

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

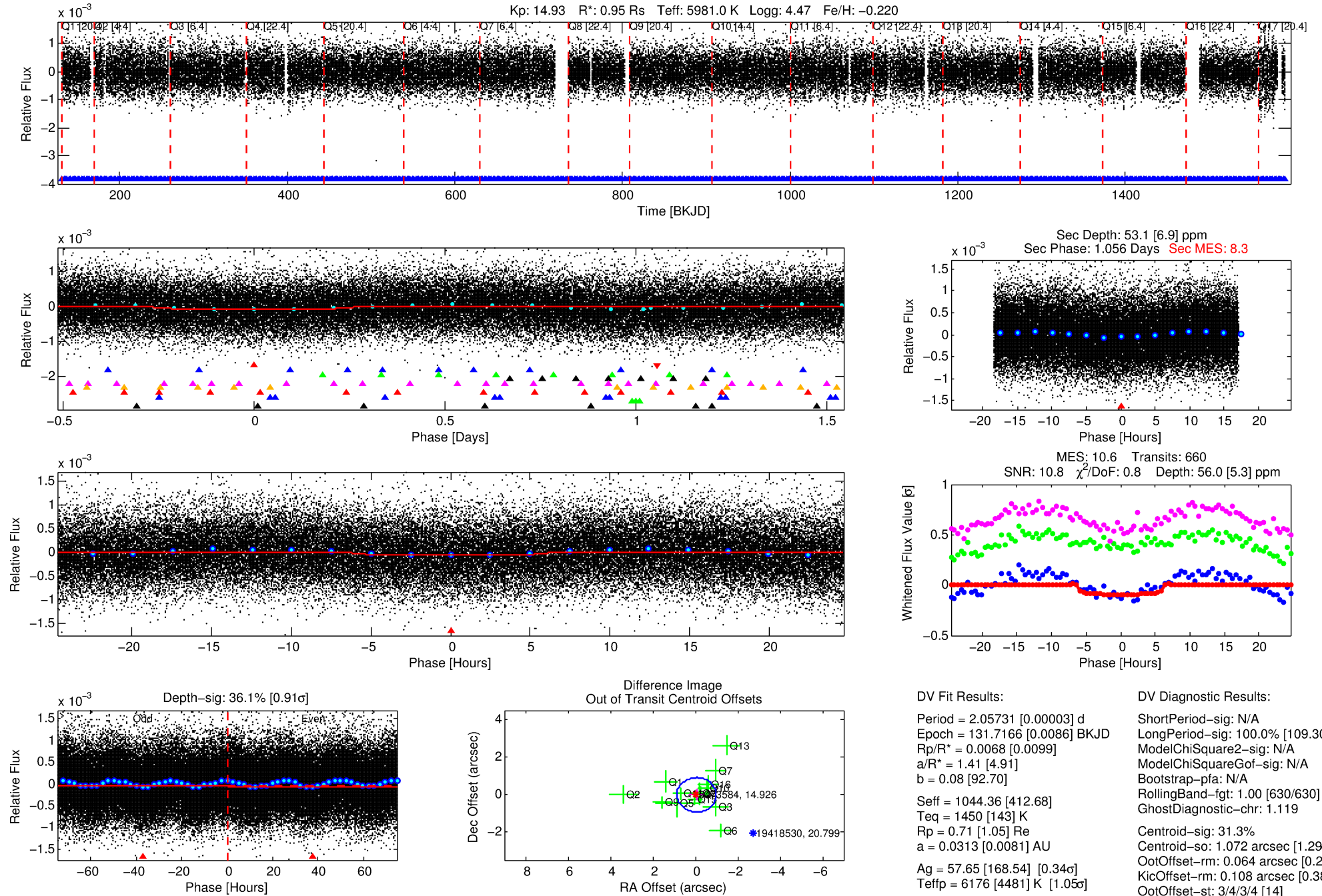
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-01

No Significant Match Found

# DV One-Page Summary

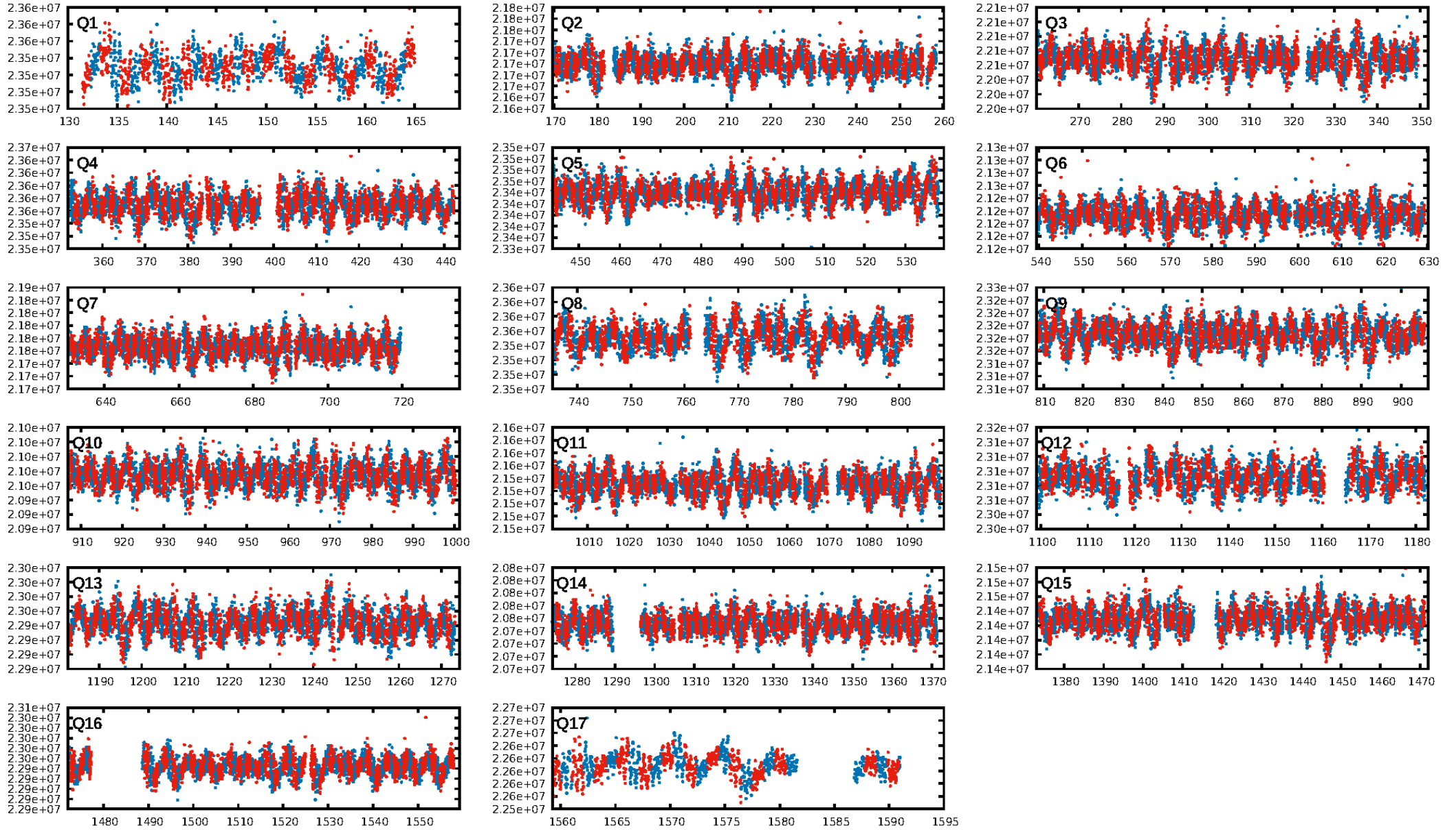
KIC: 5473584 Candidate: 1 of 10 Period: 2.057 d



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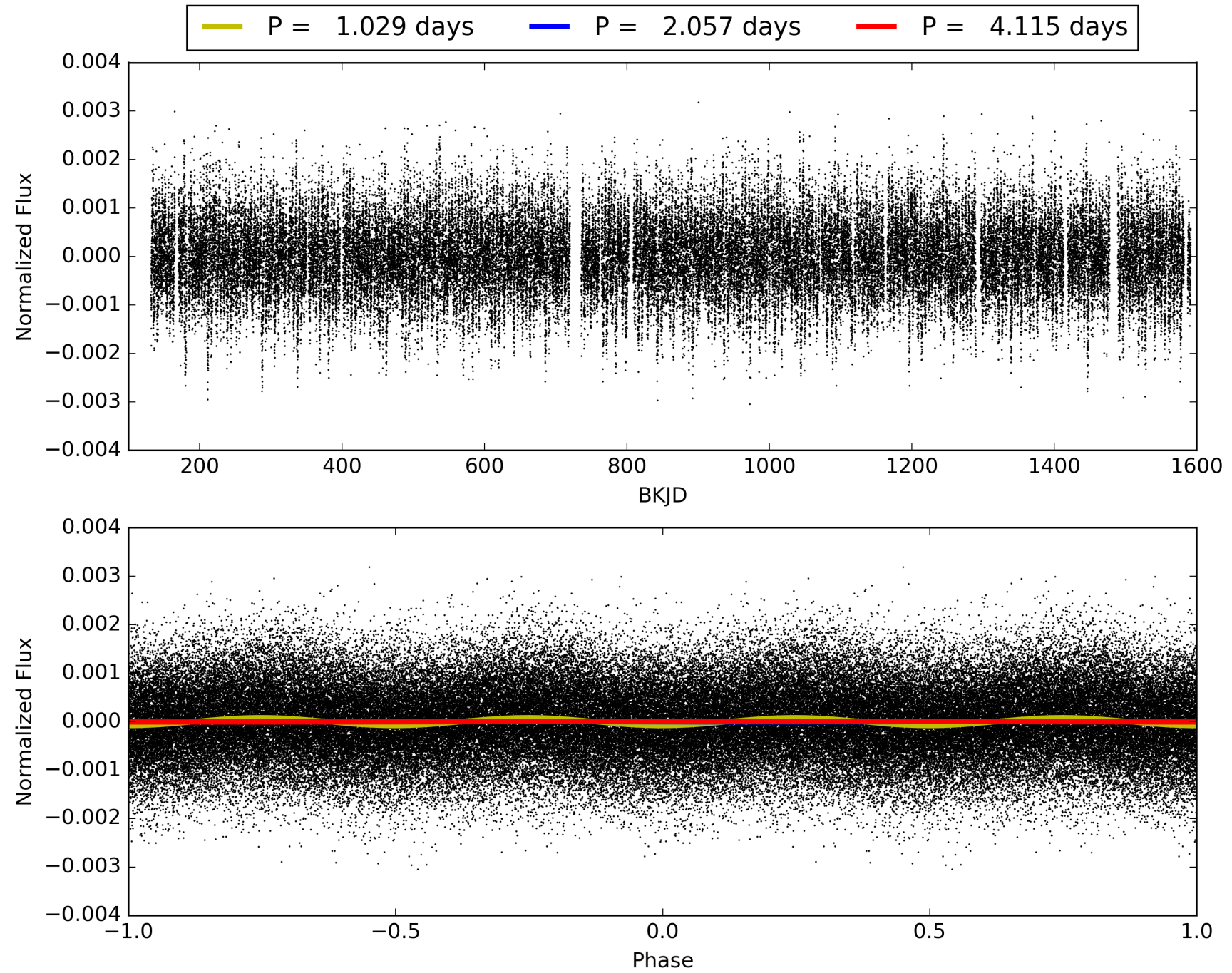
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005473584-01, PDC Light Curves





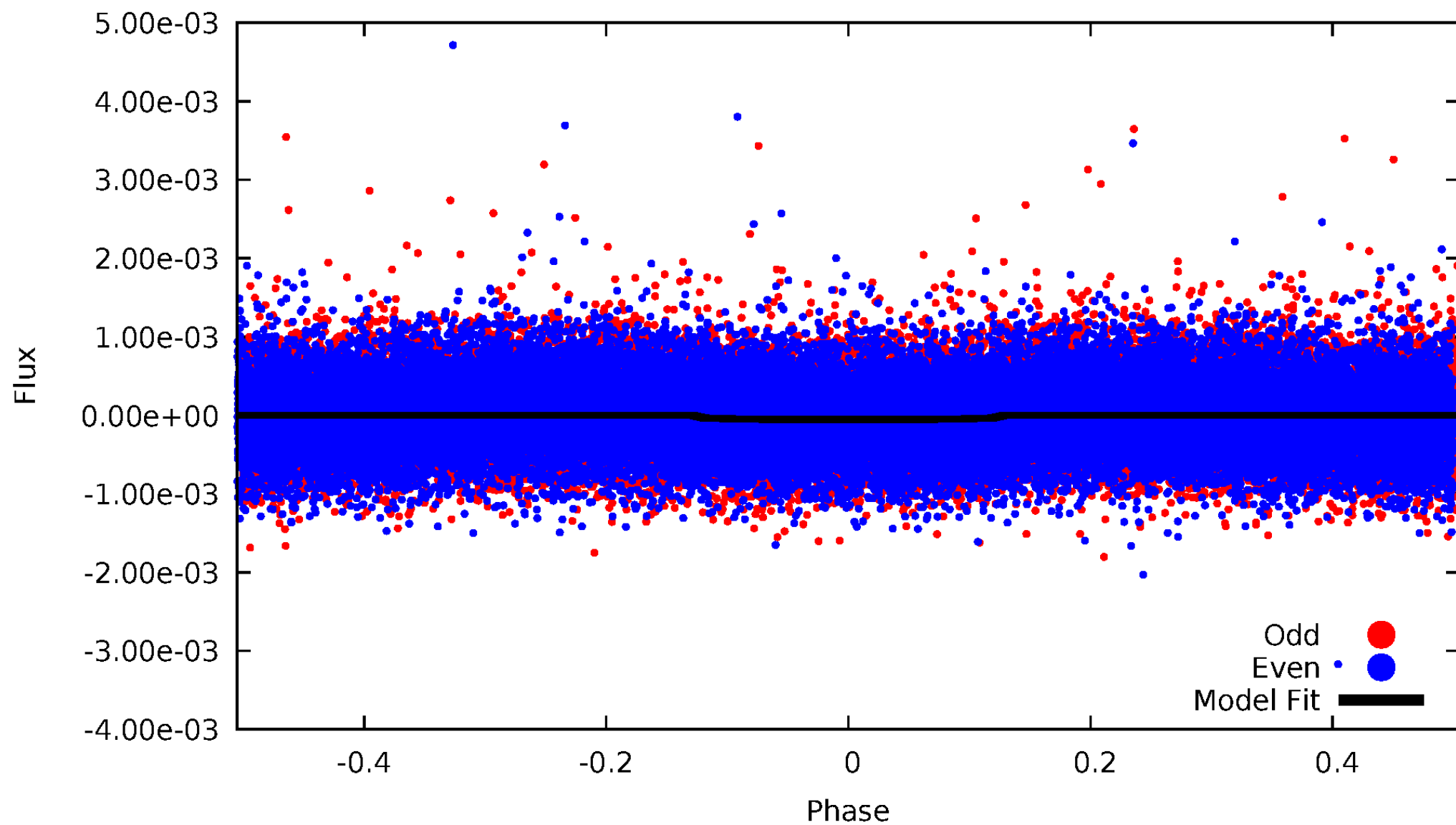
TCE 005473584-01





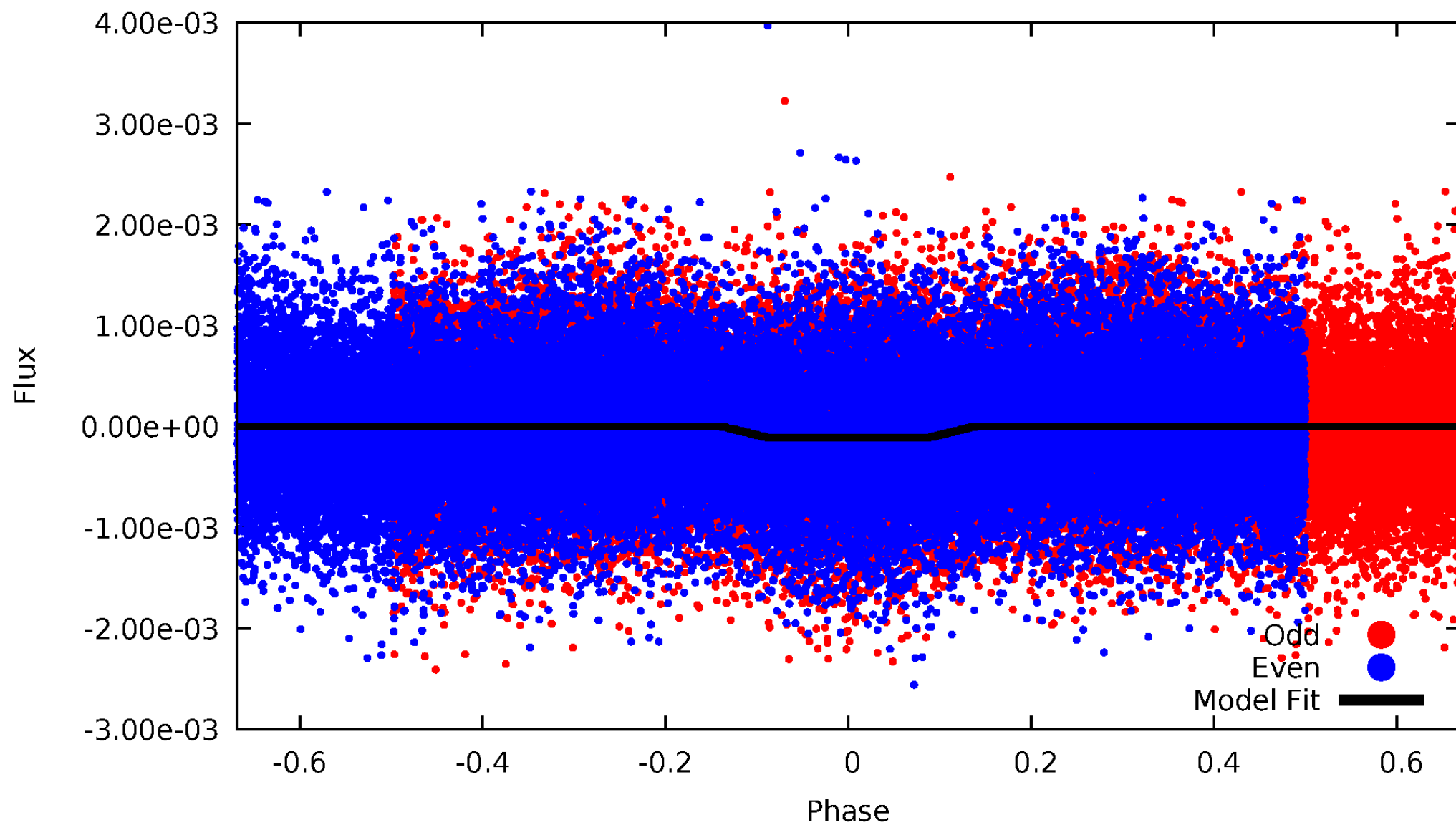
# DV Odd/Even

TCE 005473584-01

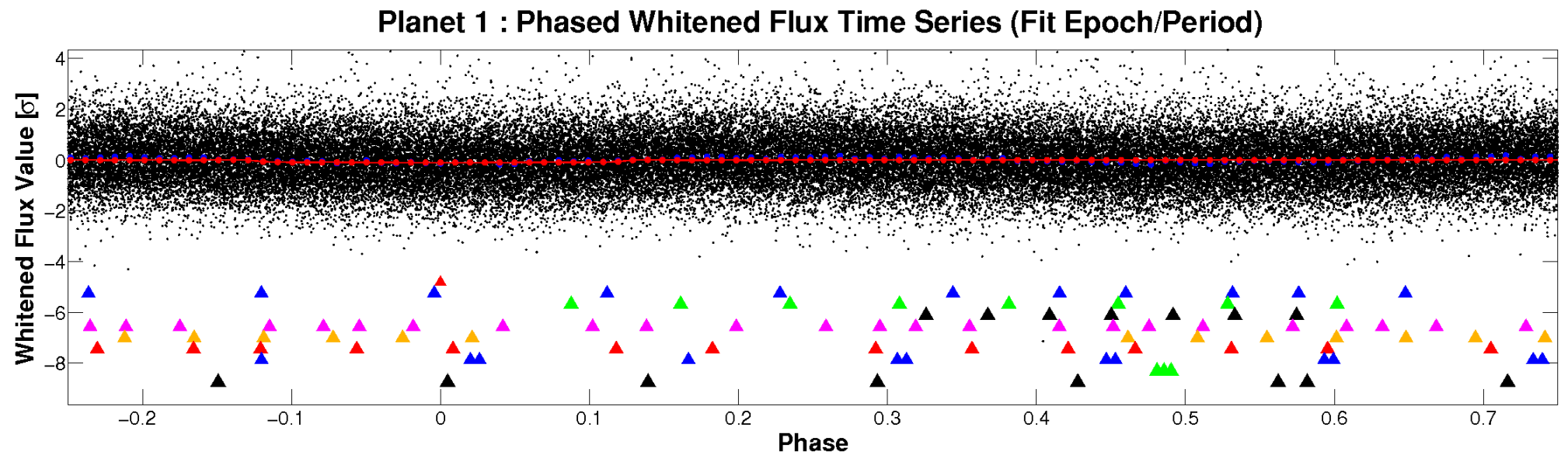
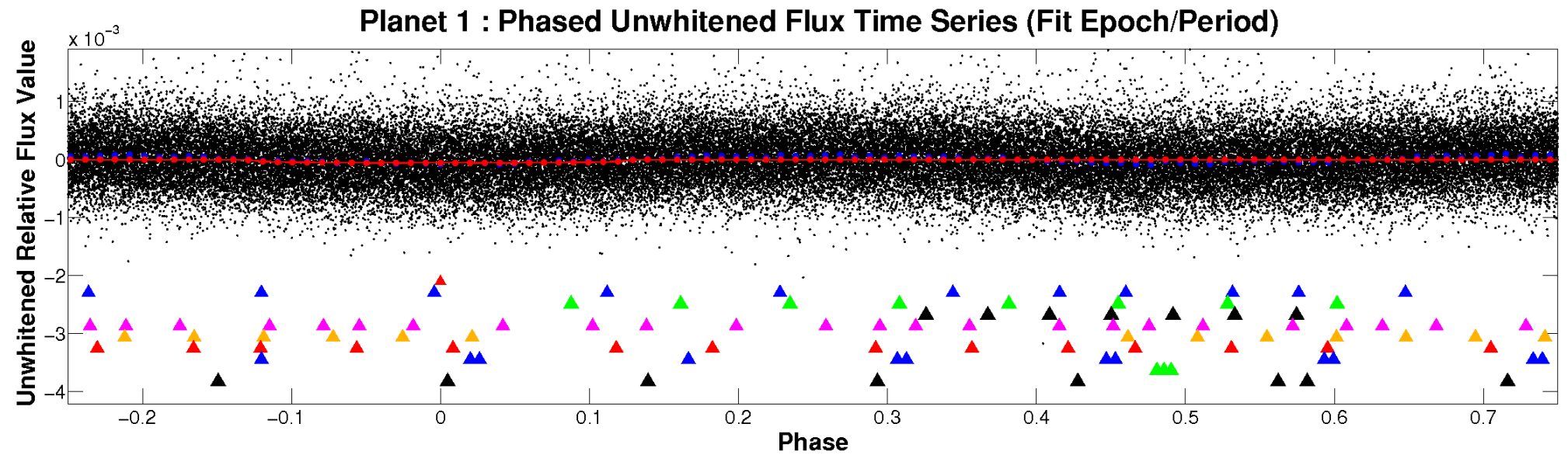


# ALT Odd/Even

TCE 005473584-01



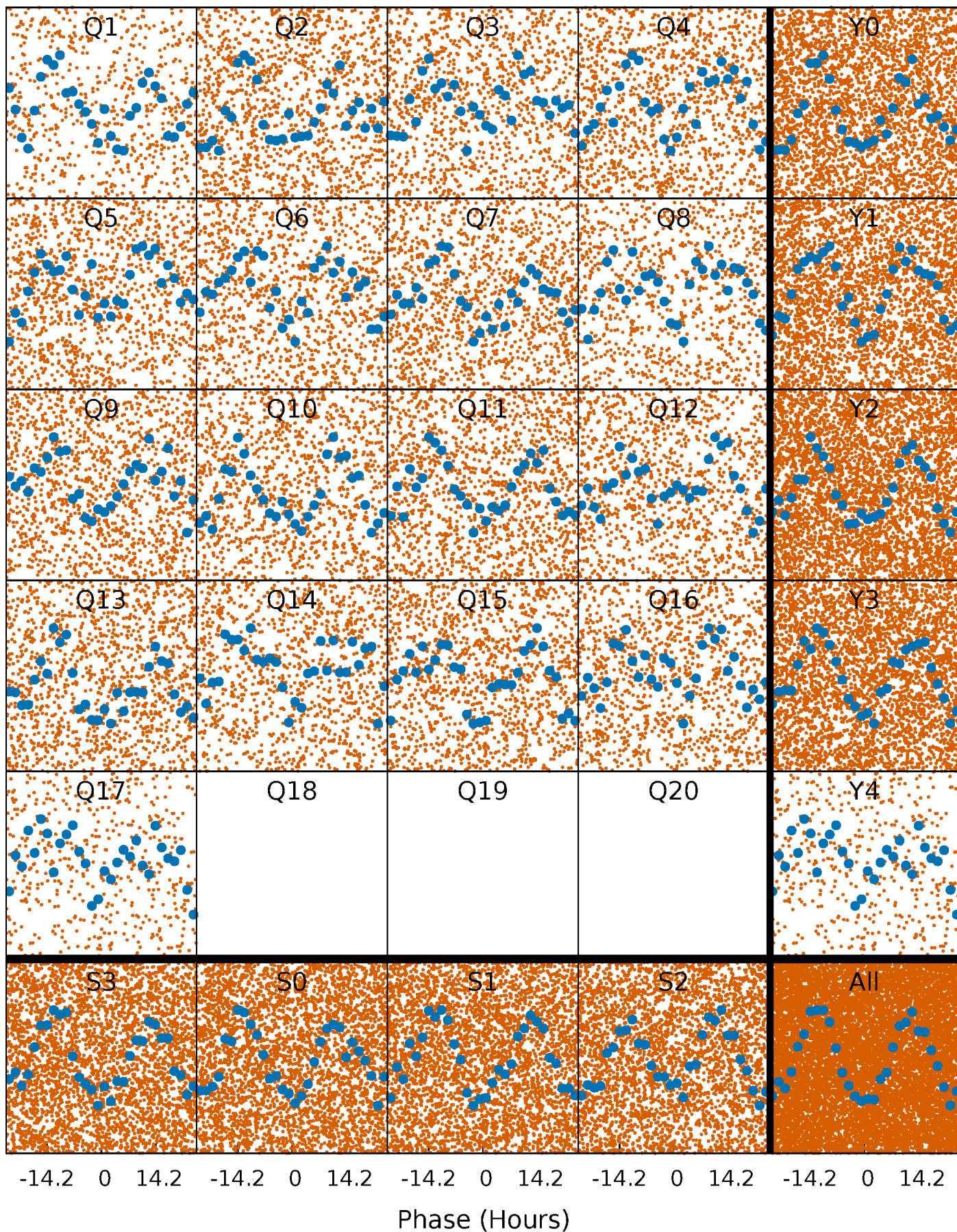
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

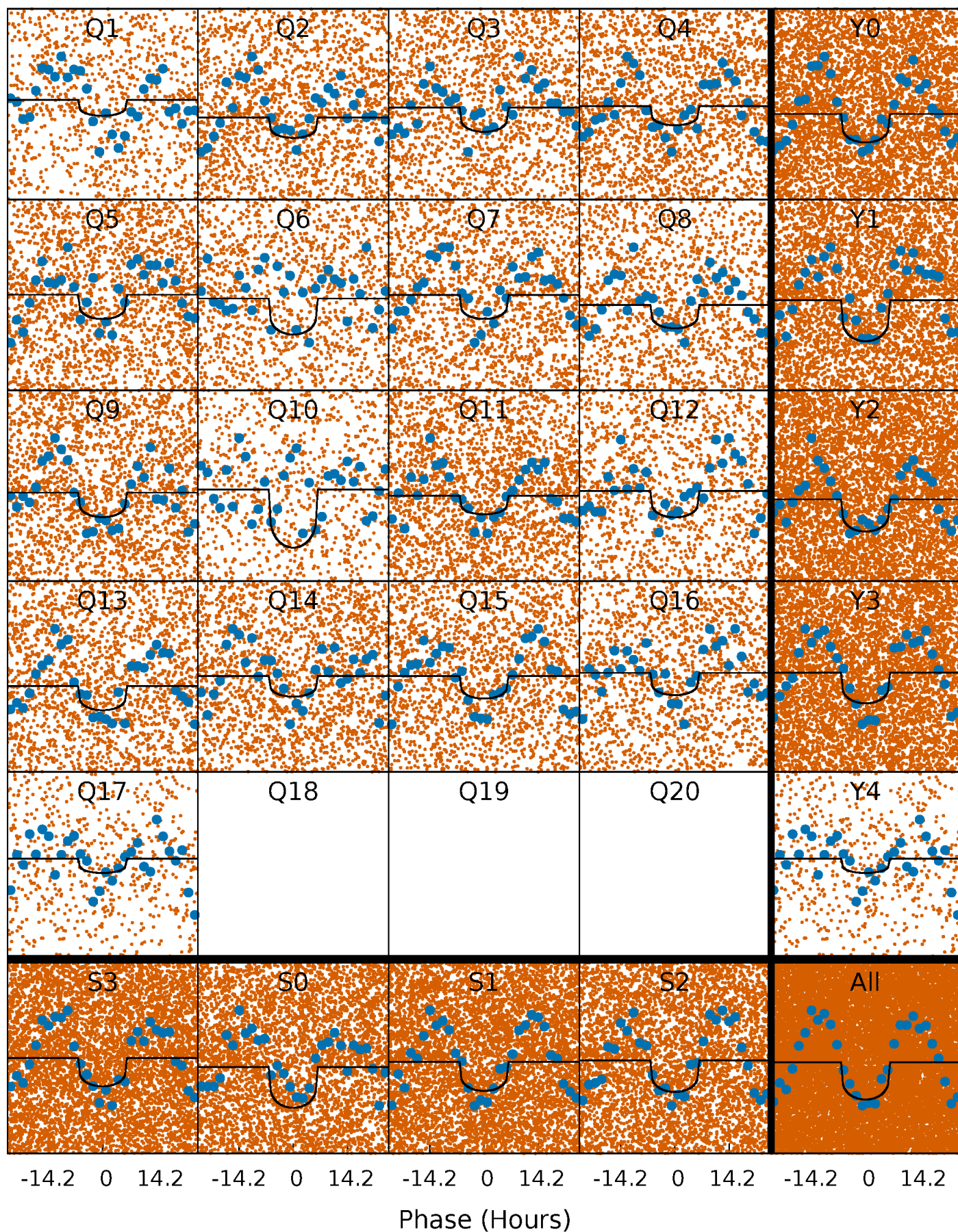
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# DV Quarter-Phased Transit Curves

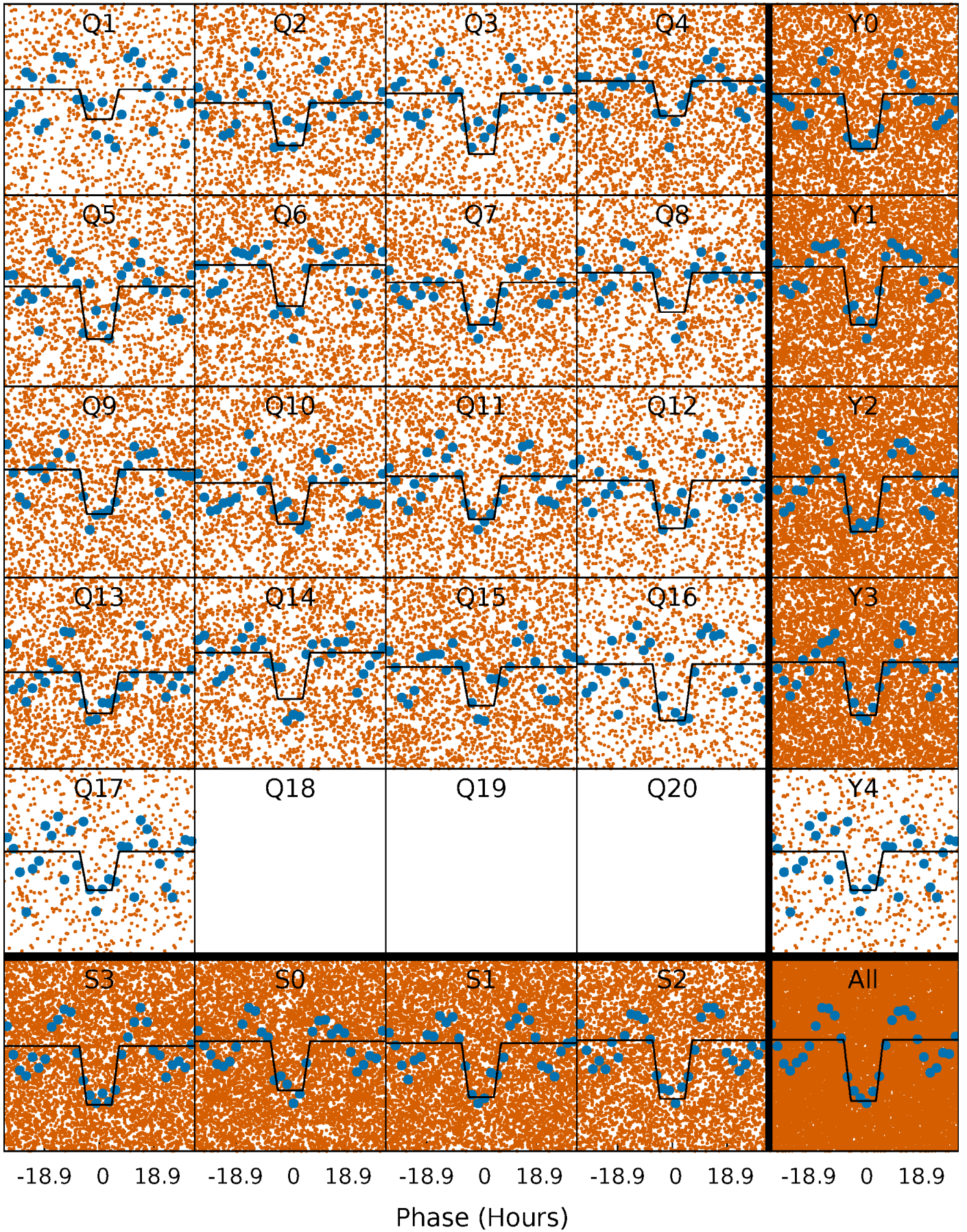
TCE 005473584-01 P= 2.057314 Days  $T_0=131.716569$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005473584-01 P= 2.057272 Days  $T_0=131.718537$  (BKJD)

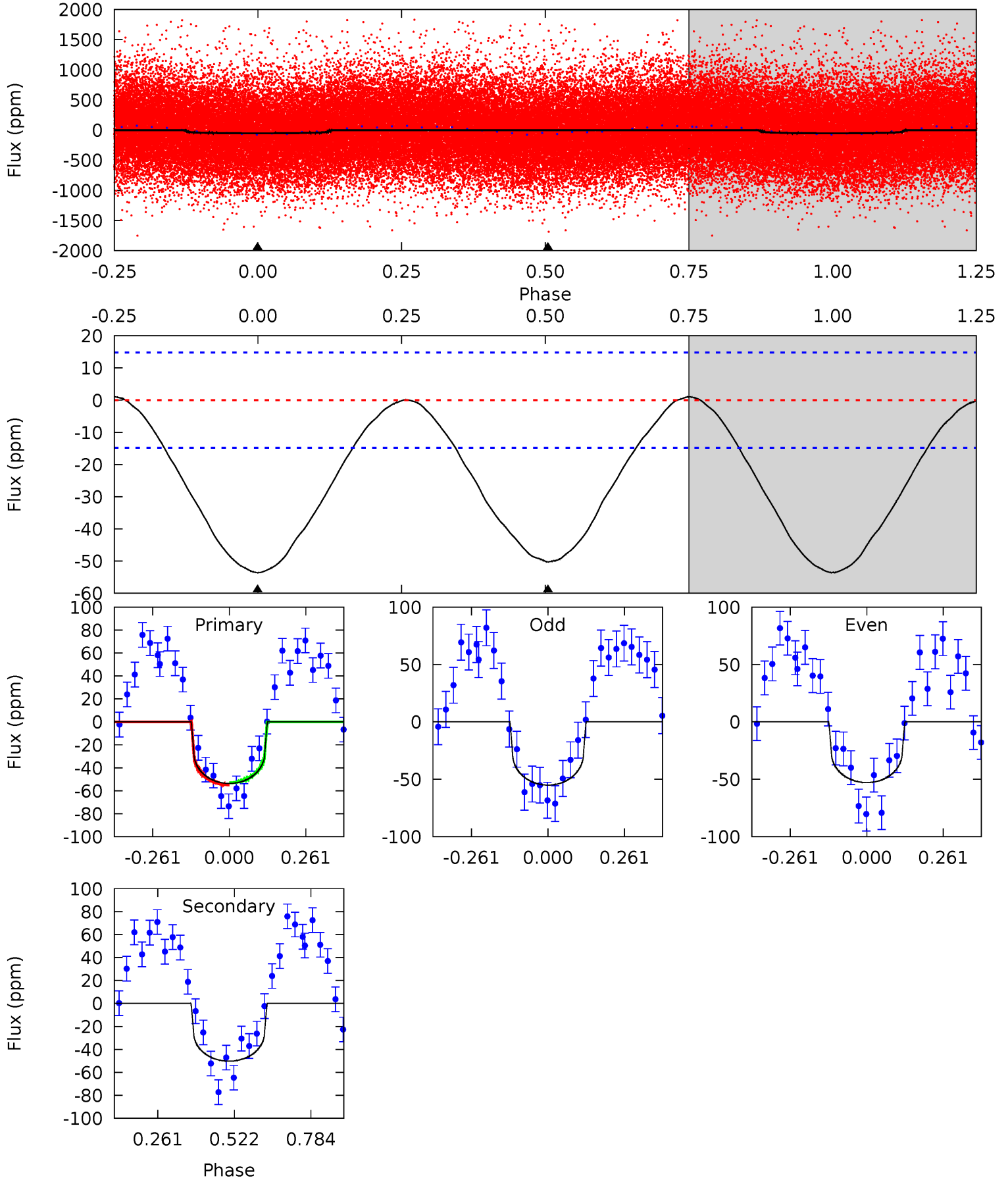




# DV Model-Shift Uniqueness Test

005473584-01, P = 2.057314 Days, E = 129.659255 Days

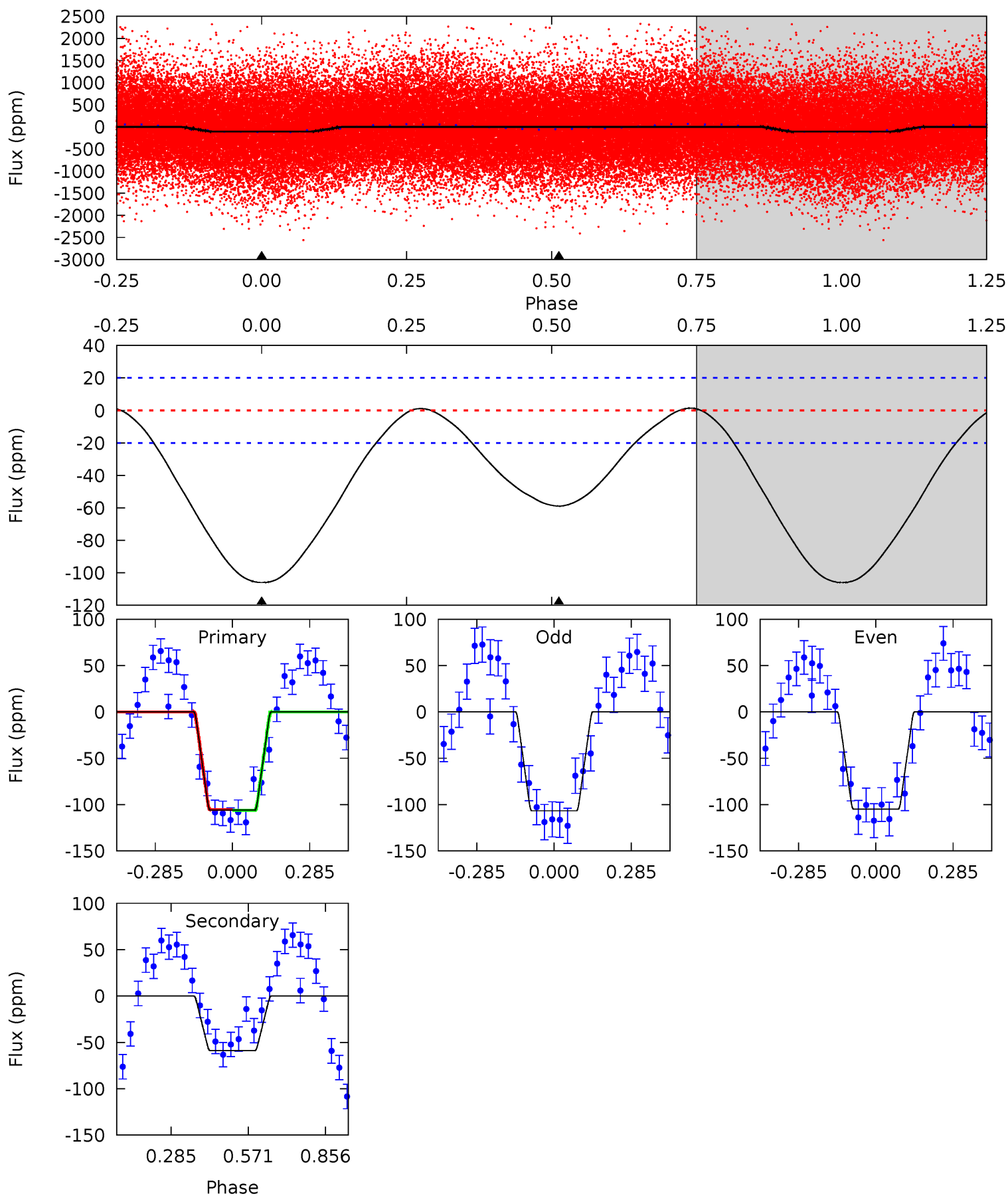
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	14.8	0	0	4.36	1.12	0.25	15.8	15.8	14.8	14.8	0.32	1.09	0.02	0.26



# Alt Model-Shift Uniqueness Test

005473584-01, P = 2.057272 Days, E = 129.661265 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.9	12.7	0	0	4.34	1.07	0.59	22.9	22.9	12.7	12.7	0.20	1.06	0.01	0.10



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-50 \pm 3$	$1.12^{+0.94}_{-0.74}$	$2067^{+141}_{-110}$	$5054^{+3918}_{-1099}$	$22^{+163}_{-16}$
Alt.	$-59 \pm 5$	$1.31^{+0.94}_{-0.72}$	$2065^{+166}_{-105}$	$4829^{+2301}_{-886}$	$18^{+68}_{-12}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$



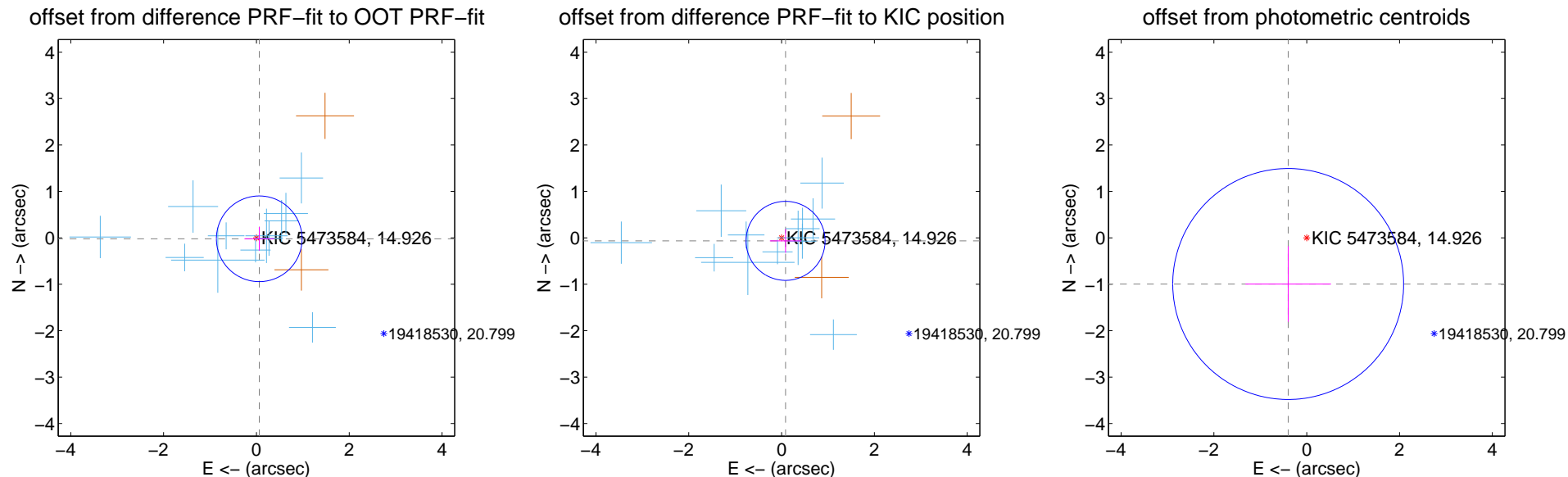
## DV Centroid Data

Supplemental centroid analysis for 005473584-01. Kepler magnitude: 14.93. Transit SNR 10.81

There are 12 quarters with good PRF difference image offsets

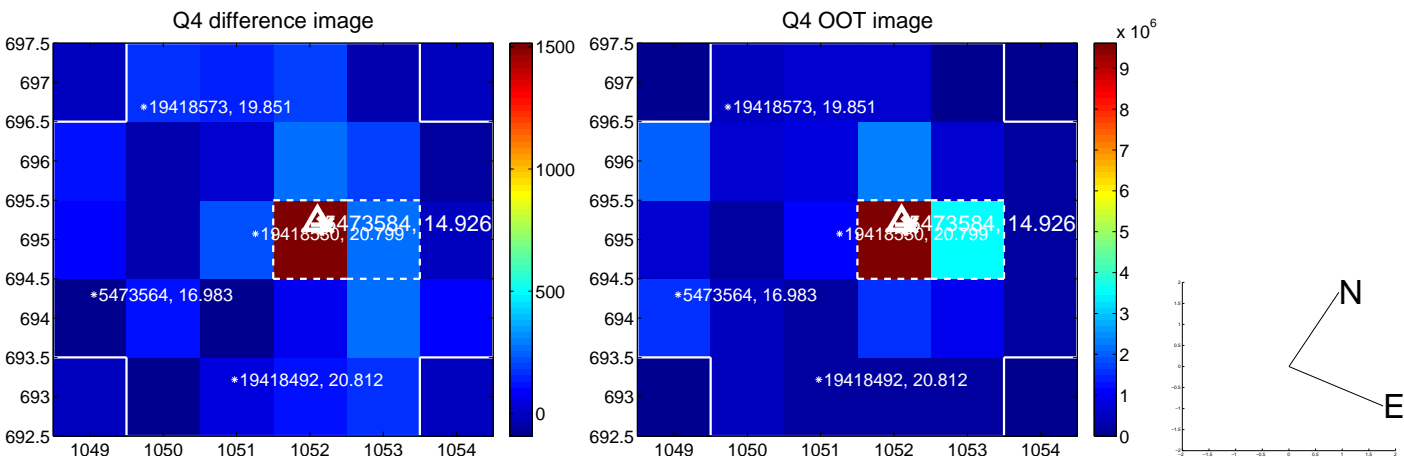
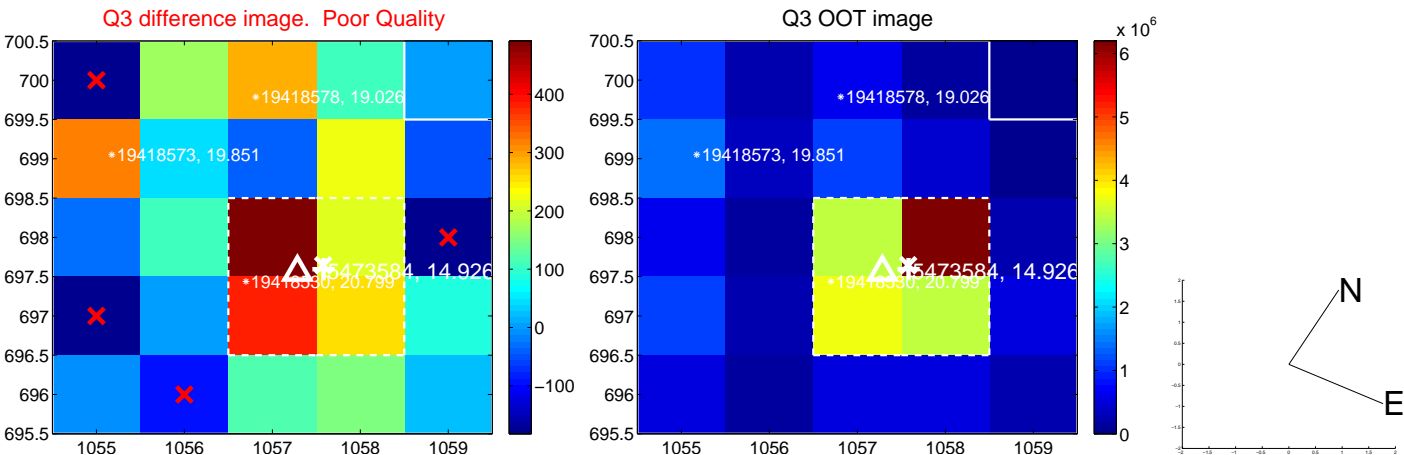
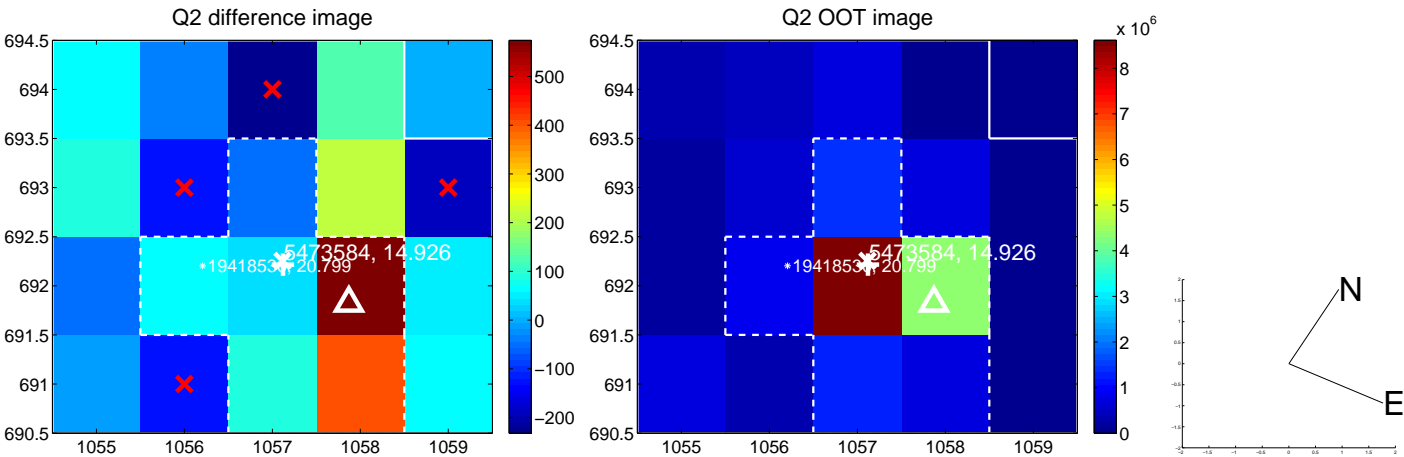
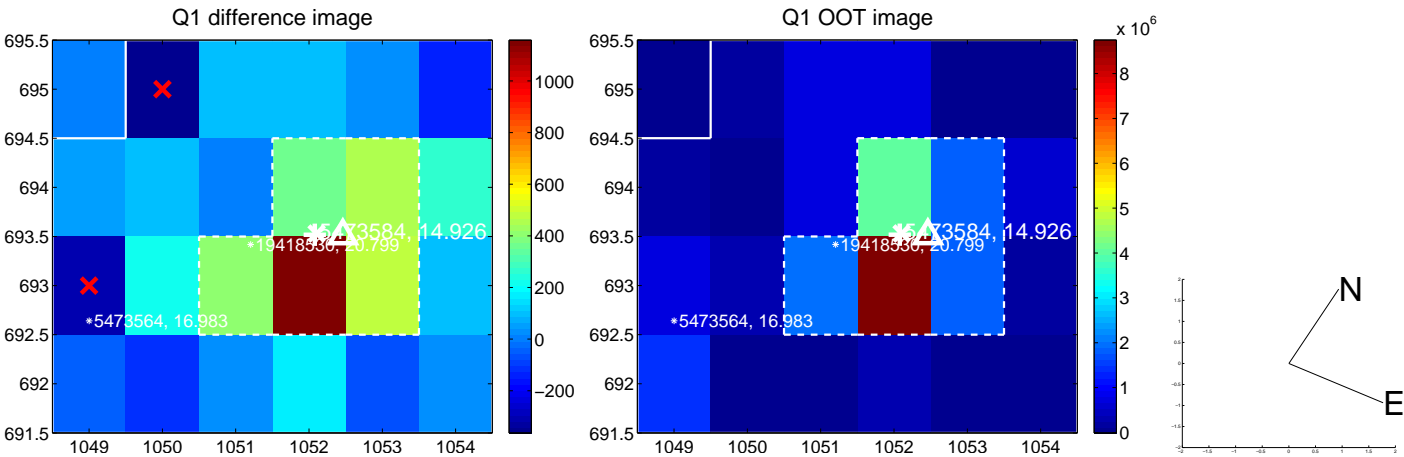
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.064 \pm 0.308$	0.21	$-0.061 \pm 0.319$	$-0.021 \pm 0.255$
PRF-fit source offset from KIC position	$0.108 \pm 0.284$	0.38	$-0.086 \pm 0.338$	$-0.065 \pm 0.257$
photometric centroid source offset	$1.07 \pm 0.83$	1.29	$0.40 \pm 0.92$	$-0.99 \pm 0.81$

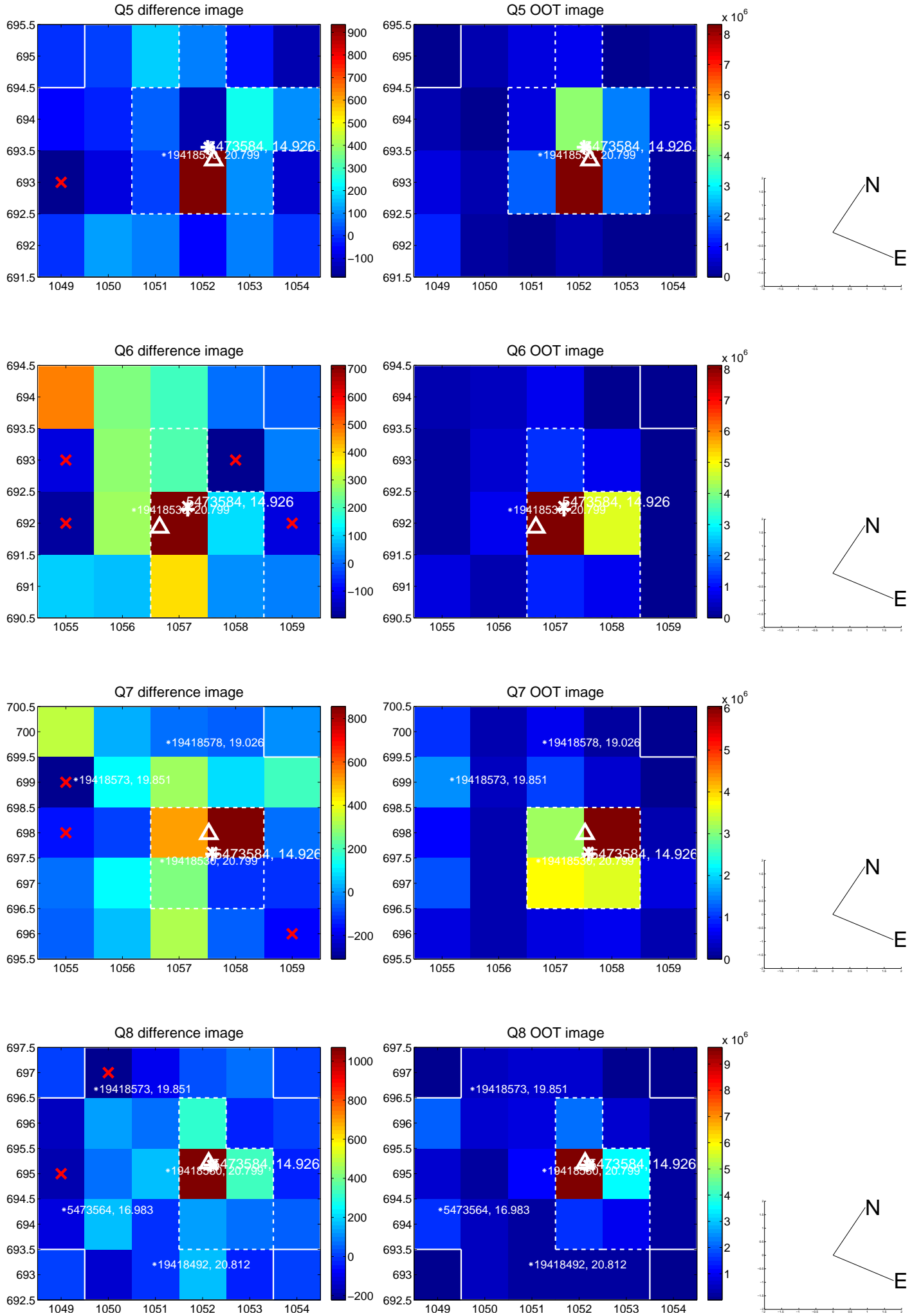


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

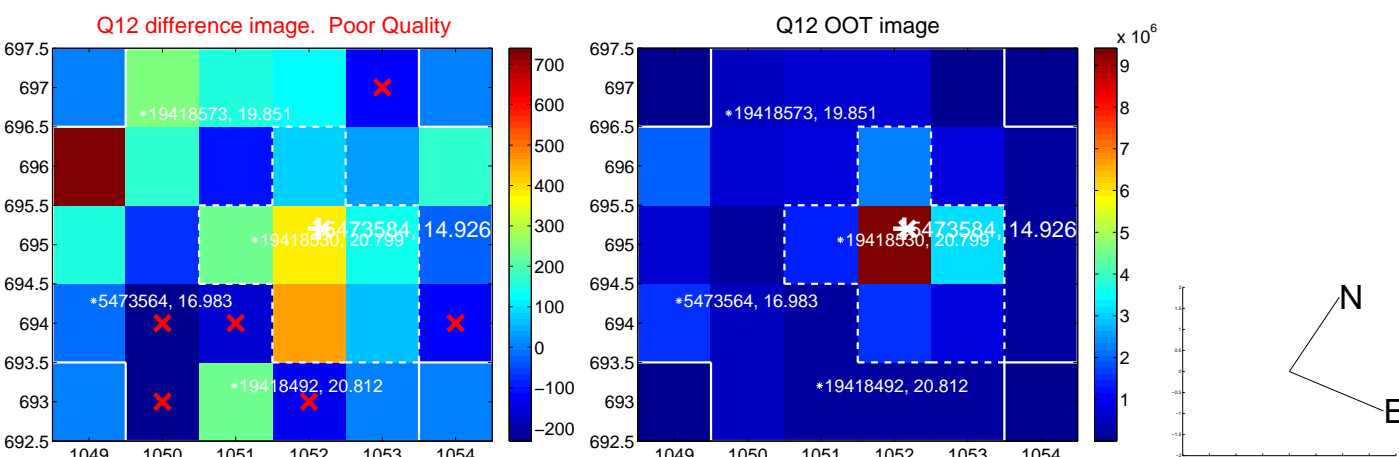
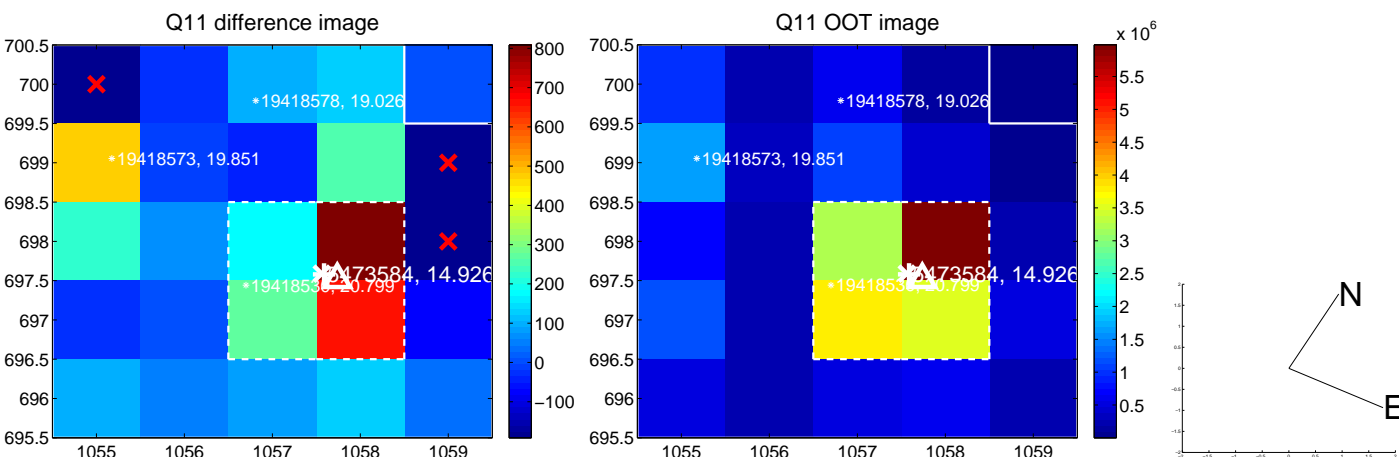
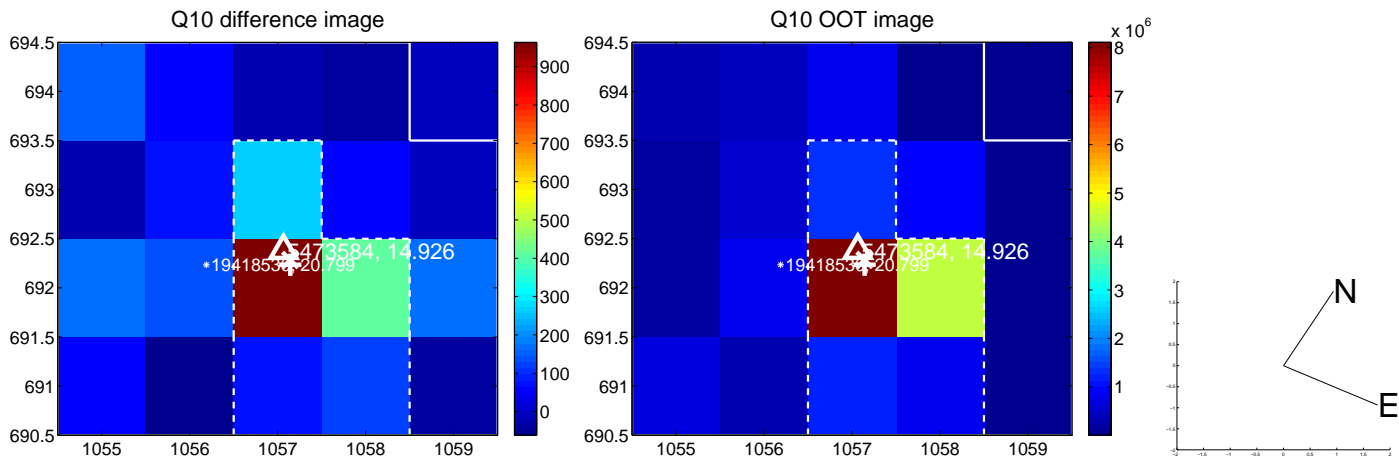
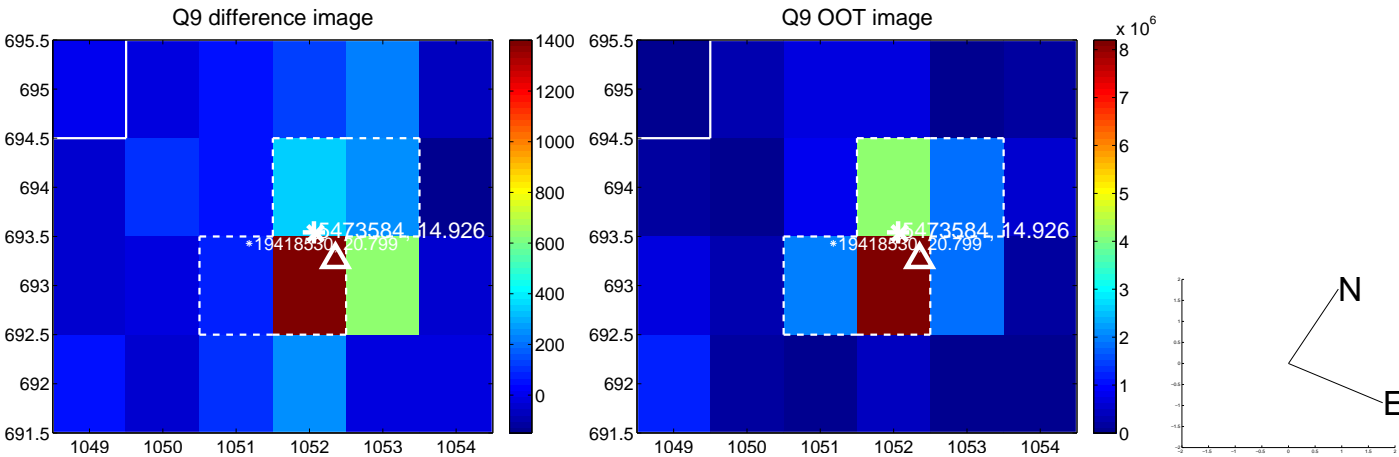


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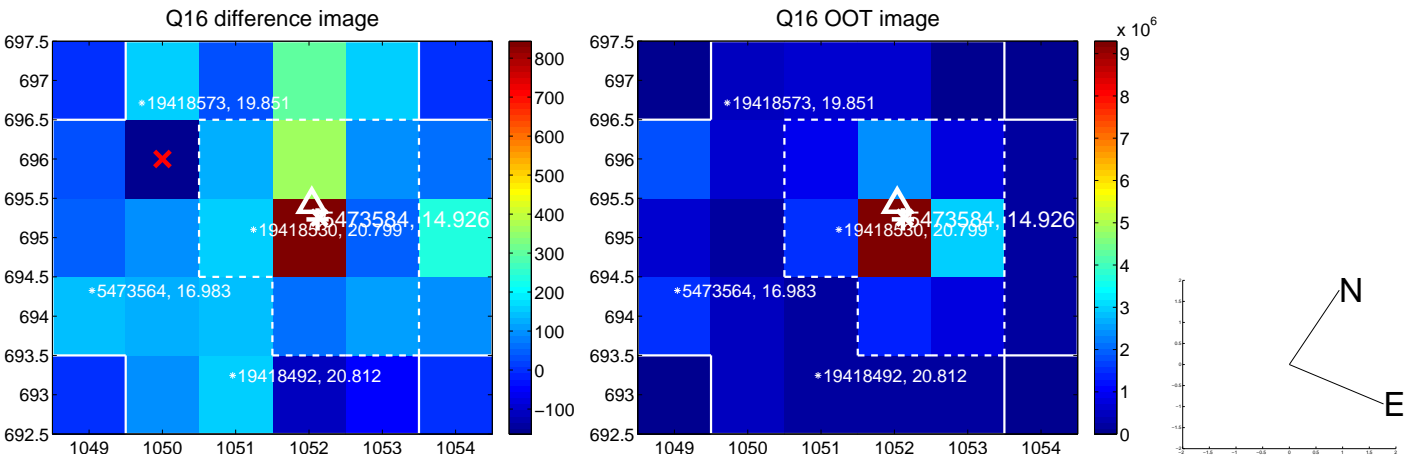
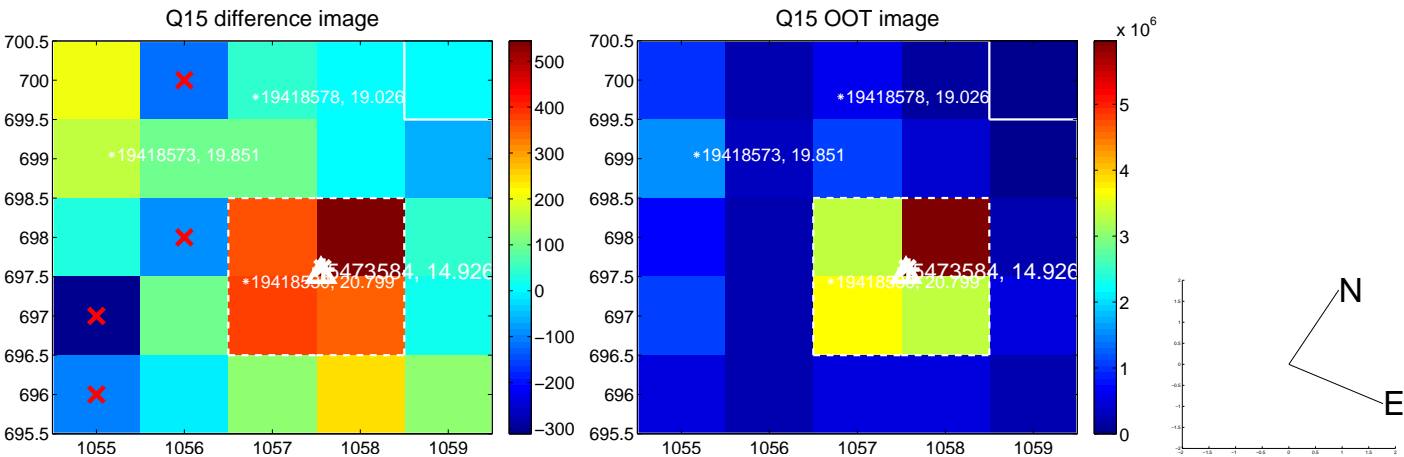
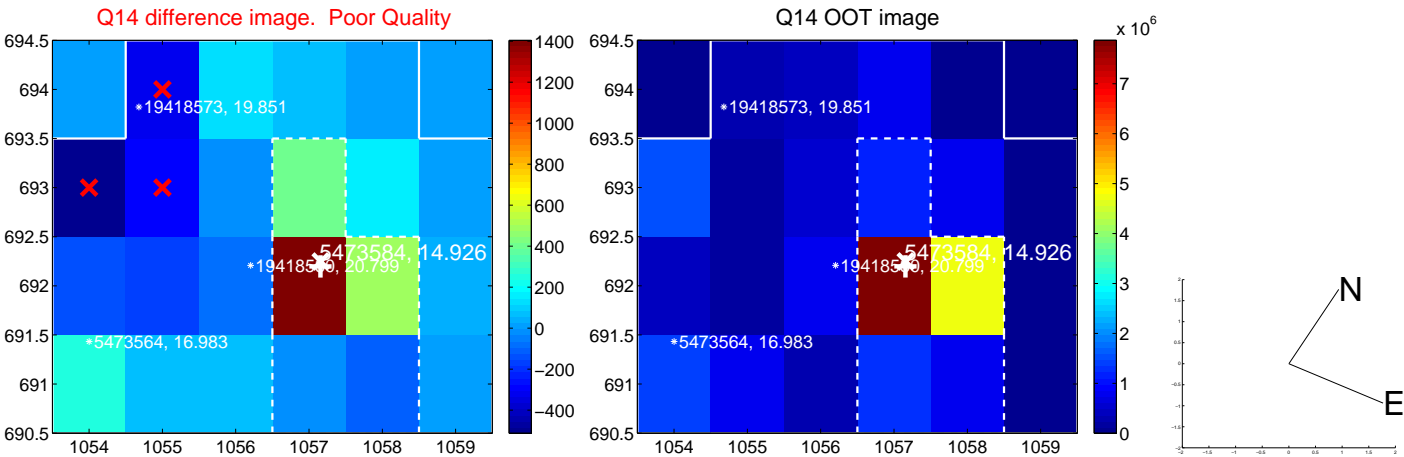
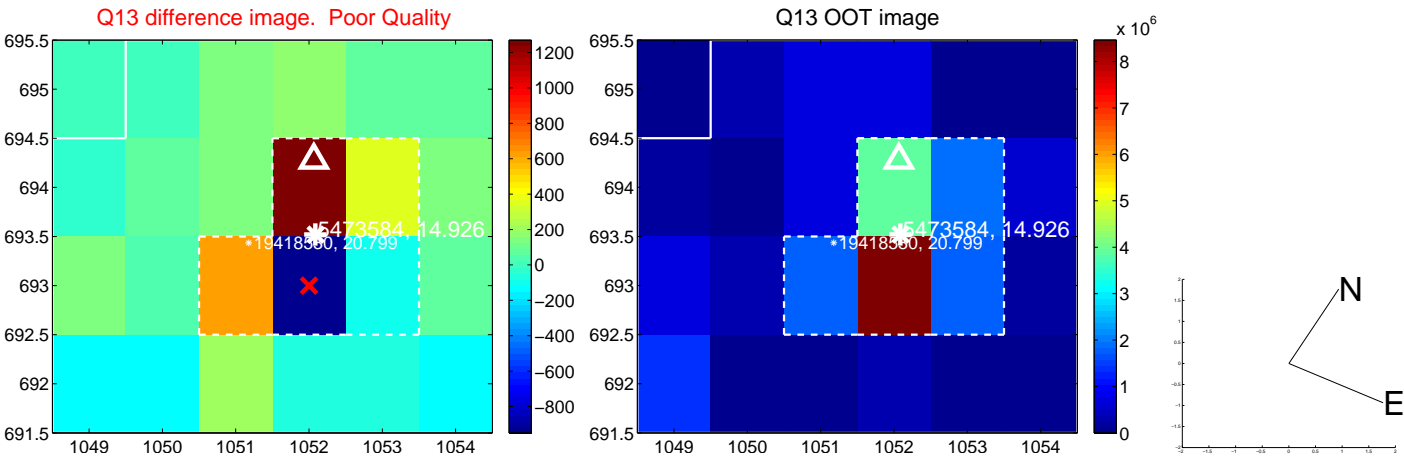




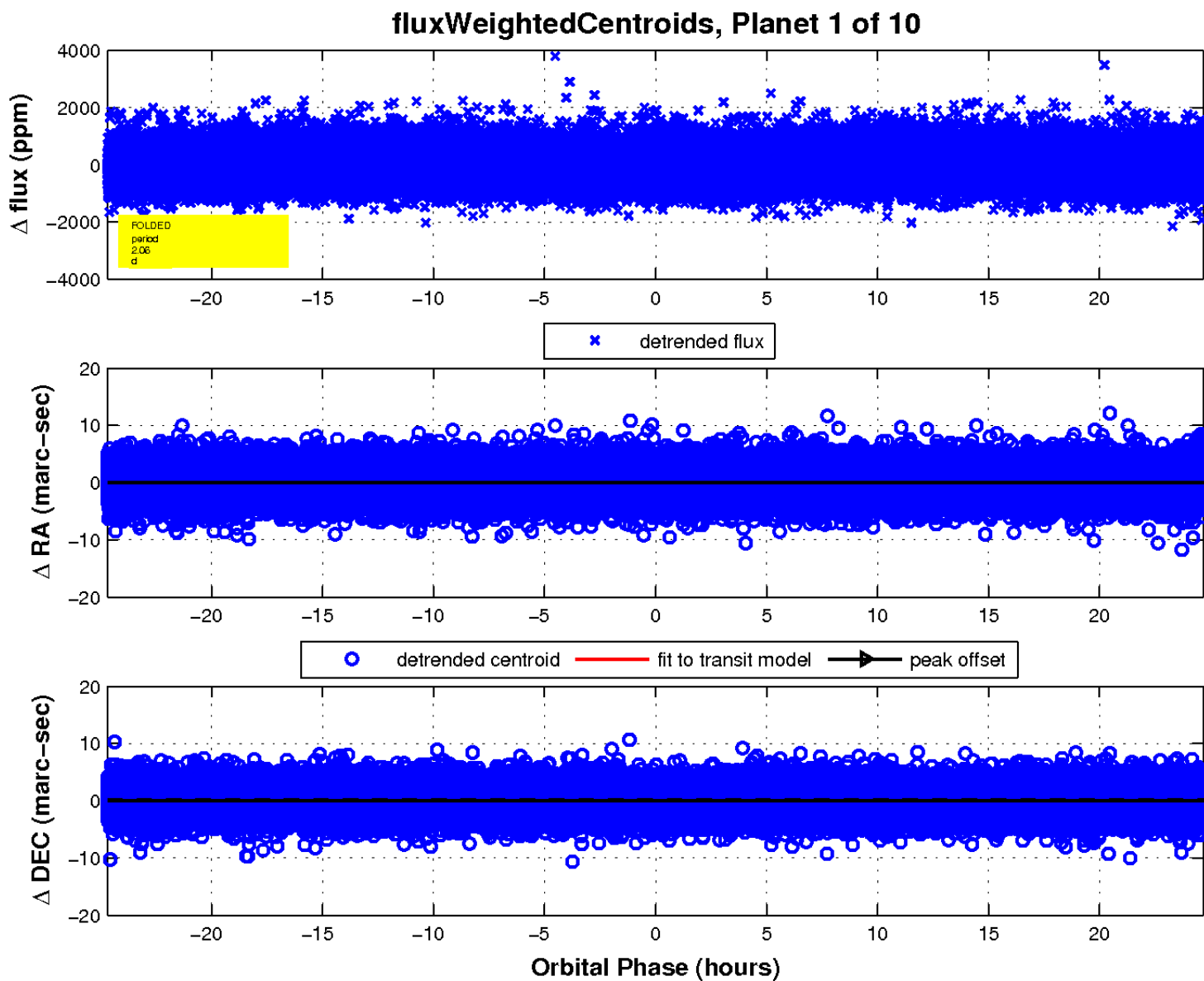
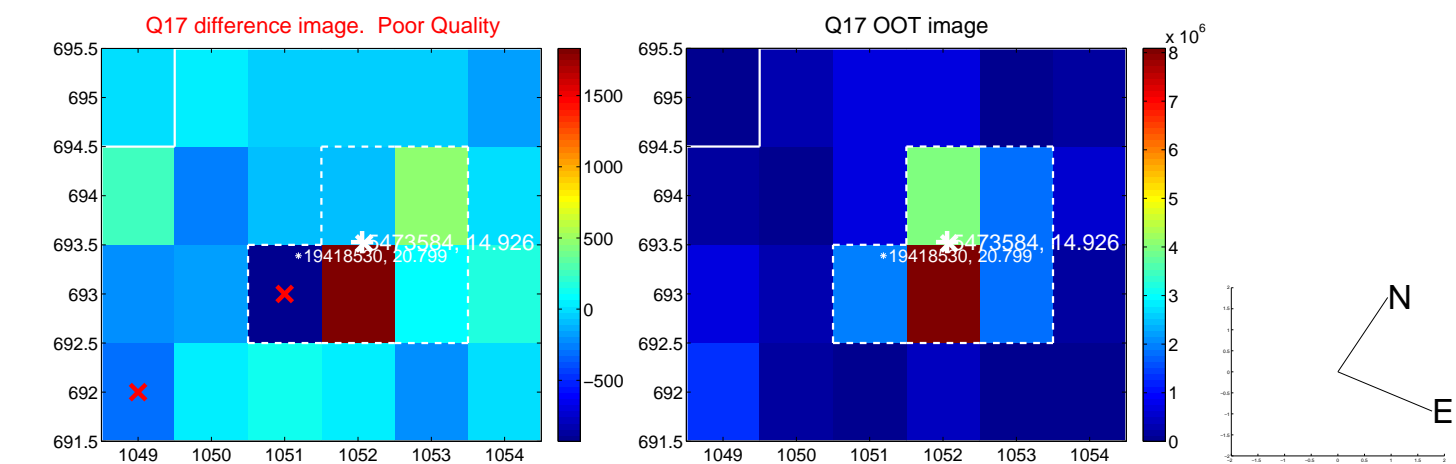
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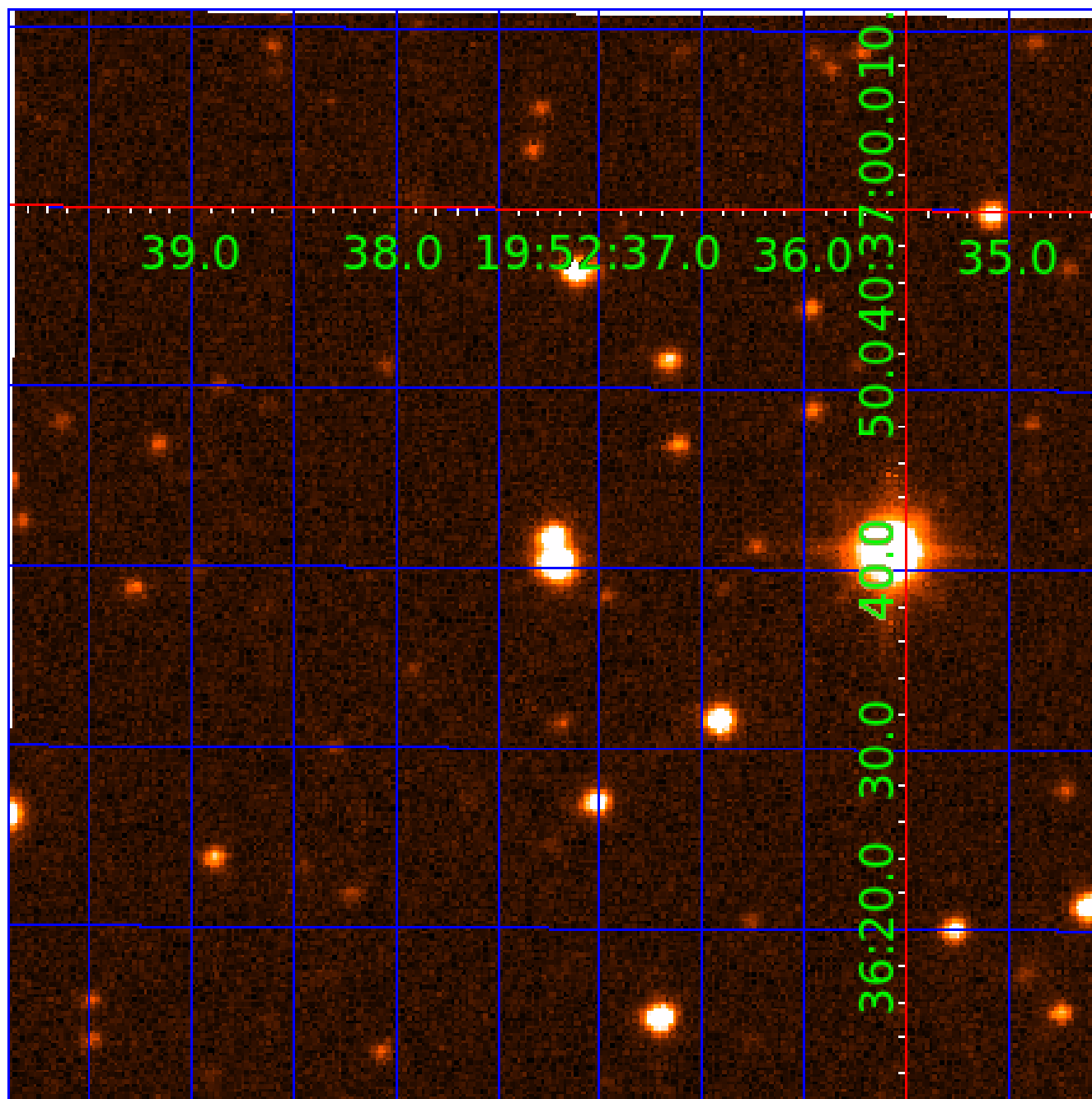


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



UKIRT Image

Declination



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## Robovetter Results

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005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

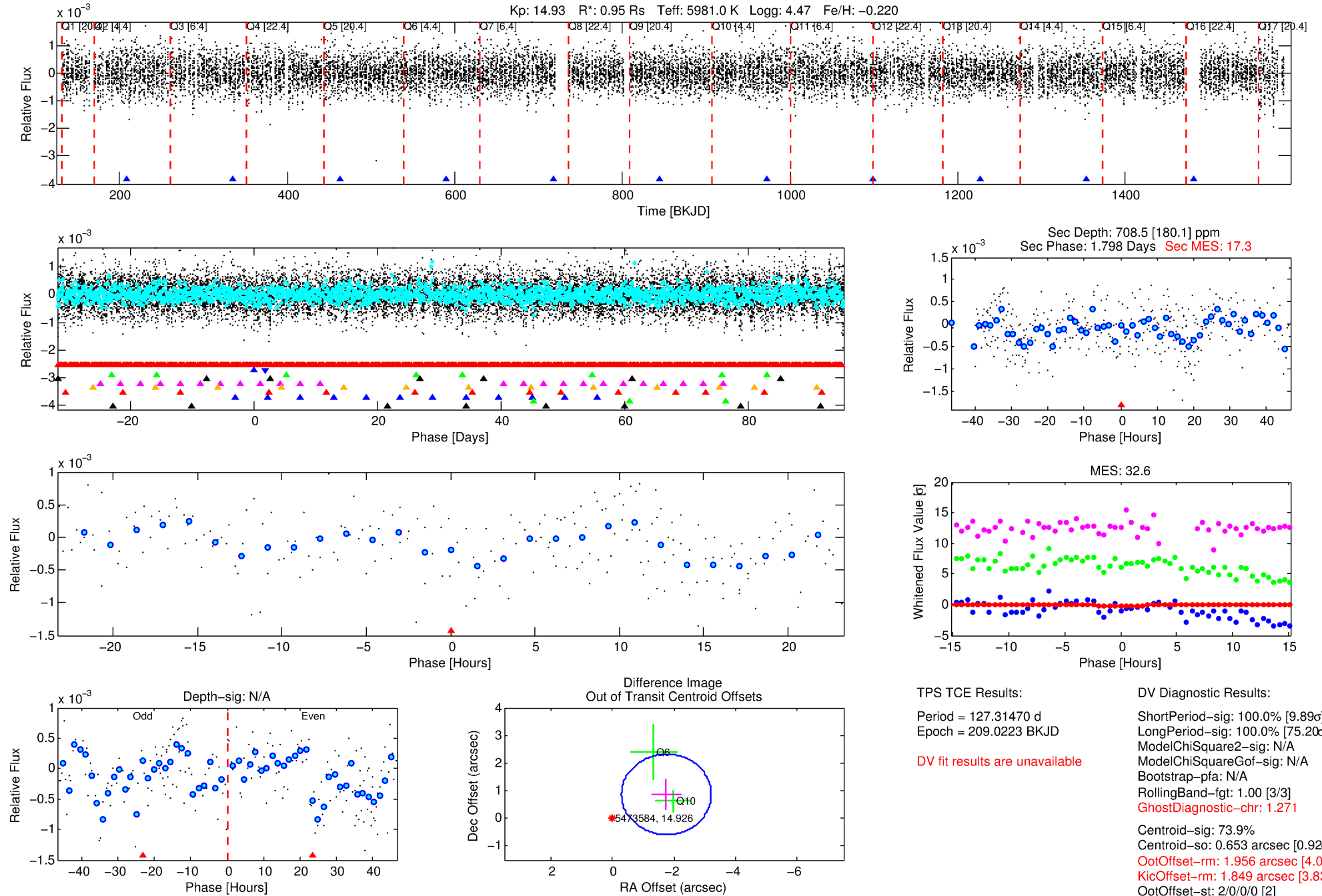
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-02

No Significant Match Found

# DV One-Page Summary

KIC: 5473584 Candidate: 2 of 10 Period: 127.315 d

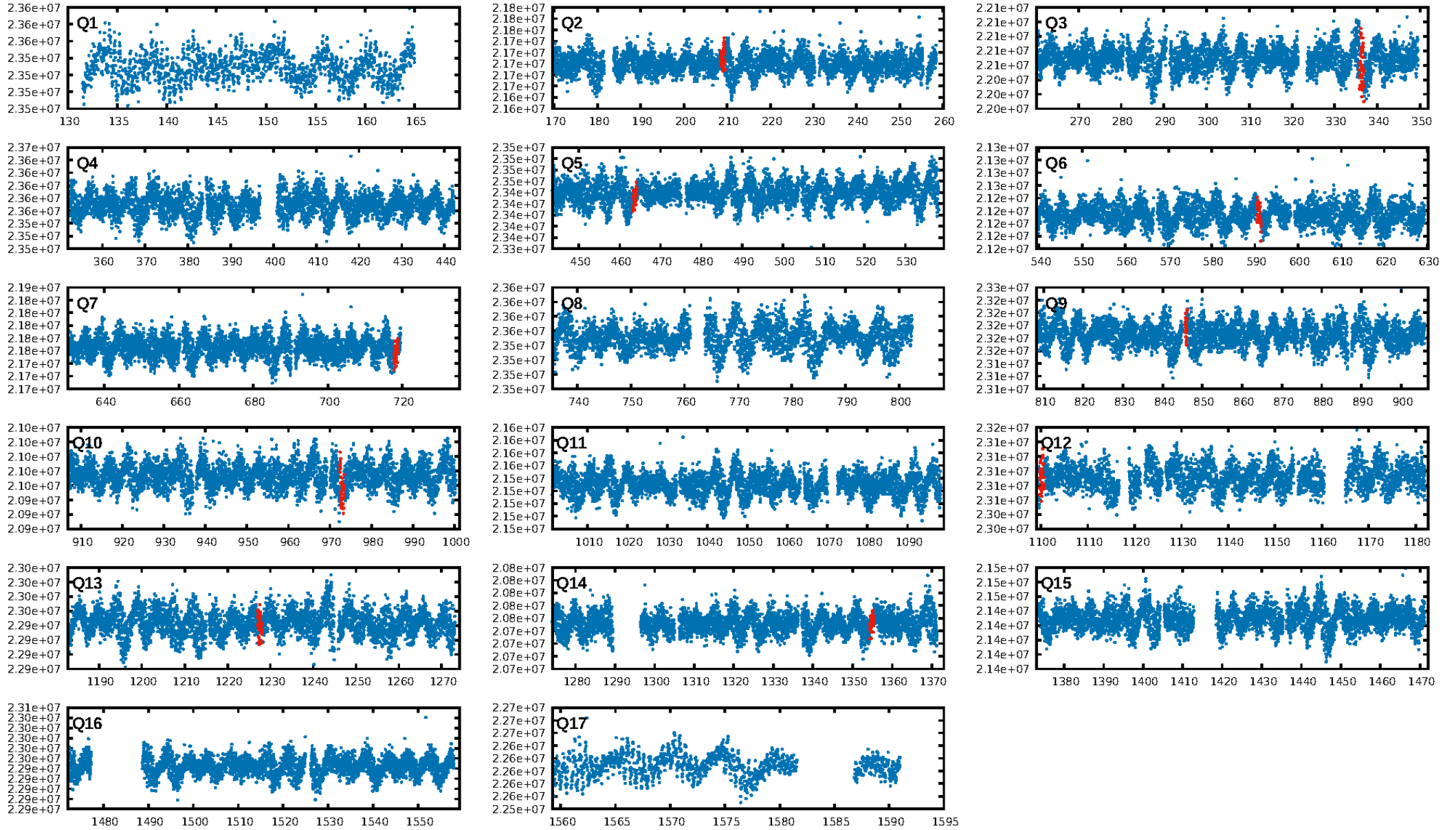


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:08:53 Z

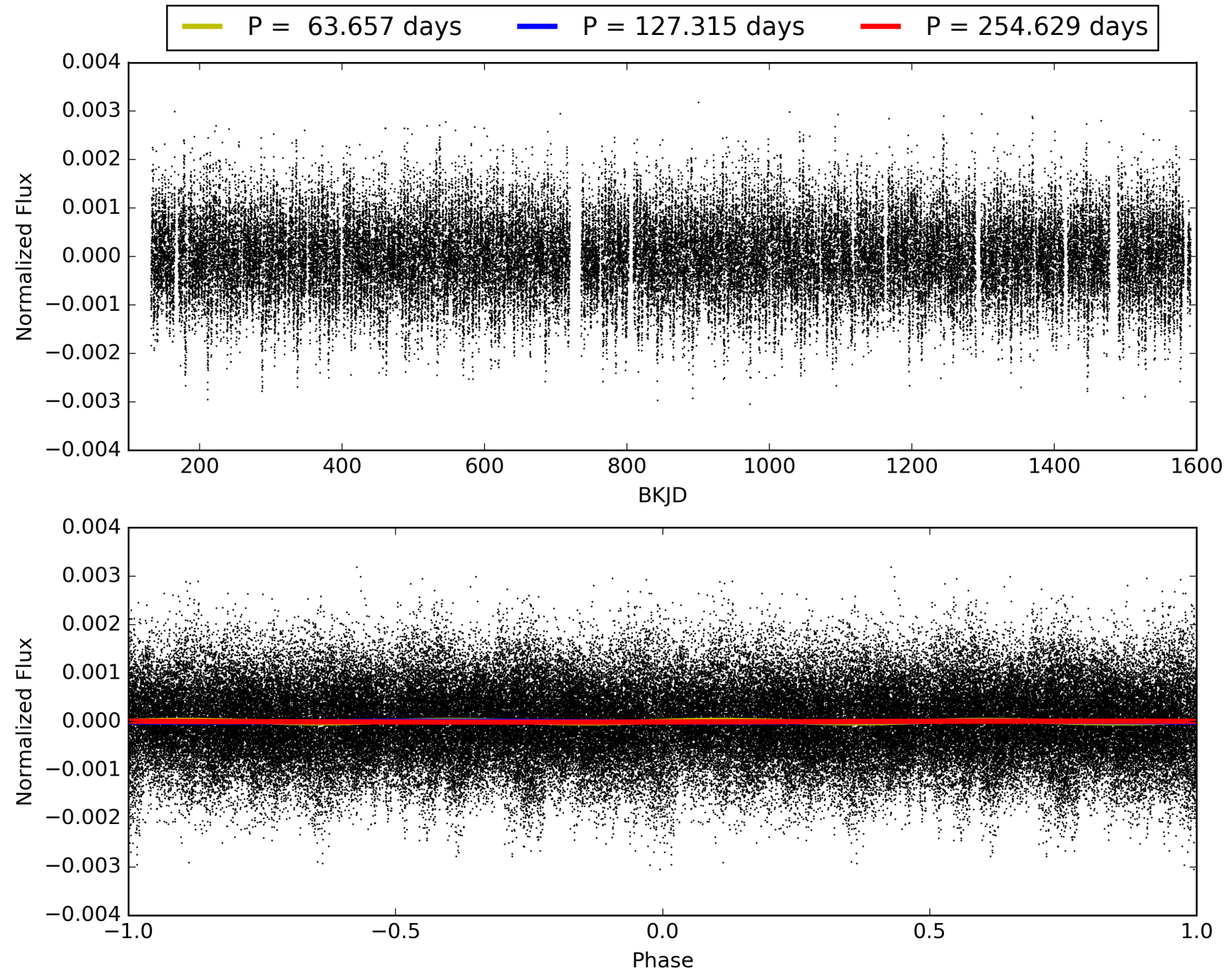
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005473584-02, PDC Light Curves

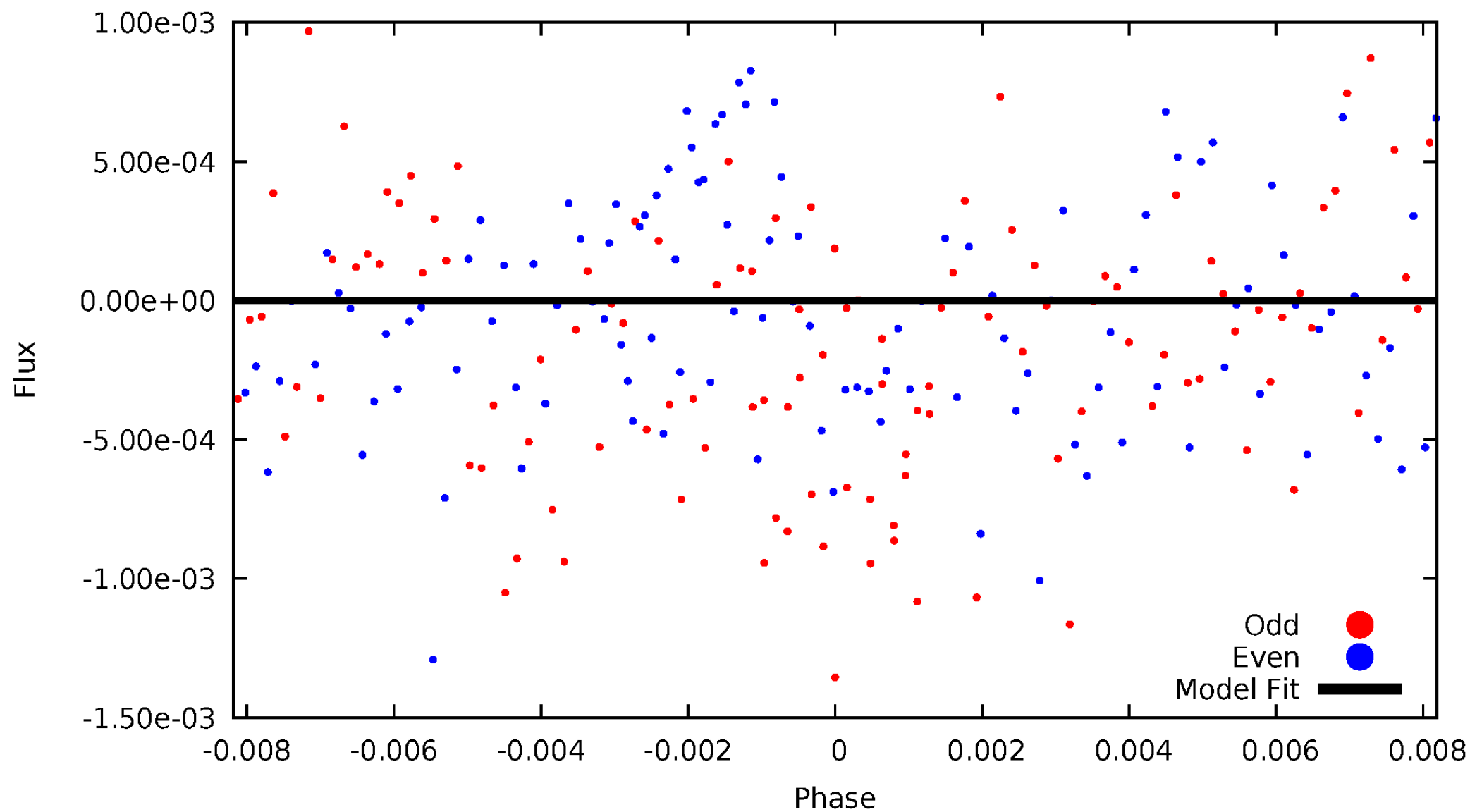


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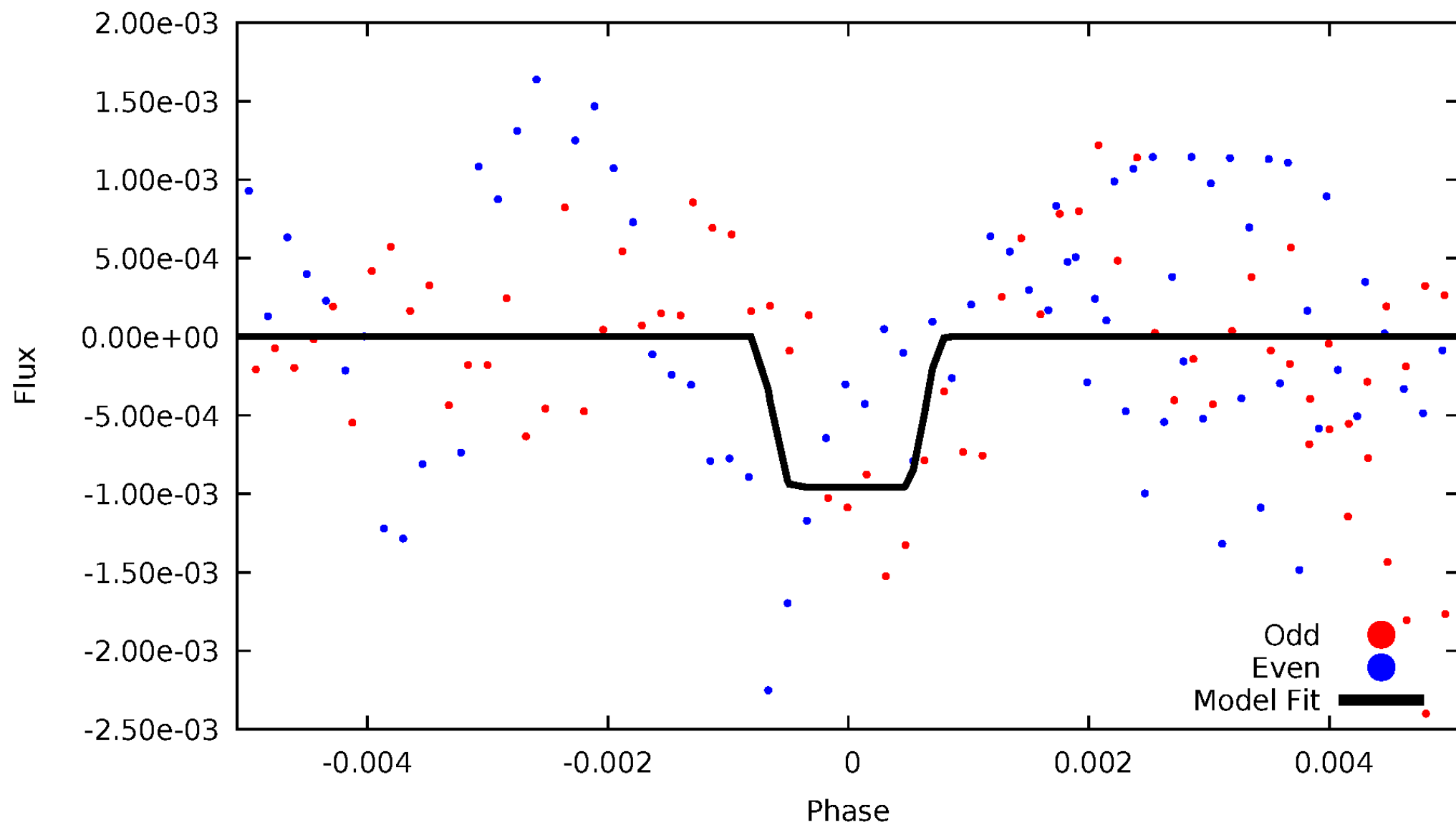
# DV Odd/Even

