

KIC 007420545

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})
007420545-01	OBS	No	488.035803	225.150084	536.5	4.088	14.9	7.0	1.94	5260	5.68	1.82
007420545-03	OBS	No	480.734986	157.707666	548.4	8.242	9.9	7.4	1.94	5260	9.27	1.86
007420545-05	OBS	No	570.484678	426.754249	452.4	9.262	11.0	6.7	1.94	5260	4.50	1.48
007420545-06	OBS	No	568.056503	214.289091	138.9	13.905	8.6	2.1	1.94	5260	2.25	1.49

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007420545-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007420545-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007420545-05	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—CENT_SATURATED
007420545-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

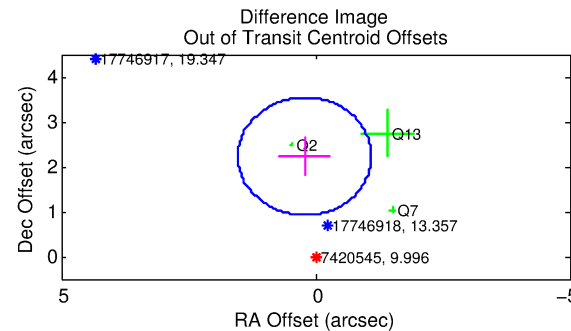
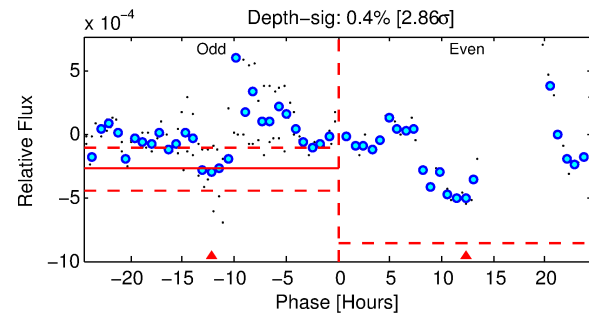
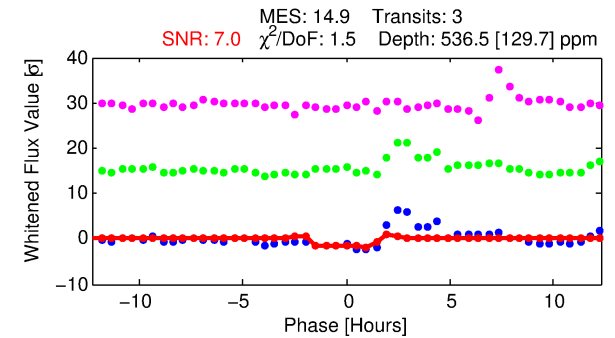
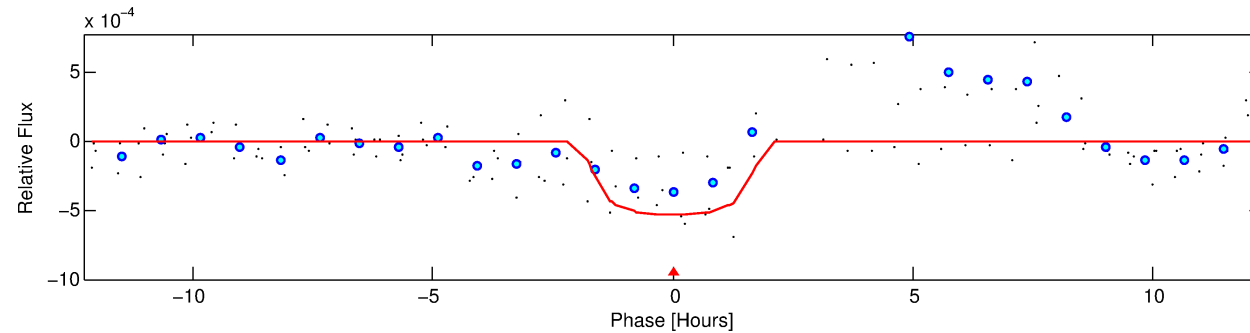
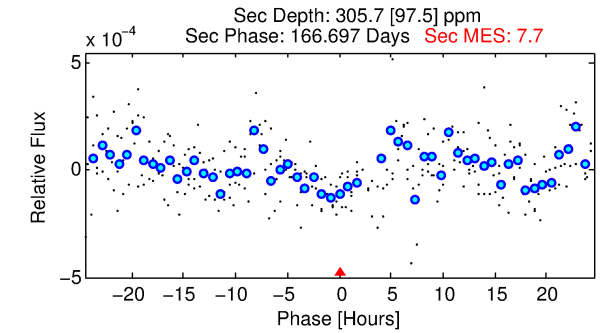
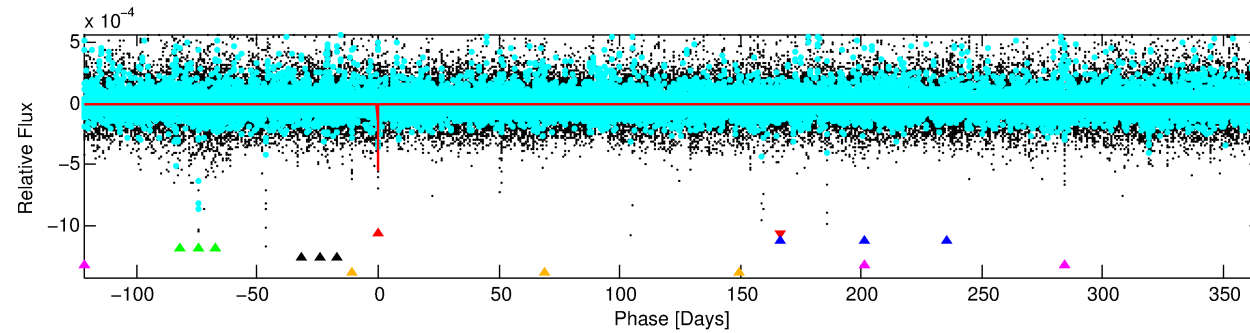
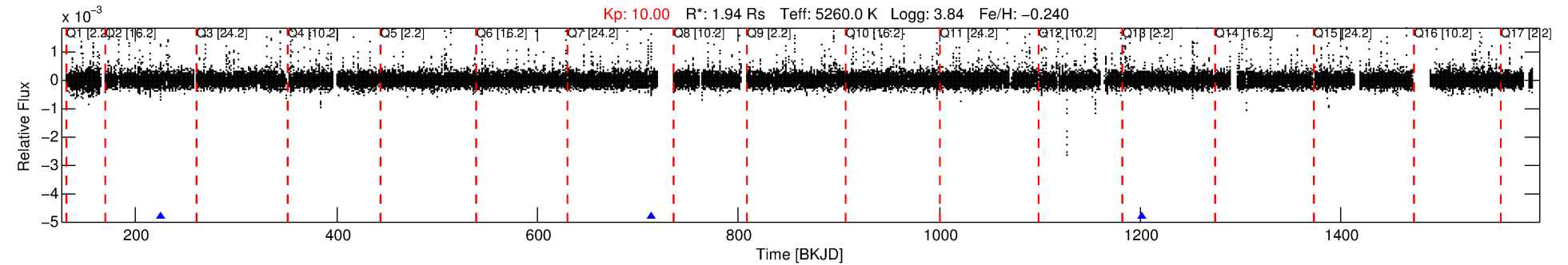
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007420545-01

No Significant Match Found

DV One-Page Summary

KIC: 7420545 Candidate: 1 of 6 Period: 488.036 d



DV Fit Results:

Period = 488.03580 [0.00523] d
Epoch = 225.1501 [0.0084] BKJD
Rp/R* = 0.0268 [0.0053]
a/R* = 386.39 [201.32]
b = 0.94 [0.08]
Seff = 1.82 [2.17]
Teq = 296 [88] K
Rp = 5.68 [3.76] Re
a = 1.1930 [0.8298] AU
Ag = 7417.42 [9565.99] [0.78 σ]
Teffp = 4249 [557] K [7.01 σ]

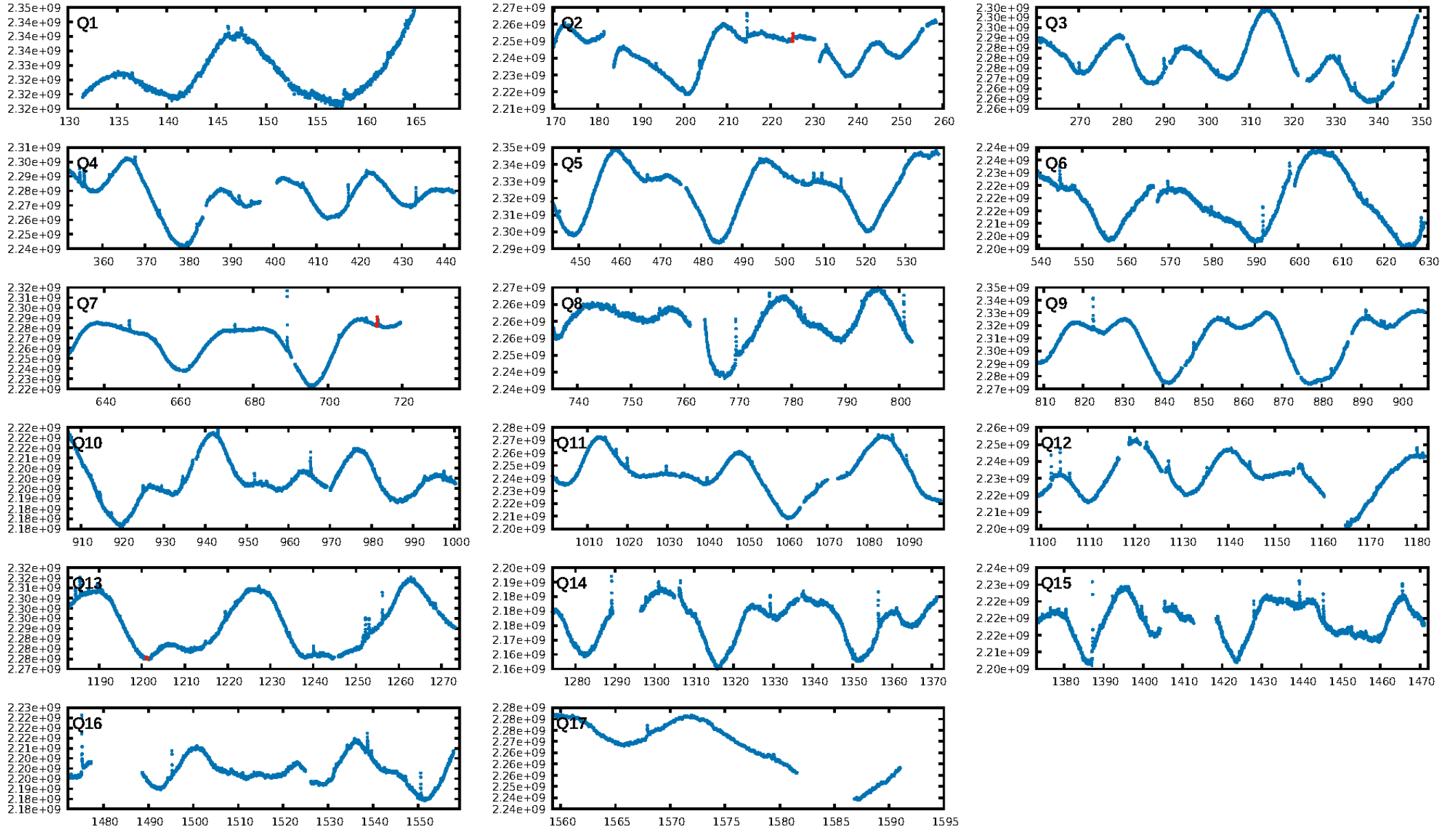
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.04 σ]
LongPeriod-sig: 100.0% [33.48 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 19.7%
Bootstrap-pfa: 1.85e-16
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 2.6%
Centroid-so: 1.814 arcsec [2.96 σ]
OotOffset-rm: 2.240 arcsec [5.12 σ]
KicOffset-rm: 3.654 arcsec [6.41 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

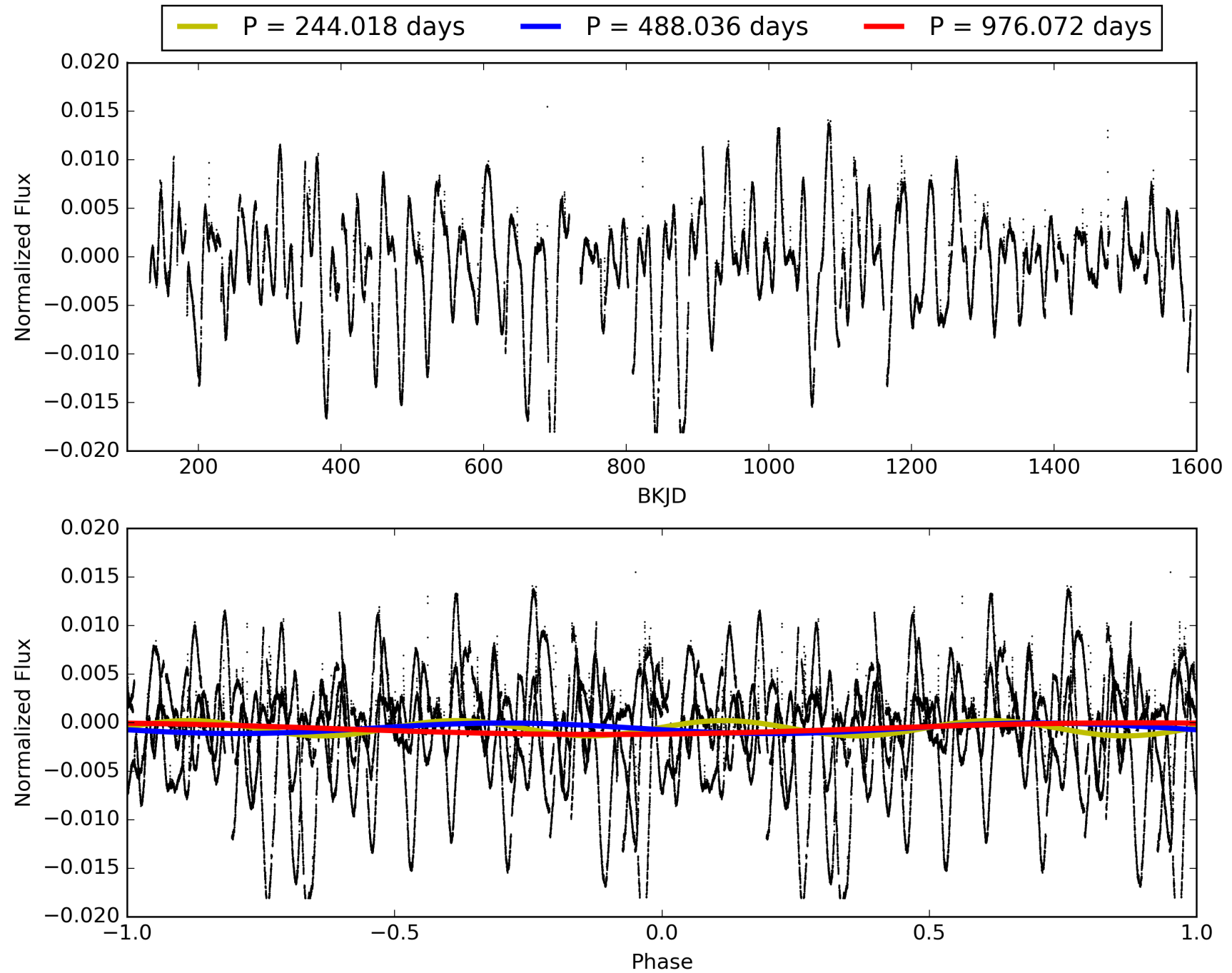
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 05:20:21 Z

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

TCE 007420545-01, PDC Light Curves

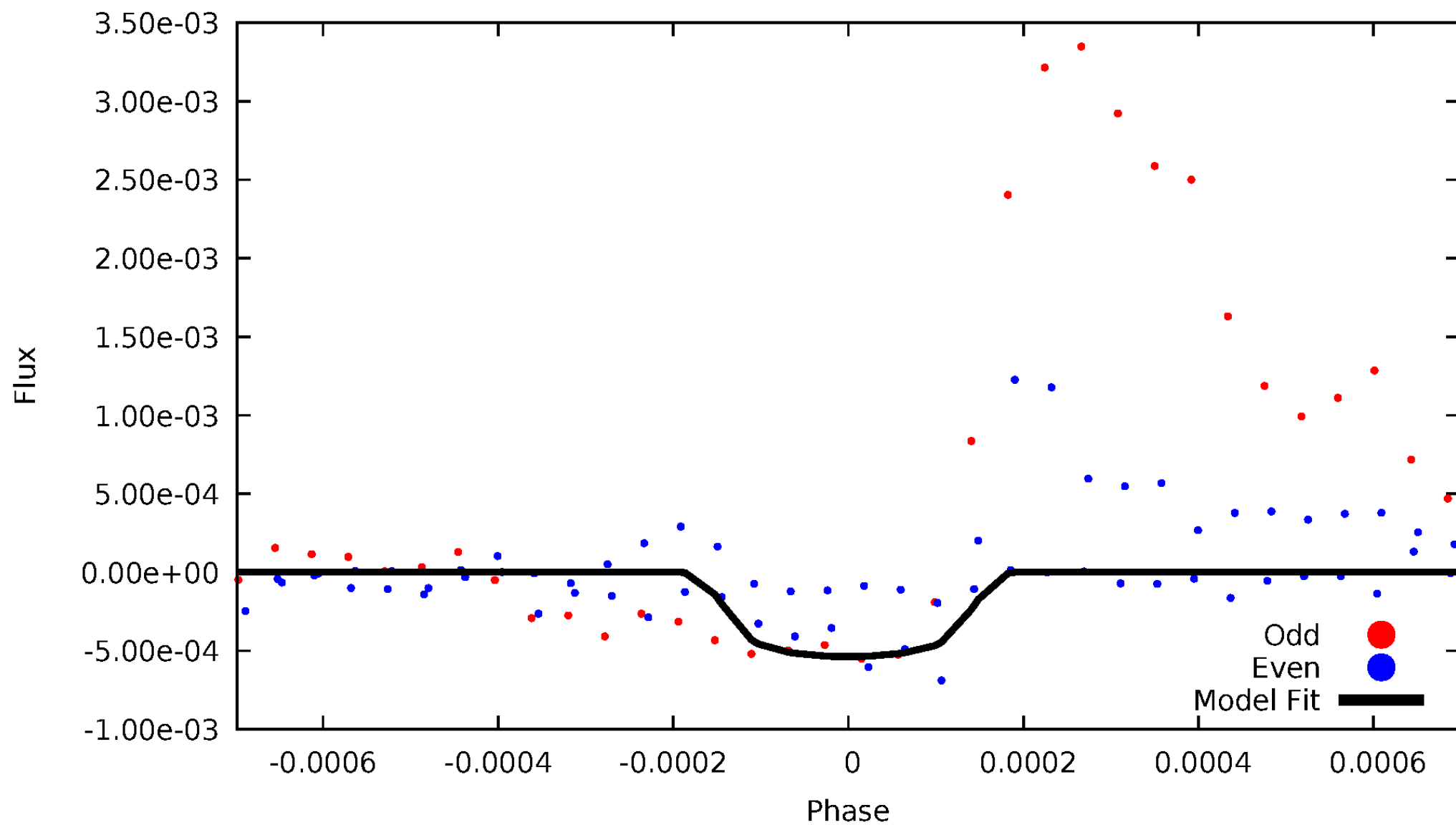


TCE 007420545-01



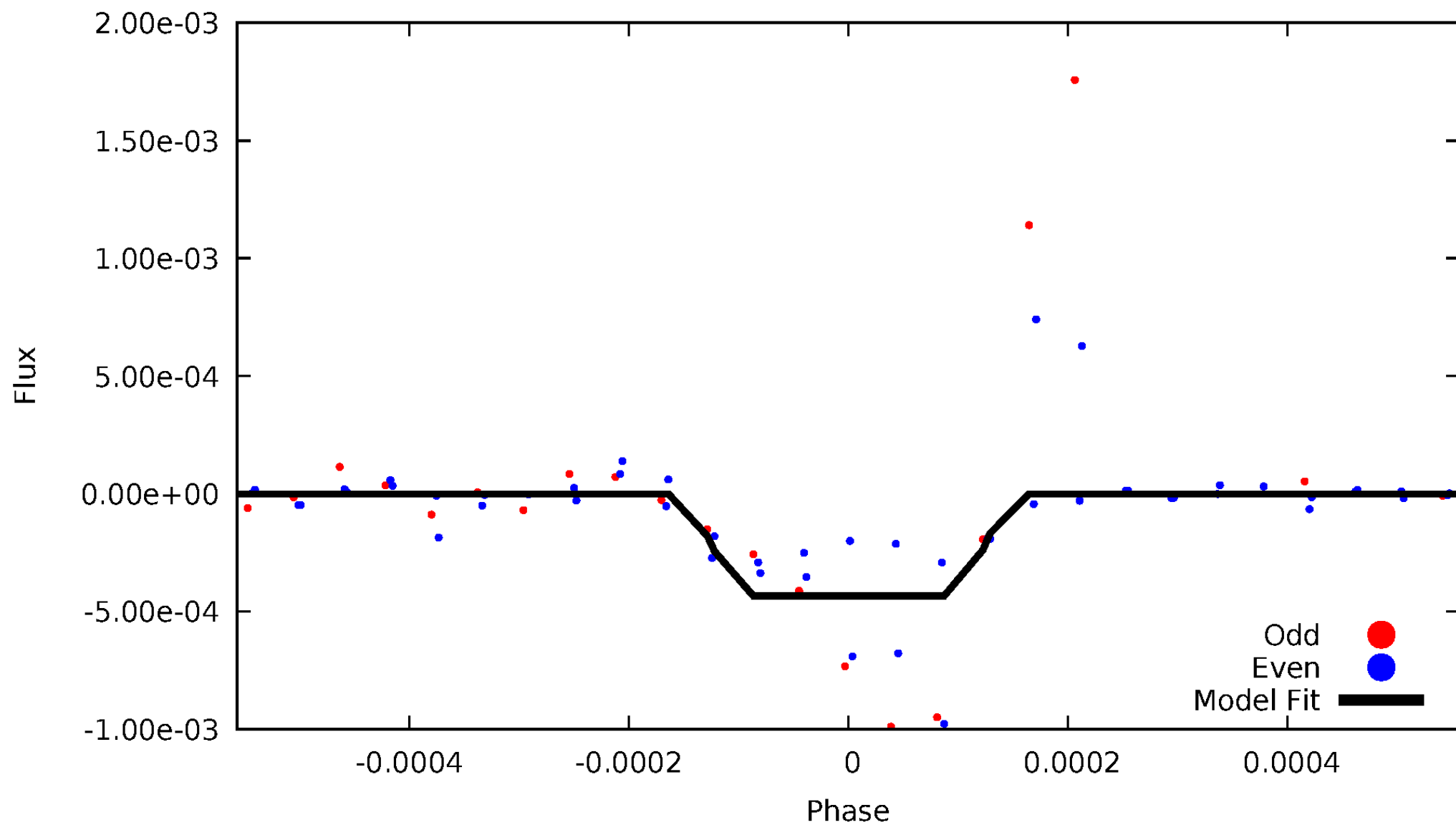
DV Odd/Even

TCE 007420545-01



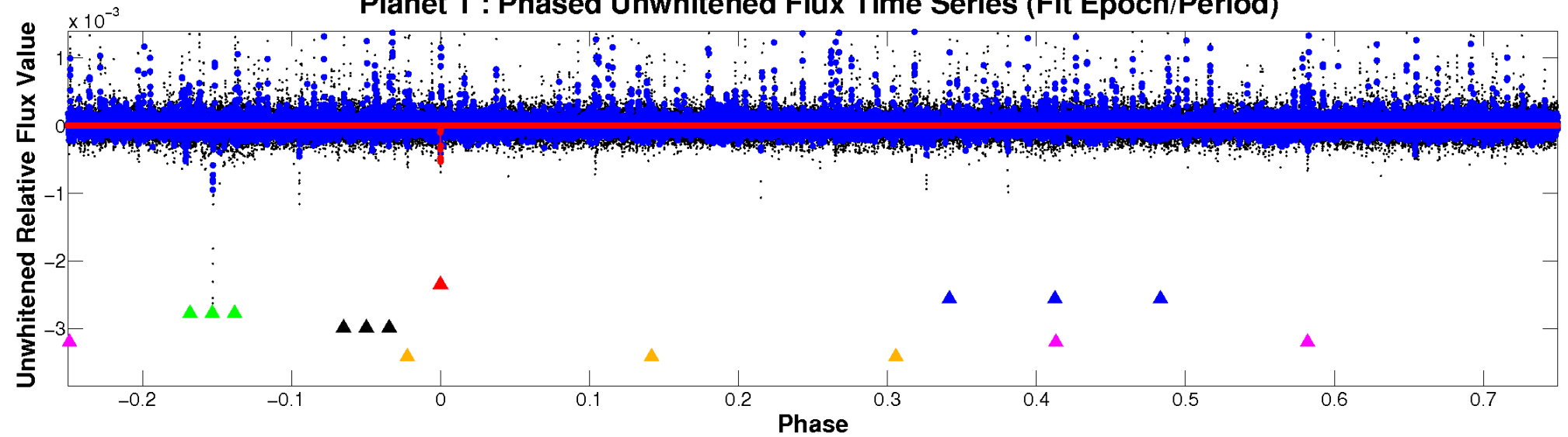
ALT Odd/Even

TCE 007420545-01

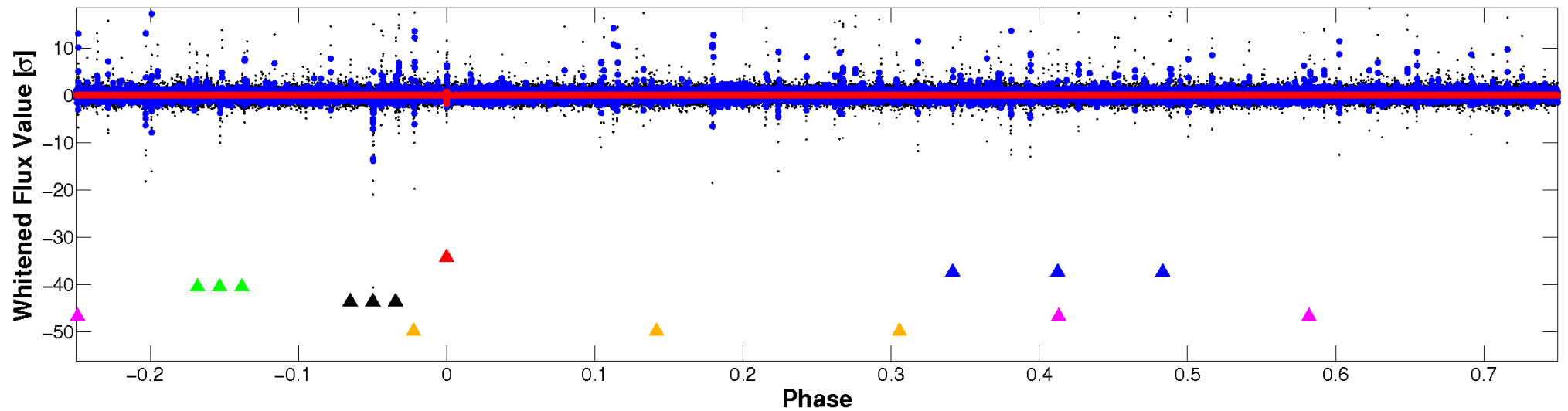


Non-Whitened Vs. Whitened Light Curve

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

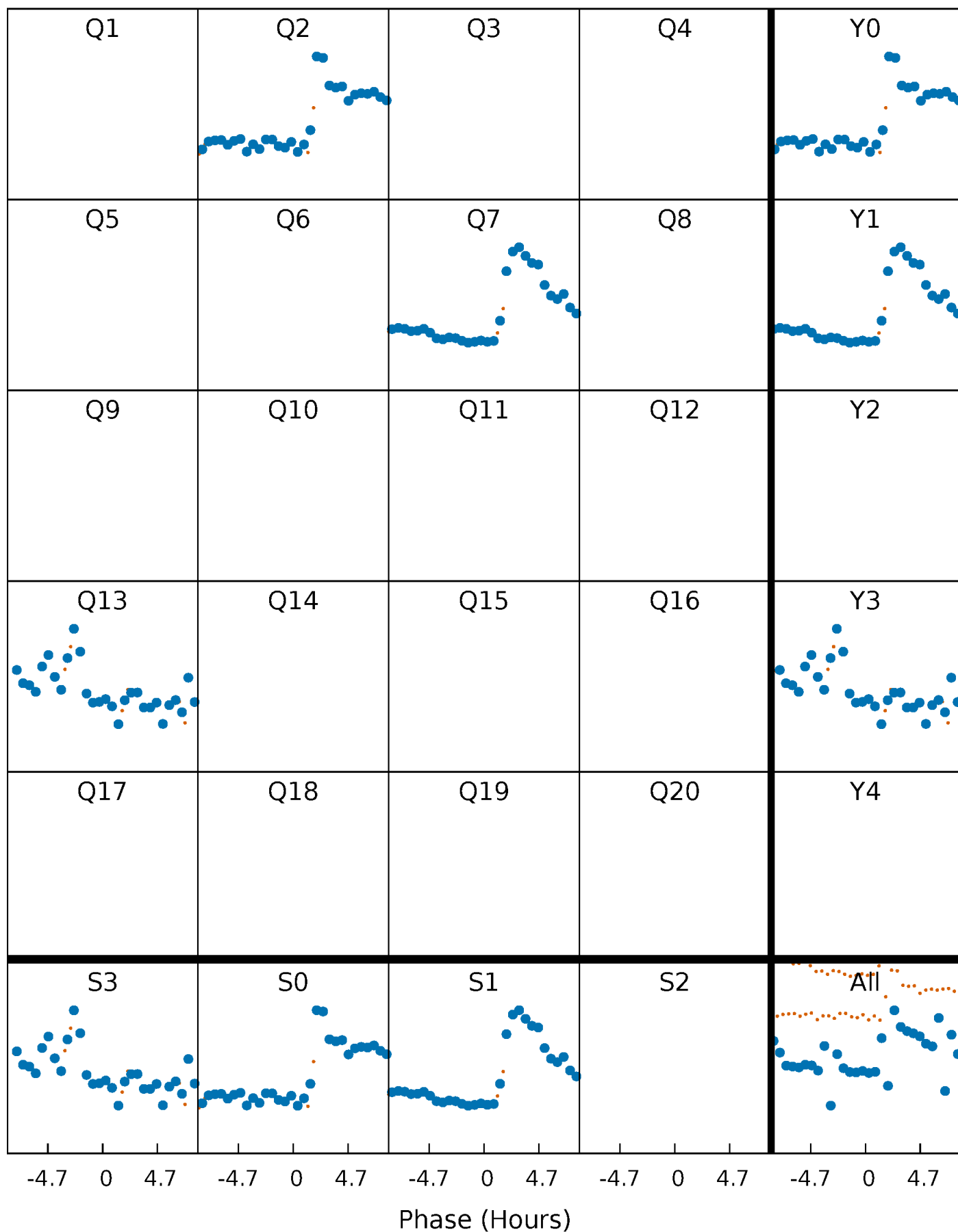


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



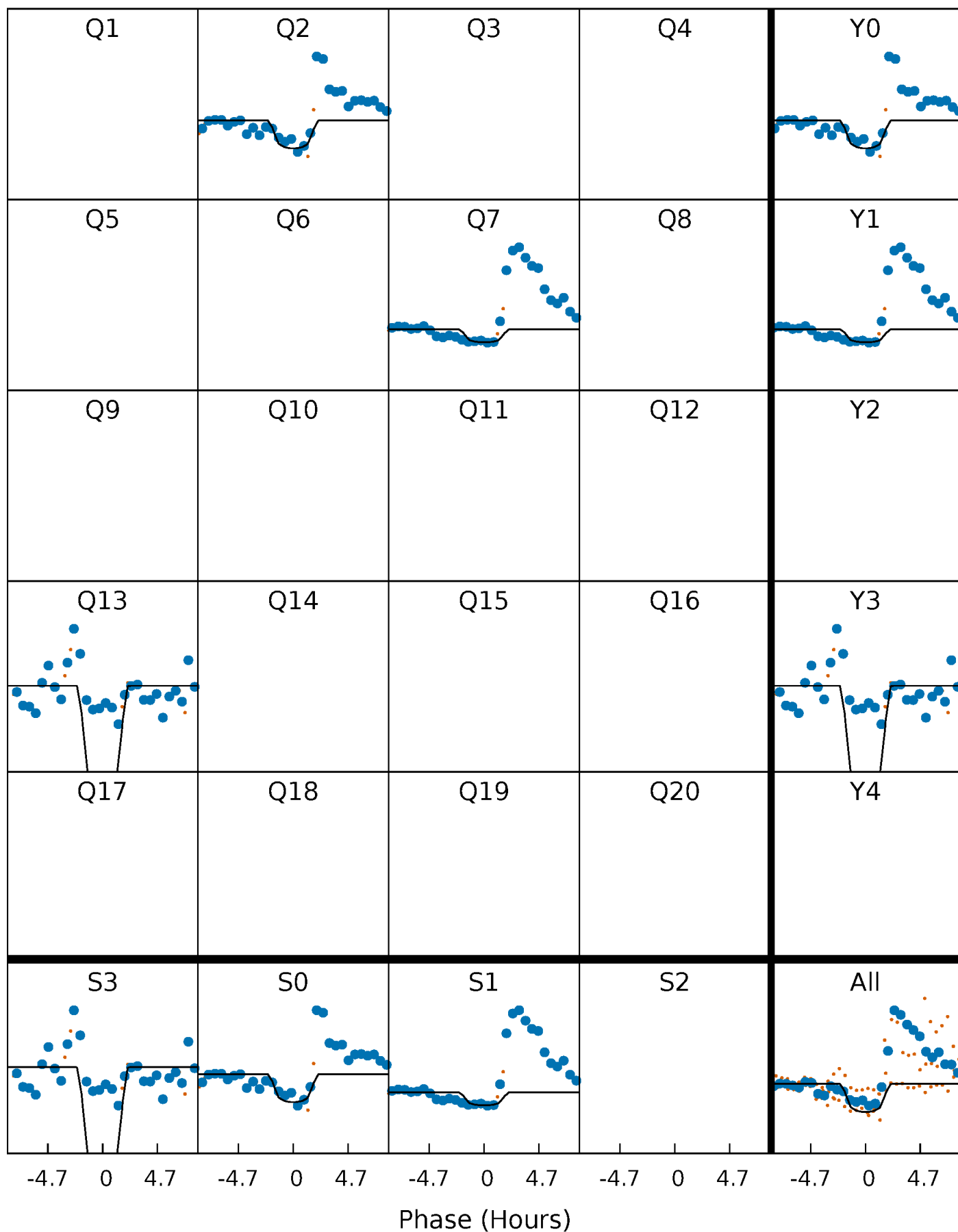
PDC Quarter-Phased Transit Curves

TCE 007420545-01 P=488.035803 Days $T_0=225.150084$ (BKJD)



