

KIC 009487994

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})
009487994-01	OBS	No	513.685808	507.766633	521.6	7.098	14.2	6.5	2.77	6147	6.72	5.22
009487994-02	OBS	No	448.527483	216.790812	329.5	8.703	10.2	5.1	2.77	6147	5.25	6.26
009487994-03	OBS	No	462.996461	179.438276	247.5	4.176	11.4	4.2	2.77	6147	4.62	6.00
009487994-04	OBS	No	250.533695	352.012748	384.0	3.935	10.5	6.9	2.77	6147	5.85	13.60
009487994-05	OBS	No	334.728886	415.847217	427.0	5.480	10.4	7.0	2.77	6147	6.01	9.24
009487994-06	OBS	No	377.571322	193.101149	383.5	5.000	11.1	-1.0	2.77	6147	5.43	7.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487994-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009487994-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009487994-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_ALT—MOD_POS_DV—INCONSISTENT_TRANS
009487994-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

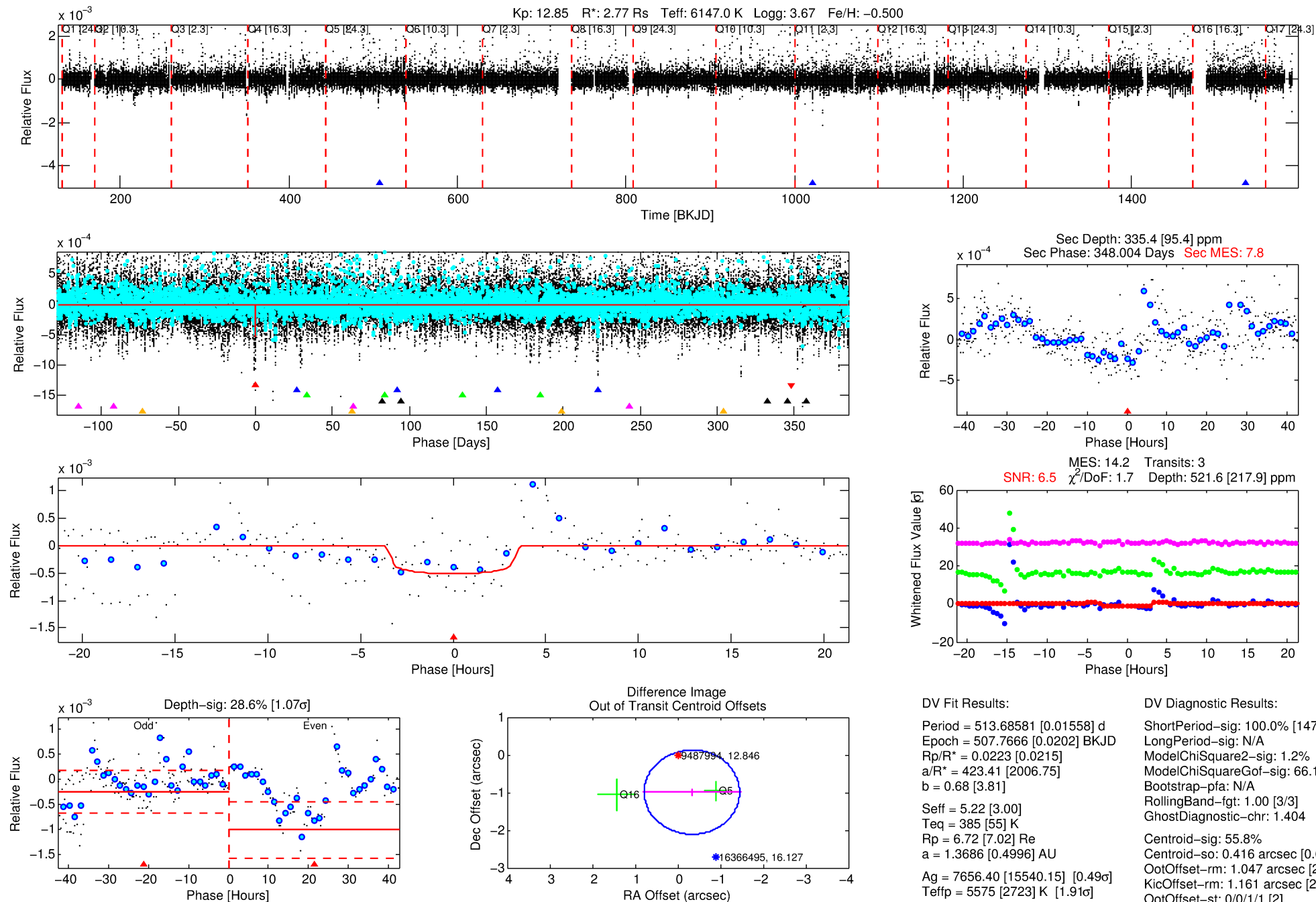
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487994-01

No Significant Match Found

DV One-Page Summary

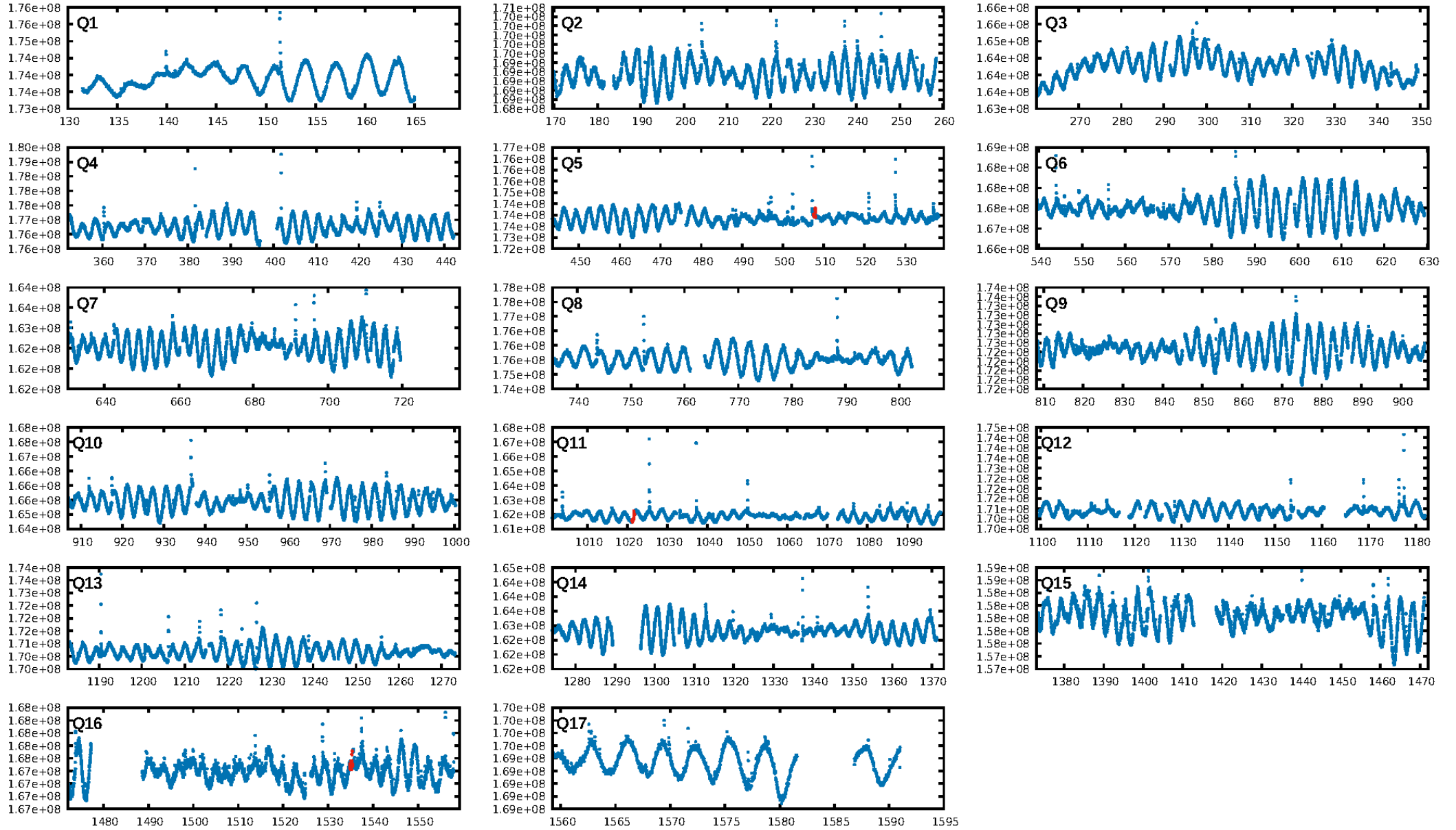
KIC: 9487994 Candidate: 1 of 6 Period: 513.686 d



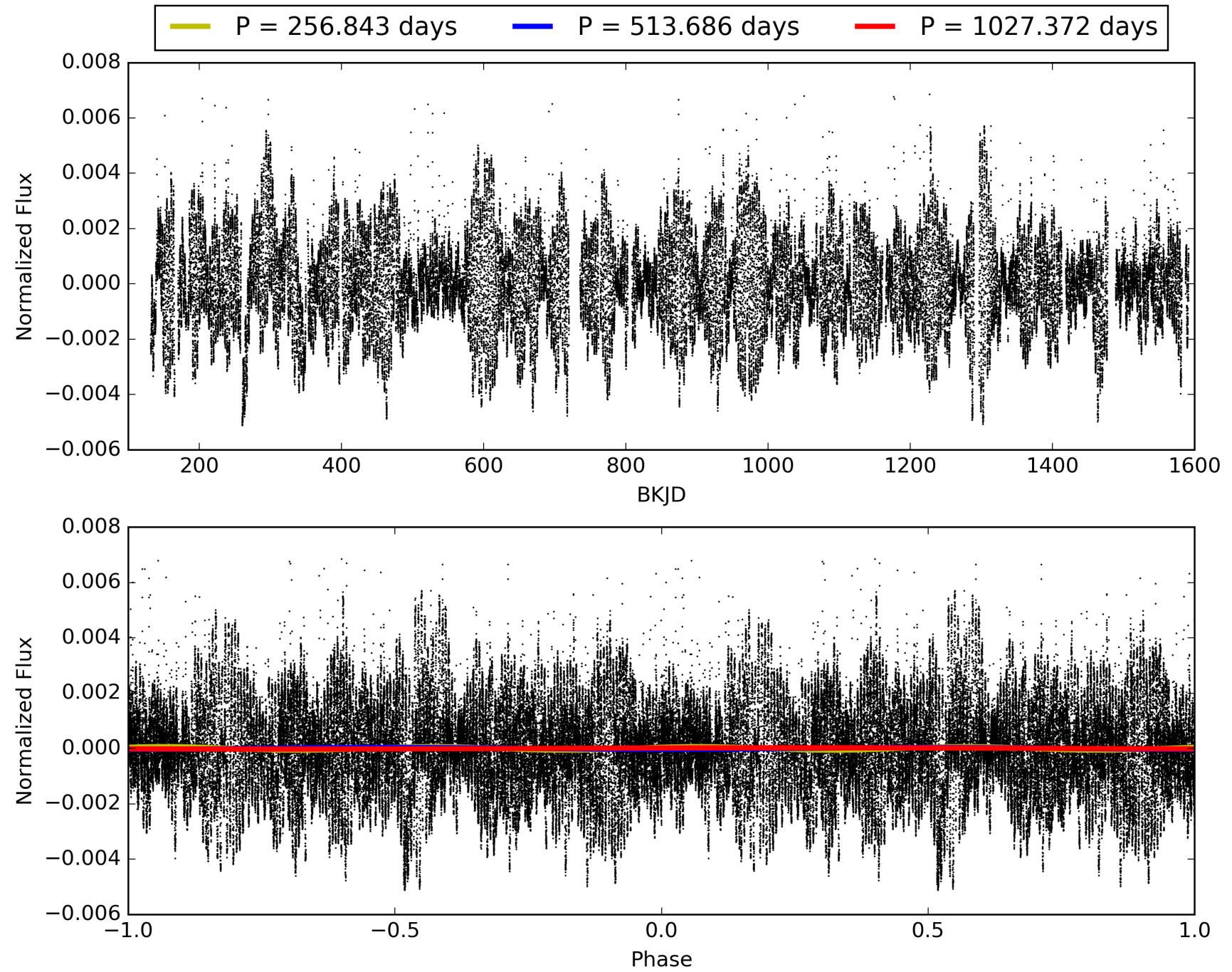
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:18:54 Z

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

TCE 009487994-01, PDC Light Curves

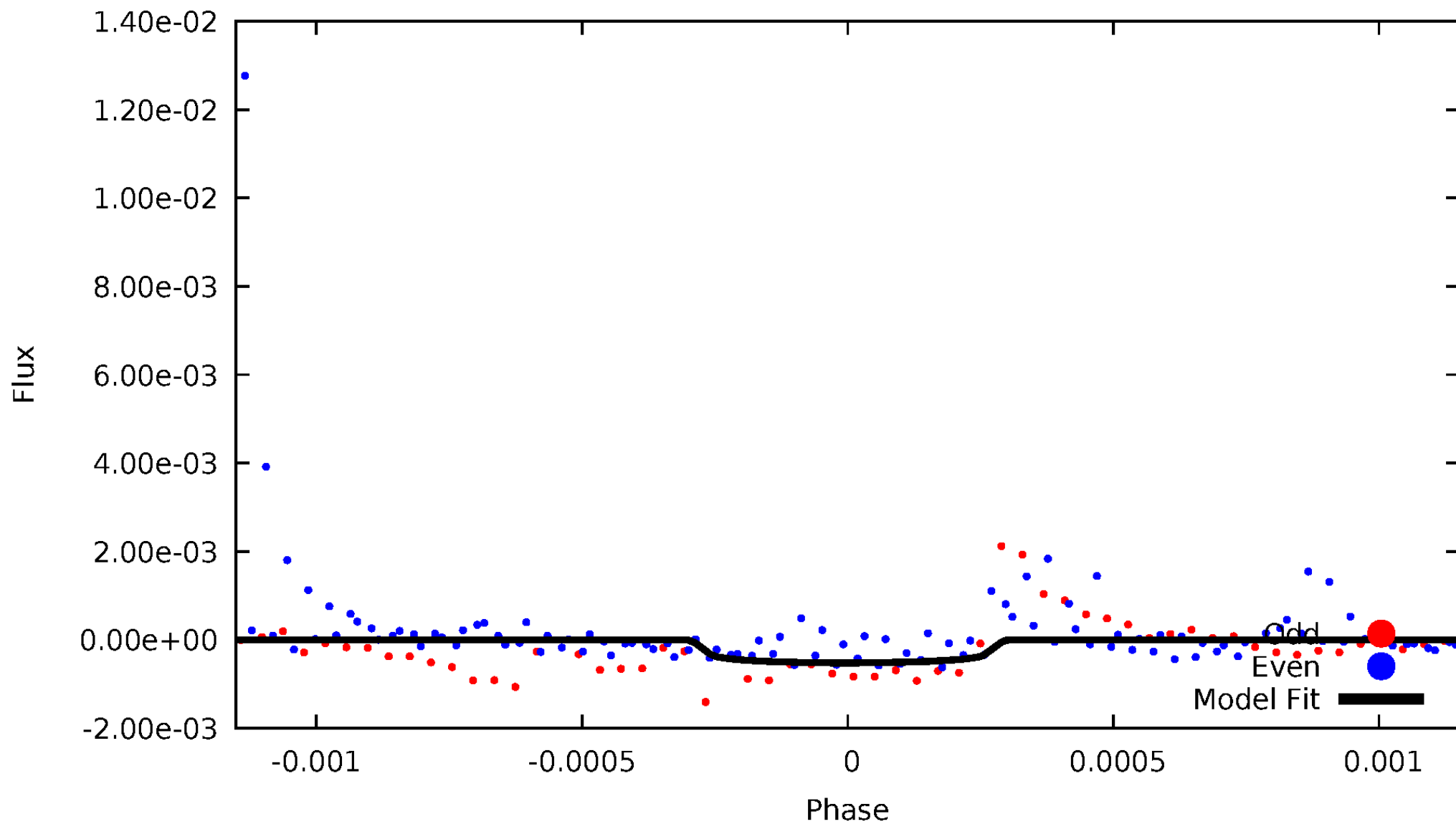


TCE 009487994-01



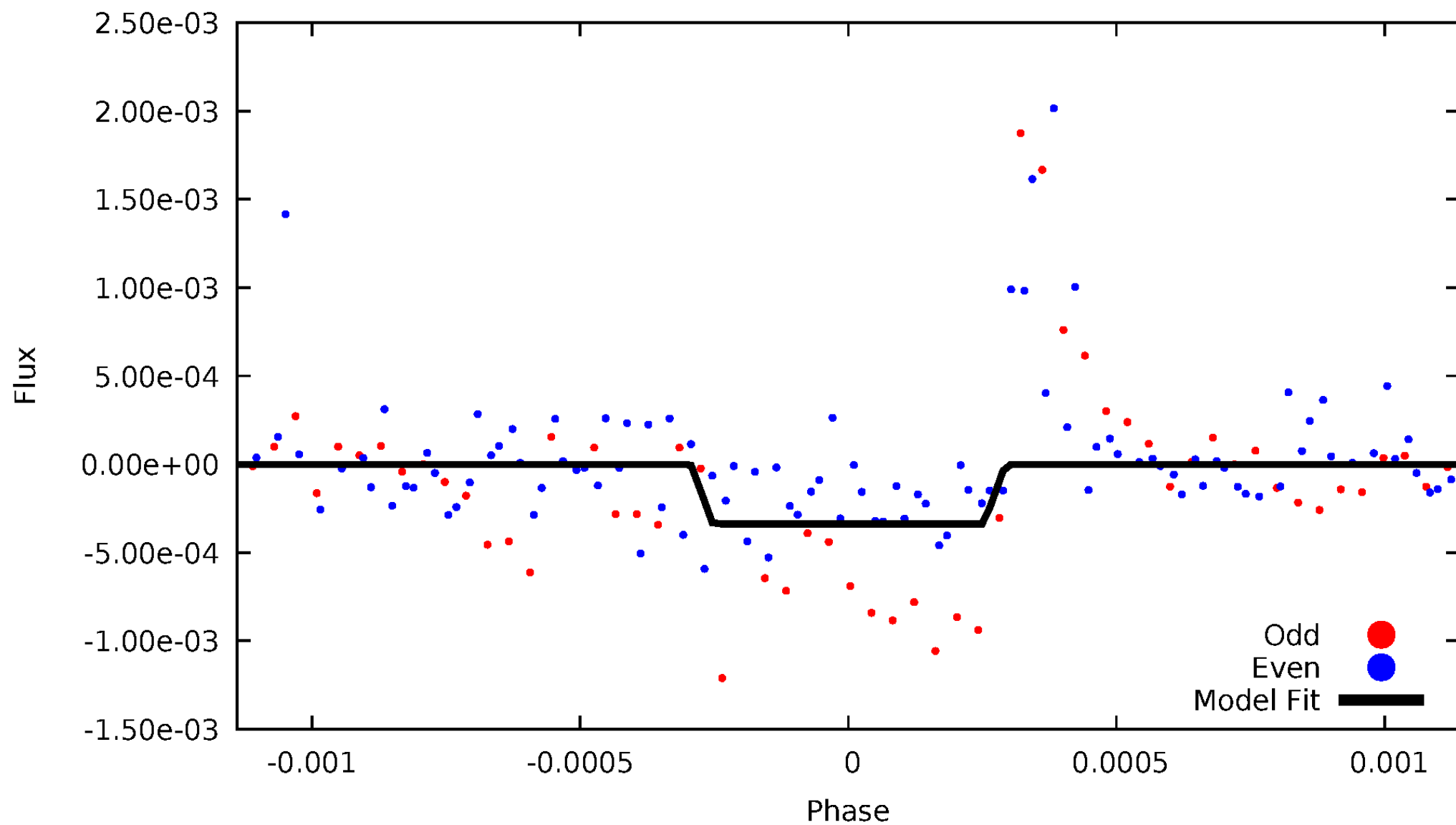
DV Odd/Even

TCE 009487994-01



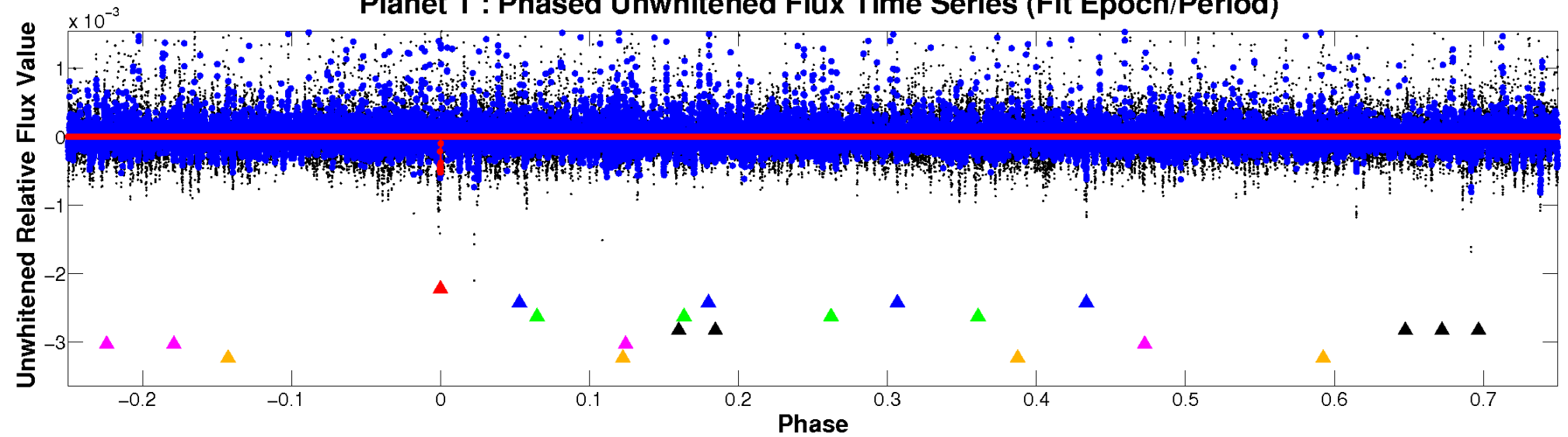
ALT Odd/Even

TCE 009487994-01

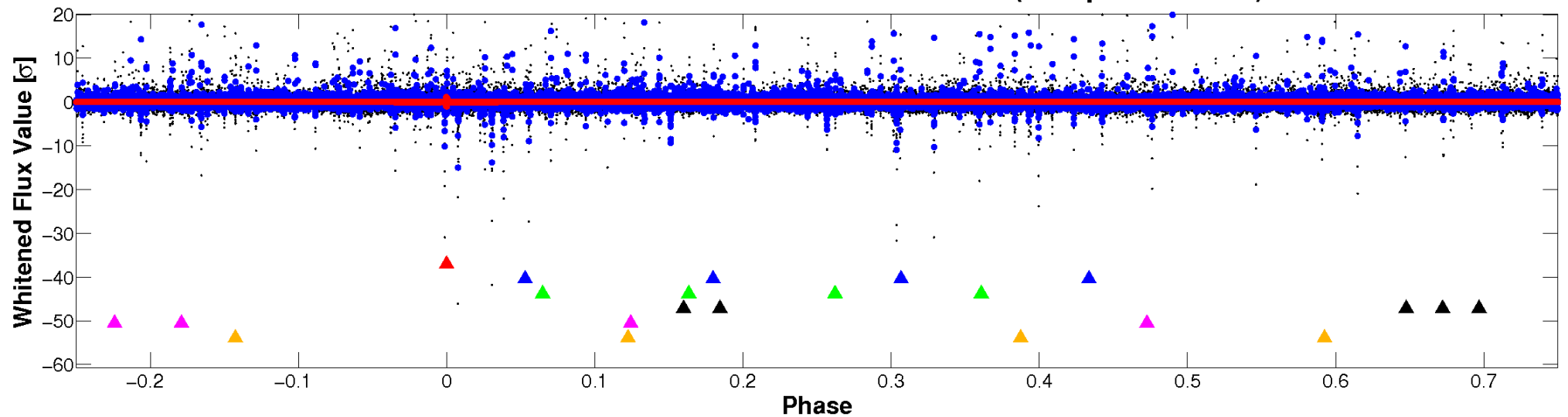


Non-Whitened Vs. Whitened Light Curve

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

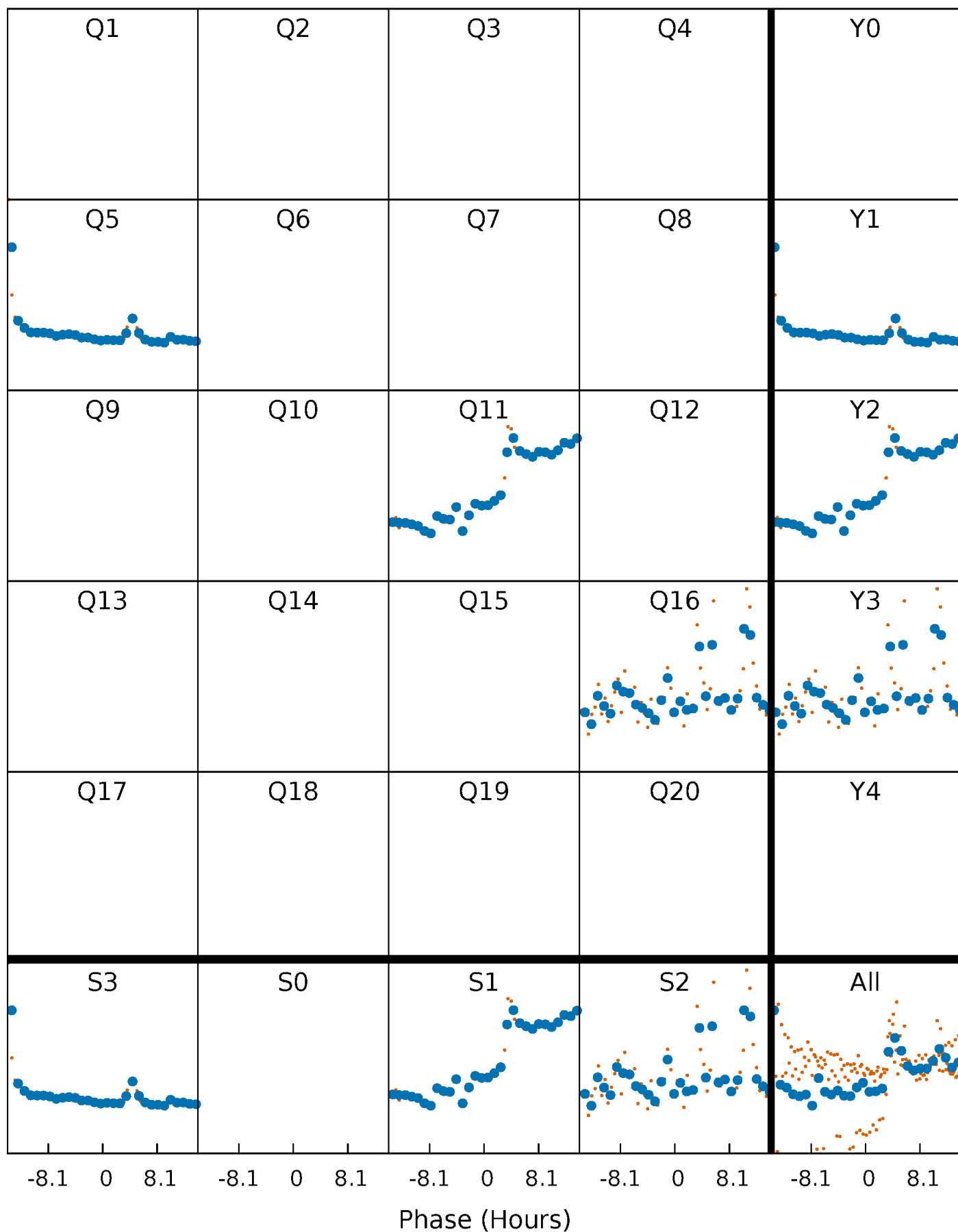


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



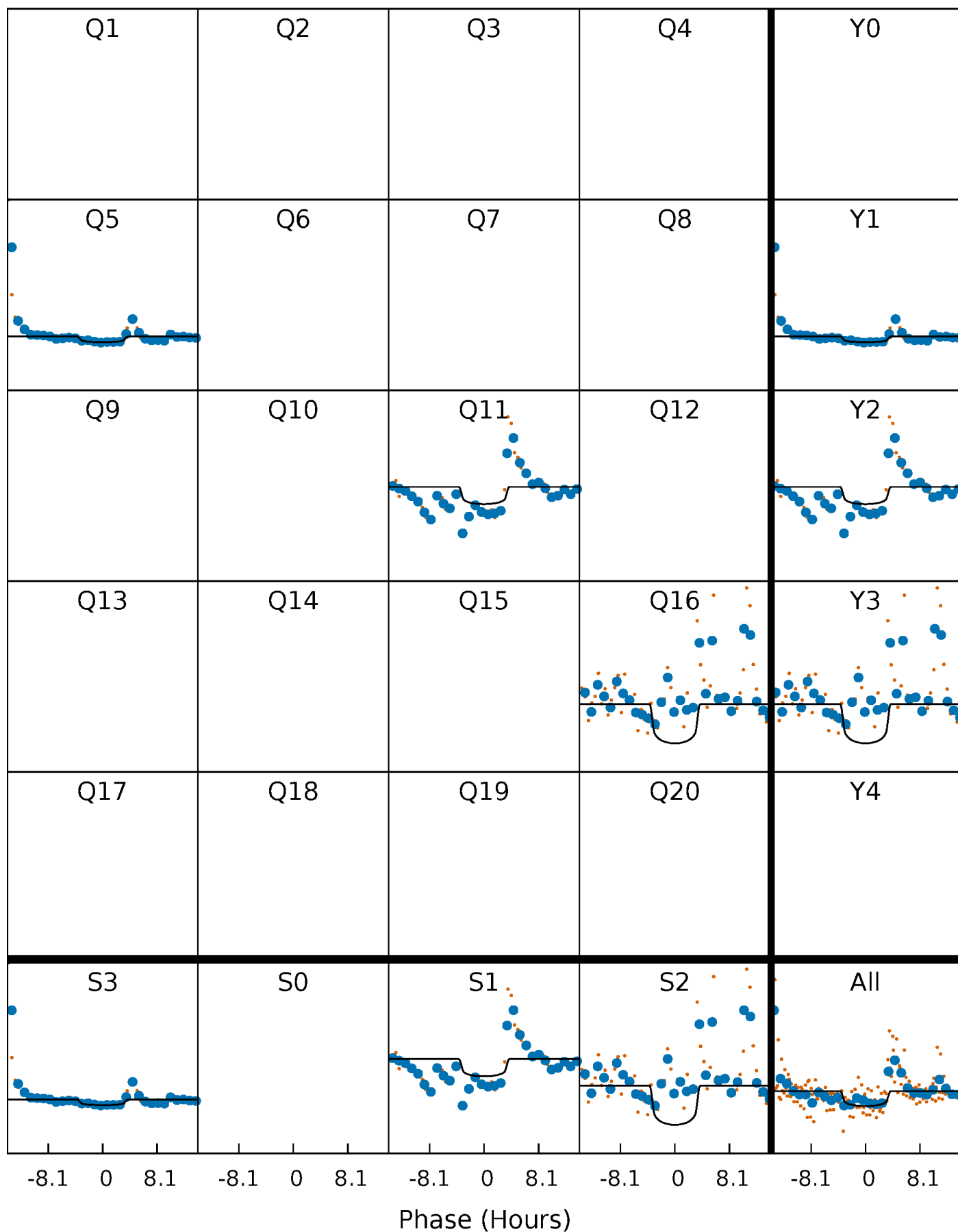
PDC Quarter-Phased Transit Curves

TCE 009487994-01 P=513.685808 Days $T_0=507.766633$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 009487994-01 P=513.685808 Days $T_0=507.766633$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

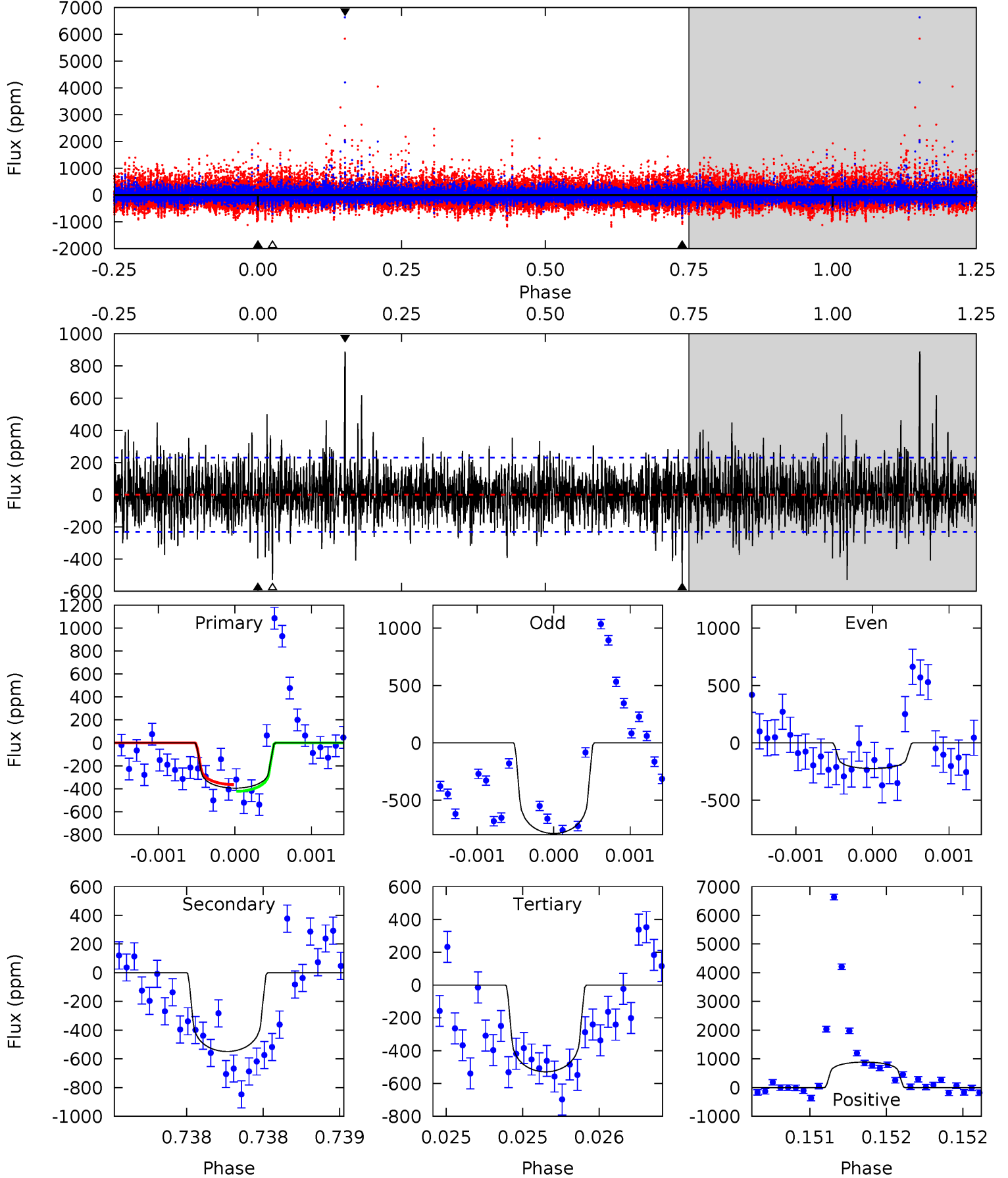
TCE 009487994-01 P=513.672454 Days $T_0=507.763402$ (BKJD)



DV Model-Shift Uniqueness Test

009487994-01, P = 513.685808 Days, E = 507.766633 Days

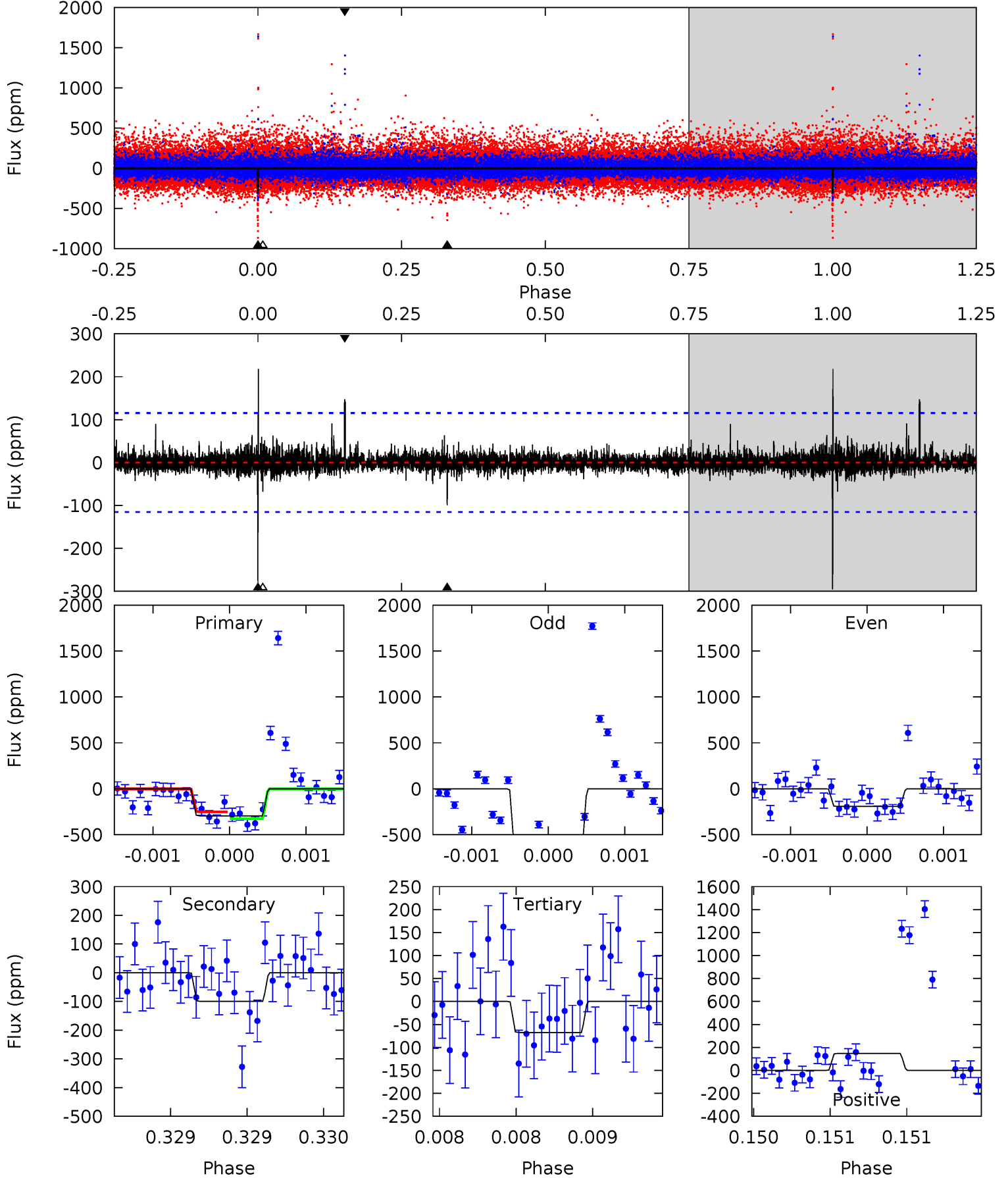
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.47	13.2	12.7	21.3	5.55	3.44	2.82	-3.22	-11.9	0.48	-8.16	4.23	0.83	0.62	0.71



Alt Model-Shift Uniqueness Test

009487994-01, P = 513.672454 Days, E = 507.763402 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	4.80	3.26	7.08	5.55	3.44	0.63	11.0	7.13	1.54	-2.28	13.3	1.77	0.43	1.75



Stellar Parameters For KIC 009487994

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6147^{+184}_{-184}	$3.667^{+0.322}_{-0.115}$	$-0.500^{+0.400}_{-0.250}$	$2.765^{+0.477}_{-1.114}$	$1.294^{+0.201}_{-0.302}$	$0.086^{+0.218}_{-0.029}$
	+3%/-3%	+9%/-3%	+80%/-50%	+17%/-40%	+16%/-23%	+253%/-34%
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 009487994-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-549 ± 42	$7.16^{+6.26}_{-4.34}$	532^{+35}_{-51}	5917^{+4704}_{-1385}	11021^{+61377}_{-7895}
Alt.	-100 ± 21	$6.59^{+5.89}_{-4.23}$	528^{+35}_{-45}	4202^{+2438}_{-756}	2298^{+17519}_{-1639}

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

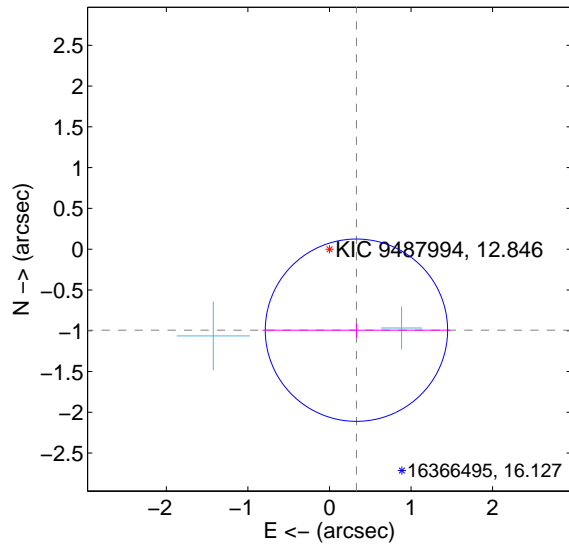
Supplemental centroid analysis for 009487994-01. Kepler magnitude: 12.85. Transit SNR 6.53

There are 2 quarters with good PRF difference image offsets

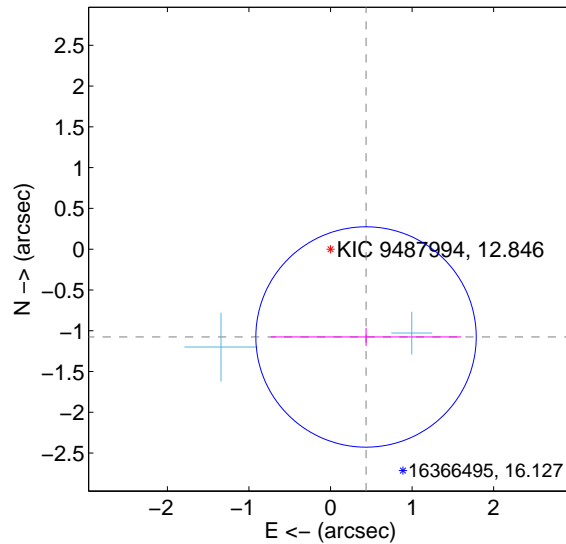
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.047 ± 0.373	2.81	-0.331 ± 1.153	-0.993 ± 0.084
PRF-fit source offset from KIC position	1.161 ± 0.450	2.58	-0.436 ± 1.169	-1.077 ± 0.112
photometric centroid source offset	0.42 ± 0.69	0.61	-0.34 ± 0.70	0.23 ± 0.66

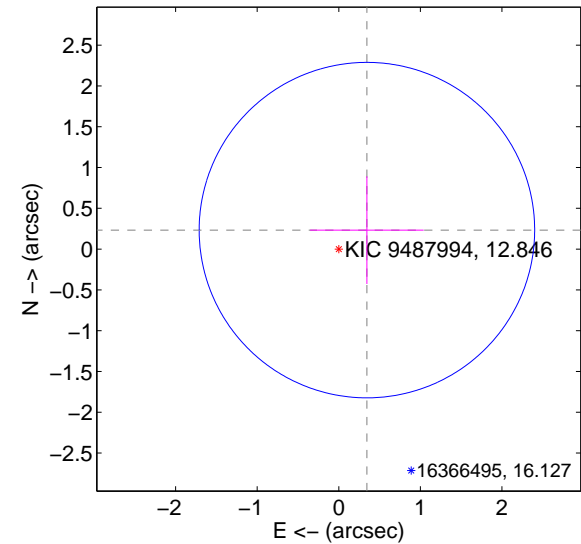
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

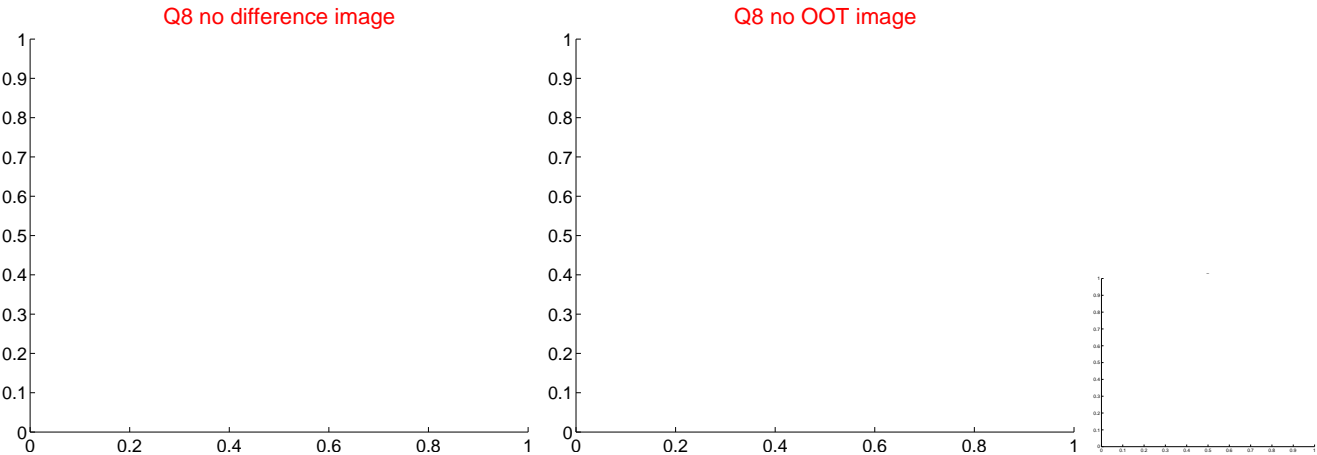
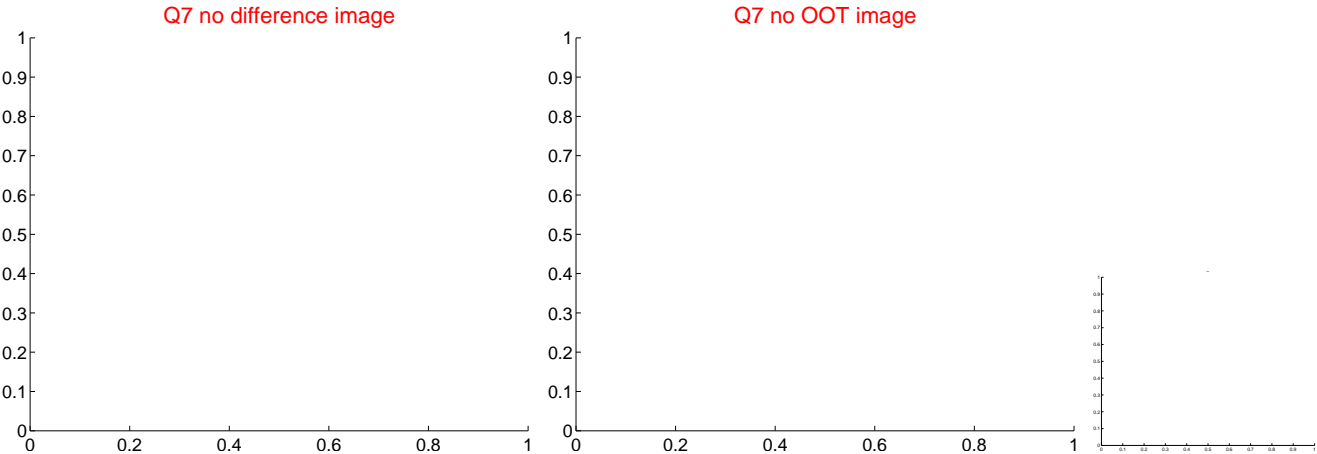
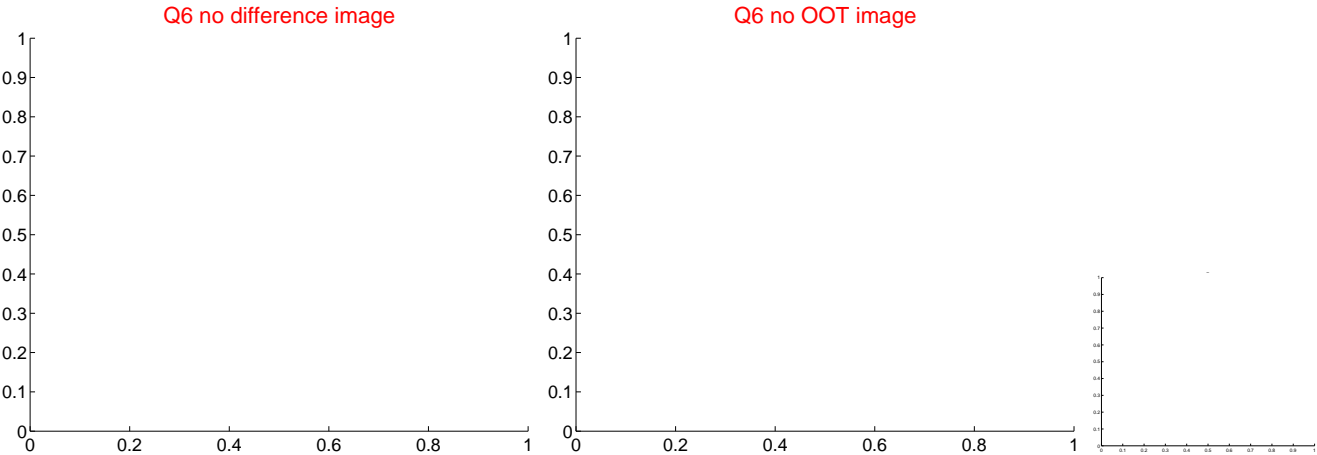
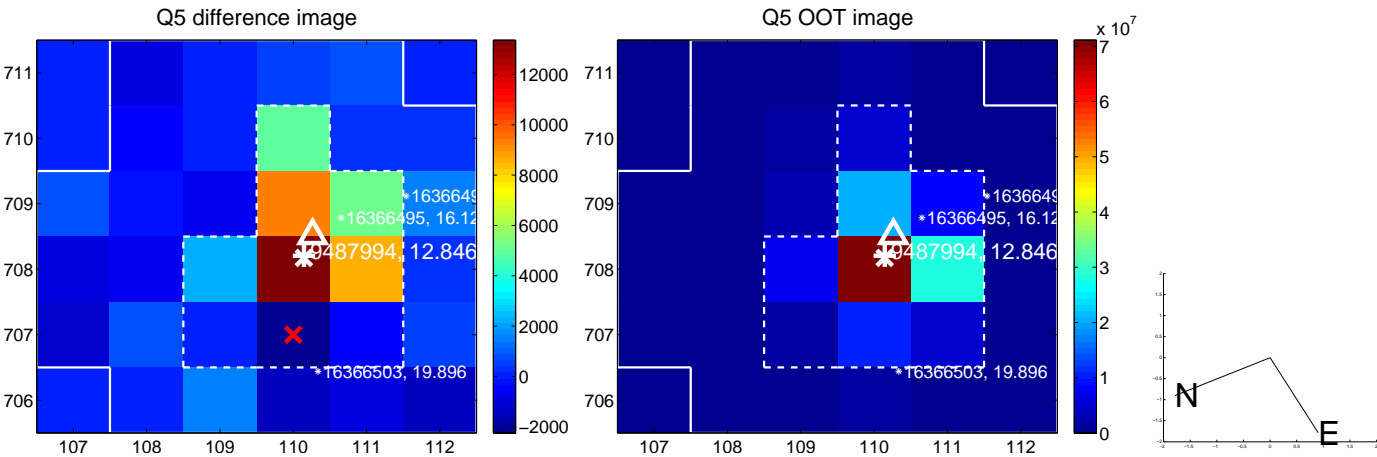


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



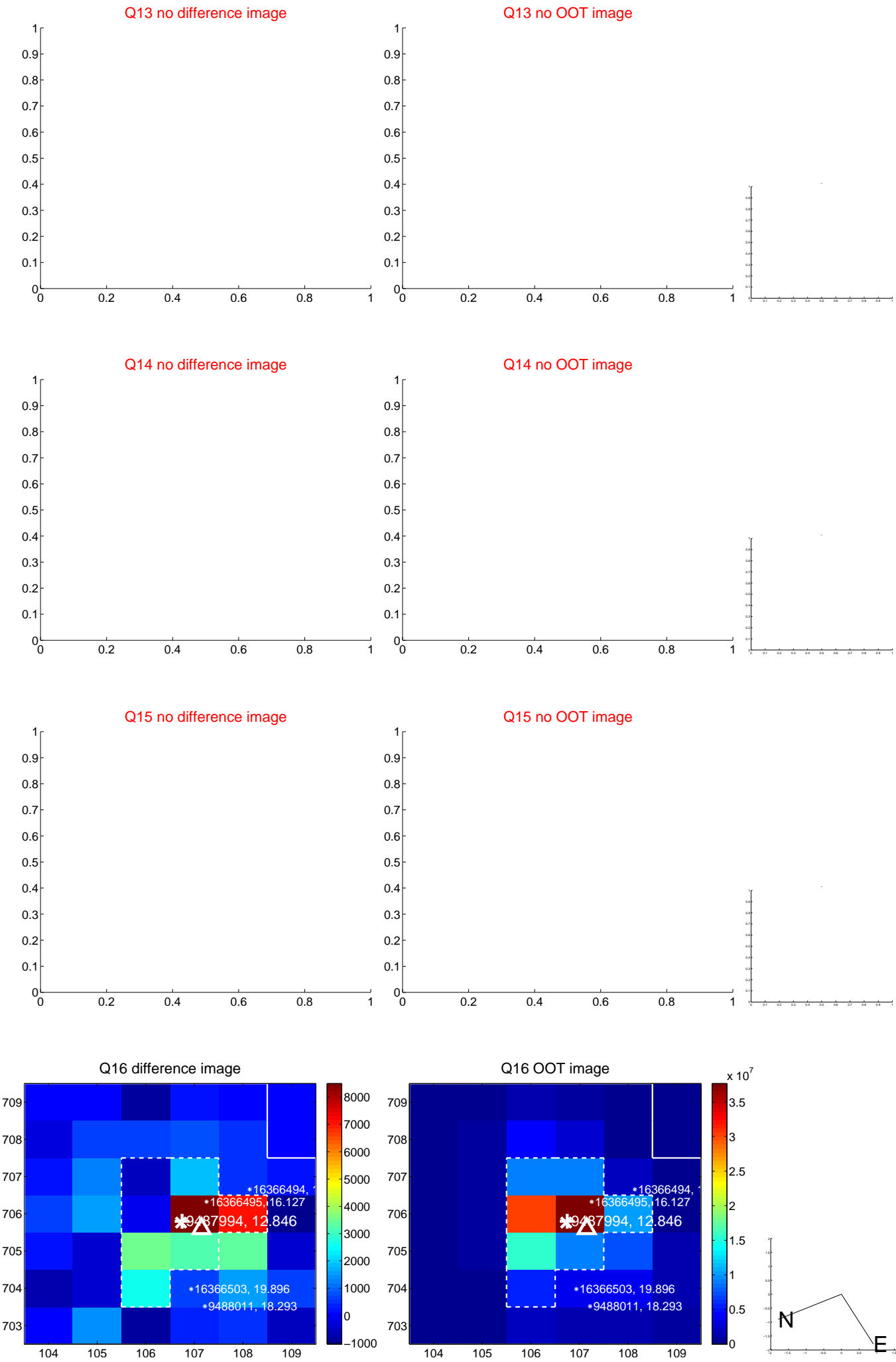
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



