

KIC 002715398

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})
002715398-01	OBS	No	0.968211	132.463170	74.5	6.670	9.2	10.4	0.69	5183	0.61	1059.22
002715398-02	OBS	No	27.041930	144.611374	1763.1	0.989	10.5	10.0	0.69	5183	3.27	12.50
002715398-03	OBS	No	23.277428	133.048130	523.6	1.845	8.8	5.3	0.69	5183	1.99	15.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002715398-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
002715398-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002715398-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

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

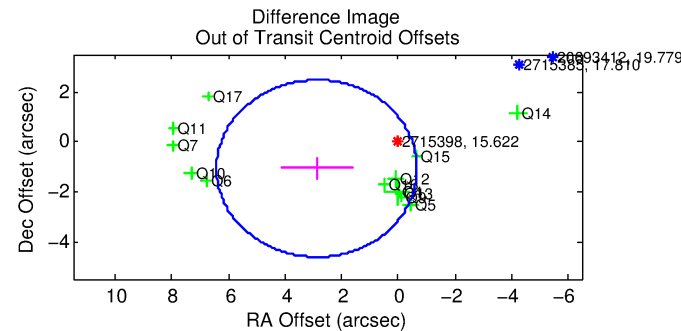
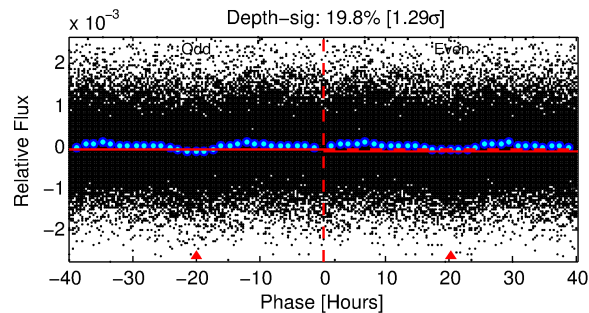
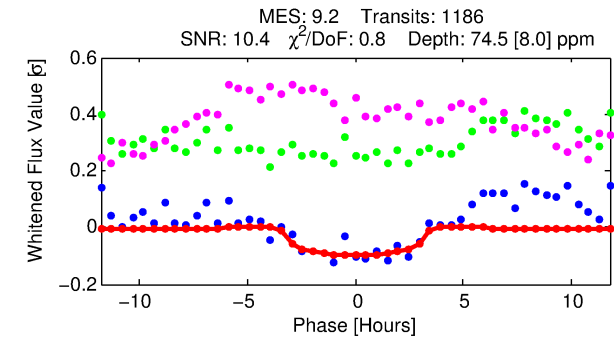
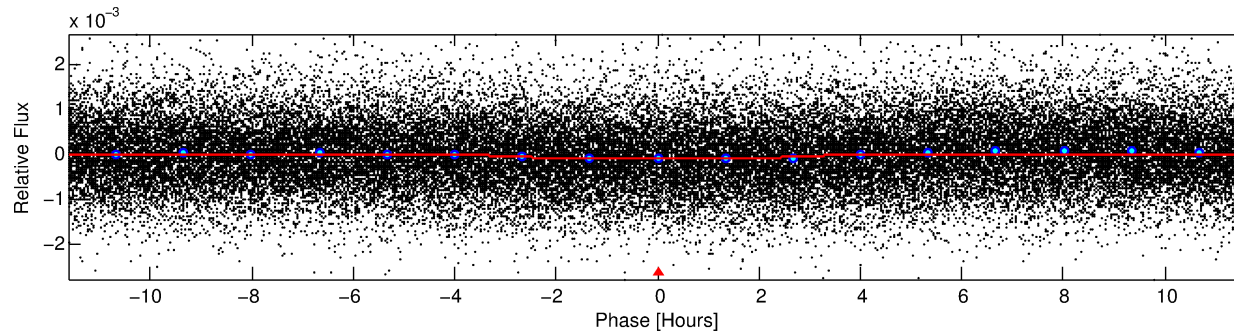
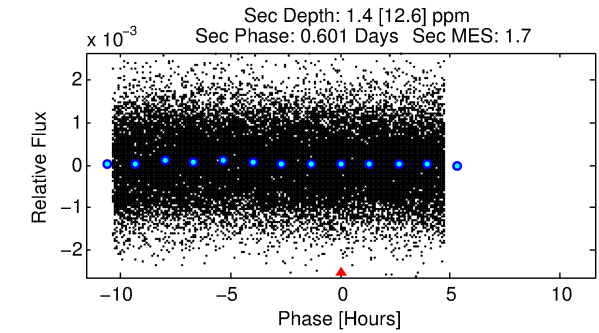
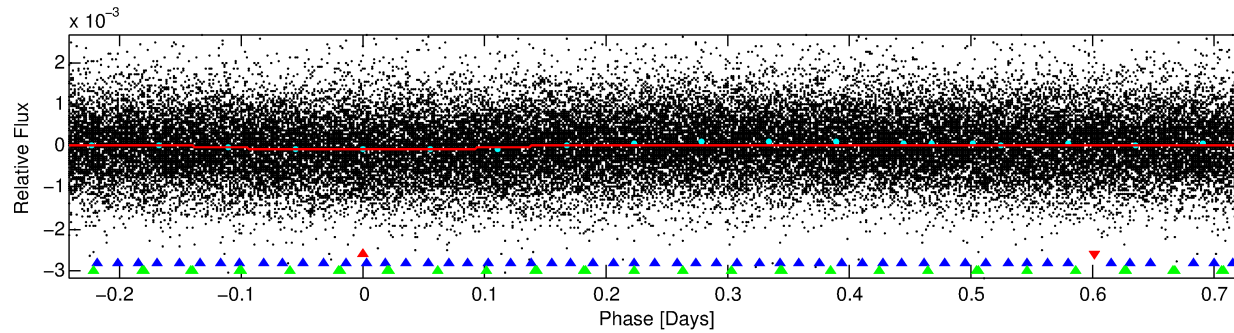
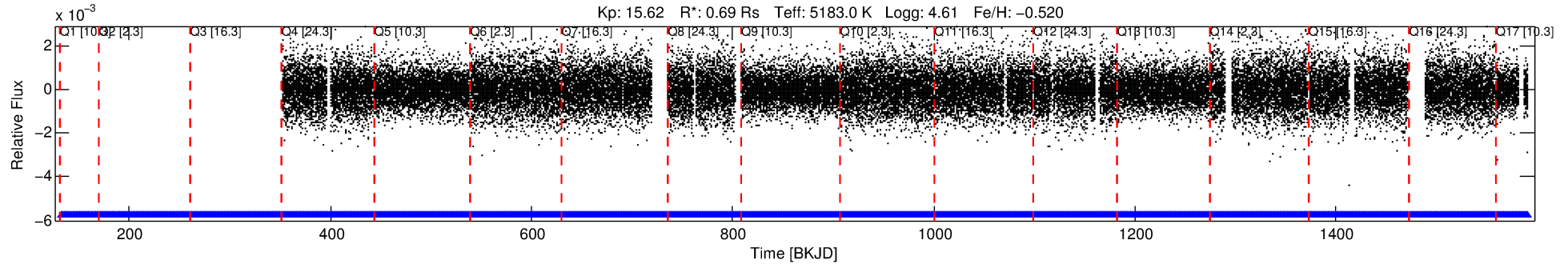
Ephemeris Match Information For 002715398-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
002715398-01	2715398	002715228-01	2715228	1:1	191.1	-48	-3	15.27	15.62	0.81	Col-Anomaly	1	2.54	1.29

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

DV One-Page Summary

KIC: 2715398 Candidate: 1 of 3 Period: 0.968 d



DV Fit Results:

Period = 0.96821 [0.00001] d
Epoch = 132.4632 [0.0071] BKJD
Rp/R* = 0.0081 [0.0100]
a/R* = 1.21 [1.88]
b = 0.53 [6.69]
Seff = 1059.22 [209.15]
Teq = 1455 [72] K
Rp = 0.61 [0.75] Re
a = 0.0170 [0.0016] AU
Ag = 0.62 [5.65] [-0.07σ]
Teffp = 1992 [4568] K [0.12σ]

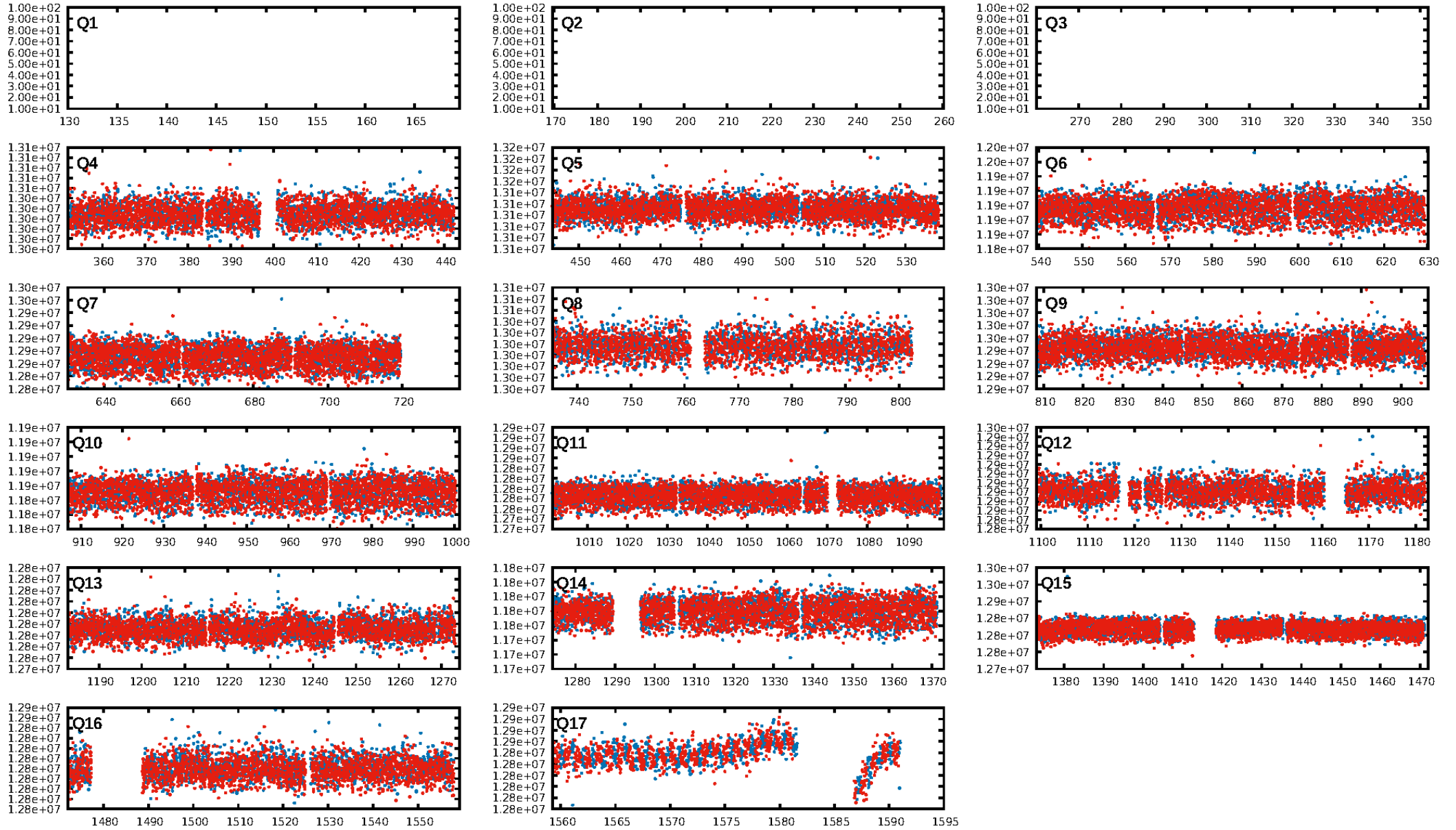
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [77.37σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.81e-11
RollingBand-fgt: 1.00 [1158/1158]
GhostDiagnostic-chr: -0.02506
Centroid-sig: N/A
Centroid-so: 10.407 arcsec [6.50σ]
OotOffset-rm: 3.074 arcsec [2.60σ]
KicOffset-rm: 3.373 arcsec [2.82σ]
OotOffset-st: 3/3/3/4 [13]
KicOffset-st: 3/3/3/4 [13]
DiffImageQuality-fgm: 0.23 [3/13]
DiffImageOverlap-fno: 1.00 [14/14]

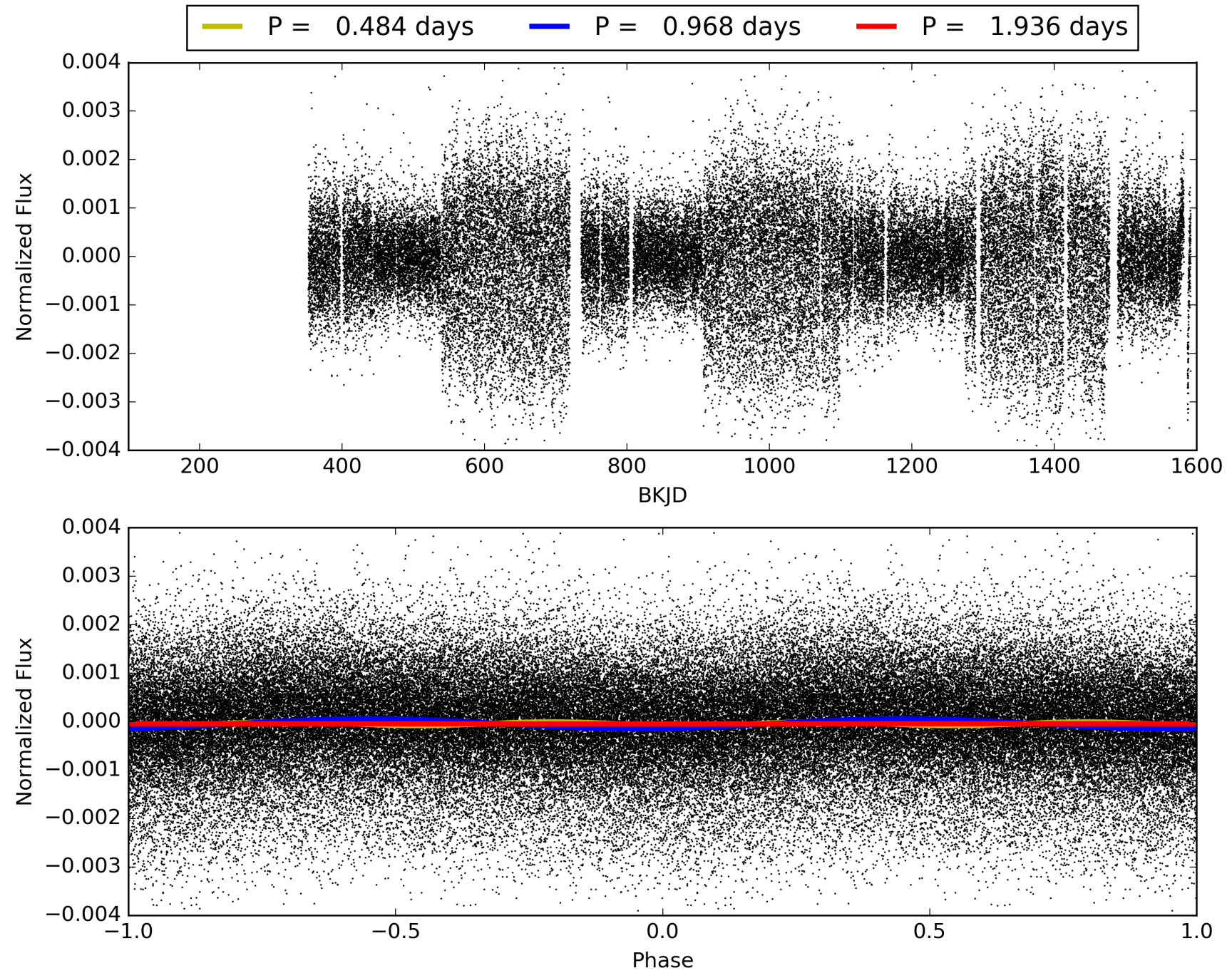
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:59 Z

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

TCE 002715398-01, PDC Light Curves

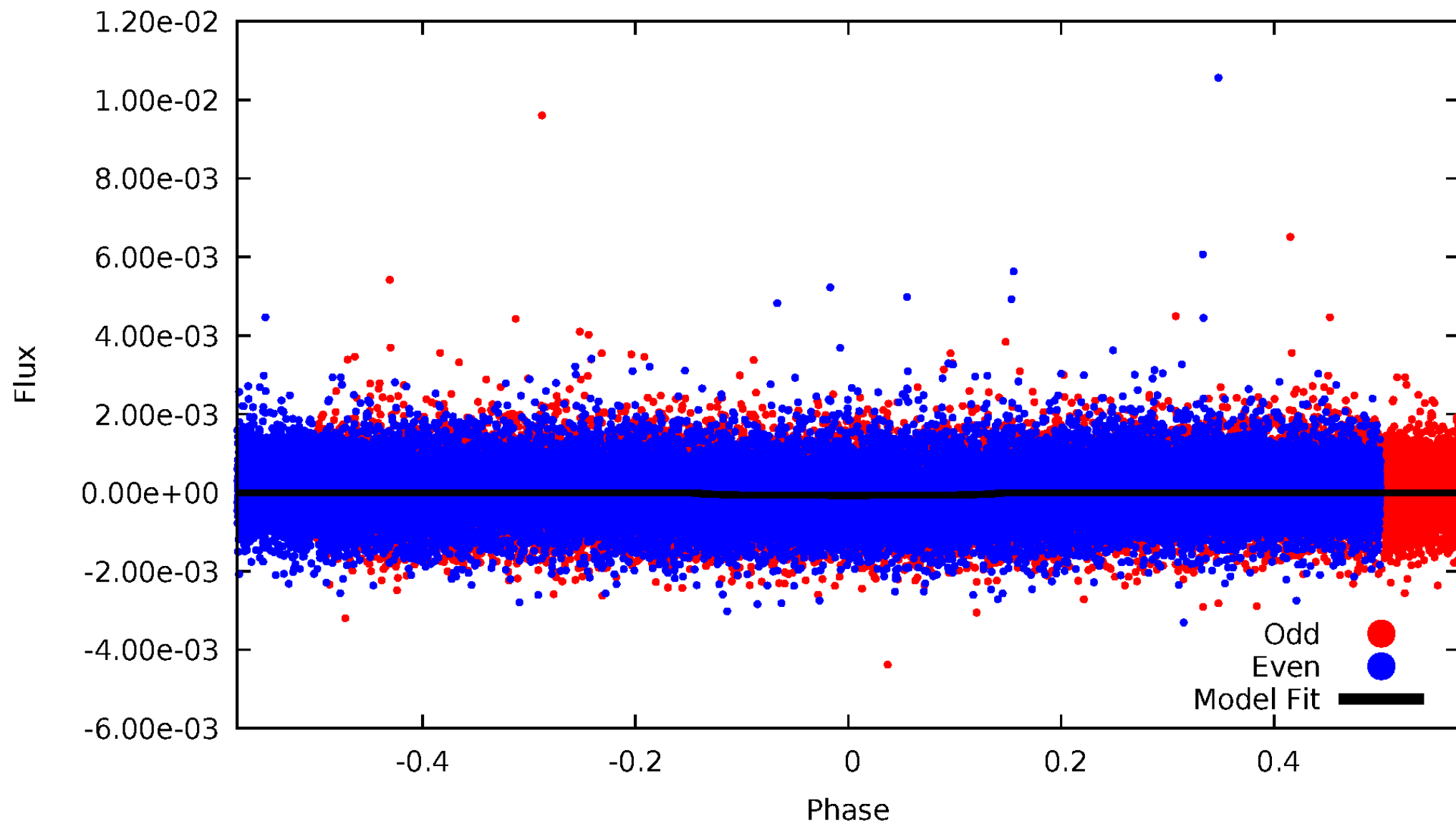


TCE 002715398-01



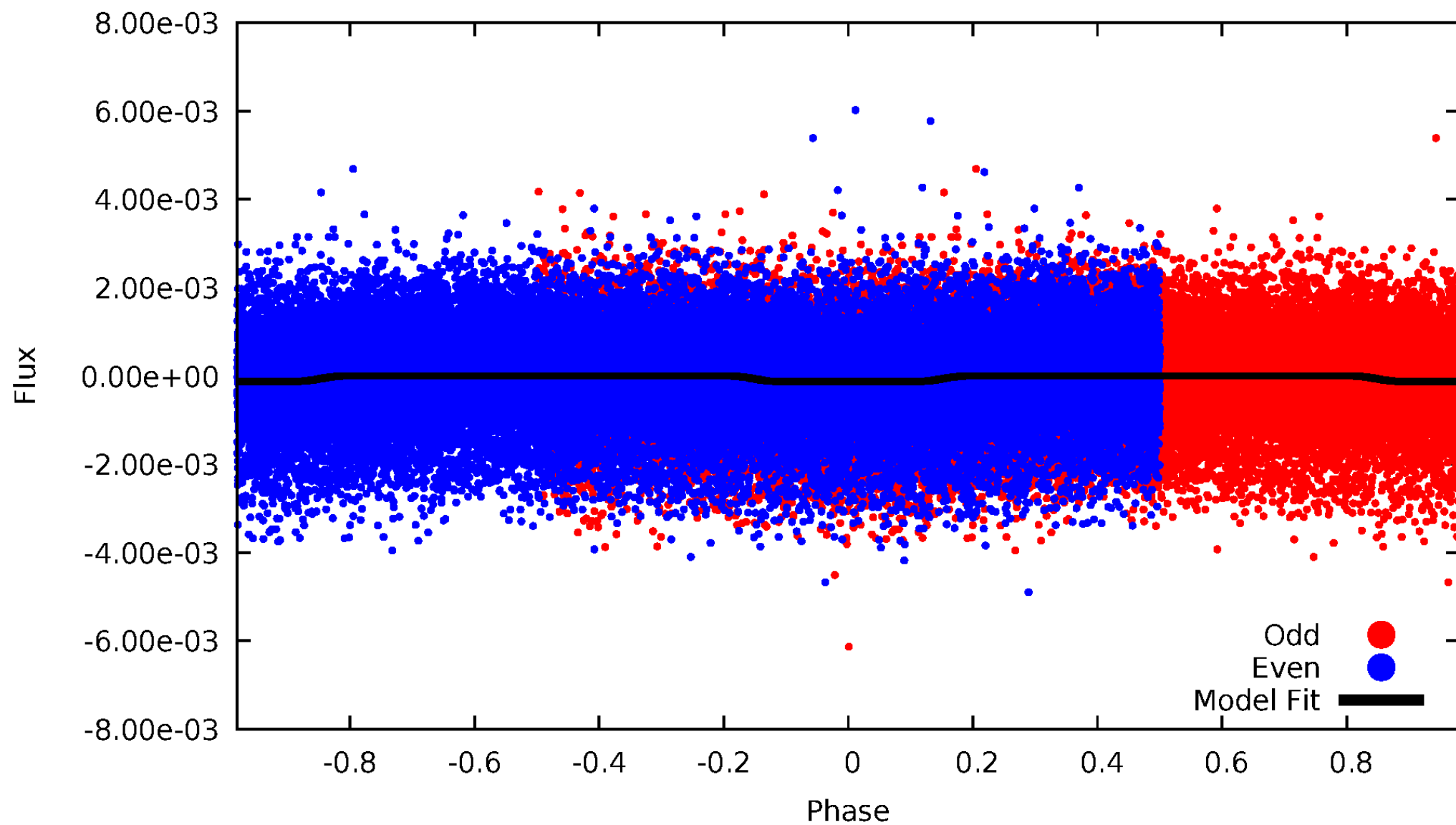
DV Odd/Even

TCE 002715398-01



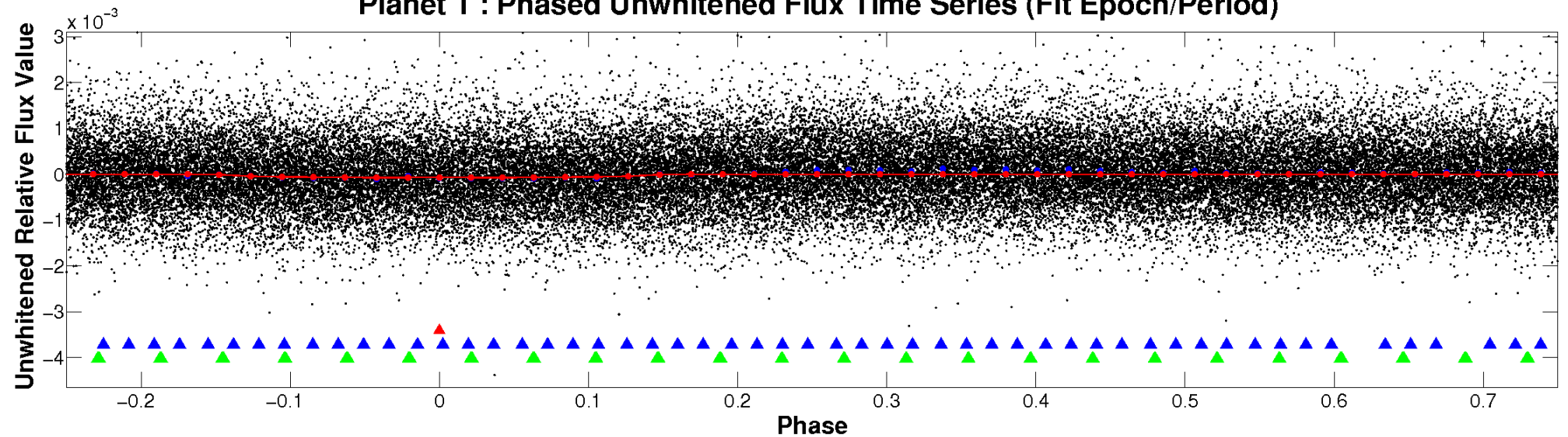
ALT Odd/Even

TCE 002715398-01

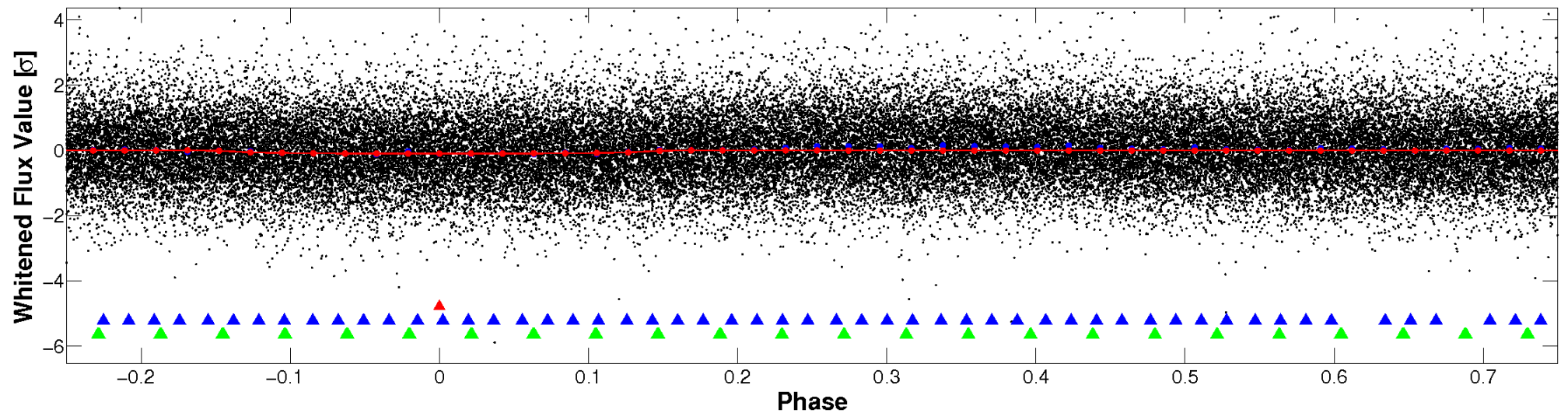


Non-Whitened Vs. Whitened Light Curve

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

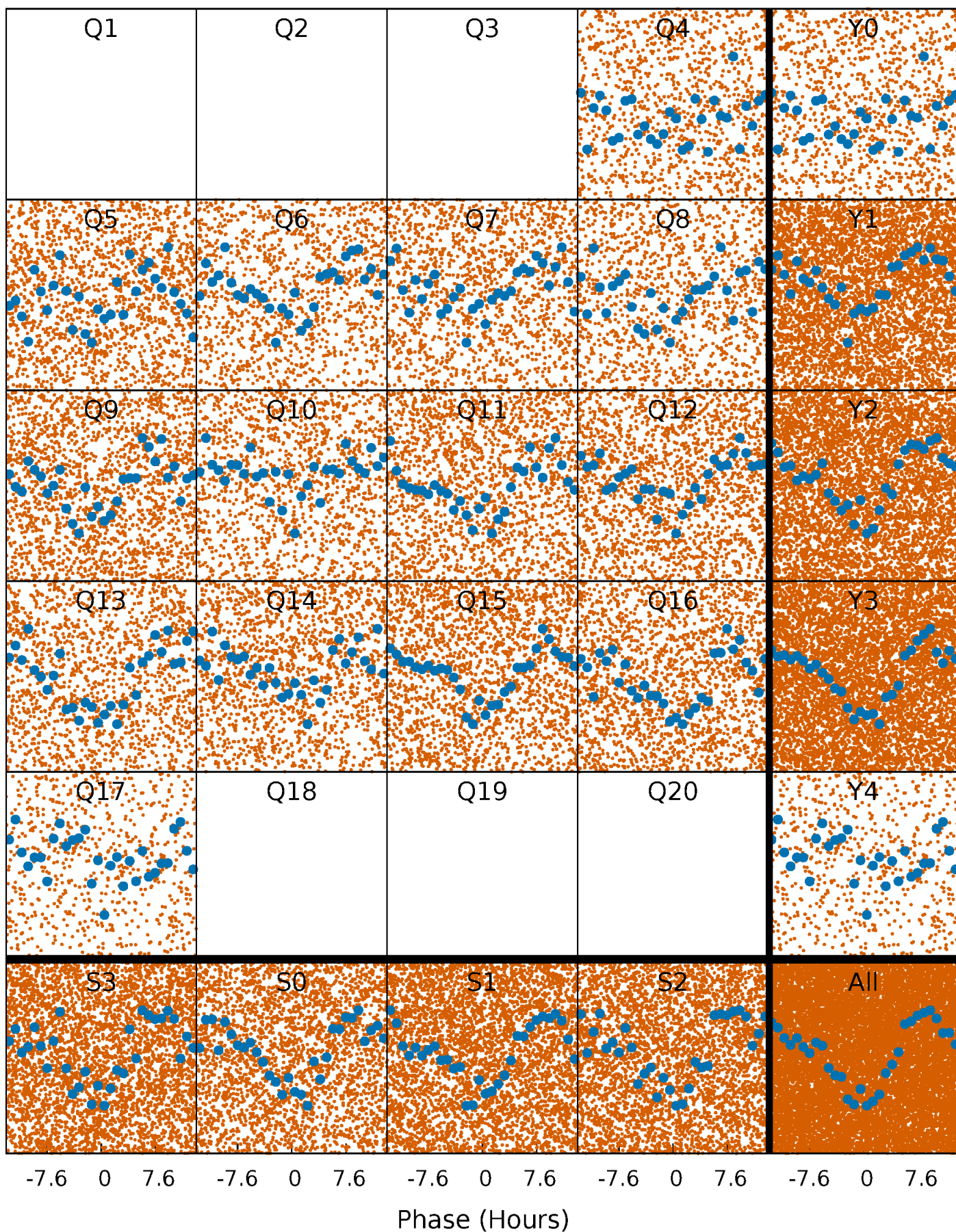


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



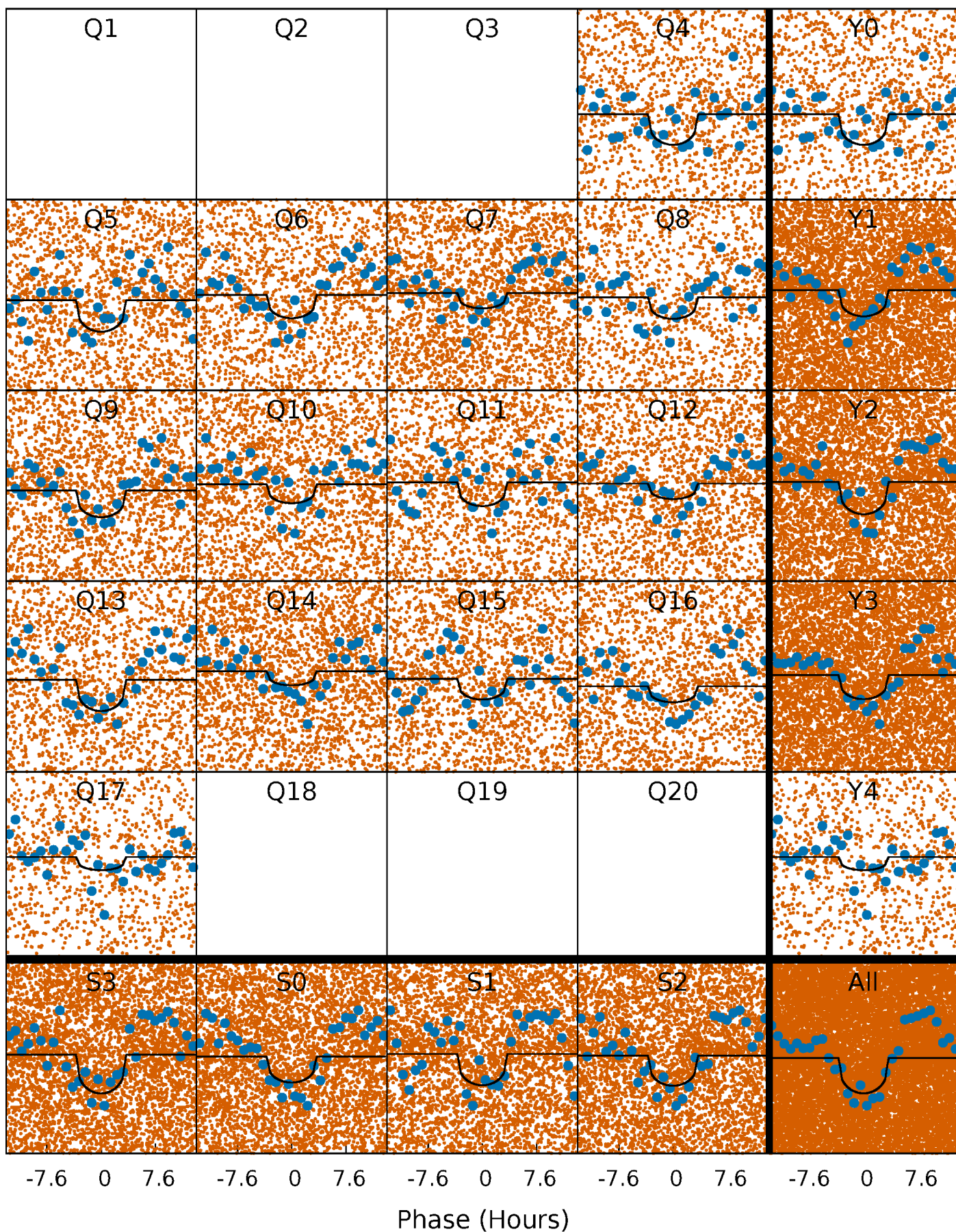
PDC Quarter-Phased Transit Curves

TCE 002715398-01 P= 0.968211 Days $T_0=132.463169$ (BKJD)



