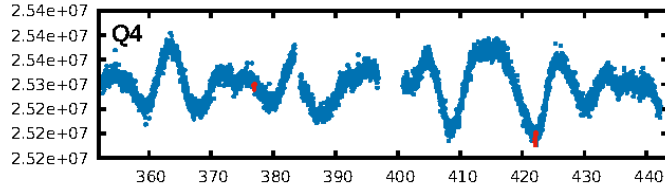
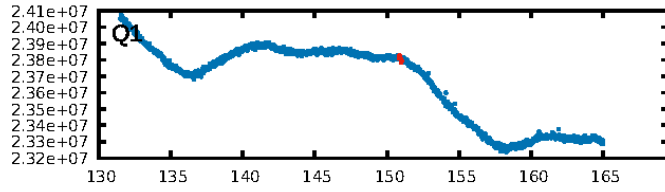
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [119.47 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 2.1%
ModelChiSquareGof-sig: 90.3%
Bootstrap-pfa: 2.01e-10
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: 1.119
Centroid-sig: 69.0%
Centroid-so: 0.673 arcsec [0.57 σ]
OotOffset-rm: 2.582 arcsec [4.22 σ]
KicOffset-rm: 2.812 arcsec [4.59 σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.00 [0/10]

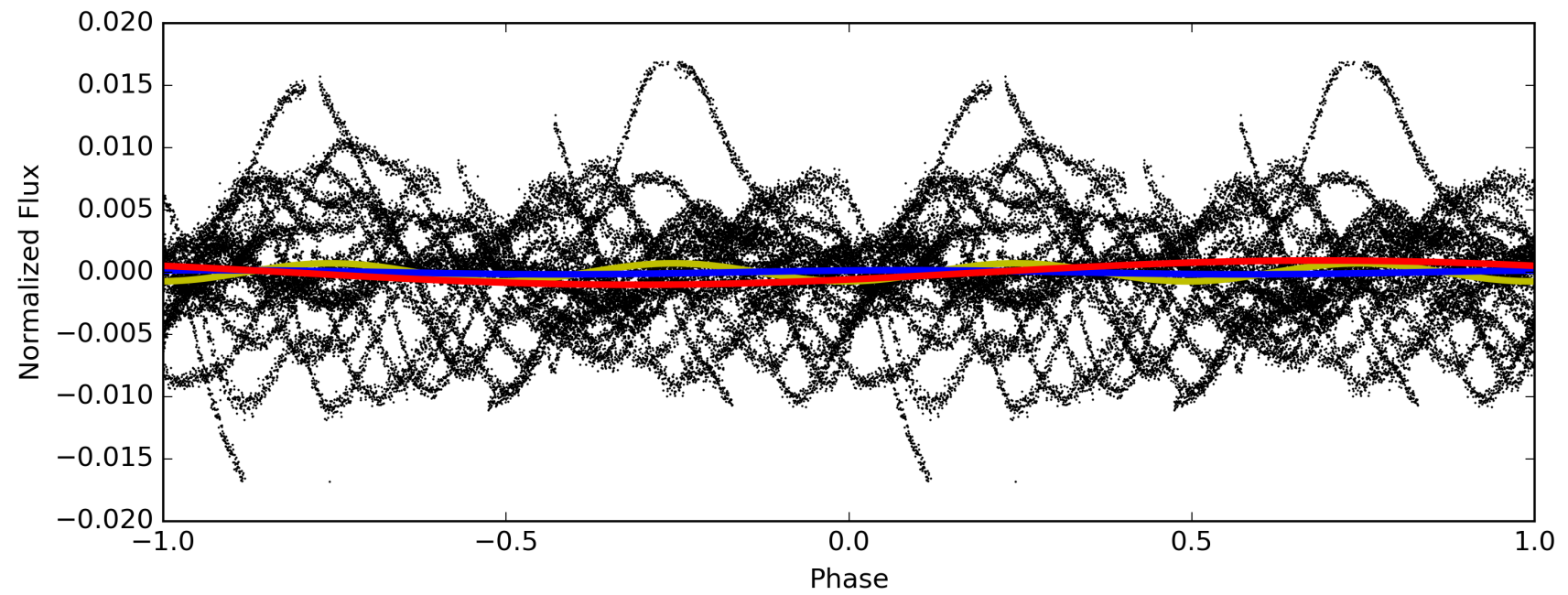
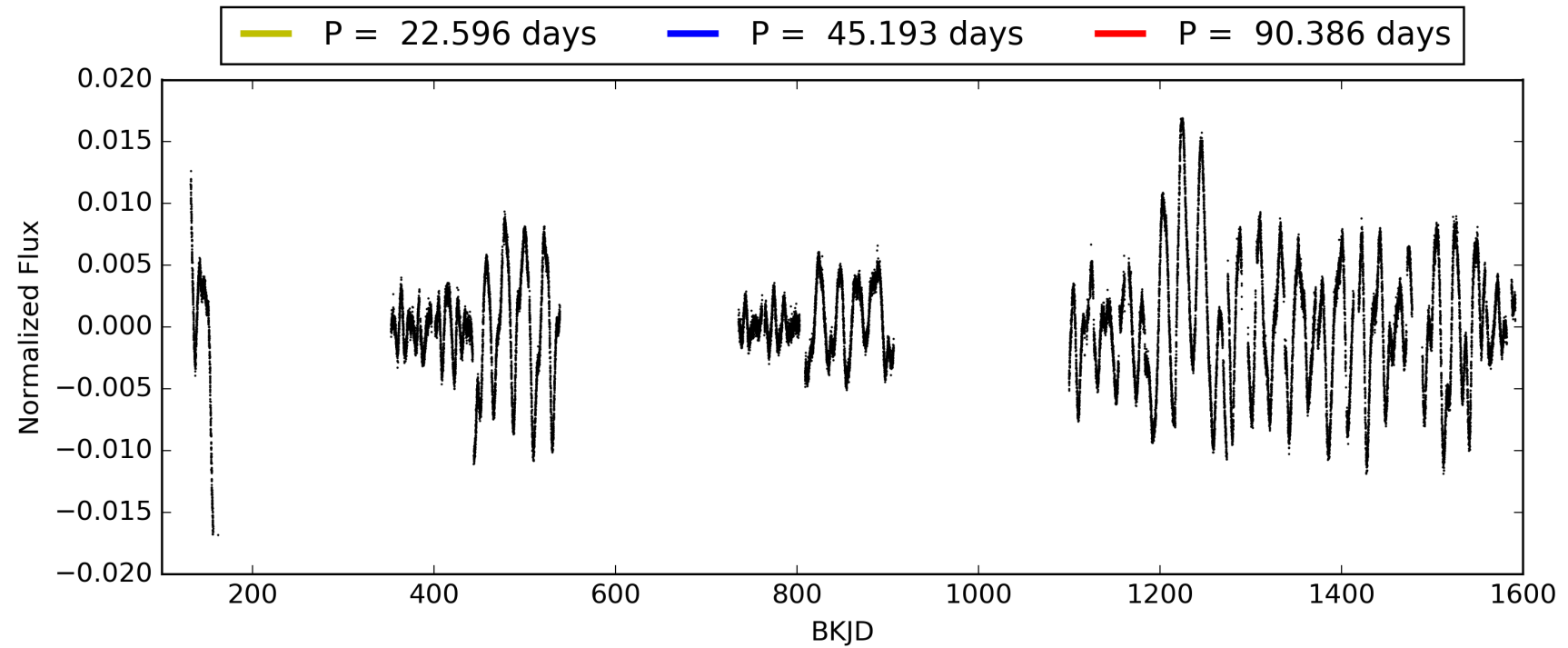
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:16:14 Z