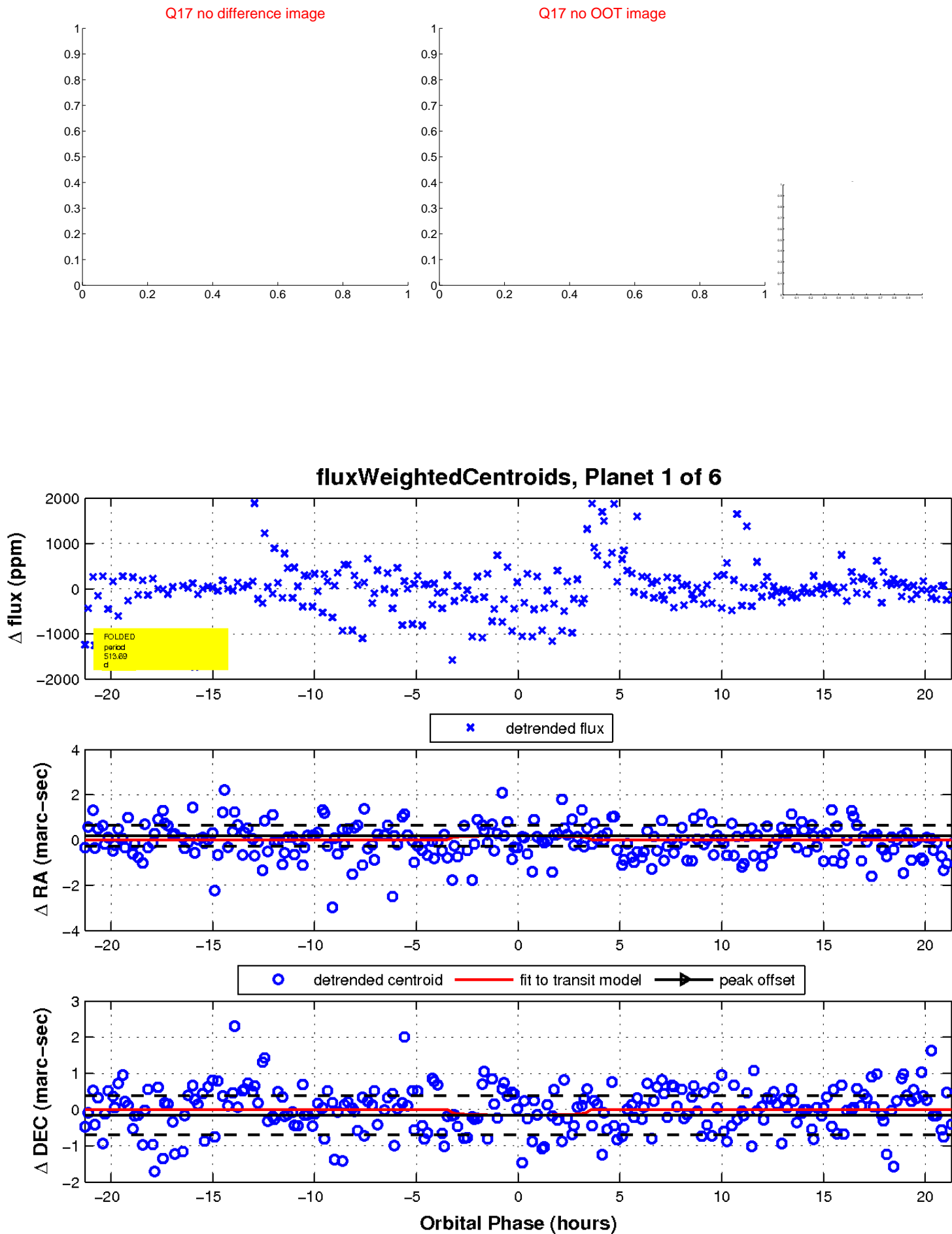
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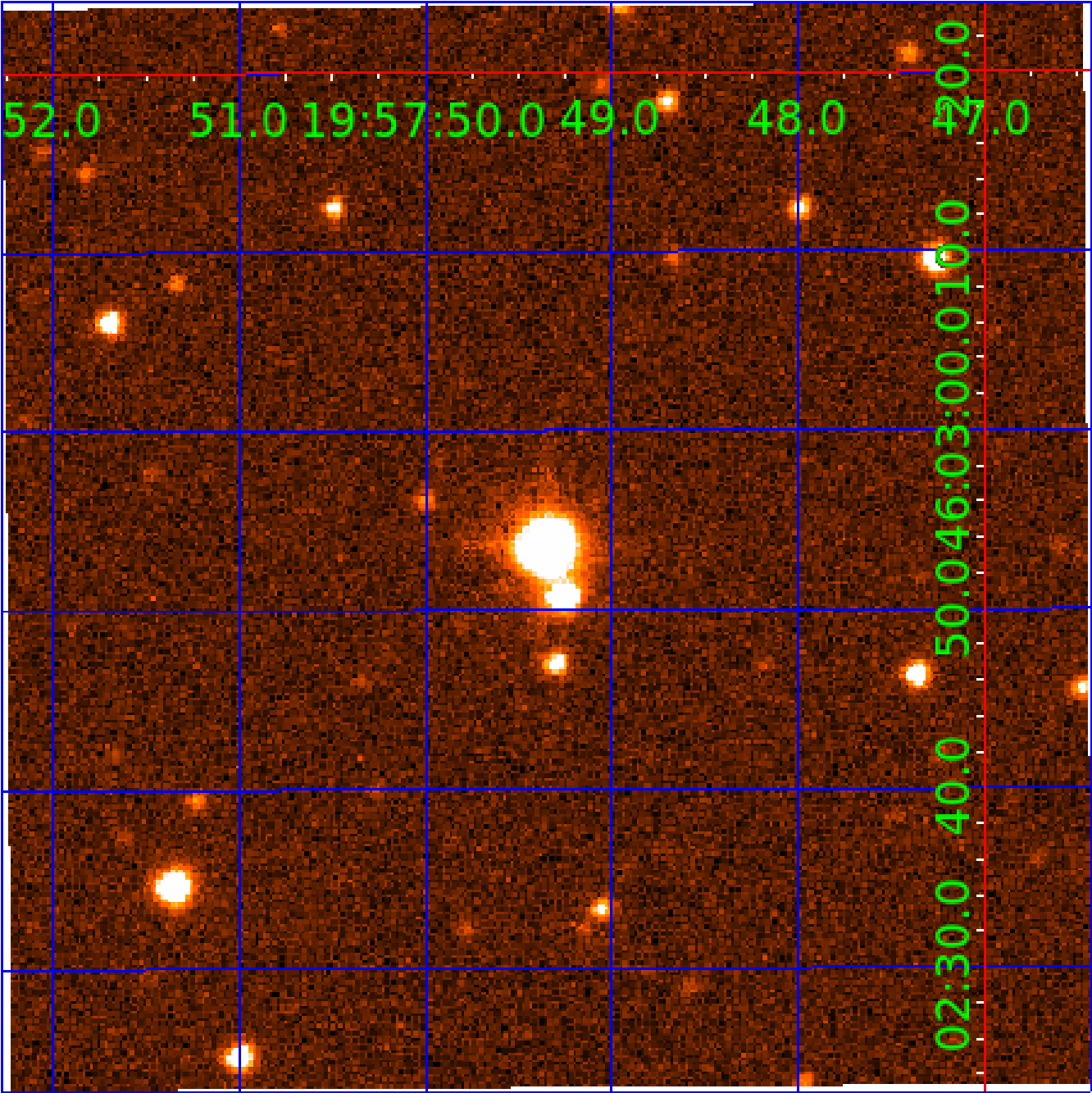


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009487994

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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009487994-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009487994-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009487994-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_ALT—MOD_POS_DV—INCONSISTENT_TRANS
009487994-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

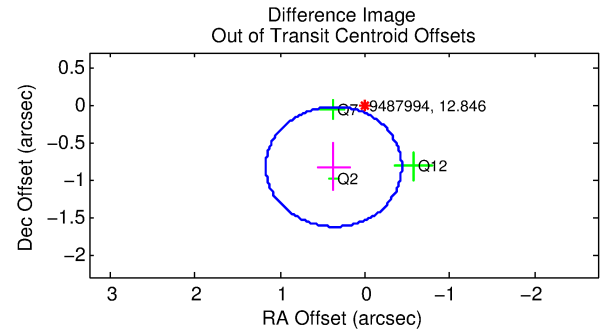
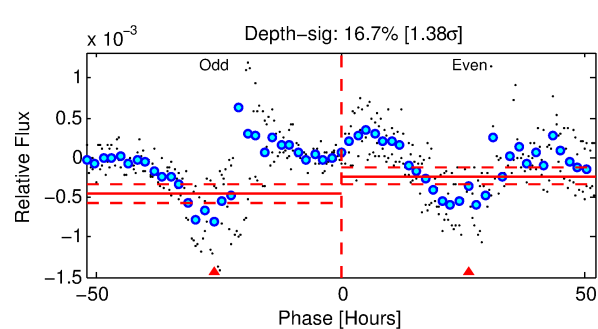
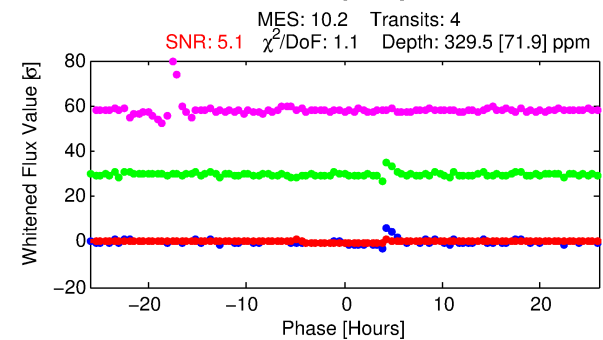
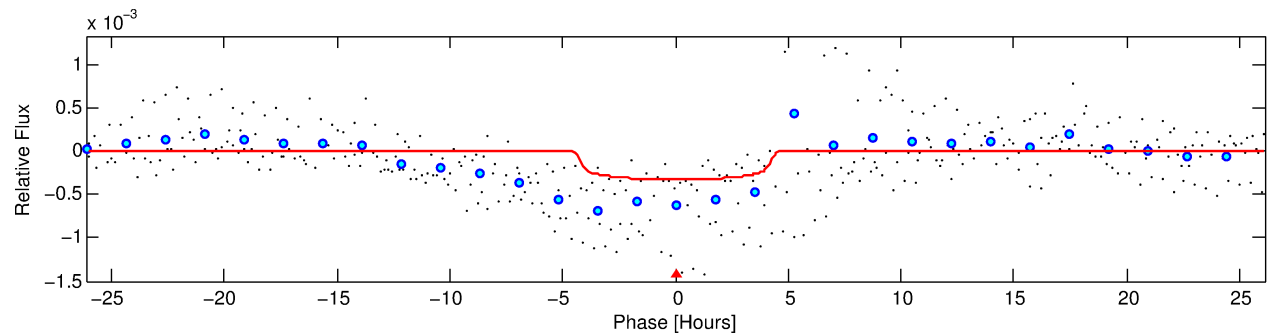
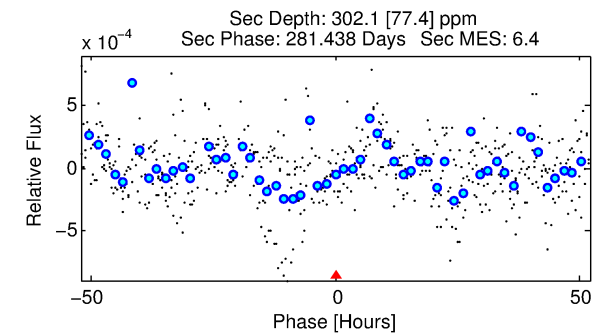
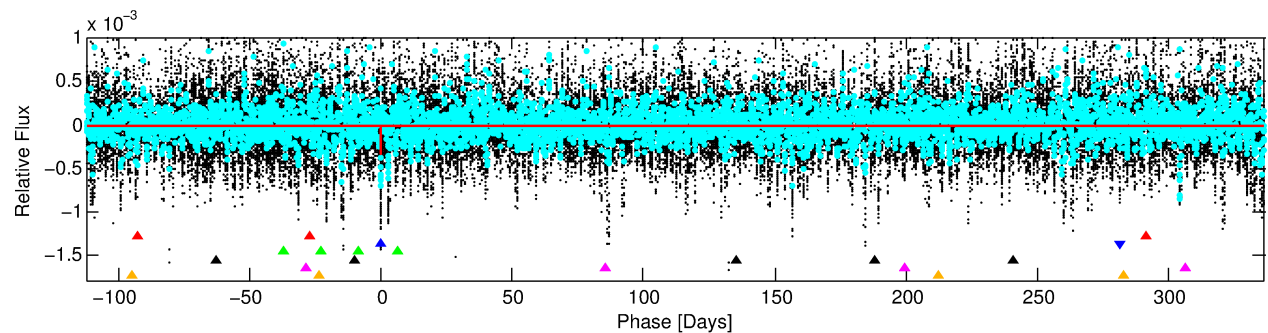
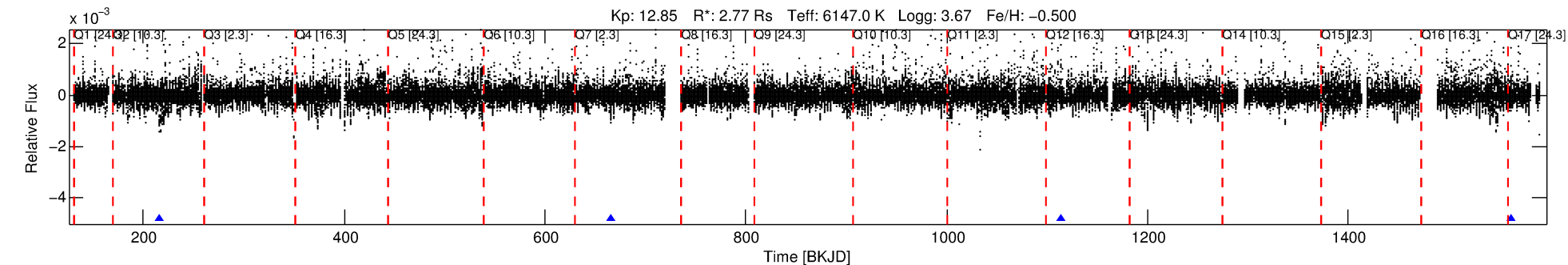
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487994-02

No Significant Match Found

DV One-Page Summary

KIC: 9487994 Candidate: 2 of 6 Period: 448.527 d



DV Fit Results:

Period = 448.52748 [0.00533] d
Epoch = 216.7908 [0.0090] BKJD
Rp/R* = 0.0174 [0.0097]
a/R* = 323.29 [898.34]
b = 0.60 [2.98]
Seff = 6.26 [3.60]
Teff = 403 [58] K
Rp = 5.25 [3.61] Re
a = 1.2503 [0.4564] AU
Ag = 9412.13 [11993.61] [0.78 σ]
Teffp = 6141 [1765] K [3.25 σ]

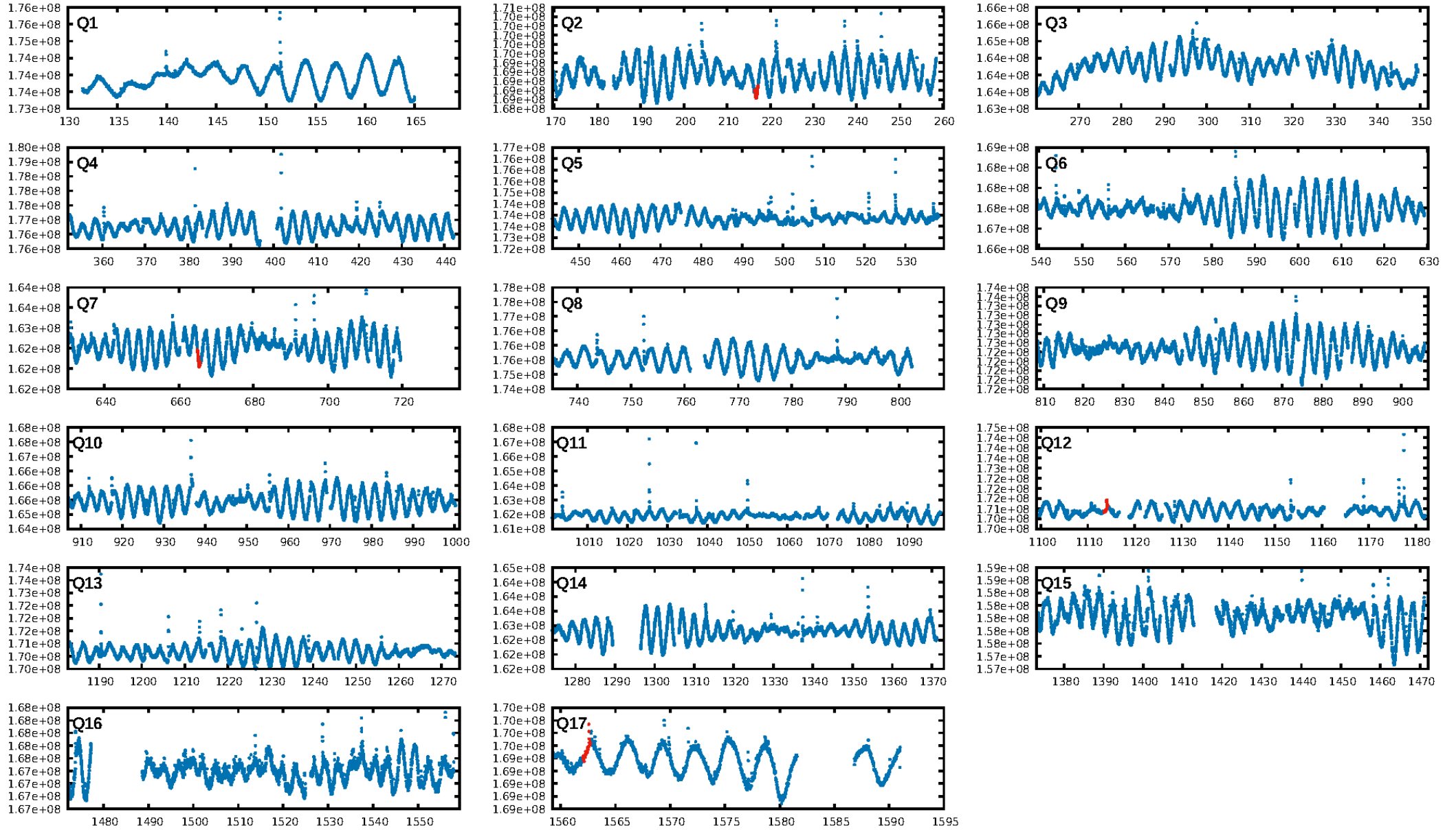
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [169.67 σ]
LongPeriod-sig: 100.0% [35.97 σ]
ModelChiSquare2-sig: 48.3%
ModelChiSquareGof-sig: 96.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -23.06
Centroid-sig: 0.5%
Centroid-so: 1.452 arcsec [2.00 σ]
OotOffset-rm: 0.904 arcsec [3.38 σ]
KicOffset-rm: 0.953 arcsec [3.14 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [4/4]

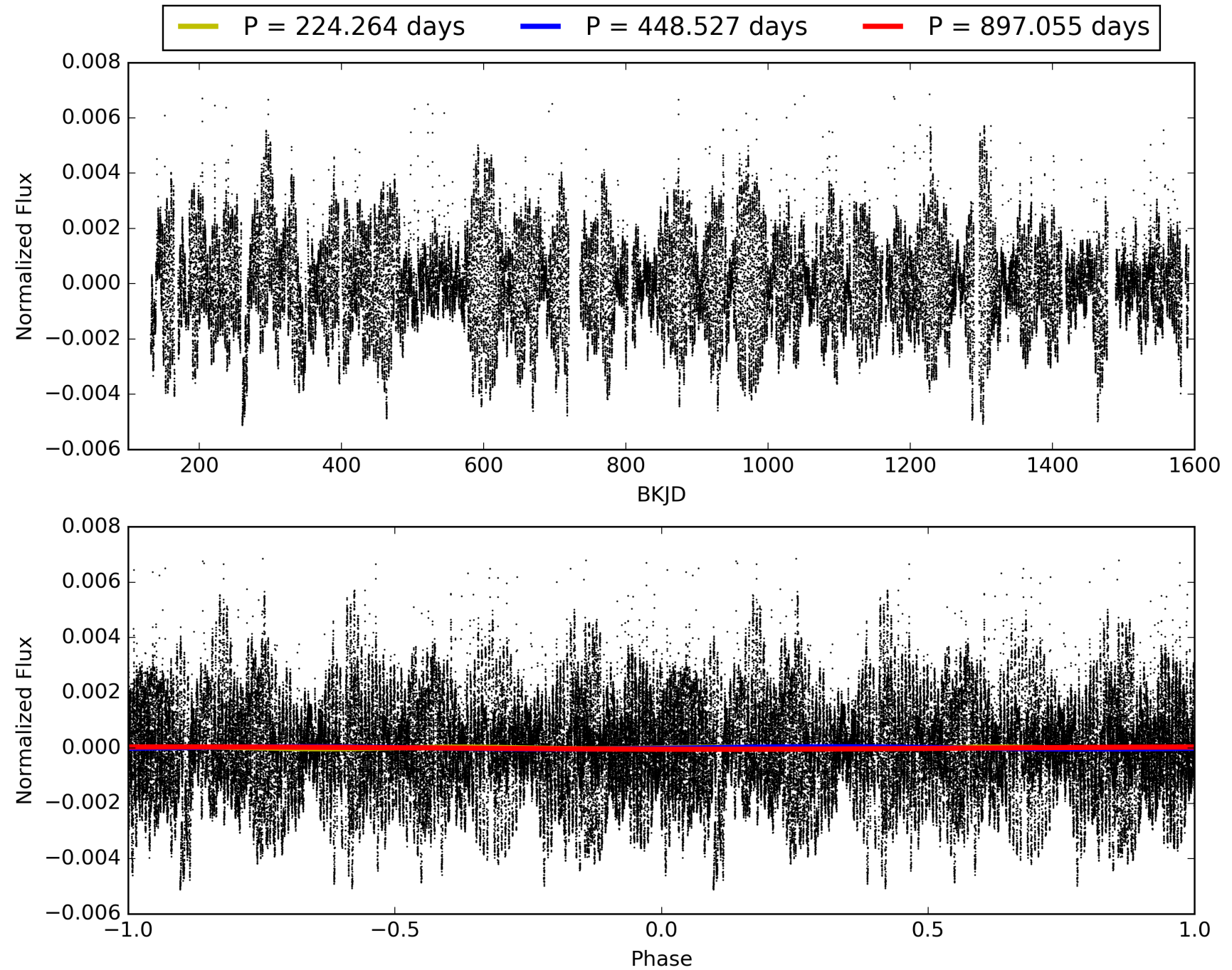
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009487994-02, PDC Light Curves

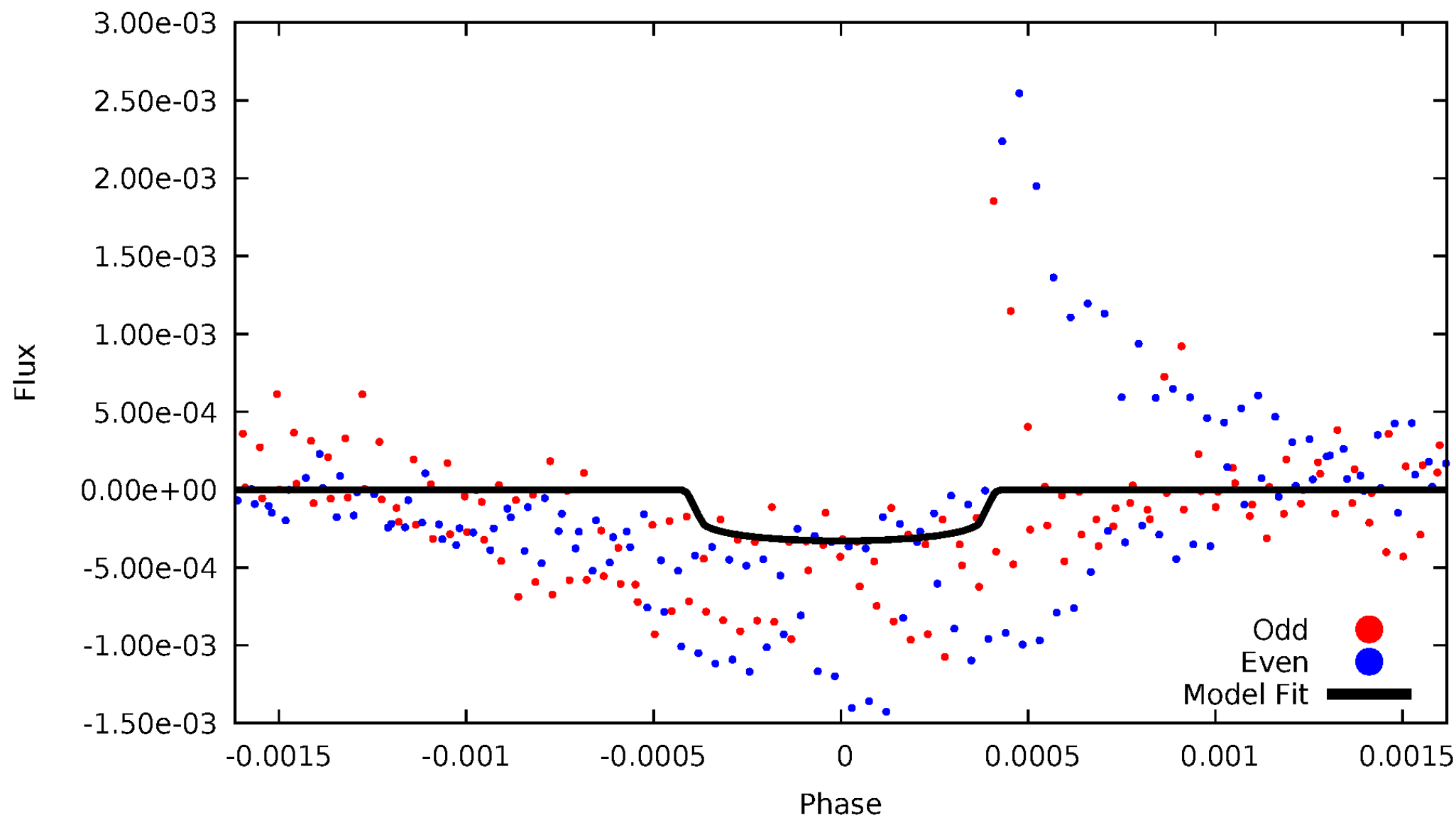


TCE 009487994-02



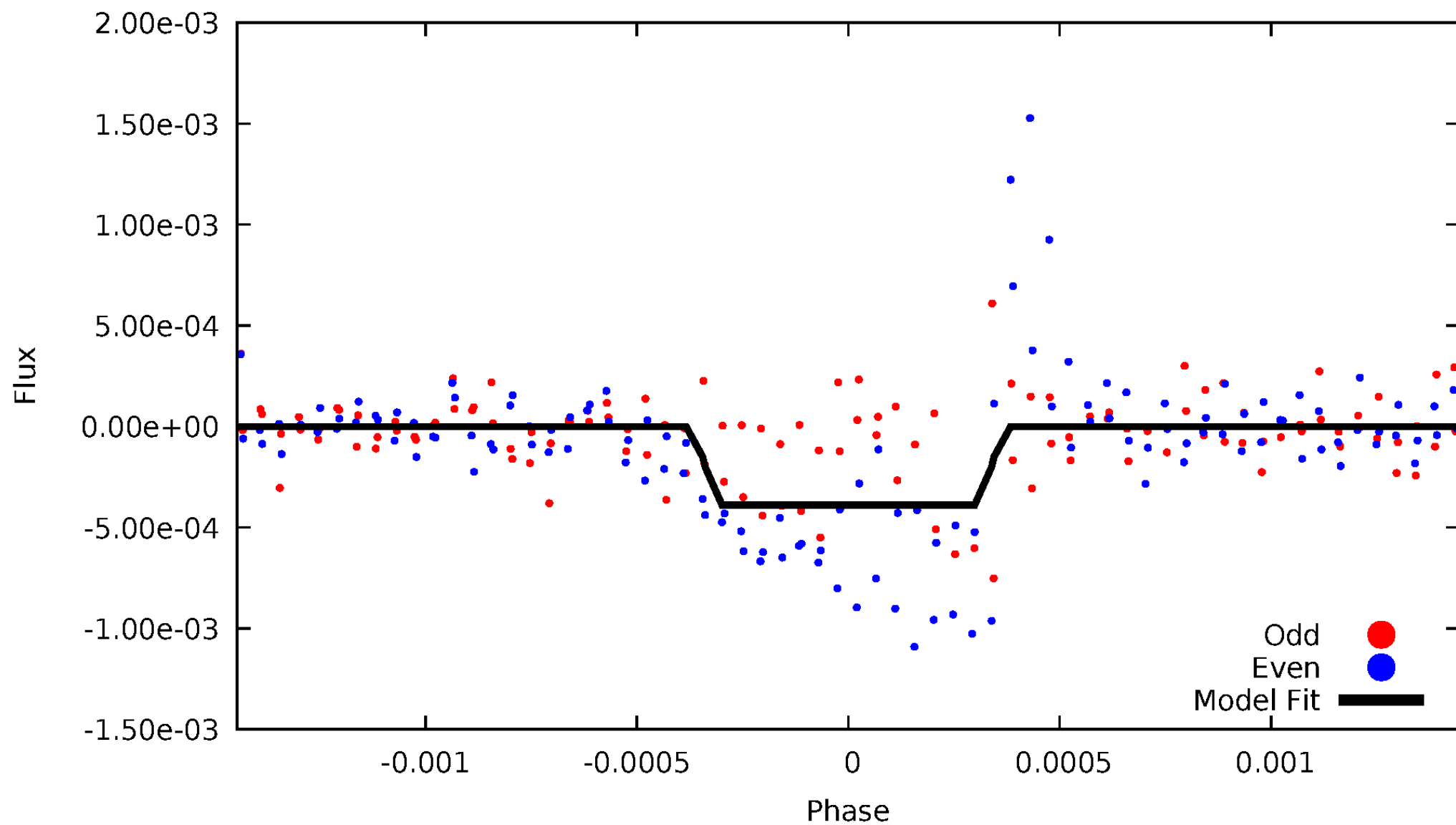
DV Odd/Even

TCE 009487994-02



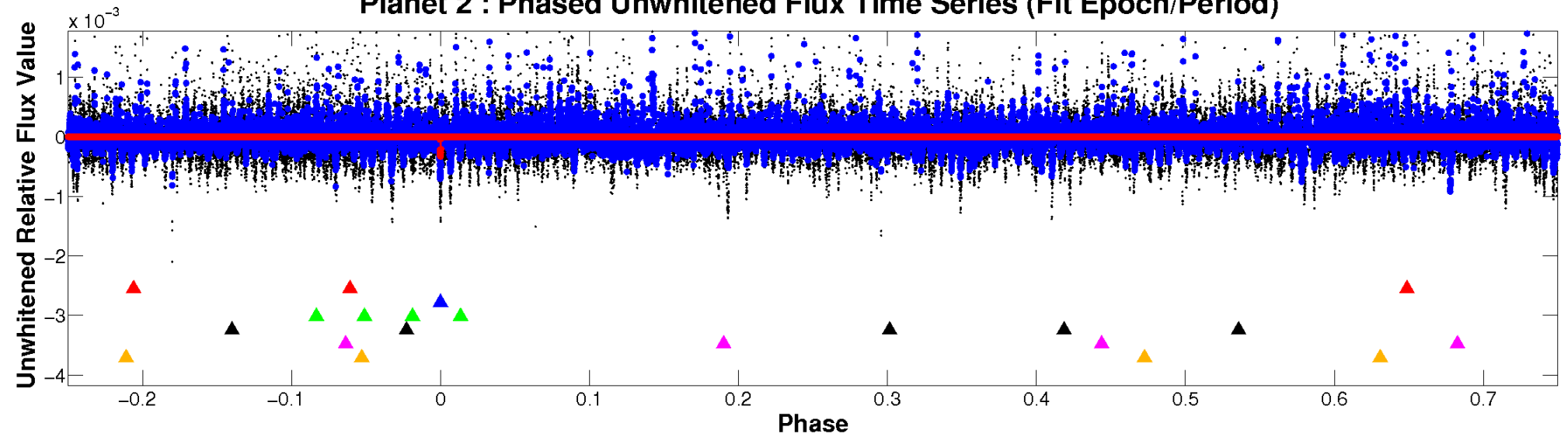
ALT Odd/Even

TCE 009487994-02

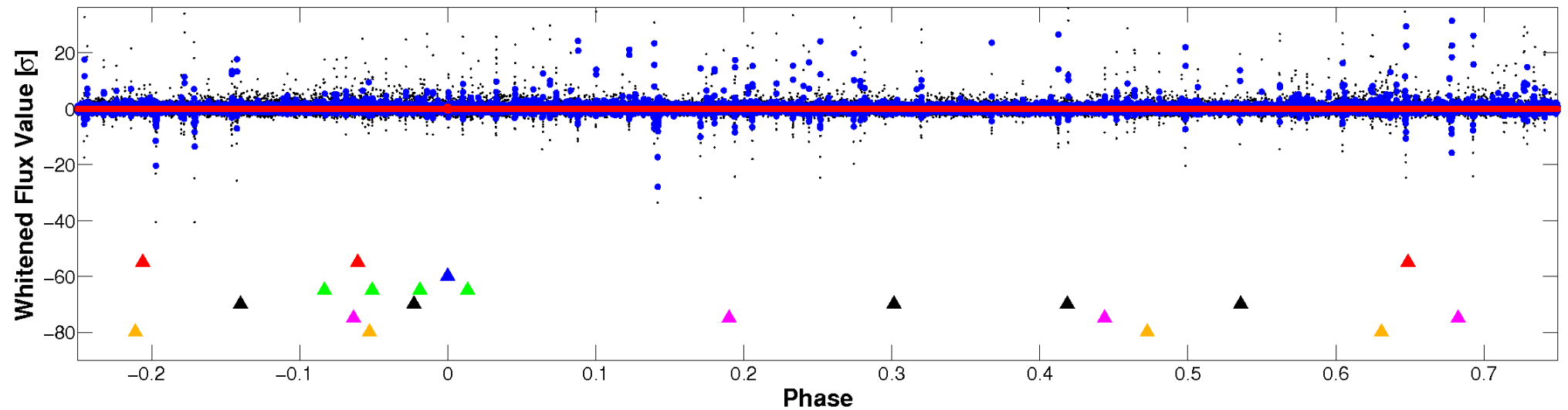


Non-Whitened Vs. Whitened Light Curve

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

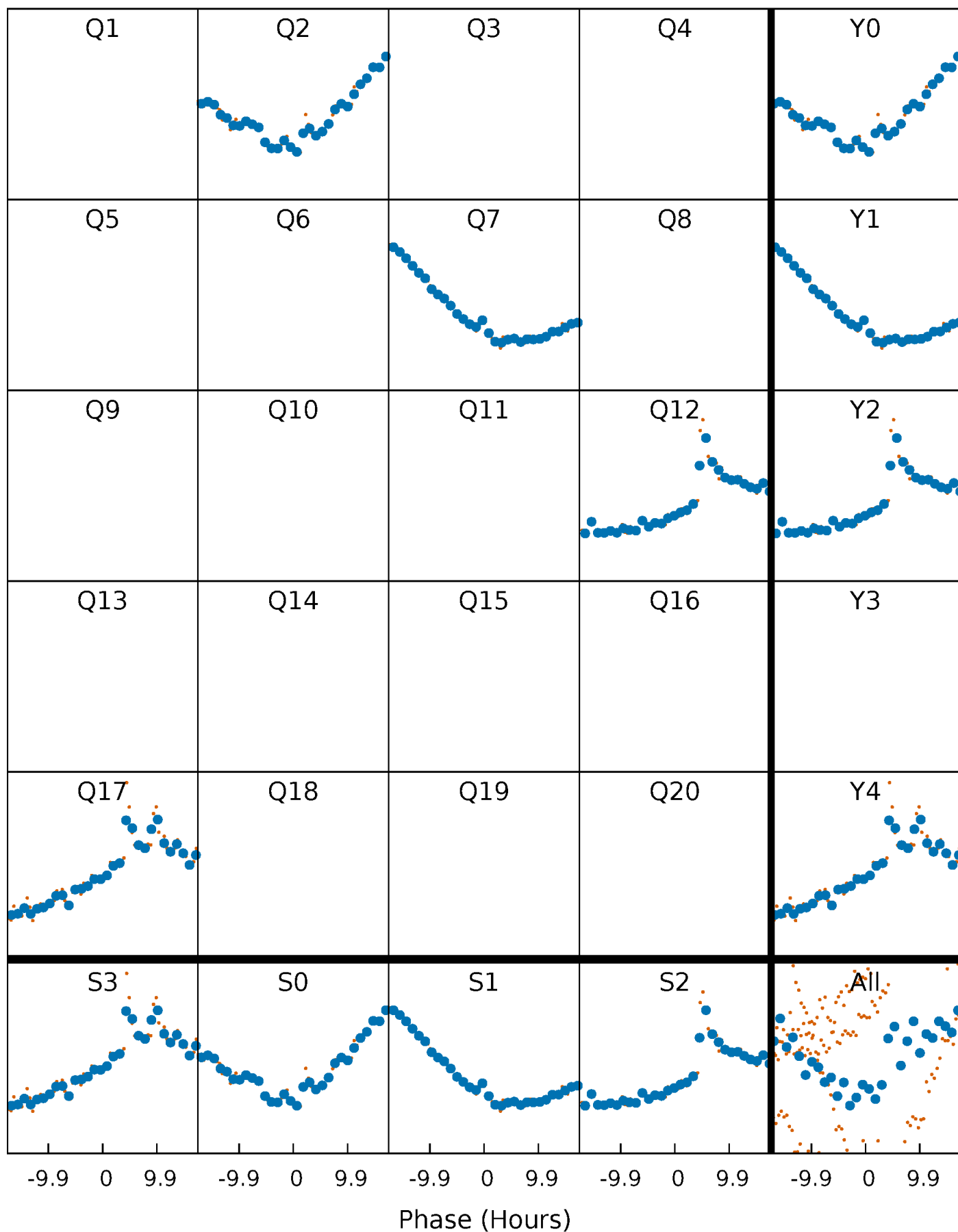


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



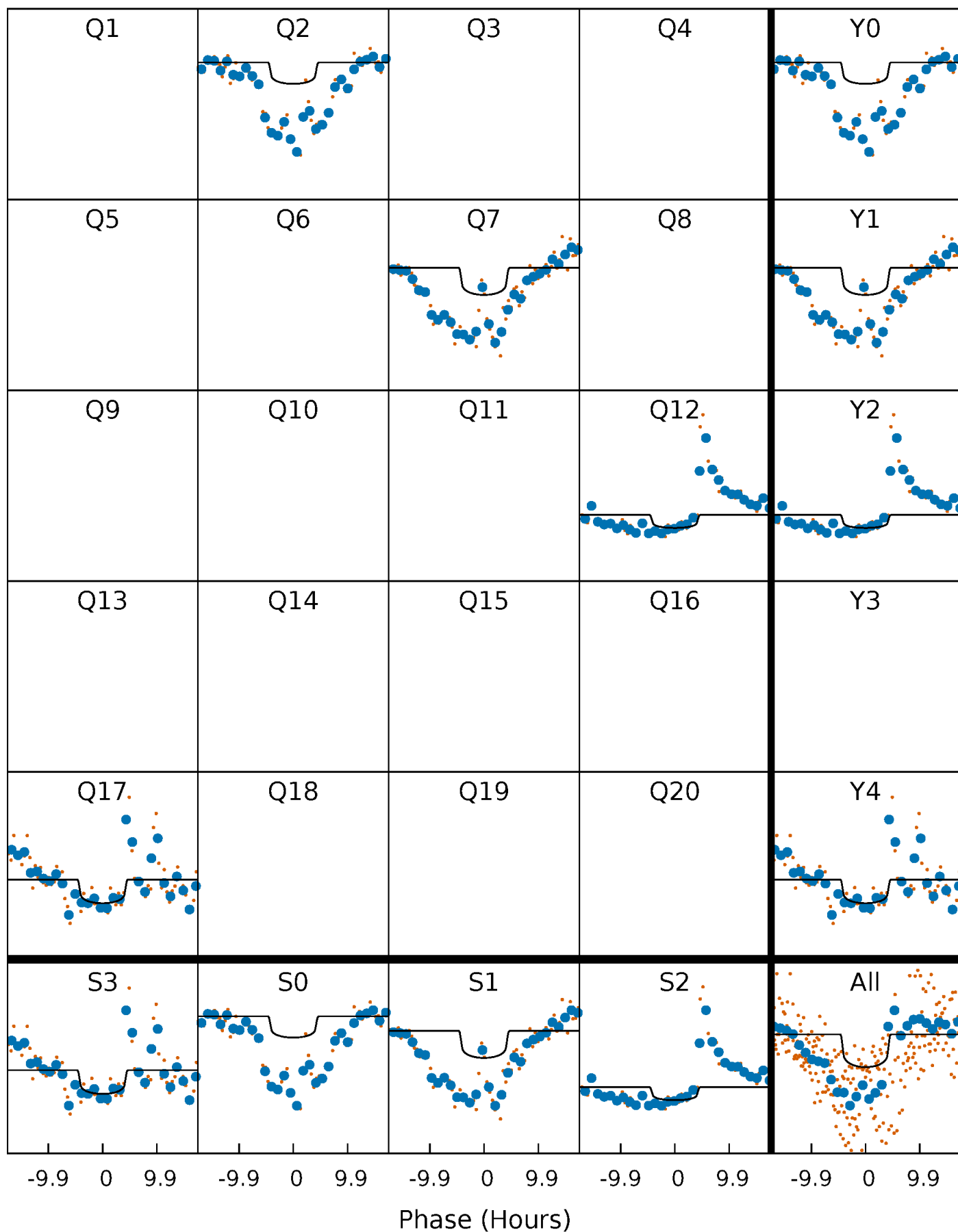
PDC Quarter-Phased Transit Curves

TCE 009487994-02 P=448.527483 Days $T_0=216.790812$ (BKJD)



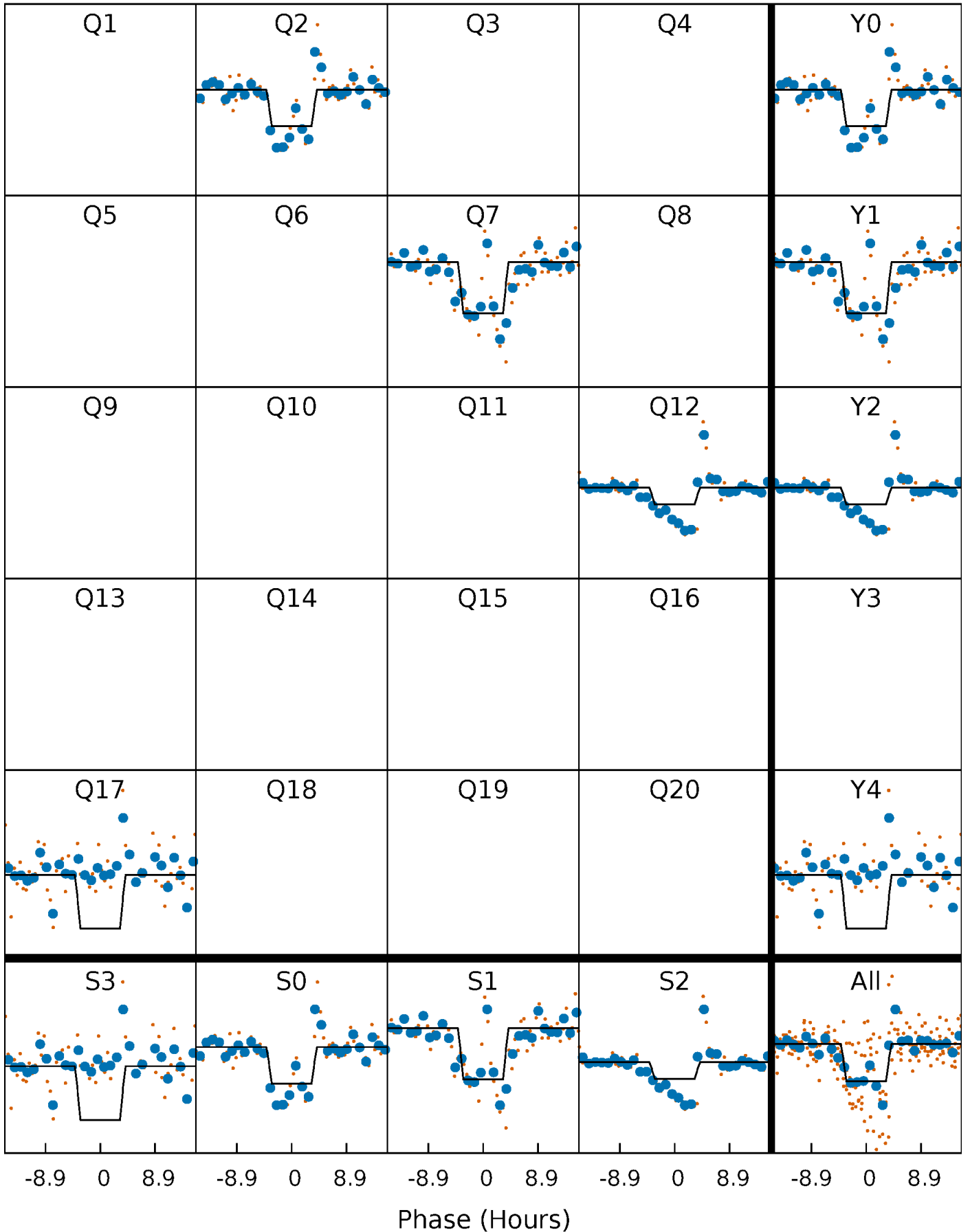
DV Quarter-Phased Transit Curves

TCE 009487994-02 $P=448.527483$ Days $T_0=216.790812$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

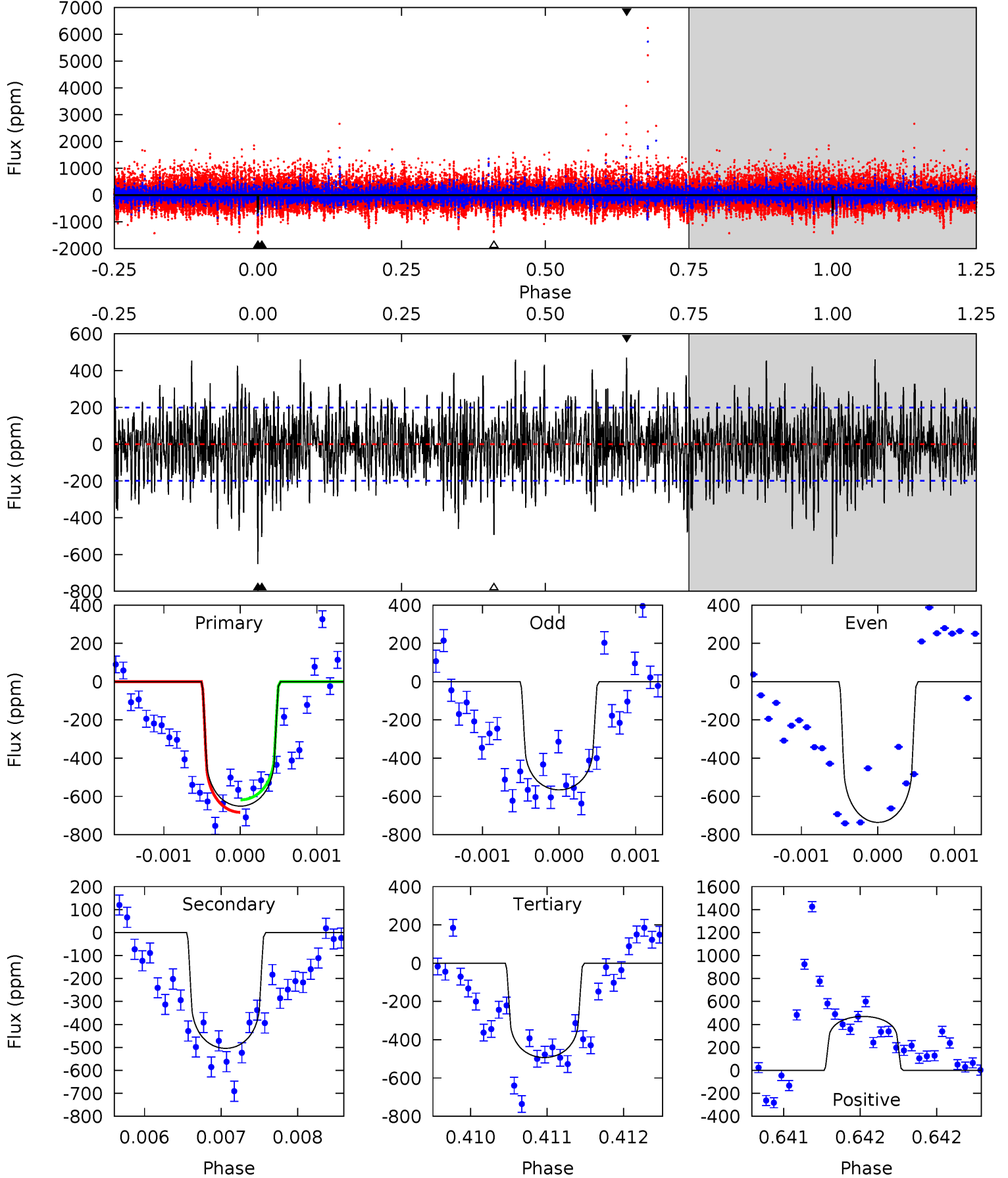
TCE 009487994-02 $P=448.577943$ Days $T_0=216.710764$ (BKJD)



DV Model-Shift Uniqueness Test

009487994-02, P = 448.527483 Days, E = 216.790812 Days

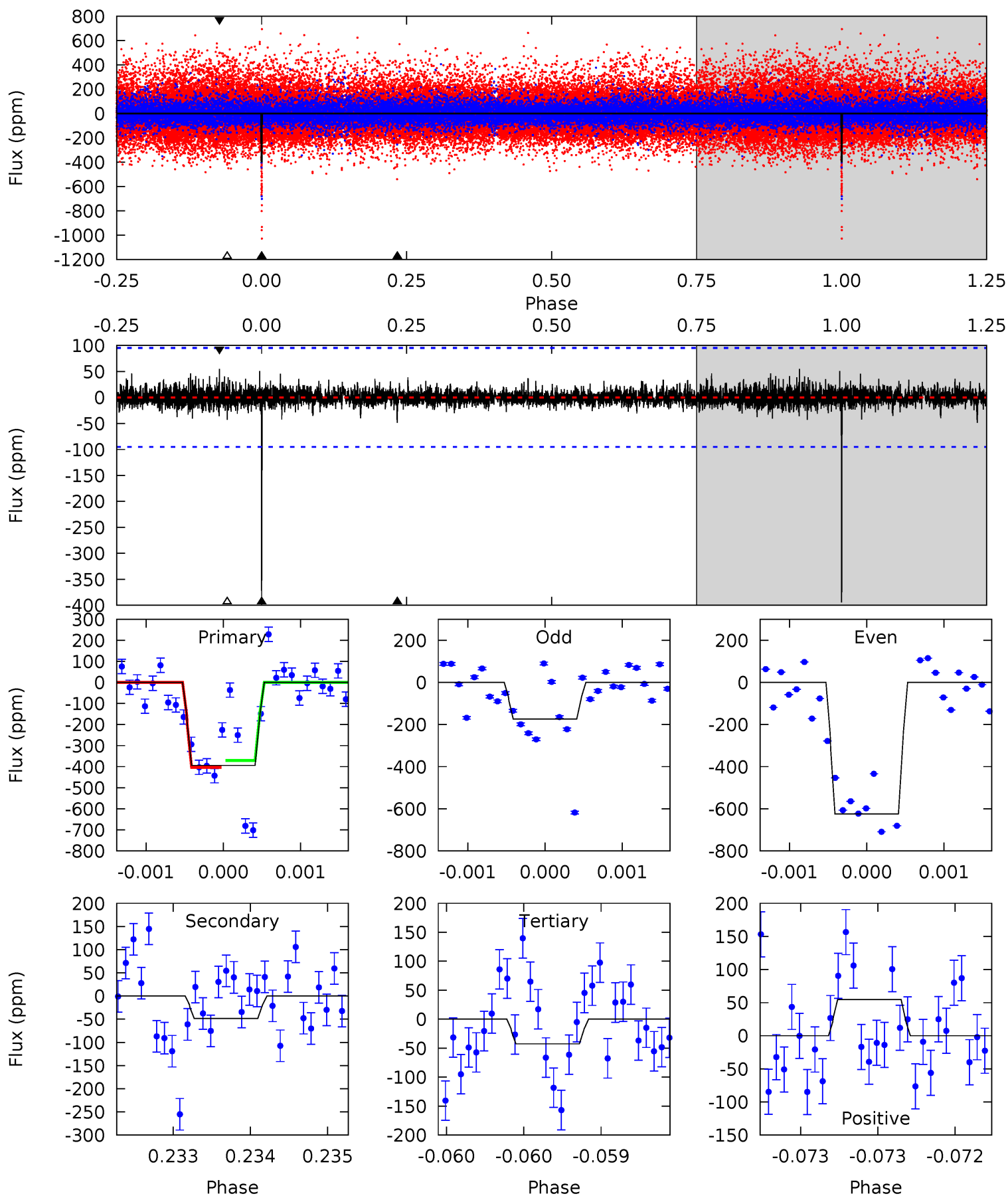
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.9	13.9	13.6	13.0	5.48	3.34	3.79	4.35	4.99	0.31	0.95	1.96	1.14	0.42	0.90



Alt Model-Shift Uniqueness Test

009487994-02, P = 448.577943 Days, E = 216.710764 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.8	2.81	2.47	3.16	5.51	3.38	0.56	20.3	19.6	0.34	-0.35	13.4	0.95	0.12	0.94



Stellar Parameters For KIC 009487994

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6147^{+184}_{-184}	$3.667^{+0.322}_{-0.115}$	$-0.500^{+0.400}_{-0.250}$	$2.765^{+0.477}_{-1.114}$	$1.294^{+0.201}_{-0.302}$	$0.086^{+0.218}_{-0.029}$
	+3%/-3%	+9%/-3%	+80%/-50%	+17%/-40%	+16%/-23%	+253%/-34%
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 009487994-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-504 ± 36	$5.04^{+3.10}_{-2.67}$	556^{+35}_{-53}	6982^{+4441}_{-1454}	17472^{+59406}_{-10852}
Alt.	-48 ± 17	$5.45^{+3.42}_{-2.39}$	556^{+35}_{-53}	3945^{+999}_{-548}	1302^{+3058}_{-830}