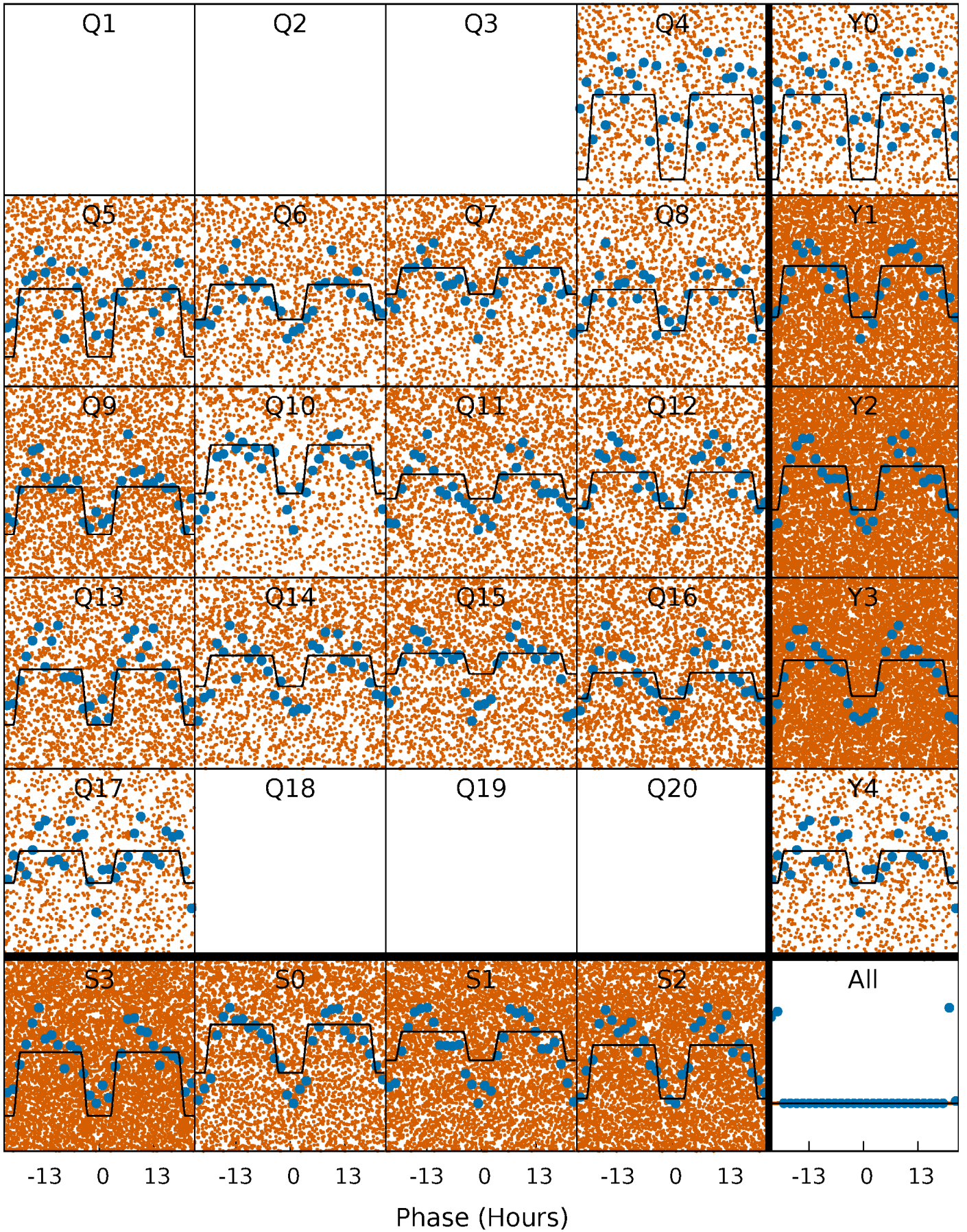
DV Quarter-Phased Transit Curves

TCE 002715398-01 P= 0.968211 Days $T_0=132.463169$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

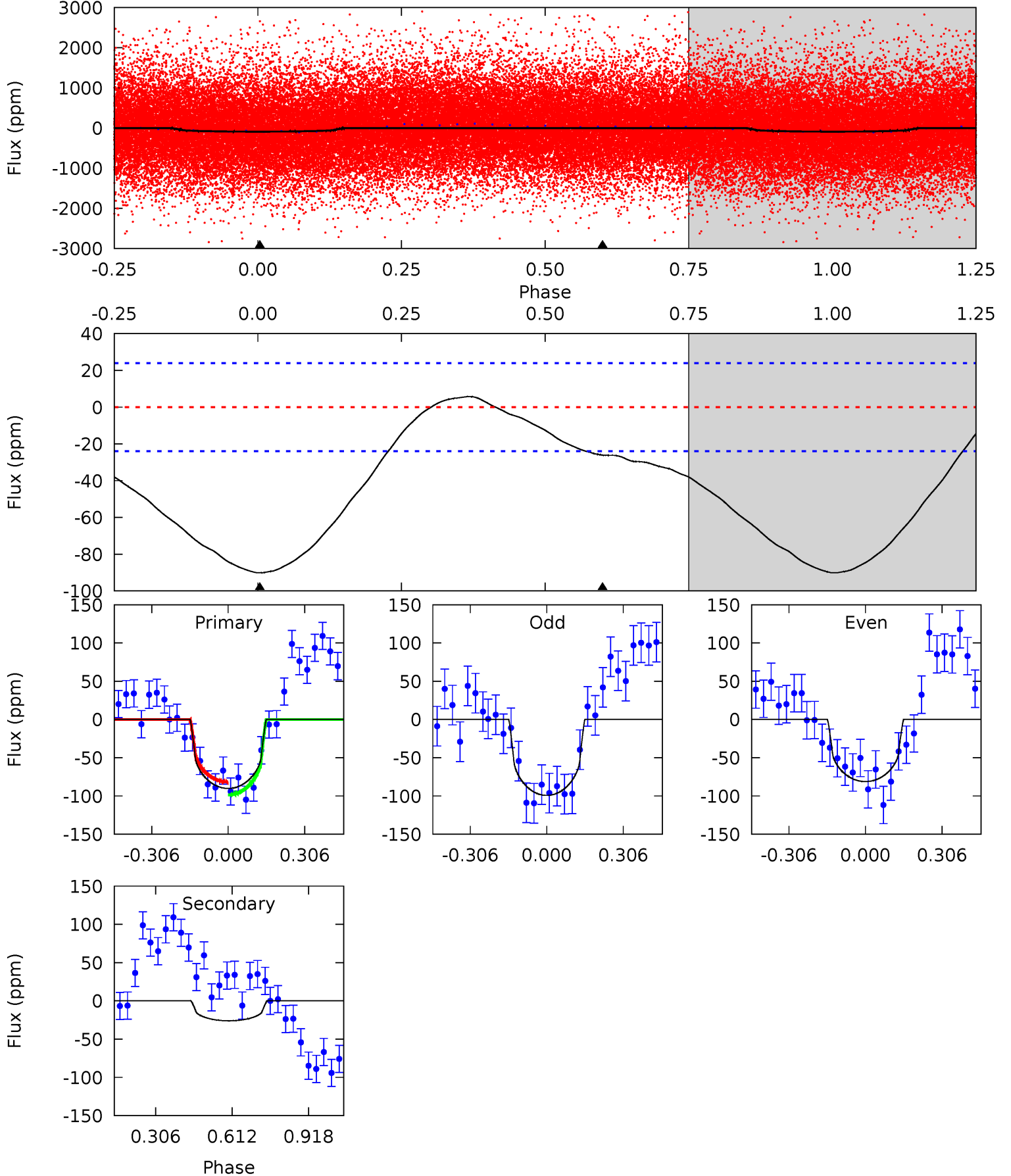
TCE 002715398-01 P= 0.968334 Days $T_0=132.335399$ (BKJD)



DV Model-Shift Uniqueness Test

002715398-01, P = 0.968211 Days, E = 132.463169 Days

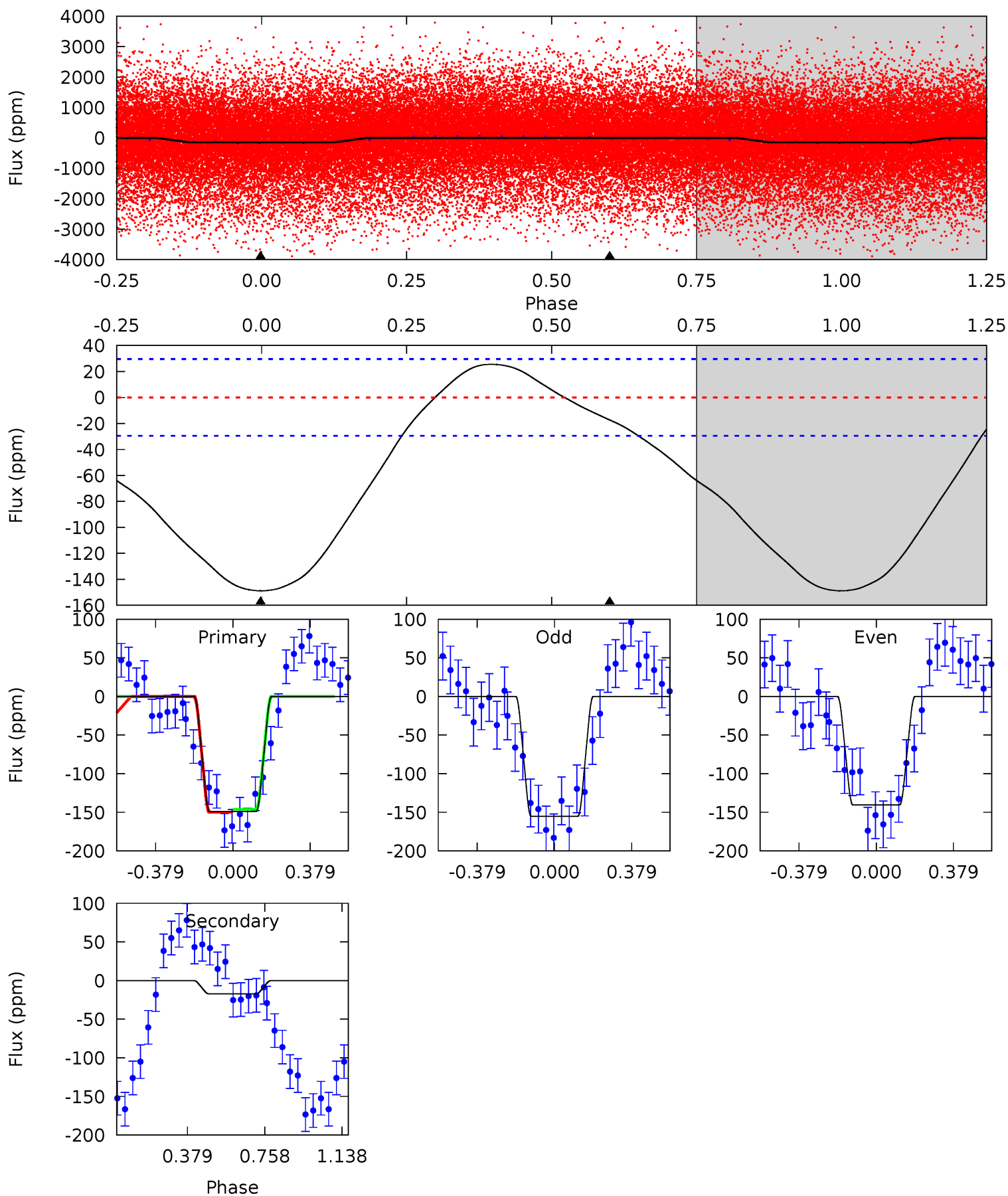
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	4.71	0	0	4.32	1.02	1.02	16.3	16.3	4.71	4.71	1.64	1.02	0.06	1.53



Alt Model-Shift Uniqueness Test

002715398-01, P = 0.968334 Days, E = 132.335399 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.5	2.50	0	0	4.28	0.88	1.86	21.5	21.5	2.50	2.50	1.06	1.16	0.15	0.30



Stellar Parameters For KIC 002715398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5183^{+197}_{-179}	$4.607^{+0.055}_{-0.061}$	$-0.520^{+0.300}_{-0.300}$	$0.688^{+0.087}_{-0.060}$	$0.699^{+0.083}_{-0.048}$	$3.024^{+0.699}_{-0.679}$
	+4%/-3%	+1%/-1%	+58%/-58%	+13%/-9%	+12%/-7%	+23%/-22%
Source	KIC0	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 002715398-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-26 ± 6	$0.79^{+0.72}_{-0.51}$	2036^{+89}_{-89}	3899^{+2183}_{-805}	$6.974^{+48.635}_{-5.271}$
Alt.	-17 ± 7	$0.95^{+0.69}_{-0.57}$	2036^{+97}_{-89}	3367^{+1382}_{-648}	$2.928^{+15.918}_{-2.037}$

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 $A_{obs} \gg 1.0$

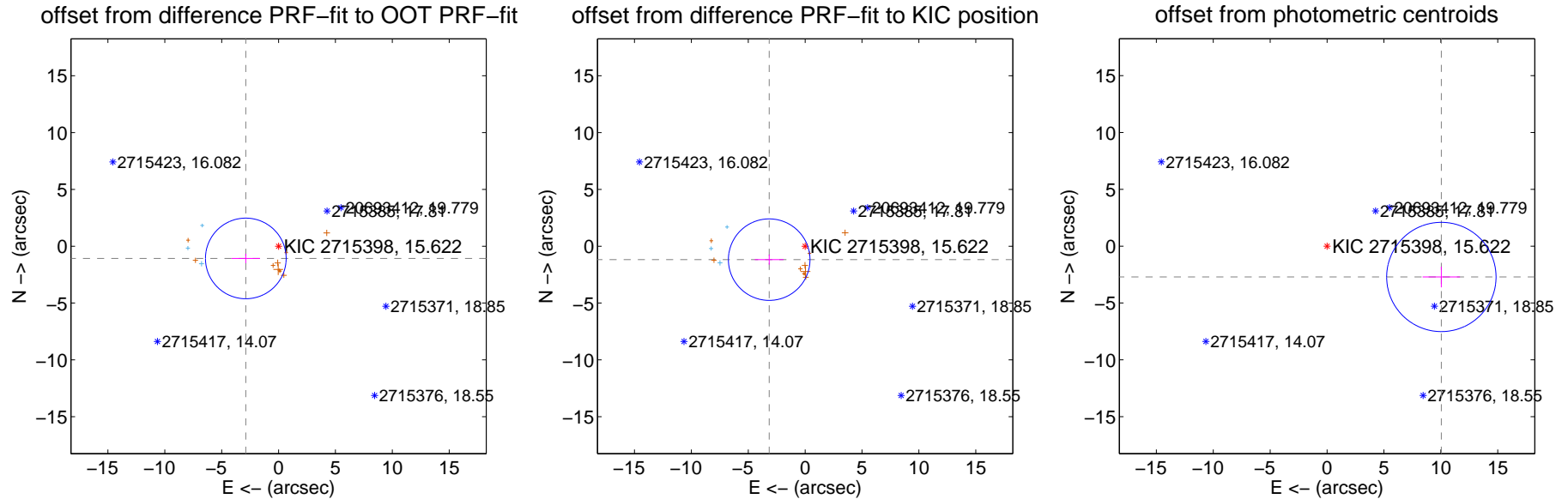
DV Centroid Data

Supplemental centroid analysis for 002715398-01. Kepler magnitude: 15.62. Transit SNR 10.38

There are 3 quarters with good PRF difference image offsets

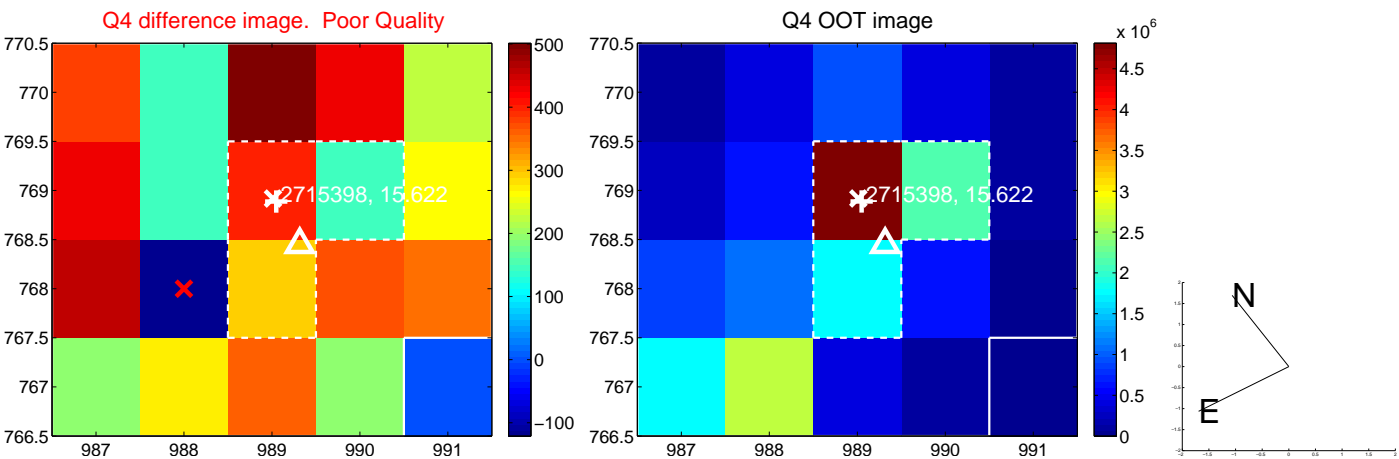
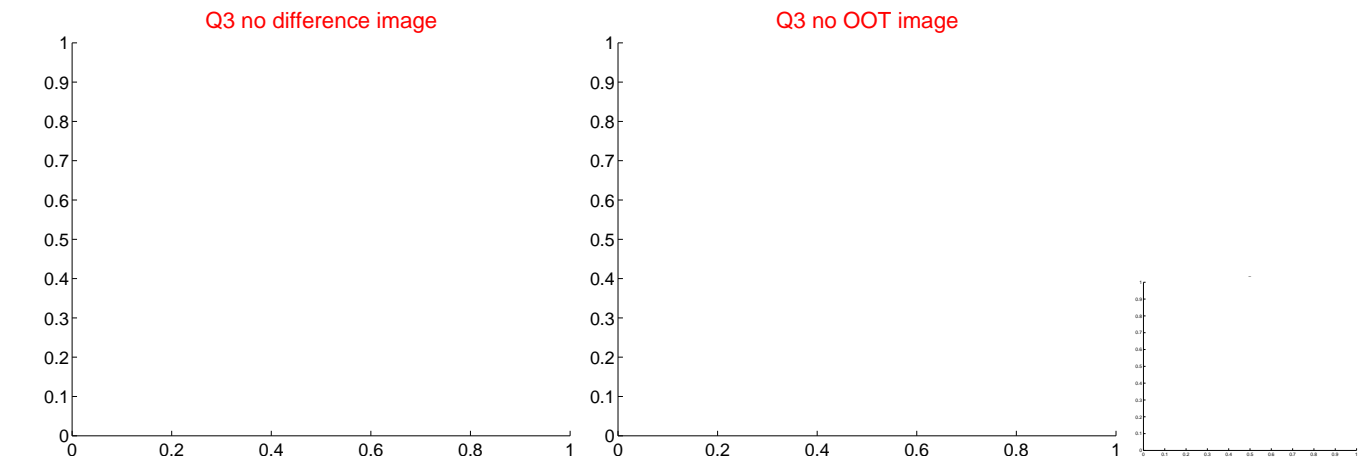
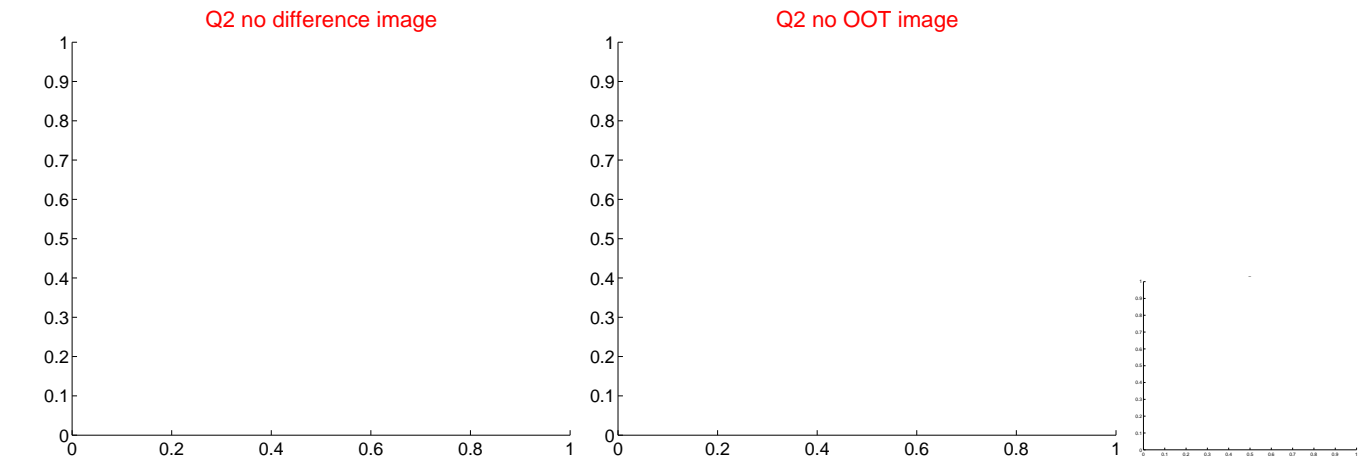
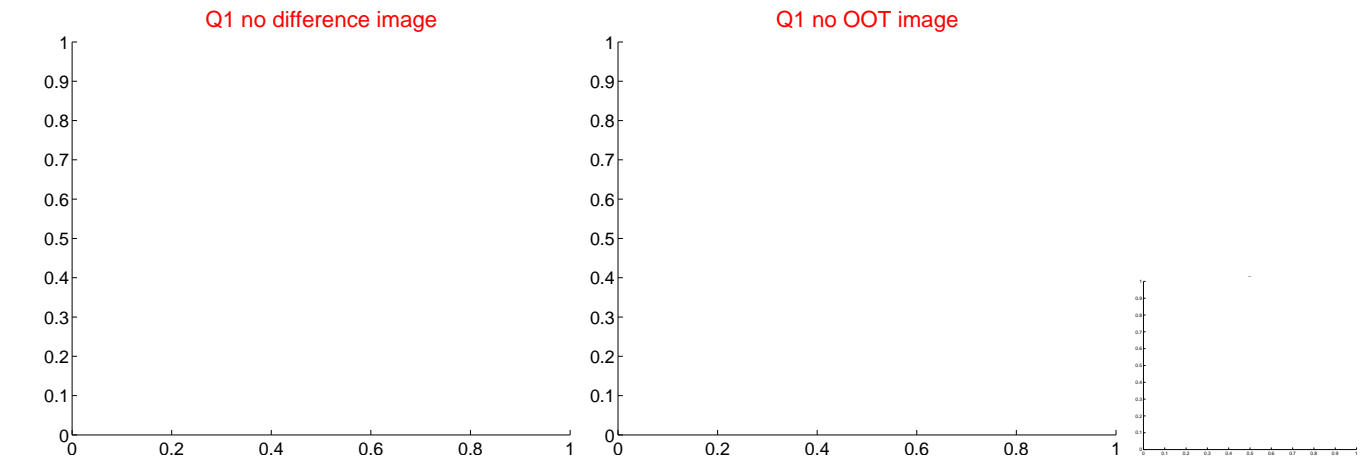
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.074 ± 1.183	2.60	2.880 ± 1.253	-1.075 ± 0.412
PRF-fit source offset from KIC position	3.373 ± 1.196	2.82	3.159 ± 1.266	-1.181 ± 0.442
photometric centroid source offset	10.41 ± 1.60	6.50	-10.05 ± 1.64	-2.71 ± 0.91

