

KIC 005177859

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})
005177859-01	OBS	4246.01	6.984718	135.998947	88.4	2.857	11.0	11.6	1.23	5839	1.52	297.81
005177859-02	OBS	4246.02	8.756238	132.478966	87.2	2.995	9.0	10.3	1.23	5839	1.36	220.32
005177859-03	OBS	No	5.558420	134.090708	53.9	3.780	7.3	7.9	1.23	5839	1.07	403.84
005177859-04	OBS	No	560.465306	418.793225	346.2	4.500	8.5	-1.0	1.23	5839	2.26	0.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177859-01	OBS	FP	0.36	1	0	0	0	LPP_DV
005177859-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
005177859-03	OBS	FP	0.00	1	0	0	0	LPP_DV
005177859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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

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

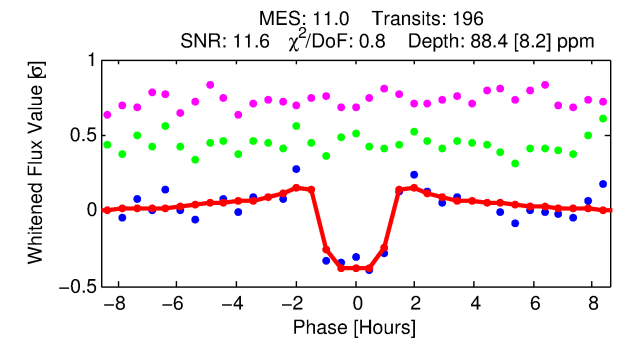
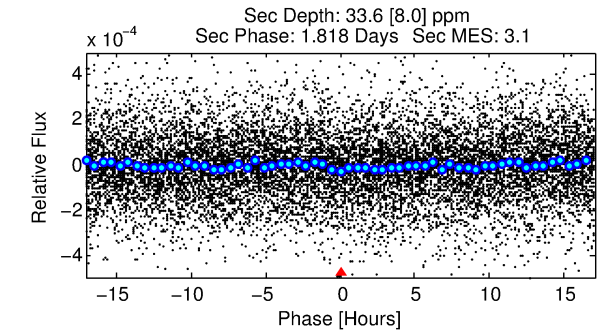
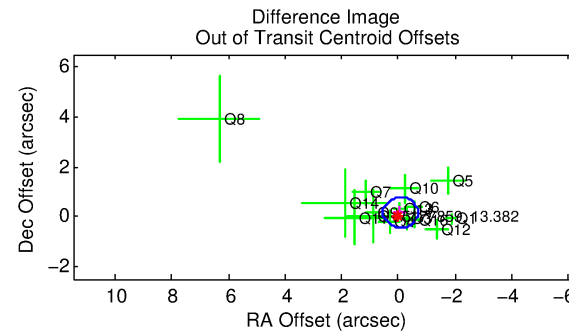
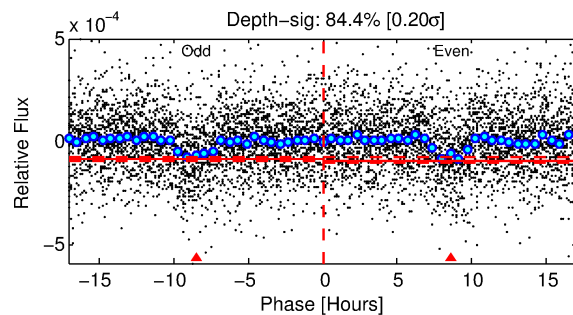
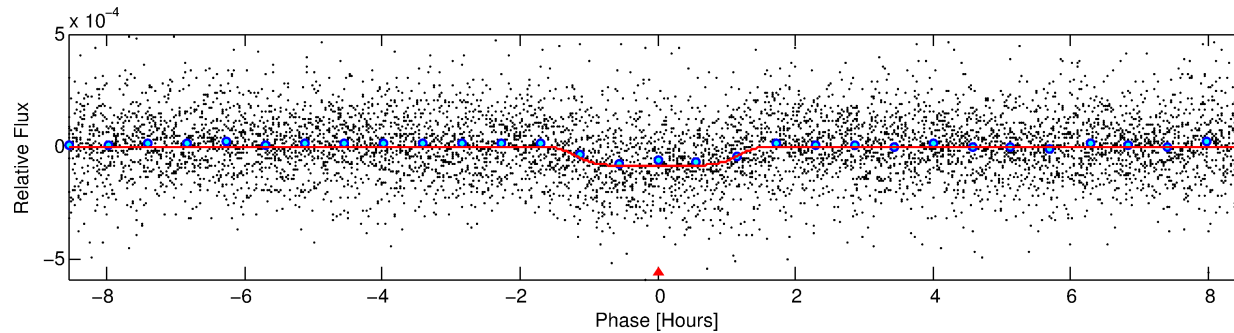
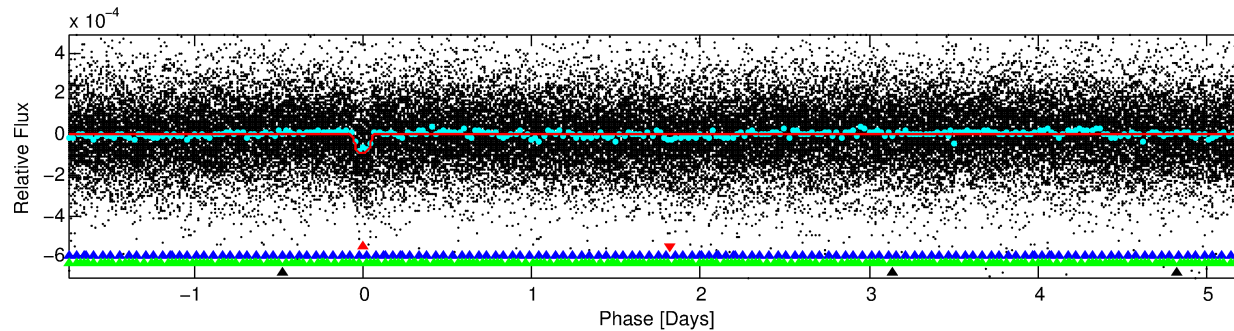
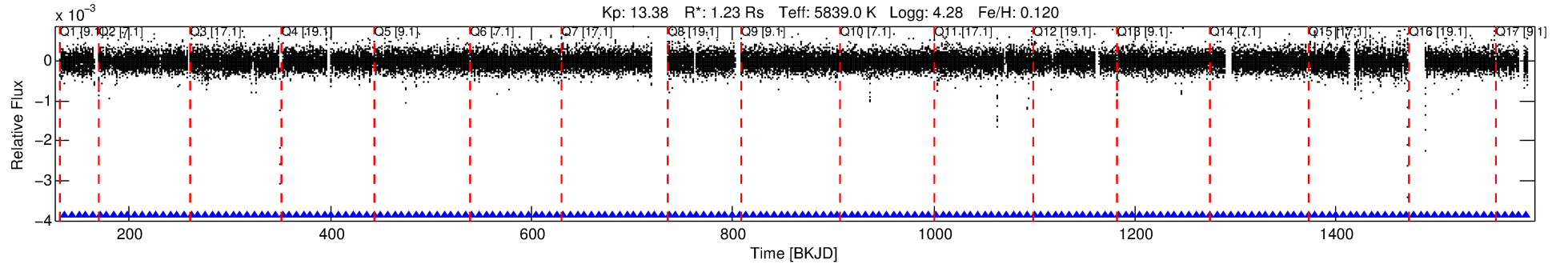
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005177859-01

No Significant Match Found

DV One-Page Summary

KIC: 5177859 Candidate: 1 of 4 Period: 6.985 d
KOI: K04246.01 Corr: 0.971



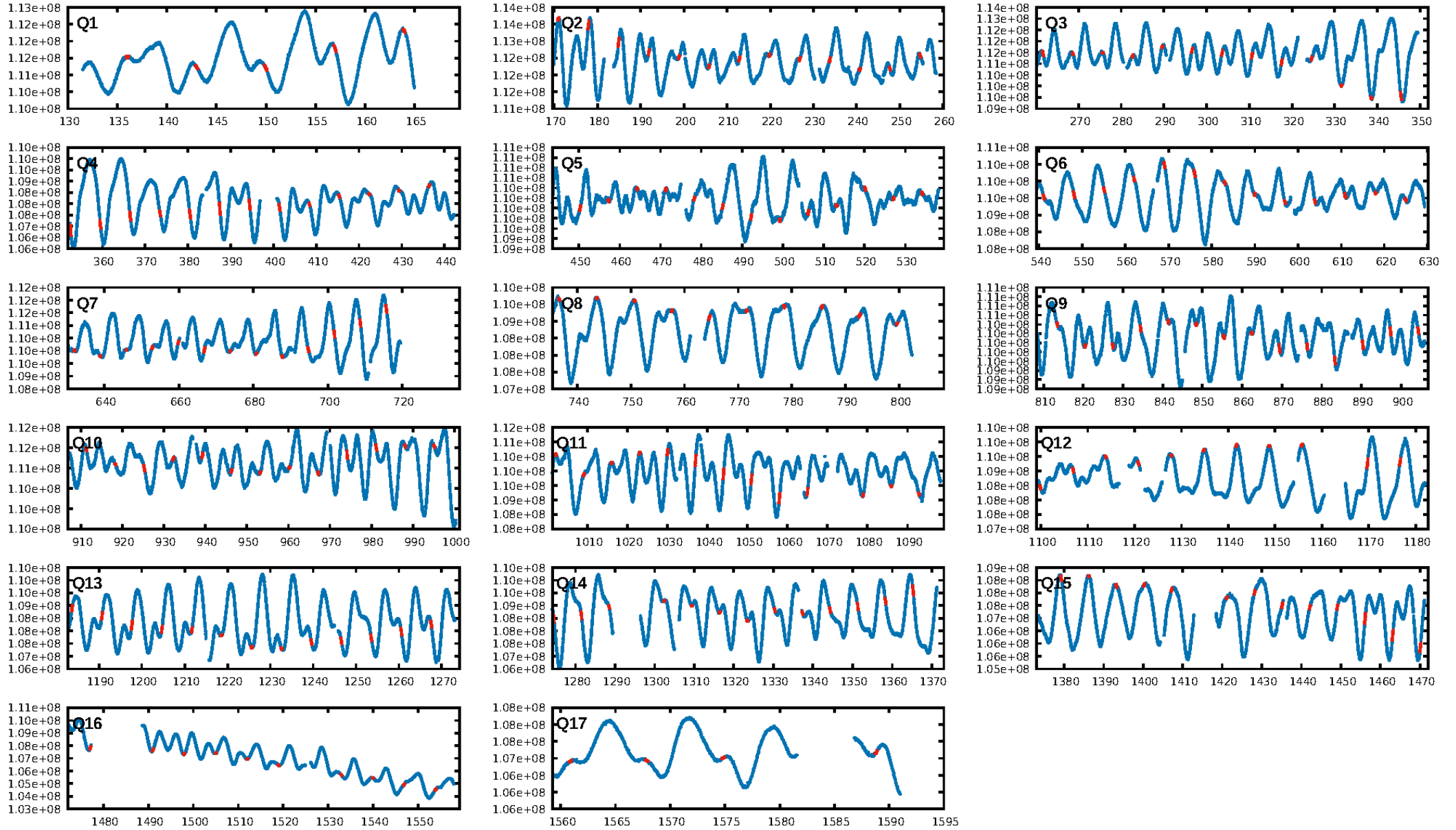
DV Fit Results:

Period = 6.98472 [0.00003] d
Epoch = 135.9989 [0.0035] BKJD
Rp/R* = 0.0114 [0.0012]
a/R* = 5.57 [2.71]
b = 0.97 [0.03]
Seff = 297.81 [105.14]
Teq = 1059 [93] K
Rp = 1.52 [0.48] Re
a = 0.0726 [0.0172] AU
Ag = 41.91 [19.45] [2.10 σ]
Teff = 4167 [360] K [8.36 σ]

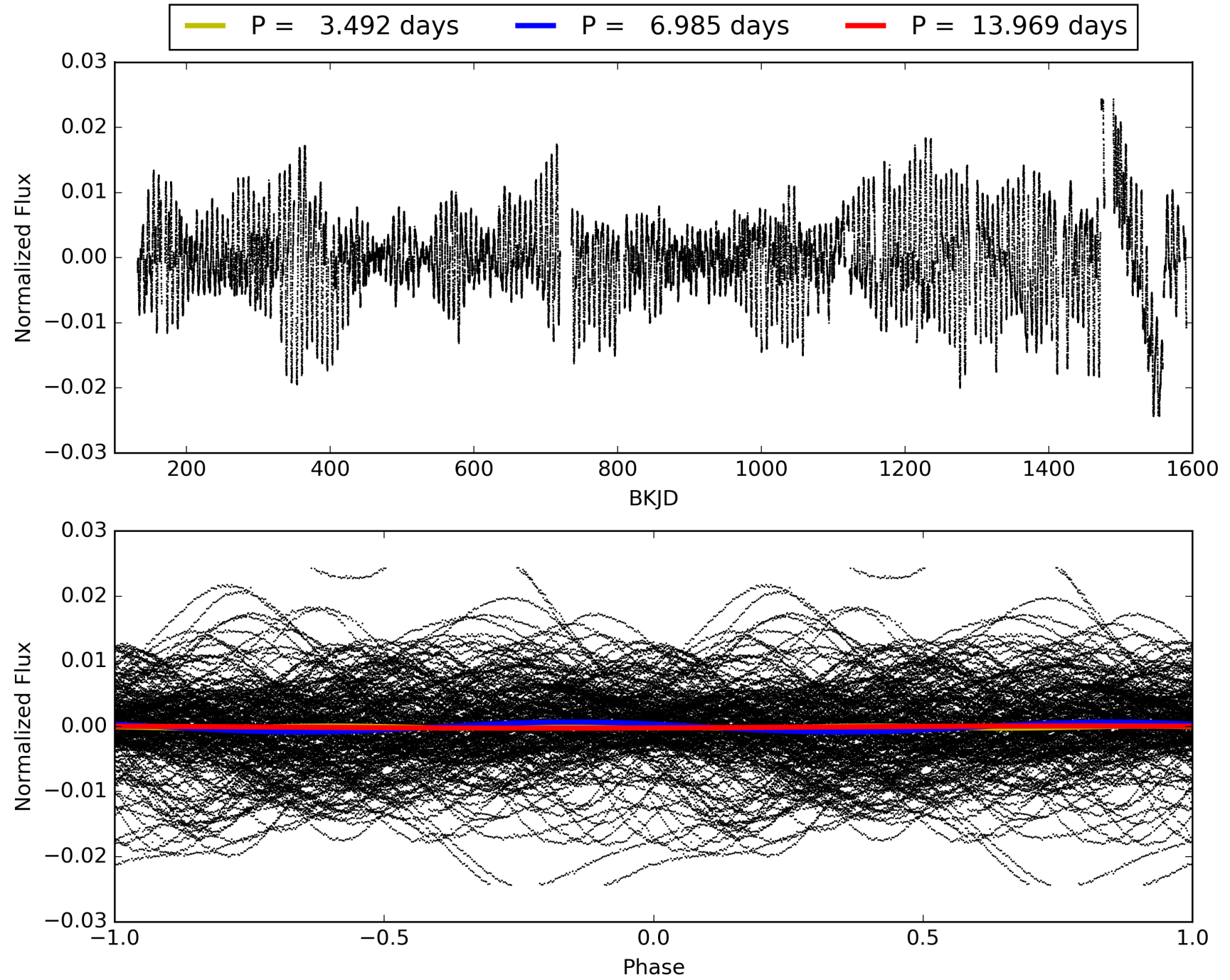
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.22 σ]
LongPeriod-sig: 100.0% [10.27 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 9.22e-26
RollingBand-fgt: 1.00 [187/187]
GhostDiagnostic-chr: -1.769
Centroid-sig: 43.4%
Centroid-so: 0.531 arcsec [0.87 σ]
OotOffset-rm: 0.180 arcsec [0.88 σ]
KicOffset-rm: 0.256 arcsec [1.18 σ]
OotOffset-st: 3/3/4/5 [15]
KicOffset-st: 3/3/4/5 [15]
DiffImageQuality-fgm: 0.73 [11/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 005177859-01, PDC Light Curves

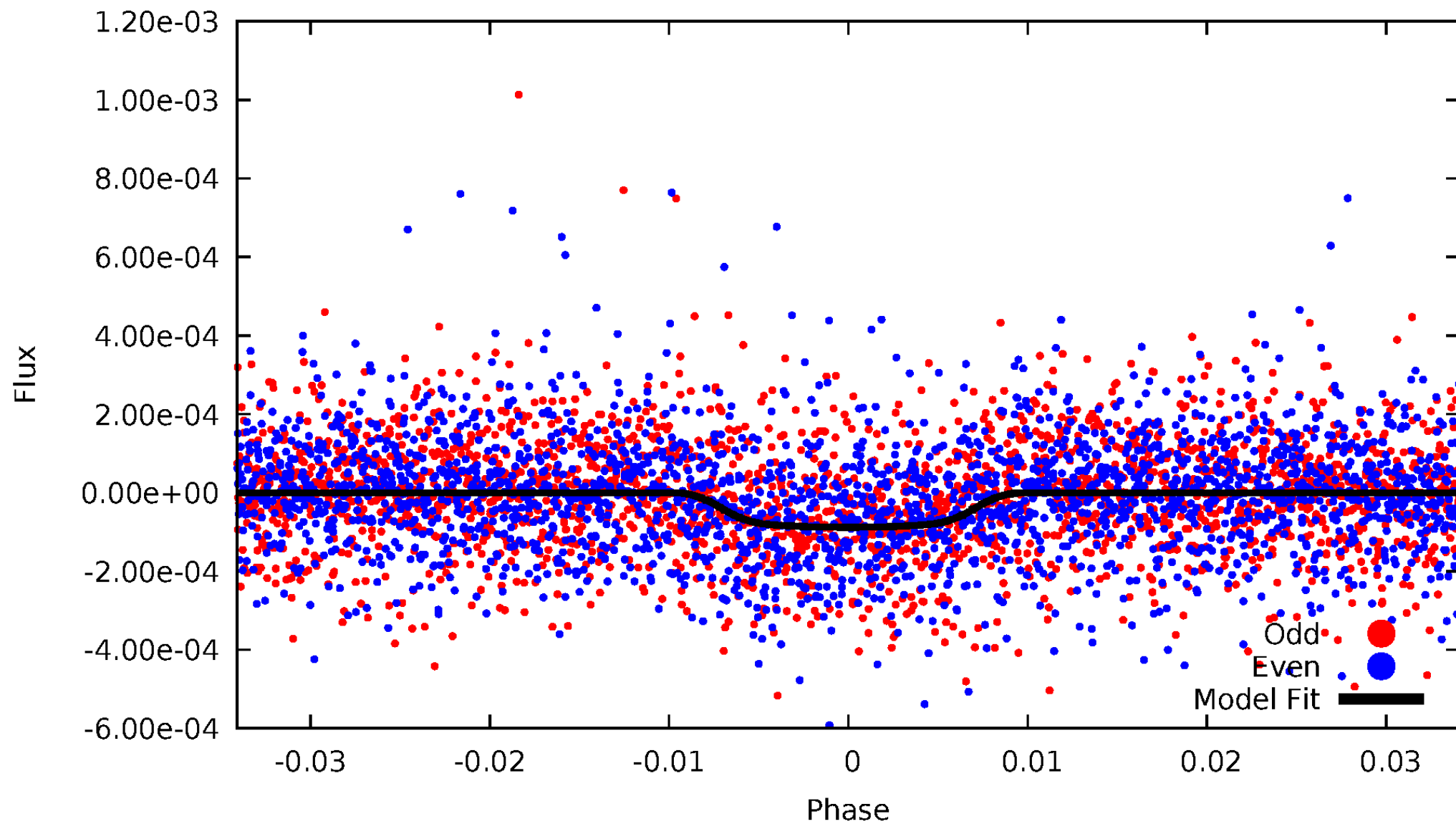


TCE 005177859-01



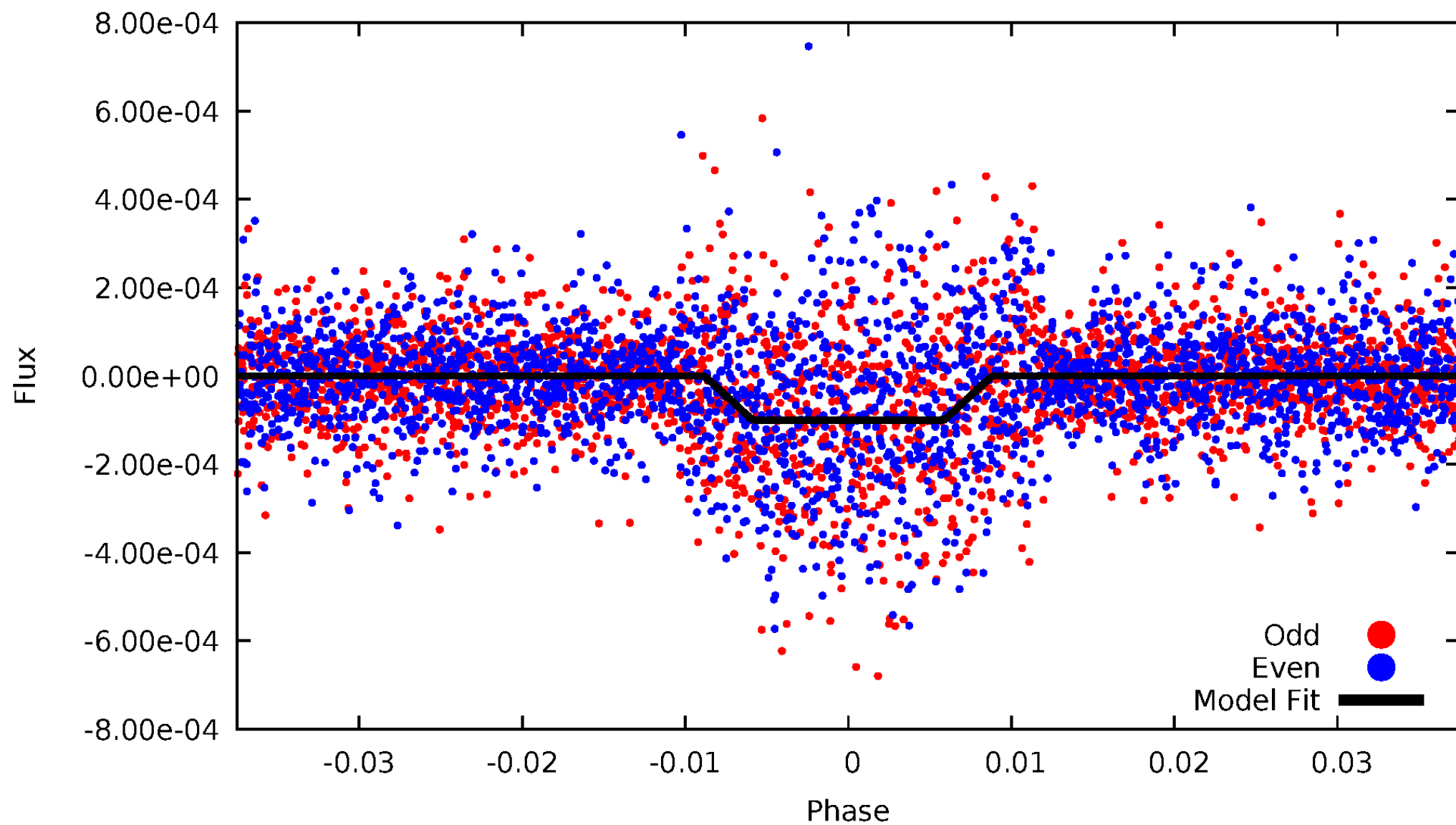
DV Odd/Even

TCE 005177859-01

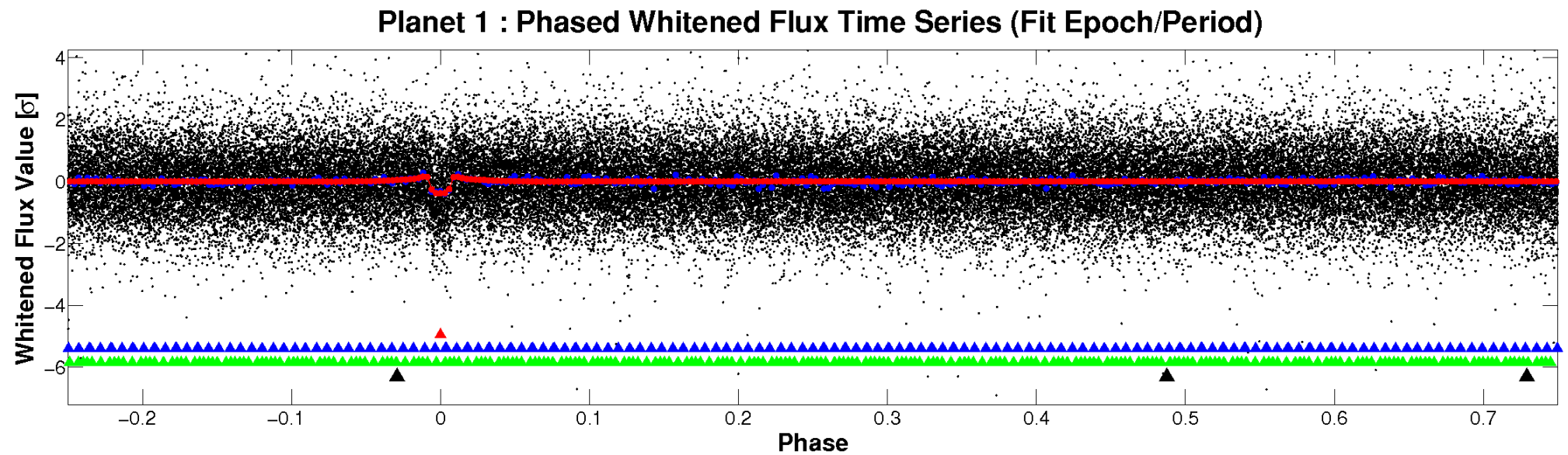
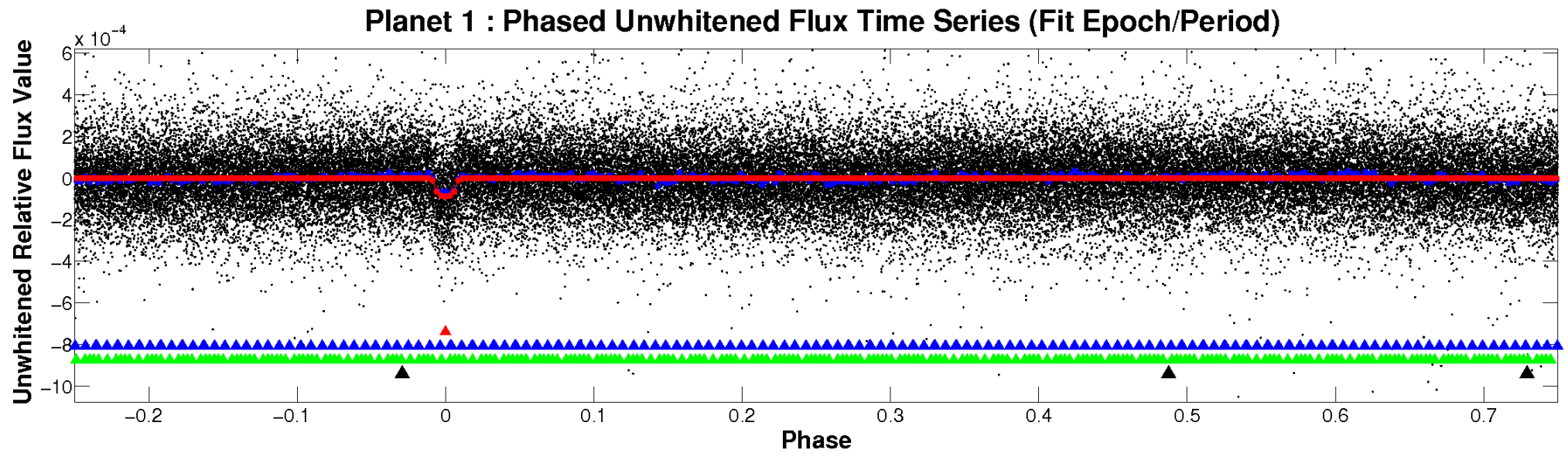


ALT Odd/Even

TCE 005177859-01

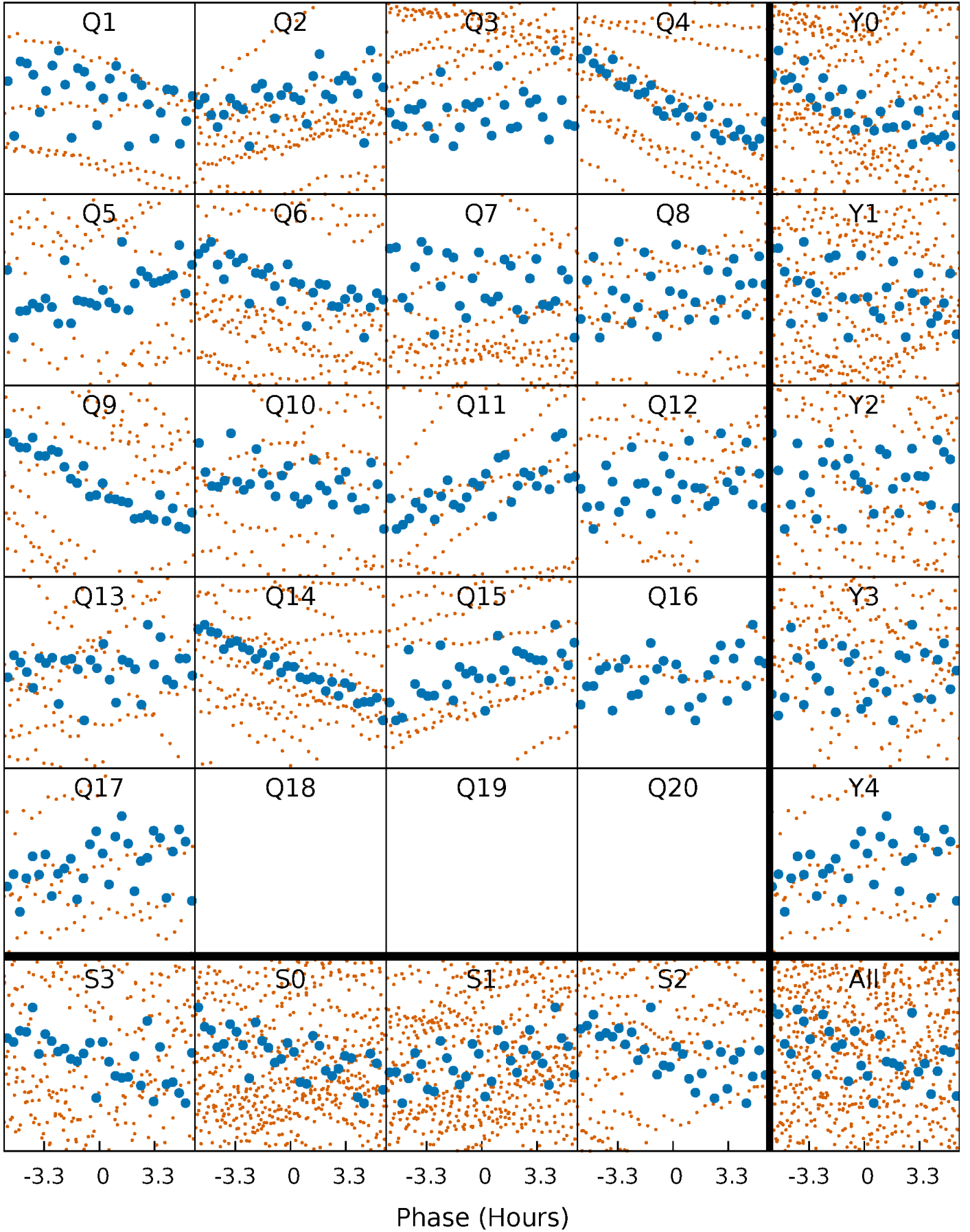


Non-Whitened Vs. Whitened Light Curve



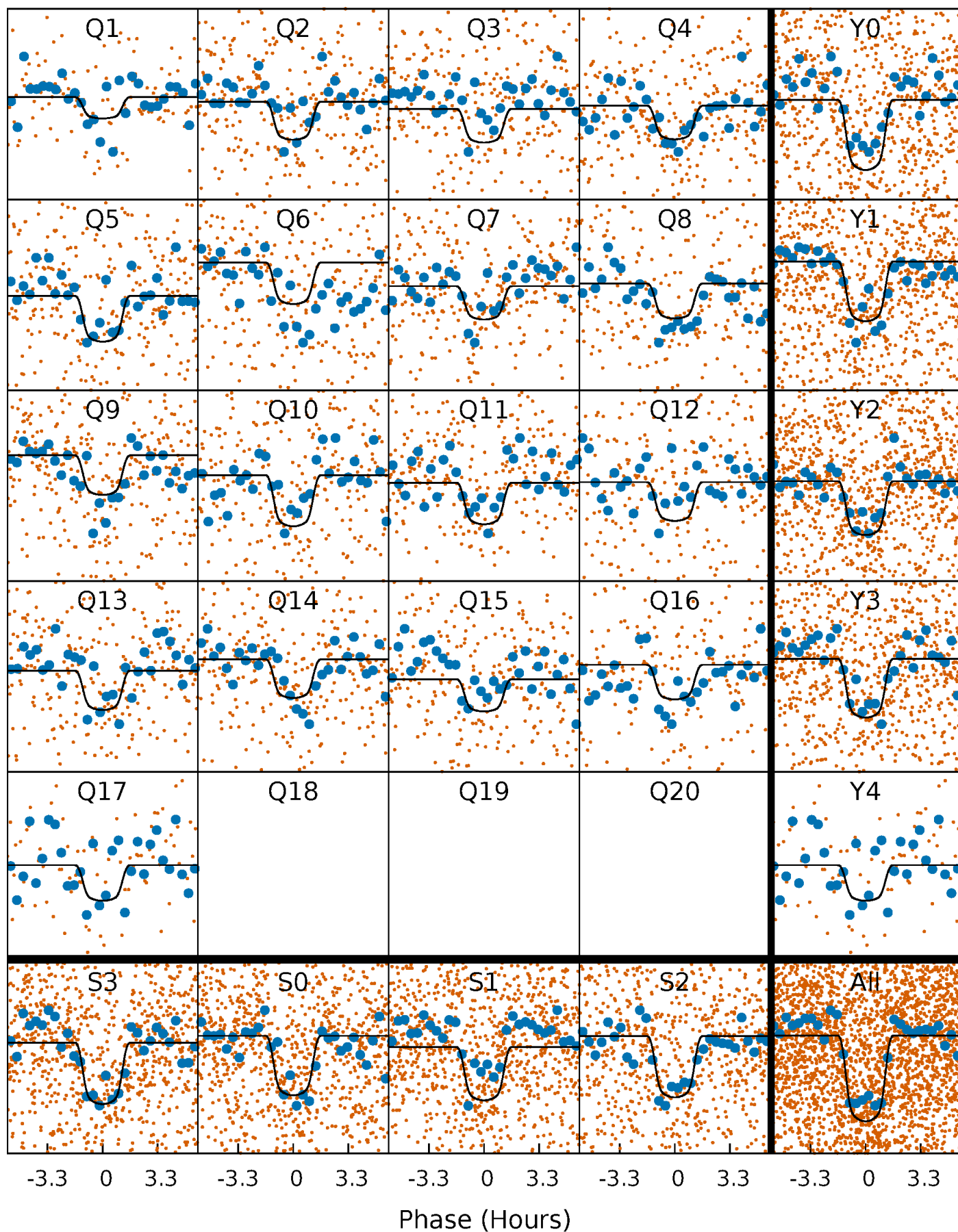
PDC Quarter-Phased Transit Curves

TCE 005177859-01 P= 6.984718 Days $T_0=135.998947$ (BKJD)



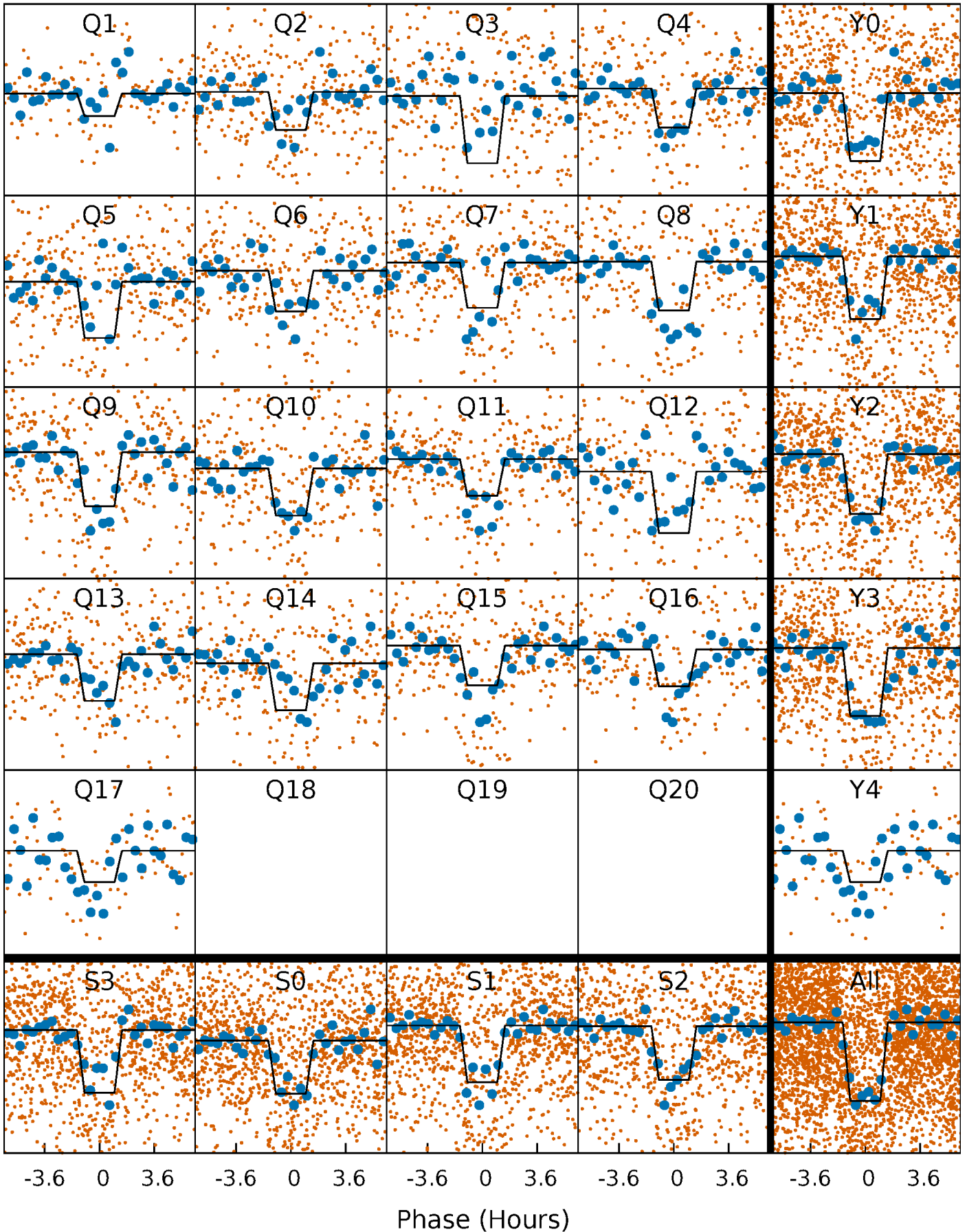
DV Quarter-Phased Transit Curves

TCE 005177859-01 P= 6.984718 Days $T_0=135.998947$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

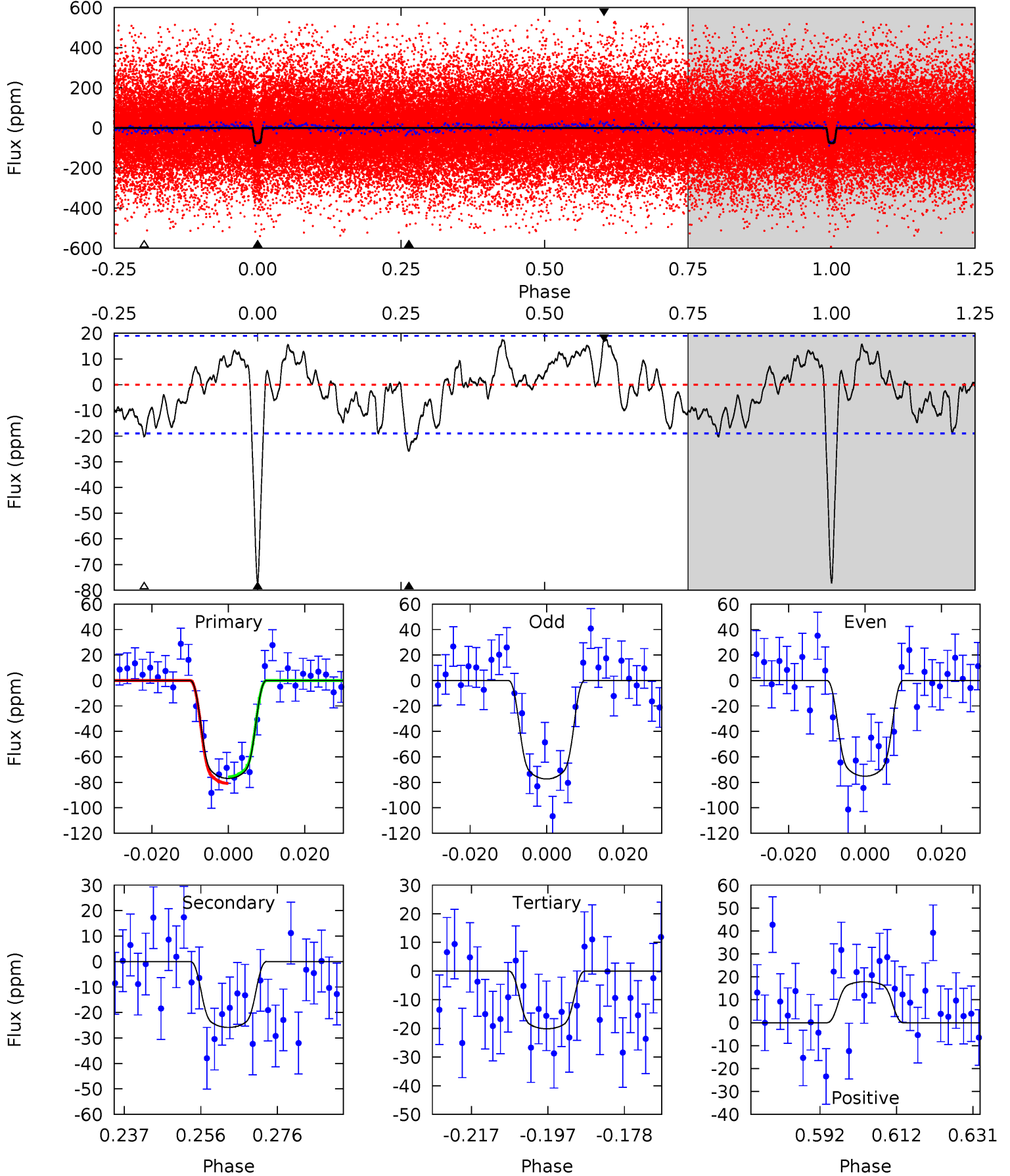
TCE 005177859-01 P= 6.984671 Days $T_0=136.002653$ (BKJD)