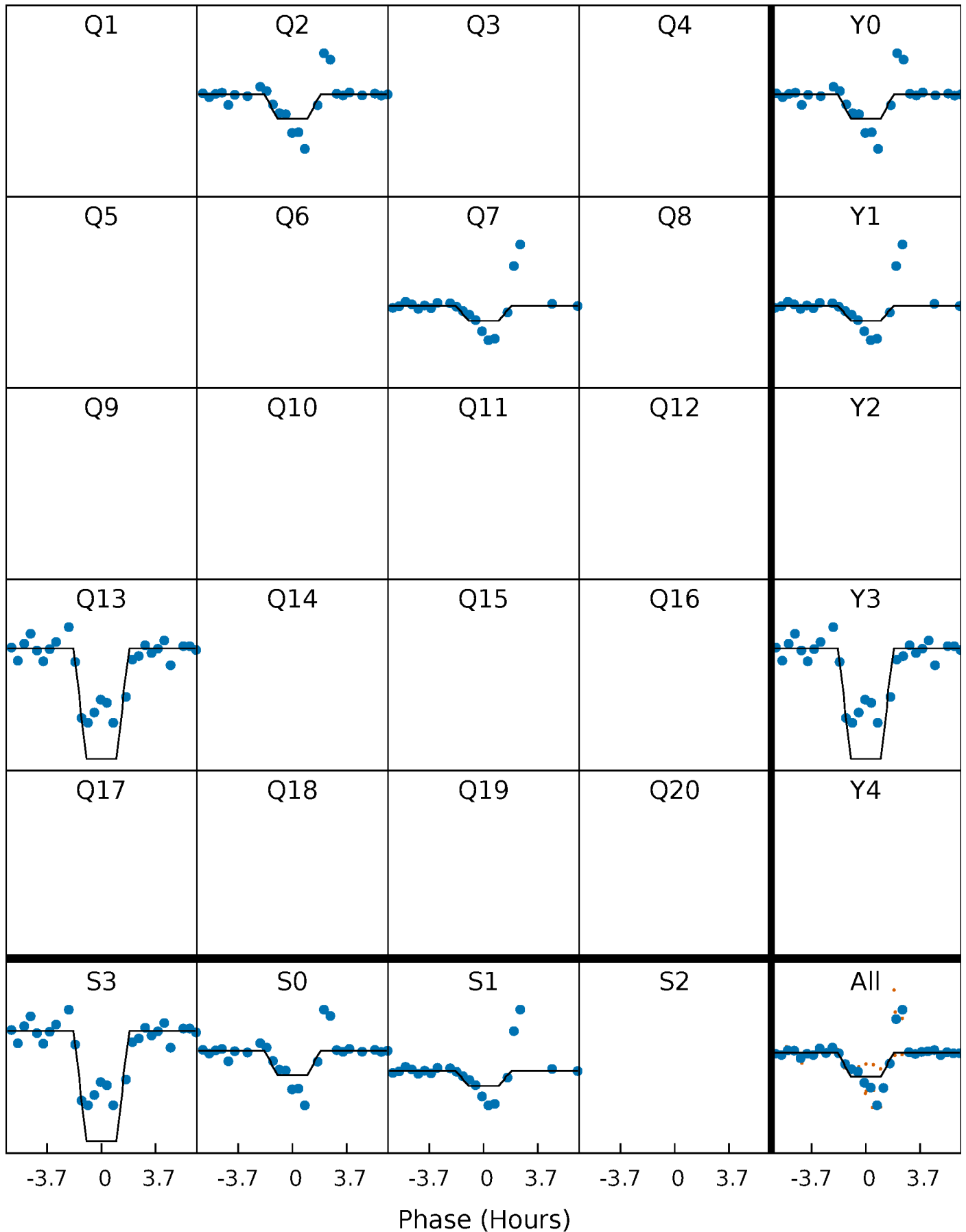
DV Quarter-Phased Transit Curves

TCE 007420545-01 P=488.035803 Days $T_0=225.150084$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

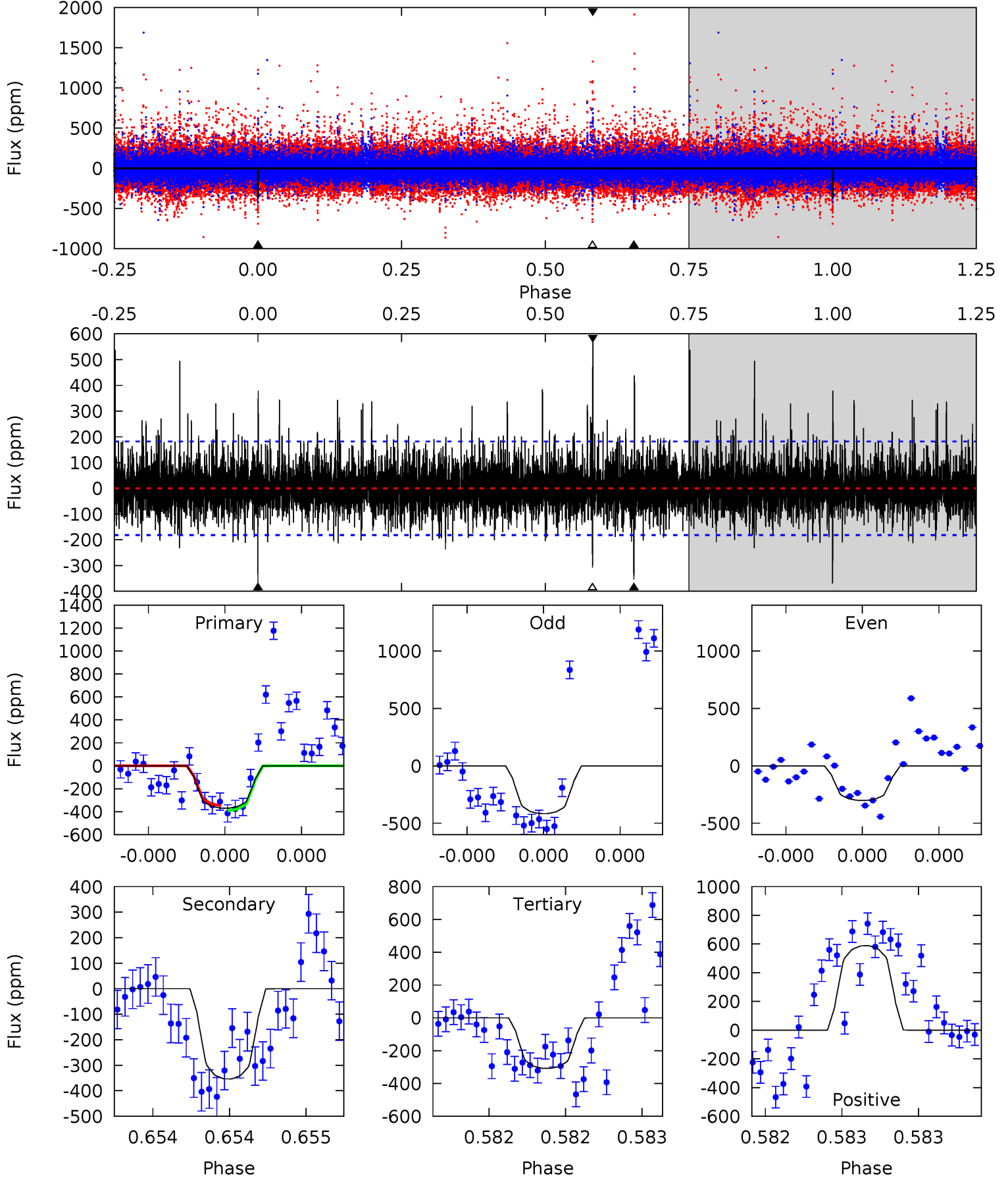
TCE 007420545-01 P=488.035147 Days $T_0=225.159458$ (BKJD)



DV Model-Shift Uniqueness Test

007420545-01, P = 488.035803 Days, E = 225.150084 Days

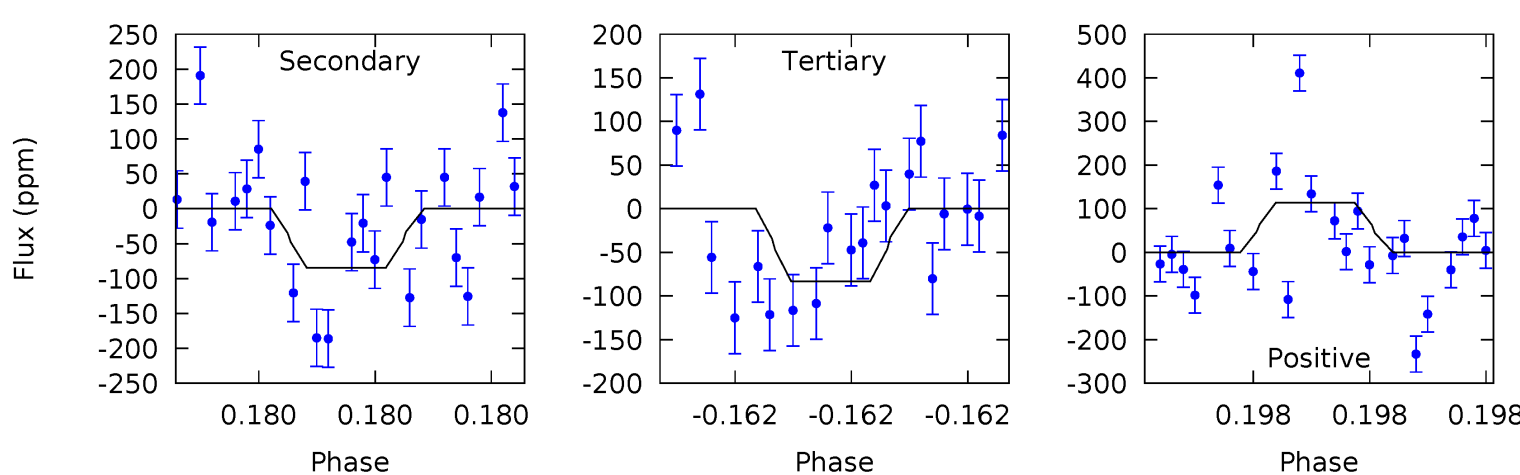
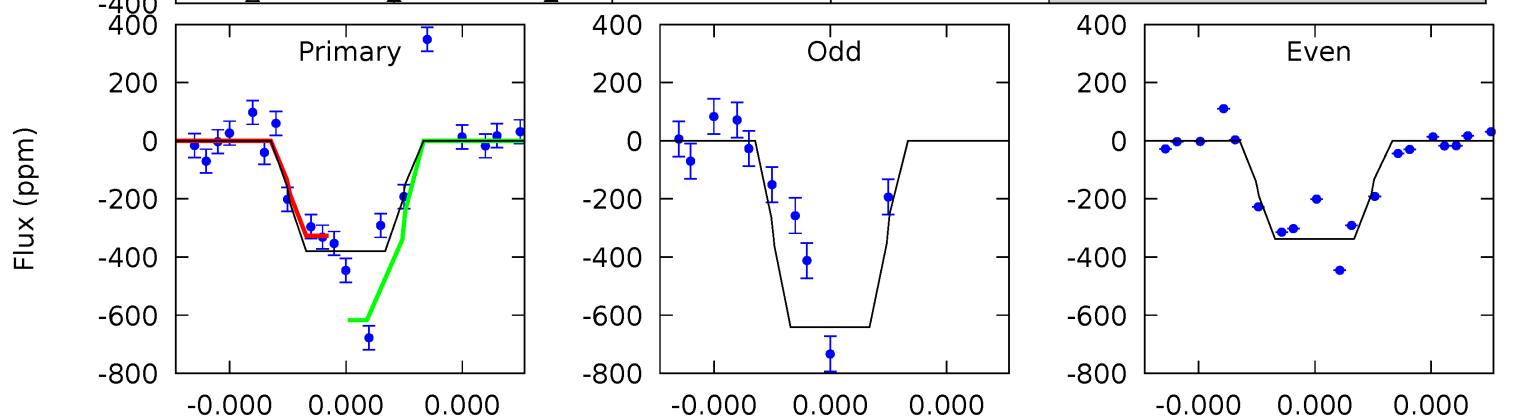
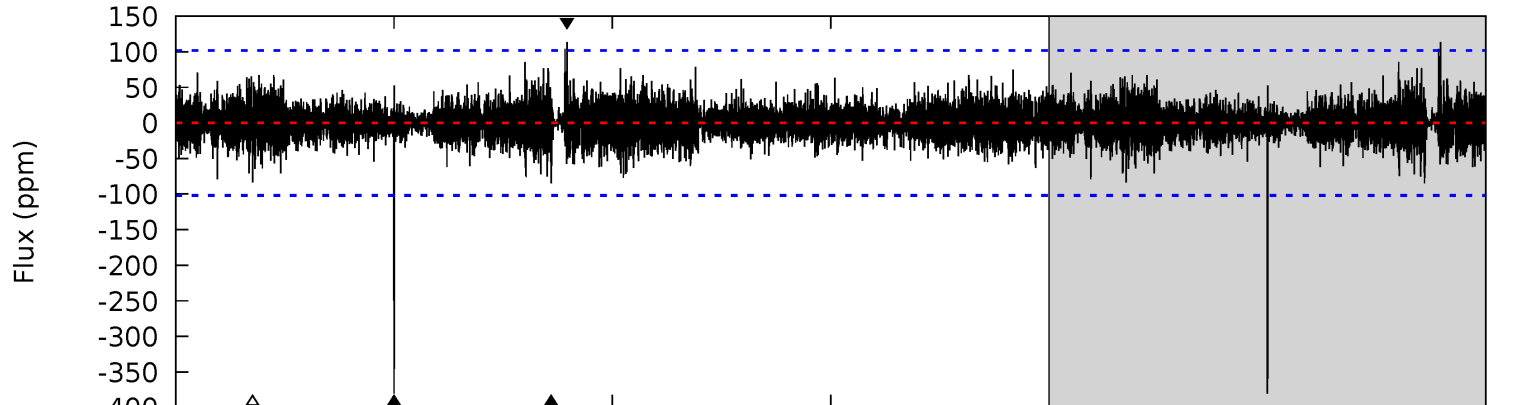
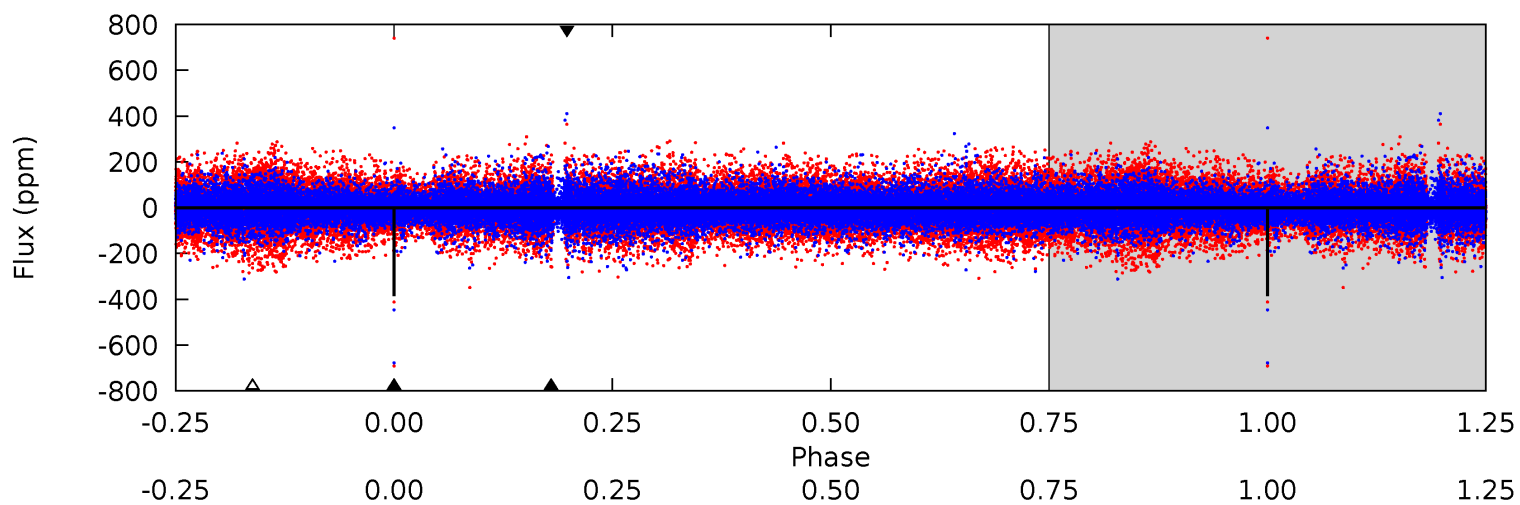
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	10.9	9.52	18.2	5.62	3.56	2.21	1.90	-6.79	1.42	-7.26	1.12	0.82	0.61	0.69



Alt Model-Shift Uniqueness Test

007420545-01, P = 488.035147 Days, E = 225.159458 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.2	4.73	4.66	6.35	5.69	3.66	0.93	16.6	14.9	0.07	-1.62	8.54	0.85	0.23	0



Stellar Parameters For KIC 007420545

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5260^{+158}_{-142}	$3.839^{+0.721}_{-0.309}$	$-0.240^{+0.350}_{-0.250}$	$1.943^{+1.005}_{-1.228}$	$0.951^{+0.218}_{-0.179}$	$0.183^{+2.352}_{-0.124}$
	+3%/-3%	+19%/-8%	+146%/-104%	+52%/-63%	+23%/-19%	+1287%/-68%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007420545-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-354 ± 32	$5.34^{+2.27}_{-1.94}$	409^{+59}_{-73}	4570^{+447}_{-335}	9868^{+14522}_{-4974}
Alt.	-85 ± 18	$4.02^{+1.78}_{-1.45}$	405^{+54}_{-71}	3861^{+450}_{-337}	4100^{+6186}_{-2153}

T_{max} = Theoretical Maximum Planetary Temperature
 T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)
 A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

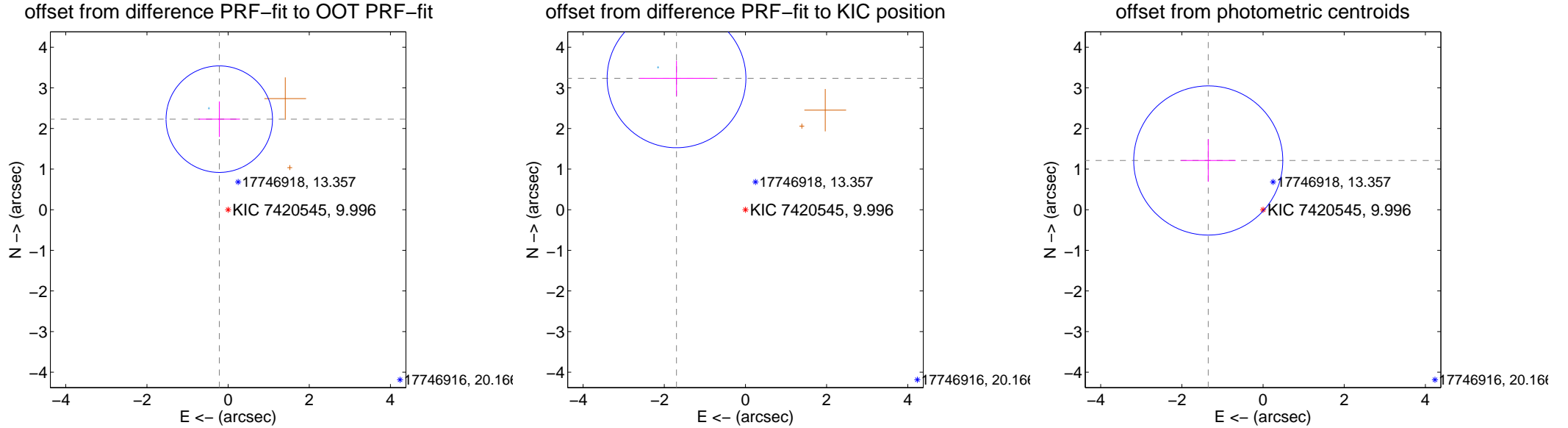
DV Centroid Data

Supplemental centroid analysis for 007420545-01. **Kepler magnitude: 10.00.** Transit SNR 7.04

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.63 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.240 ± 0.437	5.12	0.218 ± 0.511	2.229 ± 0.436
PRF-fit source offset from KIC position	3.654 ± 0.570	6.41	1.698 ± 0.907	3.235 ± 0.433
photometric centroid source offset	1.81 ± 0.61	2.96	1.35 ± 0.68	1.21 ± 0.52



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

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

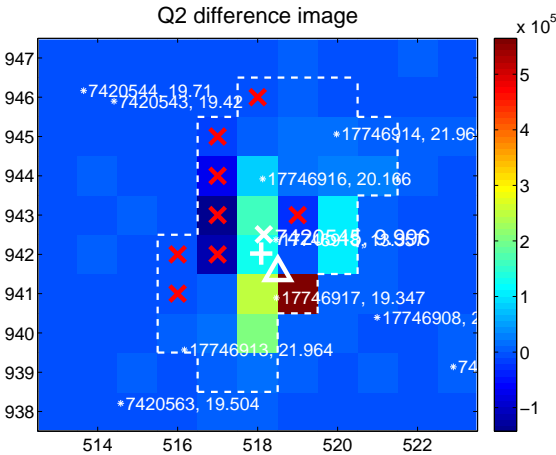
Q1 no difference image



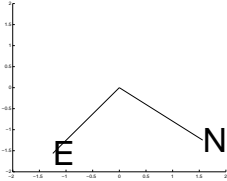
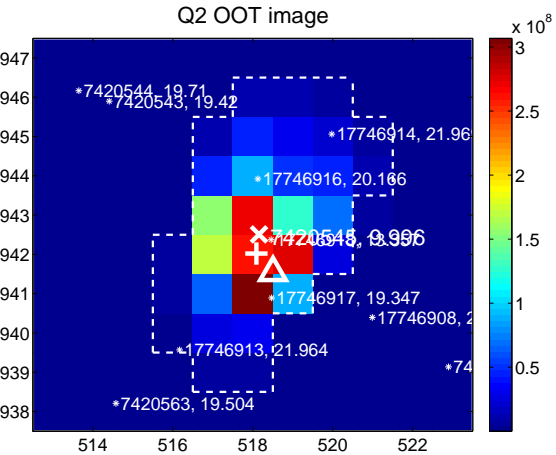
Q1 no OOT image



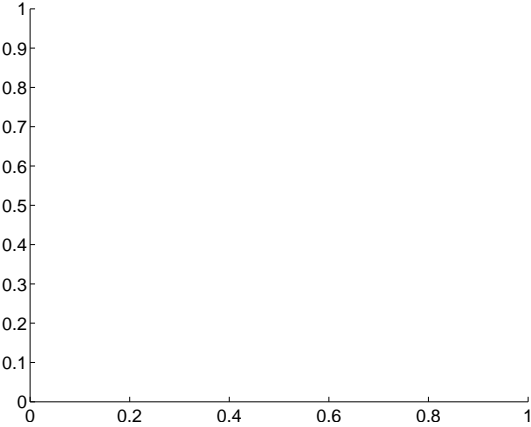
Q2 difference image



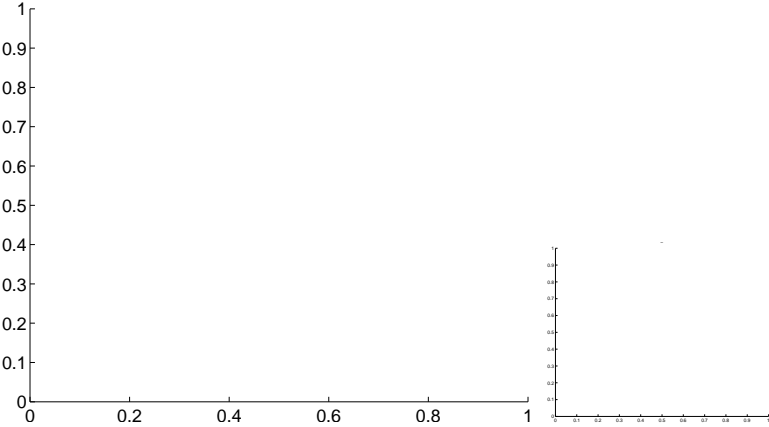
Q2 OOT image



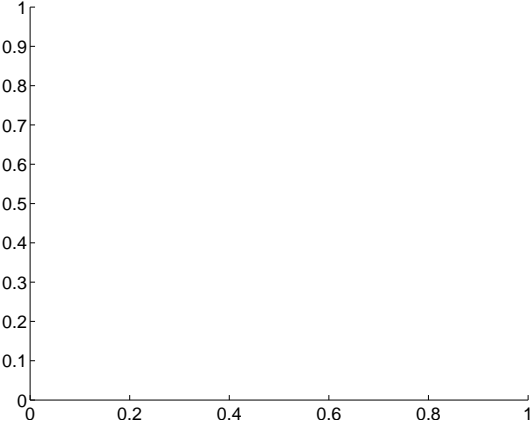
Q3 no difference image



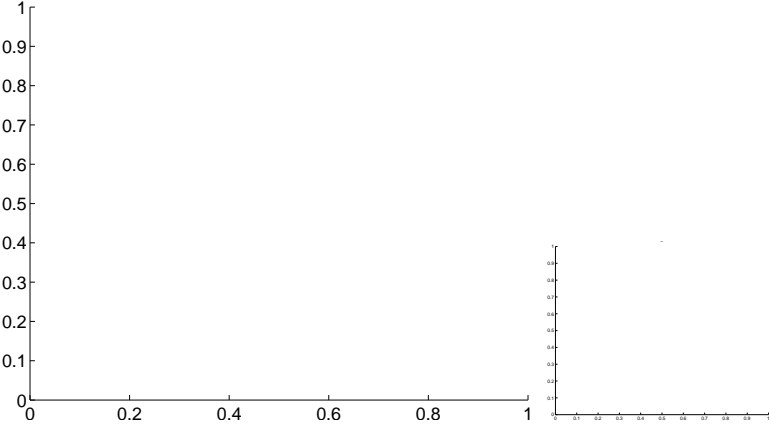
Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

Q5 no difference image



Q5 no OOT image



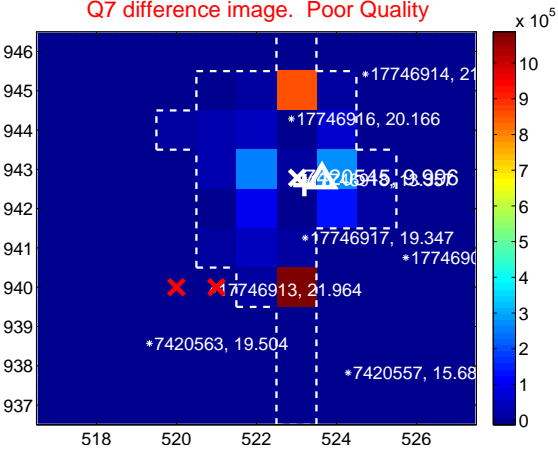
Q6 no difference image



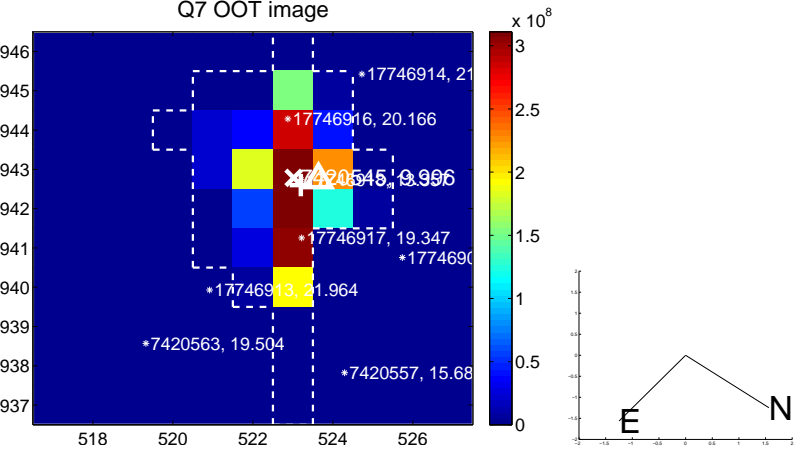
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 OOT image



Q8 no difference image



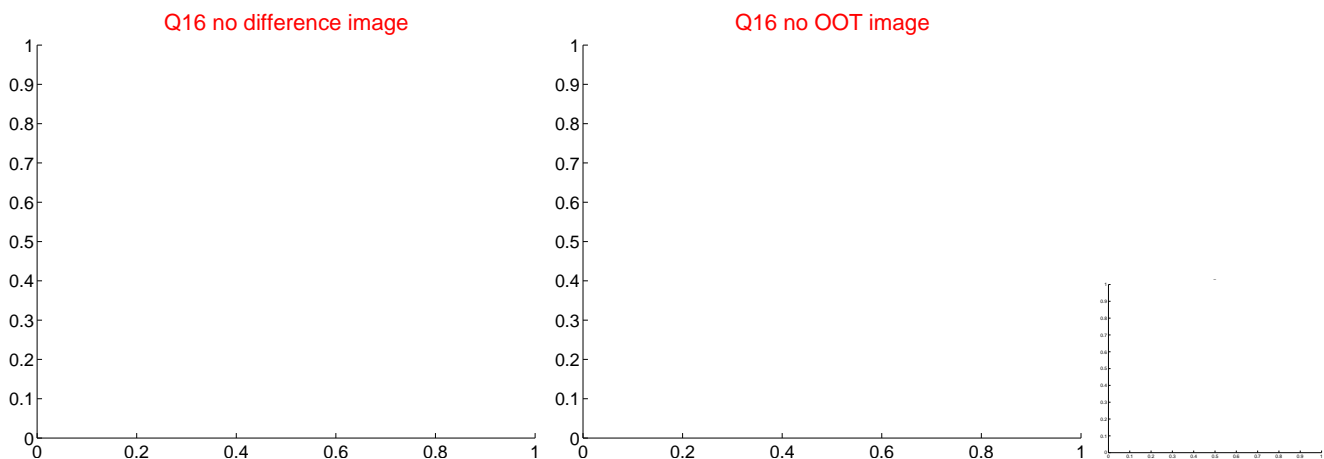
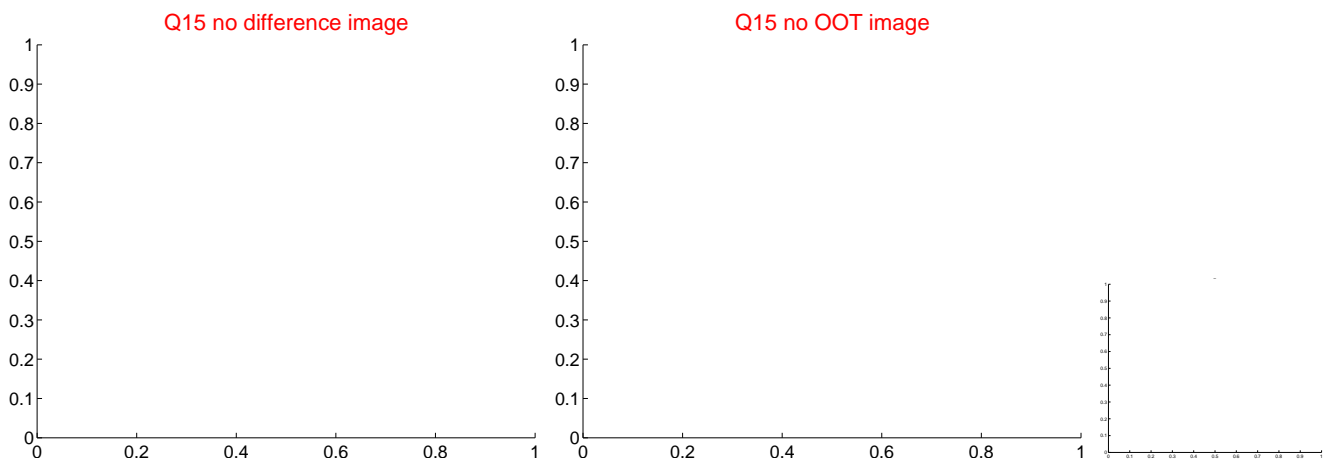
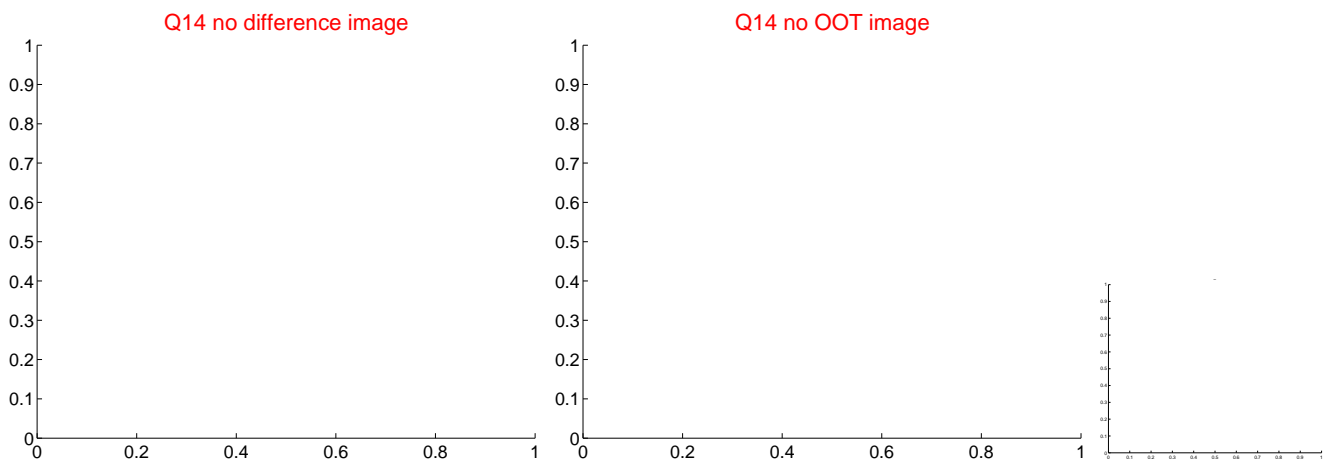
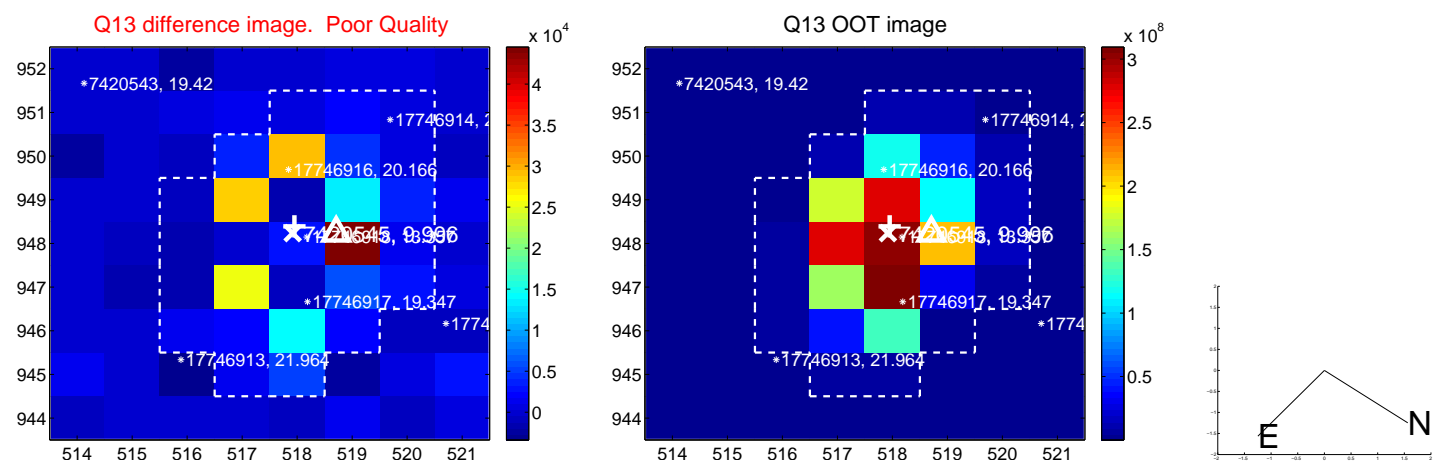
Q8 no OOT image