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

TCE 004367854-04, PDC Light Curves

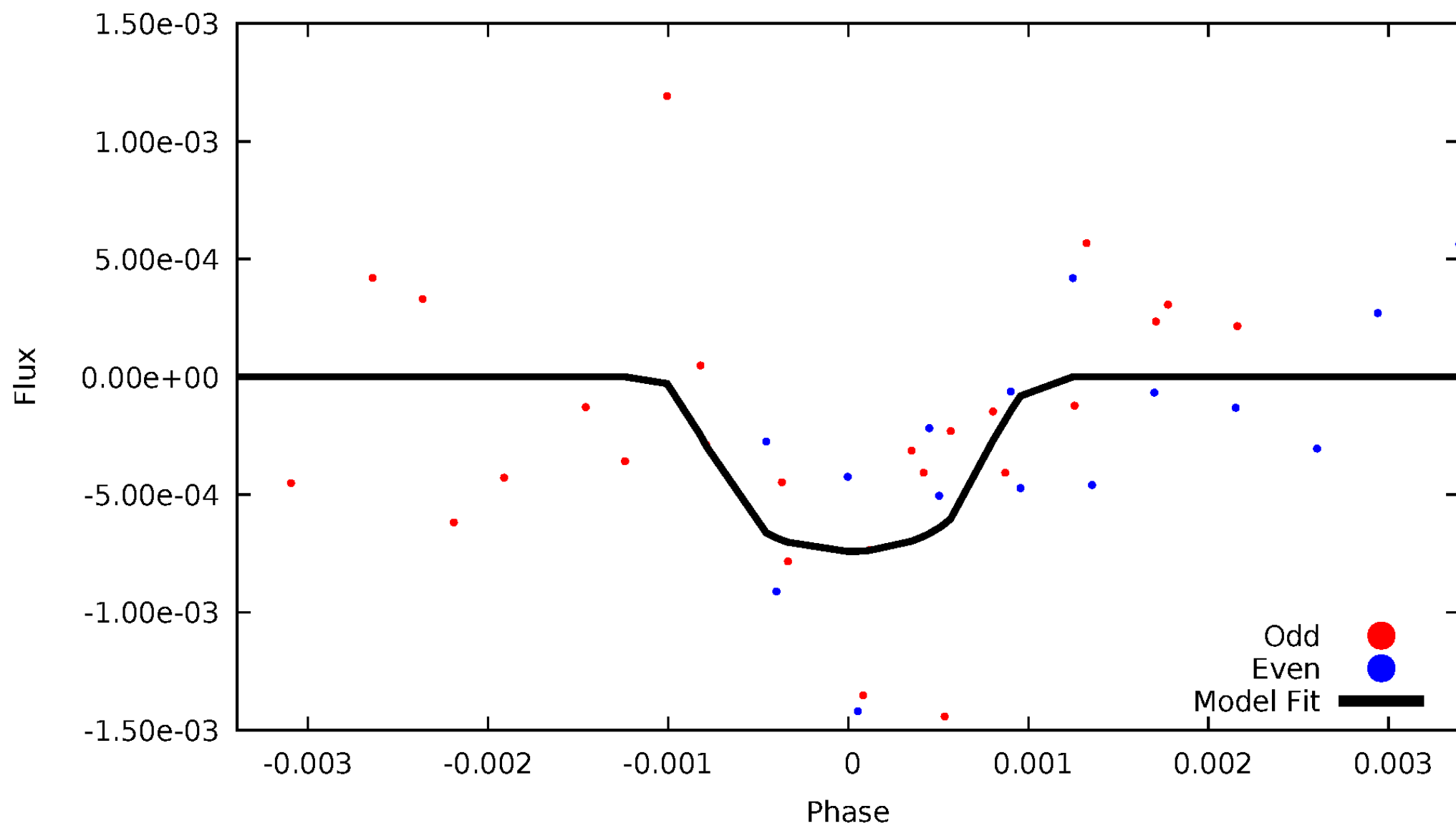


TCE 004367854-04



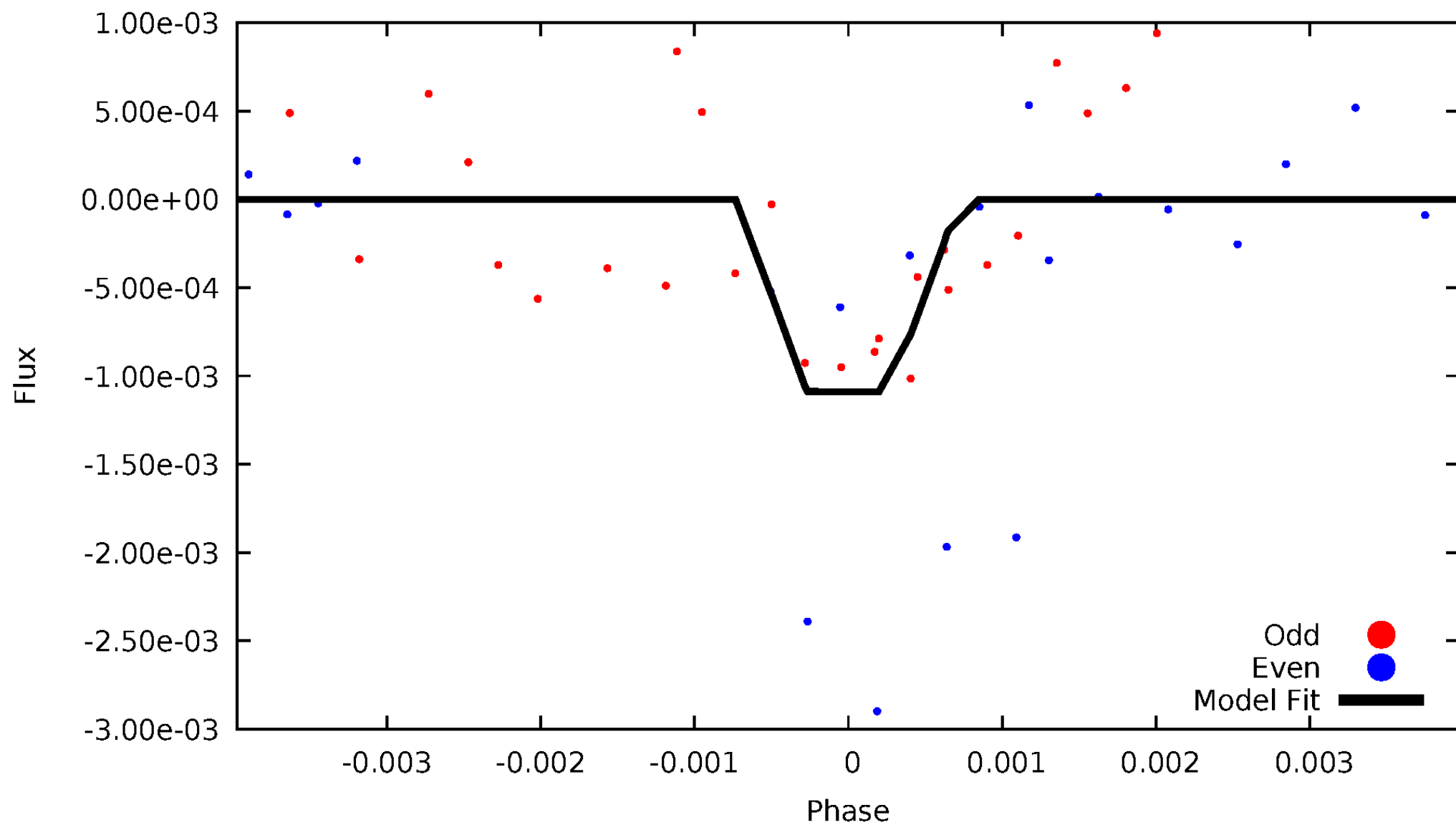
DV Odd/Even

TCE 004367854-04



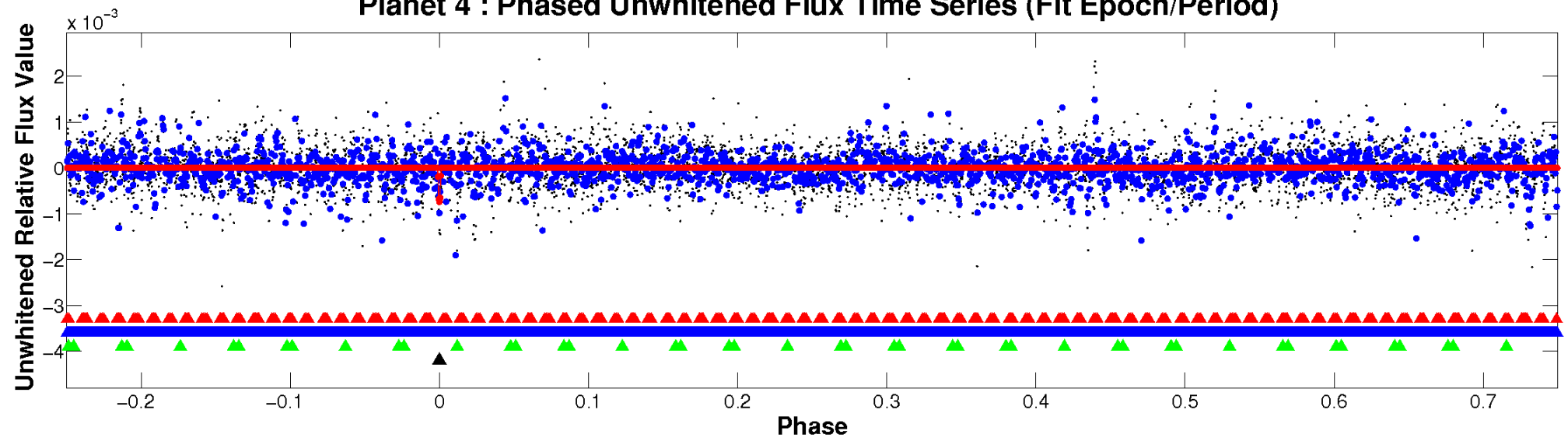
ALT Odd/Even

TCE 004367854-04

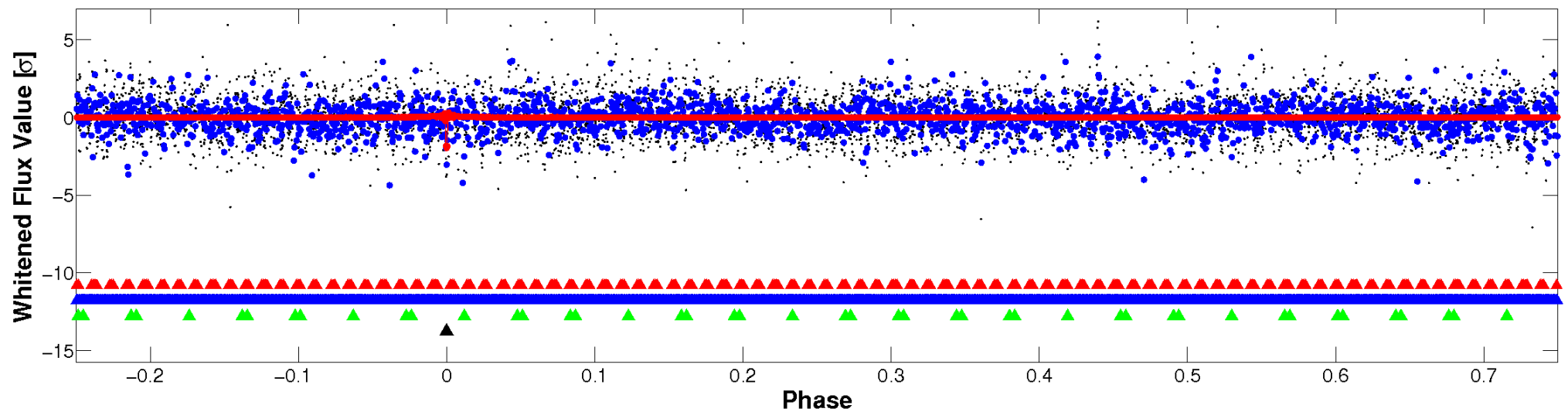


