

KIC 009588822

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})
009588822-01	OBS	4388.01	71.762294	170.095213	8572.8	29.295	192.4	305.5	2.82	5529	25.67	46.43
009588822-02	OBS	No	71.762034	145.190243	594.5	22.682	12.3	24.7	2.82	5529	7.65	46.43
009588822-03	OBS	4388.02	61.851711	191.709525	182.3	2.184	7.3	8.4	2.82	5529	4.14	56.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009588822-01	OBS	FP	0.00	0	1	0	0	HAS_SEC_TCE
009588822-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009588822-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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 009588822-01

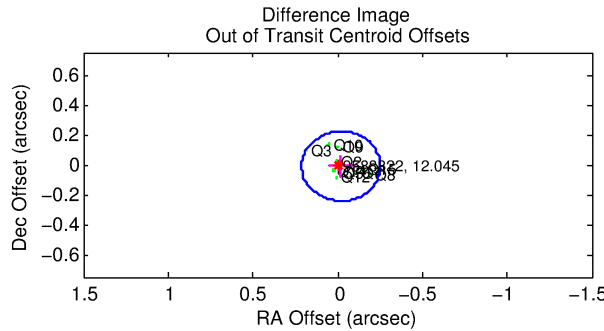
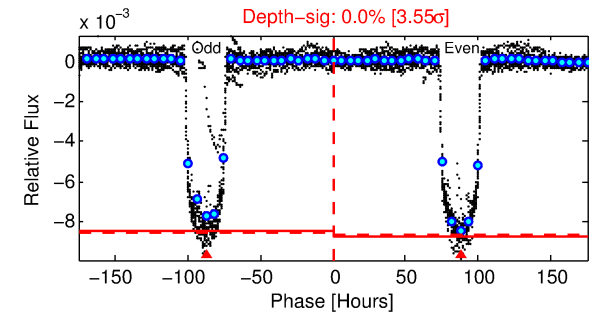
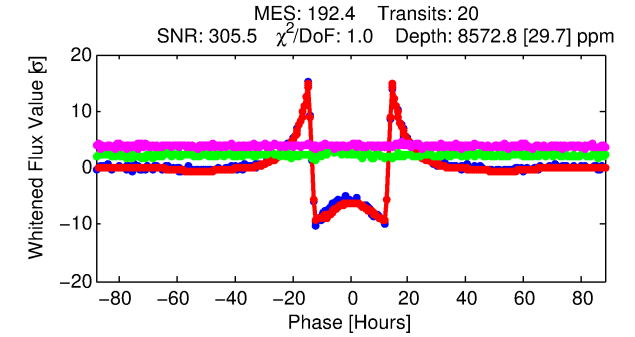
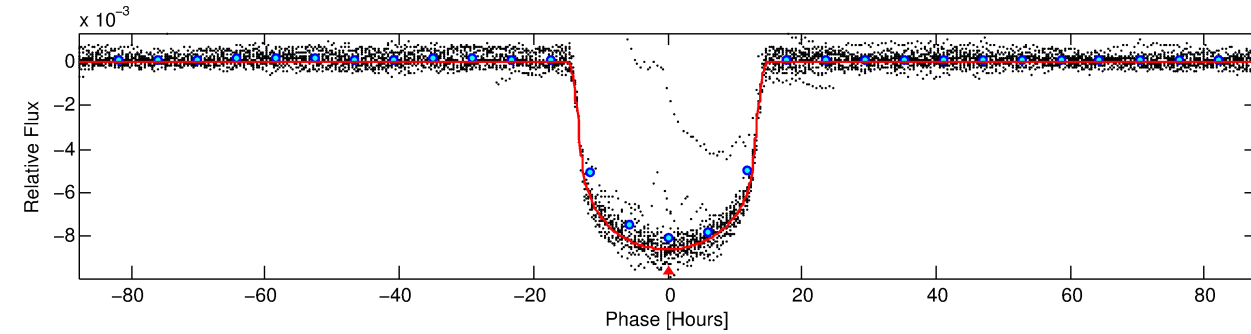
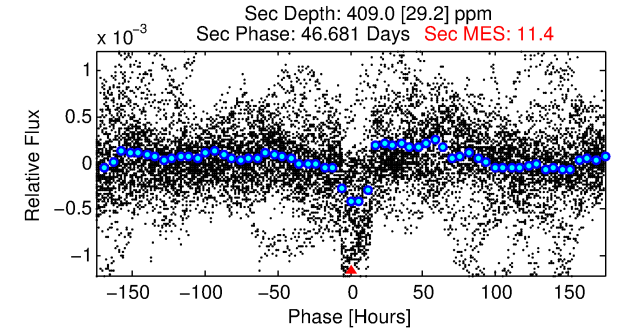
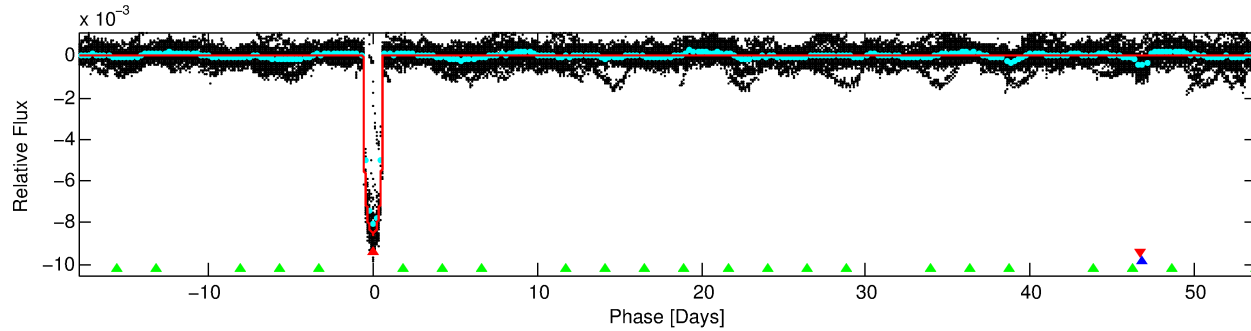
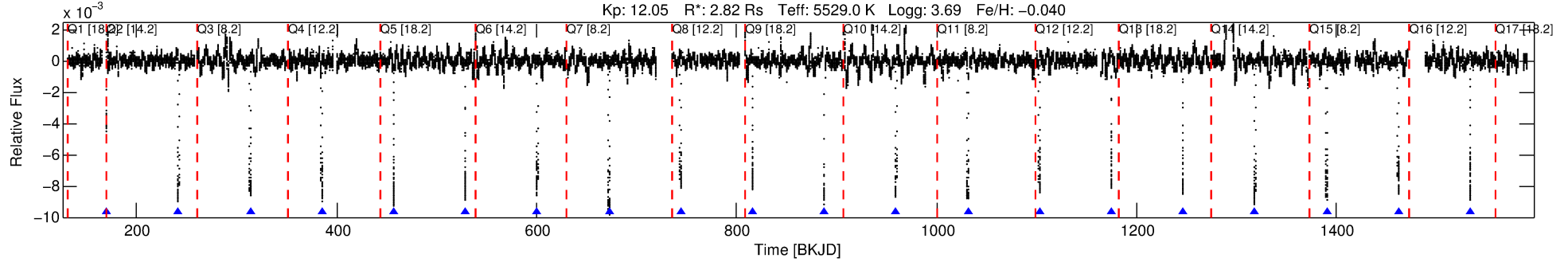
No Significant Match Found

DV One-Page Summary

KIC: 9588822 Candidate: 1 of 3 Period: 71.762 d

KOI: K04388 Corr: No Ephemeris Match

Kp: 12.05 R*: 2.82 Rs Teff: 5529.0 K Logg: 3.69 Fe/H: -0.040



DV Fit Results:

Period = 71.76229 [0.00005] d
Epoch = 170.0952 [0.0006] BKJD
Rp/R* = 0.0835 [0.0002]
a/R* = 20.29 [0.11]
b = 0.00 [4.42]
Seff = 46.43 [54.40]
Teq = 666 [195] K
Rp = 25.67 [15.57] Re
a = 0.3783 [0.2572] AU
Ag = 48.86 [57.05] [0.84σ]
Teffp = 2721 [96] K [9.46σ]

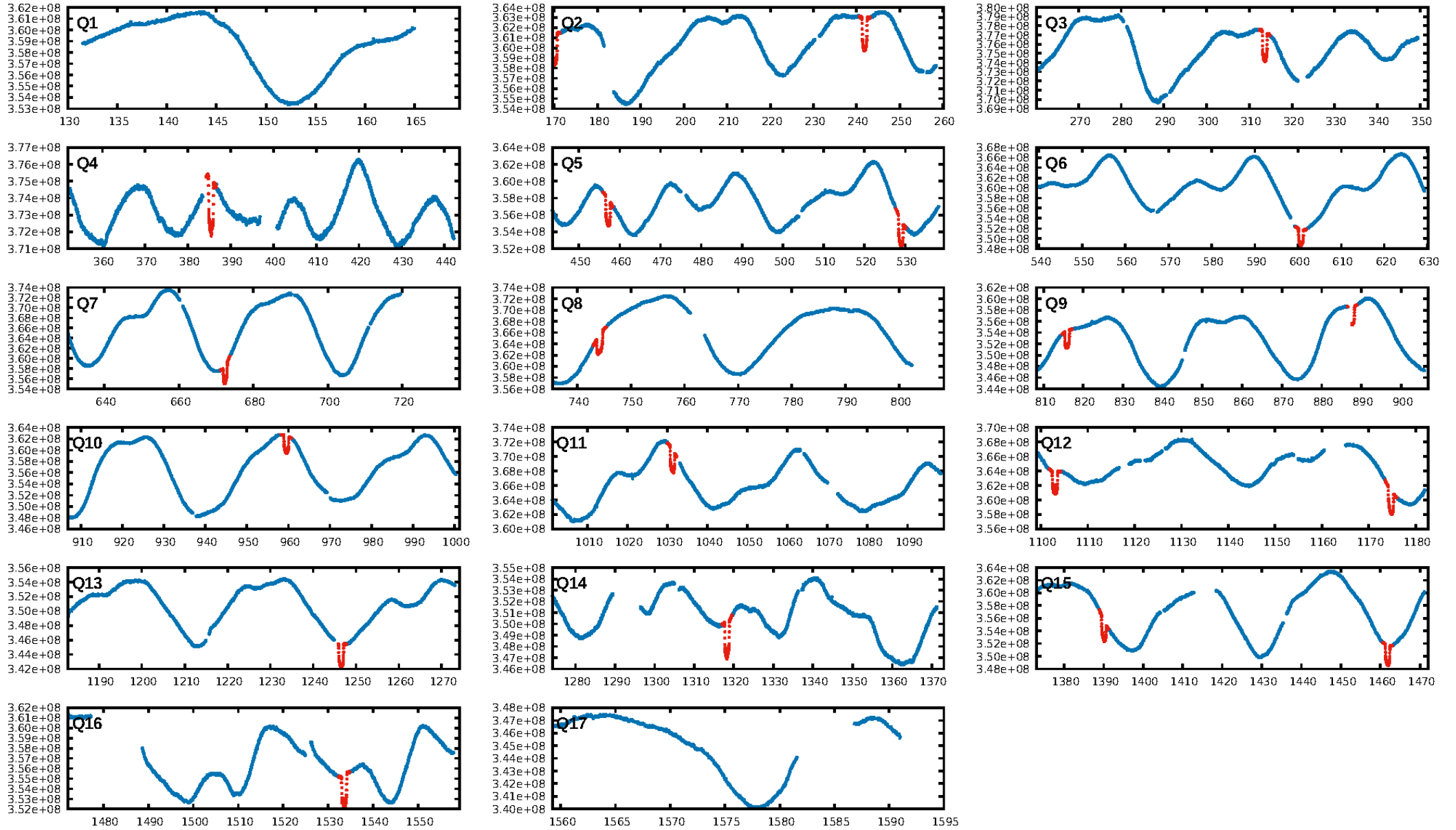
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [20/20]
GhostDiagnostic-chr: 1.811
Centroid-sig: 12.1%
Centroid-so: 0.037 arcsec [5.87σ]
OotOffset-rm: 0.023 arcsec [0.29σ]
KicOffset-rm: 0.092 arcsec [1.17σ]
OotOffset-st: 3/3/2/2 [10]
KicOffset-st: 3/3/2/2 [10]
DiffImageQuality-fgm: 1.00 [10/10]
DiffImageOverlap-fno: 0.90 [9/10]

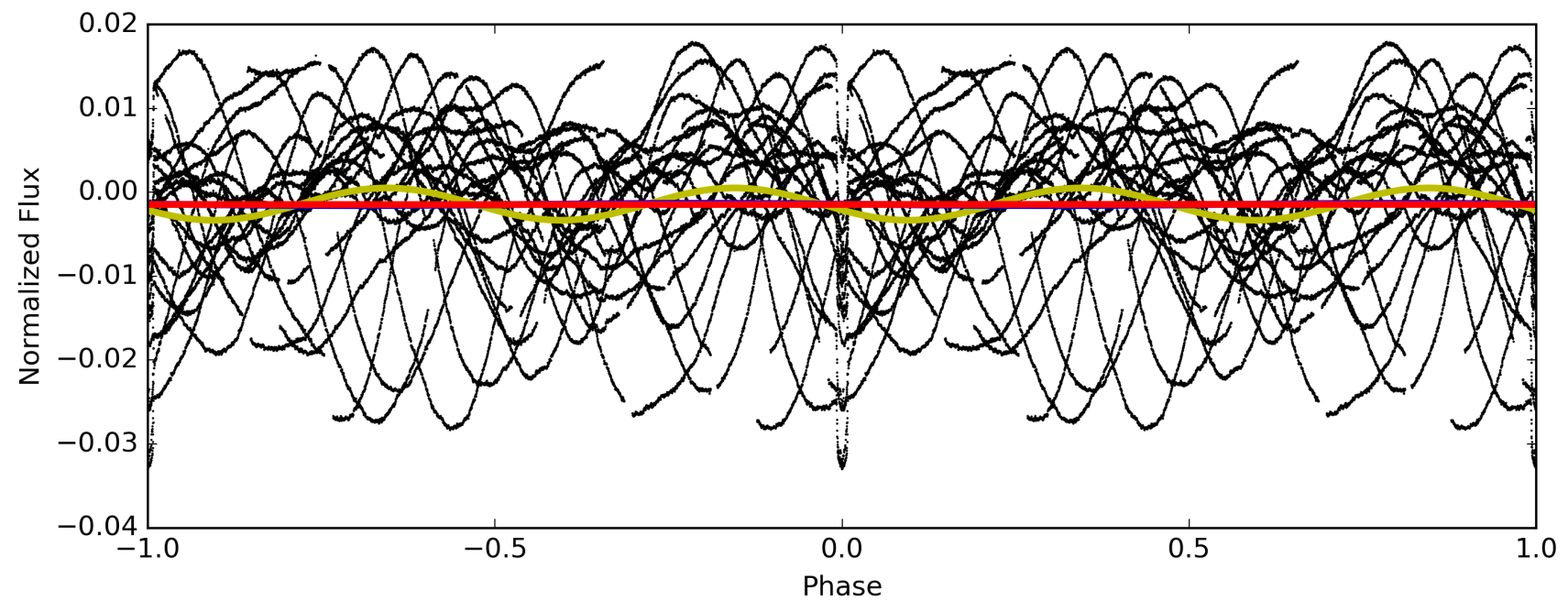
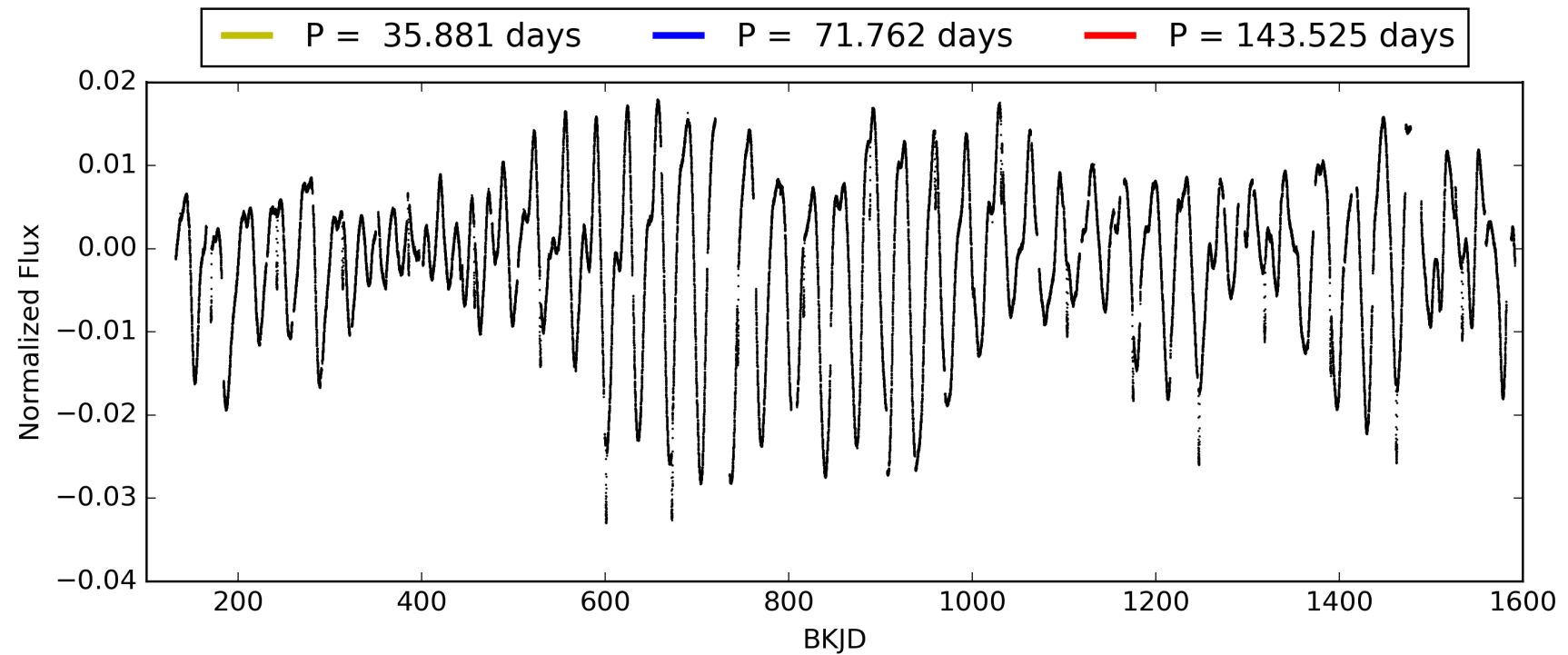
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:28:55 Z

