

# KIC 004945547

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004945547-01	OBS	No	1.693538	131.928235	32.2	6.926	7.2	7.0	0.78	4954	0.43	518.25
004945547-02	OBS	No	208.487165	251.341938	779.0	9.293	7.9	9.0	0.78	4954	2.23	0.85

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004945547-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
004945547-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

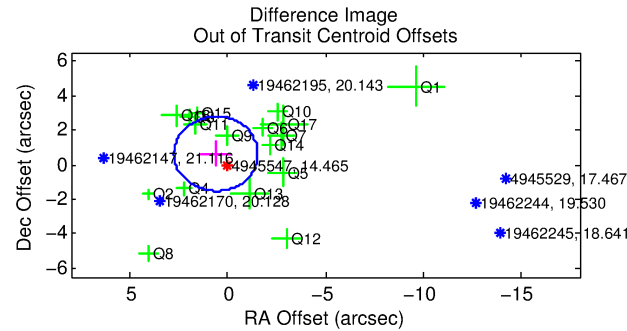
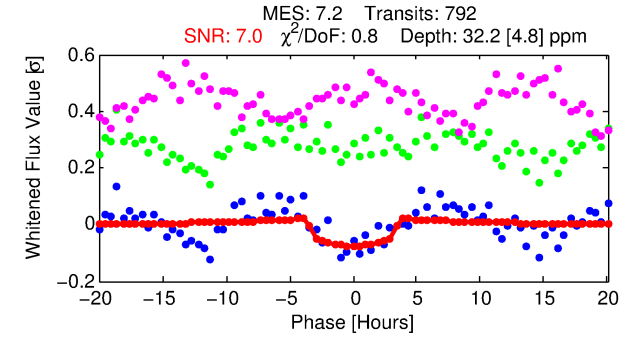
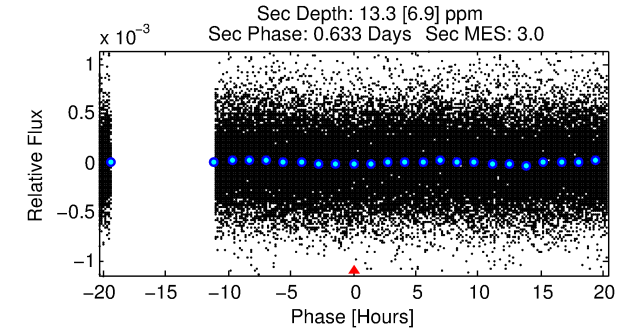
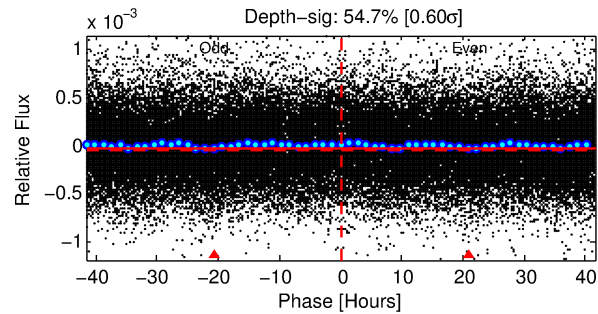
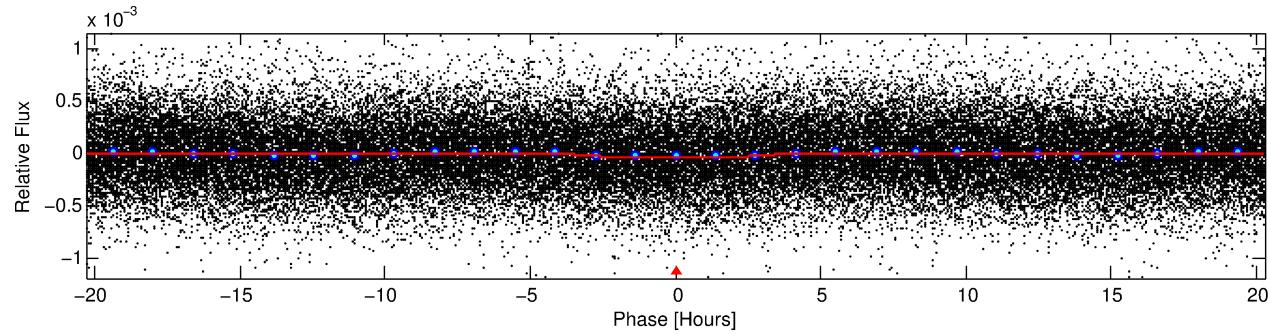
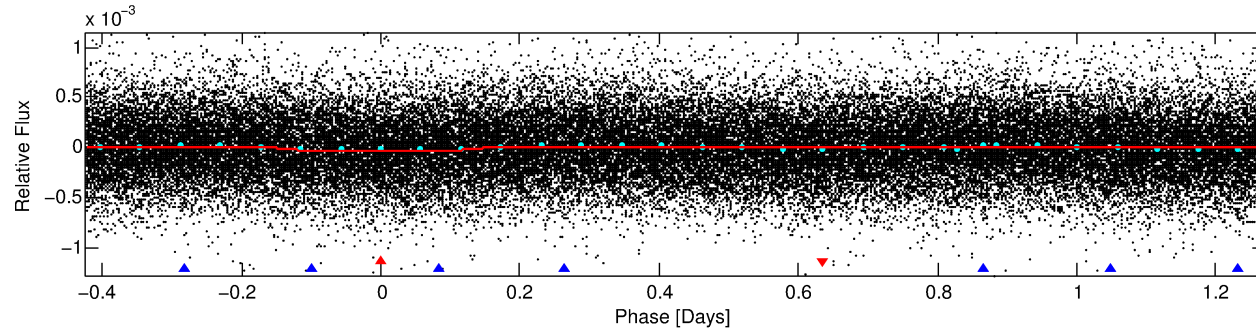
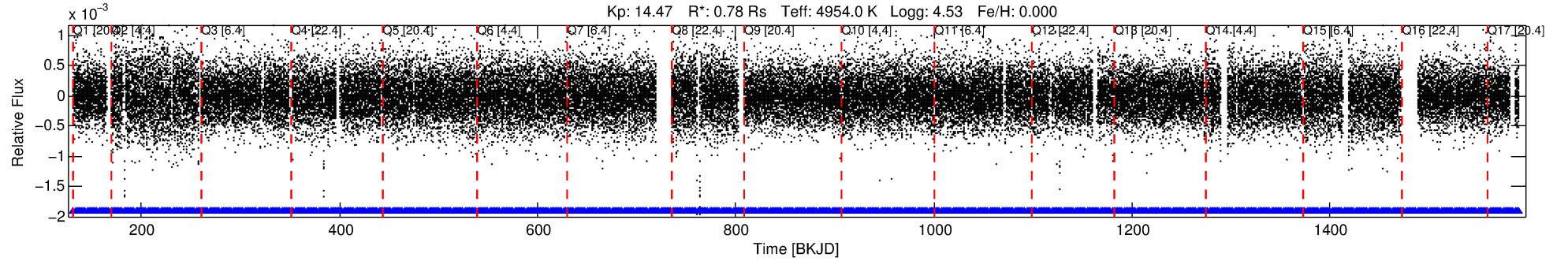
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004945547-01

