

KIC 007281951

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})
007281951-01	OBS	No	0.566764	131.868388	43.9	3.773	10.3	6.5	1.07	6078	0.86	7015.41
007281951-02	OBS	No	109.726559	146.755485	1413.3	2.641	9.2	9.3	1.07	6078	4.75	6.26
007281951-03	OBS	No	41.405847	149.527131	1559.4	3.356	9.3	9.5	1.07	6078	5.39	22.97
007281951-04	OBS	No	46.542416	148.244594	1693.1	2.879	8.4	11.7	1.07	6078	4.63	19.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281951-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281951-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET
007281951-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007281951-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

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

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

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

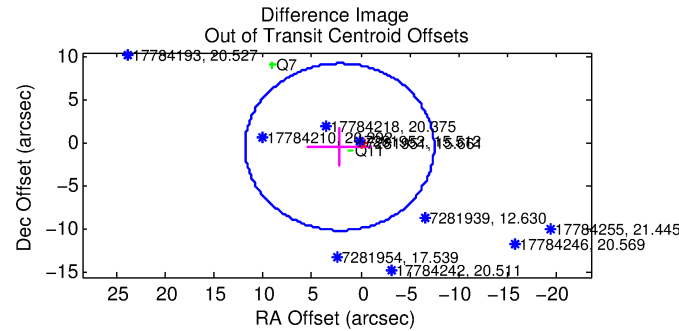
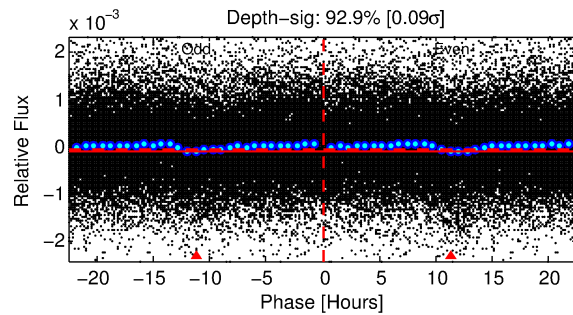
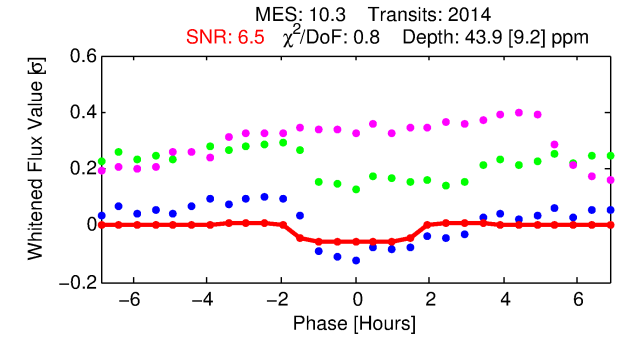
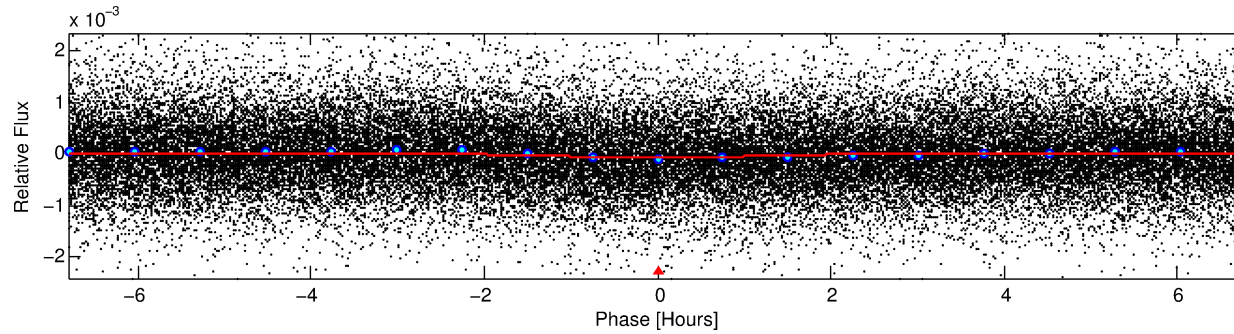
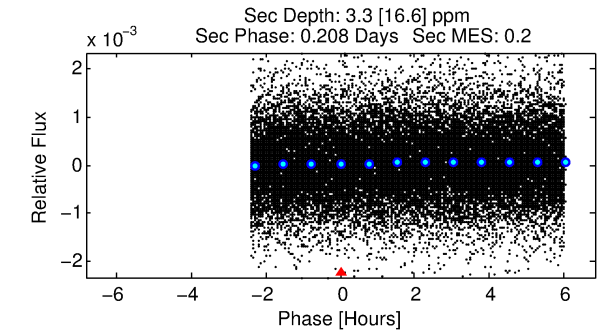
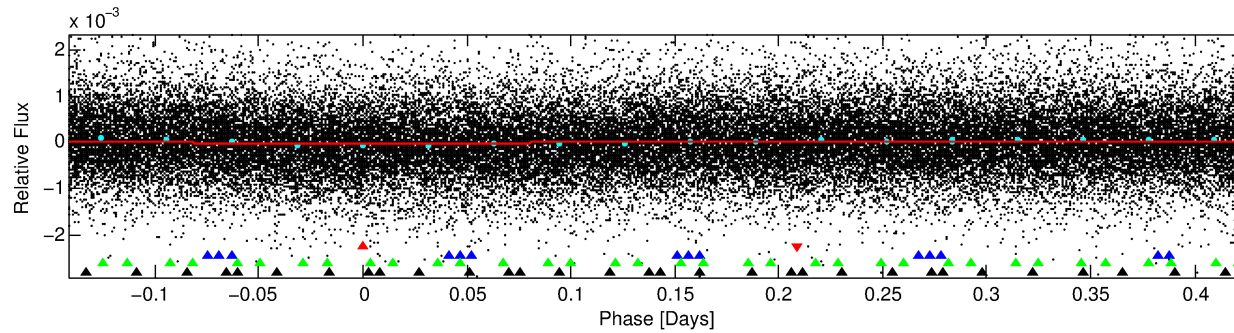
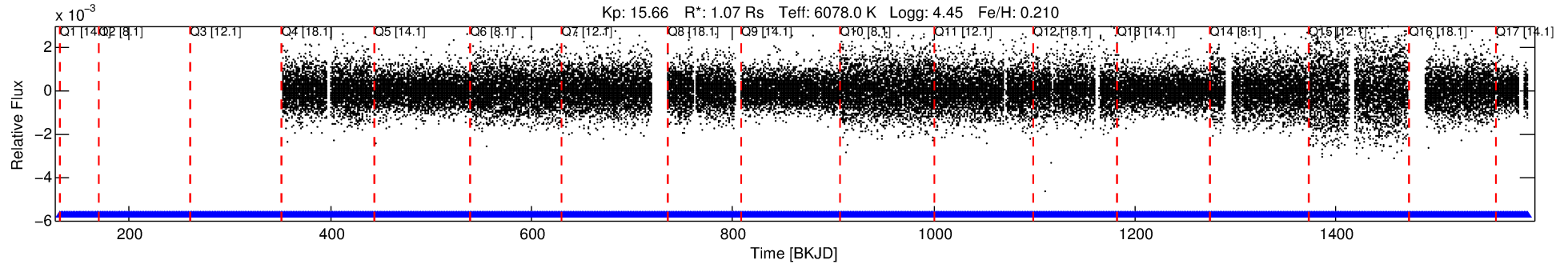
Ephemeris Match Information For 007281951-01

TCE (1)	KIC	Parent (2)	Parent KIC	P ₁ :P ₂	Dist (μ)	Δ Row	Δ Col	m ₂	m ₁	D ₂ /D ₁	Mechanism	Flag	σ_P	σ_T
007281951-01	7281951	RR-Lyr-pri	7198959	1:1	1059.5	101	246	7.86	15.66	14166.00	Direct-PRF	0	3.22	21.62

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 7281951 Candidate: 1 of 4 Period: 0.567 d



DV Fit Results:

Period = 0.56676 [0.00002] d
Epoch = 131.8684 [0.0060] BKJD
Rp/R* = 0.0074 [0.0061]
a/R* = 1.06 [0.52]
b = 0.92 [0.70]
Seff = 7015.41 [2985.05]
Teq = 2334 [248] K
Rp = 0.86 [0.76] Re
a = 0.0141 [0.0038] AU
Ag = 0.49 [2.61] [-0.20σ]
Teffp = 3016 [4017] K [0.17σ]

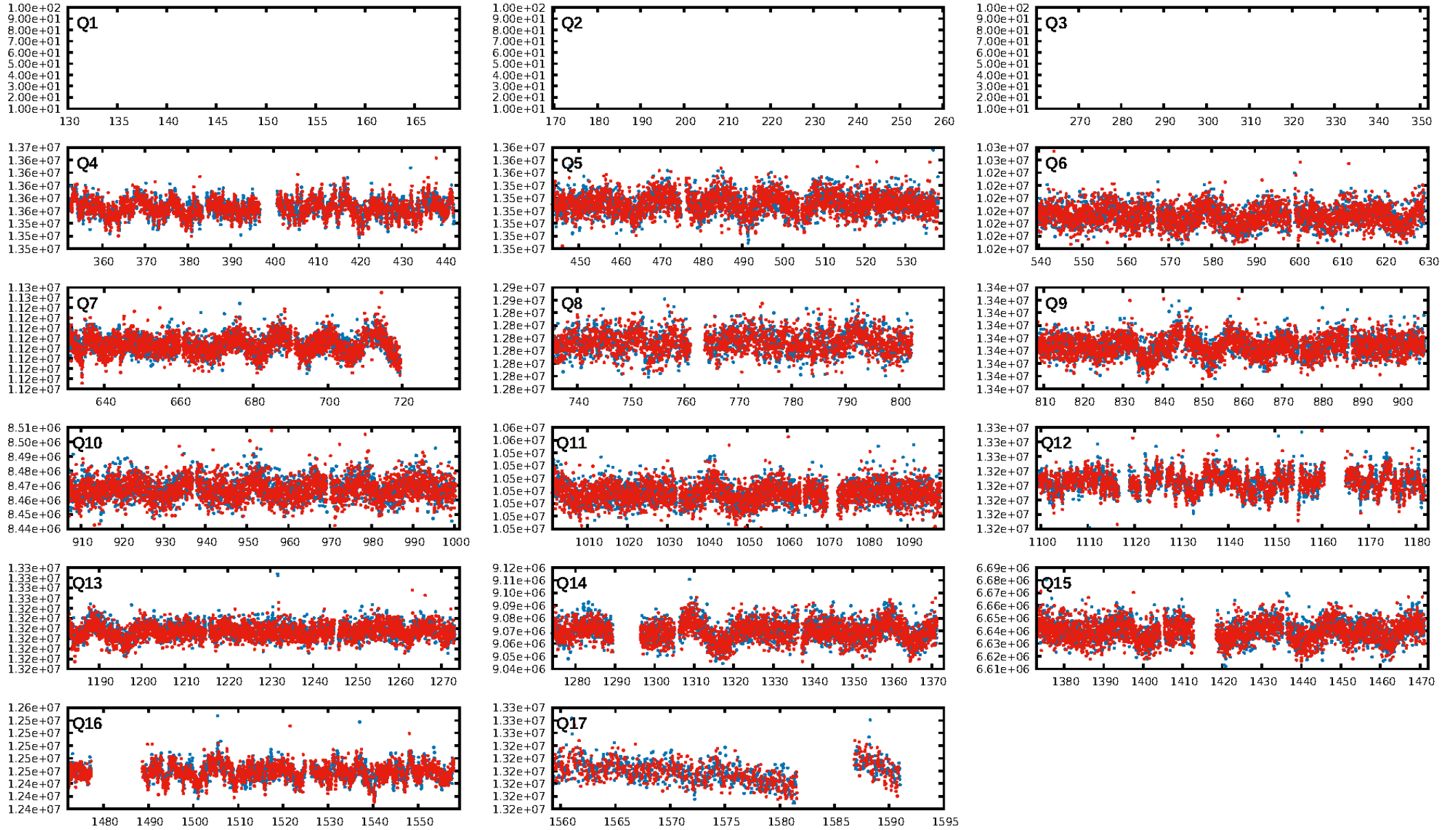
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [194.10σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.76e-19
RollingBand-fgt: 1.00 [1966/1966]
GhostDiagnostic-chr: 0.09899
Centroid-sig: 0.0%
Centroid-so: 2.152 arcsec [3.43σ]
OotOffset-rm: 2.239 arcsec [0.70σ]
KicOffset-rm: 3.843 arcsec [1.96σ]
OotOffset-st: 0/2/0/0 [2]
KicOffset-st: 0/2/0/3 [5]
DiffImageQuality-fgm: 0.20 [1/5]
DiffImageOverlap-fno: 1.00 [14/14]

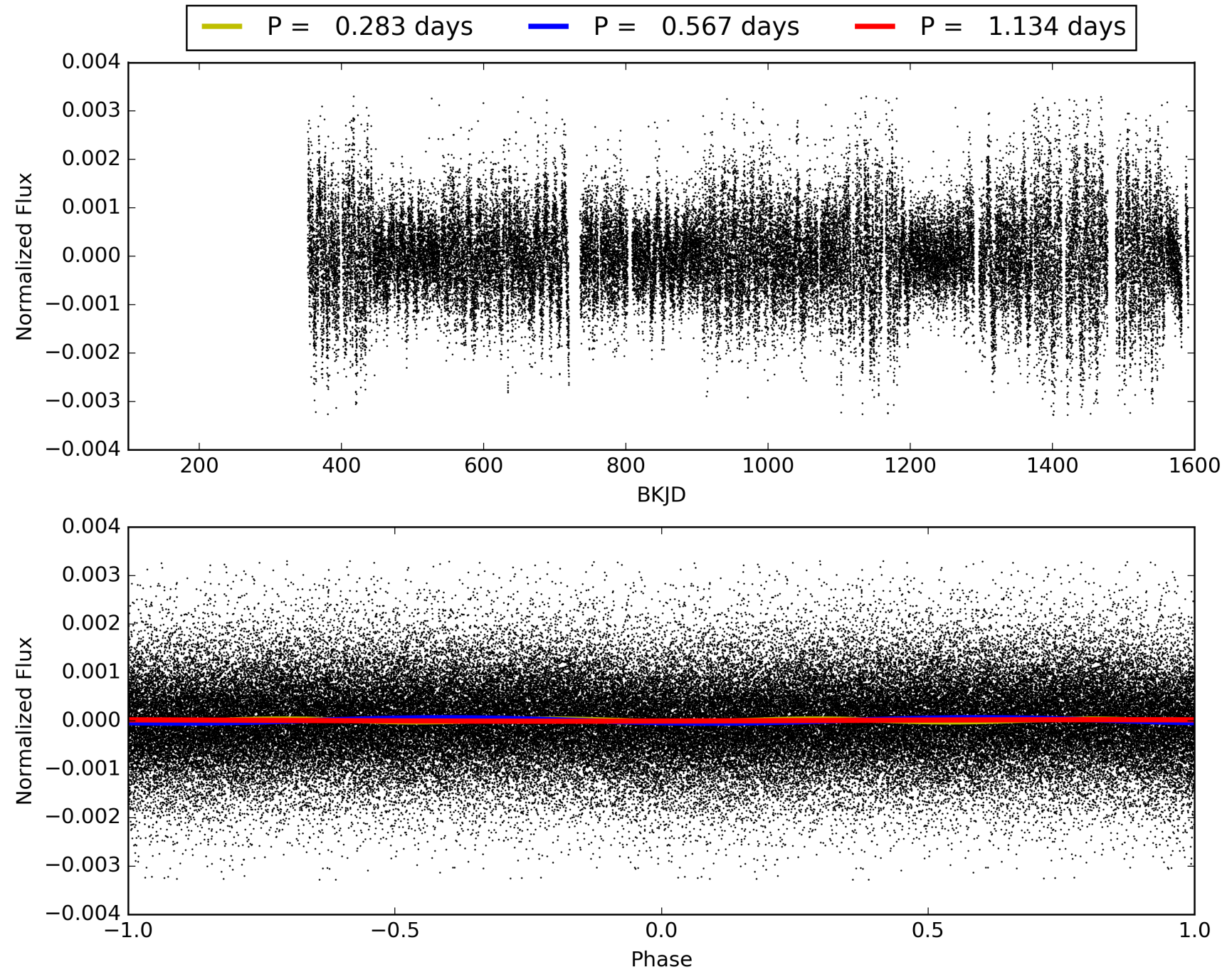
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:33:57 Z

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

TCE 007281951-01, PDC Light Curves

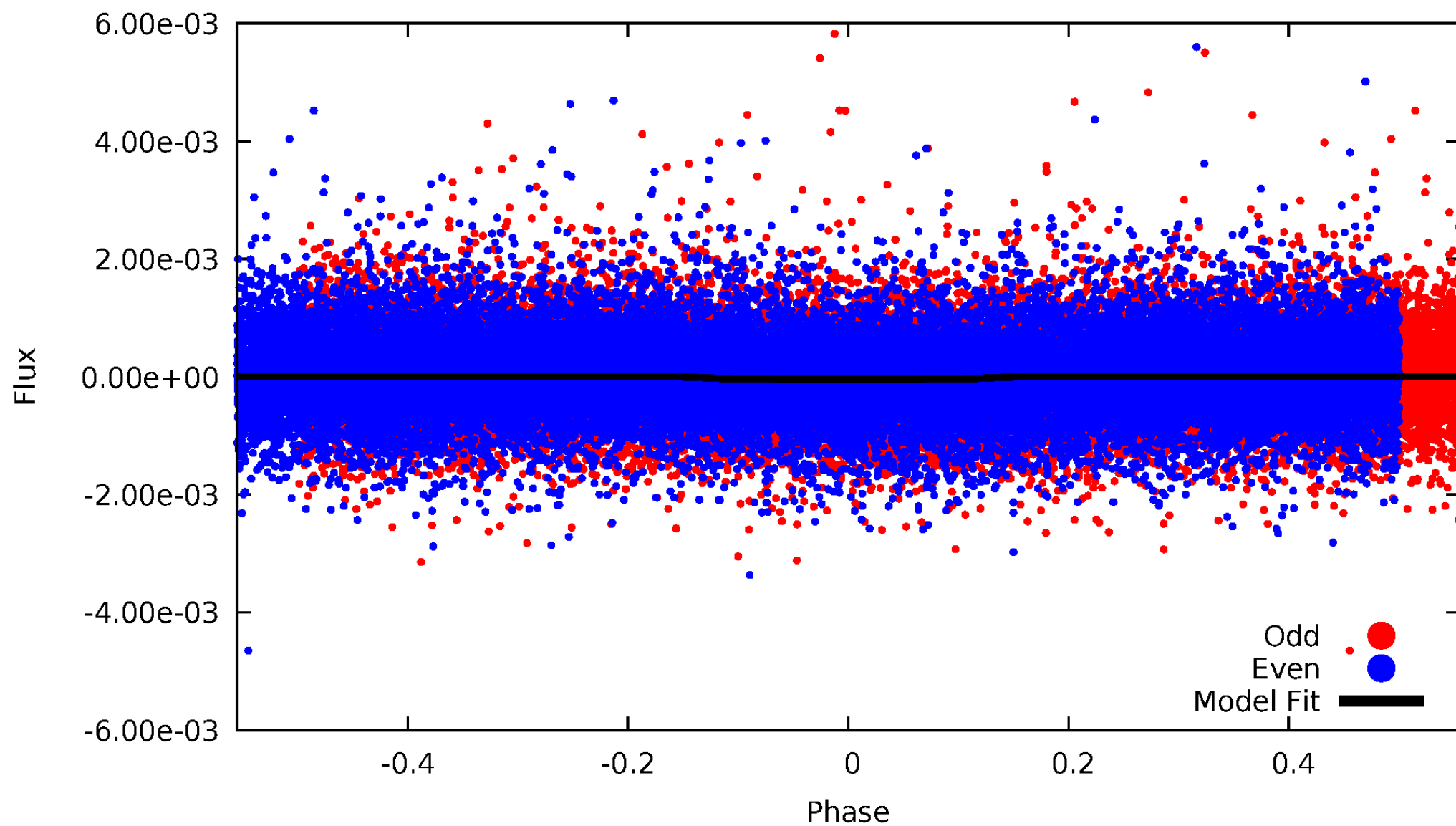


TCE 007281951-01



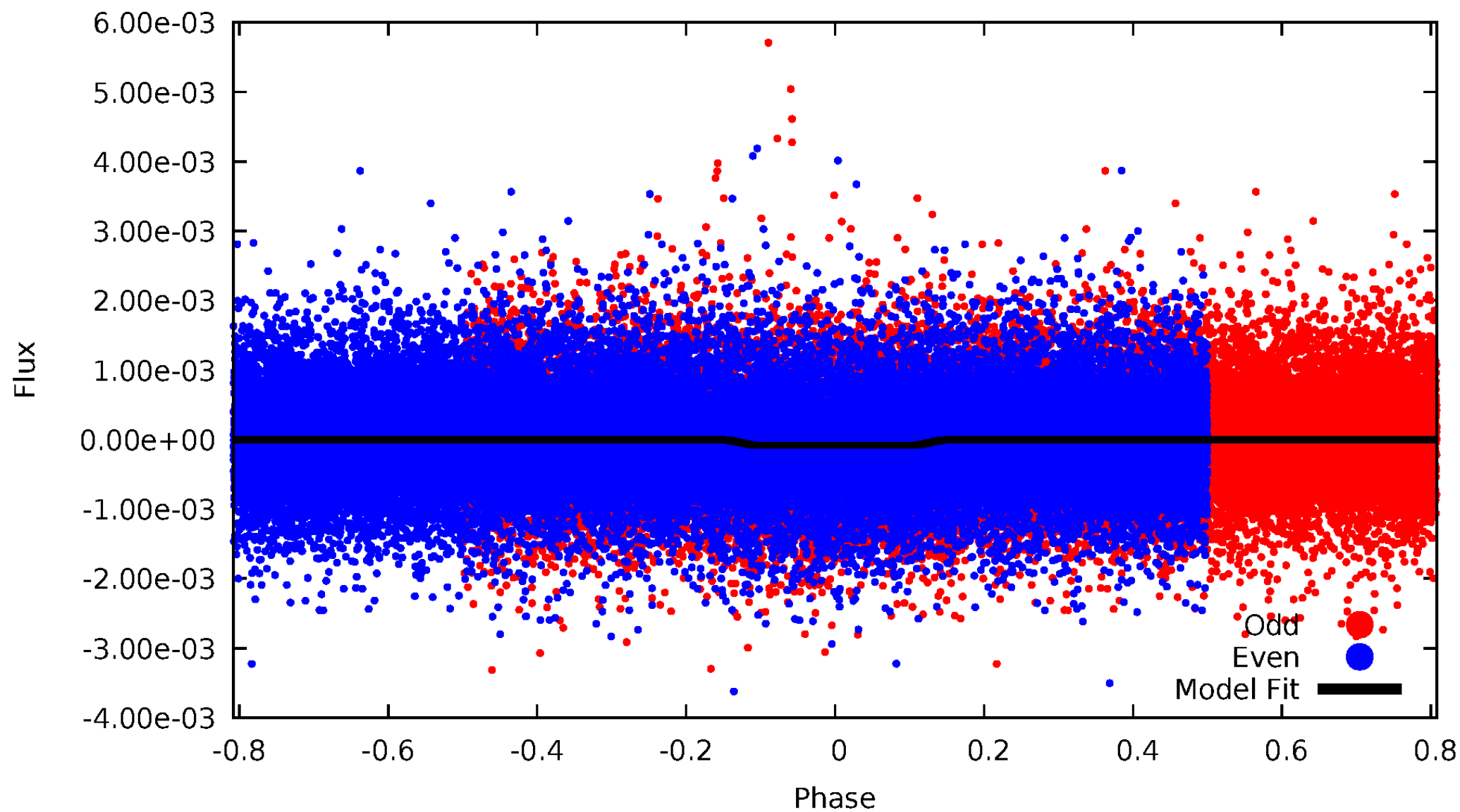
DV Odd/Even

TCE 007281951-01



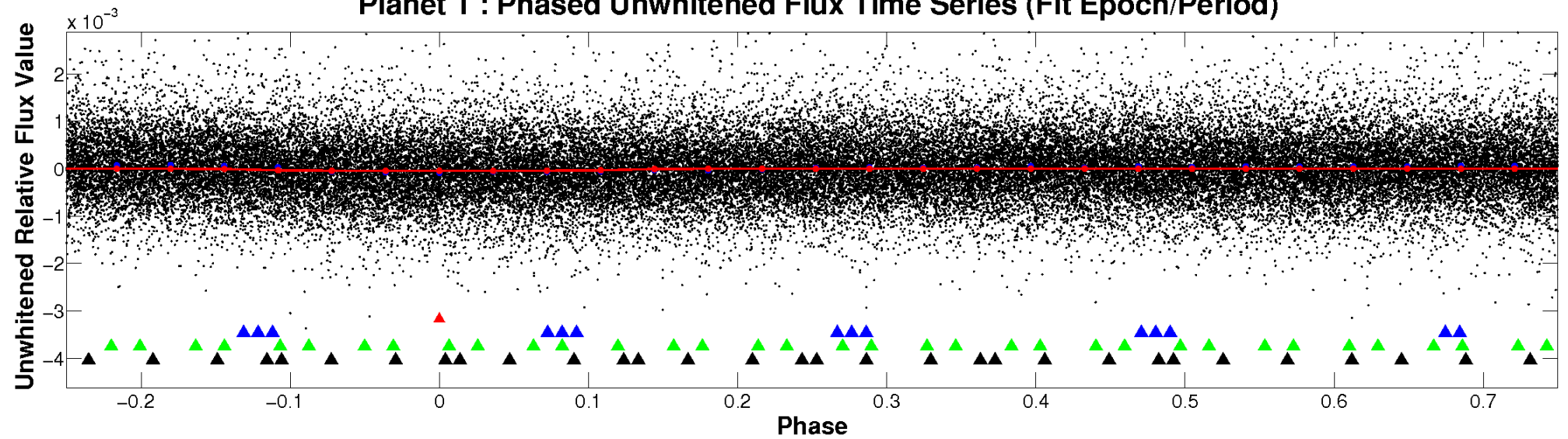
ALT Odd/Even

TCE 007281951-01

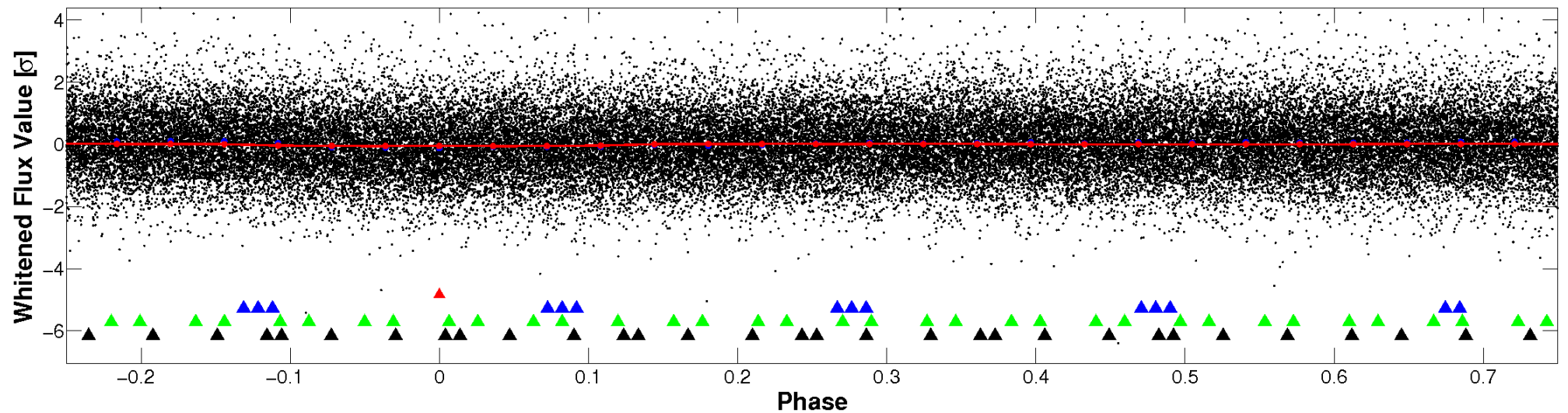


Non-Whitened Vs. Whitened Light Curve

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

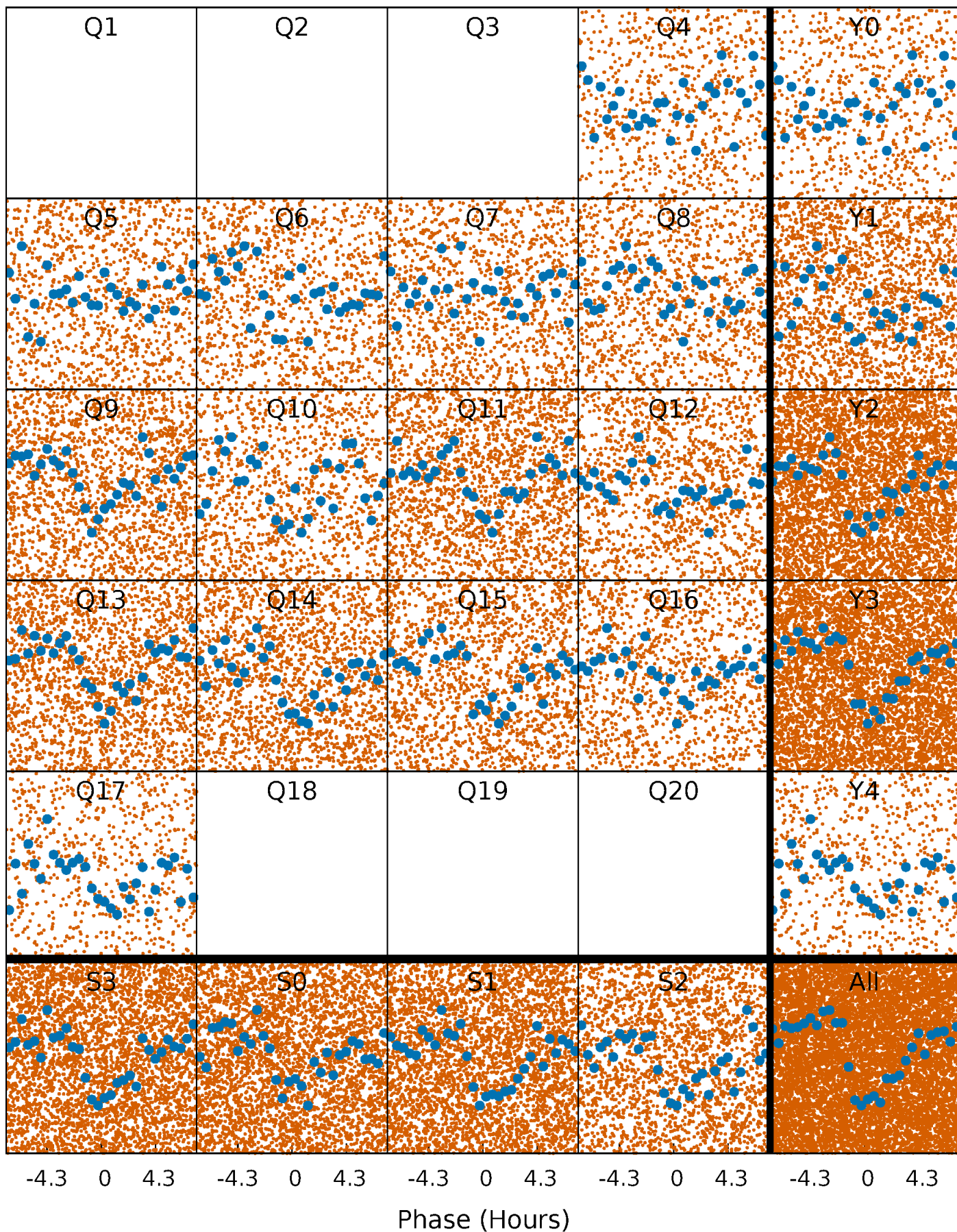


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



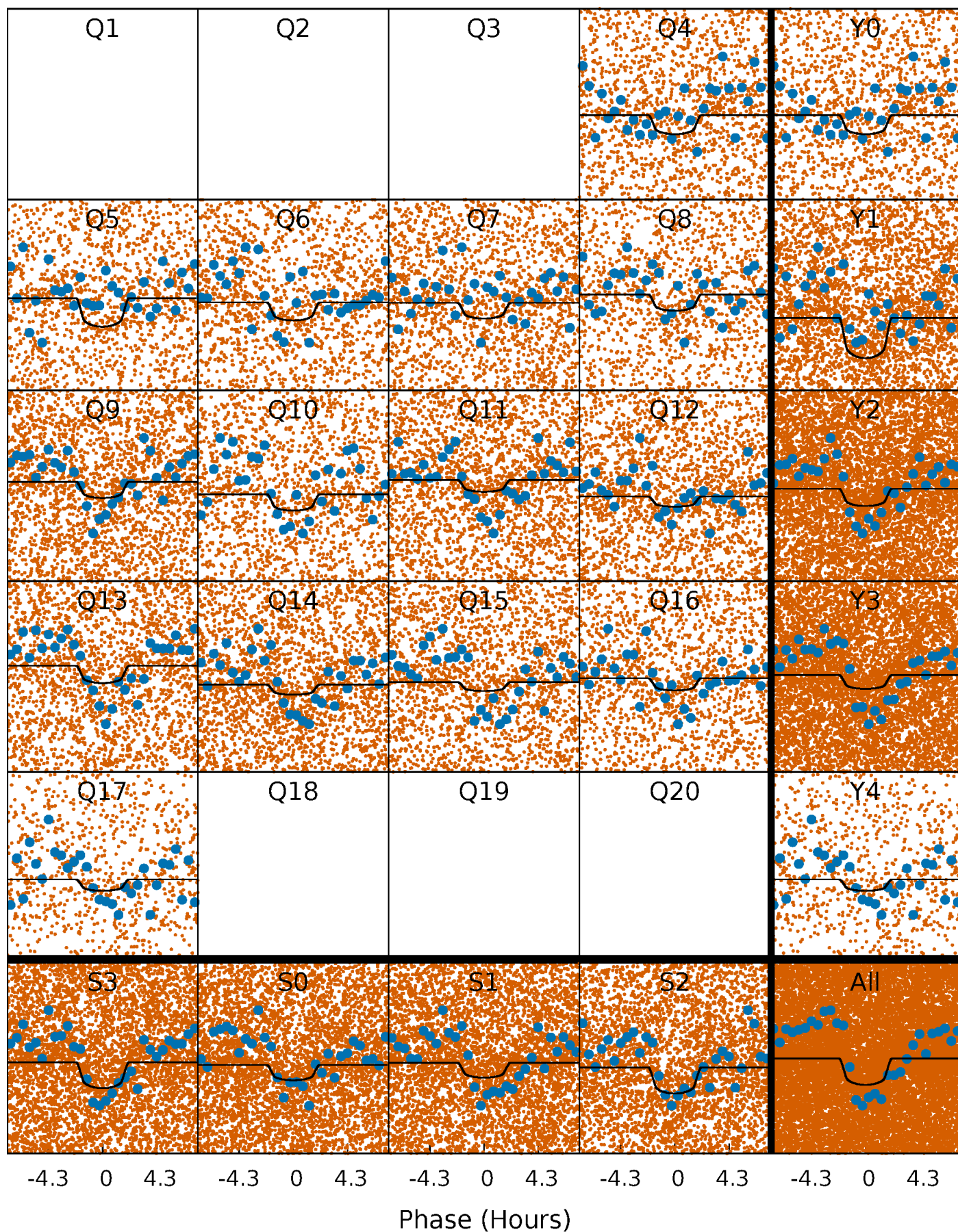
PDC Quarter-Phased Transit Curves

TCE 007281951-01 P= 0.566764 Days $T_0=131.868388$ (BKJD)



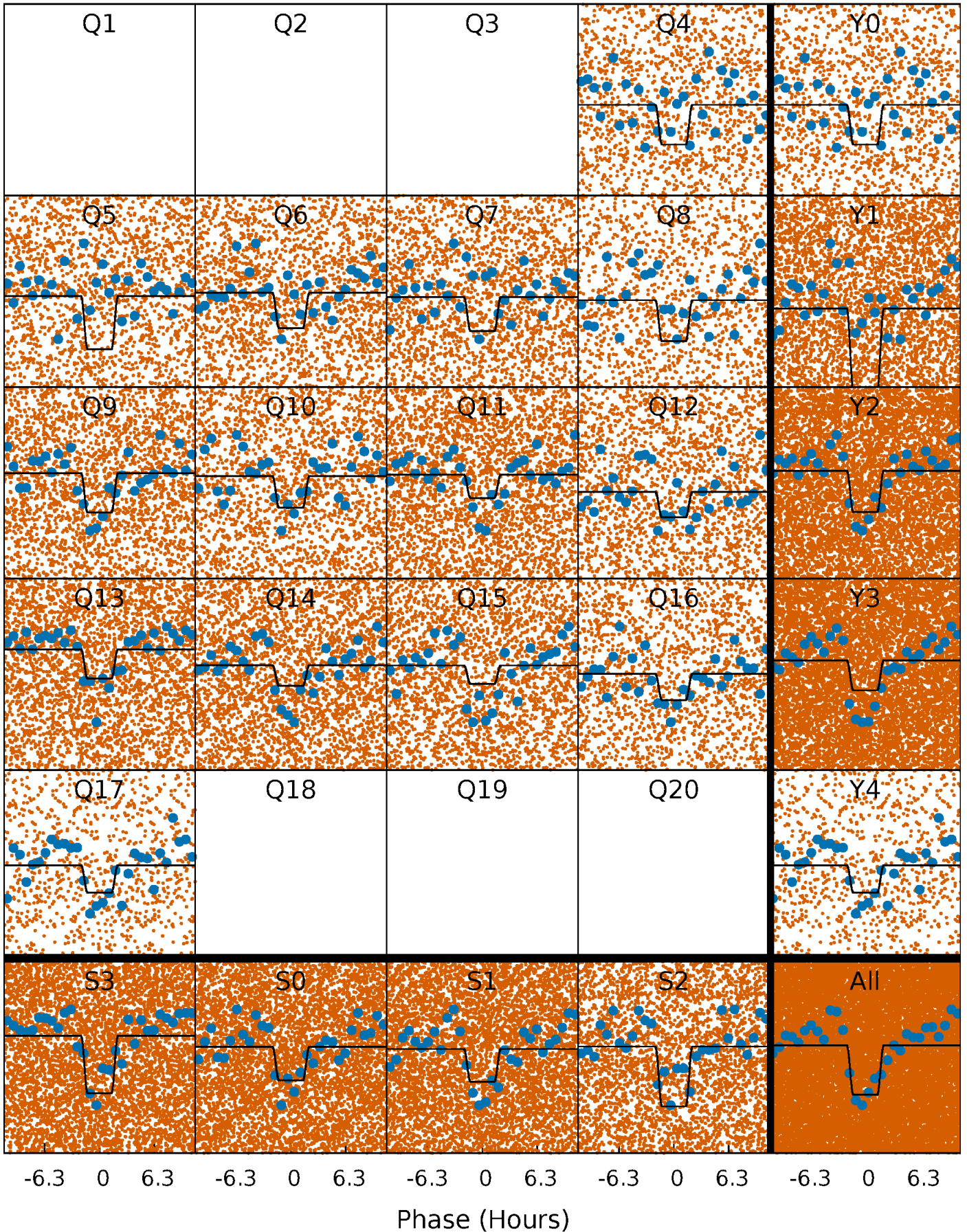
DV Quarter-Phased Transit Curves

TCE 007281951-01 P= 0.566764 Days $T_0=131.868388$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