TCE 005473584-02



# ALT Odd/Even

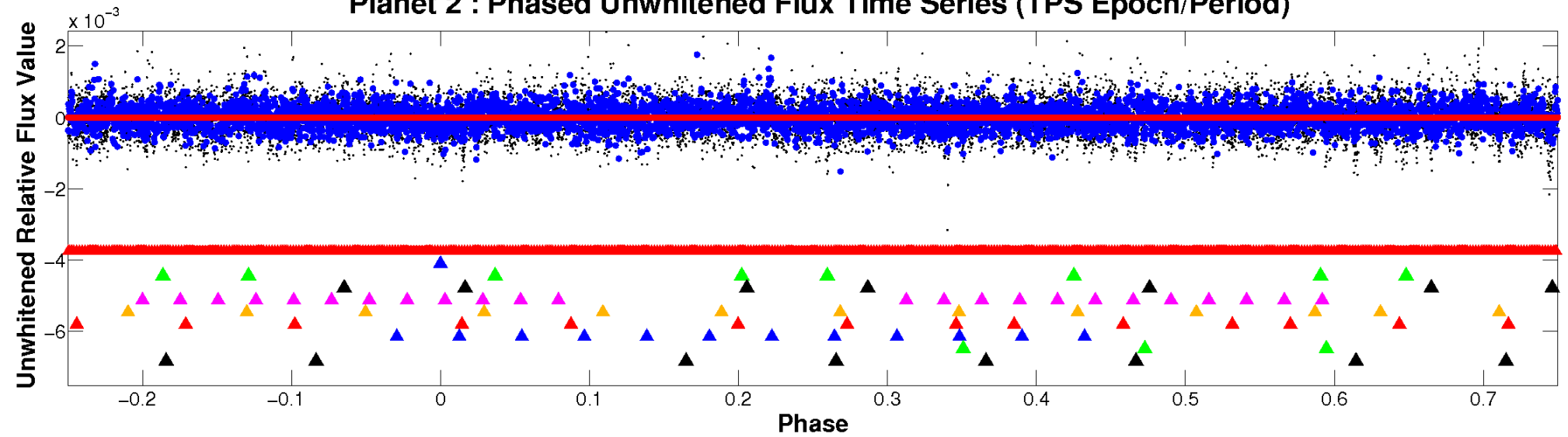
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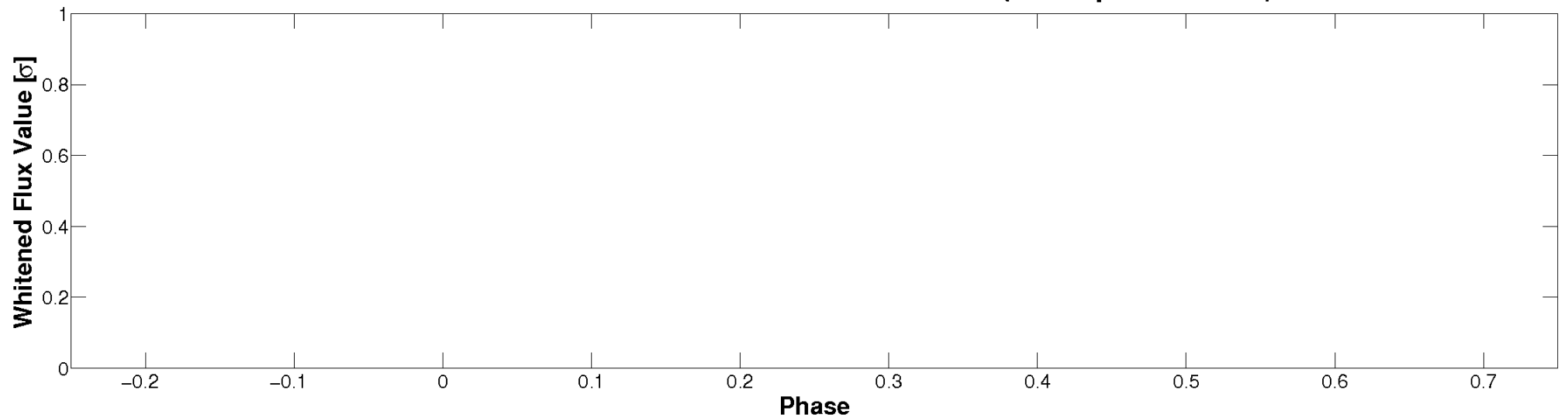


# Non-Whitened Vs. Whitened Light Curve

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

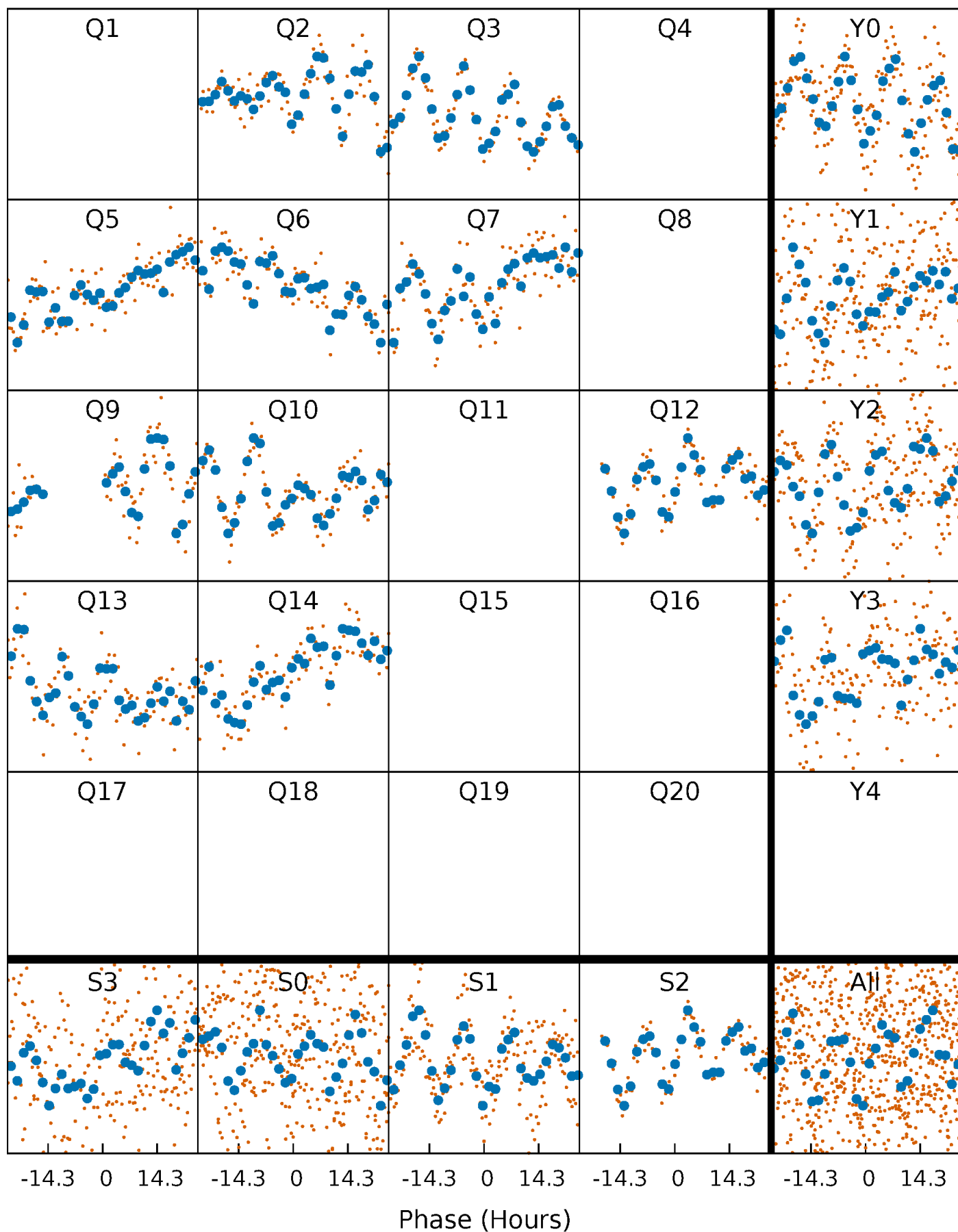


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



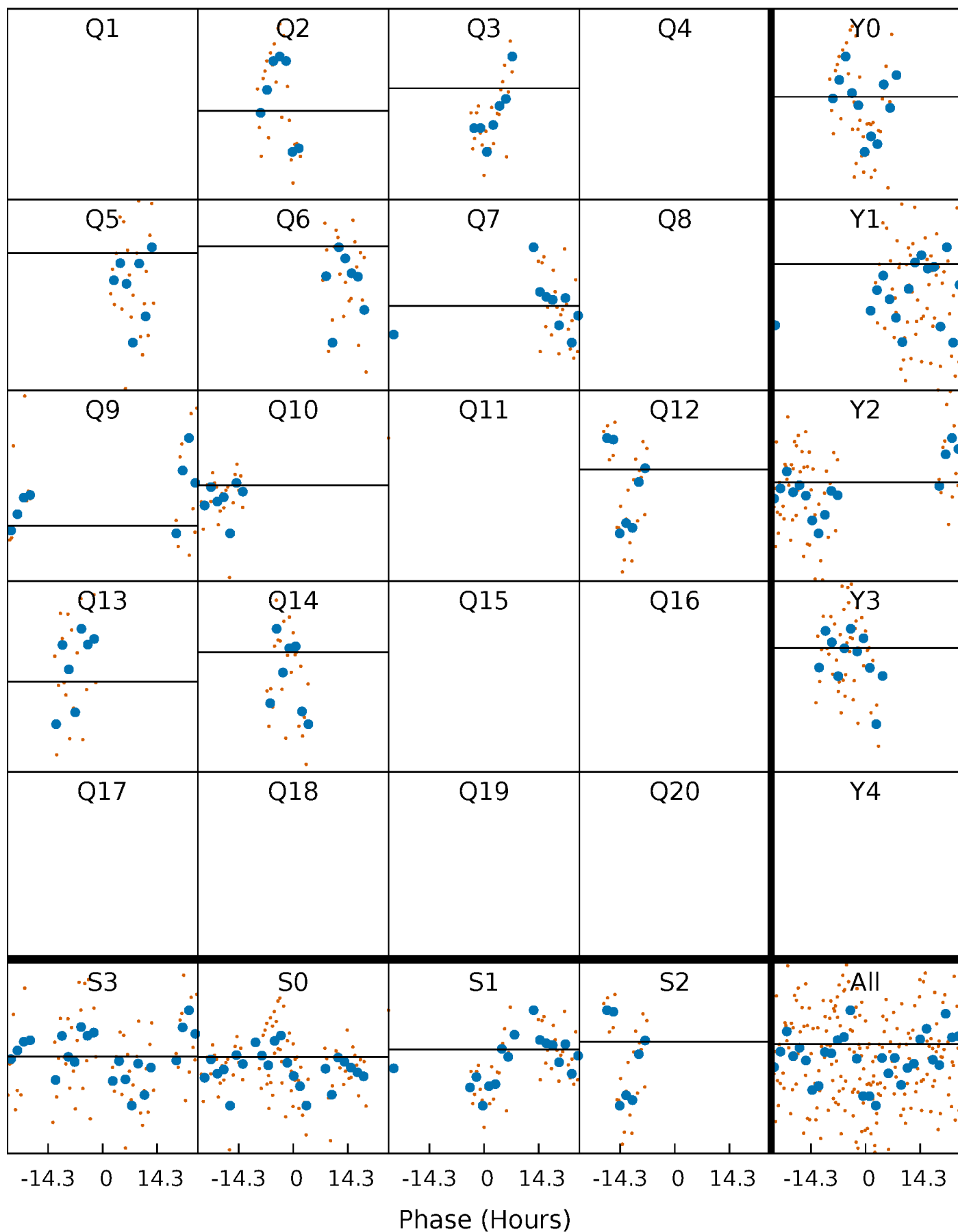
# PDC Quarter-Phased Transit Curves

TCE 005473584-02 P=127.314701 Days  $T_0=209.022298$  (BKJD)



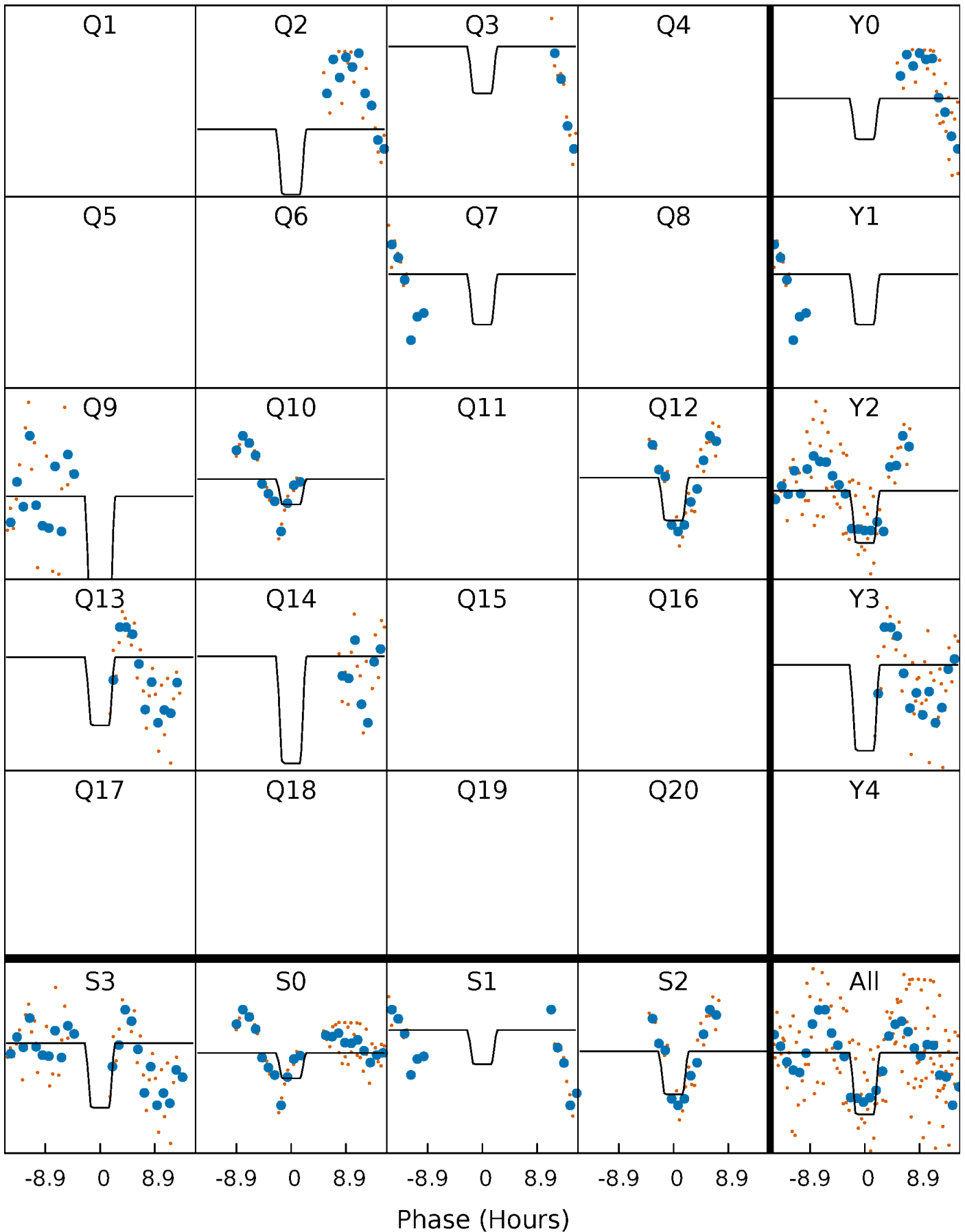
# DV Quarter-Phased Transit Curves

TCE 005473584-02 P=127.314701 Days  $T_0=209.022298$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005473584-02 P=127.314701 Days  $T_0=208.410899$  (BKJD)

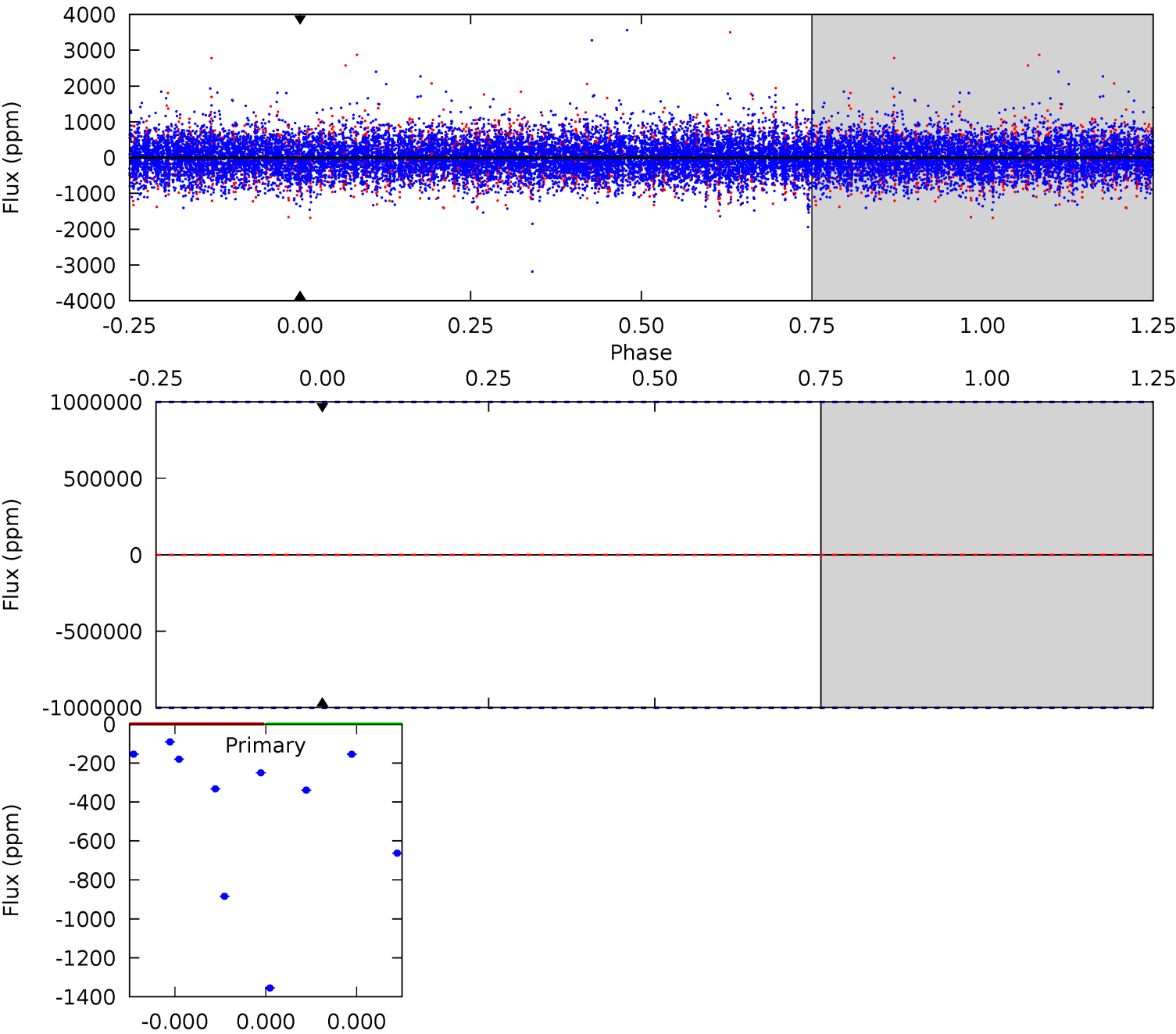




# DV Model-Shift Uniqueness Test

005473584-02, P = 127.314701 Days, E = 81.707597 Days

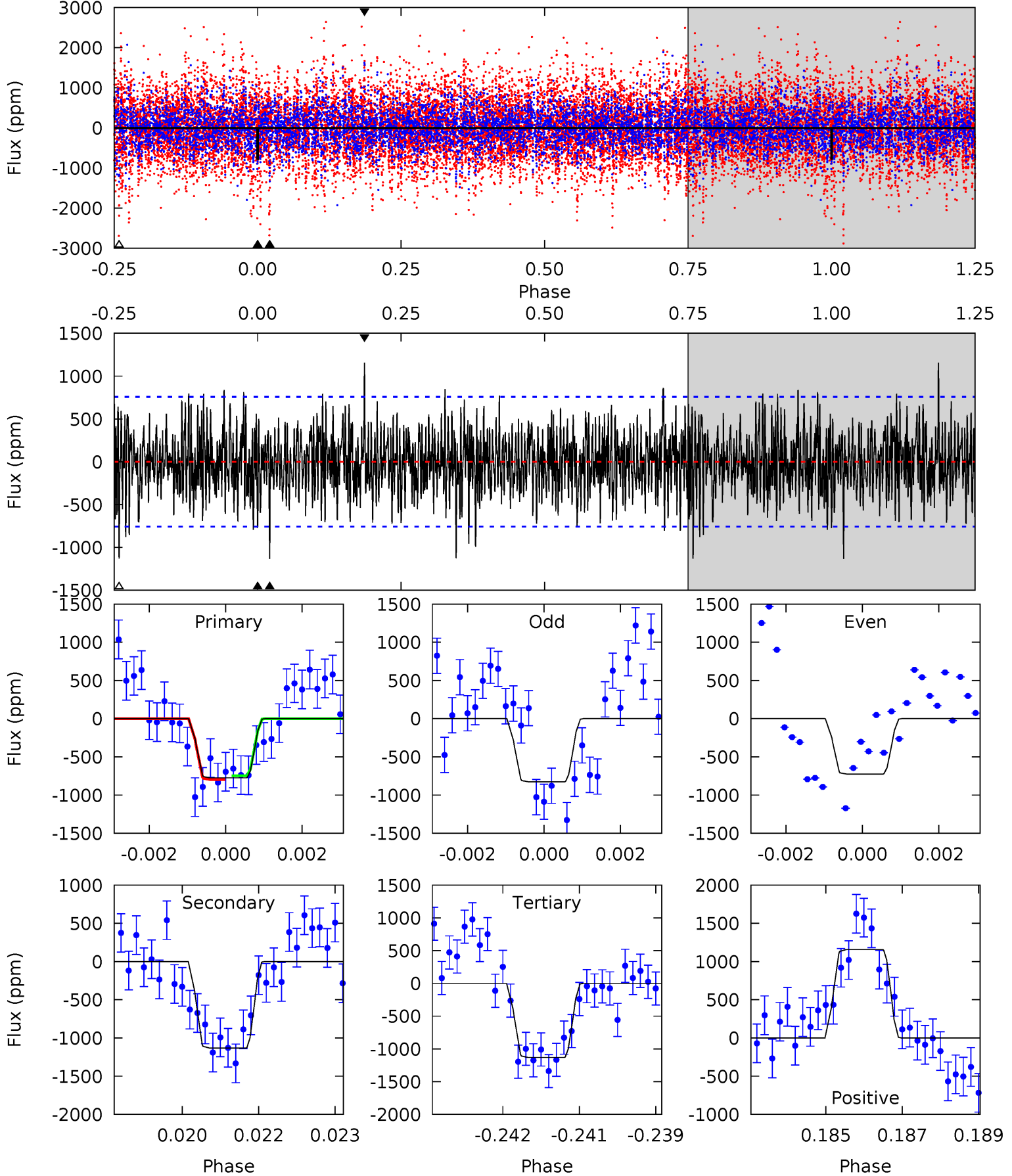
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005473584-02, P = 127.314701 Days, E = 81.096198 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.47	8.01	8.00	8.18	5.36	3.14	2.11	-2.53	-2.71	0.01	-0.18	0.36	0.96	0.51	0.17



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$10.07^{+9.06}_{-6.43}$	$522^{+38}_{-26}$	$4960^{+12963}_{-20014}$	$4808^{+230522}_{-168597}$
Alt.	$-1132 \pm 141$	$8.12^{+8.72}_{-5.32}$	$521^{+39}_{-26}$	$4230^{+2628}_{-899}$	$2207^{+16287}_{-1684}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

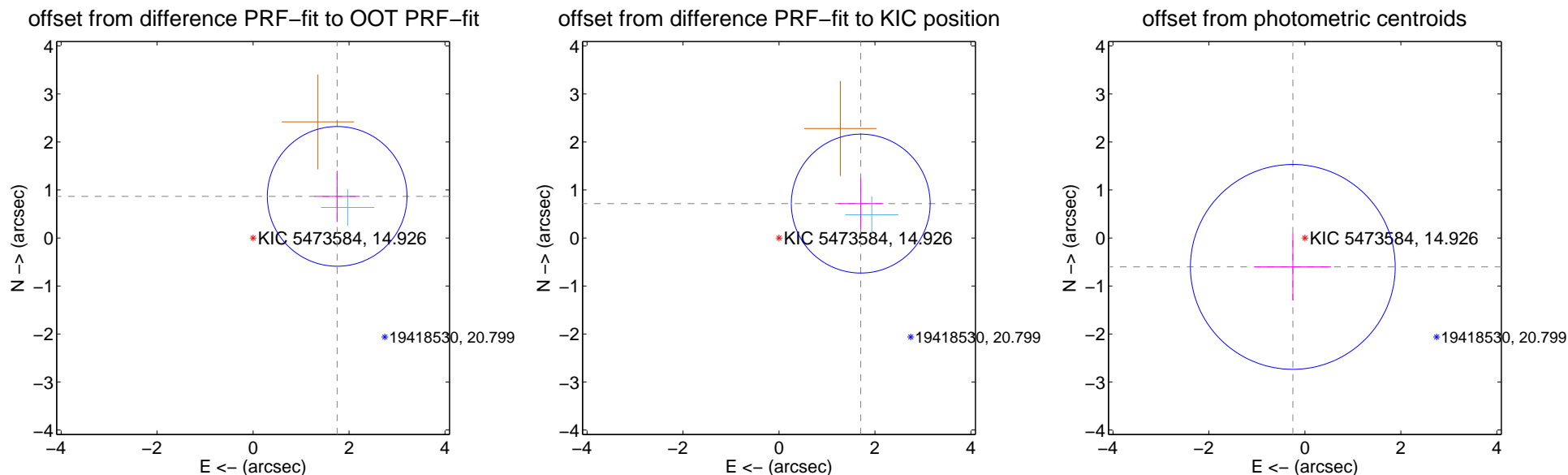
## DV Centroid Data

Supplemental centroid analysis for 005473584-02. Kepler magnitude: 14.93. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.956 \pm 0.485$	4.03	$-1.753 \pm 0.473$	$0.867 \pm 0.534$
PRF-fit source offset from KIC position	$1.849 \pm 0.482$	3.83	$-1.704 \pm 0.473$	$0.717 \pm 0.534$
photometric centroid source offset	$0.65 \pm 0.71$	0.92	$0.25 \pm 0.79$	$-0.60 \pm 0.70$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.

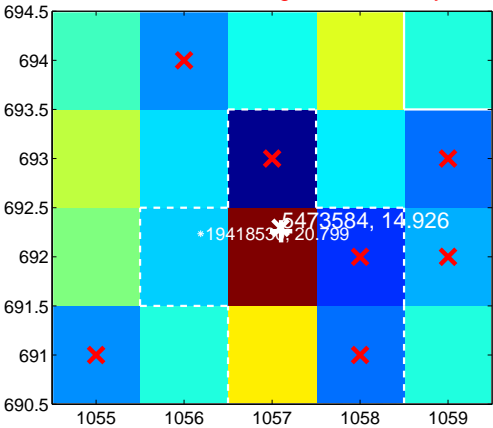
Q1 no difference image



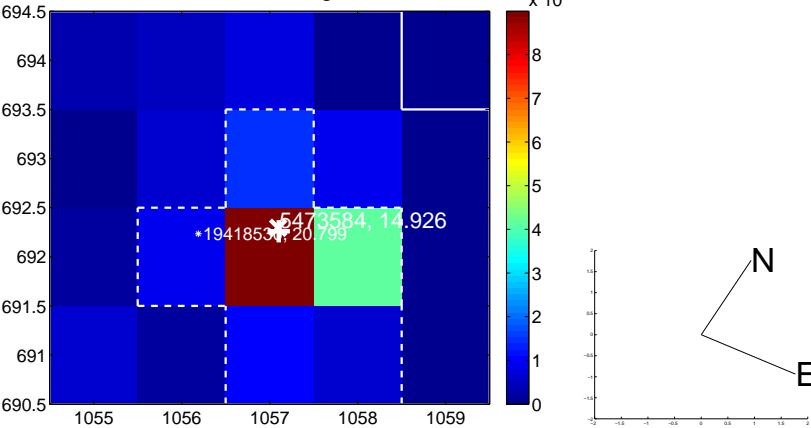
Q1 no OOT image



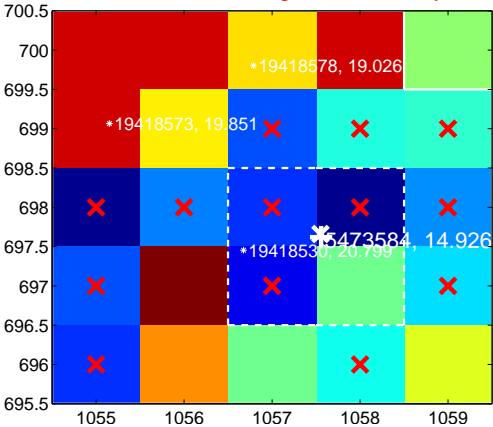
Q2 difference image. Poor Quality



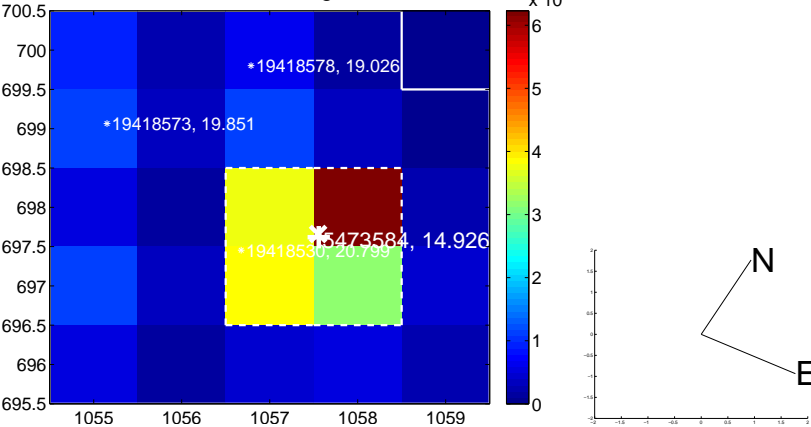
Q2 OOT image



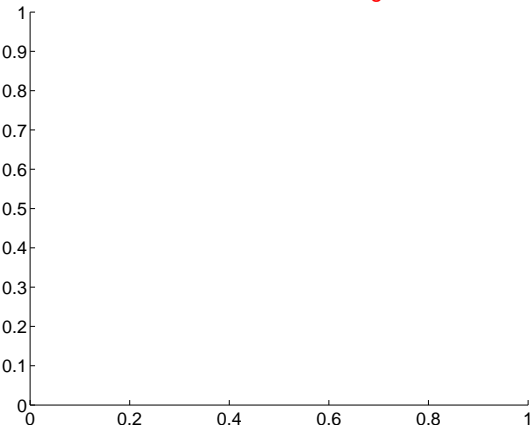
Q3 difference image. Poor Quality



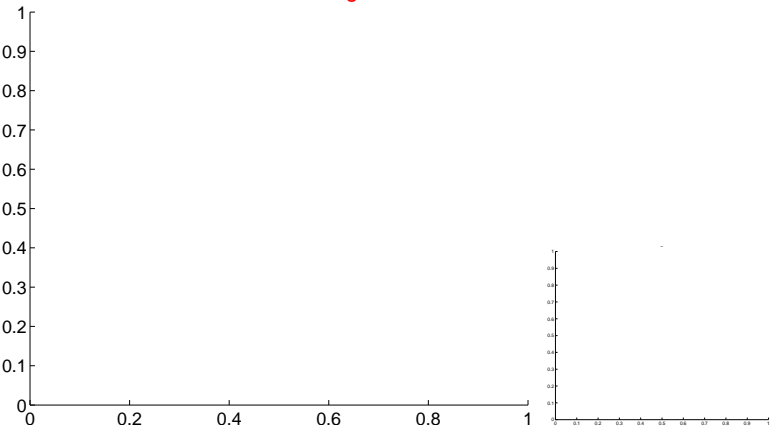
Q3 OOT image



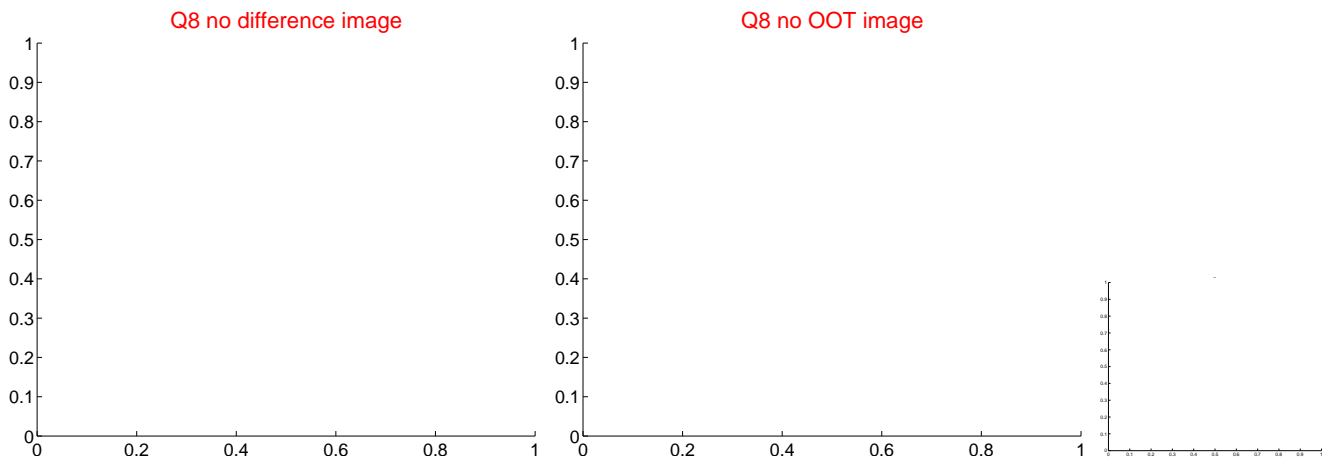
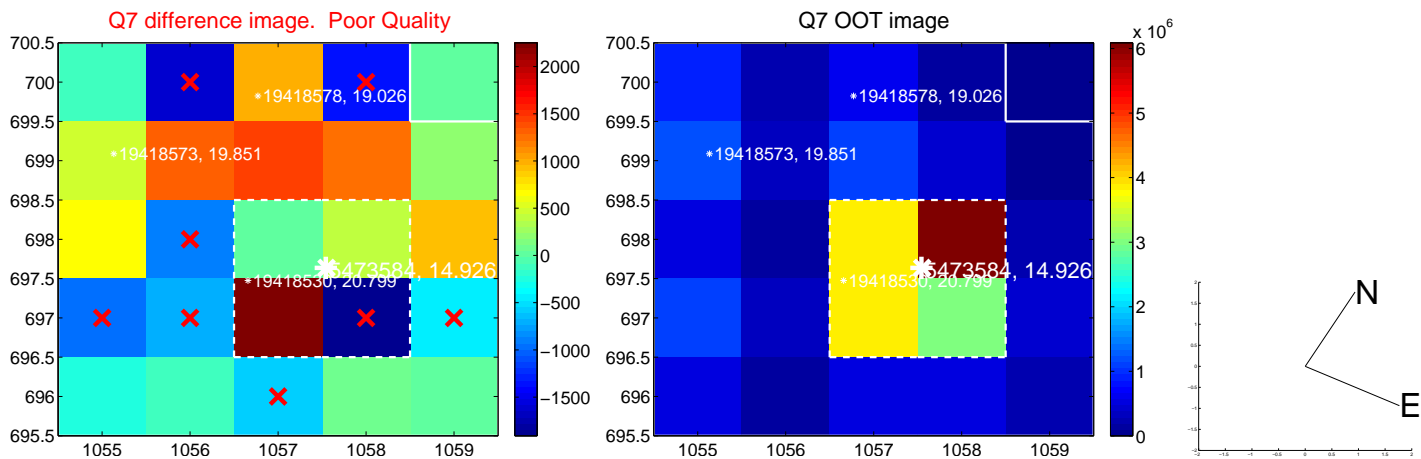
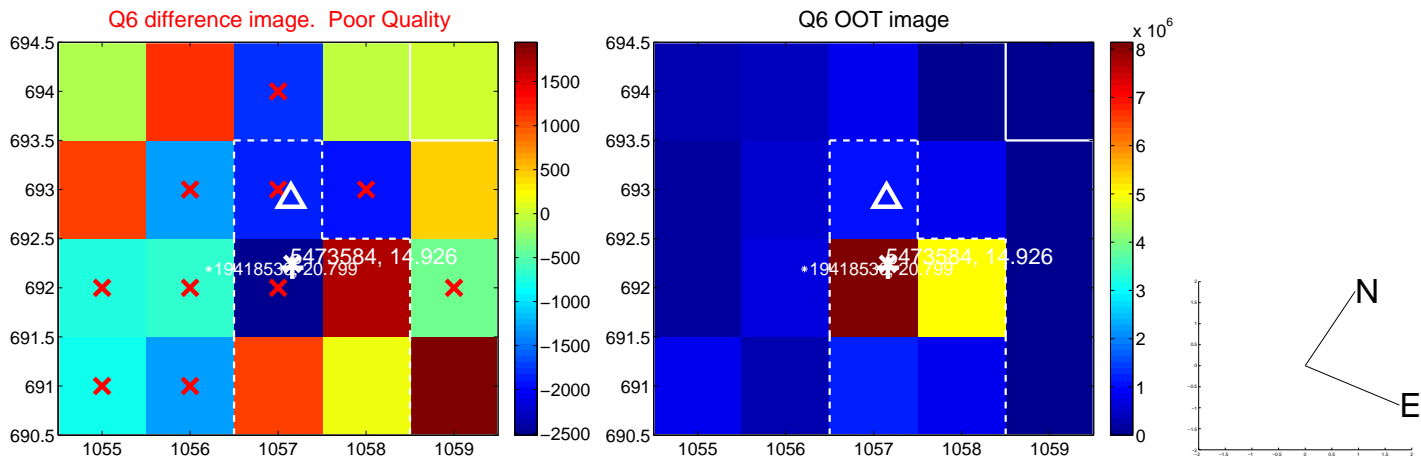
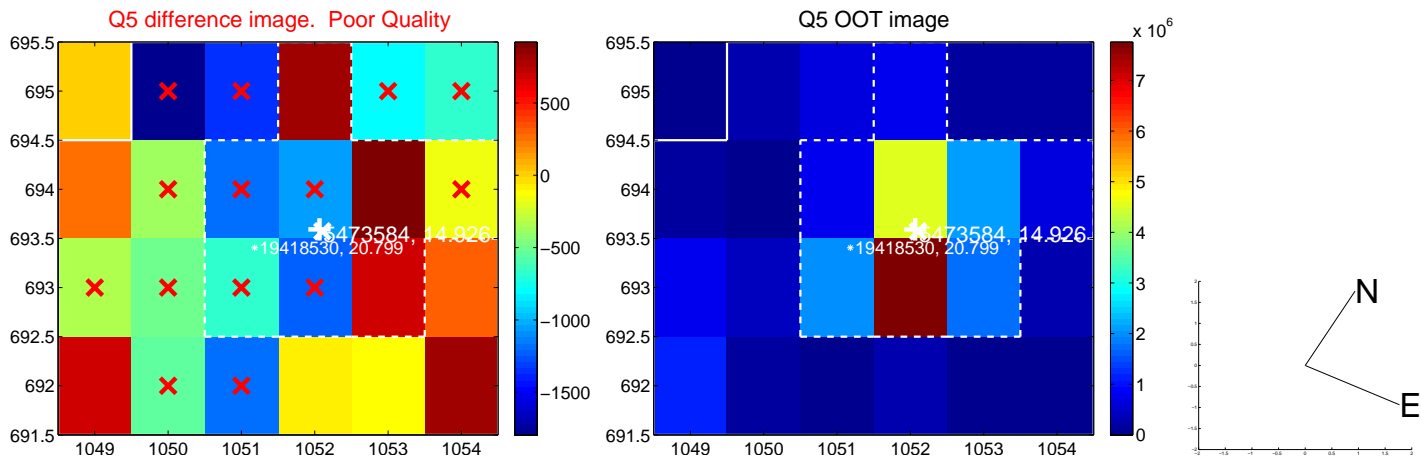
Q4 no difference image



Q4 no OOT image



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

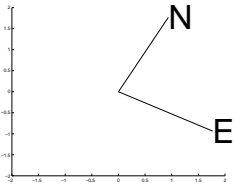
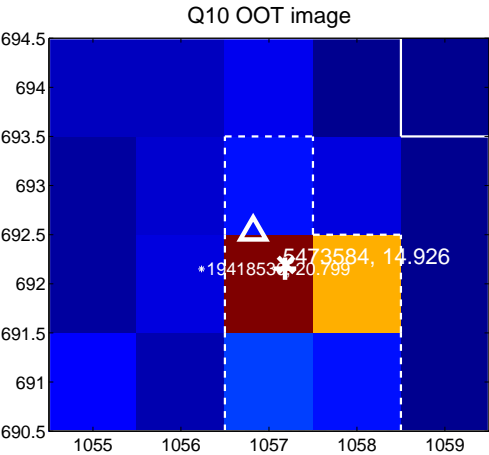
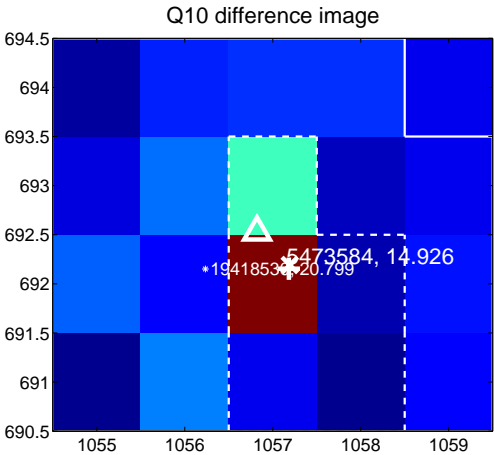


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

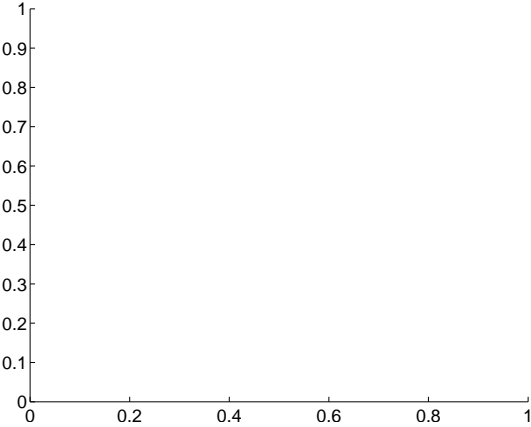
Q9 no difference image



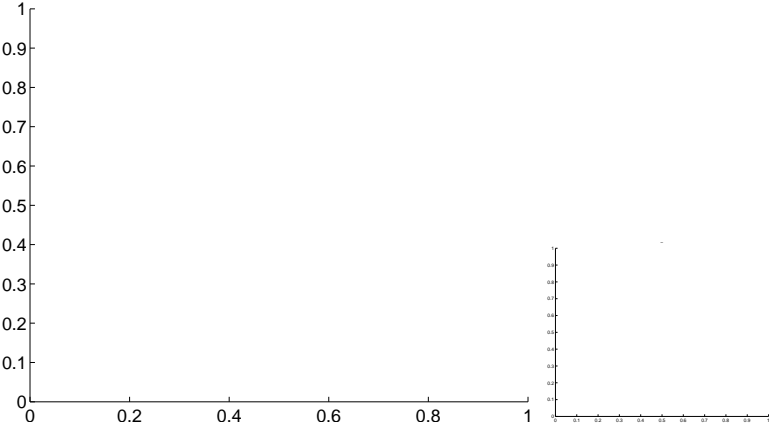
Q9 no OOT image



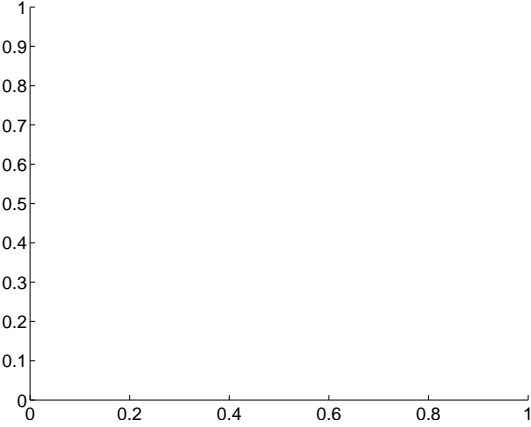
Q11 no difference image



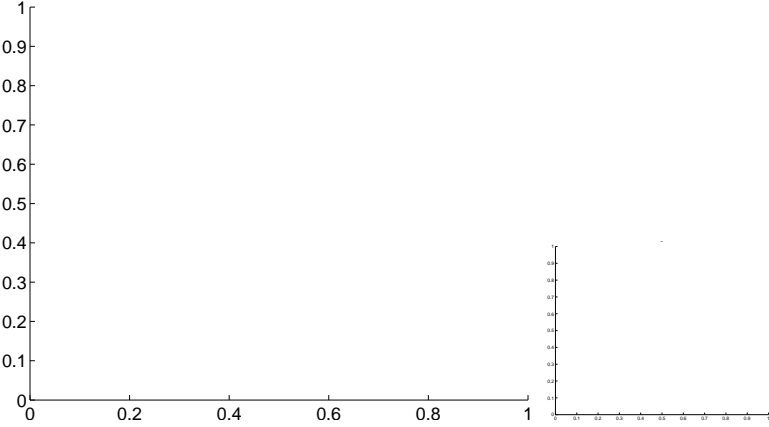
Q11 no OOT image



Q12 no difference image



Q12 no OOT image



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

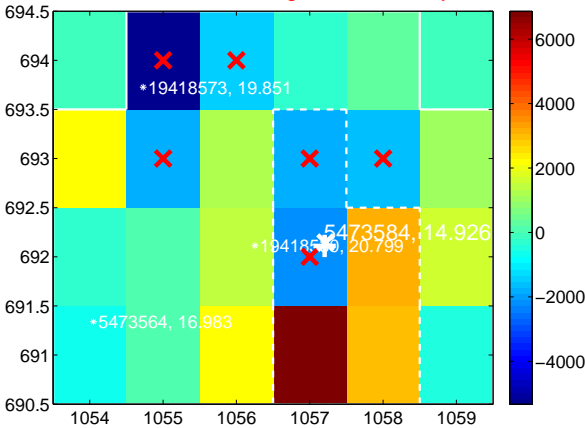
Q13 no difference image



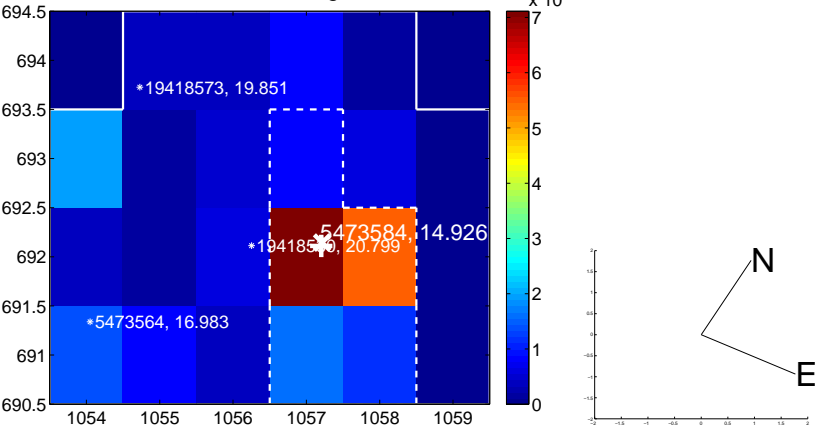
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



Q15 no difference image



Q15 no OOT image



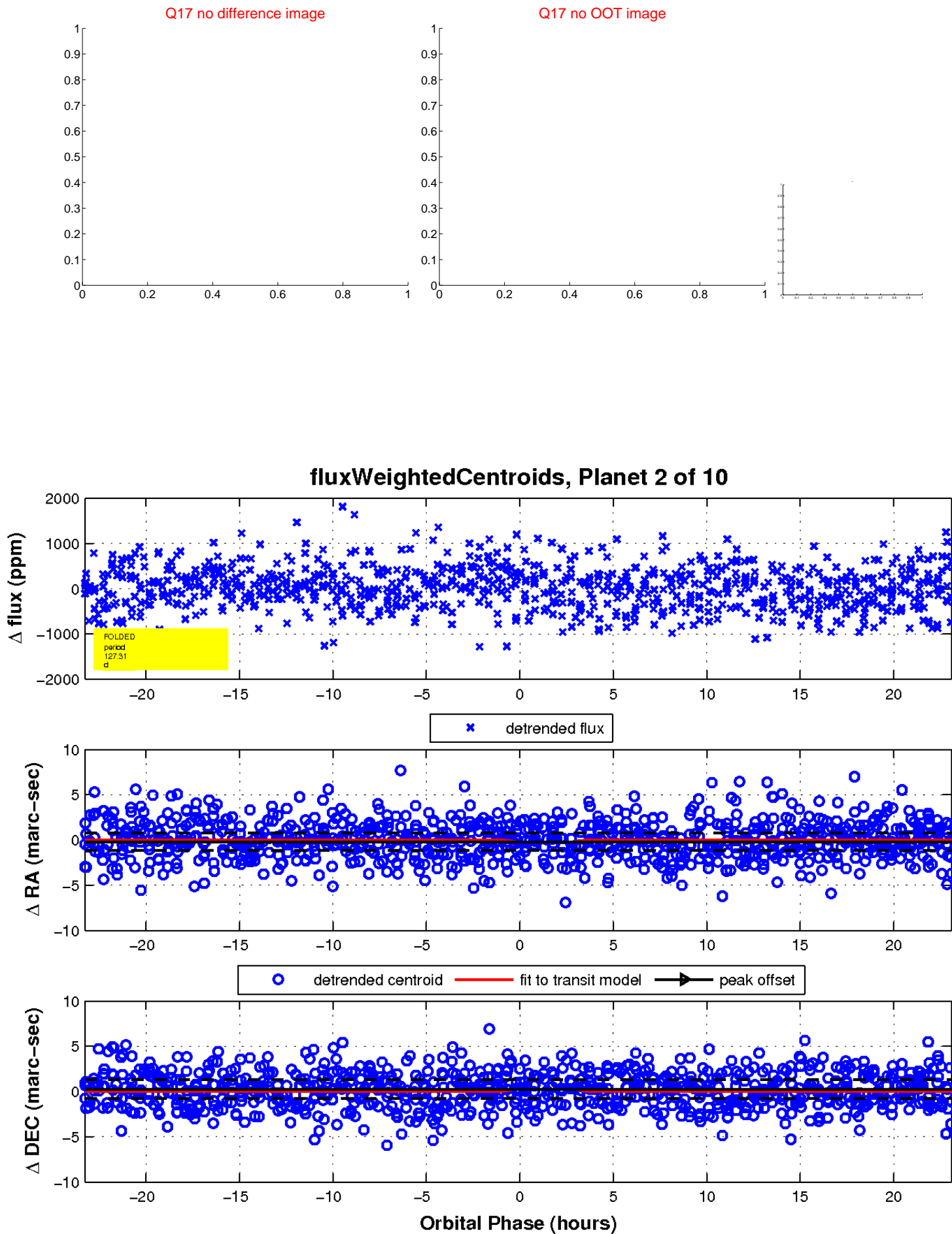
Q16 no difference image



Q16 no OOT image



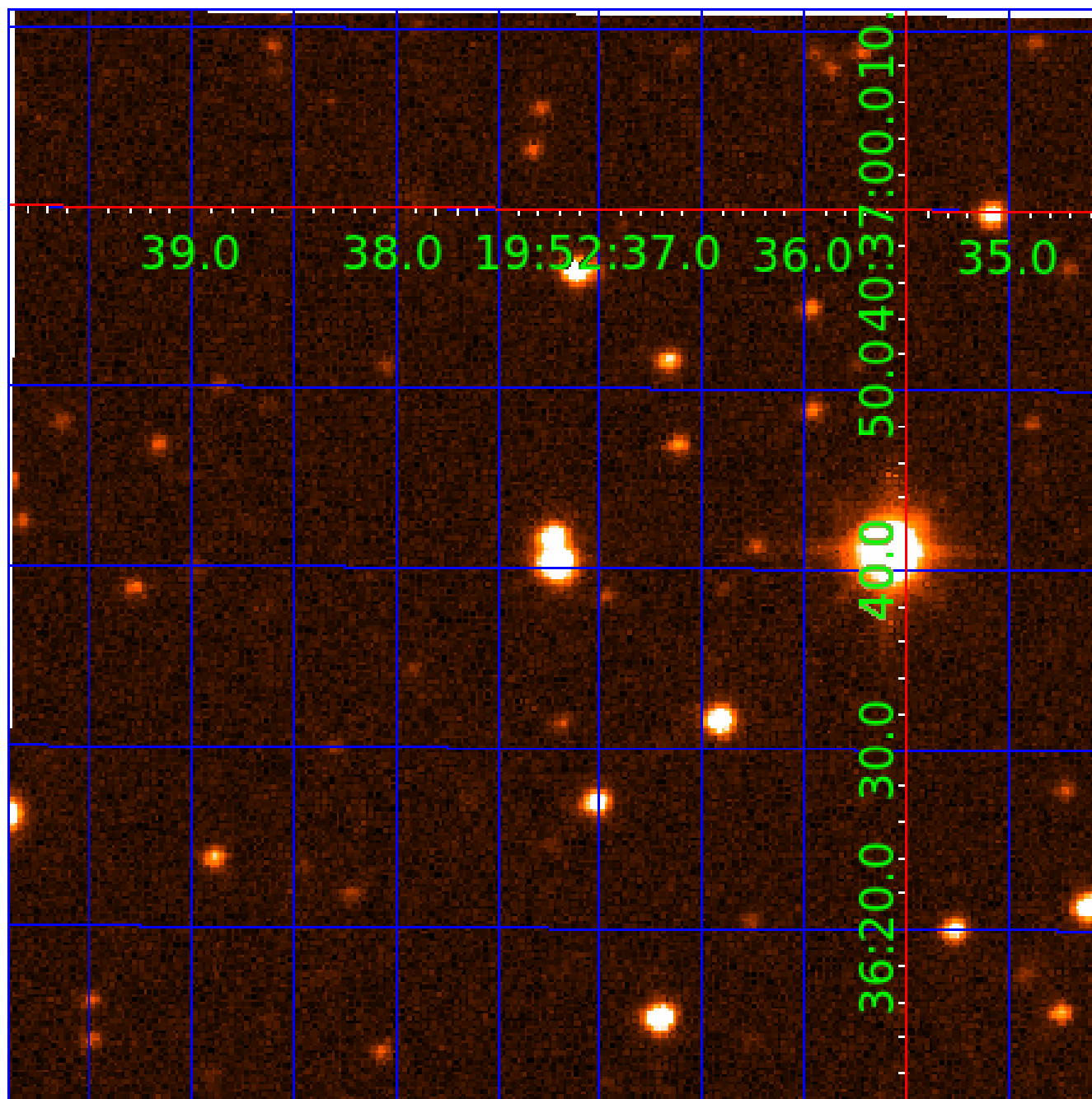
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

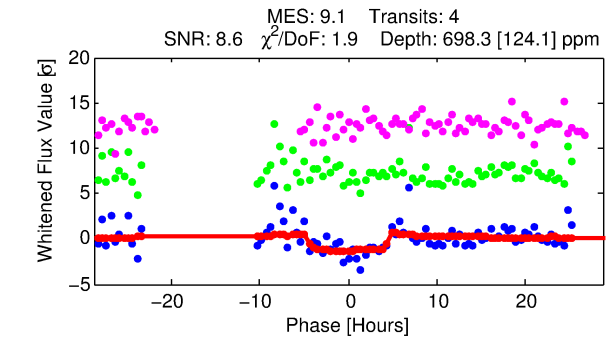
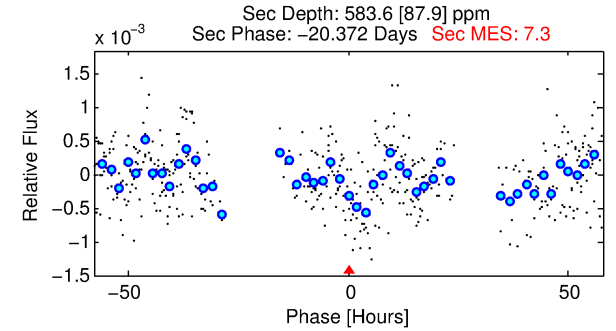
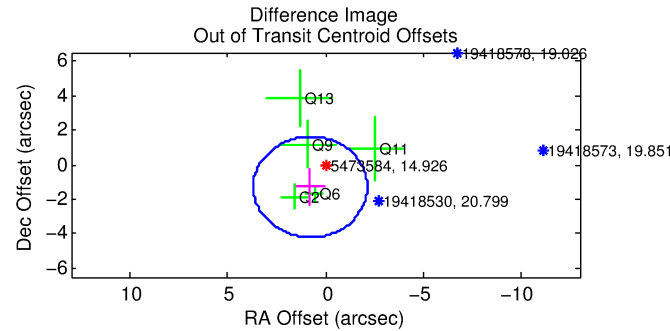
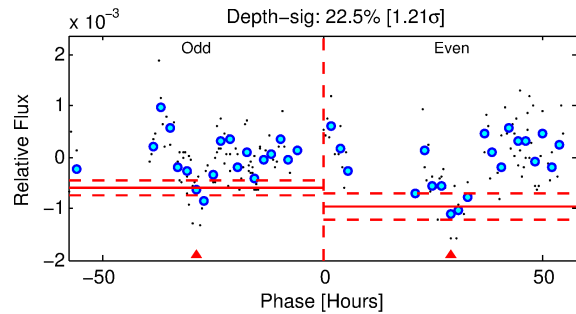
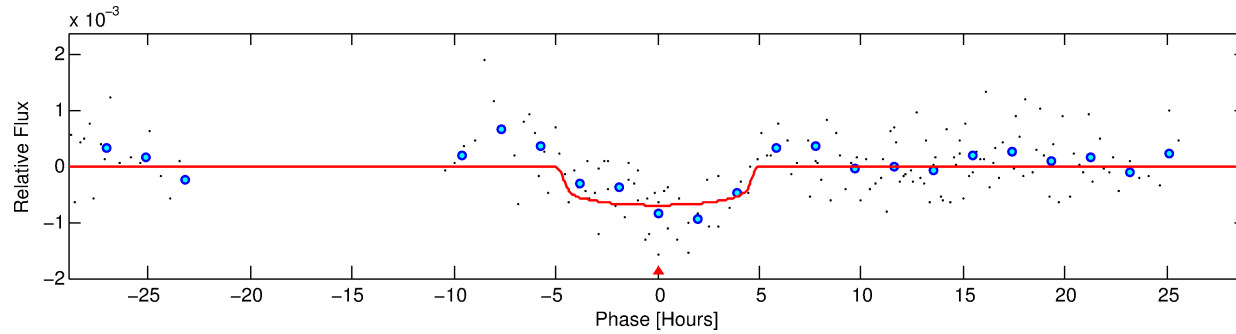
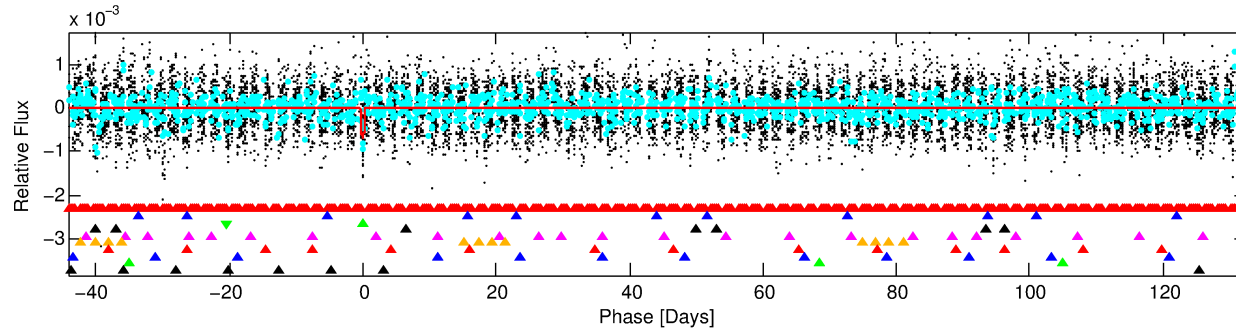
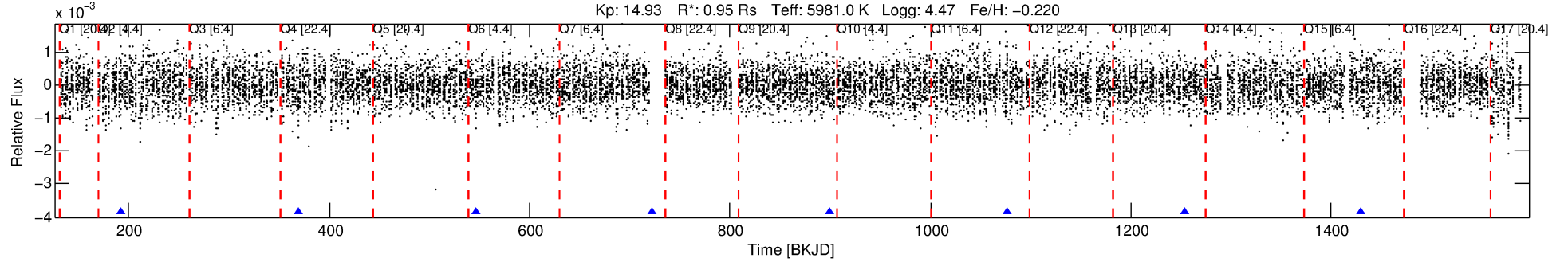
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-03

No Significant Match Found

# DV One-Page Summary

KIC: 5473584 Candidate: 3 of 10 Period: 176.778 d



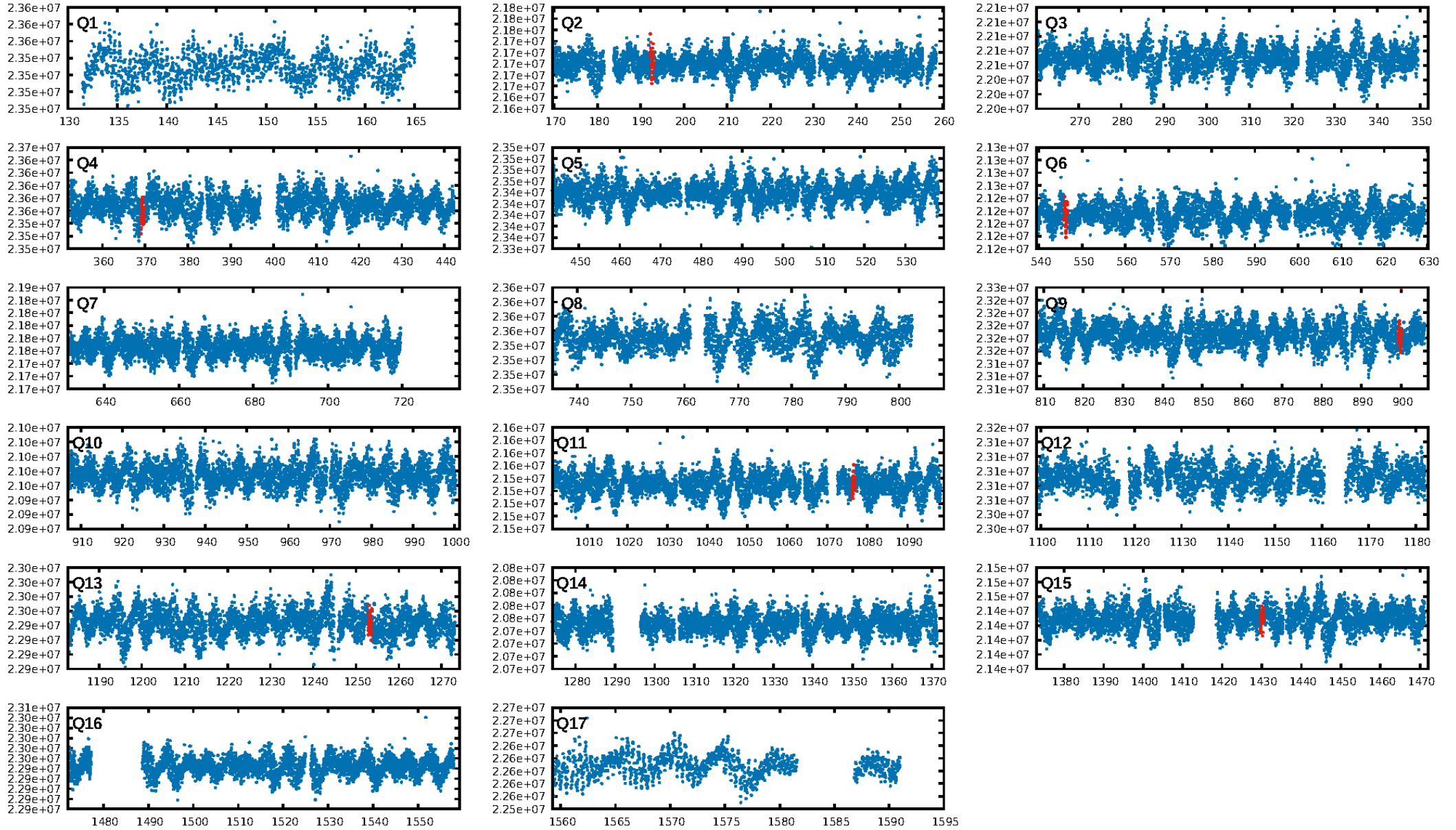
## DV Fit Results:

Period = 176.77786 [0.01315] d  
Epoch = 192.6169 [0.0263] BKJD  
Rp/R\* = 0.0250 [0.0193]  
a/R\* = 122.58 [449.60]  
b = 0.53 [4.98]  
Seff = 2.75 [1.09]  
Teq = 328 [32] K  
Rp = 2.58 [2.15] Re  
a = 0.6103 [0.1576] AU  
Ag = 17980.68 [28752.70] [0.63 $\sigma$ ]  
Teffp = 5881 [2295] K [2.42 $\sigma$ ]

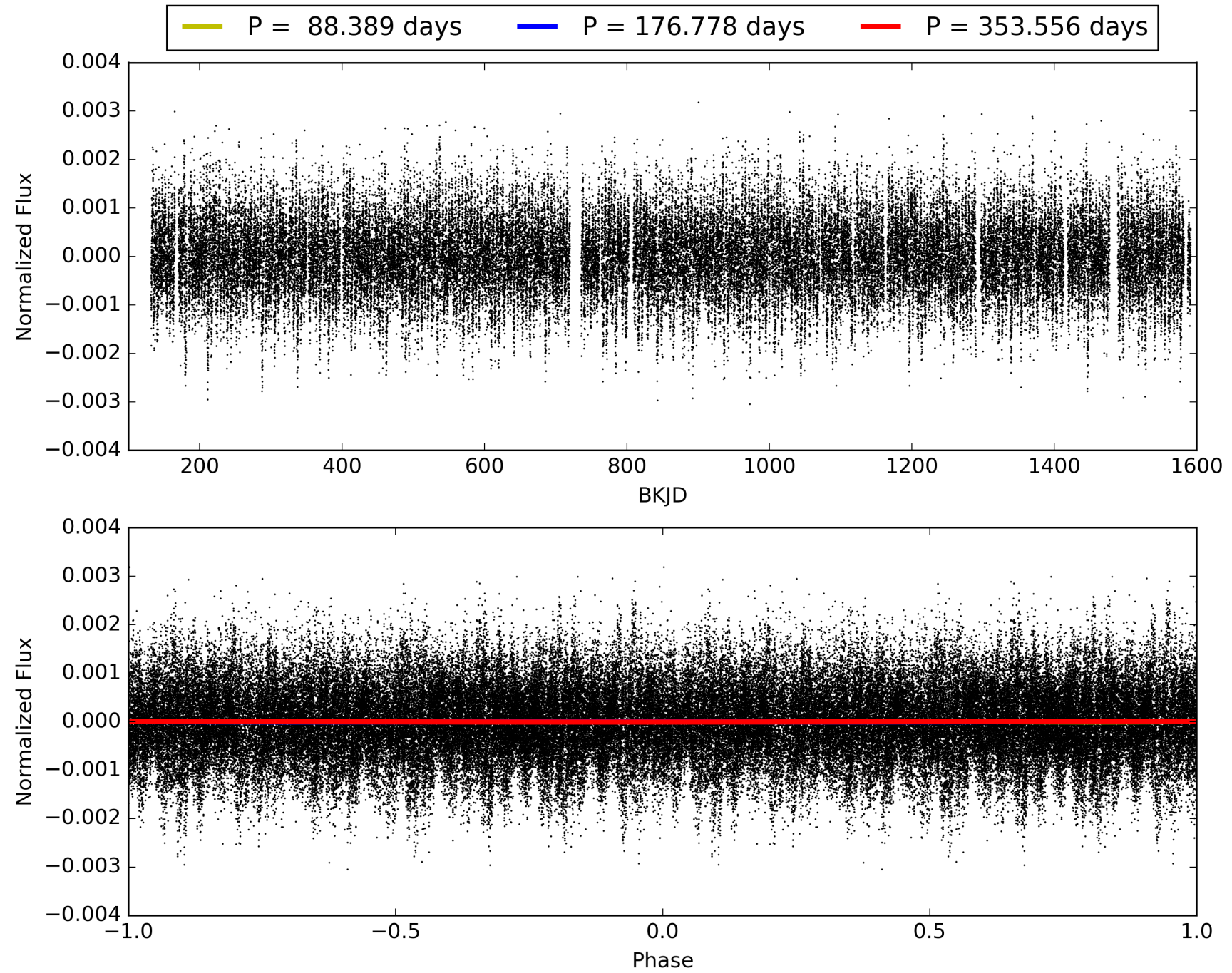
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [75.20 $\sigma$ ]  
LongPeriod-sig: 100.0% [13.87 $\sigma$ ]  
ModelChiSquare2-sig: 20.9%  
ModelChiSquareGof-sig: 96.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -34.12  
Centroid-sig: 38.6%  
Centroid-so: 0.857 arcsec [1.28 $\sigma$ ]  
OotOffset-rm: 1.510 arcsec [1.55 $\sigma$ ]  
OotOffset-st: 2/1/0/2 [5]  
KicOffset-rm: 1.627 arcsec [2.32 $\sigma$ ]  
KicOffset-st: 2/1/0/2 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 0.00 [0/7]

# TCE 005473584-03, PDC Light Curves



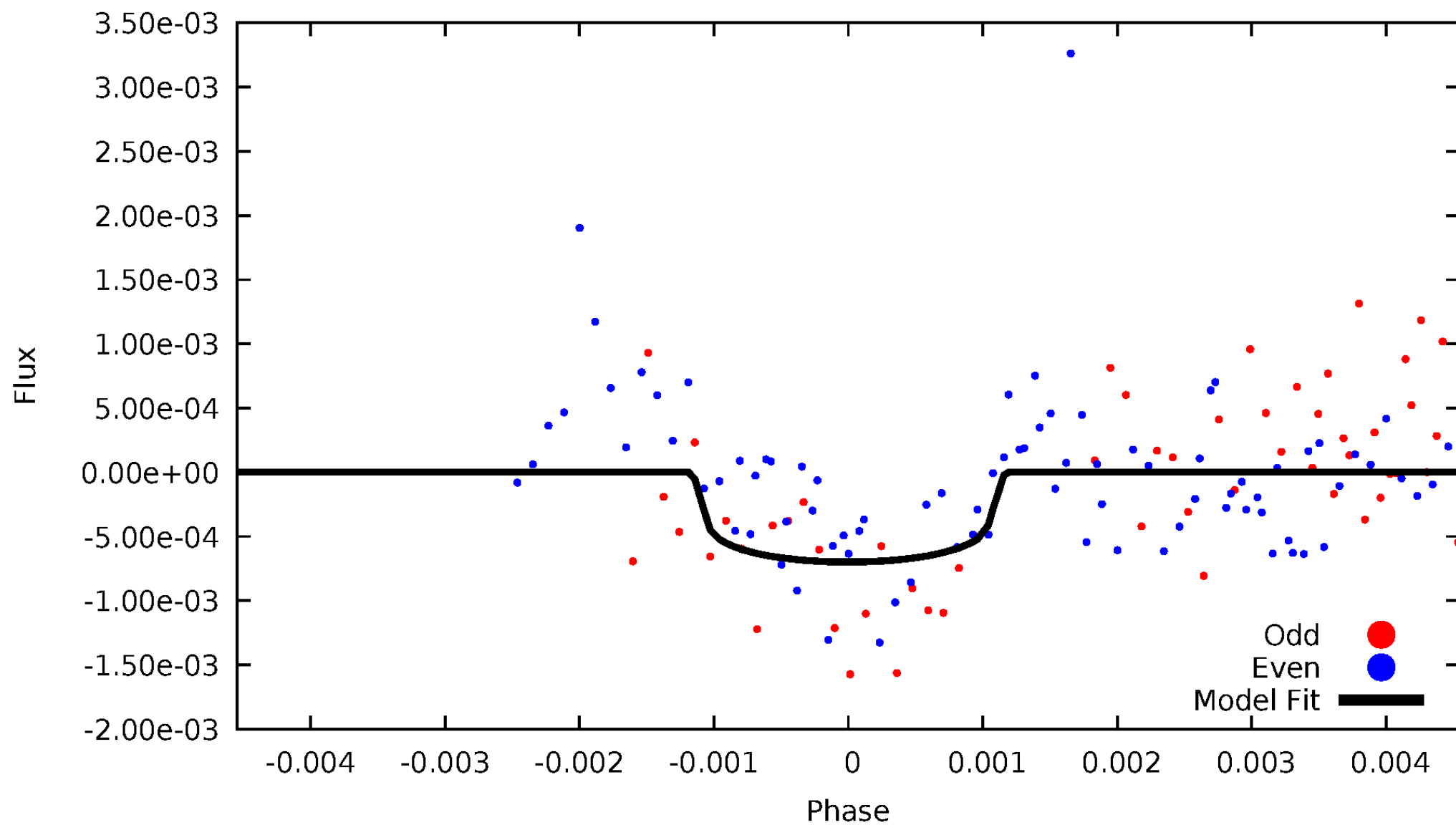
TCE 005473584-03





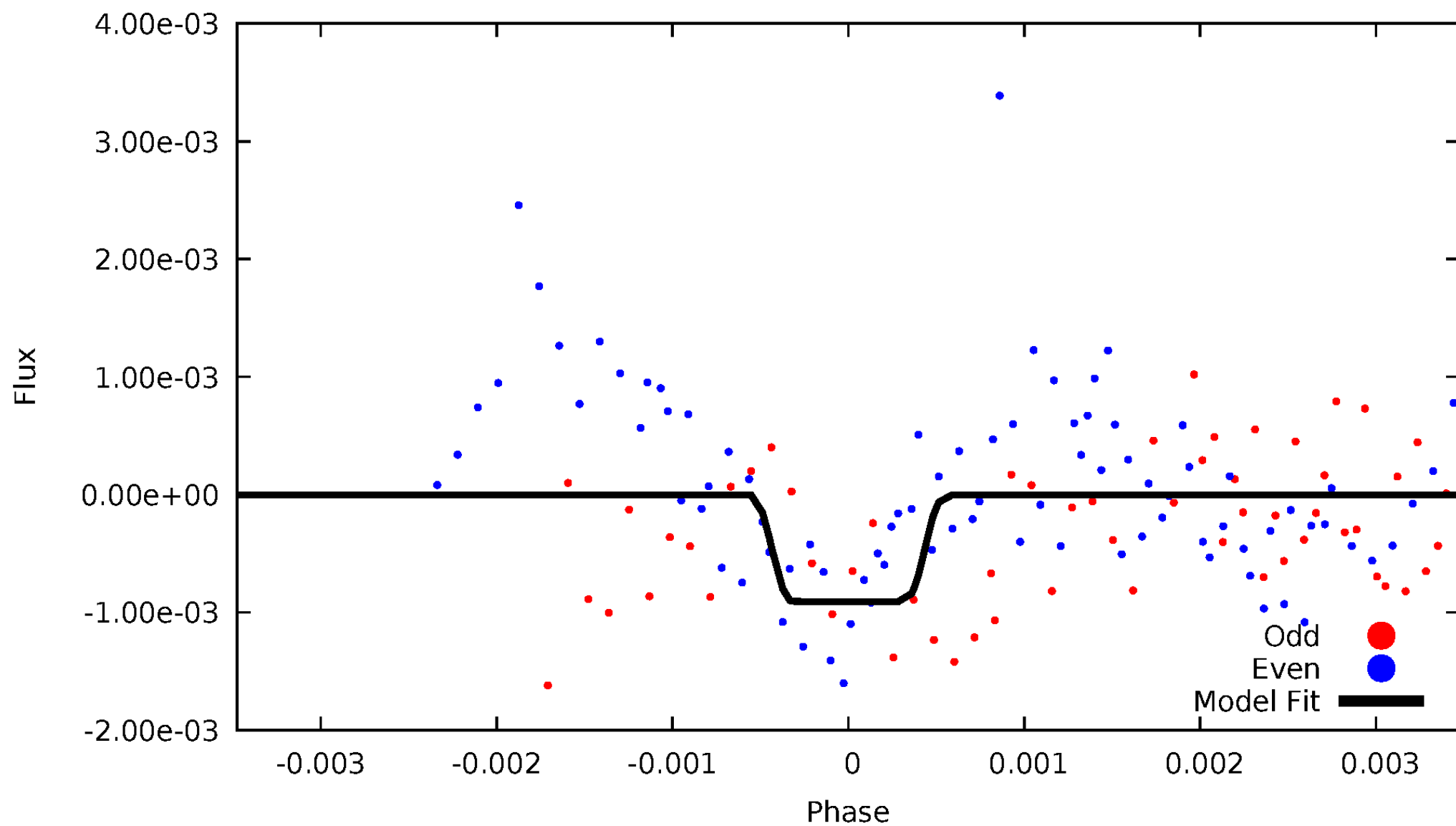
# DV Odd/Even

TCE 005473584-03



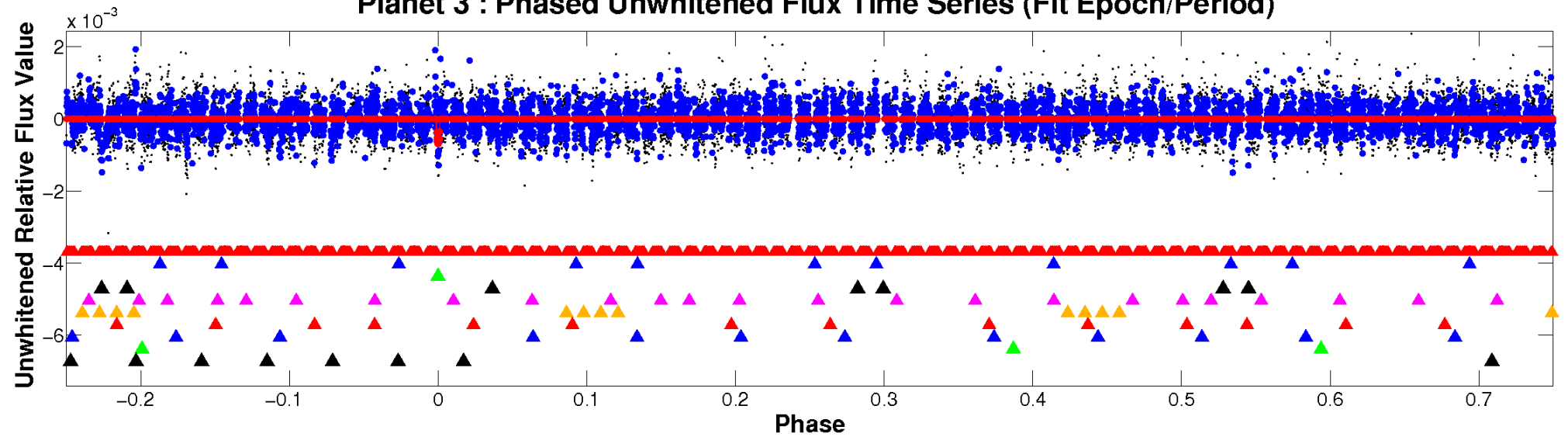
# ALT Odd/Even

TCE 005473584-03

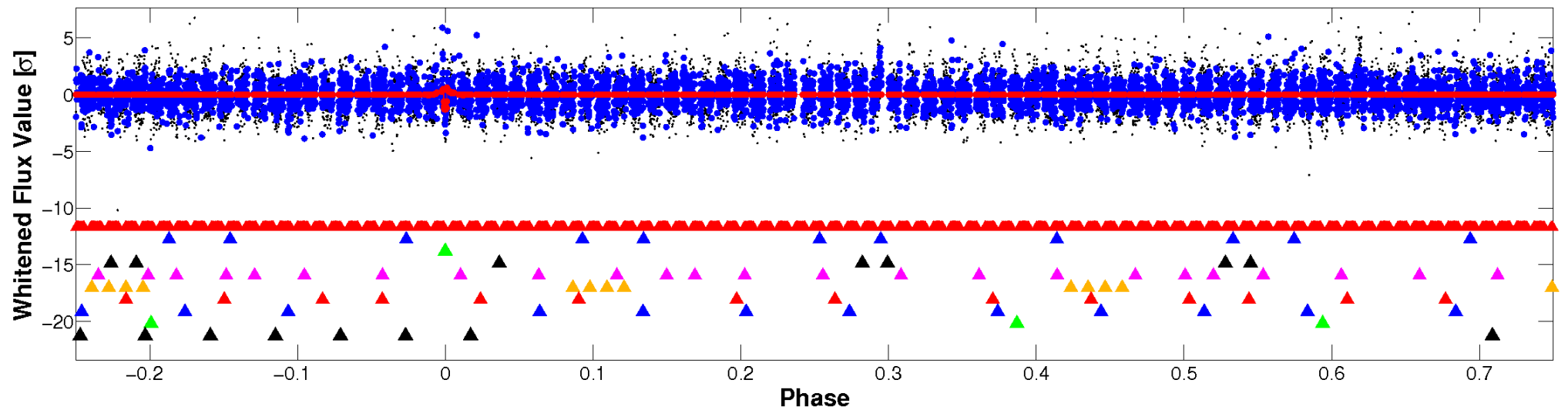


# Non-Whitened Vs. Whitened Light Curve

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

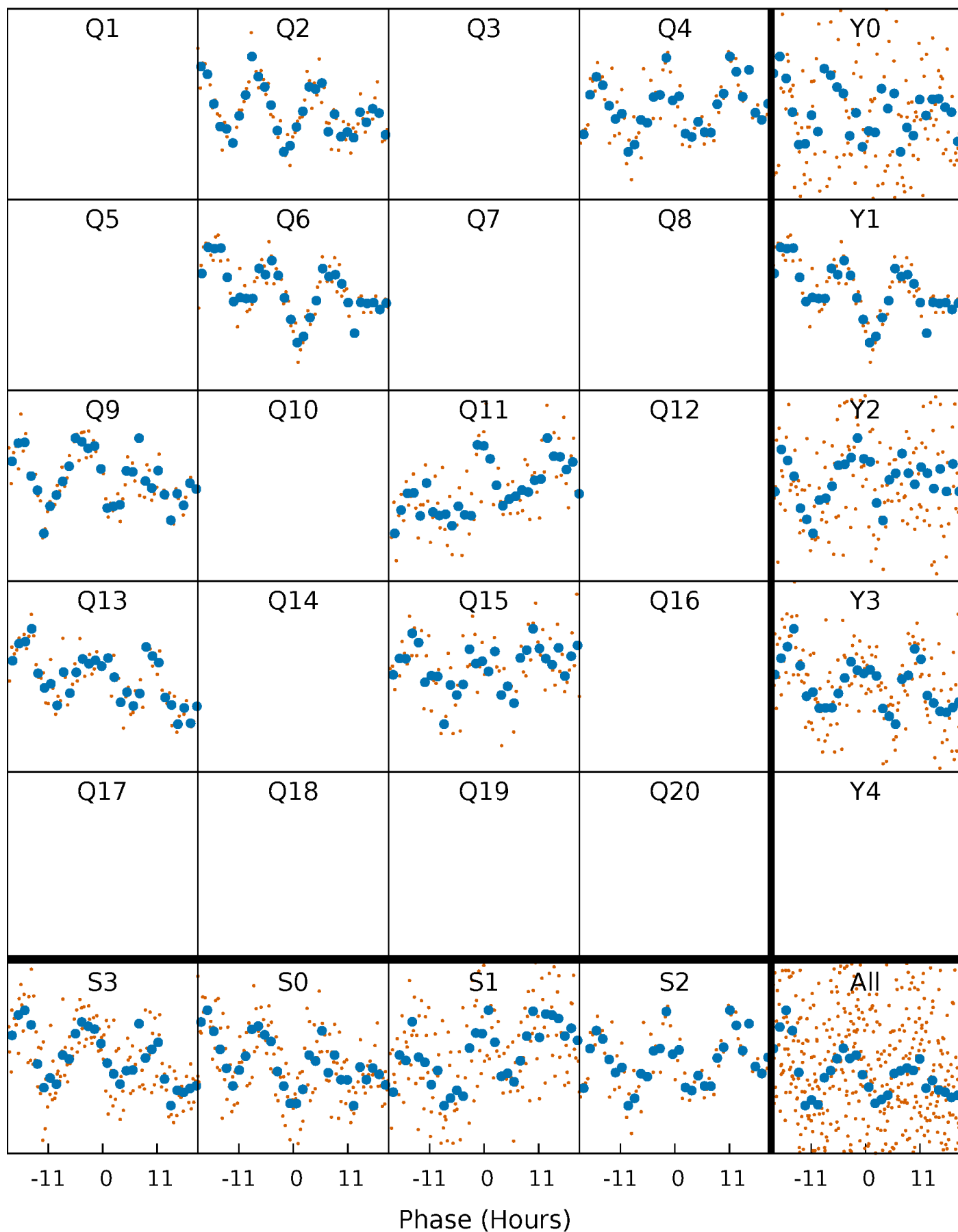


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



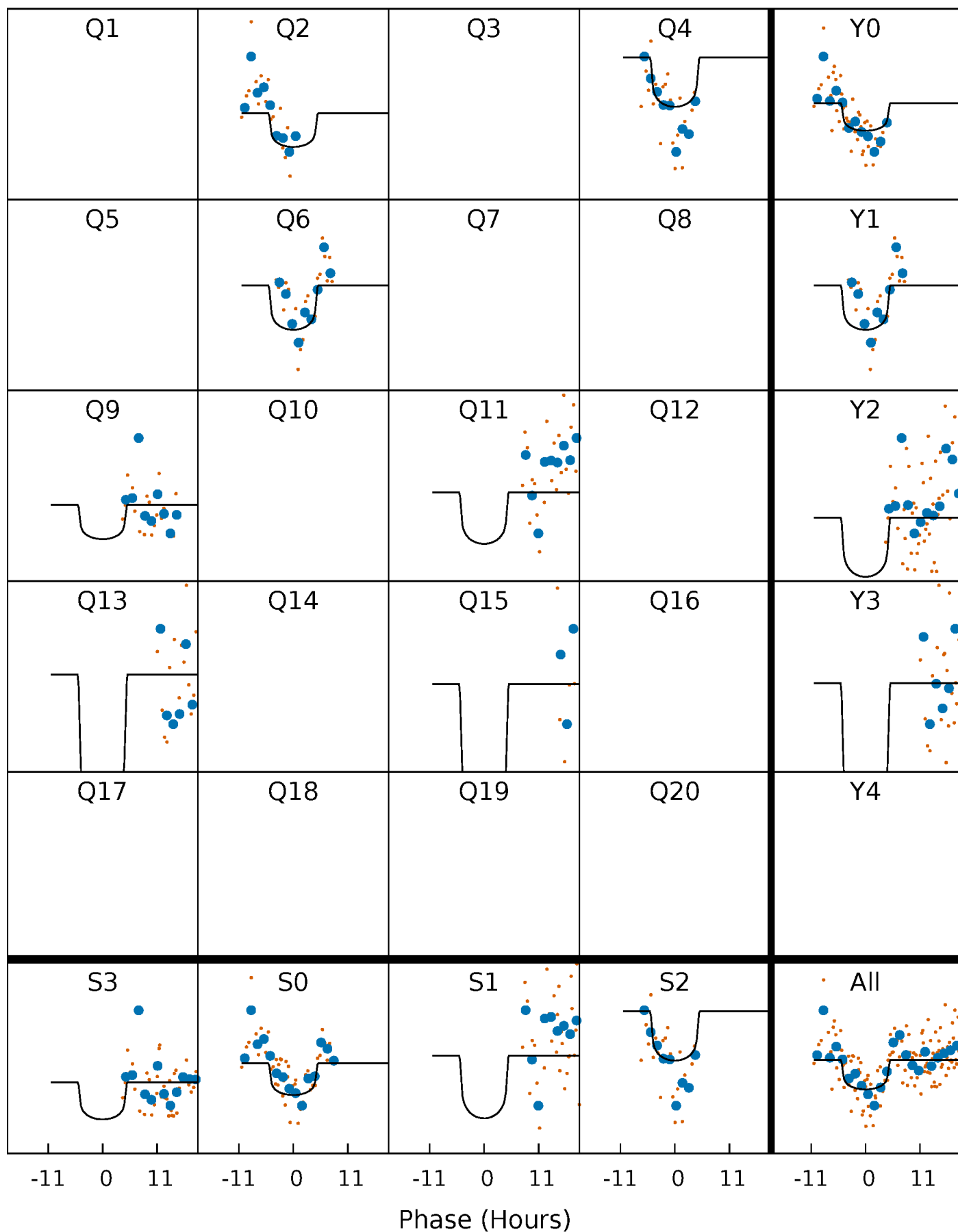
# PDC Quarter-Phased Transit Curves

TCE 005473584-03 P=176.777863 Days  $T_0=192.616919$  (BKJD)



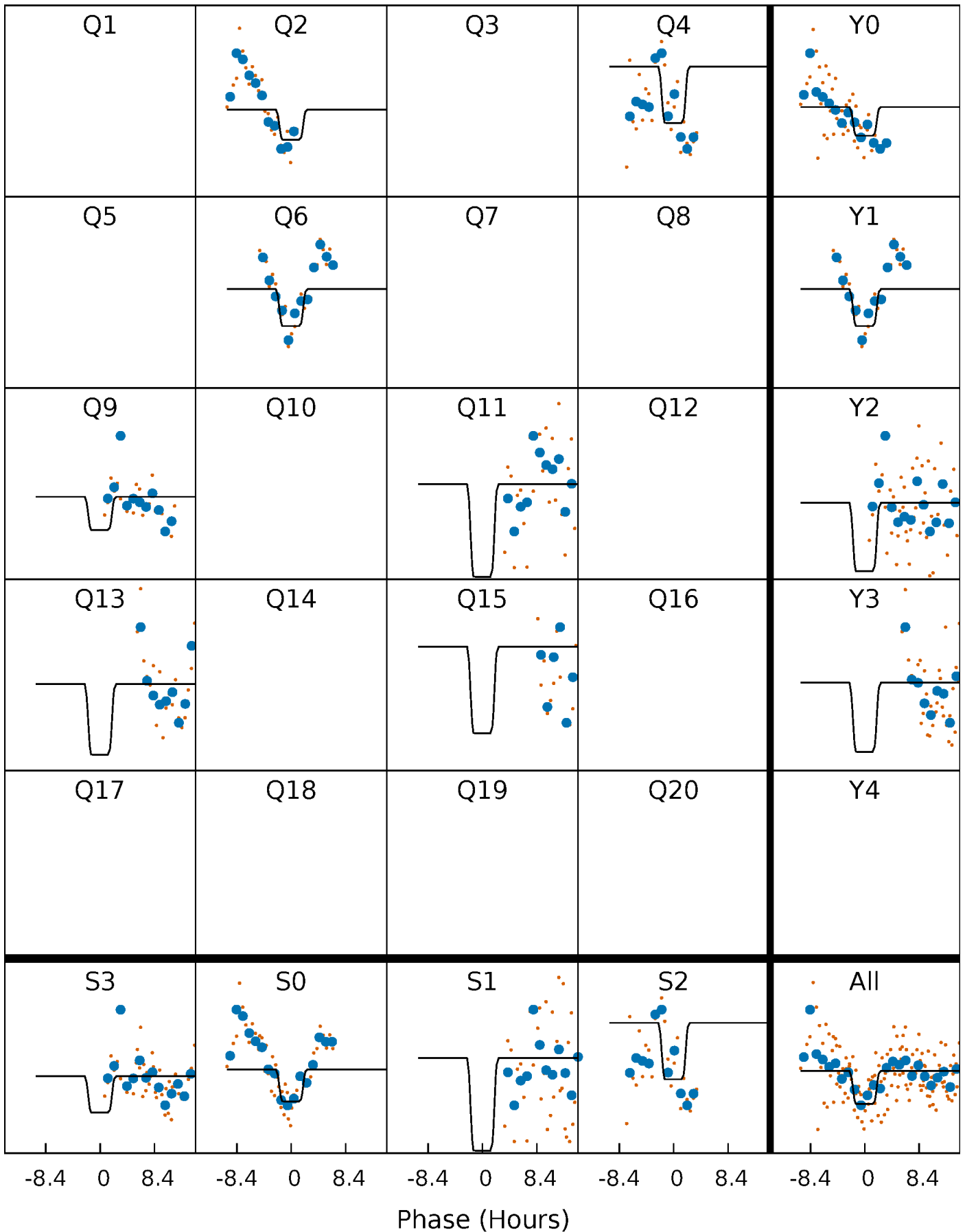
# DV Quarter-Phased Transit Curves

TCE 005473584-03 P=176.777863 Days  $T_0=192.616919$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005473584-03 P=176.818406 Days  $T_0=192.595028$  (BKJD)

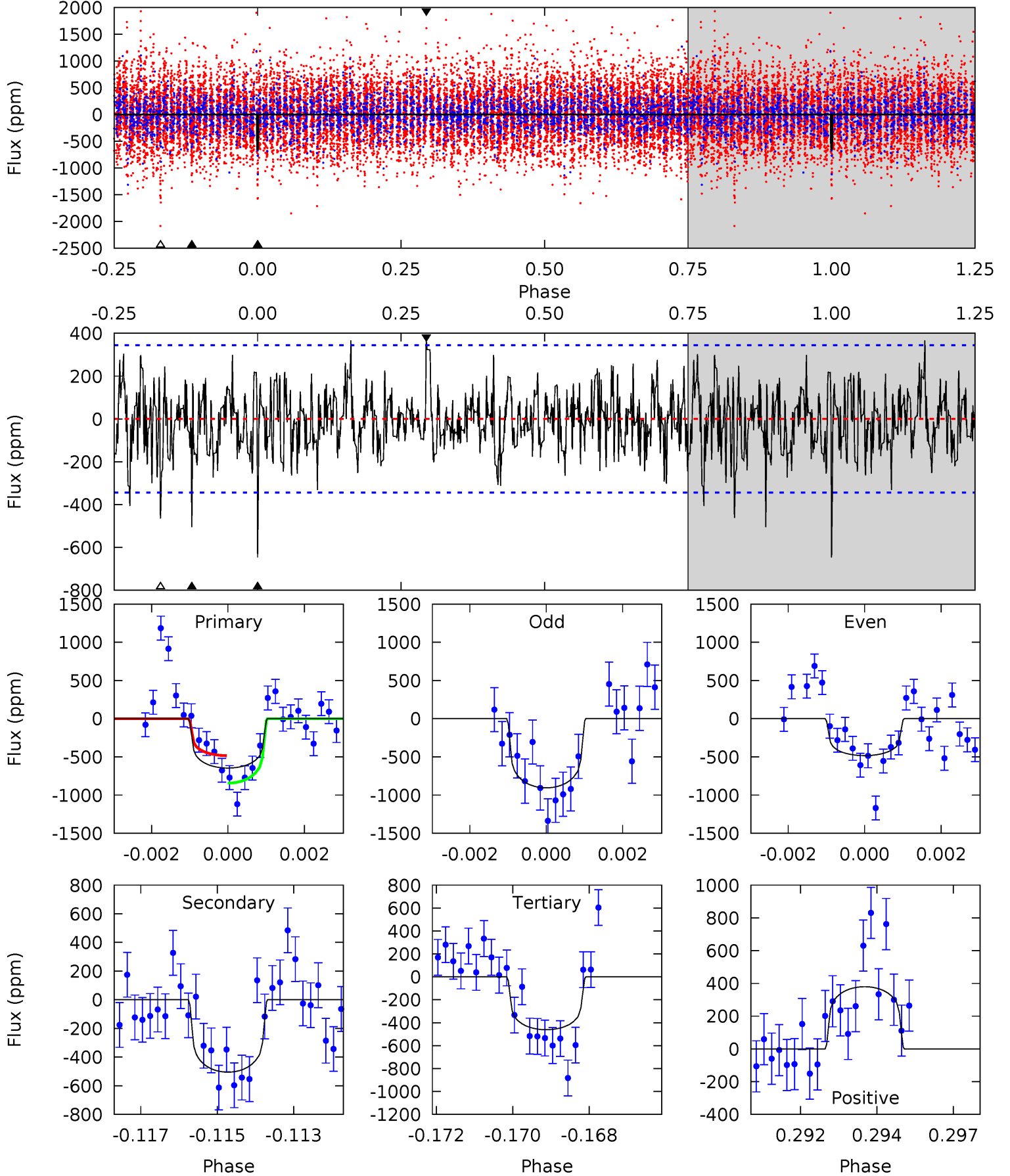




# DV Model-Shift Uniqueness Test

005473584-03,  $P = 176.777863$  Days,  $E = 15.839056$  Days

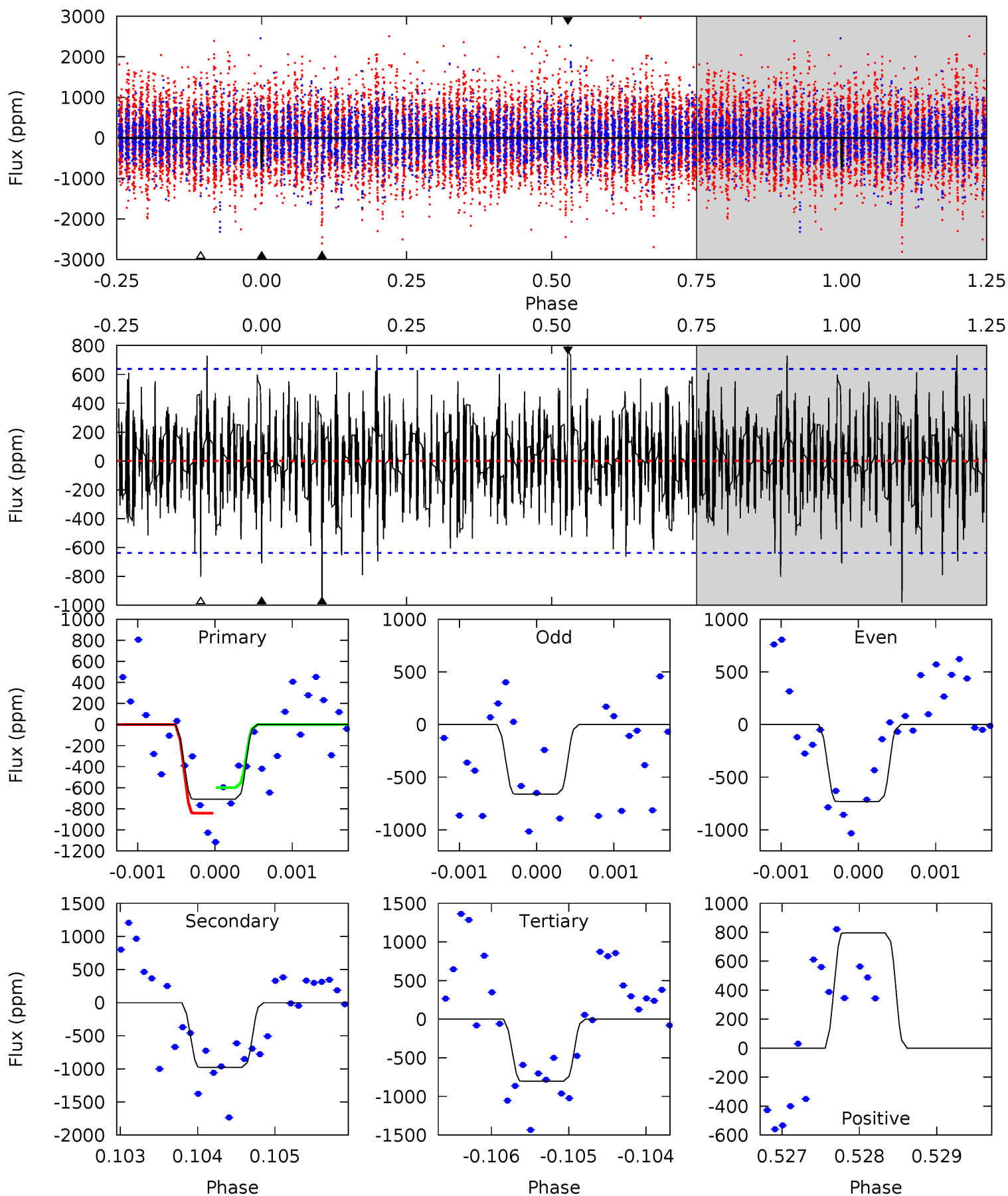
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.96	7.79	7.11	5.85	5.30	3.05	1.74	2.85	4.11	0.68	1.94	3.16	1.10	0.37	2.77