No Significant Match Found

# DV One-Page Summary

KIC: 4945547 Candidate: 1 of 2 Period: 1.694 d



## DV Fit Results:

Period = 1.69354 [0.00003] d  
Epoch = 131.9282 [0.0094] BKJD  
Rp/R\* = 0.0050 [0.0072]  
a/R\* = 1.97 [6.98]  
b = 0.01 [365.41]  
Seff = 518.25 [91.74]  
Teff = 1217 [54] K  
Rp = 0.43 [0.62] Re  
a = 0.0253 [0.0023] AU  
Ag = 25.41 [74.17] [0.33 $\sigma$ ]  
Teffp = 4223 [3081] K [0.98 $\sigma$ ]

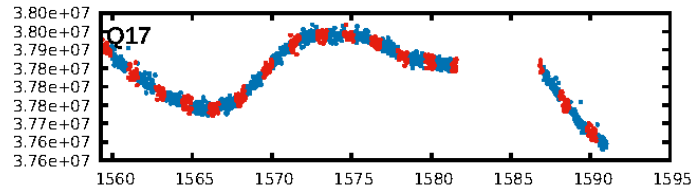
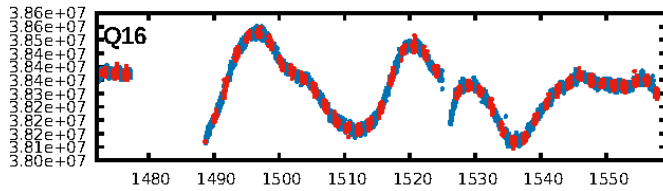
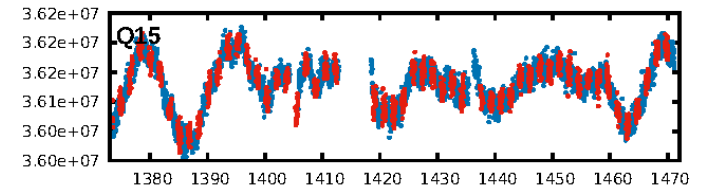
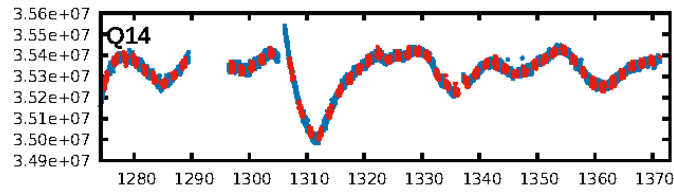
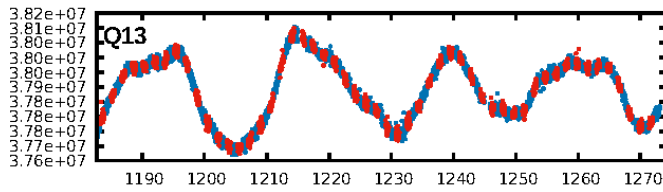
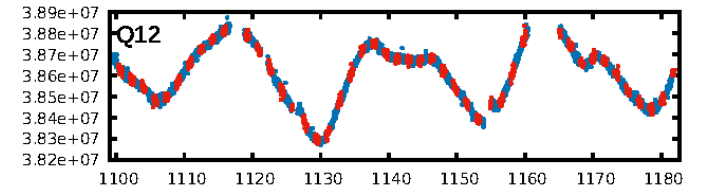
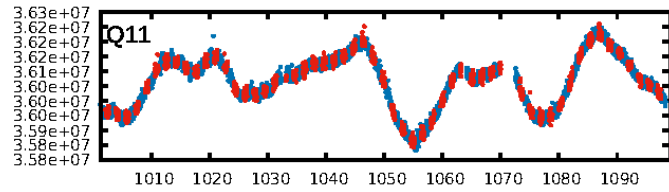
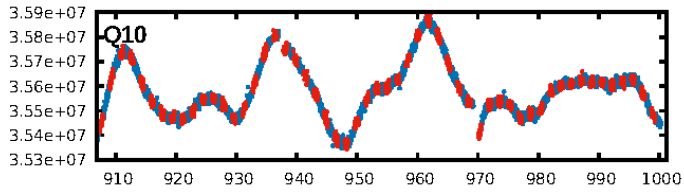
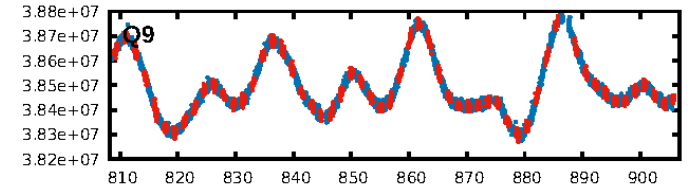
