

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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
002014991-08	OBS	No	175.413692	189.562425	164.3	6.160	7.5	6.2	3.05	6418	4.43	28.13
002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

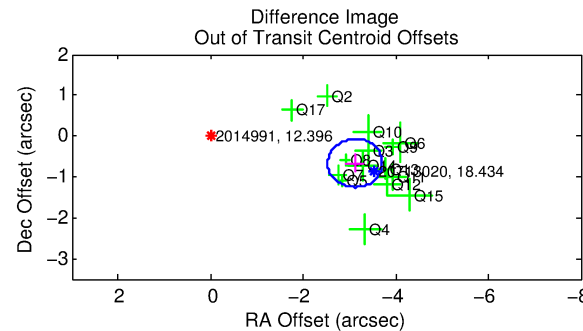
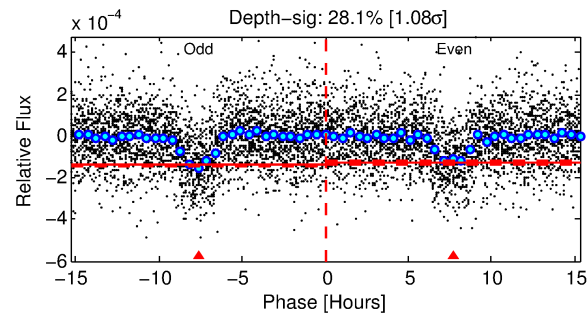
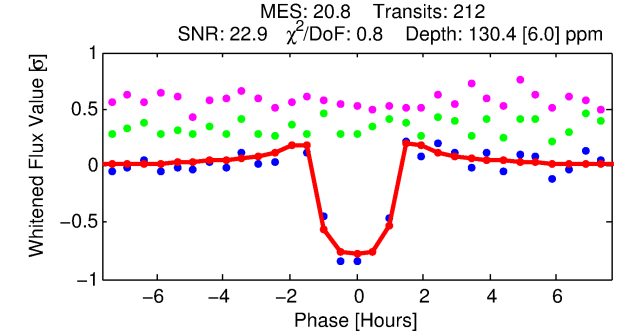
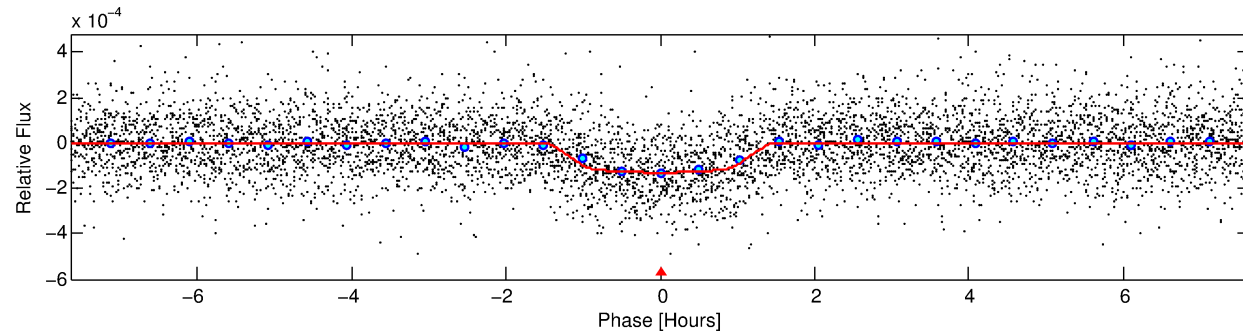
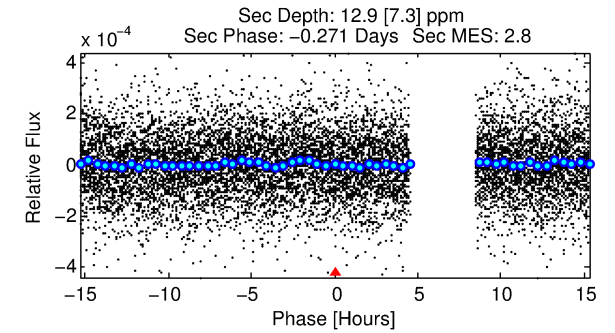
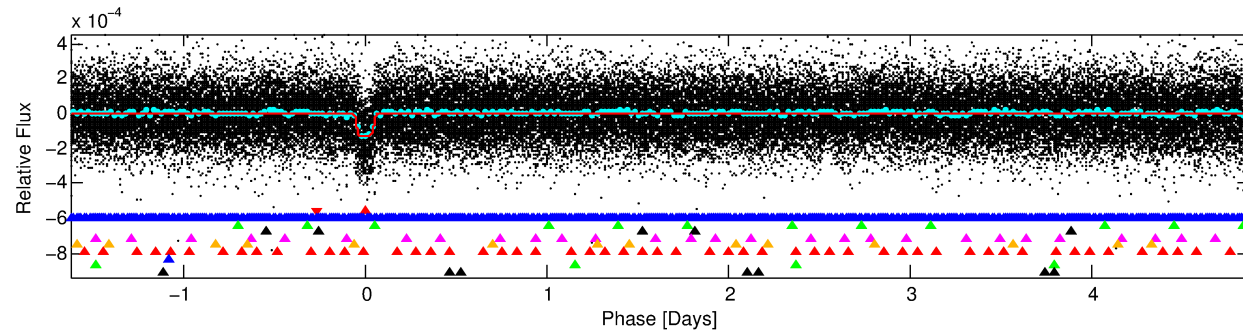
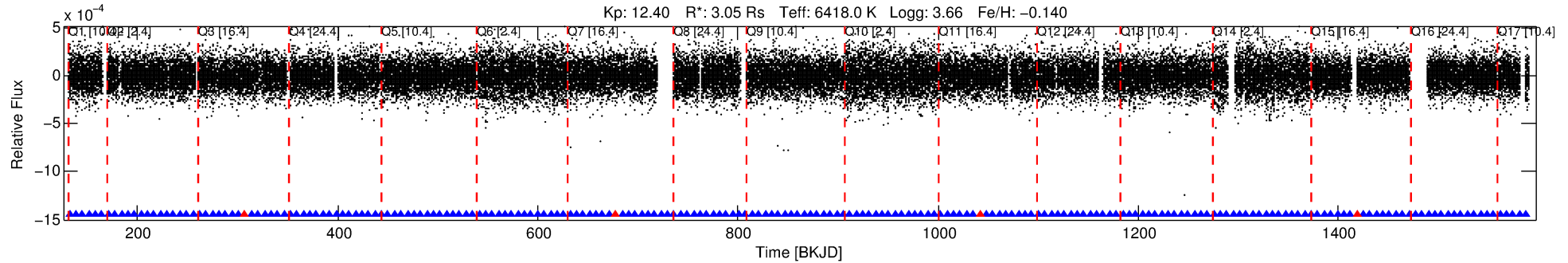
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002014991-01

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 1 of 10 Period: 6.497 d
KOI: K02178.01 Corr: 0.995



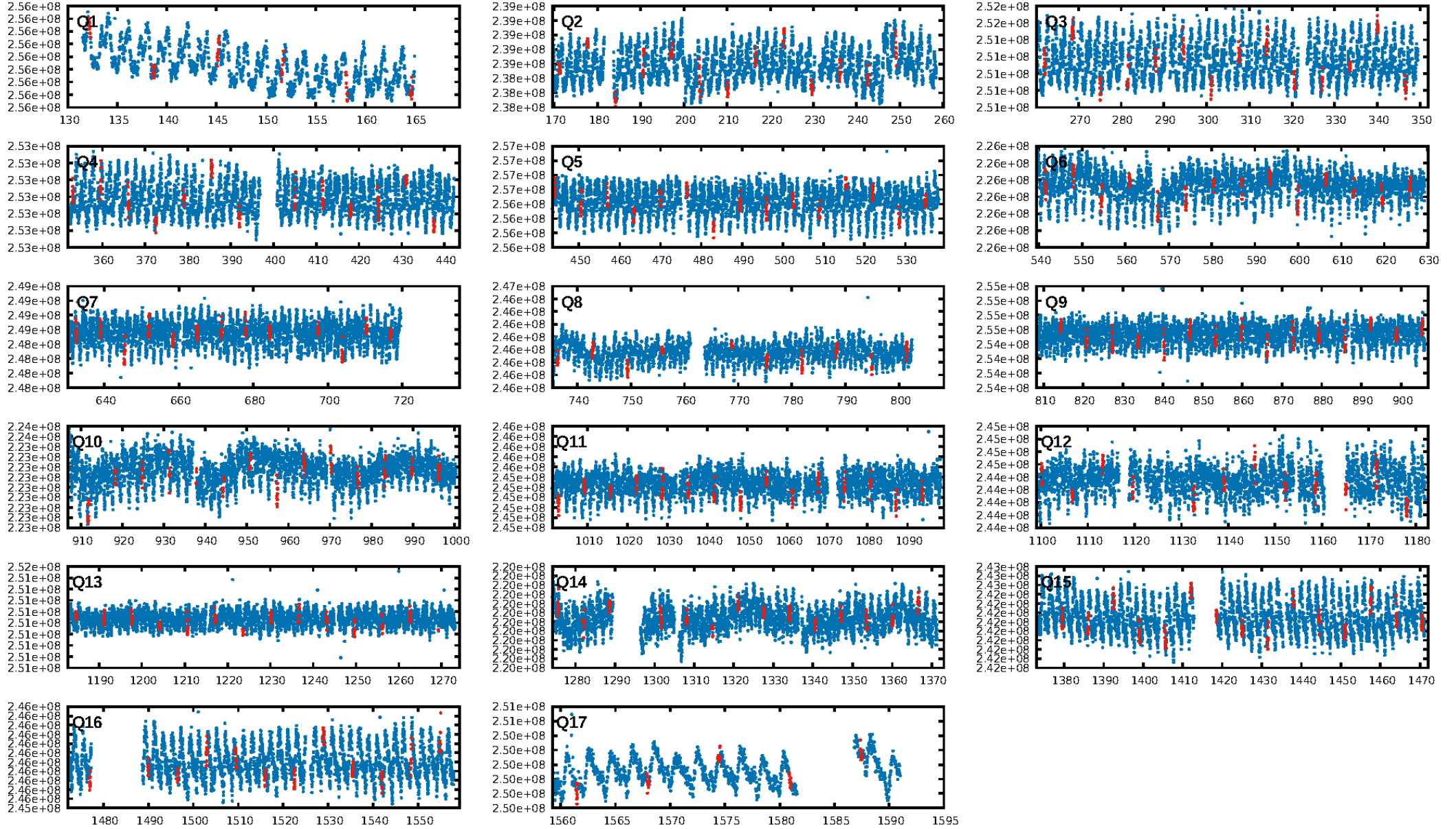
DV Fit Results:

Period = 6.49680 [0.00001] d
Epoch = 132.1711 [0.0016] BKJD
Rp/R* = 0.0120 [0.0023]
a/R* = 9.91 [10.32]
b = 0.88 [0.28]
Seff = 2278.59 [1224.93]
Teq = 1762 [237] K
Rp = 4.00 [1.64] Re
a = 0.0788 [0.0266] AU
Ag = 2.75 [2.37] [0.74σ]
Teffp = 3509 [605] K [2.69σ]

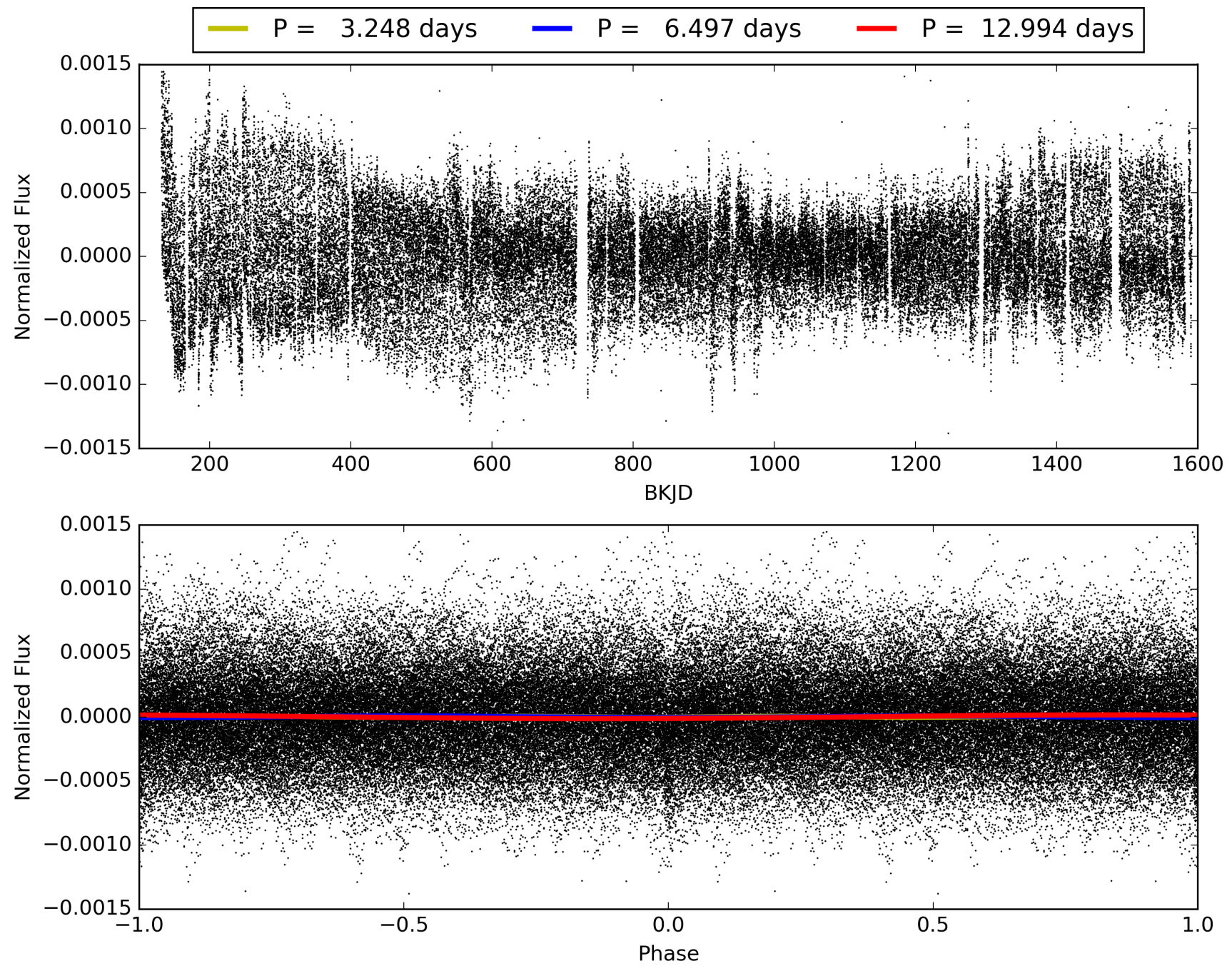
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.79σ]
LongPeriod-sig: 100.0% [49.88σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [197/201]
GhostDiagnostic-chr: 0.9579
Centroid-sig: 0.0%
Centroid-so: 4.971 arcsec [14.71σ]
OotOffset-rm: 3.185 arcsec [16.19σ]
KicOffset-rm: 3.293 arcsec [17.12σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.80 [12/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 002014991-01, PDC Light Curves

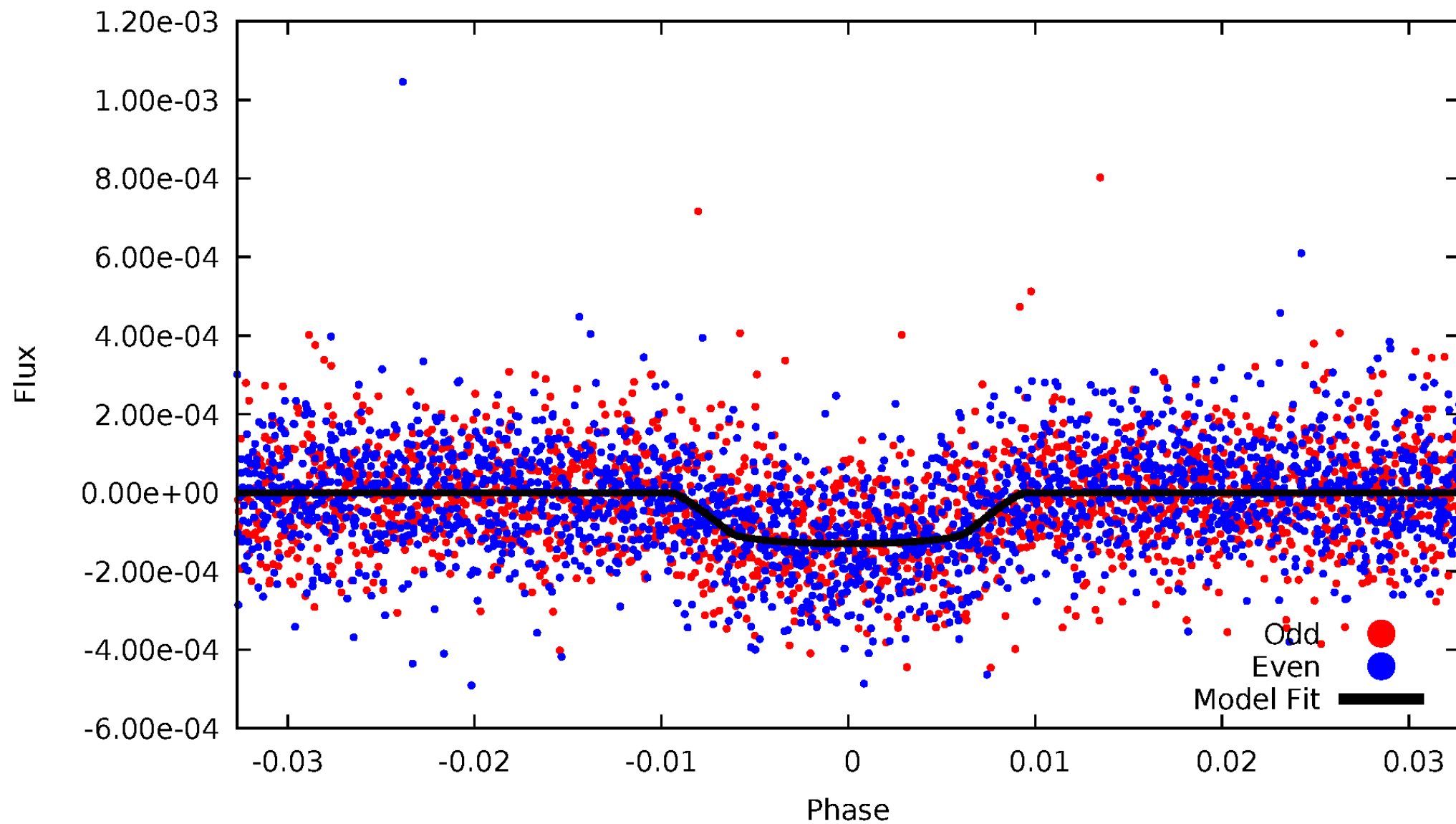


TCE 002014991-01



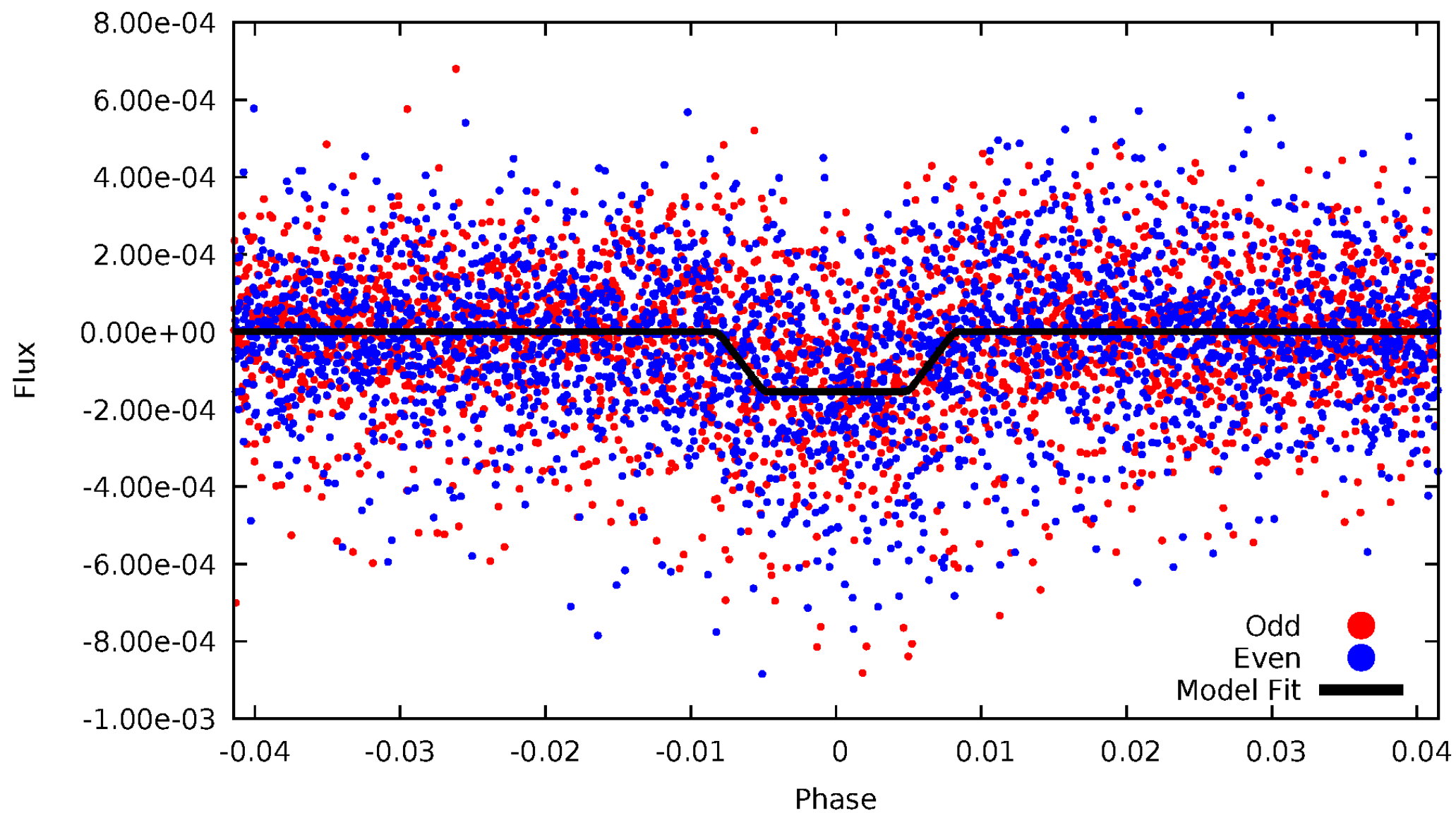
DV Odd/Even

TCE 002014991-01



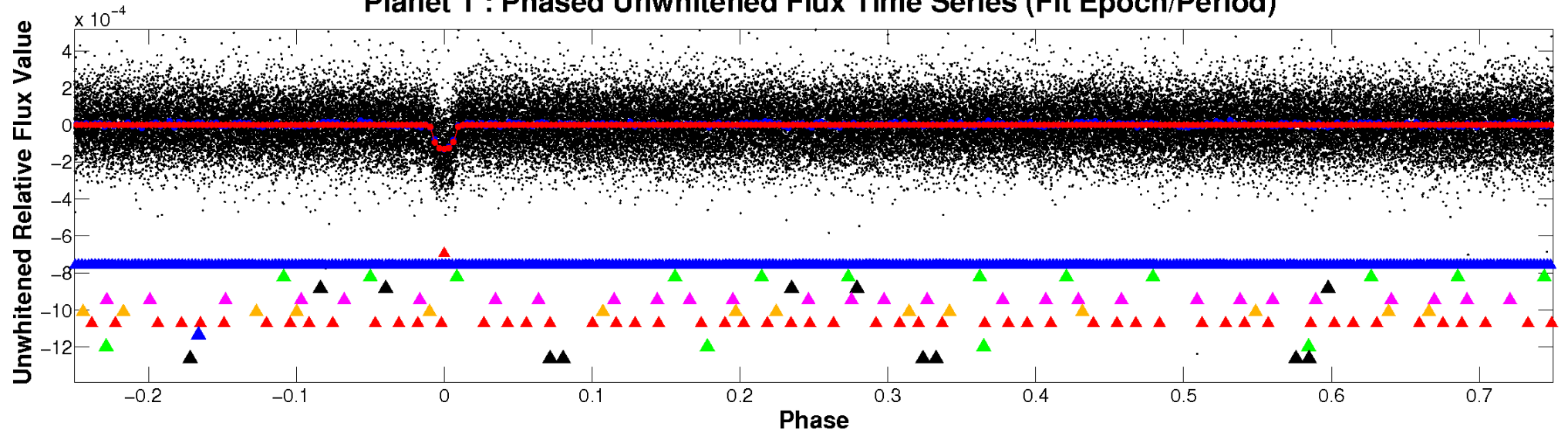
ALT Odd/Even

TCE 002014991-01

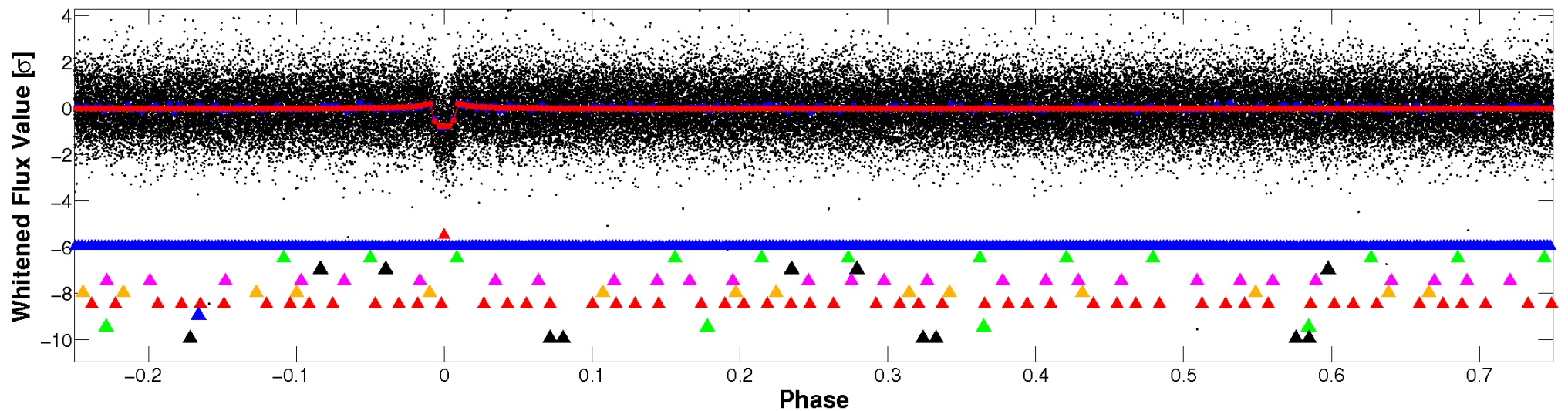


Non-Whitened Vs. Whitened Light Curve

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

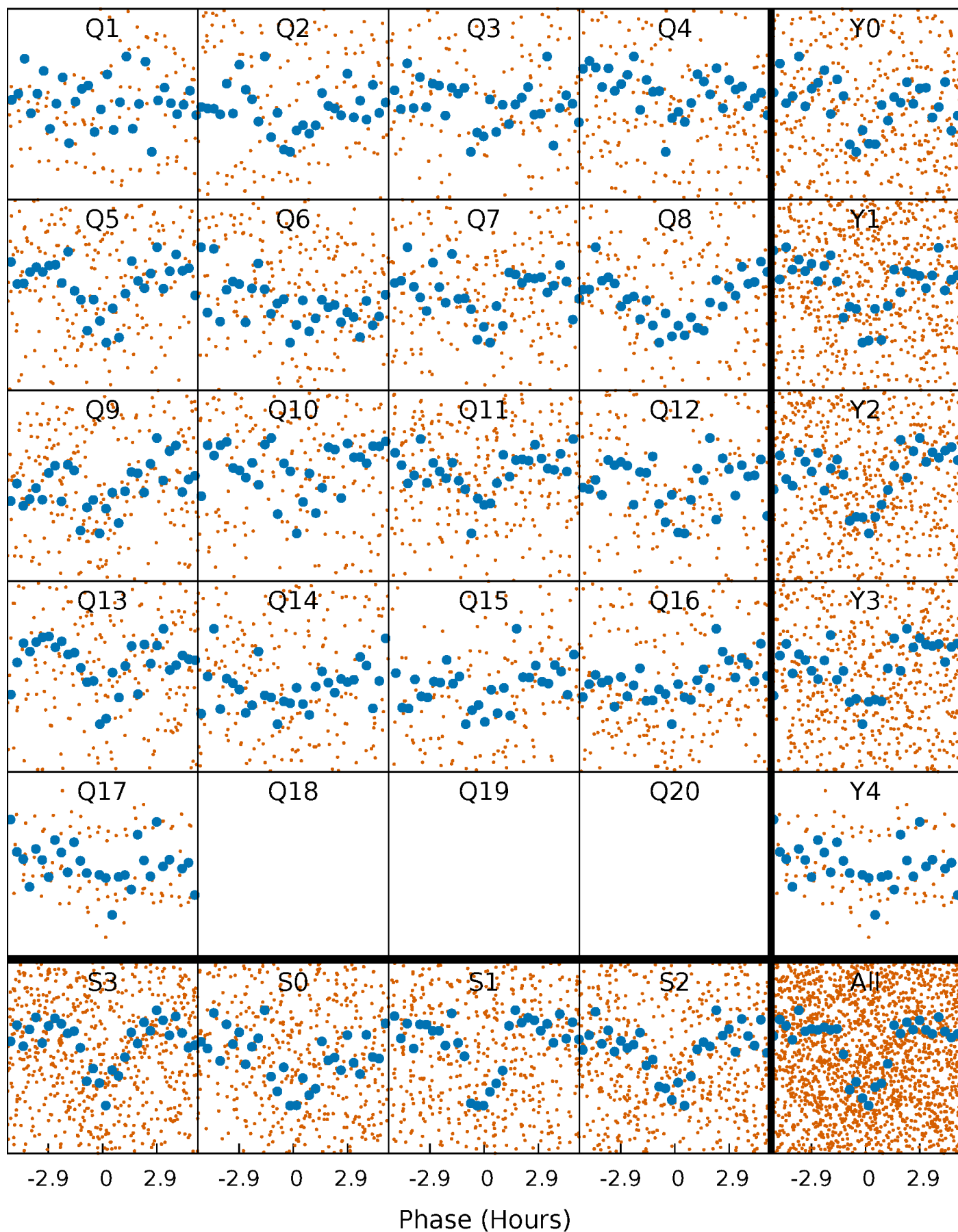


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



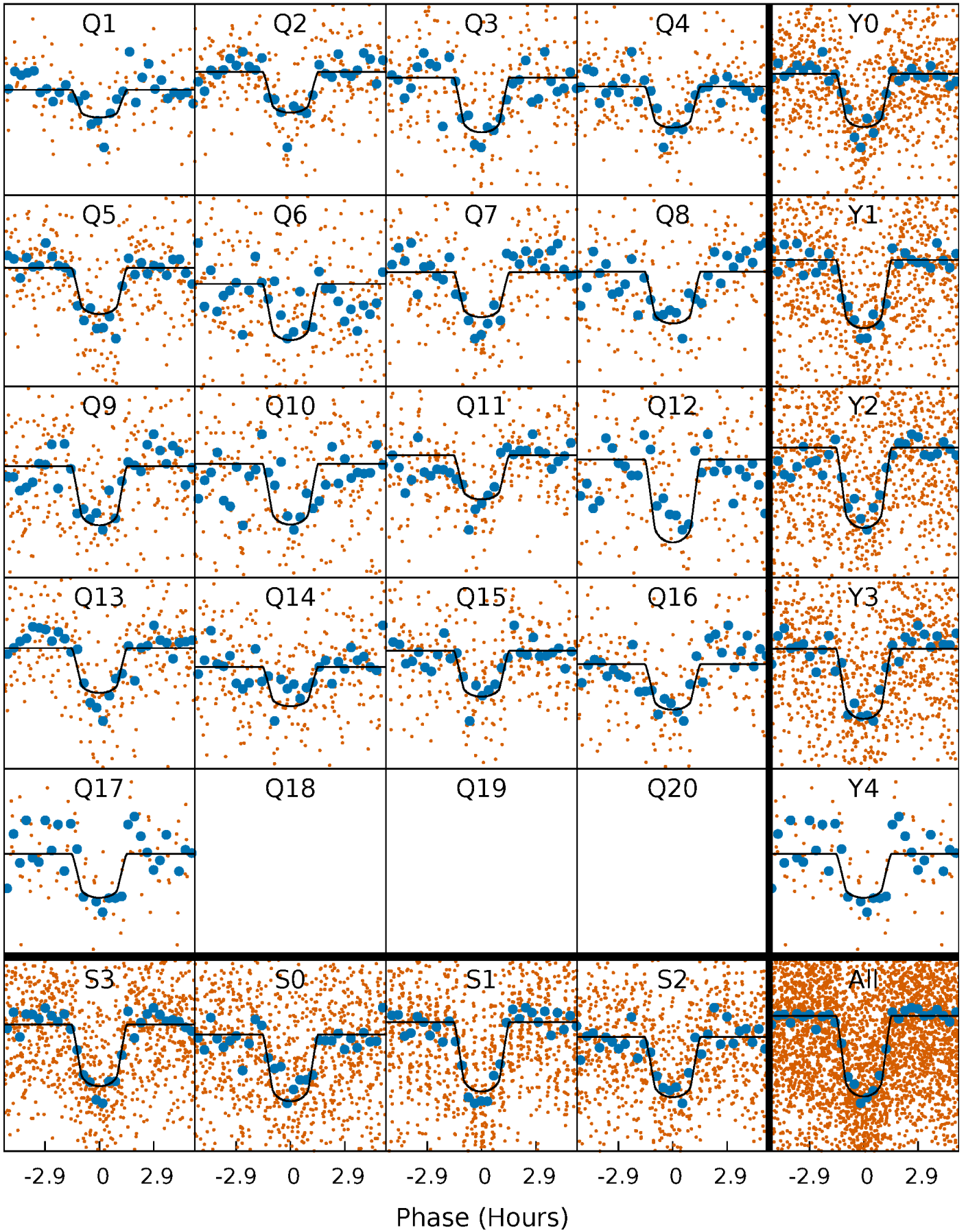
PDC Quarter-Phased Transit Curves

TCE 002014991-01 P= 6.496797 Days $T_0=132.171139$ (BKJD)



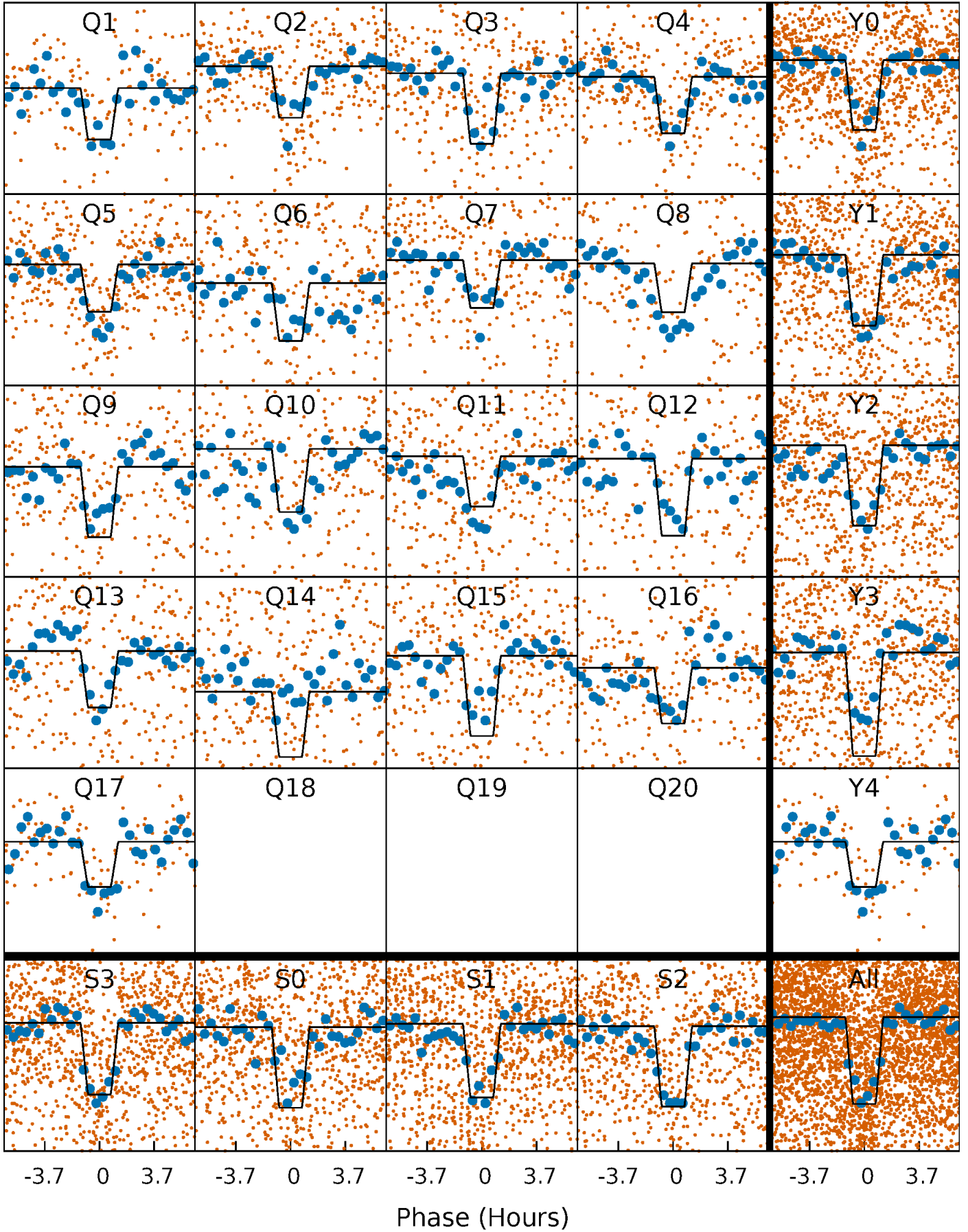
DV Quarter-Phased Transit Curves

TCE 002014991-01 P= 6.496797 Days $T_0=132.171139$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

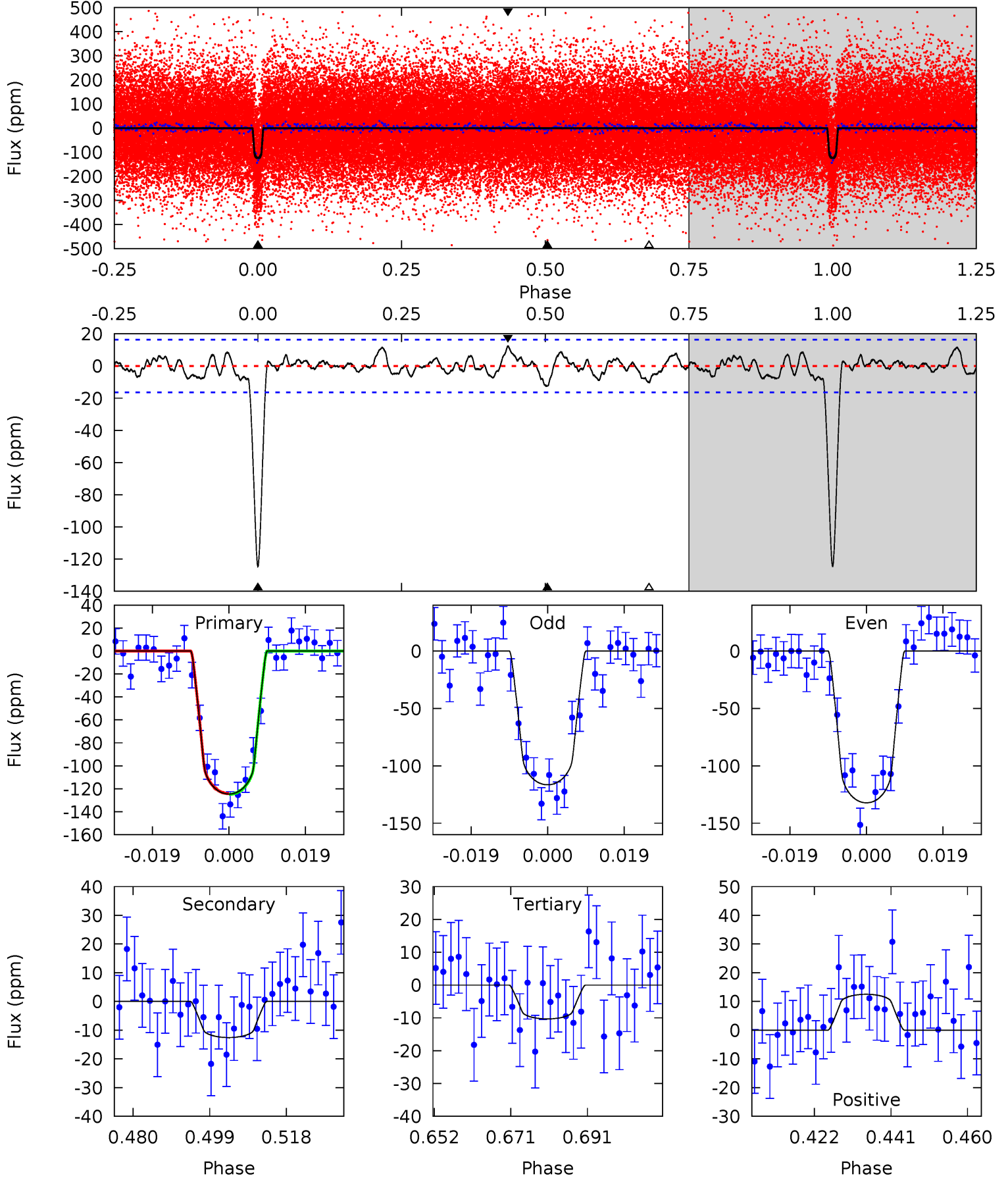
TCE 002014991-01 P= 6.496849 Days $T_0=132.165711$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-01, P = 6.496797 Days, E = 125.674342 Days

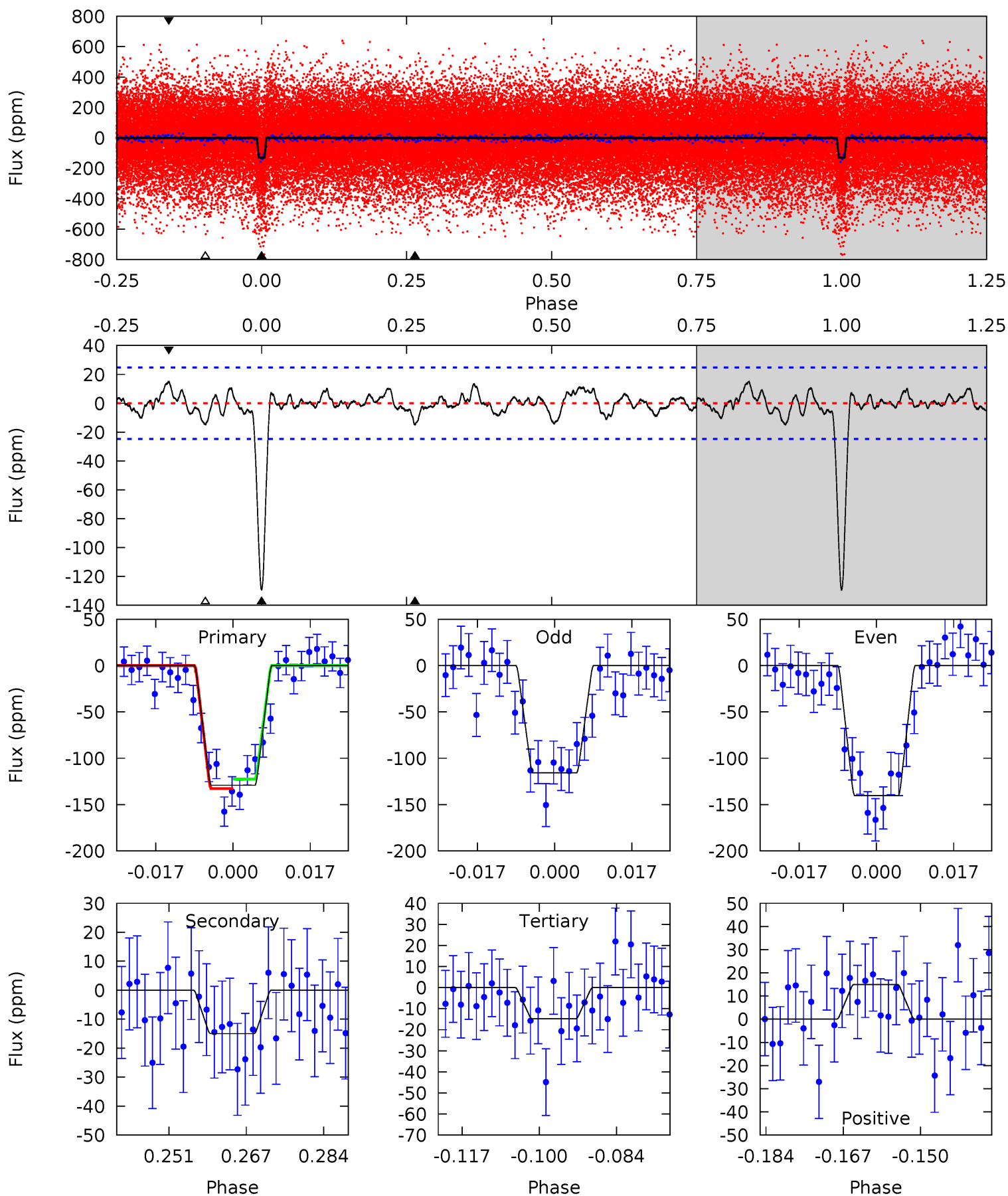
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.3	3.76	3.09	3.74	4.90	2.34	1.29	34.2	33.5	0.68	0.02	2.36	1.01	0.09	0.10



Alt Model-Shift Uniqueness Test

002014991-01, P = 6.496849 Days, E = 125.668862 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.7	2.98	2.95	2.98	4.93	2.39	1.07	22.7	22.7	0.03	-0.00	2.45	1.12	0.10	1.03



Stellar Parameters For KIC 002014991

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-01 / KOI 2178.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-13 ± 3	$3.69^{+1.03}_{-0.86}$	2406^{+143}_{-224}	3817^{+356}_{-359}	$3.253^{+2.399}_{-1.411}$
Alt.	-15 ± 5	$3.94^{+0.99}_{-1.00}$	2415^{+148}_{-202}	3857^{+417}_{-386}	$3.377^{+2.750}_{-1.577}$

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

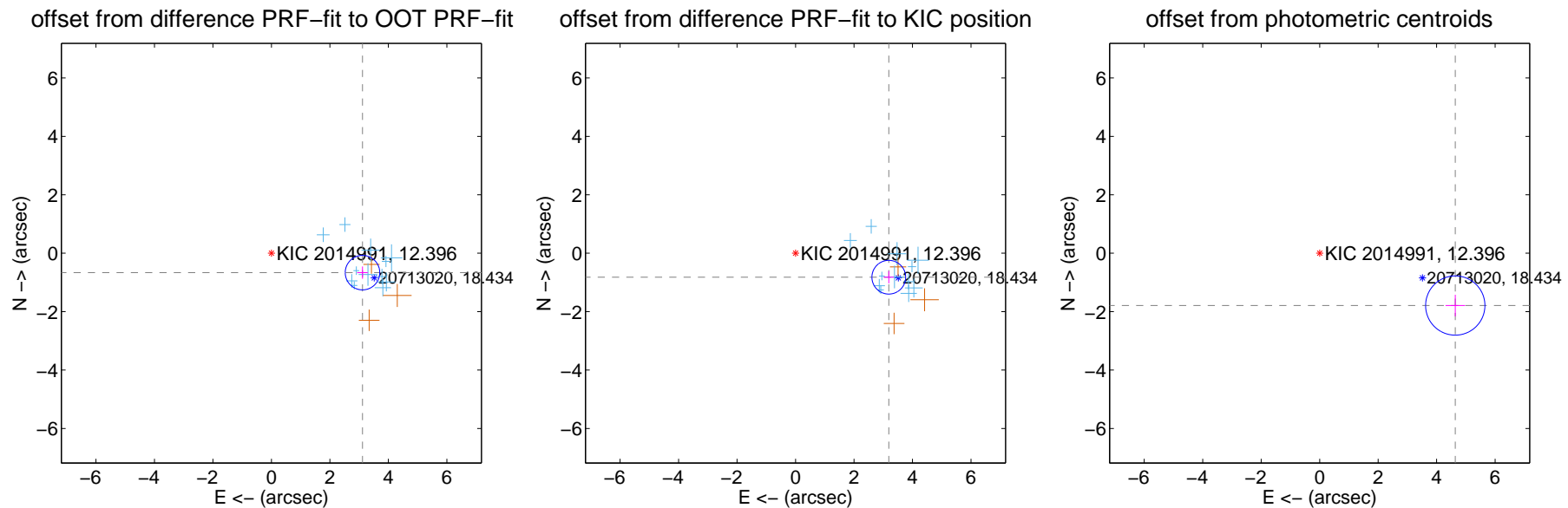
DV Centroid Data

Supplemental centroid analysis for 002014991-01. Kepler magnitude: 12.40. Transit SNR 22.89

There are 12 quarters with good PRF difference image offsets

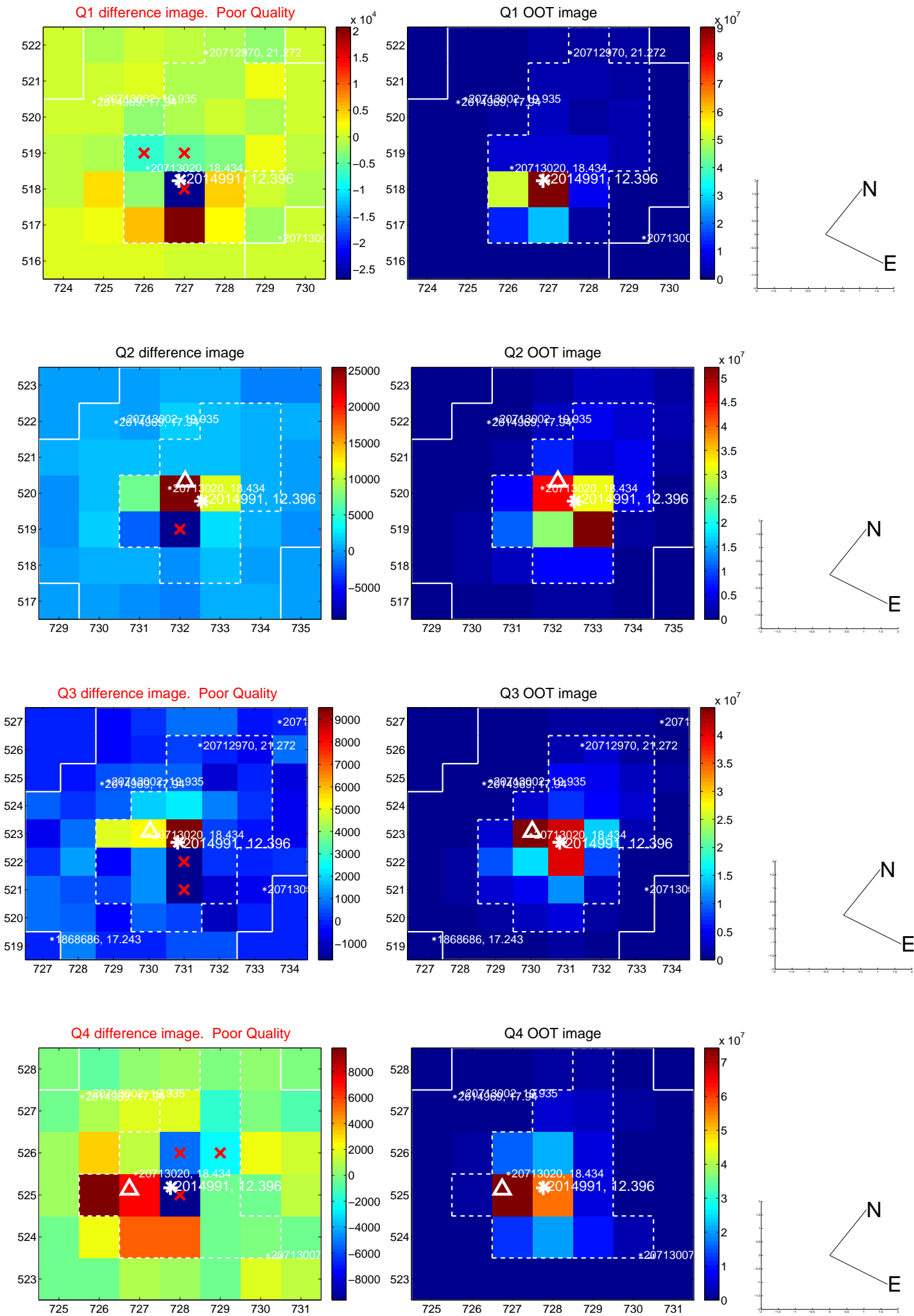
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.185 ± 0.197	16.19	-3.114 ± 0.182	-0.665 ± 0.209
PRF-fit source offset from KIC position	3.293 ± 0.192	17.12	-3.189 ± 0.176	-0.821 ± 0.211
photometric centroid source offset	4.97 ± 0.34	14.71	-4.64 ± 0.33	-1.79 ± 0.37

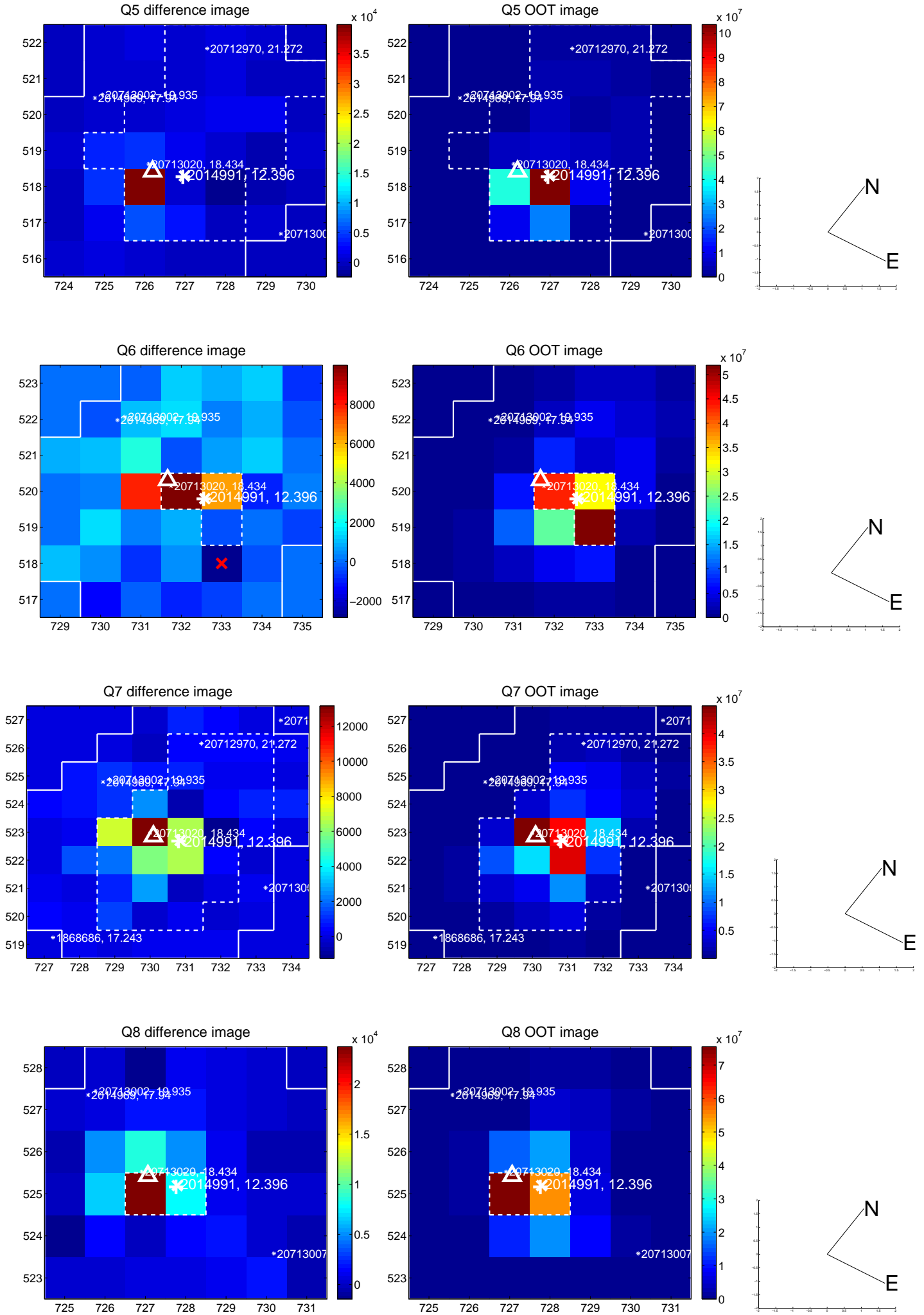


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

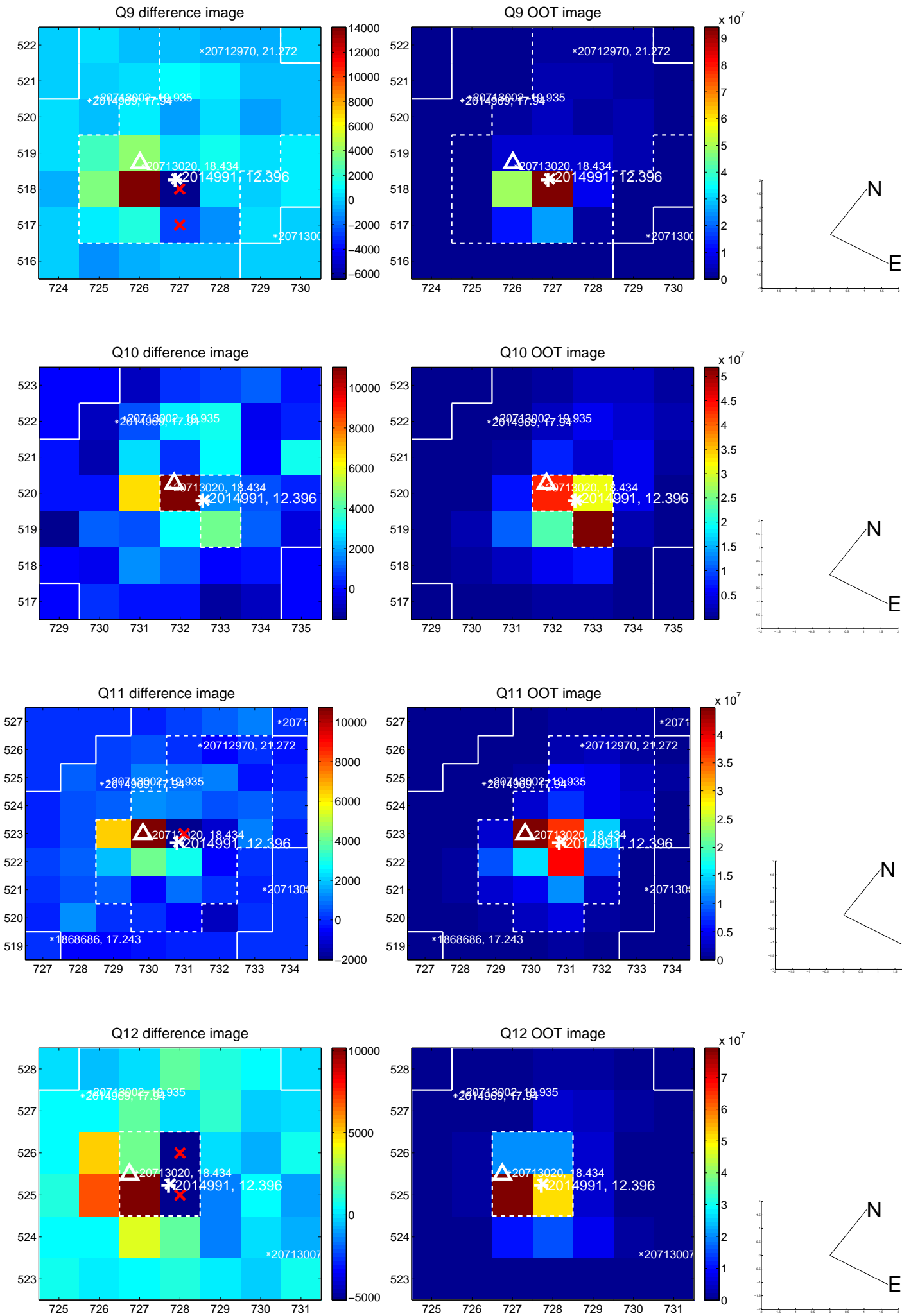
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



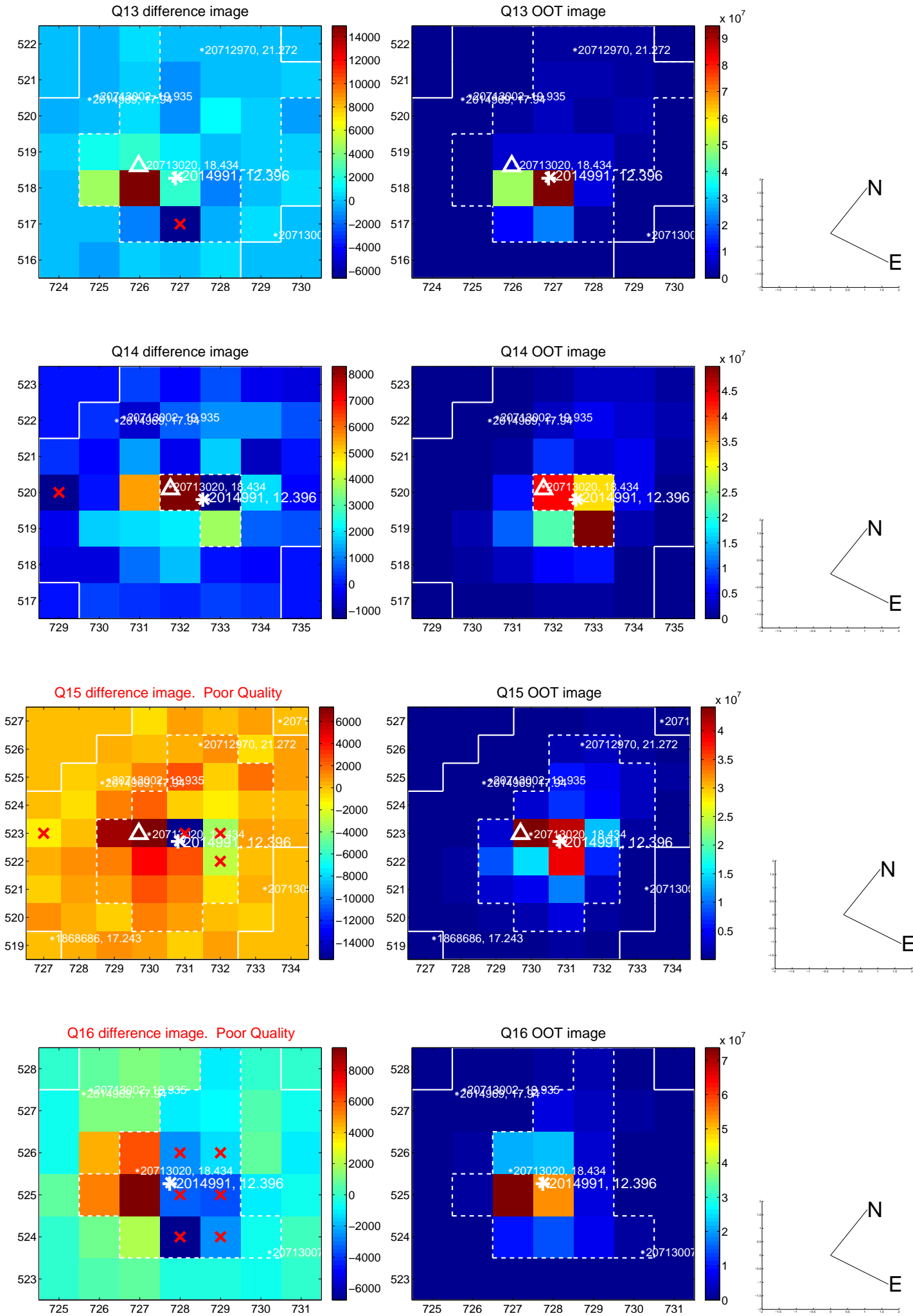
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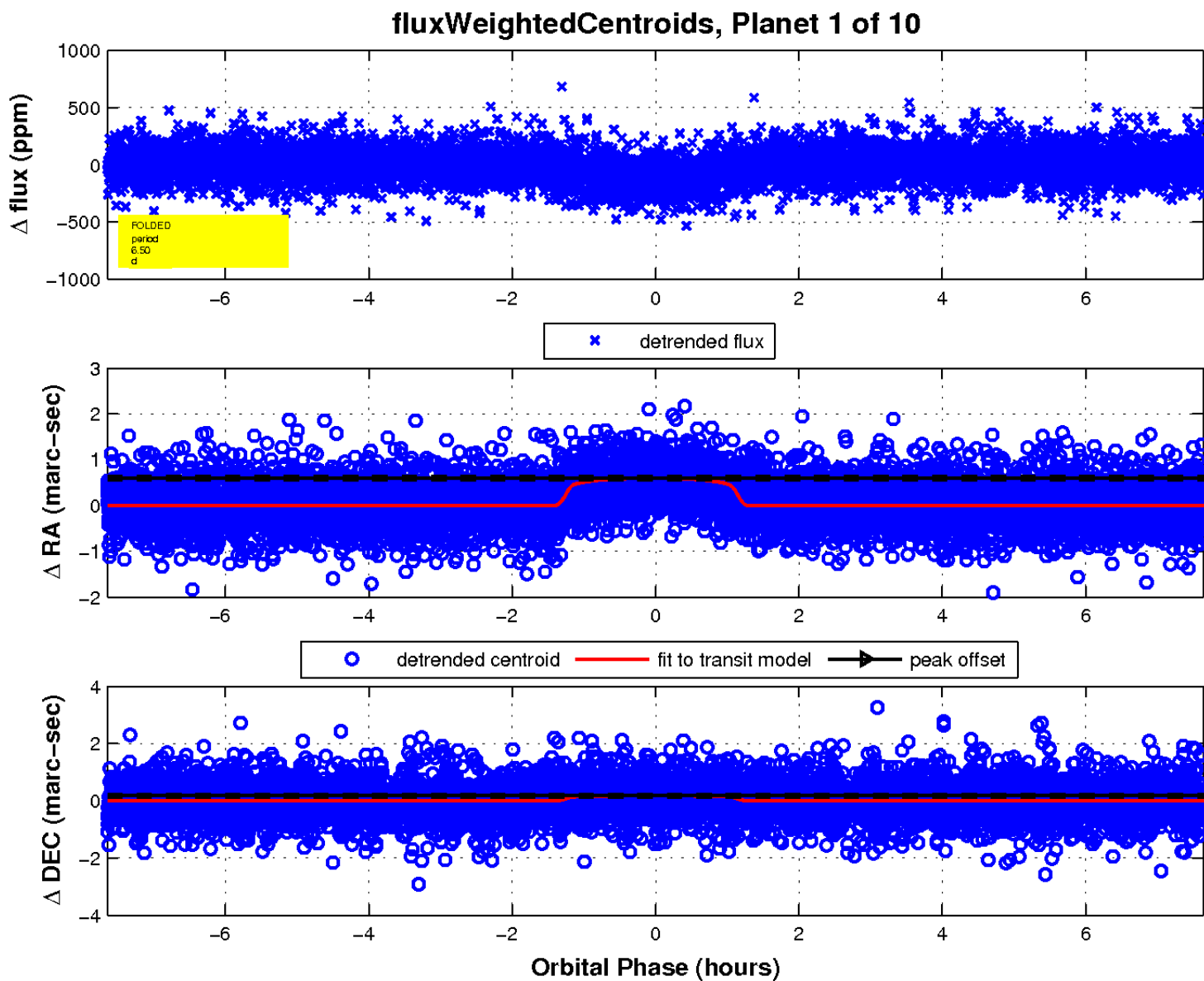
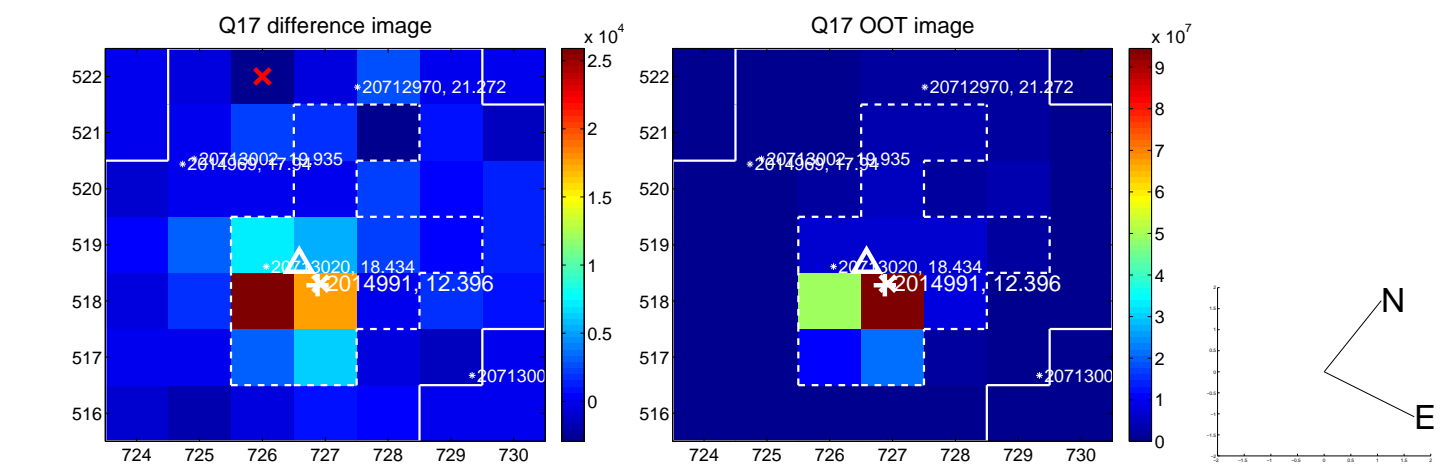
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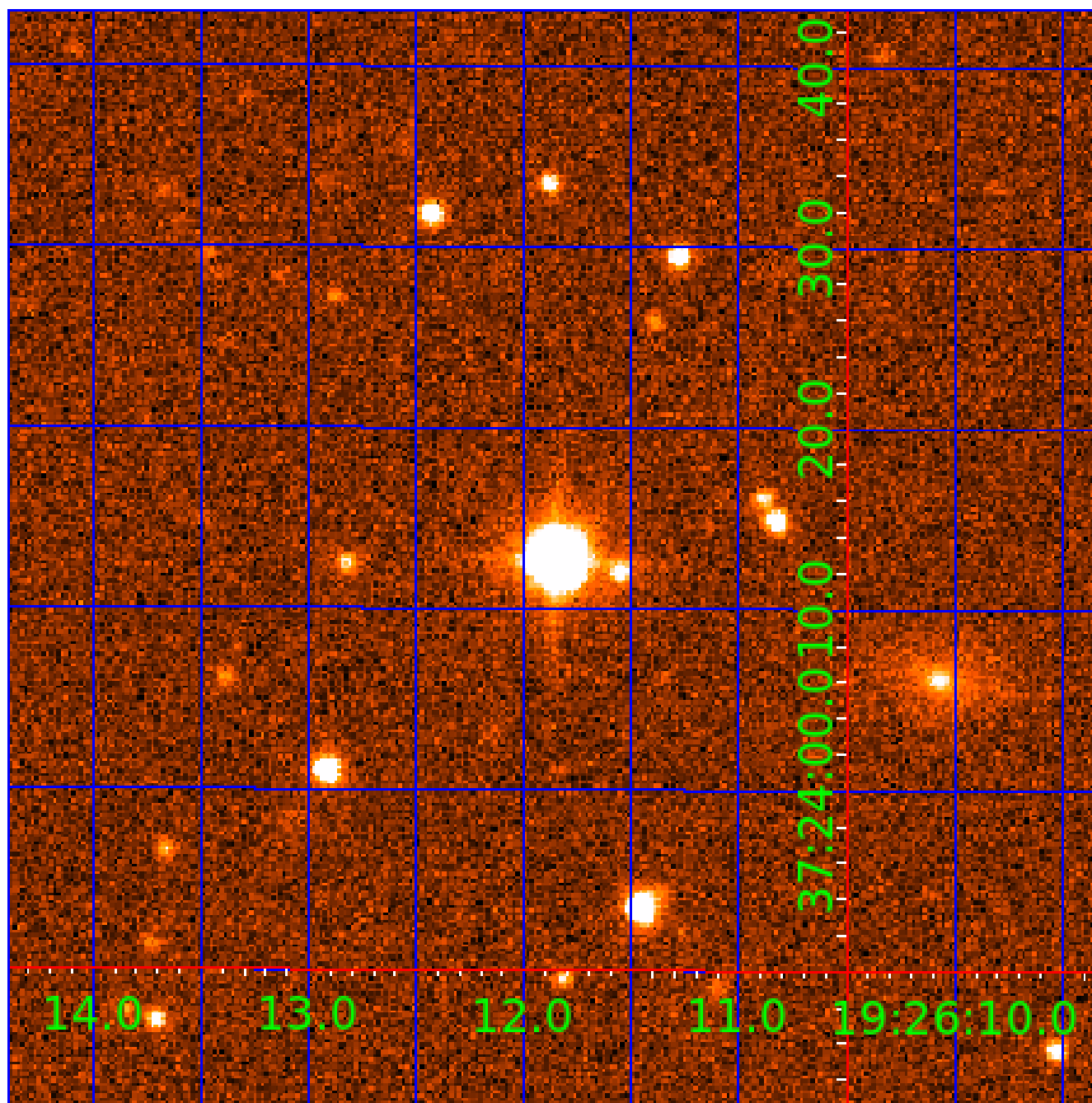


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UKIRT Image

Declination



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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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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.

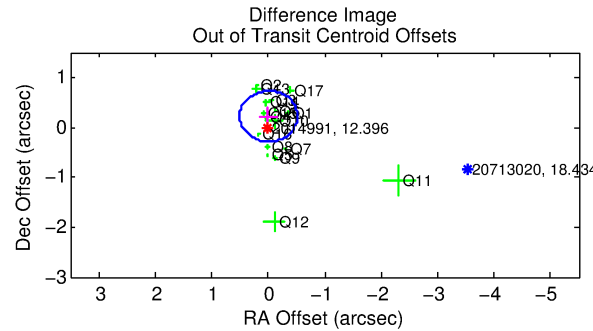
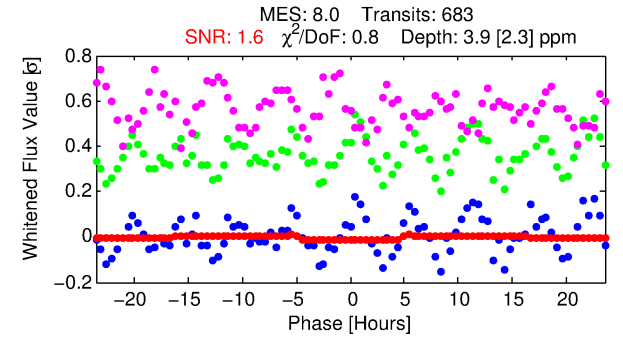
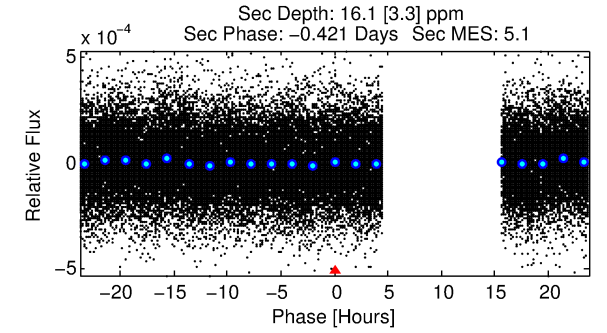
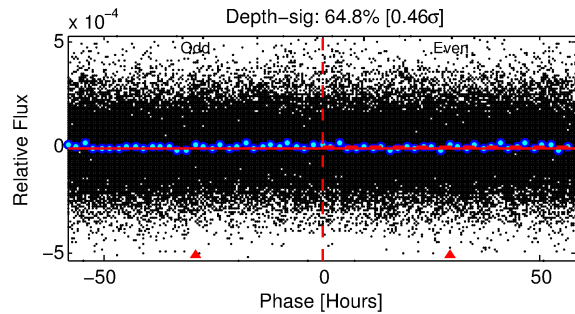
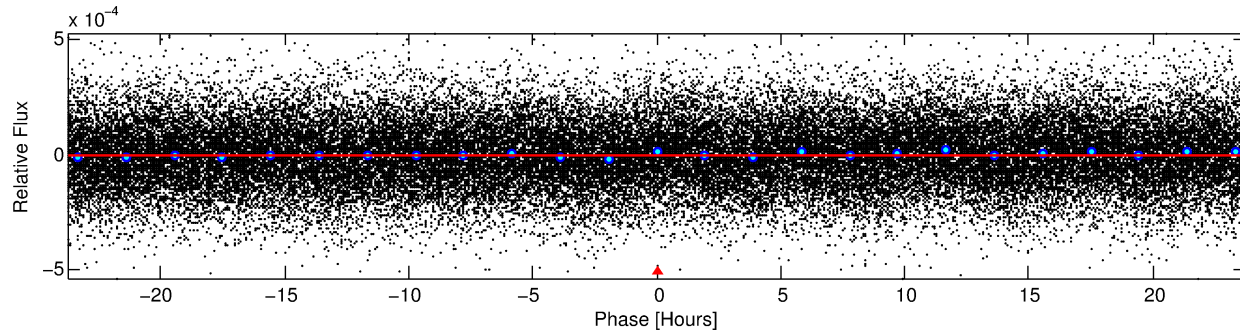
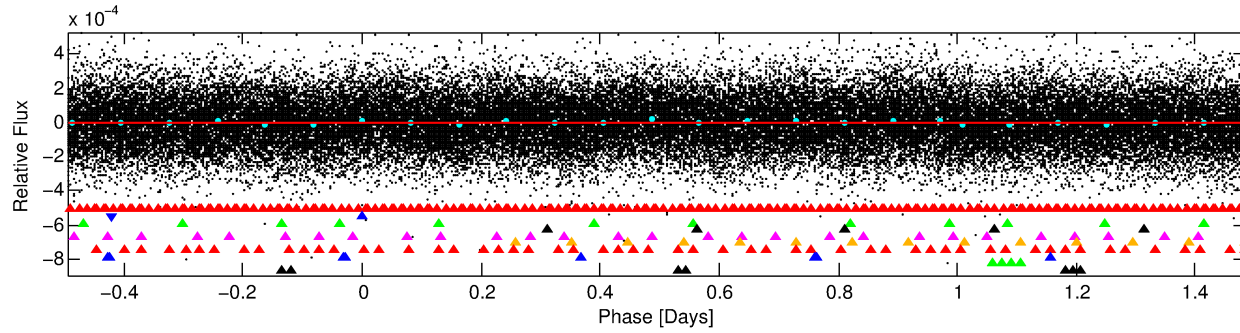
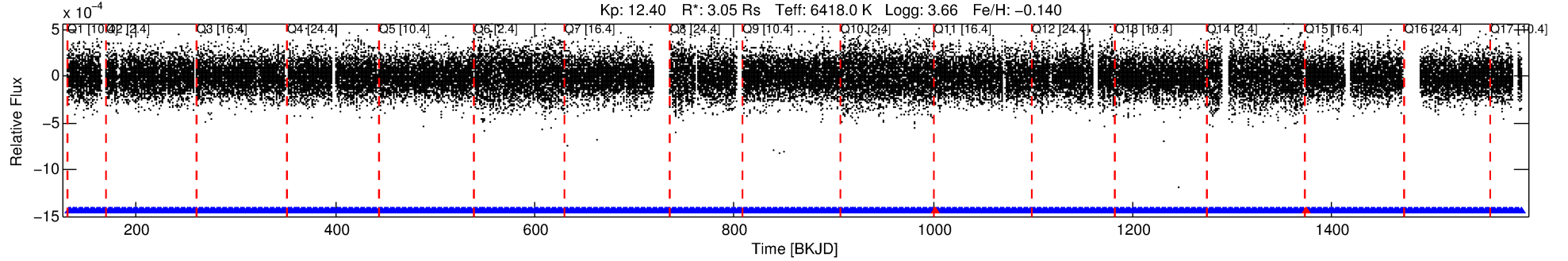
Ephemeris Match Information For 002014991-02

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 2 of 10 Period: 1.980 d
KOI: K02178 Corr: No Ephemeris Match

Kp: 12.40 R*: 3.05 Rs Teff: 6418.0 K Logg: 3.66 Fe/H: -0.140



DV Fit Results:

Period = 1.97983 [0.00012] d
Epoch = 132.5758 [0.0276] BKJD
Rp/R* = 0.0021 [0.0015]
a/R* = 1.17 [1.16]
b = 0.89 [0.83]
Seff = 11111.19 [5973.18]
Teq = 2618 [352] K
Rp = 0.70 [0.55] Re
a = 0.0357 [0.0120] AU
Ag = 23.09 [34.92] [0.63σ]
Teffp = 8873 [3154] K [1.97σ]

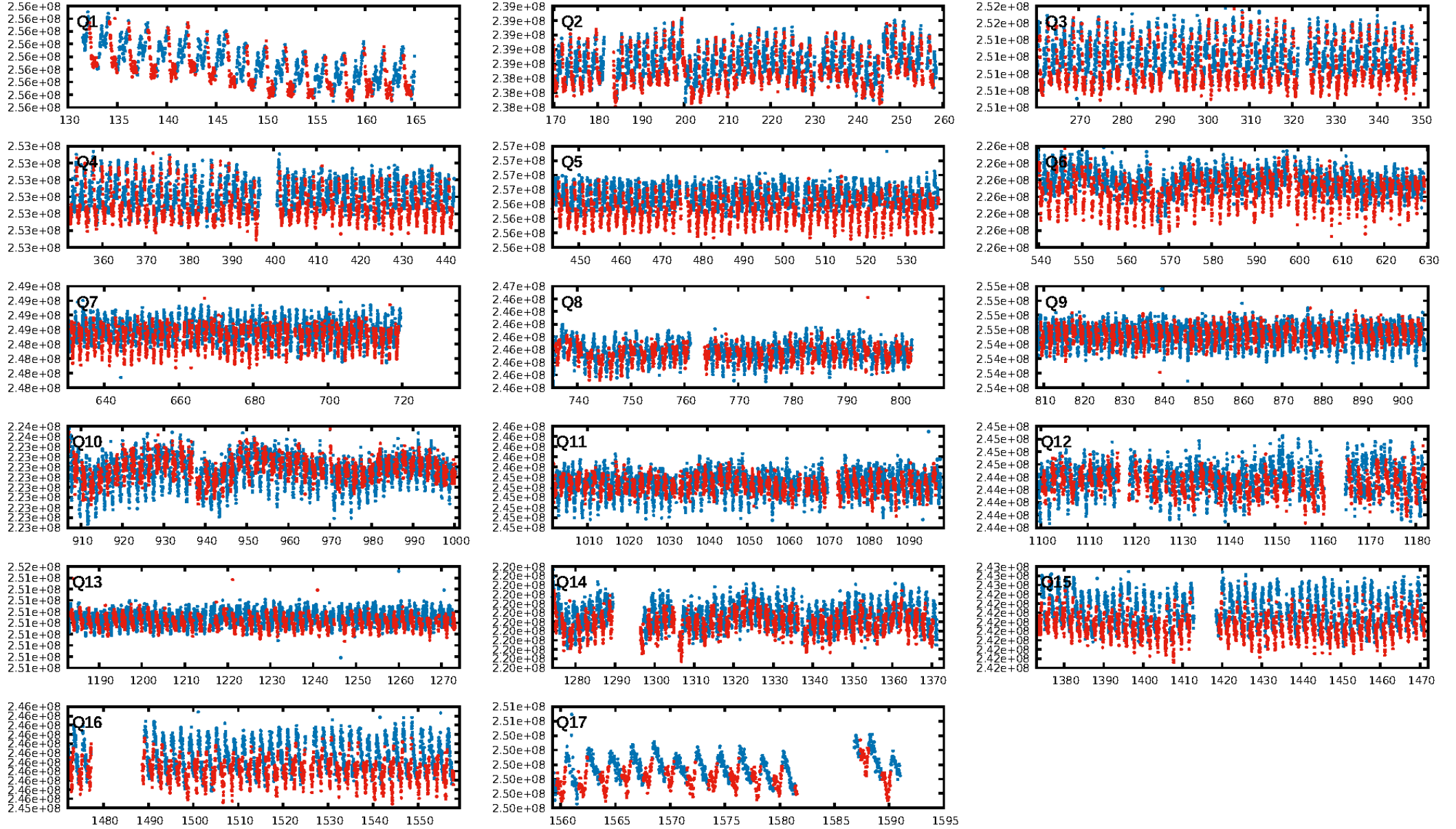
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [10.79σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [651/653]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 0.219 arcsec [1.29σ]
KicOffset-rm: 0.132 arcsec [0.92σ]
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KicOffset-st: 4/4/4/5 [17]
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DiffImageOverlap-fno: 1.00 [17/17]

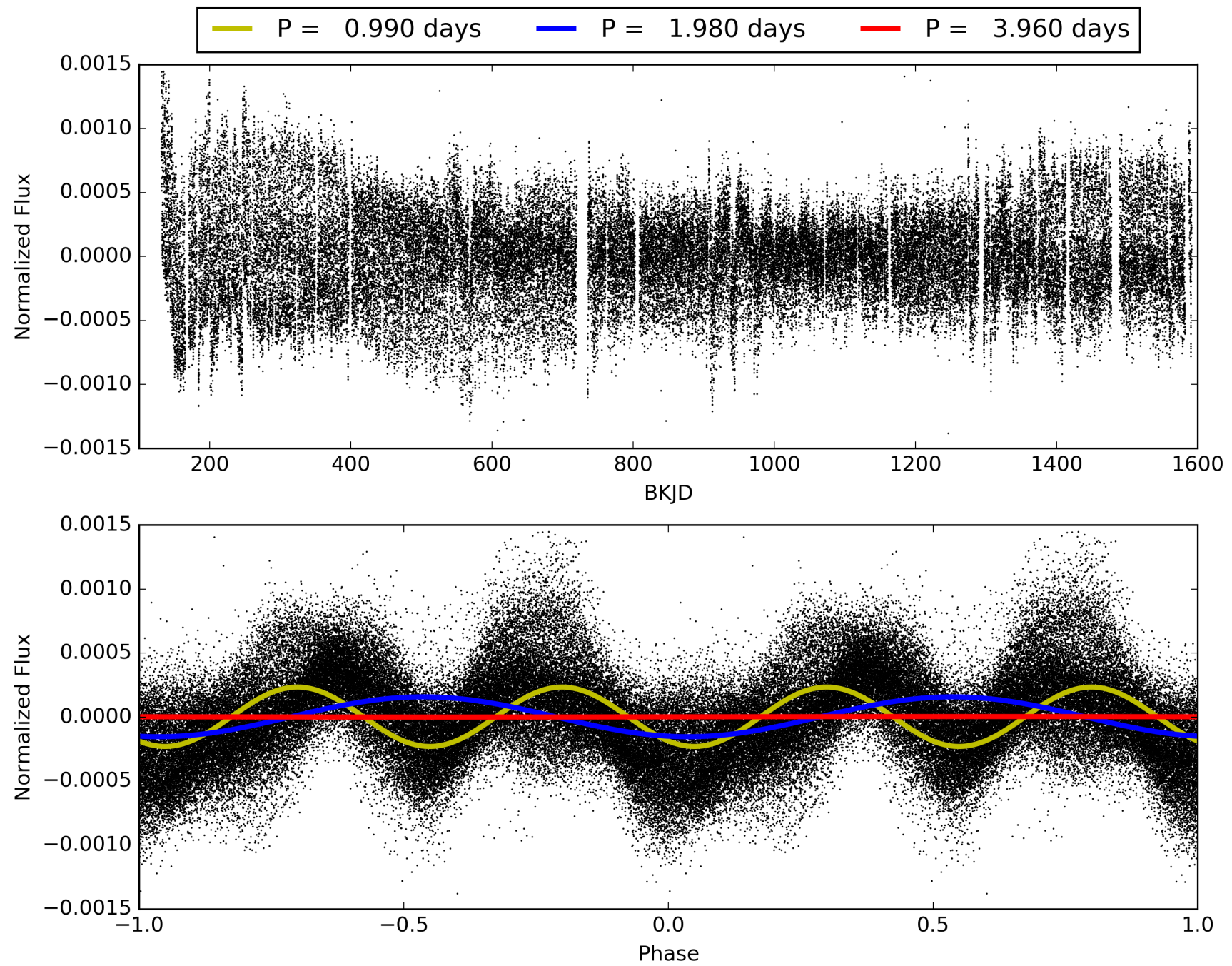
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:52:22 Z