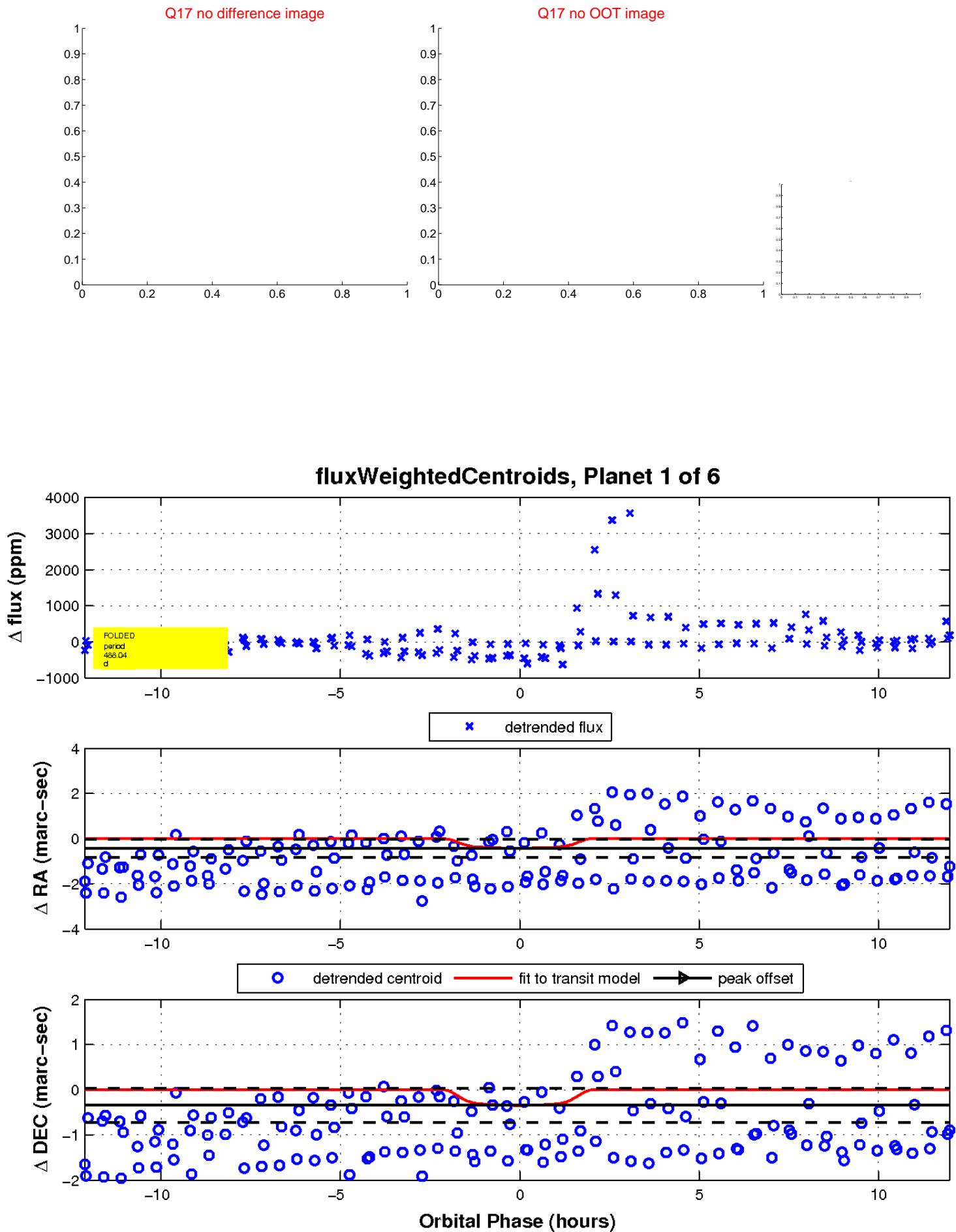
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



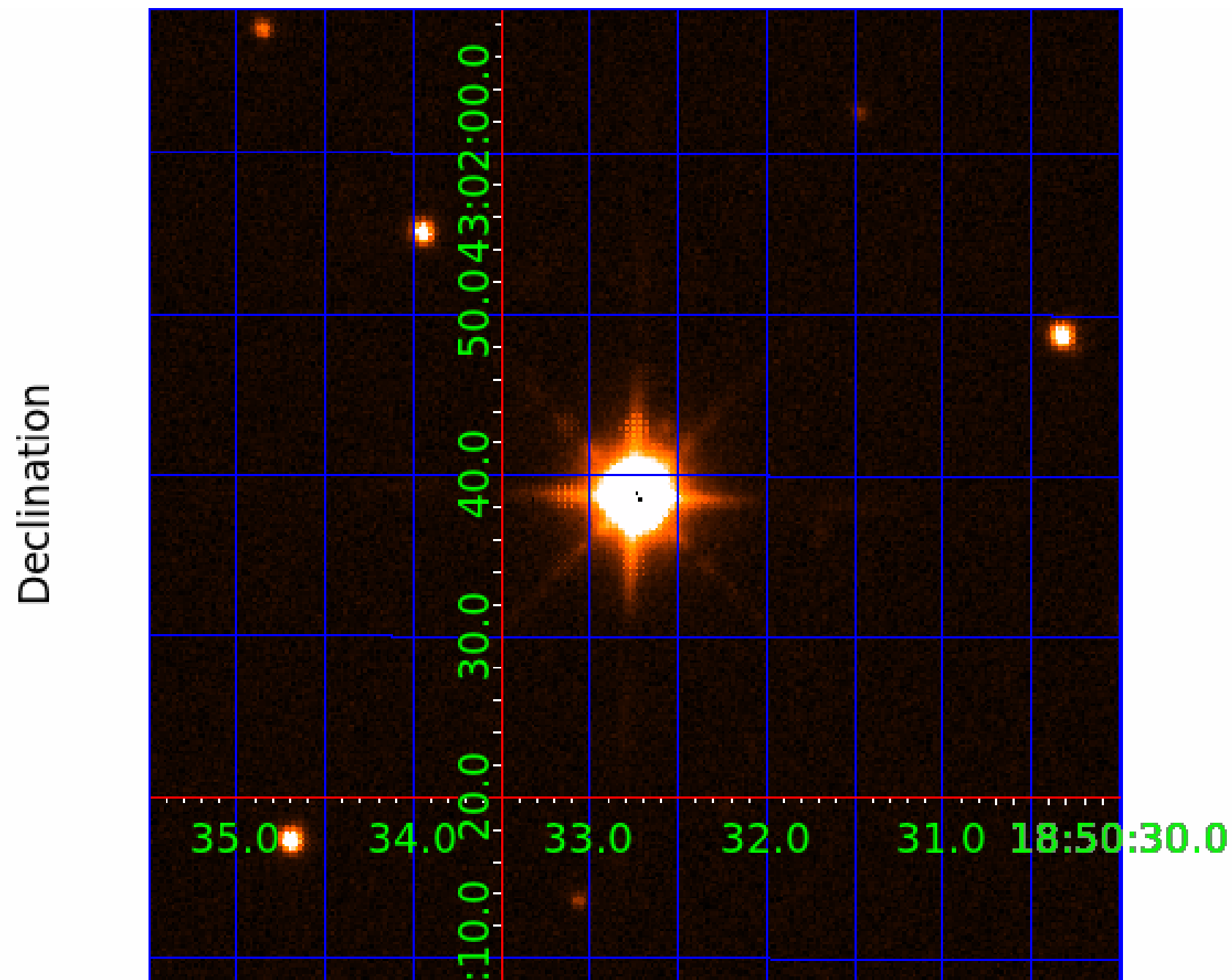
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007420545

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})
007420545-01	OBS	No	488.035803	225.150084	536.5	4.088	14.9	7.0	1.94	5260	5.68	1.82
007420545-03	OBS	No	480.734986	157.707666	548.4	8.242	9.9	7.4	1.94	5260	9.27	1.86
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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007420545-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007420545-05	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—CENT_SATURATED
007420545-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

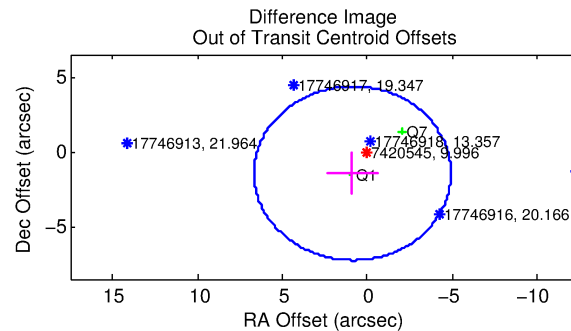
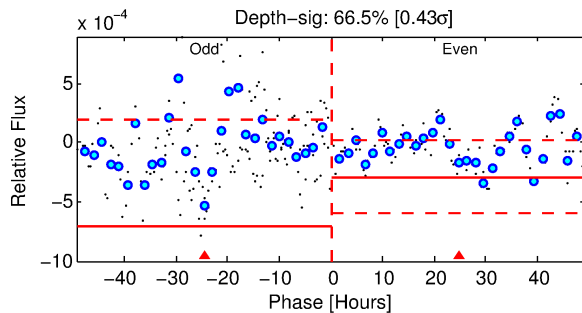
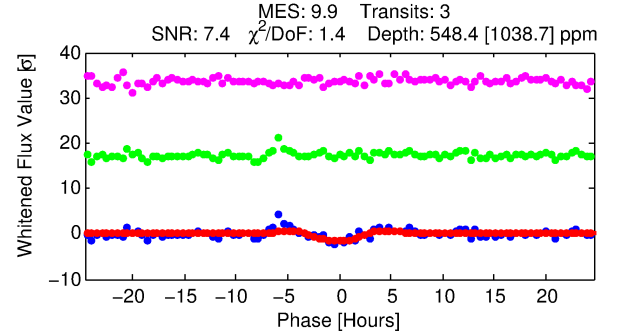
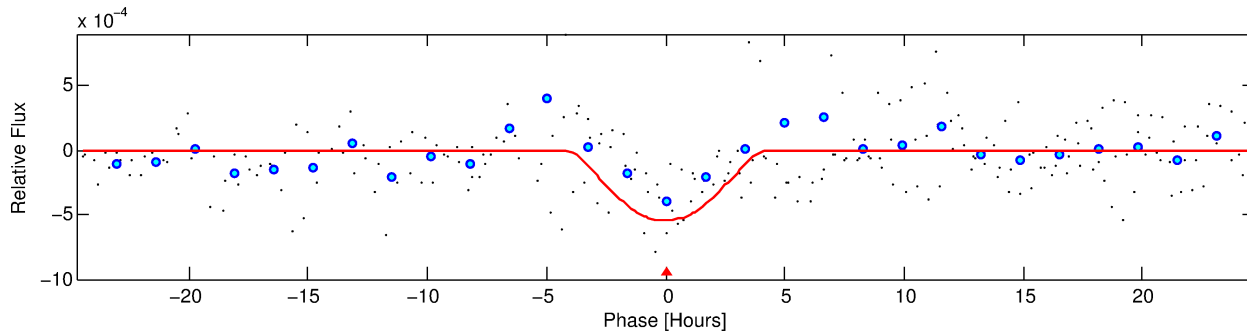
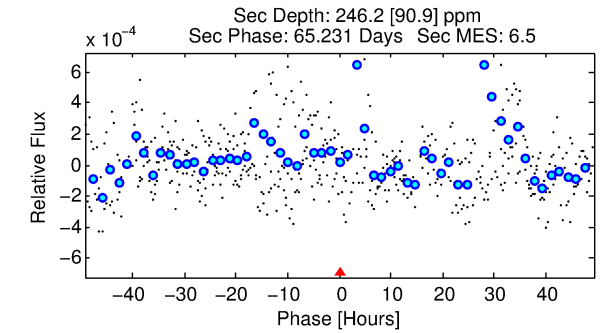
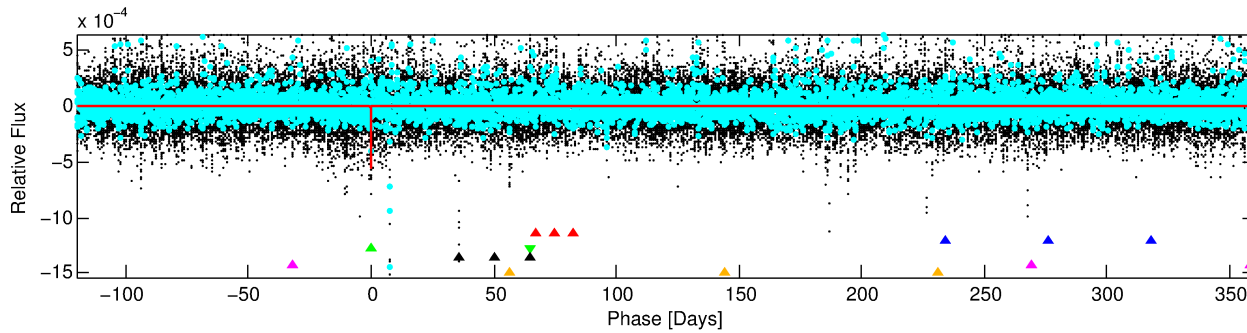
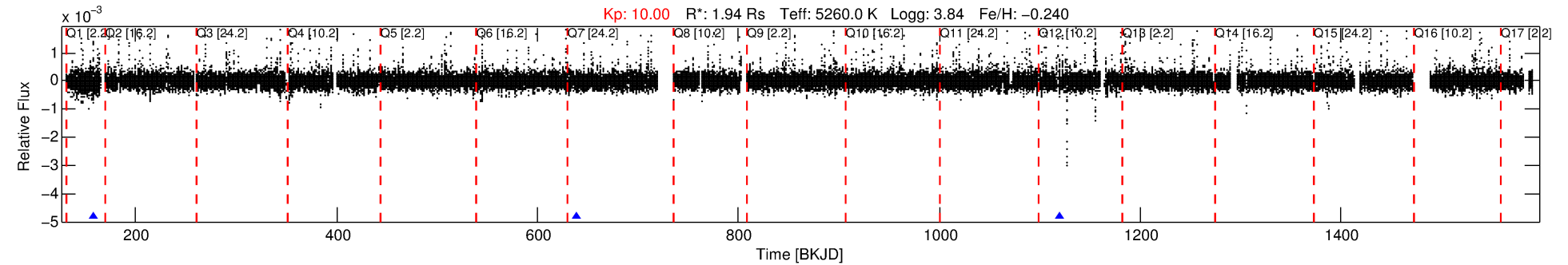
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007420545-03

No Significant Match Found

DV One-Page Summary

KIC: 7420545 Candidate: 3 of 6 Period: 480.735 d



DV Fit Results:

Period = 480.73499 [0.01628] d
Epoch = 157.7077 [0.0233] BKJD
Rp/R* = 0.0437 [0.1730]
a/R* = 133.16 [127.69]
b = 1.00 [0.19]
Seff = 1.86 [2.21]
Teq = 298 [89] K
Rp = 9.27 [37.14] Re
a = 1.1811 [0.8215] AU
Ag = 2200.65 [17633.87] [0.12 σ]
Teffp = 3152 [6245] K [0.46 σ]

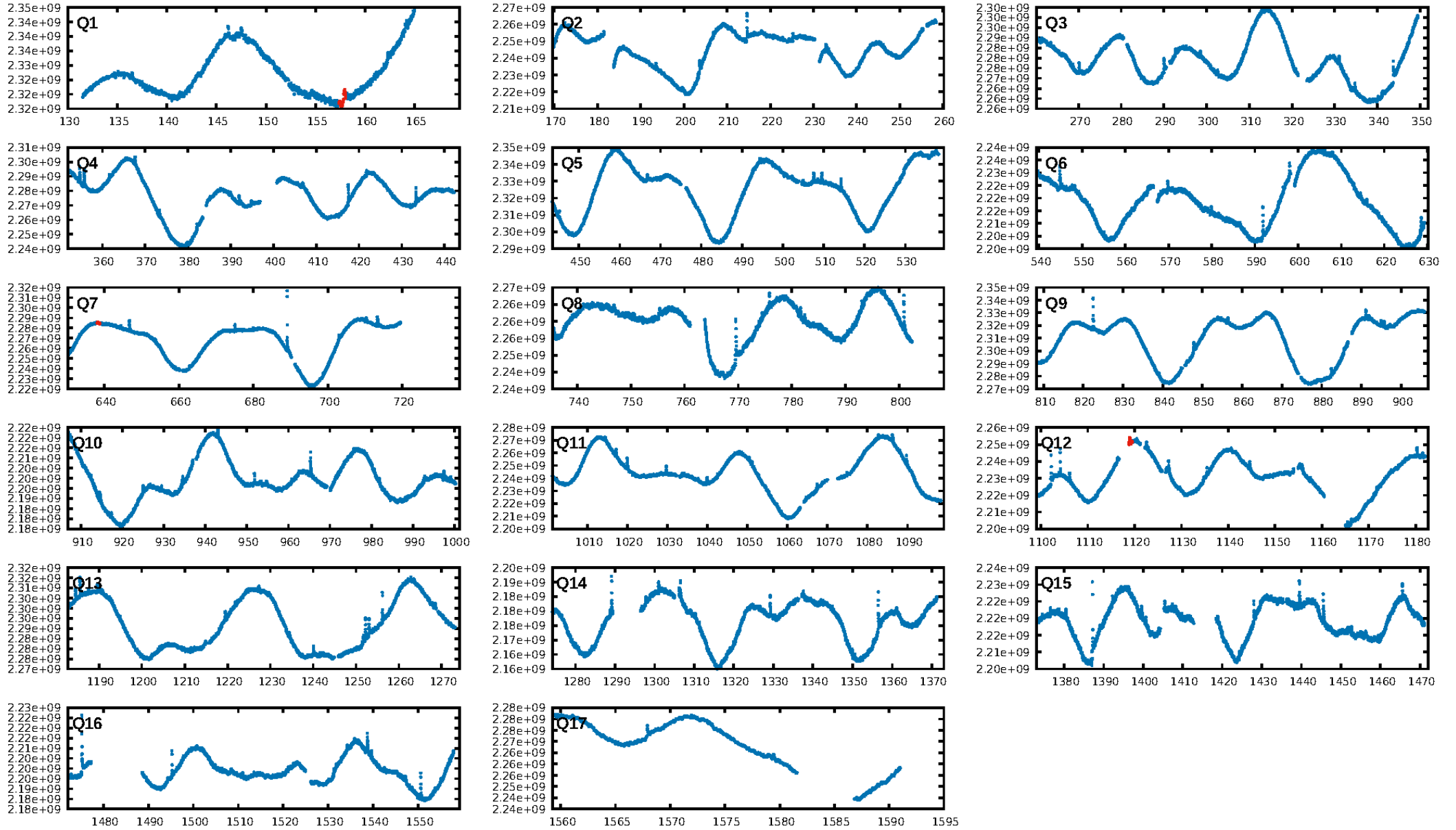
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [19.04 σ]
ModelChiSquare2-sig: 1.2%
ModelChiSquareGof-sig: 73.9%
Bootstrap-pfa: 5.28e-10
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: N/A
Centroid-sig: 35.1%
Centroid-so: 1.270 arcsec [2.18 σ]
OotOffset-rm: 1.683 arcsec [0.87 σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-rm: 1.754 arcsec [1.27 σ]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [2/2]

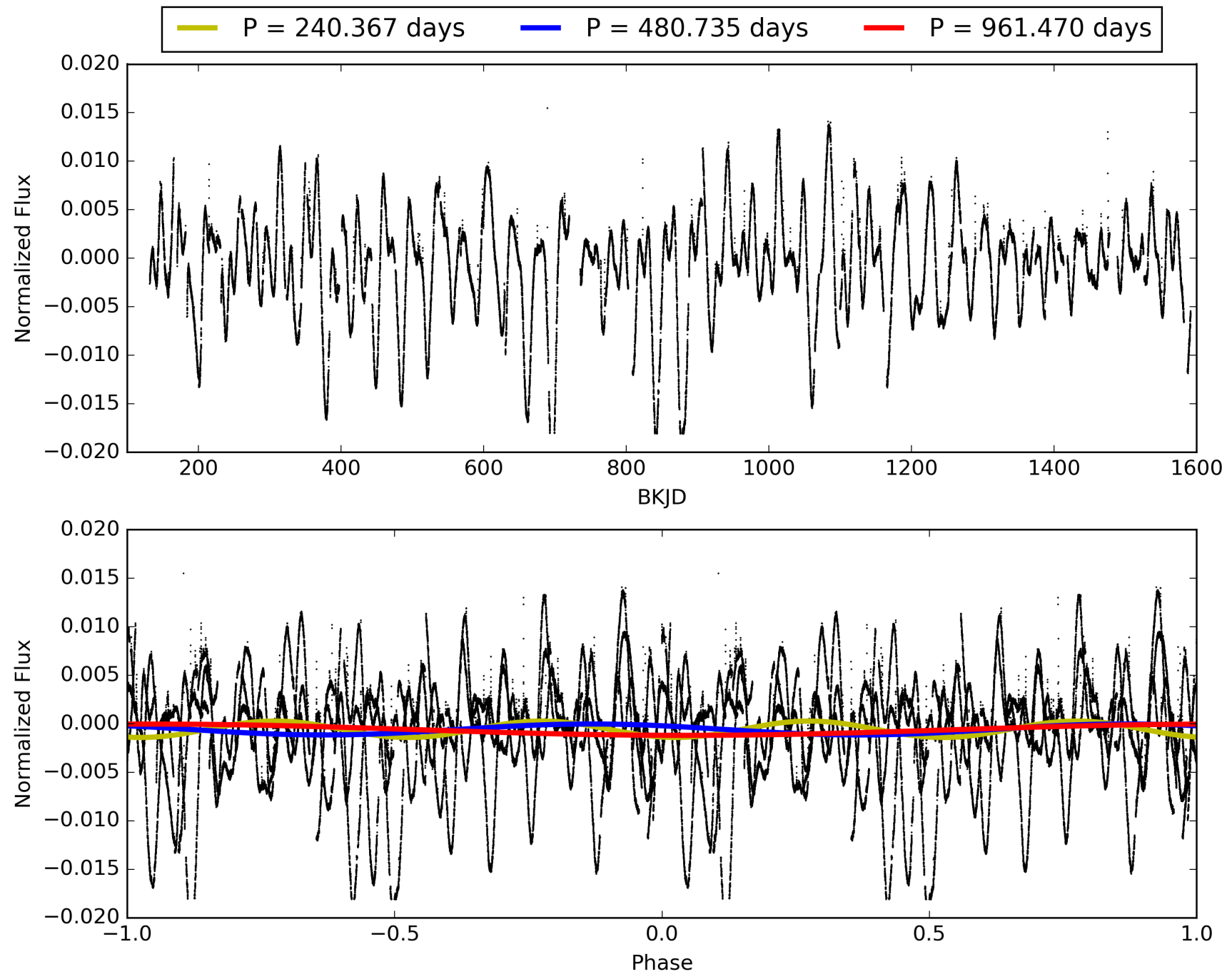
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 007420545-03, PDC Light Curves

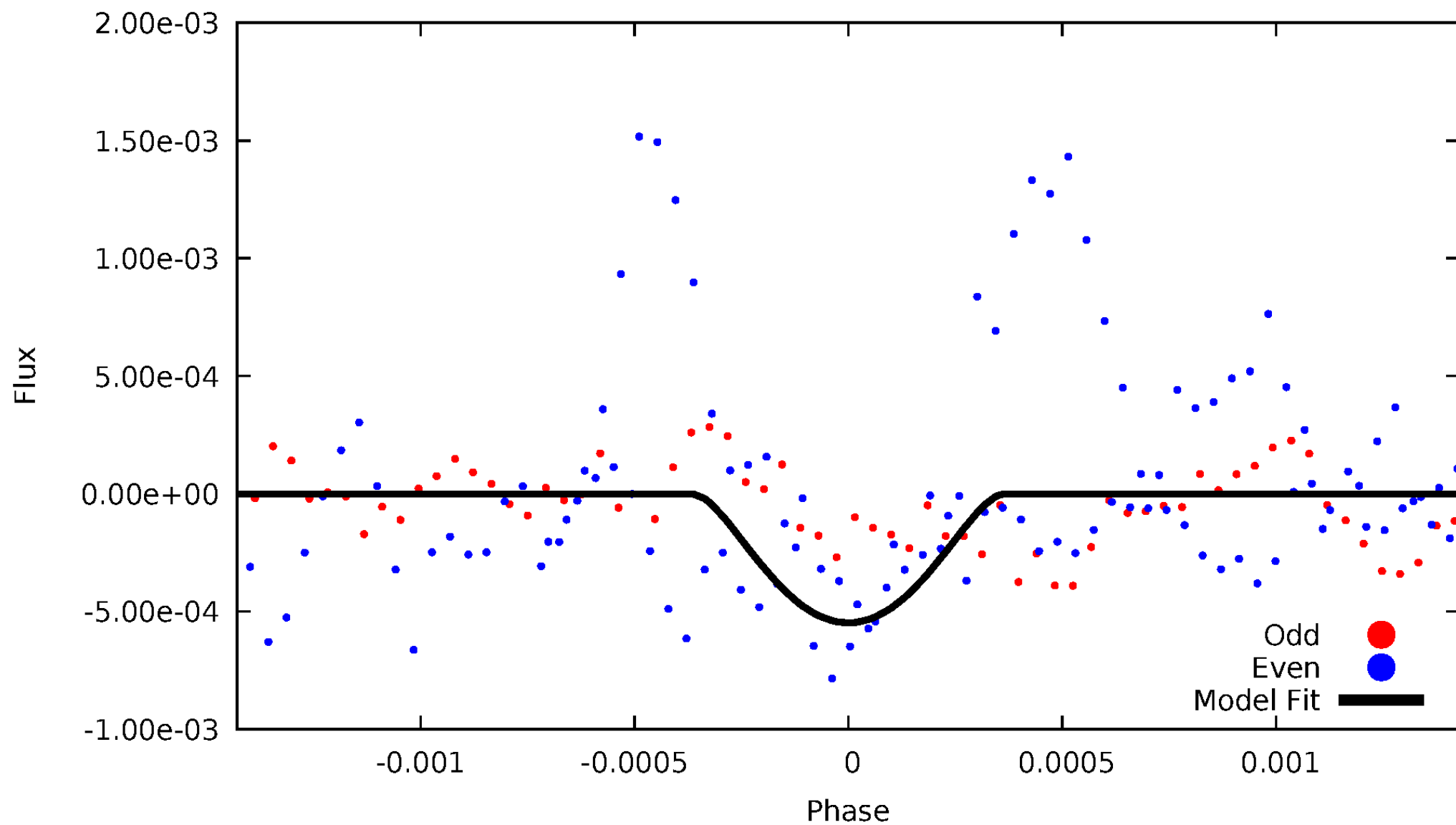


TCE 007420545-03



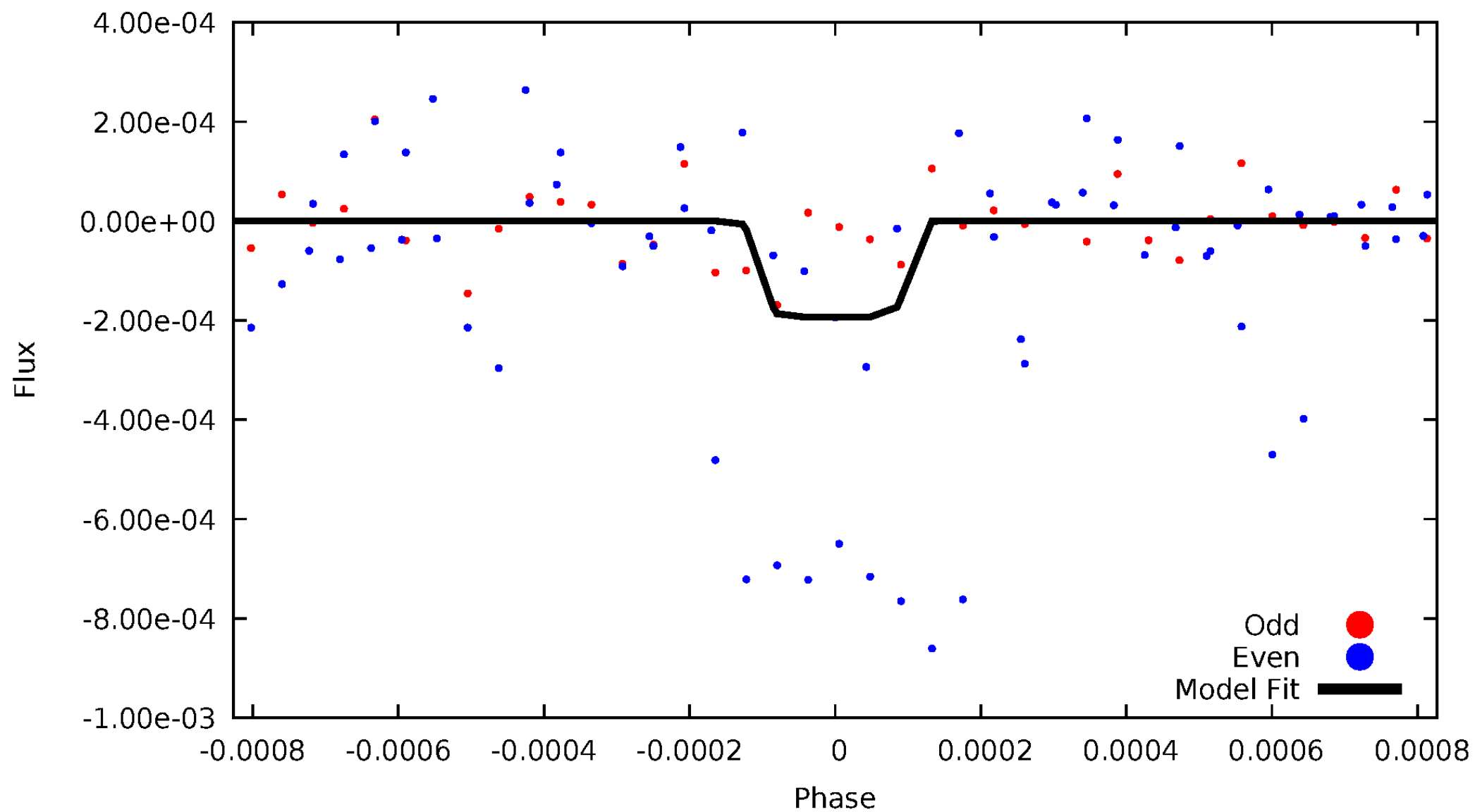
DV Odd/Even

TCE 007420545-03



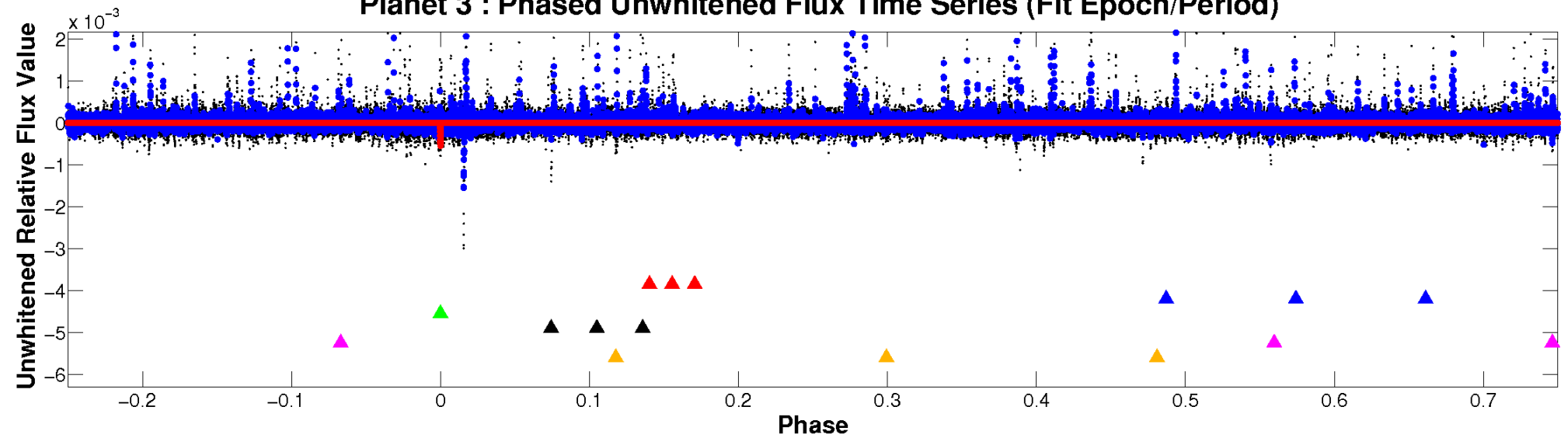
ALT Odd/Even

TCE 007420545-03

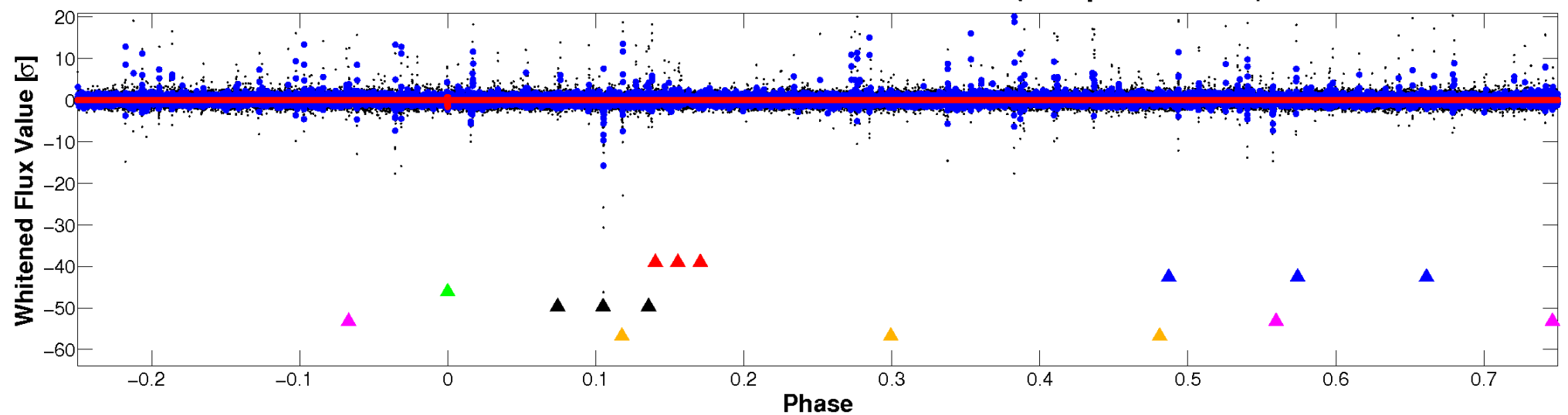


Non-Whitened Vs. Whitened Light Curve

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

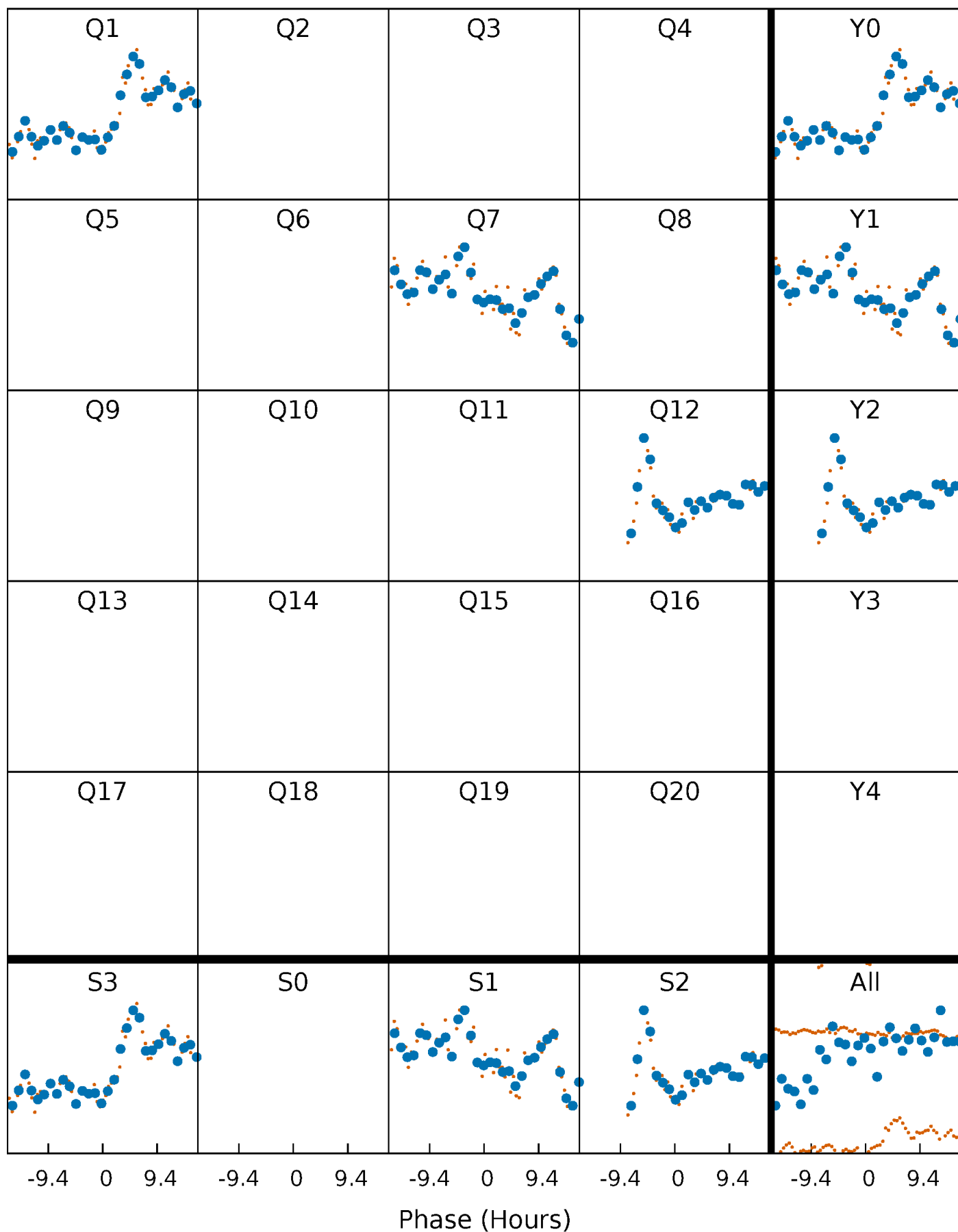


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



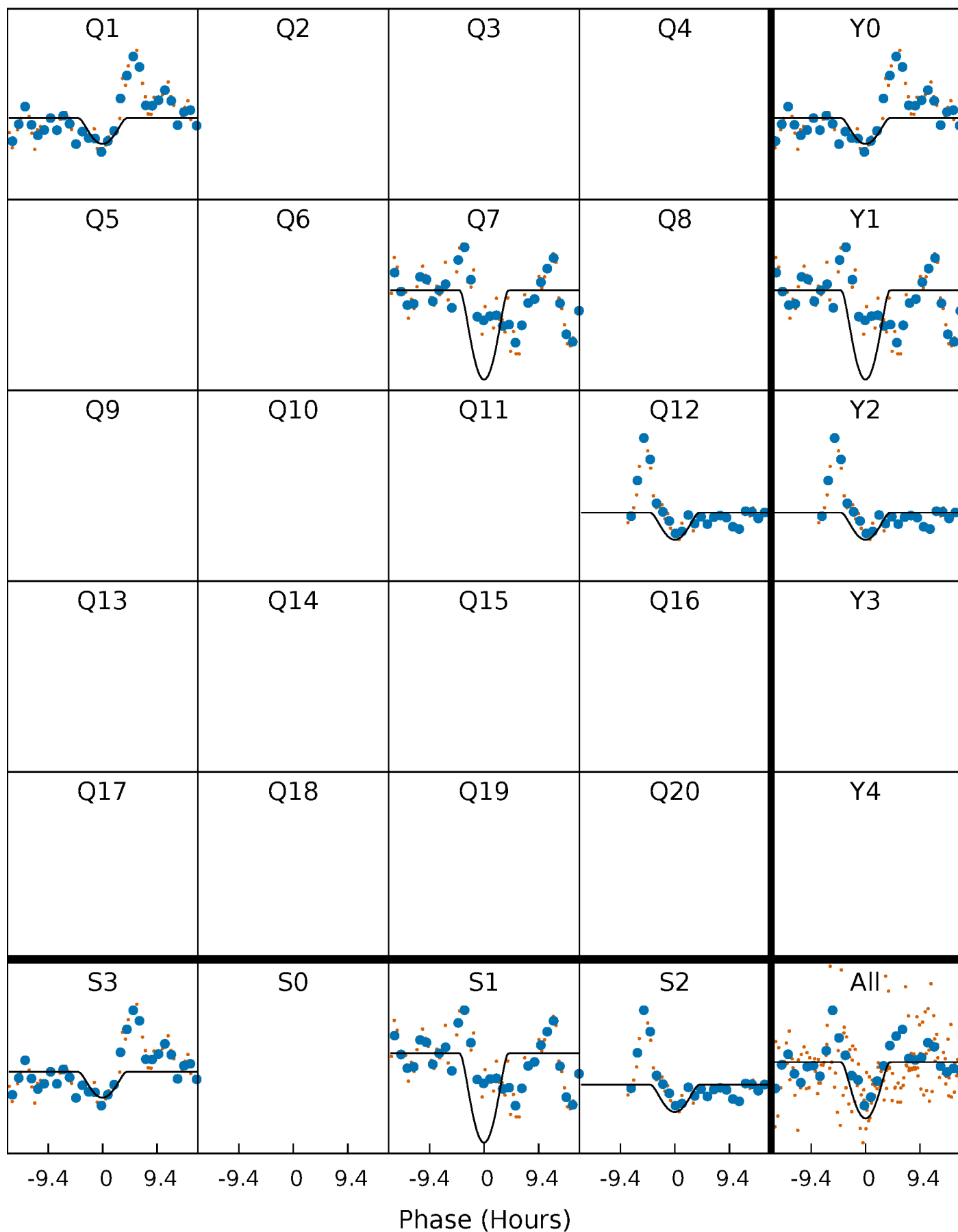
PDC Quarter-Phased Transit Curves

TCE 007420545-03 P=480.734986 Days $T_0=157.707666$ (BKJD)