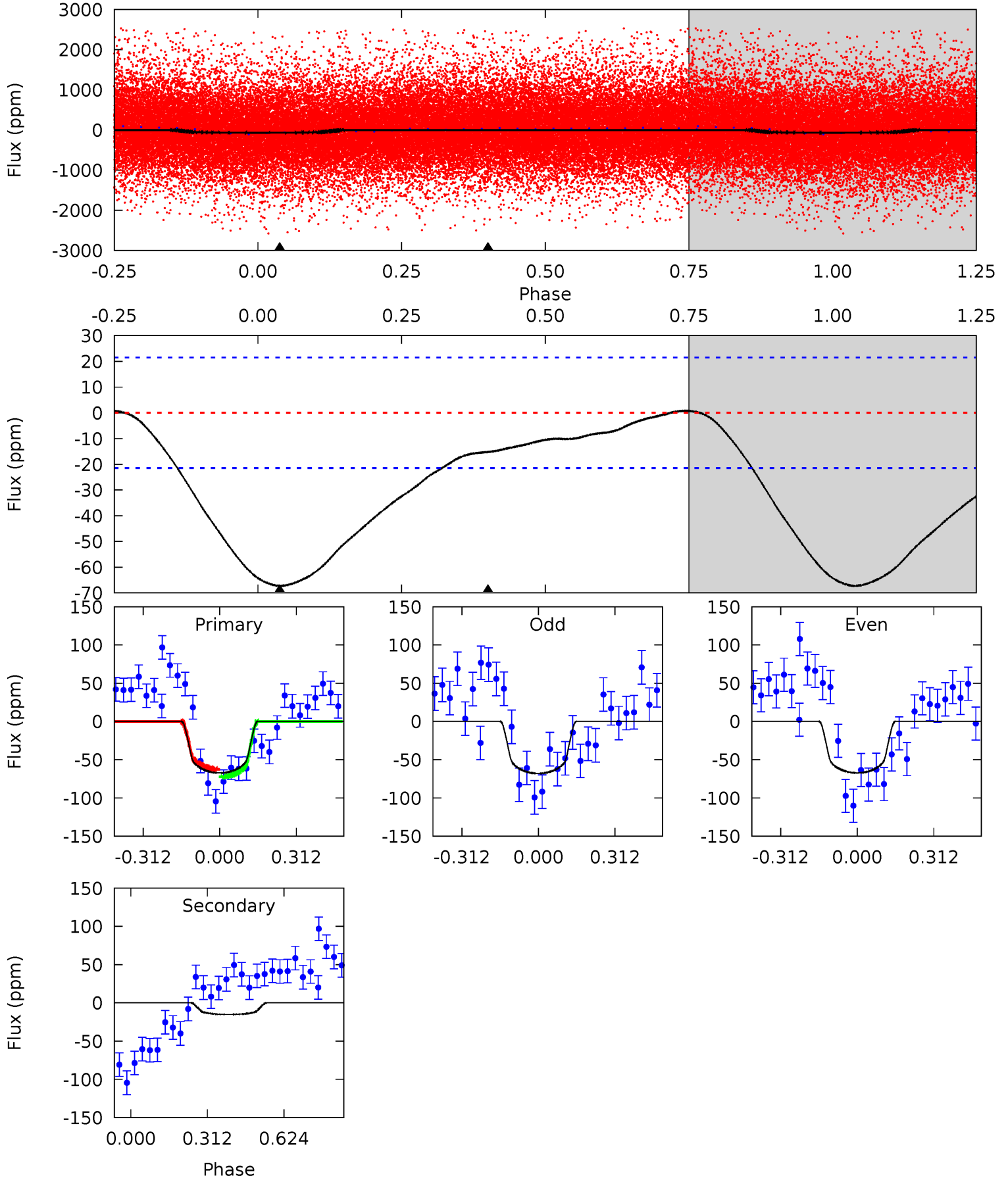
TCE 007281951-01 P= 0.566788 Days $T_0=131.852002$ (BKJD)



DV Model-Shift Uniqueness Test

007281951-01, P = 0.566764 Days, E = 131.868388 Days

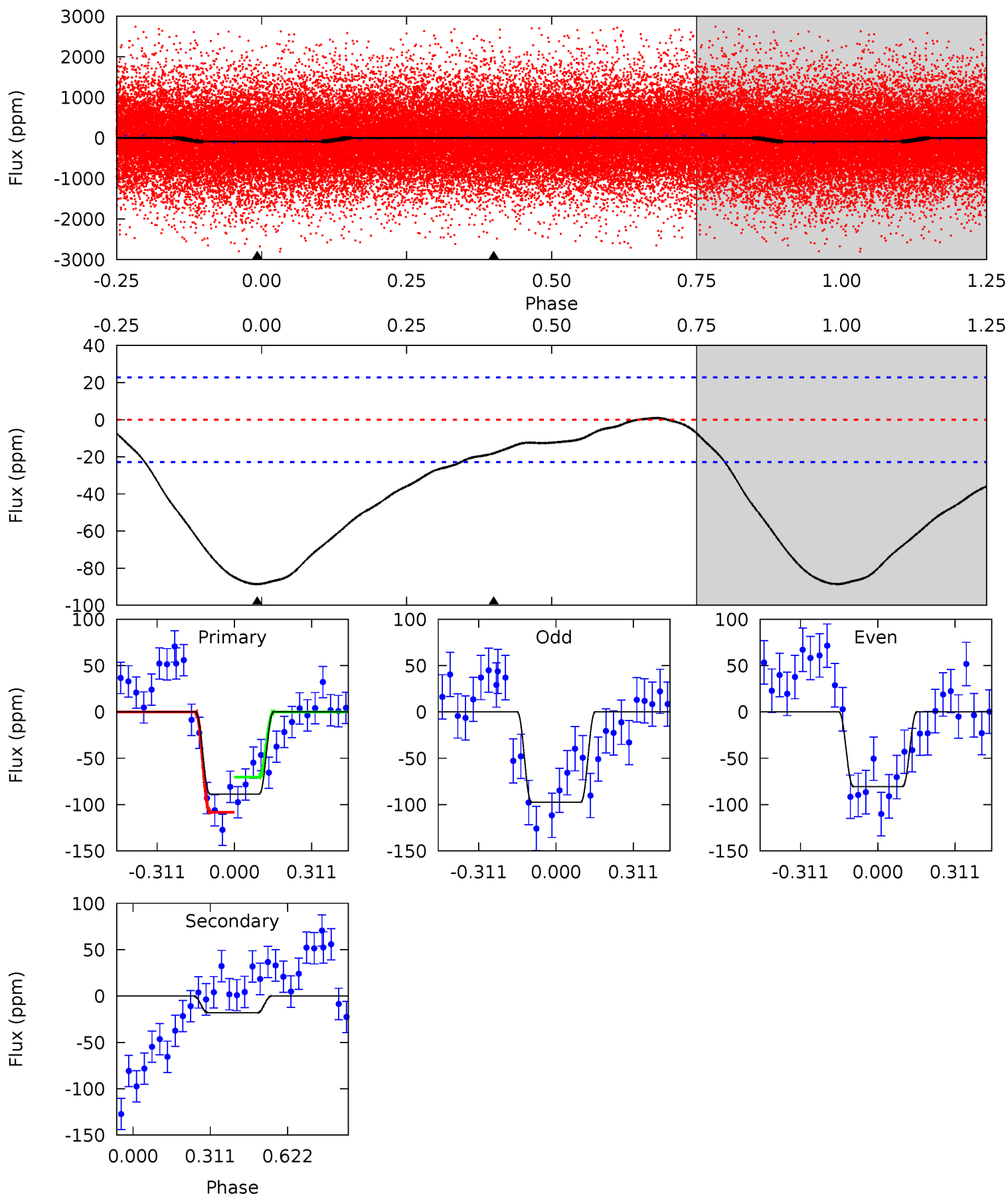
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	3.07	0	0	4.32	1.01	0.22	13.5	13.5	3.07	3.07	0.07	0.96	0.01	0.99



Alt Model-Shift Uniqueness Test

007281951-01, P = 0.566788 Days, E = 131.852002 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.8	3.43	0	0	4.32	1.01	0.37	16.8	16.8	3.43	3.43	1.62	1.14	0.01	3.57



Stellar Parameters For KIC 007281951

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6078^{+190}_{-253}	$4.447^{+0.054}_{-0.216}$	$0.210^{+0.150}_{-0.350}$	$1.069^{+0.334}_{-0.111}$	$1.167^{+0.136}_{-0.166}$	$1.347^{+0.388}_{-0.716}$
	+3%/-4%	+1%/-5%	+71%/-167%	+31%/-10%	+12%/-14%	+29%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 007281951-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-15 ± 5	$0.98^{+0.70}_{-0.57}$	3311^{+247}_{-171}	4204^{+2400}_{-1126}	$1.595^{+8.238}_{-1.094}$
Alt.	-18 ± 5	$1.22^{+0.76}_{-0.68}$	3333^{+249}_{-185}	4006^{+1803}_{-1035}	$1.331^{+5.568}_{-0.886}$

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

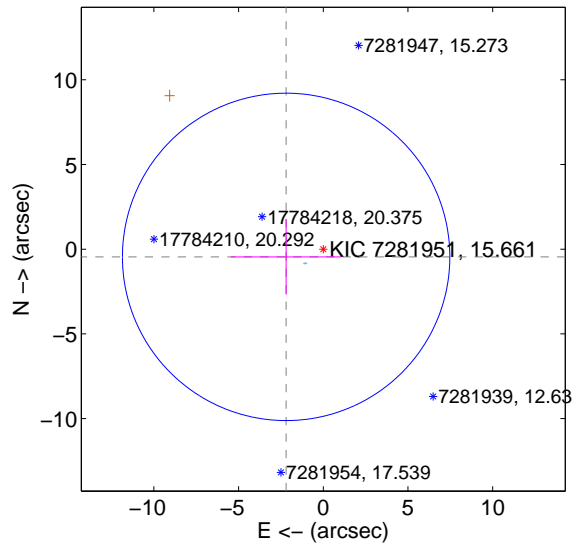
Supplemental centroid analysis for 007281951-01. Kepler magnitude: 15.66. Transit SNR 6.52

There are 1 quarters with good PRF difference image offsets

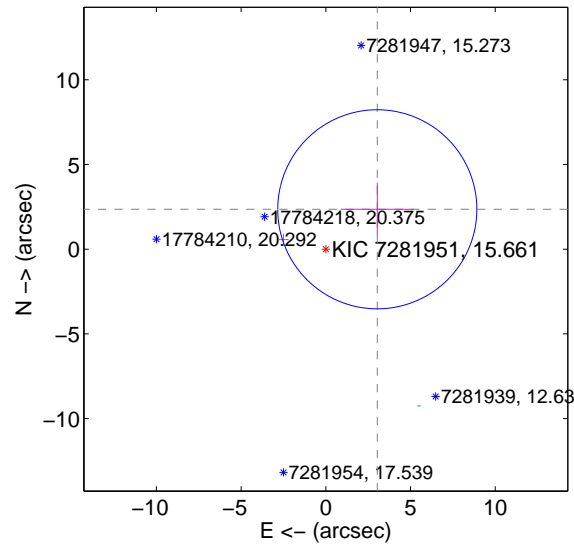
The OOT PRF centroid is offset from the target star catalog position by about 10.67 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.239 ± 3.220	0.70	2.192 ± 3.256	-0.455 ± 2.231
PRF-fit source offset from KIC position	3.843 ± 1.958	1.96	-3.038 ± 2.158	2.354 ± 1.571
photometric centroid source offset	2.15 ± 0.63	3.43	1.55 ± 0.55	1.49 ± 0.70

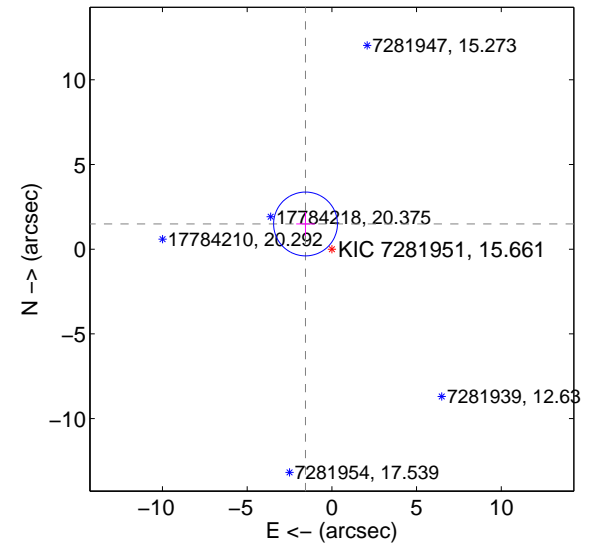
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

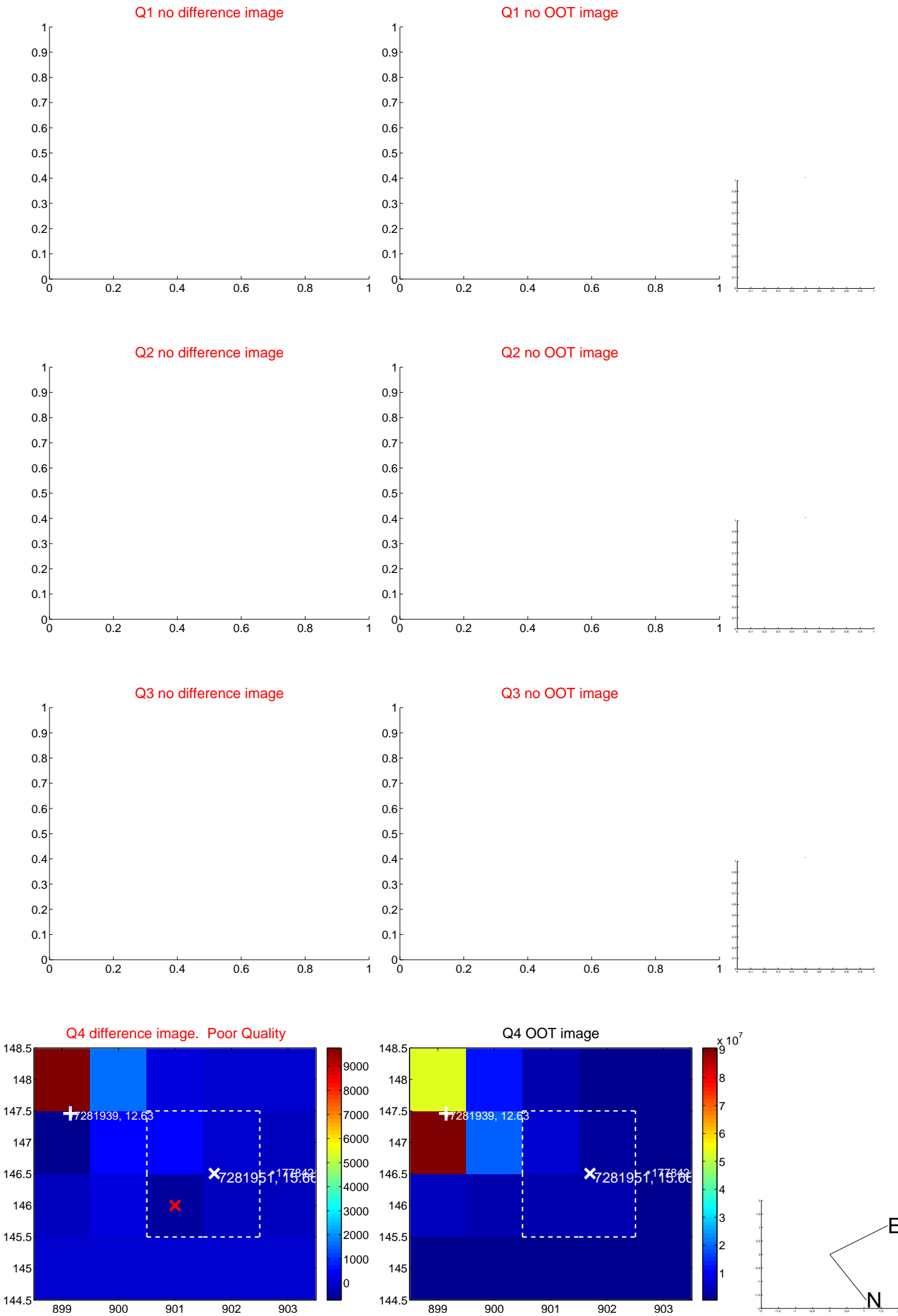


offset from photometric centroids

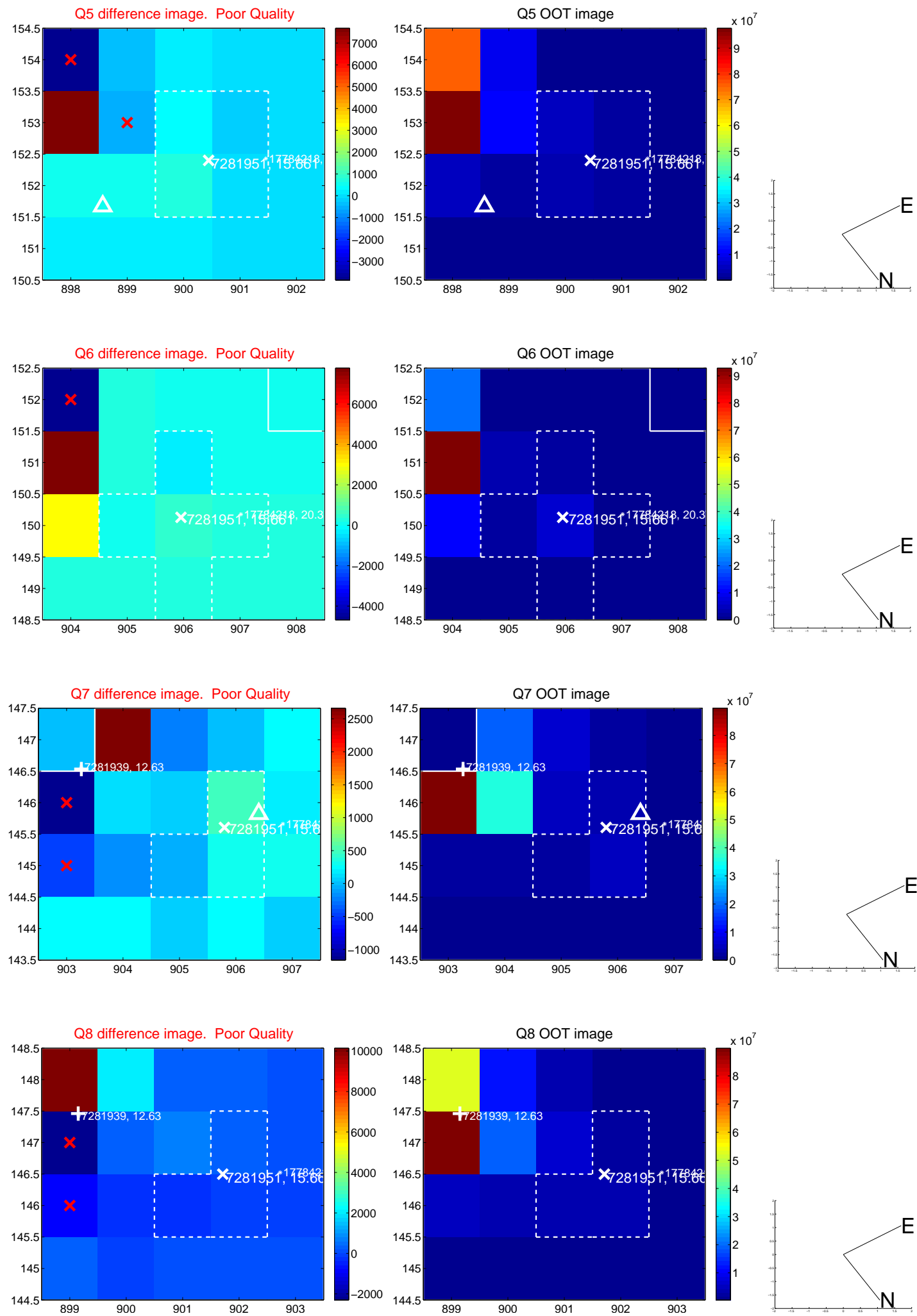


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

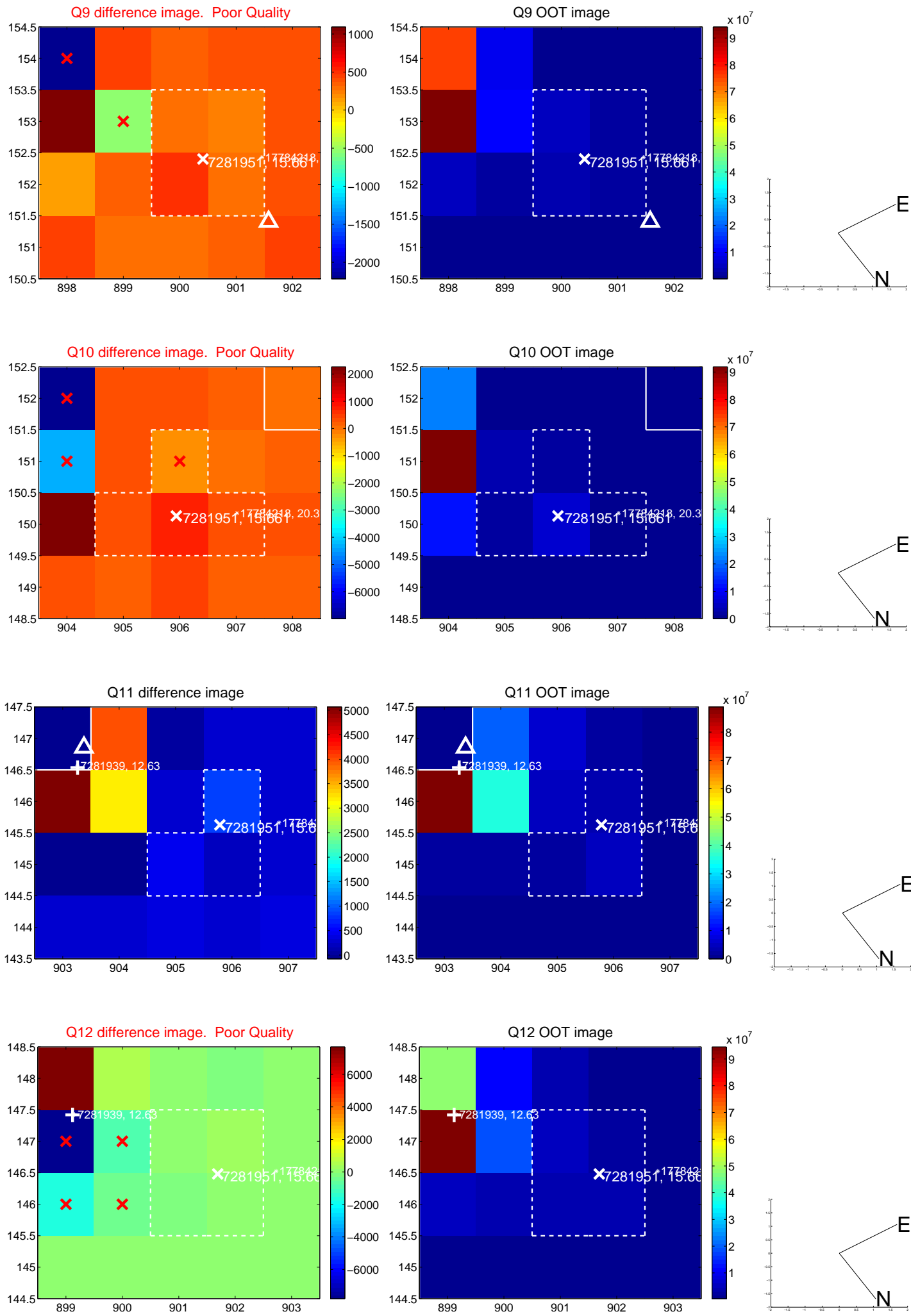
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



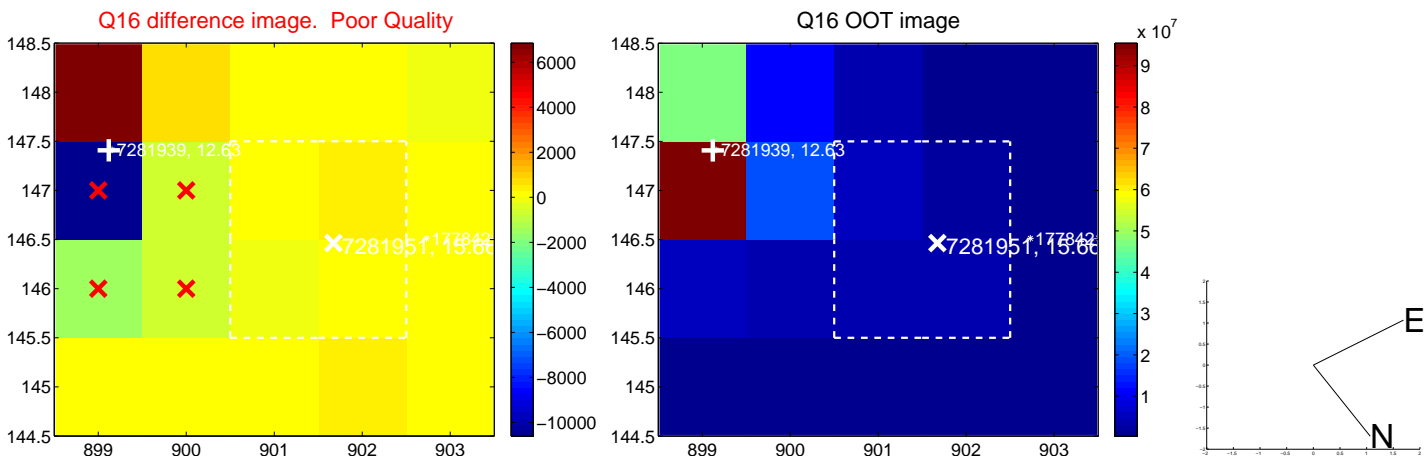
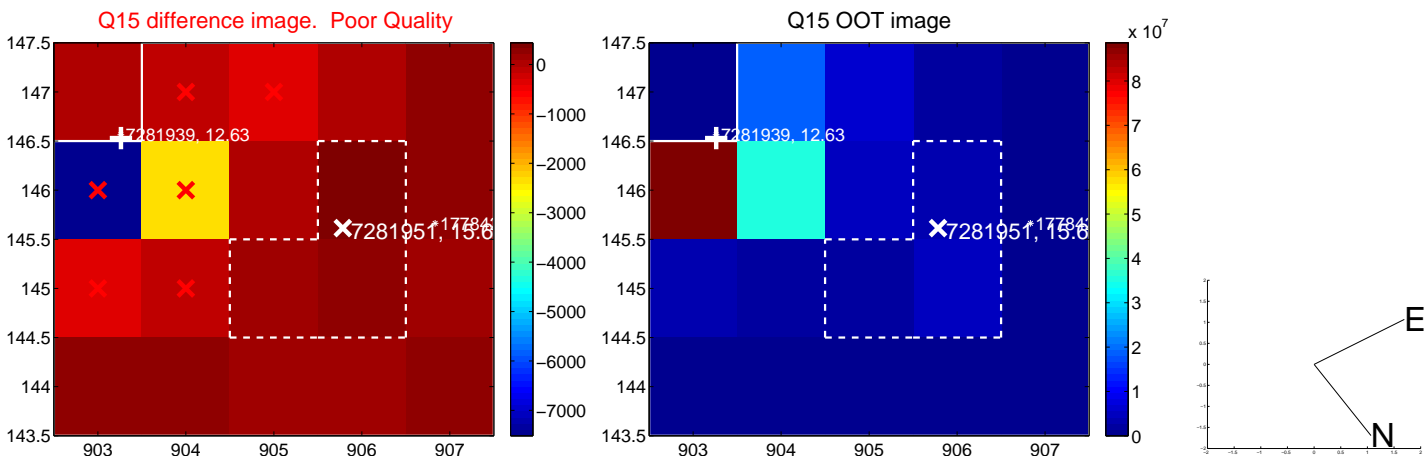
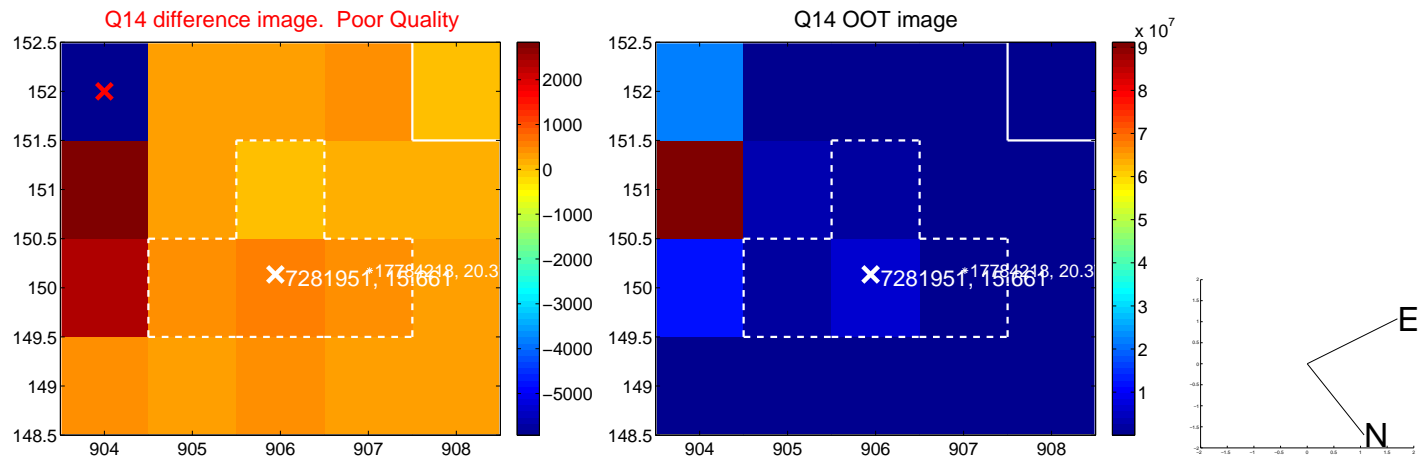
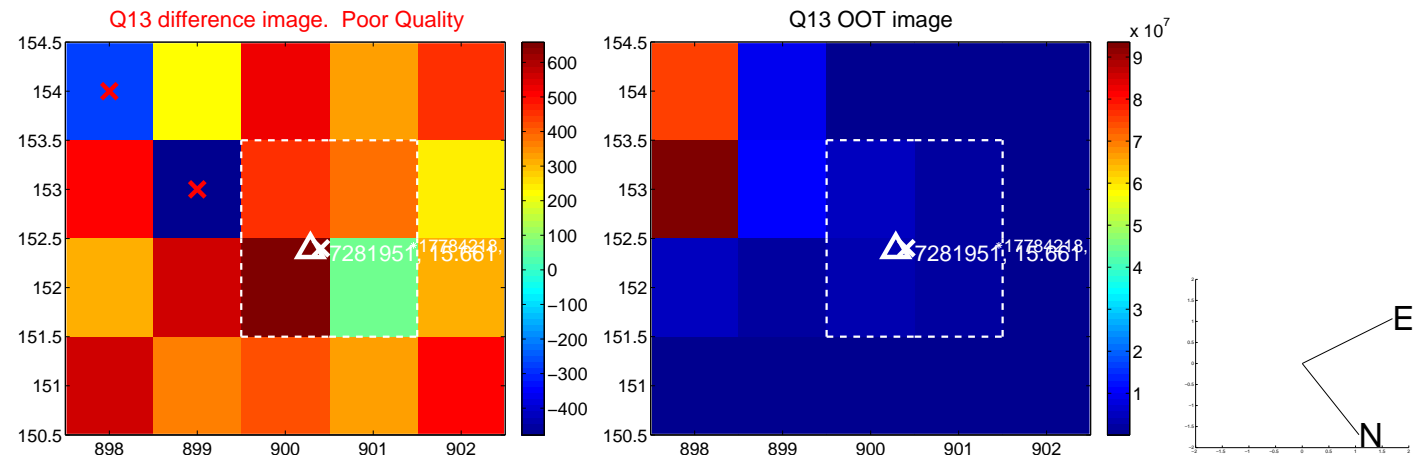
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



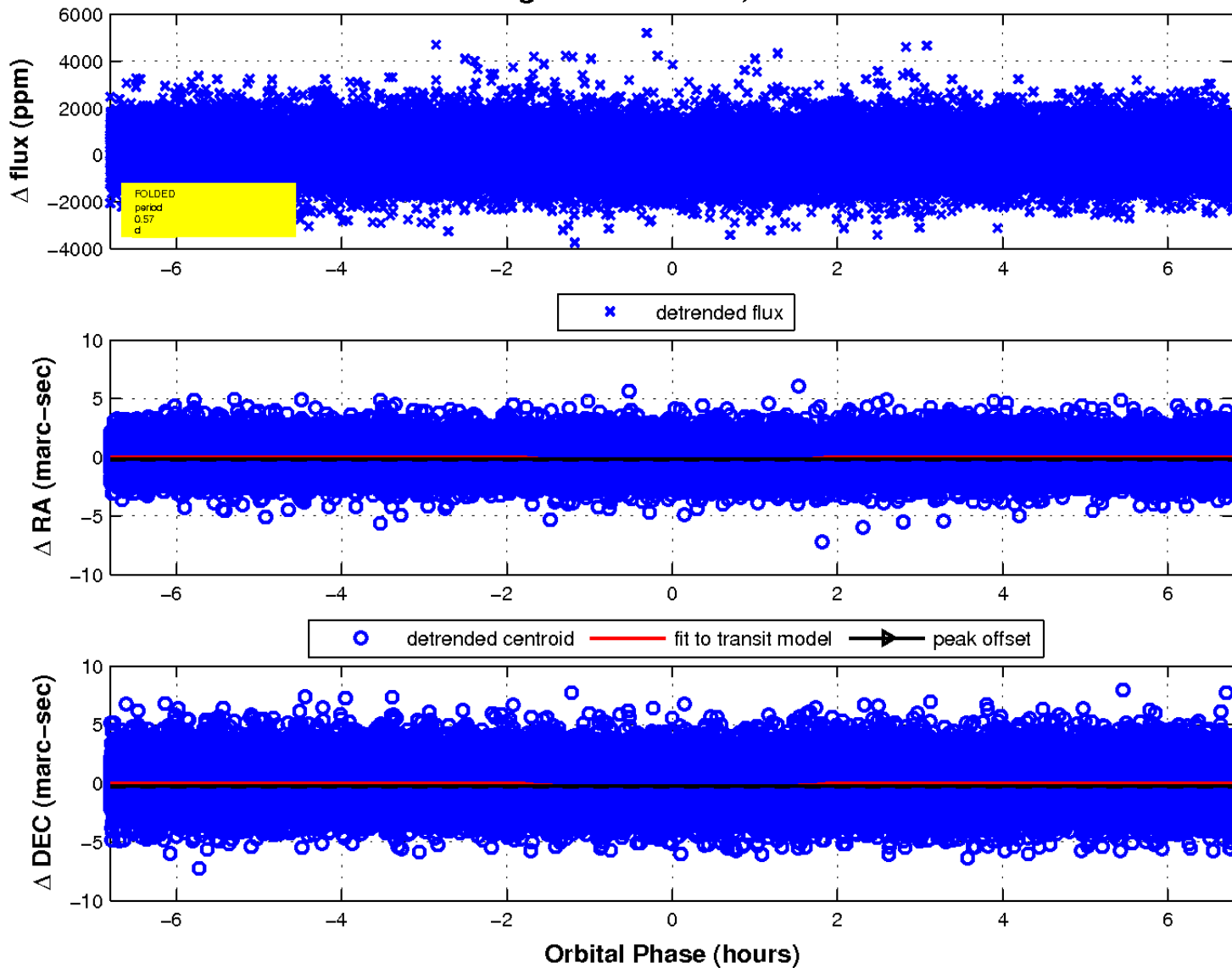
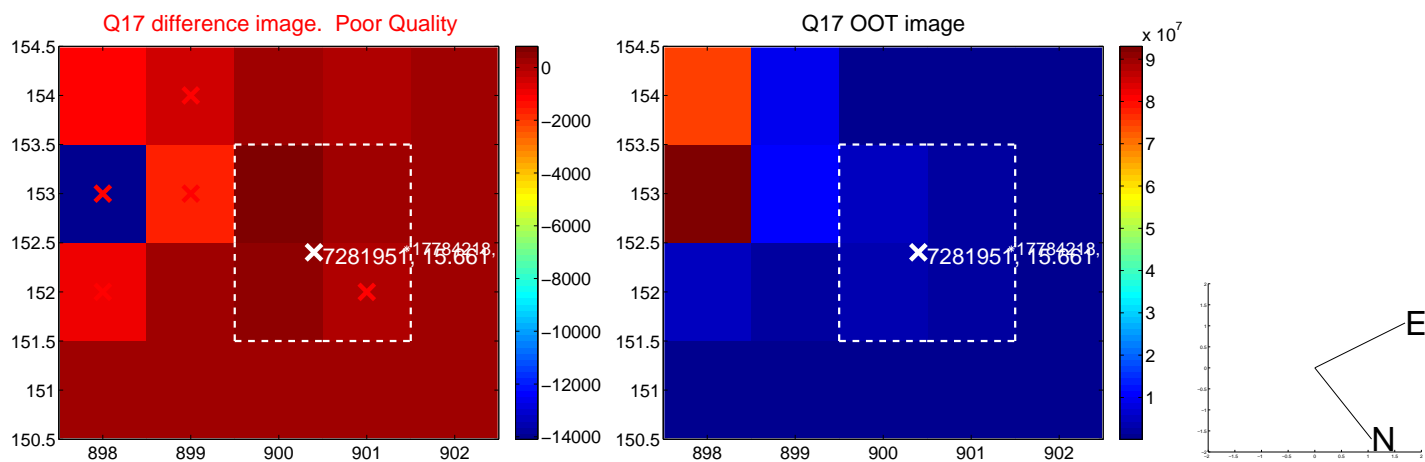
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