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

TCE 002014991-02, PDC Light Curves

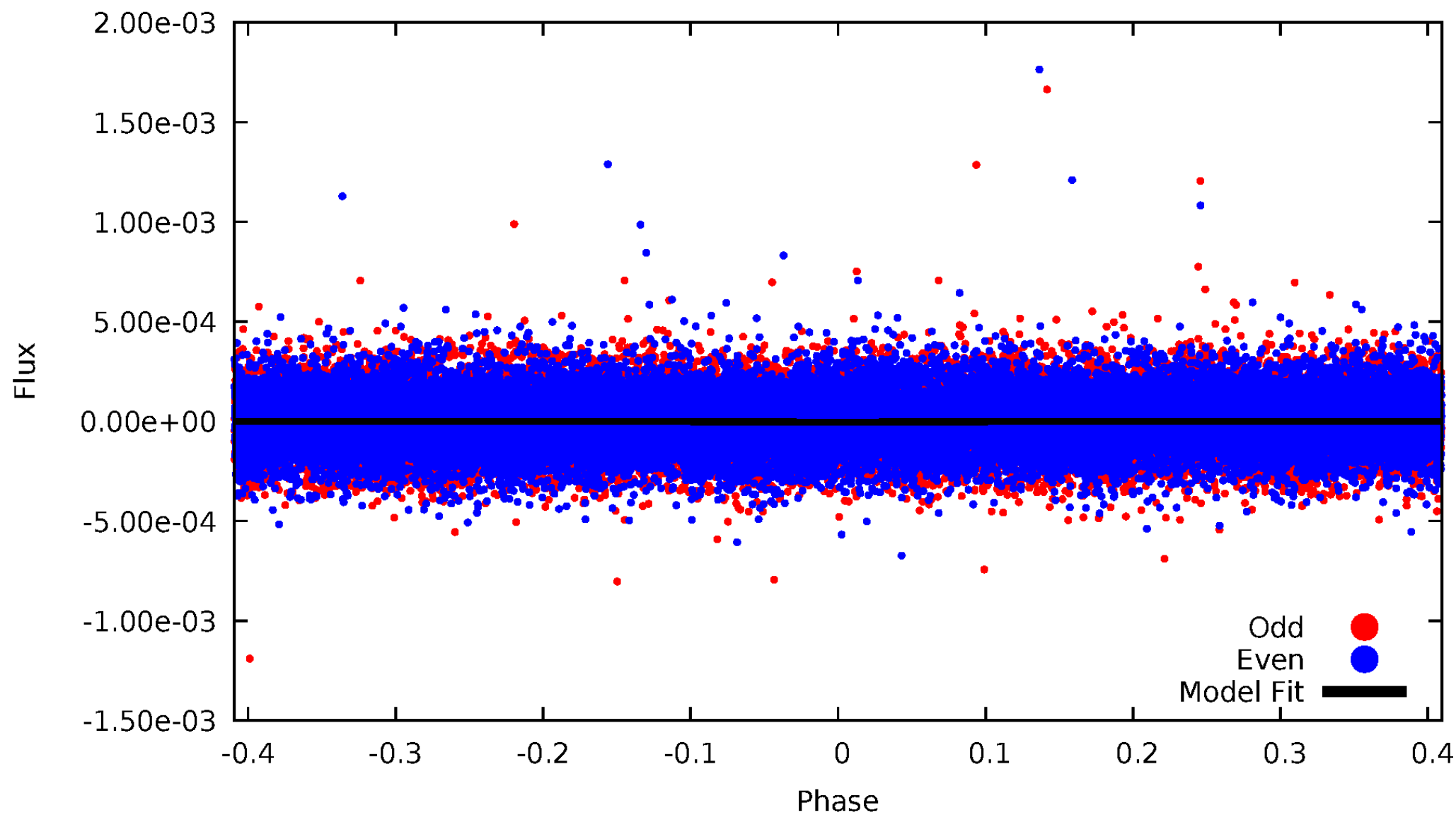


TCE 002014991-02



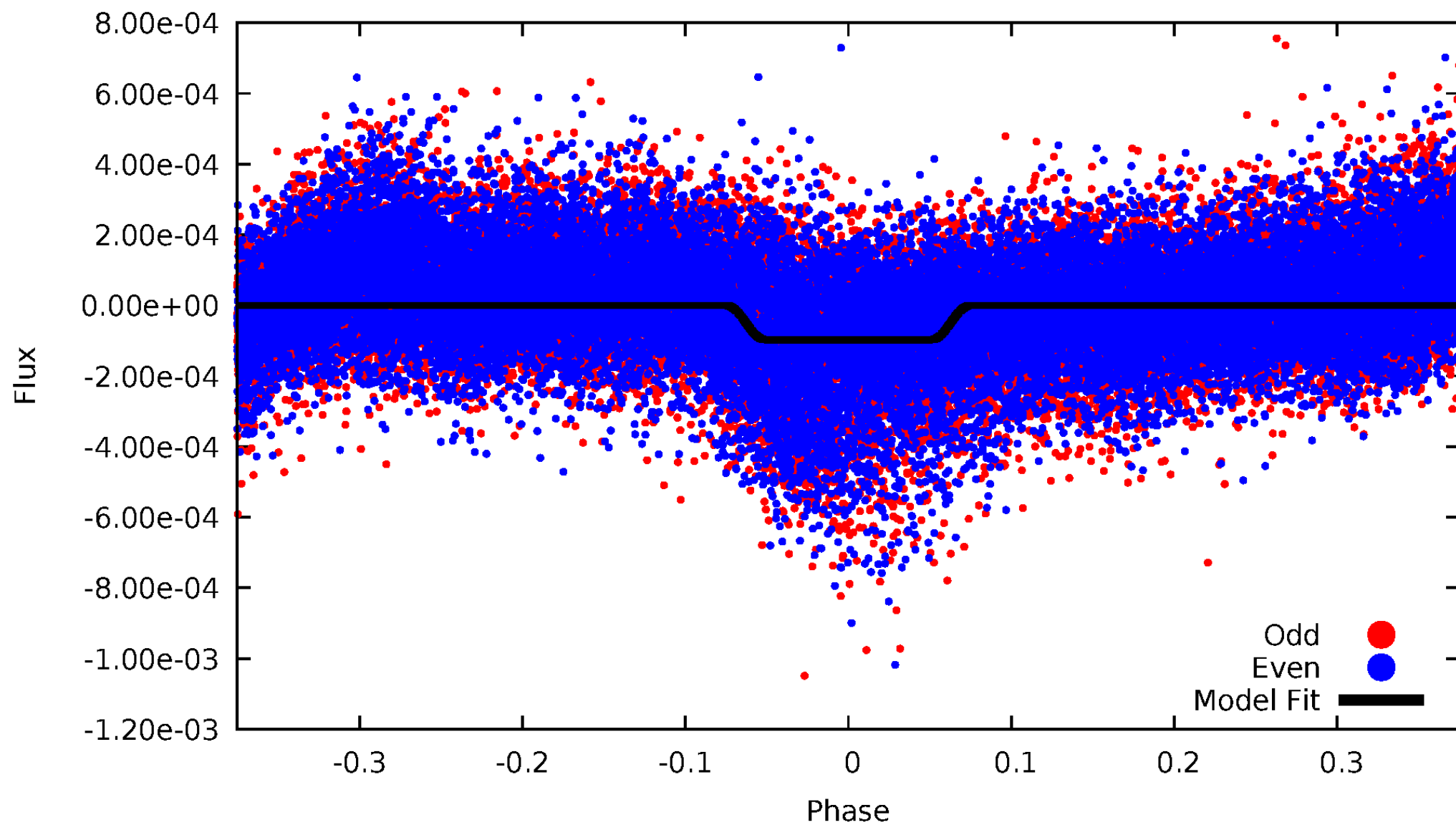
DV Odd/Even

TCE 002014991-02



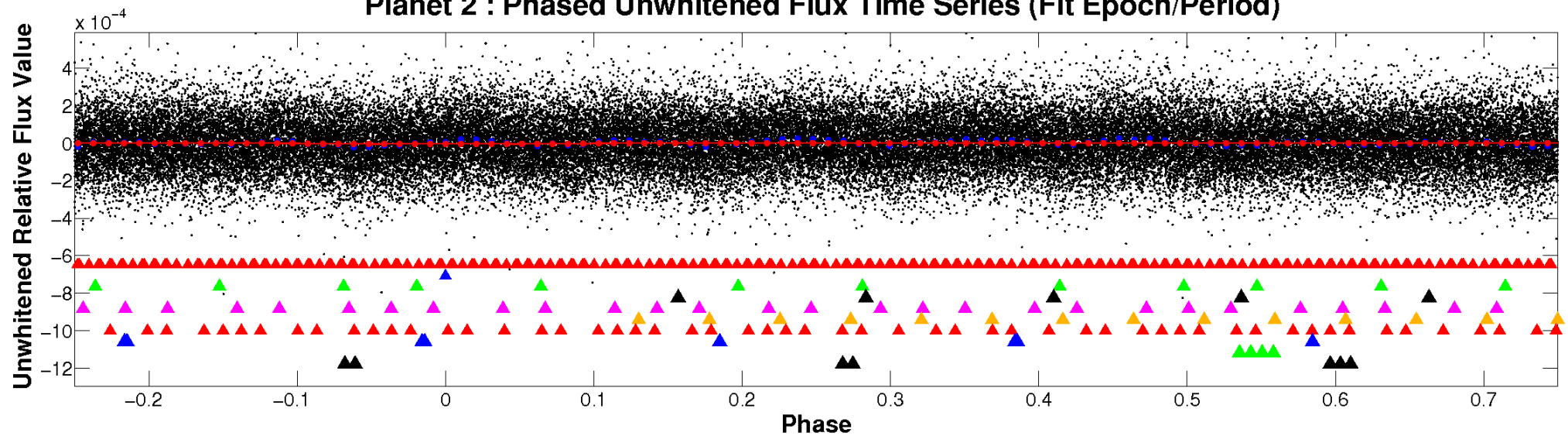
ALT Odd/Even

TCE 002014991-02

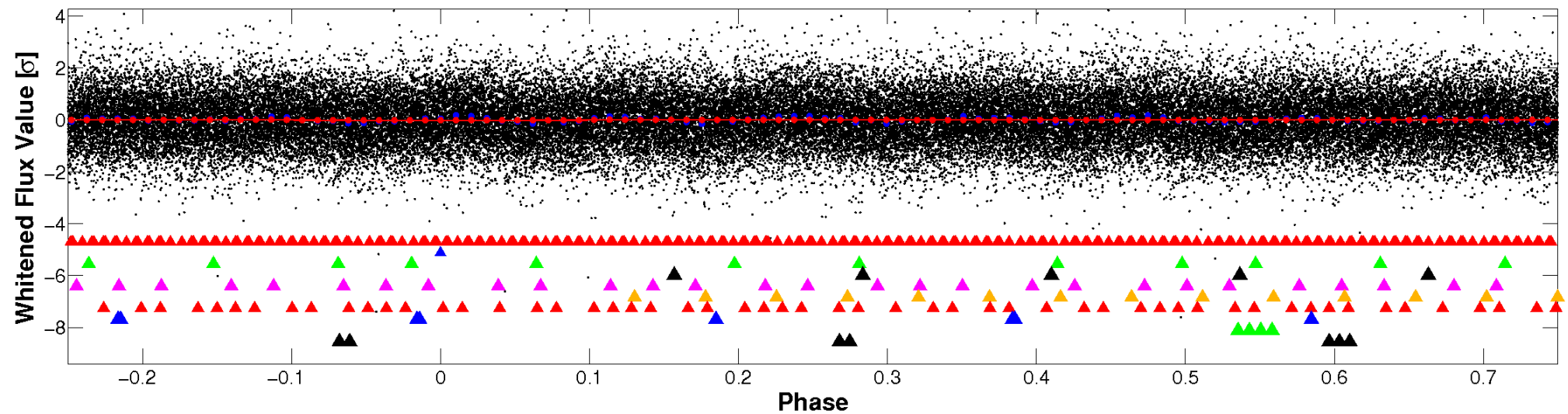


Non-Whitened Vs. Whitened Light Curve

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

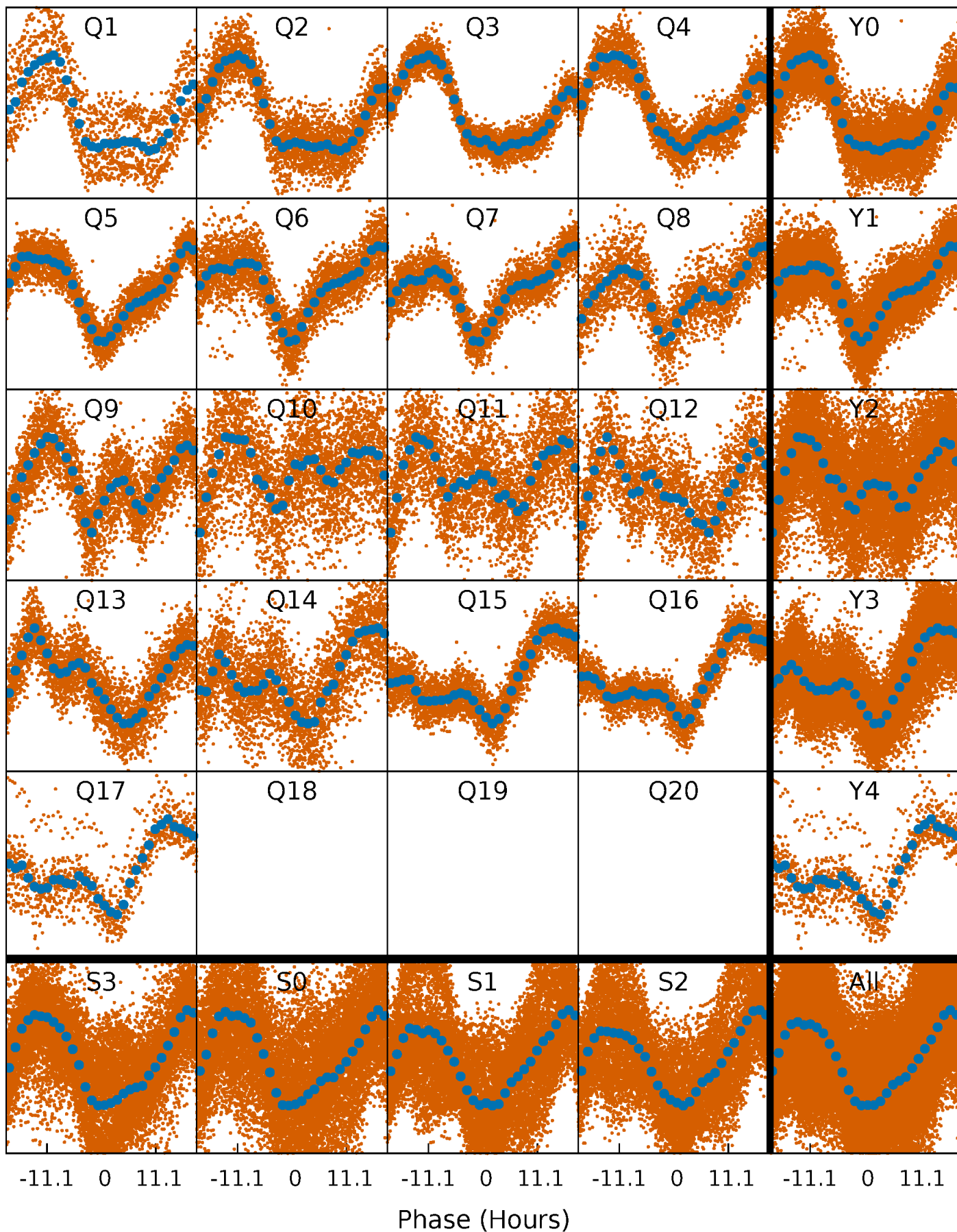


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



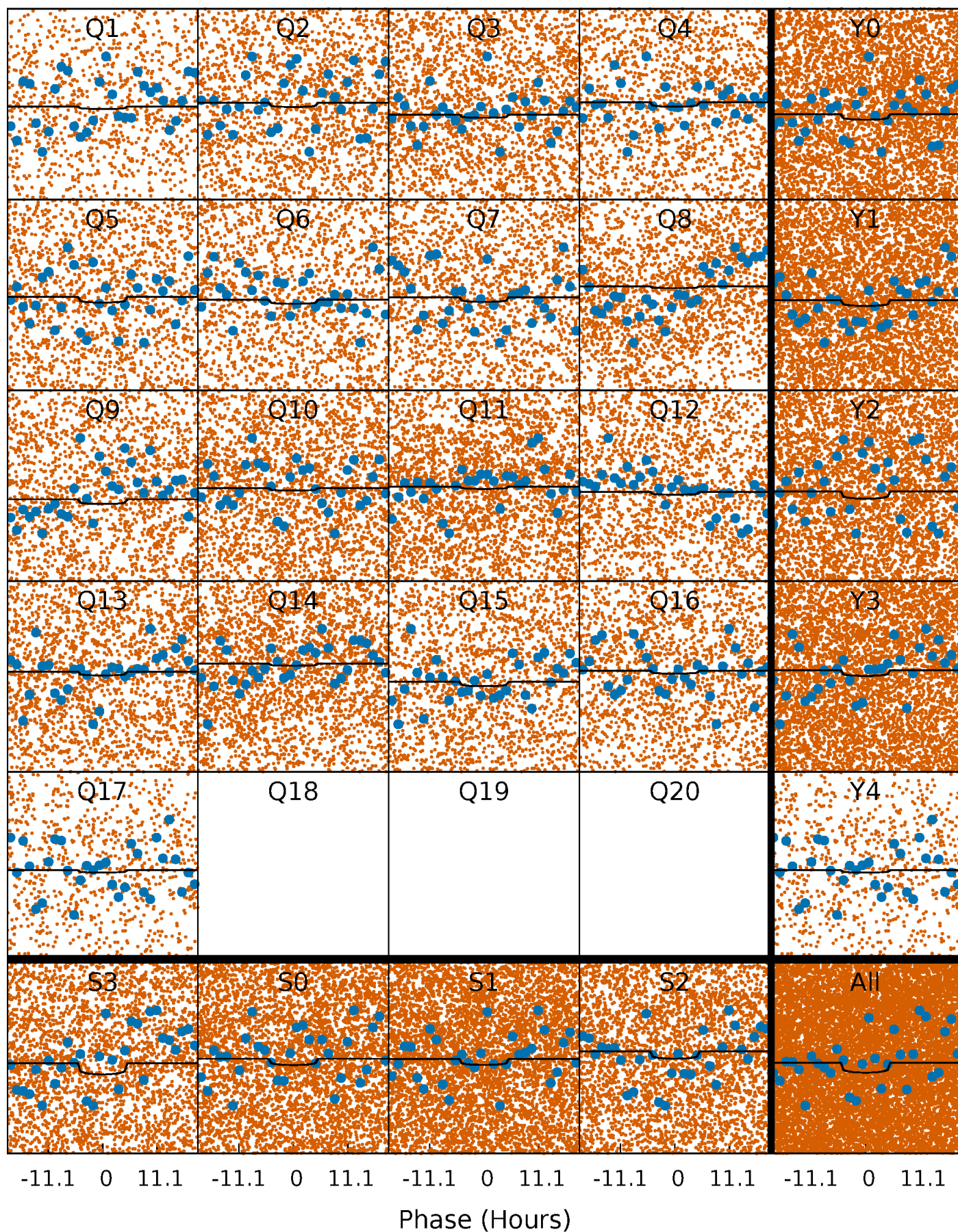
PDC Quarter-Phased Transit Curves

TCE 002014991-02 P= 1.979831 Days $T_0=132.575846$ (BKJD)



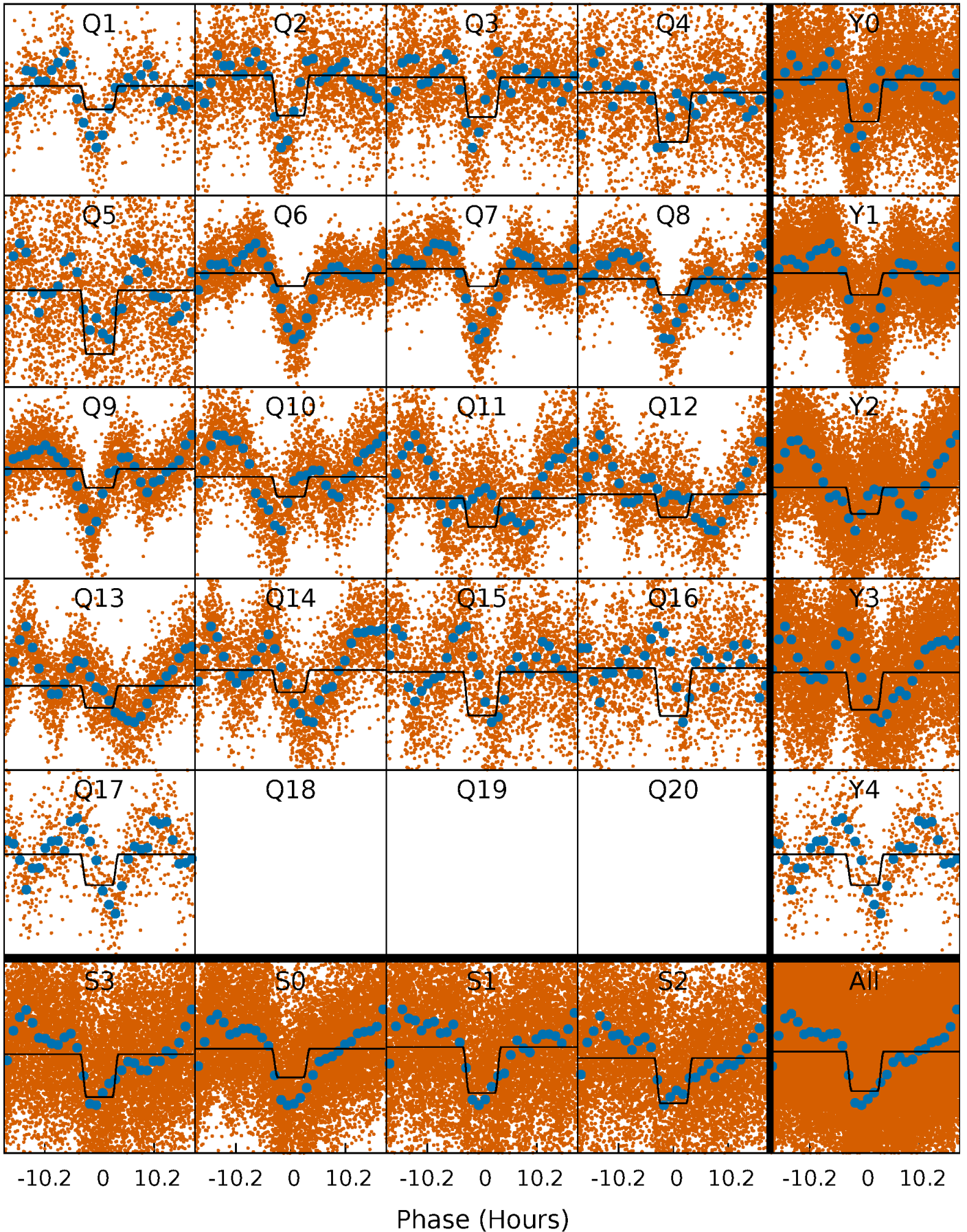
DV Quarter-Phased Transit Curves

TCE 002014991-02 P= 1.979831 Days $T_0=132.575846$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

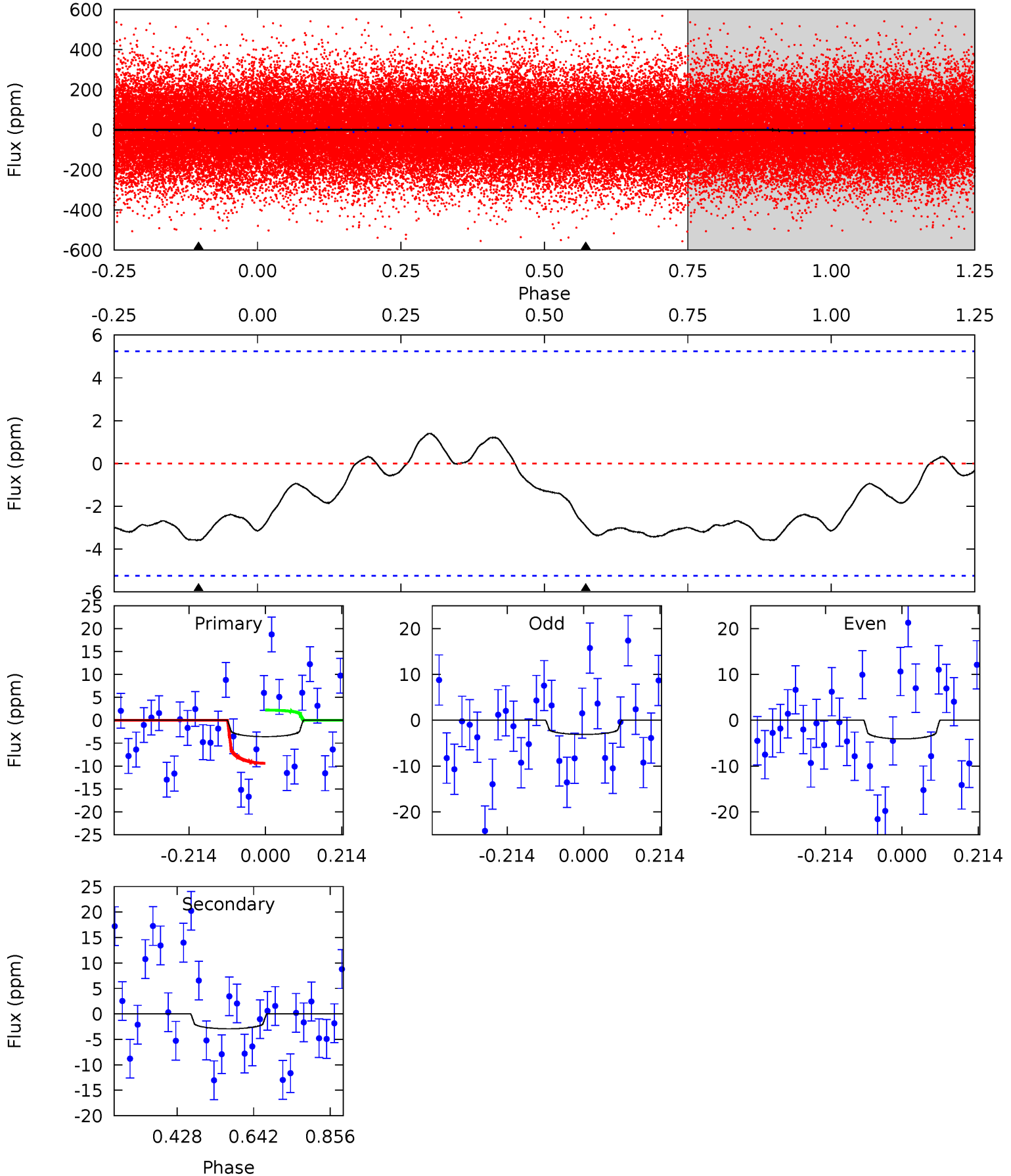
TCE 002014991-02 P= 1.980001 Days $T_0=132.482724$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-02, P = 1.979831 Days, E = 130.596015 Days

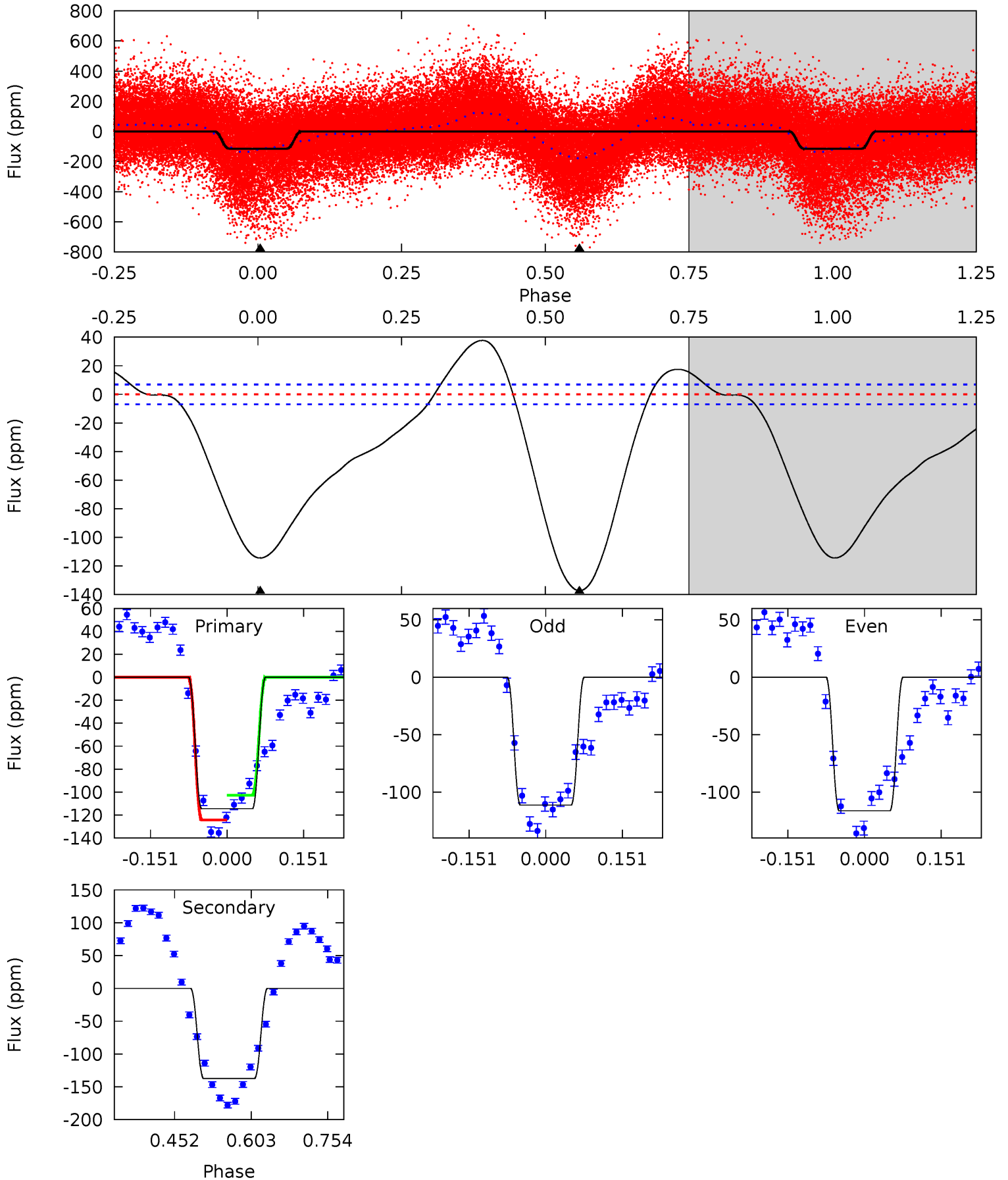
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.01	2.46	0	0	4.40	1.24	0.73	3.01	3.01	2.46	2.46	0.41	1.04	0.28	3.00



Alt Model-Shift Uniqueness Test

002014991-02, P = 1.980001 Days, E = 130.502723 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
73.6	88.3	0	0	4.48	1.44	15.9	73.6	73.6	88.3	88.3	1.59	1.54	0.22	7.43



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3 ± 1	$0.69^{+0.50}_{-0.39}$	3572^{+205}_{-313}	5388^{+3026}_{-1222}	$3.979^{+17.054}_{-2.709}$
Alt.	-137 ± 2	$3.16^{+0.66}_{-0.72}$	3584^{+197}_{-325}	6943^{+727}_{-563}	$9.823^{+6.300}_{-2.907}$

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 $A_{obs} \gg 1.0$

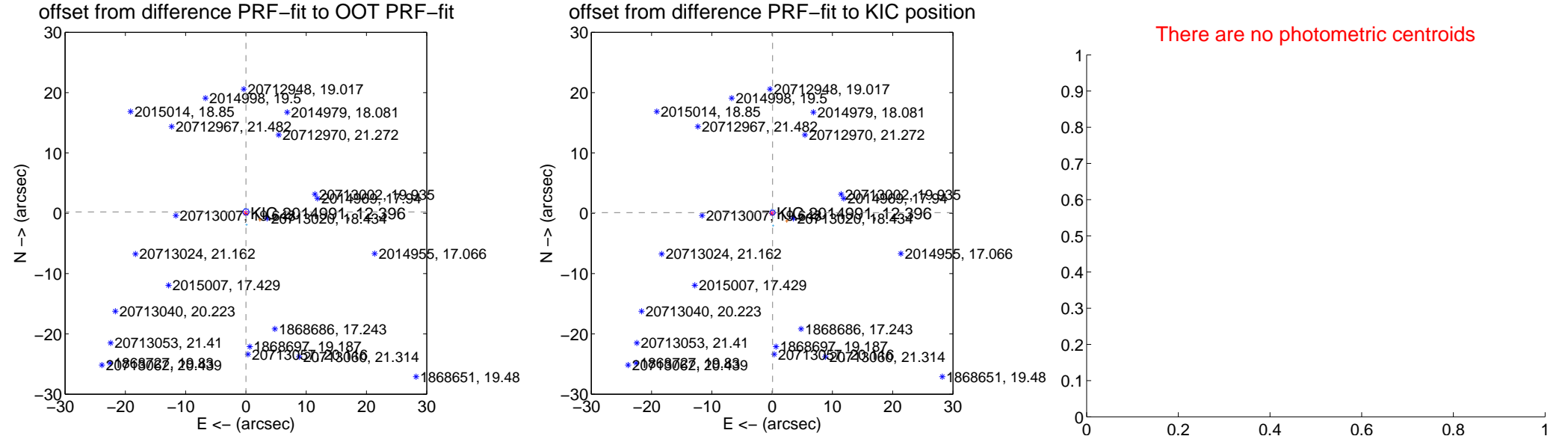
DV Centroid Data

Supplemental centroid analysis for 002014991-02. Kepler magnitude: 12.40. Transit SNR 1.64

There are 16 quarters with good PRF difference image offsets

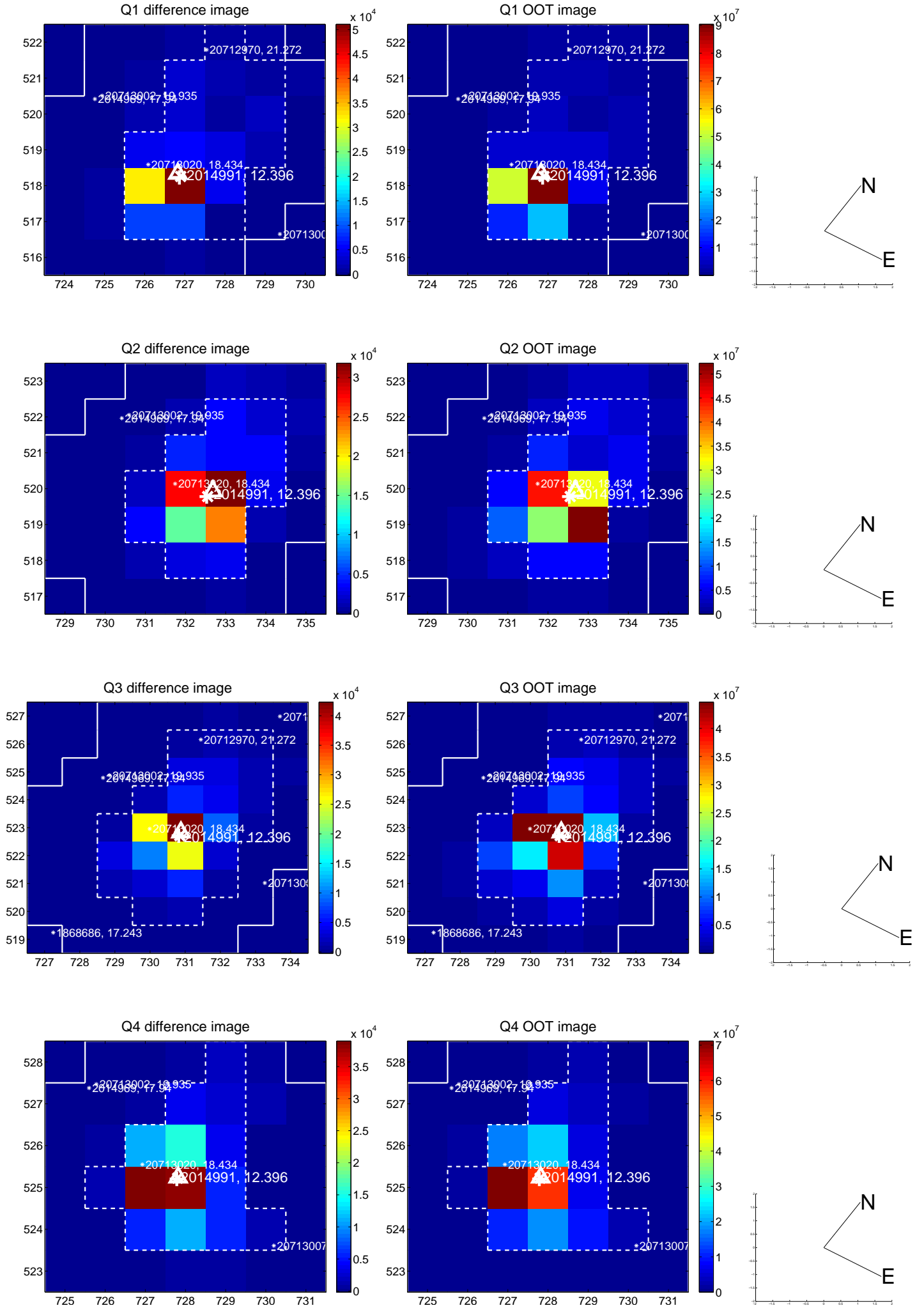
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.219 ± 0.170	1.29	-0.007 ± 0.151	0.219 ± 0.171
PRF-fit source offset from KIC position	0.132 ± 0.144	0.92	-0.075 ± 0.154	0.109 ± 0.182
photometric centroid source offset	—	—	—	—

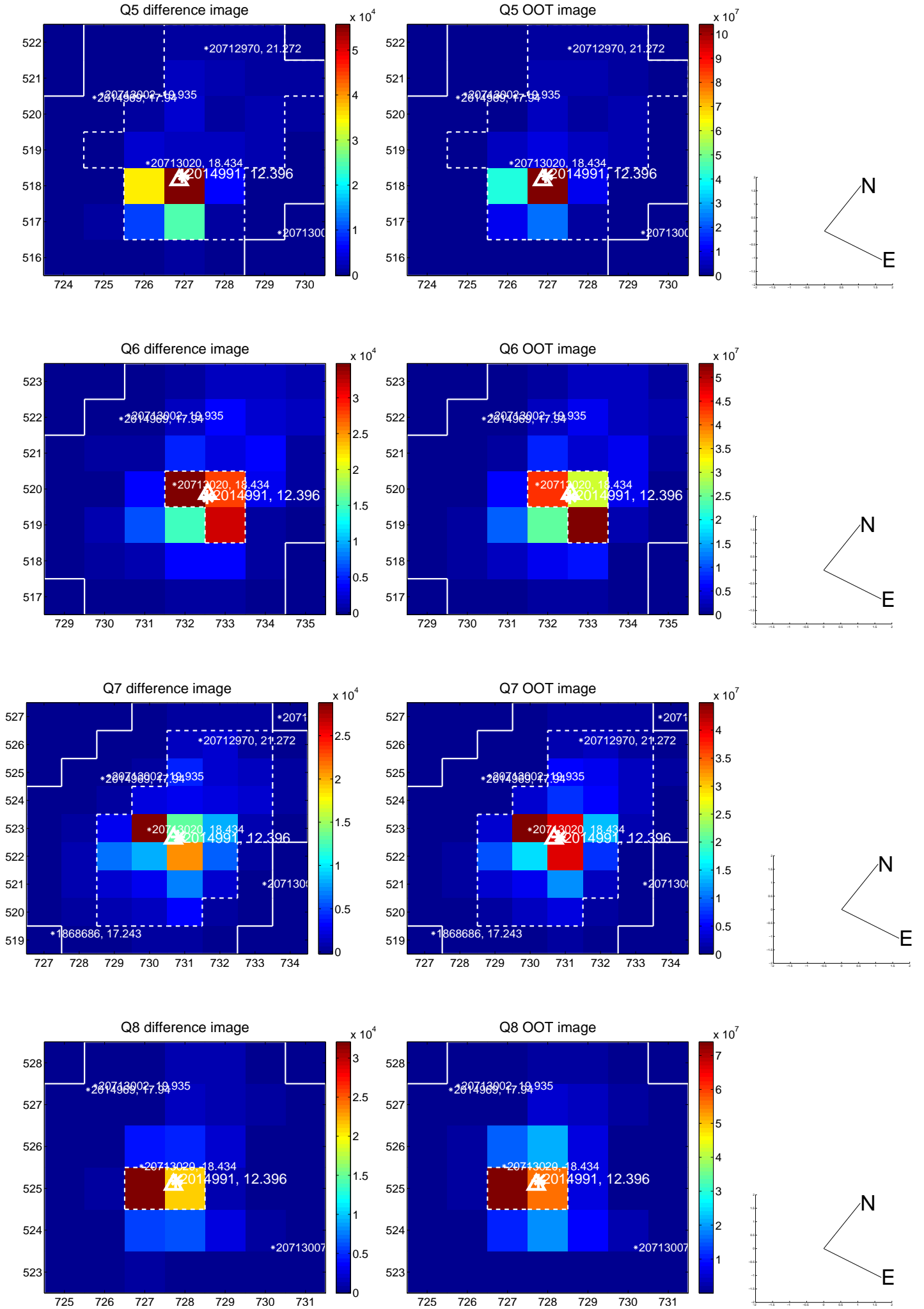


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

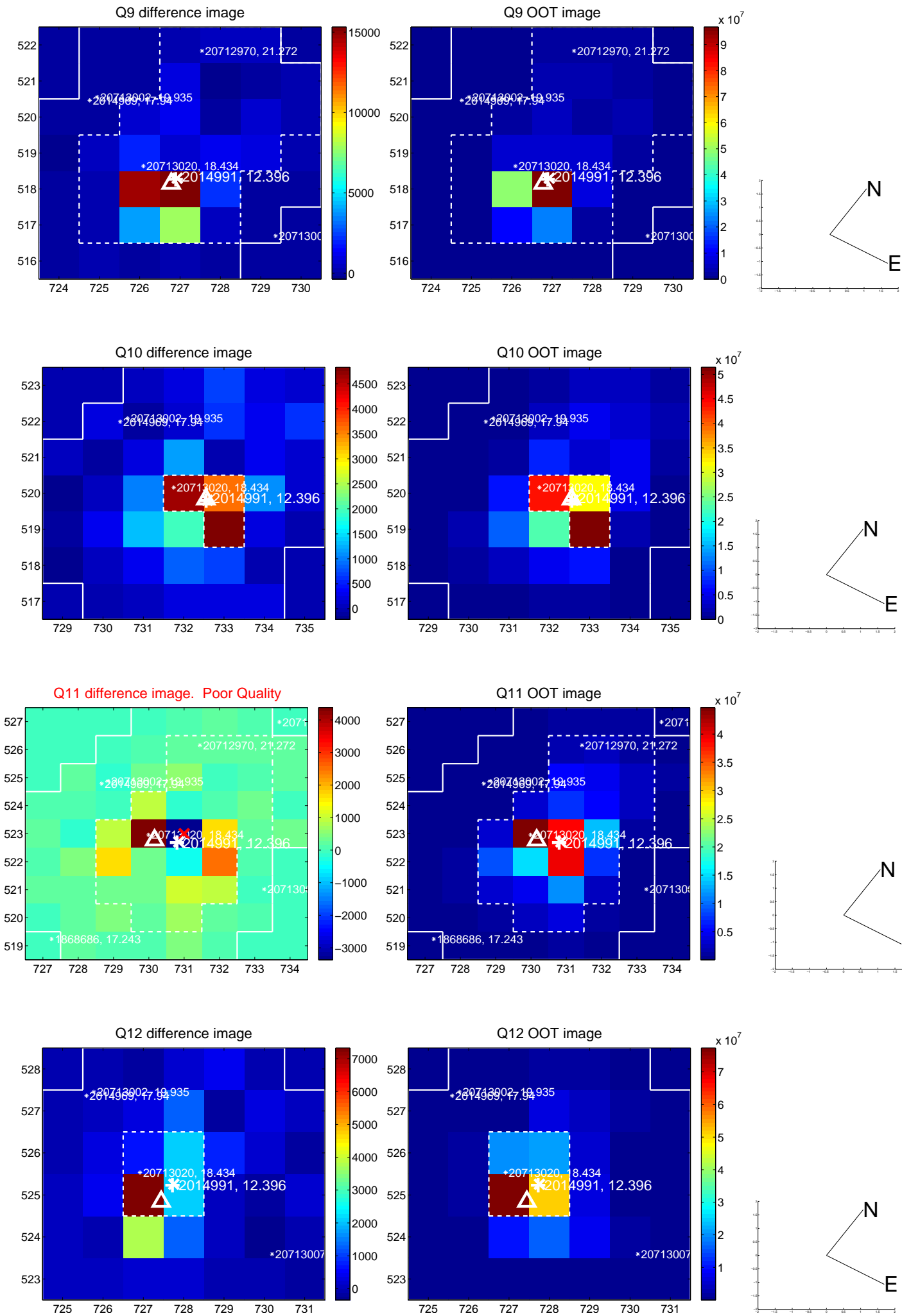
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



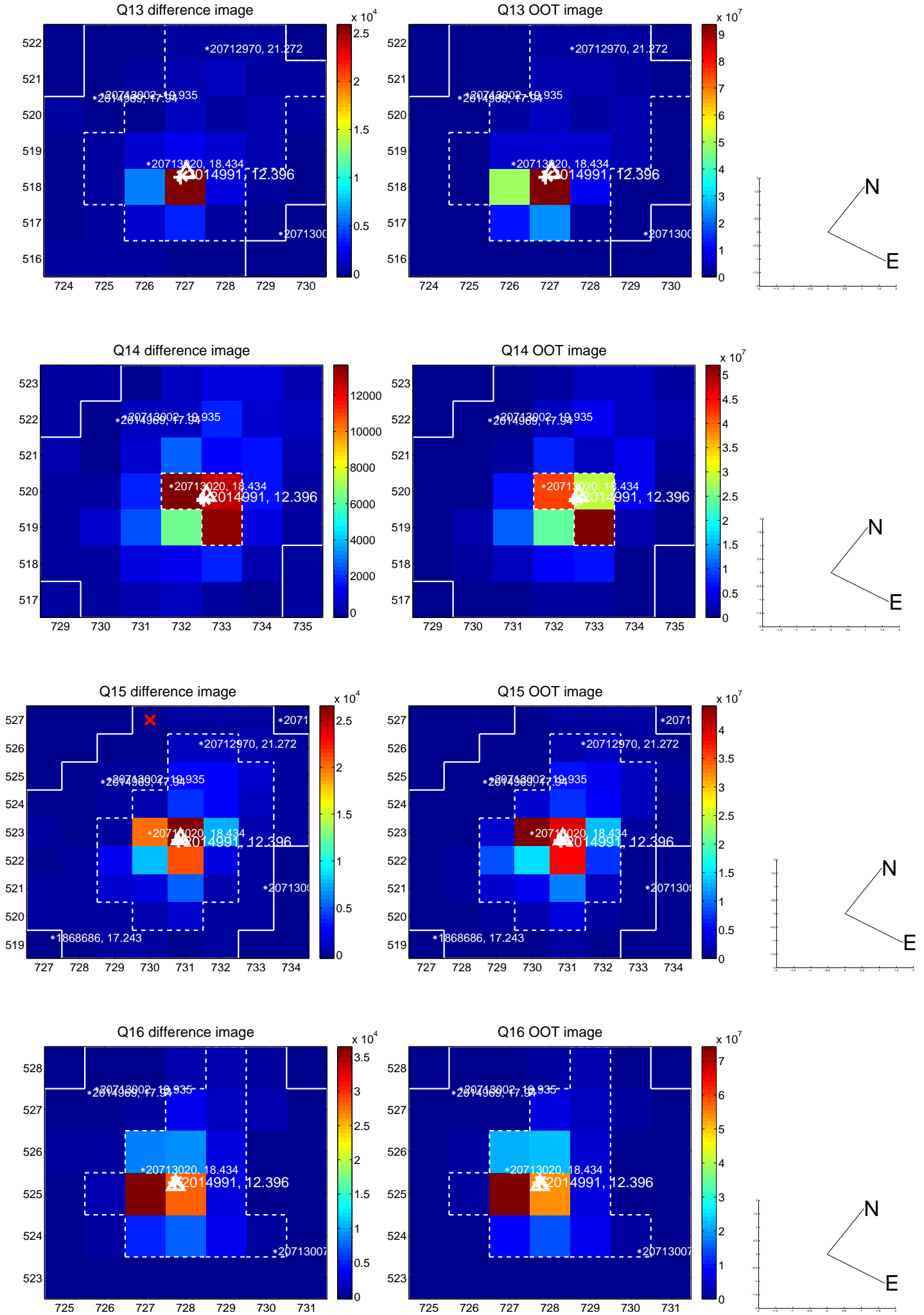
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



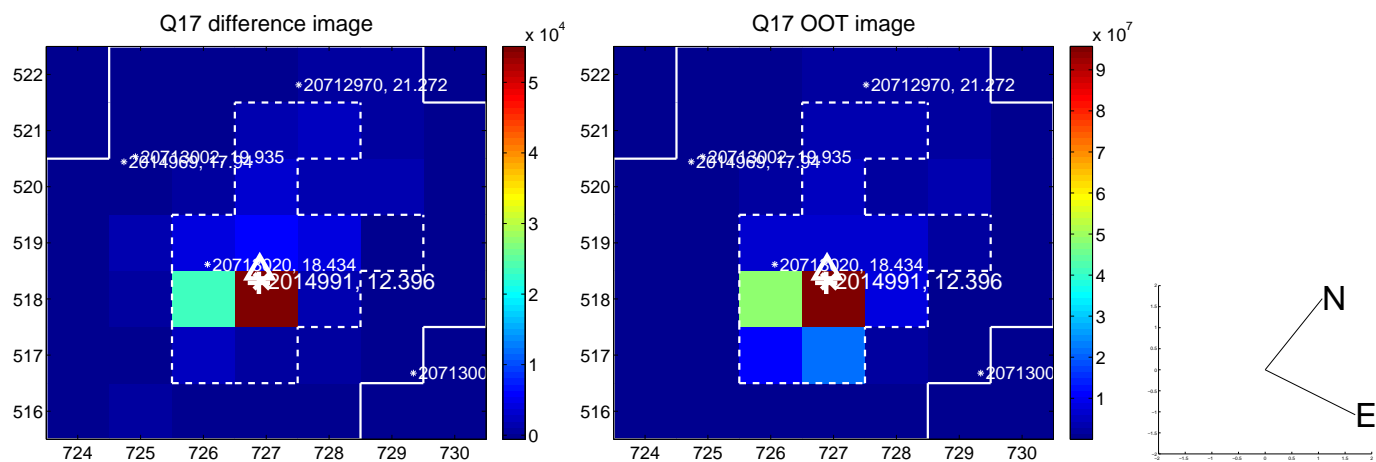
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

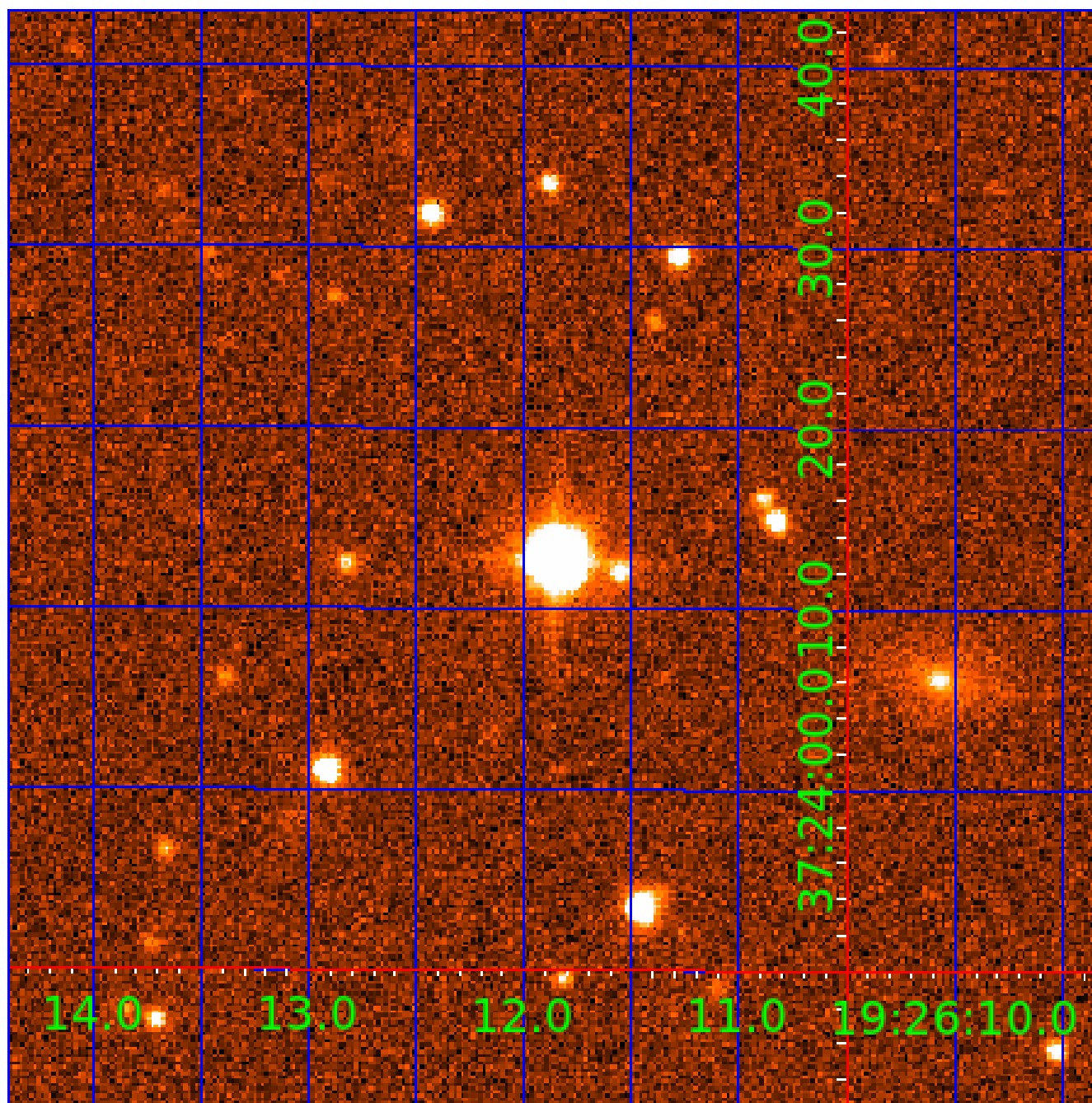


folded centroid time series figure for this object.



UKIRT Image

Declination



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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
002014991-08	OBS	No	175.413692	189.562425	164.3	6.160	7.5	6.2	3.05	6418	4.43	28.13
002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQU_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQU_DV—MOD_NONUNIQU_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQU_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQU_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQU_DV—MOD_NONUNIQU_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQU_DV—MOD_NONUNIQU_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQU_DV—MOD_NONUNIQU_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQU_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQU_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

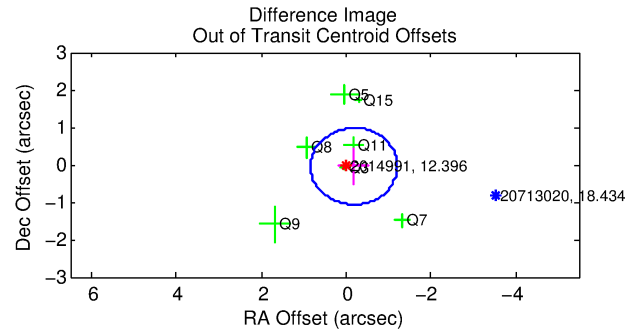
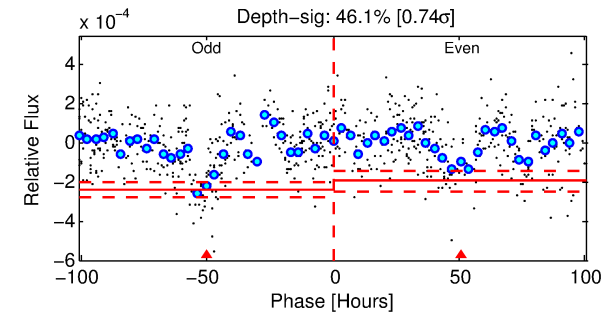
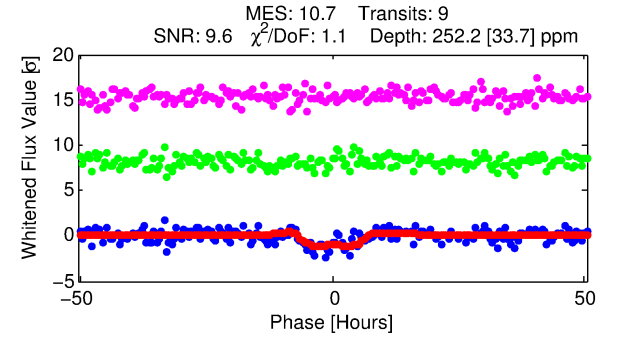
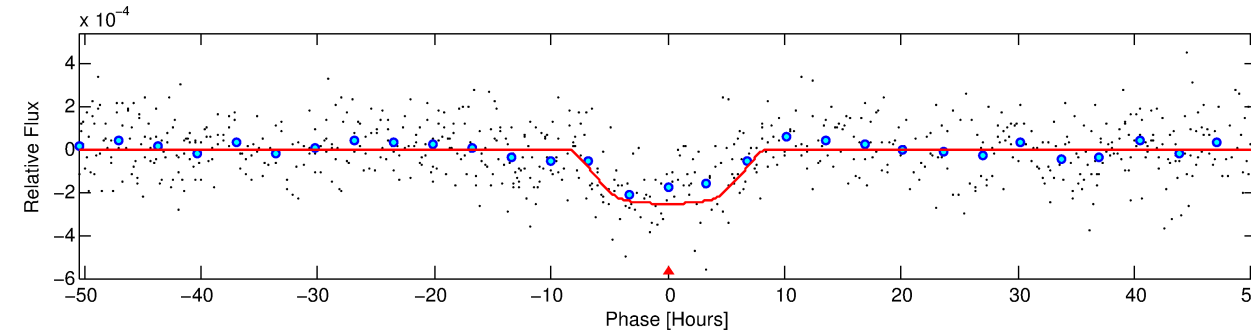
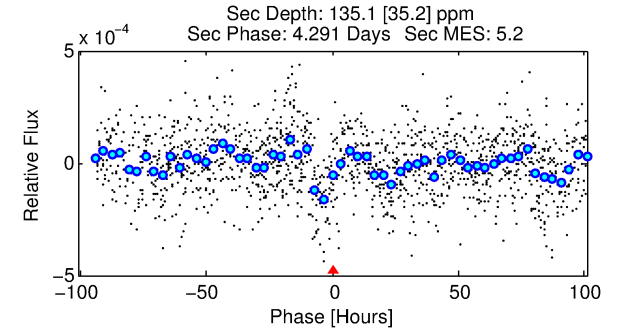
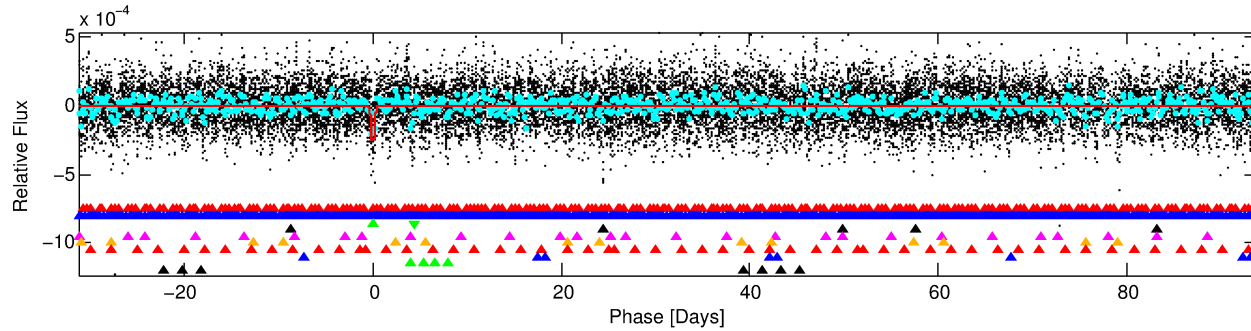
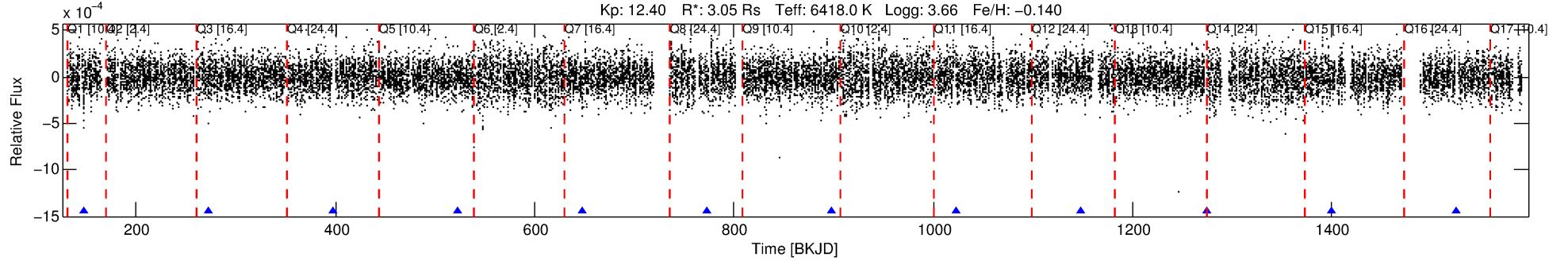
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002014991-03

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 3 of 10 Period: 125.158 d
KOI: K02178 Corr: No Ephemeris Match



DV Fit Results:

Period = 125.15846 [0.00436] d
Epoch = 147.5179 [0.0237] BKJD
Rp/R* = 0.0188 [0.0015]
a/R* = 17.43 [2.67]
b = 0.97 [0.01]
Seff = 44.12 [23.72]
Teq = 657 [88] K
Rp = 6.27 [2.34] Re
a = 0.5659 [0.1909] AU
Ag = 605.59 [368.40] [1.64σ]
Teffp = 5041 [408] K [10.50σ]

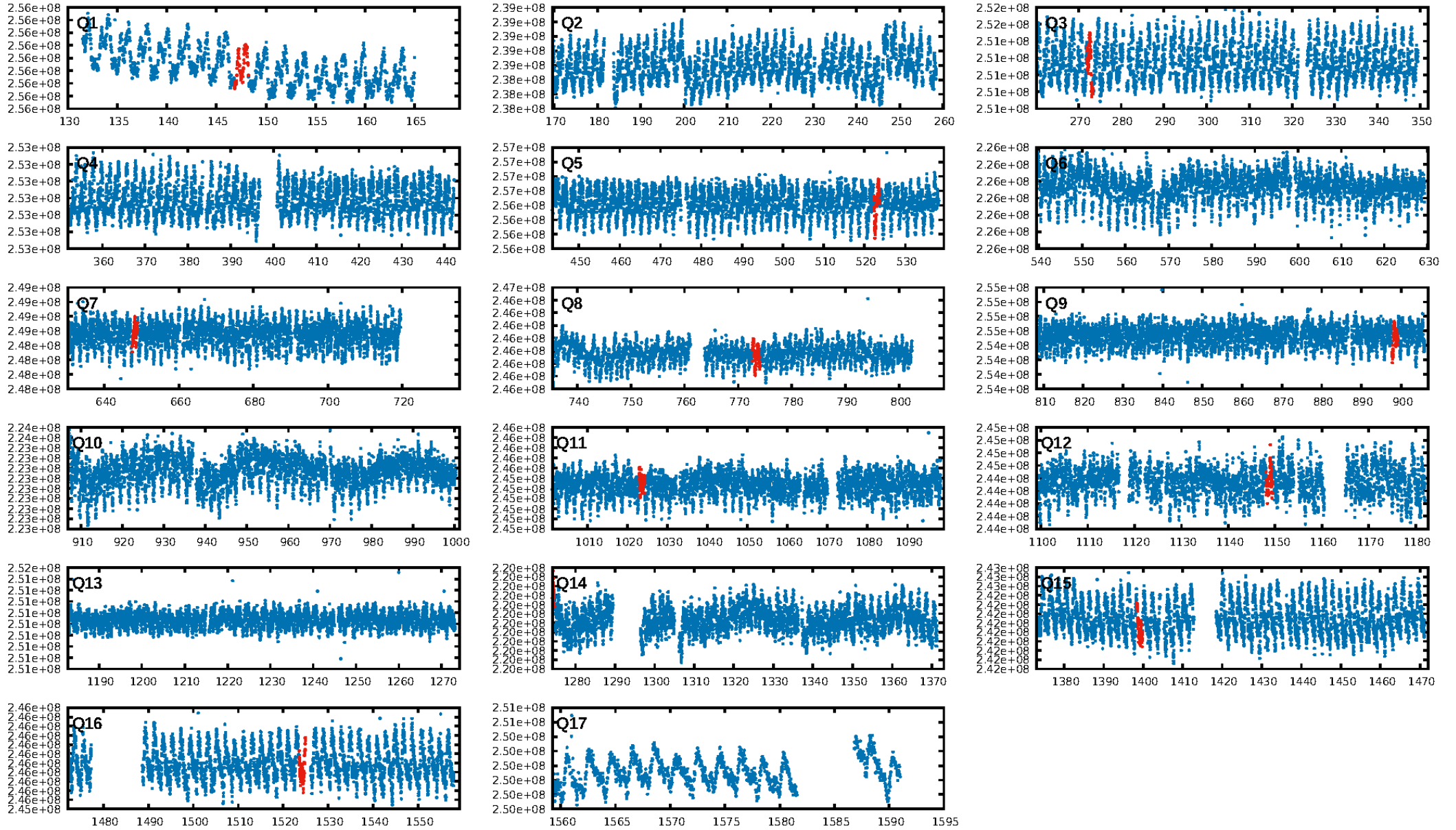
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [24.87σ]
LongPeriod-sig: 100.0% [67.29σ]
ModelChiSquare2-sig: 11.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: -3.921
Centroid-sig: 83.7%
Centroid-so: 0.281 arcsec [0.56σ]
OotOffset-rm: 0.195 arcsec [0.57σ]
KicOffset-rm: 0.357 arcsec [0.97σ]
OotOffset-st: 0/4/1/2 [7]
KicOffset-st: 0/4/1/2 [7]
DiffImageQuality-fgm: 0.43 [3/7]
DiffImageOverlap-fno: 0.00 [0/9]

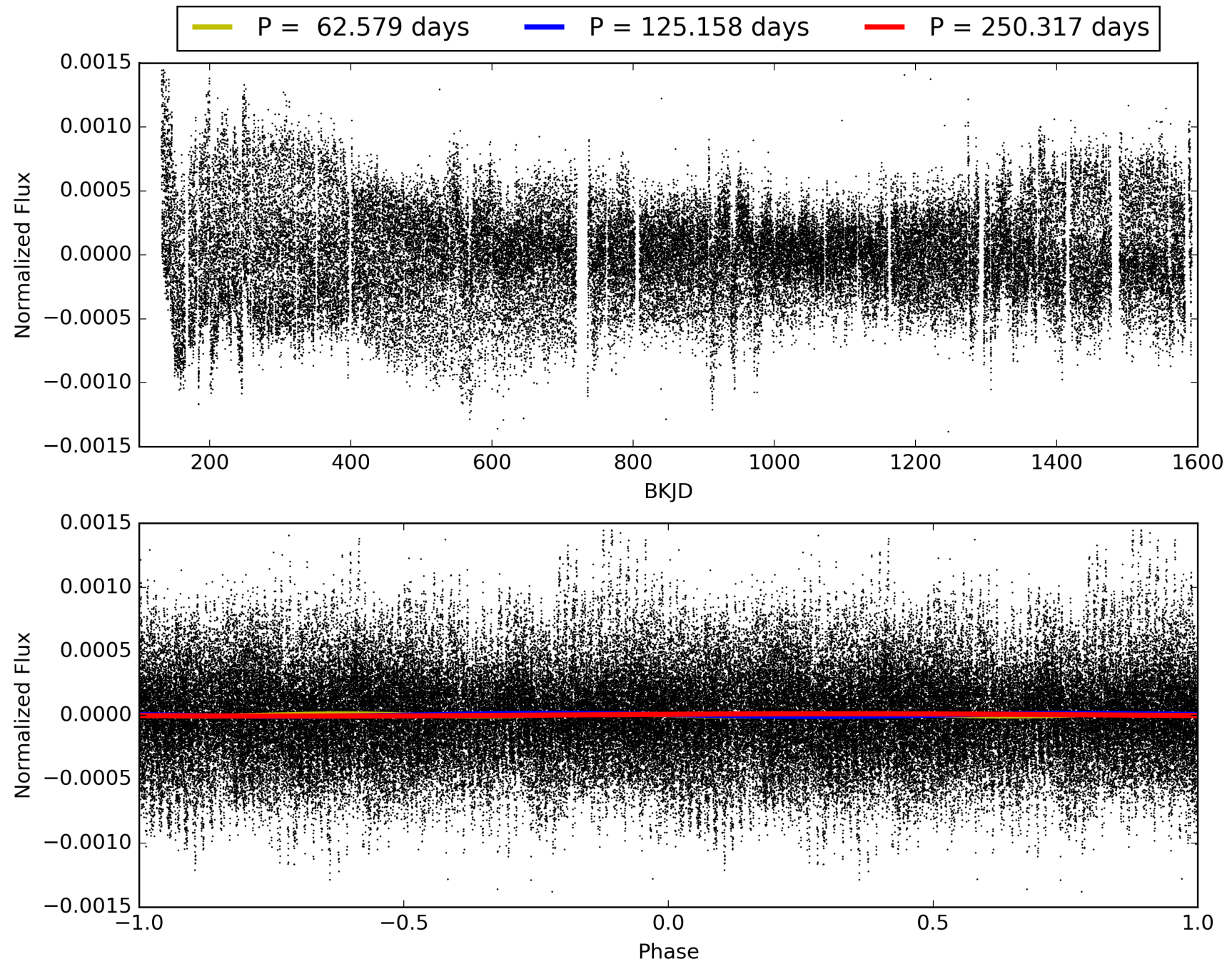
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:52:33 Z

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

TCE 002014991-03, PDC Light Curves

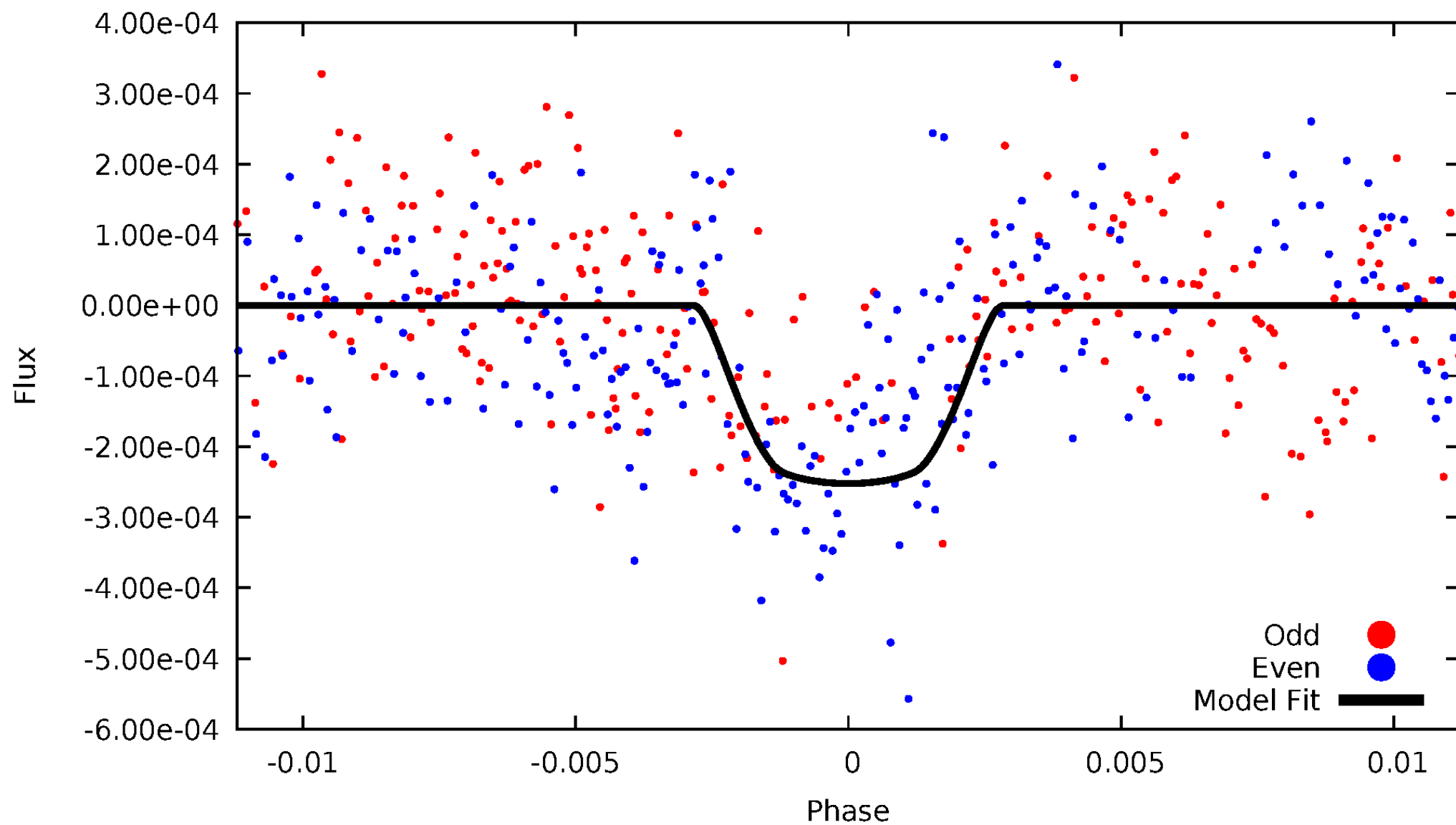


TCE 002014991-03



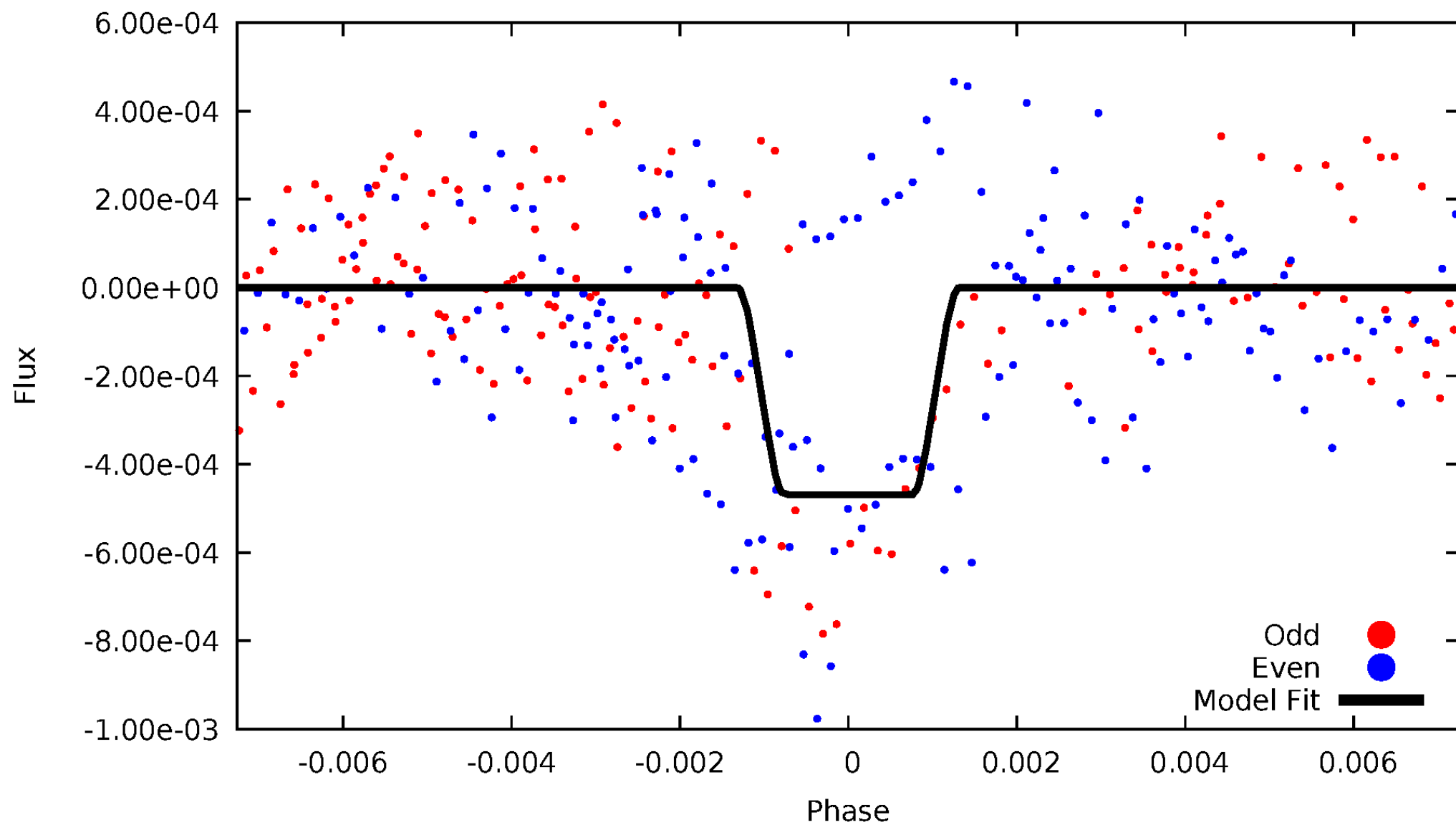
DV Odd/Even

TCE 002014991-03



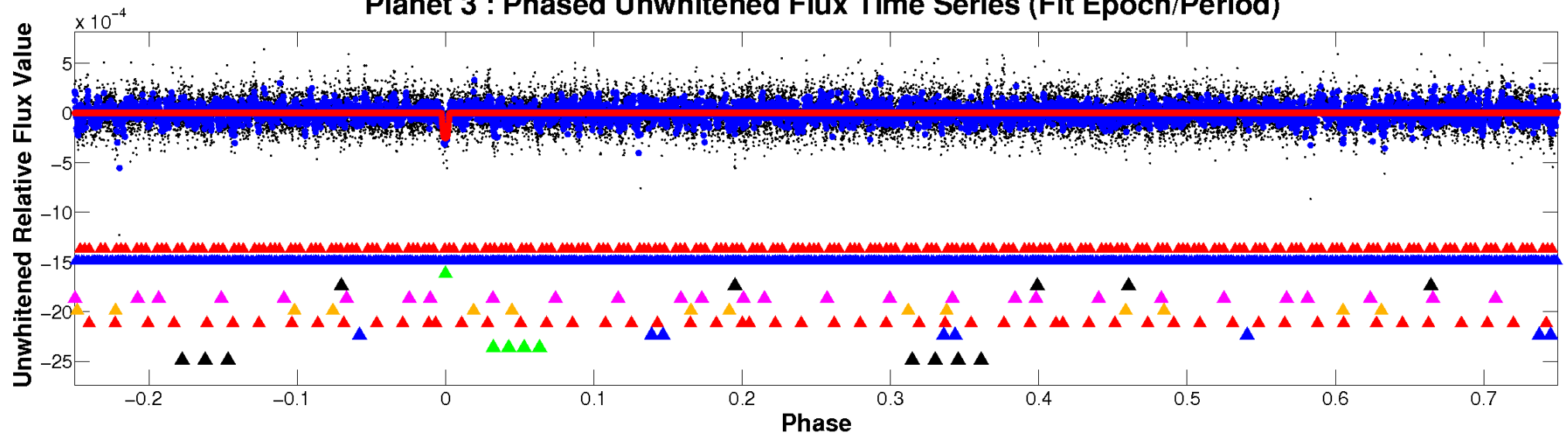
ALT Odd/Even

TCE 002014991-03

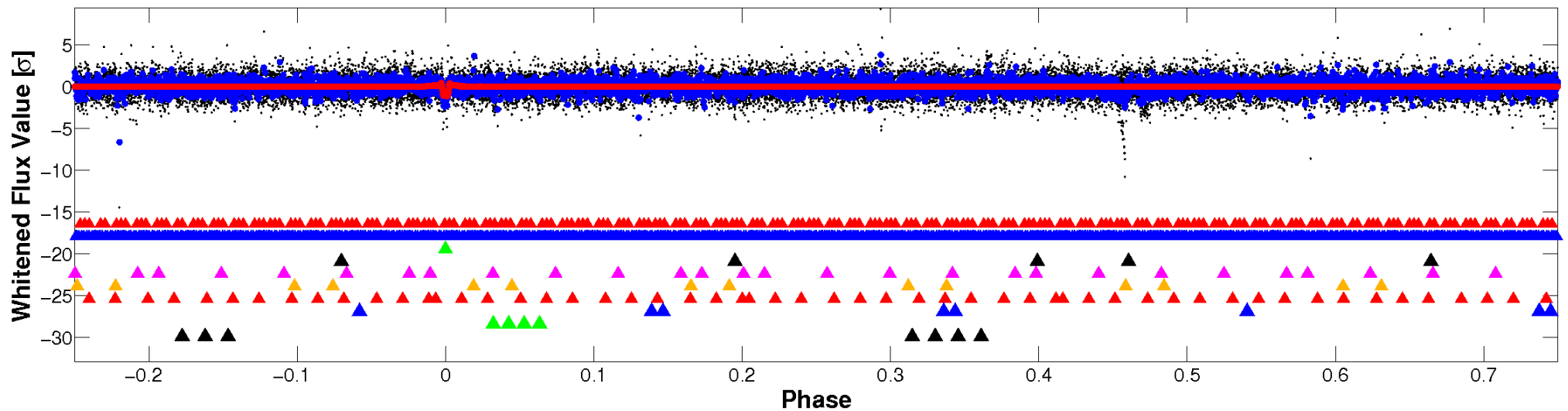


Non-Whitened Vs. Whitened Light Curve

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

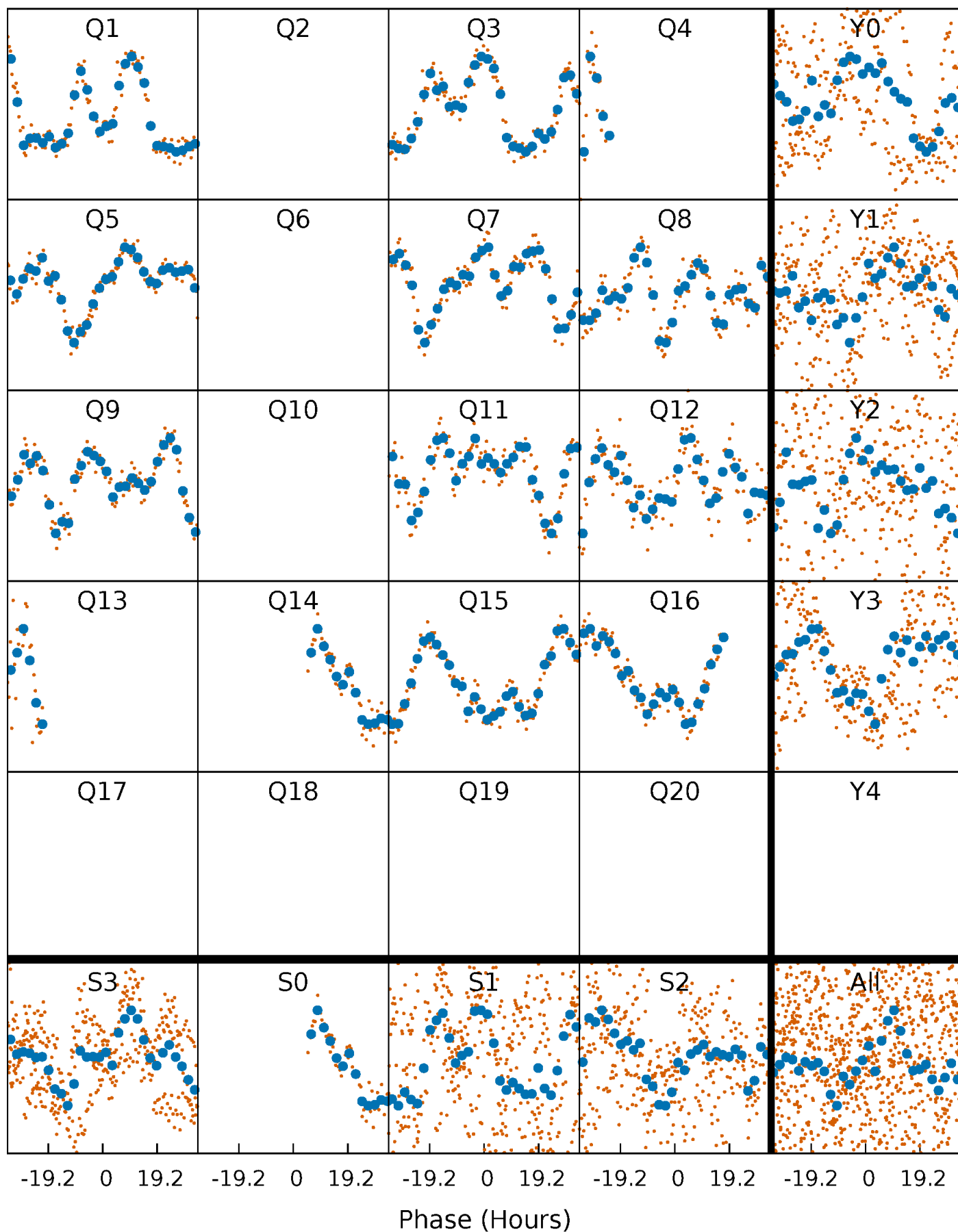


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



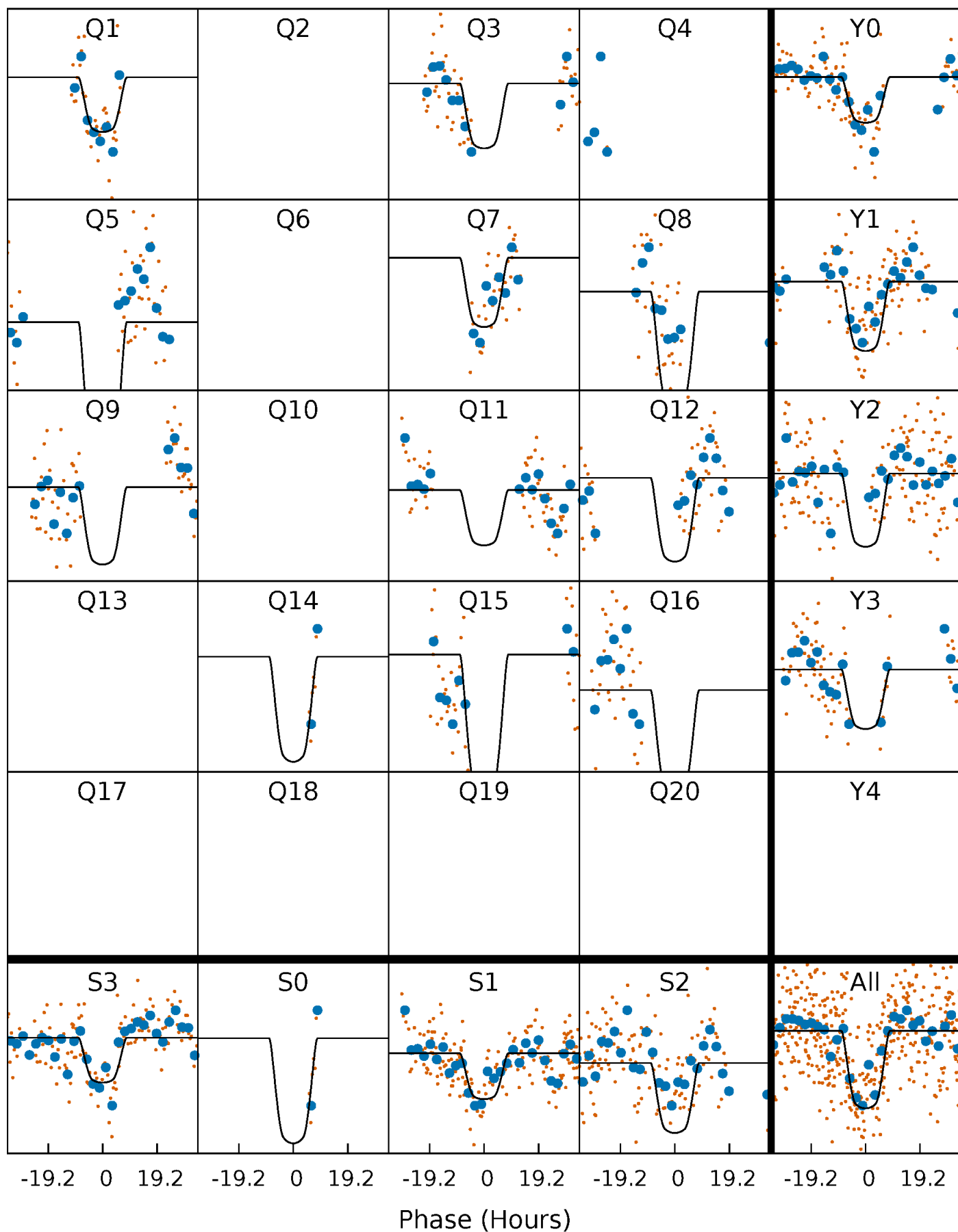
PDC Quarter-Phased Transit Curves

TCE 002014991-03 P=125.158456 Days $T_0=147.517921$ (BKJD)



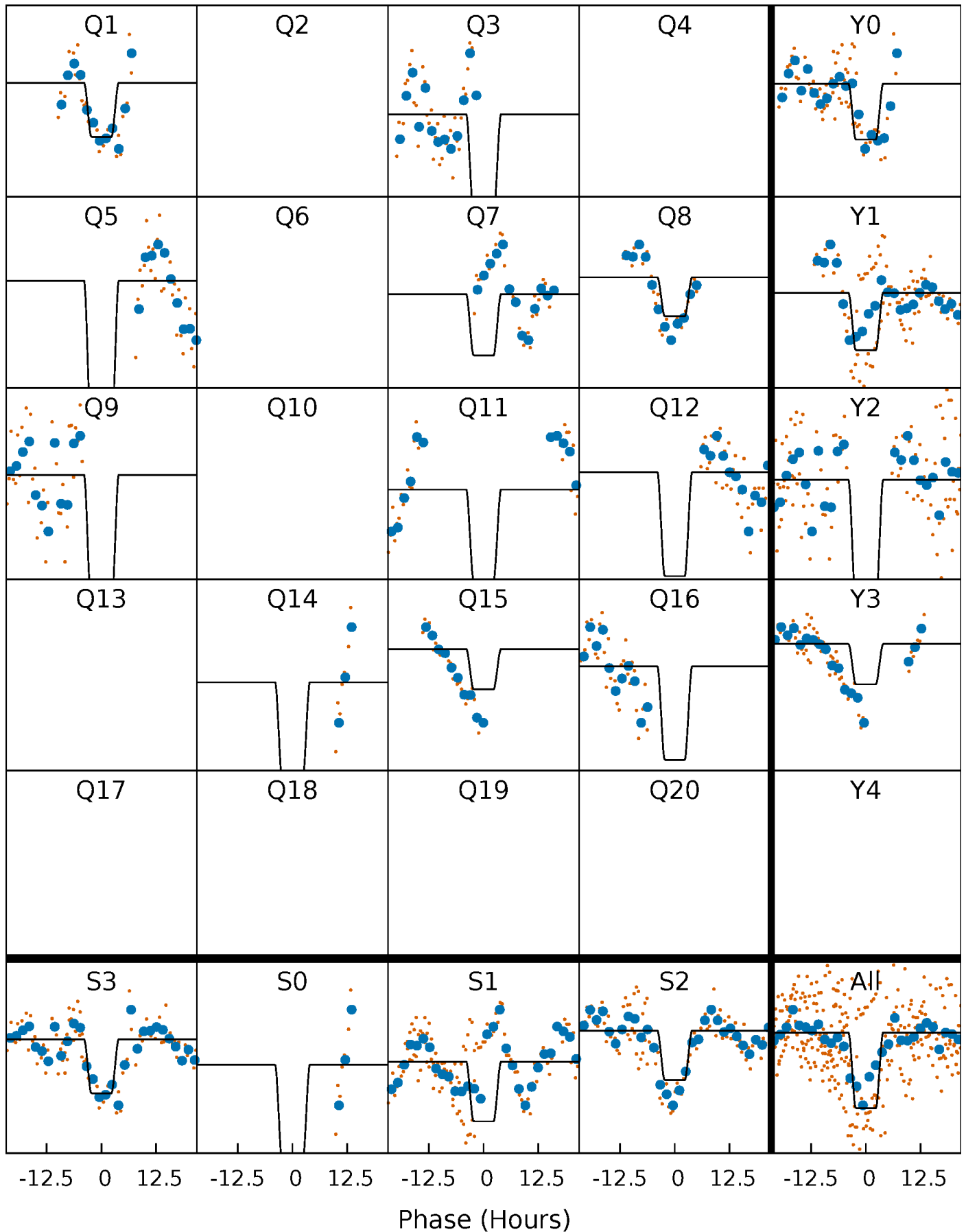
DV Quarter-Phased Transit Curves

TCE 002014991-03 P=125.158456 Days $T_0=147.517921$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

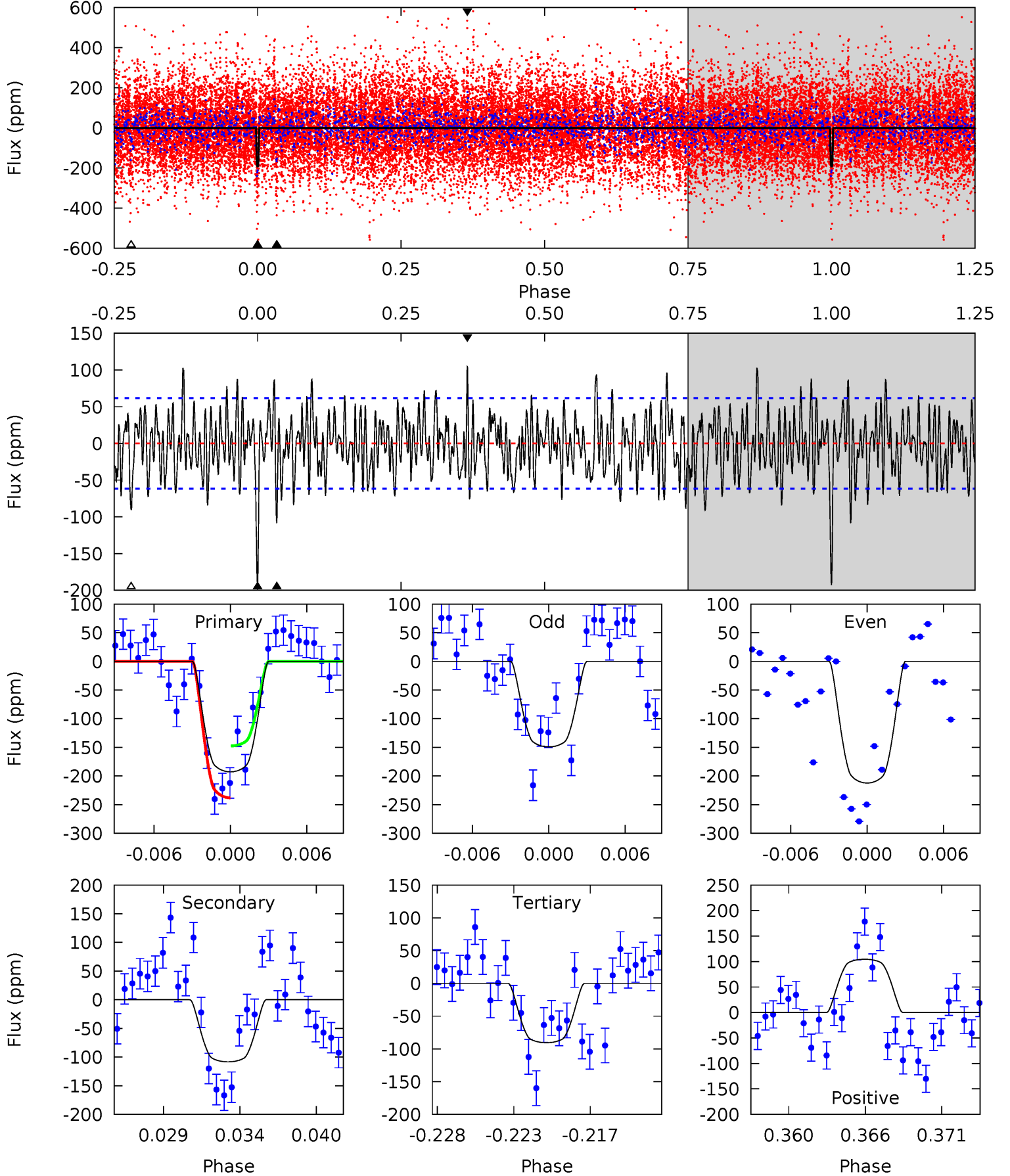
TCE 002014991-03 P=125.141933 Days $T_0=147.472400$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-03, $P = 125.158456$ Days, $E = 22.359465$ Days