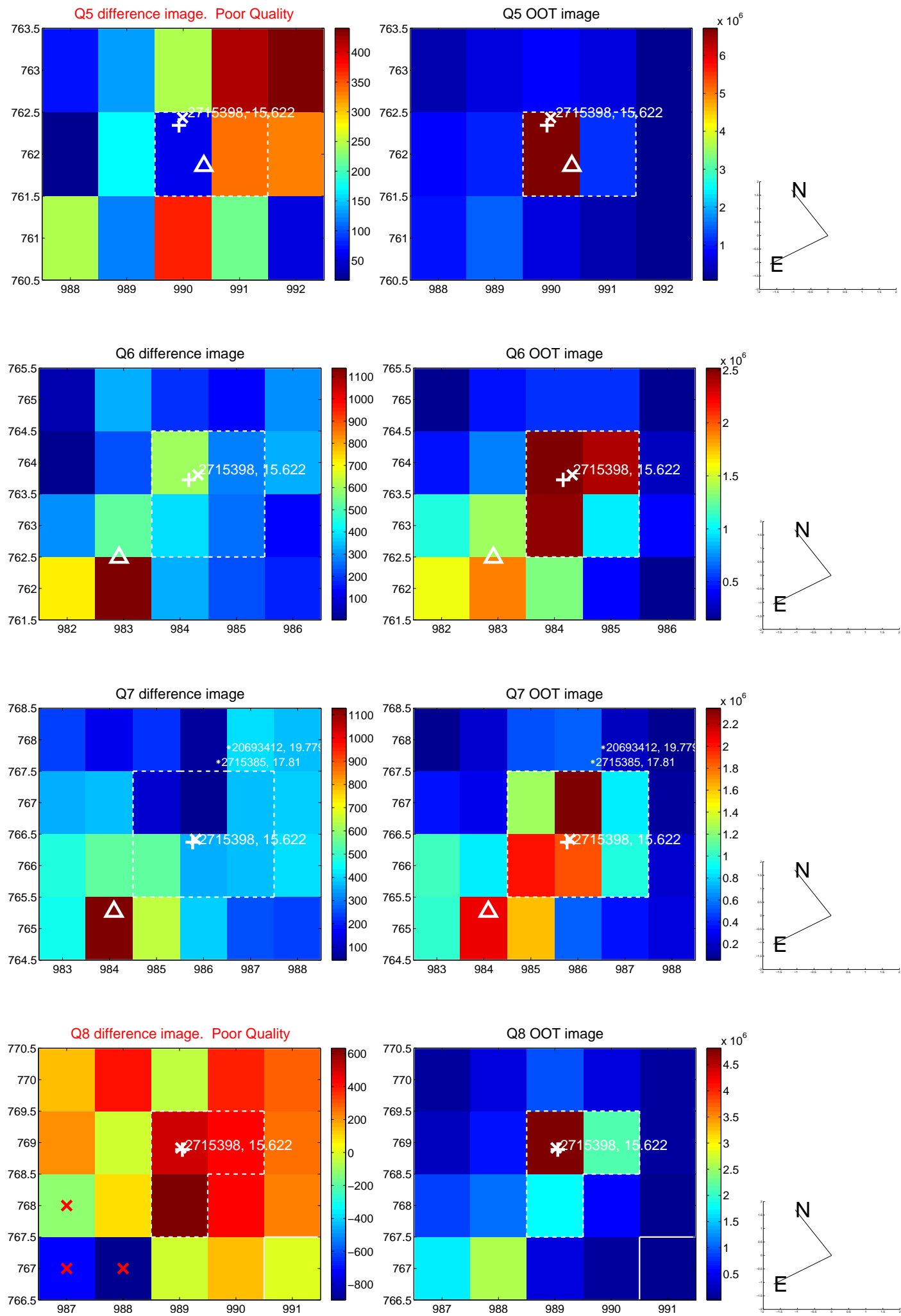


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

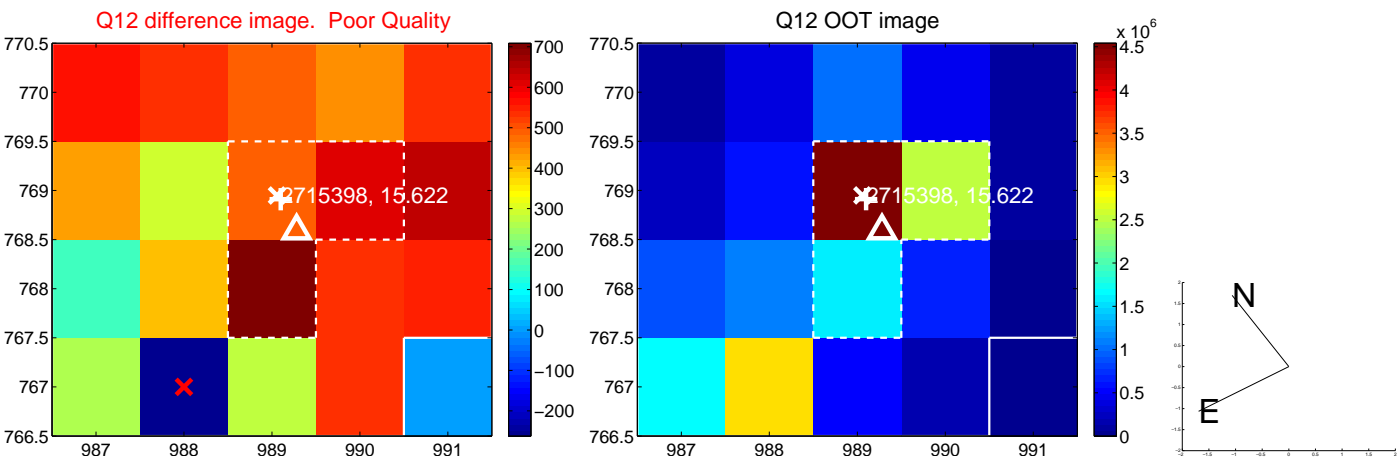
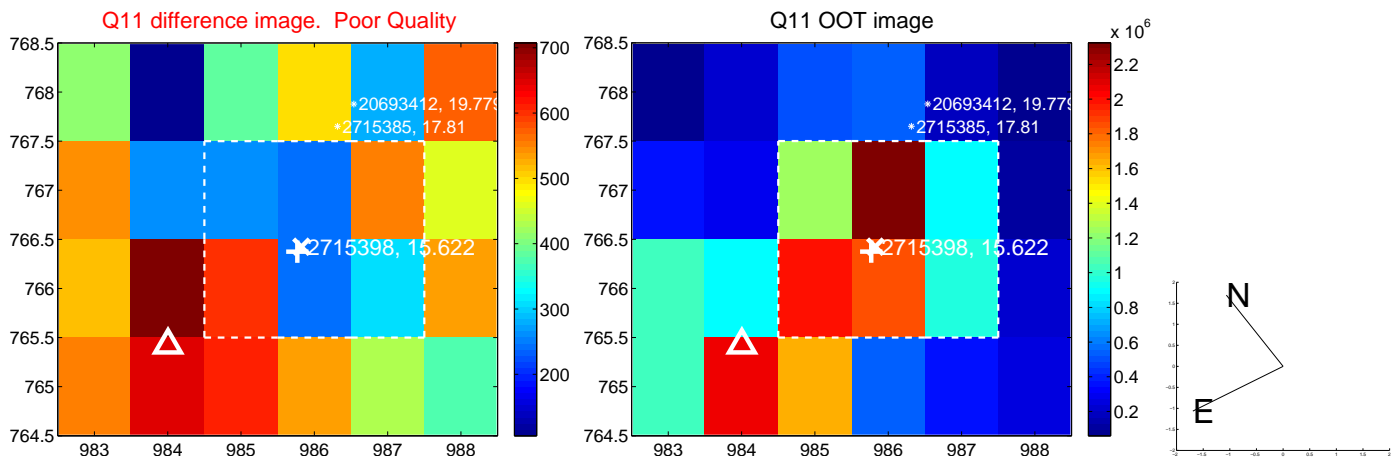
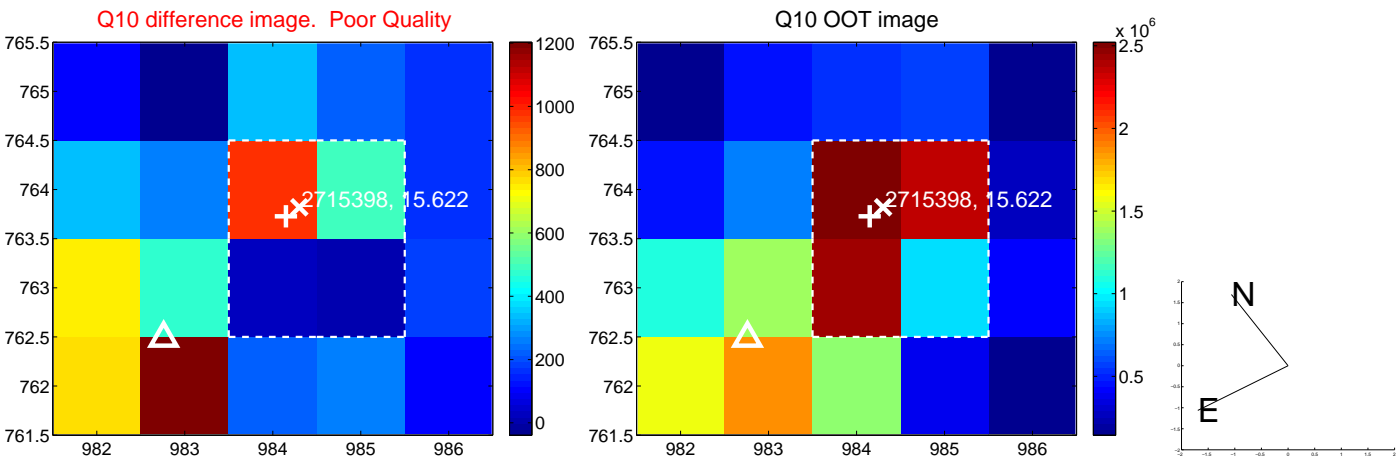
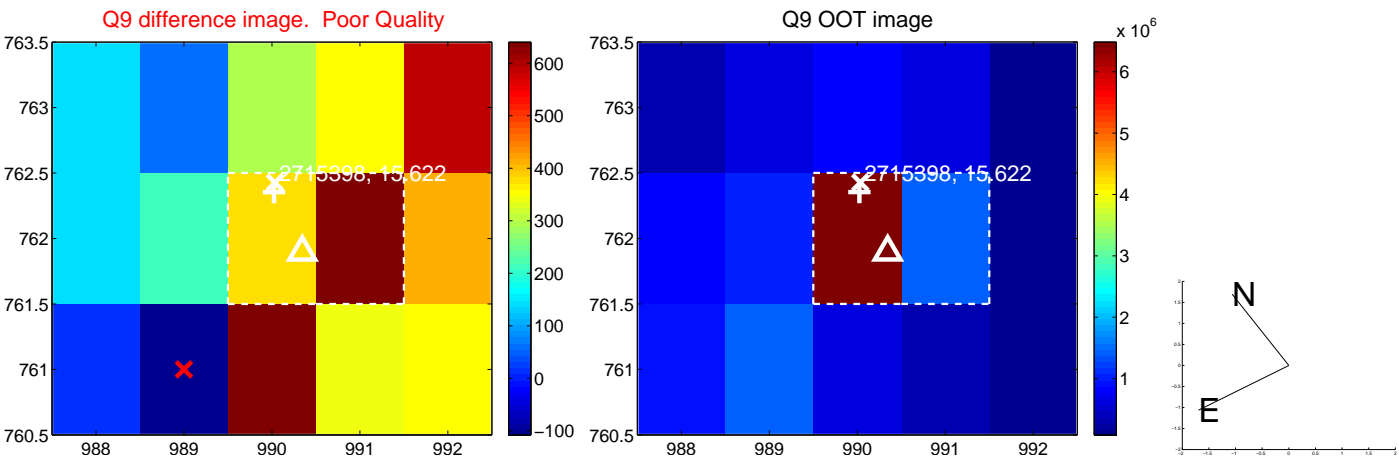
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



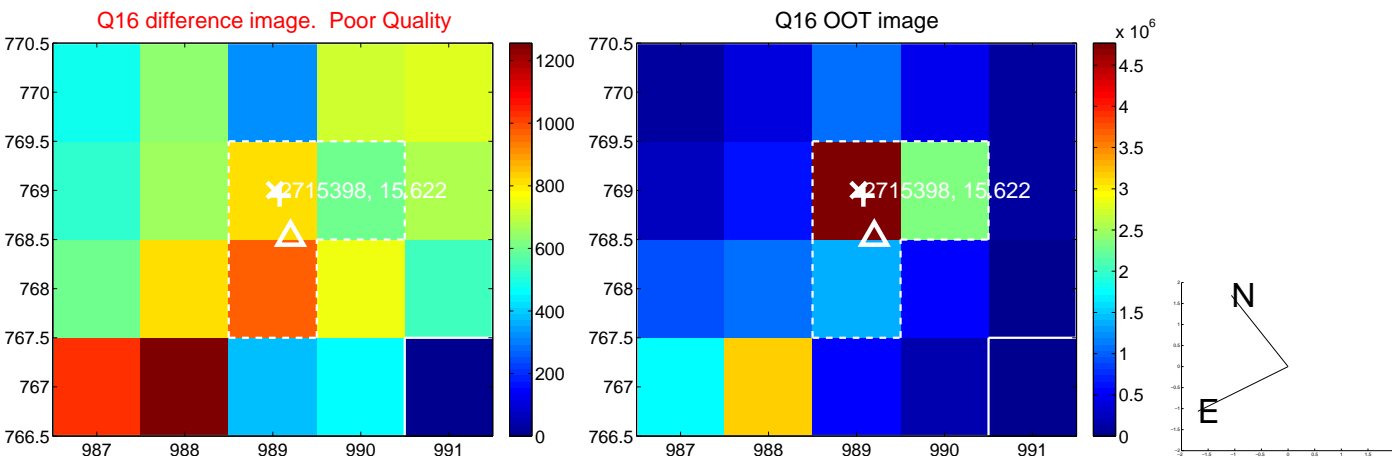
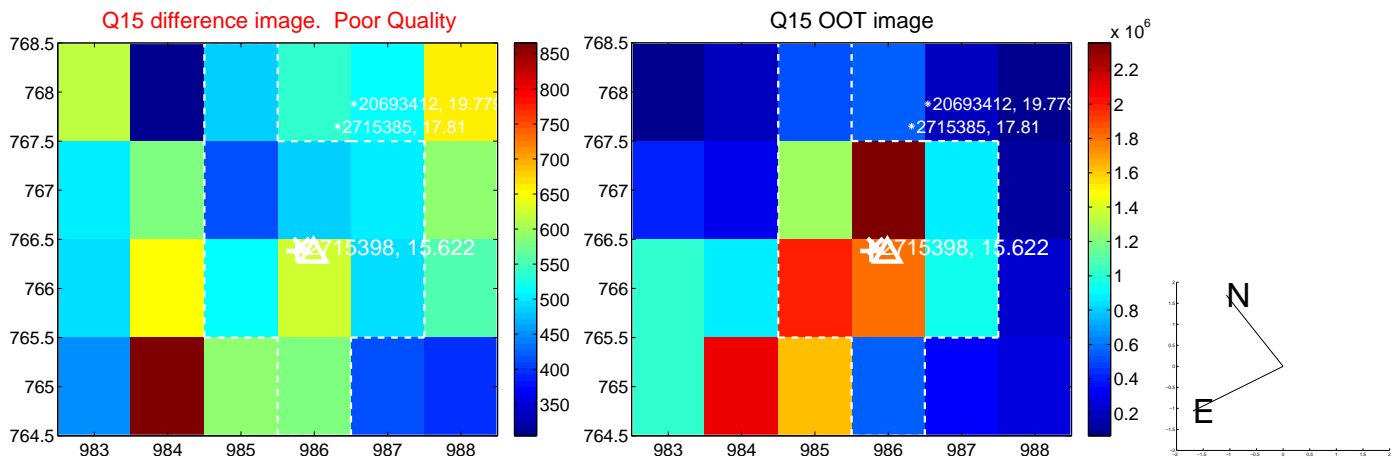
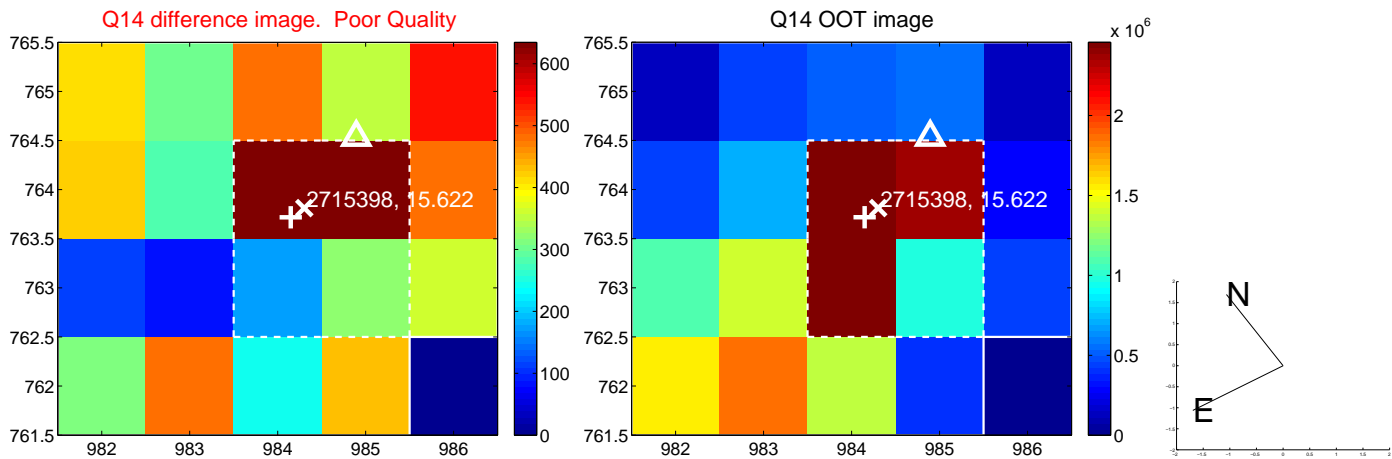
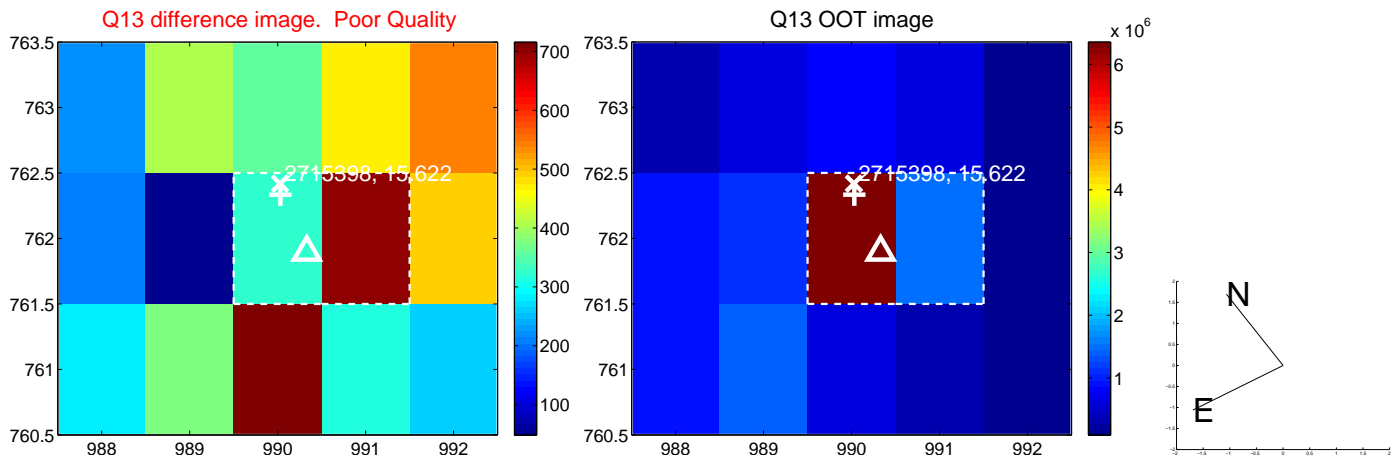
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



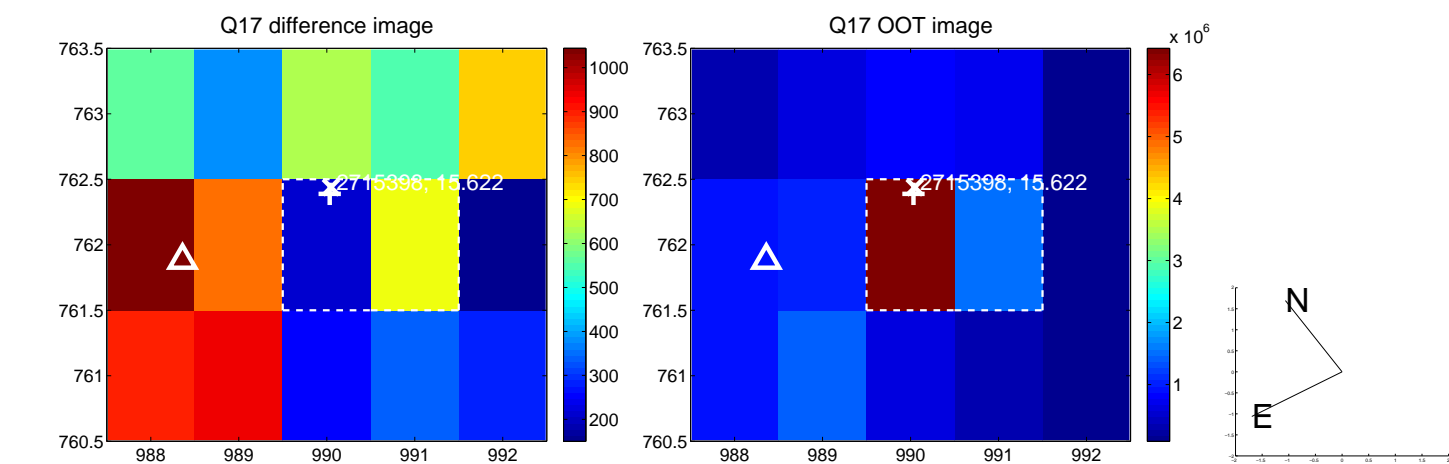
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



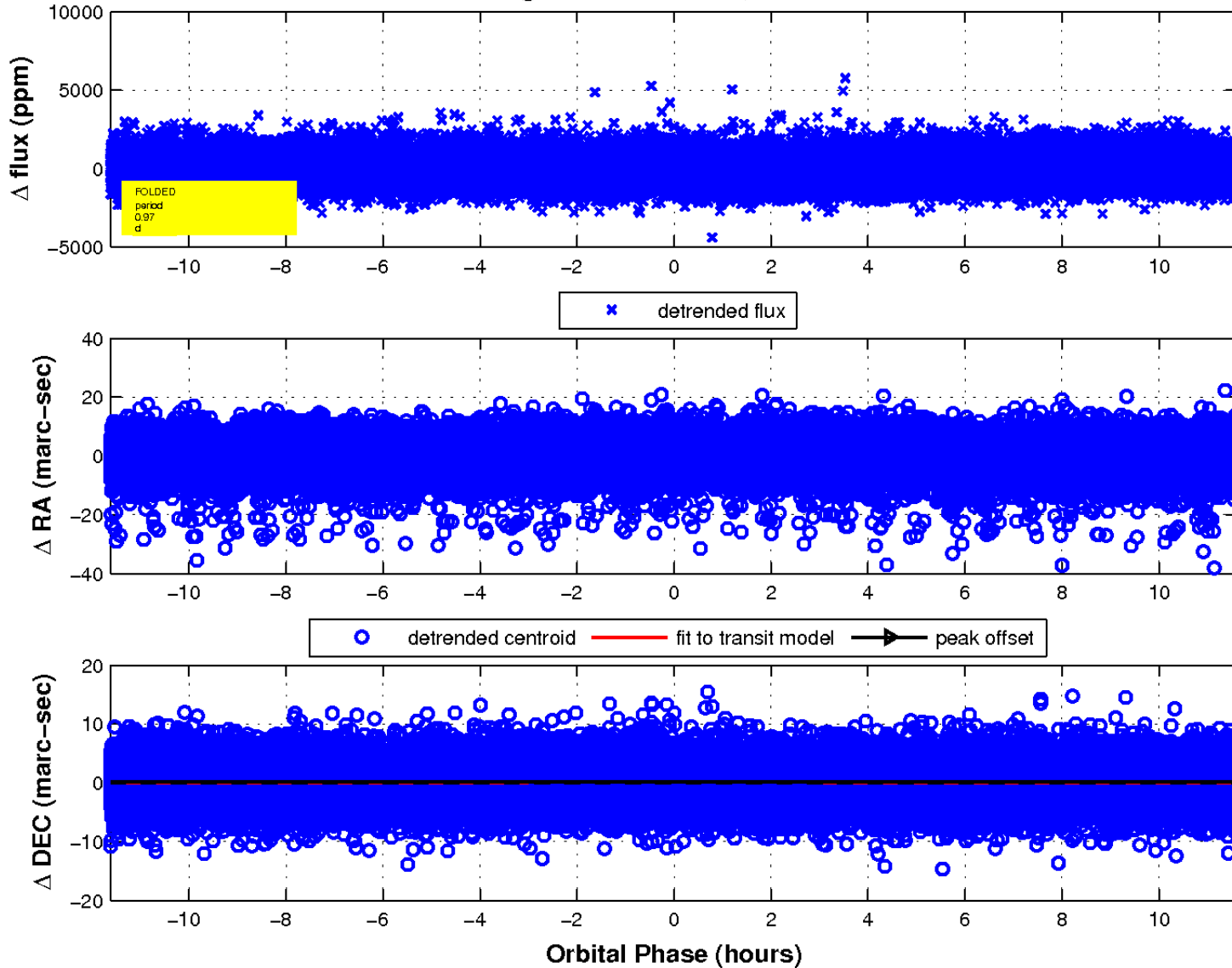
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

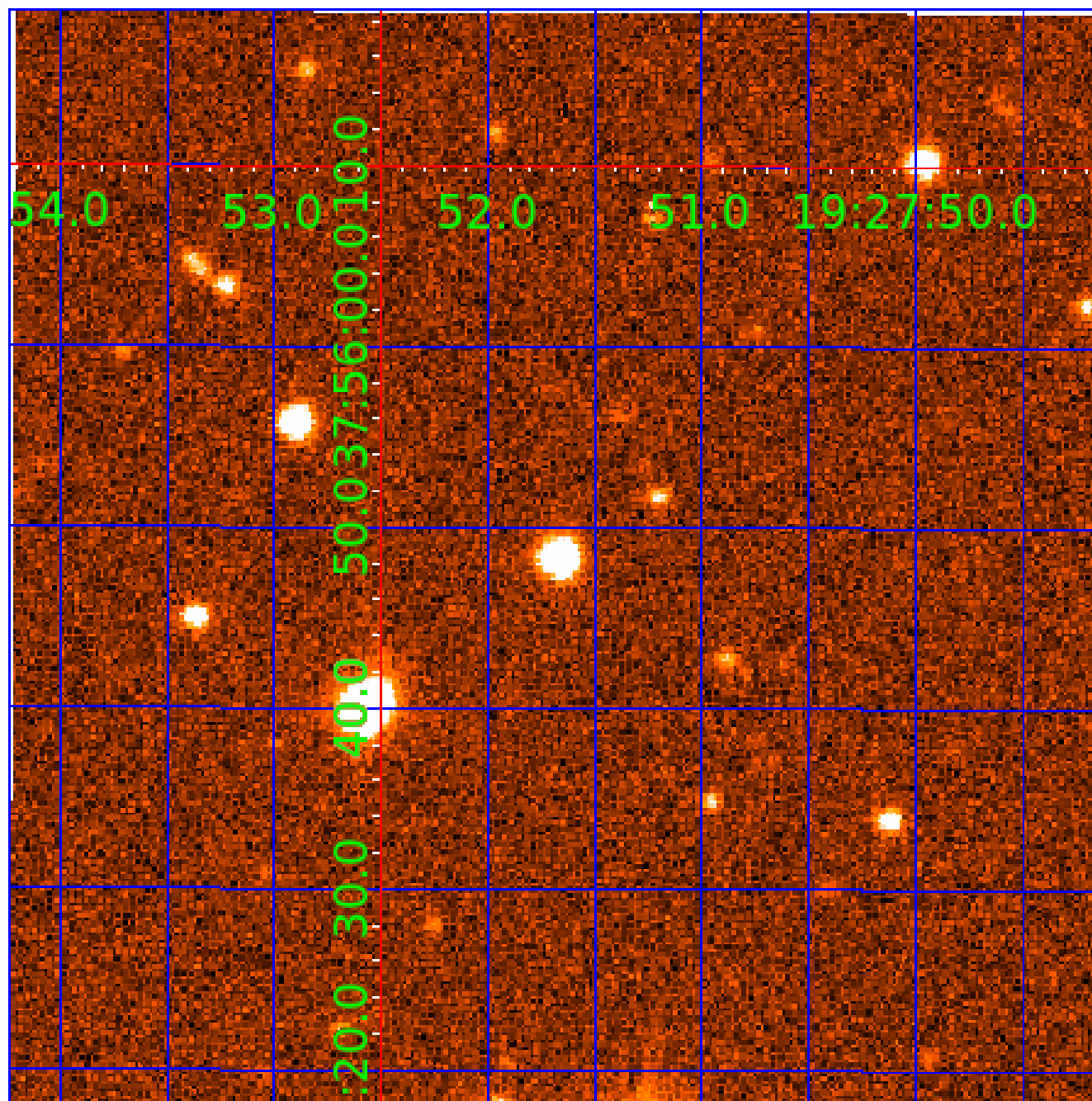


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 002715398

Q1-17 DR25 TCE Parameters

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Robovetter Results

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002715398-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

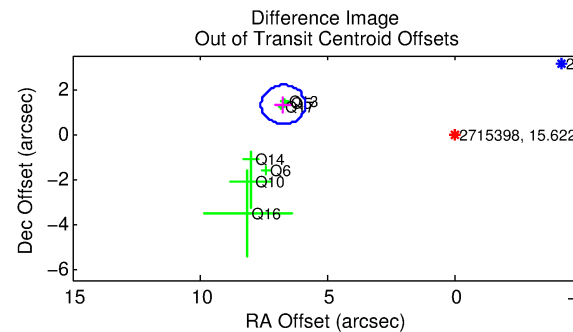
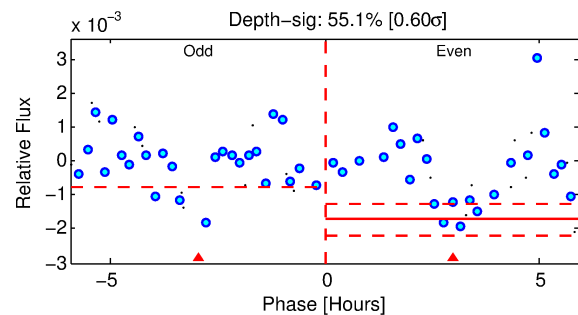
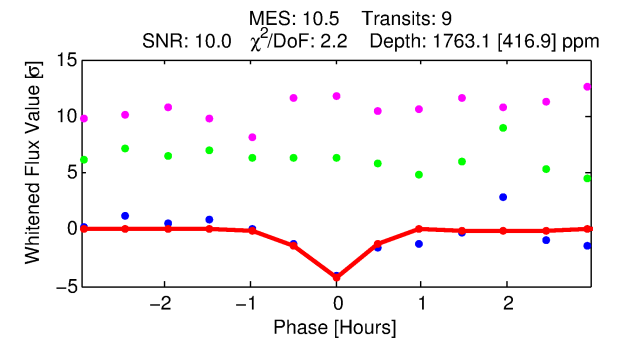
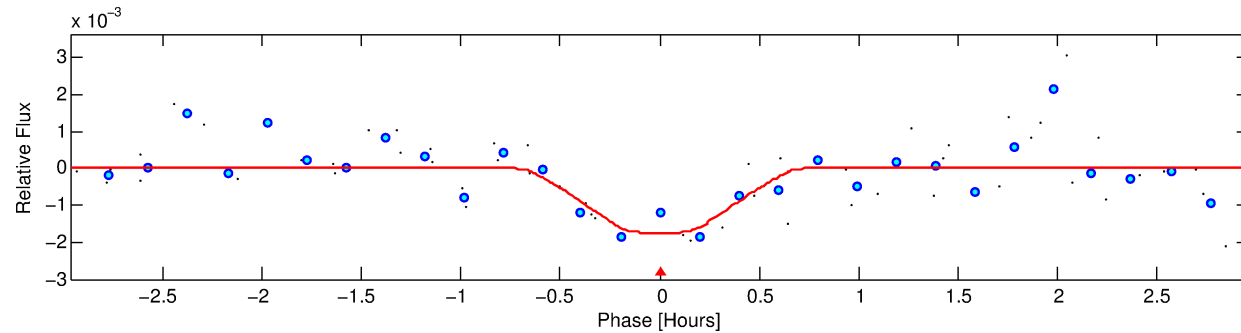
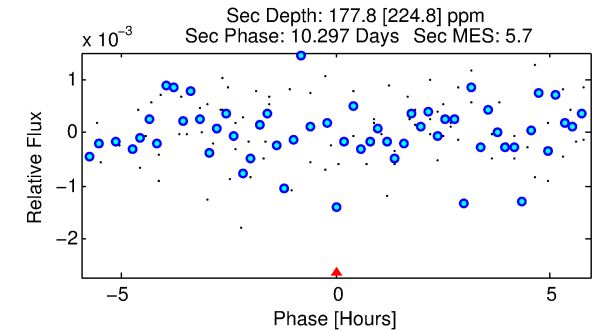
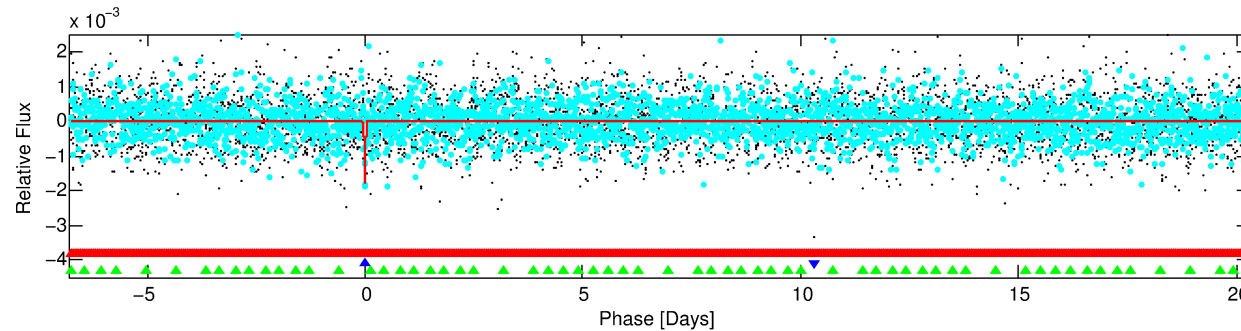
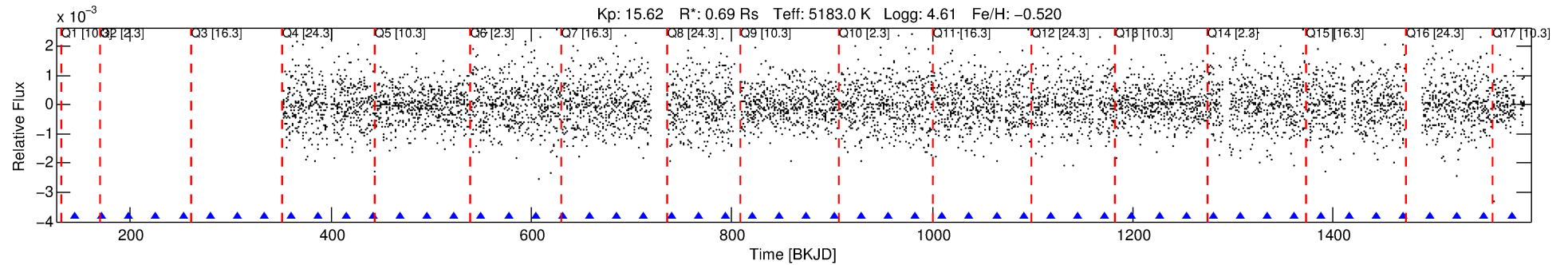
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002715398-02

No Significant Match Found

DV One-Page Summary

KIC: 2715398 Candidate: 2 of 3 Period: 27.042 d



DV Fit Results:

Period = 27.04193 [0.00022] d
Epoch = 144.6114 [0.0071] BKJD
Rp/R* = 0.0435 [0.0739]
a/R* = 139.07 [897.79]
b = 0.80 [2.95]
Seff = 12.50 [2.47]
Teq = 479 [24] K
Rp = 3.27 [5.56] Re
a = 0.1565 [0.0151] AU
Ag = 224.12 [811.99] [0.27 σ]
Teff = 2868 [2599] K [0.92 σ]