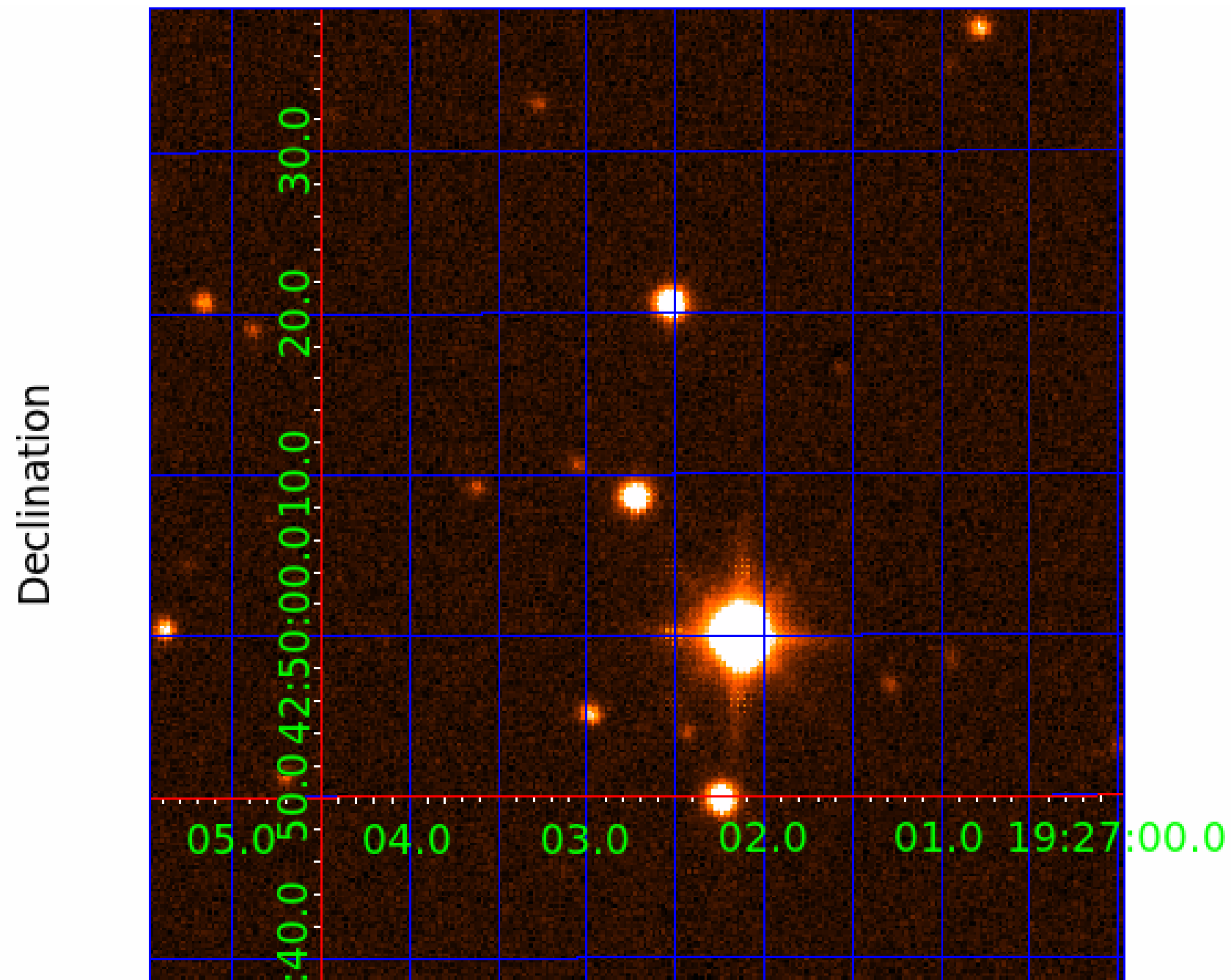
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007281951

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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007281951-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET
007281951-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007281951-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

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

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

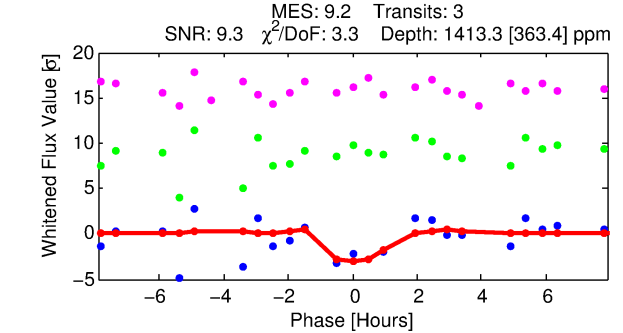
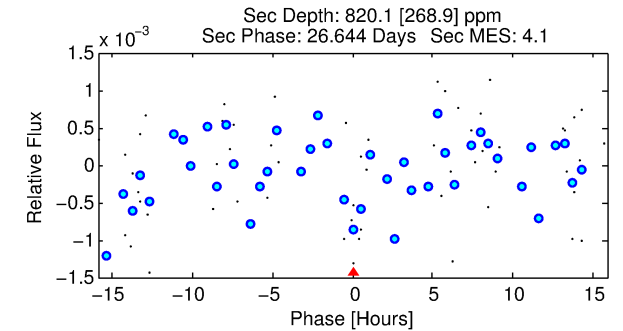
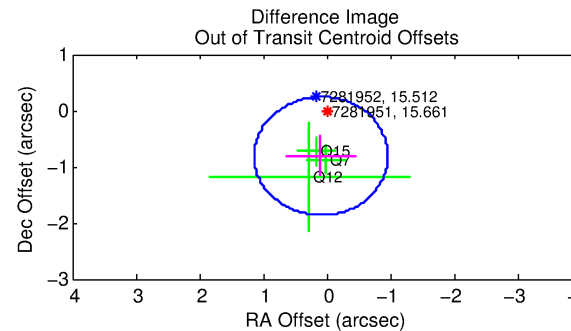
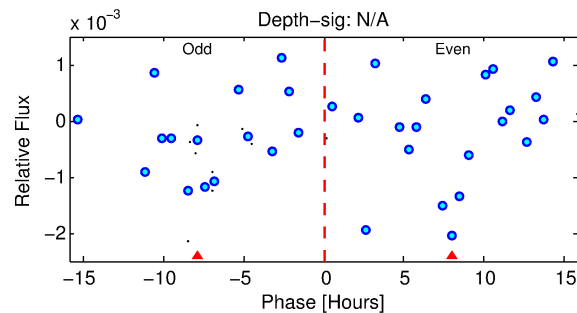
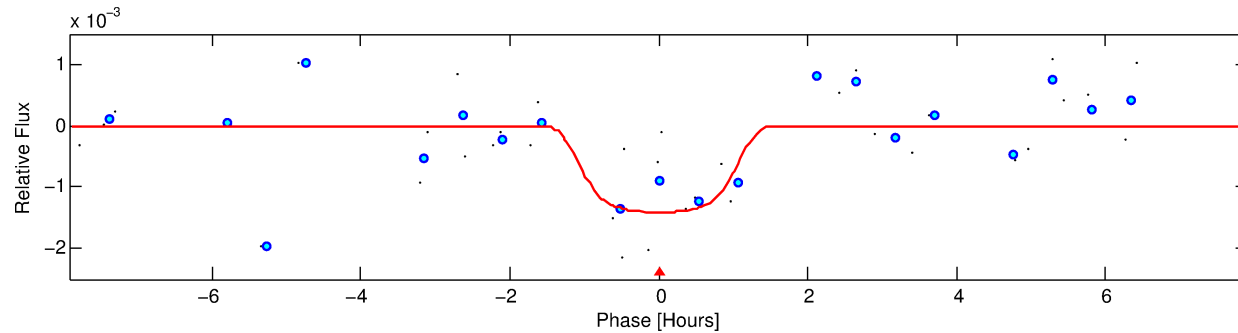
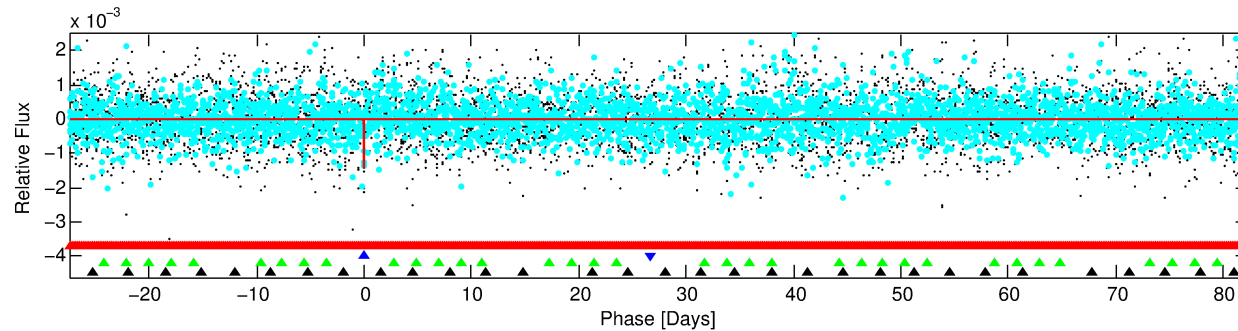
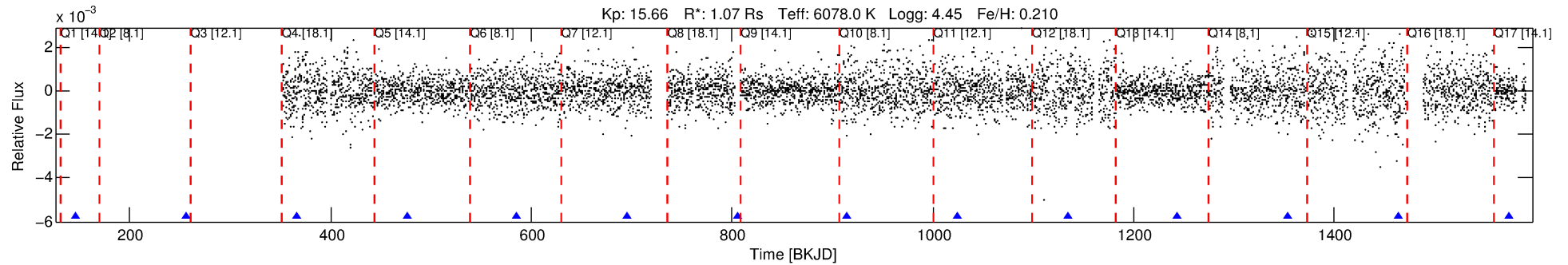
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007281951-02

No Significant Match Found

DV One-Page Summary

KIC: 7281951 Candidate: 2 of 4 Period: 109.727 d



DV Fit Results:

Period = 109.72656 [0.00249] d
Epoch = 146.7555 [0.0245] BKJD
Rp/R* = 0.0408 [0.0457]
a/R* = 167.26 [897.64]
b = 0.90 [1.15]
Seff = 6.26 [2.67]
Teq = 403 [43] K
Rp = 4.75 [5.53] Re
a = 0.4723 [0.1257] AU
Ag = 4452.02 [10239.95] [0.43σ]
Teffp = 5095 [2895] K [1.62σ]

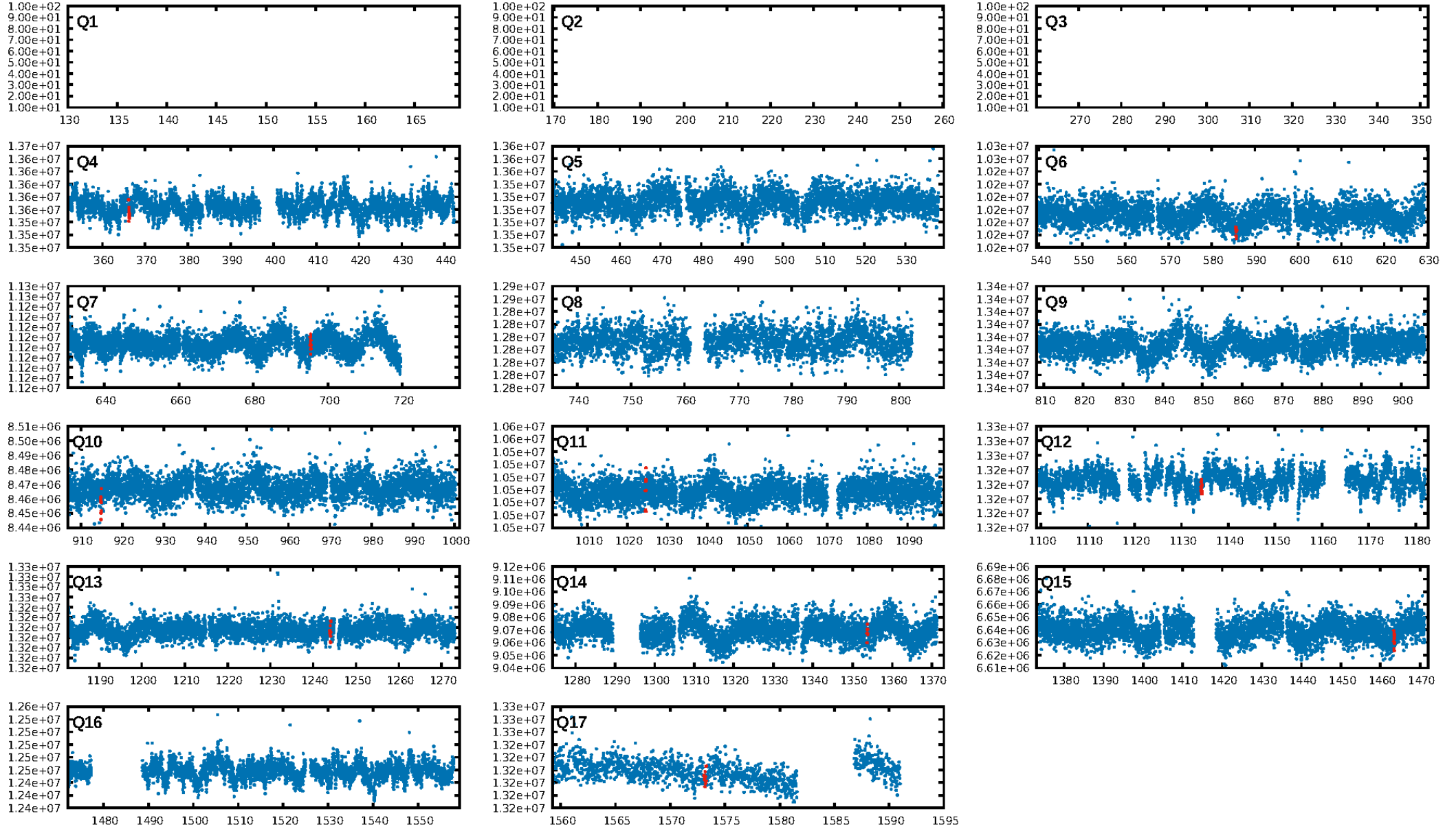
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [388.16σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 7.4%
ModelChiSquareGof-sig: 39.6%
Bootstrap-pfa: 1.30e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.529
Centroid-sig: 22.9%
Centroid-so: 5.012 arcsec [15.58σ]
OotOffset-rm: 0.817 arcsec [2.33σ]
KicOffset-rm: 10.647 arcsec [8.71σ]
OotOffset-st: 0/2/1/0 [3]
KicOffset-st: 2/2/1/0 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 0.00 [0/10]

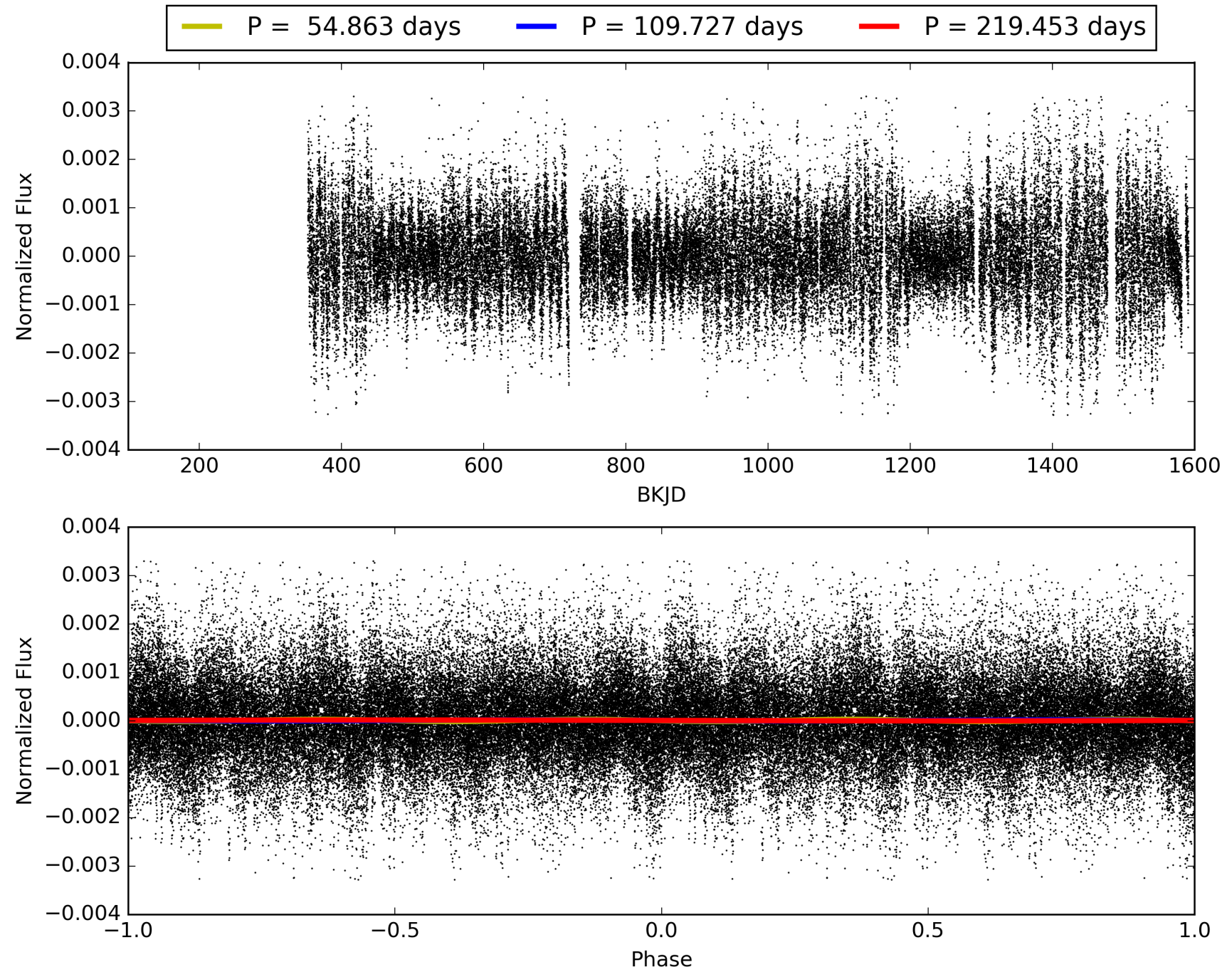
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:34:08 Z

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

TCE 007281951-02, PDC Light Curves

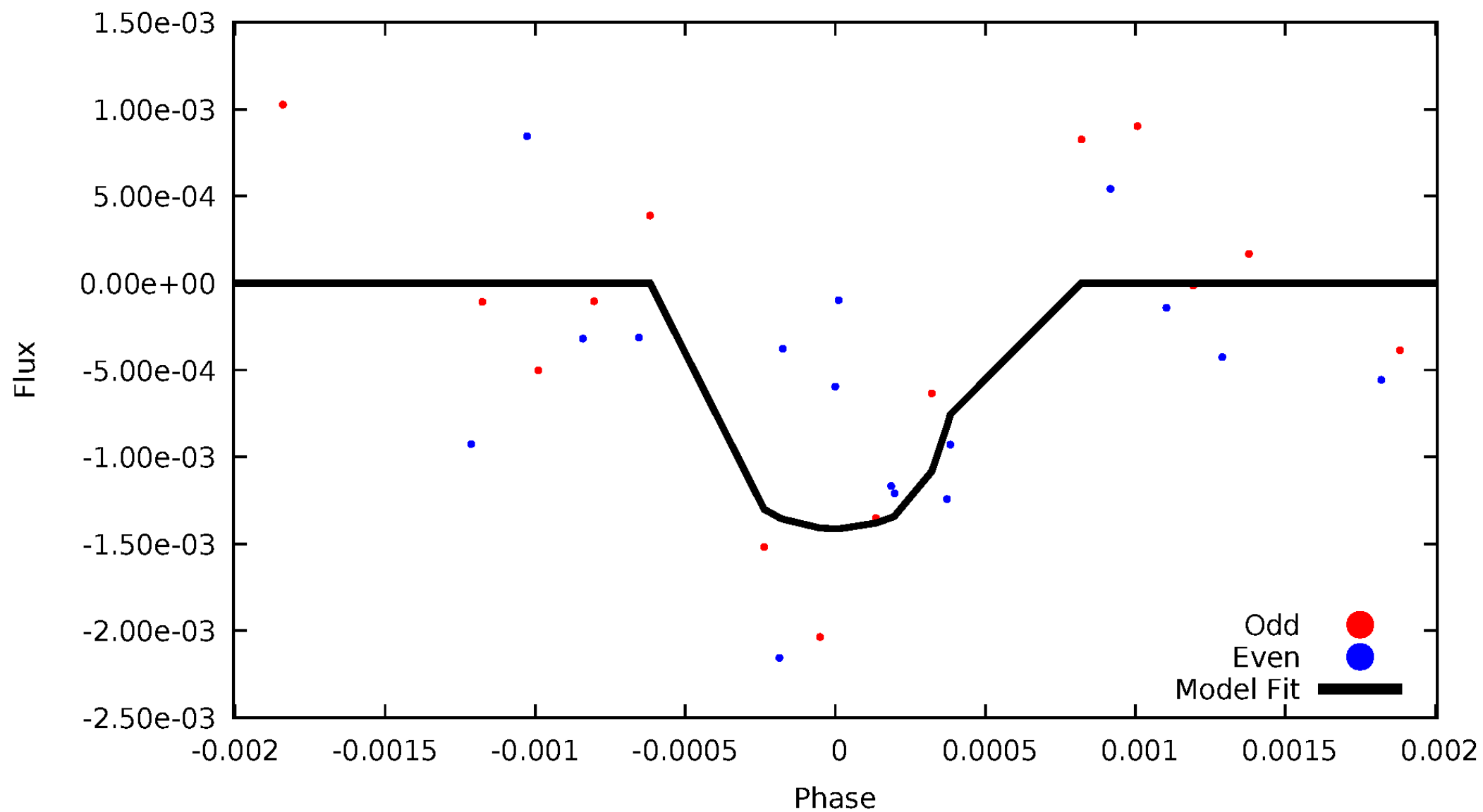


TCE 007281951-02



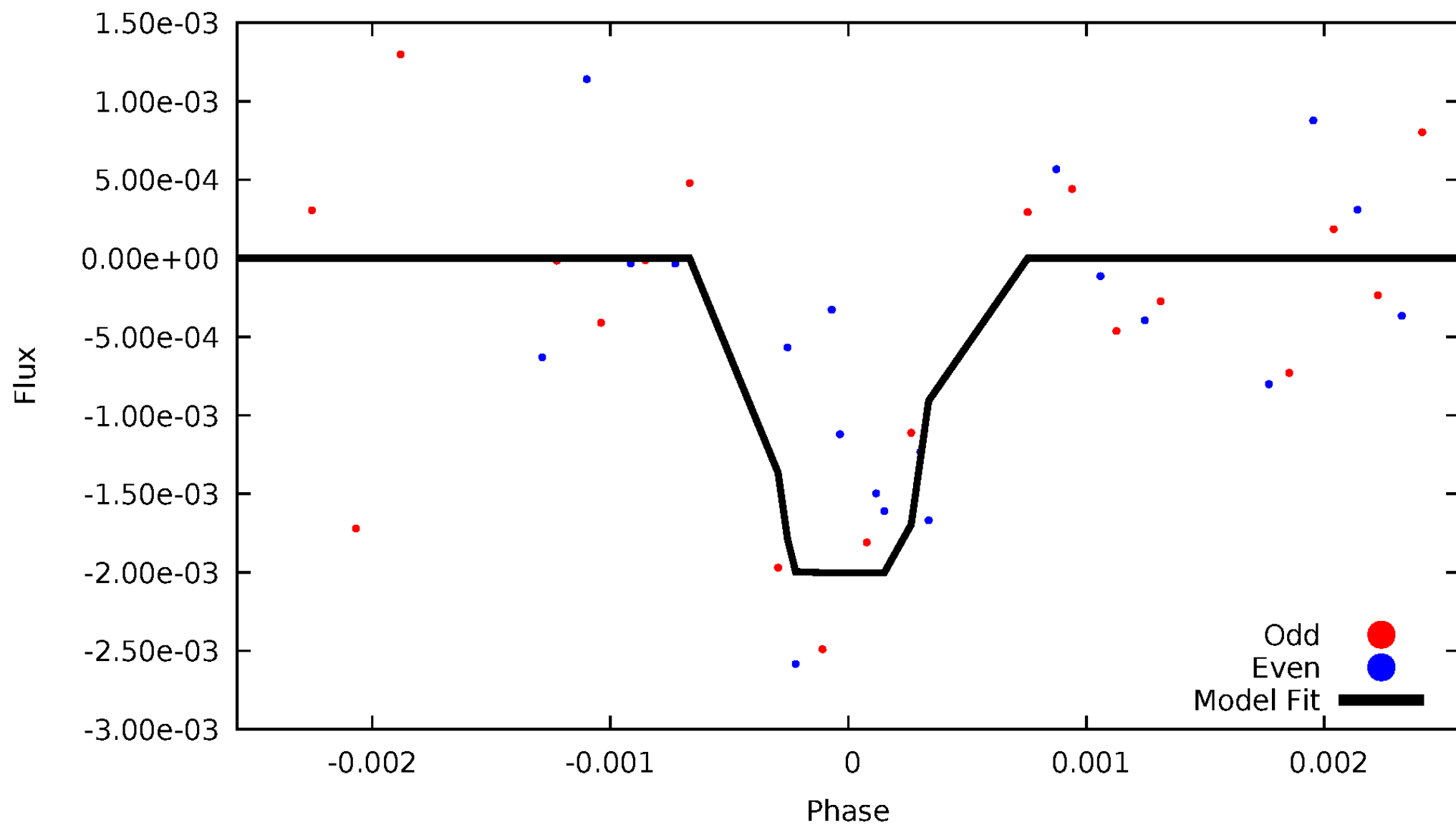
DV Odd/Even

TCE 007281951-02



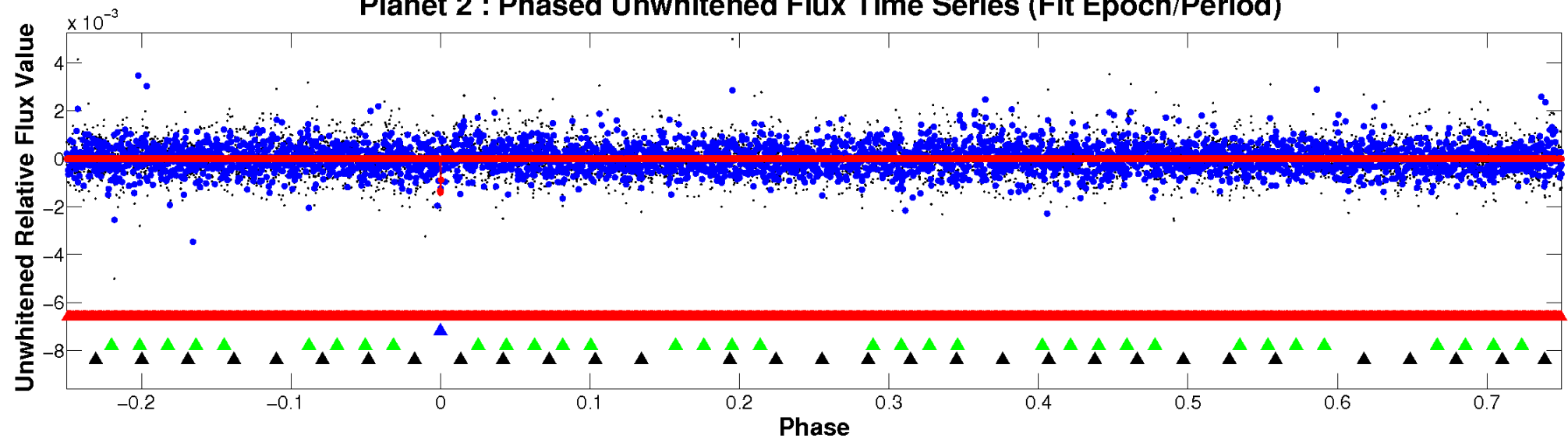
ALT Odd/Even

TCE 007281951-02

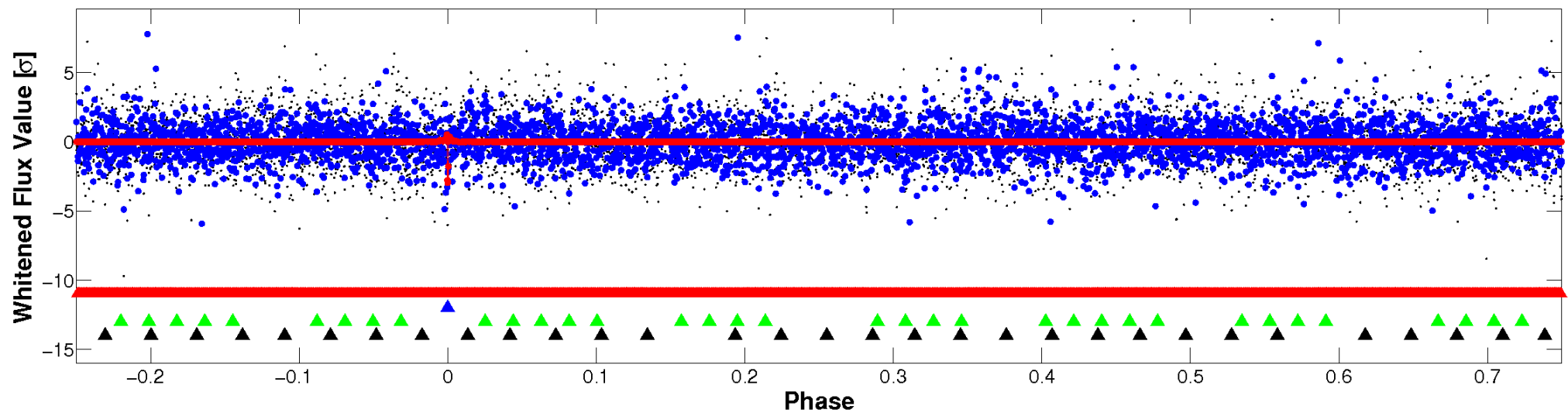


Non-Whitened Vs. Whitened Light Curve

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

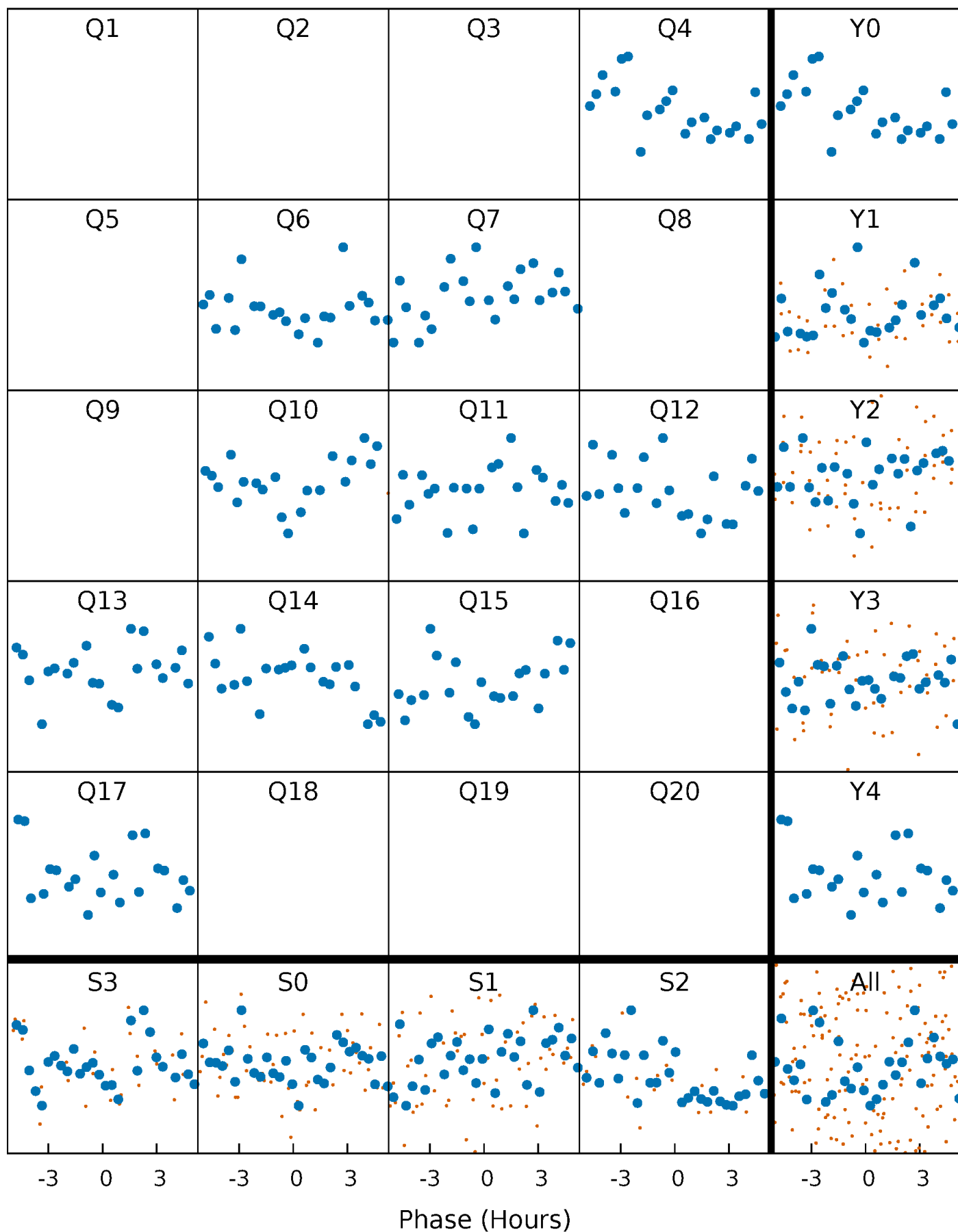


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



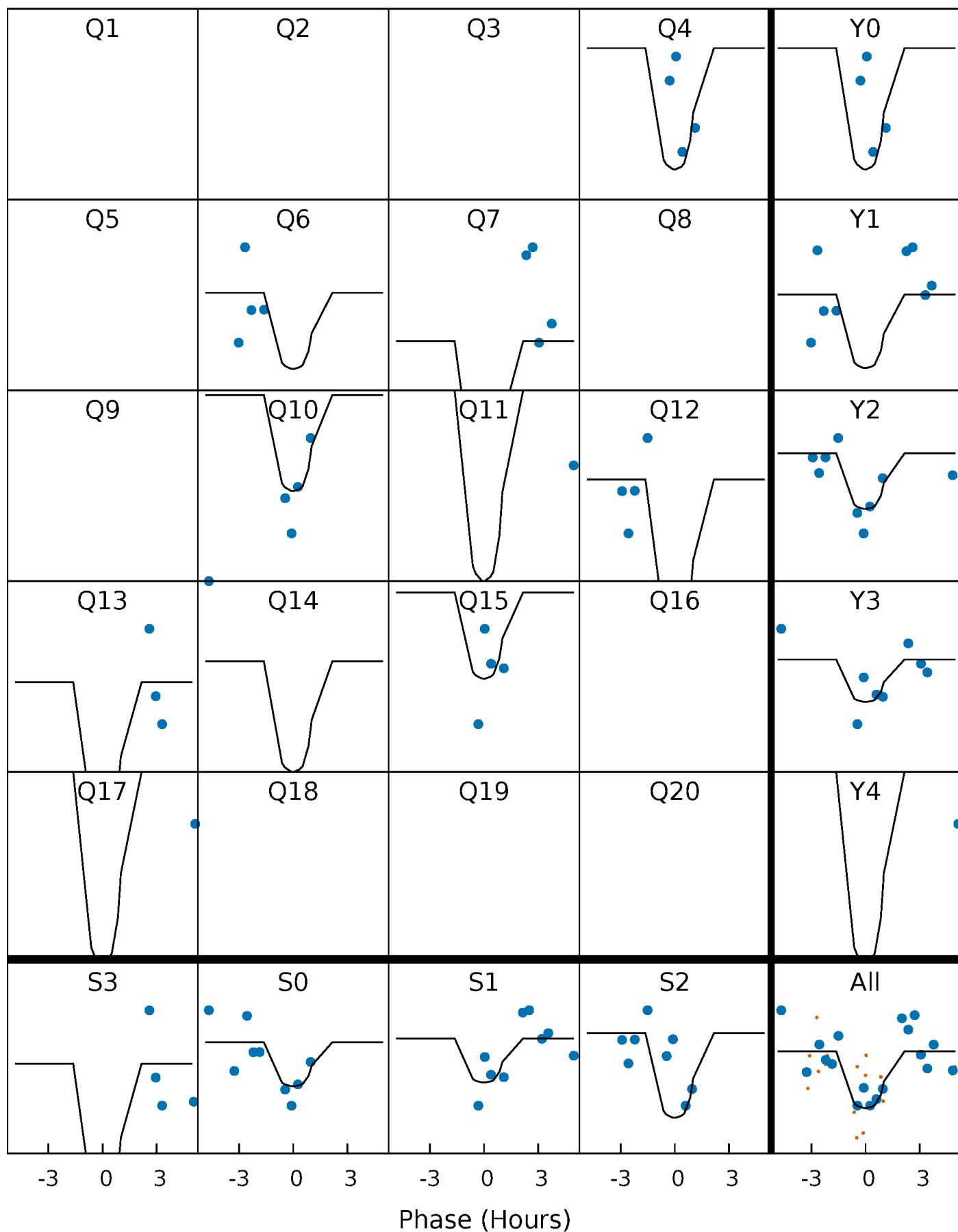
PDC Quarter-Phased Transit Curves

TCE 007281951-02 P=109.726559 Days $T_0=146.755485$ (BKJD)