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

TCE 009588822-01, PDC Light Curves

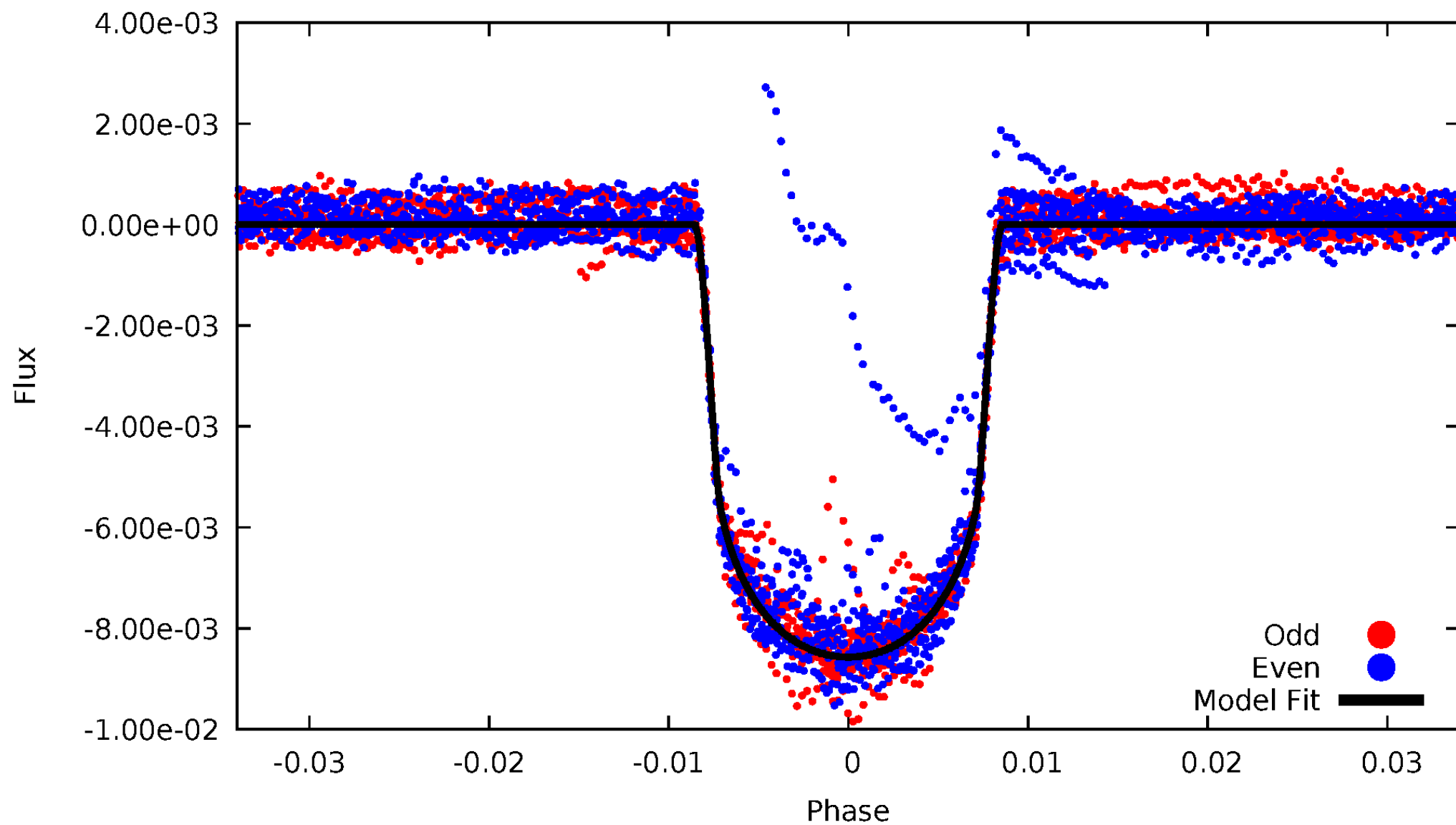


TCE 009588822-01



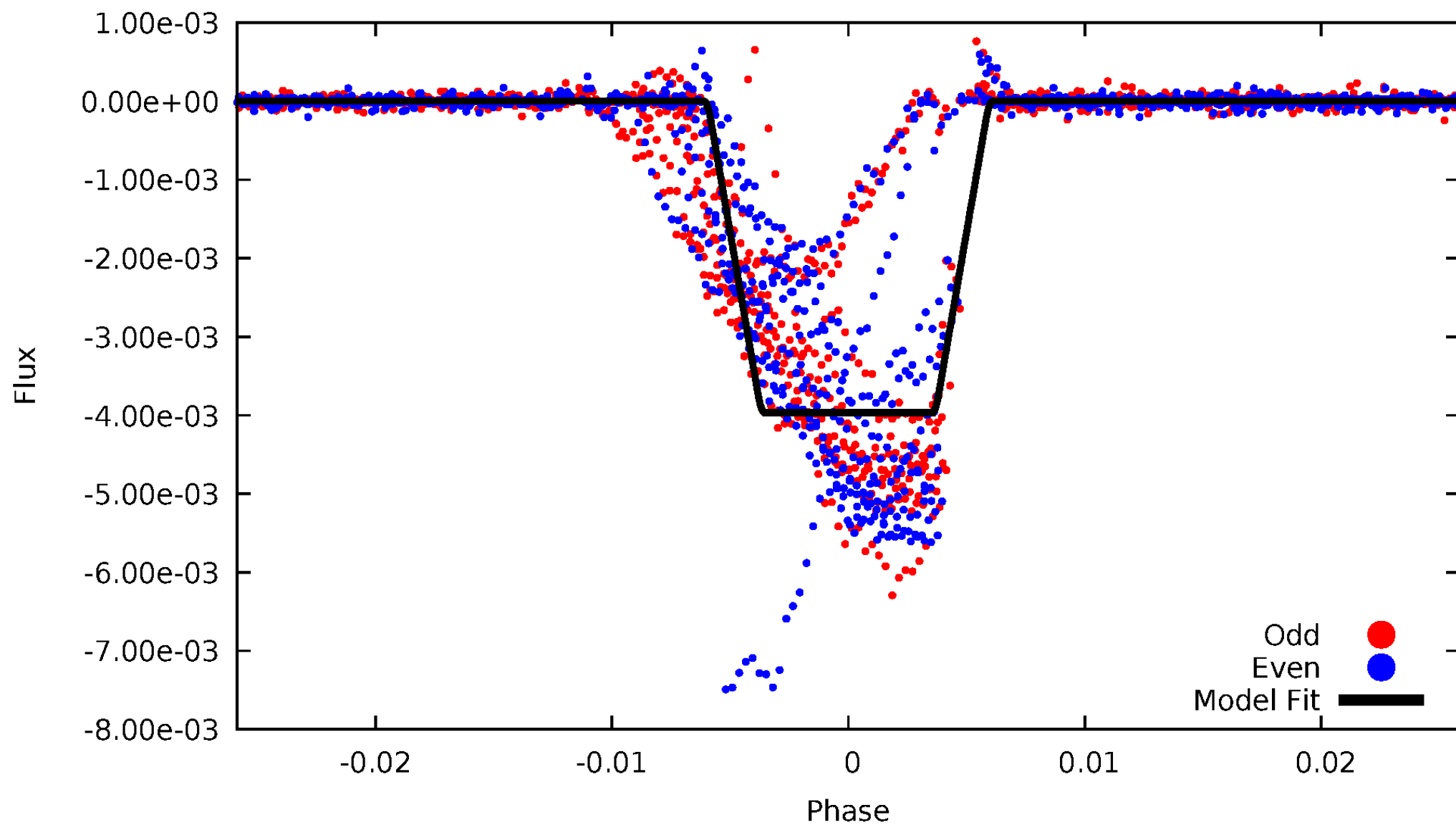
DV Odd/Even

TCE 009588822-01



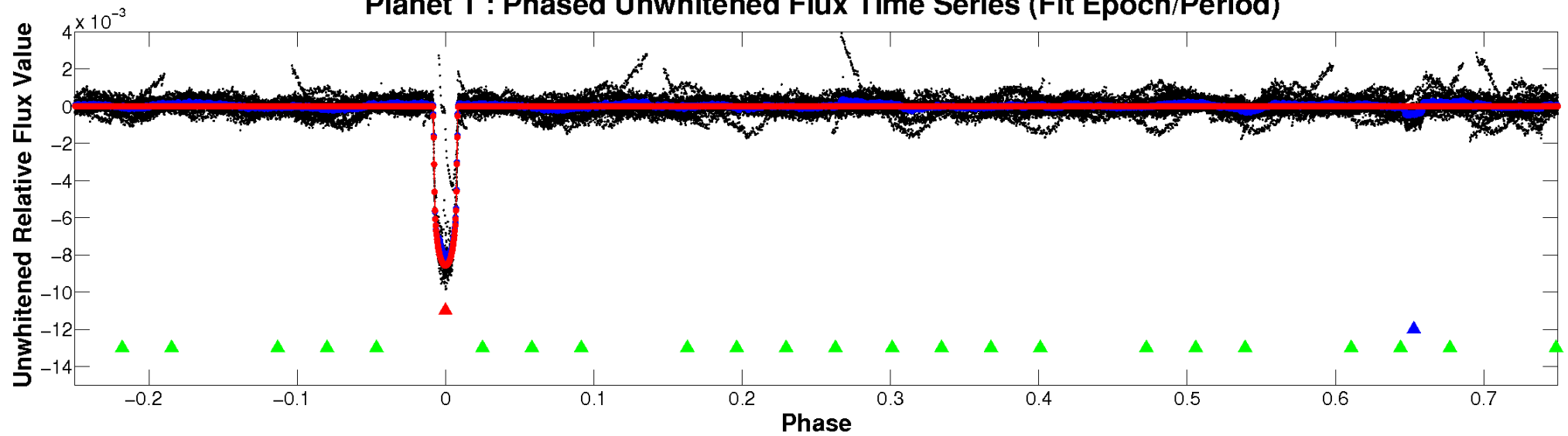
ALT Odd/Even

TCE 009588822-01

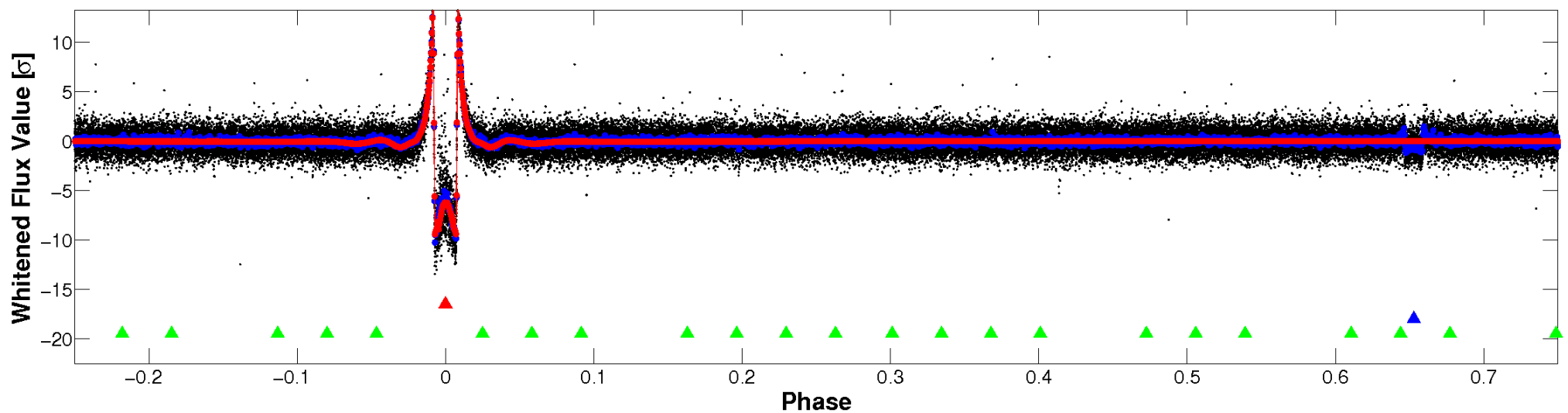


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

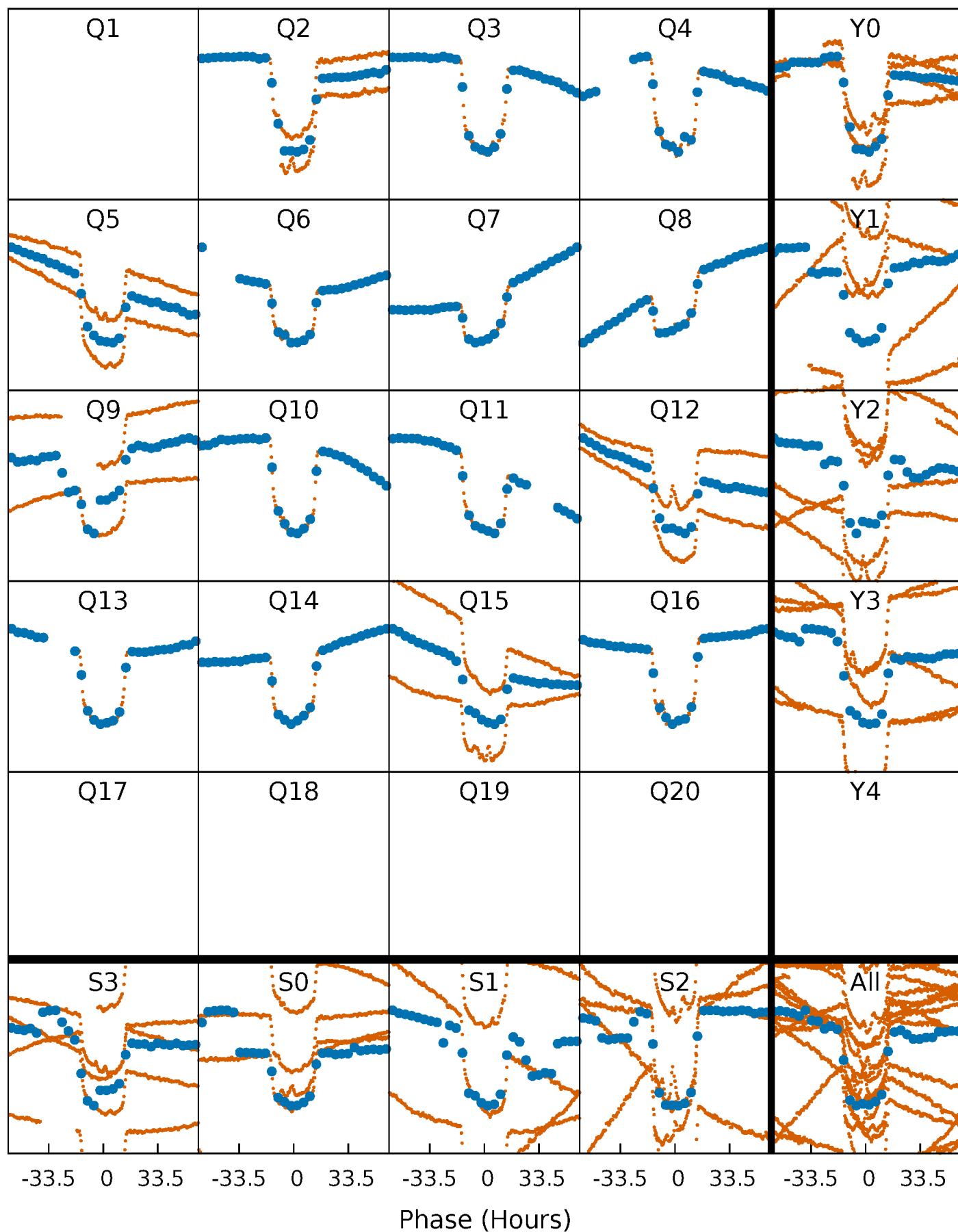


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



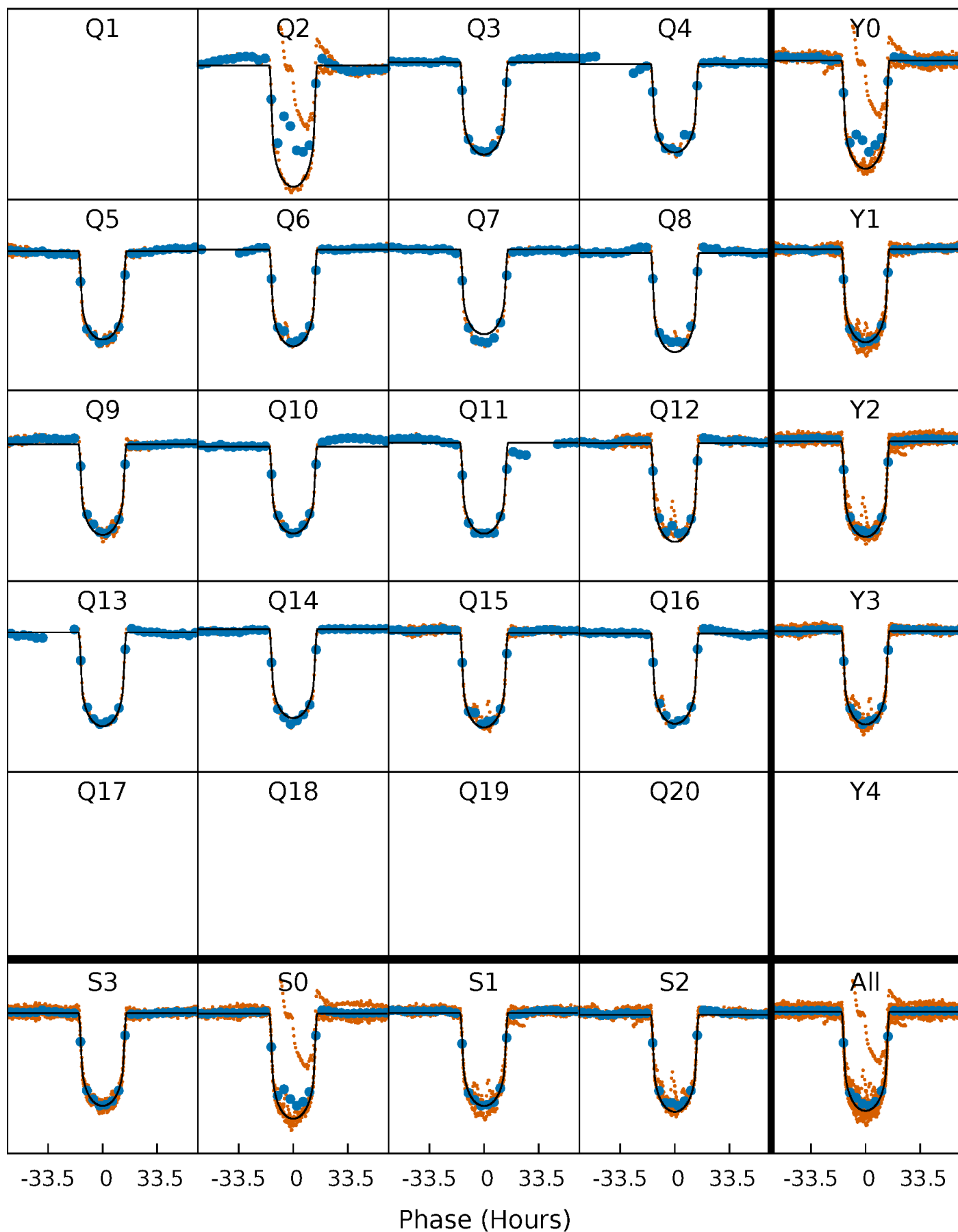
PDC Quarter-Phased Transit Curves

TCE 009588822-01 P= 71.762294 Days $T_0=170.095213$ (BKJD)



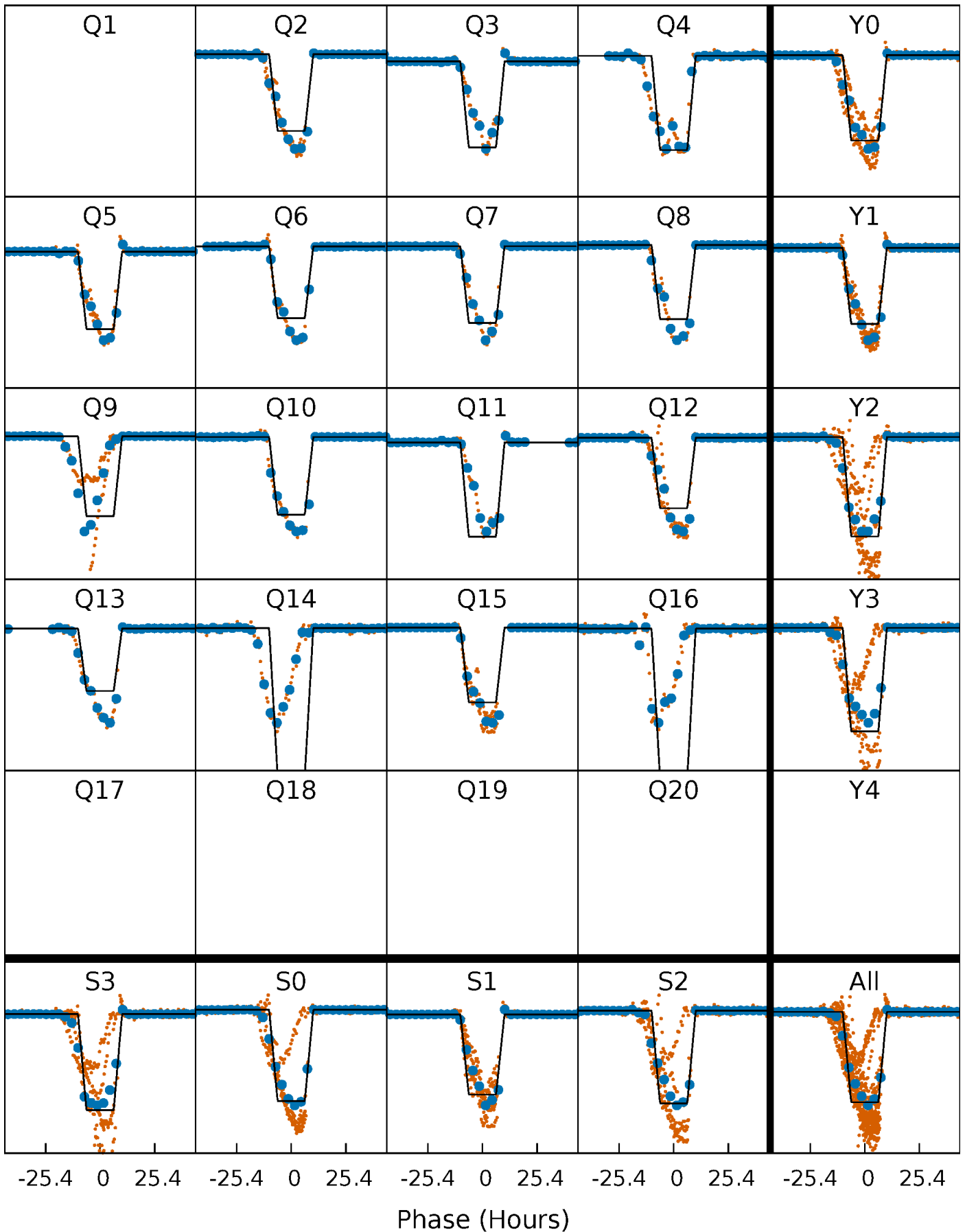
DV Quarter-Phased Transit Curves

TCE 009588822-01 P= 71.762294 Days $T_0=170.095213$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

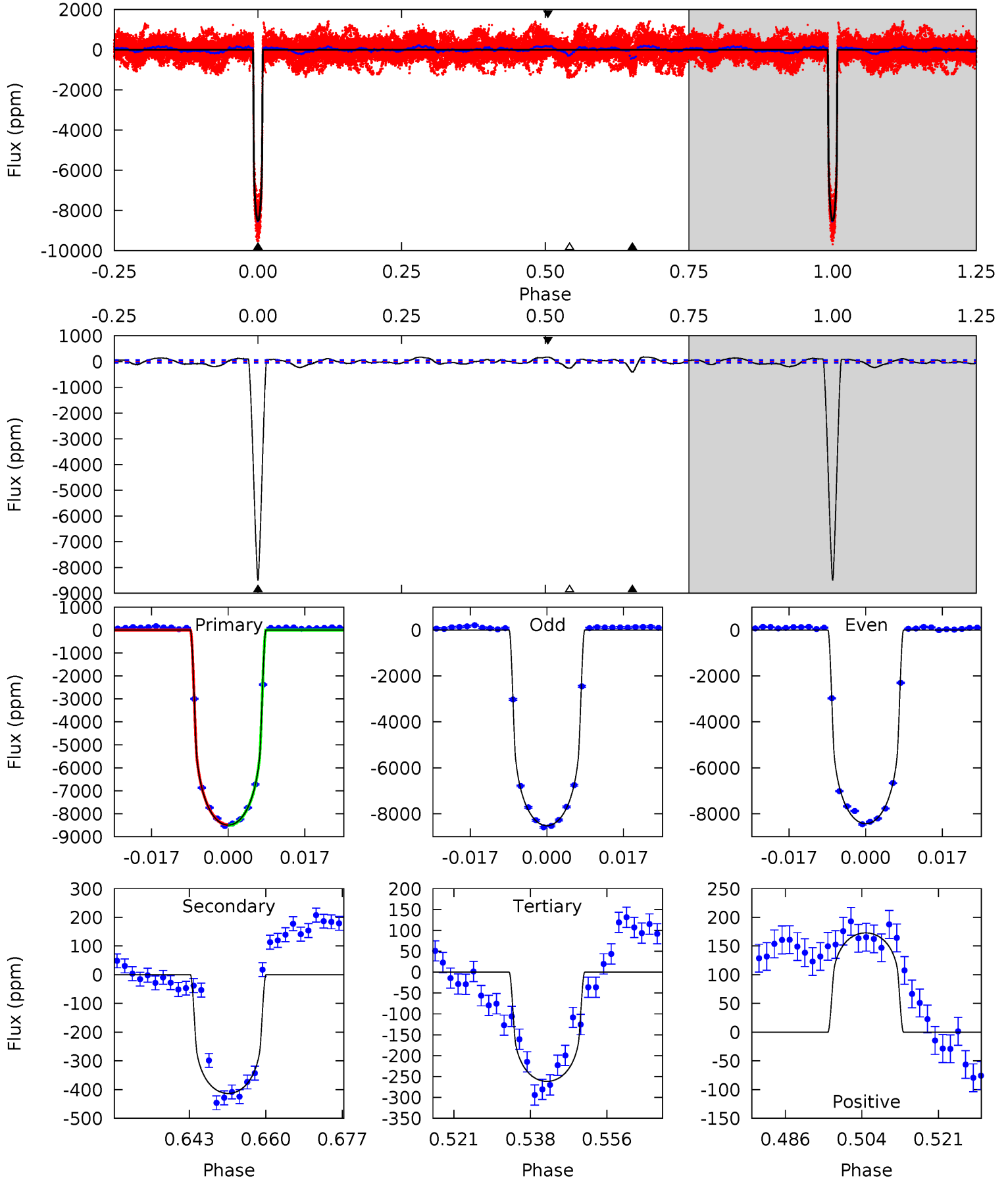
TCE 009588822-01 P= 71.759612 Days $T_0=170.352368$ (BKJD)



DV Model-Shift Uniqueness Test

009588822-01, P = 71.762294 Days, E = 98.332919 Days

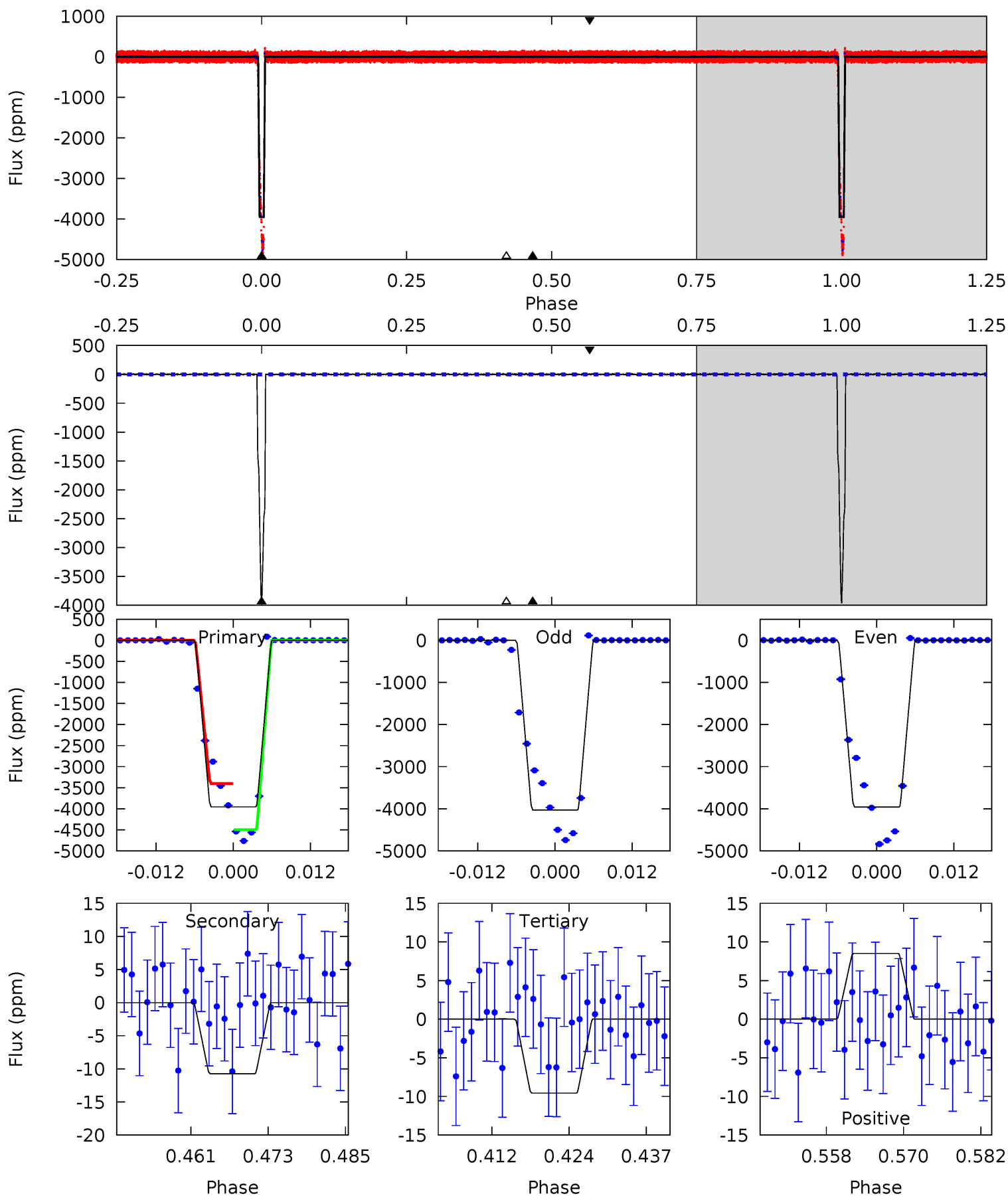
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
813.8	39.6	25.1	16.6	4.92	2.38	8.95	788.7	797.2	14.6	23.0	4.08	0.97	0.02	0



Alt Model-Shift Uniqueness Test

009588822-01, P = 71.759612 Days, E = 98.592756 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1038	2.82	2.51	2.23	4.99	2.51	0.65	1035	1036	0.31	0.58	10.4	0.93	0.00	0



Stellar Parameters For KIC 009588822

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5529^{+168}_{-140}	$3.685^{+0.712}_{-0.178}$	$-0.040^{+0.300}_{-0.250}$	$2.817^{+0.789}_{-1.709}$	$1.402^{+0.216}_{-0.505}$	$0.088^{+1.239}_{-0.046}$
	+3%/-3%	+19%/-5%	+750%/-625%	+28%/-61%	+15%/-36%	+1403%/-52%
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 009588822-01 / KOI 4388.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-413 ± 10	$25.21^{+4.25}_{-8.81}$	916^{+88}_{-158}	3282^{+68}_{-59}	53^{+62}_{-15}
Alt.	-11 ± 4	$18.32^{+3.97}_{-6.65}$	905^{+88}_{-159}	2177^{+90}_{-140}	$2.610^{+2.743}_{-1.198}$

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

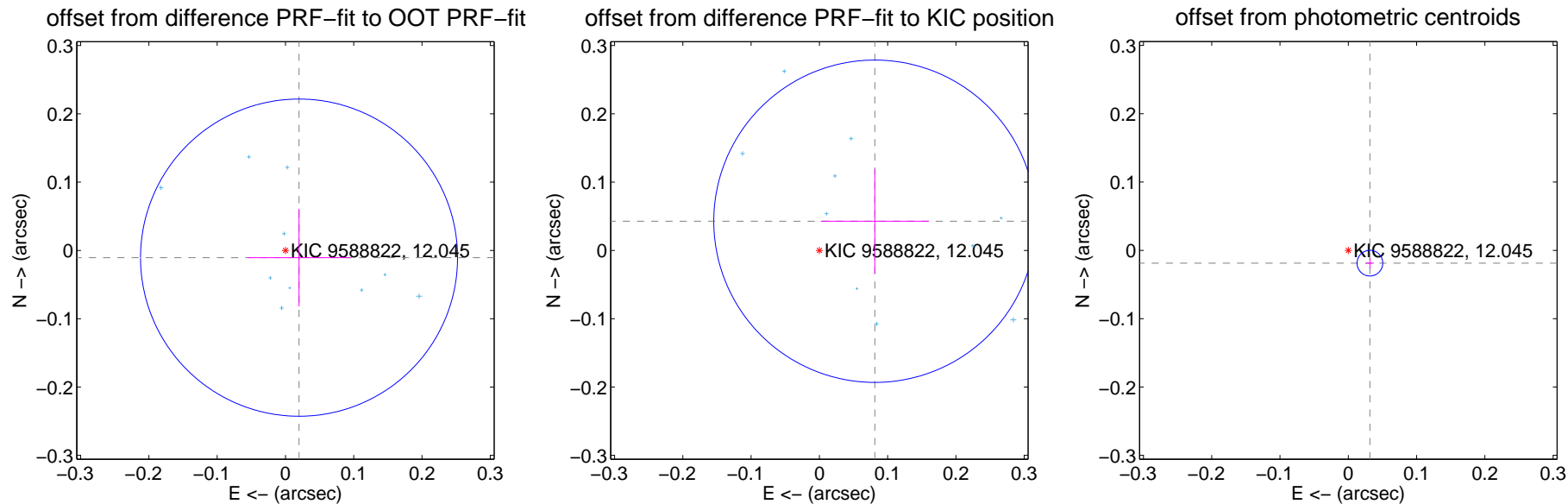
DV Centroid Data

Supplemental centroid analysis for 009588822-01. Kepler magnitude: 12.04. Transit SNR 305.46

There are 10 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.023 ± 0.077	0.29	-0.020 ± 0.075	-0.011 ± 0.072
PRF-fit source offset from KIC position	0.092 ± 0.079	1.17	-0.081 ± 0.079	0.043 ± 0.077
photometric centroid source offset	0.04 ± 0.01	5.87	-0.03 ± 0.01	-0.02 ± 0.01



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.