Non-Whitened Vs. Whitened Light Curve

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

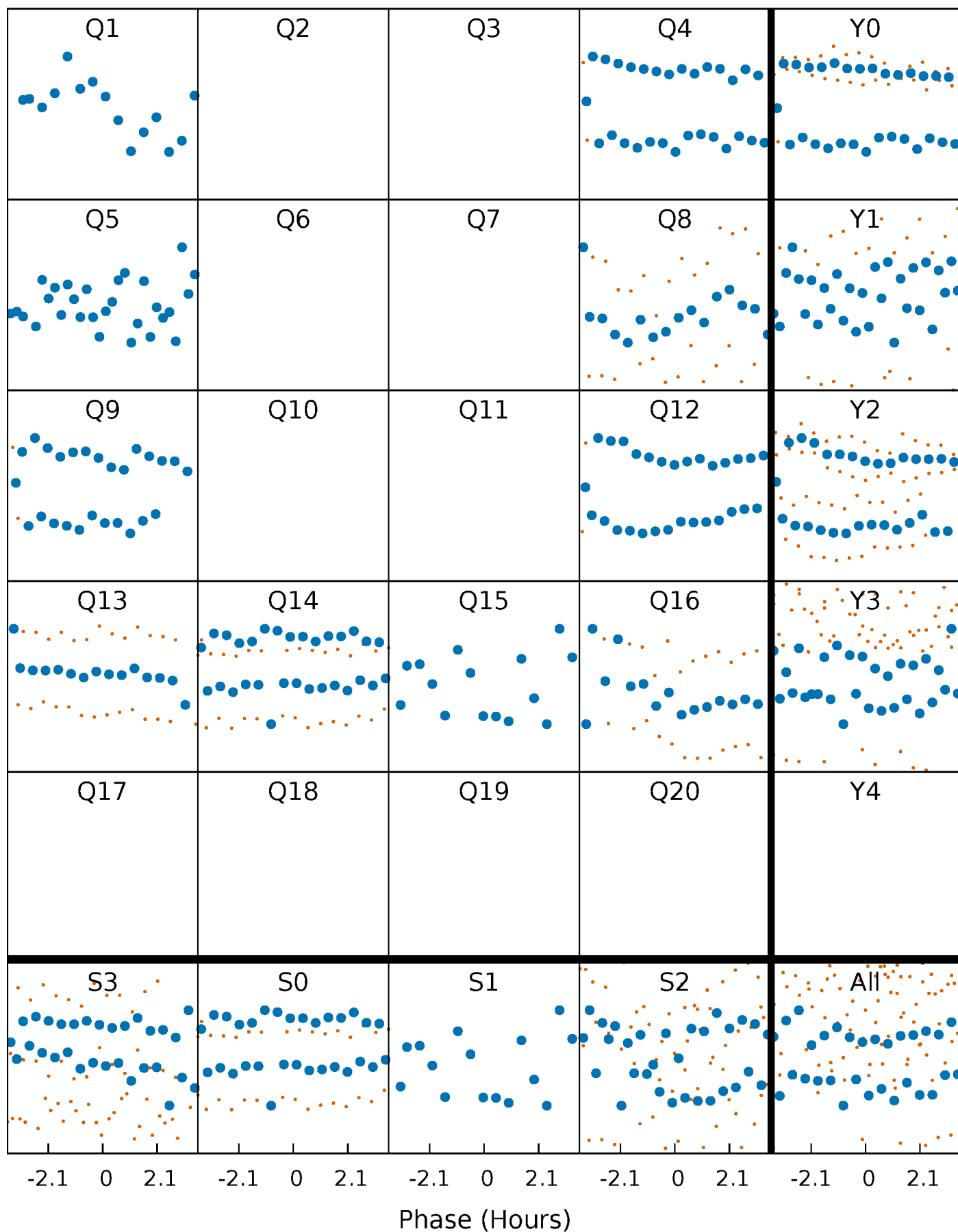


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



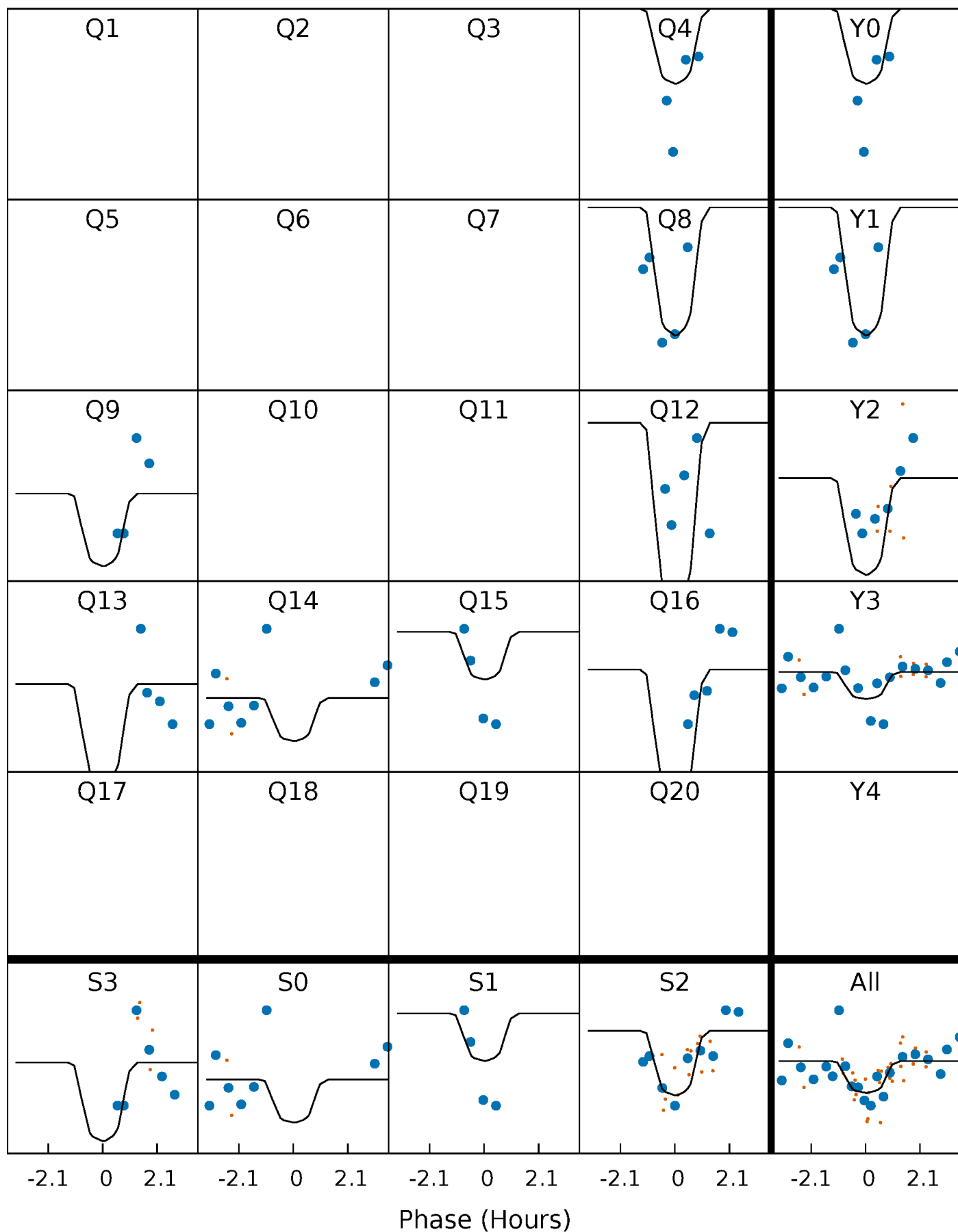
PDC Quarter-Phased Transit Curves

TCE 004367854-04 P= 45.192873 Days $T_0=150.935771$ (BKJD)