DV Model-Shift Uniqueness Test

005177859-01, P = 6.984718 Days, E = 129.014229 Days

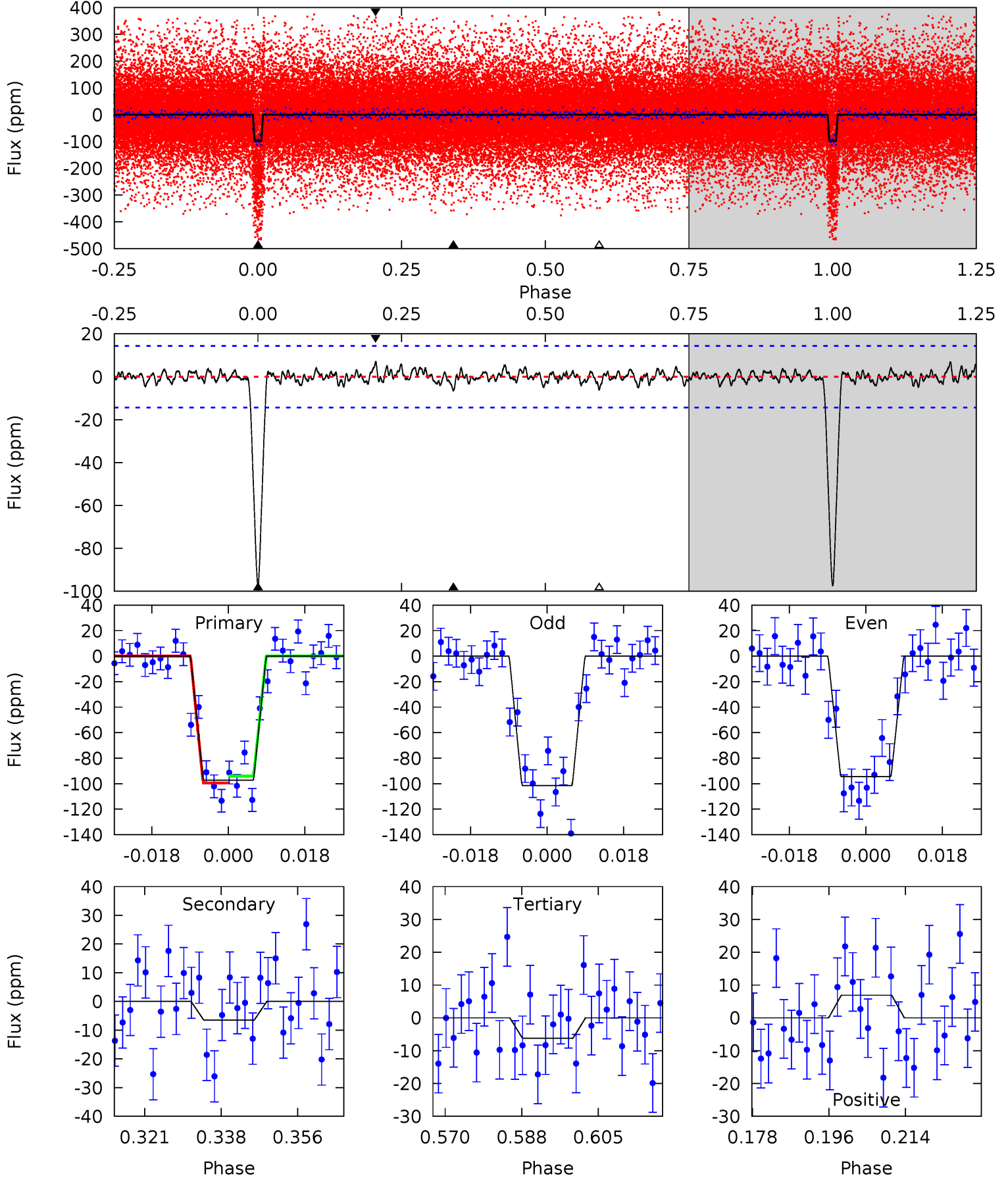
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	6.66	5.19	4.61	4.89	2.33	2.28	14.6	15.2	1.47	2.05	0.28	0.98	0.19	0.66



Alt Model-Shift Uniqueness Test

005177859-01, P = 6.984671 Days, E = 129.017982 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.3	2.22	2.13	2.36	4.91	2.37	0.69	31.1	30.9	0.10	-0.13	1.19	0.96	0.07	0.94



Stellar Parameters For KIC 005177859

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5839^{+156}_{-174}	$4.279^{+0.175}_{-0.175}$	$0.120^{+0.200}_{-0.300}$	$1.227^{+0.360}_{-0.270}$	$1.044^{+0.137}_{-0.125}$	$0.796^{+0.725}_{-0.381}$
	+3%/-3%	+4%/-4%	+167%/-250%	+29%/-22%	+13%/-12%	+91%/-48%
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 005177859-01 / KOI 4246.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-26 ± 4	$1.52^{+0.30}_{-0.25}$	1484^{+104}_{-96}	4153^{+246}_{-206}	31^{+15}_{-9}
Alt.	-7 ± 3	$1.34^{+0.27}_{-0.23}$	1473^{+115}_{-97}	3432^{+276}_{-346}	10^{+7}_{-5}

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 $A_{obs} \gg 1.0$

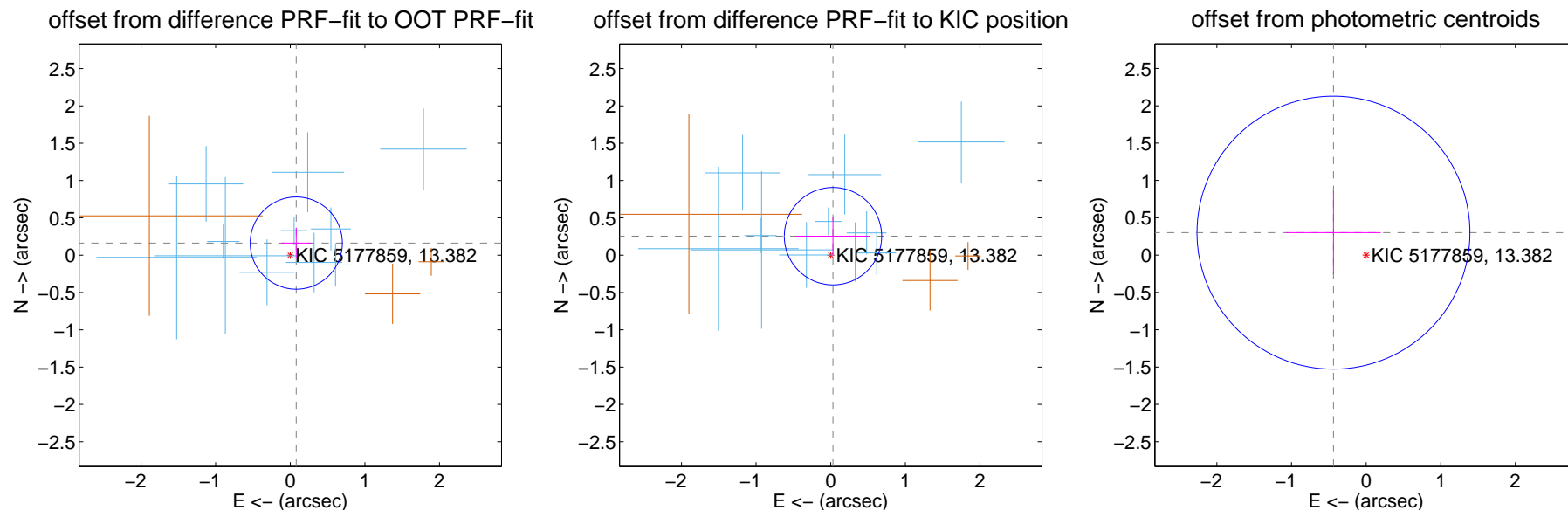
DV Centroid Data

Supplemental centroid analysis for 005177859-01. Kepler magnitude: 13.38. Transit SNR 11.59

There are 11 quarters with good PRF difference image offsets

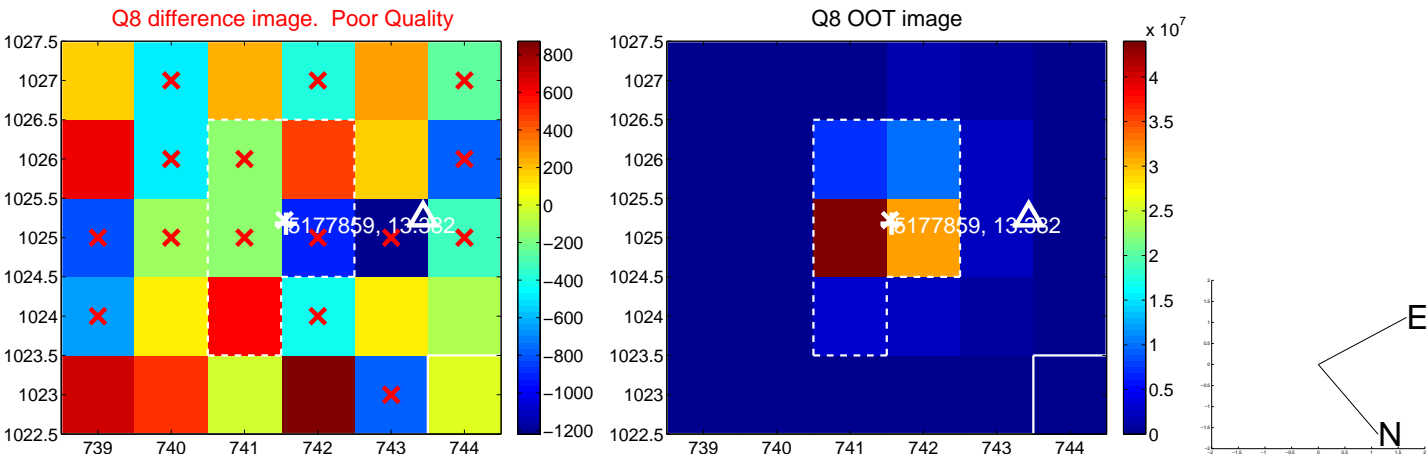
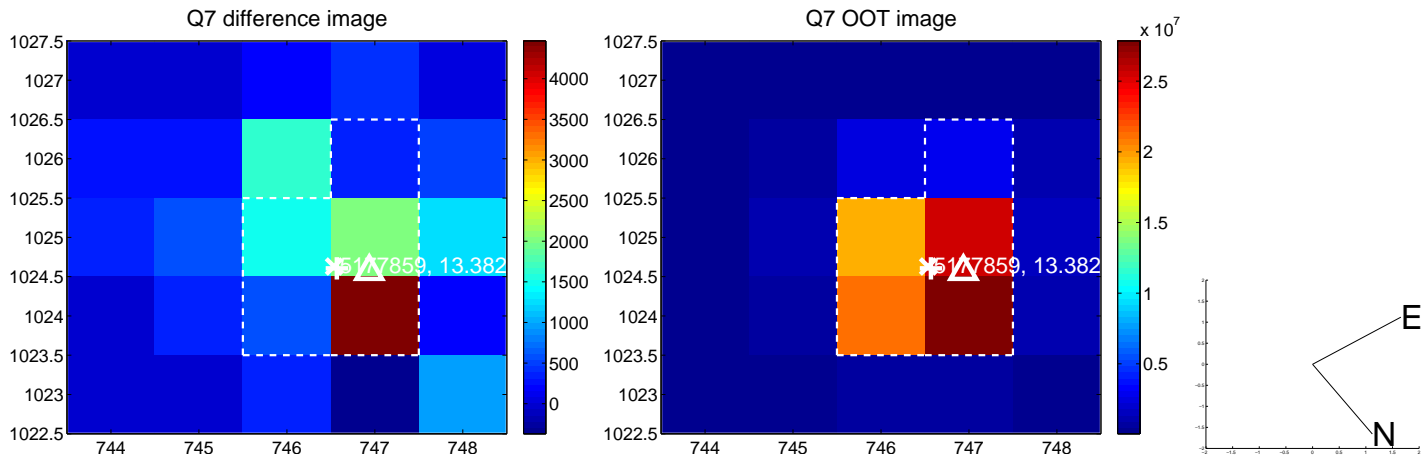
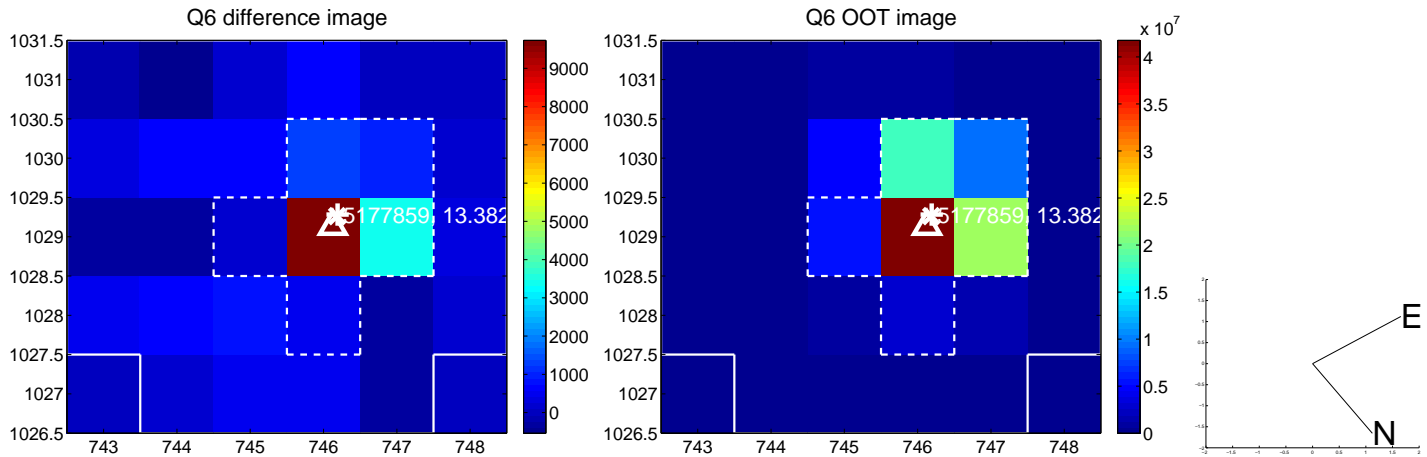
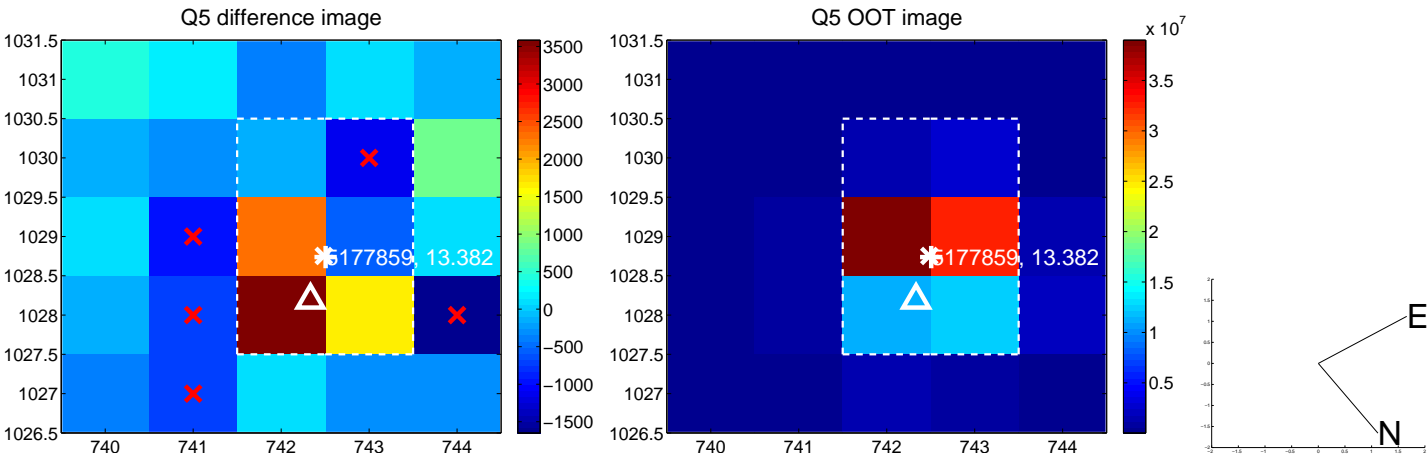
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.180 ± 0.206	0.88	-0.080 ± 0.199	0.162 ± 0.208
PRF-fit source offset from KIC position	0.256 ± 0.218	1.18	-0.031 ± 0.502	0.254 ± 0.259
photometric centroid source offset	0.53 ± 0.61	0.87	0.44 ± 0.63	0.30 ± 0.55

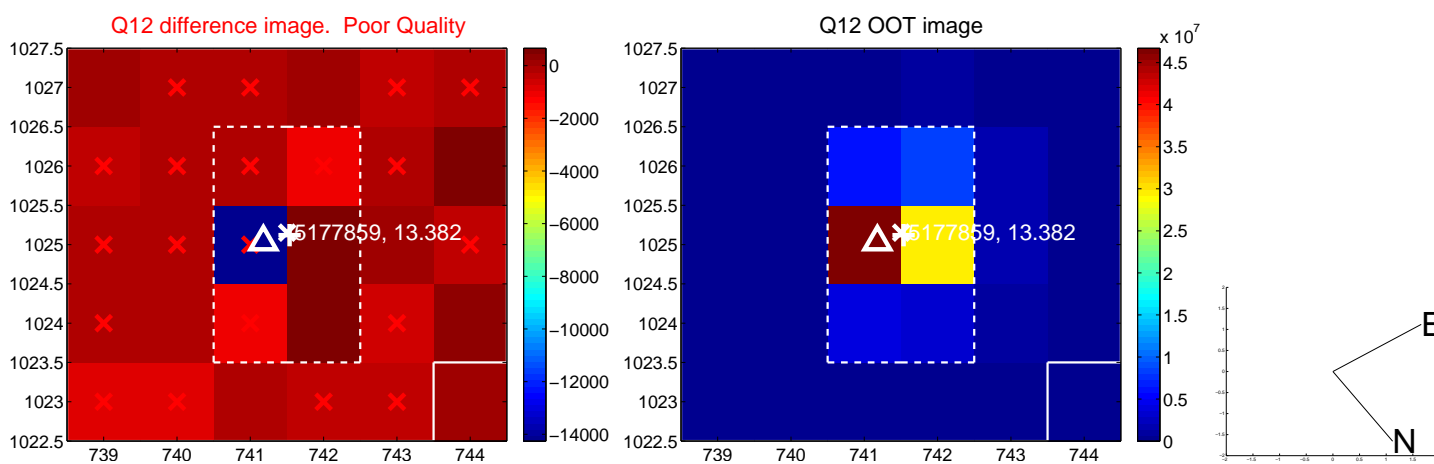
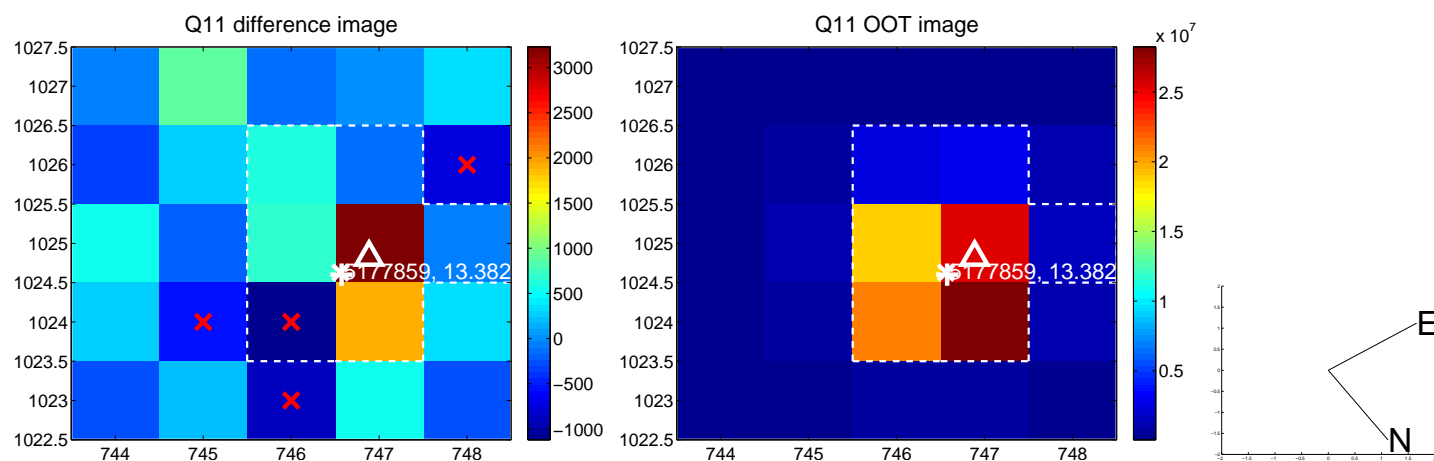
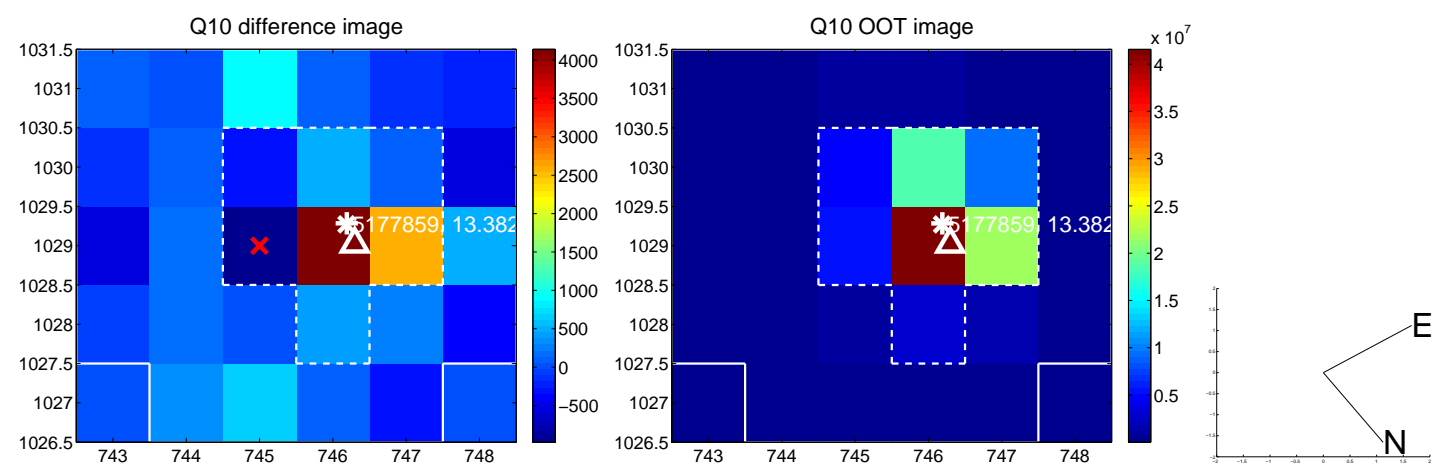
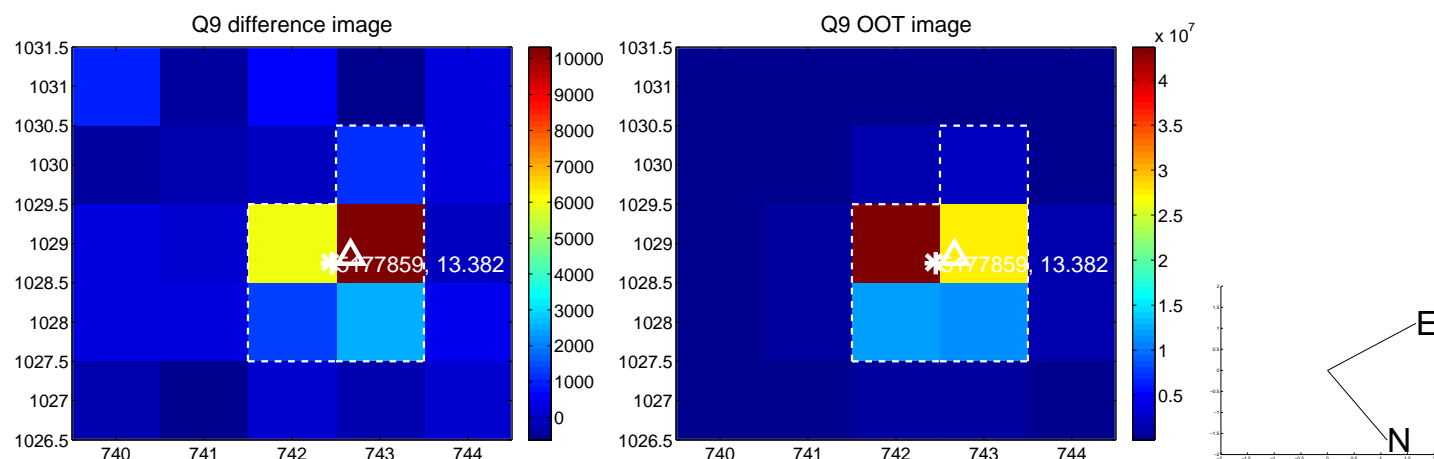


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

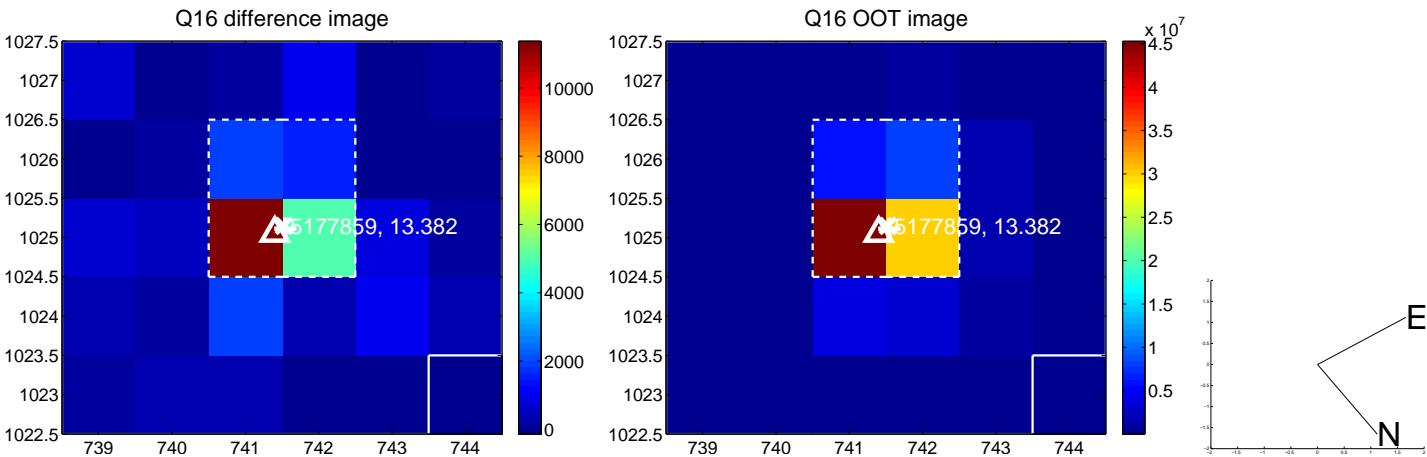
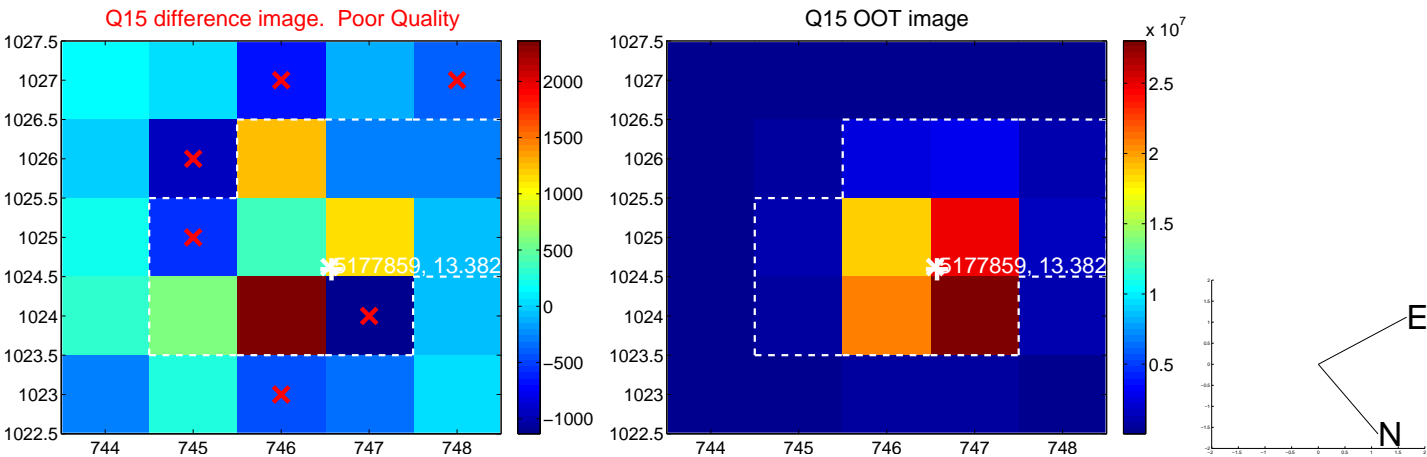
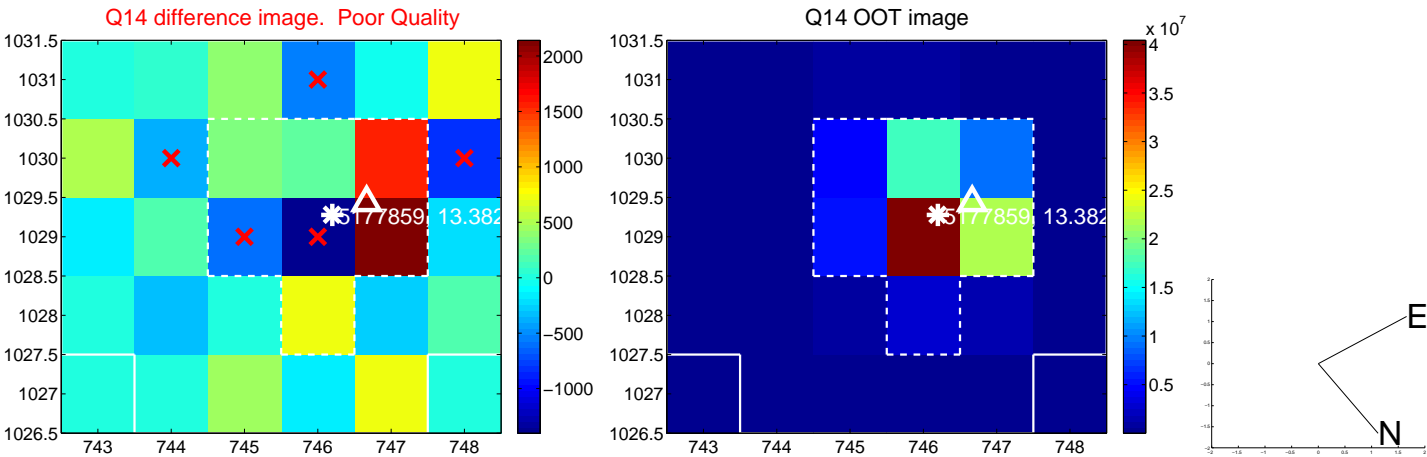
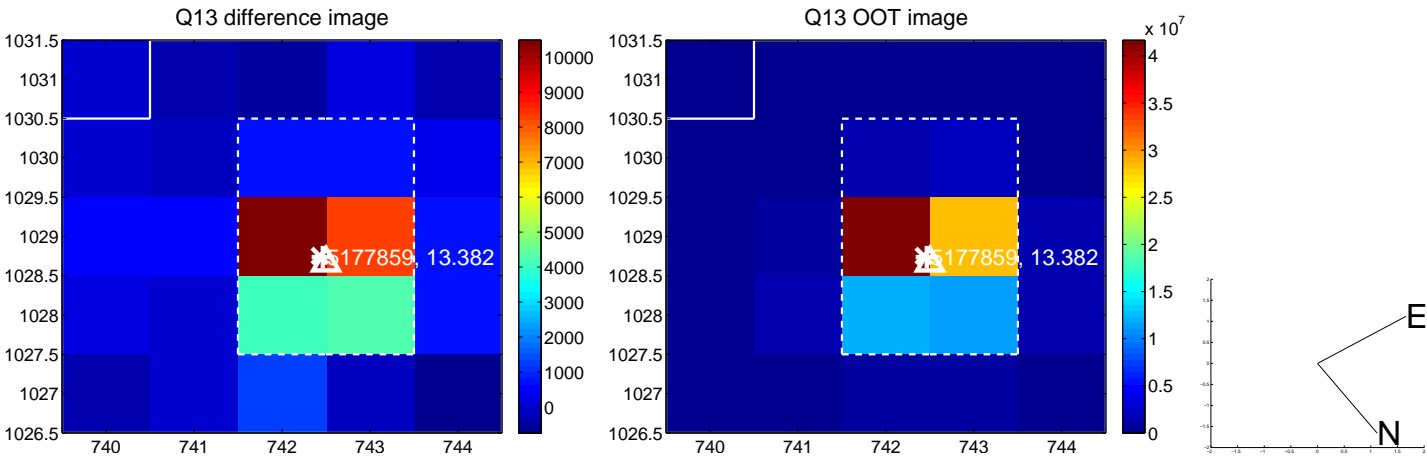
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



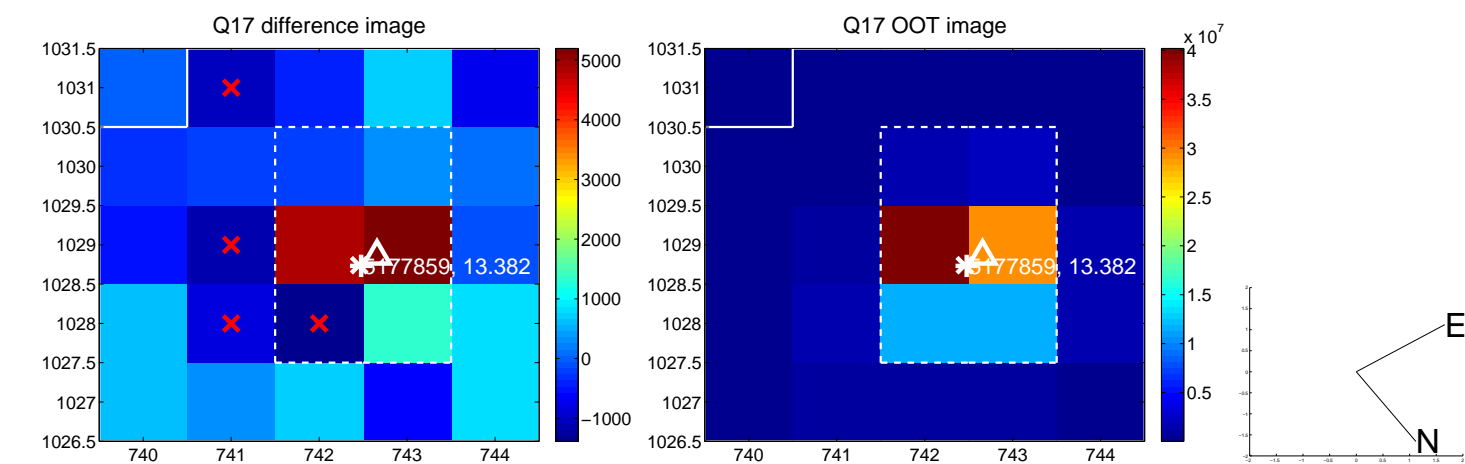
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



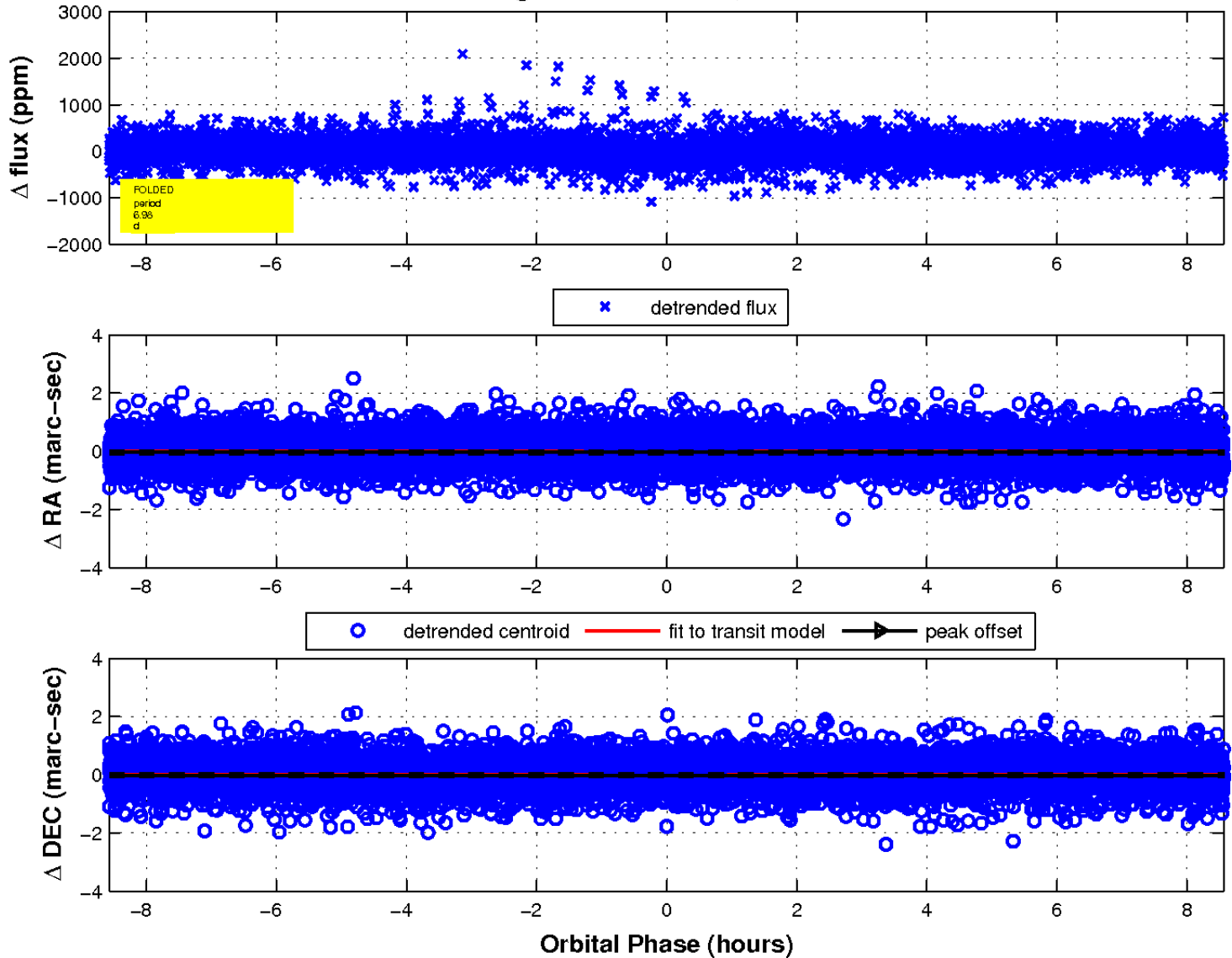
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



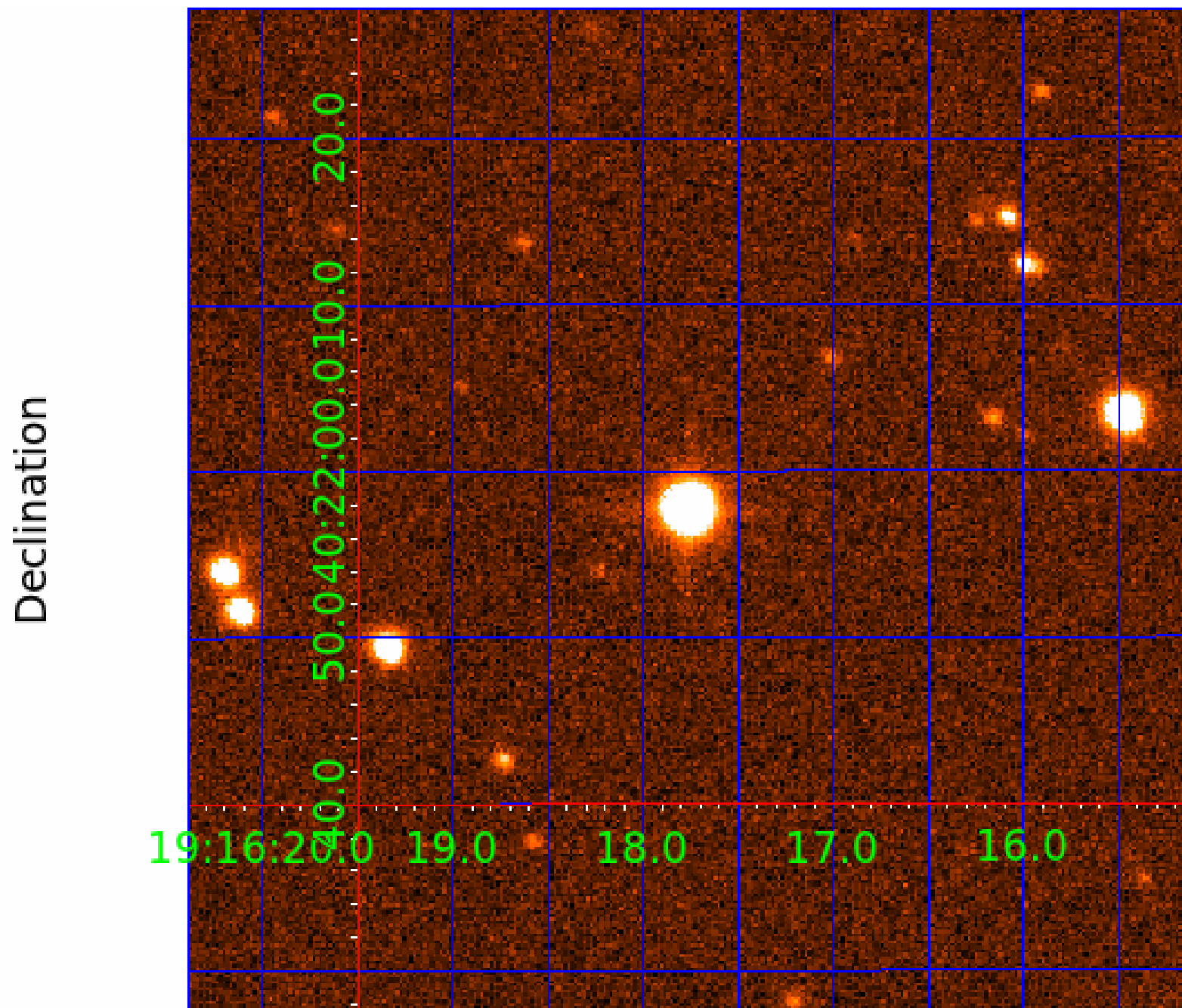
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 4



UKIRT Image



KIC 005177859

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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005177859-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
005177859-03	OBS	FP	0.00	1	0	0	0	LPP_DV
005177859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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.