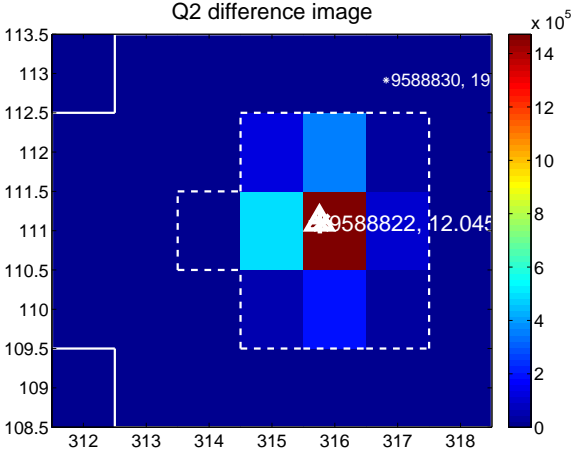
Q1 no difference image



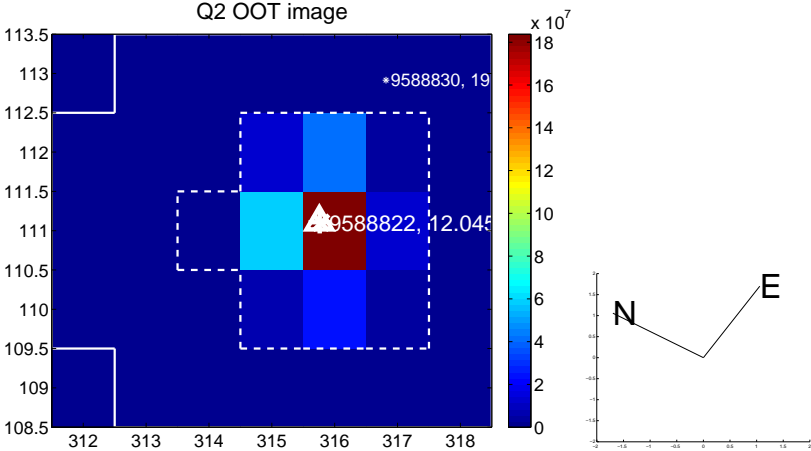
Q1 no OOT image



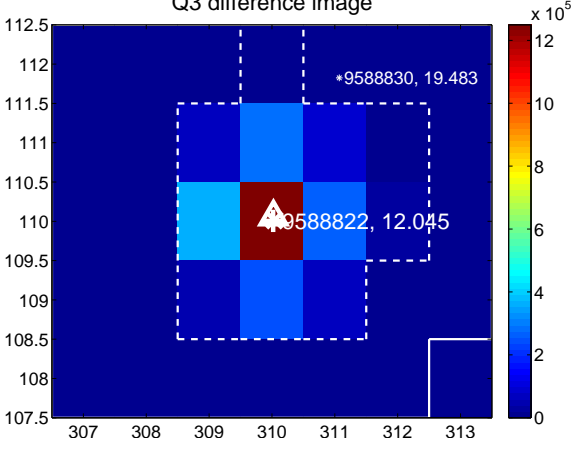
Q2 difference image



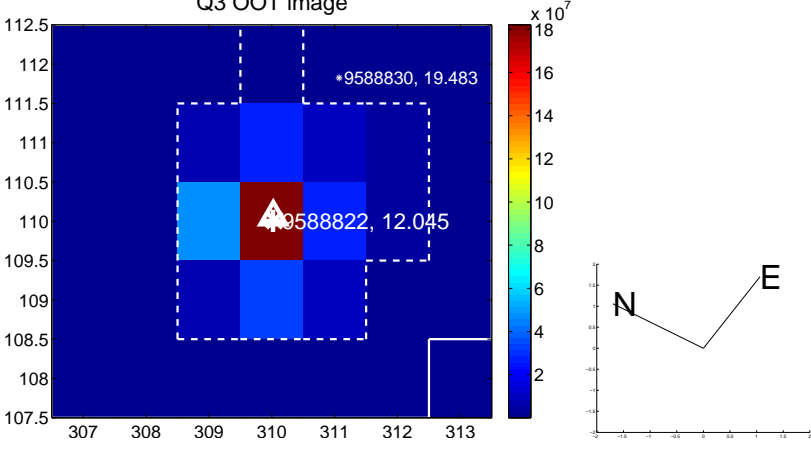
Q2 OOT image



Q3 difference image



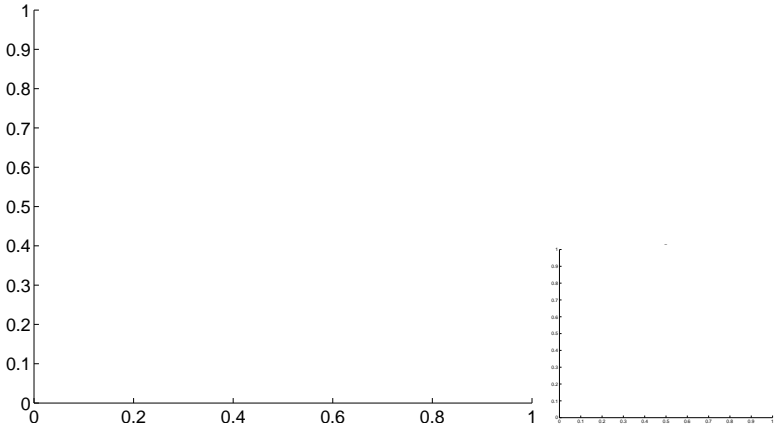
Q3 OOT image



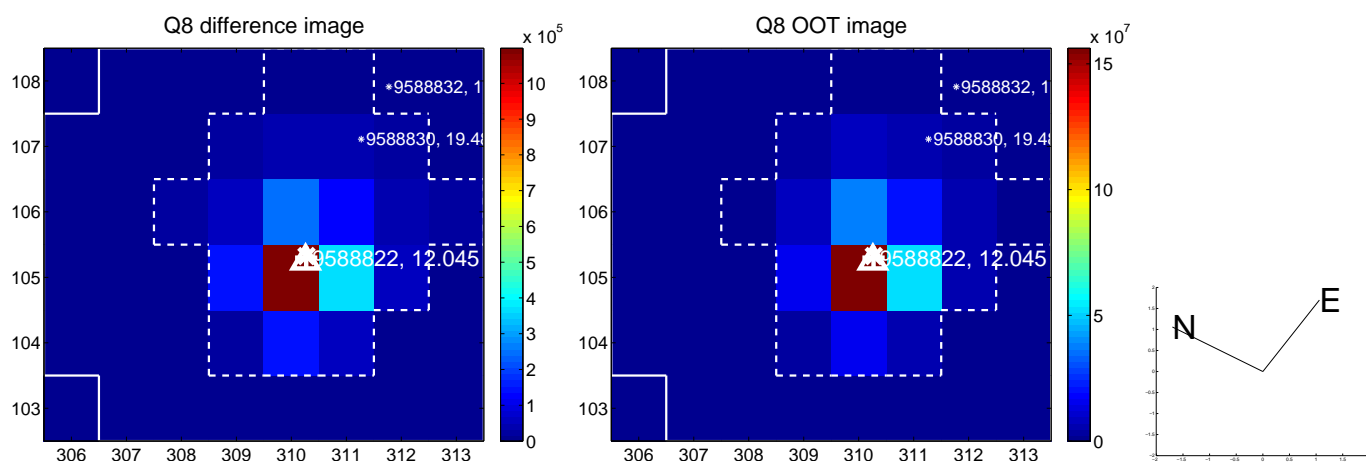
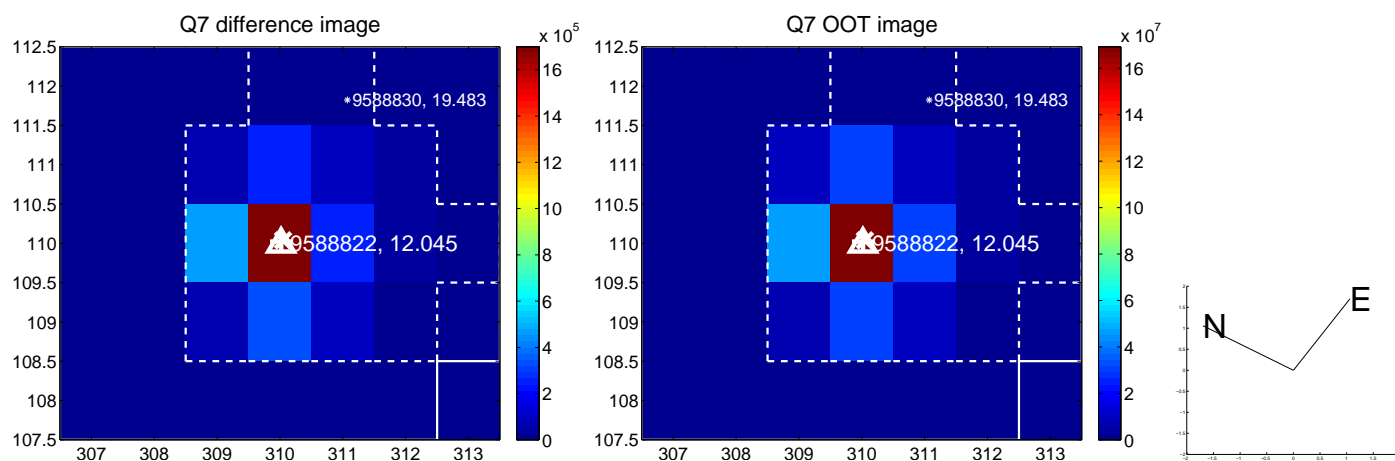
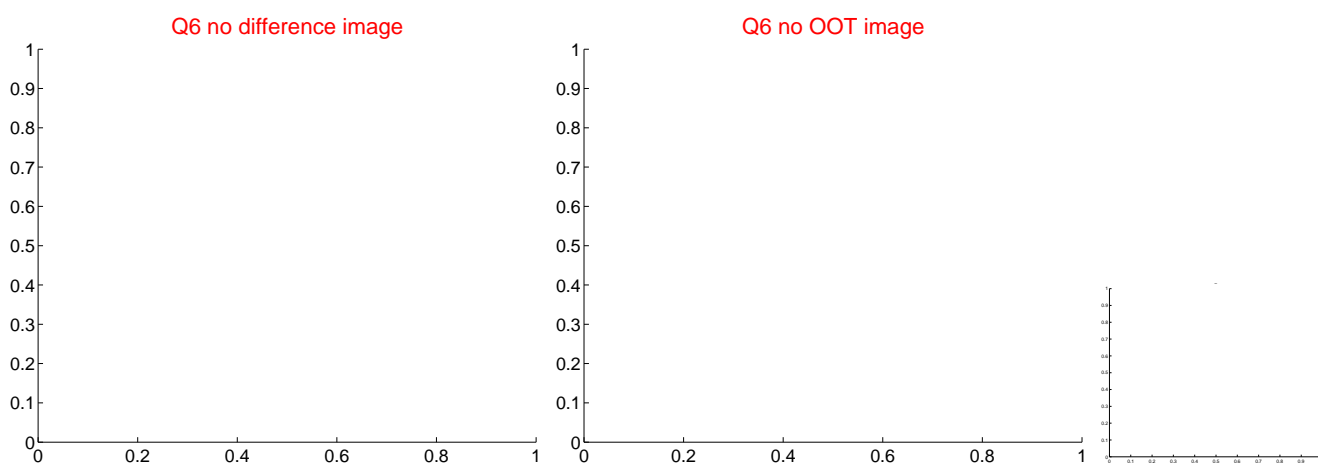
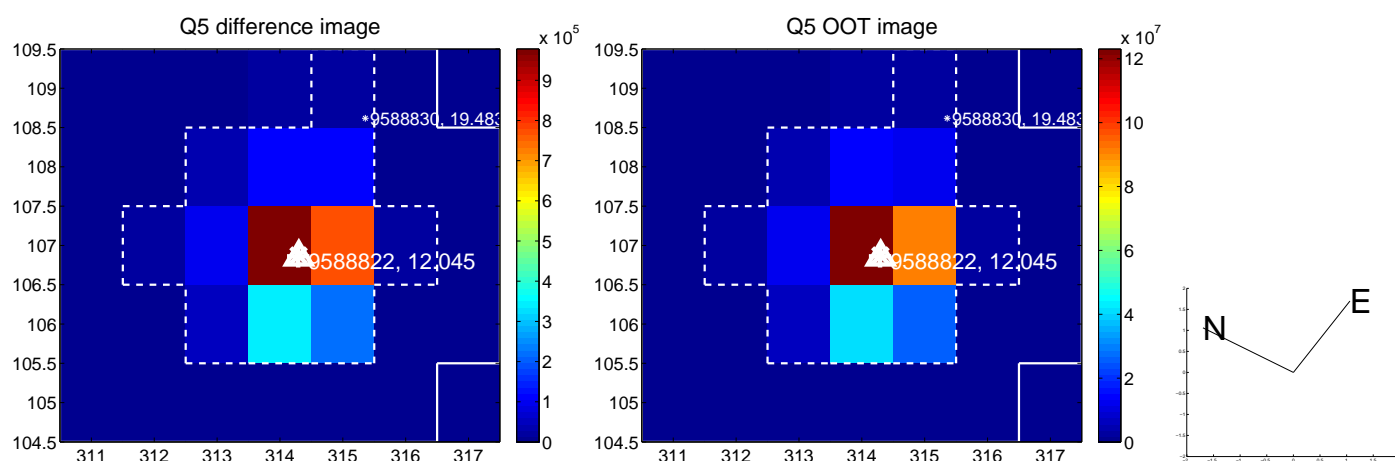
Q4 no difference image



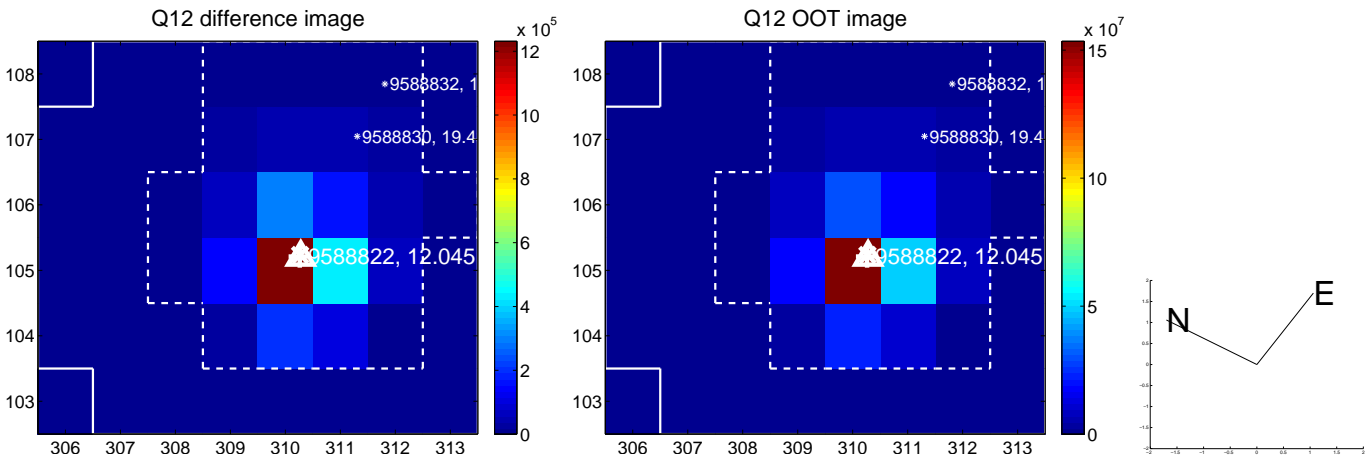
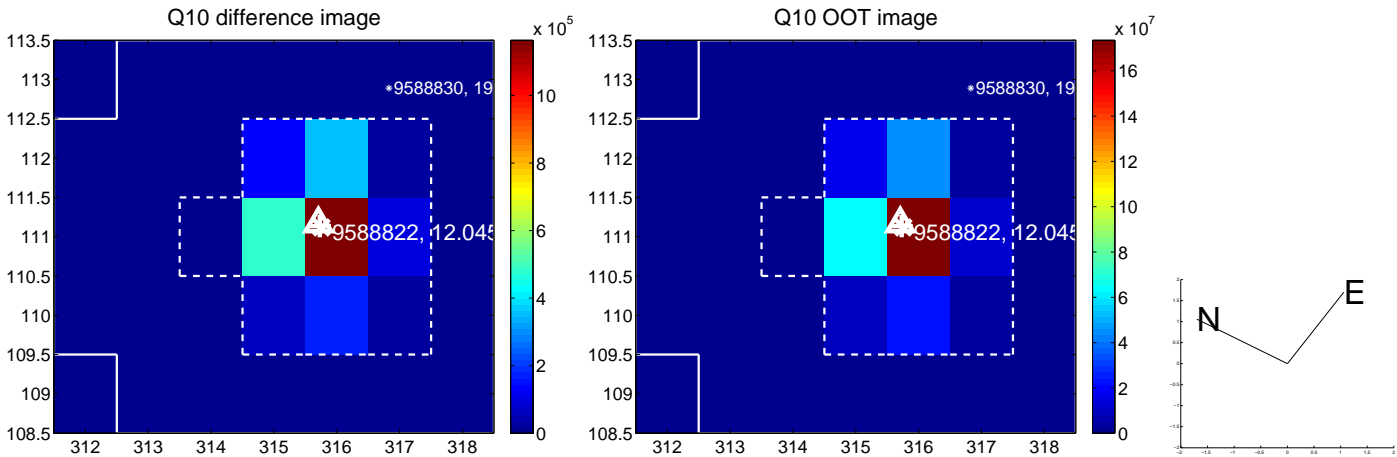
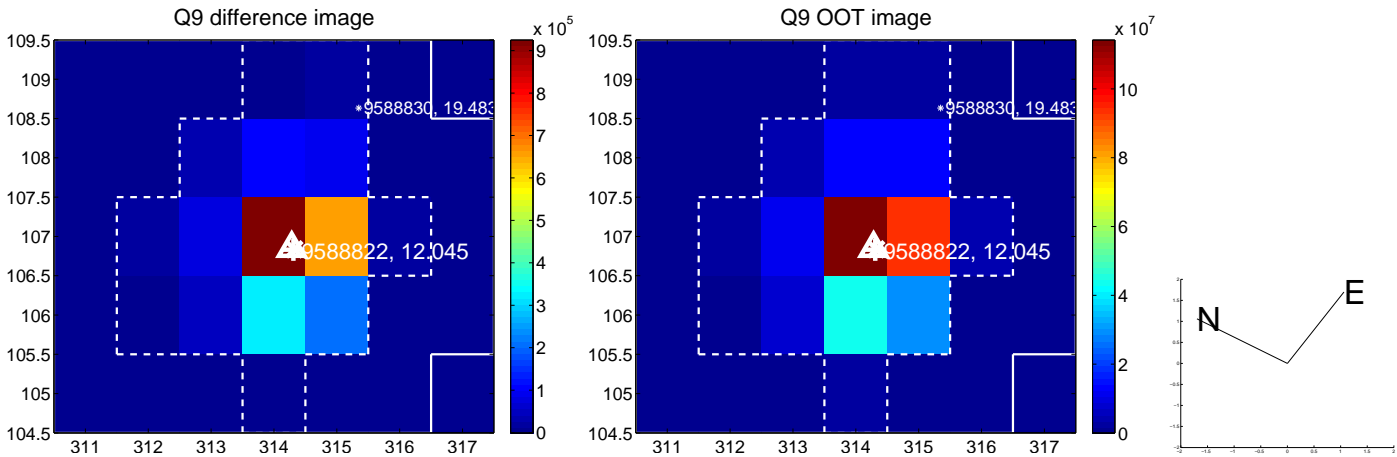
Q4 no OOT image



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.

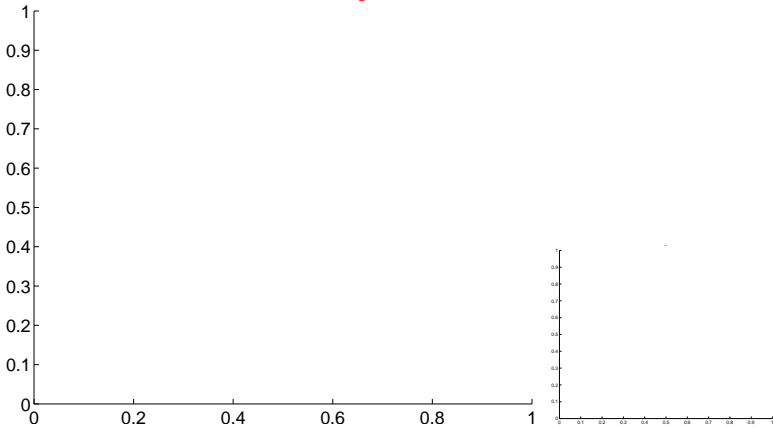


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

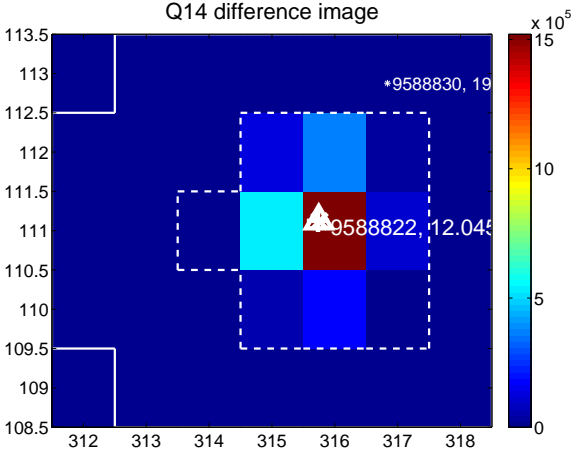
Q13 no difference image



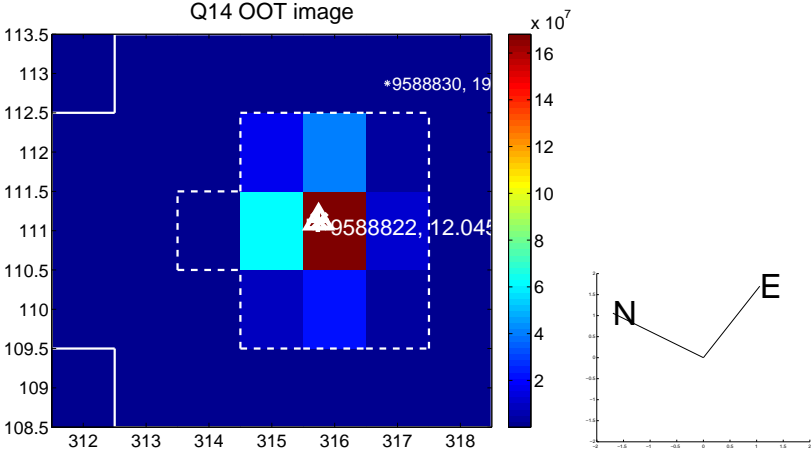
Q13 no OOT image



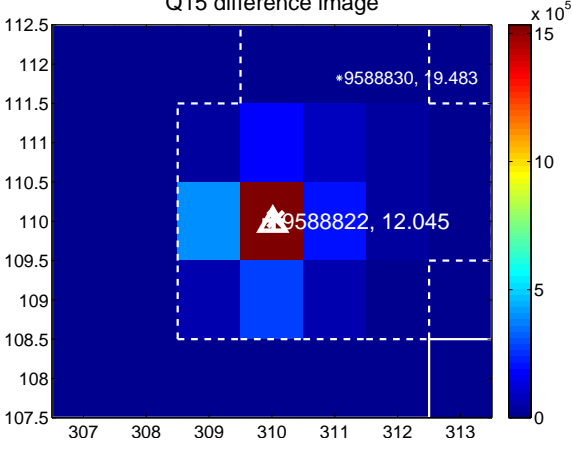
Q14 difference image



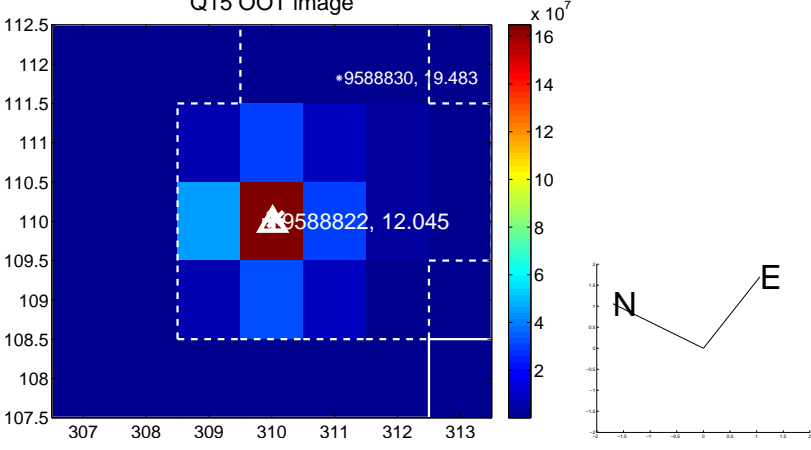
Q14 OOT image



Q15 difference image



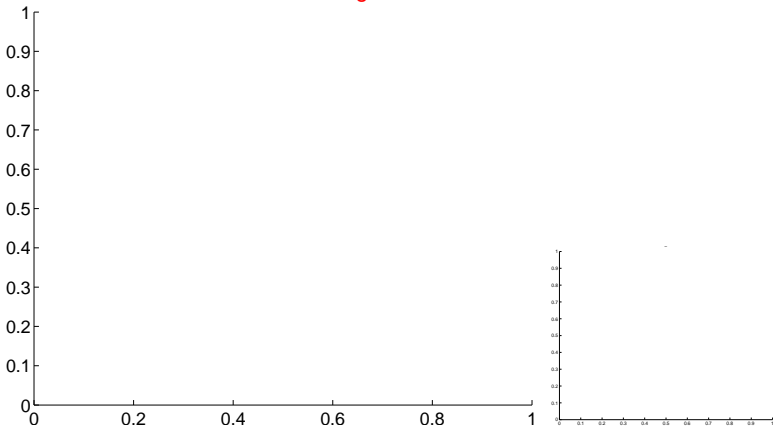
Q15 OOT image



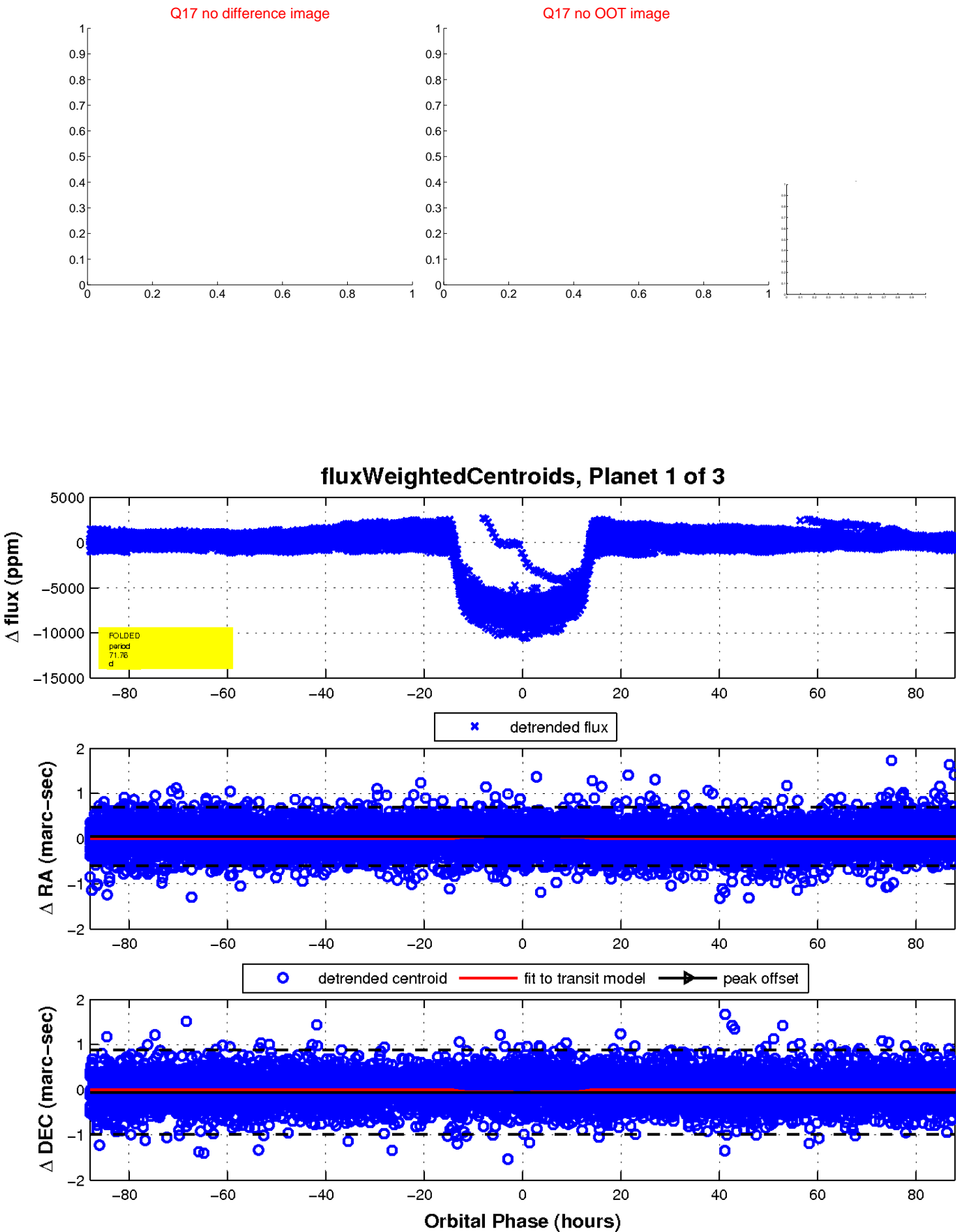
Q16 no difference image



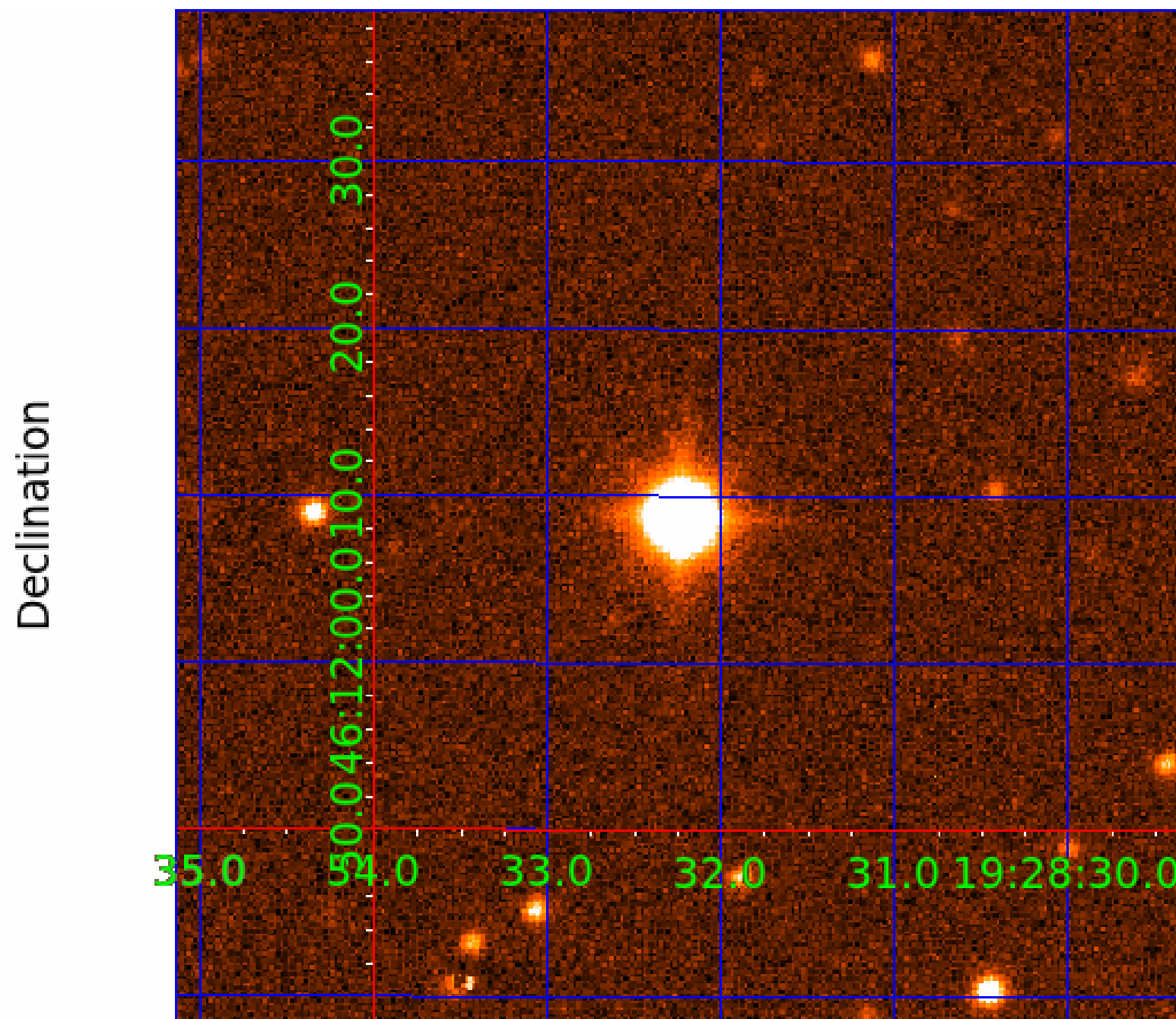
Q16 no OOT image



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



UKIRT Image



KIC 009588822

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})
009588822-01	OBS	4388.01	71.762294	170.095213	8572.8	29.295	192.4	305.5	2.82	5529	25.67	46.43
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009588822-01	OBS	FP	0.00	0	1	0	0	HAS_SEC_TCE
009588822-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009588822-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