# Alt Model-Shift Uniqueness Test

005473584-03, P = 176.818406 Days, E = 15.776622 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.05	8.35	6.86	6.79	5.44	3.27	1.99	-0.80	-0.74	1.50	1.56	0.28	0.90	0.45	1.03



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-505 \pm 65$	$2.86^{+2.06}_{-1.69}$	$466^{+35}_{-22}$	$5525^{+3515}_{-1106}$	$12317^{+59813}_{-8144}$
Alt.	$-979 \pm 117$	$3.49^{+1.93}_{-1.84}$	$468^{+34}_{-24}$	$5846^{+3196}_{-1009}$	$16043^{+55105}_{-9262}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

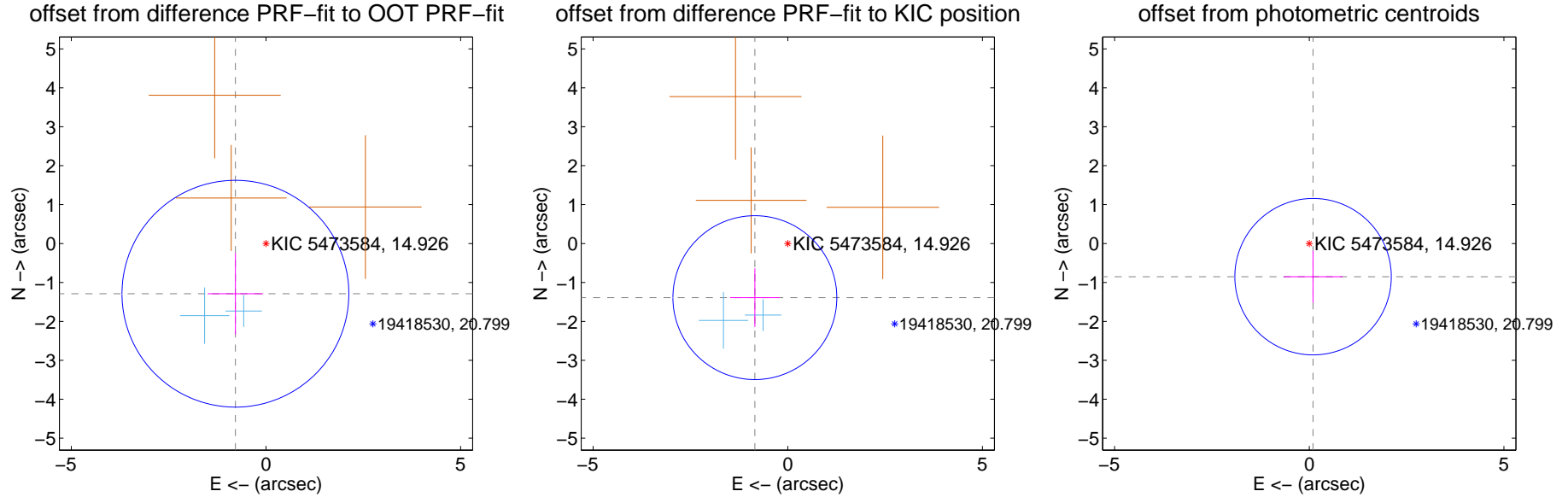
## DV Centroid Data

Supplemental centroid analysis for 005473584-03. Kepler magnitude: 14.93. Transit SNR 8.63

There are 2 quarters with good PRF difference image offsets

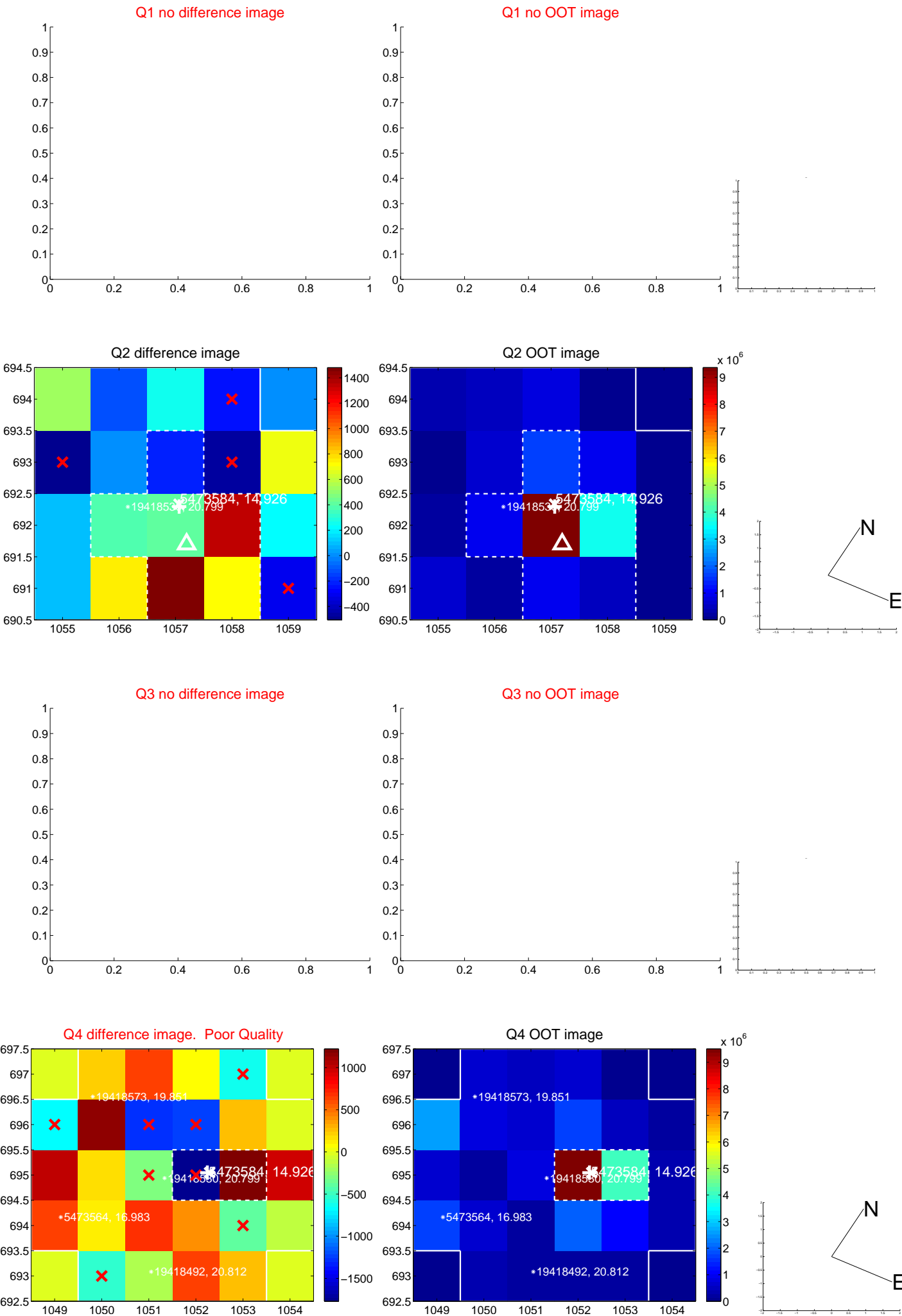
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.510 \pm 0.971$	1.55	$0.785 \pm 0.712$	$-1.289 \pm 1.049$
PRF-fit source offset from KIC position	$1.627 \pm 0.702$	2.32	$0.845 \pm 0.636$	$-1.390 \pm 0.753$
photometric centroid source offset	$0.86 \pm 0.67$	1.28	$-0.10 \pm 0.76$	$-0.85 \pm 0.67$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

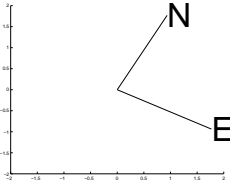
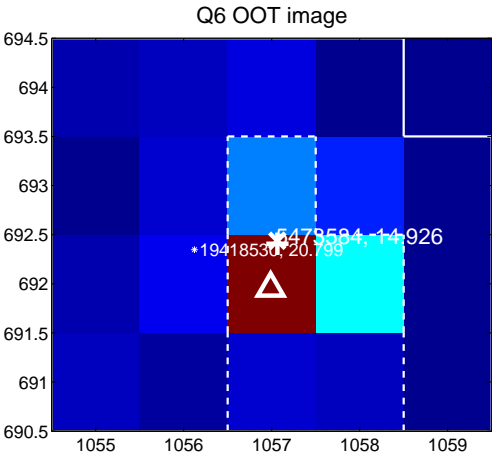
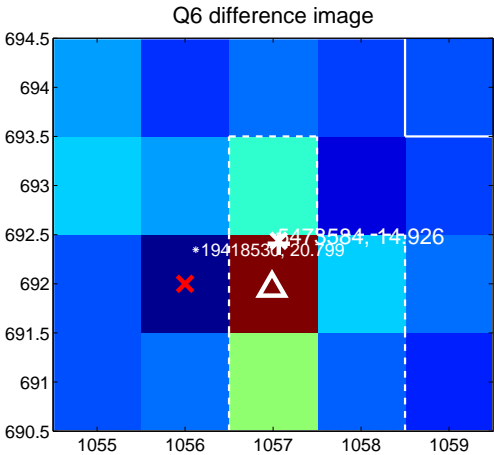


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

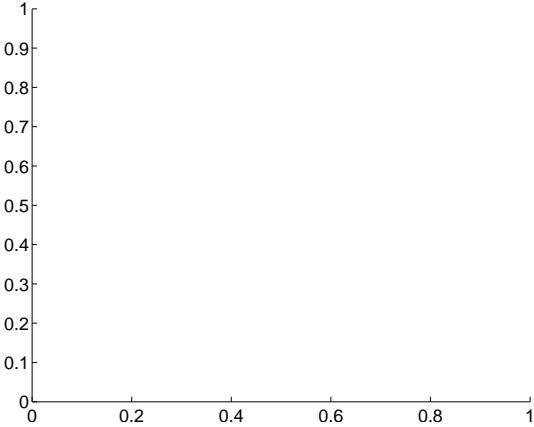
Q5 no difference image



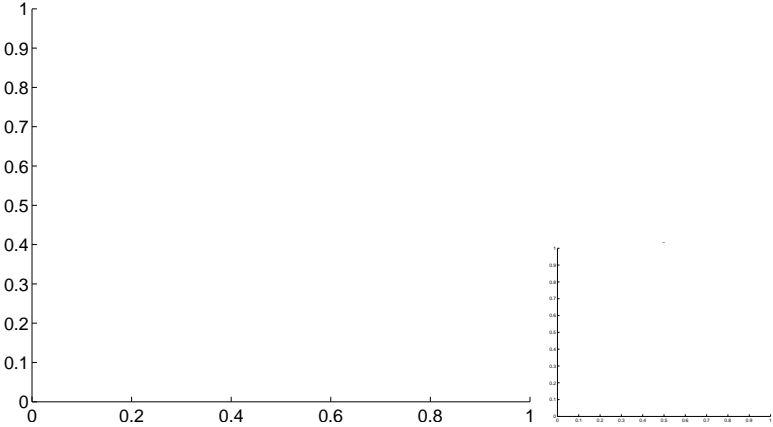
Q5 no OOT image



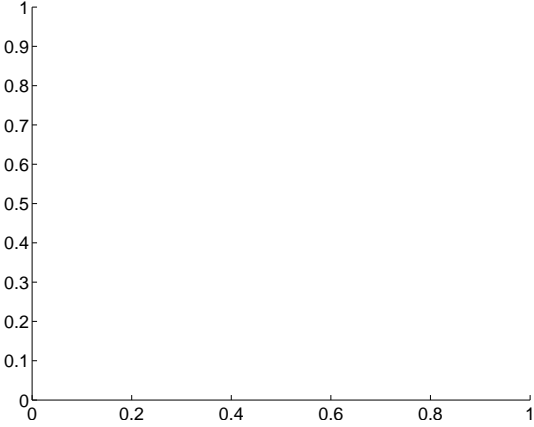
Q7 no difference image



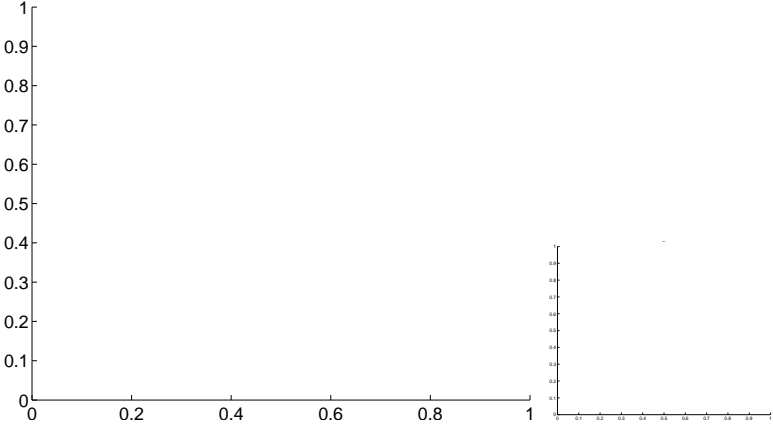
Q7 no OOT image



Q8 no difference image

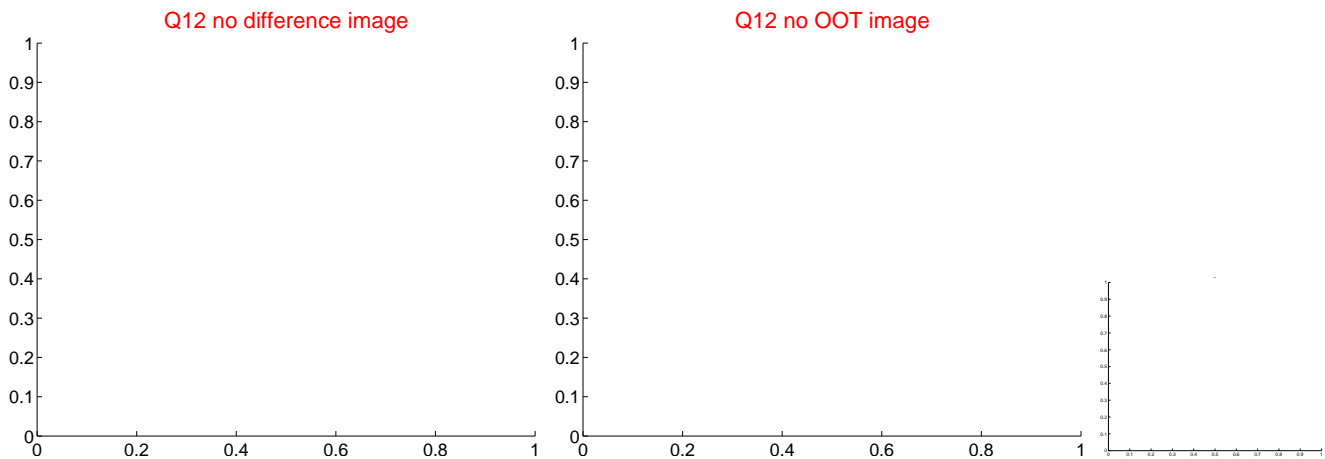
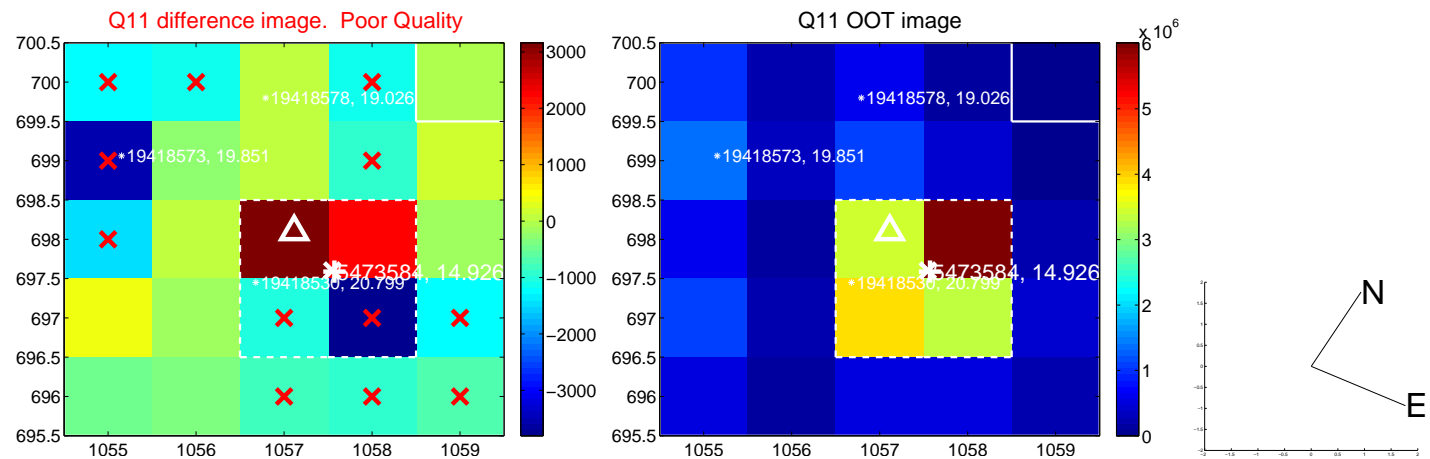
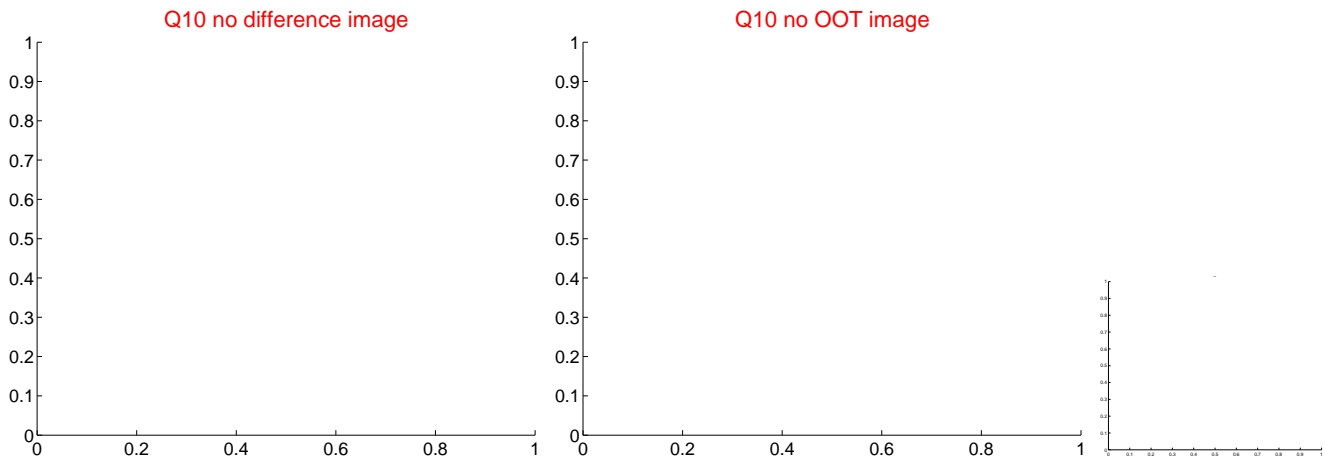
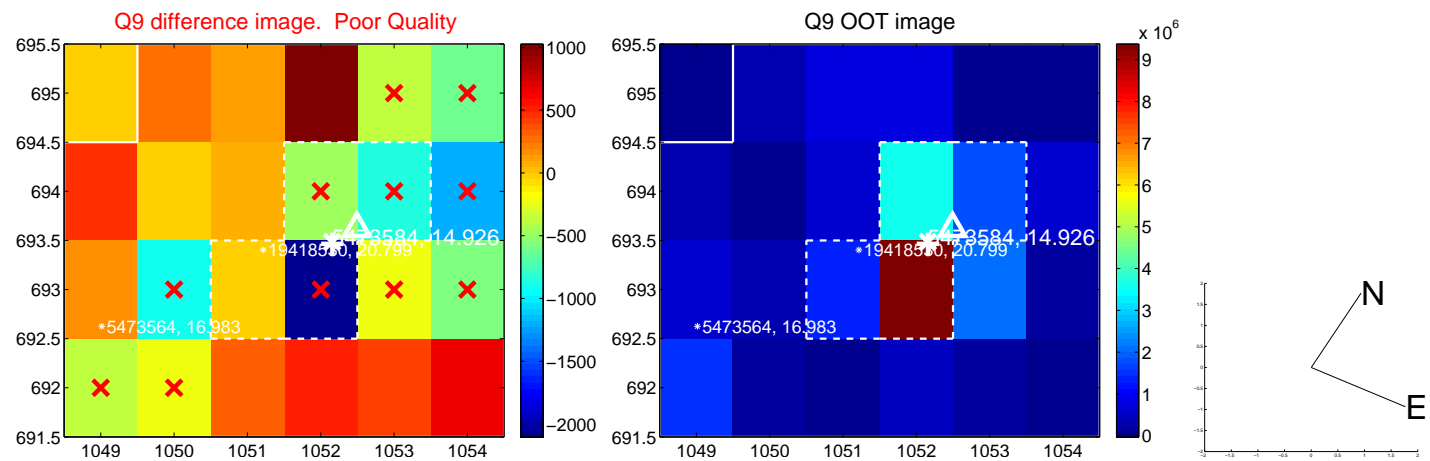


Q8 no OOT image

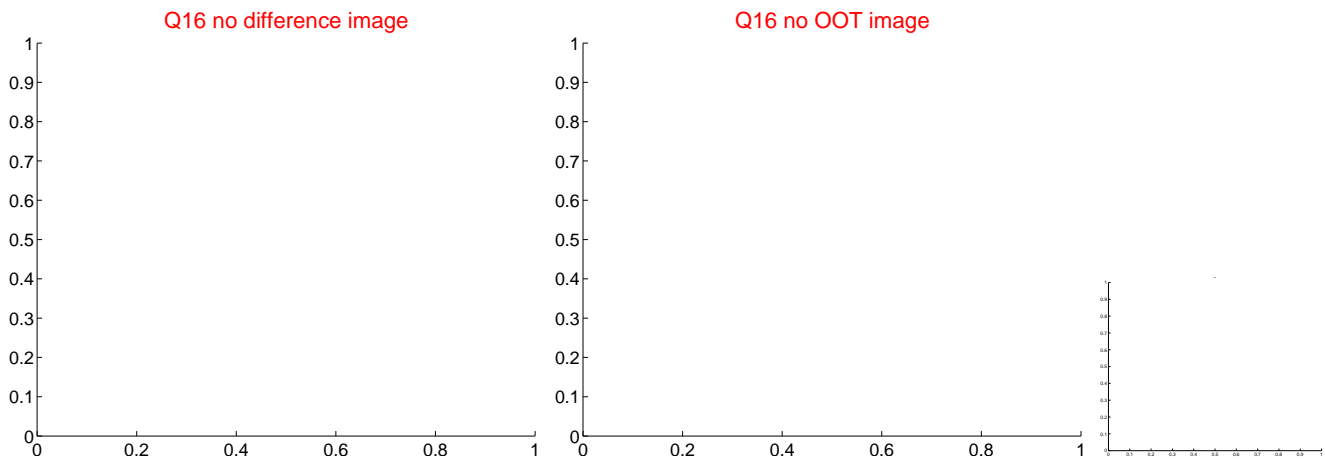
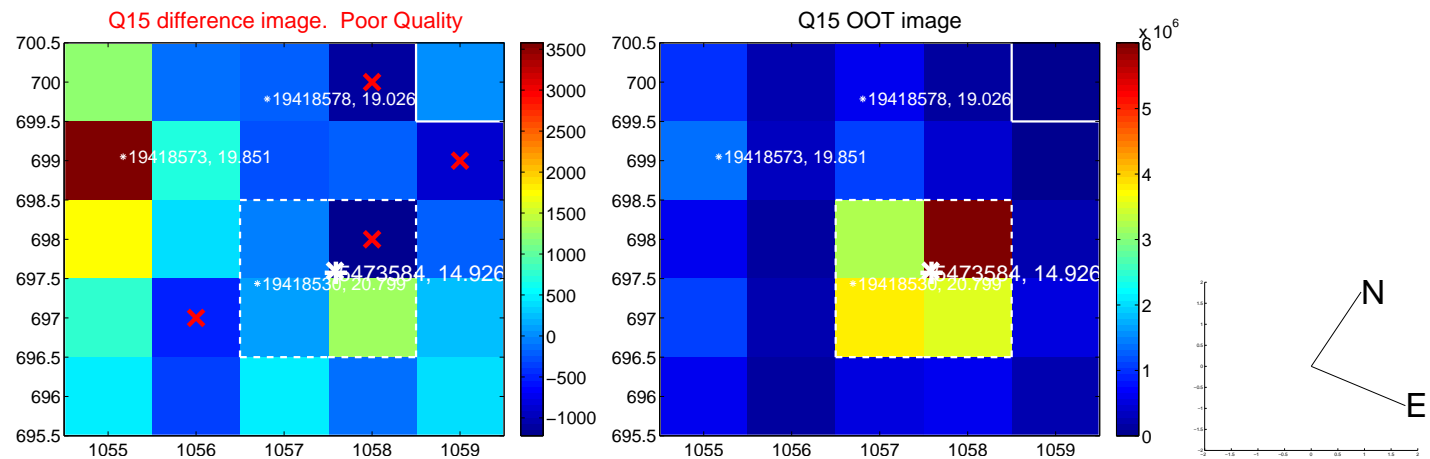
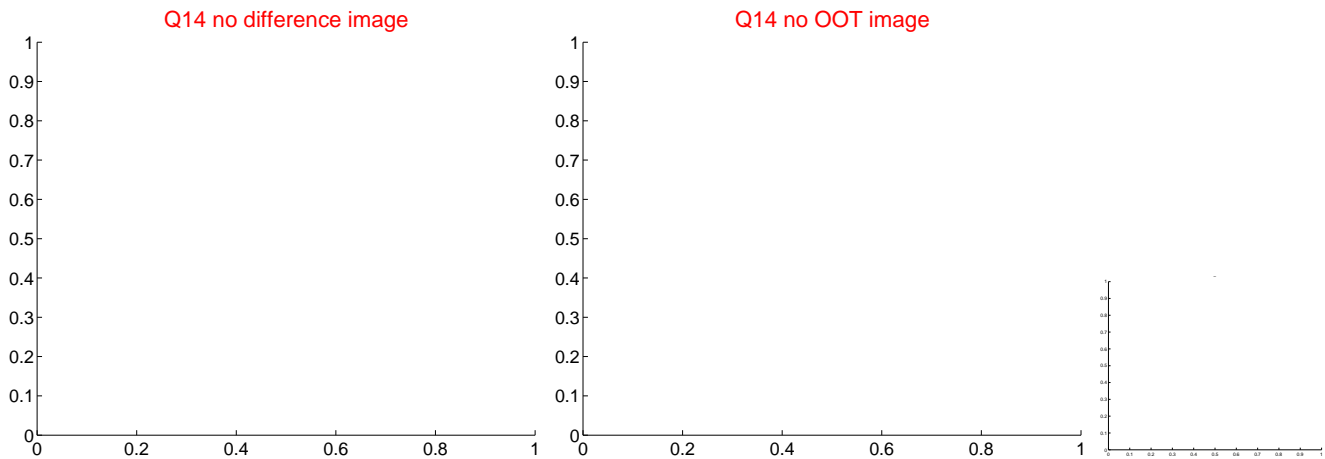
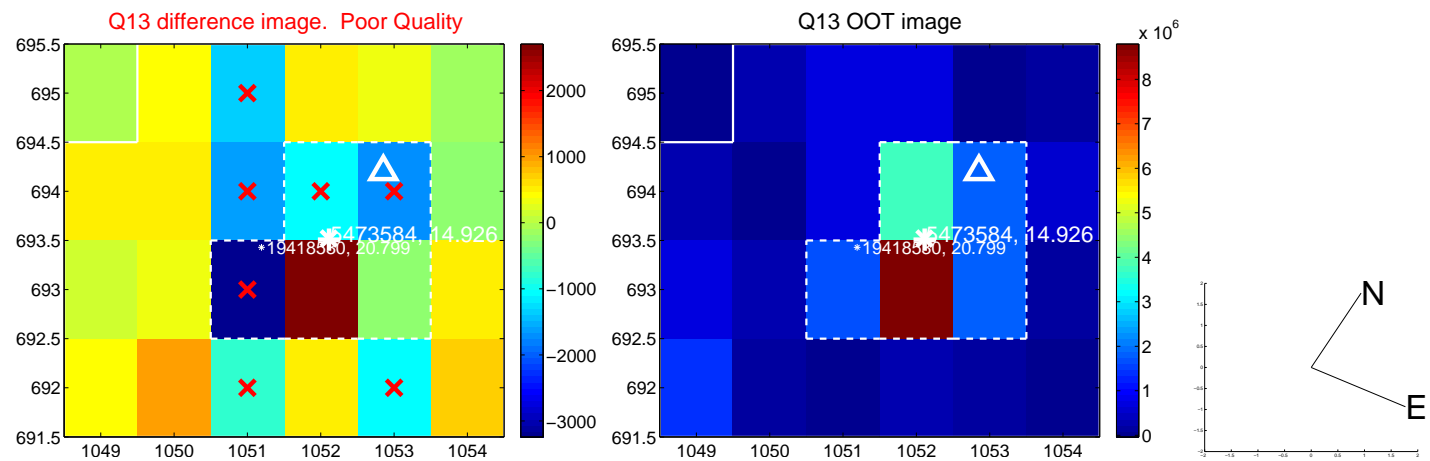




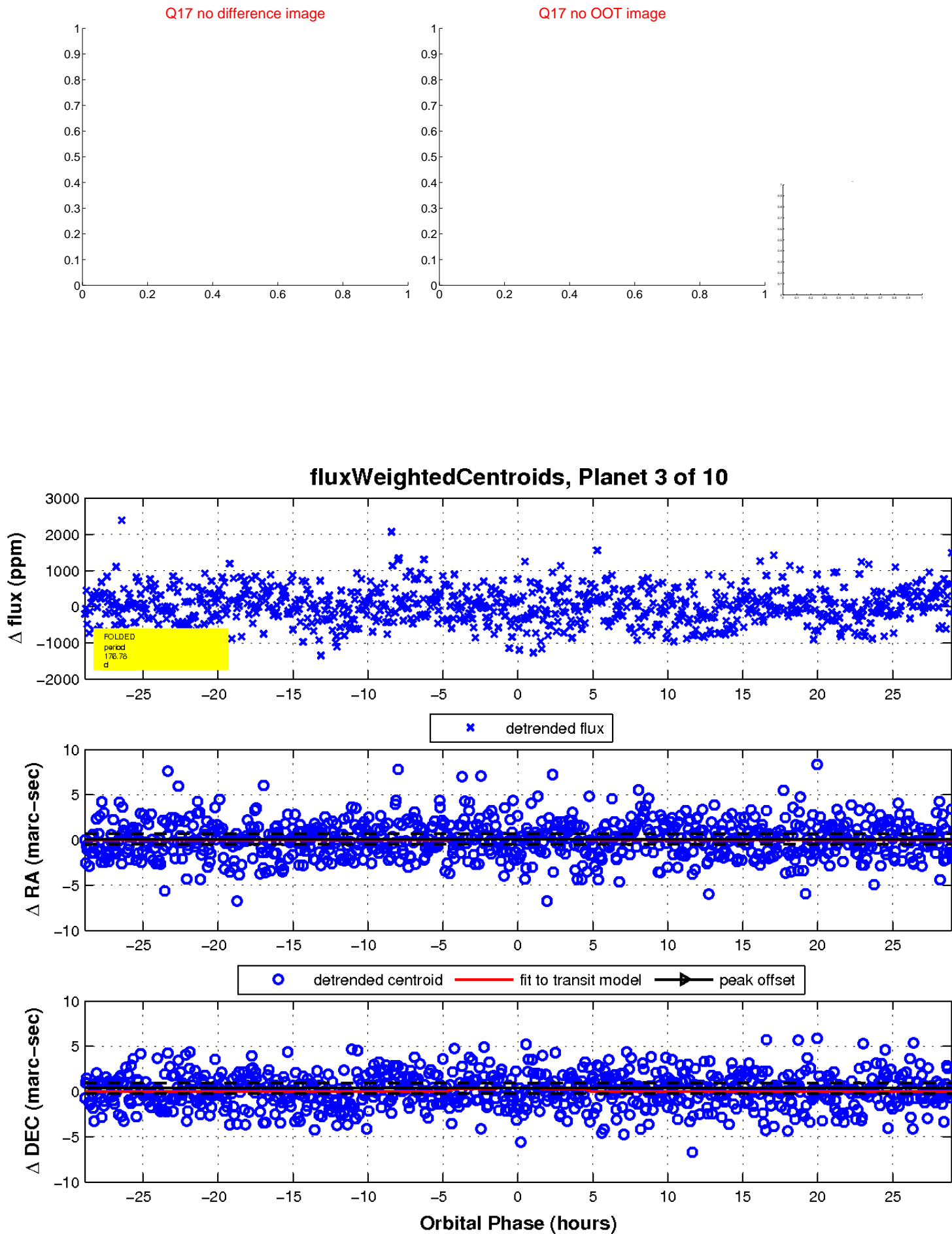
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

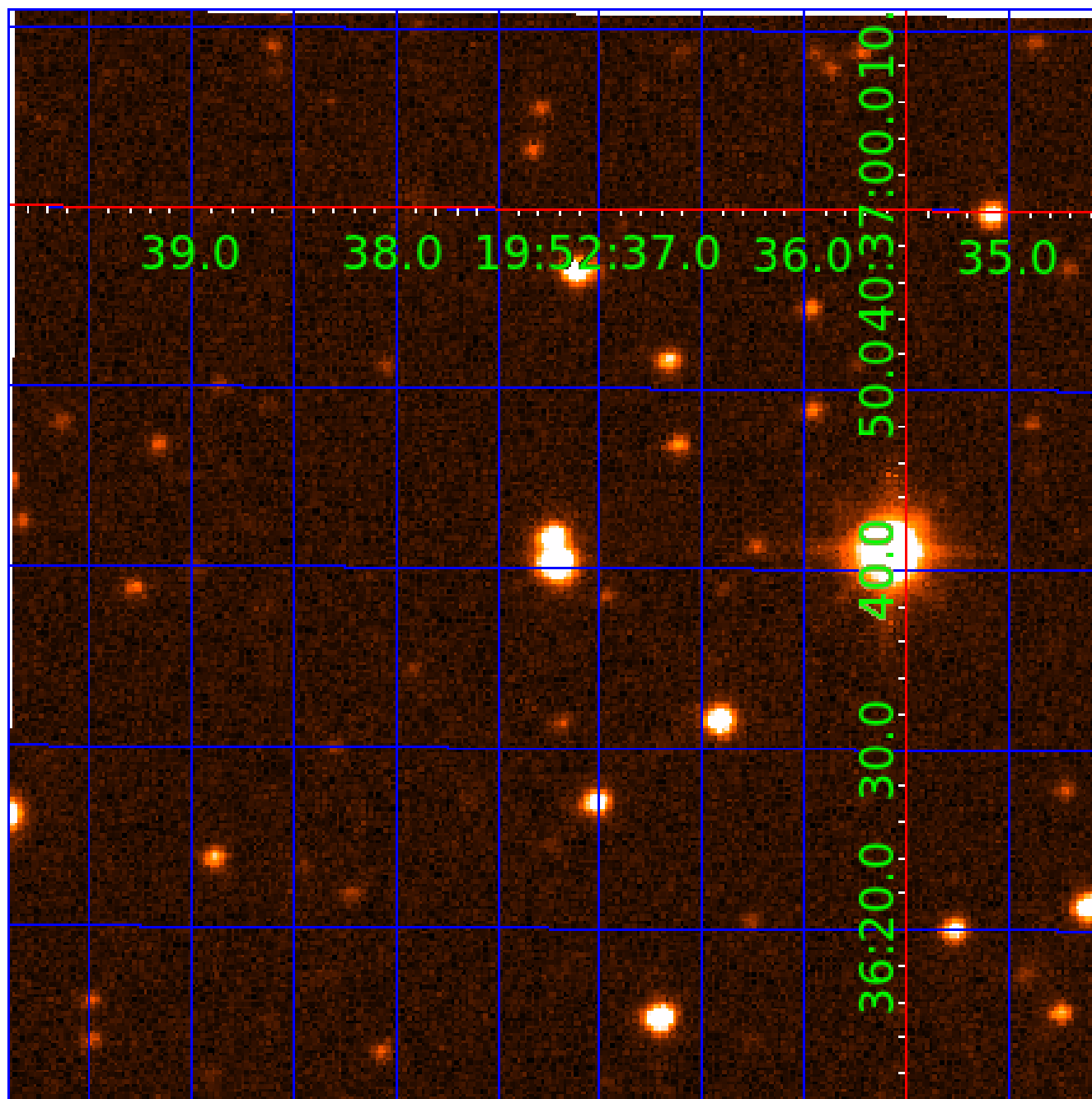


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

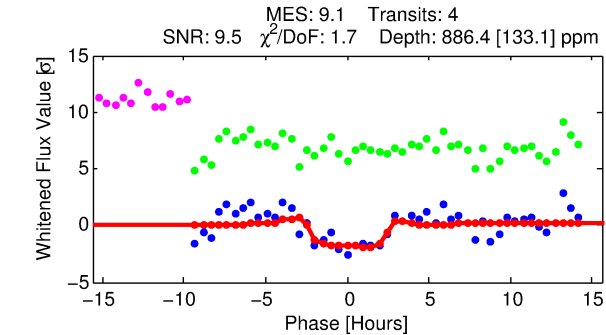
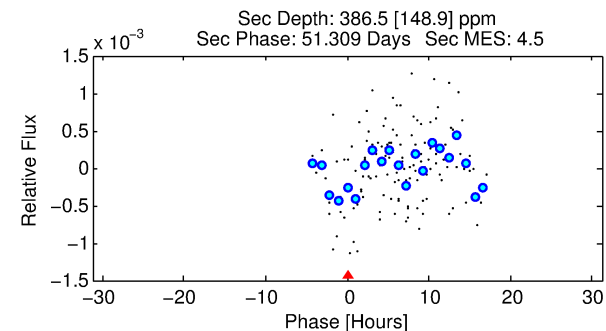
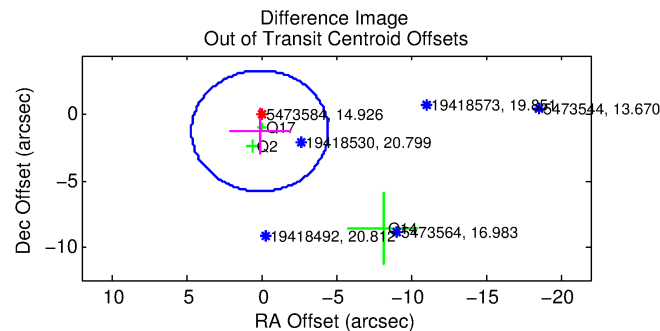
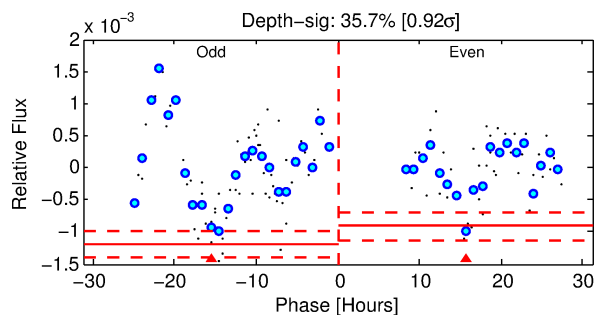
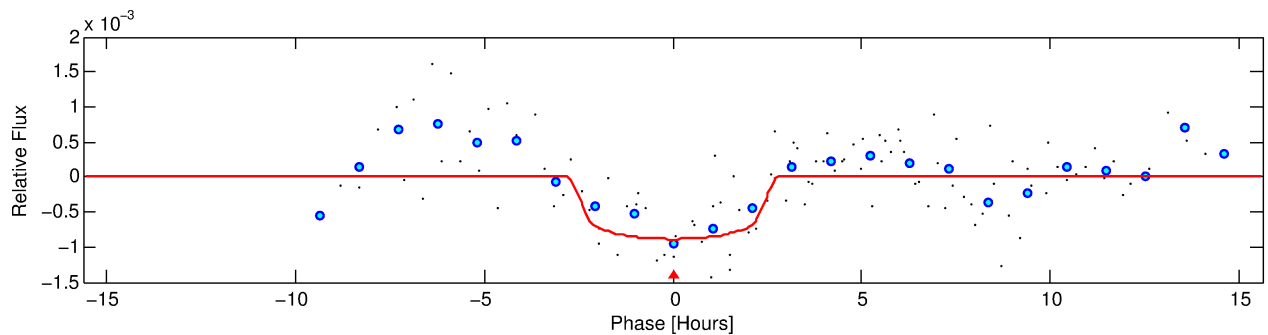
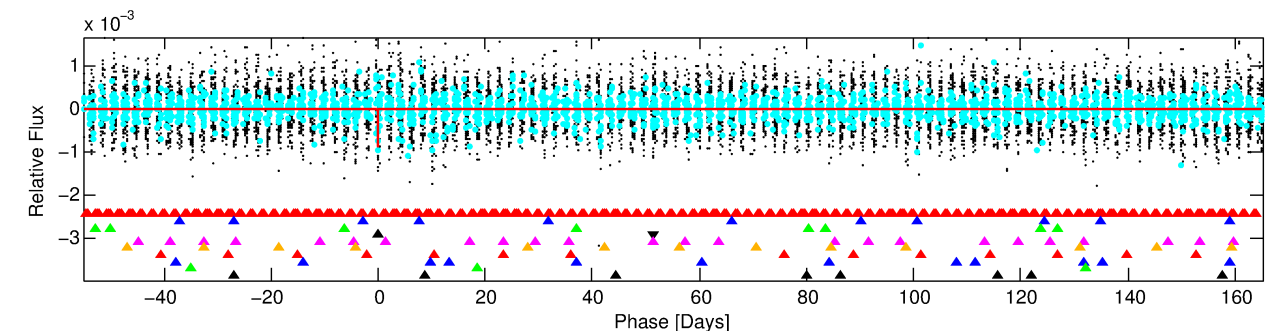
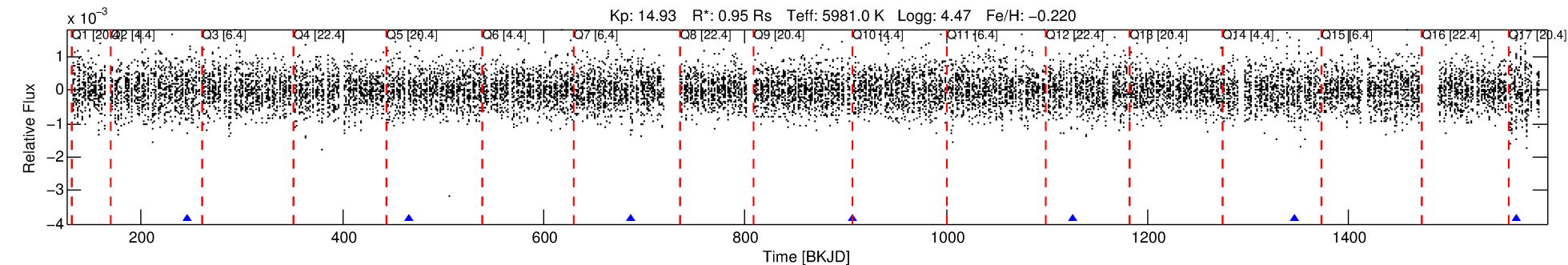
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-04

No Significant Match Found

# DV One-Page Summary

KIC: 5473584 Candidate: 4 of 10 Period: 220.218 d



## DV Fit Results:

Period = 220.21782 [0.00495] d  
Epoch = 245.5394 [0.0207] BKJD  
Rp/R\* = 0.0286 [0.0314]  
a/R\* = 263.91 [1384.96]  
b = 0.63 [5.11]  
Seff = 2.05 [0.81]  
Teq = 305 [30] K  
Rp = 2.96 [3.37] Re  
a = 0.7066 [0.1825] AU  
Ag = 12149.46 [27463.63] [0.44 $\sigma$ ]  
Teffp = 4956 [2767] K [1.68 $\sigma$ ]

## DV Diagnostic Results:

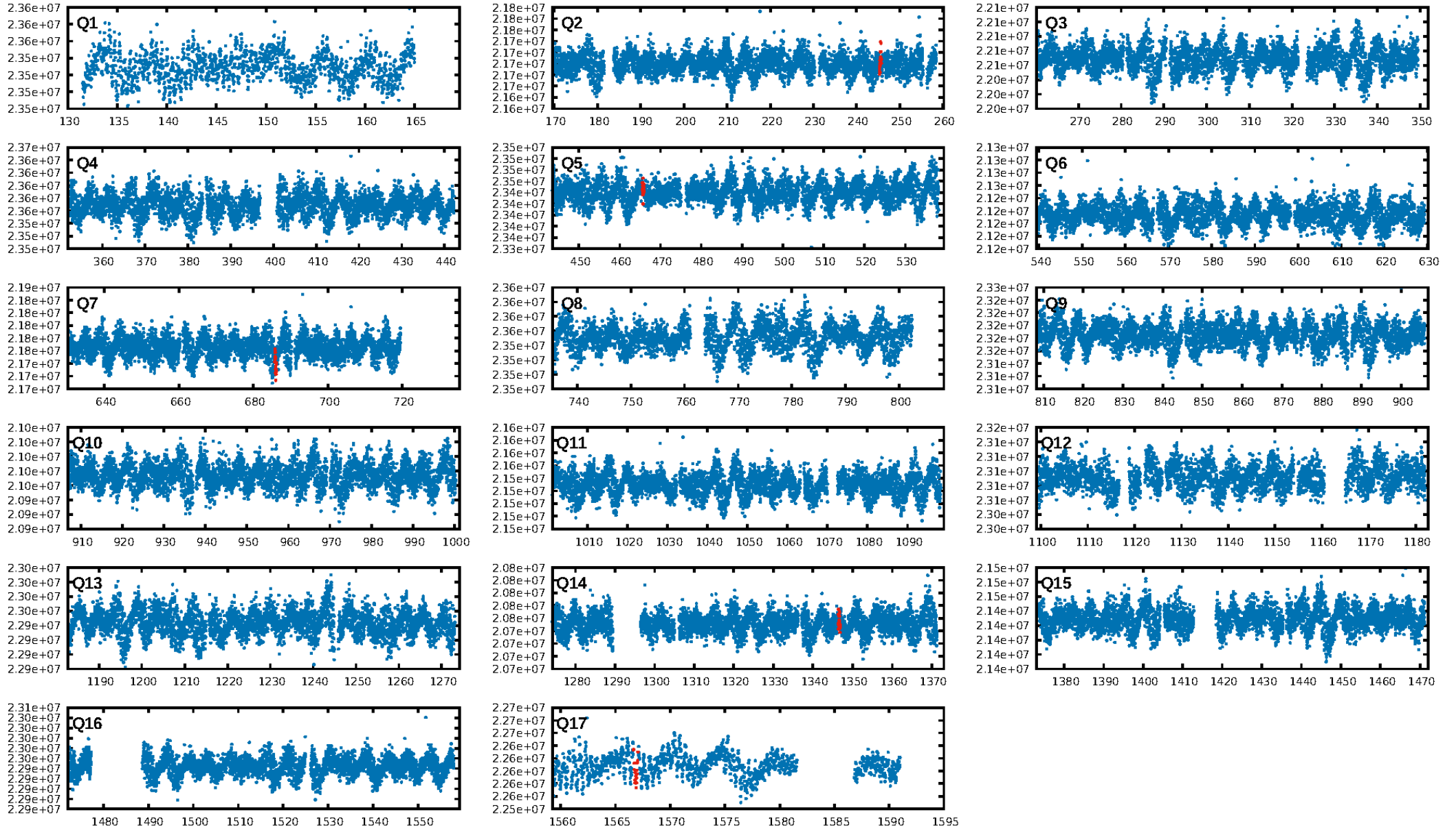
ShortPeriod-sig: 100.0% [79.56 $\sigma$ ]  
LongPeriod-sig: 100.0% [1000.47 $\sigma$ ]  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 87.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.791  
Centroid-sig: 6.3%  
Centroid-so: 1.360 arcsec [1.24 $\sigma$ ]  
OotOffset-rm: 1.226 arcsec [0.80 $\sigma$ ]  
OotOffset-st: 2/0/0/1 [3]  
KicOffset-rm: 1.233 arcsec [0.63 $\sigma$ ]  
KicOffset-st: 2/0/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.80 [4/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:09:01 Z

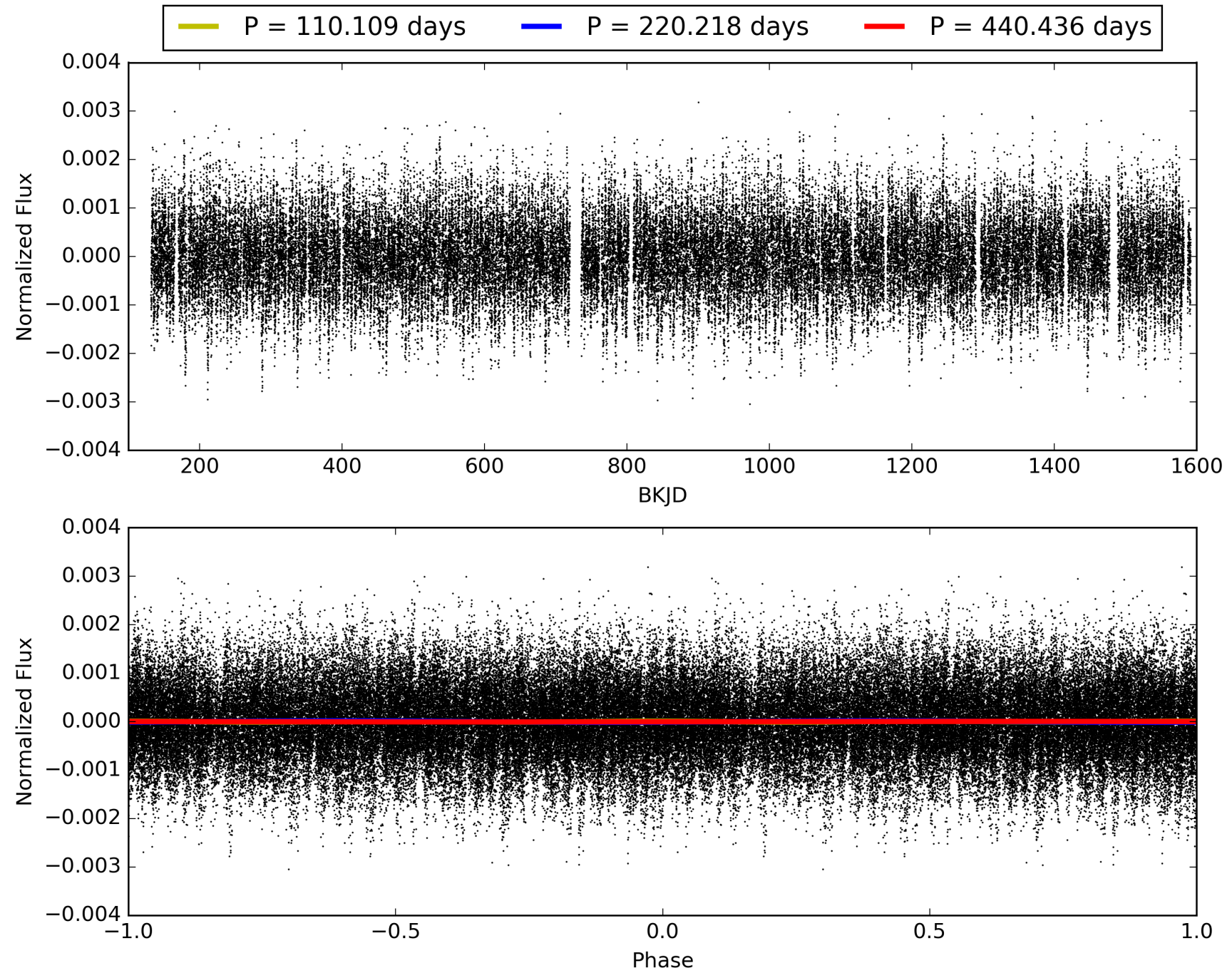
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005473584-04, PDC Light Curves

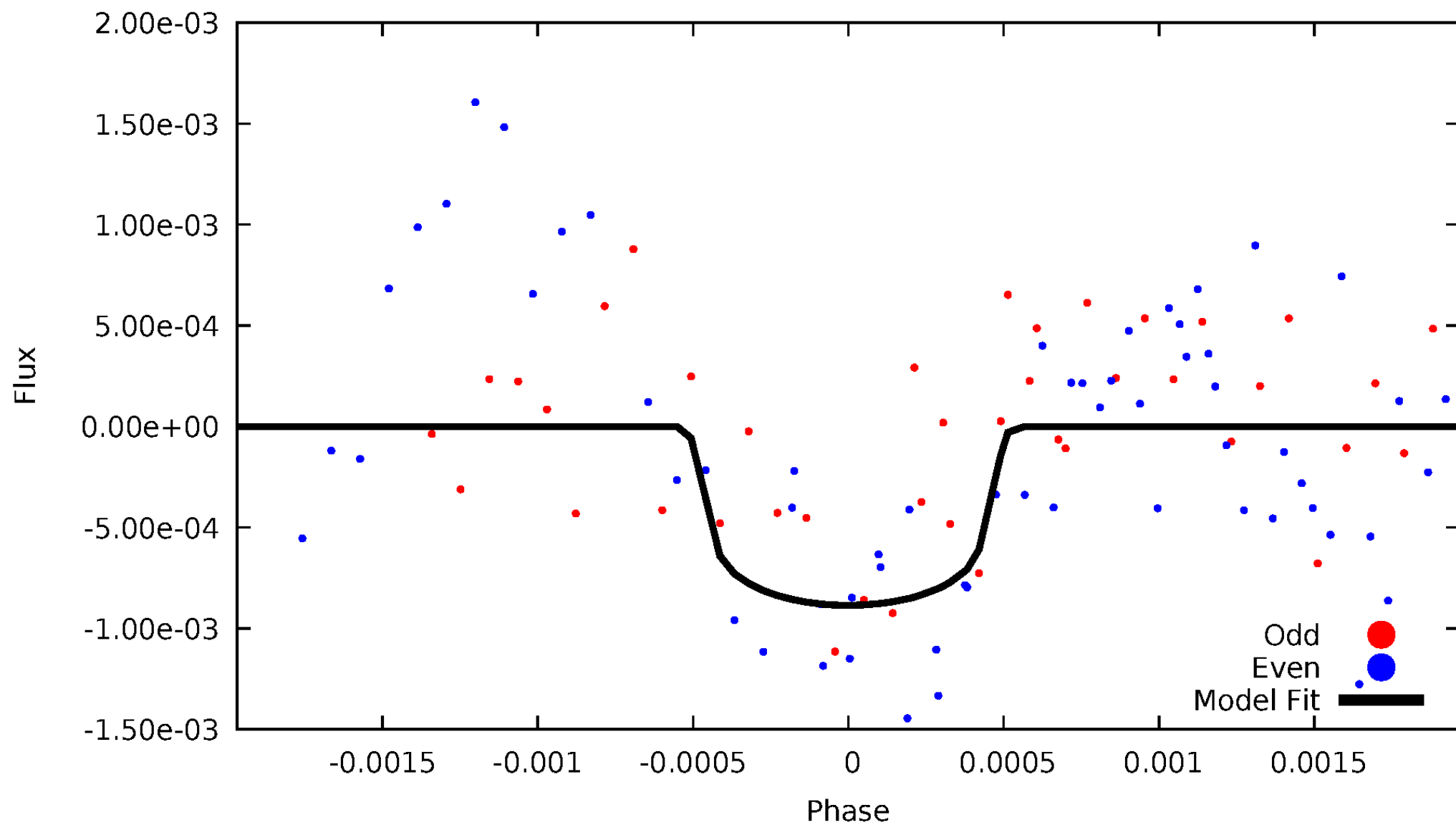


TCE 005473584-04



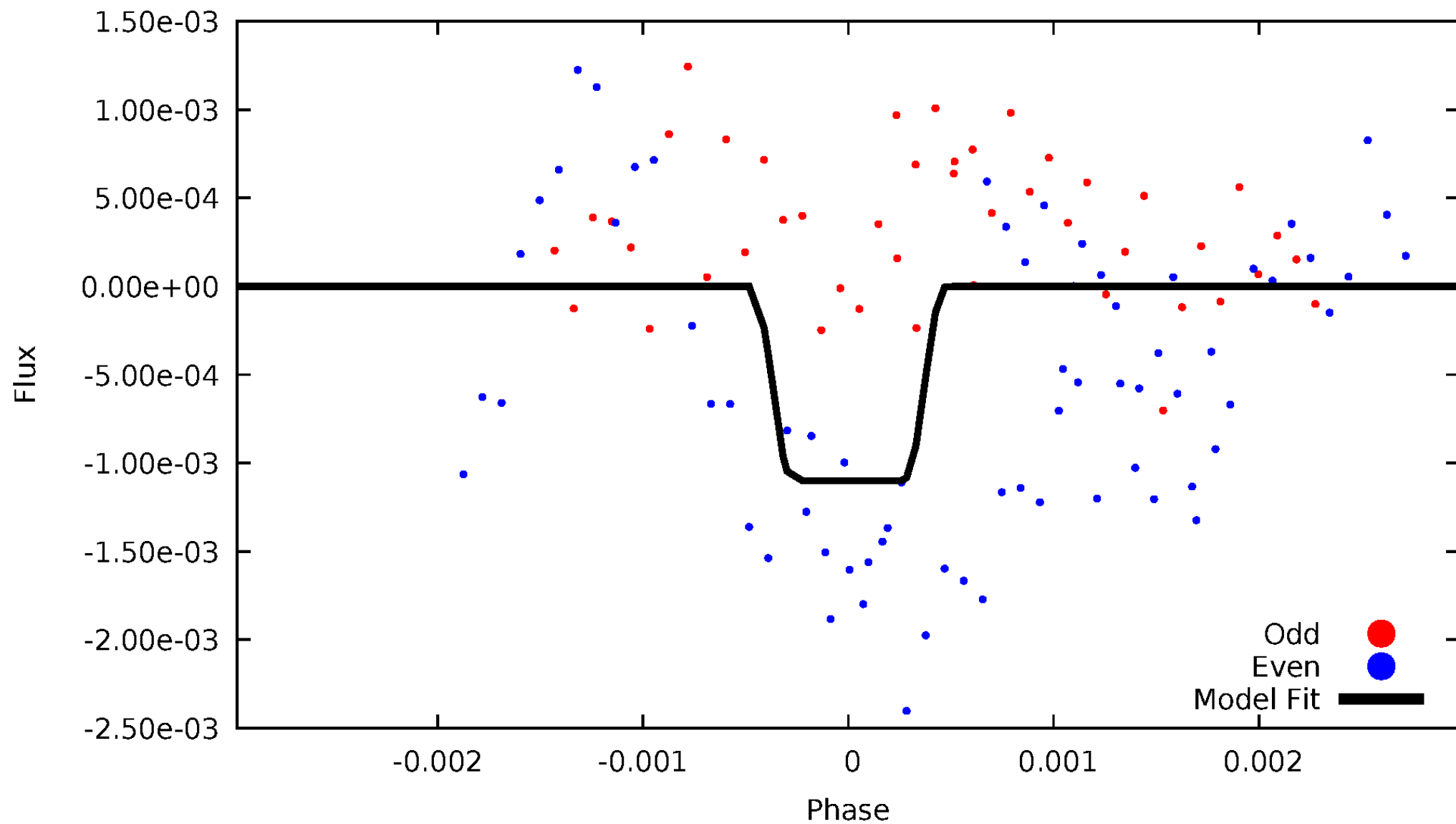
# DV Odd/Even

TCE 005473584-04



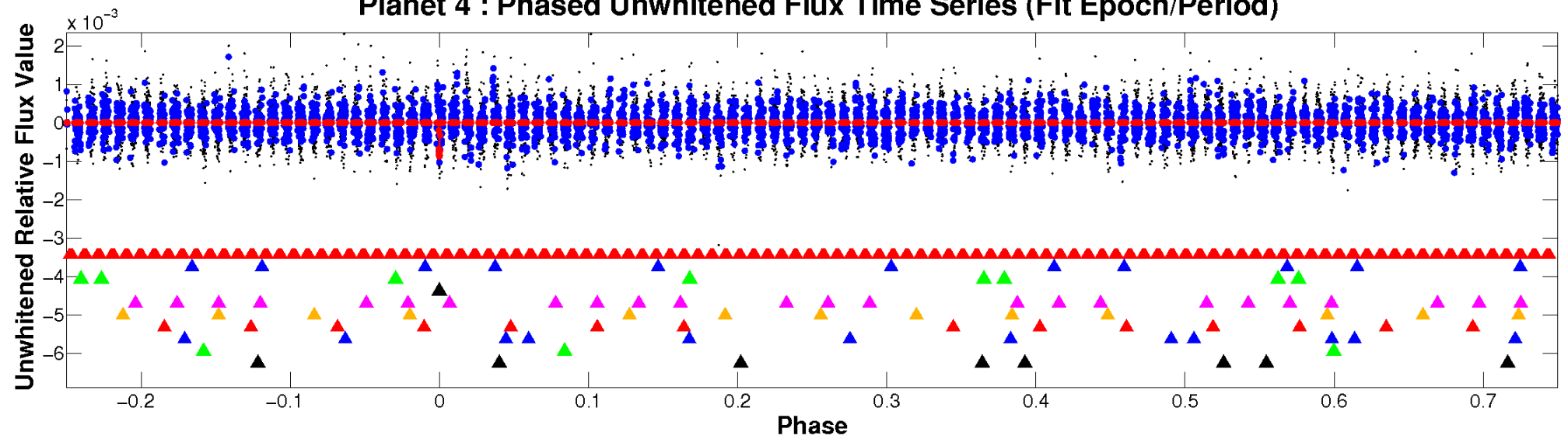
# ALT Odd/Even

TCE 005473584-04

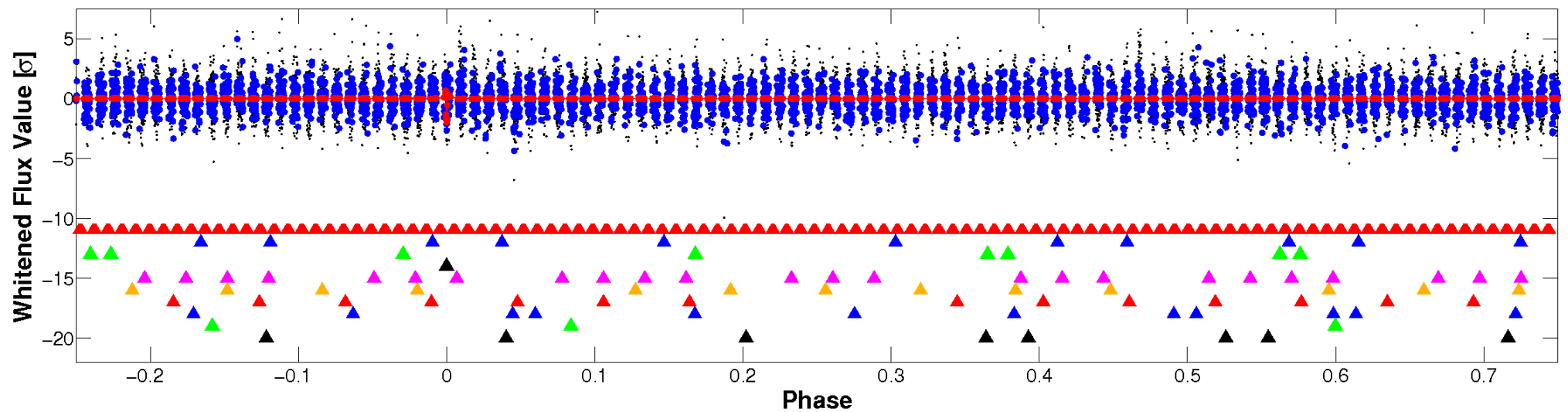


# Non-Whitened Vs. Whitened Light Curve

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

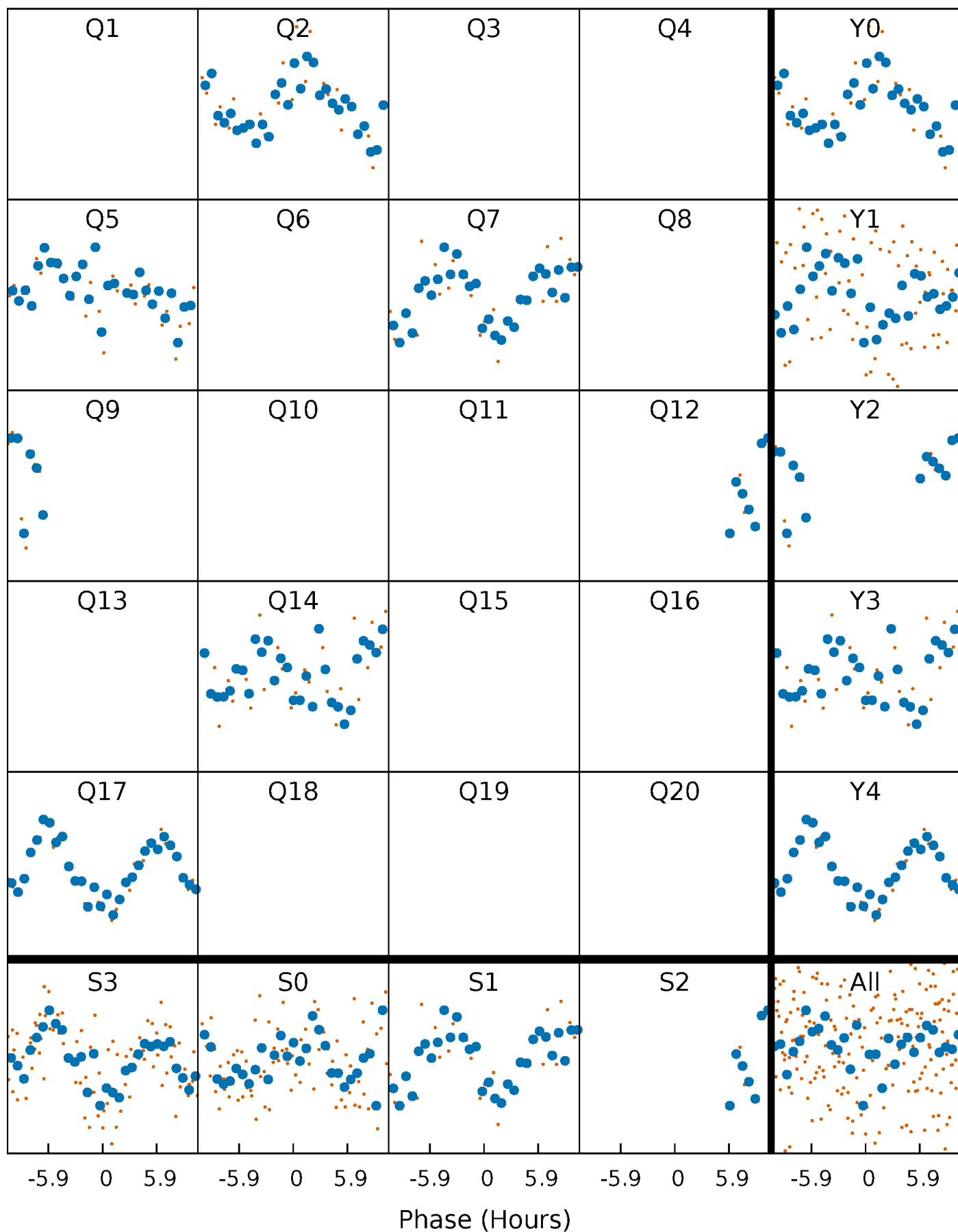


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

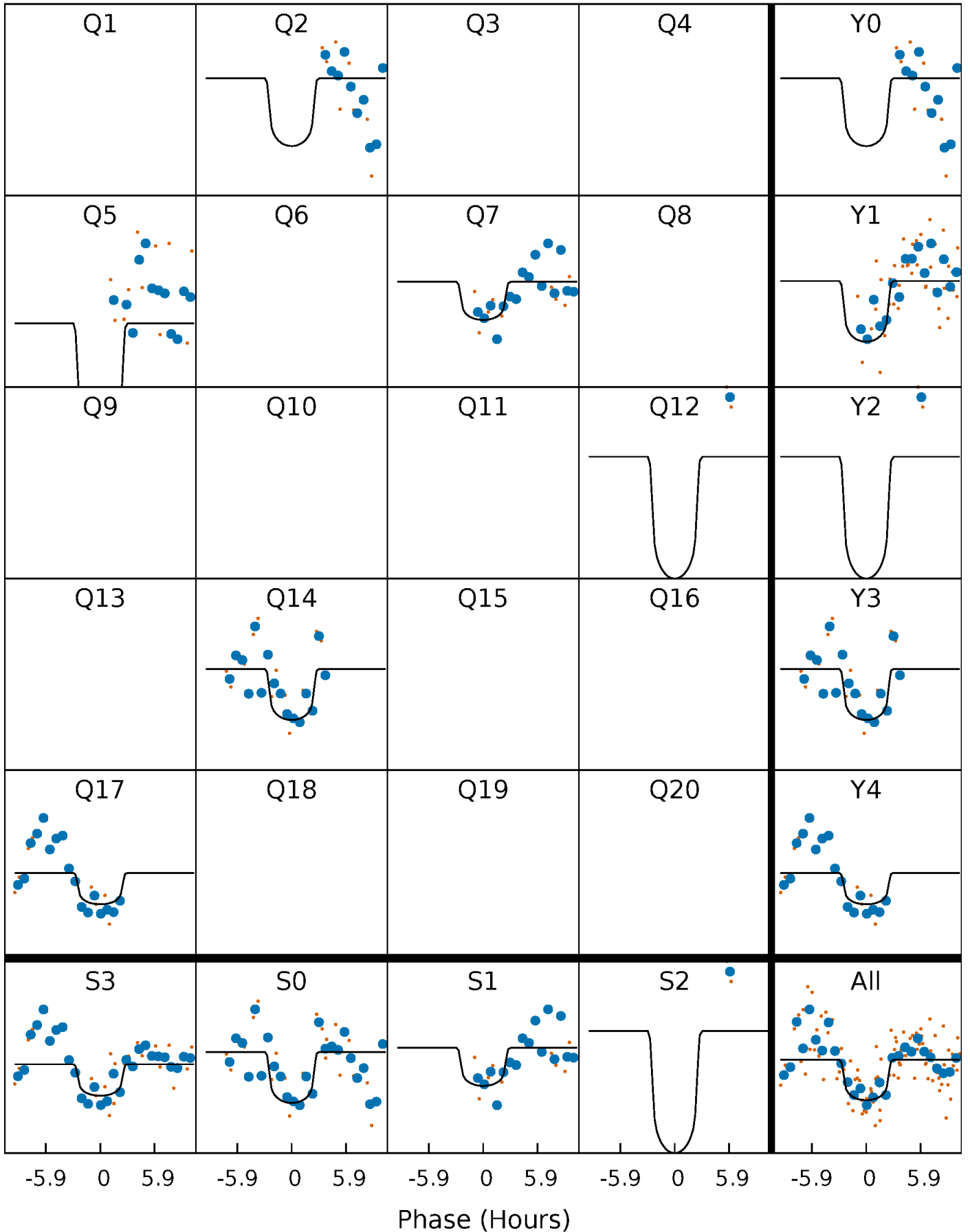
TCE 005473584-04     $P=220.217822$  Days     $T_0=245.539358$  (BKJD)





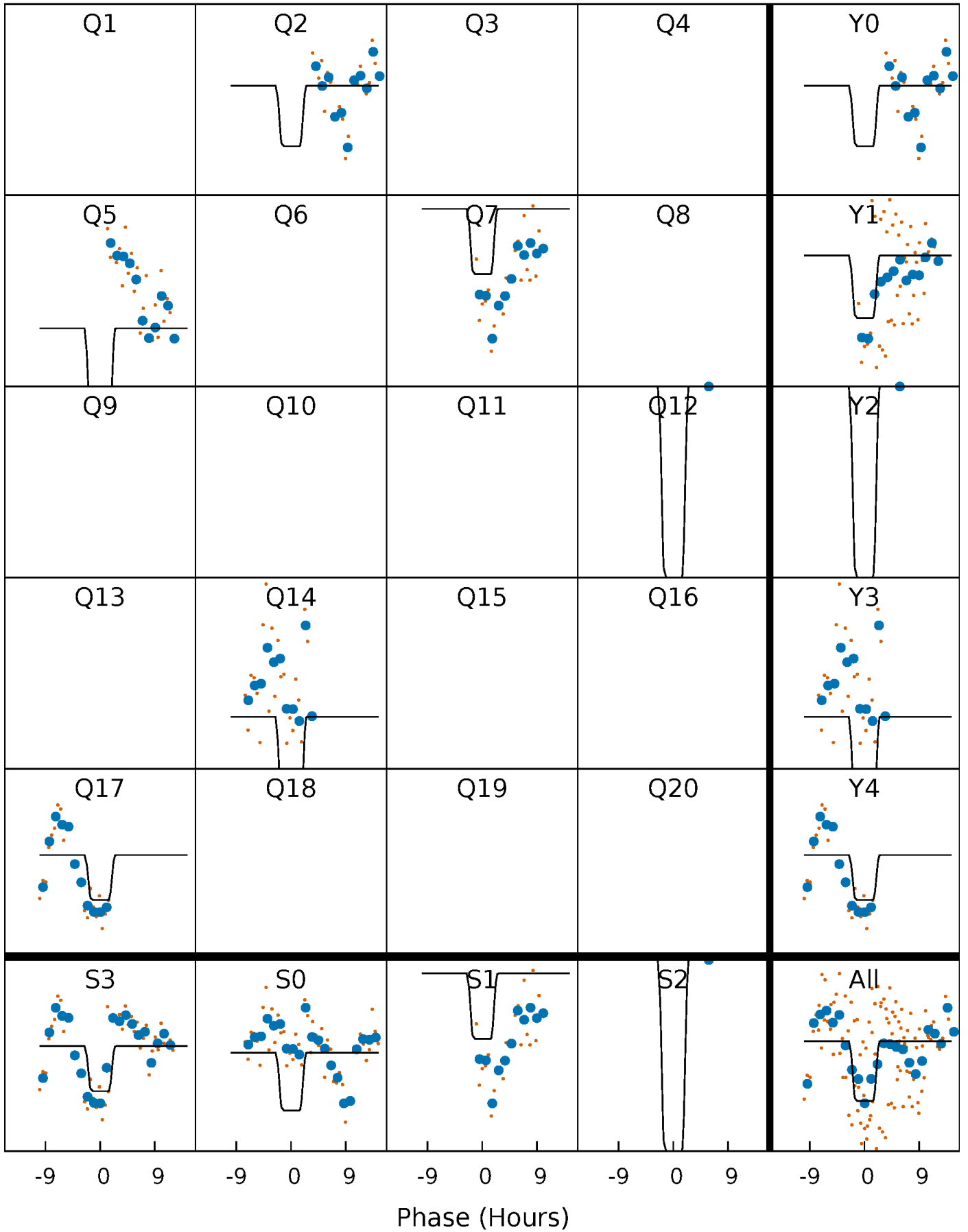
# DV Quarter-Phased Transit Curves

TCE 005473584-04     $P=220.217822$  Days     $T_0=245.539358$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

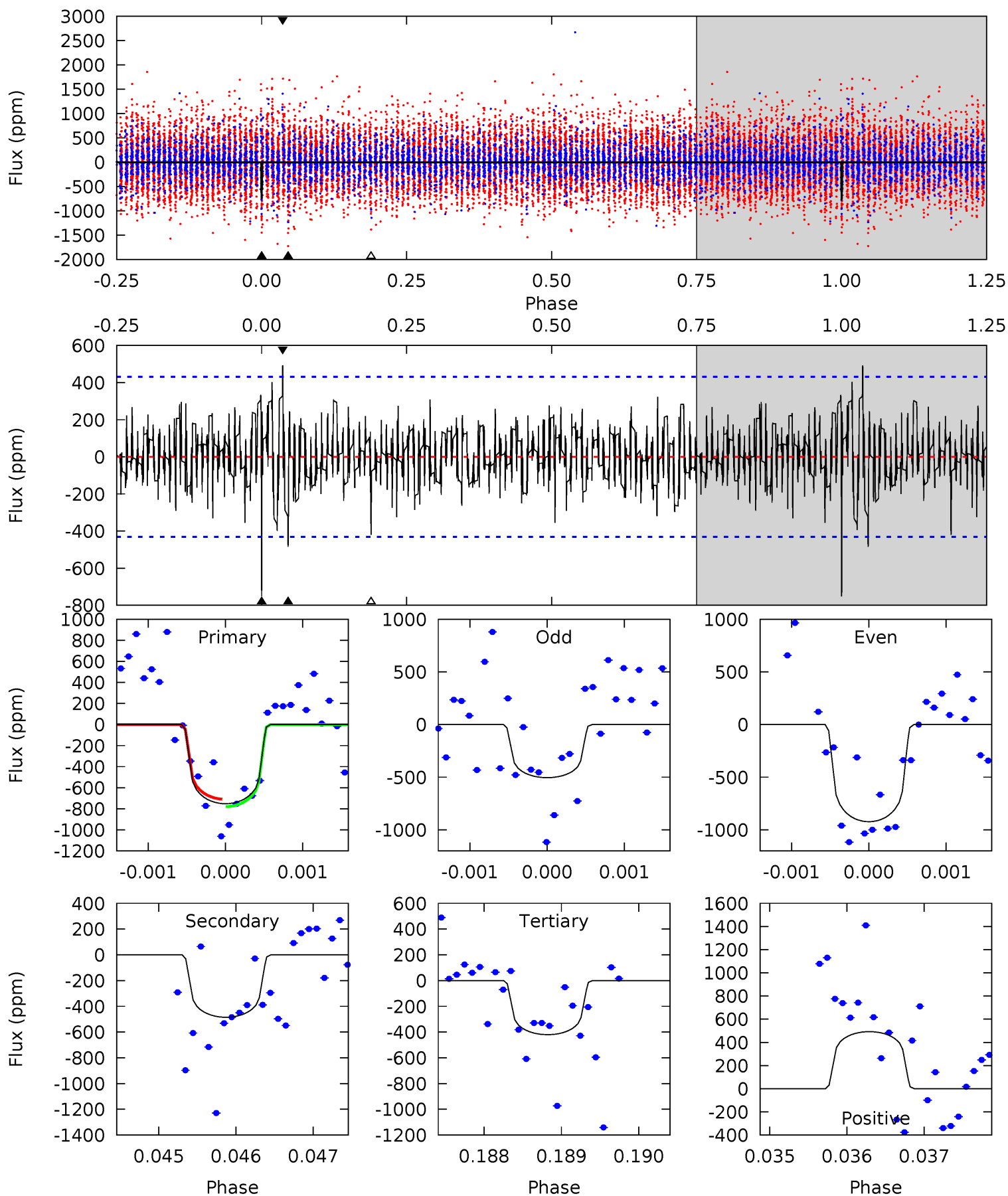
TCE 005473584-04 P=220.223974 Days  $T_0=245.528311$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-04, P = 220.217822 Days, E = 25.321536 Days

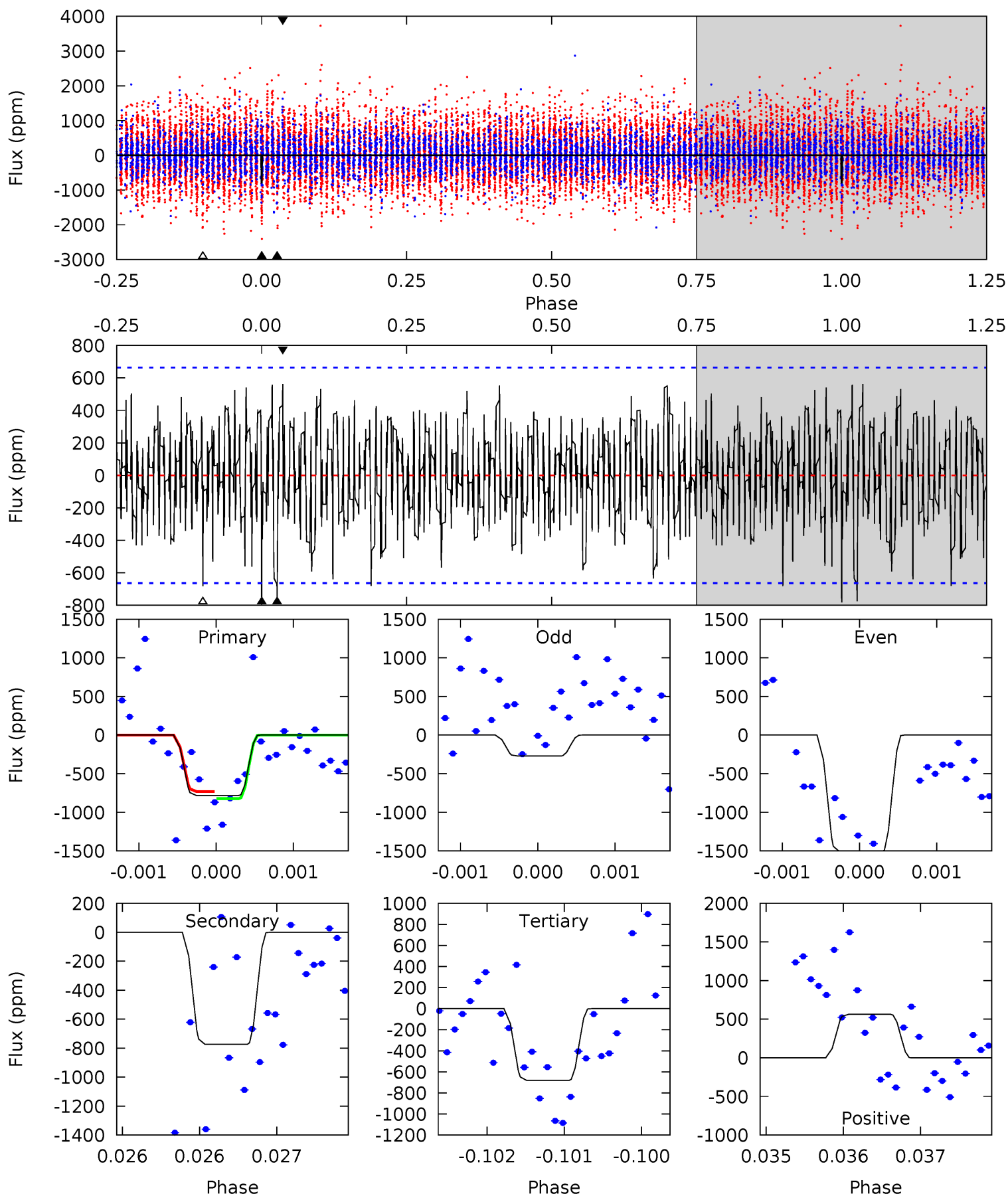
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.51	6.14	5.32	6.23	5.46	3.30	1.42	4.19	3.28	0.82	-0.09	2.66	0.78	0.40	0.43



# Alt Model-Shift Uniqueness Test

005473584-04, P = 220.223974 Days, E = 25.304337 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.45	6.38	5.62	4.64	5.47	3.33	1.69	0.83	1.81	0.76	1.74	5.01	0.83	0.42	0.37



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-485 \pm 79$	$3.84^{+2.98}_{-2.47}$	$433^{+32}_{-20}$	$4850^{+3150}_{-981}$	$8903^{+63258}_{-6224}$
Alt.	$-774 \pm 121$	$4.07^{+3.15}_{-2.53}$	$436^{+31}_{-22}$	$5198^{+3580}_{-1062}$	$12396^{+77134}_{-8363}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

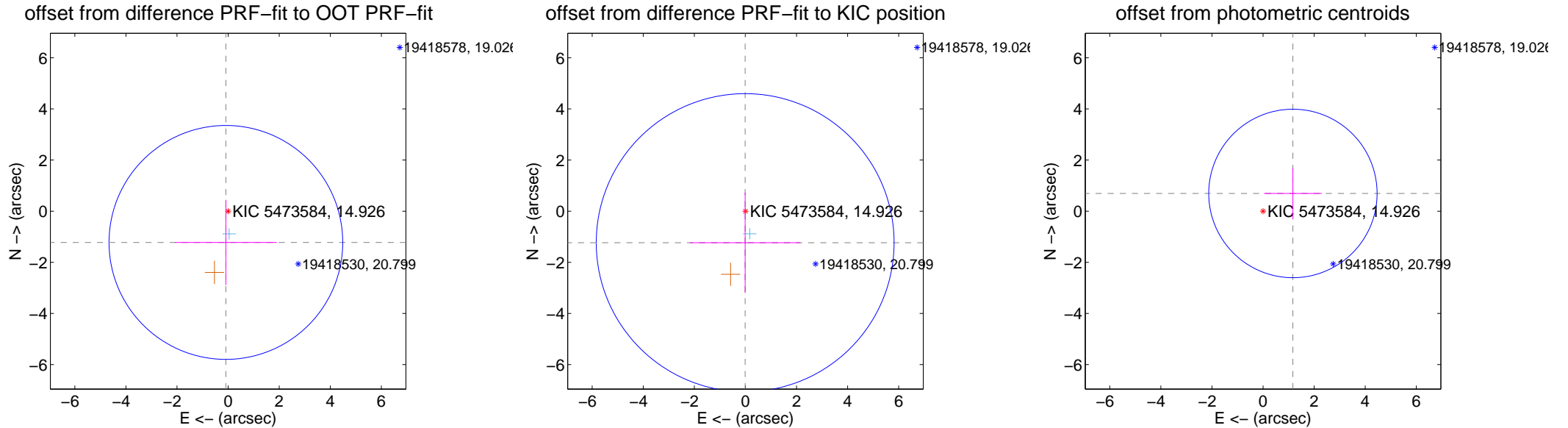
## DV Centroid Data

Supplemental centroid analysis for 005473584-04. Kepler magnitude: 14.93. Transit SNR 9.48

There are 1 quarters with good PRF difference image offsets

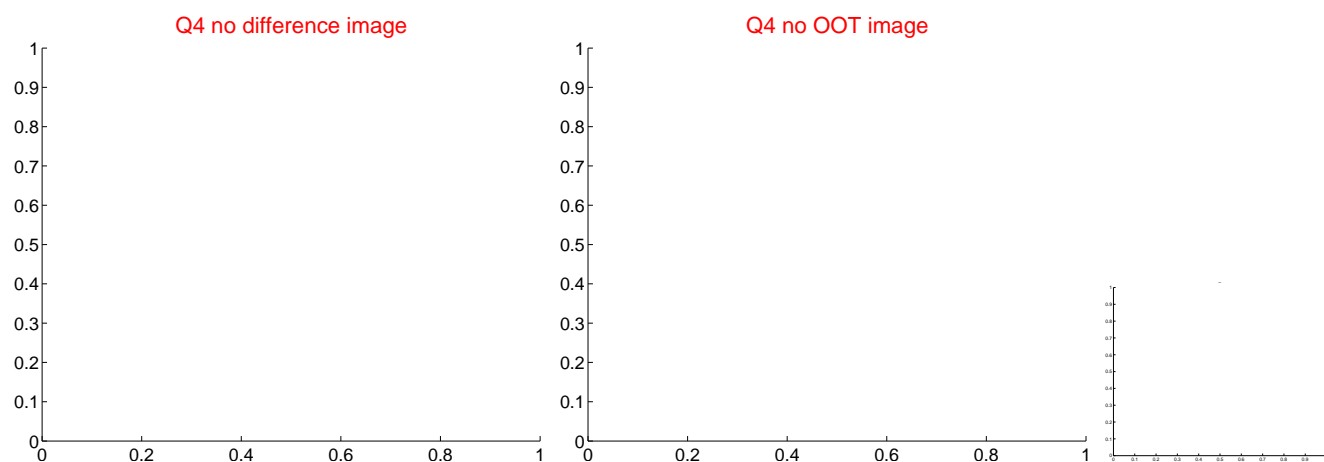
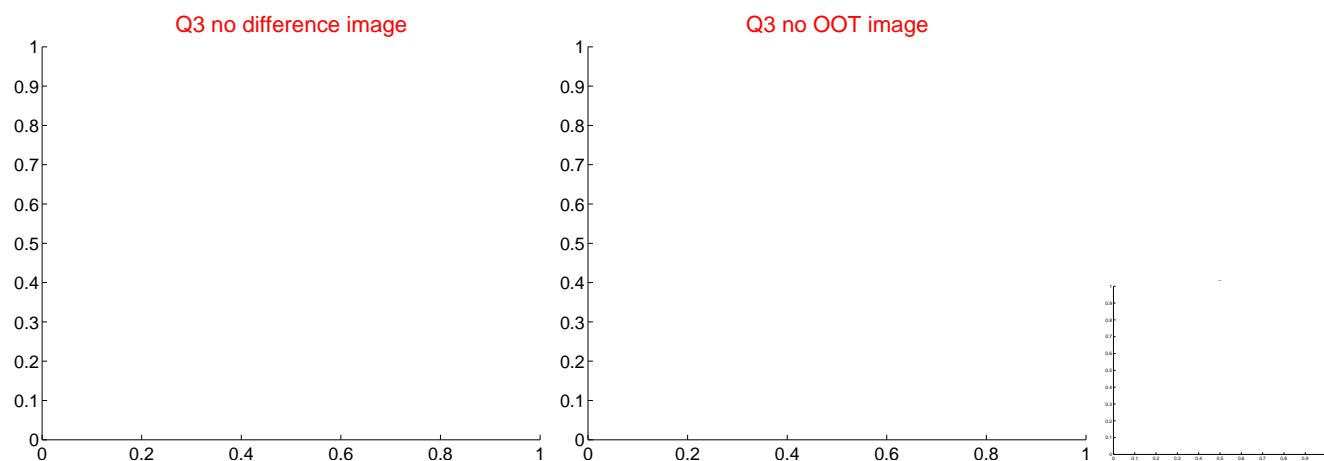
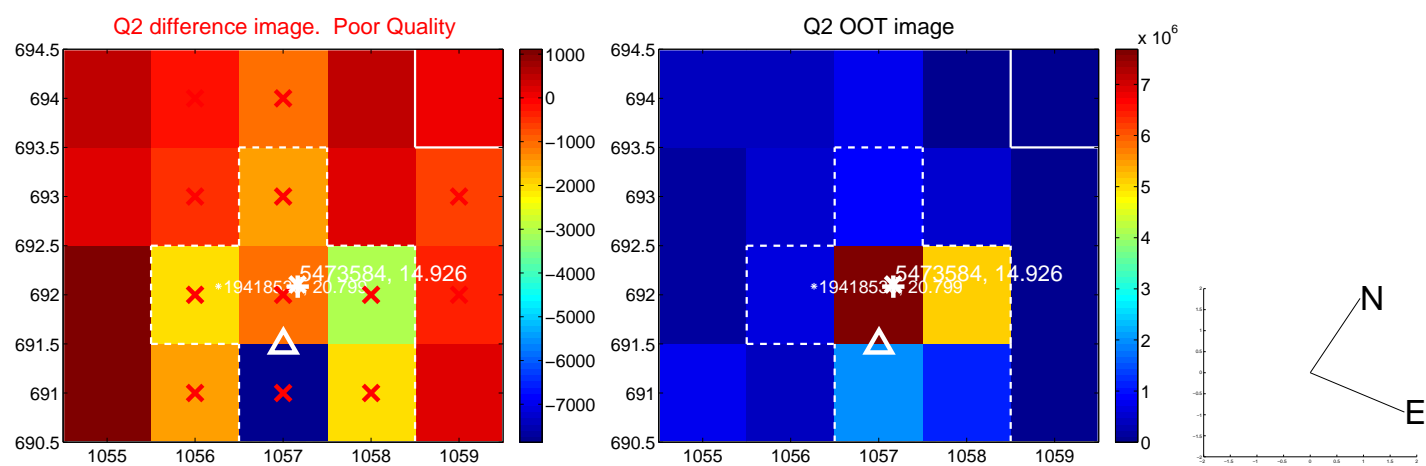
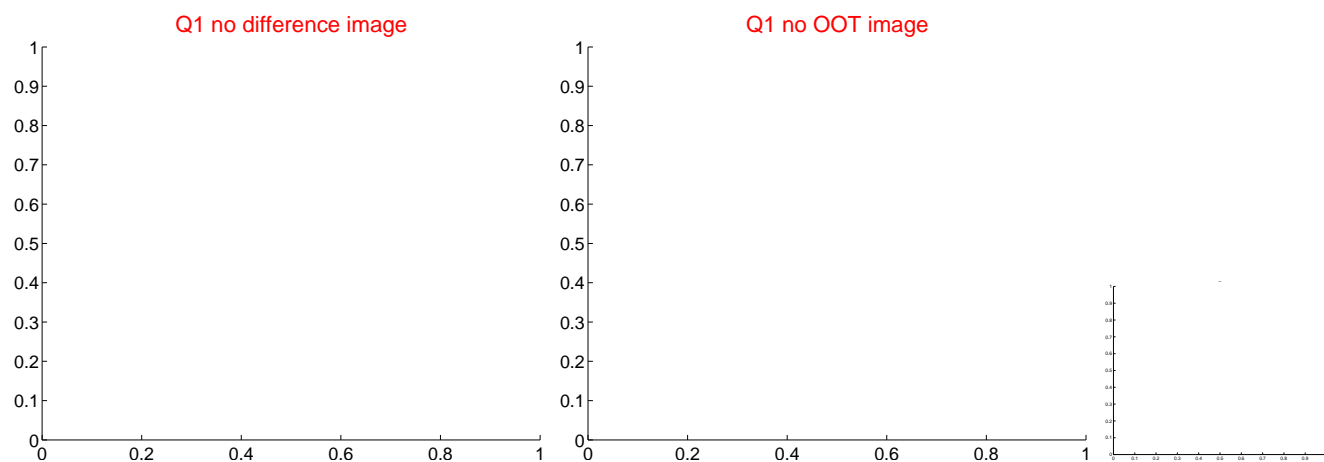
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.226 \pm 1.525$	0.80	$0.087 \pm 1.997$	$-1.222 \pm 1.665$
PRF-fit source offset from KIC position	$1.233 \pm 1.943$	0.63	$0.011 \pm 2.159$	$-1.233 \pm 1.961$
photometric centroid source offset	$1.36 \pm 1.10$	1.24	$-1.17 \pm 1.13$	$0.69 \pm 1.00$



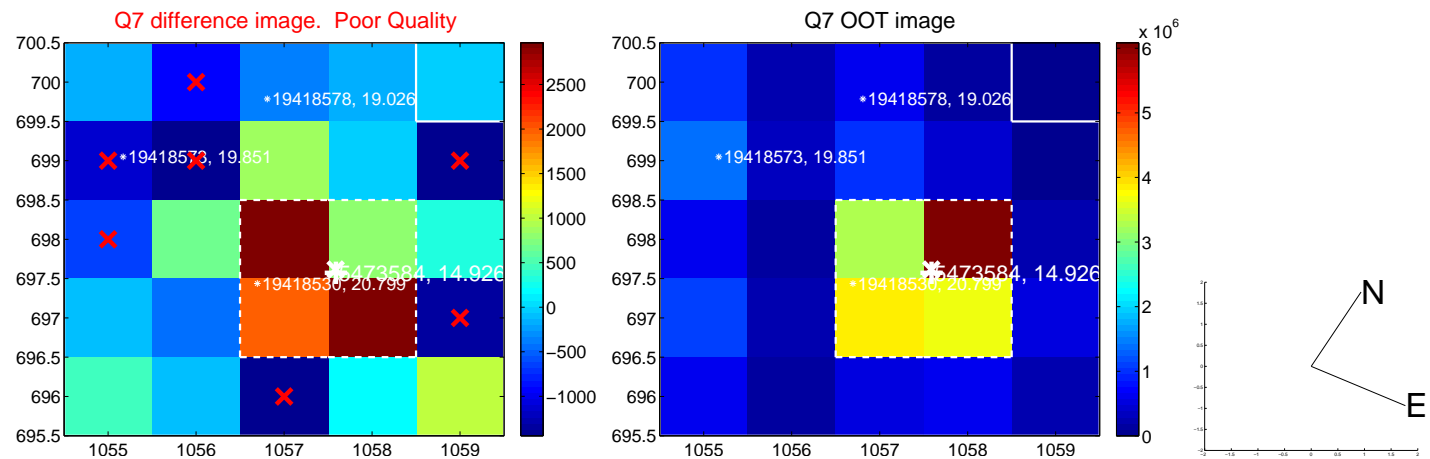
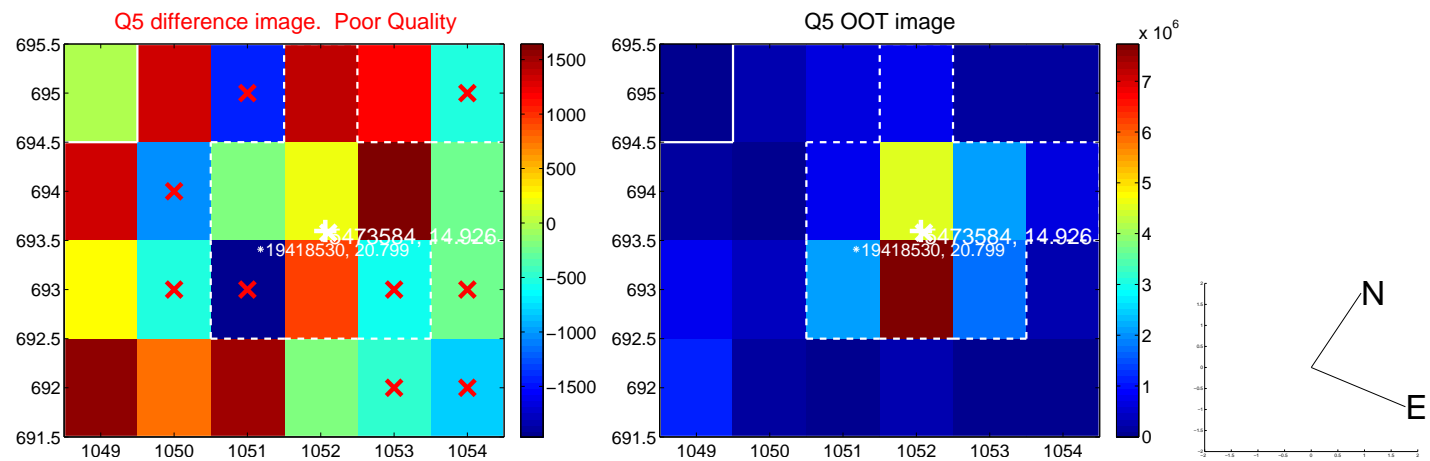
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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