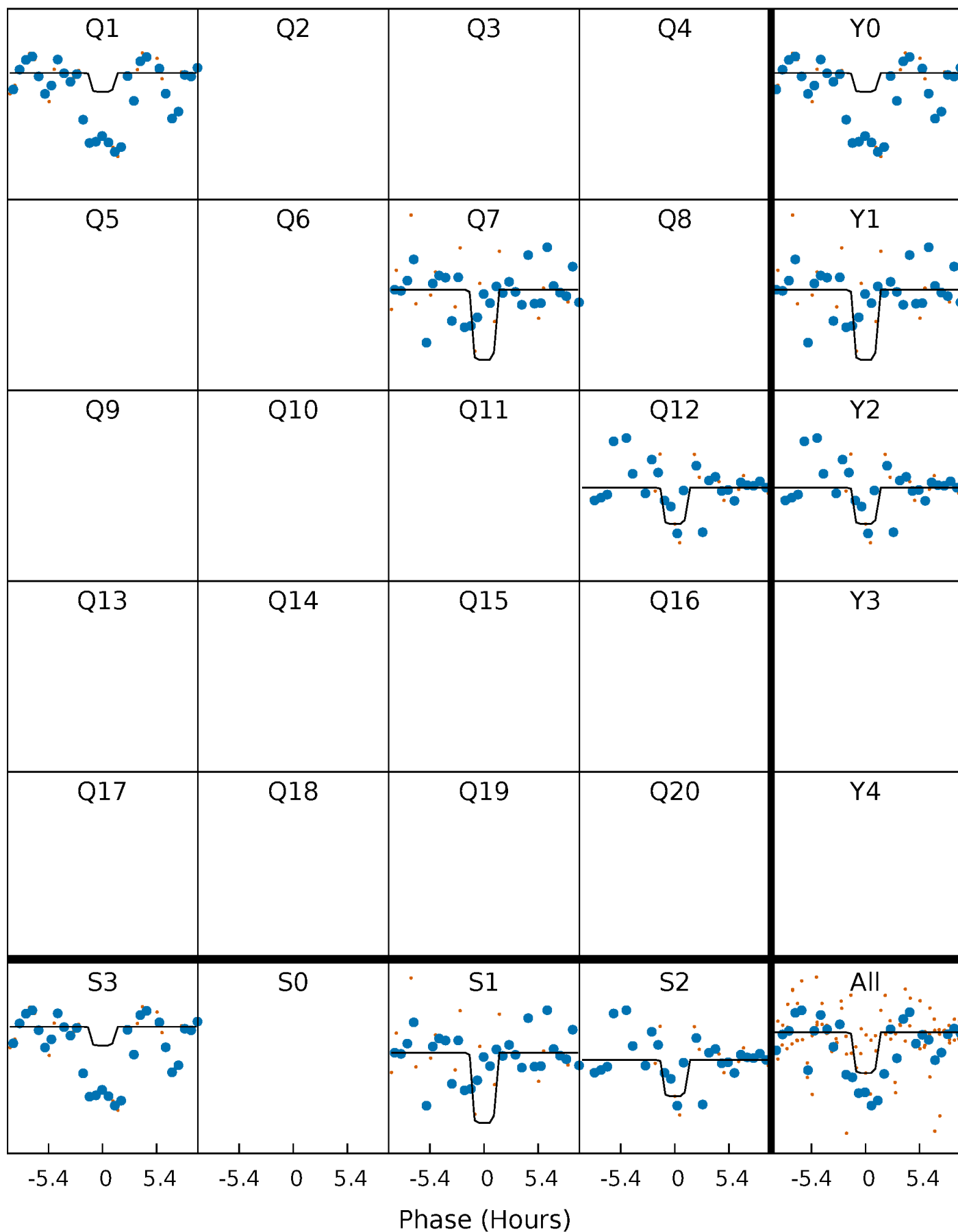
DV Quarter-Phased Transit Curves

TCE 007420545-03 P=480.734986 Days $T_0=157.707666$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

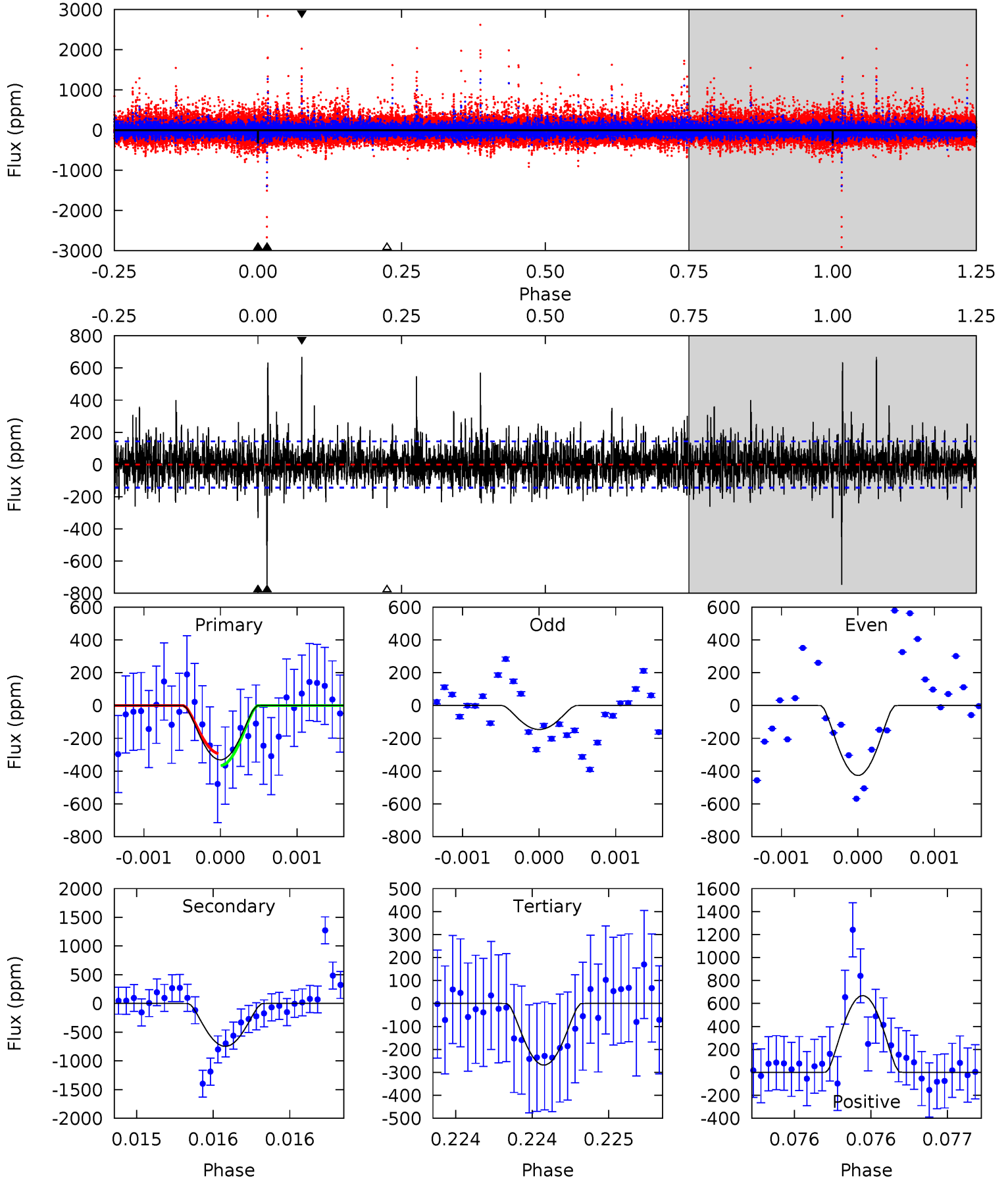
TCE 007420545-03 P=480.719933 Days $T_0=157.747845$ (BKJD)



DV Model-Shift Uniqueness Test

007420545-03, P = 480.734986 Days, E = 157.707666 Days

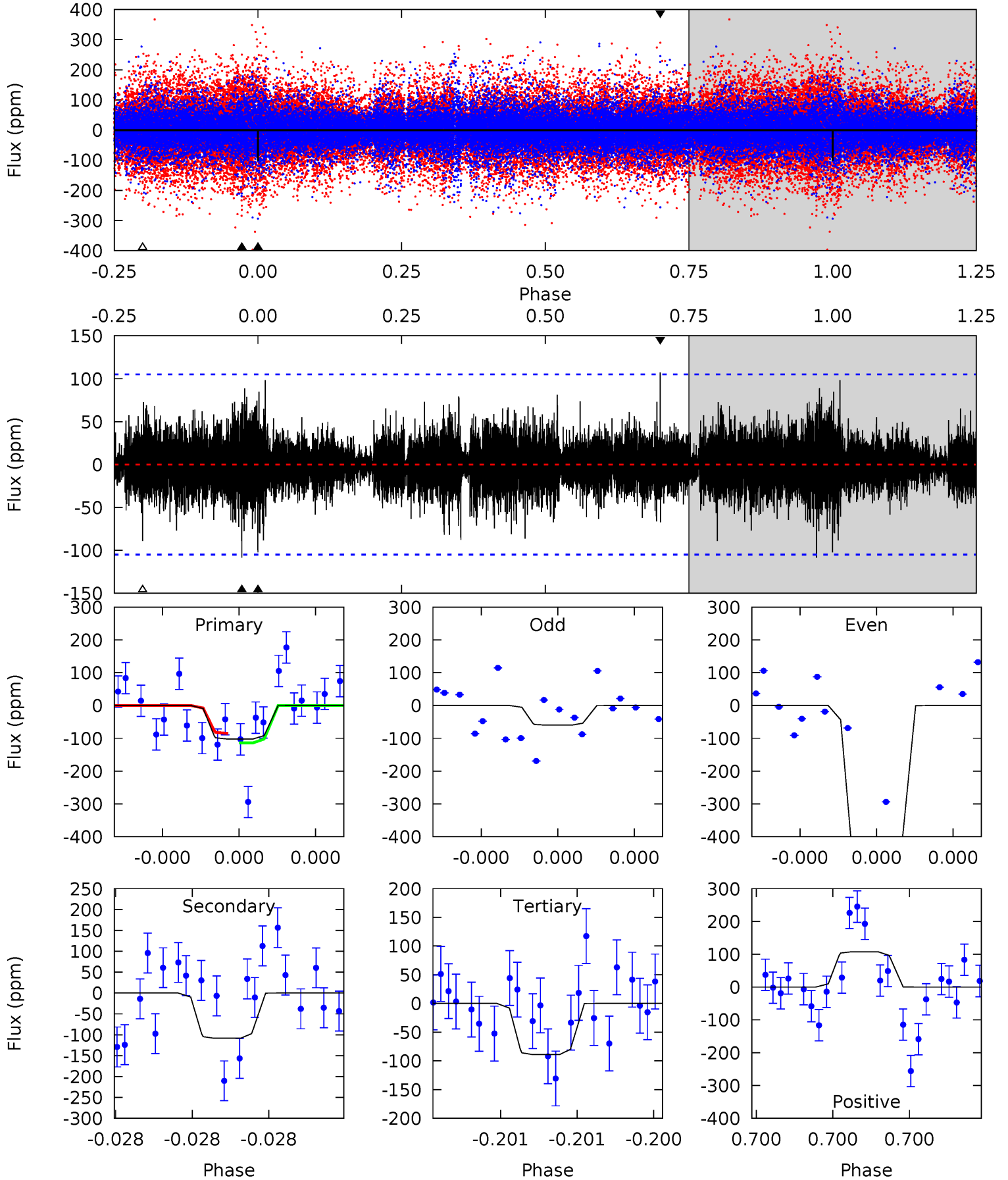
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	28.5	10.3	25.5	5.50	3.37	3.30	2.41	-12.8	18.3	3.00	3.59	1.21	0.47	1.40



Alt Model-Shift Uniqueness Test

007420545-03, P = 480.719933 Days, E = 157.747845 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.53	5.86	4.82	5.81	5.69	3.65	0.98	0.71	-0.28	1.04	0.05	12.5	2.22	0.50	0



Stellar Parameters For KIC 007420545

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5260^{+158}_{-142}	$3.839^{+0.721}_{-0.309}$	$-0.240^{+0.350}_{-0.250}$	$1.943^{+1.005}_{-1.228}$	$0.951^{+0.218}_{-0.179}$	$0.183^{+2.352}_{-0.124}$
	+3%/-3%	+19%/-8%	+146%/-104%	+52%/-63%	+23%/-19%	+1287%/-68%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007420545-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-747 ± 26	$26.60^{+29.21}_{-18.07}$	410^{+60}_{-67}	3029^{+1216}_{-542}	793^{+6767}_{-614}
Alt.	-108 ± 18	$24.04^{+30.88}_{-17.59}$	411^{+54}_{-71}	2365^{+927}_{-332}	146^{+1706}_{-119}

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

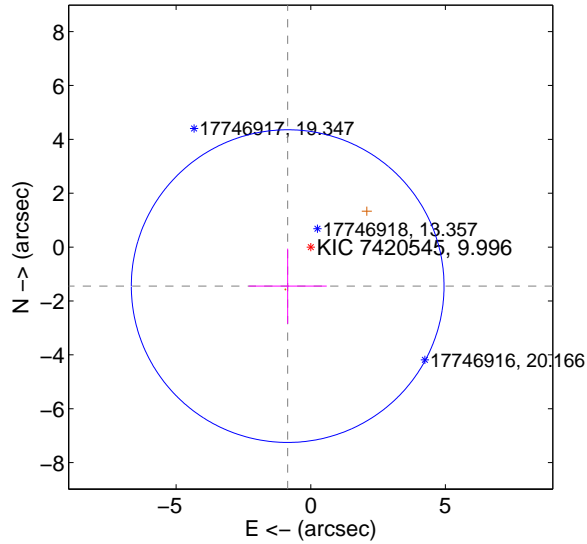
Supplemental centroid analysis for 007420545-03. **Kepler magnitude: 10.00.** Transit SNR 7.35

There are 0 quarters with good PRF difference image offsets

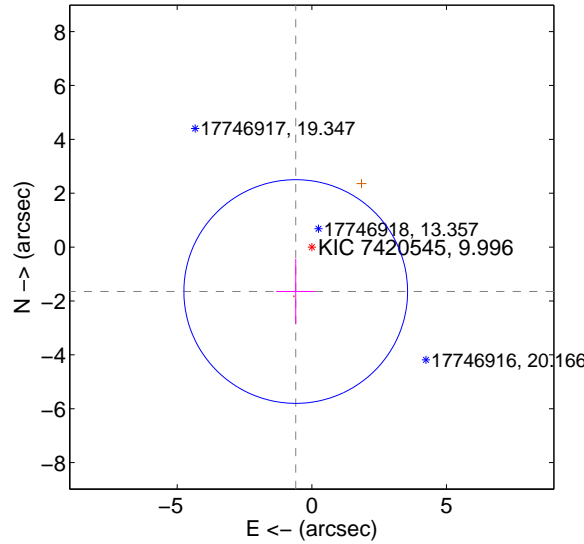
The direct PRF centroid is offset from the target star catalog position by about 1.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.683 ± 1.935	0.87	0.857 ± 1.448	-1.448 ± 1.393
PRF-fit source offset from KIC position	1.754 ± 1.384	1.27	0.597 ± 0.727	-1.649 ± 1.210
photometric centroid source offset	1.27 ± 0.58	2.18	1.05 ± 0.63	0.72 ± 0.47

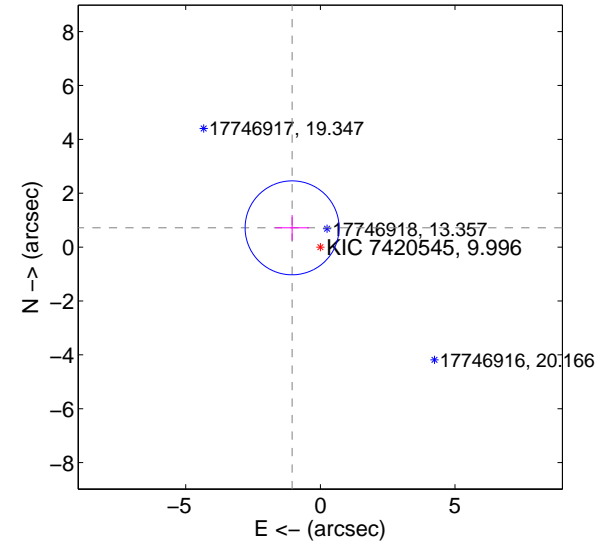
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

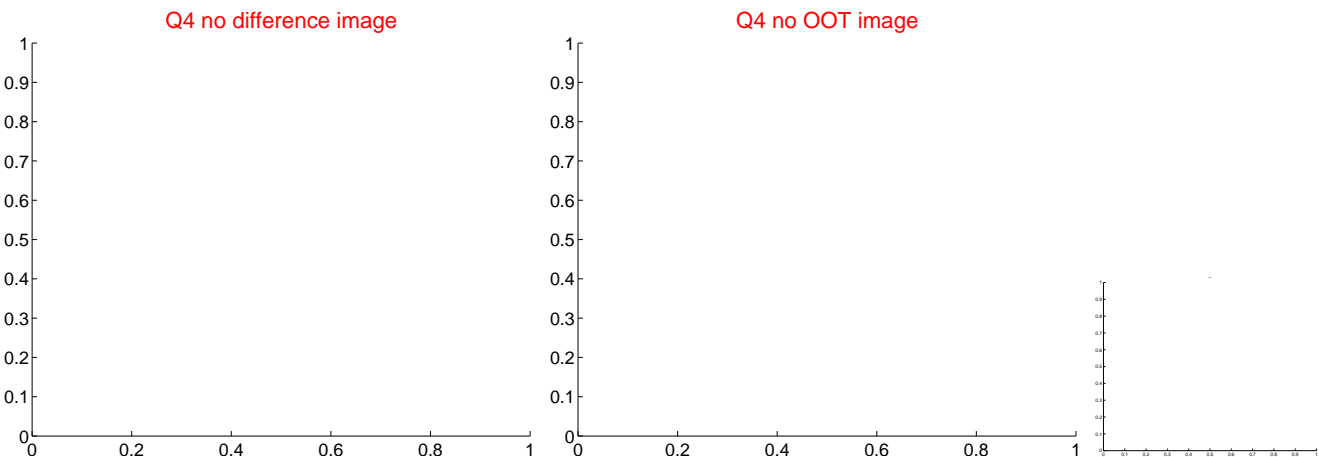
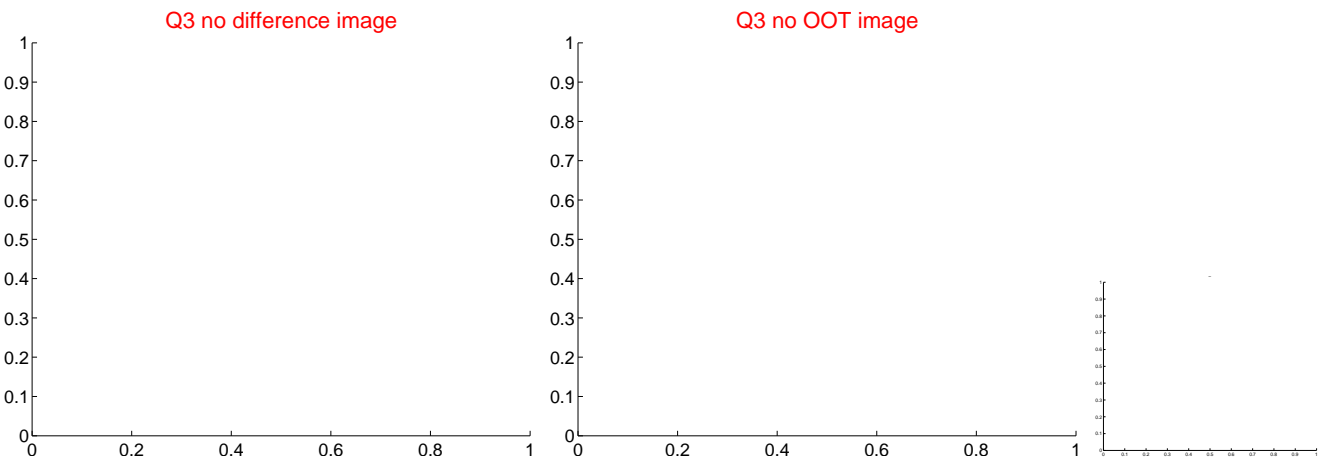
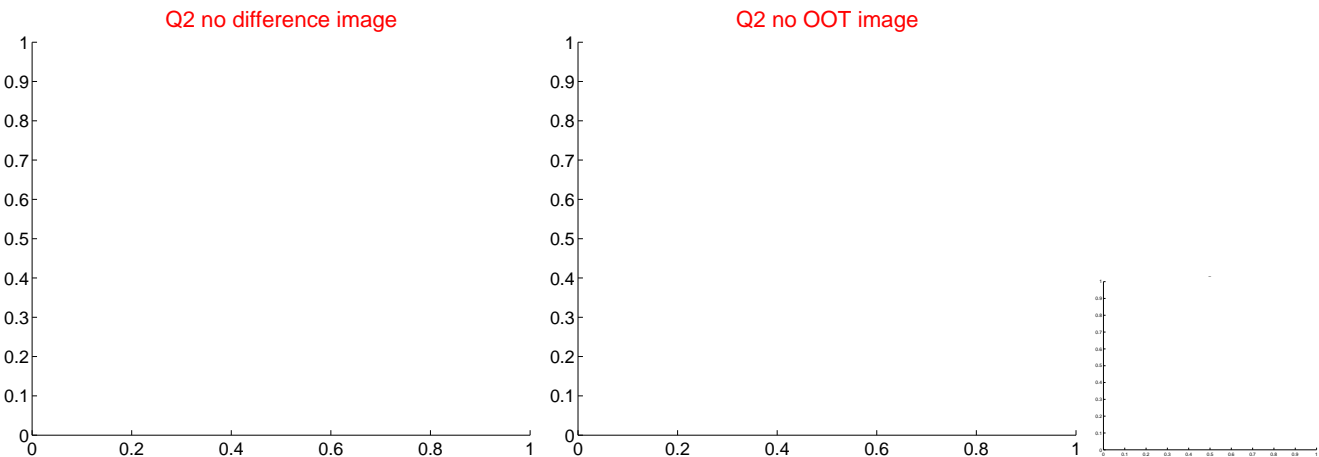
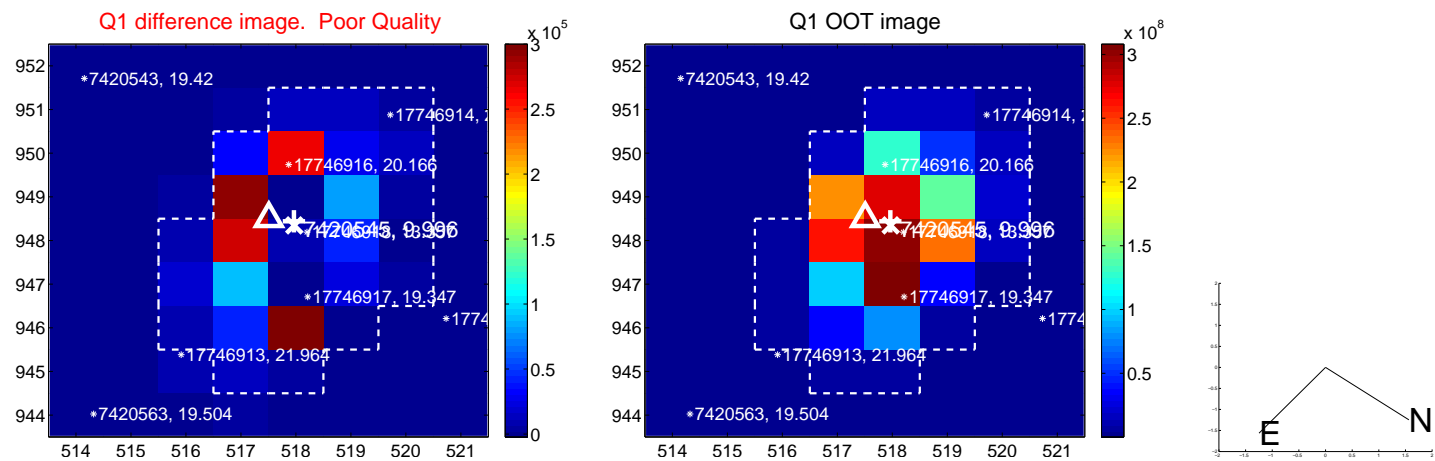


offset from photometric centroids

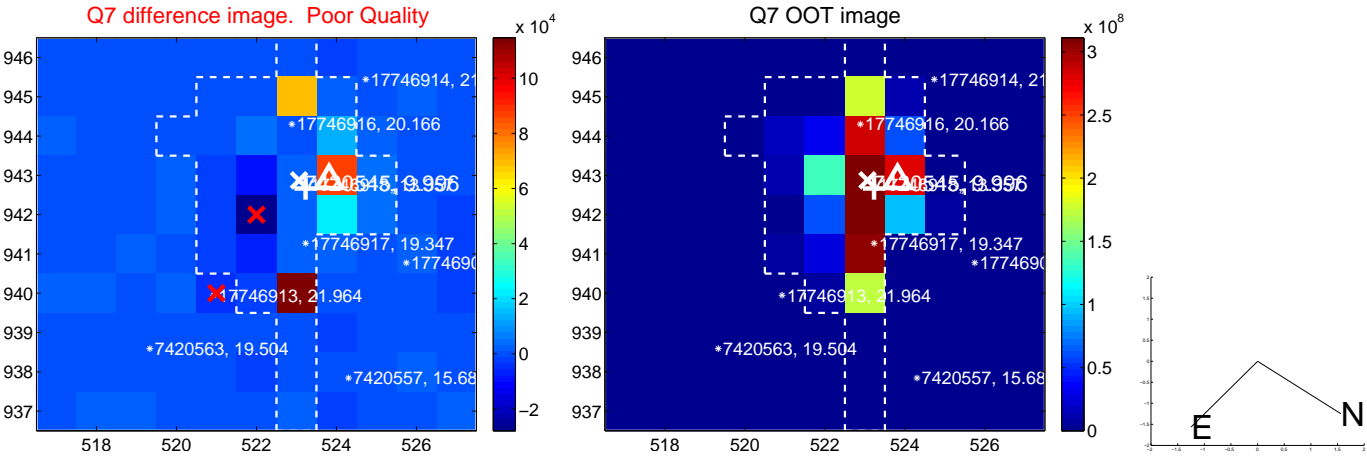


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



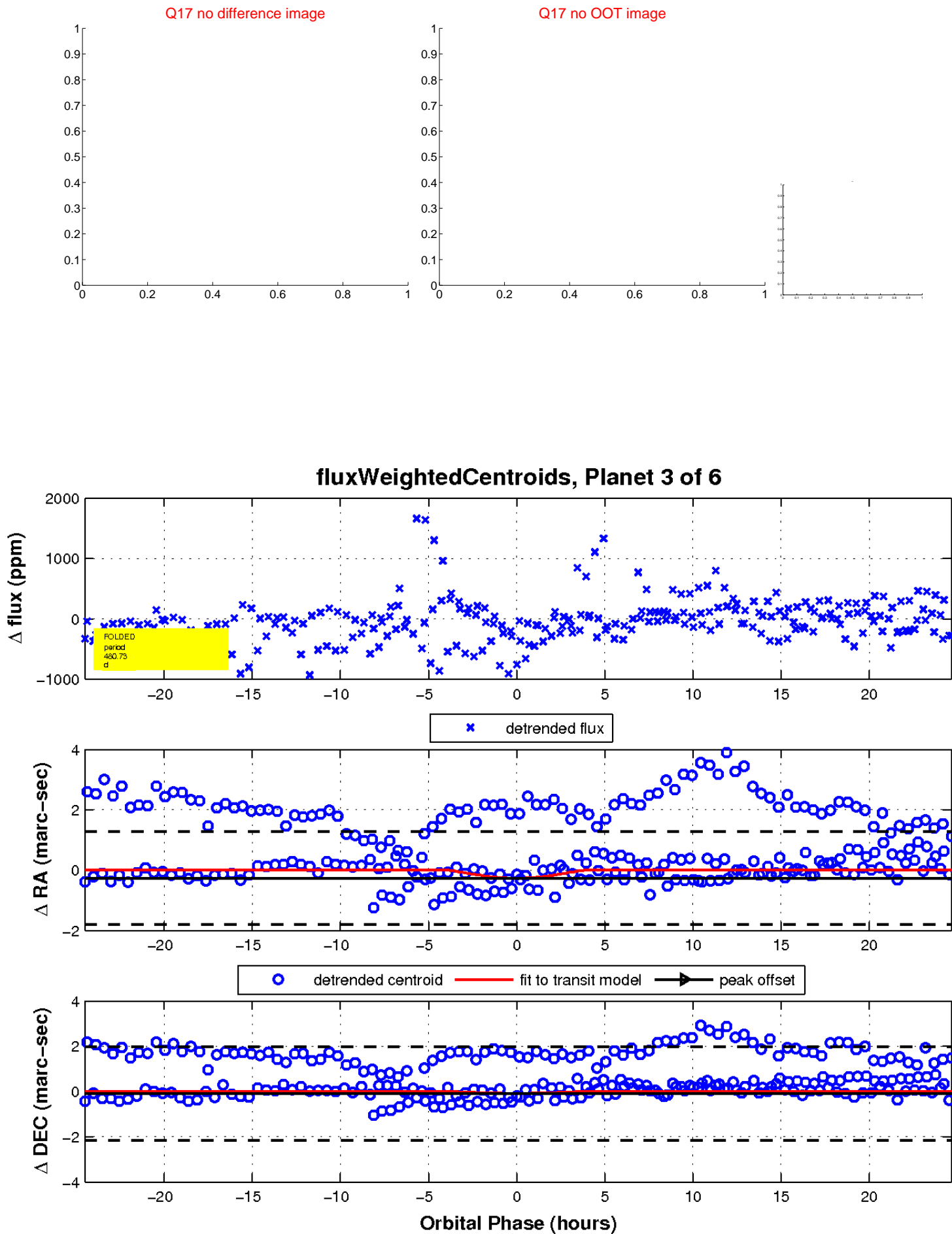
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