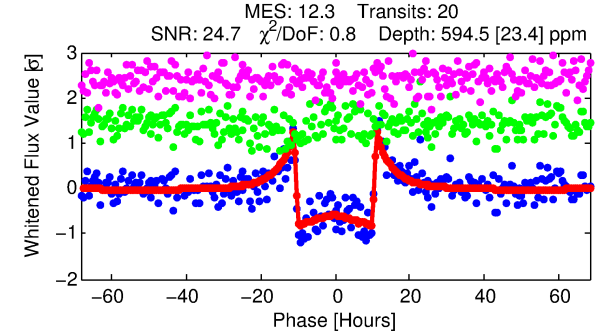
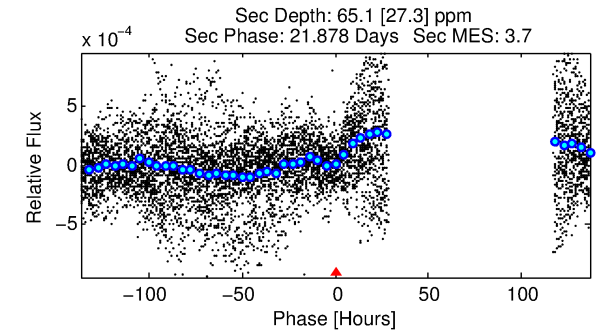
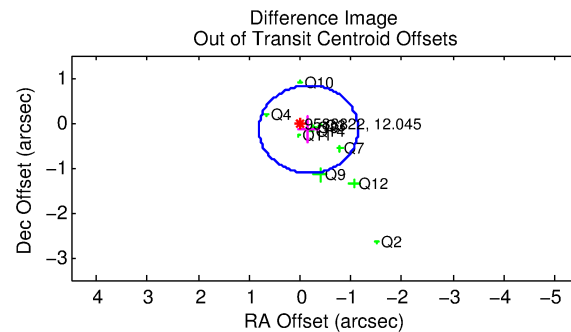
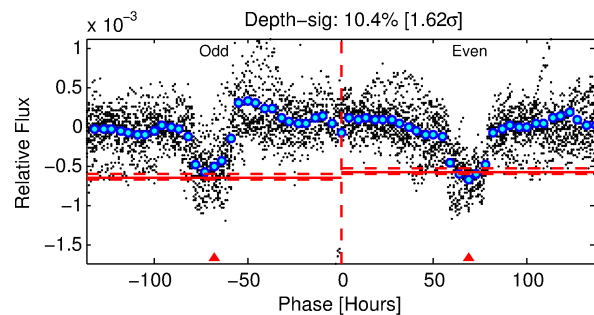
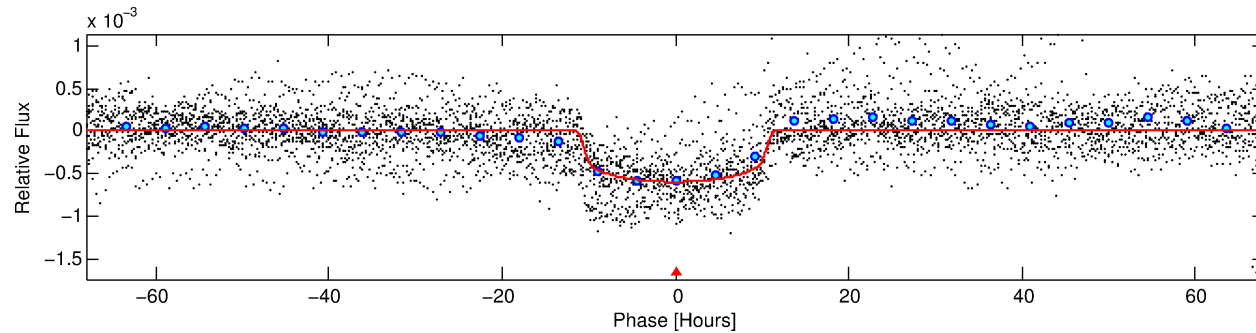
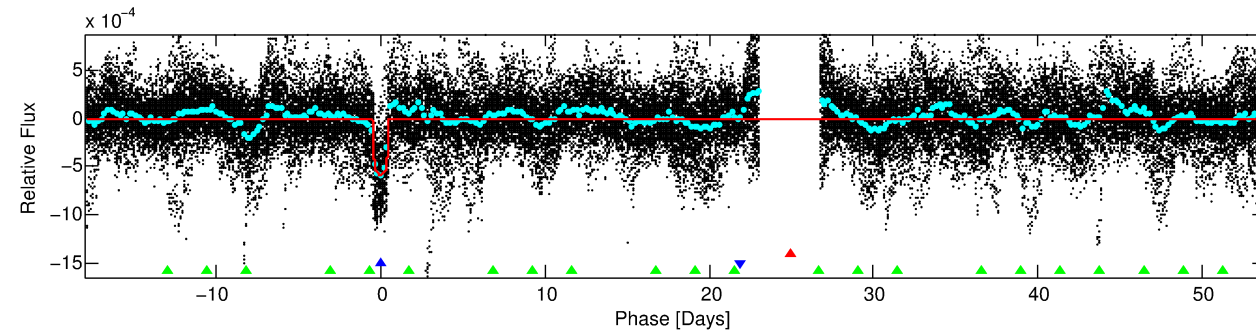
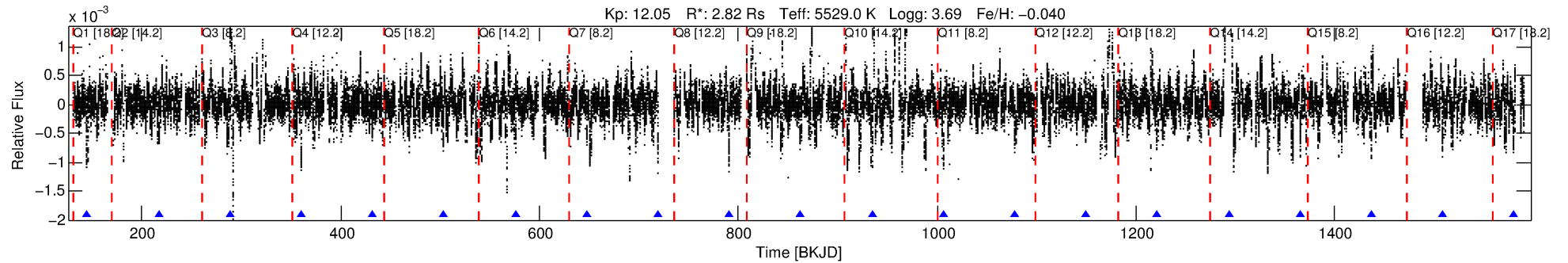
Ephemeris Match Information For 009588822-02

No Significant Match Found

DV One-Page Summary

KIC: 9588822 Candidate: 2 of 3 Period: 71.762 d

KOI: K04388.01 Corr: 0.964



DV Fit Results:

Period = 71.76203 [0.00039] d
Epoch = 145.1902 [0.0046] BKJD
Rp/R* = 0.0249 [0.0006]
a/R* = 15.41 [1.00]
b = 0.80 [0.03]
Seff = 46.43 [54.40]
Teq = 666 [195] K
Rp = 7.65 [4.64] Re
a = 0.3783 [0.2572] AU
Ag = 87.64 [108.63] [0.80 σ]
Teffp = 3149 [346] K [6.26 σ]

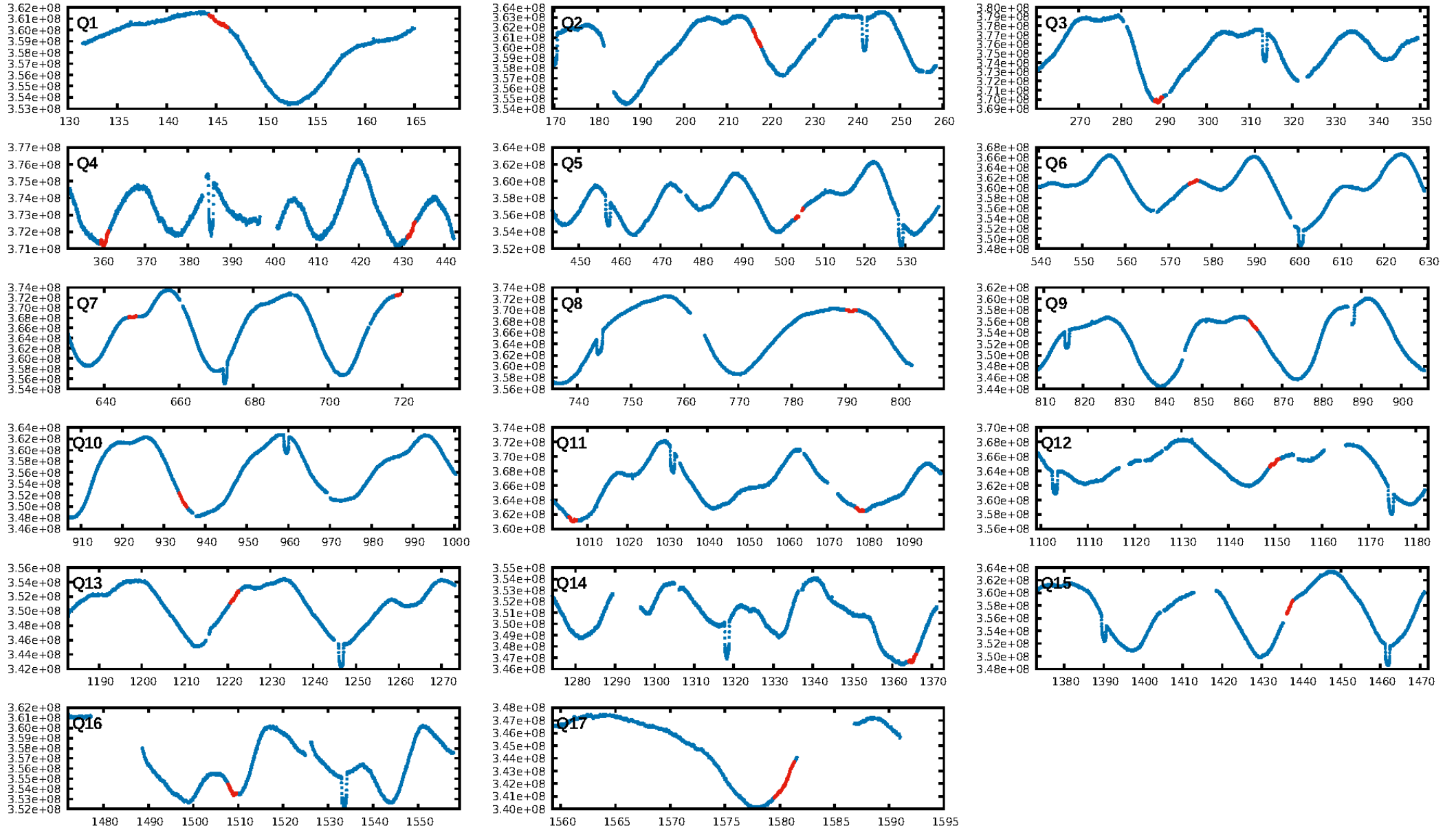
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.44 σ]
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: 87.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.31e-31
RollingBand-fgt: 1.00 [18/18]
GhostDiagnostic-chr: 3.354
Centroid-sig: 0.1%
Centroid-so: 0.161 arcsec [1.60 σ]
OotOffset-rm: 0.220 arcsec [0.68 σ]
KicOffset-rm: 0.244 arcsec [0.88 σ]
OotOffset-st: 3/3/3/1 [10]
KicOffset-st: 3/3/3/1 [10]
DiffImageQuality-fgm: 1.00 [10/10]
DiffImageOverlap-fno: 0.92 [11/12]

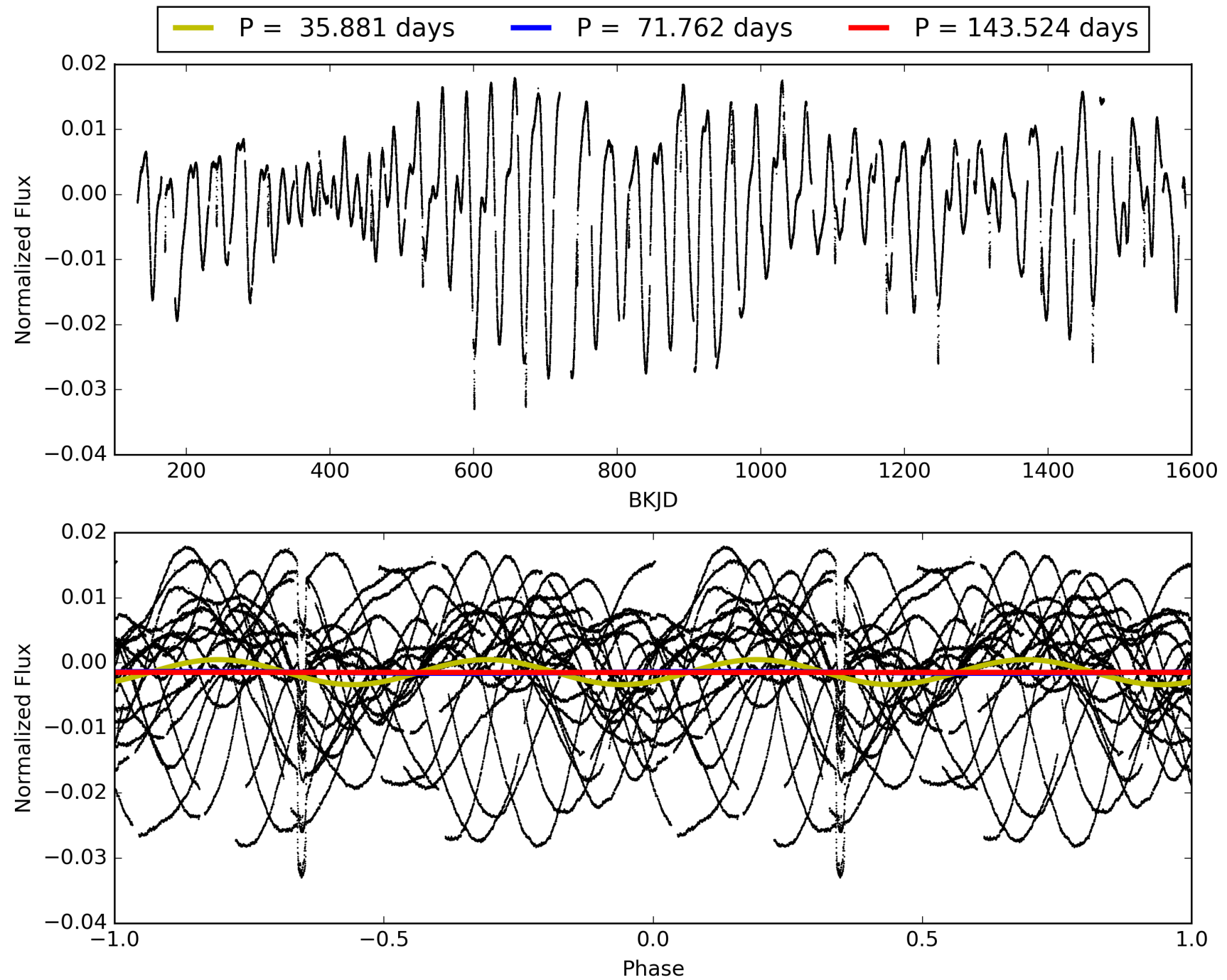
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:29:02 Z

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

TCE 009588822-02, PDC Light Curves

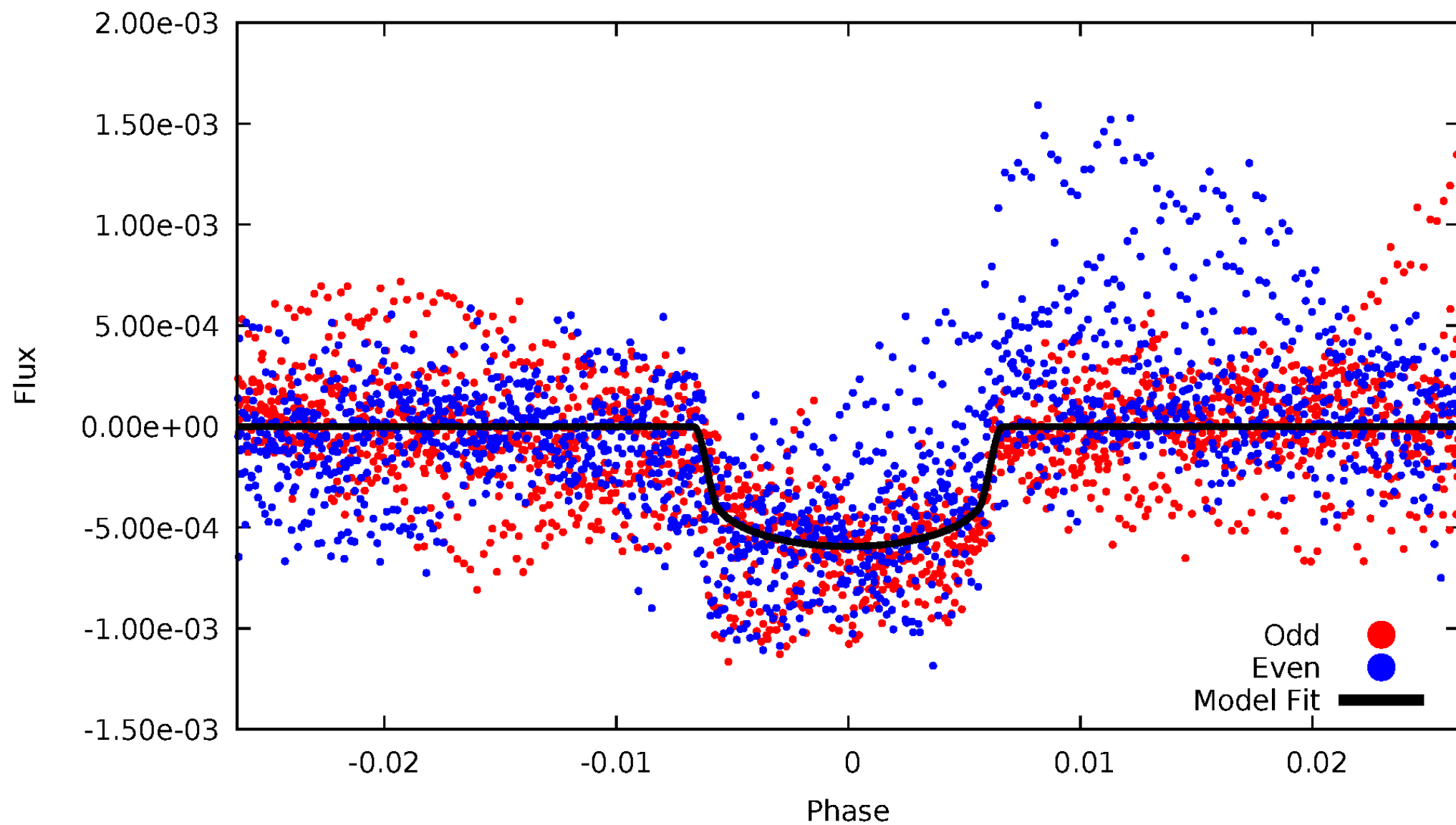


TCE 009588822-02



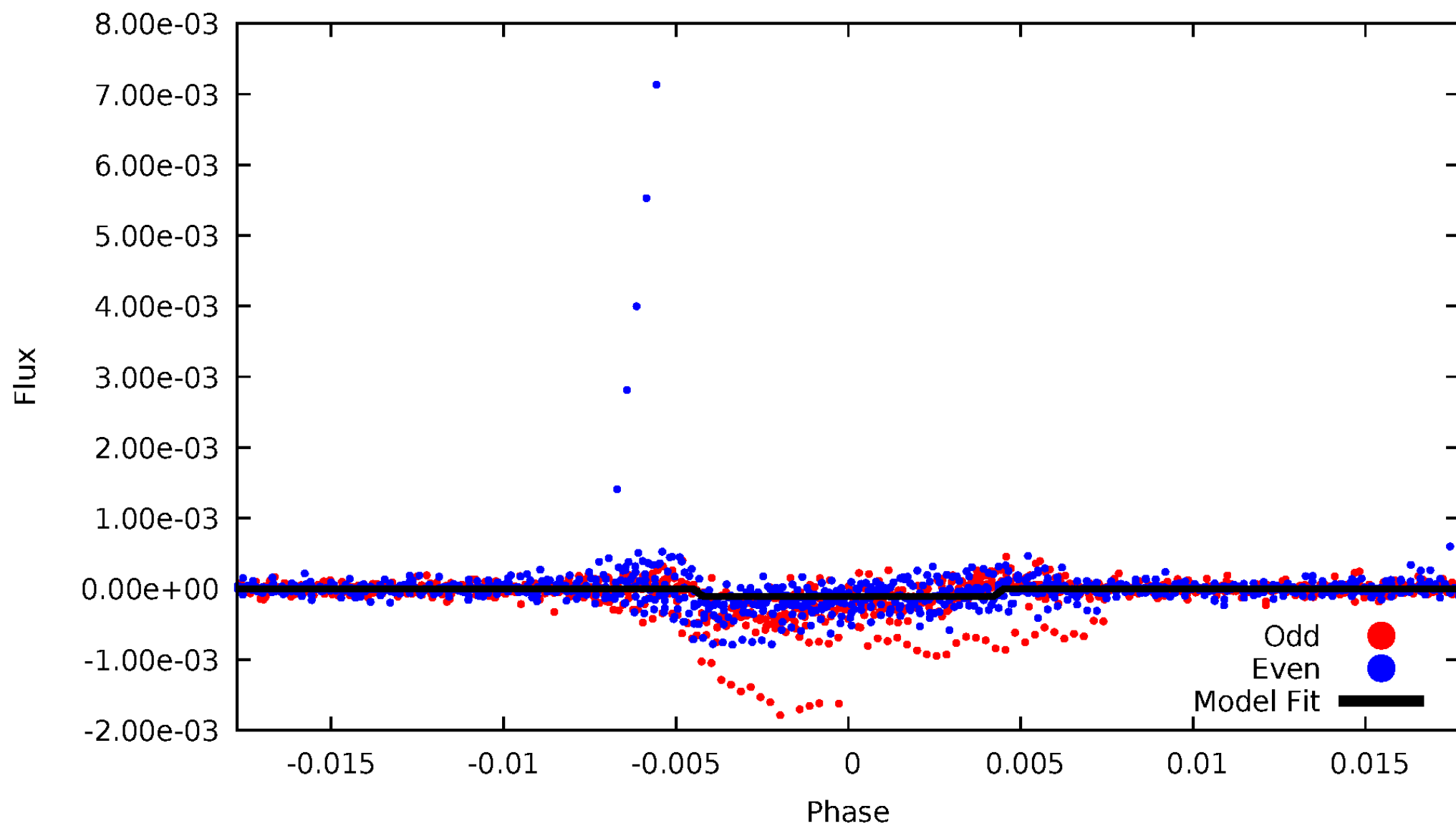
DV Odd/Even

TCE 009588822-02



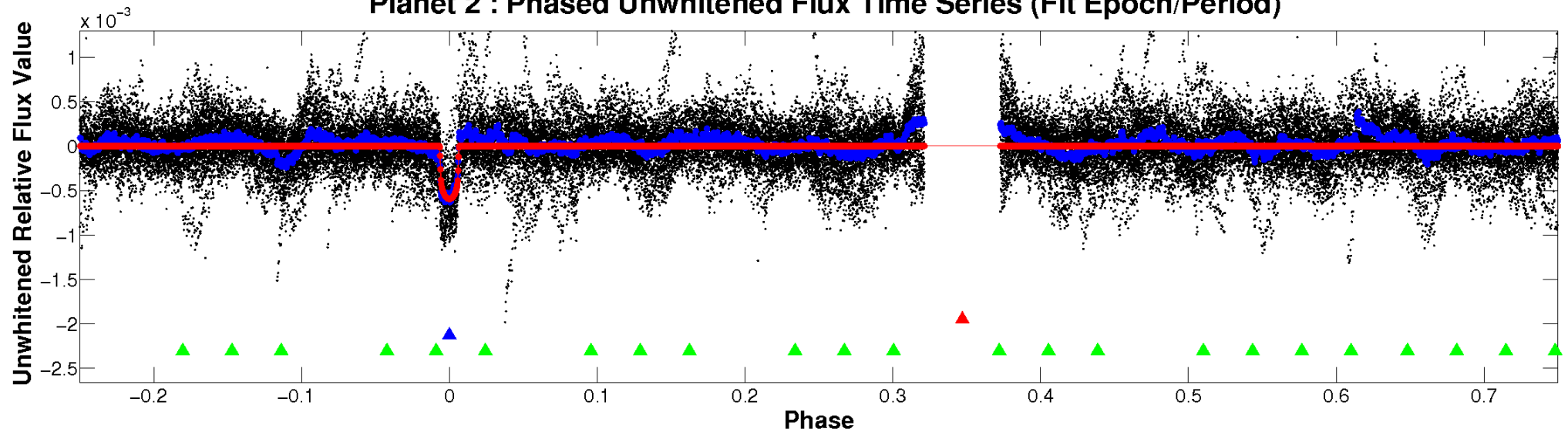
ALT Odd/Even

TCE 009588822-02

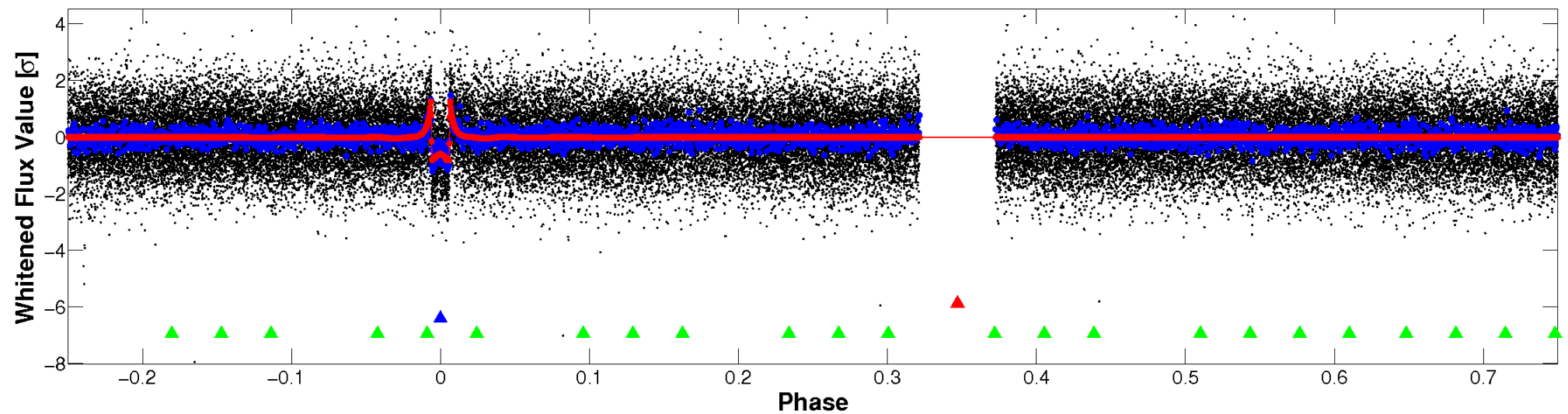


Non-Whitened Vs. Whitened Light Curve

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

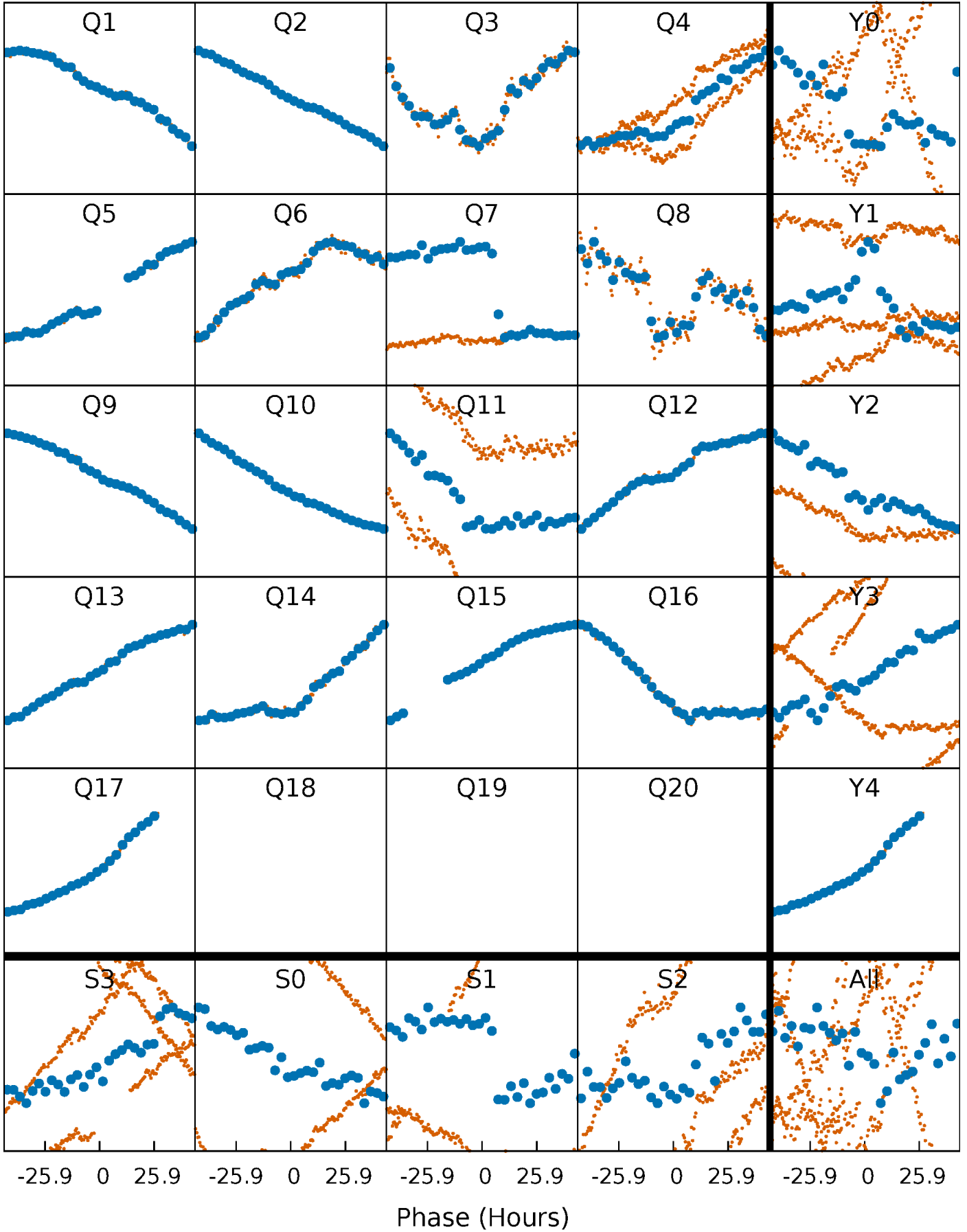


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



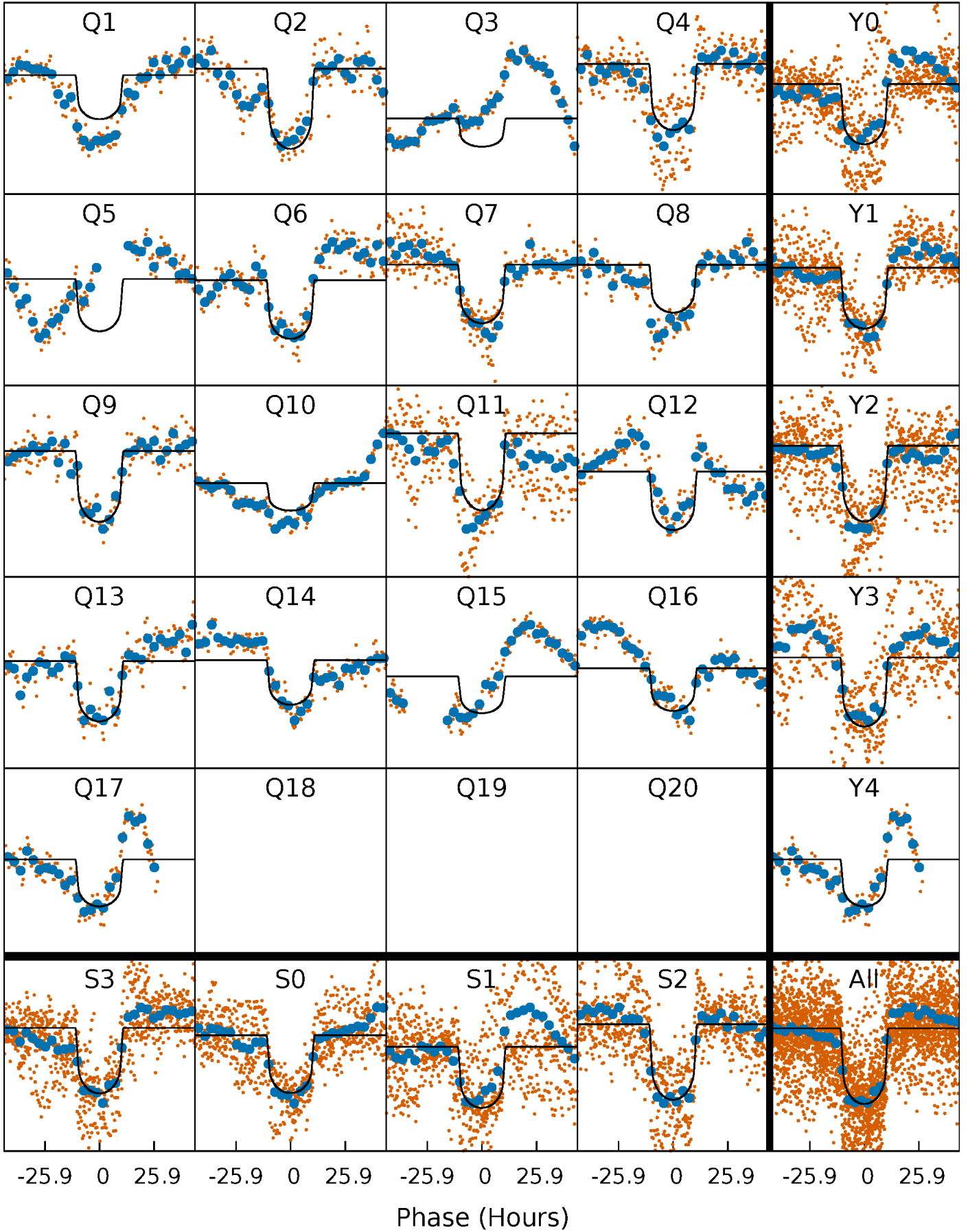
PDC Quarter-Phased Transit Curves

TCE 009588822-02 P= 71.762034 Days $T_0=145.190243$ (BKJD)