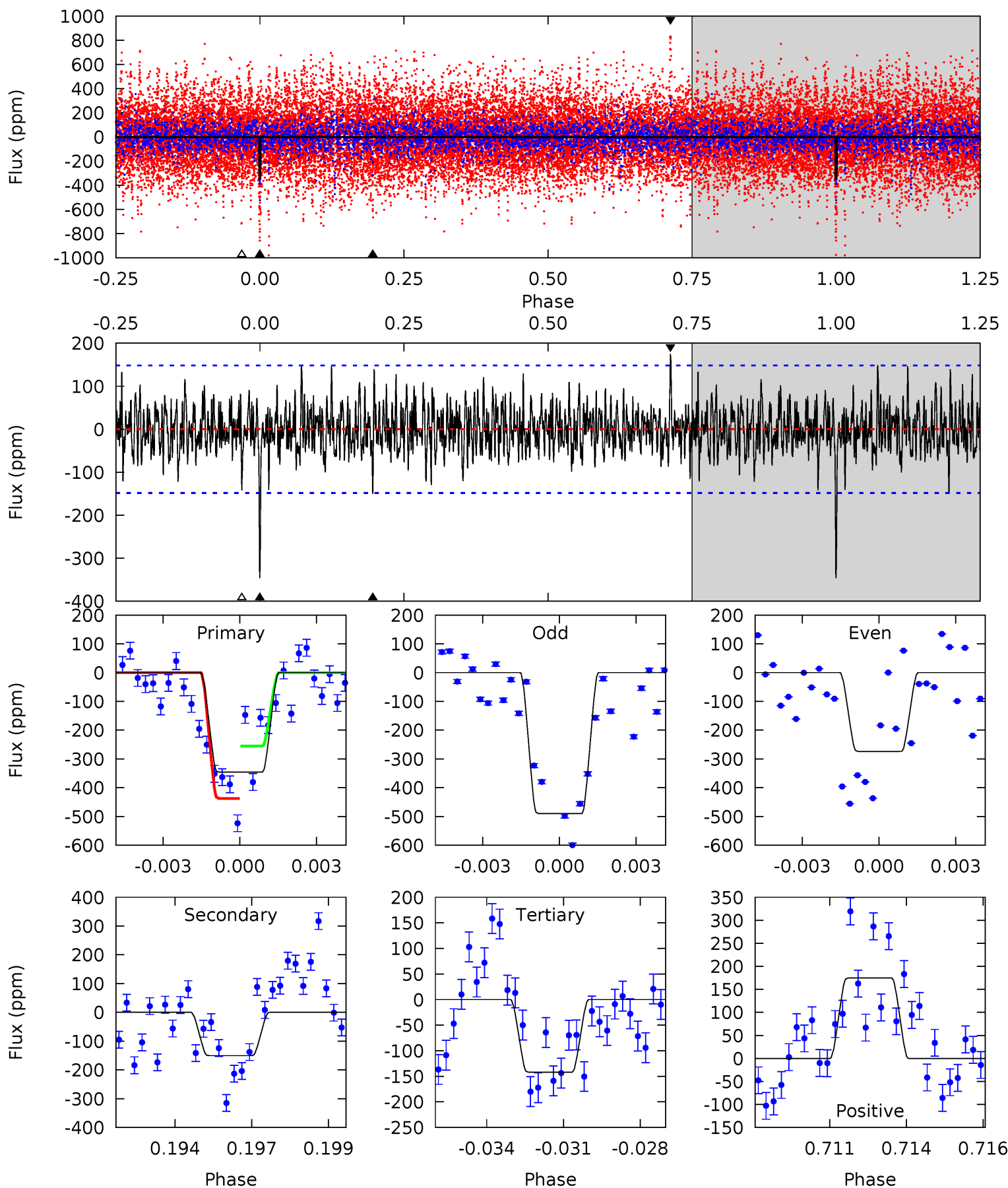
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	9.01	7.53	8.69	5.13	2.76	2.84	8.50	7.34	1.48	0.32	2.53	1.16	0.35	3.77



Alt Model-Shift Uniqueness Test

002014991-03, P = 125.141933 Days, E = 22.330467 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	5.36	5.06	6.23	5.28	3.01	1.56	7.27	6.11	0.30	-0.87	3.68	0.62	0.34	3.18



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-108 ± 12	$6.01^{+0.89}_{-1.16}$	900^{+50}_{-82}	4879^{+207}_{-218}	536^{+270}_{-133}
Alt.	-150 ± 28	$6.87^{+1.01}_{-1.31}$	896^{+50}_{-80}	4915^{+261}_{-267}	571^{+267}_{-158}

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 $A_{obs} \gg 1.0$

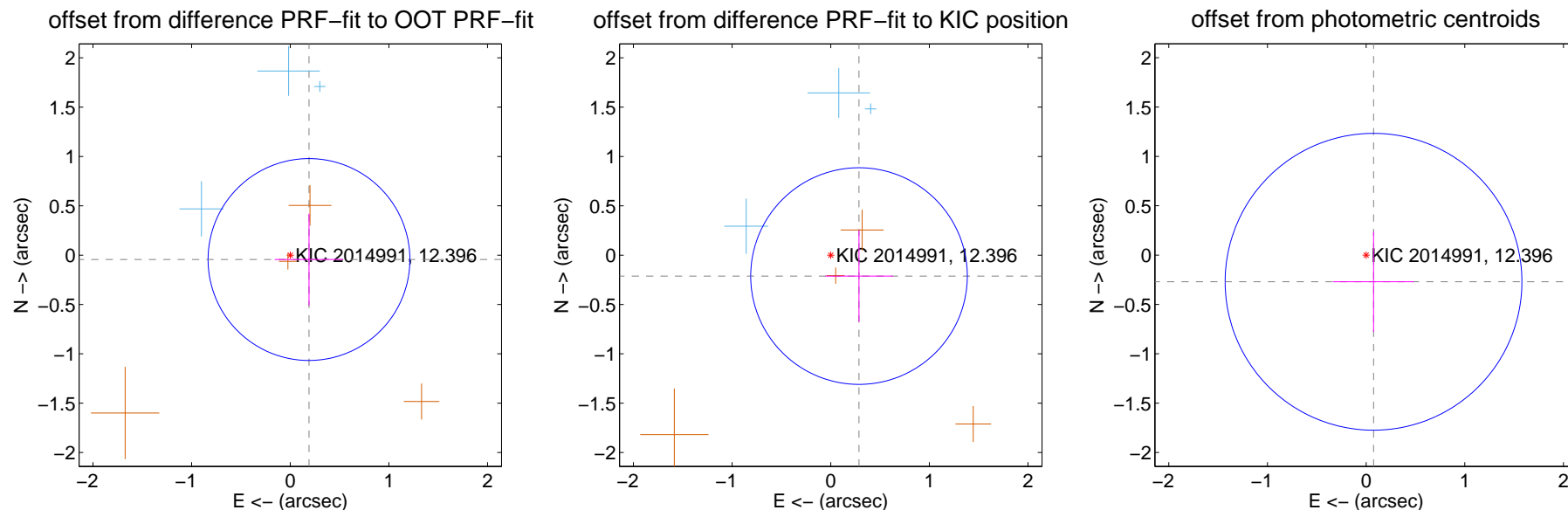
DV Centroid Data

Supplemental centroid analysis for 002014991-03. Kepler magnitude: 12.40. Transit SNR 9.60

There are 3 quarters with good PRF difference image offsets

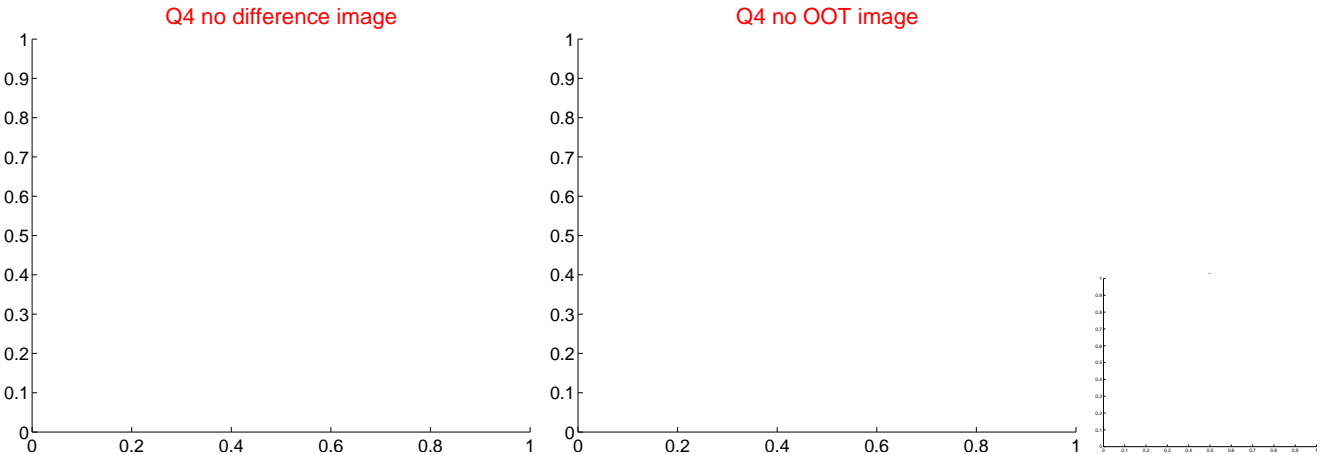
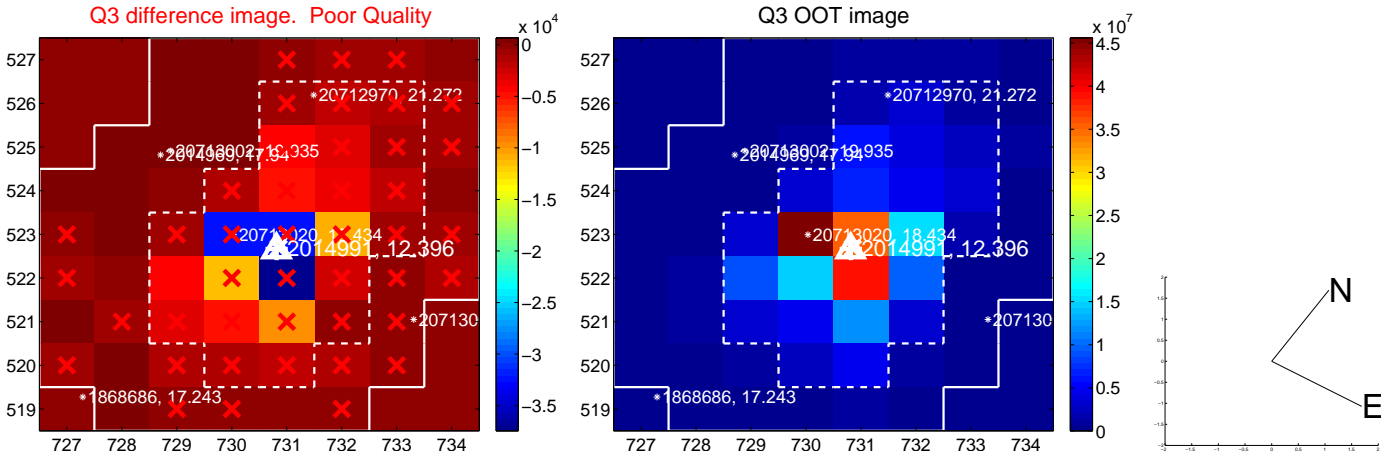
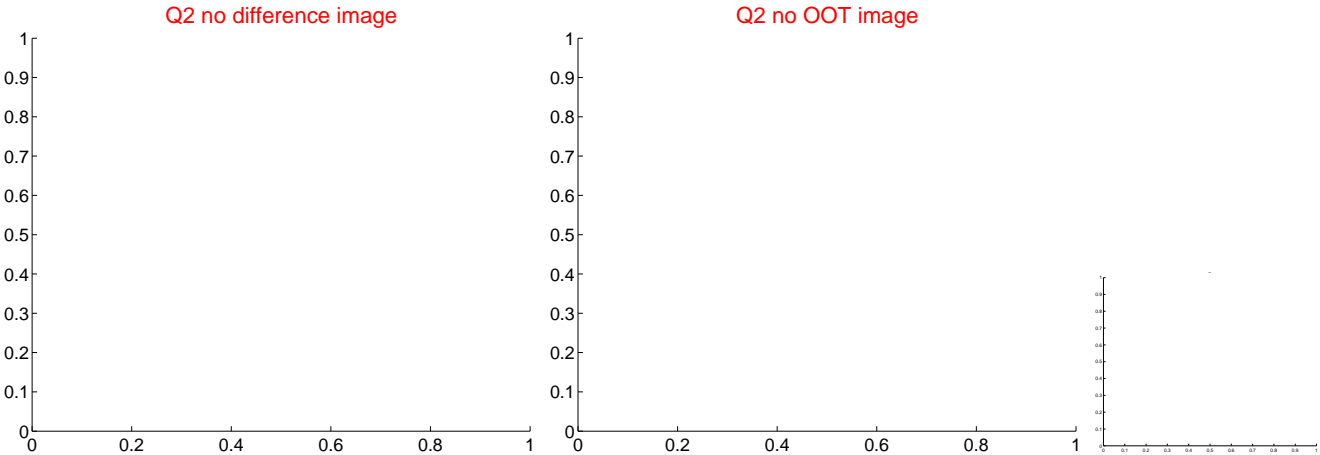
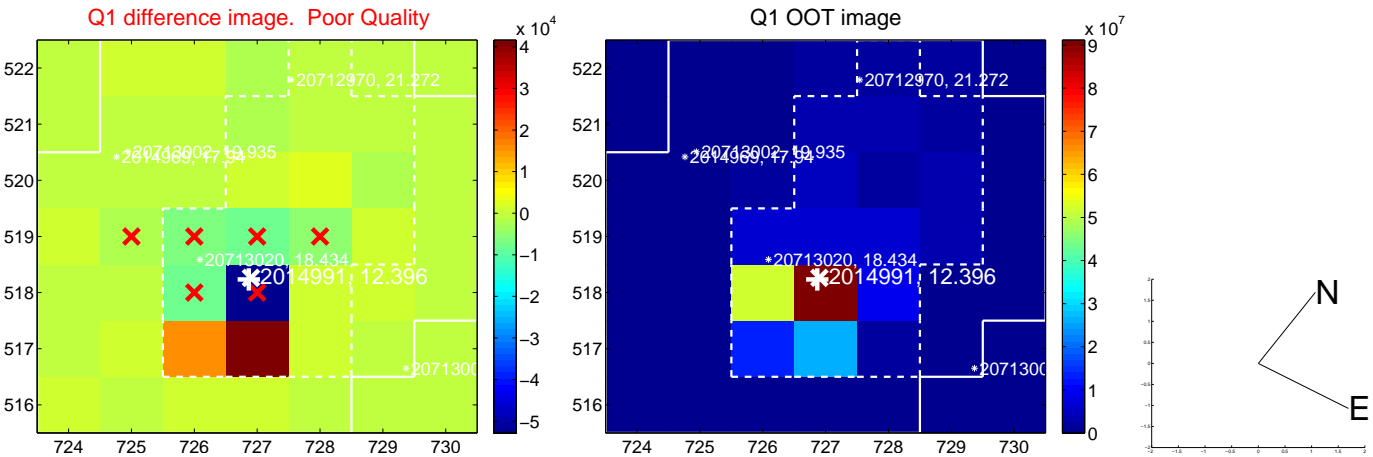
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.195 ± 0.341	0.57	-0.190 ± 0.347	-0.044 ± 0.466
PRF-fit source offset from KIC position	0.357 ± 0.366	0.97	-0.287 ± 0.343	-0.212 ± 0.464
photometric centroid source offset	0.28 ± 0.50	0.56	-0.08 ± 0.41	-0.27 ± 0.51

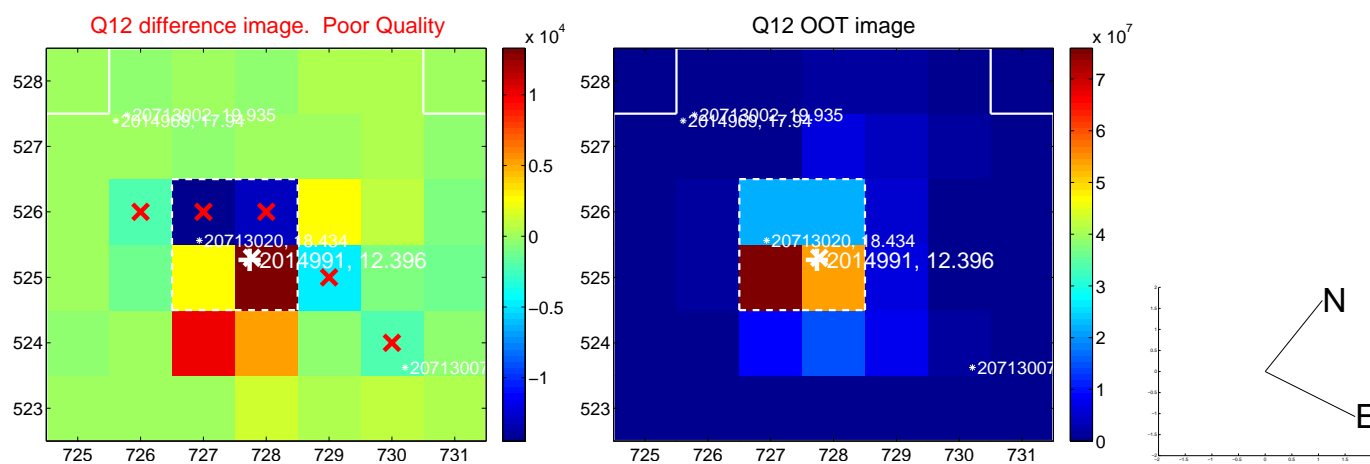
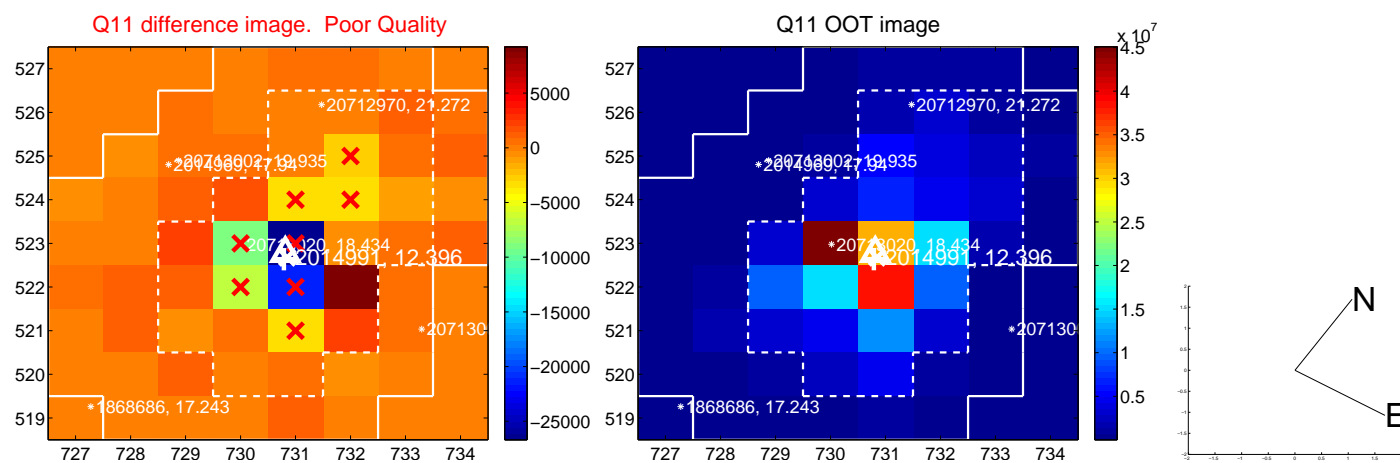
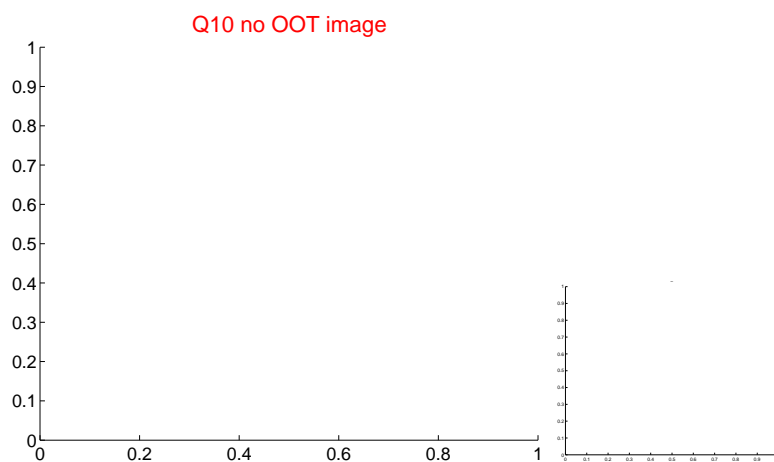
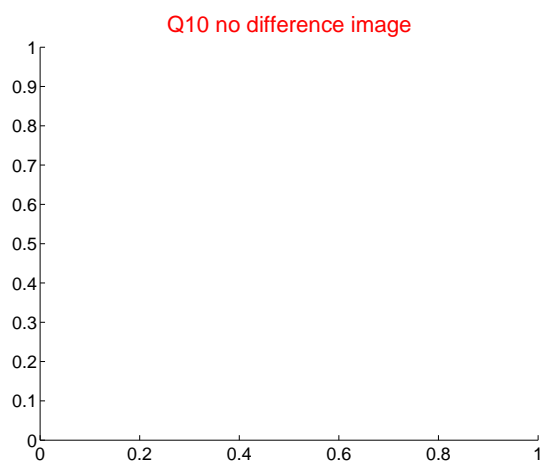
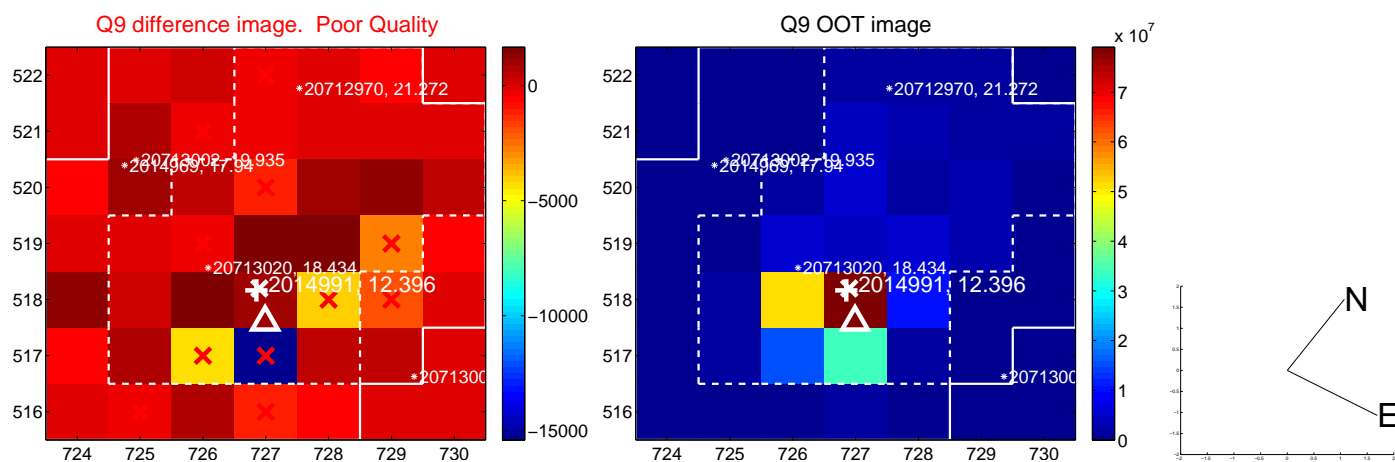


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

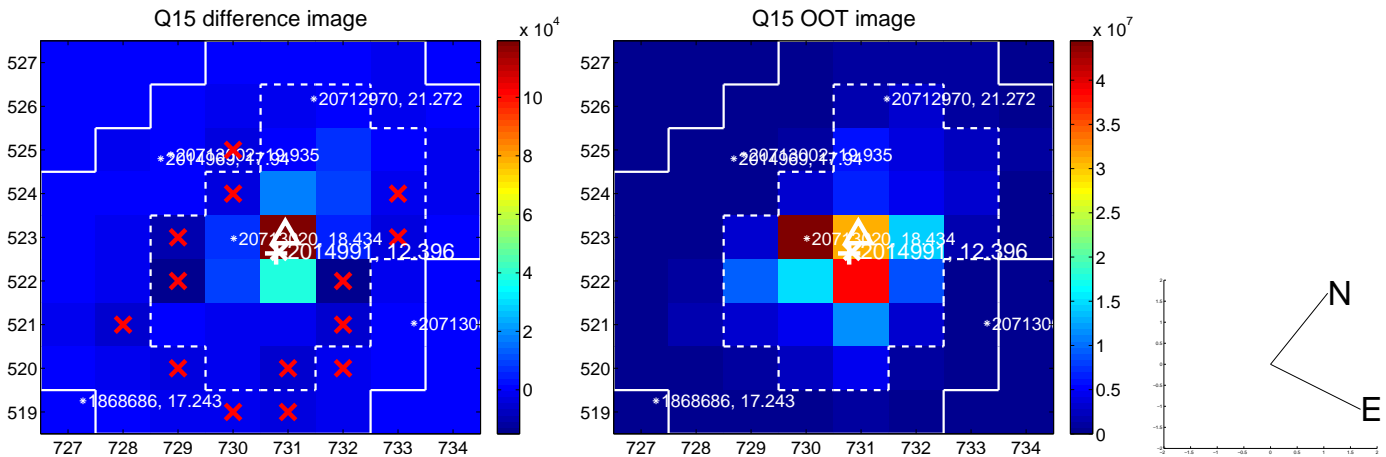
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



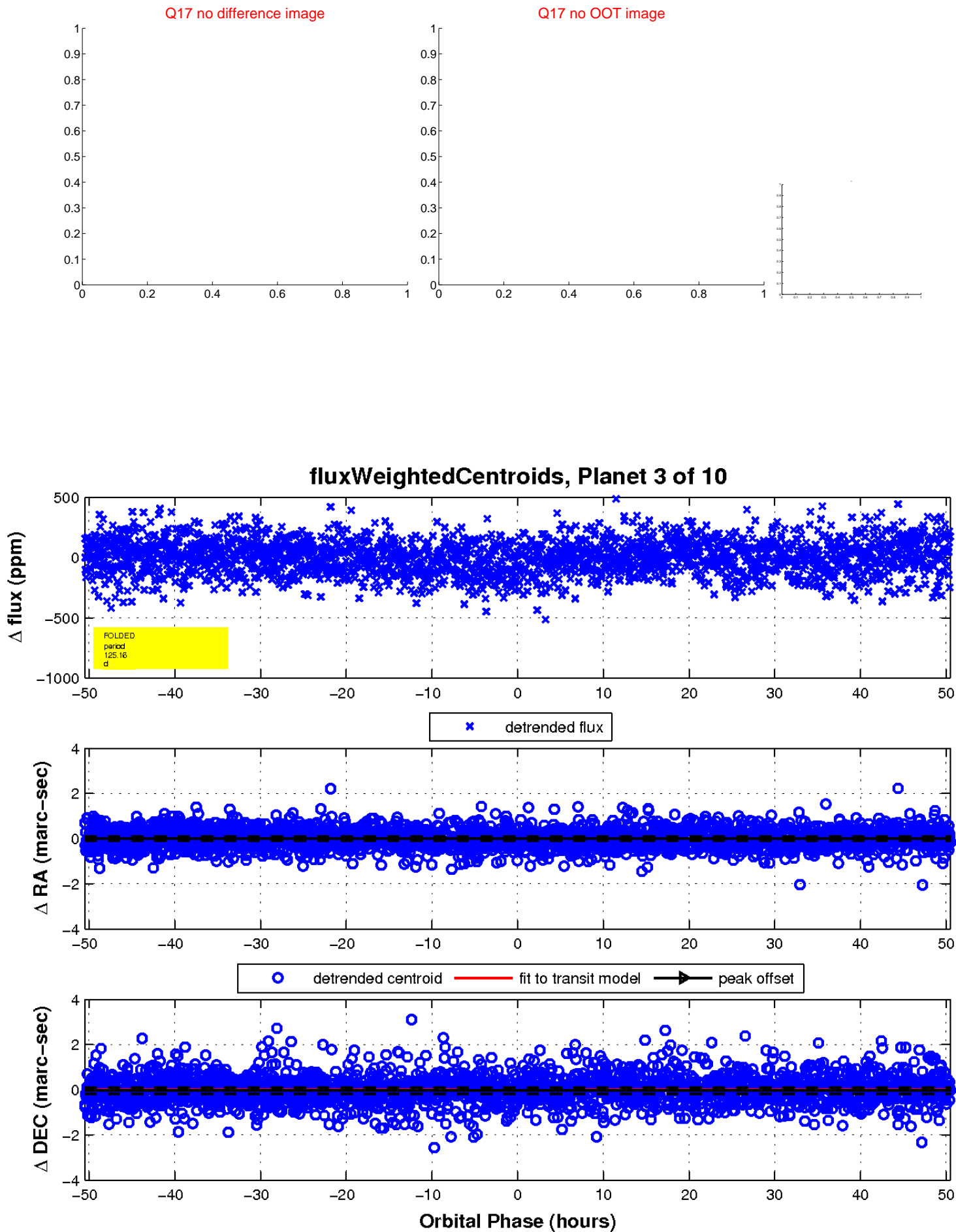
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

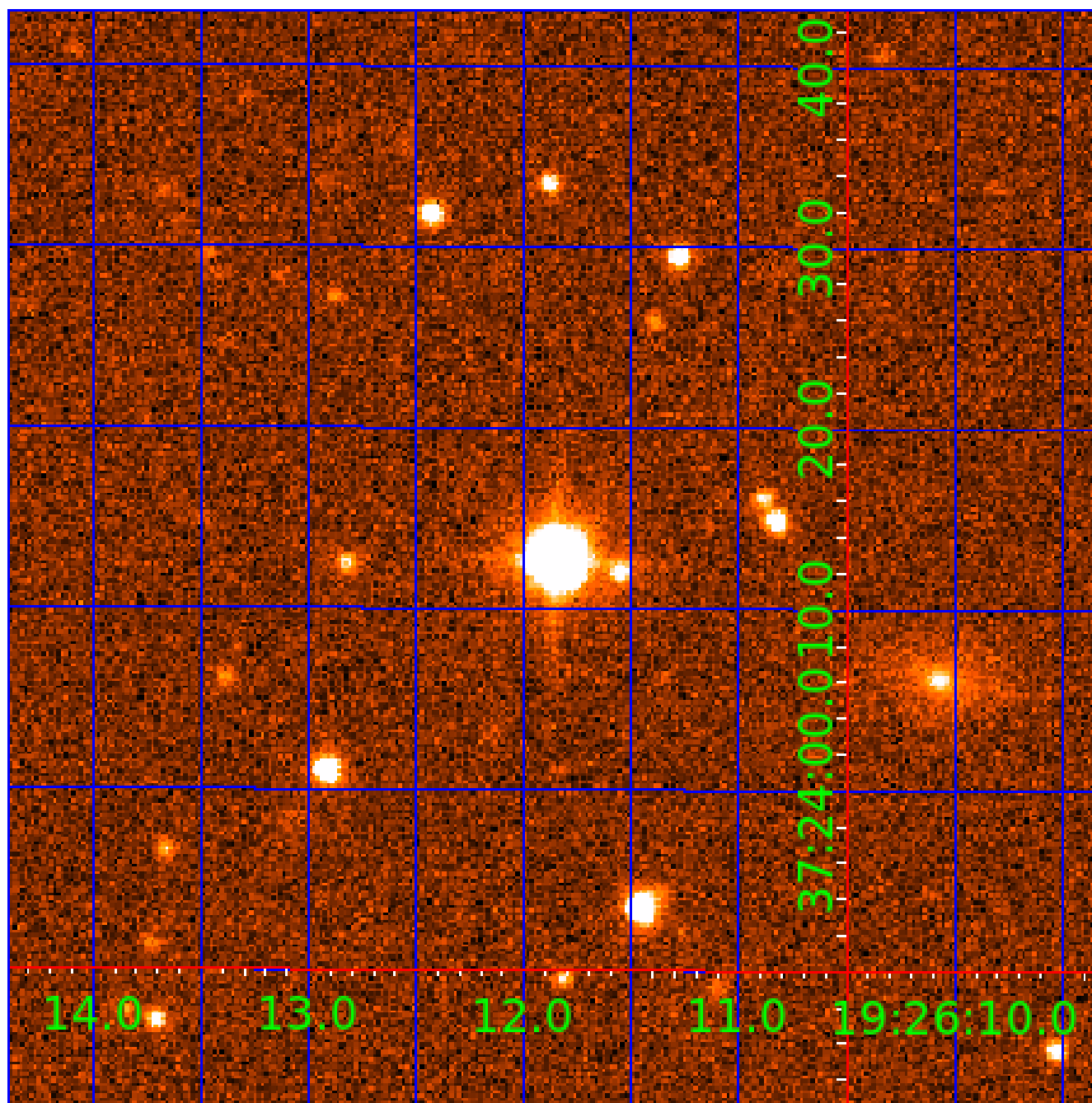


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
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002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

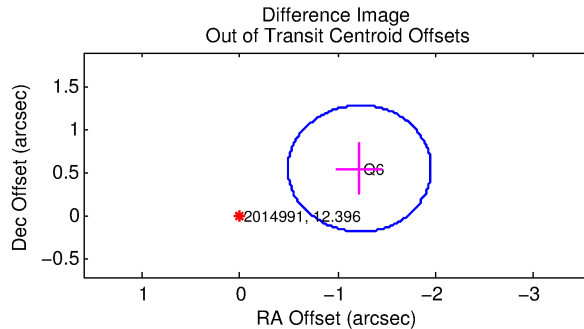
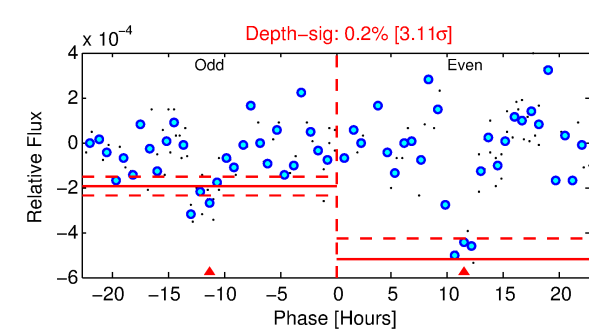
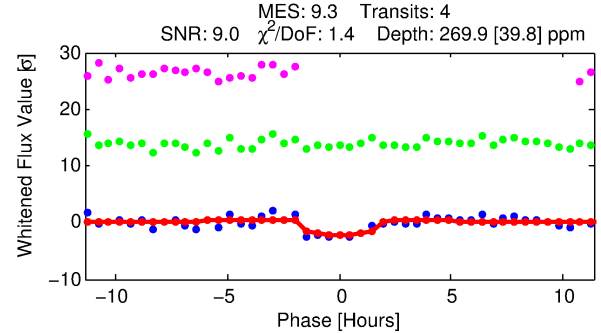
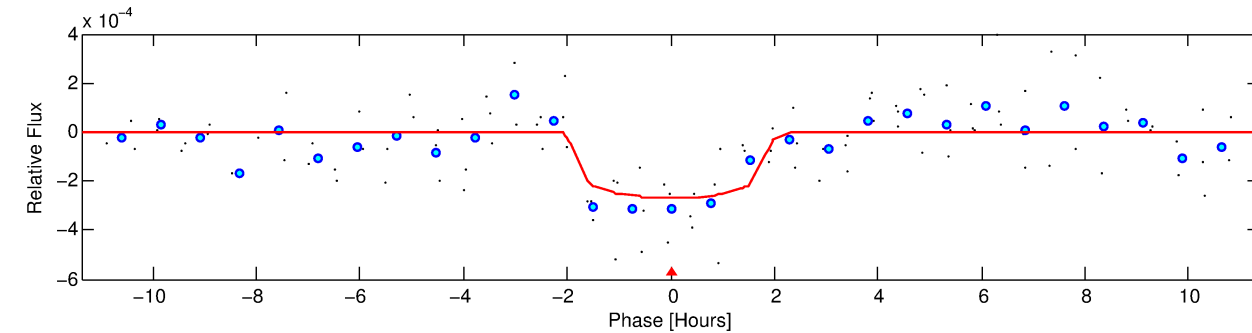
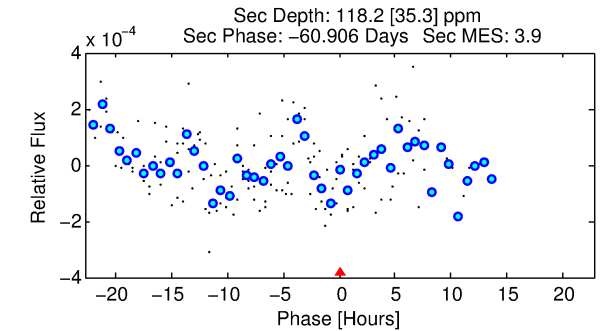
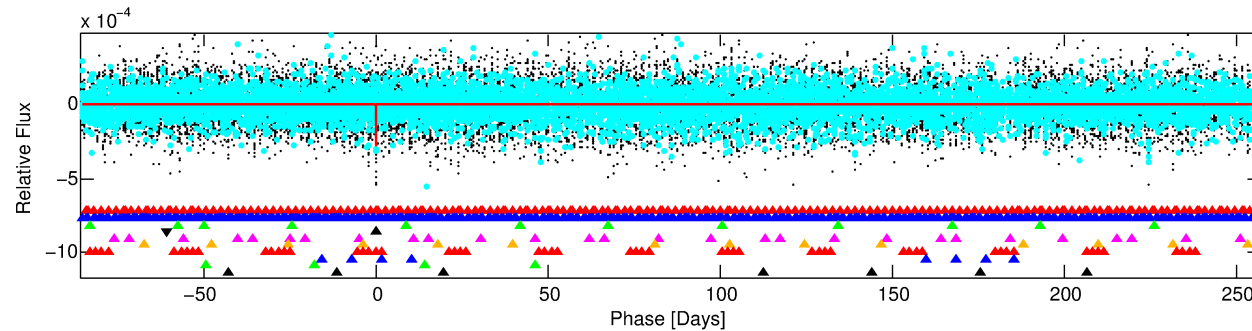
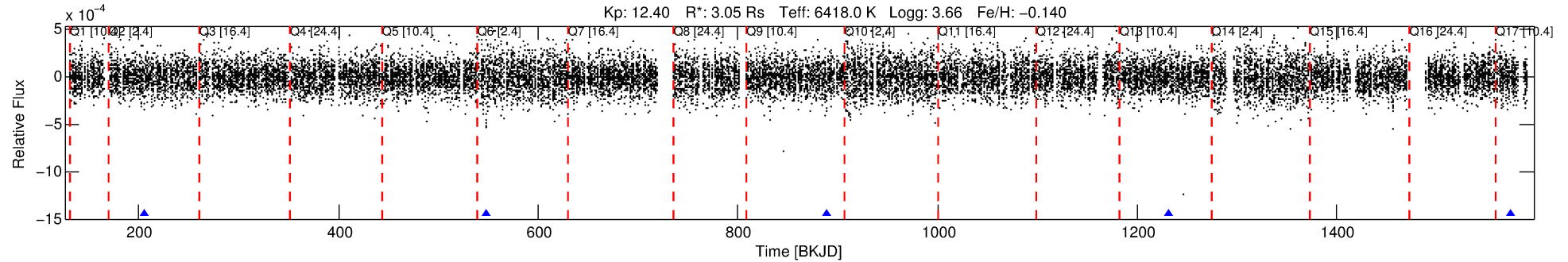
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002014991-04

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 4 of 10 Period: 342.260 d
KOI: K02178 Corr: No Ephemeris Match



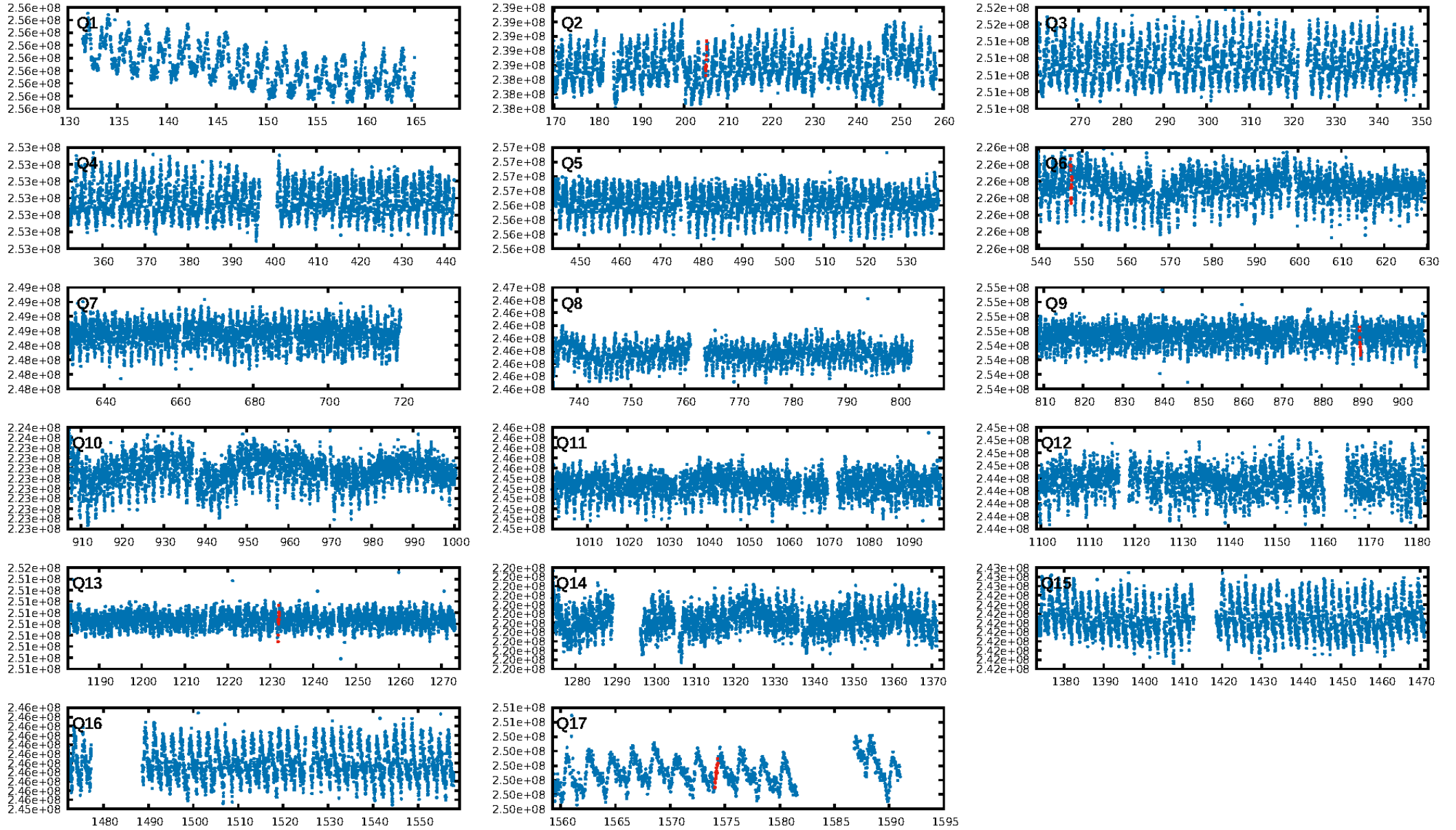
DV Fit Results:

Period = 342.26020 [0.00542] d
Epoch = 205.1626 [0.0120] BKJD
Rp/R* = 0.0163 [0.0208]
a/R* = 478.52 [3365.44]
b = 0.74 [4.27]
Seff = 11.54 [6.20]
Teq = 470 [63] K
Rp = 5.43 [7.21] Re
a = 1.1067 [0.3733] AU
Ag = 2706.70 [7105.40] [0.38 σ]
Teffp = 5241 [3373] K [1.41 σ]

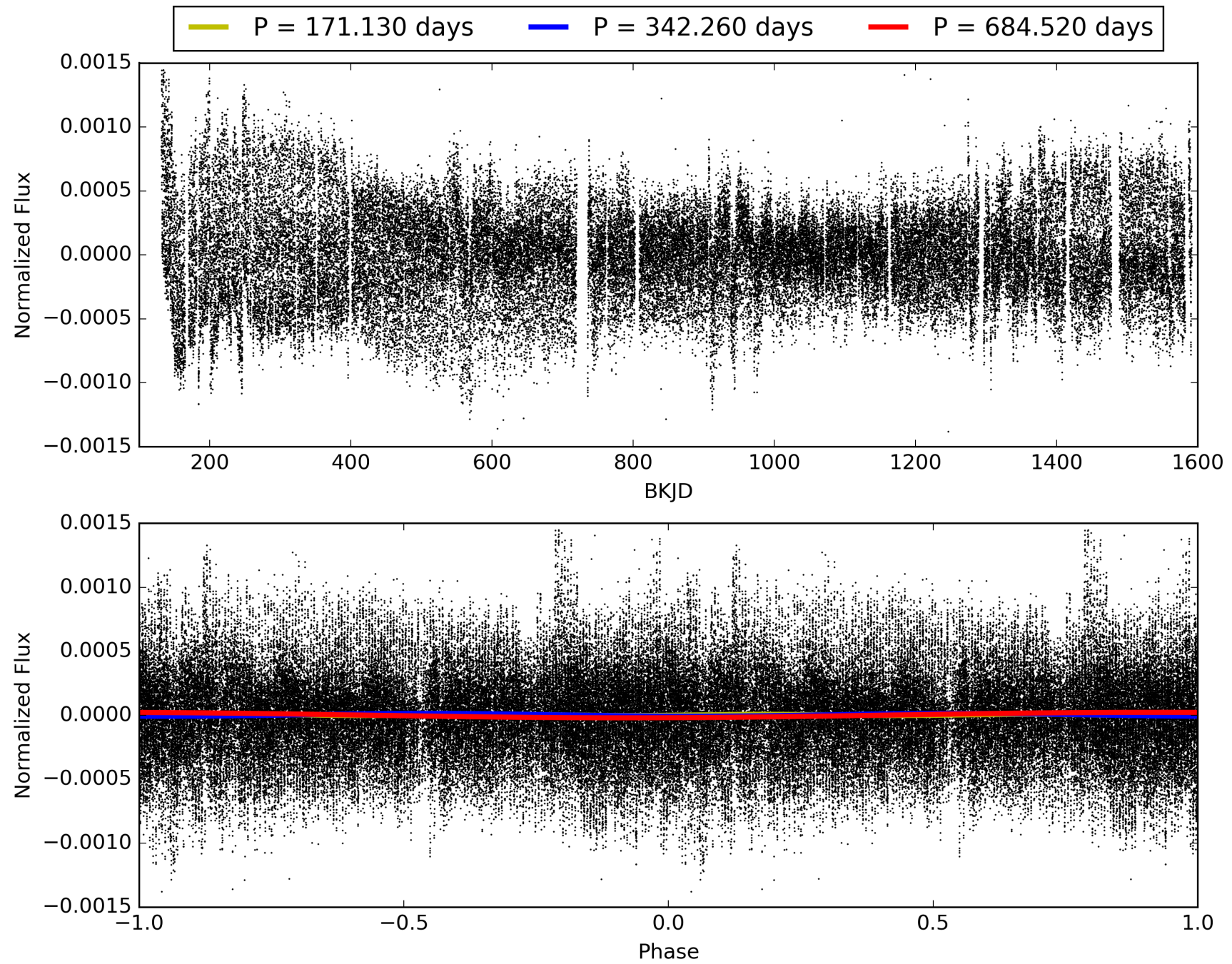
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [565.31 σ]
LongPeriod-sig: 100.0% [53.72 σ]
ModelChiSquare2-sig: 3.8%
ModelChiSquareGof-sig: 84.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 2.371
Centroid-sig: 85.4%
Centroid-so: 0.756 arcsec [0.69 σ]
OotOffset-rm: 1.344 arcsec [5.51 σ]
KicOffset-rm: 1.342 arcsec [5.58 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.75 [3/4]

TCE 002014991-04, PDC Light Curves

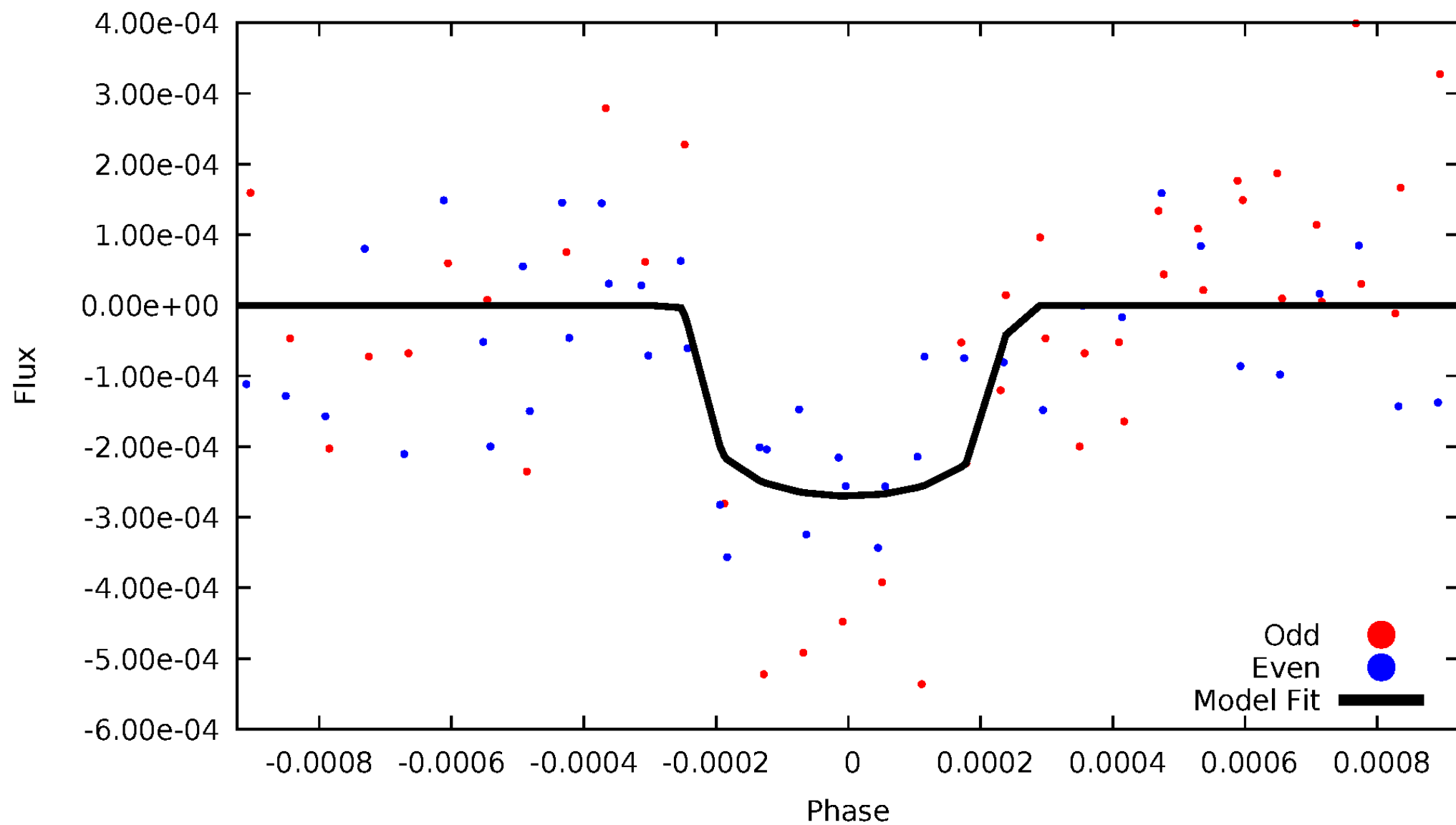


TCE 002014991-04



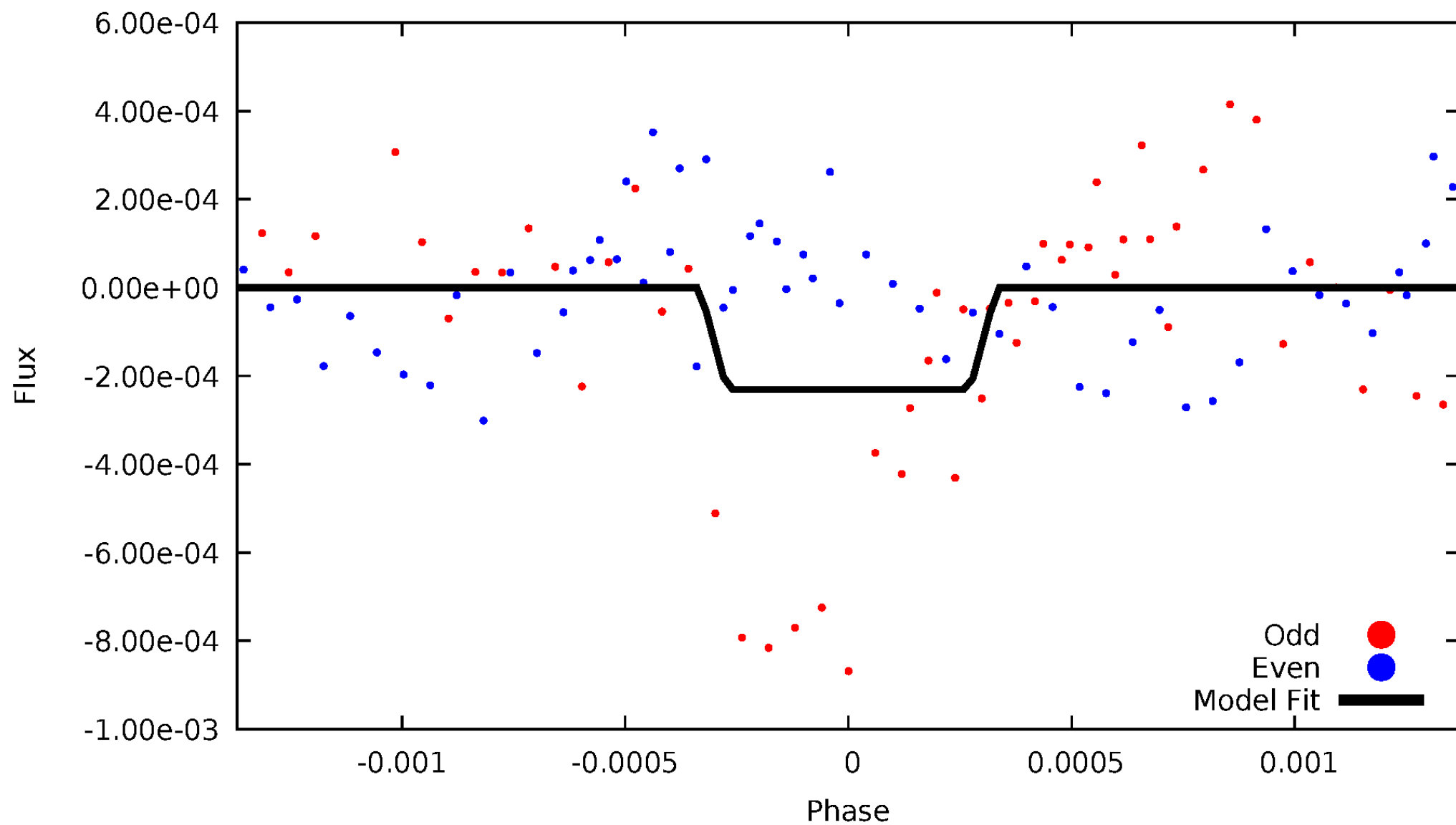
DV Odd/Even

TCE 002014991-04



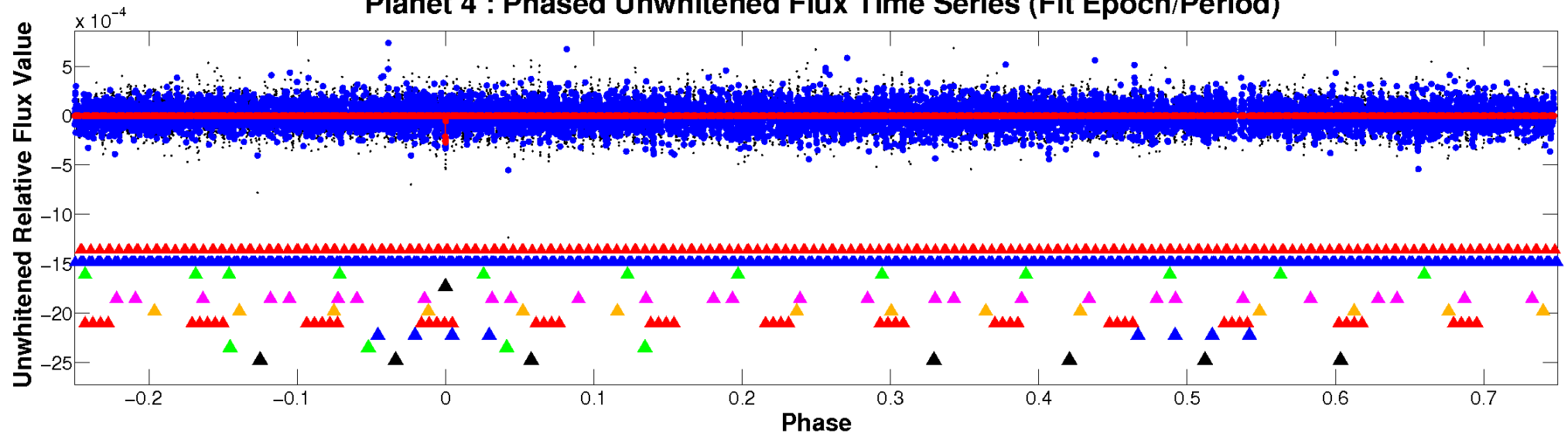
ALT Odd/Even

TCE 002014991-04

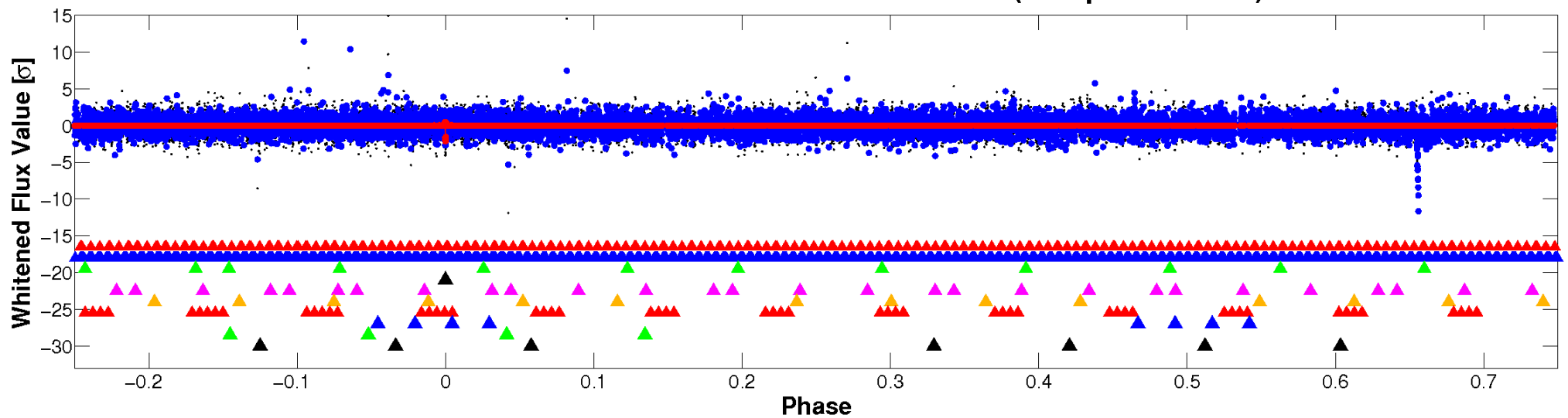


Non-Whitened Vs. Whitened Light Curve

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

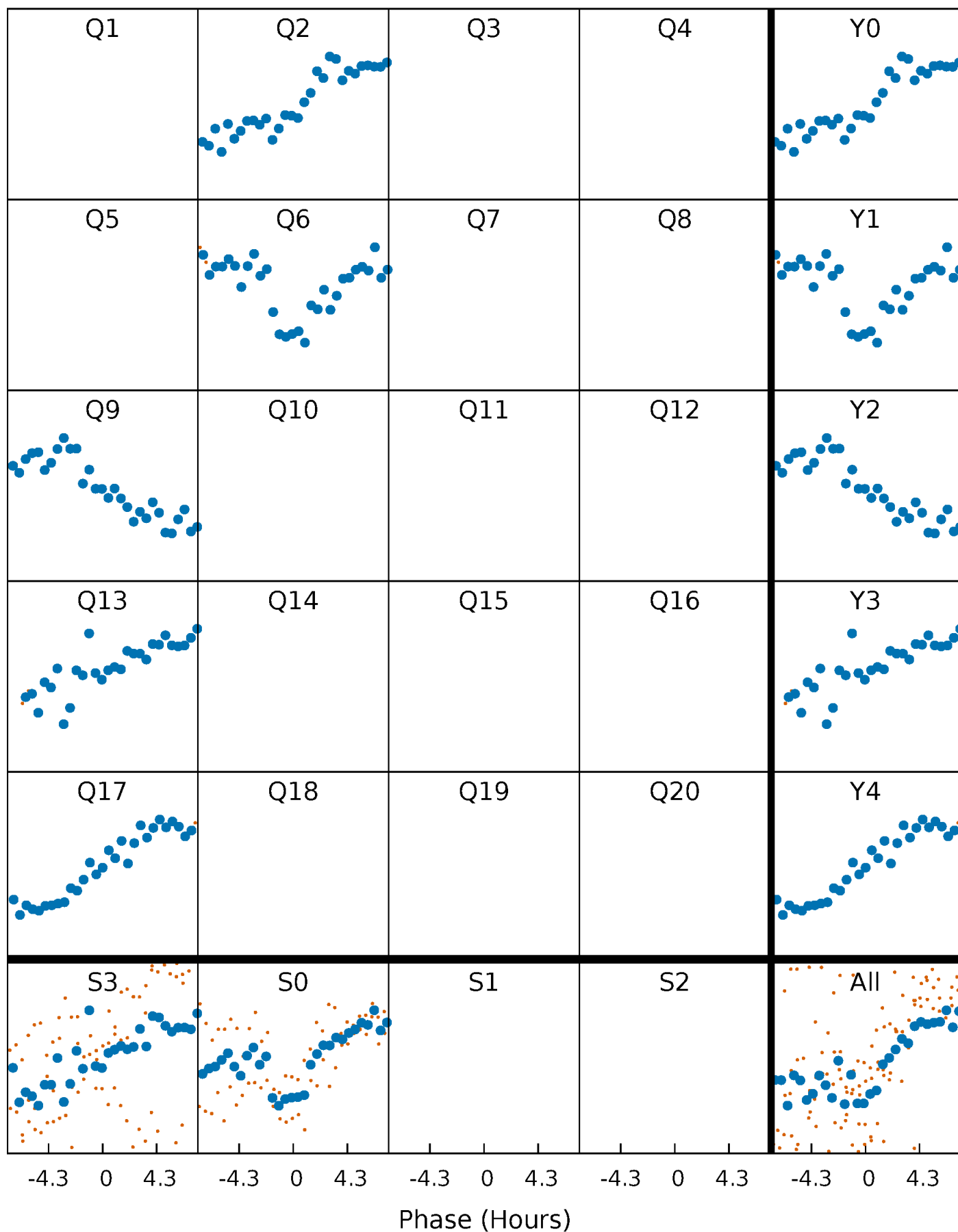


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



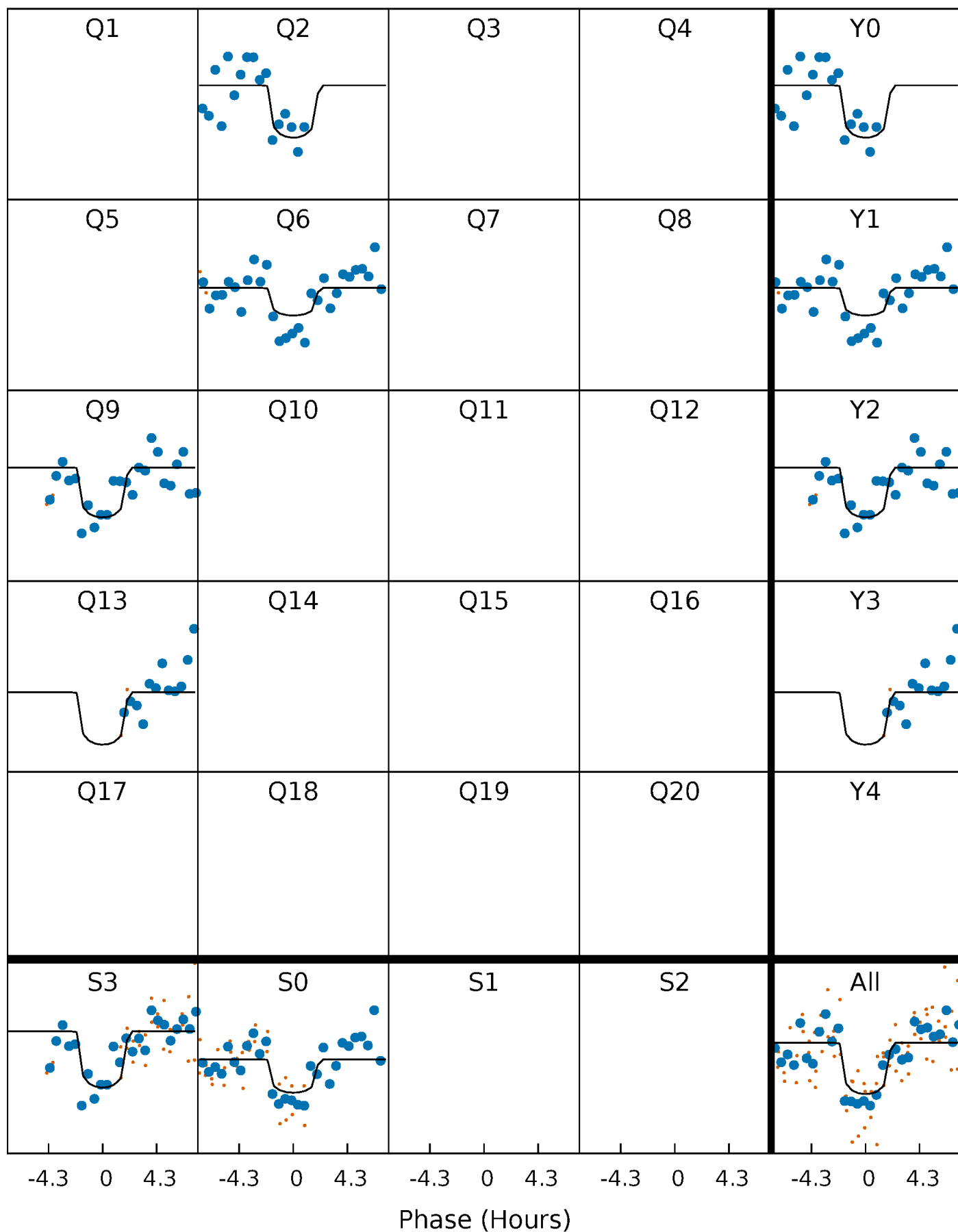
PDC Quarter-Phased Transit Curves

TCE 002014991-04 P=342.260199 Days $T_0=205.162607$ (BKJD)



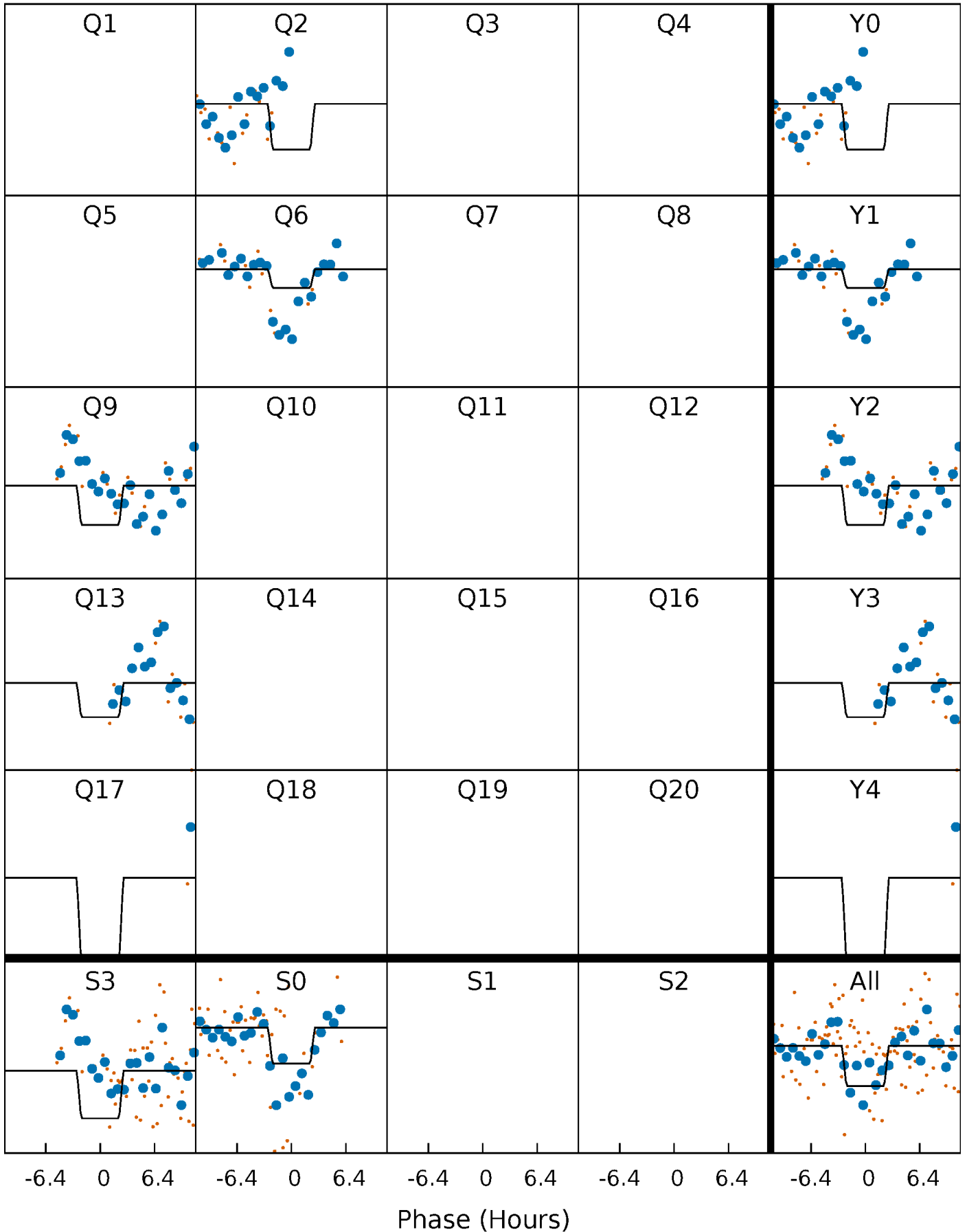
DV Quarter-Phased Transit Curves

TCE 002014991-04 P=342.260199 Days $T_0=205.162607$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

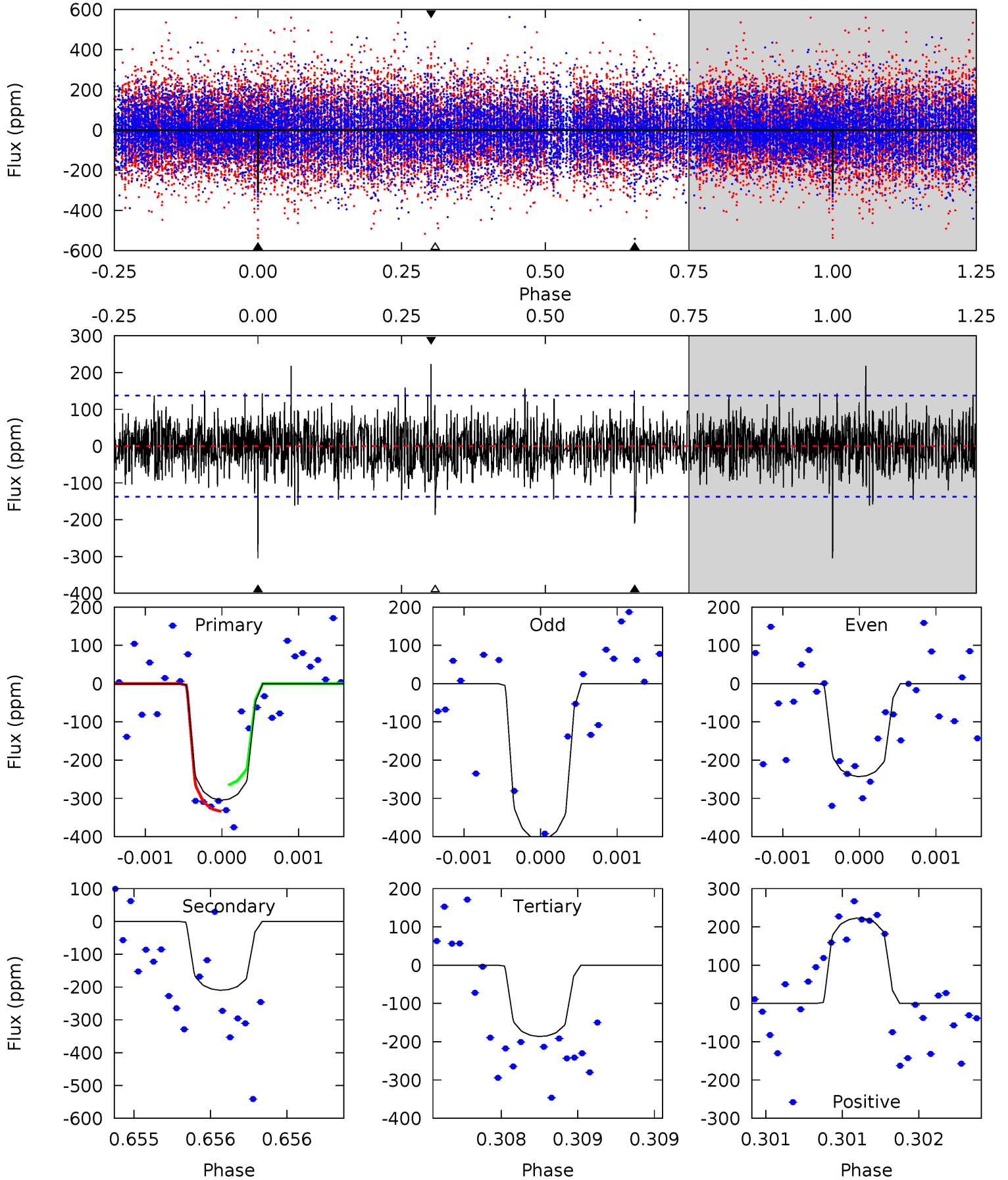
TCE 002014991-04 $P=342.248181$ Days $T_0=205.212442$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-04, P = 342.260199 Days, E = 205.162607 Days

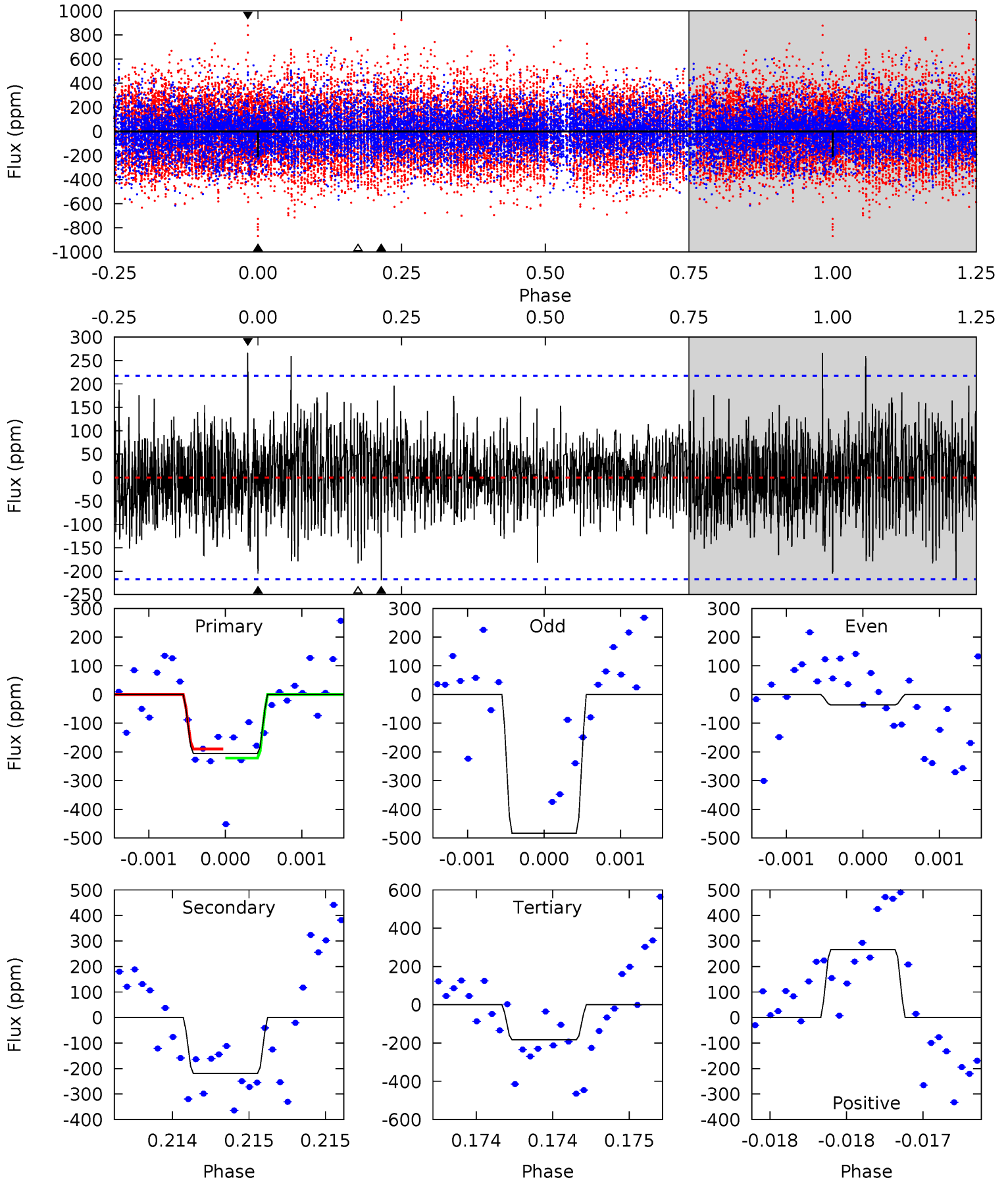
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	8.47	7.53	9.02	5.56	3.46	1.74	4.78	3.30	0.94	-0.54	3.31	1.16	0.42	1.38



Alt Model-Shift Uniqueness Test

002014991-04, P = 342.248181 Days, E = 205.212442 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.23	5.58	4.67	6.79	5.54	3.42	1.40	0.56	-1.56	0.92	-1.21	5.72	2.72	0.55	0.41



Stellar Parameters For KIC 002014991

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-210 ± 25	$6.94^{+5.67}_{-4.25}$	642^{+37}_{-58}	5184^{+3582}_{-1069}	3050^{+17272}_{-2162}
Alt.	-219 ± 39	$6.30^{+5.79}_{-4.12}$	640^{+37}_{-59}	5397^{+4435}_{-1200}	3812^{+28977}_{-2790}

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

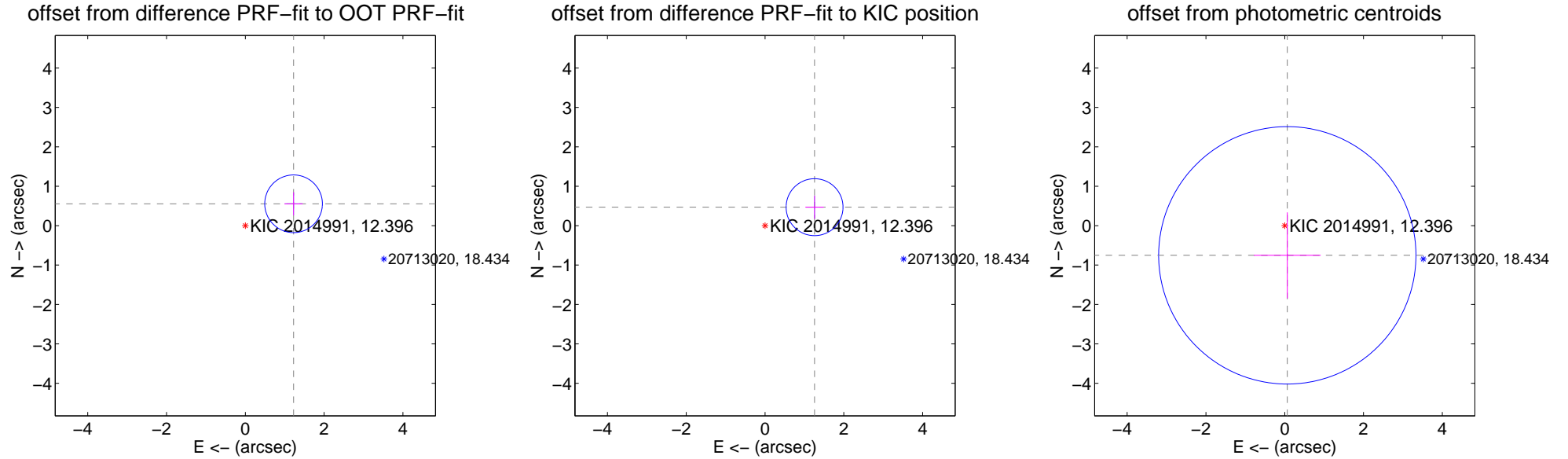
DV Centroid Data

Supplemental centroid analysis for 002014991-04. Kepler magnitude: 12.40. Transit SNR 8.95

There are 1 quarters with good PRF difference image offsets

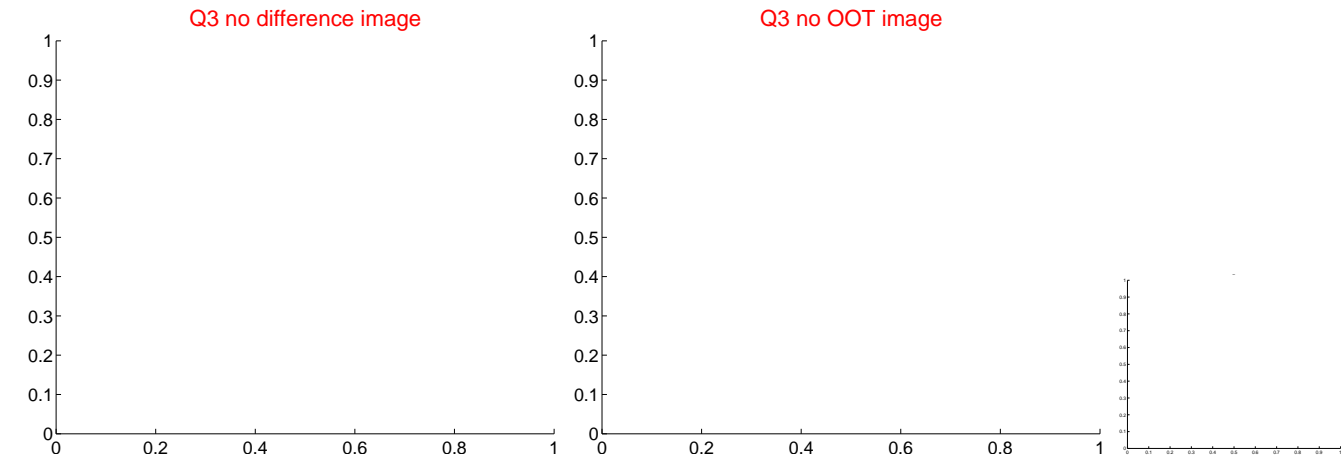
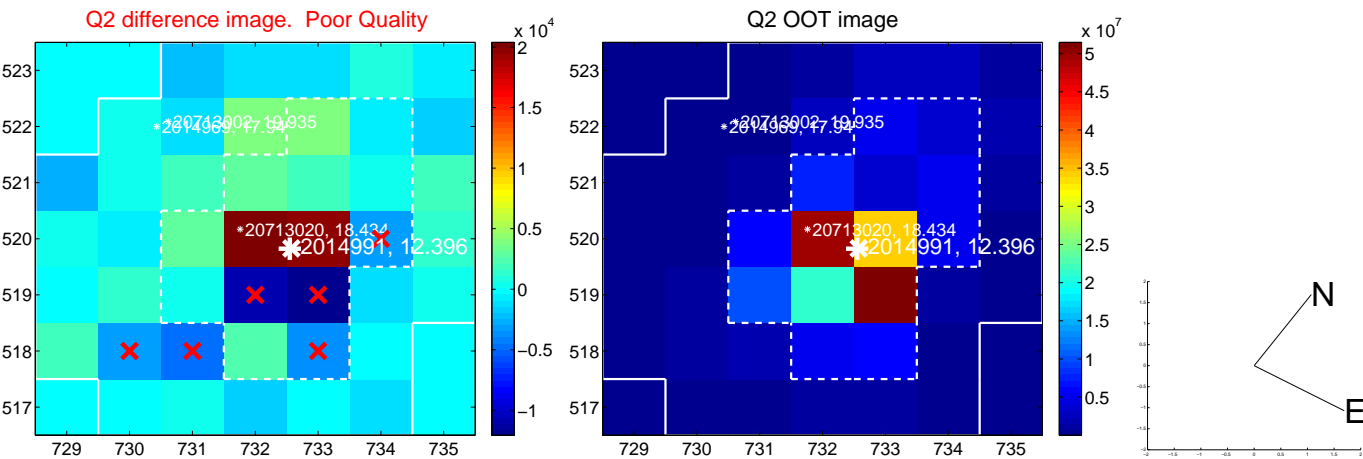
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.344 ± 0.244	5.51	-1.224 ± 0.233	0.555 ± 0.293
PRF-fit source offset from KIC position	1.342 ± 0.241	5.58	-1.257 ± 0.233	0.468 ± 0.293
photometric centroid source offset	0.76 ± 1.09	0.69	-0.07 ± 0.85	-0.75 ± 1.09

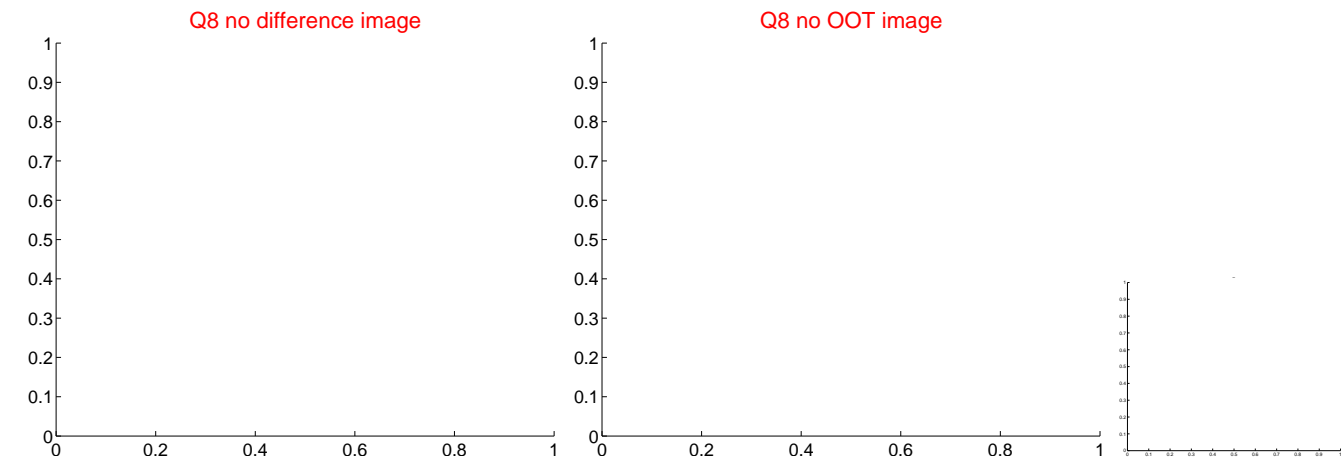
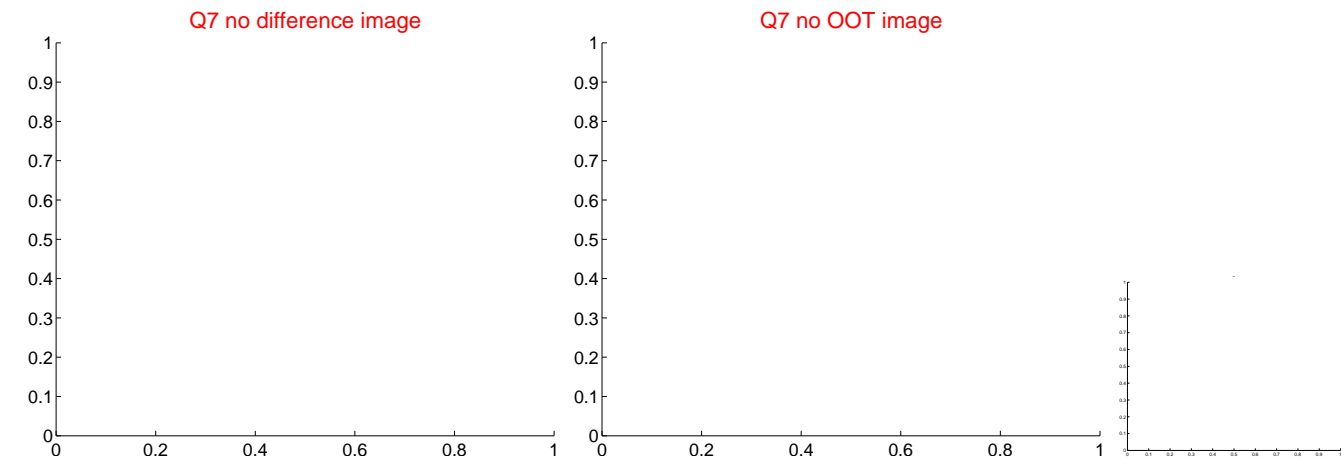
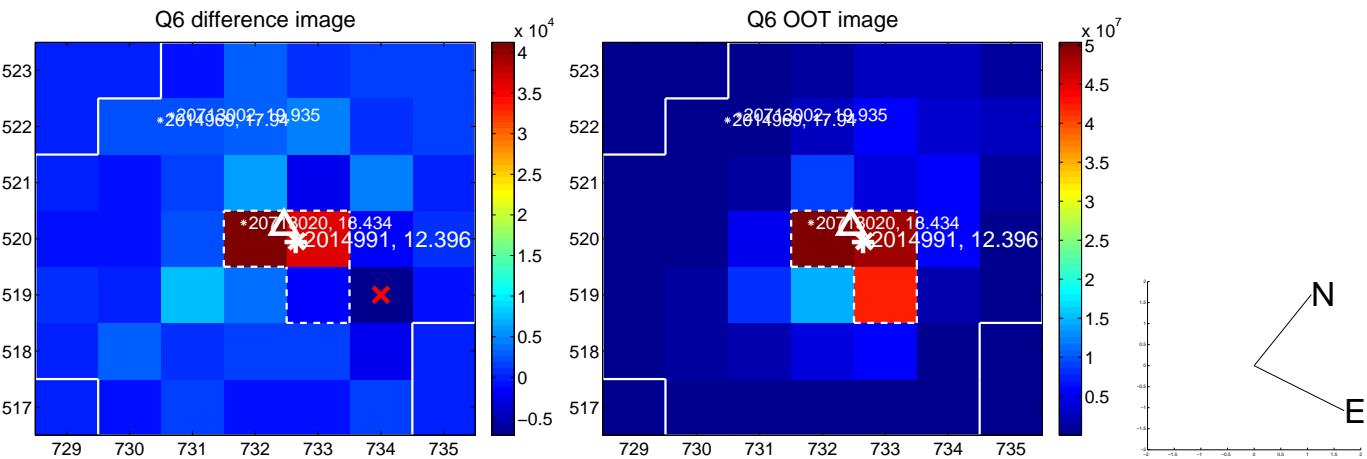


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

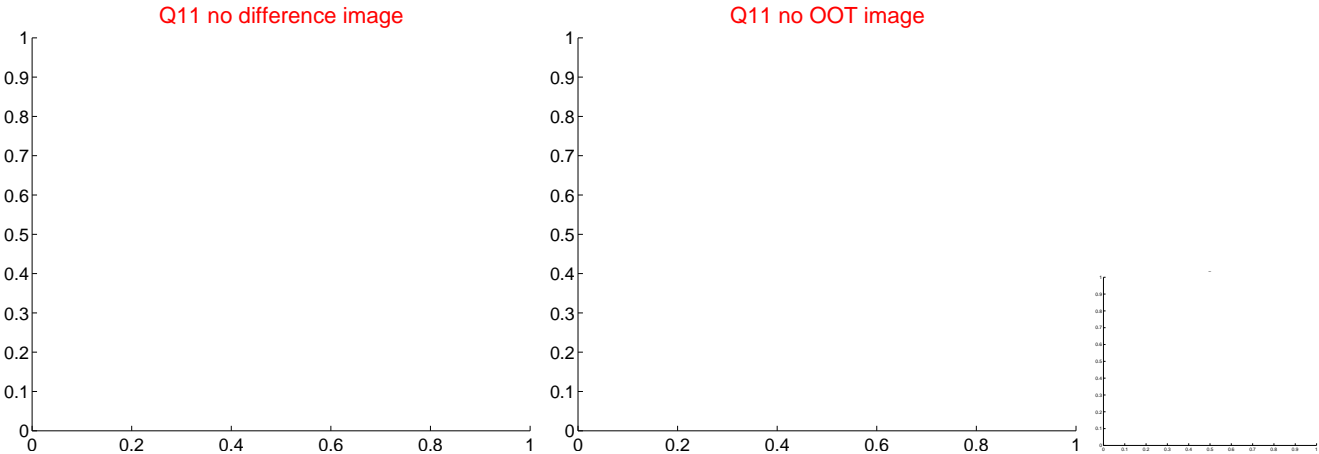
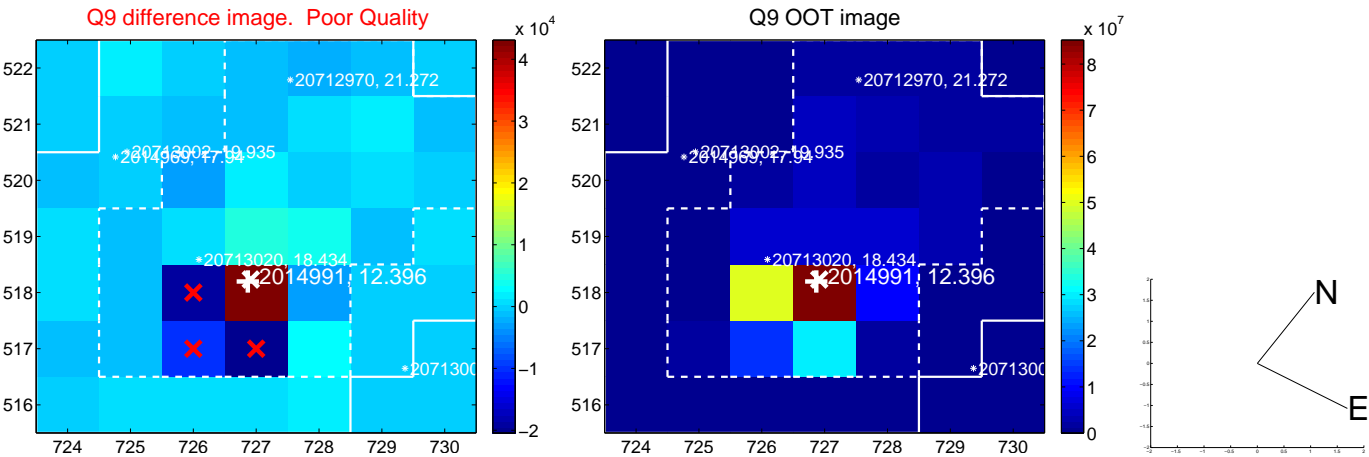
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