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



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



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

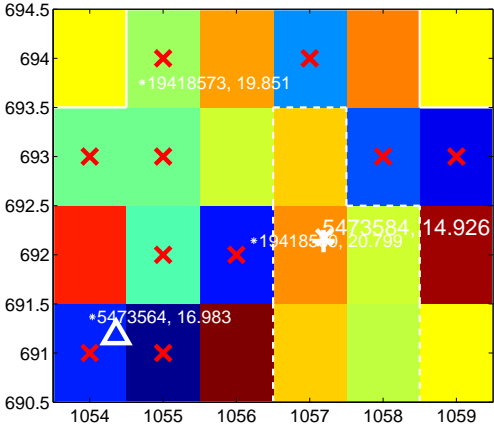
Q13 no difference image



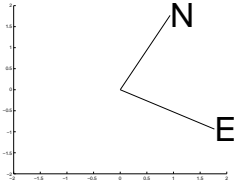
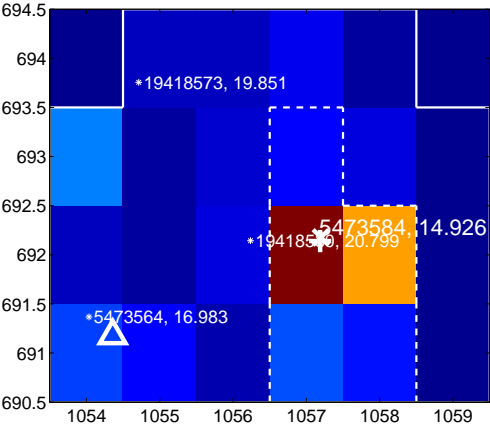
Q13 no OOT image



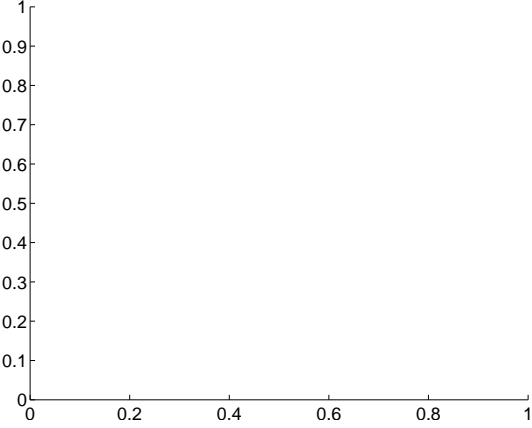
Q14 difference image. Poor Quality



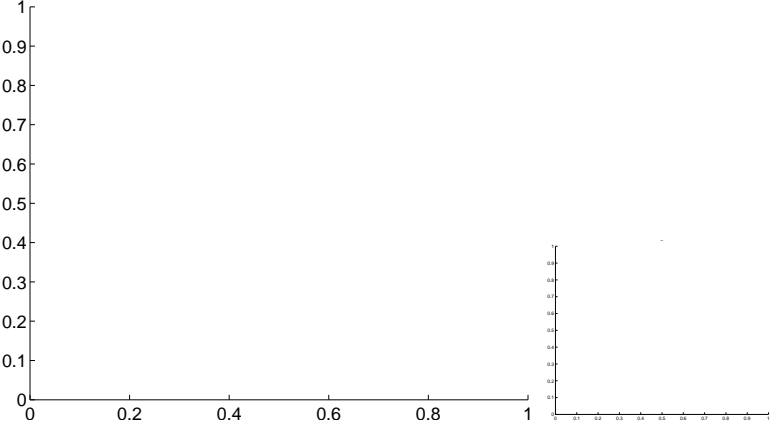
Q14 OOT image



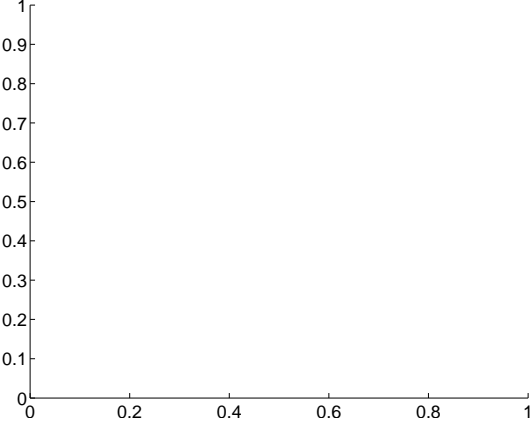
Q15 no difference image



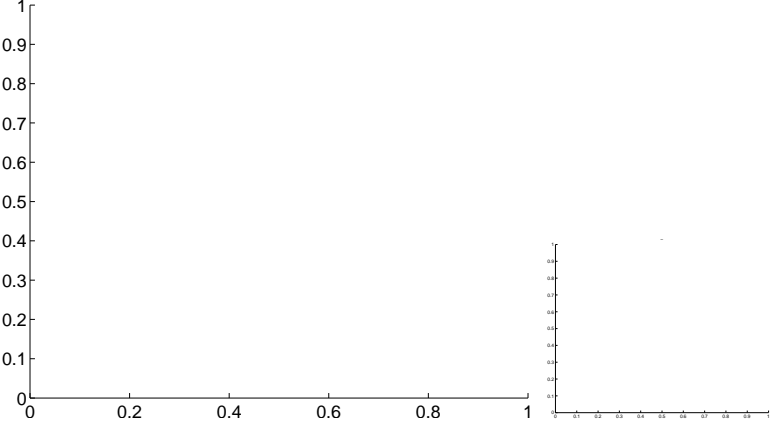
Q15 no OOT image



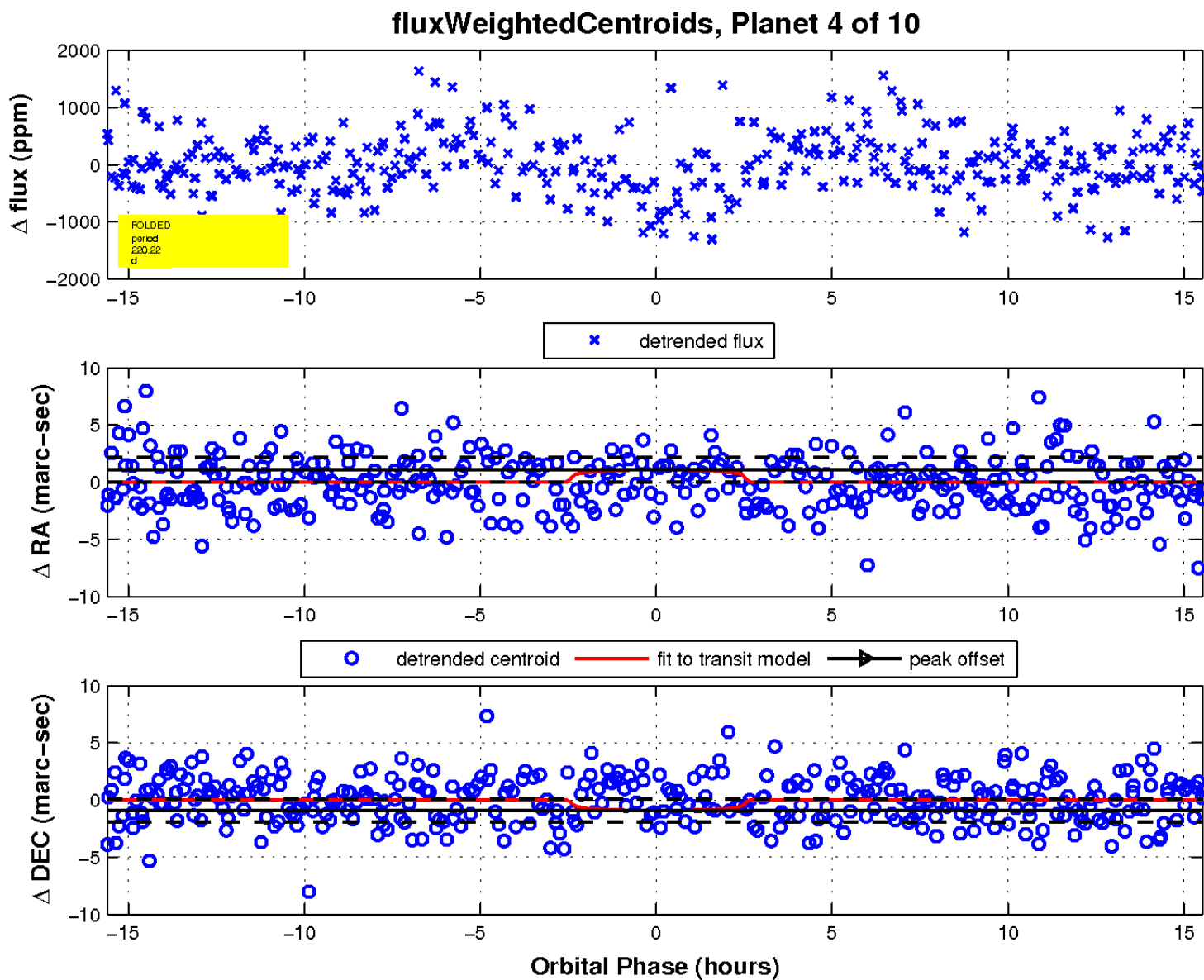
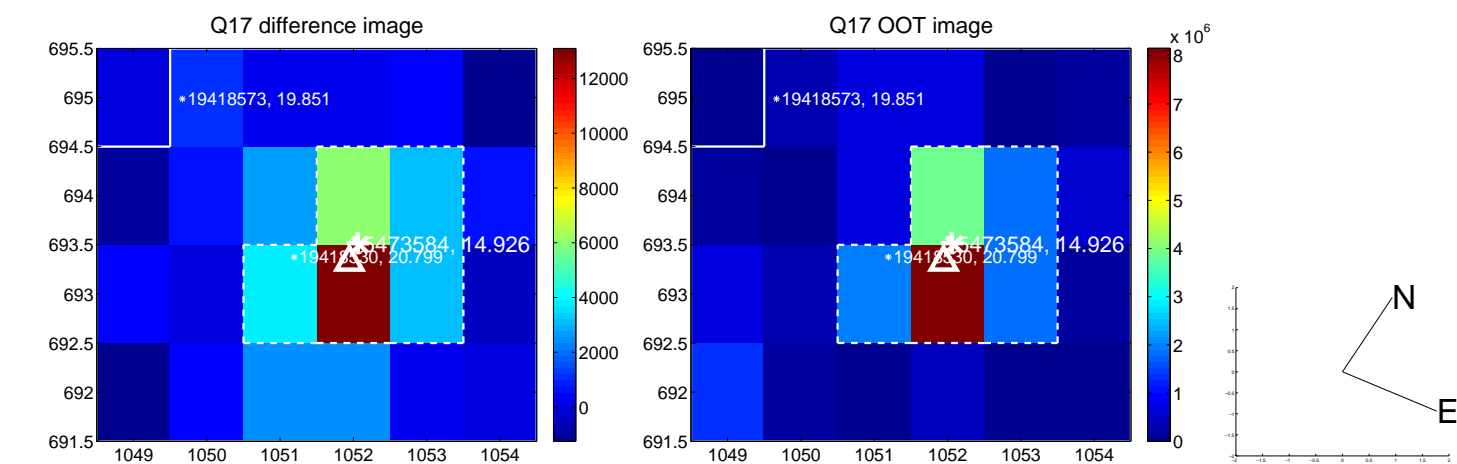
Q16 no difference image



Q16 no OOT image

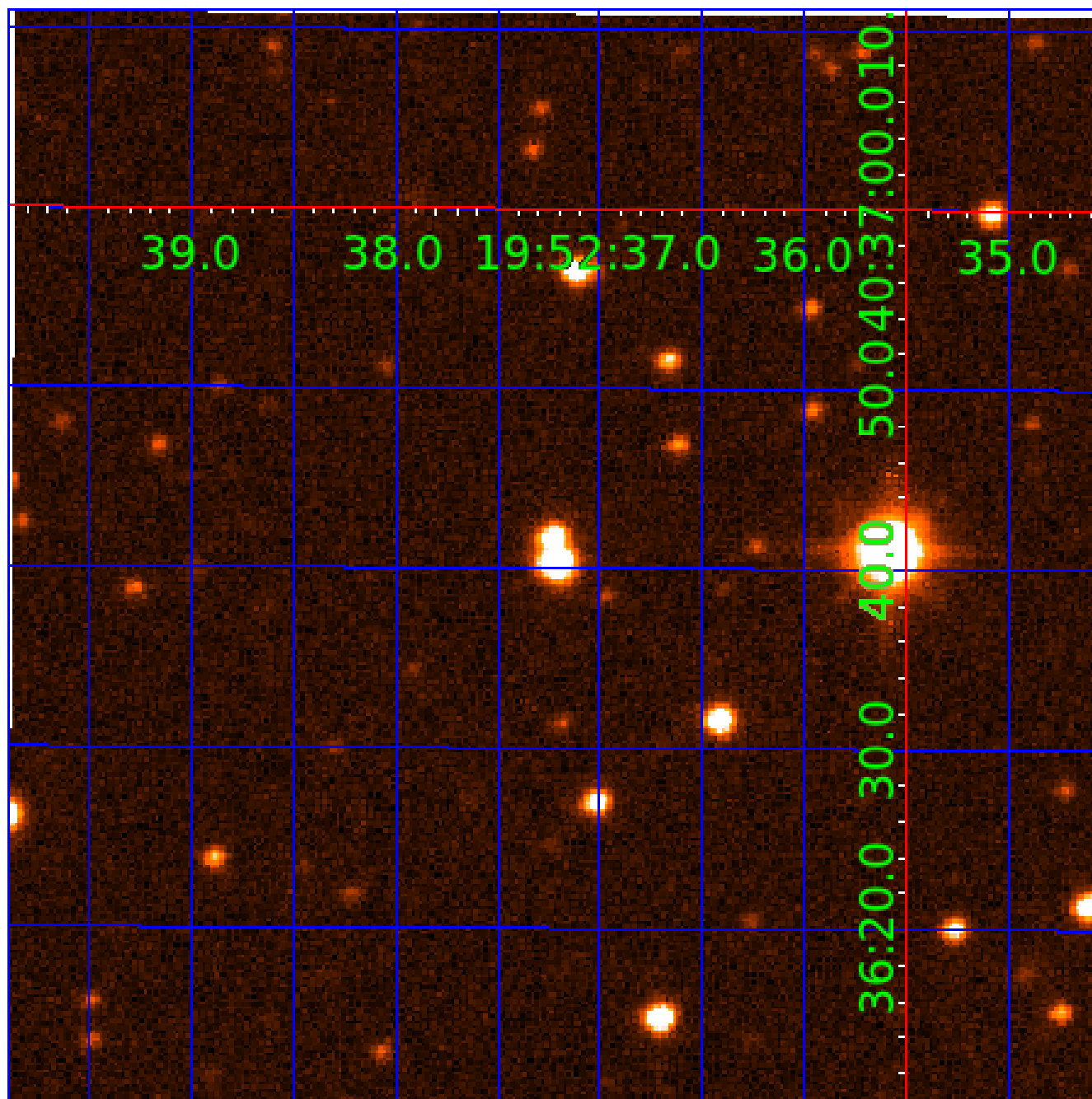


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 005473584

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

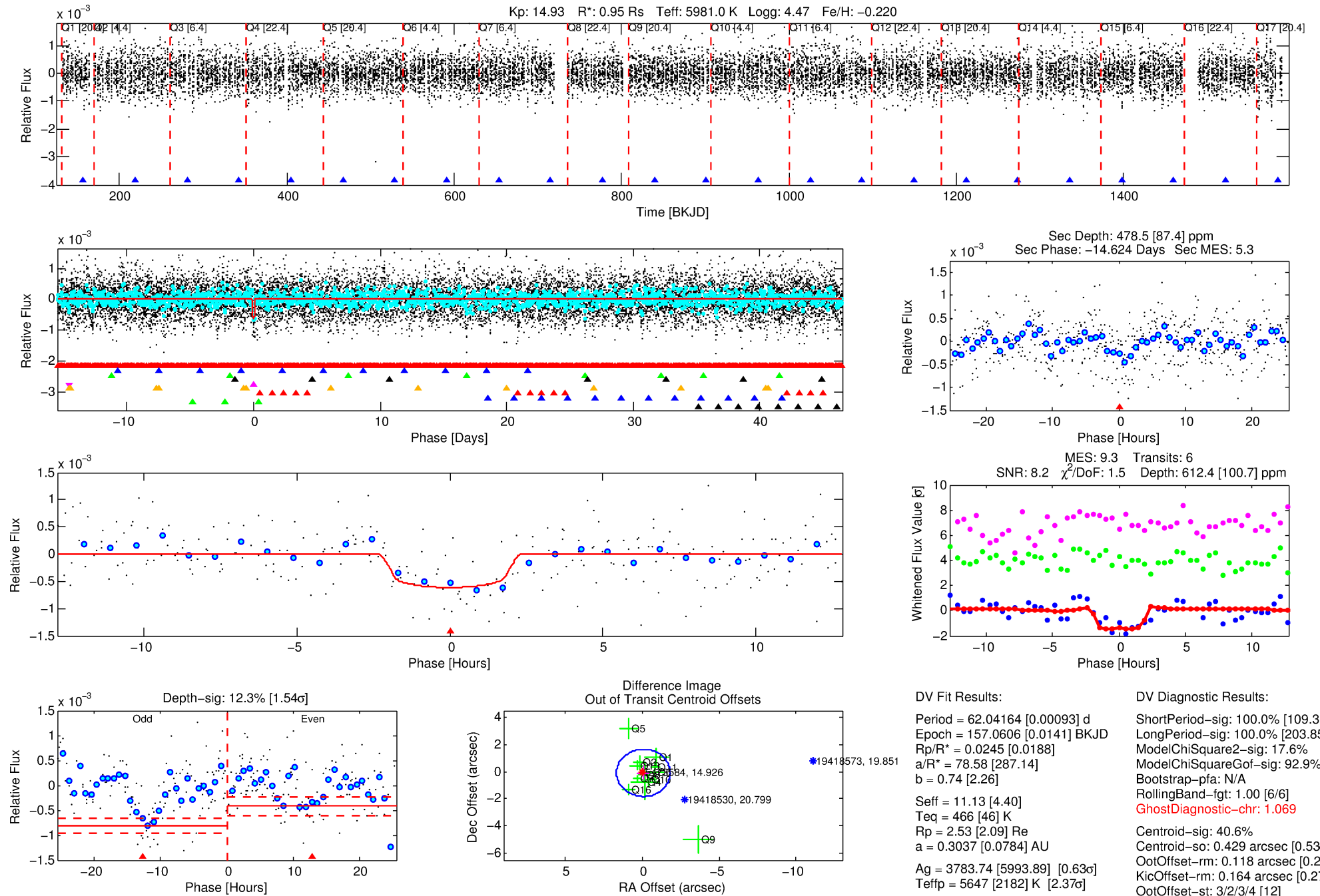
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-05

No Significant Match Found

# DV One-Page Summary

KIC: 5473584 Candidate: 5 of 10 Period: 62.042 d

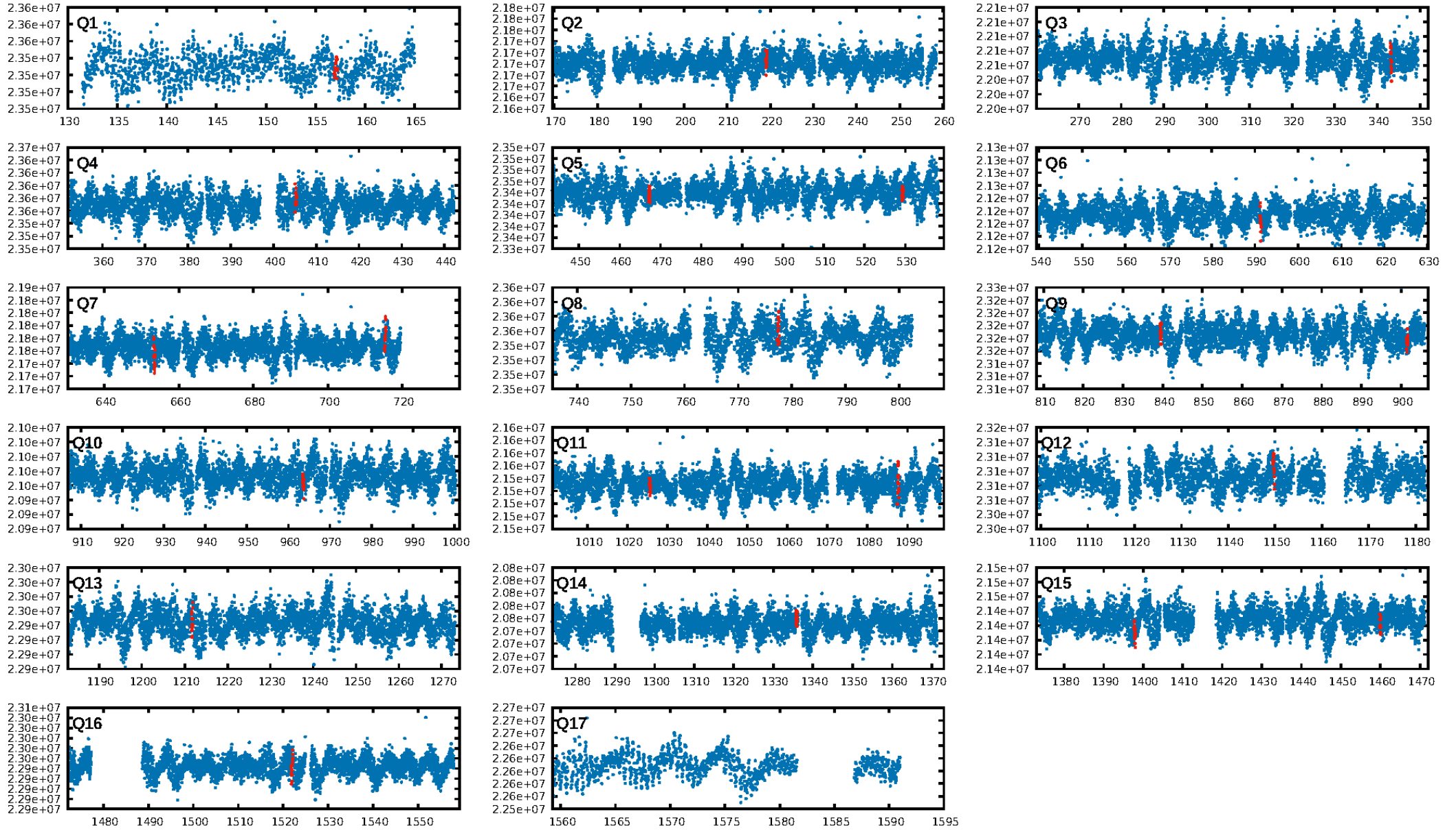


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:09:05 Z

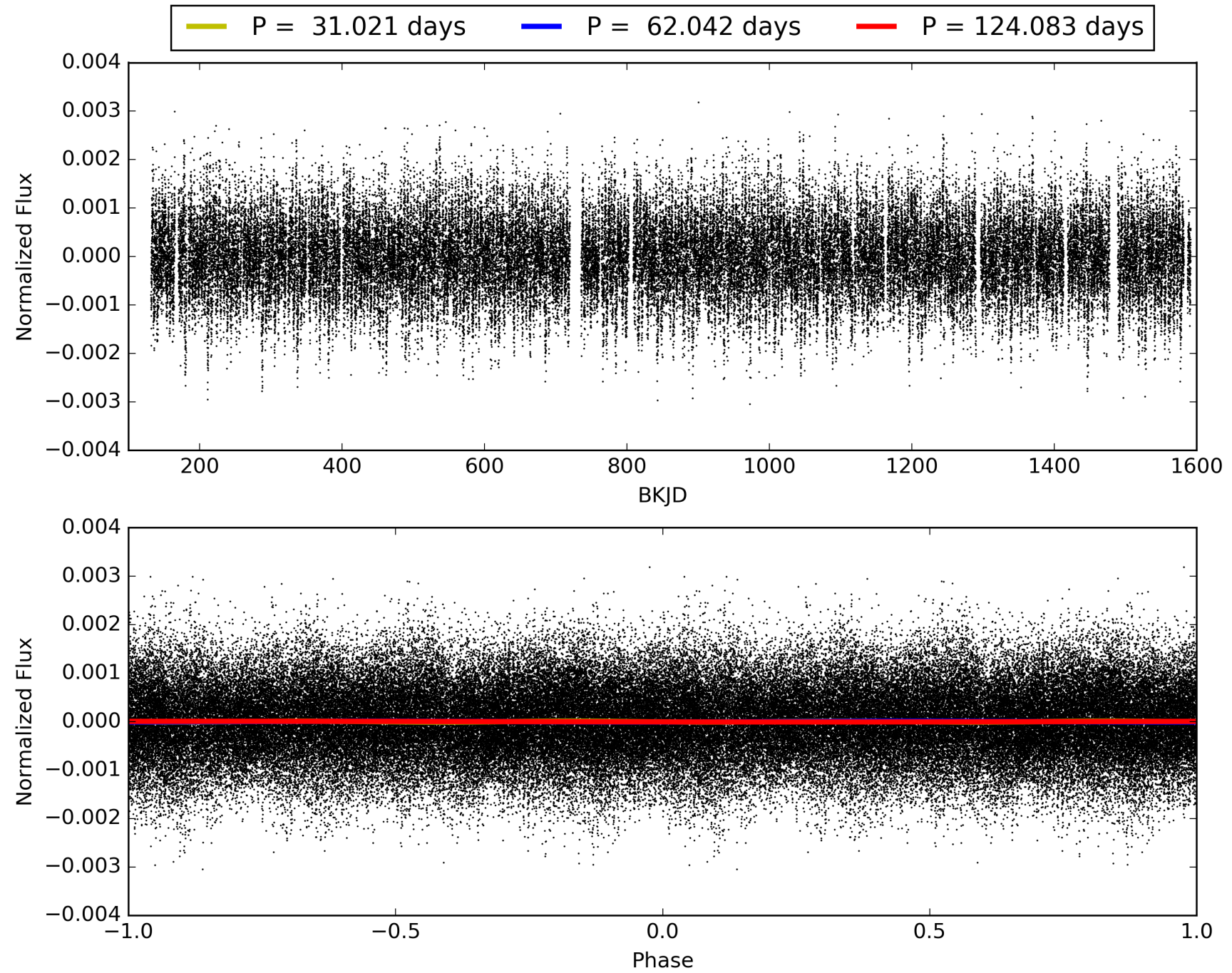
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005473584-05, PDC Light Curves

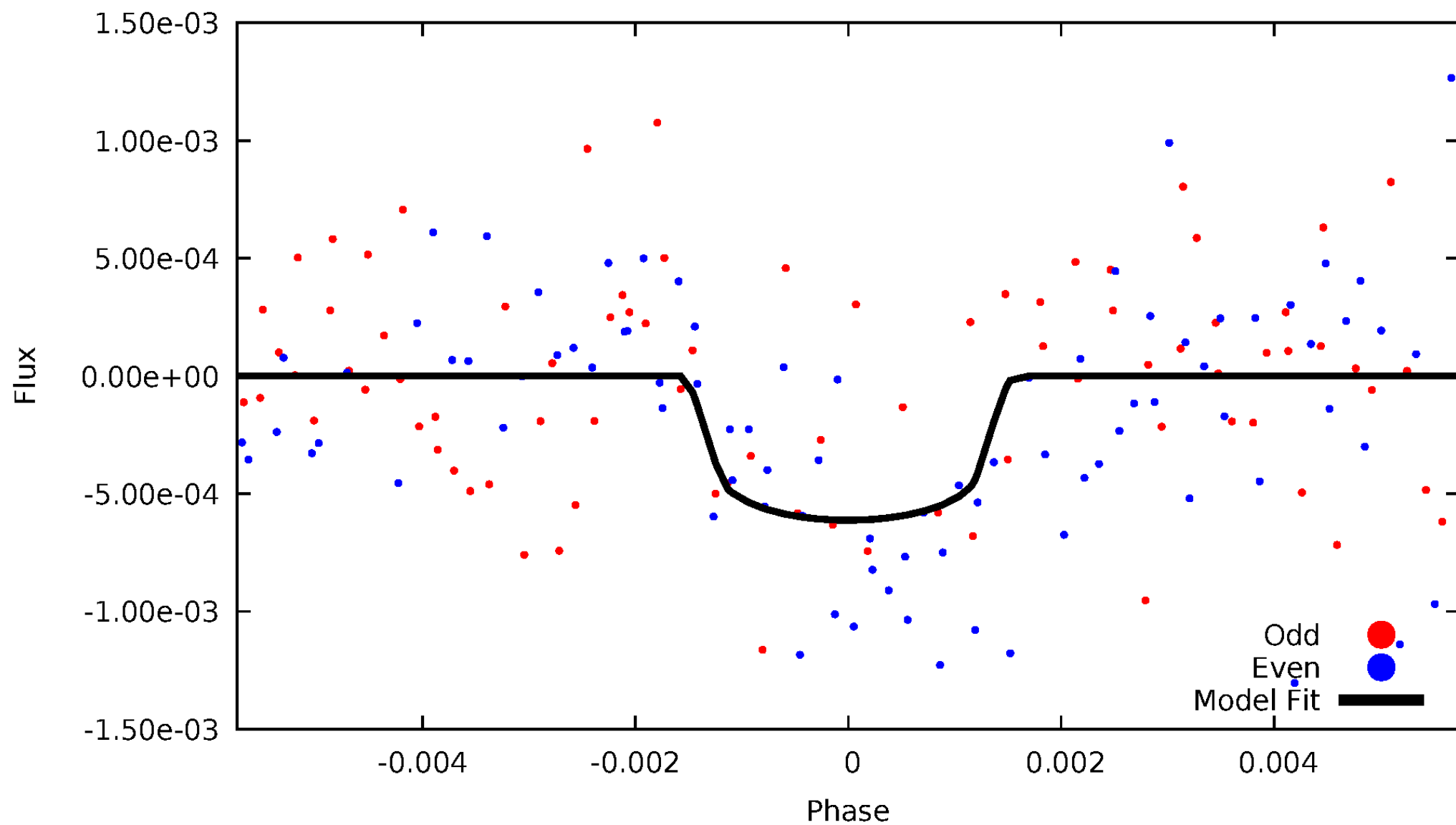


TCE 005473584-05



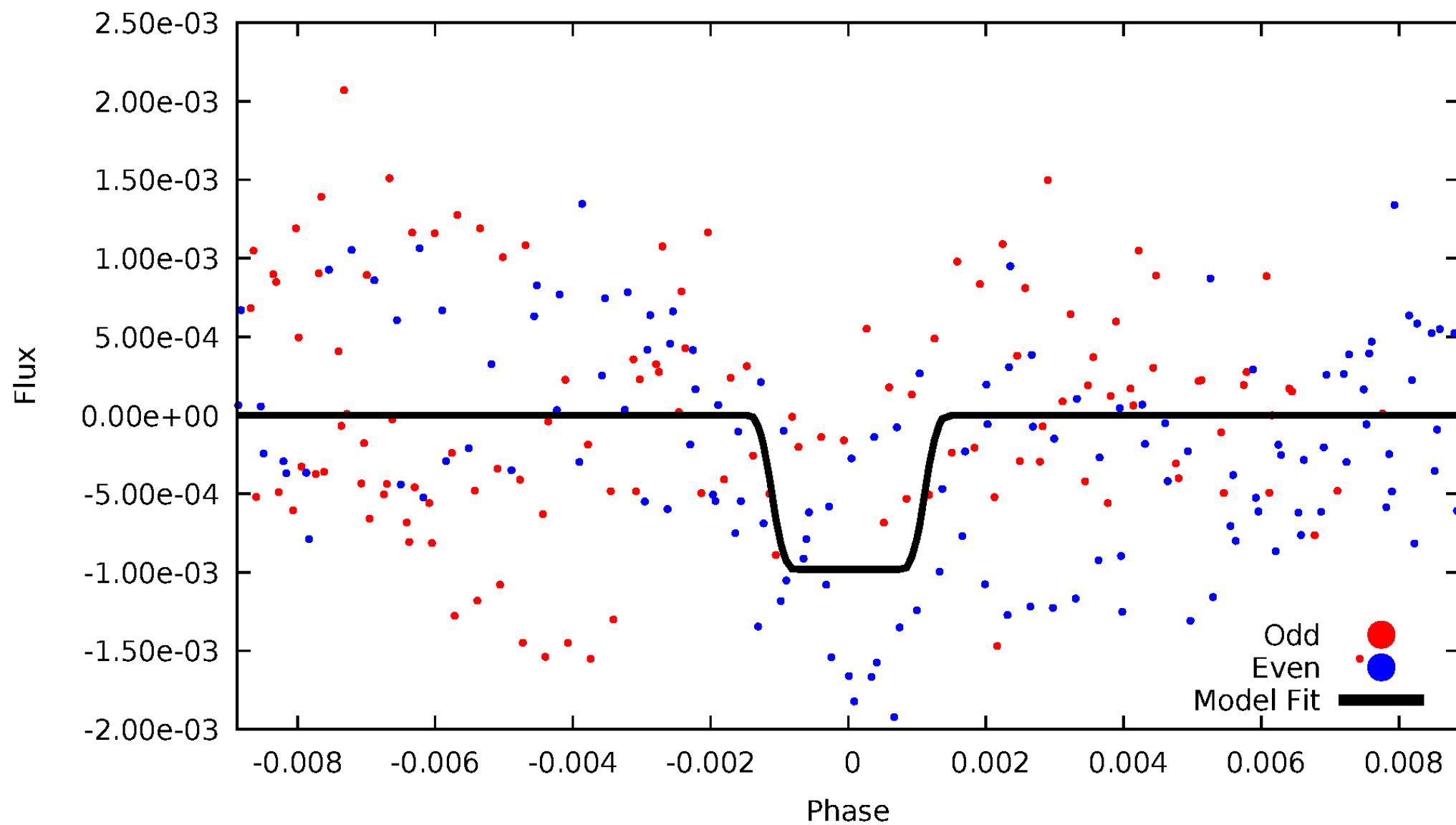
# DV Odd/Even

TCE 005473584-05



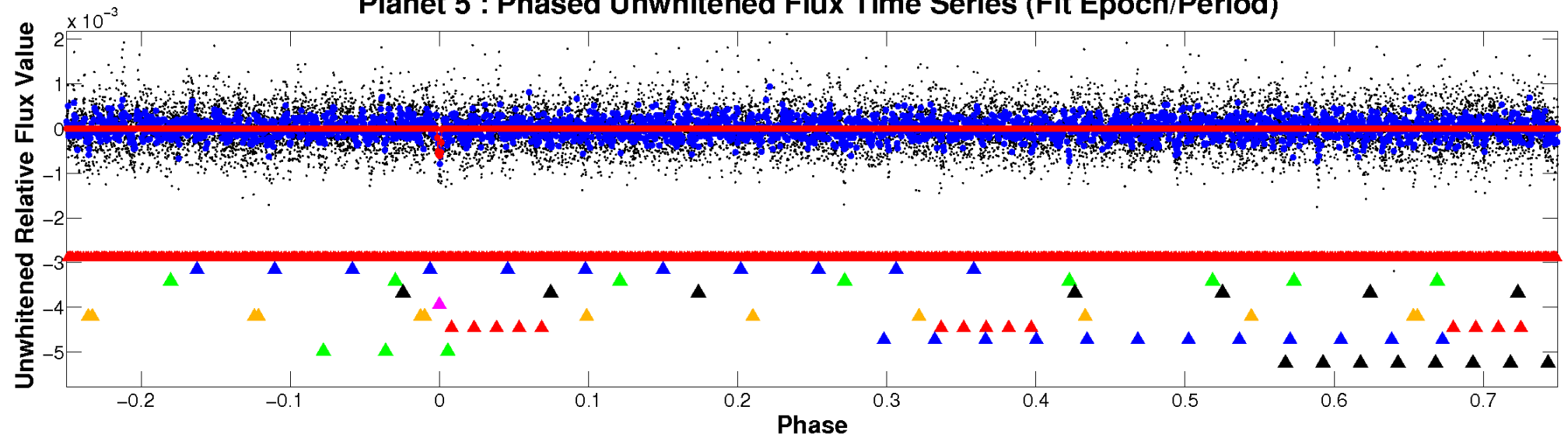
# ALT Odd/Even

TCE 005473584-05

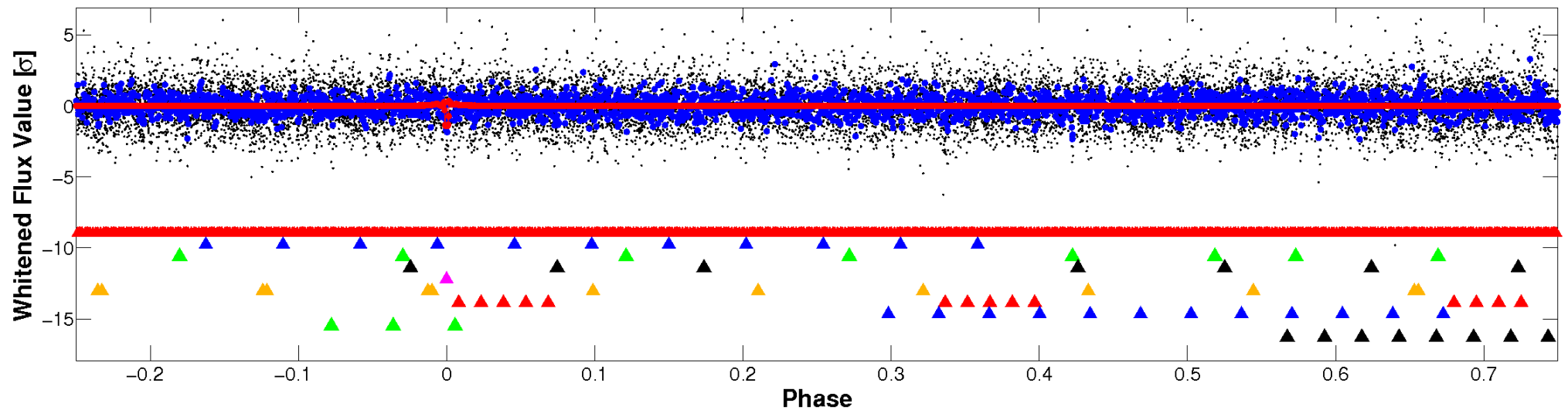


# Non-Whitened Vs. Whitened Light Curve

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

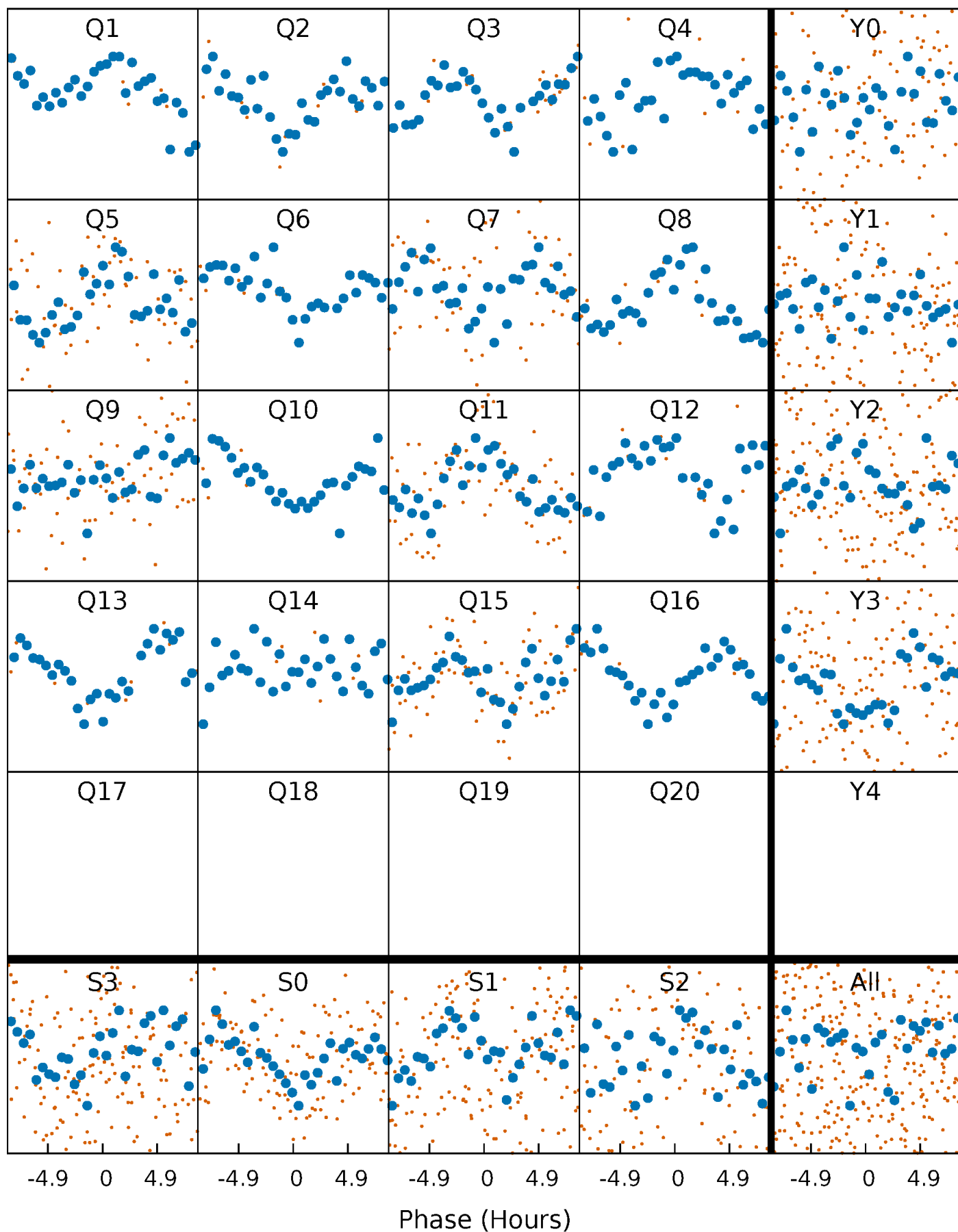


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



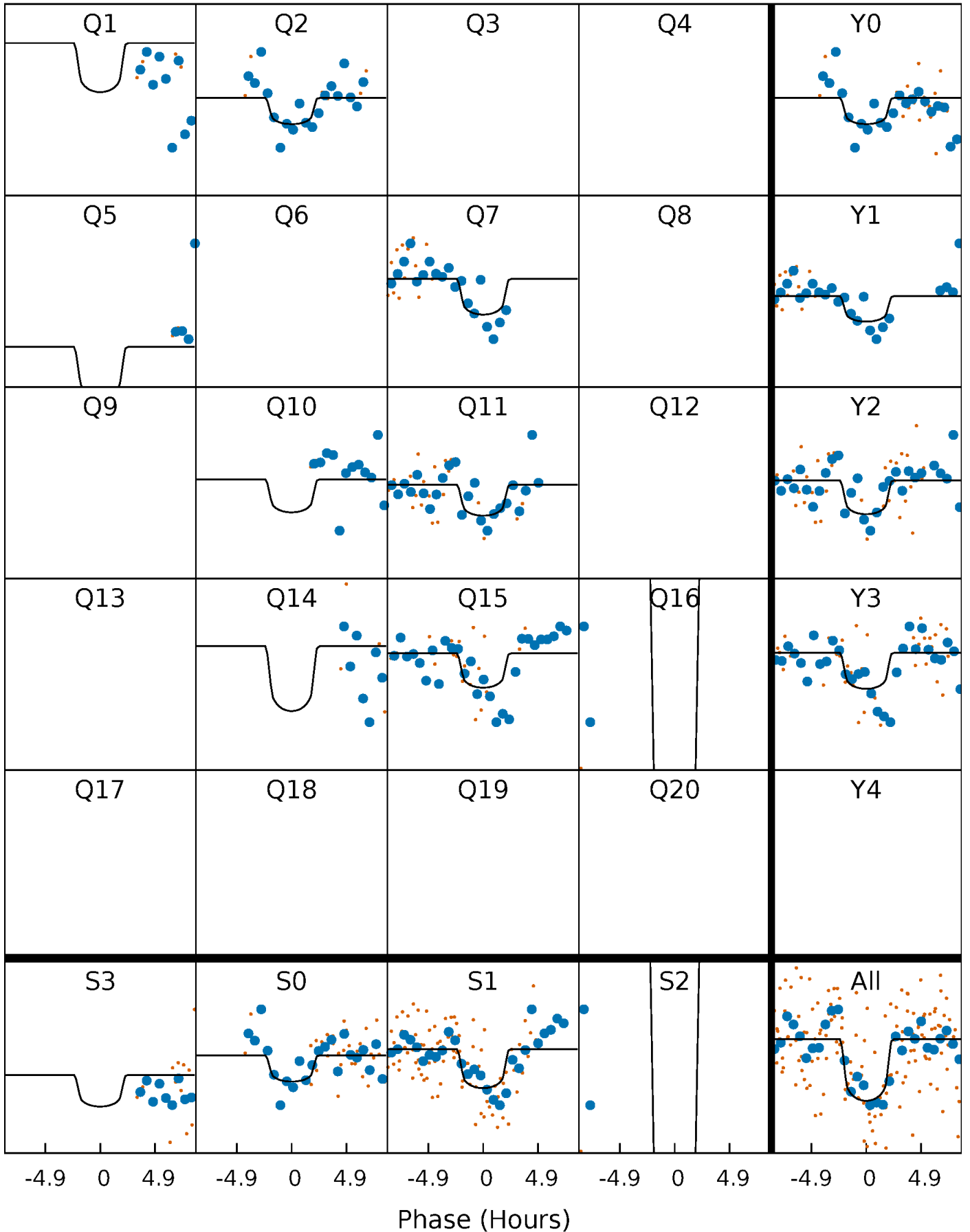
# PDC Quarter-Phased Transit Curves

TCE 005473584-05   P= 62.041641 Days    $T_0=157.060612$  (BKJD)



# DV Quarter-Phased Transit Curves

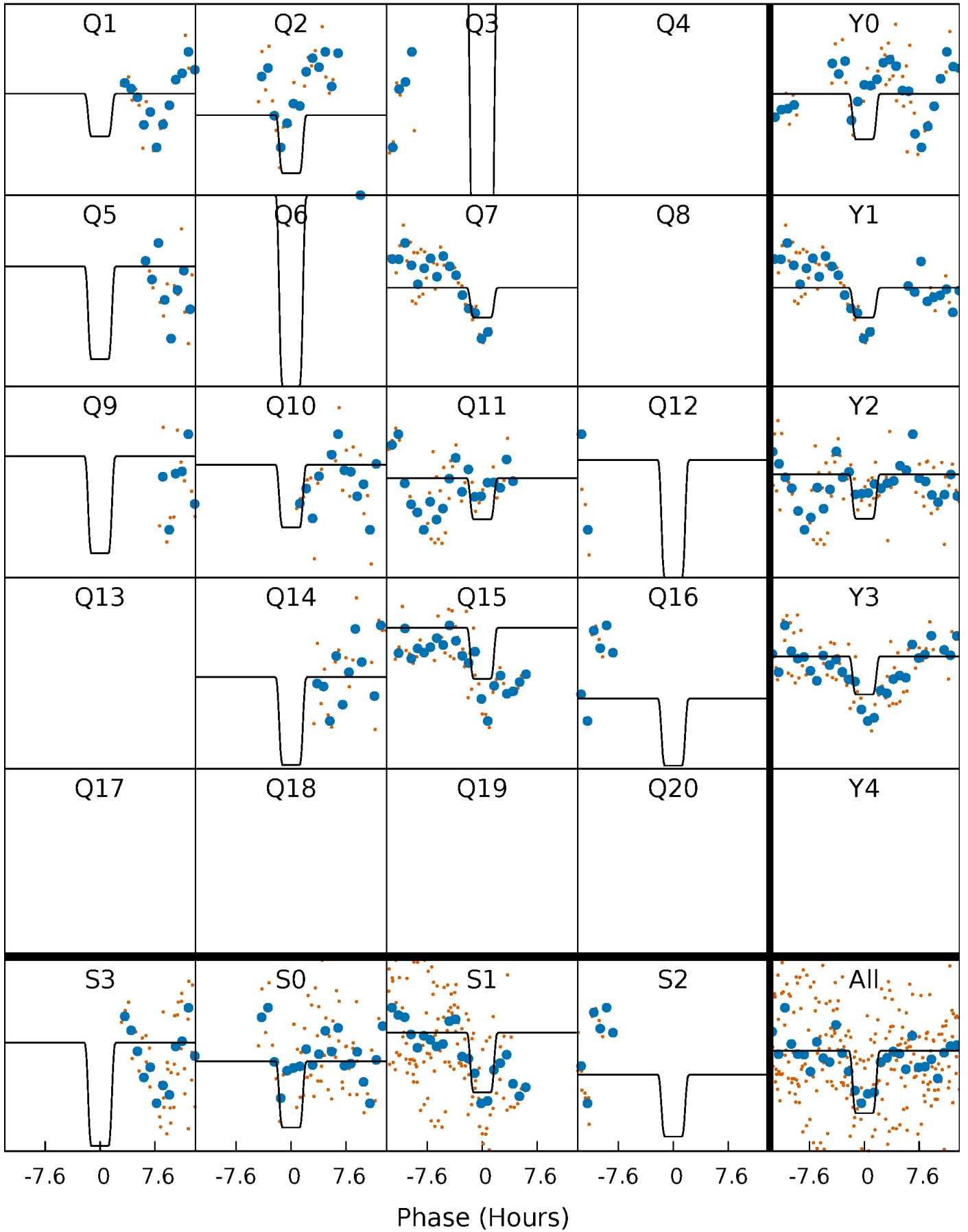
TCE 005473584-05     $P = 62.041641$  Days     $T_0 = 157.060612$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

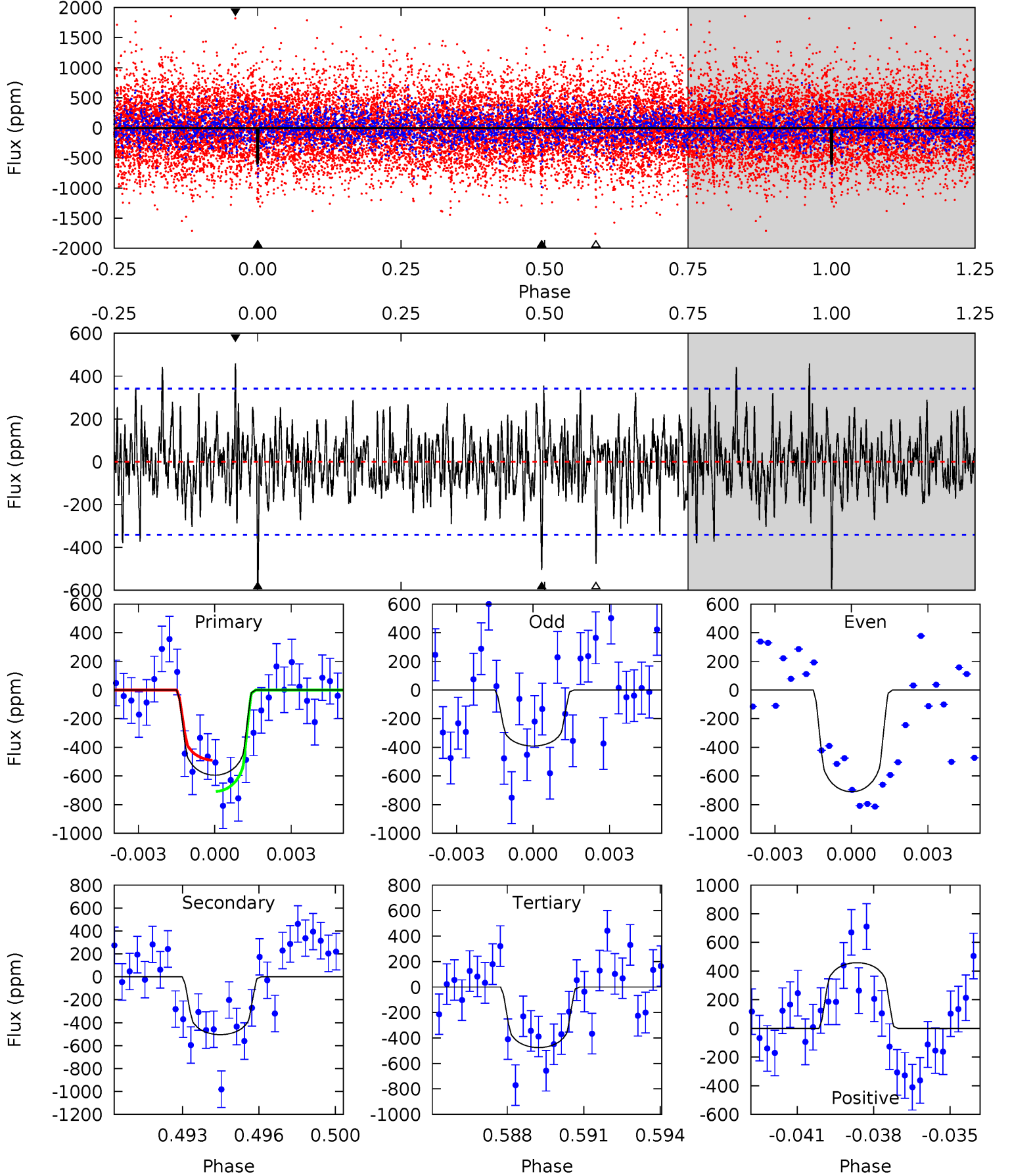
TCE 005473584-05   P= 62.043624 Days    $T_0=157.073963$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-05, P = 62.041641 Days, E = 95.018971 Days

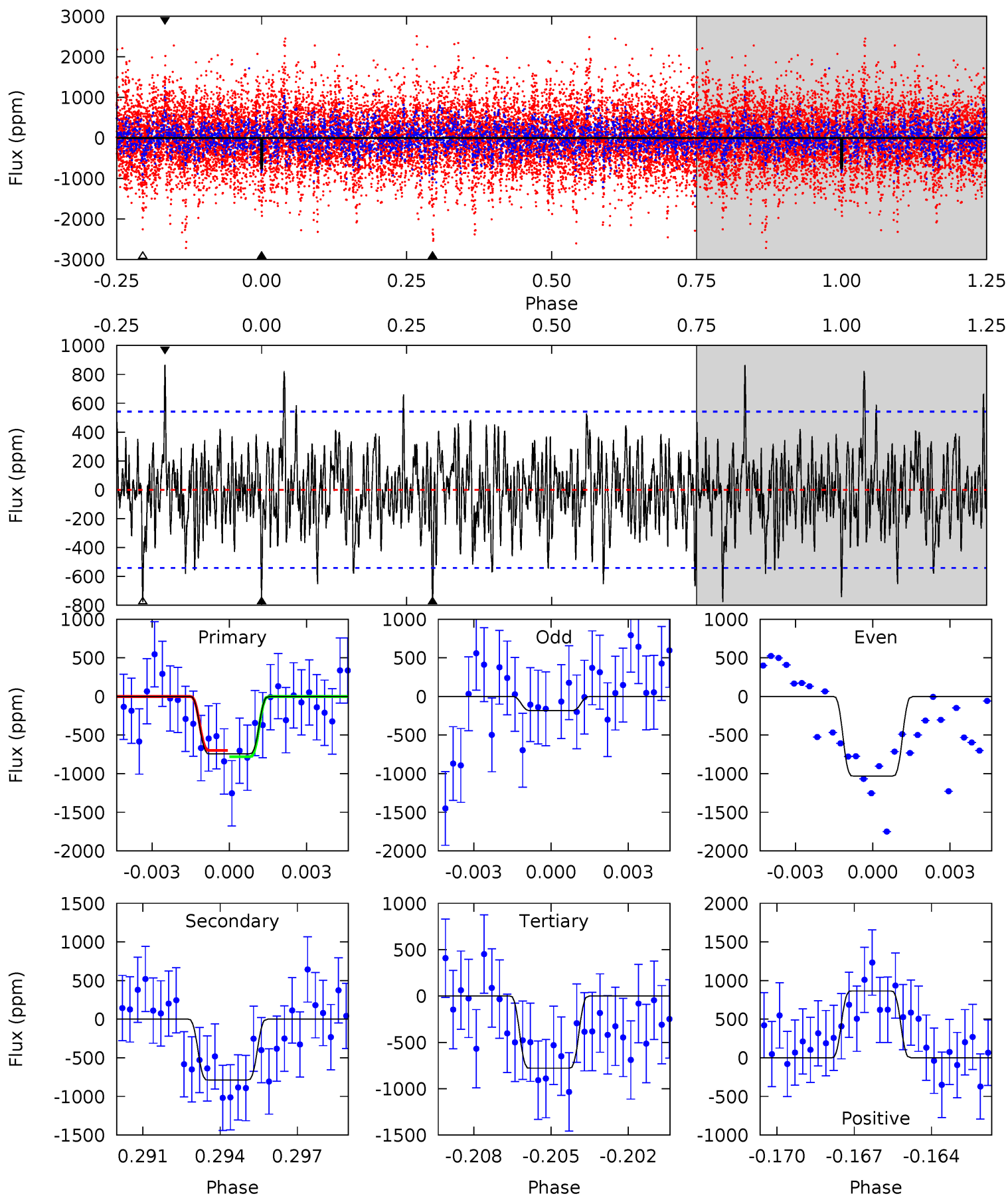
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.12	7.74	7.29	7.04	5.24	2.95	1.81	1.82	2.08	0.44	0.70	2.35	0.69	0.44	1.68



# Alt Model-Shift Uniqueness Test

005473584-05, P = 62.043624 Days, E = 95.030339 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.21	7.63	7.55	8.40	5.26	2.98	2.11	-0.34	-1.19	0.08	-0.76	3.91	1.42	0.52	0.41



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-504 \pm 65$	$2.82^{+2.01}_{-1.57}$	$664^{+49}_{-36}$	$5503^{+3004}_{-1026}$	$3088^{+13155}_{-1998}$
Alt.	$-786 \pm 103$	$3.44^{+2.27}_{-1.82}$	$663^{+49}_{-35}$	$5596^{+2695}_{-1075}$	$3243^{+10867}_{-2049}$

$T_{max}$  = 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

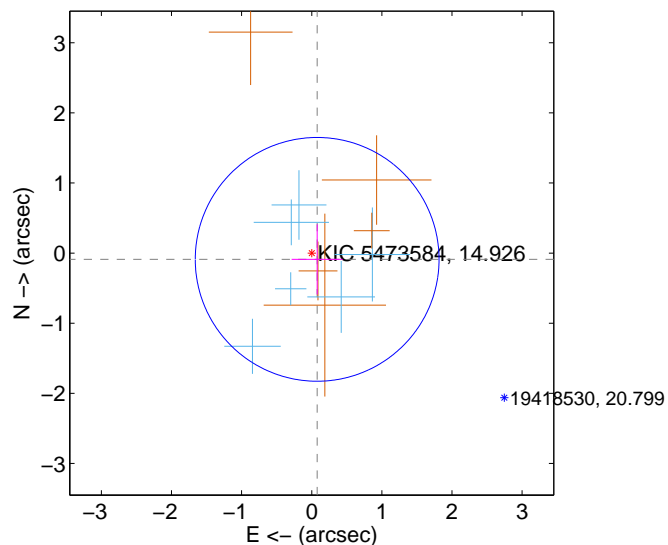
Supplemental centroid analysis for 005473584-05. Kepler magnitude: 14.93. Transit SNR 8.19

There are 6 quarters with good PRF difference image offsets

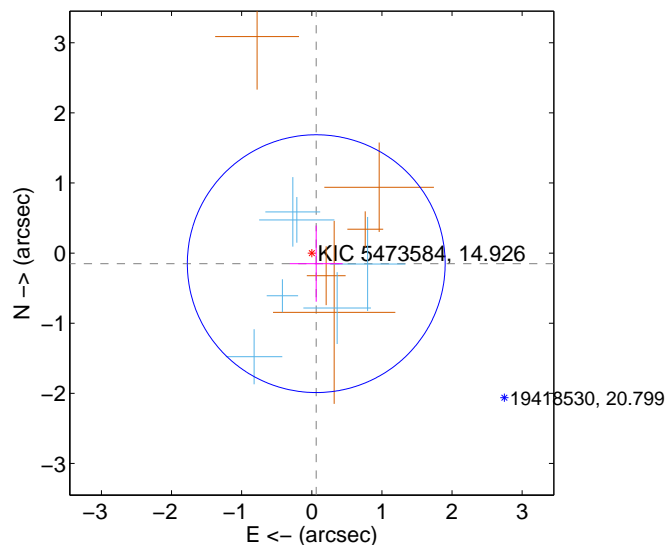
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.118 \pm 0.580$	0.20	$-0.077 \pm 0.364$	$-0.089 \pm 0.501$
PRF-fit source offset from KIC position	$0.164 \pm 0.613$	0.27	$-0.064 \pm 0.377$	$-0.151 \pm 0.544$
photometric centroid source offset	$0.43 \pm 0.82$	0.53	$-0.42 \pm 0.82$	$0.09 \pm 0.72$

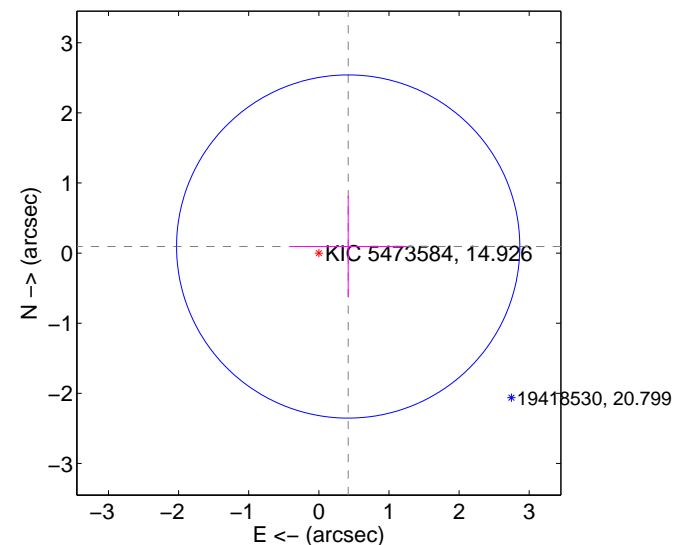
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

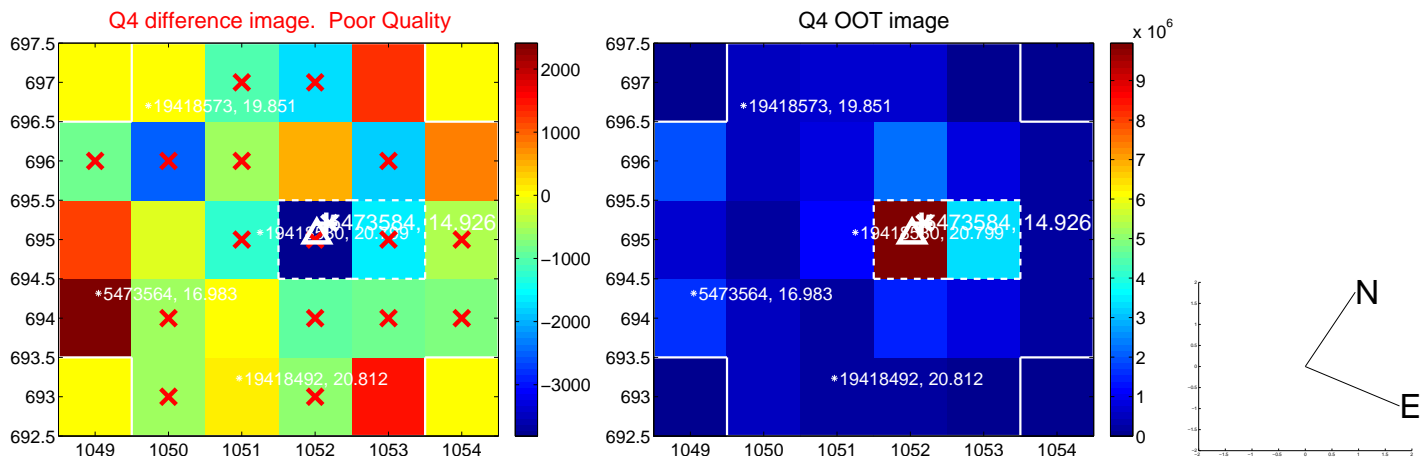
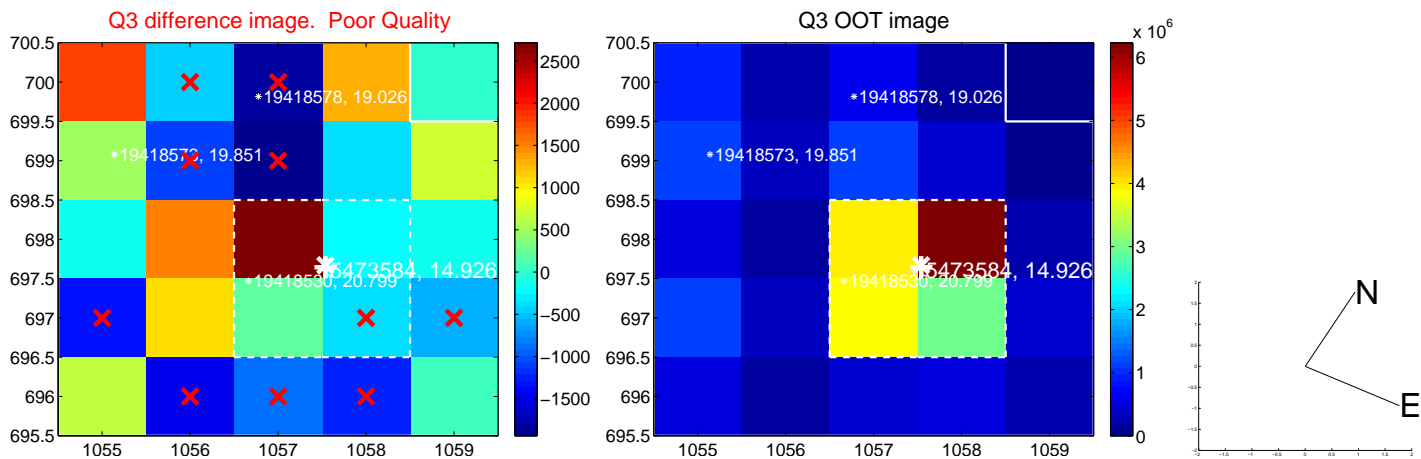
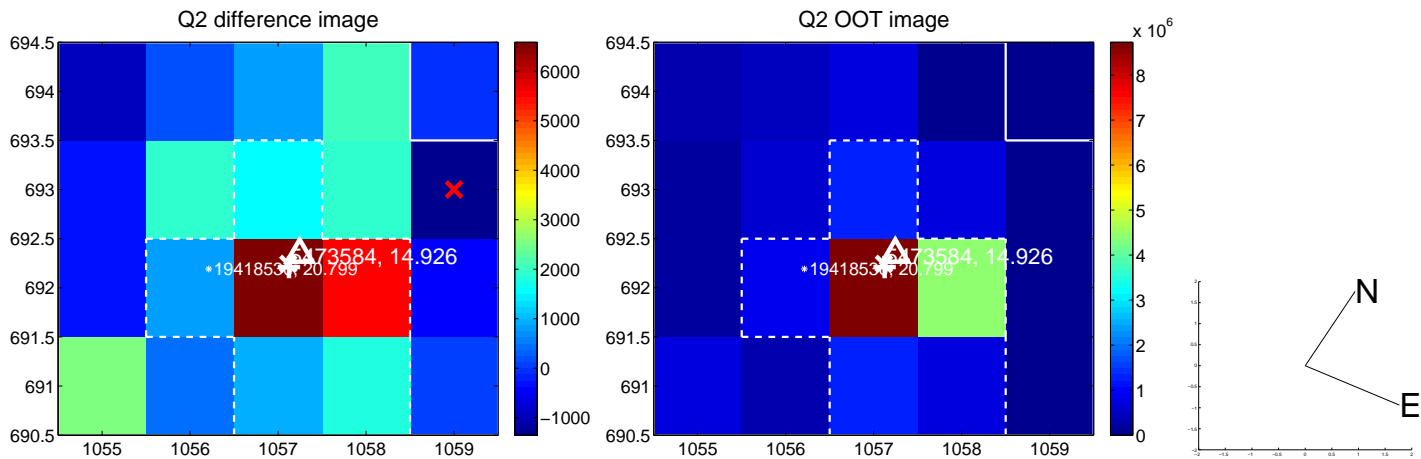
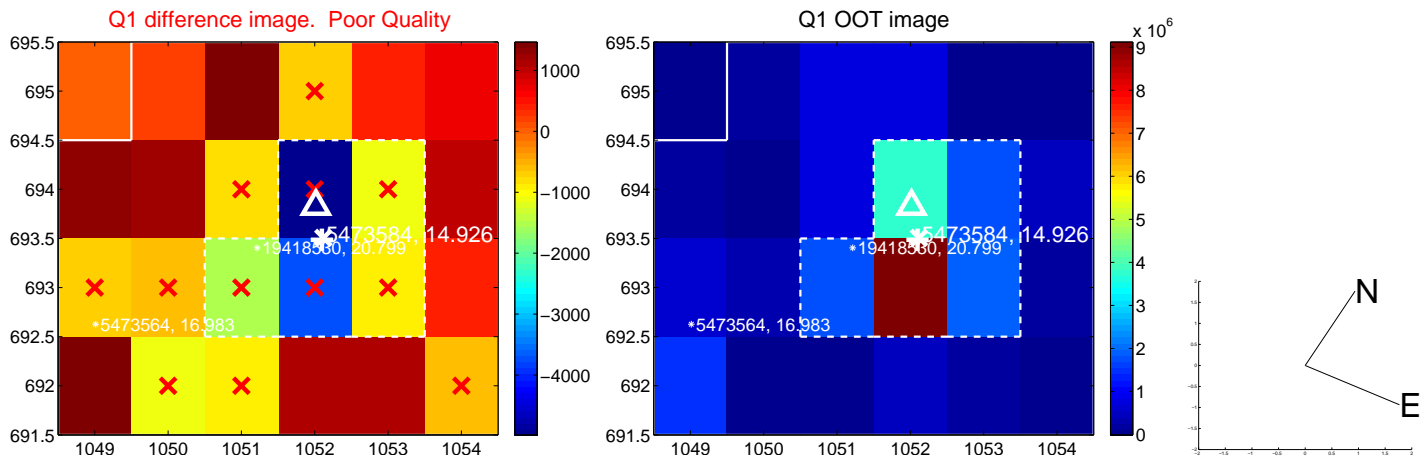


offset from photometric centroids

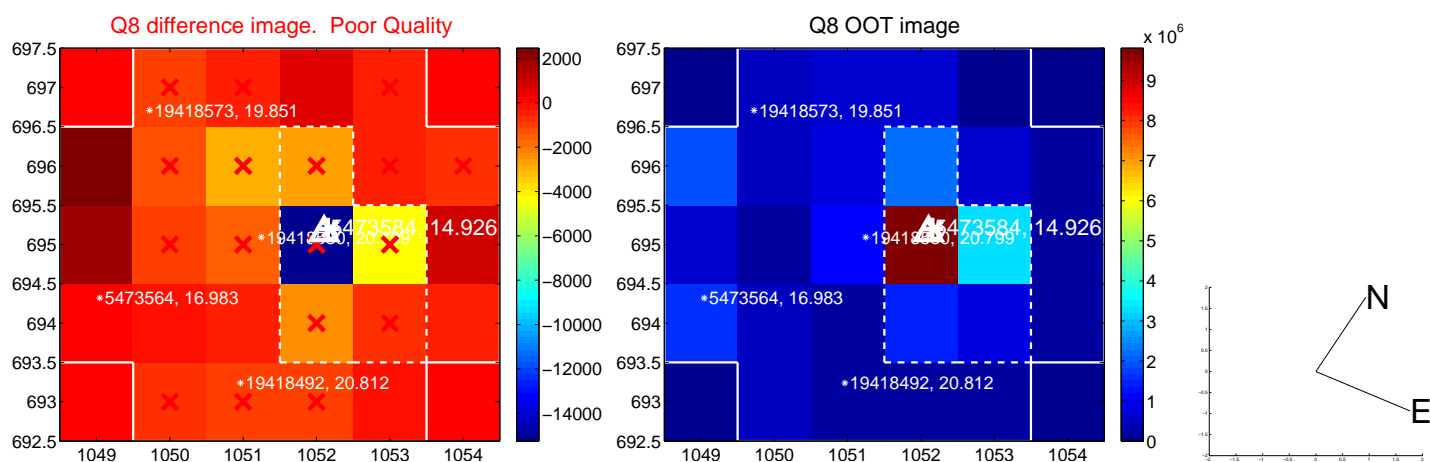
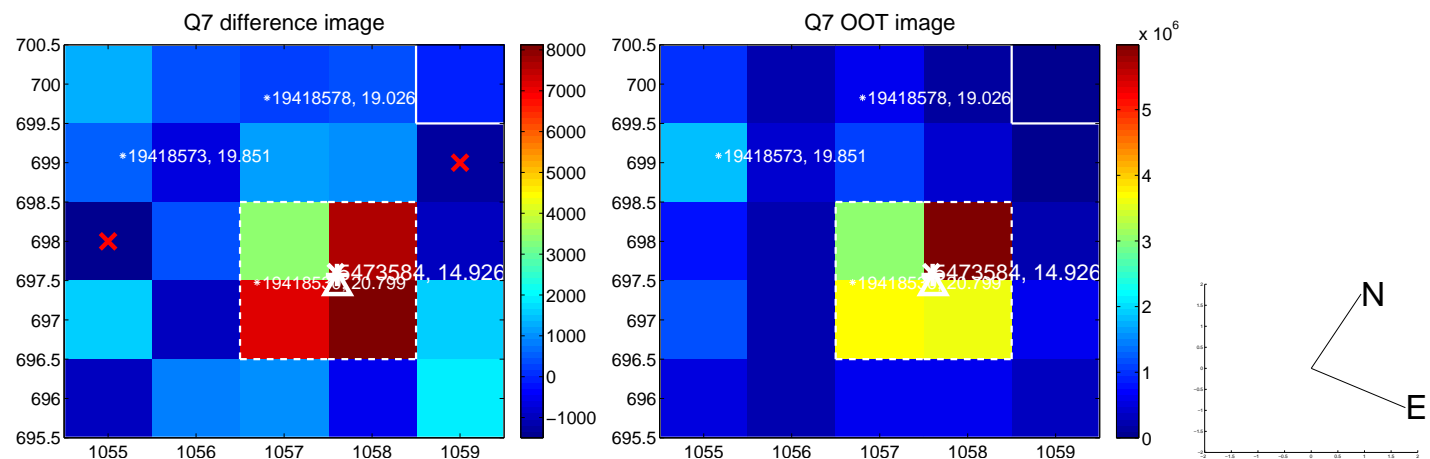
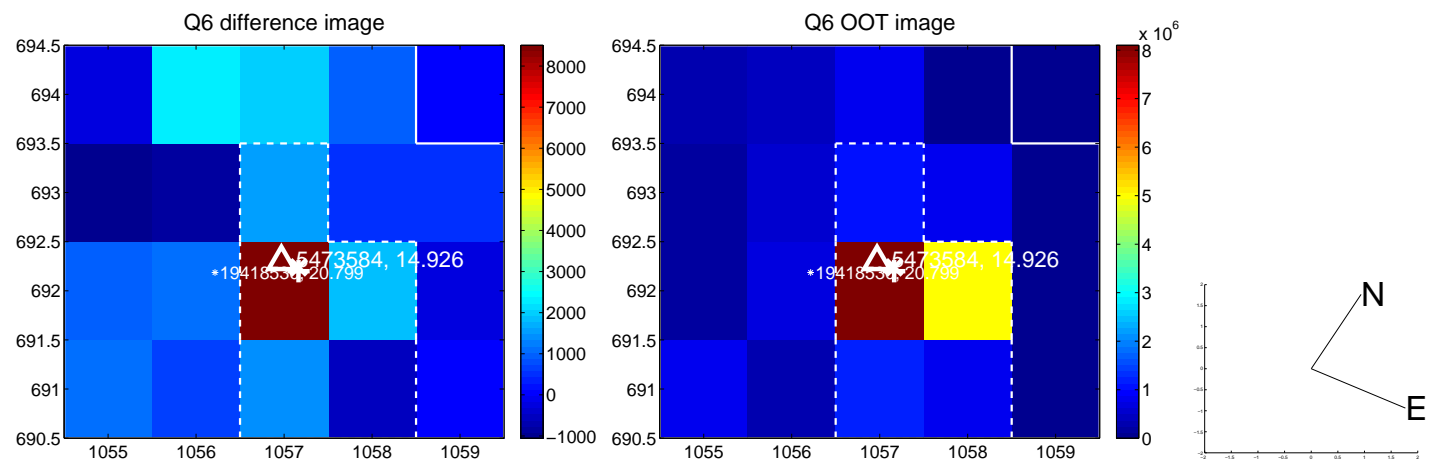
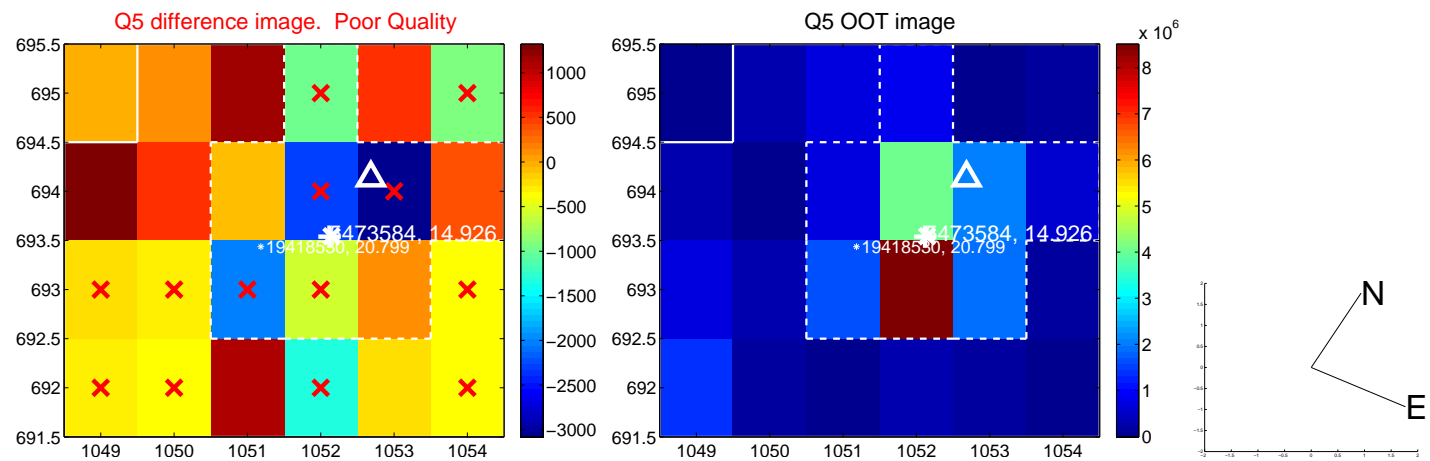


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

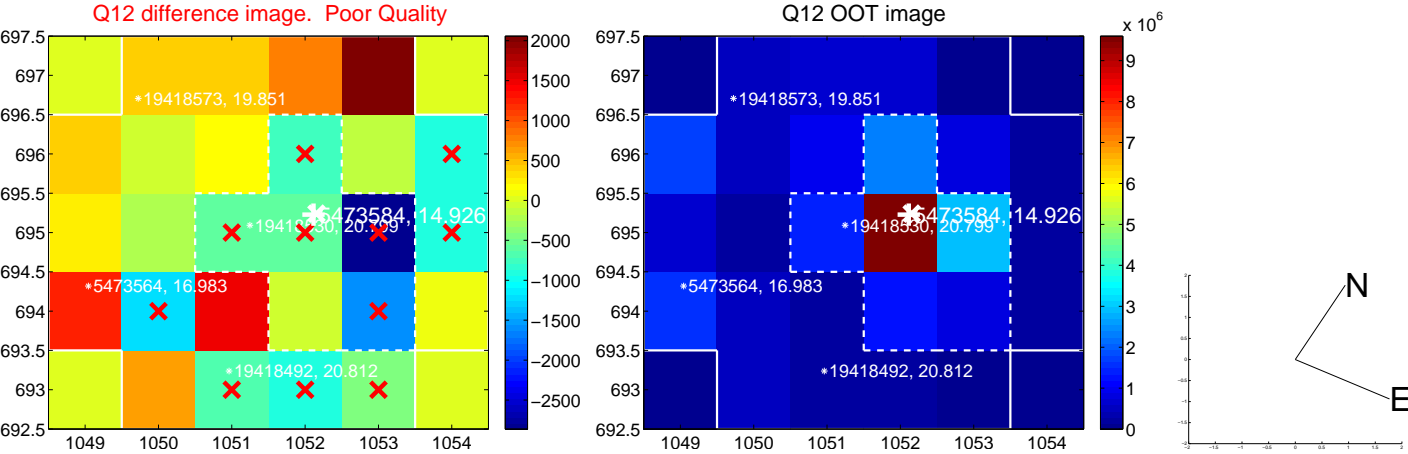
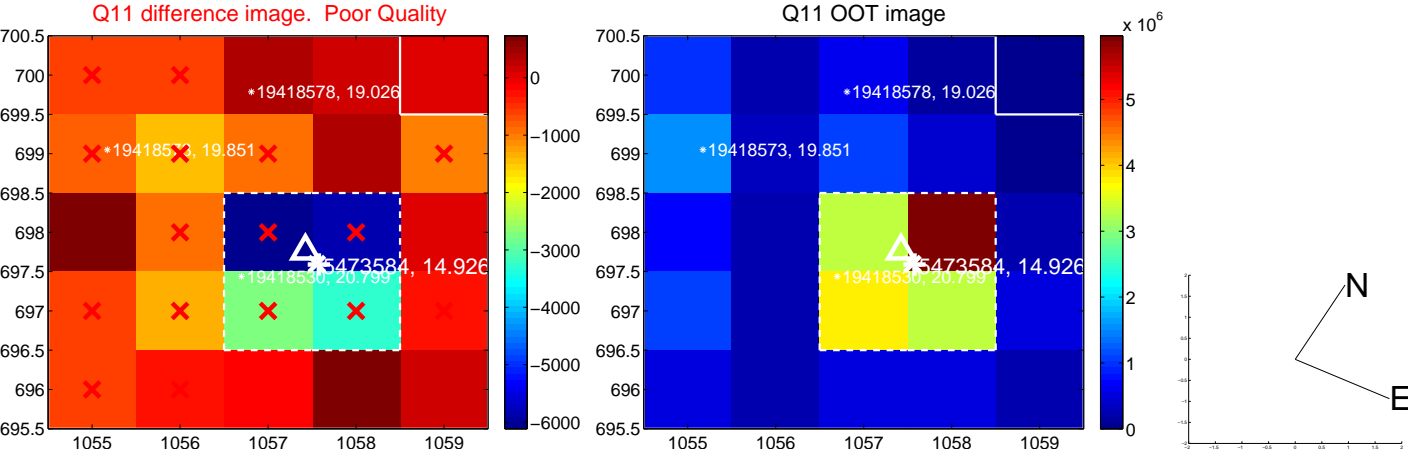
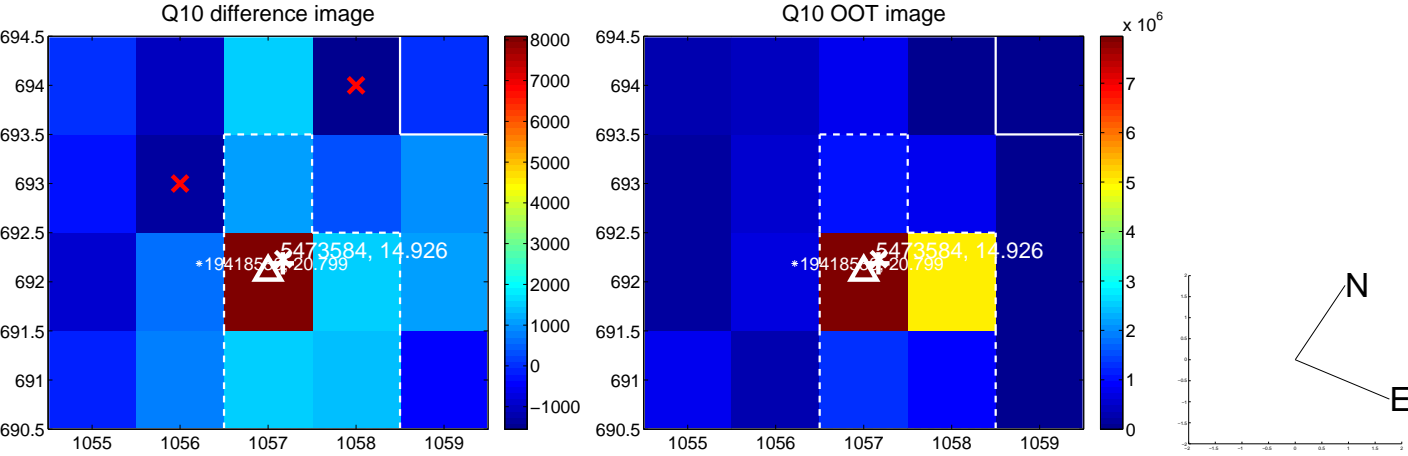
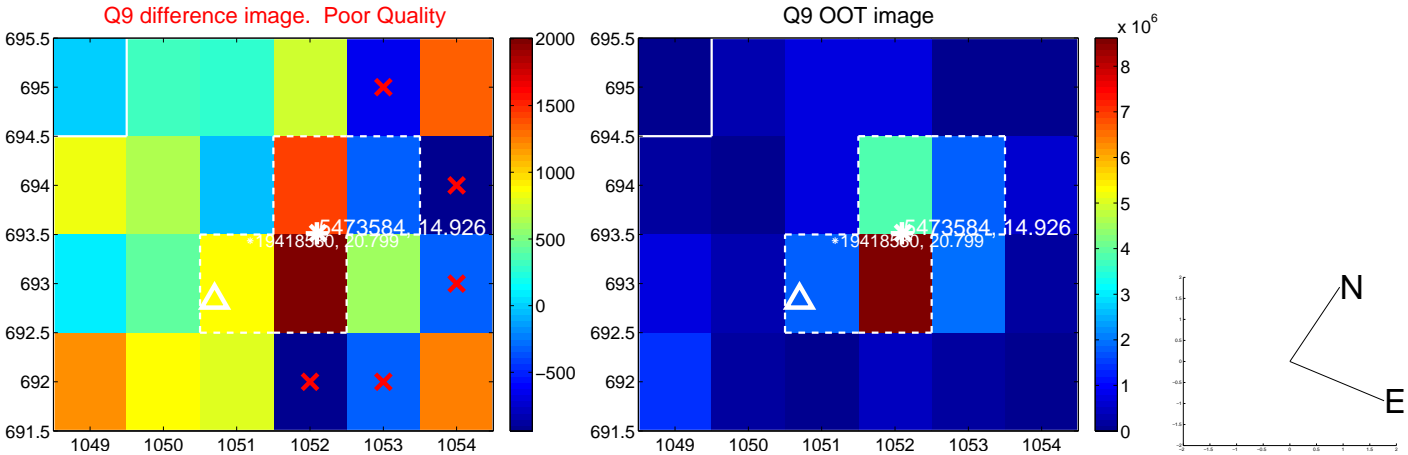


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

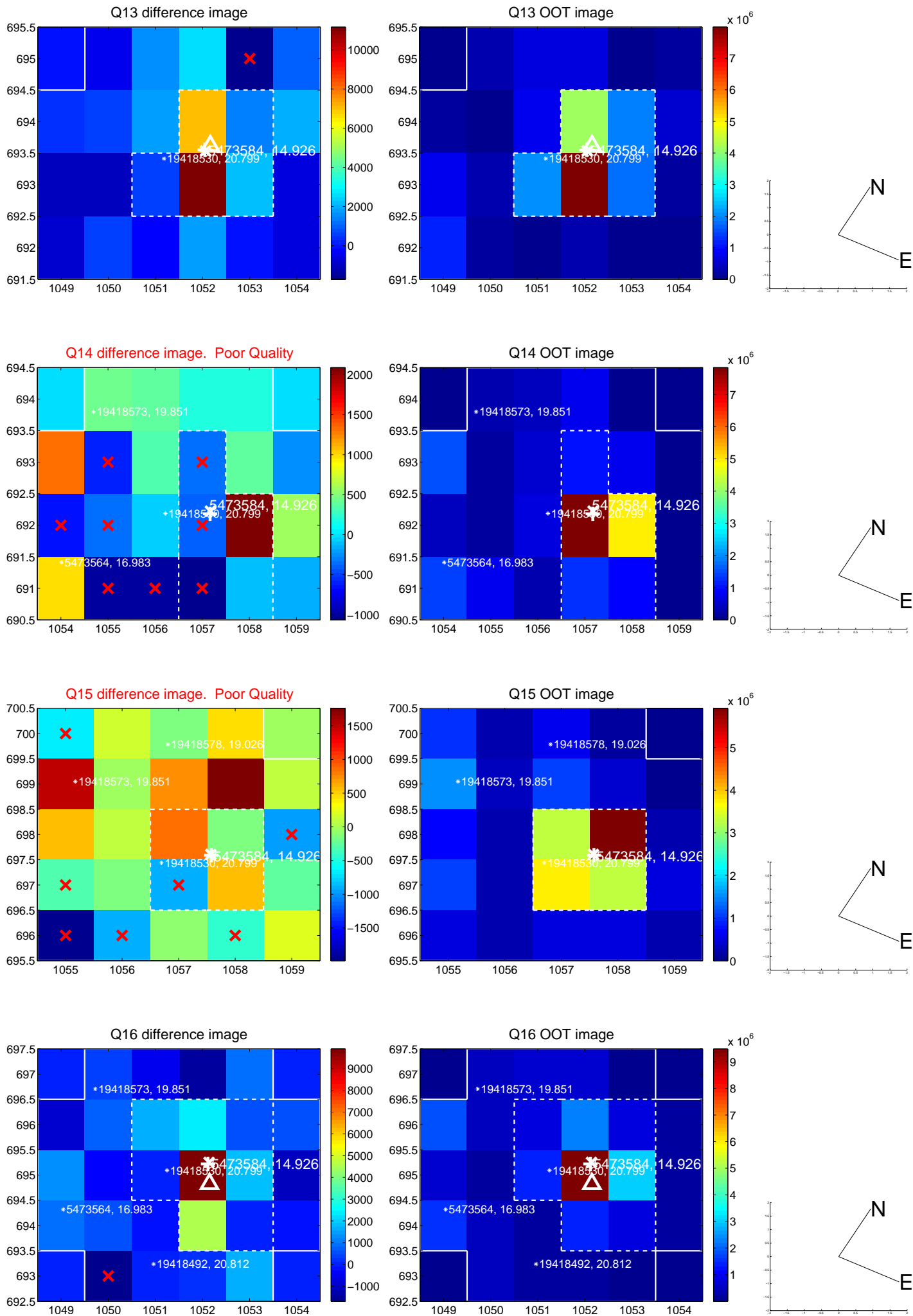




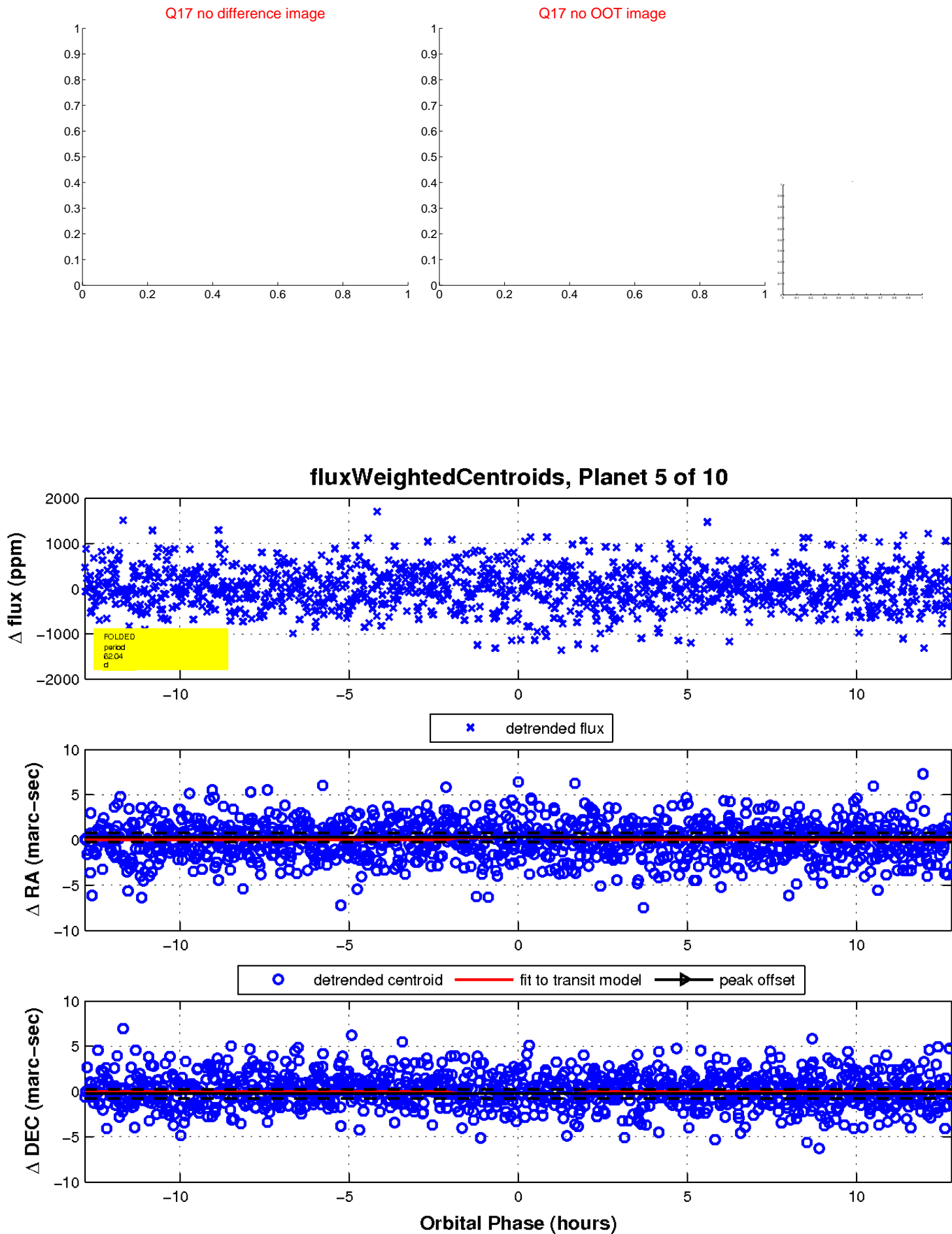
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

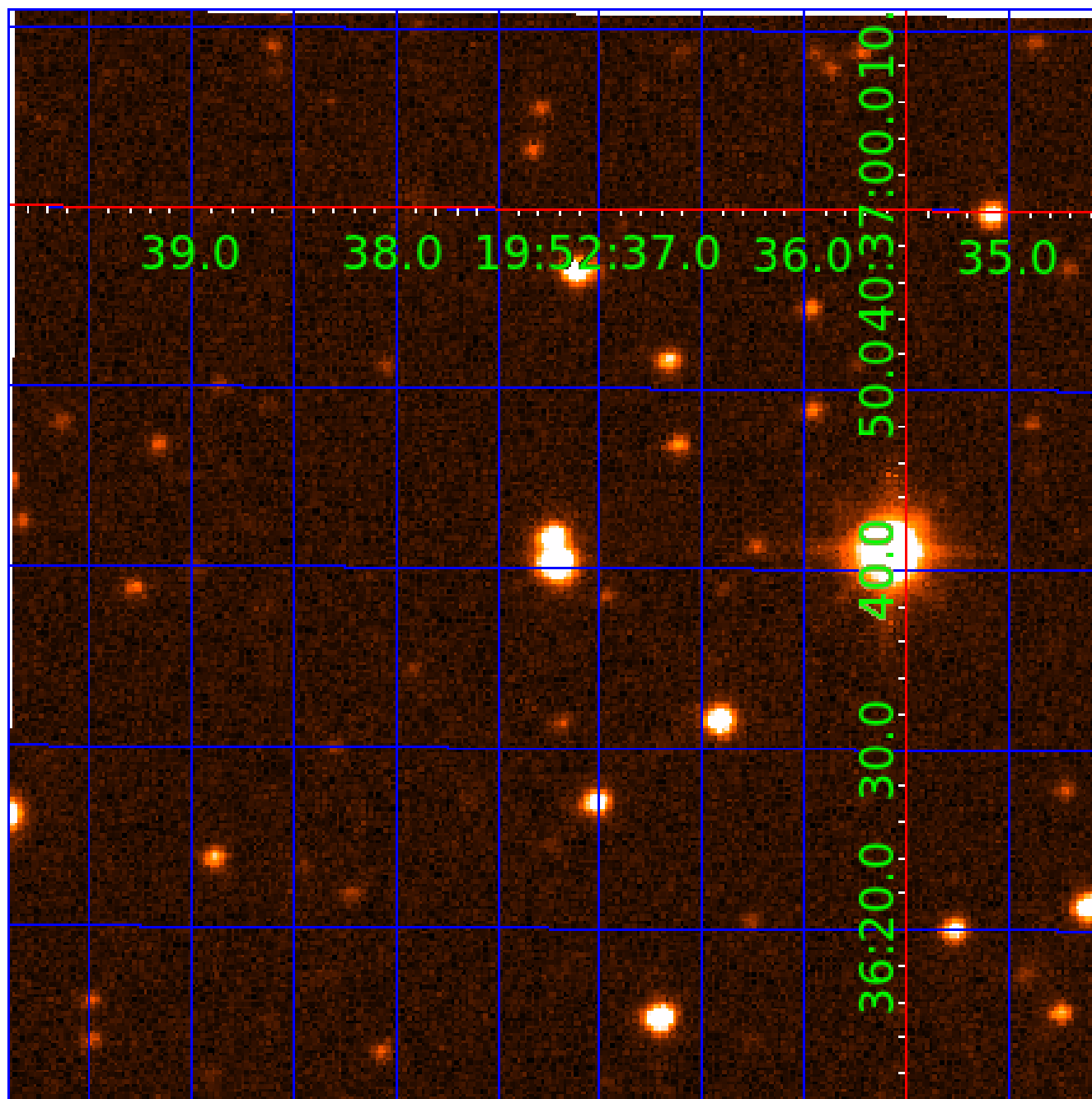


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

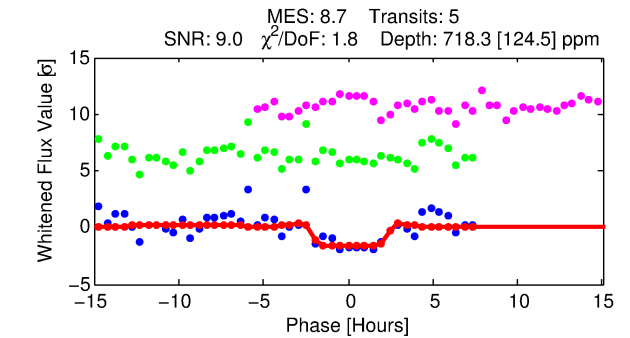
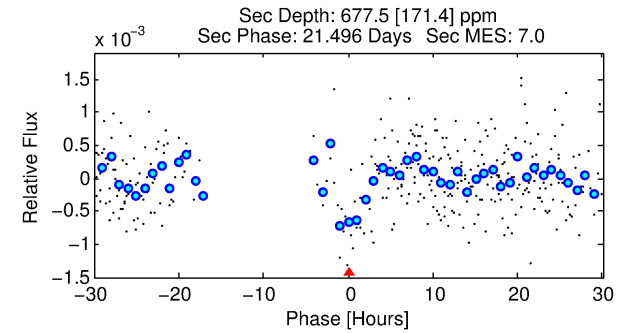
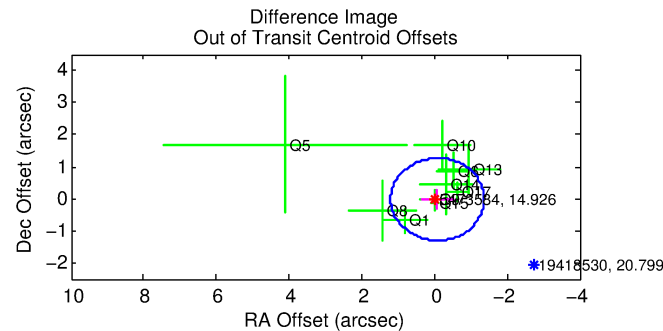
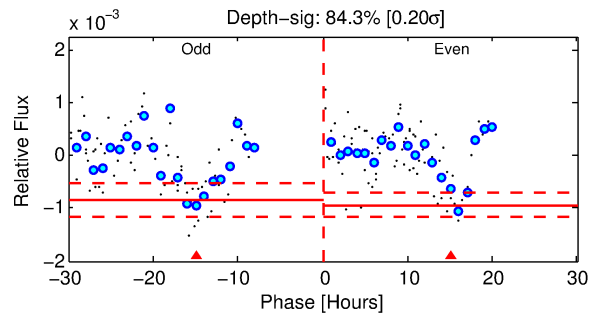
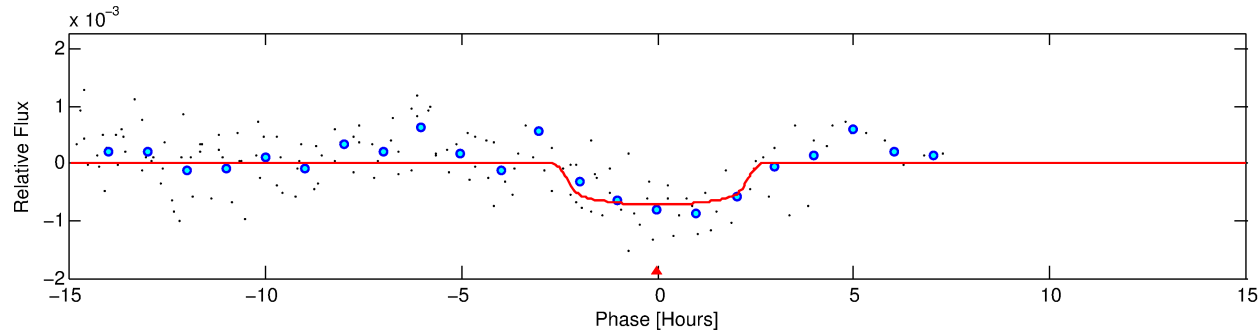
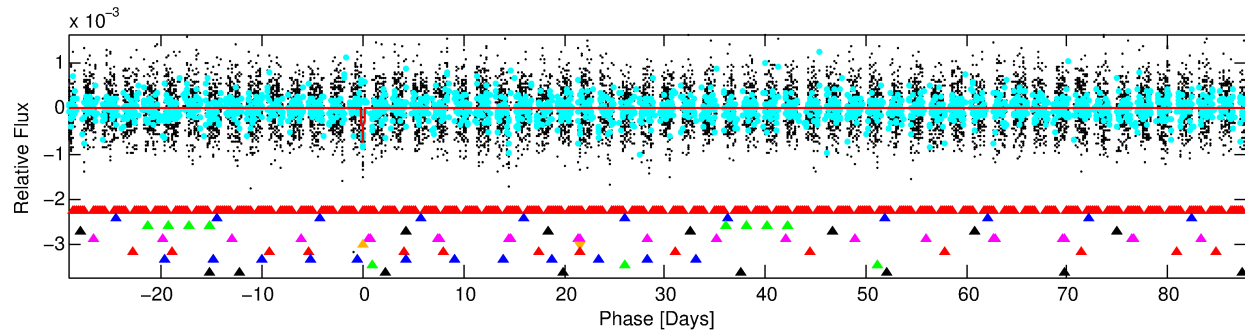
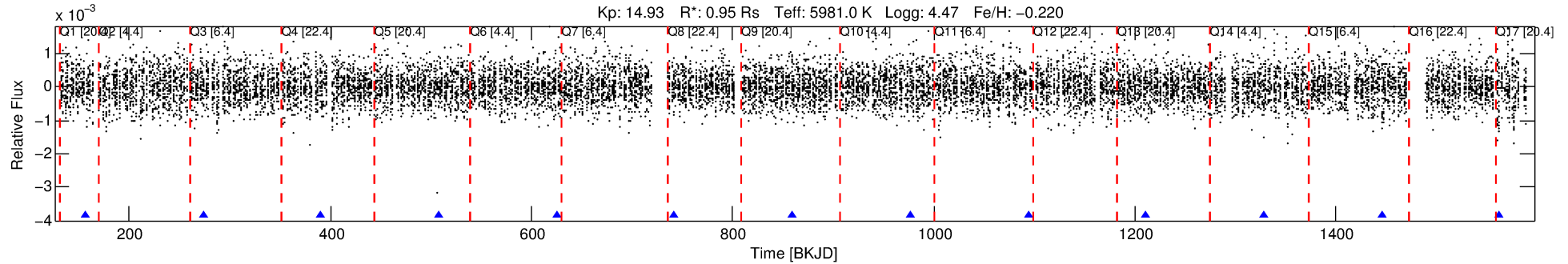
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-06