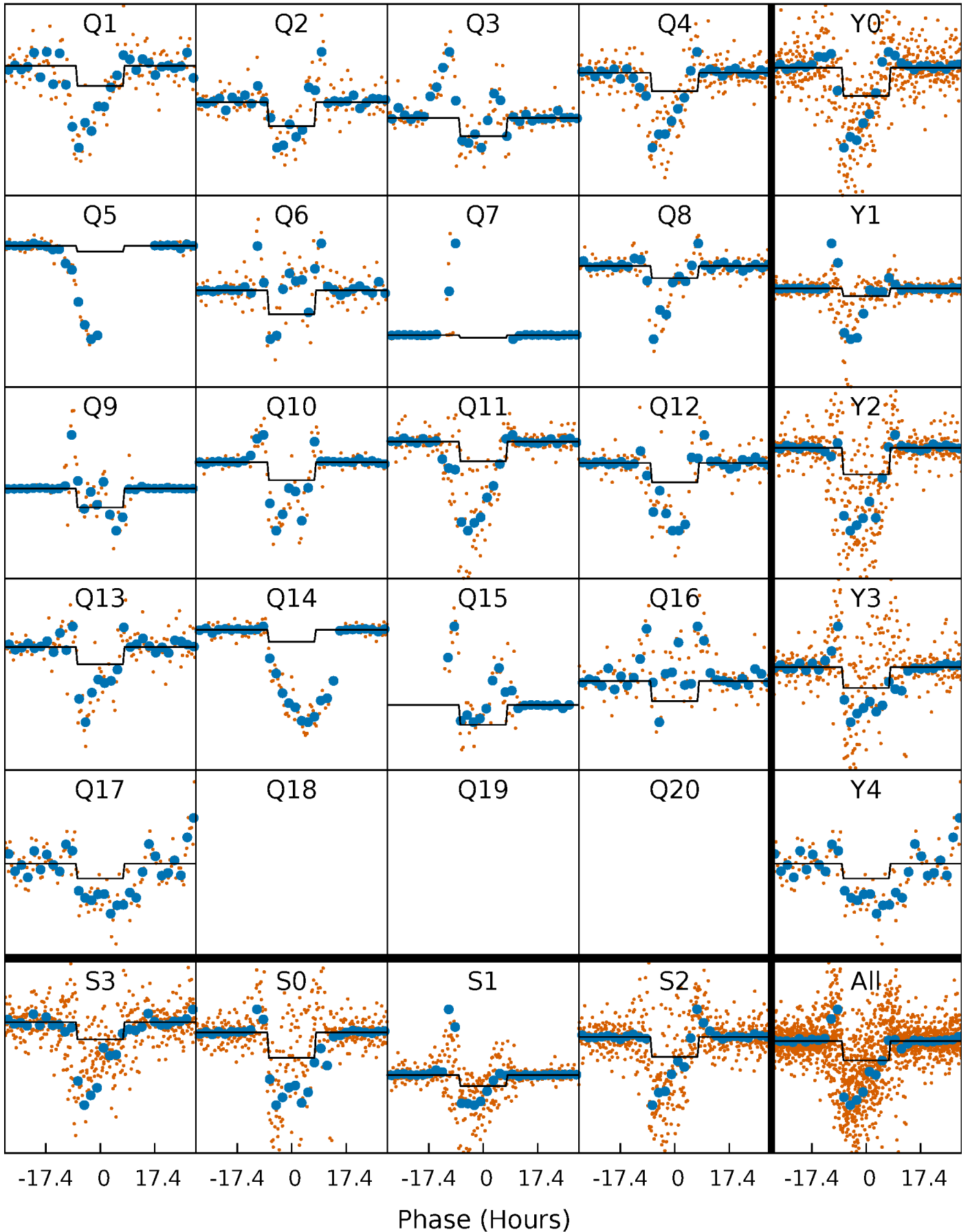
DV Quarter-Phased Transit Curves

TCE 009588822-02 P= 71.762034 Days $T_0=145.190243$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

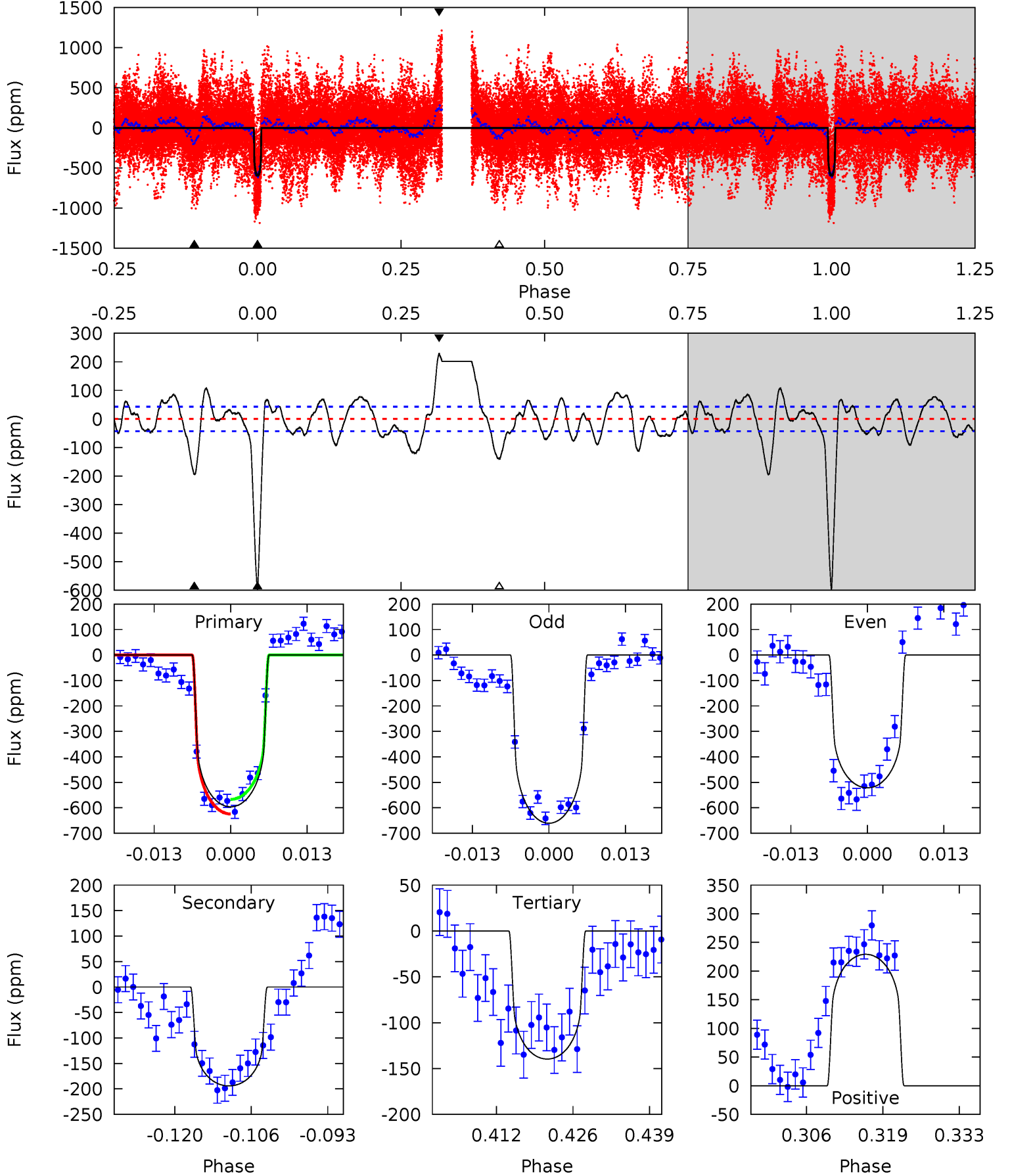
TCE 009588822-02 P= 71.759612 Days $T_0=145.115456$ (BKJD)



DV Model-Shift Uniqueness Test

009588822-02, P = 71.762034 Days, E = 73.428209 Days

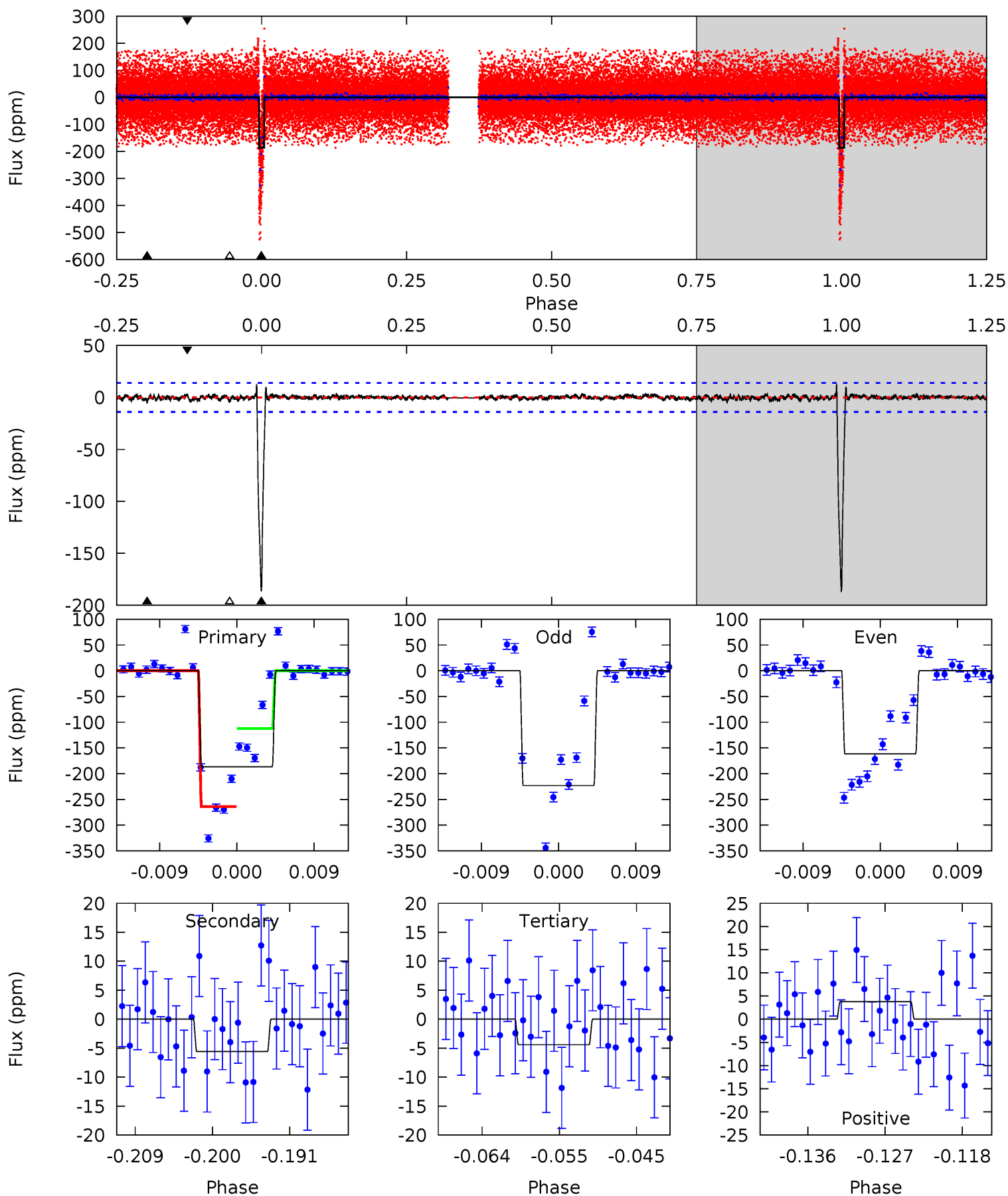
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.7	22.4	16.1	26.4	4.97	2.48	6.99	52.6	42.3	6.28	-4.05	8.16	1.03	0.28	3.30



Alt Model-Shift Uniqueness Test

009588822-02, P = 71.759612 Days, E = 73.355844 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
67.2	2.01	1.59	1.36	5.04	2.61	0.44	65.6	65.9	0.42	0.65	11.3	1.19	0.06	27.1



Stellar Parameters For KIC 009588822

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5529^{+168}_{-140}	$3.685^{+0.712}_{-0.178}$	$-0.040^{+0.300}_{-0.250}$	$2.817^{+0.789}_{-1.709}$	$1.402^{+0.216}_{-0.505}$	$0.088^{+1.239}_{-0.046}$
	+3%/-3%	+19%/-5%	+750%/-625%	+28%/-61%	+15%/-36%	+1403%/-52%
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 009588822-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-194 ± 9	$7.36^{+1.42}_{-2.55}$	907^{+90}_{-151}	4346^{+125}_{-106}	285^{+322}_{-86}
Alt.	-6 ± 3	$3.02^{+0.64}_{-1.06}$	913^{+87}_{-165}	3219^{+233}_{-322}	49^{+62}_{-27}

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 $A_{obs} \gg 1.0$

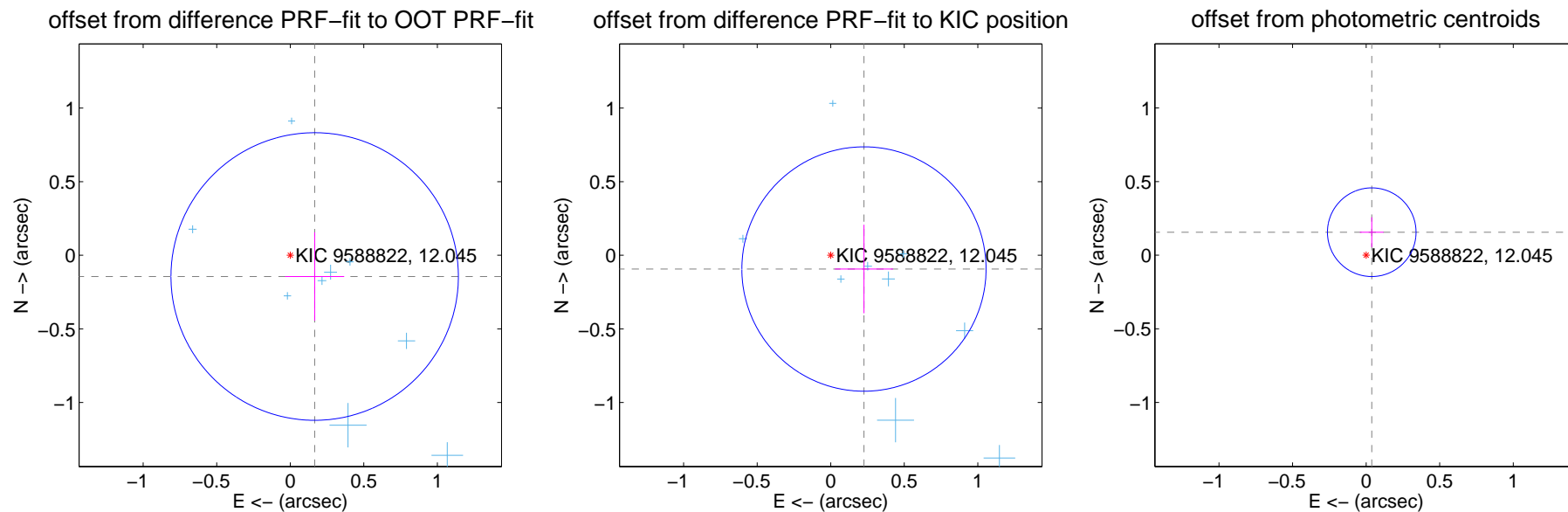
DV Centroid Data

Supplemental centroid analysis for 009588822-02. Kepler magnitude: 12.04. Transit SNR 24.73

There are 10 quarters with good PRF difference image offsets

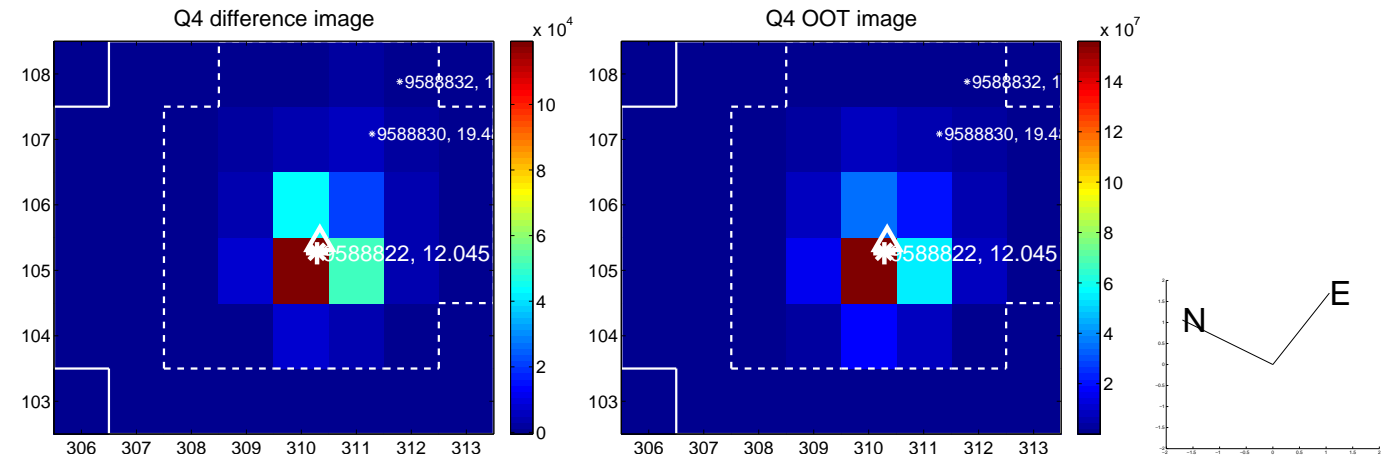
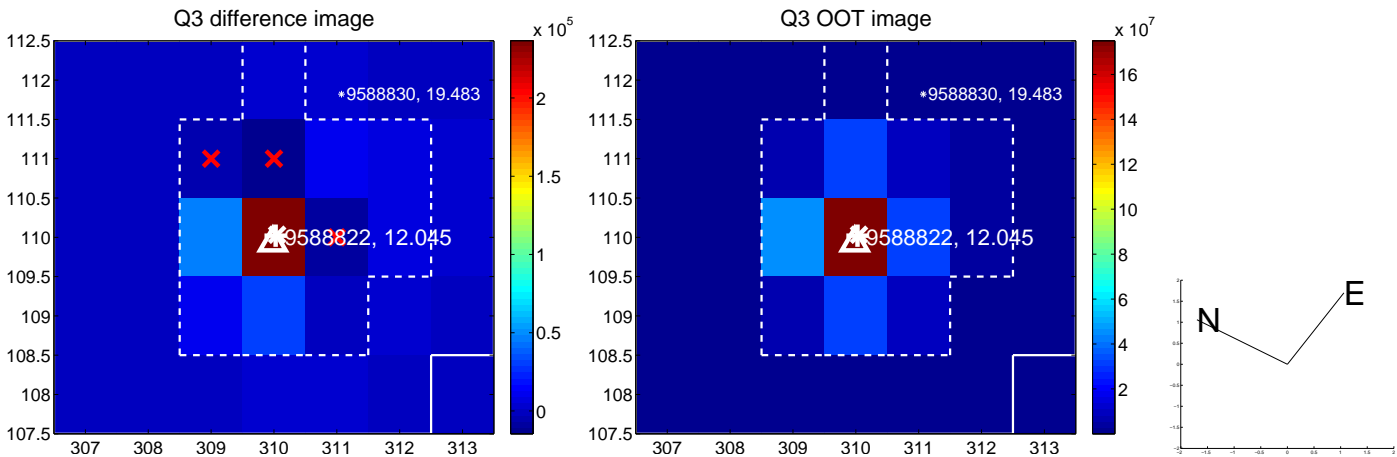
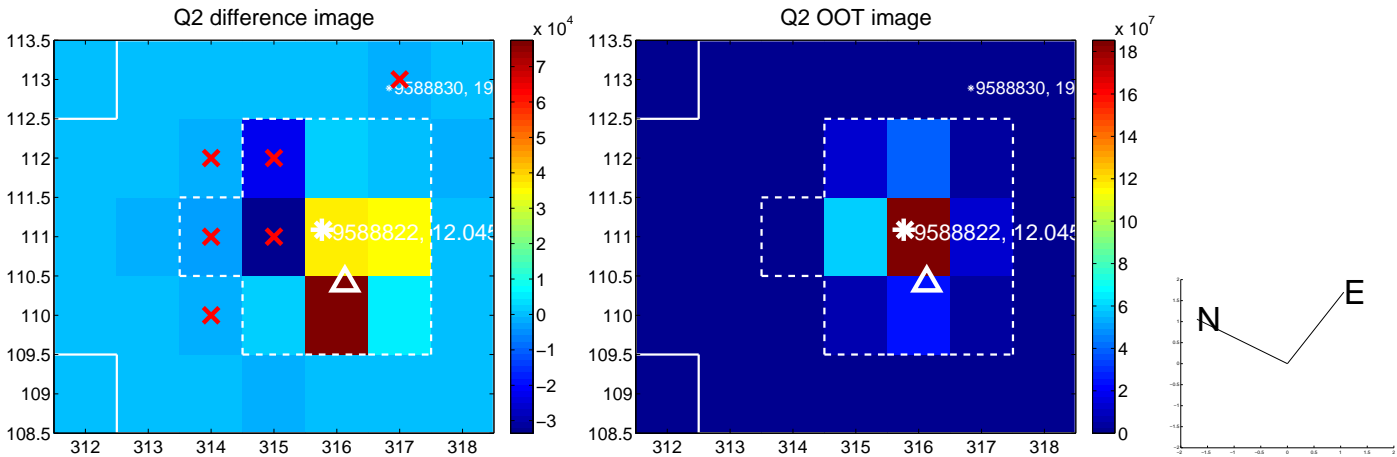
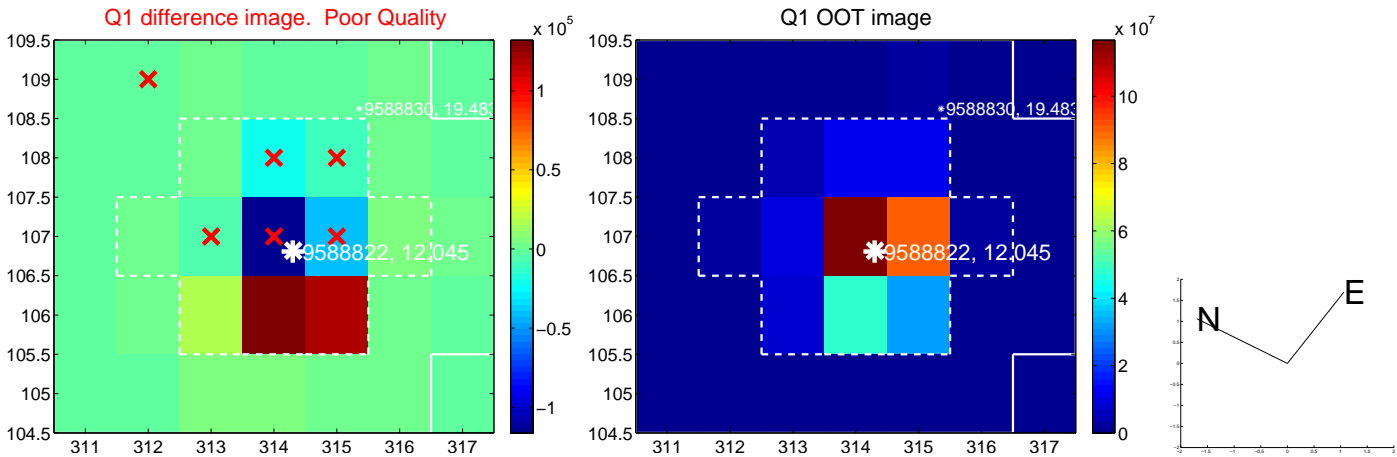
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.220 ± 0.326	0.68	-0.166 ± 0.201	-0.144 ± 0.300
PRF-fit source offset from KIC position	0.244 ± 0.277	0.88	-0.226 ± 0.198	-0.093 ± 0.301
photometric centroid source offset	0.16 ± 0.10	1.60	-0.04 ± 0.08	0.16 ± 0.10