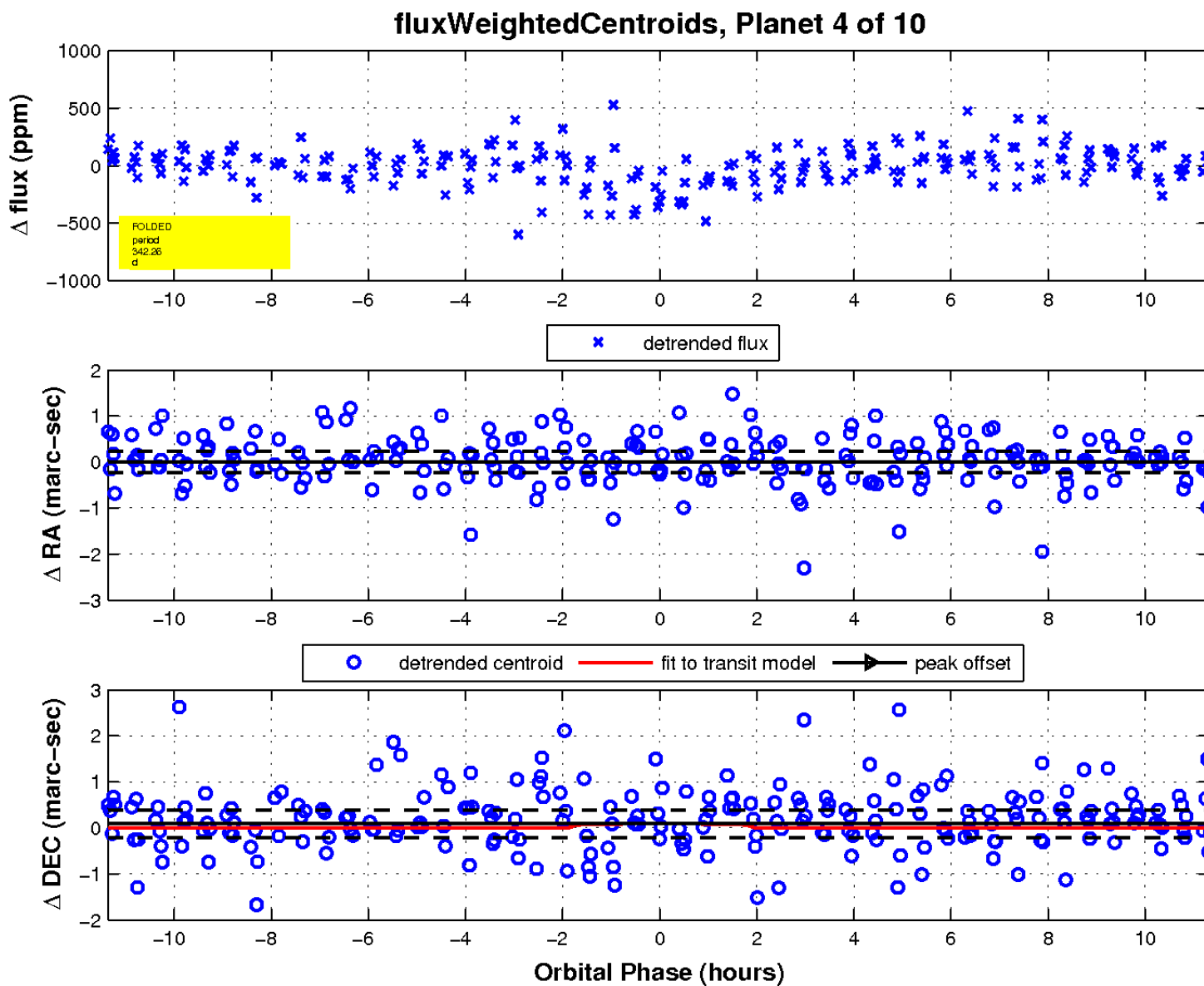
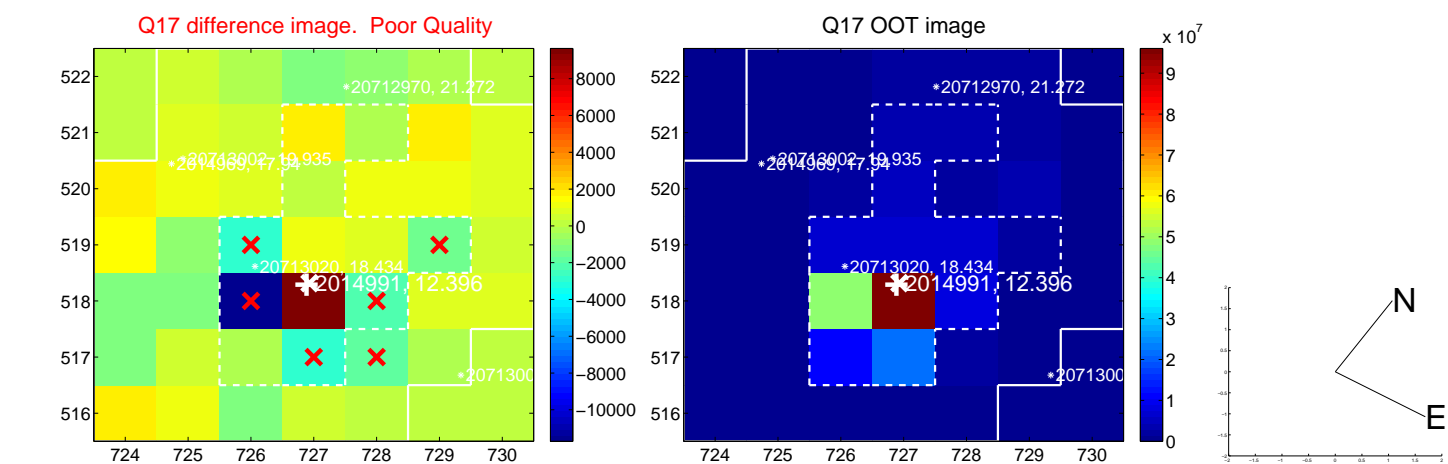
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

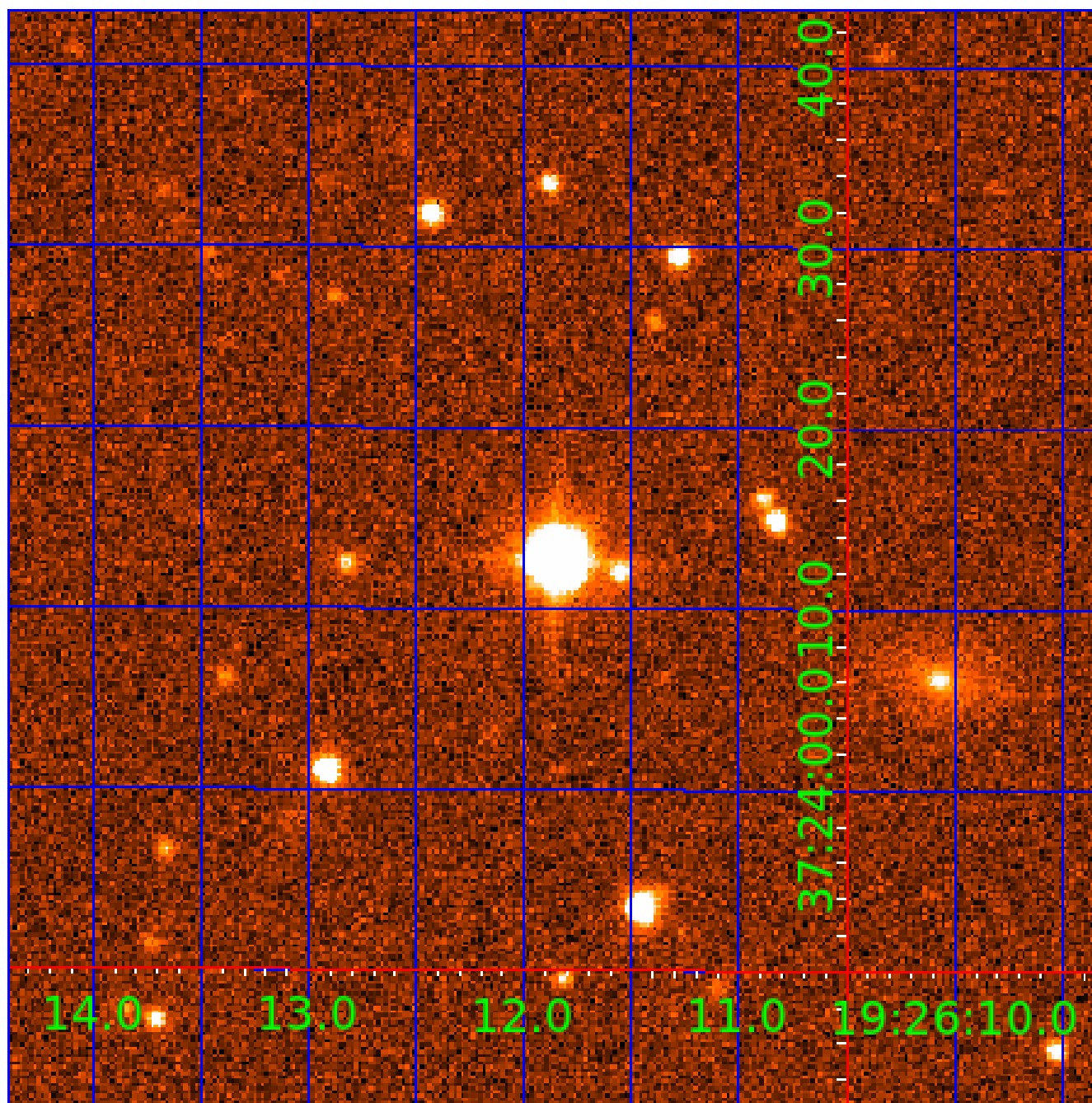


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UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

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002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
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Robovetter Results

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002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

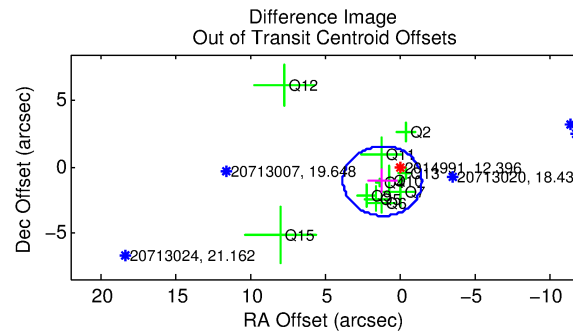
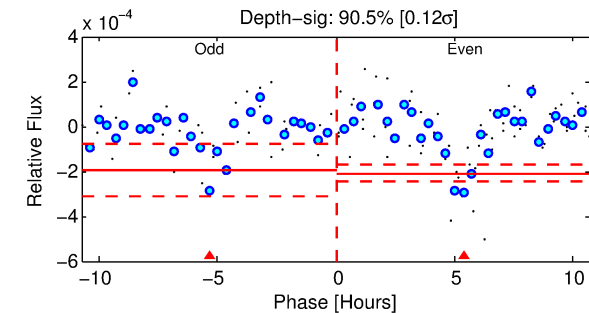
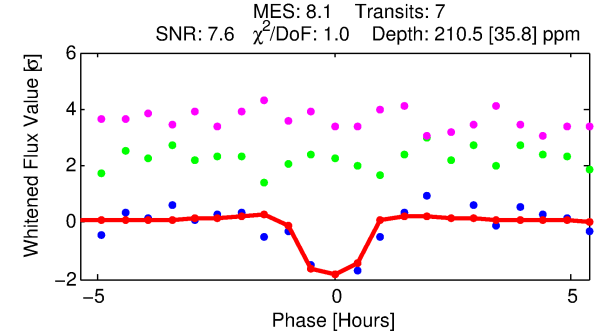
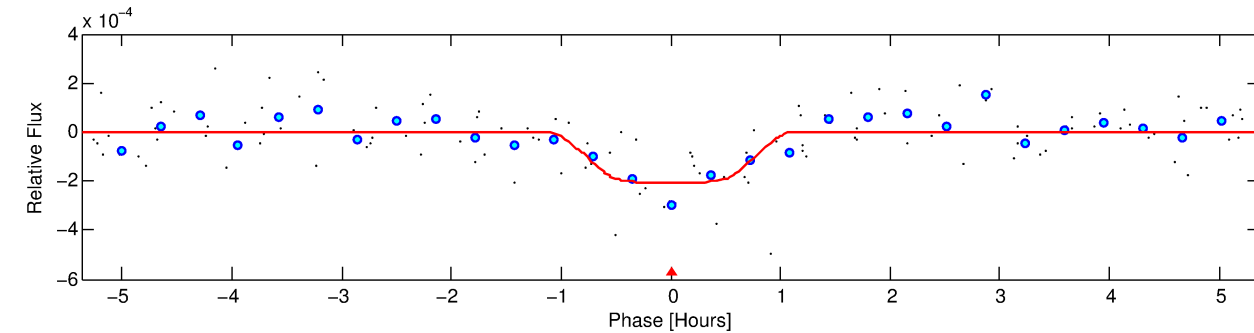
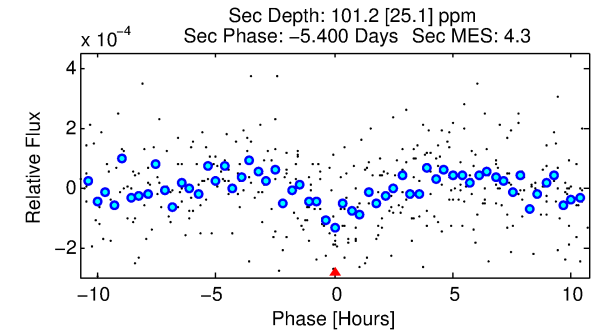
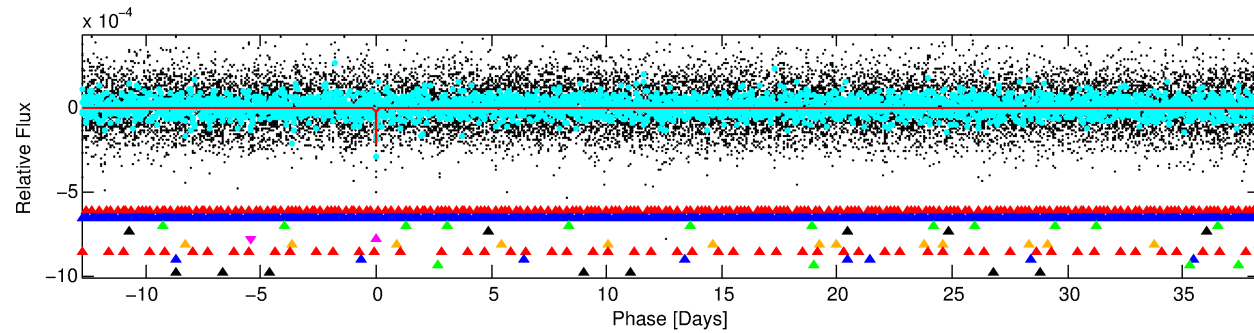
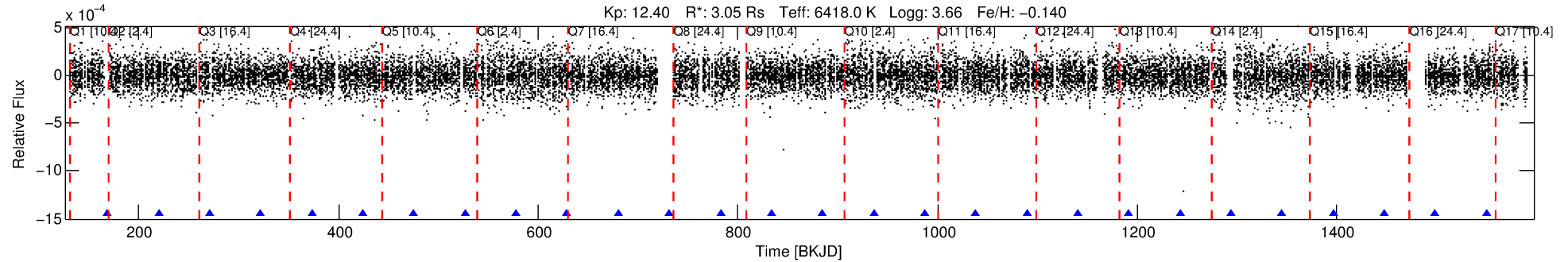
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002014991-05

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 5 of 10 Period: 51.121 d
KOI: K02178 Corr: No Ephemeris Match



DV Fit Results:

Period = 51.12076 [0.00044] d
Epoch = 169.1485 [0.0091] BKJD
Rp/R* = 0.0159 [0.0123]
ModelChiSquare2-sig: 63.5%
ModelChiSquareGof-sig: 95.0%
b = 0.92 [0.71]
Seff = 145.59 [78.27]
Teq = 886 [119] K
Rp = 5.30 [4.53] Re
a = 0.3116 [0.1051] AU
Ag = 192.48 [318.05] [0.60σ]
Teffp = 5101 [2002] K [2.10σ]

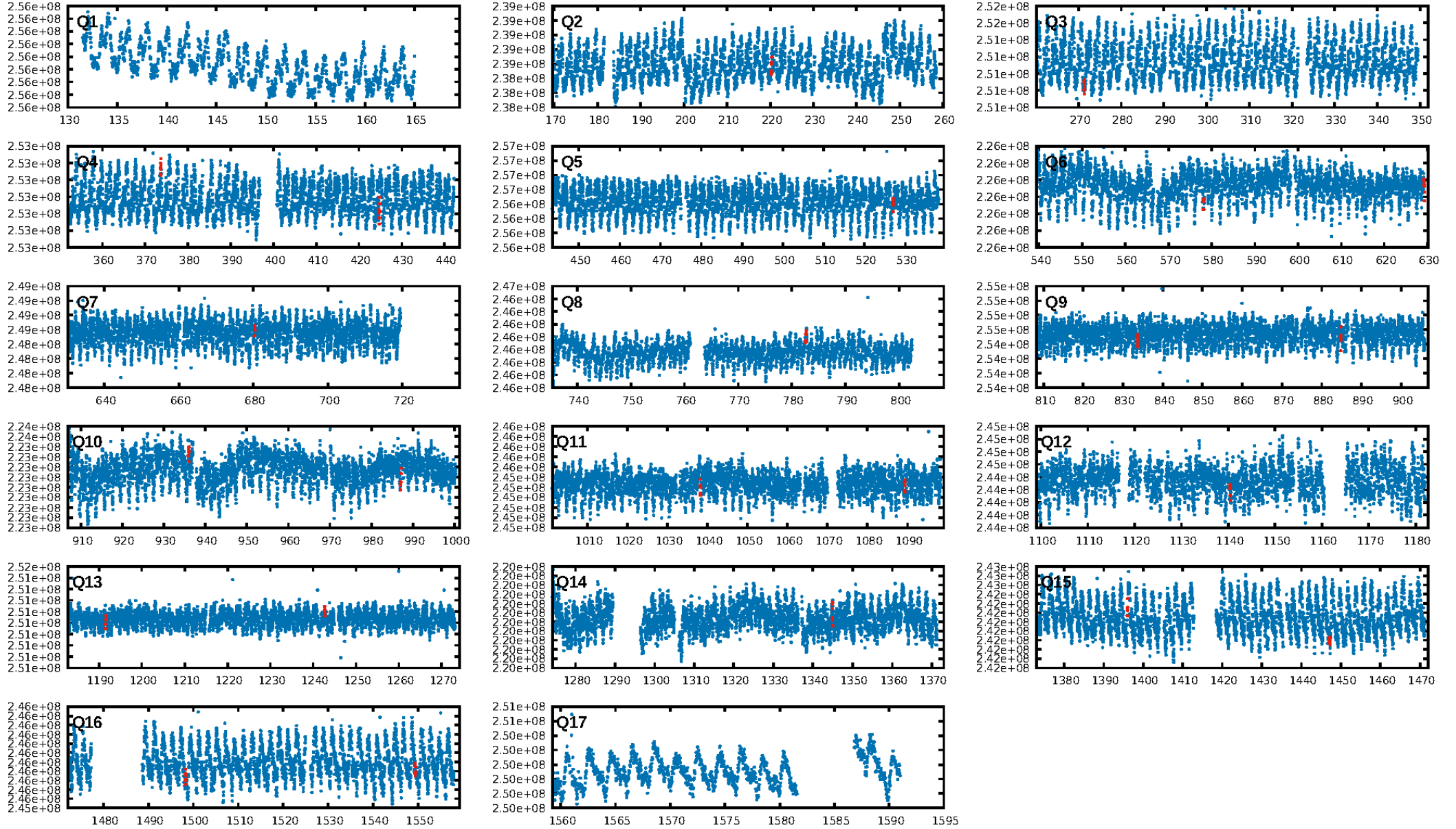
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [62.72σ]
LongPeriod-sig: 100.0% [231.88σ]
ModelChiSquare2-sig: 63.5%
ModelChiSquareGof-sig: 95.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: -0.6526
Centroid-sig: 39.5%
Centroid-so: 0.859 arcsec [1.06σ]
OotOffset-rm: 1.570 arcsec [1.78σ]
KicOffset-rm: 1.642 arcsec [1.75σ]
OotOffset-st: 3/3/2/3 [11]
KicOffset-st: 3/3/2/3 [11]
DiffImageQuality-fgm: 0.27 [3/11]
DiffImageOverlap-fno: 0.62 [8/13]

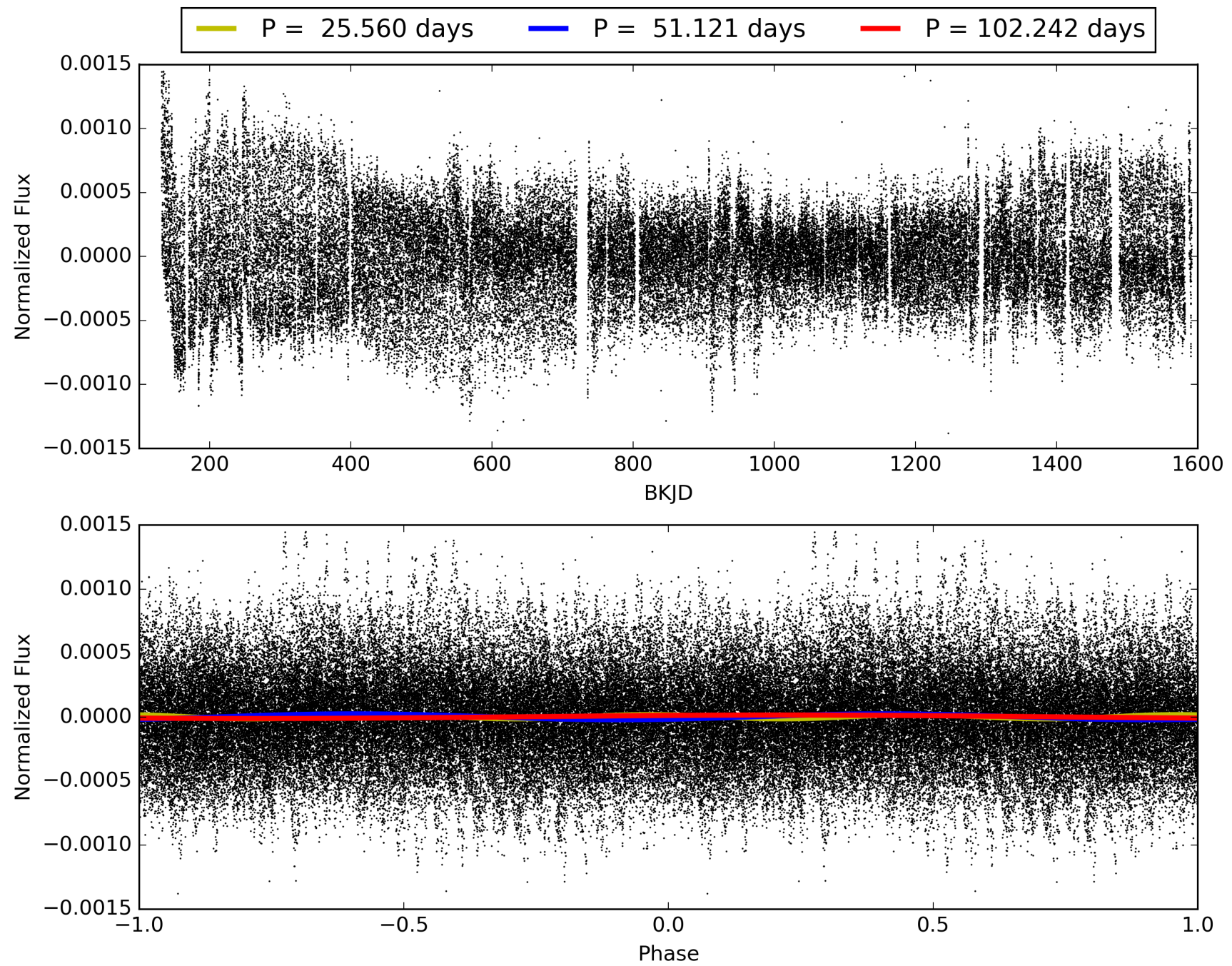
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:52:46 Z

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

TCE 002014991-05, PDC Light Curves

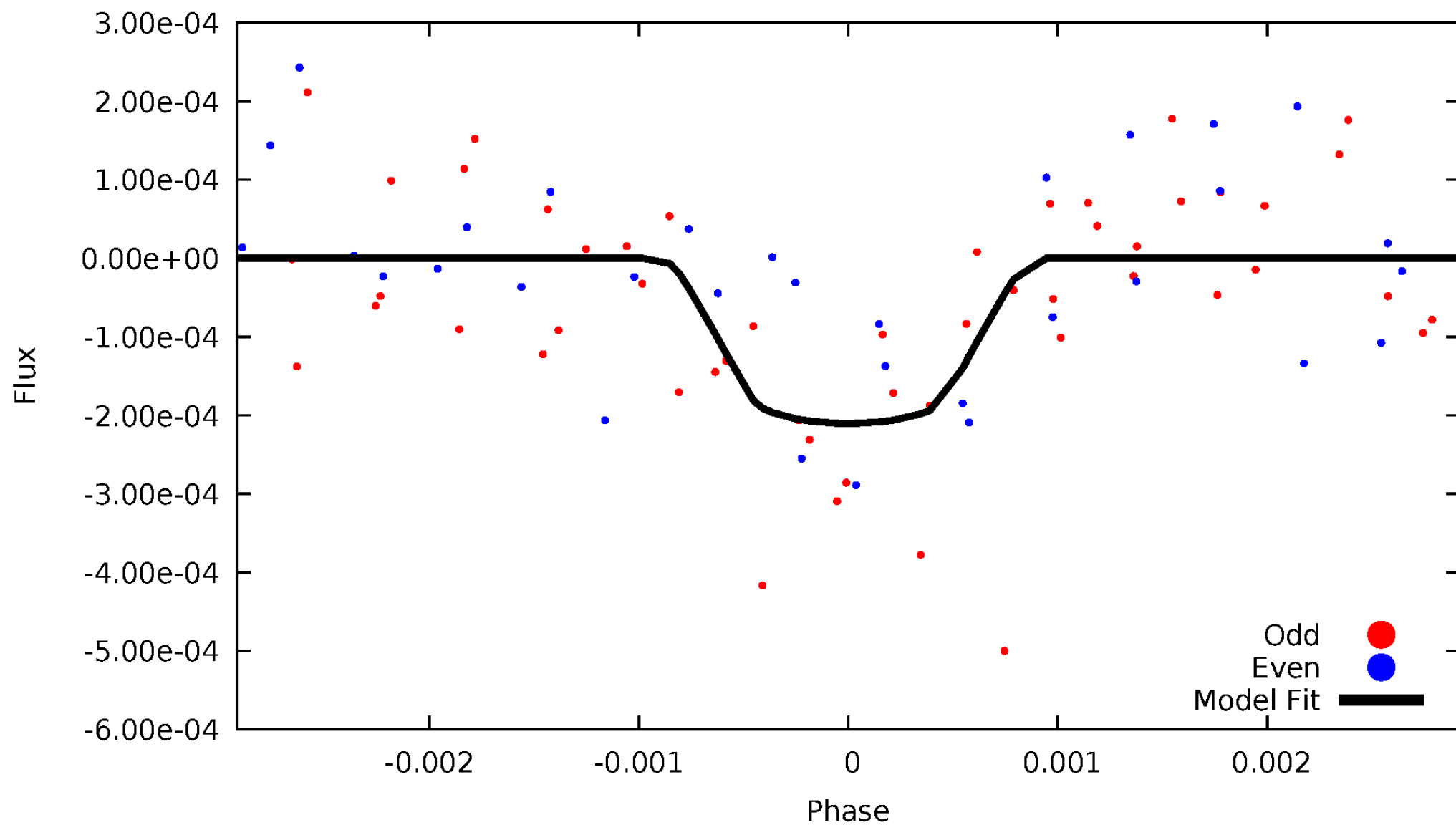


TCE 002014991-05



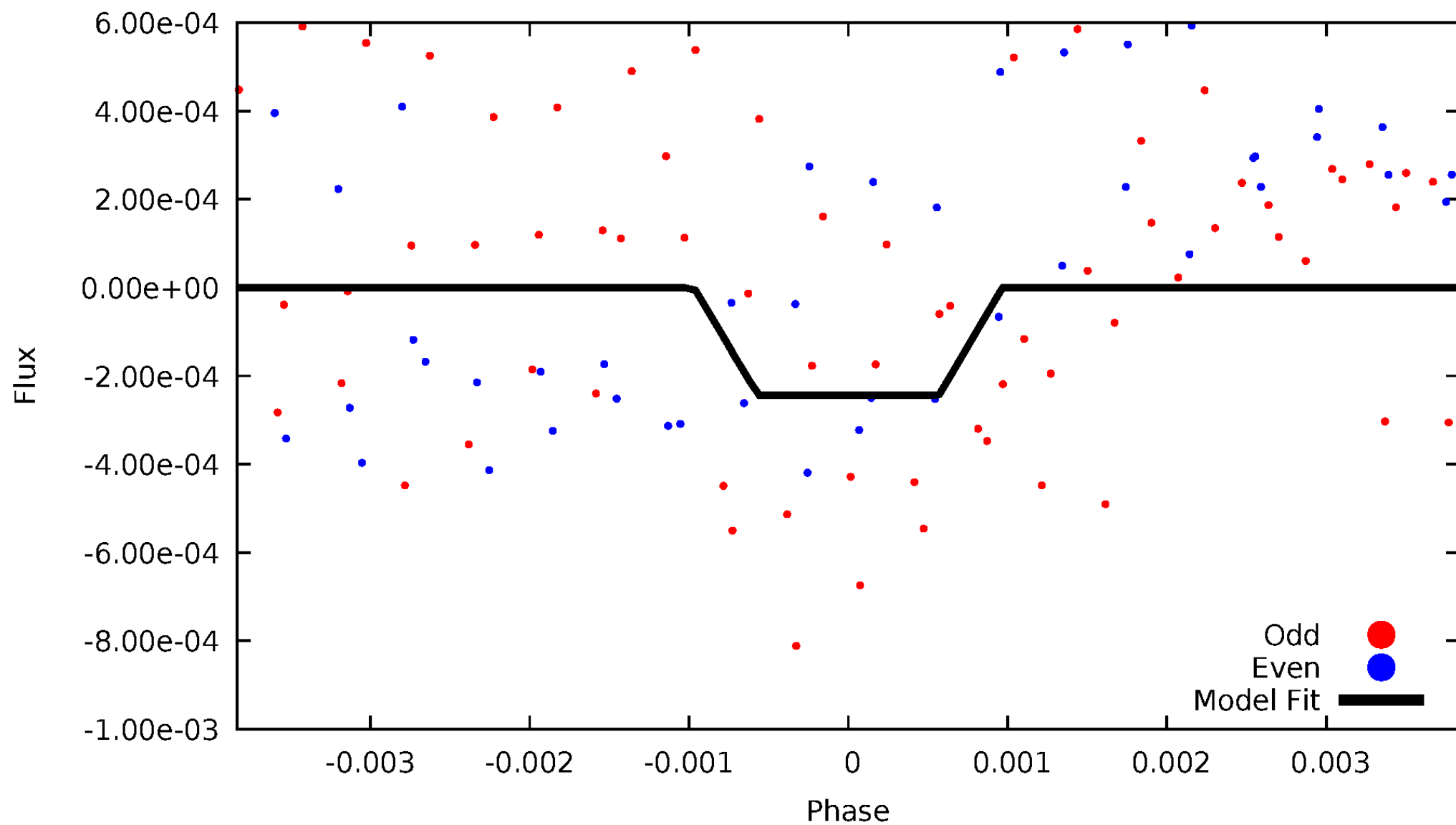
DV Odd/Even

TCE 002014991-05



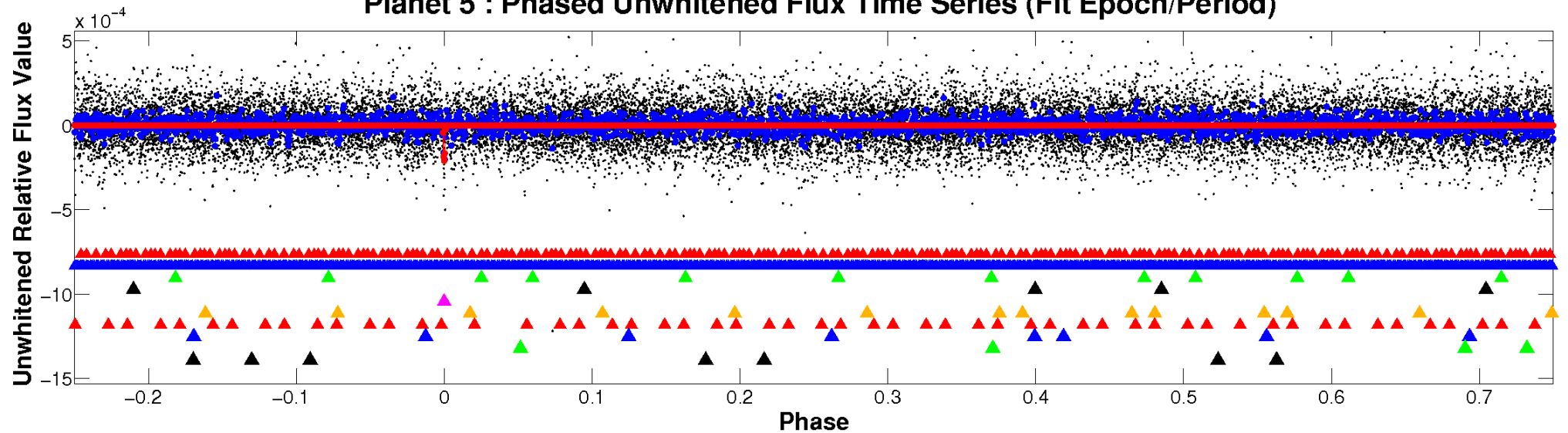
ALT Odd/Even

TCE 002014991-05

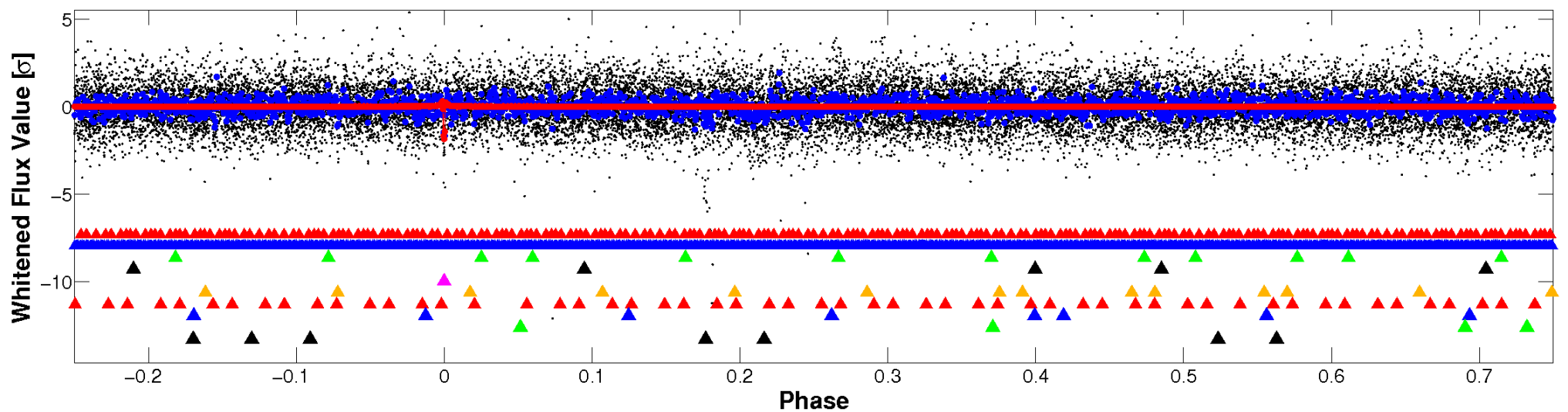


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

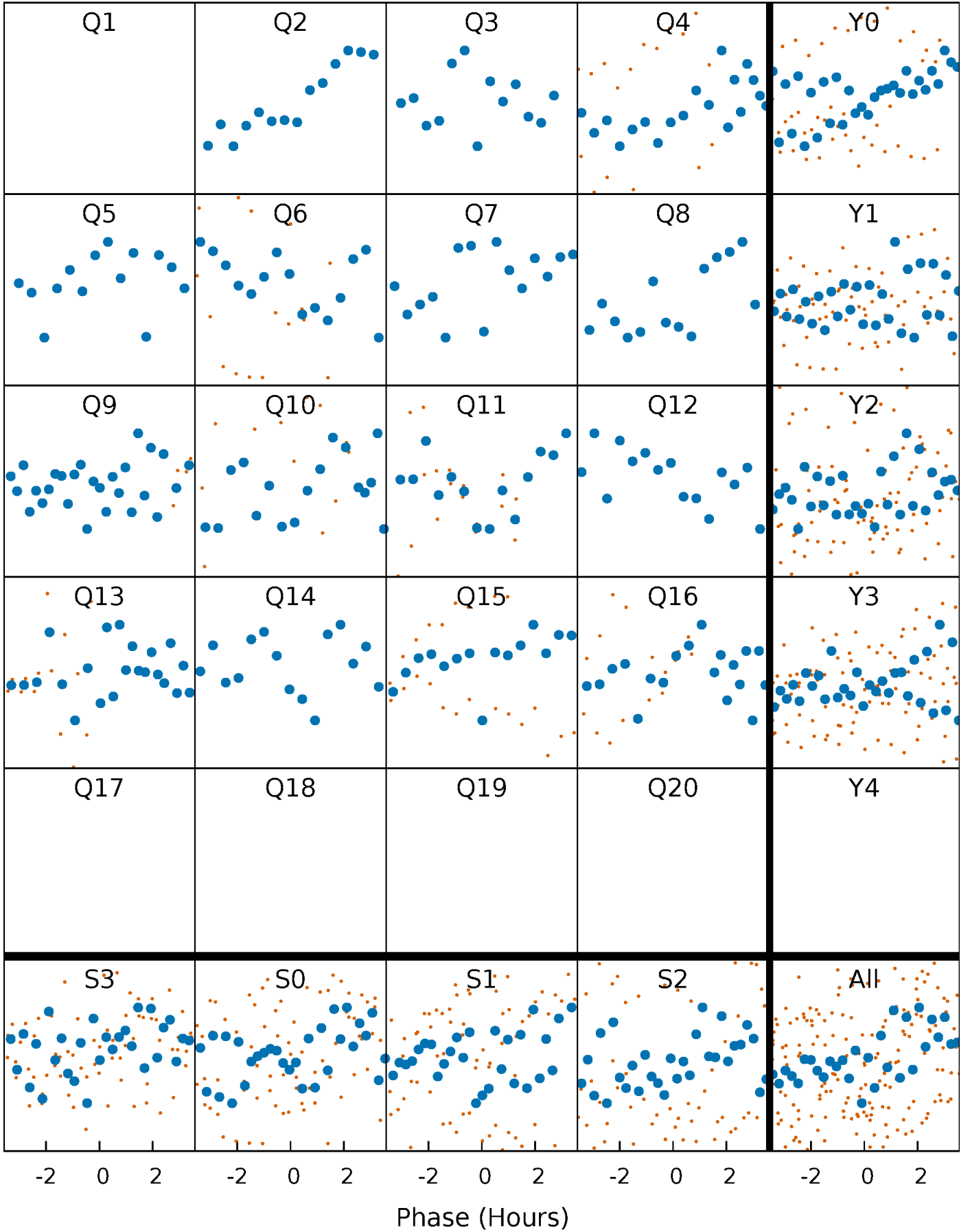


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



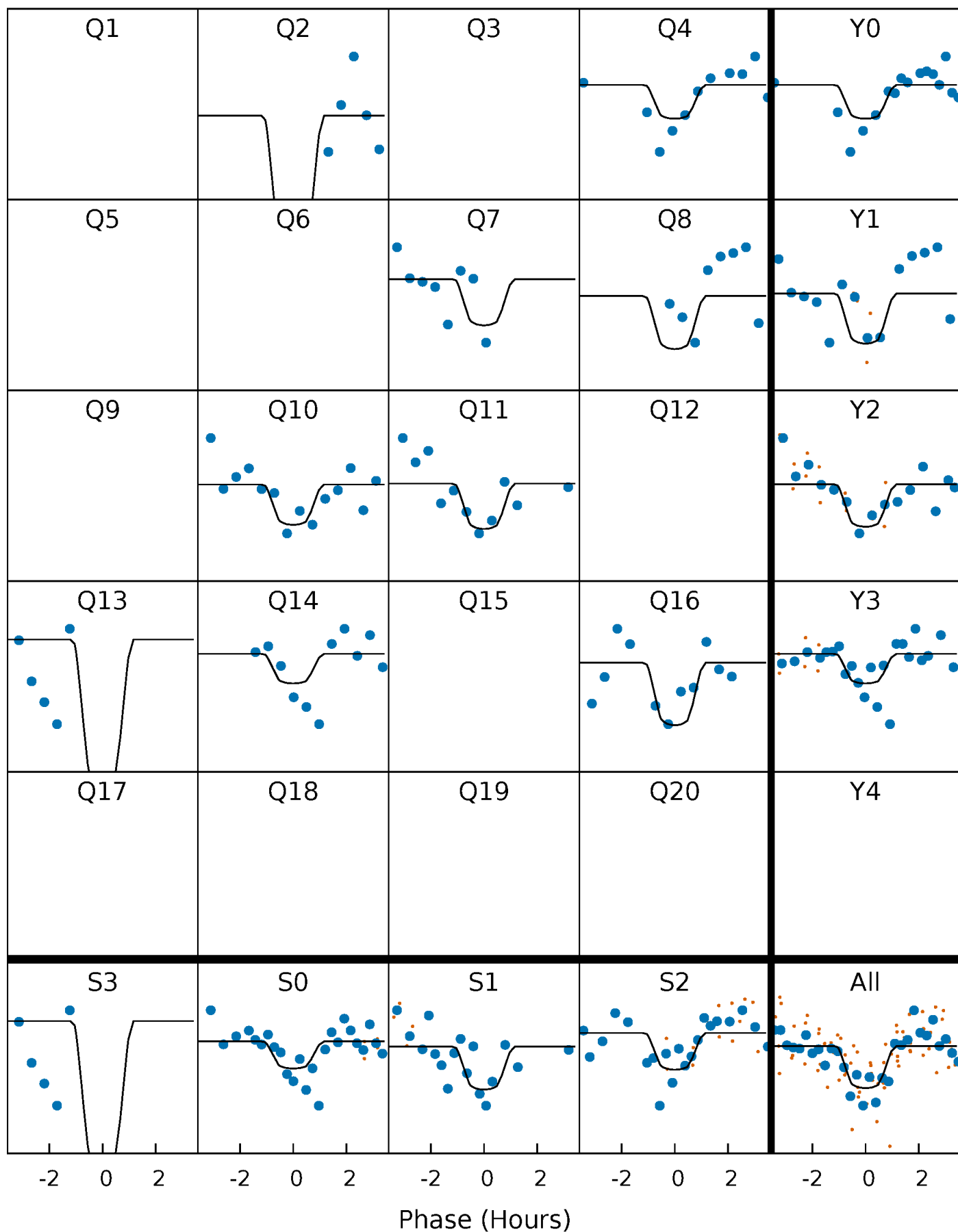
PDC Quarter-Phased Transit Curves

TCE 002014991-05 P= 51.120756 Days $T_0=169.148492$ (BKJD)



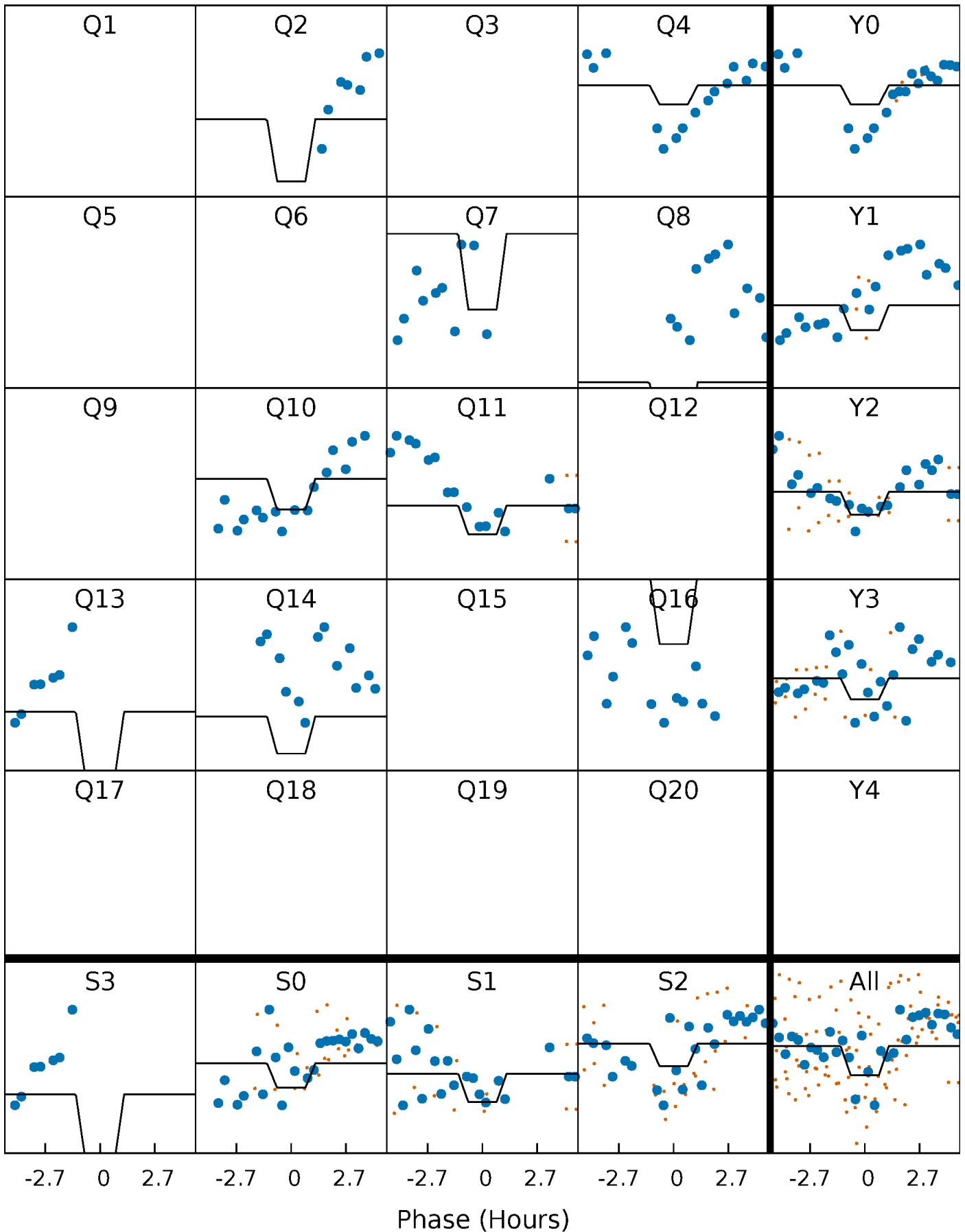
DV Quarter-Phased Transit Curves

TCE 002014991-05 P= 51.120756 Days $T_0=169.148492$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

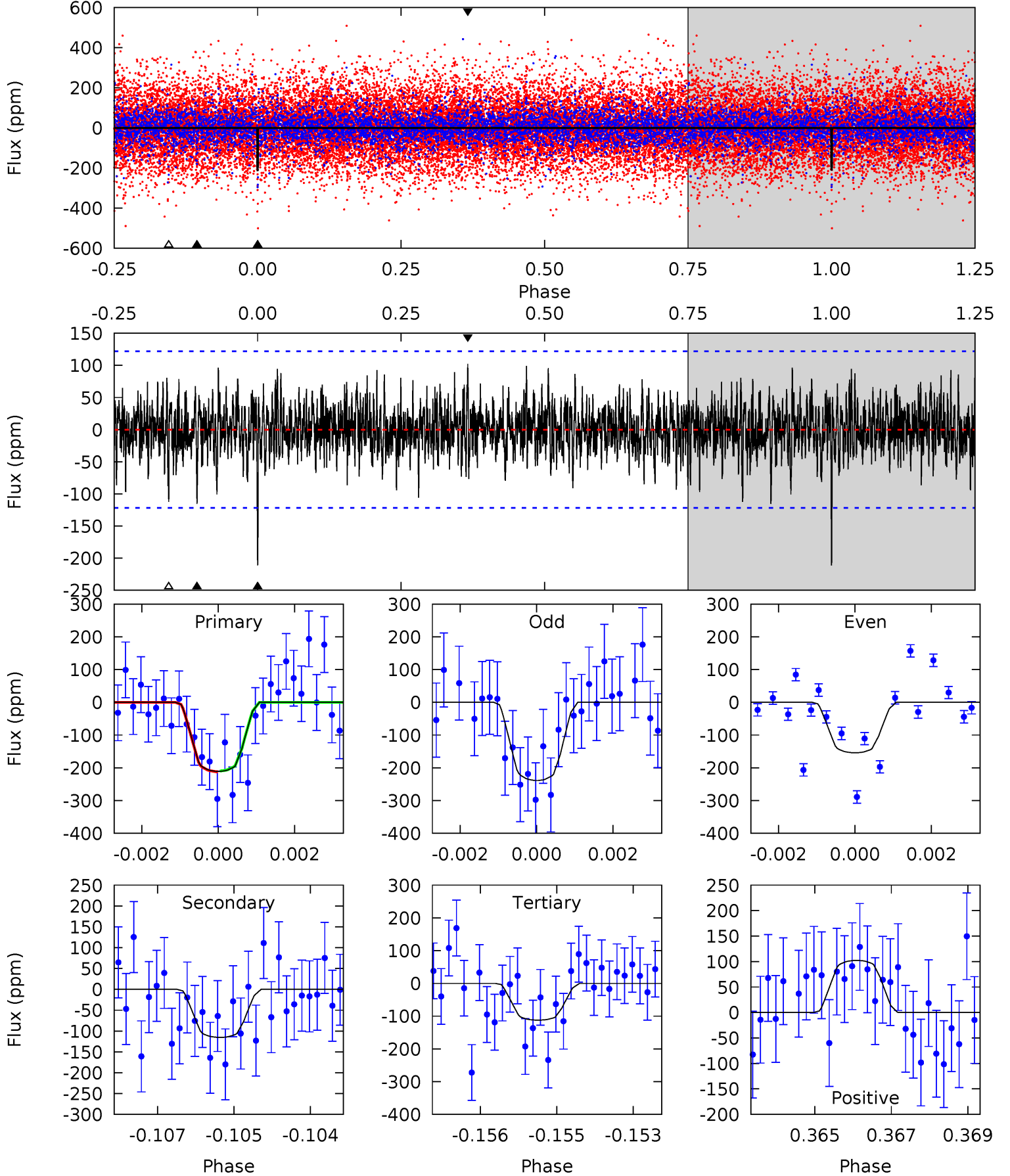
TCE 002014991-05 P= 51.121294 Days $T_0=169.141579$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-05, $P = 51.120756$ Days, $E = 118.027736$ Days

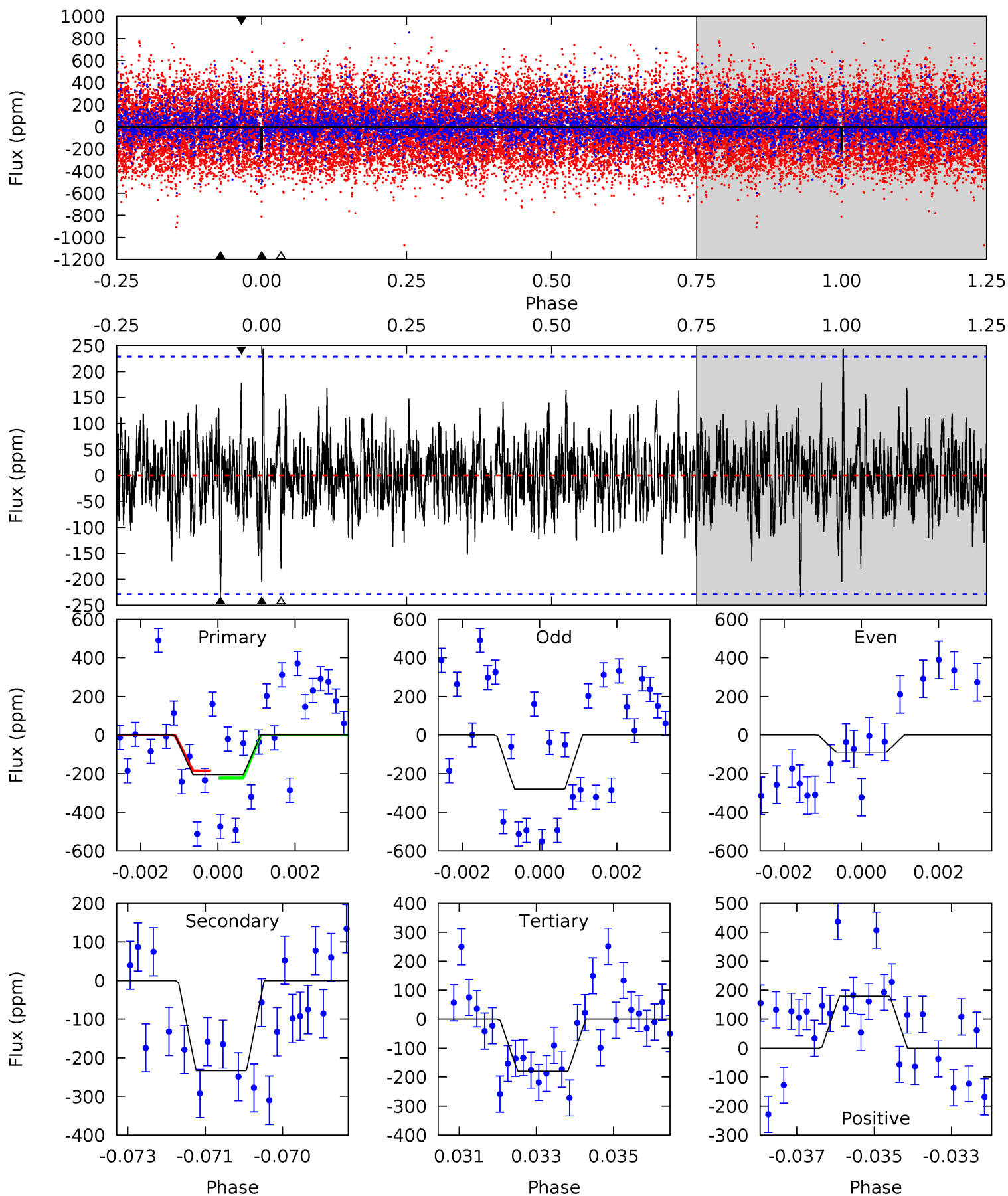
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.28	5.07	4.93	4.50	5.35	3.13	1.32	4.34	4.78	0.14	0.57	1.79	1.11	0.33	0.05



Alt Model-Shift Uniqueness Test

002014991-05, P = 51.121294 Days, E = 118.020285 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.82	5.47	4.21	4.20	5.35	3.13	1.20	0.61	0.62	1.26	1.28	2.18	1.24	0.51	0.42



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-115 ± 23	$5.23^{+4.03}_{-3.14}$	1210^{+70}_{-109}	5147^{+3000}_{-958}	219^{+1075}_{-149}
Alt.	-234 ± 43	$5.36^{+4.05}_{-3.20}$	1211^{+69}_{-102}	5972^{+4281}_{-1238}	429^{+2313}_{-290}

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 $A_{obs} \gg 1.0$

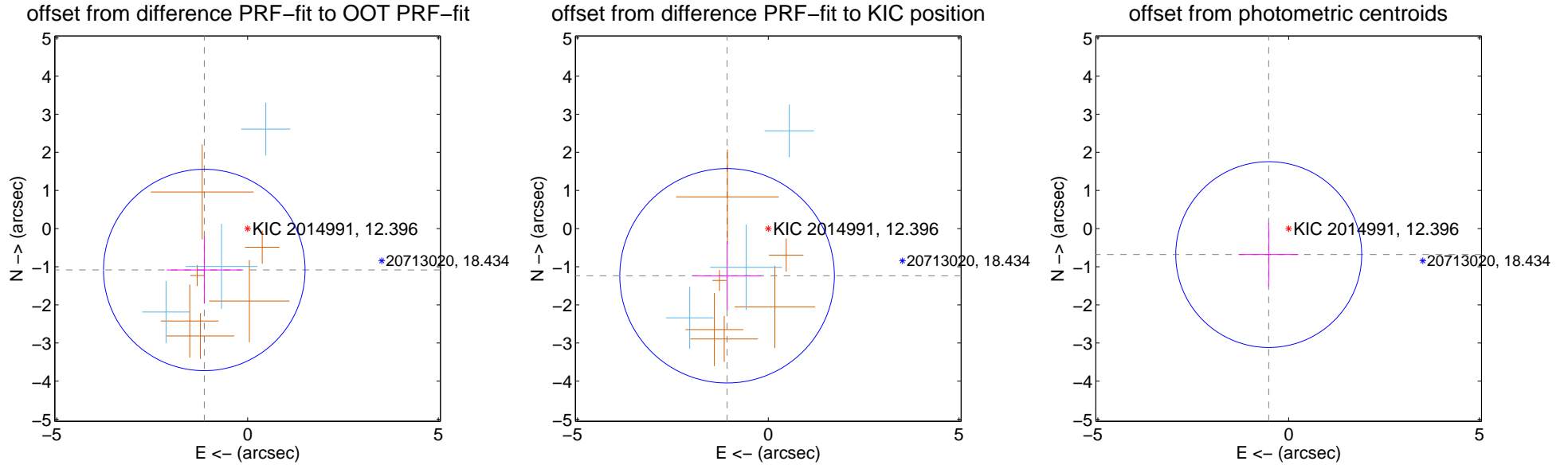
DV Centroid Data

Supplemental centroid analysis for 002014991-05. Kepler magnitude: 12.40. Transit SNR 7.59

There are 3 quarters with good PRF difference image offsets

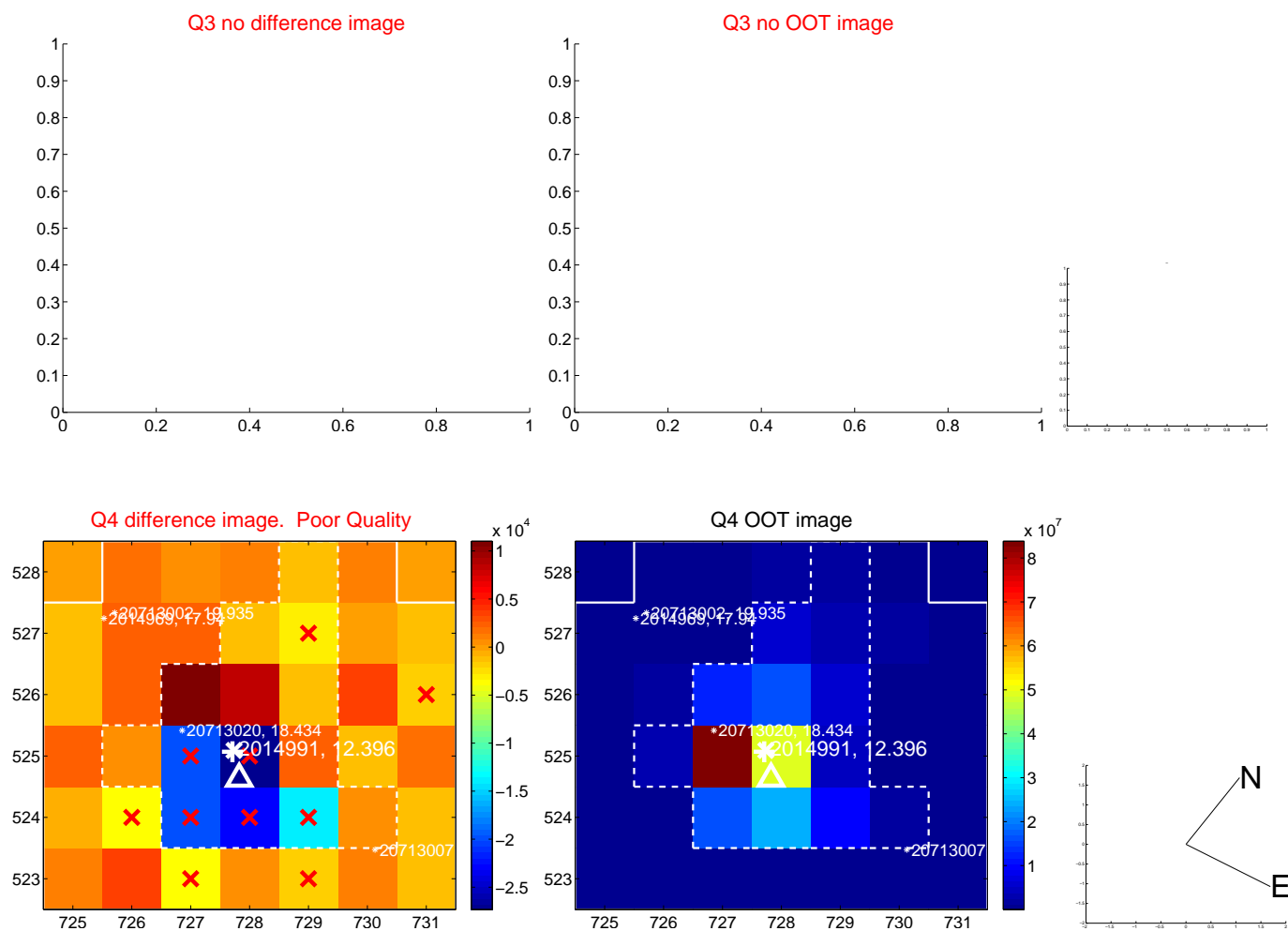
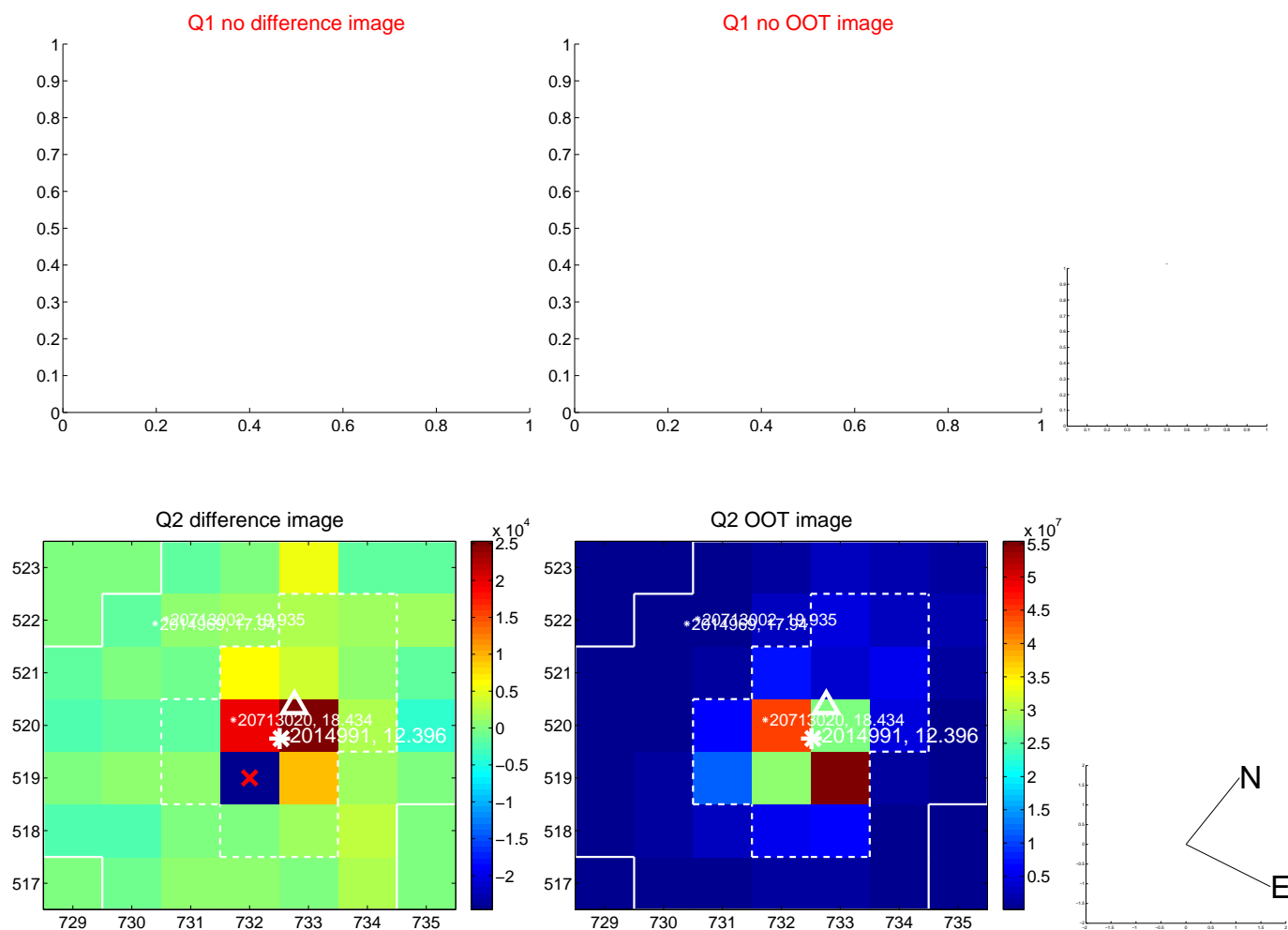
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.570 ± 0.880	1.78	1.135 ± 0.980	-1.085 ± 0.882
PRF-fit source offset from KIC position	1.642 ± 0.937	1.75	1.080 ± 0.906	-1.237 ± 0.906
photometric centroid source offset	0.86 ± 0.81	1.06	0.52 ± 0.78	-0.68 ± 0.83

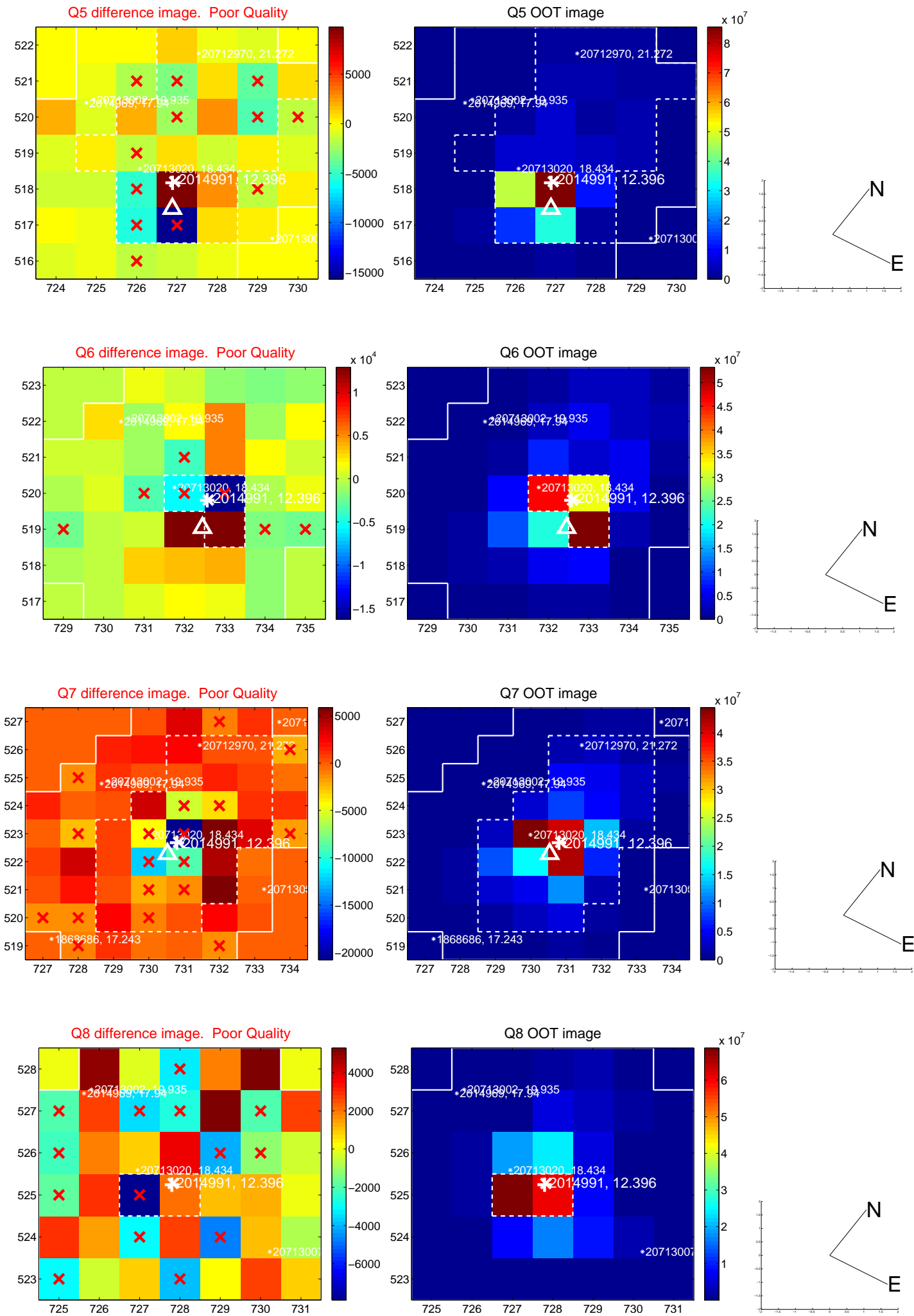


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

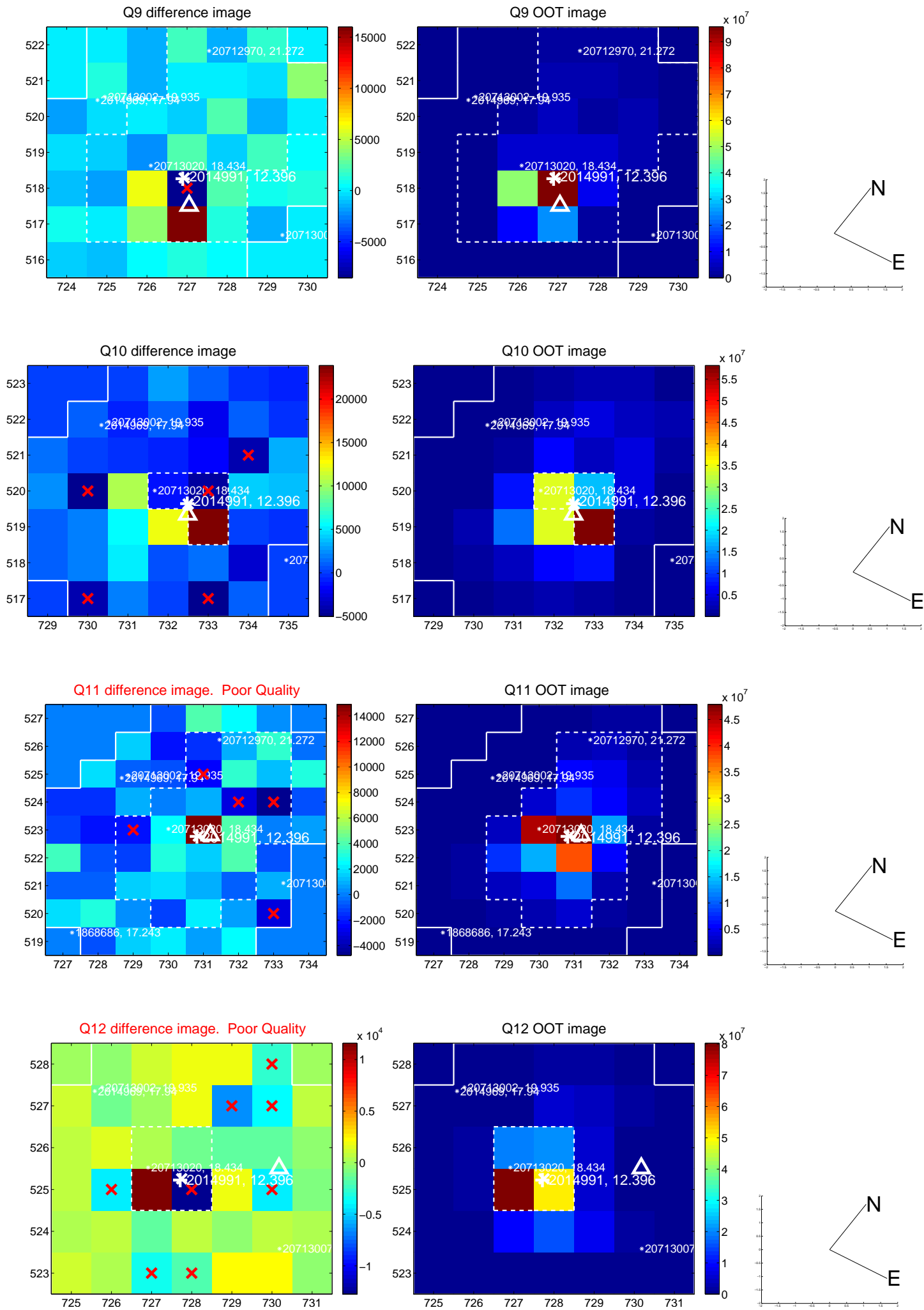
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



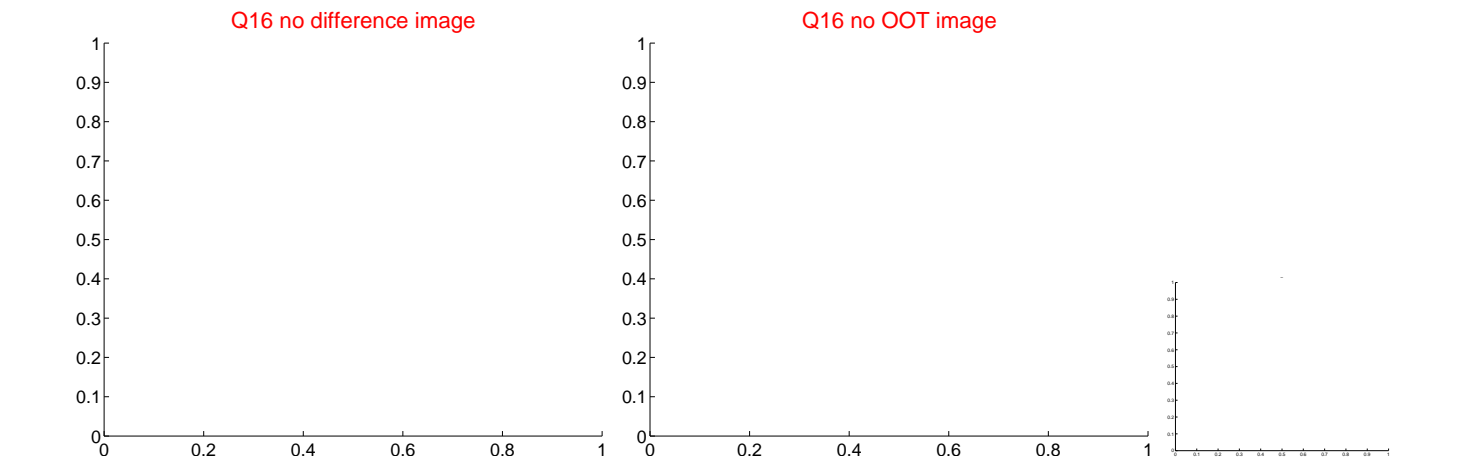
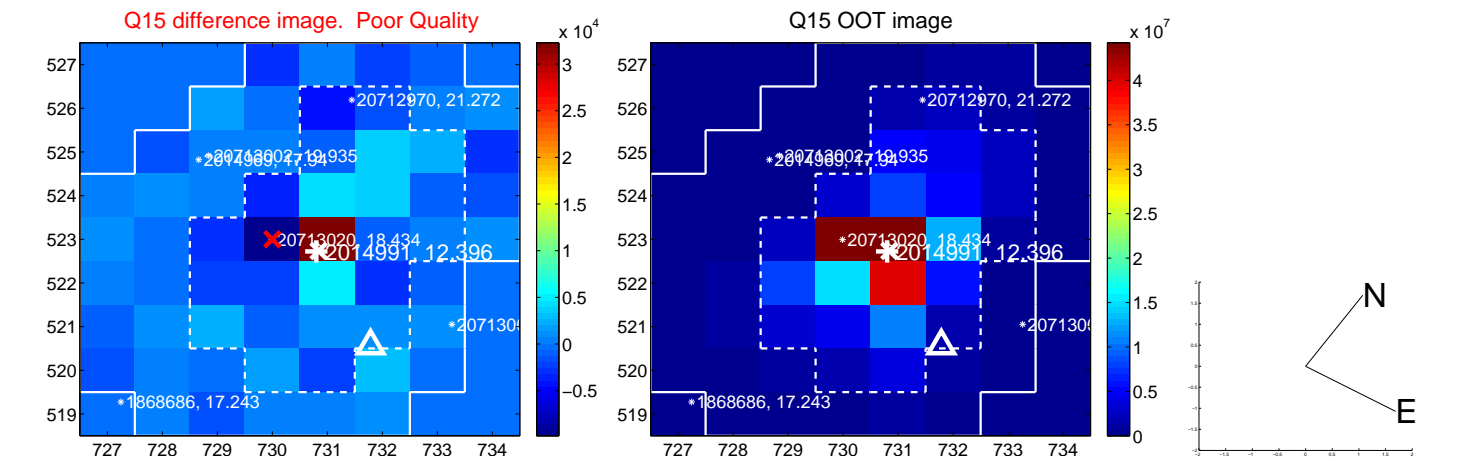
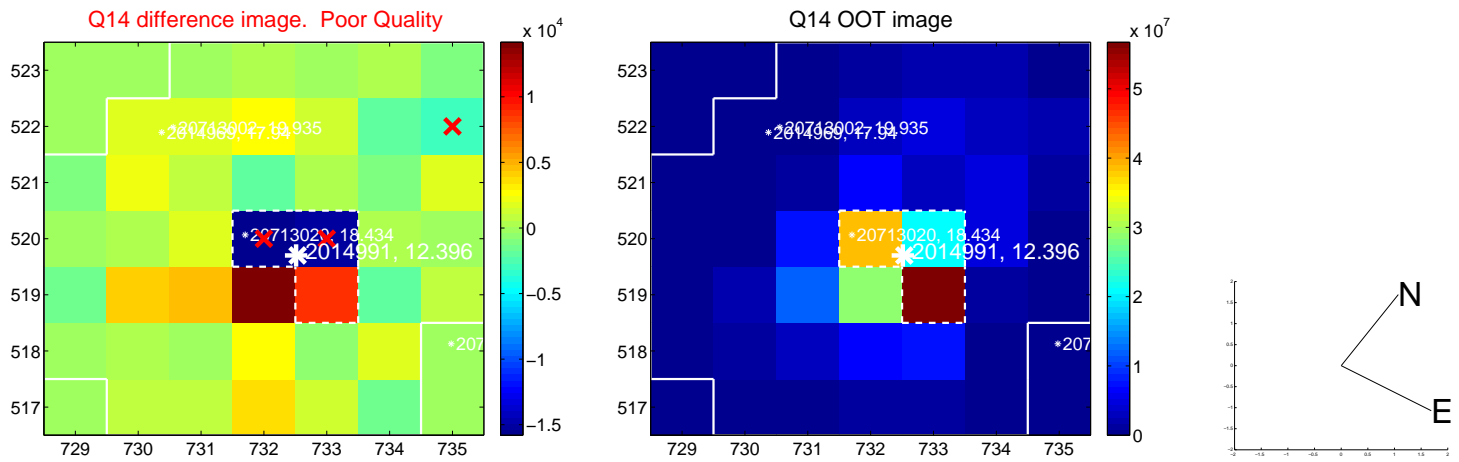
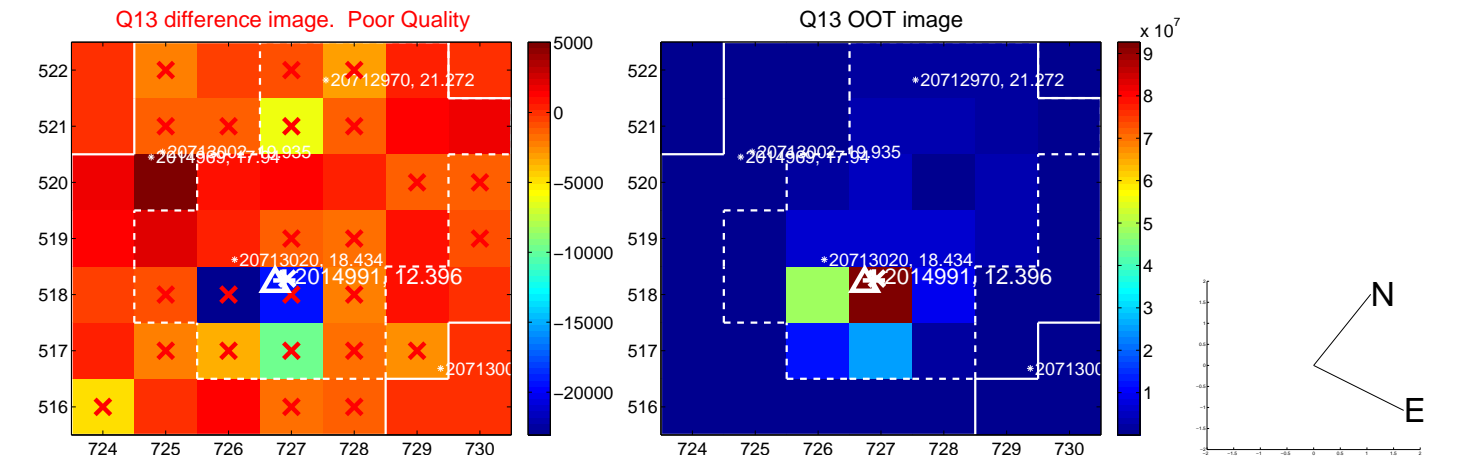
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



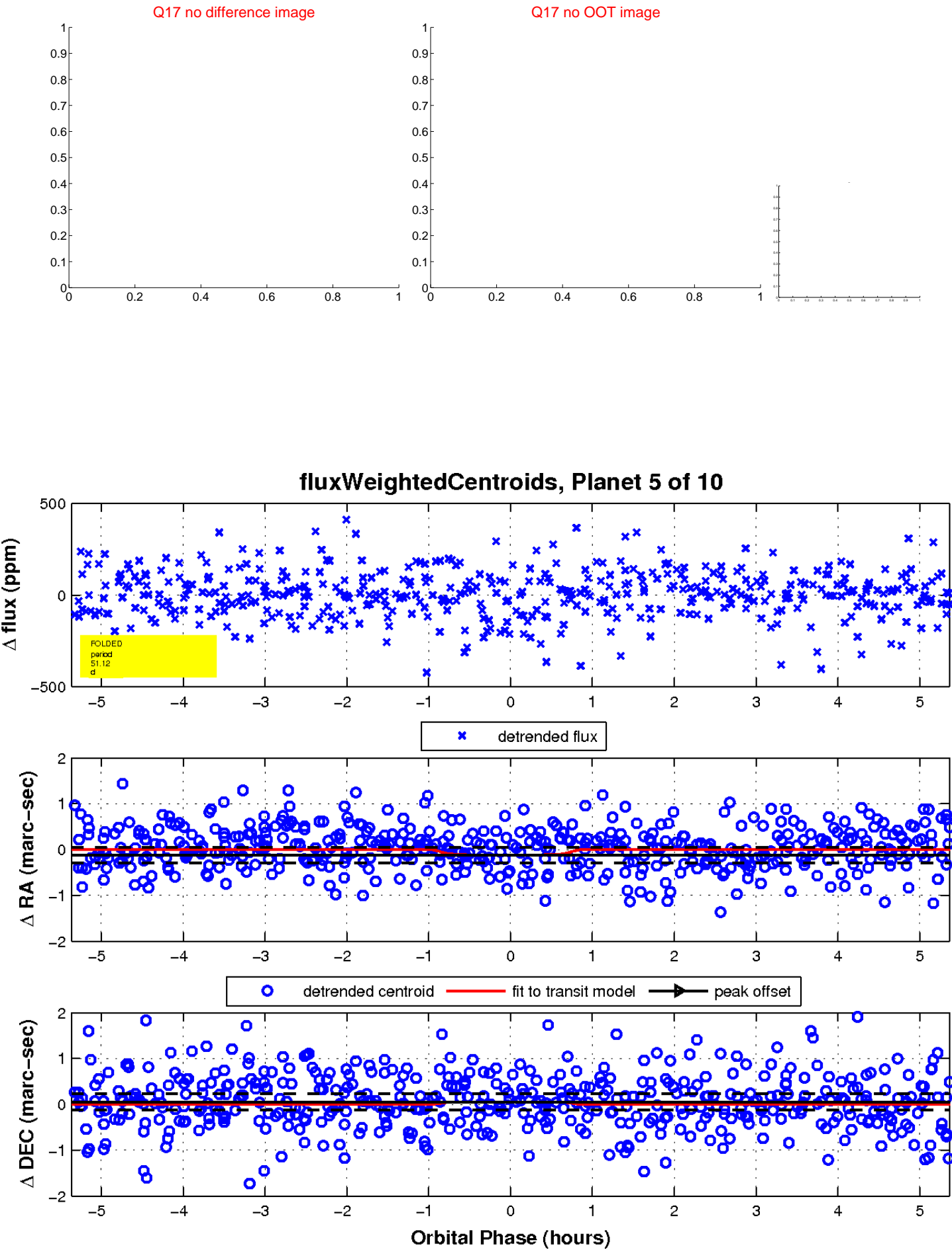
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

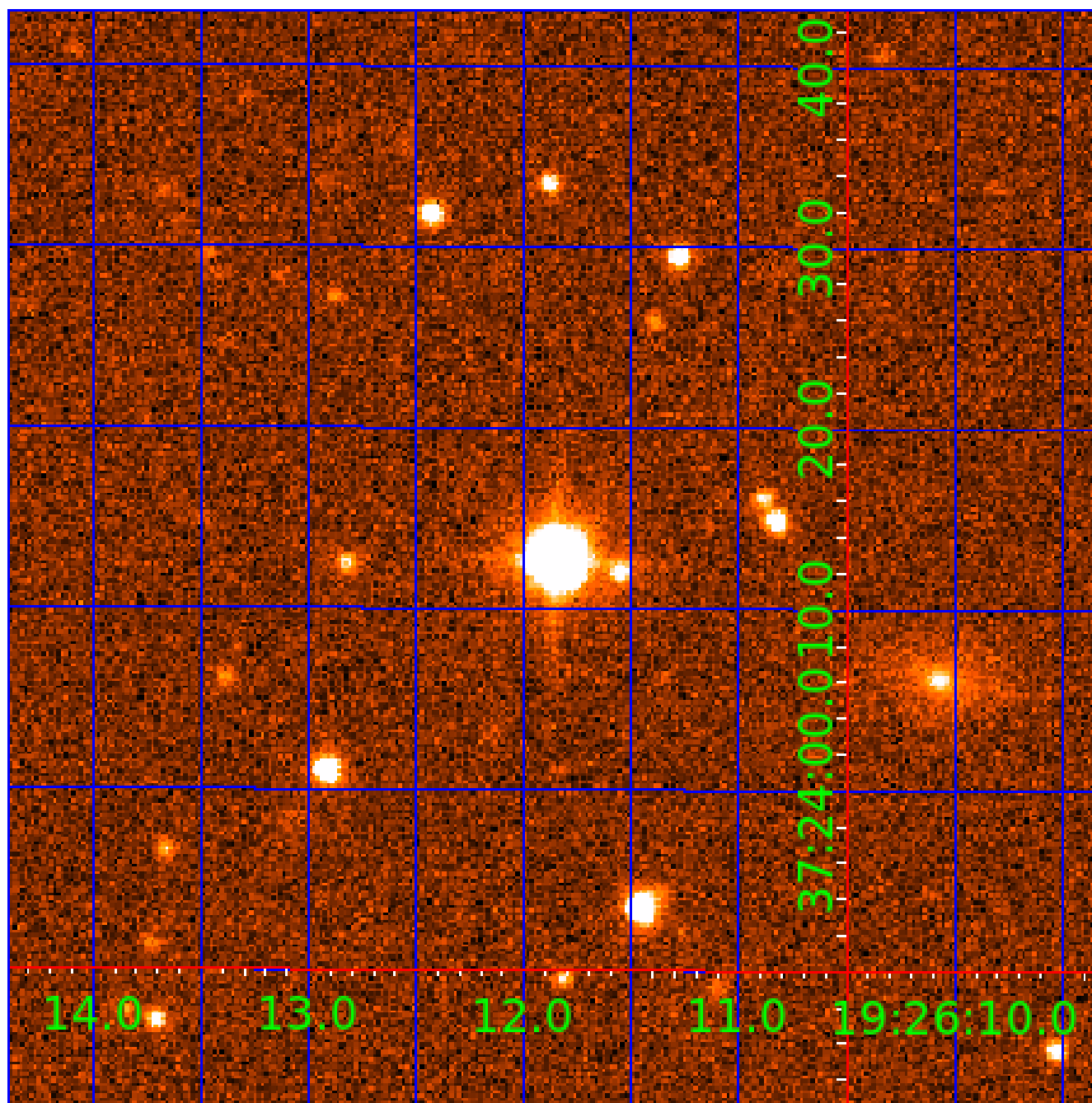


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
002014991-08	OBS	No	175.413692	189.562425	164.3	6.160	7.5	6.2	3.05	6418	4.43	28.13
002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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.