No Significant Match Found

# DV One-Page Summary

KIC: 5473584 Candidate: 6 of 10 Period: 117.171 d



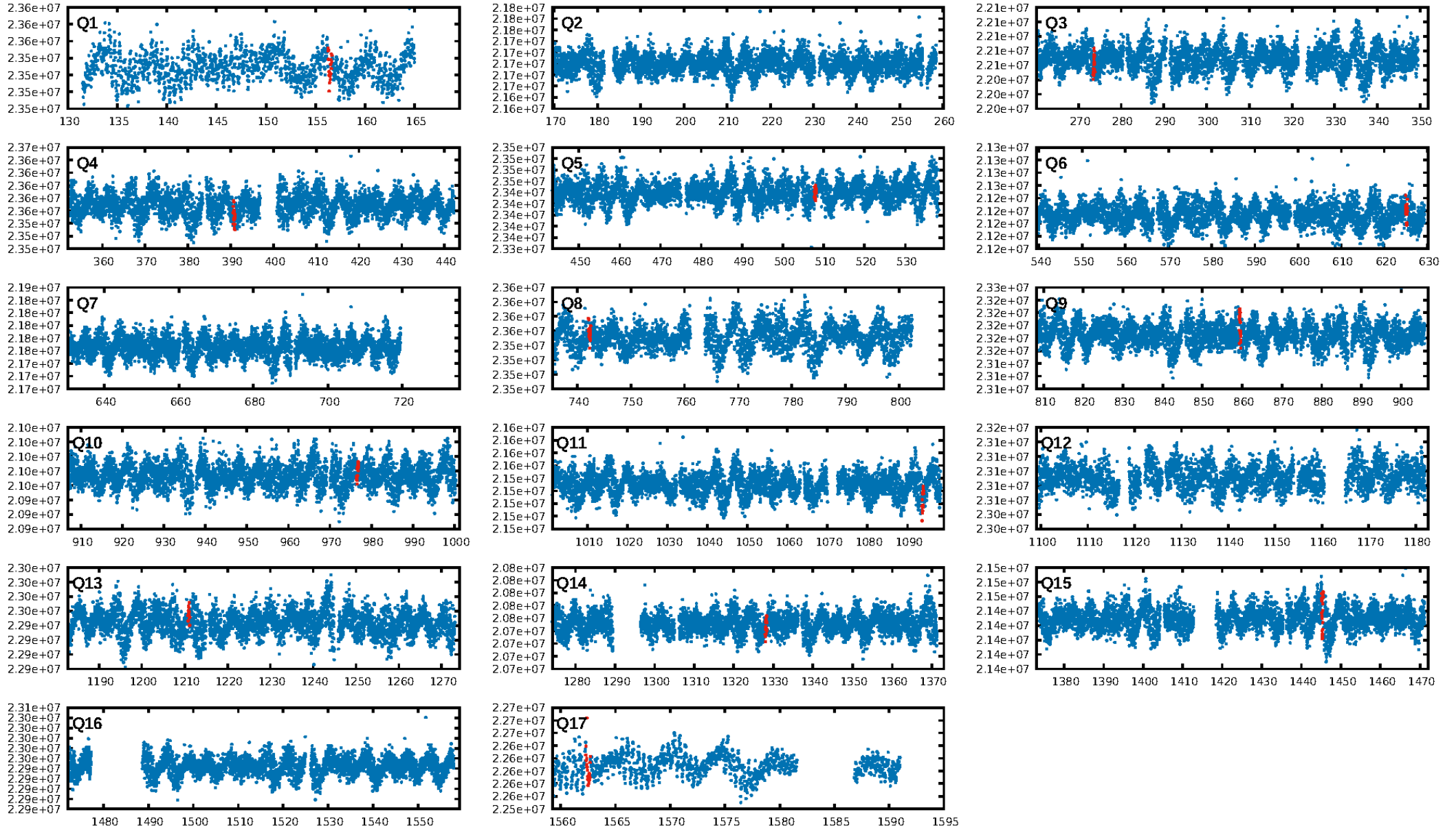
## DV Fit Results:

Period = 117.17090 [0.00537] d  
Epoch = 156.4481 [0.0580] BKJD  
Rp/R\* = 0.0271 [0.0228]  
a/R\* = 117.47 [486.30]  
b = 0.79 [2.00]  
Seff = 4.77 [1.88]  
Teq = 377 [37] K  
Rp = 2.80 [2.51] Re  
a = 0.4640 [0.1198] AU  
Ag = 10270.33 [17911.54] [0.57 $\sigma$ ]  
Teff = 5864 [2505] K [2.19 $\sigma$ ]

## DV Diagnostic Results:

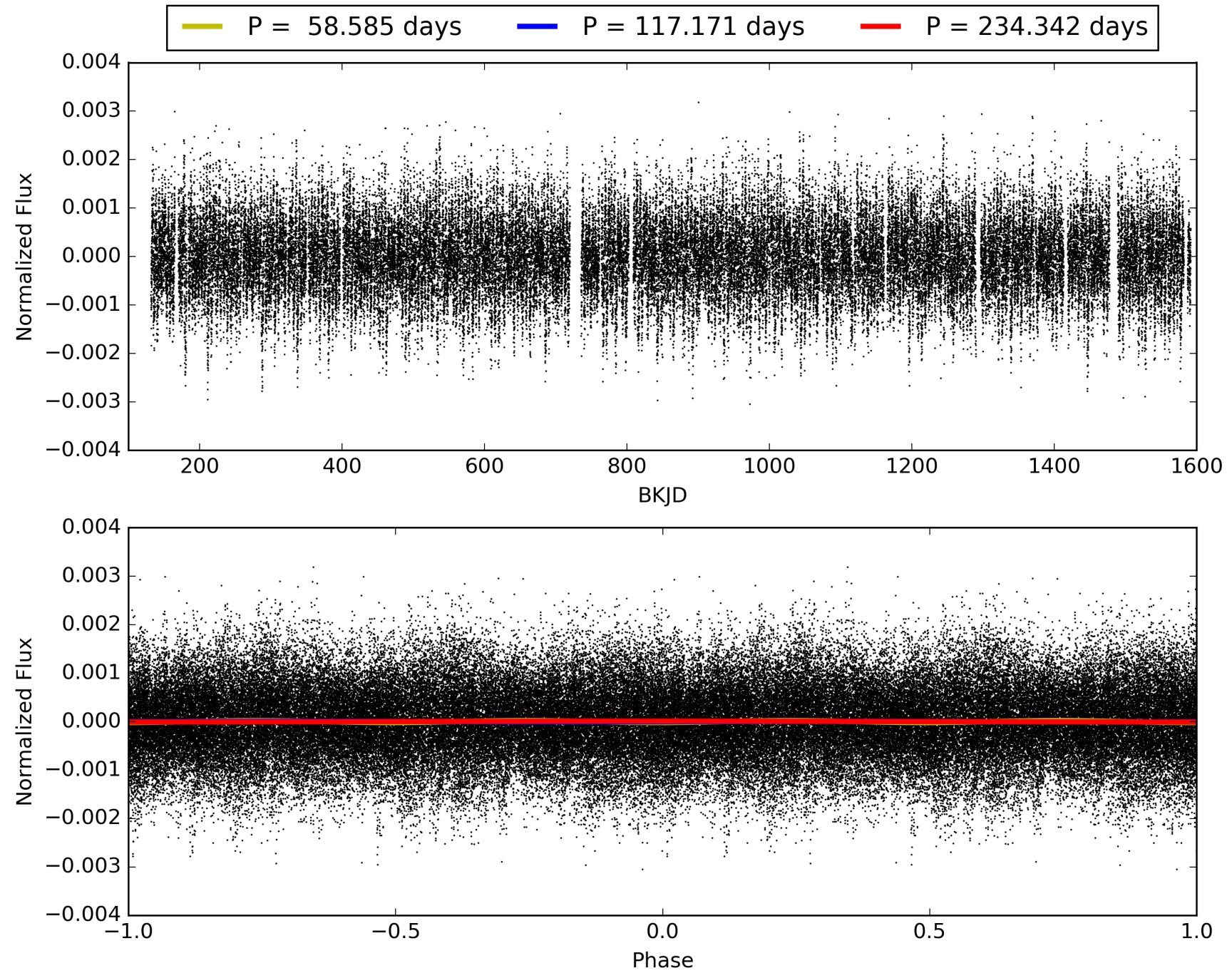
ShortPeriod-sig: 100.0% [58.16 $\sigma$ ]  
LongPeriod-sig: 100.0% [18.97 $\sigma$ ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 98.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.8912  
Centroid-sig: 48.3%  
Centroid-so: 0.474 arcsec [0.58 $\sigma$ ]  
OotOffset-rm: 0.079 arcsec [0.18 $\sigma$ ]  
OotOffset-st: 3/1/1/5 [10]  
KicOffset-rm: 0.079 arcsec [0.24 $\sigma$ ]  
KicOffset-st: 3/1/1/5 [10]  
DiffImageQuality-fgm: 0.40 [4/10]  
DiffImageOverlap-fno: 0.33 [4/12]

# TCE 005473584-06, PDC Light Curves



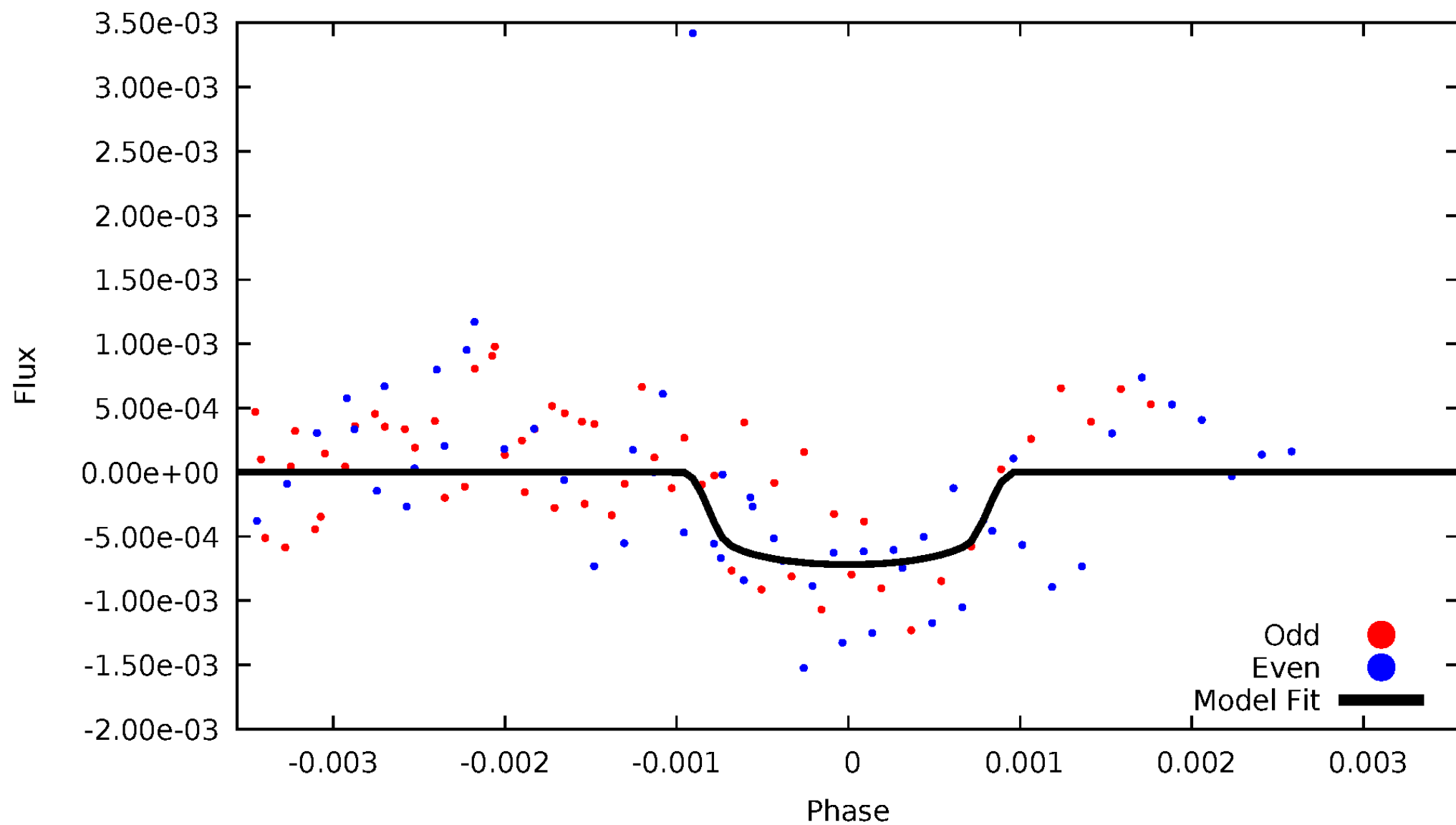


TCE 005473584-06



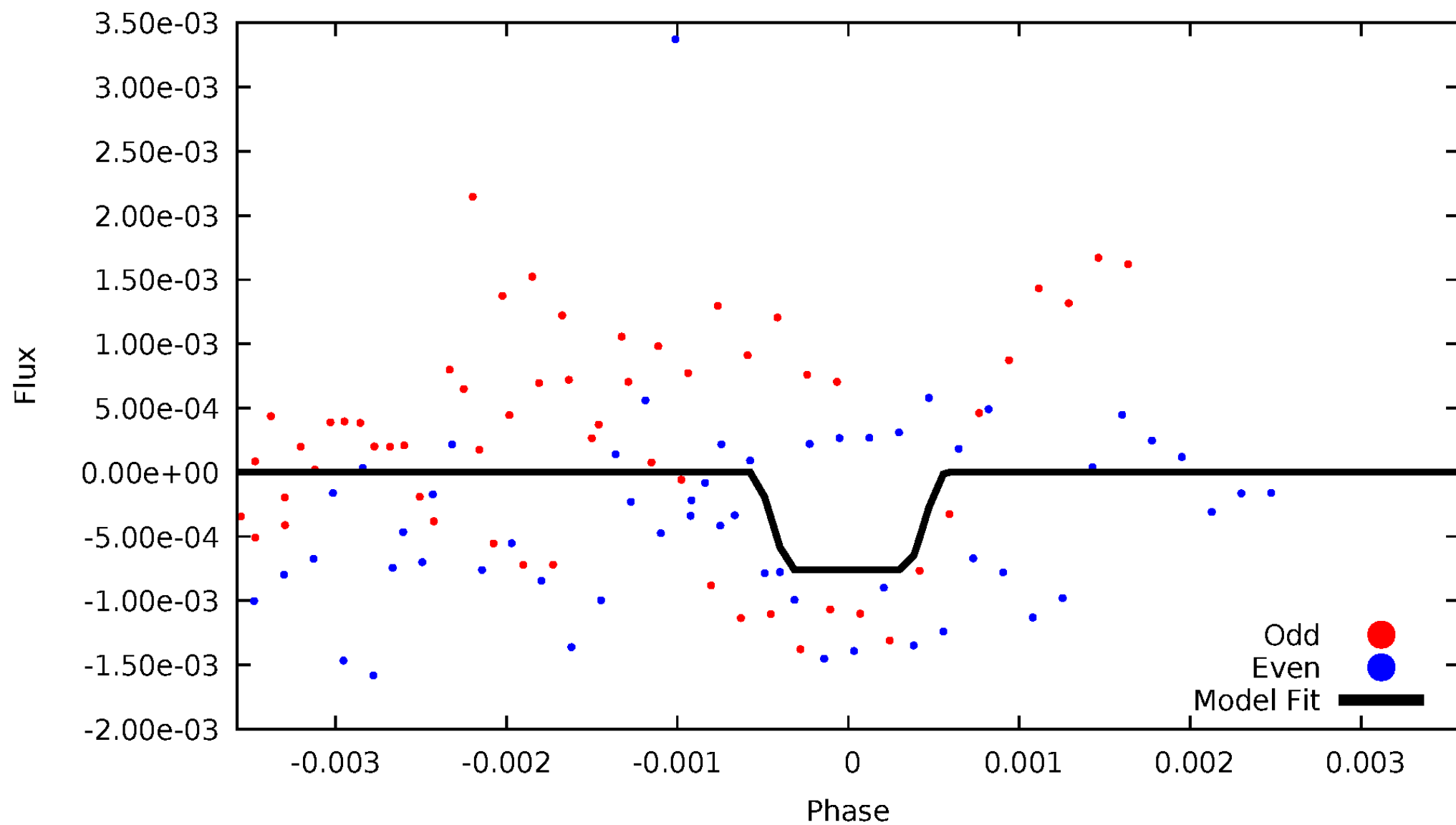
# DV Odd/Even

TCE 005473584-06



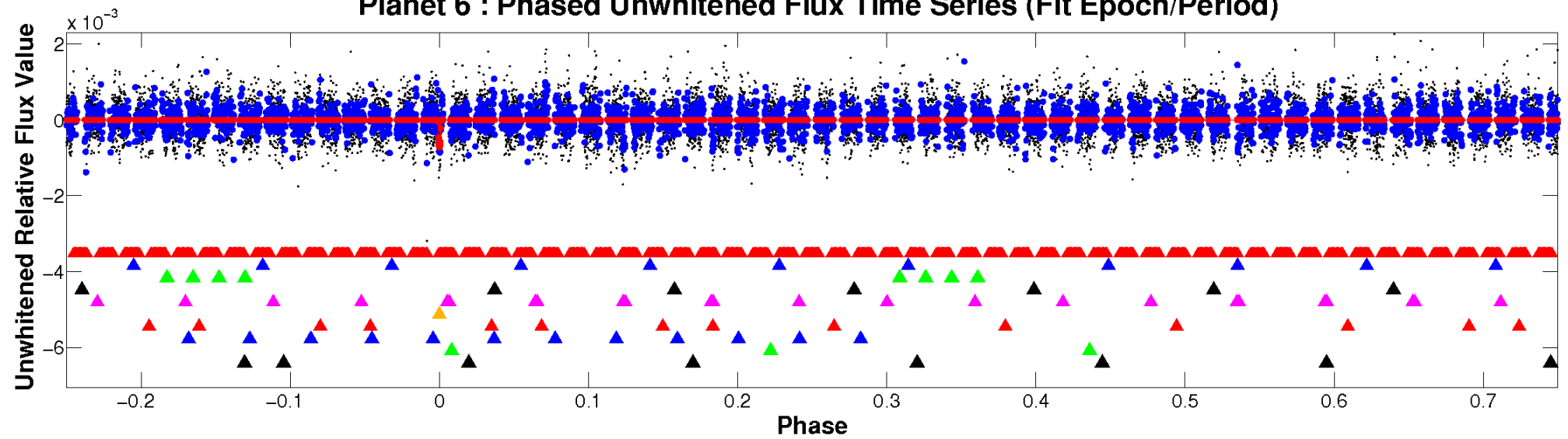
# ALT Odd/Even

TCE 005473584-06

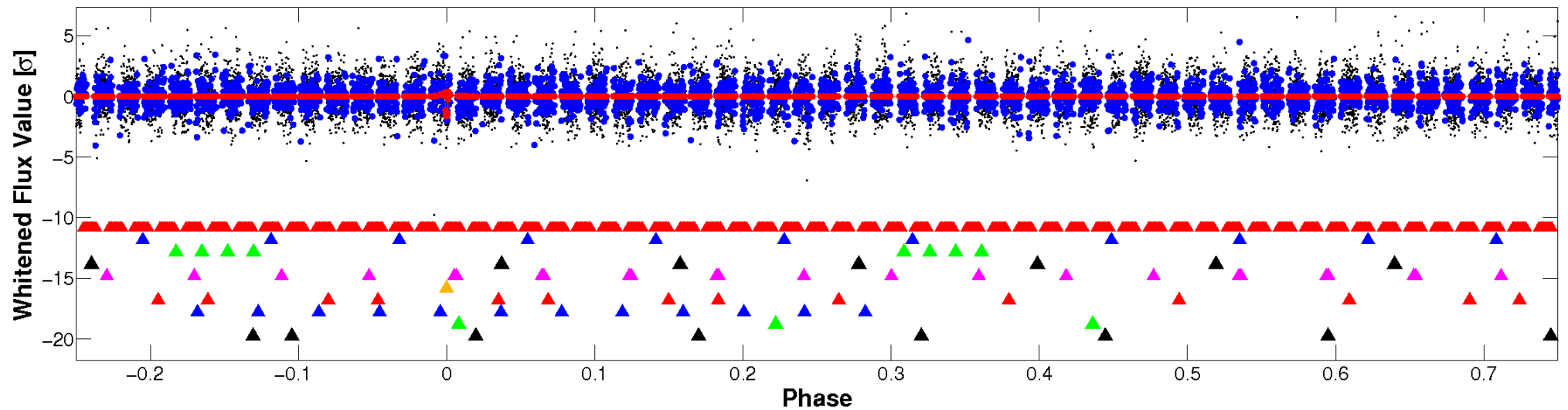


# Non-Whitened Vs. Whitened Light Curve

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

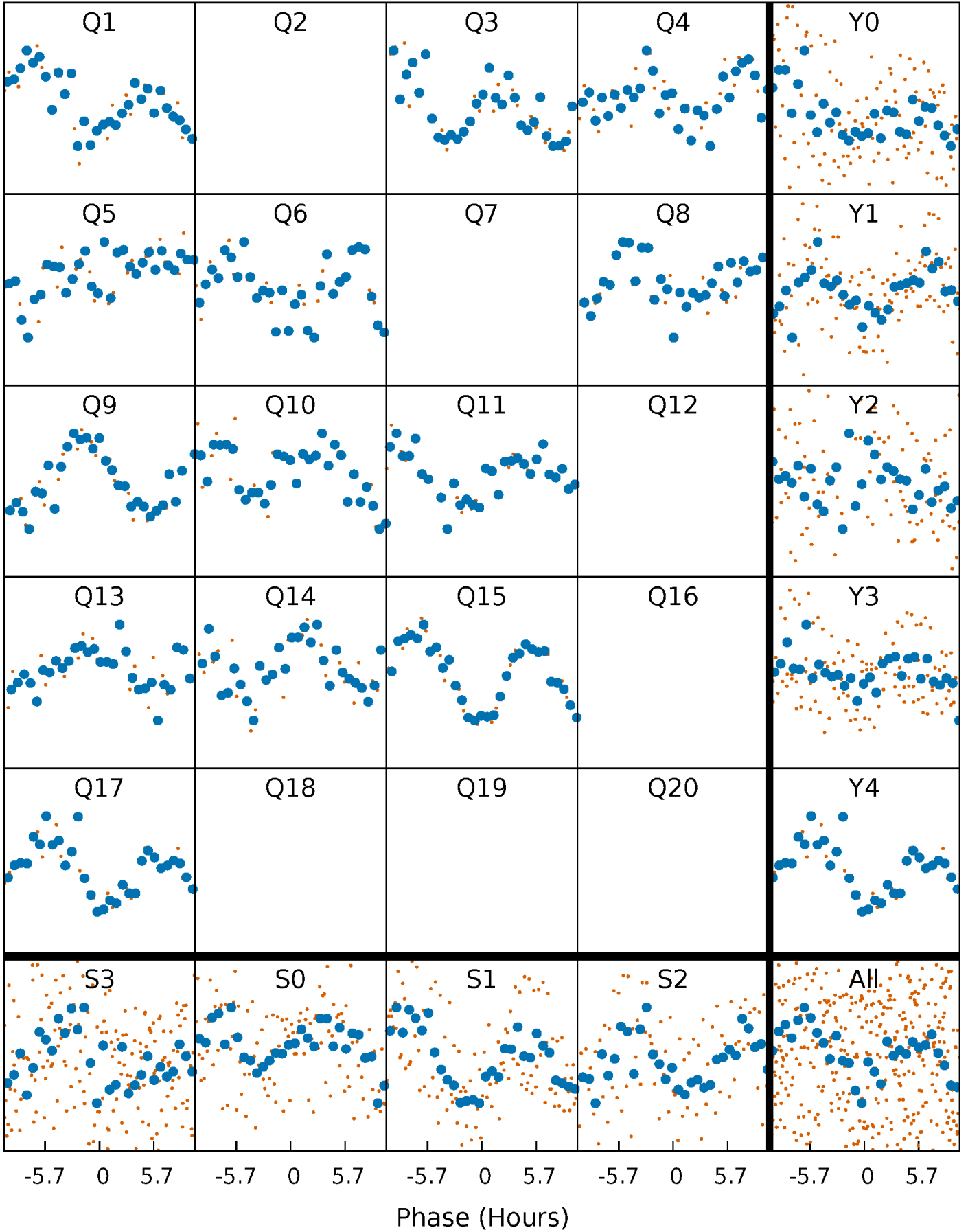


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



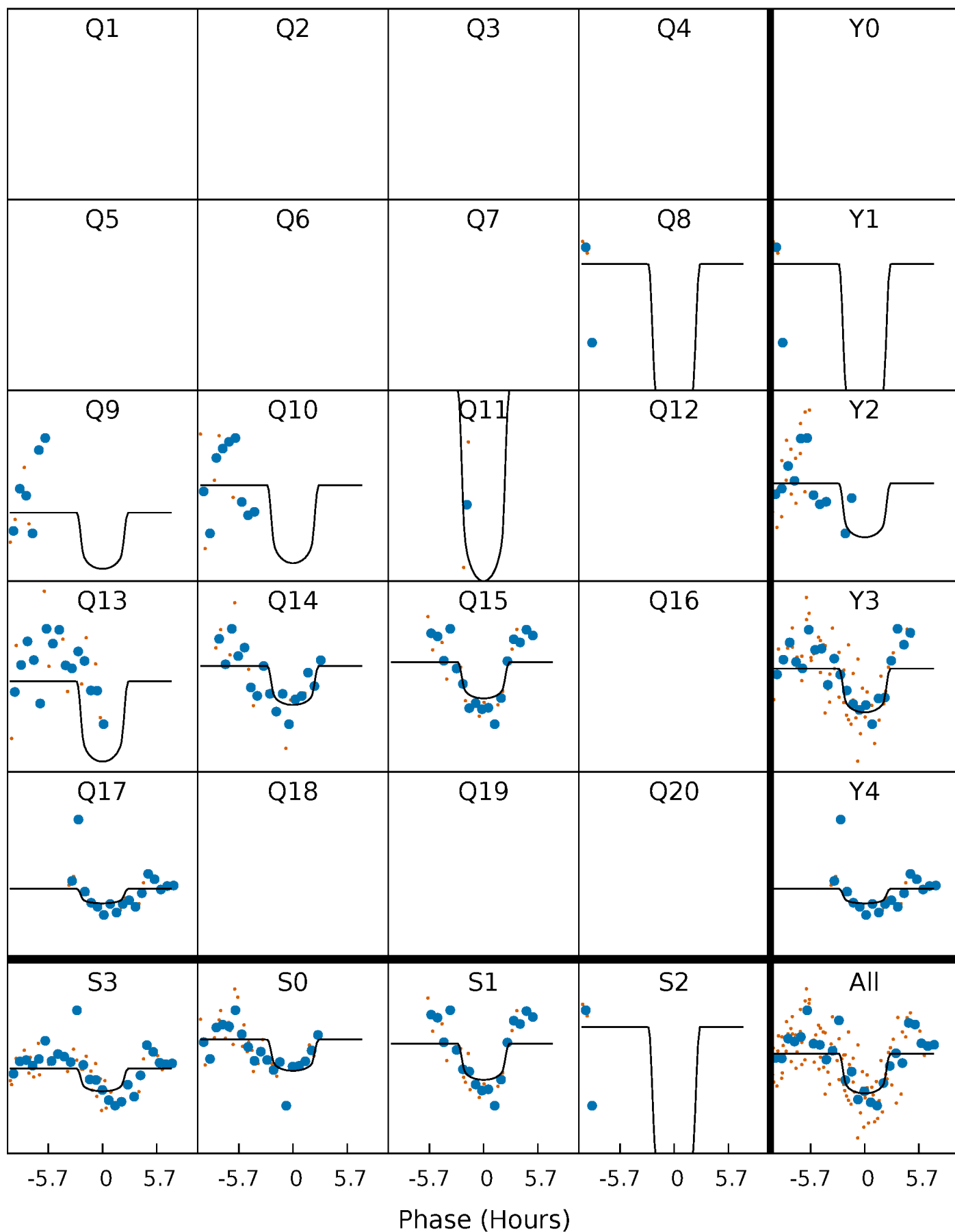
# PDC Quarter-Phased Transit Curves

TCE 005473584-06 P=117.170899 Days  $T_0=156.448113$  (BKJD)



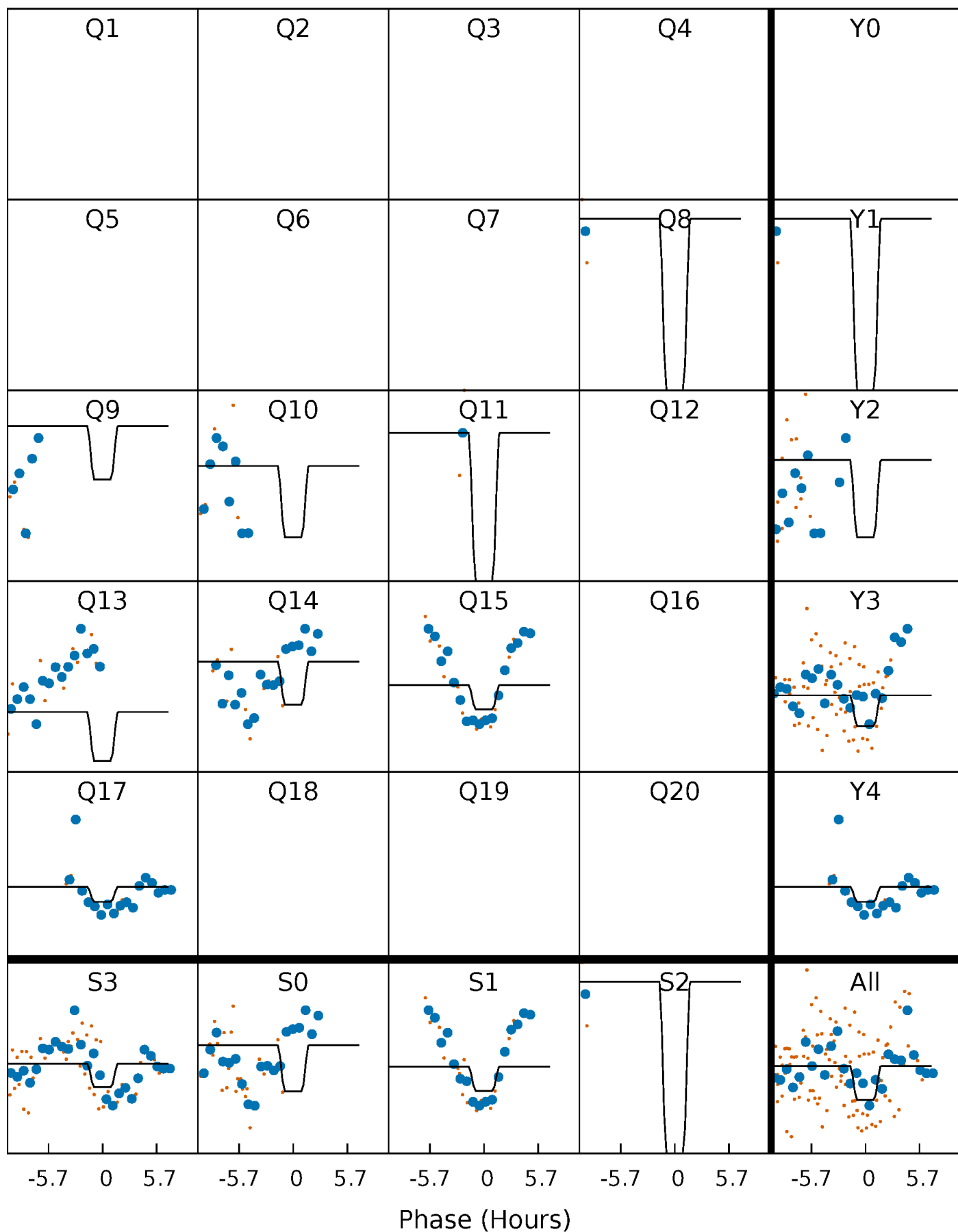
# DV Quarter-Phased Transit Curves

TCE 005473584-06 P=117.170899 Days  $T_0=156.448113$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

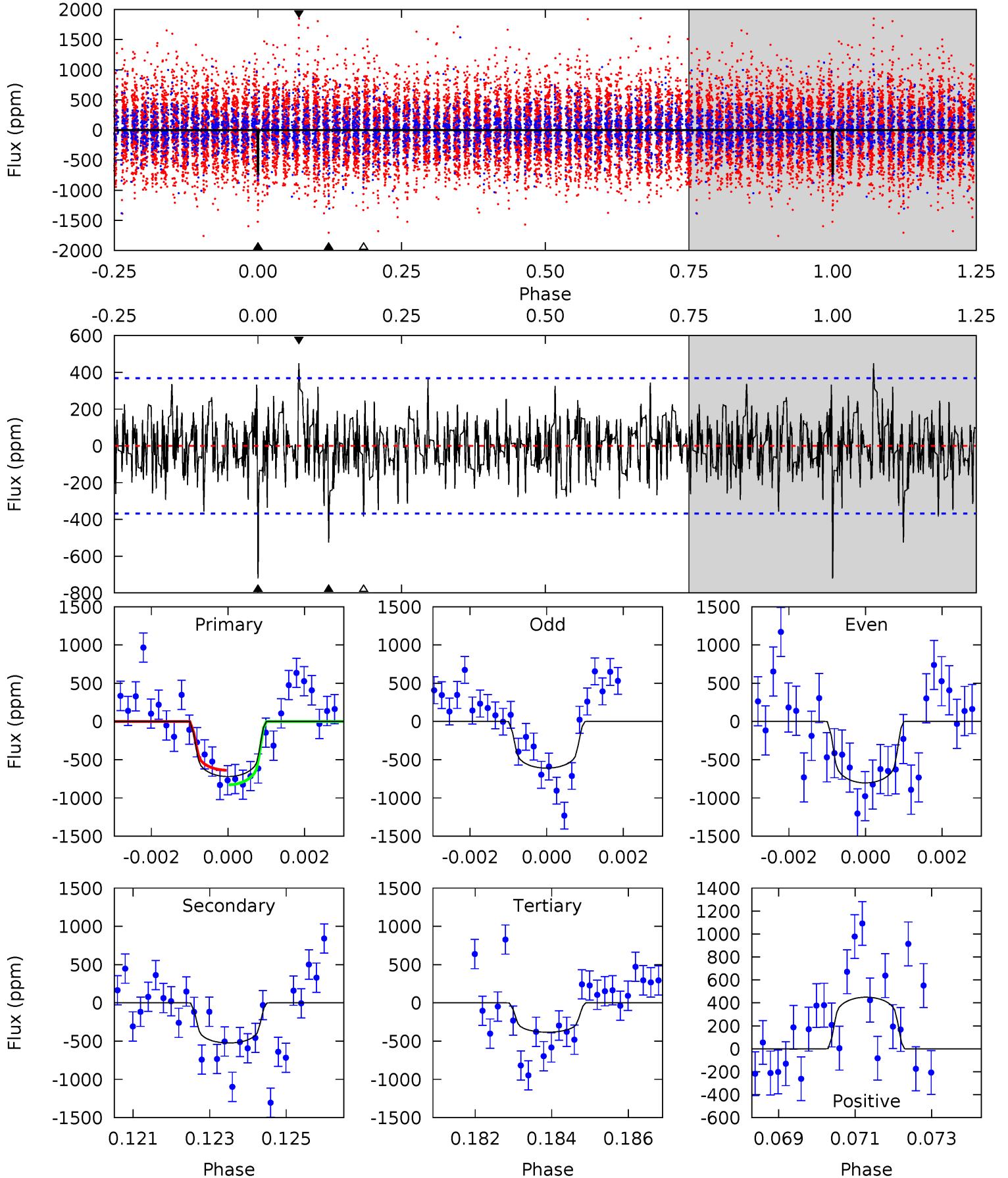
TCE 005473584-06 P=117.168907 Days  $T_0=156.484537$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-06, P = 117.170899 Days, E = 39.277214 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	7.60	5.56	6.52	5.33	3.10	1.61	4.88	3.93	2.04	1.08	1.40	0.87	0.38	1.37

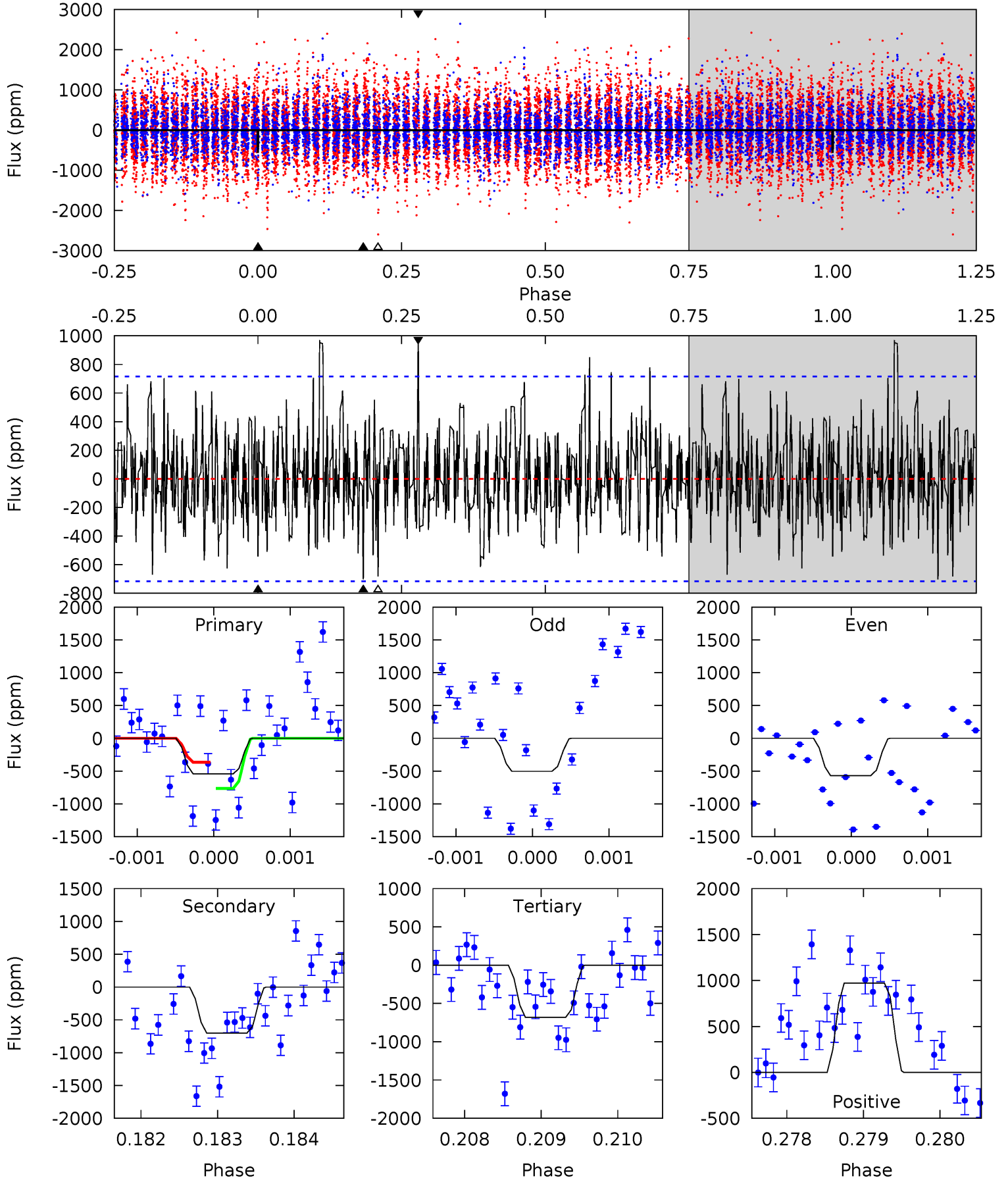




# Alt Model-Shift Uniqueness Test

005473584-06,  $P = 117.168907$  Days,  $E = 39.315630$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.10	5.33	5.17	7.37	5.42	3.25	1.63	-1.07	-3.27	0.15	-2.04	0.25	0.65	0.58	1.51



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-524 \pm 69$	$3.36^{+2.25}_{-2.06}$	$536^{+38}_{-28}$	$5199^{+3144}_{-947}$	$5455^{+29055}_{-3556}$
Alt.	$-703 \pm 132$	$3.25^{+2.24}_{-1.90}$	$535^{+40}_{-28}$	$5627^{+3959}_{-1149}$	$7991^{+38328}_{-5277}$

$T_{max}$  = 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

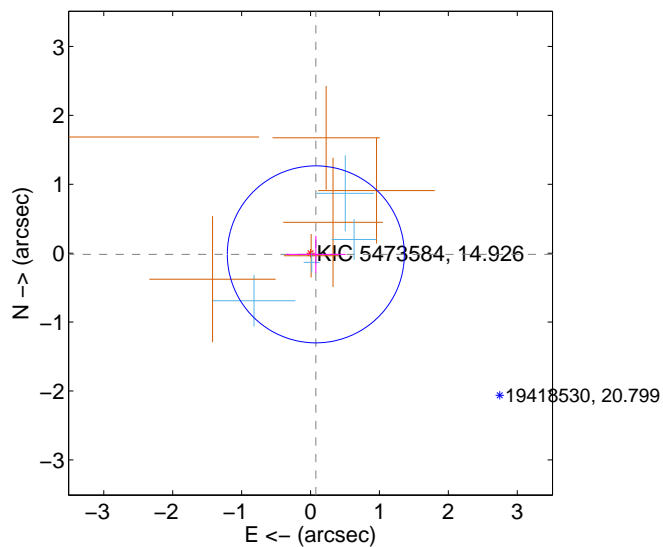
Supplemental centroid analysis for 005473584-06. Kepler magnitude: 14.93. Transit SNR 8.97

There are 4 quarters with good PRF difference image offsets

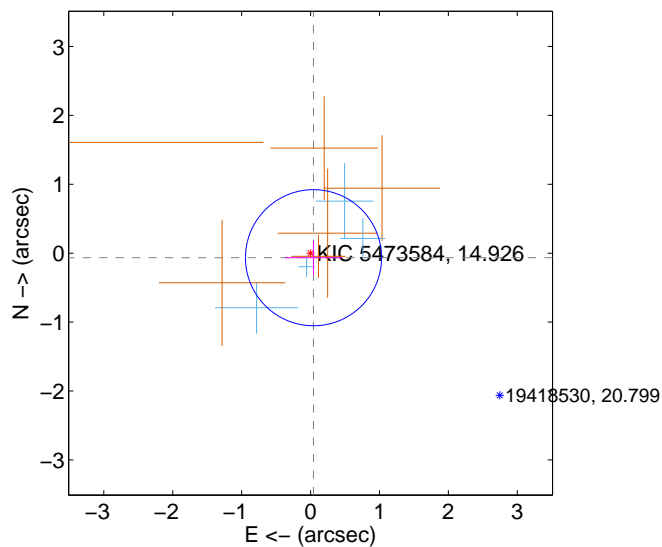
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.079 \pm 0.428$	0.18	$-0.077 \pm 0.432$	$-0.017 \pm 0.269$
PRF-fit source offset from KIC position	$0.079 \pm 0.329$	0.24	$-0.043 \pm 0.415$	$-0.066 \pm 0.243$
photometric centroid source offset	$0.47 \pm 0.82$	0.58	$0.47 \pm 0.82$	$0.02 \pm 0.72$

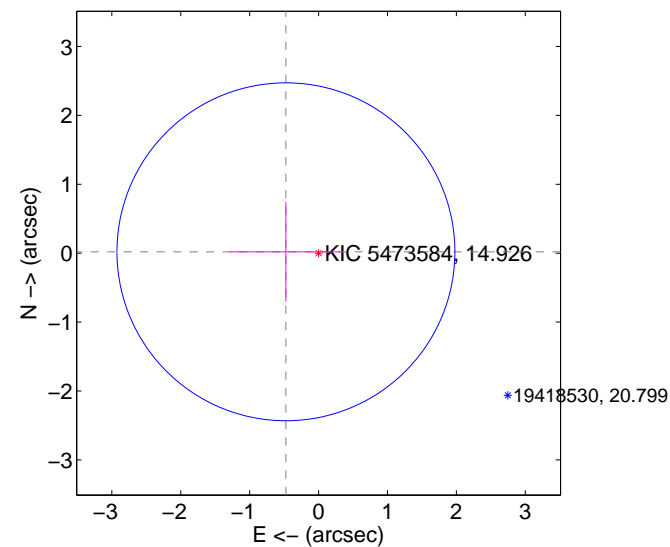
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

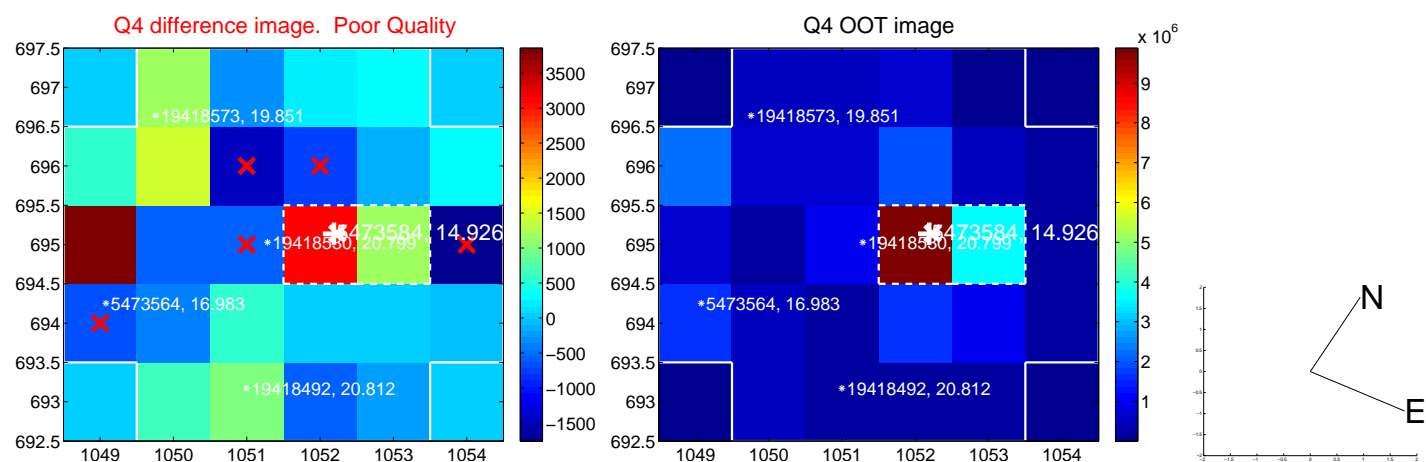
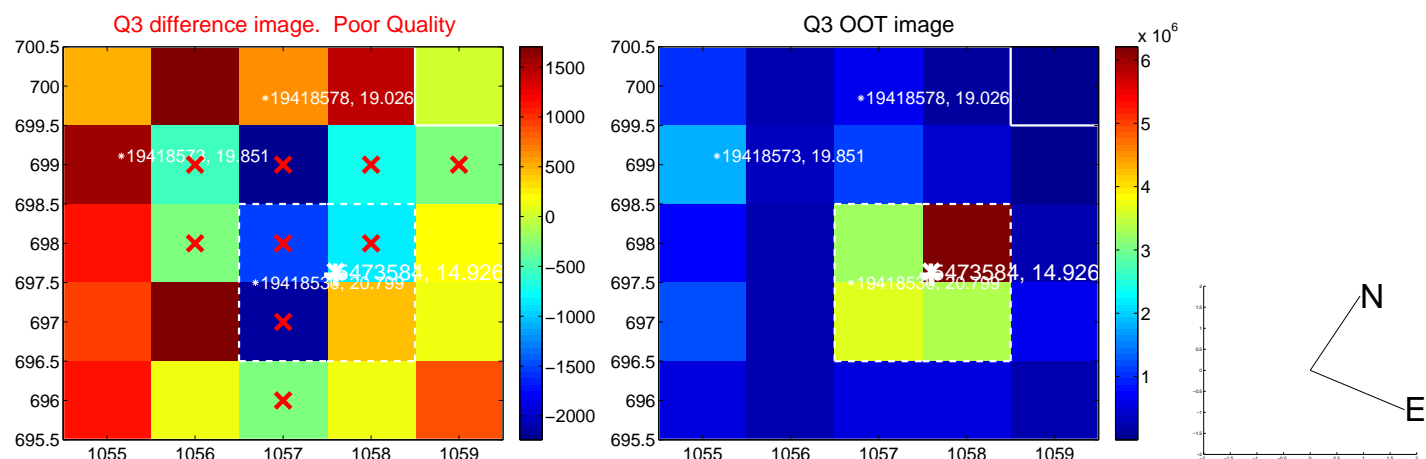
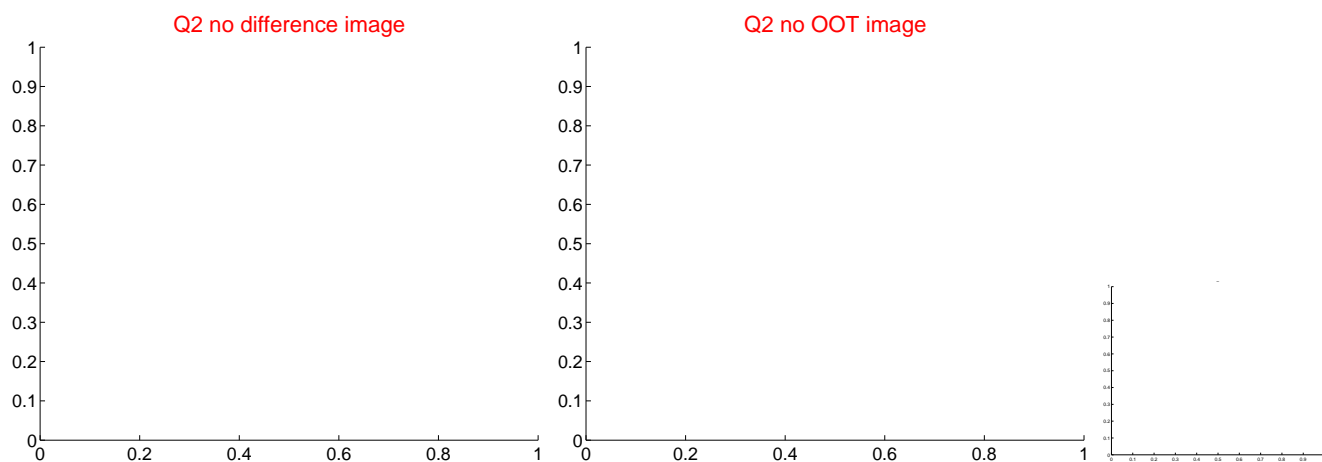
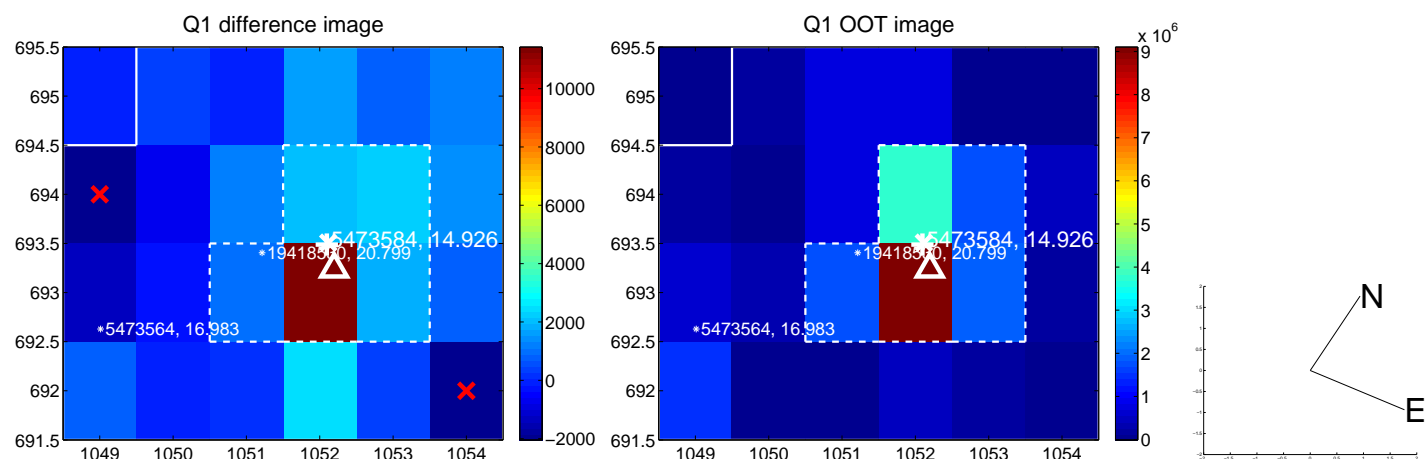


offset from photometric centroids

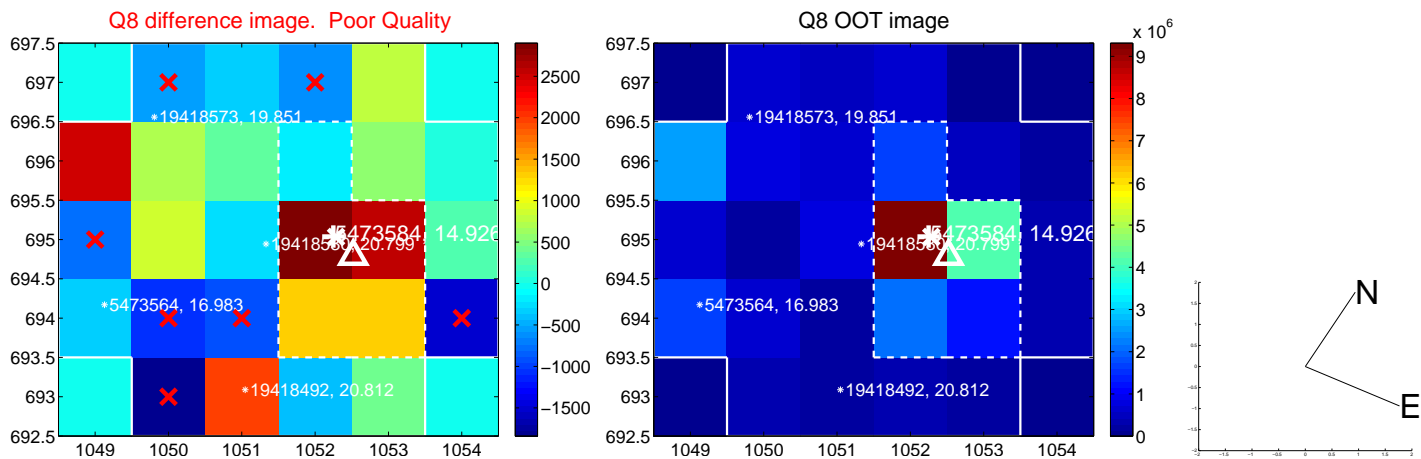
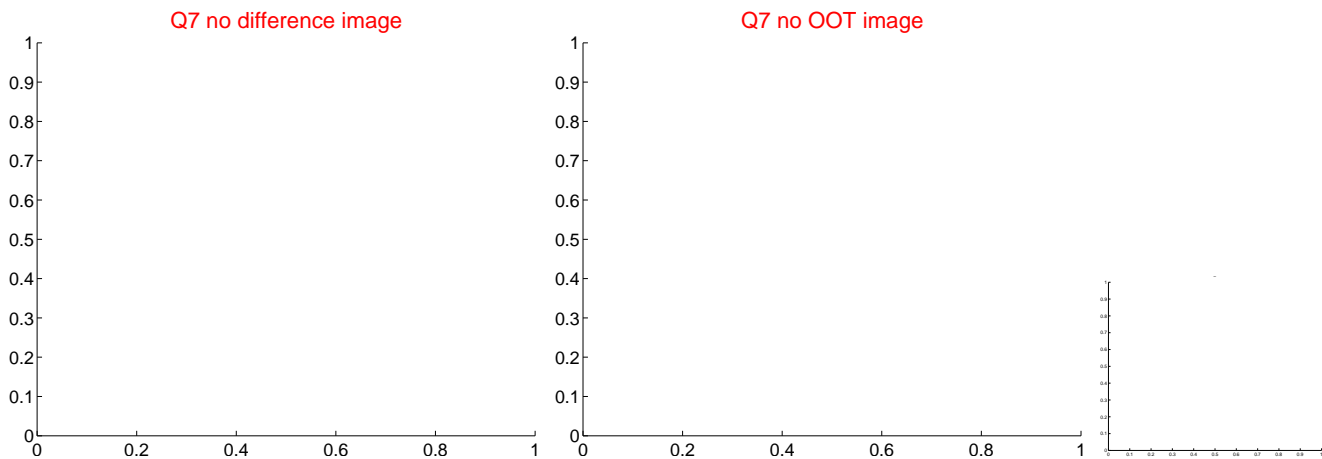
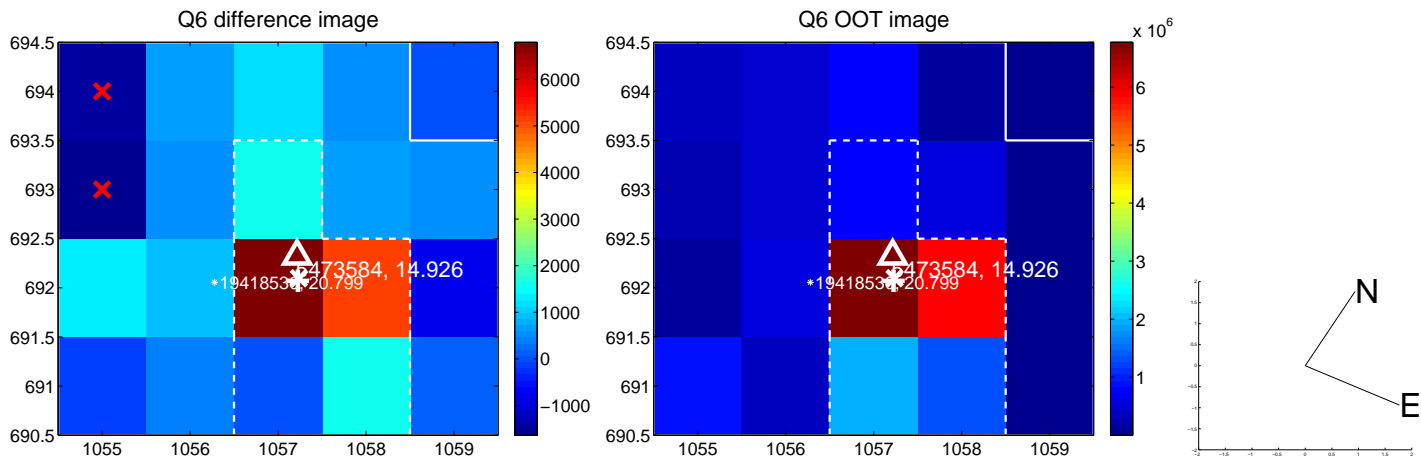
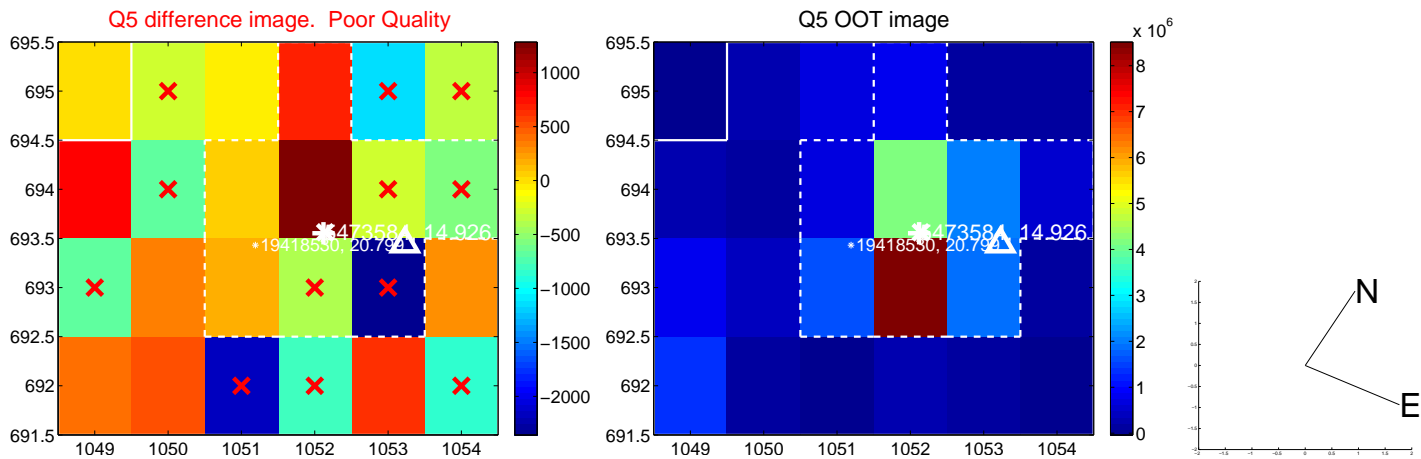


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

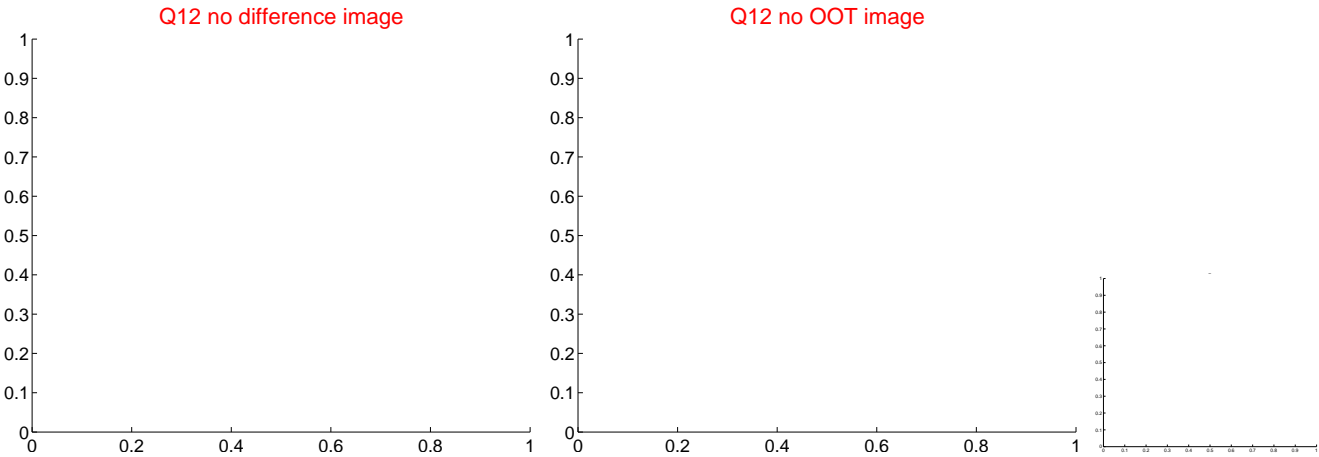
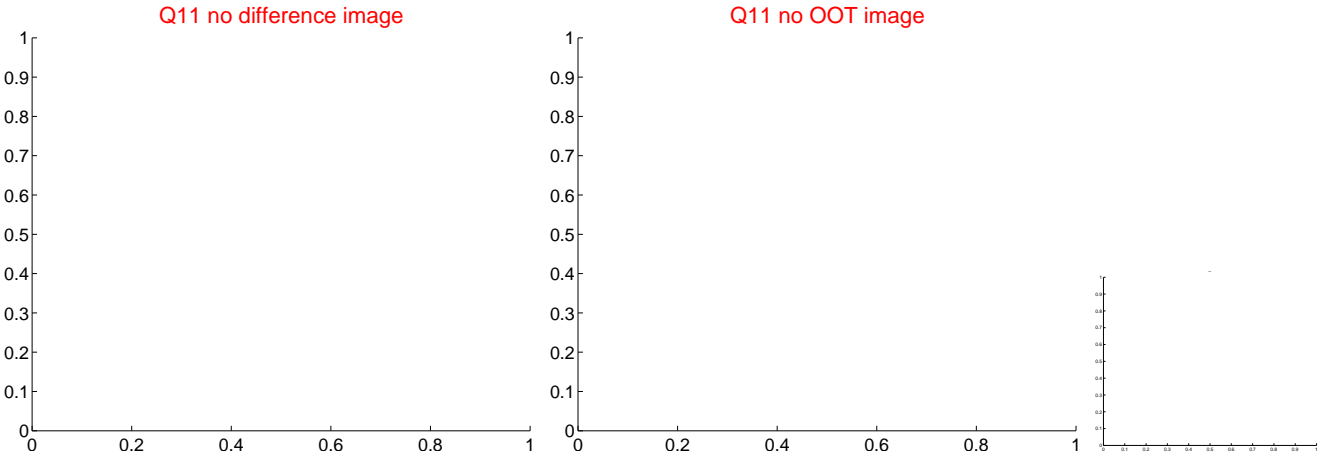
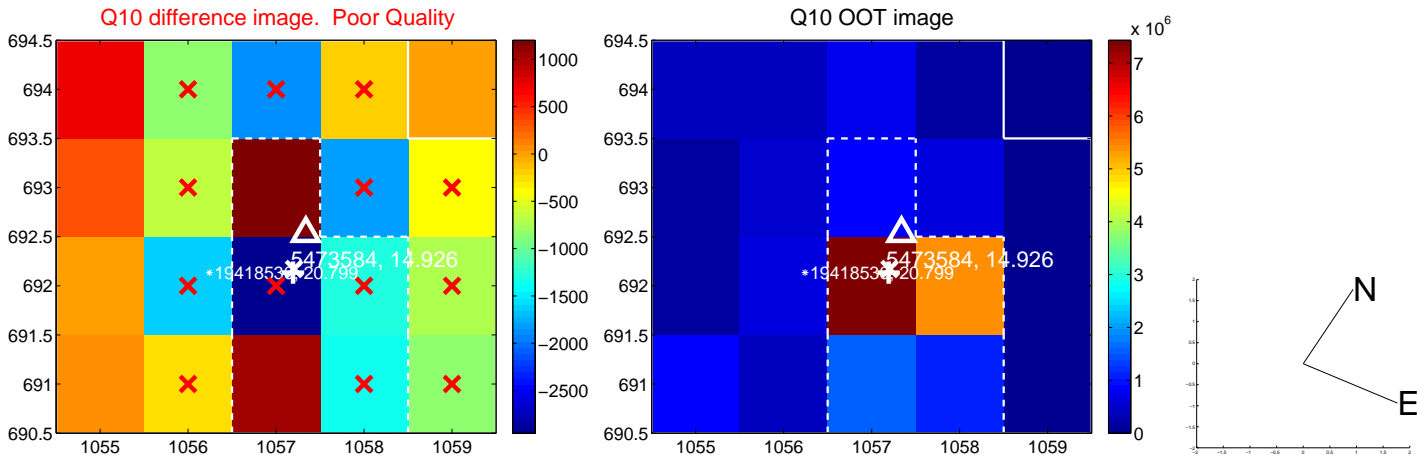
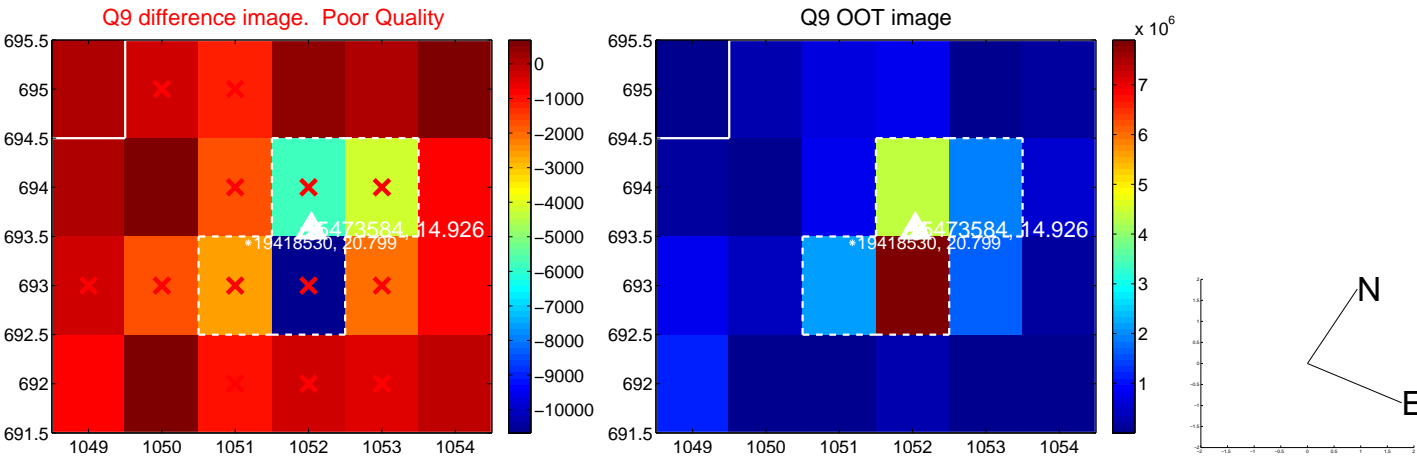
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



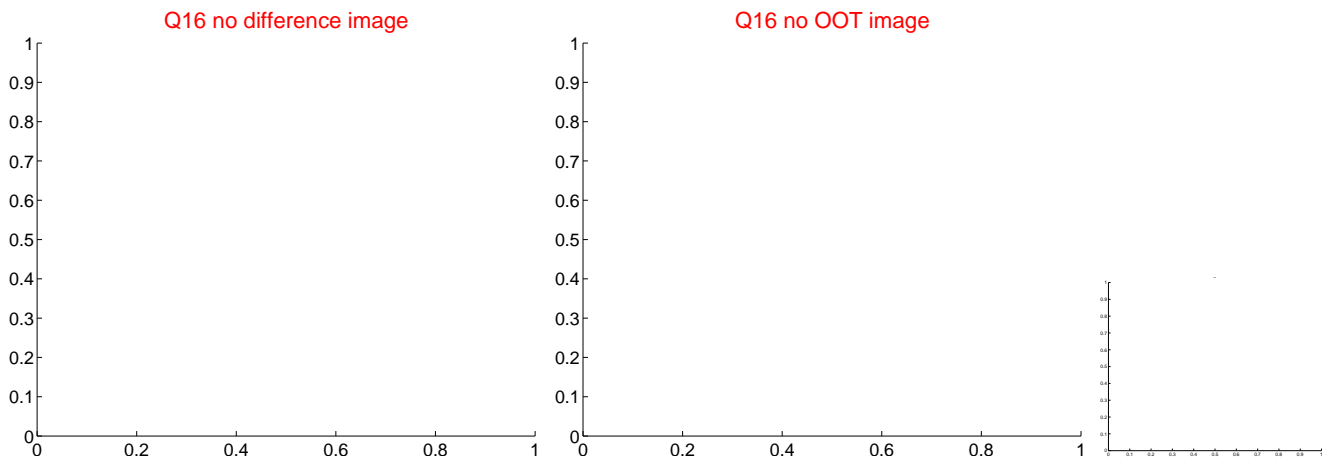
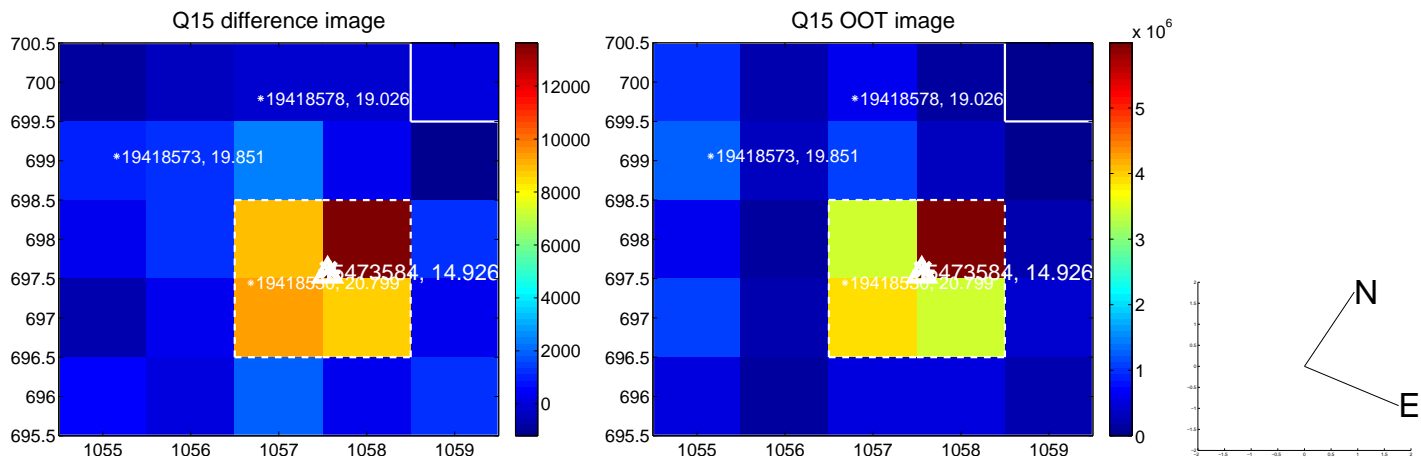
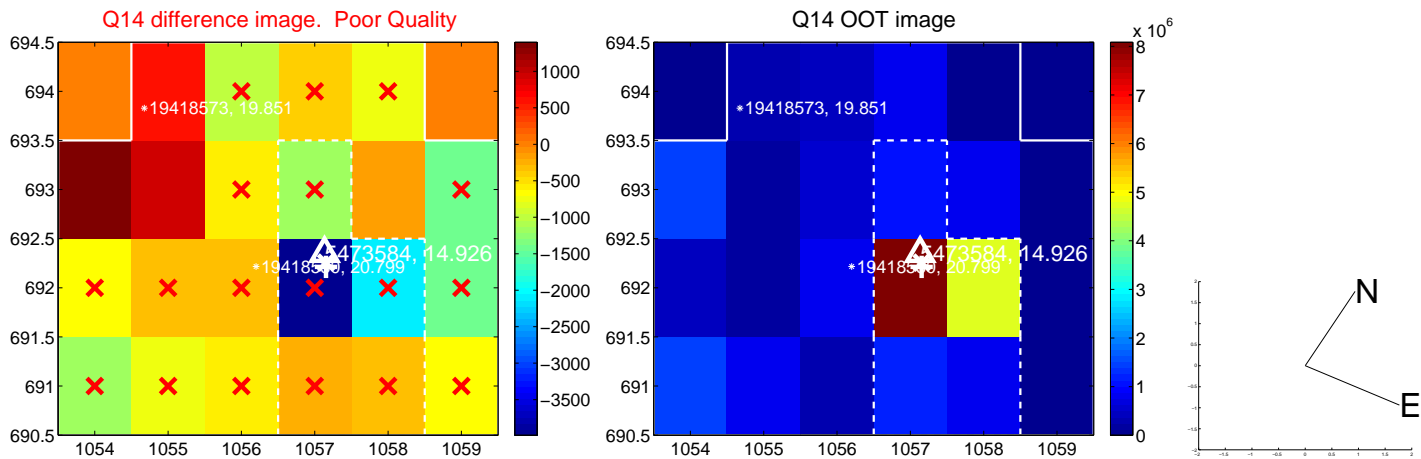
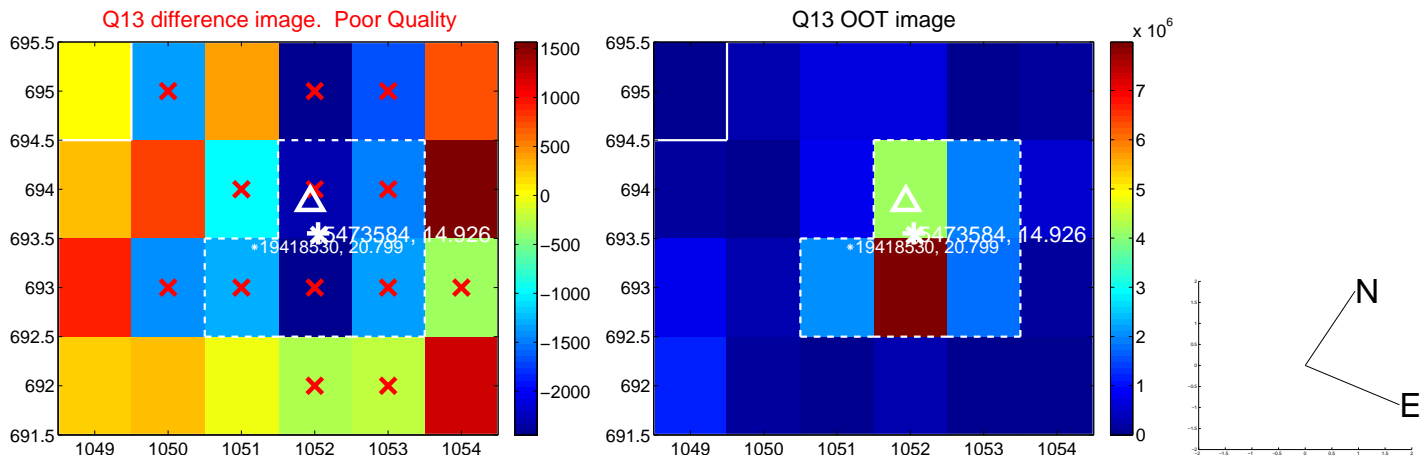
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



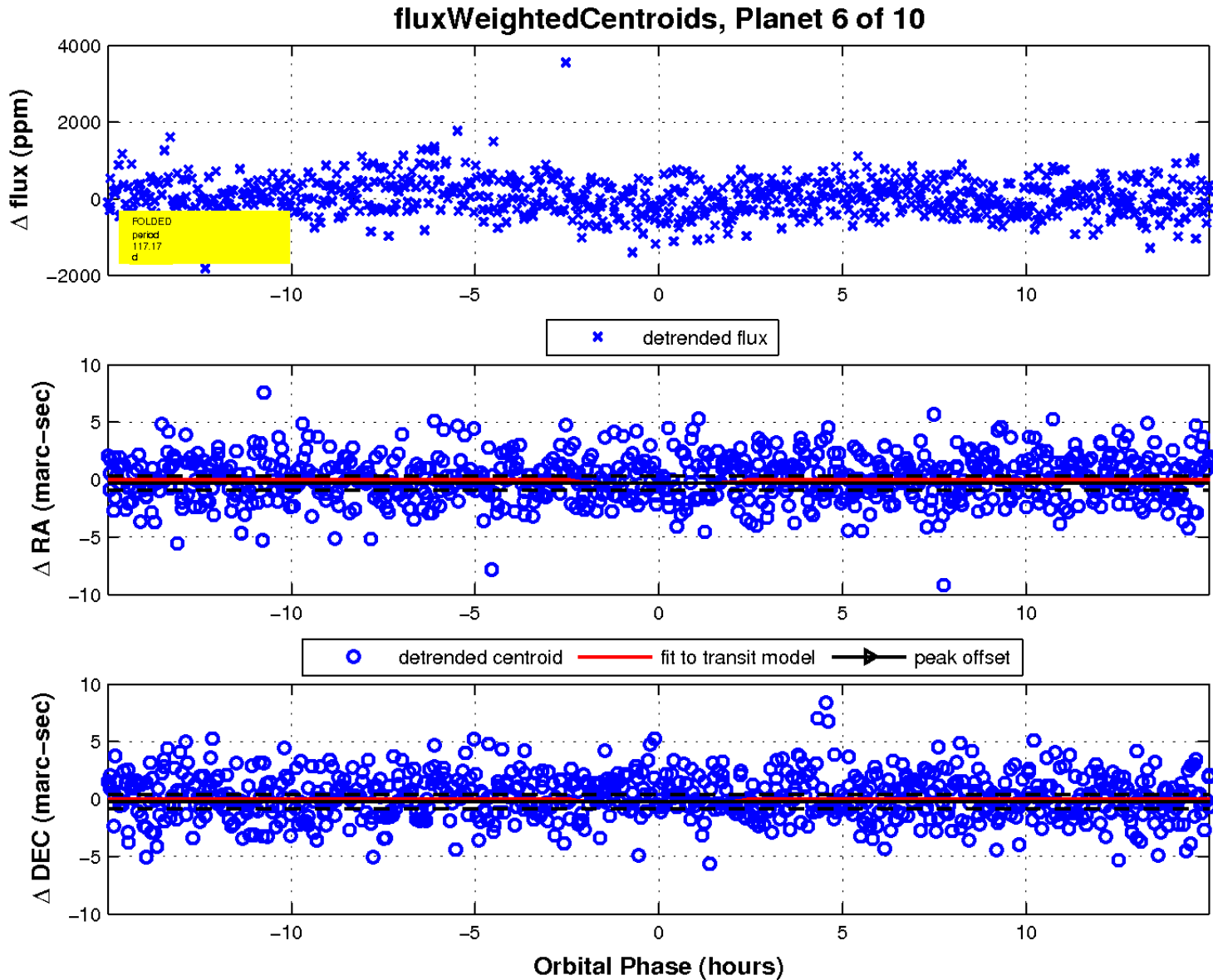
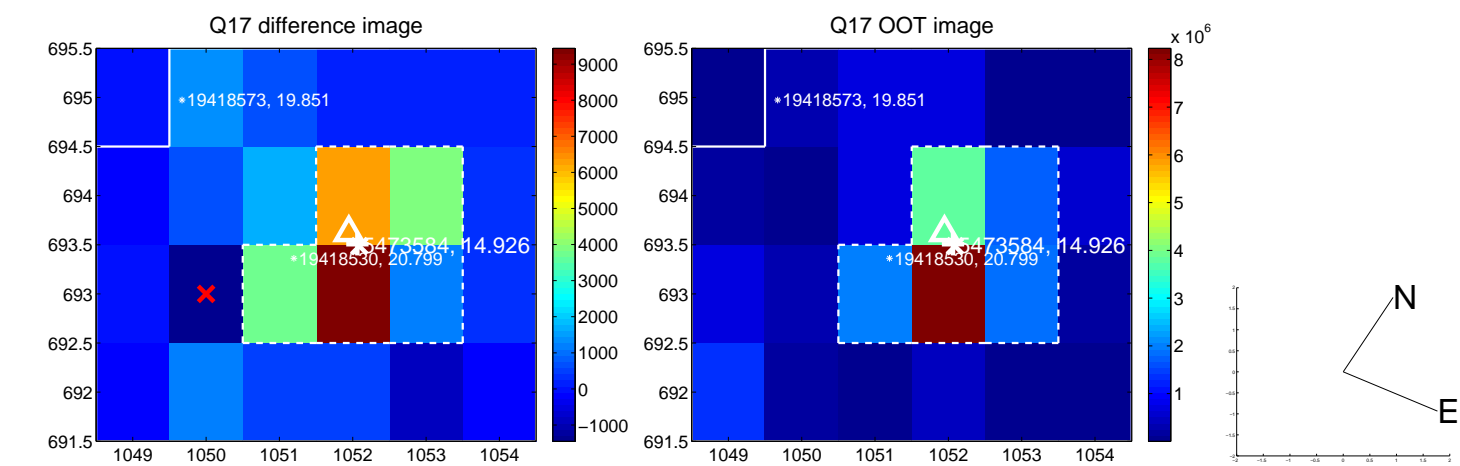
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



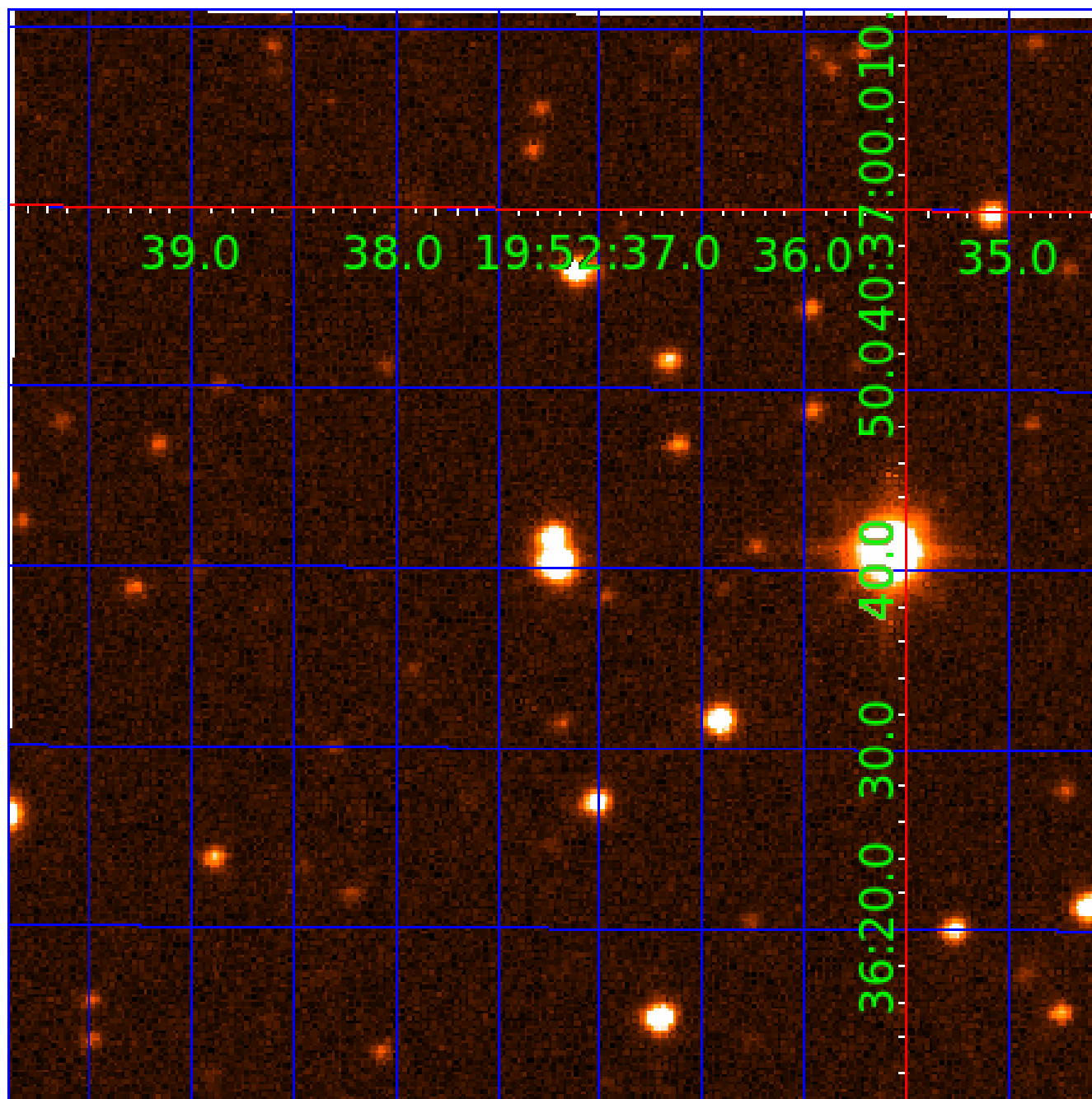
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

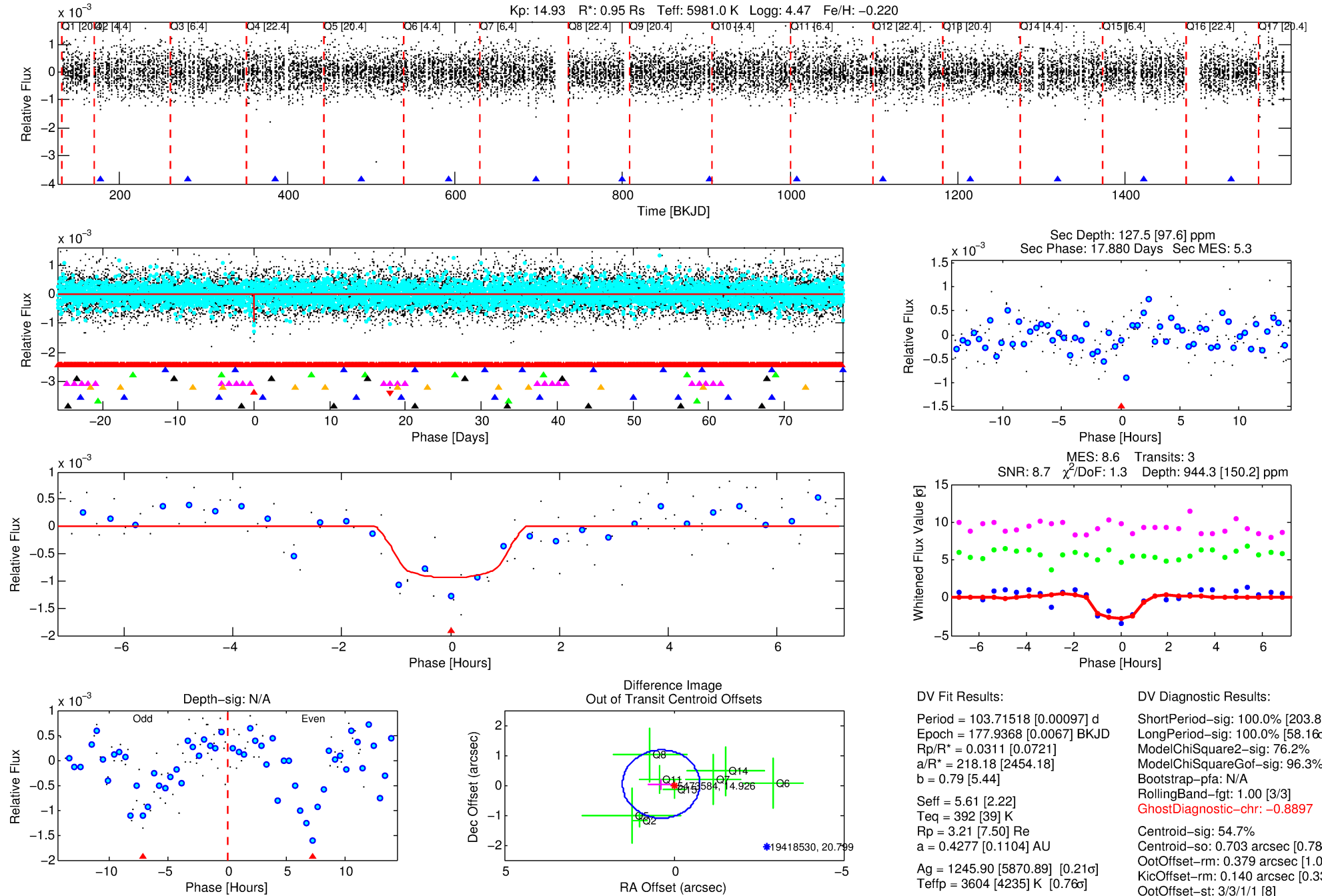
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-07

No Significant Match Found

# DV One-Page Summary

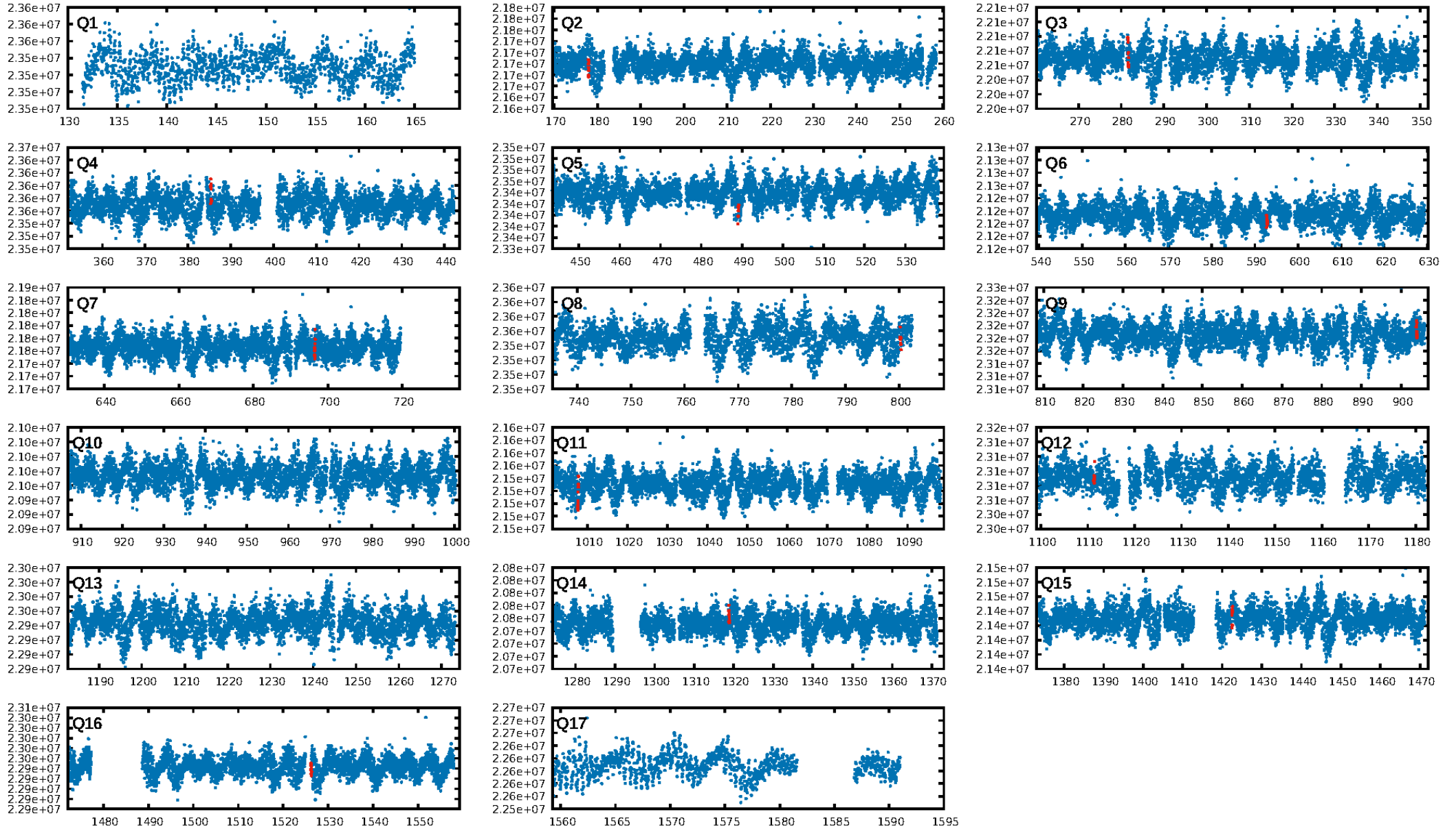
KIC: 5473584 Candidate: 7 of 10 Period: 103.715 d