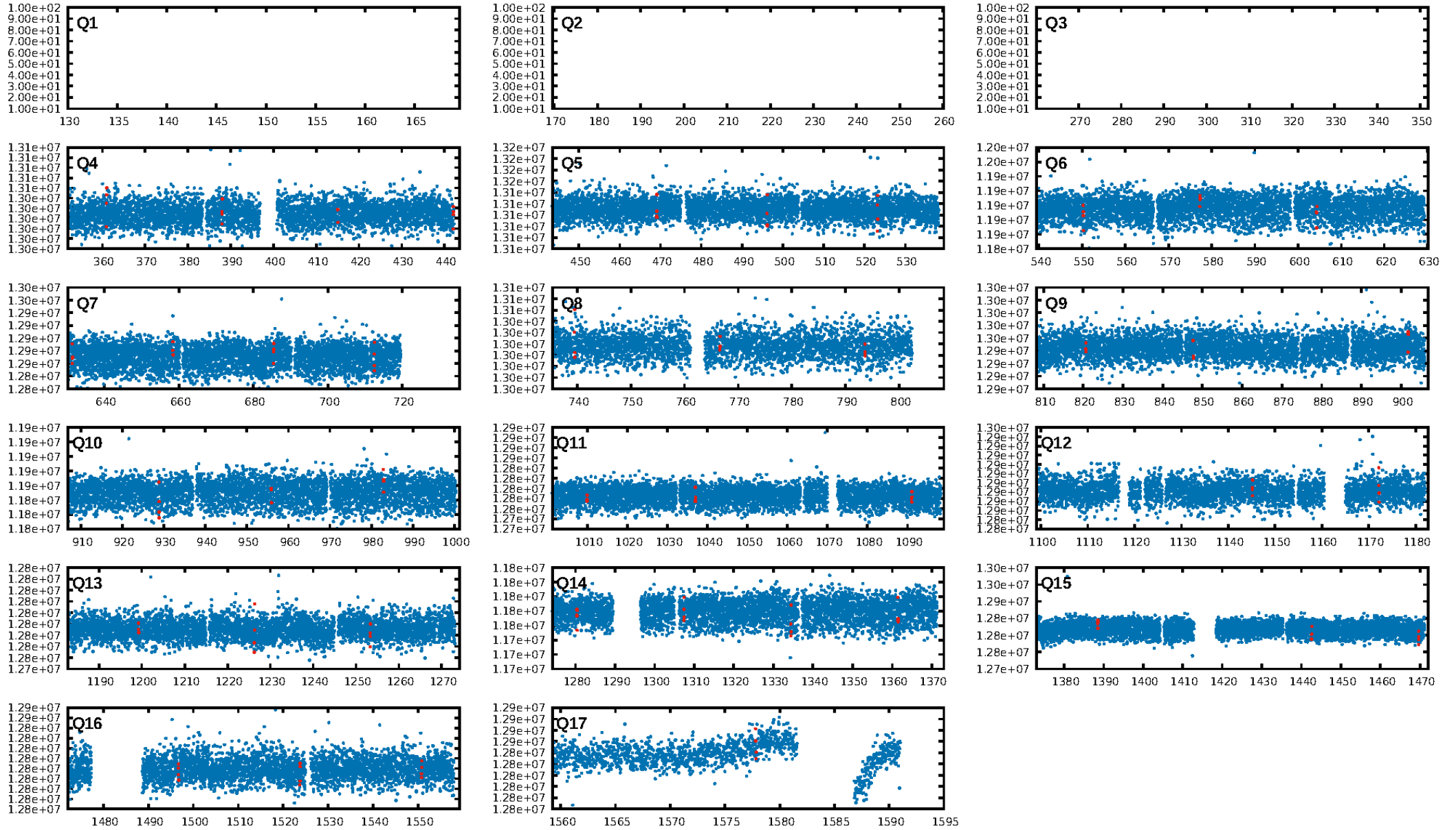
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [43.17 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 13.4%
ModelChiSquareGoF-sig: 71.6%
Bootstrap-pfa: 1.54e-09
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: -1.596
Centroid-sig: N/A
Centroid-so: 1.674 arcsec [1.88 σ]
OotOffset-rm: 6.846 arcsec [23.61 σ]
KicOffset-rm: 6.995 arcsec [24.17 σ]
OotOffset-st: 3/0/1/3 [7]
KicOffset-st: 3/0/1/3 [7]
DiffImageQuality-fgm: 0.71 [5/7]
DiffImageOverlap-fno: 0.36 [5/14]

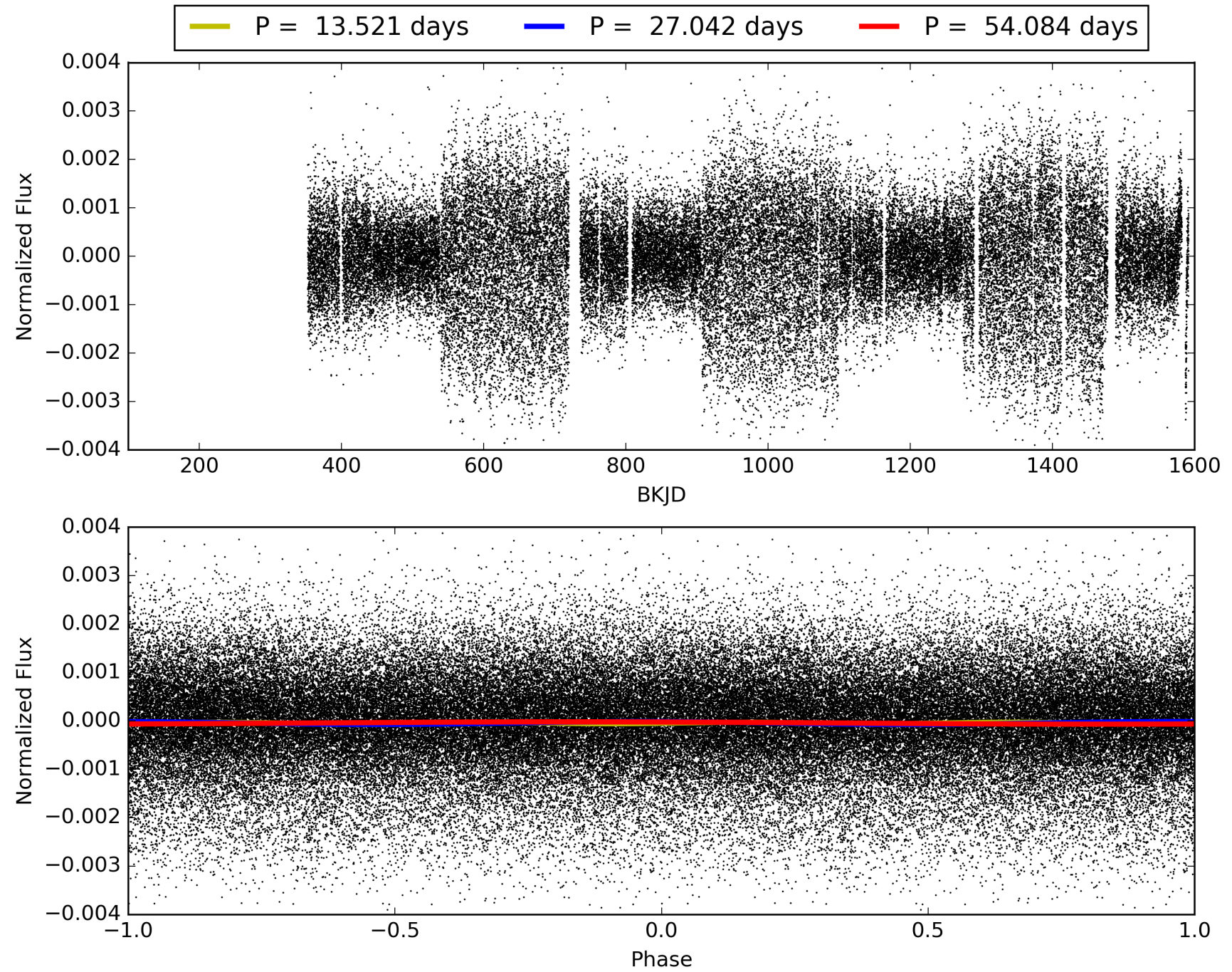
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:57:09 Z

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

TCE 002715398-02, PDC Light Curves

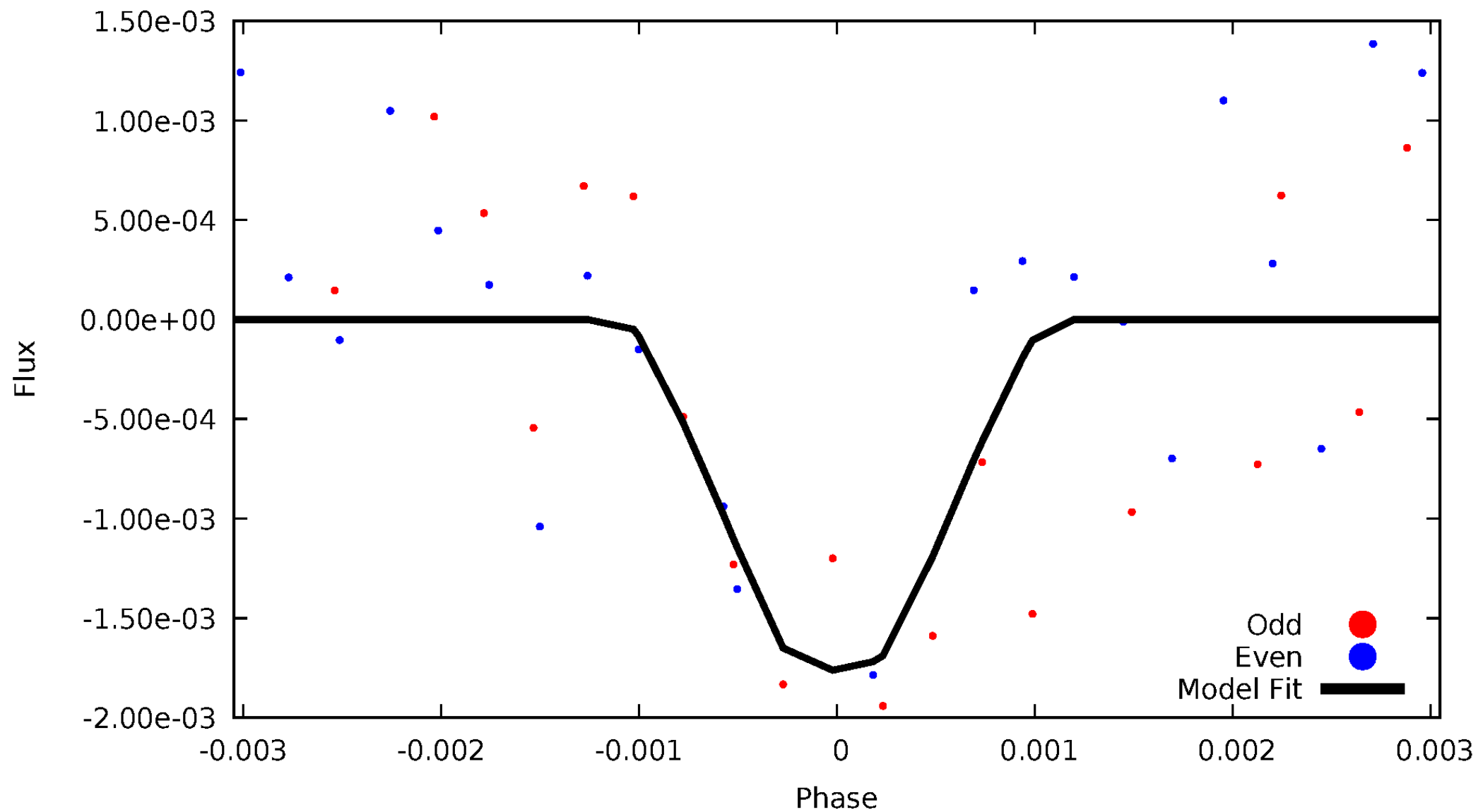


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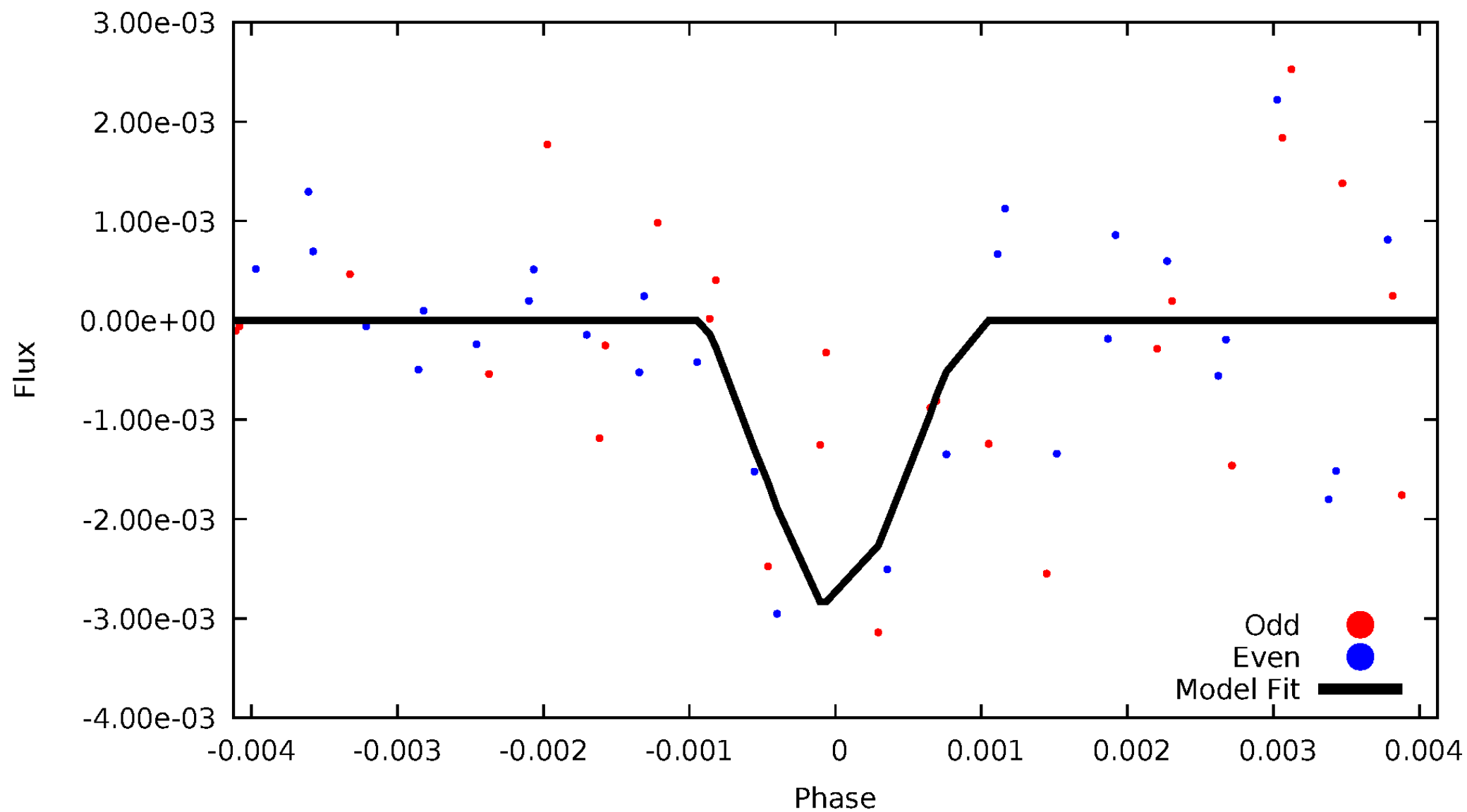
DV Odd/Even

TCE 002715398-02



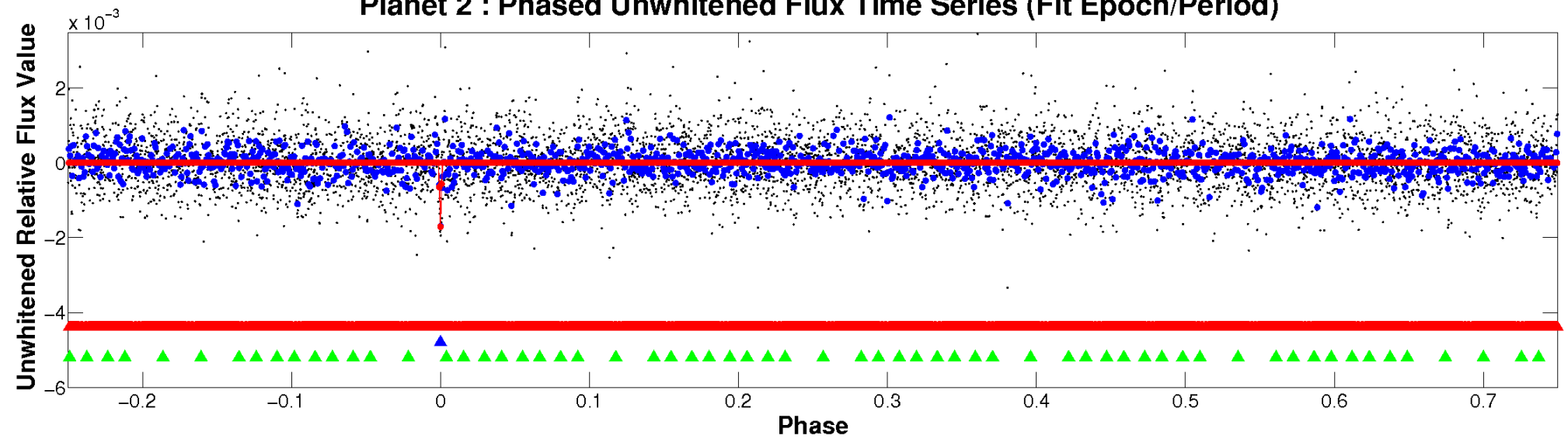
ALT Odd/Even

TCE 002715398-02

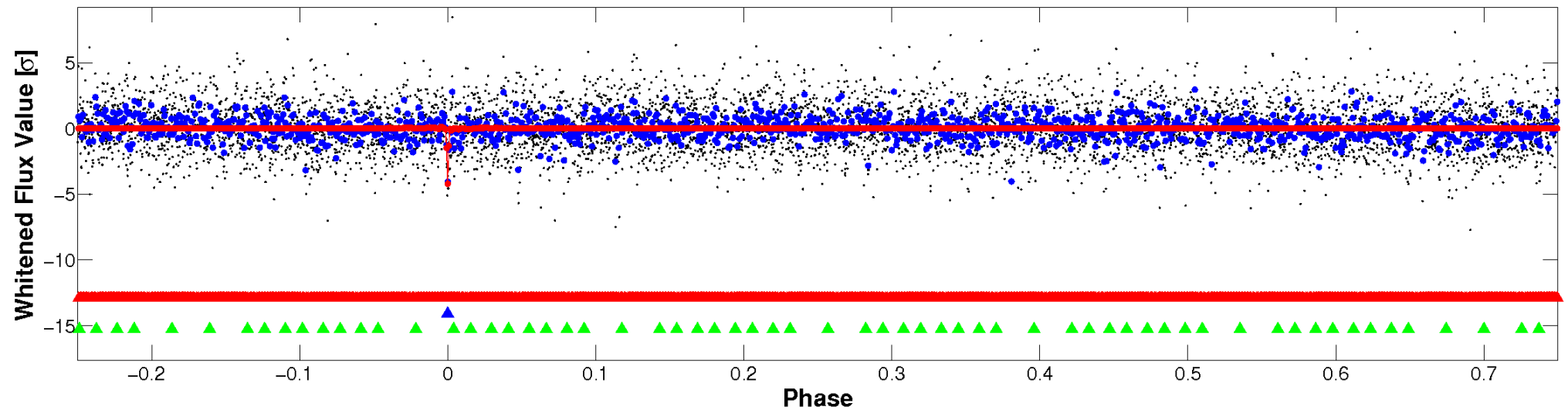


Non-Whitened Vs. Whitened Light Curve

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

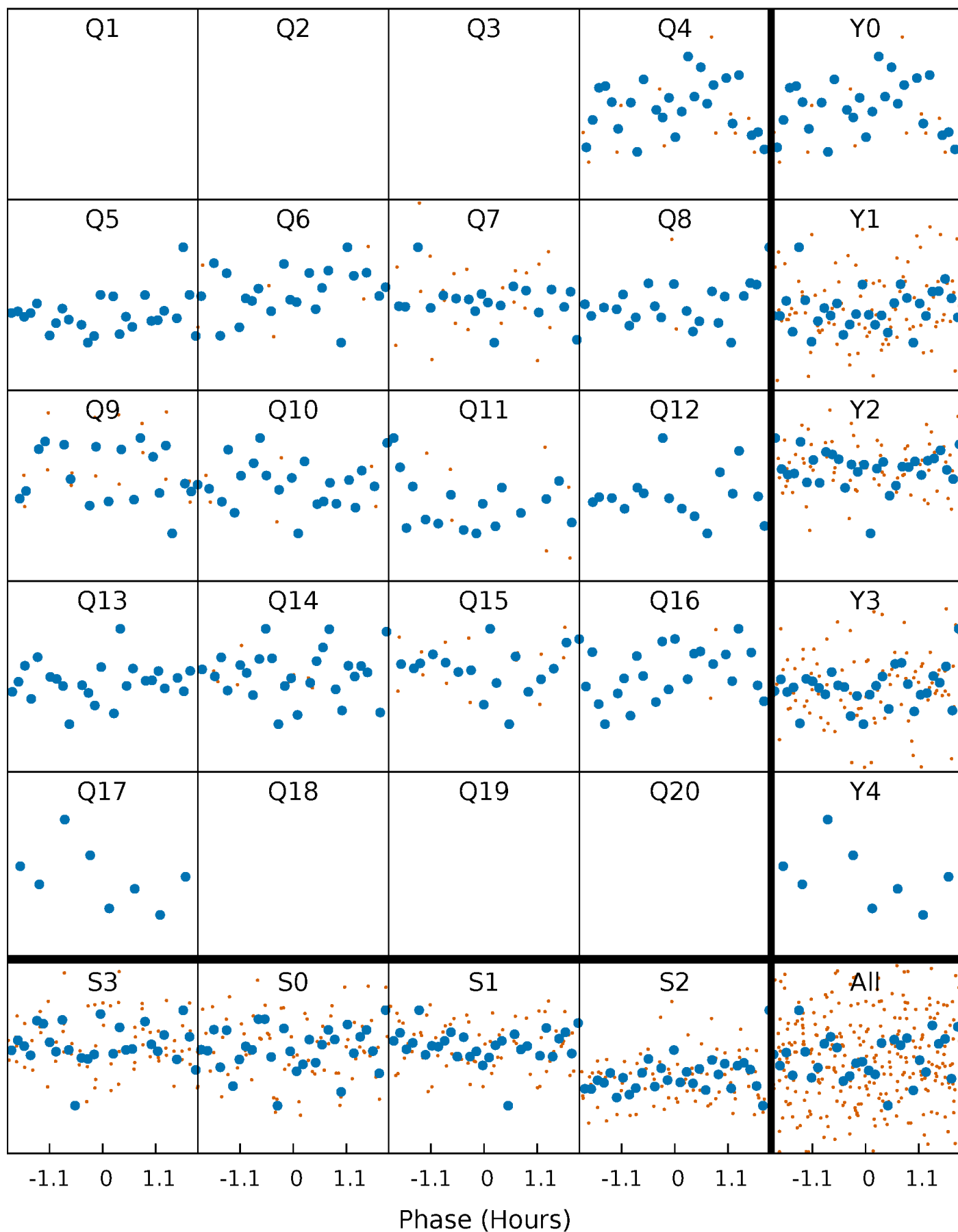


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



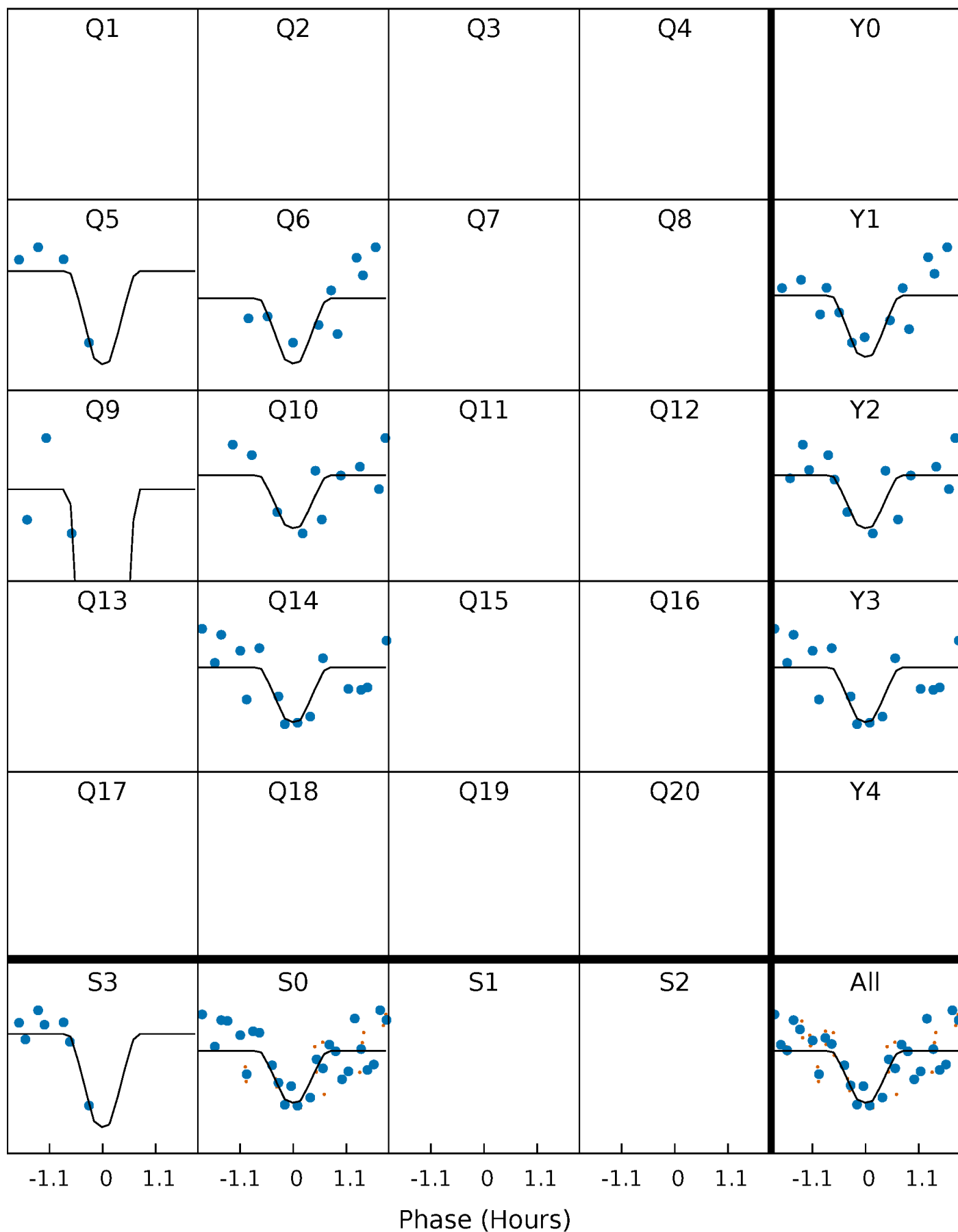
PDC Quarter-Phased Transit Curves

TCE 002715398-02 P= 27.041930 Days $T_0=144.611374$ (BKJD)



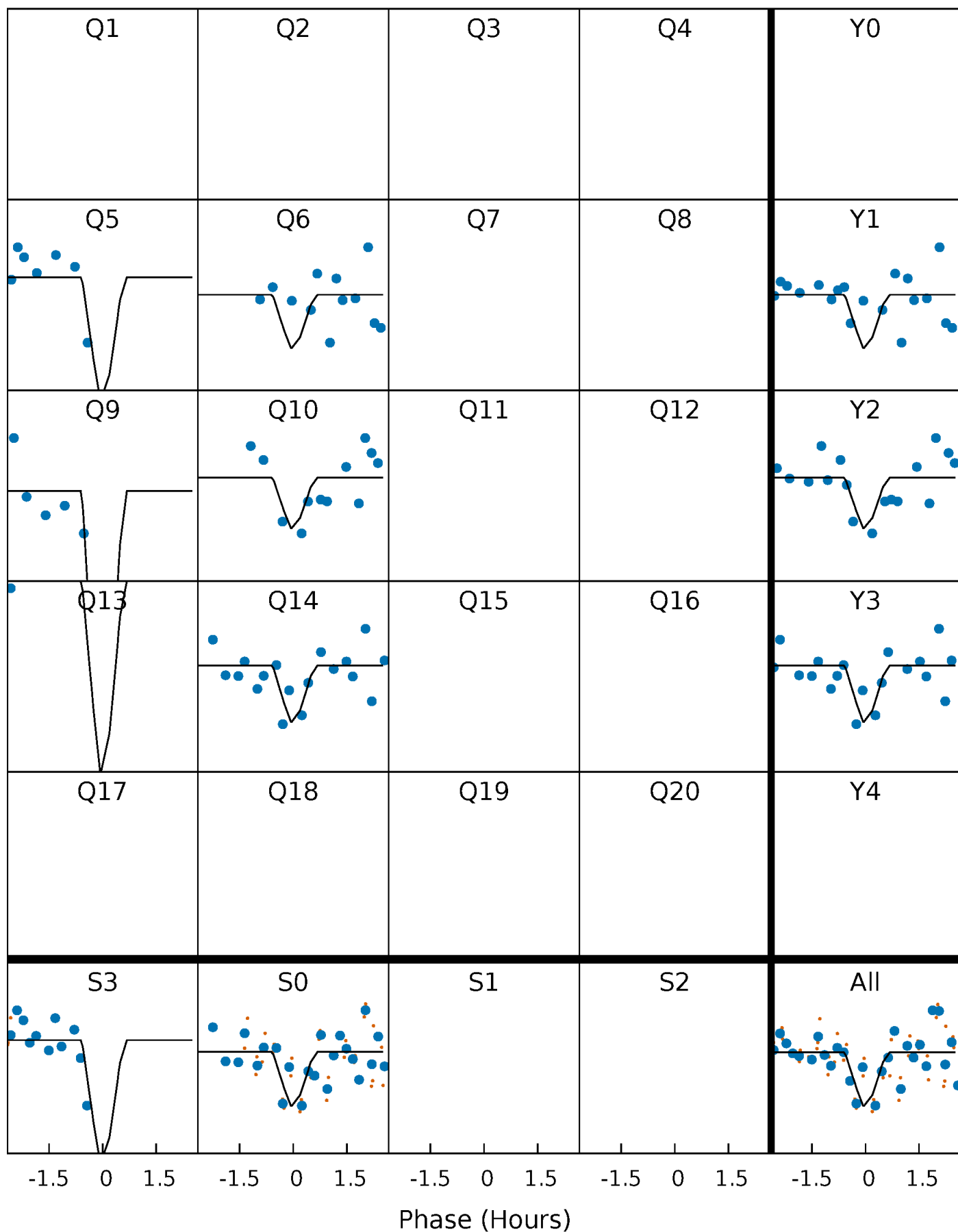
DV Quarter-Phased Transit Curves

TCE 002715398-02 P= 27.041930 Days $T_0=144.611374$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

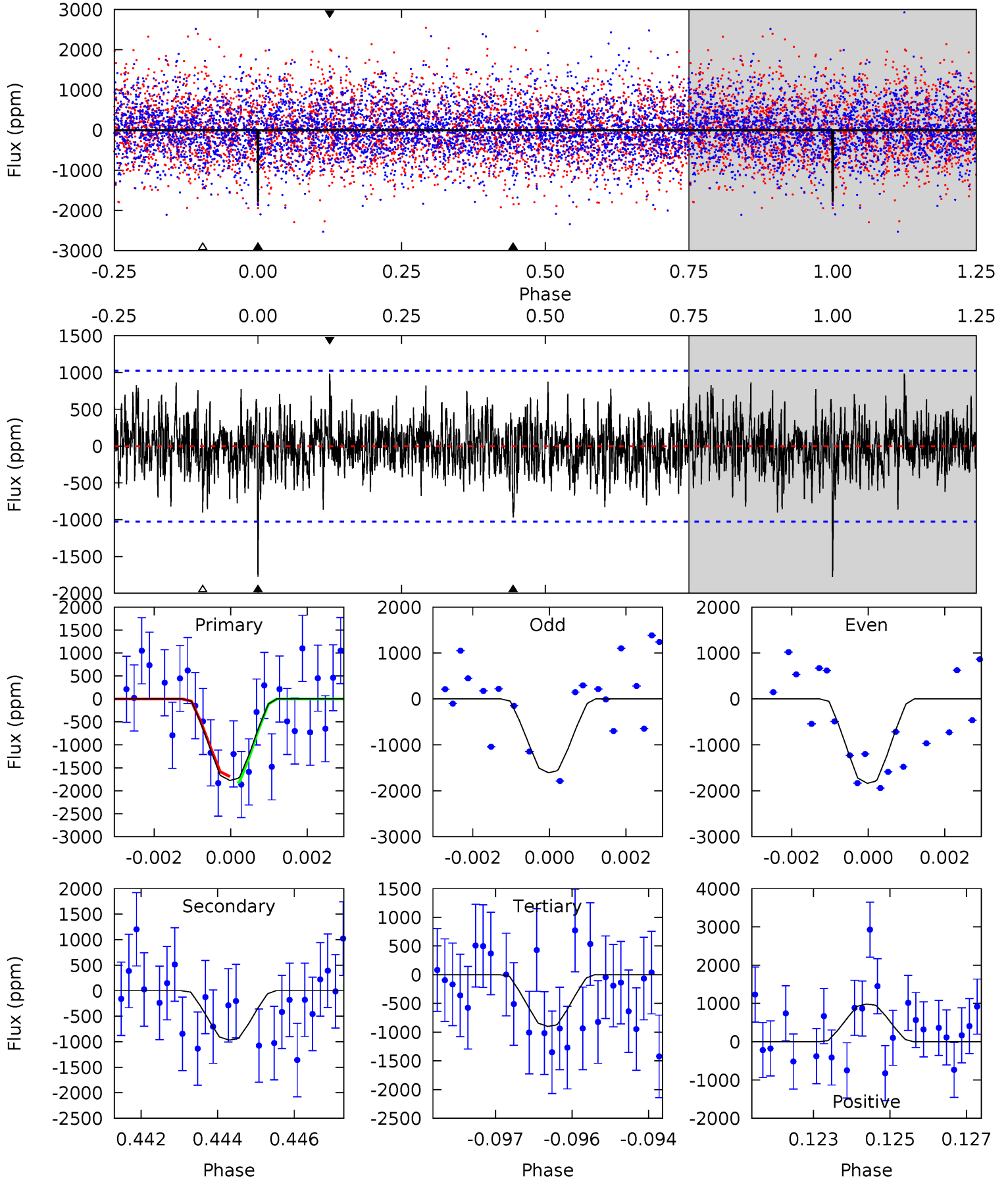
TCE 002715398-02 P= 27.041728 Days $T_0=144.615566$ (BKJD)