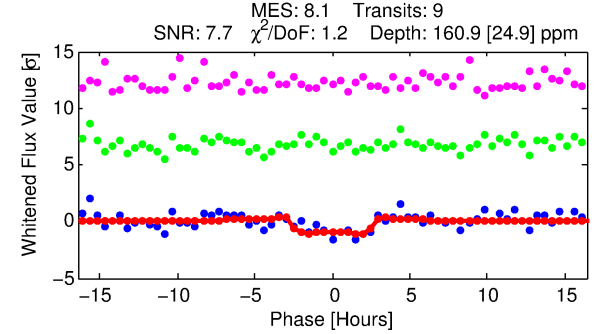
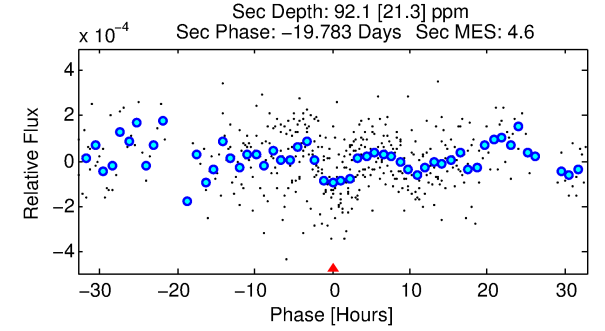
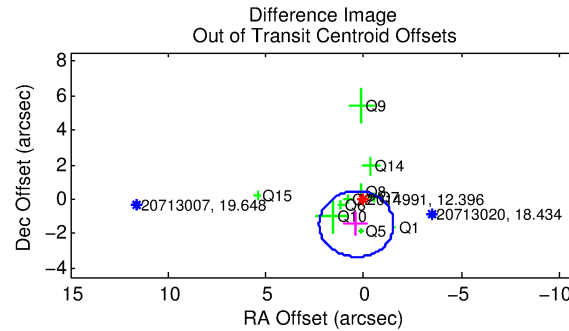
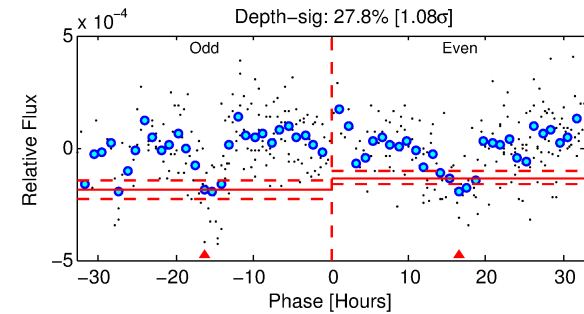
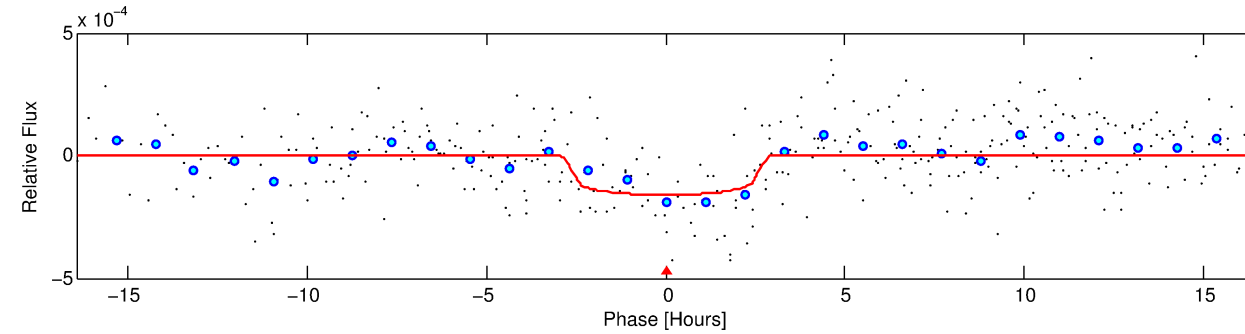
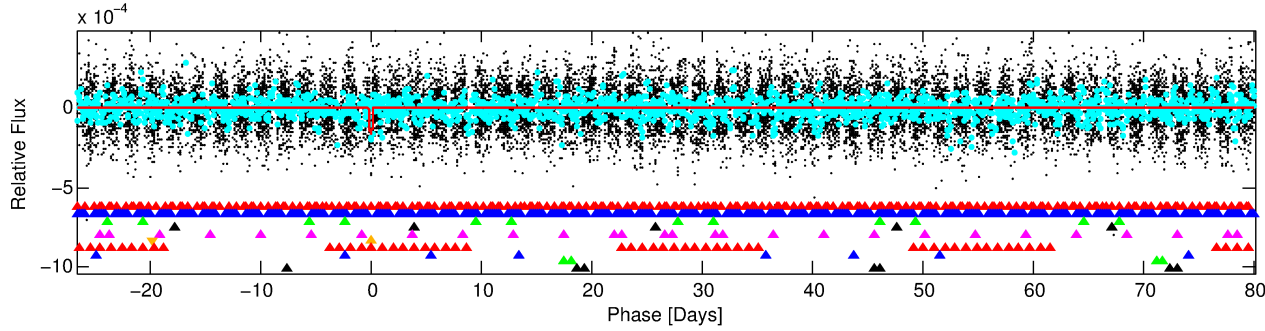
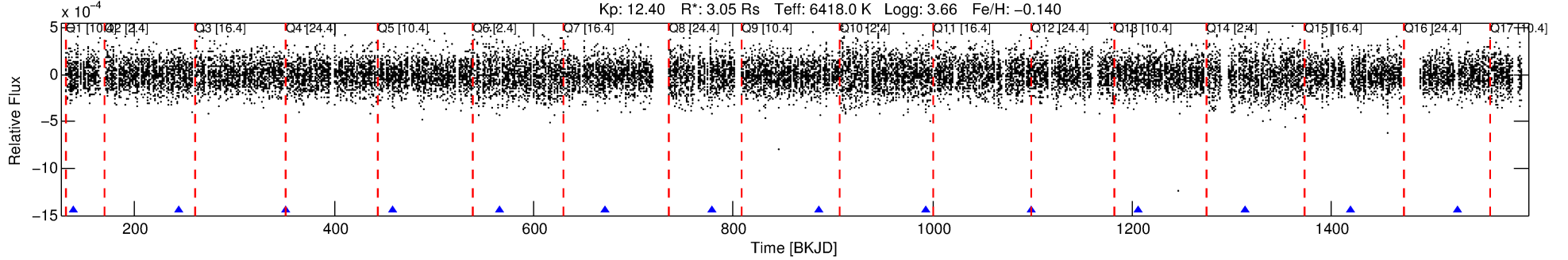
Ephemeris Match Information For 002014991-06

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 6 of 10 Period: 106.817 d
KOI: K02178 Corr: No Ephemeris Match

Kp: 12.40 R*: 3.05 Rs Teff: 6418.0 K Logg: 3.66 Fe/H: -0.140



DV Fit Results:

Period = 106.81650 [0.00257] d
Epoch = 138.0201 [0.0151] BKJD
Rp/R* = 0.0128 [0.0069]
a/R* = 93.38 [278.97]
b = 0.80 [1.38]
Seff = 54.50 [29.30]
Teq = 693 [93] K
Rp = 4.26 [2.79] Re
a = 0.5092 [0.1718] AU
Ag = 722.58 [885.79] [0.81σ]
Teffp = 5554 [1545] K [3.14σ]

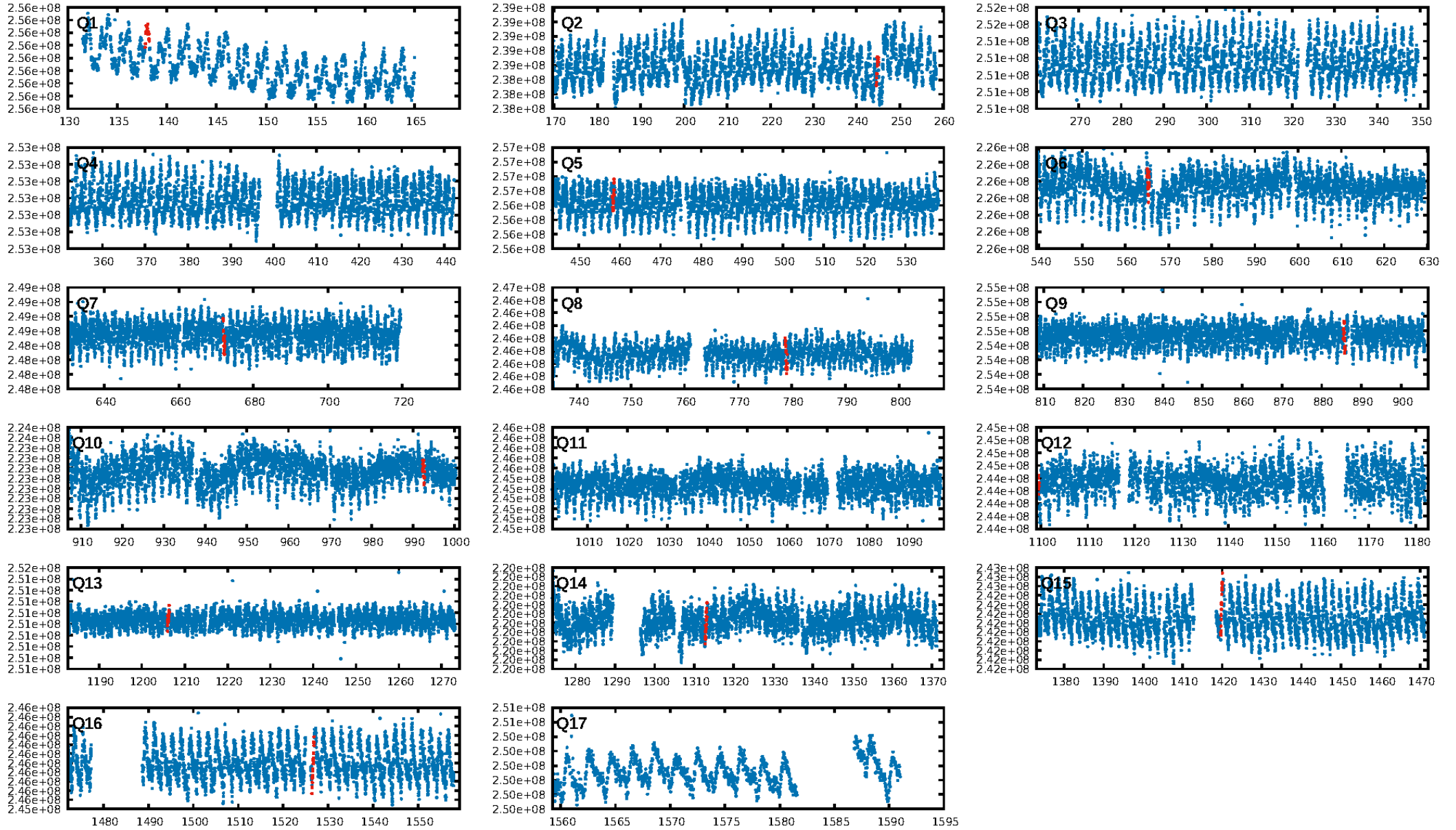
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [231.88σ]
LongPeriod-sig: 100.0% [24.87σ]
ModelChiSquare2-sig: 45.2%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: -4.22
Centroid-sig: 24.4%
Centroid-so: 1.074 arcsec [1.30σ]
OotOffset-rm: 1.485 arcsec [2.33σ]
KicOffset-rm: 1.596 arcsec [2.39σ]
OotOffset-st: 4/2/1/3 [10]
KicOffset-st: 4/2/1/3 [10]
DiffImageQuality-fgm: 0.30 [3/10]
DiffImageOverlap-fno: 0.50 [5/10]

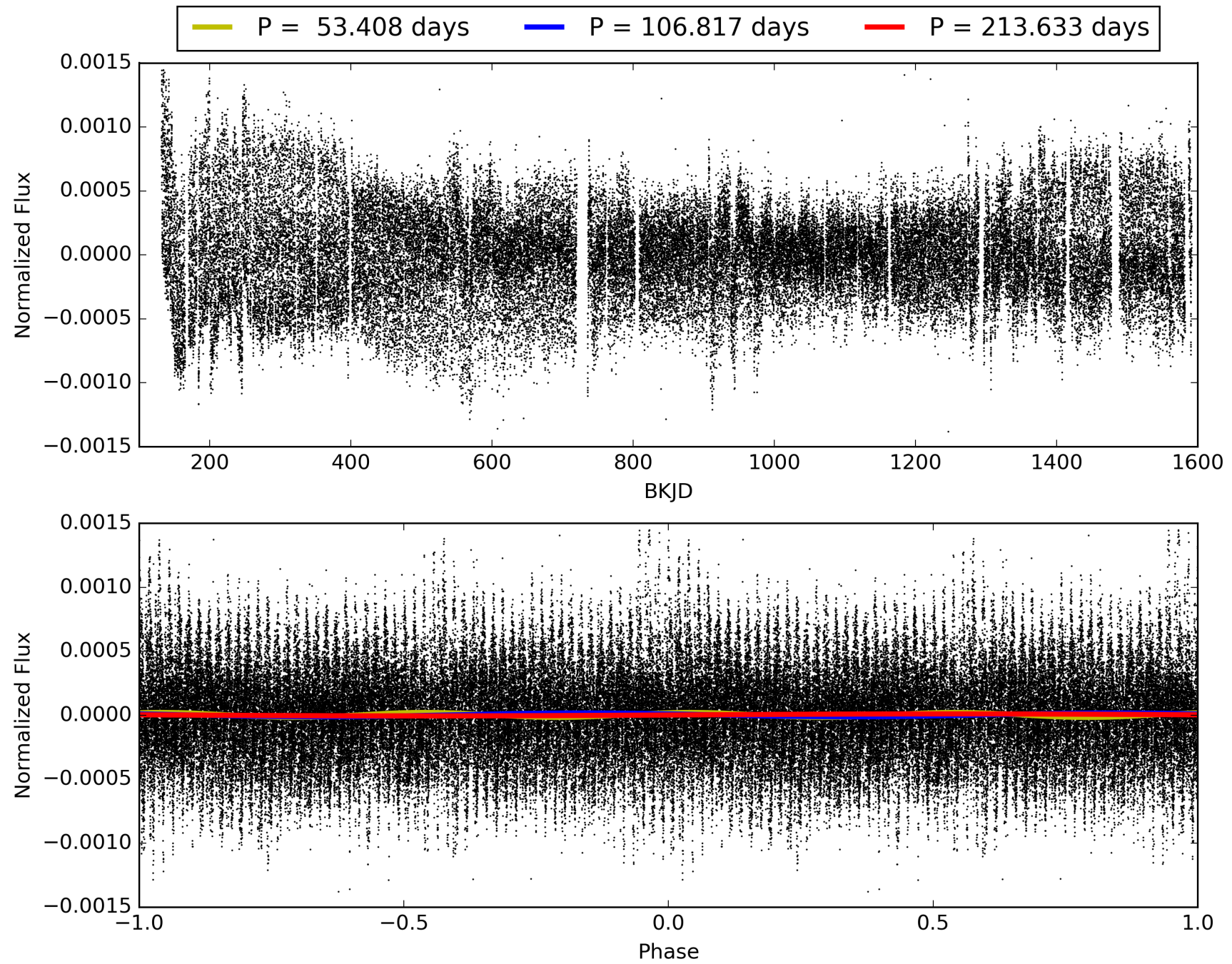
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:52:50 Z

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

TCE 002014991-06, PDC Light Curves

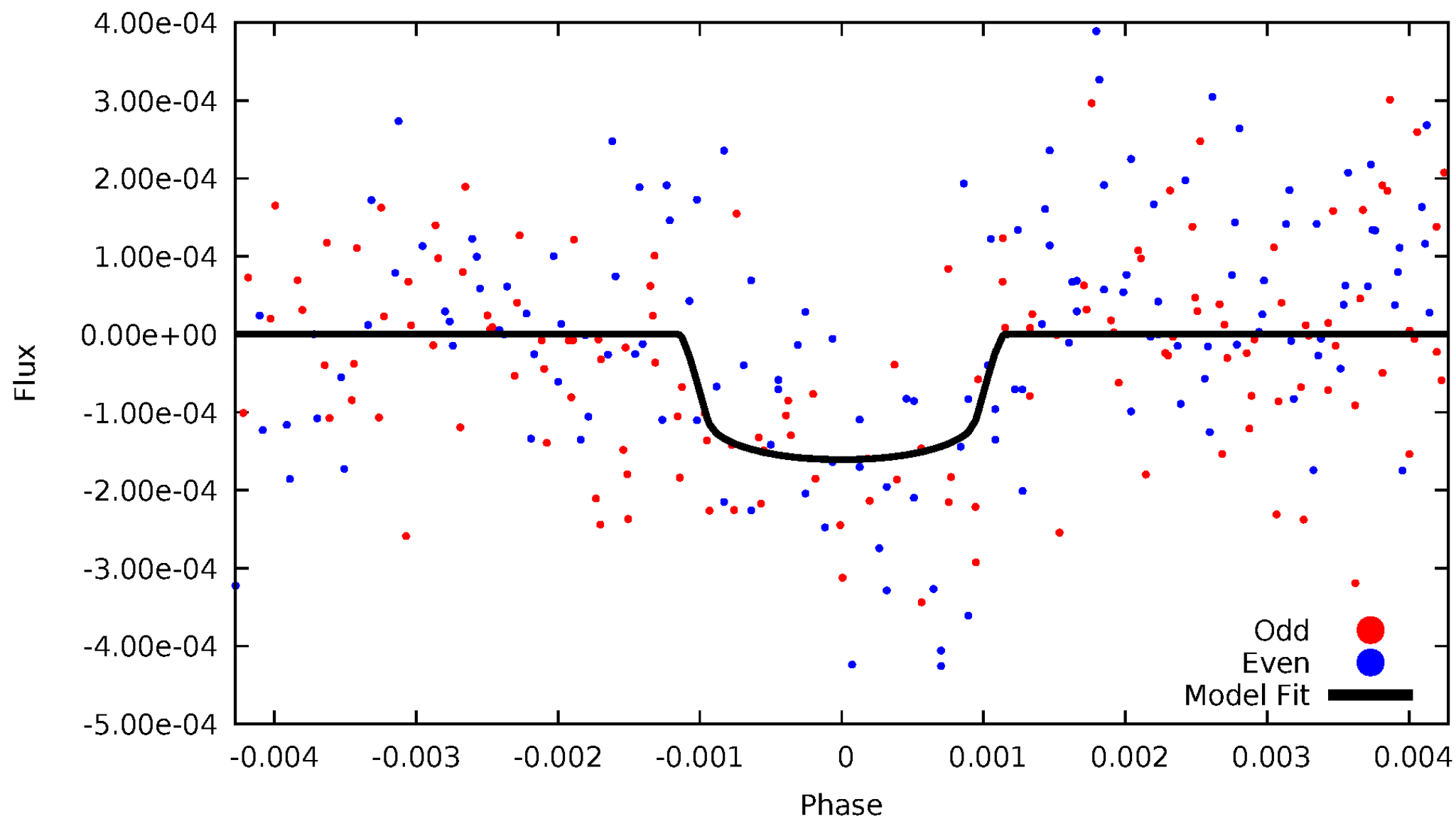


TCE 002014991-06



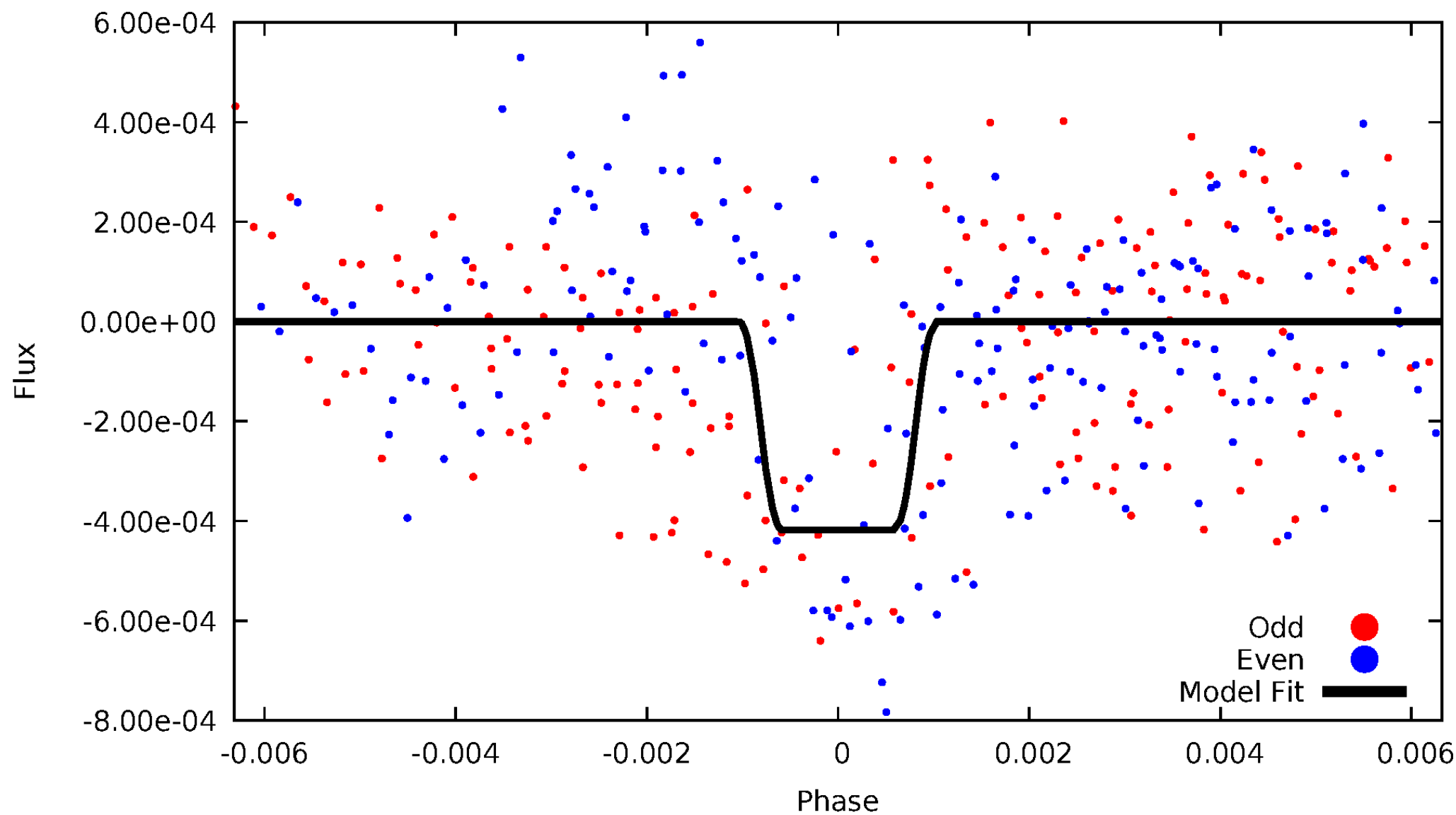
DV Odd/Even

TCE 002014991-06



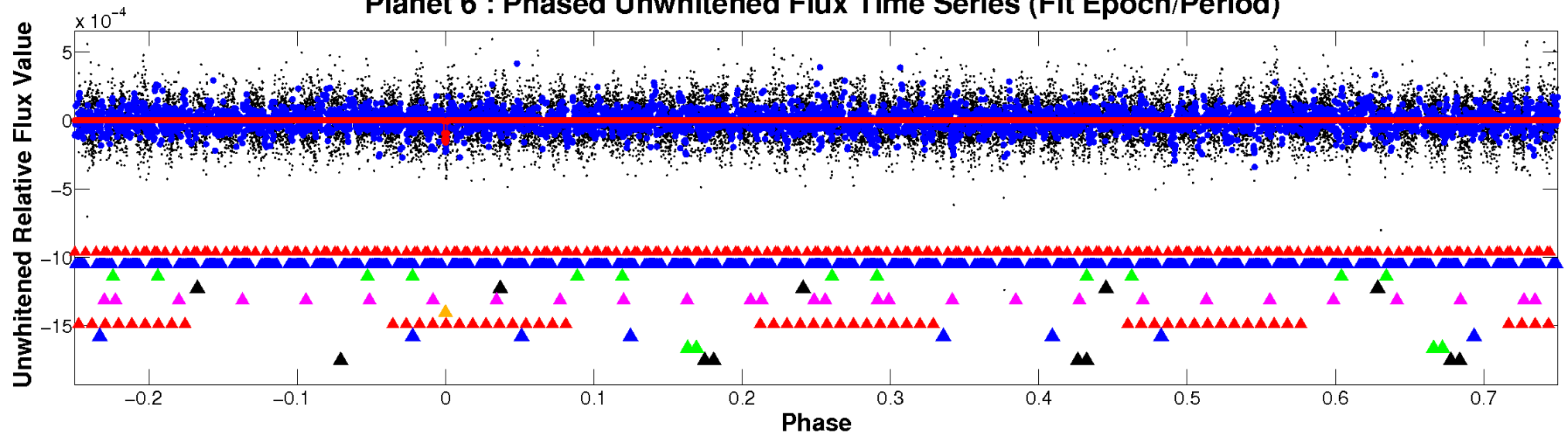
ALT Odd/Even

TCE 002014991-06

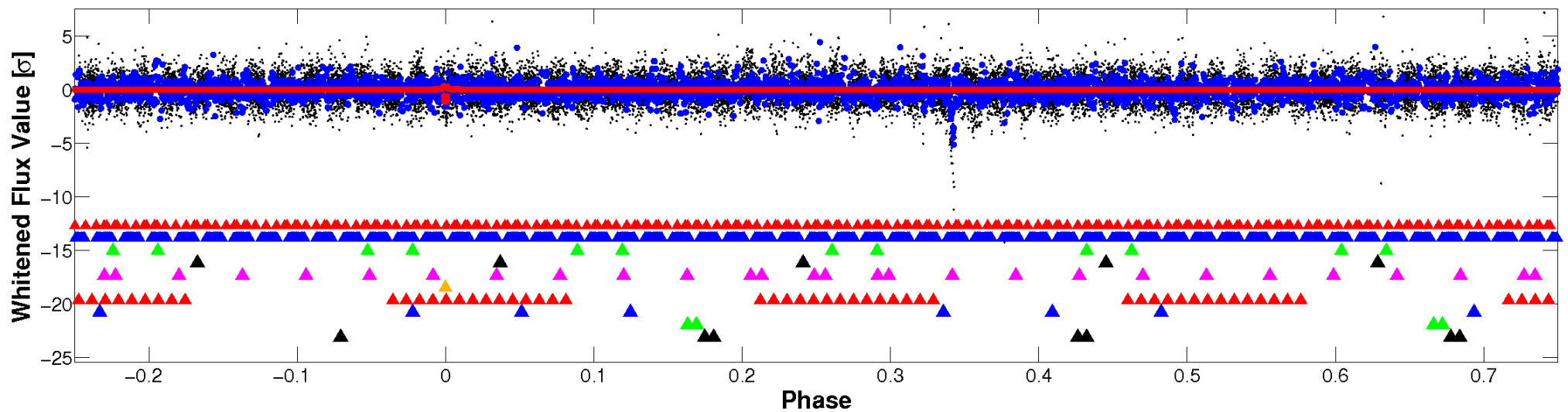


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

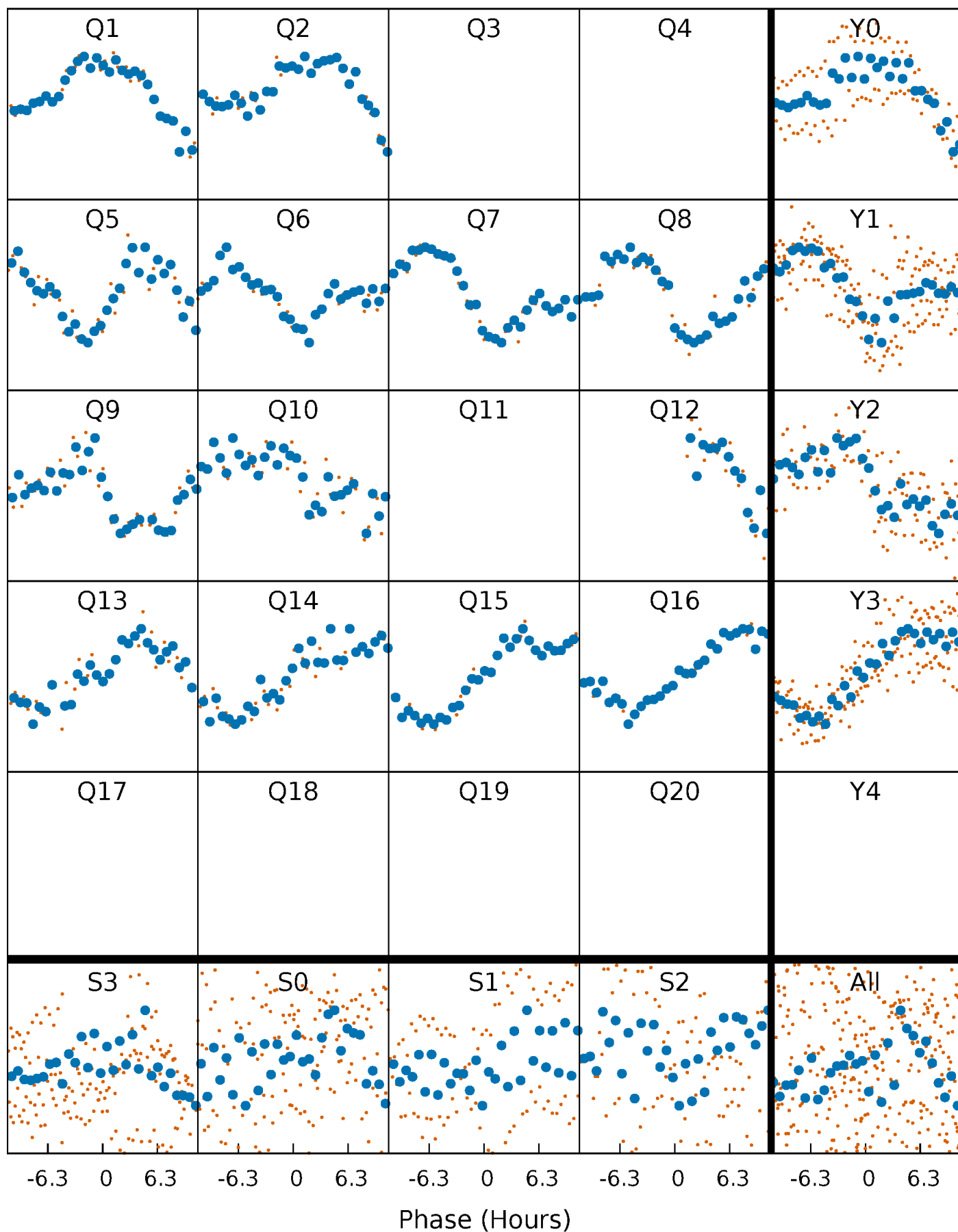


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



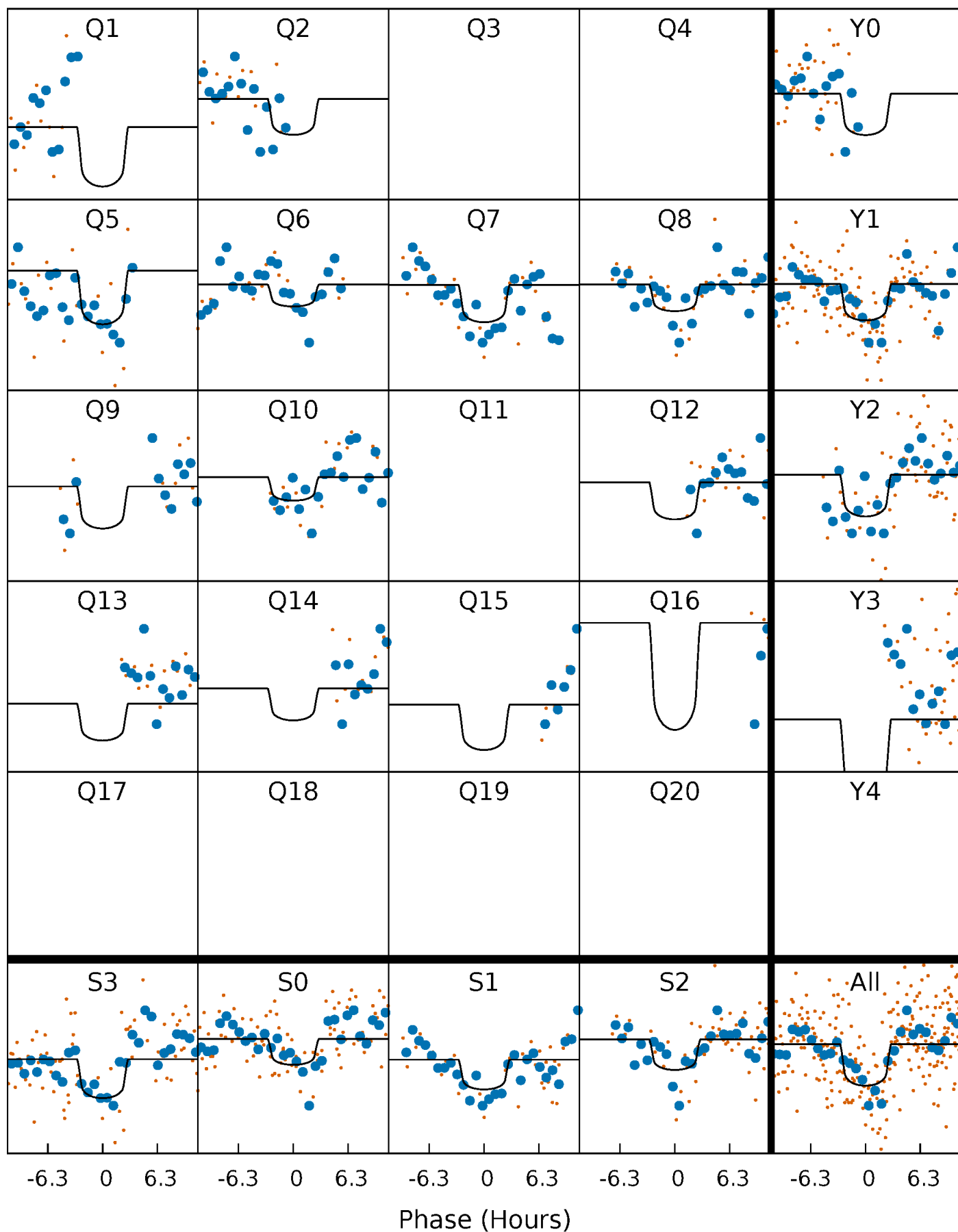
PDC Quarter-Phased Transit Curves

TCE 002014991-06 P=106.816505 Days $T_0=138.020084$ (BKJD)



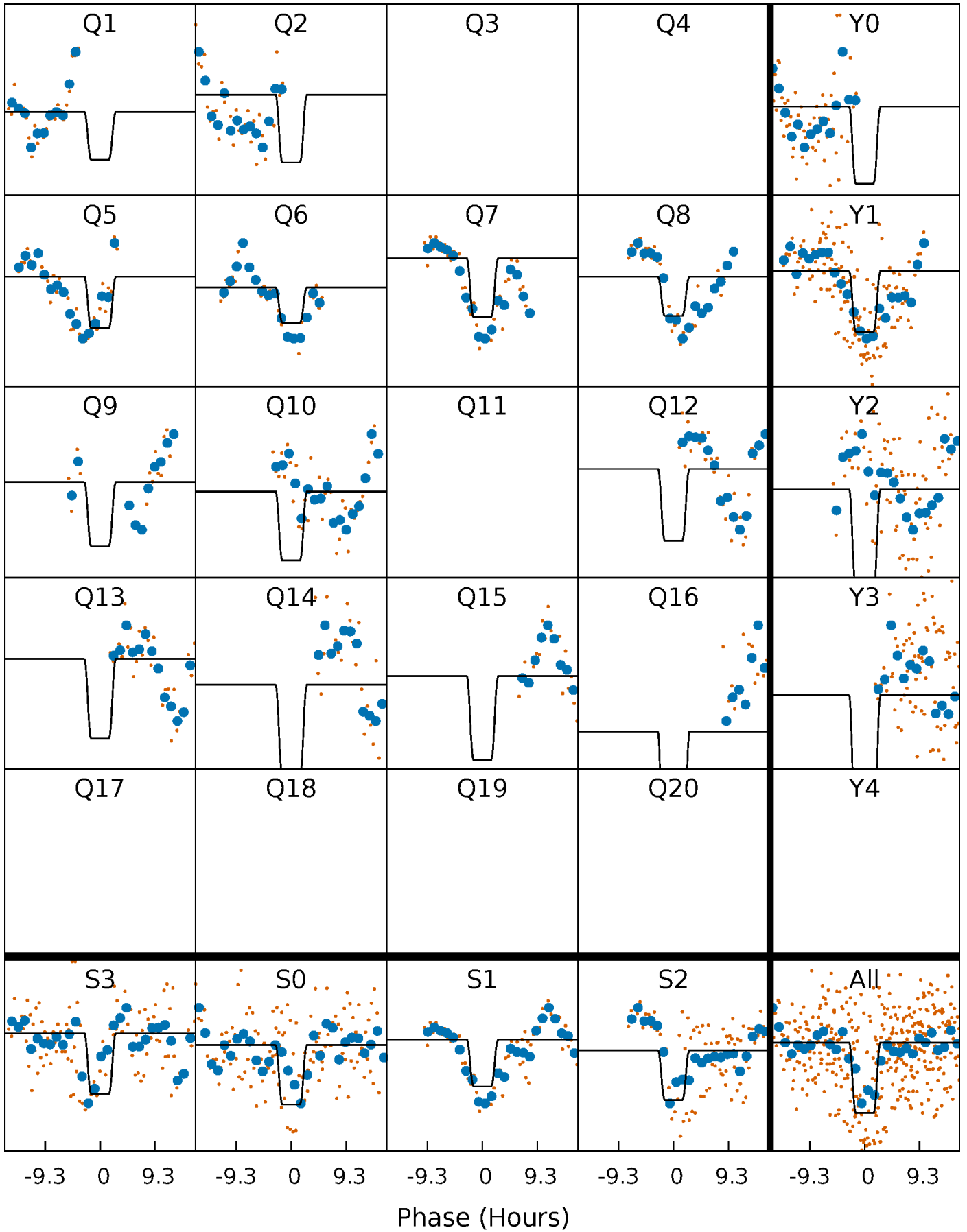
DV Quarter-Phased Transit Curves

TCE 002014991-06 P=106.816505 Days $T_0=138.020084$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

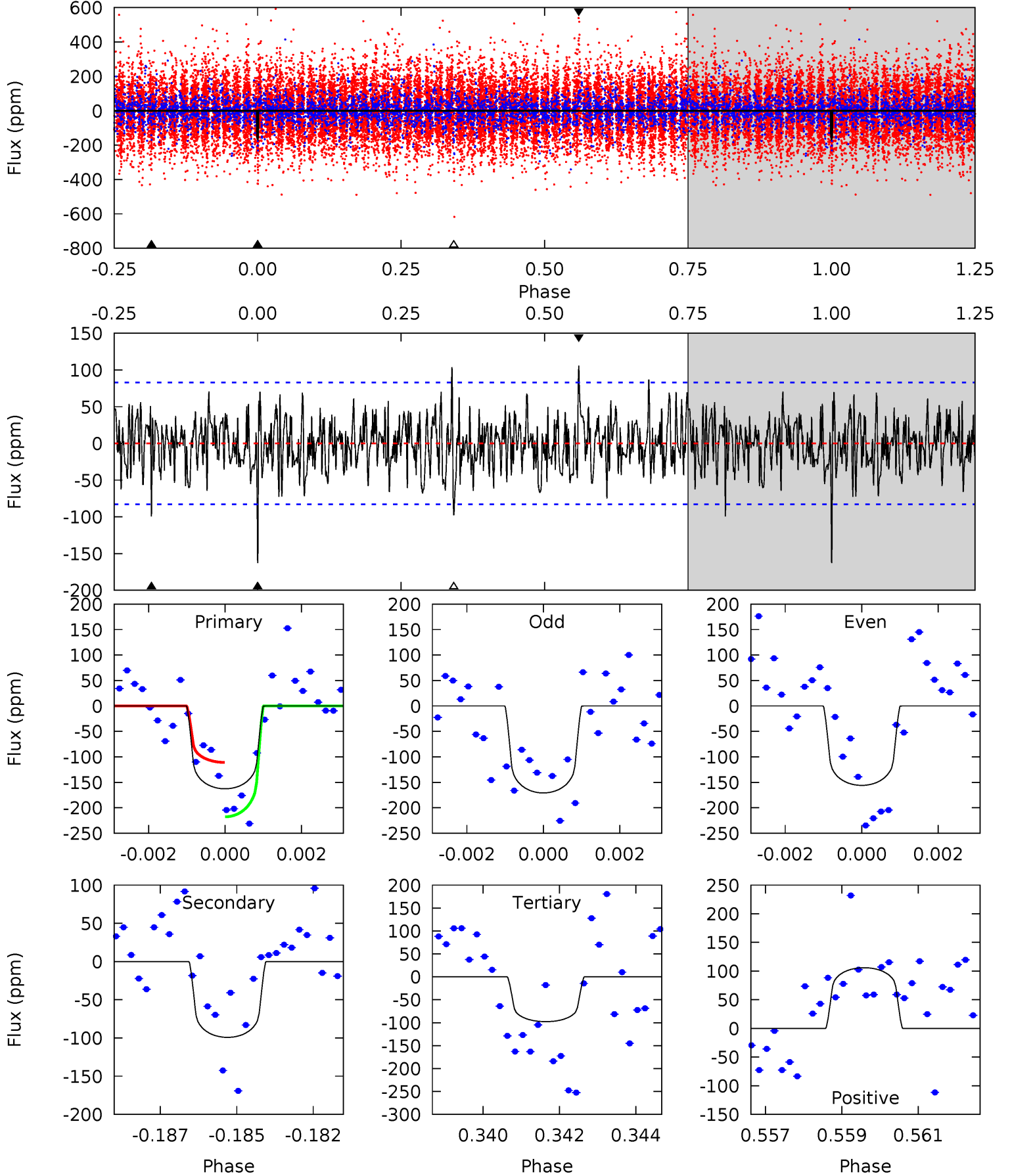
TCE 002014991-06 P=106.816111 Days $T_0=138.042424$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-06, P = 106.816505 Days, E = 31.203579 Days

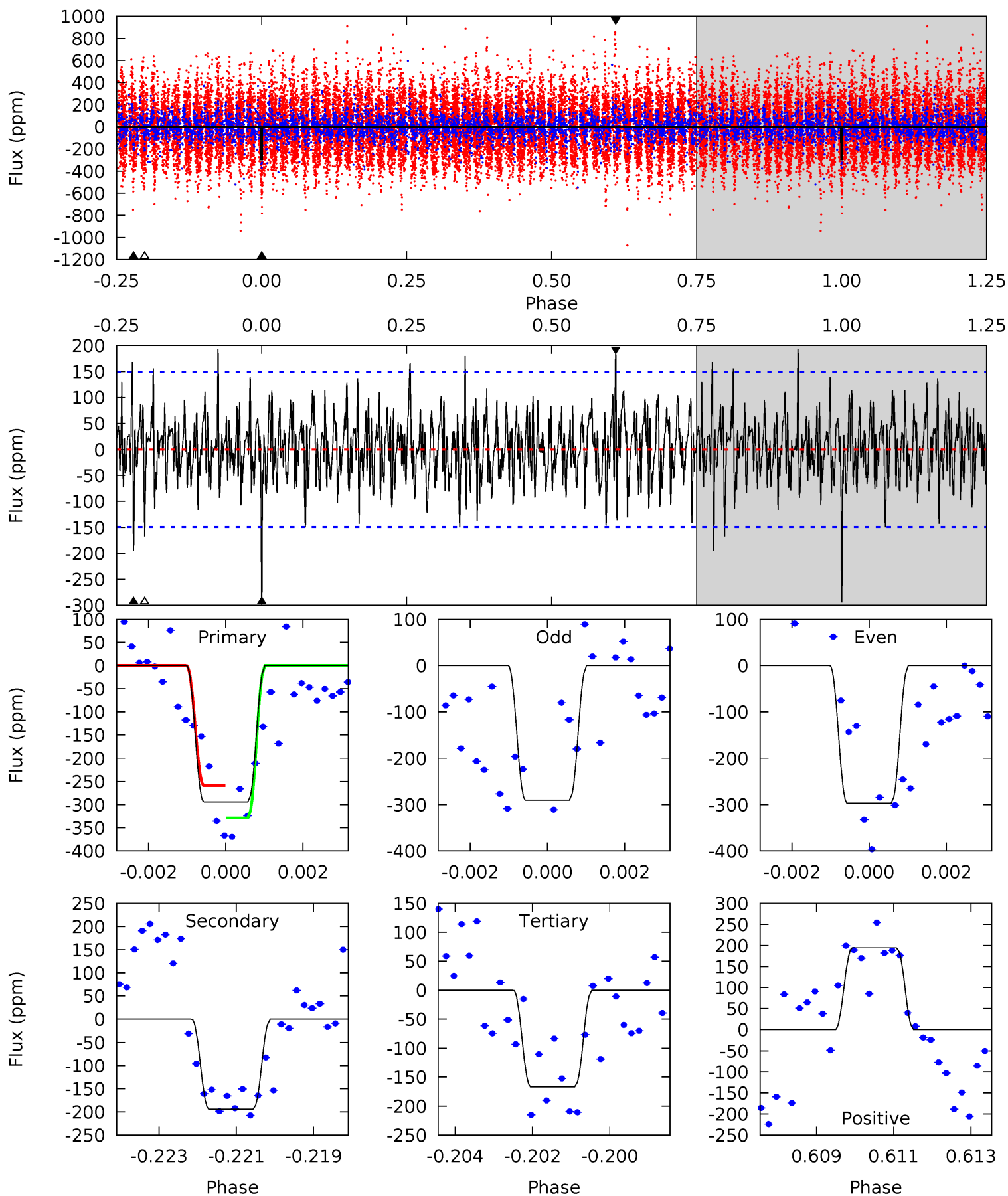
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	6.34	6.25	6.77	5.30	3.05	1.77	4.15	3.63	0.09	-0.43	0.47	0.72	0.39	3.42



Alt Model-Shift Uniqueness Test

002014991-06, P = 106.816111 Days, E = 31.226313 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	6.92	5.95	6.93	5.32	3.08	1.93	4.54	3.55	0.97	-0.01	0.12	1.45	0.40	1.25



Stellar Parameters For KIC 002014991

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-99 ± 16	$3.93^{+2.27}_{-1.95}$	946^{+57}_{-90}	5667^{+2492}_{-1032}	929^{+2672}_{-564}
Alt.	-194 ± 28	$6.31^{+2.57}_{-2.26}$	948^{+54}_{-84}	5331^{+1132}_{-673}	697^{+1013}_{-348}

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

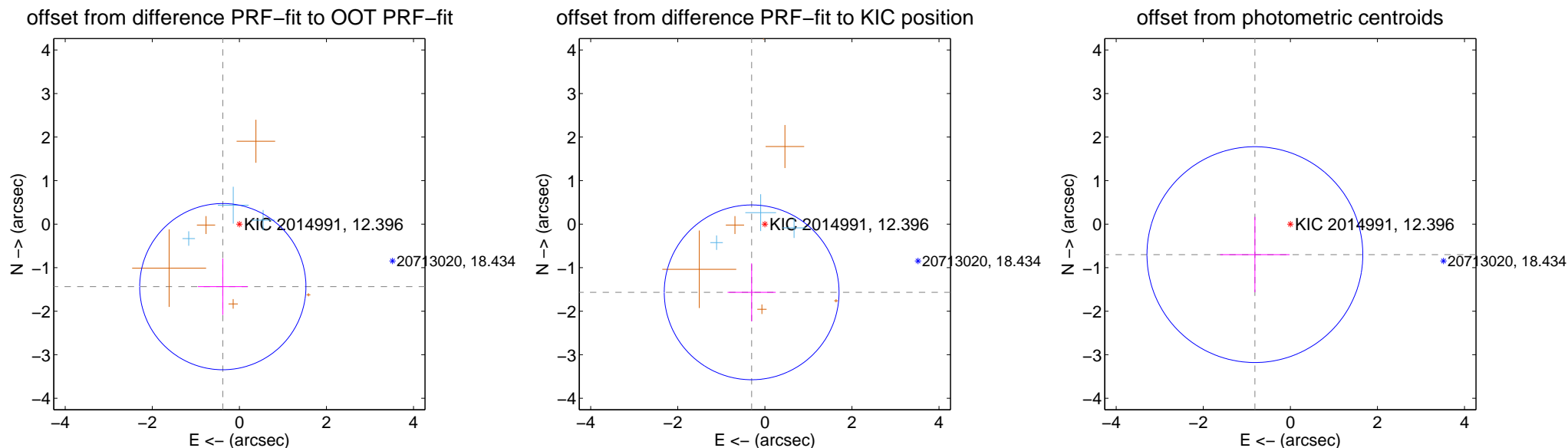
DV Centroid Data

Supplemental centroid analysis for 002014991-06. Kepler magnitude: 12.40. Transit SNR 7.71

There are 3 quarters with good PRF difference image offsets

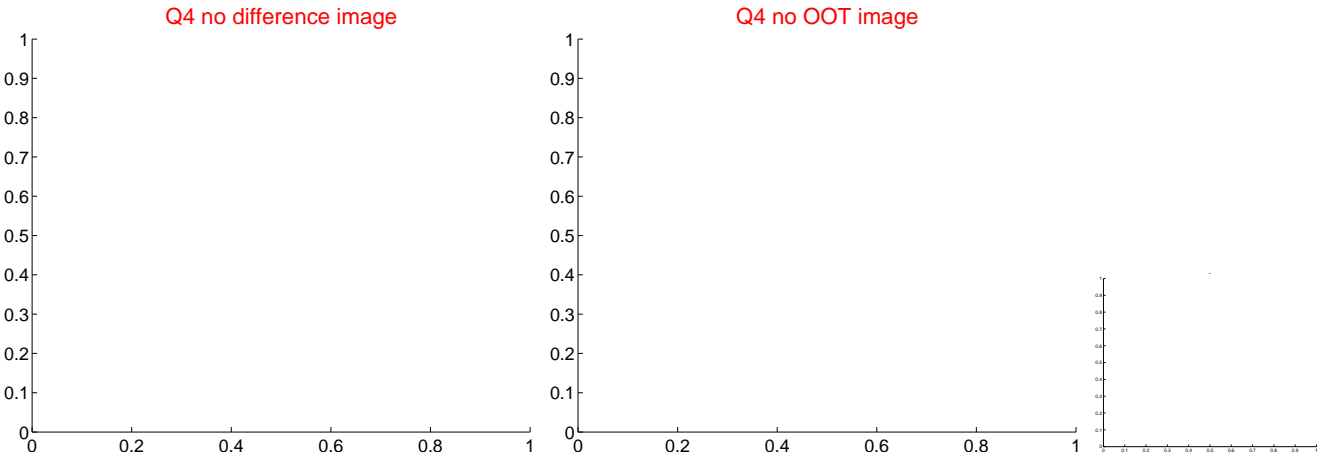
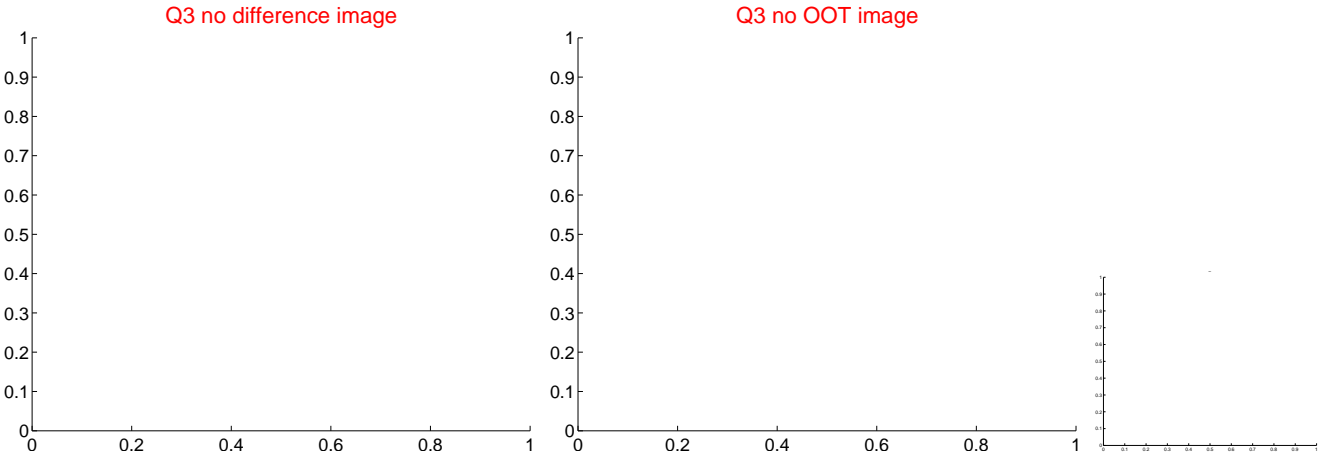
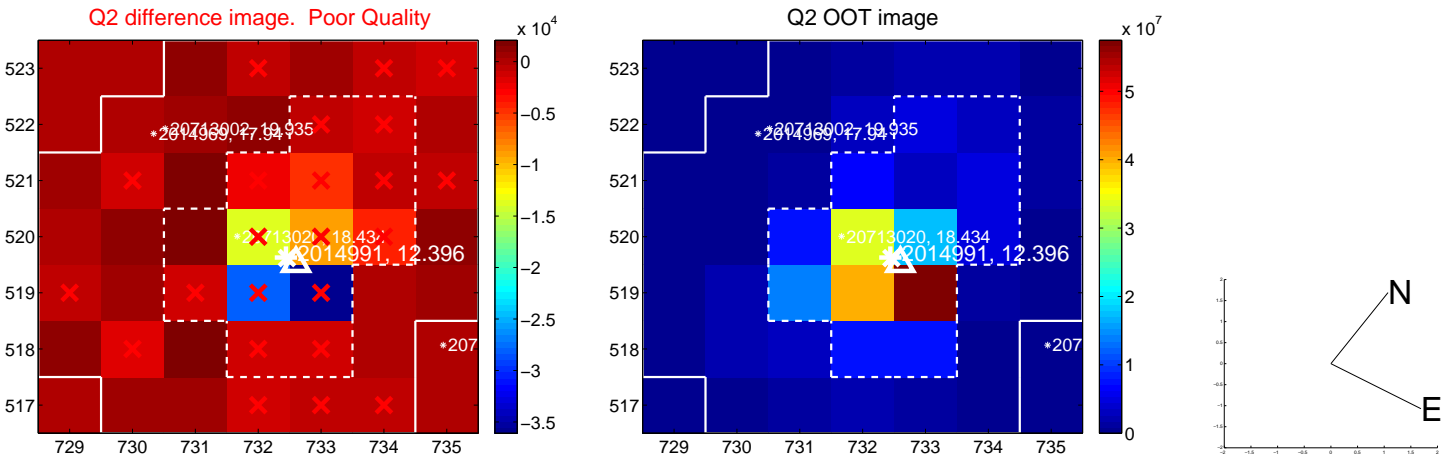
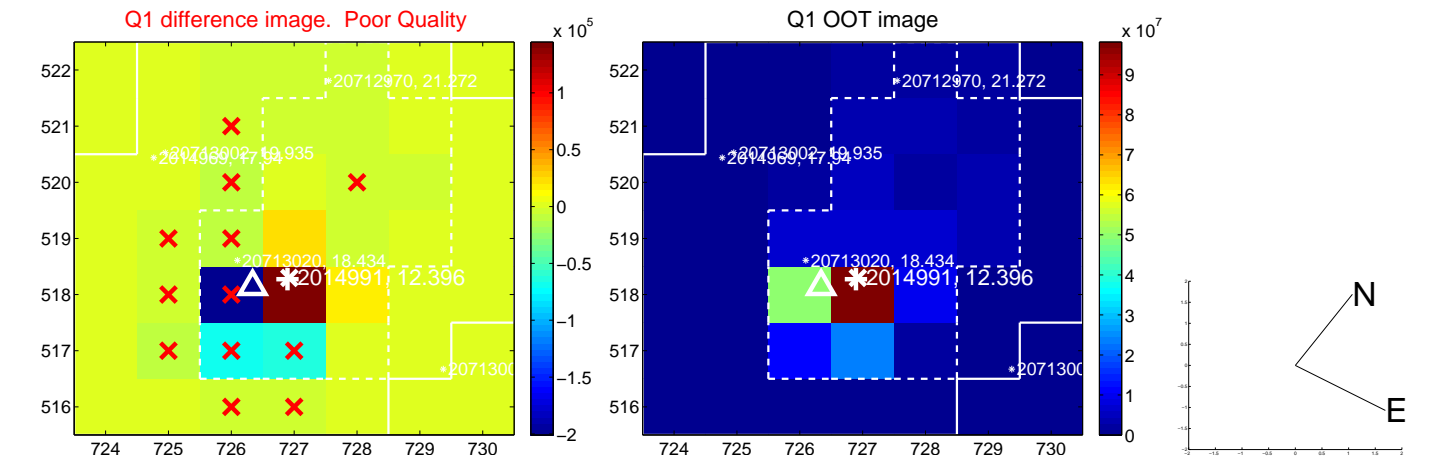
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.485 ± 0.636	2.33	0.380 ± 0.572	-1.436 ± 0.648
PRF-fit source offset from KIC position	1.596 ± 0.669	2.39	0.304 ± 0.553	-1.567 ± 0.666
photometric centroid source offset	1.07 ± 0.83	1.30	0.81 ± 0.80	-0.70 ± 0.86

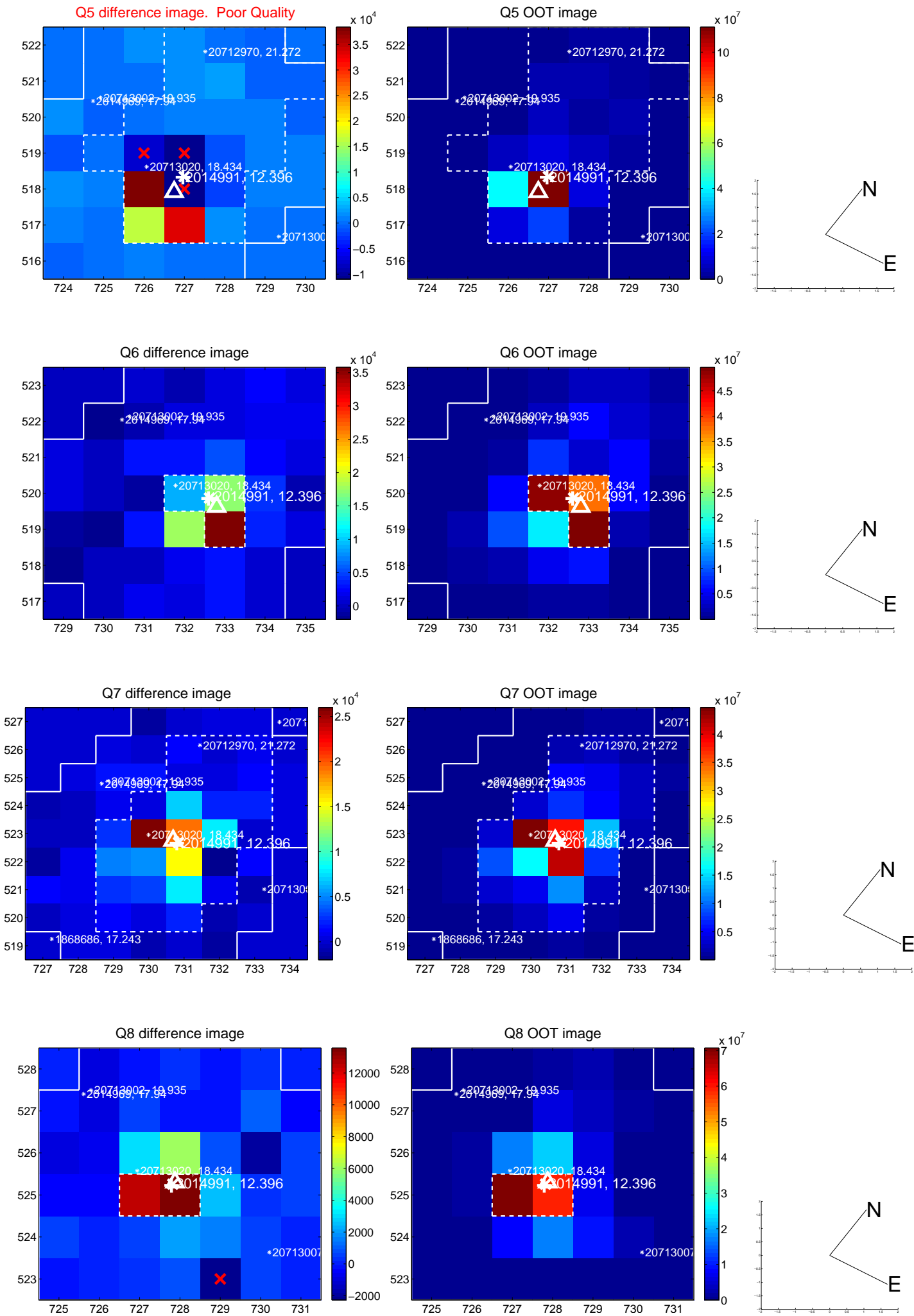


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

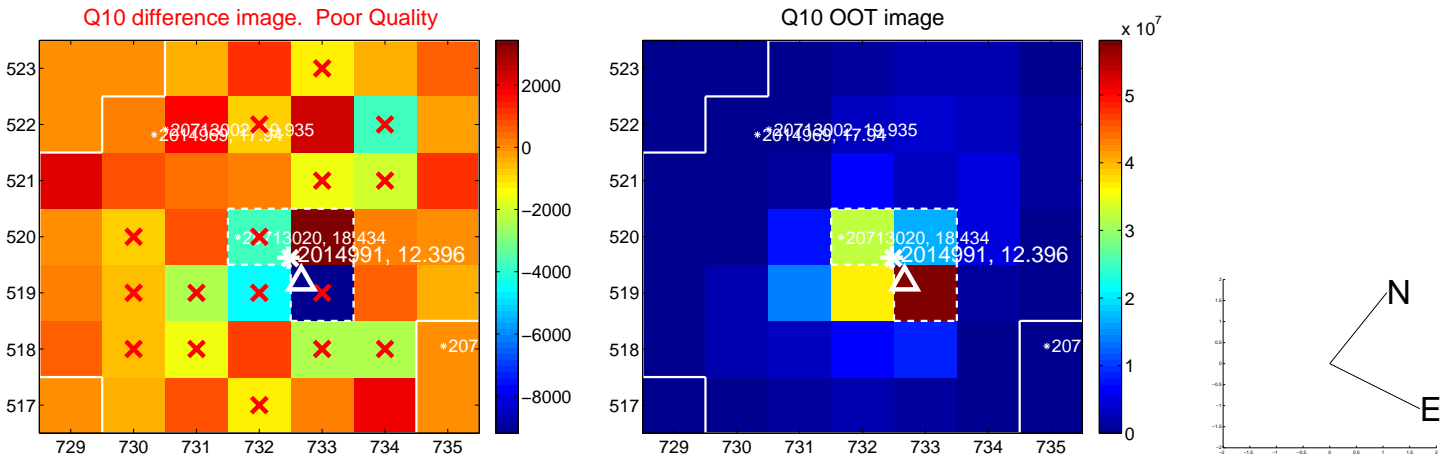
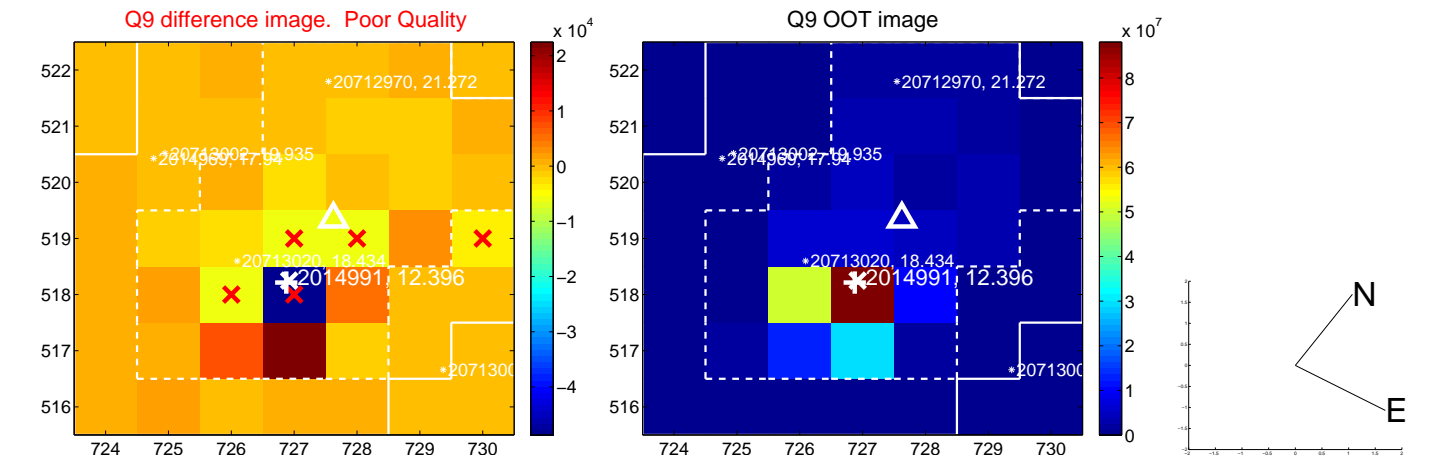
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

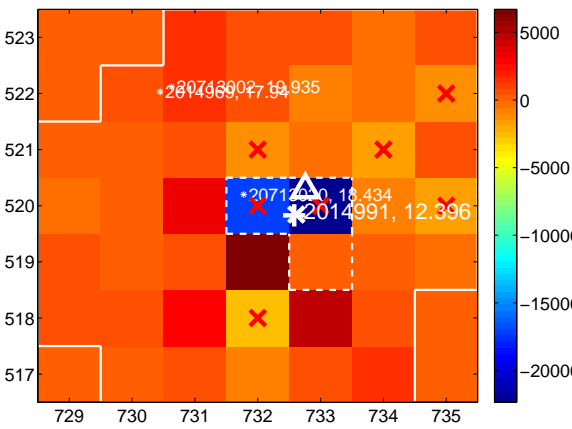
Q13 no difference image



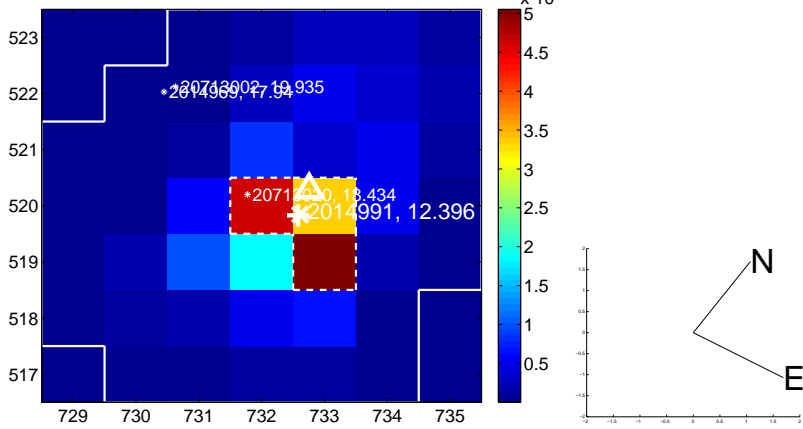
Q13 no OOT image



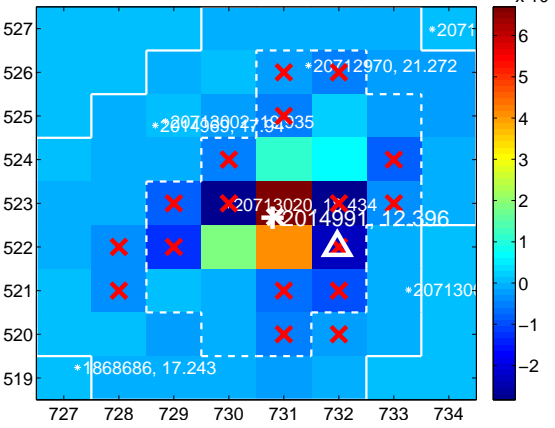
Q14 difference image. Poor Quality



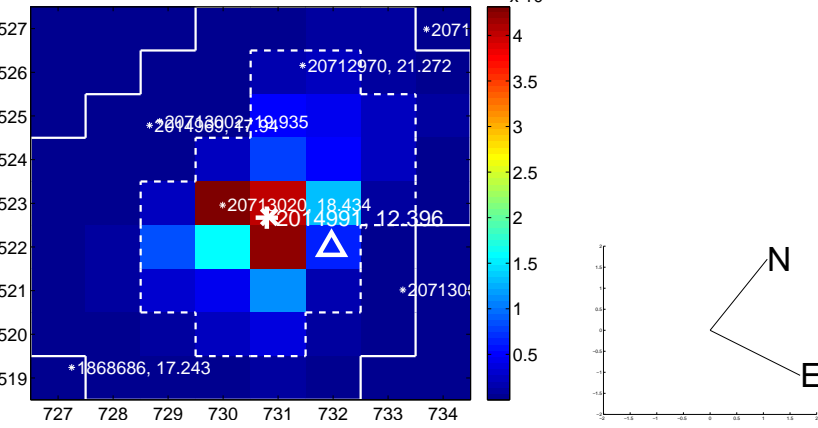
Q14 OOT image



Q15 difference image. Poor Quality



Q15 OOT image



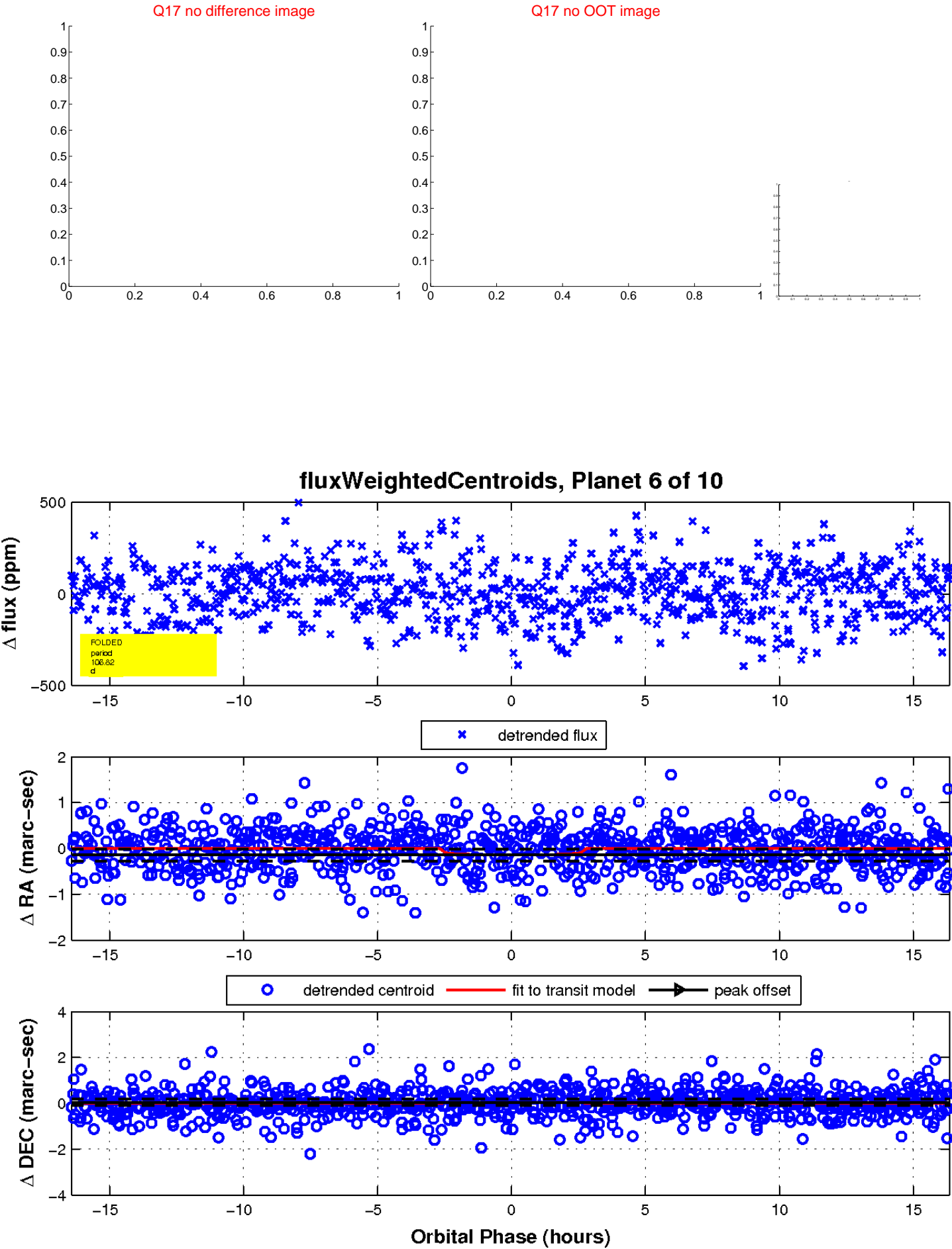
Q16 no difference image



Q16 no OOT image

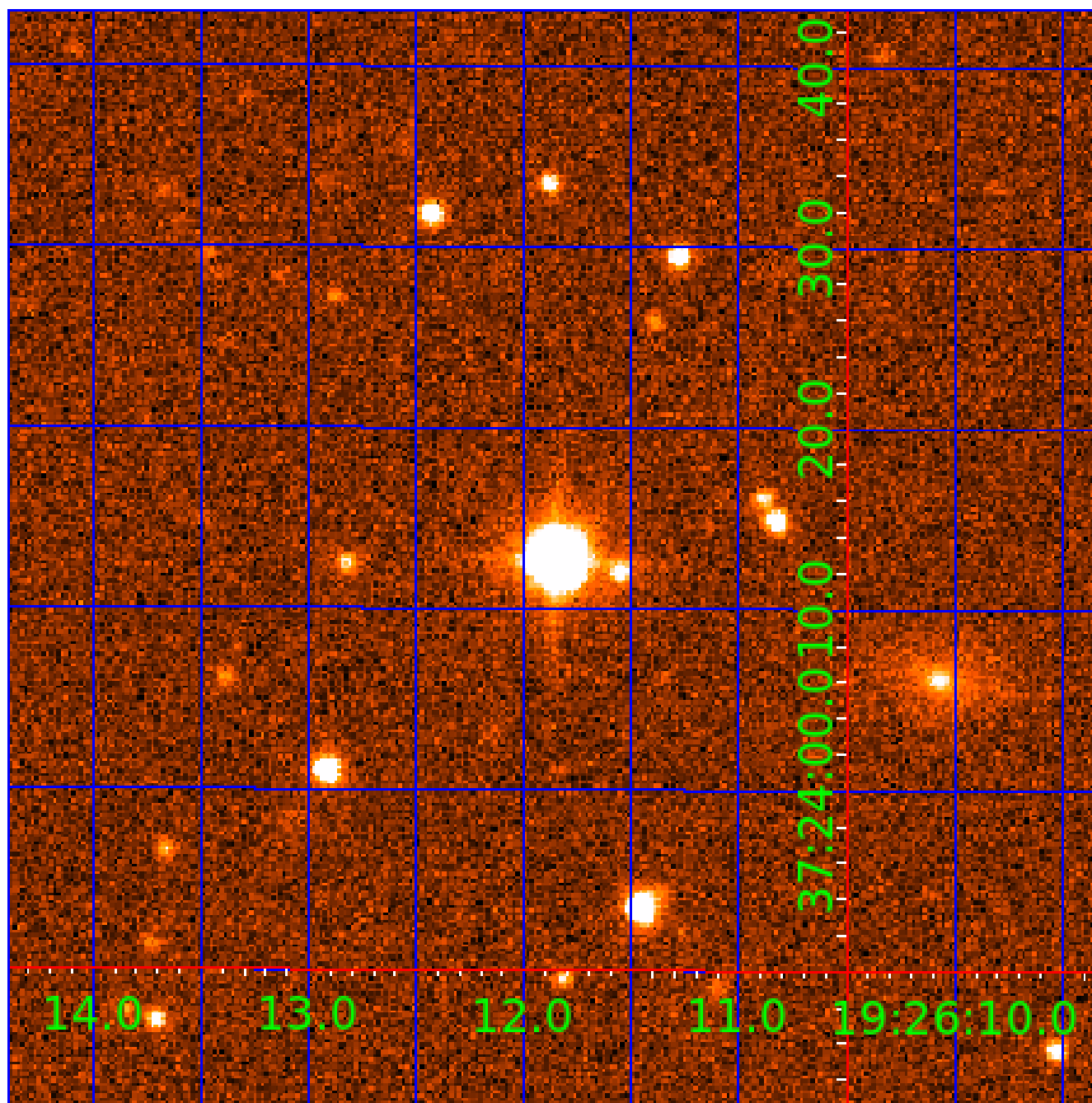


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
002014991-08	OBS	No	175.413692	189.562425	164.3	6.160	7.5	6.2	3.05	6418	4.43	28.13
002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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.

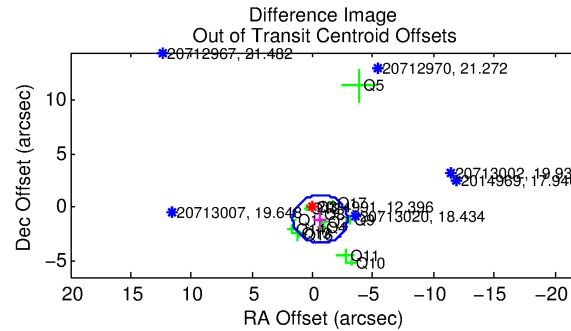
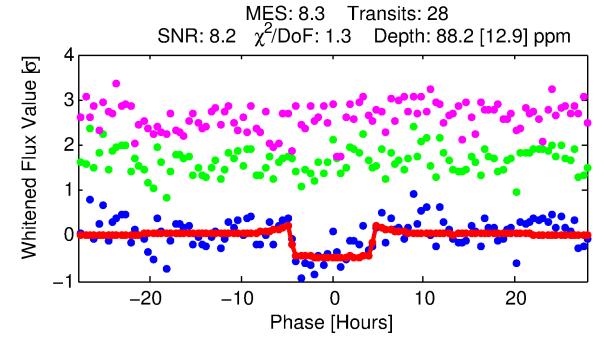
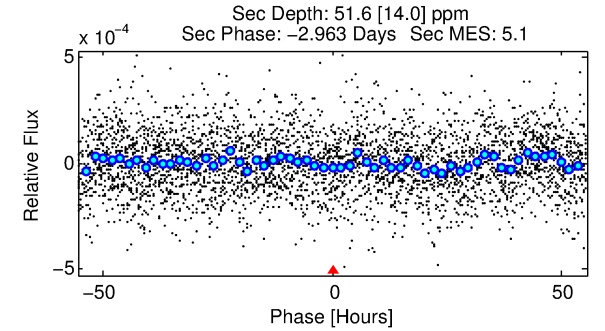
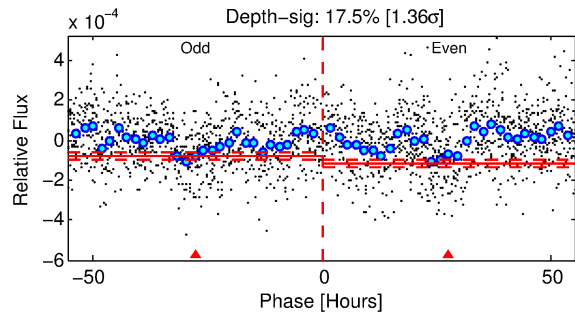
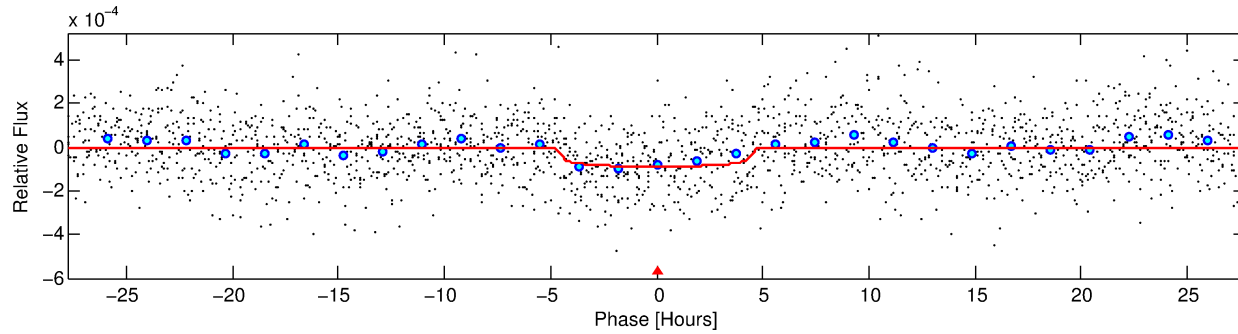
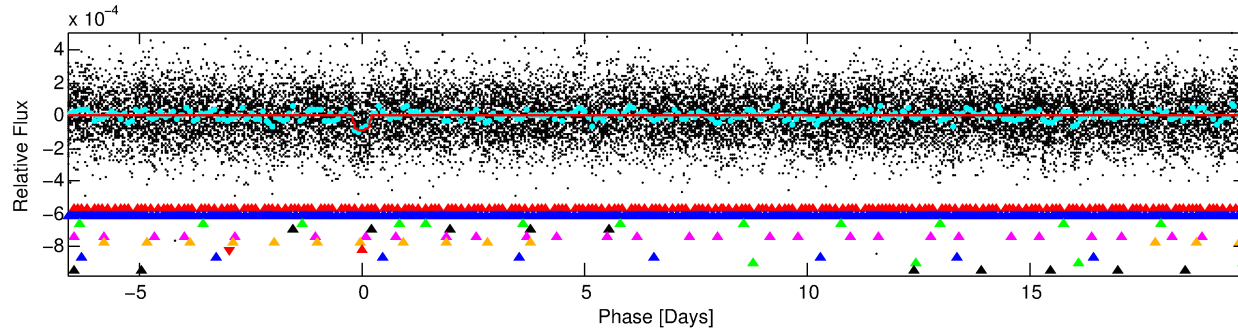
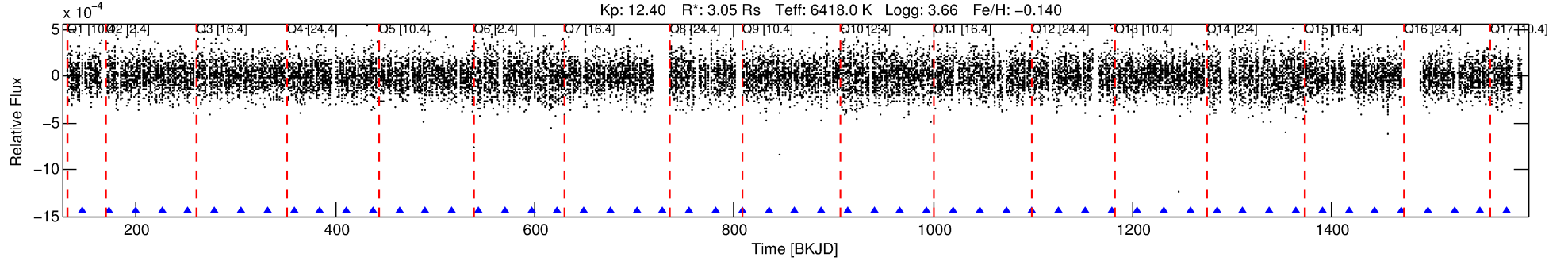
Ephemeris Match Information For 002014991-07

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 7 of 10 Period: 26.465 d

KOI: K02178 Corr: No Ephemeris Match



DV Fit Results:

Period = 26.46459 [0.00042] d
Epoch = 146.6884 [0.0131] BKJD
Rp/R* = 0.0093 [0.0038]
a/R* = 15.50 [33.81]
b = 0.72 [1.49]
Seff = 350.25 [188.29]
Teq = 1103 [148] K
Rp = 3.08 [1.70] Re
a = 0.2009 [0.0678] AU
Ag = 120.87 [122.83] [0.98 σ]
Teffp = 5655 [1239] K [3.65 σ]

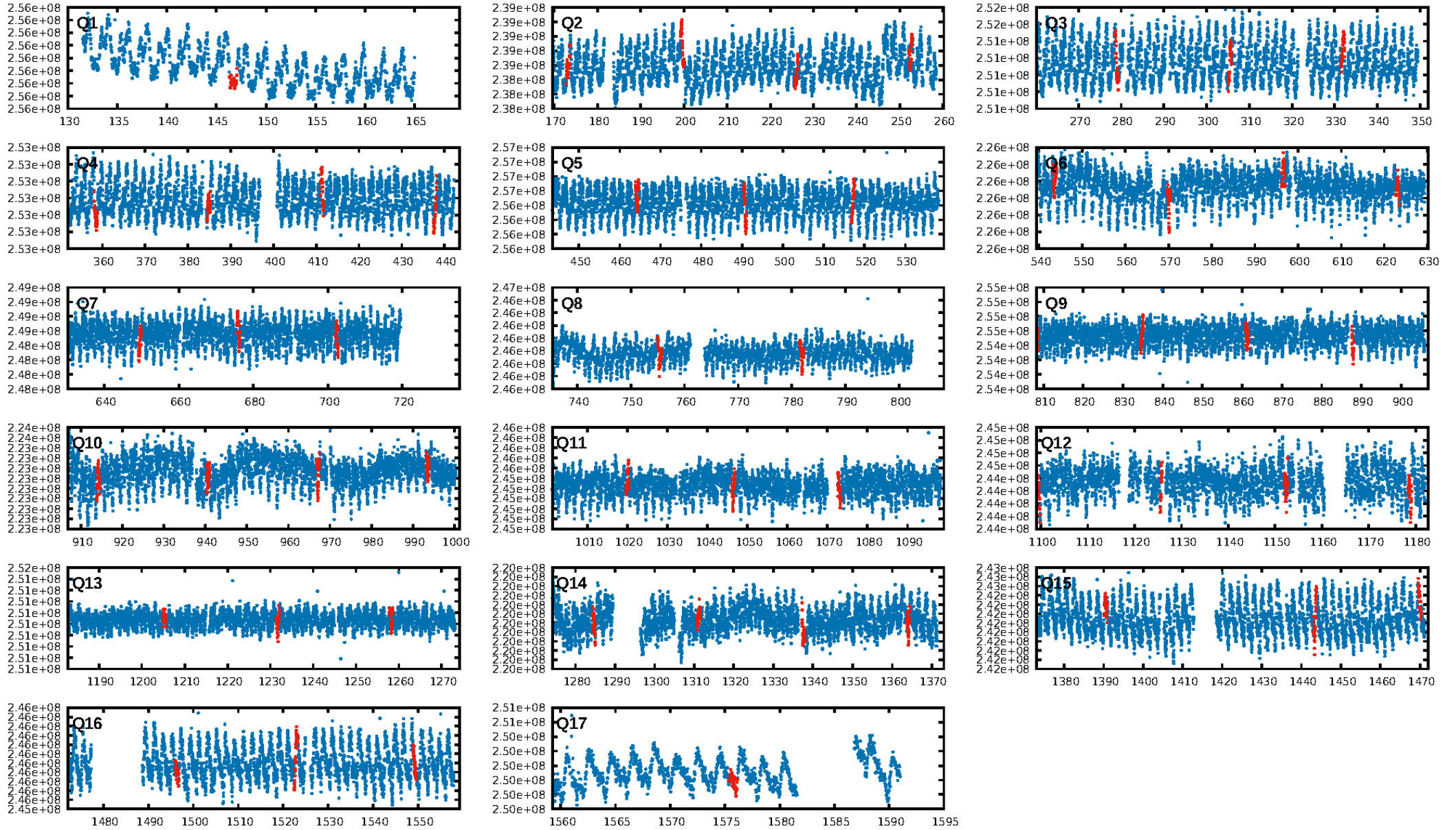
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [49.88 σ]
LongPeriod-sig: 100.0% [62.72 σ]
ModelChiSquare2-sig: 19.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [28/28]
GhostDiagnostic-chr: 0.7198
Centroid-sig: 65.9%
Centroid-so: 0.205 arcsec [0.31 σ]
OotOffset-rm: 1.245 arcsec [1.66 σ]
KicOffset-rm: 1.410 arcsec [1.79 σ]
OotOffset-st: 3/2/4/5 [14]
KicOffset-st: 3/2/4/5 [14]
DiffImageQuality-fgm: 0.57 [8/14]
DiffImageOverlap-fno: 0.12 [2/17]

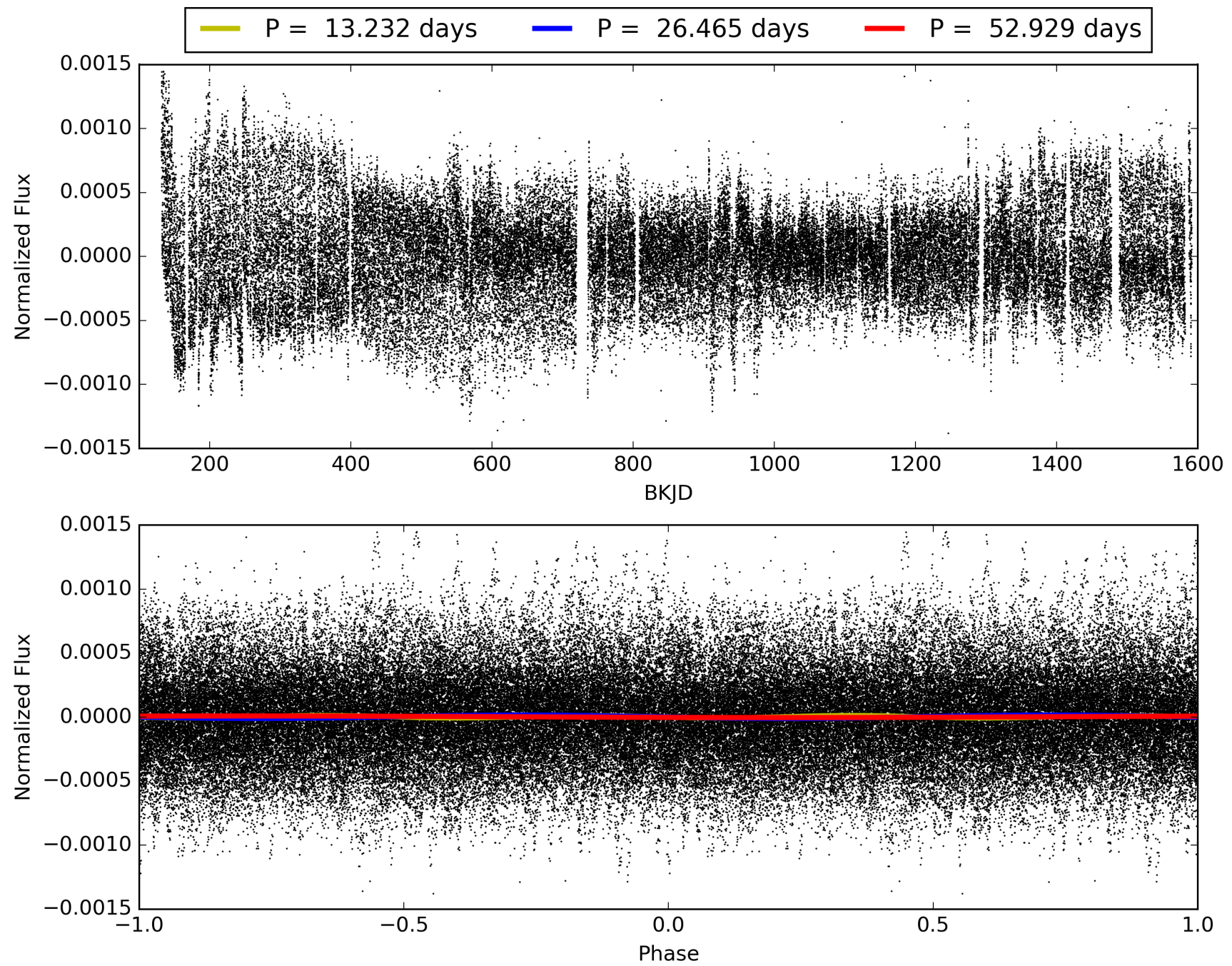
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:52:55 Z