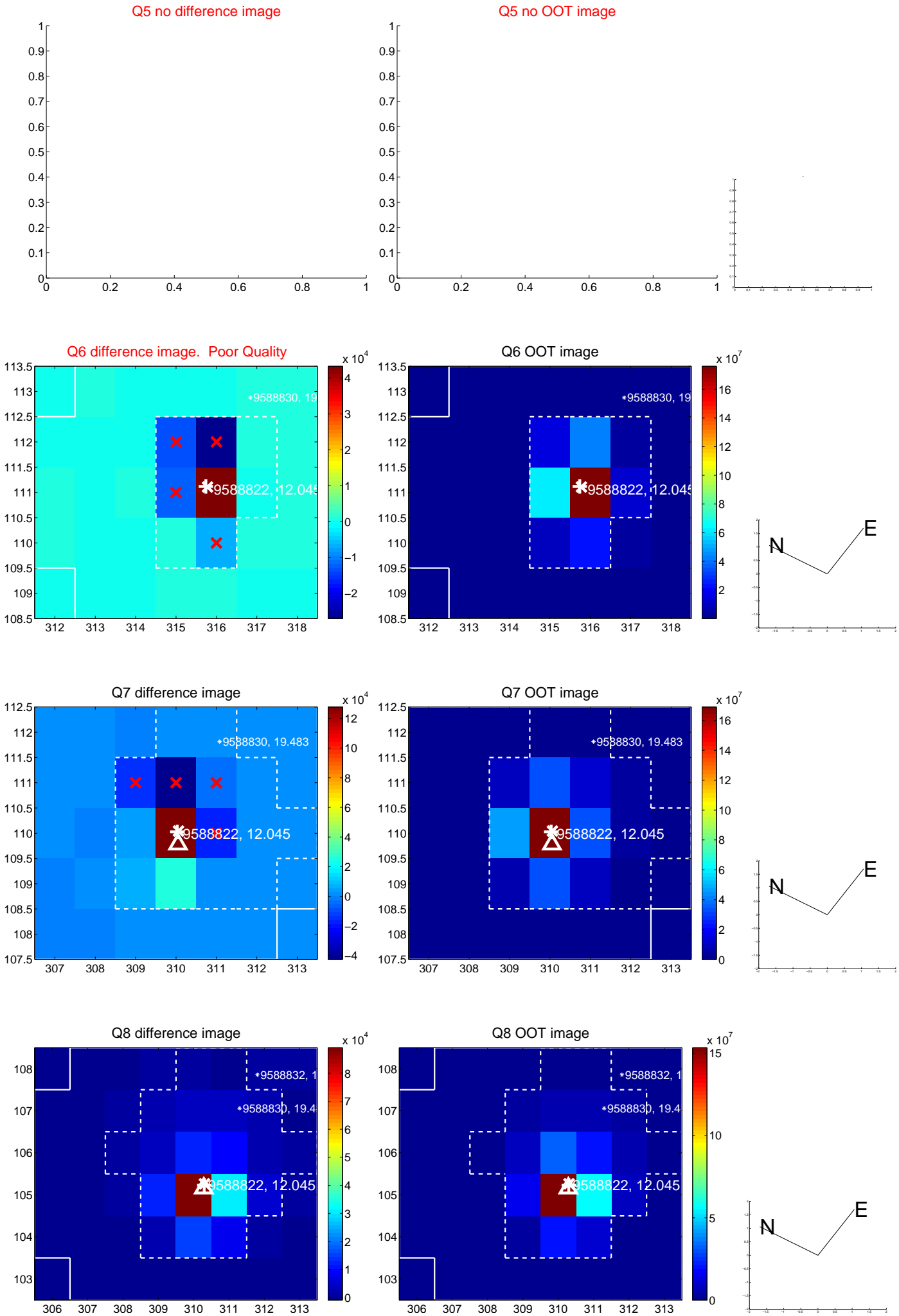


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

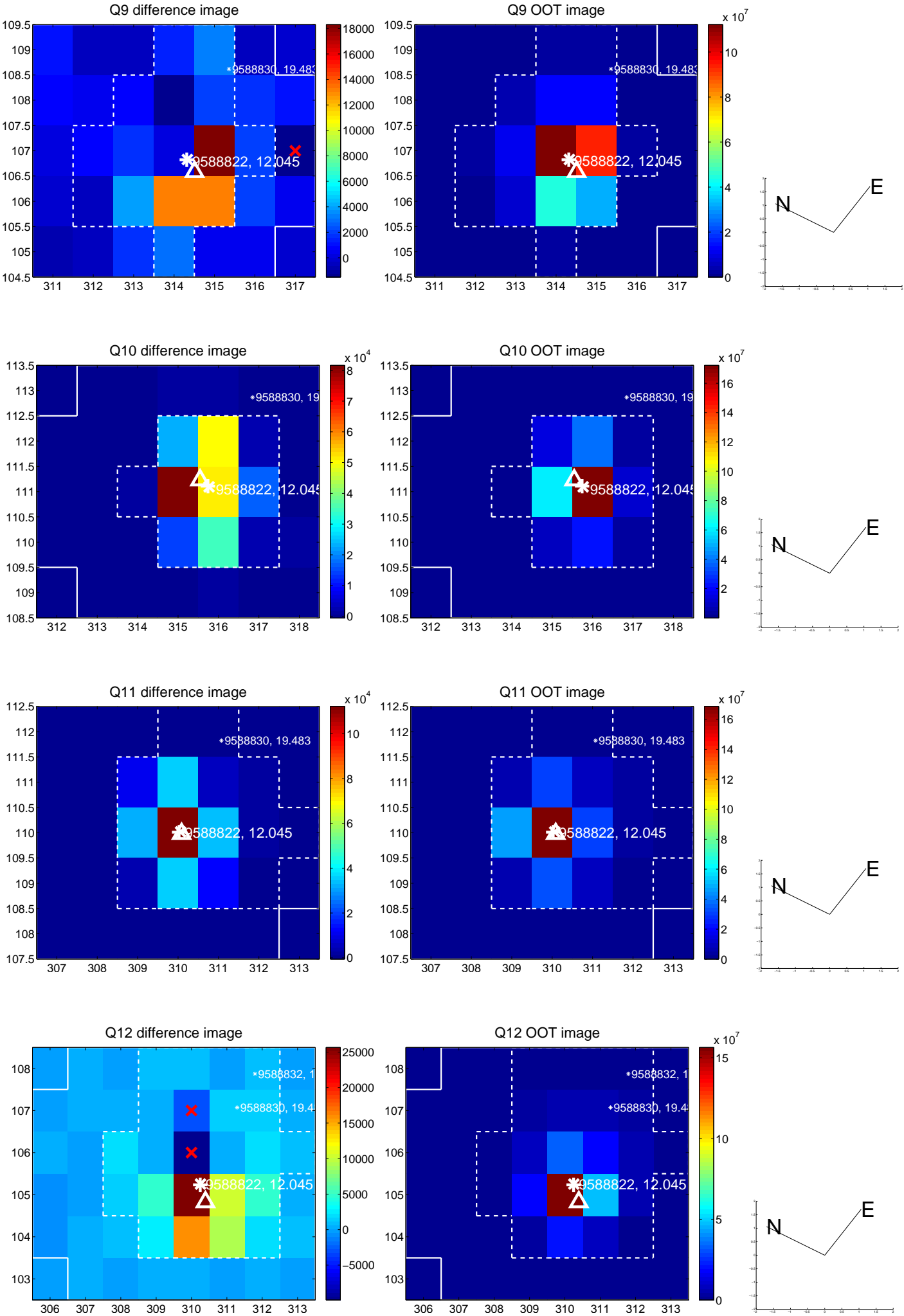
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



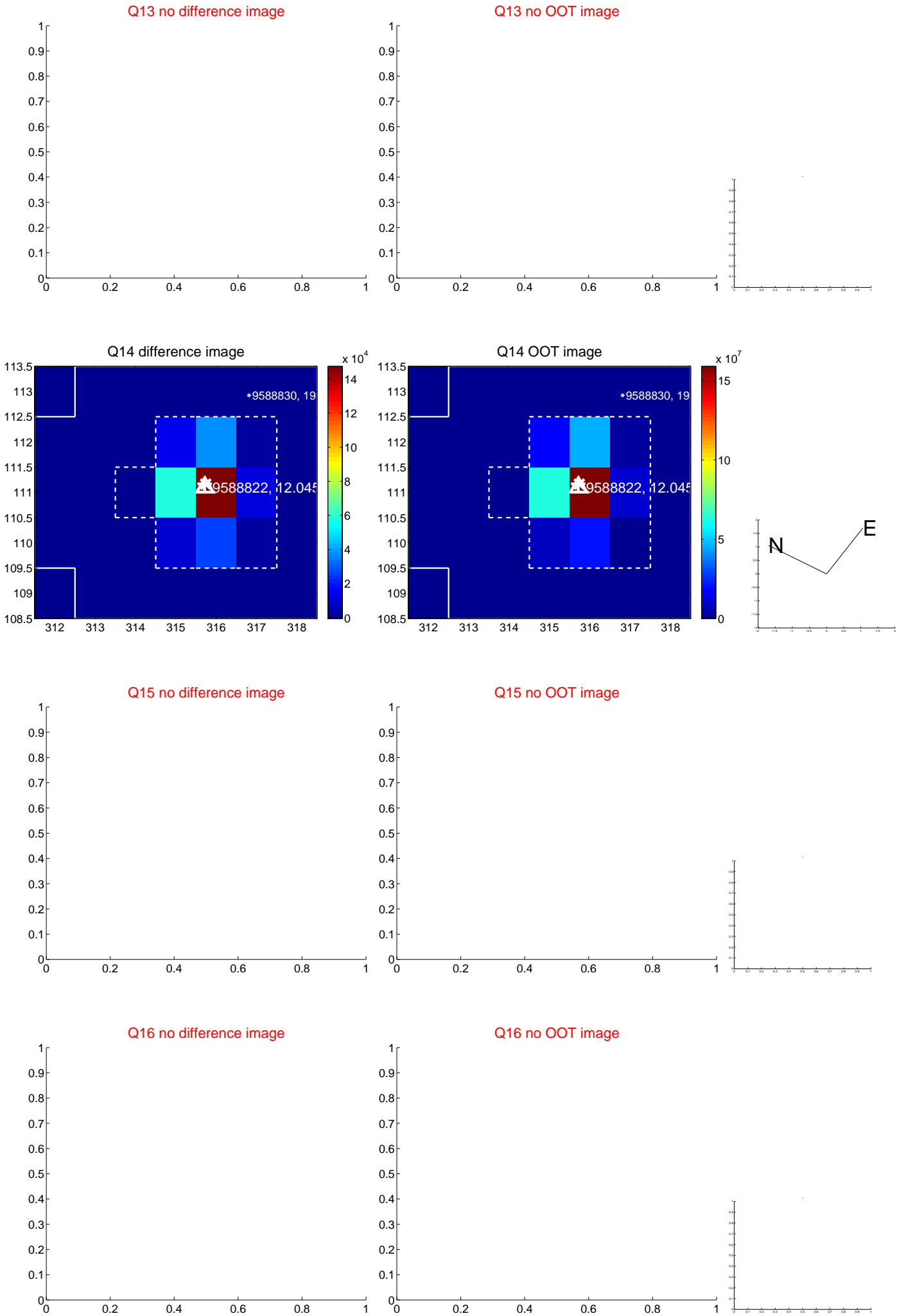
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



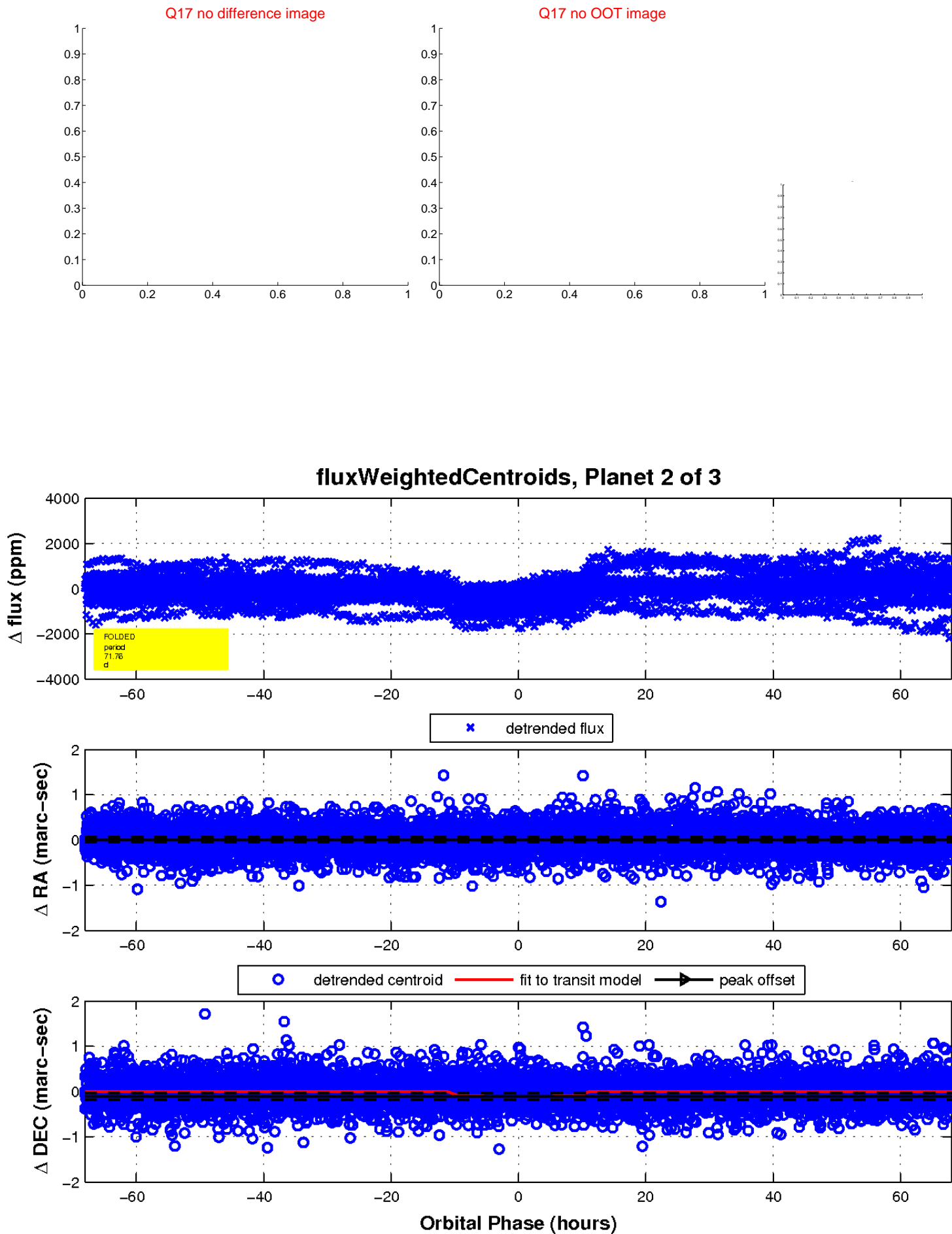
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

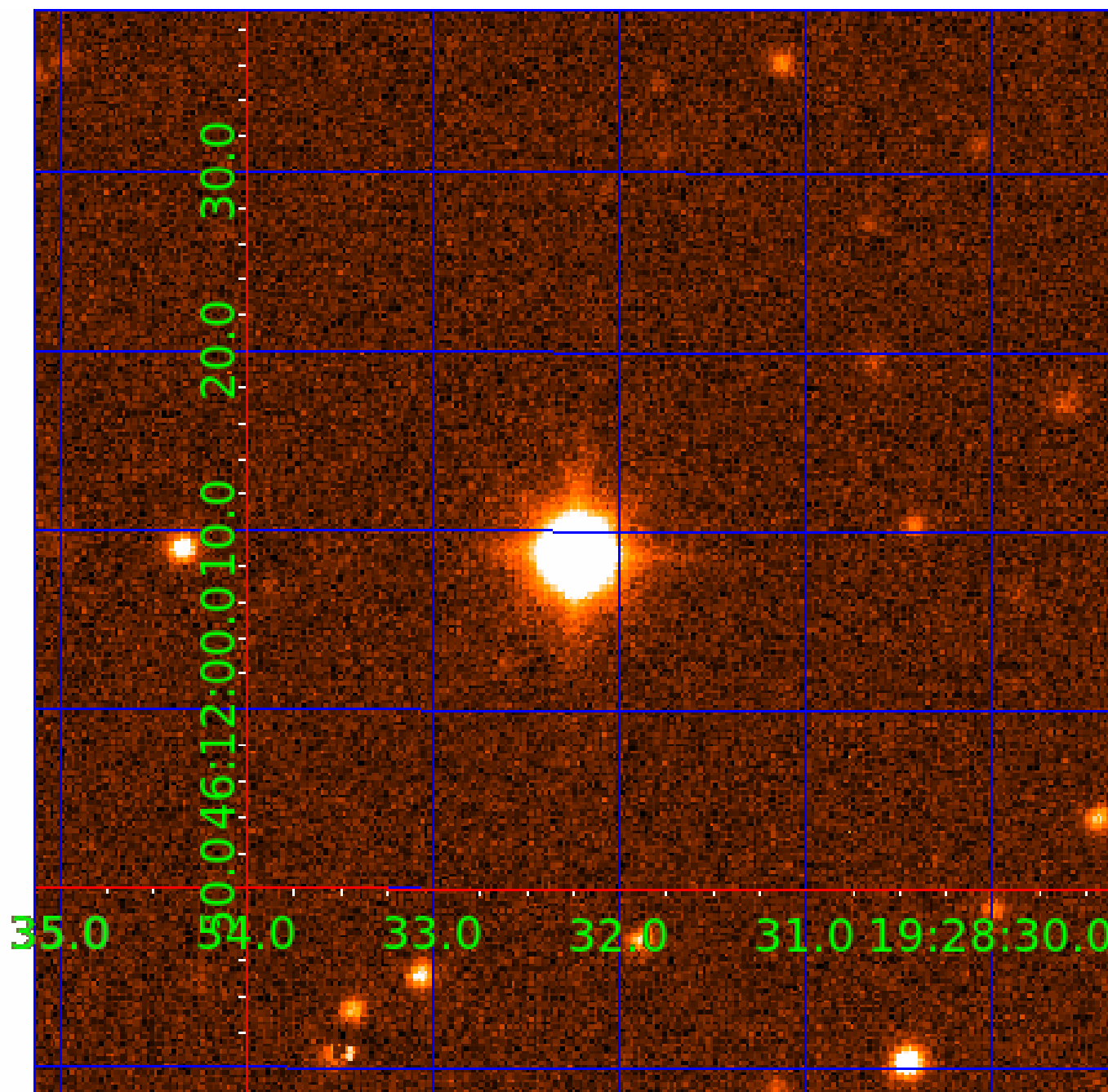


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009588822

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})
009588822-01	OBS	4388.01	71.762294	170.095213	8572.8	29.295	192.4	305.5	2.82	5529	25.67	46.43
009588822-02	OBS	No	71.762034	145.190243	594.5	22.682	12.3	24.7	2.82	5529	7.65	46.43
009588822-03	OBS	4388.02	61.851711	191.709525	182.3	2.184	7.3	8.4	2.82	5529	4.14	56.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009588822-01	OBS	FP	0.00	0	1	0	0	HAS_SEC_TCE
009588822-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009588822-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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 009588822-03

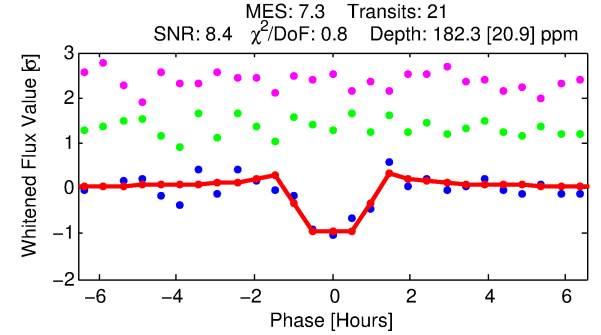
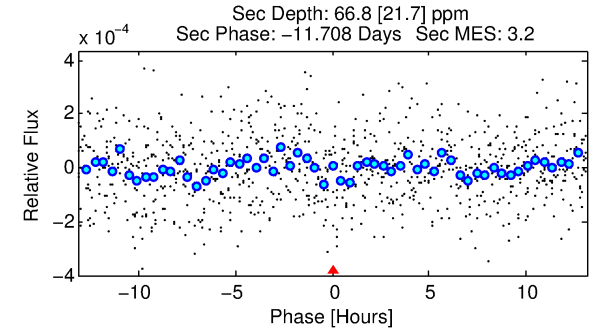
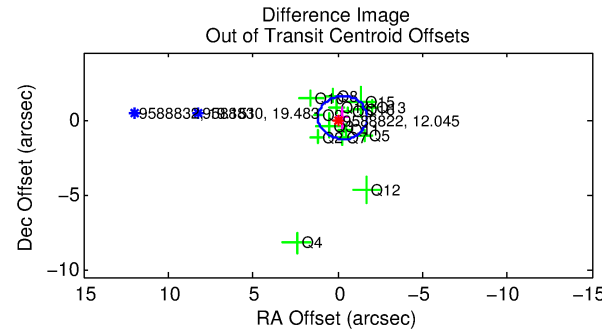
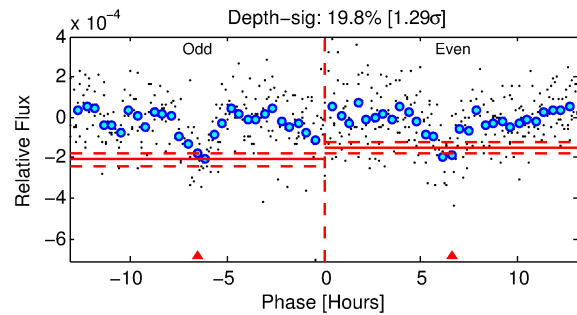
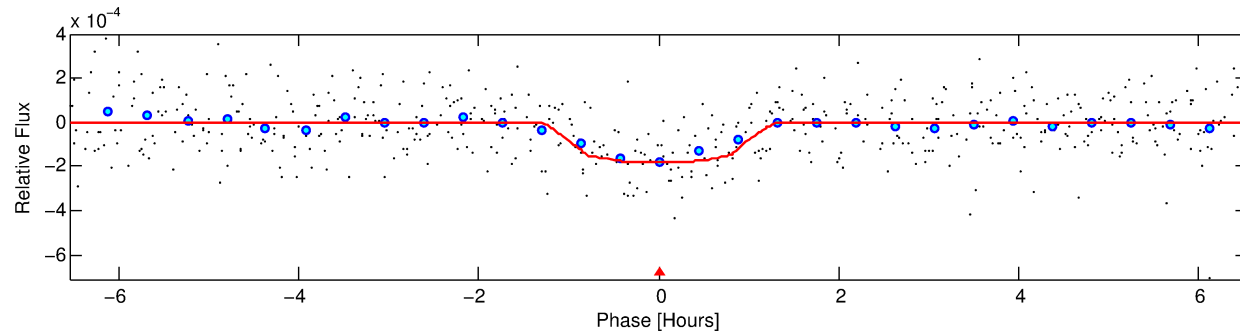
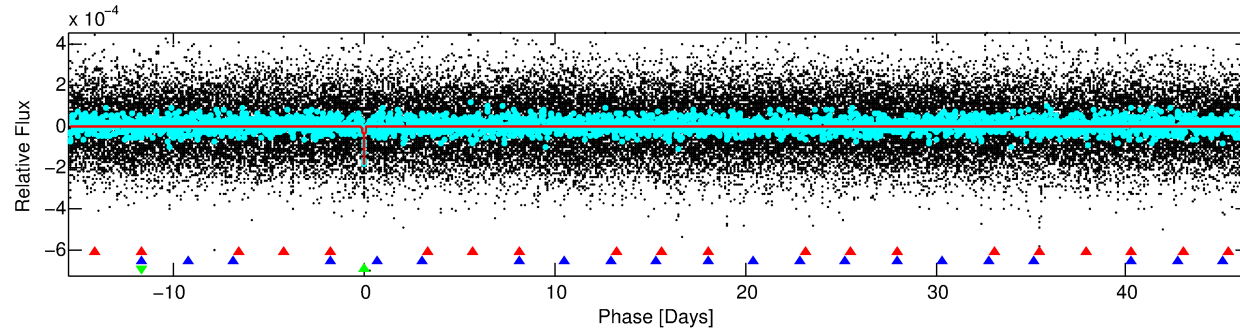
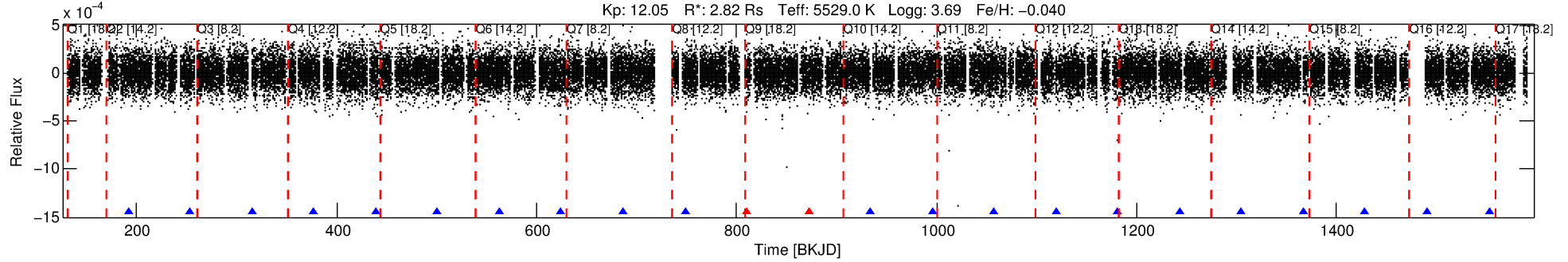
No Significant Match Found

DV One-Page Summary

KIC: 9588822 Candidate: 3 of 3 Period: 61.852 d

KOI: K04388 Corr: No Ephemeris Match

Kp: 12.05 R*: 2.82 Rs Teff: 5529.0 K Logg: 3.69 Fe/H: -0.040



DV Fit Results:

Period = 61.85171 [0.00034] d
Epoch = 191.7095 [0.0043] BKJD
Rp/R* = 0.0135 [0.0091]
a/R* = 146.93 [419.28]
b = 0.75 [1.67]
Seff = 56.61 [66.33]
Teq = 699 [205] K
Rp = 4.15 [3.77] Re
a = 0.3426 [0.2329] AU
Ag = 250.95 [455.82] [0.55σ]
Teffp = 4304 [1505] K [2.37σ]

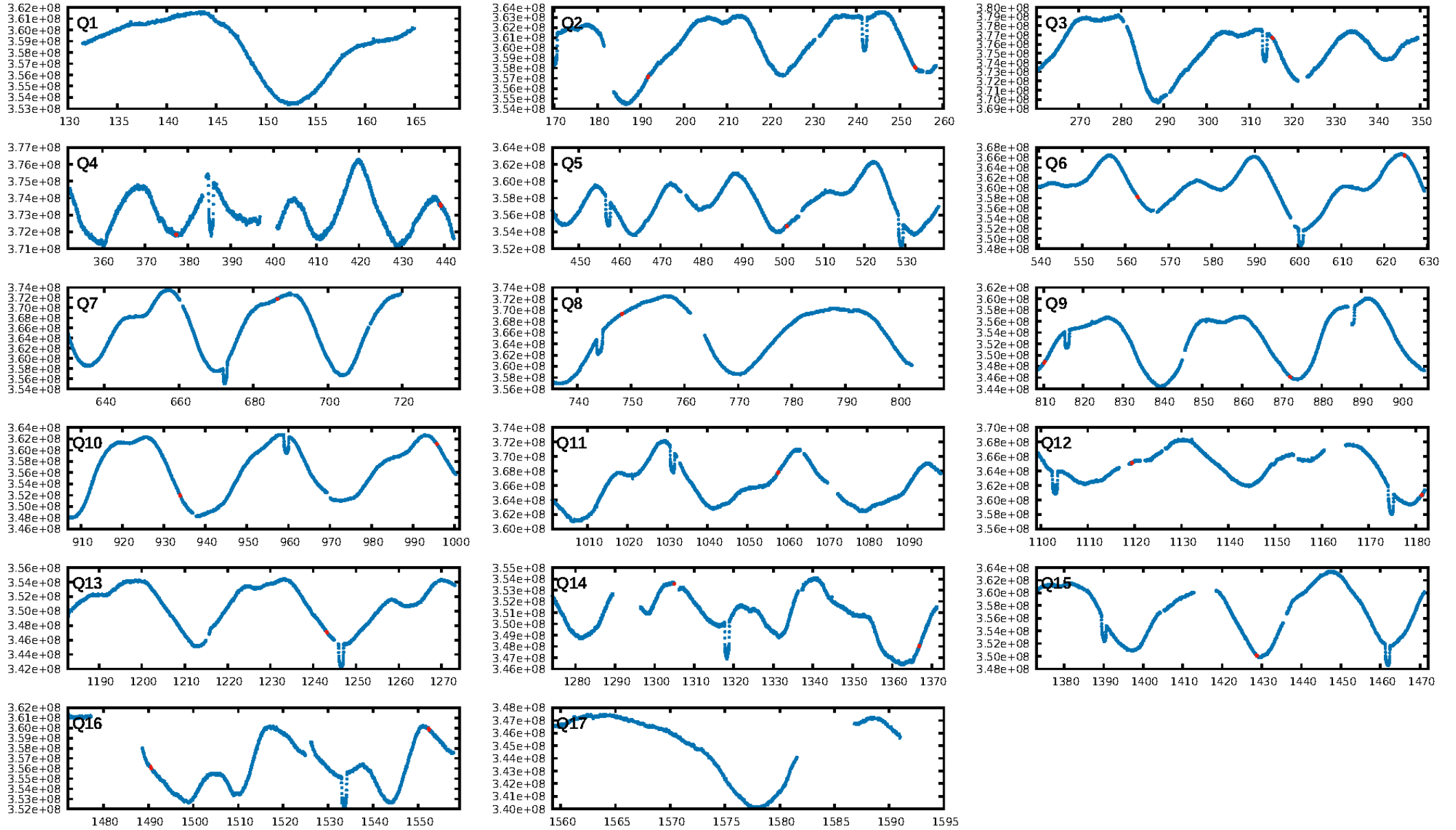
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [10.44σ]
ModelChiSquare2-sig: 97.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.05e-11
RollingBand-fgt: 0.90 [19/21]
GhostDiagnostic-chr: 2.647
Centroid-sig: 57.3%
Centroid-so: 0.323 arcsec [0.55σ]
OotOffset-rm: 0.318 arcsec [0.66σ]
KicOffset-rm: 0.407 arcsec [0.81σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 0.73 [11/15]
DiffImageOverlap-fno: 1.00 [15/15]

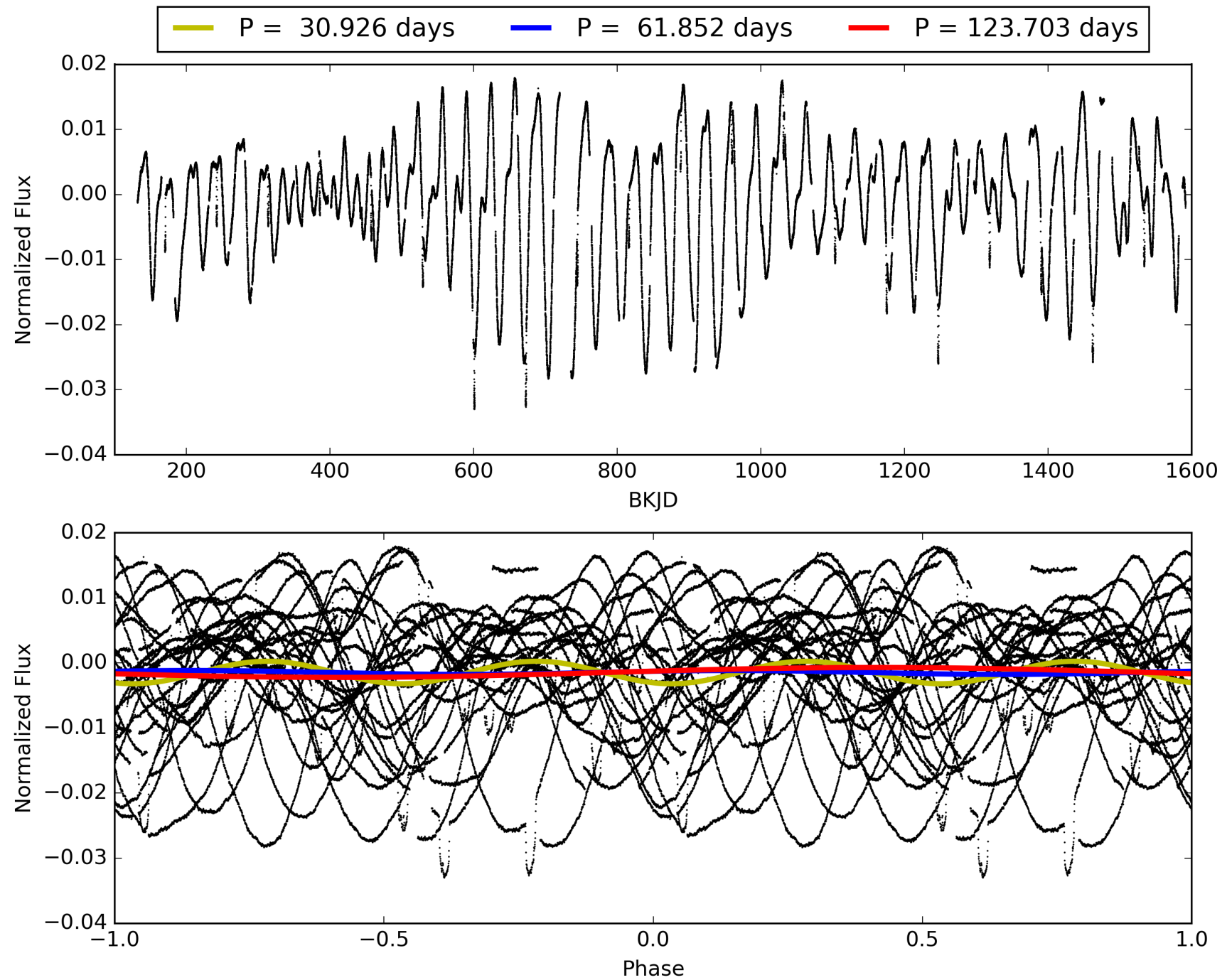
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:29:10 Z