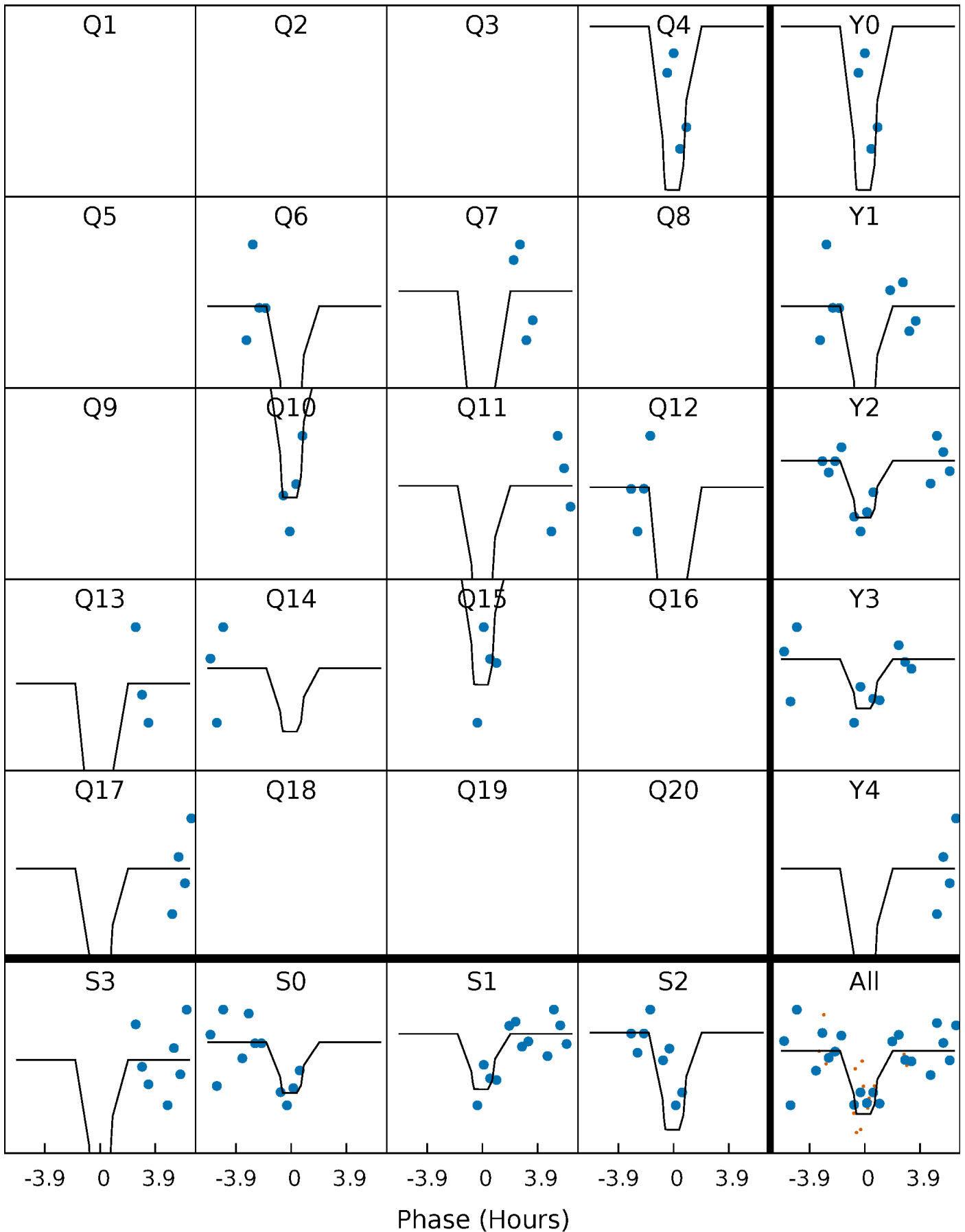
DV Quarter-Phased Transit Curves

TCE 007281951-02 P=109.726559 Days $T_0=146.755485$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

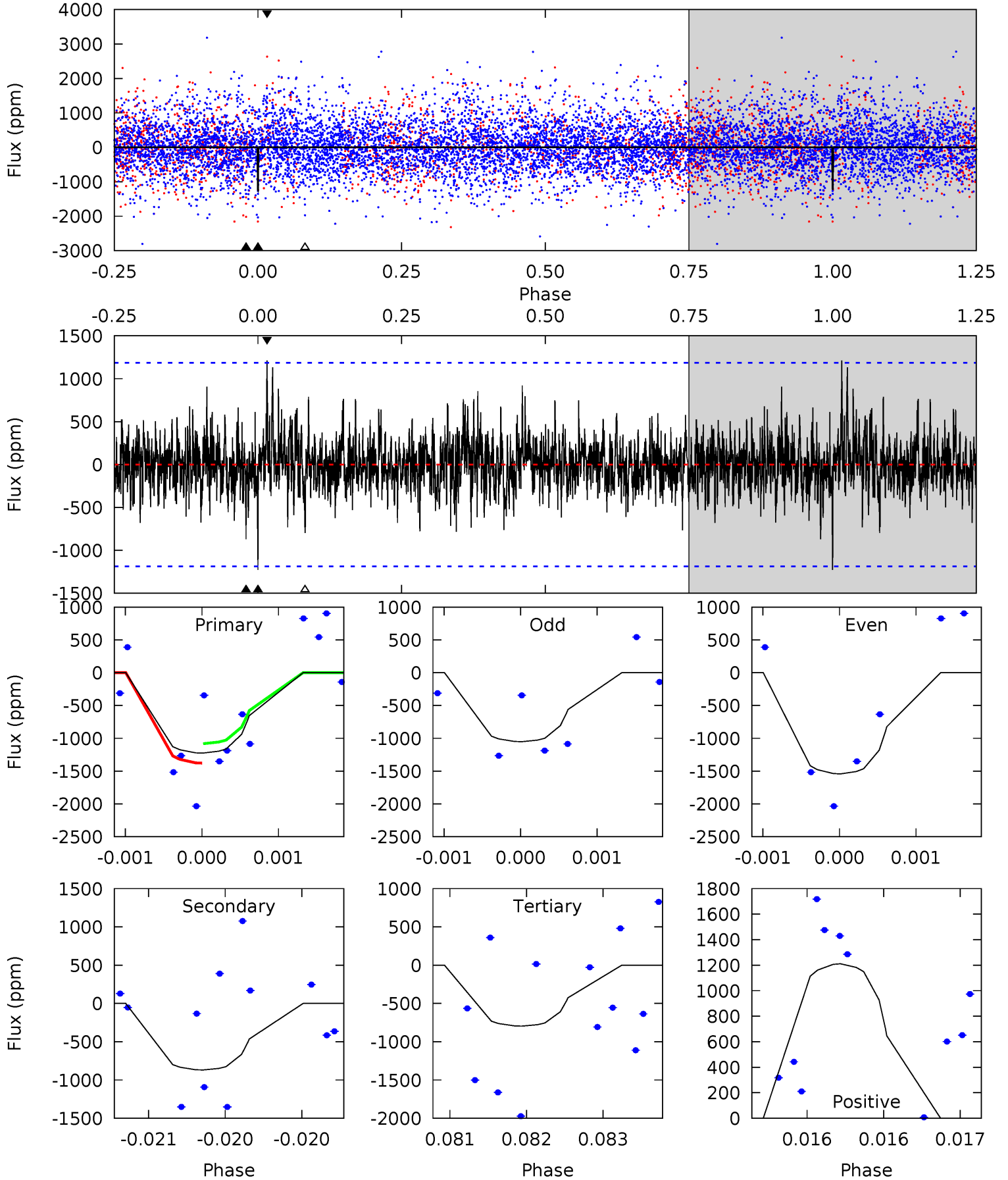
TCE 007281951-02 P=109.726060 Days $T_0=146.765334$ (BKJD)



DV Model-Shift Uniqueness Test

007281951-02, P = 109.726559 Days, E = 146.755485 Days

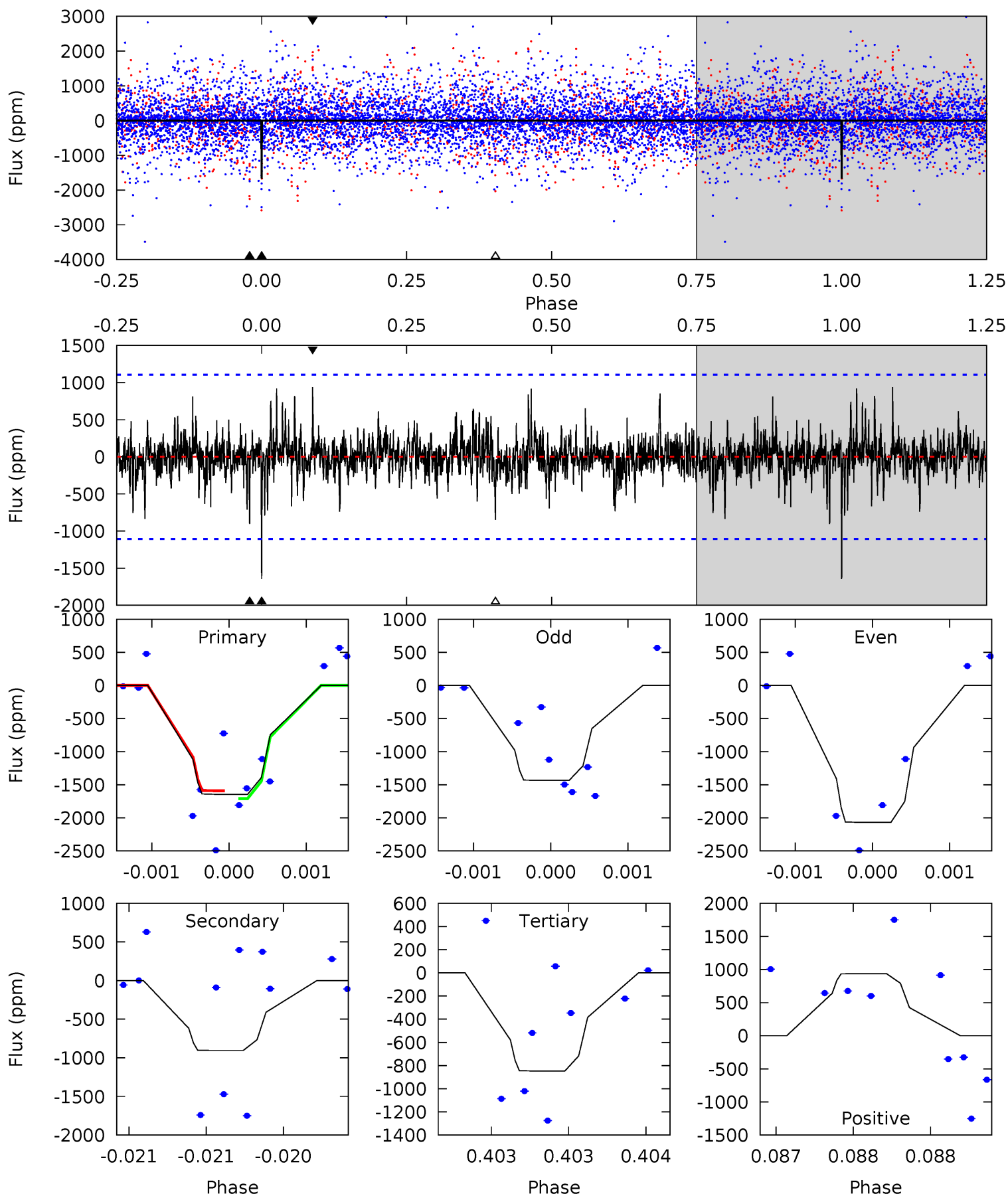
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.72	4.05	3.71	5.65	5.54	3.42	1.16	2.00	0.07	0.34	-1.59	1.14	0.86	0.50	0.69



Alt Model-Shift Uniqueness Test

007281951-02, P = 109.726060 Days, E = 146.765334 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.22	4.52	4.23	4.68	5.53	3.42	1.07	3.98	3.54	0.29	-0.16	1.58	0.87	0.36	0.30



Stellar Parameters For KIC 007281951

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6078^{+190}_{-253}	$4.447^{+0.054}_{-0.216}$	$0.210^{+0.150}_{-0.350}$	$1.069^{+0.334}_{-0.111}$	$1.167^{+0.136}_{-0.166}$	$1.347^{+0.388}_{-0.716}$
	+3%/-4%	+1%/-5%	+71%/-167%	+31%/-10%	+12%/-14%	+29%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 007281951-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-869 ± 214	$6.66^{+4.66}_{-4.40}$	575^{+47}_{-30}	4641^{+2944}_{-880}	2395^{+15432}_{-1614}
Alt.	-905 ± 200	$6.52^{+5.32}_{-4.00}$	574^{+43}_{-33}	4700^{+2536}_{-964}	2634^{+13679}_{-1907}

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

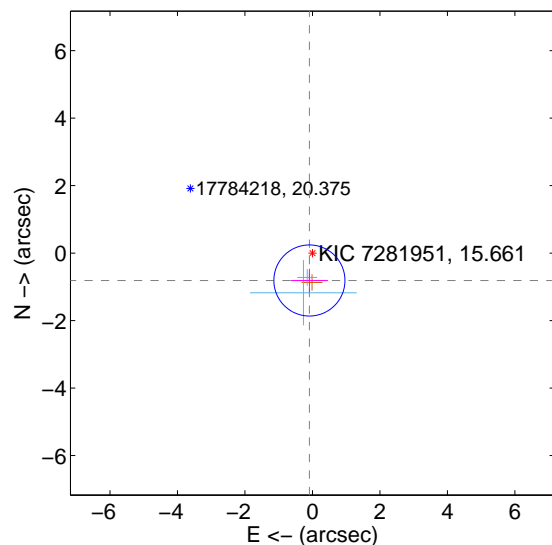
Supplemental centroid analysis for 007281951-02. Kepler magnitude: 15.66. Transit SNR 9.26

There are 3 quarters with good PRF difference image offsets

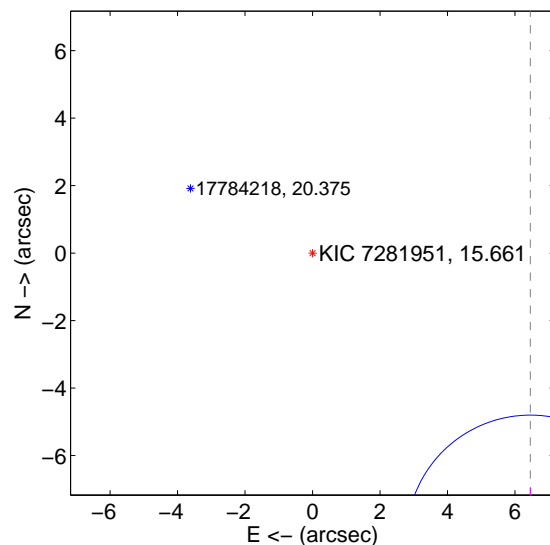
The OOT PRF centroid is offset from the target star catalog position by about 10.67 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.817 ± 0.351	2.33	0.090 ± 0.550	-0.812 ± 0.348
PRF-fit source offset from KIC position	10.647 ± 1.222	8.71	-6.455 ± 0.214	-8.467 ± 1.508
photometric centroid source offset	5.01 ± 0.32	15.58	-2.48 ± 0.30	-4.36 ± 0.33

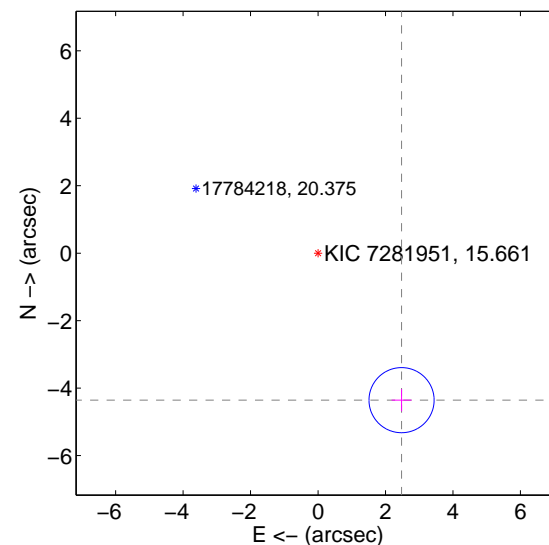
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

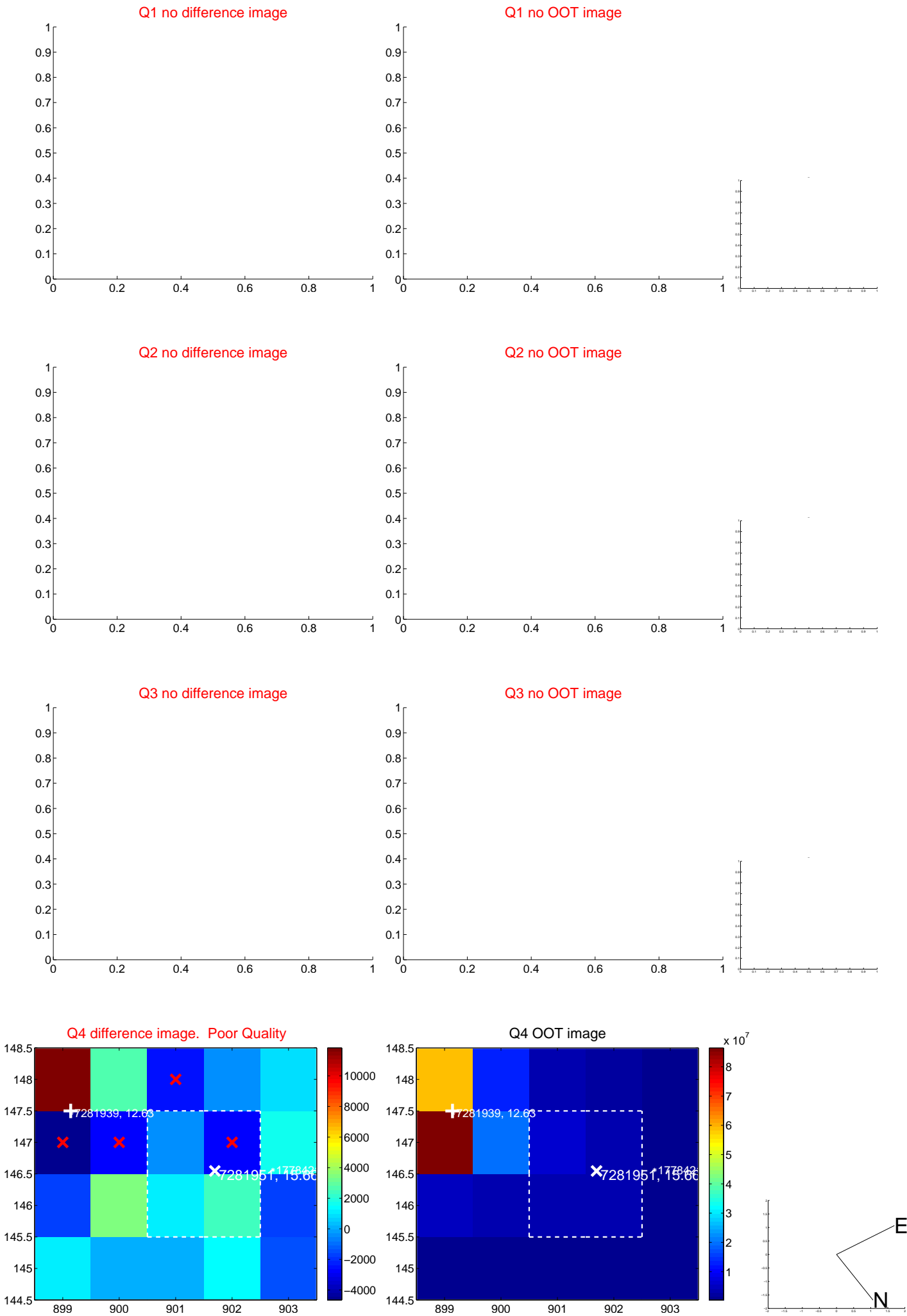


offset from photometric centroids



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.

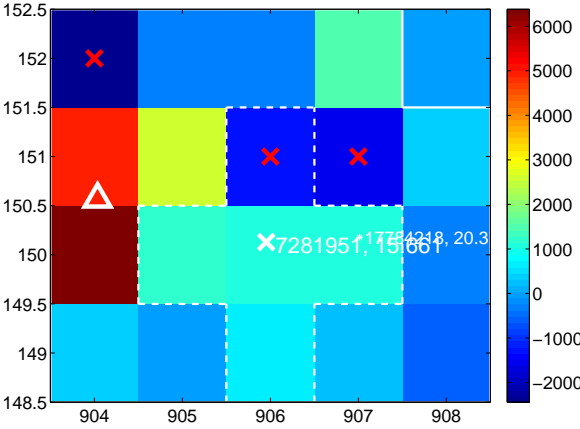
Q5 no difference image



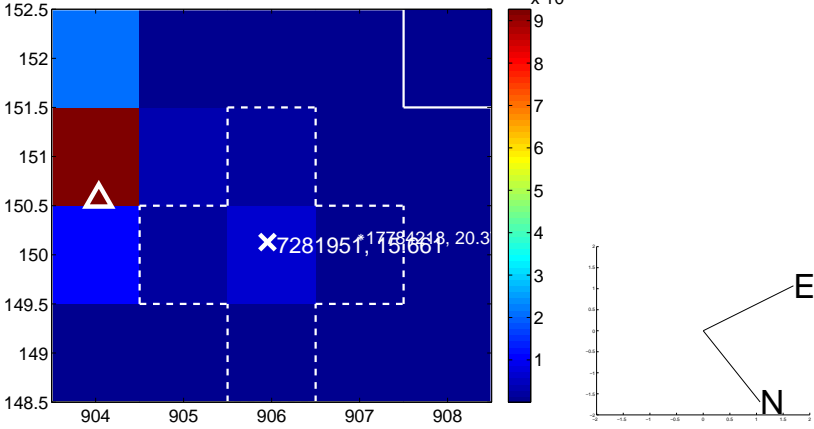
Q5 no OOT image



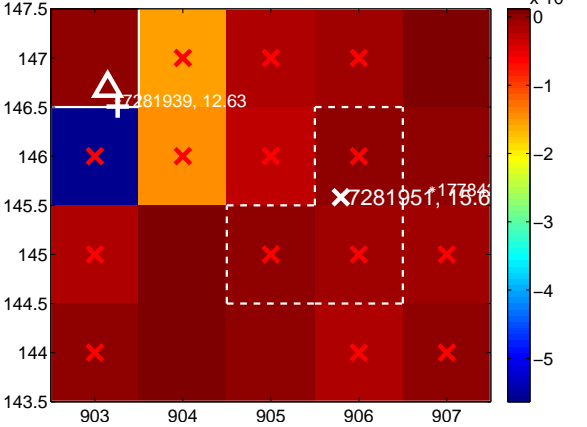
Q6 difference image



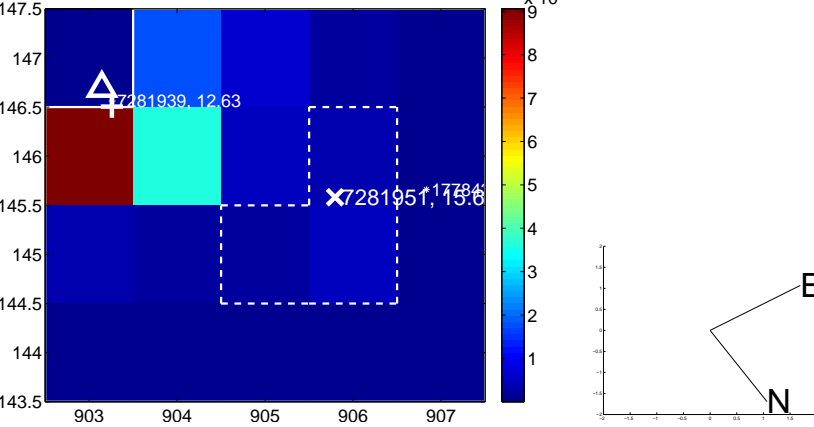
Q6 OOT image



Q7 difference image. Poor Quality



Q7 OOT image



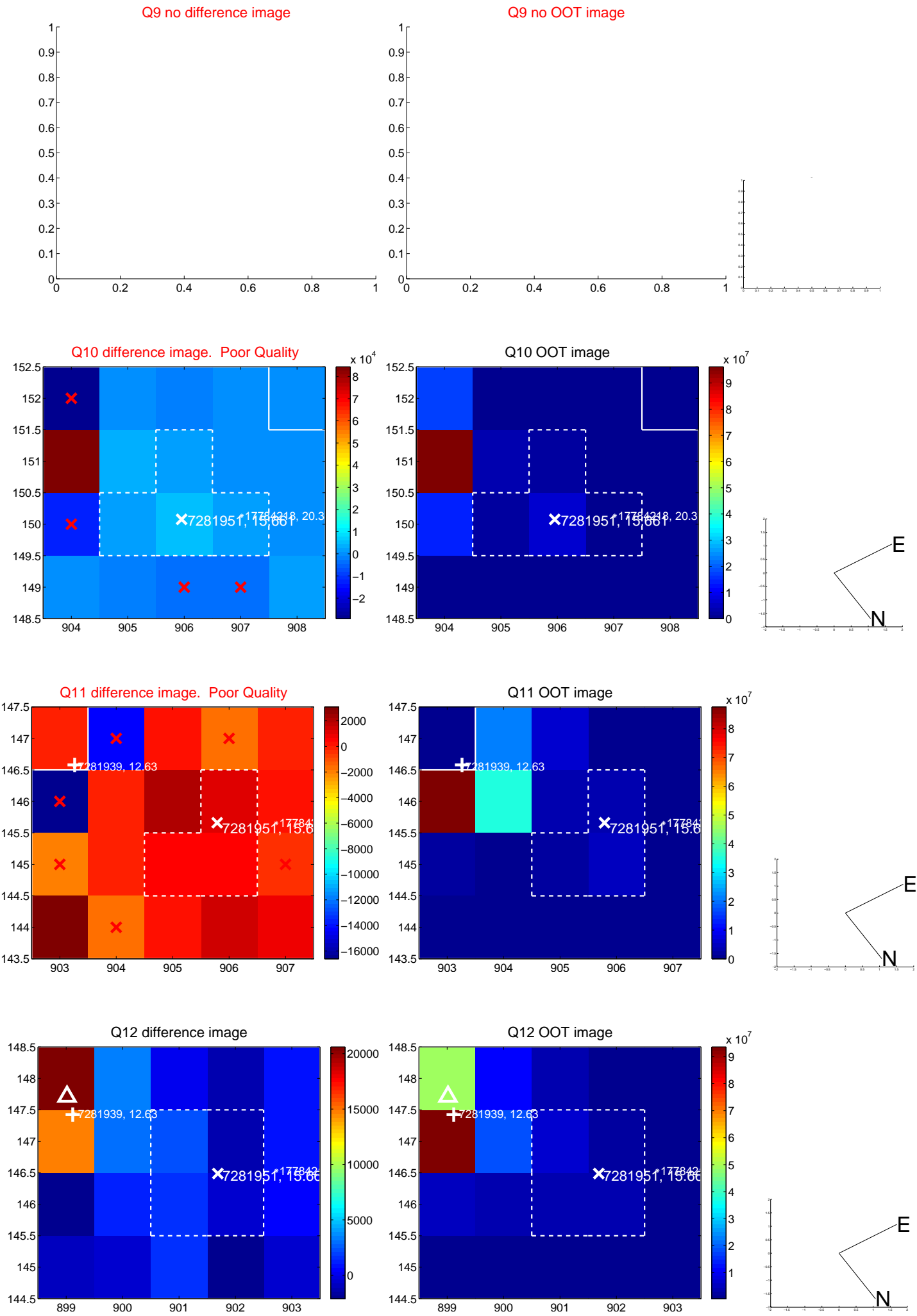
Q8 no difference image



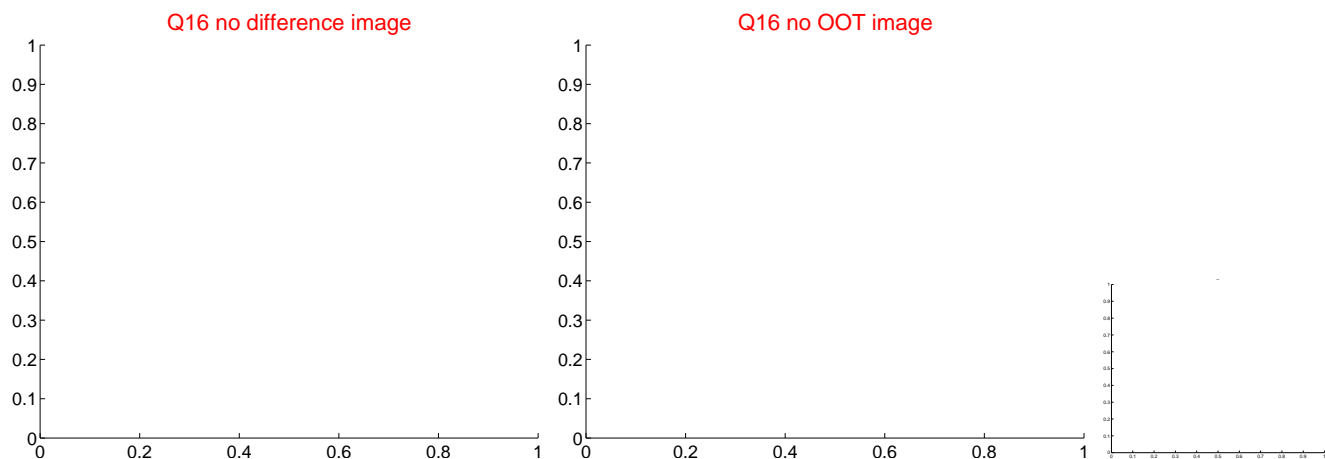
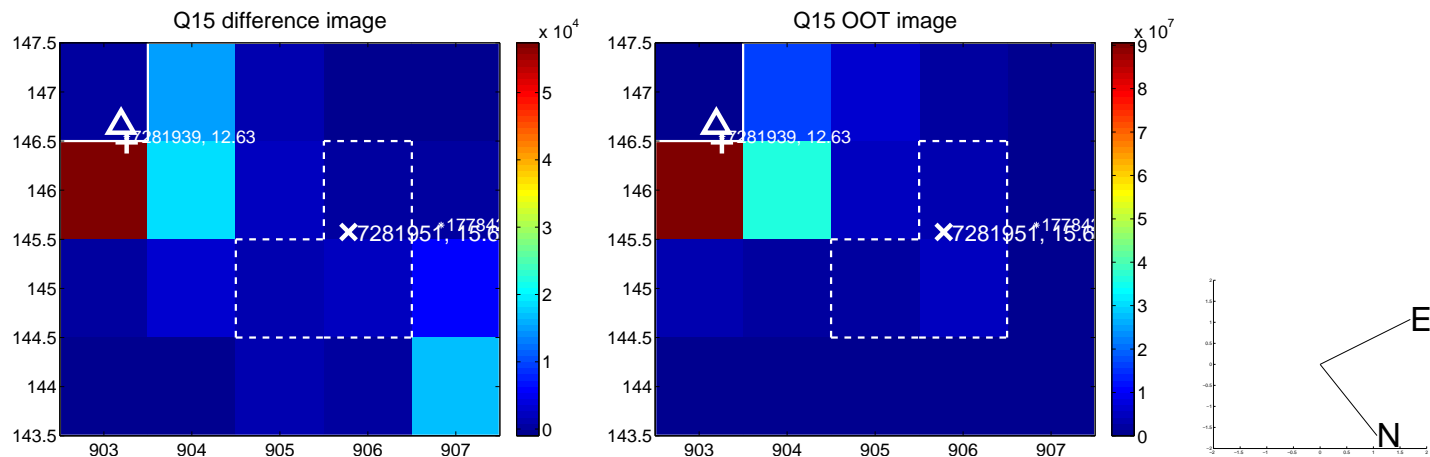
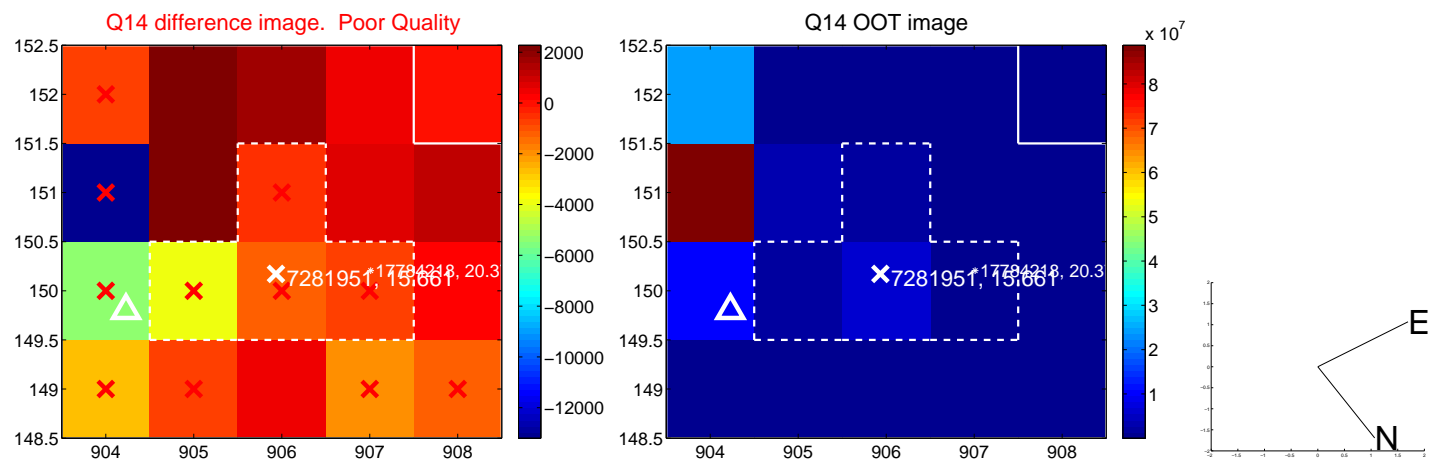
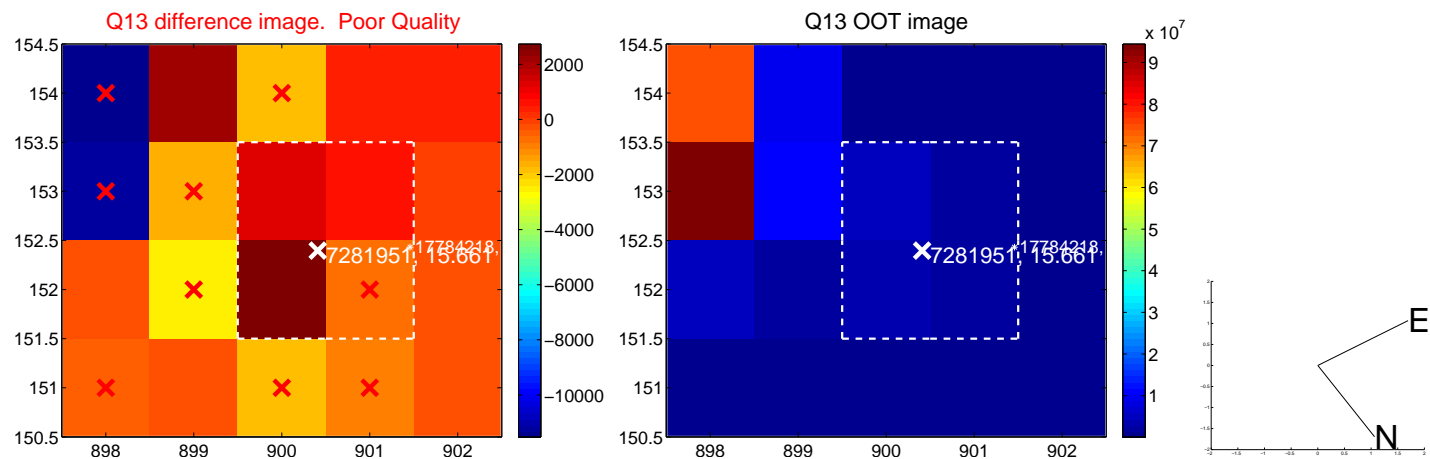
Q8 no OOT image



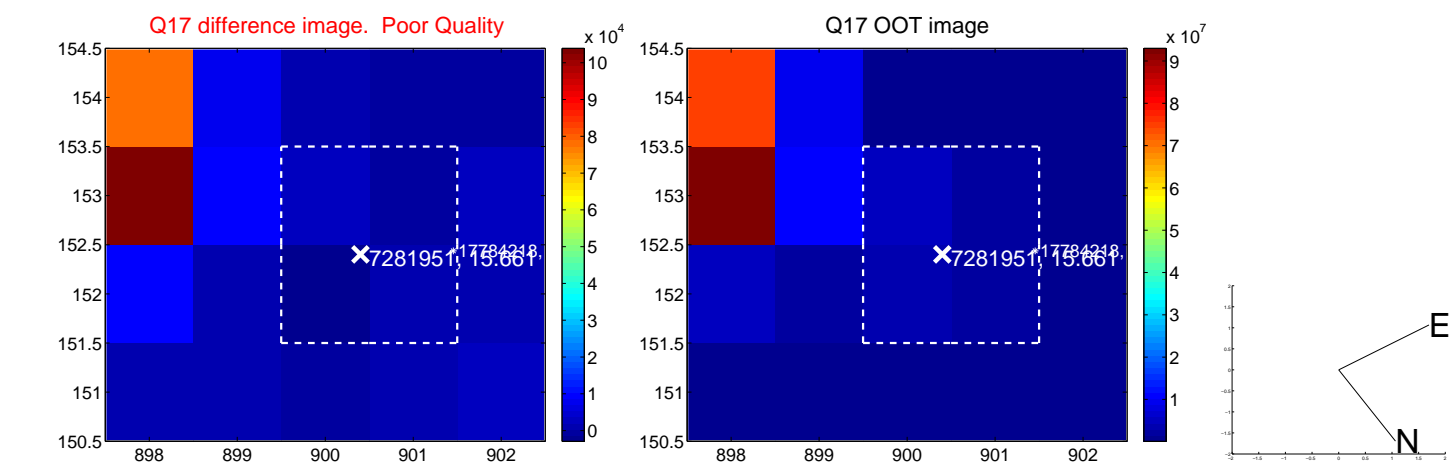
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