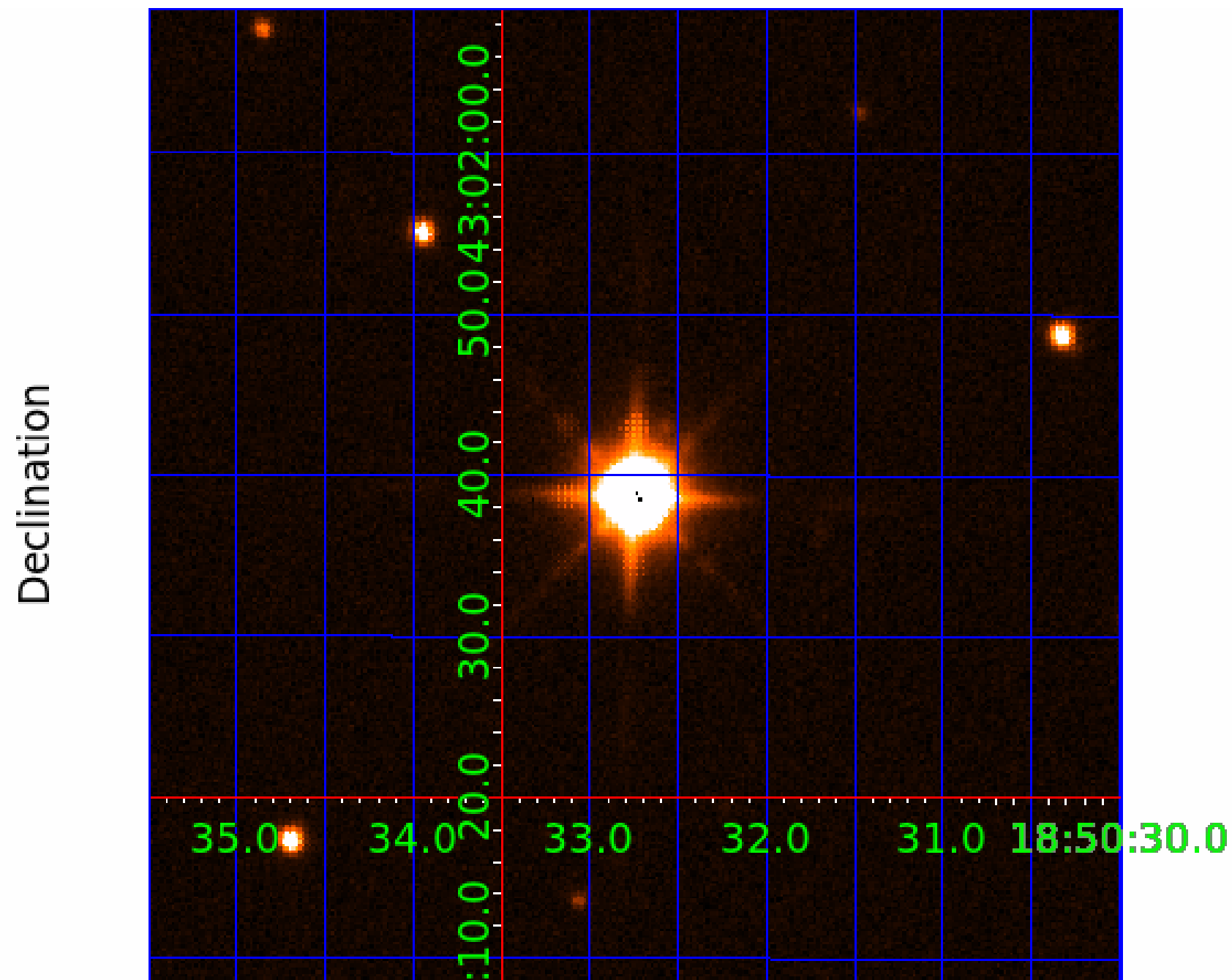
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007420545

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})
007420545-01	OBS	No	488.035803	225.150084	536.5	4.088	14.9	7.0	1.94	5260	5.68	1.82
007420545-03	OBS	No	480.734986	157.707666	548.4	8.242	9.9	7.4	1.94	5260	9.27	1.86
007420545-05	OBS	No	570.484678	426.754249	452.4	9.262	11.0	6.7	1.94	5260	4.50	1.48
007420545-06	OBS	No	568.056503	214.289091	138.9	13.905	8.6	2.1	1.94	5260	2.25	1.49

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007420545-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007420545-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007420545-05	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—CENT_SATURATED
007420545-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

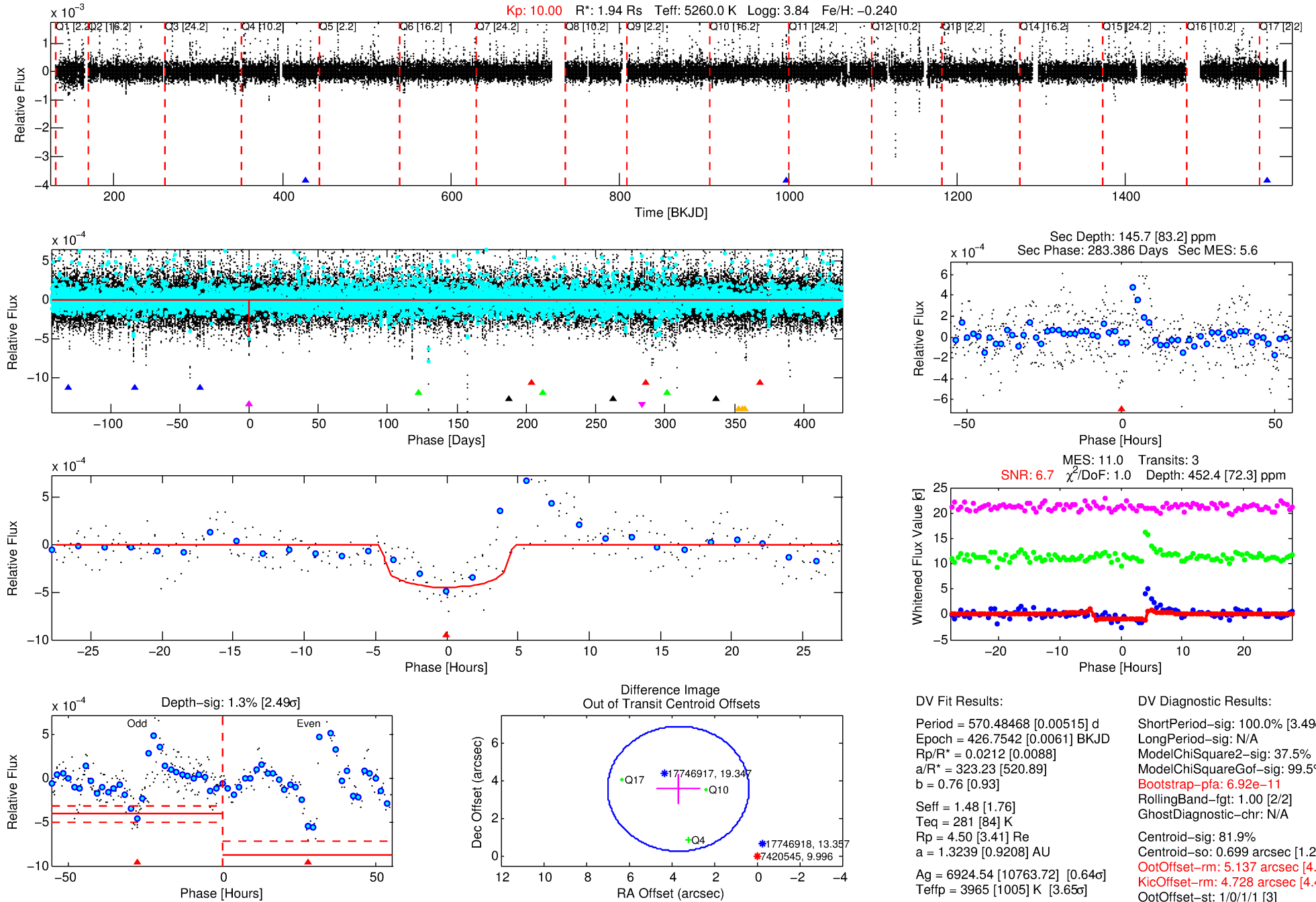
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007420545-05

No Significant Match Found

DV One-Page Summary

KIC: 7420545 Candidate: 5 of 6 Period: 570.485 d



DV Fit Results:

Period = 570.48468 [0.00515] d
Epoch = 426.7542 [0.0061] BKJD
Rp/R* = 0.0212 [0.0088]
a/R* = 323.23 [520.89]
b = 0.76 [0.93]
Seff = 1.48 [1.76]
Teq = 281 [84] K
Rp = 4.50 [3.41] Re
a = 1.3239 [0.9208] AU
Ag = 6924.54 [10763.72] [0.64σ]
Teffp = 3965 [1005] K [3.65σ]

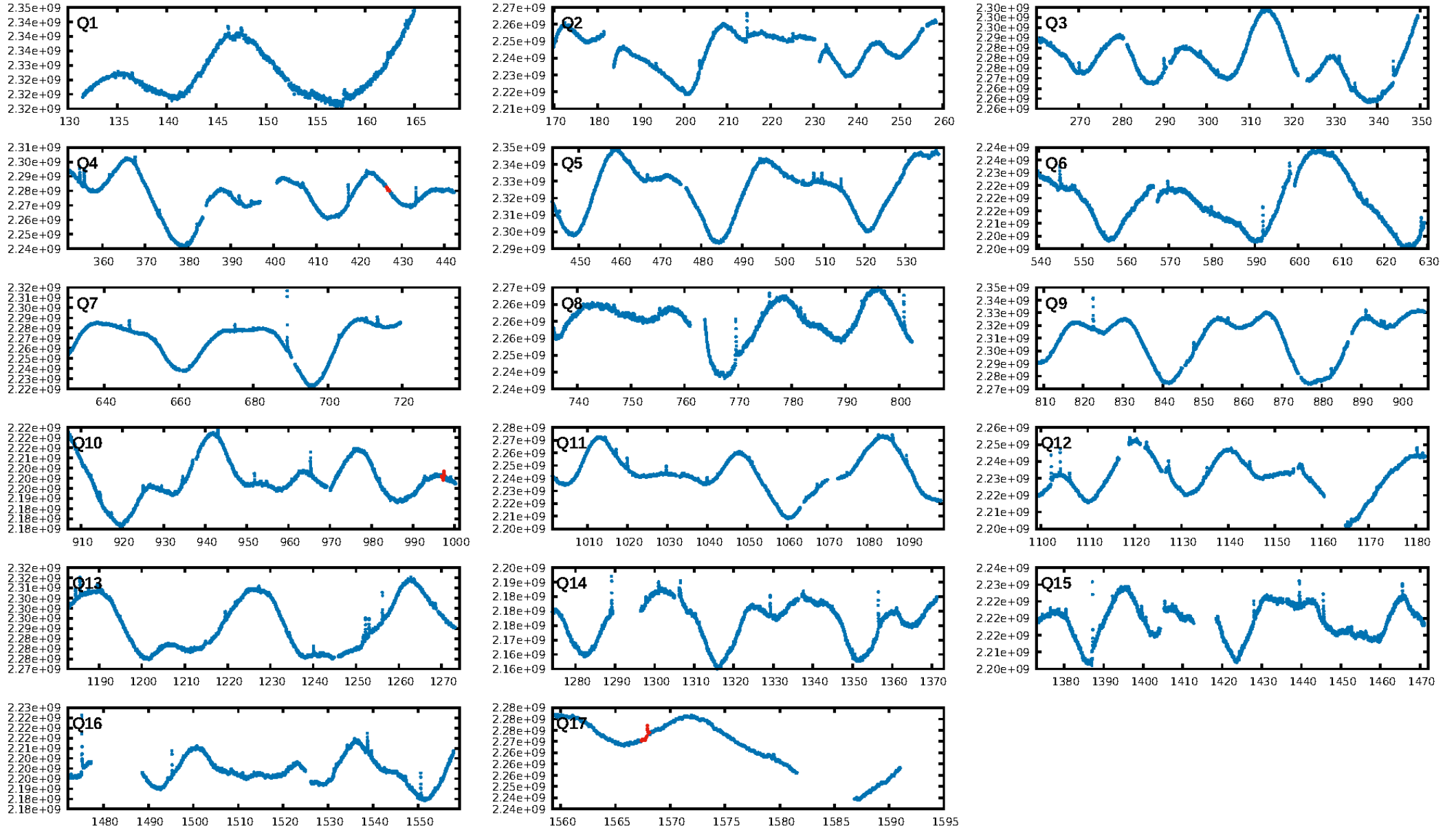
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [3.49σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 37.5%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 6.92e-11
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: N/A
Centroid-sig: 81.9%
Centroid-so: 0.699 arcsec [1.21σ]
OotOffset-rm: 5.137 arcsec [4.65σ]
KicOffset-rm: 4.728 arcsec [4.44σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

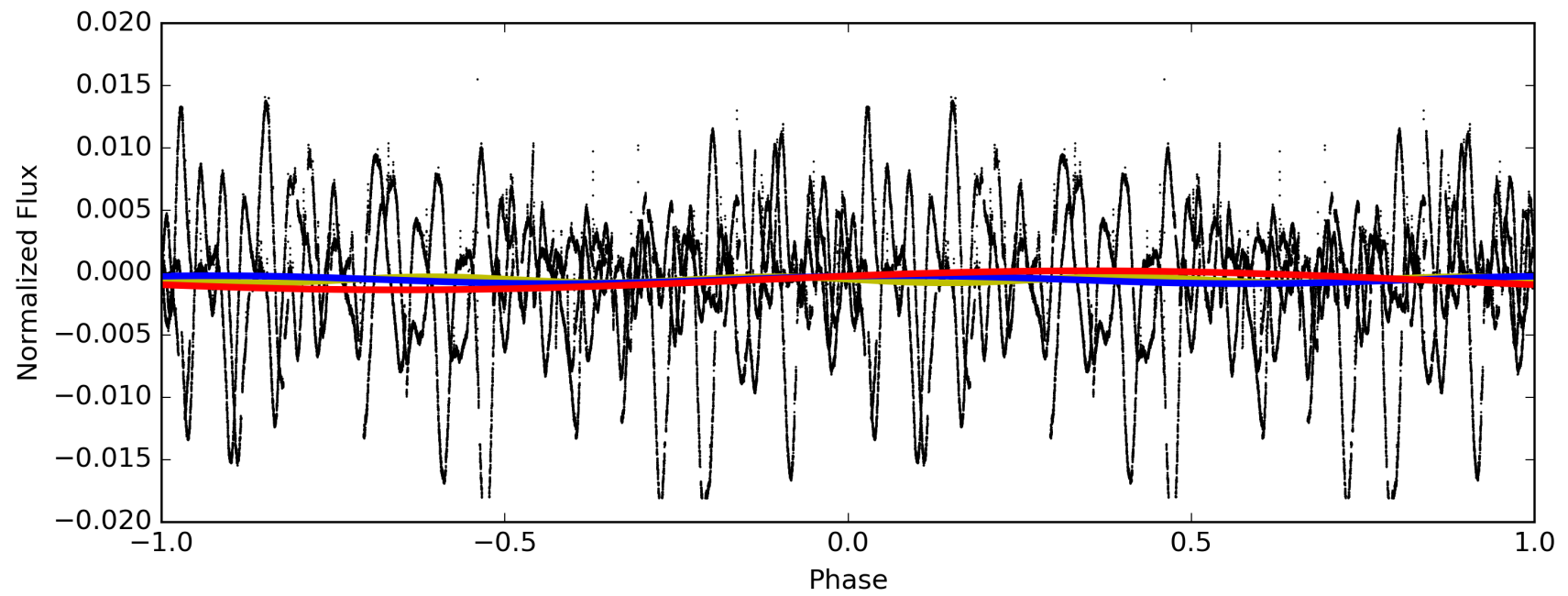
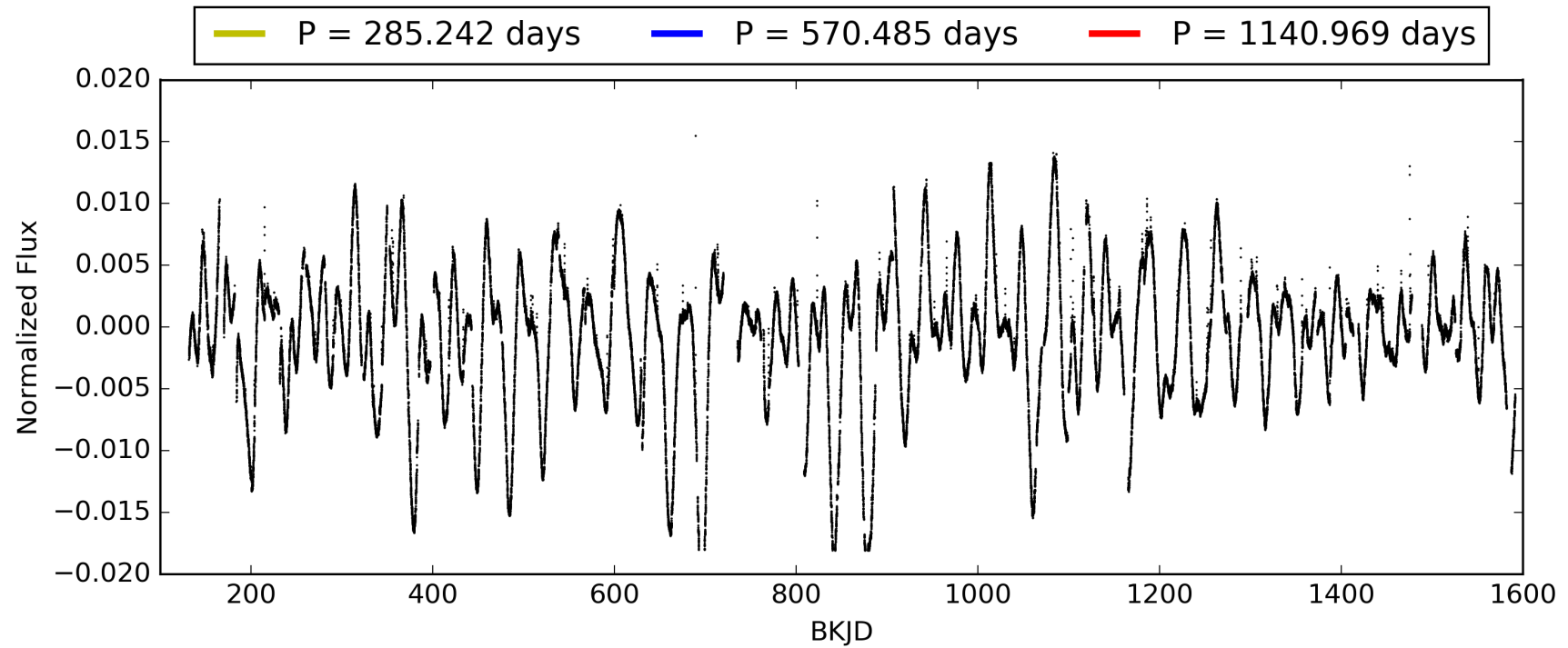
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 05:21:27 Z

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

TCE 007420545-05, PDC Light Curves

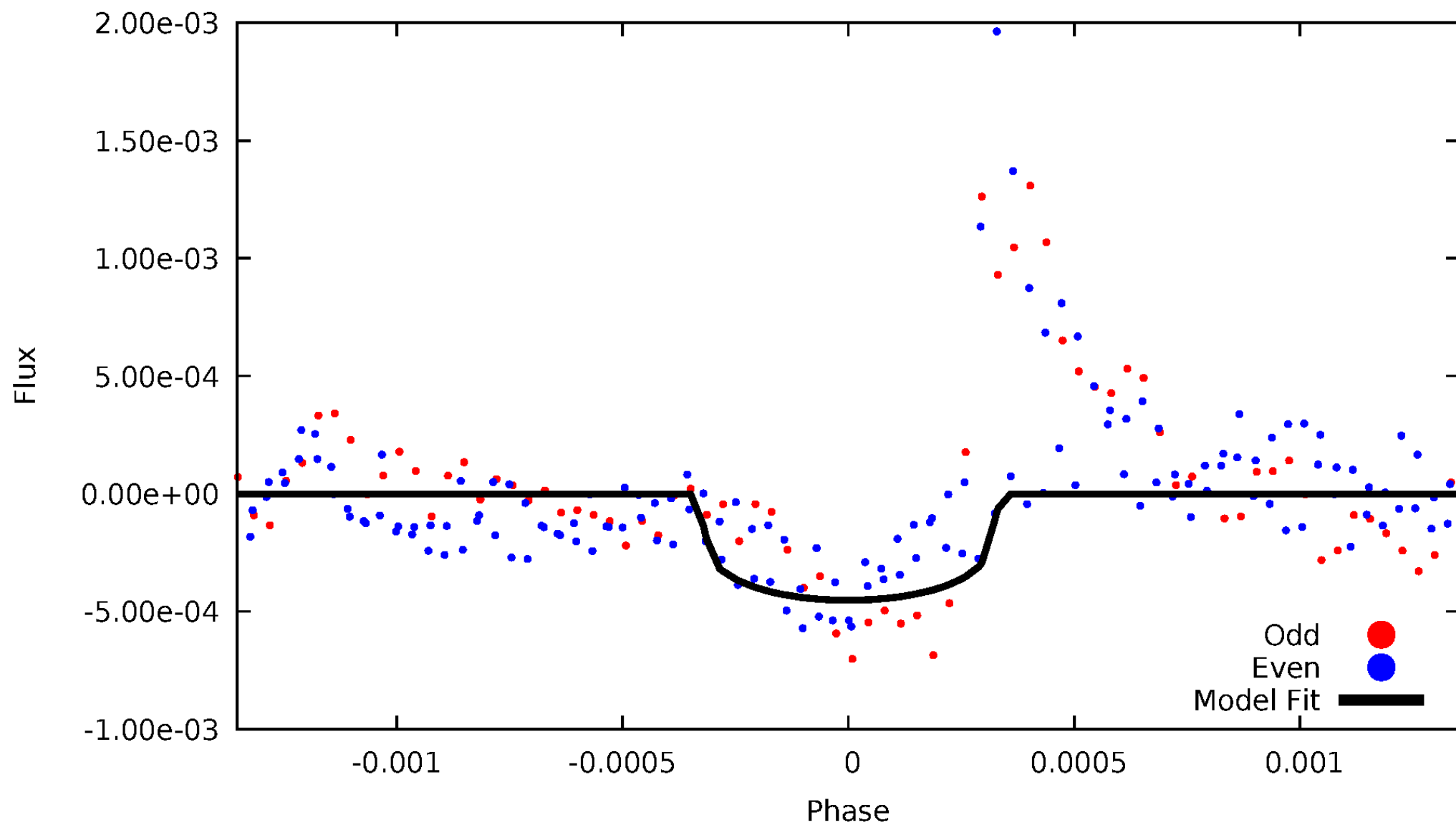


TCE 007420545-05



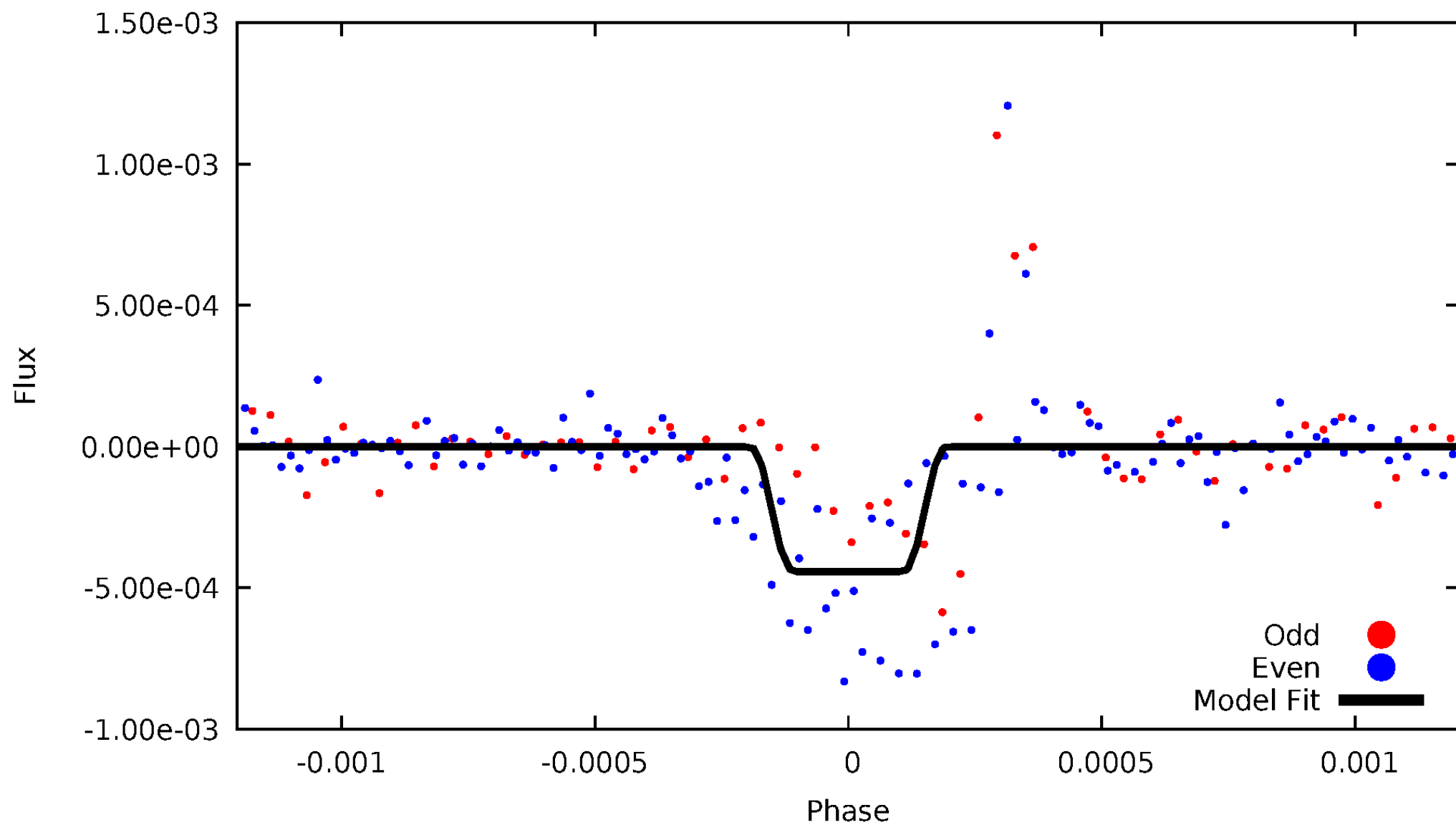
DV Odd/Even

TCE 007420545-05



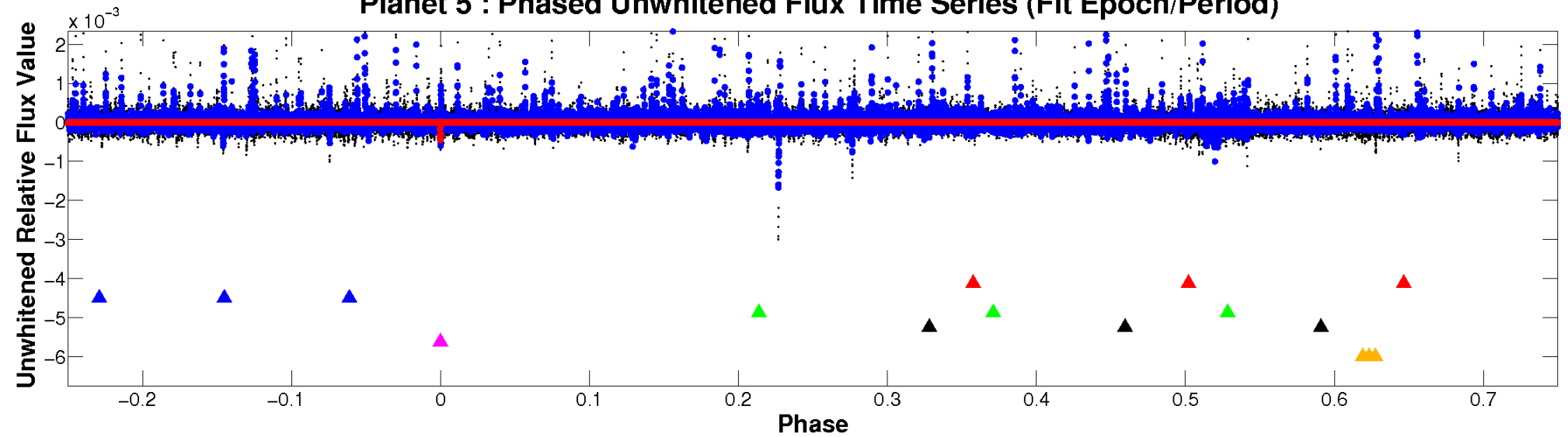
ALT Odd/Even

TCE 007420545-05

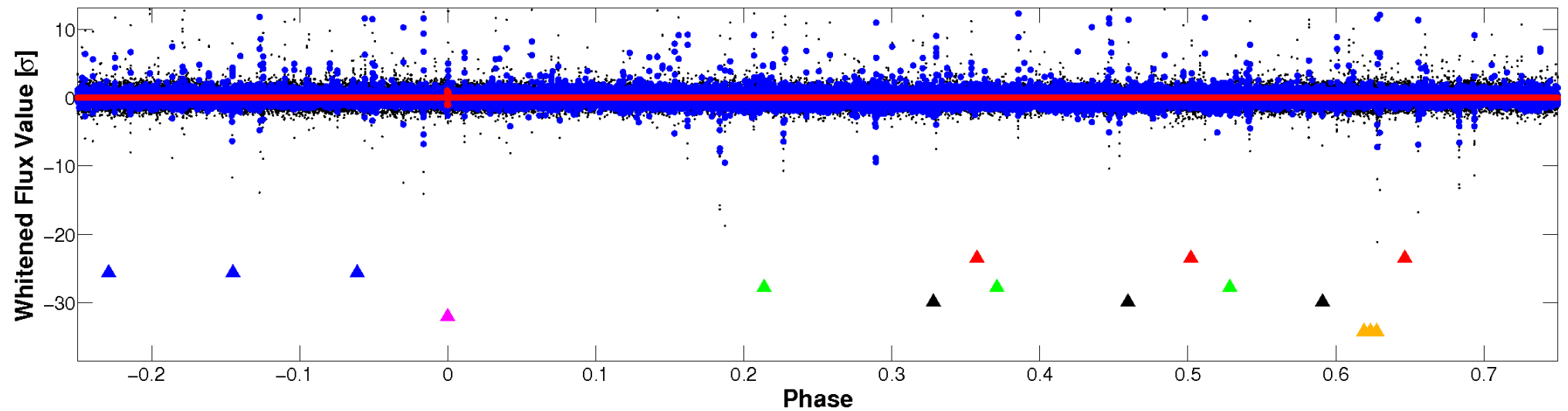


Non-Whitened Vs. Whitened Light Curve

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

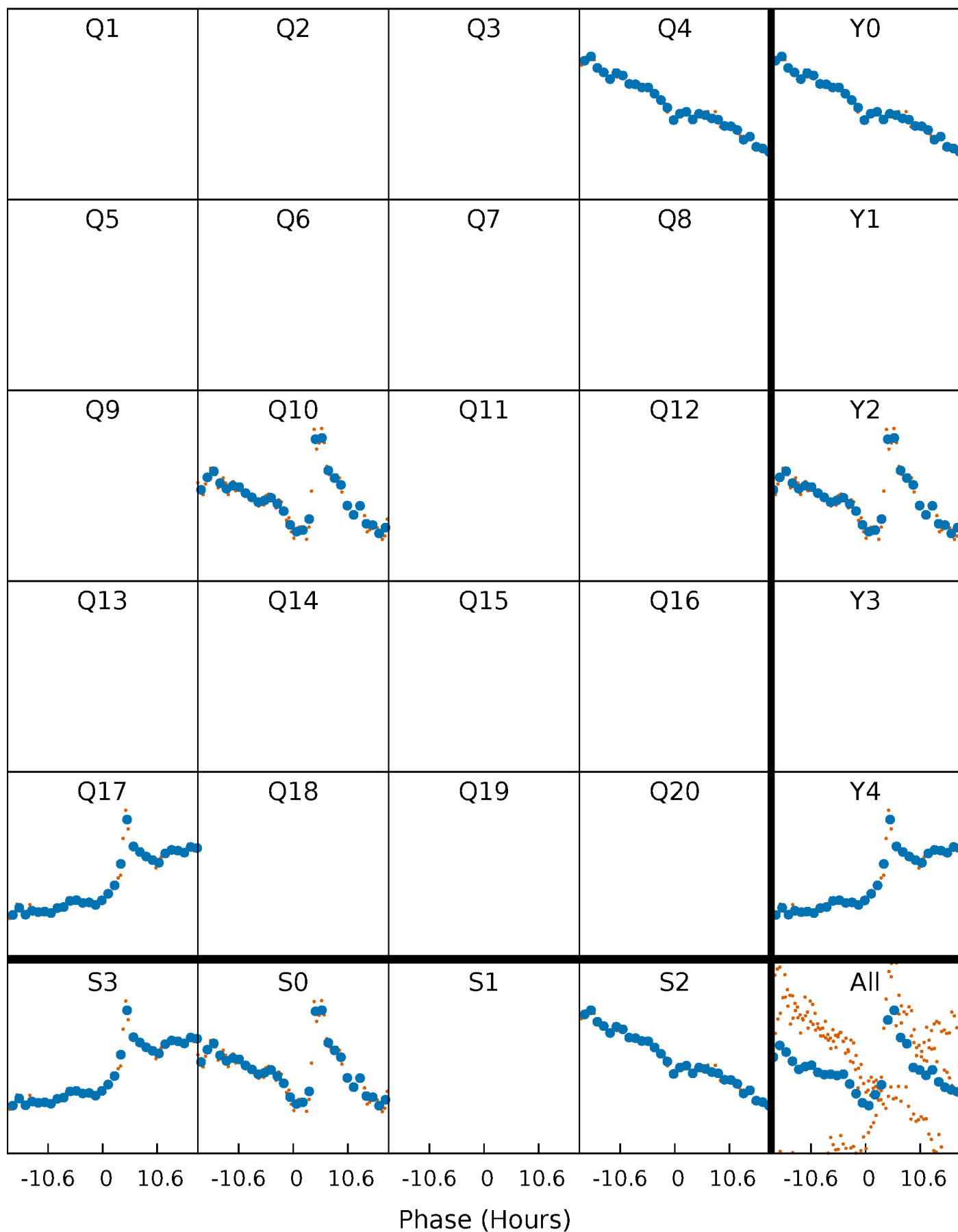


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



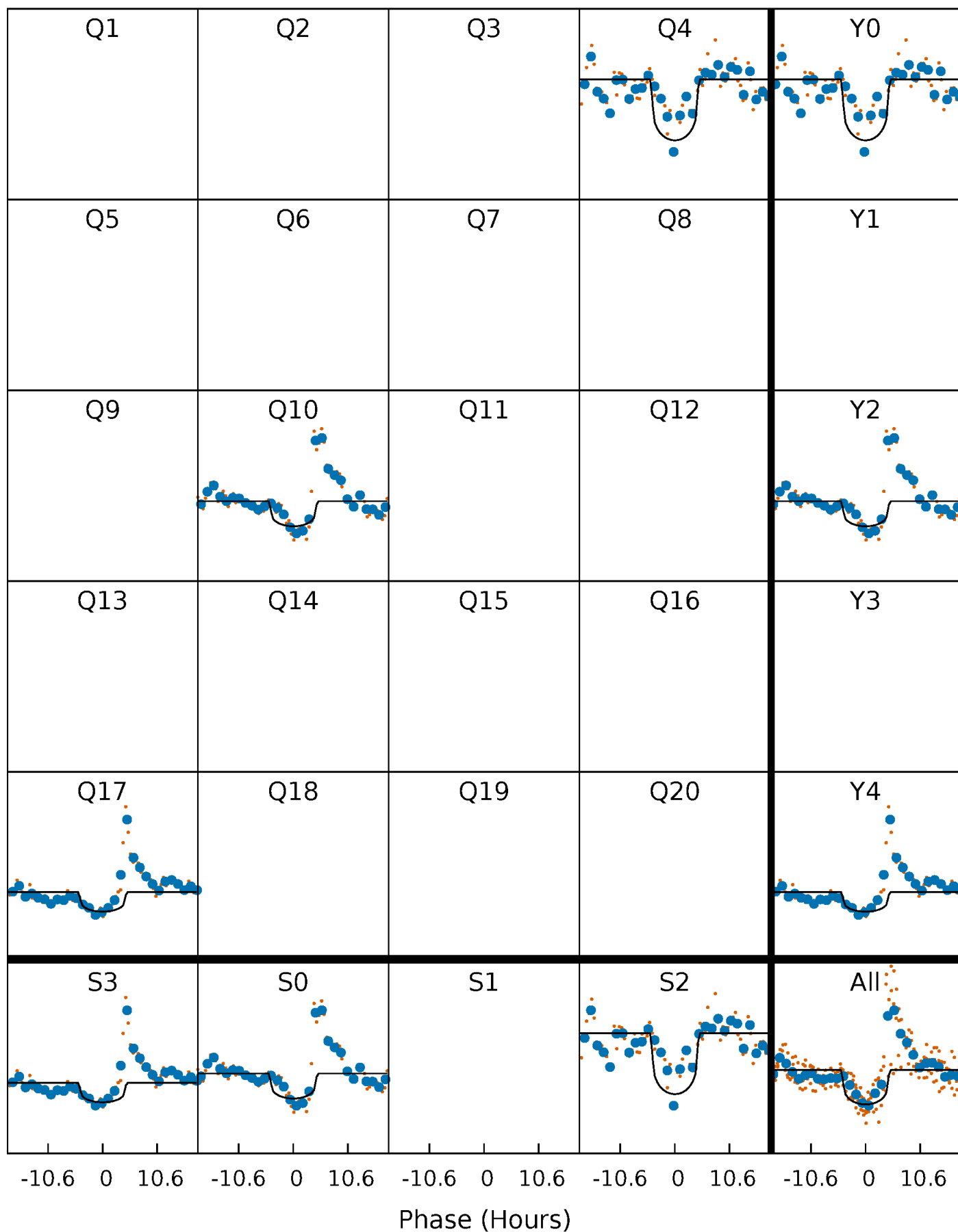
PDC Quarter-Phased Transit Curves

TCE 007420545-05 $P=570.484678$ Days $T_0=426.754249$ (BKJD)