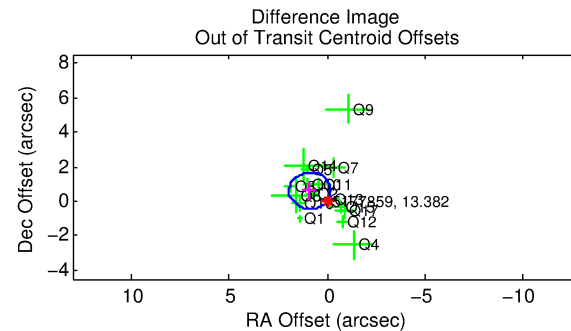
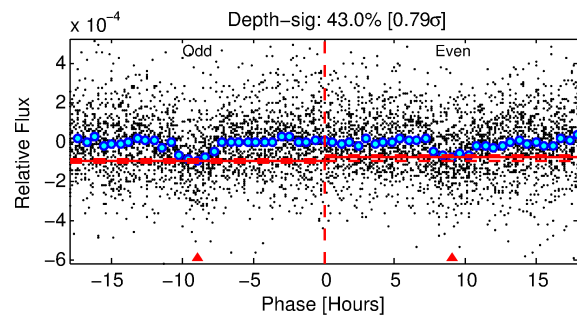
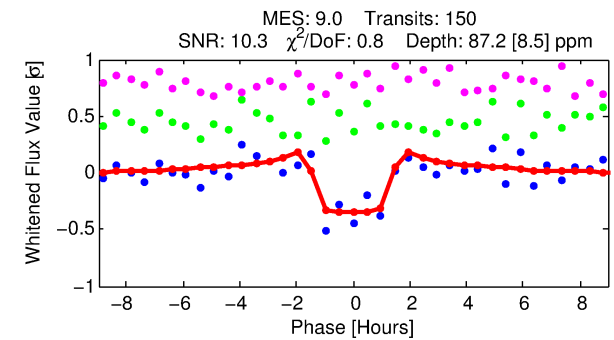
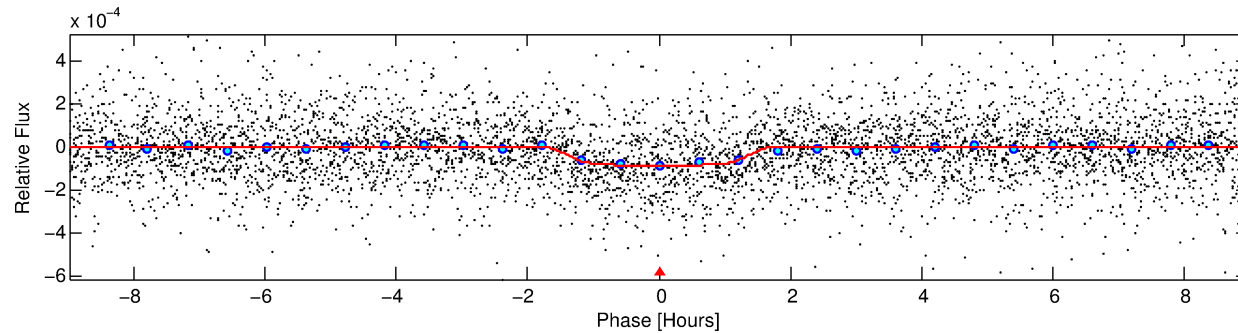
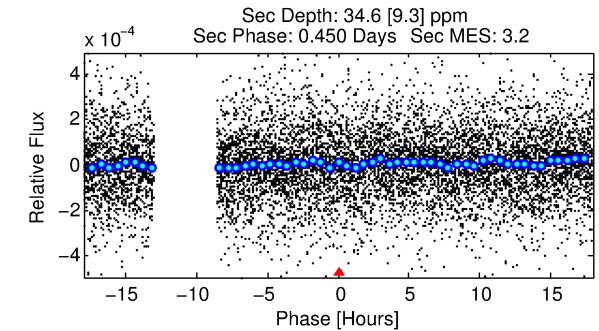
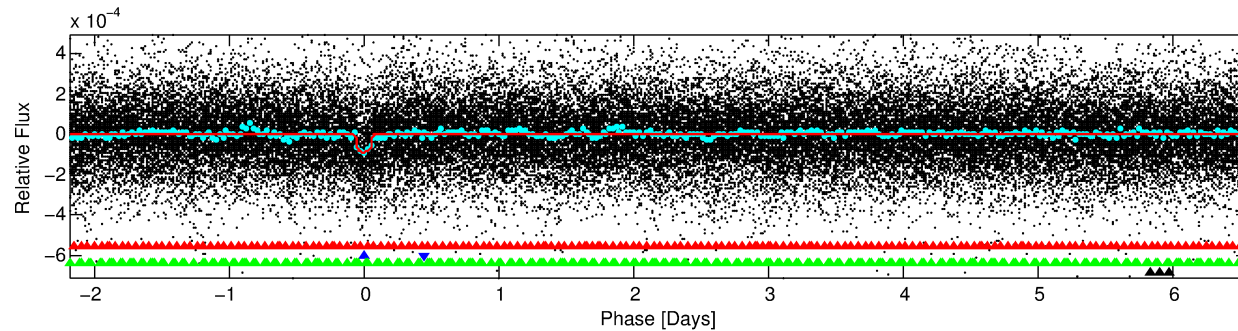
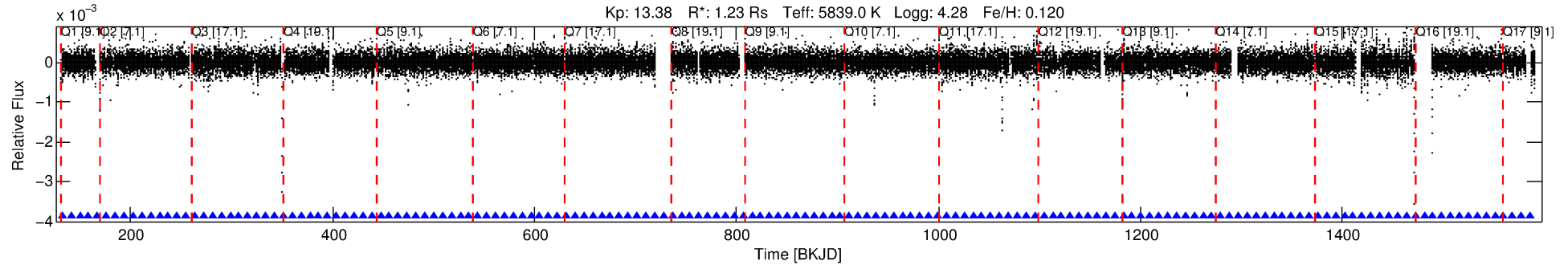
Ephemeris Match Information For 005177859-02

No Significant Match Found

DV One-Page Summary

KIC: 5177859 Candidate: 2 of 4 Period: 8.756 d
KOI: K04246.02 Corr: 0.943

Kp: 13.38 R*: 1.23 Rs Teff: 5839.0 K Logg: 4.28 Fe/H: 0.120



DV Fit Results:

Period = 8.75624 [0.00005] d
Epoch = 132.4790 [0.0041] BKJD
Rp/R* = 0.0101 [0.0043]
a/R* = 10.48 [21.03]
b = 0.90 [0.46]
Seff = 220.32 [77.78]
Teq = 982 [87] K
Rp = 1.36 [0.70] Re
a = 0.0844 [0.0200] AU
Ag = 73.71 [69.73] [1.04σ]
Teffp = 4451 [994] K [3.47σ]

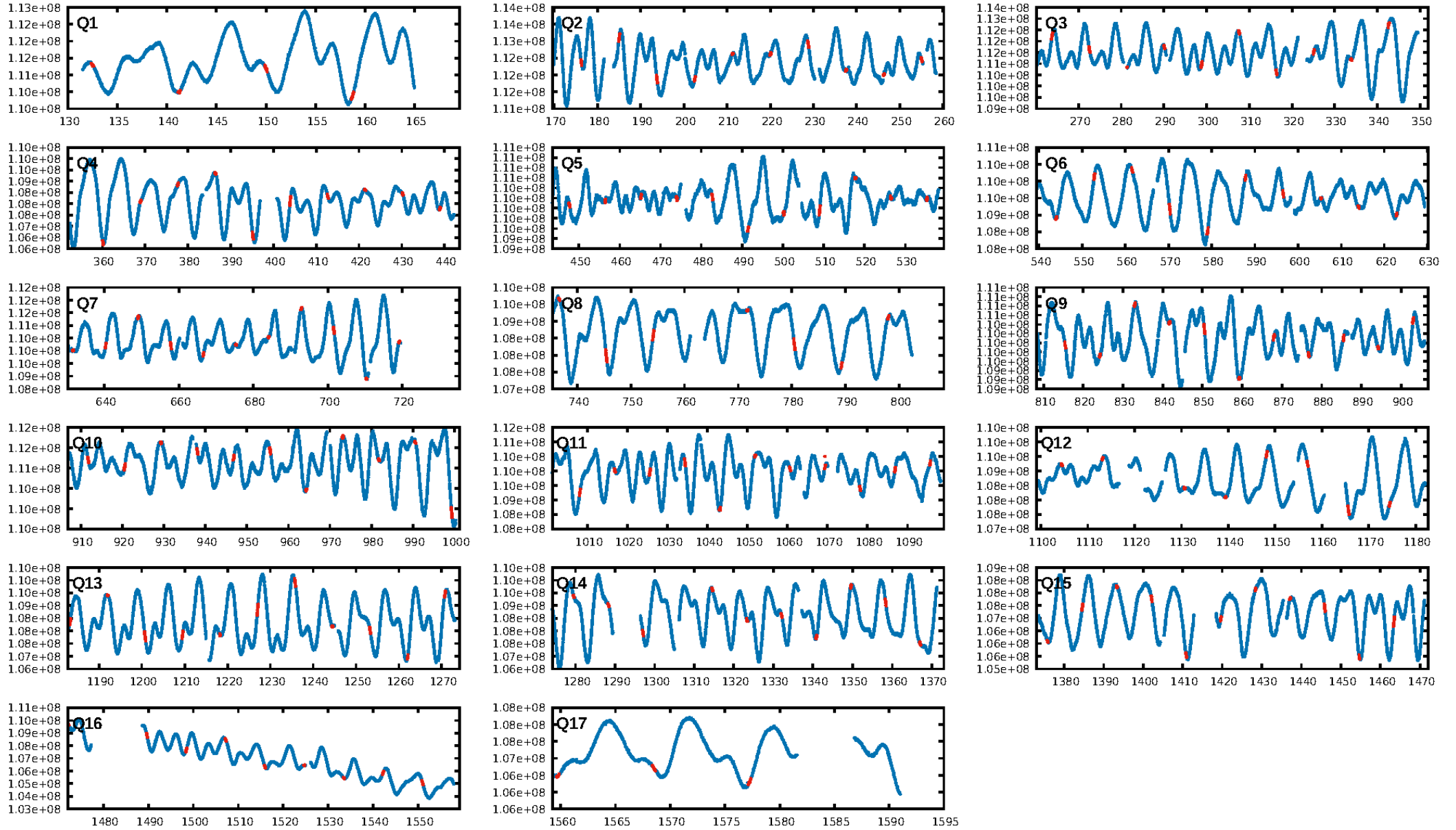
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.27σ]
LongPeriod-sig: 100.0% [2449.42σ]
ModelChiSquare2-sig: 98.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.22e-17
RollingBand-fgt: 1.00 [144/144]
GhostDiagnostic-chr: -2.209
Centroid-sig: 0.6%
Centroid-so: 1.478 arcsec [2.27σ]
OotOffset-rm: 1.075 arcsec [3.05σ]
KicOffset-rm: 1.152 arcsec [3.45σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
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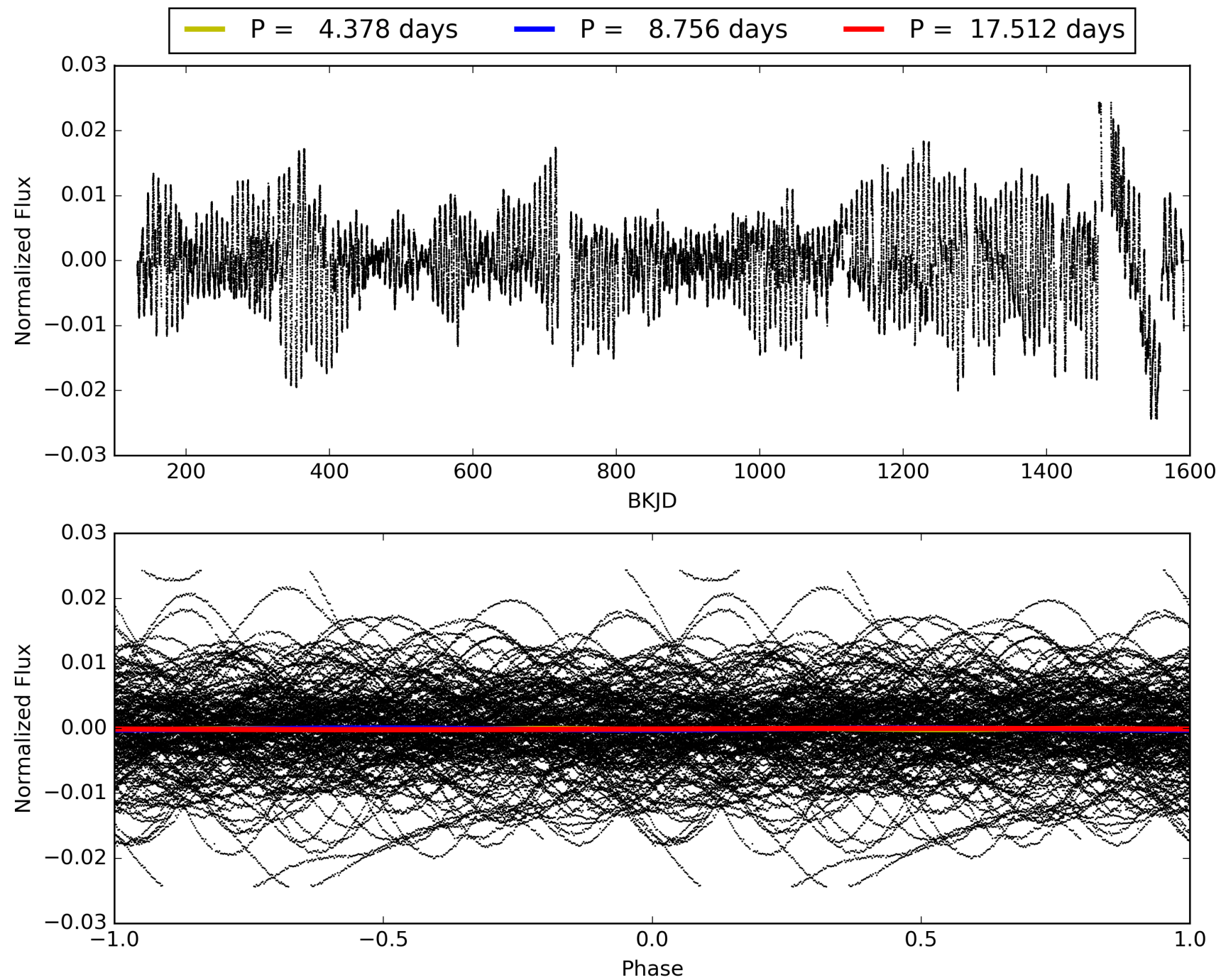
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:02:45 Z

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

TCE 005177859-02, PDC Light Curves

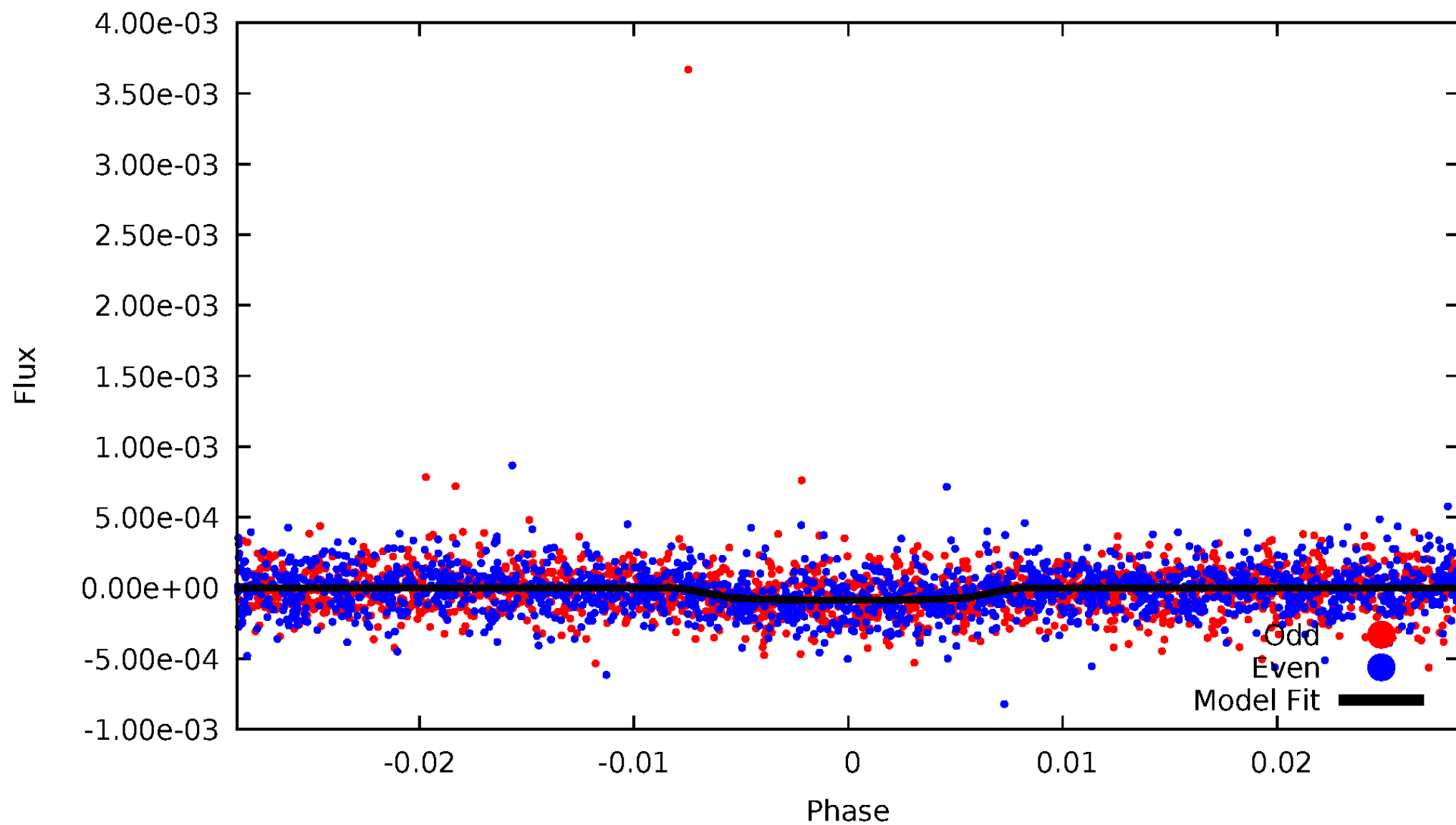


TCE 005177859-02



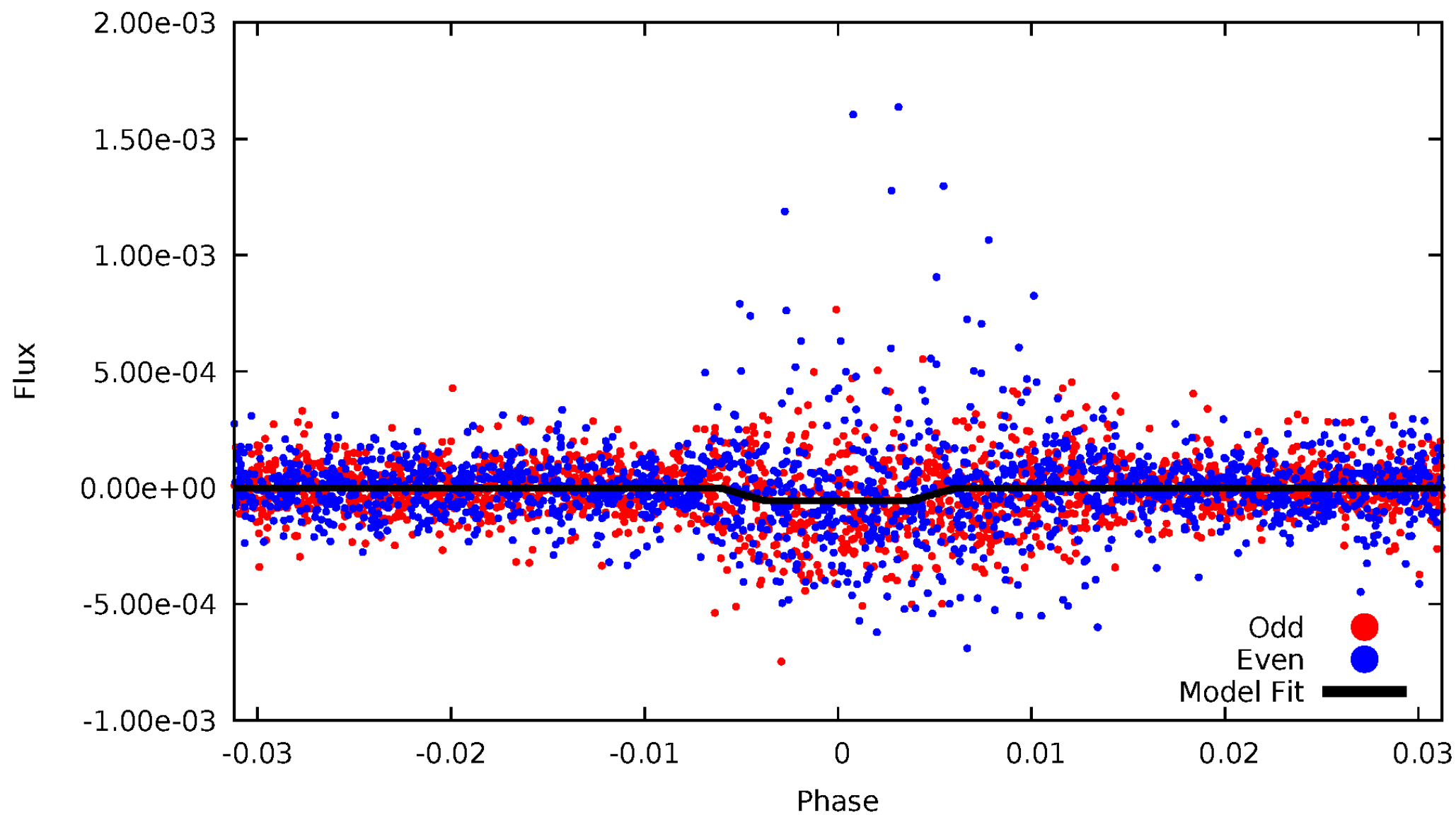
DV Odd/Even

TCE 005177859-02



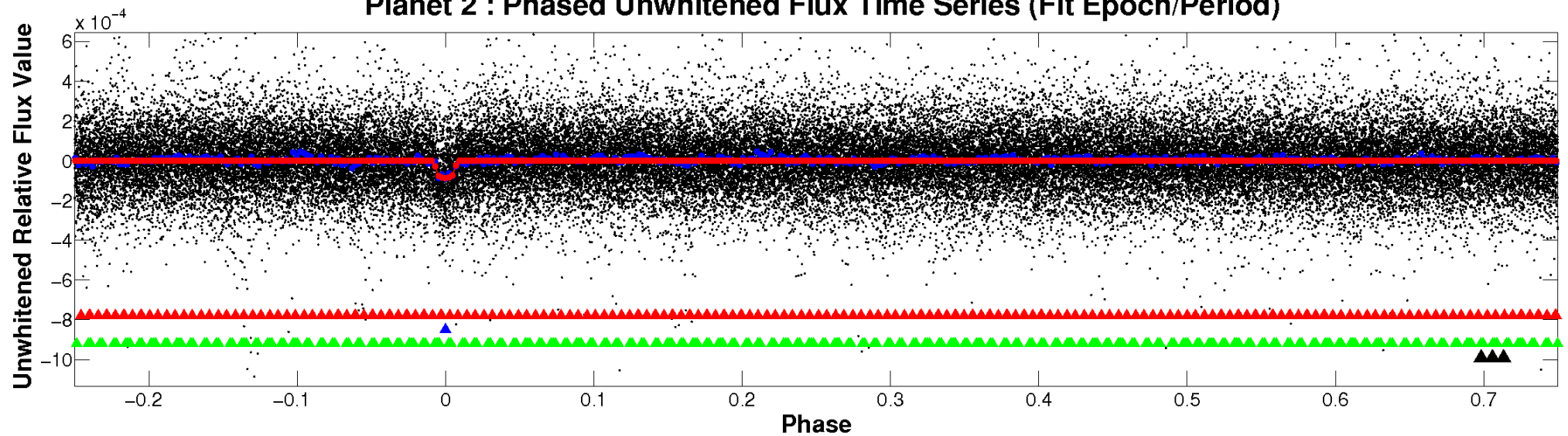
ALT Odd/Even

TCE 005177859-02

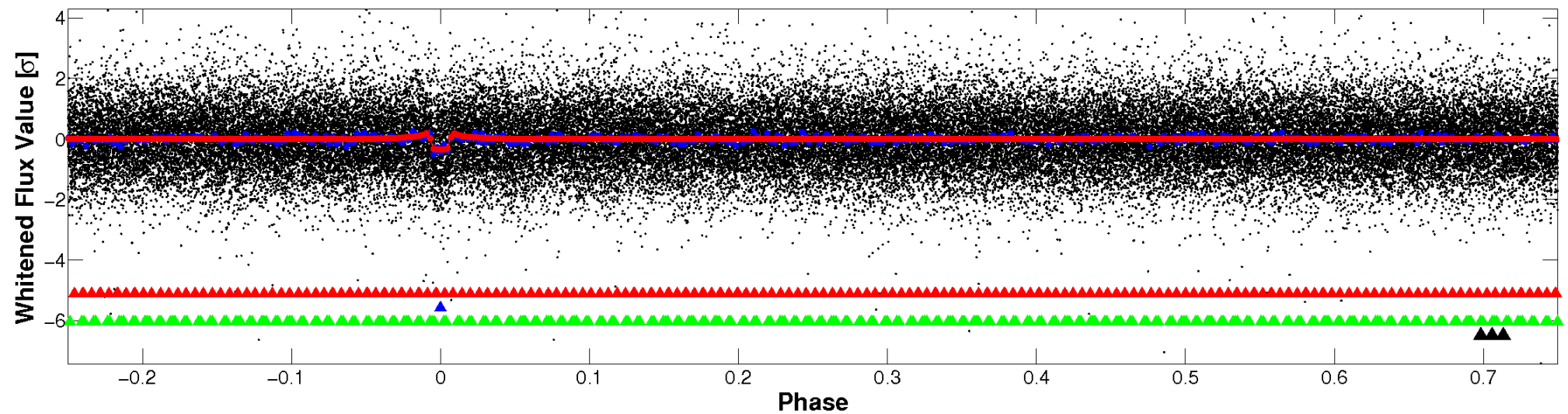


Non-Whitened Vs. Whitened Light Curve

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

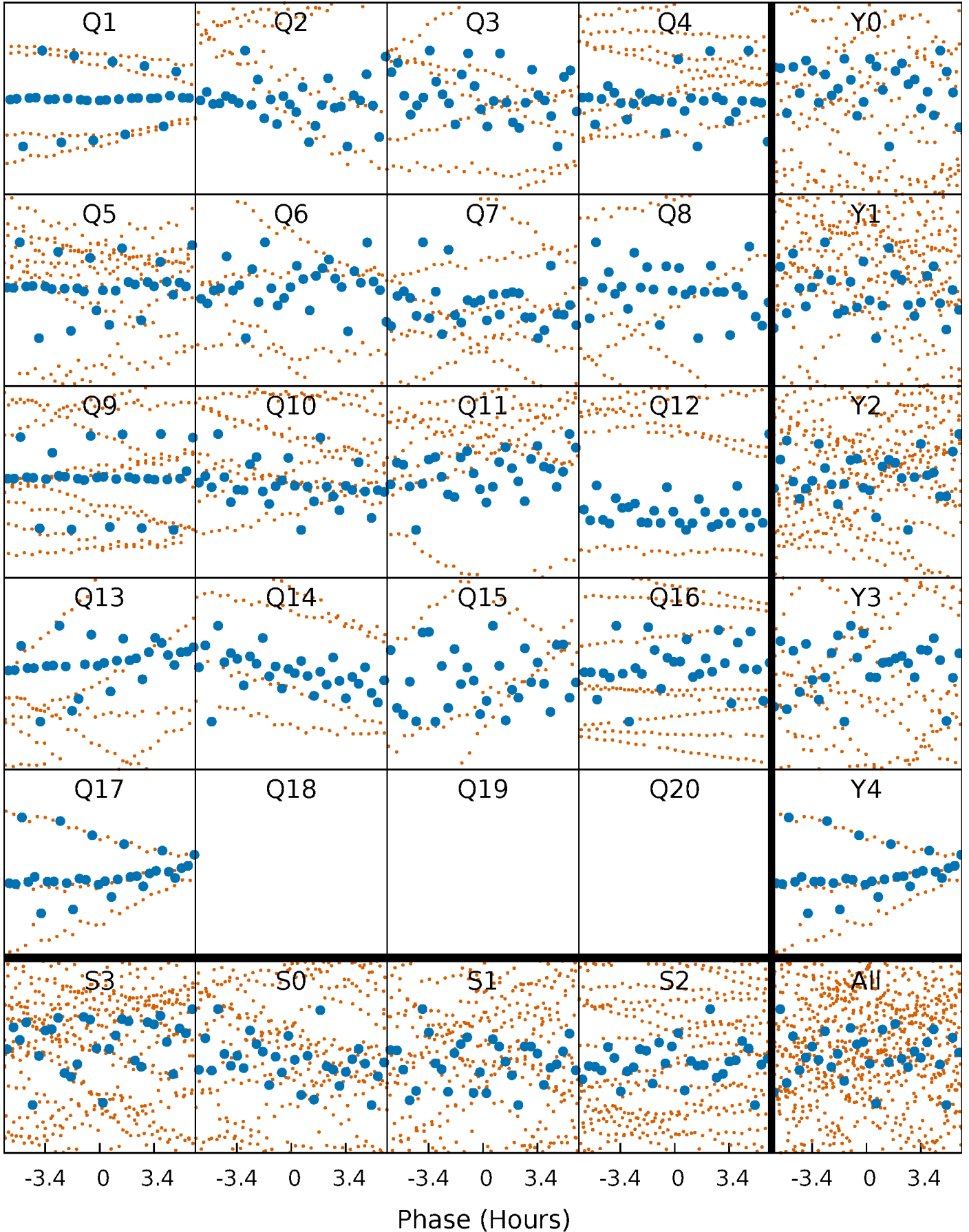


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



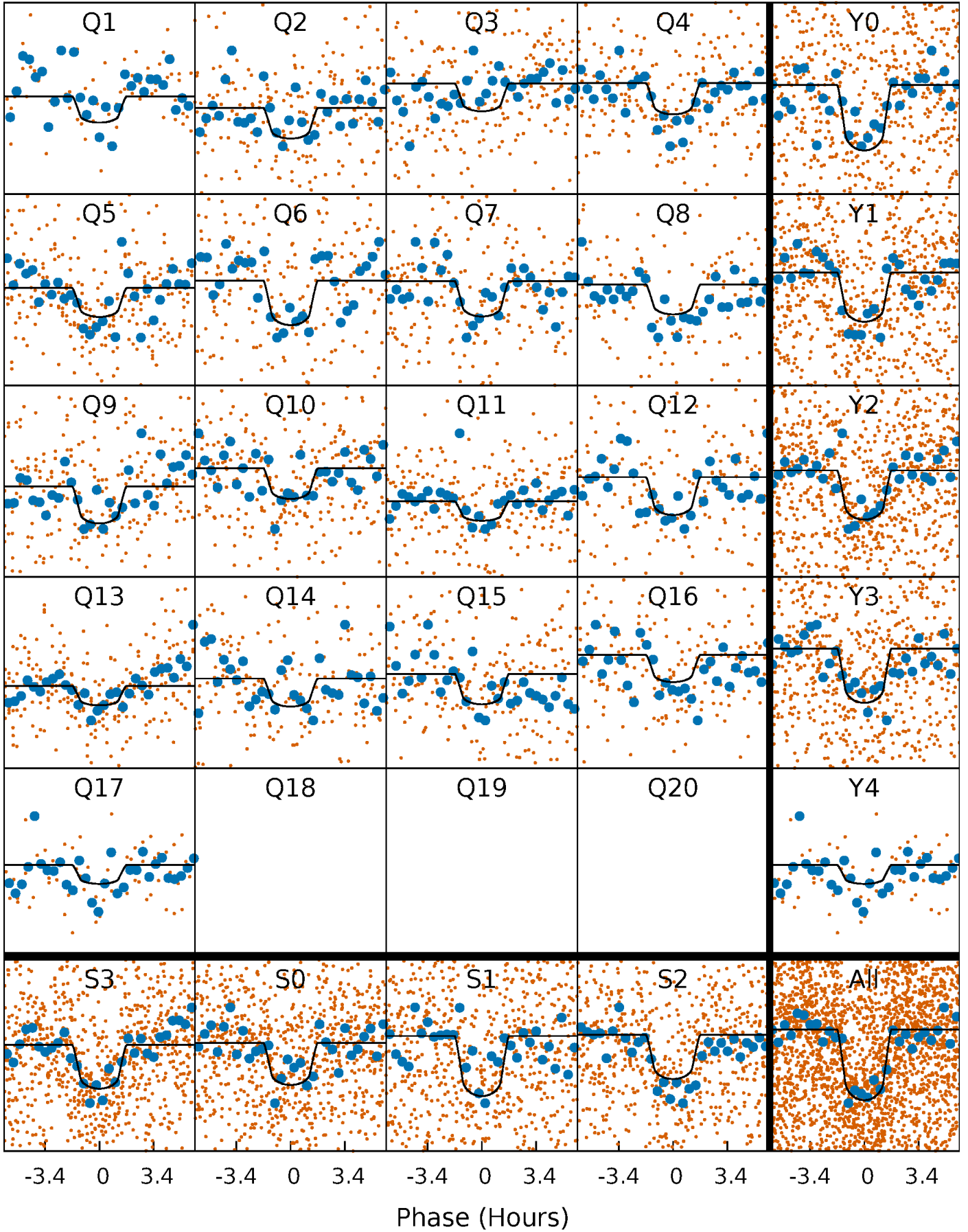
PDC Quarter-Phased Transit Curves

TCE 005177859-02 P= 8.756238 Days $T_0=132.478966$ (BKJD)



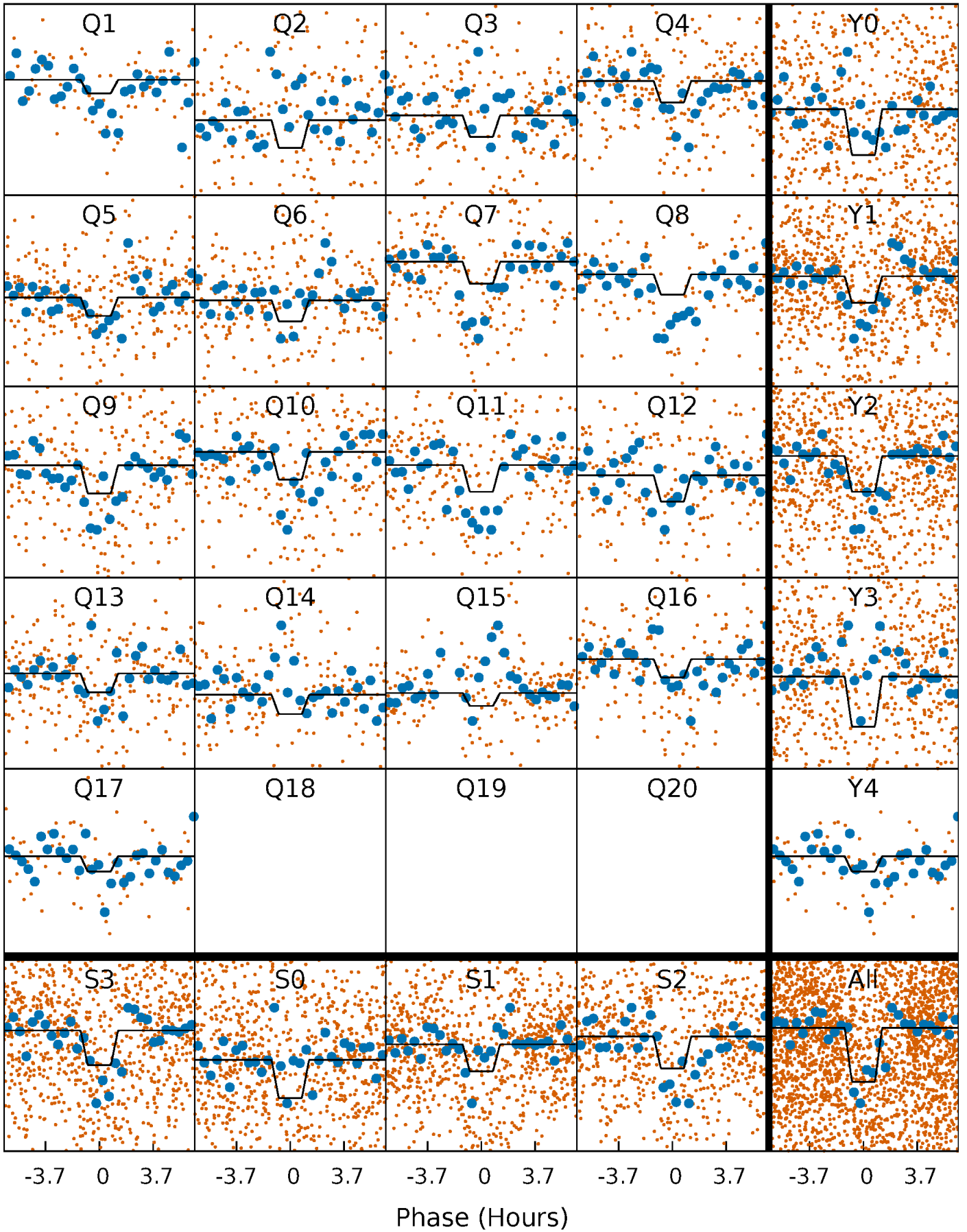
DV Quarter-Phased Transit Curves

TCE 005177859-02 P= 8.756238 Days $T_0=132.478966$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