DV Model-Shift Uniqueness Test

002715398-02, P = 27.041930 Days, E = 144.611374 Days

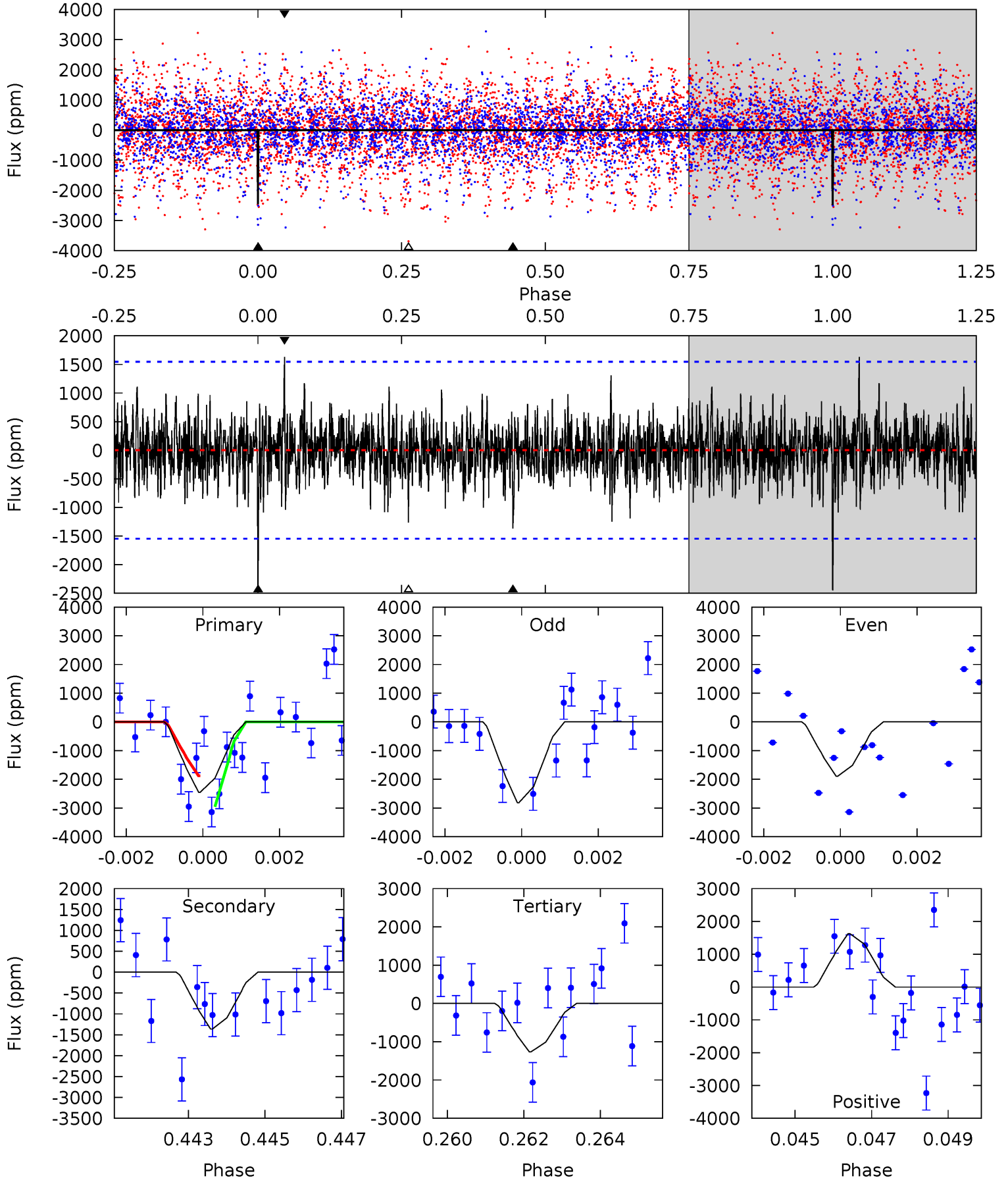
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.23	5.03	4.68	5.11	5.33	3.09	1.45	4.55	4.12	0.36	-0.08	0.60	0.94	0.36	0.37



Alt Model-Shift Uniqueness Test

002715398-02, P = 27.041728 Days, E = 144.615566 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.46	4.71	4.37	5.63	5.34	3.11	1.20	4.09	2.83	0.35	-0.91	1.58	0.93	0.40	1.88



Stellar Parameters For KIC 002715398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5183^{+197}_{-179}	$4.607^{+0.055}_{-0.061}$	$-0.520^{+0.300}_{-0.300}$	$0.688^{+0.087}_{-0.060}$	$0.699^{+0.083}_{-0.048}$	$3.024^{+0.699}_{-0.679}$
	+4%/-3%	+1%/-1%	+58%/-58%	+13%/-9%	+12%/-7%	+23%/-22%
Source	KIC0	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 002715398-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-968 ± 192	$5.52^{+4.81}_{-3.93}$	672^{+30}_{-30}	3749^{+2371}_{-685}	435^{+4624}_{-312}
Alt.	-1365 ± 290	$5.88^{+4.71}_{-4.02}$	671^{+31}_{-25}	3932^{+2262}_{-707}	564^{+4385}_{-399}

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 $A_{obs} \gg 1.0$

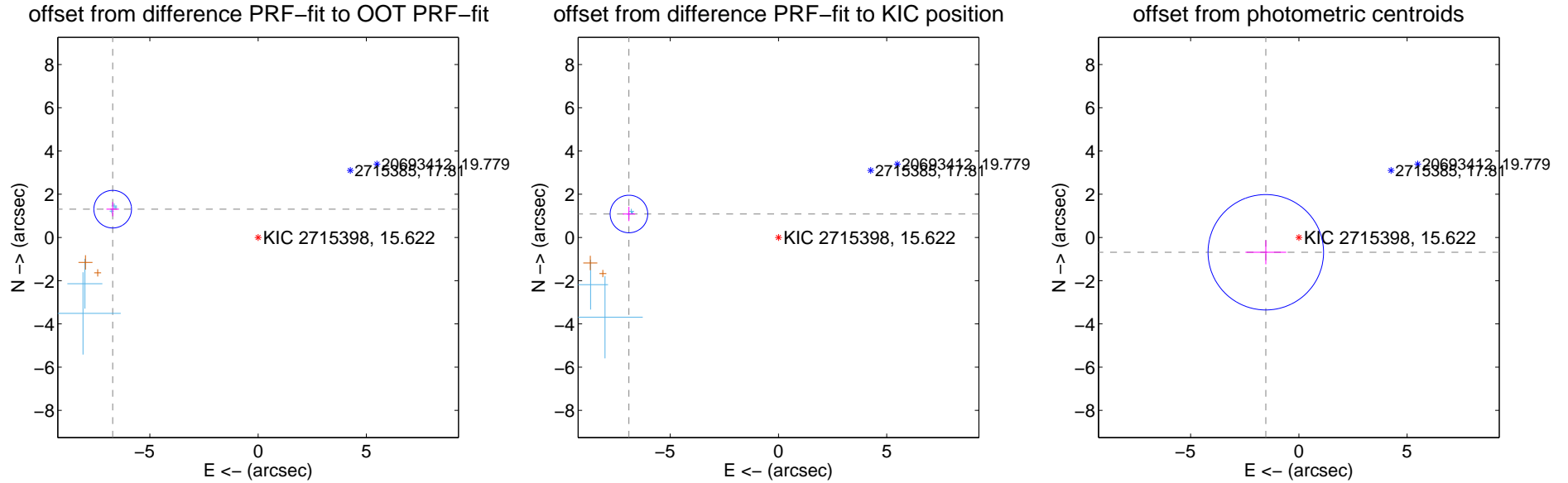
DV Centroid Data

Supplemental centroid analysis for 002715398-02. Kepler magnitude: 15.62. Transit SNR 9.99

There are 5 quarters with good PRF difference image offsets

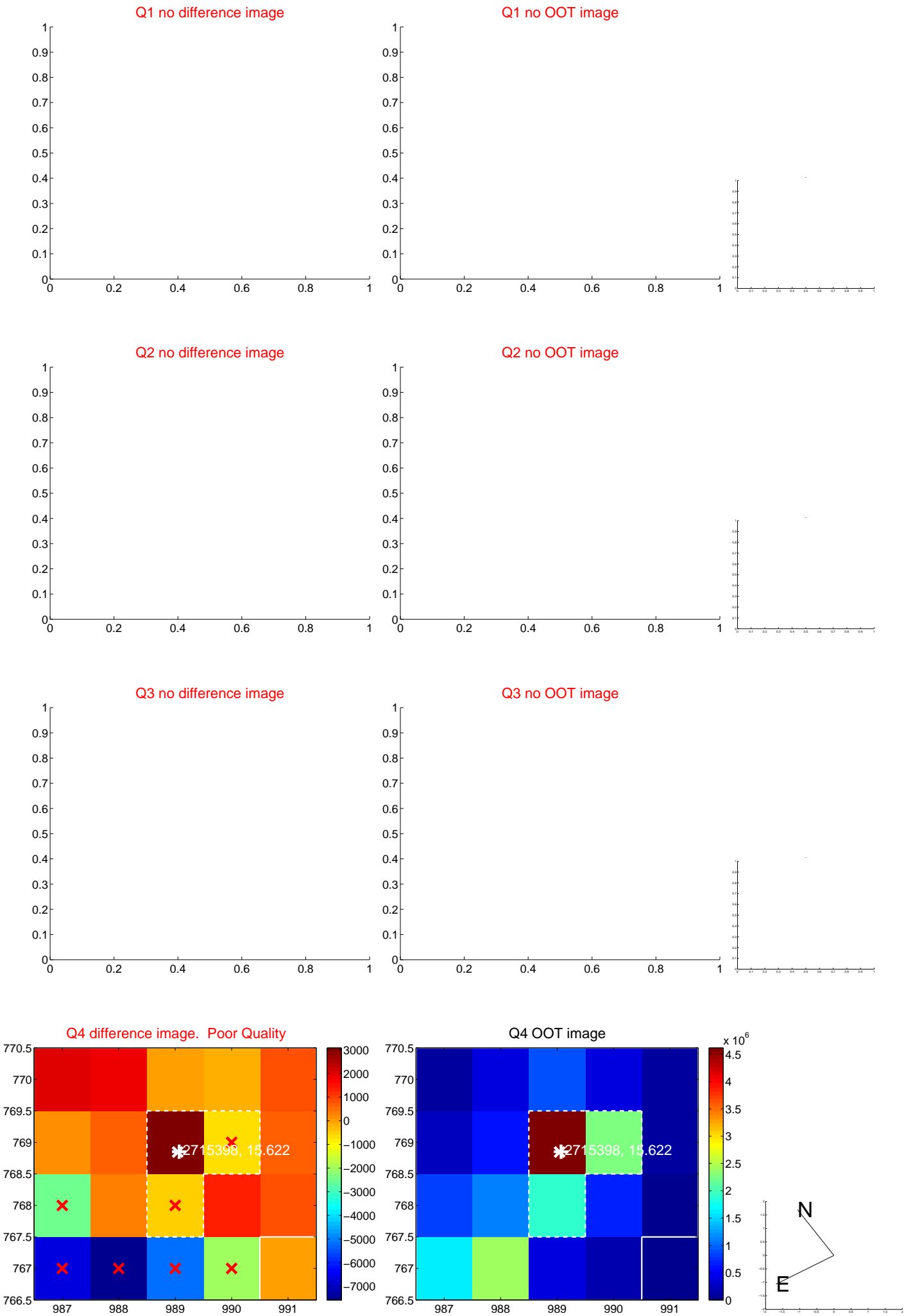
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.846 ± 0.290	23.61	6.720 ± 0.288	1.308 ± 0.330
PRF-fit source offset from KIC position	6.995 ± 0.289	24.17	6.911 ± 0.288	1.086 ± 0.330
photometric centroid source offset	1.67 ± 0.89	1.88	1.53 ± 0.94	-0.69 ± 0.56

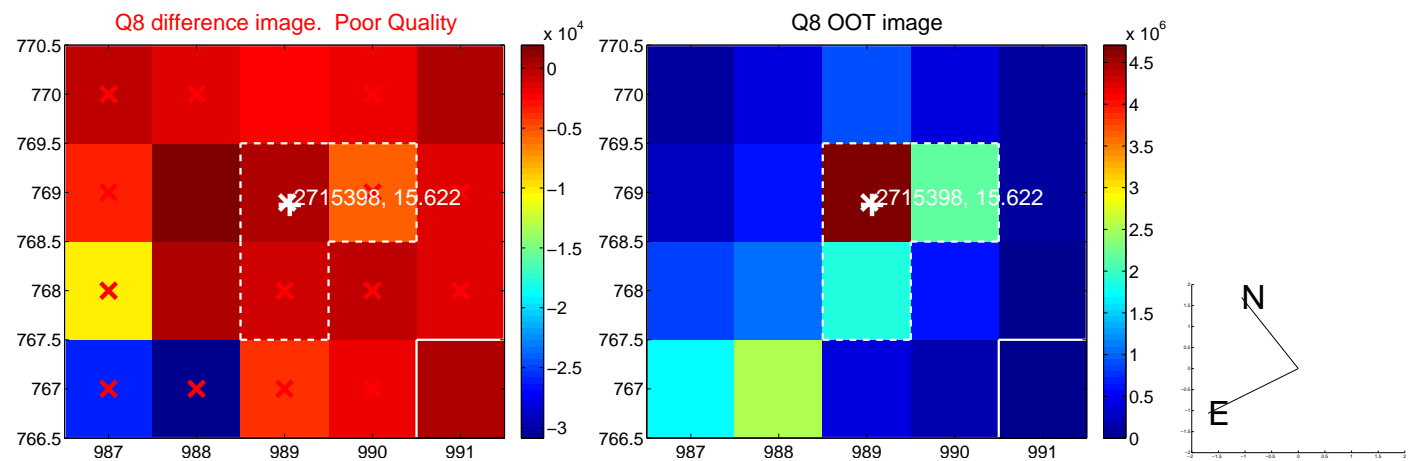
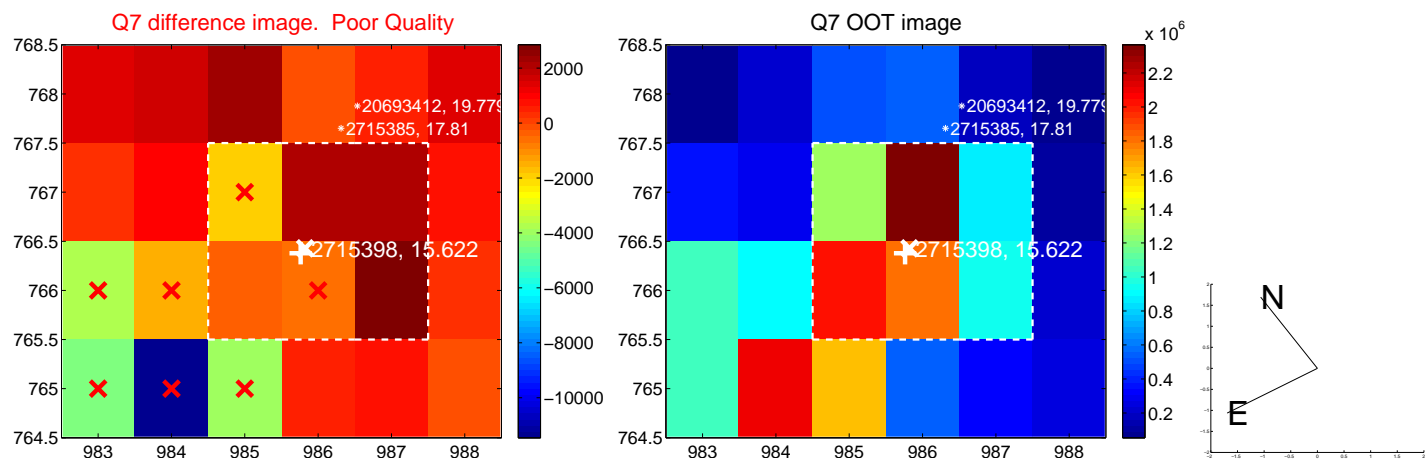
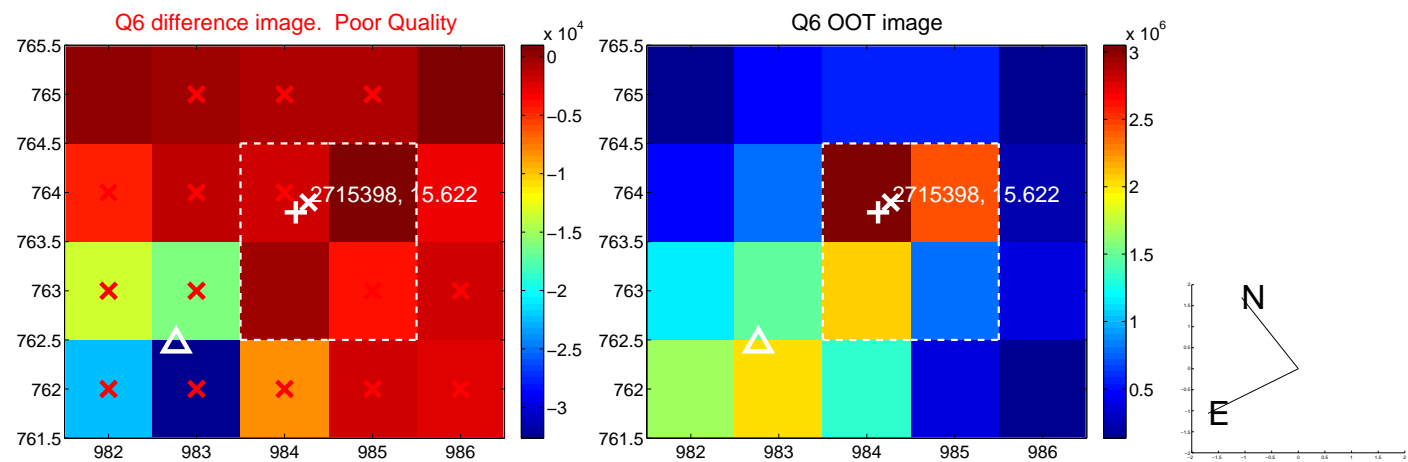
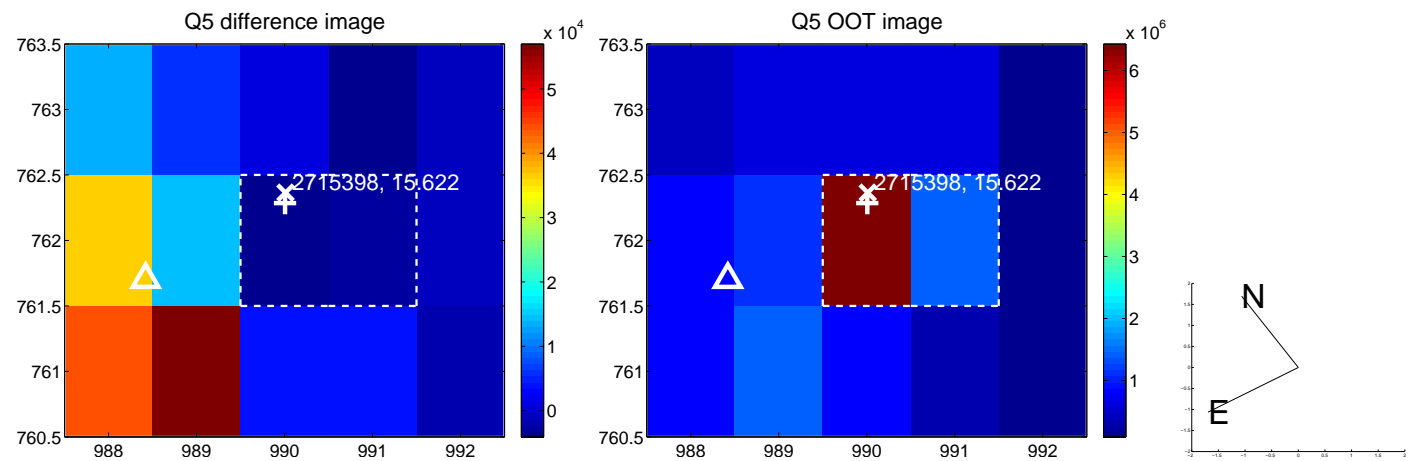


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

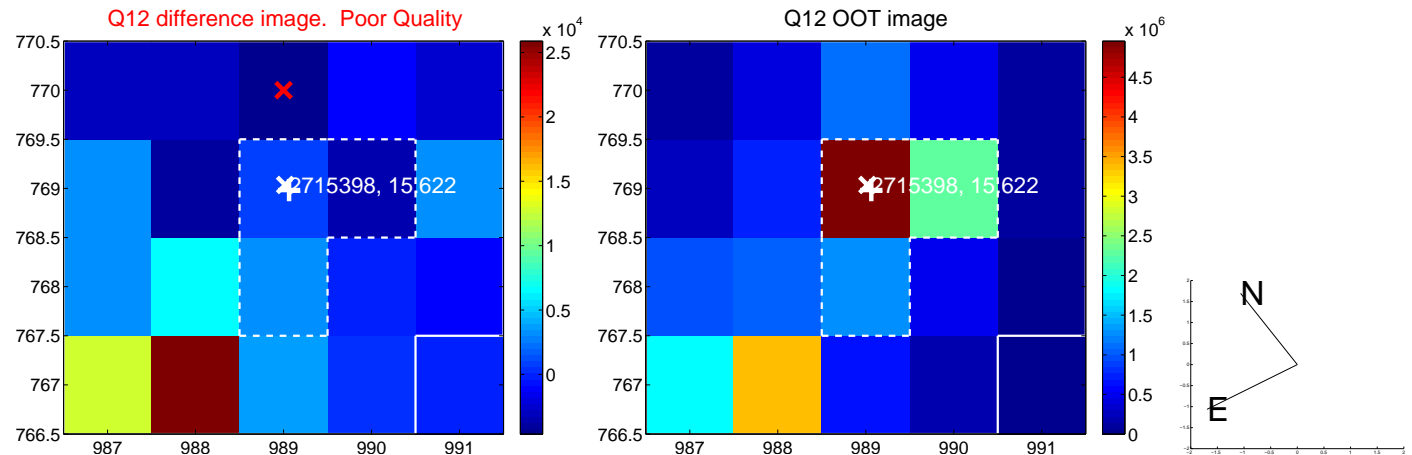
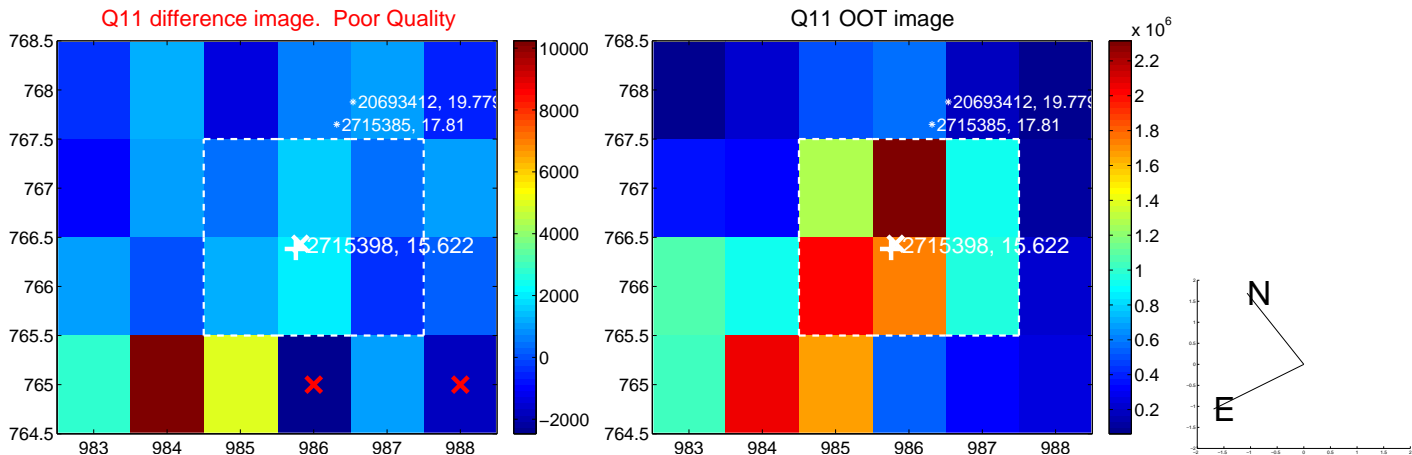
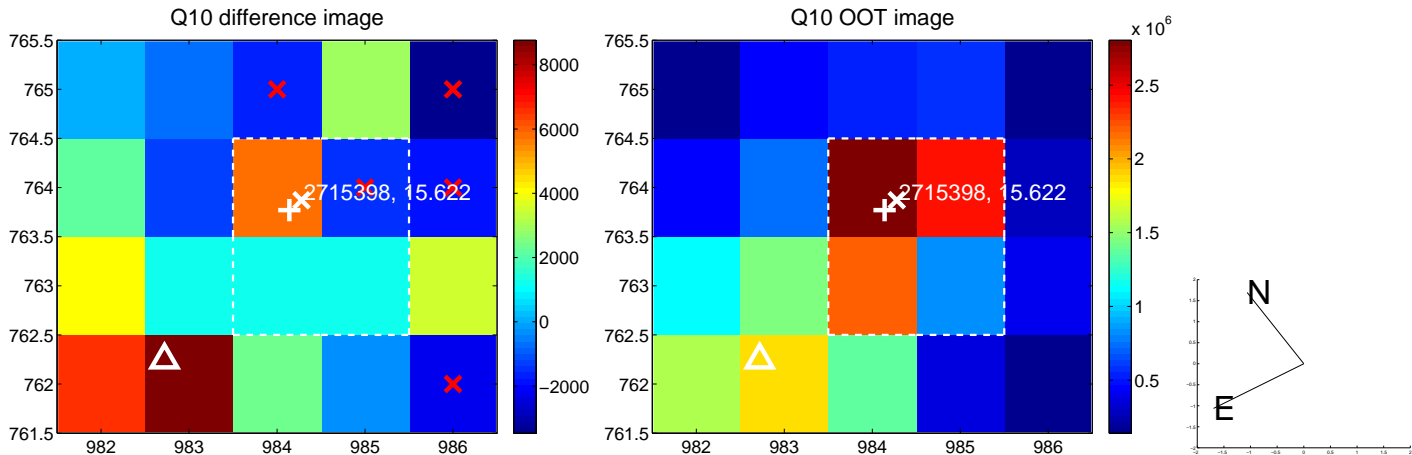
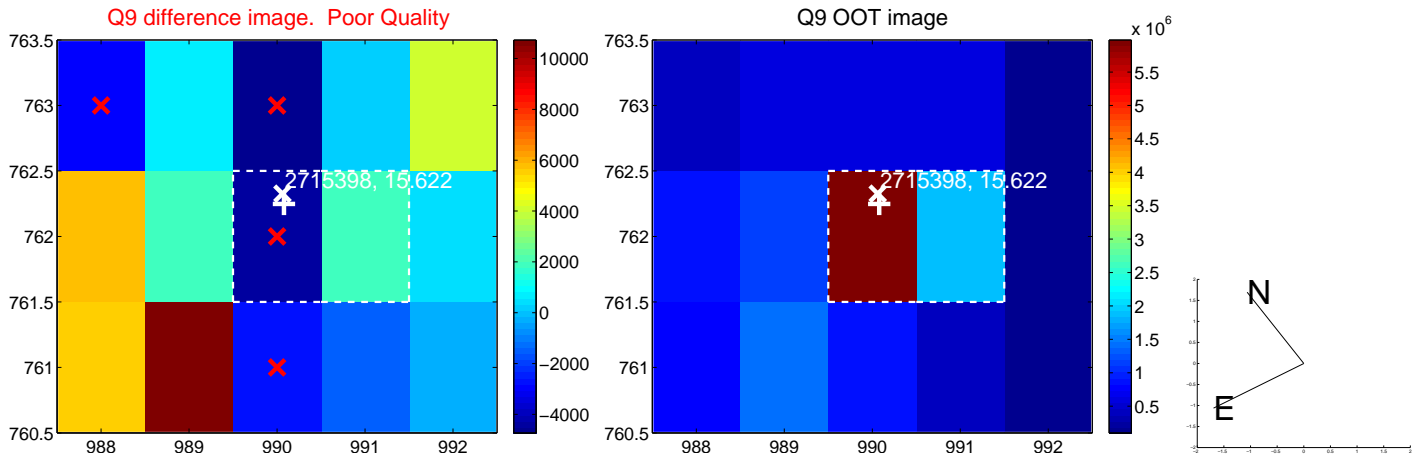
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