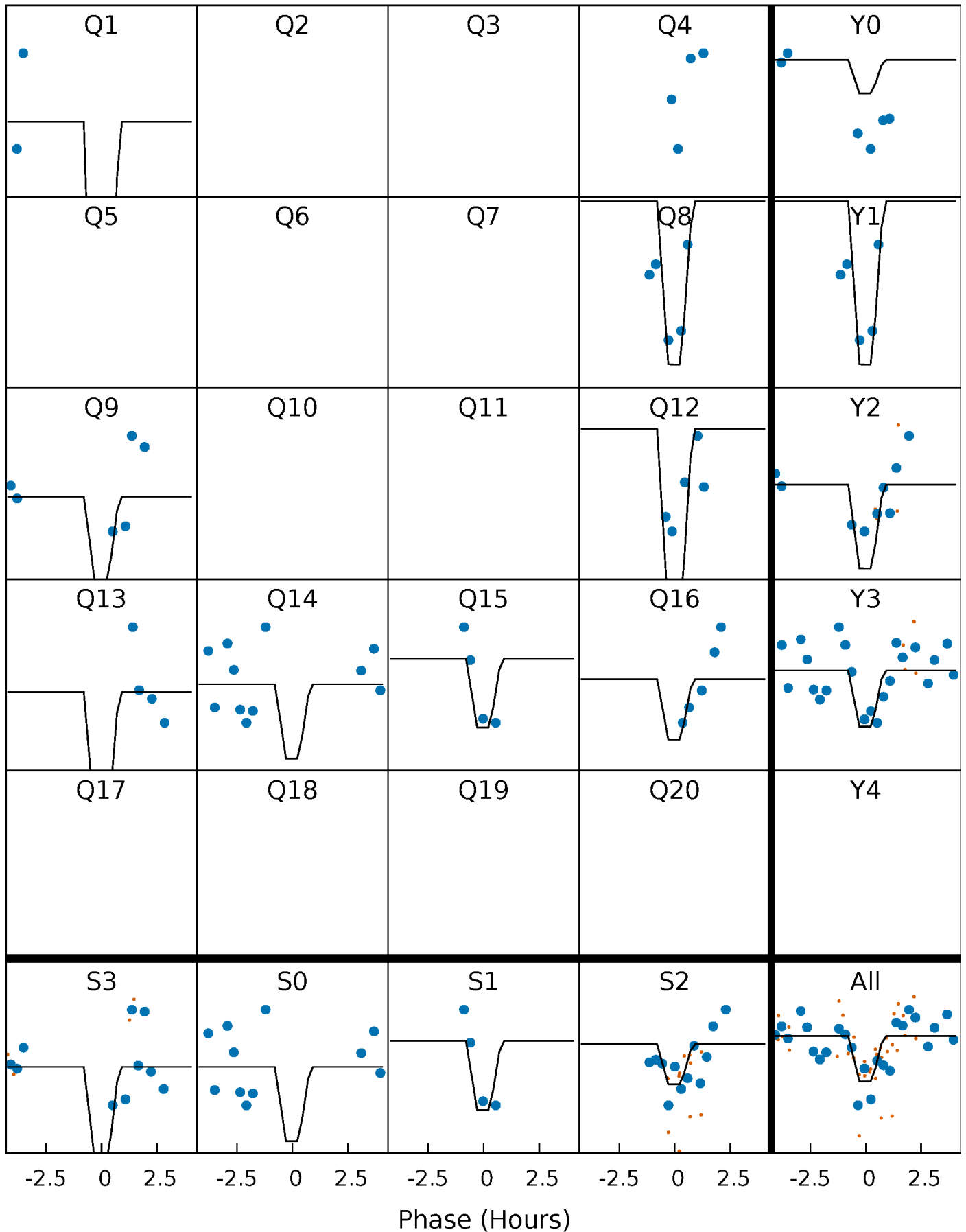
DV Quarter-Phased Transit Curves

TCE 004367854-04 P= 45.192873 Days $T_0=150.935771$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

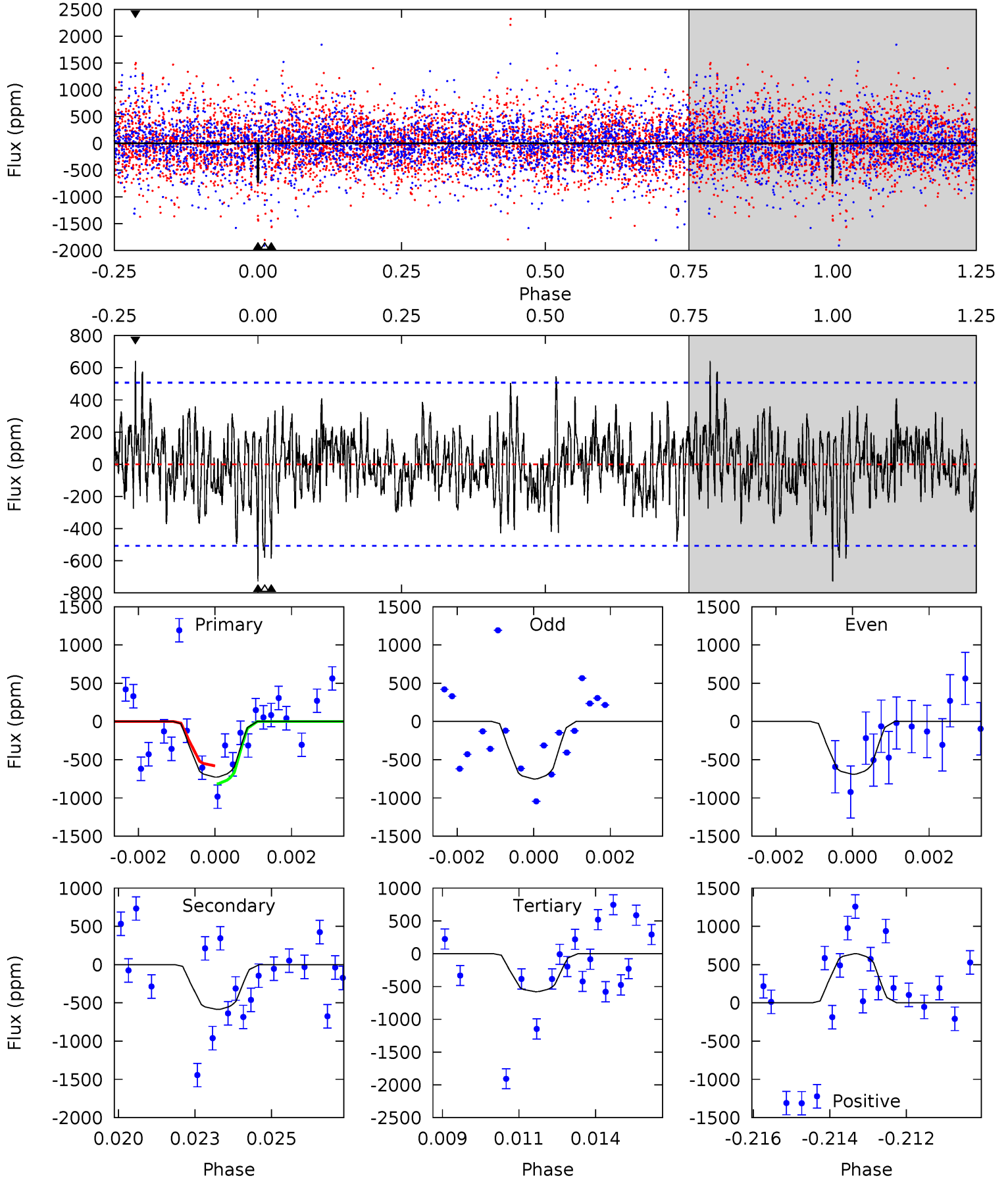
TCE 004367854-04 $P = 45.193394$ Days $T_0 = 150.926560$ (BKJD)