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

TCE 002014991-07, PDC Light Curves

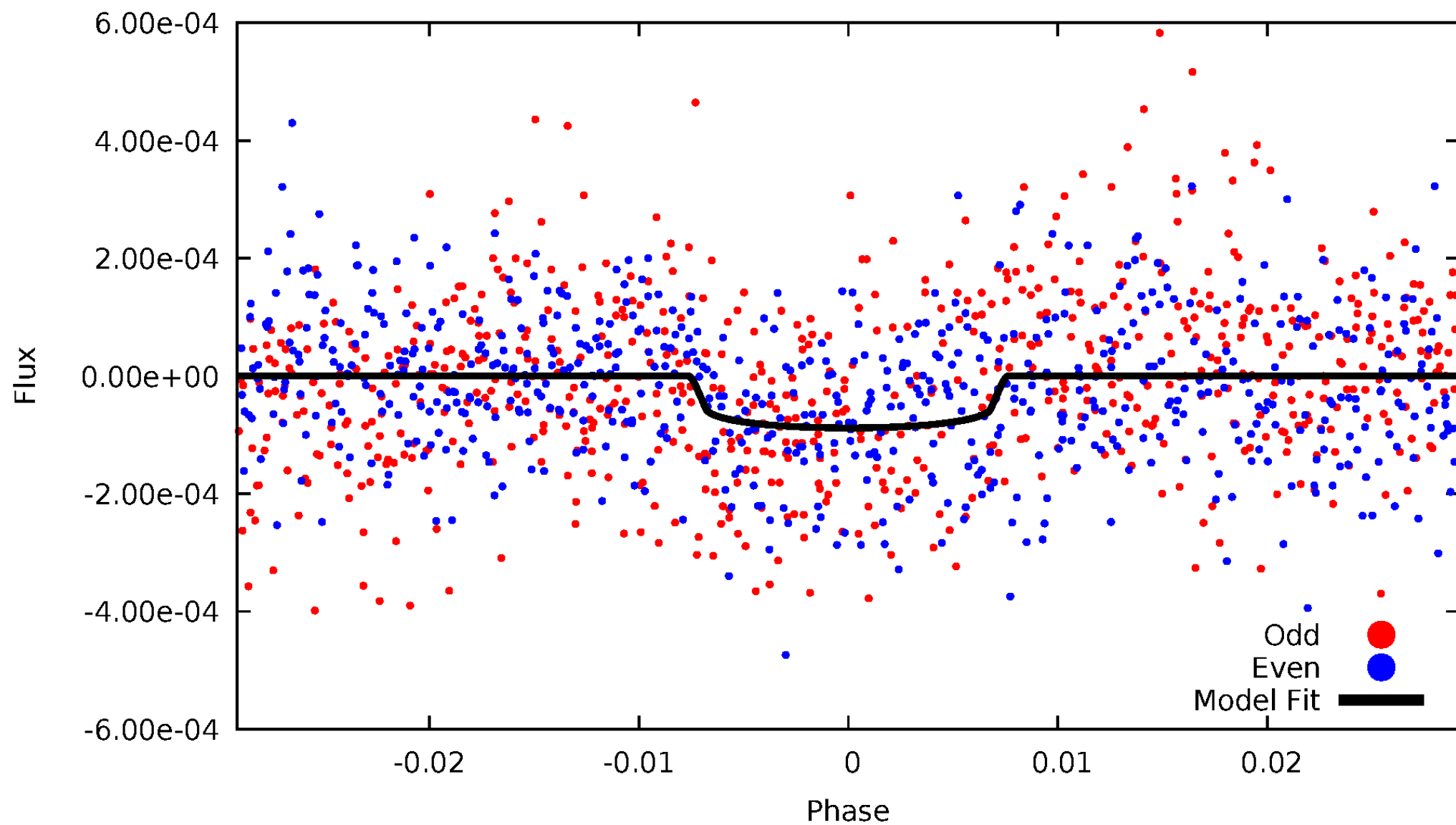


TCE 002014991-07



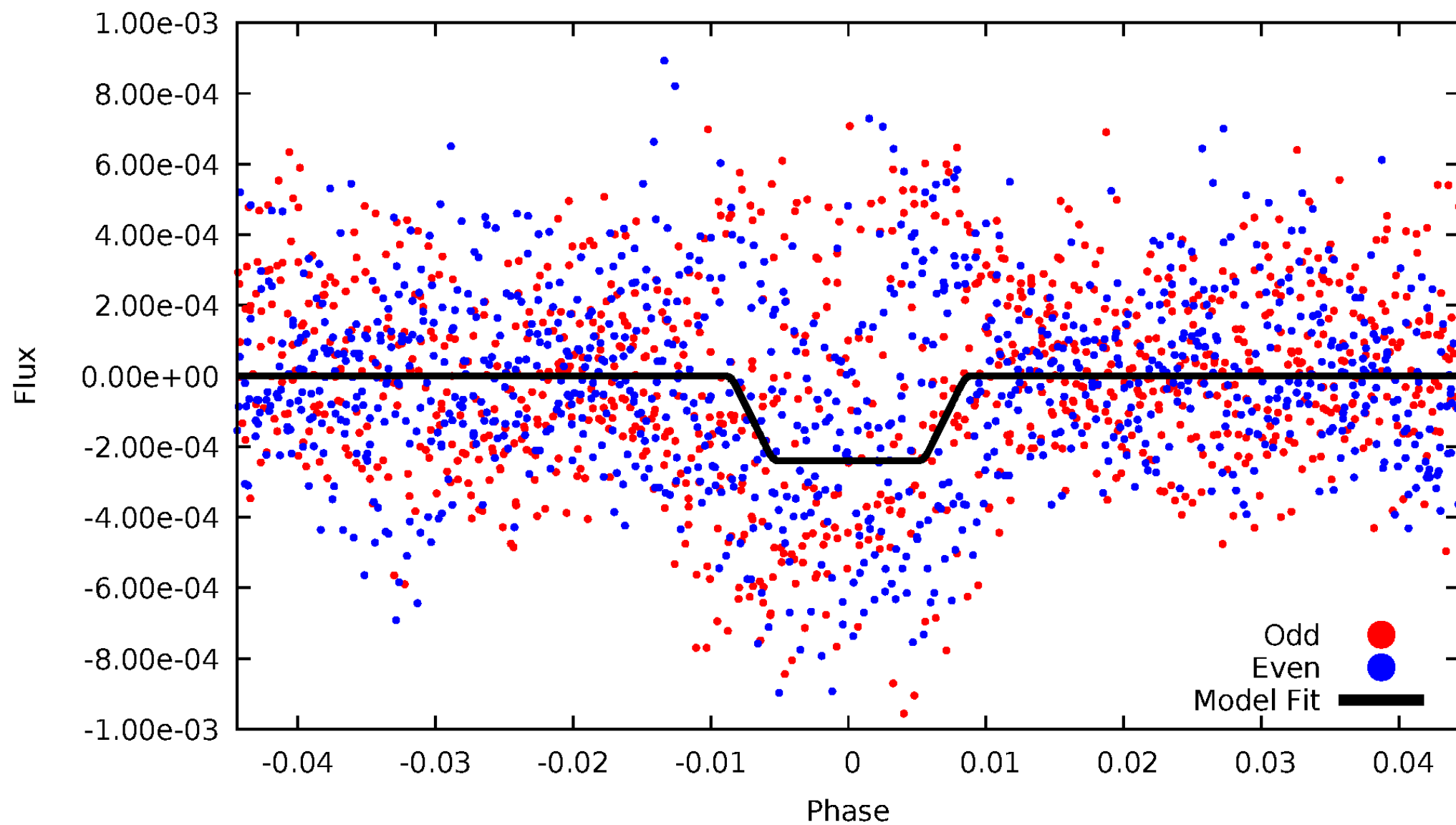
DV Odd/Even

TCE 002014991-07



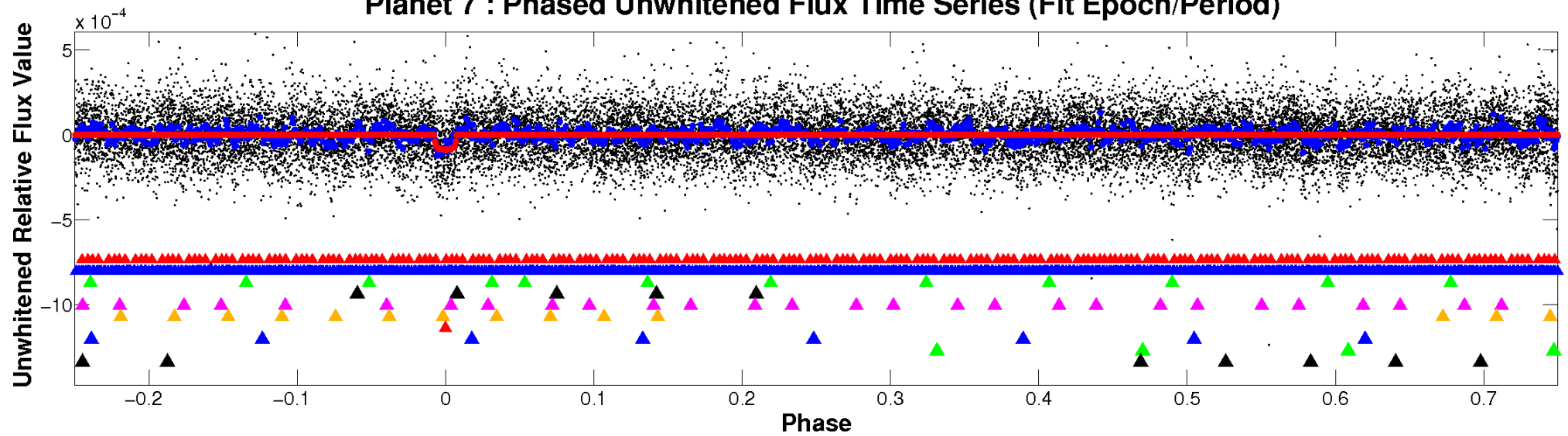
ALT Odd/Even

TCE 002014991-07

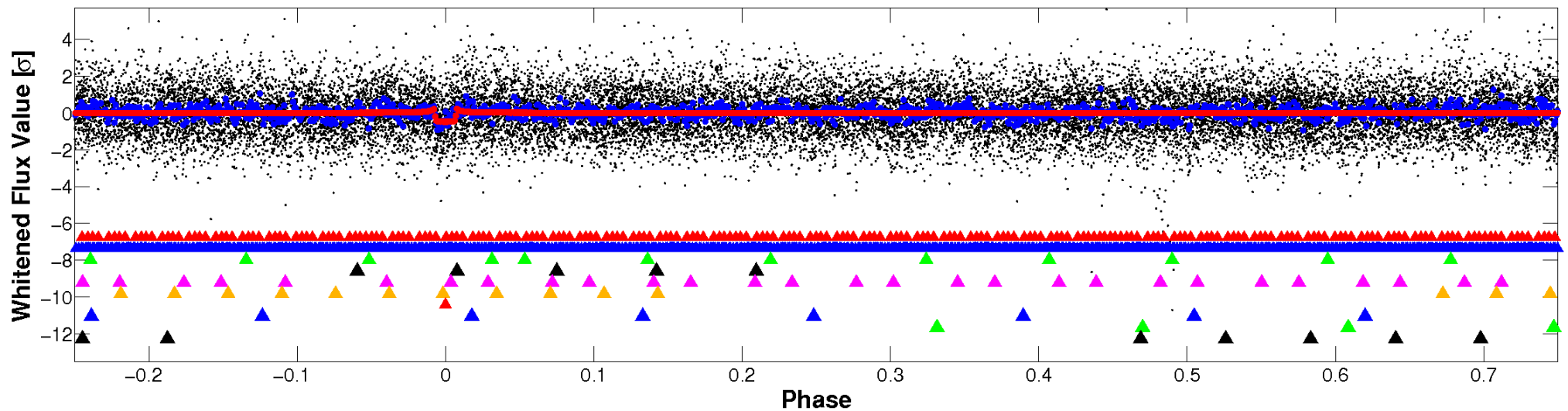


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

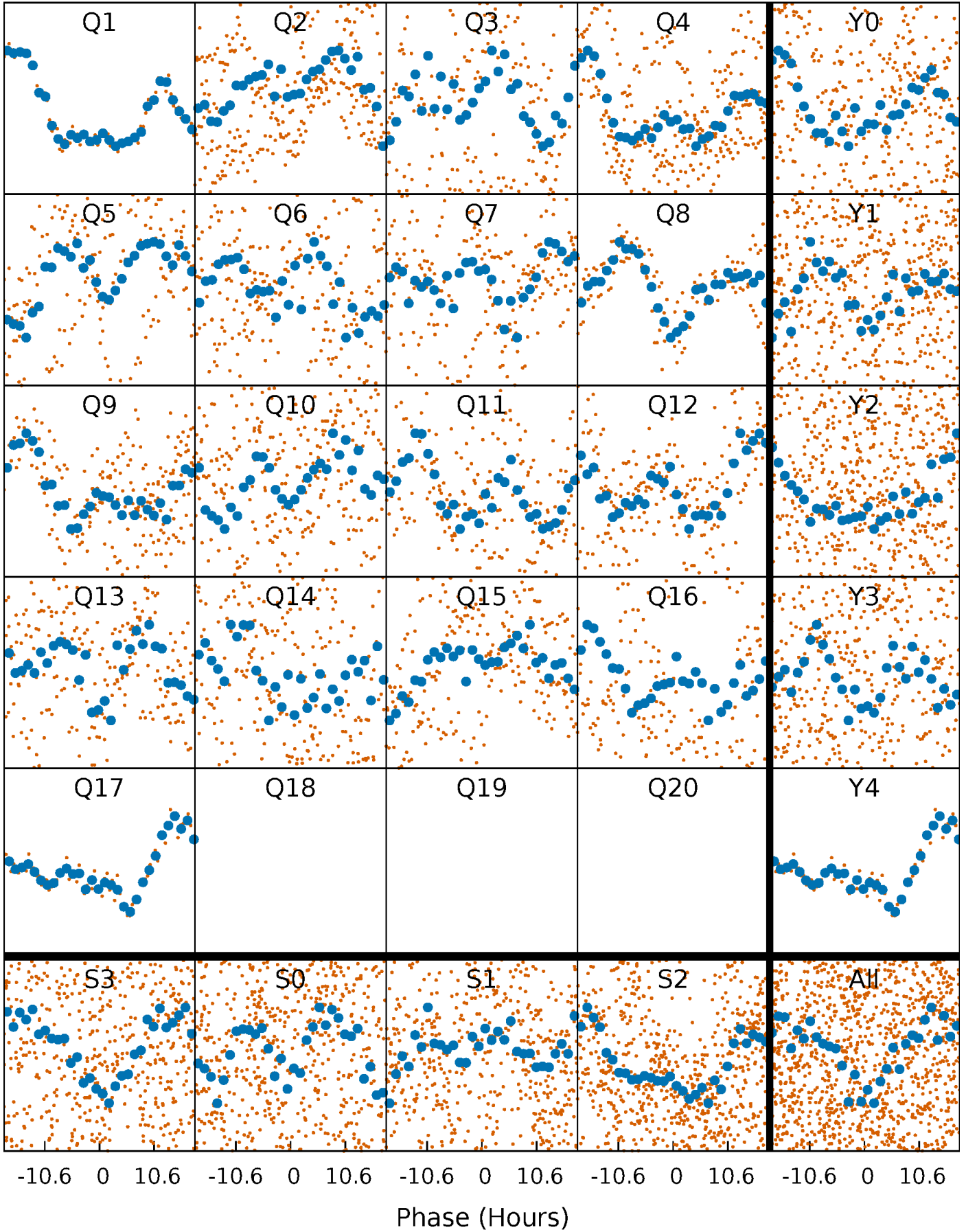


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



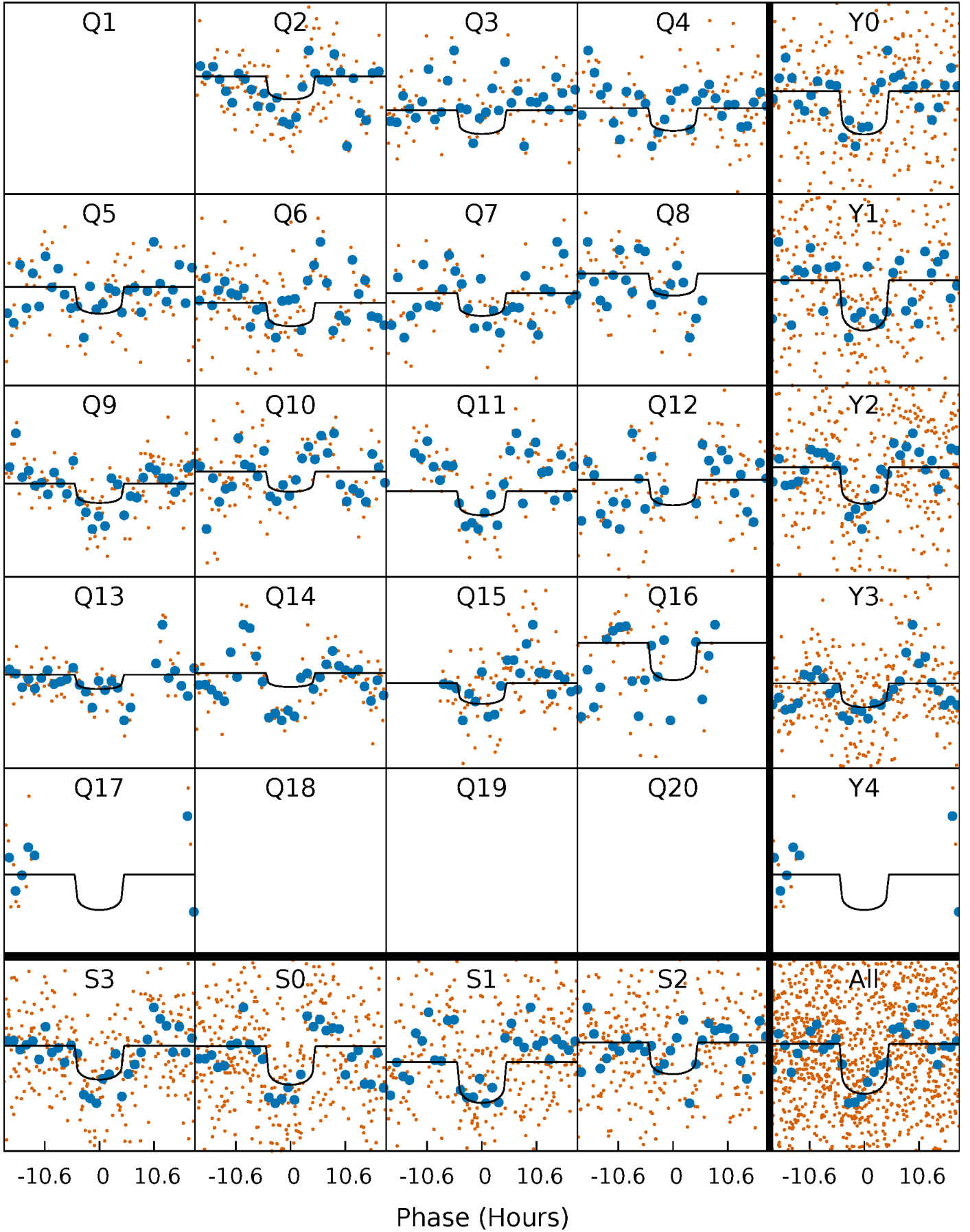
PDC Quarter-Phased Transit Curves

TCE 002014991-07 $P = 26.464589$ Days $T_0 = 146.688446$ (BKJD)



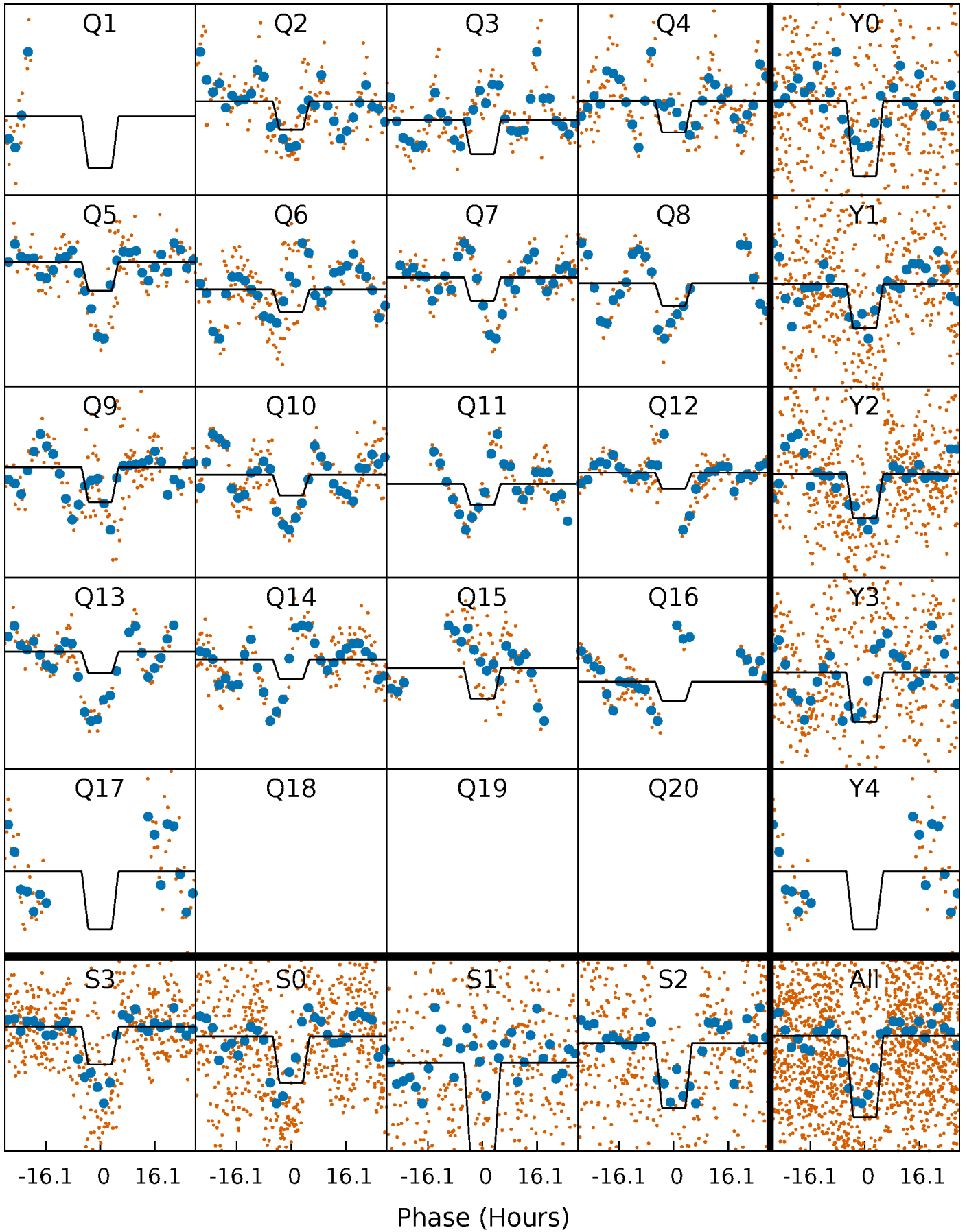
DV Quarter-Phased Transit Curves

TCE 002014991-07 P= 26.464589 Days $T_0=146.688446$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

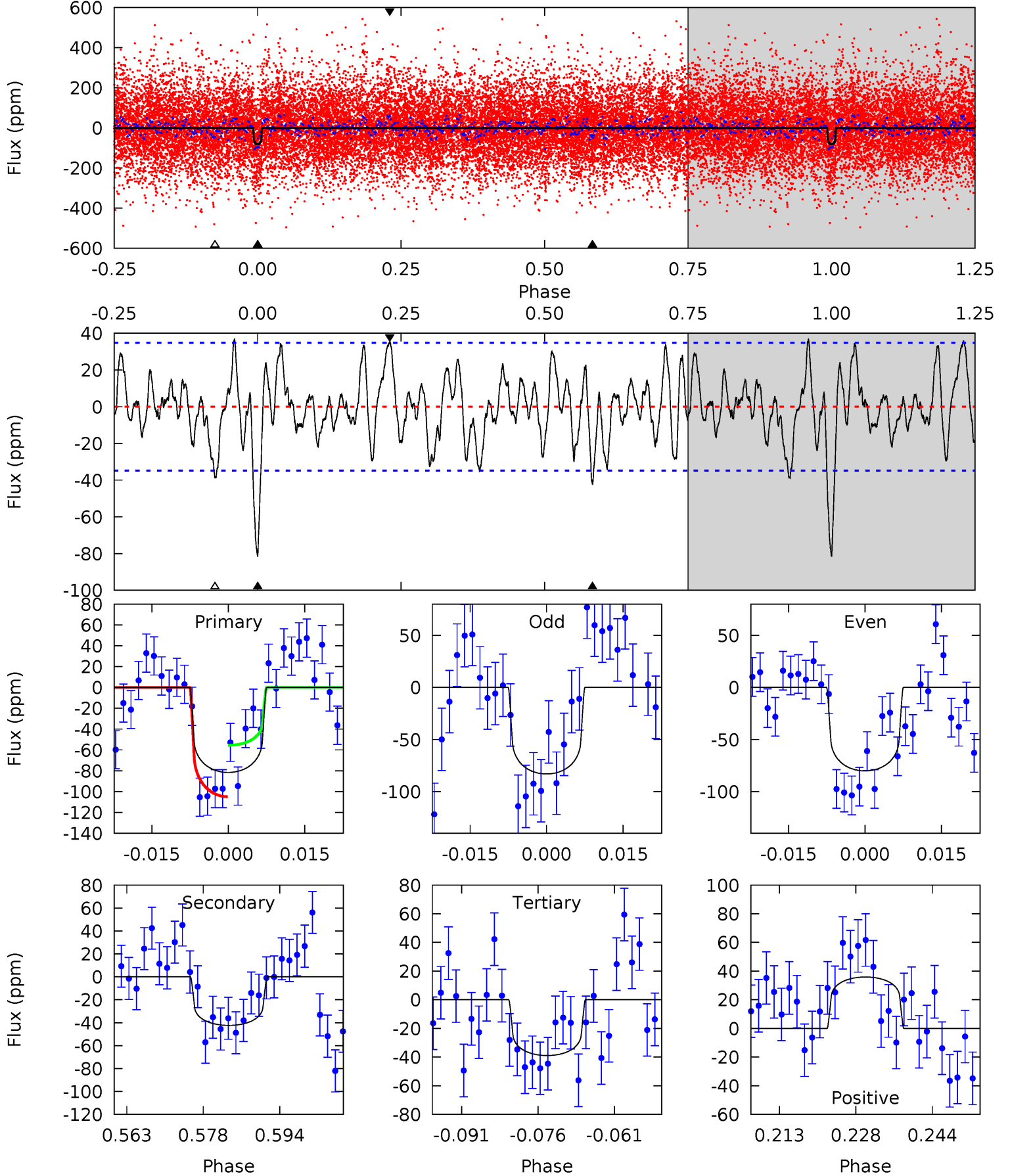
TCE 002014991-07 $P = 26.467698$ Days $T_0 = 146.650165$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-07, P = 26.464589 Days, E = 120.223857 Days

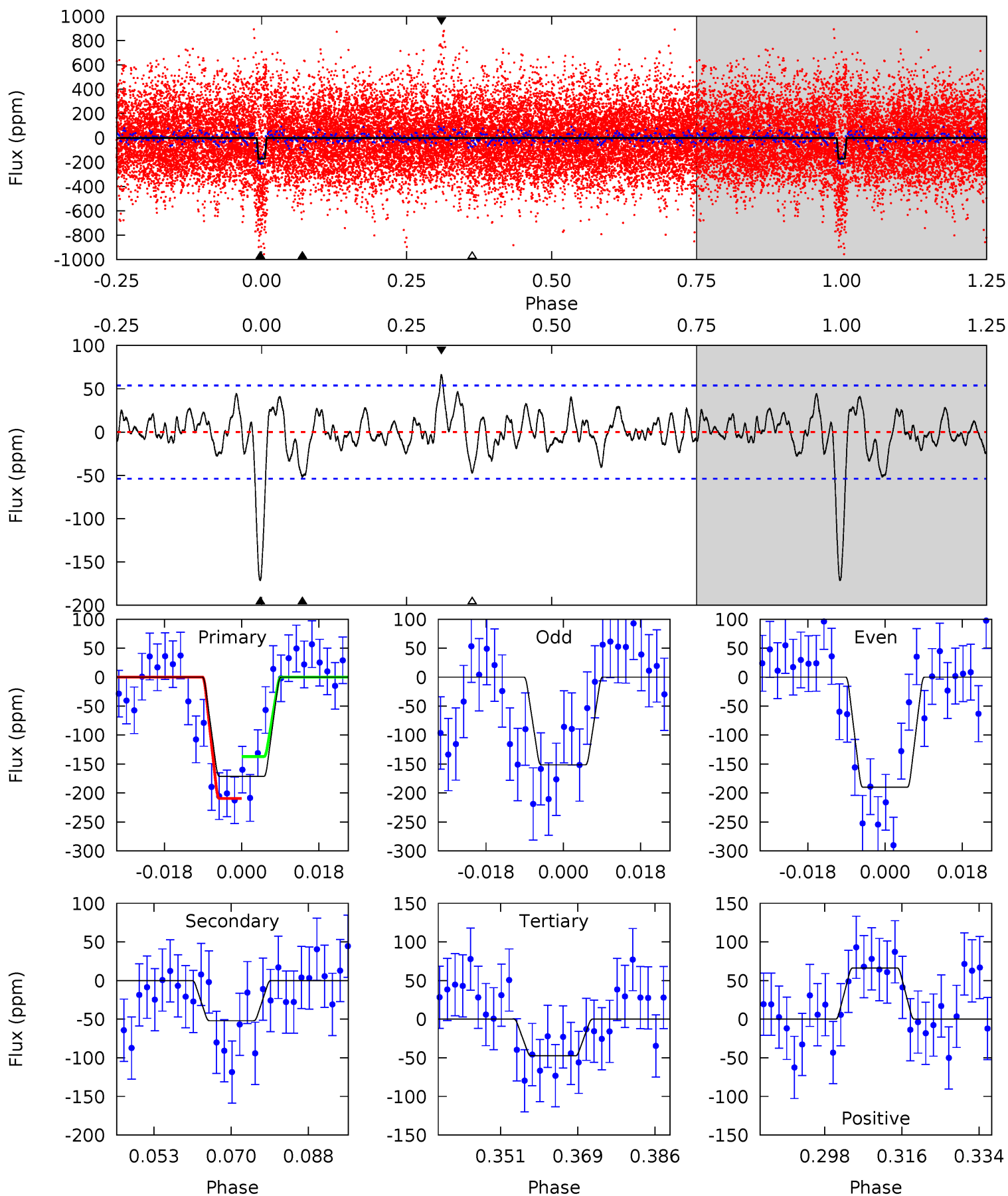
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	6.02	5.54	5.10	4.95	2.43	2.14	6.07	6.50	0.49	0.92	0.21	0.96	0.31	3.53



Alt Model-Shift Uniqueness Test

002014991-07, P = 26.467698 Days, E = 120.182467 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.6	4.74	4.33	6.05	4.92	2.37	1.57	11.3	9.59	0.41	-1.31	1.77	0.44	0.28	3.30



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-07 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-42 ± 7	$2.71^{+1.52}_{-1.03}$	1510^{+82}_{-138}	5485^{+1530}_{-817}	126^{+213}_{-71}
Alt.	-52 ± 11	$4.89^{+1.39}_{-1.46}$	1511^{+86}_{-138}	4521^{+623}_{-403}	48^{+52}_{-20}

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

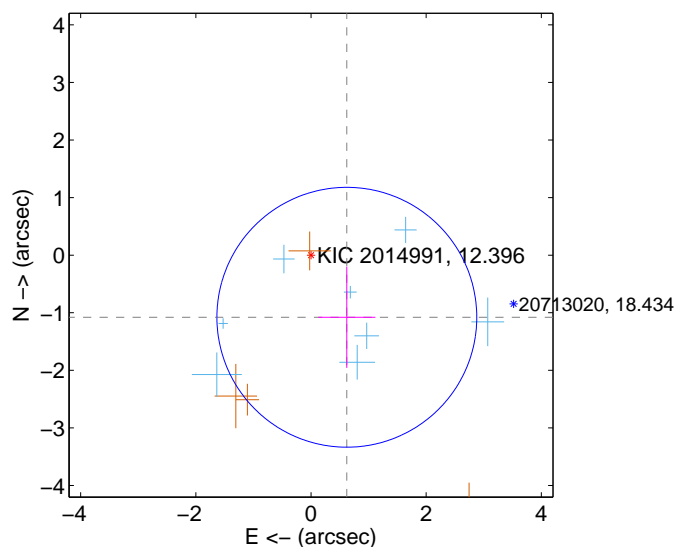
Supplemental centroid analysis for 002014991-07. Kepler magnitude: 12.40. Transit SNR 8.24

There are 8 quarters with good PRF difference image offsets

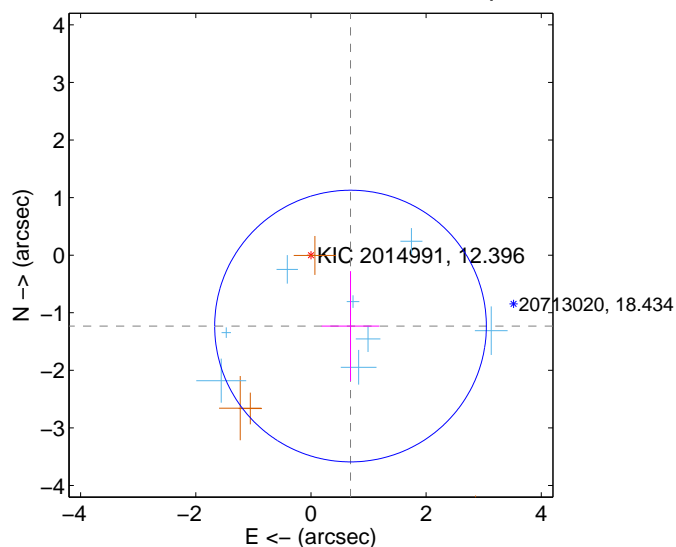
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.245 ± 0.752	1.66	-0.622 ± 0.497	-1.078 ± 0.879
PRF-fit source offset from KIC position	1.410 ± 0.786	1.79	-0.687 ± 0.501	-1.231 ± 0.954
photometric centroid source offset	0.20 ± 0.67	0.31	0.15 ± 0.62	-0.14 ± 0.71

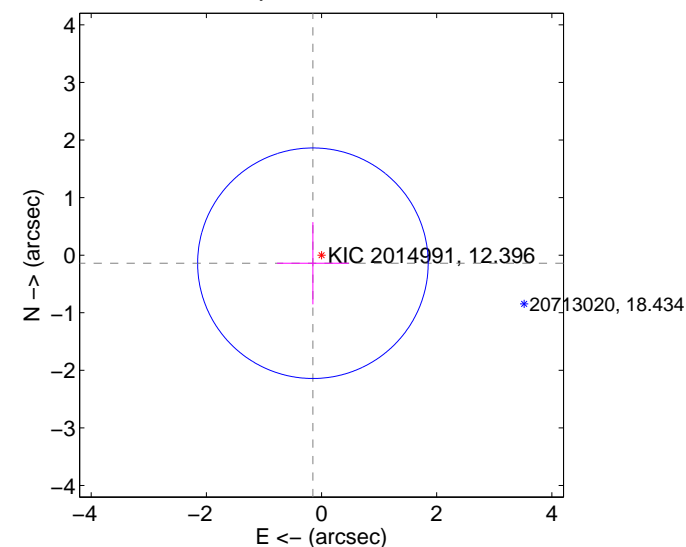
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

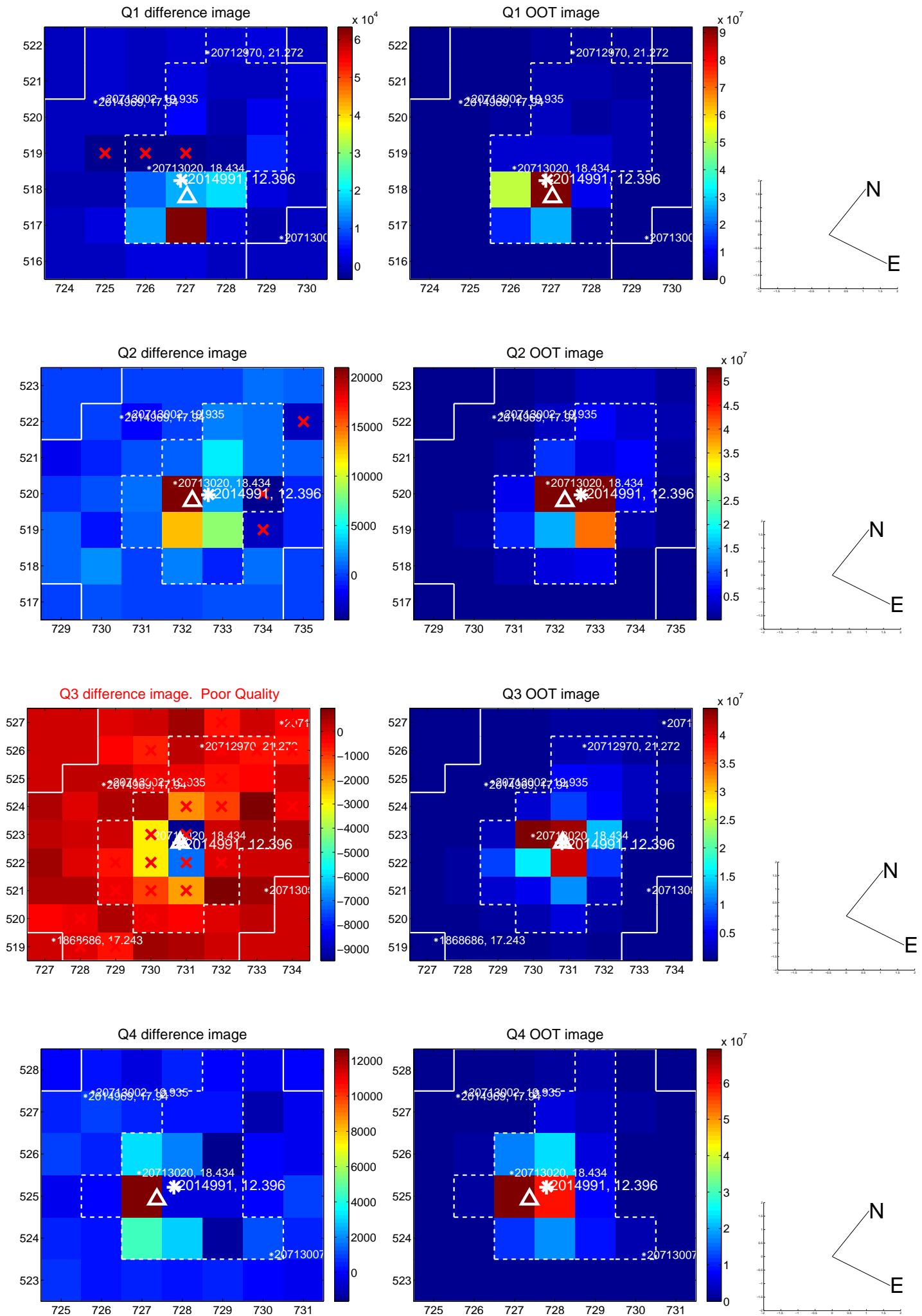


offset from photometric centroids

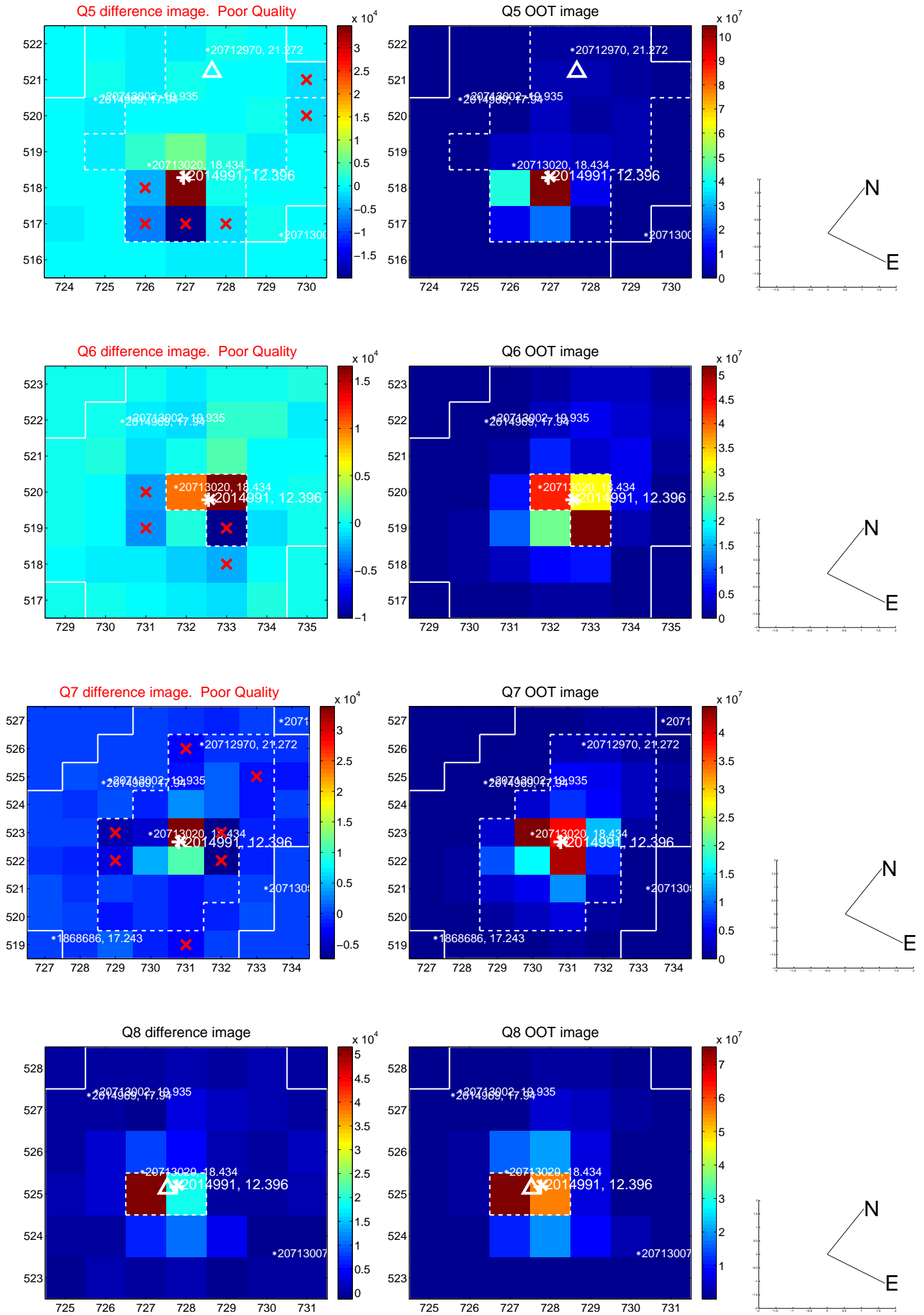


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

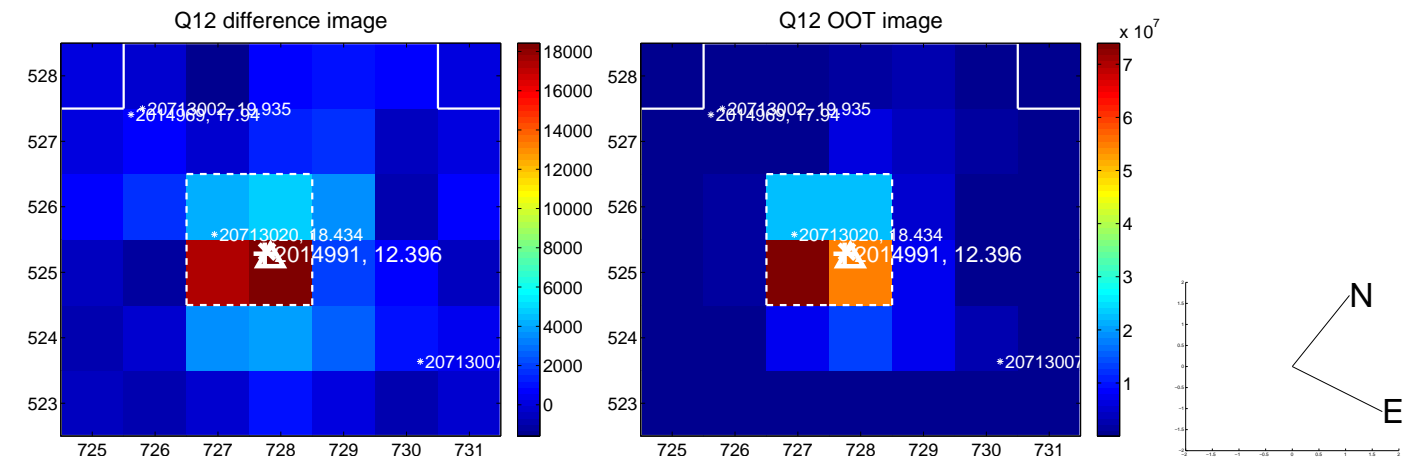
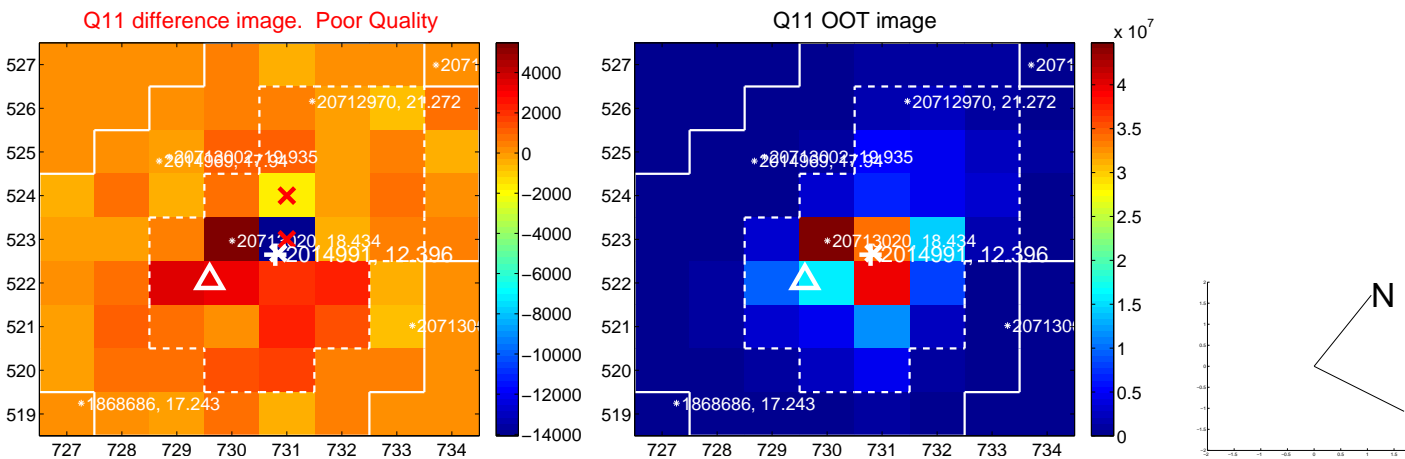
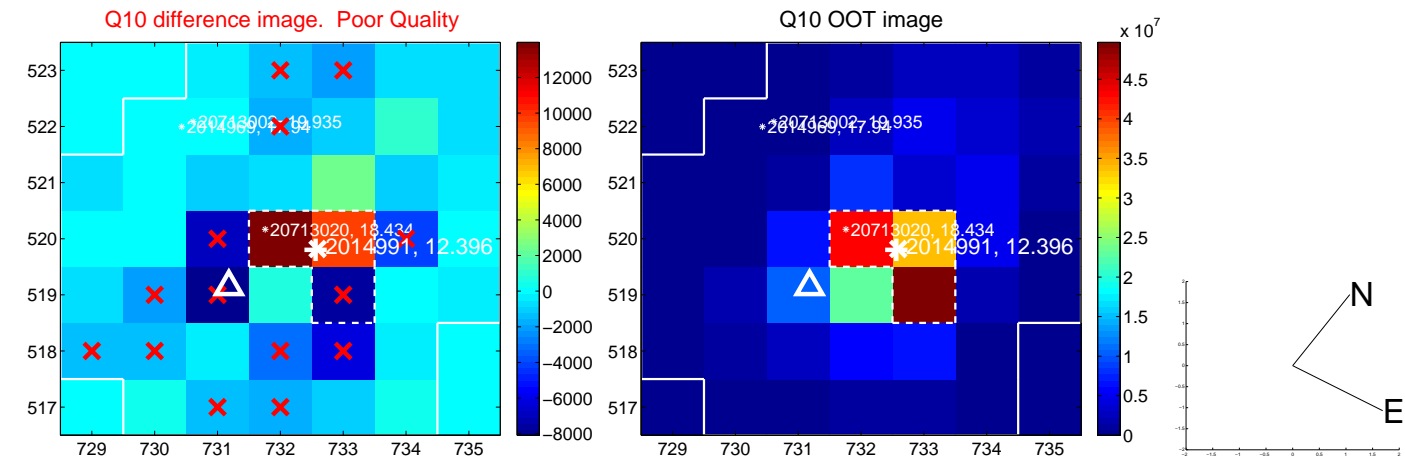
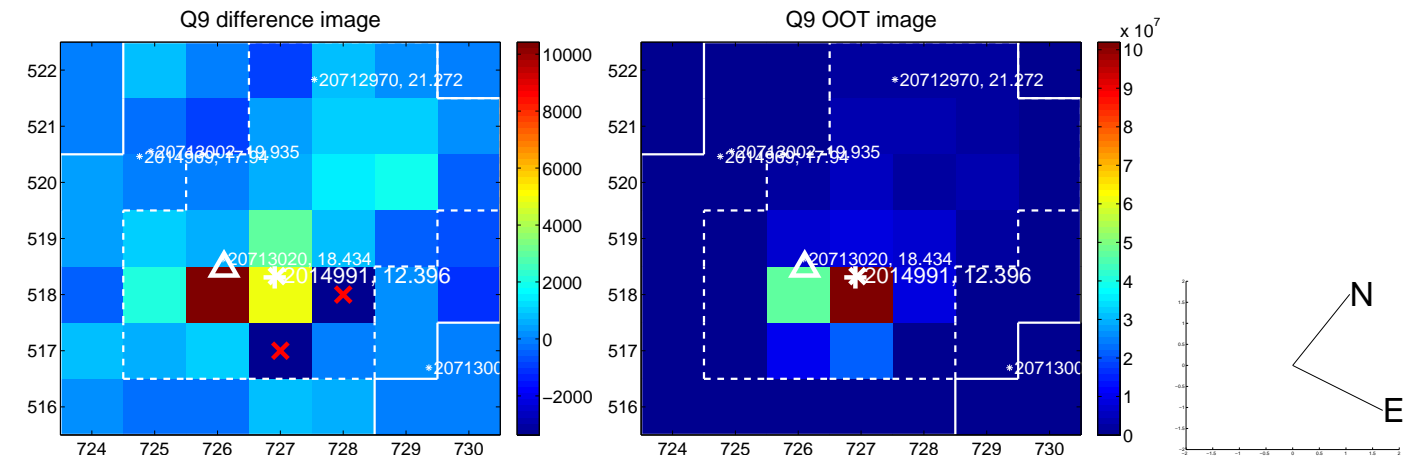
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



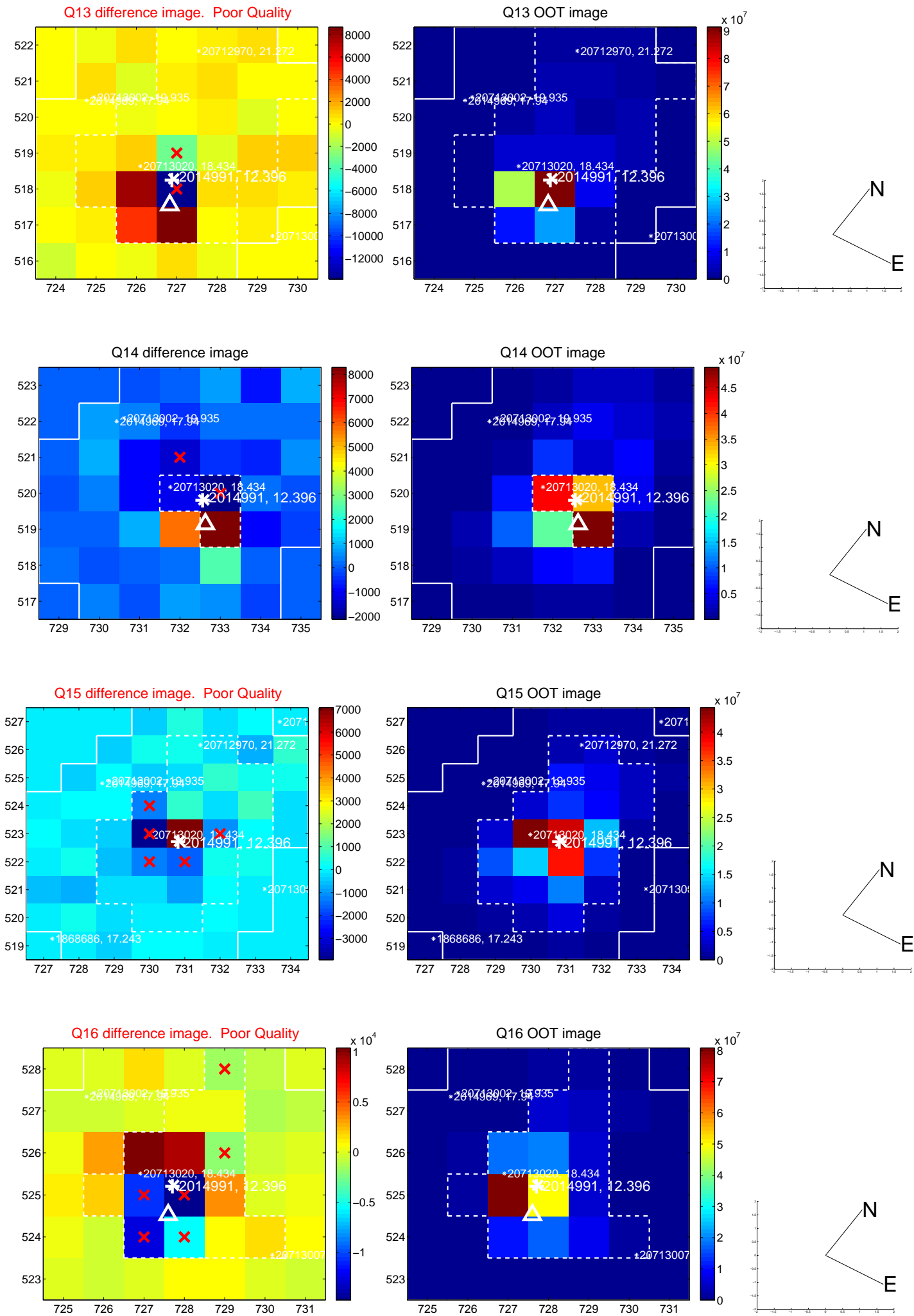
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



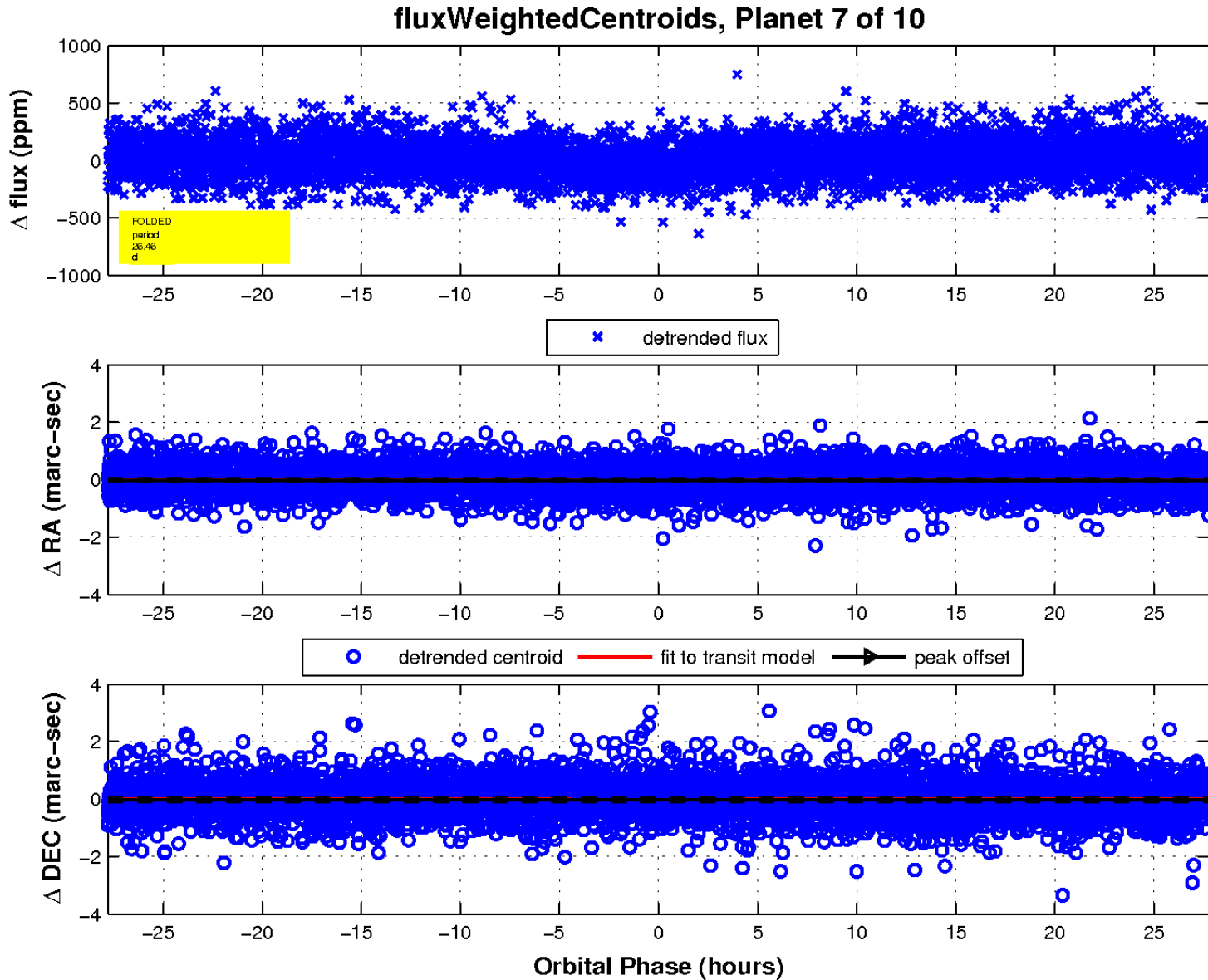
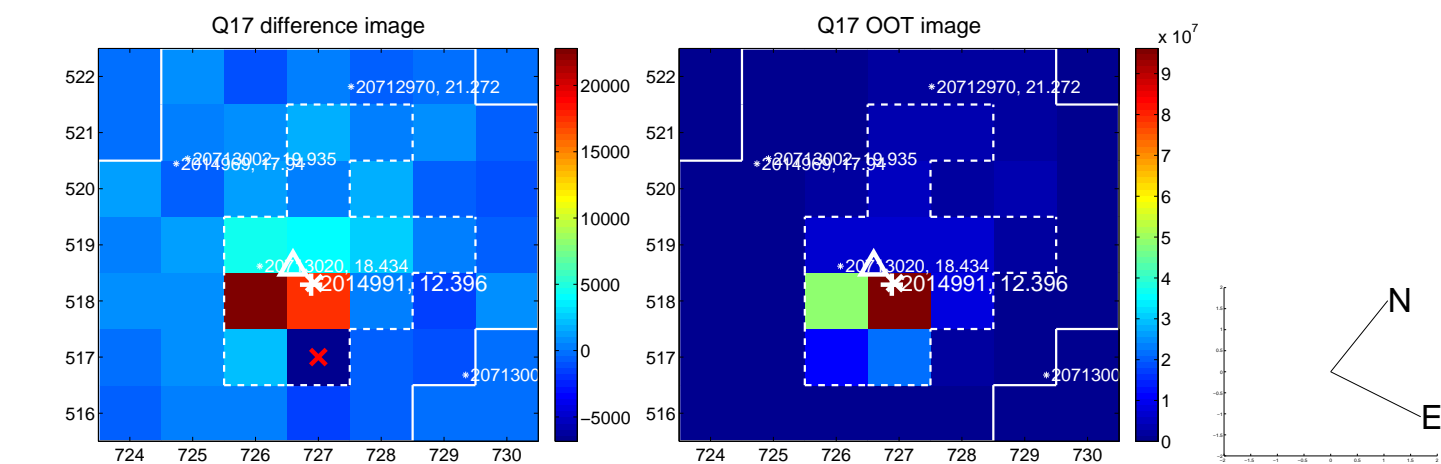
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

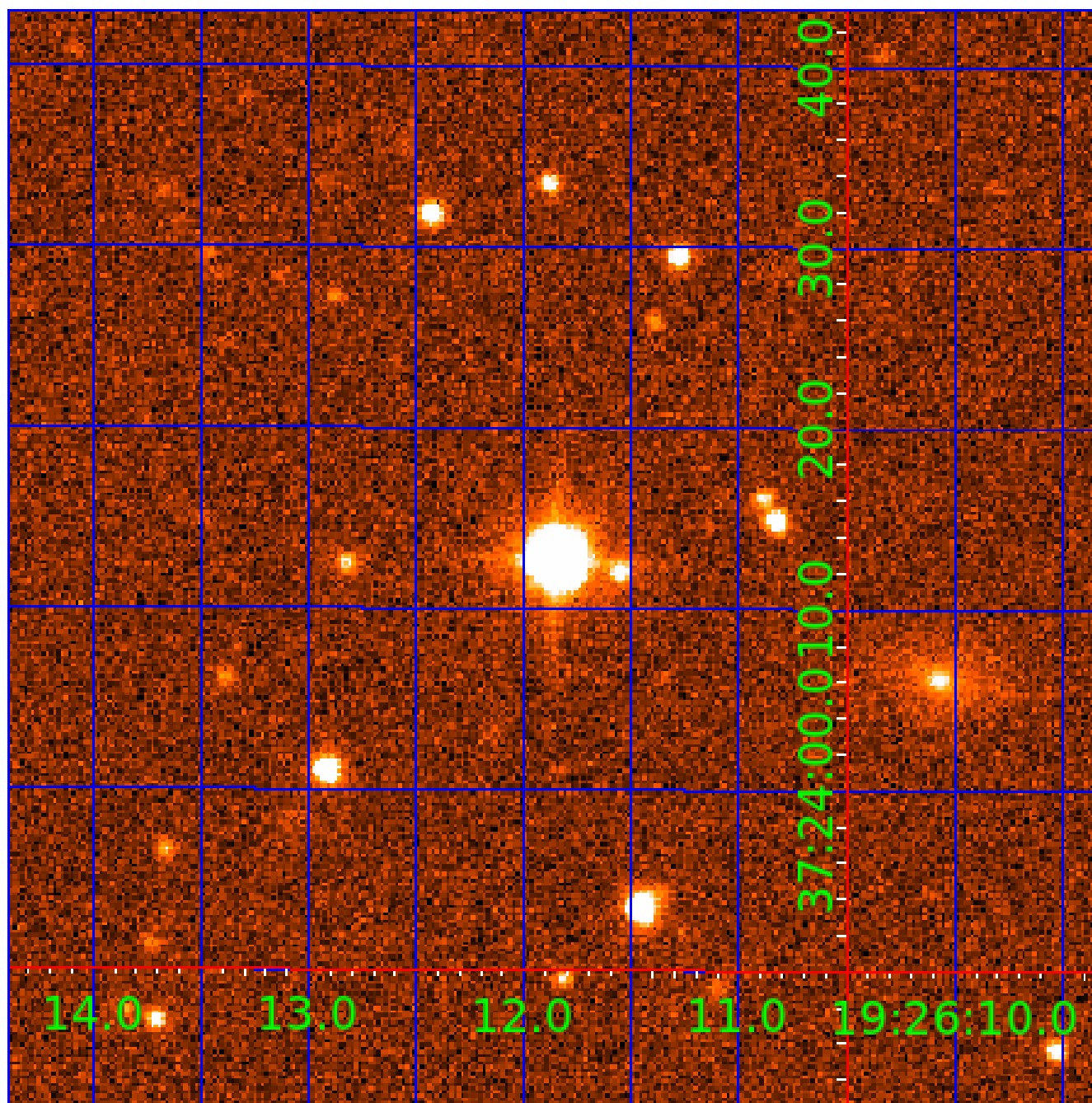


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
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002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

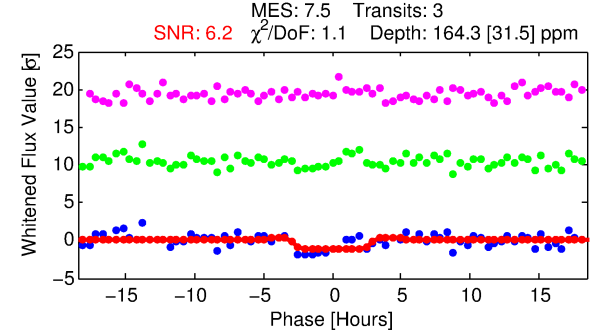
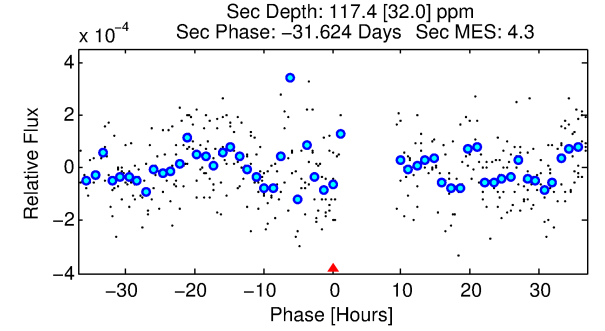
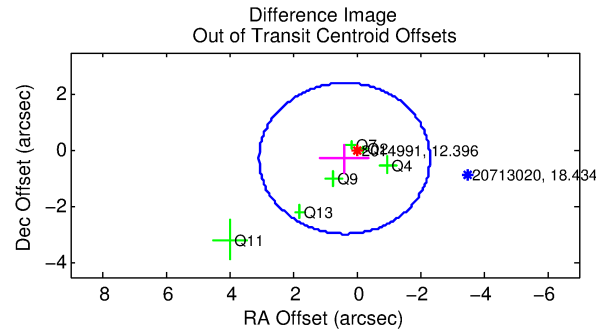
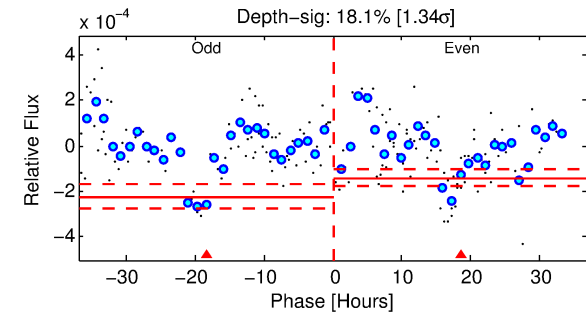
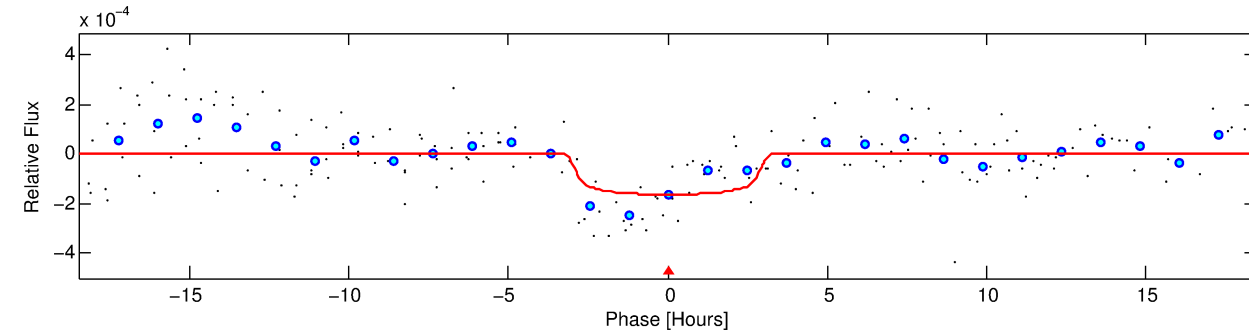
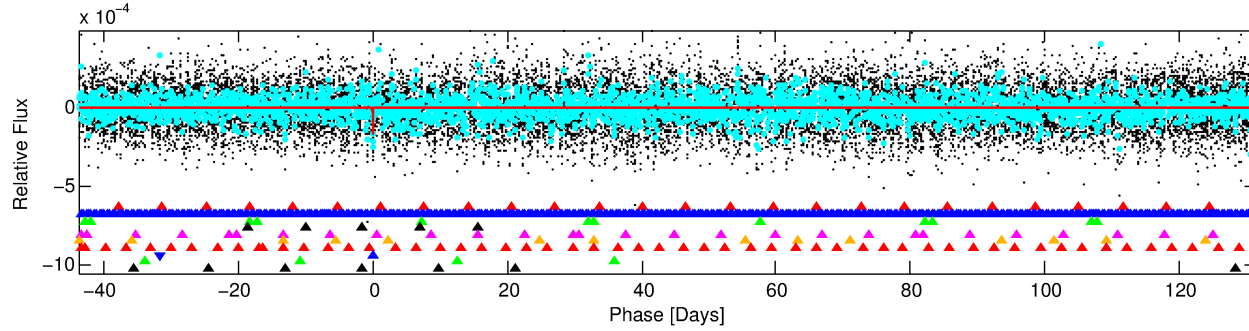
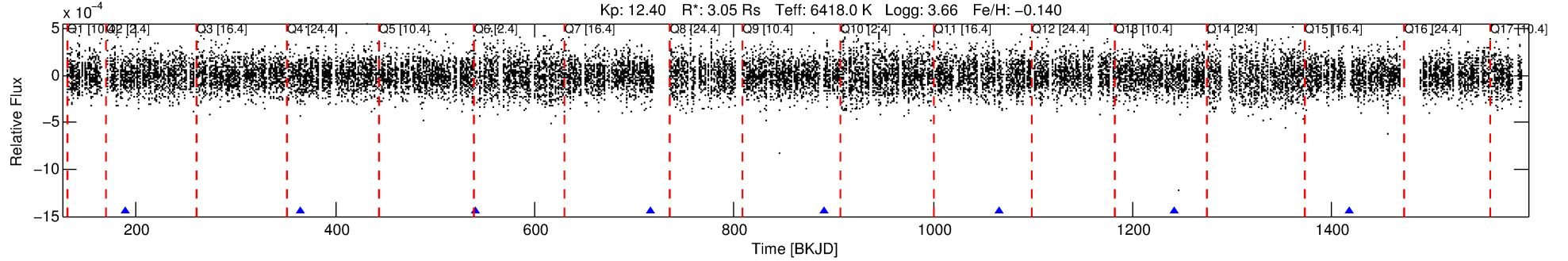
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002014991-08

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 8 of 10 Period: 175.414 d
KOI: K02178 Corr: No Ephemeris Match



DV Fit Results:

Period = 175.41369 [0.00441] d
Epoch = 189.5624 [0.0187] BKJD
Rp/R* = 0.0133 [0.0085]
a/R* = 118.07 [411.03]
b = 0.86 [1.10]
Seff = 28.13 [15.12]
Teff = 587 [79] K
Rp = 4.43 [3.27] Re
a = 0.7088 [0.2391] AU
Ag = 1649.97 [2325.55] [0.71 σ]
Teffp = 5787 [1898] K [2.74 σ]

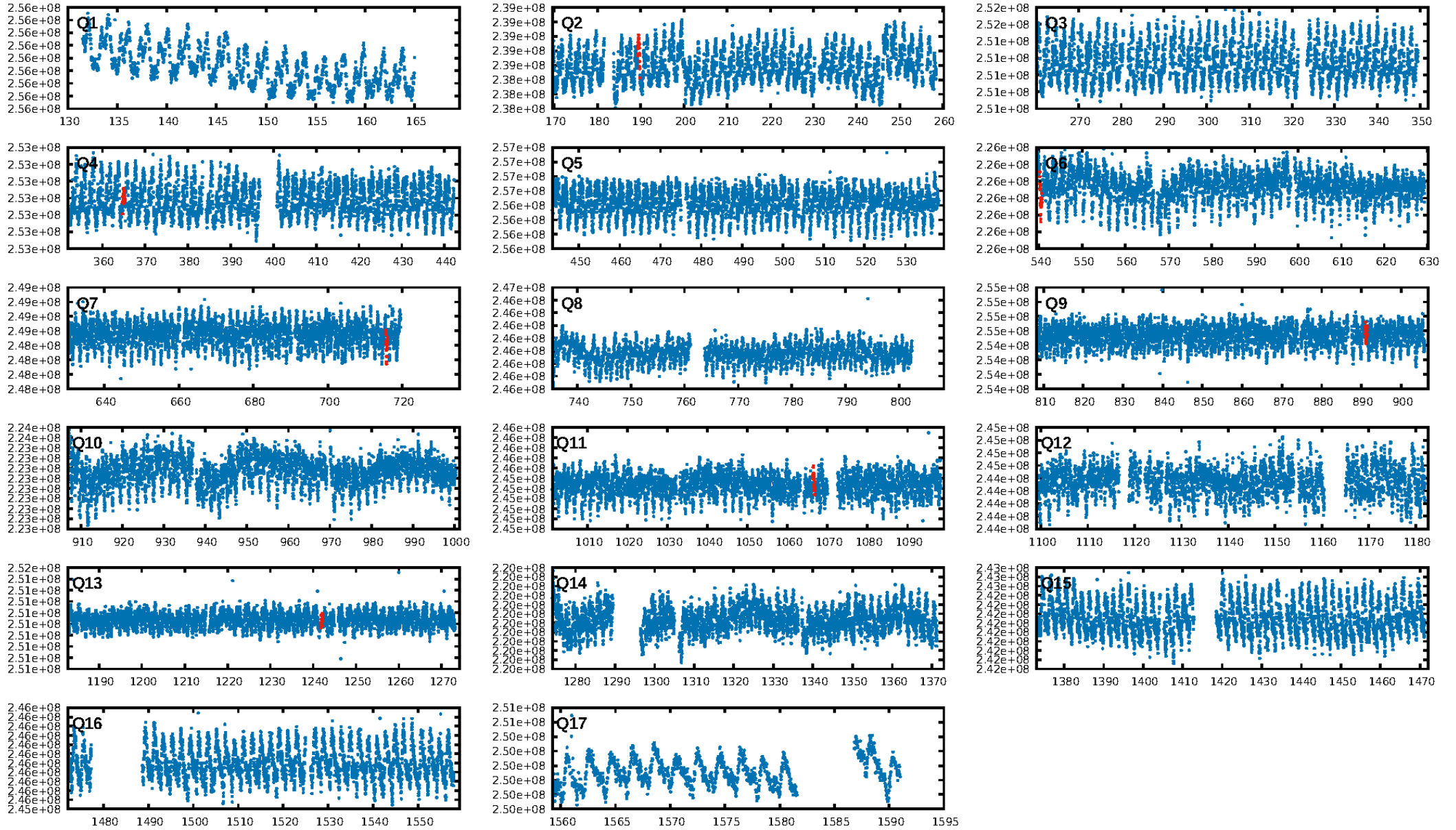
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.29 σ]
LongPeriod-sig: 100.0% [33.26 σ]
ModelChiSquare2-sig: 50.8%
ModelChiSquareGof-sig: 66.8%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.299
Centroid-sig: 97.7%
Centroid-so: 0.459 arcsec [0.33 σ]
OotOffset-rm: 0.469 arcsec [0.52 σ]
OotOffset-st: 1/2/1/2 [6]
KicOffset-rm: 0.487 arcsec [0.78 σ]
KicOffset-st: 1/2/1/2 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.50 [3/6]

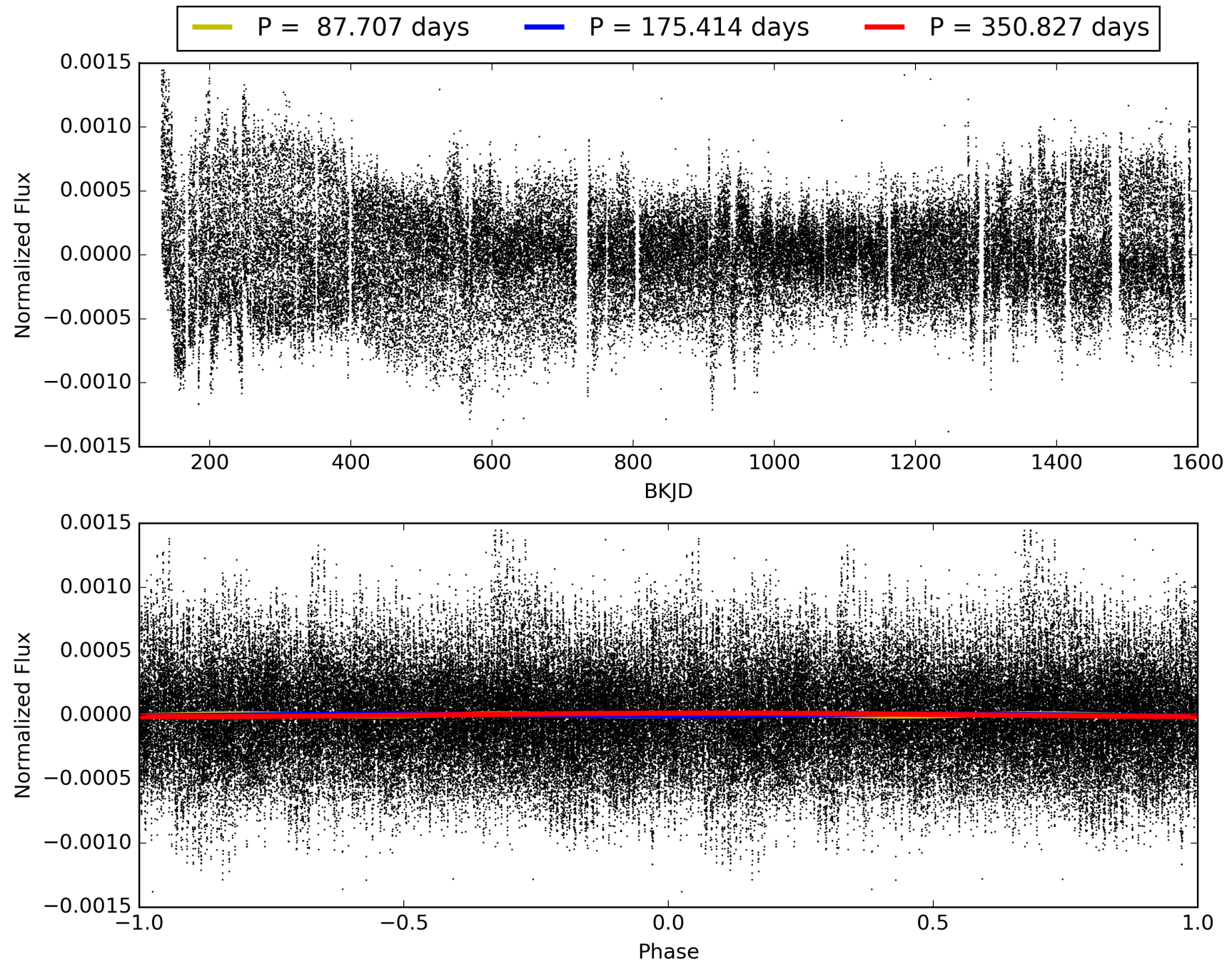
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:53:00 Z

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

TCE 002014991-08, PDC Light Curves

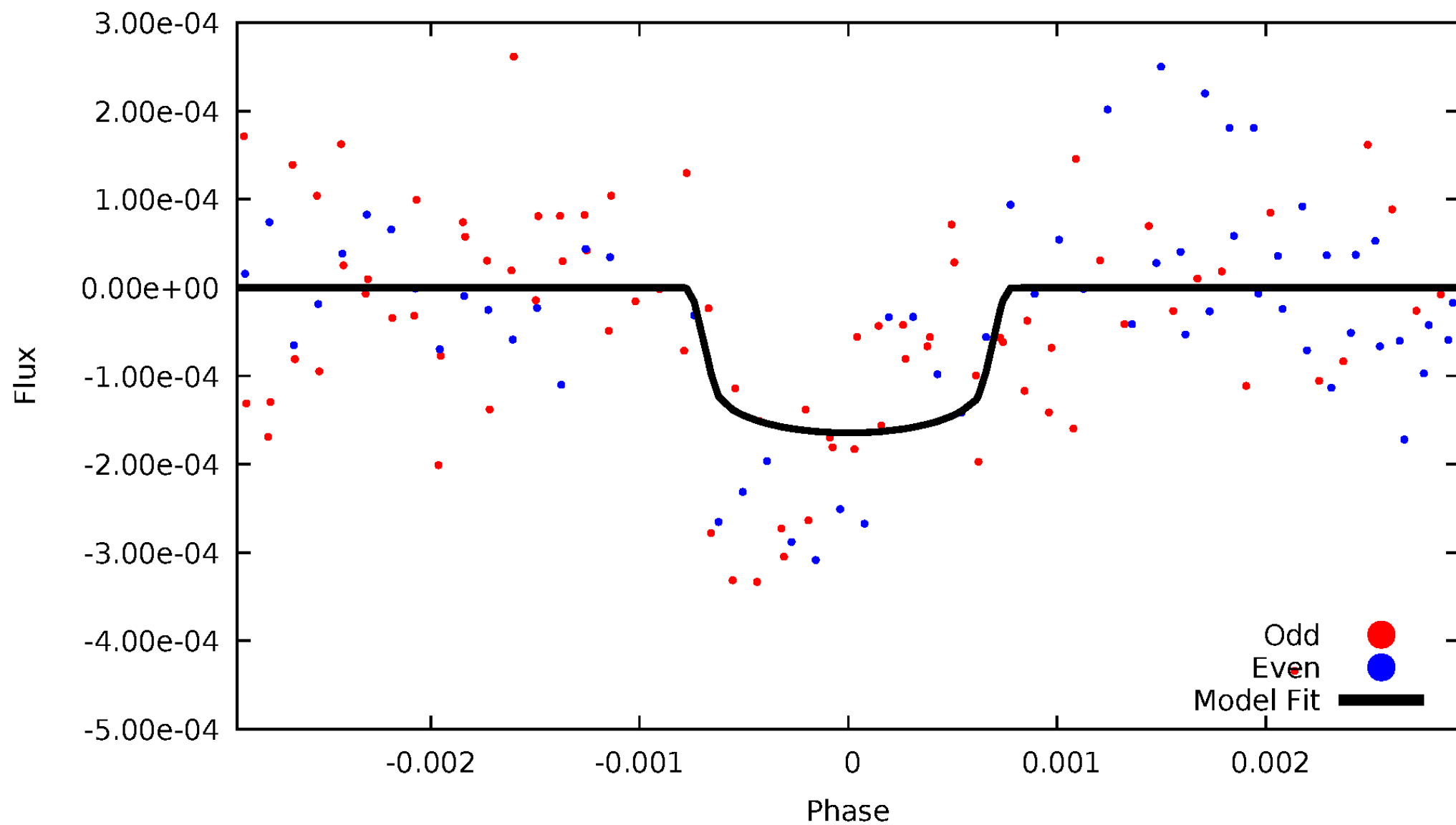


TCE 002014991-08



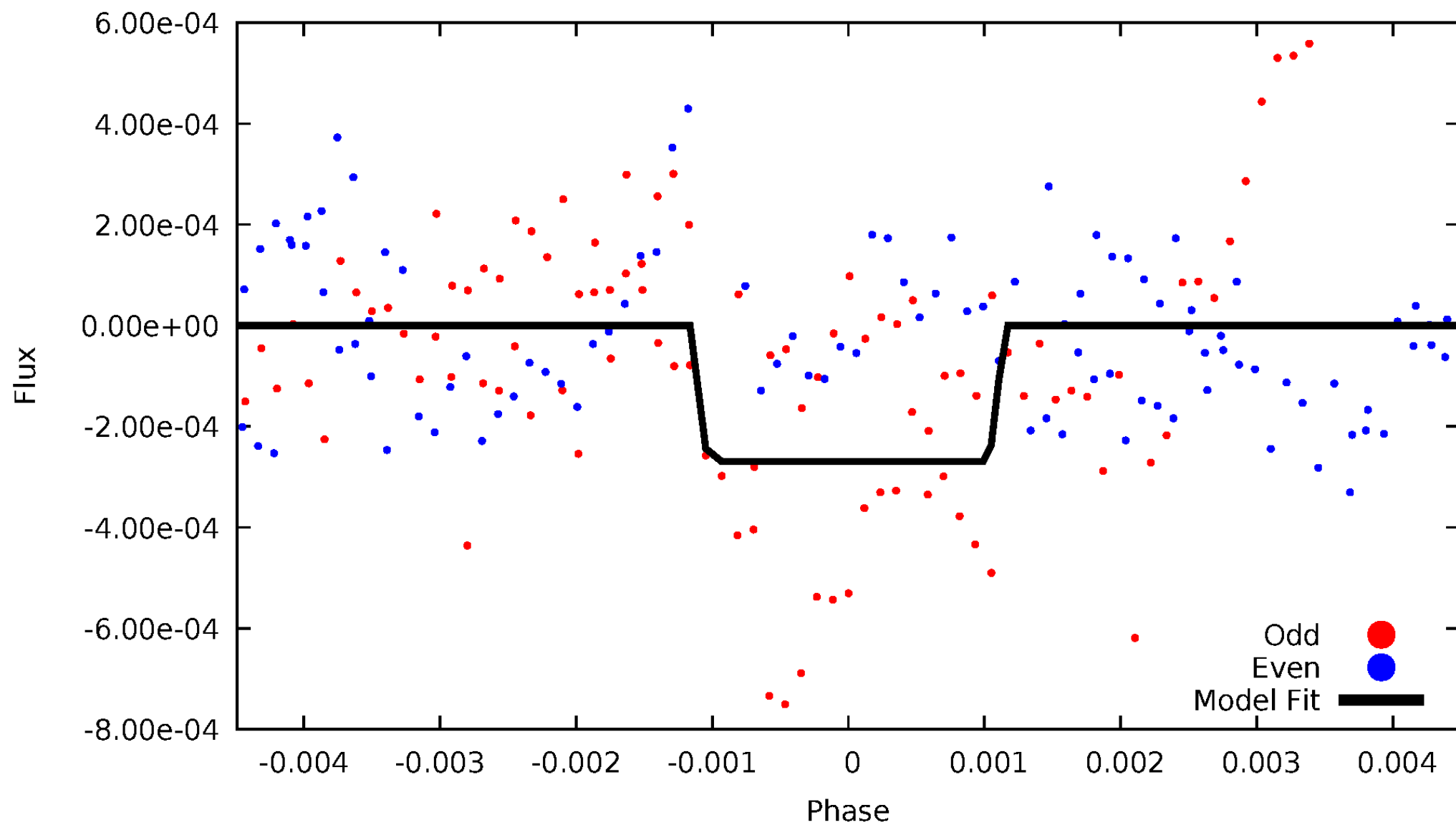
DV Odd/Even

TCE 002014991-08



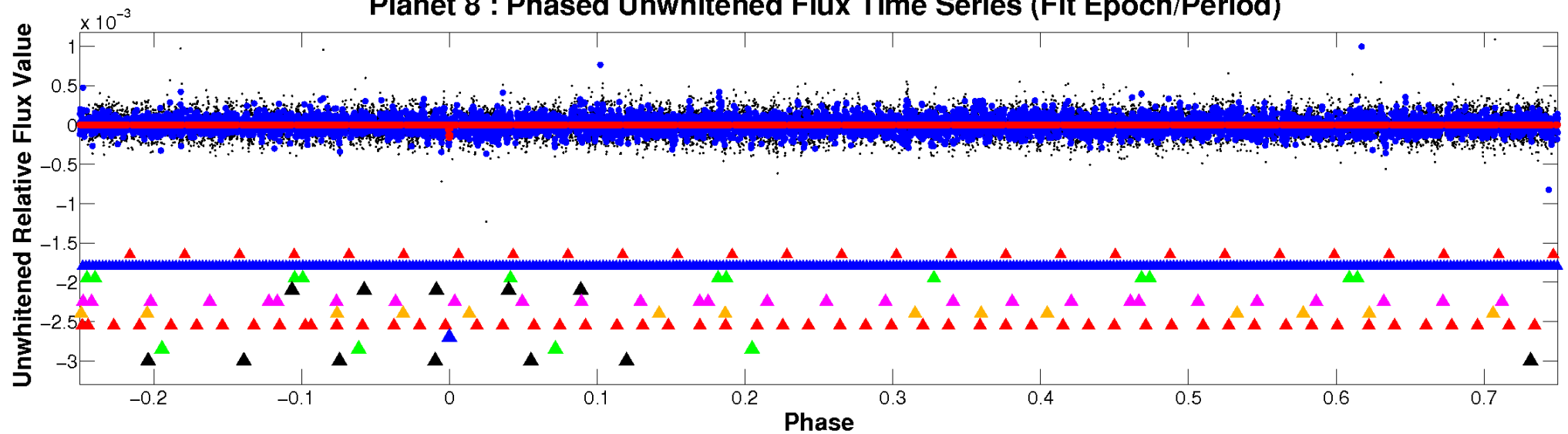
ALT Odd/Even

TCE 002014991-08

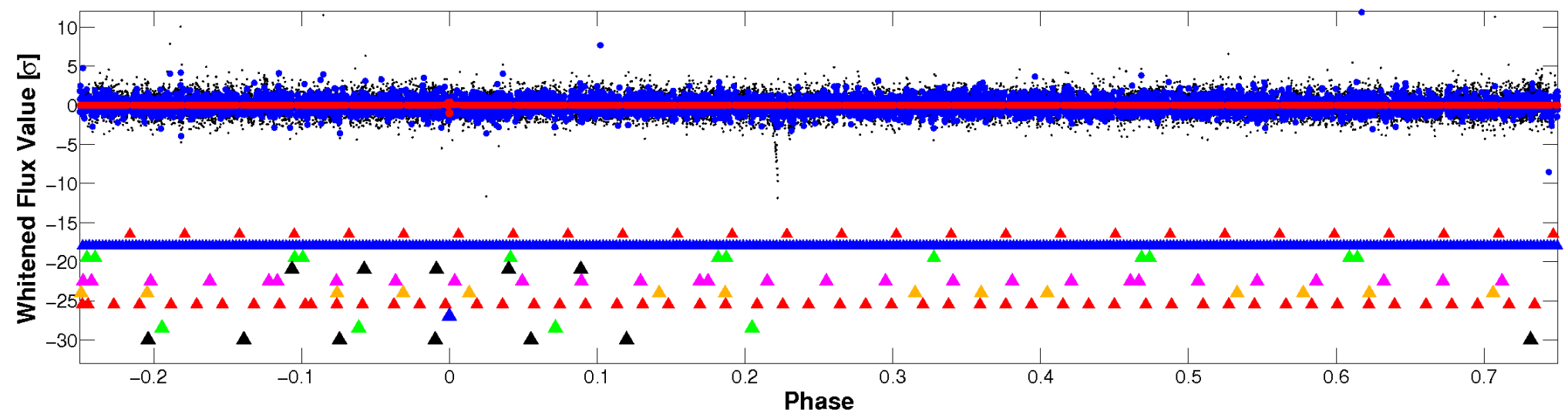


Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

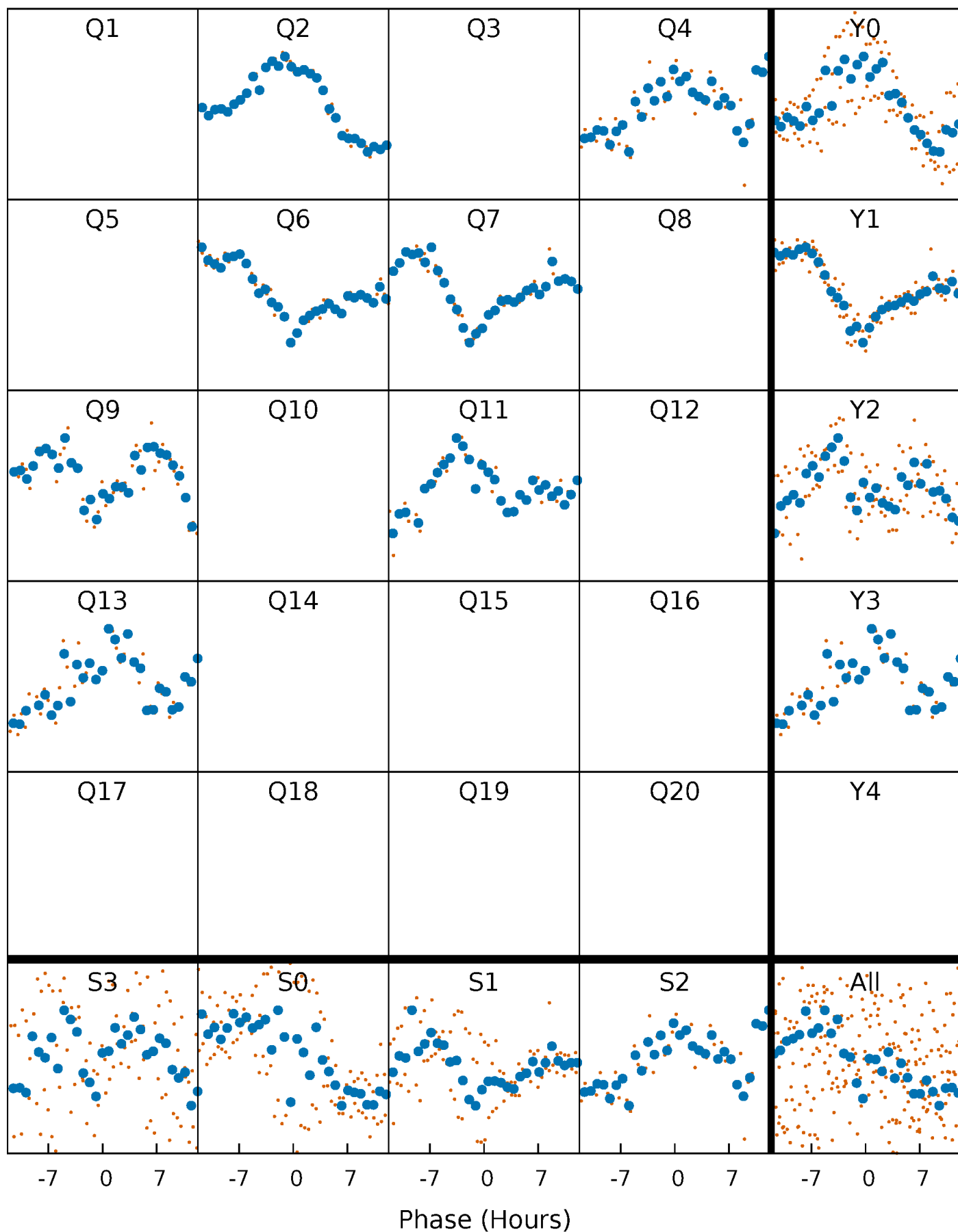


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



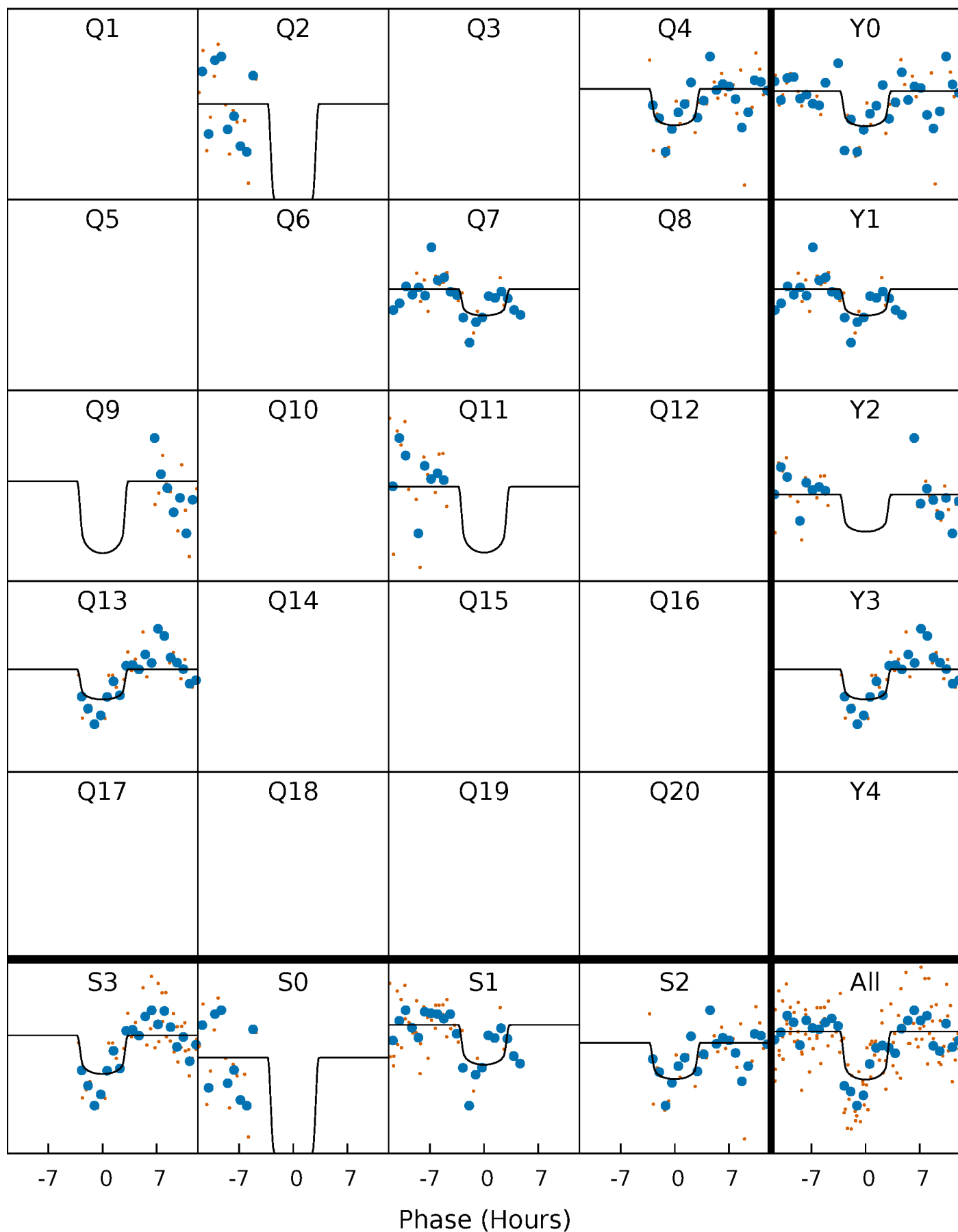
PDC Quarter-Phased Transit Curves

TCE 002014991-08 $P=175.413692$ Days $T_0=189.562425$ (BKJD)