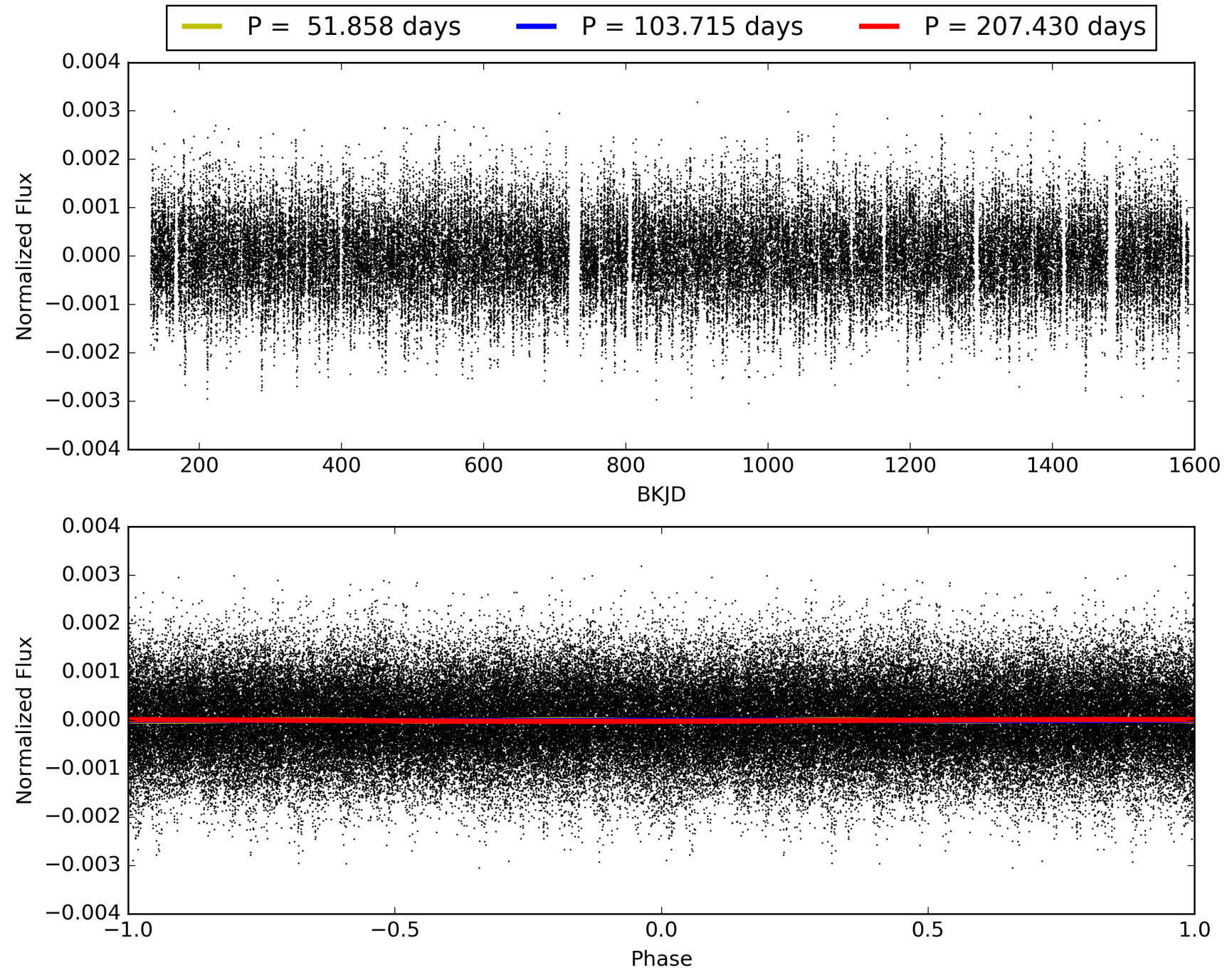
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:09:14 Z

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

# TCE 005473584-07, PDC Light Curves

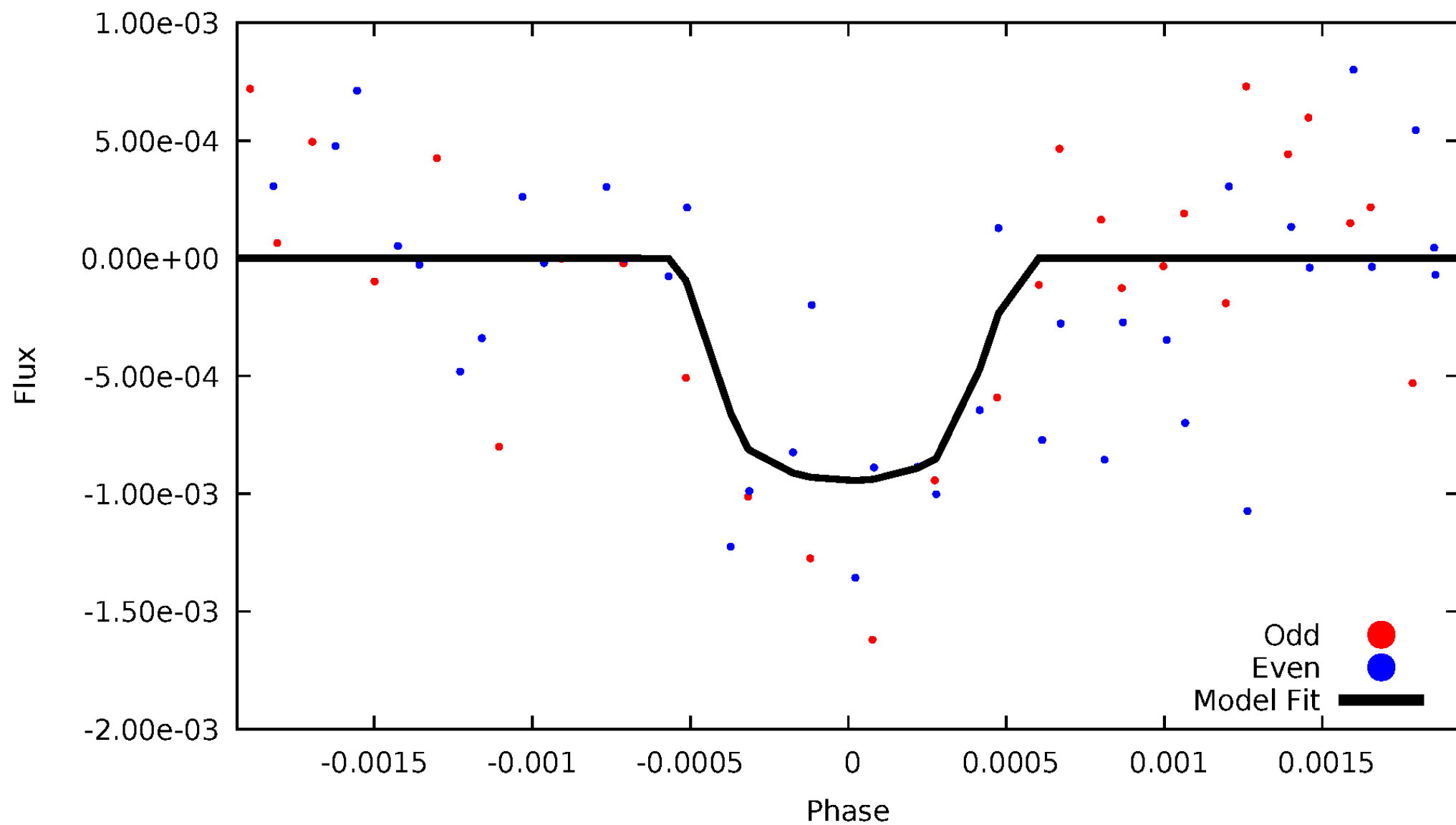


# TCE 005473584-07



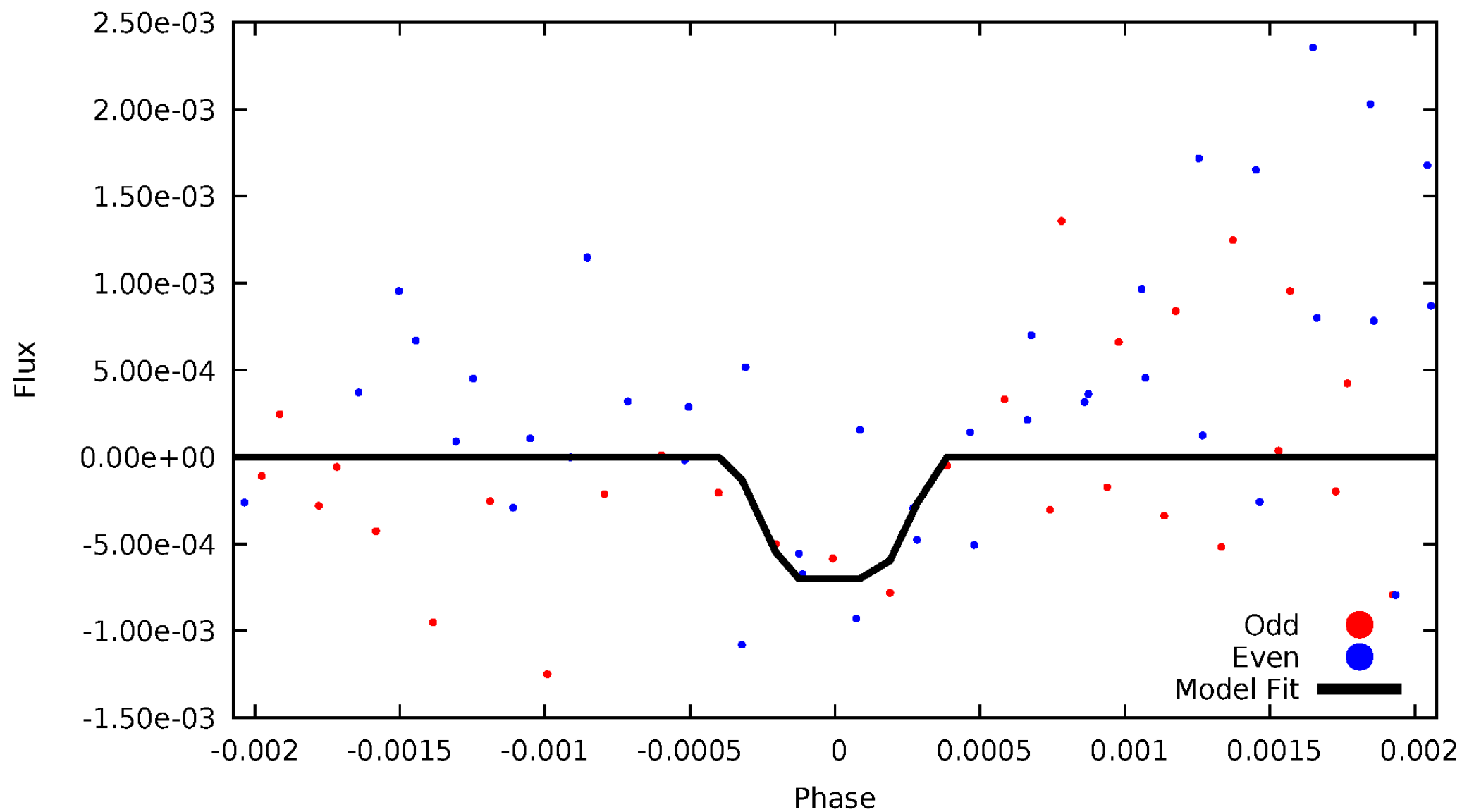
# DV Odd/Even

TCE 005473584-07



# ALT Odd/Even

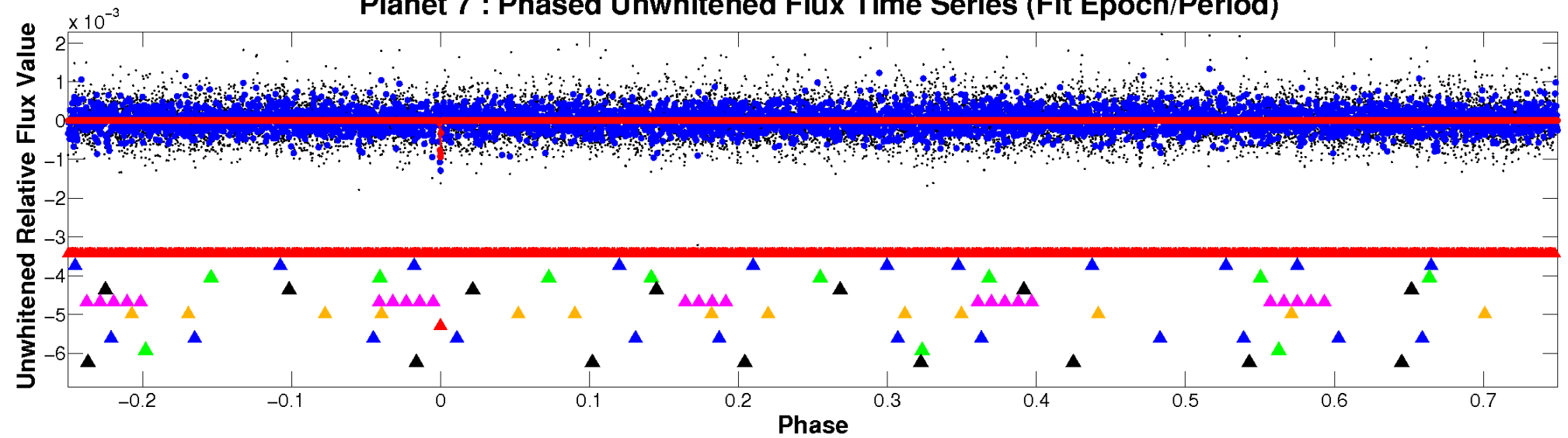
TCE 005473584-07



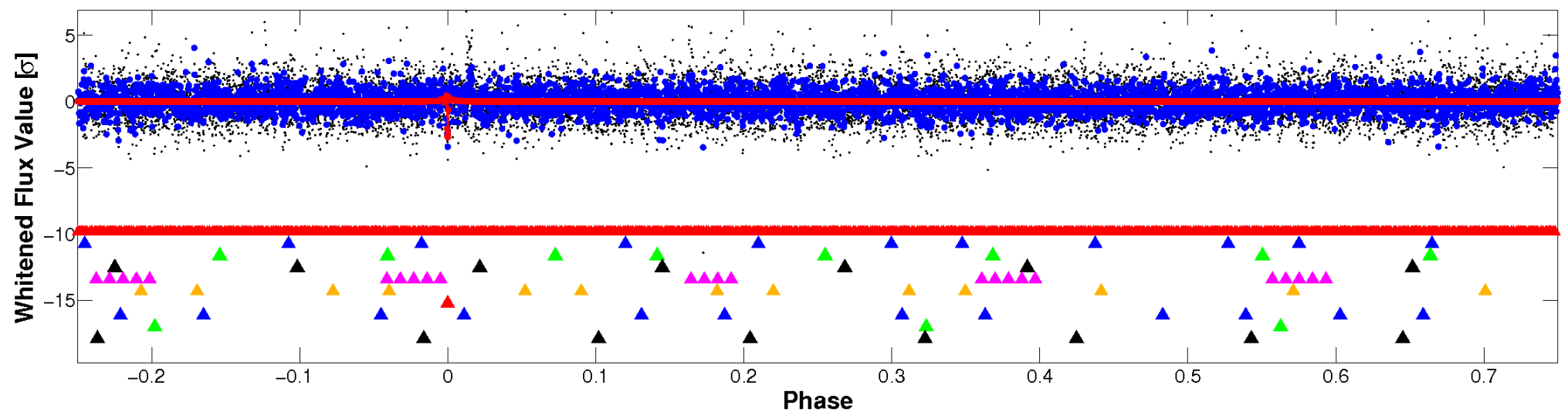


# Non-Whitened Vs. Whitened Light Curve

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



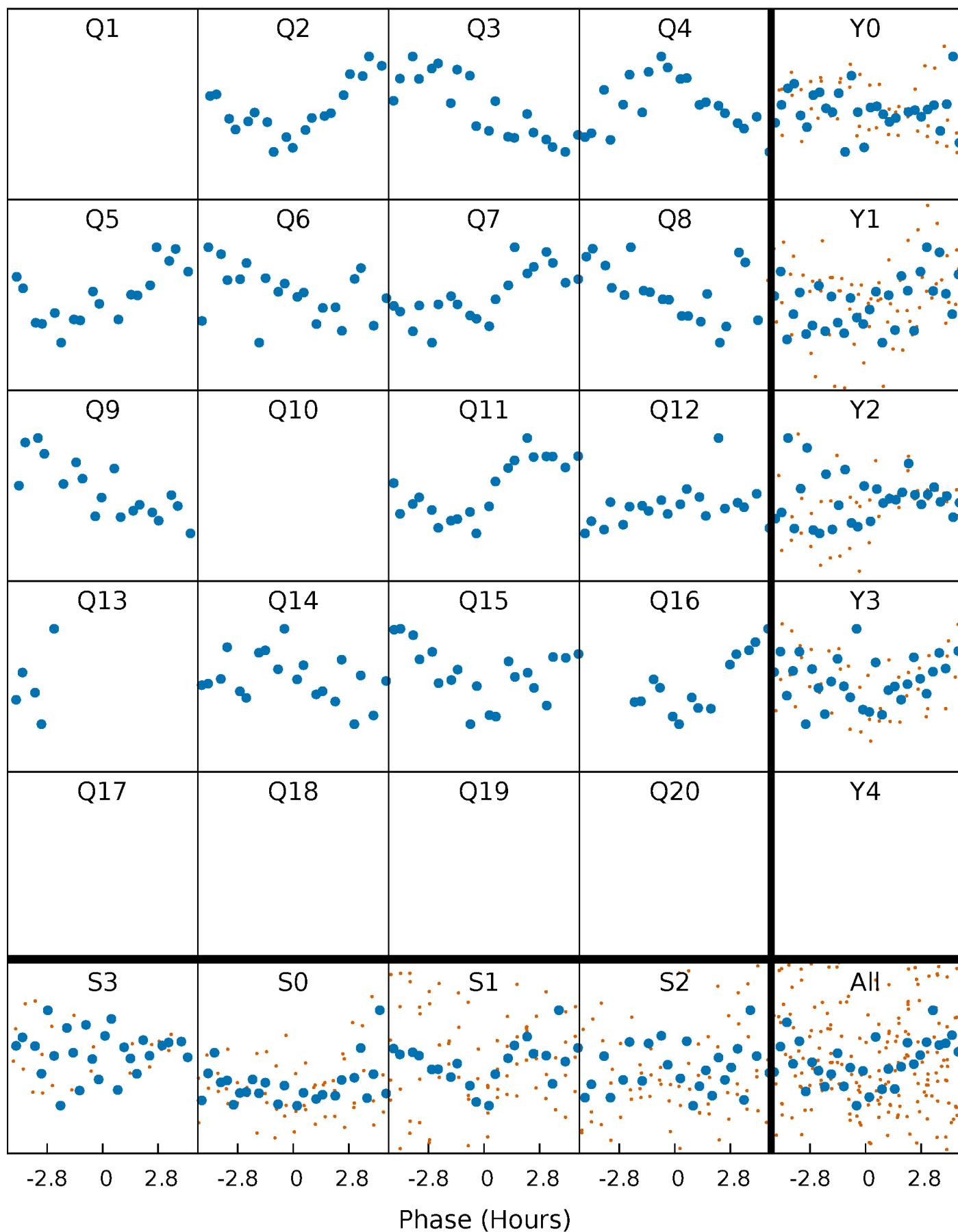
## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)





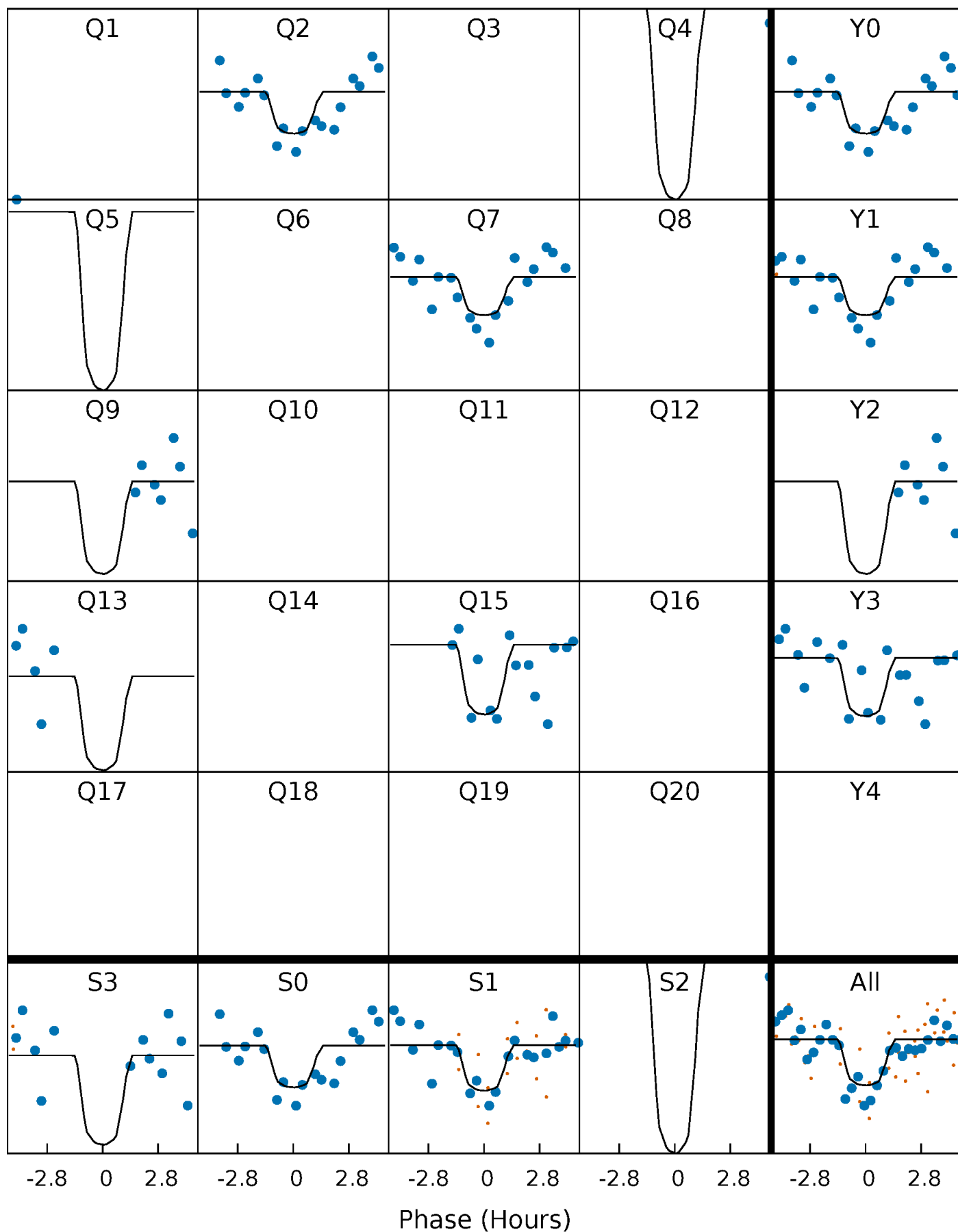
# PDC Quarter-Phased Transit Curves

TCE 005473584-07 P=103.715178 Days  $T_0=177.936830$  (BKJD)



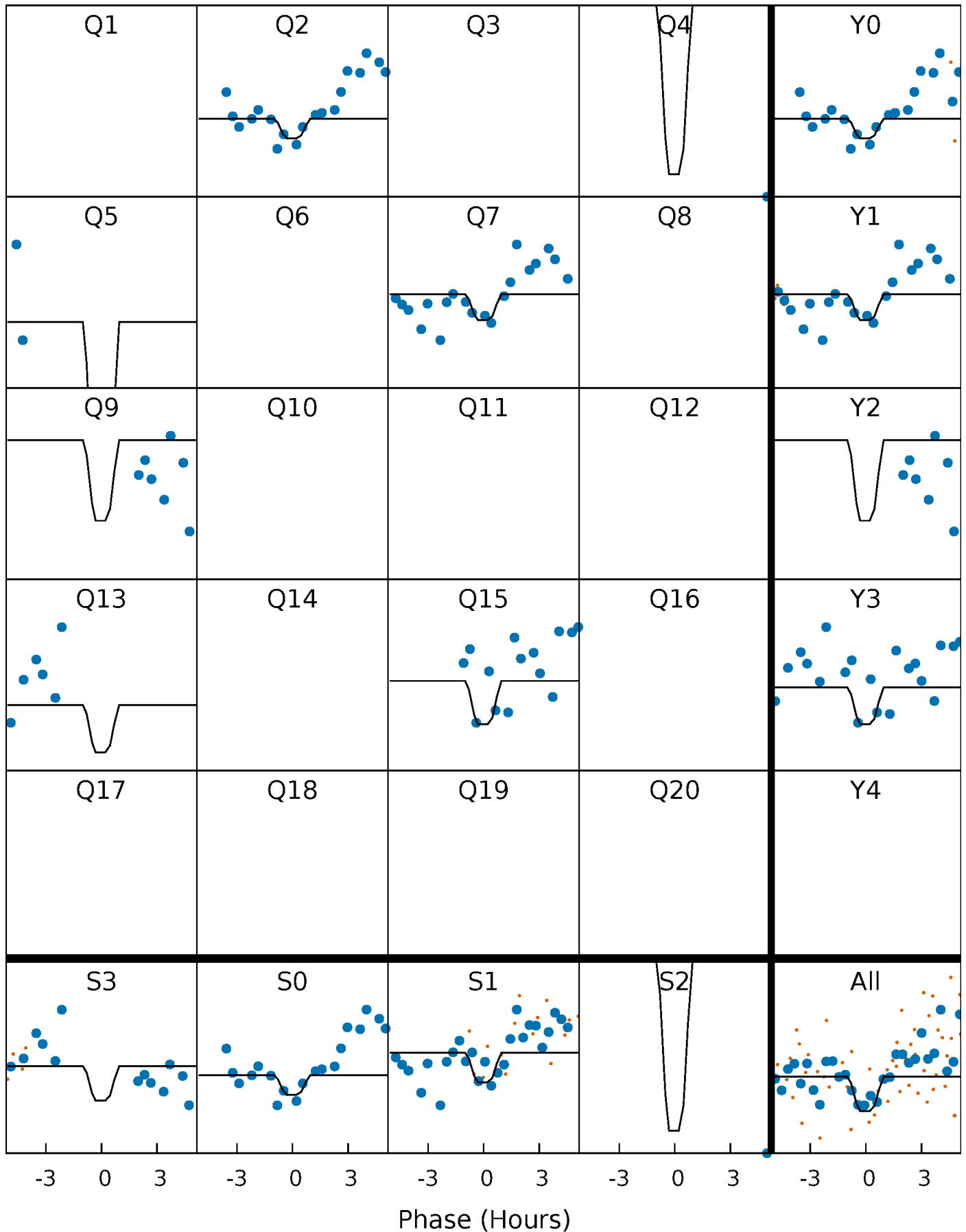
# DV Quarter-Phased Transit Curves

TCE 005473584-07 P=103.715178 Days  $T_0=177.936830$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

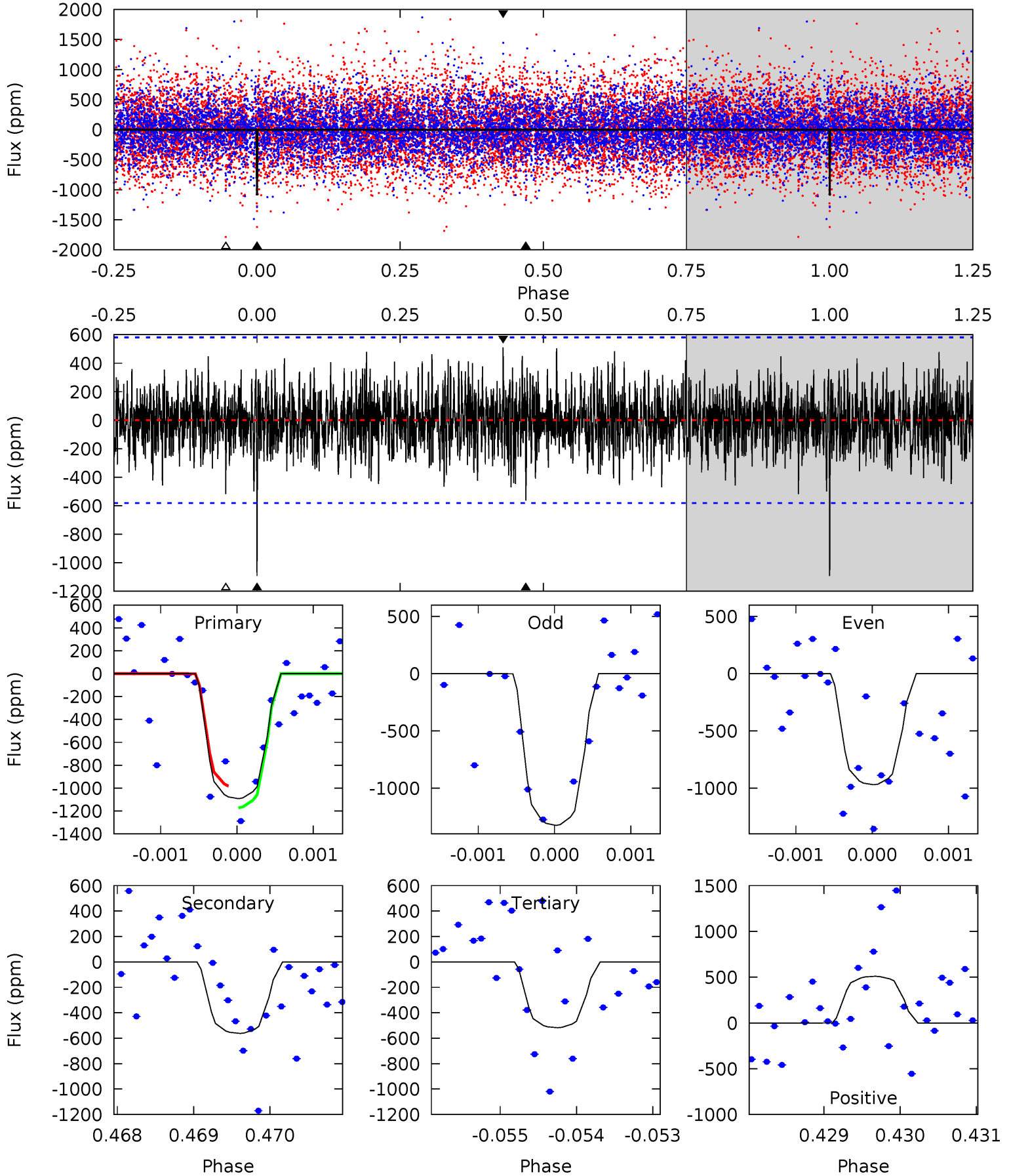
TCE 005473584-07 P=103.713871 Days  $T_0=177.931600$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-07, P = 103.715178 Days, E = 74.221652 Days

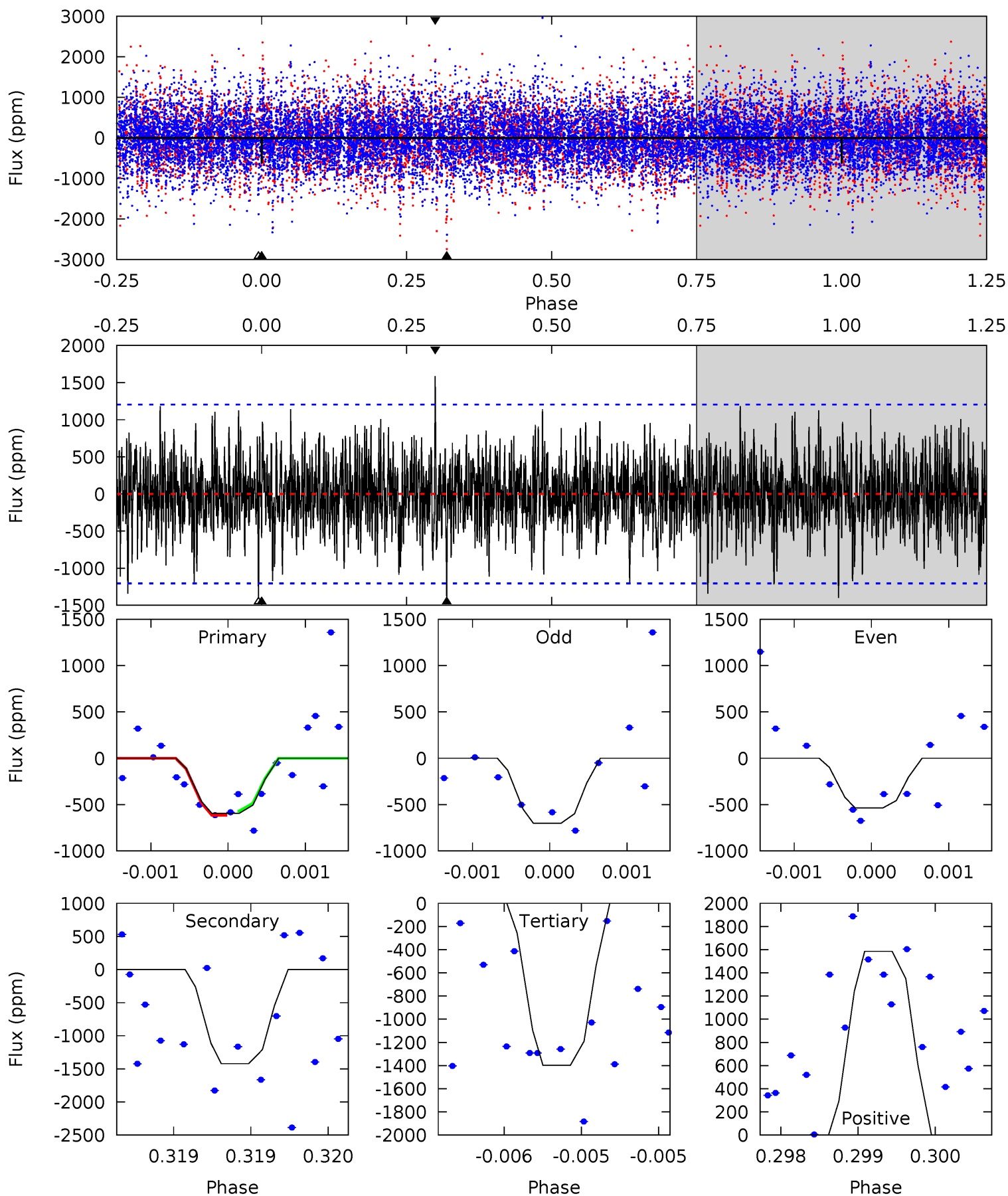
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	5.27	4.85	4.78	5.44	3.28	1.46	5.39	5.46	0.42	0.49	1.66	0.93	0.32	0.89



# Alt Model-Shift Uniqueness Test

005473584-07, P = 103.713871 Days, E = 74.217729 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.73	6.54	6.43	7.29	5.54	3.44	1.70	-3.70	-4.56	0.11	-0.75	0.37	0.84	0.53	0.10



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-562±107	$6.36^{+6.69}_{-3.99}$	$559^{+42}_{-29}$	$4024^{+2271}_{-787}$	$1308^{+8853}_{-988}$
Alt.	-1421±217	$6.51^{+6.17}_{-4.50}$	$562^{+40}_{-31}$	$4872^{+4302}_{-1072}$	$3374^{+31320}_{-2497}$

$T_{max}$  = 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

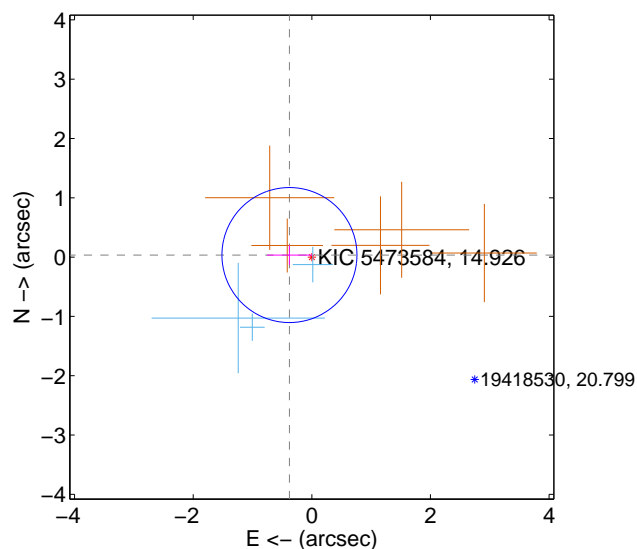
Supplemental centroid analysis for 005473584-07. Kepler magnitude: 14.93. Transit SNR 8.66

There are 3 quarters with good PRF difference image offsets

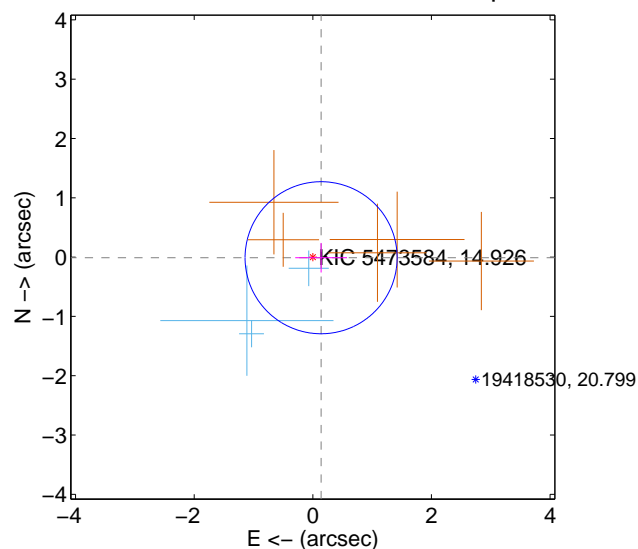
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.379 \pm 0.379$	1.00	$0.377 \pm 0.381$	$0.035 \pm 0.165$
PRF-fit source offset from KIC position	$0.140 \pm 0.427$	0.33	$-0.140 \pm 0.436$	$-0.011 \pm 0.248$
photometric centroid source offset	$0.70 \pm 0.90$	0.78	$-0.68 \pm 0.91$	$-0.18 \pm 0.78$

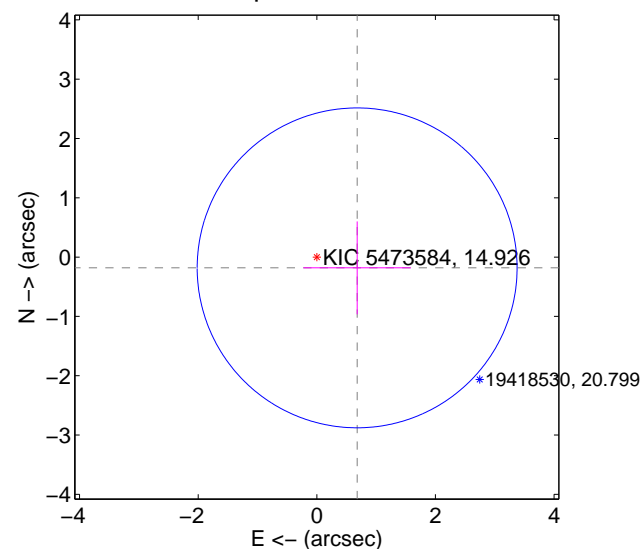
offset from difference PRF-fit to OOT PRF-fit



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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.

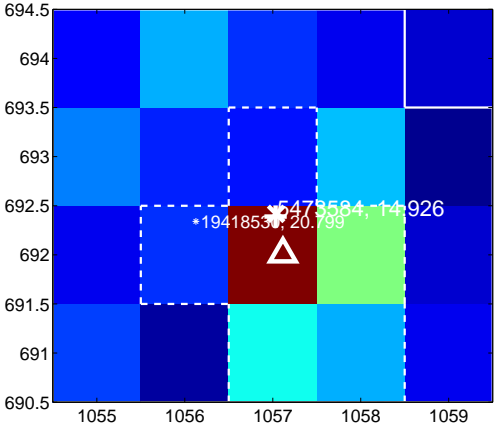
Q1 no difference image



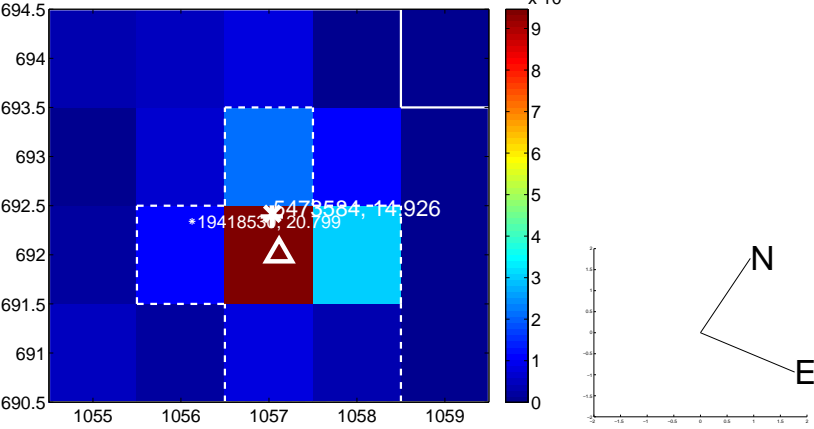
Q1 no OOT image



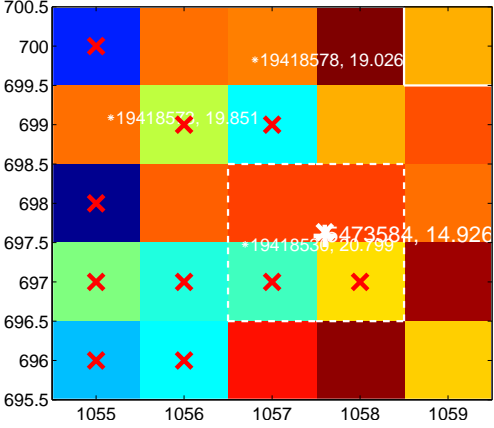
Q2 difference image



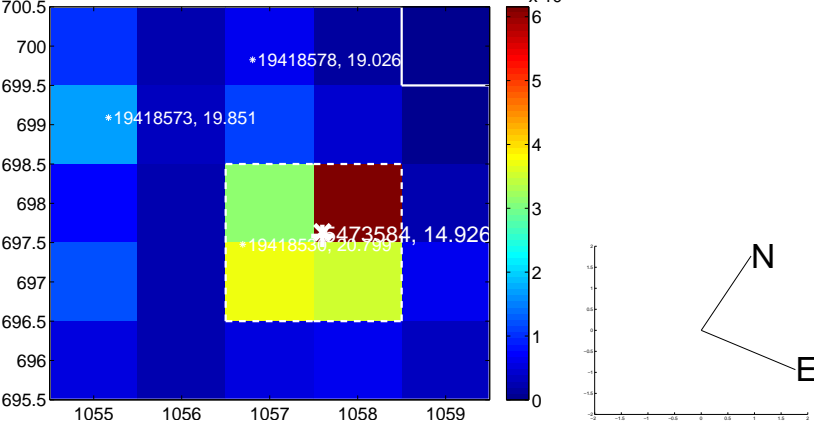
Q2 OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image

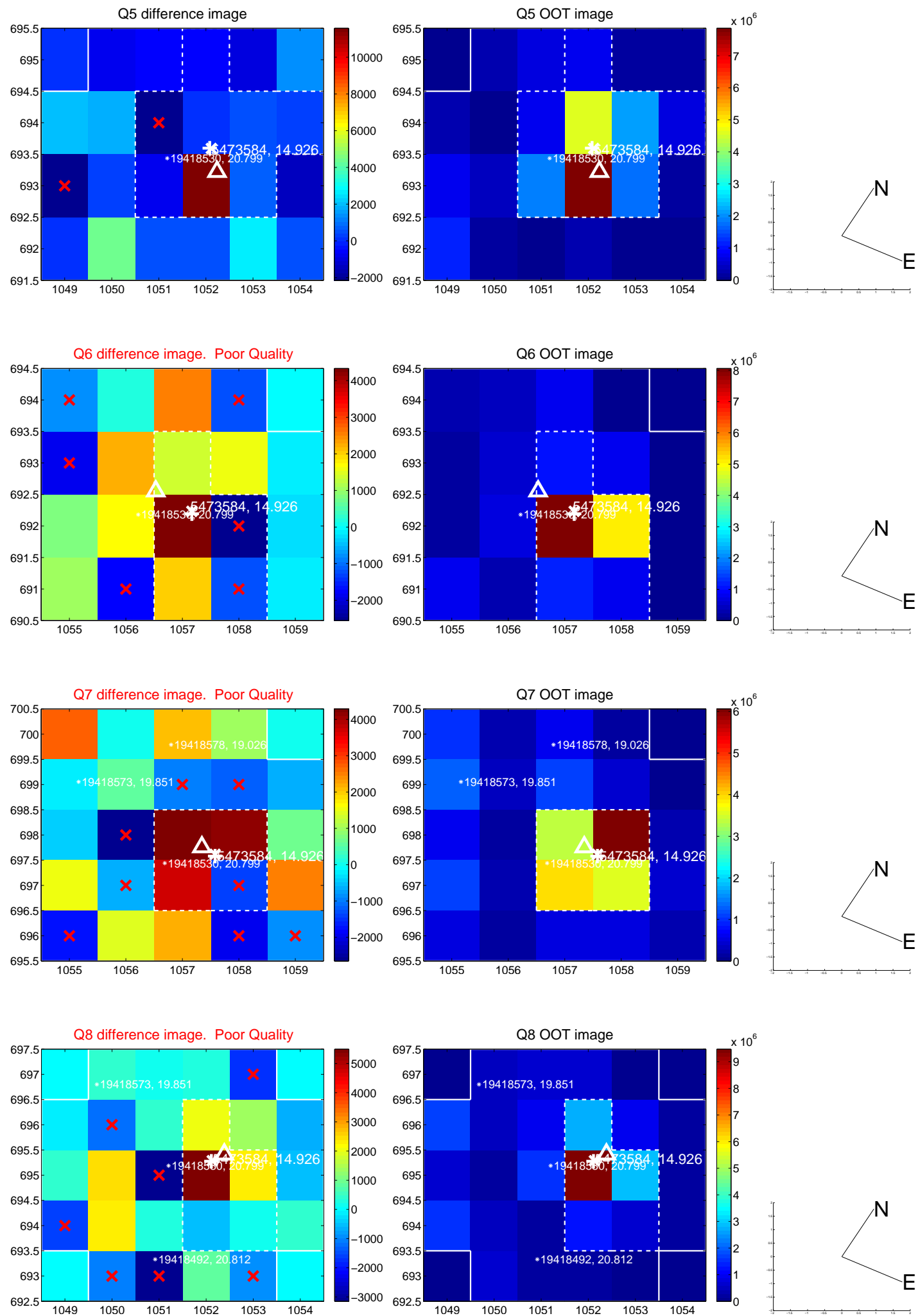


Q4 no OOT image

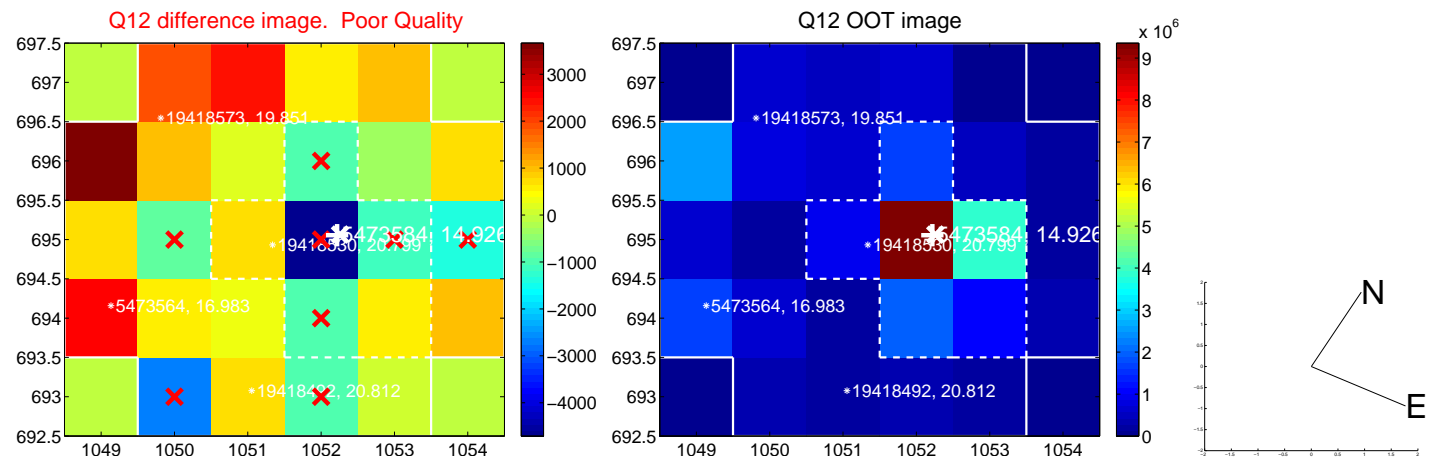
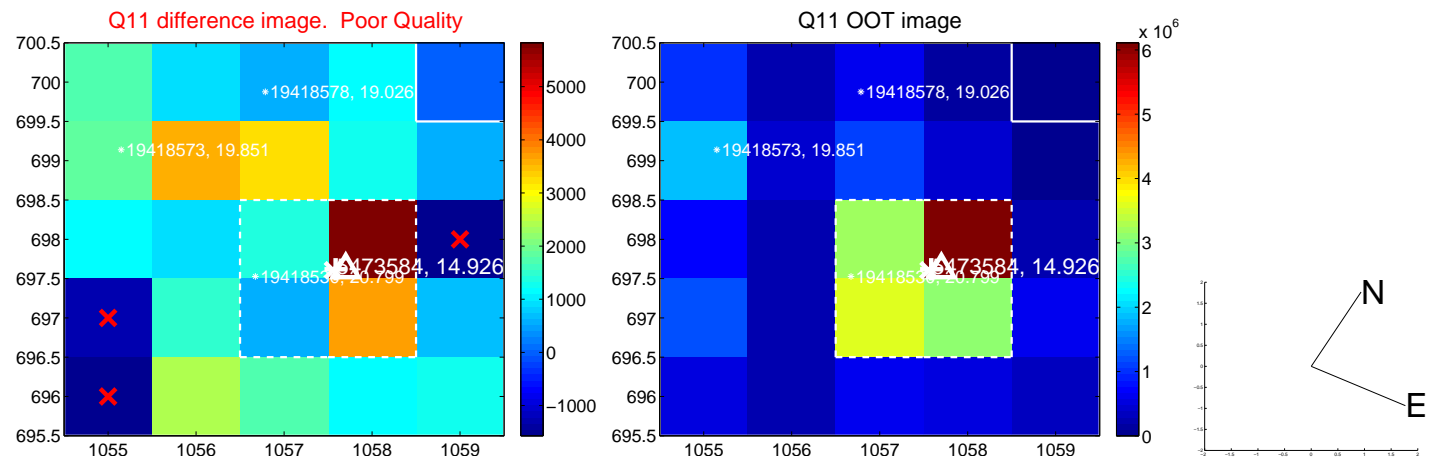
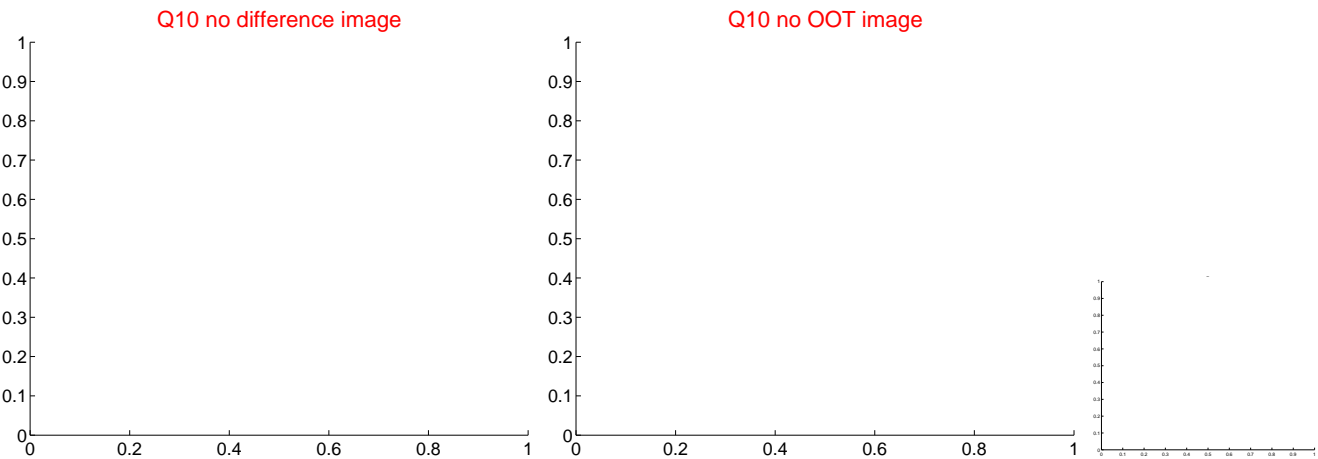
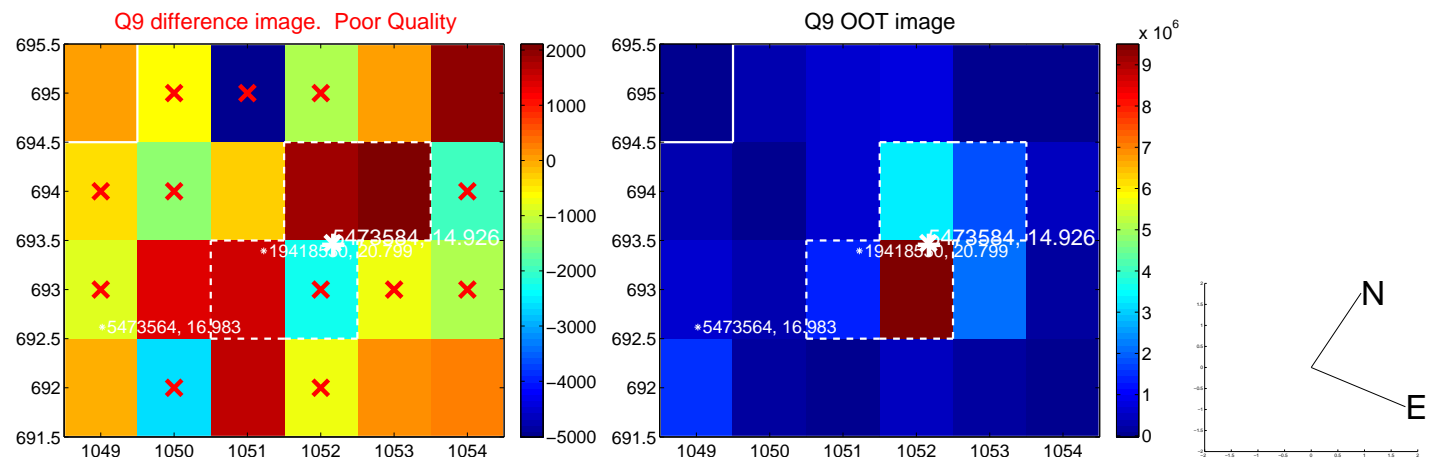




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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

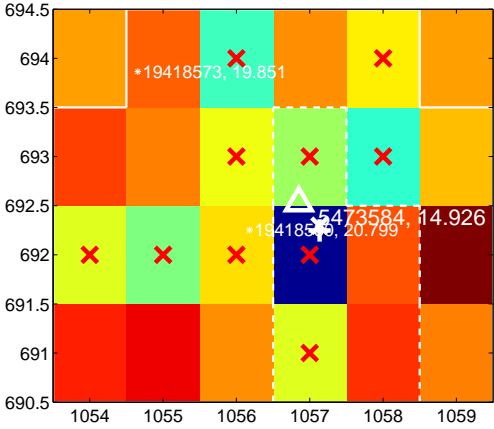
Q13 no difference image



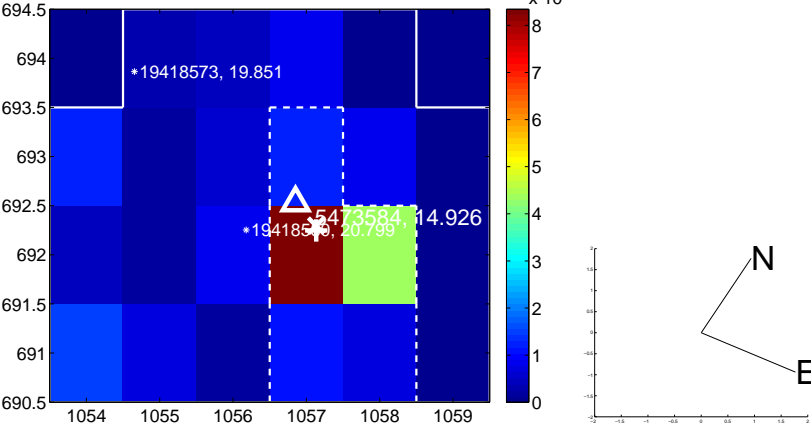
Q13 no OOT image



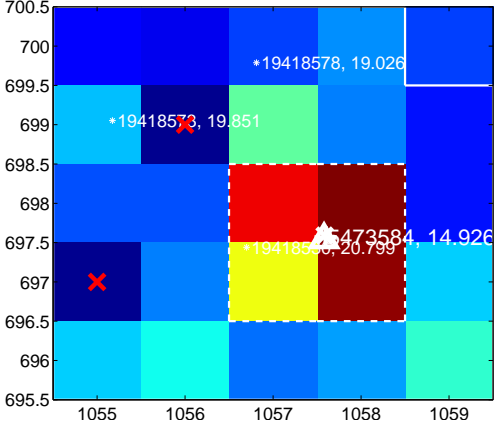
Q14 difference image. Poor Quality



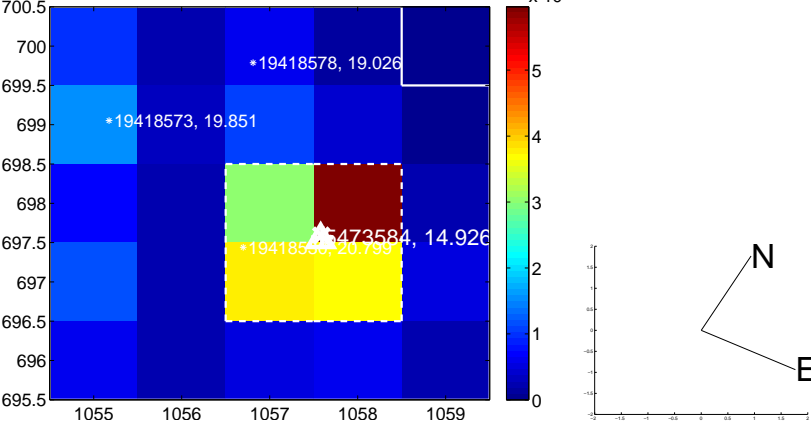
Q14 OOT image



Q15 difference image



Q15 OOT image



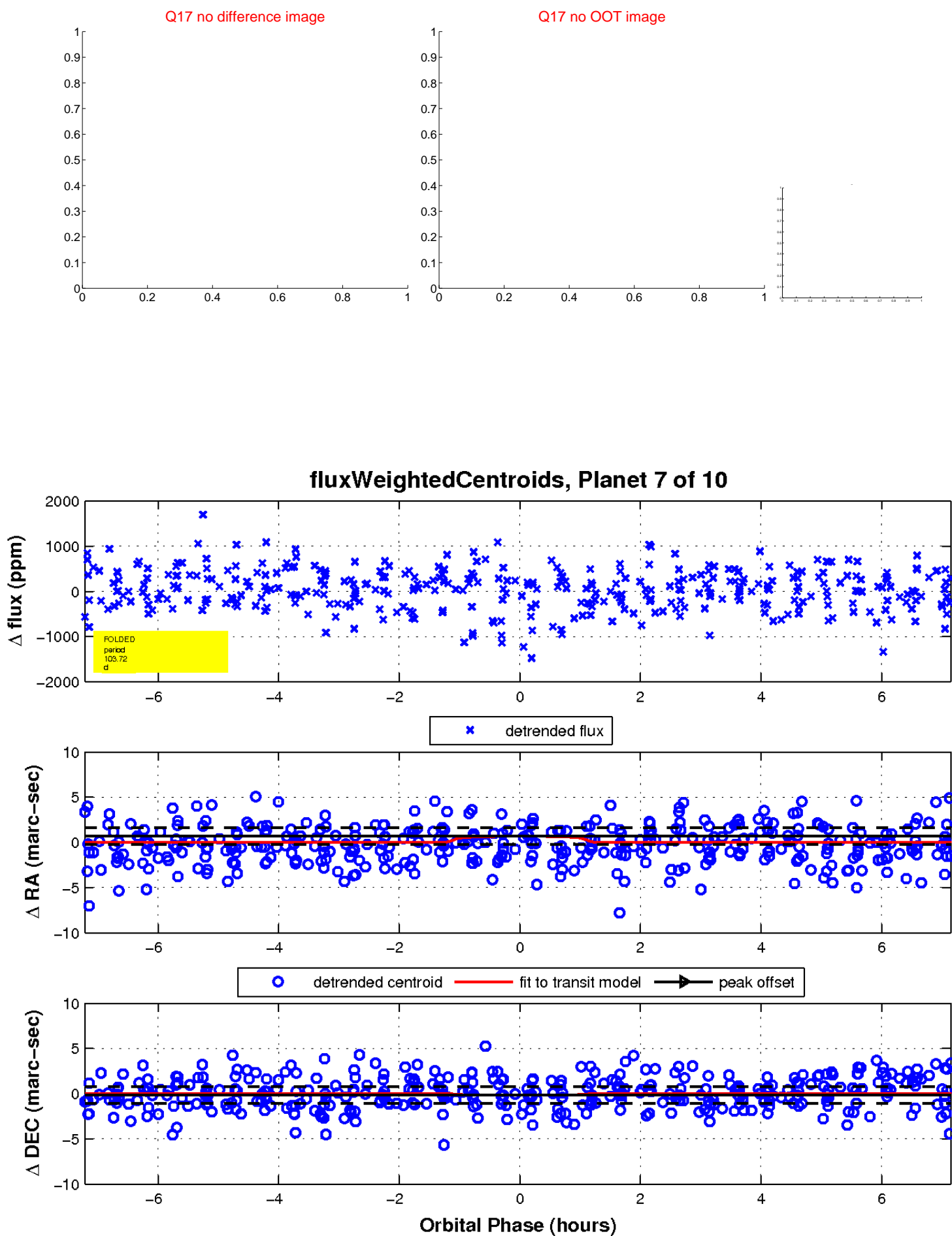
Q16 no difference image



Q16 no OOT image

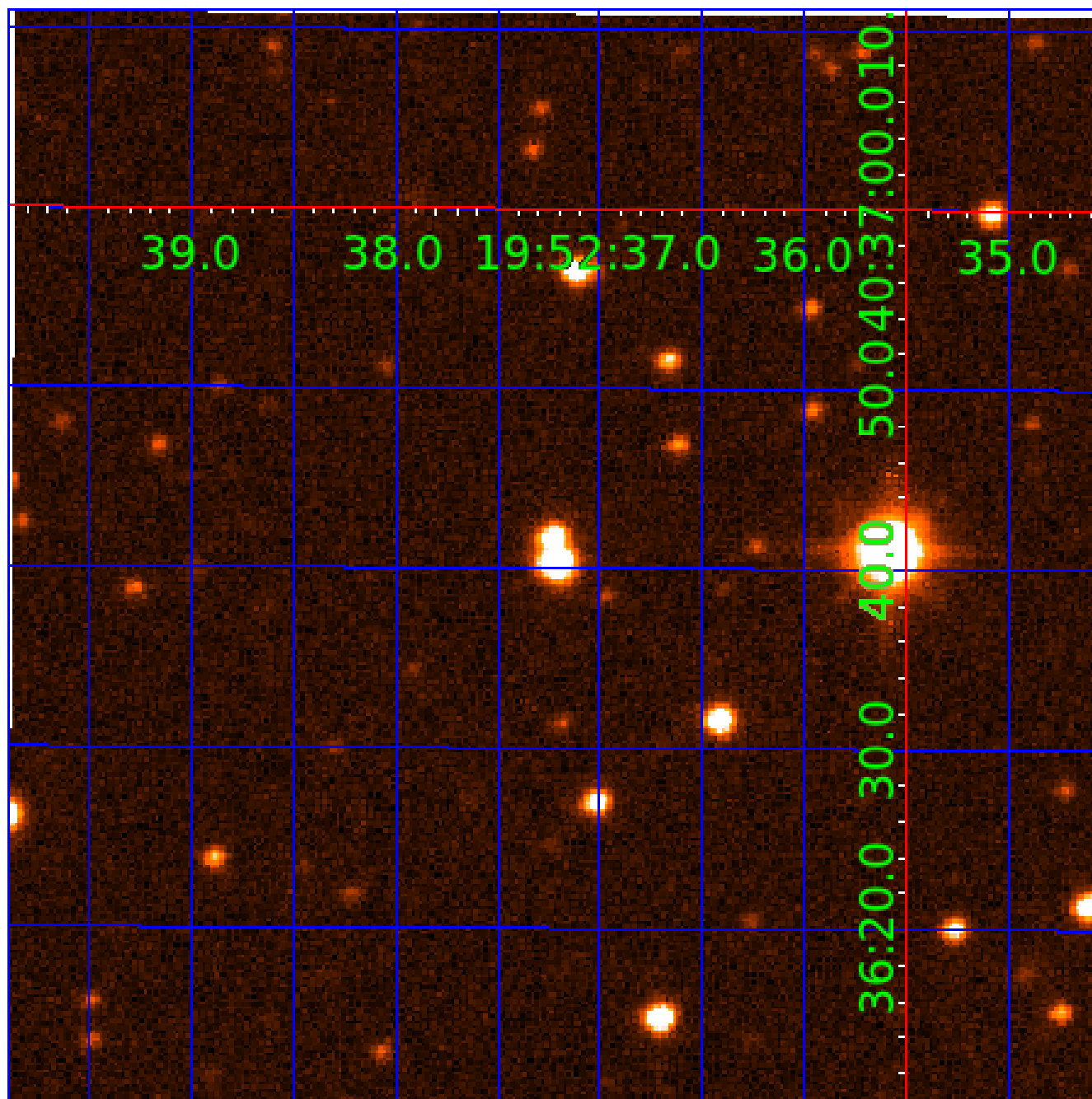


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

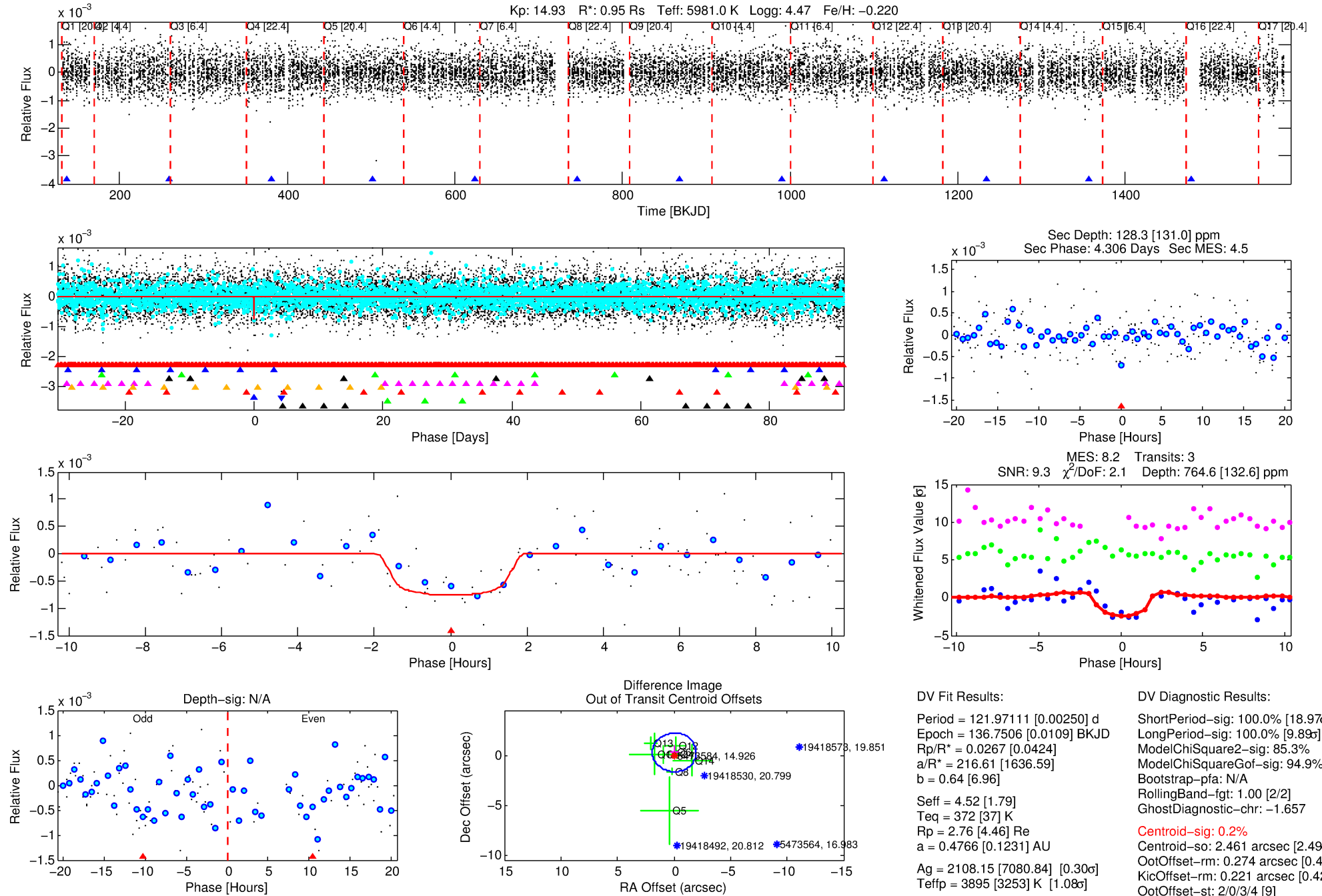
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-08

No Significant Match Found

# DV One-Page Summary

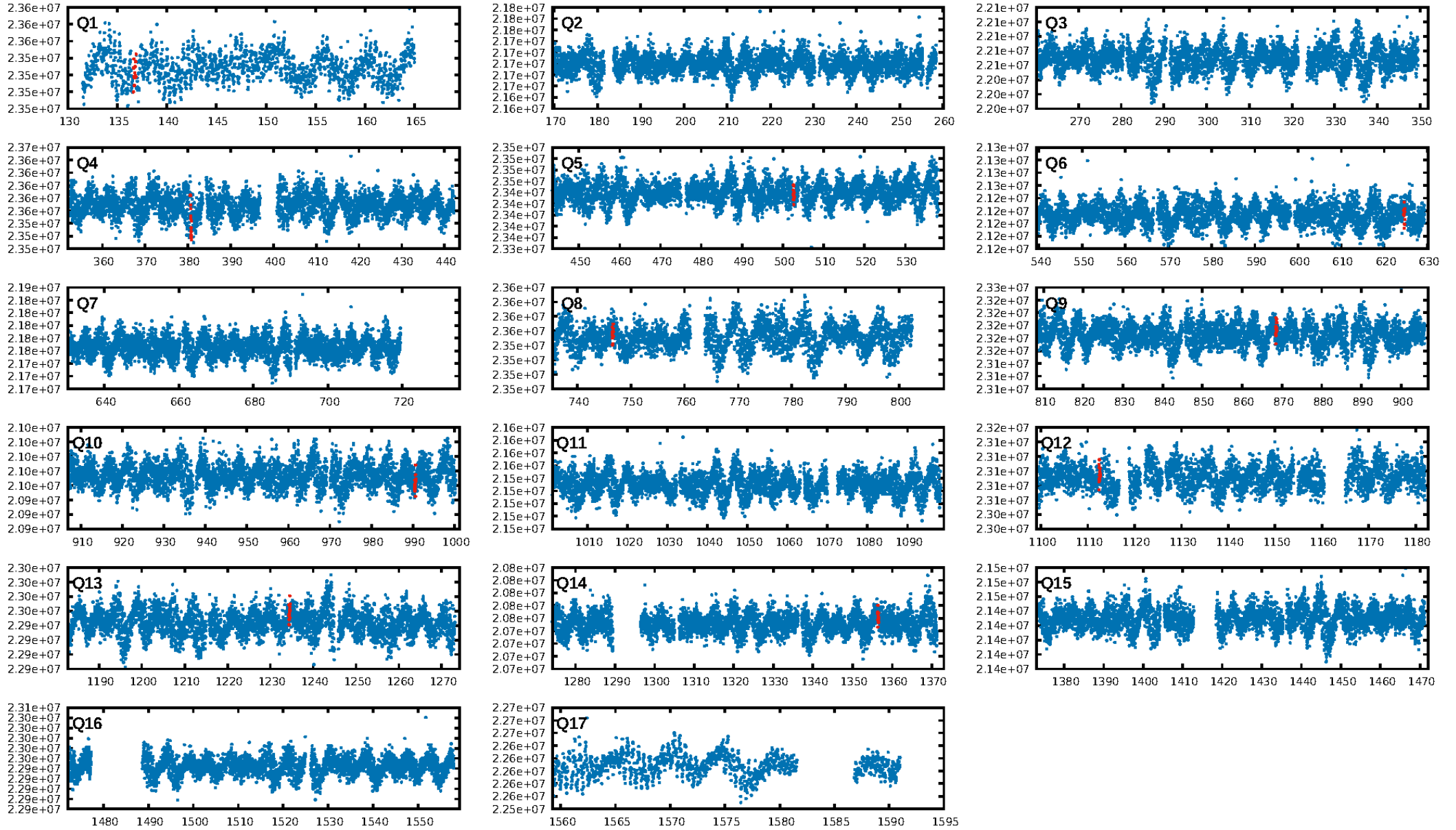
KIC: 5473584 Candidate: 8 of 10 Period: 121.971 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:09:18 Z

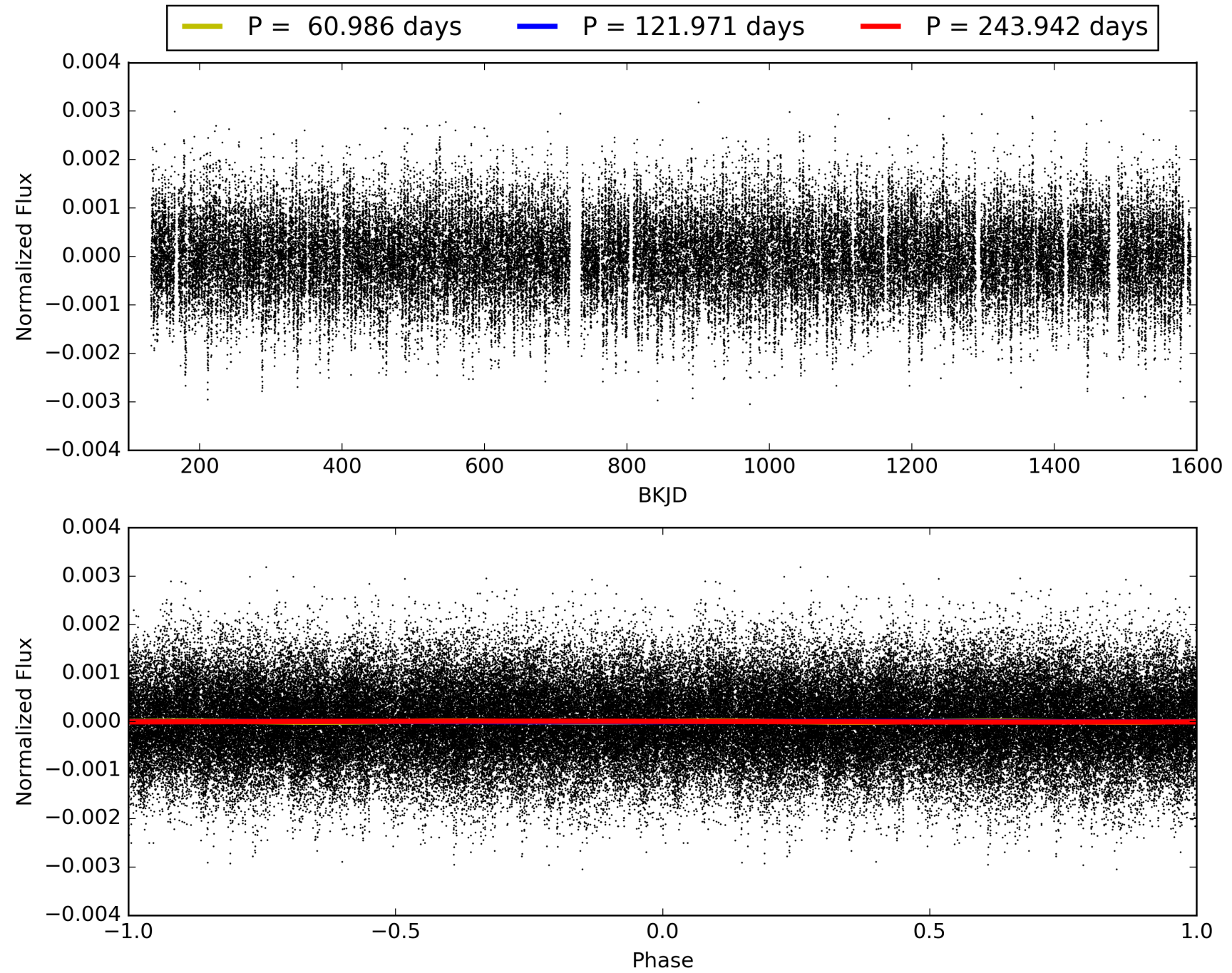
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005473584-08, PDC Light Curves



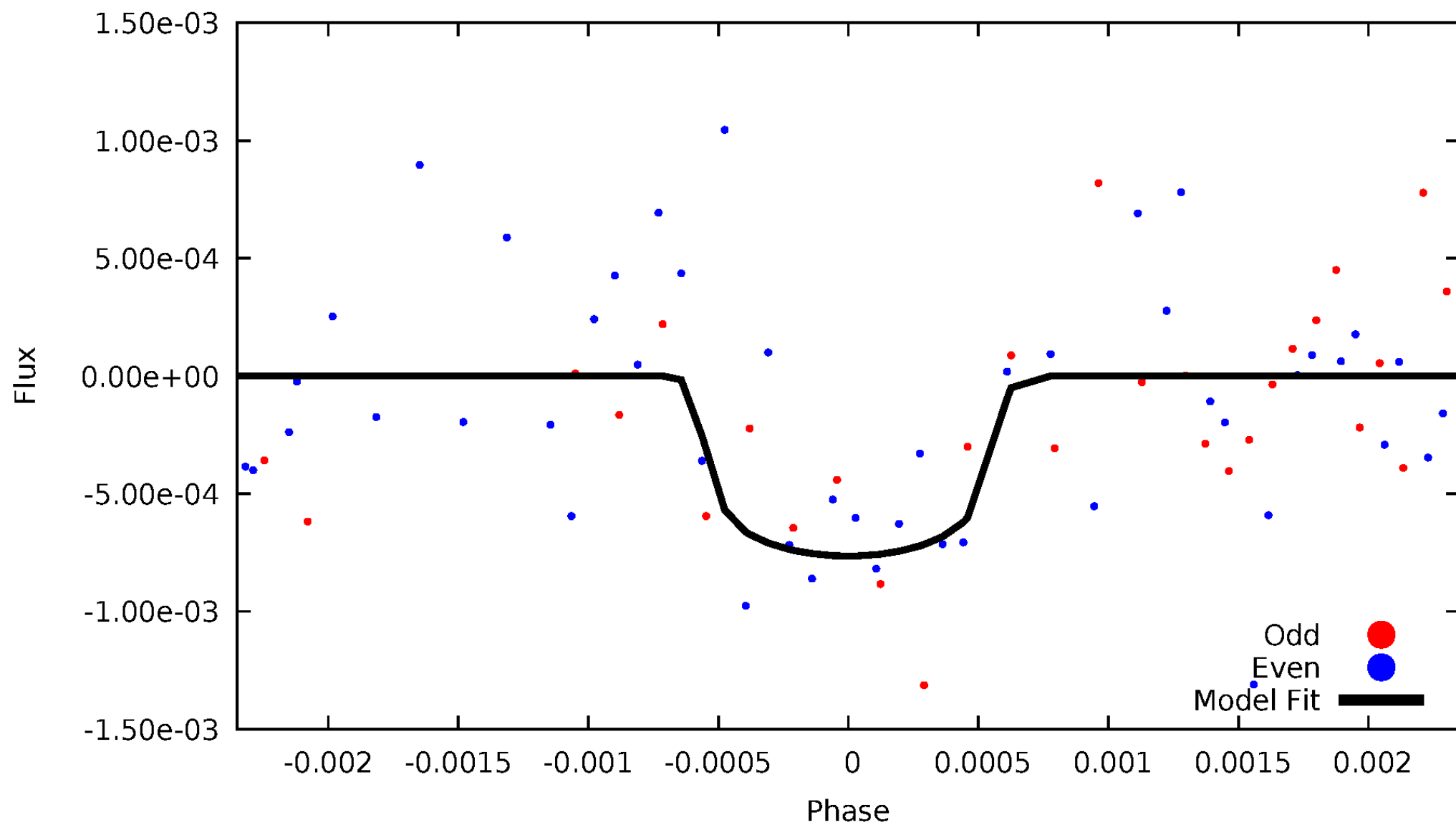


TCE 005473584-08



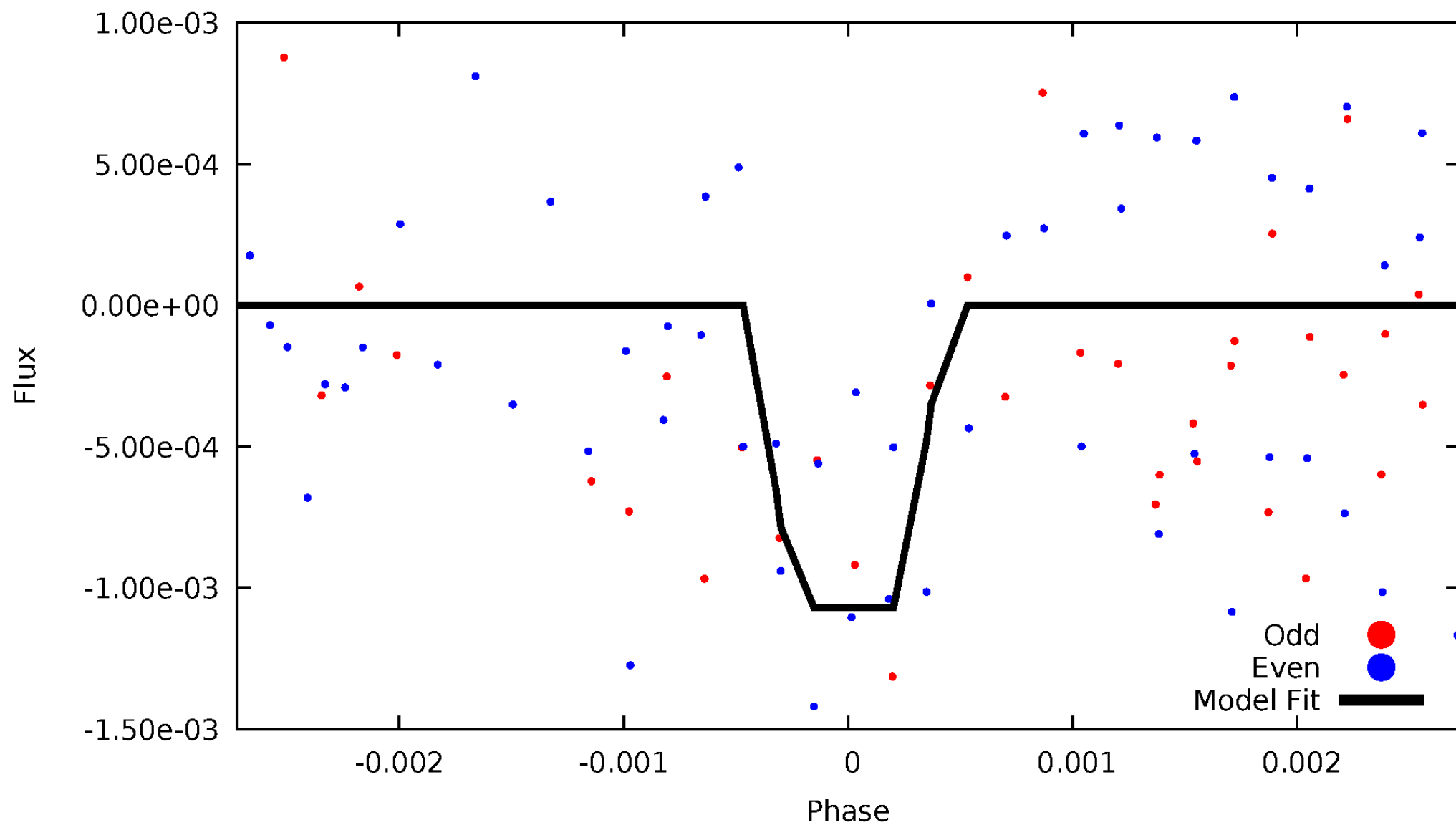
# DV Odd/Even

TCE 005473584-08



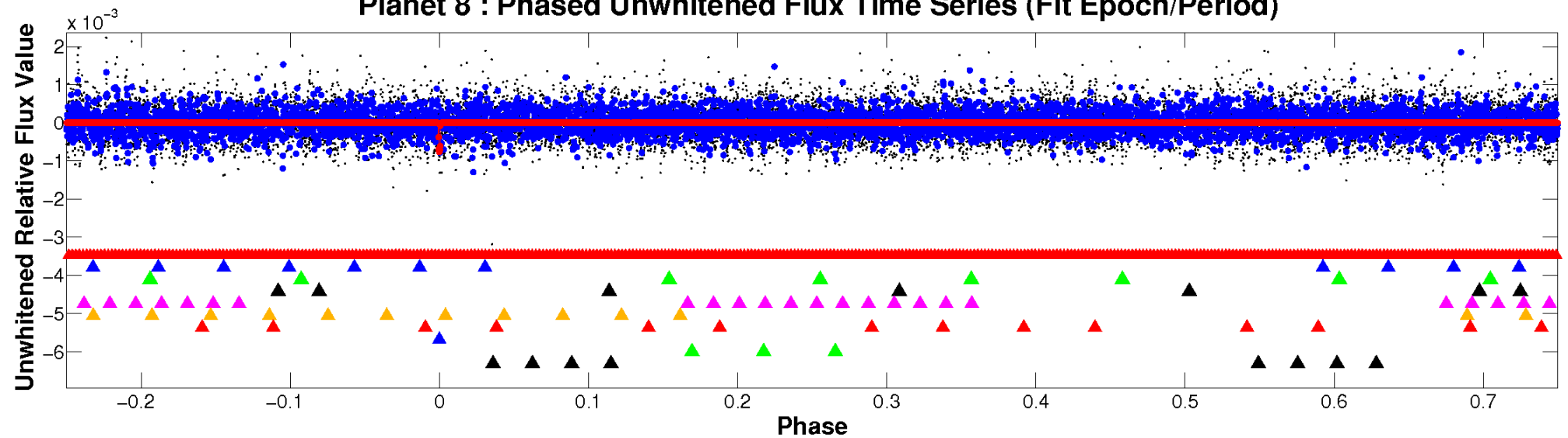
# ALT Odd/Even

TCE 005473584-08

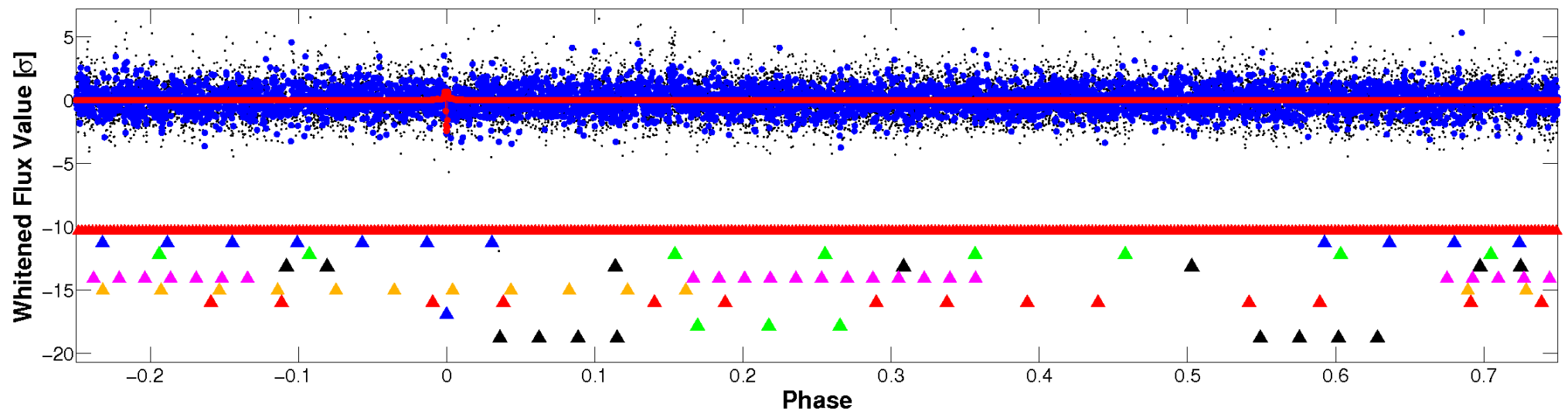


# Non-Whitened Vs. Whitened Light Curve

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

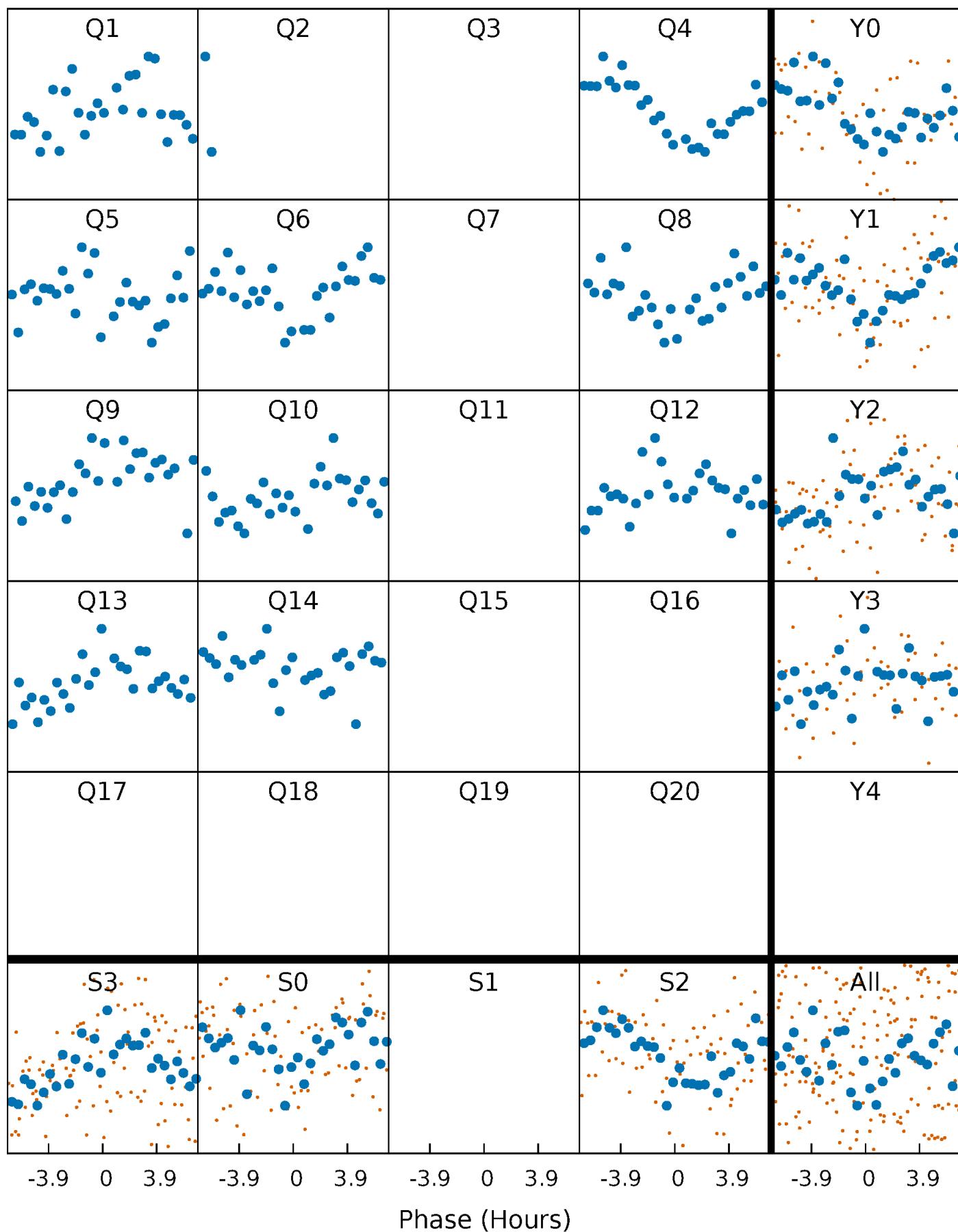


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



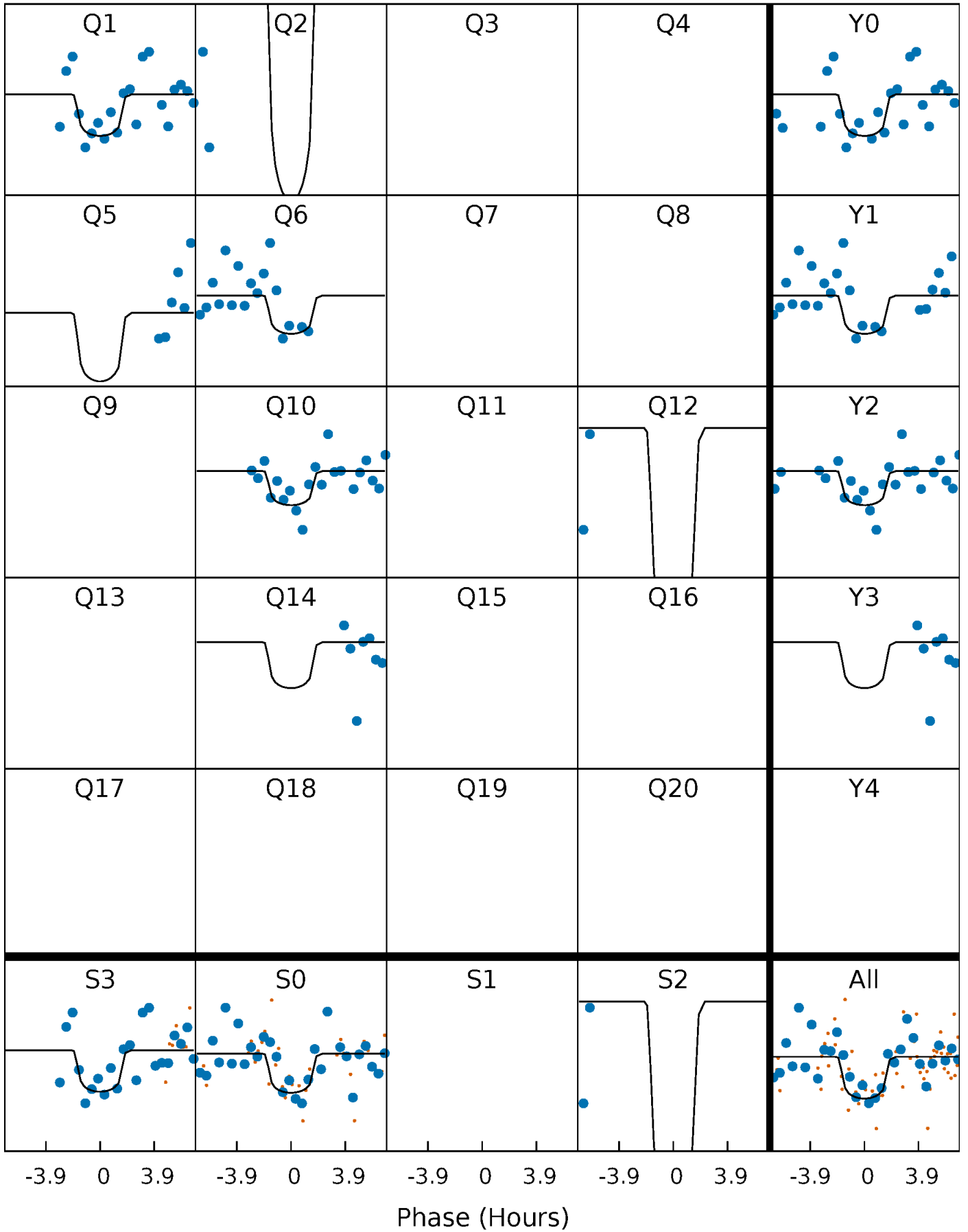
# PDC Quarter-Phased Transit Curves

TCE 005473584-08 P=121.971110 Days  $T_0=136.750593$  (BKJD)



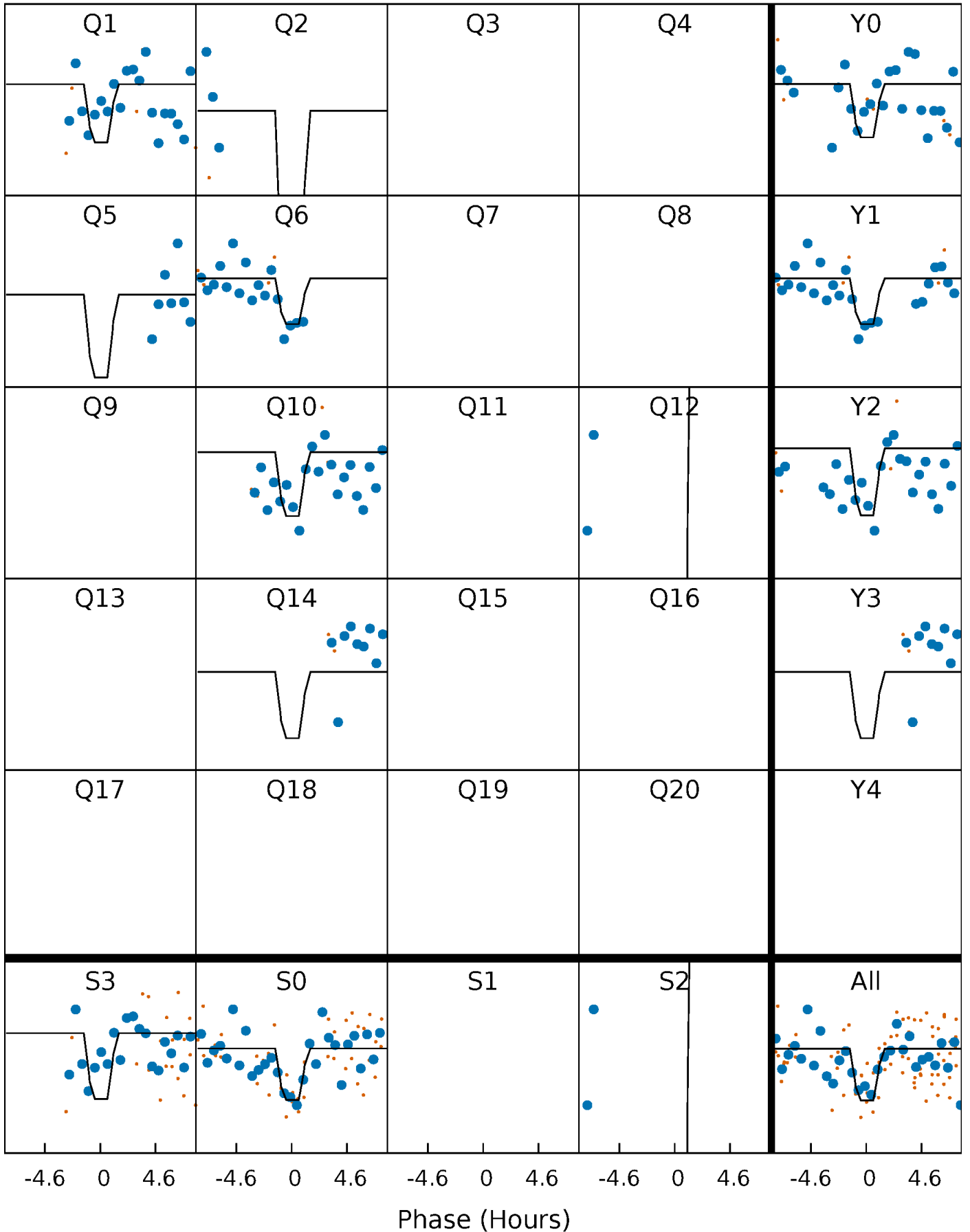
# DV Quarter-Phased Transit Curves

TCE 005473584-08 P=121.971110 Days  $T_0=136.750593$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