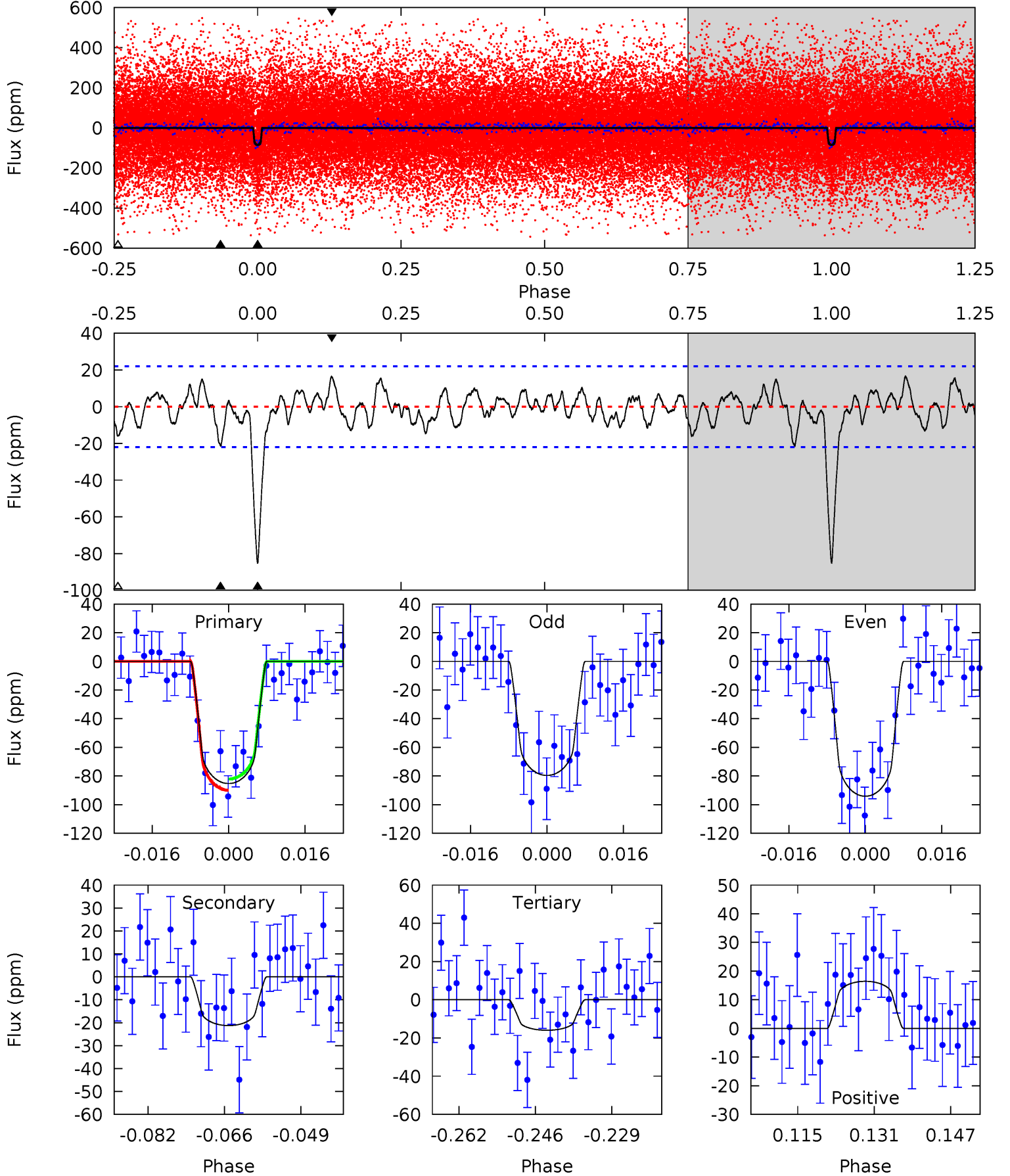
TCE 005177859-02 P= 8.756235 Days $T_0=132.461221$ (BKJD)



DV Model-Shift Uniqueness Test

005177859-02, P = 8.756238 Days, E = 123.722728 Days

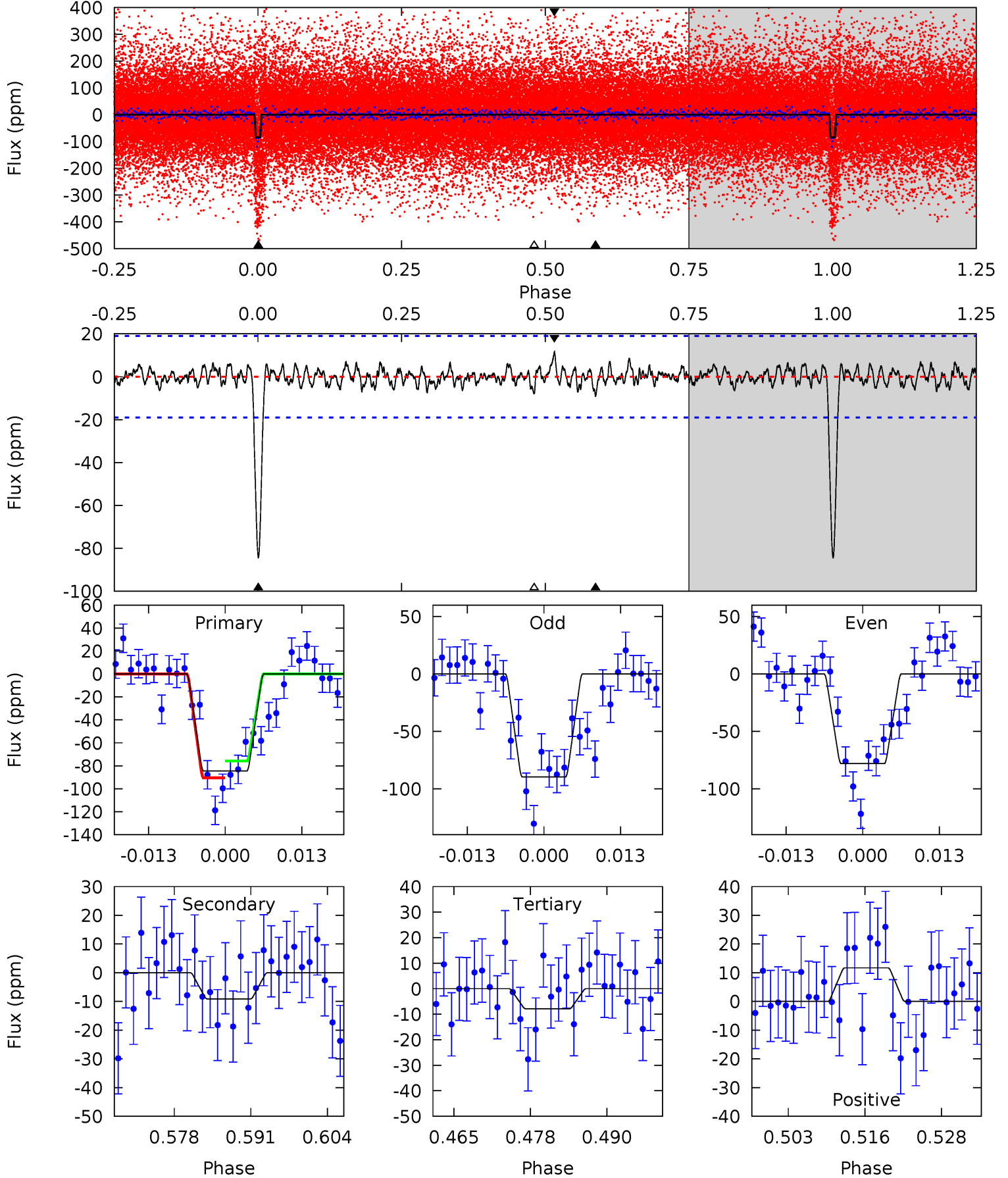
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	4.76	3.57	3.68	4.93	2.40	1.43	15.5	15.4	1.18	1.08	1.63	0.91	0.16	0.88



Alt Model-Shift Uniqueness Test

005177859-02, P = 8.756235 Days, E = 123.704986 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.1	2.38	2.07	3.06	4.98	2.50	0.78	20.0	19.0	0.31	-0.68	1.52	0.44	0.12	1.93



Stellar Parameters For KIC 005177859

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5839^{+156}_{-174}	$4.279^{+0.175}_{-0.175}$	$0.120^{+0.200}_{-0.300}$	$1.227^{+0.360}_{-0.270}$	$1.044^{+0.137}_{-0.125}$	$0.796^{+0.725}_{-0.381}$
	+3%/-3%	+4%/-4%	+167%/-250%	+29%/-22%	+13%/-12%	+91%/-48%
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 005177859-02 / KOI 4246.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-21 ± 4	$1.35^{+0.59}_{-0.55}$	1374^{+101}_{-94}	4203^{+990}_{-502}	45^{+90}_{-23}
Alt.	-9 ± 4	$1.01^{+0.63}_{-0.55}$	1375^{+108}_{-90}	3962^{+1421}_{-615}	33^{+121}_{-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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

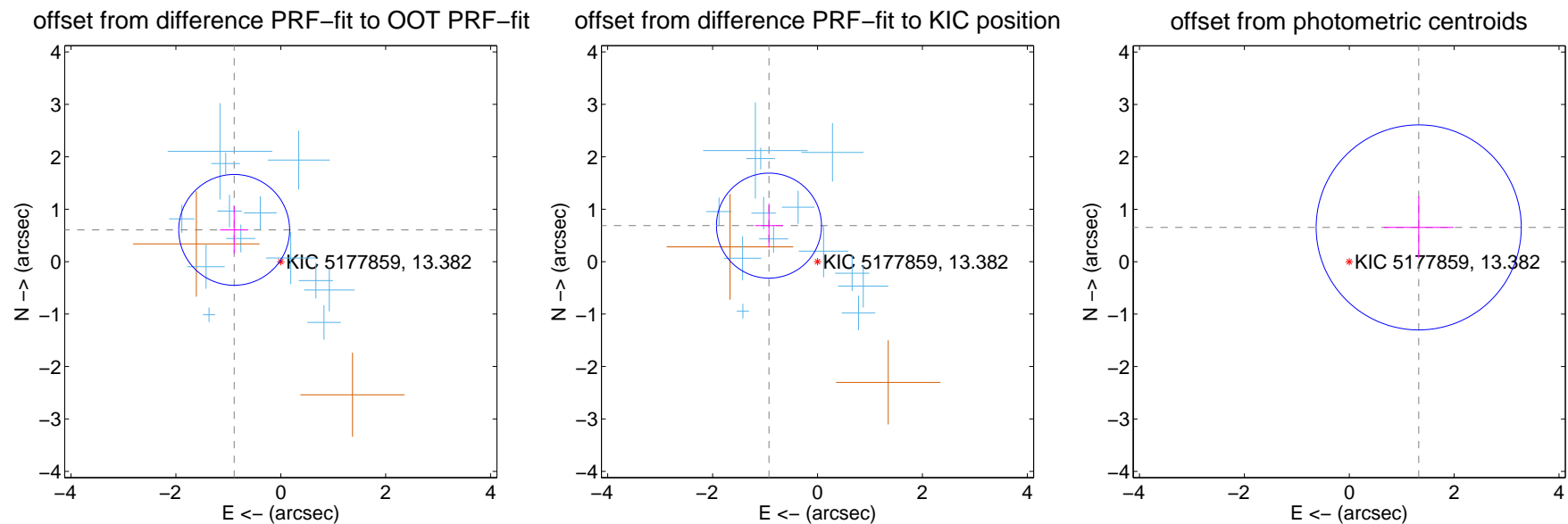
DV Centroid Data

Supplemental centroid analysis for 005177859-02. Kepler magnitude: 13.38. Transit SNR 10.28

There are 14 quarters with good PRF difference image offsets

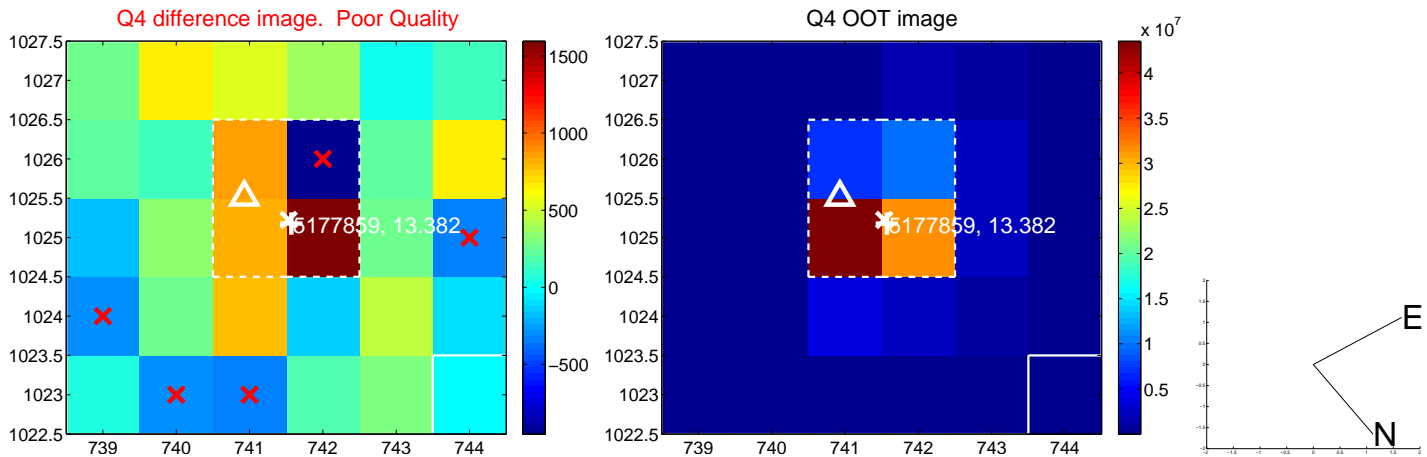
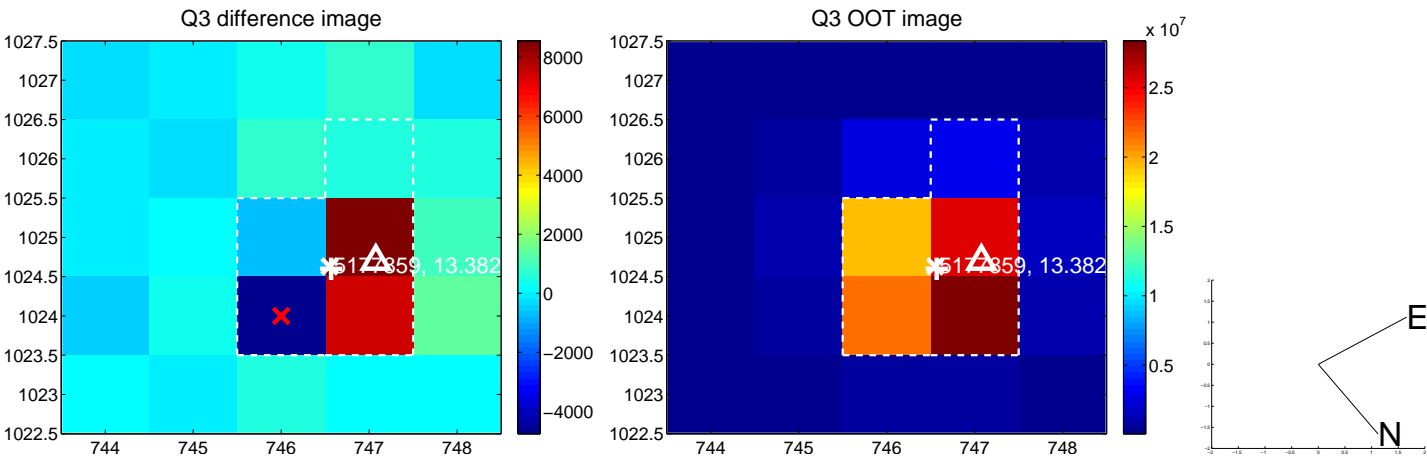
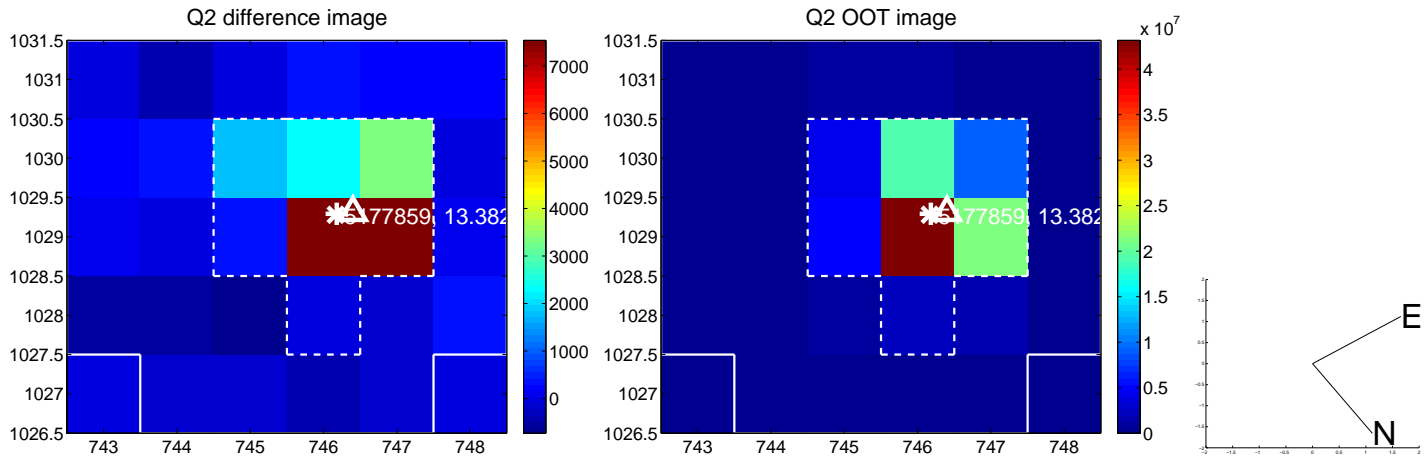
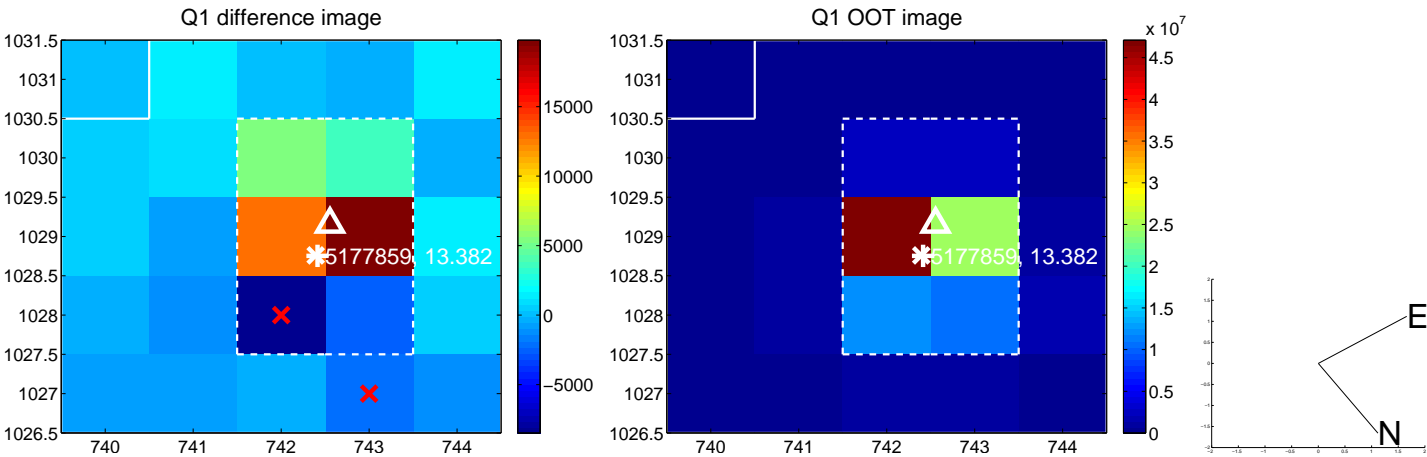
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.075 ± 0.352	3.05	0.889 ± 0.269	0.606 ± 0.450
PRF-fit source offset from KIC position	1.152 ± 0.334	3.45	0.925 ± 0.267	0.687 ± 0.420
photometric centroid source offset	1.48 ± 0.65	2.27	-1.32 ± 0.67	0.65 ± 0.59

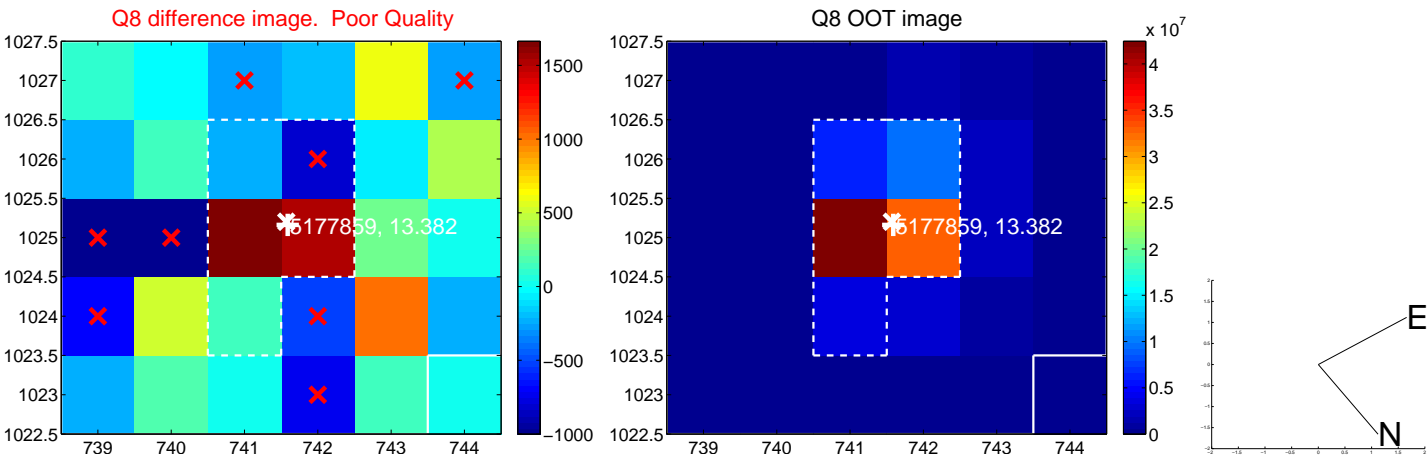
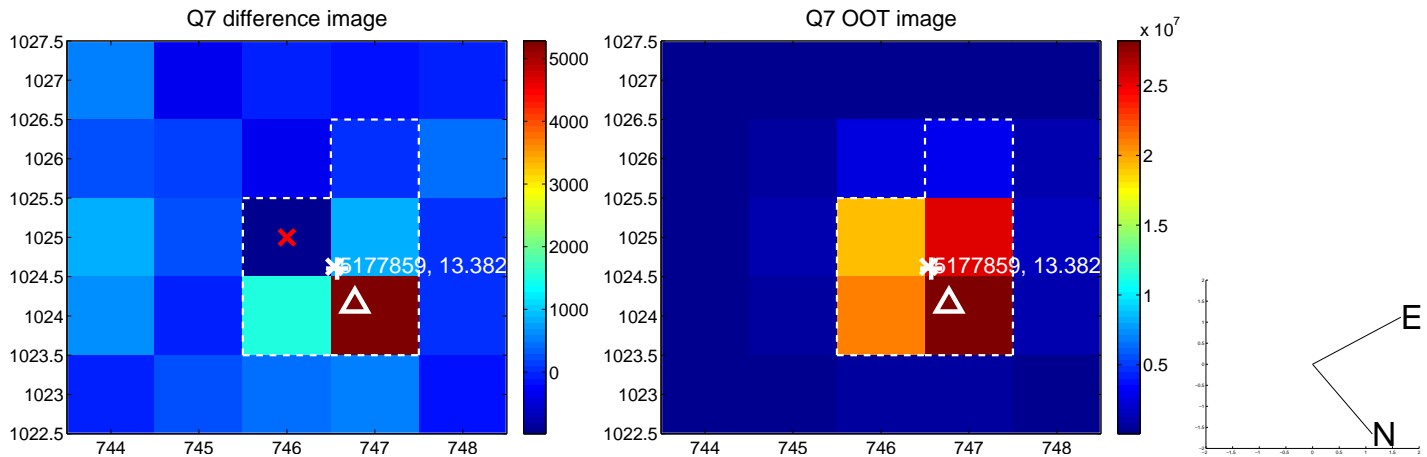
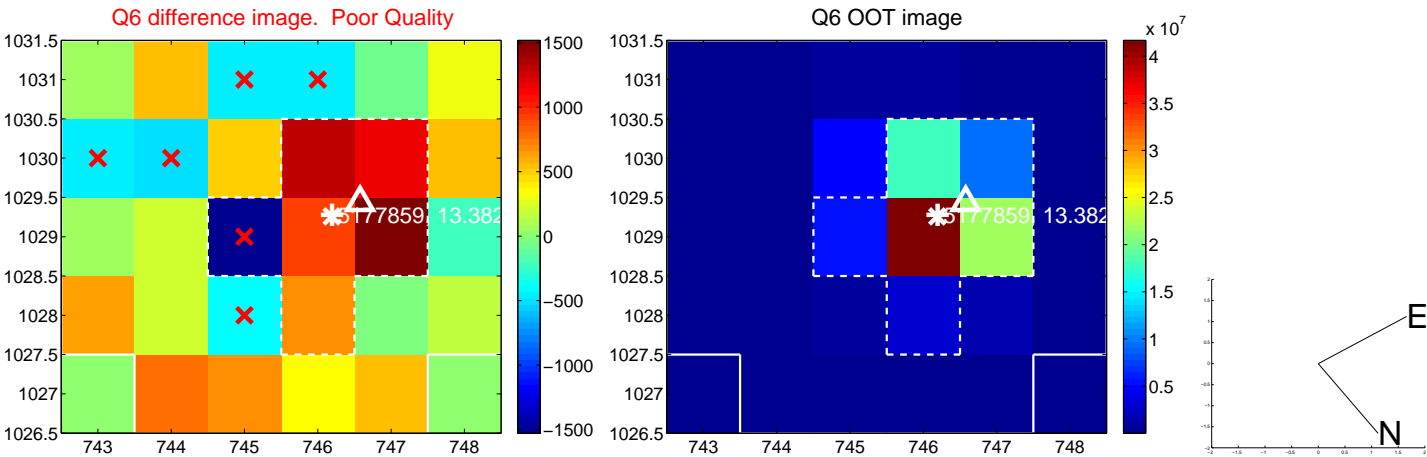
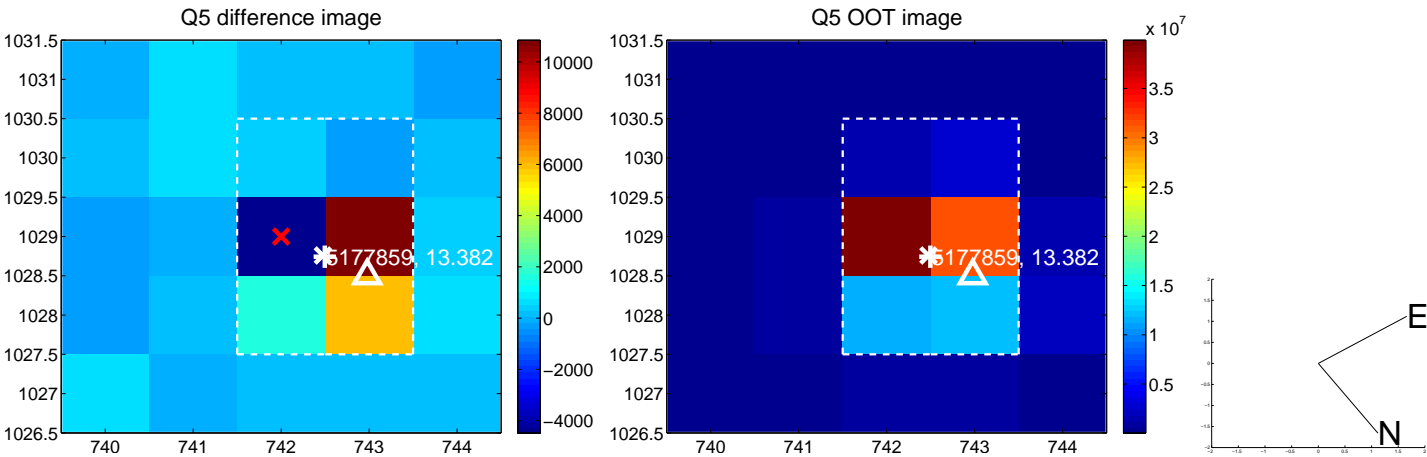


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

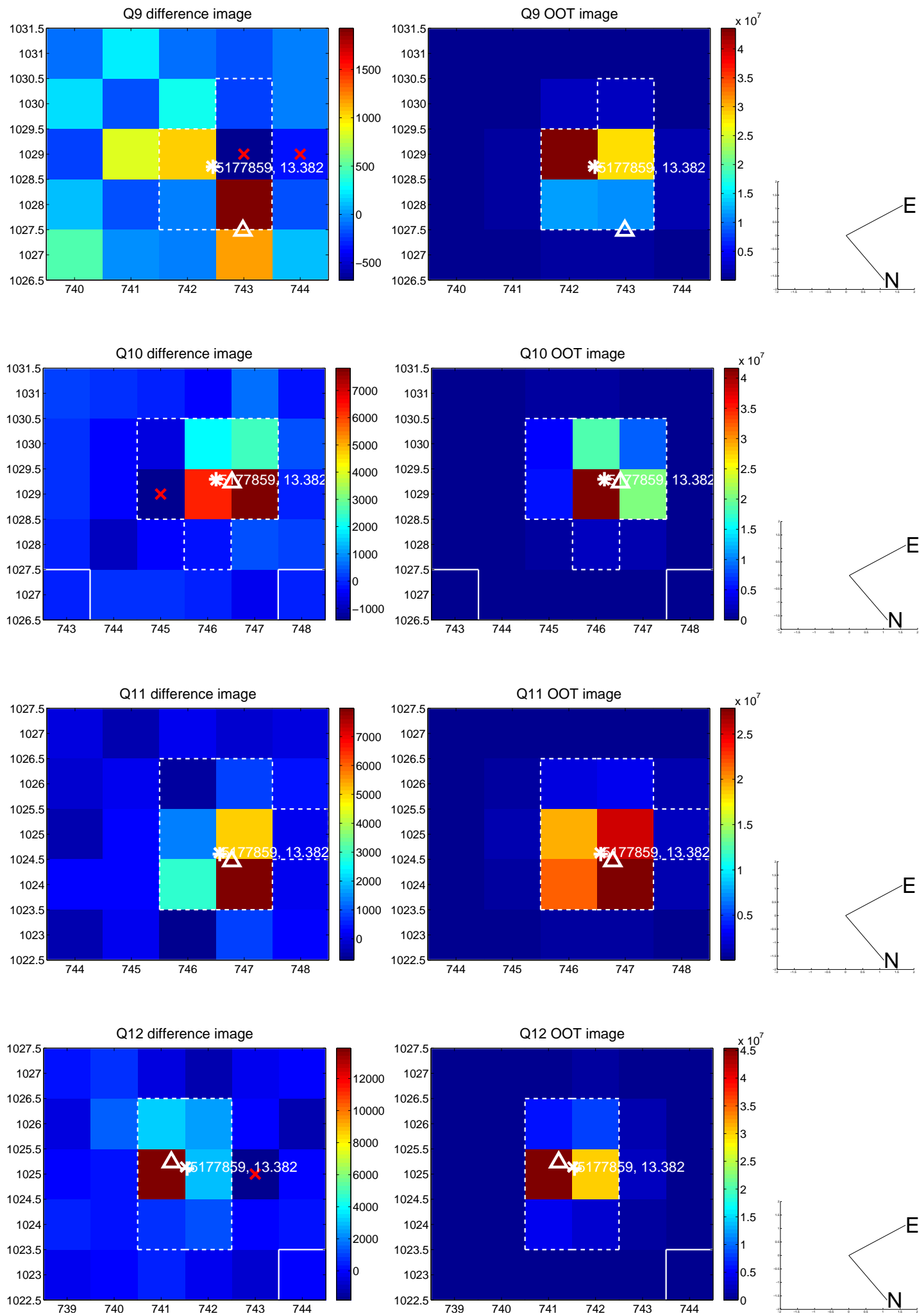
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



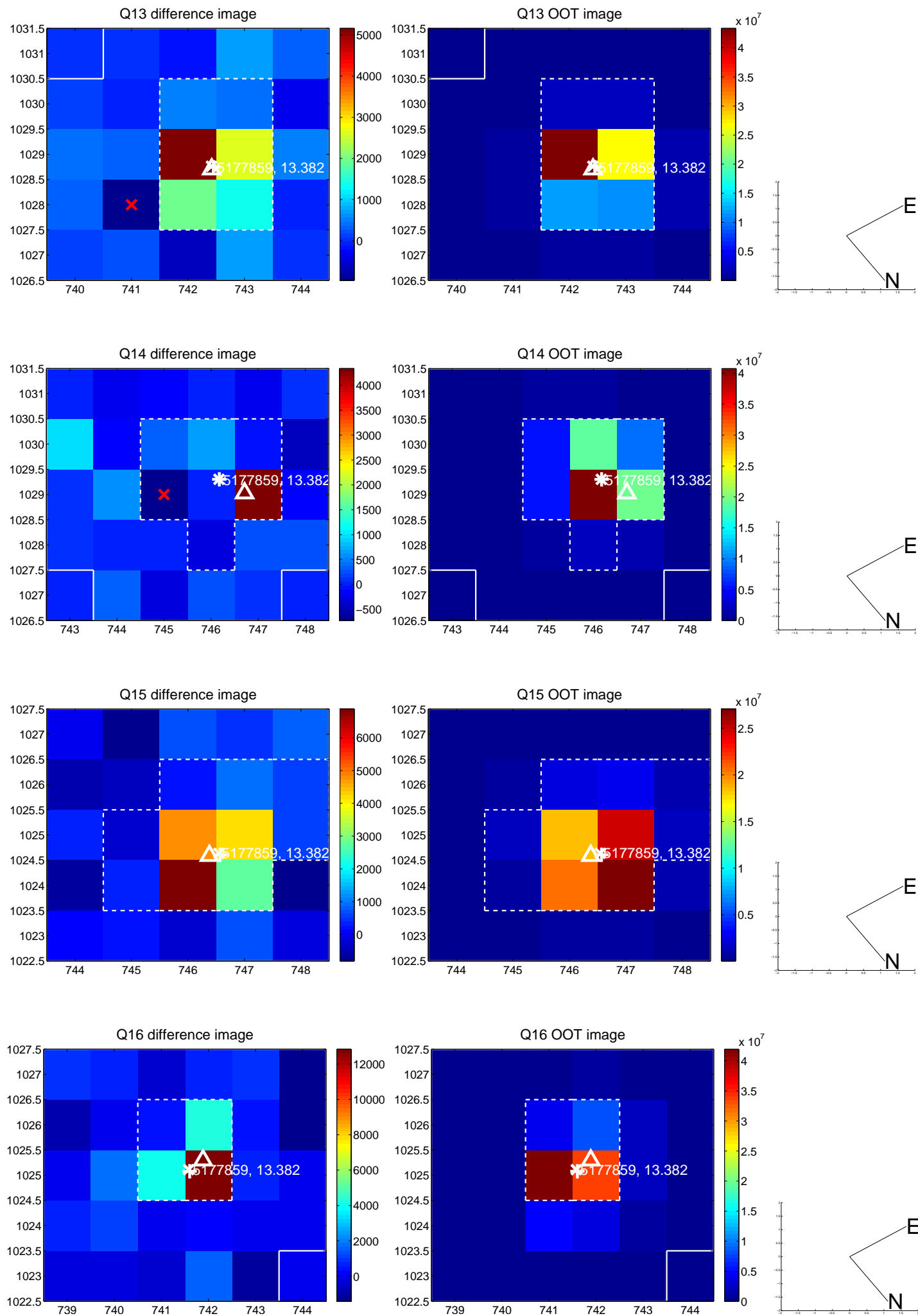
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



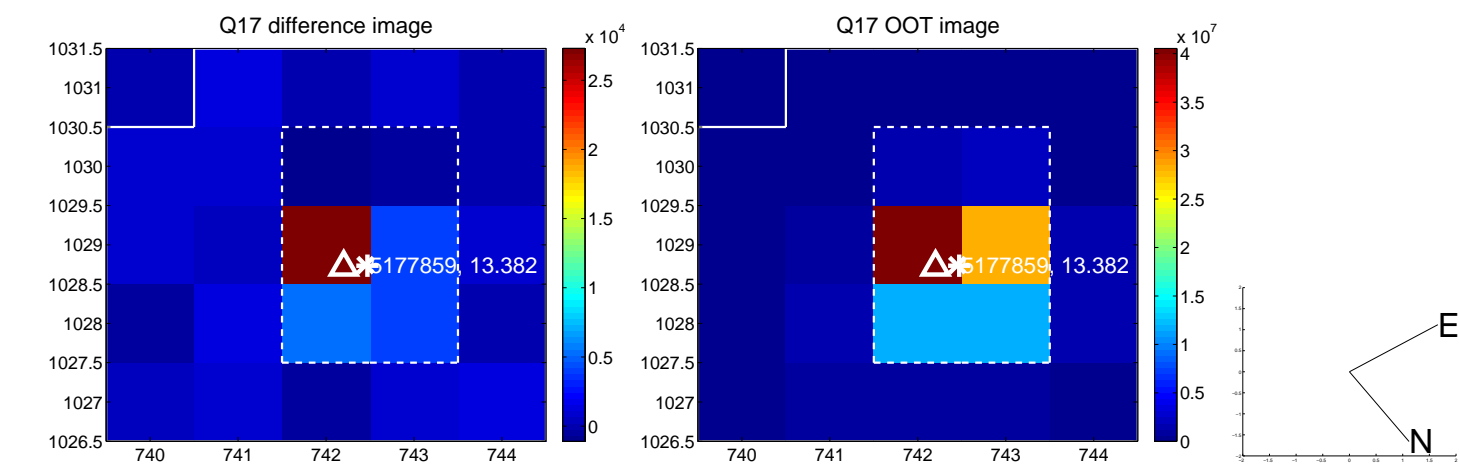
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



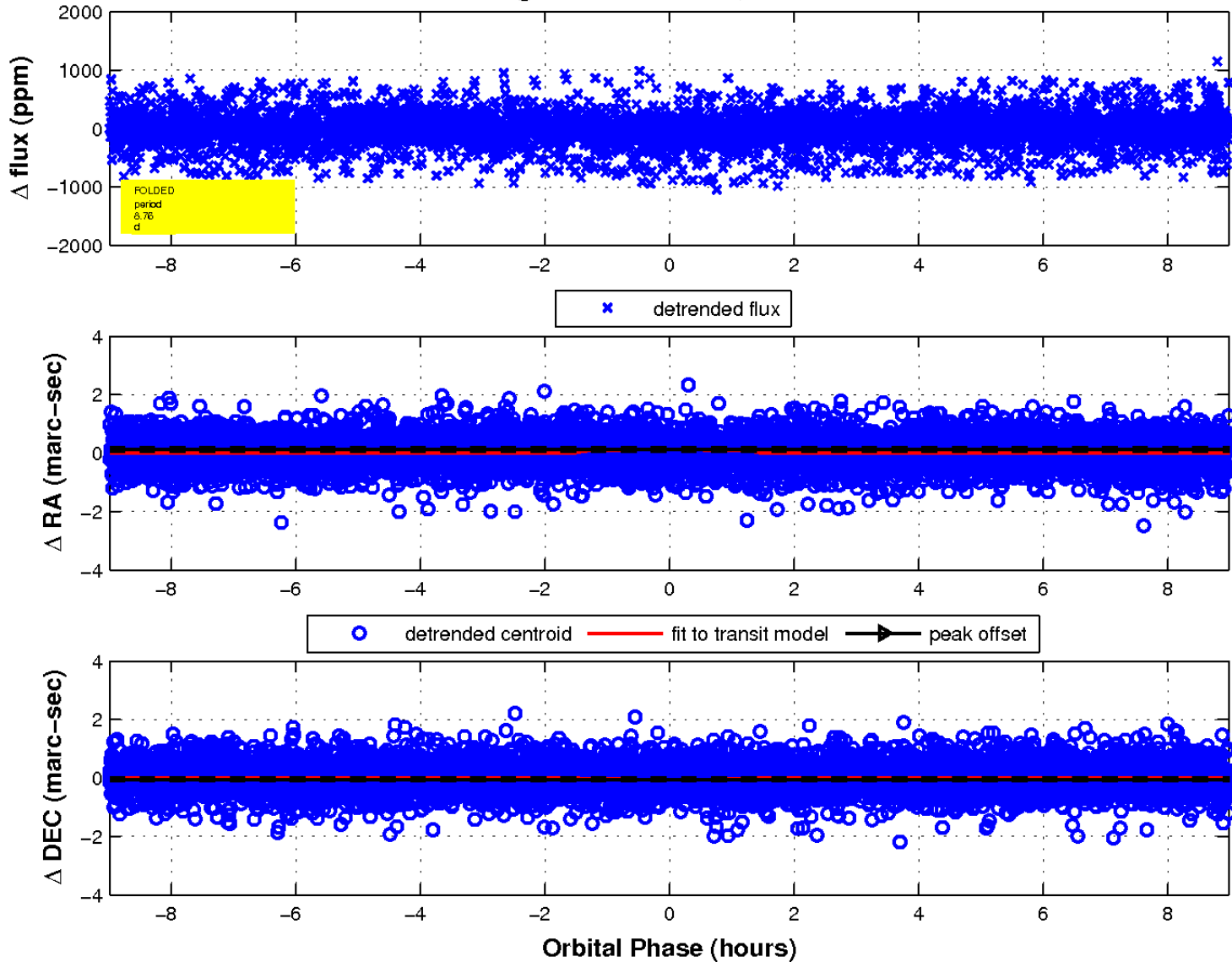
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



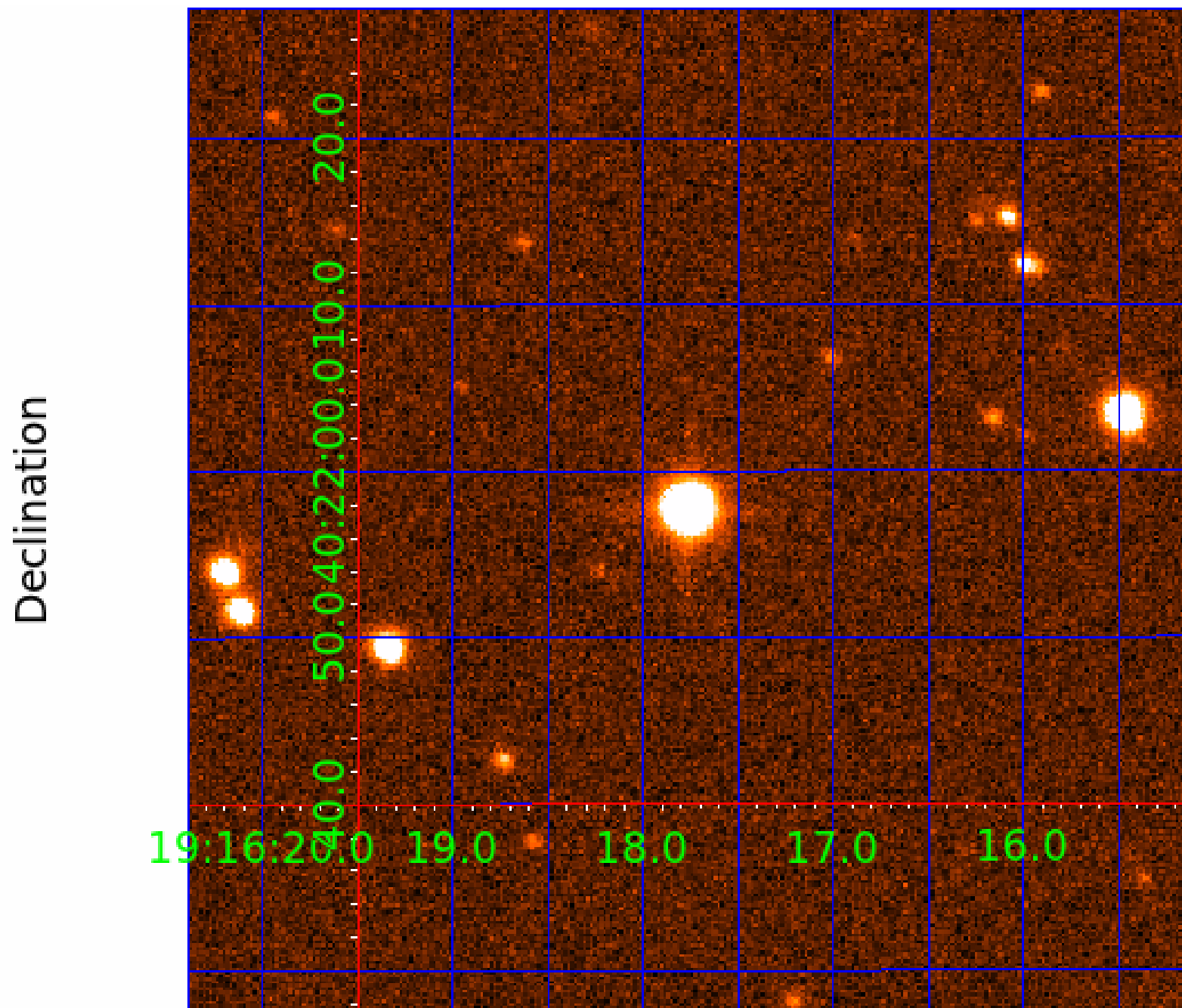
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 4



UKIRT Image



KIC 005177859

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})
005177859-01	OBS	4246.01	6.984718	135.998947	88.4	2.857	11.0	11.6	1.23	5839	1.52	297.81
005177859-02	OBS	4246.02	8.756238	132.478966	87.2	2.995	9.0	10.3	1.23	5839	1.36	220.32
005177859-03	OBS	No	5.558420	134.090708	53.9	3.780	7.3	7.9	1.23	5839	1.07	403.84
005177859-04	OBS	No	560.465306	418.793225	346.2	4.500	8.5	-1.0	1.23	5839	2.26	0.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177859-01	OBS	FP	0.36	1	0	0	0	LPP_DV
005177859-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
005177859-03	OBS	FP	0.00	1	0	0	0	LPP_DV
005177859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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.