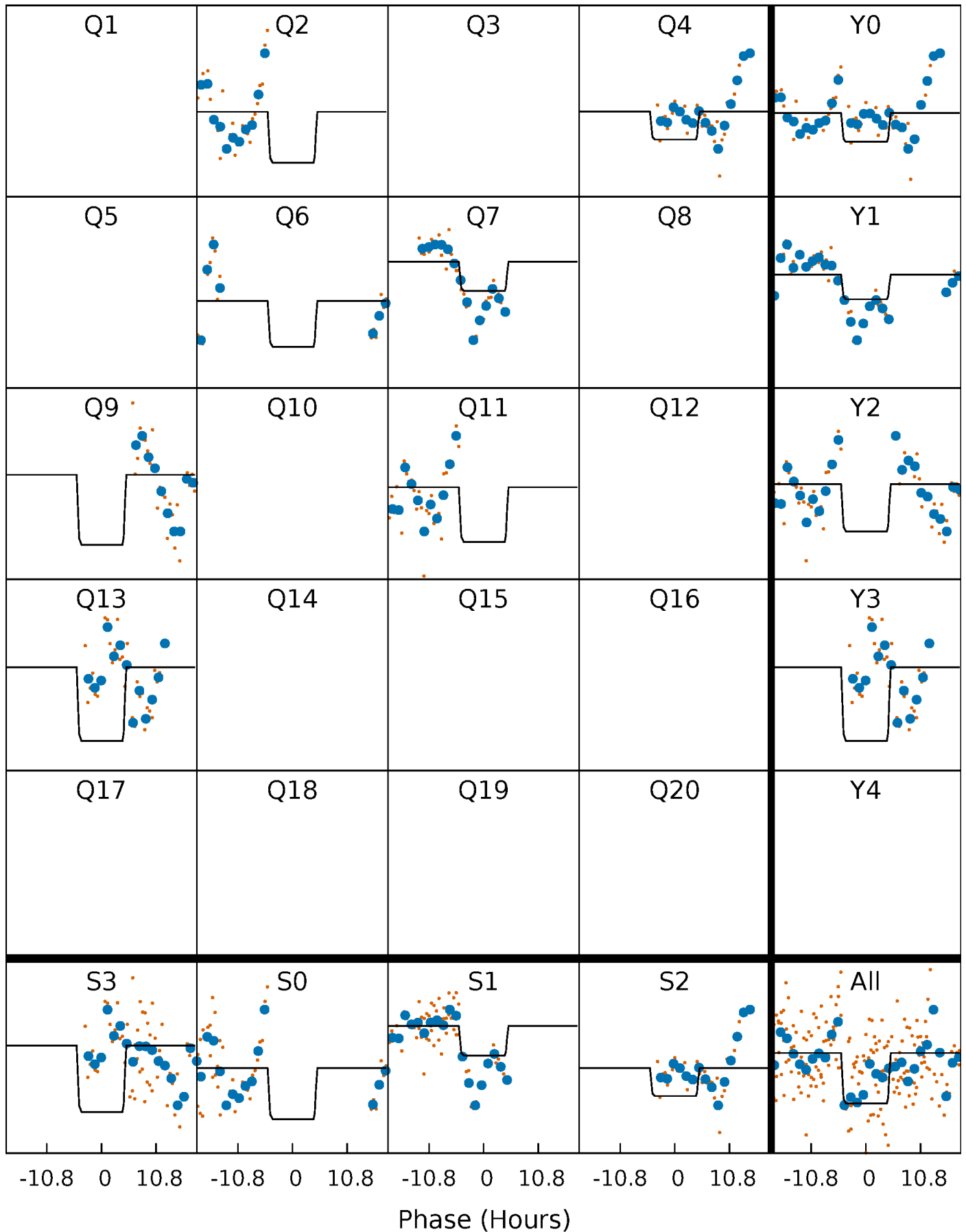
DV Quarter-Phased Transit Curves

TCE 002014991-08 $P=175.413692$ Days $T_0=189.562425$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

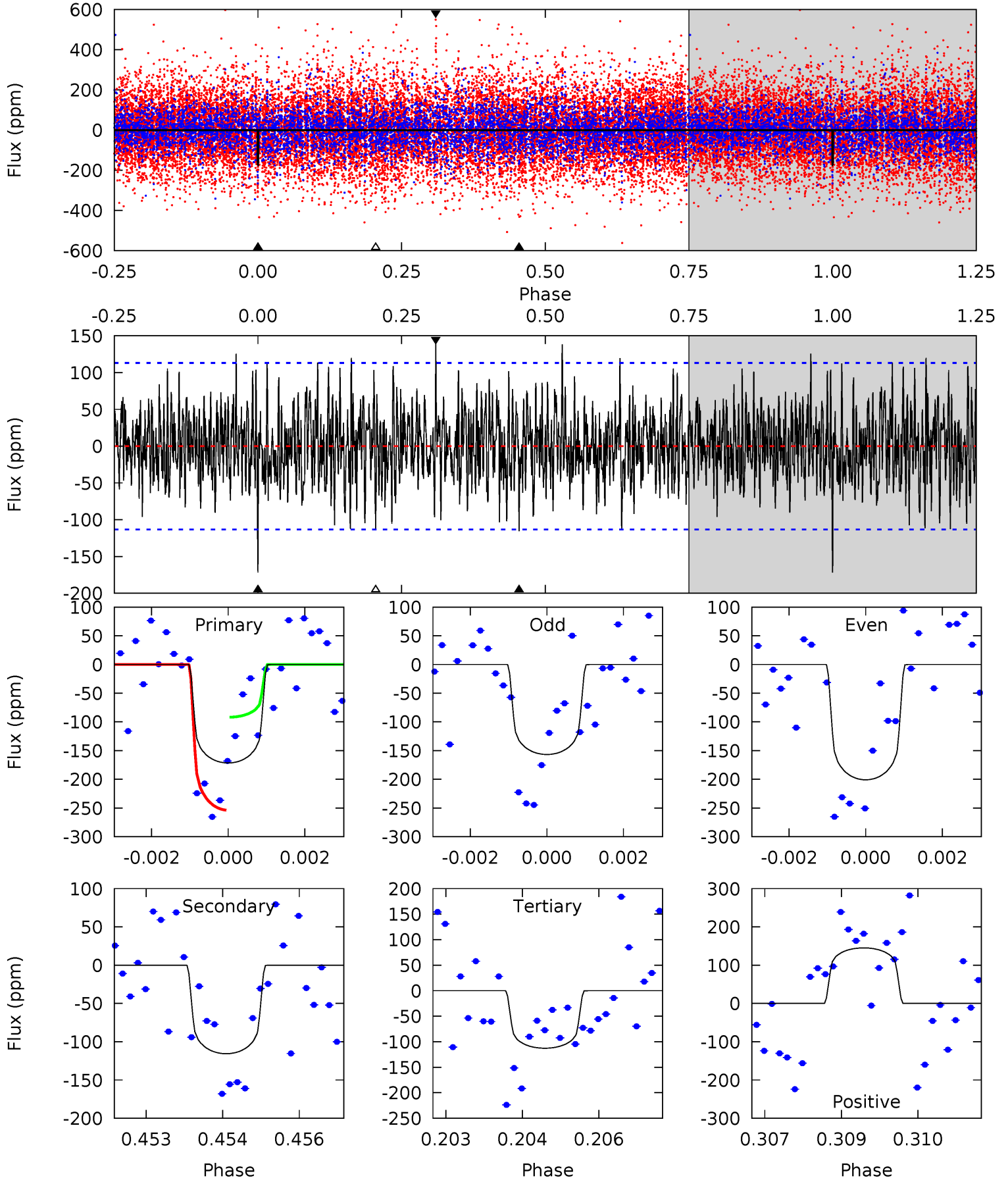
TCE 002014991-08 $P=175.413213$ Days $T_0=189.568650$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-08, P = 175.413692 Days, E = 14.148733 Days

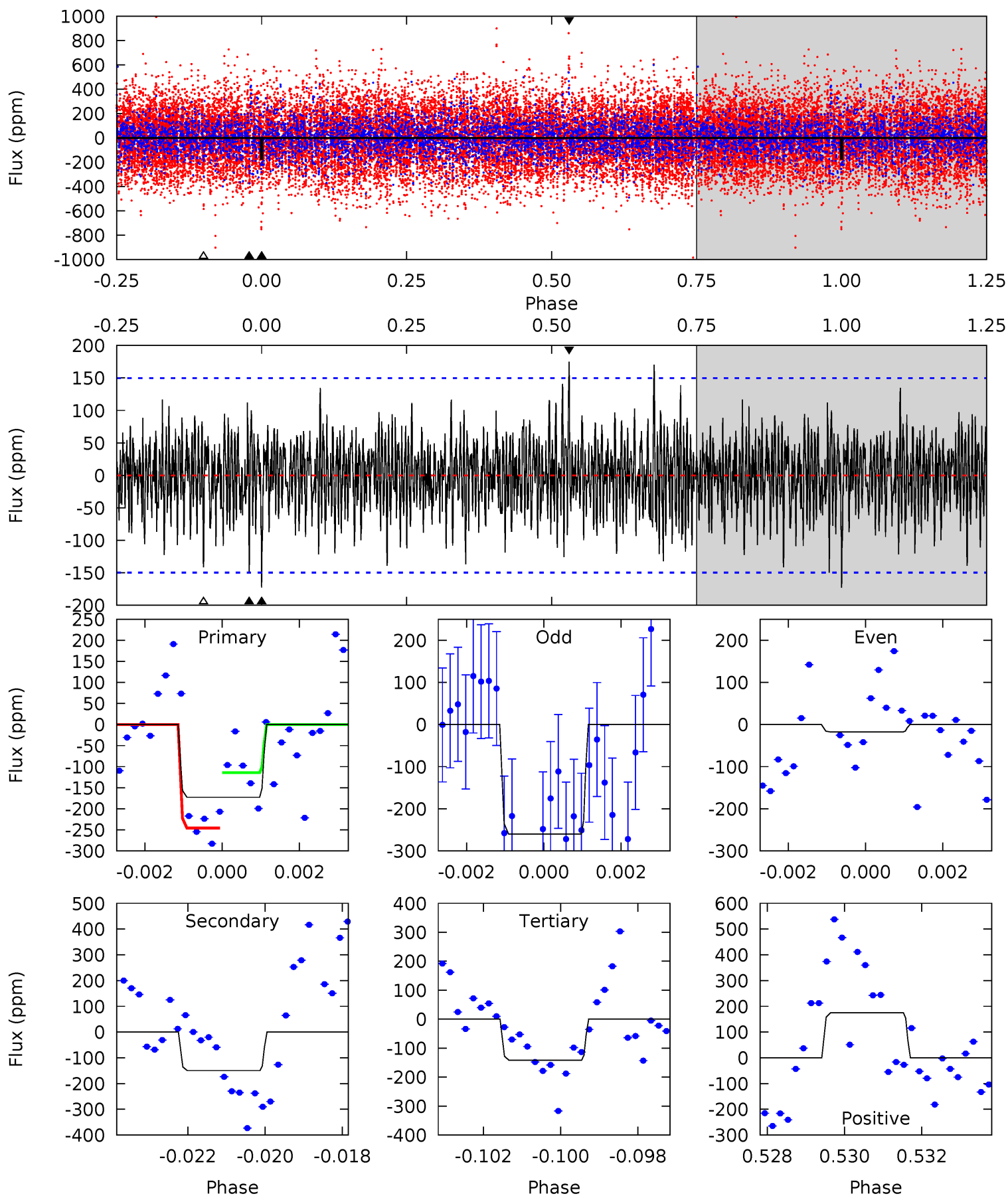
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.15	5.49	5.36	6.90	5.38	3.17	1.86	2.79	1.25	0.14	-1.40	1.00	1.07	0.46	3.84



Alt Model-Shift Uniqueness Test

002014991-08, P = 175.413213 Days, E = 14.155437 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.14	5.31	5.03	6.22	5.32	3.08	1.61	1.11	-0.08	0.29	-0.91	4.08	2.79	0.50	2.31



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-116 ± 21	$4.20^{+2.75}_{-2.28}$	799^{+51}_{-70}	5703^{+3062}_{-1073}	1778^{+6578}_{-1101}
Alt.	-149 ± 28	$5.11^{+3.03}_{-2.45}$	802^{+46}_{-72}	5541^{+2397}_{-969}	1599^{+4254}_{-1005}

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 $A_{obs} \gg 1.0$

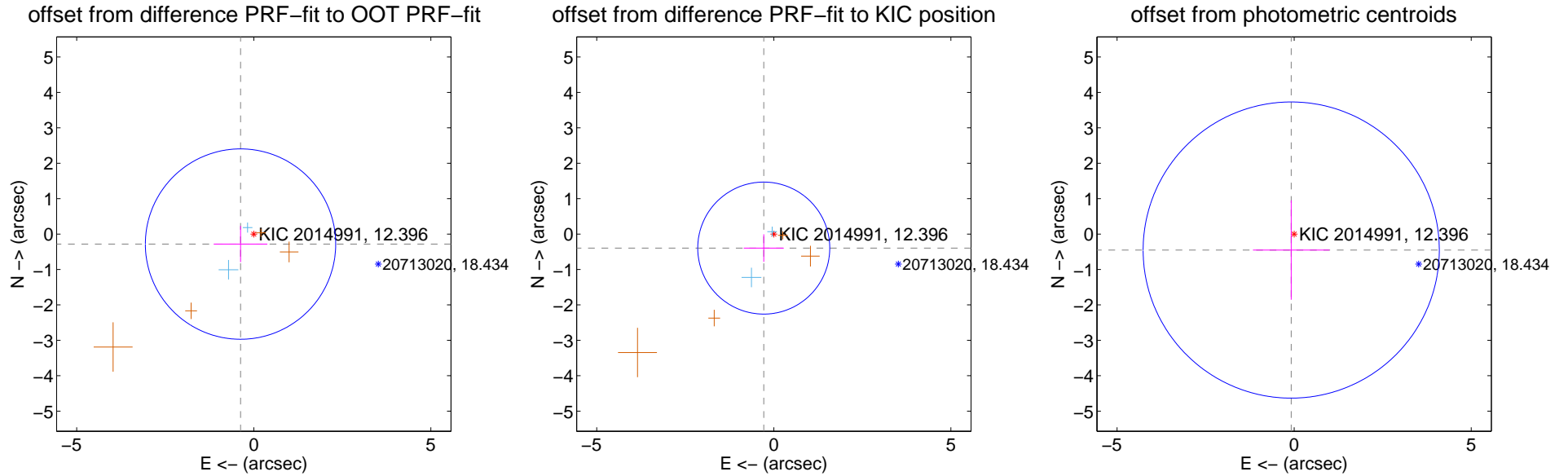
DV Centroid Data

Supplemental centroid analysis for 002014991-08. Kepler magnitude: 12.40. Transit SNR 6.17

There are 2 quarters with good PRF difference image offsets

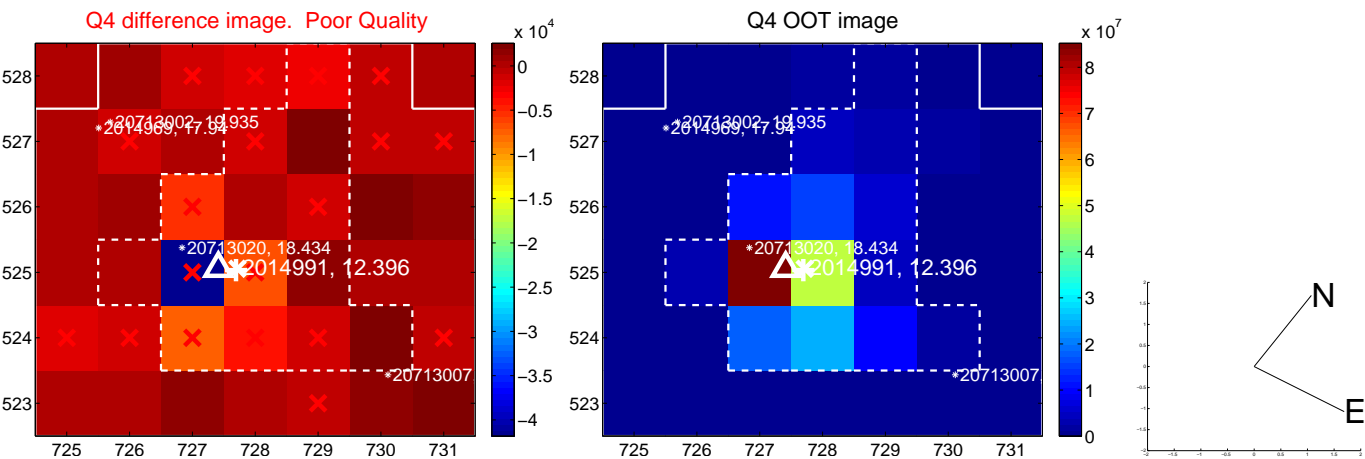
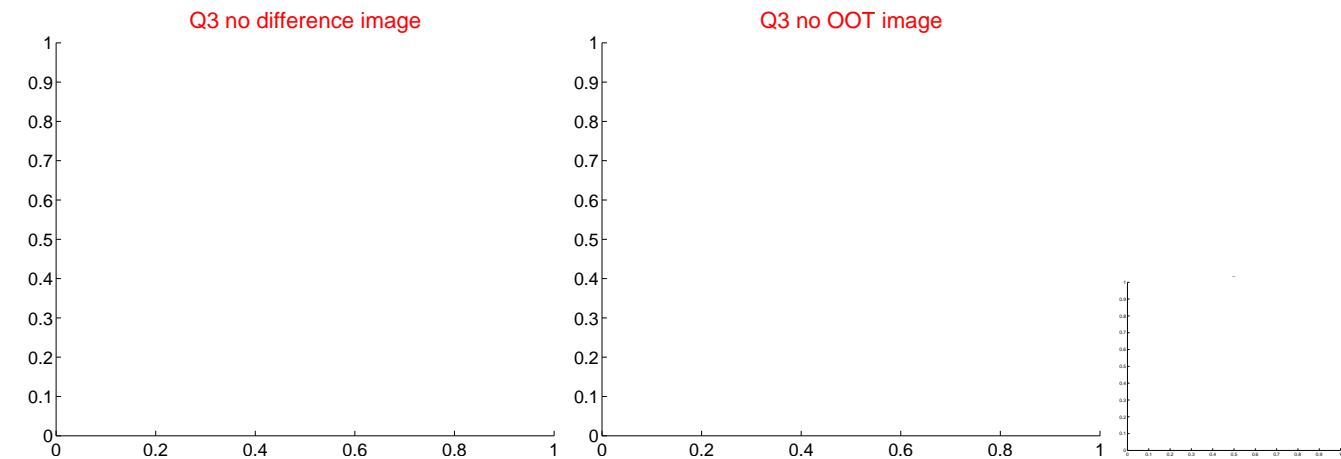
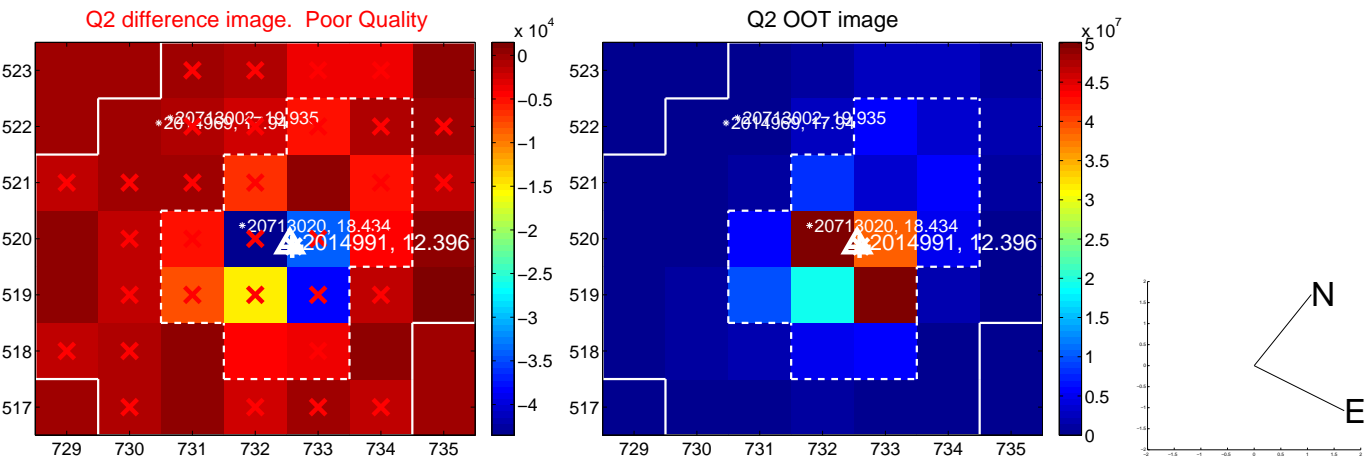
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.469 ± 0.896	0.52	0.374 ± 0.757	-0.283 ± 0.509
PRF-fit source offset from KIC position	0.487 ± 0.621	0.78	0.284 ± 0.566	-0.396 ± 0.389
photometric centroid source offset	0.46 ± 1.39	0.33	0.08 ± 1.08	-0.45 ± 1.40

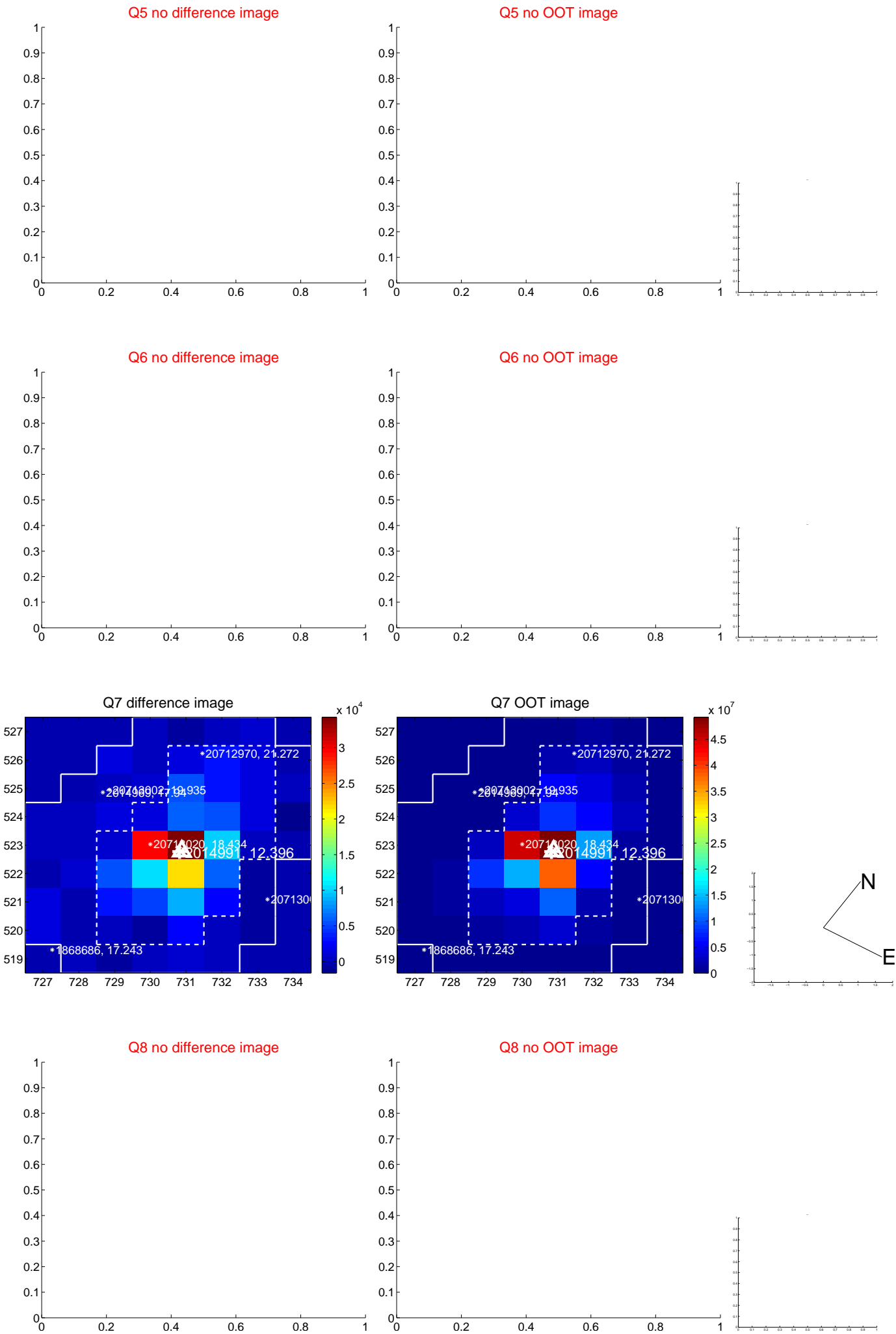


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

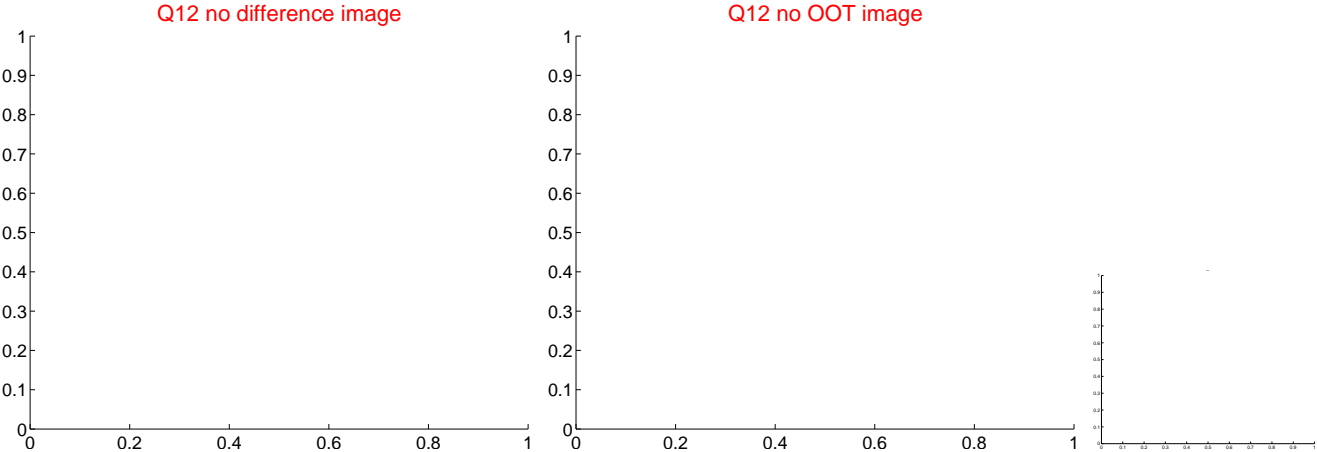
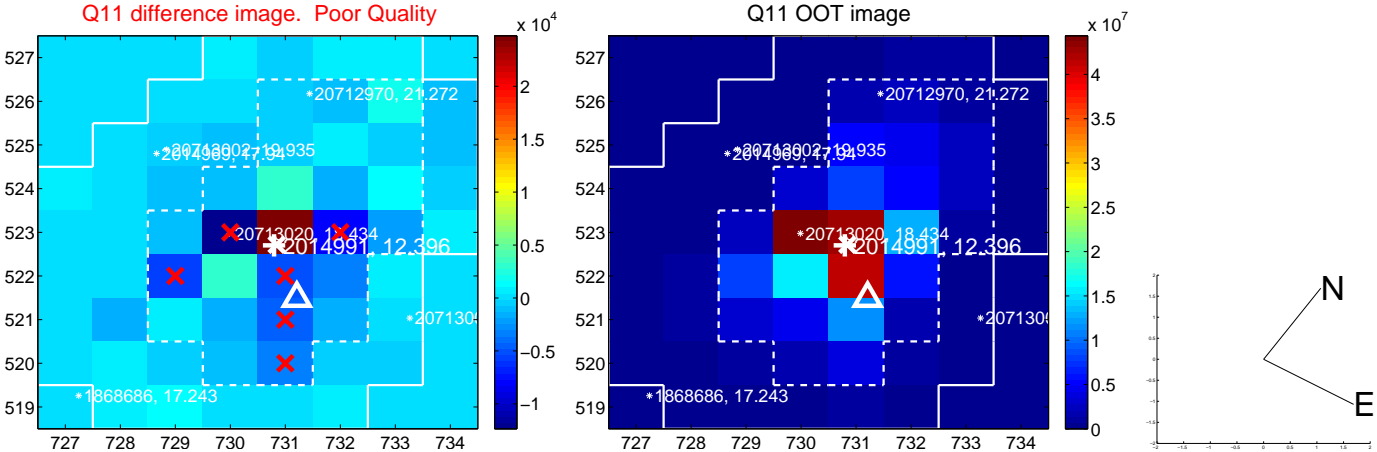
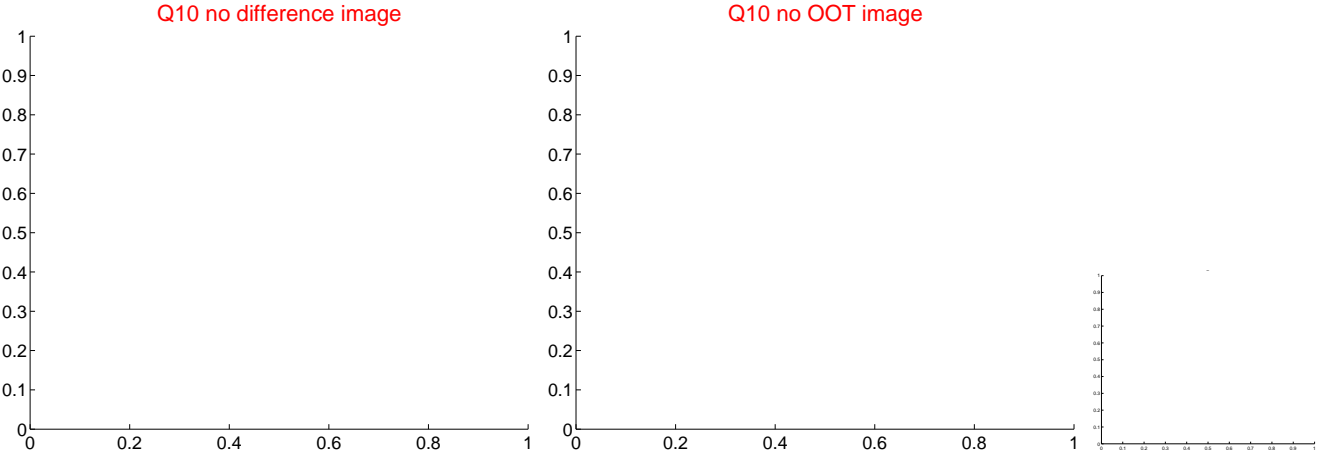
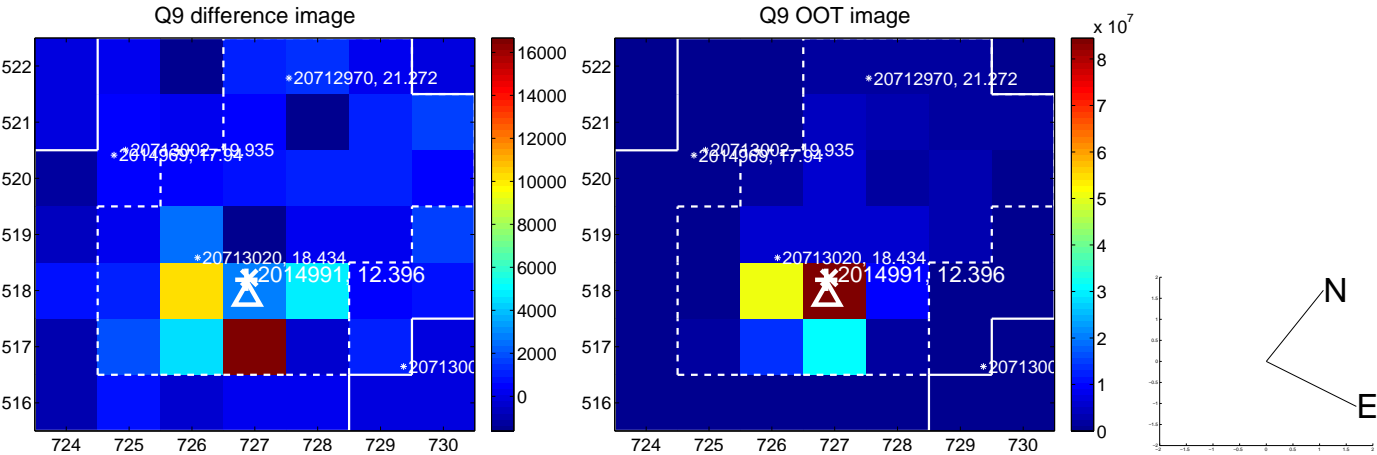
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



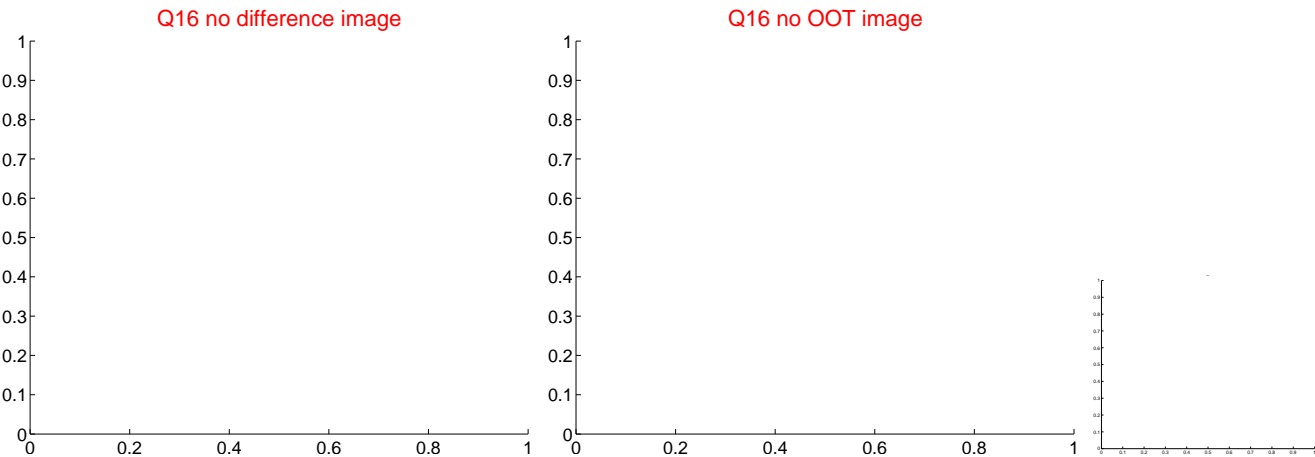
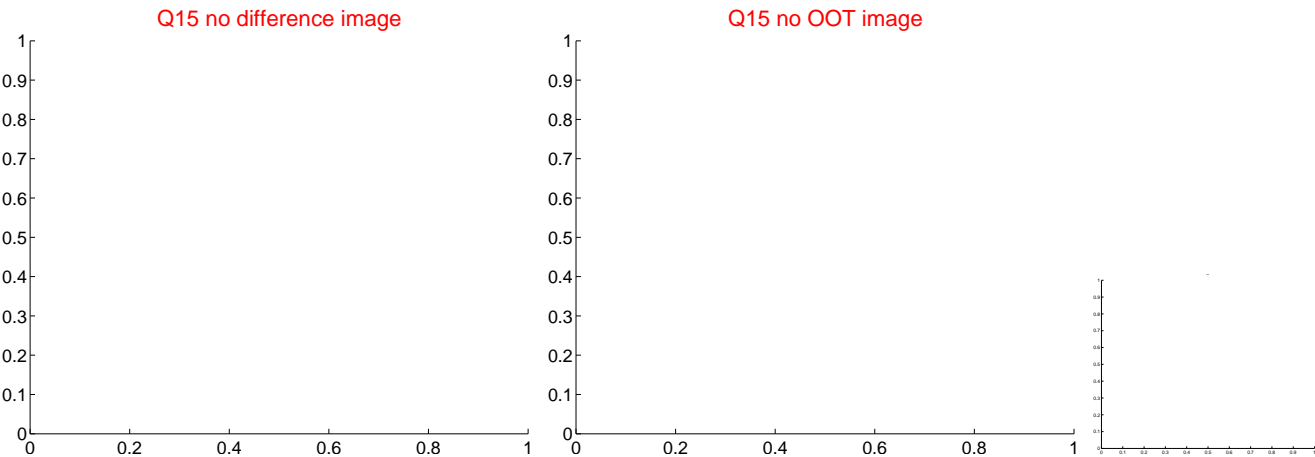
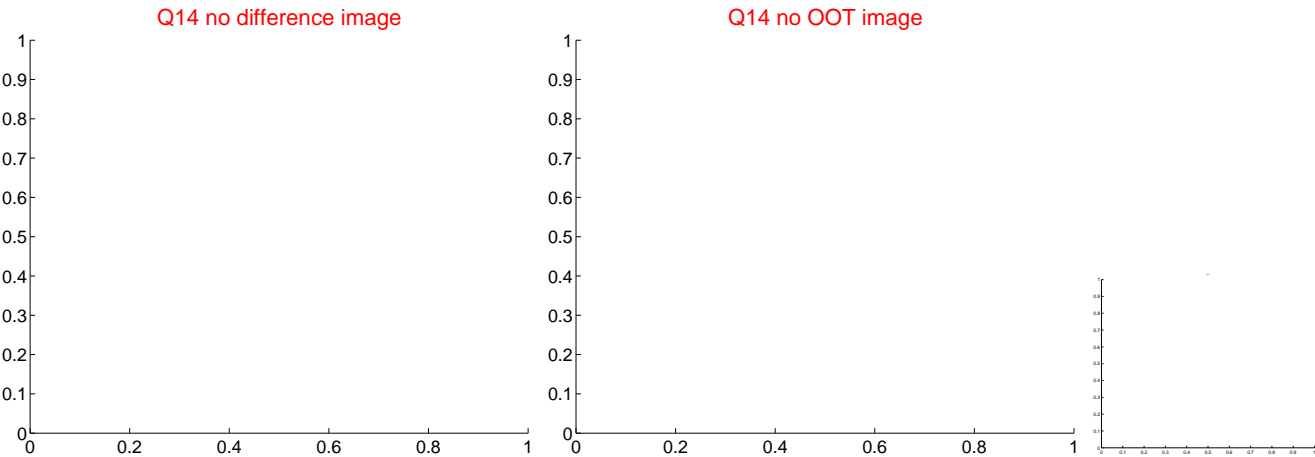
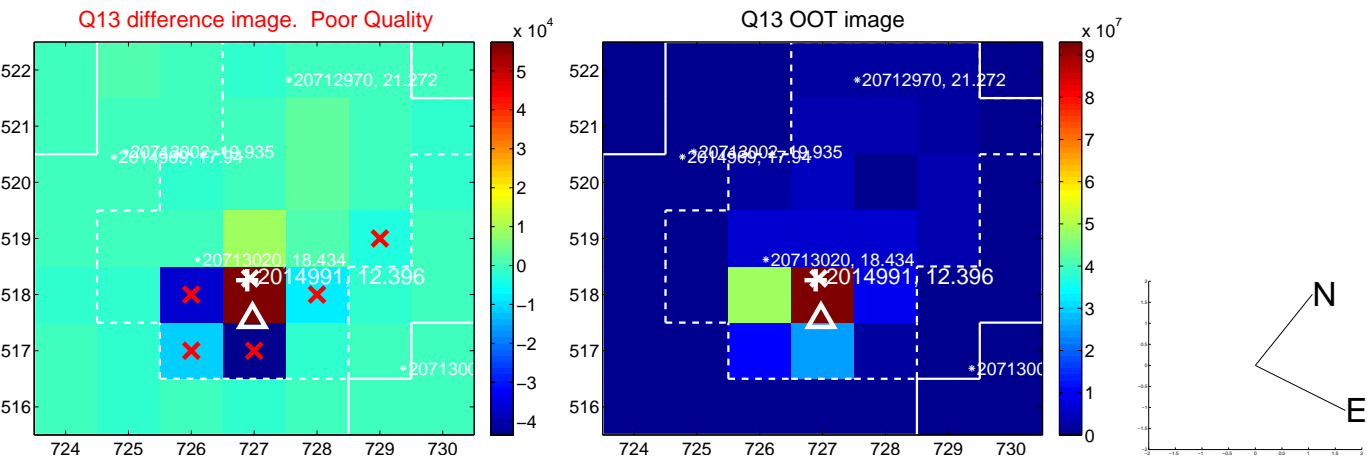
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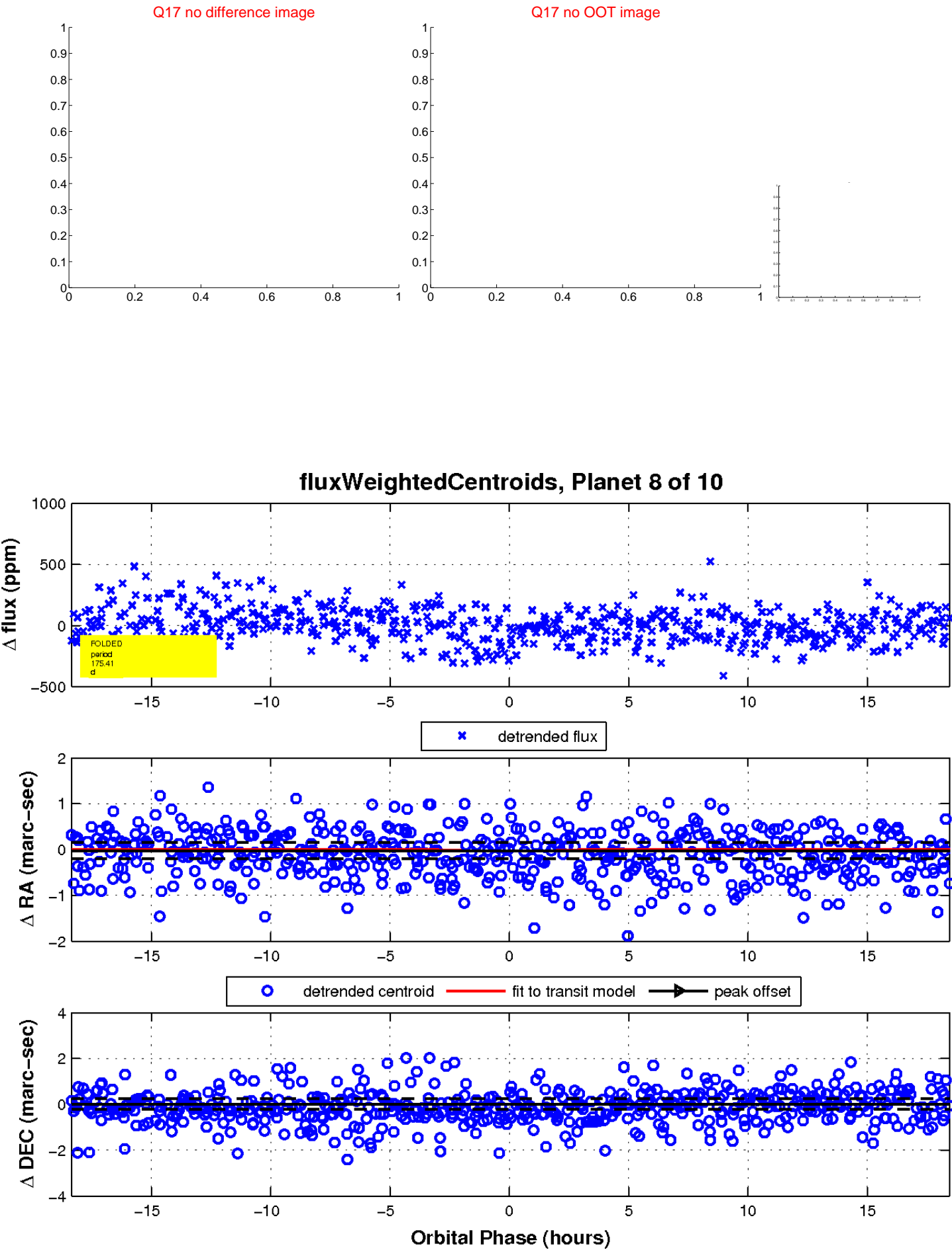
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white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

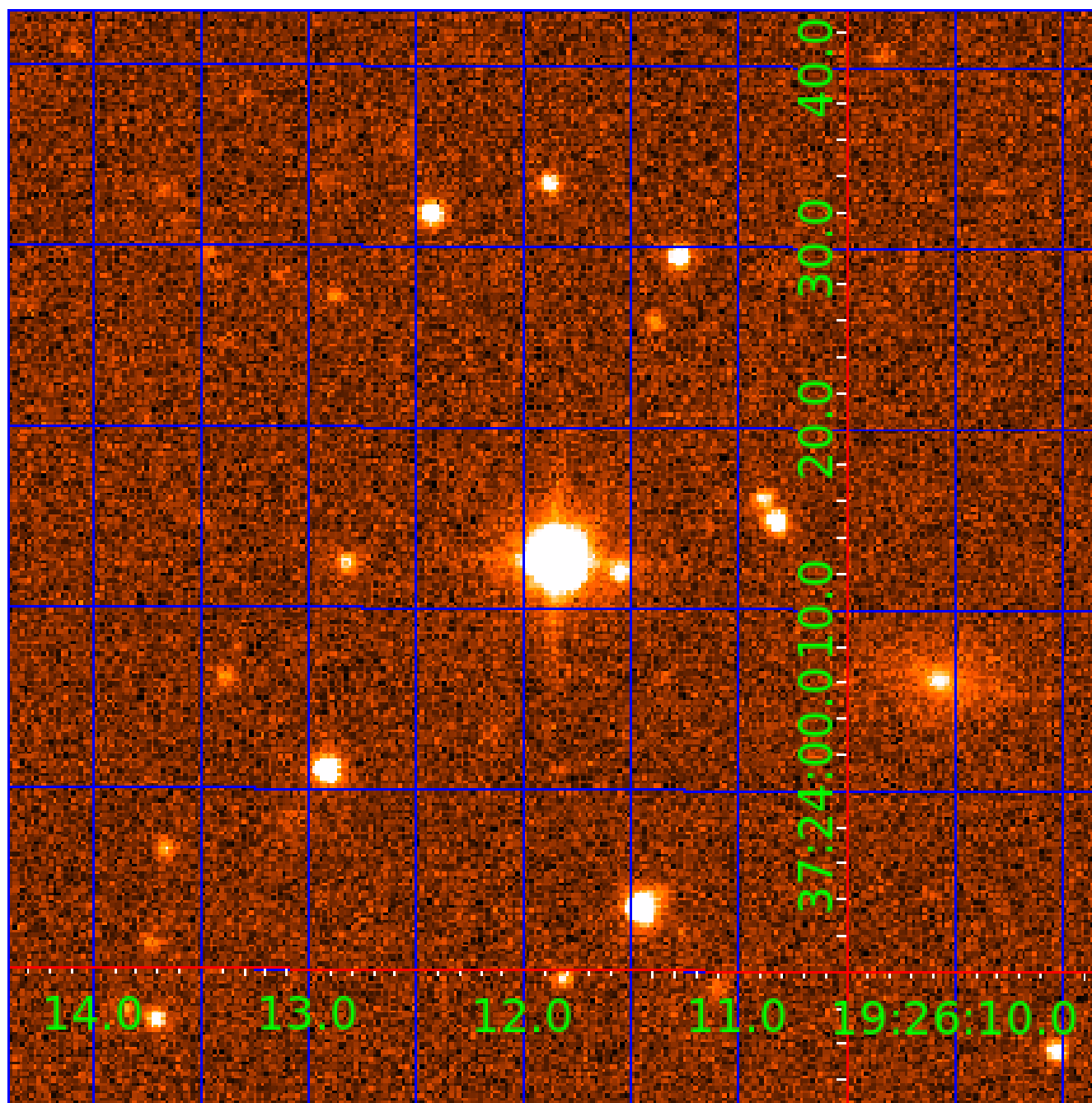


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UKIRT Image

Declination



Q1-17 DR25 TCE Parameters

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002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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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.

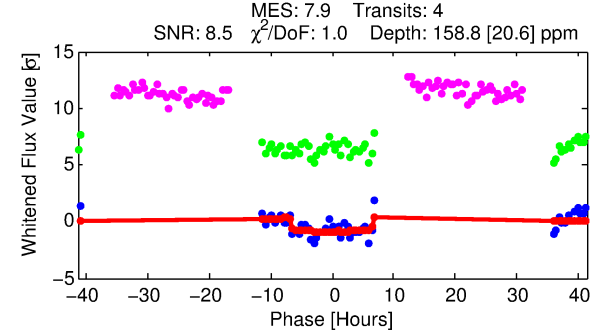
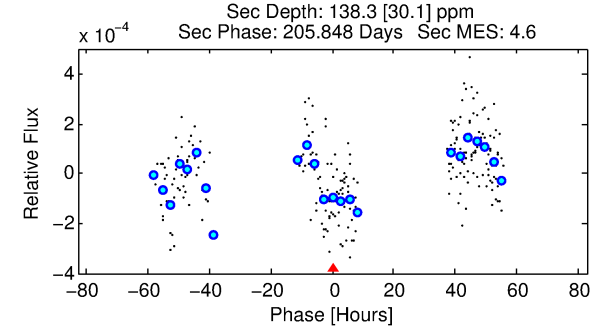
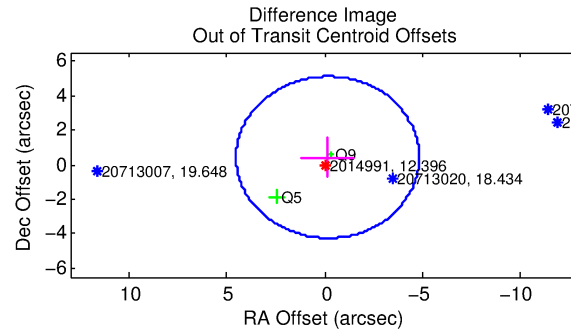
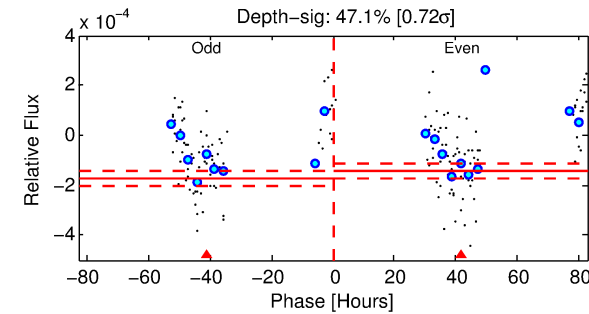
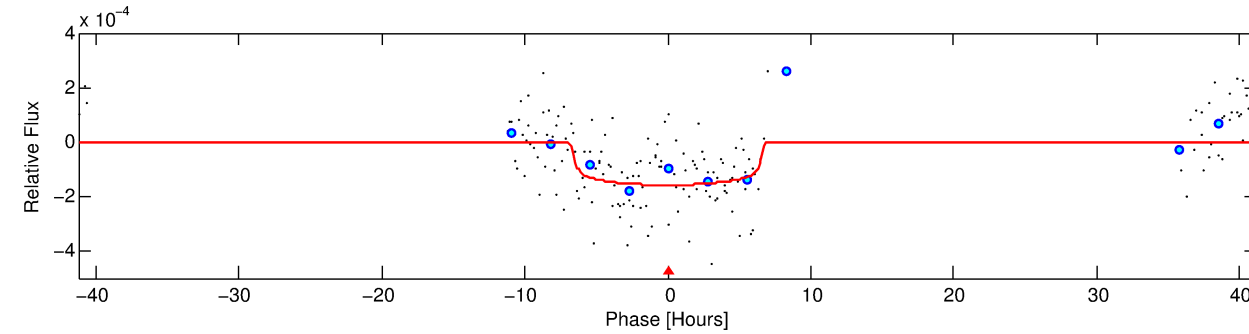
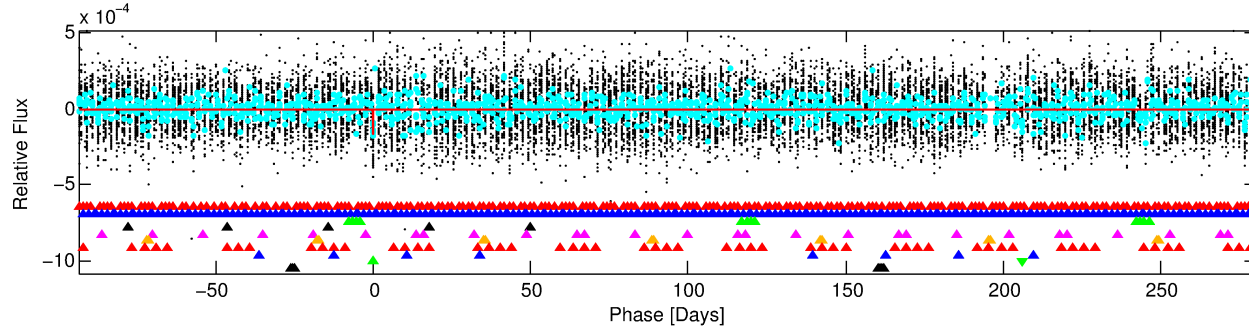
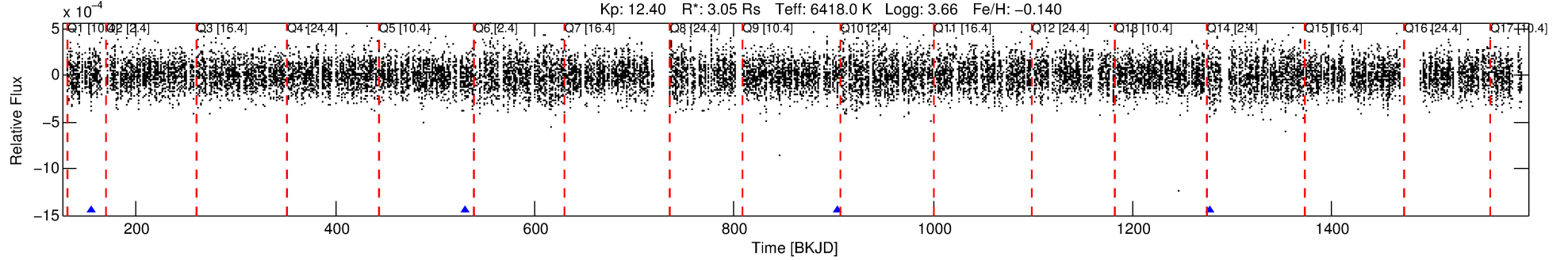
Ephemeris Match Information For 002014991-09

No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 9 of 10 Period: 374.173 d
KOI: K02178 Corr: No Ephemeris Match

Kp: 12.40 R*: 3.05 Rs Teff: 6418.0 K Logg: 3.66 Fe/H: -0.140



DV Fit Results:

Period = 374.17298 [0.01215] d
Epoch = 155.4591 [0.0259] BKJD
Rp/R* = 0.0130 [0.0025]
a/R* = 119.38 [119.74]
b = 0.83 [0.37]
Seff = 10.24 [5.51]
Teq = 456 [61] K
Rp = 4.31 [1.79] Re
a = 1.1745 [0.3962] AU
Ag = 5651.04 [3910.24] [1.44σ]
Teffp = 6115 [707] K [7.98σ]

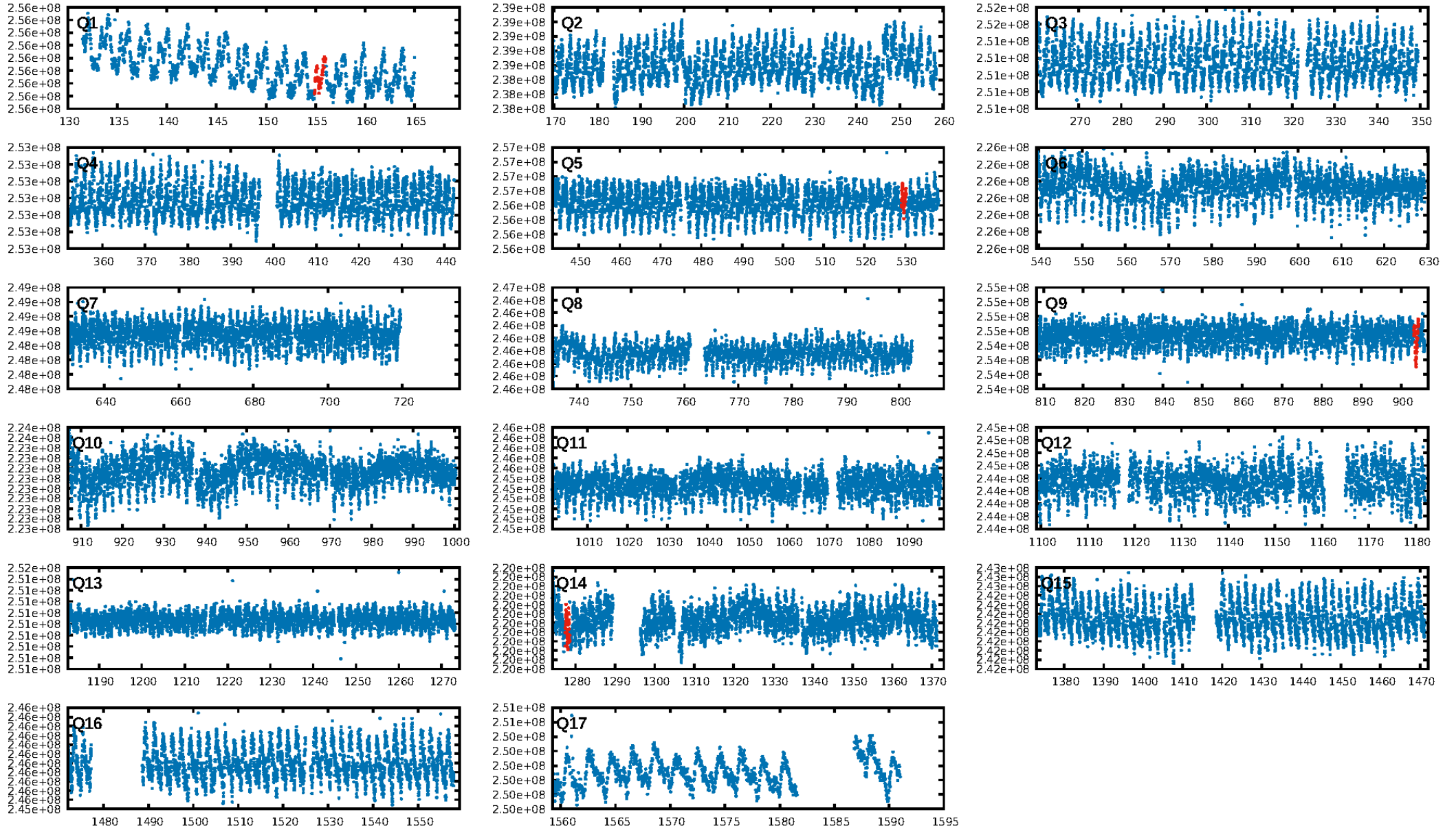
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [53.72σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 41.8%
ModelChiSquareGof-sig: 99.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.262
Centroid-sig: 59.9%
Centroid-so: 0.250 arcsec [0.23σ]
OotOffset-rm: 0.454 arcsec [0.29σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-rm: 0.324 arcsec [0.22σ]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 0.00 [0/3]

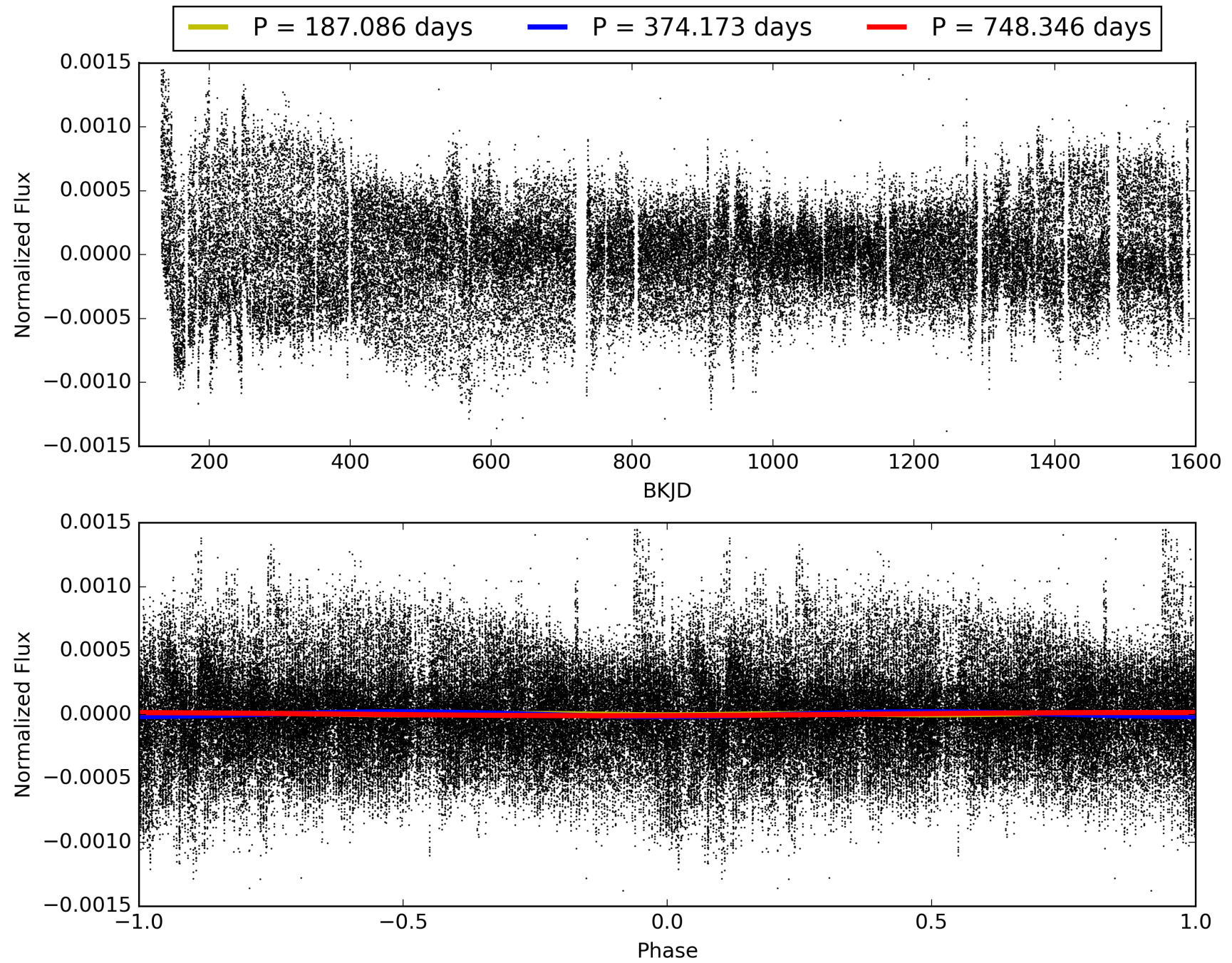
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:53:05 Z

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

TCE 002014991-09, PDC Light Curves

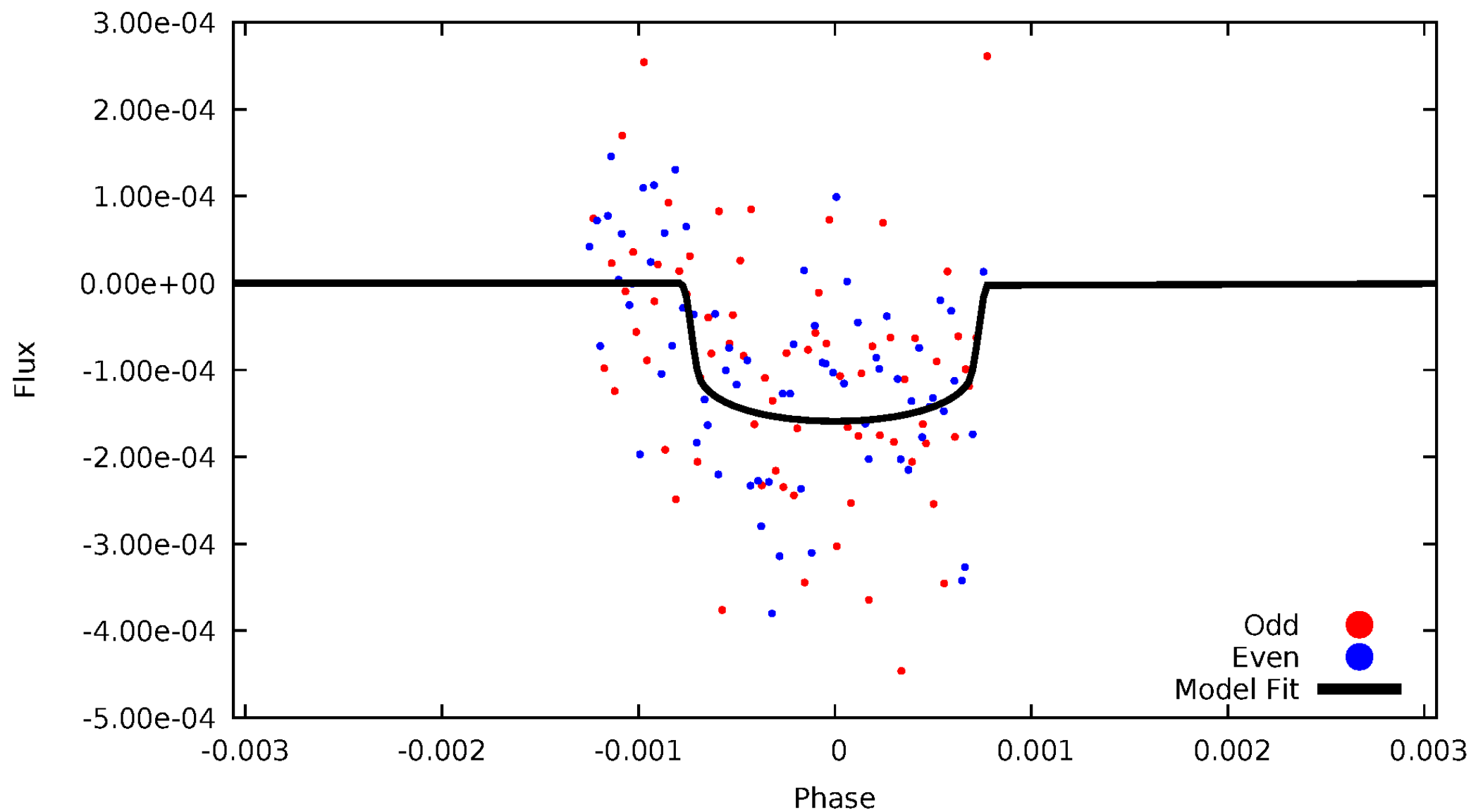


TCE 002014991-09



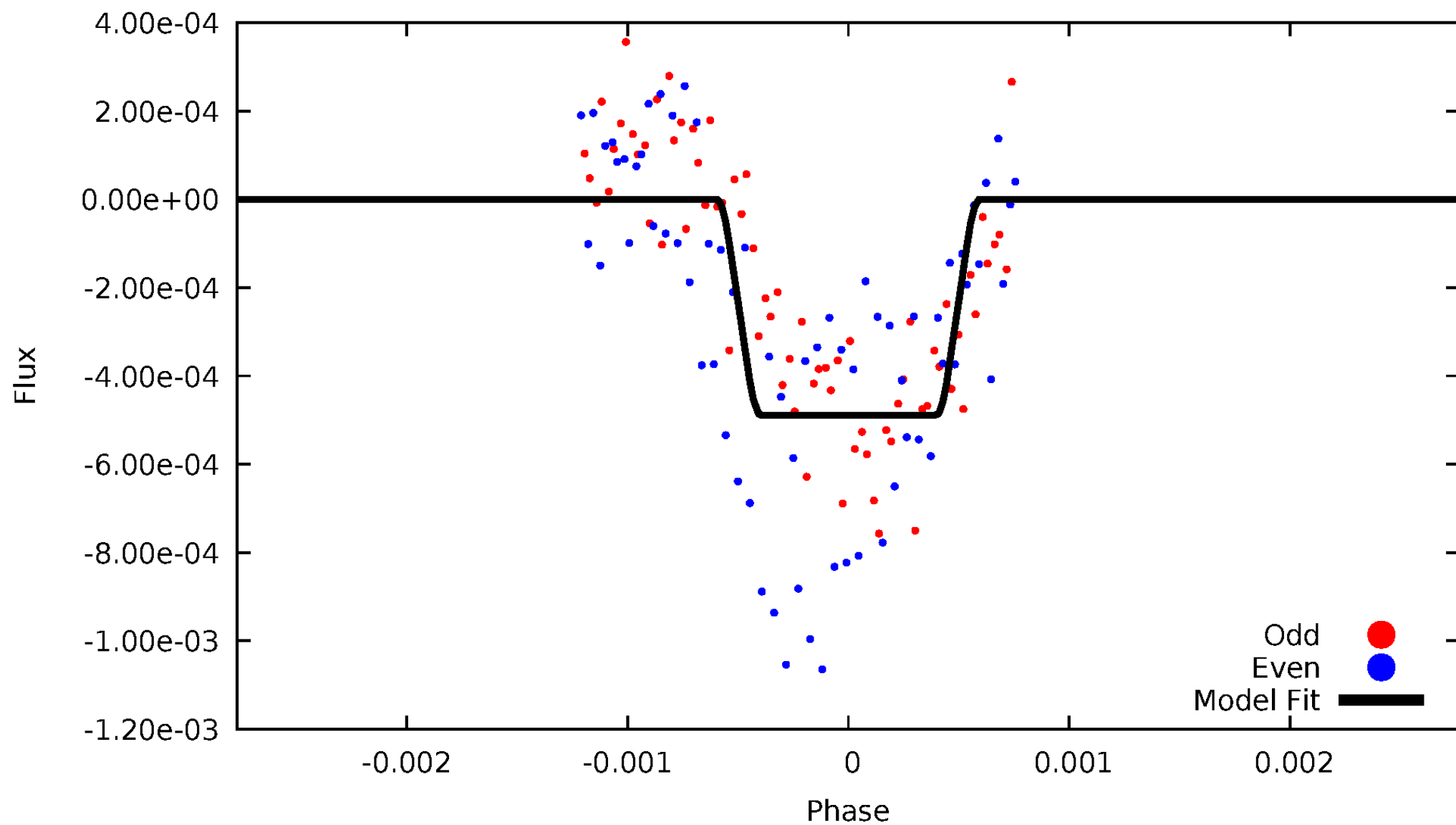
DV Odd/Even

TCE 002014991-09



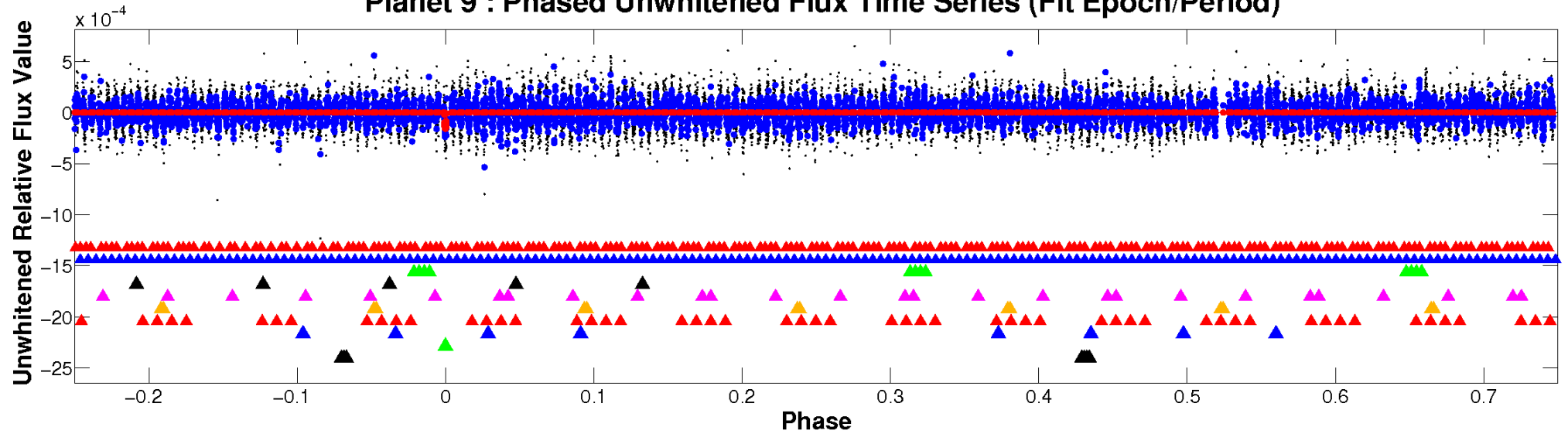
ALT Odd/Even

TCE 002014991-09

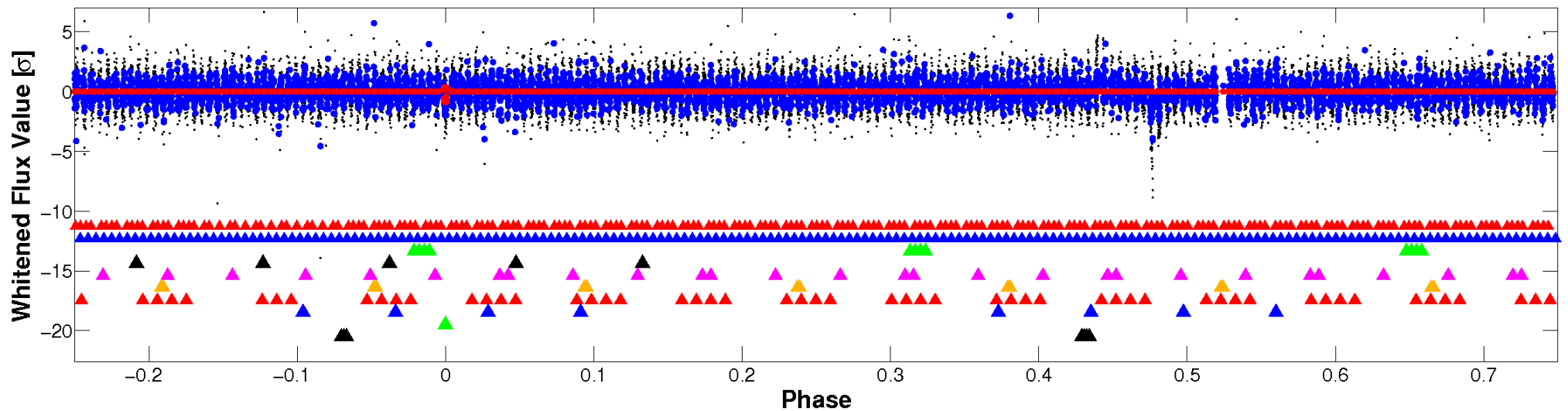


Non-Whitened Vs. Whitened Light Curve

Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

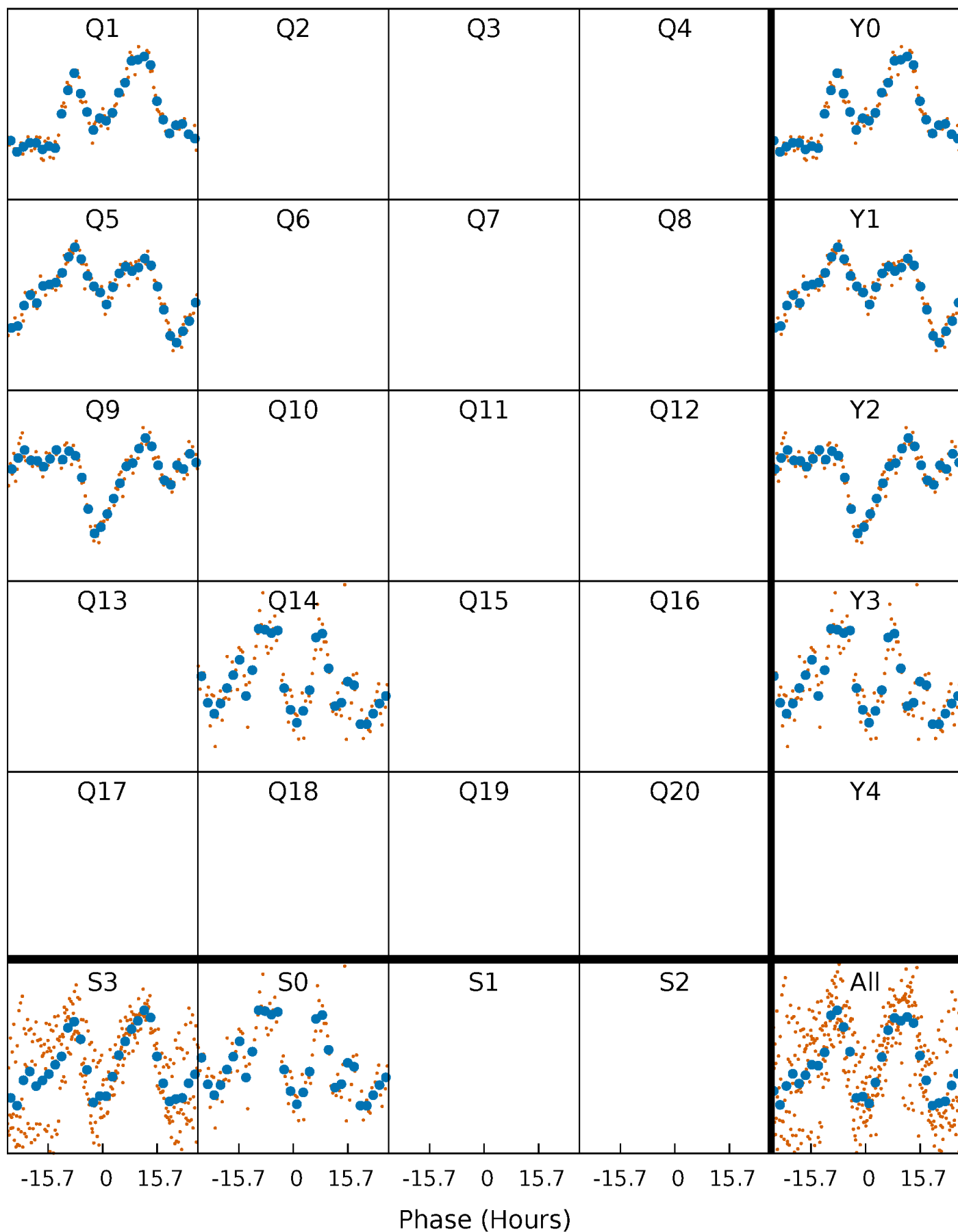


Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



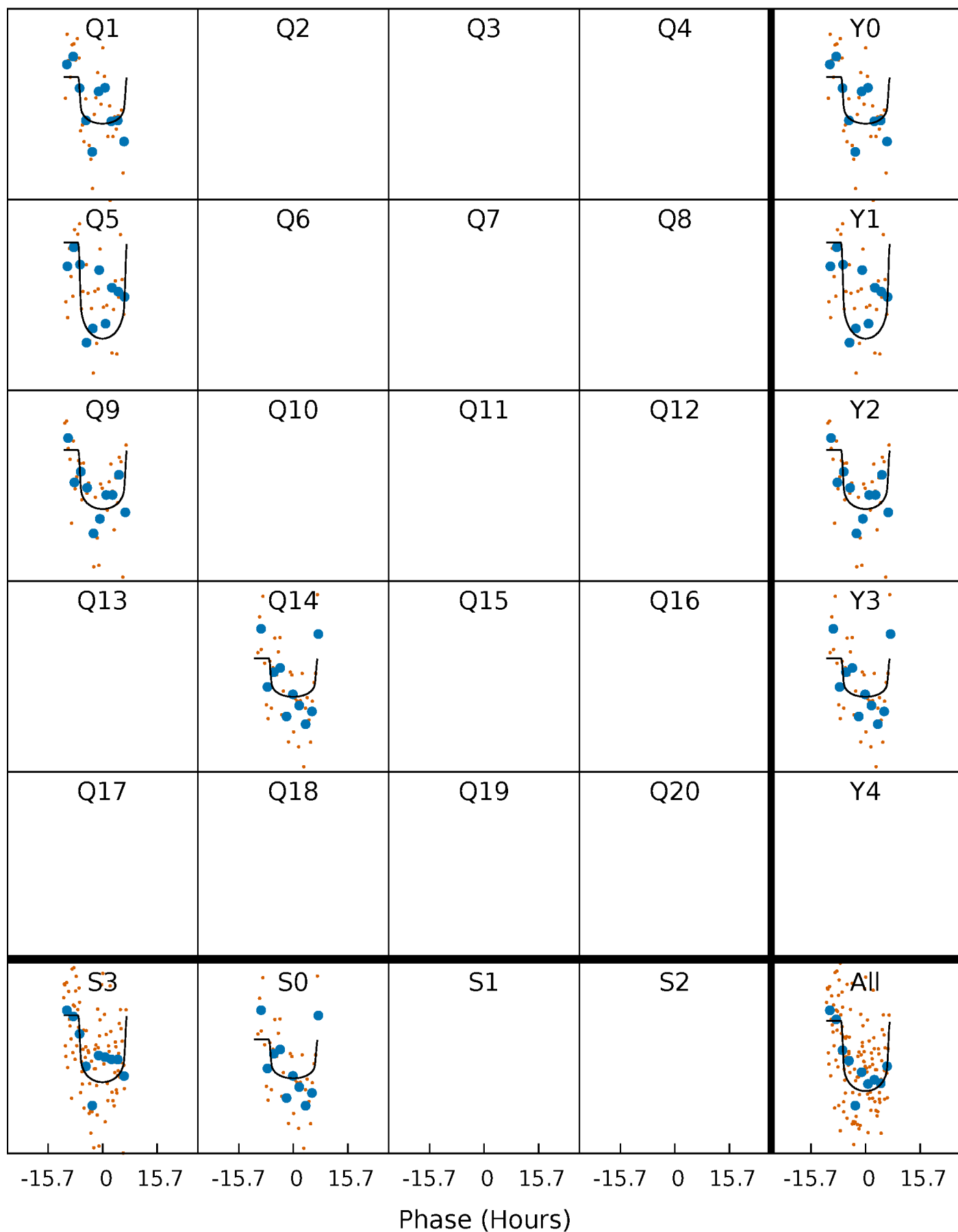
PDC Quarter-Phased Transit Curves

TCE 002014991-09 $P=374.172977$ Days $T_0=155.459111$ (BKJD)



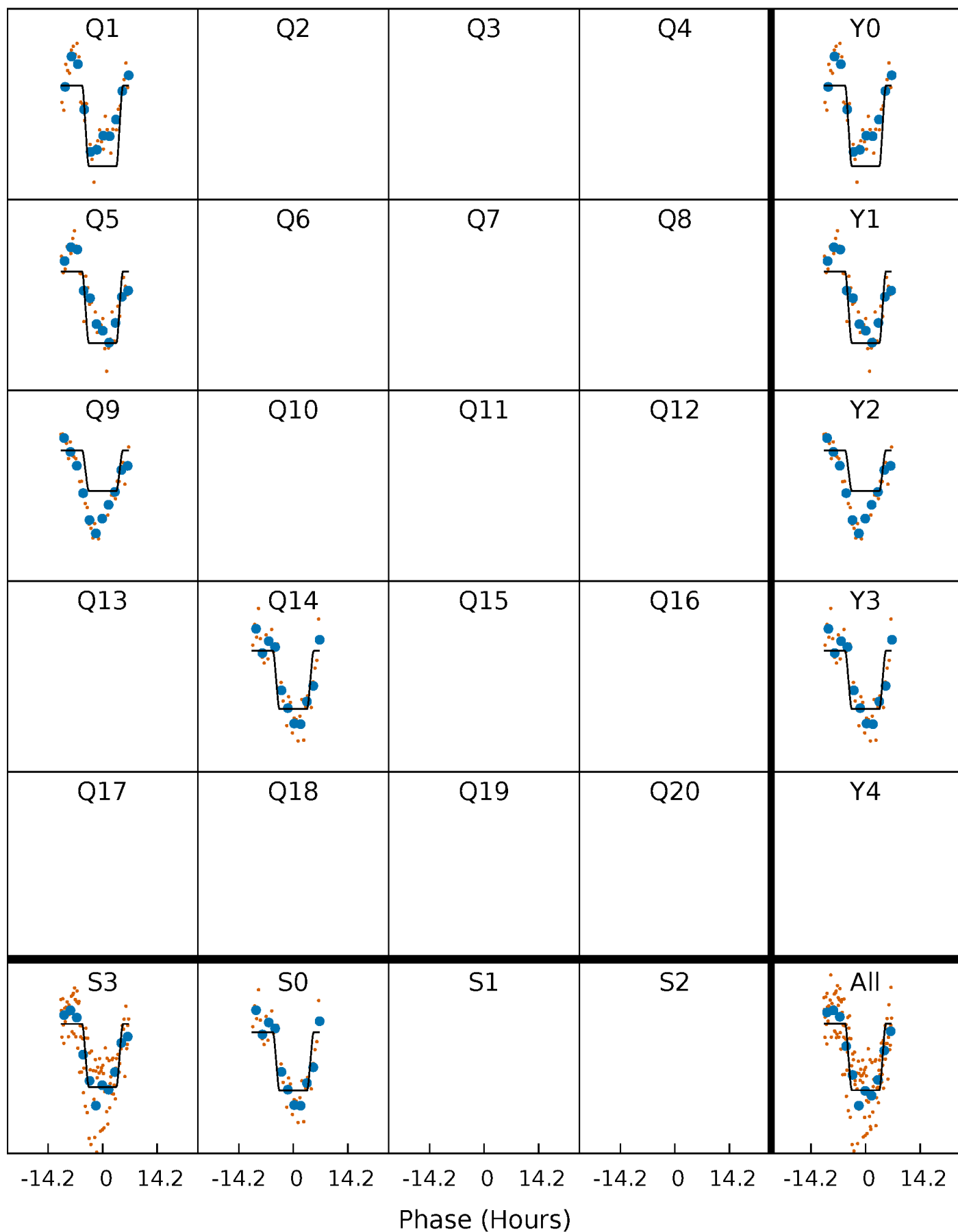
DV Quarter-Phased Transit Curves

TCE 002014991-09 P=374.172977 Days $T_0=155.459111$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

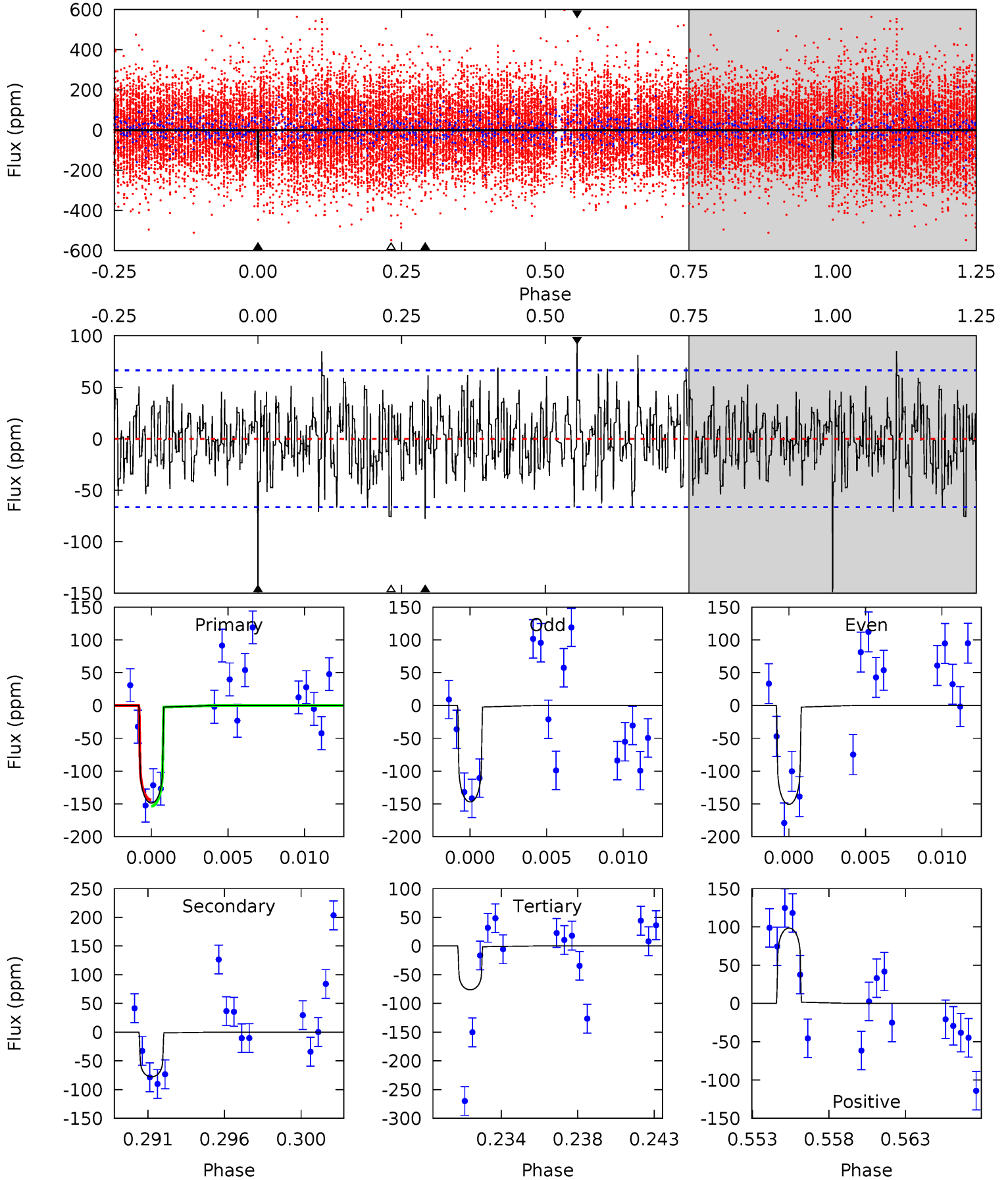
TCE 002014991-09 P=374.186162 Days $T_0=155.432734$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-09, P = 374.172977 Days, E = 155.459111 Days

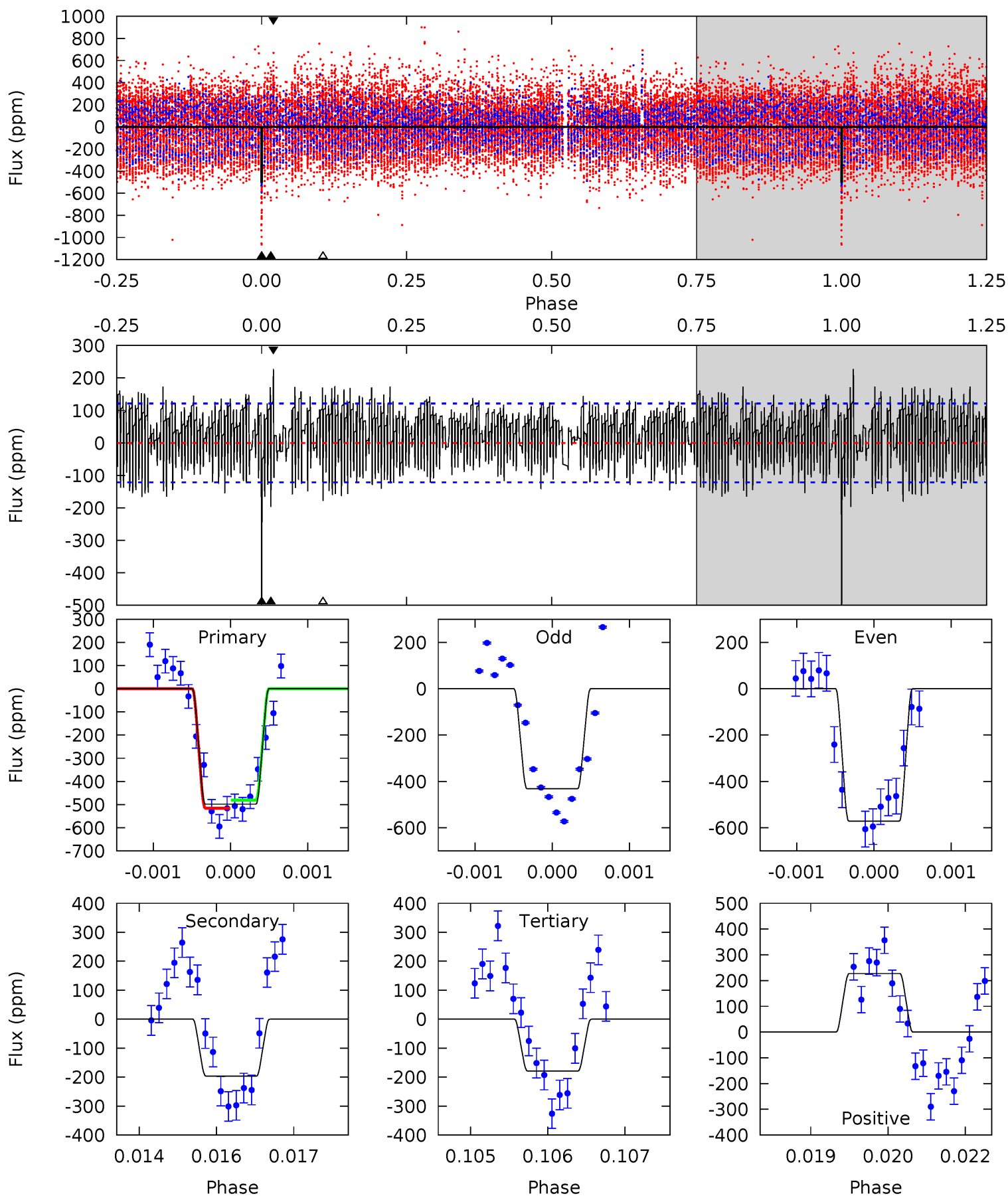
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	6.05	5.93	7.66	5.17	2.82	2.05	5.65	3.92	0.13	-1.61	0.14	0.99	0.40	0.36