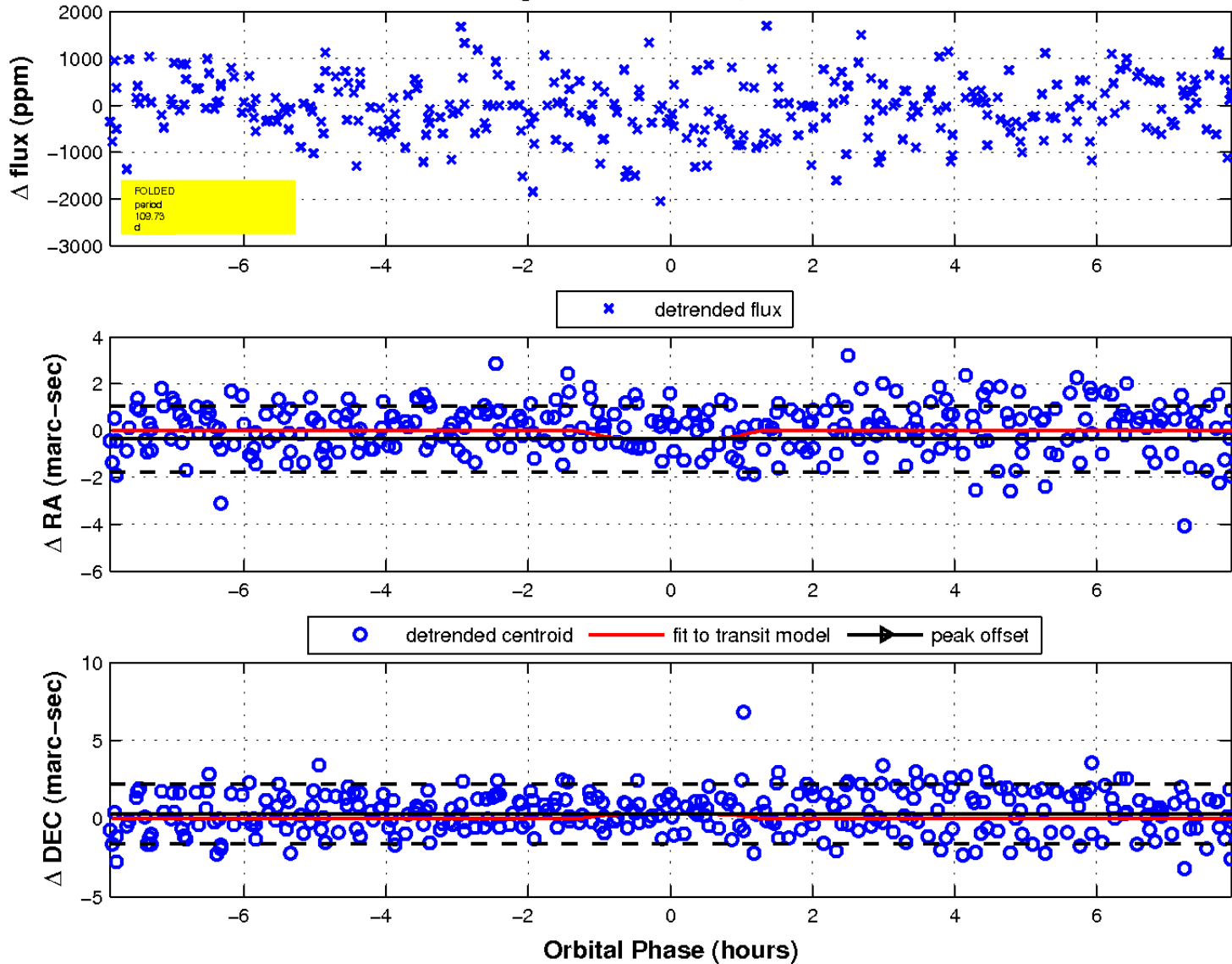
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



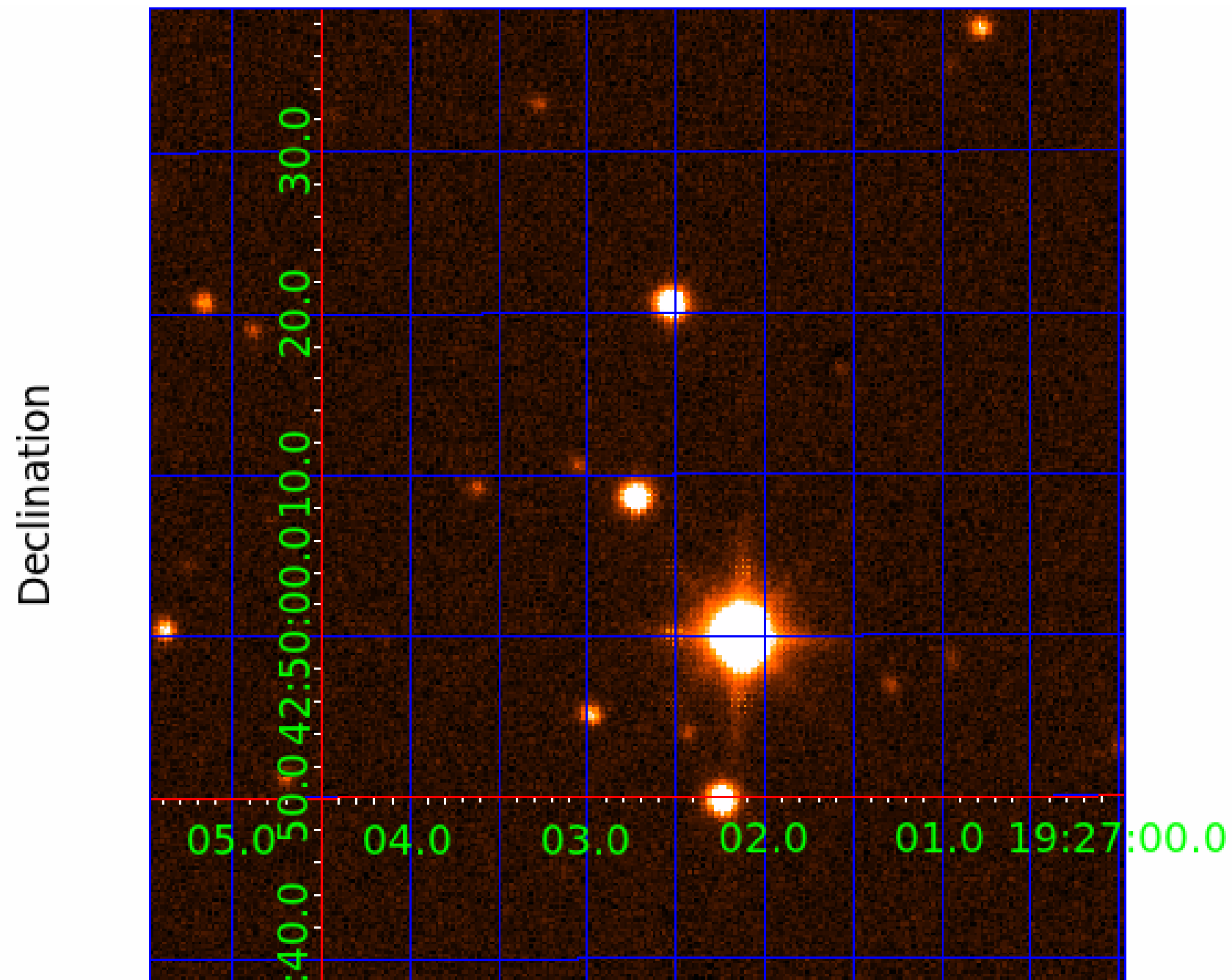
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 4



UKIRT Image



KIC 007281951

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})
007281951-01	OBS	No	0.566764	131.868388	43.9	3.773	10.3	6.5	1.07	6078	0.86	7015.41
007281951-02	OBS	No	109.726559	146.755485	1413.3	2.641	9.2	9.3	1.07	6078	4.75	6.26
007281951-03	OBS	No	41.405847	149.527131	1559.4	3.356	9.3	9.5	1.07	6078	5.39	22.97
007281951-04	OBS	No	46.542416	148.244594	1693.1	2.879	8.4	11.7	1.07	6078	4.63	19.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281951-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281951-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET
007281951-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007281951-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

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

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

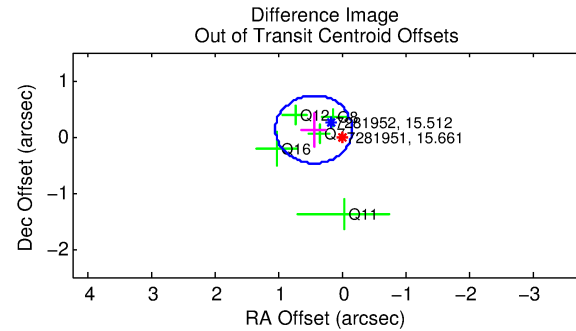
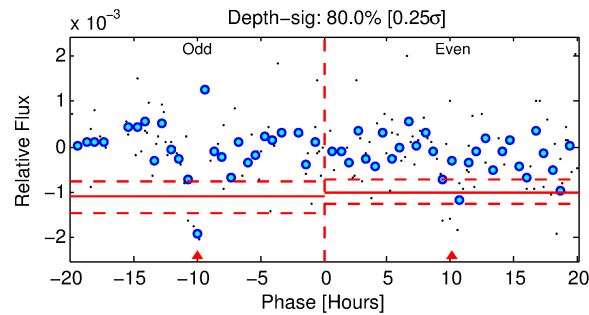
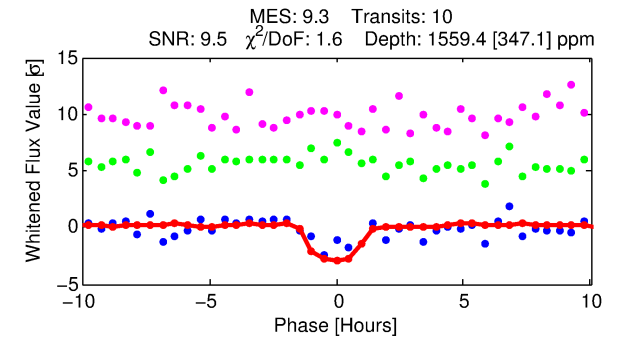
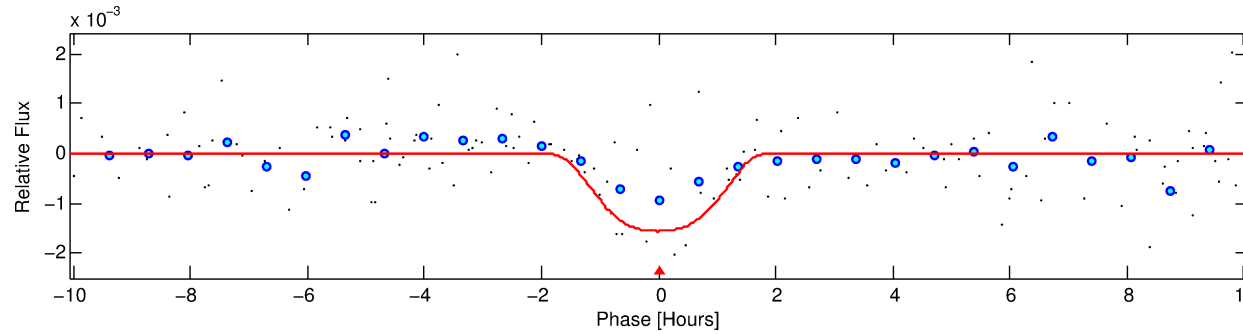
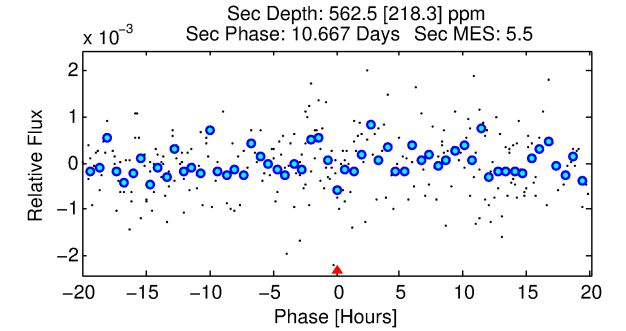
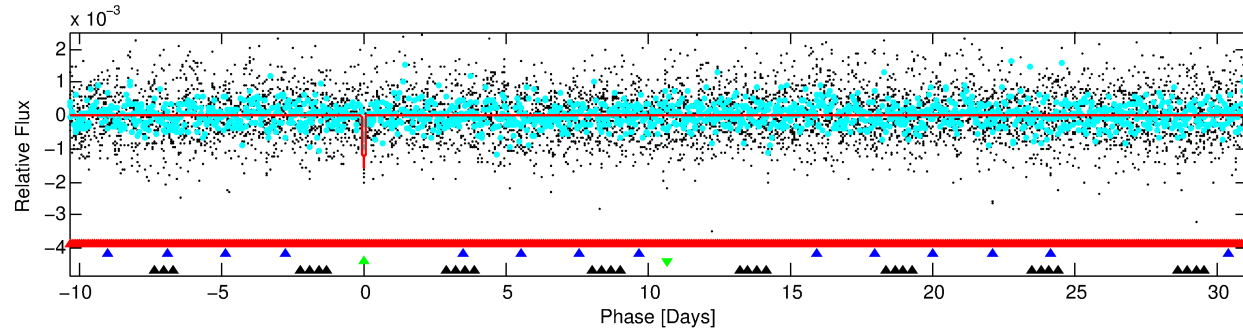
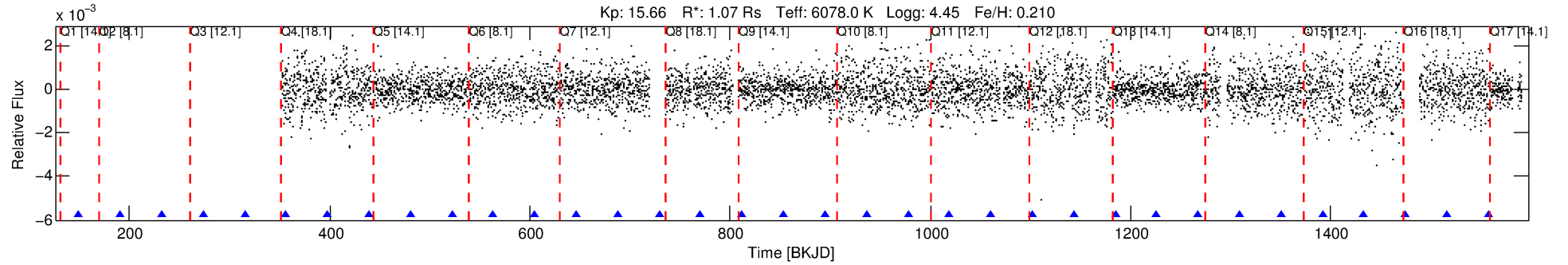
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007281951-03

No Significant Match Found

DV One-Page Summary

KIC: 7281951 Candidate: 3 of 4 Period: 41.406 d



DV Fit Results:

Period = 41.40585 [0.00052] d
Epoch = 149.5271 [0.0099] BKJD
Rp/R* = 0.0462 [0.0081]
a/R* = 40.93 [9.47]
b = 0.95 [0.03]
Seff = 22.97 [9.77]
Teq = 558 [59] K
Rp = 5.39 [1.93] Re
a = 0.2466 [0.0657] AU
Ag = 647.86 [422.55] [1.53 σ]
Teff = 4354 [596] K [6.34 σ]

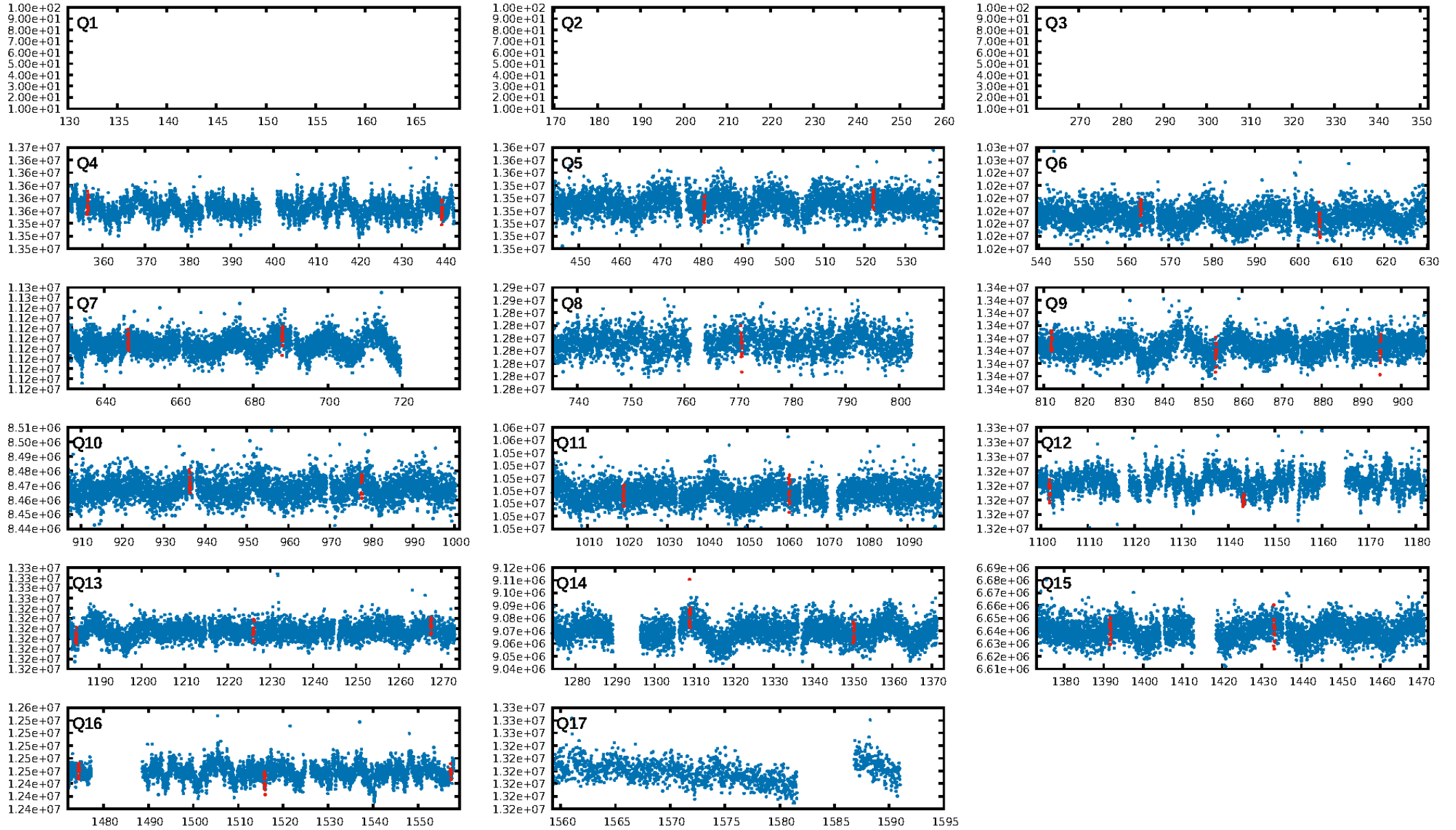
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [194.10 σ]
LongPeriod-sig: 100.0% [27.88 σ]
ModelChiSquare2-sig: 28.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.74e-11
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: 1.34
Centroid-sig: 93.7%
Centroid-so: 4.964 arcsec [24.21 σ]
OotOffset-rm: 0.470 arcsec [2.34 σ]
KicOffset-rm: 10.402 arcsec [36.29 σ]
OotOffset-st: 0/2/3/0 [5]
KicOffset-st: 0/2/3/1 [6]
DiffImageQuality-fgm: 0.50 [3/6]
DiffImageOverlap-fno: 0.00 [0/13]

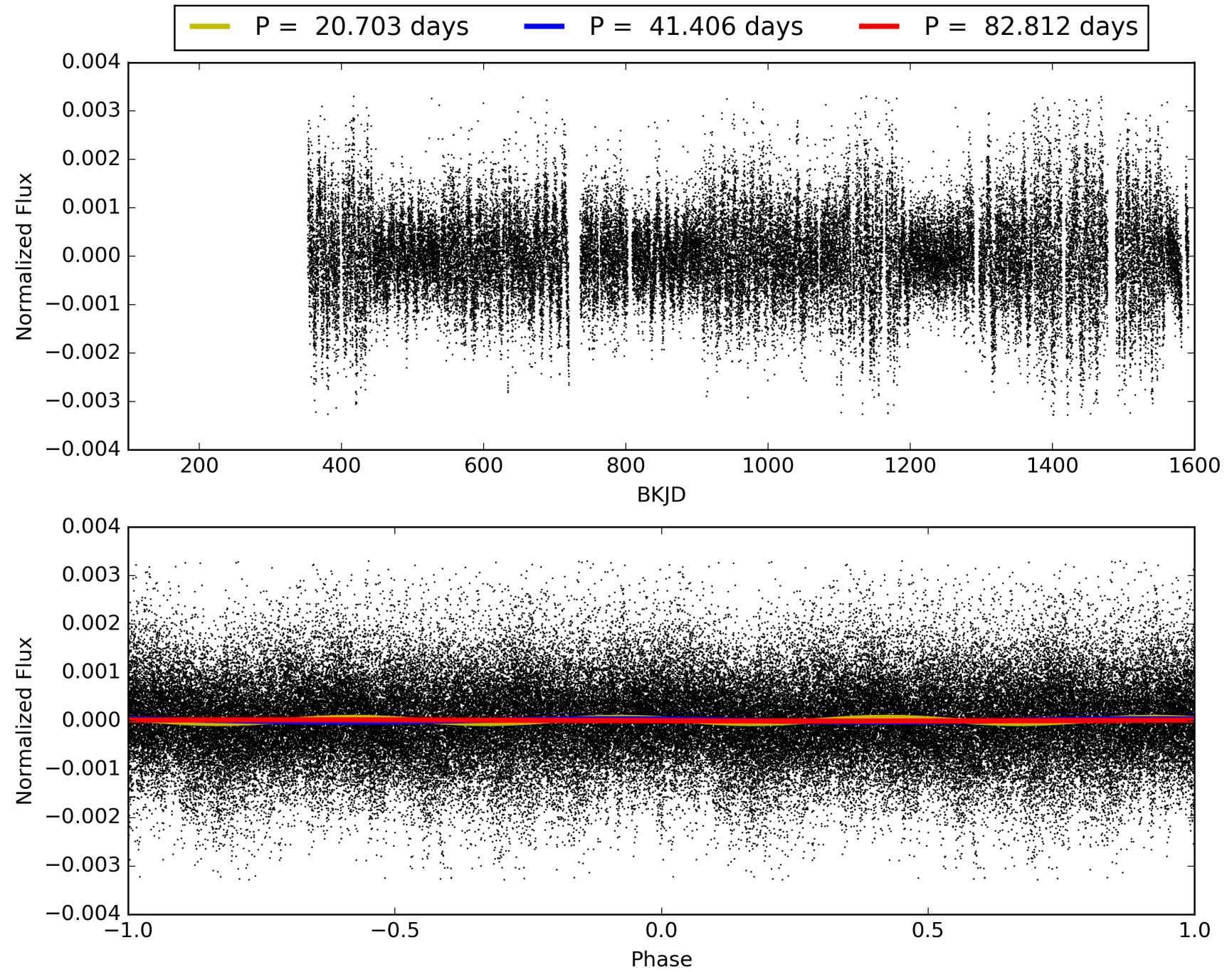
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:34:11 Z

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

TCE 007281951-03, PDC Light Curves

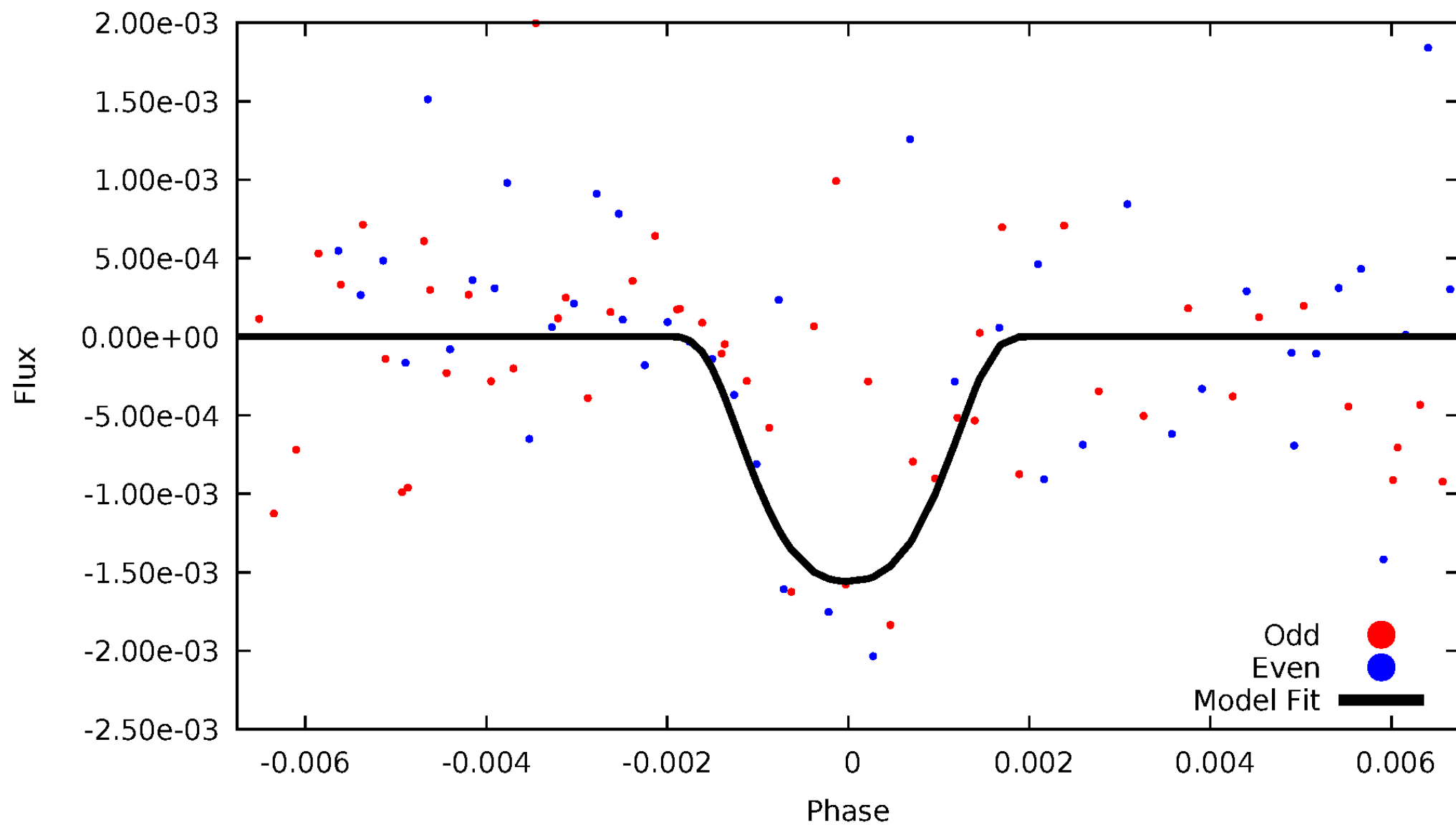


TCE 007281951-03



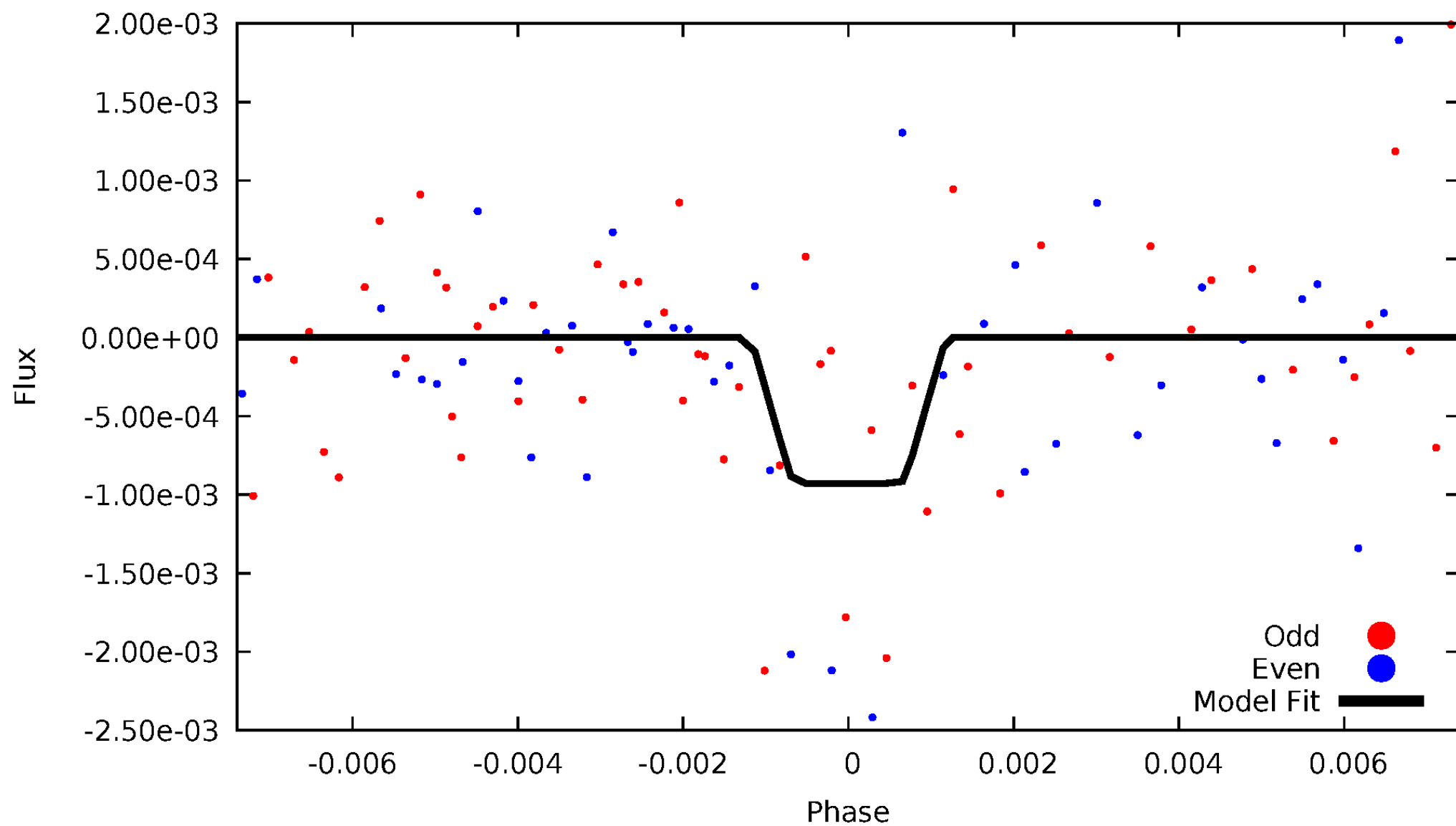
DV Odd/Even

TCE 007281951-03



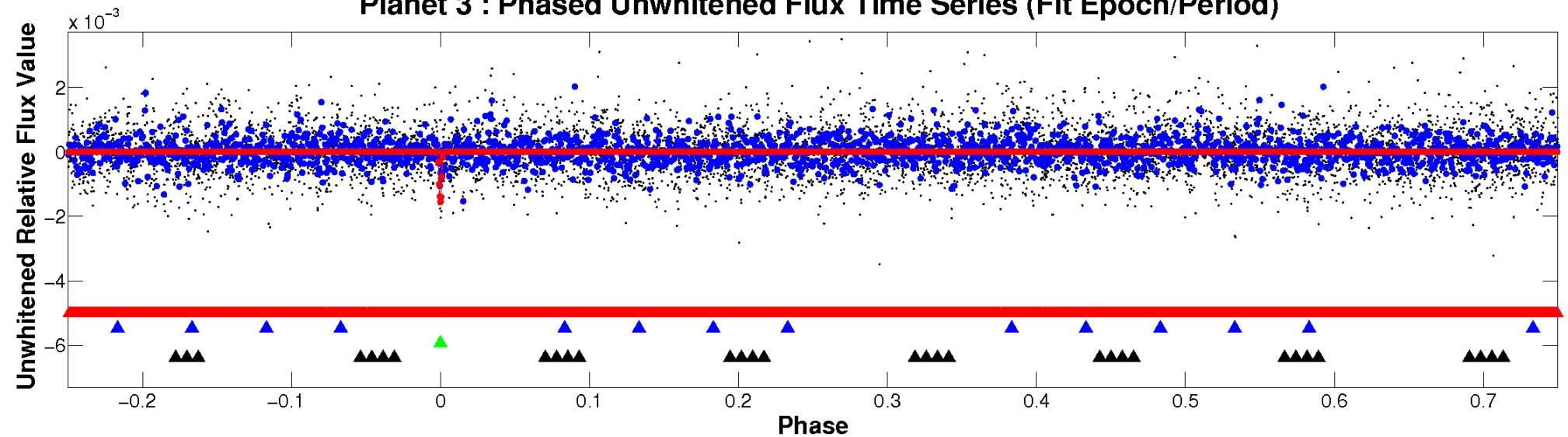
ALT Odd/Even

TCE 007281951-03

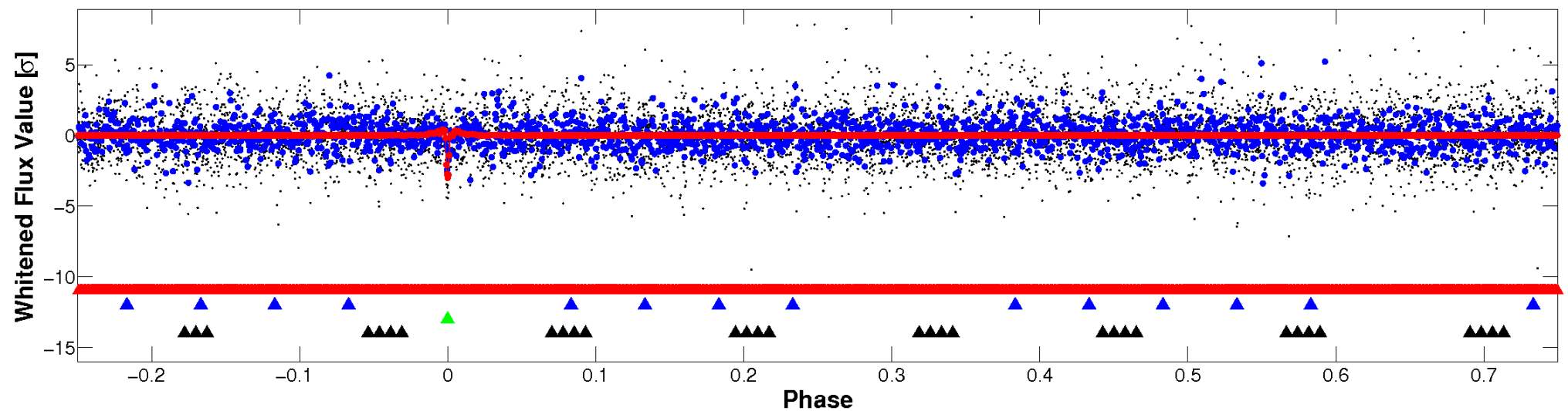


Non-Whitened Vs. Whitened Light Curve

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

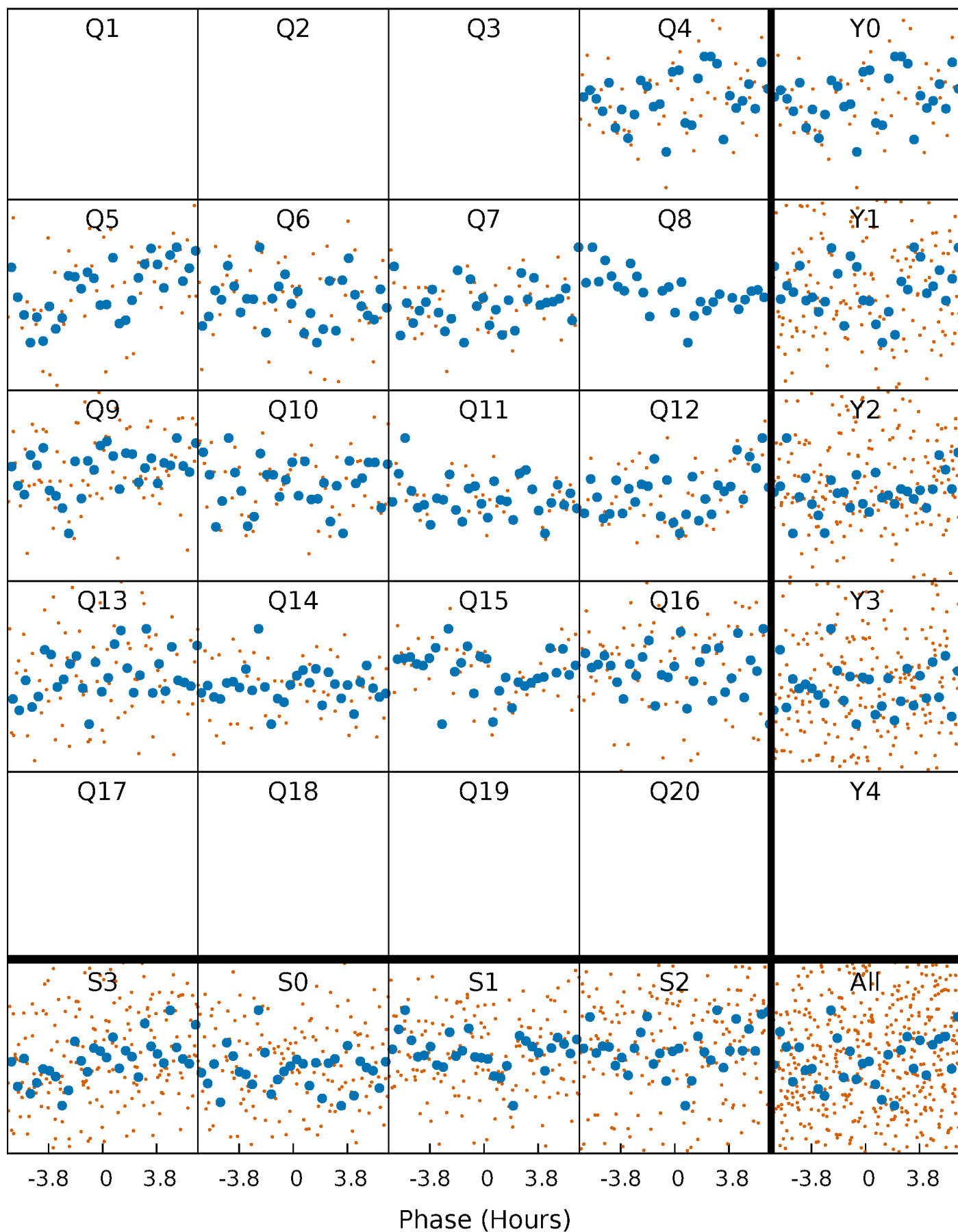


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



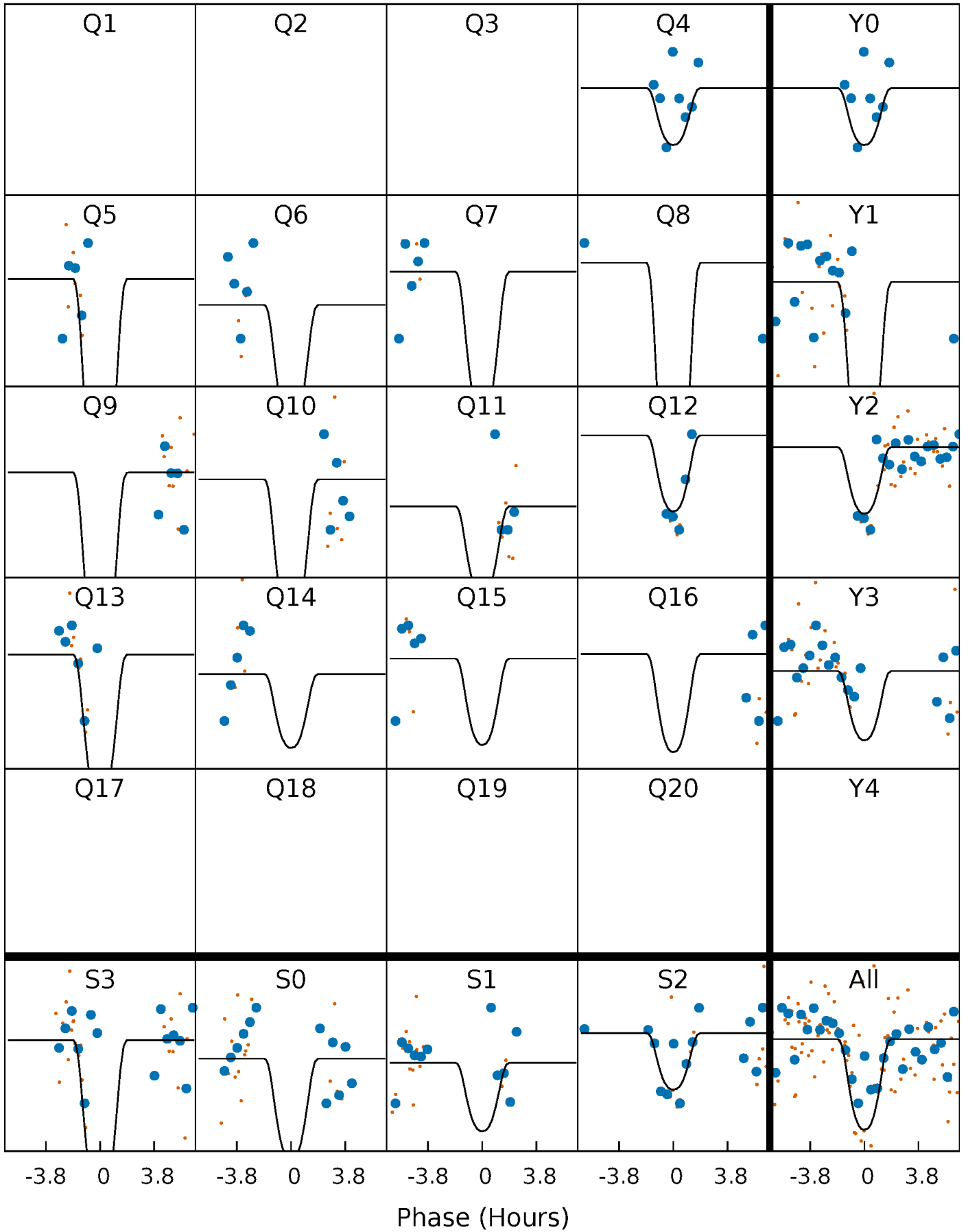
PDC Quarter-Phased Transit Curves

TCE 007281951-03 P= 41.405847 Days $T_0=149.527131$ (BKJD)