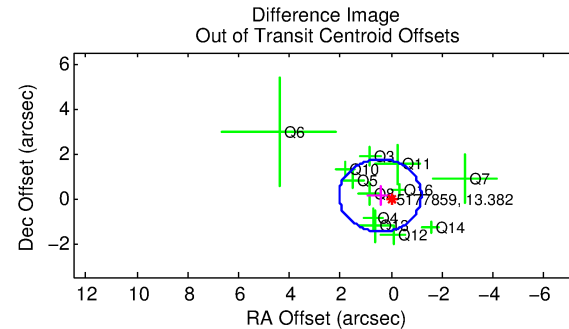
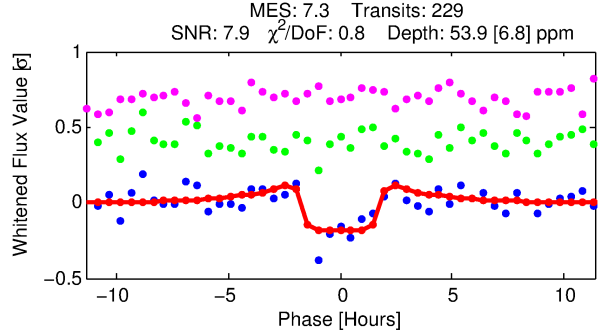
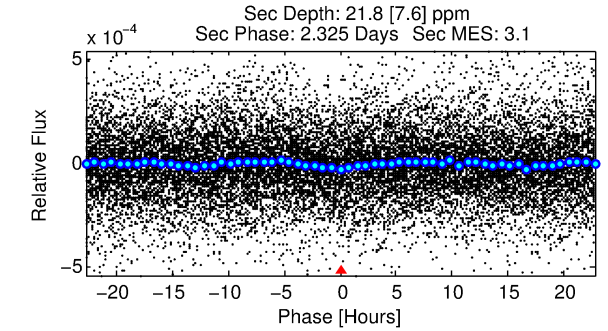
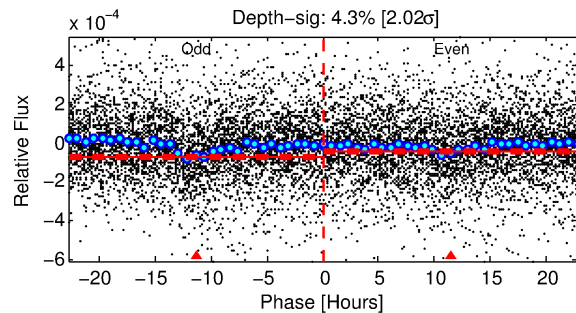
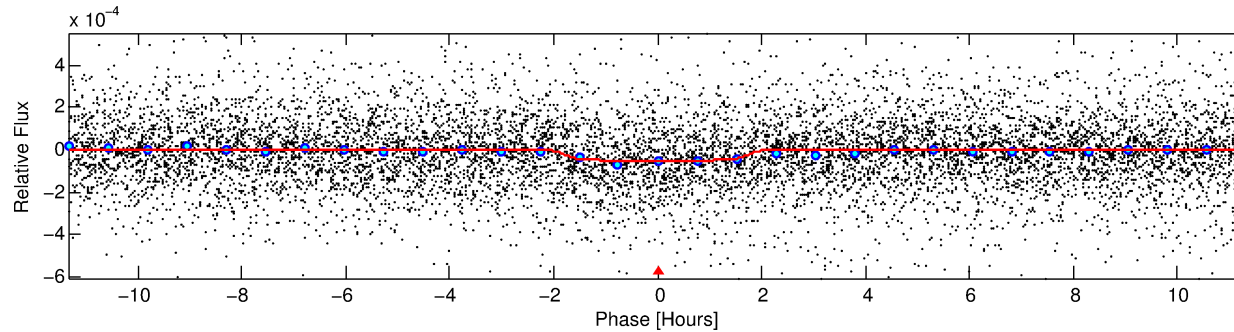
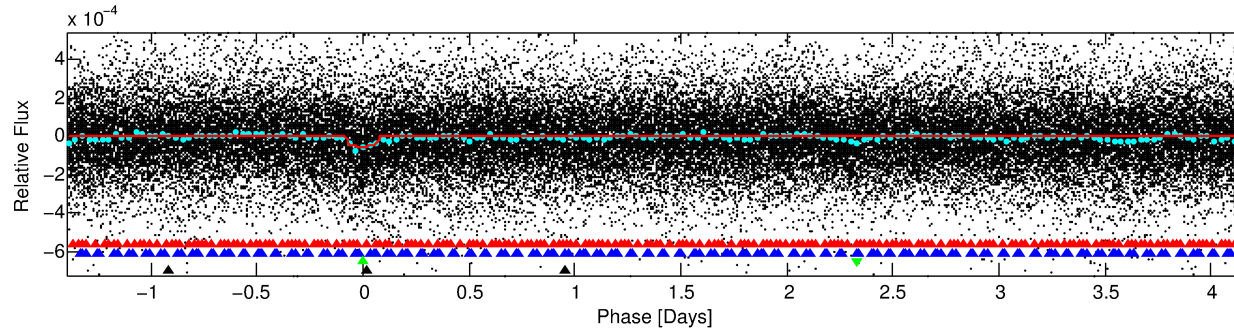
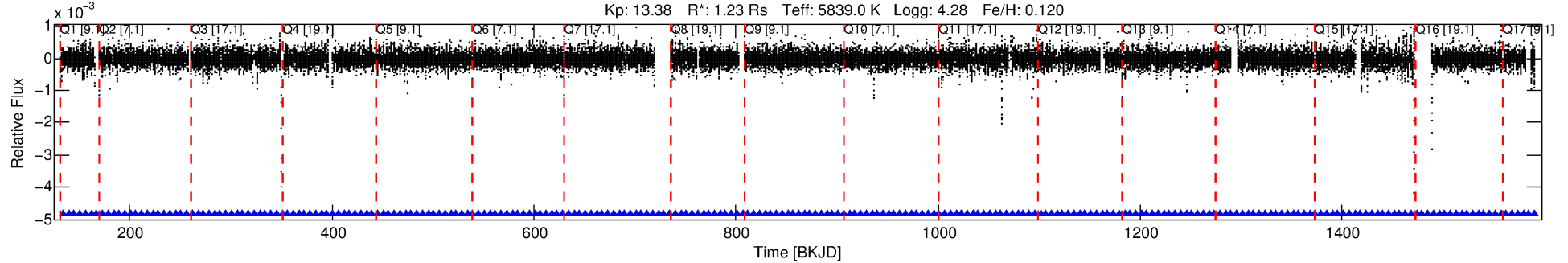
Ephemeris Match Information For 005177859-03

No Significant Match Found

DV One-Page Summary

KIC: 5177859 Candidate: 3 of 4 Period: 5.558 d
KOI: K04246 Corr: No Ephemeris Match

Kp: 13.38 R*: 1.23 Rs Teff: 5839.0 K Logg: 4.28 Fe/H: 0.120



DV Fit Results:

Period = 5.55842 [0.00004] d
Epoch = 134.0907 [0.0048] BKJD
Rp/R* = 0.0080 [0.0032]
a/R* = 5.14 [9.34]
b = 0.90 [0.40]
Seff = 403.84 [142.57]
Teq = 1143 [101] K
Rp = 1.07 [0.53] Re
a = 0.0623 [0.0148] AU
Ag = 40.49 [37.34] [1.06σ]
Teffp = 4458 [968] K [3.41σ]

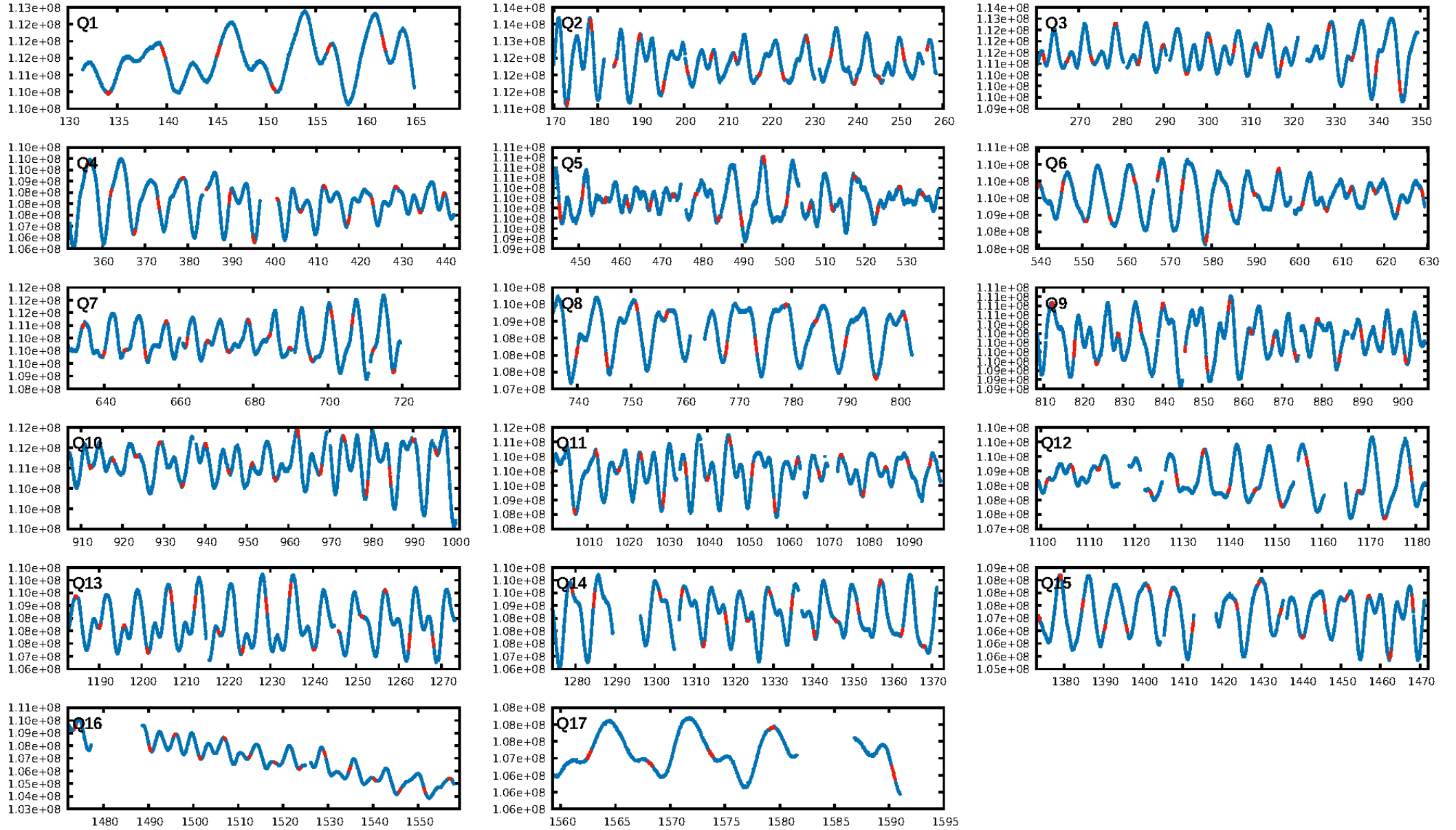
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [7.22σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.97e-12
RollingBand-fgt: 1.00 [218/218]
GhostDiagnostic-chr: 9.876
Centroid-sig: 0.1%
Centroid-so: 1.668 arcsec [2.35σ]
OotOffset-rm: 0.455 arcsec [0.84σ]
KicOffset-rm: 0.530 arcsec [0.98σ]
OotOffset-st: 3/3/4/2 [12]
KicOffset-st: 3/3/4/2 [12]
DiffImageQuality-fgm: 0.75 [9/12]
DiffImageOverlap-fno: 1.00 [17/17]

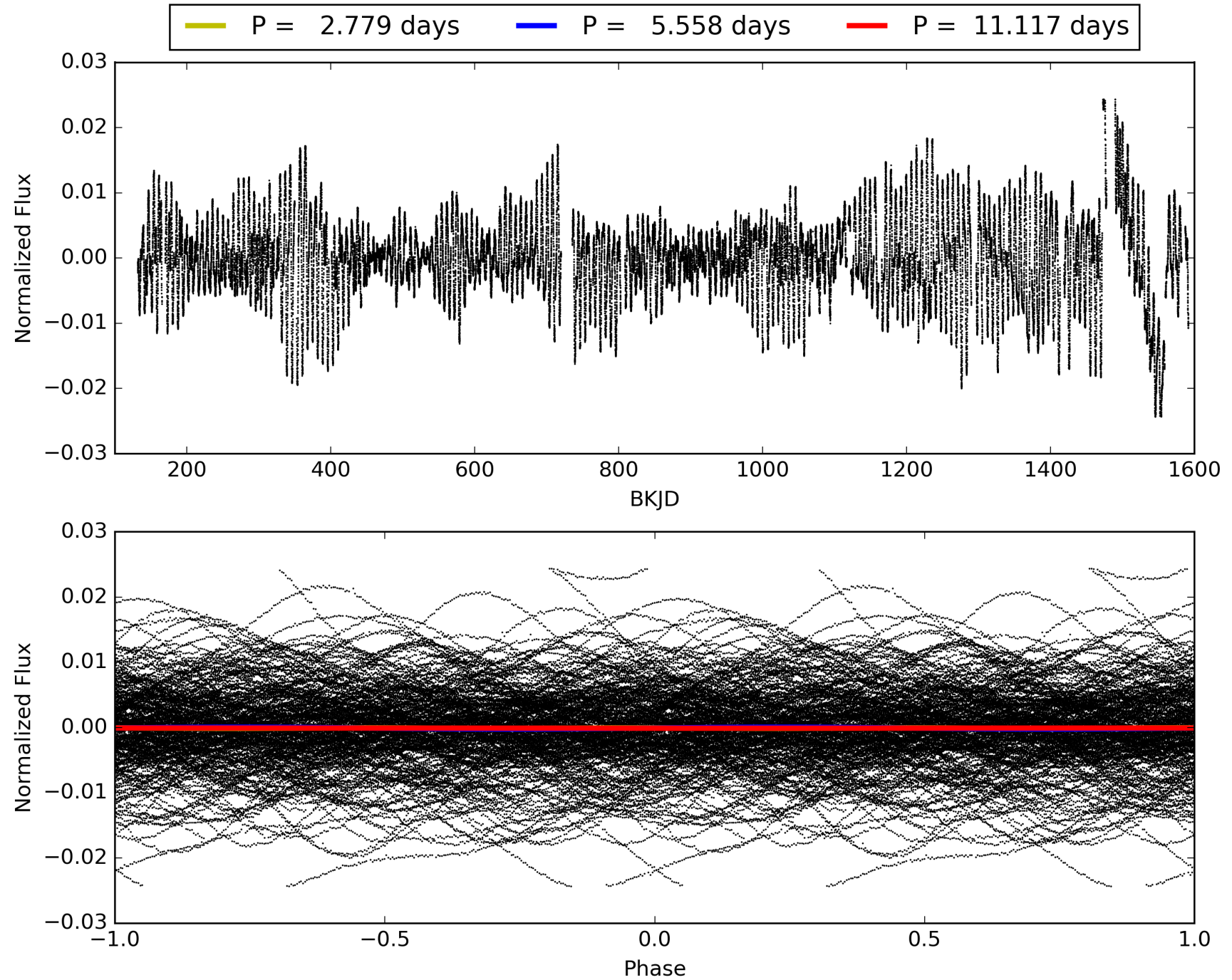
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:02:52 Z

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

TCE 005177859-03, PDC Light Curves

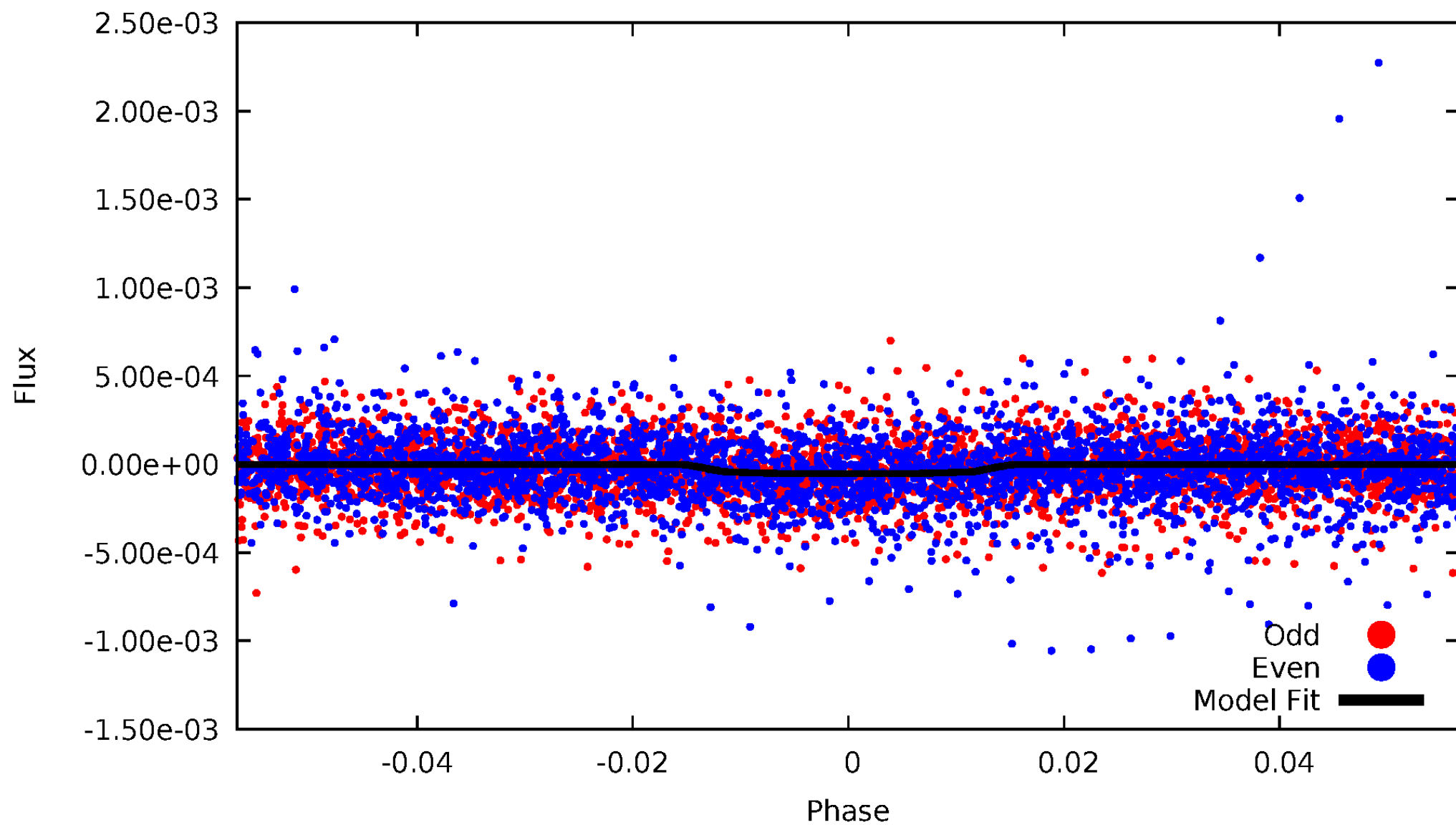


TCE 005177859-03



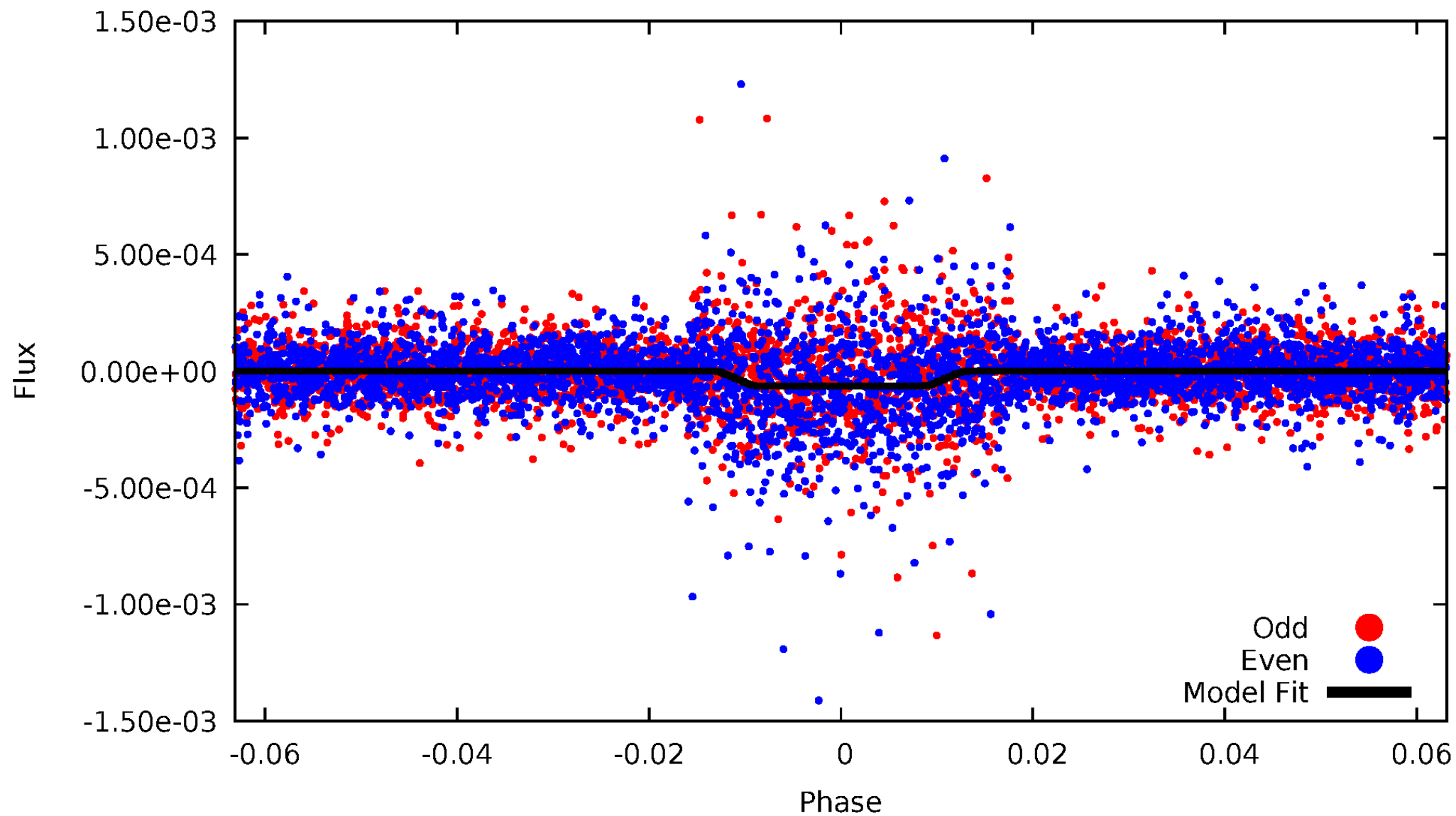
DV Odd/Even

TCE 005177859-03

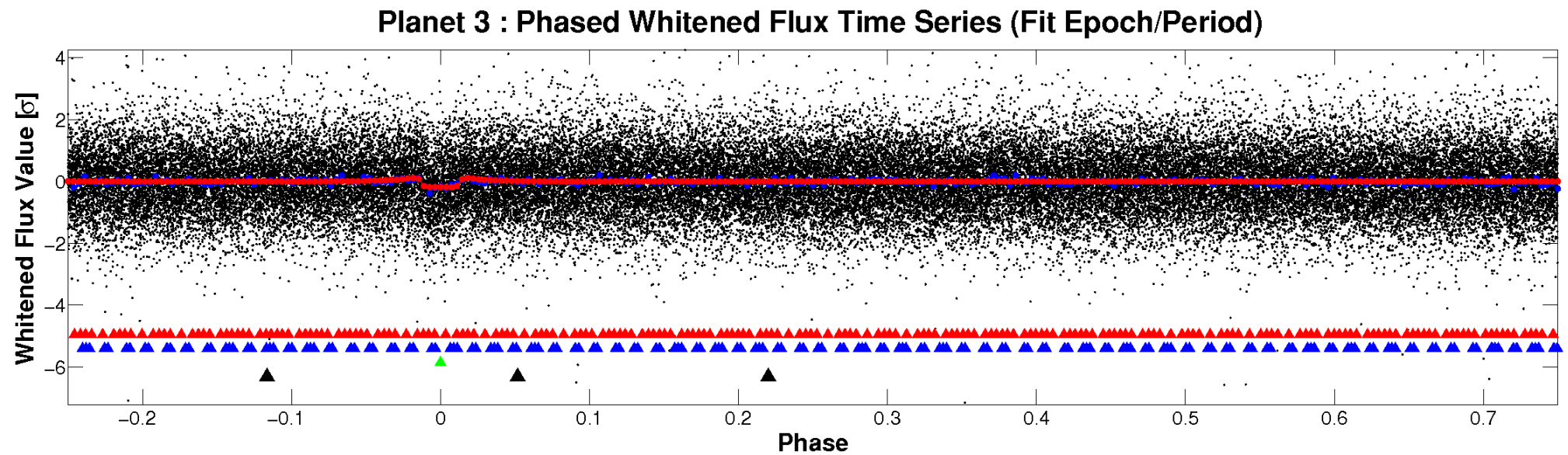
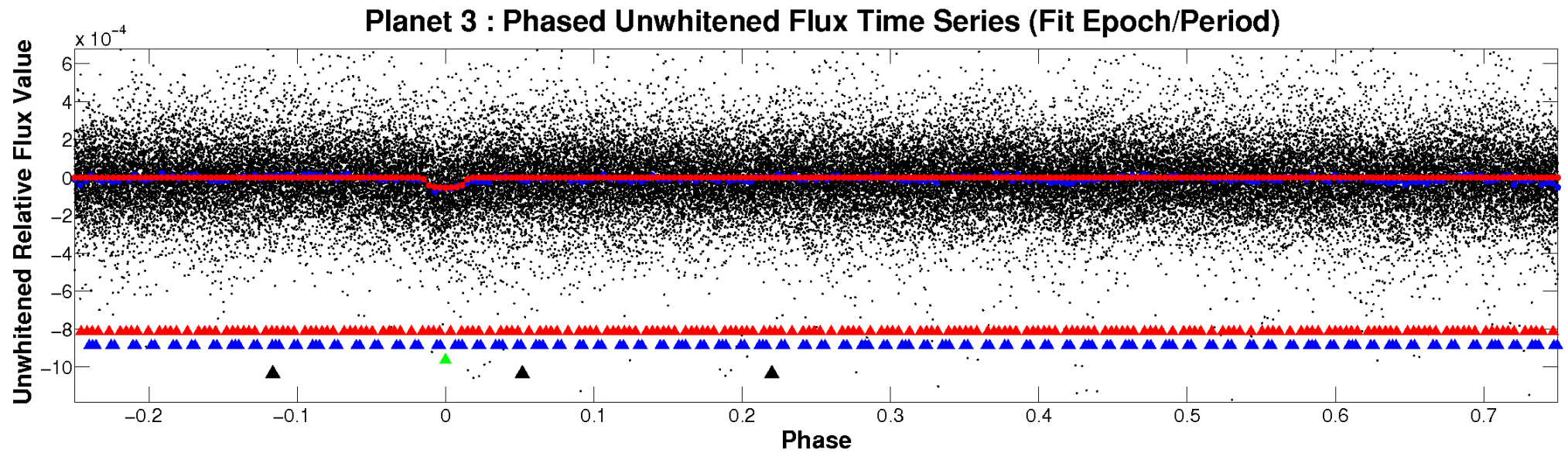


ALT Odd/Even

TCE 005177859-03

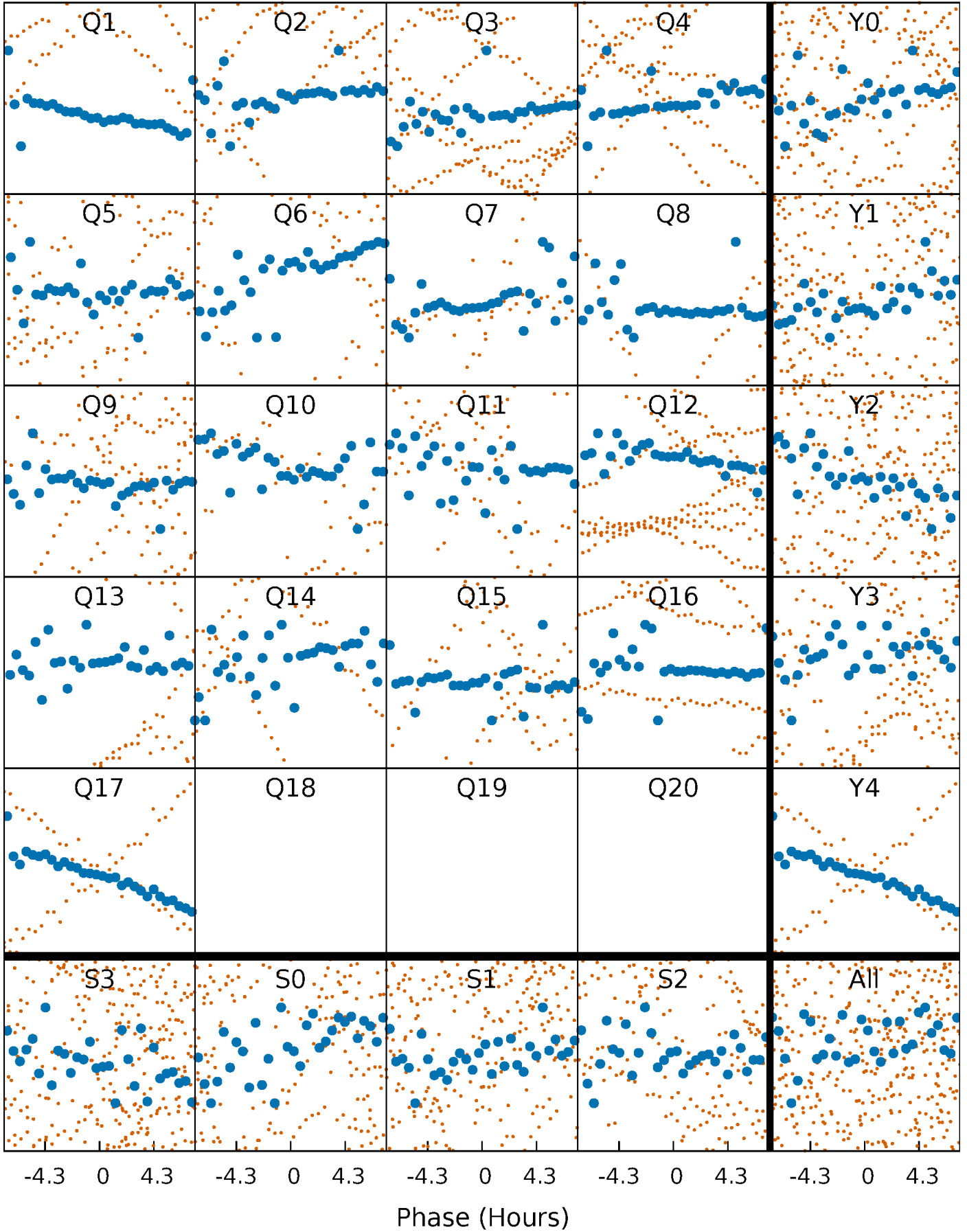


Non-Whitened Vs. Whitened Light Curve



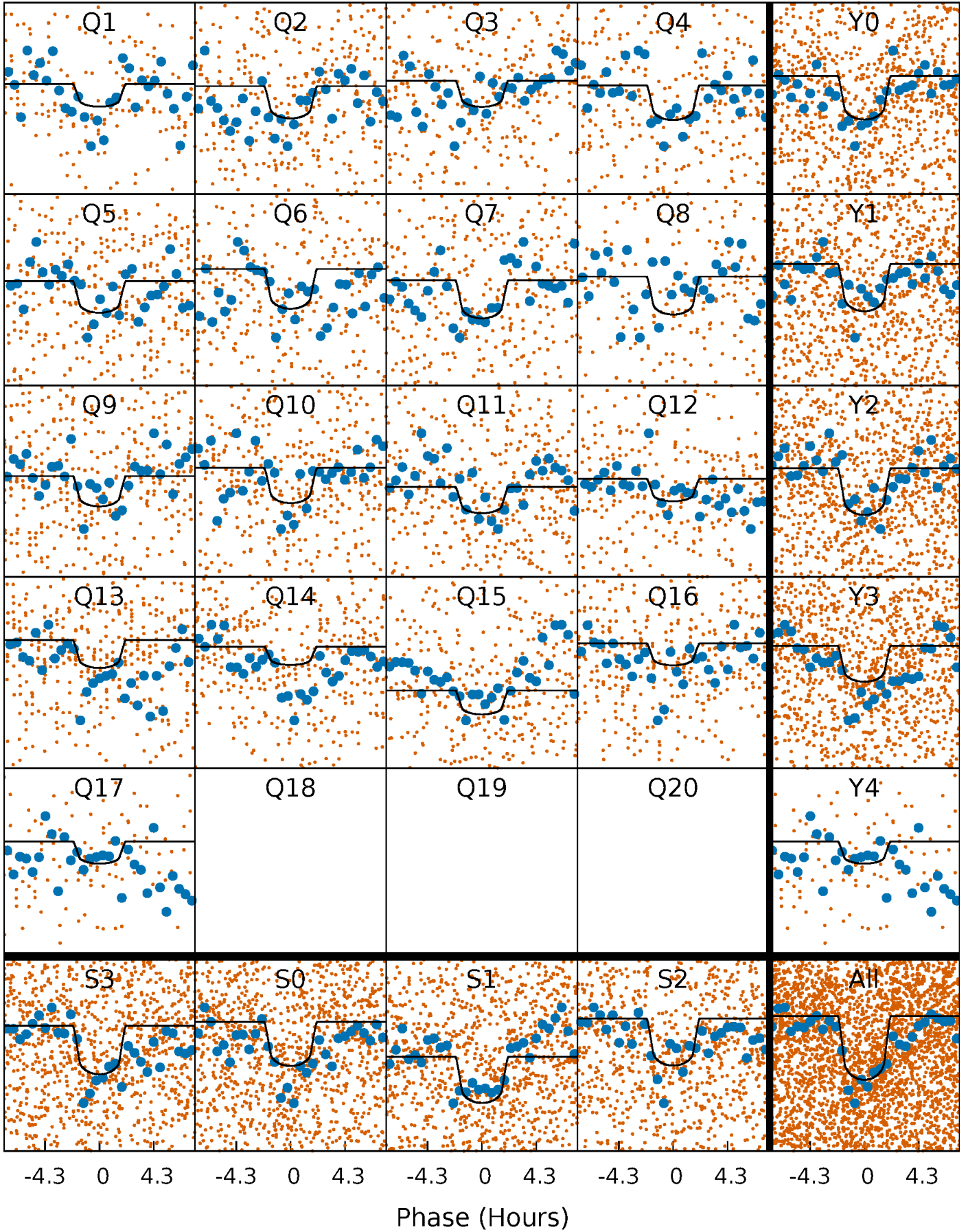
PDC Quarter-Phased Transit Curves

TCE 005177859-03 P= 5.558420 Days $T_0=134.090708$ (BKJD)