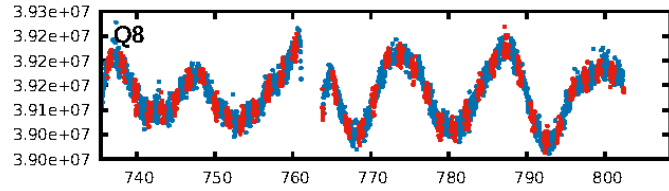
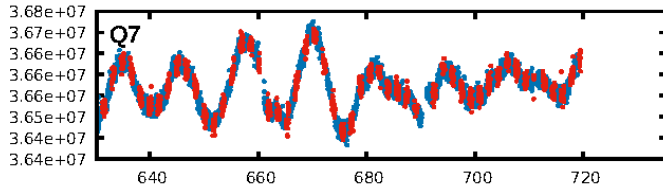
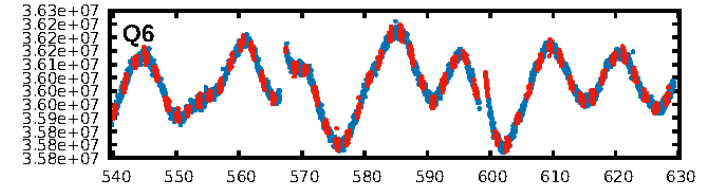
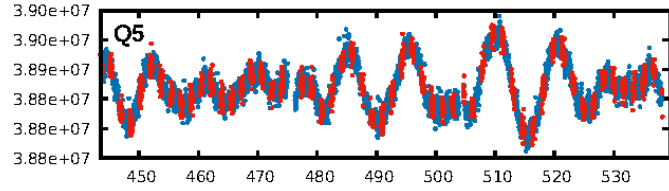
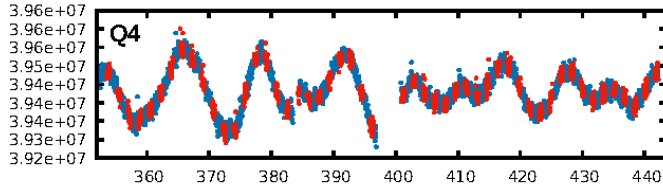
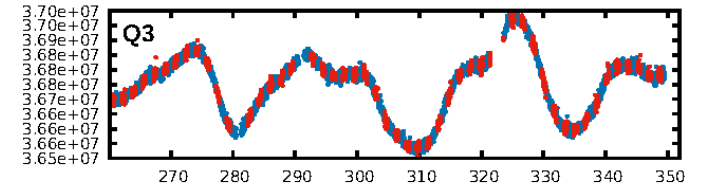
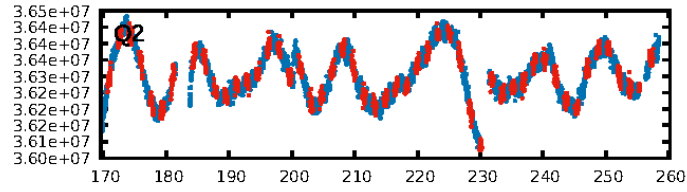
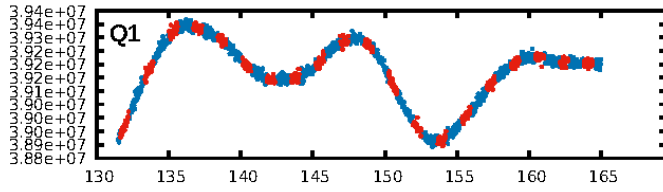
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [428.23 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.05e-12  
RollingBand-fgt: 1.00 [756/756]  
GhostDiagnostic-chr: 0.357  
Centroid-sig: 0.0%  
Centroid-so: 4.204 arcsec [3.12 $\sigma$ ]  
OotOffset-rm: 0.865 arcsec [1.21 $\sigma$ ]  
KicOffset-rm: 0.816 arcsec [1.14 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.12 [2/17]  
DiffImageOverlap-fno: 1.00 [17/17]