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

TCE 009588822-03, PDC Light Curves

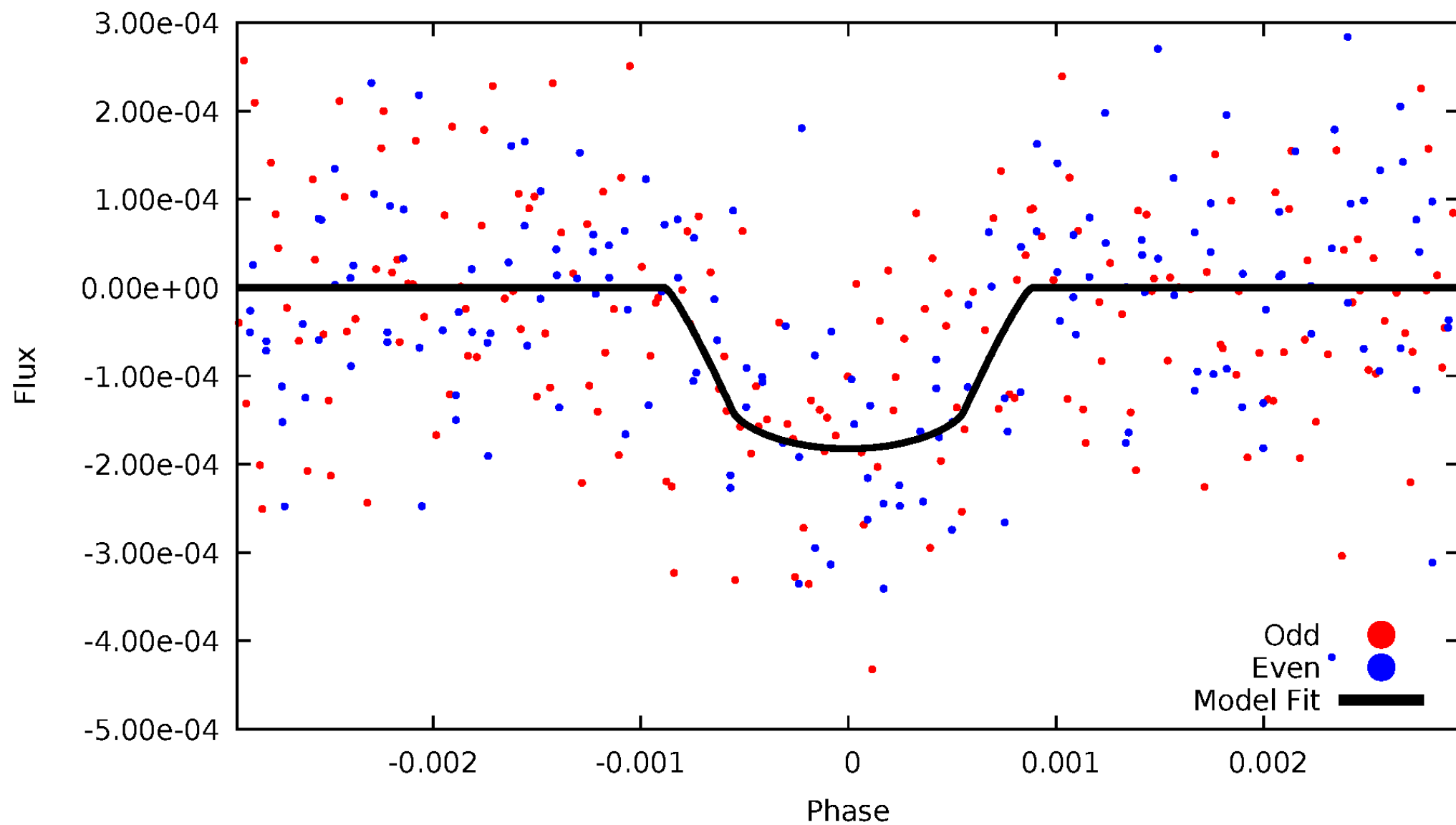


TCE 009588822-03



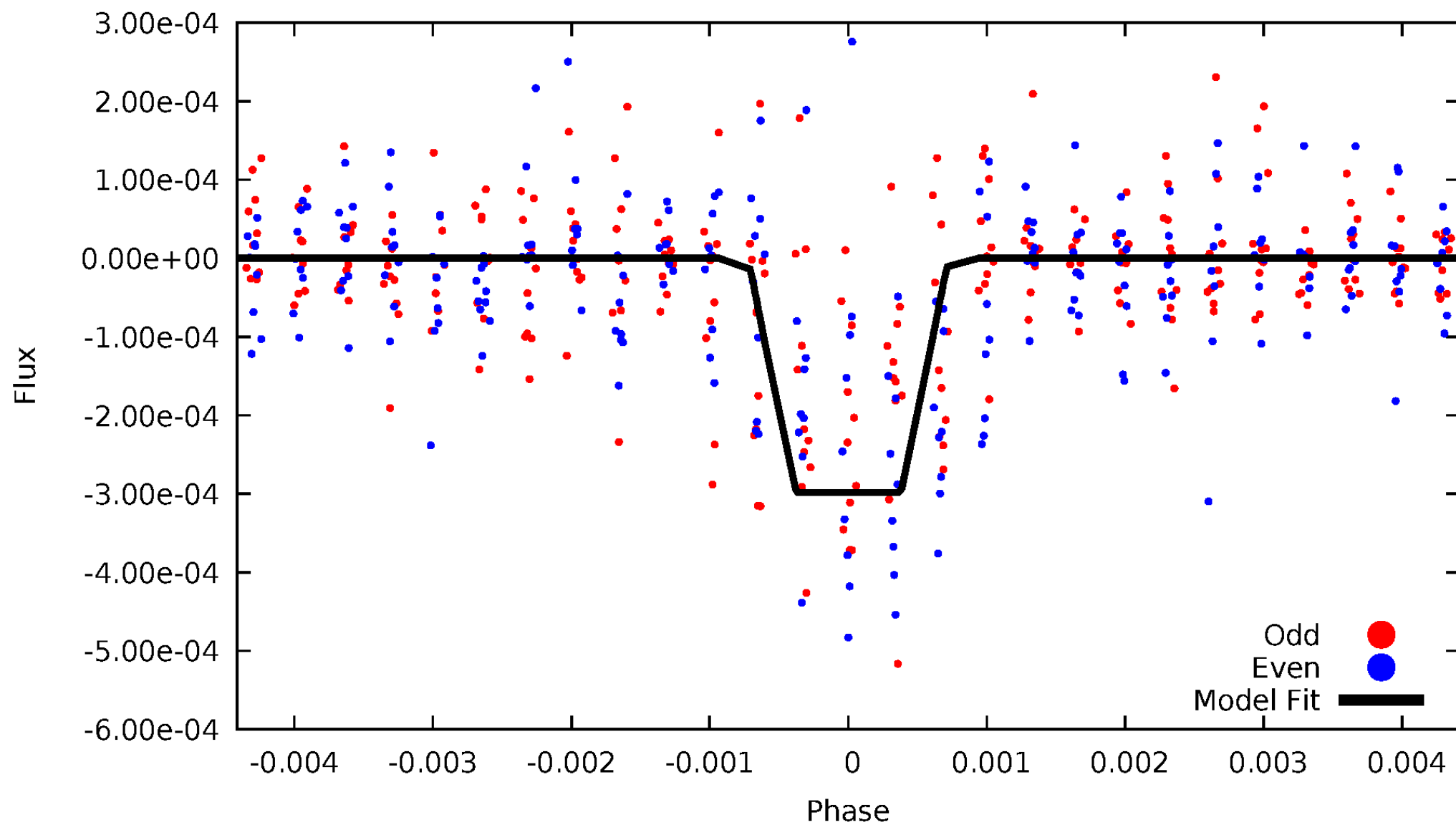
DV Odd/Even

TCE 009588822-03

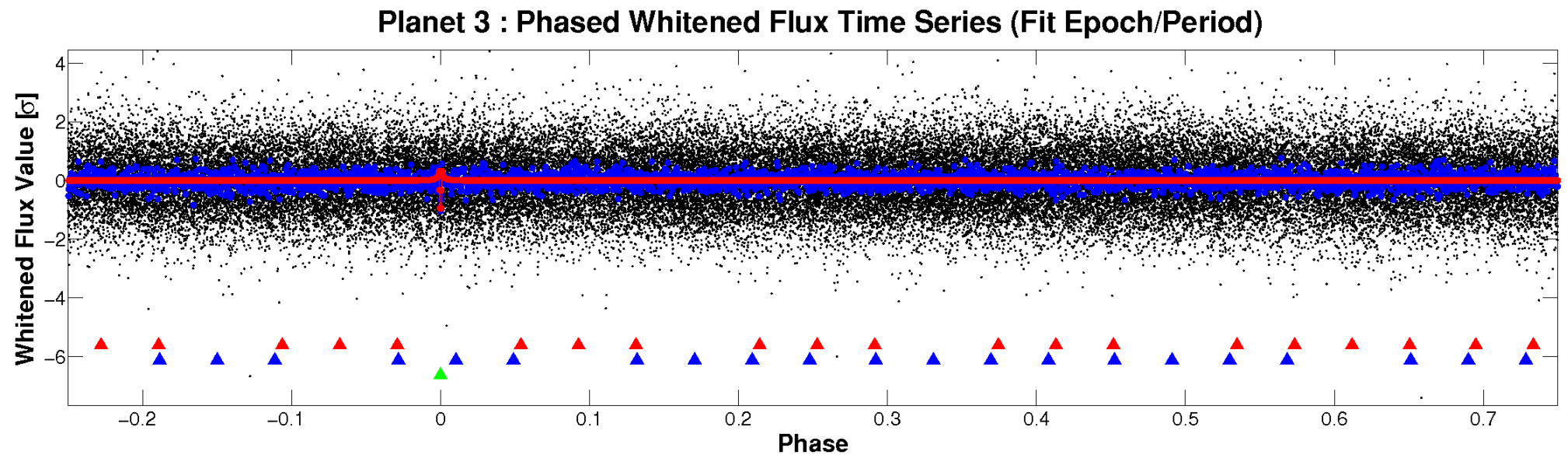
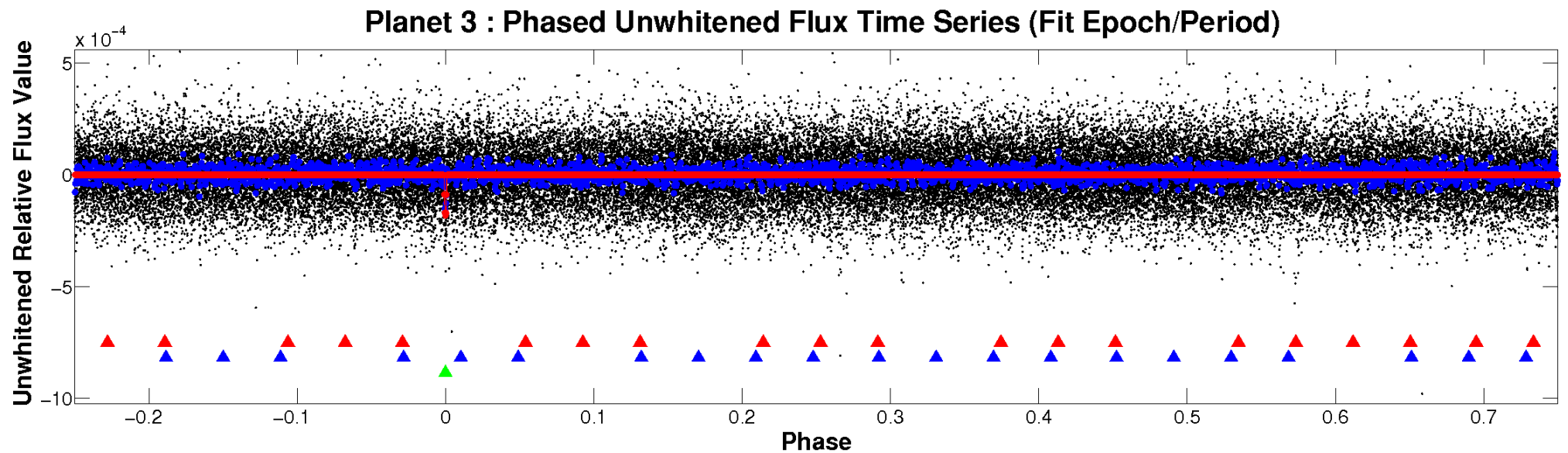


ALT Odd/Even

TCE 009588822-03

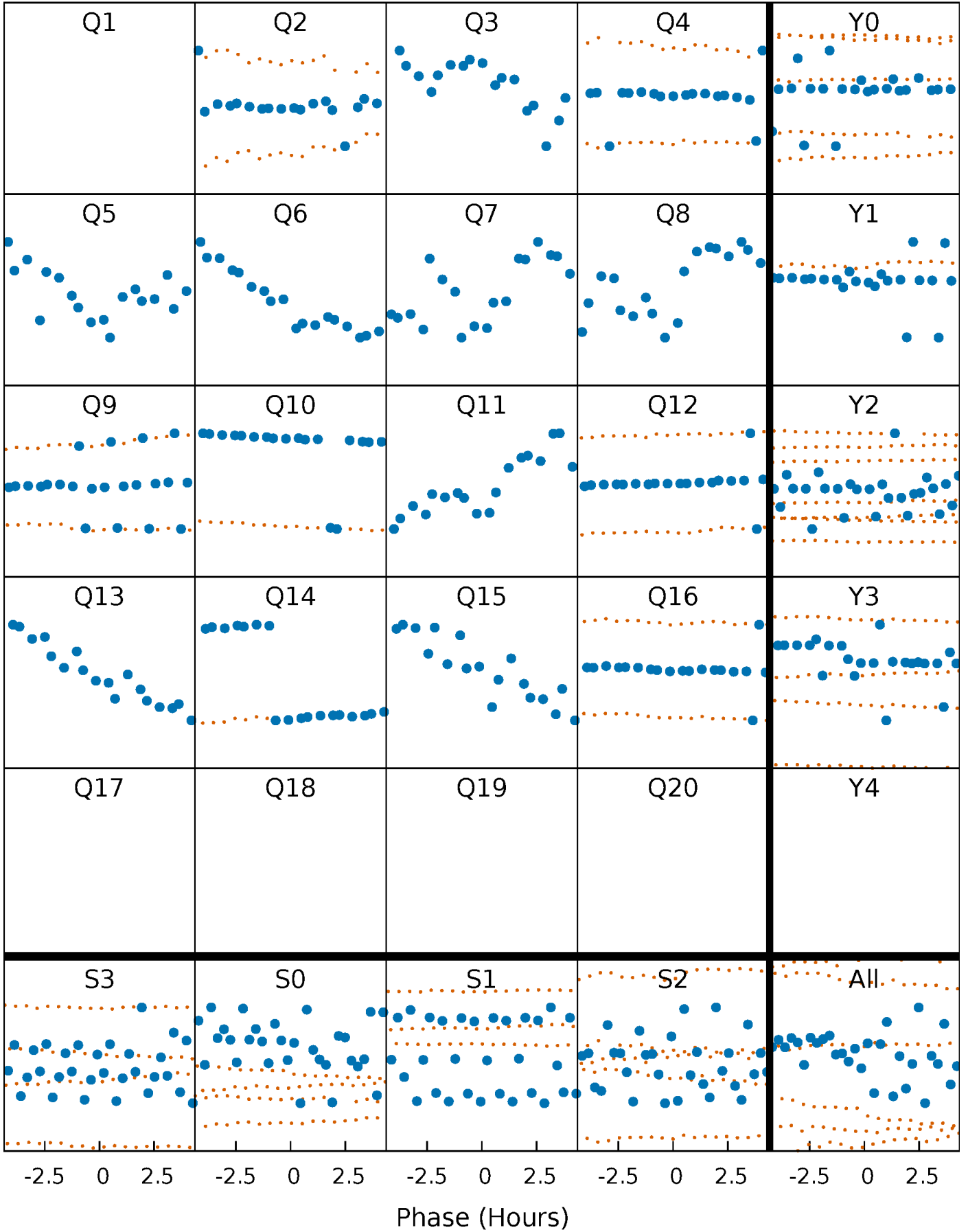


Non-Whitened Vs. Whitened Light Curve



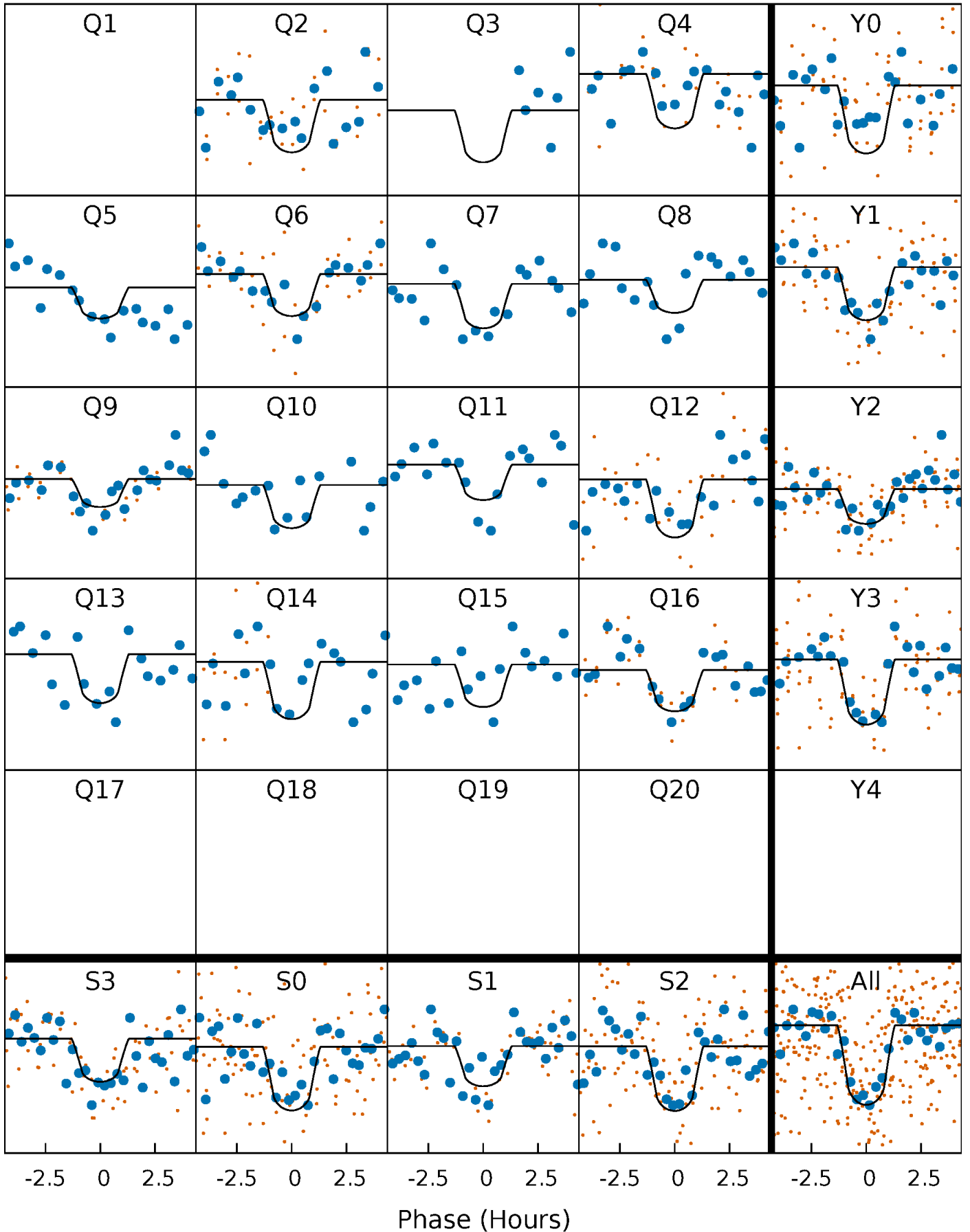
PDC Quarter-Phased Transit Curves

TCE 009588822-03 P= 61.851711 Days $T_0=191.709525$ (BKJD)



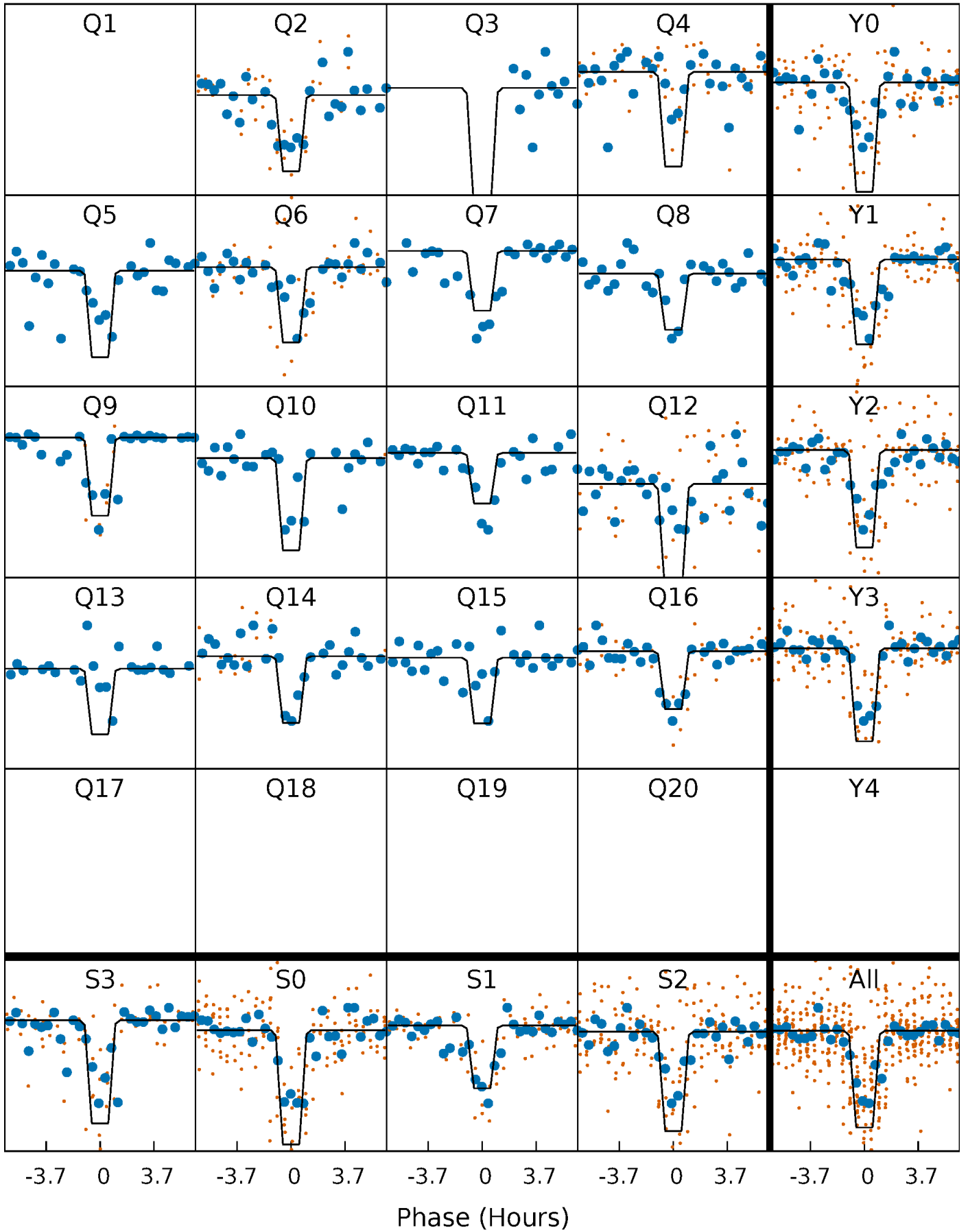
DV Quarter-Phased Transit Curves

TCE 009588822-03 P= 61.851711 Days $T_0=191.709525$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

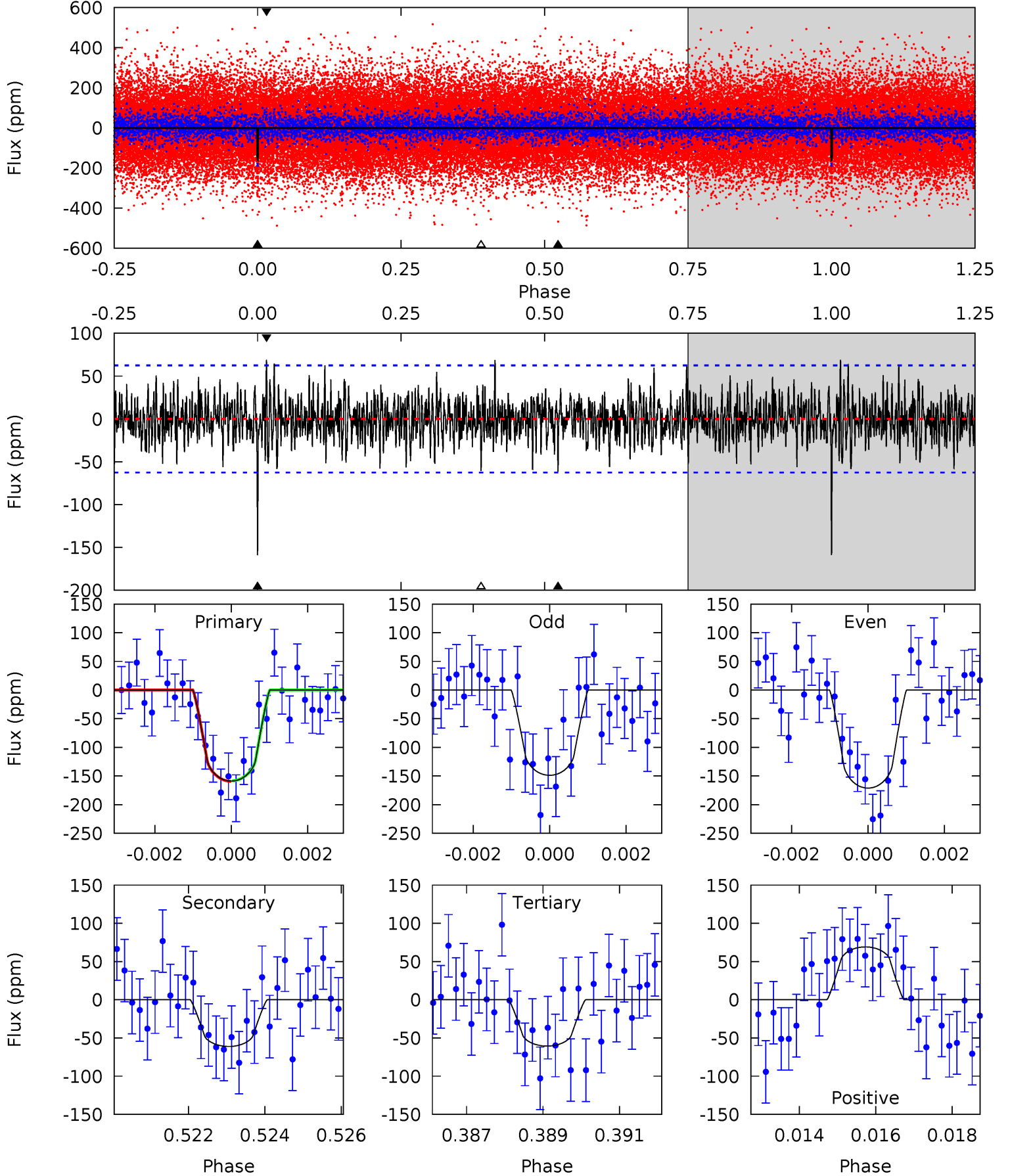
TCE 009588822-03 P= 61.852352 Days $T_0=191.690094$ (BKJD)