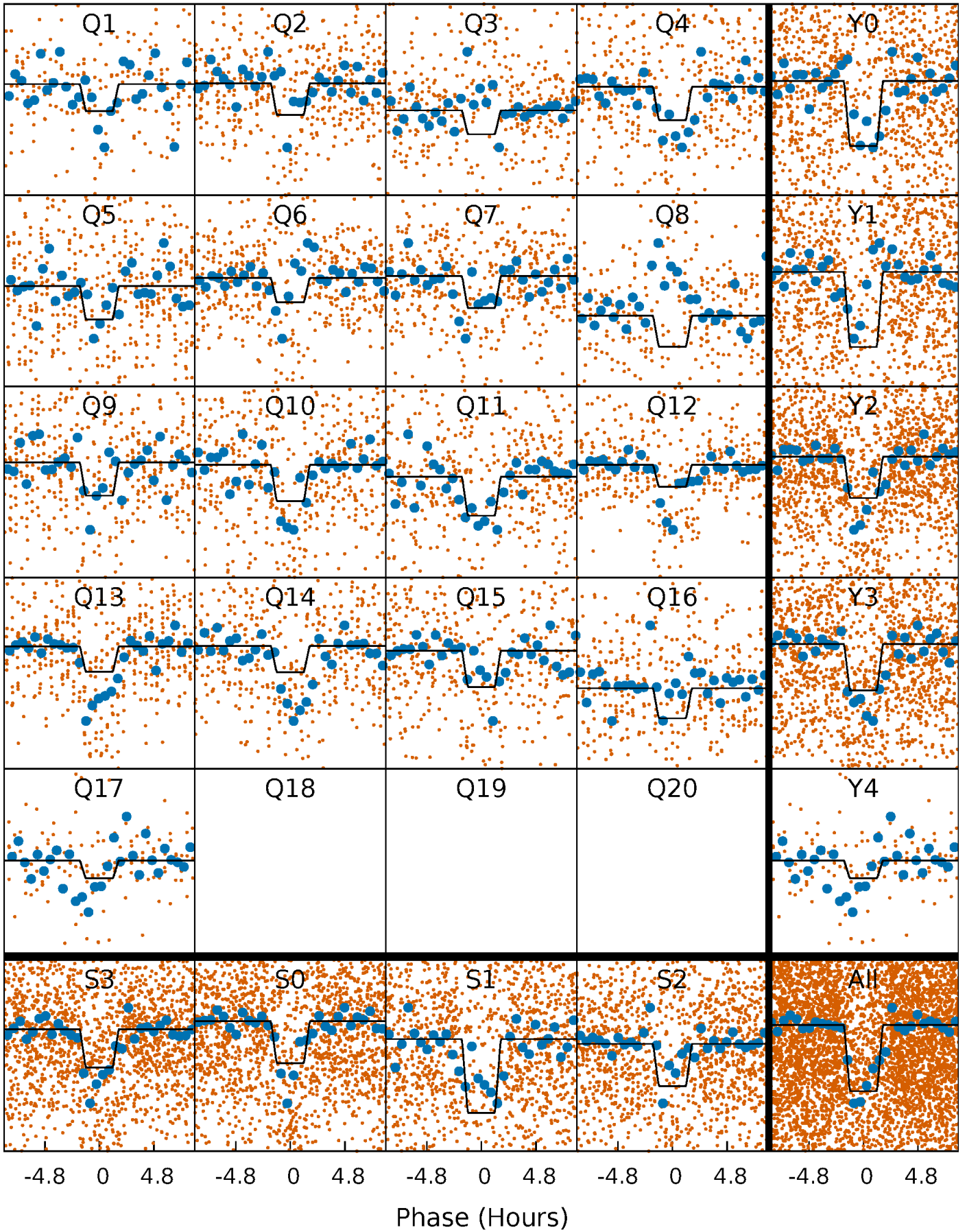
DV Quarter-Phased Transit Curves

TCE 005177859-03 P= 5.558420 Days $T_0=134.090708$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

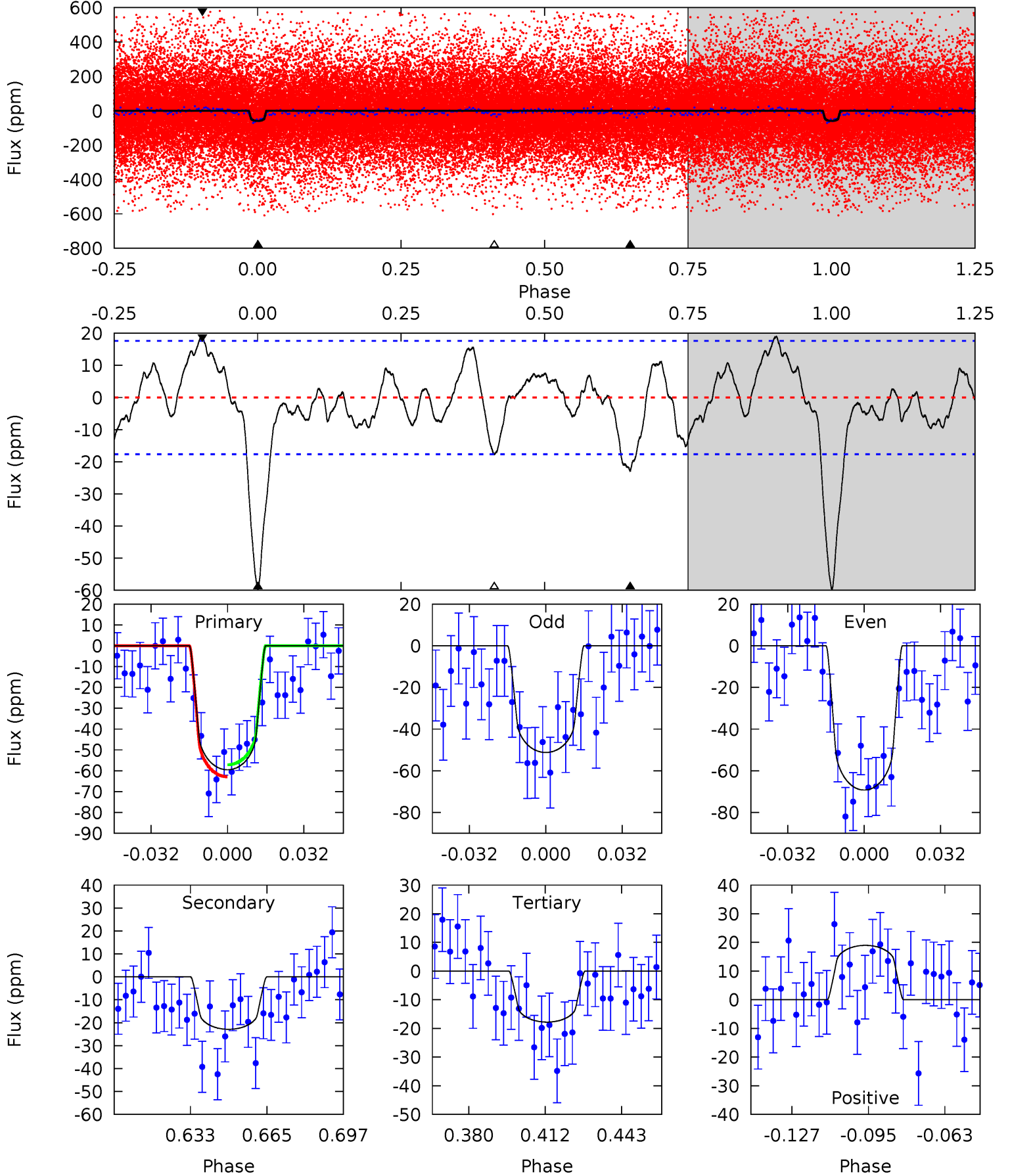
TCE 005177859-03 P= 5.558440 Days $T_0=134.082386$ (BKJD)



DV Model-Shift Uniqueness Test

005177859-03, P = 5.558420 Days, E = 128.532288 Days

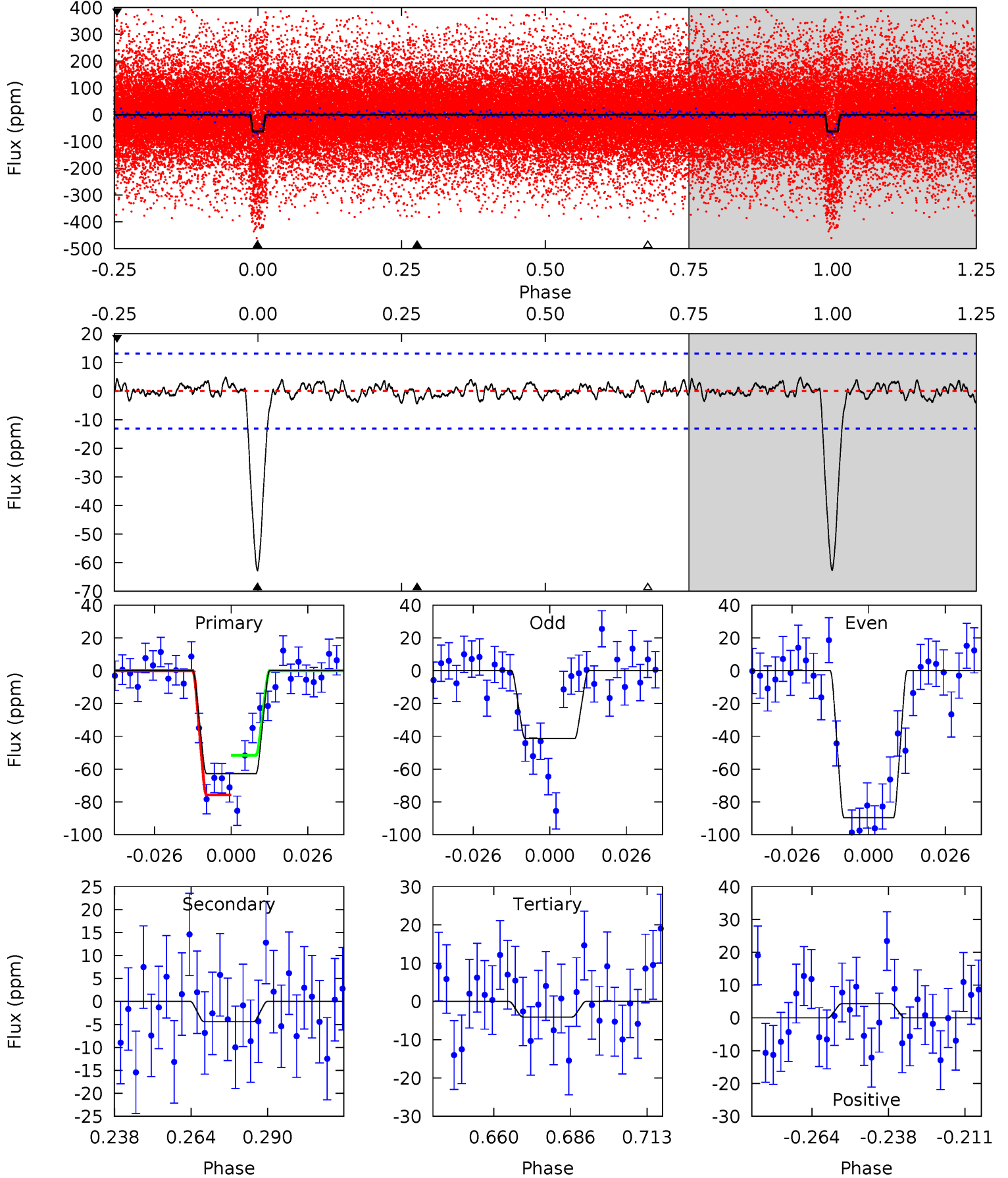
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	6.23	4.84	5.17	4.80	2.15	2.00	11.4	11.0	1.38	1.06	2.46	1.16	0.24	0.78



Alt Model-Shift Uniqueness Test

005177859-03, P = 5.558440 Days, E = 128.523946 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.1	1.63	1.49	1.58	4.84	2.22	0.66	21.6	21.5	0.13	0.05	8.92	0.98	0.07	0



Stellar Parameters For KIC 005177859

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5839^{+156}_{-174}	$4.279^{+0.175}_{-0.175}$	$0.120^{+0.200}_{-0.300}$	$1.227^{+0.360}_{-0.270}$	$1.044^{+0.137}_{-0.125}$	$0.796^{+0.725}_{-0.381}$
	+3%/-3%	+4%/-4%	+167%/-250%	+29%/-22%	+13%/-12%	+91%/-48%
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 005177859-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-23 ± 4	$1.09^{+0.46}_{-0.43}$	1600^{+116}_{-107}	4624^{+1063}_{-584}	40^{+71}_{-21}
Alt.	-4 ± 3	$1.11^{+0.48}_{-0.45}$	1602^{+119}_{-106}	3391^{+620}_{-537}	$6.949^{+14.141}_{-4.547}$

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 $A_{obs} \gg 1.0$

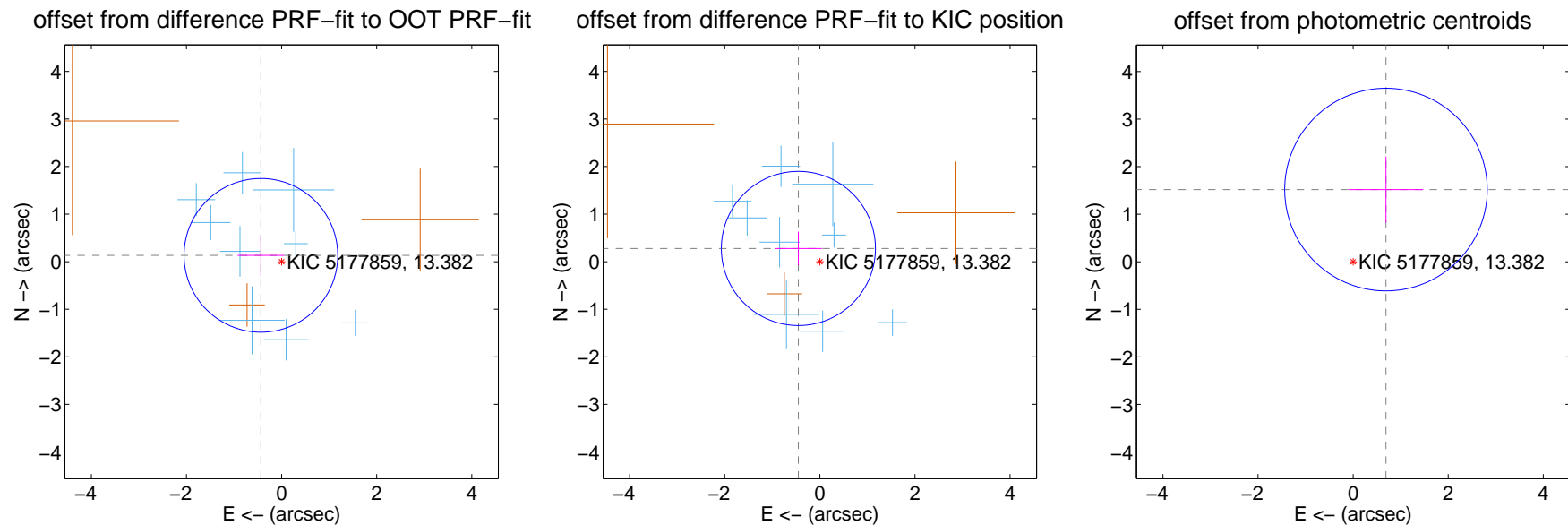
DV Centroid Data

Supplemental centroid analysis for 005177859-03. Kepler magnitude: 13.38. Transit SNR 7.95

There are 9 quarters with good PRF difference image offsets

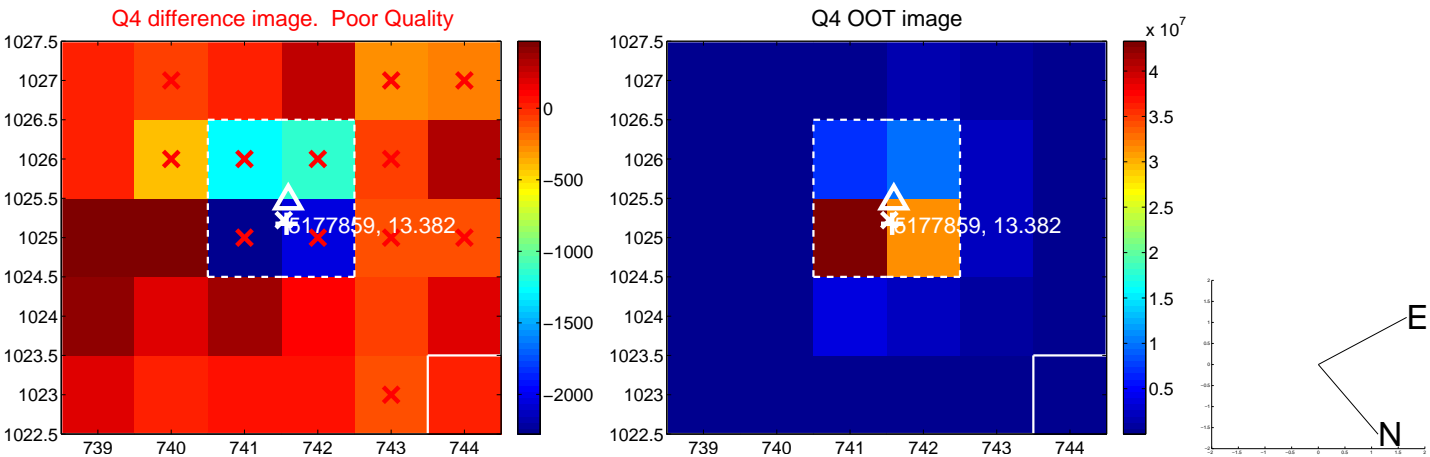
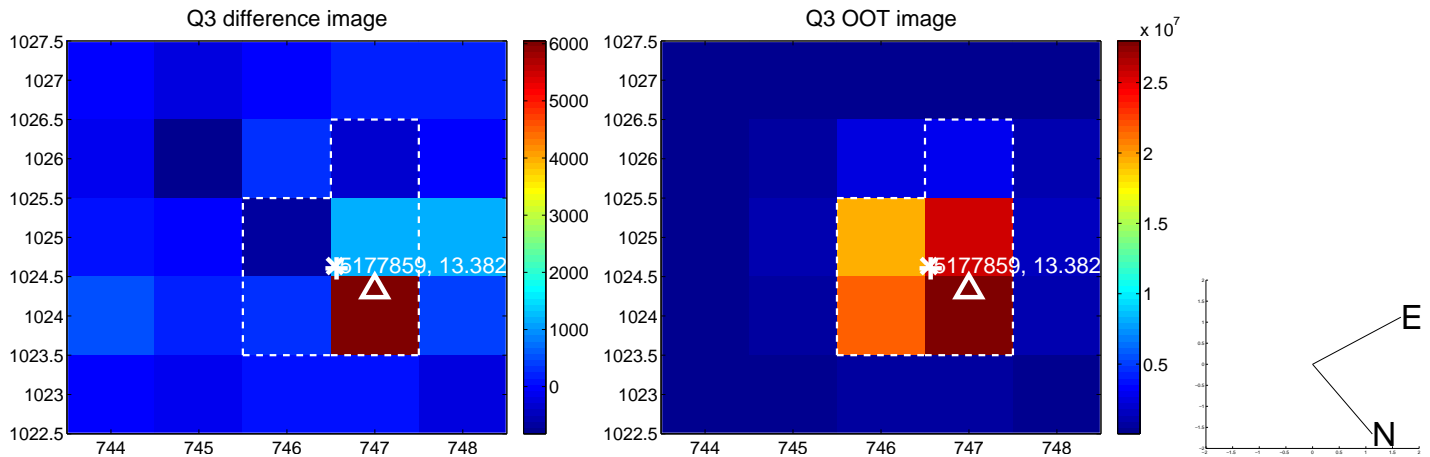
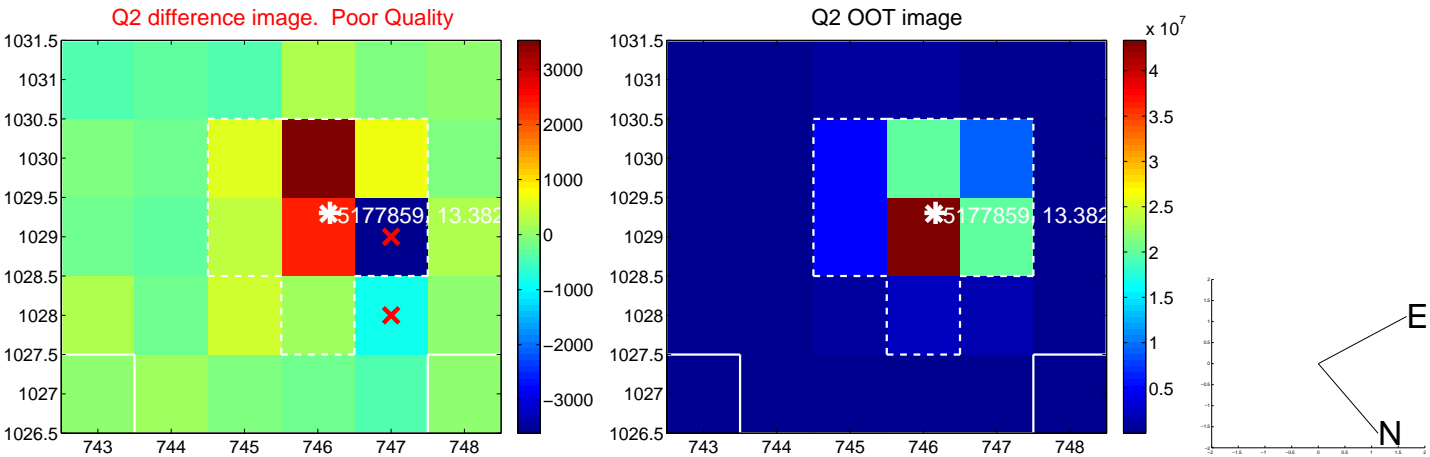
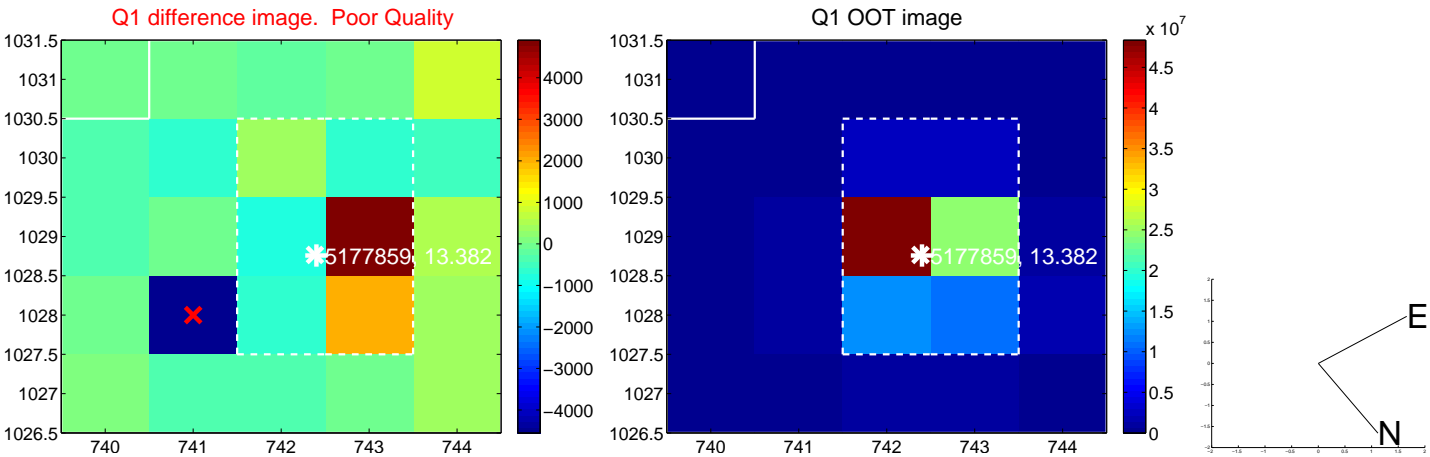
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.455 ± 0.539	0.84	0.435 ± 0.491	0.133 ± 0.435
PRF-fit source offset from KIC position	0.530 ± 0.540	0.98	0.451 ± 0.496	0.278 ± 0.354
photometric centroid source offset	1.67 ± 0.71	2.35	-0.69 ± 0.78	1.52 ± 0.69

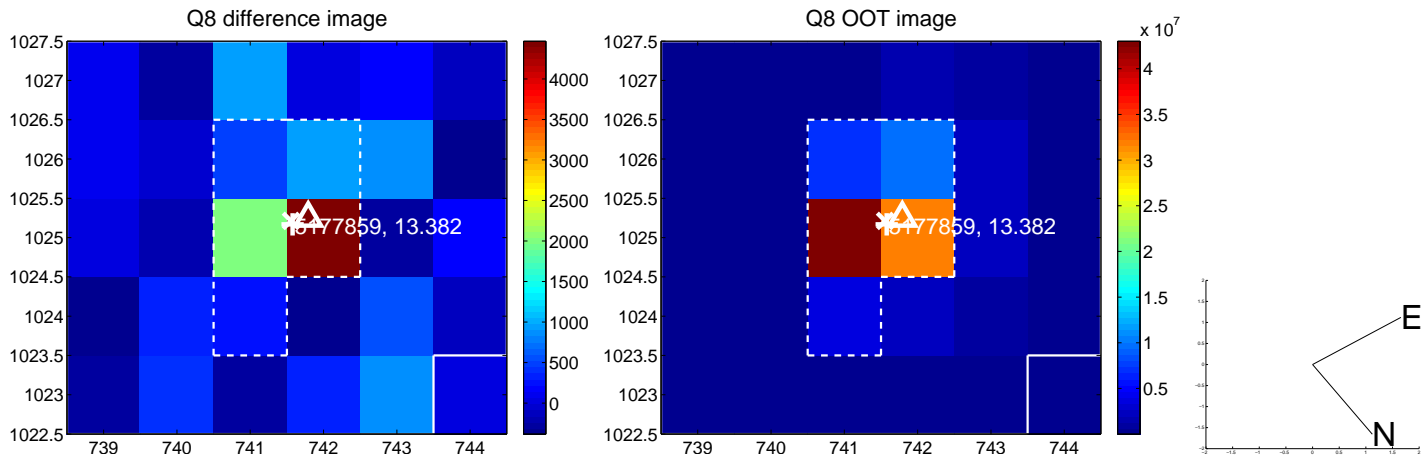
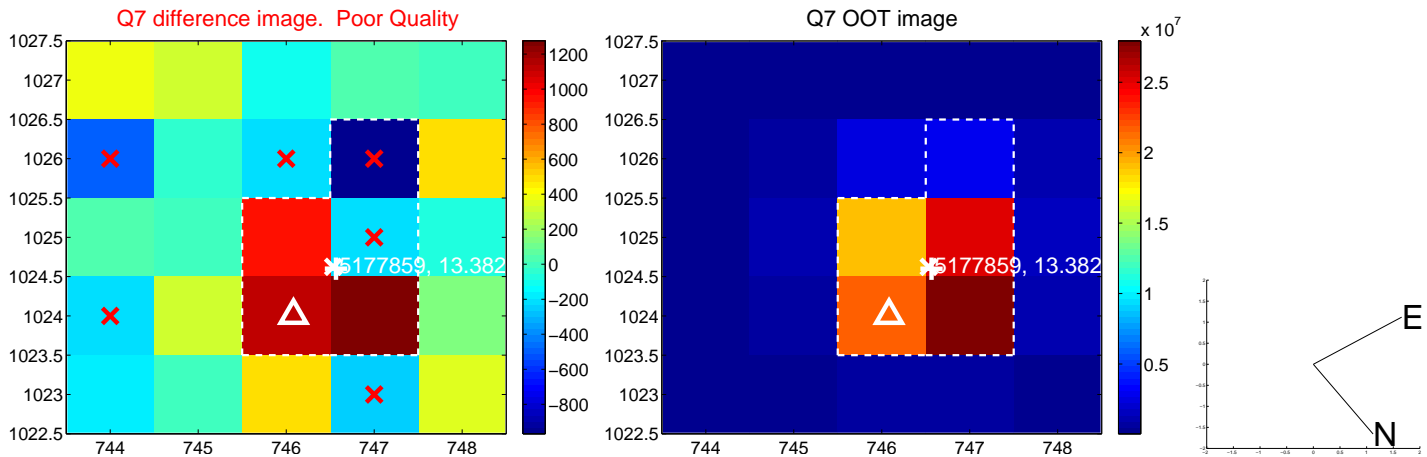
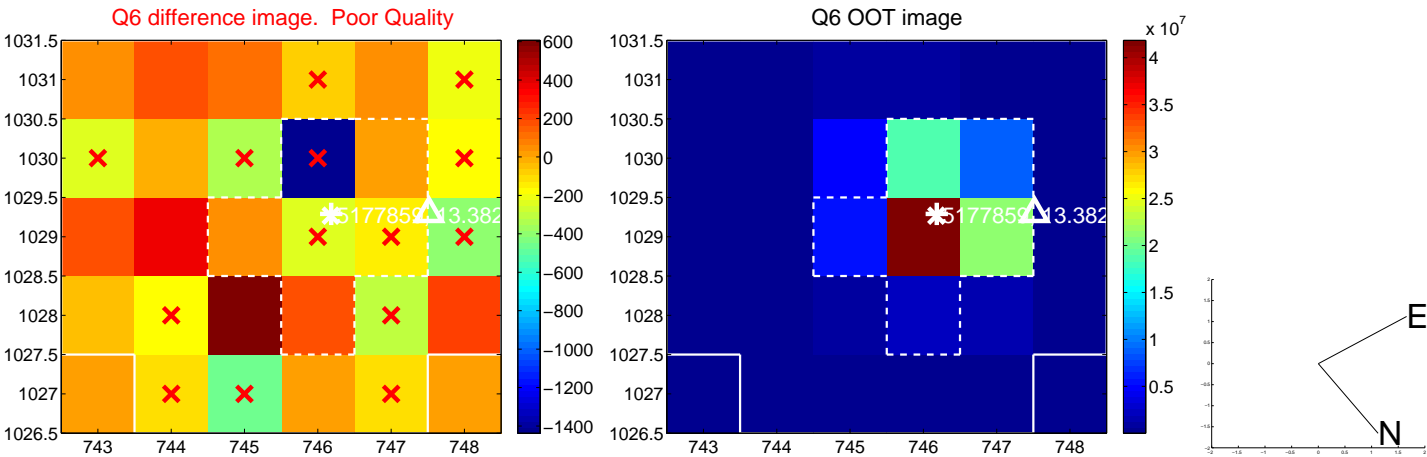
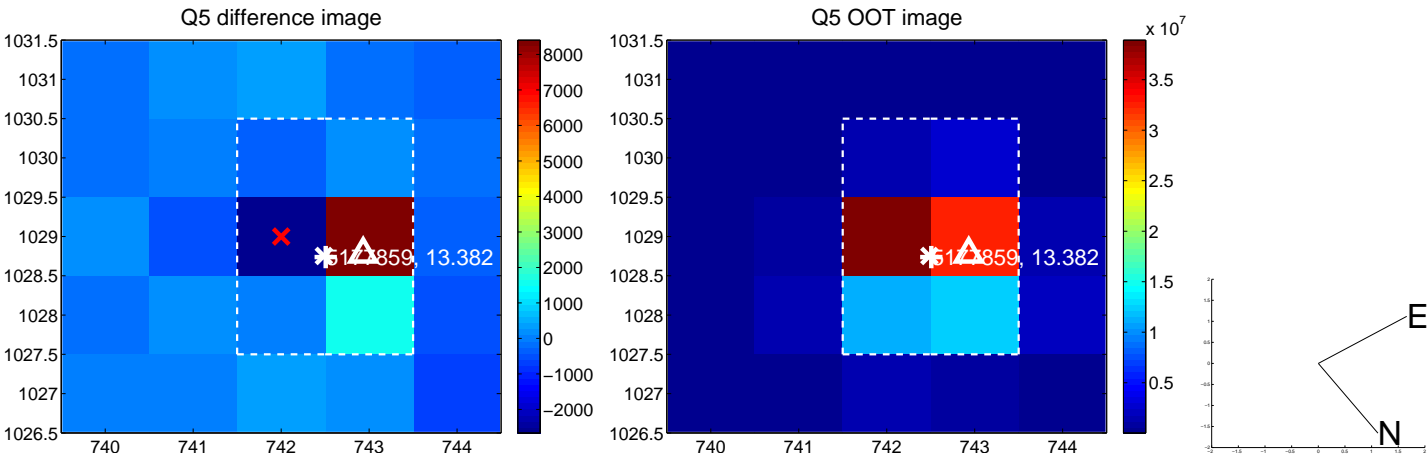


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

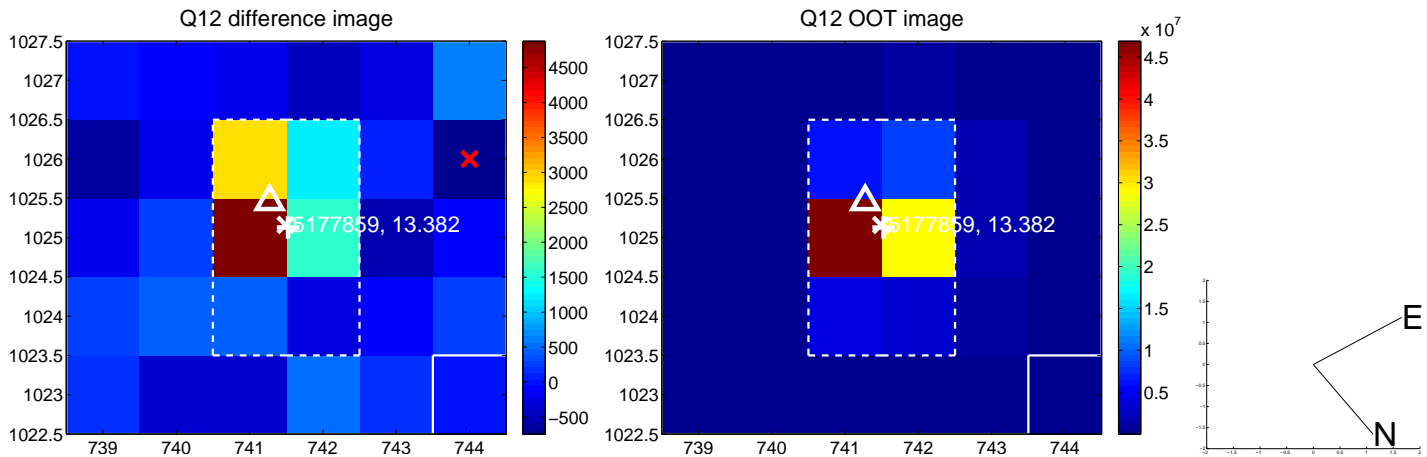
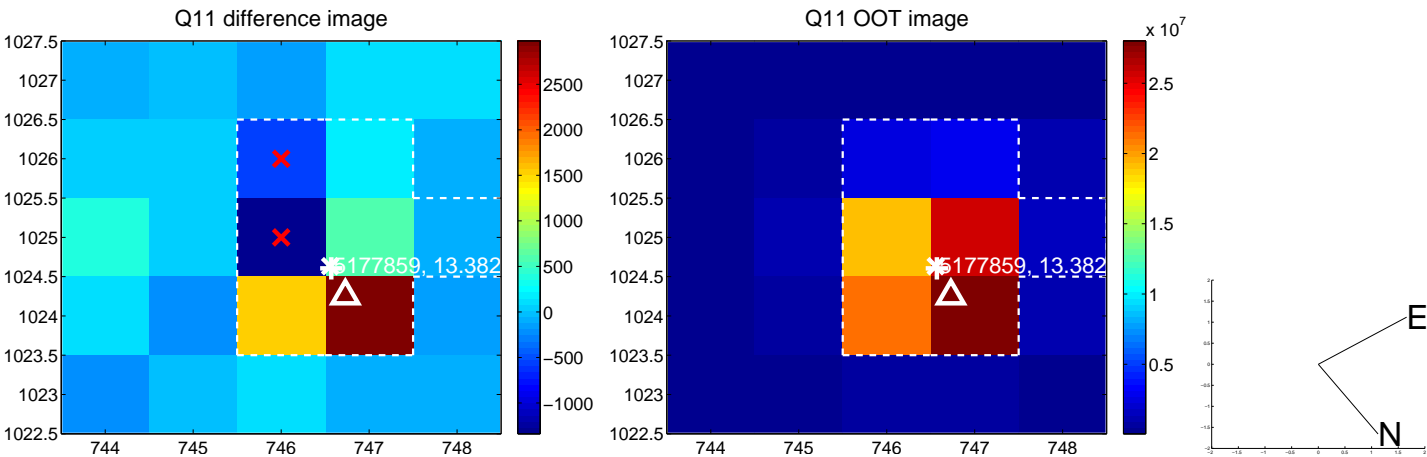
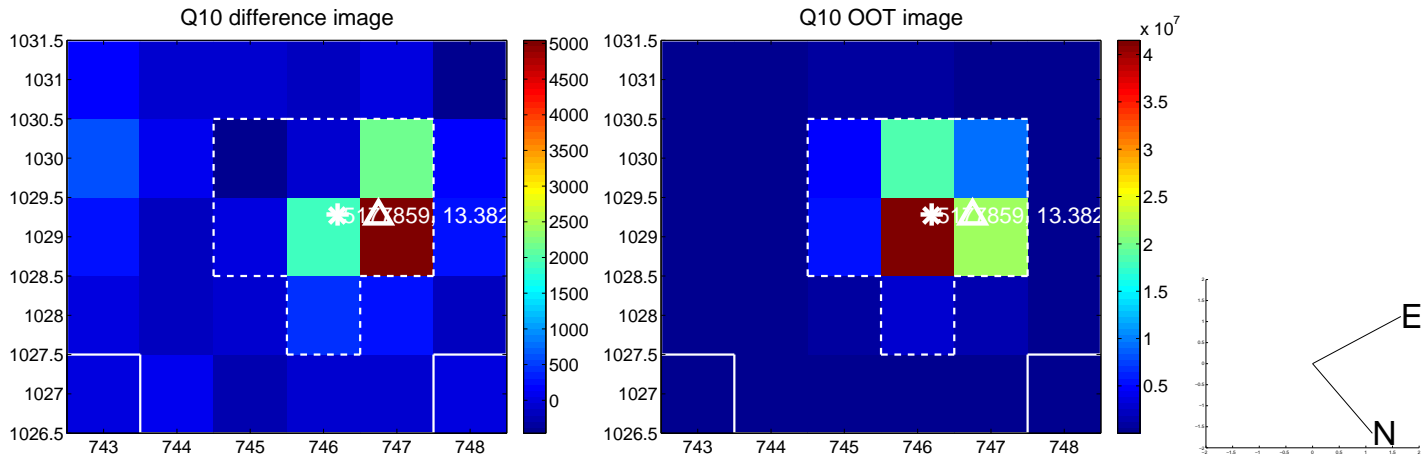
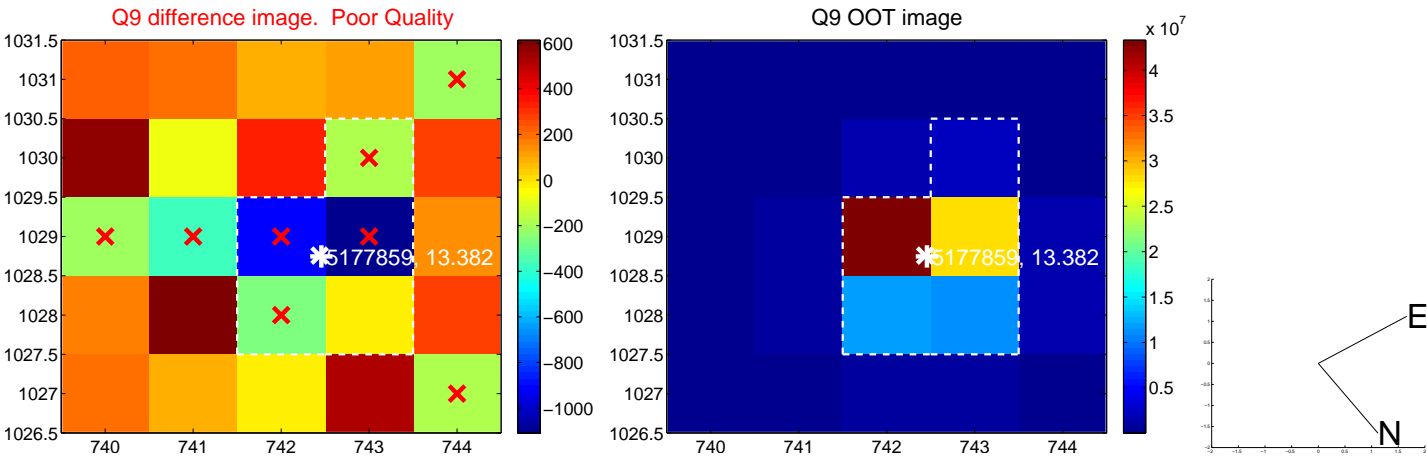
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