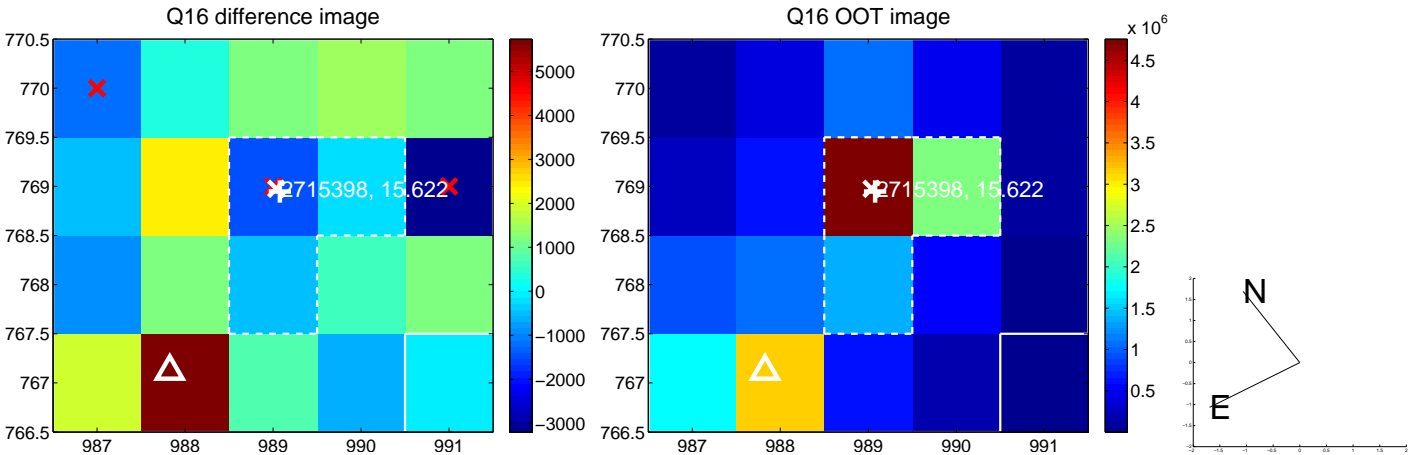
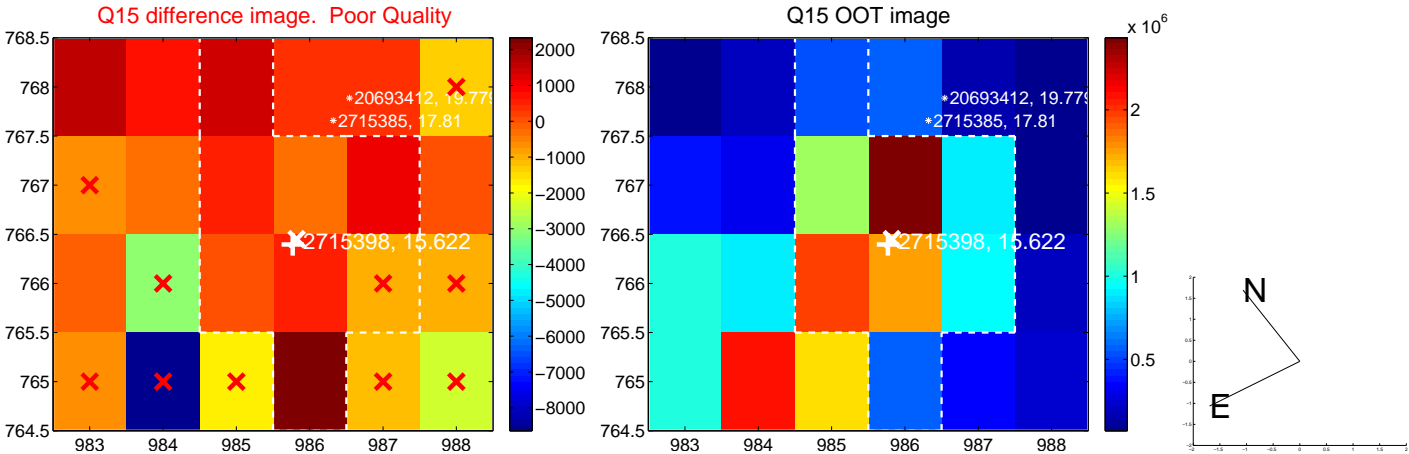
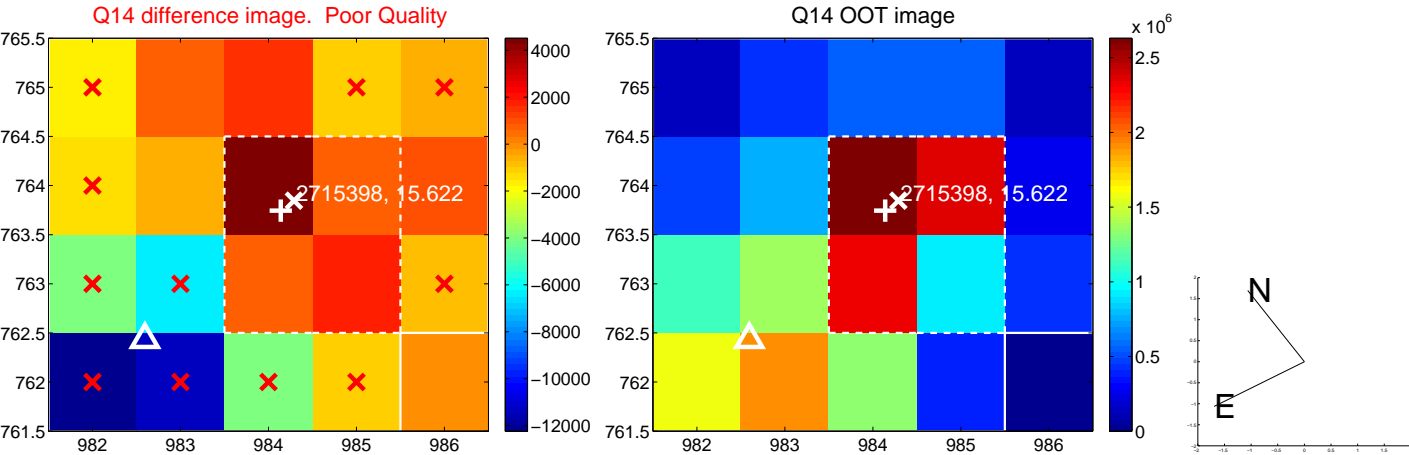
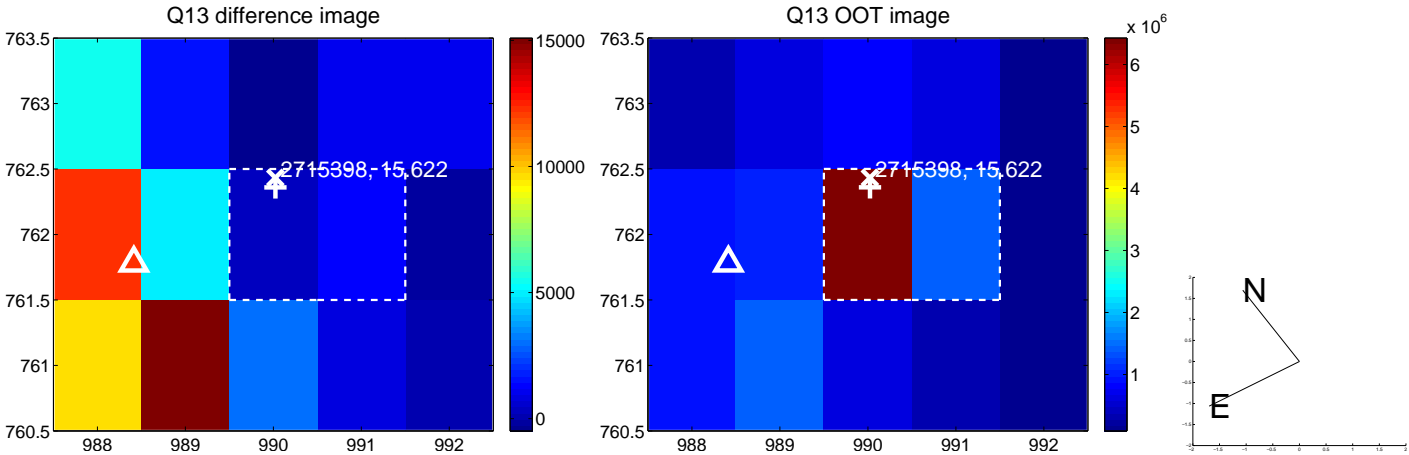
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



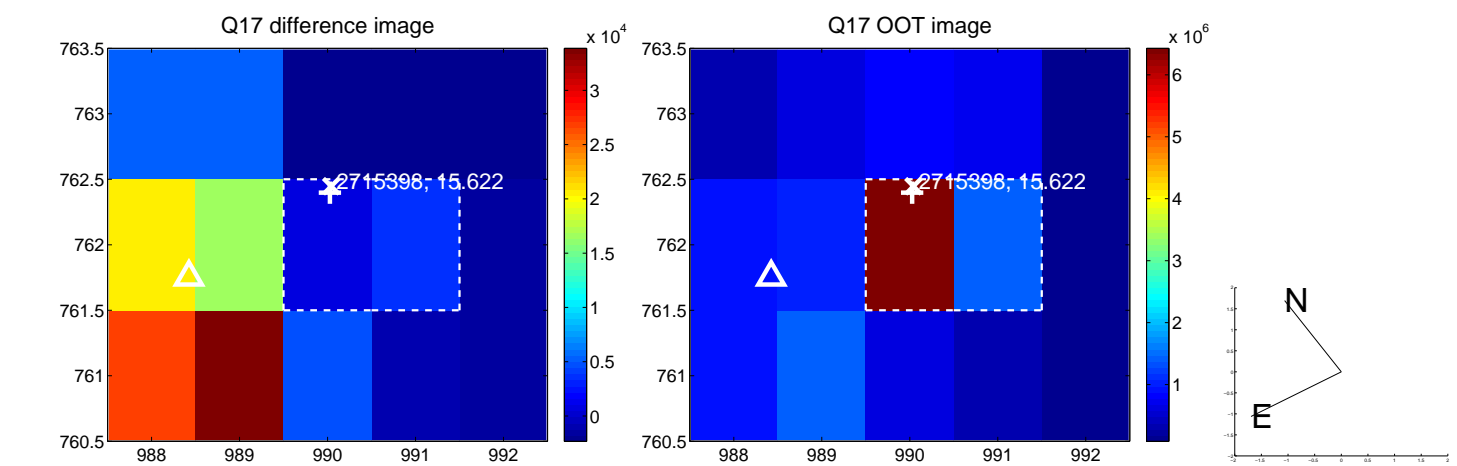
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



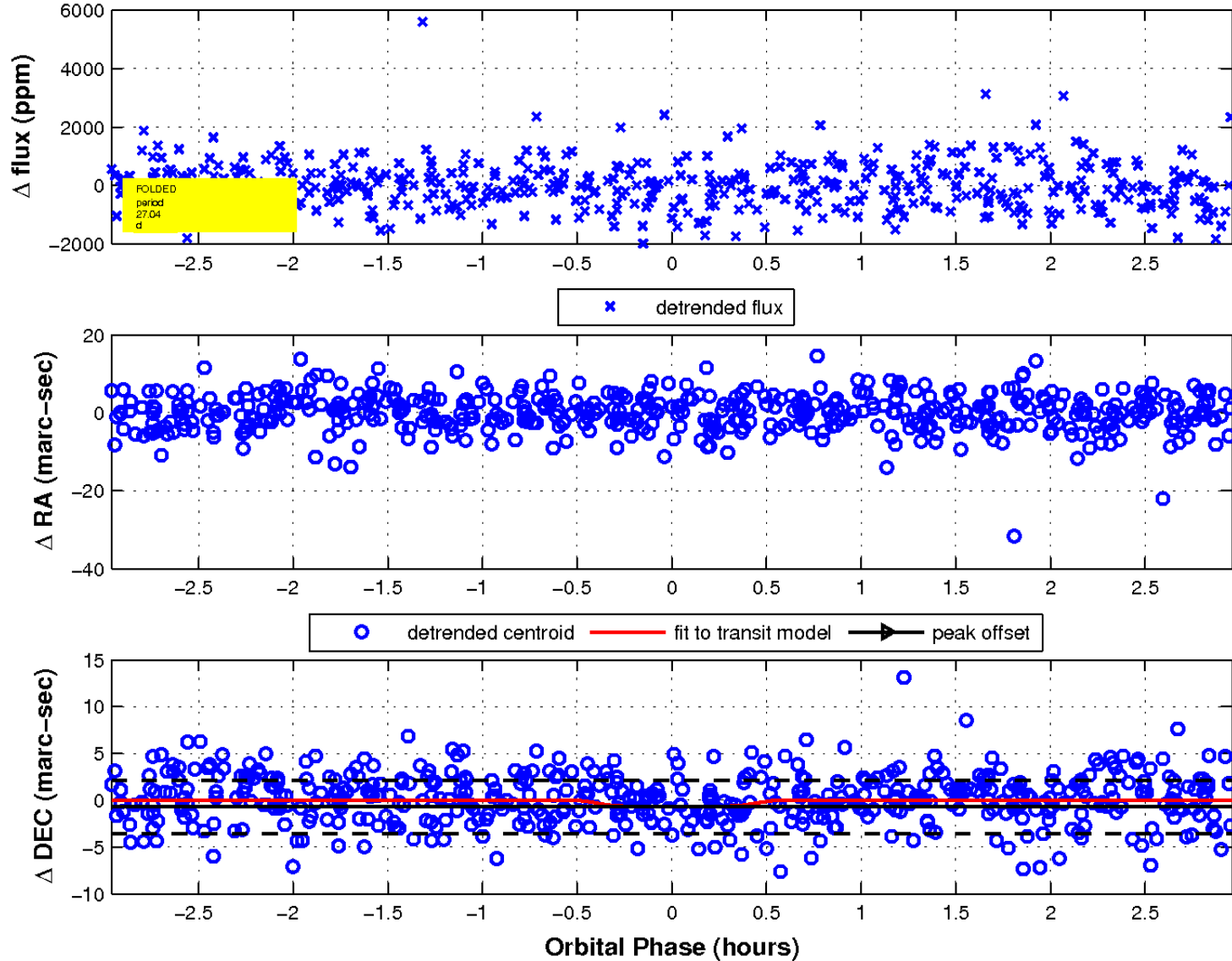
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

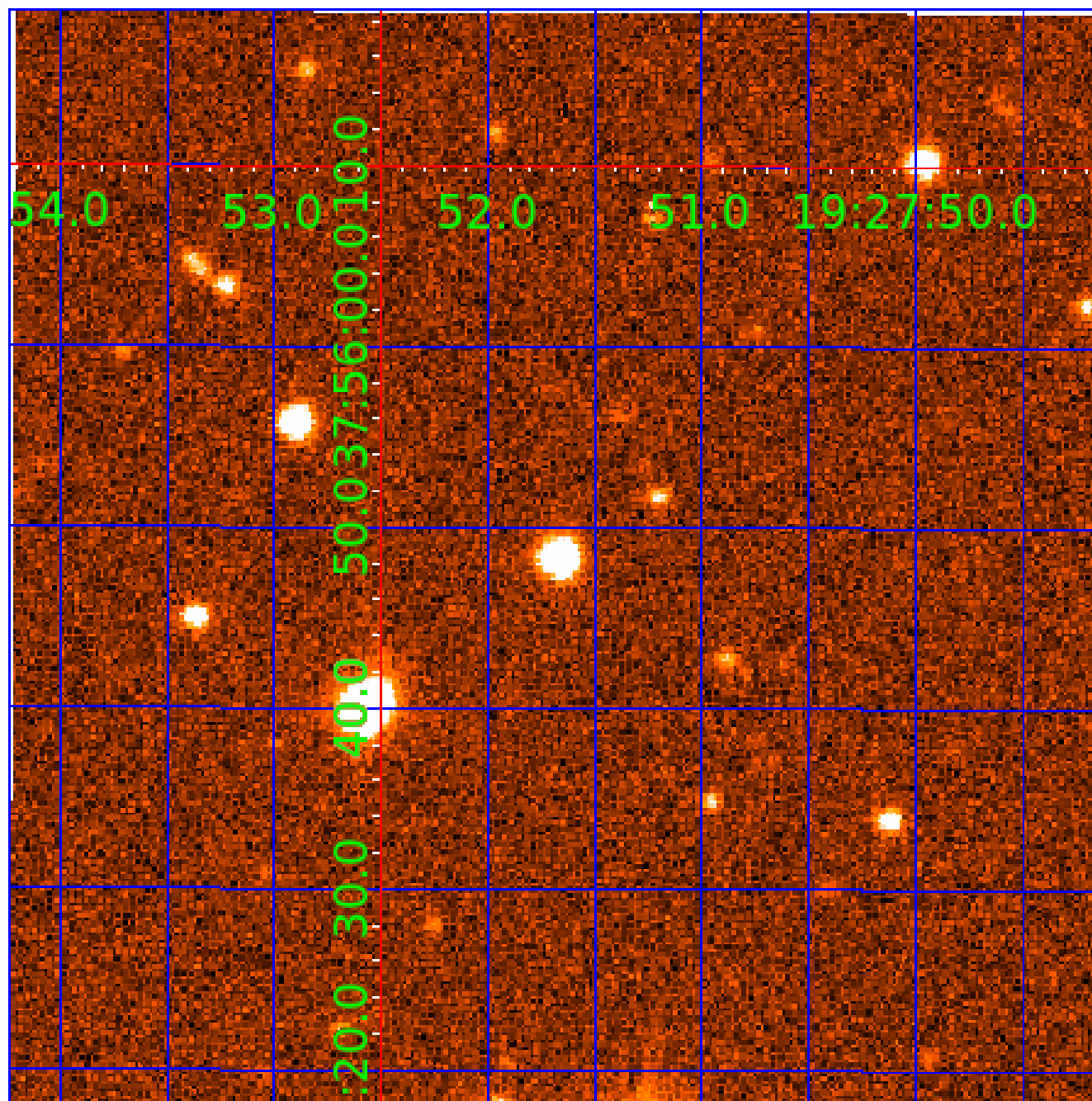


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 002715398

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})
002715398-01	OBS	No	0.968211	132.463170	74.5	6.670	9.2	10.4	0.69	5183	0.61	1059.22
002715398-02	OBS	No	27.041930	144.611374	1763.1	0.989	10.5	10.0	0.69	5183	3.27	12.50
002715398-03	OBS	No	23.277428	133.048130	523.6	1.845	8.8	5.3	0.69	5183	1.99	15.27

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002715398-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
002715398-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002715398-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET

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

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

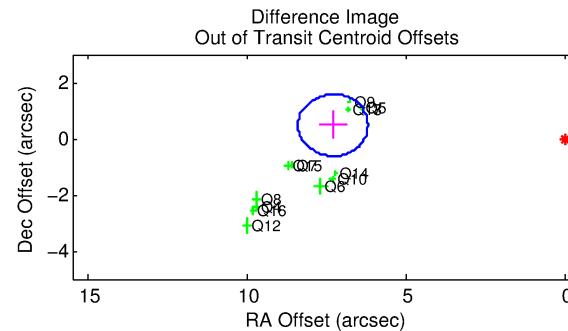
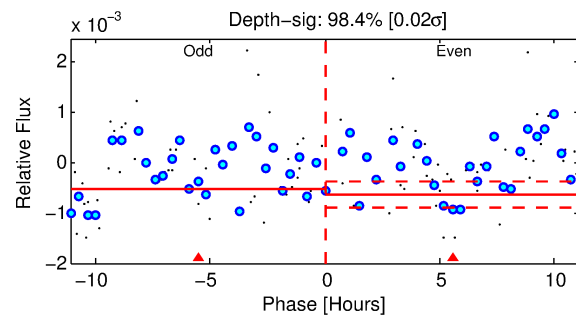
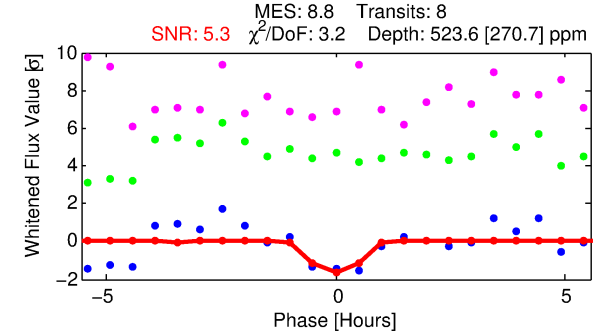
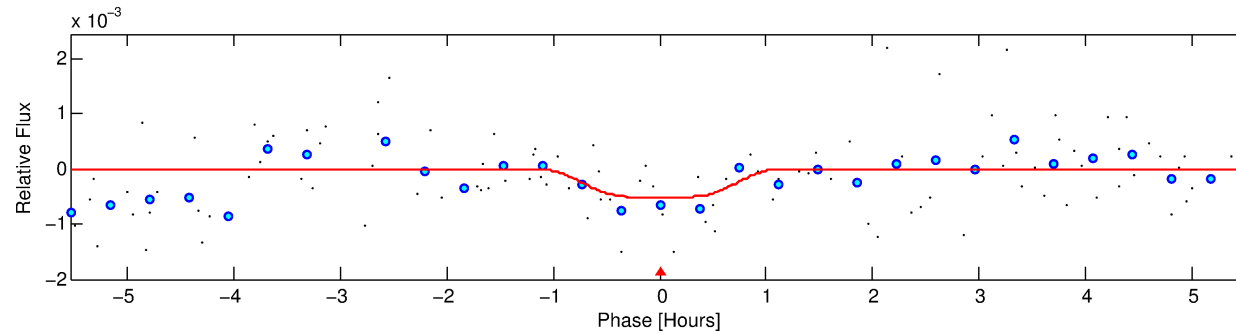
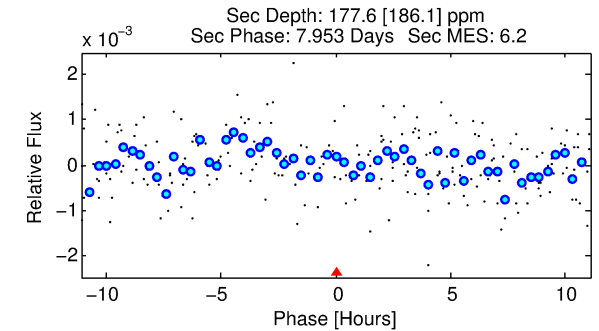
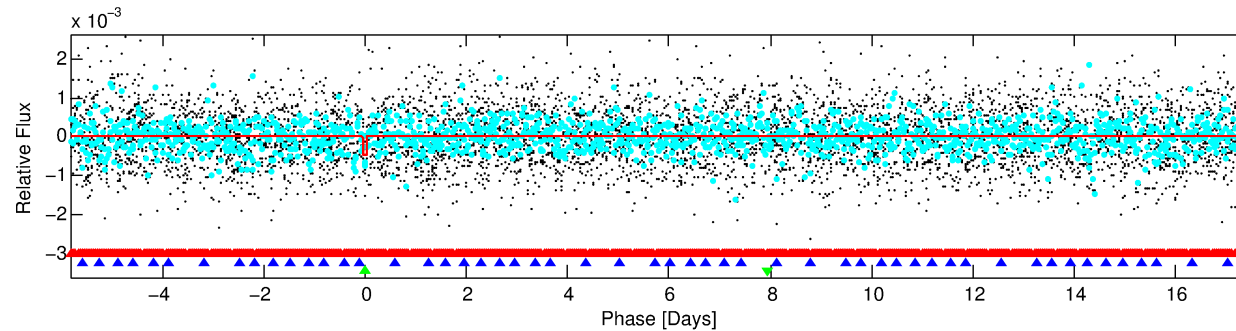
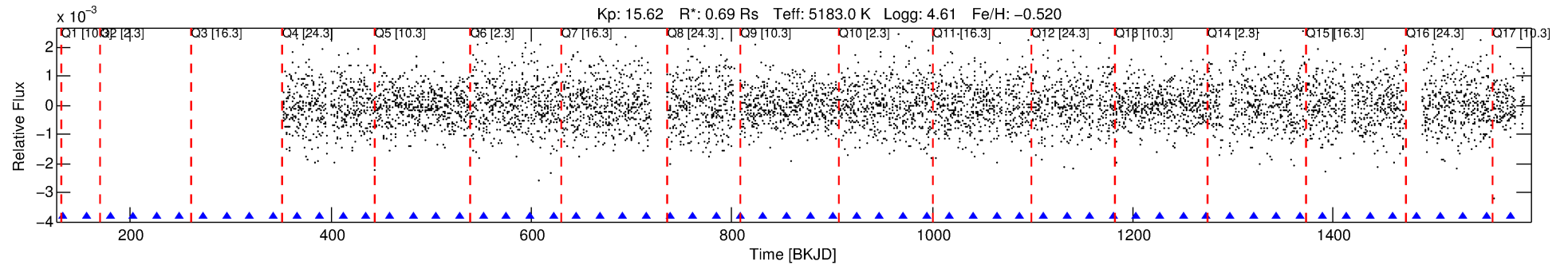
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002715398-03

No Significant Match Found

DV One-Page Summary

KIC: 2715398 Candidate: 3 of 3 Period: 23.277 d



DV Fit Results:

Period = 23.27743 [0.00093] d
Epoch = 133.0481 [0.0383] BKJD
Rp/R* = 0.0265 [0.0327]
a/R* = 40.95 [203.34]
b = 0.93 [0.70]
Seff = 15.27 [3.01]
Teq = 504 [25] K
Rp = 1.99 [2.47] Re
a = 0.1416 [0.0137] AU
Ag = 496.55 [1336.13] [0.37σ]
Teff = 3679 [2476] K [1.28σ]

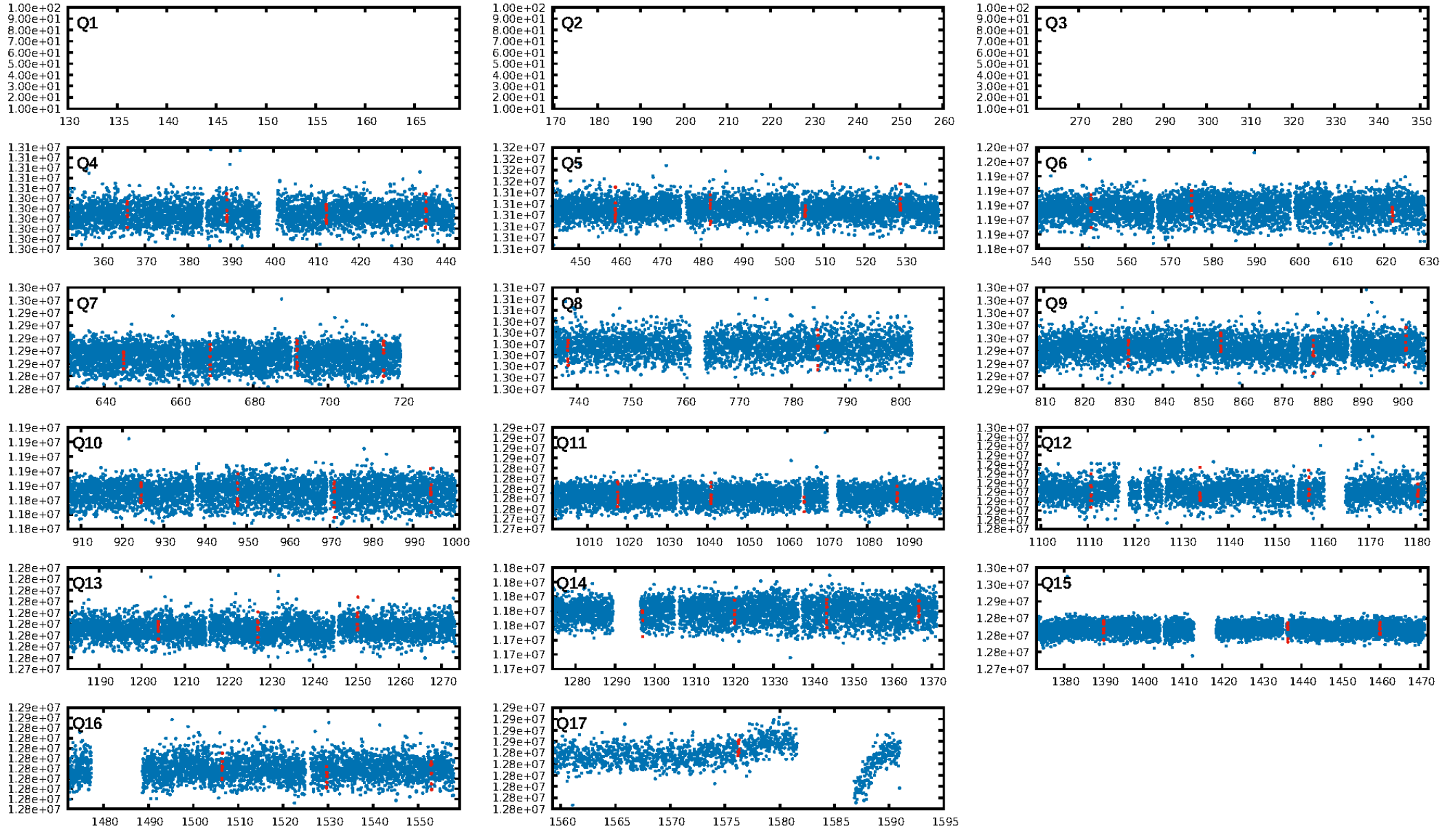
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [77.37σ]
LongPeriod-sig: 100.0% [43.17σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 32.8%
Bootstrap-pfa: 1.69e-07
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 1.655
Centroid-sig: N/A
Centroid-so: 0.377 arcsec [0.17σ]
OotOffset-rm: 7.319 arcsec [19.96σ]
KicOffset-rm: 7.599 arcsec [24.36σ]
OotOffset-st: 3/2/4/4 [13]
KicOffset-st: 3/2/4/4 [13]
DiffImageQuality-fgm: 0.46 [6/13]
DiffImageOverlap-fno: 0.29 [4/14]

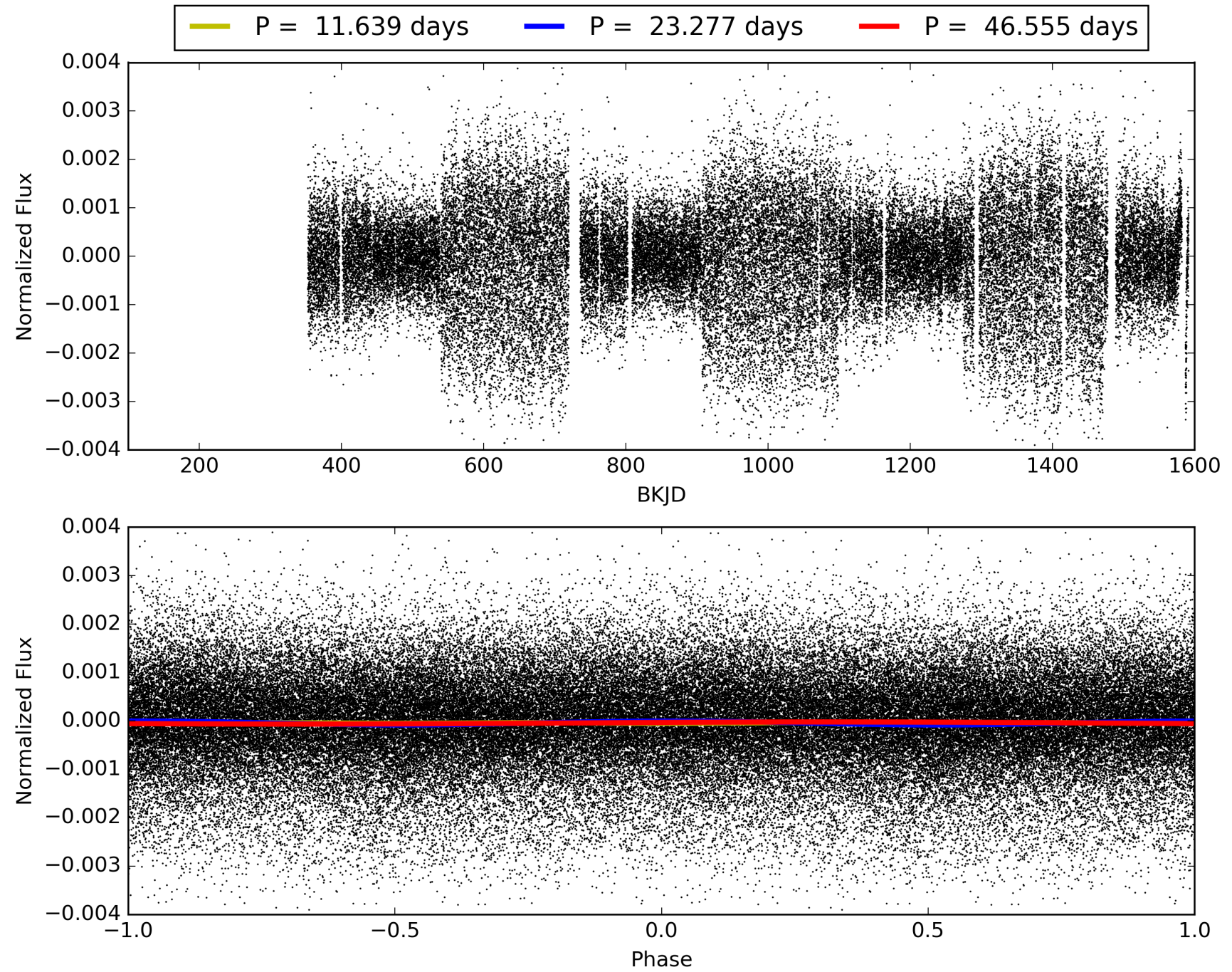
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:57:13 Z