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 $A_{obs} \gg 1.0$

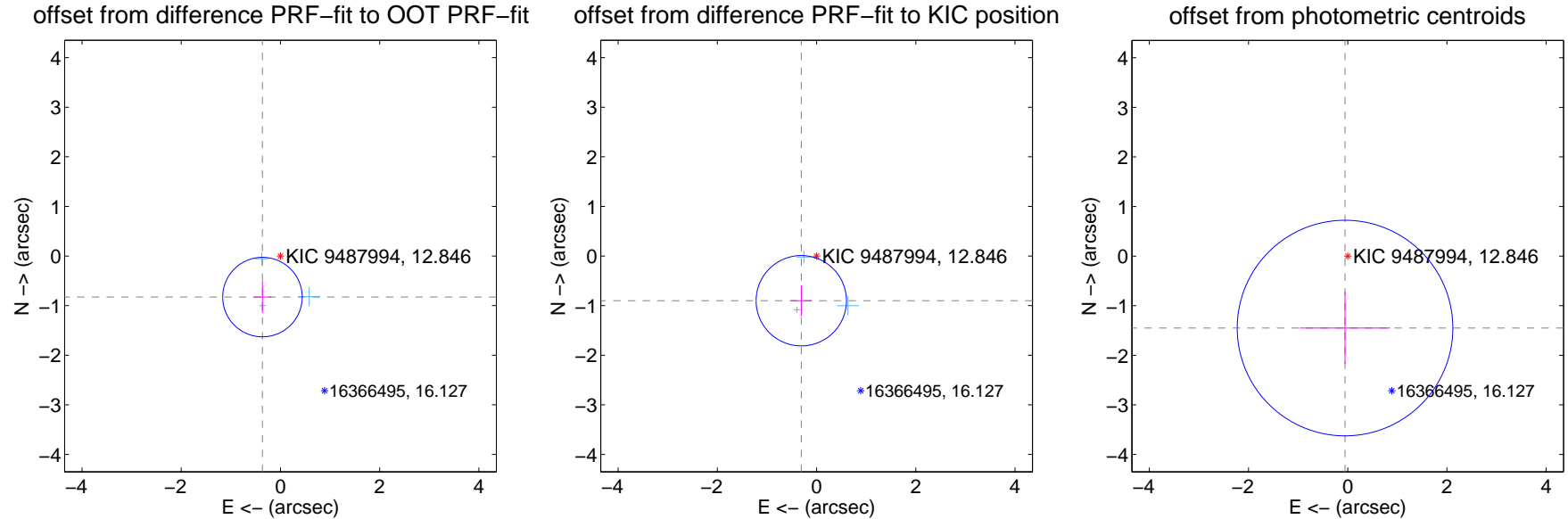
DV Centroid Data

Supplemental centroid analysis for 009487994-02. Kepler magnitude: 12.85. Transit SNR 5.08

There are 3 quarters with good PRF difference image offsets

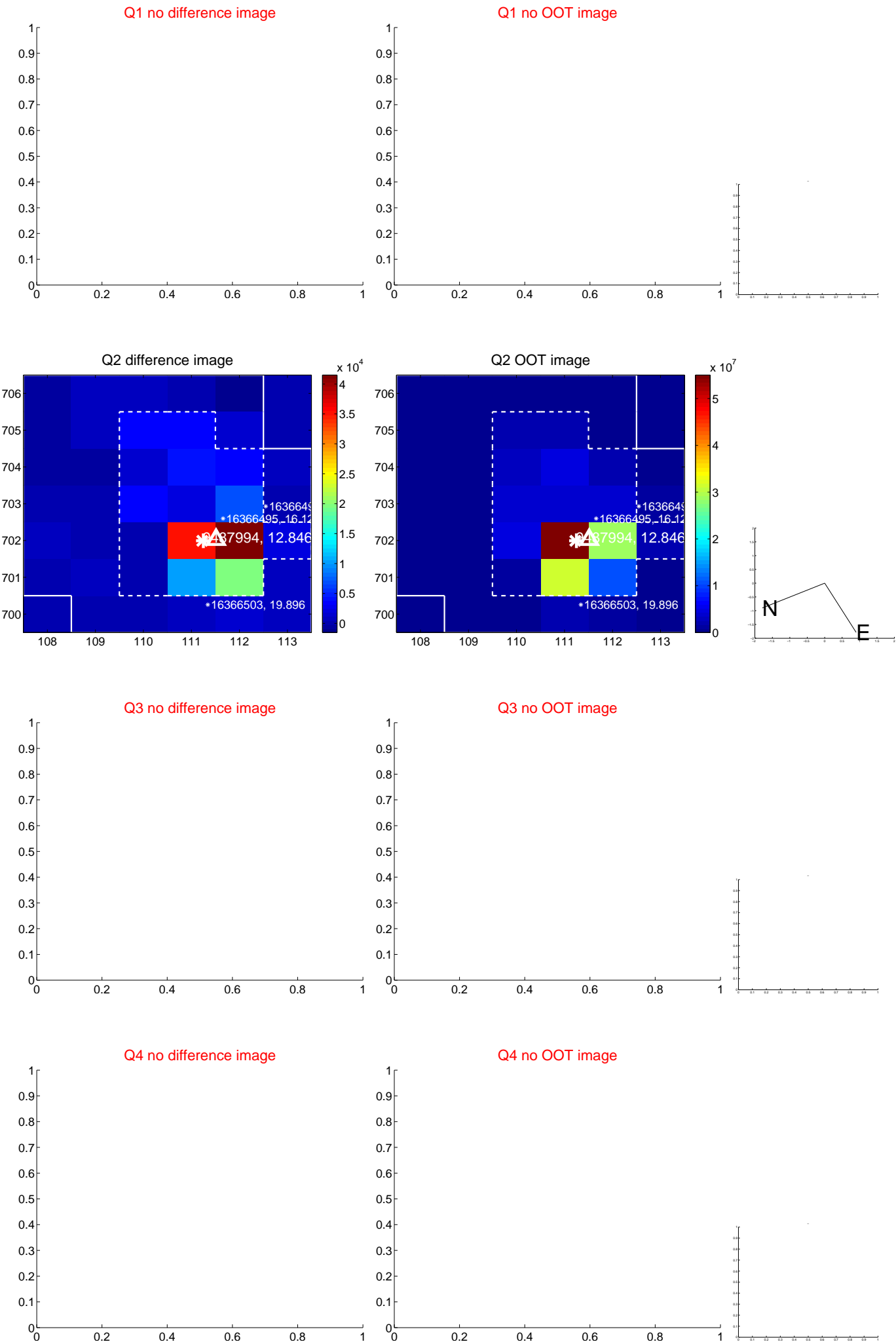
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.904 ± 0.267	3.38	0.363 ± 0.181	-0.828 ± 0.322
PRF-fit source offset from KIC position	0.953 ± 0.304	3.14	0.308 ± 0.213	-0.901 ± 0.312
photometric centroid source offset	1.45 ± 0.72	2.00	0.05 ± 0.91	-1.45 ± 0.72

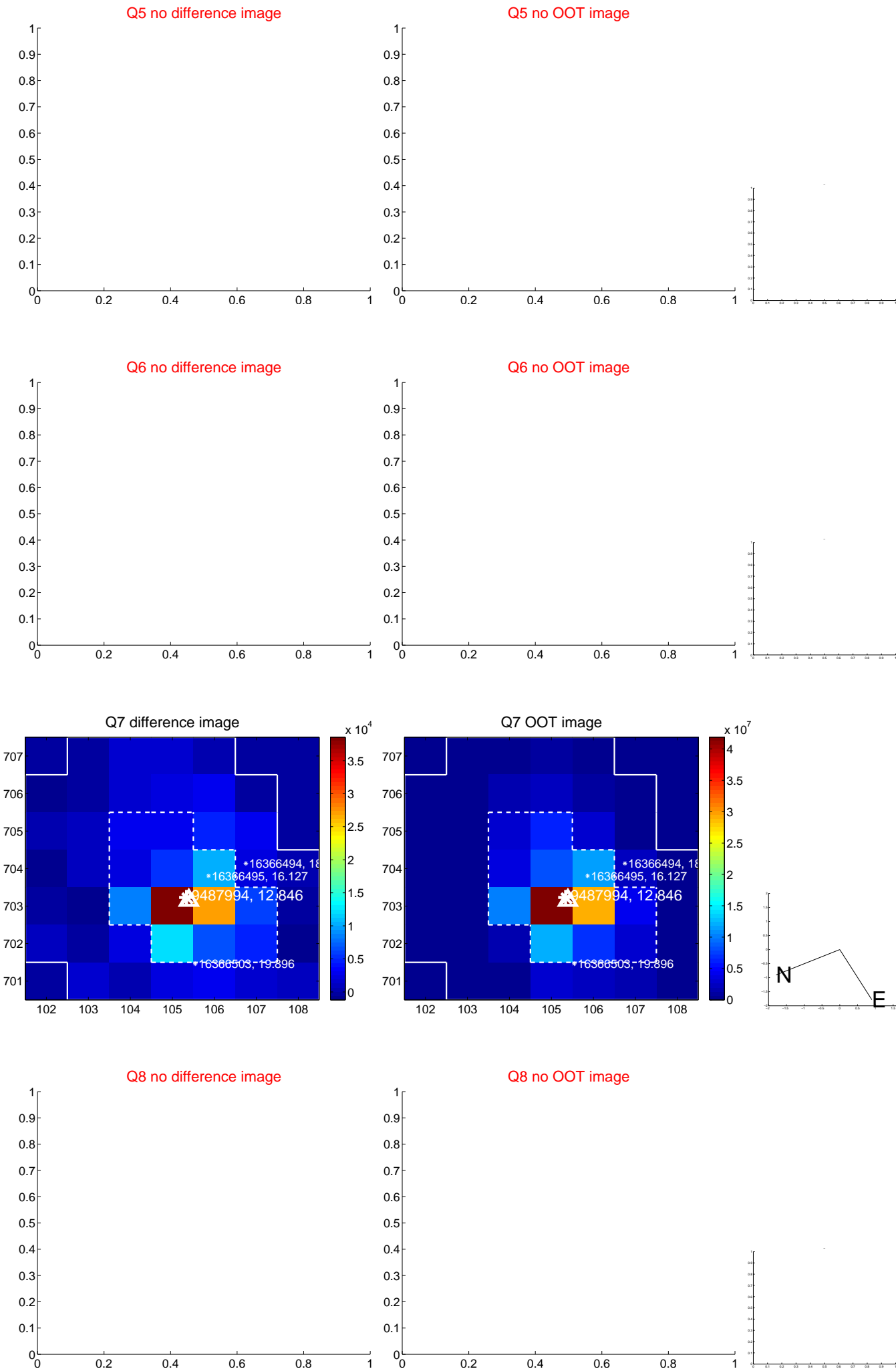


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

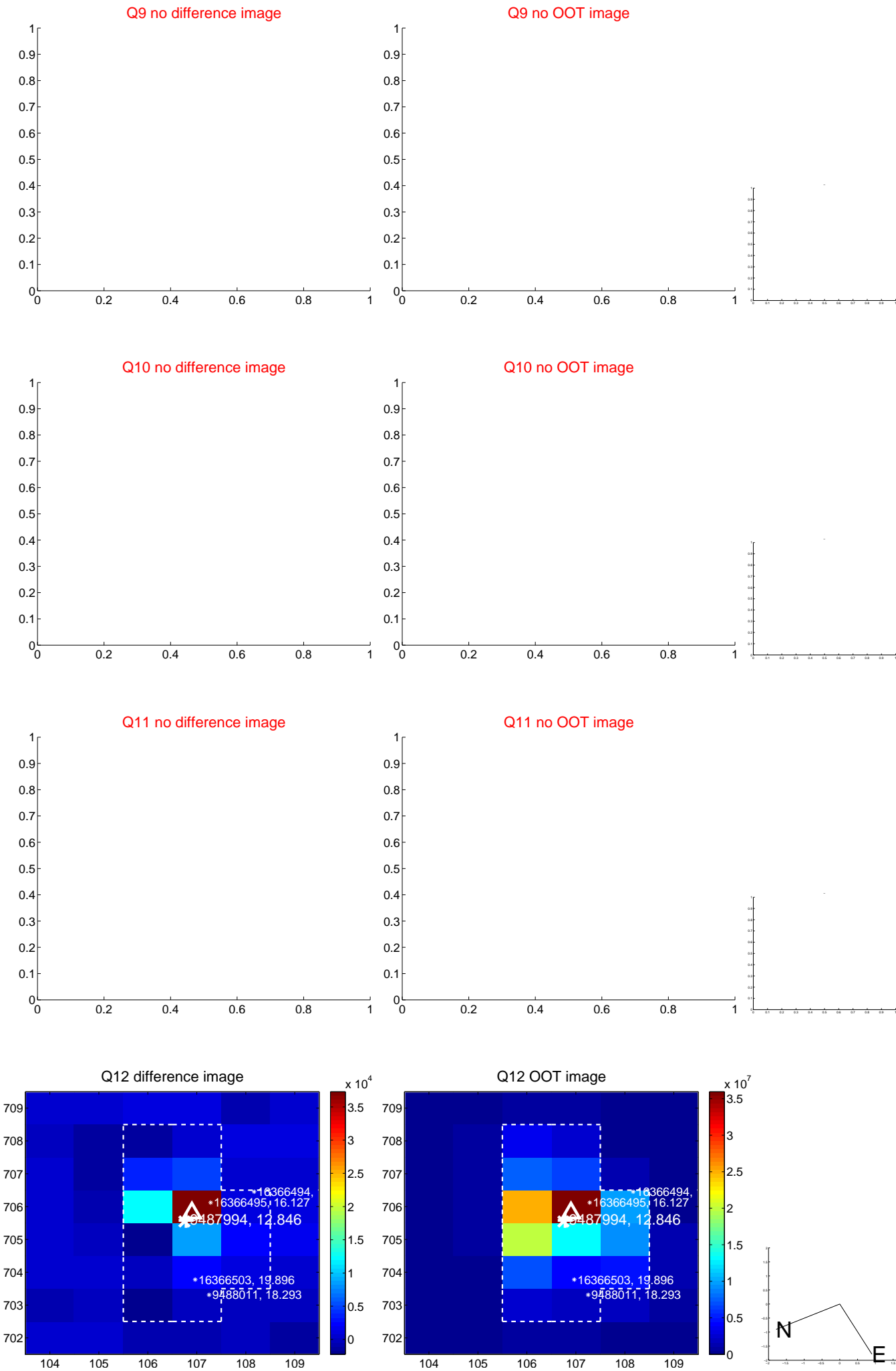
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



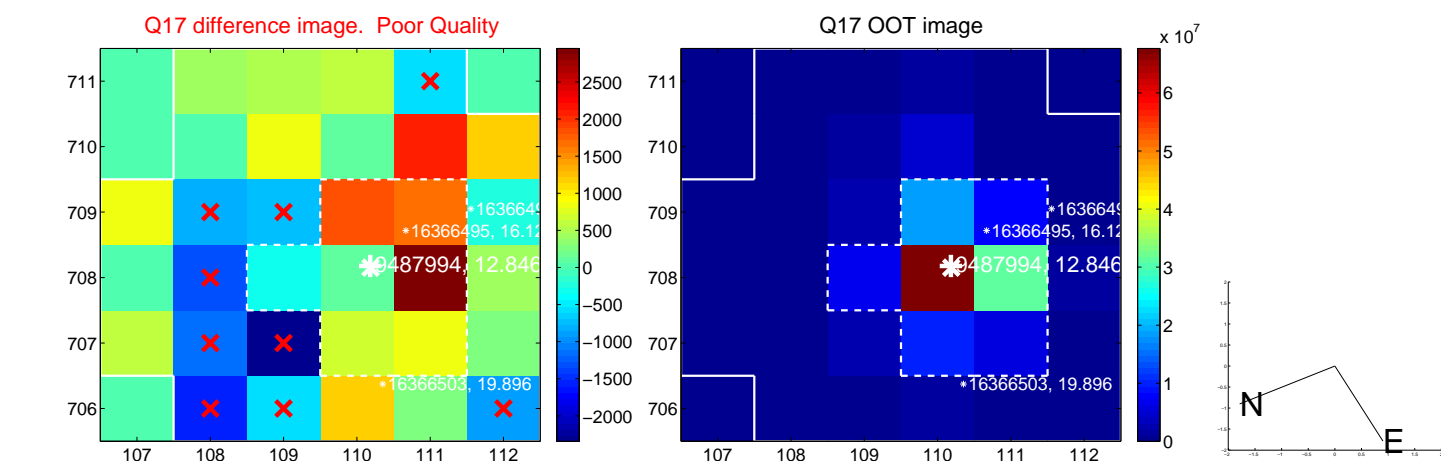
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



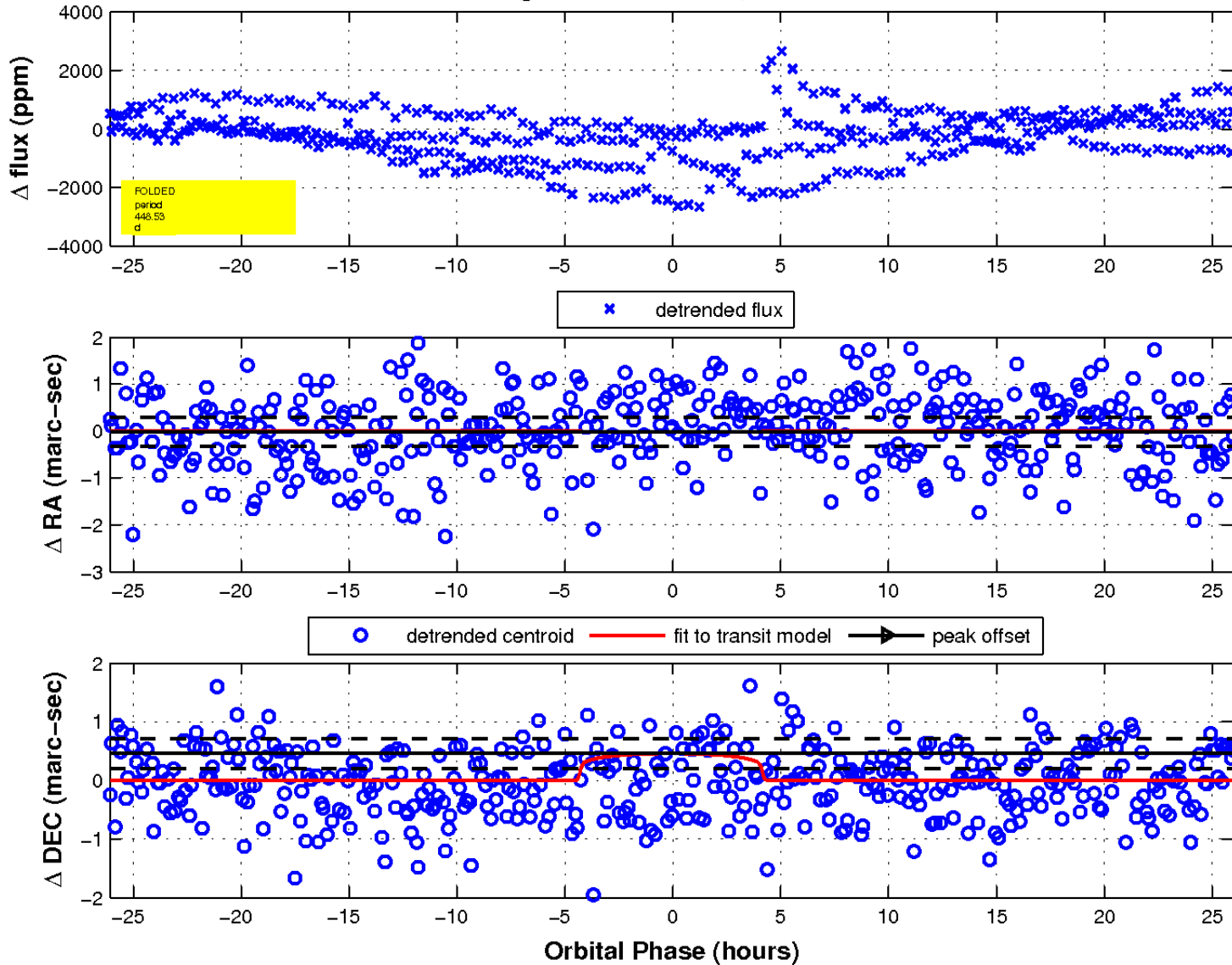
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

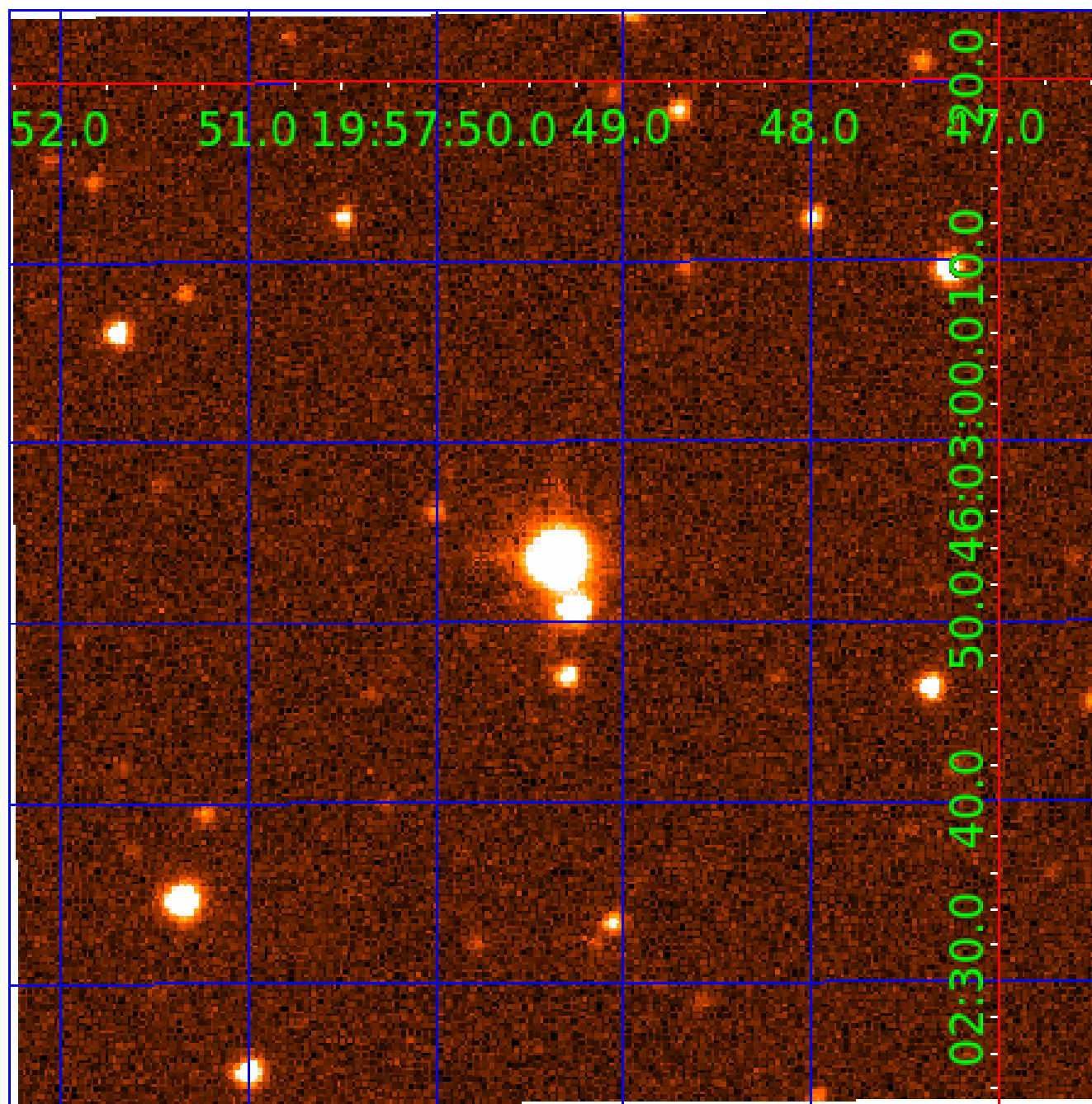


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



KIC 009487994

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})
009487994-01	OBS	No	513.685808	507.766633	521.6	7.098	14.2	6.5	2.77	6147	6.72	5.22
009487994-02	OBS	No	448.527483	216.790812	329.5	8.703	10.2	5.1	2.77	6147	5.25	6.26
009487994-03	OBS	No	462.996461	179.438276	247.5	4.176	11.4	4.2	2.77	6147	4.62	6.00
009487994-04	OBS	No	250.533695	352.012748	384.0	3.935	10.5	6.9	2.77	6147	5.85	13.60
009487994-05	OBS	No	334.728886	415.847217	427.0	5.480	10.4	7.0	2.77	6147	6.01	9.24
009487994-06	OBS	No	377.571322	193.101149	383.5	5.000	11.1	-1.0	2.77	6147	5.43	7.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487994-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009487994-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009487994-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_ALT—MOD_POS_DV—INCONSISTENT_TRANS
009487994-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

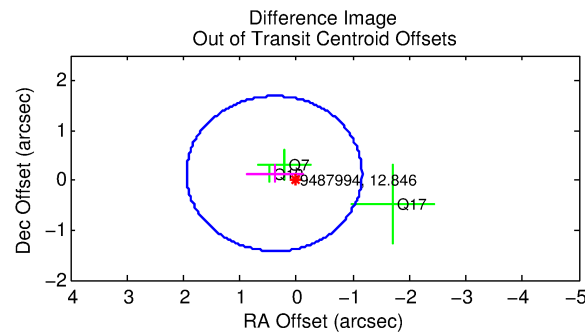
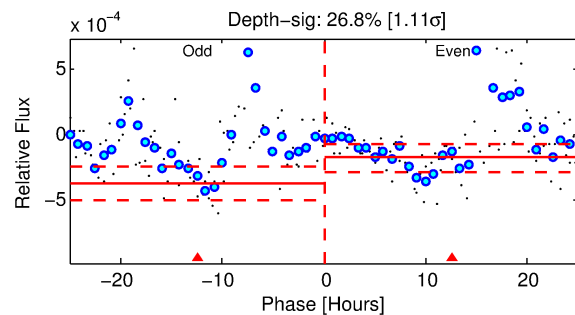
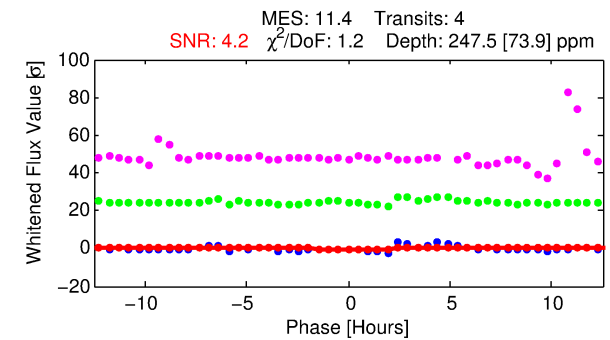
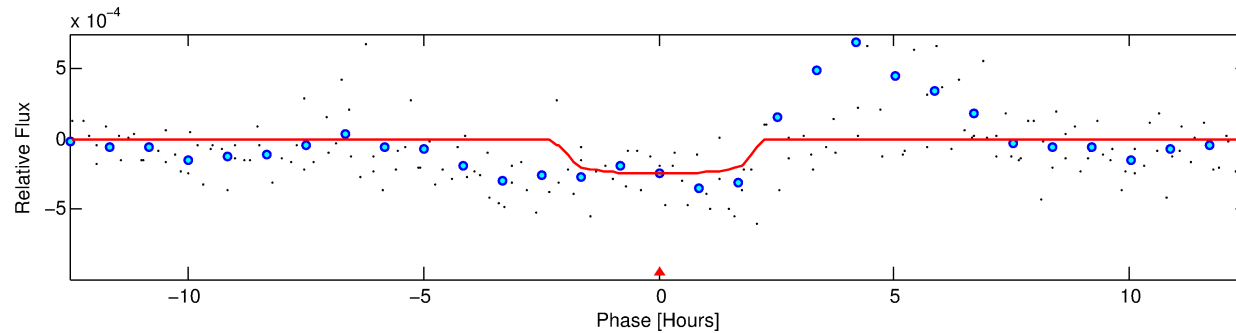
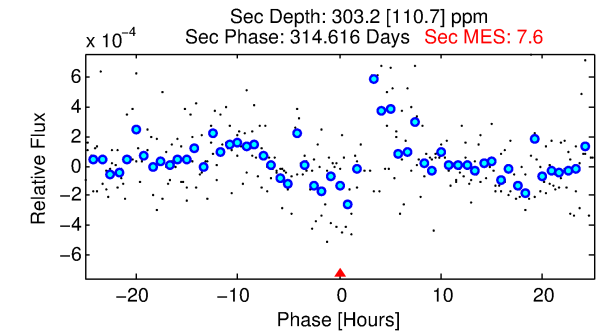
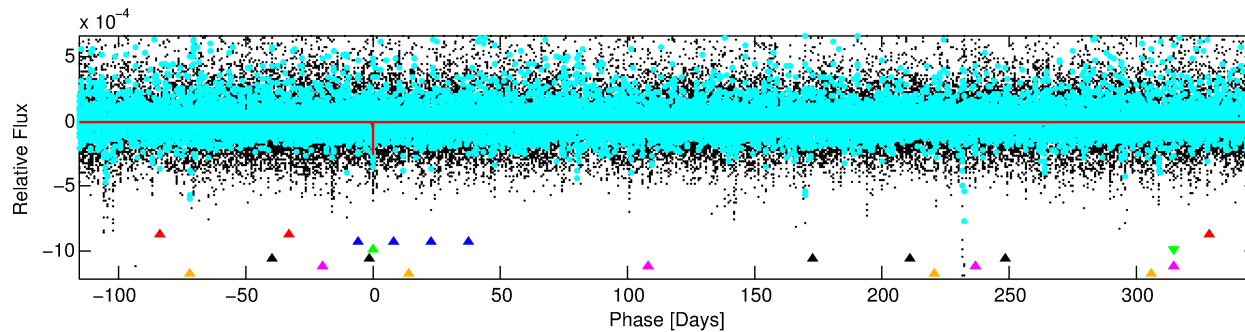
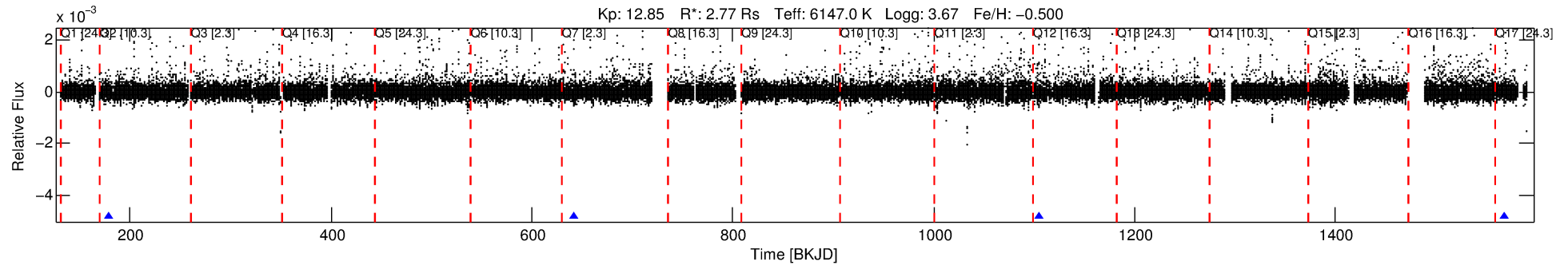
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487994-03

No Significant Match Found

DV One-Page Summary

KIC: 9487994 Candidate: 3 of 6 Period: 462.996 d



DV Fit Results:

Period = 462.99646 [0.00879] d
Epoch = 179.4383 [0.0156] BKJD
Rp/R* = 0.0153 [0.0201]
a/R* = 646.45 [4475.83]
b = 0.67 [5.72]
Seff = 6.00 [3.45]
Teq = 399 [57] K
Rp = 4.62 [6.35] Re
a = 1.2771 [0.4661] AU
Ag = 12741.51 [34546.25] [0.37σ]
Teffp = 6555 [4351] K [1.41σ]

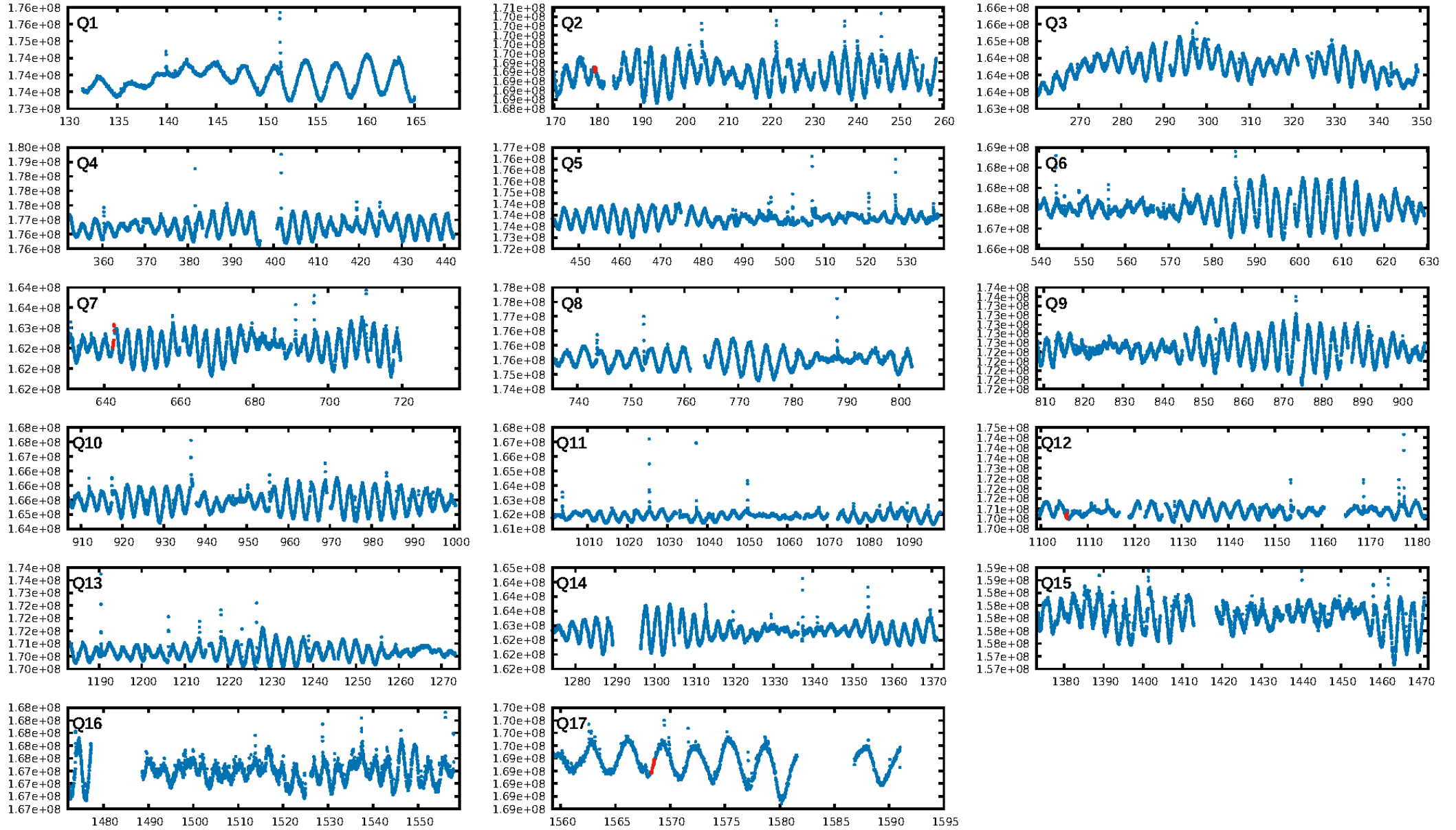
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.97σ]
LongPeriod-sig: 100.0% [147.72σ]
ModelChiSquare2-sig: 4.1%
ModelChiSquareGof-sig: 85.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.3881
Centroid-sig: 57.3%
Centroid-so: 1.001 arcsec [0.64σ]
OotOffset-rm: 0.411 arcsec [0.79σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 0.335 arcsec [0.64σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [4/4]

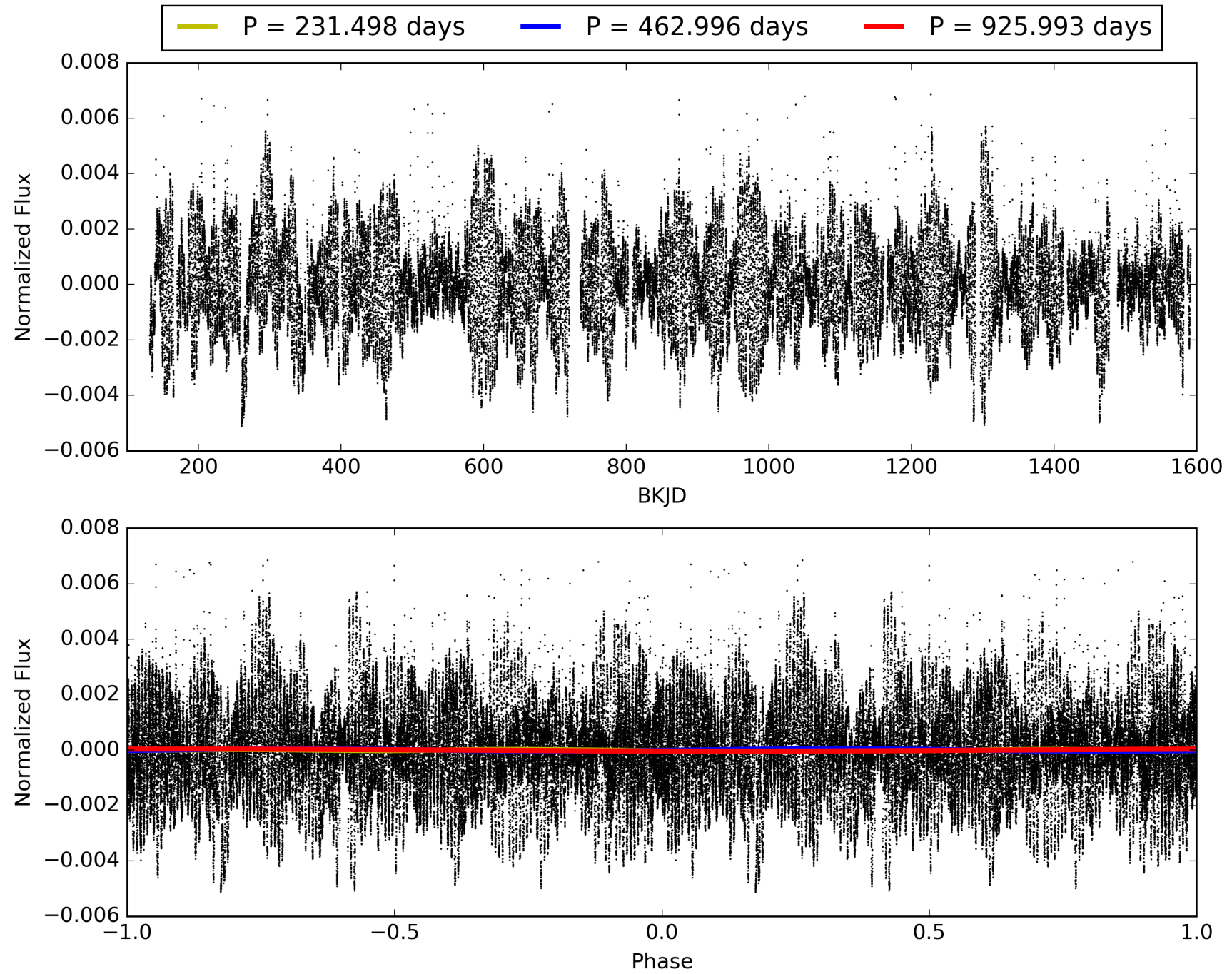
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:19:21 Z

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

TCE 009487994-03, PDC Light Curves

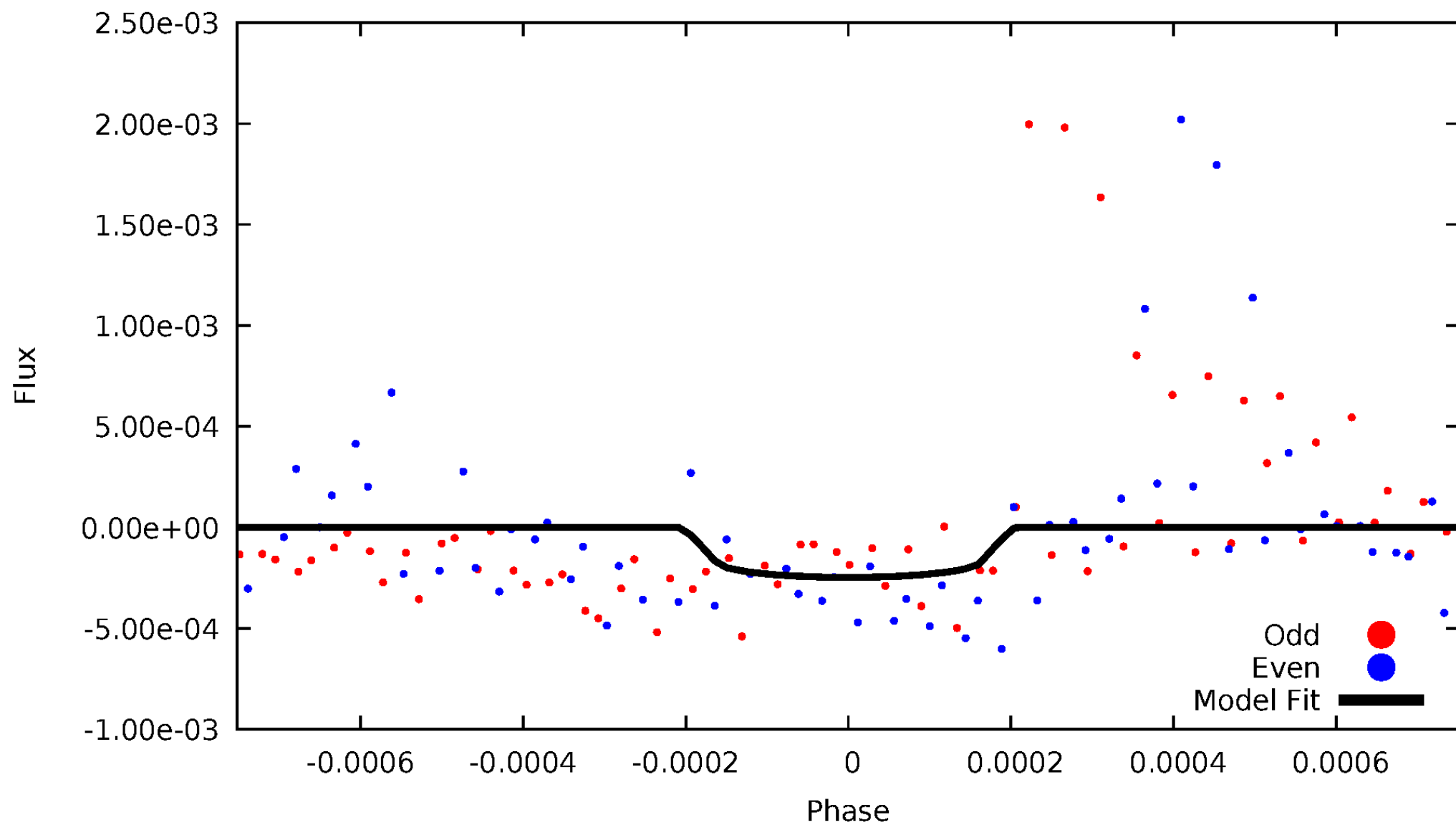


TCE 009487994-03



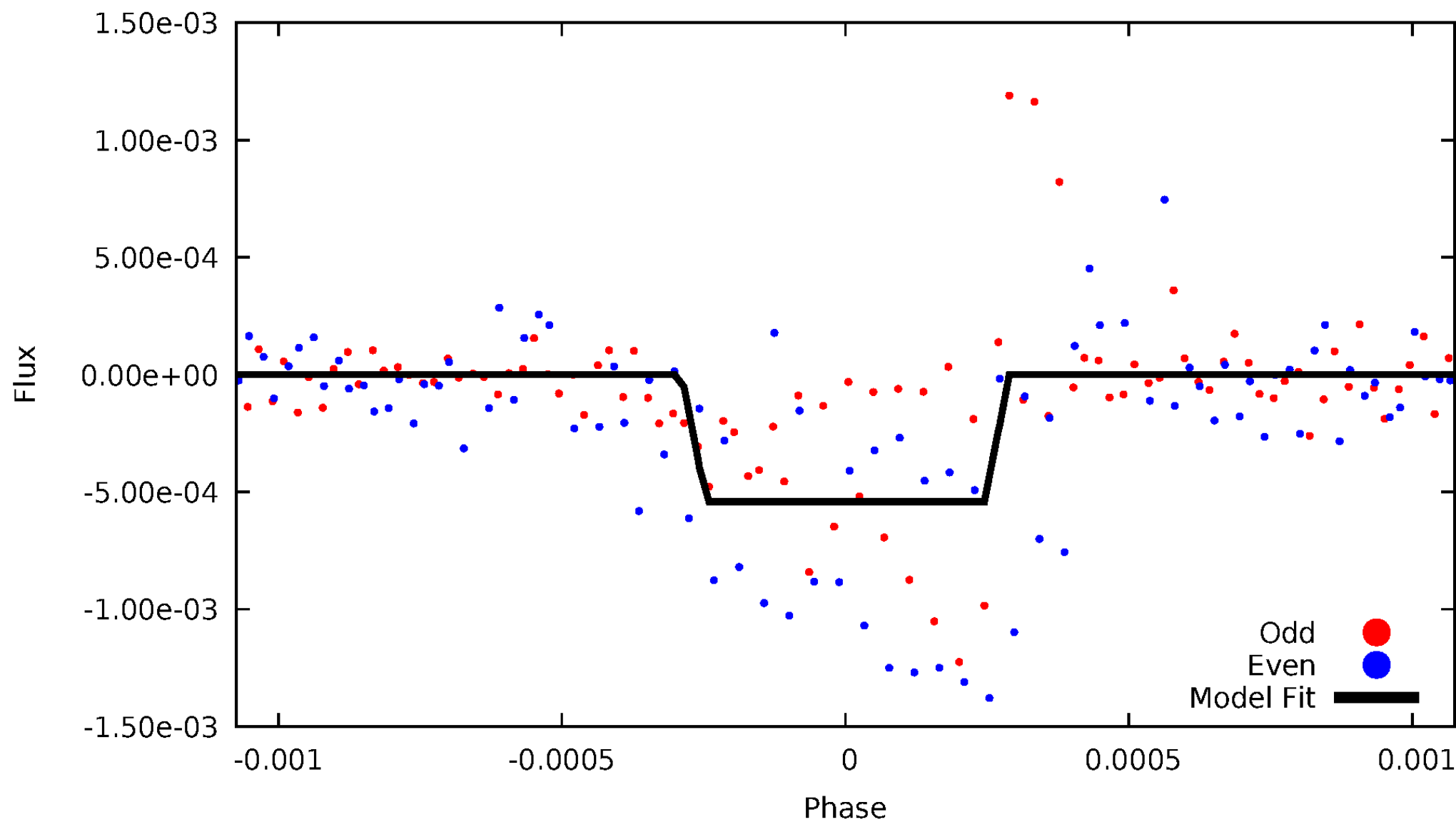
DV Odd/Even

TCE 009487994-03



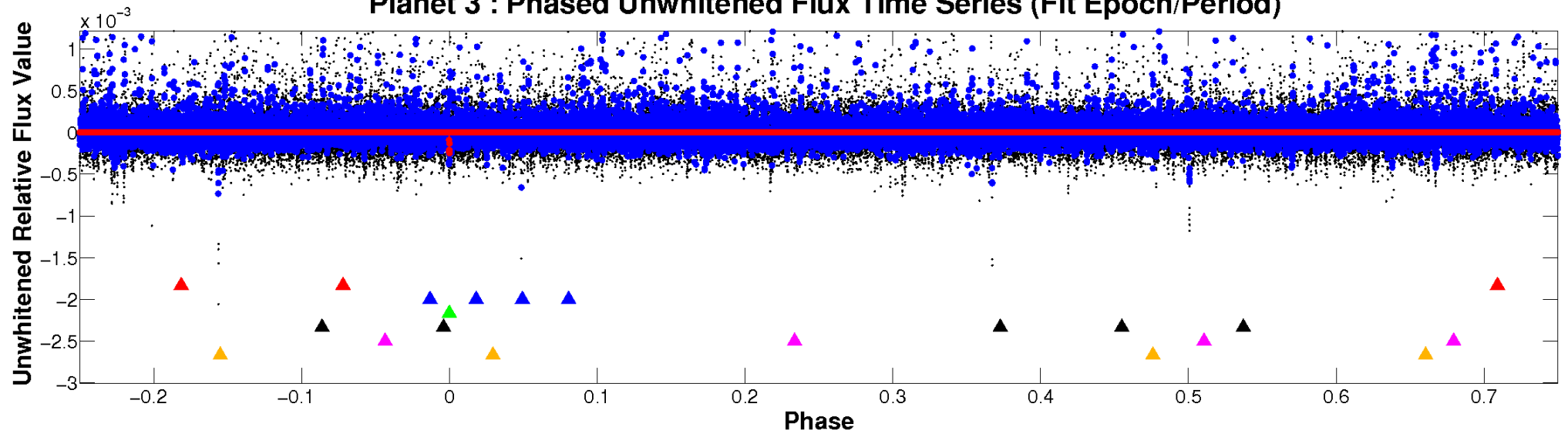
ALT Odd/Even

TCE 009487994-03

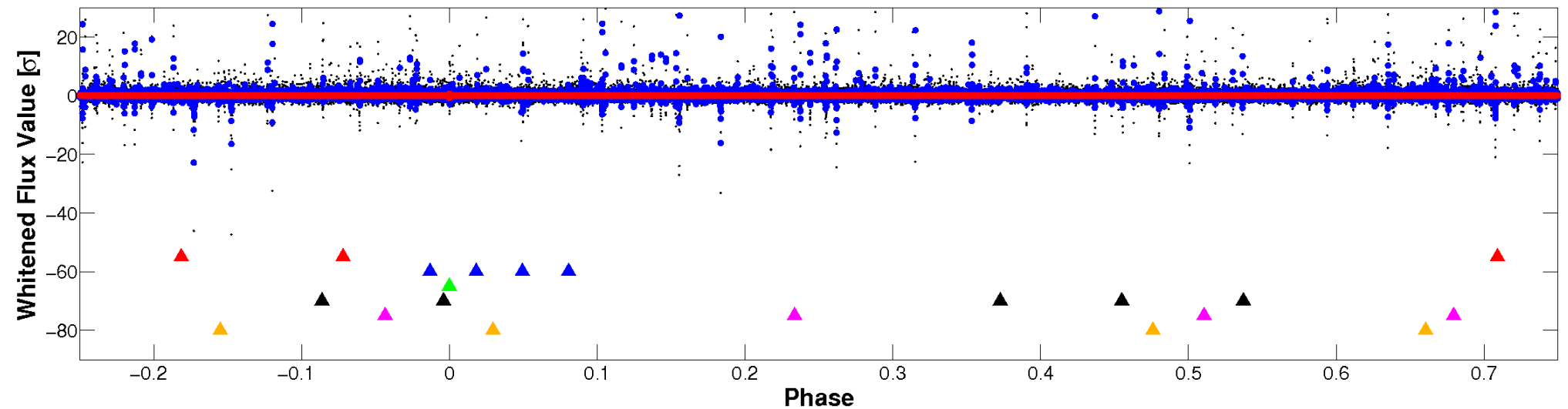


Non-Whitened Vs. Whitened Light Curve

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

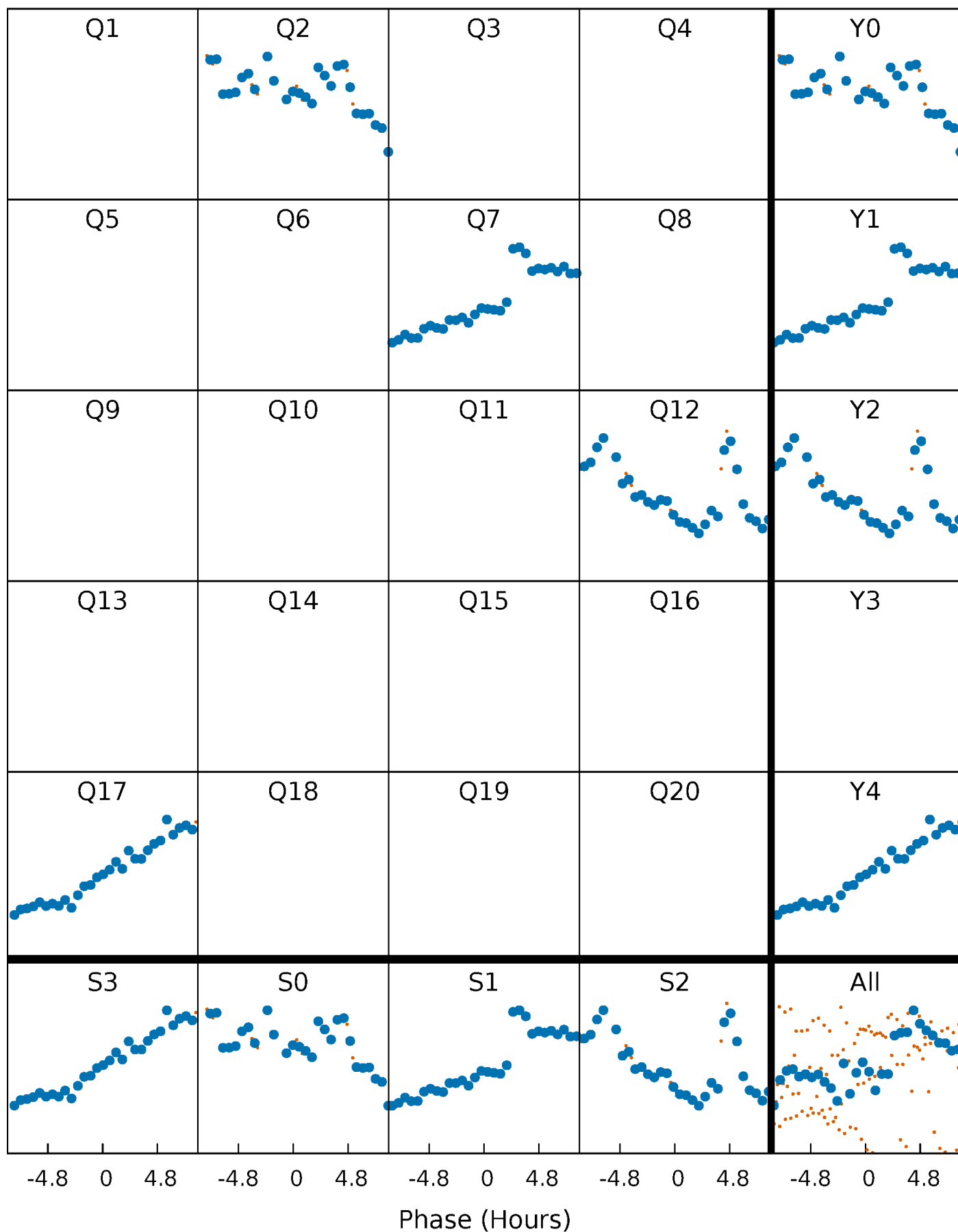


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



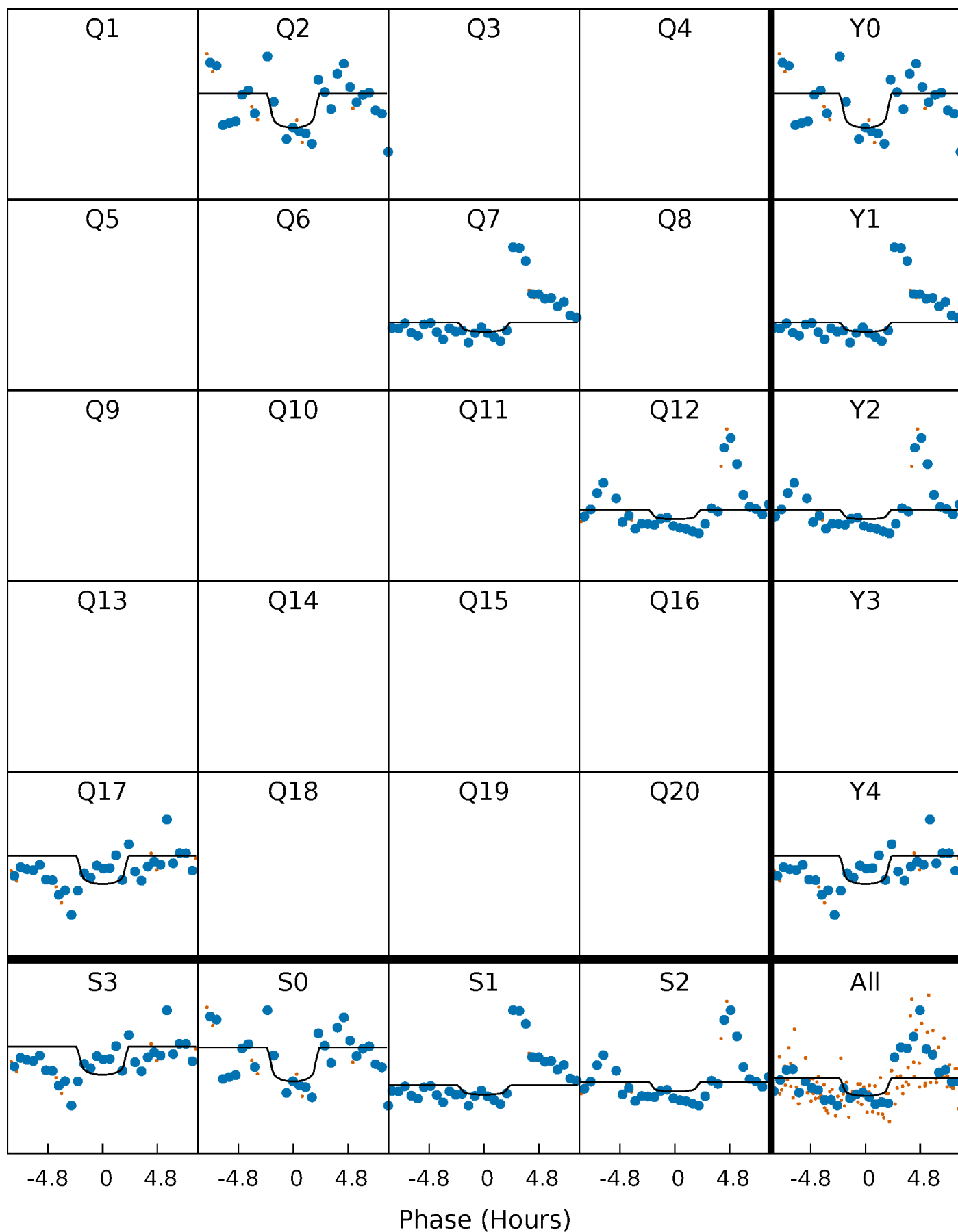
PDC Quarter-Phased Transit Curves

TCE 009487994-03 $P=462.996461$ Days $T_0=179.438276$ (BKJD)