DV Model-Shift Uniqueness Test

004367854-04, P = 45.192873 Days, E = 105.742898 Days

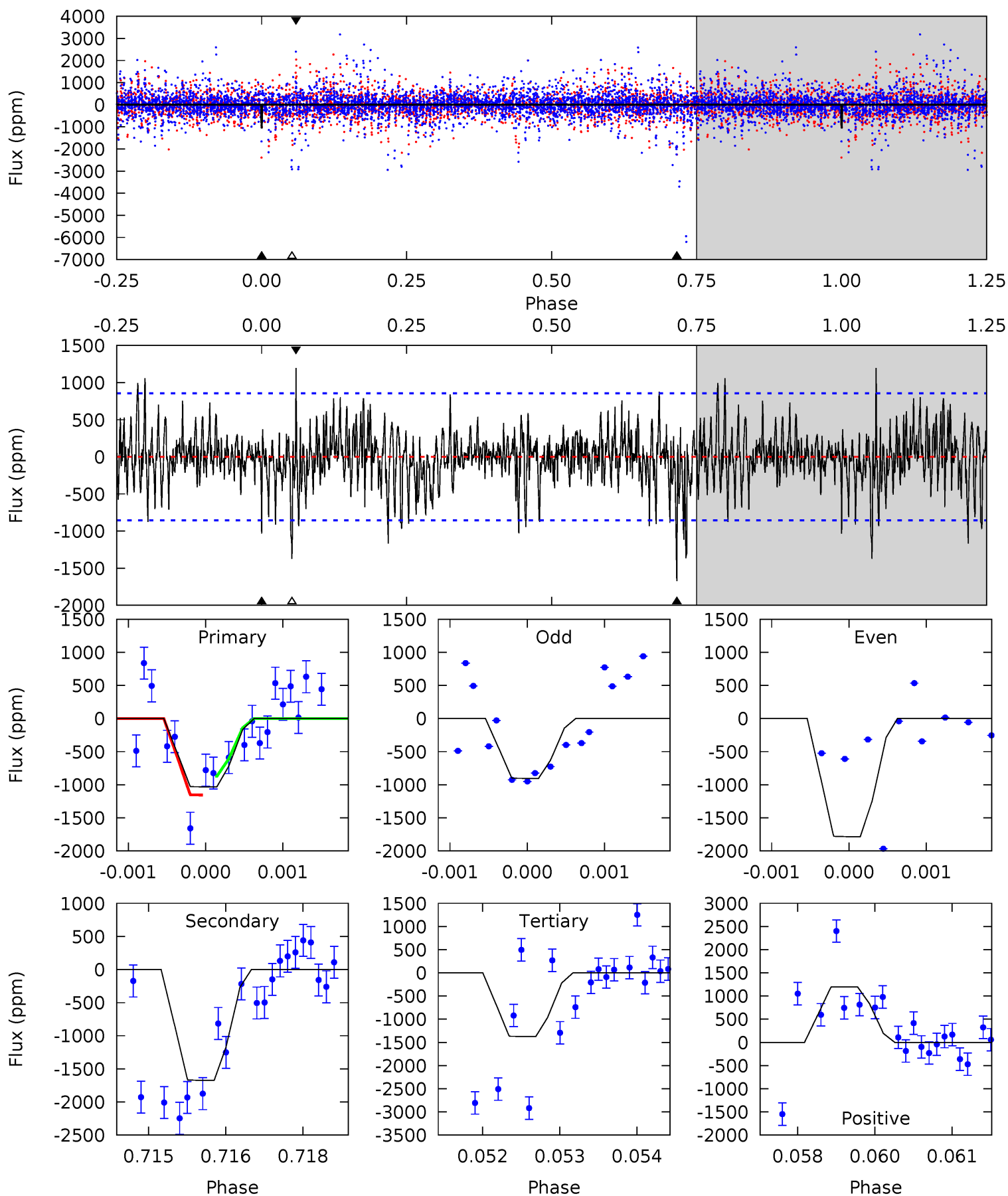
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.62	6.12	6.06	6.73	5.31	3.05	1.63	1.55	0.89	0.06	-0.60	0.32	1.13	0.47	1.16



Alt Model-Shift Uniqueness Test

004367854-04, P = 45.193394 Days, E = 105.733166 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.51	10.6	8.66	7.55	5.40	3.20	1.76	-2.15	-1.04	1.89	3.00	2.90	1.34	0.42	0.91



Stellar Parameters For KIC 004367854

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5044^{+151}_{-136}	$4.551^{+0.078}_{-0.048}$	$-0.280^{+0.300}_{-0.300}$	$0.738^{+0.072}_{-0.079}$	$0.708^{+0.100}_{-0.050}$	$2.475^{+0.794}_{-0.419}$
	+3%/-3%	+2%/-1%	+107%/-107%	+10%/-11%	+14%/-7%	+32%/-17%
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 004367854-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-585 ± 96	$7.28^{+7.74}_{-5.03}$	565^{+22}_{-21}	3156^{+1643}_{-558}	293^{+2944}_{-224}
Alt.	-1673 ± 159	$7.29^{+8.66}_{-4.89}$	566^{+21}_{-20}	3733^{+2123}_{-771}	864^{+7313}_{-686}

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

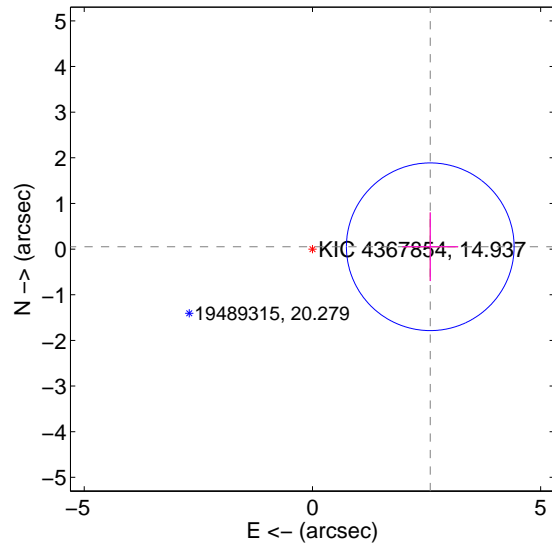
Supplemental centroid analysis for 004367854-04. Kepler magnitude: 14.94. Transit SNR 7.20

There are 0 quarters with good PRF difference image offsets

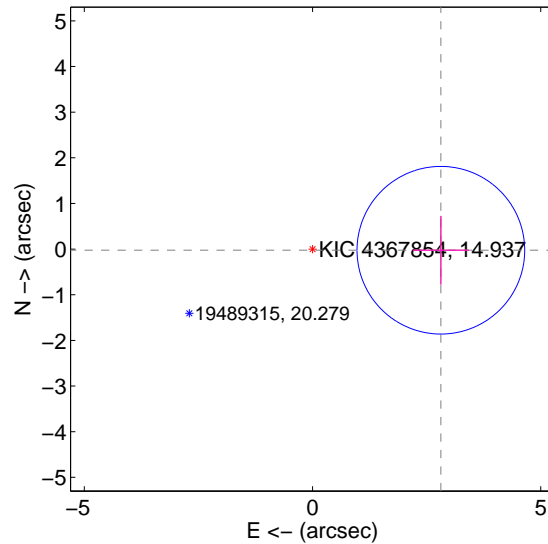
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.582 ± 0.612	4.22	-2.581 ± 0.612	0.051 ± 0.753
PRF-fit source offset from KIC position	2.812 ± 0.612	4.59	-2.812 ± 0.612	-0.025 ± 0.753
photometric centroid source offset	0.67 ± 1.19	0.57	0.36 ± 1.12	-0.57 ± 1.22

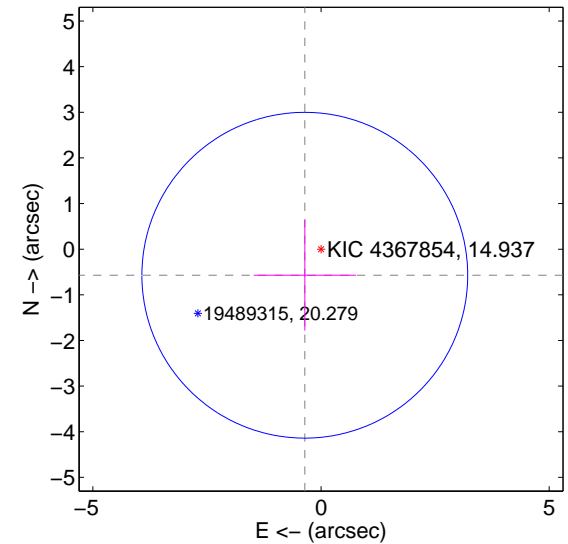
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