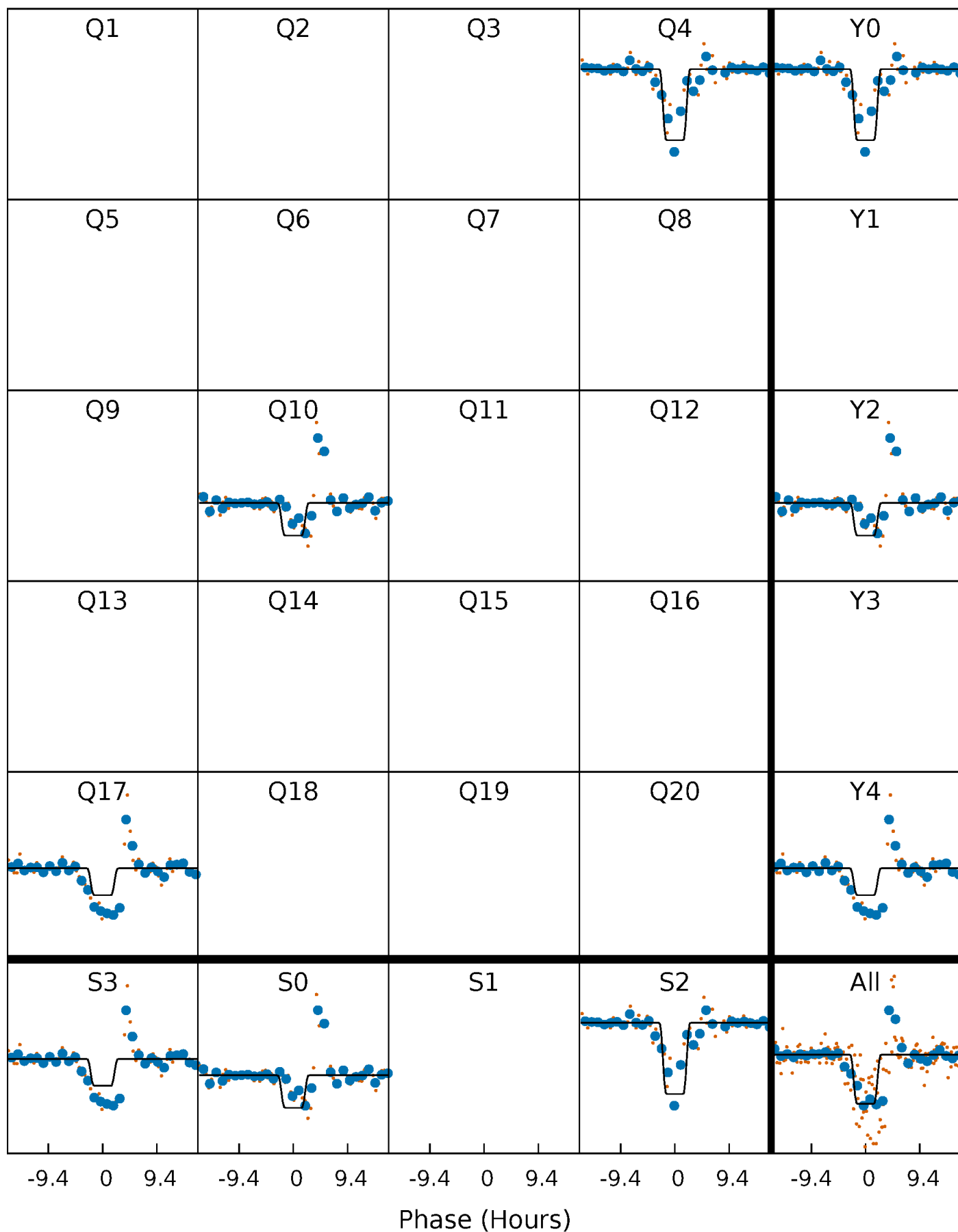
DV Quarter-Phased Transit Curves

TCE 007420545-05 $P=570.484678$ Days $T_0=426.754249$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

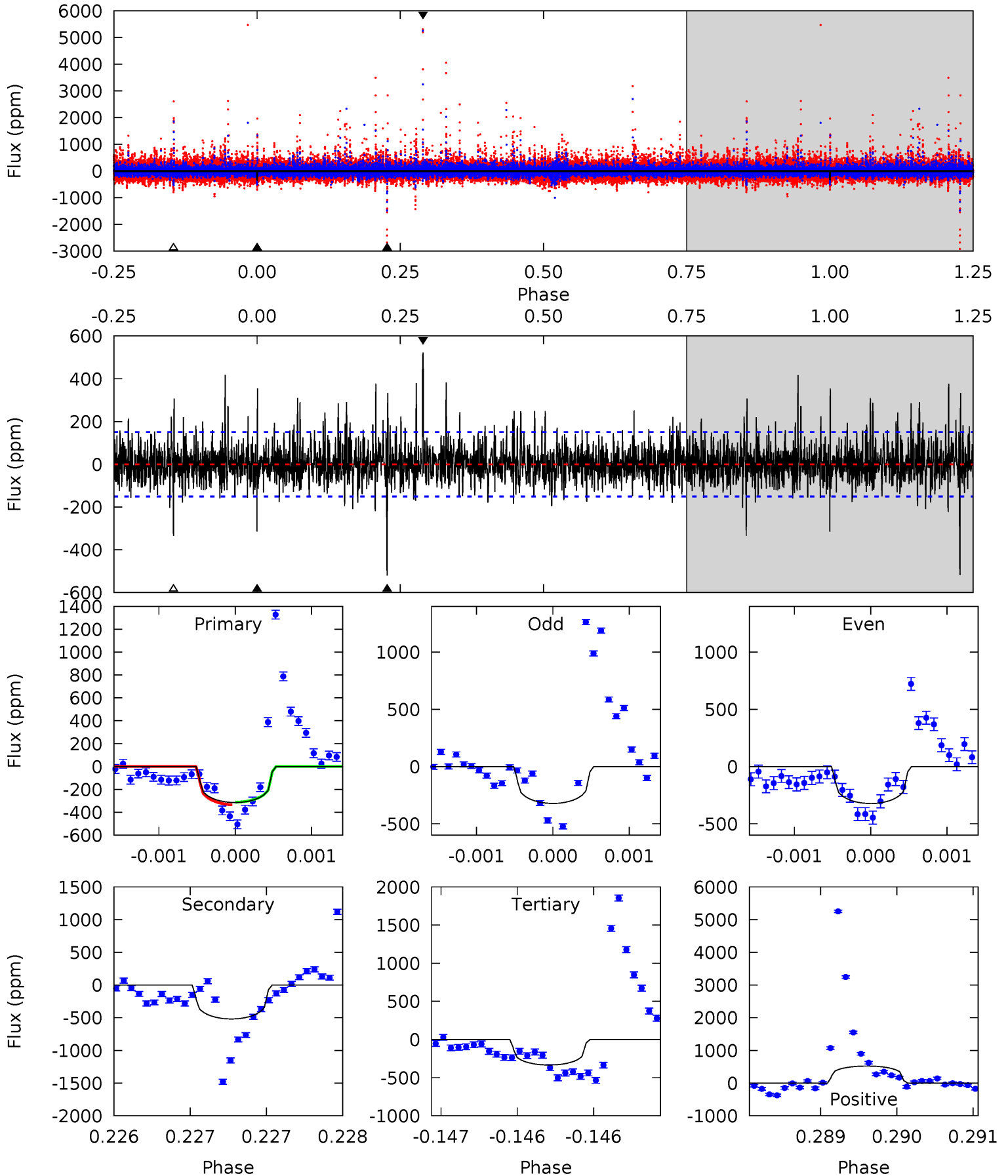
TCE 007420545-05 $P=570.491373$ Days $T_0=426.749071$ (BKJD)



DV Model-Shift Uniqueness Test

007420545-05, P = 570.484678 Days, E = 426.754249 Days

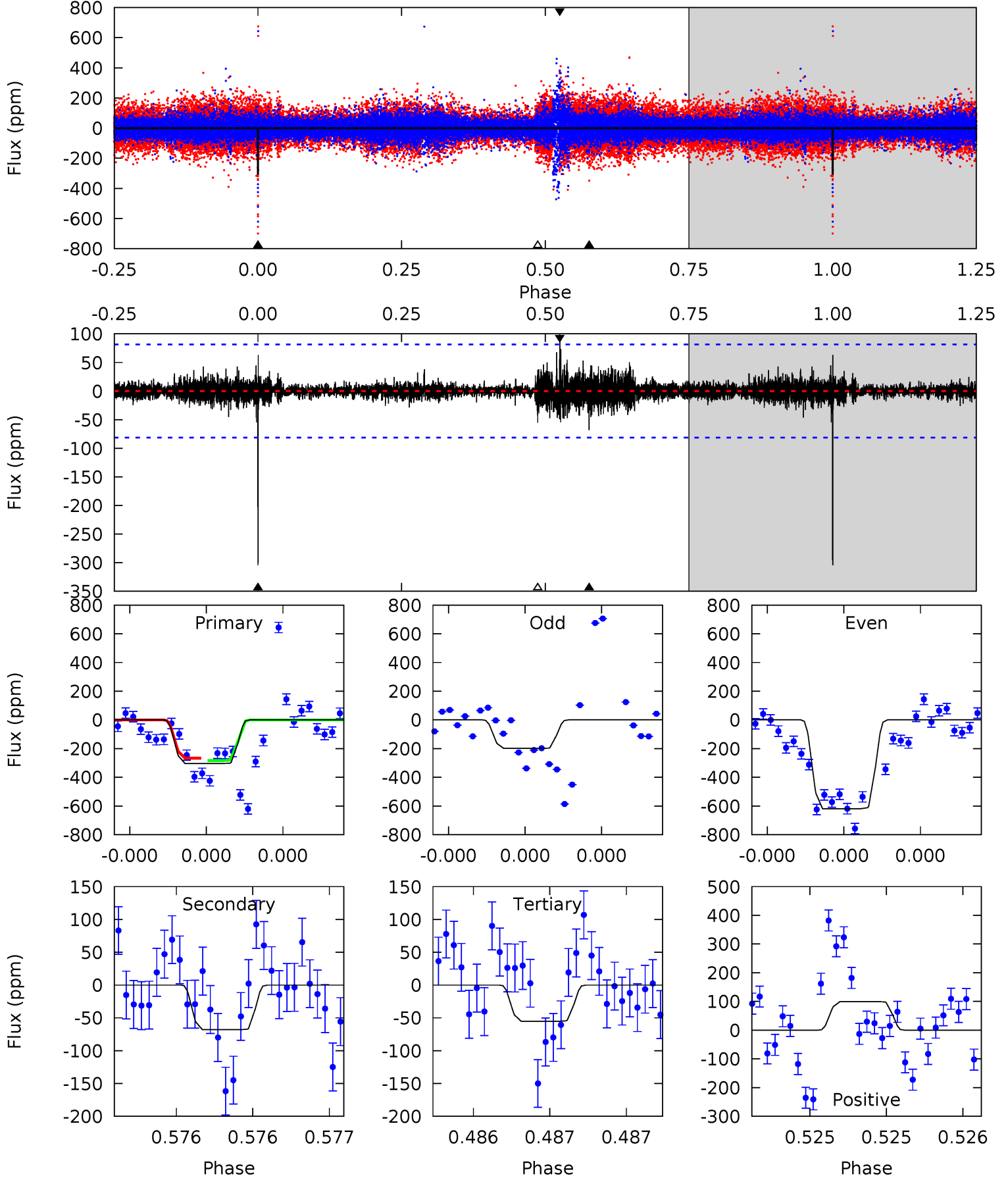
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	19.0	12.2	19.1	5.52	3.40	2.59	-0.71	-7.60	6.78	-0.11	0.01	1.03	0.50	0.41



Alt Model-Shift Uniqueness Test

007420545-05, P = 570.491373 Days, E = 426.749071 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.1	4.71	3.82	6.88	5.63	3.57	0.65	17.2	14.2	0.89	-2.17	15.1	1.33	0.25	0



Stellar Parameters For KIC 007420545

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5260^{+158}_{-142}	$3.839^{+0.721}_{-0.309}$	$-0.240^{+0.350}_{-0.250}$	$1.943^{+1.005}_{-1.228}$	$0.951^{+0.218}_{-0.179}$	$0.183^{+2.352}_{-0.124}$
	+3%/-3%	+19%/-8%	+146%/-104%	+52%/-63%	+23%/-19%	+1287%/-68%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007420545-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-519 ± 27	$4.23^{+2.70}_{-2.12}$	389^{+56}_{-66}	5477^{+1544}_{-808}	27621^{+84498}_{-16653}
Alt.	-68 ± 14	$4.13^{+2.65}_{-1.91}$	393^{+49}_{-71}	3685^{+834}_{-415}	3915^{+9665}_{-2532}

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 $A_{obs} \gg 1.0$

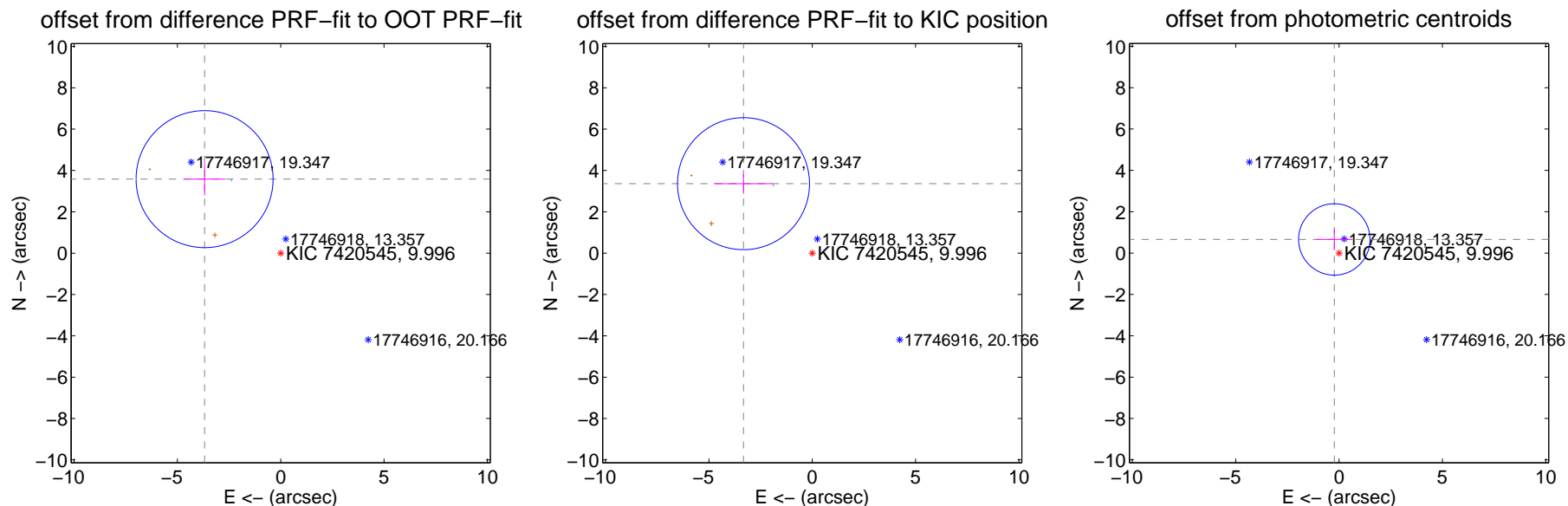
DV Centroid Data

Supplemental centroid analysis for 007420545-05. **Kepler magnitude: 10.00.** Transit SNR 6.68

There are 1 quarters with good PRF difference image offsets

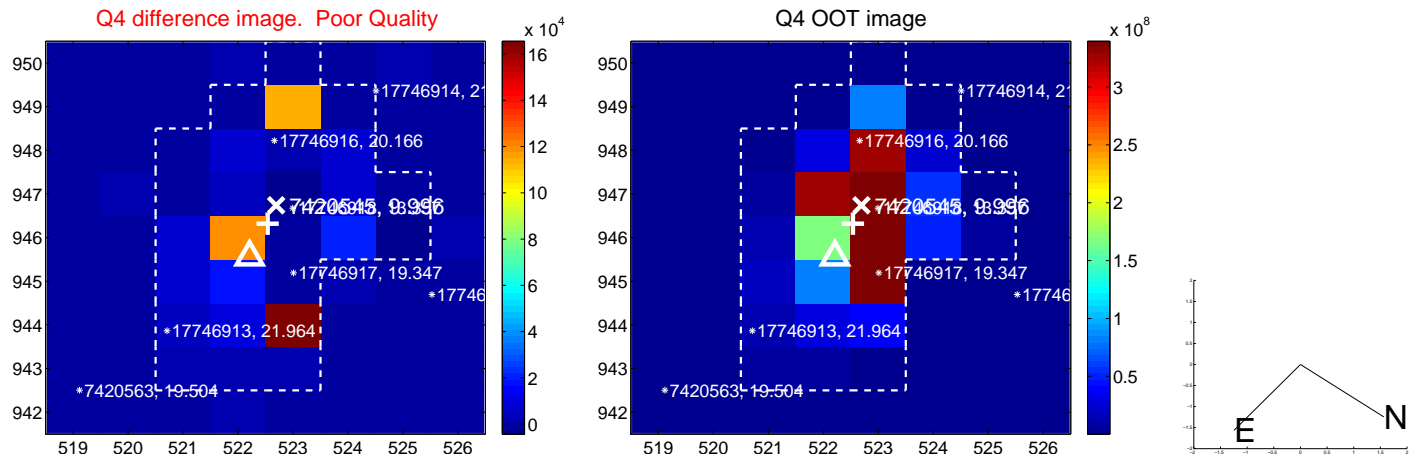
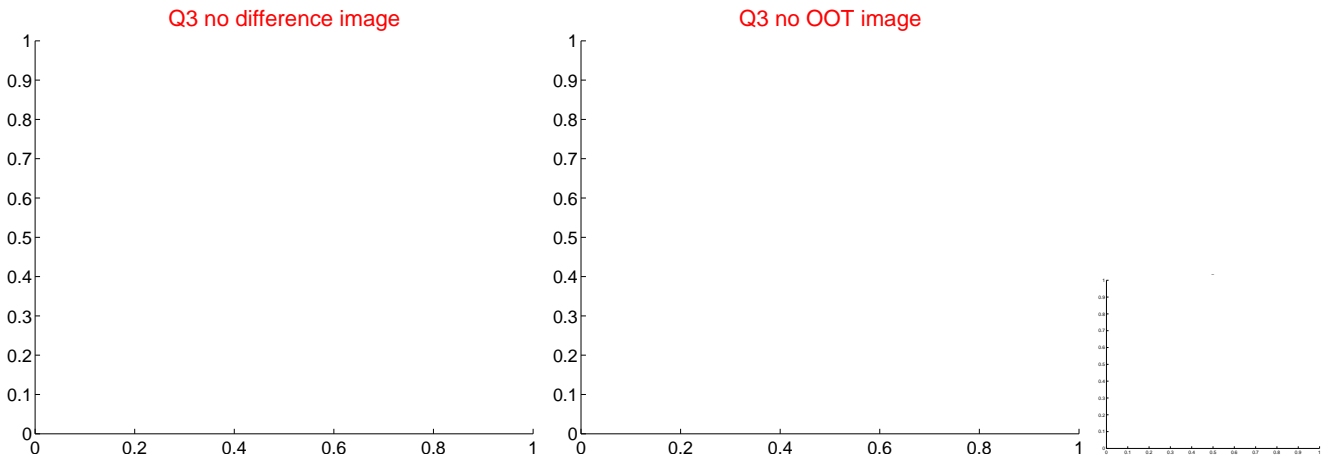
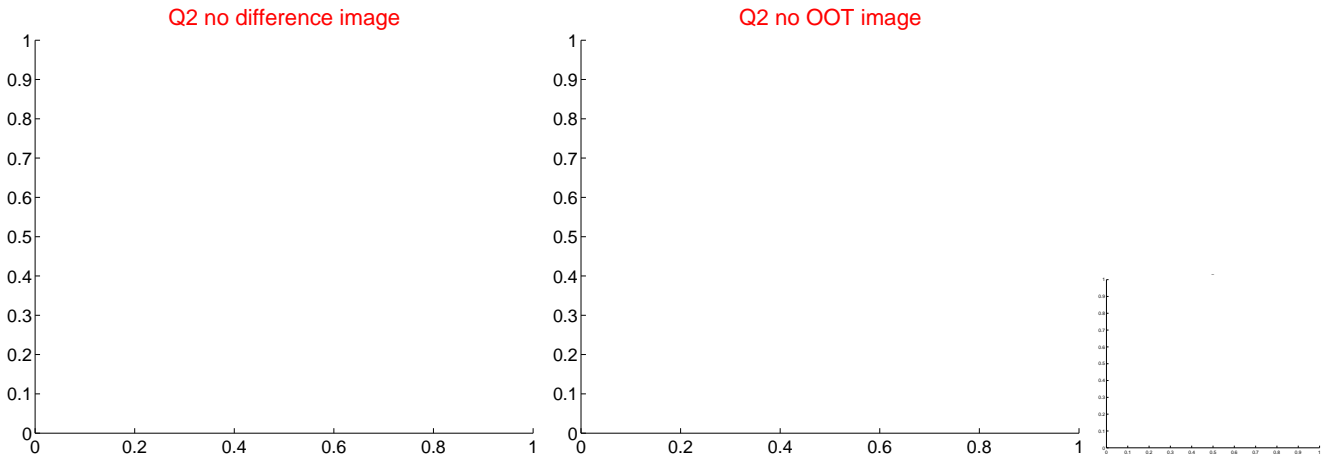
The direct PRF centroid is offset from the target star catalog position by about 0.58 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.137 ± 1.104	4.65	3.684 ± 1.004	3.581 ± 0.782
PRF-fit source offset from KIC position	4.728 ± 1.064	4.44	3.325 ± 1.430	3.361 ± 0.489
photometric centroid source offset	0.70 ± 0.58	1.21	0.23 ± 0.88	0.66 ± 0.53



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.

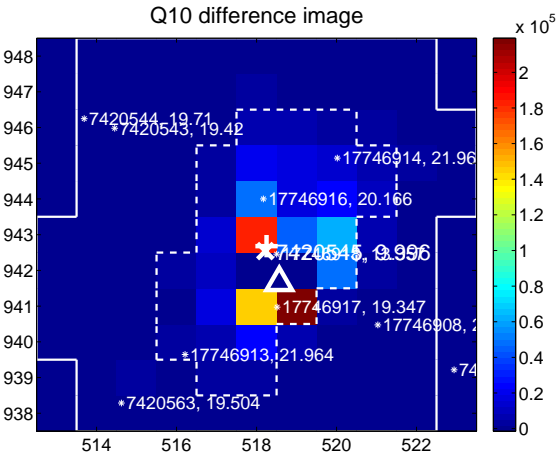
Q9 no difference image



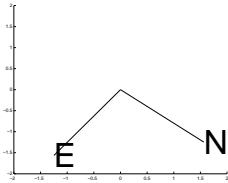
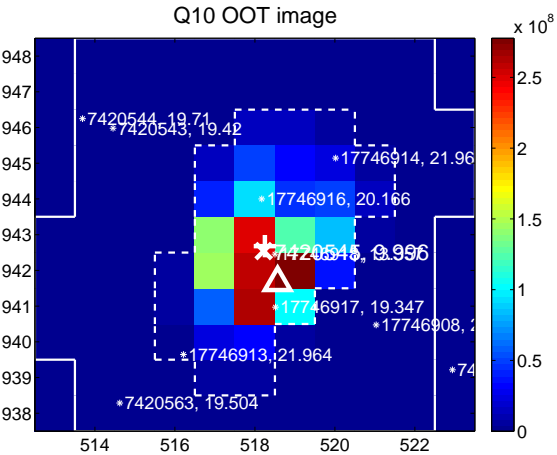
Q9 no OOT image



Q10 difference image



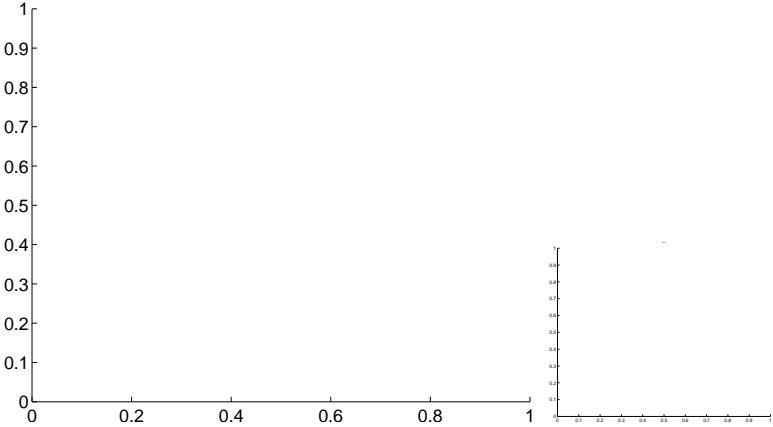
Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



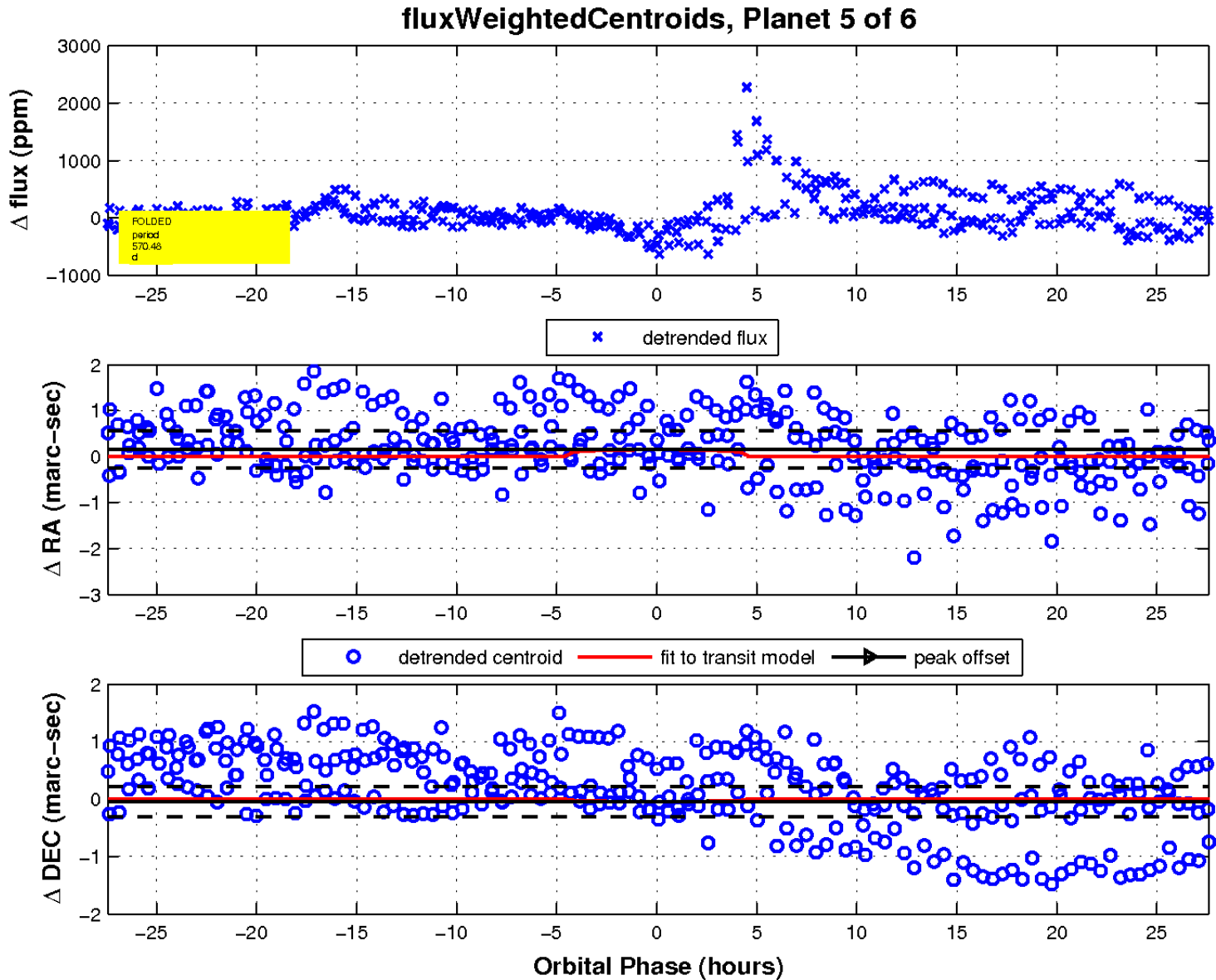
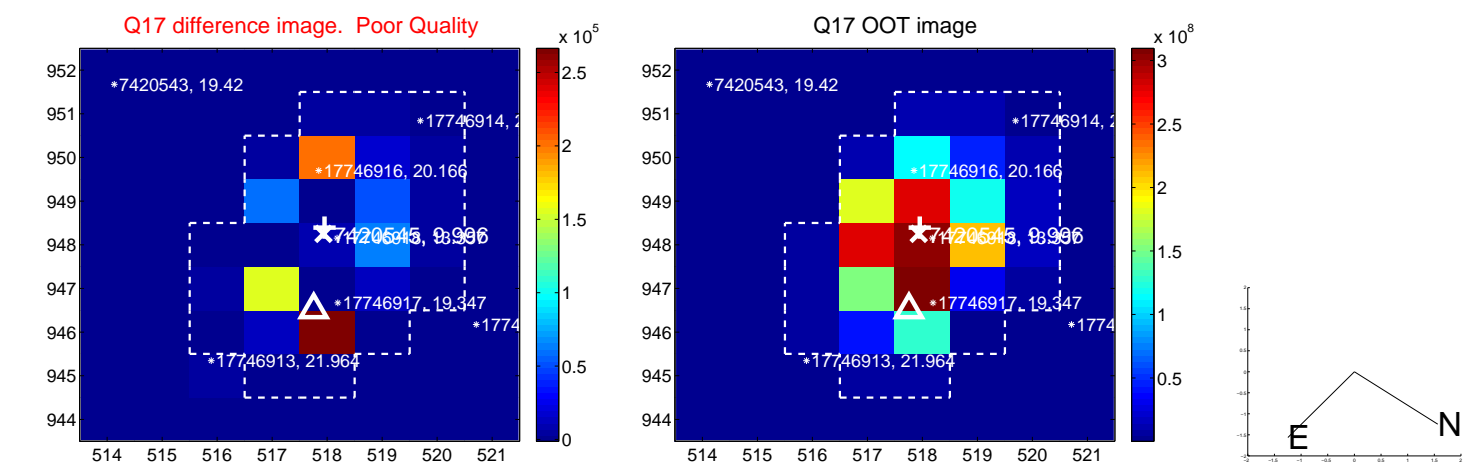
Q12 no OOT image



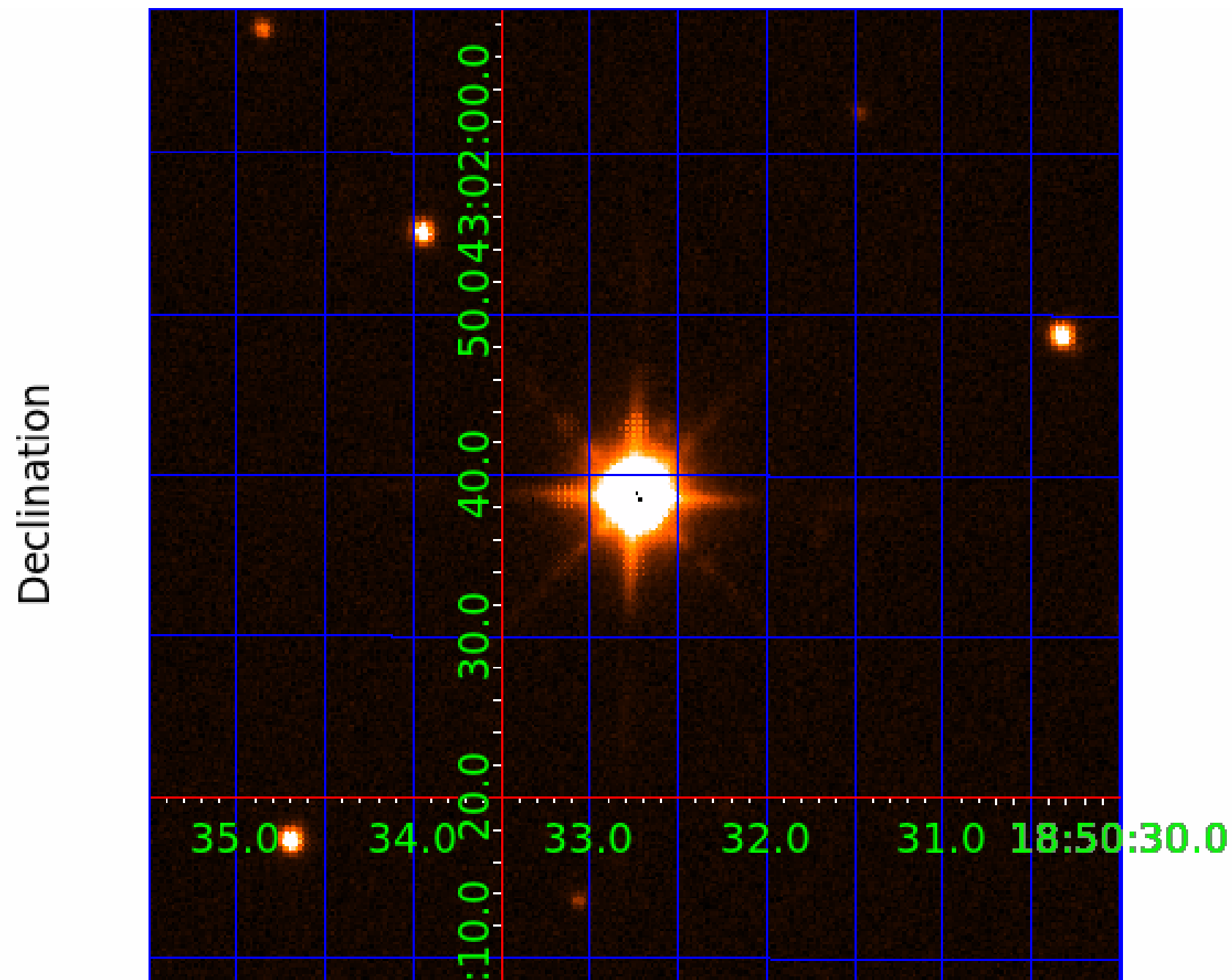
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 007420545

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})
007420545-01	OBS	No	488.035803	225.150084	536.5	4.088	14.9	7.0	1.94	5260	5.68	1.82
007420545-03	OBS	No	480.734986	157.707666	548.4	8.242	9.9	7.4	1.94	5260	9.27	1.86
007420545-05	OBS	No	570.484678	426.754249	452.4	9.262	11.0	6.7	1.94	5260	4.50	1.48
007420545-06	OBS	No	568.056503	214.289091	138.9	13.905	8.6	2.1	1.94	5260	2.25	1.49

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007420545-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007420545-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007420545-05	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—CENT_SATURATED
007420545-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED