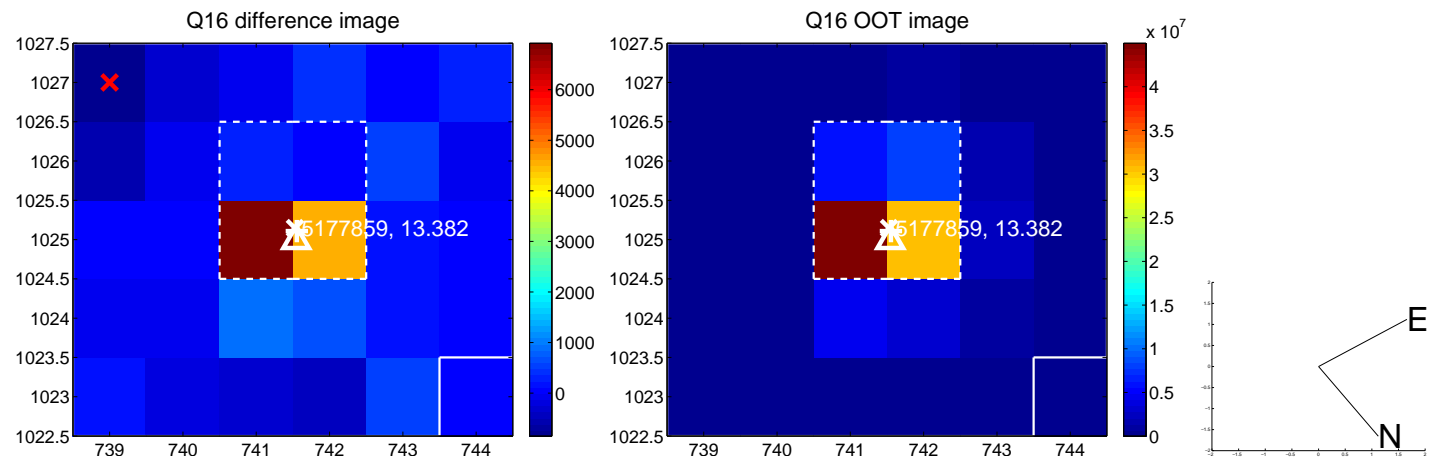
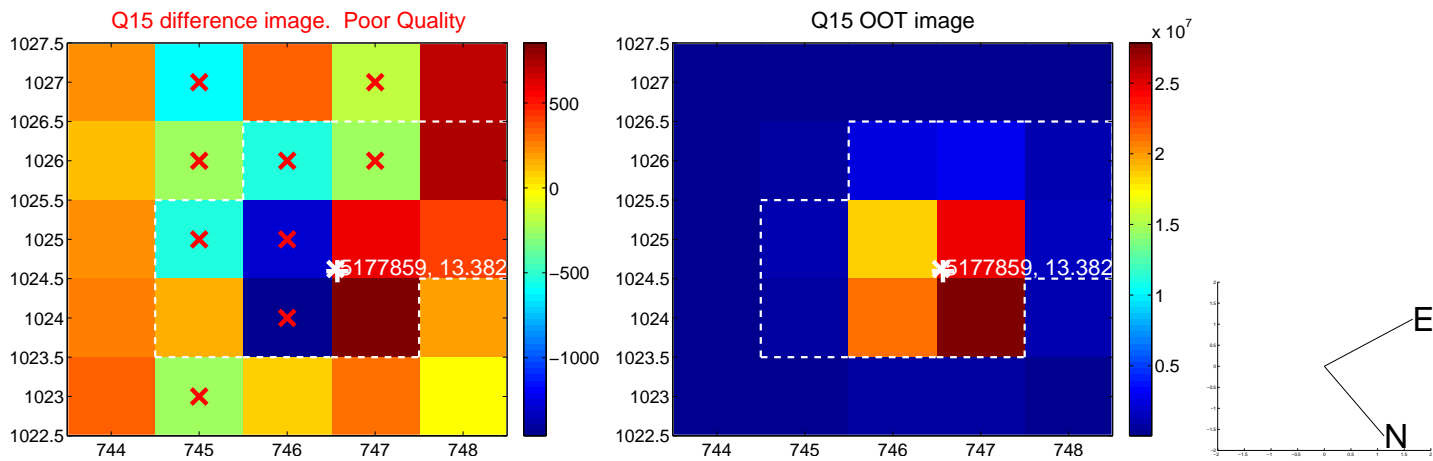
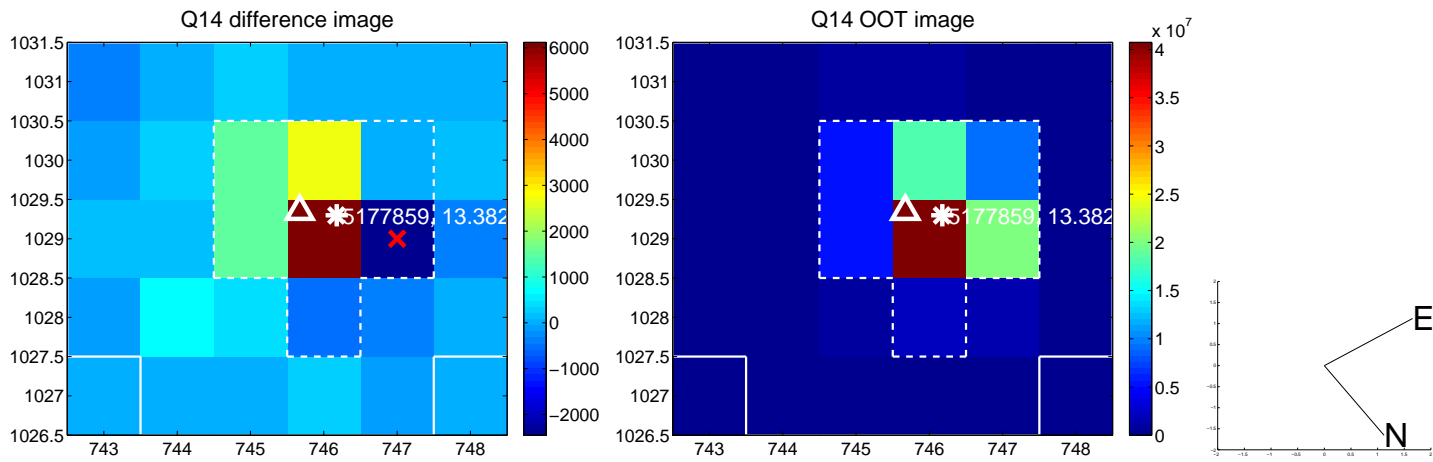
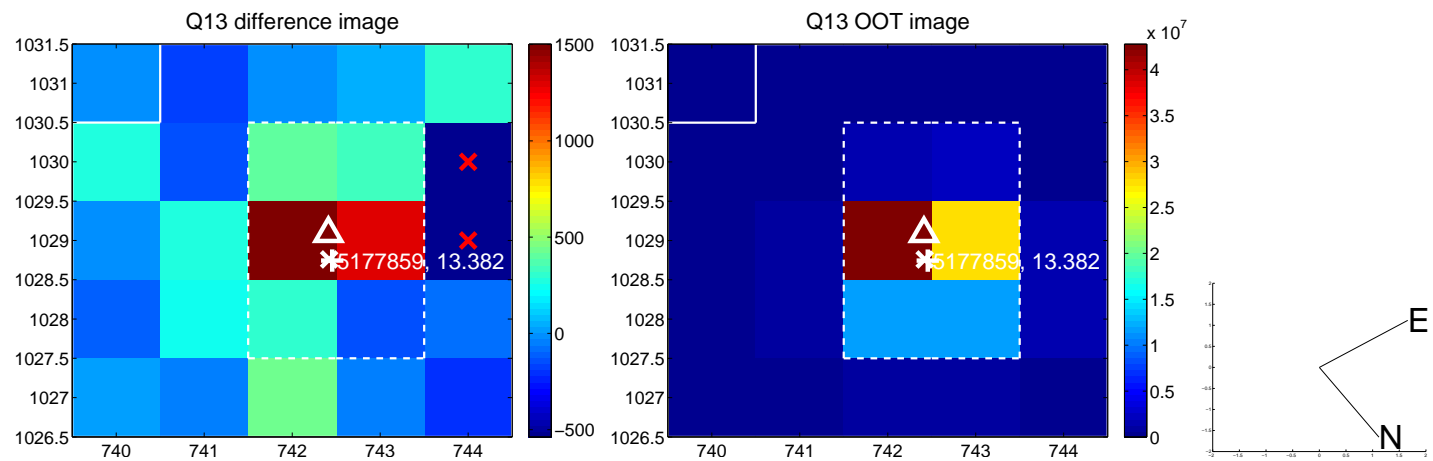
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



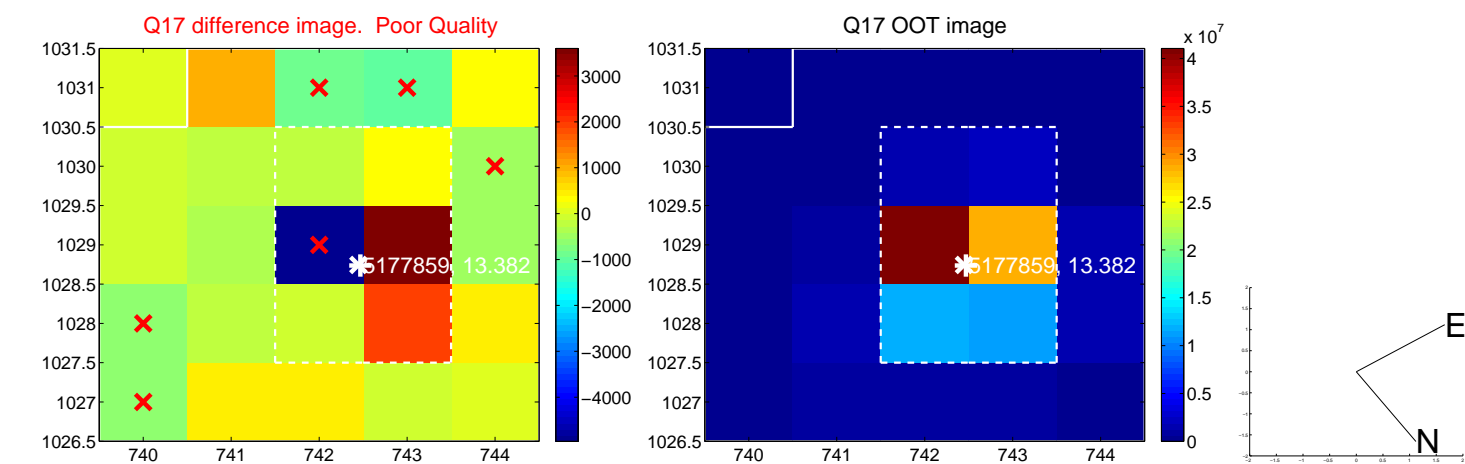
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



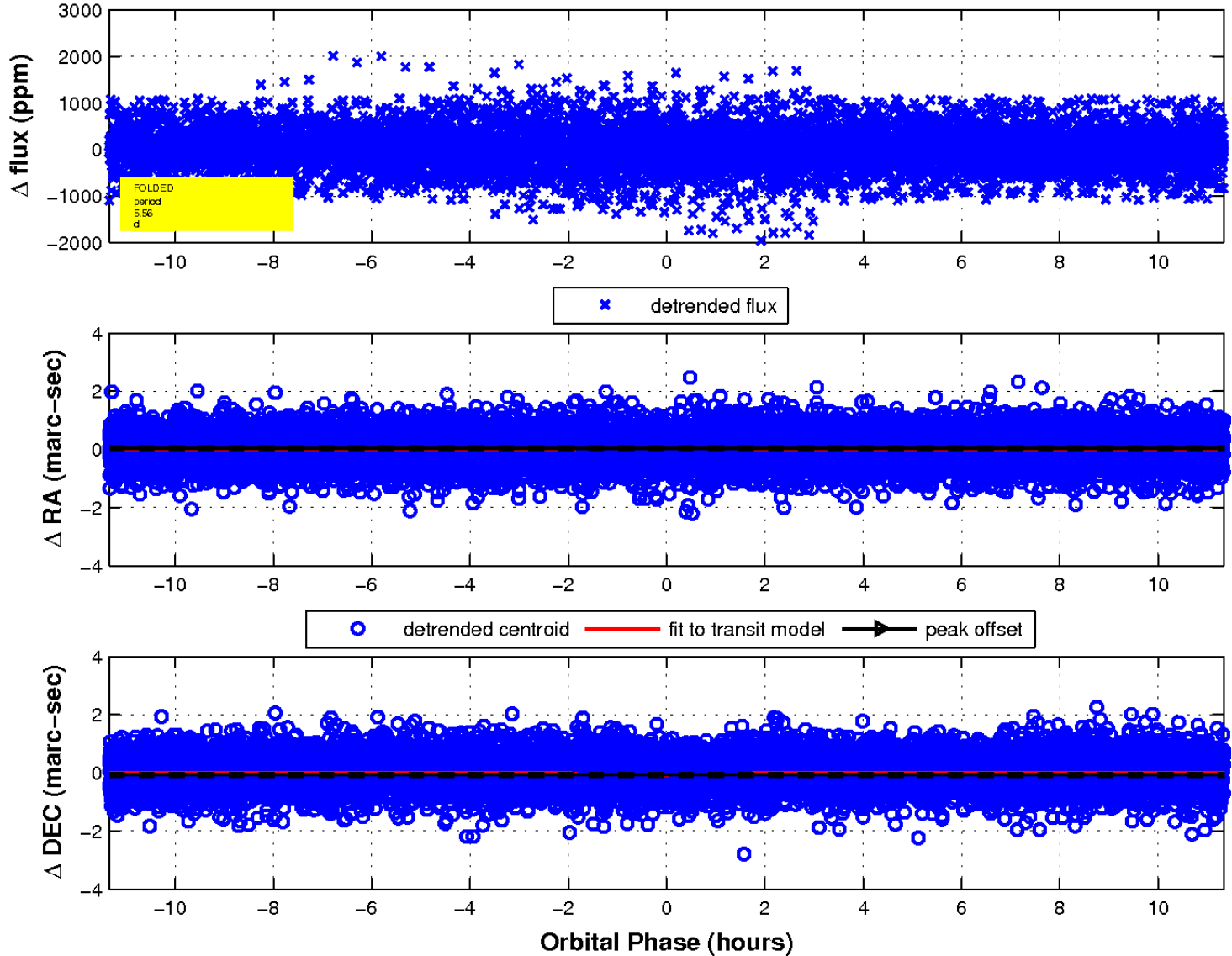
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



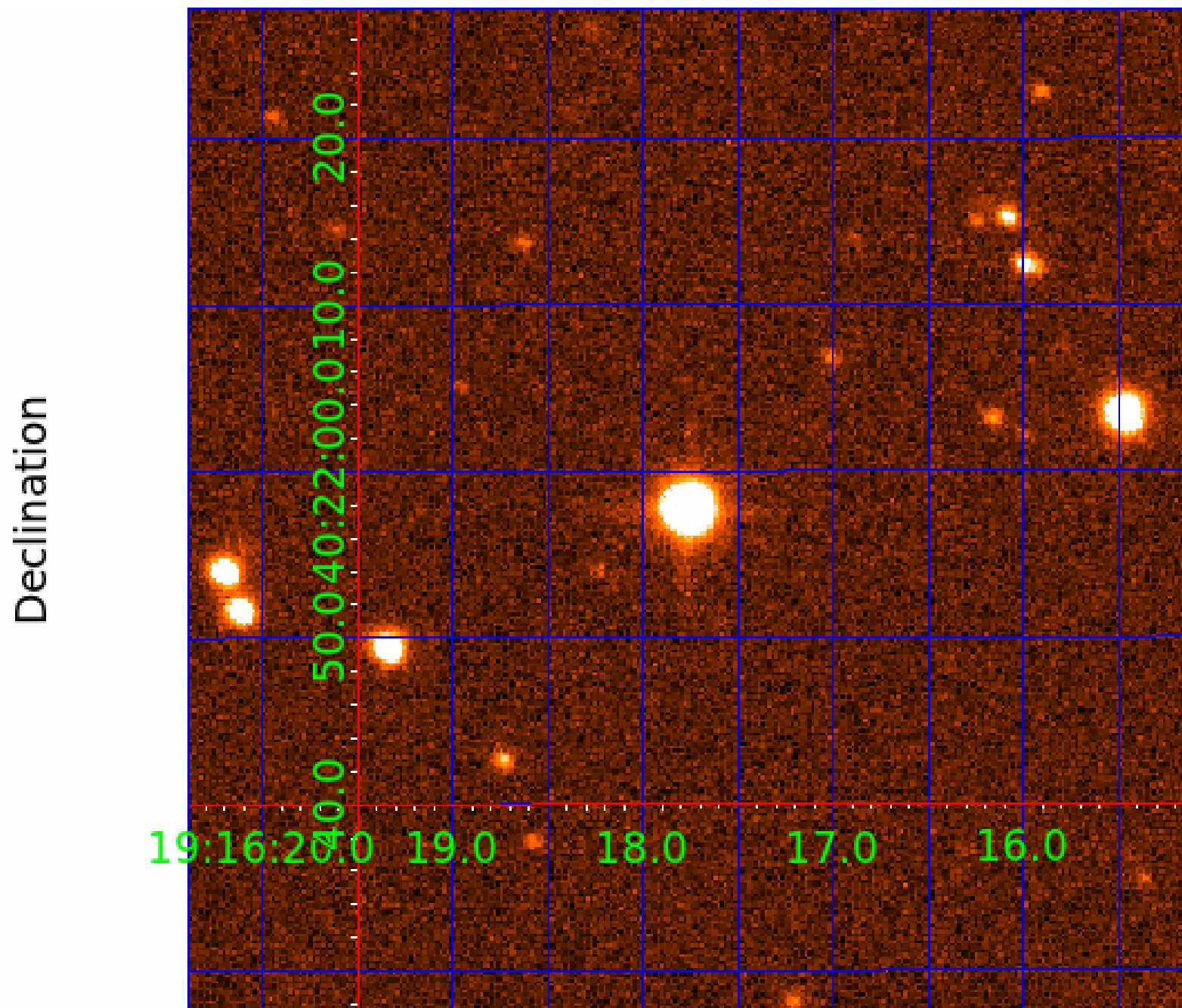
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 3 of 4



UKIRT Image



KIC 005177859

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})
005177859-01	OBS	4246.01	6.984718	135.998947	88.4	2.857	11.0	11.6	1.23	5839	1.52	297.81
005177859-02	OBS	4246.02	8.756238	132.478966	87.2	2.995	9.0	10.3	1.23	5839	1.36	220.32
005177859-03	OBS	No	5.558420	134.090708	53.9	3.780	7.3	7.9	1.23	5839	1.07	403.84
005177859-04	OBS	No	560.465306	418.793225	346.2	4.500	8.5	-1.0	1.23	5839	2.26	0.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005177859-01	OBS	FP	0.36	1	0	0	0	LPP_DV
005177859-02	OBS	PC	0.98	0	0	0	0	NO_COMMENT
005177859-03	OBS	FP	0.00	1	0	0	0	LPP_DV
005177859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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 005177859-04

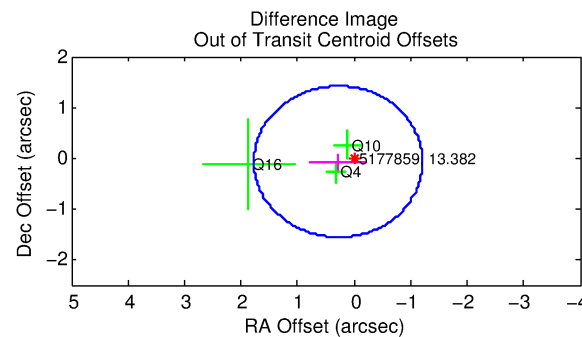
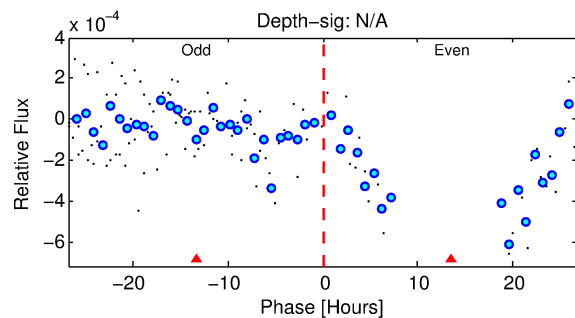
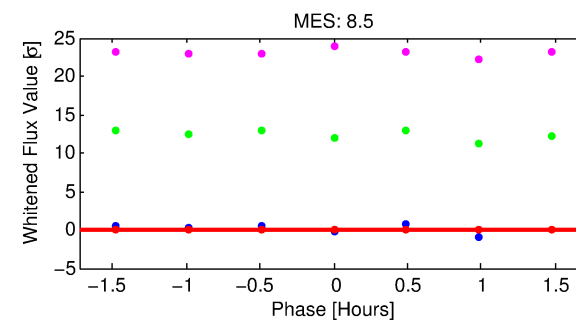
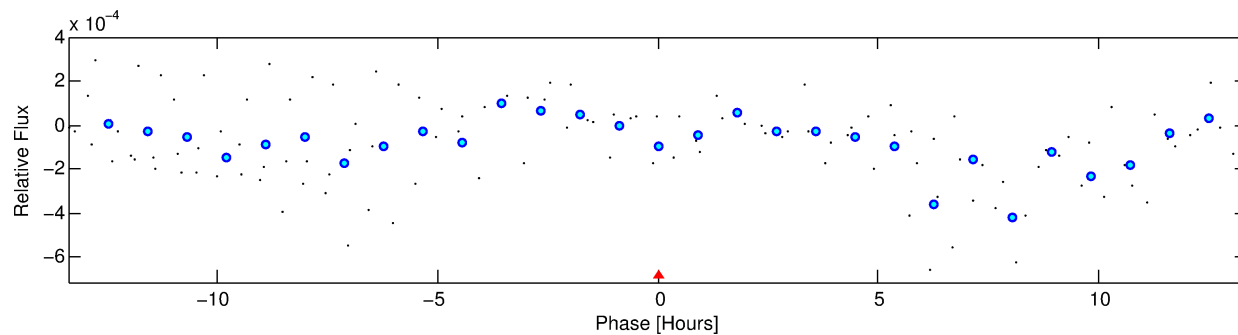
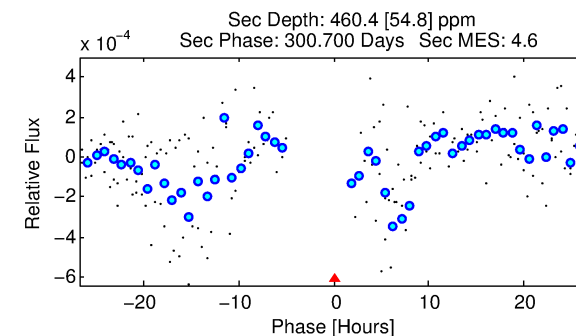
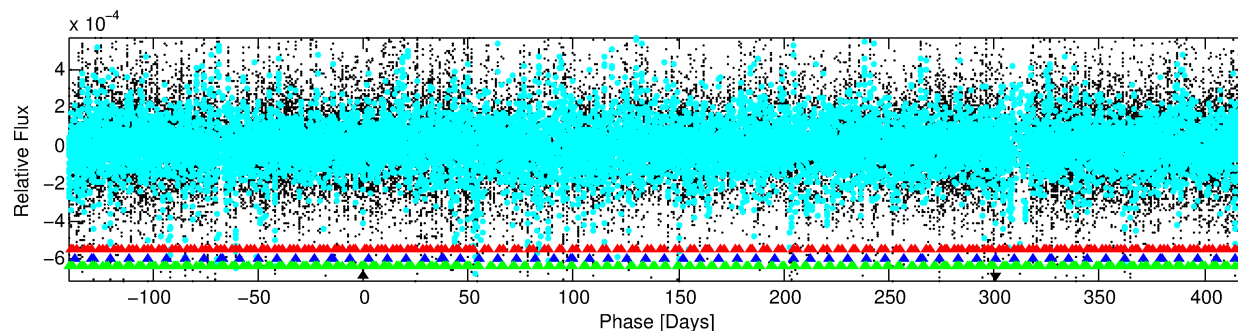
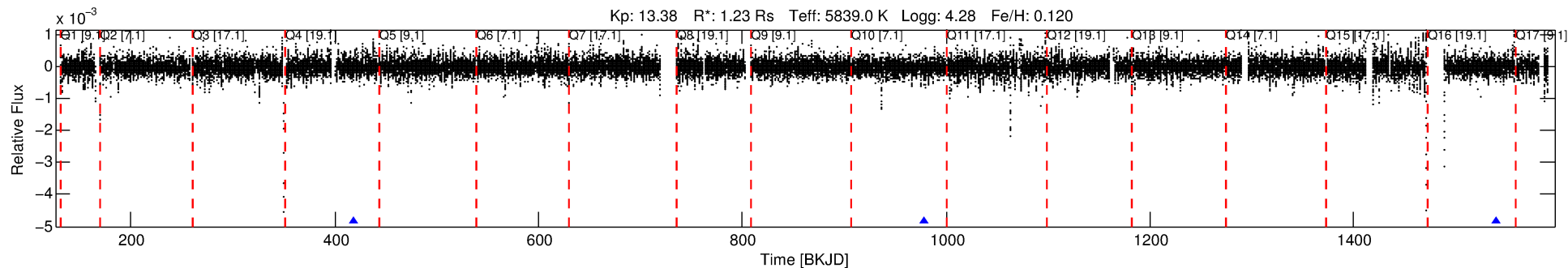
No Significant Match Found

DV One-Page Summary

KIC: 5177859 Candidate: 4 of 4 Period: 560.465 d

KOI: K04246 Corr: No Ephemeris Match

Kp: 13.38 R*: 1.23 Rs Teff: 5839.0 K Logg: 4.28 Fe/H: 0.120



TPS TCE Results:

Period = 560.46531 d

Epoch = 418.7932 BKJD

DV fit results are unavailable

DV Diagnostic Results:

ShortPeriod-sig: 100.0% [2449.42σ]

LongPeriod-sig: N/A

ModelChiSquare2-sig: N/A

ModelChiSquareGof-sig: N/A

Bootstrap-pfa: 5.96e-08

RollingBand-fgt: 1.00 [2/2]

GhostDiagnostic-chr: -0.5562

Centroid-sig: 17.2%

Centroid-so: 37.297 arcsec [0.87σ]

OotOffset-rm: 0.290 arcsec [0.58σ]

KicOffset-rm: 0.316 arcsec [0.66σ]

OotOffset-st: 1/0/2/0 [3]

KicOffset-st: 1/0/2/0 [3]

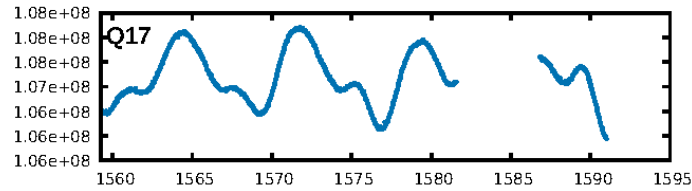
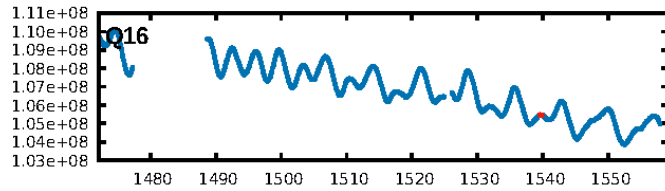
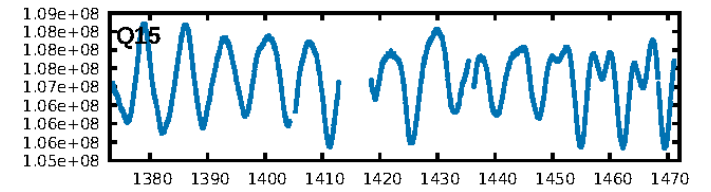
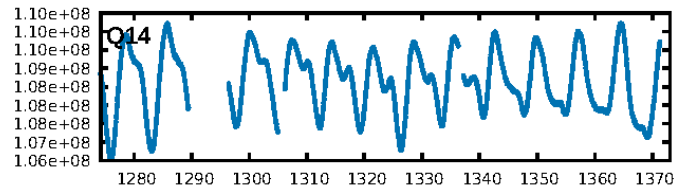
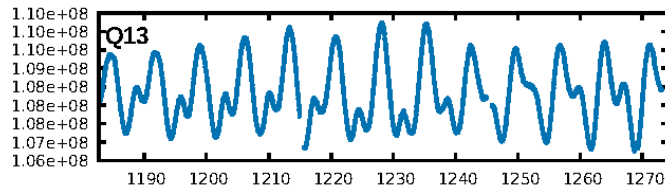
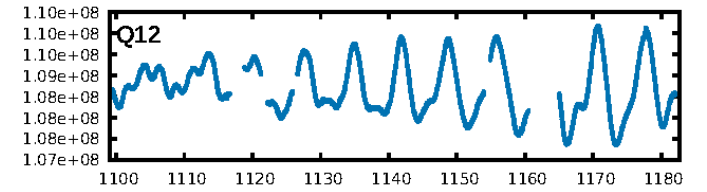
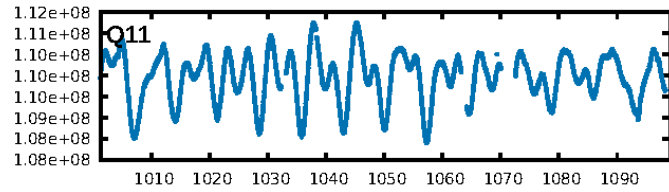
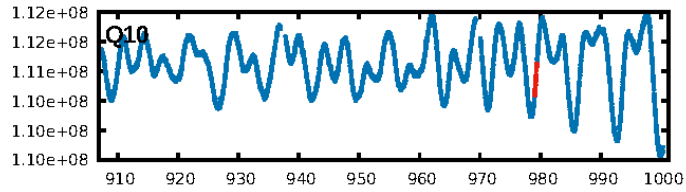
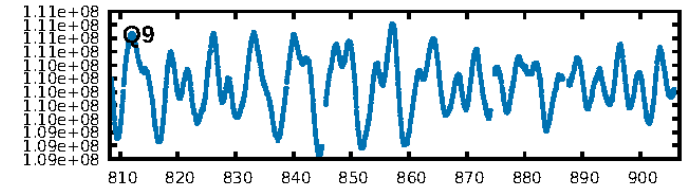
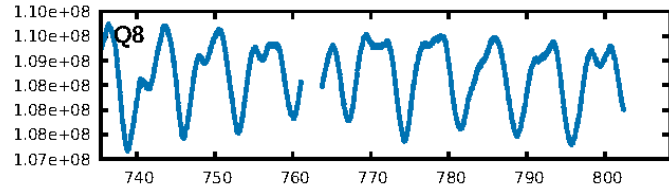
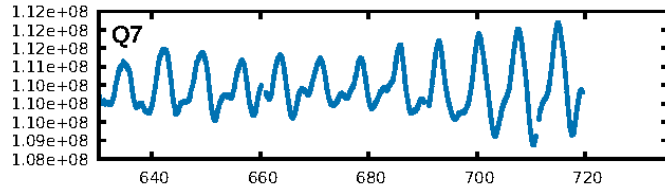
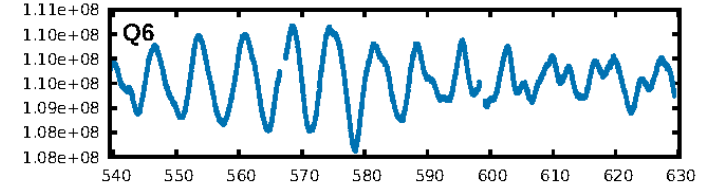
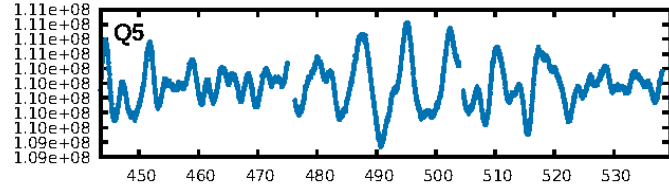
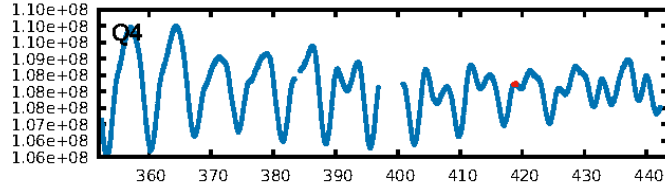
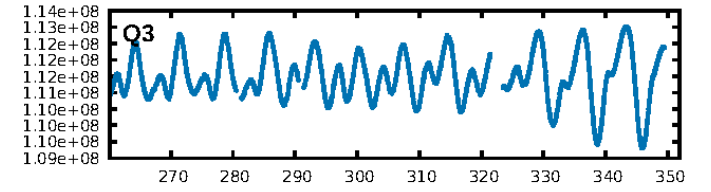
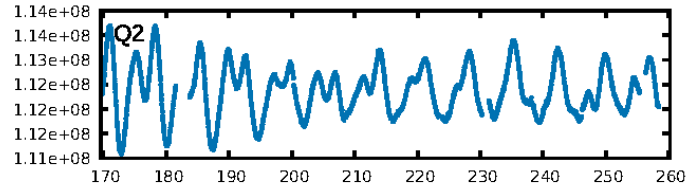
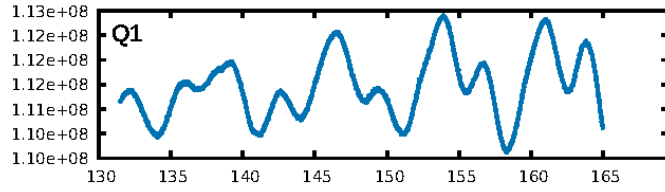
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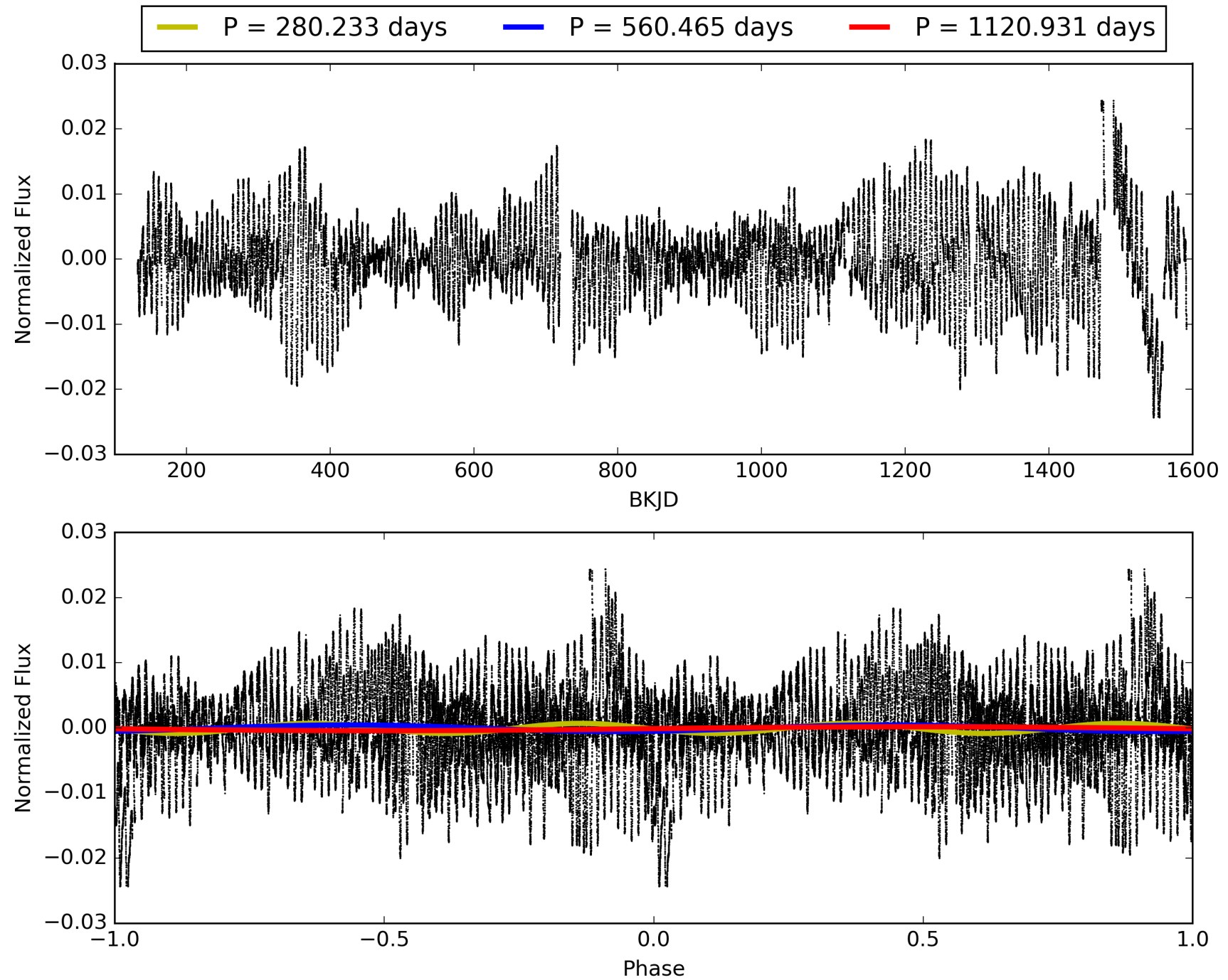
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:03:09 Z