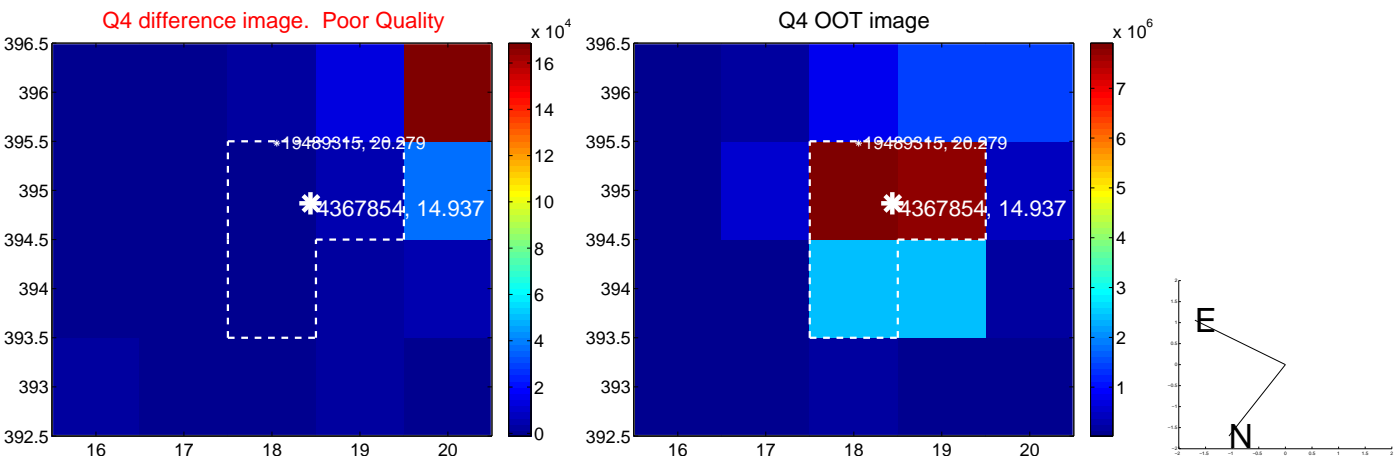
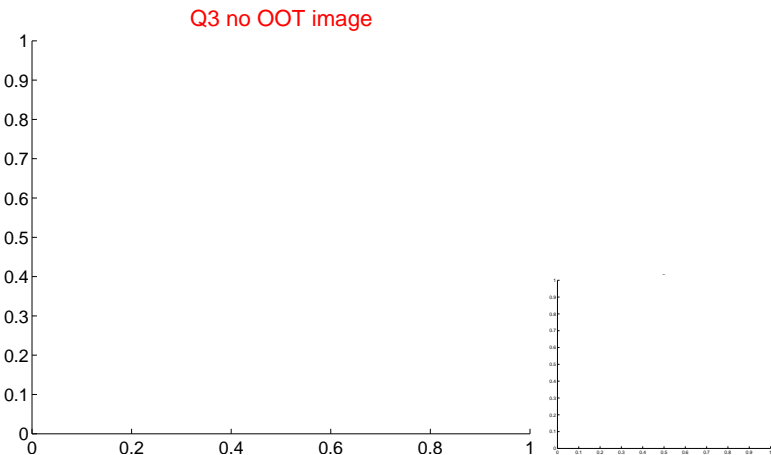
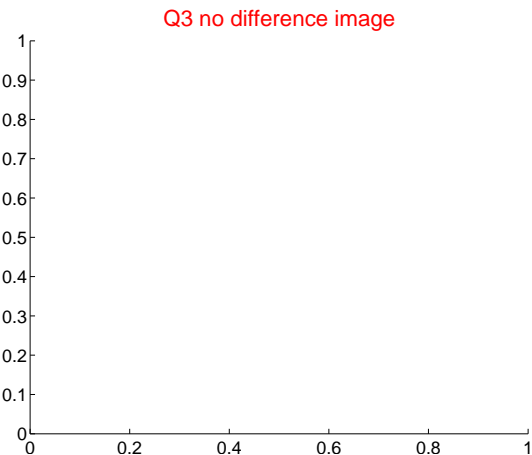
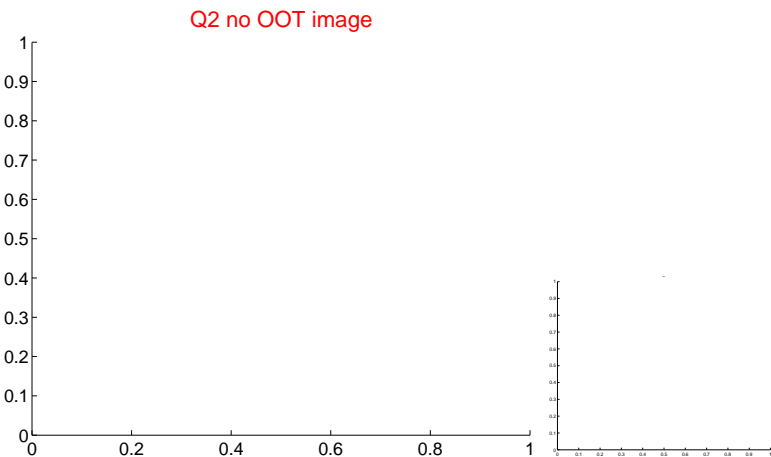
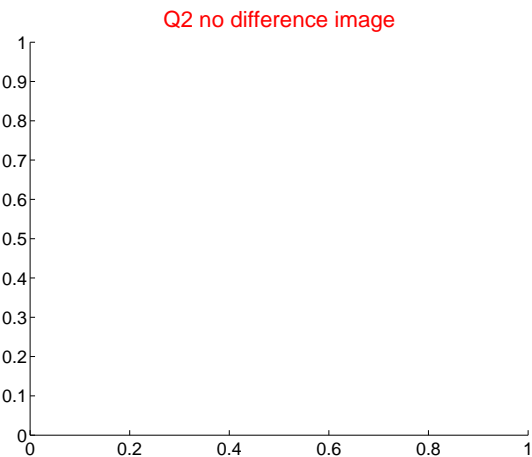
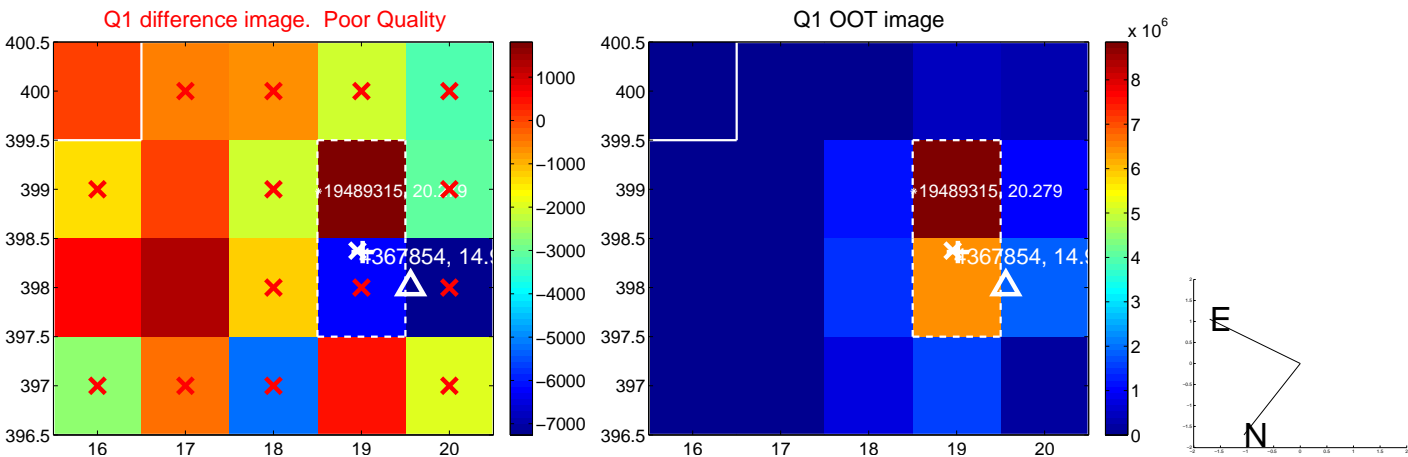


offset from photometric centroids

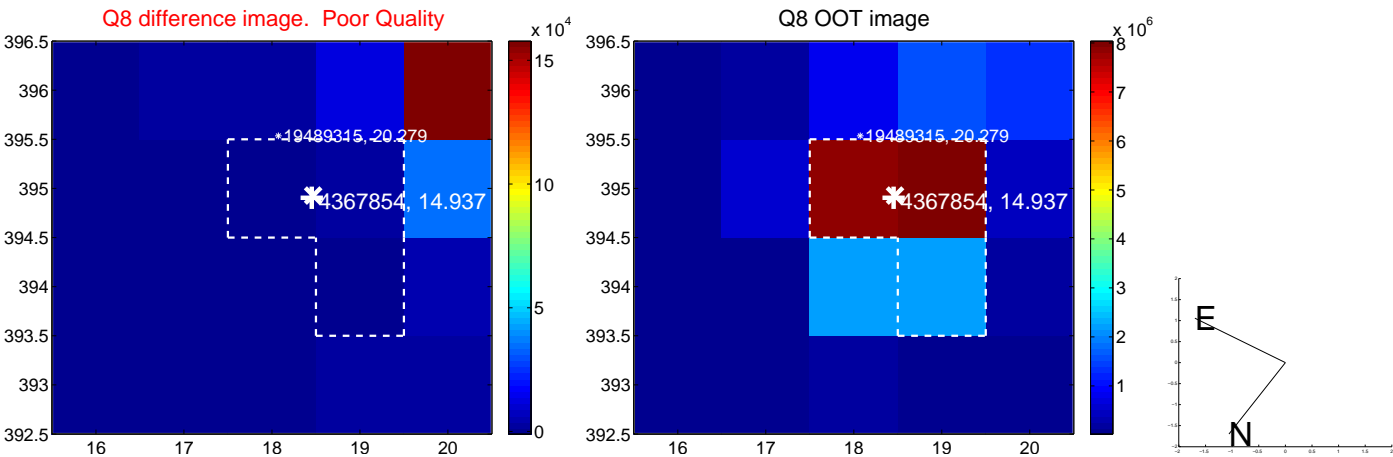
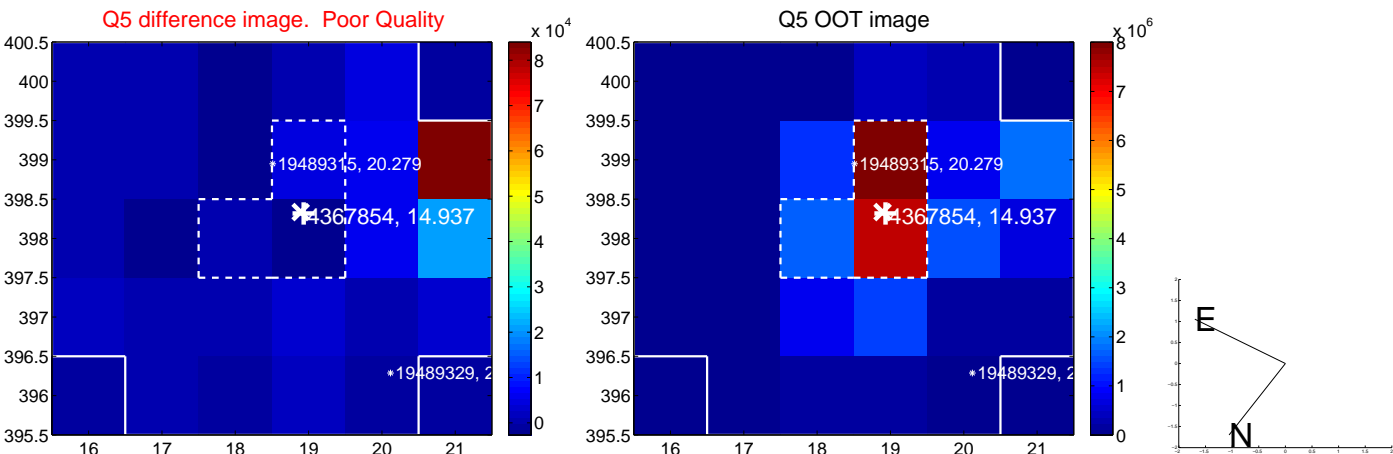