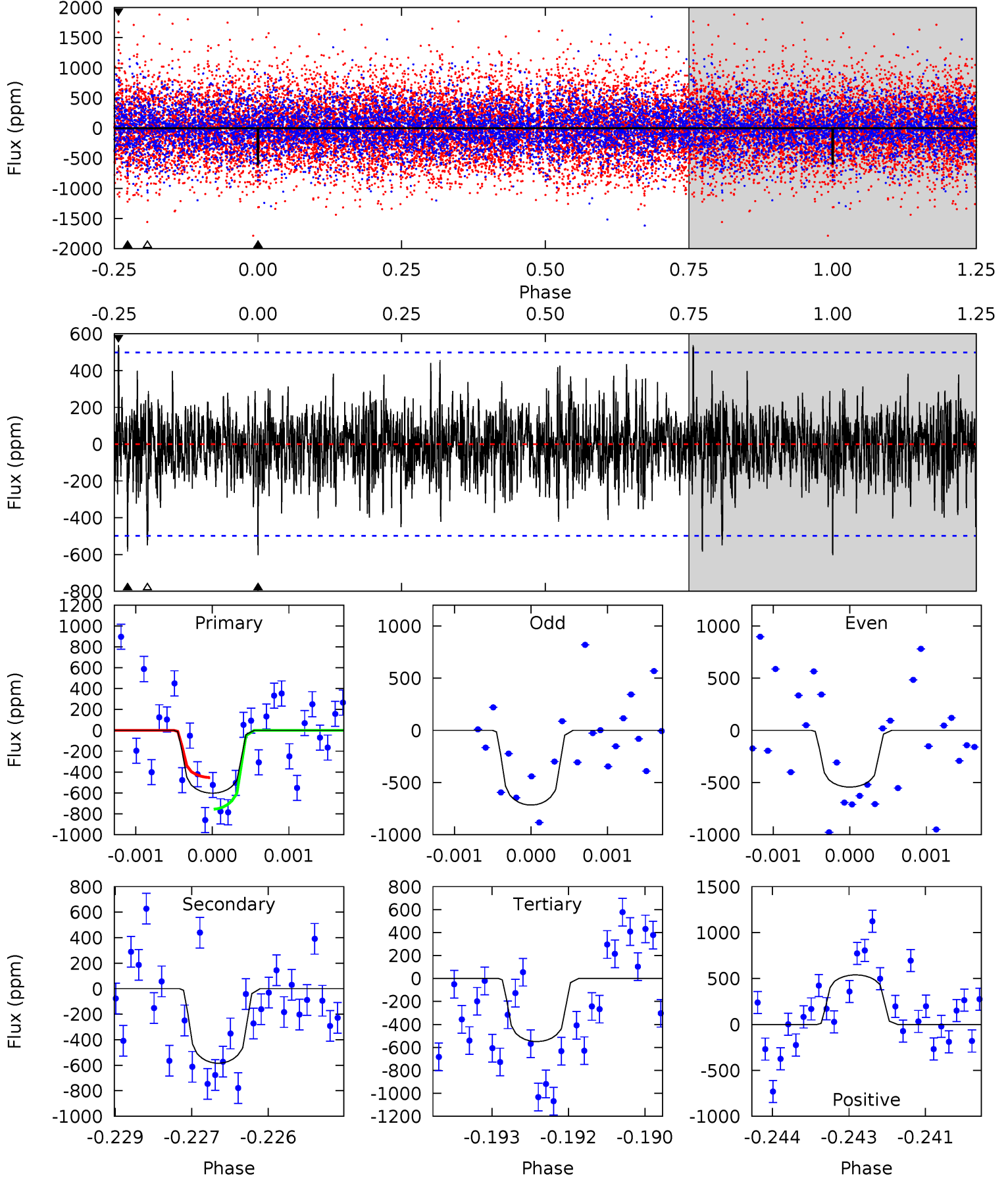
TCE 005473584-08 P=121.974391 Days  $T_0=136.739137$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-08,  $P = 121.971110$  Days,  $E = 14.779483$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.51	6.31	5.94	5.83	5.39	3.19	1.47	0.57	0.68	0.37	0.48	0.91	0.84	0.47	1.64

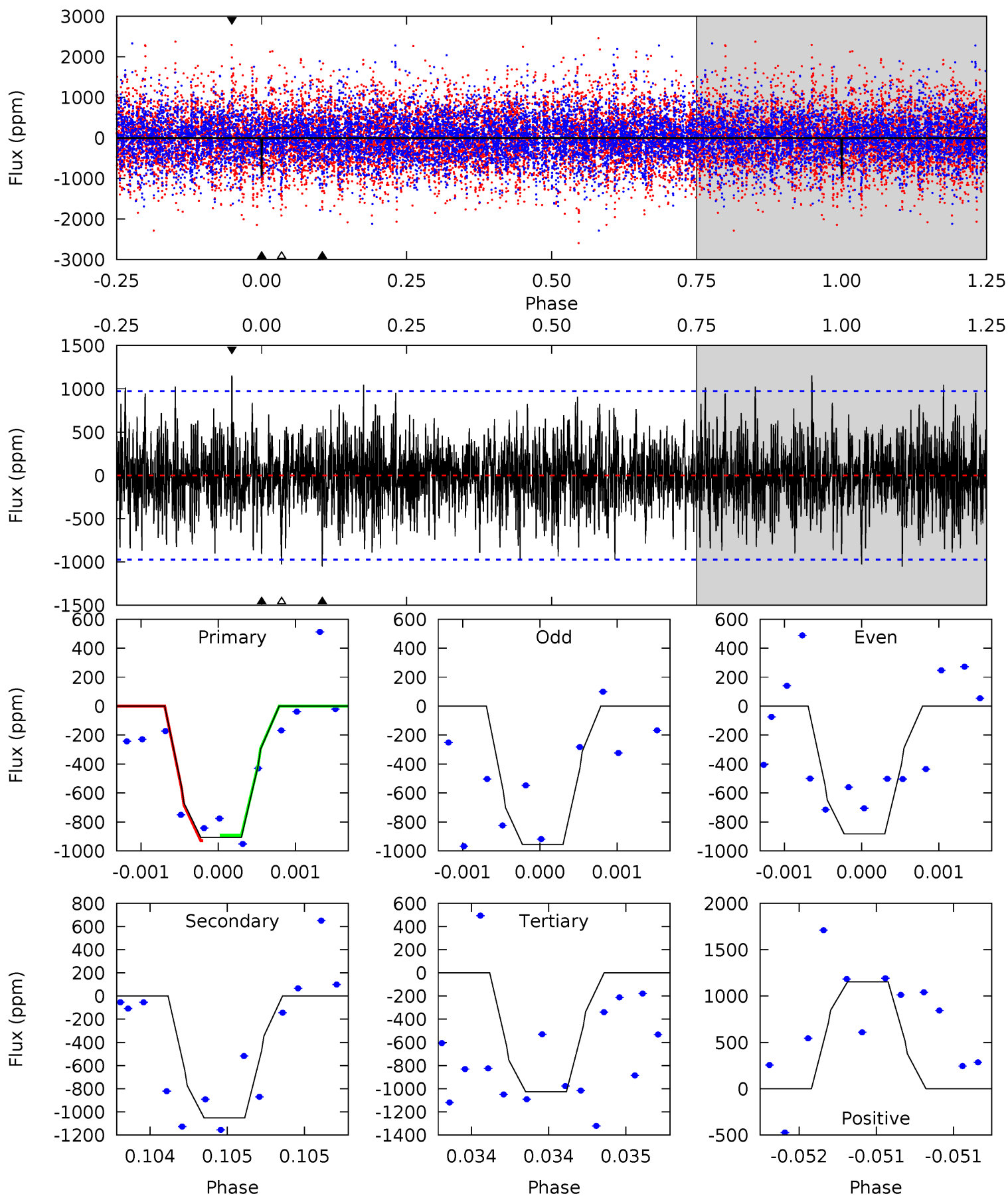




# Alt Model-Shift Uniqueness Test

005473584-08, P = 121.974391 Days, E = 14.764746 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.14	5.97	5.82	6.53	5.52	3.40	1.73	-0.68	-1.39	0.14	-0.57	0.19	0.95	0.52	0.10



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-584 \pm 93$	$4.62^{+4.10}_{-2.99}$	$529^{+39}_{-25}$	$4643^{+2917}_{-910}$	$3493^{+23217}_{-2499}$
Alt.	$-1052 \pm 176$	$5.02^{+4.30}_{-3.28}$	$531^{+37}_{-29}$	$5081^{+3720}_{-1071}$	$5417^{+38260}_{-3946}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

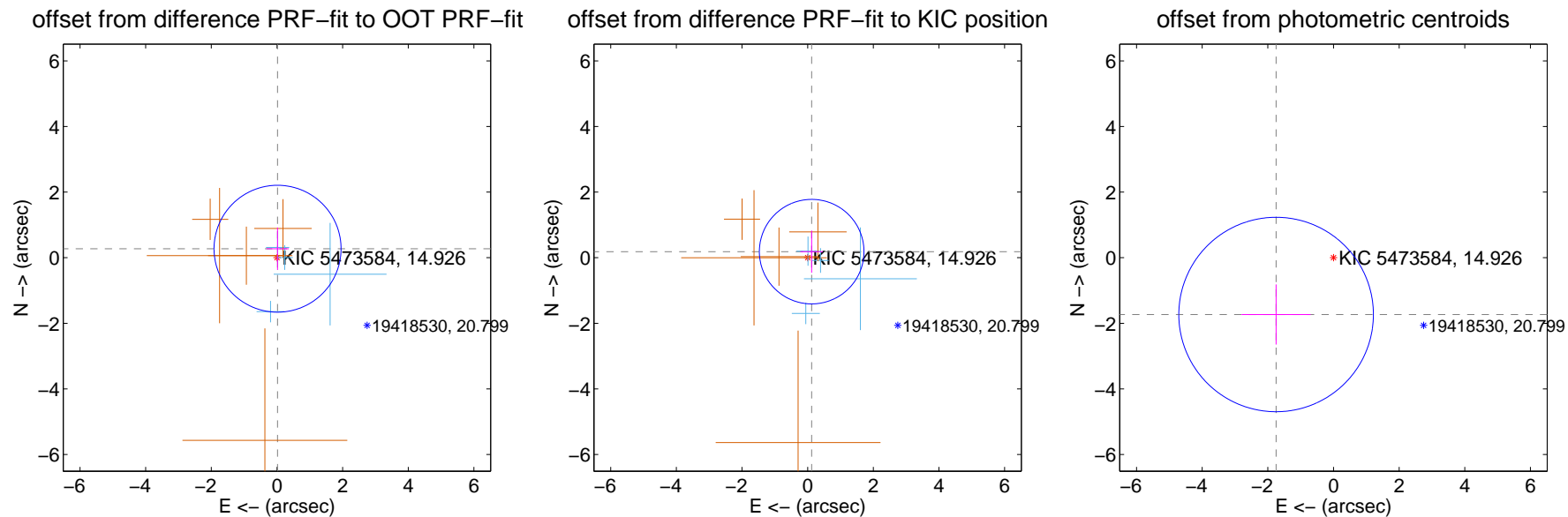
## DV Centroid Data

Supplemental centroid analysis for 005473584-08. Kepler magnitude: 14.93. Transit SNR 9.30

There are 4 quarters with good PRF difference image offsets

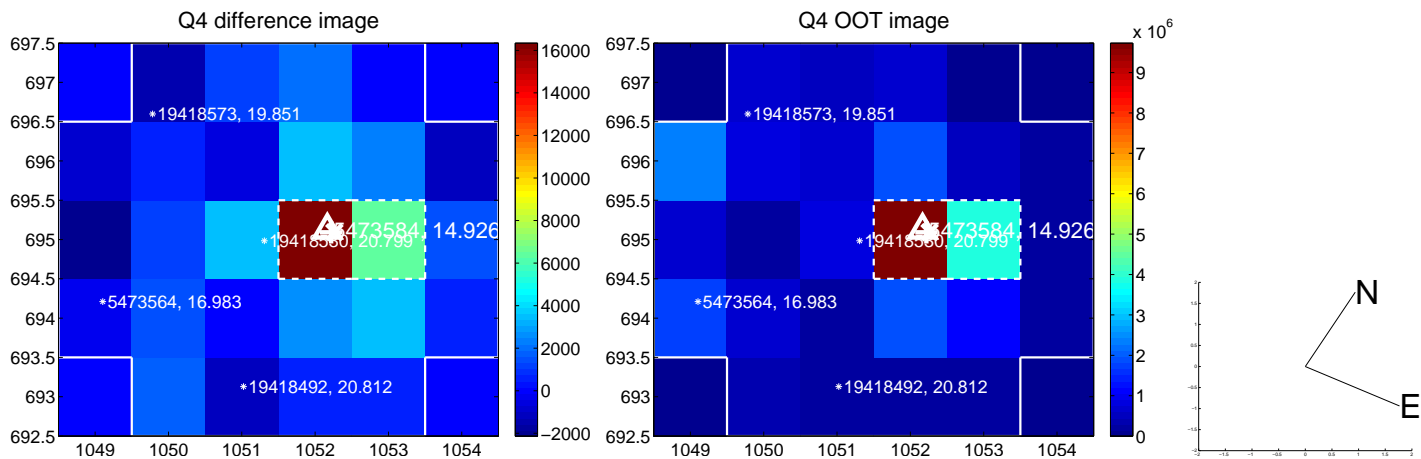
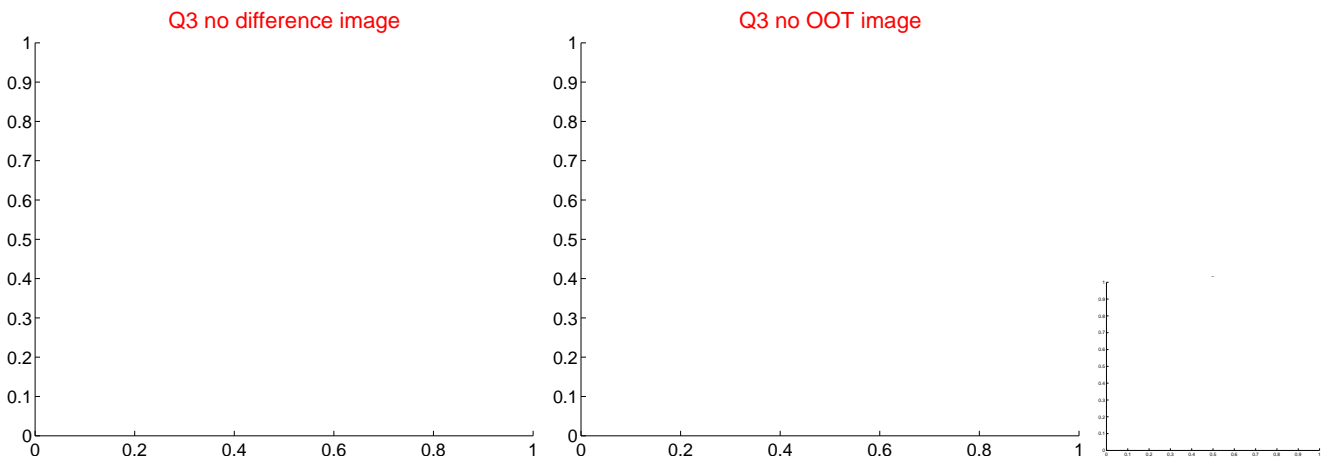
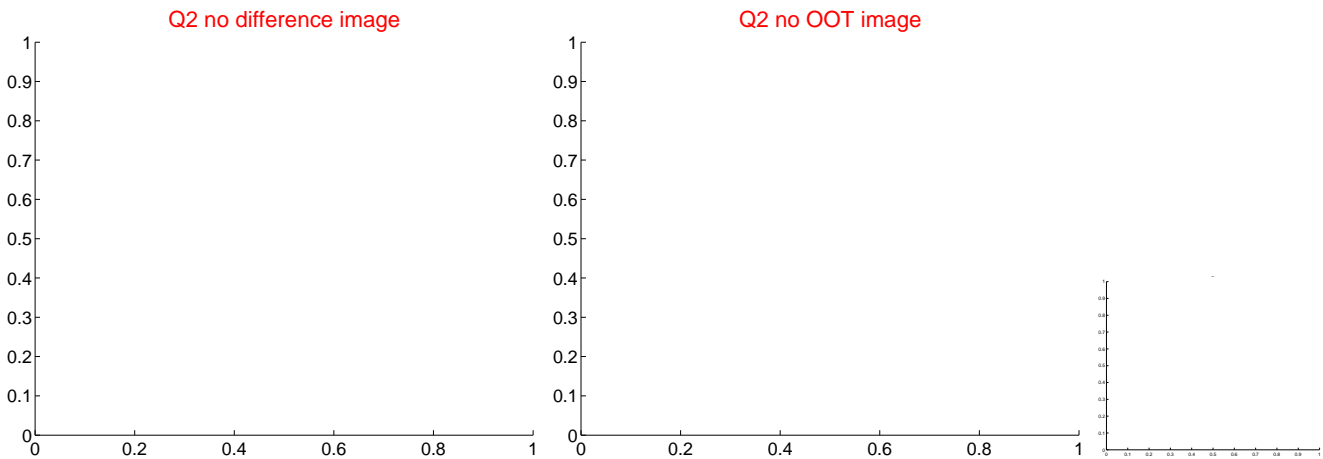
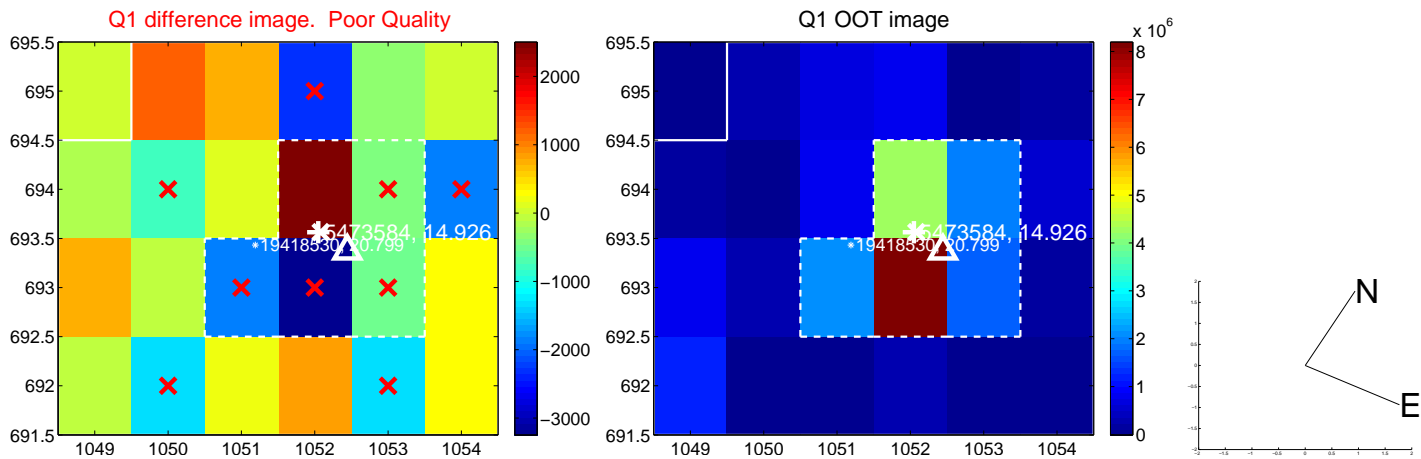
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.274 \pm 0.645$	0.43	$-0.018 \pm 0.340$	$0.274 \pm 0.648$
PRF-fit source offset from KIC position	$0.221 \pm 0.531$	0.42	$-0.122 \pm 0.341$	$0.185 \pm 0.643$
photometric centroid source offset	$2.46 \pm 0.99$	2.49	$1.75 \pm 1.05$	$-1.73 \pm 0.92$

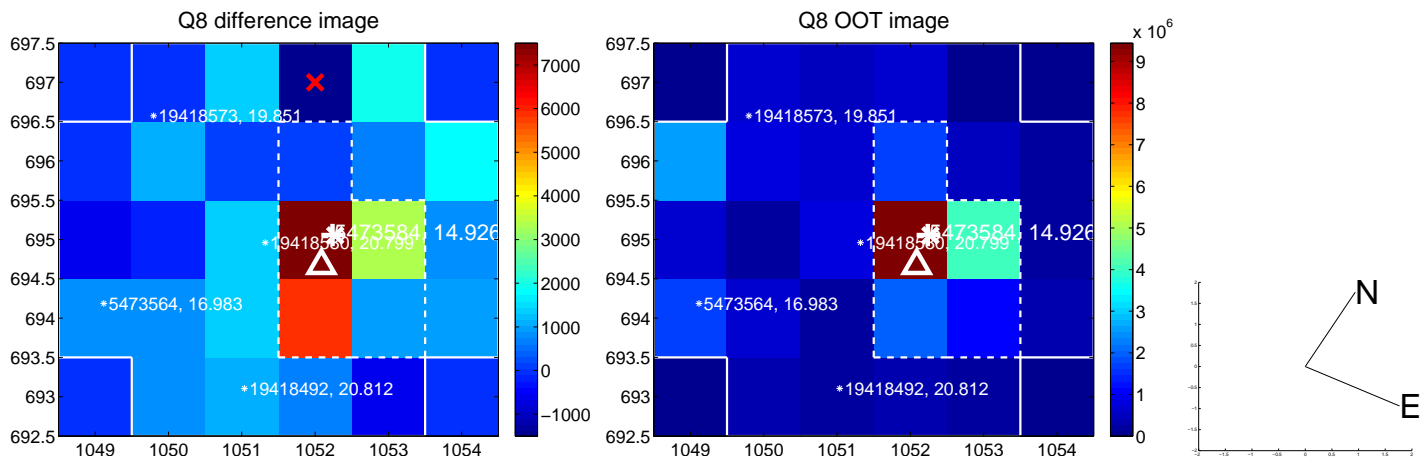
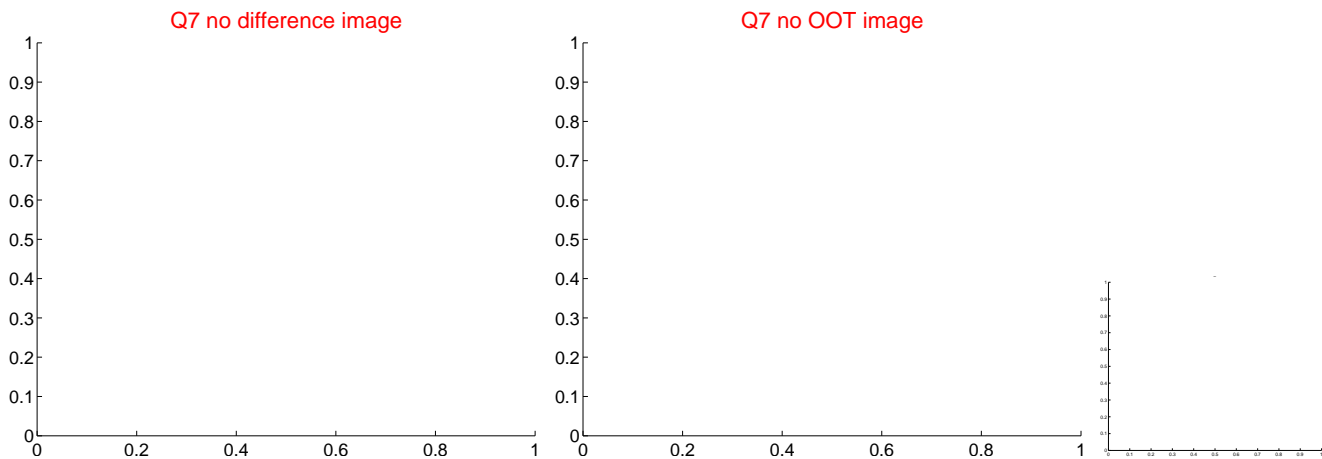
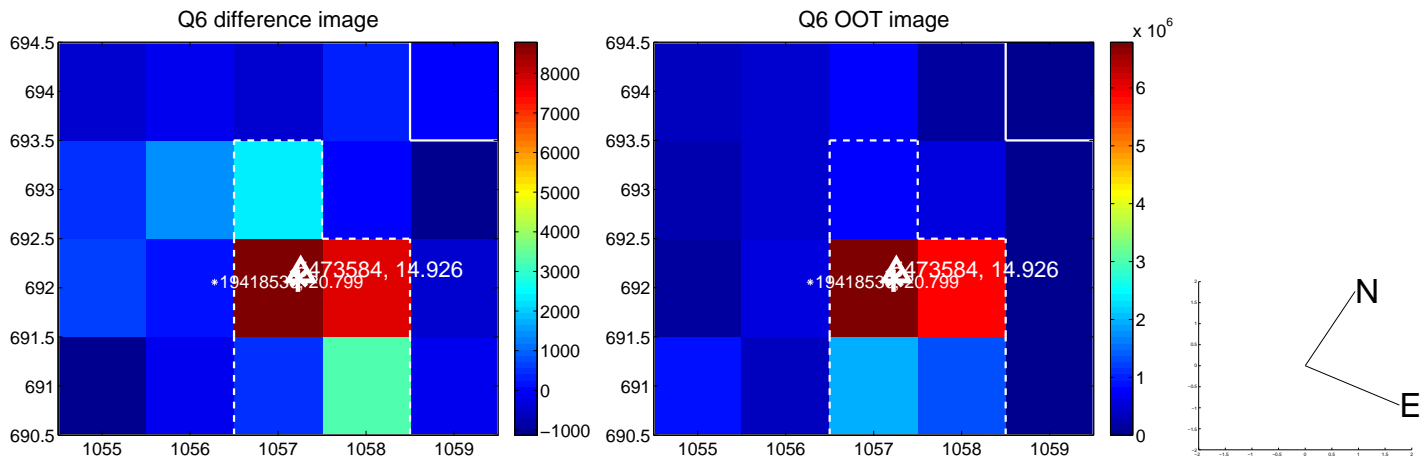
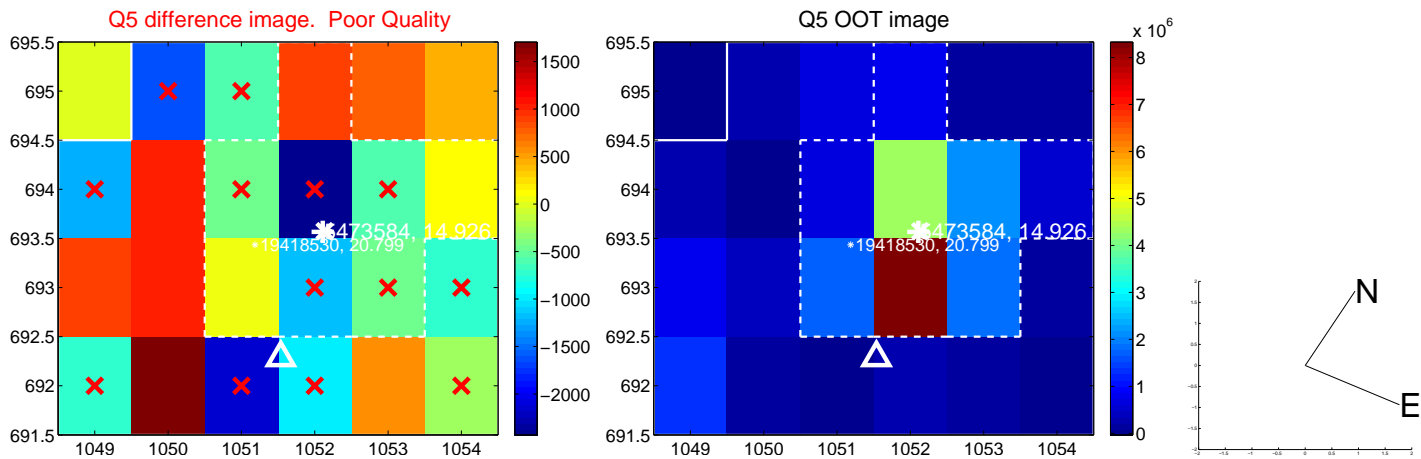


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

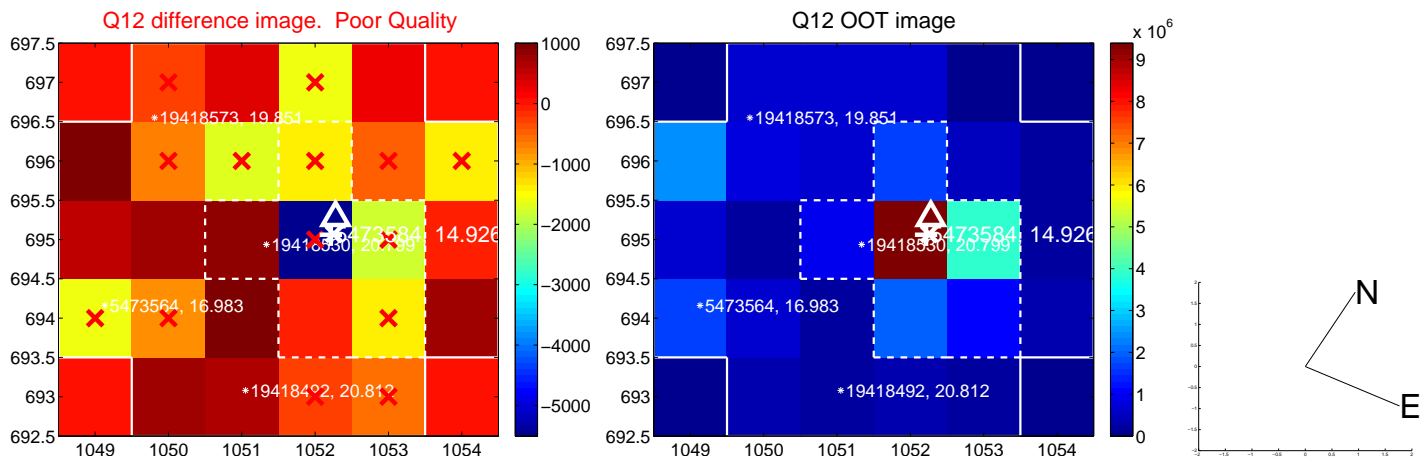
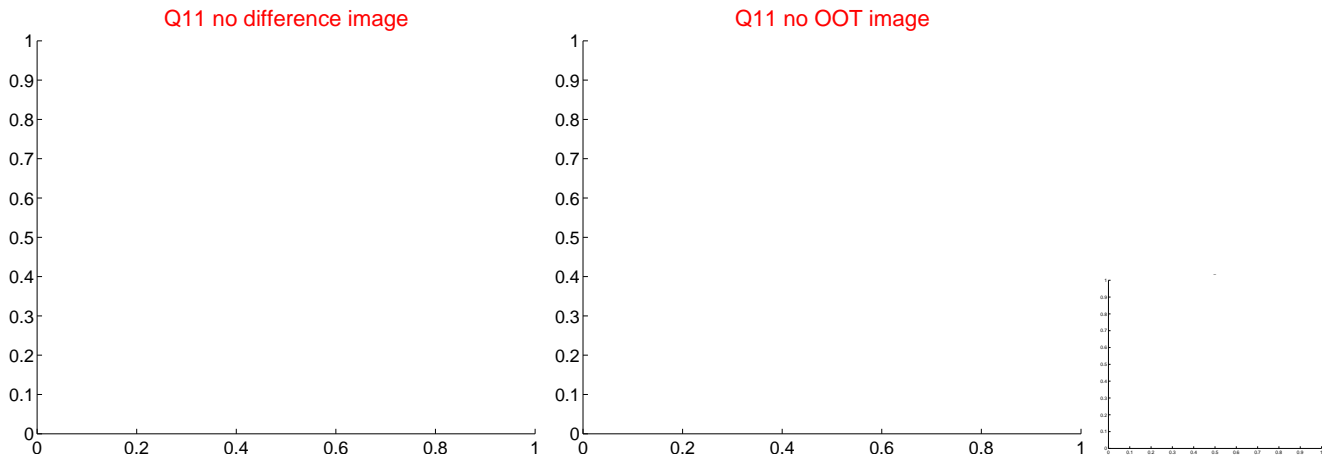
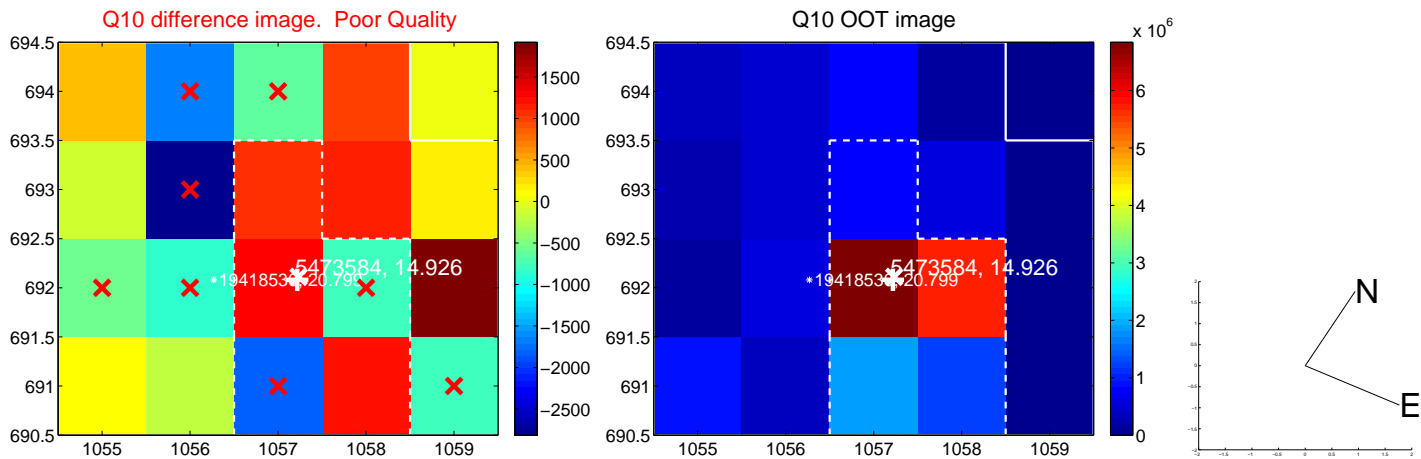
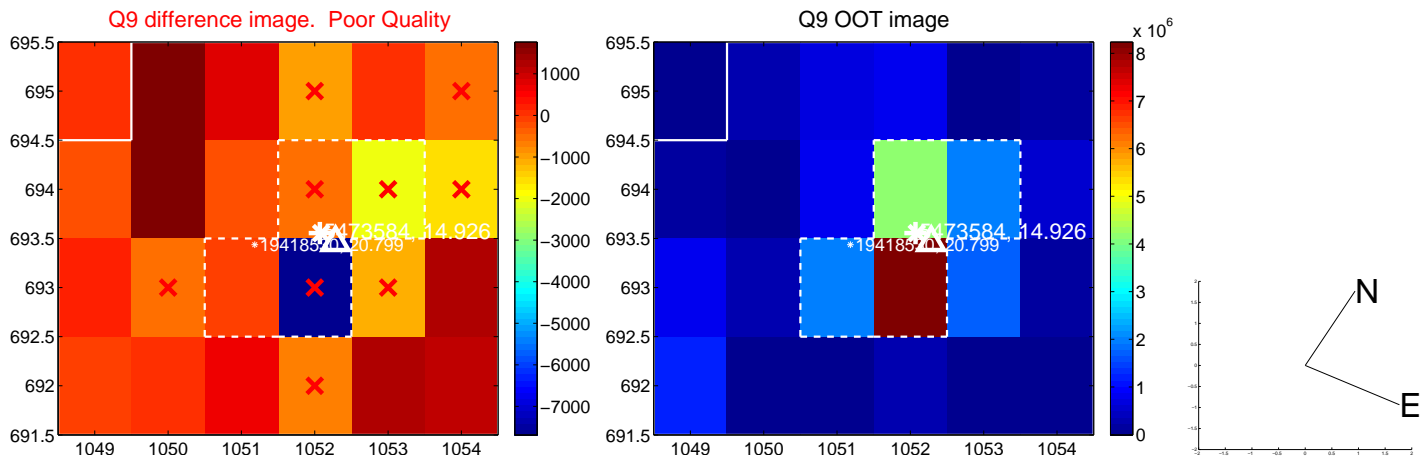
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



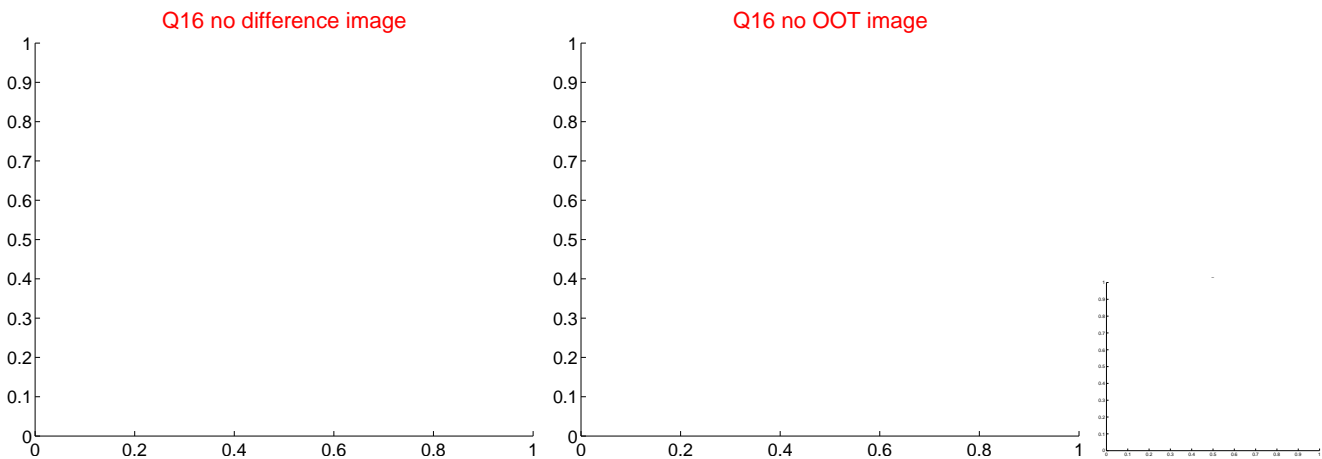
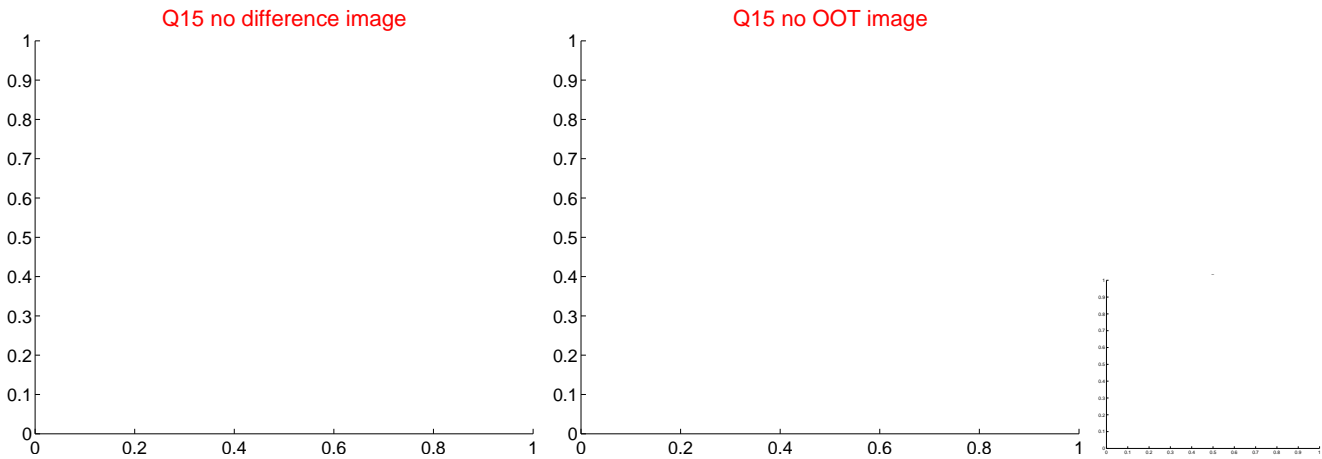
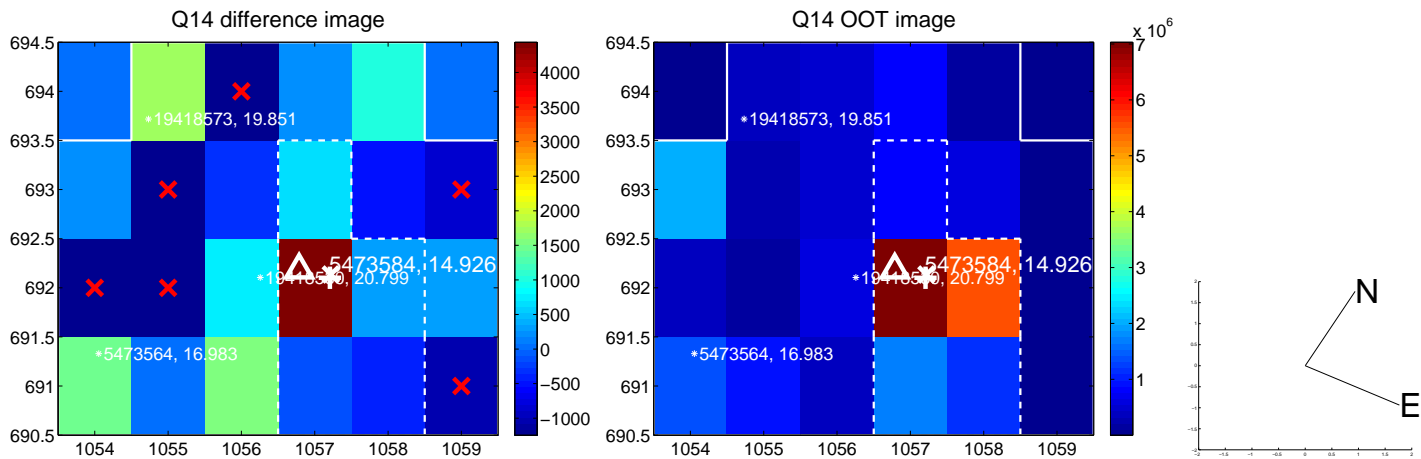
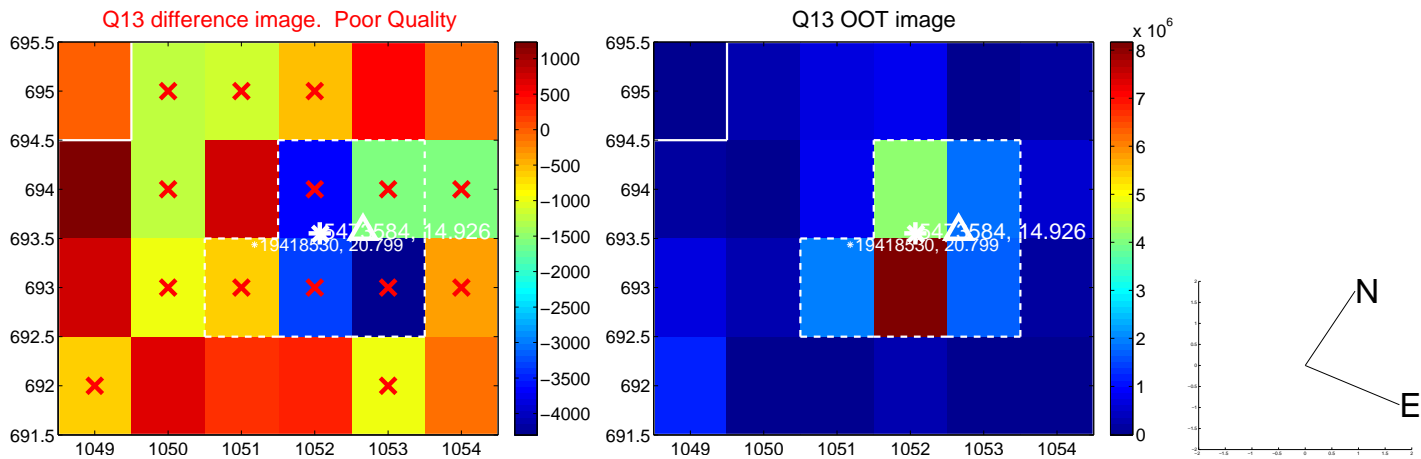
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



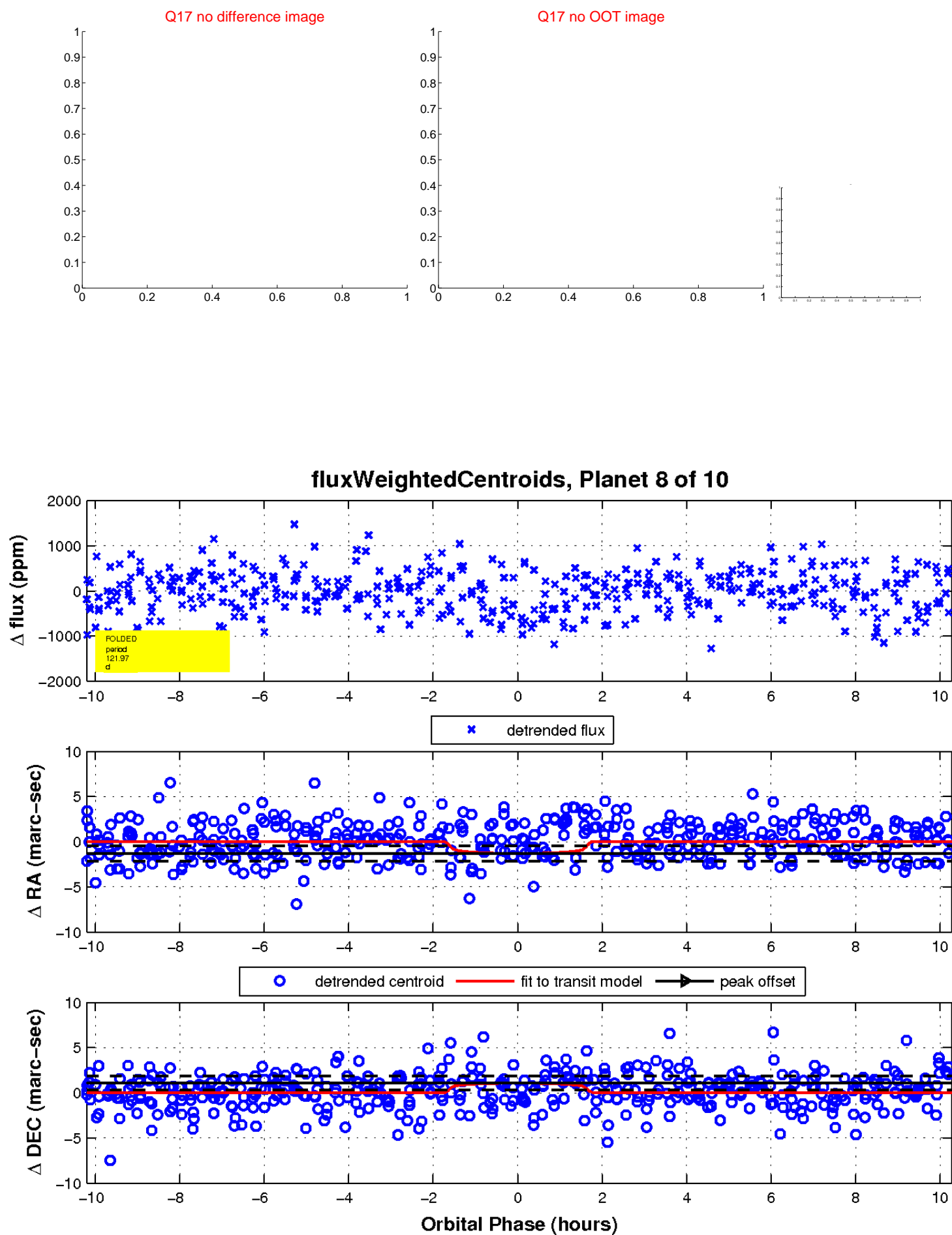
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



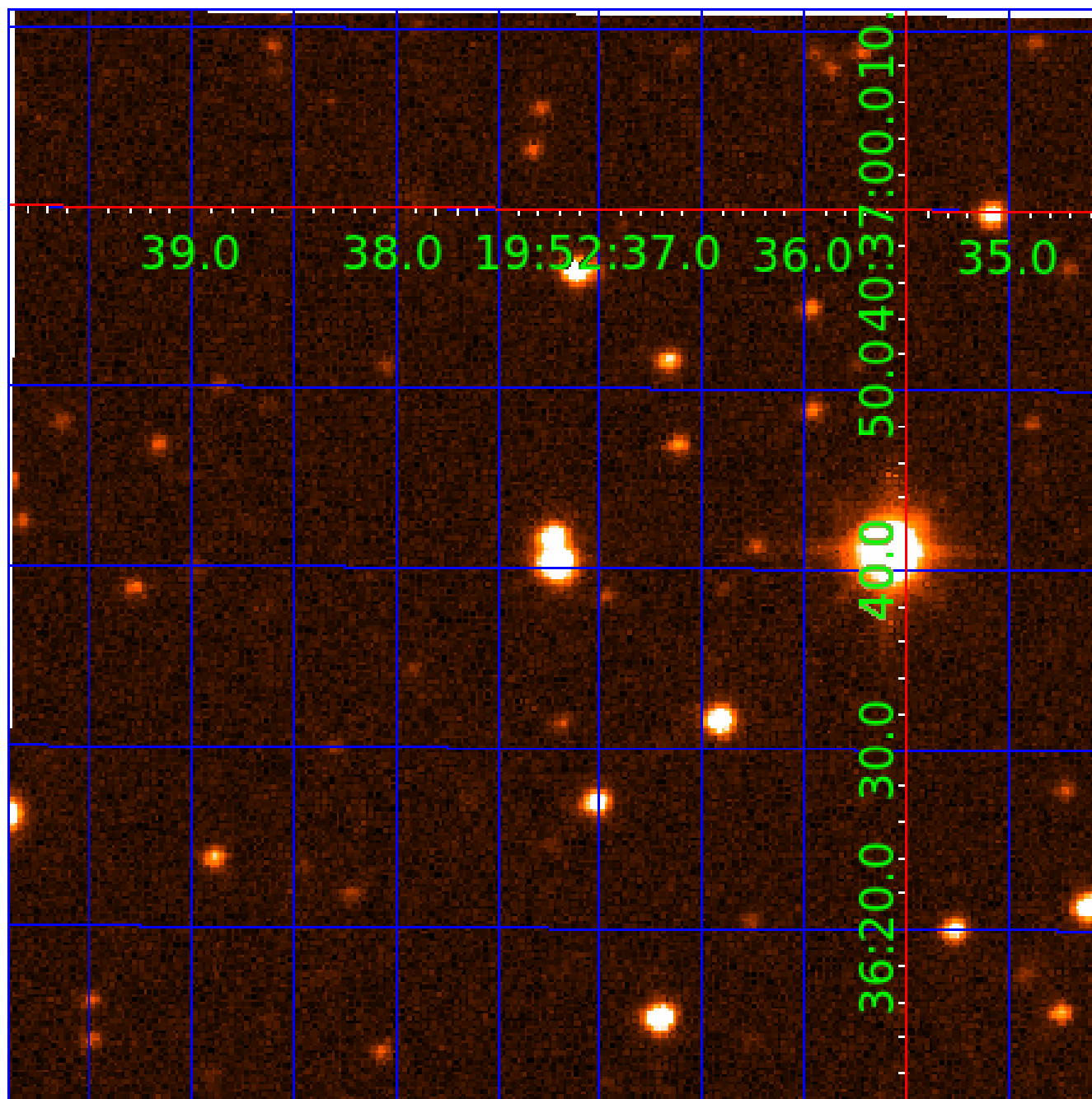
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

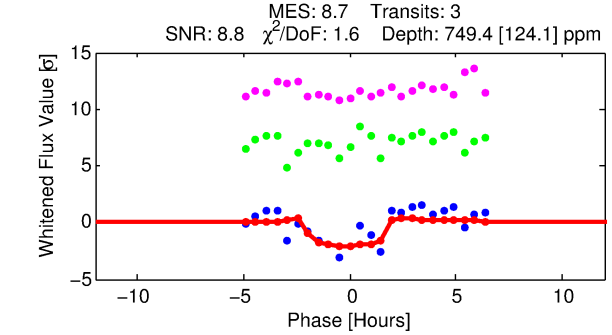
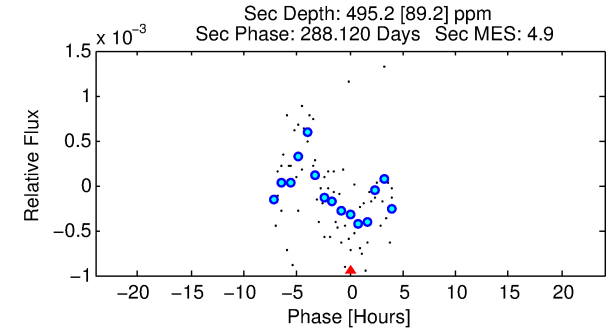
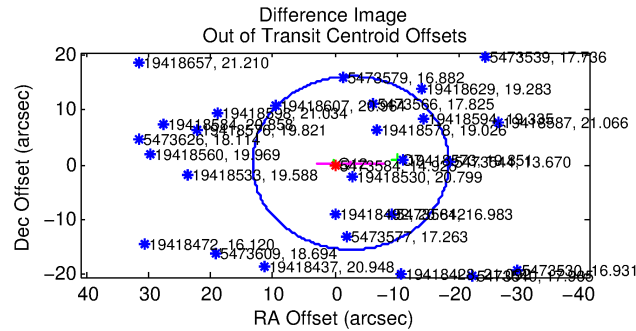
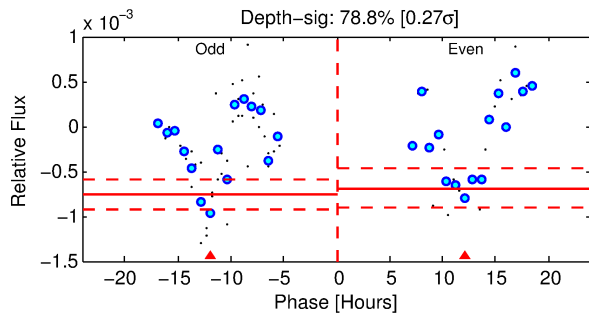
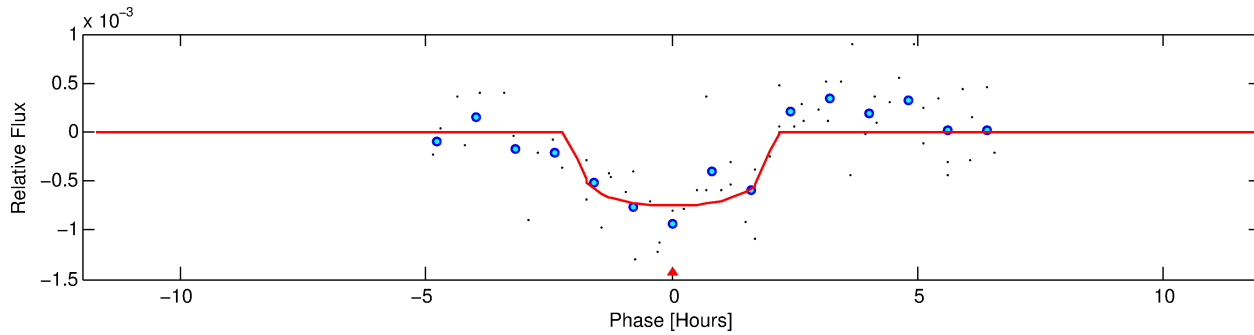
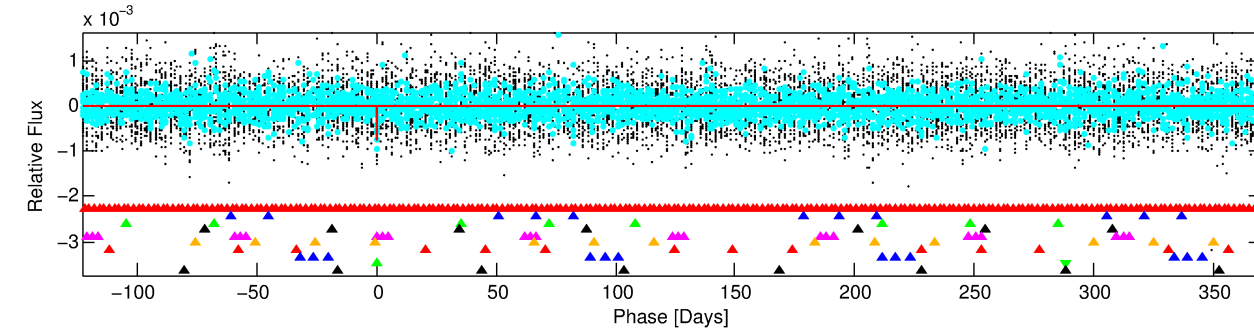
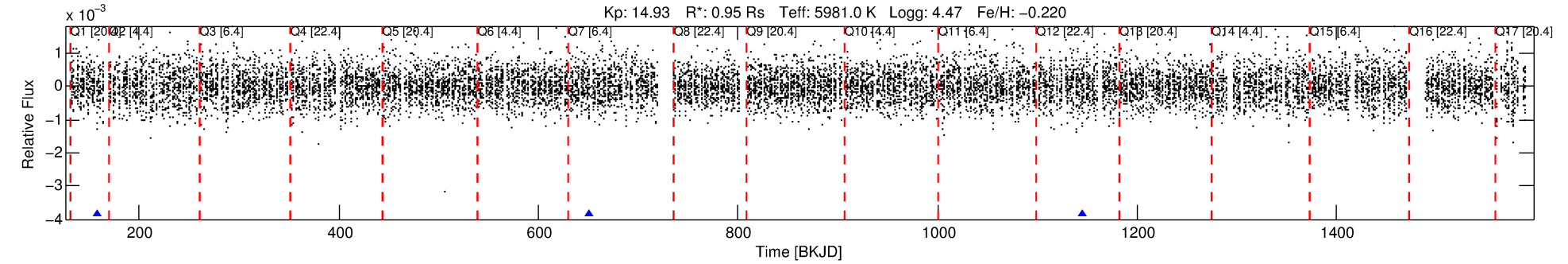
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-09

No Significant Match Found

# DV One-Page Summary

KIC: 5473584 Candidate: 9 of 10 Period: 493.746 d



## DV Fit Results:

Period = 493.74554 [0.00856] d  
Epoch = 157.4133 [0.0104] BKJD  
Rp/R\* = 0.0251 [0.0694]  
a/R\* = 952.01 [12533.83]  
b = 0.18 [72.62]  
Seff = 0.70 [0.28]  
Teq = 233 [23] K  
Rp = 2.59 [7.20] Re  
a = 1.2105 [0.3126] AU  
Ag = 59490.79 [329793.10] [0.18 $\sigma$ ]  
Teffp = 5632 [7790] K [0.69 $\sigma$ ]

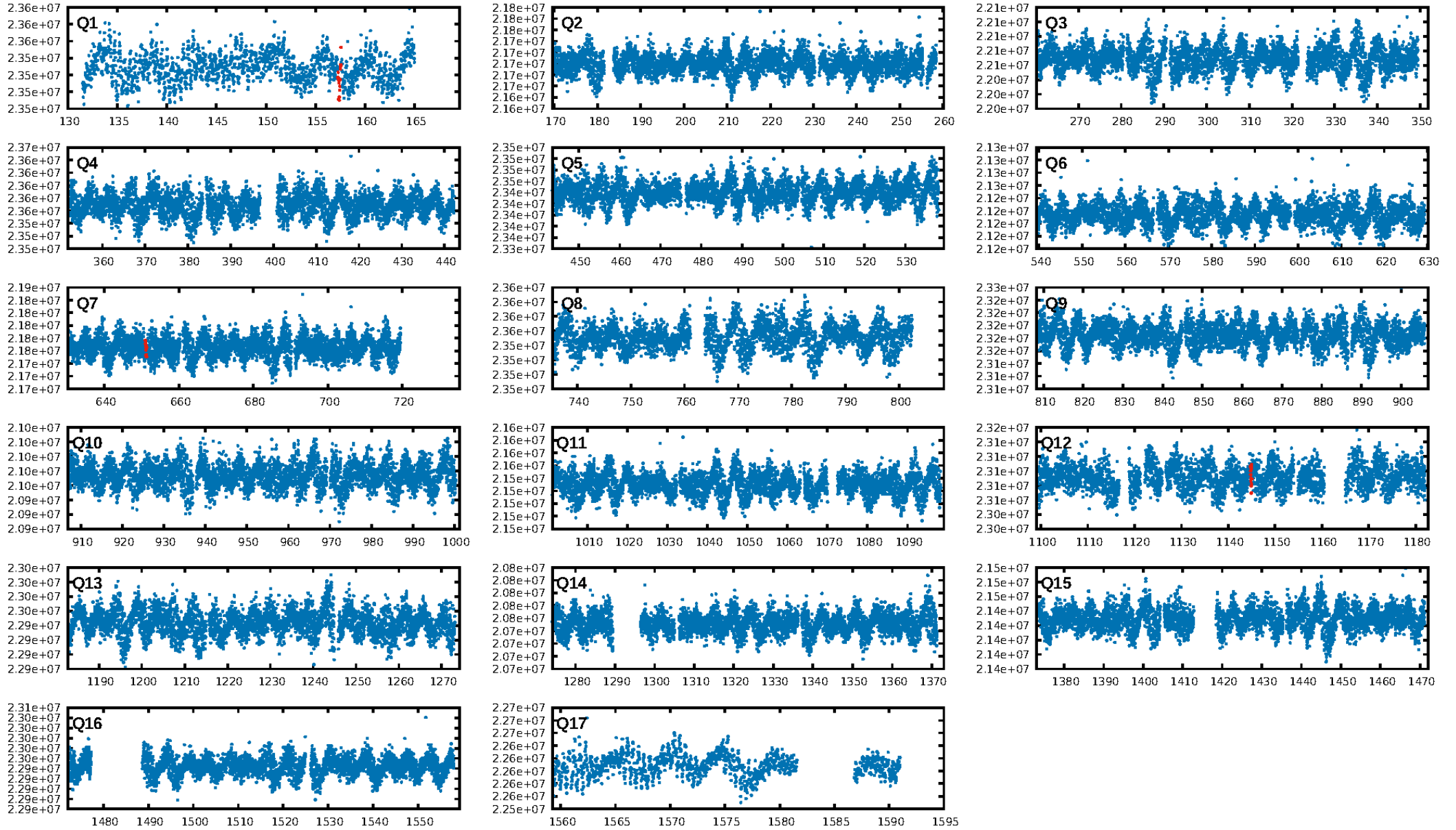
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1000.47 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 89.9%  
ModelChiSquareGof-sig: 68.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.3065  
Centroid-sig: 54.4%  
Centroid-so: 0.710 arcsec [0.42 $\sigma$ ]  
OotOffset-rm: 2.569 arcsec [0.49 $\sigma$ ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-rm: 2.616 arcsec [0.51 $\sigma$ ]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.67 [2/3]

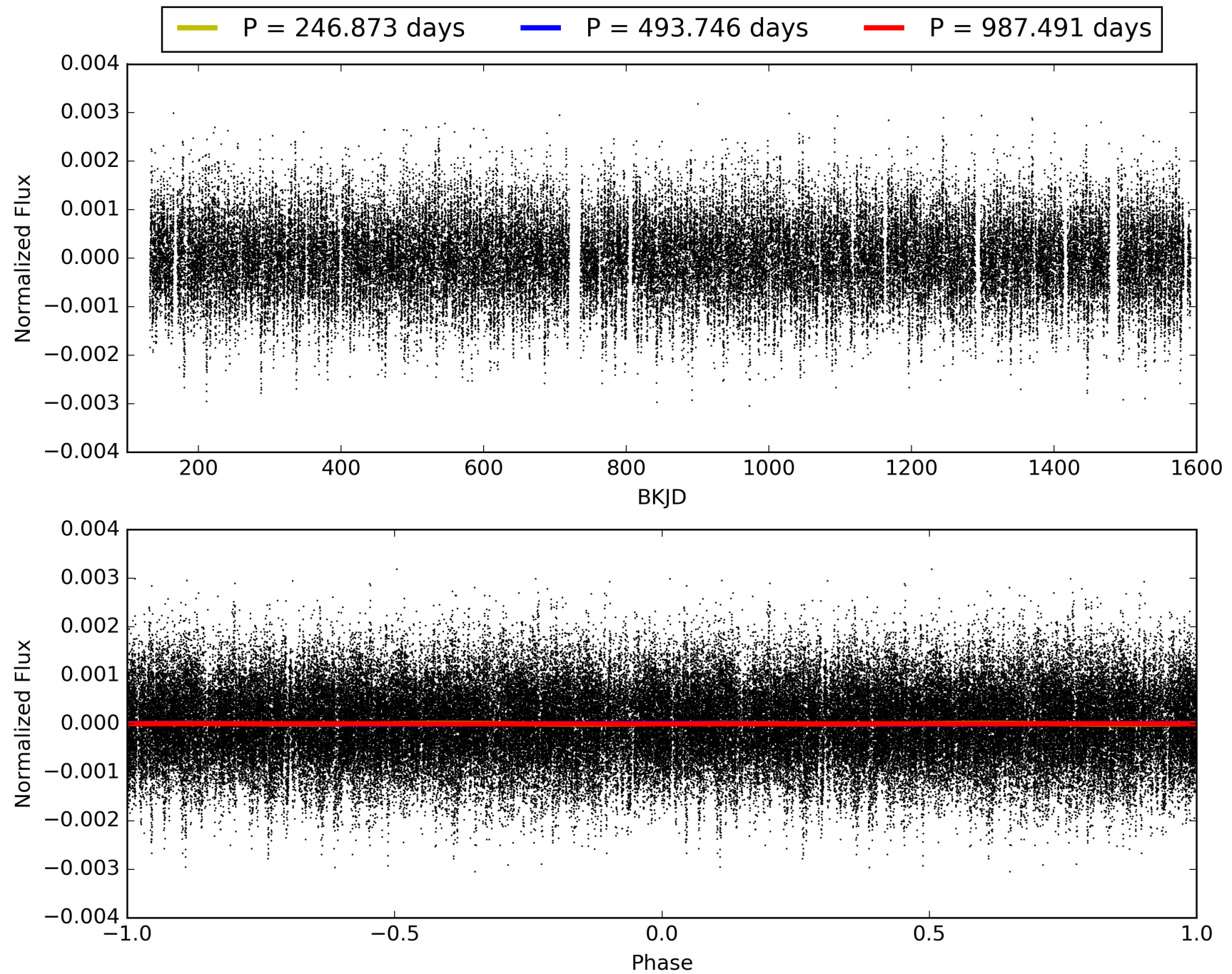
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:09:25 Z

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

# TCE 005473584-09, PDC Light Curves

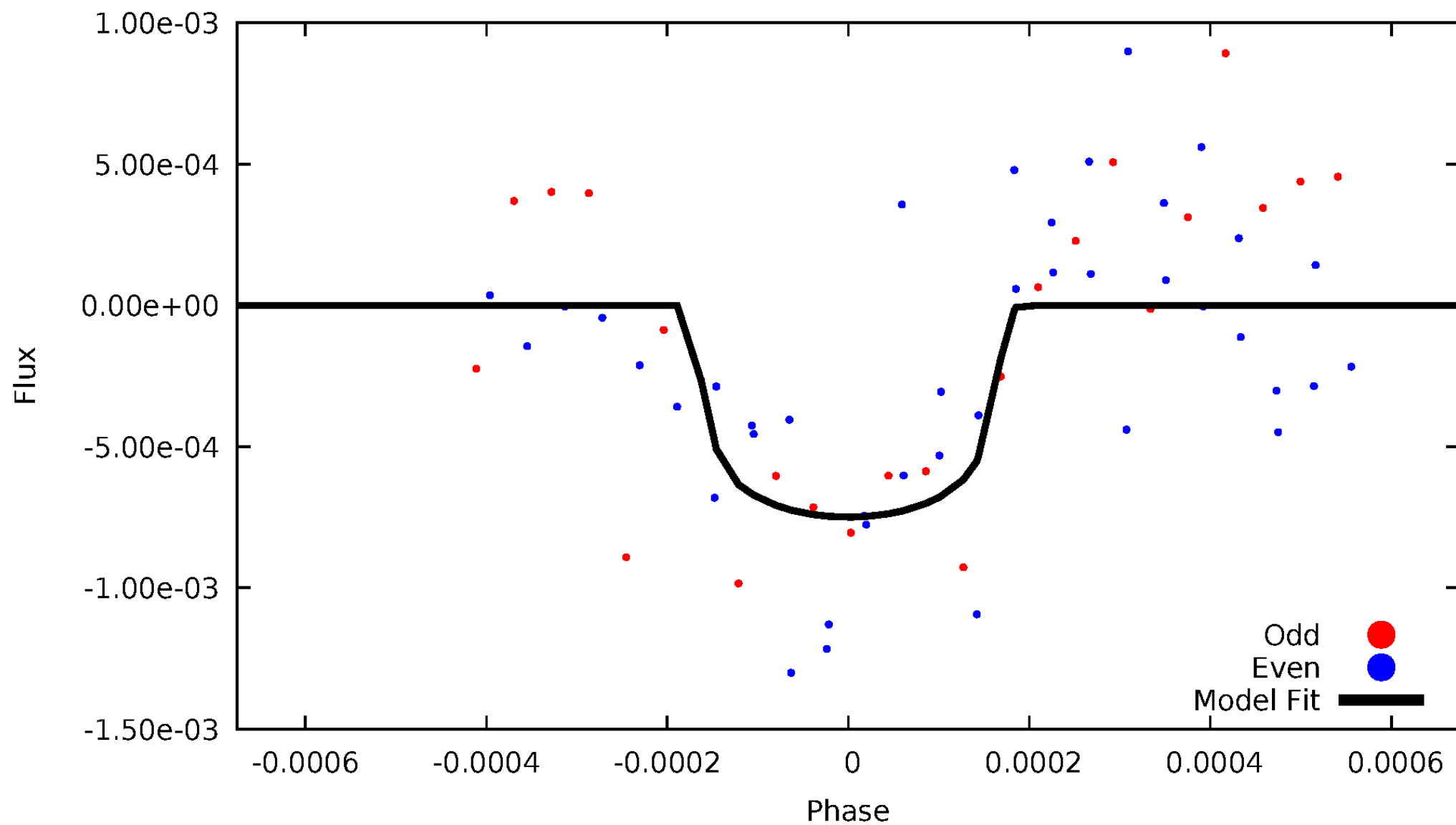


TCE 005473584-09



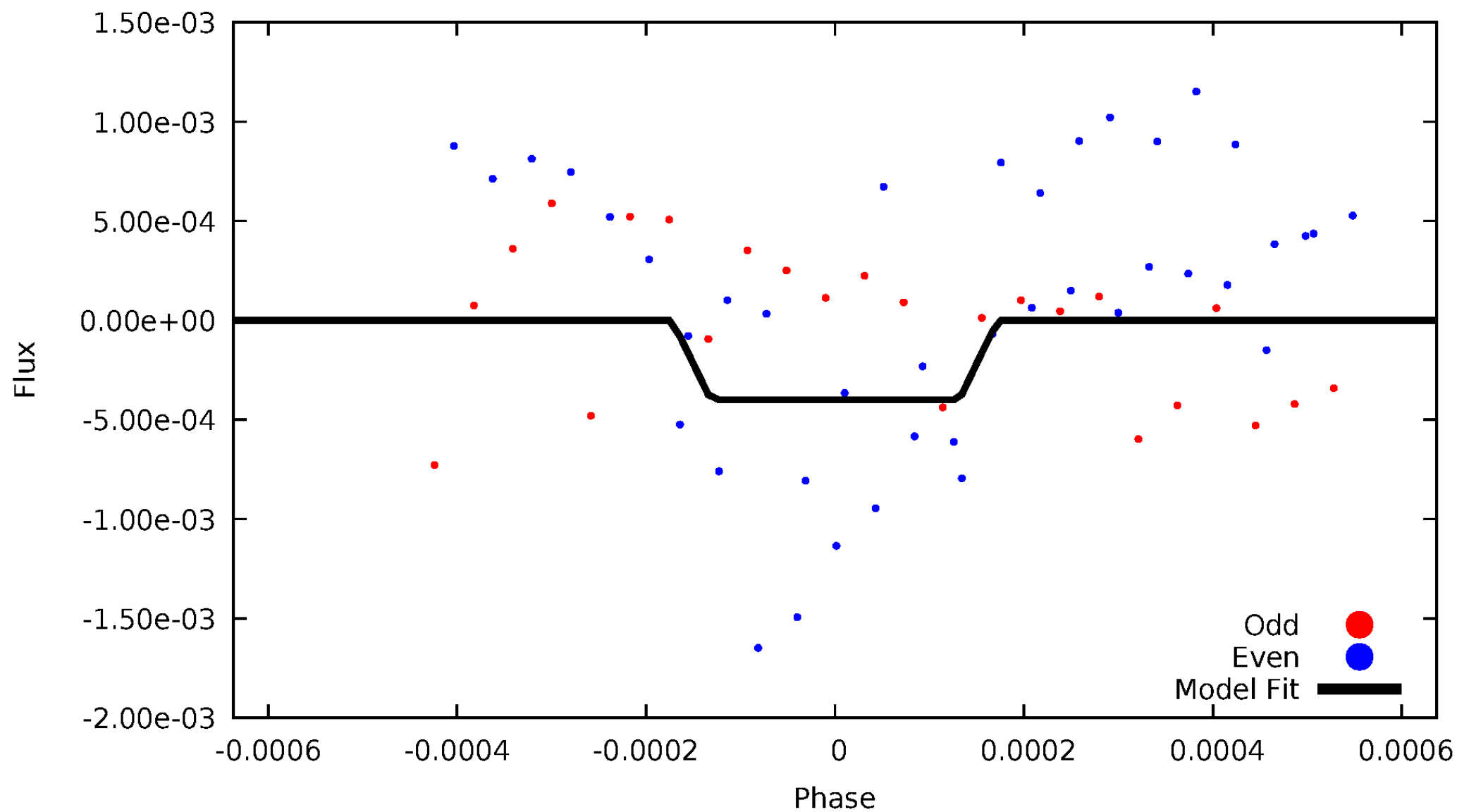
# DV Odd/Even

TCE 005473584-09



# ALT Odd/Even

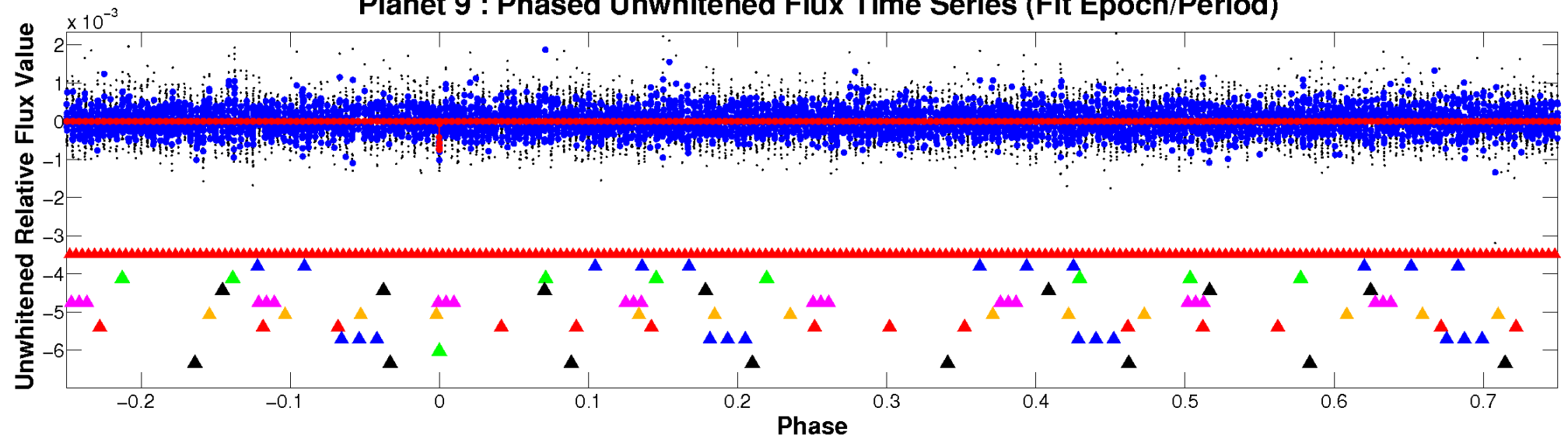
TCE 005473584-09



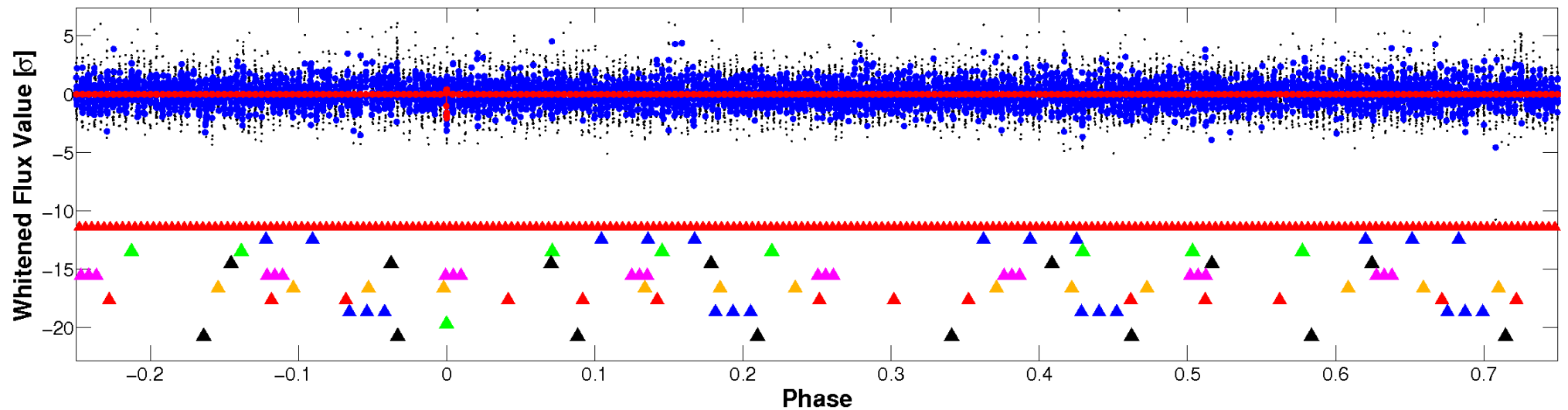


# Non-Whitened Vs. Whitened Light Curve

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



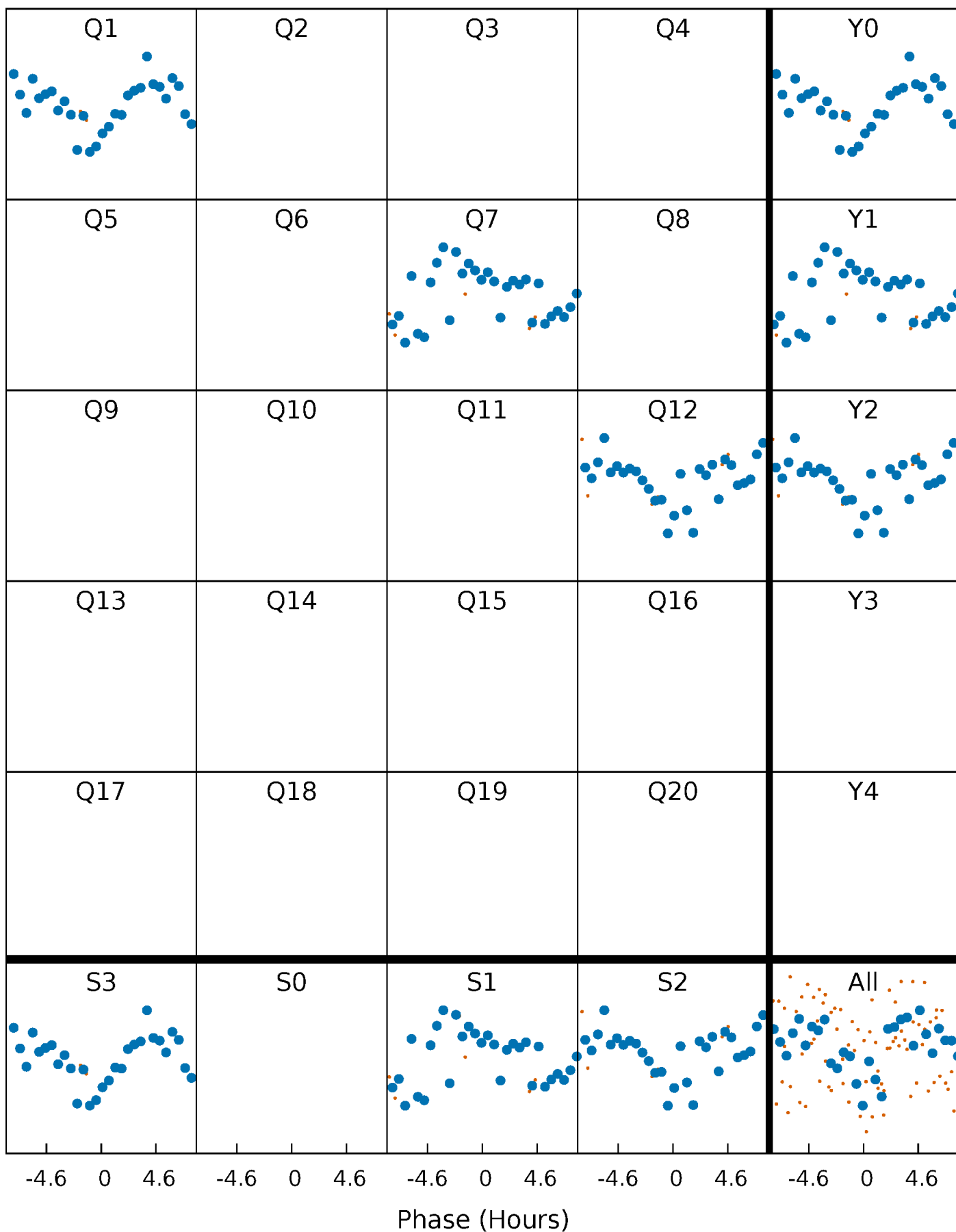
## Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)





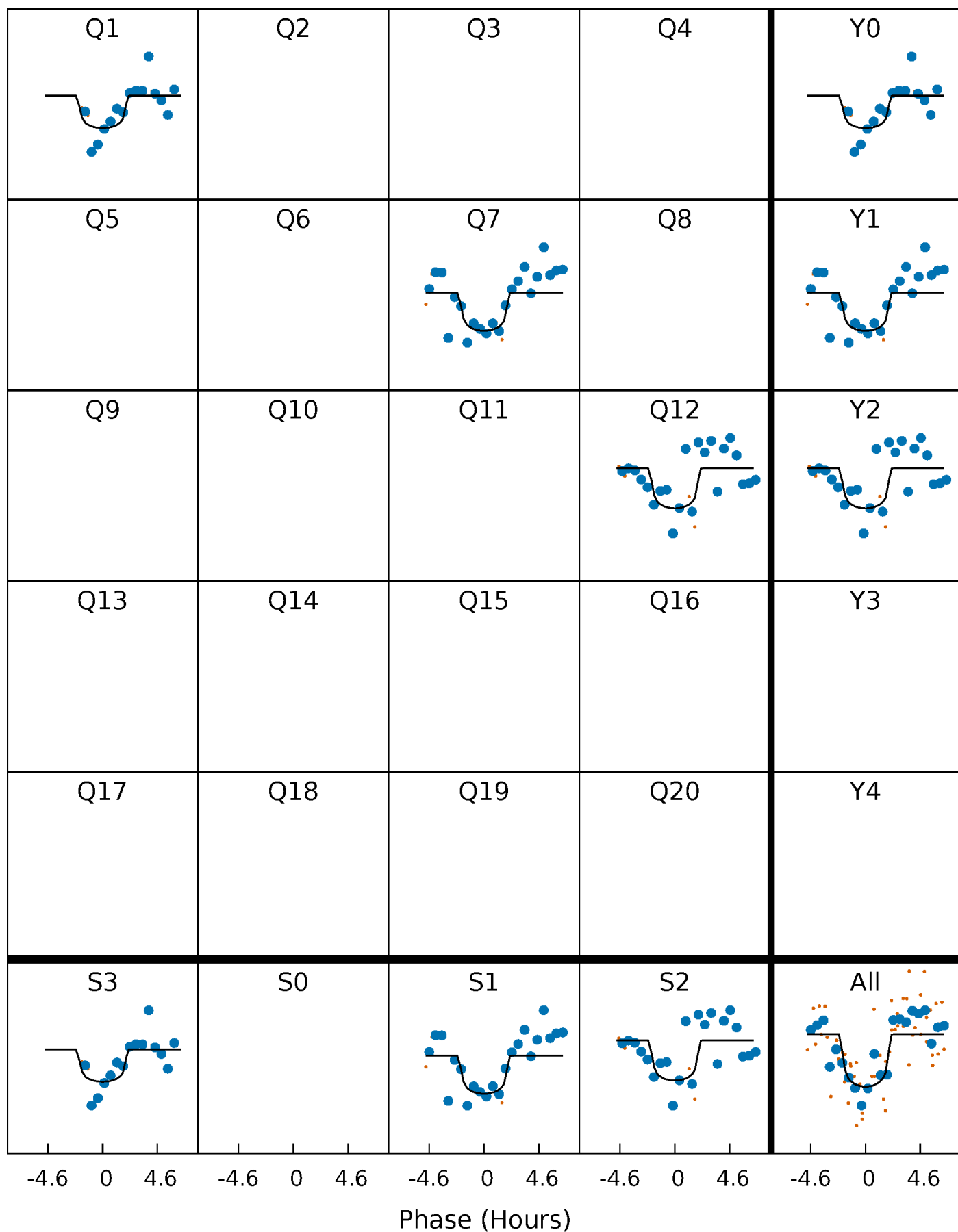
# PDC Quarter-Phased Transit Curves

TCE 005473584-09     $P=493.745537$  Days     $T_0=157.413320$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005473584-09 P=493.745537 Days  $T_0=157.413320$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

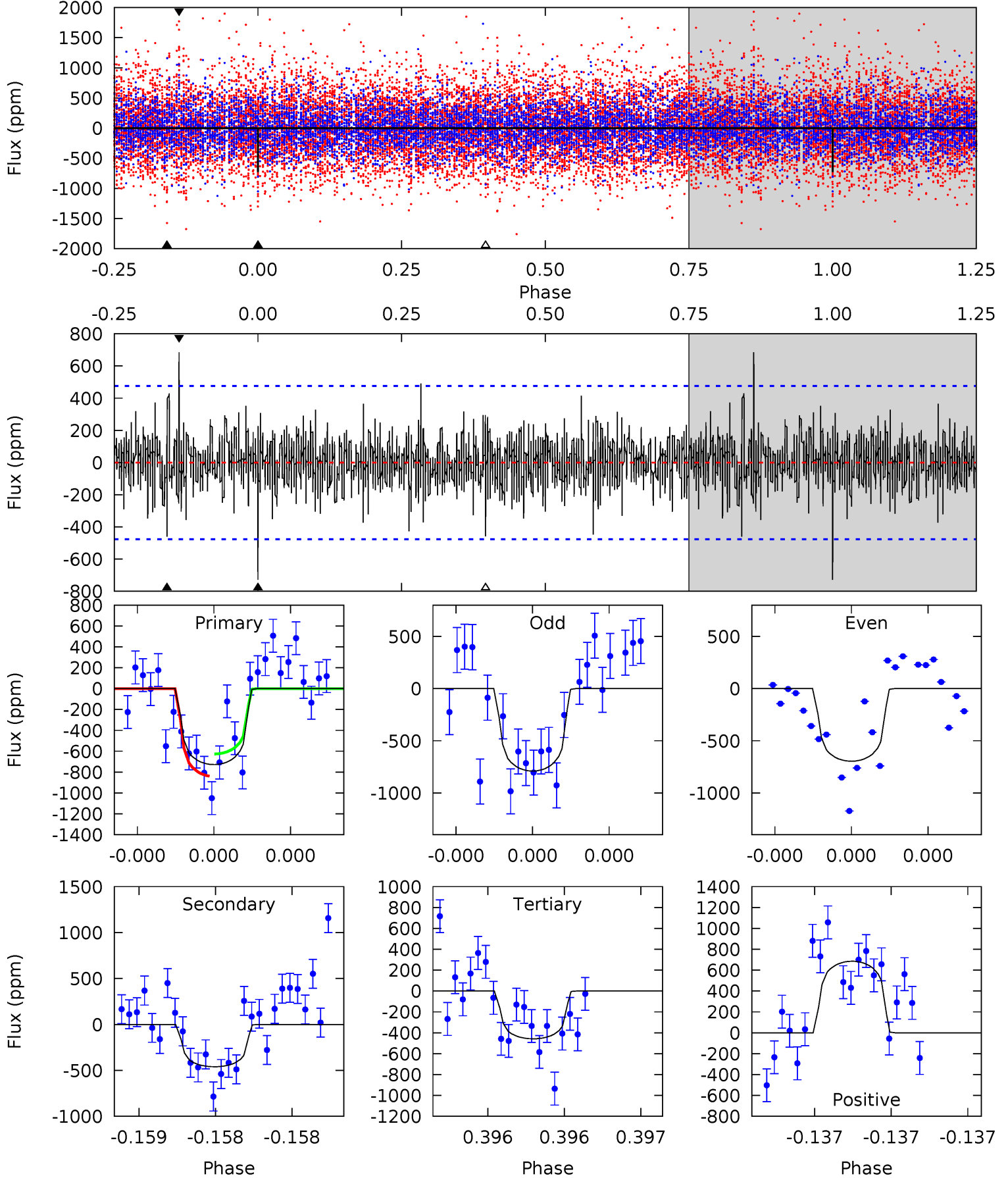
TCE 005473584-09 P=493.742921 Days  $T_0=157.422285$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-09, P = 493.745537 Days, E = 157.413320 Days

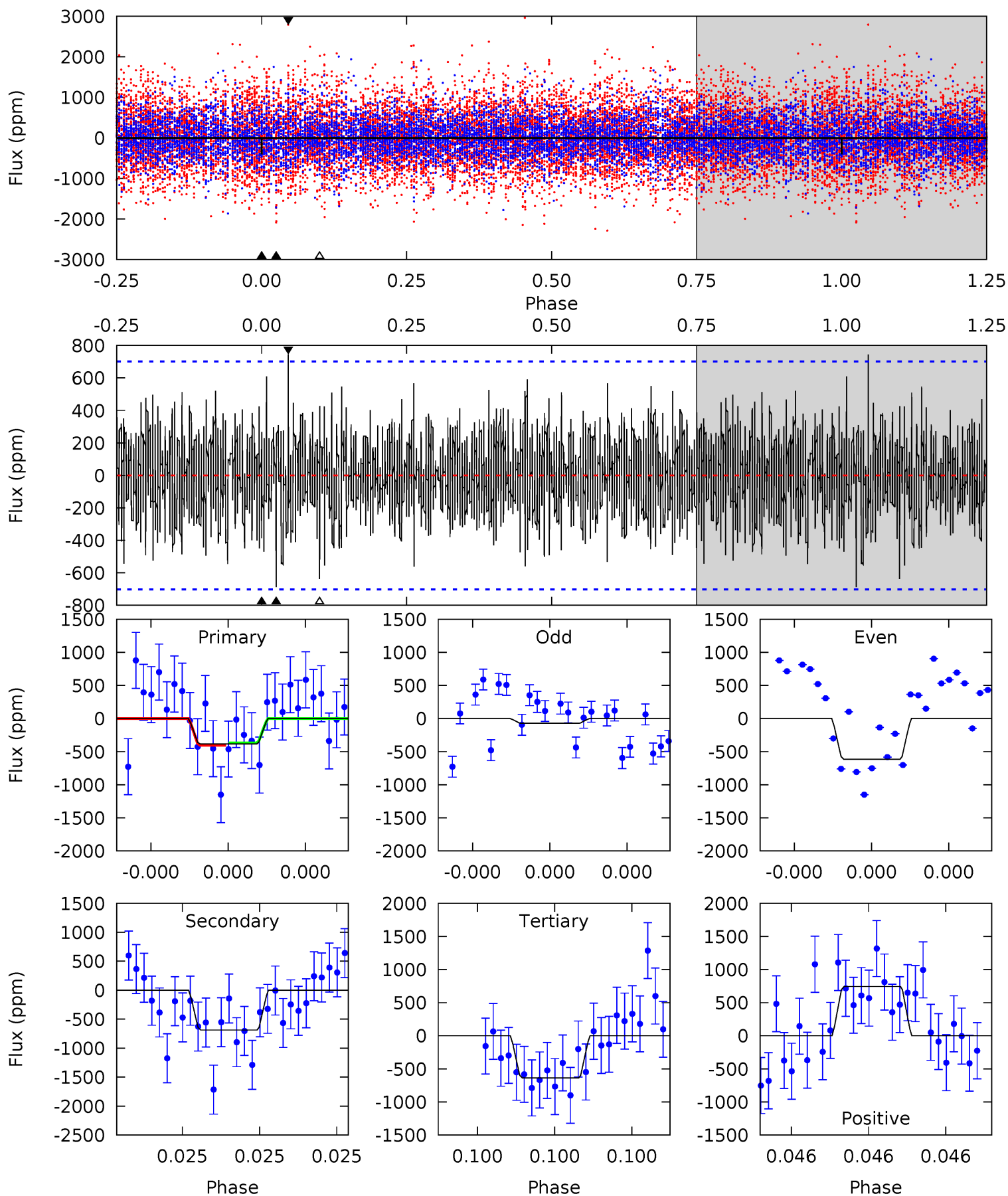
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.60	5.44	5.41	8.10	5.62	3.56	1.47	3.19	0.50	0.03	-2.65	0.52	0.96	0.48	1.24



# Alt Model-Shift Uniqueness Test

005473584-09, P = 493.742921 Days, E = 157.422285 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.10	5.52	5.12	5.97	5.64	3.58	1.67	-2.02	-2.87	0.40	-0.45	2.06	1.98	0.52	0.15



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-461 \pm 85$	$6.35^{+6.07}_{-4.38}$	$331^{+24}_{-17}$	$3971^{+2416}_{-778}$	$9361^{+81165}_{-6976}$
Alt.	$-687 \pm 124$	$5.61^{+6.17}_{-3.80}$	$331^{+26}_{-17}$	$4397^{+3312}_{-946}$	$17423^{+151992}_{-13575}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

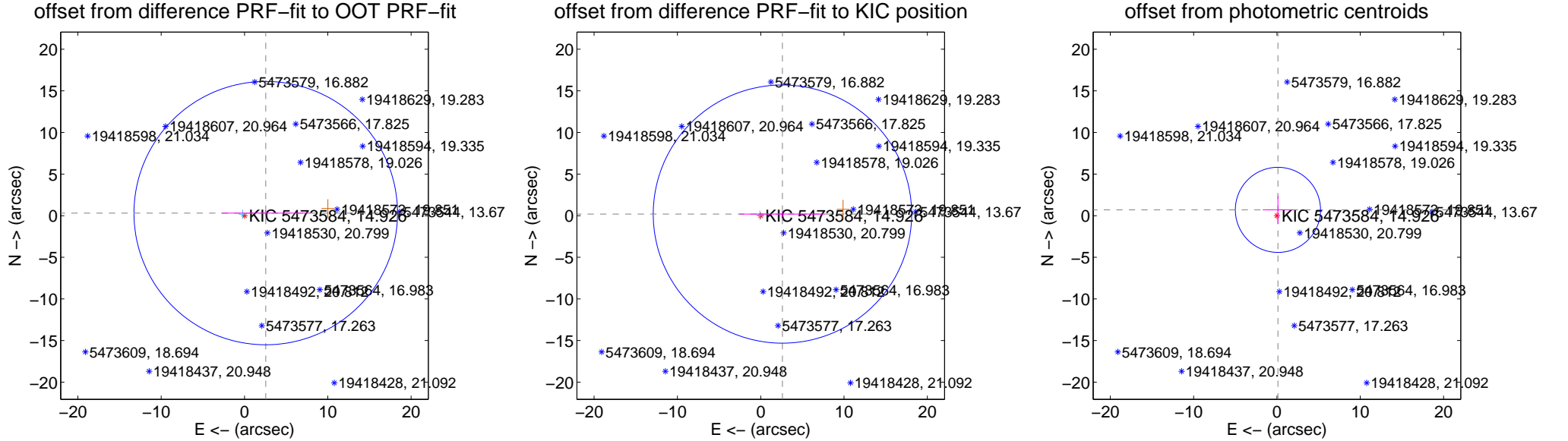
## DV Centroid Data

Supplemental centroid analysis for 005473584-09. Kepler magnitude: 14.93. Transit SNR 8.78

There are 1 quarters with good PRF difference image offsets

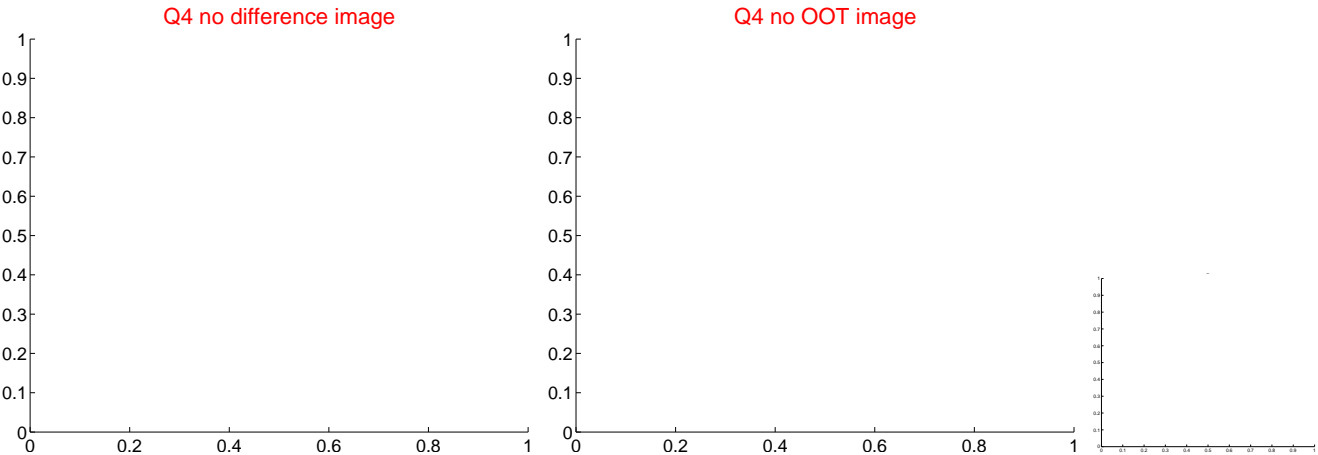
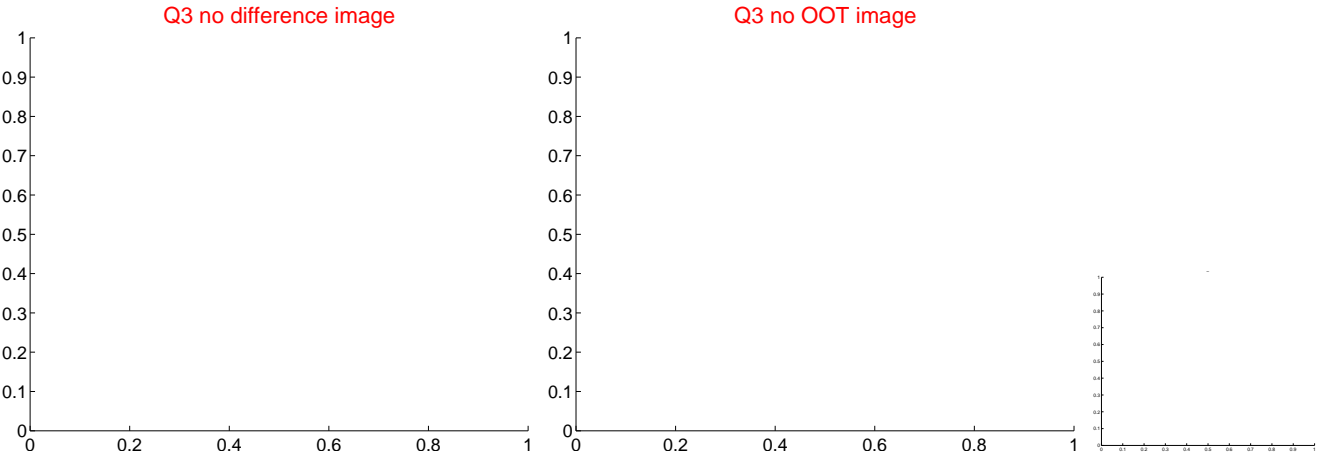
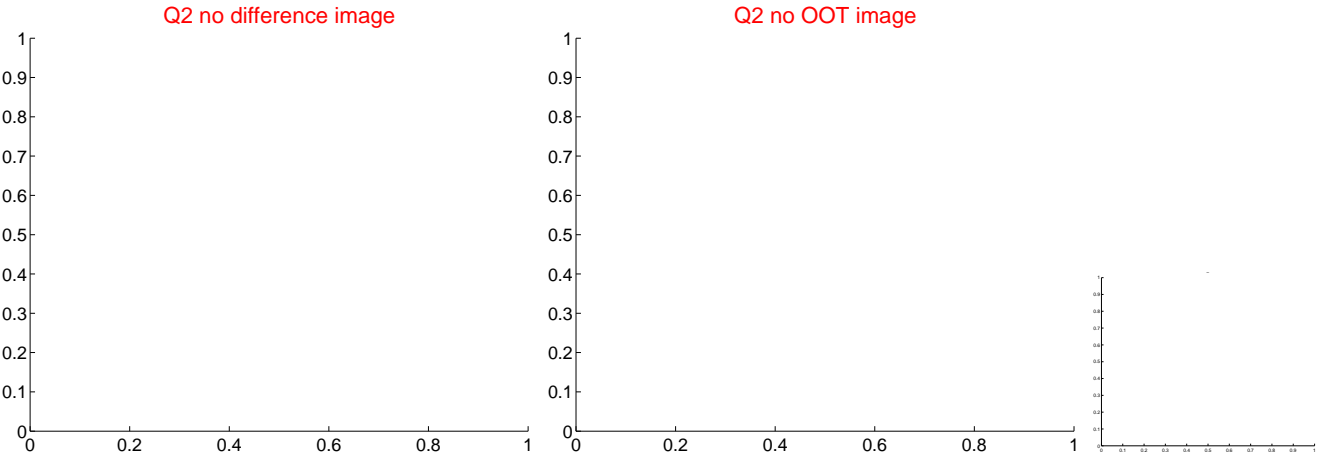
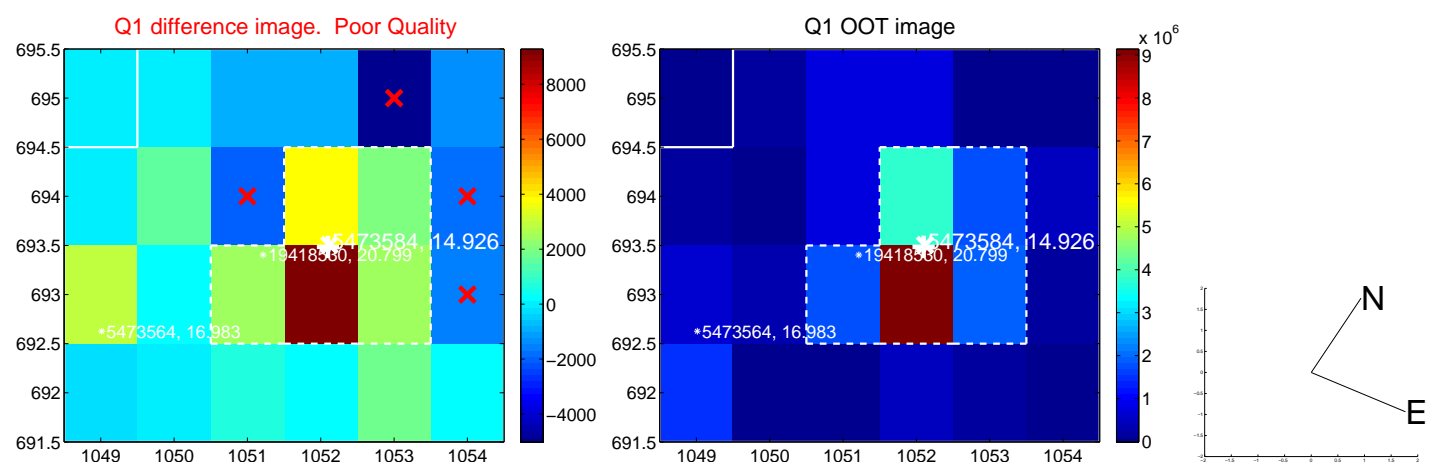
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.569 \pm 5.271$	0.49	$-2.551 \pm 5.309$	$0.308 \pm 0.327$
PRF-fit source offset from KIC position	$2.616 \pm 5.168$	0.51	$-2.609 \pm 5.182$	$0.193 \pm 0.339$
photometric centroid source offset	$0.71 \pm 1.70$	0.42	$-0.12 \pm 1.82$	$0.70 \pm 1.70$



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- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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





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

Q5 no difference image



Q5 no OOT image



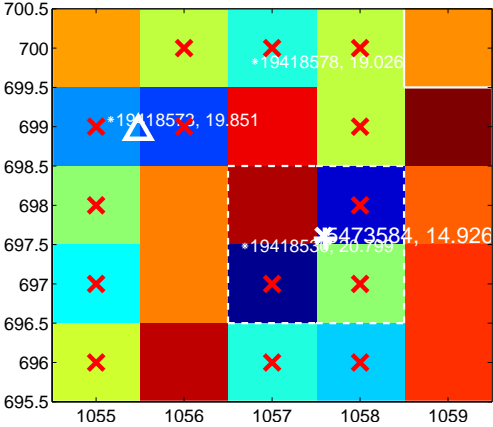
Q6 no difference image



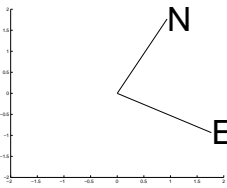
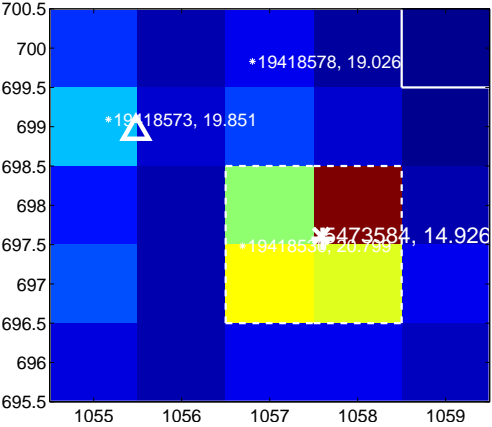
Q6 no OOT image



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.