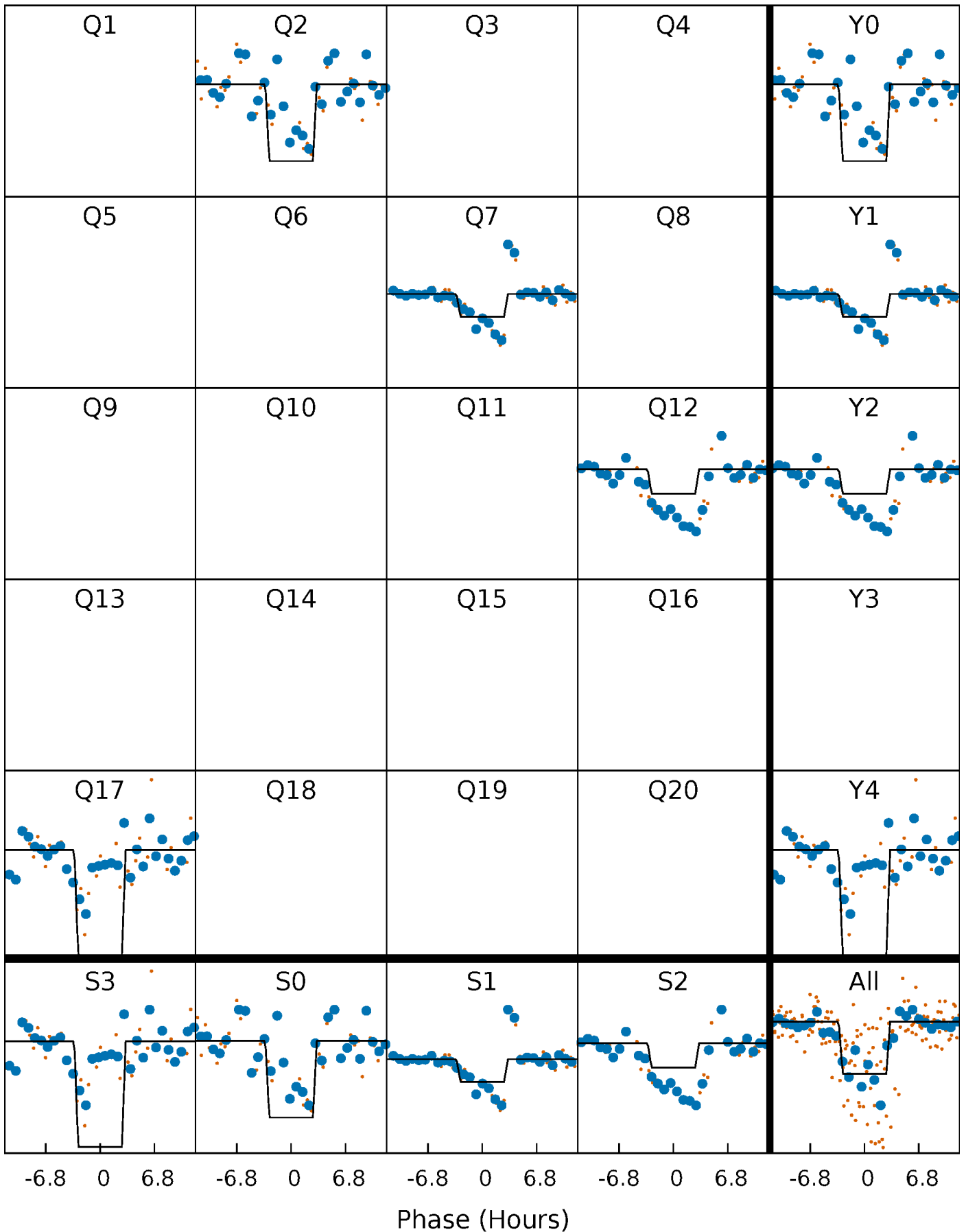
DV Quarter-Phased Transit Curves

TCE 009487994-03 $P=462.996461$ Days $T_0=179.438276$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

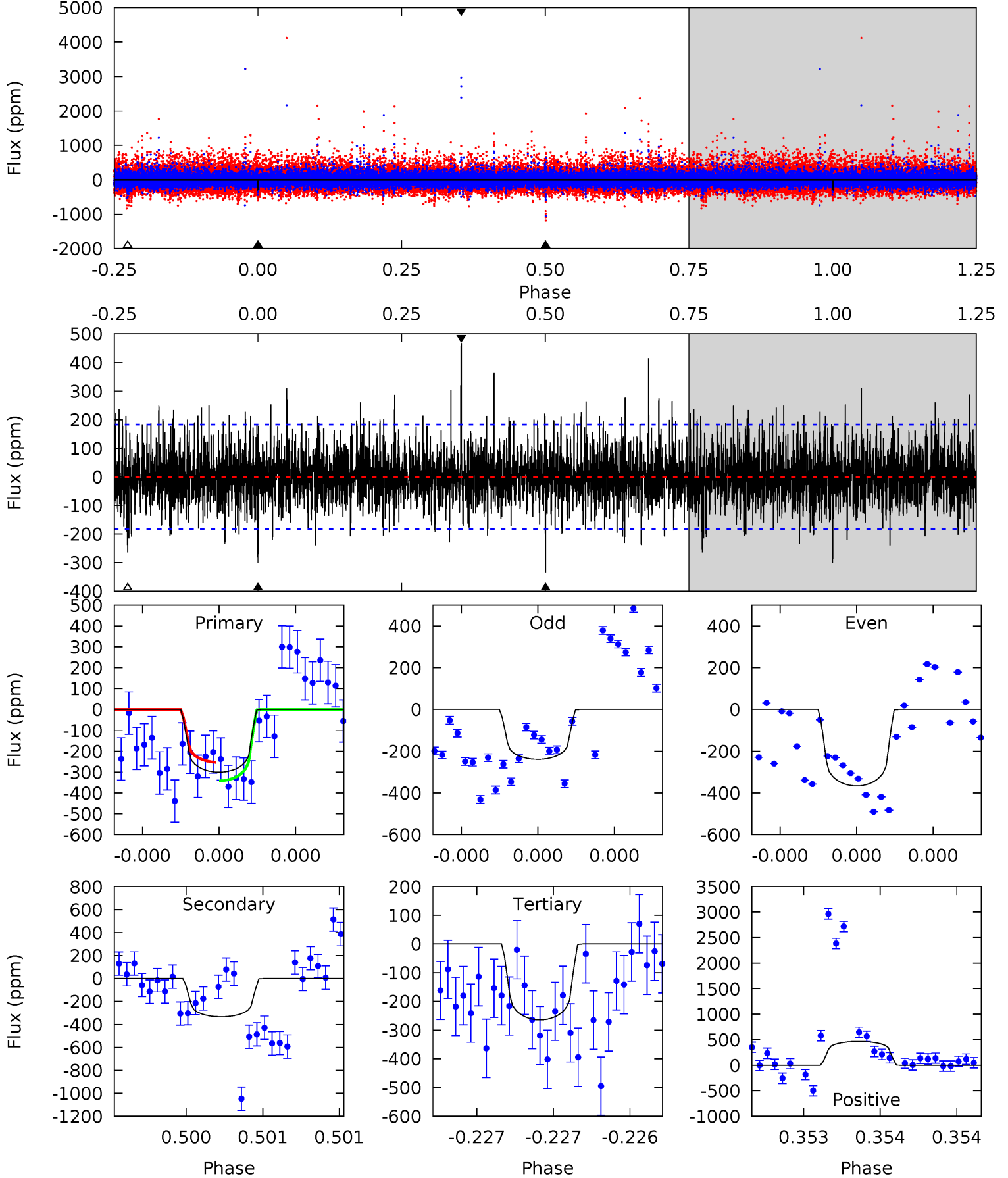
TCE 009487994-03 $P=462.997225$ Days $T_0=179.406475$ (BKJD)



DV Model-Shift Uniqueness Test

009487994-03, P = 462.996461 Days, E = 179.438276 Days

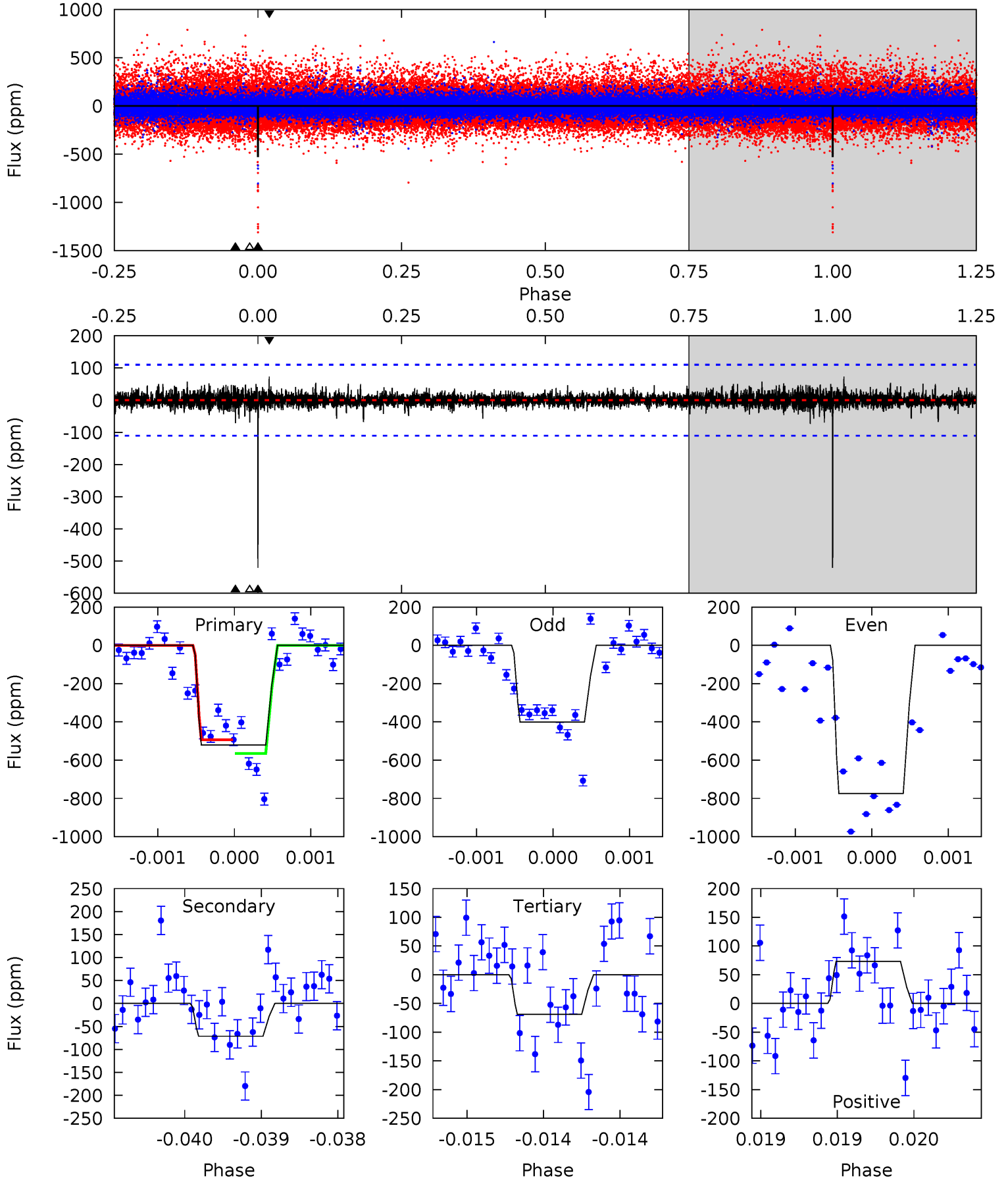
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.21	10.2	8.09	14.3	5.61	3.53	2.23	1.12	-5.10	2.11	-4.11	1.19	0.97	0.58	1.36



Alt Model-Shift Uniqueness Test

009487994-03, P = 462.997225 Days, E = 179.406475 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.2	3.59	3.47	3.68	5.55	3.45	0.62	22.8	22.5	0.12	-0.10	9.79	1.13	0.12	1.78



Stellar Parameters For KIC 009487994

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6147^{+184}_{-184}	$3.667^{+0.322}_{-0.115}$	$-0.500^{+0.400}_{-0.250}$	$2.765^{+0.477}_{-1.114}$	$1.294^{+0.201}_{-0.302}$	$0.086^{+0.218}_{-0.029}$
	+3%/-3%	+9%/-3%	+80%/-50%	+17%/-40%	+16%/-23%	+253%/-34%
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 009487994-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-333 ± 33	$5.80^{+5.26}_{-3.68}$	550^{+35}_{-50}	5792^{+4880}_{-1368}	8663^{+56672}_{-6264}
Alt.	-71 ± 20	$7.47^{+5.74}_{-4.69}$	549^{+35}_{-52}	3804^{+1890}_{-605}	1112^{+7141}_{-774}

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

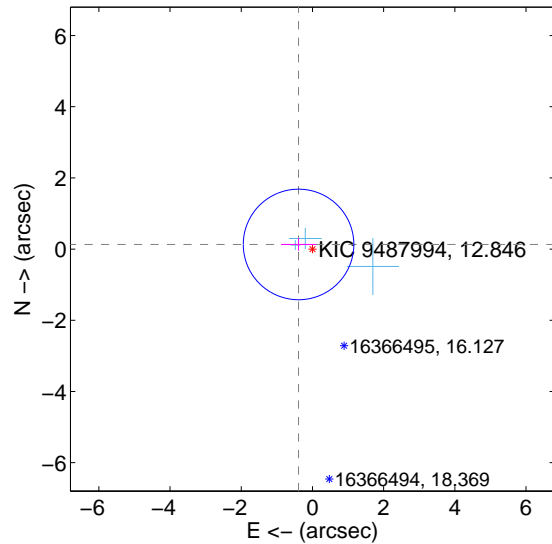
Supplemental centroid analysis for 009487994-03. Kepler magnitude: 12.85. Transit SNR 4.18

There are 3 quarters with good PRF difference image offsets

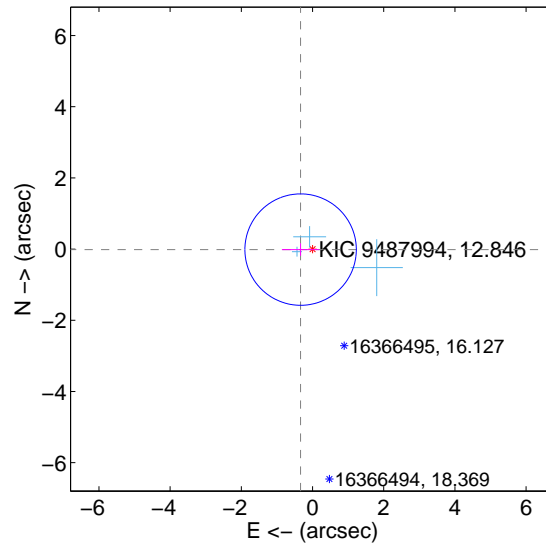
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.411 ± 0.518	0.79	0.390 ± 0.493	0.130 ± 0.176
PRF-fit source offset from KIC position	0.335 ± 0.522	0.64	0.335 ± 0.526	-0.014 ± 0.176
photometric centroid source offset	1.00 ± 1.55	0.64	-0.75 ± 1.67	-0.66 ± 1.39

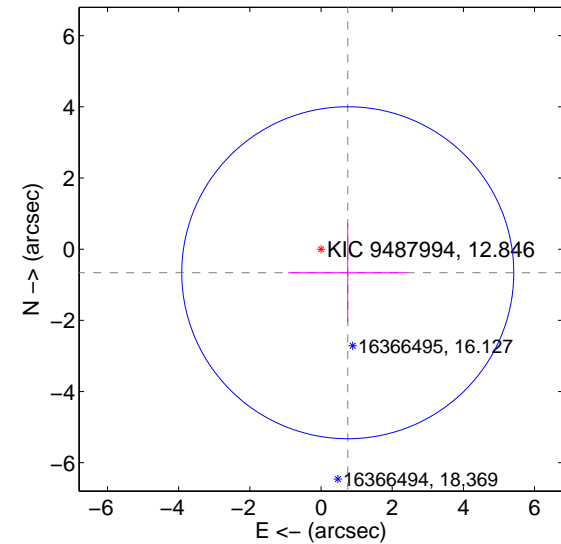
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

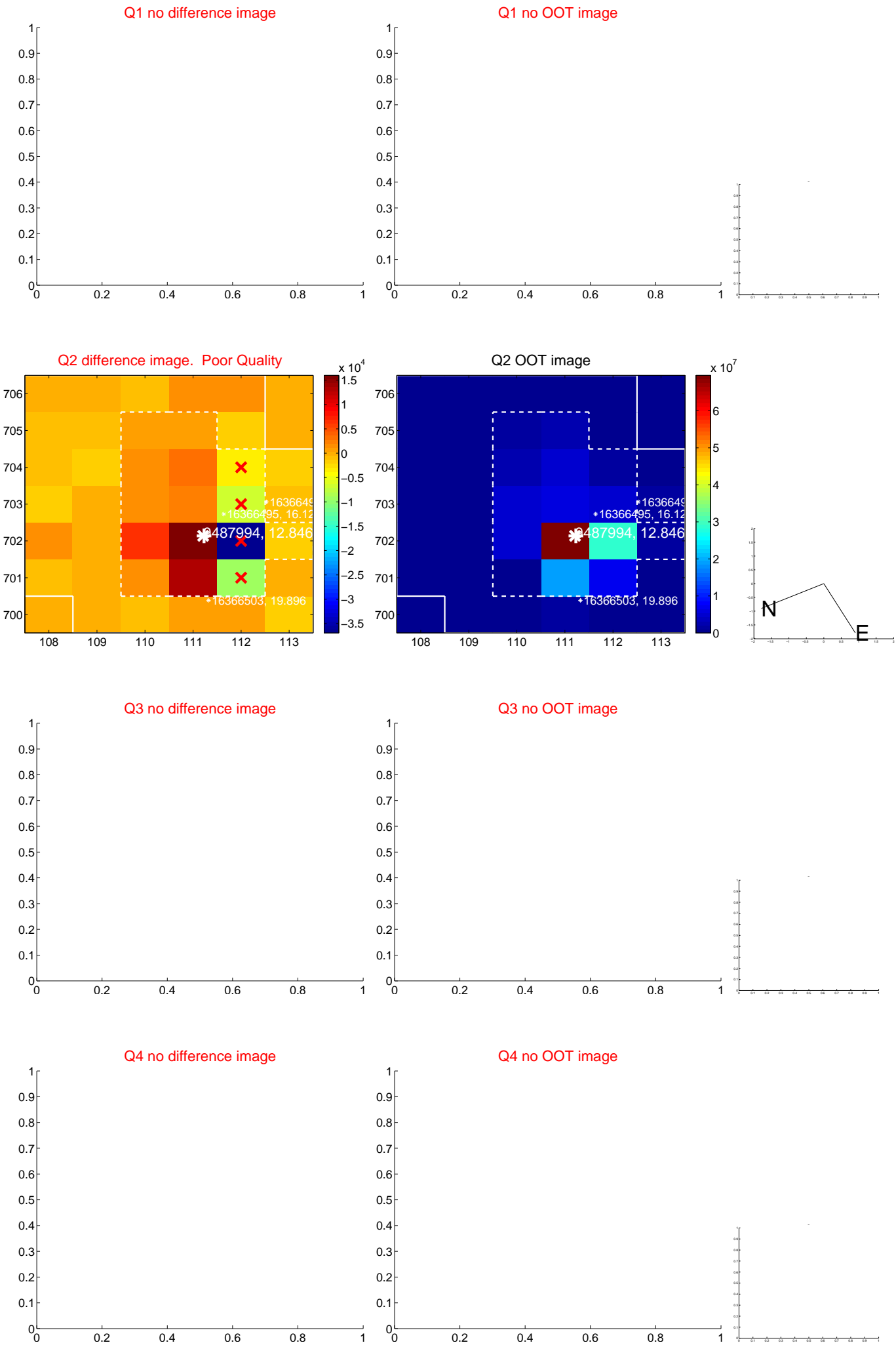


offset from photometric centroids

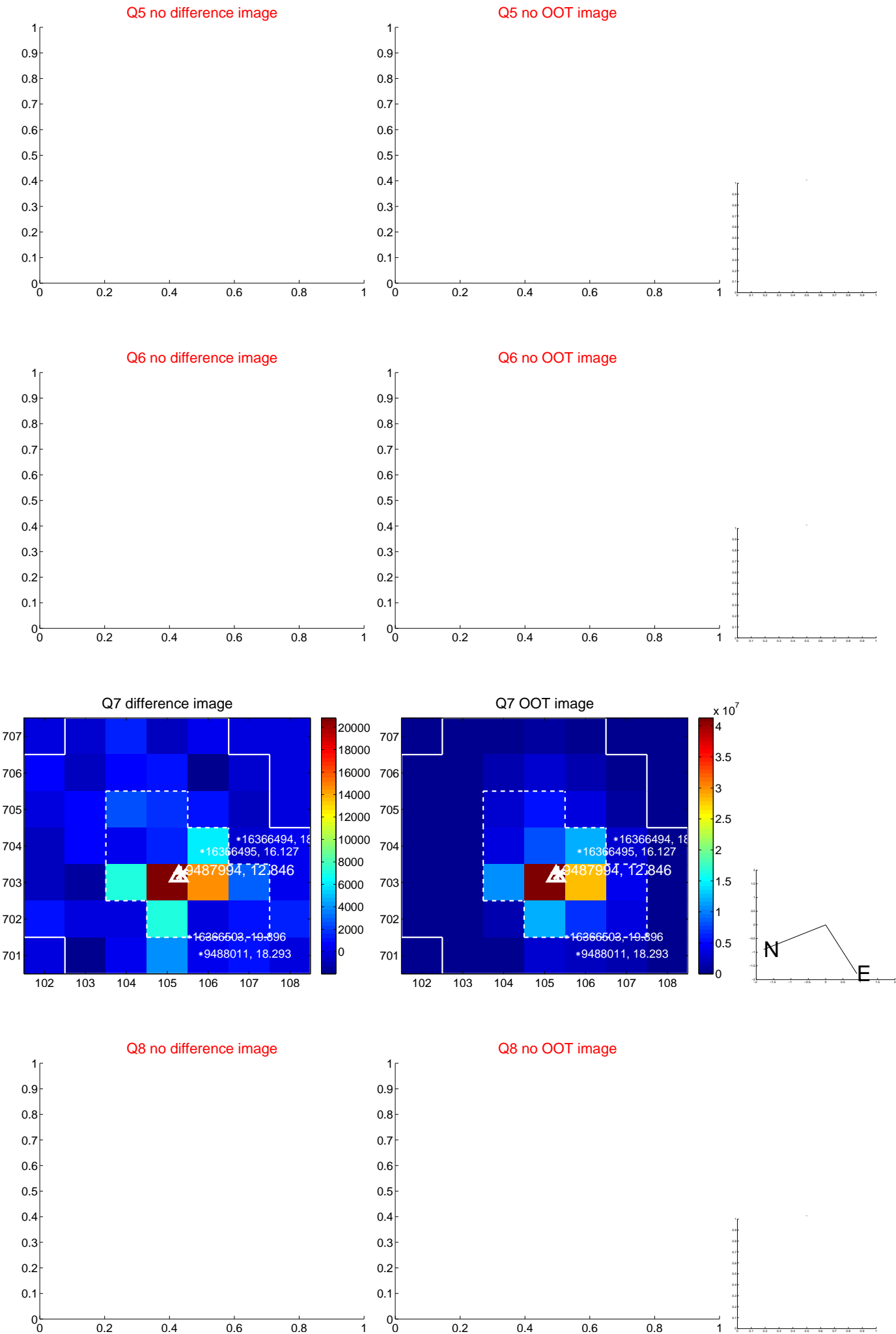


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

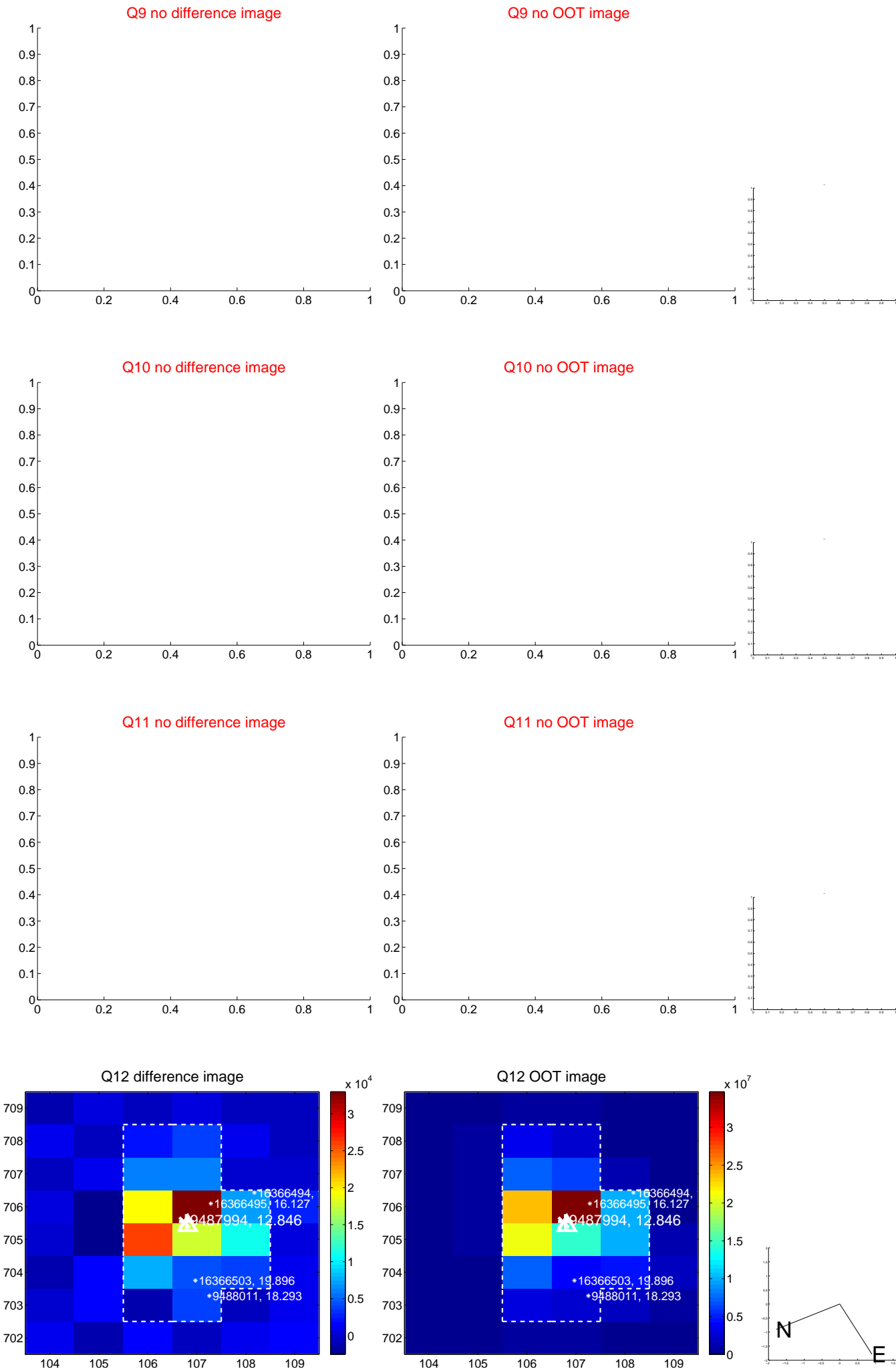
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



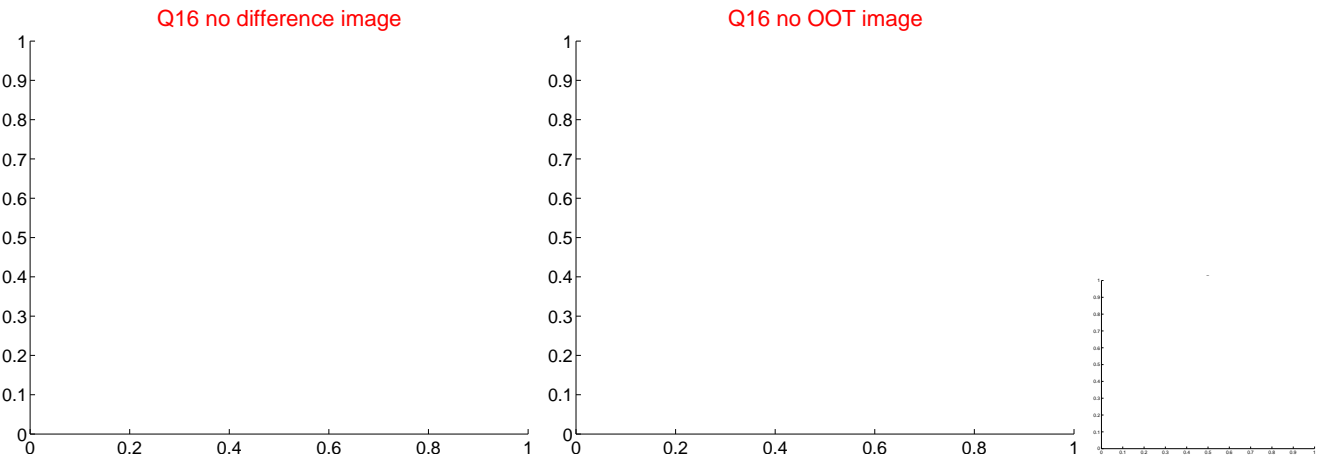
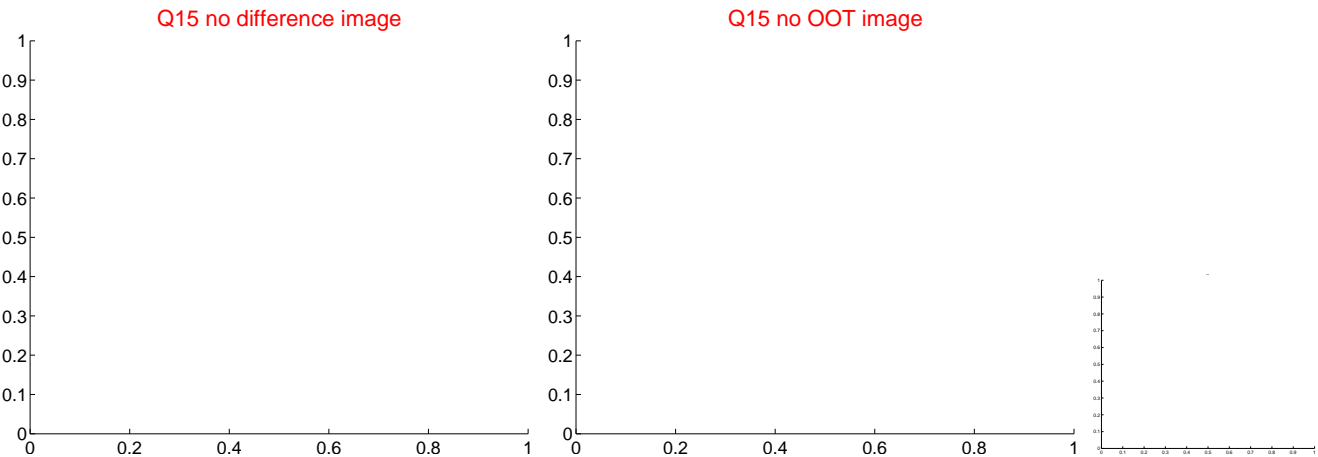
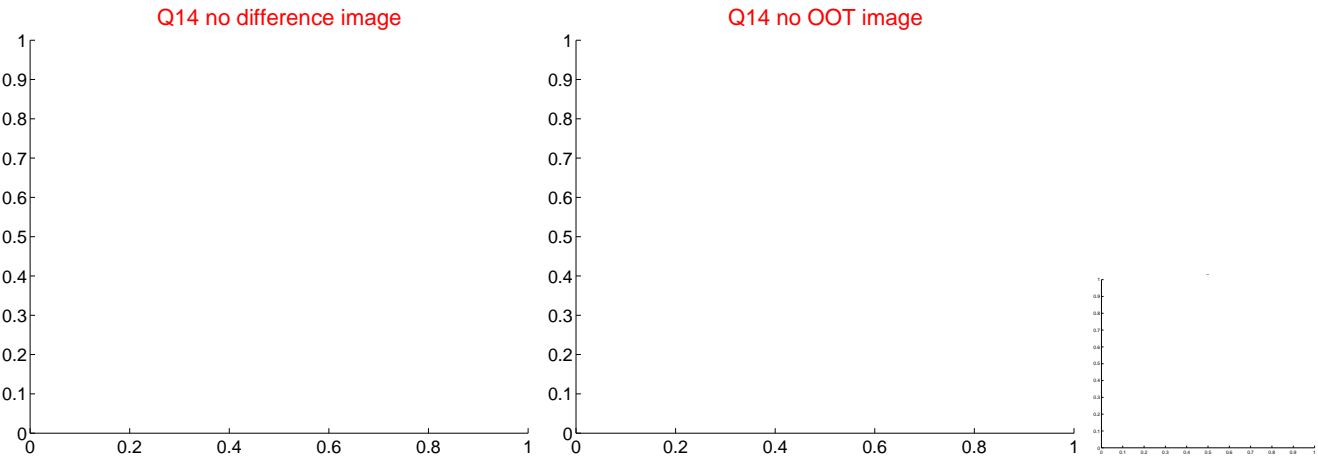
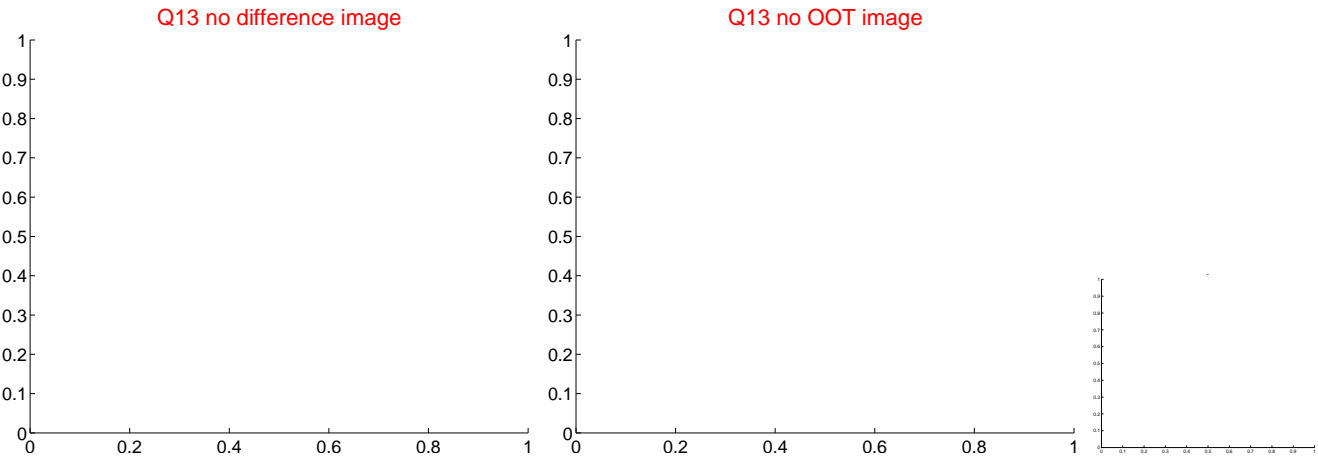
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



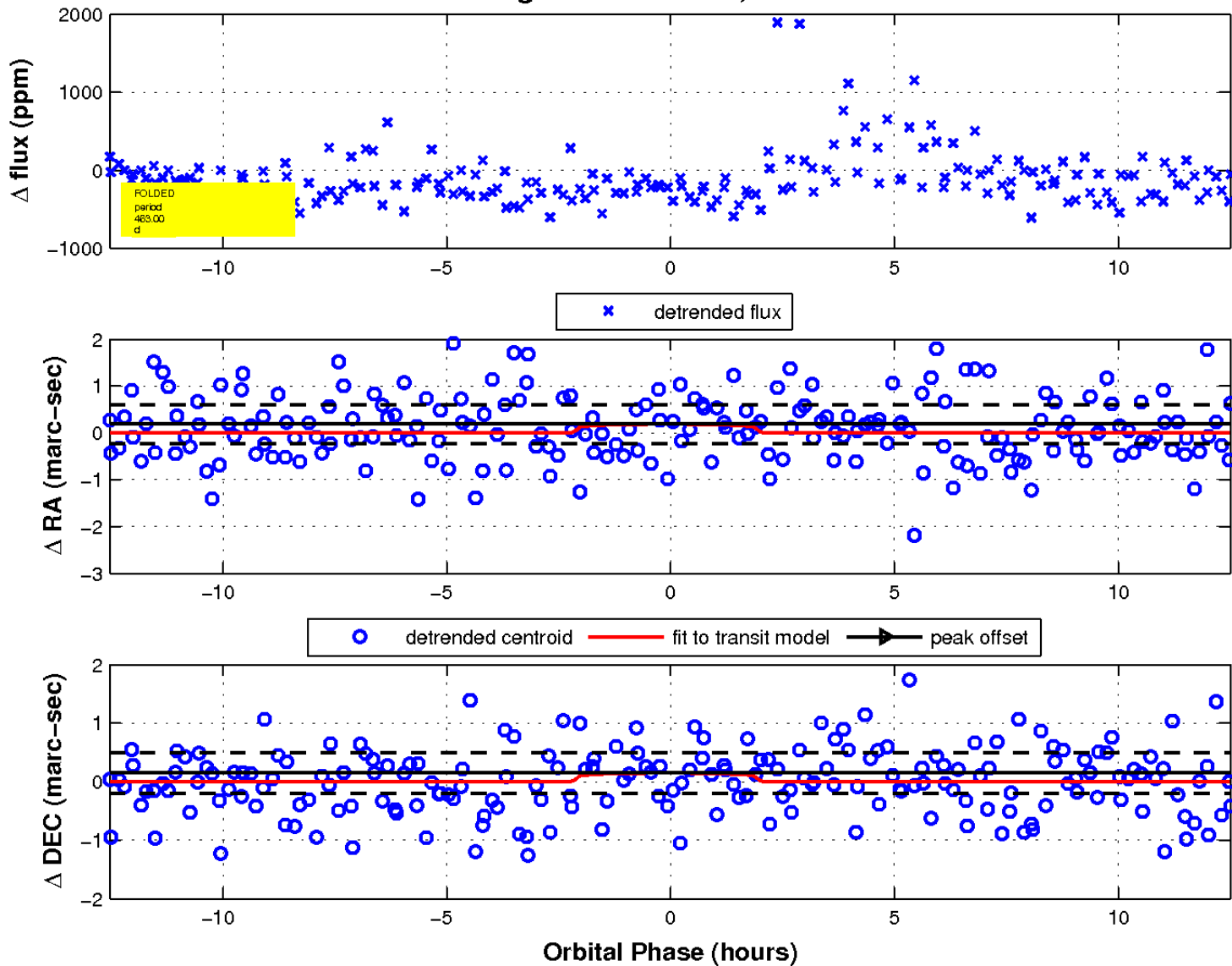
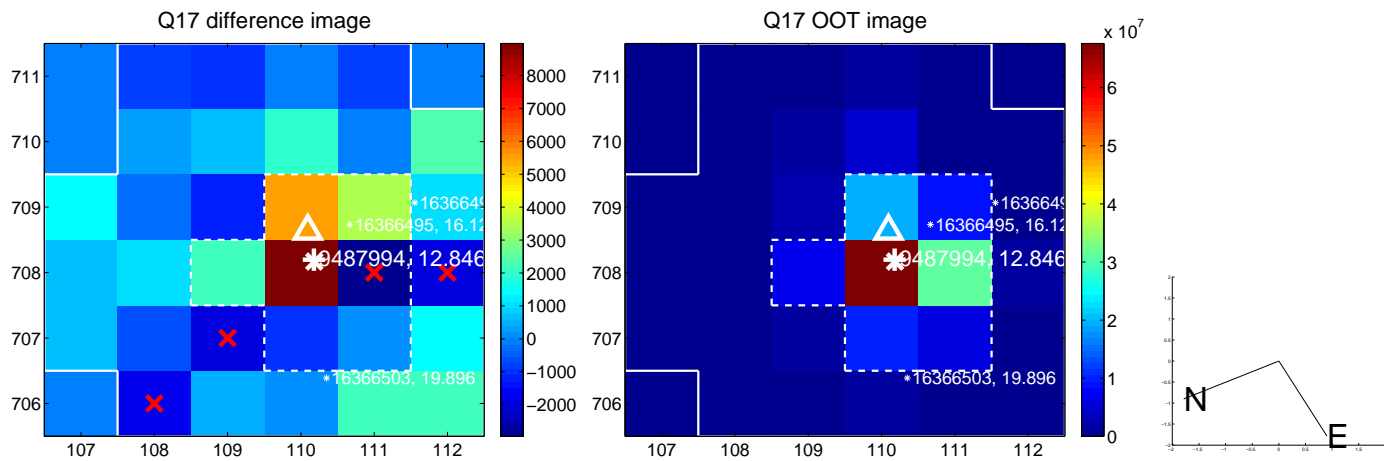
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

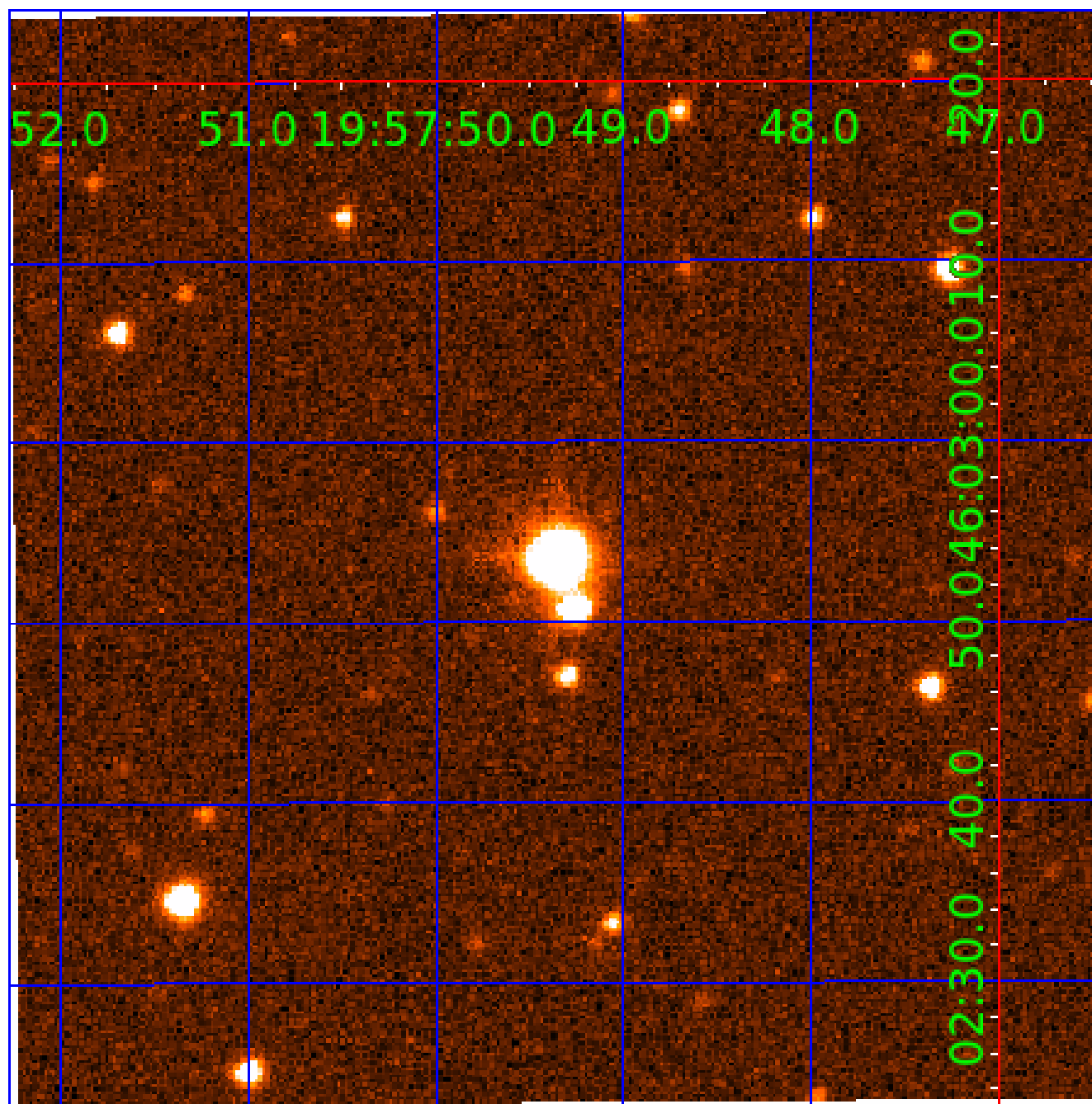


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009487994

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})
009487994-01	OBS	No	513.685808	507.766633	521.6	7.098	14.2	6.5	2.77	6147	6.72	5.22
009487994-02	OBS	No	448.527483	216.790812	329.5	8.703	10.2	5.1	2.77	6147	5.25	6.26
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009487994-05	OBS	No	334.728886	415.847217	427.0	5.480	10.4	7.0	2.77	6147	6.01	9.24
009487994-06	OBS	No	377.571322	193.101149	383.5	5.000	11.1	-1.0	2.77	6147	5.43	7.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487994-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009487994-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009487994-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_ALT—MOD_POS_DV—INCONSISTENT_TRANS
009487994-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

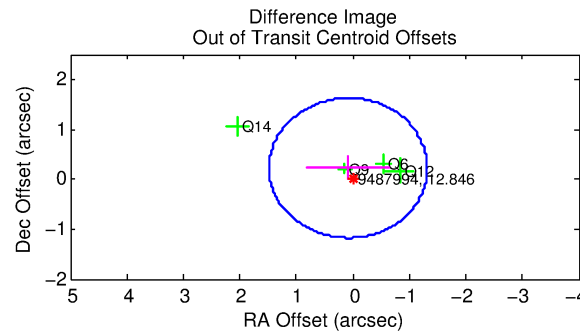
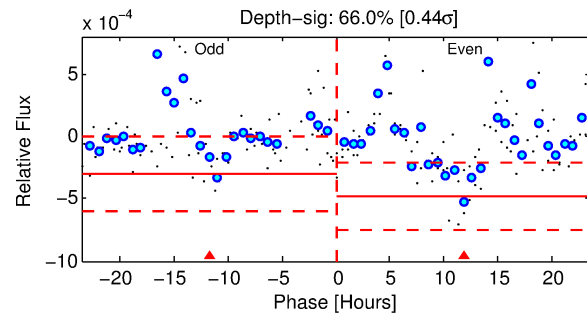
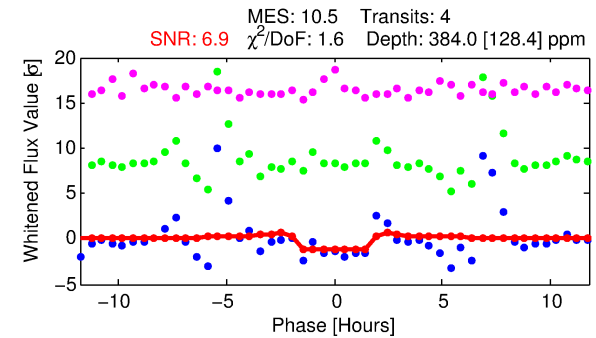
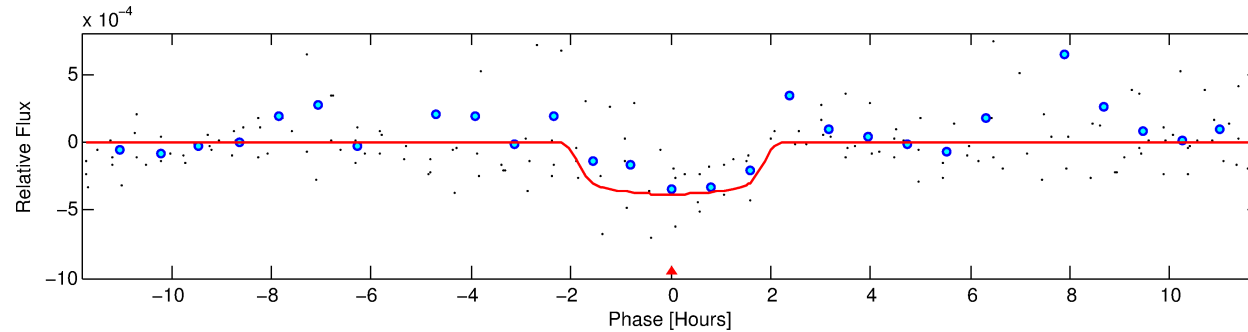
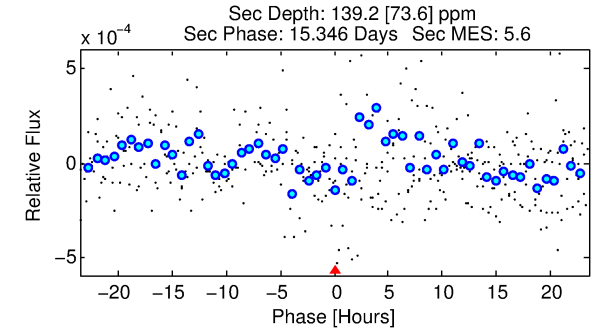
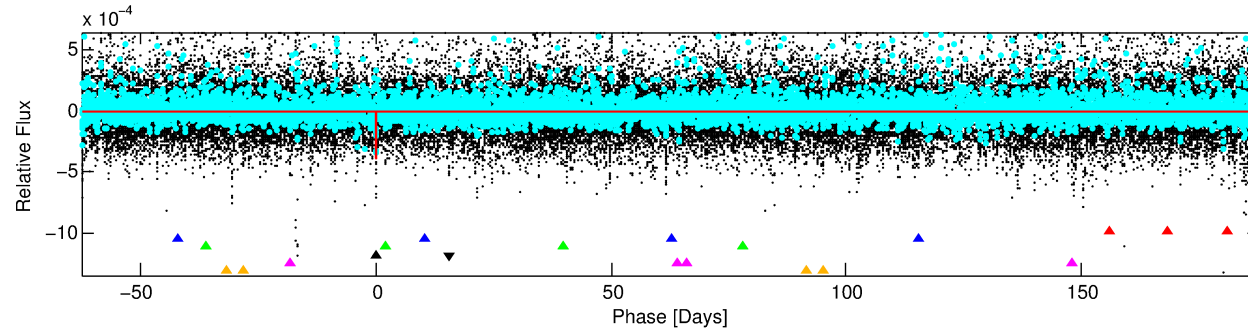
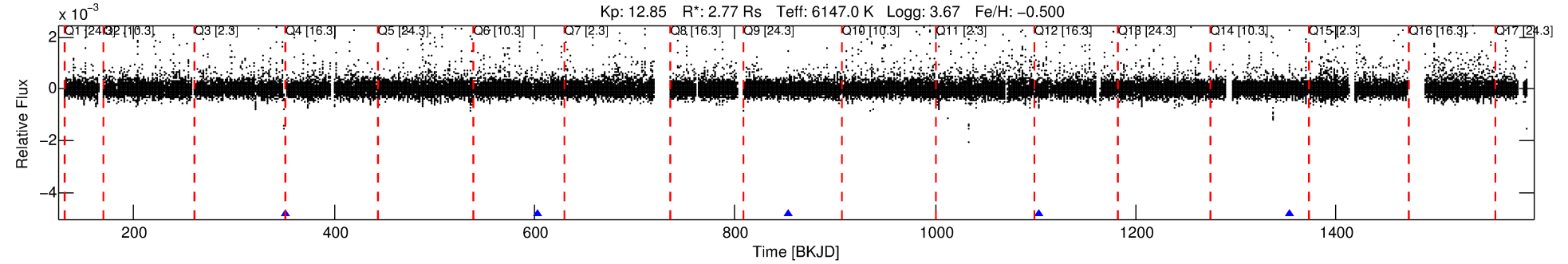
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487994-04