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

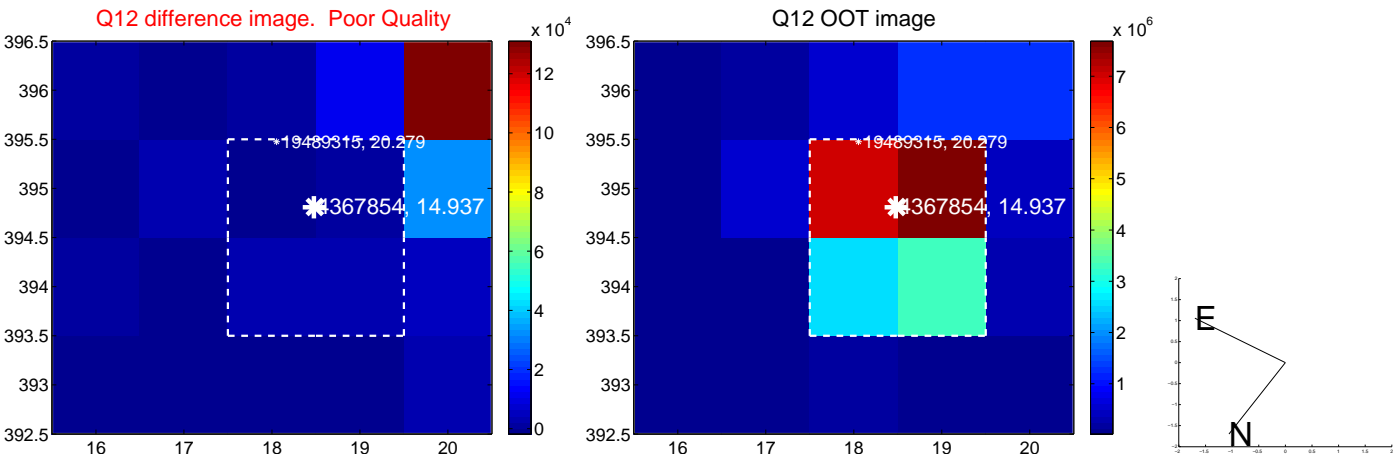
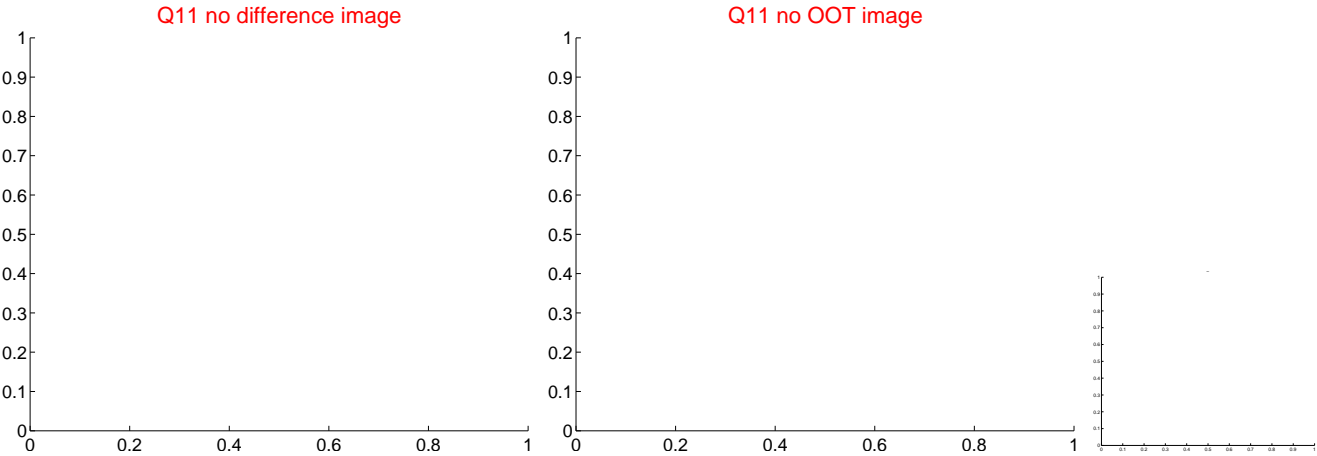
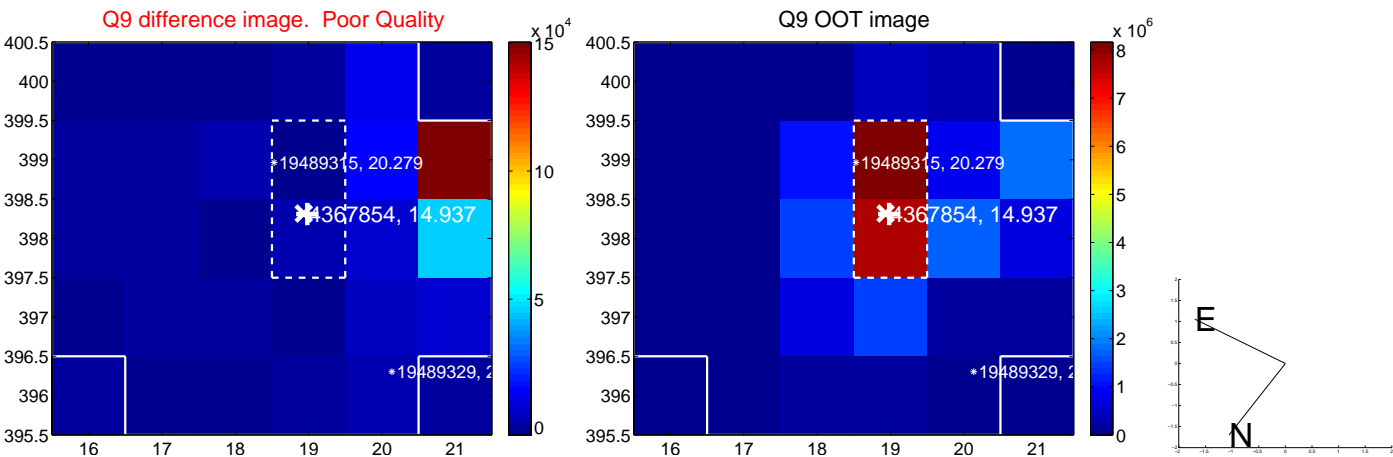
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