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

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

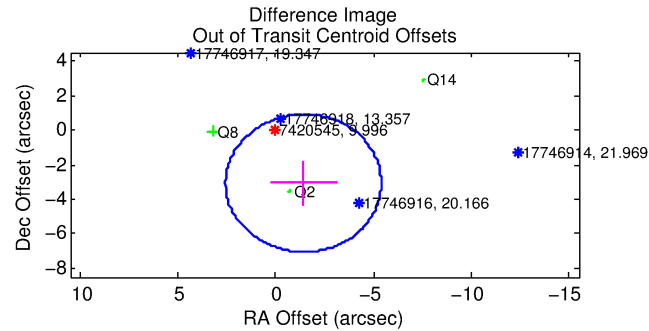
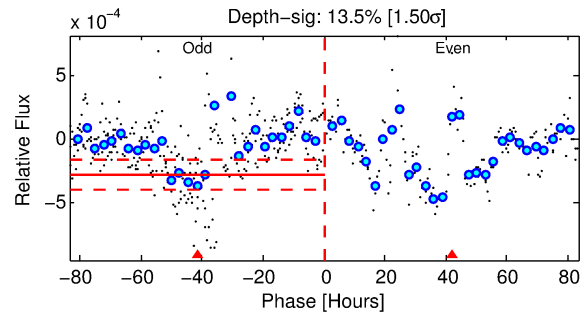
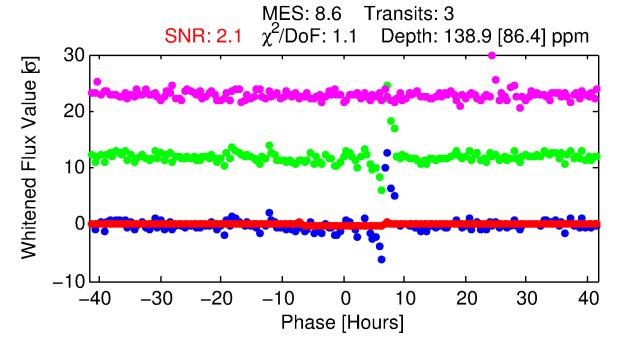
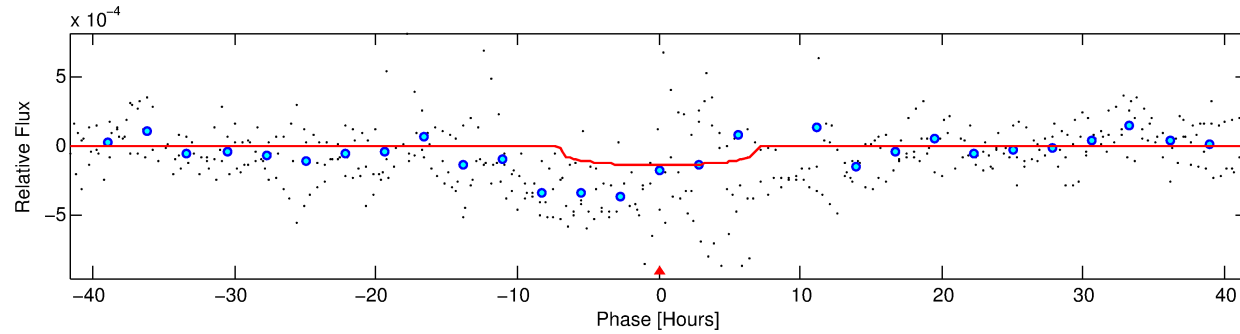
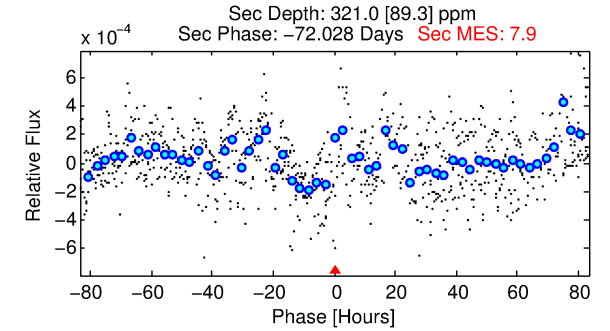
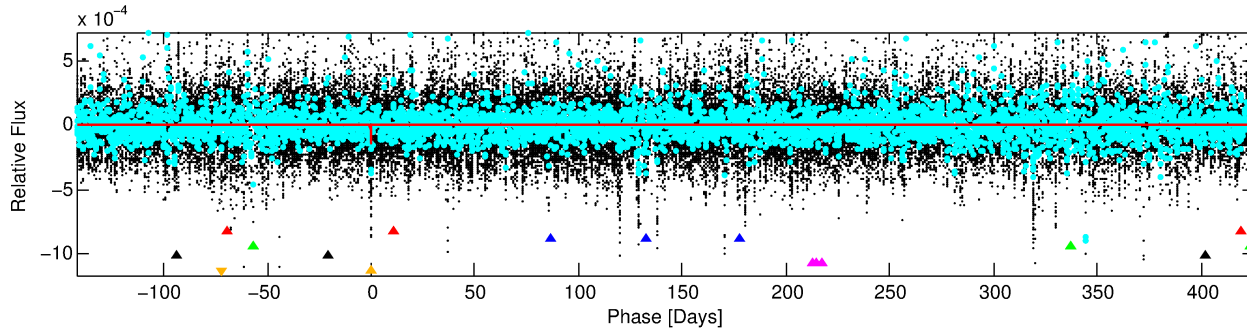
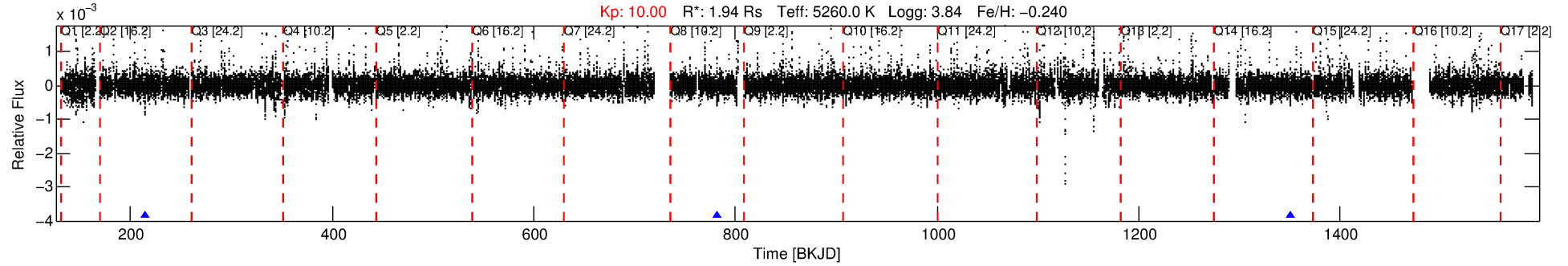
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007420545-06

No Significant Match Found

DV One-Page Summary

KIC: 7420545 Candidate: 6 of 6 Period: 568.057 d



DV Fit Results:

Period = 568.05650 [0.02185] d
Epoch = 214.2891 [0.0347] BKJD
Rp/R* = 0.0106 [0.0294]
a/R* = 312.31 [3485.70]
b = 0.14 [77.89]
Seff = 1.49 [1.77]
Teq = 282 [84] K
Rp = 2.25 [6.39] Re
a = 1.3201 [0.9182] AU
Ag = 61027.56 [346536.43] [0.18 σ]
Teffp = 6841 [9500] K [0.69 σ]

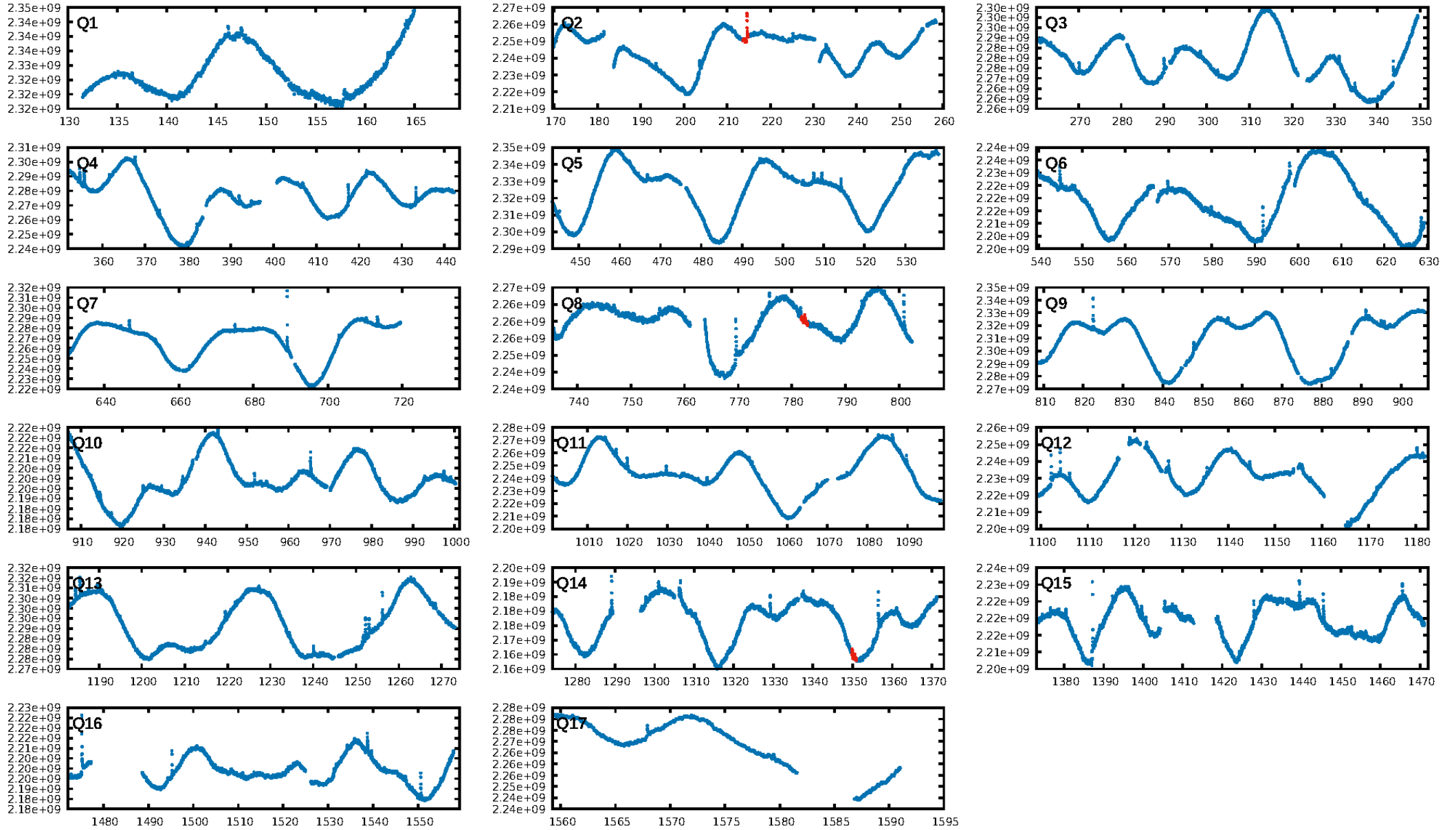
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [76.57 σ]
LongPeriod-sig: 100.0% [3.49 σ]
ModelChiSquare2-sig: 3.4%
ModelChiSquareGof-sig: 82.8%
Bootstrap-pfa: 4.45e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 3.4%
Centroid-so: 5.470 arcsec [2.11 σ]
OotOffset-rm: 3.383 arcsec [2.55 σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-rm: 2.119 arcsec [1.41 σ]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

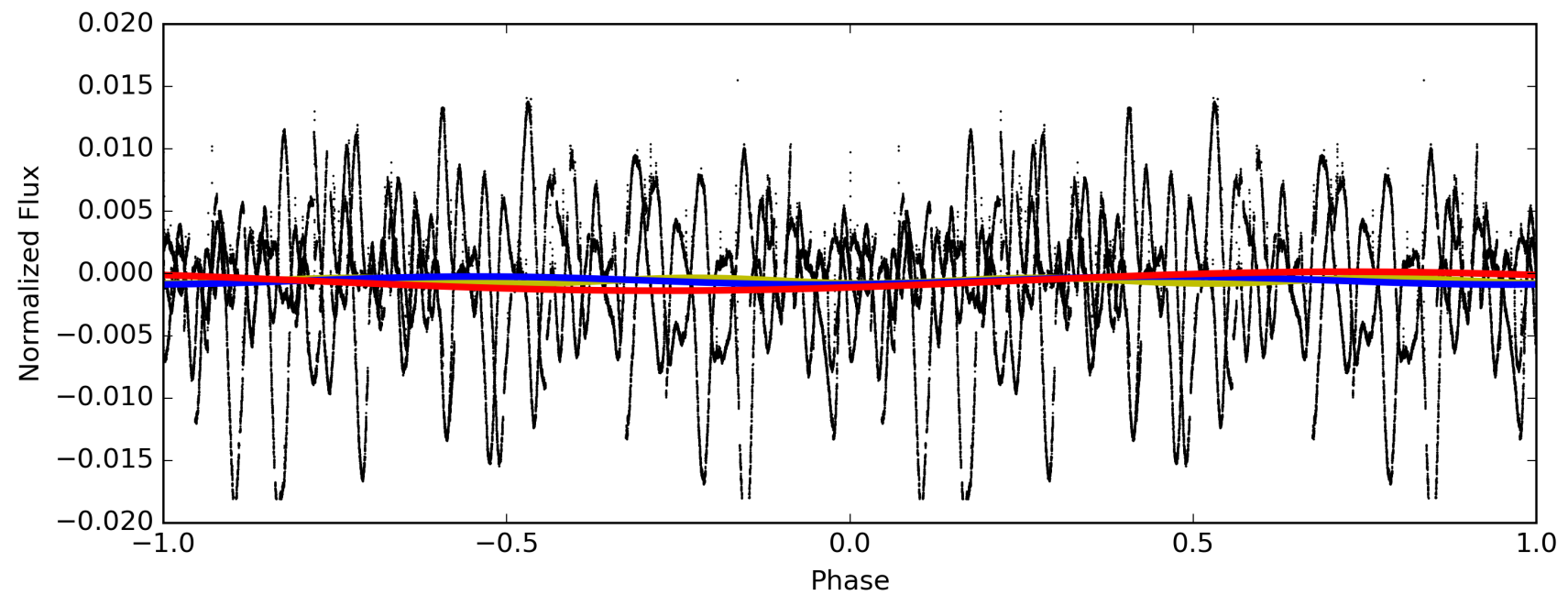
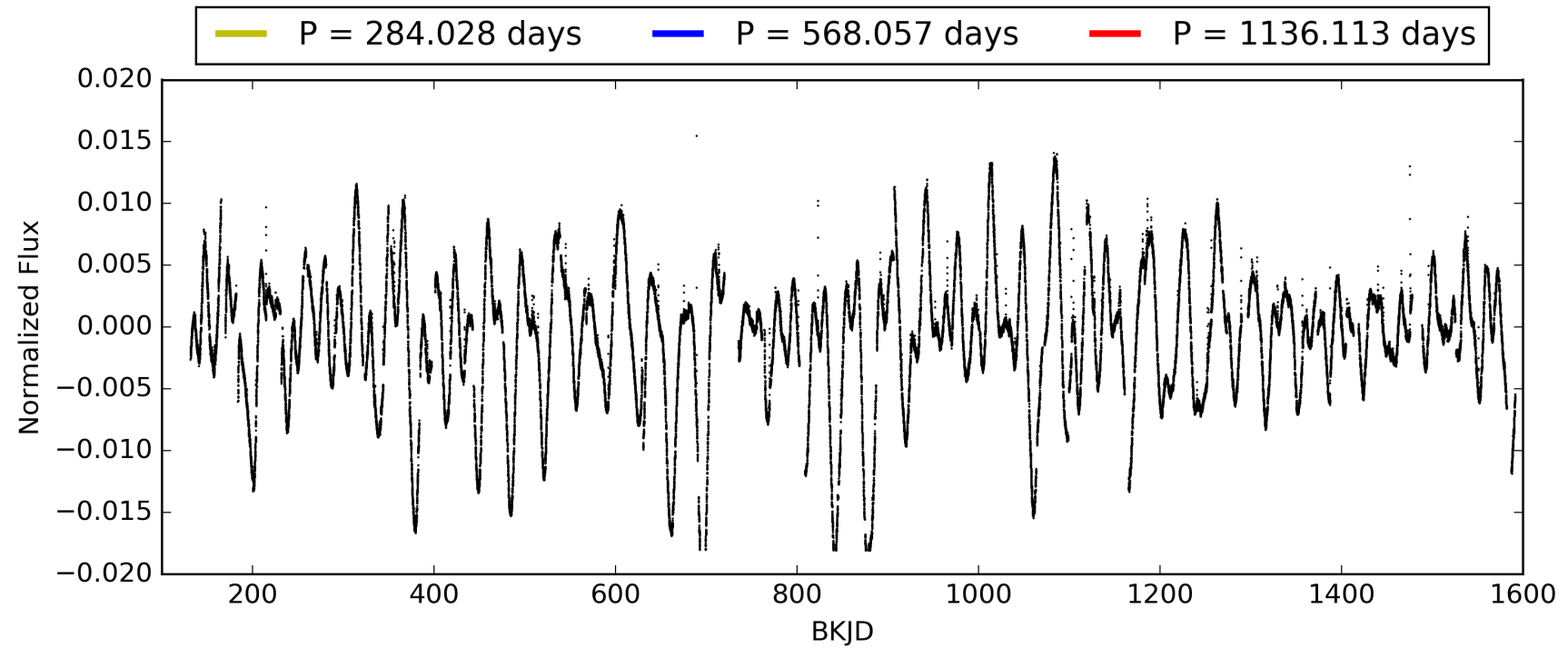
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 05:21:37 Z

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

TCE 007420545-06, PDC Light Curves

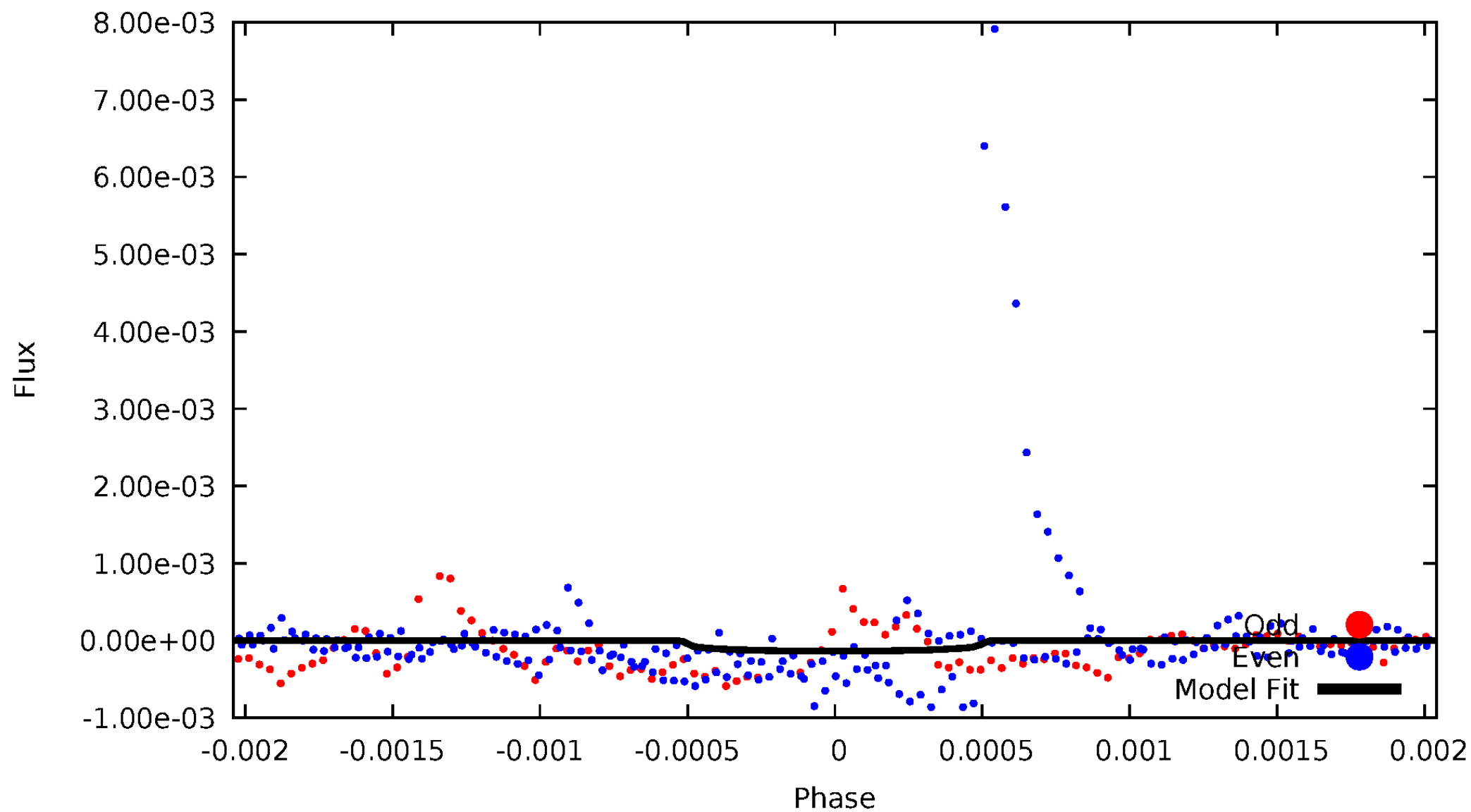


TCE 007420545-06



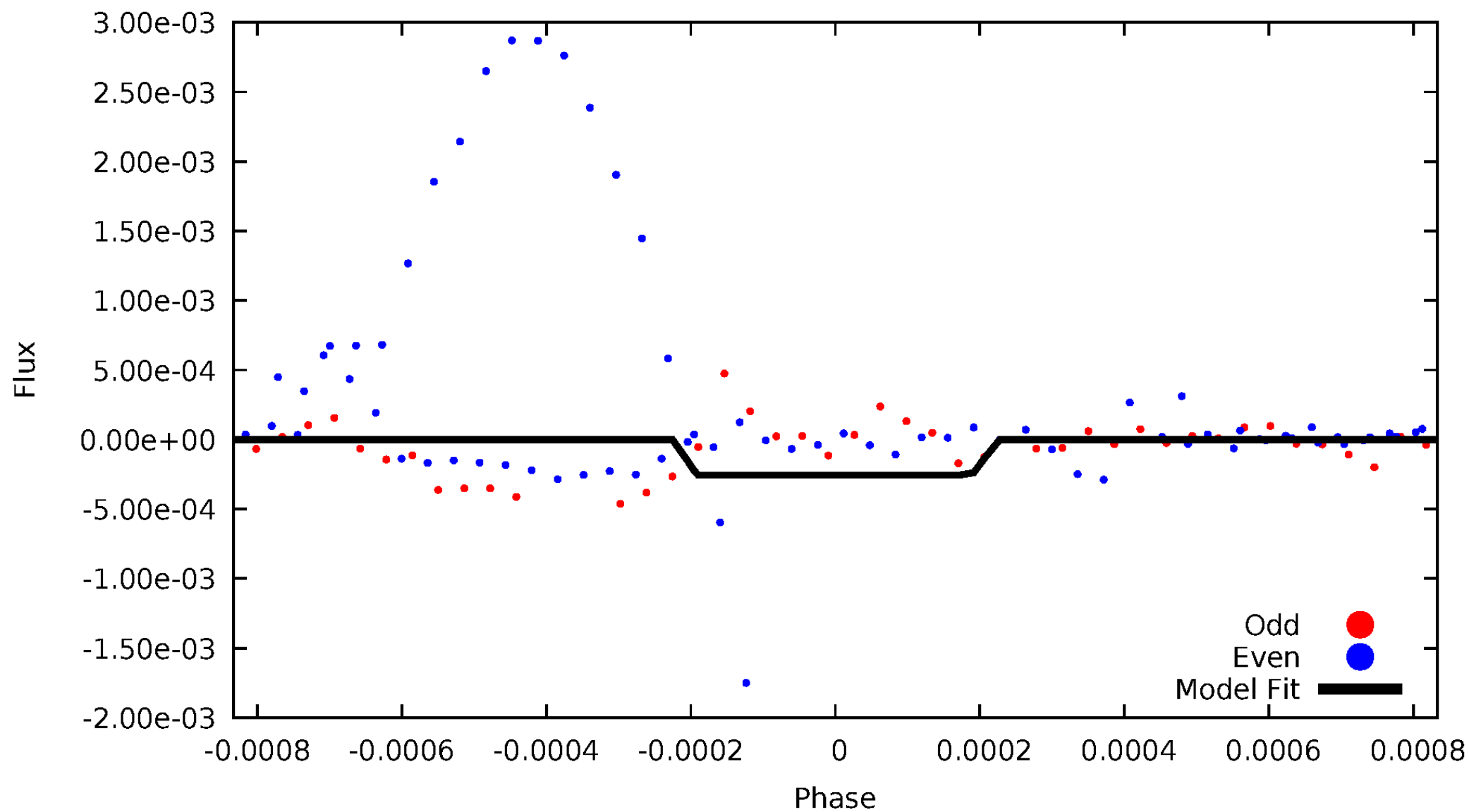
DV Odd/Even

TCE 007420545-06



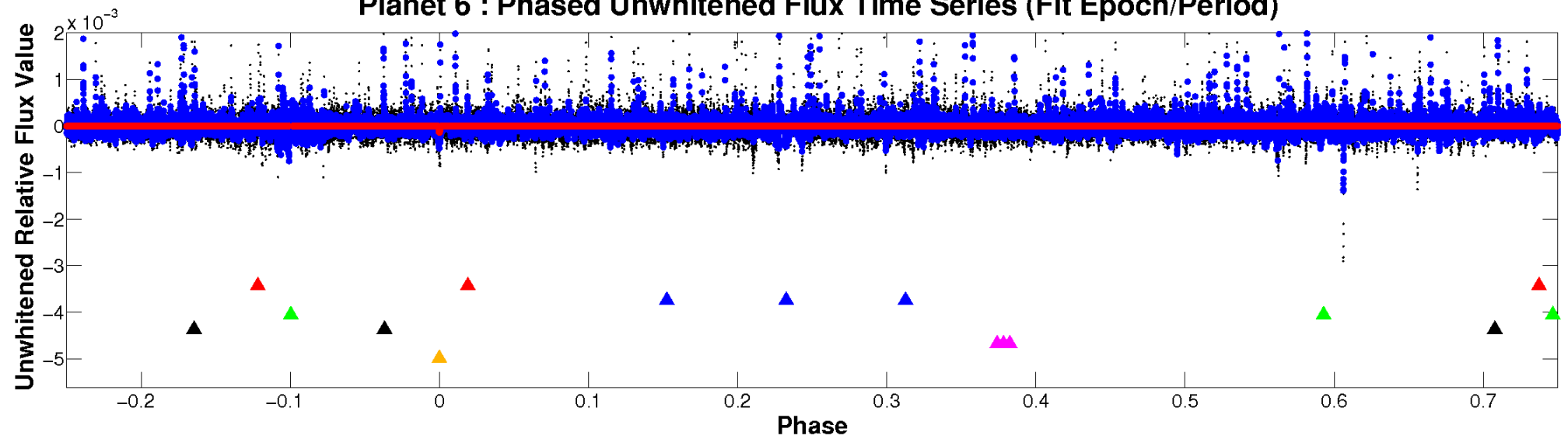
ALT Odd/Even

TCE 007420545-06

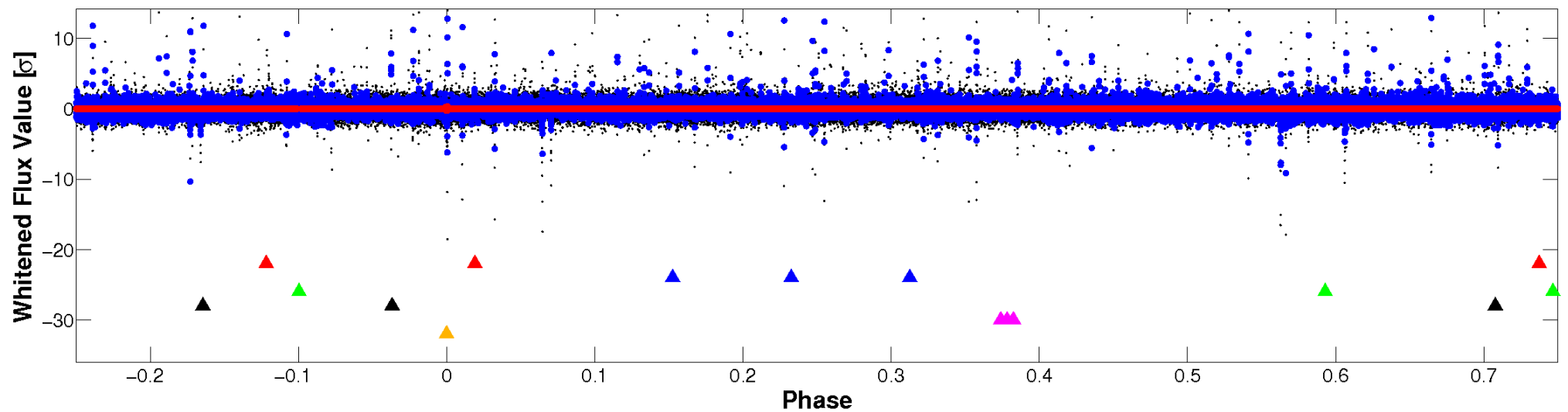


Non-Whitened Vs. Whitened Light Curve

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

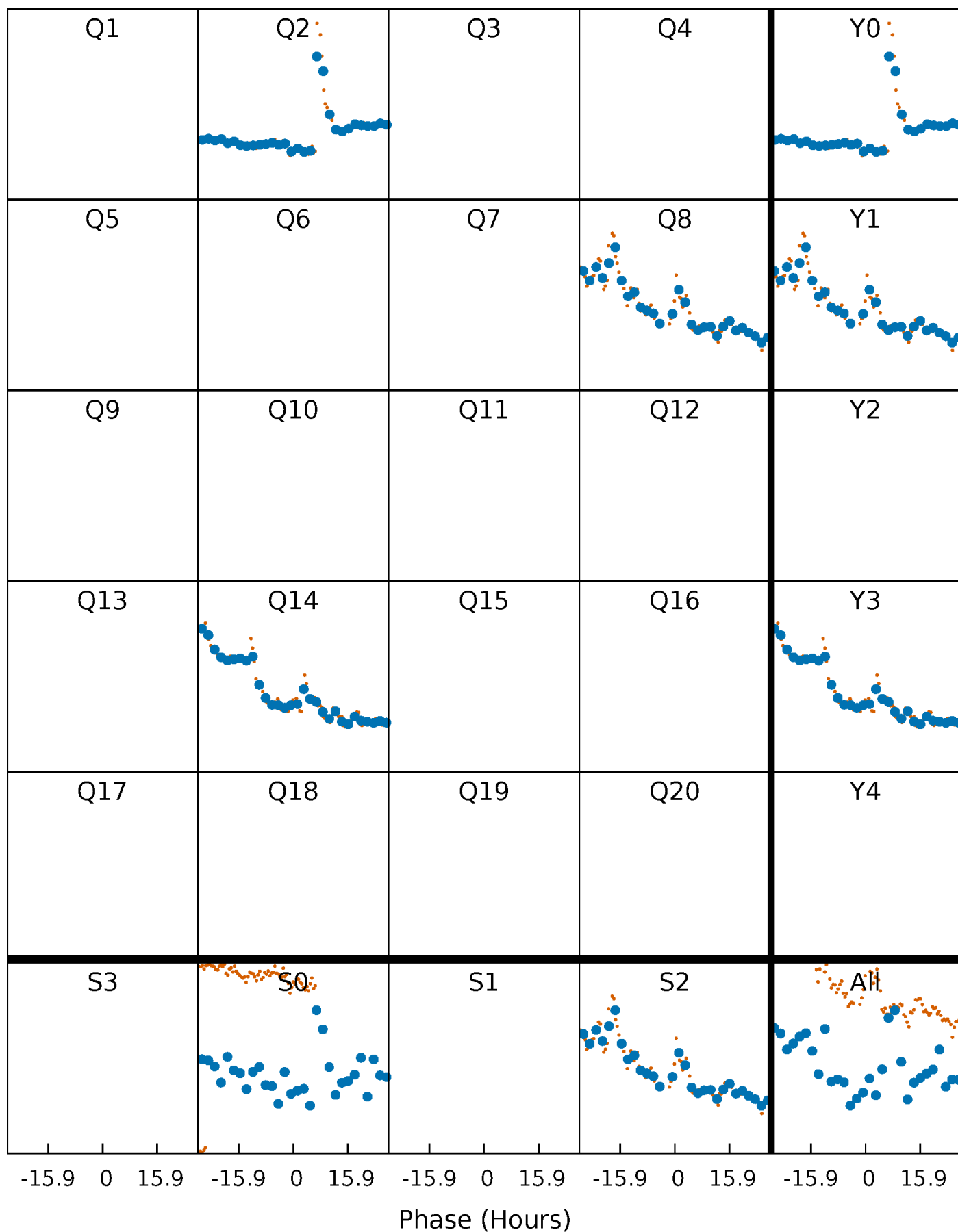


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



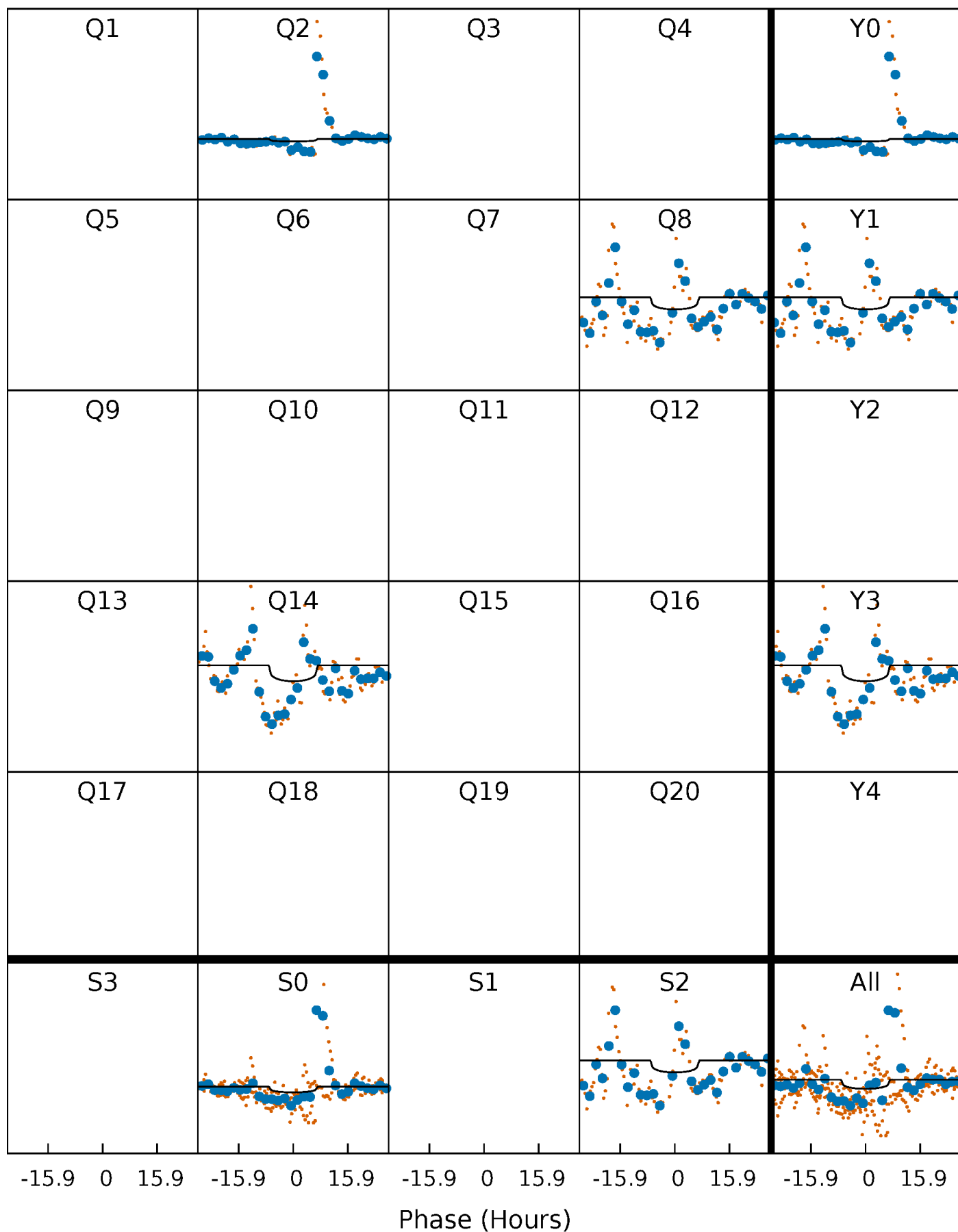
PDC Quarter-Phased Transit Curves

TCE 007420545-06 P=568.056503 Days $T_0=214.289091$ (BKJD)