No Significant Match Found

DV One-Page Summary

KIC: 9487994 Candidate: 4 of 6 Period: 250.534 d



DV Fit Results:

Period = 250.53369 [0.00751] d
Epoch = 352.0127 [0.0198] BKJD
Rp/R* = 0.0194 [0.0625]
a/R* = 344.69 [5920.60]
b = 0.73 [10.93]
Seff = 13.60 [7.82]
Teq = 490 [70] K
Rp = 5.85 [19.01] Re
a = 0.8480 [0.3095] AU
Ag = 1607.72 [10436.47] [0.15σ]
Teffp = 4794 [7752] K [0.56σ]

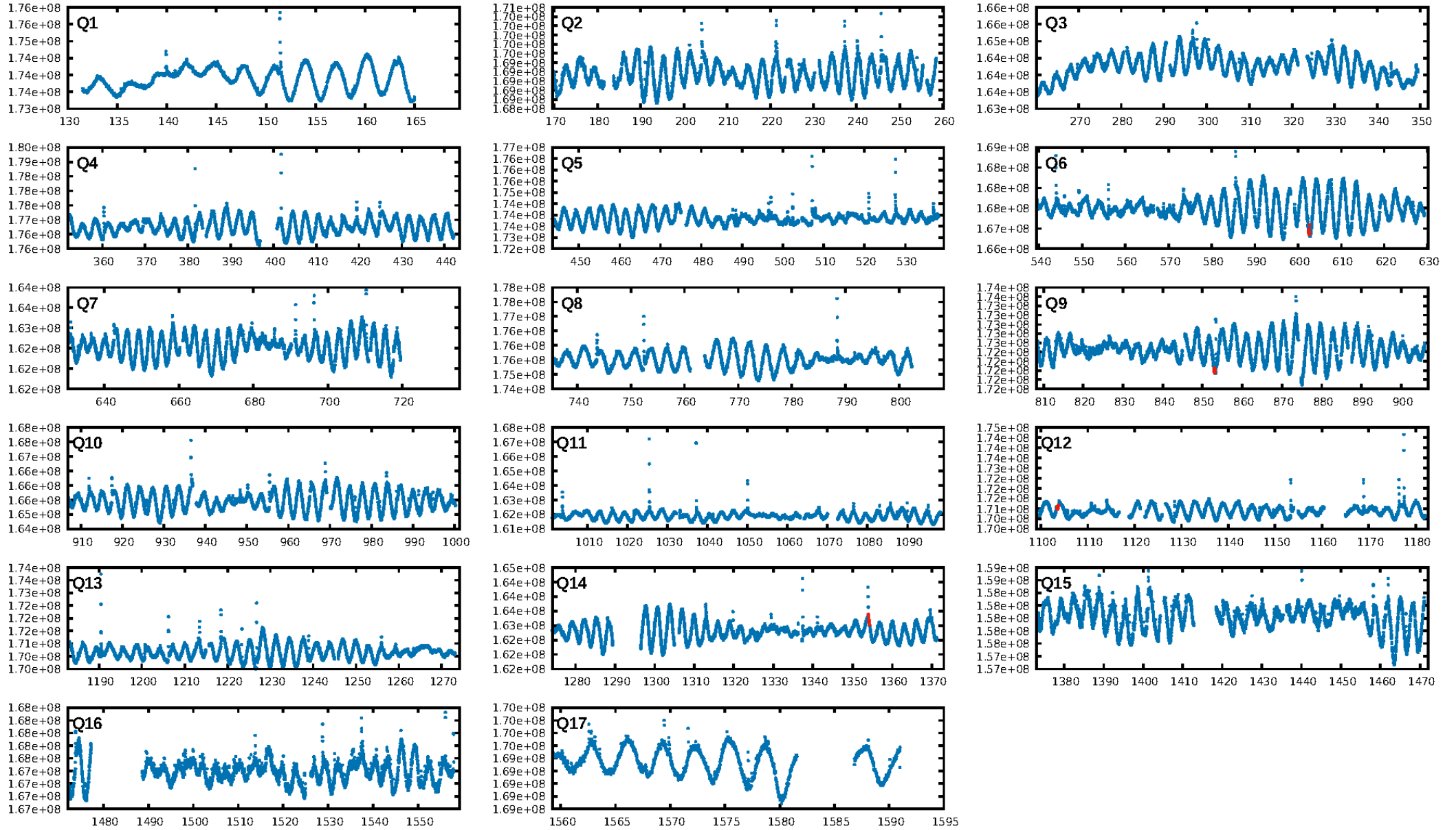
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [299.52σ]
ModelChiSquare2-sig: 60.0%
ModelChiSquareGof-sig: 82.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 2.649
Centroid-sig: 20.5%
Centroid-so: 1.507 arcsec [1.22σ]
OotOffset-rm: 0.238 arcsec [0.51σ]
OotOffset-st: 2/0/1/1 [4]
KicOffset-rm: 0.154 arcsec [0.54σ]
KicOffset-st: 2/0/1/1 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [4/4]

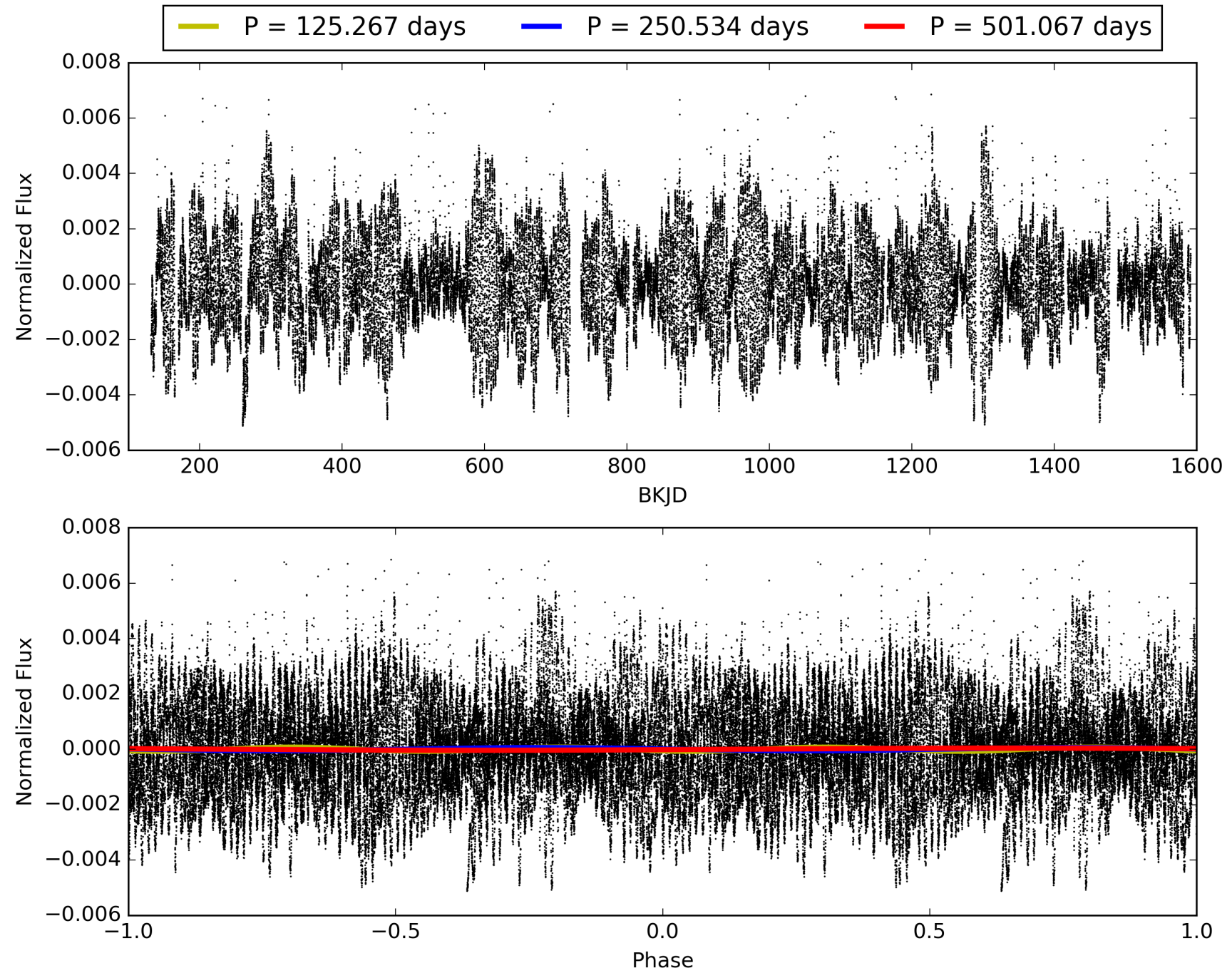
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:19:33 Z

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

TCE 009487994-04, PDC Light Curves

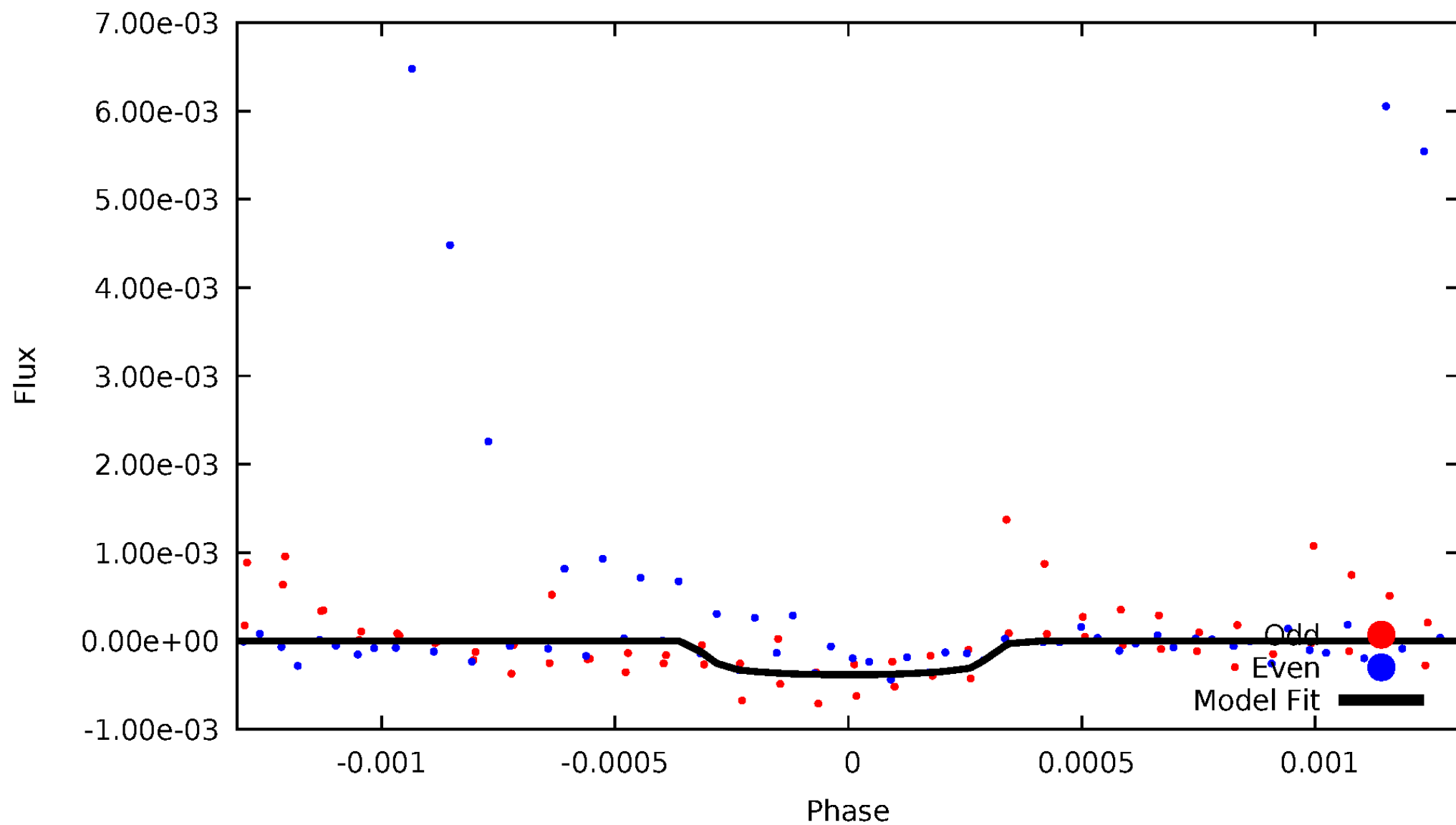


TCE 009487994-04



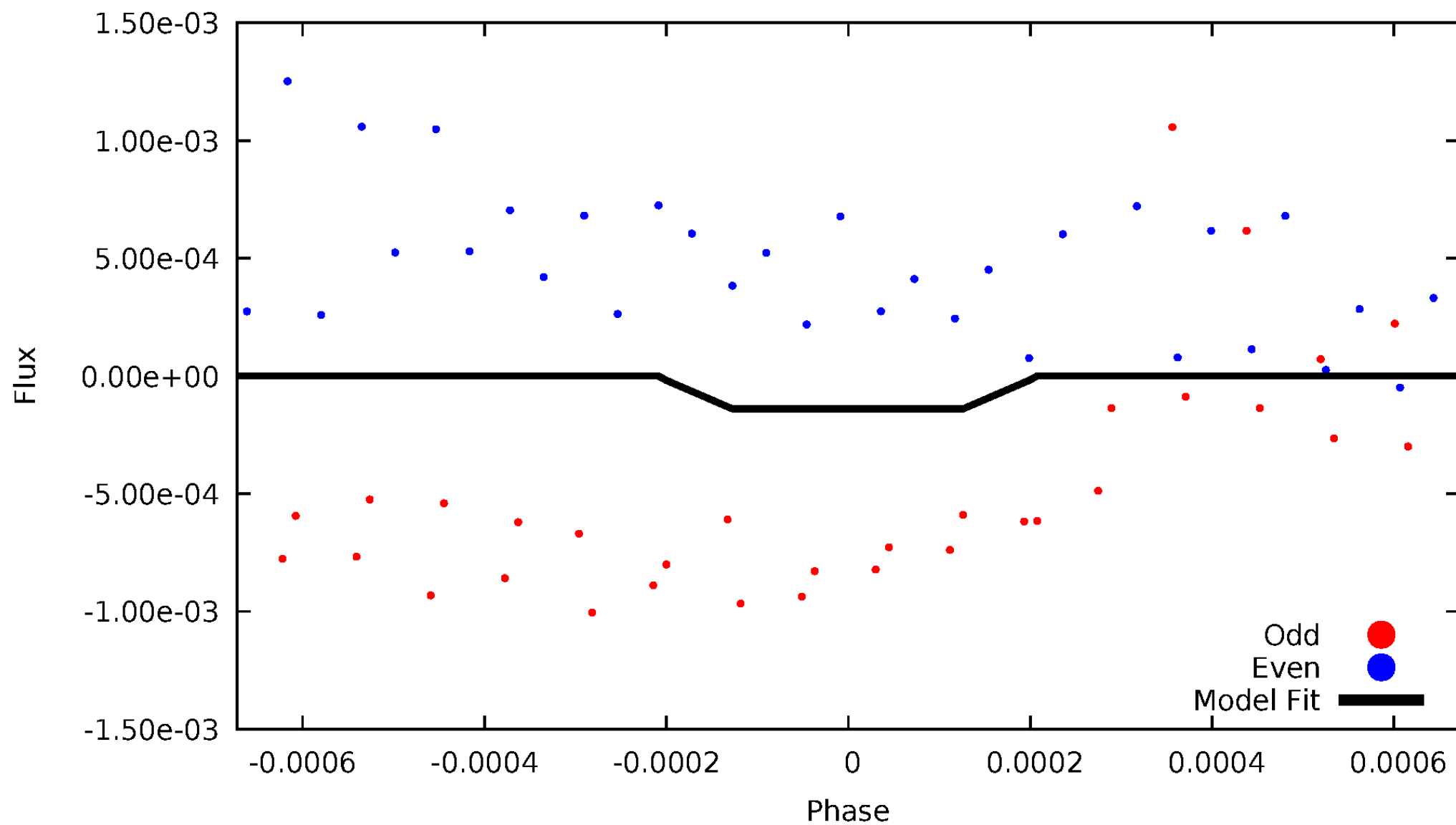
DV Odd/Even

TCE 009487994-04



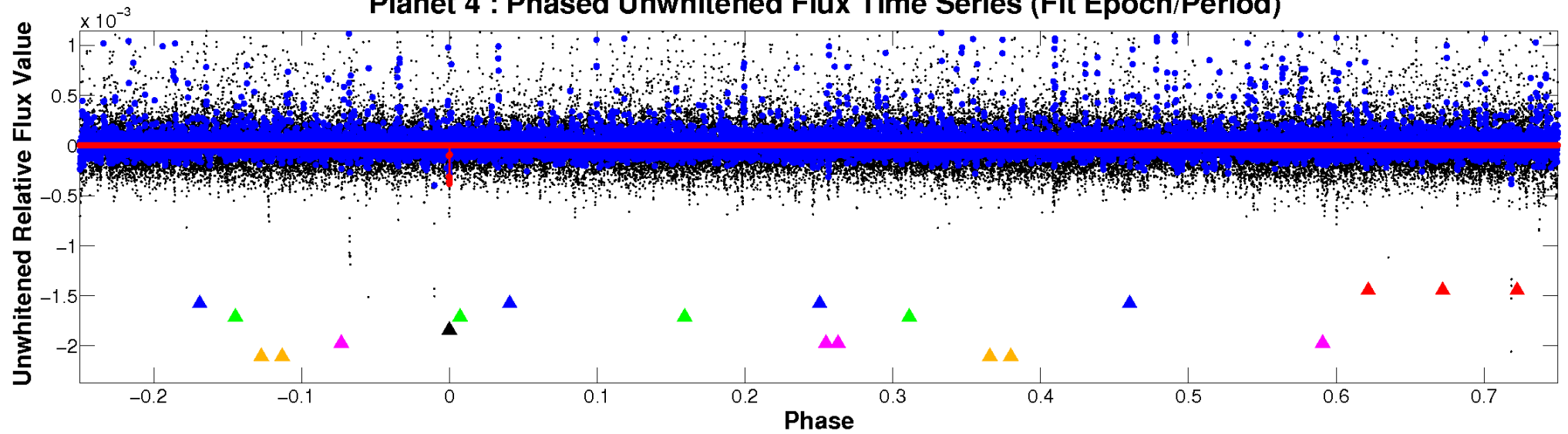
ALT Odd/Even

TCE 009487994-04

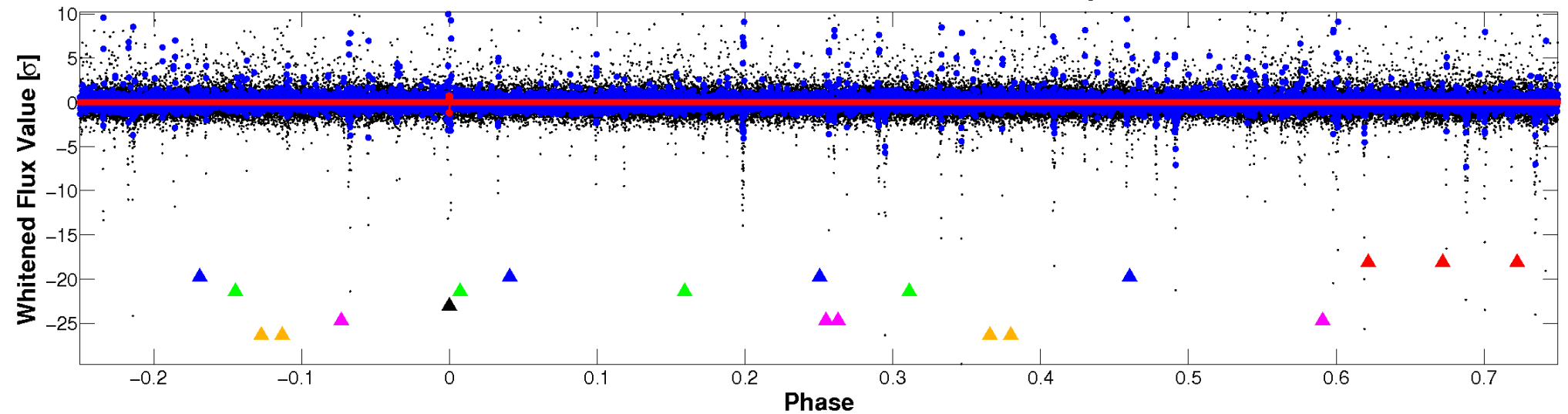


Non-Whitened Vs. Whitened Light Curve

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

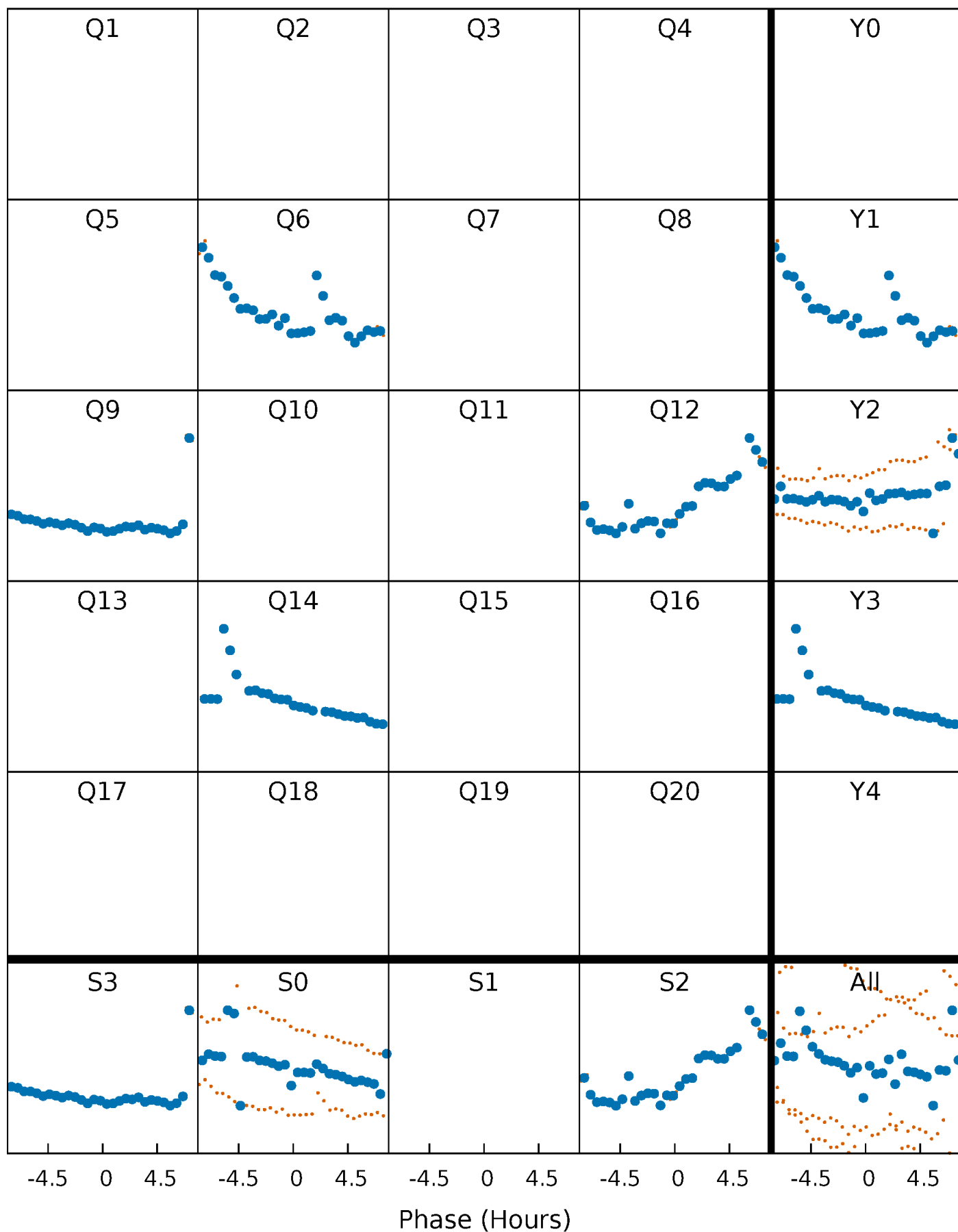


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



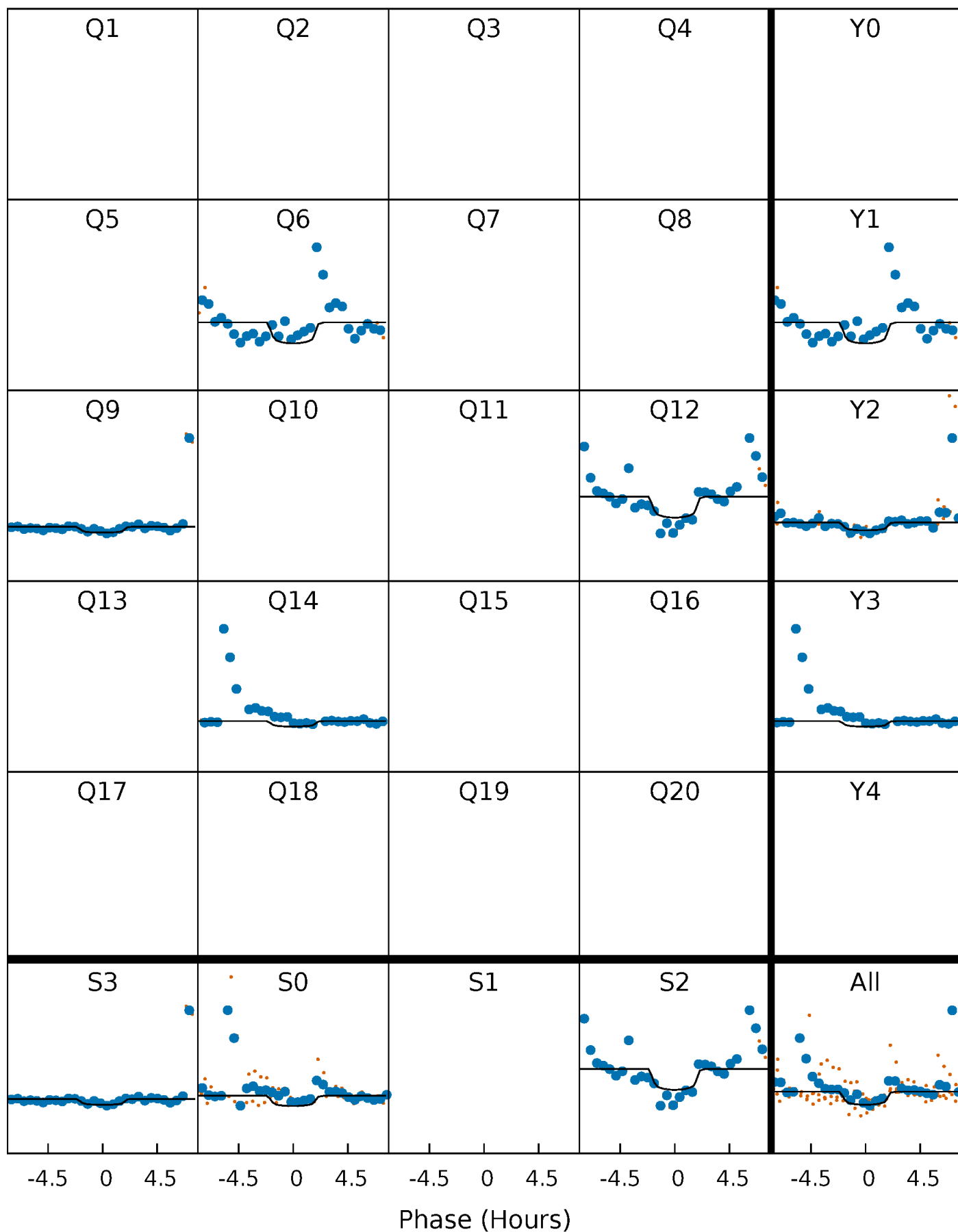
PDC Quarter-Phased Transit Curves

TCE 009487994-04 P=250.533695 Days $T_0=352.012748$ (BKJD)



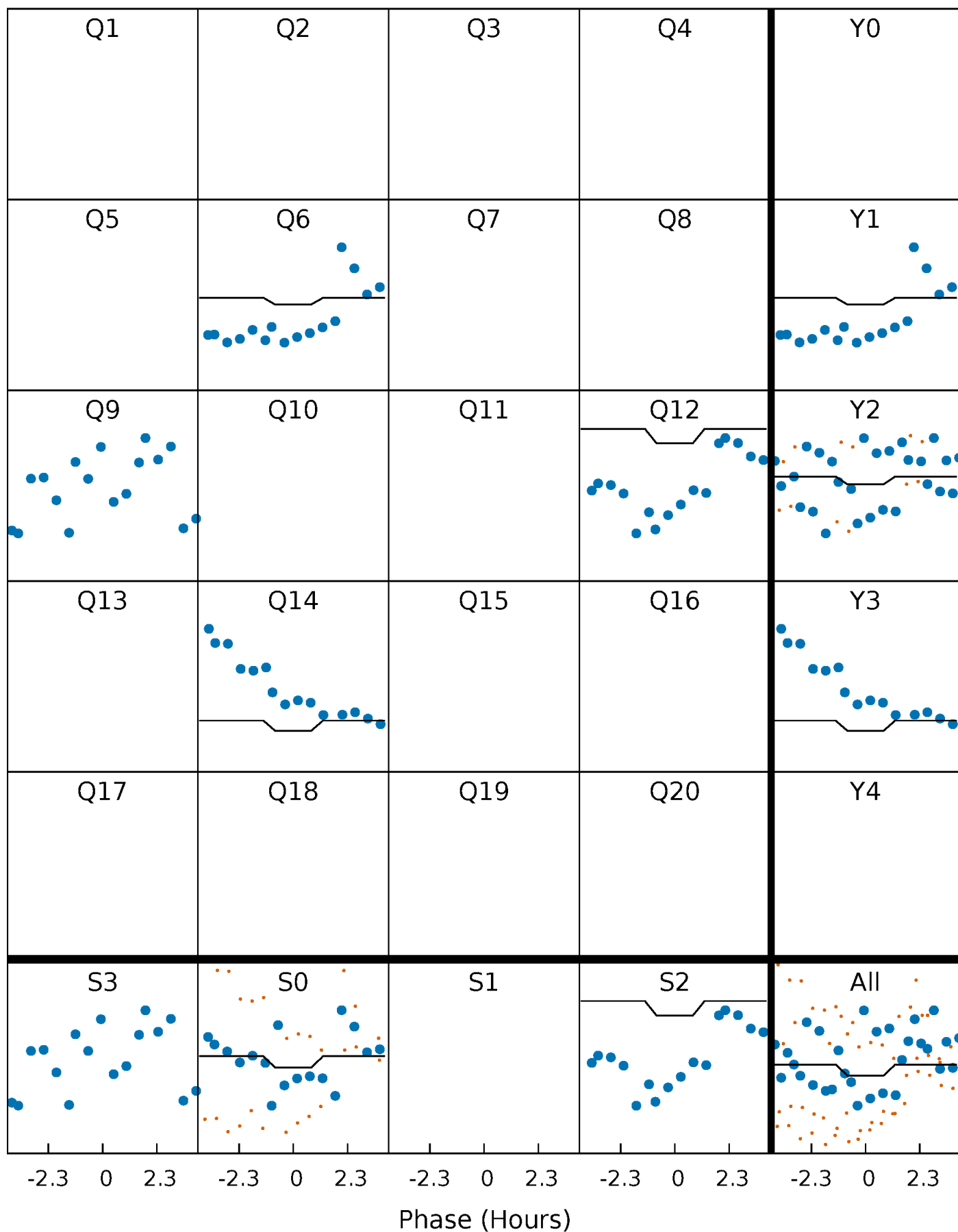
DV Quarter-Phased Transit Curves

TCE 009487994-04 $P=250.533695$ Days $T_0=352.012748$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

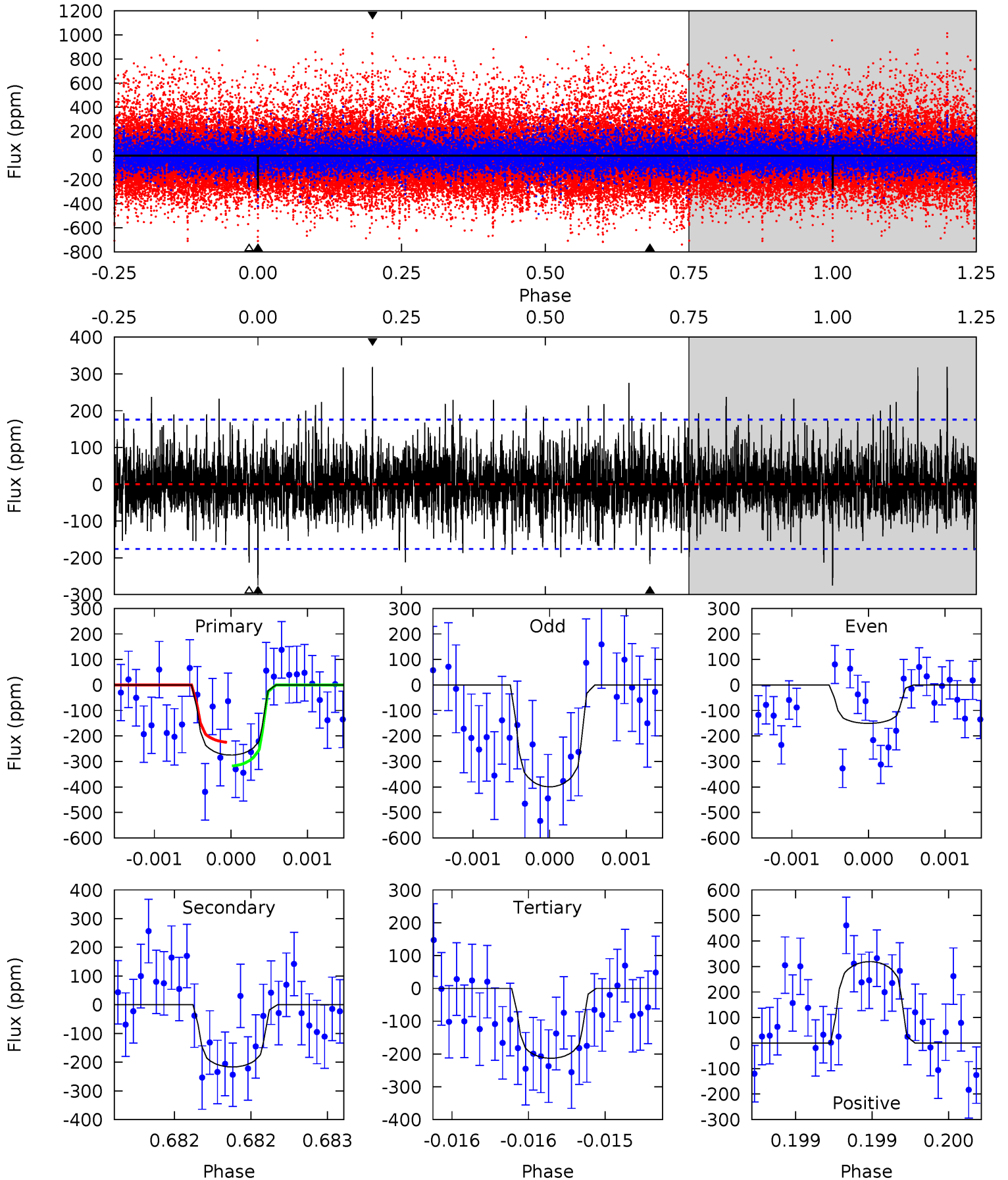
TCE 009487994-04 P=250.542690 Days $T_0=351.999359$ (BKJD)



DV Model-Shift Uniqueness Test

009487994-04, P = 250.533695 Days, E = 101.479053 Days

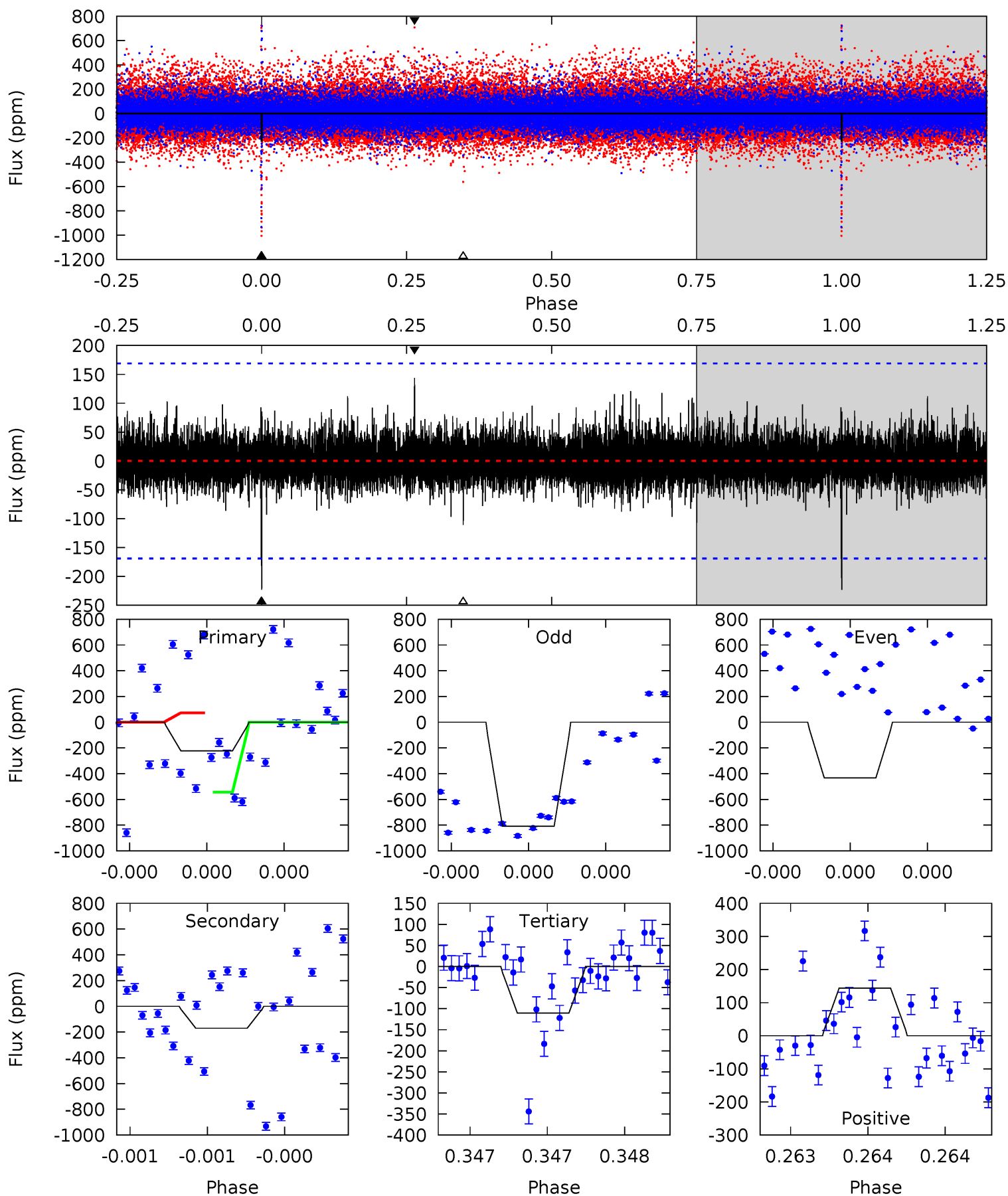
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.62	6.79	6.68	10.00	5.51	3.39	1.84	1.94	-1.38	0.11	-3.21	3.71	1.11	0.54	1.45



Alt Model-Shift Uniqueness Test

009487994-04, P = 250.542690 Days, E = 101.456669 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.42	5.65	3.68	4.78	5.62	3.55	0.84	3.75	2.65	1.97	0.87	6.38	0.71	0.39	6.84



Stellar Parameters For KIC 009487994

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6147^{+184}_{-184}	$3.667^{+0.322}_{-0.115}$	$-0.500^{+0.400}_{-0.250}$	$2.765^{+0.477}_{-1.114}$	$1.294^{+0.201}_{-0.302}$	$0.086^{+0.218}_{-0.029}$
	+3%/-3%	+9%/-3%	+80%/-50%	+17%/-40%	+16%/-23%	+253%/-34%
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 009487994-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-217 ± 32	$15.40^{+13.54}_{-10.79}$	676^{+43}_{-61}	3638^{+2115}_{-627}	361^{+3476}_{-261}
Alt.	-170 ± 30	$13.79^{+13.82}_{-9.10}$	674^{+48}_{-65}	3632^{+1851}_{-671}	343^{+2834}_{-258}

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 $A_{obs} \gg 1.0$

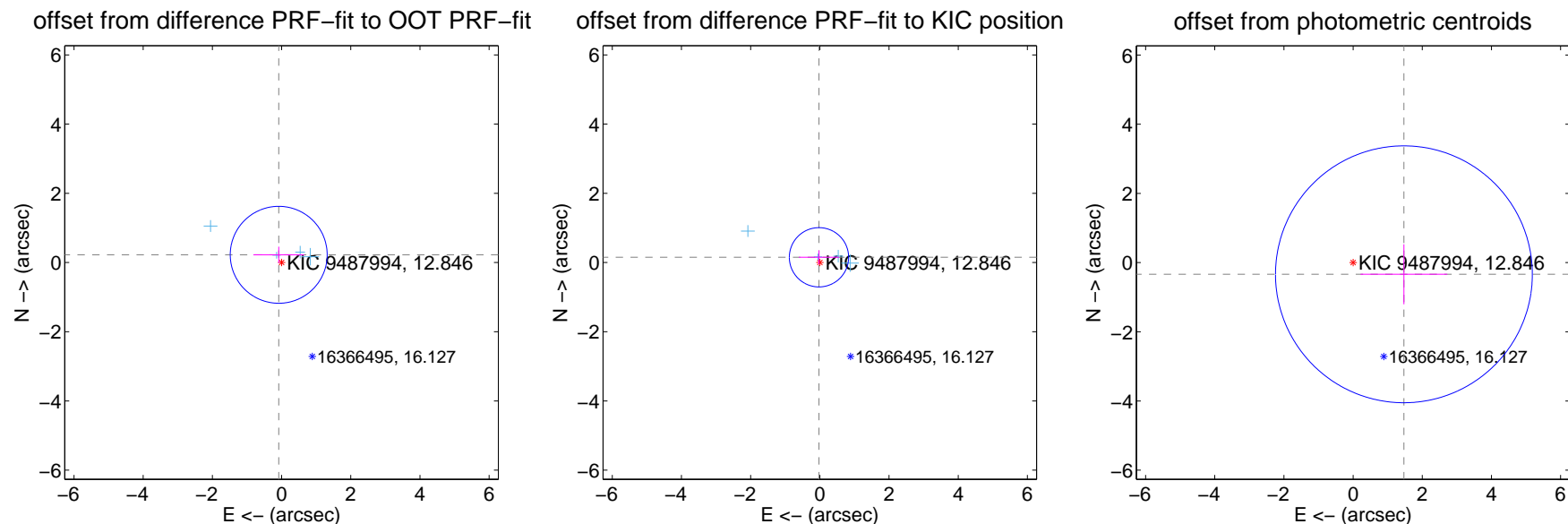
DV Centroid Data

Supplemental centroid analysis for 009487994-04. Kepler magnitude: 12.85. Transit SNR 6.95

There are 4 quarters with good PRF difference image offsets

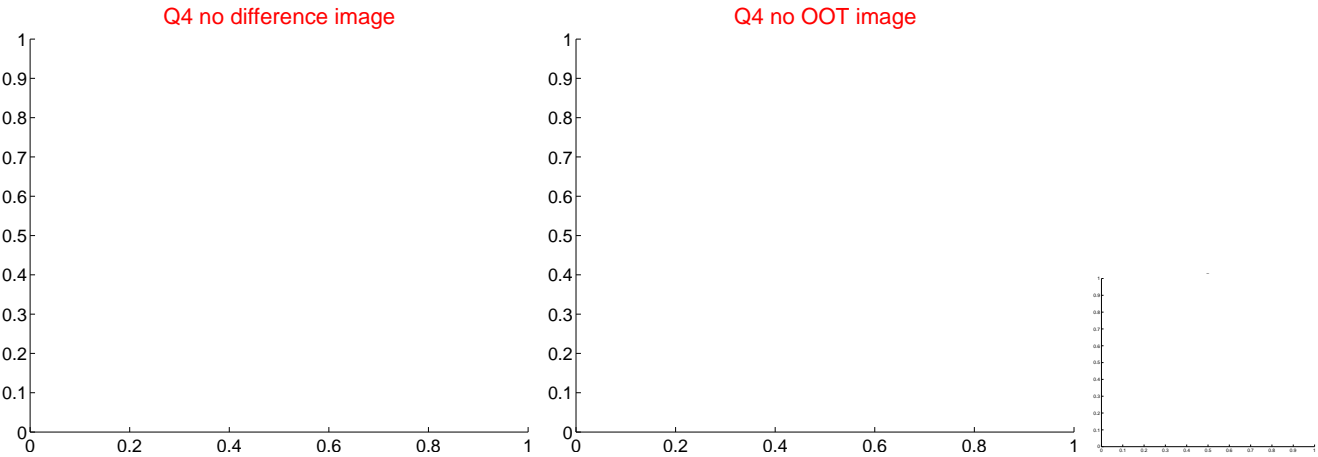
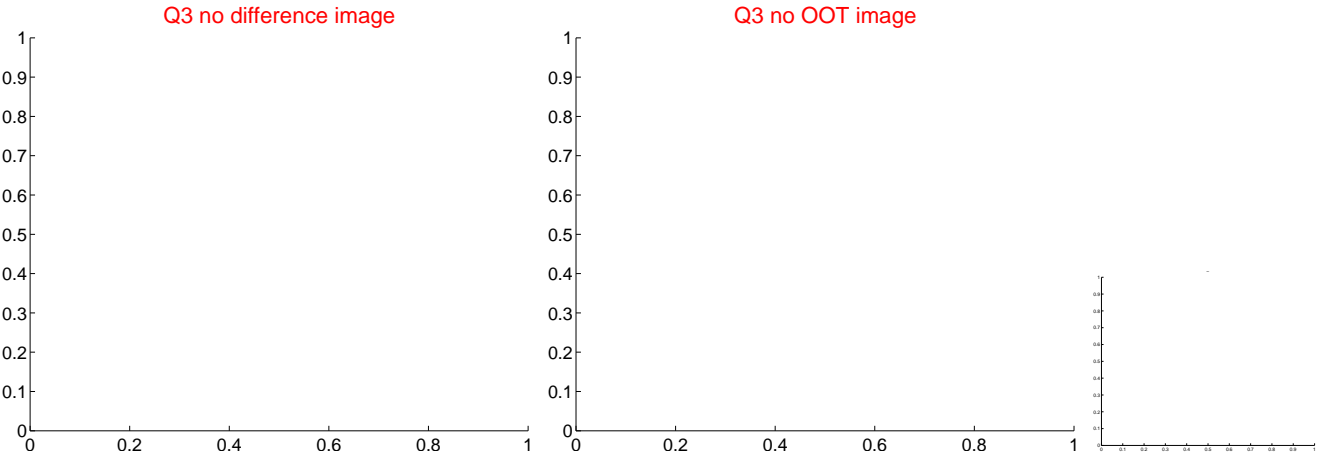
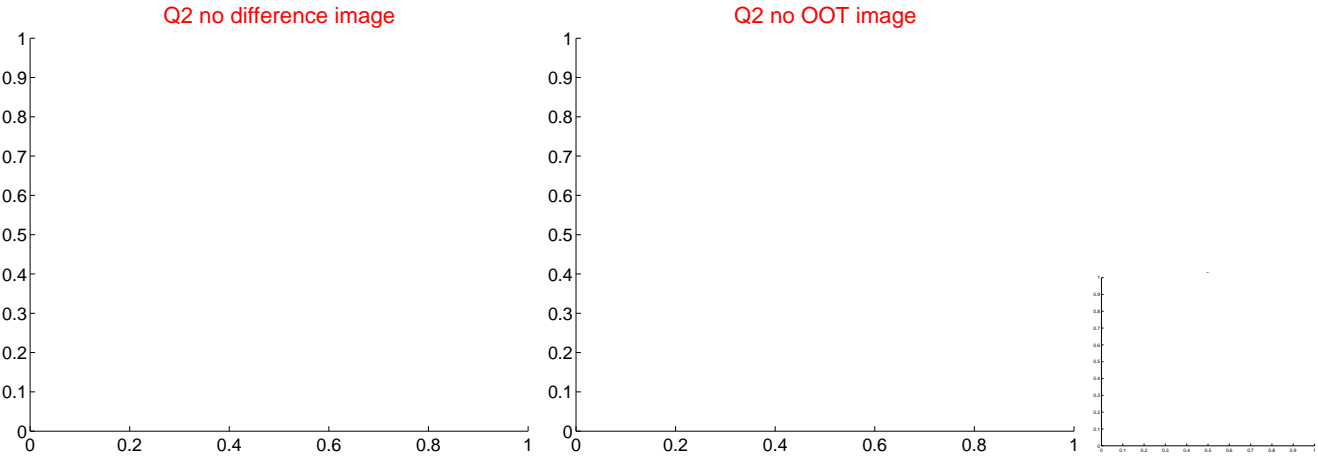
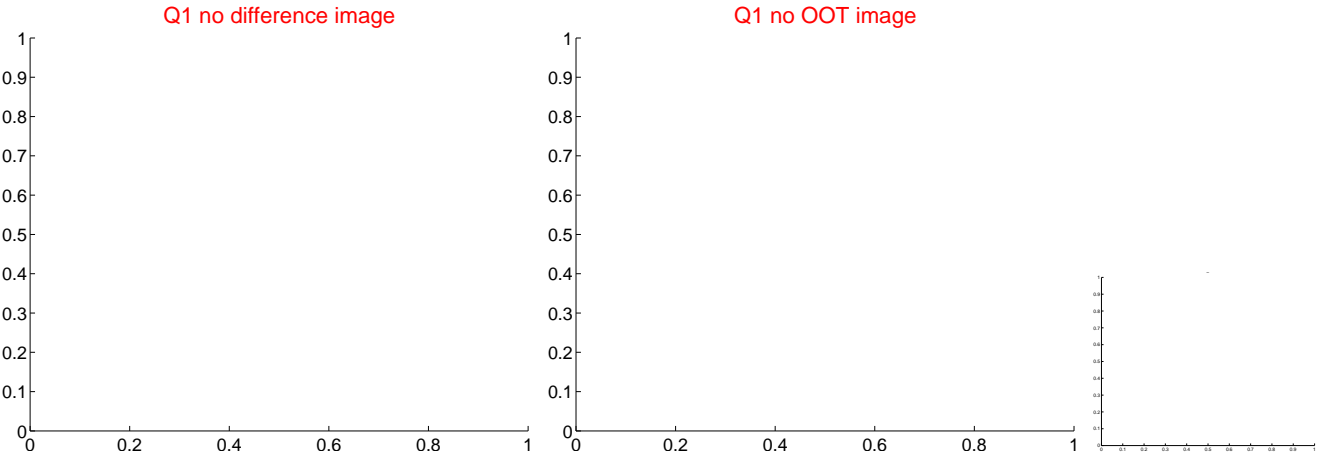
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.238 ± 0.467	0.51	0.083 ± 0.734	0.224 ± 0.236
PRF-fit source offset from KIC position	0.154 ± 0.286	0.54	0.025 ± 0.581	0.152 ± 0.199
photometric centroid source offset	1.51 ± 1.24	1.22	-1.47 ± 1.25	-0.34 ± 0.87