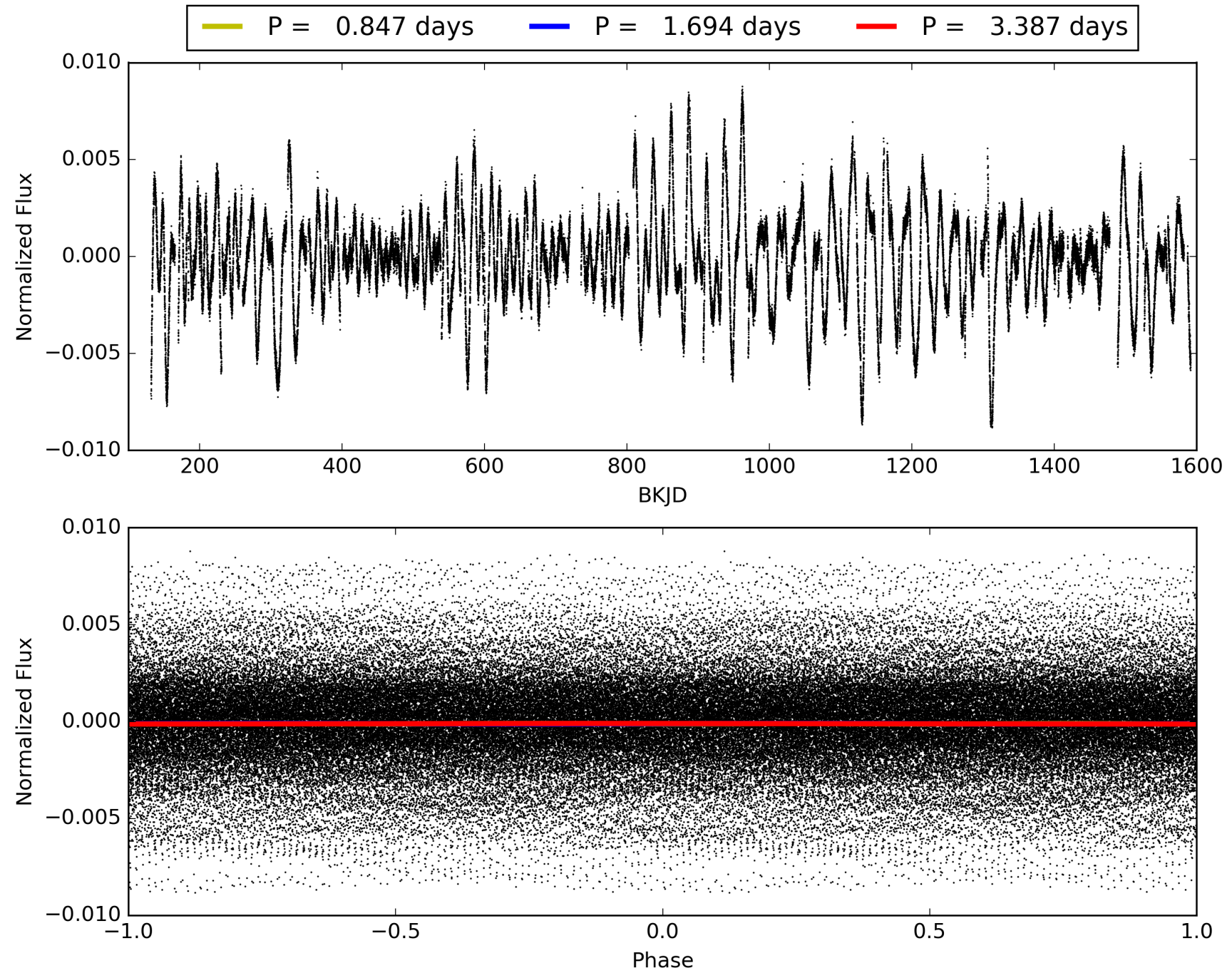
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:15:48 Z