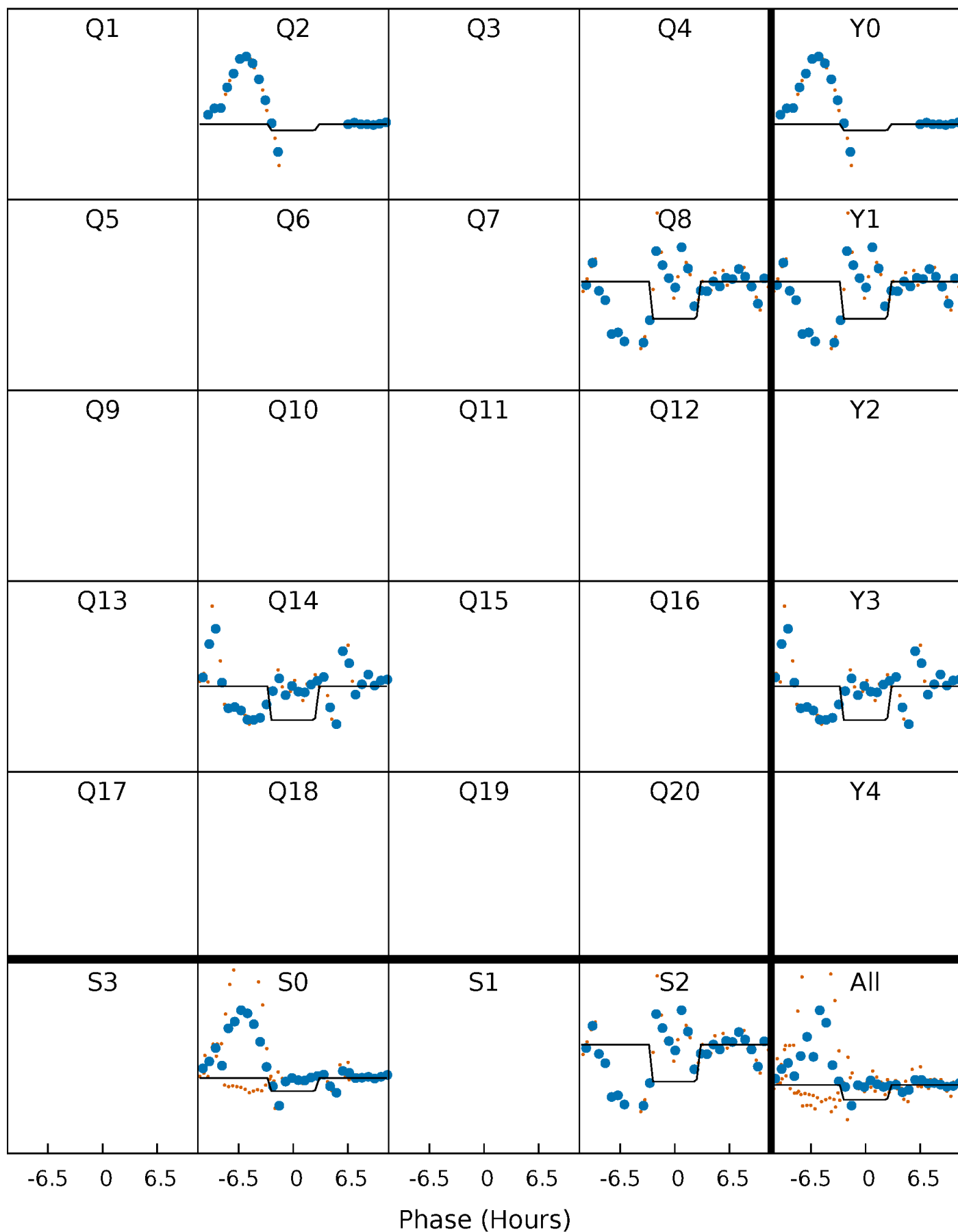
DV Quarter-Phased Transit Curves

TCE 007420545-06 P=568.056503 Days $T_0=214.289091$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

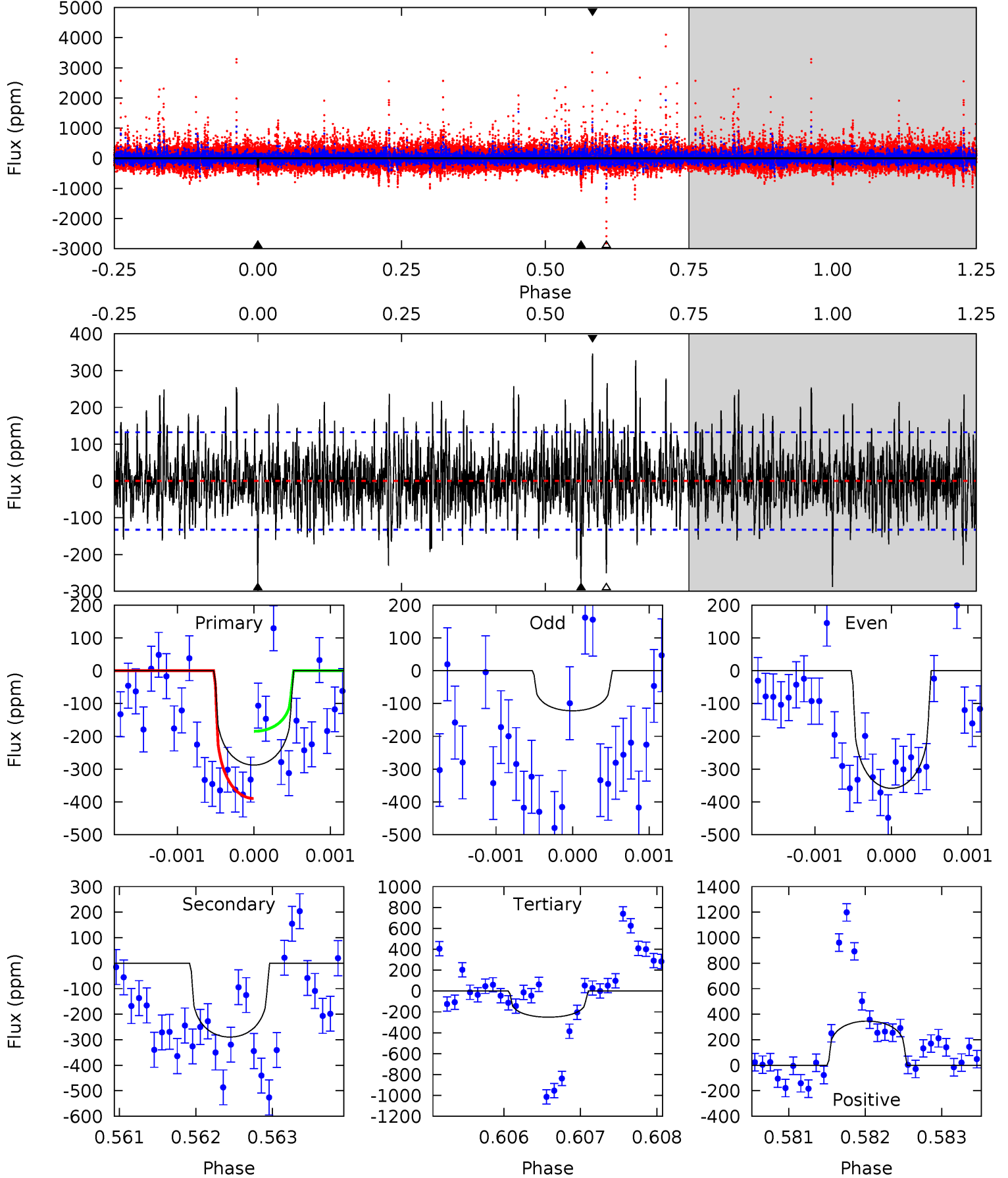
TCE 007420545-06 P=567.841821 Days $T_0=214.606072$ (BKJD)



DV Model-Shift Uniqueness Test

007420545-06, P = 568.056503 Days, E = 214.289091 Days

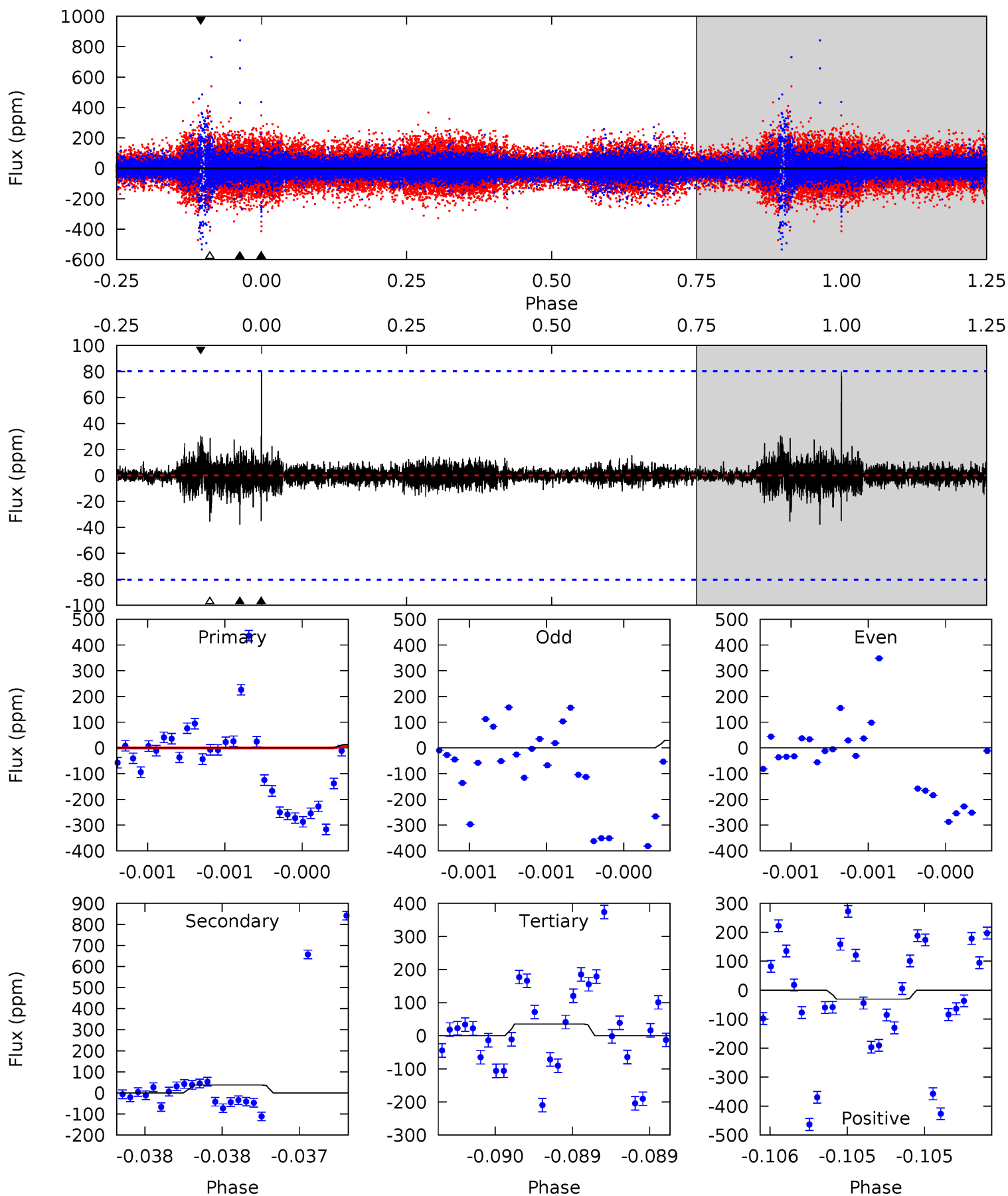
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	11.9	10.3	14.2	5.45	3.29	2.80	1.53	-2.39	1.60	-2.32	3.67	1.18	0.54	4.23



Alt Model-Shift Uniqueness Test

007420545-06, P = 567.841821 Days, E = 214.606072 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.90	2.64	2.48	2.13	5.61	3.54	0.30	-1.58	-1.23	0.16	0.51	0.94	66.6	0.68	0.49



Stellar Parameters For KIC 007420545

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5260^{+158}_{-142}	$3.839^{+0.721}_{-0.309}$	$-0.240^{+0.350}_{-0.250}$	$1.943^{+1.005}_{-1.228}$	$0.951^{+0.218}_{-0.179}$	$0.183^{+2.352}_{-0.124}$
	+3%/-3%	+19%/-8%	+146%/-104%	+52%/-63%	+23%/-19%	+1287%/-68%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 007420545-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-290 ± 24	$4.88^{+5.33}_{-3.28}$	389^{+56}_{-68}	4474^{+3080}_{-894}	12162^{+99416}_{-9487}
Alt.	-38 ± 14	$5.46^{+5.49}_{-3.78}$	389^{+52}_{-70}	3084^{+1282}_{-485}	1170^{+10880}_{-896}

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 $A_{obs} \gg 1.0$

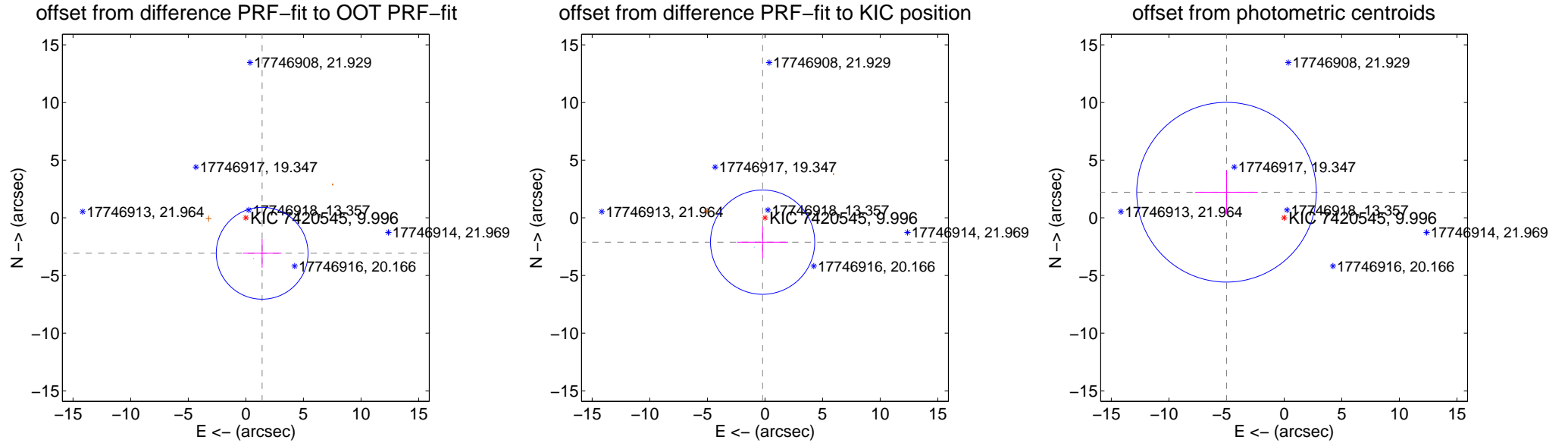
DV Centroid Data

Supplemental centroid analysis for 007420545-06. **Kepler magnitude: 10.00.** Transit SNR 2.05

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.83 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.383 ± 1.328	2.55	-1.416 ± 1.676	-3.072 ± 1.241
PRF-fit source offset from KIC position	2.119 ± 1.507	1.41	0.206 ± 2.217	-2.109 ± 1.379
photometric centroid source offset	5.47 ± 2.60	2.11	5.00 ± 2.71	2.22 ± 1.90



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

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

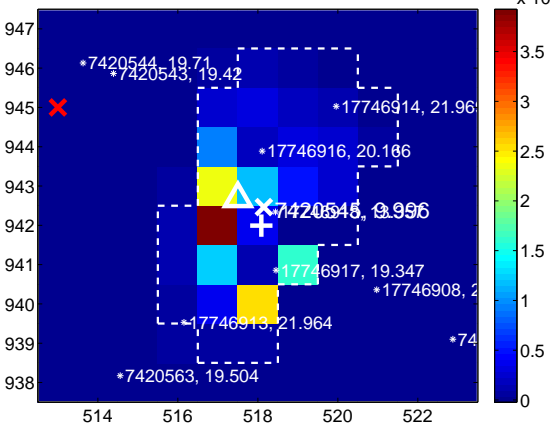
Q1 no difference image



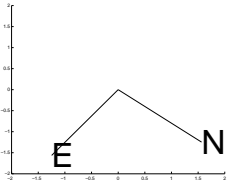
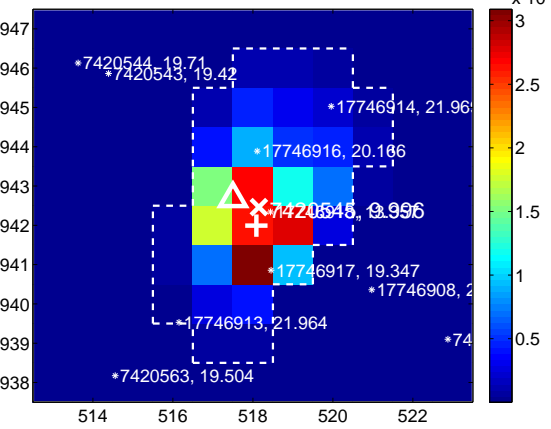
Q1 no OOT image



Q2 difference image



Q2 OOT image



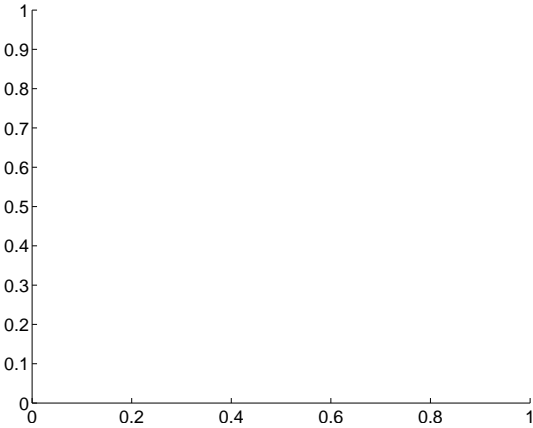
Q3 no difference image



Q3 no OOT image



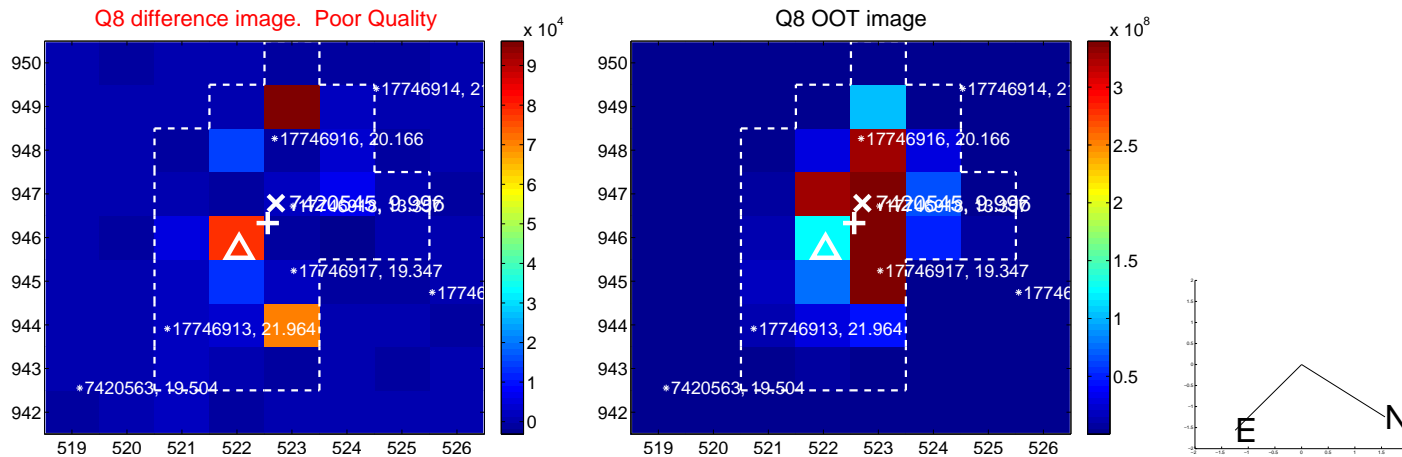
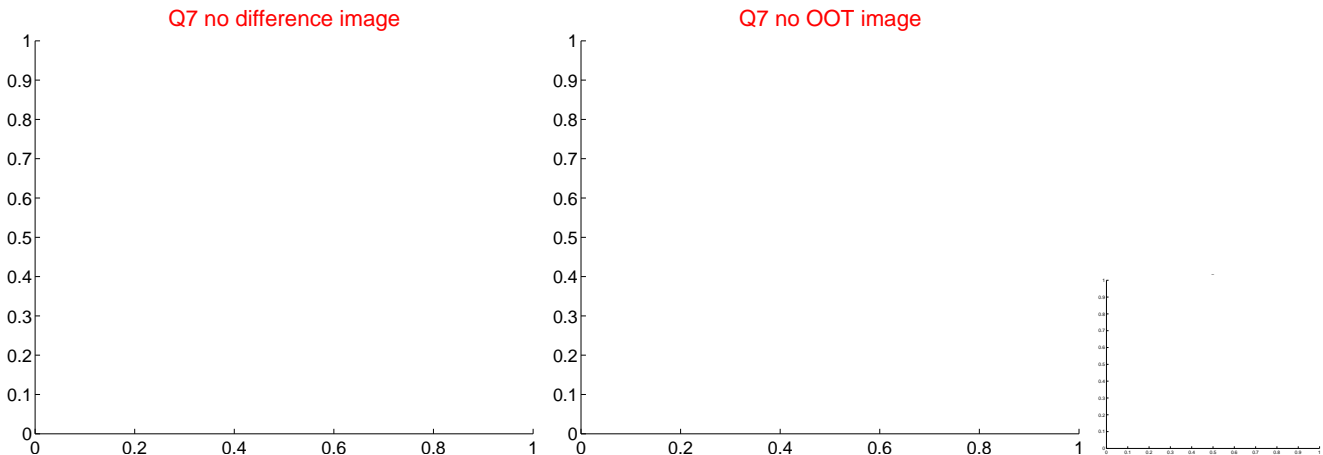
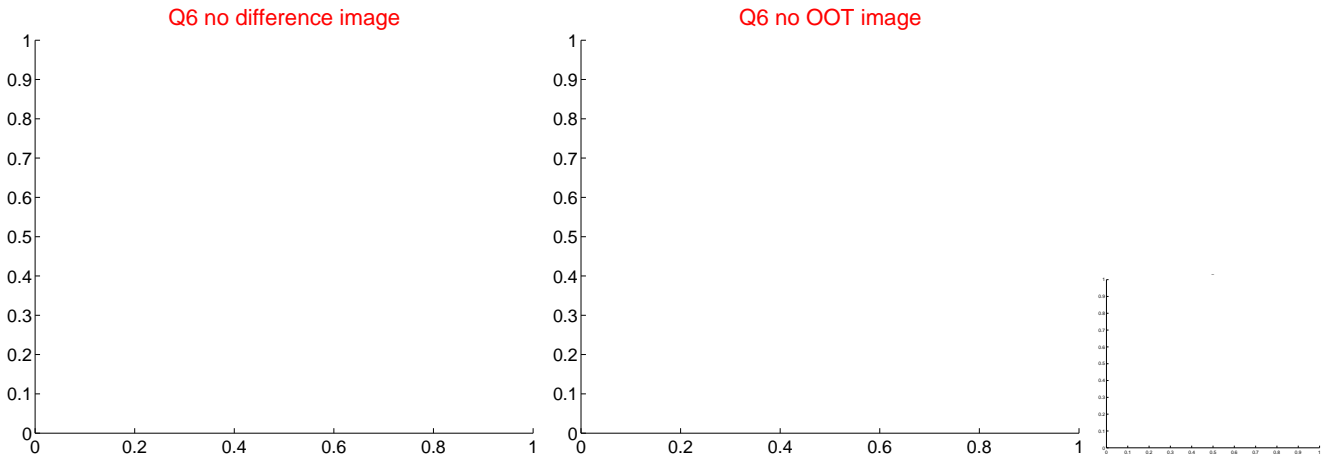
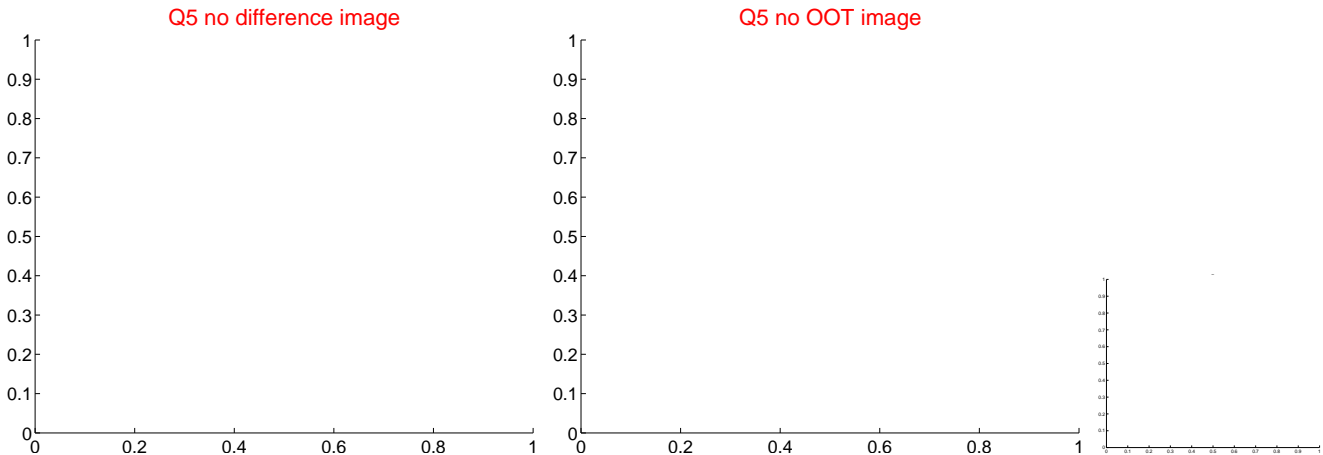
Q4 no difference image



Q4 no OOT image



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



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



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

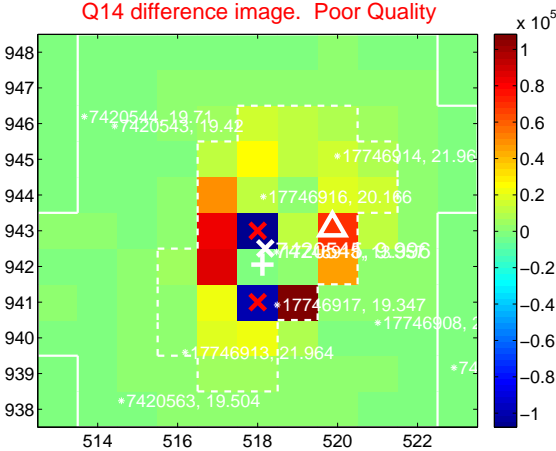
Q13 no difference image



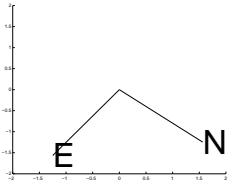
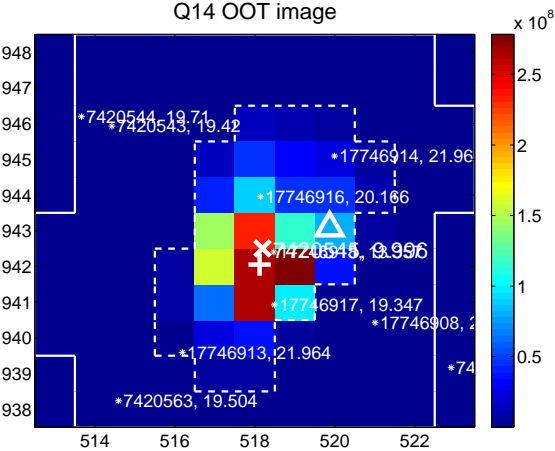
Q13 no OOT image



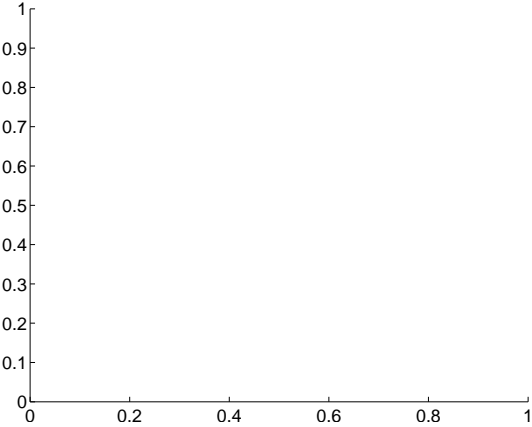
Q14 difference image. Poor Quality



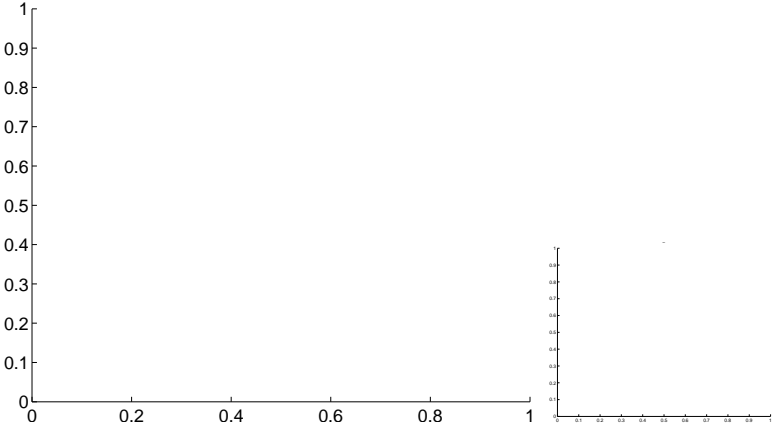
Q14 OOT image



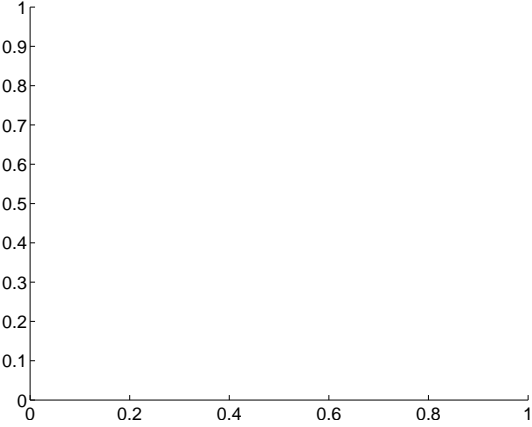
Q15 no difference image



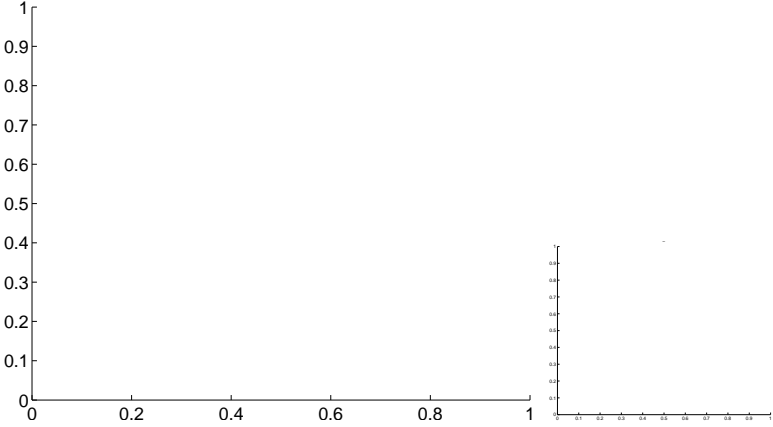
Q15 no OOT image



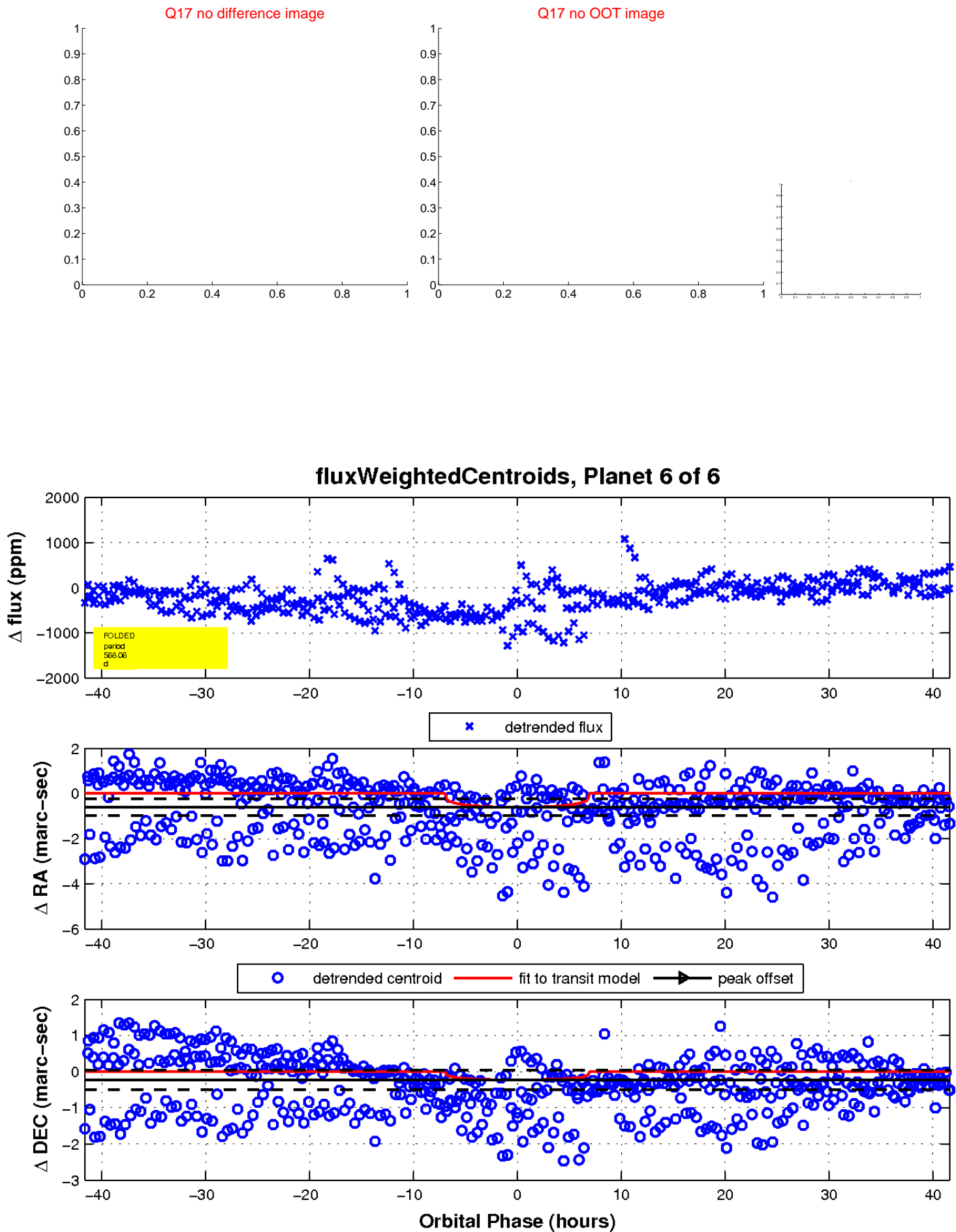
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