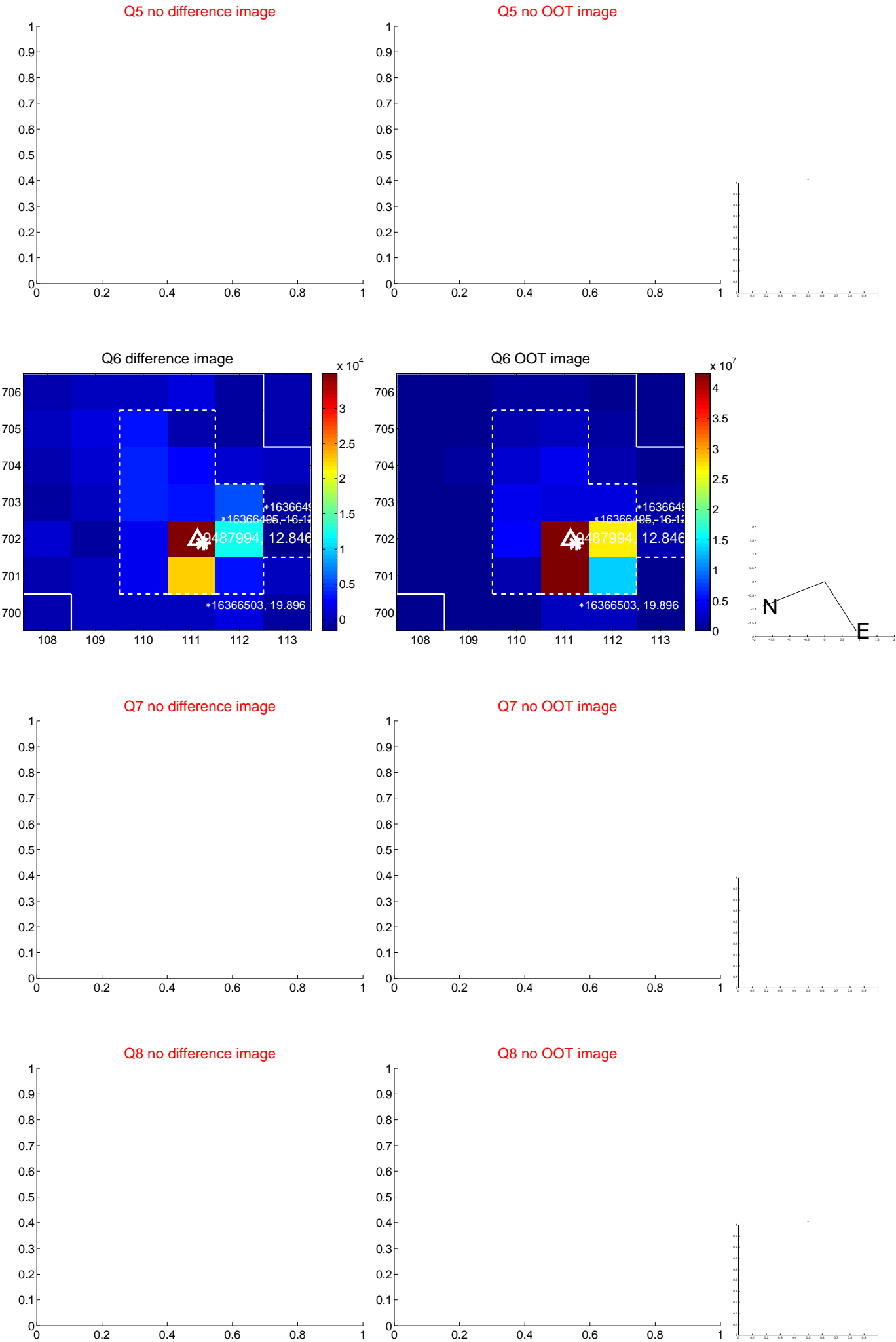


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

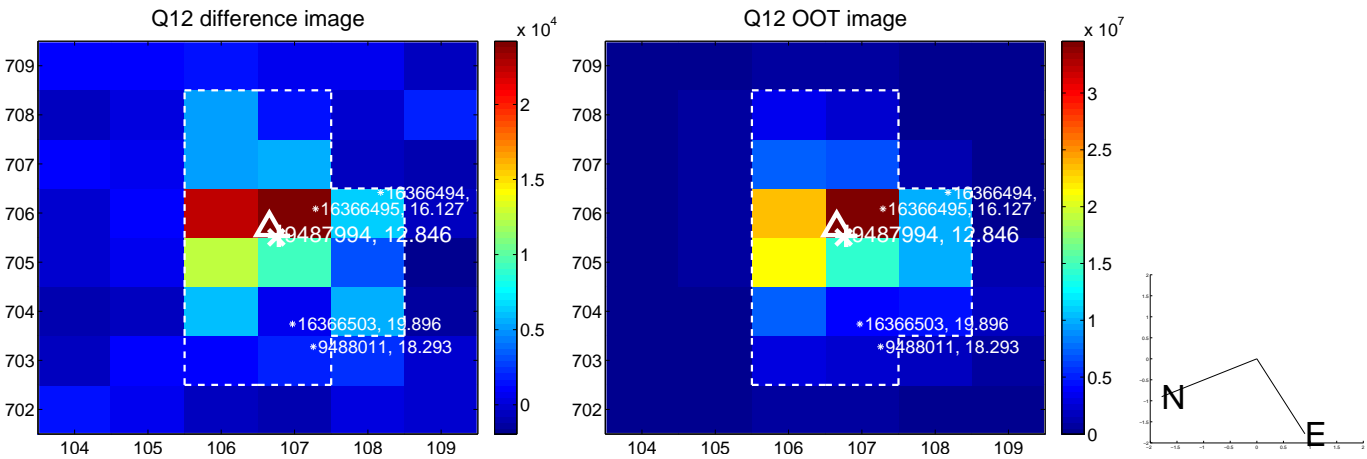
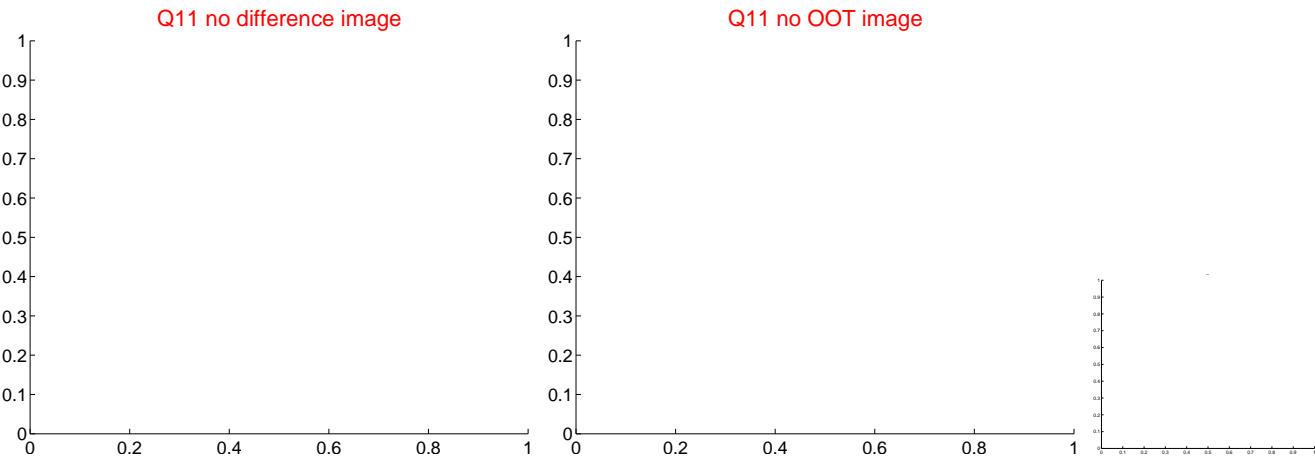
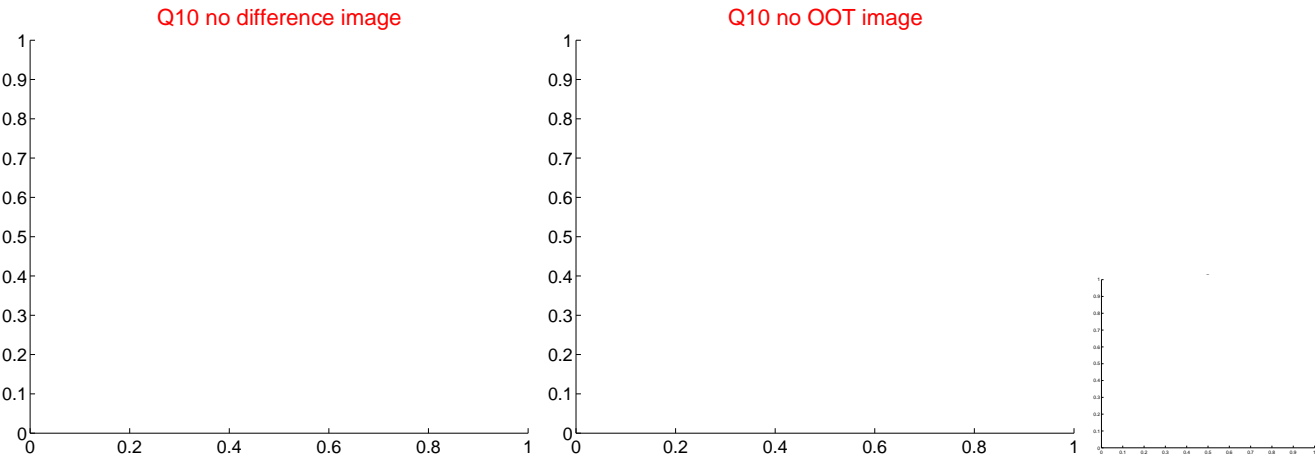
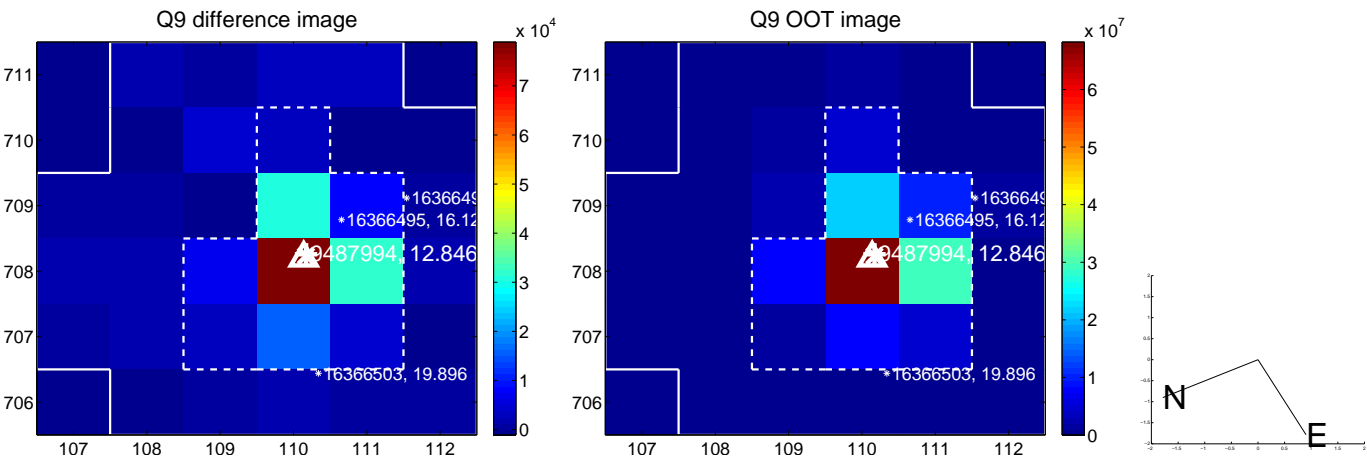
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



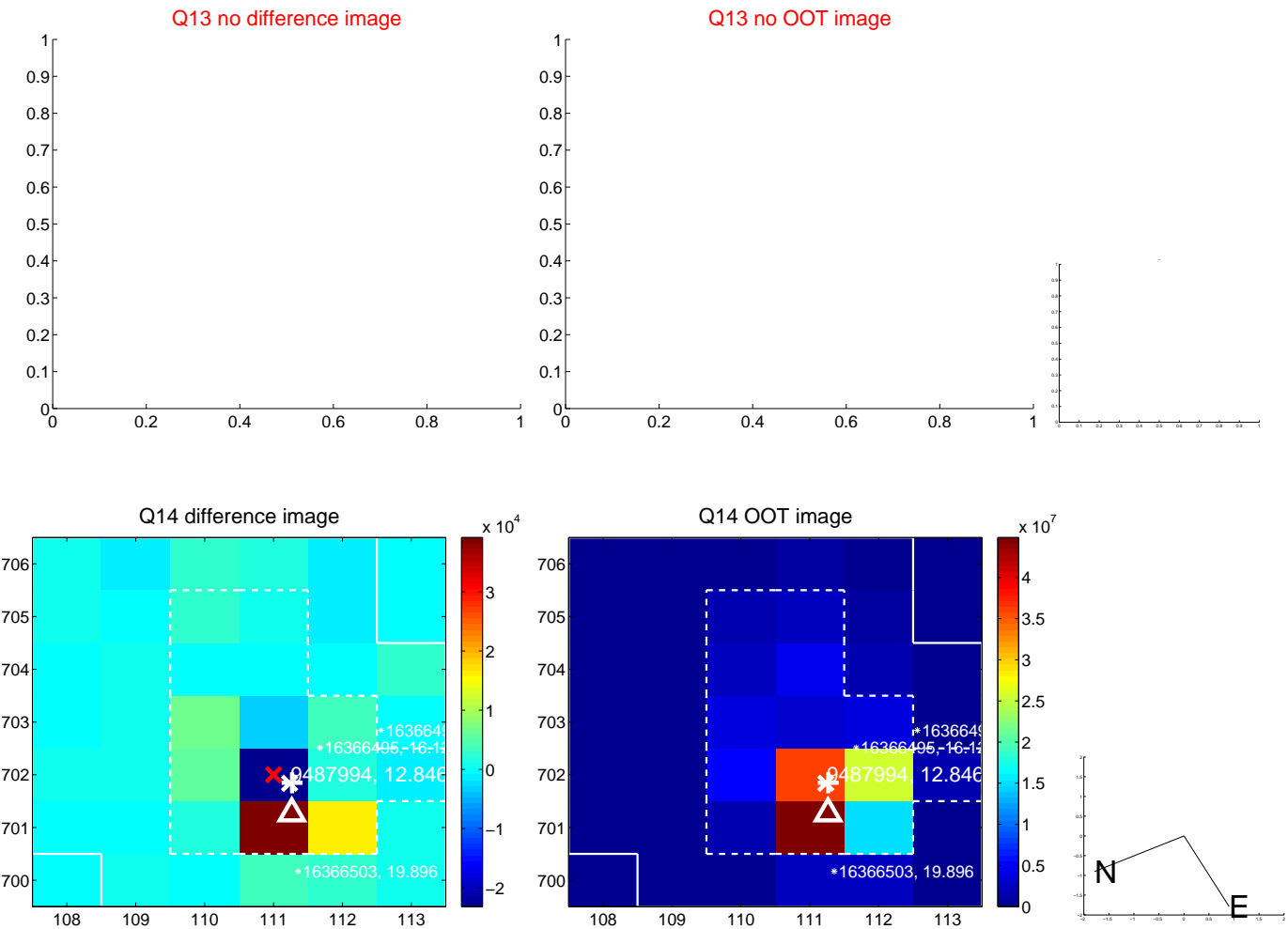
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



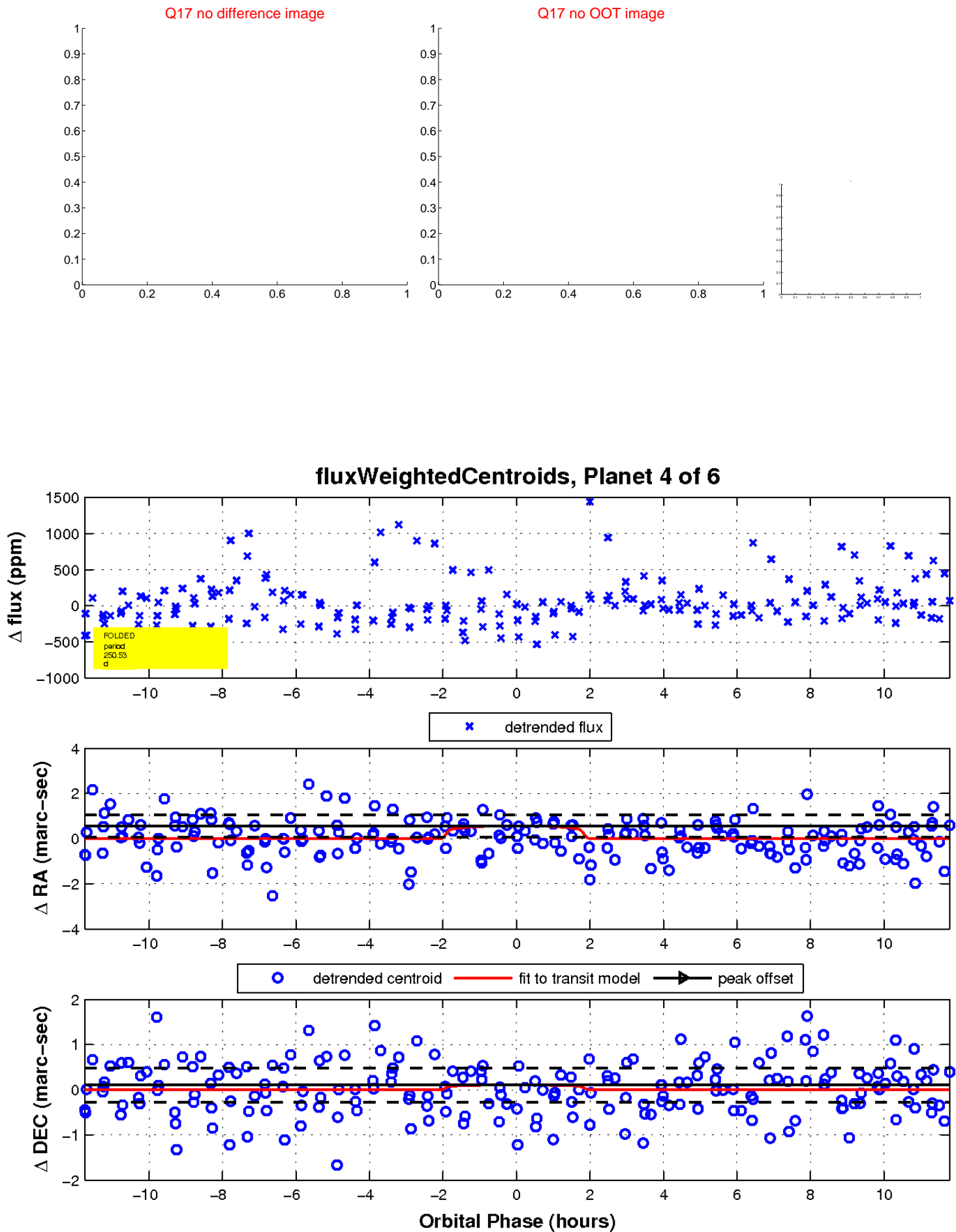
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

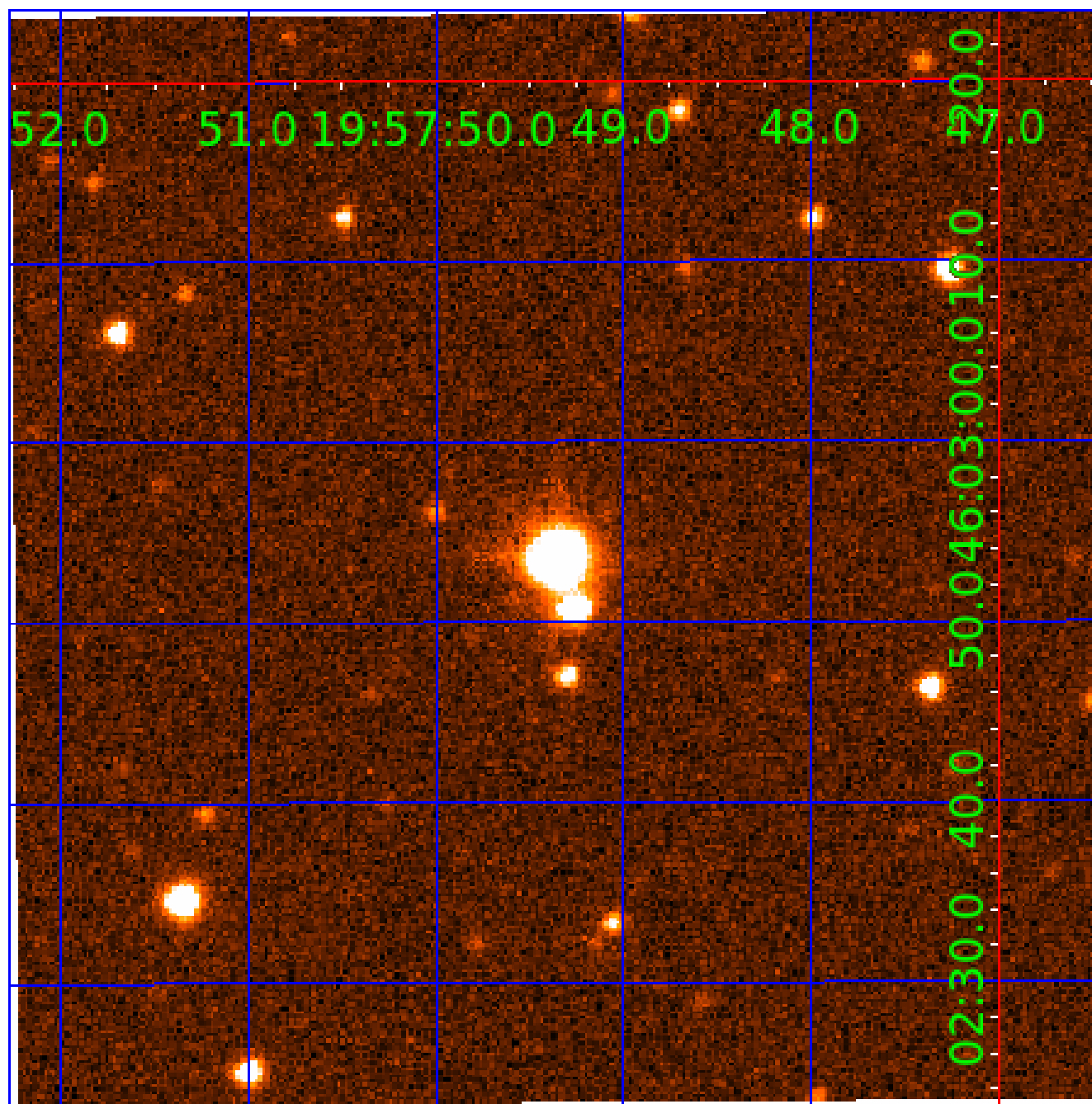


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009487994

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})
009487994-01	OBS	No	513.685808	507.766633	521.6	7.098	14.2	6.5	2.77	6147	6.72	5.22
009487994-02	OBS	No	448.527483	216.790812	329.5	8.703	10.2	5.1	2.77	6147	5.25	6.26
009487994-03	OBS	No	462.996461	179.438276	247.5	4.176	11.4	4.2	2.77	6147	4.62	6.00
009487994-04	OBS	No	250.533695	352.012748	384.0	3.935	10.5	6.9	2.77	6147	5.85	13.60
009487994-05	OBS	No	334.728886	415.847217	427.0	5.480	10.4	7.0	2.77	6147	6.01	9.24
009487994-06	OBS	No	377.571322	193.101149	383.5	5.000	11.1	-1.0	2.77	6147	5.43	7.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487994-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009487994-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009487994-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_ALT—MOD_POS_DV—INCONSISTENT_TRANS
009487994-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

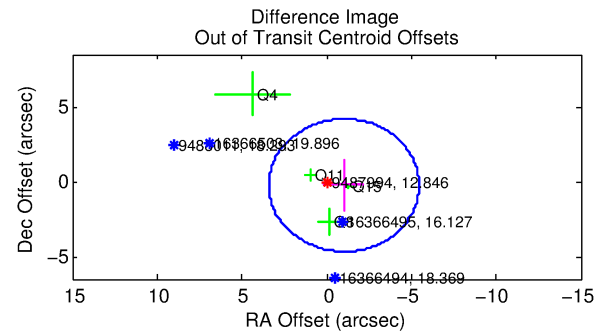
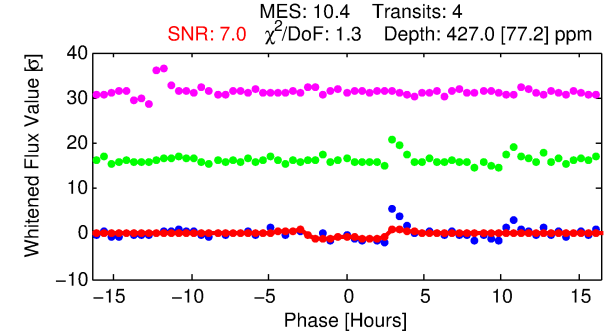
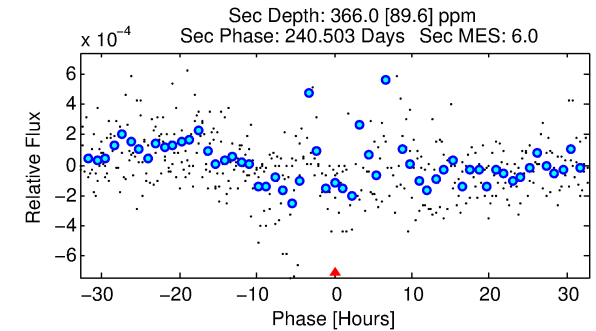
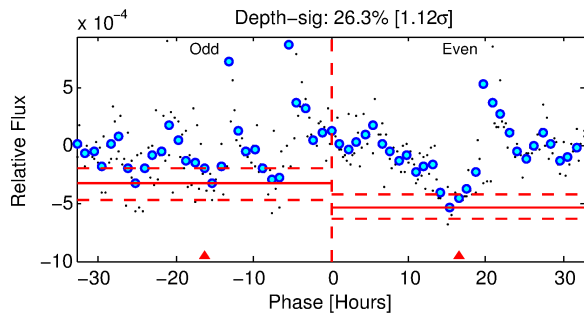
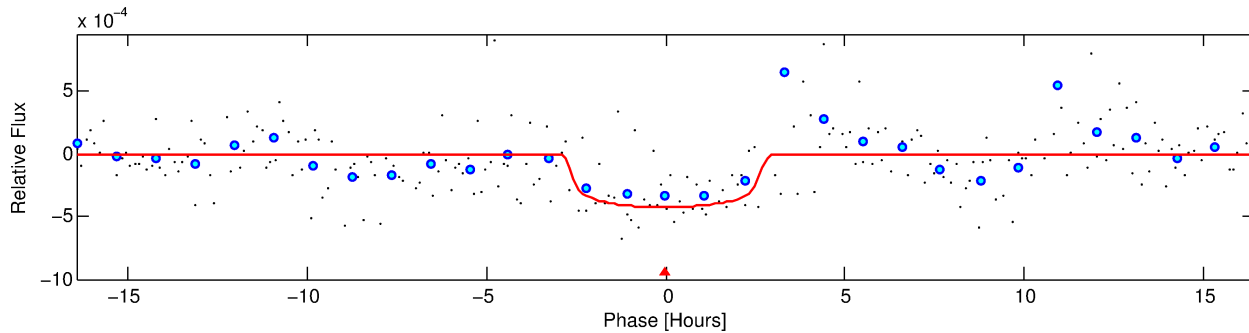
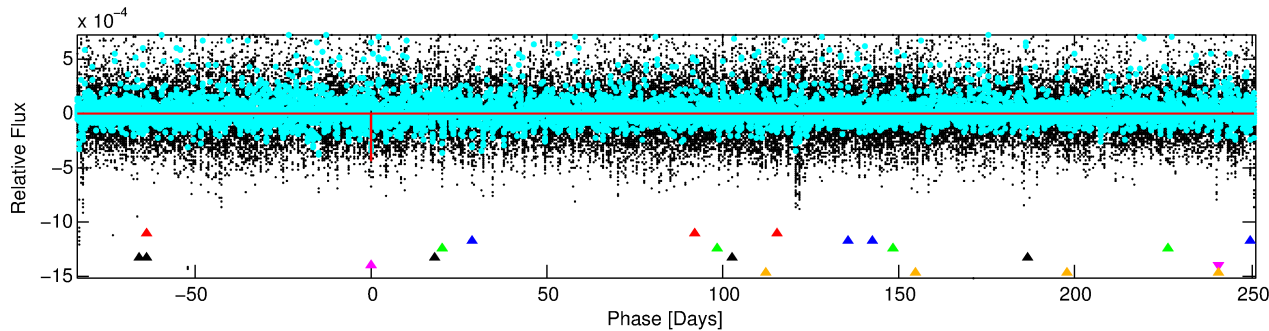
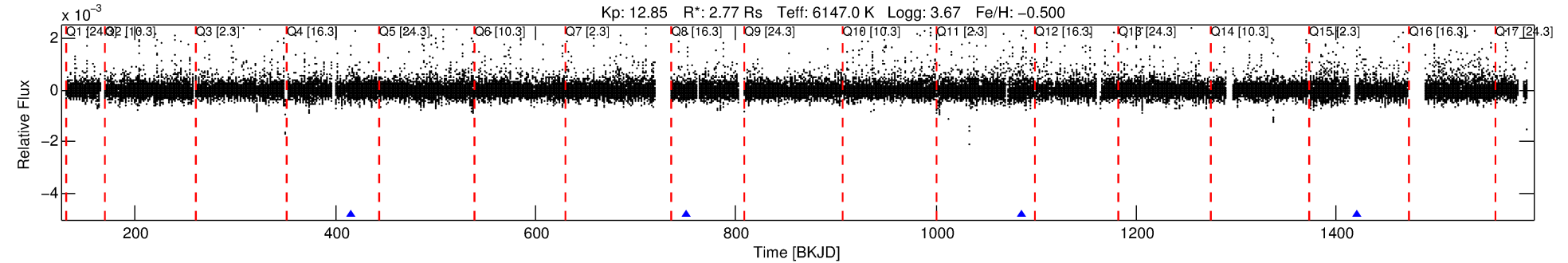
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487994-05

No Significant Match Found

DV One-Page Summary

KIC: 9487994 Candidate: 5 of 6 Period: 334.729 d



DV Fit Results:

Period = 334.72889 [0.00389] d
Epoch = 415.8472 [0.0070] BKJD
Rp/R* = 0.0199 [0.0204]
a/R* = 376.34 [1998.70]
b = 0.62 [5.23]
Seff = 9.24 [5.32]
Teq = 445 [64] K
Rp = 6.01 [6.63] Re
a = 1.0287 [0.3755] AU
Ag = 5899.59 [12643.06] [0.47] σ
Teffp = 6024 [3120] K [1.79] σ

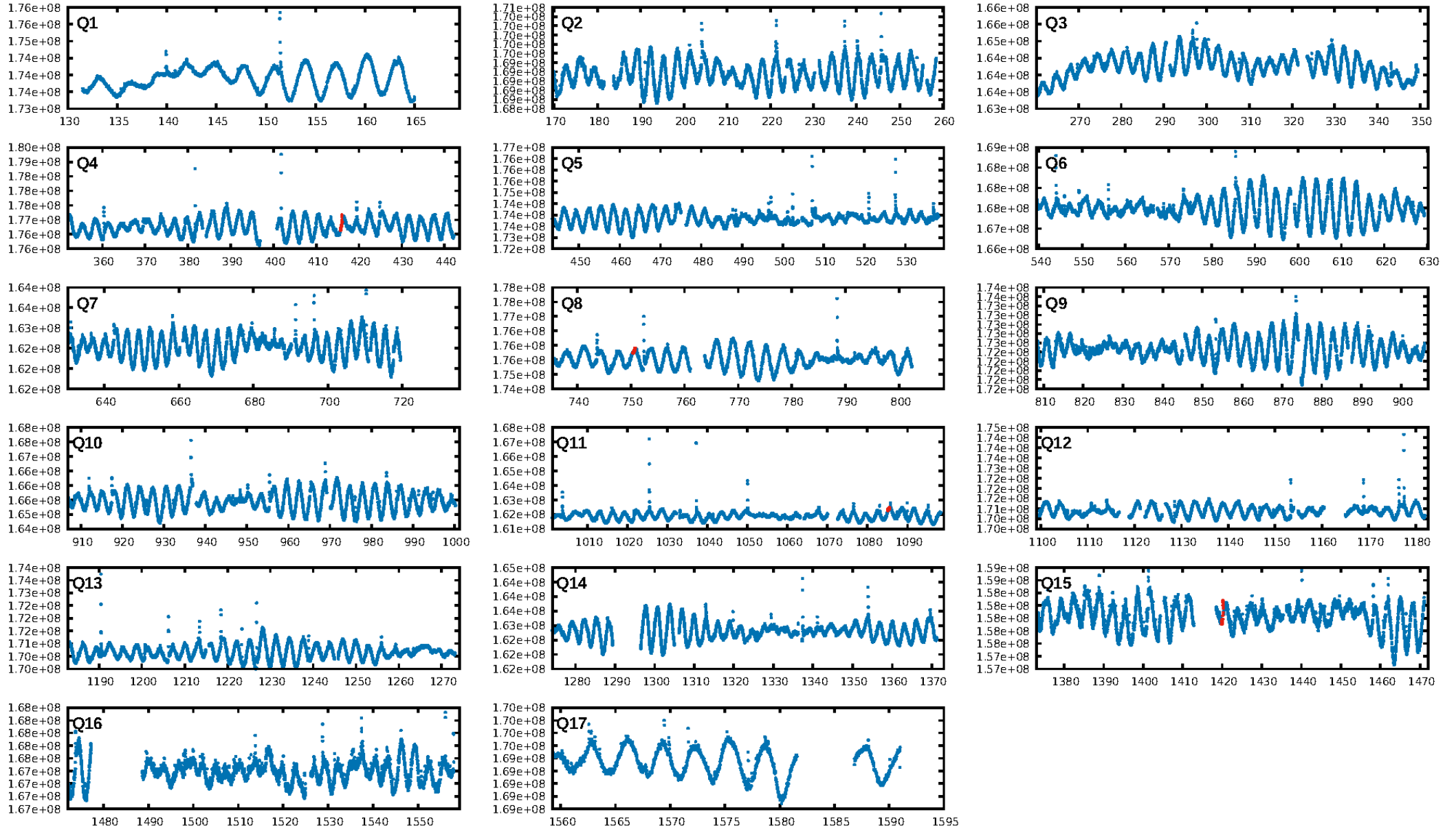
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [299.52] σ
LongPeriod-sig: 100.0% [138.60] σ
ModelChiSquare2-sig: 0.3%
ModelChiSquareGof-sig: 84.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.968
Centroid-sig: 13.5%
Centroid-so: 0.952 arcsec [1.15] σ
OotOffset-rm: 1.048 arcsec [0.71] σ
OotOffset-st: 0/2/2/0 [4]
KicOffset-rm: 1.175 arcsec [0.73] σ
KicOffset-st: 0/2/2/0 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 1.00 [4/4]

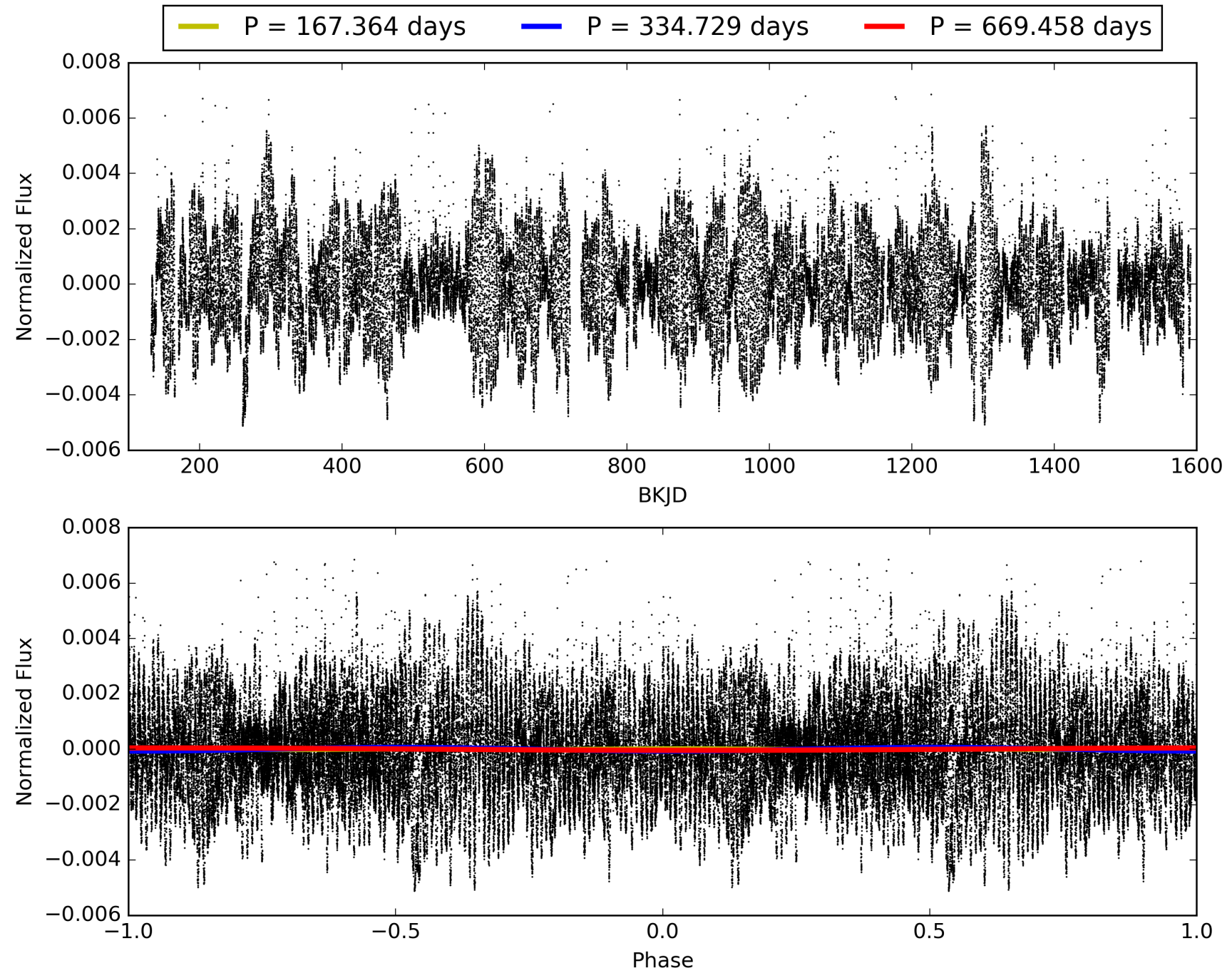
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:19:45 Z

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

TCE 009487994-05, PDC Light Curves

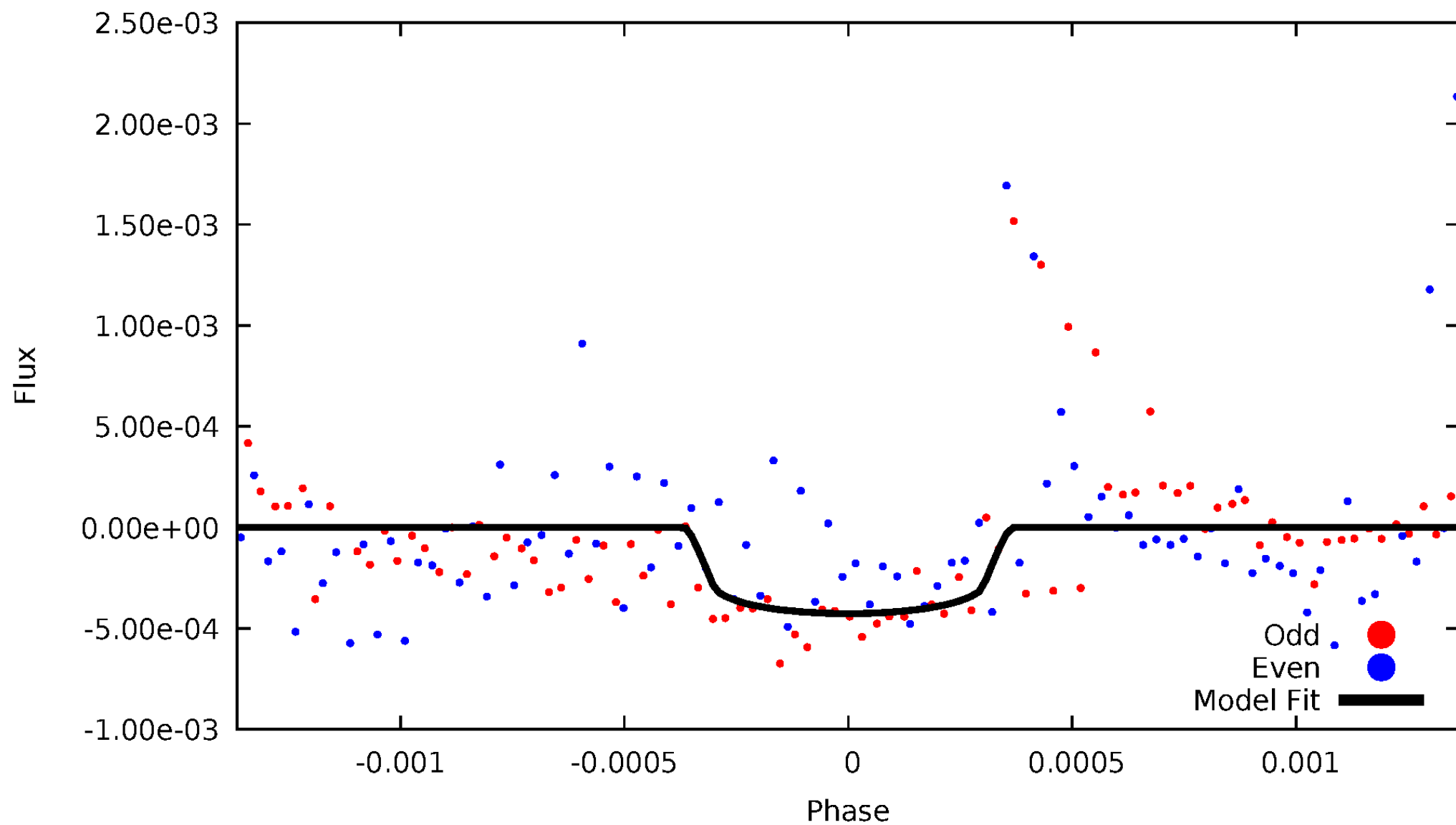


TCE 009487994-05



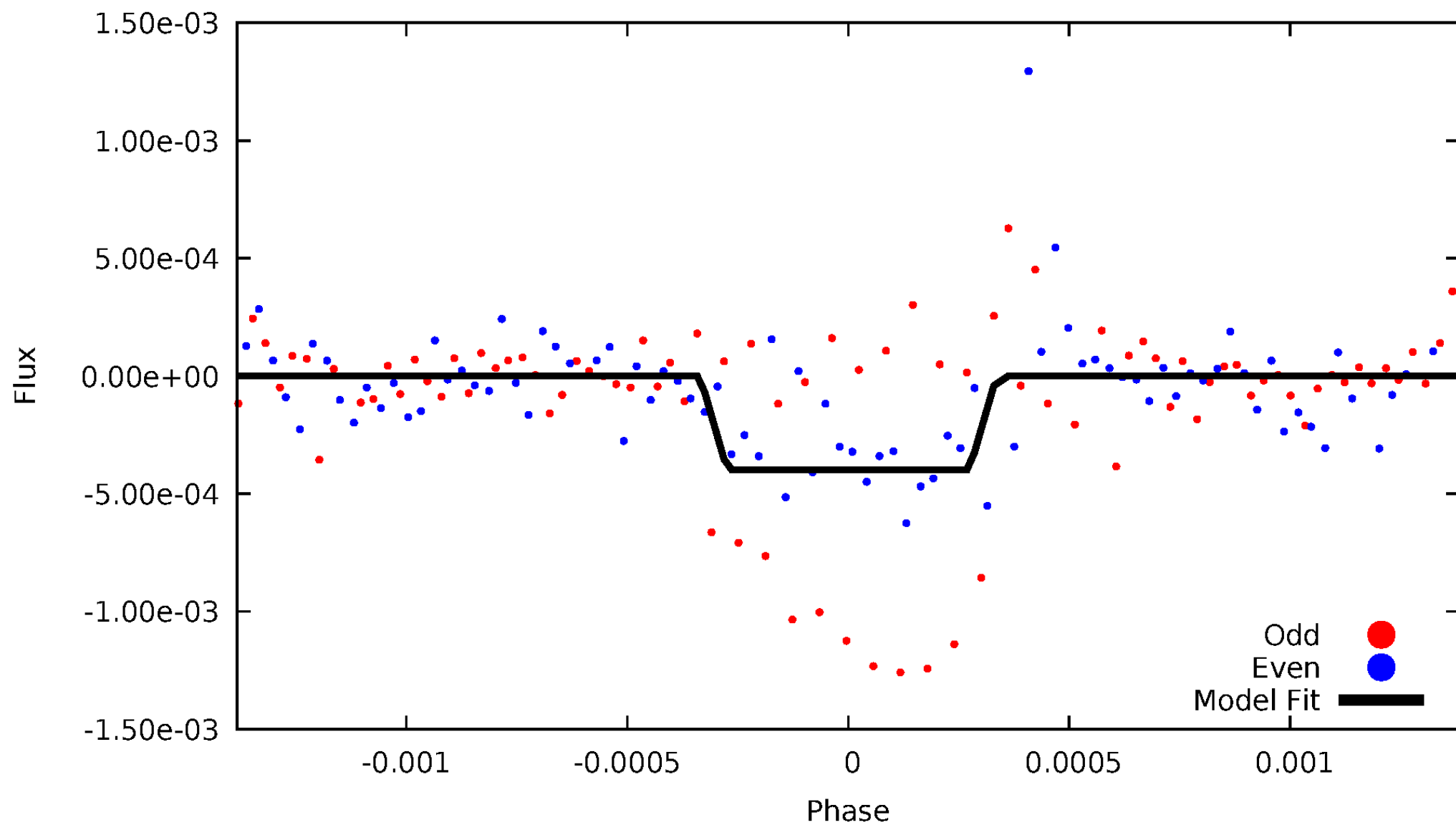
DV Odd/Even

TCE 009487994-05



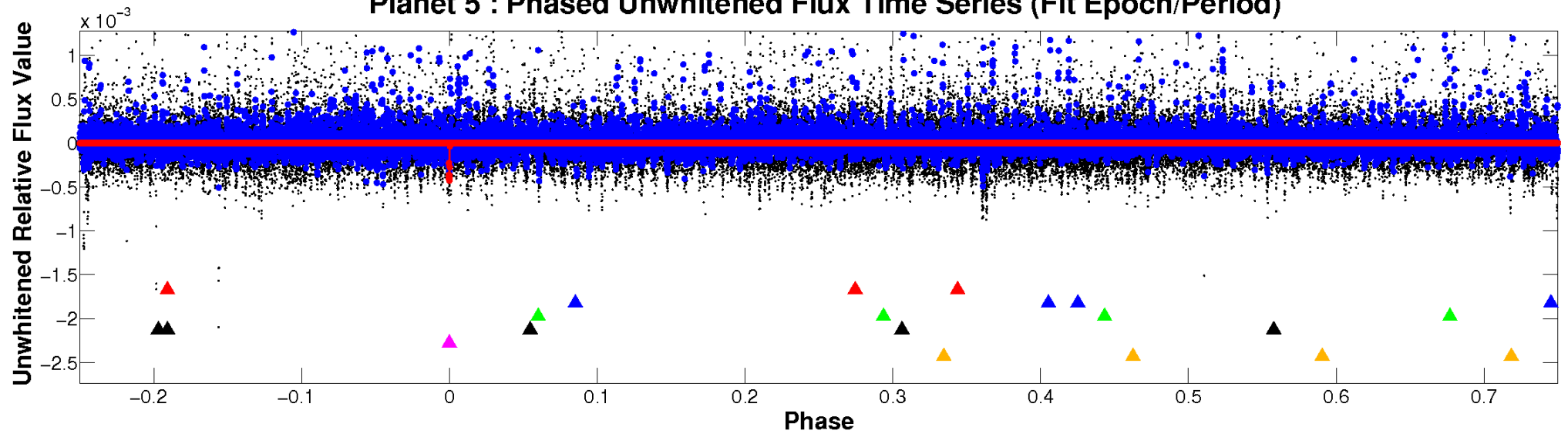
ALT Odd/Even

TCE 009487994-05

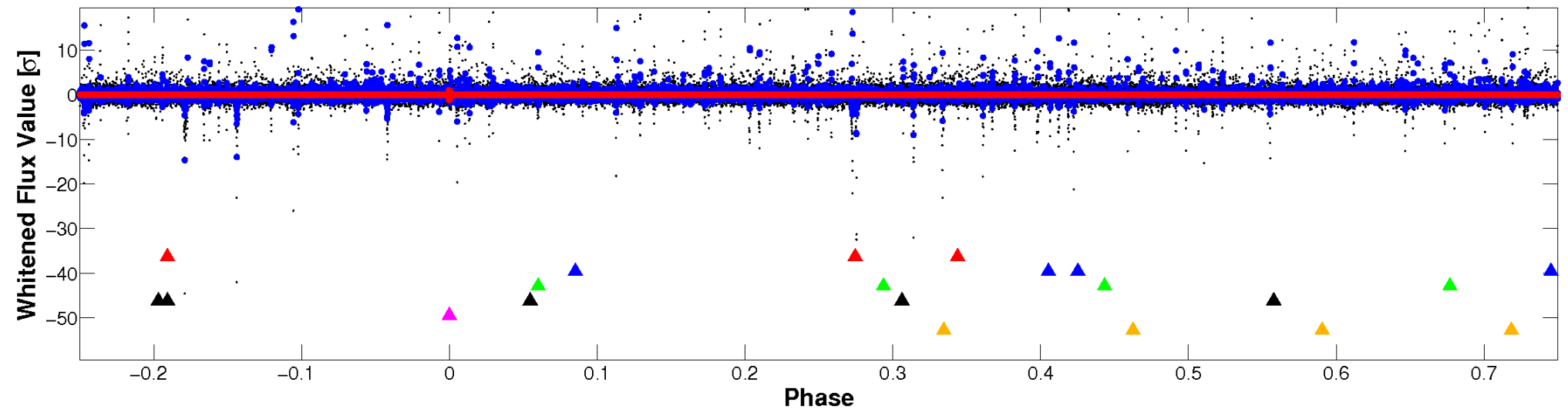


Non-Whitened Vs. Whitened Light Curve

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

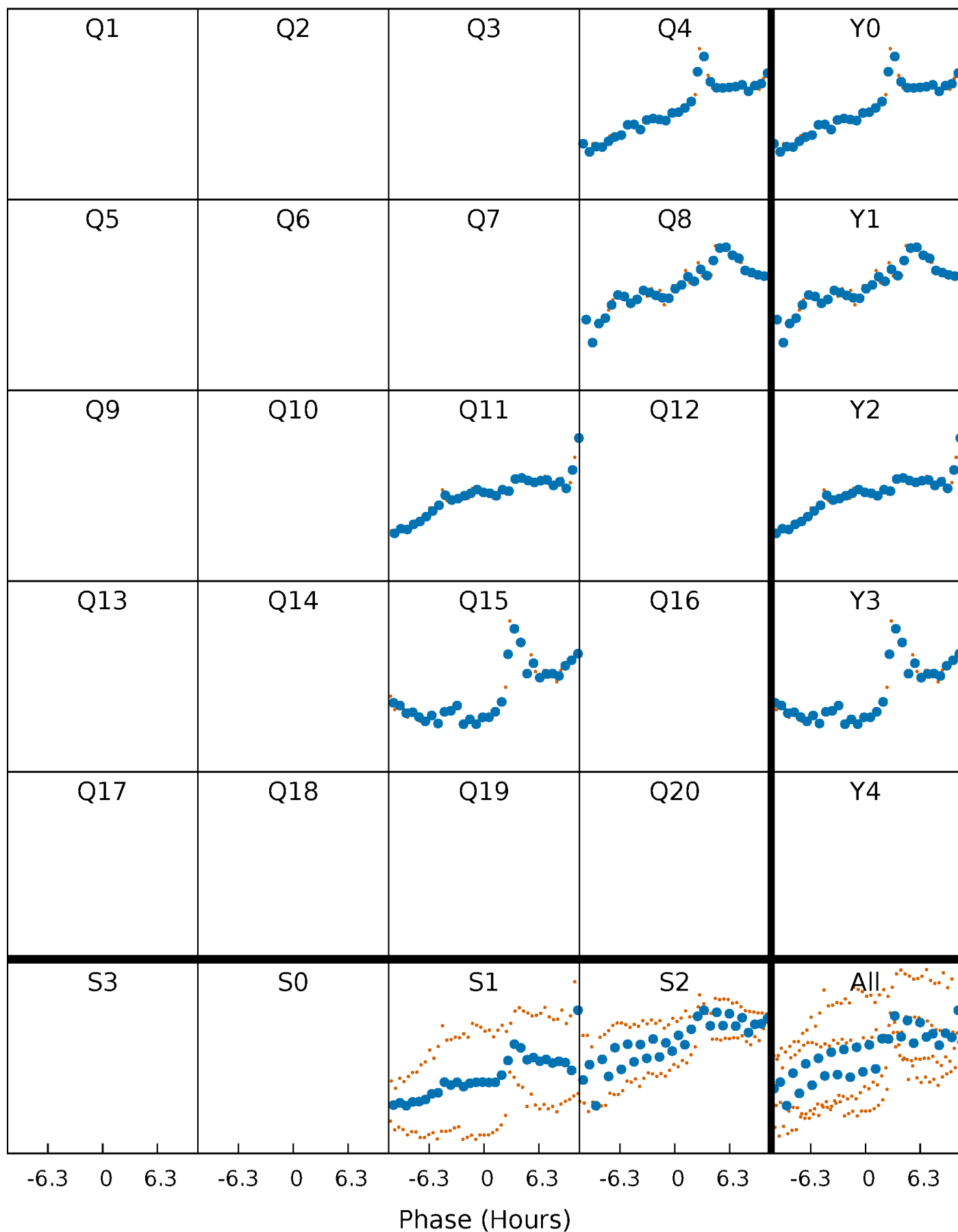


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



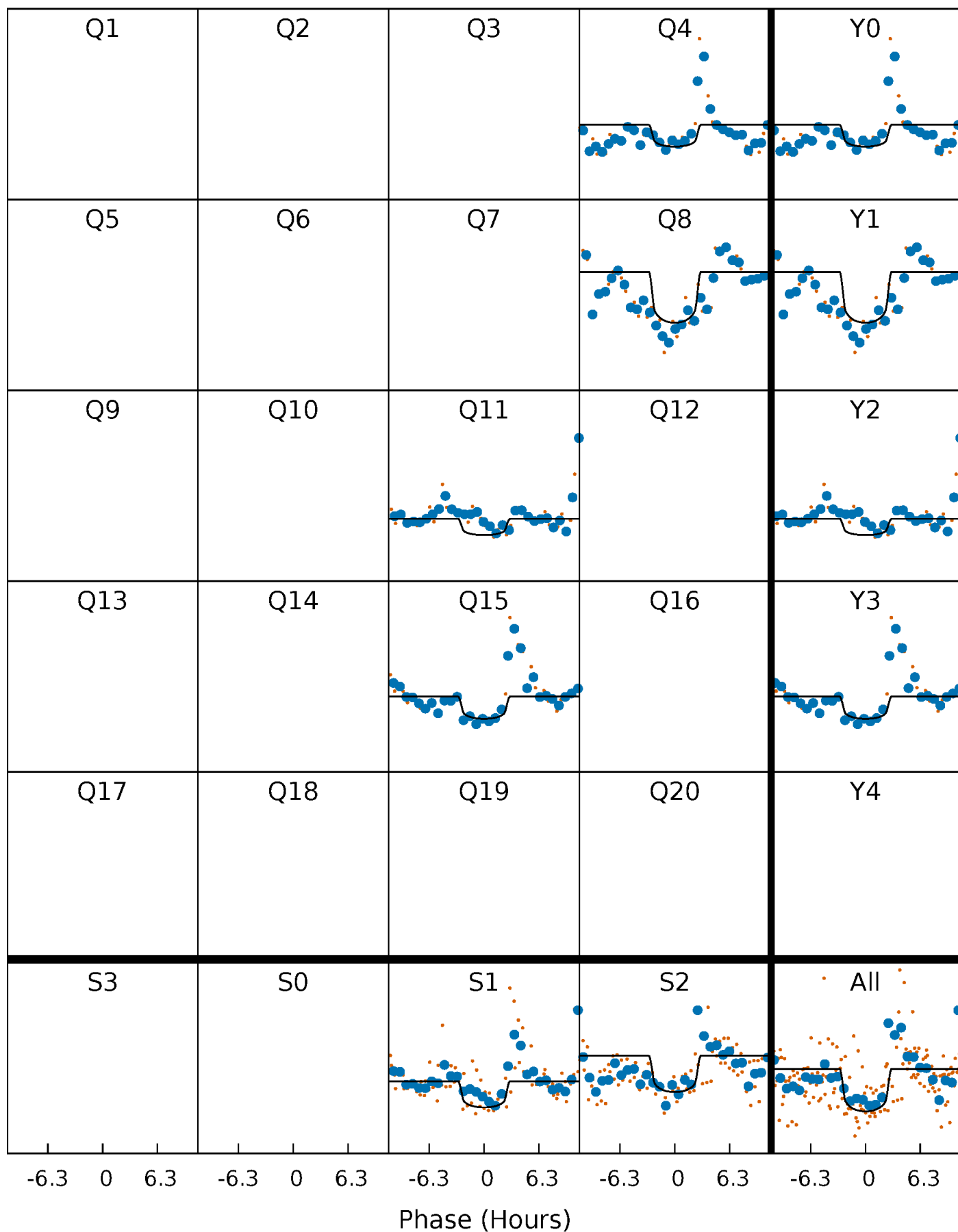
PDC Quarter-Phased Transit Curves

TCE 009487994-05 $P=334.728886$ Days $T_0=415.847217$ (BKJD)