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

TCE 002715398-03, PDC Light Curves

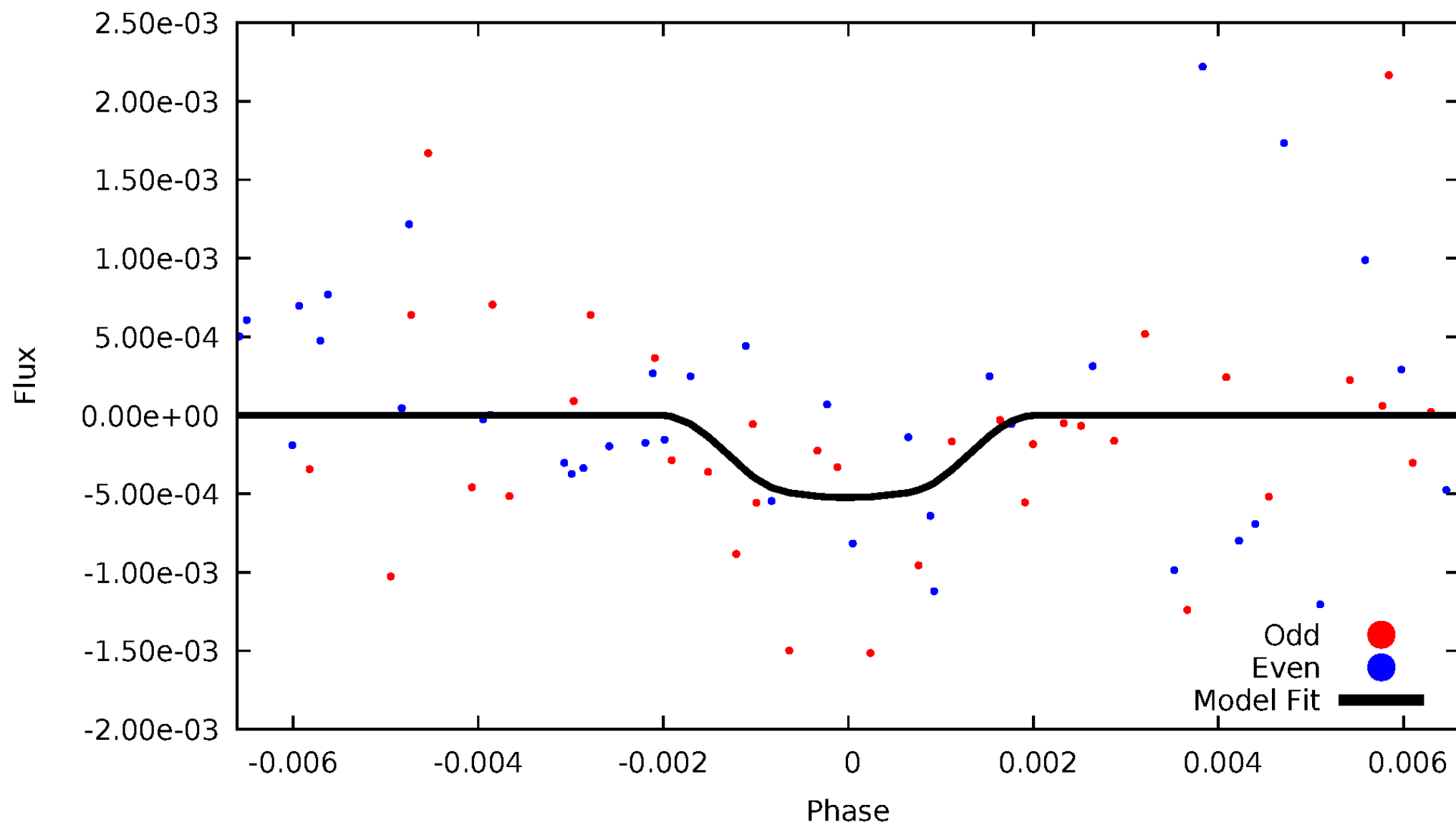


TCE 002715398-03



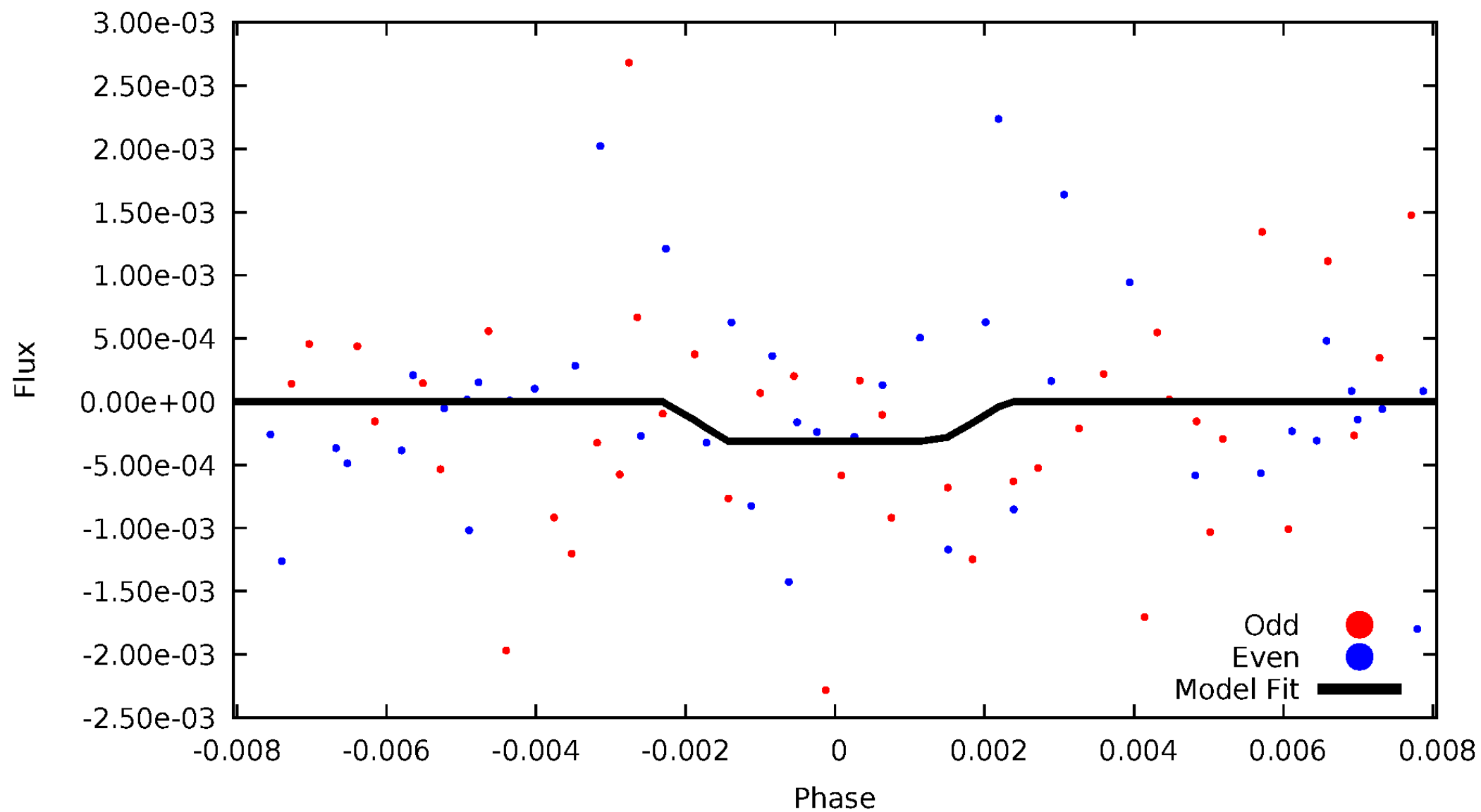
DV Odd/Even

TCE 002715398-03



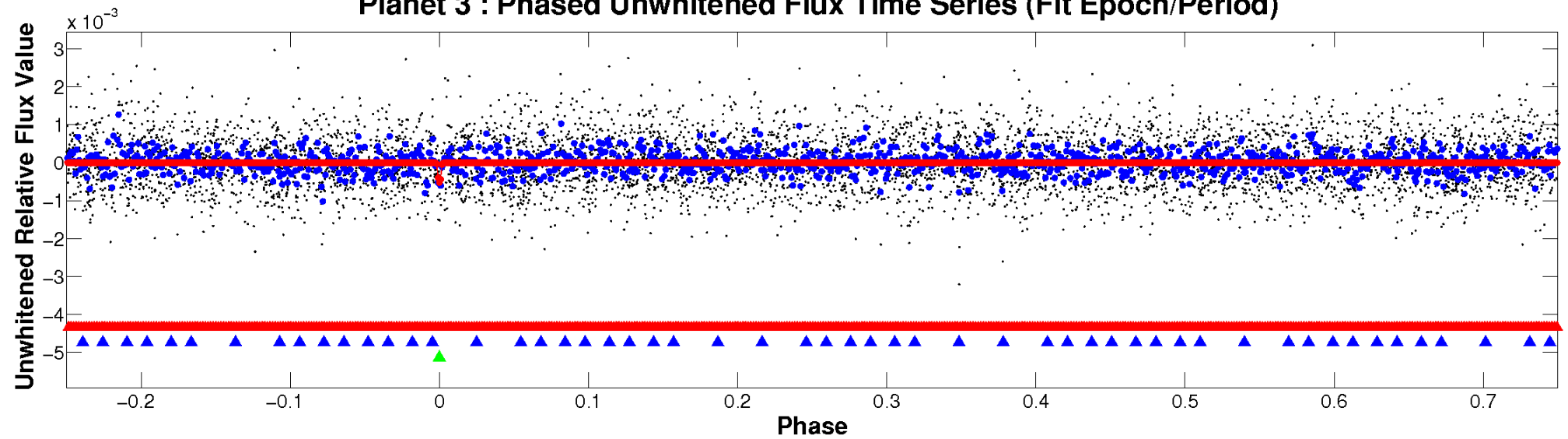
ALT Odd/Even

TCE 002715398-03

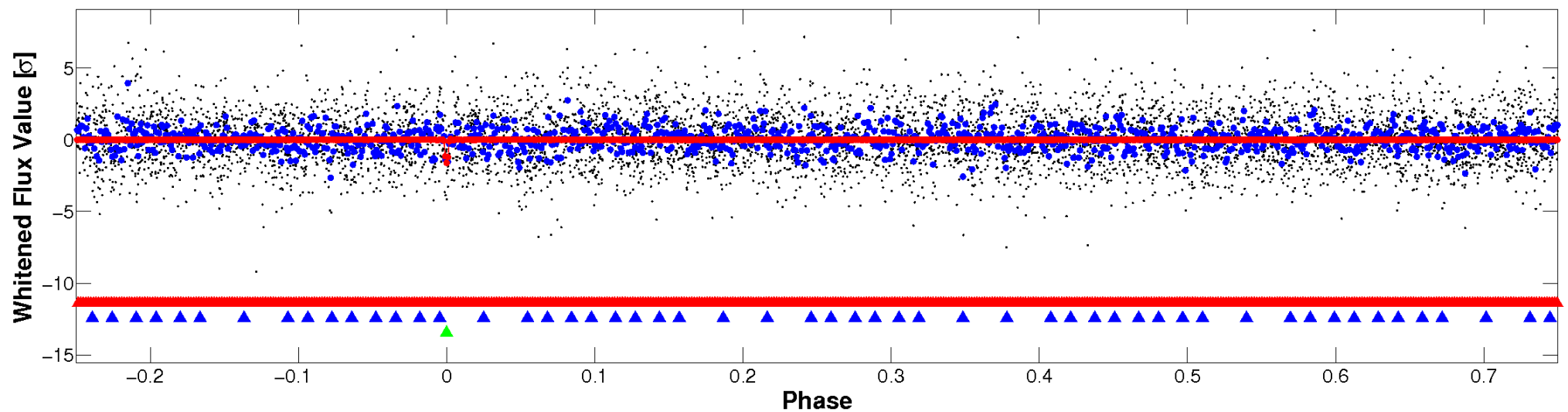


Non-Whitened Vs. Whitened Light Curve

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

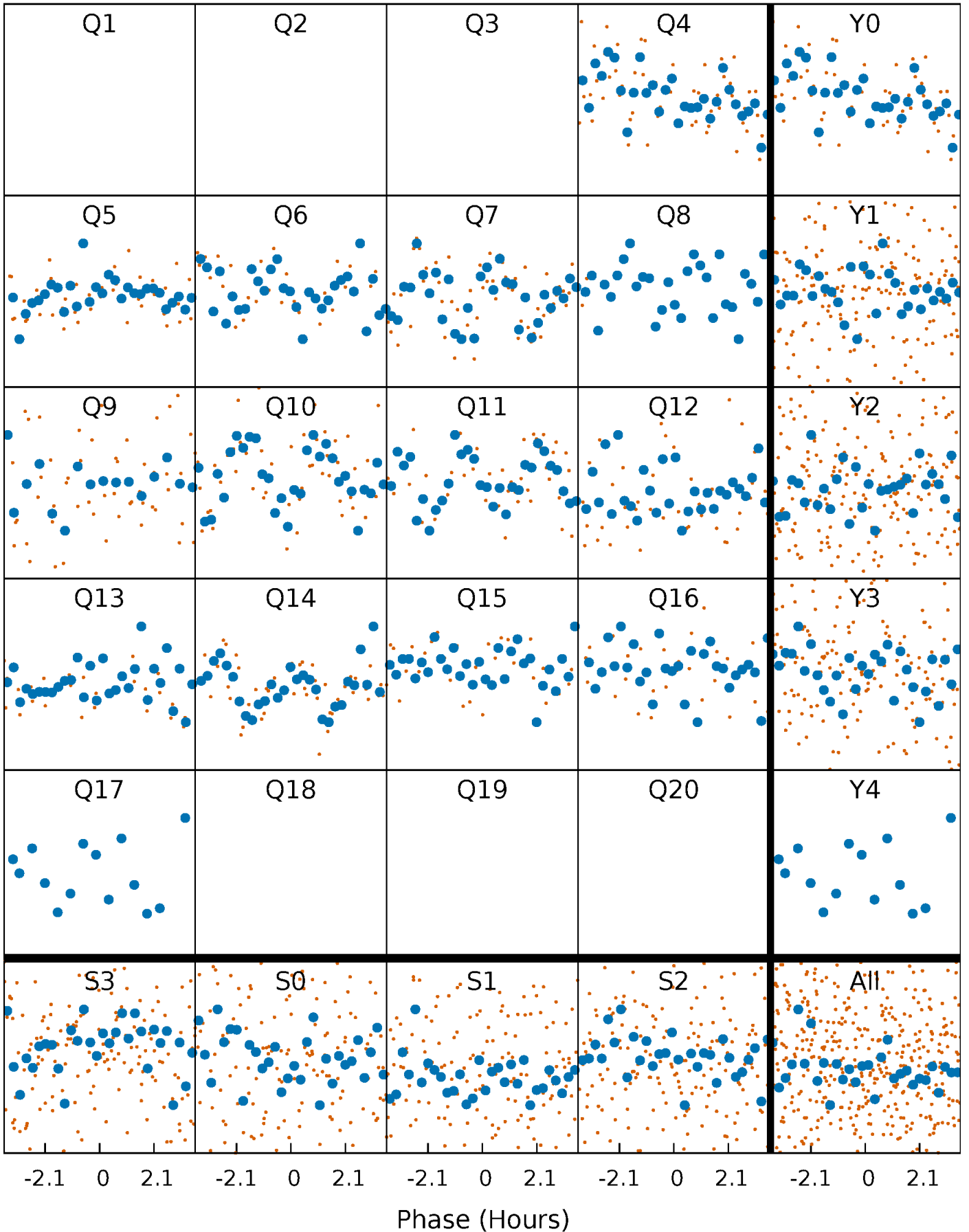


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



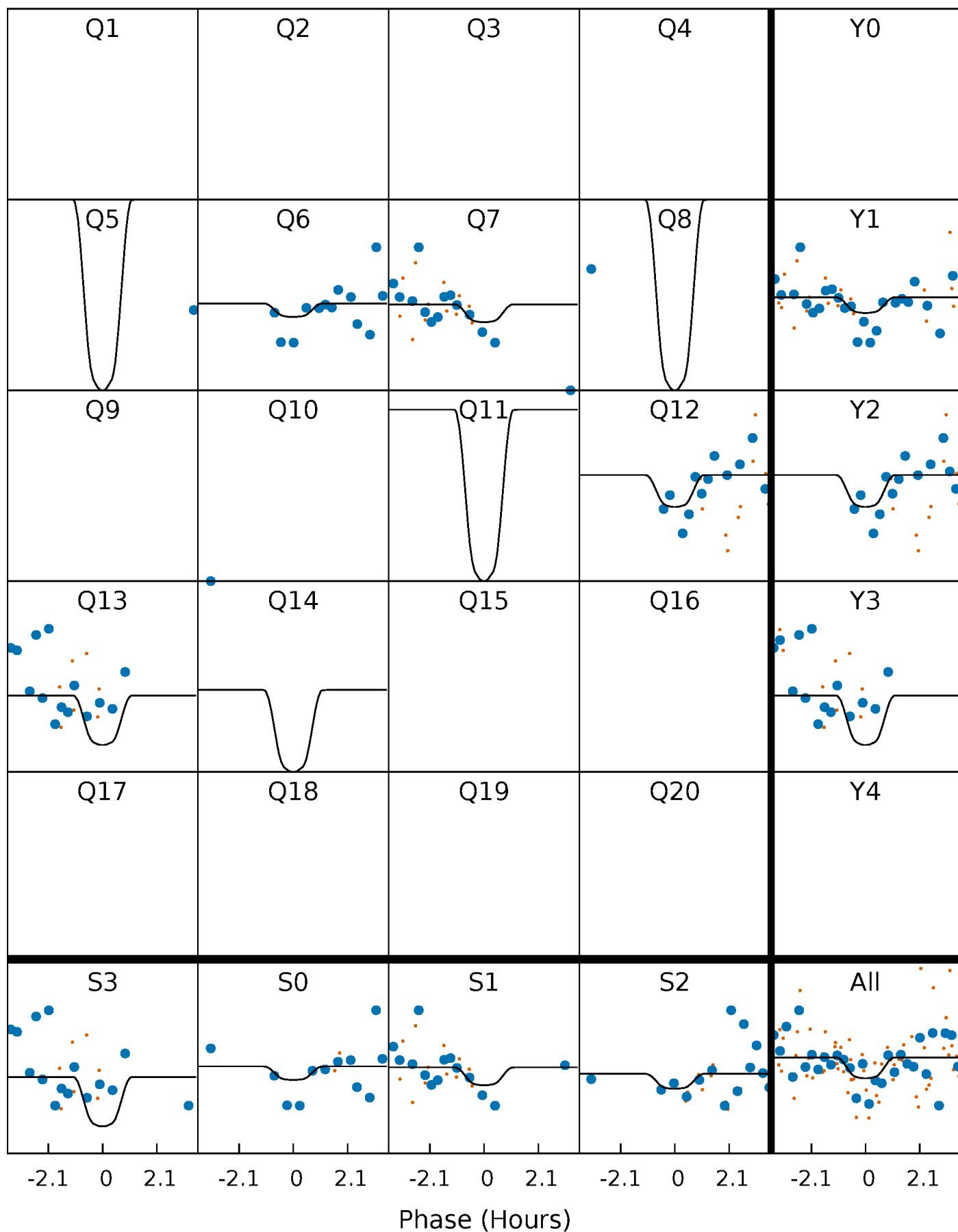
PDC Quarter-Phased Transit Curves

TCE 002715398-03 P= 23.277428 Days $T_0=133.048130$ (BKJD)



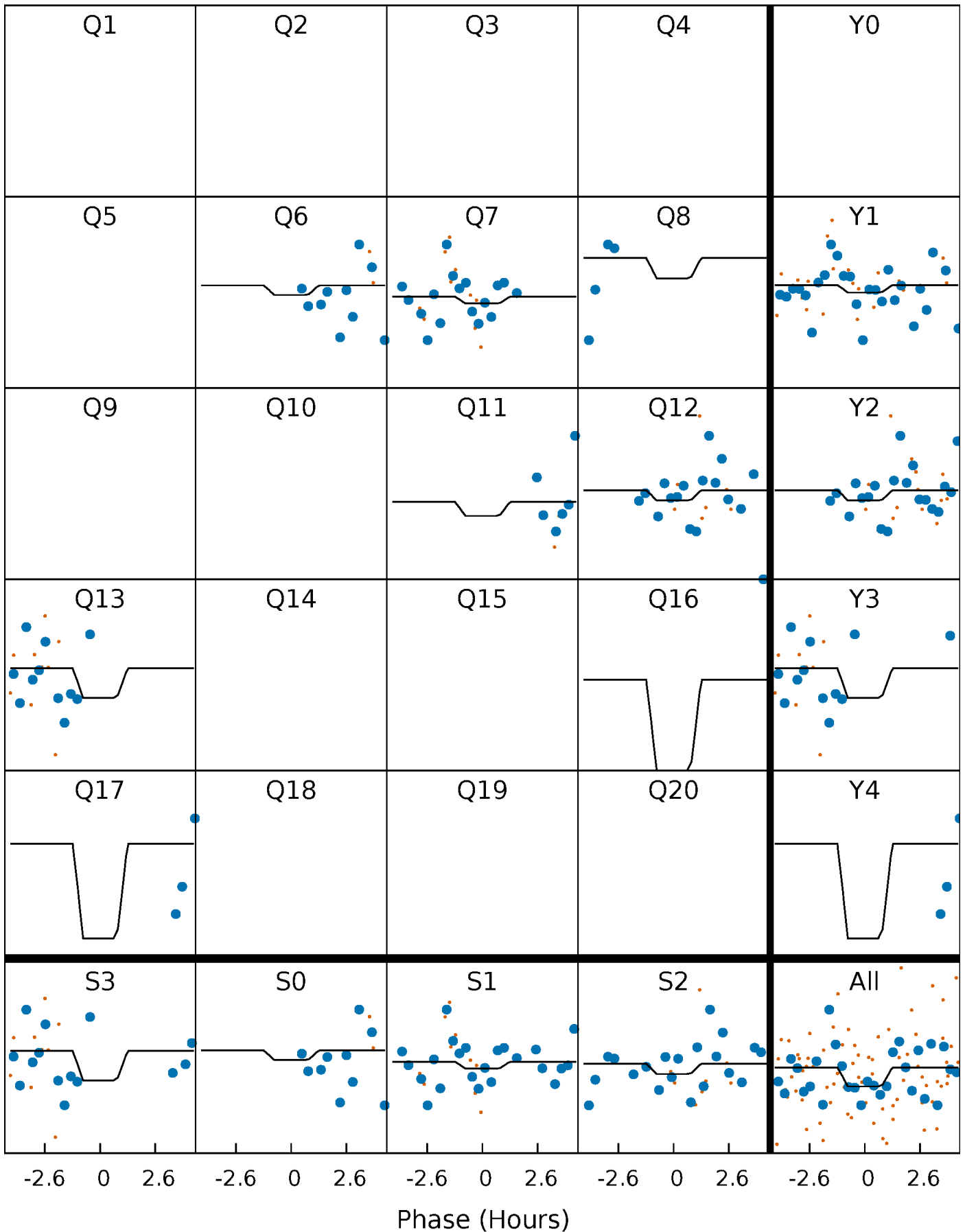
DV Quarter-Phased Transit Curves

TCE 002715398-03 P= 23.277428 Days $T_0=133.048130$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

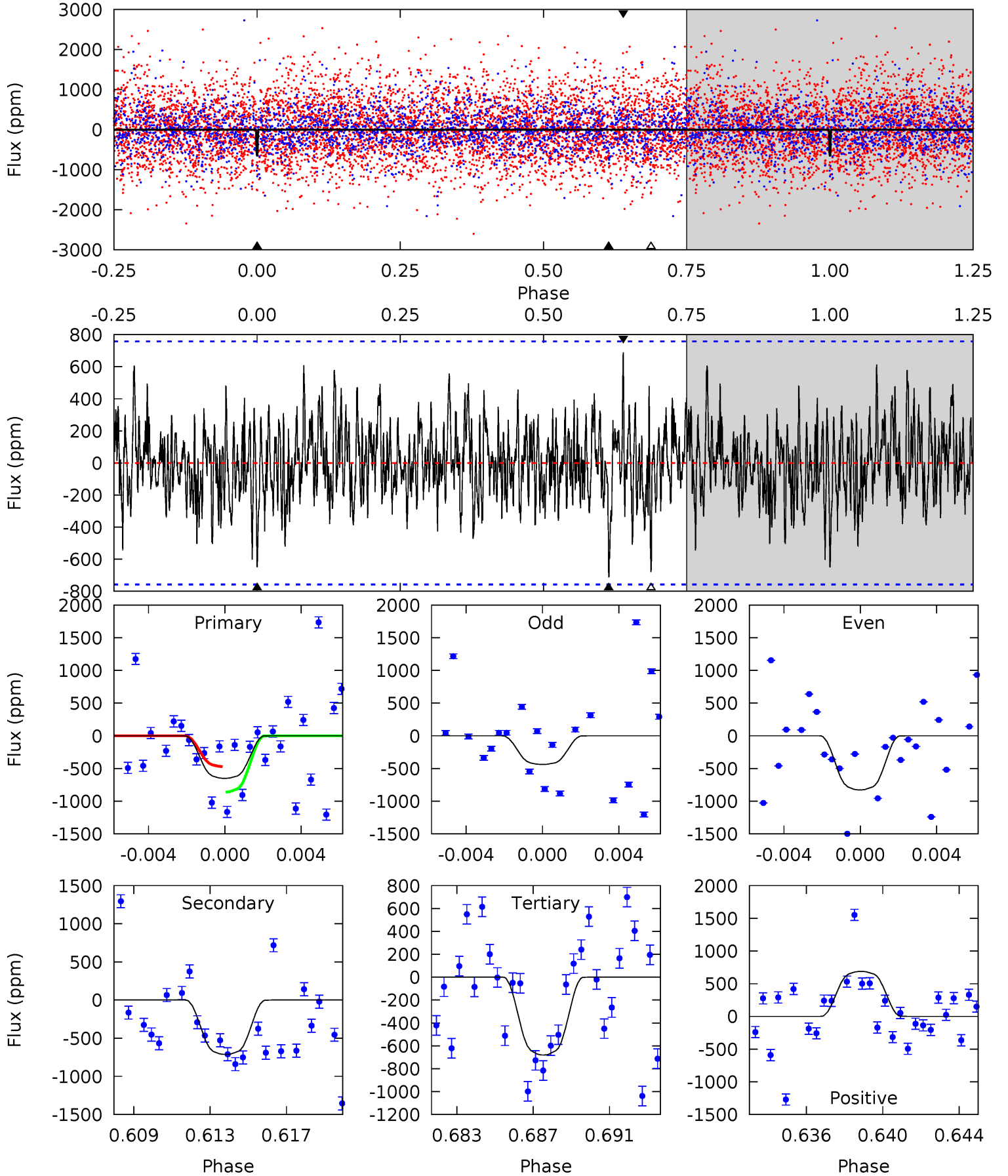
TCE 002715398-03 P= 23.281630 Days $T_0=132.909915$ (BKJD)



DV Model-Shift Uniqueness Test

002715398-03, P = 23.277428 Days, E = 133.048130 Days

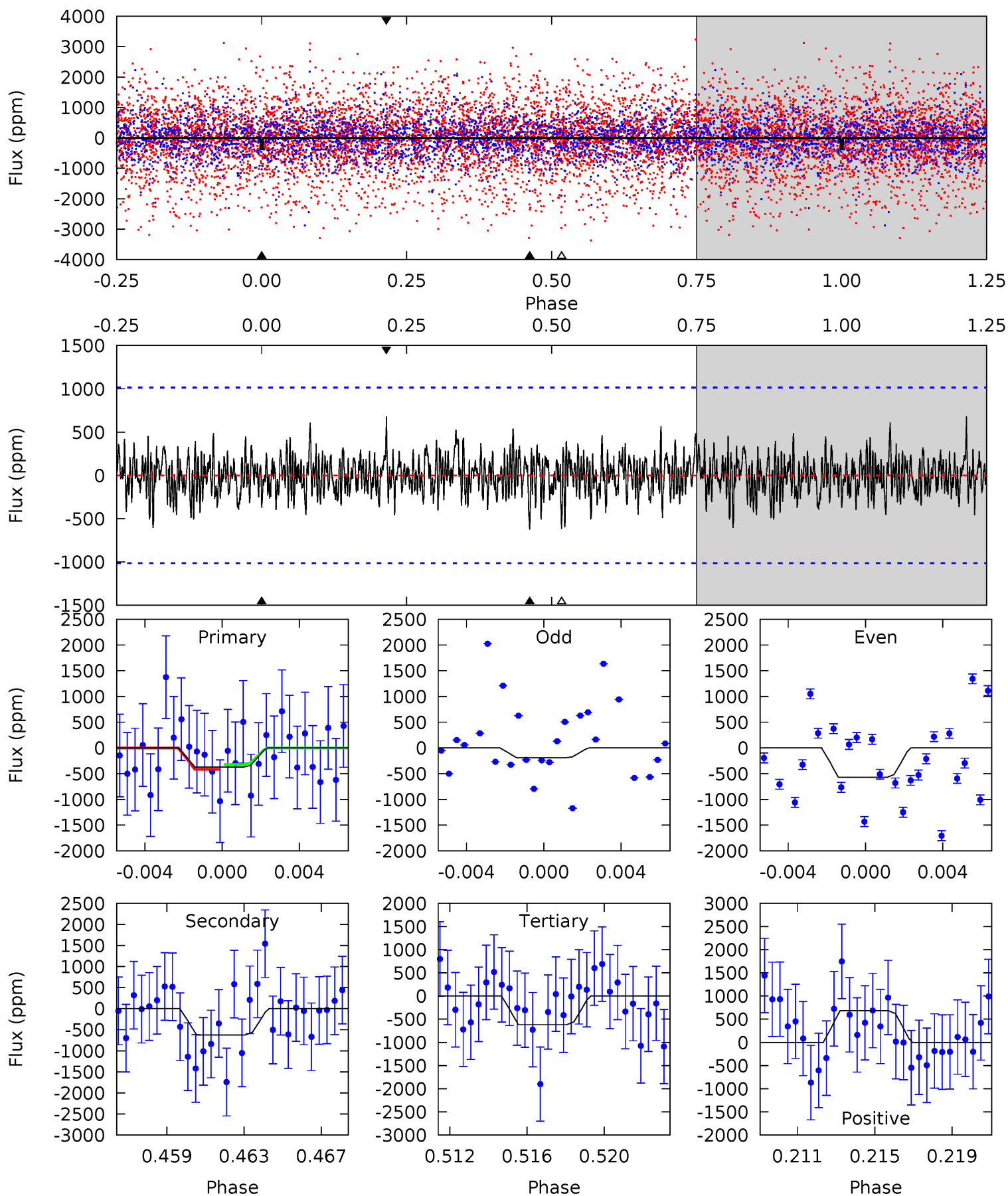
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.47	4.89	4.67	4.72	5.20	2.89	1.36	-0.20	-0.25	0.22	0.17	1.33	0.89	0.49	1.35



Alt Model-Shift Uniqueness Test

002715398-03, P = 23.281630 Days, E = 132.909915 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.91	3.20	3.16	3.49	5.20	2.87	0.98	-1.26	-1.59	0.04	-0.29	0.97	1.01	0.52	0.24



Stellar Parameters For KIC 002715398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5183^{+197}_{-179}	$4.607^{+0.055}_{-0.061}$	$-0.520^{+0.300}_{-0.300}$	$0.688^{+0.087}_{-0.060}$	$0.699^{+0.083}_{-0.048}$	$3.024^{+0.699}_{-0.679}$
	+4%/-3%	+1%/-1%	+58%/-58%	+13%/-9%	+12%/-7%	+23%/-22%
Source	KIC0	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 002715398-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-713 ± 146	$2.60^{+2.26}_{-1.71}$	705^{+33}_{-32}	4673^{+3453}_{-990}	1150^{+9471}_{-832}
Alt.	-624 ± 195	$2.27^{+2.17}_{-1.53}$	705^{+33}_{-30}	4765^{+3591}_{-1070}	1259^{+10632}_{-938}

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

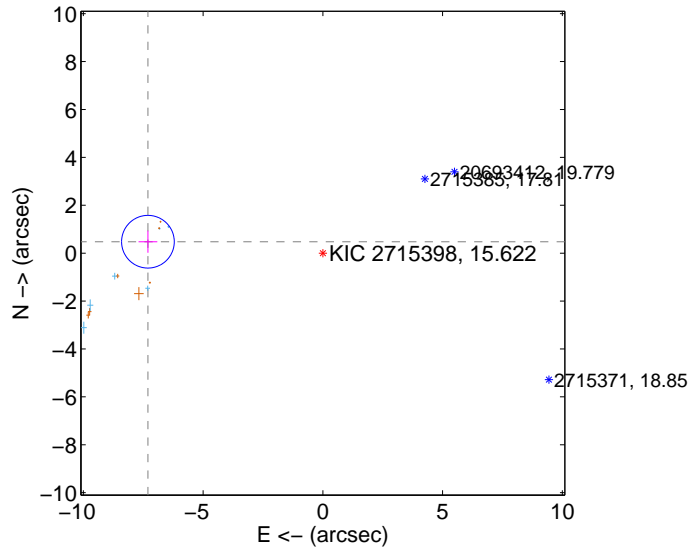
Supplemental centroid analysis for 002715398-03. Kepler magnitude: 15.62. Transit SNR 5.27