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

TCE 005177859-04, PDC Light Curves

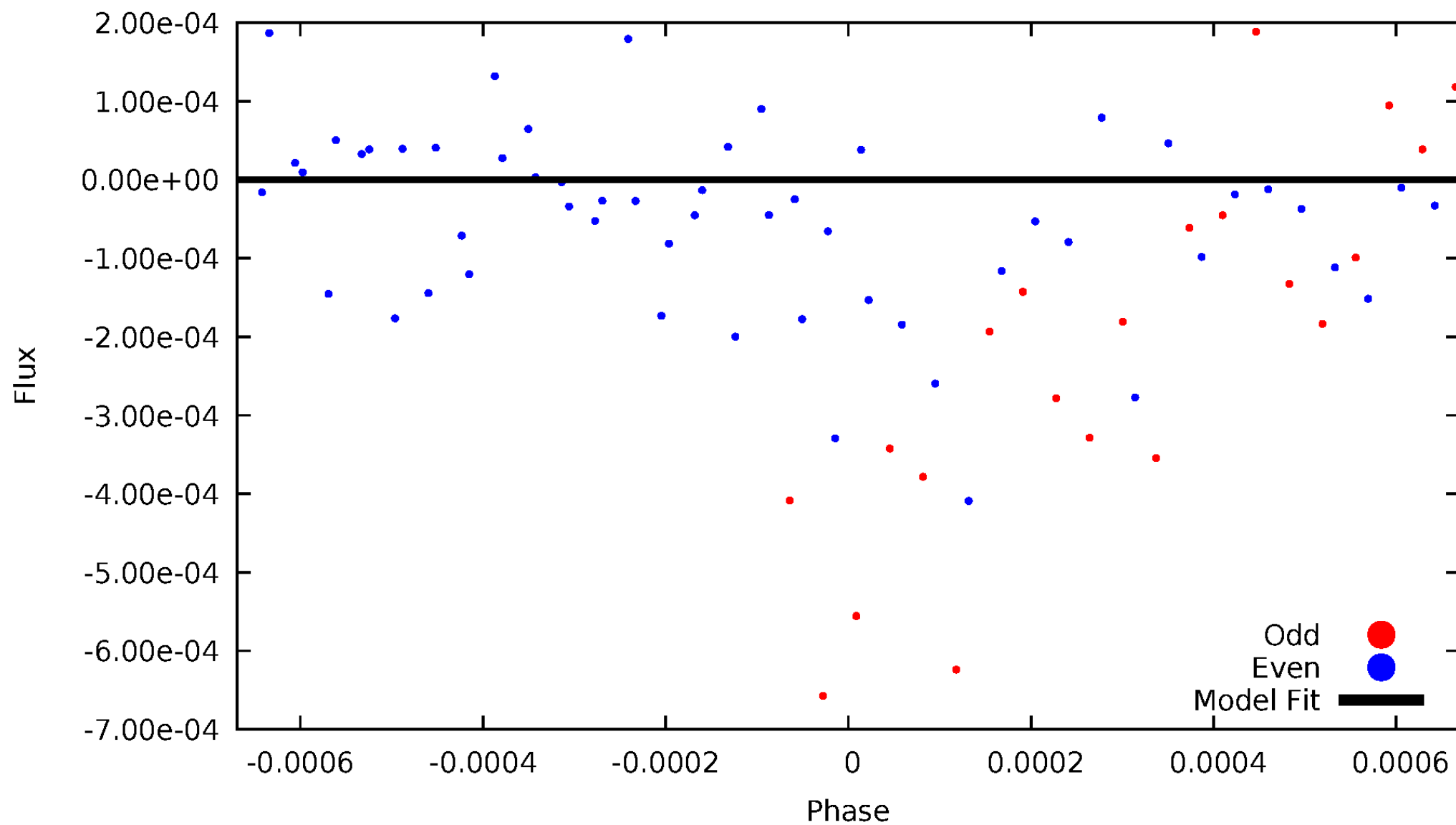


TCE 005177859-04



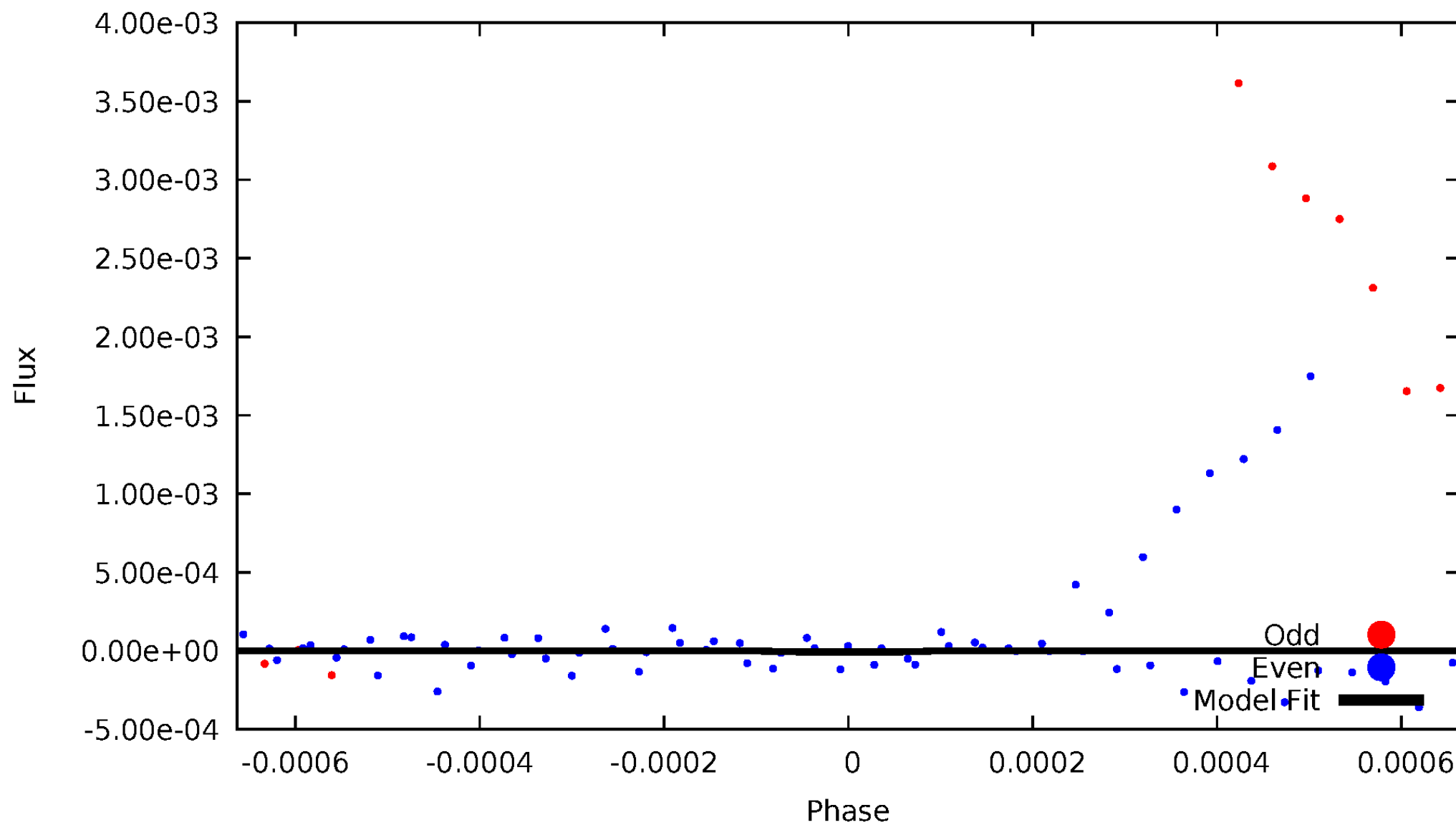
DV Odd/Even

TCE 005177859-04



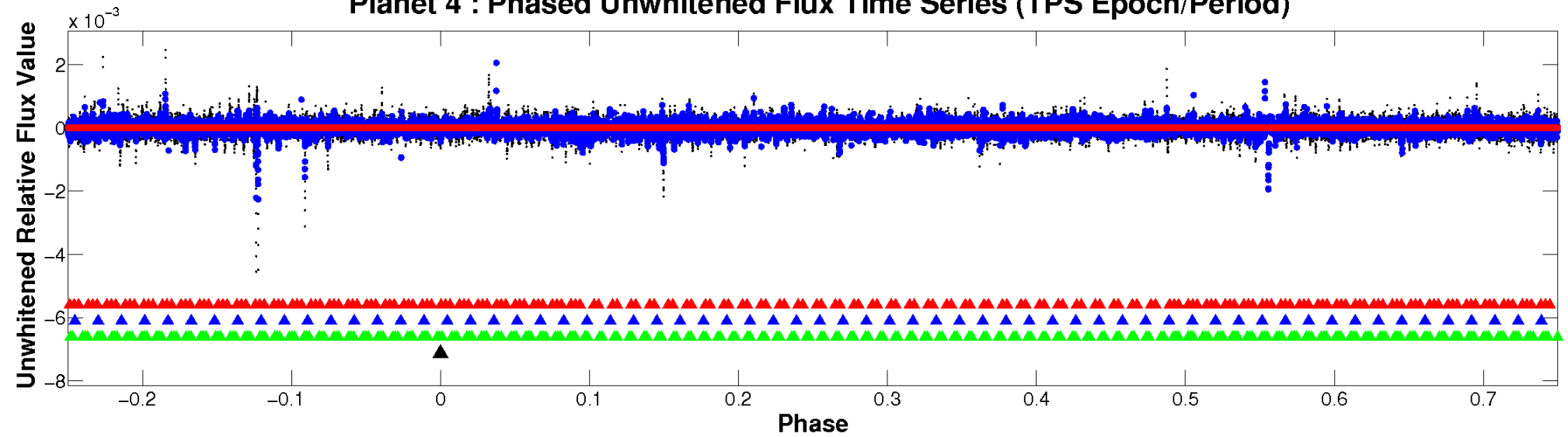
ALT Odd/Even

TCE 005177859-04

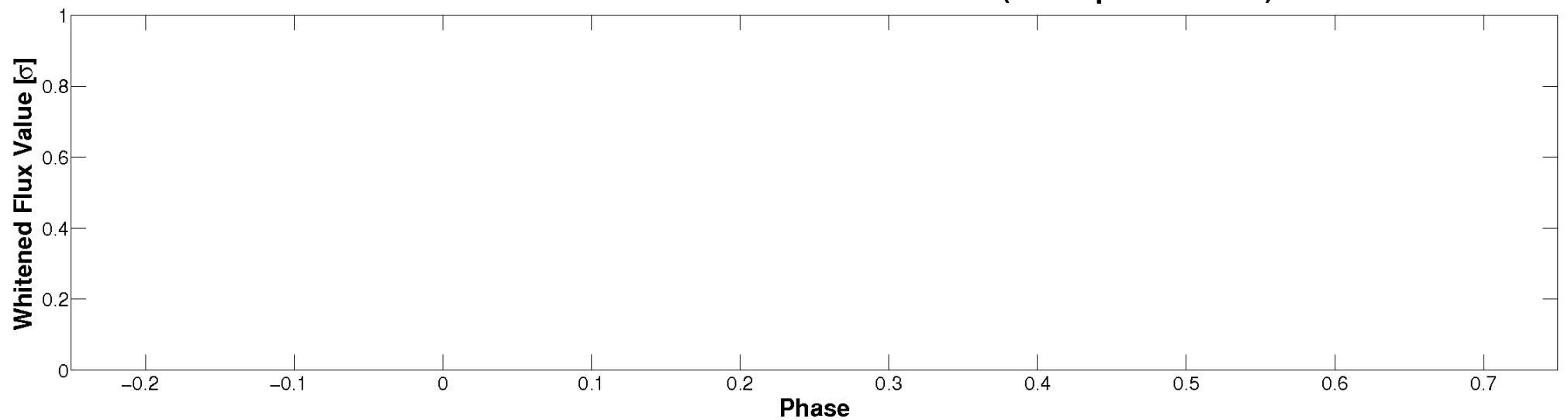


Non-Whitened Vs. Whitened Light Curve

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

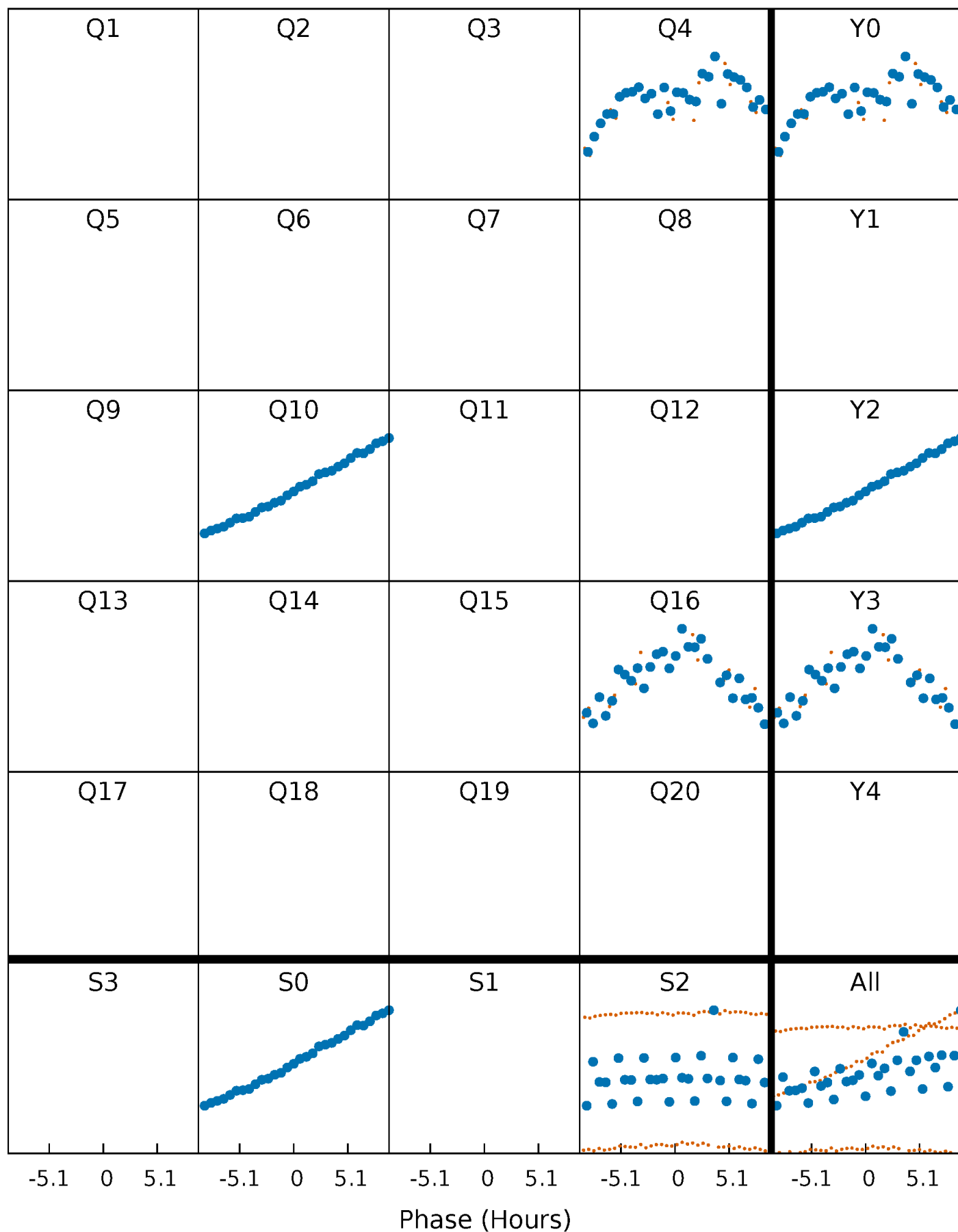


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



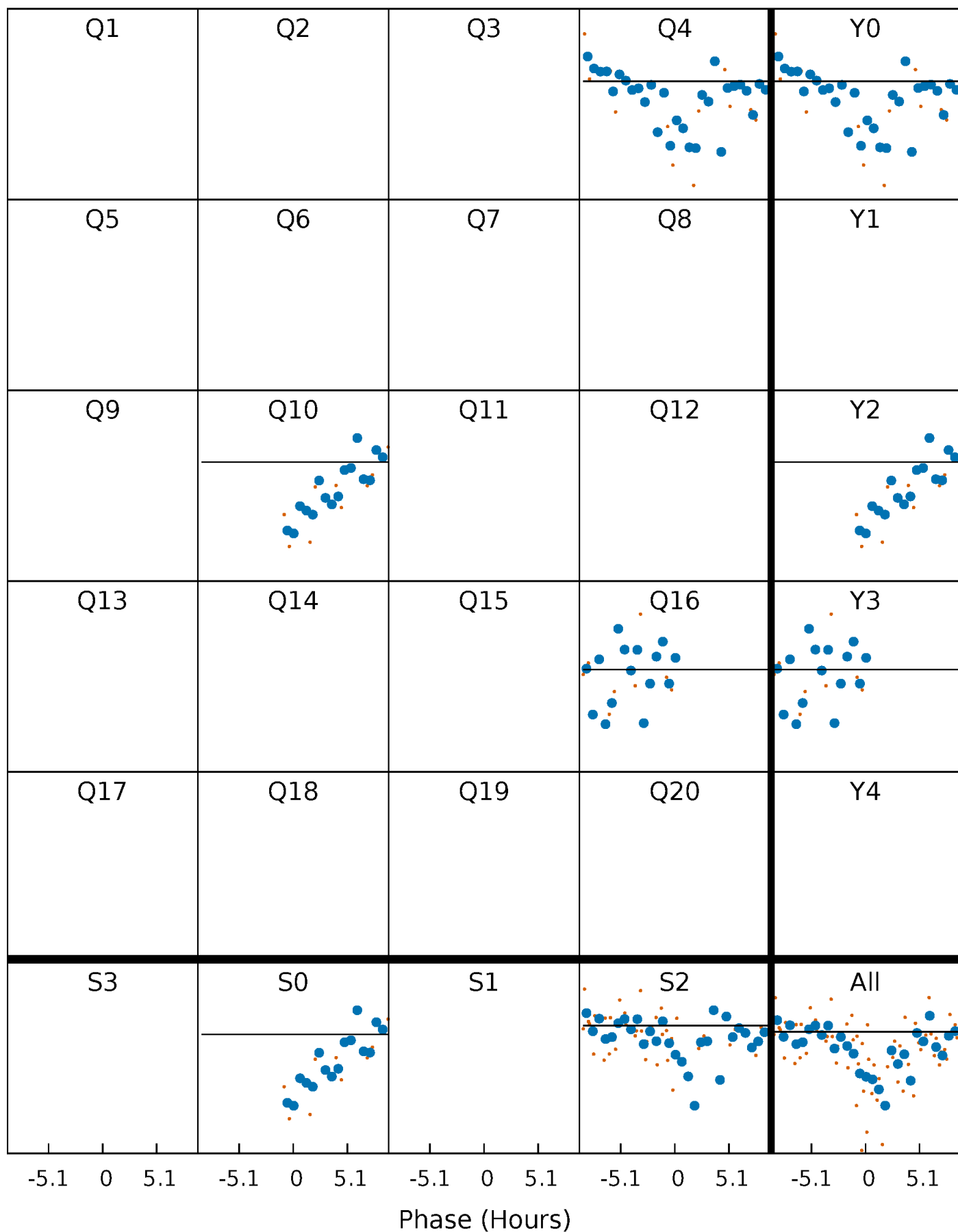
PDC Quarter-Phased Transit Curves

TCE 005177859-04 P=560.465306 Days $T_0=418.793225$ (BKJD)



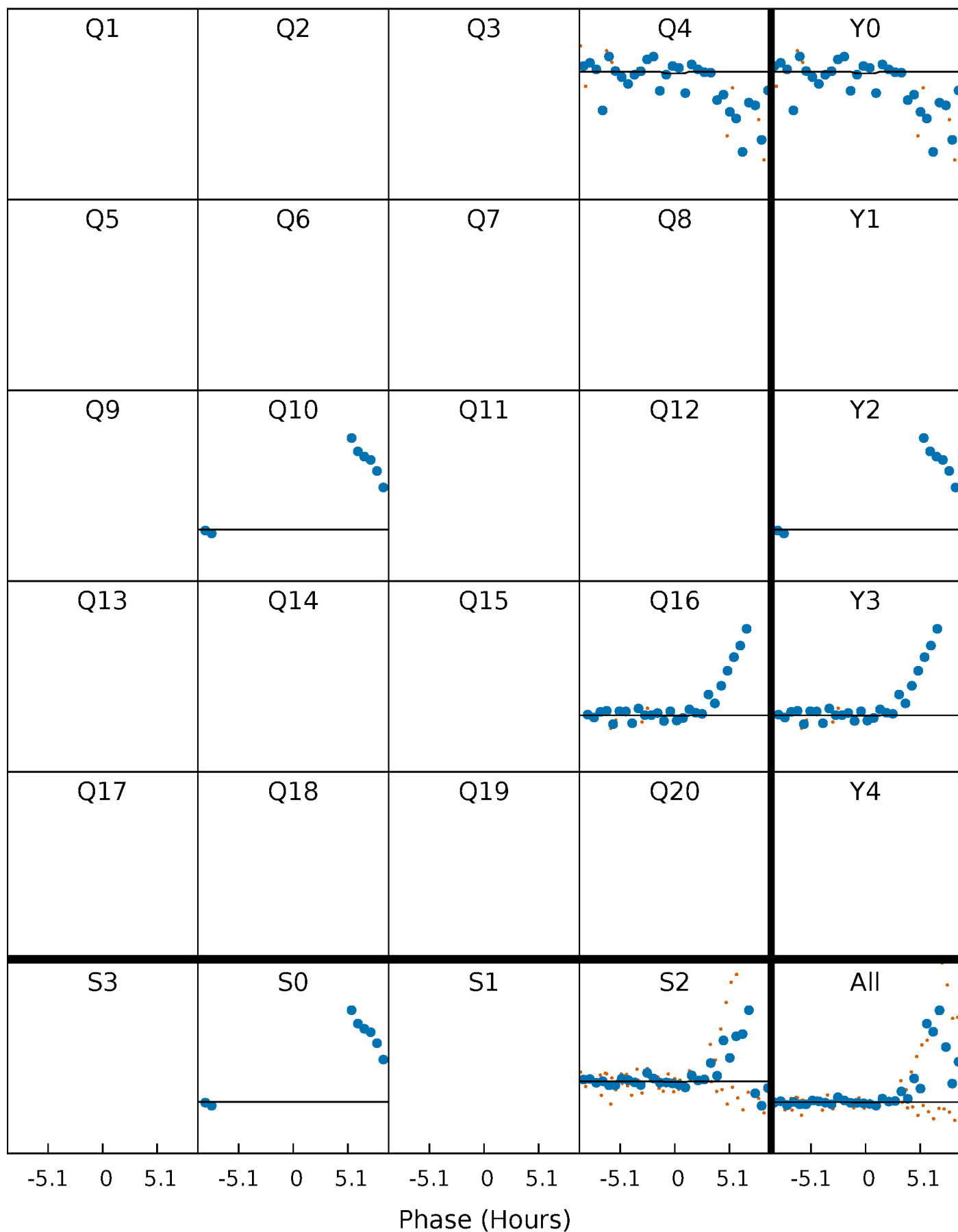
DV Quarter-Phased Transit Curves

TCE 005177859-04 $P=560.465306$ Days $T_0=418.793225$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

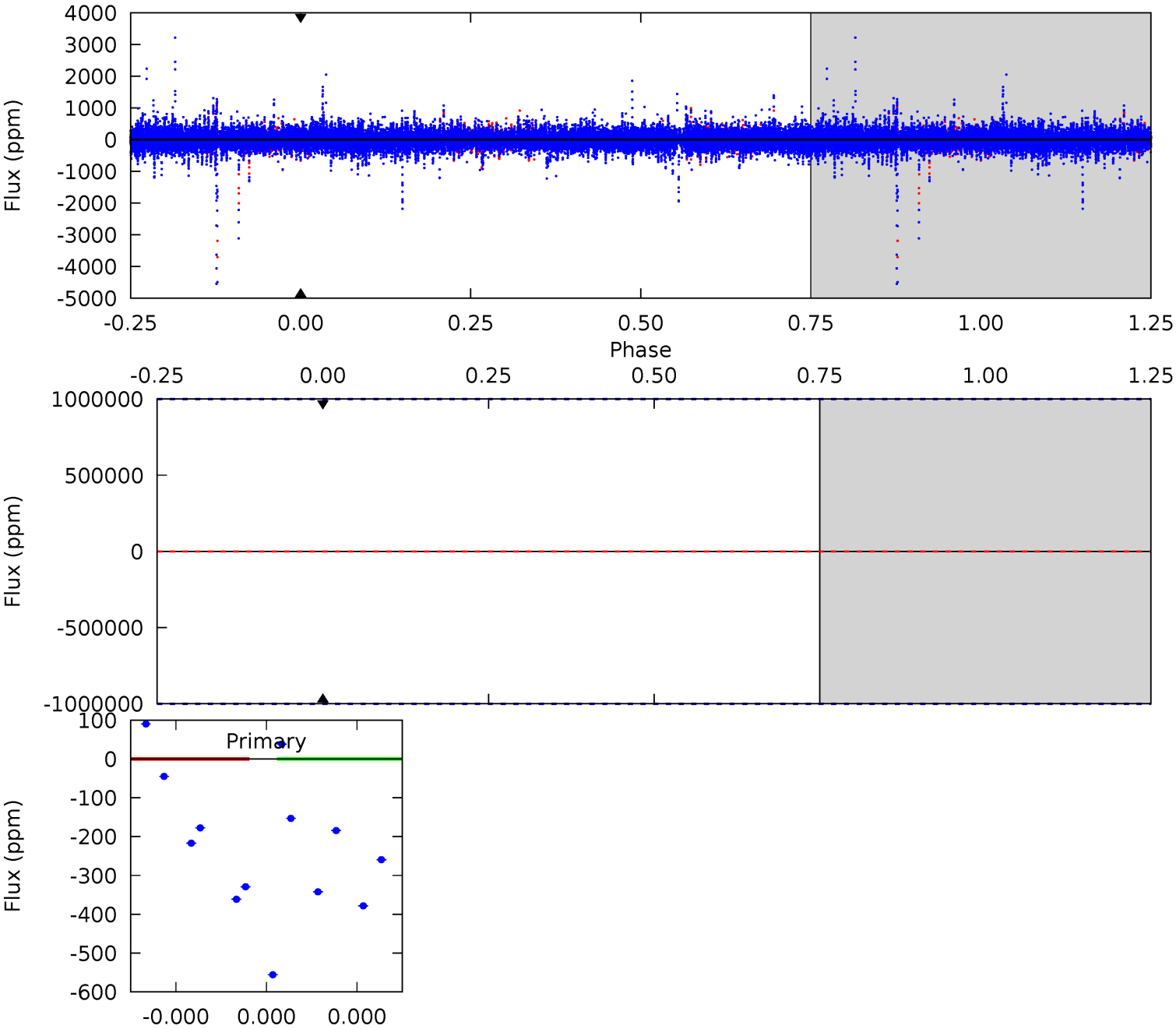
TCE 005177859-04 P=560.465306 Days $T_0=418.519821$ (BKJD)



DV Model-Shift Uniqueness Test

005177859-04, P = 560.465306 Days, E = 418.793225 Days

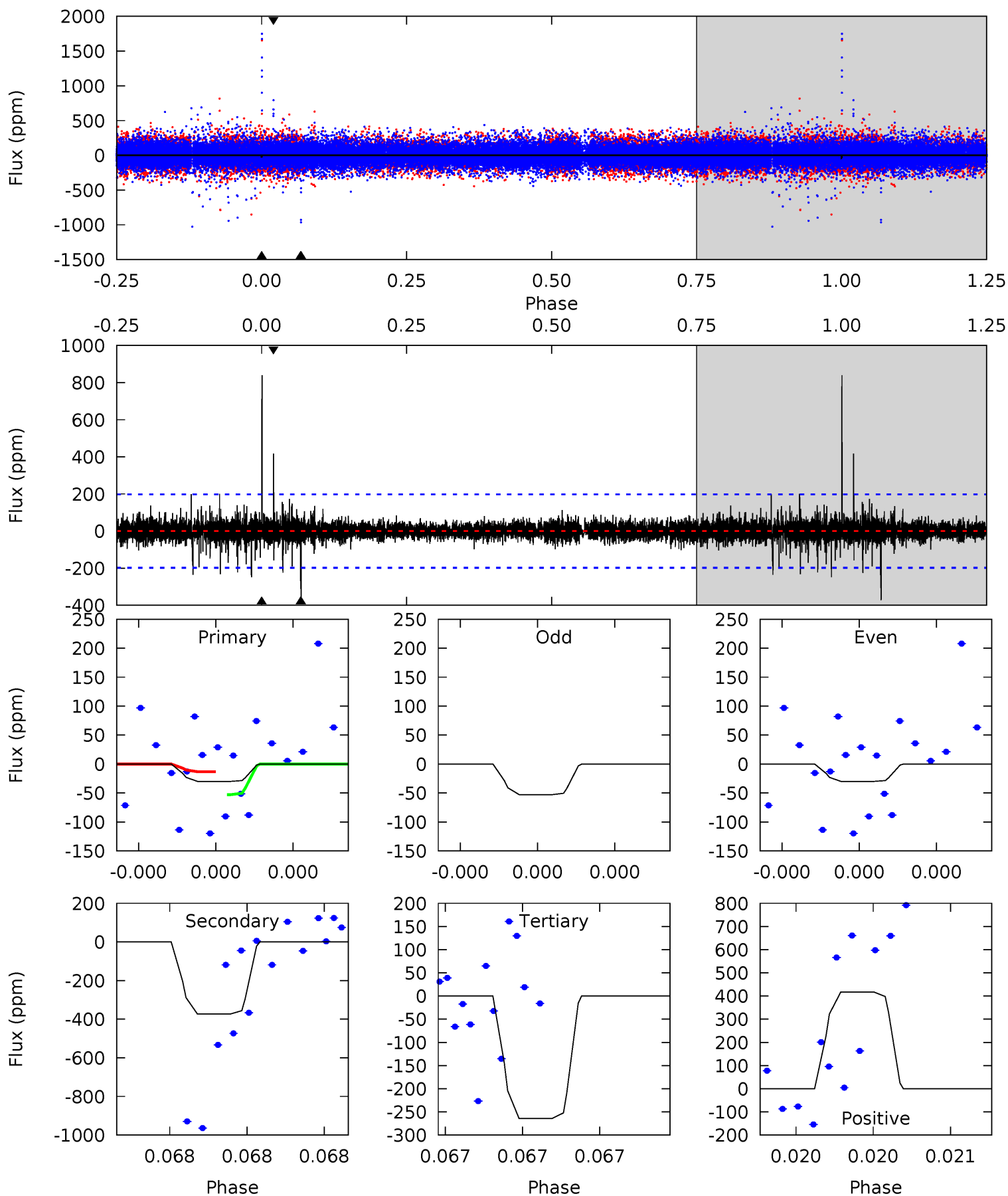
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

005177859-04, P = 560.465306 Days, E = 418.519821 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.87	10.8	7.68	12.1	5.74	3.73	0.86	-6.81	-11.2	3.16	-1.28	0.39	1.00	0.69	0.58



Stellar Parameters For KIC 005177859

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5839^{+156}_{-174}	$4.279^{+0.175}_{-0.175}$	$0.120^{+0.200}_{-0.300}$	$1.227^{+0.360}_{-0.270}$	$1.044^{+0.137}_{-0.125}$	$0.796^{+0.725}_{-0.381}$
	+3%/-3%	+4%/-4%	+167%/-250%	+29%/-22%	+13%/-12%	+91%/-48%
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 005177859-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$10.33^{+10.04}_{-7.09}$	342^{+27}_{-22}	-2217^{+22039}_{-17142}	$-128.603^{+1566441.609}_{-1598219.912}$
Alt.	-373 ± 34	$9.33^{+10.51}_{-6.60}$	343^{+27}_{-23}	3572^{+2078}_{-727}	4277^{+46280}_{-3342}

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 $A_{obs} \gg 1.0$

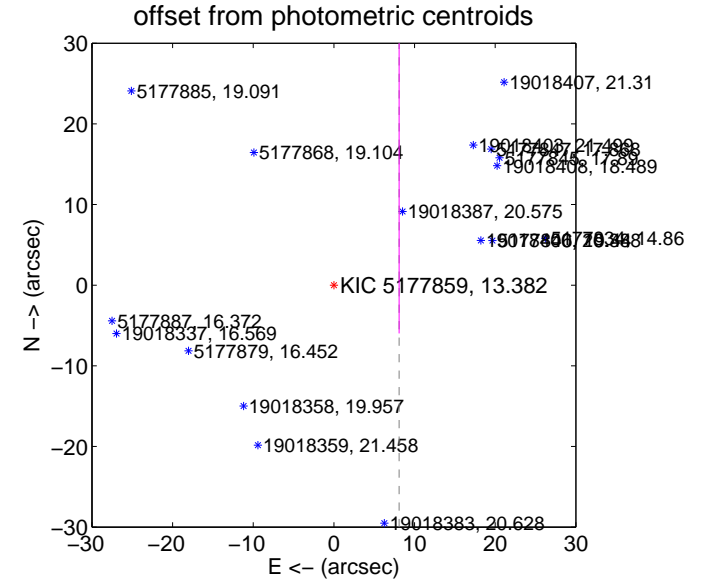
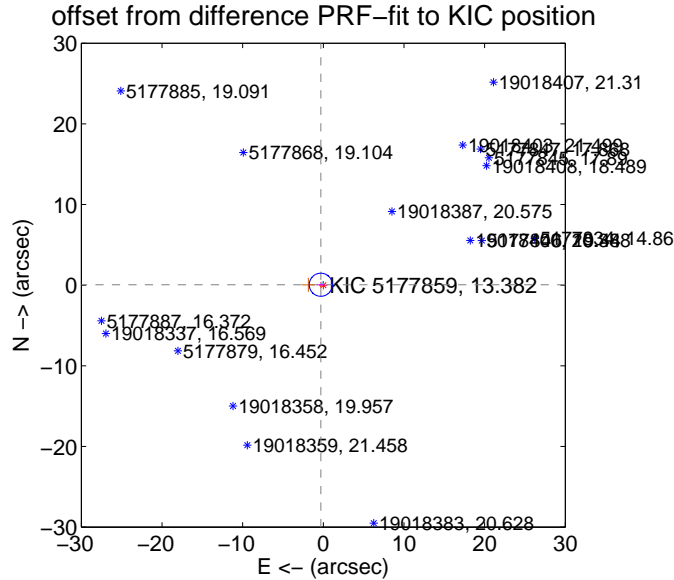
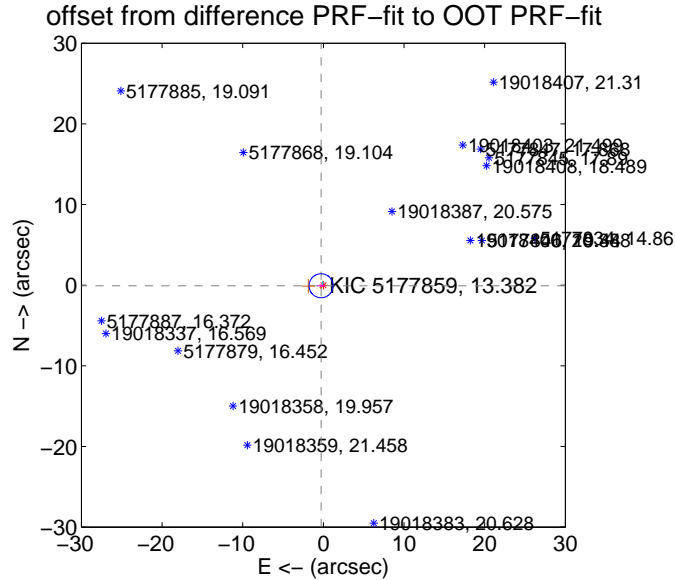
DV Centroid Data

Supplemental centroid analysis for 005177859-04. Kepler magnitude: 13.38. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

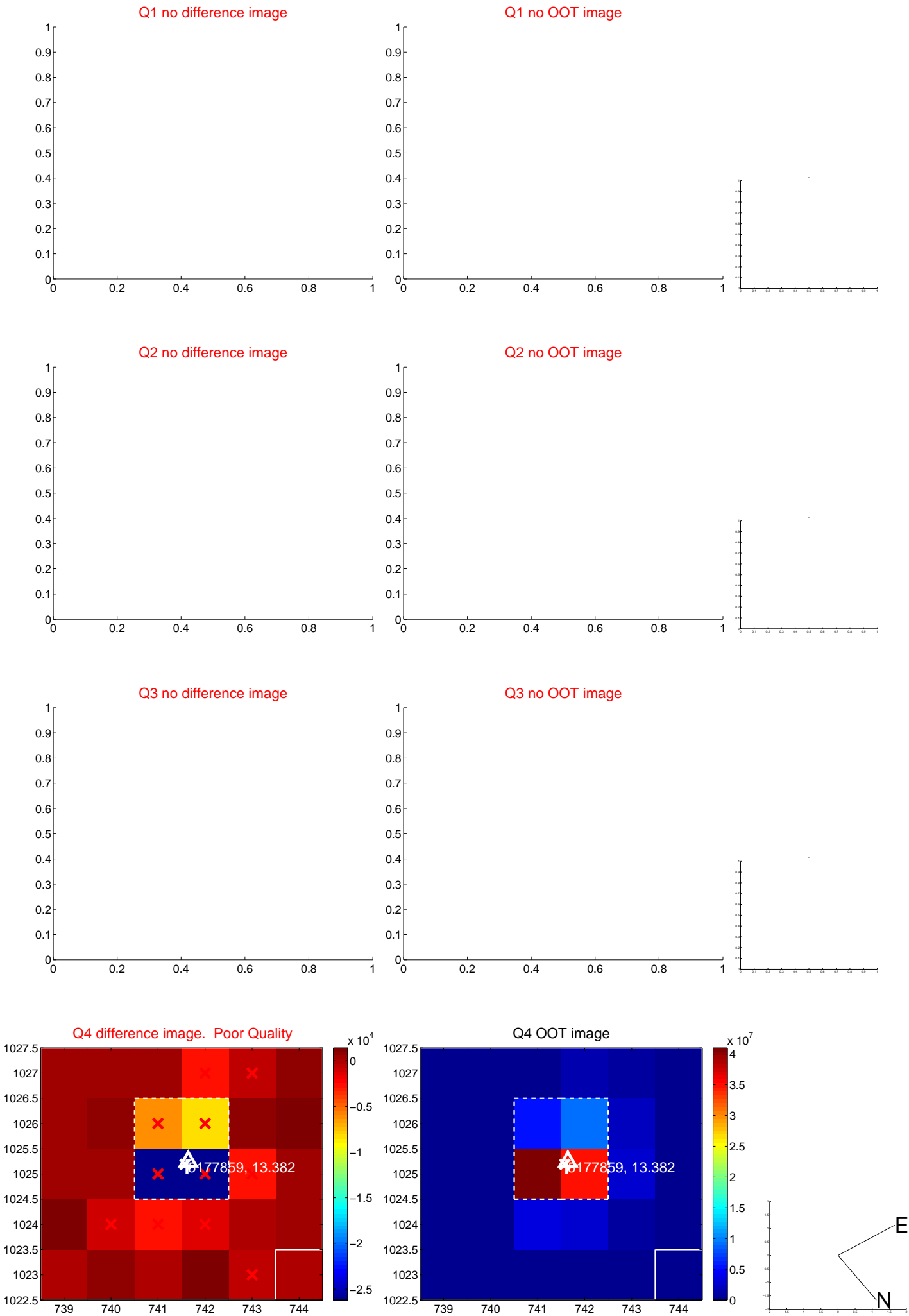
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.290 ± 0.497	0.58	0.281 ± 0.494	-0.071 ± 0.147
PRF-fit source offset from KIC position	0.316 ± 0.477	0.66	0.311 ± 0.490	0.052 ± 0.117
photometric centroid source offset	37.30 ± 42.89	0.87	-8.09 ± 51.81	36.41 ± 42.40



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.

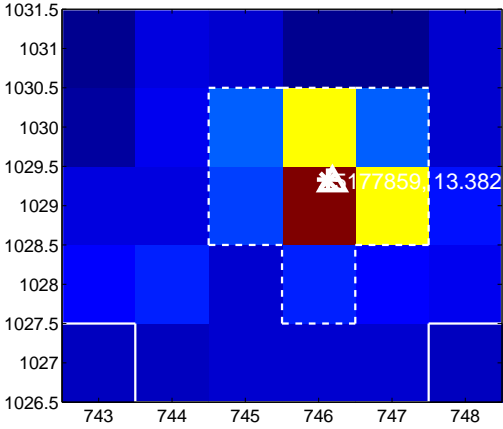
Q9 no difference image



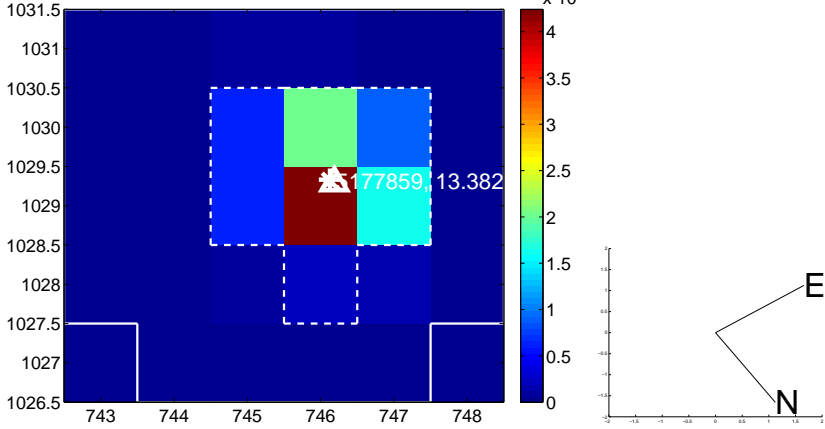
Q9 no OOT image



Q10 difference image



Q10 OOT image



Q11 no difference image



Q11 no OOT image



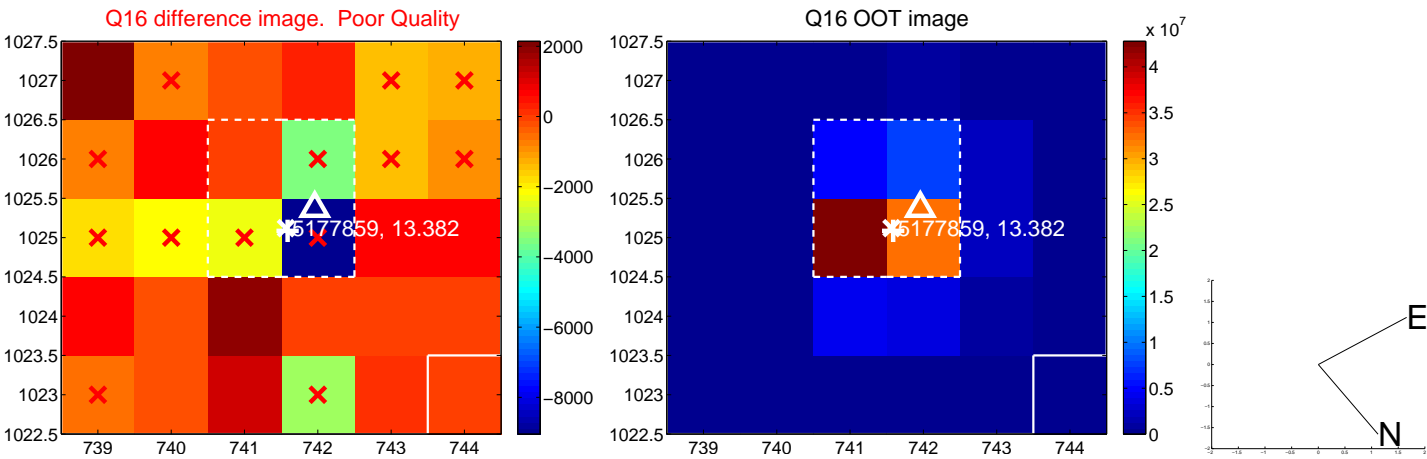
Q12 no difference image



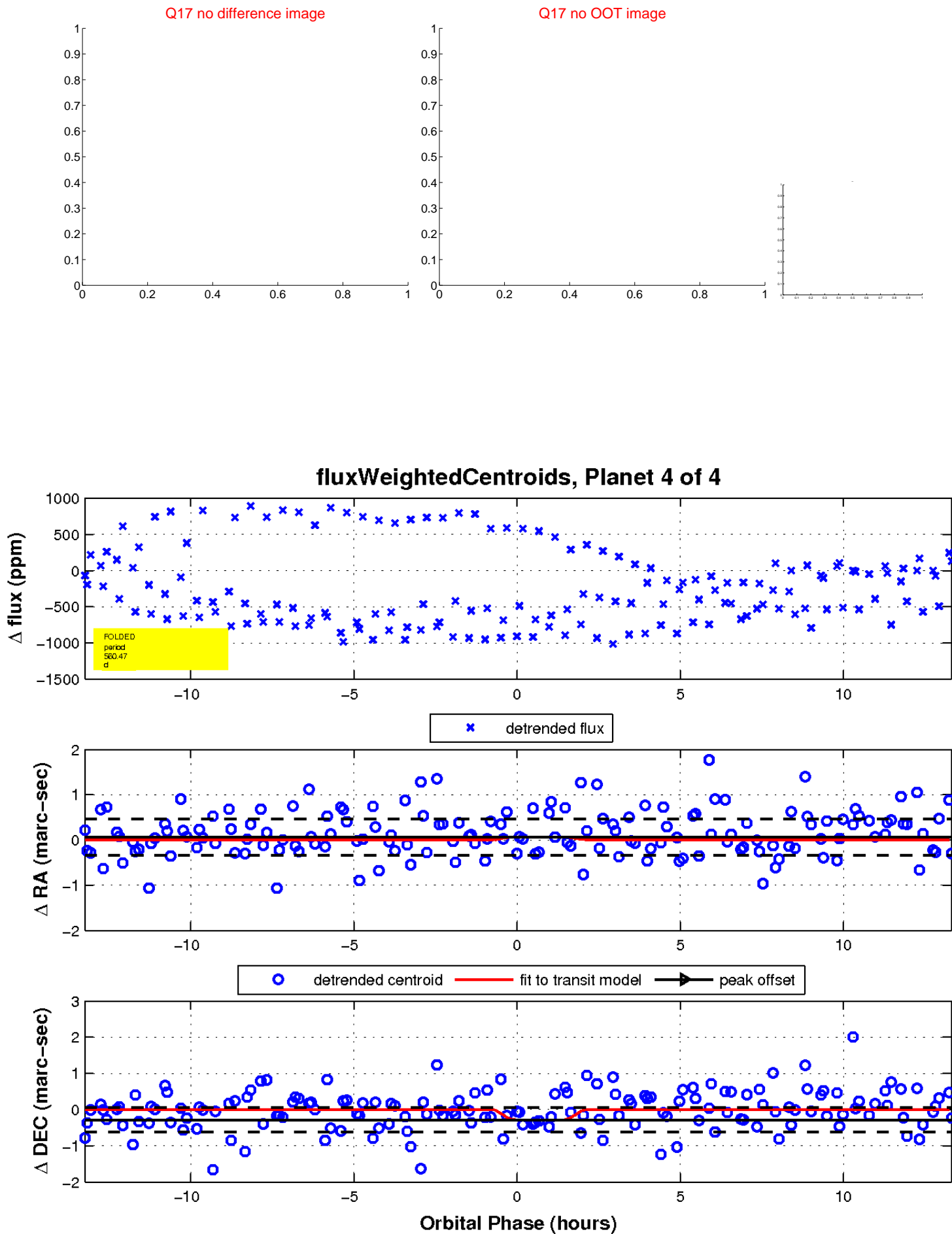
Q12 no OOT image



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