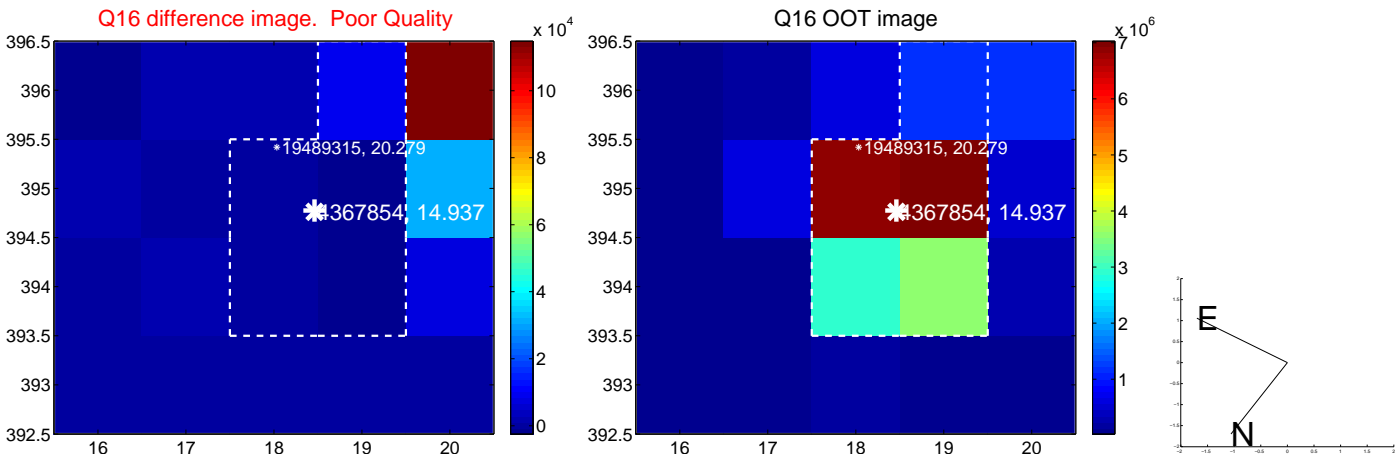
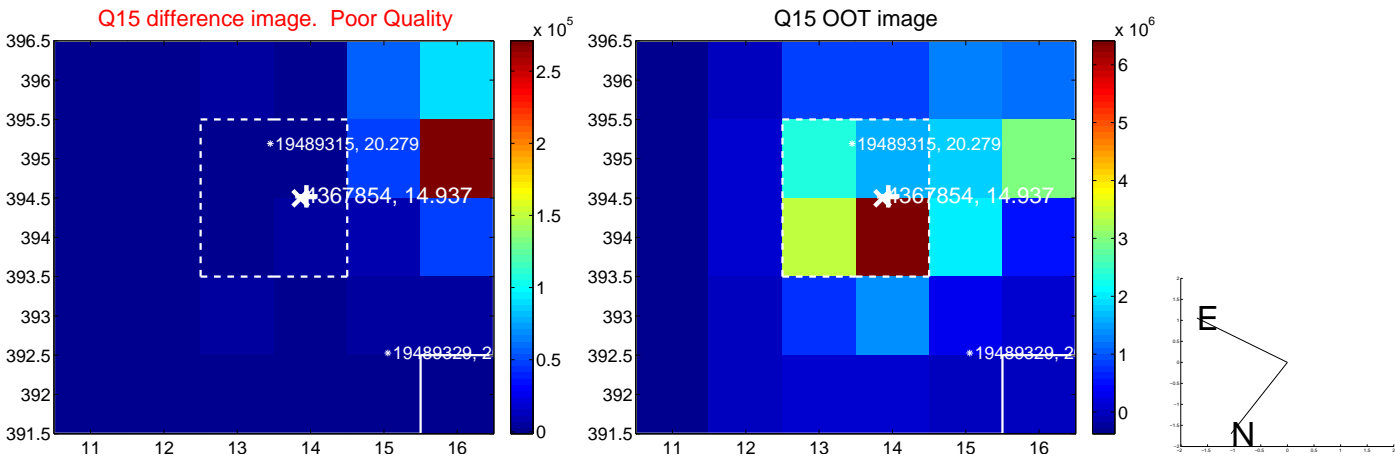
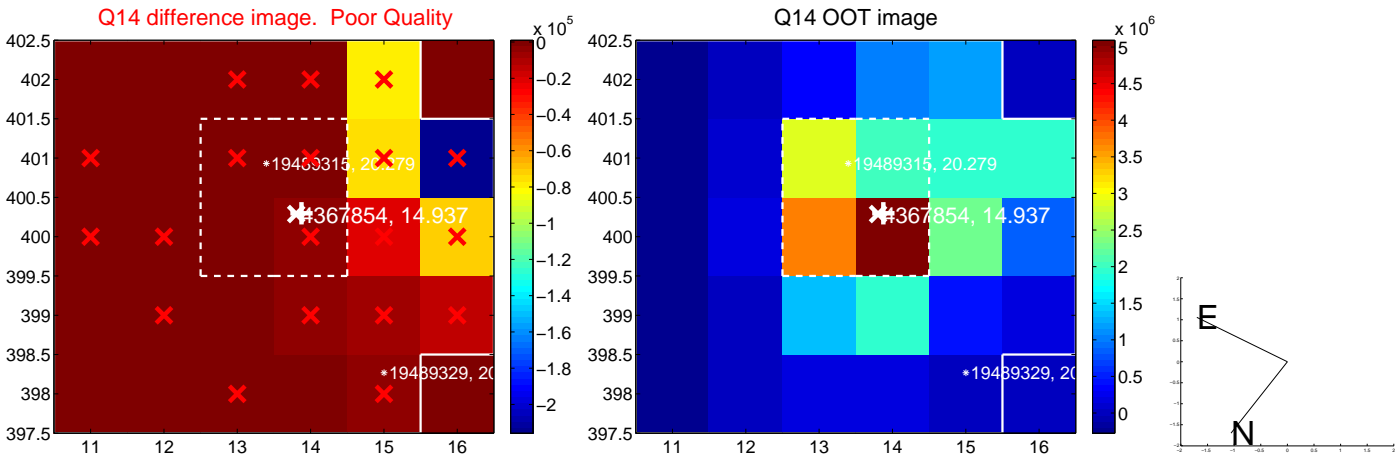
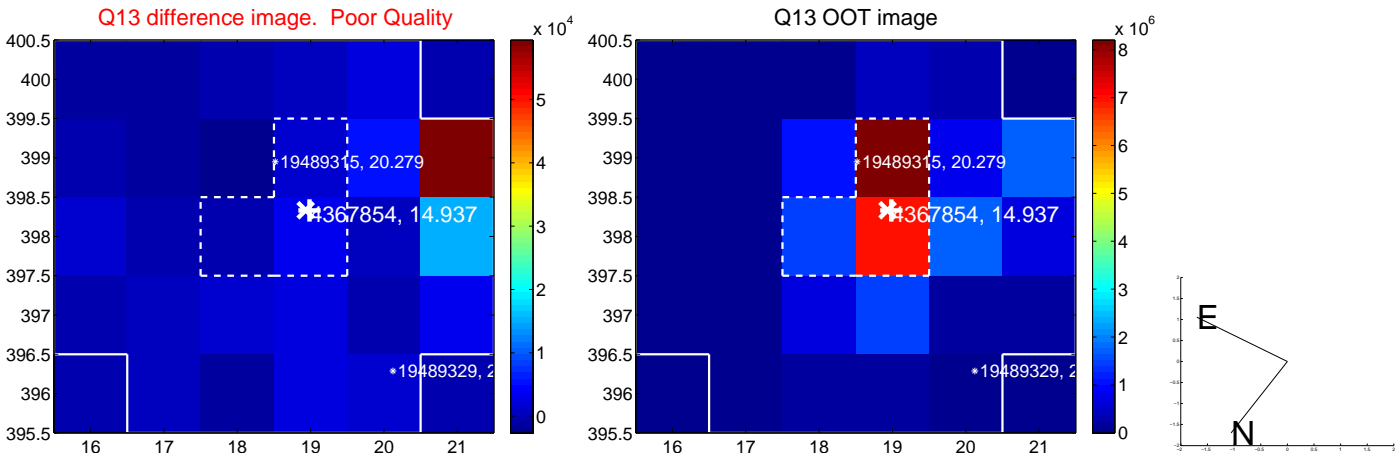
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



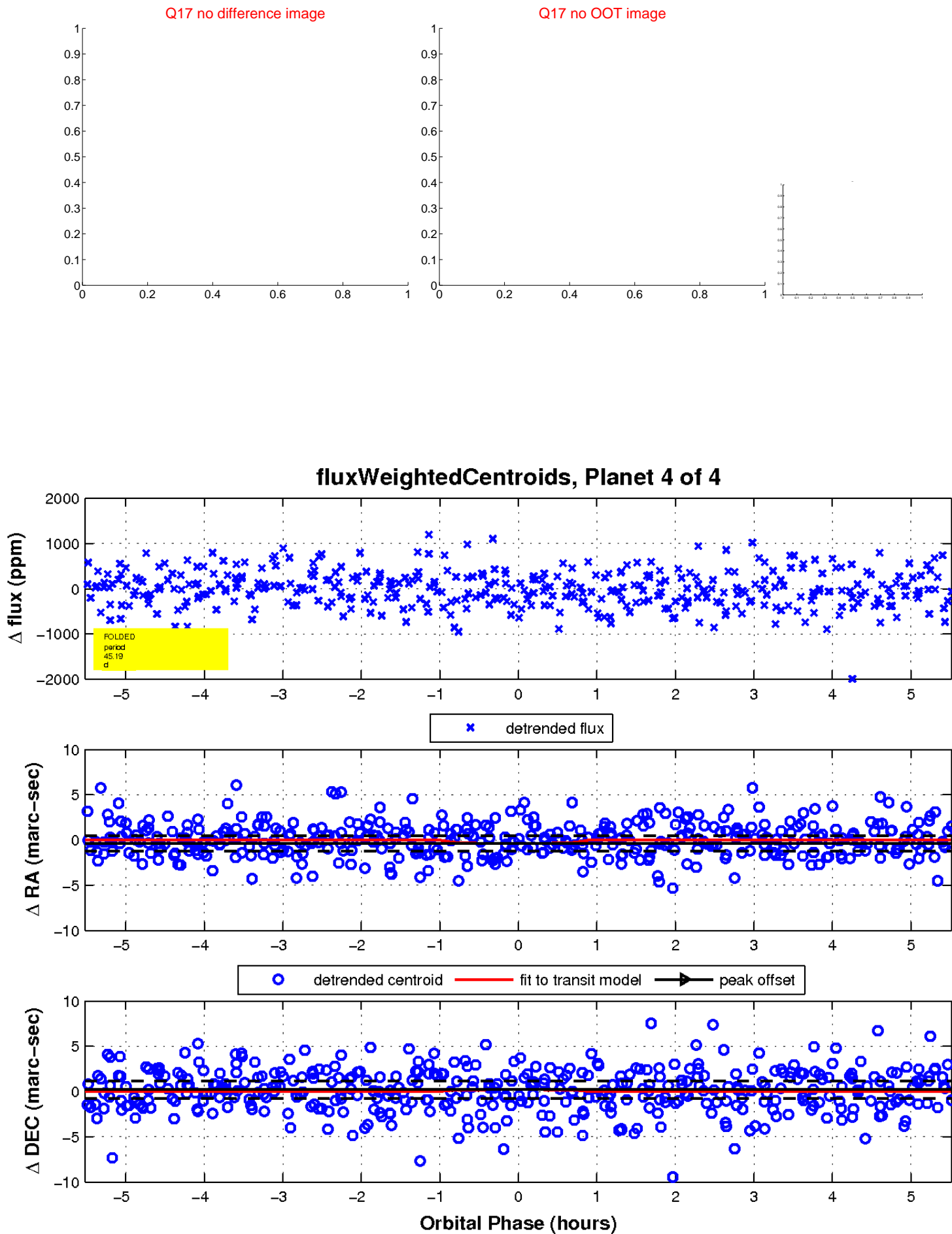
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