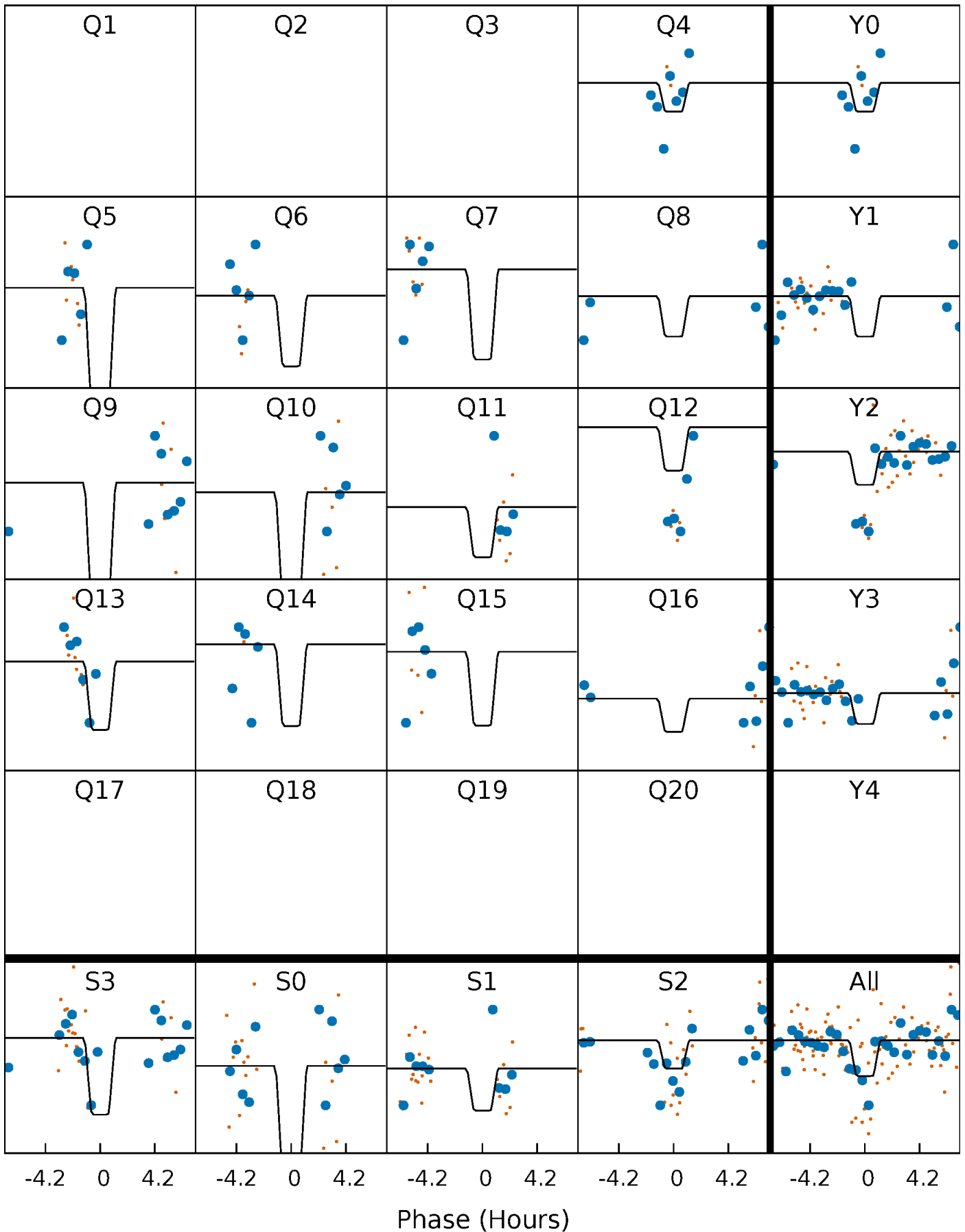
DV Quarter-Phased Transit Curves

TCE 007281951-03 P= 41.405847 Days $T_0=149.527131$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

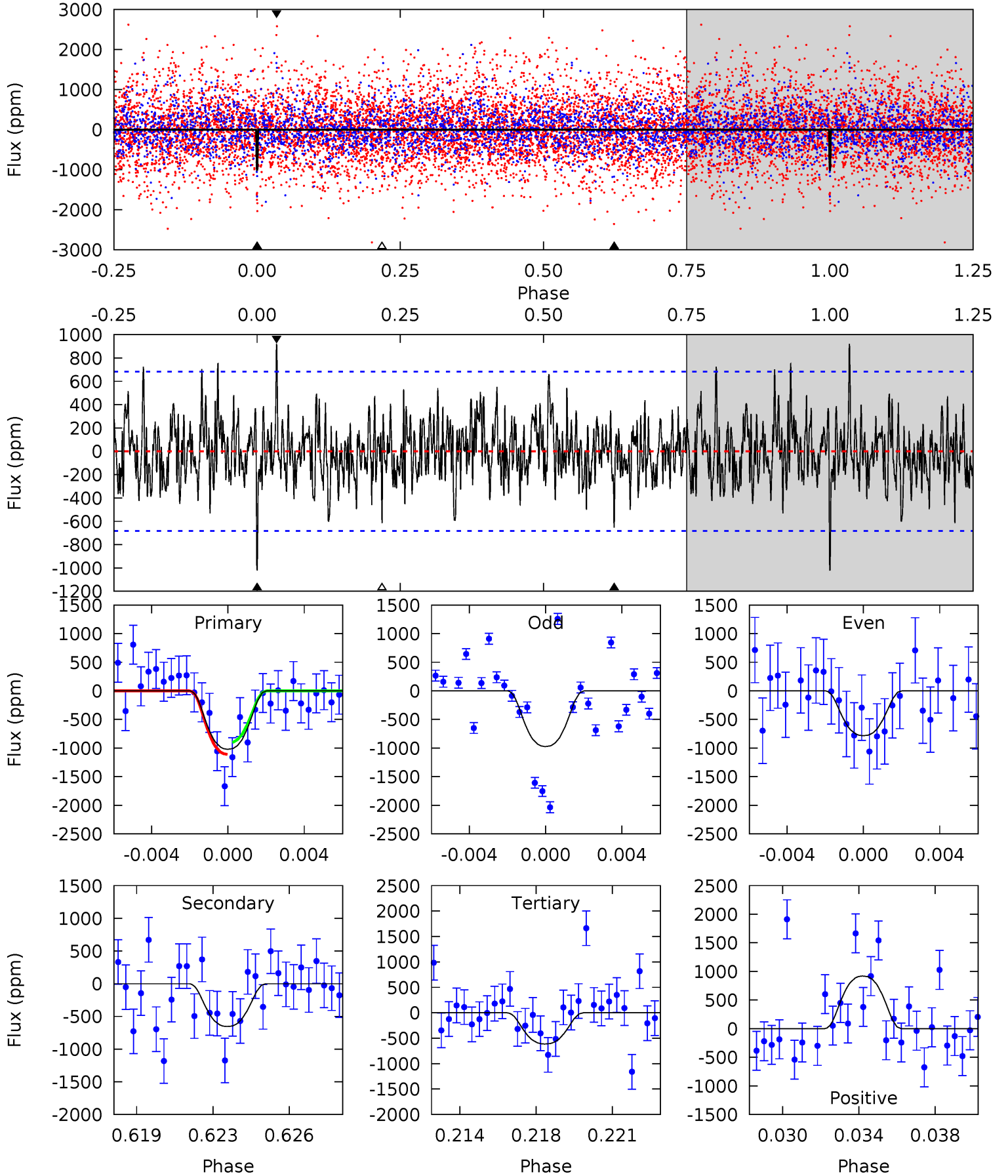
TCE 007281951-03 $P = 41.404866$ Days $T_0 = 149.549893$ (BKJD)



DV Model-Shift Uniqueness Test

007281951-03, $P = 41.405847$ Days, $E = 149.527131$ Days

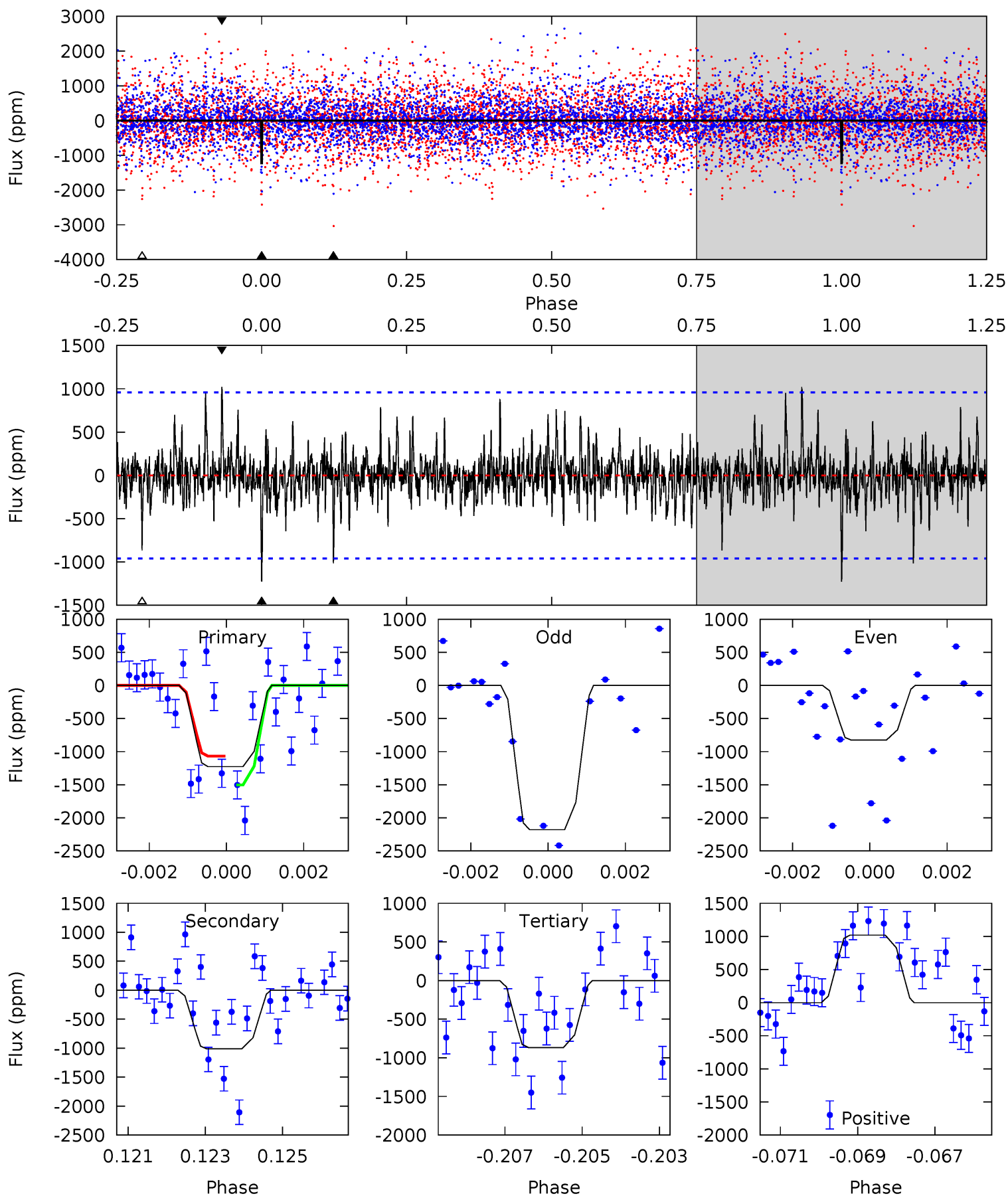
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.79	5.00	4.69	7.03	5.21	2.90	1.62	3.11	0.77	0.31	-2.03	0.72	1.43	0.47	0.80



Alt Model-Shift Uniqueness Test

007281951-03, P = 41.404866 Days, E = 149.549893 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.80	5.62	4.81	5.65	5.31	3.07	1.15	2.00	1.15	0.81	-0.04	3.47	1.54	0.45	1.19



Stellar Parameters For KIC 007281951

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6078^{+190}_{-253}	$4.447^{+0.054}_{-0.216}$	$0.210^{+0.150}_{-0.350}$	$1.069^{+0.334}_{-0.111}$	$1.167^{+0.136}_{-0.166}$	$1.347^{+0.388}_{-0.716}$
	+3%/-4%	+1%/-5%	+71%/-167%	+31%/-10%	+12%/-14%	+29%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 007281951-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-655 ± 131	$5.63^{+1.22}_{-1.12}$	793^{+60}_{-45}	4630^{+468}_{-347}	661^{+414}_{-232}
Alt.	-1013 ± 180	$3.77^{+1.03}_{-1.05}$	796^{+54}_{-45}	6220^{+1135}_{-825}	2357^{+2239}_{-998}

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 $A_{obs} \gg 1.0$

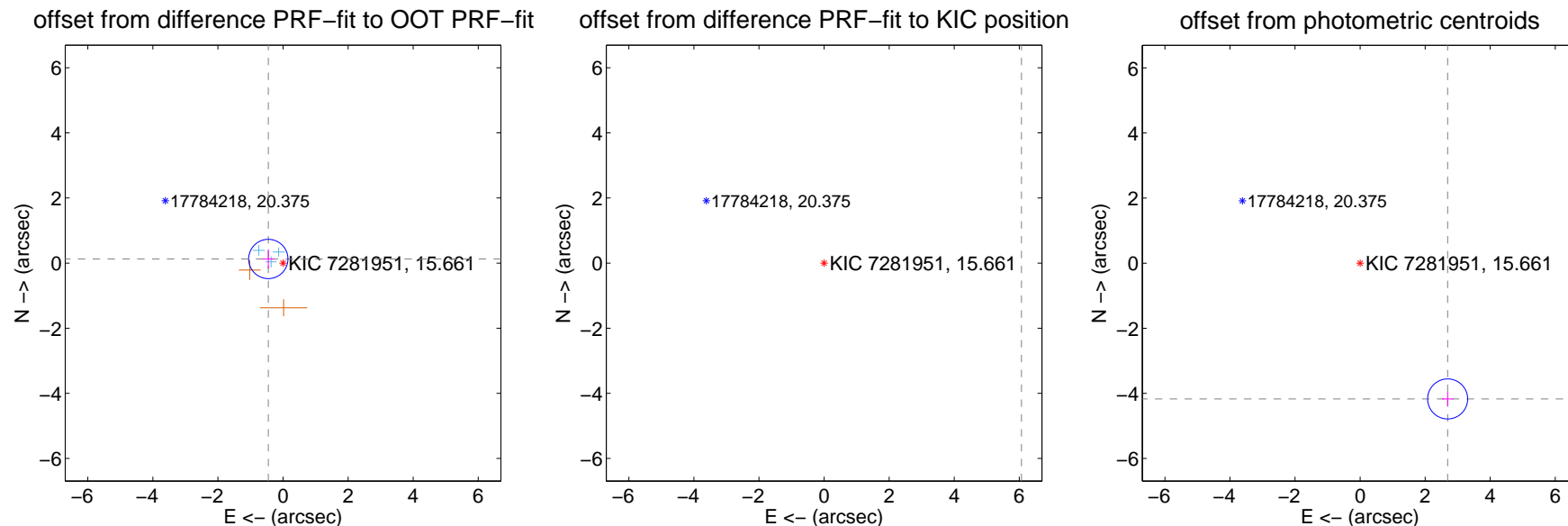
DV Centroid Data

Supplemental centroid analysis for 007281951-03. Kepler magnitude: 15.66. Transit SNR 9.51

There are 3 quarters with good PRF difference image offsets

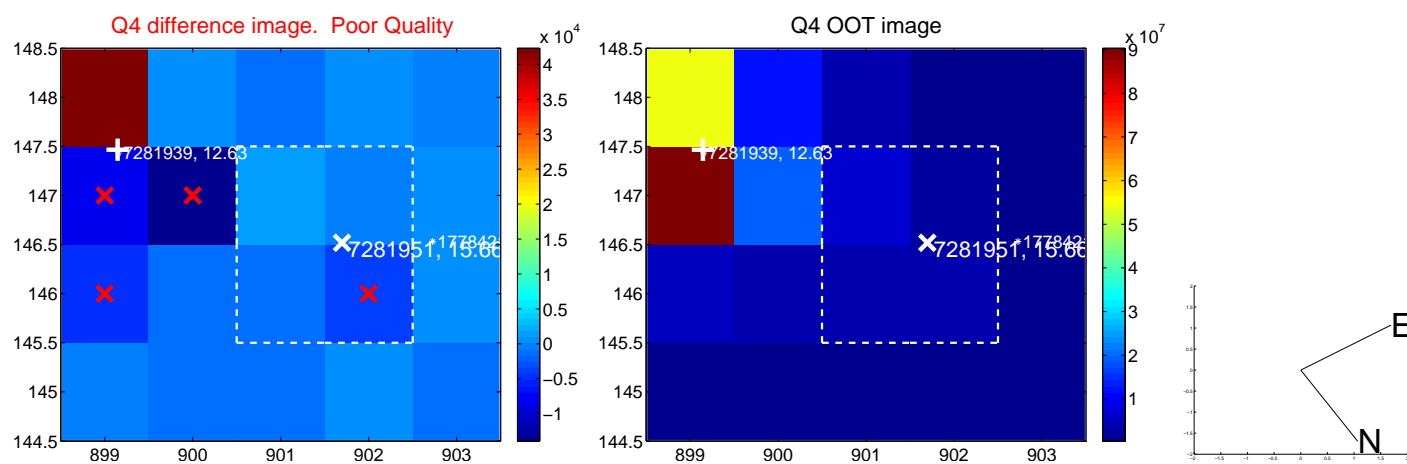
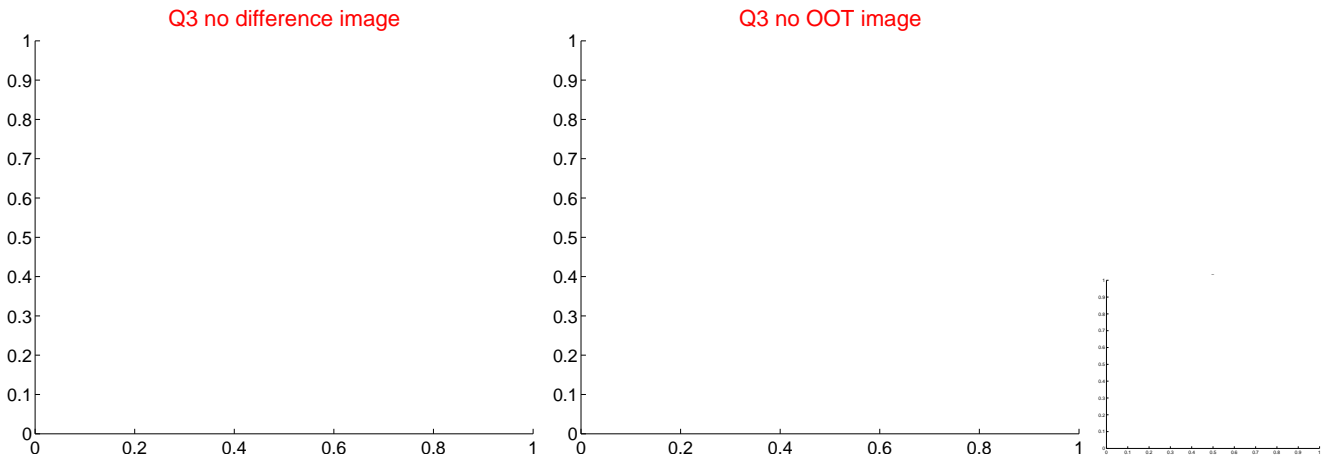
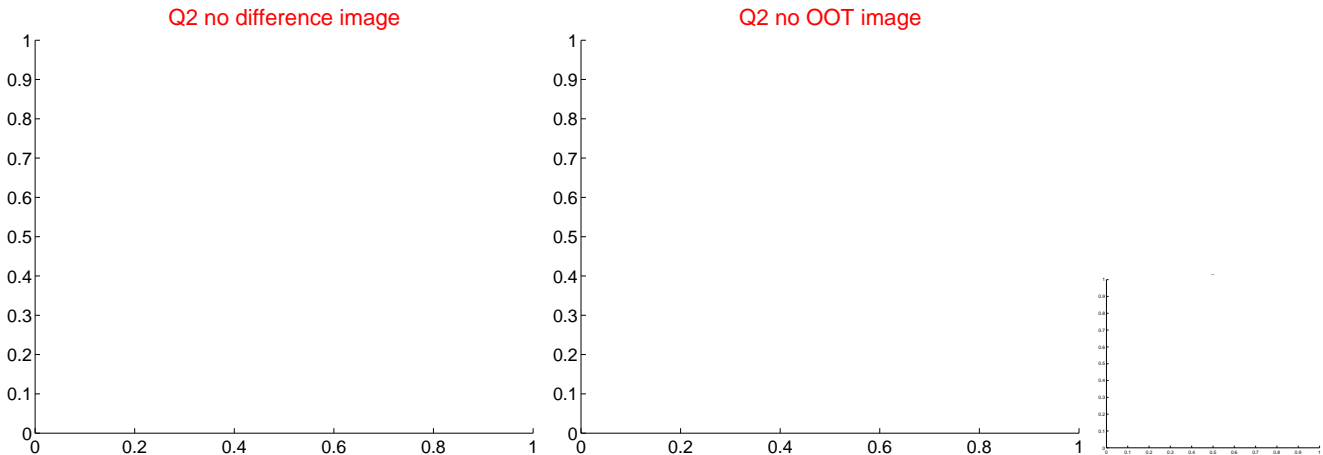
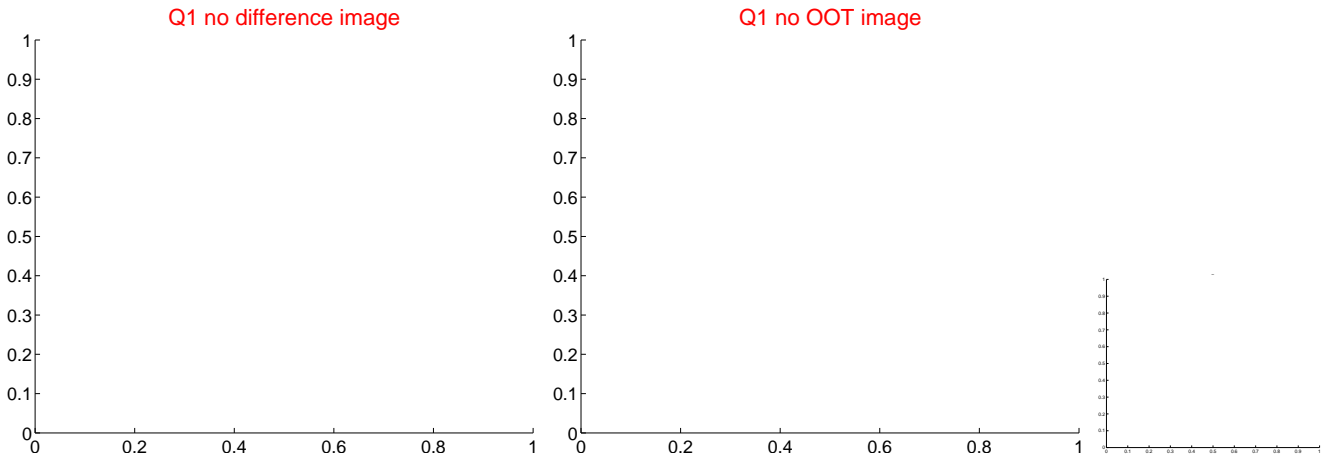
The OOT PRF centroid is offset from the target star catalog position by about 10.82 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.470 ± 0.201	2.34	0.452 ± 0.182	0.127 ± 0.298
PRF-fit source offset from KIC position	10.402 ± 0.287	36.29	-6.067 ± 0.156	-8.449 ± 0.295
photometric centroid source offset	4.96 ± 0.21	24.21	-2.69 ± 0.17	-4.17 ± 0.22

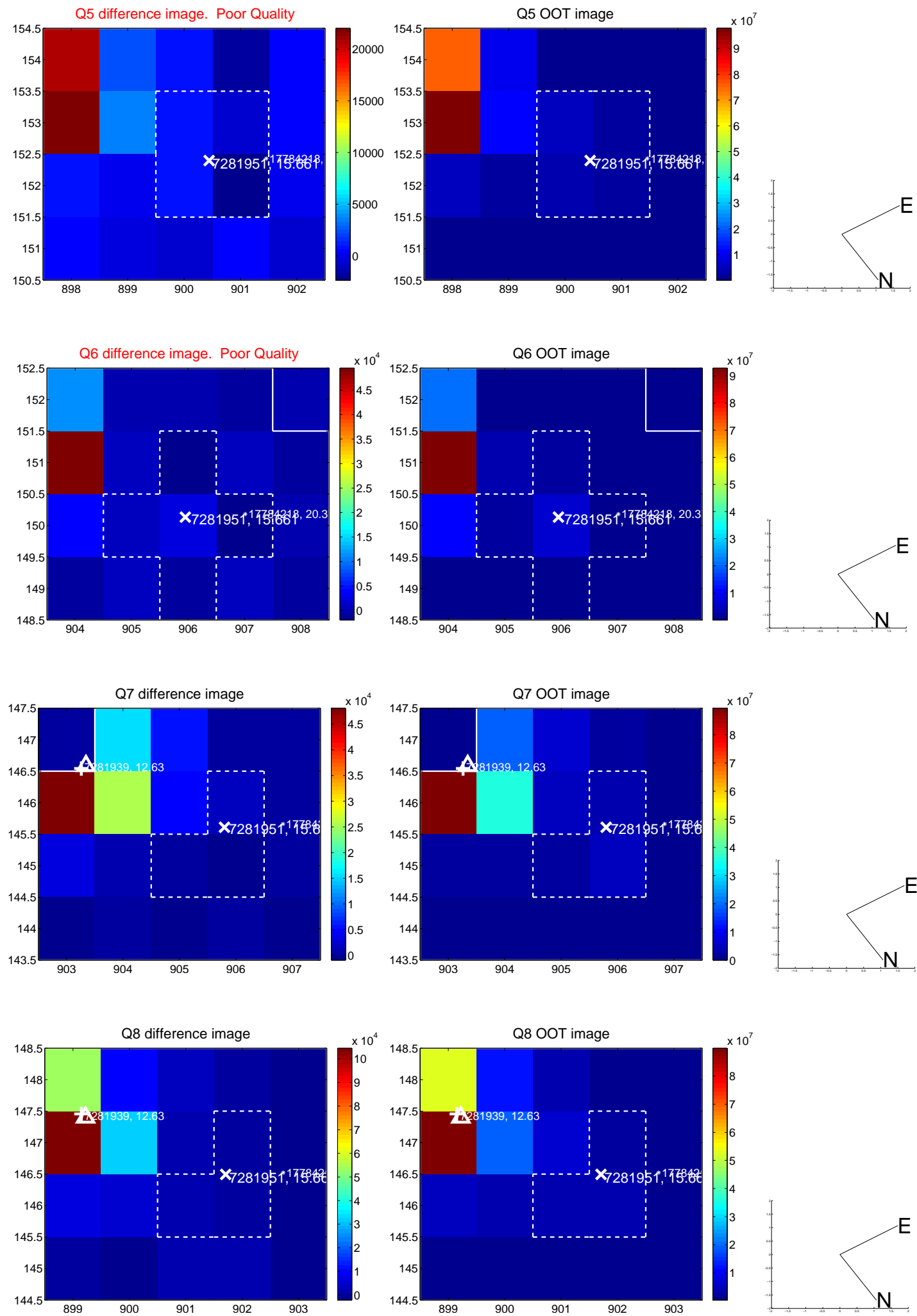


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

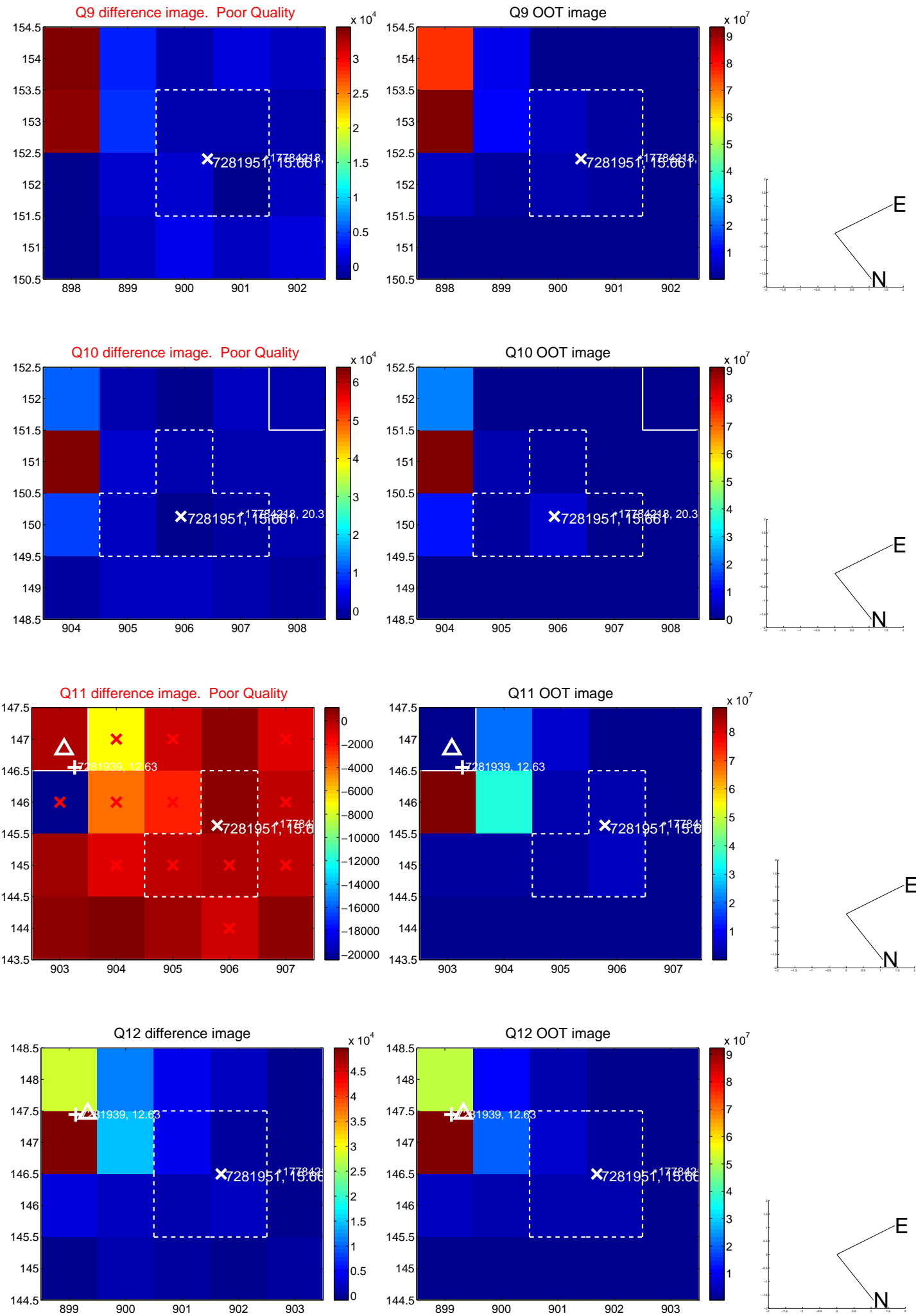
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



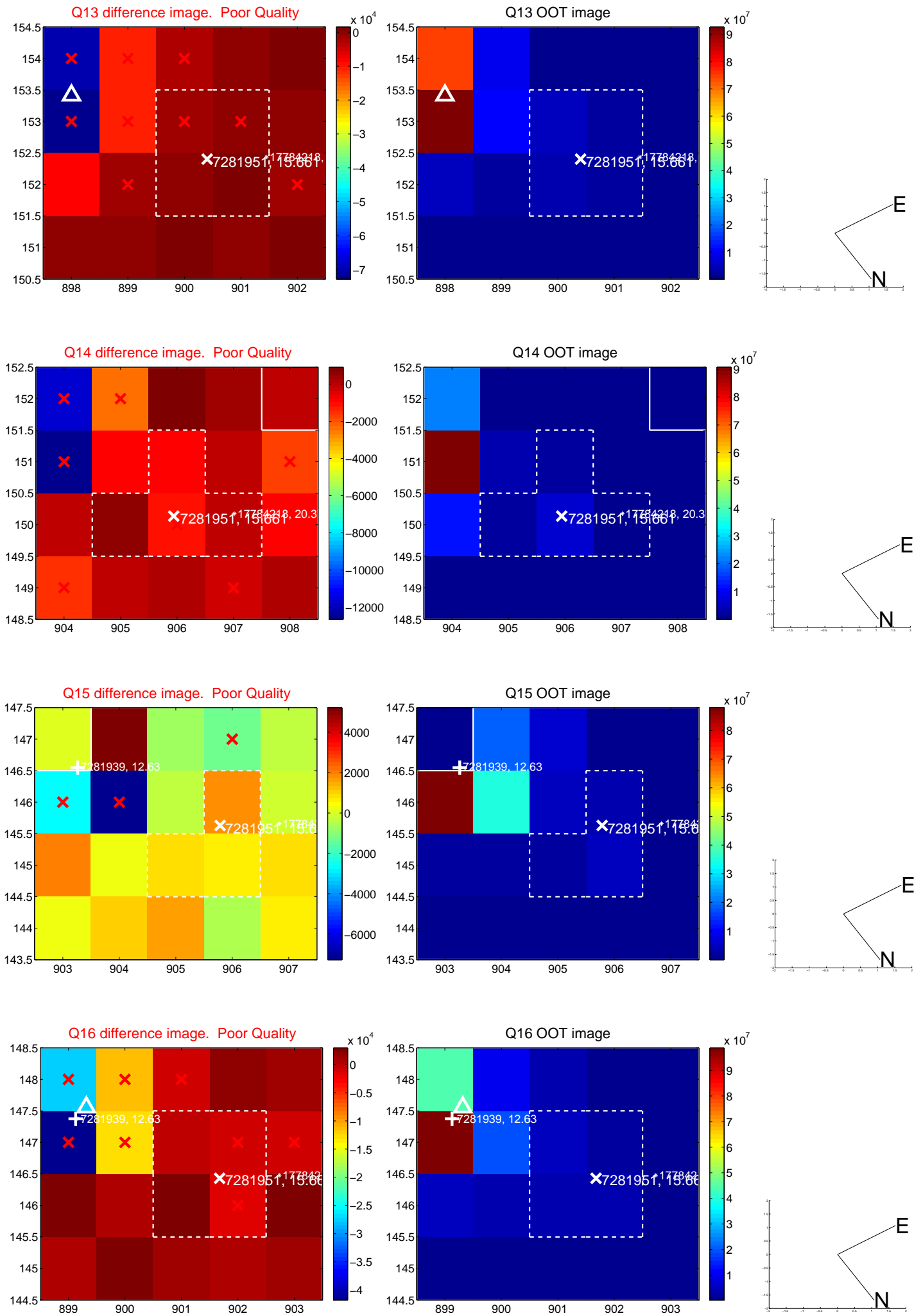
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