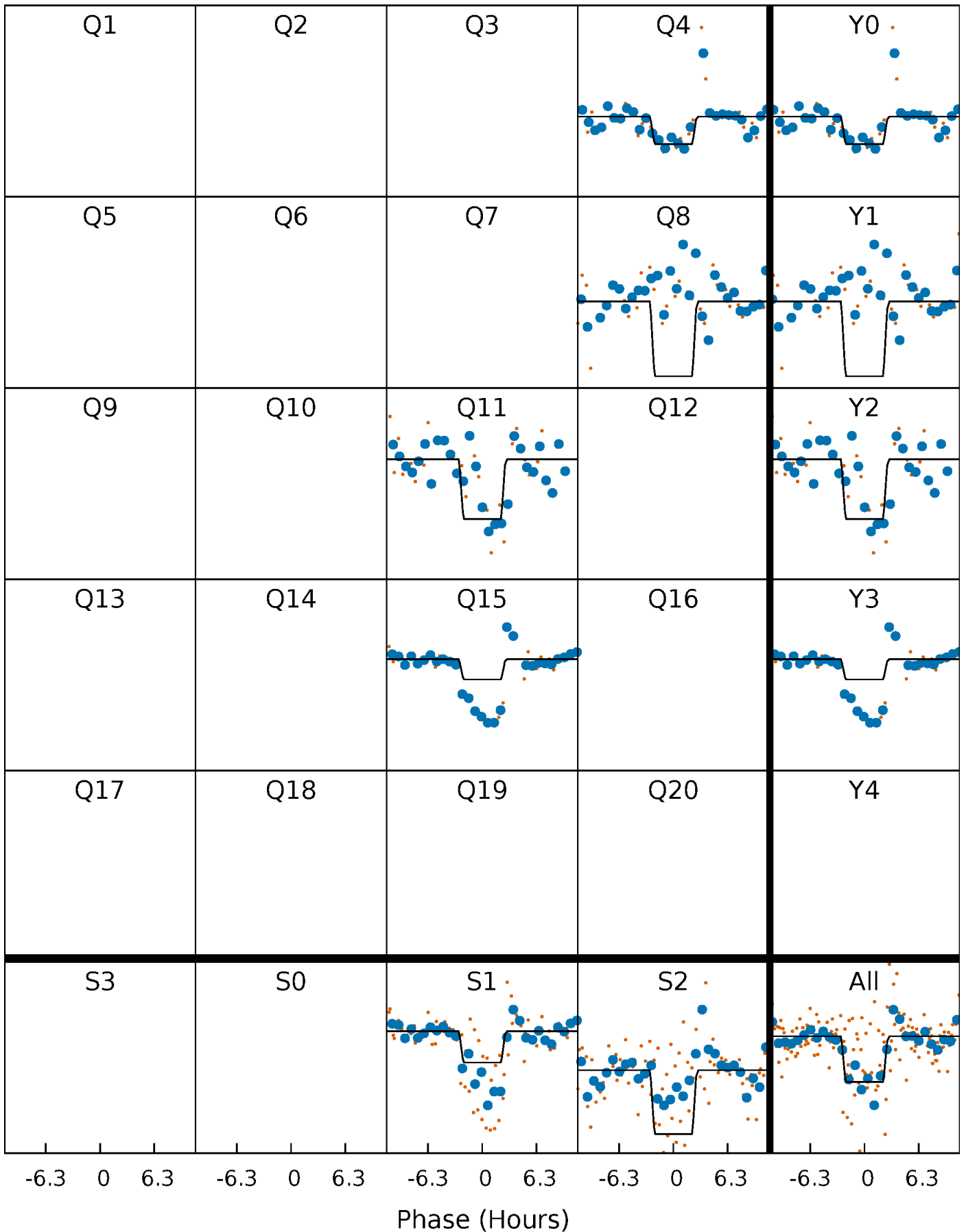
DV Quarter-Phased Transit Curves

TCE 009487994-05 $P=334.728886$ Days $T_0=415.847217$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

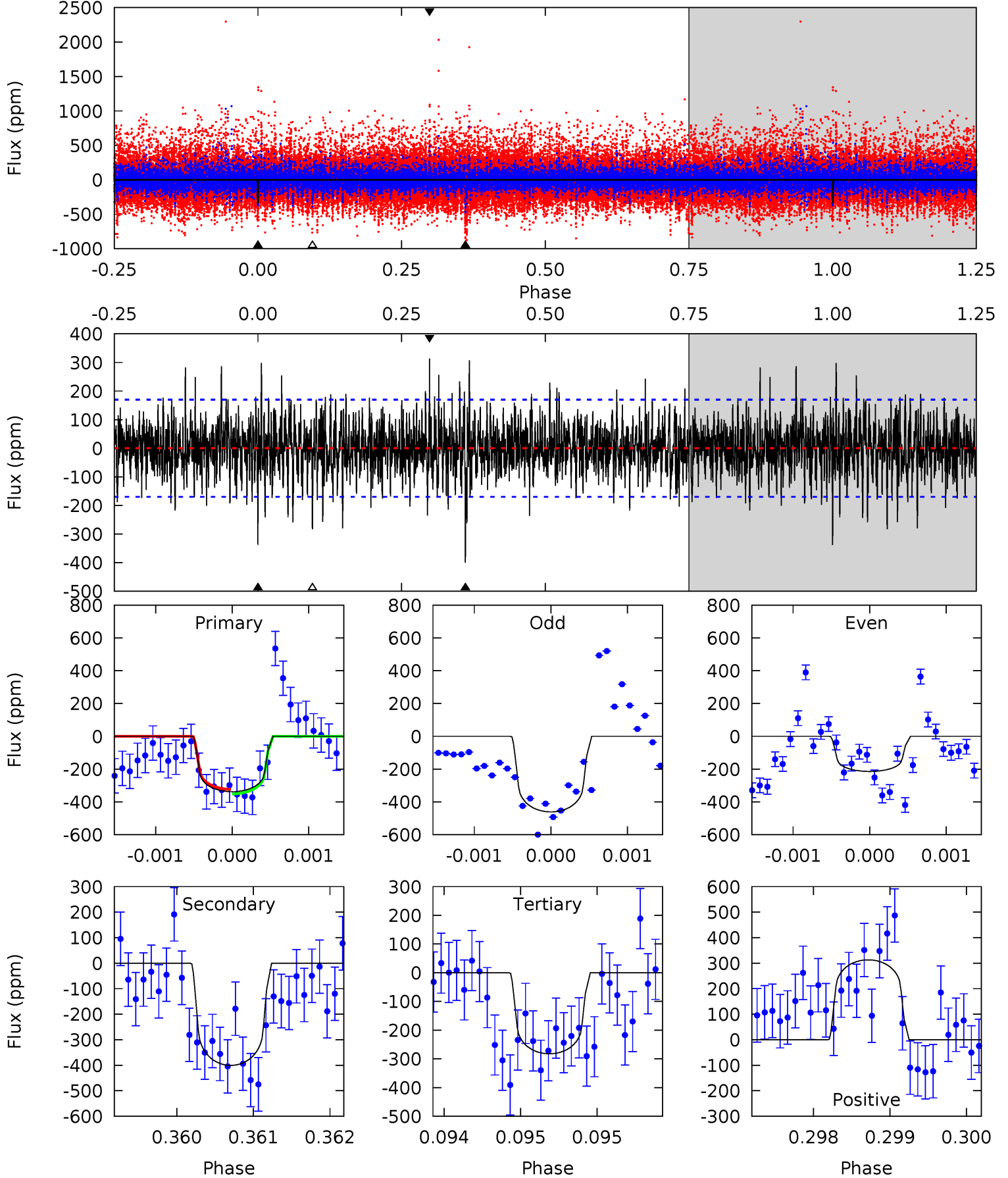
TCE 009487994-05 $P=334.728957$ Days $T_0=415.849360$ (BKJD)



DV Model-Shift Uniqueness Test

009487994-05, $P = 334.728886$ Days, $E = 81.118331$ Days

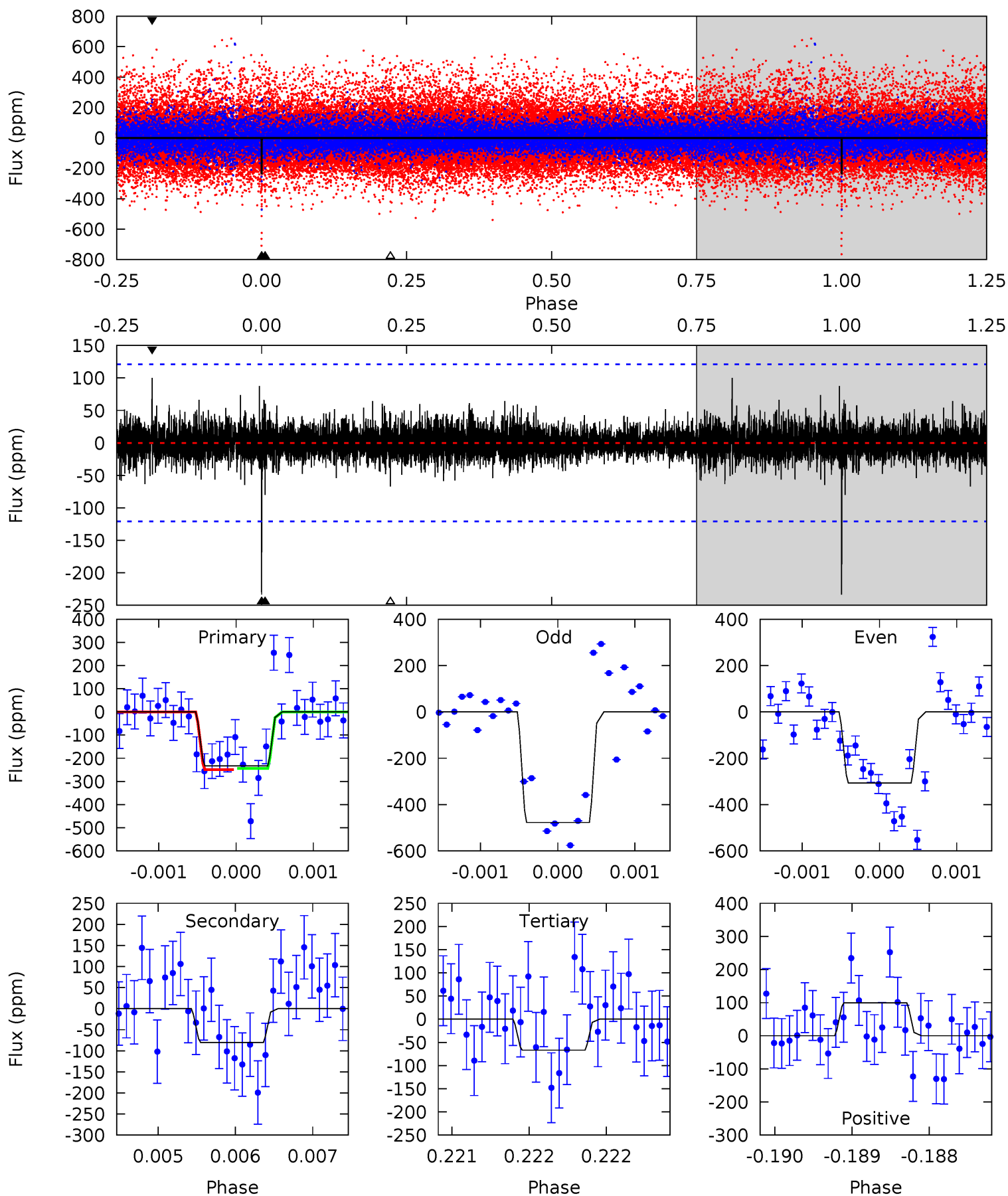
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	13.0	9.16	10.2	5.51	3.38	2.36	1.80	0.80	3.84	2.84	3.38	0.90	0.44	0.45



Alt Model-Shift Uniqueness Test

009487994-05, P = 334.728957 Days, E = 81.120403 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	3.66	3.05	4.56	5.53	3.41	0.72	7.62	6.11	0.60	-0.90	4.38	1.32	0.30	0



Stellar Parameters For KIC 009487994

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6147^{+184}_{-184}	$3.667^{+0.322}_{-0.115}$	$-0.500^{+0.400}_{-0.250}$	$2.765^{+0.477}_{-1.114}$	$1.294^{+0.201}_{-0.302}$	$0.086^{+0.218}_{-0.029}$
	+3%/-3%	+9%/-3%	+80%/-50%	+17%/-40%	+16%/-23%	+253%/-34%
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 009487994-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-400 ± 31	$6.67^{+5.35}_{-4.20}$	612^{+41}_{-60}	5696^{+4338}_{-1235}	5232^{+30605}_{-3658}
Alt.	-80 ± 22	$7.37^{+5.27}_{-4.57}$	614^{+41}_{-55}	3957^{+1755}_{-665}	833^{+4749}_{-564}

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

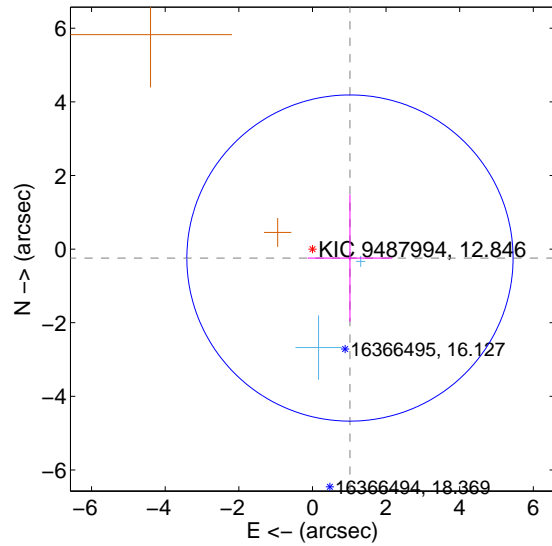
Supplemental centroid analysis for 009487994-05. Kepler magnitude: 12.85. Transit SNR 6.96

There are 2 quarters with good PRF difference image offsets

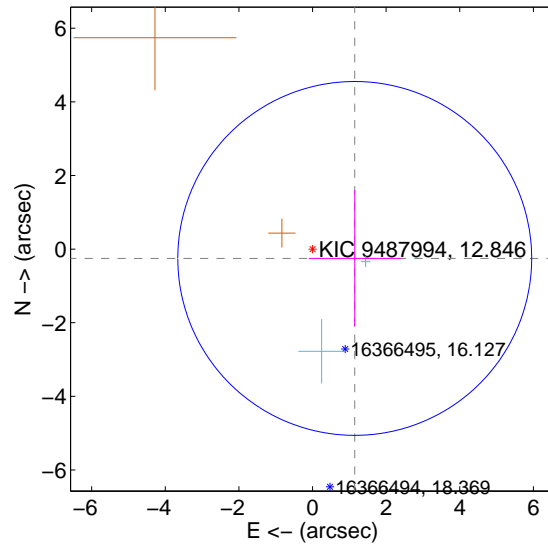
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.048 ± 1.477	0.71	-1.020 ± 1.149	-0.243 ± 1.727
PRF-fit source offset from KIC position	1.175 ± 1.602	0.73	-1.147 ± 1.252	-0.253 ± 1.856
photometric centroid source offset	0.95 ± 0.83	1.15	-0.29 ± 1.04	-0.91 ± 0.80

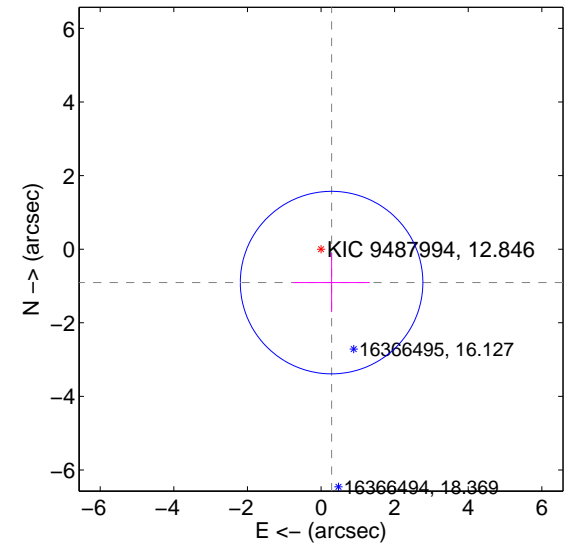
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

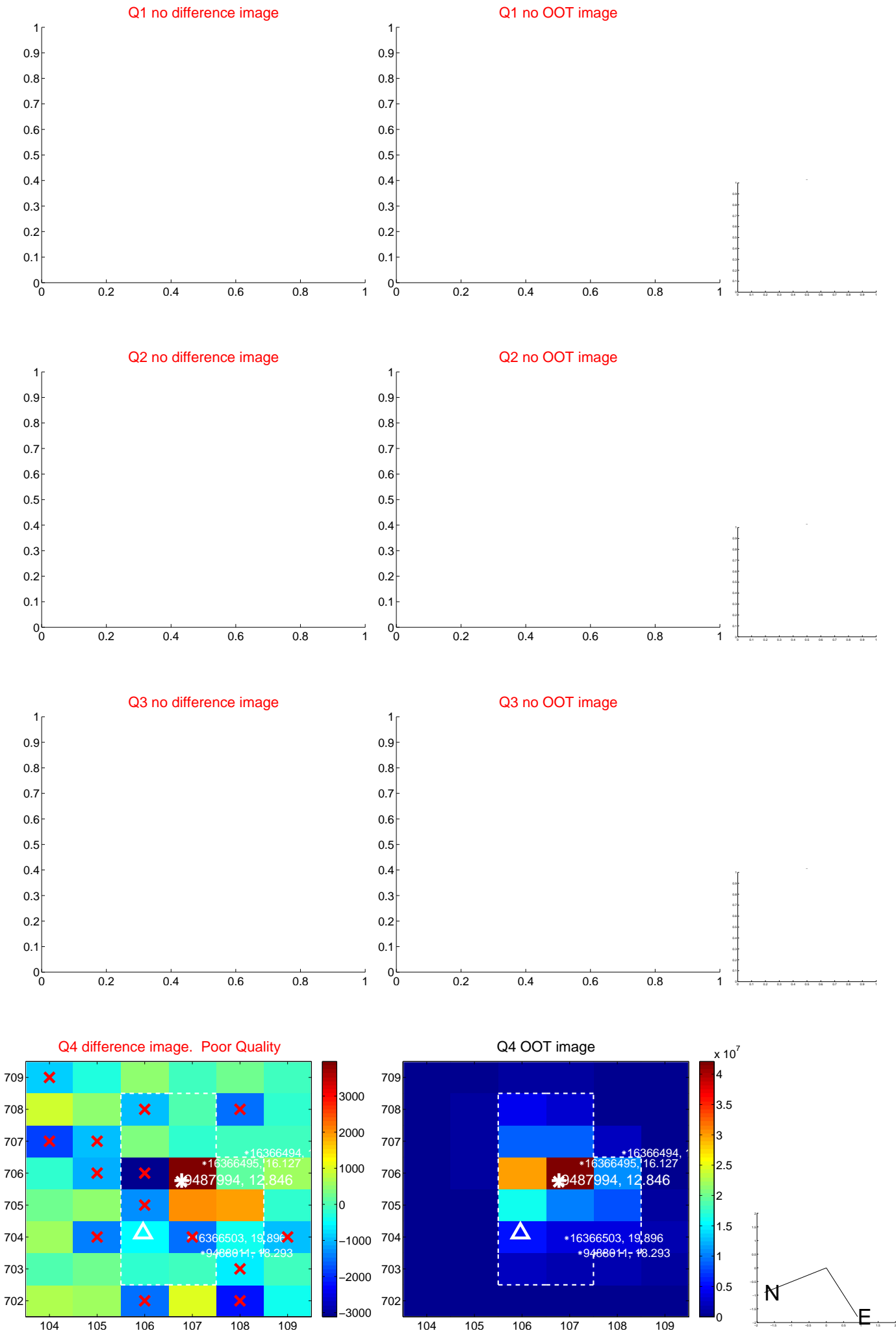


offset from photometric centroids

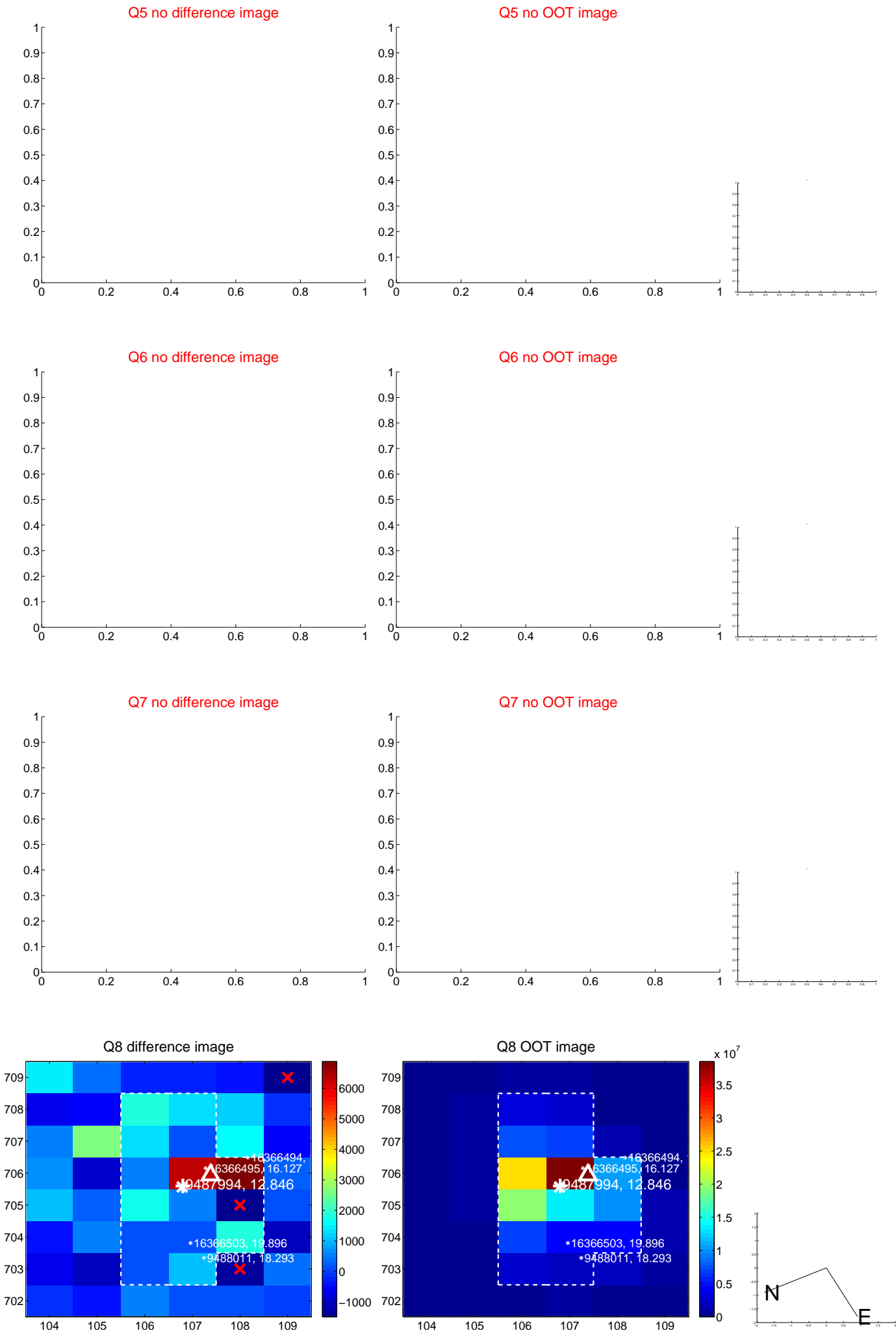


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

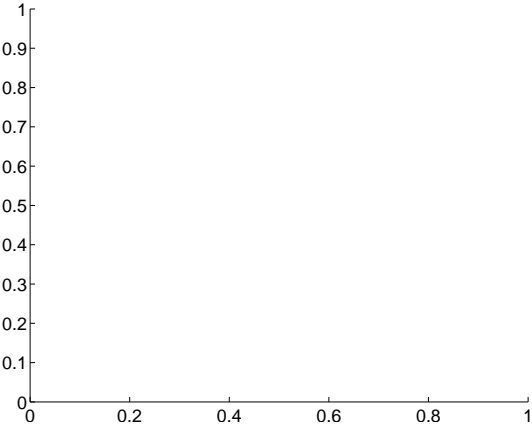


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

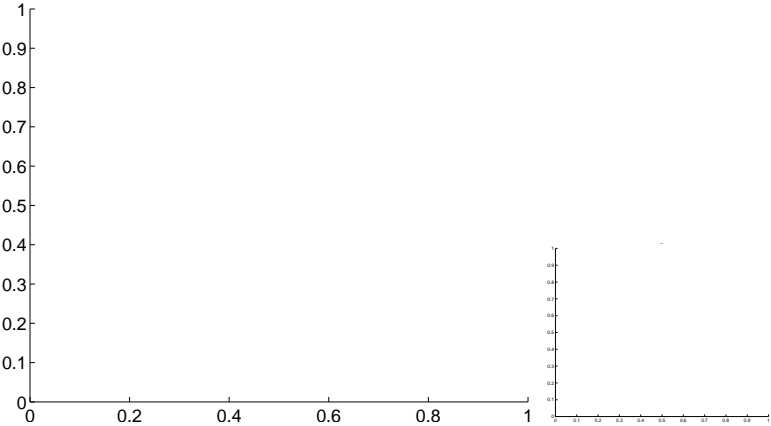


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

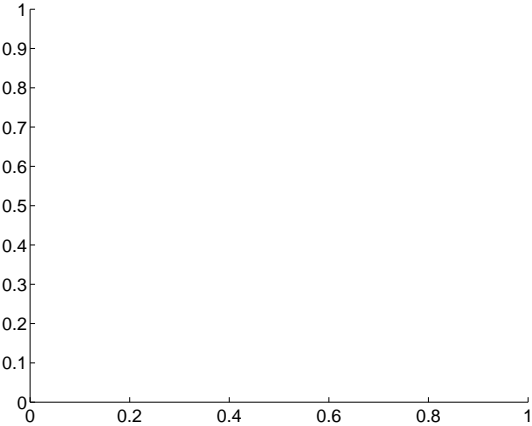
Q9 no difference image



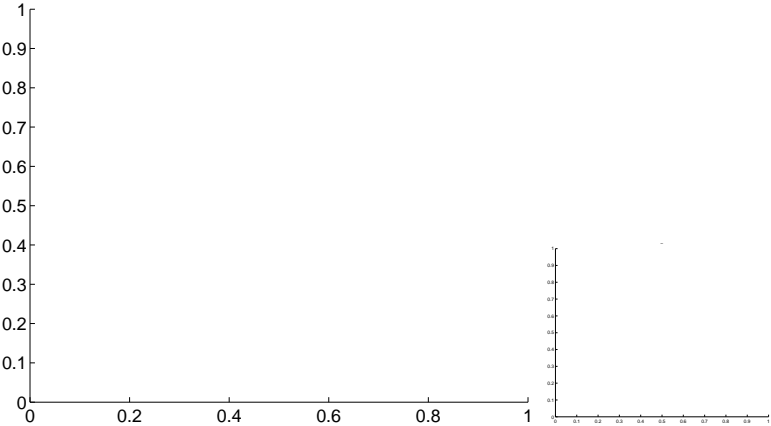
Q9 no OOT image



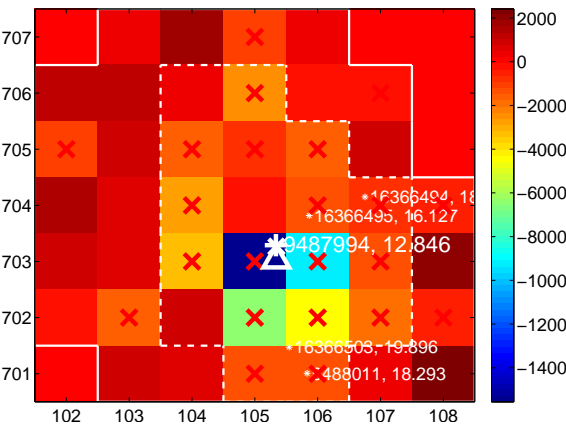
Q10 no difference image



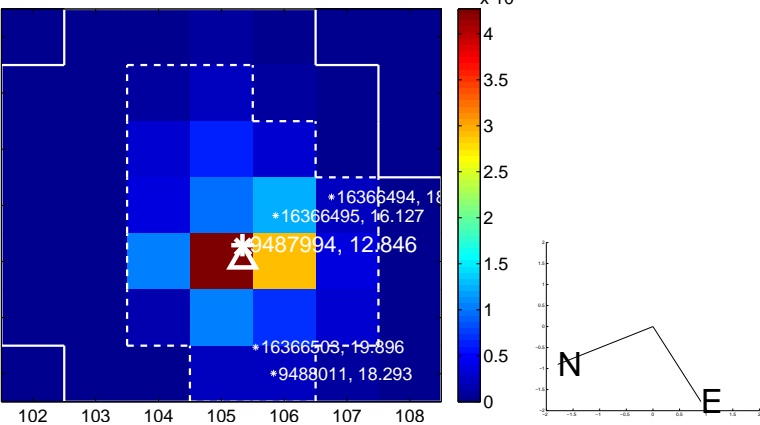
Q10 no OOT image



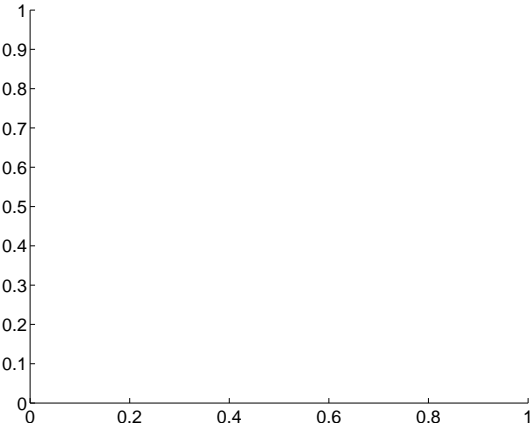
Q11 difference image. Poor Quality



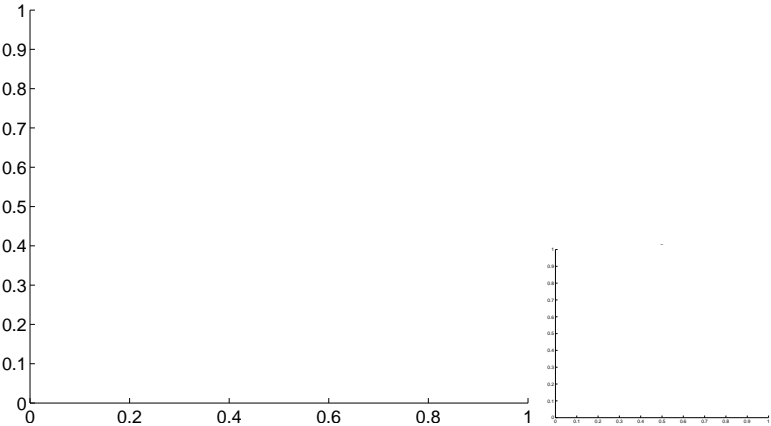
Q11 OOT image



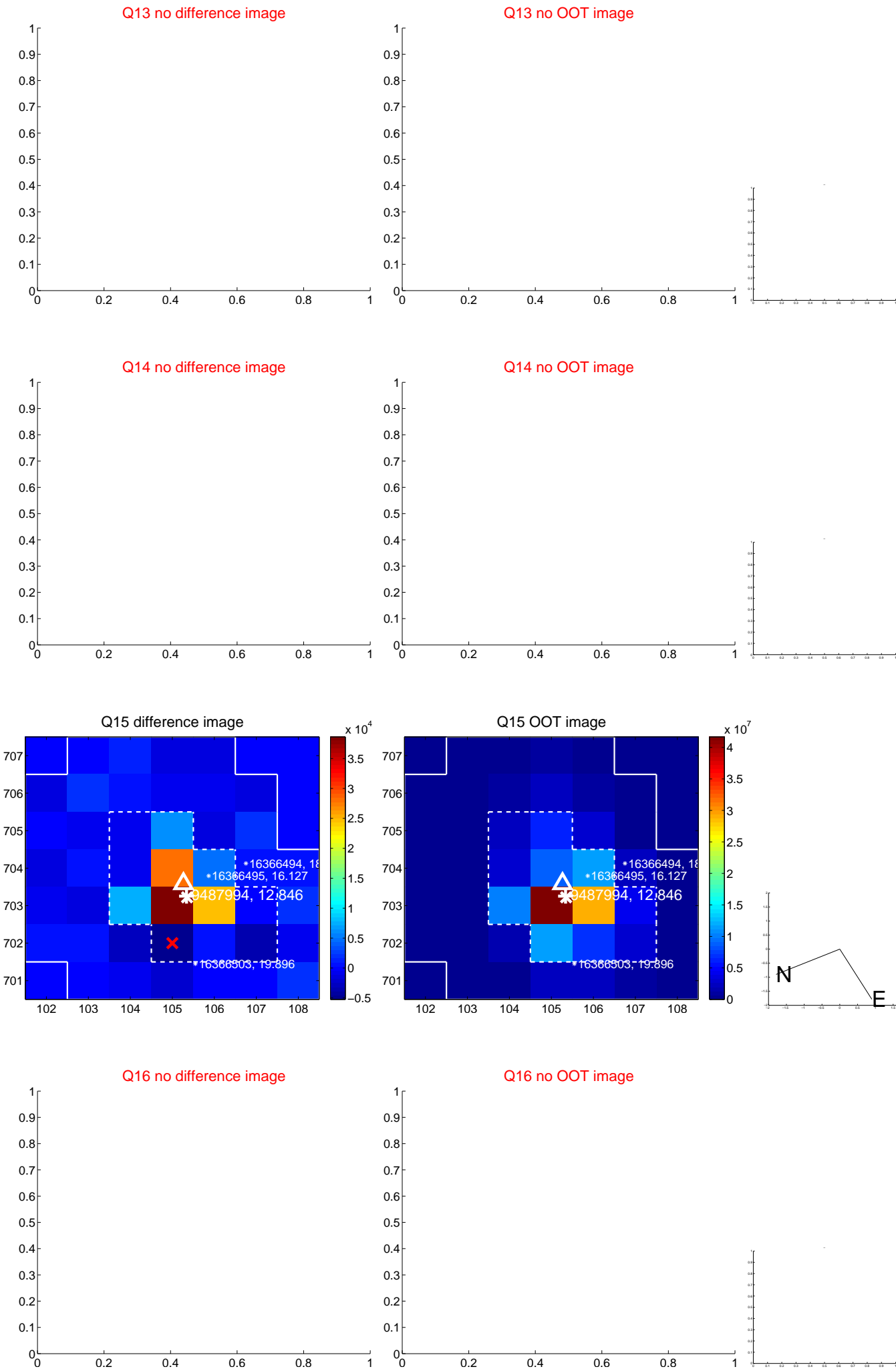
Q12 no difference image



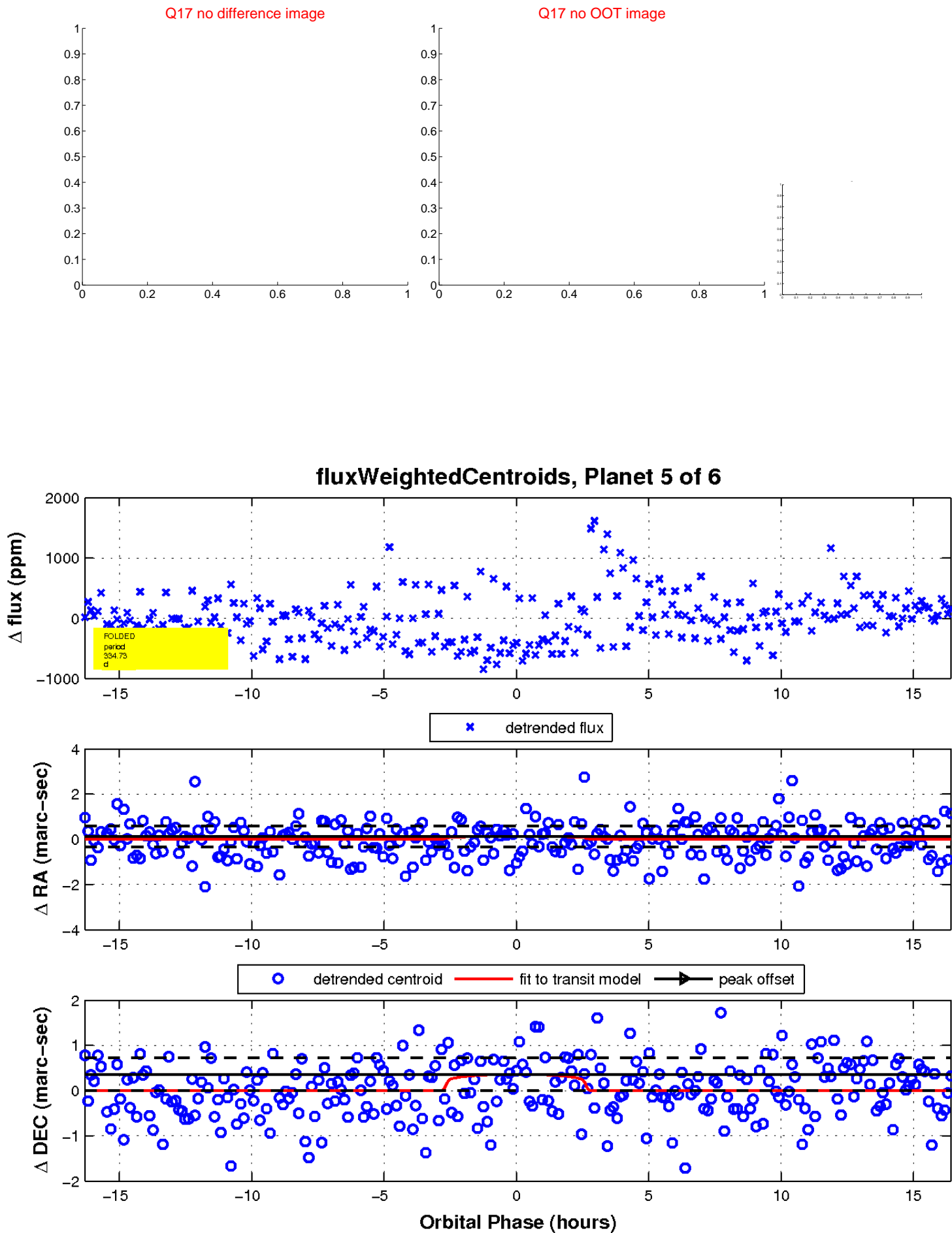
Q12 no OOT image



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

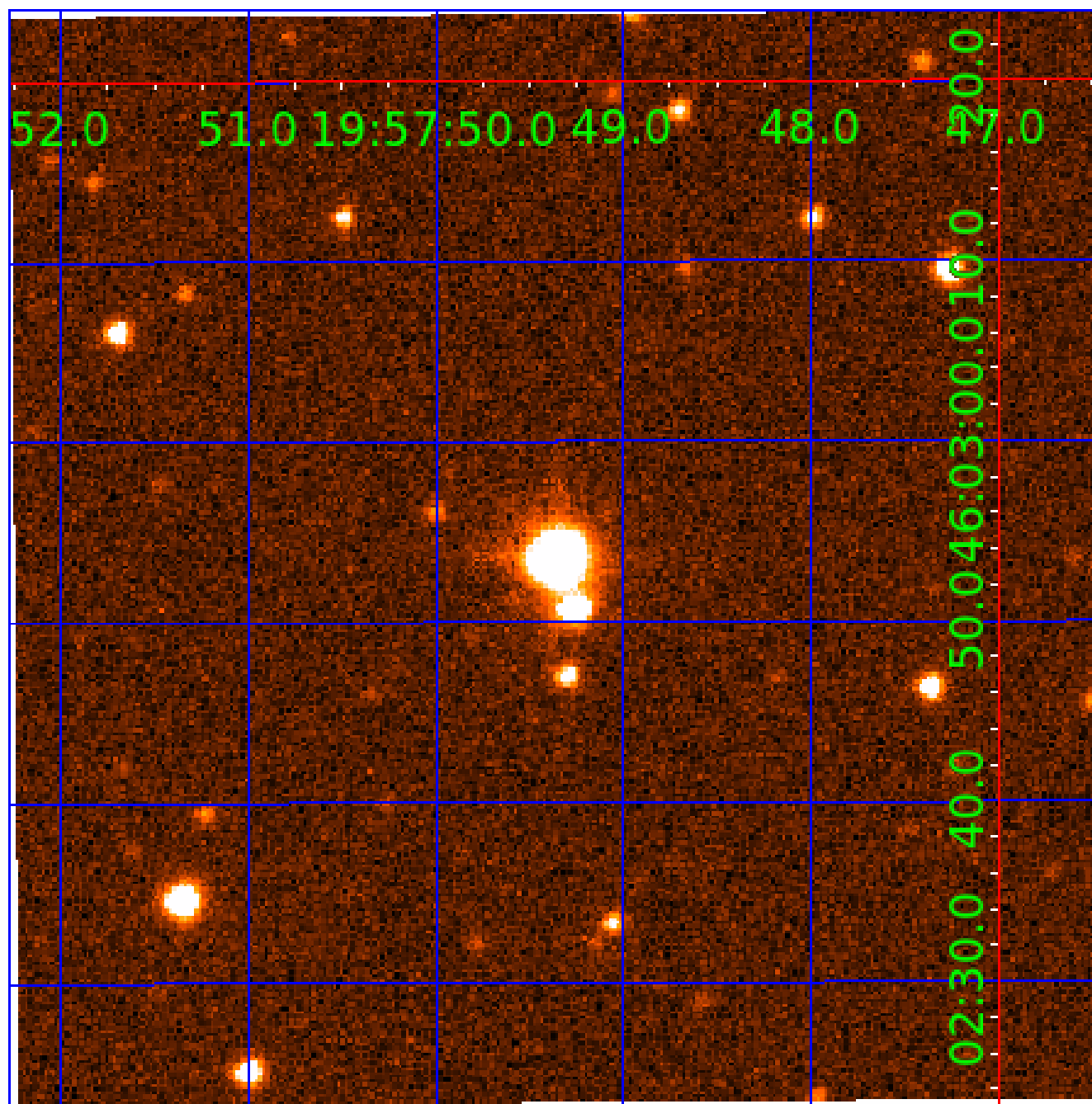


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009487994

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})
009487994-01	OBS	No	513.685808	507.766633	521.6	7.098	14.2	6.5	2.77	6147	6.72	5.22
009487994-02	OBS	No	448.527483	216.790812	329.5	8.703	10.2	5.1	2.77	6147	5.25	6.26
009487994-03	OBS	No	462.996461	179.438276	247.5	4.176	11.4	4.2	2.77	6147	4.62	6.00
009487994-04	OBS	No	250.533695	352.012748	384.0	3.935	10.5	6.9	2.77	6147	5.85	13.60
009487994-05	OBS	No	334.728886	415.847217	427.0	5.480	10.4	7.0	2.77	6147	6.01	9.24
009487994-06	OBS	No	377.571322	193.101149	383.5	5.000	11.1	-1.0	2.77	6147	5.43	7.87

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487994-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009487994-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009487994-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_ALT—MOD_POS_DV—INCONSISTENT_TRANS
009487994-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009487994-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

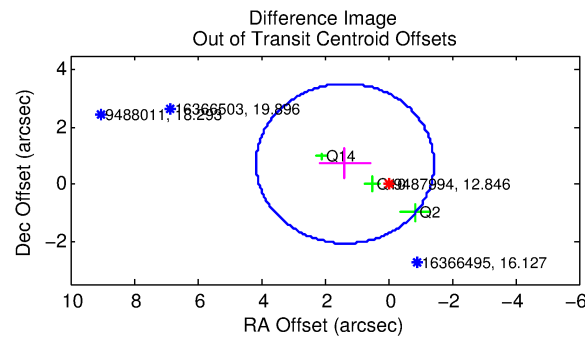
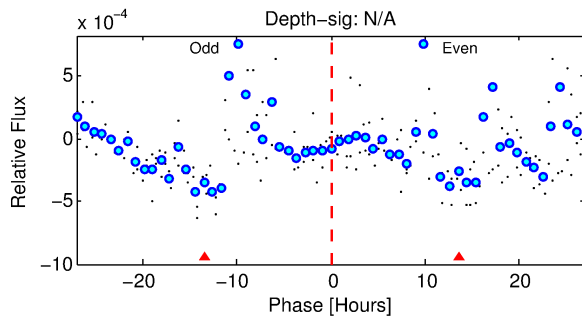
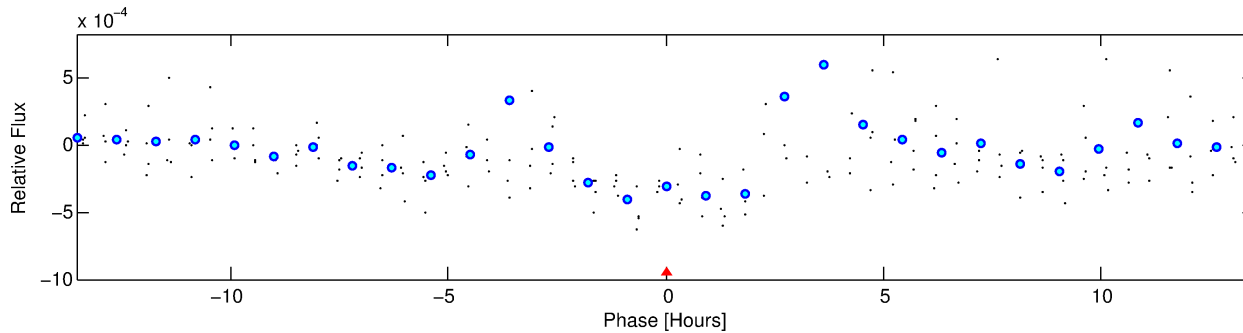
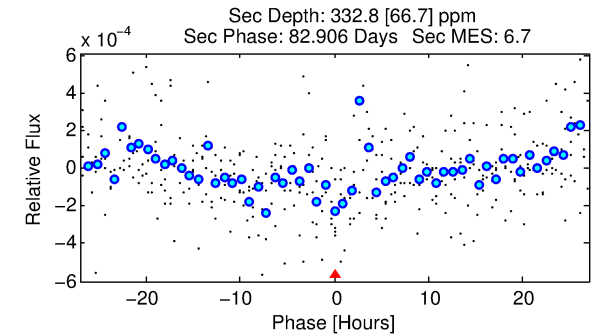
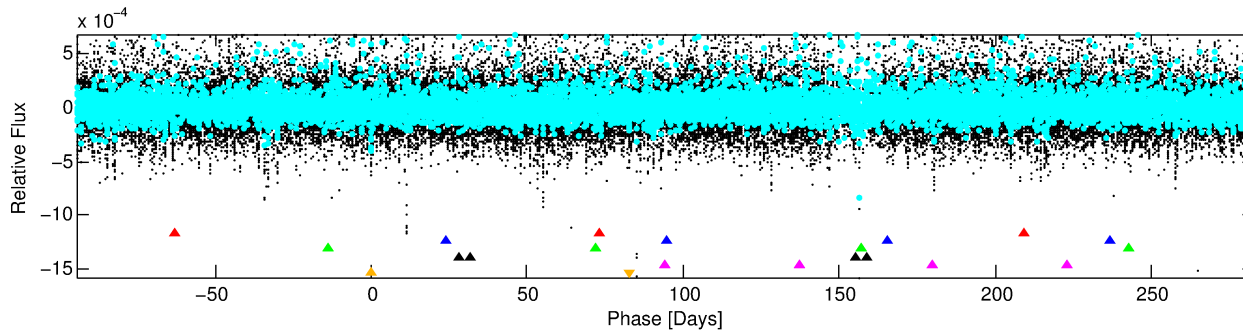
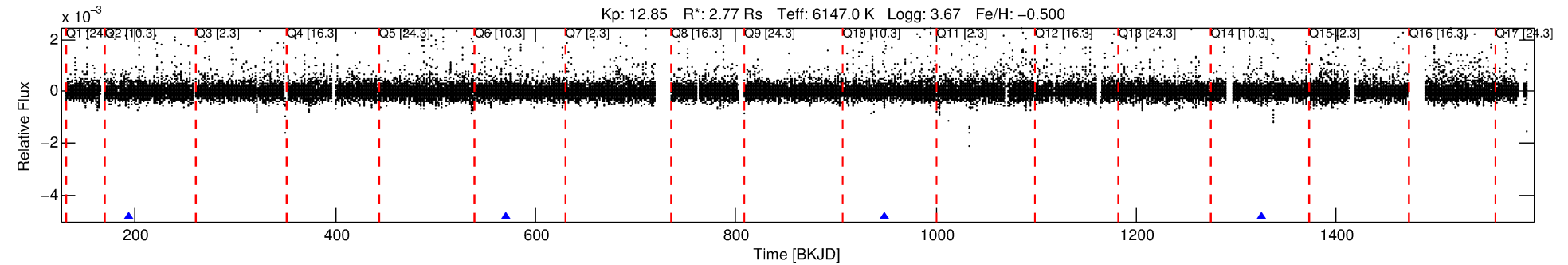
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487994-06

No Significant Match Found

DV One-Page Summary

KIC: 9487994 Candidate: 6 of 6 Period: 377.571 d



TPS TCE Results:

Period = 377.57132 d
Epoch = 193.1011 BKJD

DV fit results are unavailable

DV Diagnostic Results:

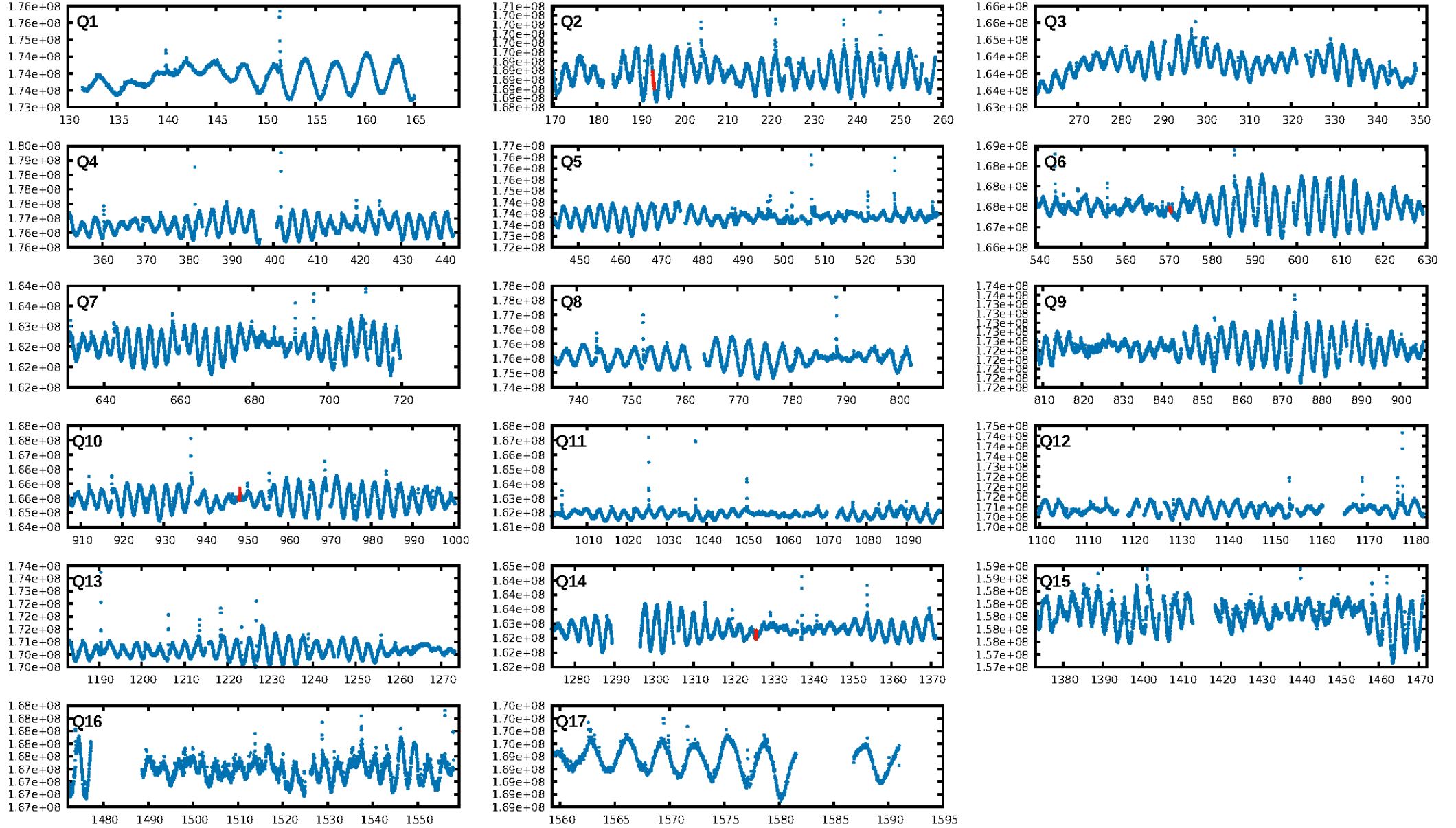
ShortPeriod-sig: 100.0% [138.60σ]
LongPeriod-sig: 100.0% [169.67σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 5.929

Centroid-sig: 5.2%
Centroid-so: 0.794 arcsec [1.29σ]
OotOffset-rm: 1.533 arcsec [1.65σ]
KicOffset-rm: 1.527 arcsec [1.84σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [4/4]

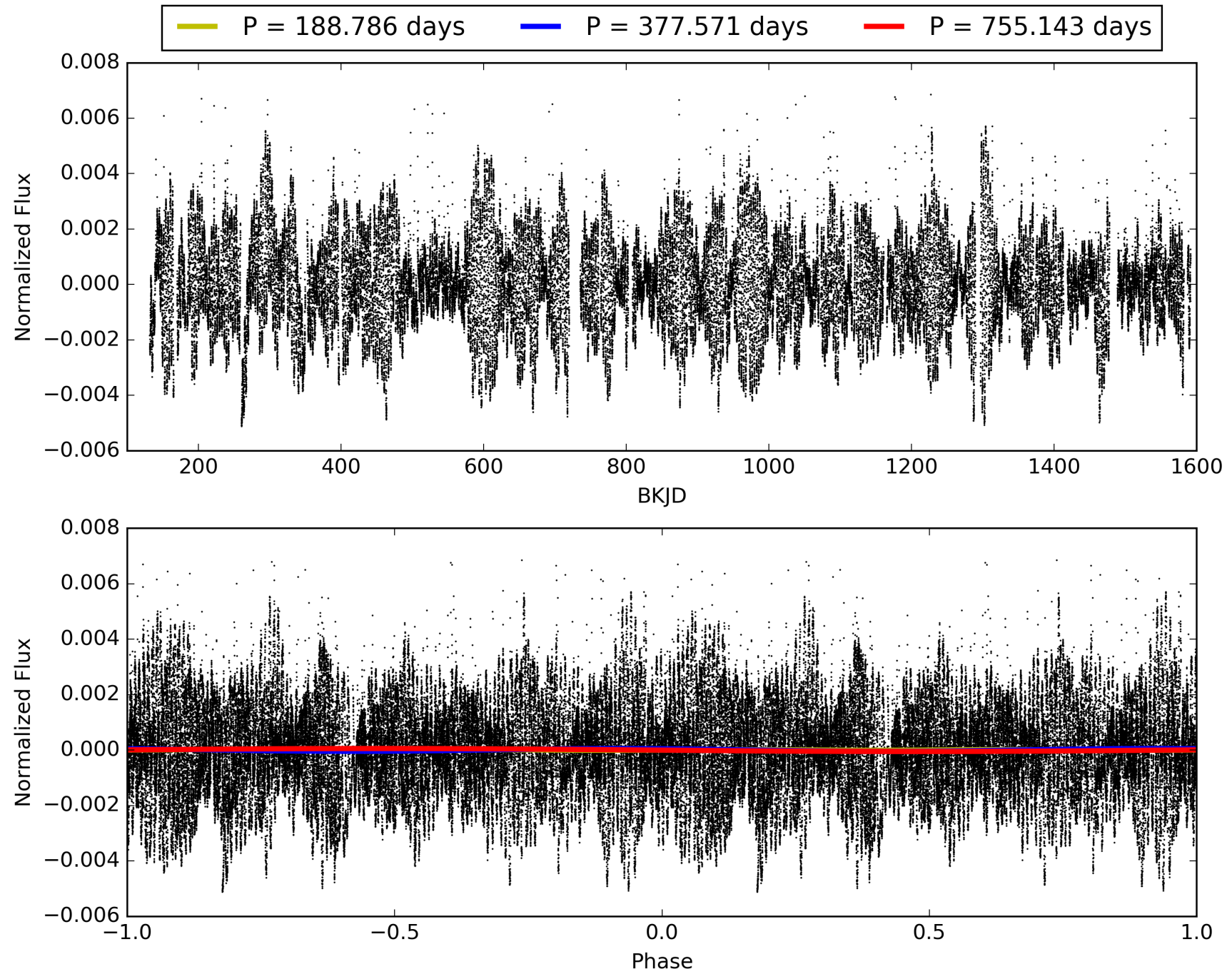
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:19:59 Z