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

# TCE 004945547-01, PDC Light Curves

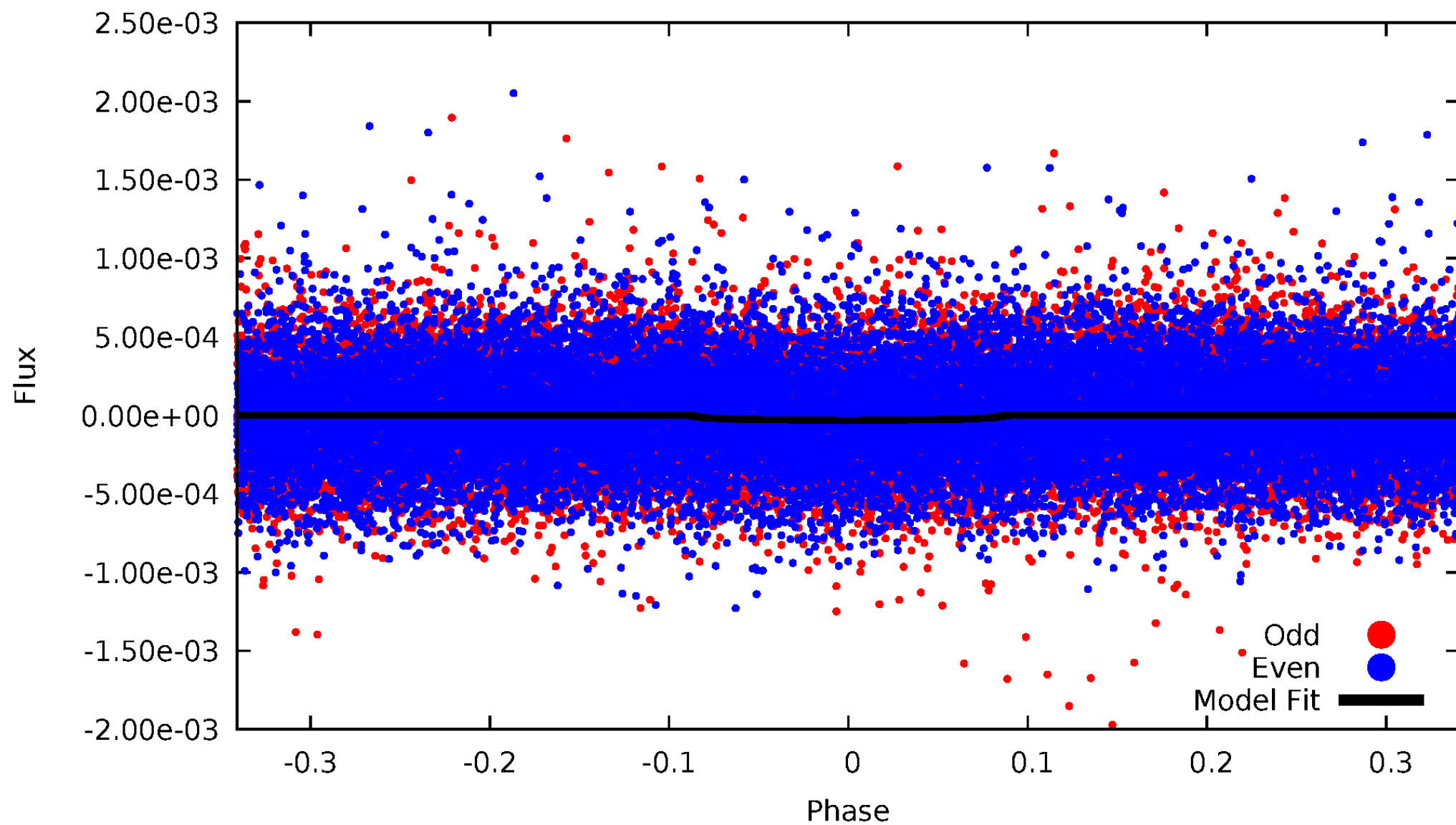


TCE 004945547-01



# DV Odd/Even

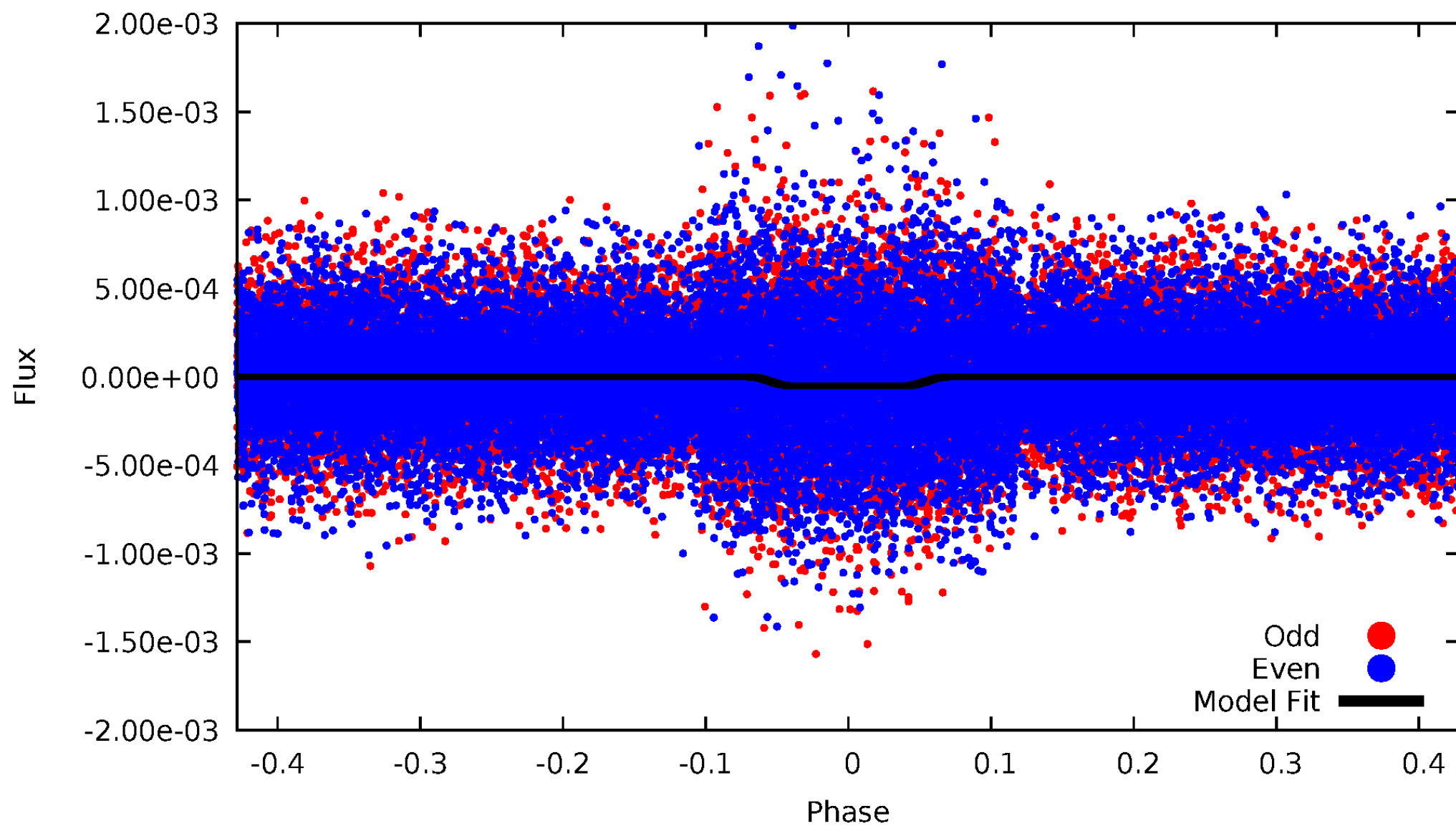