Alt Model-Shift Uniqueness Test

002014991-09, P = 374.186162 Days, E = 155.432734 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.3	8.78	7.99	10.2	5.42	3.24	3.31	14.3	12.1	0.80	-1.37	3.12	1.15	0.31	0.78



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-78 ± 13	$4.07^{+0.99}_{-0.97}$	625^{+36}_{-57}	5348^{+619}_{-471}	3599^{+2761}_{-1371}
Alt.	-197 ± 22	$6.94^{+1.34}_{-1.48}$	623^{+36}_{-61}	5177^{+360}_{-319}	3128^{+1846}_{-937}

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 $A_{obs} \gg 1.0$

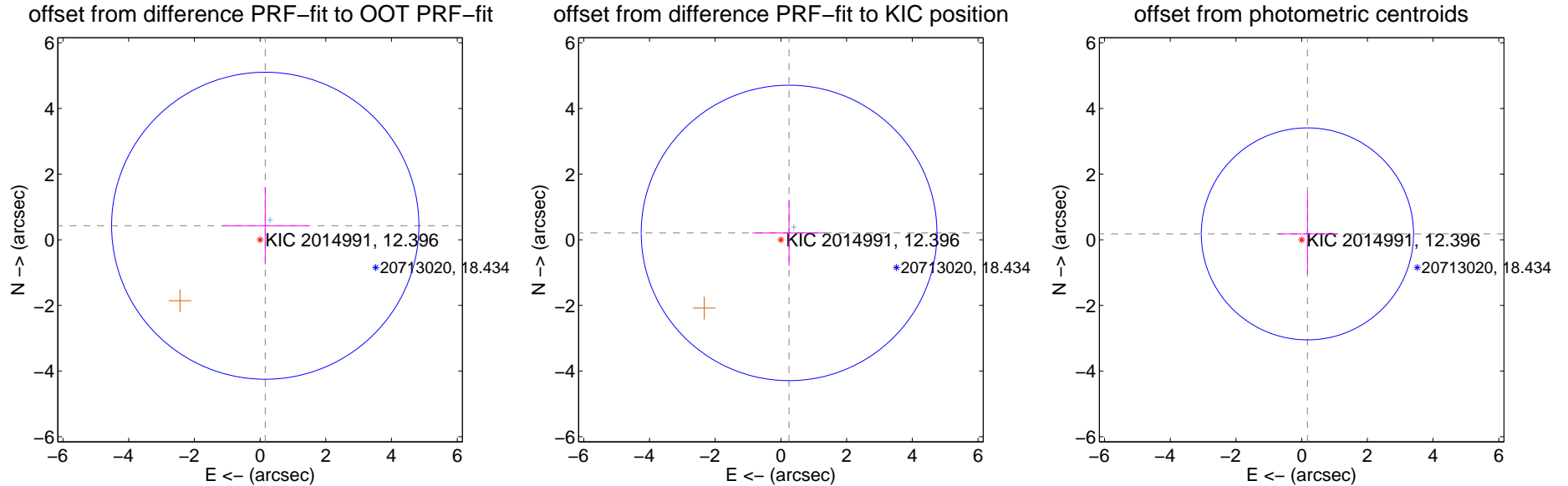
DV Centroid Data

Supplemental centroid analysis for 002014991-09. Kepler magnitude: 12.40. Transit SNR 8.46

There are 1 quarters with good PRF difference image offsets

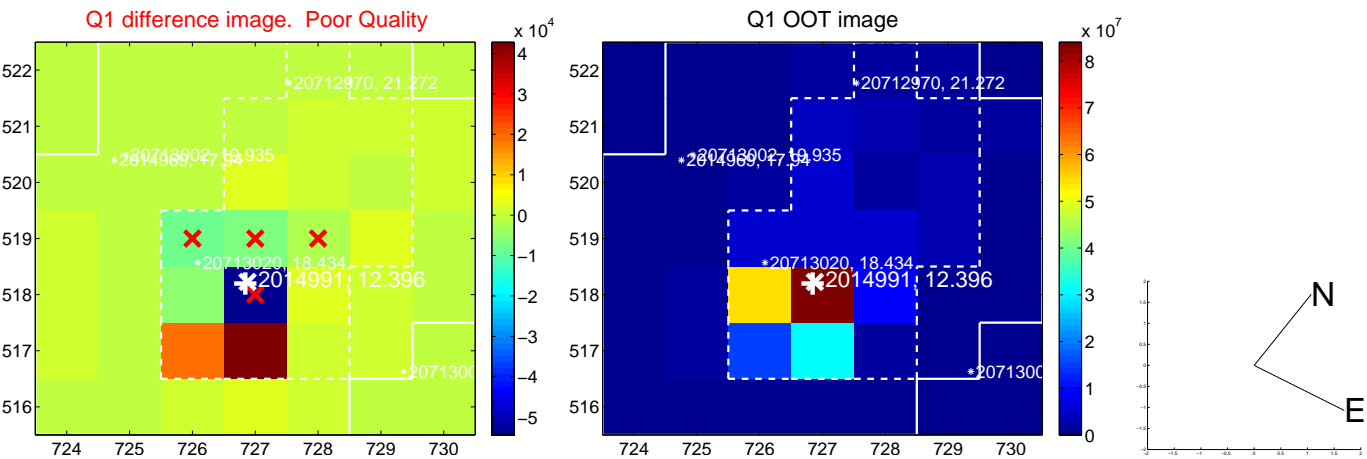
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.454 ± 1.559	0.29	-0.157 ± 1.313	0.426 ± 1.179
PRF-fit source offset from KIC position	0.324 ± 1.500	0.22	-0.249 ± 1.115	0.208 ± 1.008
photometric centroid source offset	0.25 ± 1.08	0.23	-0.18 ± 0.90	0.18 ± 1.22

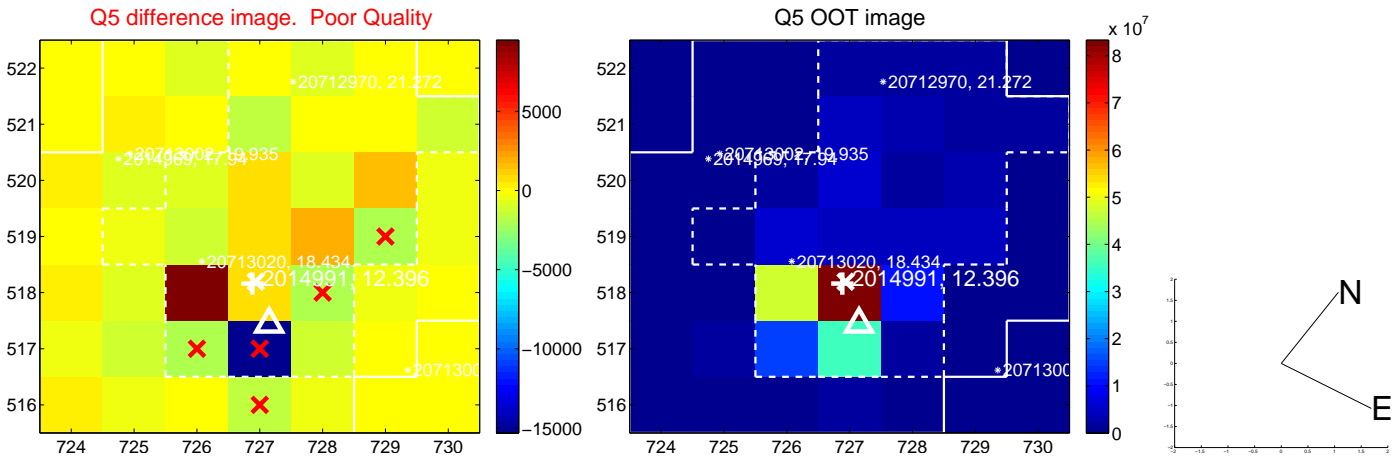


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

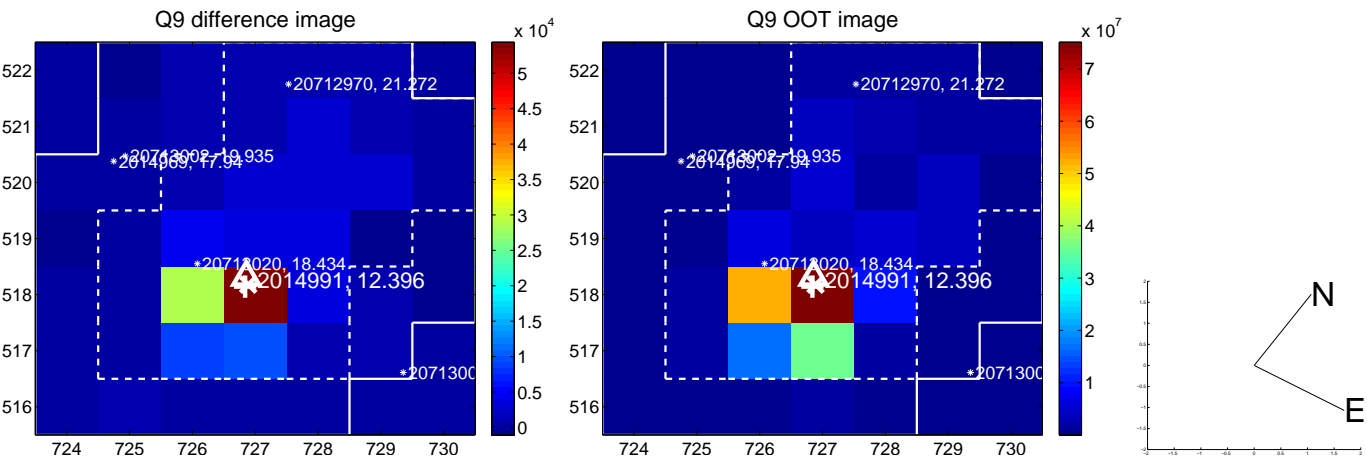
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



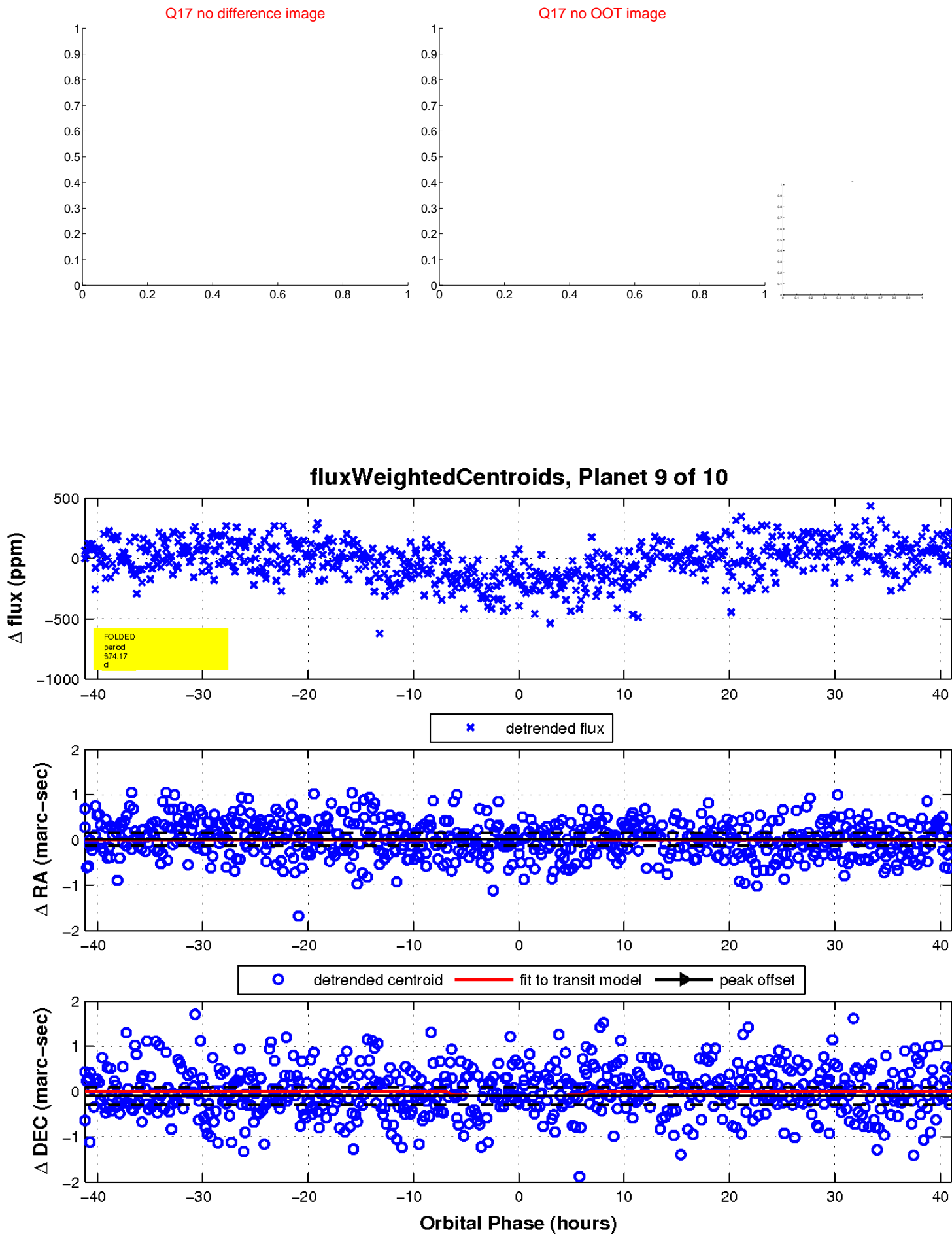
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

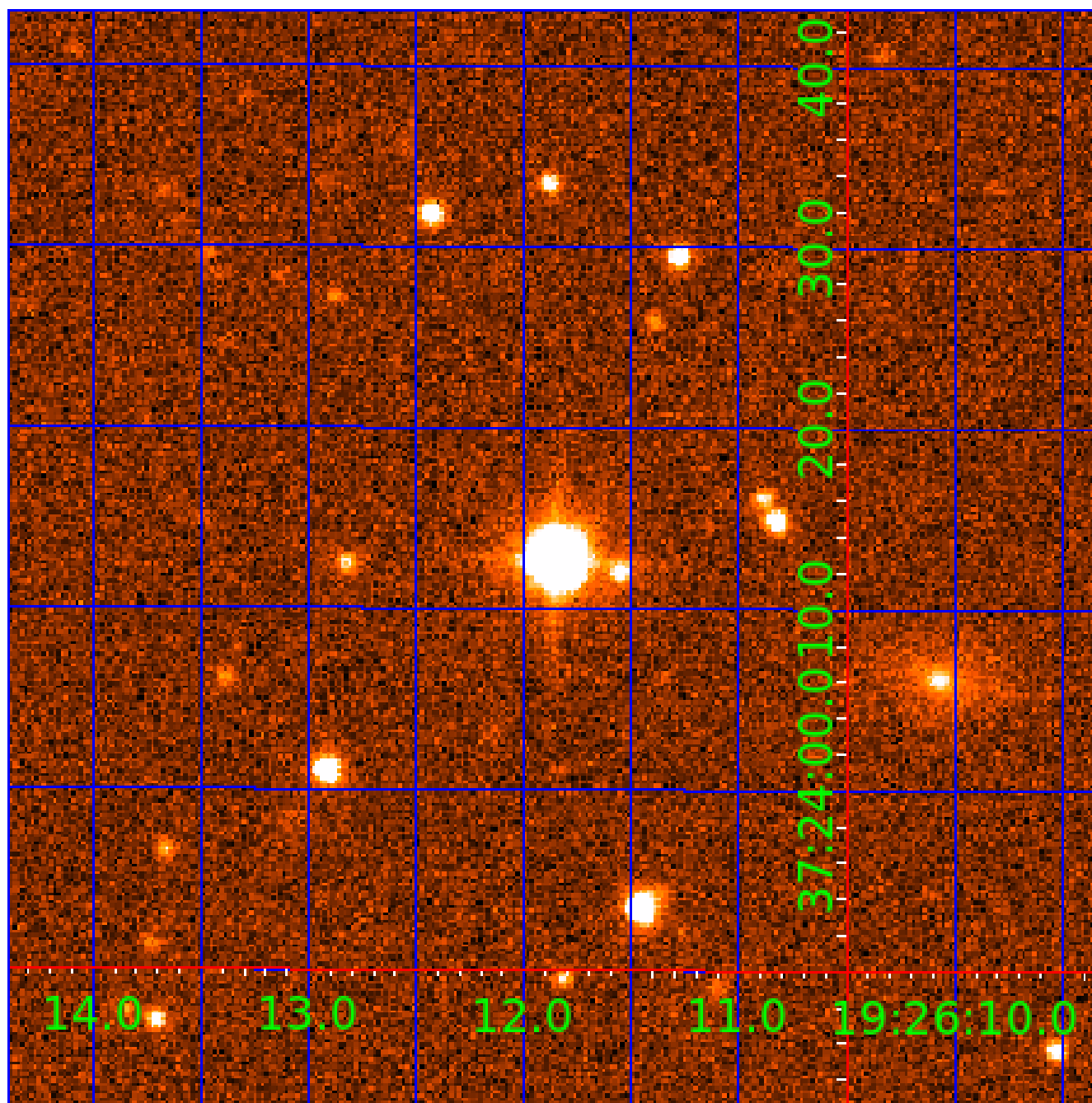


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



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})
002014991-01	OBS	2178.01	6.496797	132.171139	130.4	2.548	20.8	22.9	3.05	6418	4.00	2278.59
002014991-02	OBS	No	1.979831	132.575846	3.9	9.723	8.0	1.6	3.05	6418	0.70	11111.19
002014991-03	OBS	No	125.158456	147.517921	252.2	16.831	10.7	9.6	3.05	6418	6.27	44.12
002014991-04	OBS	No	342.260199	205.162607	269.9	3.795	9.3	9.0	3.05	6418	5.42	11.54
002014991-05	OBS	No	51.120756	169.148492	210.5	1.790	8.1	7.6	3.05	6418	5.30	145.59
002014991-06	OBS	No	106.816505	138.020084	160.9	5.480	8.1	7.7	3.05	6418	4.26	54.50
002014991-07	OBS	No	26.464589	146.688446	88.2	9.263	8.3	8.2	3.05	6418	3.08	350.25
002014991-08	OBS	No	175.413692	189.562425	164.3	6.160	7.5	6.2	3.05	6418	4.43	28.13
002014991-09	OBS	No	374.172977	155.459111	158.8	13.742	7.9	8.5	3.05	6418	4.31	10.24
002014991-10	OBS	No	186.768572	317.881217	165.3	5.401	7.7	6.9	3.05	6418	4.42	25.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002014991-01	OBS	FP	0.00	0	1	1	0	HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
002014991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
002014991-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
002014991-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002014991-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
002014991-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002014991-08	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
002014991-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002014991-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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 002014991-10

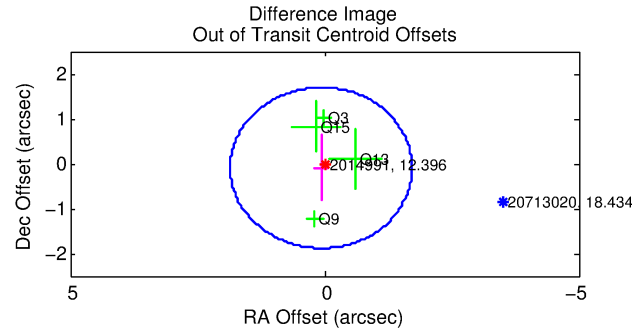
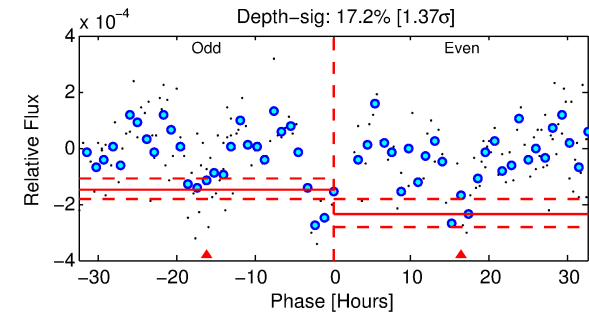
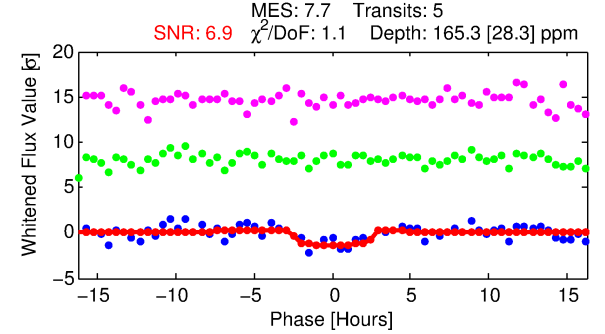
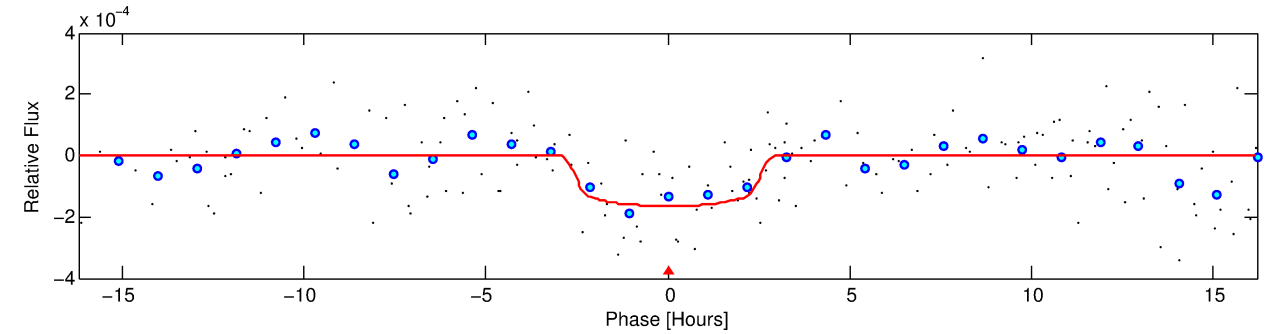
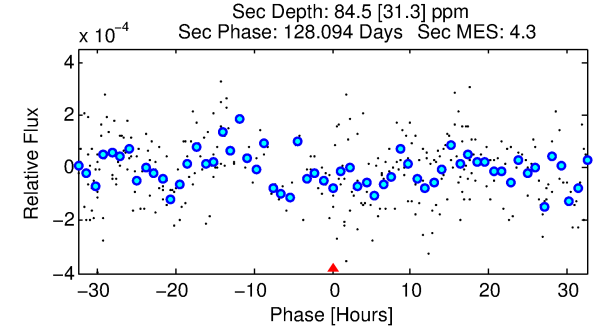
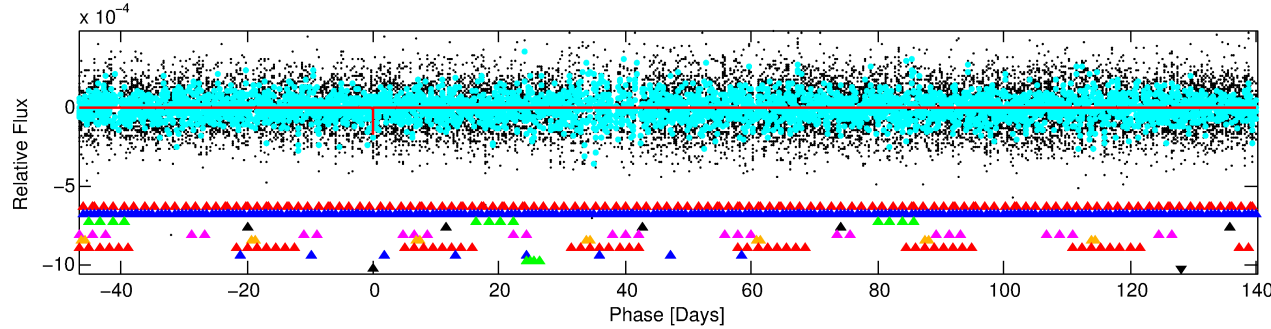
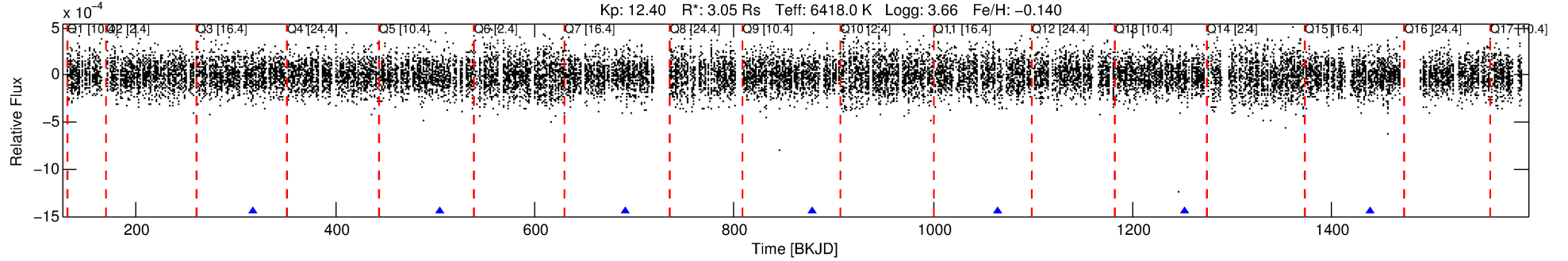
No Significant Match Found

DV One-Page Summary

KIC: 2014991 Candidate: 10 of 10 Period: 186.769 d

KOI: K02178 Corr: No Ephemeris Match

Kp: 12.40 R*: 3.05 Rs Teff: 6418.0 K Logg: 3.66 Fe/H: -0.140



DV Fit Results:

Period = 186.76857 [0.00304] d
Epoch = 317.8812 [0.0124] BKJD
Rp/R* = 0.0133 [0.0074]
a/R* = 147.33 [447.86]
b = 0.85 [1.03]
Seff = 25.87 [13.91]
Teq = 575 [77] K
Rp = 4.42 [2.94] Re
a = 0.7390 [0.2493] AU
Ag = 1297.56 [1666.01] [0.78σ]
Teff = 5337 [1569] K [3.03σ]

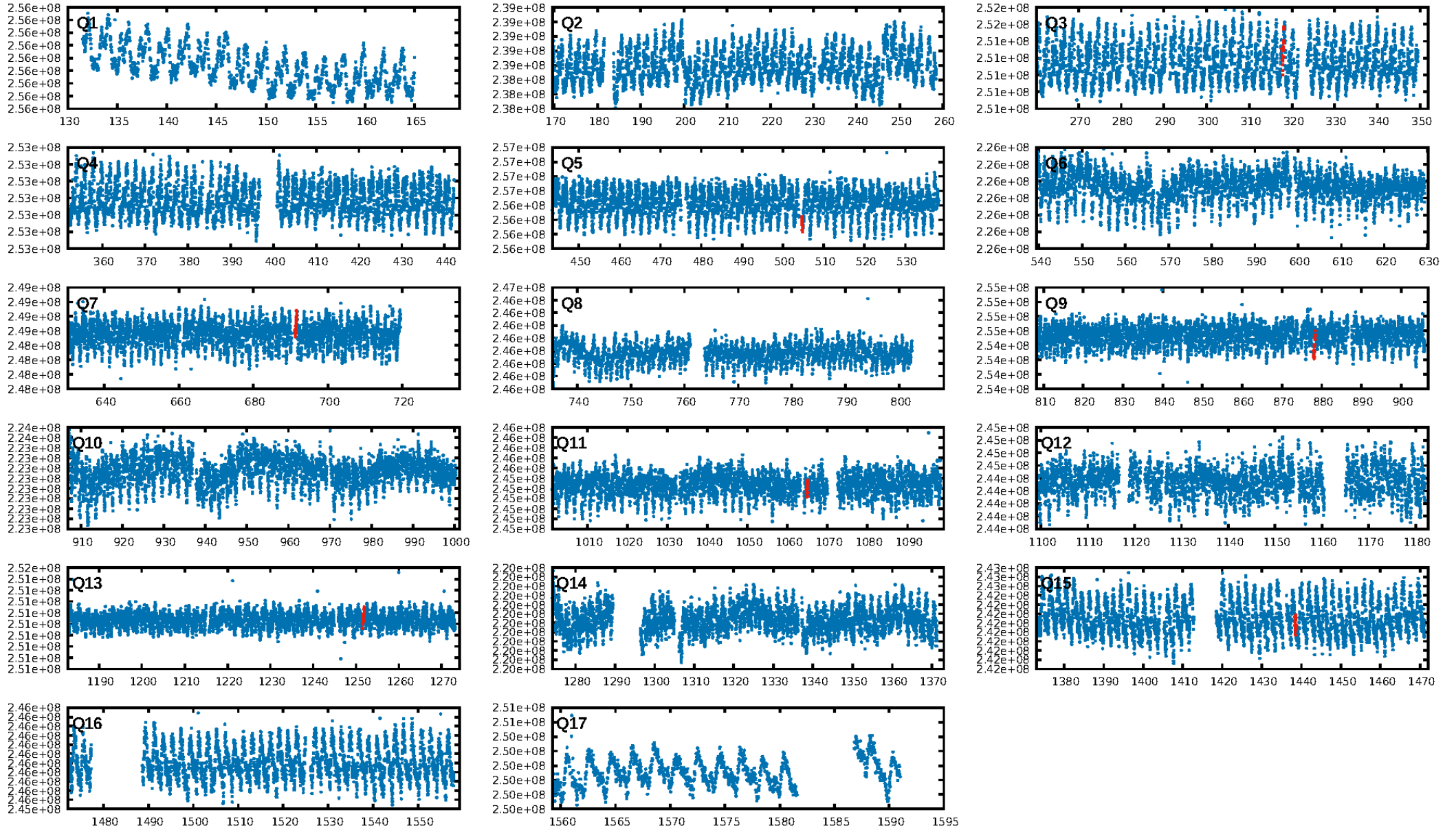
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.26σ]
LongPeriod-sig: 100.0% [565.31σ]
ModelChiSquare2-sig: 50.6%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -9.941
Centroid-sig: 6.5%
Centroid-so: 2.366 arcsec [1.50σ]
OotOffset-rm: 0.115 arcsec [0.19σ]
OotOffset-st: 0/2/0/2 [4]
KicOffset-rm: 0.229 arcsec [0.29σ]
KicOffset-st: 0/2/0/2 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 0.50 [2/4]

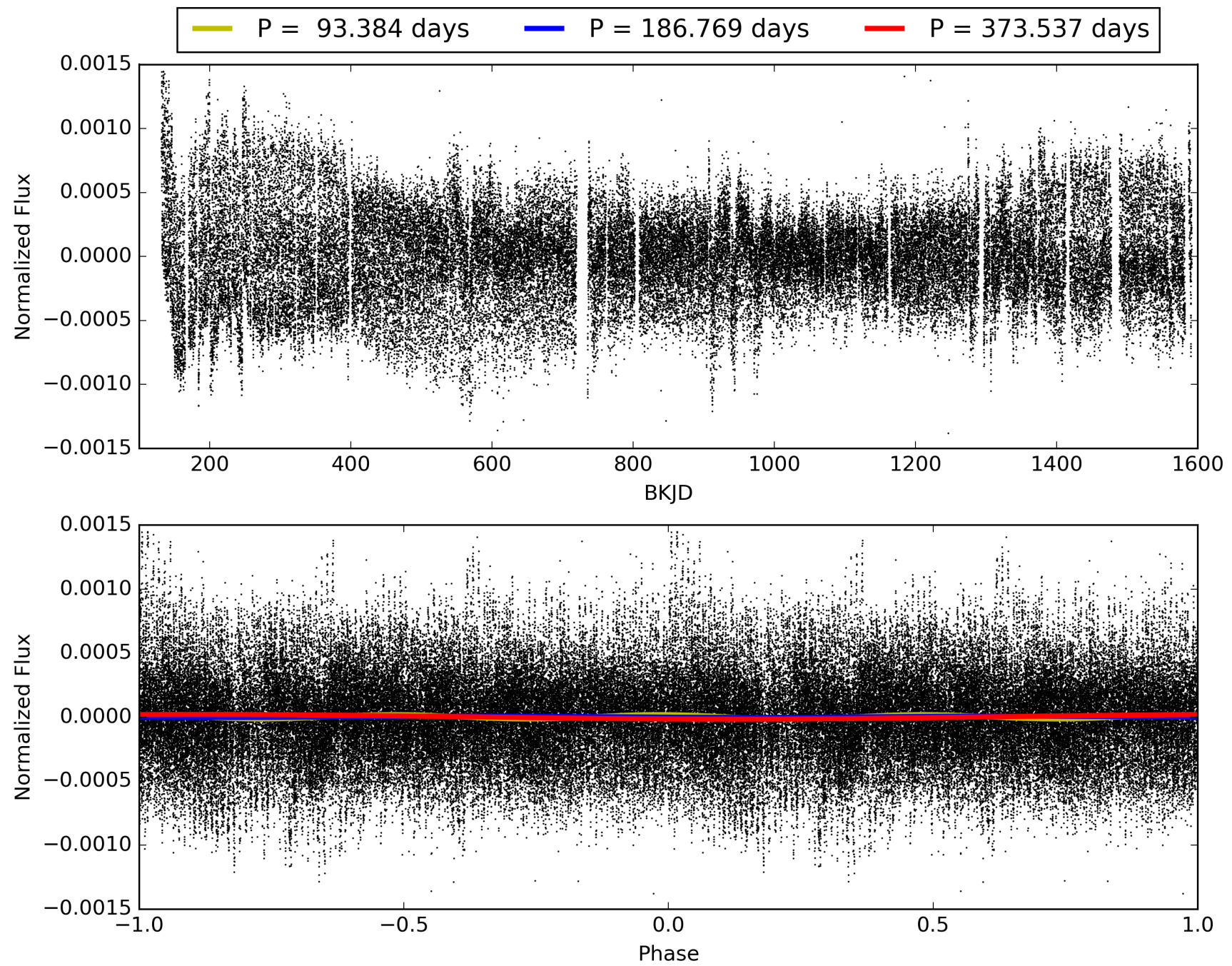
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:53:10 Z

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

TCE 002014991-10, PDC Light Curves

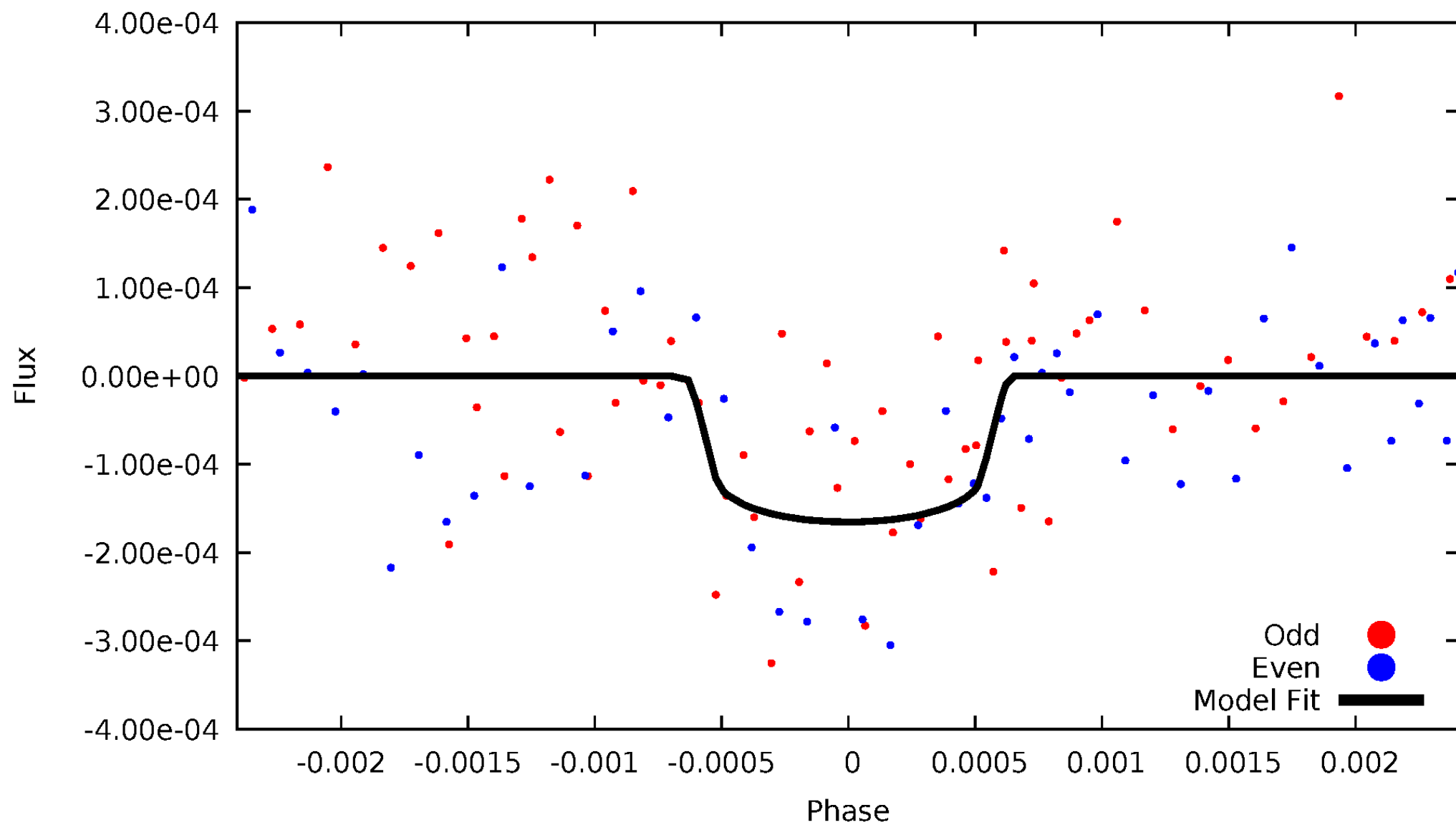


TCE 002014991-10



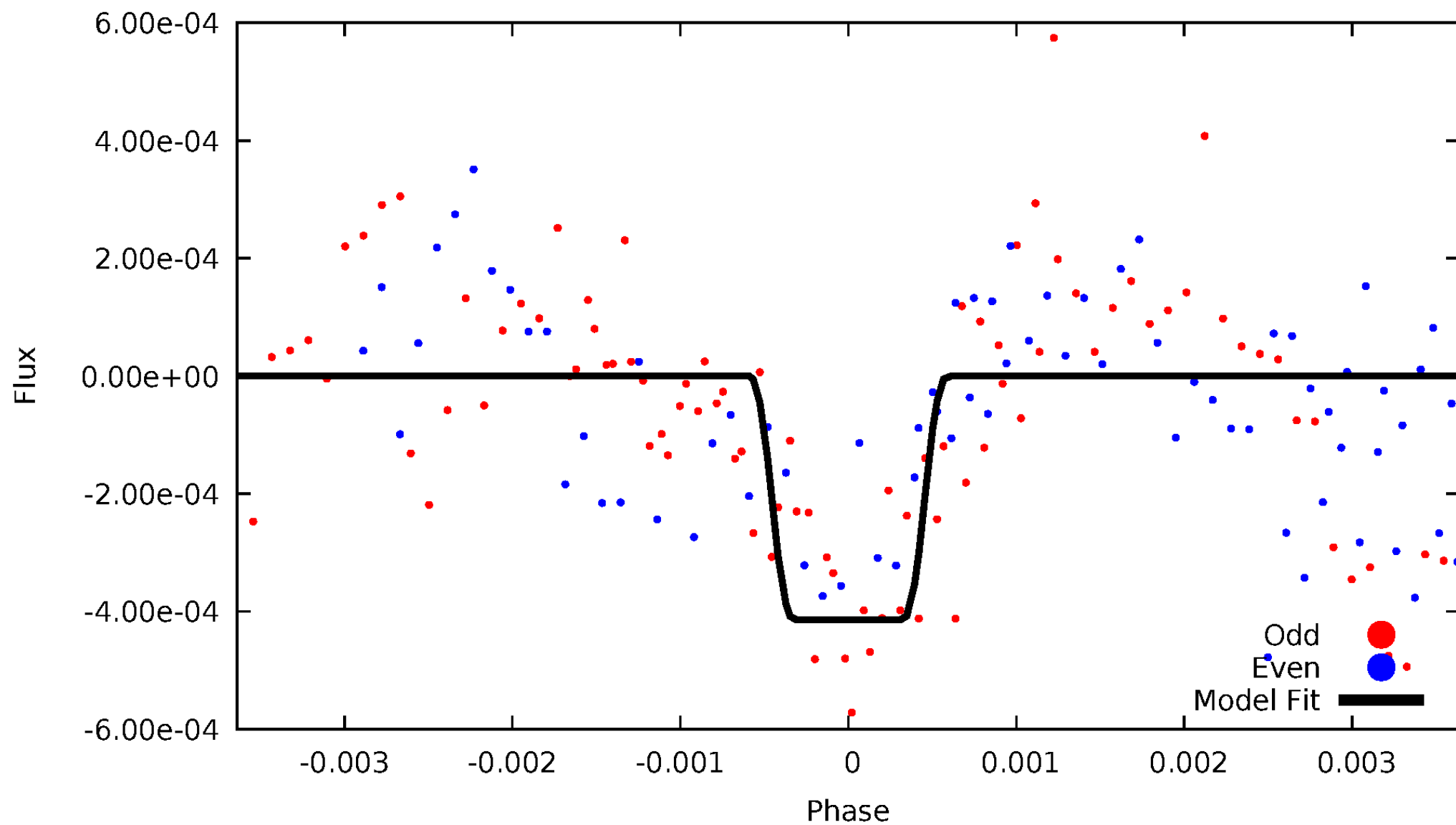
DV Odd/Even

TCE 002014991-10



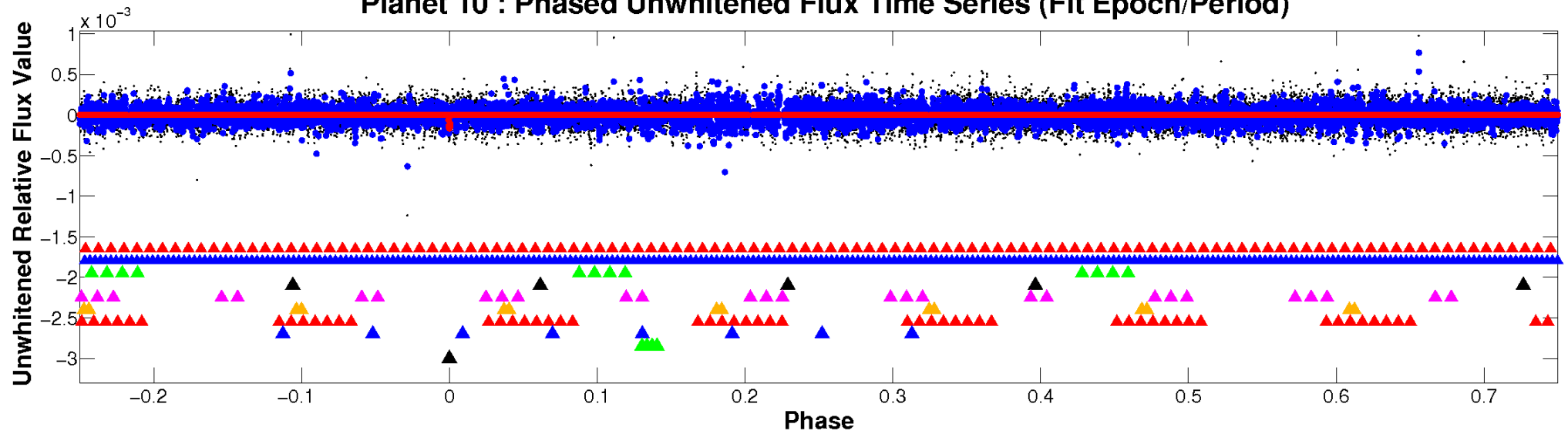
ALT Odd/Even

TCE 002014991-10

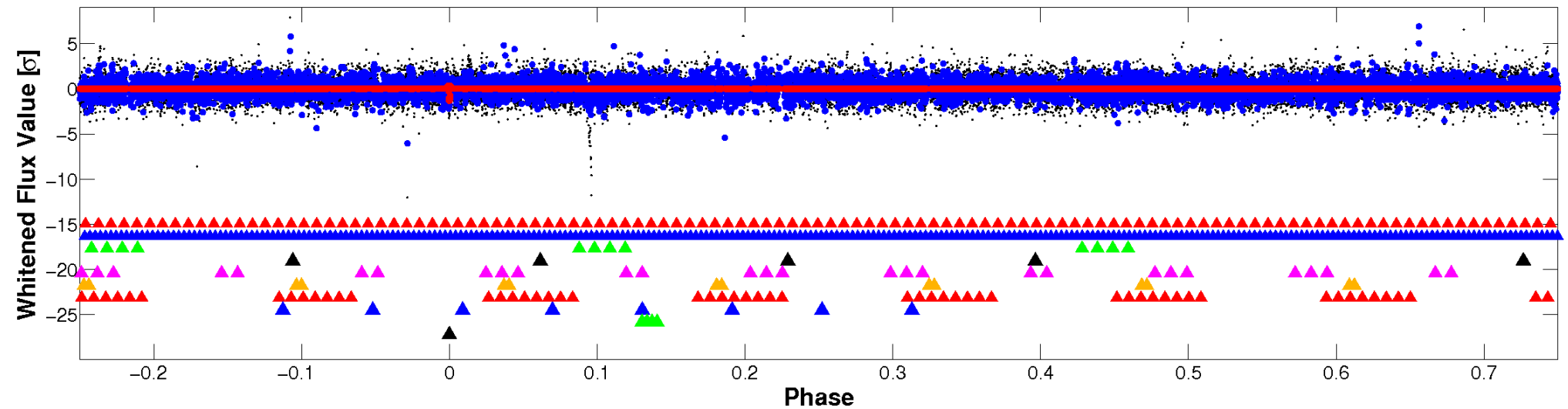


Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

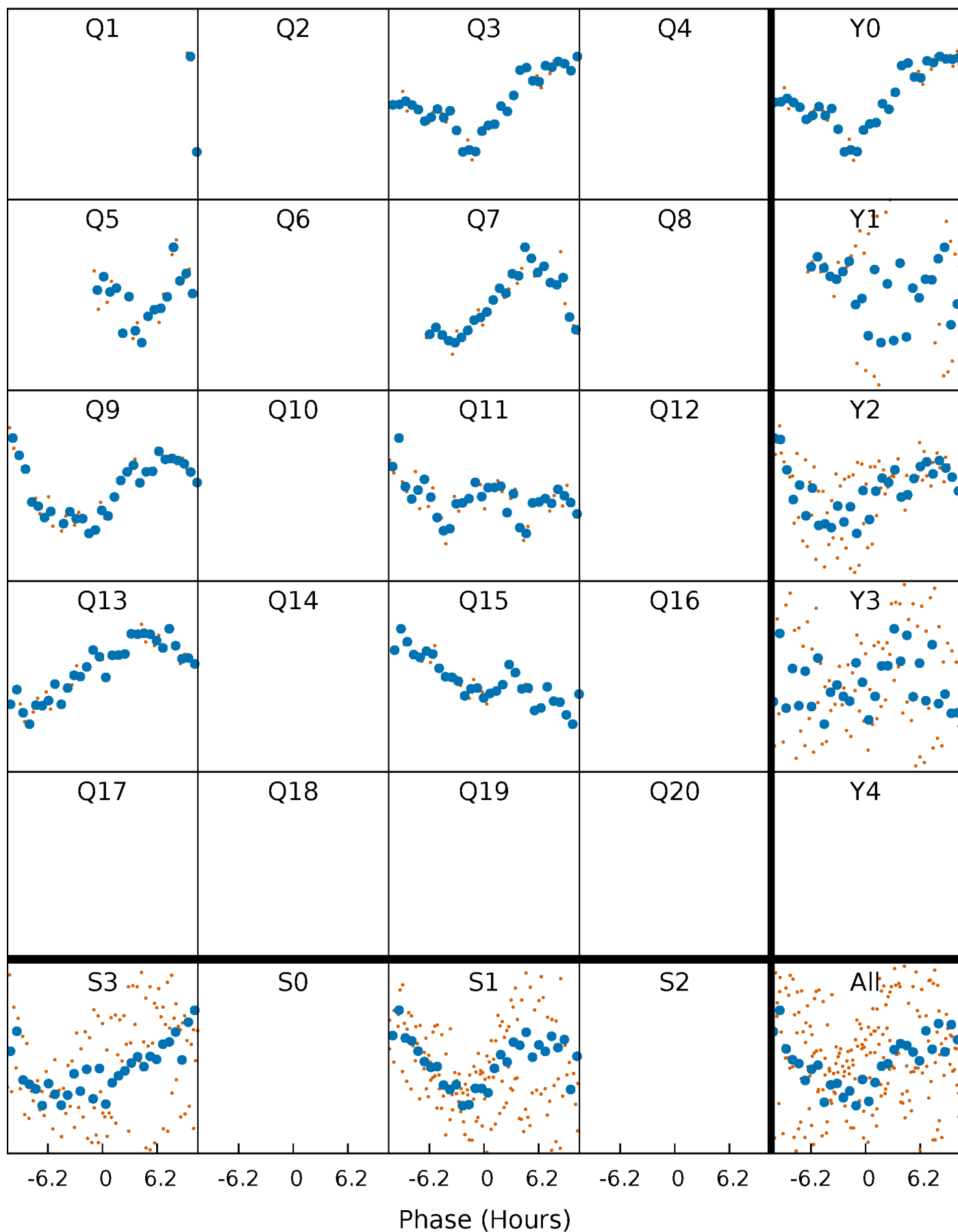


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



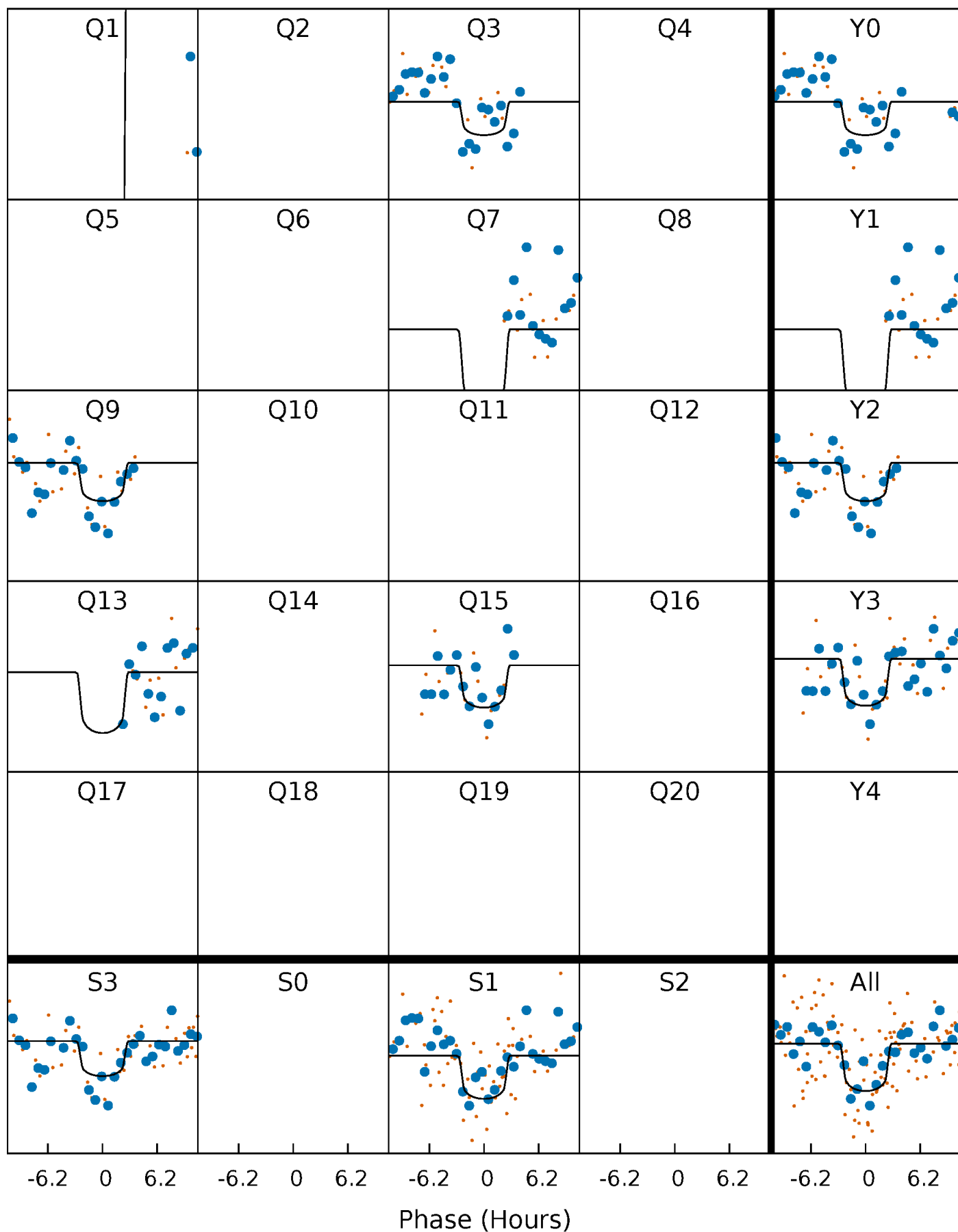
PDC Quarter-Phased Transit Curves

TCE 002014991-10 P=186.768572 Days $T_0=317.881217$ (BKJD)



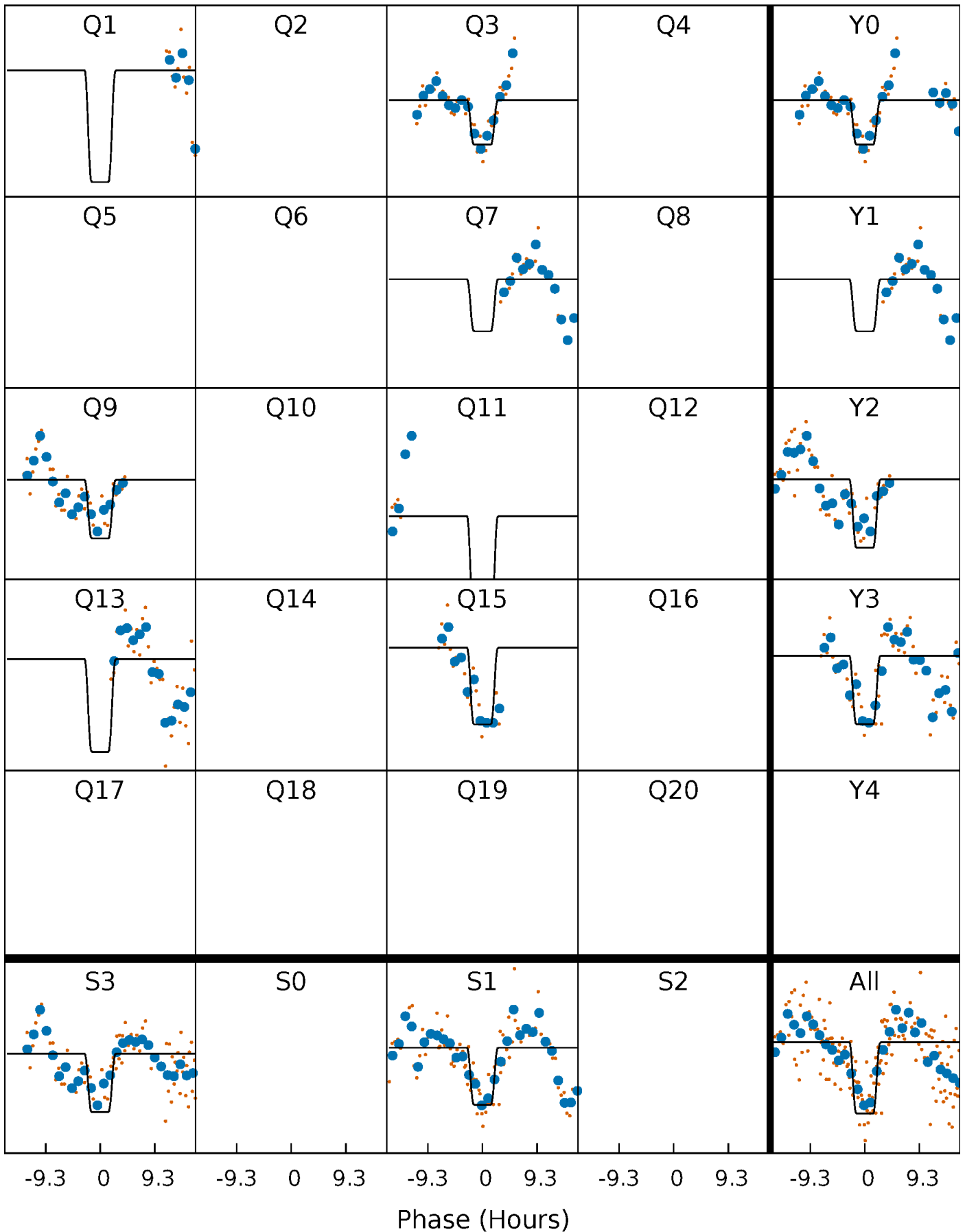
DV Quarter-Phased Transit Curves

TCE 002014991-10 P=186.768572 Days $T_0=317.881217$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

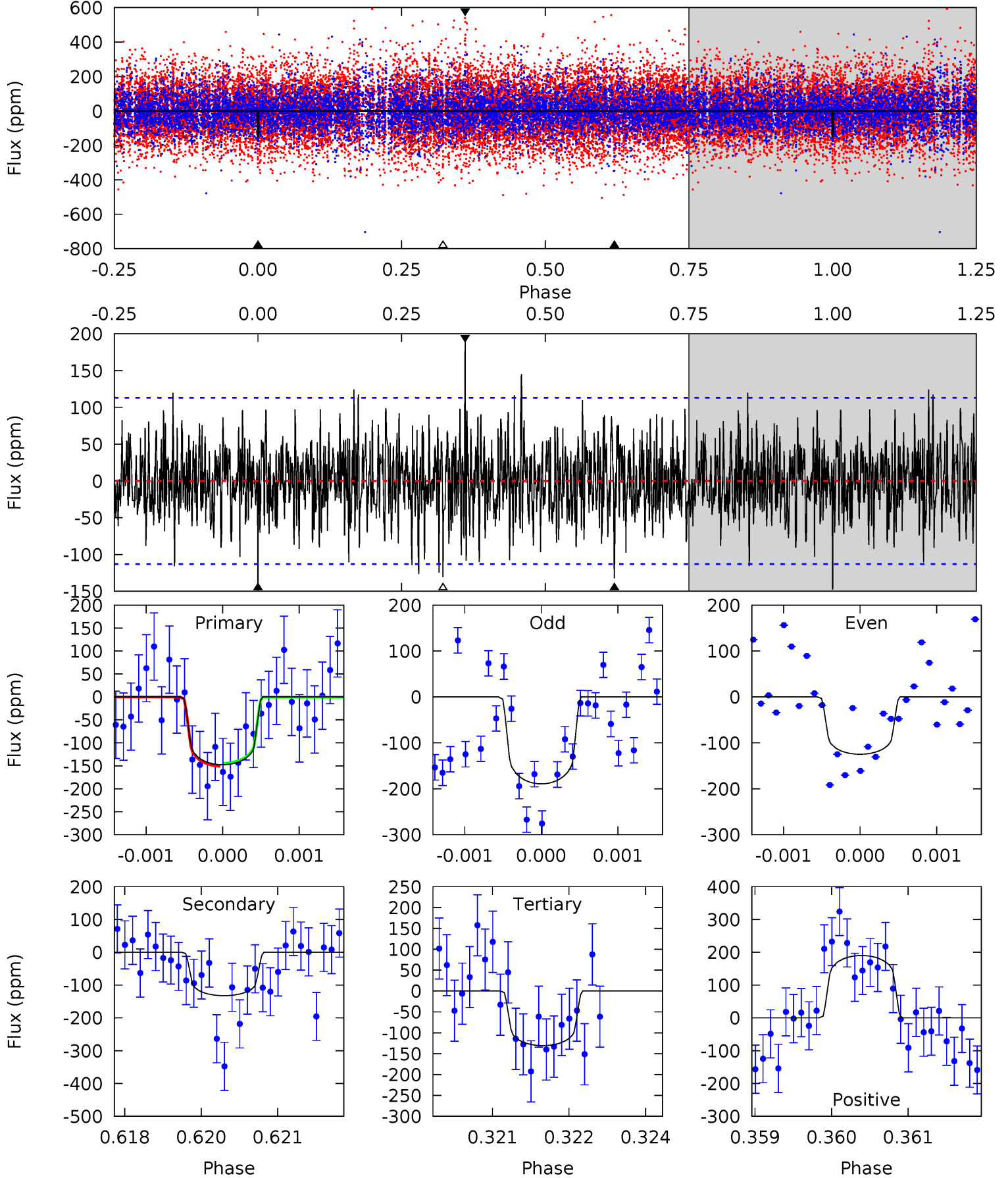
TCE 002014991-10 P=186.781269 Days $T_0=317.820872$ (BKJD)



DV Model-Shift Uniqueness Test

002014991-10, P = 186.768572 Days, E = 131.112645 Days

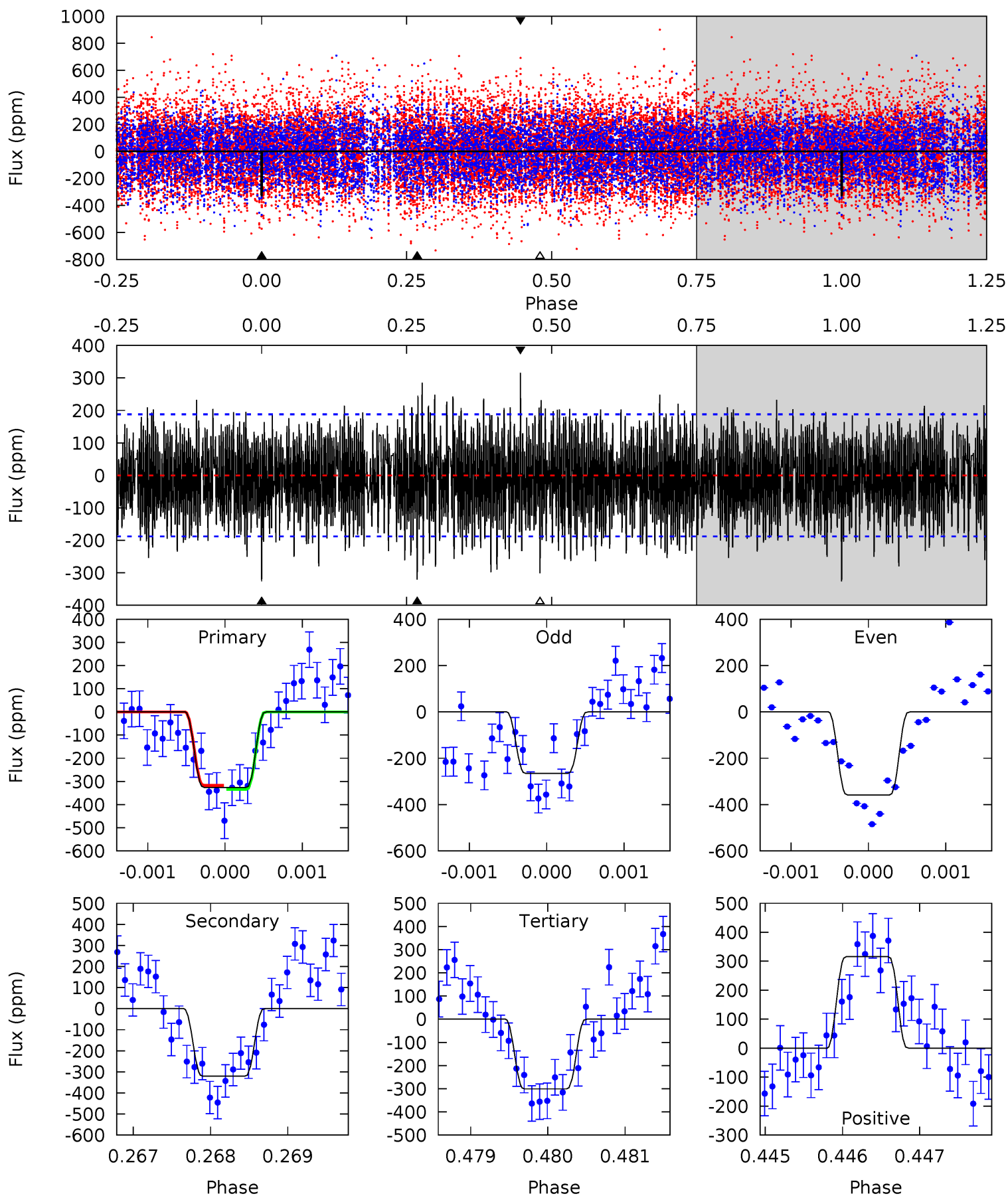
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.06	6.34	6.26	9.09	5.41	3.23	1.87	0.80	-2.03	0.08	-2.76	1.46	0.91	0.56	0.15



Alt Model-Shift Uniqueness Test

002014991-10, P = 186.781269 Days, E = 131.039603 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.41	9.25	8.68	9.11	5.43	3.25	3.22	0.73	0.30	0.57	0.14	1.30	0.89	0.49	0.25



Stellar Parameters For KIC 002014991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6418^{+175}_{-175}	$3.658^{+0.304}_{-0.076}$	$-0.140^{+0.300}_{-0.250}$	$3.049^{+0.477}_{-1.114}$	$1.541^{+0.248}_{-0.303}$	$0.077^{+0.158}_{-0.020}$
	+3%/-3%	+8%/-2%	+214%/-179%	+16%/-37%	+16%/-20%	+206%/-26%
Source	PHO1	FLK73	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 002014991-10 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-132 ± 21	$4.23^{+2.43}_{-2.29}$	783^{+47}_{-65}	5896^{+3160}_{-1057}	2286^{+8129}_{-1365}
Alt.	-321 ± 35	$6.08^{+3.03}_{-2.16}$	785^{+47}_{-69}	6088^{+1548}_{-874}	2612^{+3570}_{-1358}

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

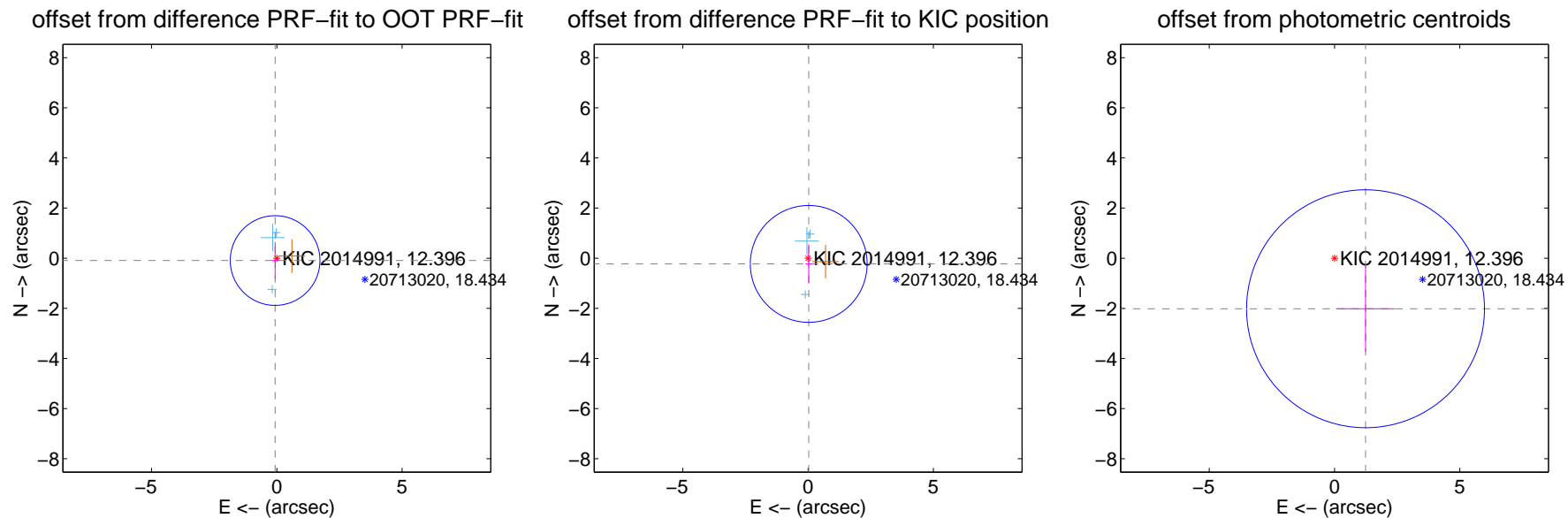
DV Centroid Data

Supplemental centroid analysis for 002014991-10. Kepler magnitude: 12.40. Transit SNR 6.87

There are 3 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.115 ± 0.596	0.19	0.068 ± 0.127	-0.093 ± 0.735
PRF-fit source offset from KIC position	0.229 ± 0.777	0.29	-0.025 ± 0.129	-0.228 ± 0.781
photometric centroid source offset	2.37 ± 1.58	1.50	-1.24 ± 1.18	-2.02 ± 1.71



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.

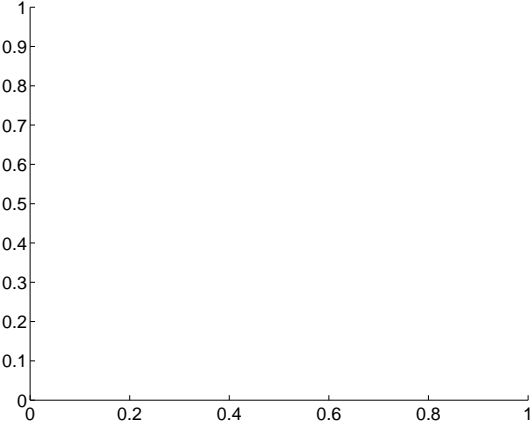
Q1 no difference image



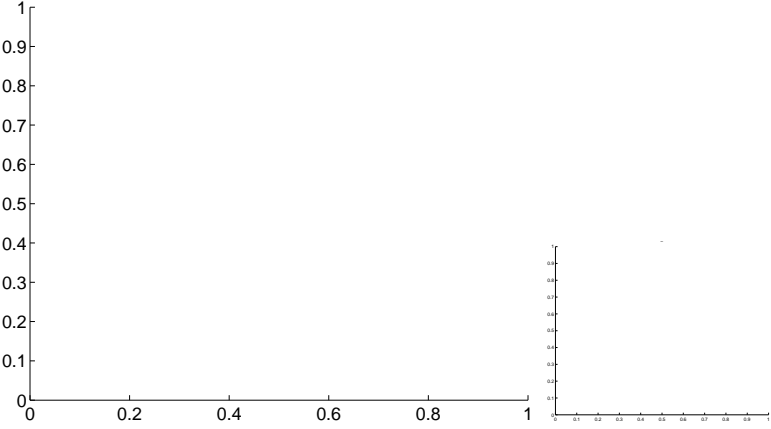
Q1 no OOT image



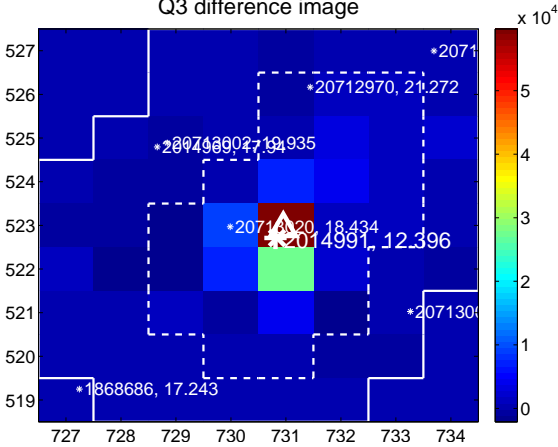
Q2 no difference image



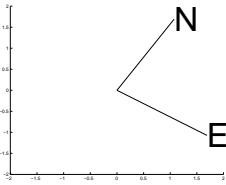
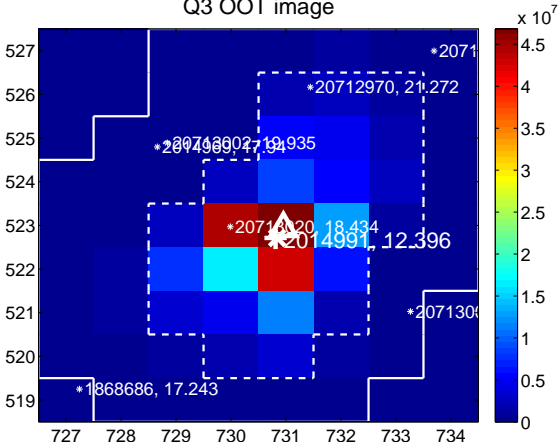
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



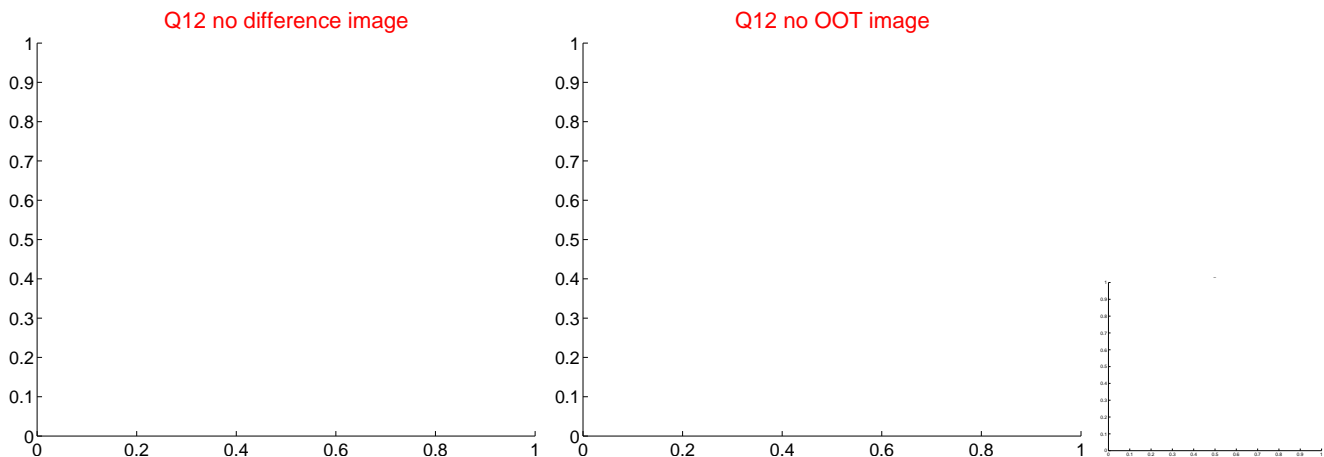
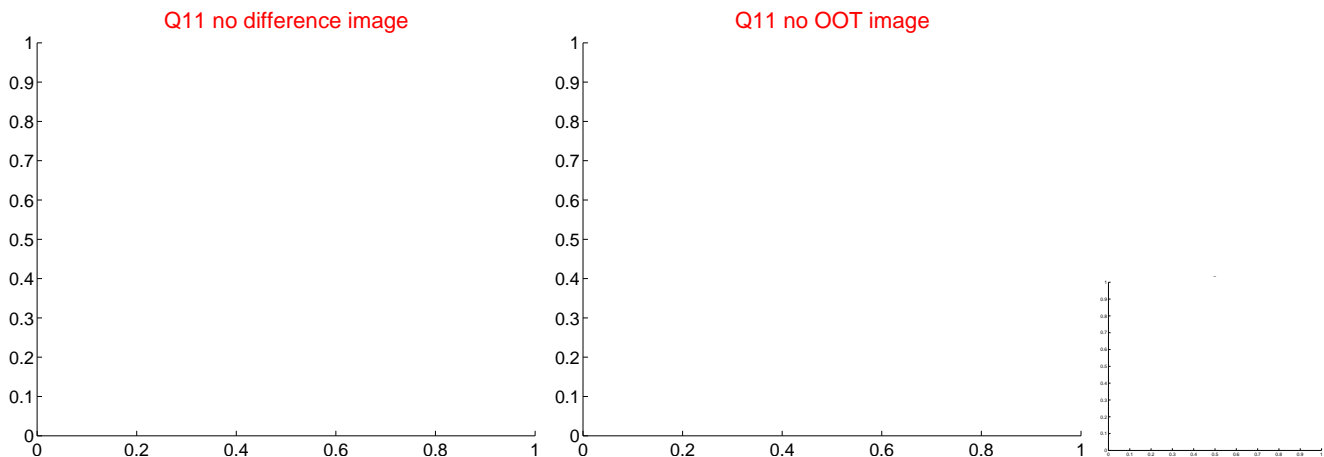
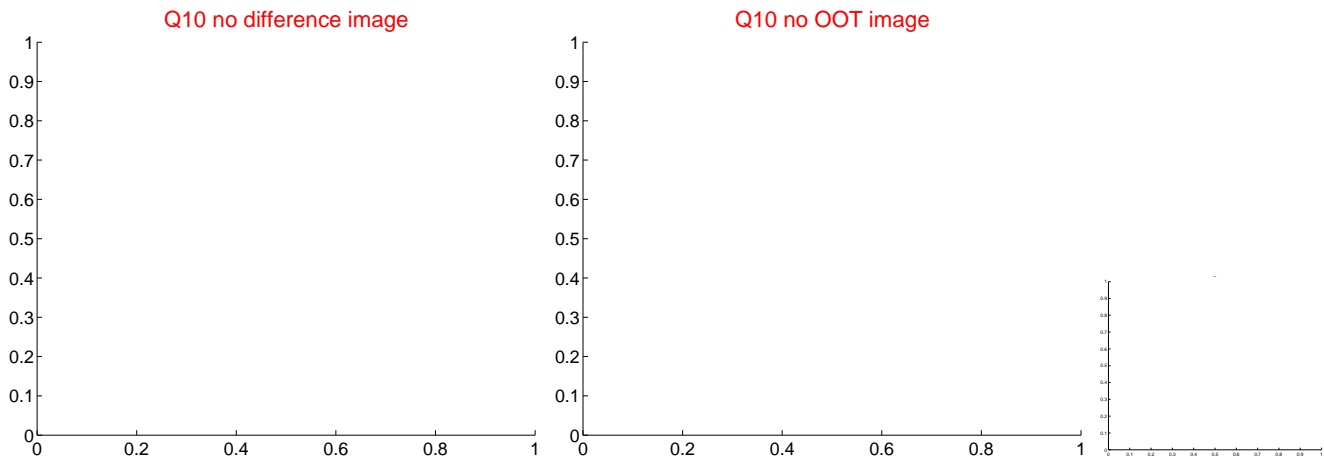
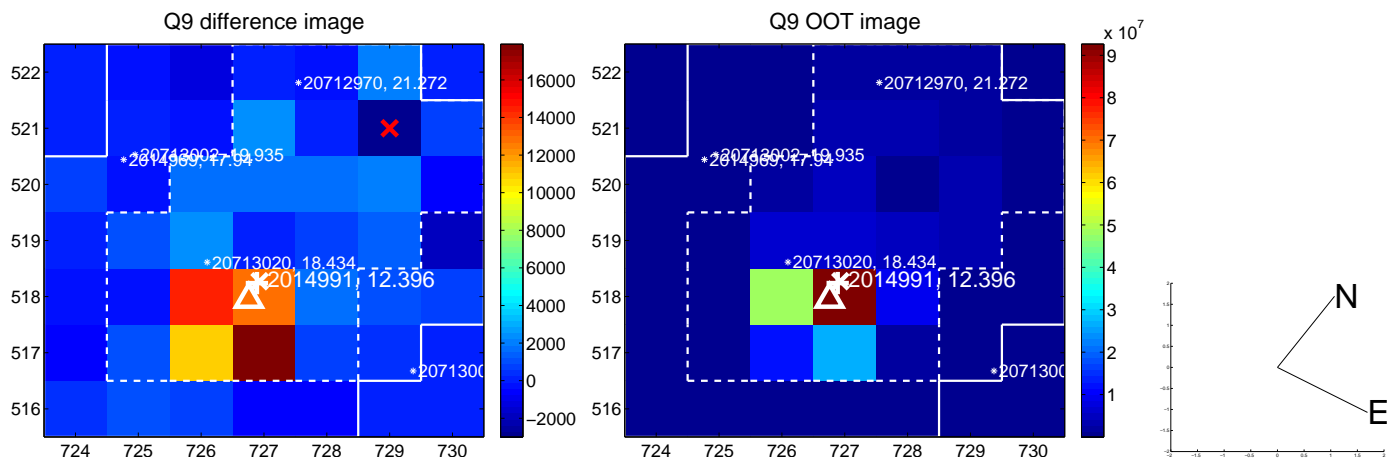
Q4 no OOT image



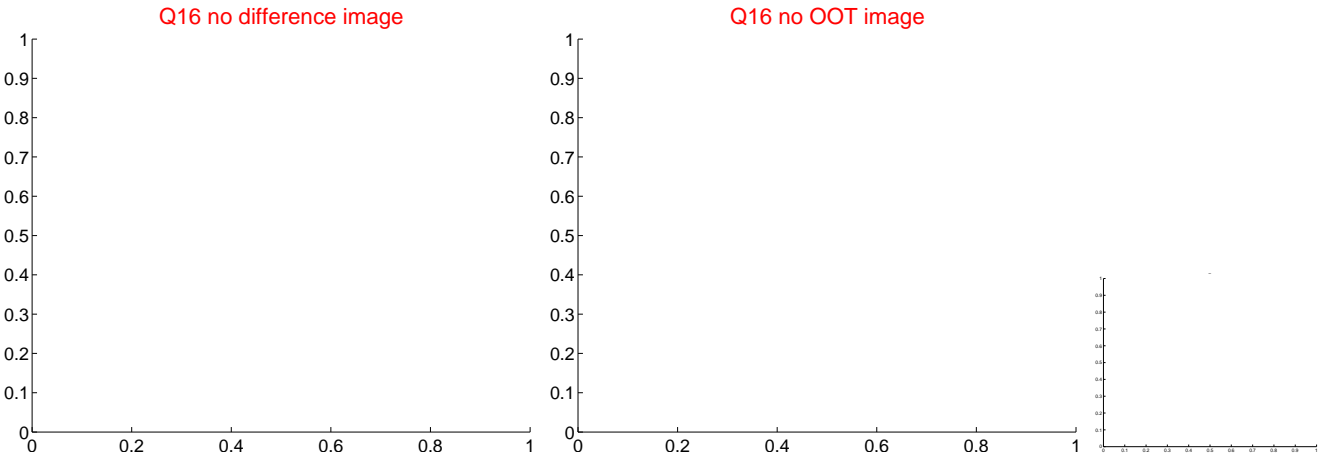
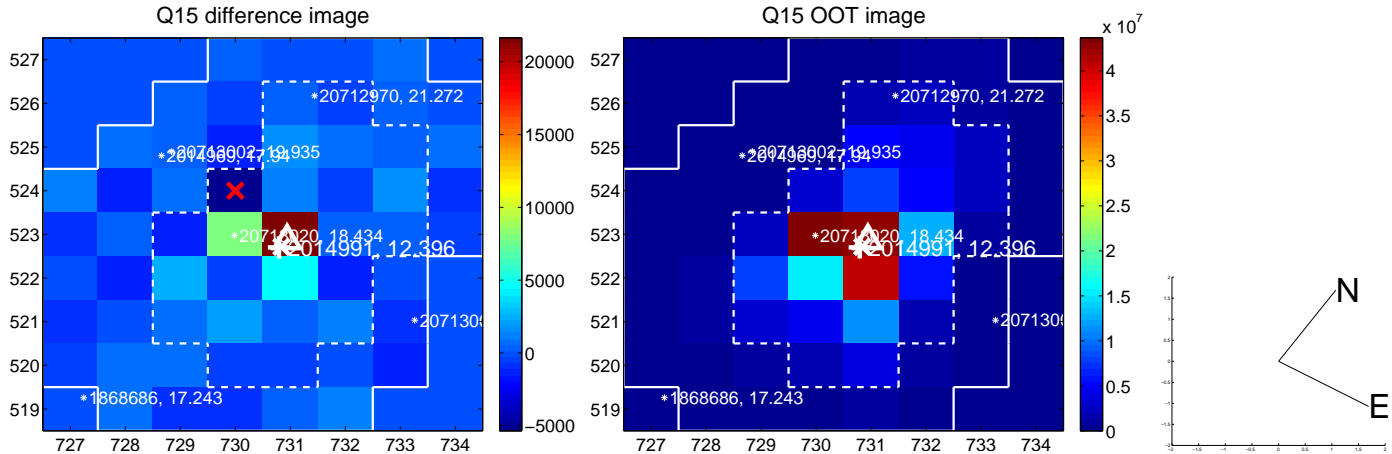
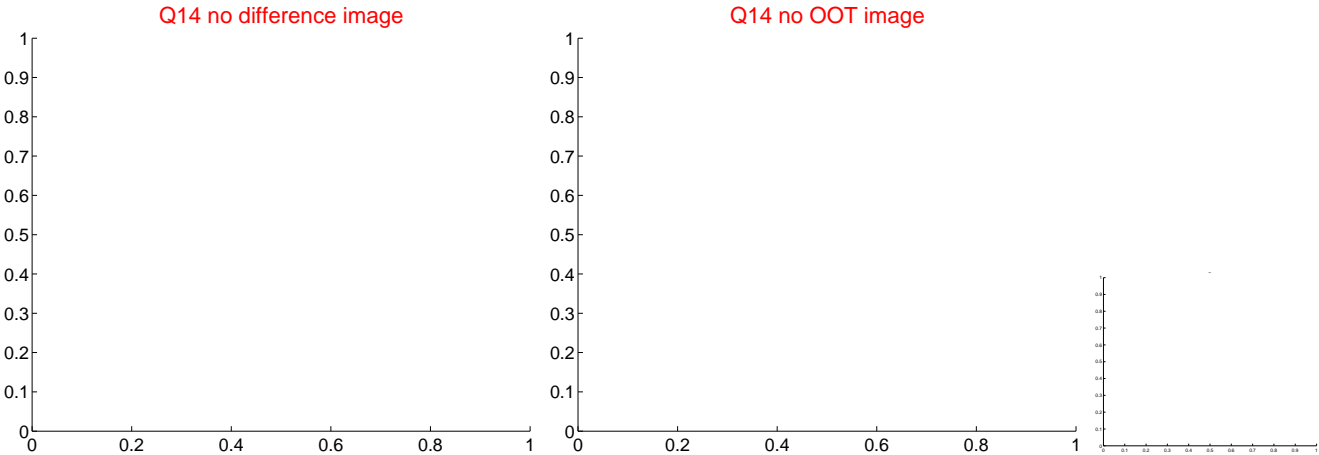
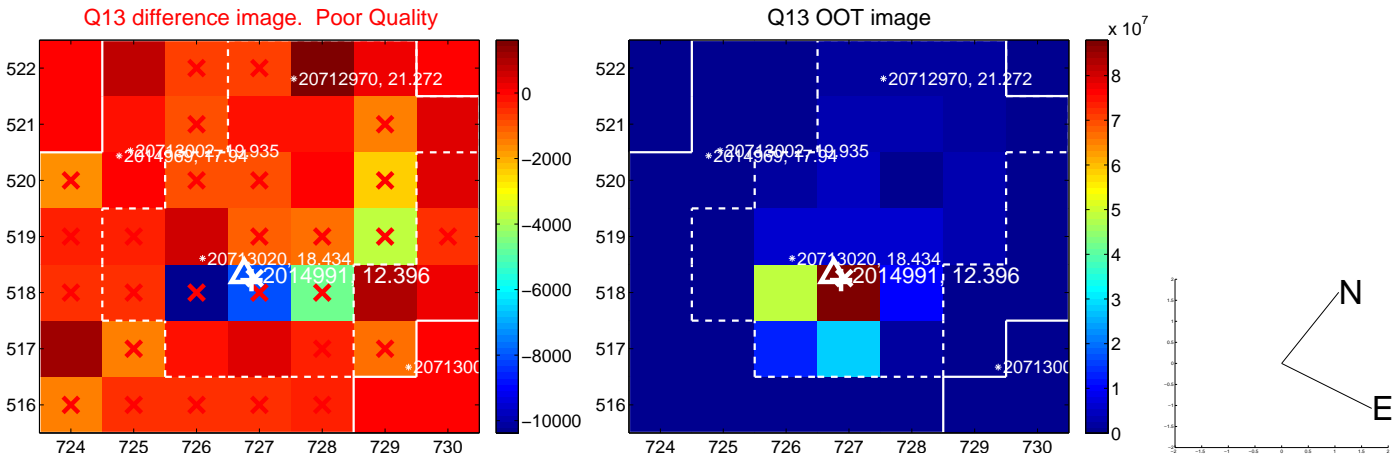
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



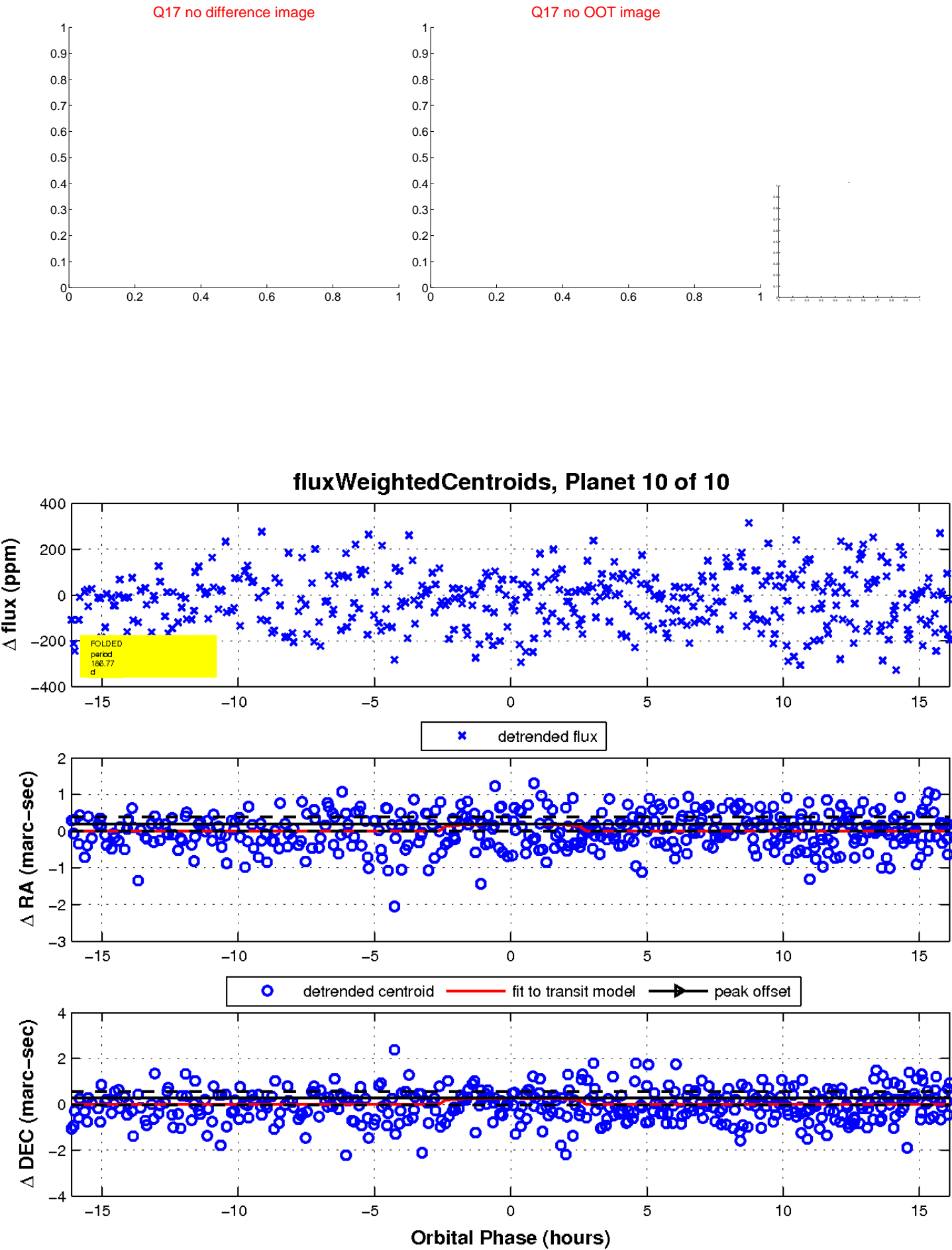
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