Q9 no difference image



Q9 no OOT image



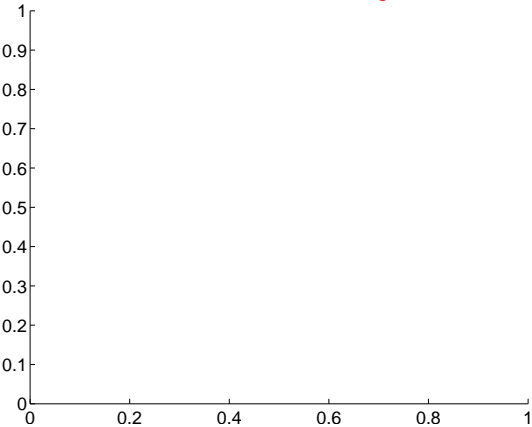
Q10 no difference image



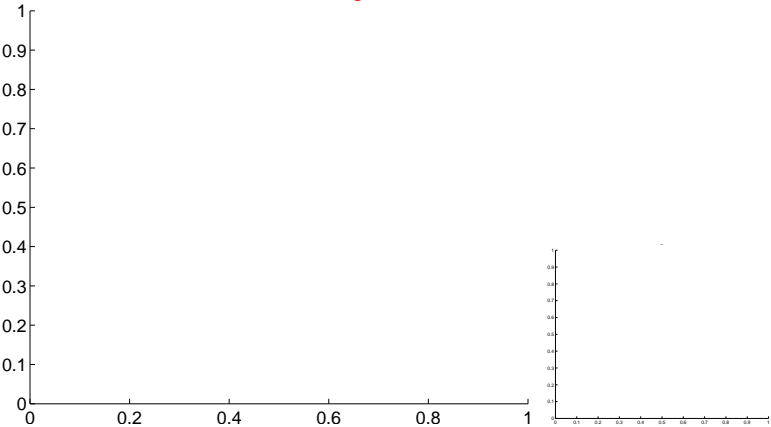
Q10 no OOT image



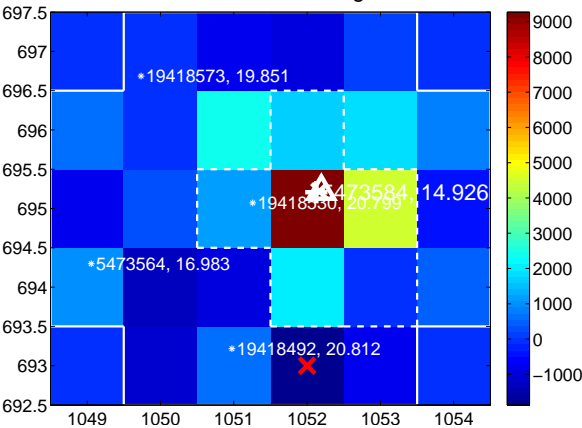
Q11 no difference image



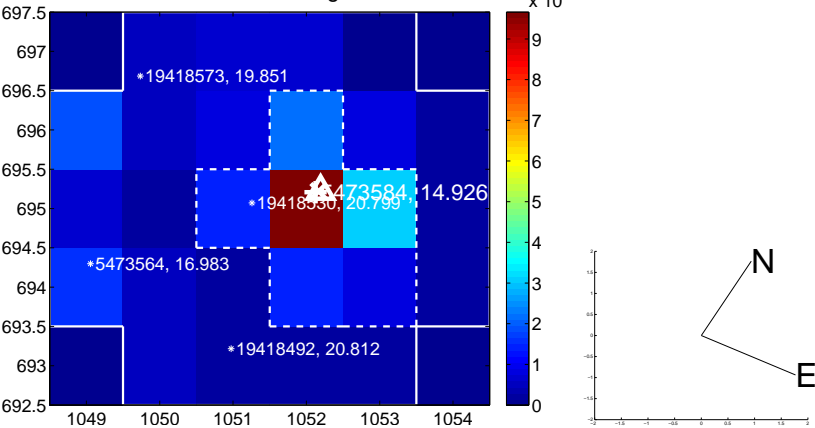
Q11 no OOT image



Q12 difference image



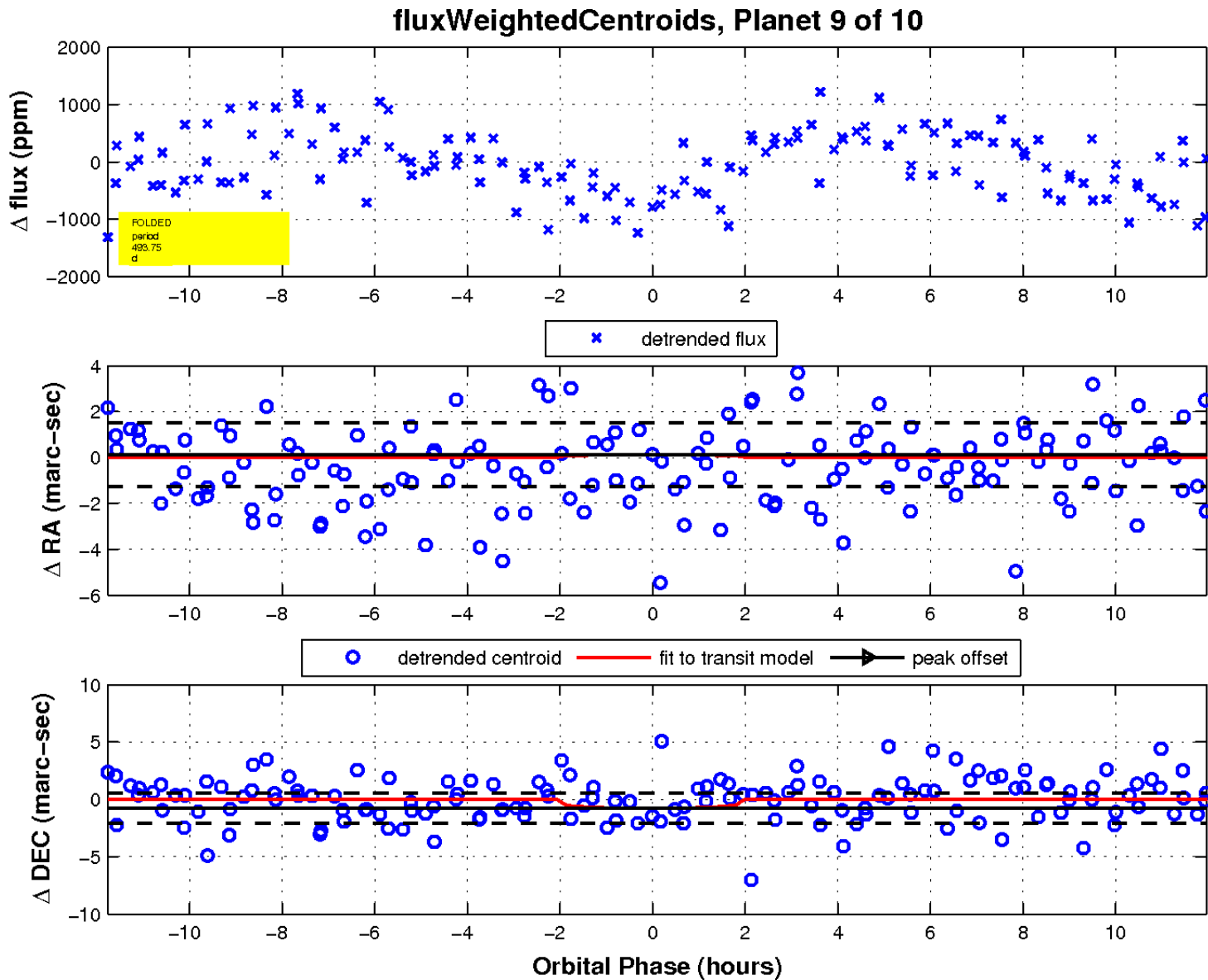
Q12 OOT image



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

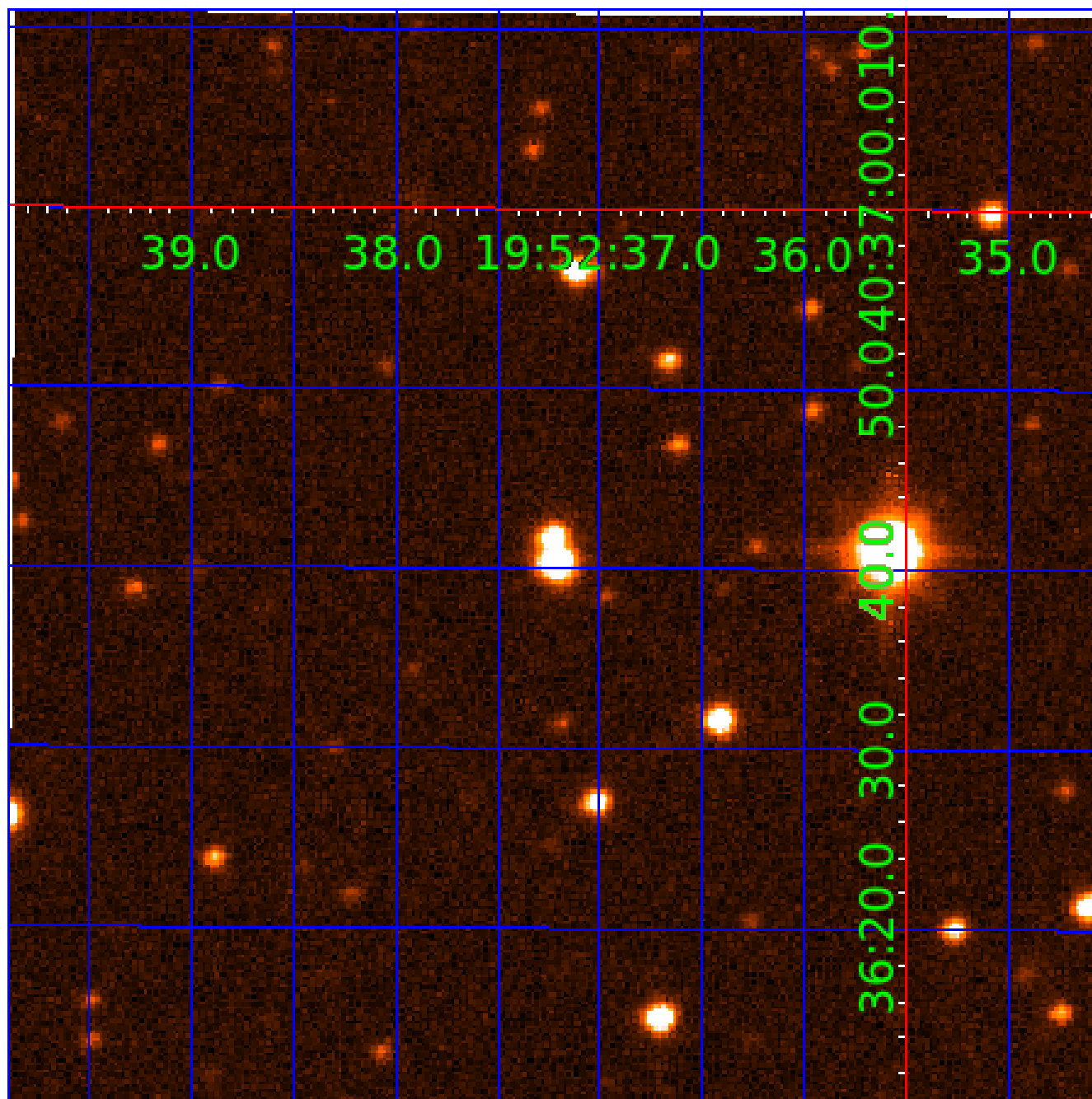


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005473584-01	OBS	No	2.057314	131.716569	56.0	12.458	10.6	10.8	0.95	5981	0.71	1044.36
005473584-02	OBS	No	127.314701	209.022298	3501.0	12.500	32.6	-1.0	0.95	5981	5.58	4.27
005473584-03	OBS	No	176.777863	192.616919	698.3	9.643	9.1	8.6	0.95	5981	2.58	2.75
005473584-04	OBS	No	220.217822	245.539358	886.4	5.201	9.1	9.5	0.95	5981	2.96	2.06
005473584-05	OBS	No	62.041641	157.060612	612.4	4.276	9.3	8.2	0.95	5981	2.53	11.13
005473584-06	OBS	No	117.170899	156.448113	718.3	5.004	8.7	9.0	0.95	5981	2.79	4.77
005473584-07	OBS	No	103.715178	177.936830	944.3	2.406	8.6	8.7	0.95	5981	3.21	5.61
005473584-08	OBS	No	121.971110	136.750593	764.6	3.439	8.2	9.3	0.95	5981	2.76	4.52
005473584-09	OBS	No	493.745537	157.413319	749.4	4.001	8.7	8.8	0.95	5981	2.59	0.70
005473584-10	OBS	No	184.564683	141.142796	591.9	9.414	7.7	8.0	0.95	5981	2.48	2.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005473584-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005473584-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
005473584-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005473584-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-07	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005473584-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005473584-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

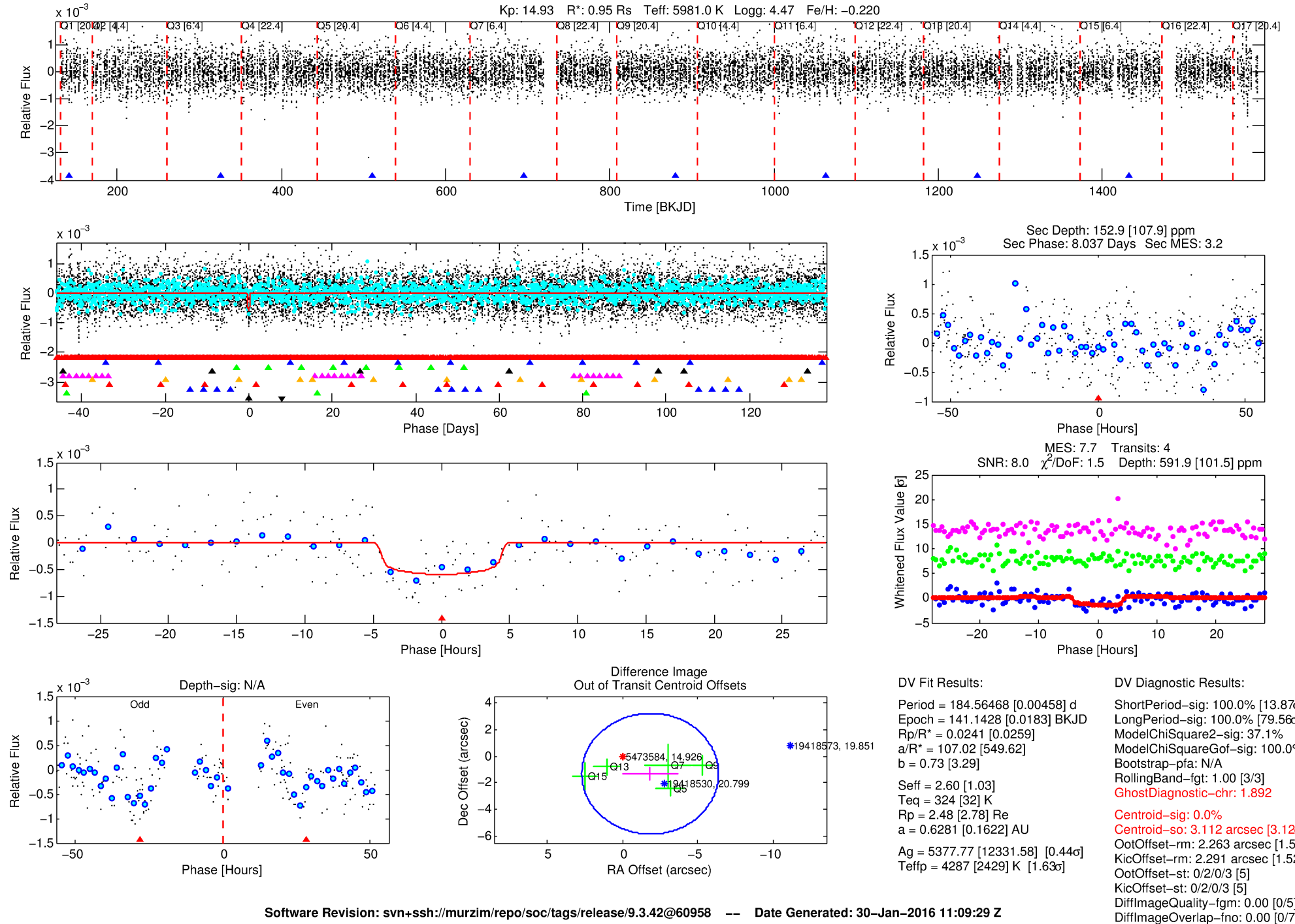
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005473584-10

No Significant Match Found

# DV One-Page Summary

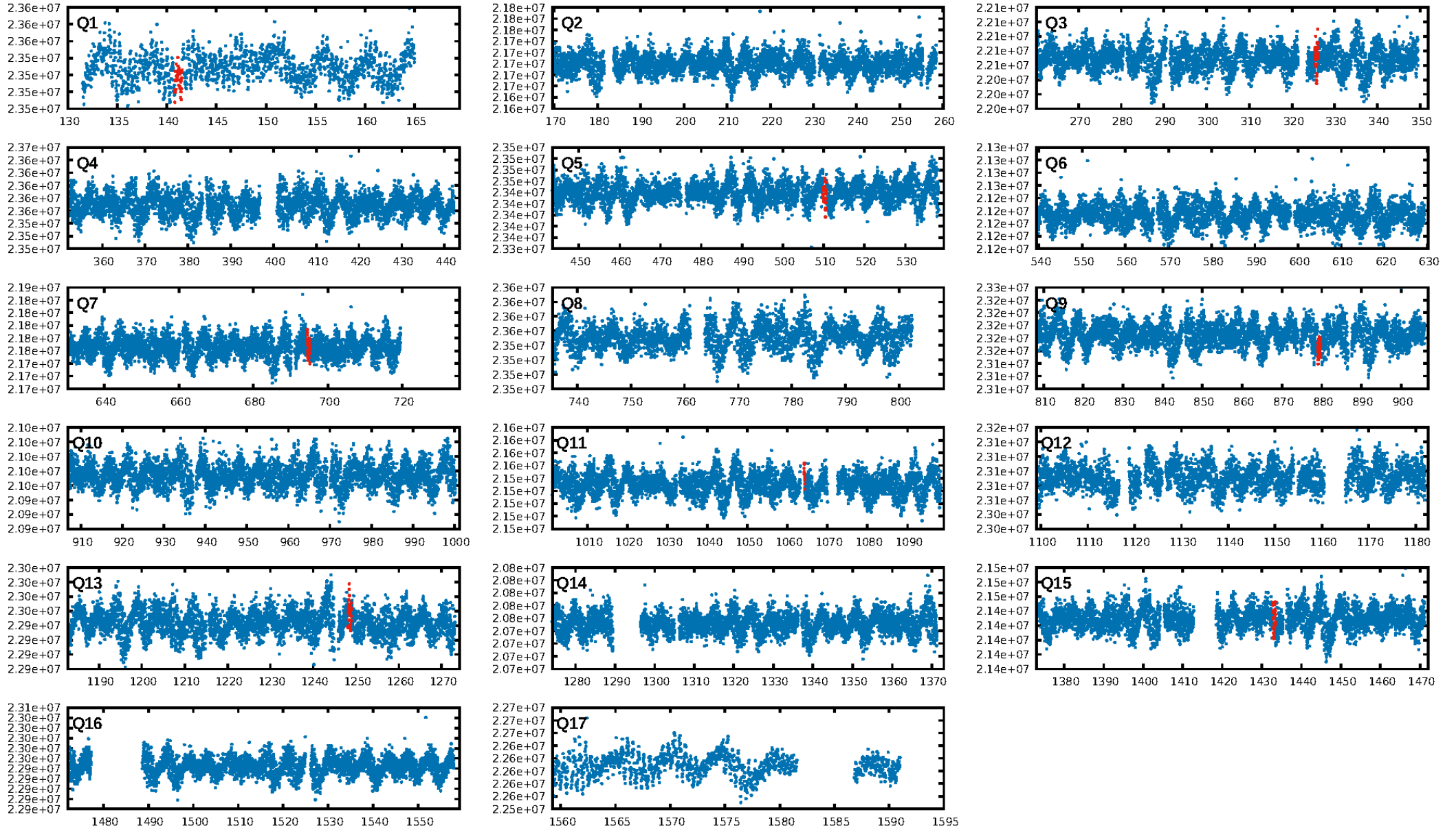
KIC: 5473584 Candidate: 10 of 10 Period: 184.565 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:09:29 Z

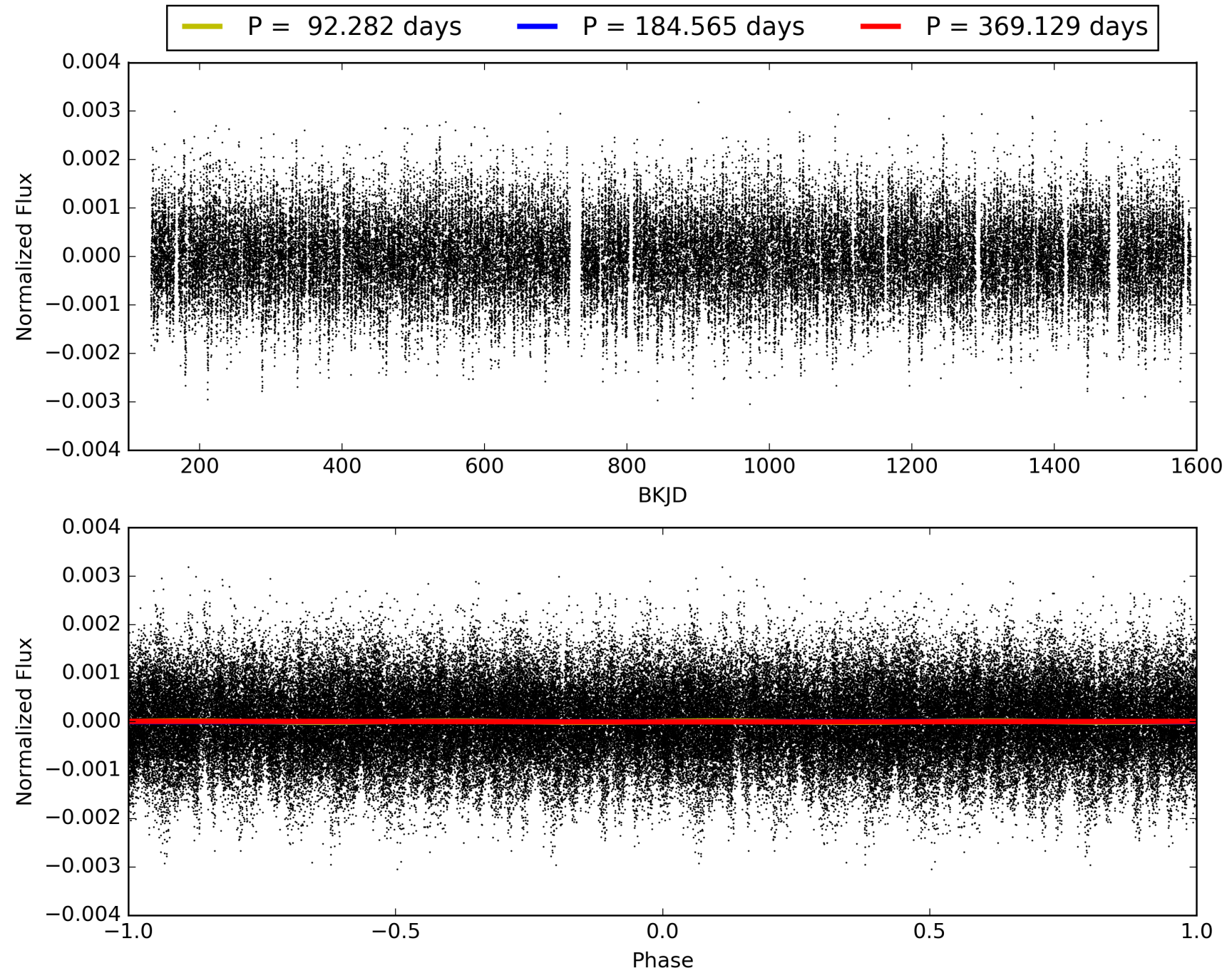
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005473584-10, PDC Light Curves



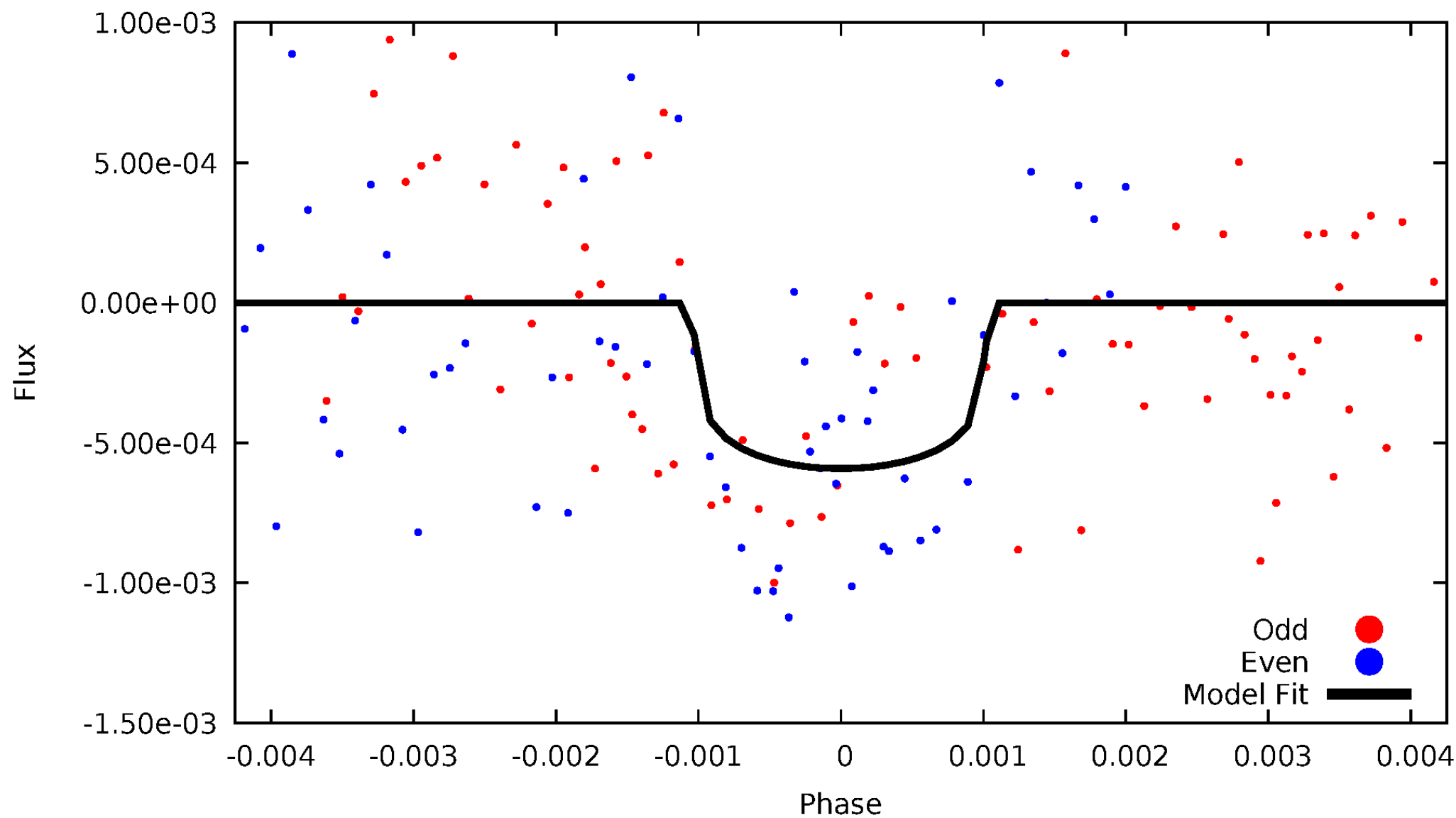


# TCE 005473584-10



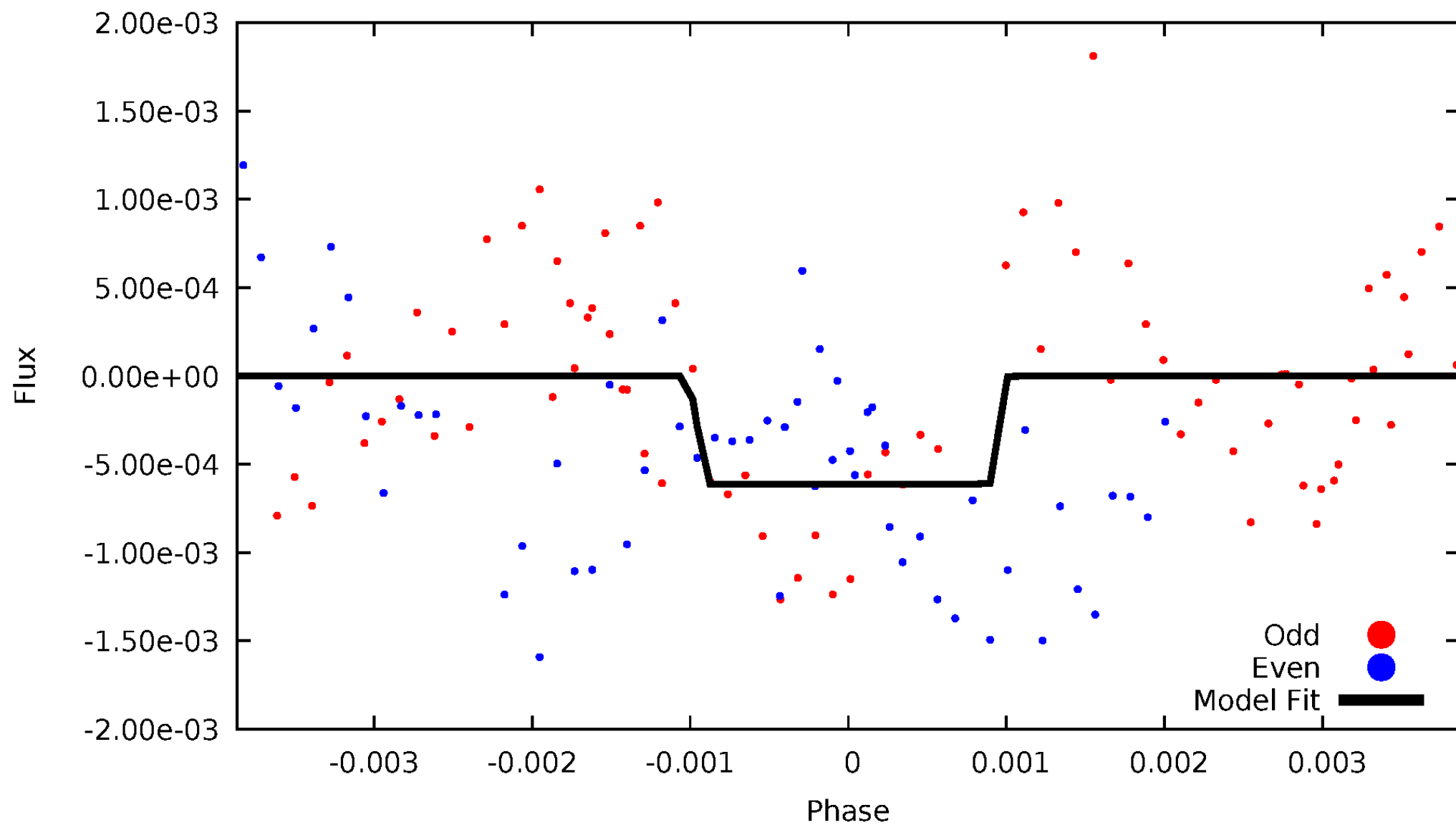
# DV Odd/Even

TCE 005473584-10



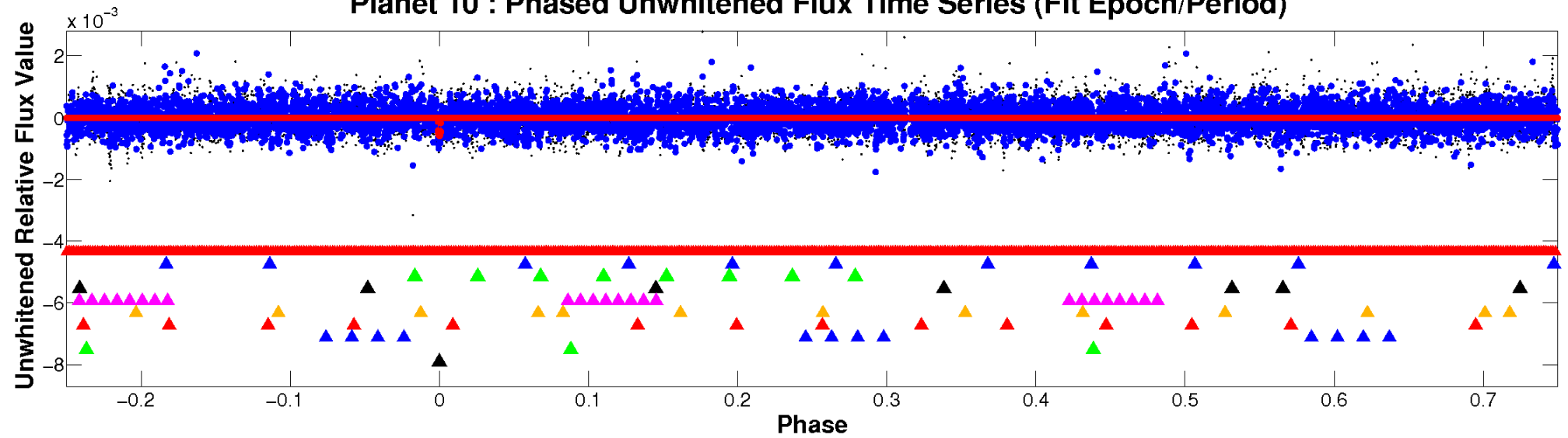
# ALT Odd/Even

TCE 005473584-10

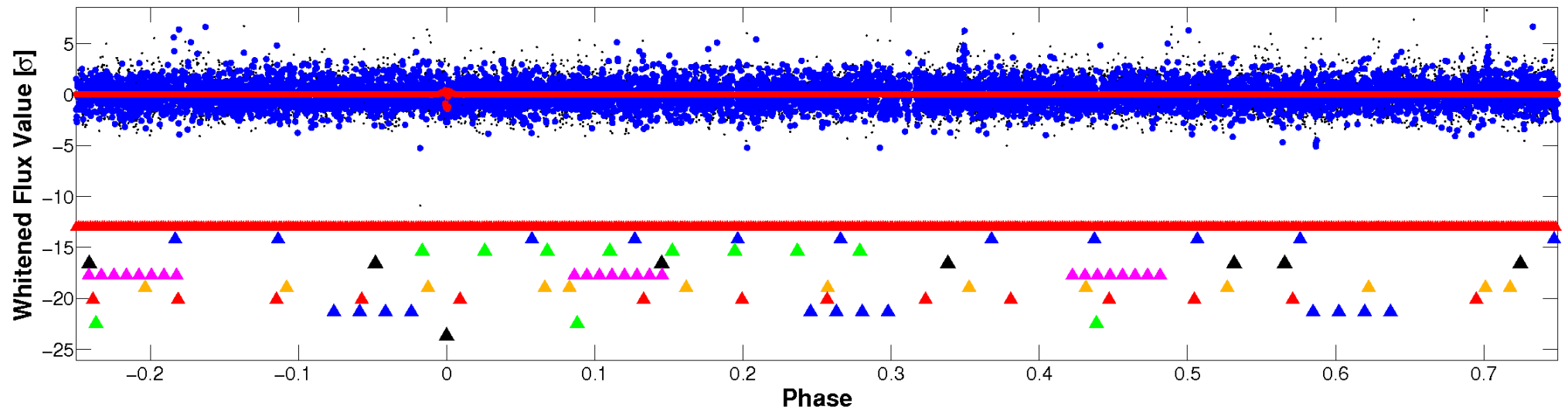


# Non-Whitened Vs. Whitened Light Curve

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

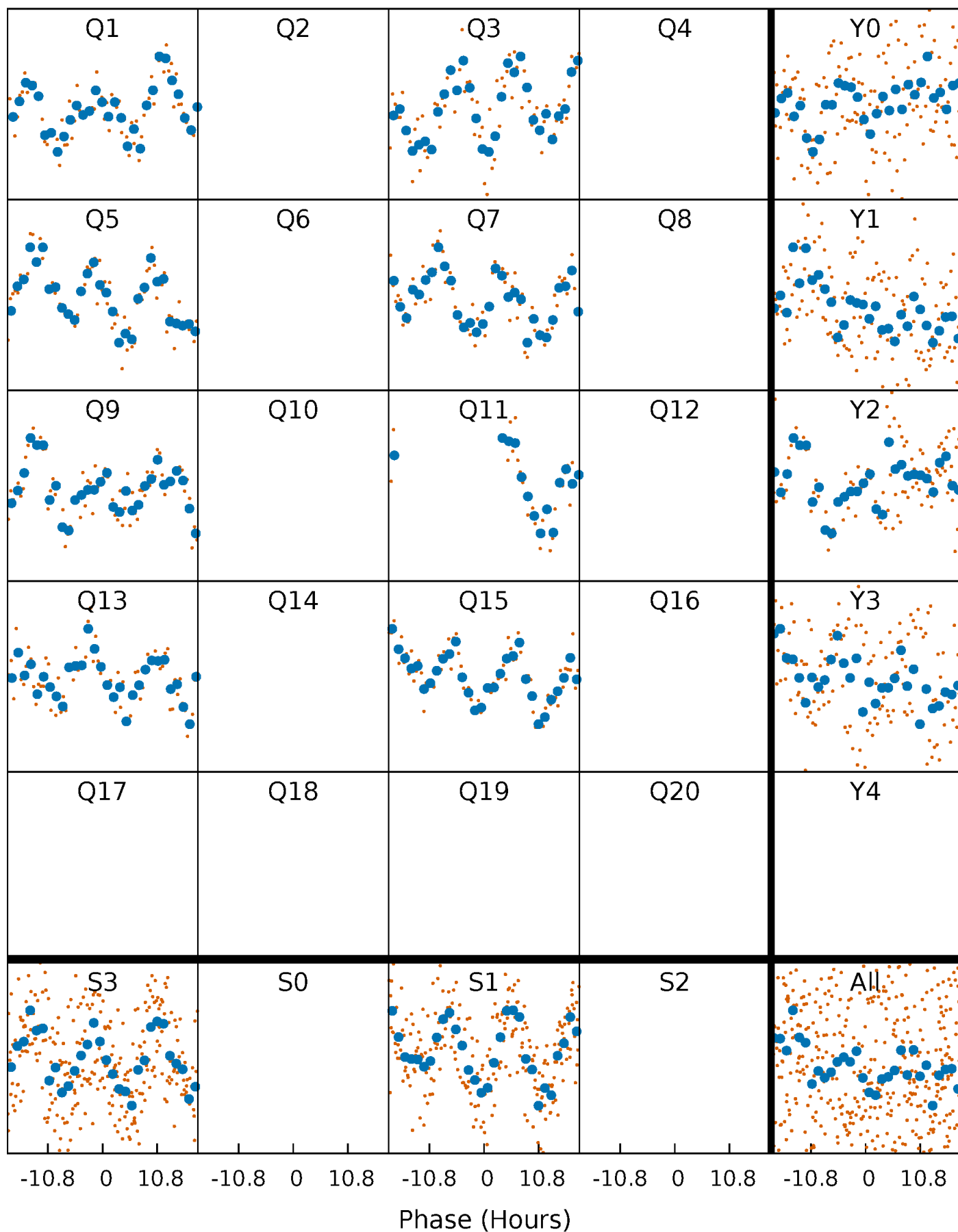


Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)



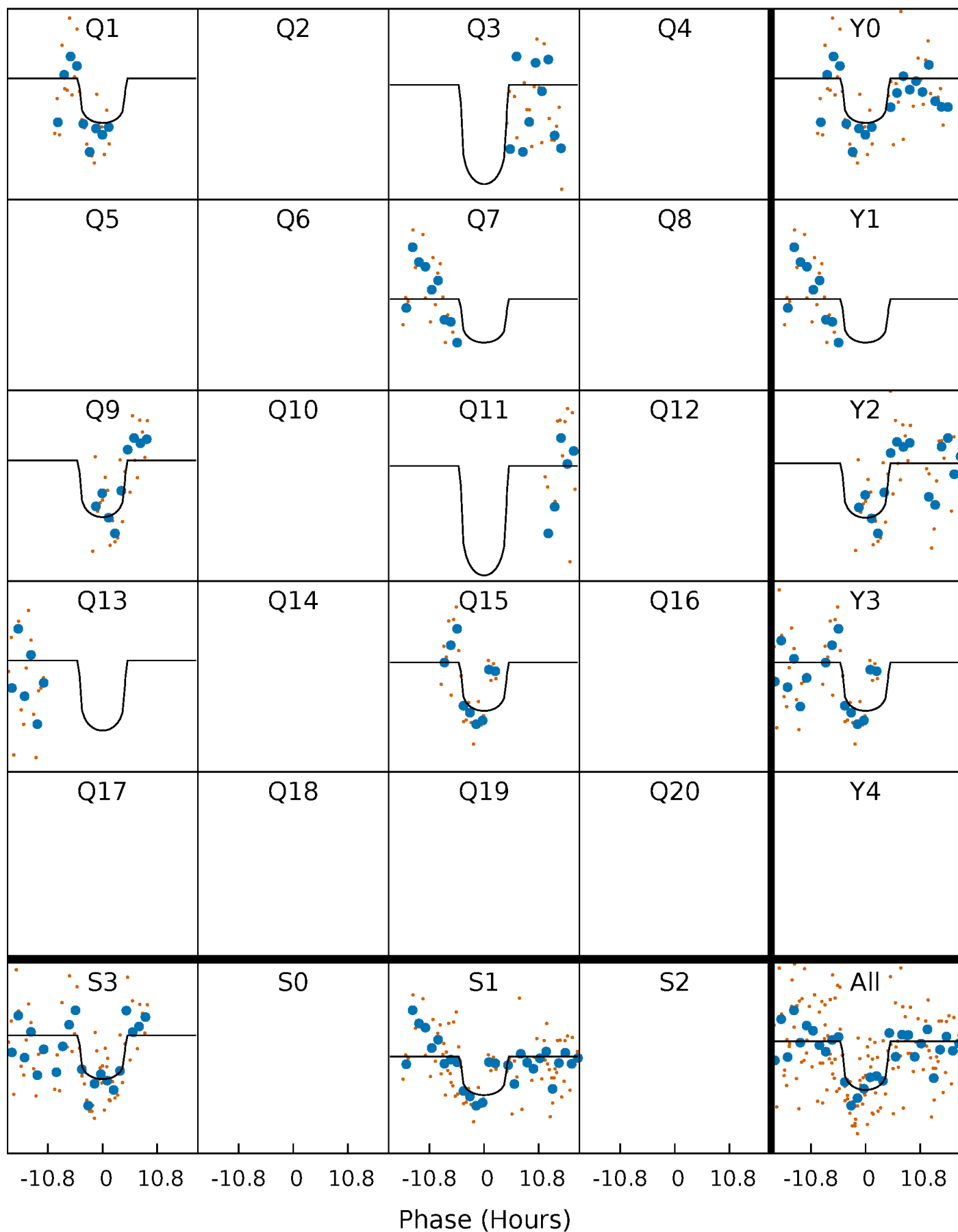
# PDC Quarter-Phased Transit Curves

TCE 005473584-10 P=184.564683 Days  $T_0=141.142796$  (BKJD)



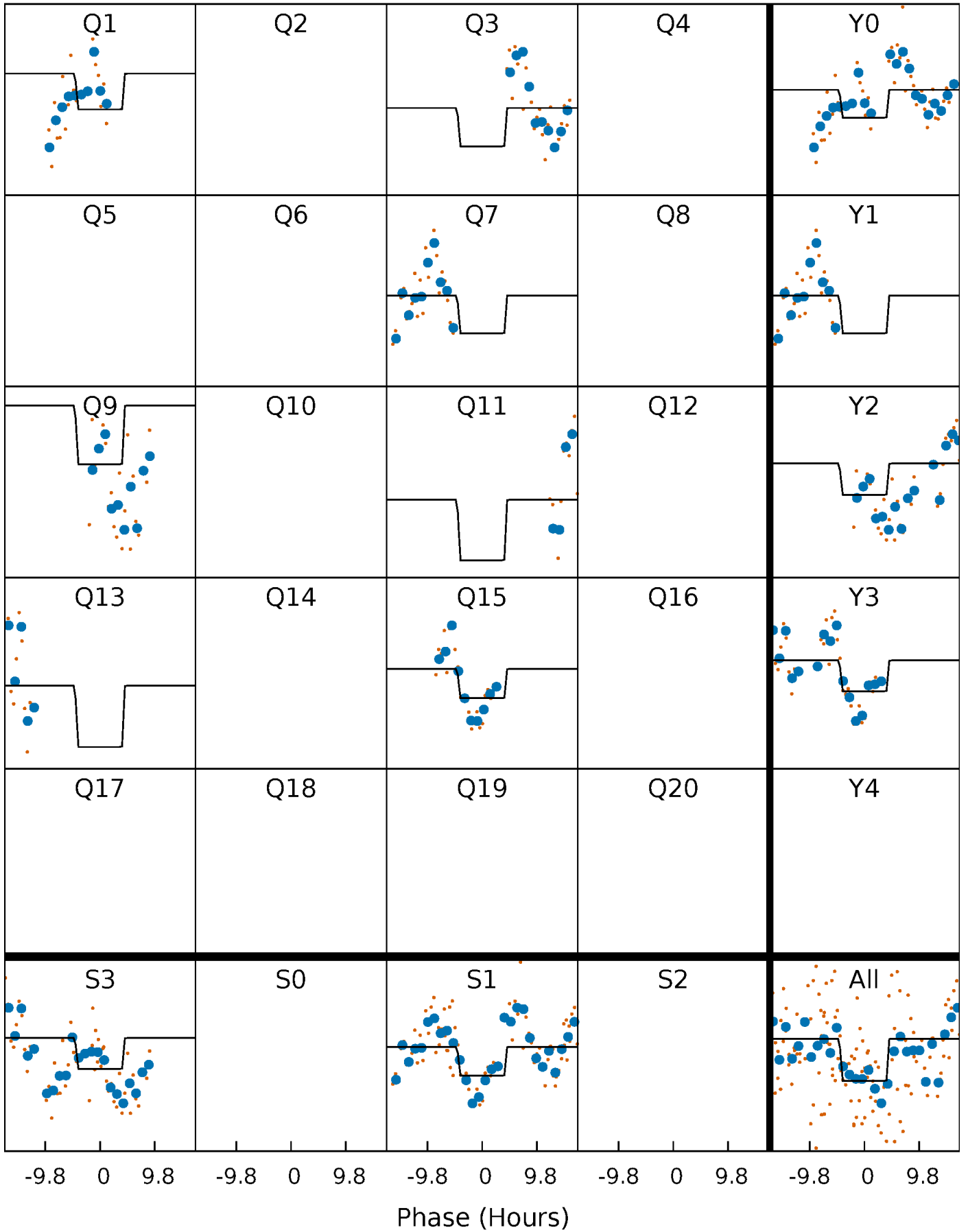
# DV Quarter-Phased Transit Curves

TCE 005473584-10     $P=184.564683$  Days     $T_0=141.142796$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

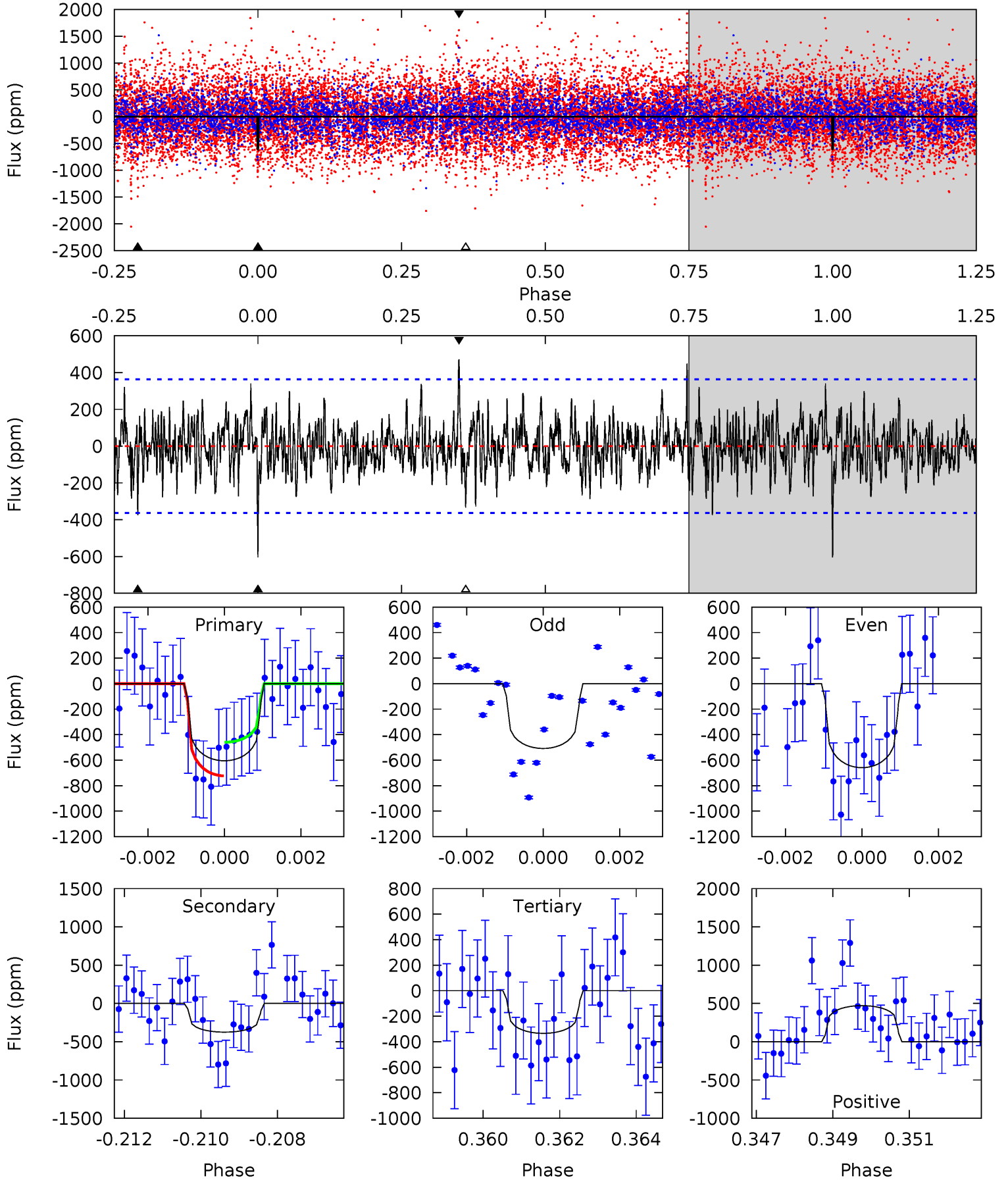
TCE 005473584-10 P=184.562725 Days  $T_0=141.149568$  (BKJD)



# DV Model-Shift Uniqueness Test

005473584-10, P = 184.564683 Days, E = 141.142796 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.84	5.48	4.89	6.89	5.31	3.07	1.60	3.95	1.95	0.59	-1.42	1.07	1.15	0.44	1.92

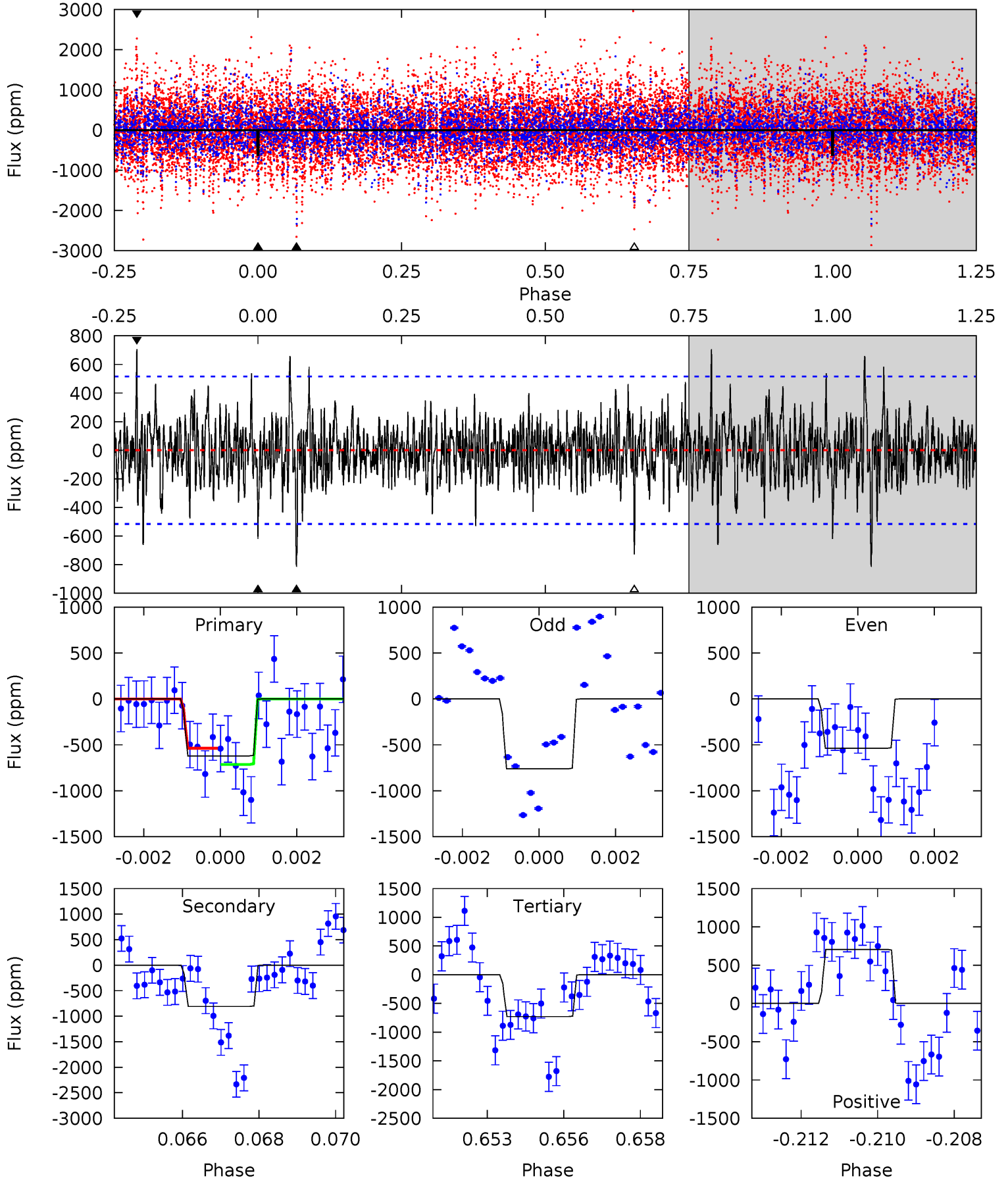




# Alt Model-Shift Uniqueness Test

005473584-10, P = 184.562725 Days, E = 141.149568 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.40	8.35	7.52	7.29	5.32	3.08	1.72	-1.12	-0.88	0.83	1.06	1.13	0.78	0.47	0.92



### Stellar Parameters For KIC 005473584

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5981^{+179}_{-197}$	$4.473^{+0.067}_{-0.202}$	$-0.220^{+0.300}_{-0.300}$	$0.946^{+0.293}_{-0.117}$	$0.971^{+0.133}_{-0.121}$	$1.617^{+0.550}_{-0.833}$
	+3%/-3%	+1%/-5%	+136%/-136%	+31%/-12%	+14%/-12%	+34%/-52%
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 005473584-10 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-375 \pm 68$	$3.26^{+2.55}_{-2.02}$	$461^{+34}_{-24}$	$4894^{+3071}_{-973}$	$7563^{+44863}_{-5258}$
Alt.	$-809 \pm 97$	$3.41^{+2.47}_{-2.14}$	$461^{+32}_{-22}$	$5636^{+4404}_{-1113}$	$14750^{+92642}_{-9758}$

$T_{max}$  = 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

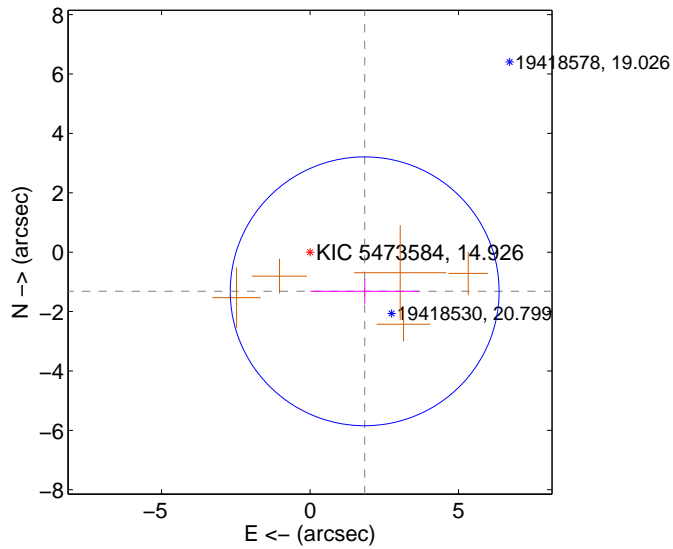
Supplemental centroid analysis for 005473584-10. Kepler magnitude: 14.93. Transit SNR 7.96

There are 0 quarters with good PRF difference image offsets

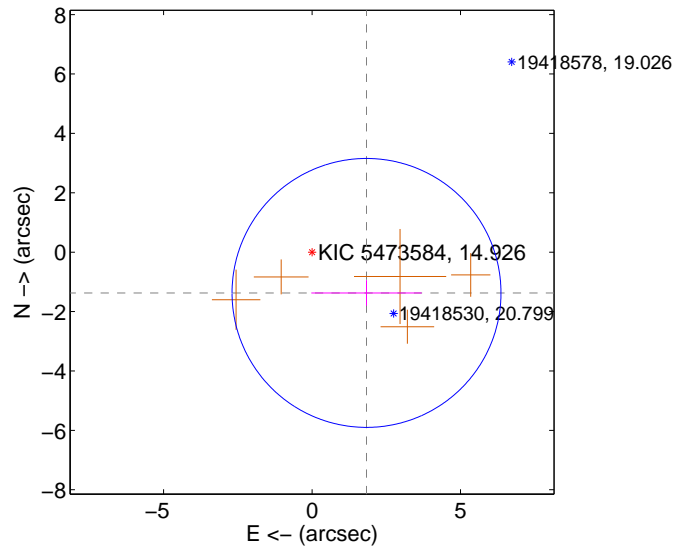
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.263 \pm 1.509$	1.50	$-1.840 \pm 1.831$	$-1.318 \pm 0.420$
PRF-fit source offset from KIC position	$2.291 \pm 1.509$	1.52	$-1.834 \pm 1.857$	$-1.373 \pm 0.431$
photometric centroid source offset	$3.11 \pm 1.00$	3.12	$3.11 \pm 1.00$	$-0.16 \pm 0.87$

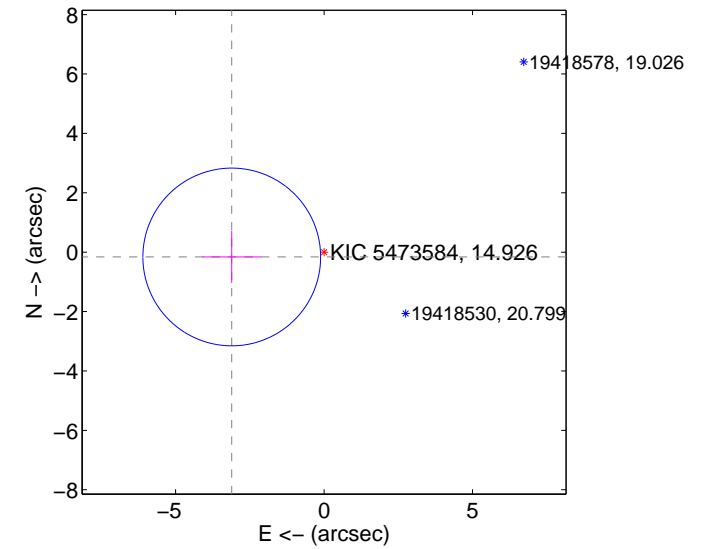
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

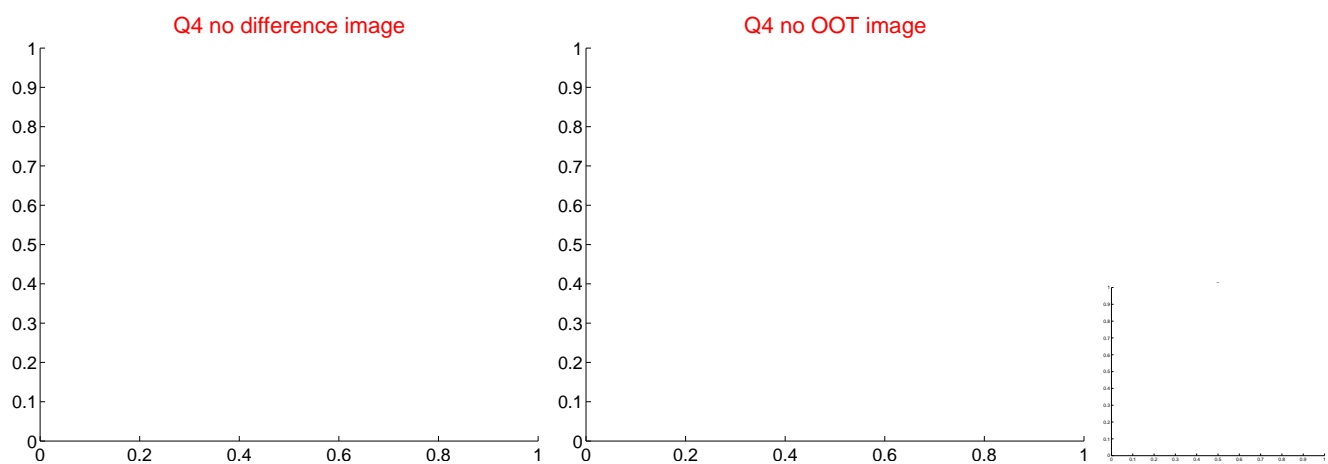
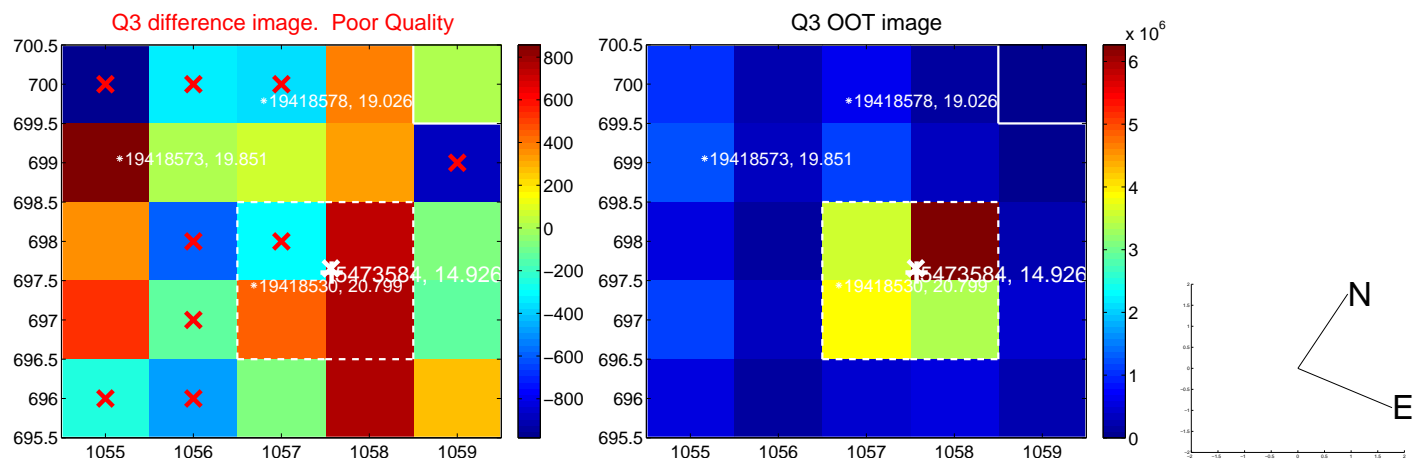
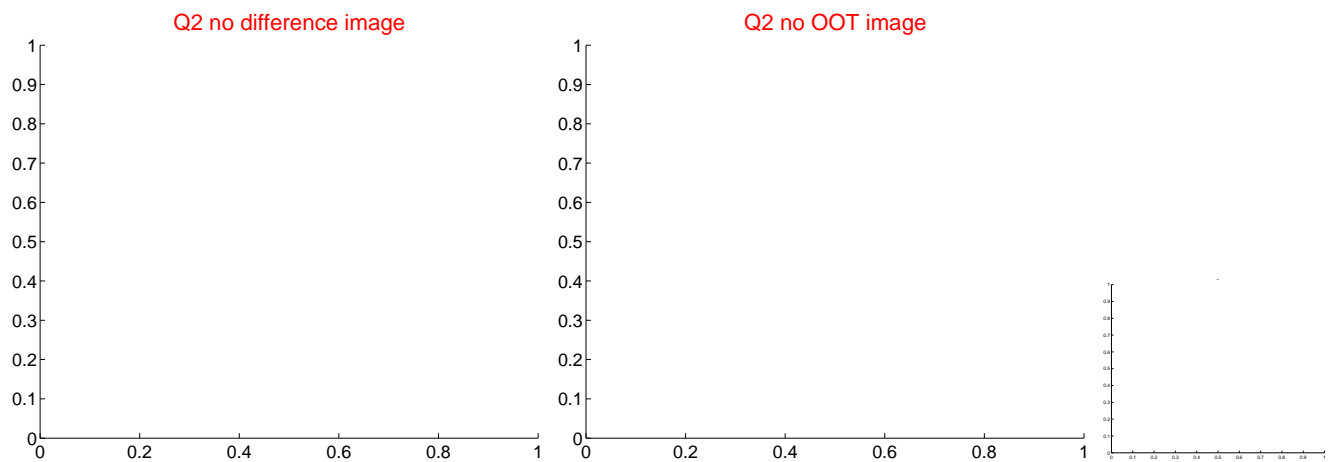
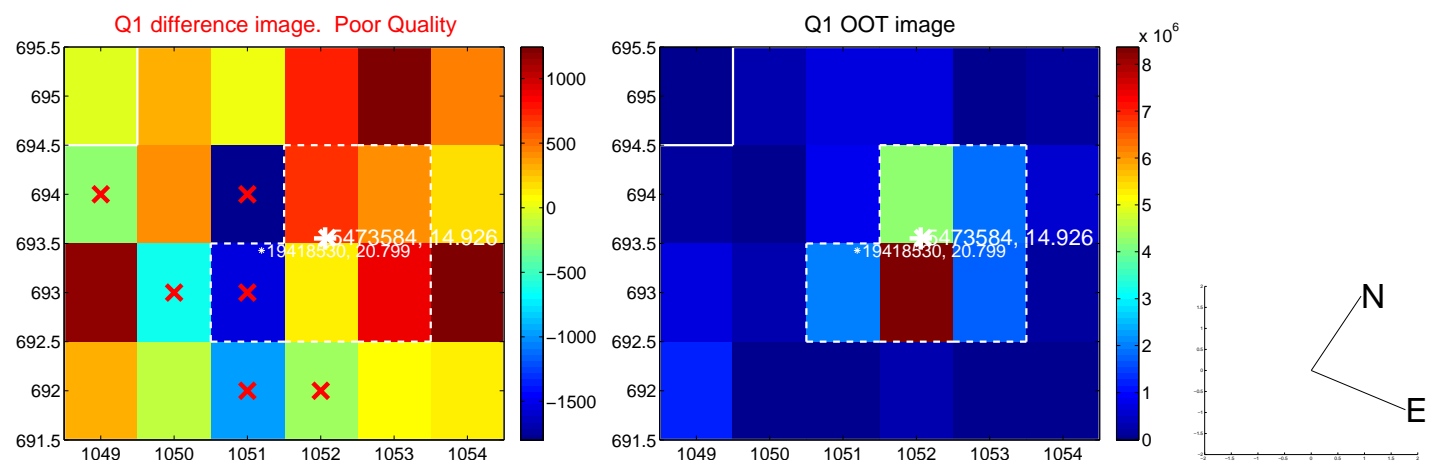


offset from photometric centroids

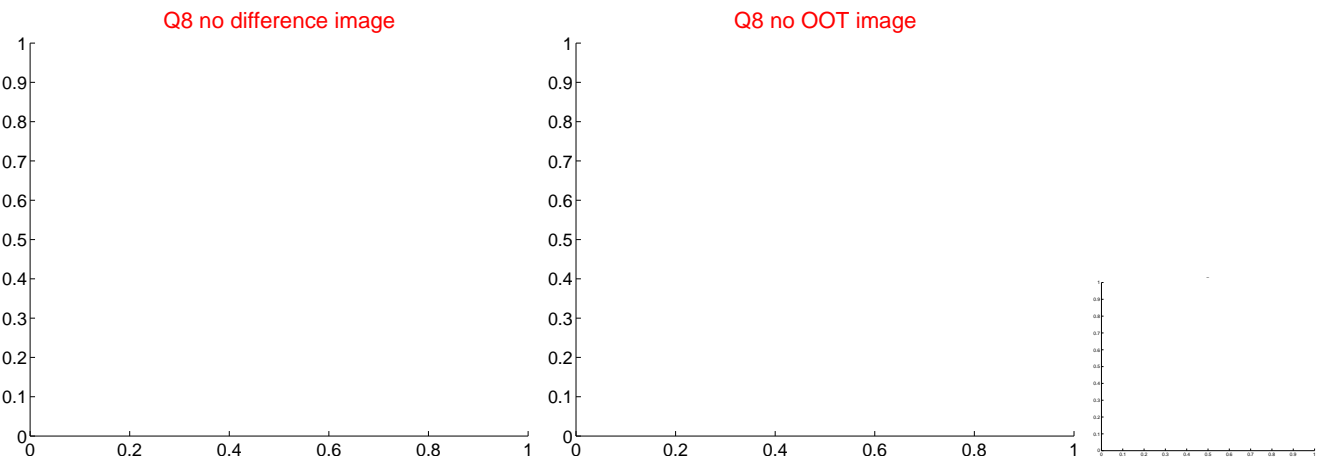
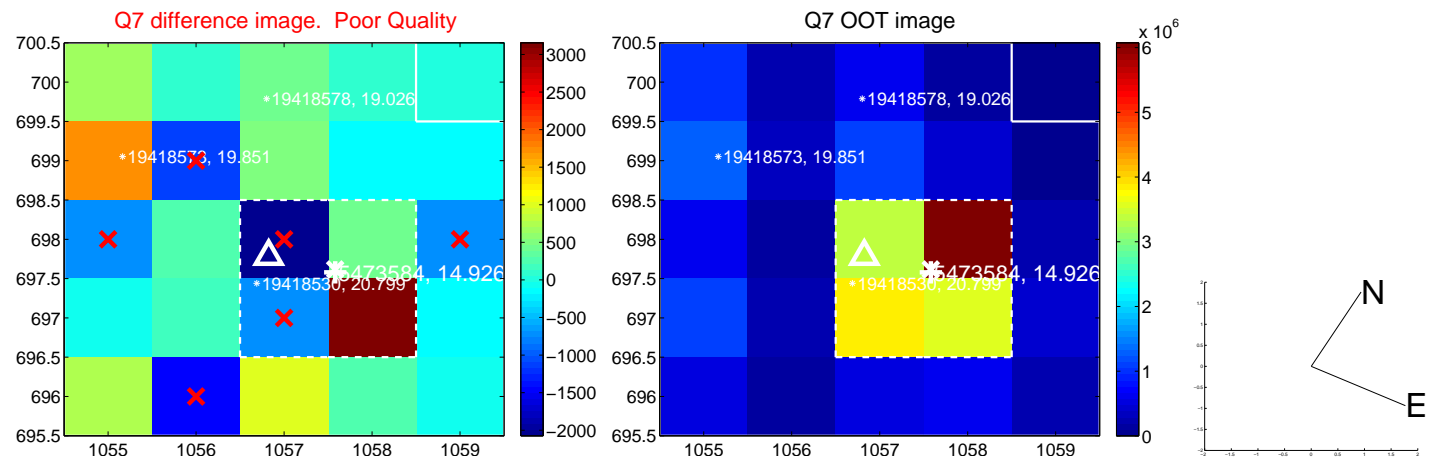
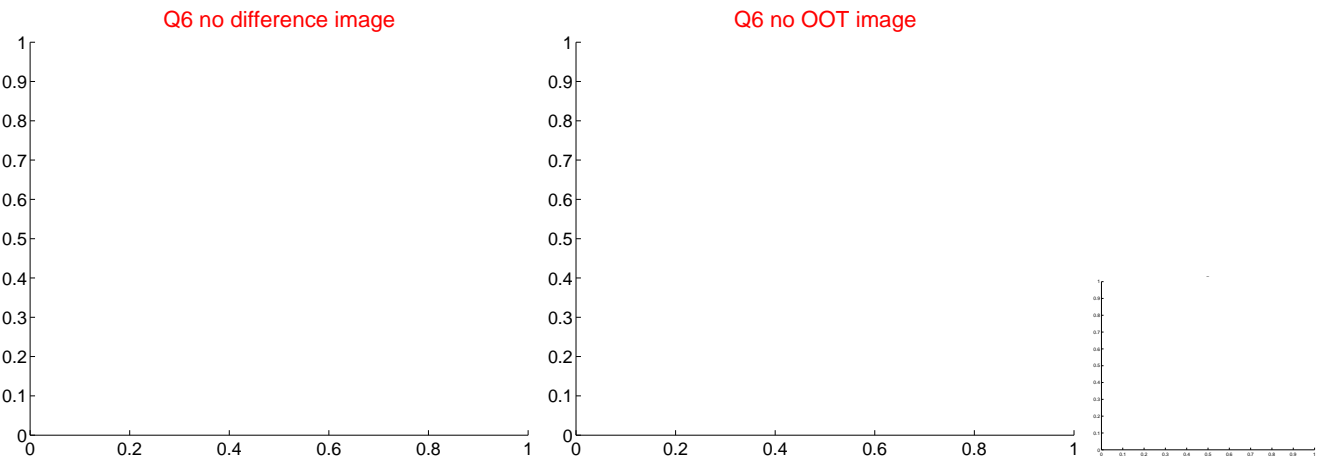
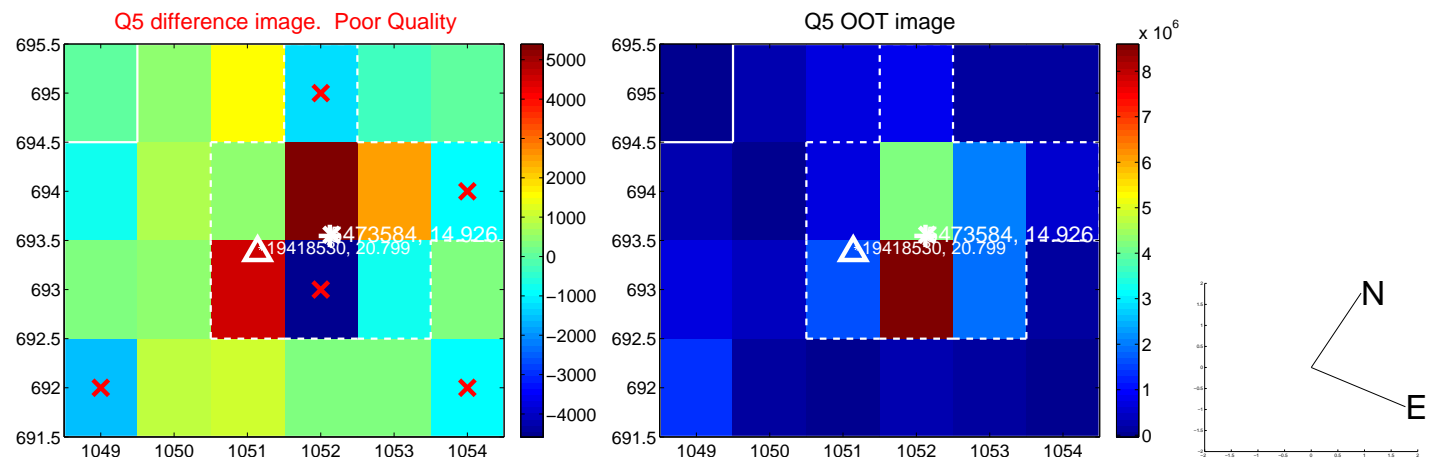


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

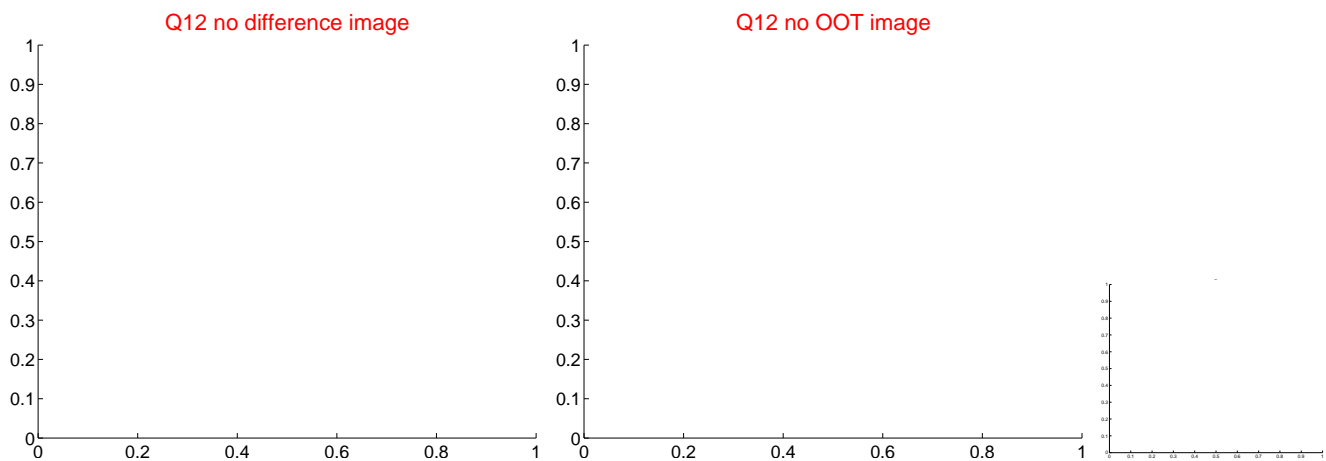
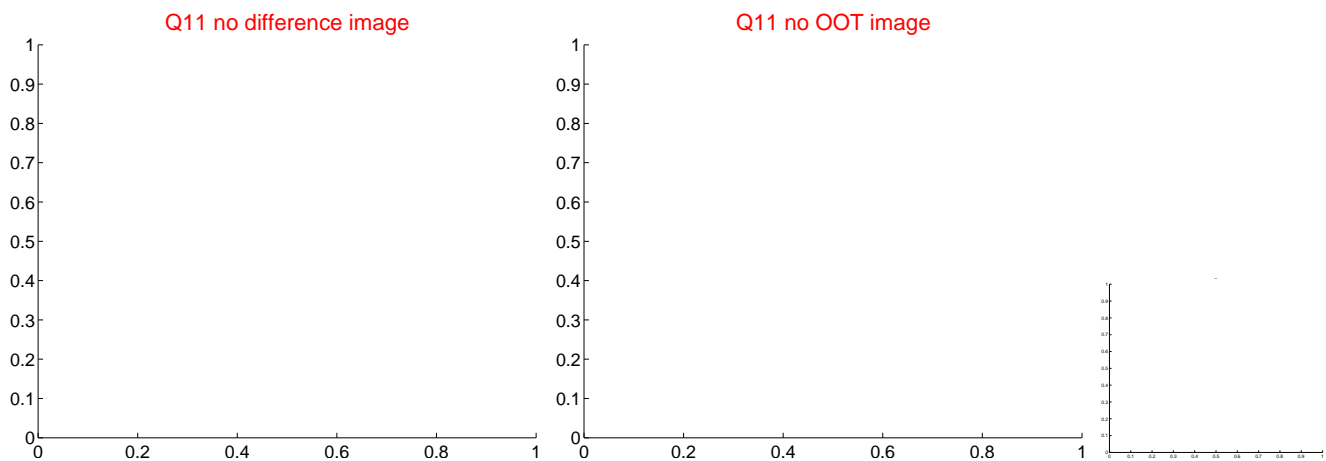
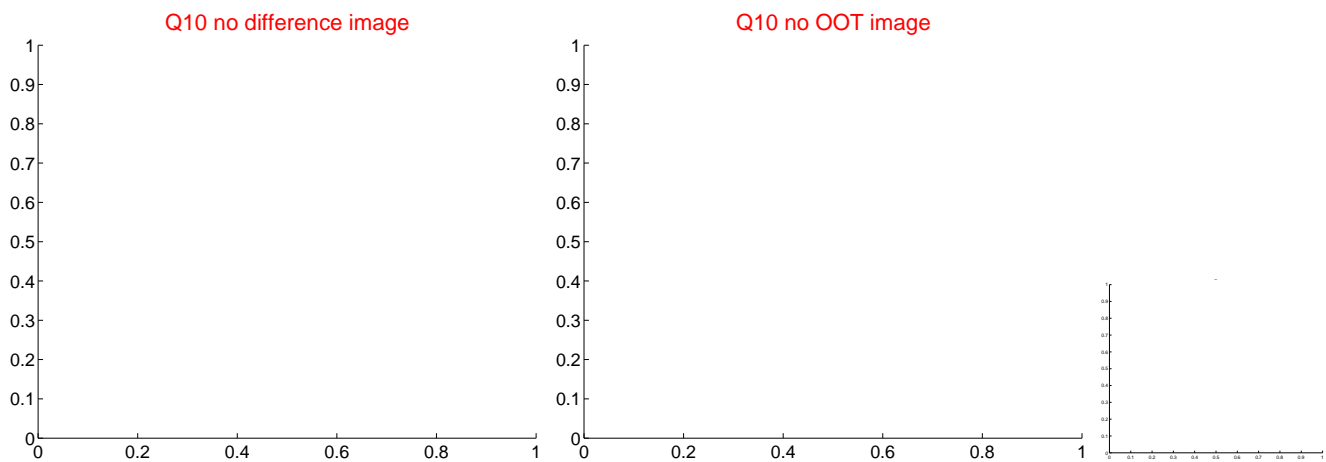
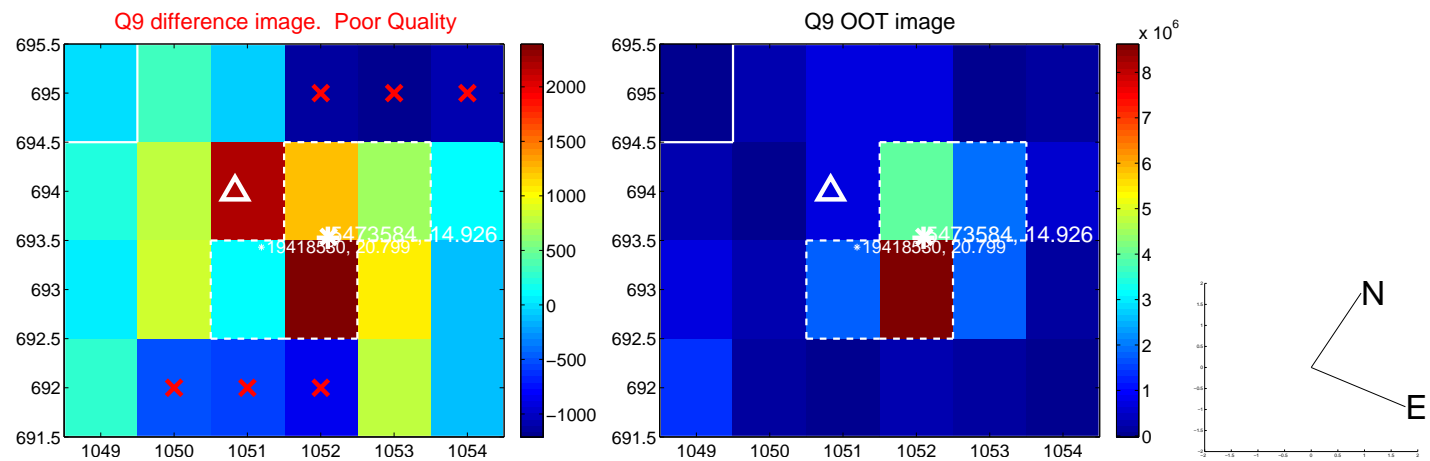
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



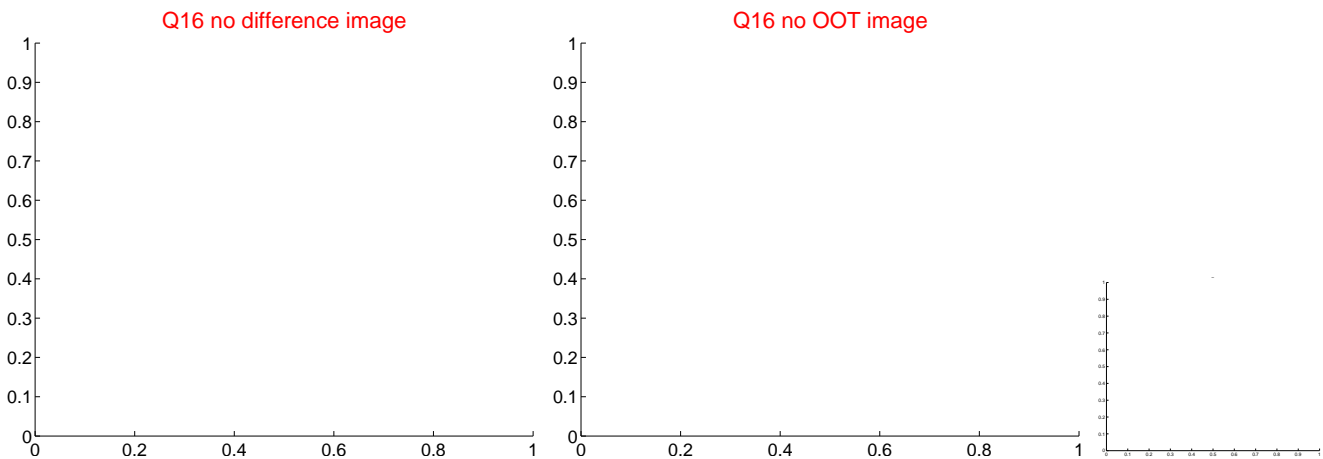
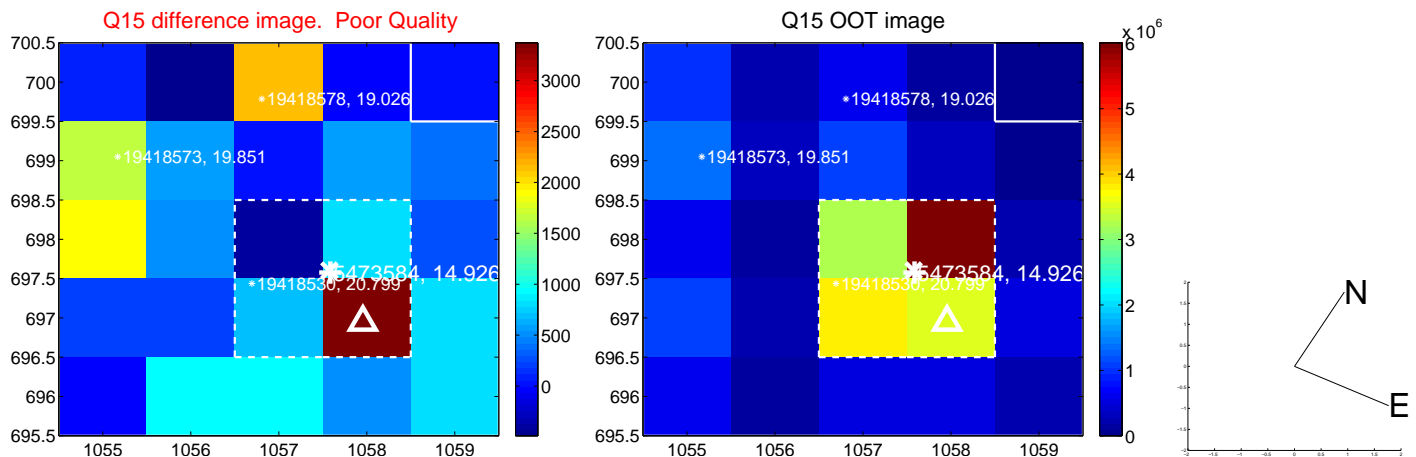
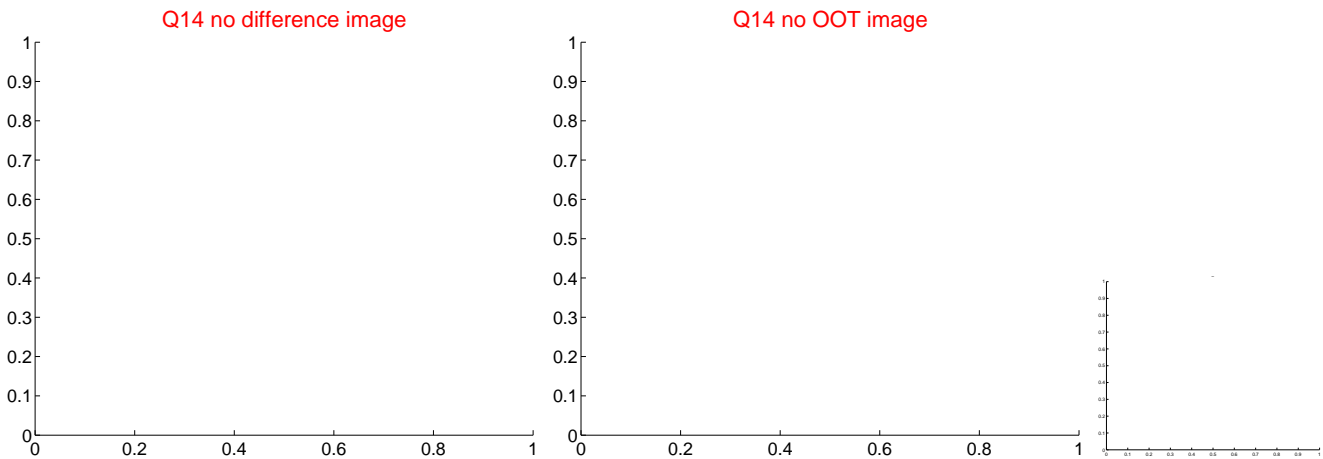
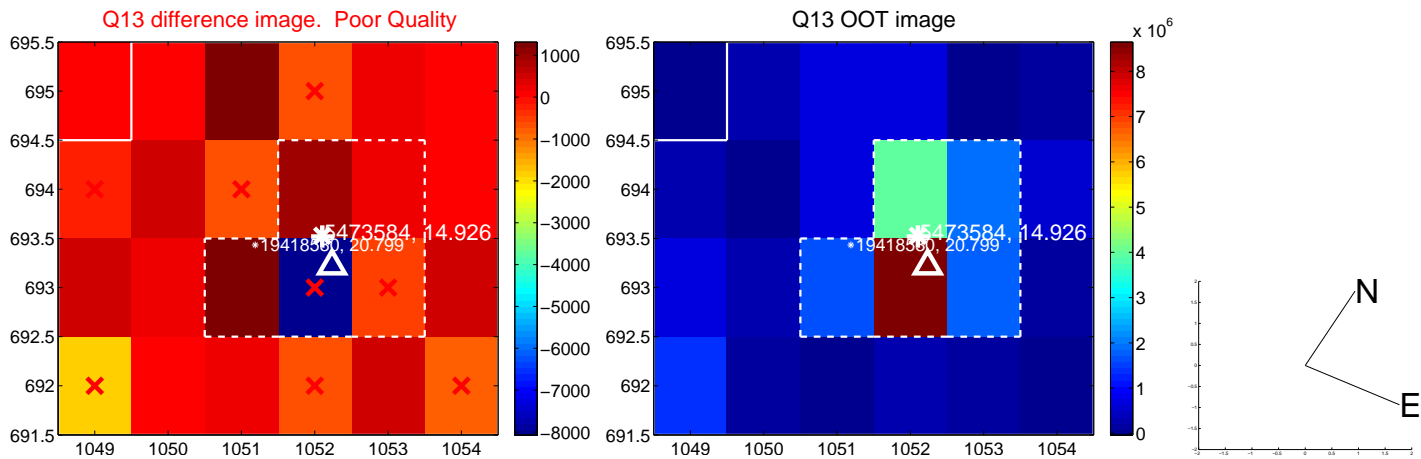
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



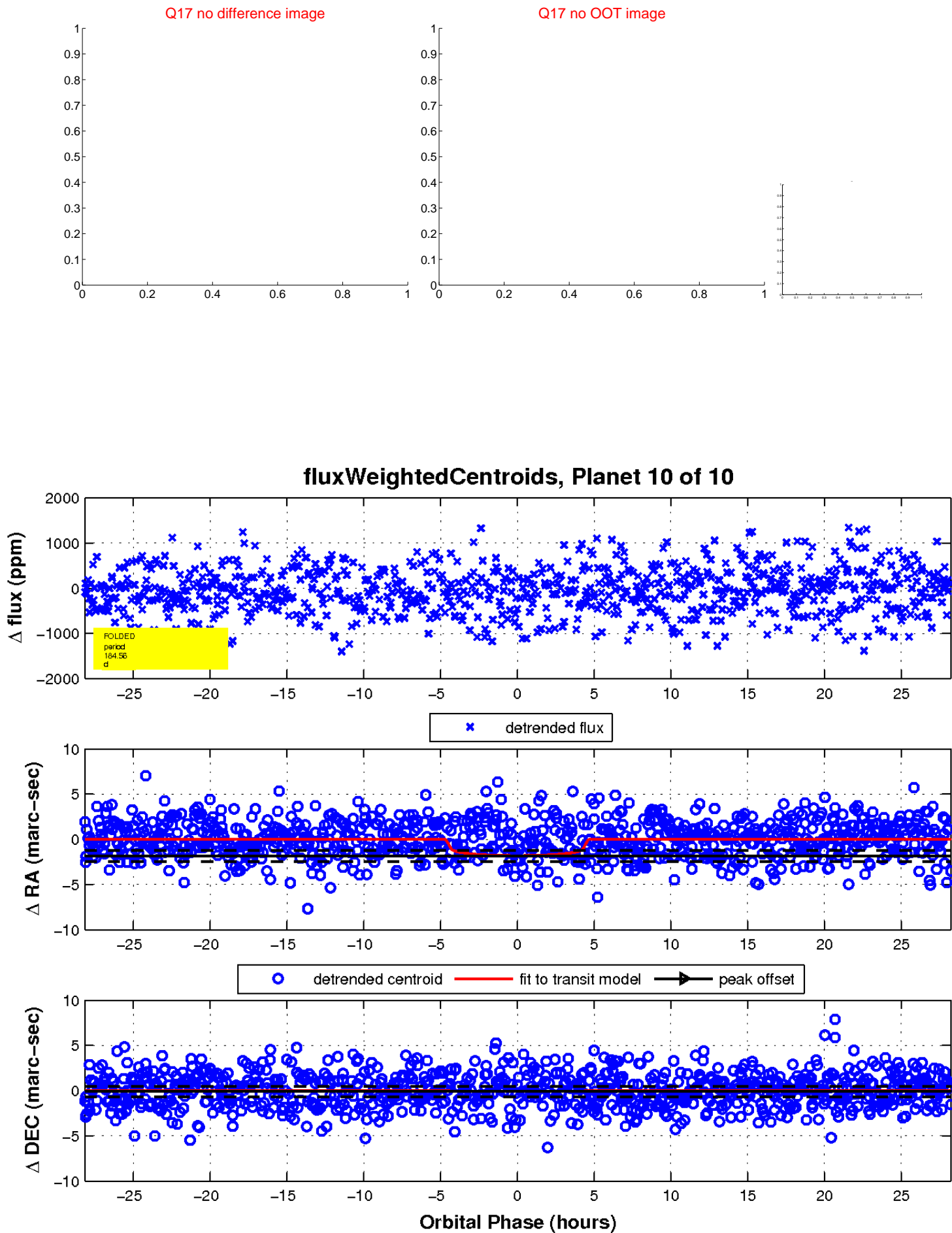
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