There are 6 quarters with good PRF difference image offsets

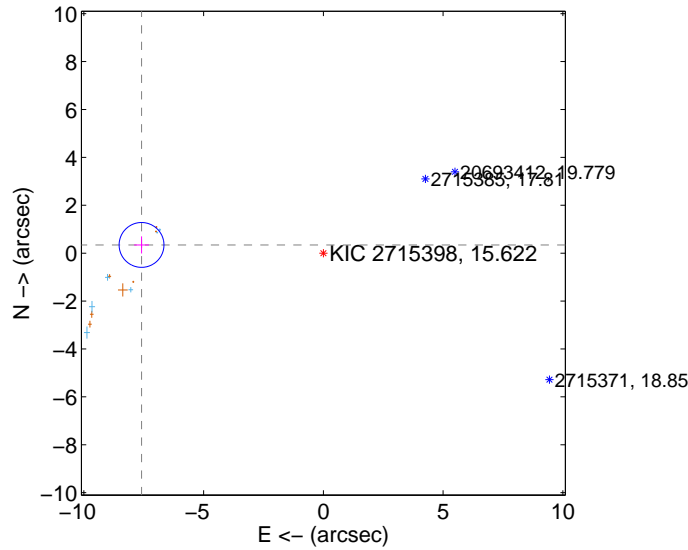
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.319 ± 0.367	19.96	7.303 ± 0.393	0.478 ± 0.460
PRF-fit source offset from KIC position	7.599 ± 0.312	24.36	7.591 ± 0.312	0.344 ± 0.358
photometric centroid source offset	0.38 ± 2.23	0.17	0.37 ± 2.24	-0.05 ± 1.29

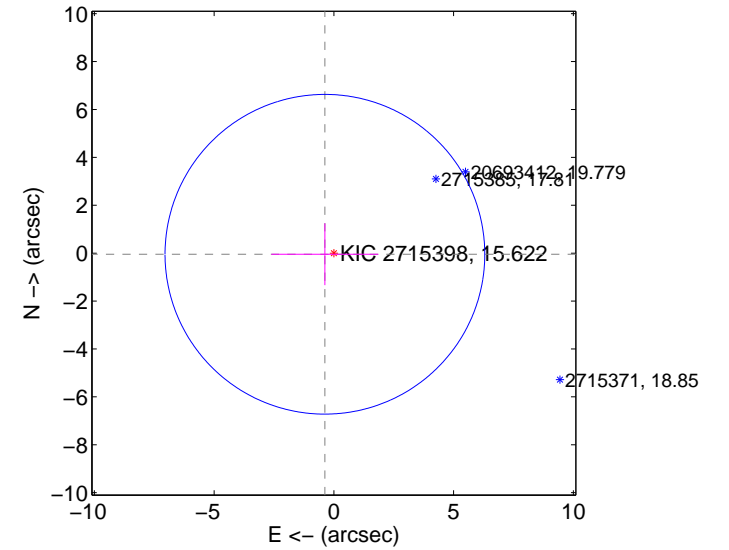
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

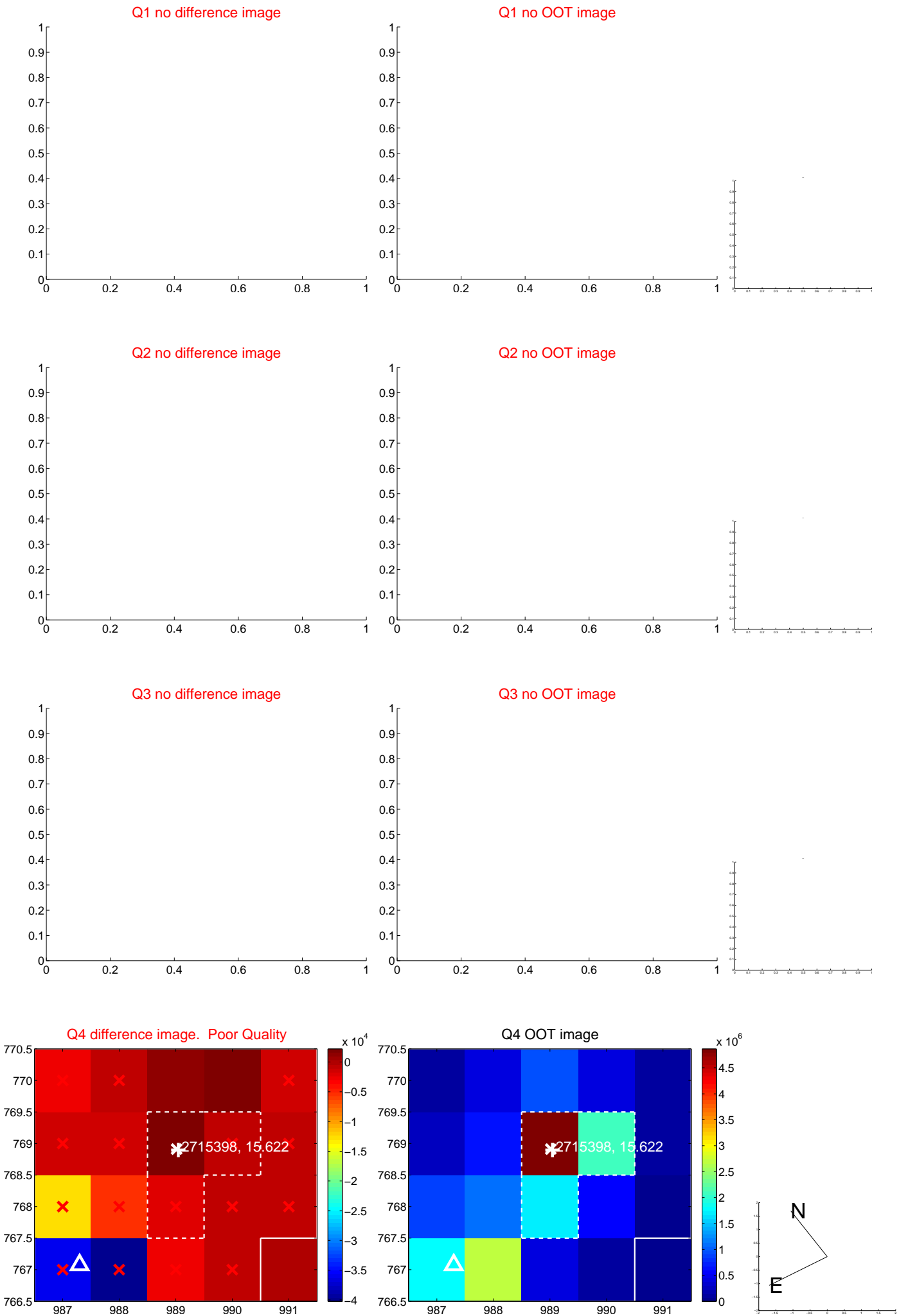


offset from photometric centroids

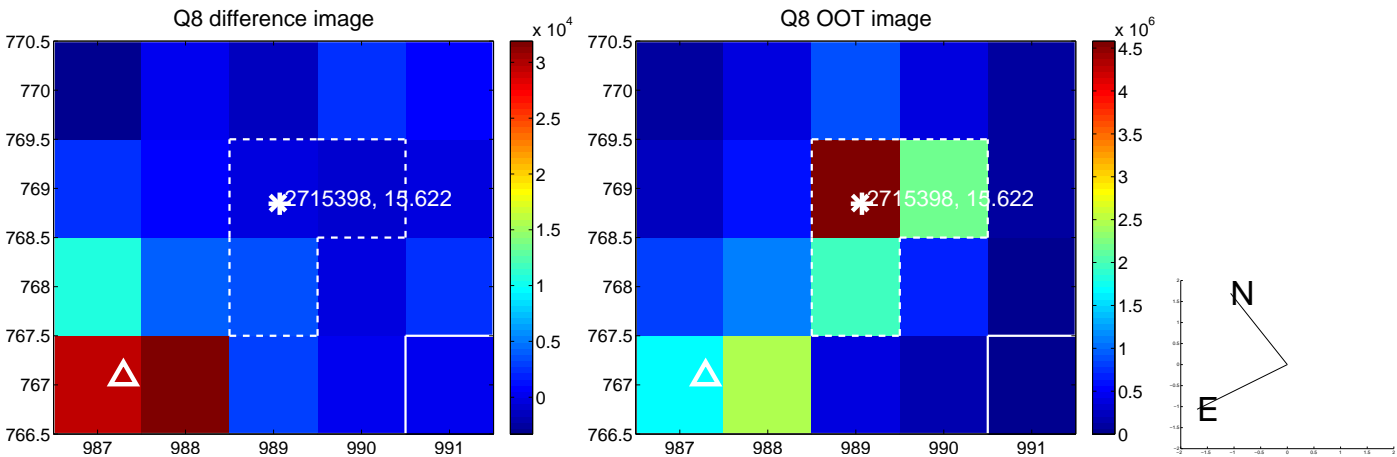
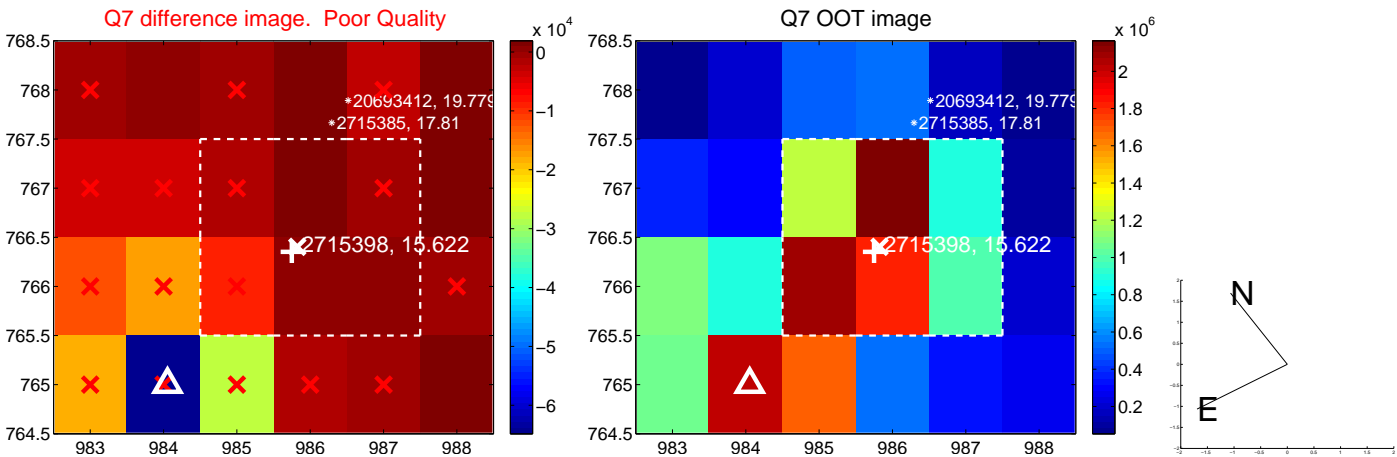
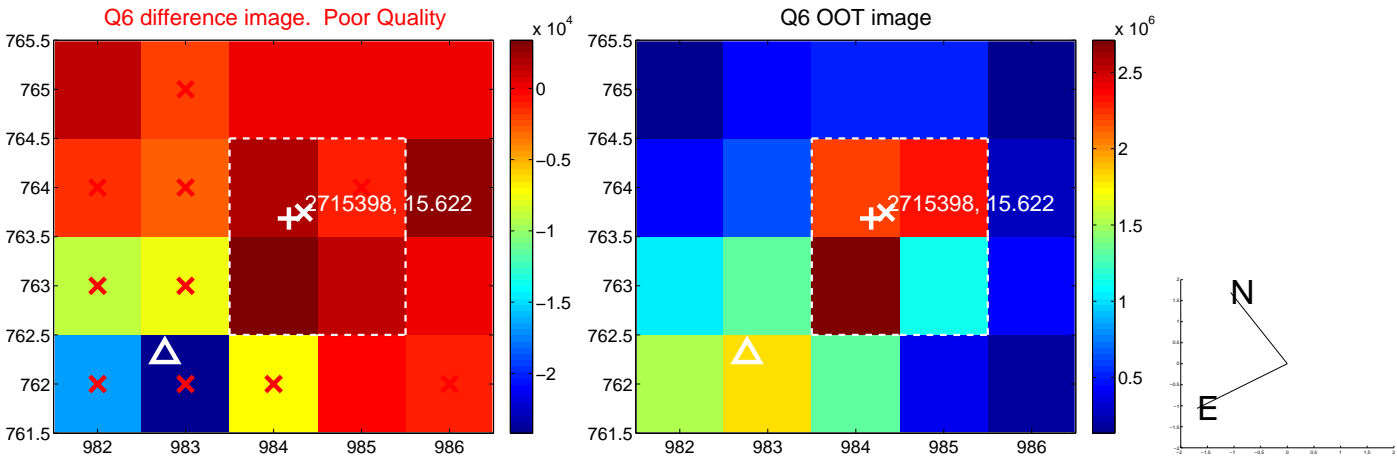
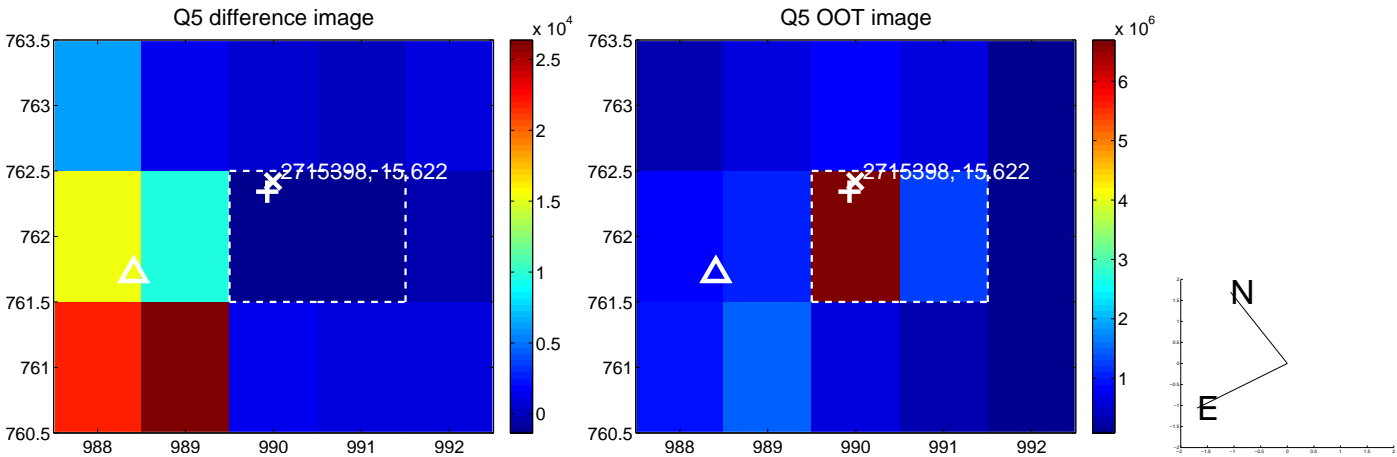


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

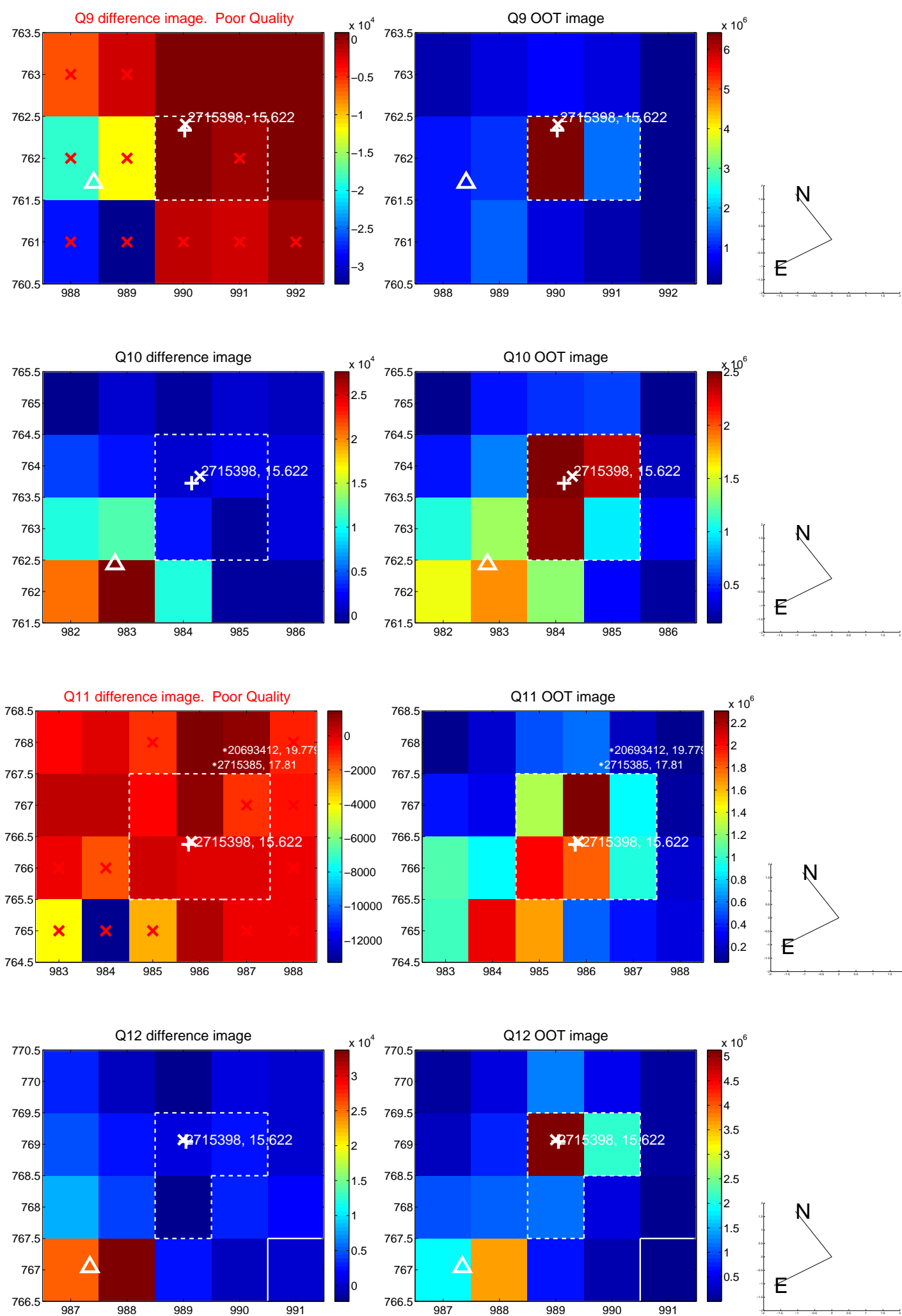
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



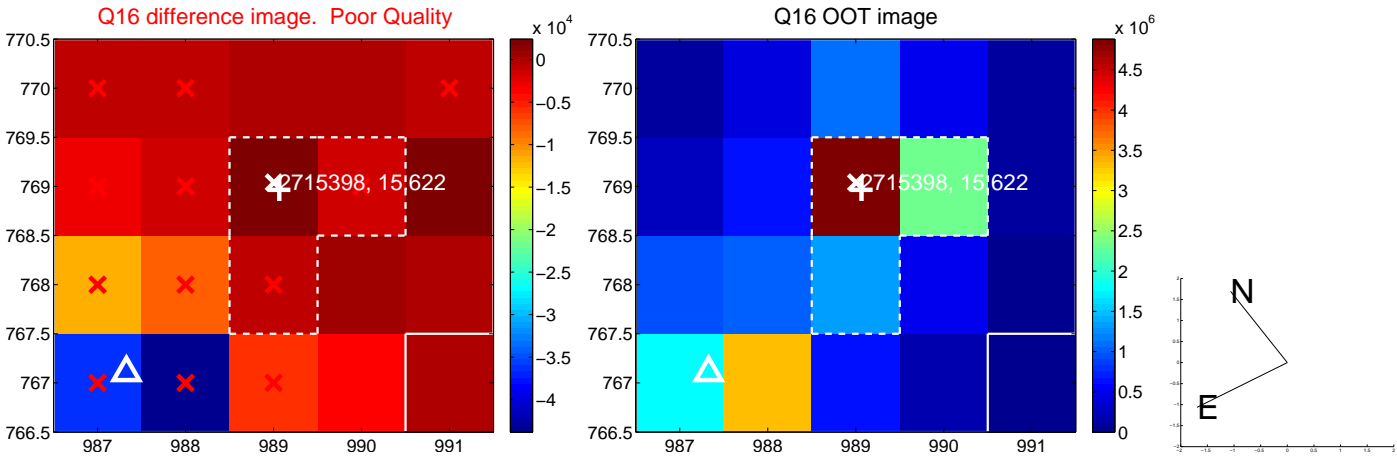
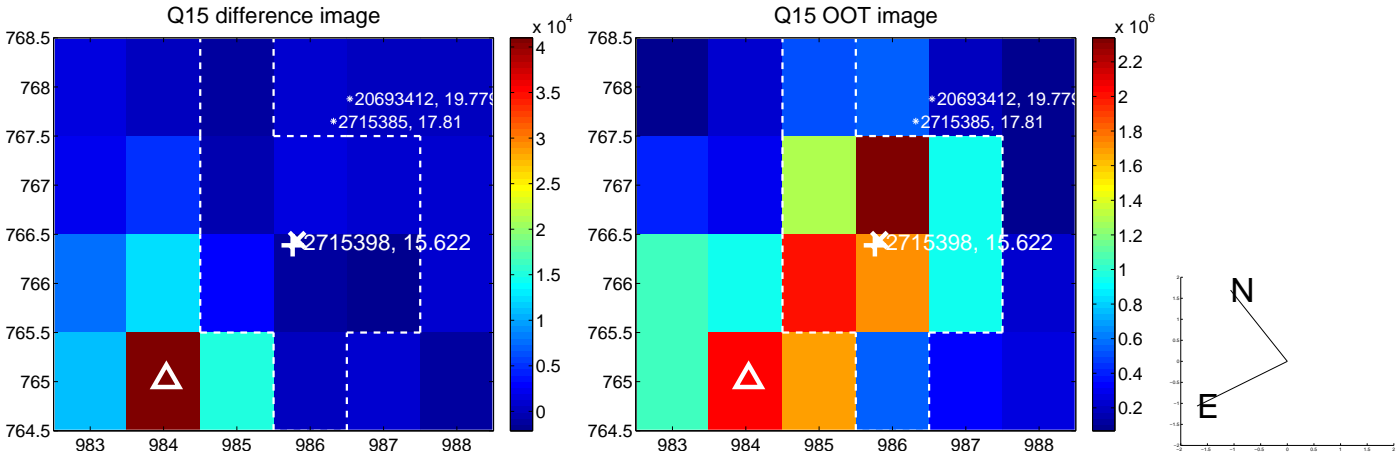
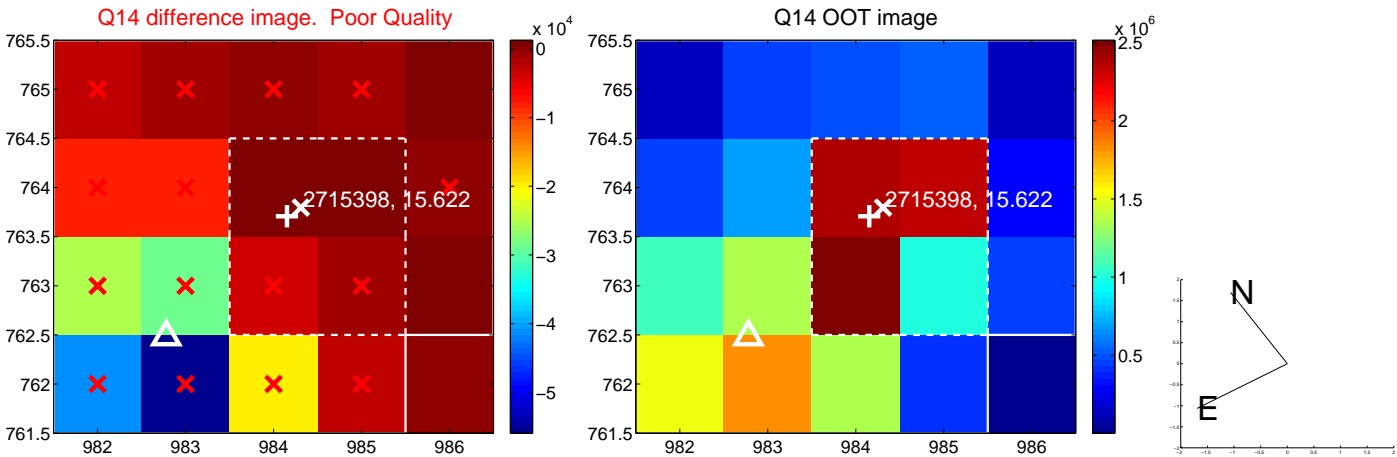
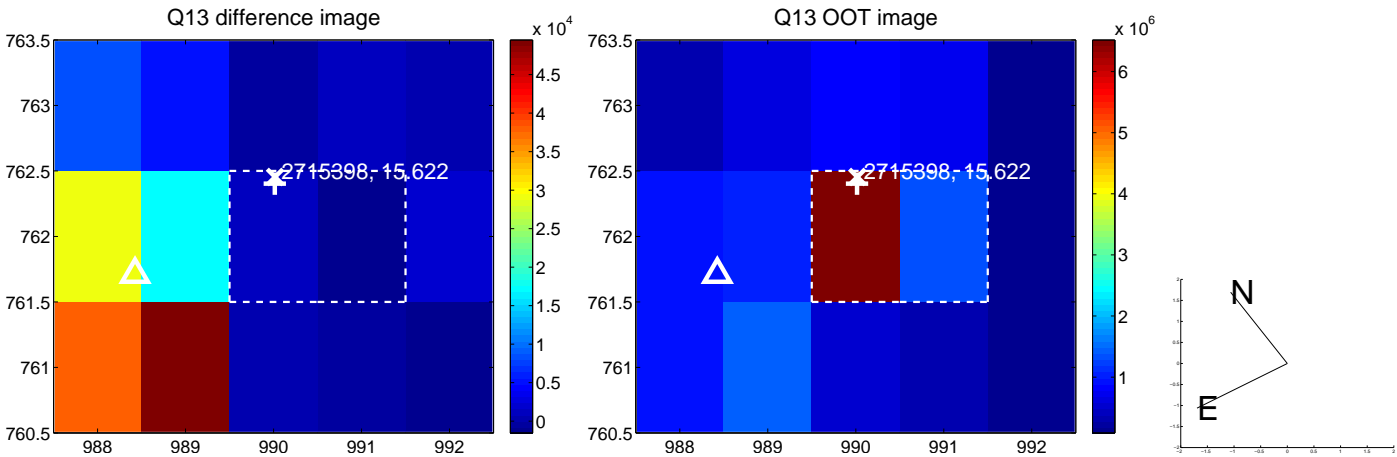
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



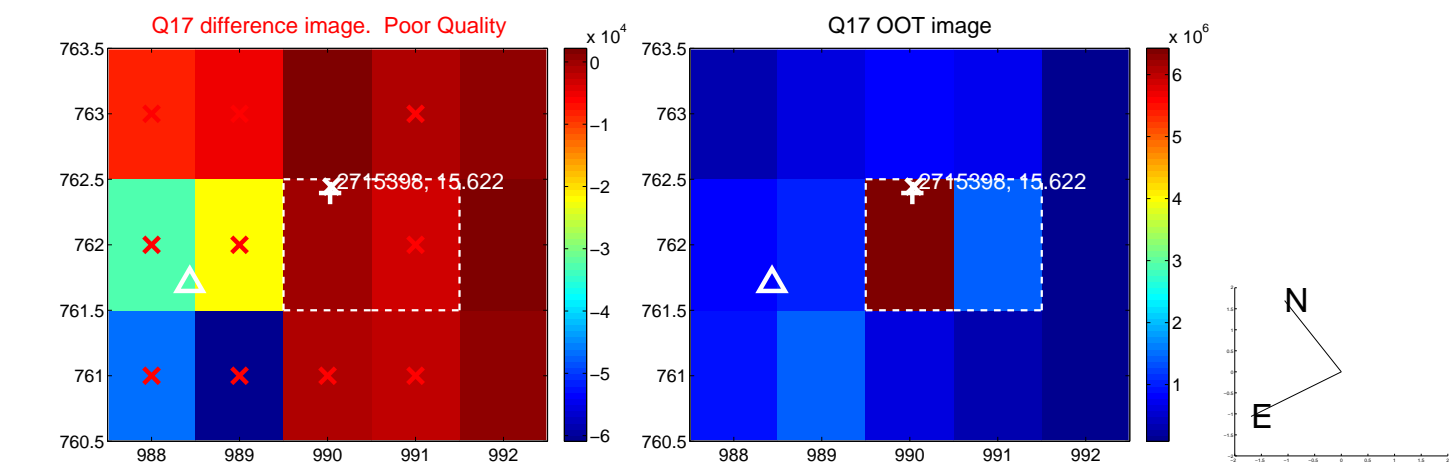
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



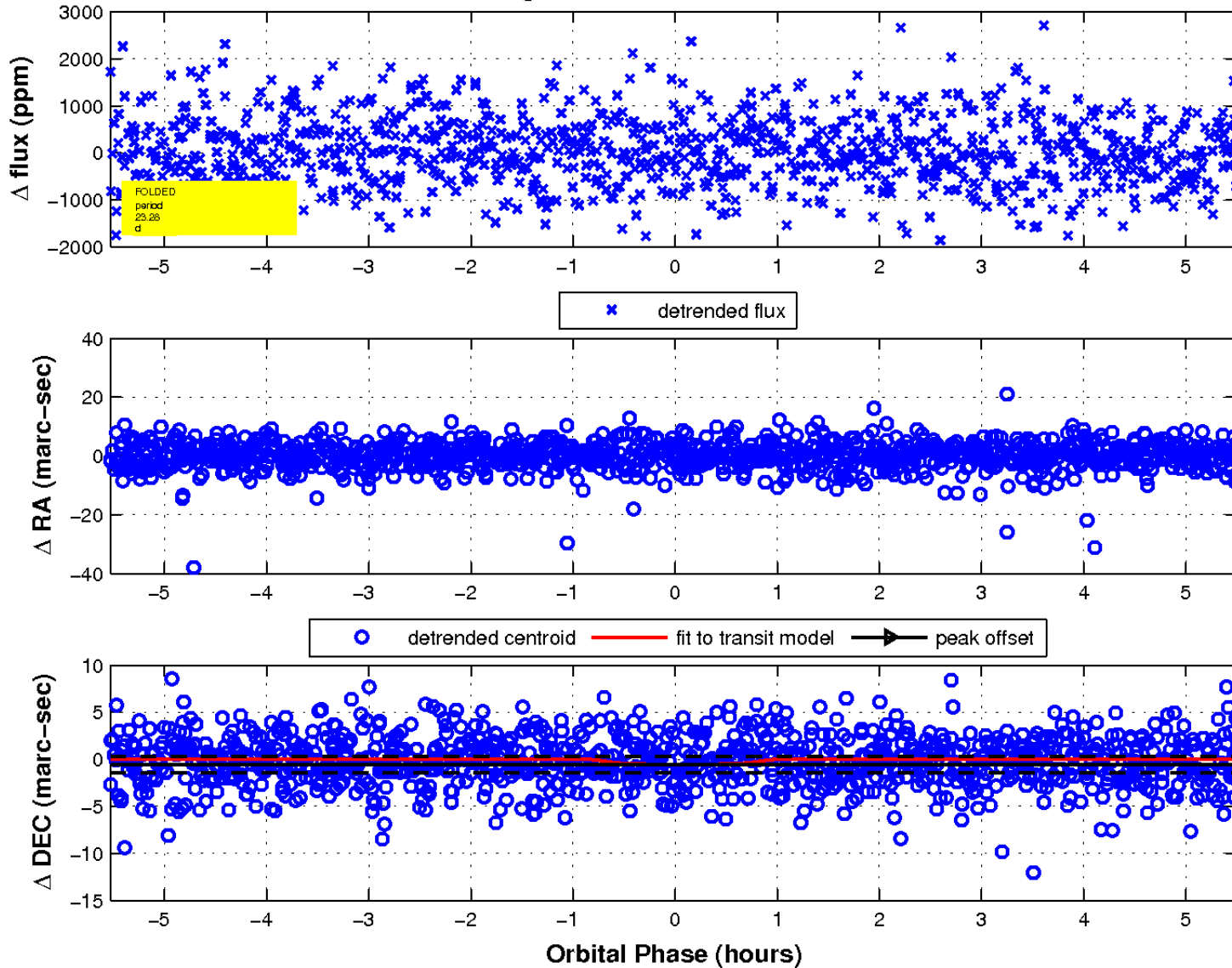
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