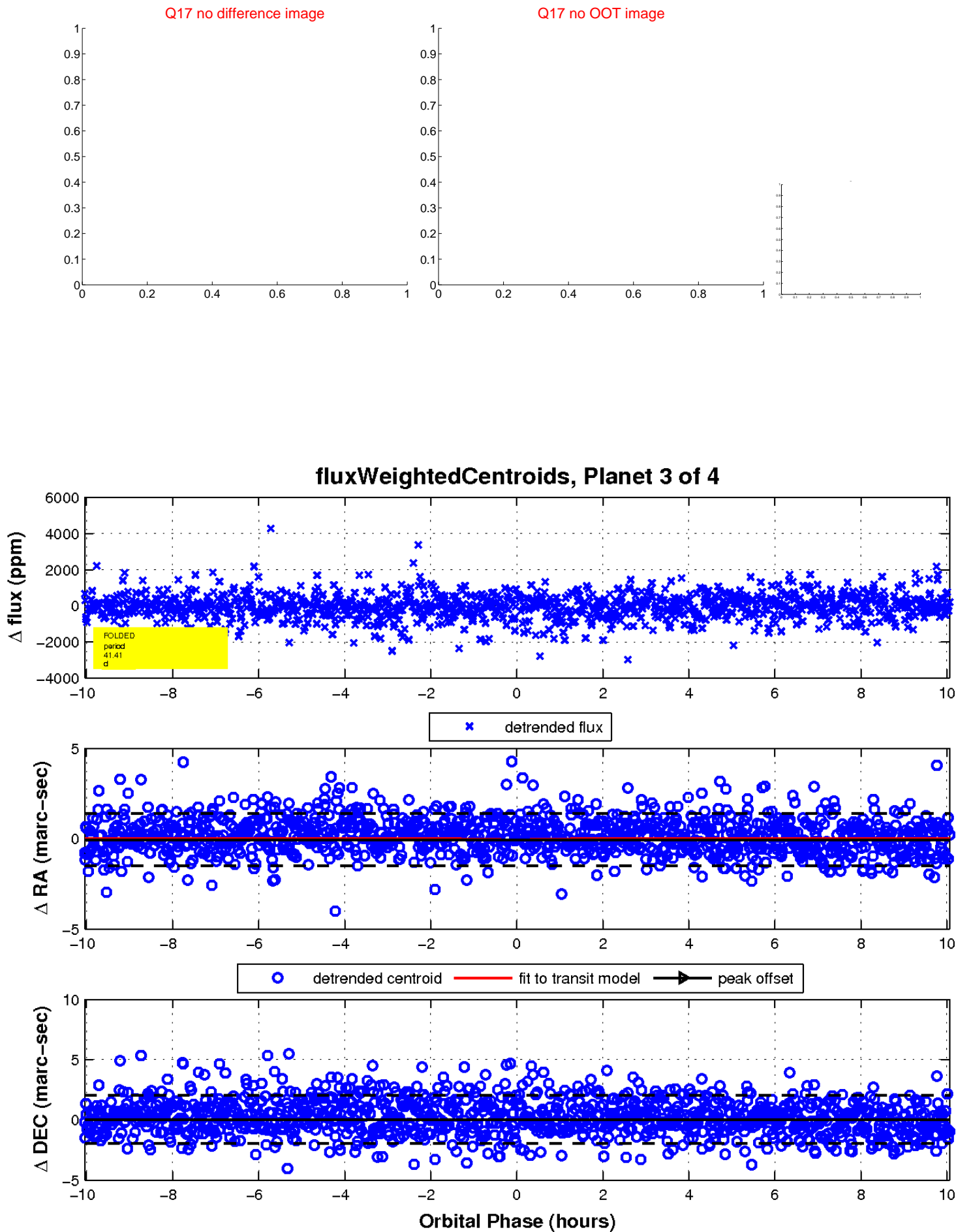
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



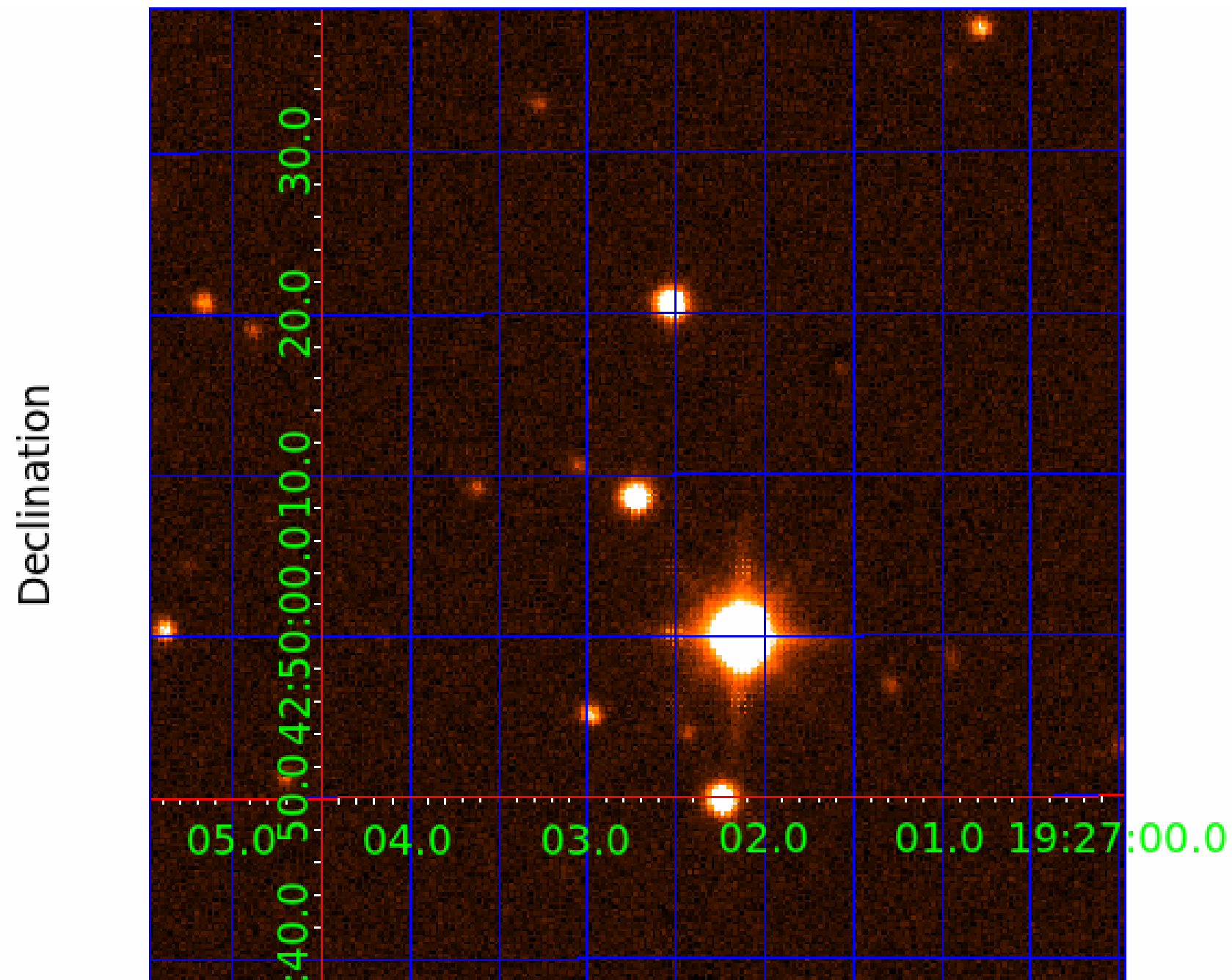
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007281951

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})
007281951-01	OBS	No	0.566764	131.868388	43.9	3.773	10.3	6.5	1.07	6078	0.86	7015.41
007281951-02	OBS	No	109.726559	146.755485	1413.3	2.641	9.2	9.3	1.07	6078	4.75	6.26
007281951-03	OBS	No	41.405847	149.527131	1559.4	3.356	9.3	9.5	1.07	6078	5.39	22.97
007281951-04	OBS	No	46.542416	148.244594	1693.1	2.879	8.4	11.7	1.07	6078	4.63	19.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007281951-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH
007281951-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_RESOLVED_OFFSET
007281951-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007281951-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET

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

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

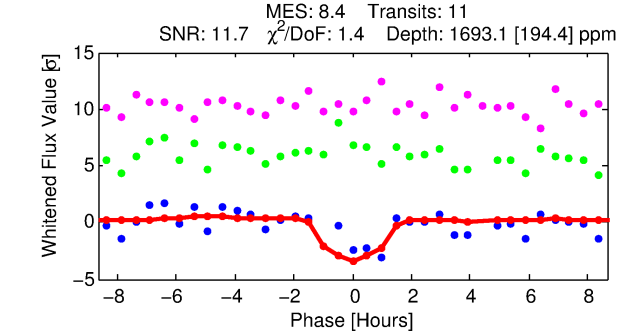
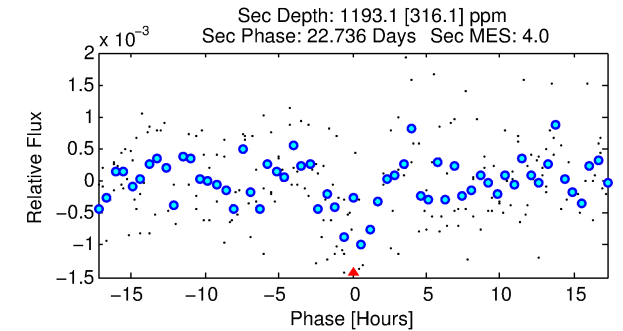
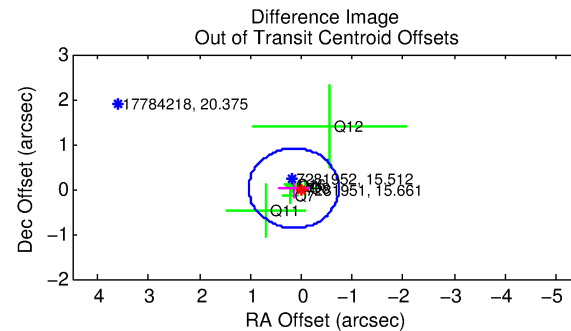
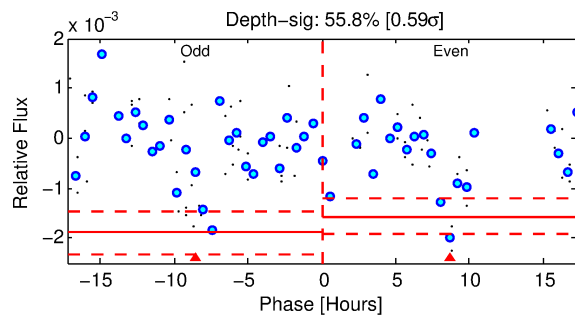
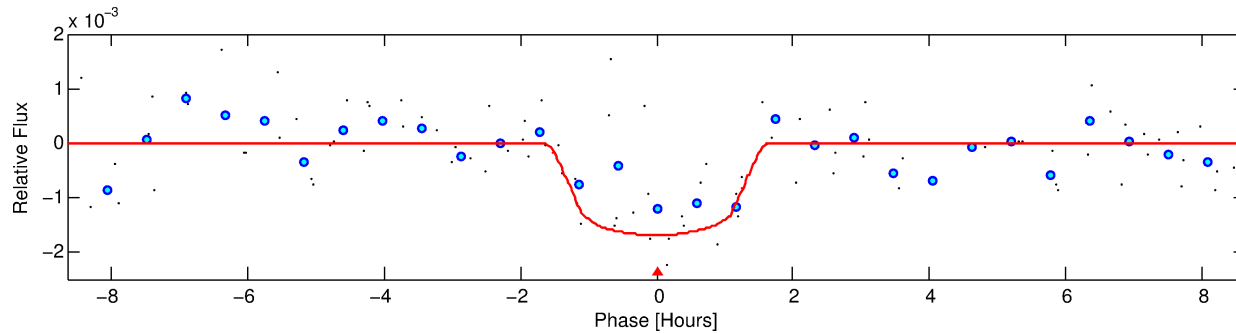
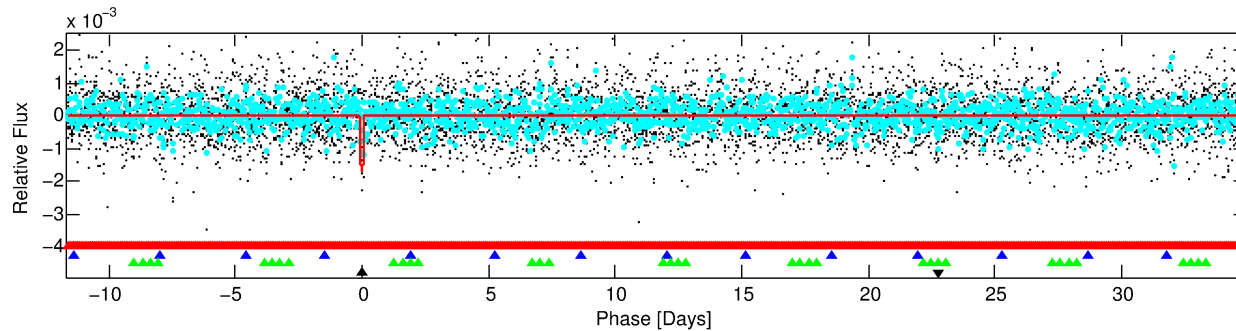
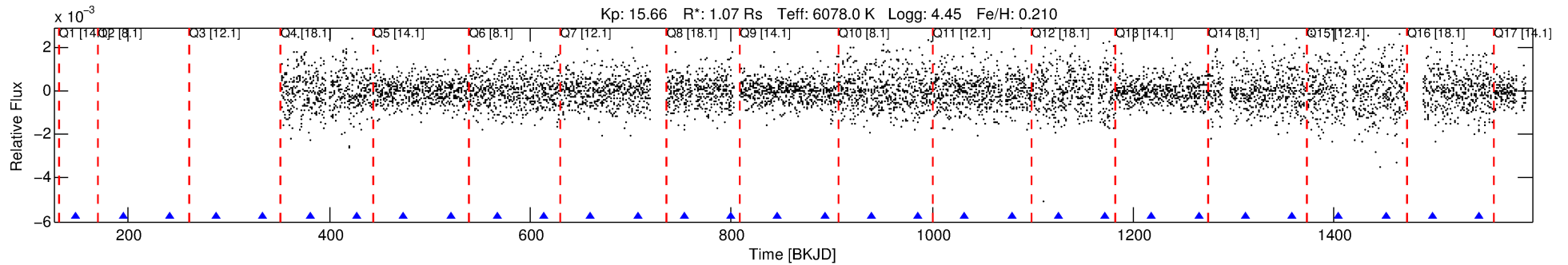
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007281951-04

No Significant Match Found

DV One-Page Summary

KIC: 7281951 Candidate: 4 of 4 Period: 46.542 d



DV Fit Results:

Period = 46.54242 [0.00042] d
Epoch = 148.2446 [0.0089] BKJD
Rp/R* = 0.0397 [0.0442]
a/R* = 101.45 [512.77]
b = 0.64 [4.79]
Seff = 19.65 [8.36]
Teq = 537 [57] K
Rp = 4.63 [5.35] Re
a = 0.2666 [0.0710] AU
Ag = 2179.31 [4959.26] [0.44 σ]
Teffp = 5672 [3187] K [1.61 σ]

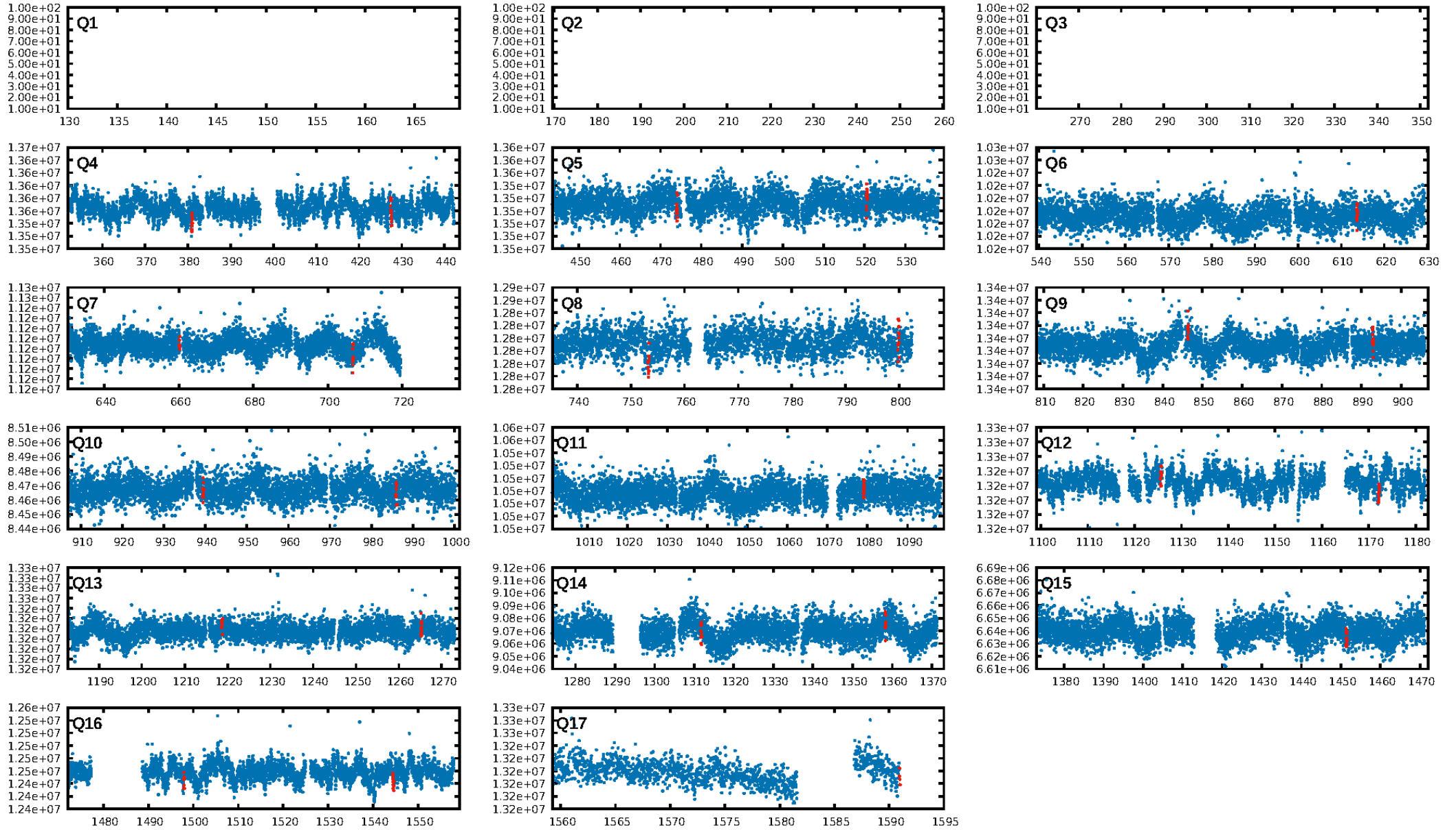
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.88 σ]
LongPeriod-sig: 100.0% [388.16 σ]
ModelChiSquare2-sig: 40.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.75e-13
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: 1.468
Centroid-sig: 14.6%
Centroid-so: 5.172 arcsec [27.49 σ]
OotOffset-rm: 0.148 arcsec [0.50 σ]
KicOffset-rm: 10.715 arcsec [8.43 σ]
OotOffset-st: 0/2/4/0 [6]
KicOffset-st: 1/2/4/0 [7]
DiffImageQuality-fgm: 0.57 [4/7]
DiffImageOverlap-fno: 0.00 [0/13]

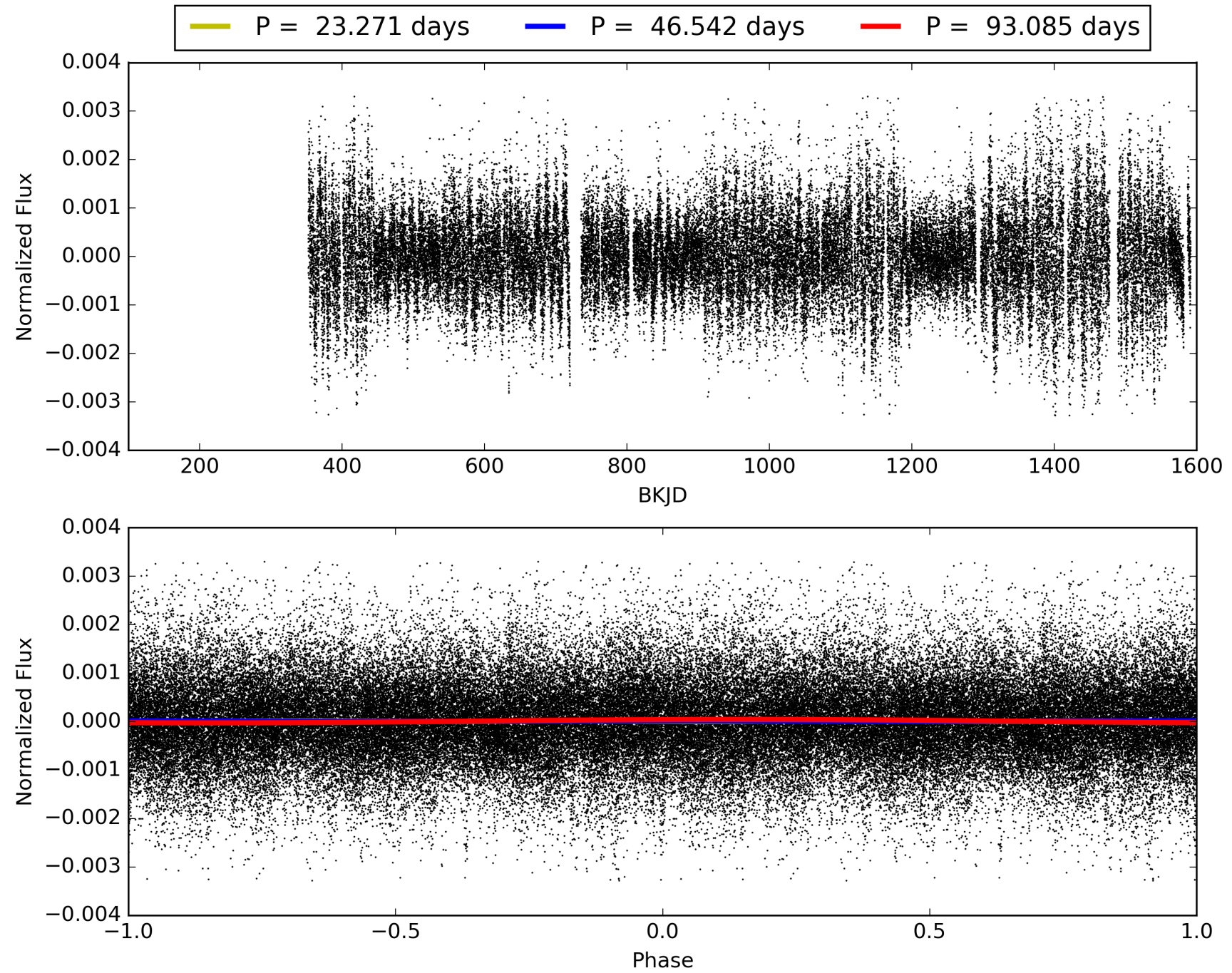
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:34:15 Z

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

TCE 007281951-04, PDC Light Curves

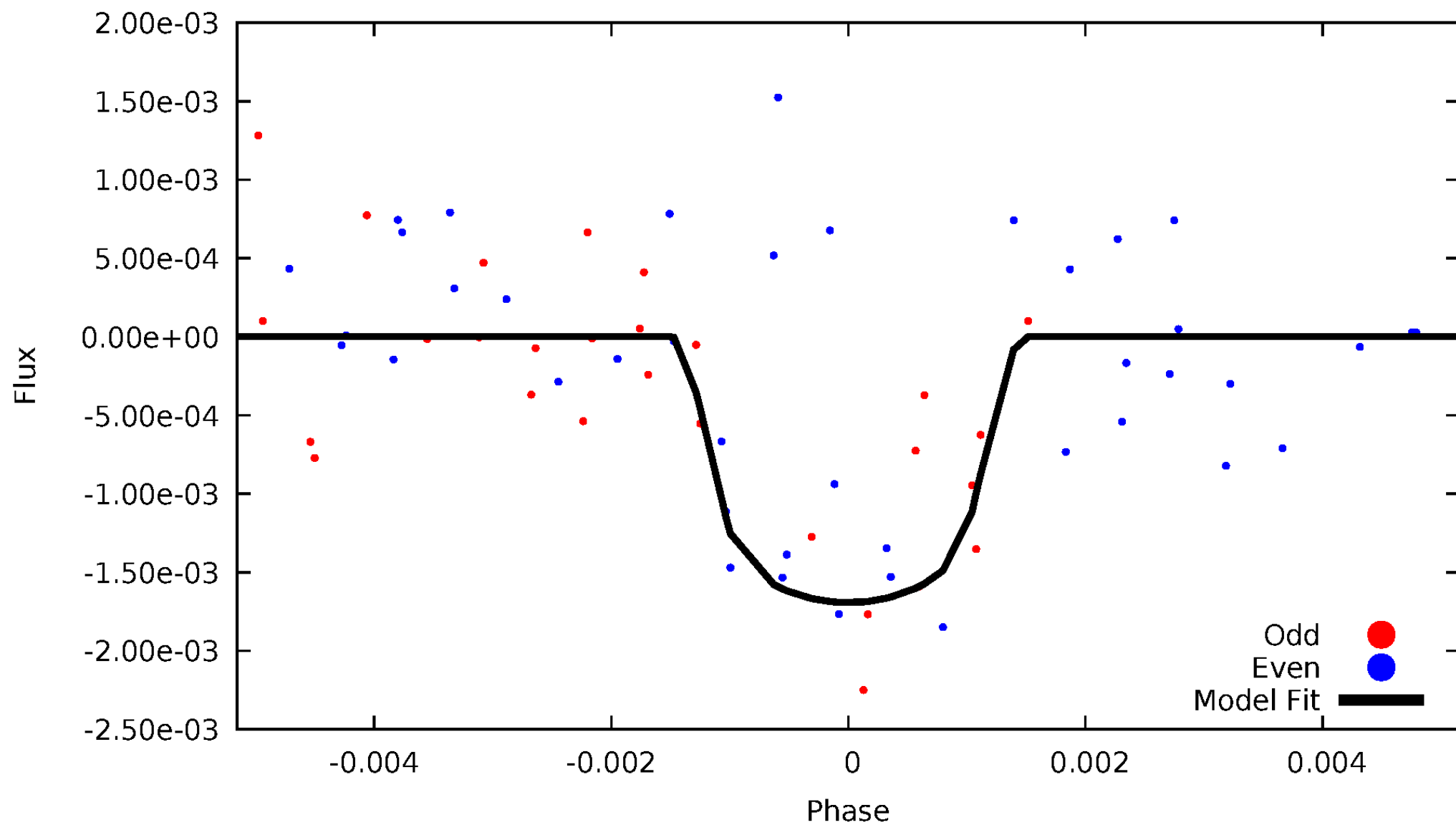


TCE 007281951-04



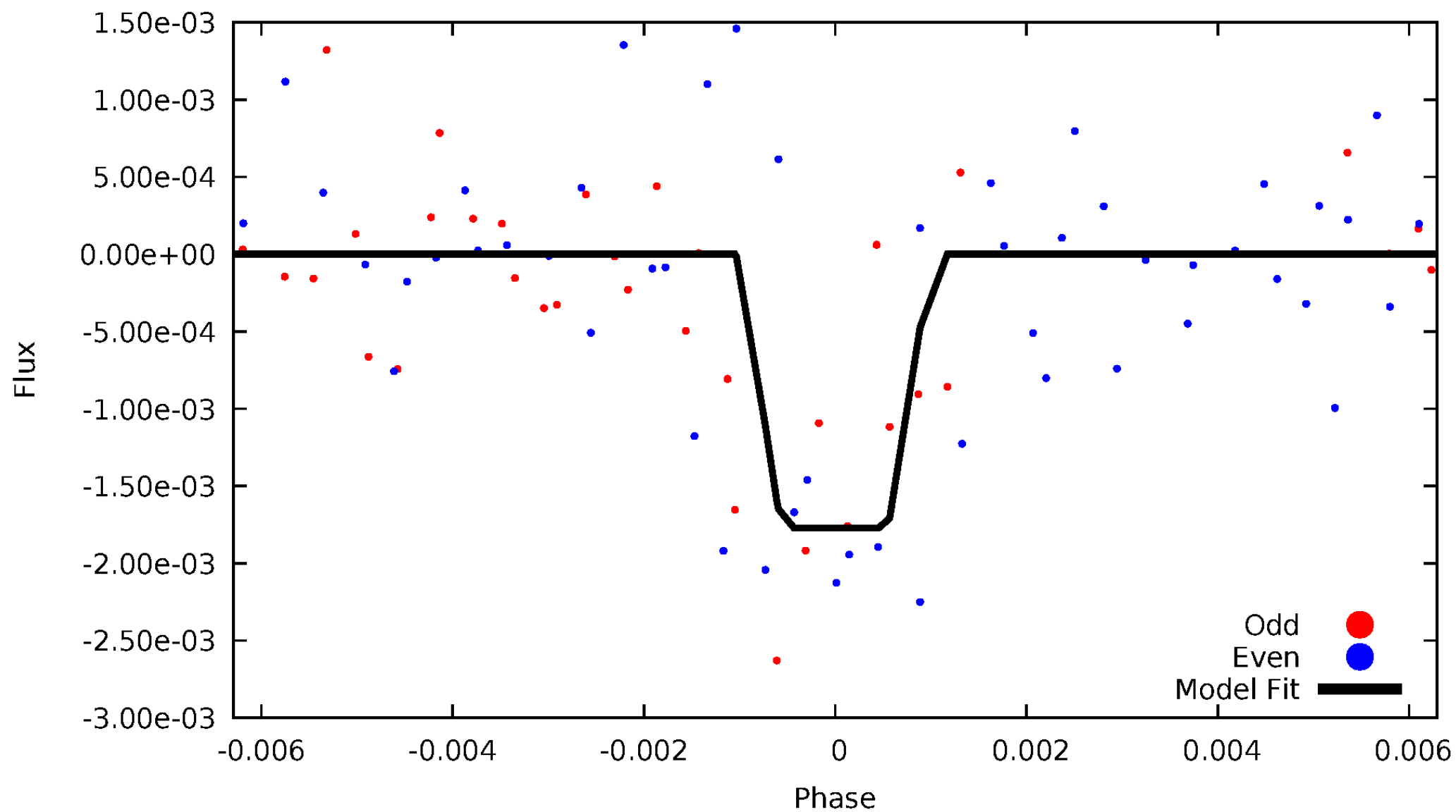
DV Odd/Even

TCE 007281951-04



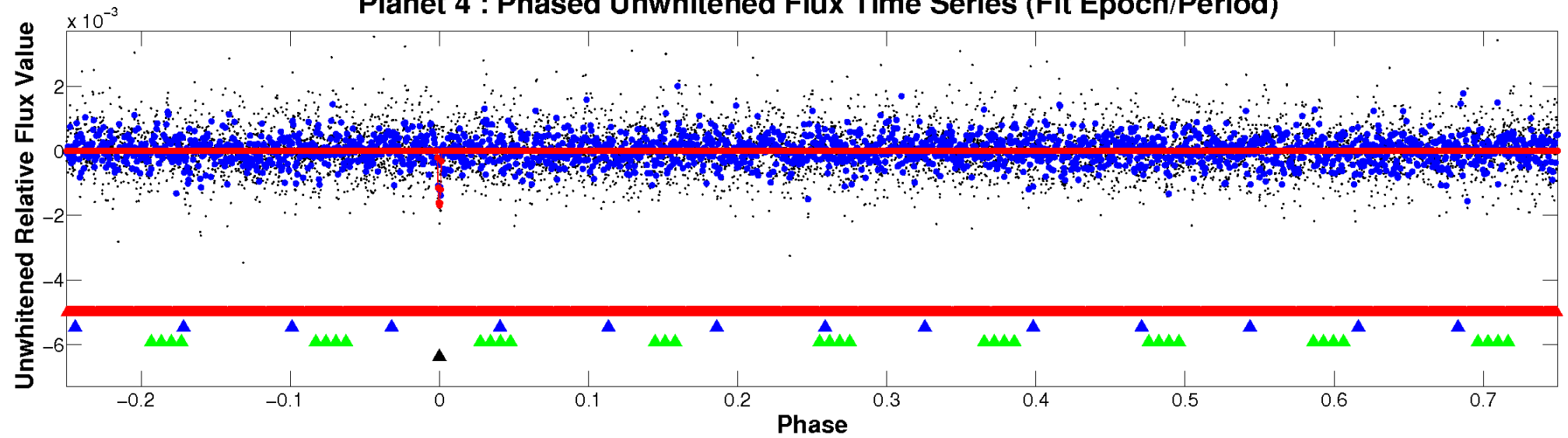
ALT Odd/Even

TCE 007281951-04

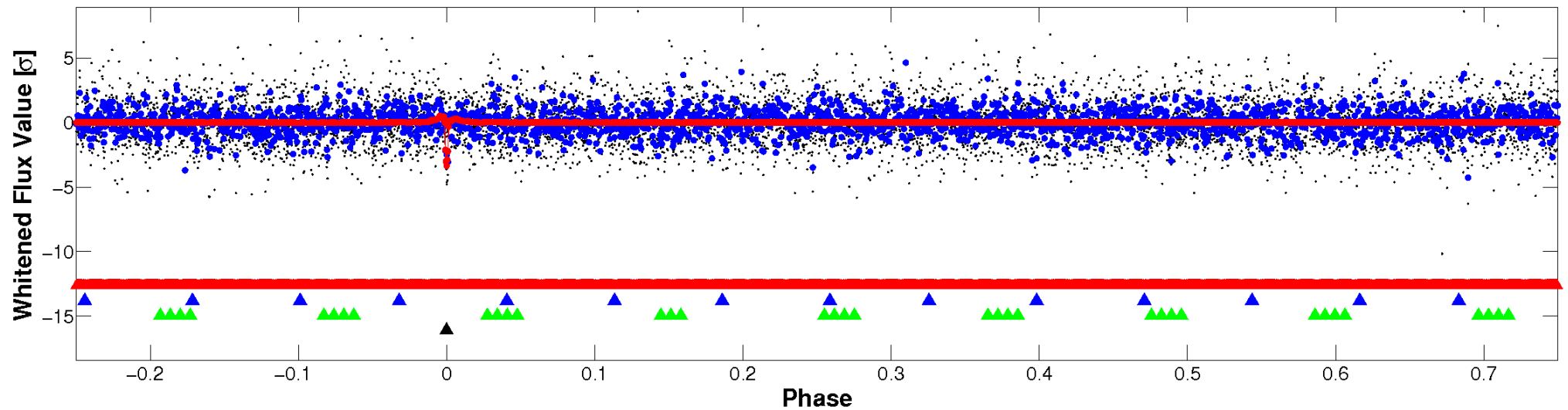


Non-Whitened Vs. Whitened Light Curve

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

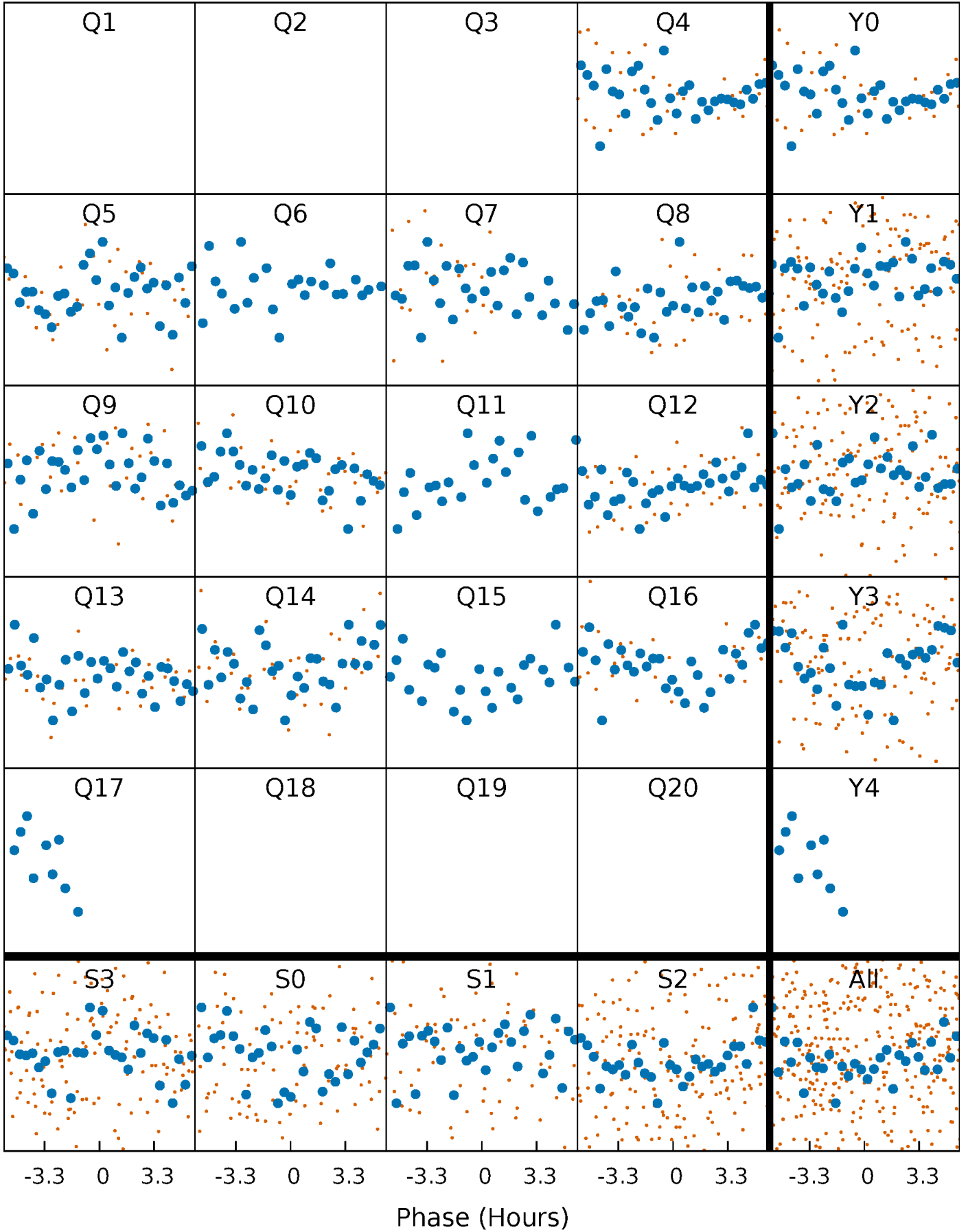


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



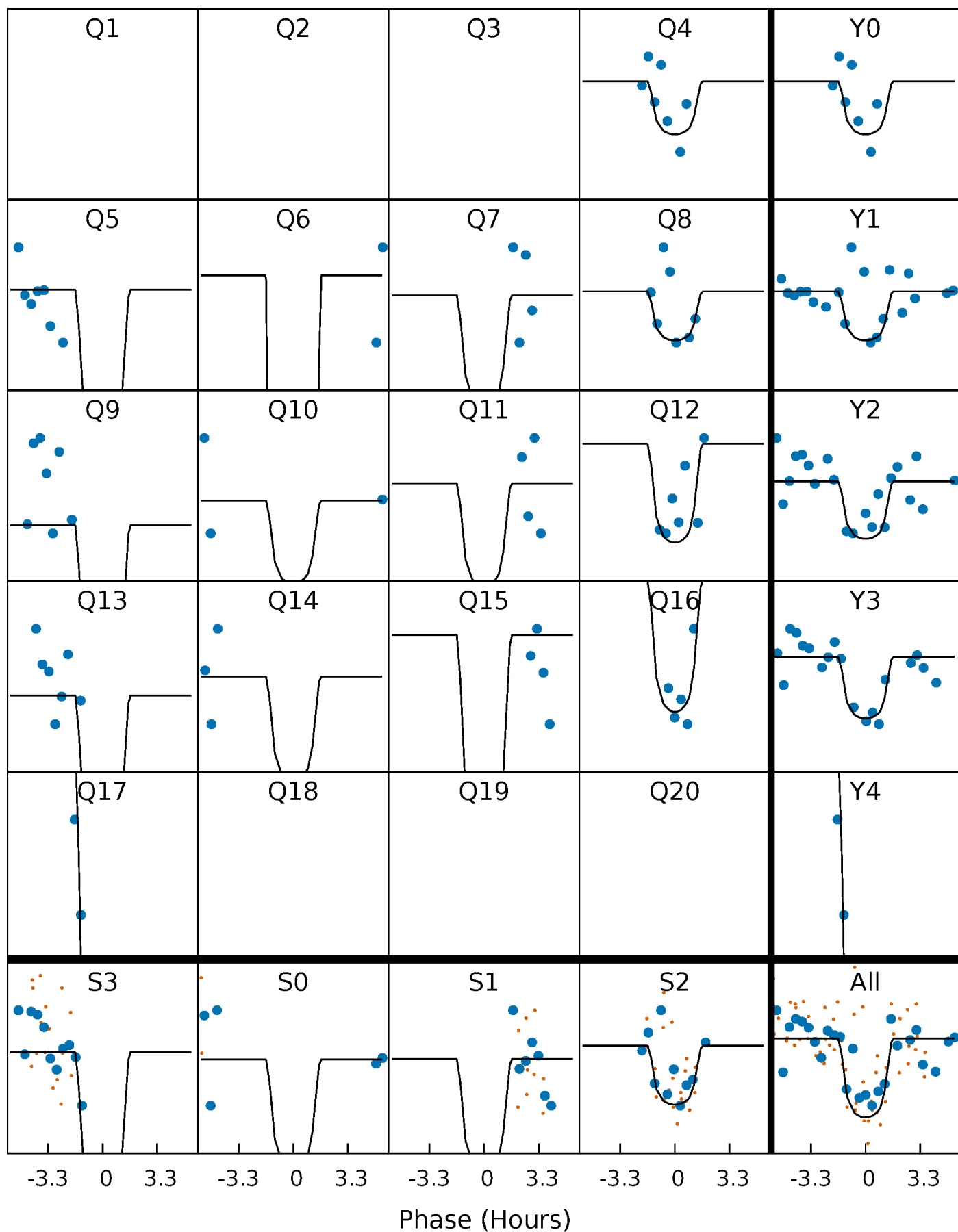
PDC Quarter-Phased Transit Curves

TCE 007281951-04 P= 46.542416 Days $T_0=148.244594$ (BKJD)