DV Model-Shift Uniqueness Test

009588822-03, P = 61.851711 Days, E = 129.857814 Days

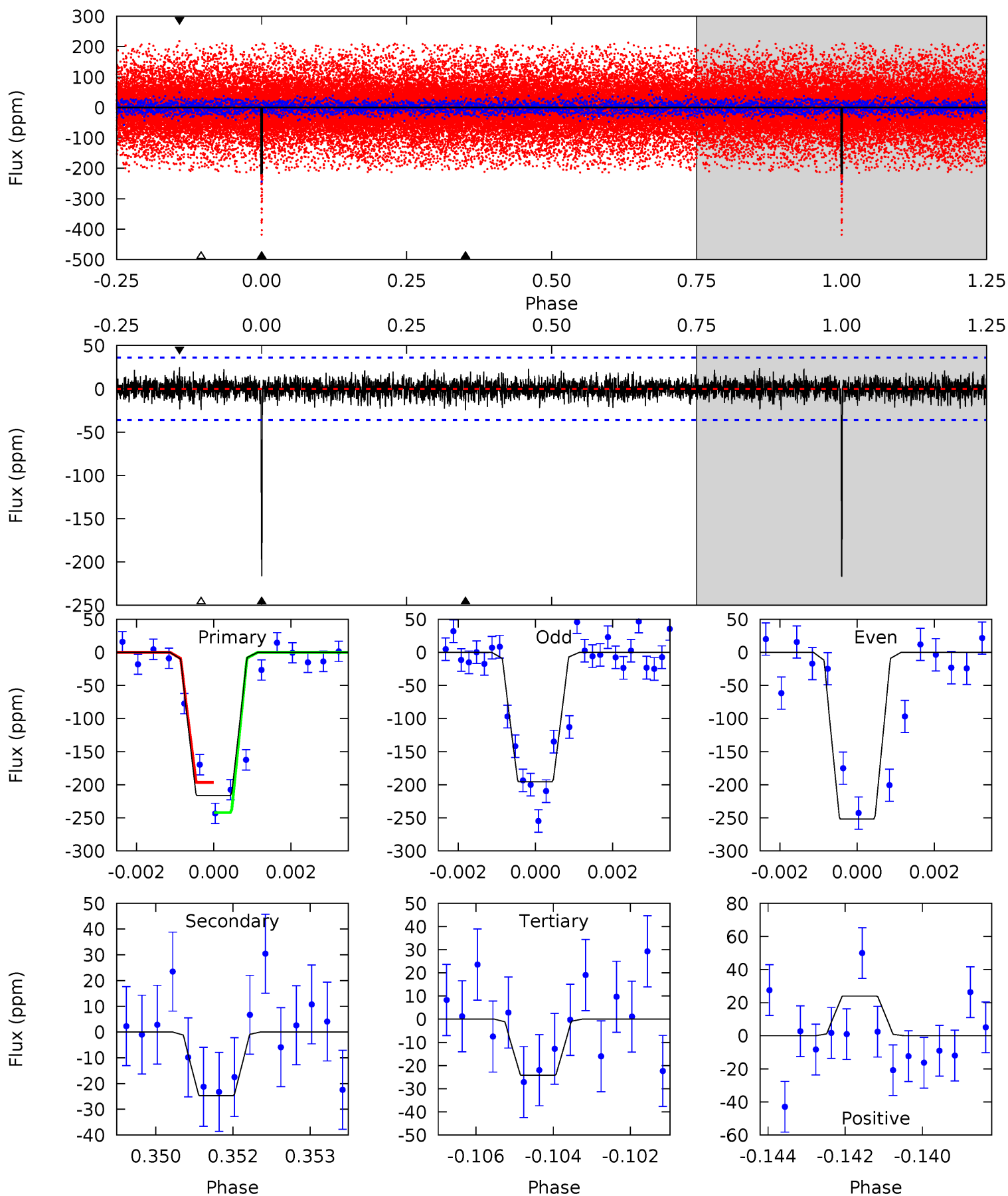
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.6	5.24	5.19	5.92	5.35	3.13	1.65	8.42	7.68	0.05	-0.69	0.95	0.95	0.30	0.04



Alt Model-Shift Uniqueness Test

009588822-03, P = 61.852352 Days, E = 129.837742 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.2	3.67	3.61	3.57	5.36	3.15	0.99	28.6	28.6	0.06	0.10	4.22	0.86	0.10	3.38



Stellar Parameters For KIC 009588822

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5529^{+168}_{-140}	$3.685^{+0.712}_{-0.178}$	$-0.040^{+0.300}_{-0.250}$	$2.817^{+0.789}_{-1.709}$	$1.402^{+0.216}_{-0.505}$	$0.088^{+1.239}_{-0.046}$
	+3%/-3%	+19%/-5%	+750%/-625%	+28%/-61%	+15%/-36%	+1403%/-52%
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 009588822-03 / KOI 4388.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-61 ± 12	$3.83^{+3.05}_{-2.27}$	953^{+93}_{-161}	4291^{+1682}_{-686}	265^{+1182}_{-185}
Alt.	-25 ± 7	$4.66^{+3.02}_{-2.50}$	954^{+91}_{-175}	3406^{+861}_{-410}	69^{+227}_{-44}

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

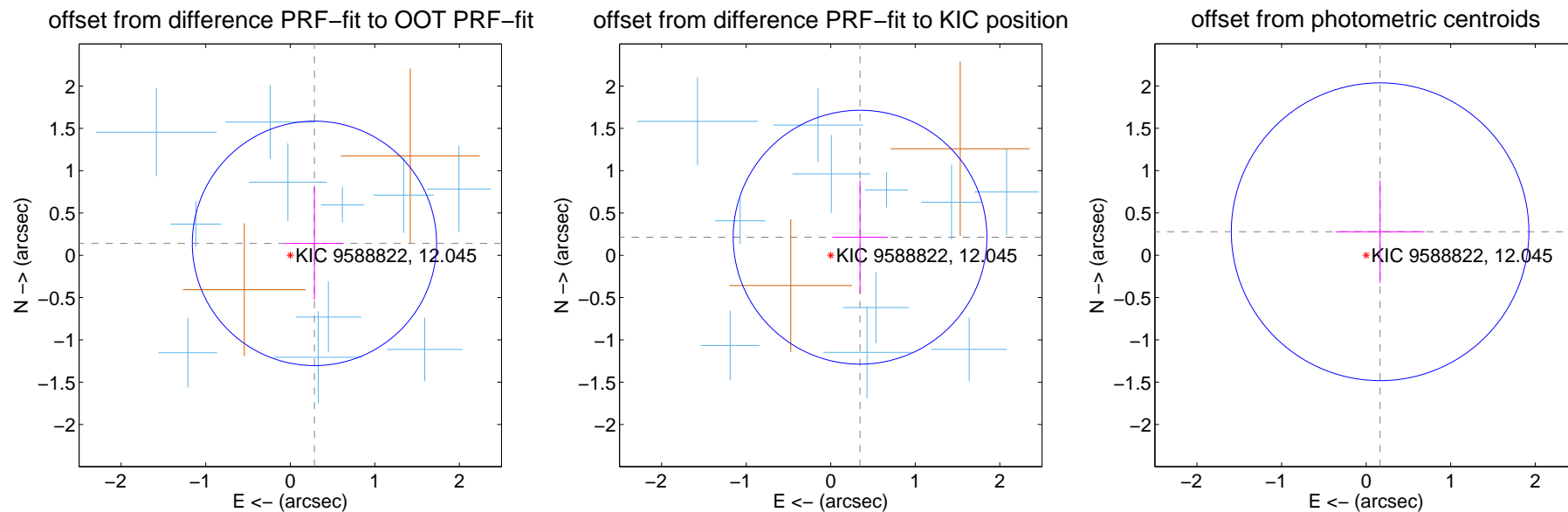
DV Centroid Data

Supplemental centroid analysis for 009588822-03. Kepler magnitude: 12.04. Transit SNR 8.43

There are 11 quarters with good PRF difference image offsets

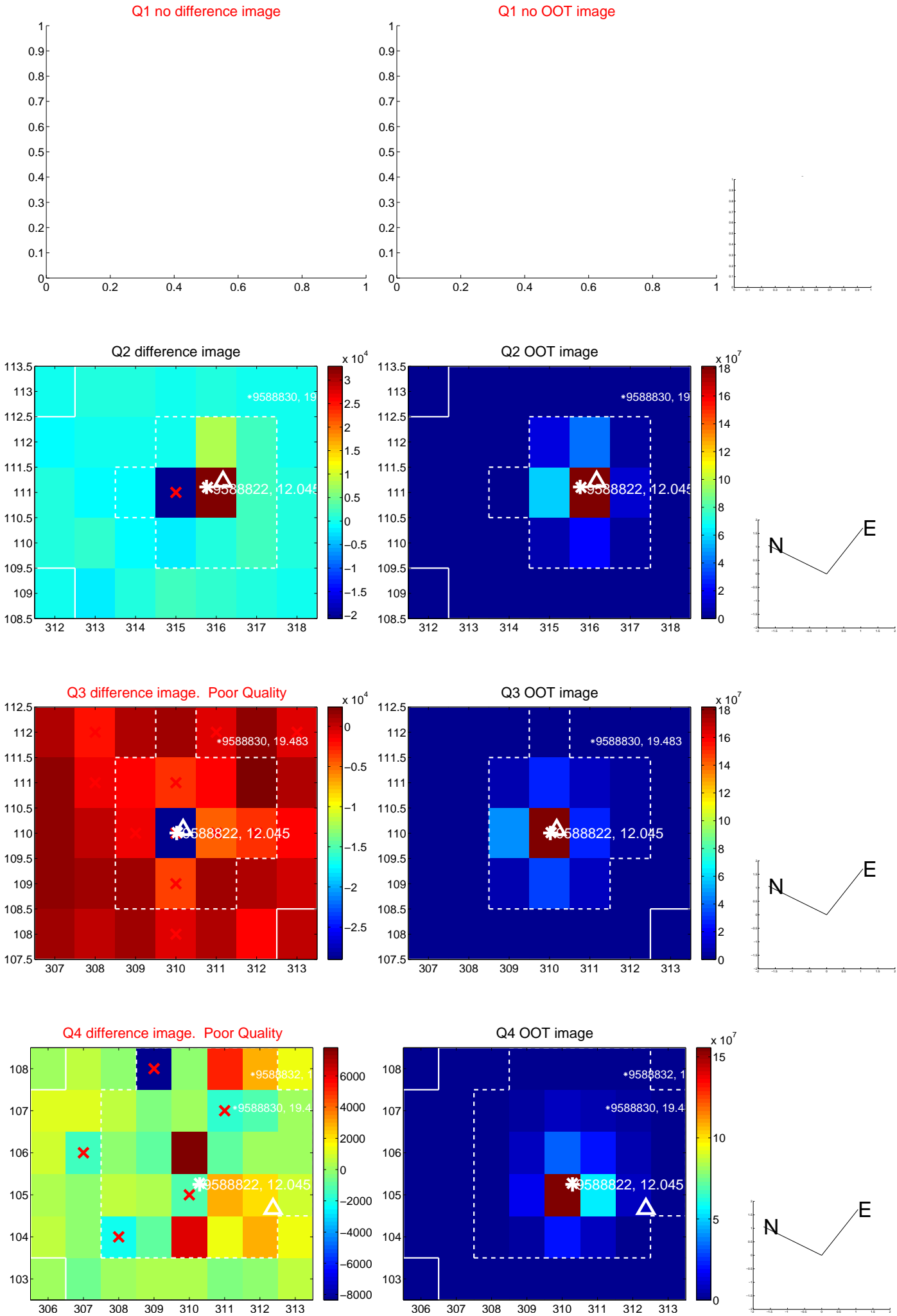
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.318 ± 0.481	0.66	-0.286 ± 0.342	0.141 ± 0.665
PRF-fit source offset from KIC position	0.407 ± 0.500	0.81	-0.347 ± 0.327	0.214 ± 0.671
photometric centroid source offset	0.32 ± 0.59	0.55	-0.17 ± 0.53	0.28 ± 0.61

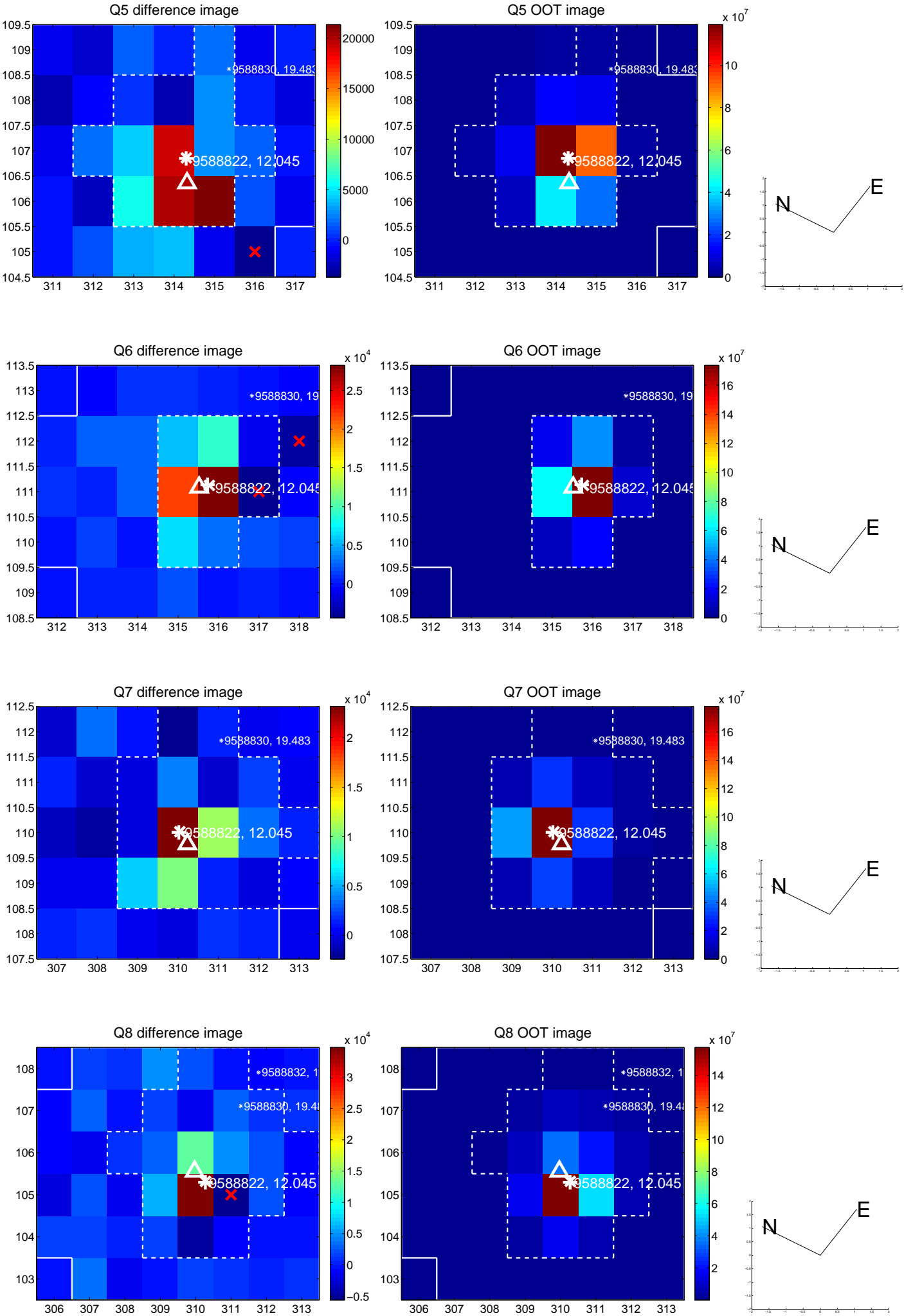


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

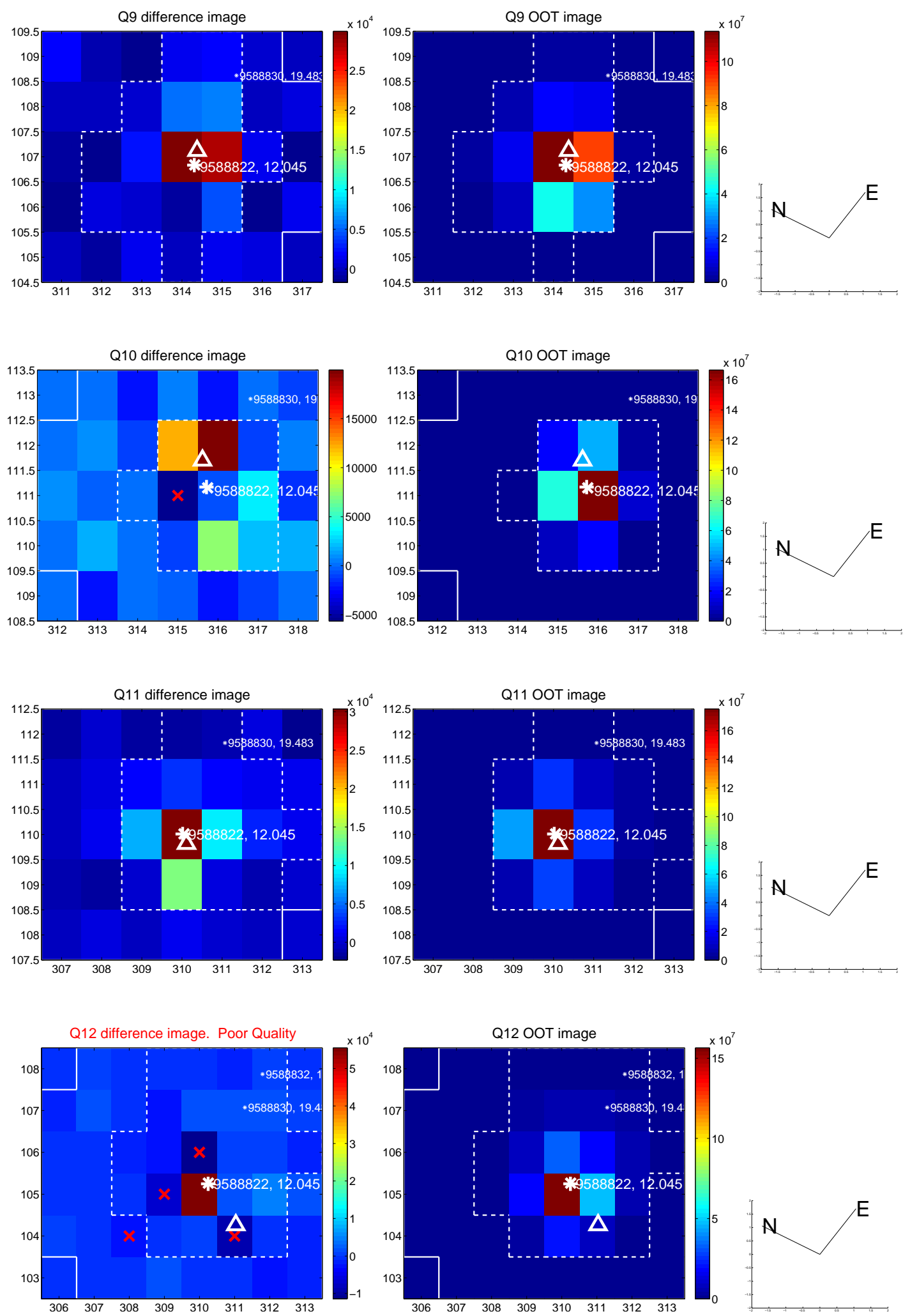
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



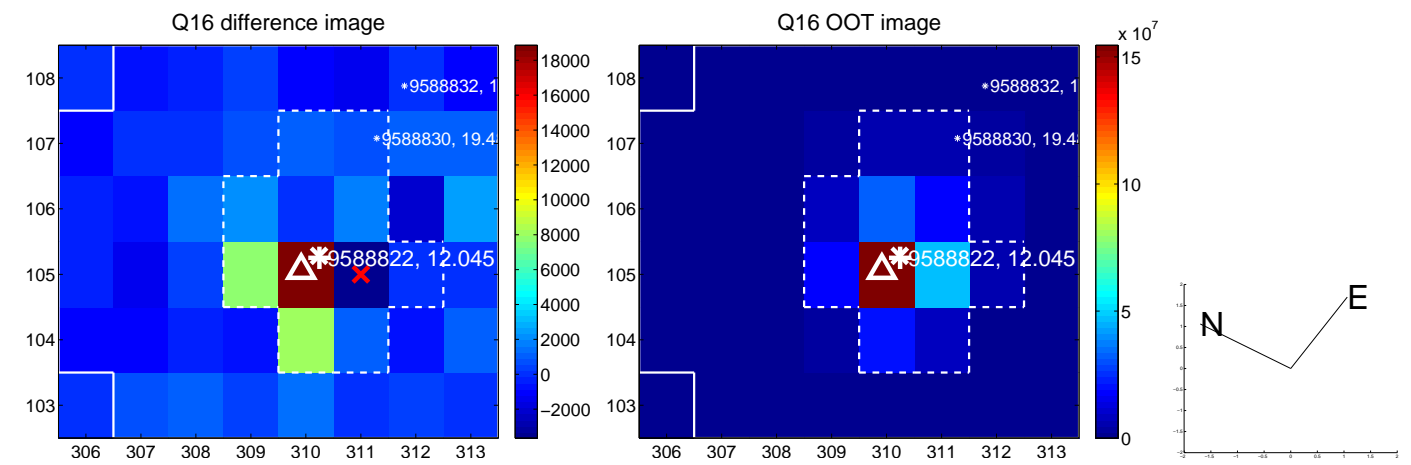
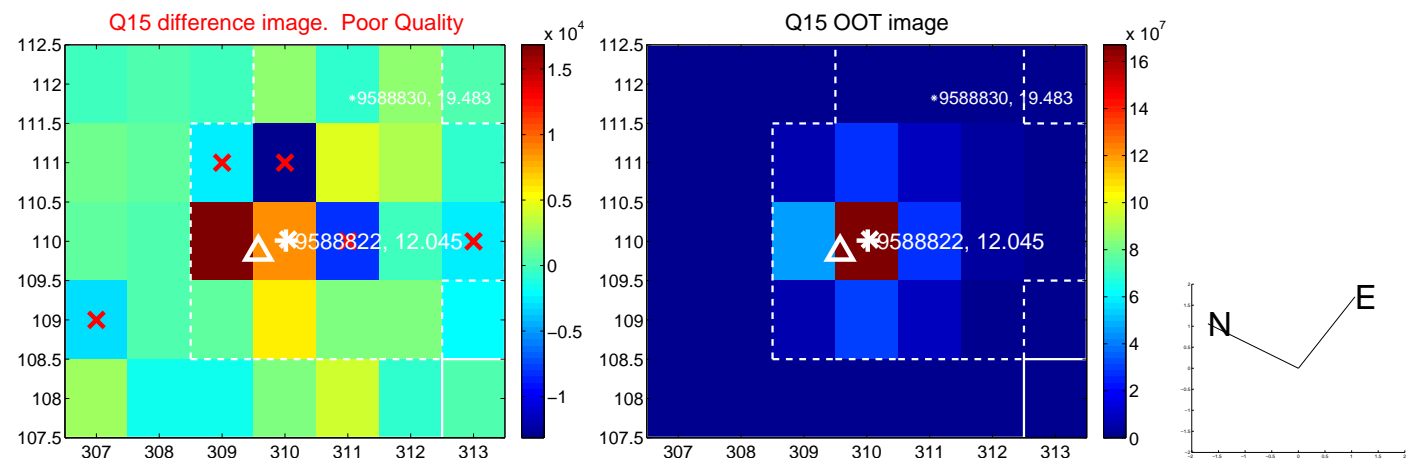
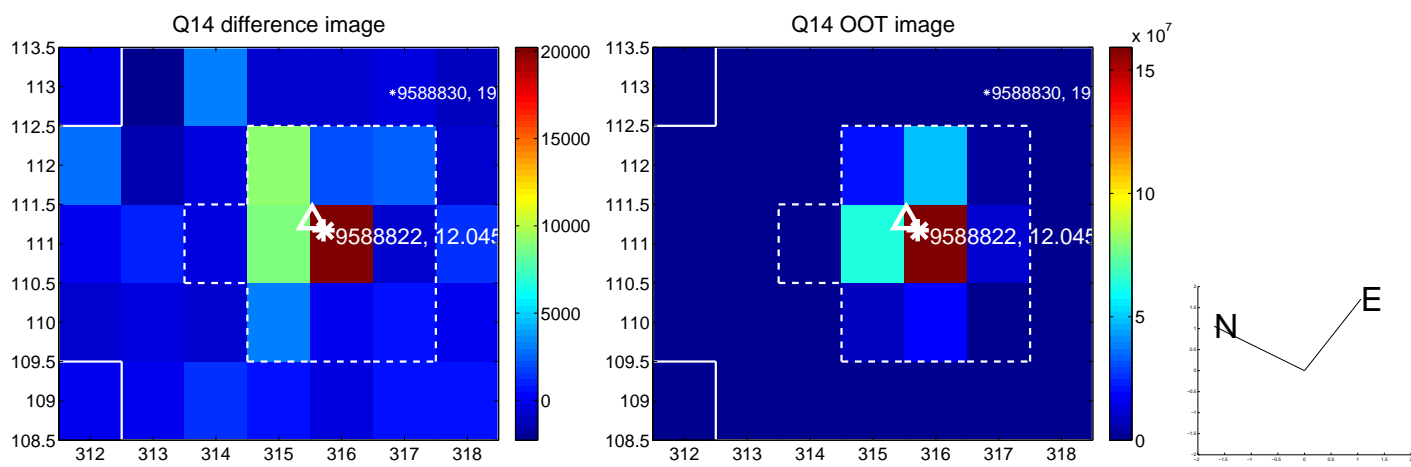
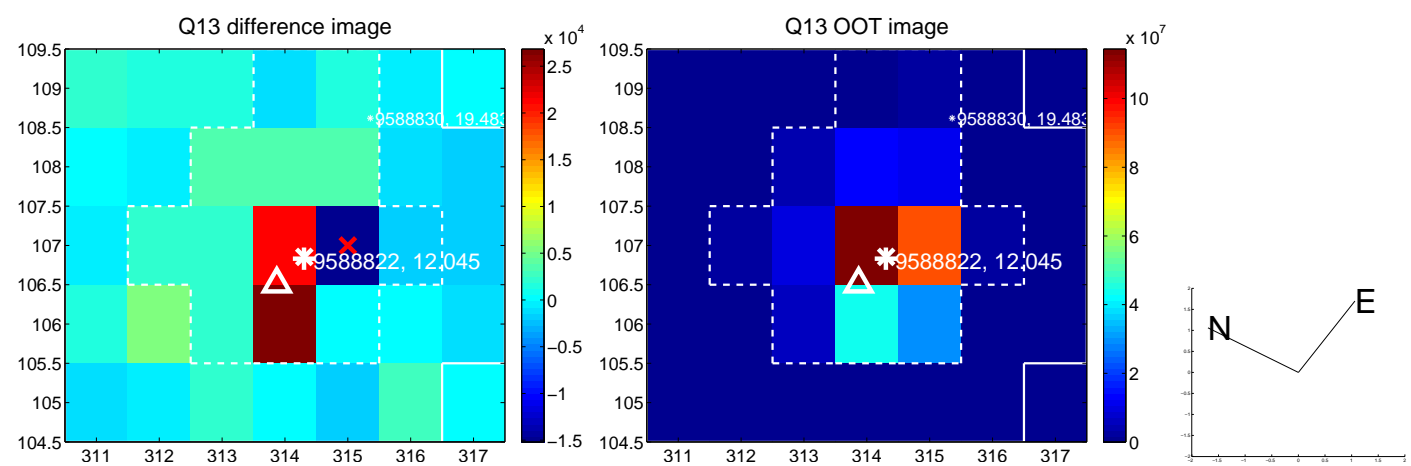
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



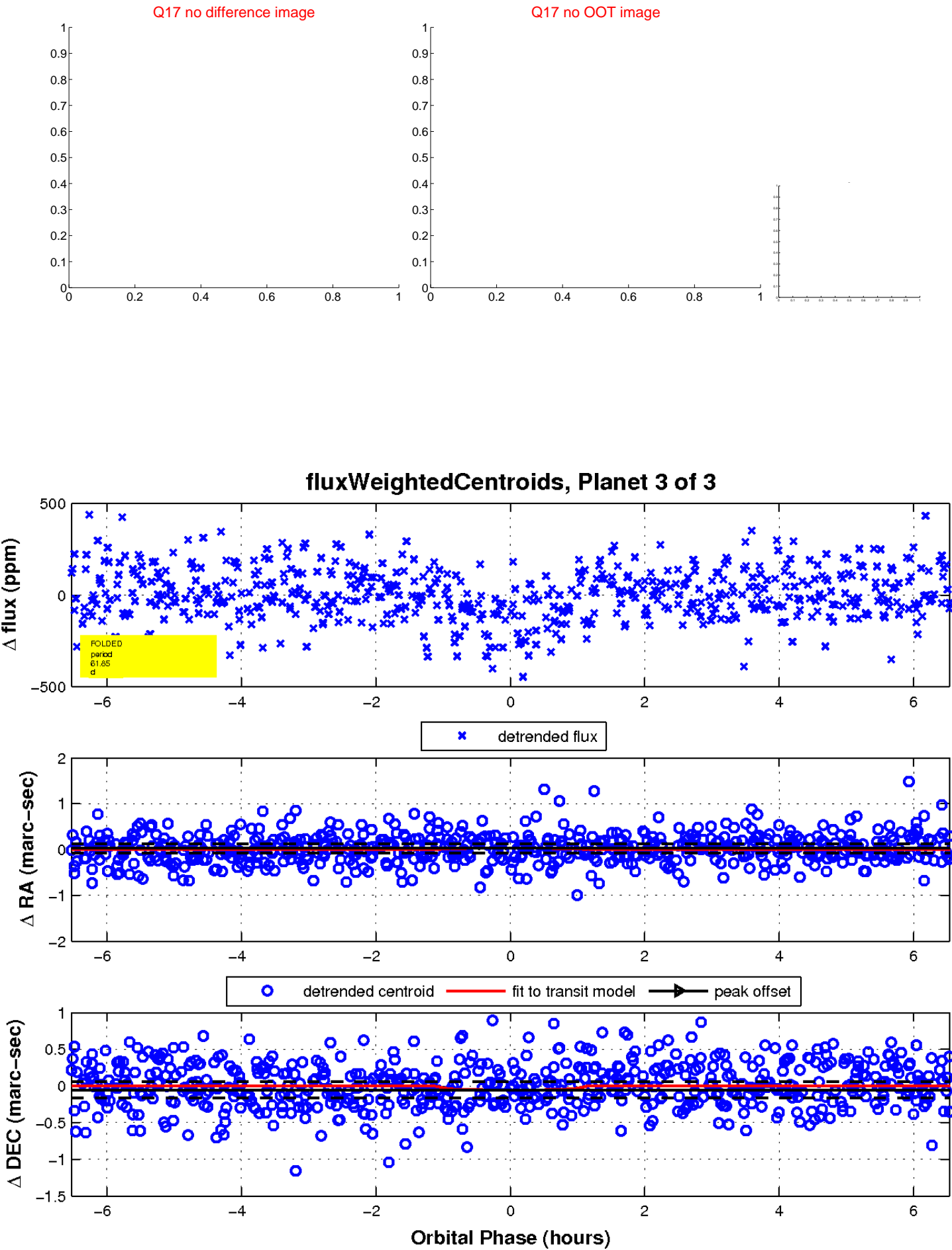
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