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

TCE 009487994-06, PDC Light Curves

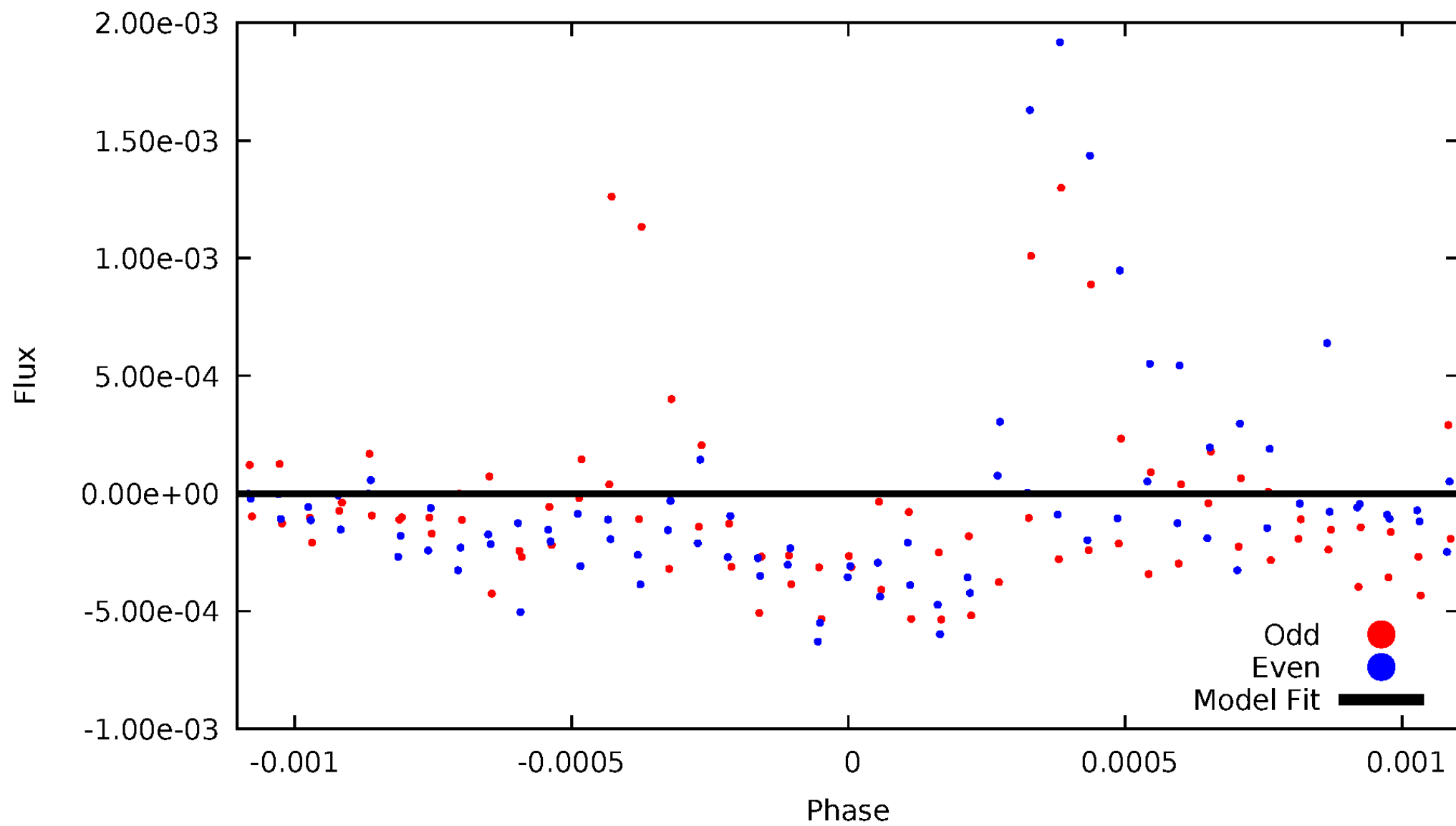


TCE 009487994-06



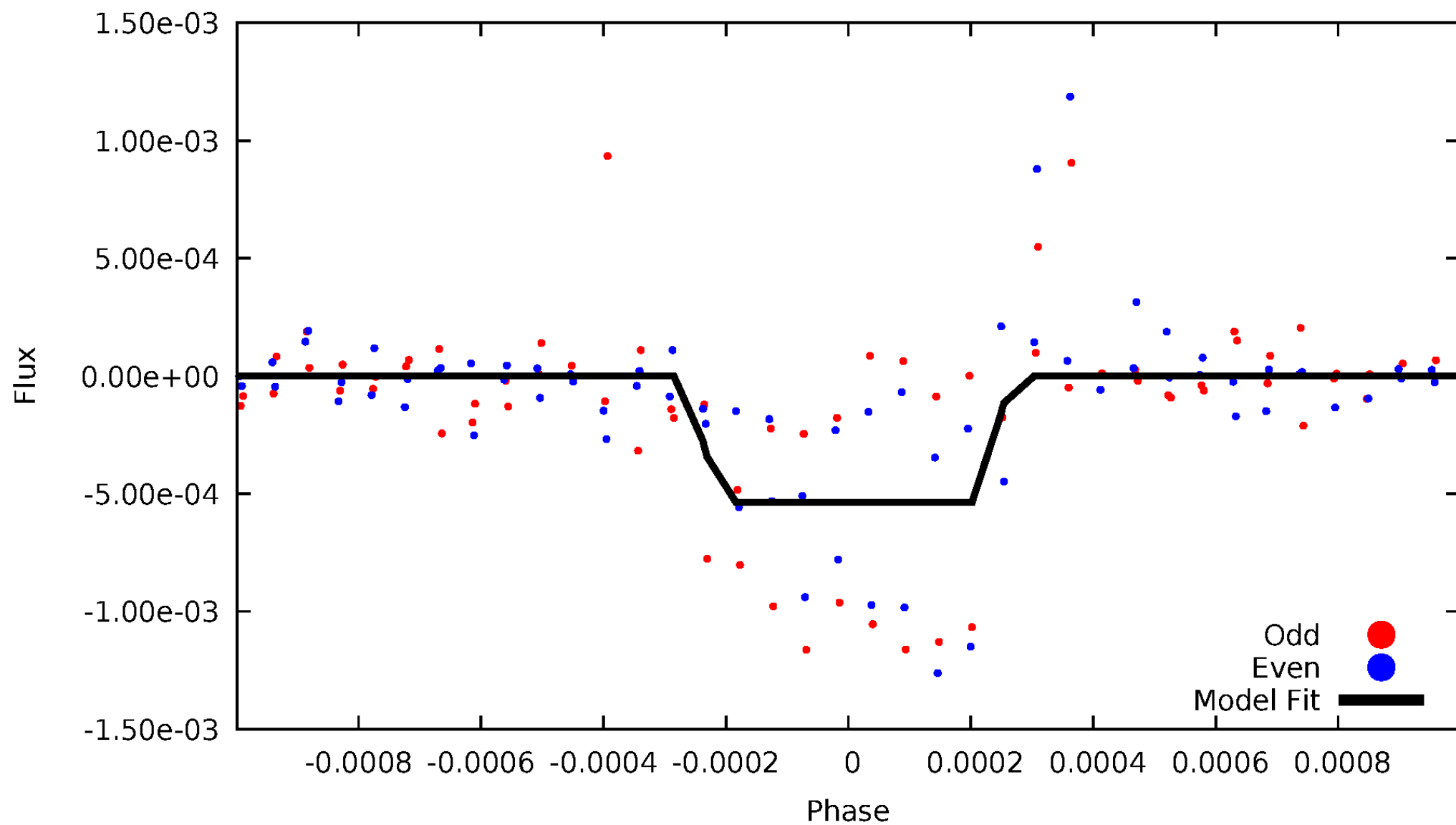
DV Odd/Even

TCE 009487994-06



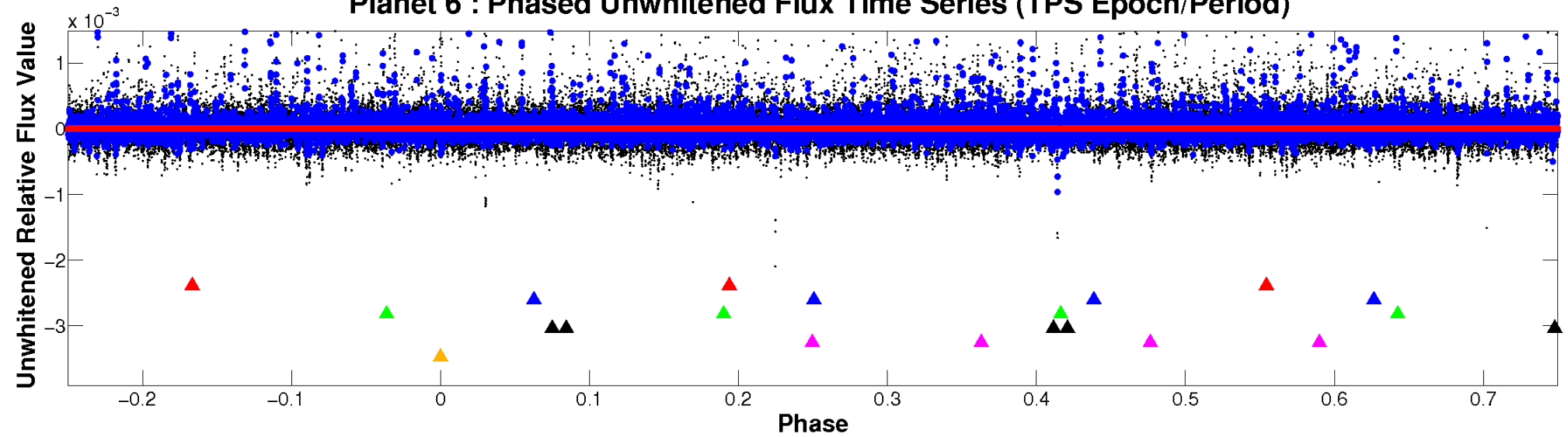
ALT Odd/Even

TCE 009487994-06

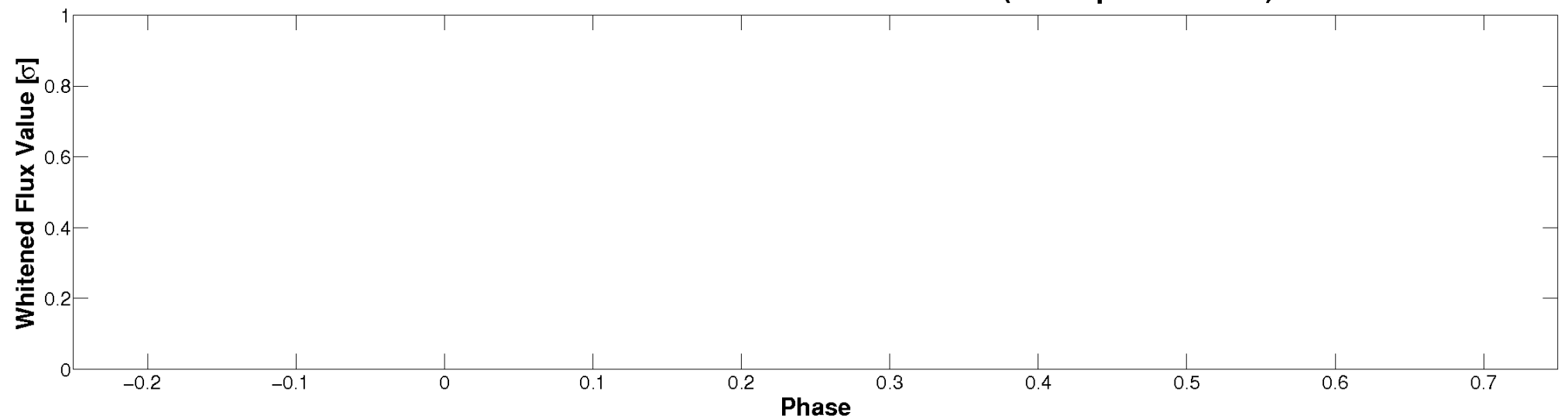


Non-Whitened Vs. Whitened Light Curve

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

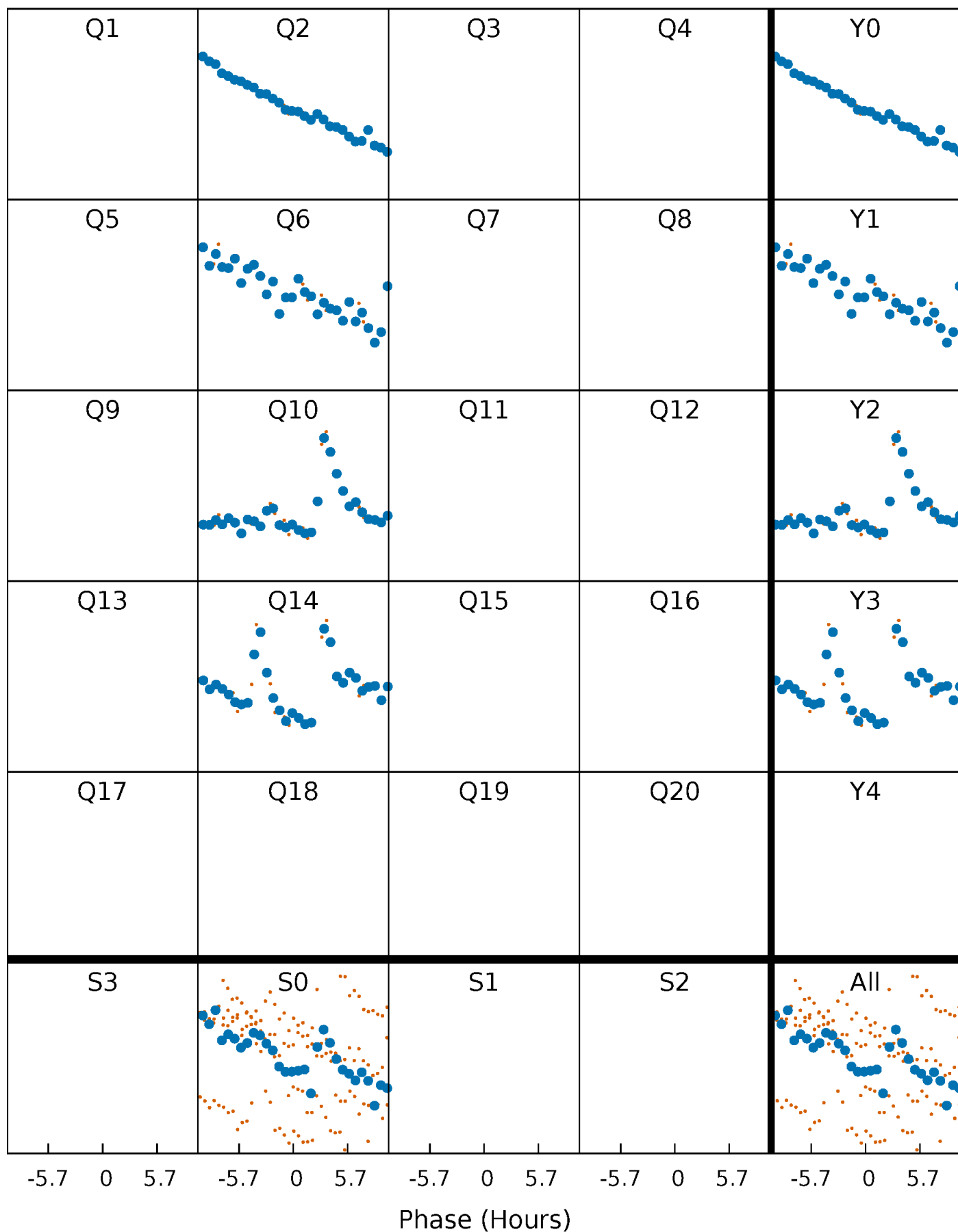


Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)



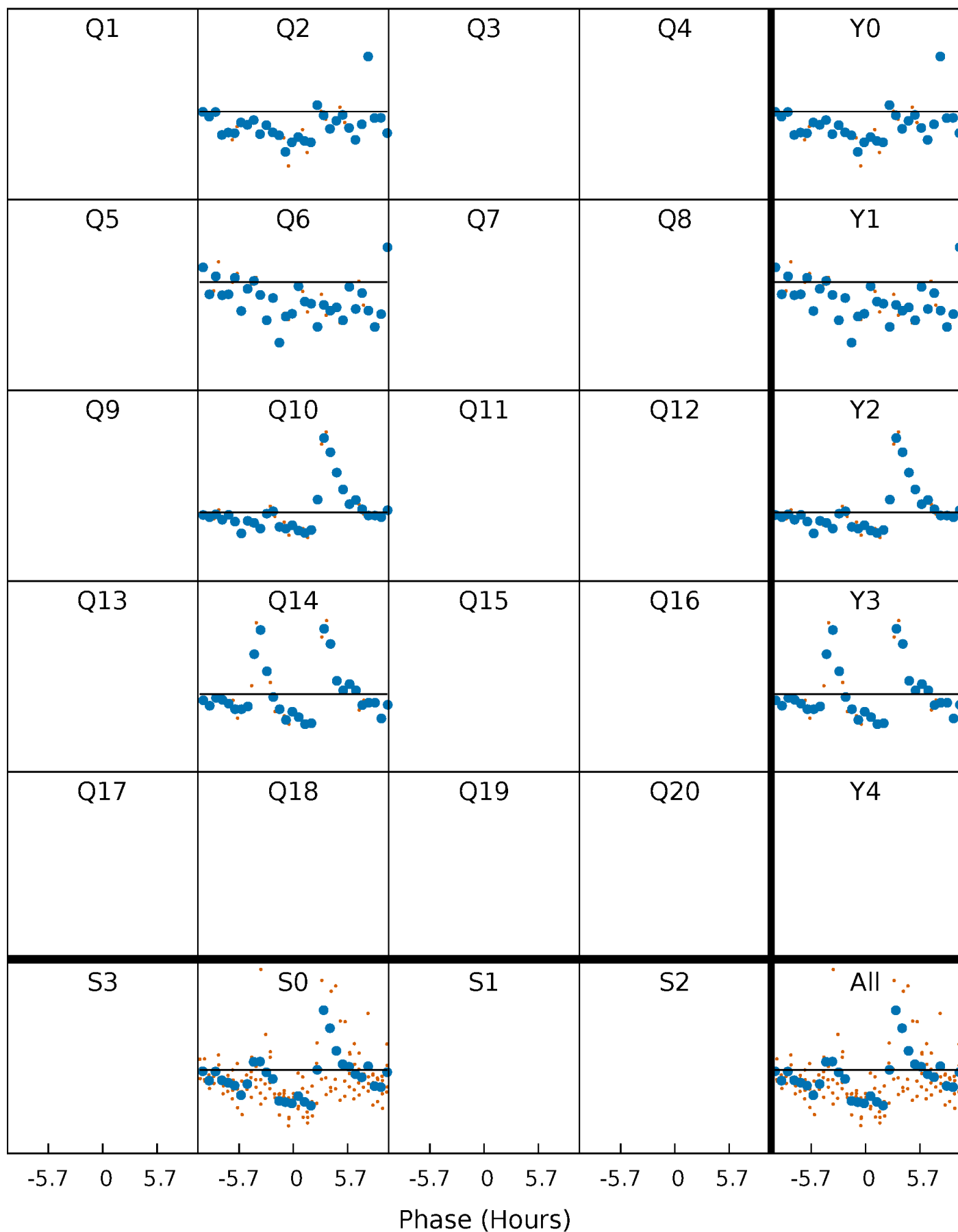
PDC Quarter-Phased Transit Curves

TCE 009487994-06 P=377.571322 Days $T_0=193.101149$ (BKJD)



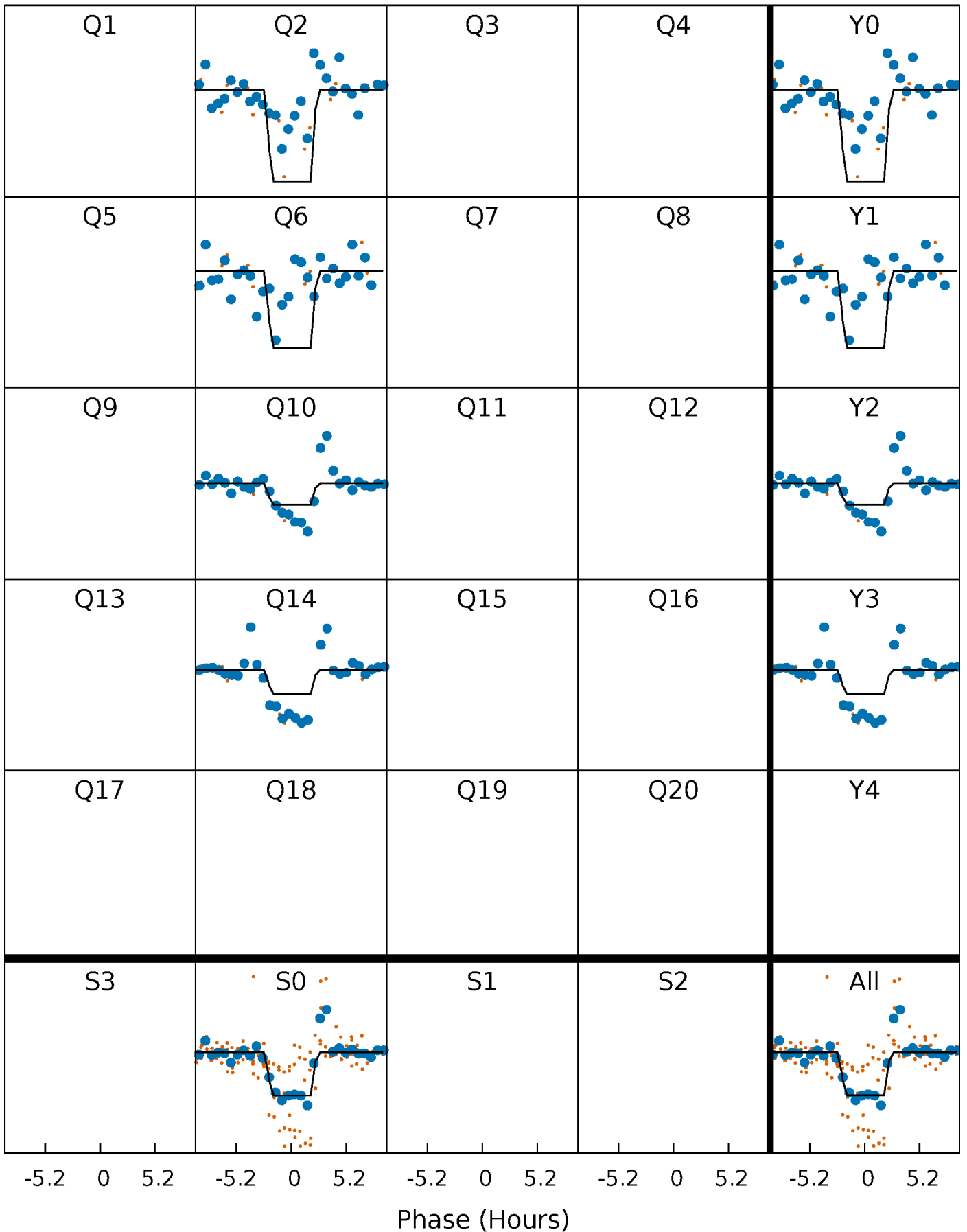
DV Quarter-Phased Transit Curves

TCE 009487994-06 P=377.571322 Days $T_0=193.101149$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

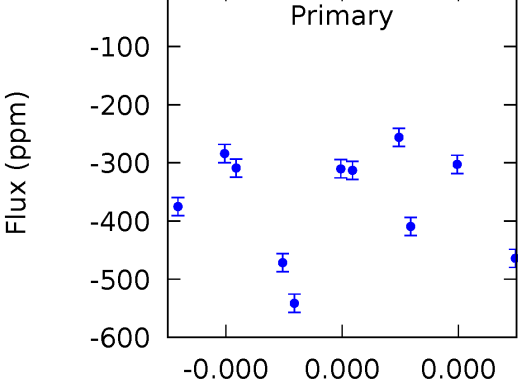
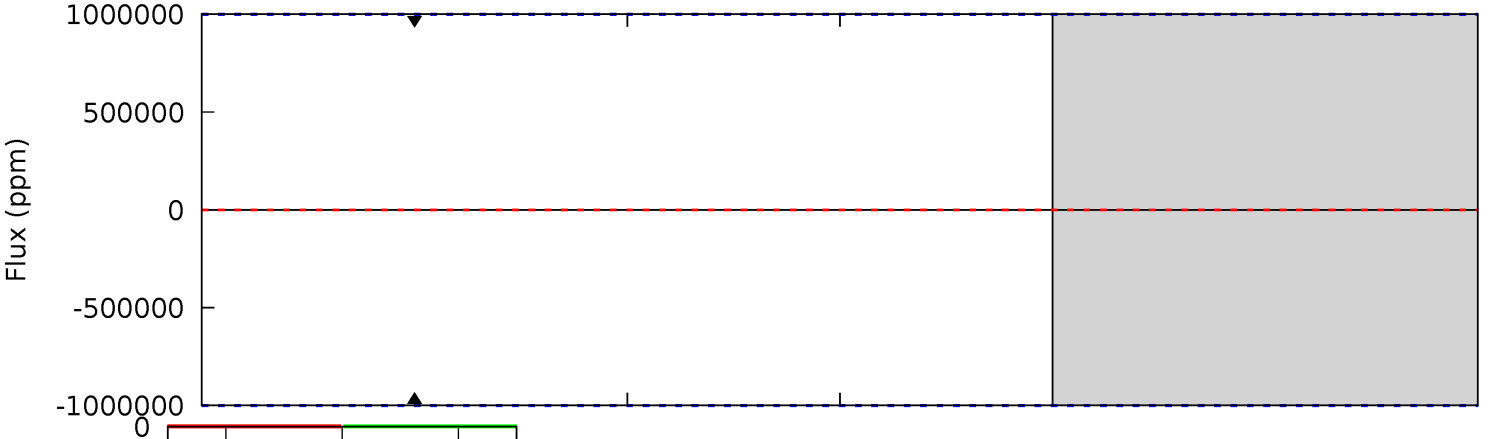
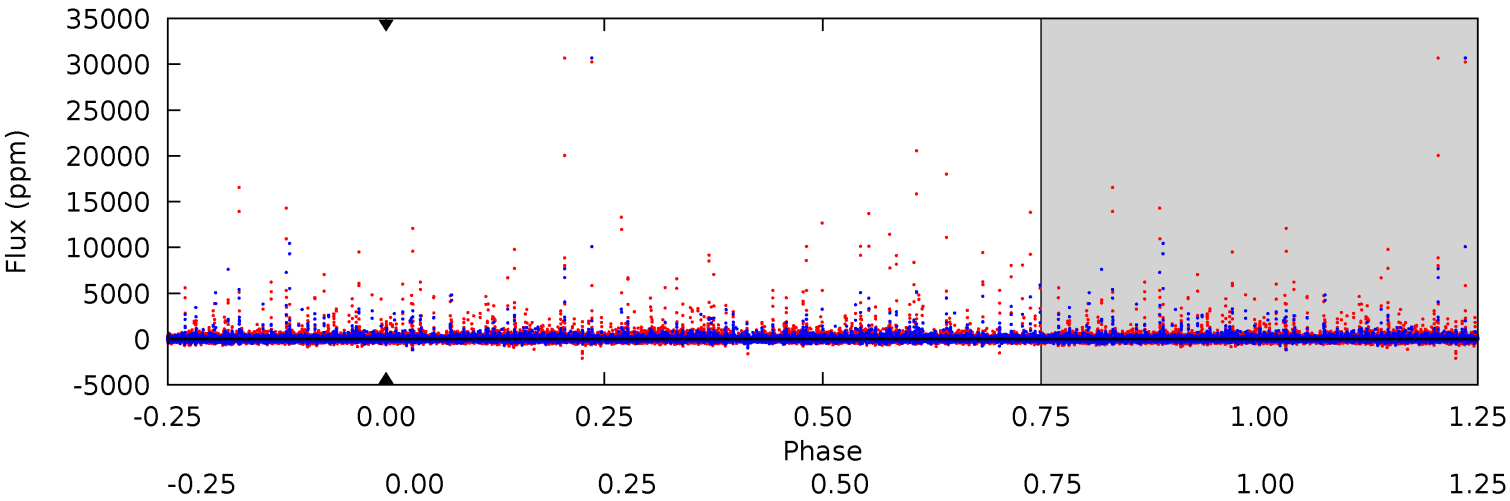
TCE 009487994-06 P=377.571322 Days $T_0=193.108645$ (BKJD)



DV Model-Shift Uniqueness Test

009487994-06, P = 377.571322 Days, E = 193.101149 Days

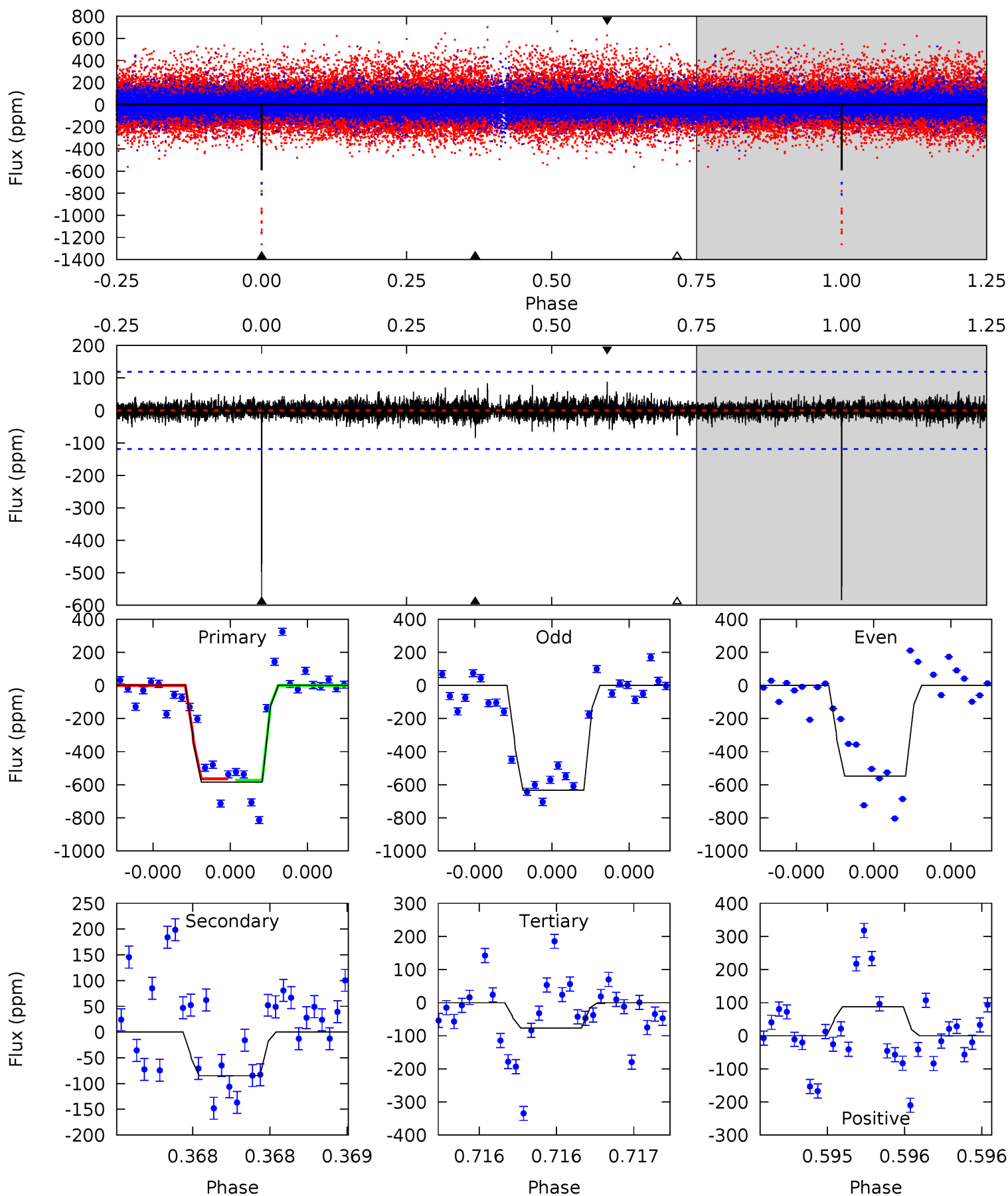
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009487994-06, P = 377.571322 Days, E = 193.108645 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.4	3.97	3.60	4.11	5.58	3.49	0.70	23.8	23.3	0.37	-0.14	1.99	1.04	0.13	0.19



Stellar Parameters For KIC 009487994

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6147^{+184}_{-184}	$3.667^{+0.322}_{-0.115}$	$-0.500^{+0.400}_{-0.250}$	$2.765^{+0.477}_{-1.114}$	$1.294^{+0.201}_{-0.302}$	$0.086^{+0.218}_{-0.029}$
	+3%/-3%	+9%/-3%	+80%/-50%	+17%/-40%	+16%/-23%	+253%/-34%
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 009487994-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$20.30^{+24.24}_{-13.92}$	587^{+40}_{-52}	6155^{+29523}_{-23355}	$7956^{+434777}_{-158187}$
Alt.	-85 ± 21	$22.83^{+22.05}_{-14.85}$	587^{+37}_{-52}	2814^{+1123}_{-437}	110^{+816}_{-81}

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 $A_{obs} \gg 1.0$

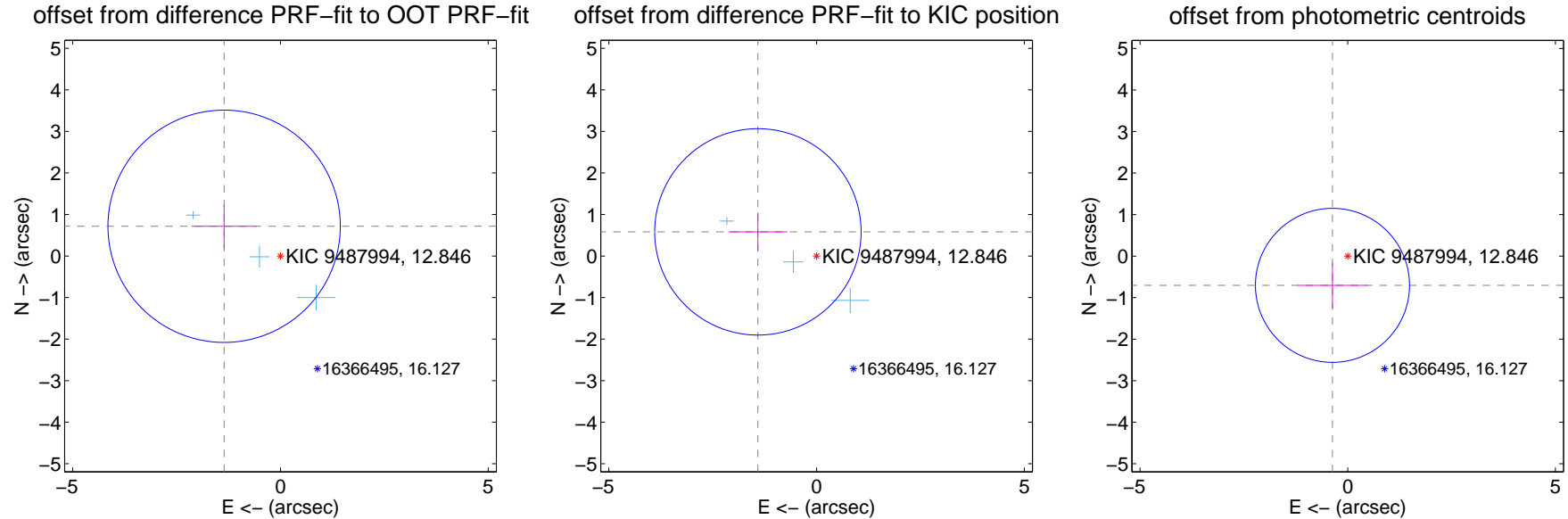
DV Centroid Data

Supplemental centroid analysis for 009487994-06. Kepler magnitude: 12.85. Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

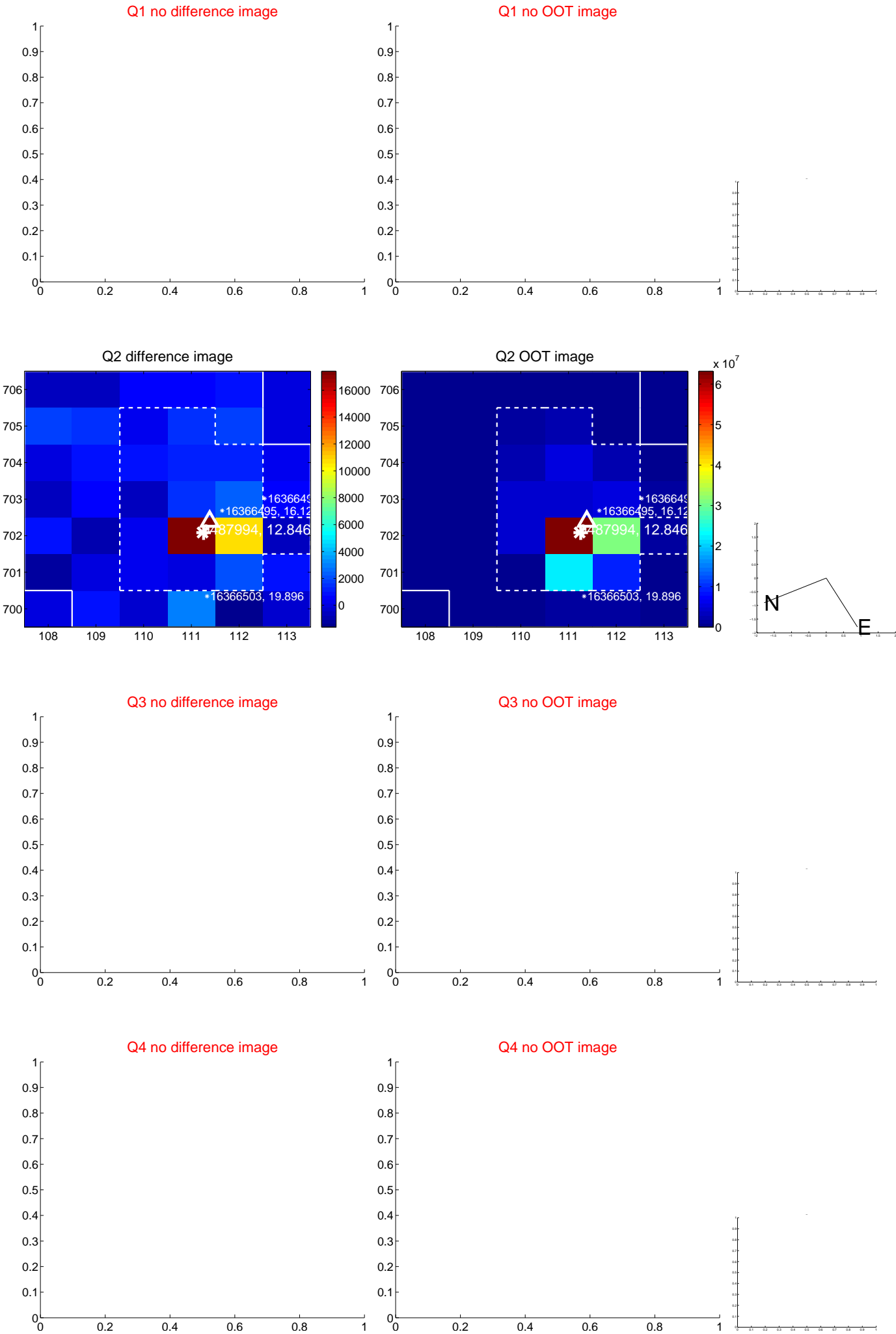
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.533 ± 0.932	1.65	1.356 ± 0.781	0.716 ± 0.522
PRF-fit source offset from KIC position	1.527 ± 0.828	1.84	1.412 ± 0.707	0.581 ± 0.464
photometric centroid source offset	0.79 ± 0.62	1.29	0.37 ± 0.83	-0.70 ± 0.55

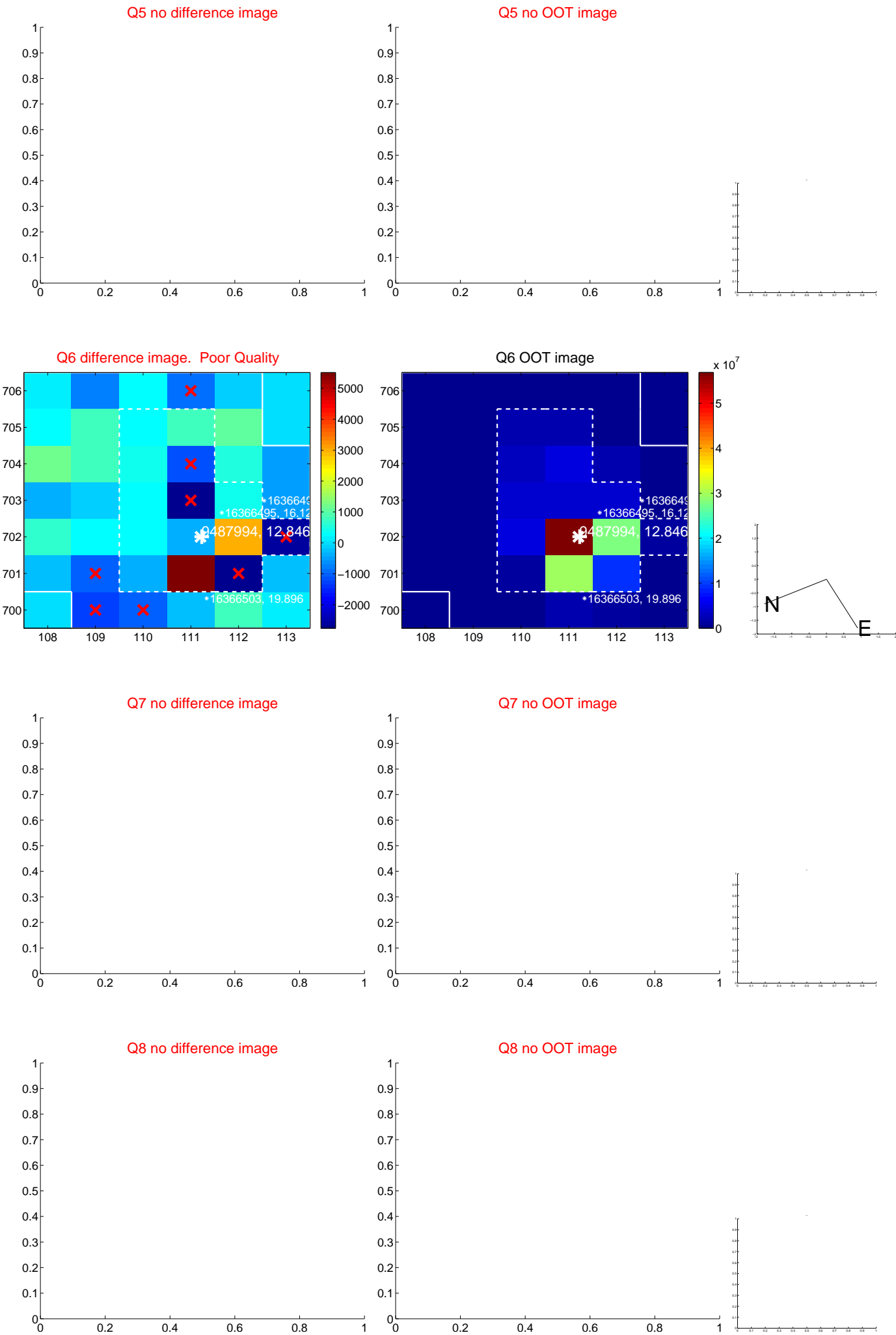


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

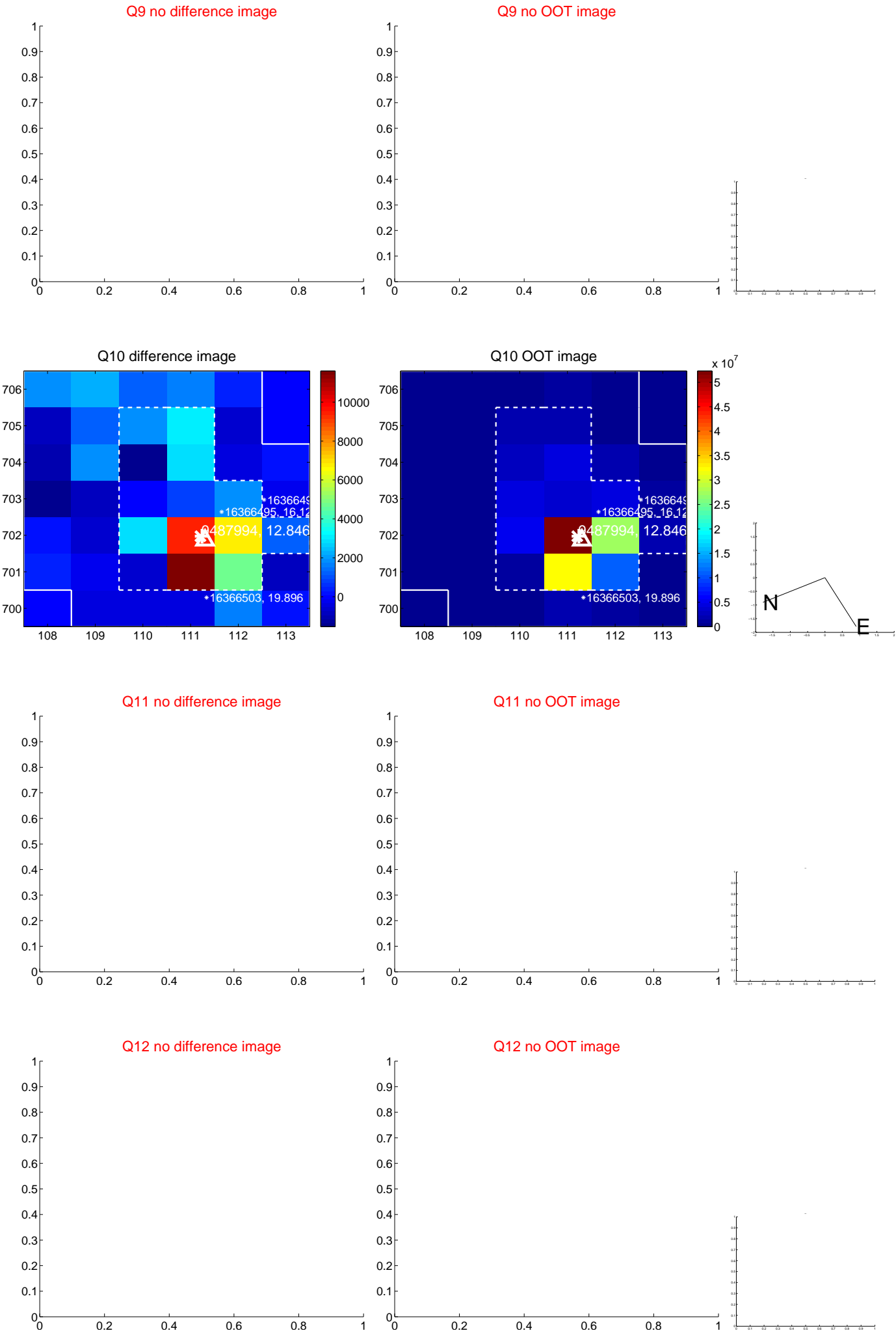
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



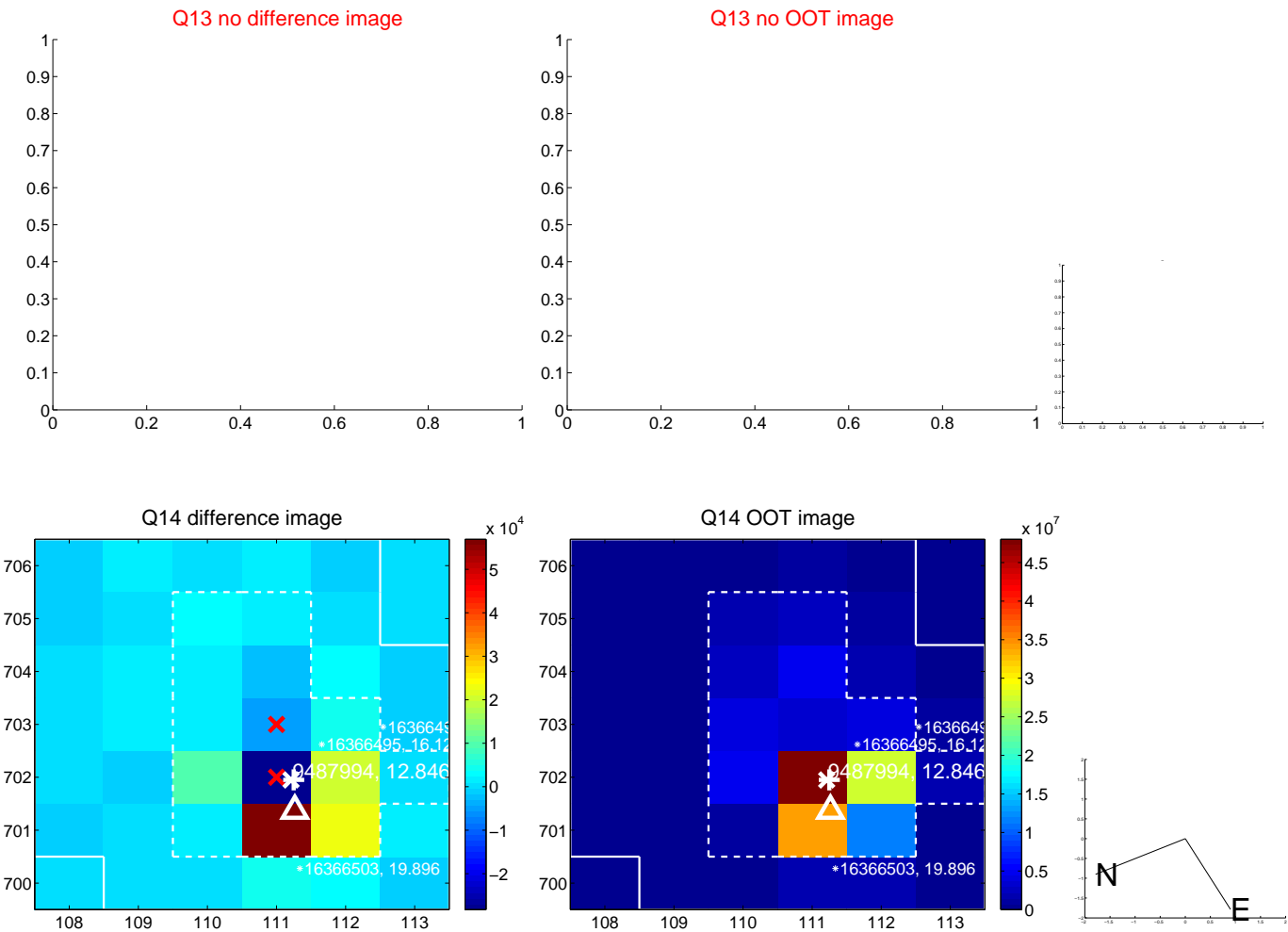
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



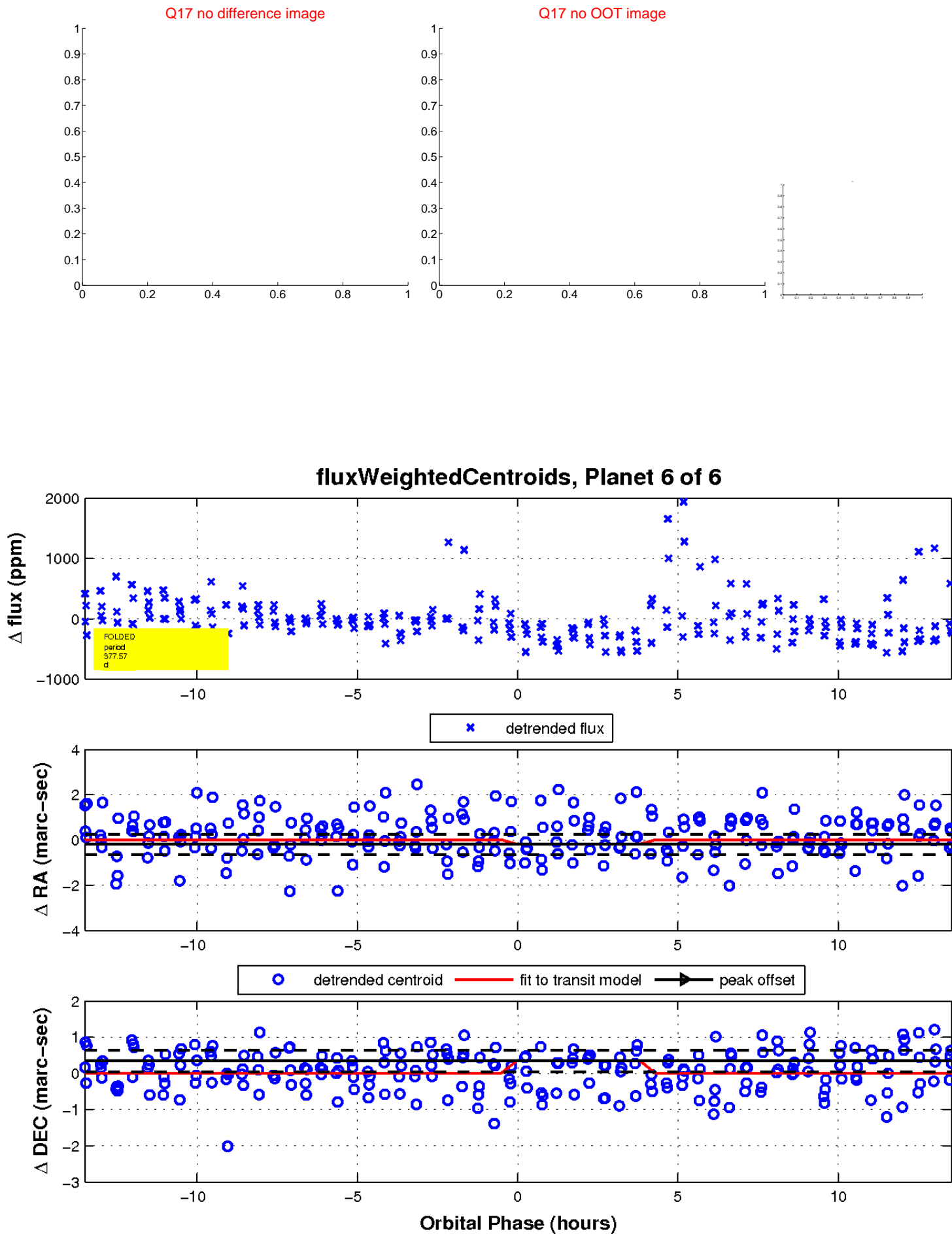
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