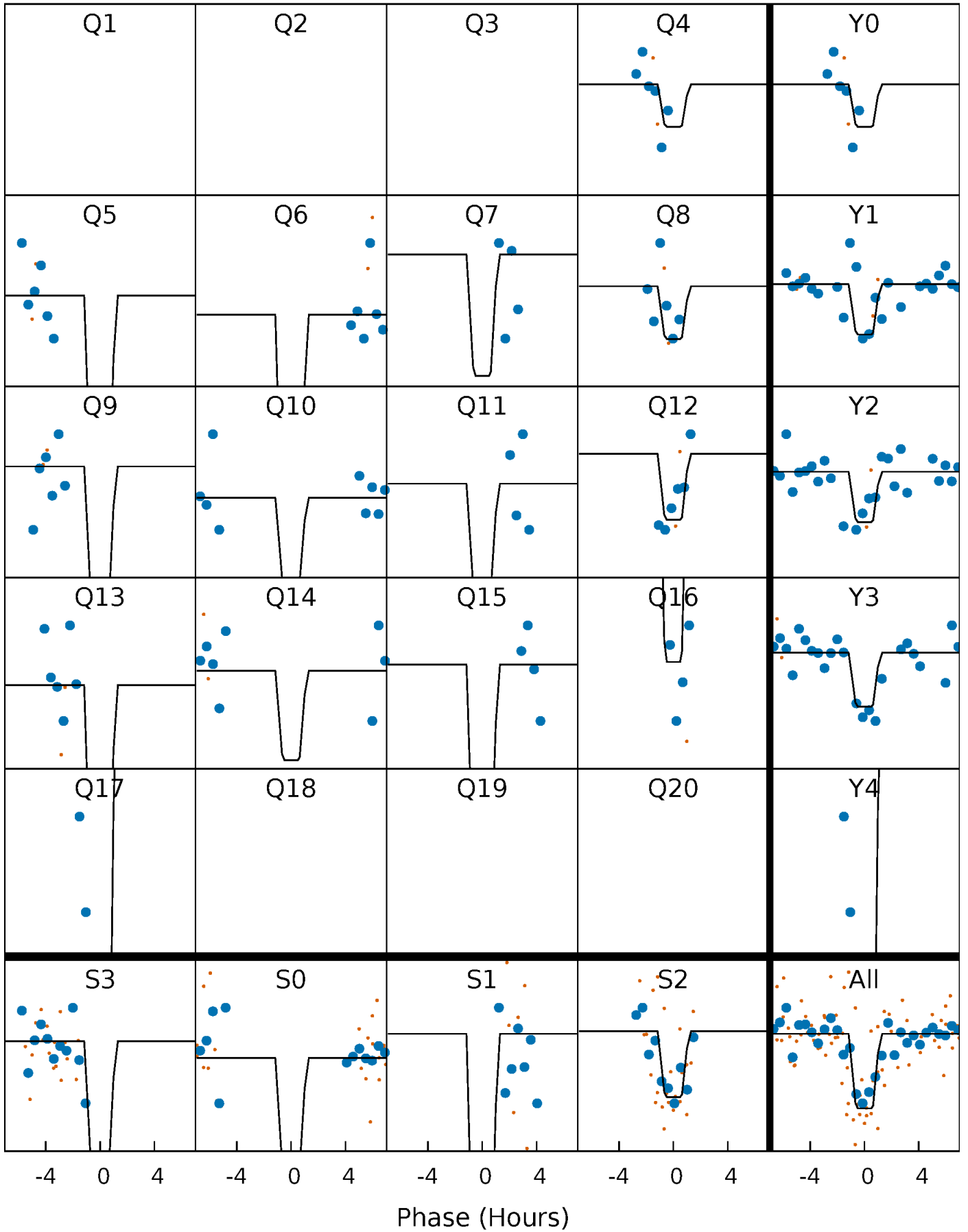
DV Quarter-Phased Transit Curves

TCE 007281951-04 $P = 46.542416$ Days $T_0 = 148.244594$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

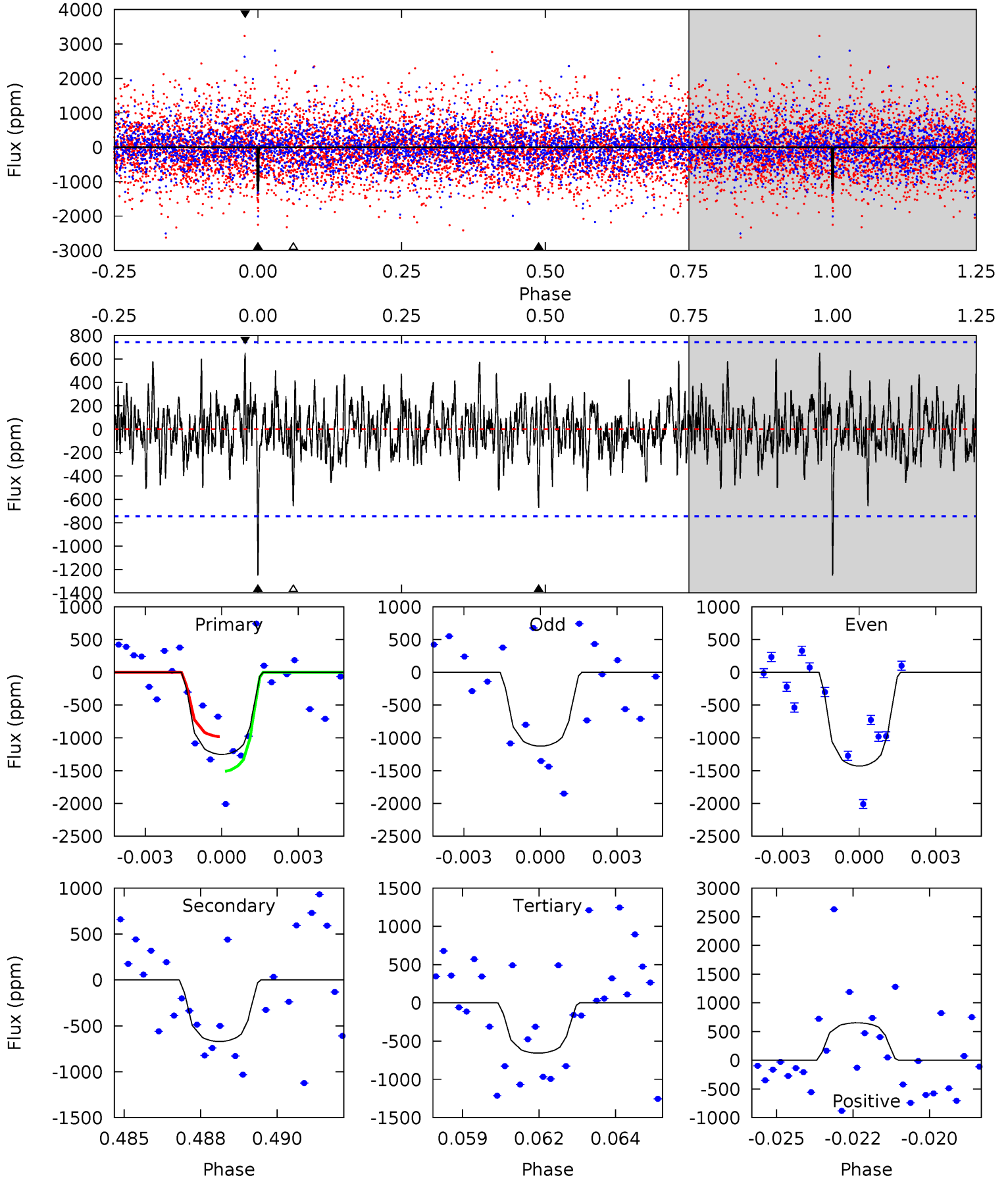
TCE 007281951-04 $P = 46.540873$ Days $T_0 = 148.286680$ (BKJD)



DV Model-Shift Uniqueness Test

007281951-04, P = 46.542416 Days, E = 148.244594 Days

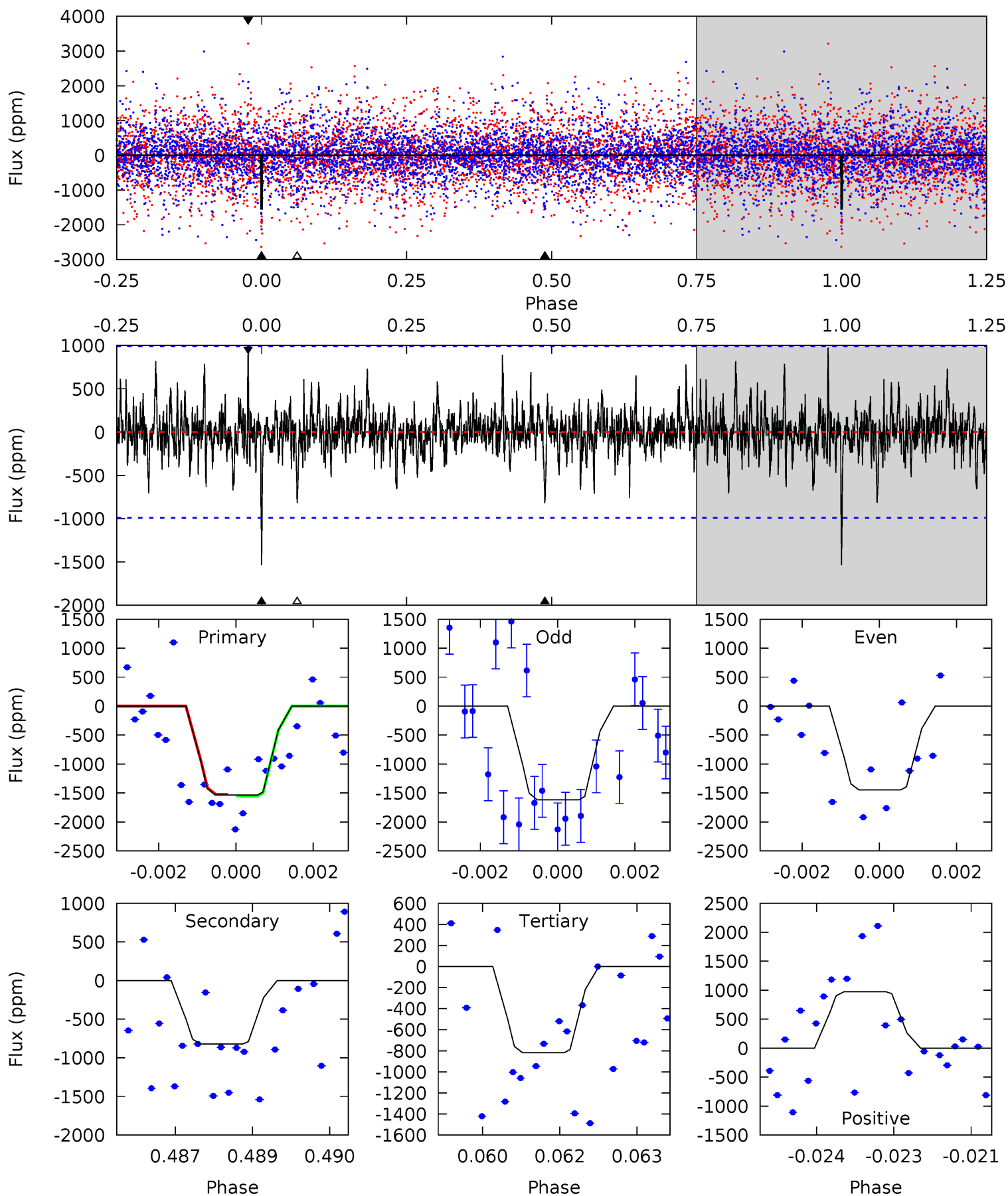
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.86	4.75	4.65	4.62	5.27	2.99	1.26	4.21	4.24	0.10	0.13	1.06	0.67	0.34	1.89



Alt Model-Shift Uniqueness Test

007281951-04, P = 46.540873 Days, E = 148.286680 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.32	4.44	4.43	5.28	5.37	3.15	1.10	3.90	3.05	0.02	-0.83	0.46	0.67	0.39	0.09



Stellar Parameters For KIC 007281951

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6078^{+190}_{-253}	$4.447^{+0.054}_{-0.216}$	$0.210^{+0.150}_{-0.350}$	$1.069^{+0.334}_{-0.111}$	$1.167^{+0.136}_{-0.166}$	$1.347^{+0.388}_{-0.716}$
	+3%/-4%	+1%/-5%	+71%/-167%	+31%/-10%	+12%/-14%	+29%/-53%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 007281951-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-671 ± 141	$6.17^{+5.01}_{-3.92}$	764^{+51}_{-40}	4507^{+2890}_{-883}	672^{+4213}_{-479}
Alt.	-820 ± 185	$6.09^{+5.36}_{-3.80}$	766^{+57}_{-43}	4710^{+2853}_{-921}	839^{+5176}_{-595}

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 $A_{obs} \gg 1.0$

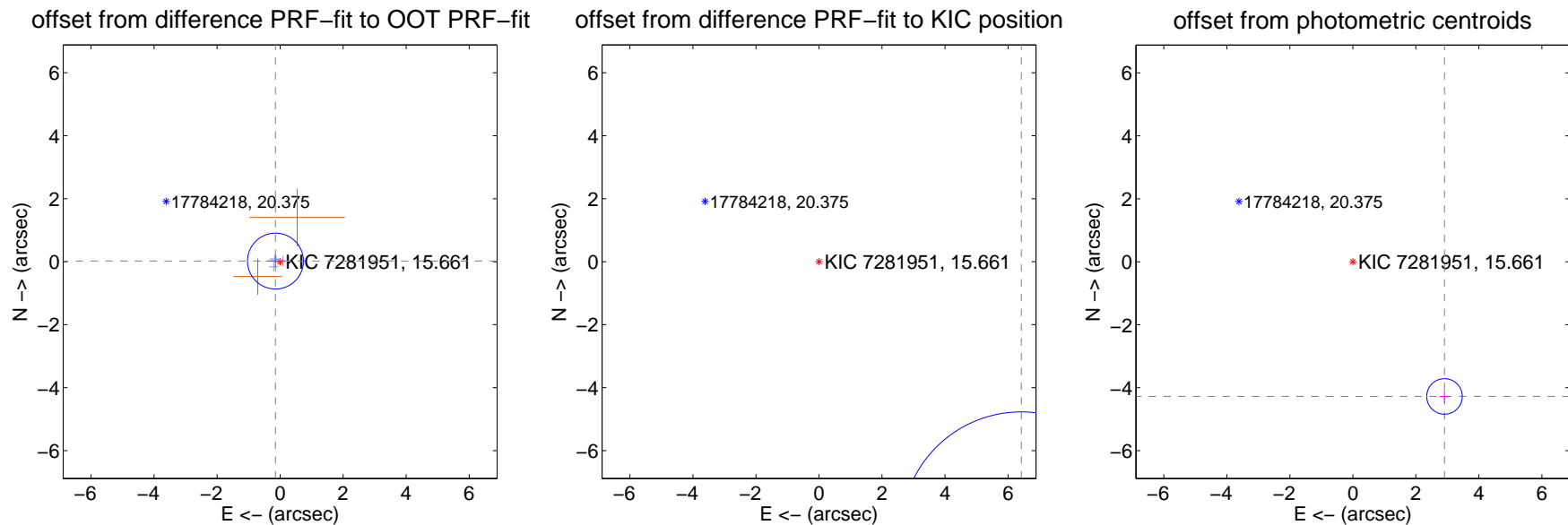
DV Centroid Data

Supplemental centroid analysis for 007281951-04. Kepler magnitude: 15.66. Transit SNR 11.69

There are 4 quarters with good PRF difference image offsets

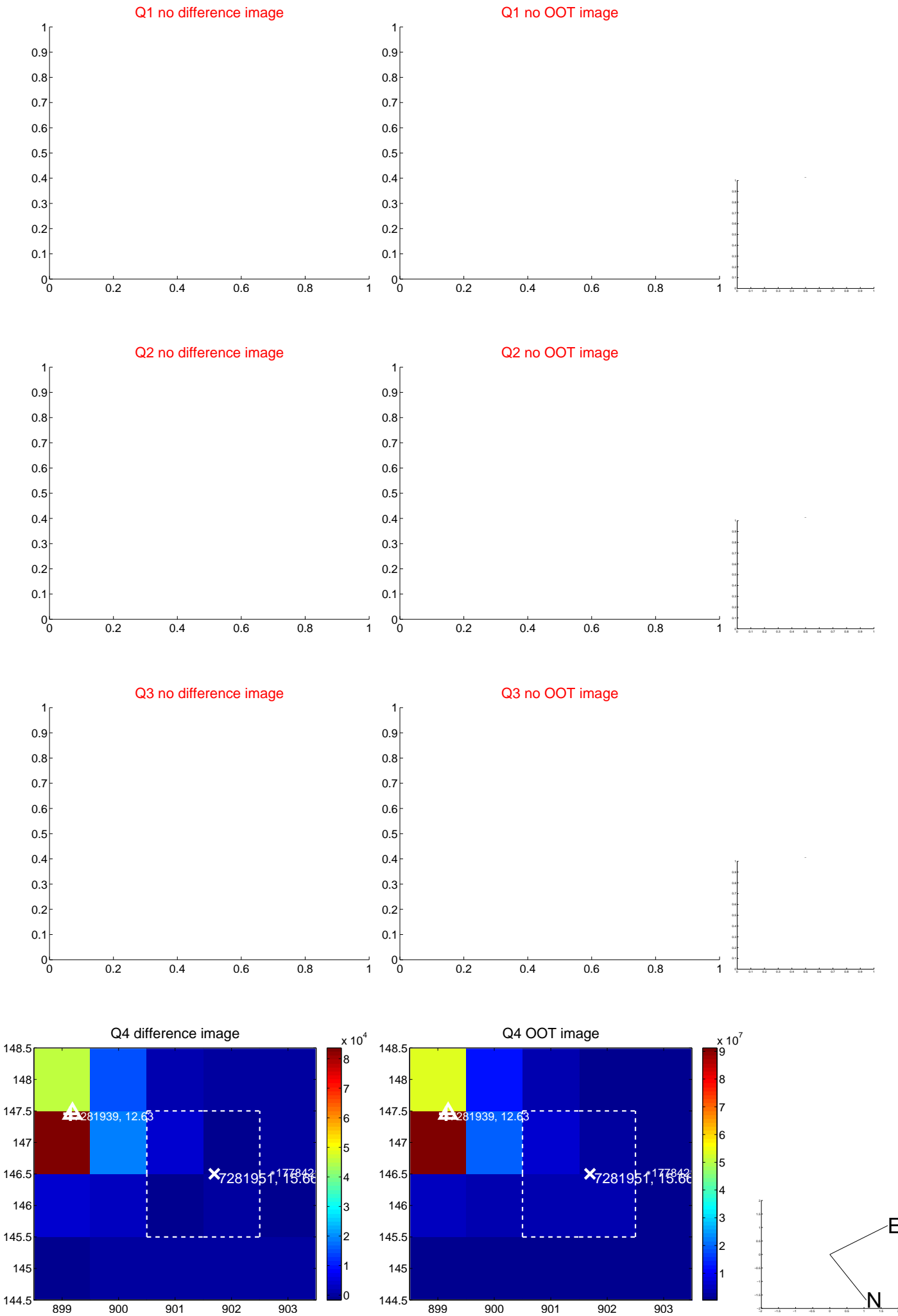
The OOT PRF centroid is offset from the target star catalog position by about 10.83 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.148 ± 0.296	0.50	0.147 ± 0.297	0.020 ± 0.198
PRF-fit source offset from KIC position	10.715 ± 1.270	8.43	-6.420 ± 0.811	-8.579 ± 1.007
photometric centroid source offset	5.17 ± 0.19	27.49	-2.91 ± 0.16	-4.28 ± 0.20

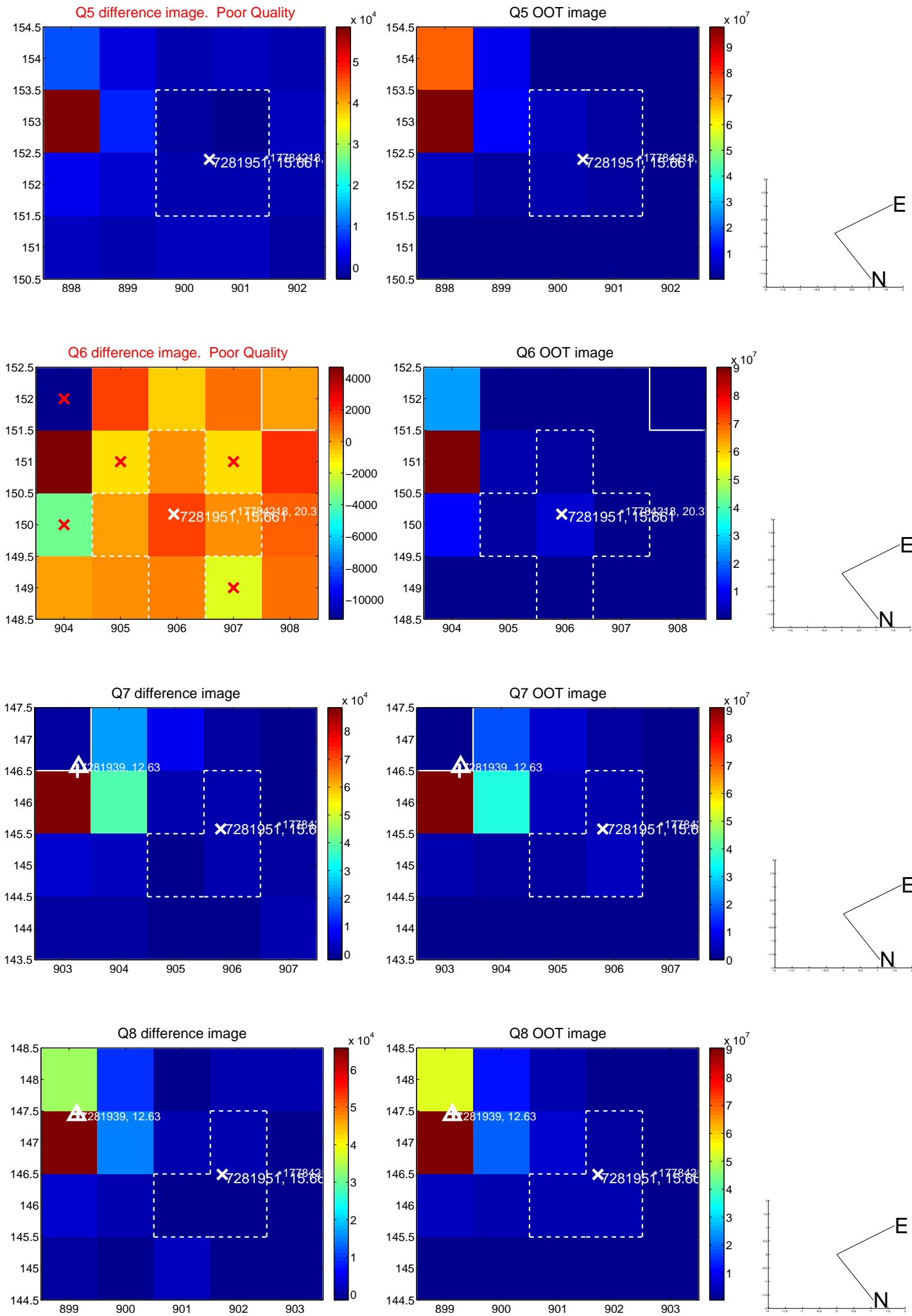


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

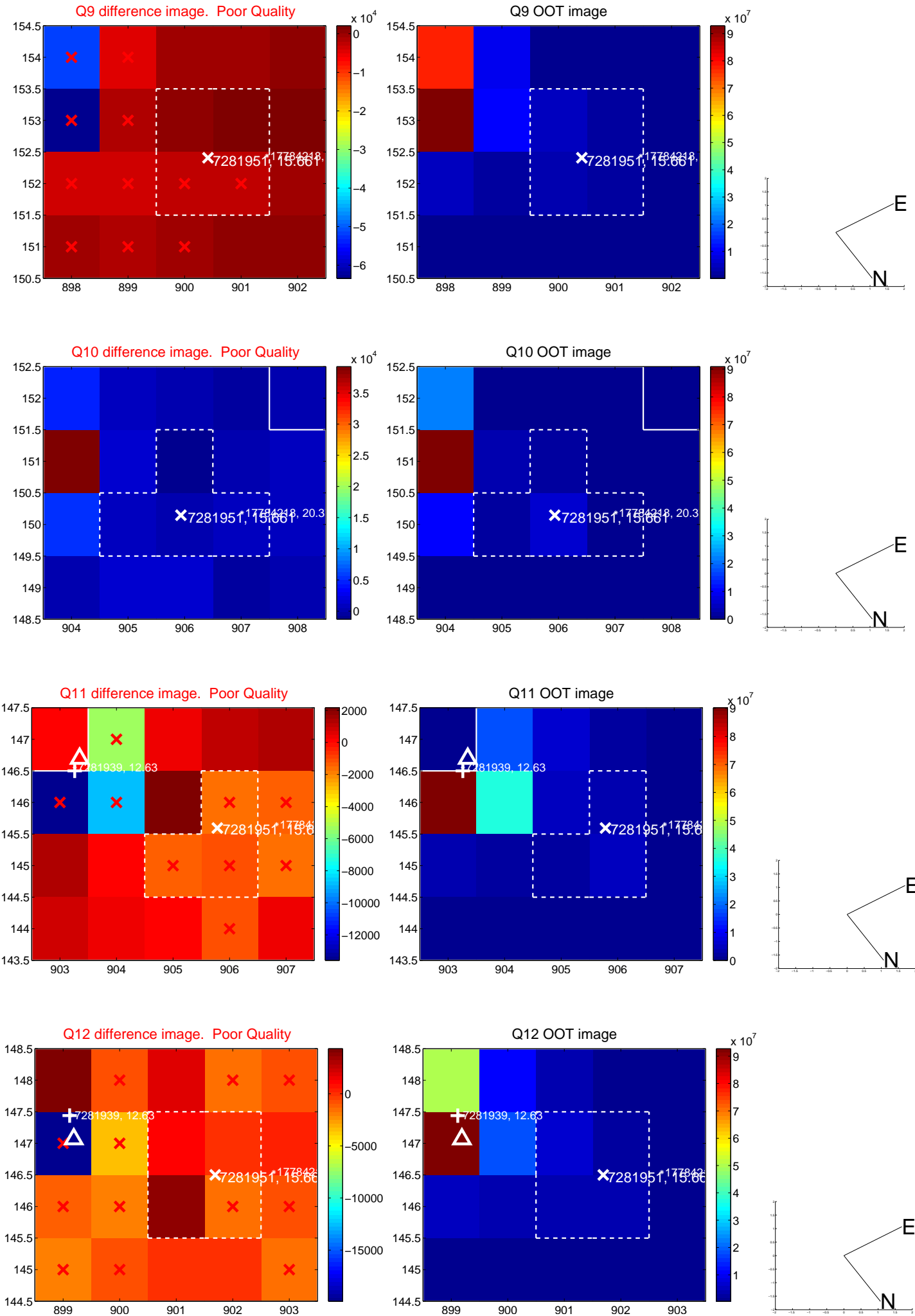
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



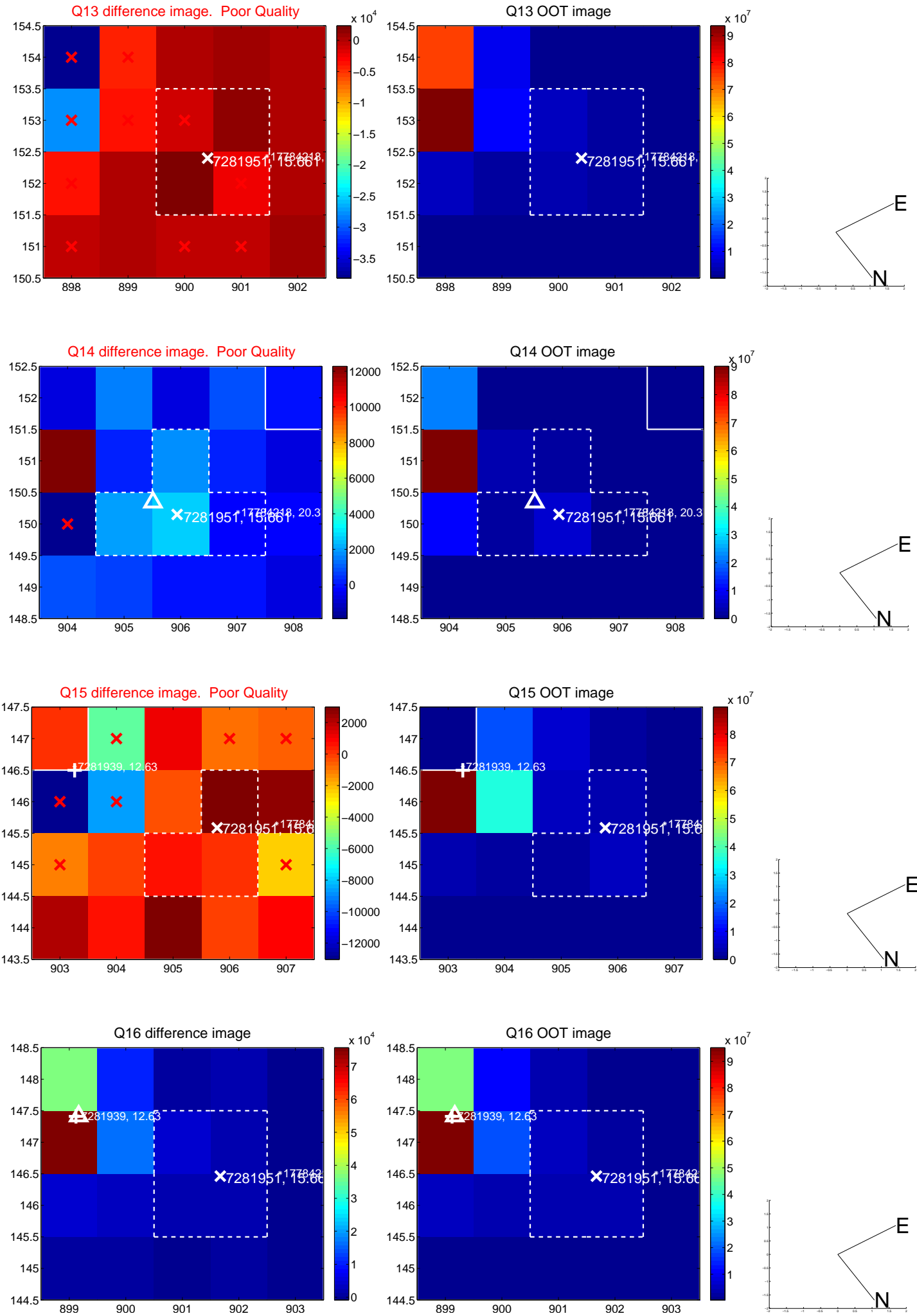
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



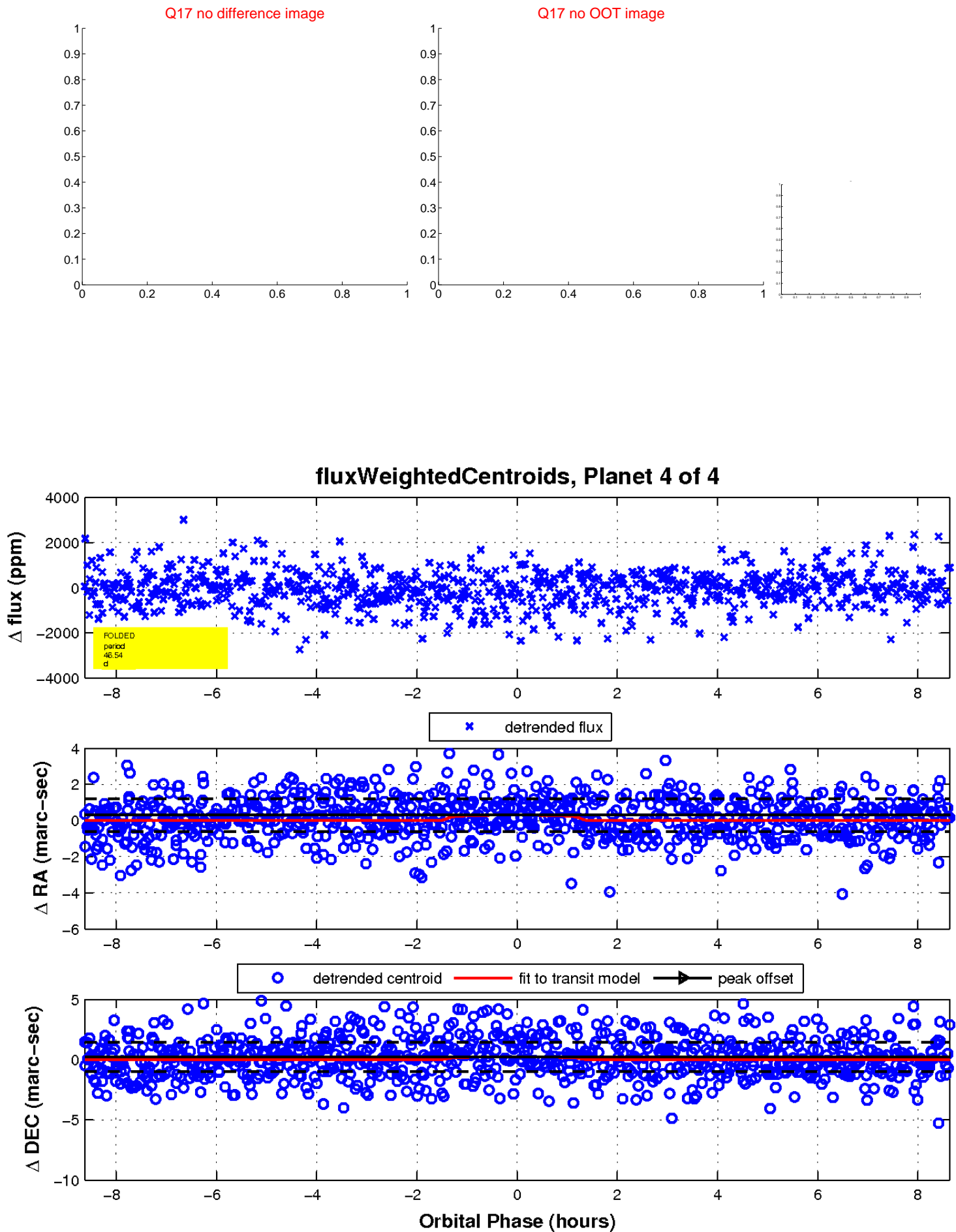
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