TCE 004945547-01



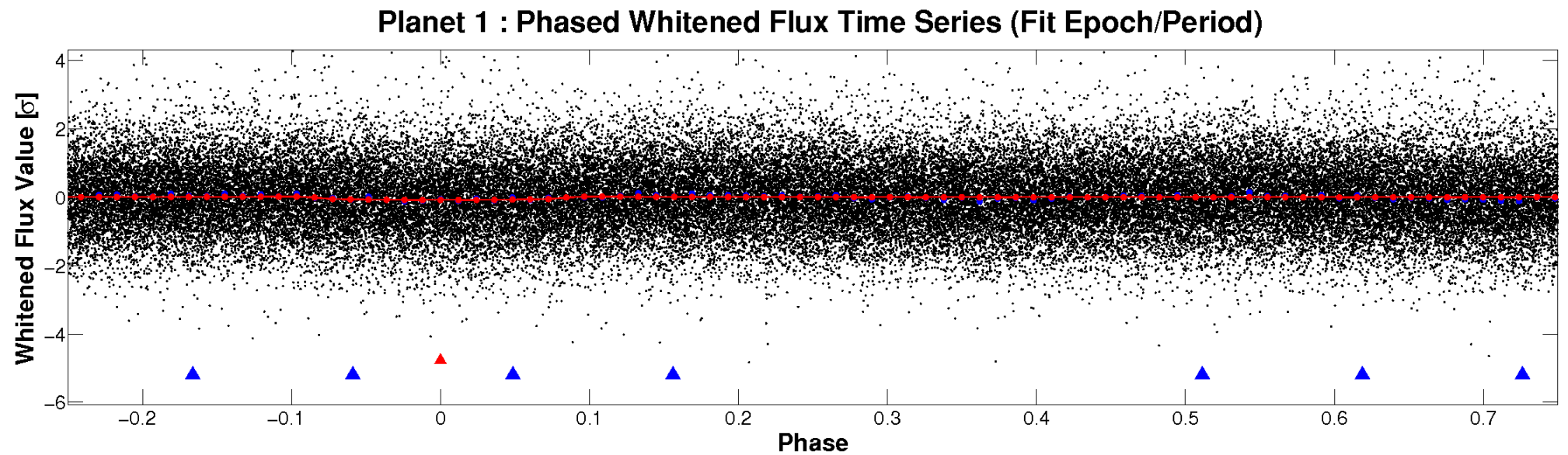
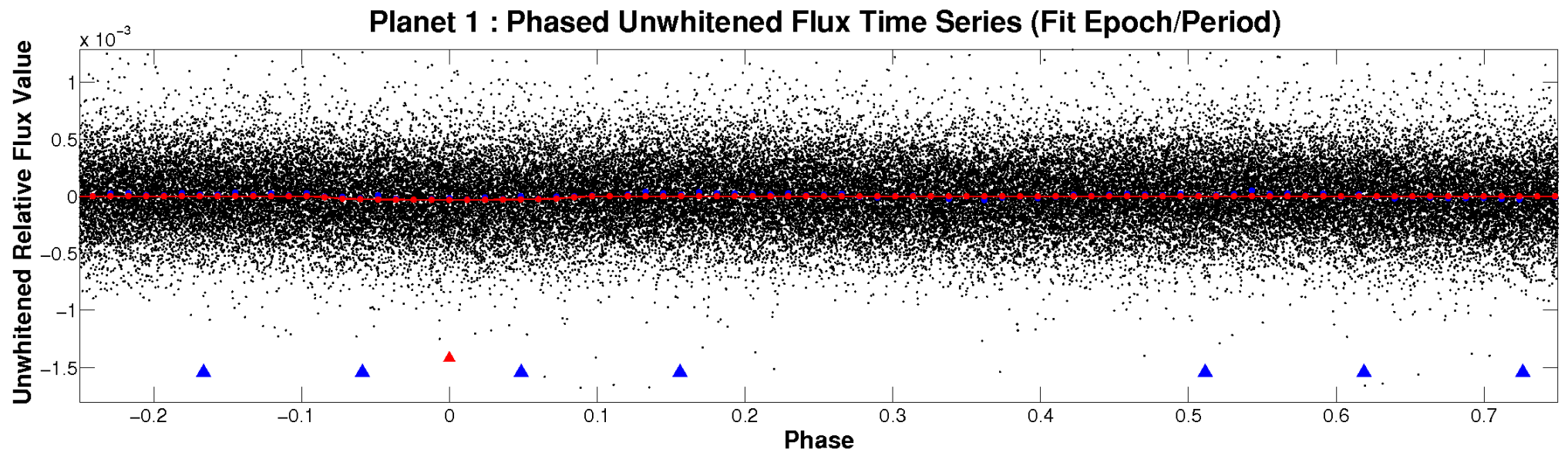


# ALT Odd/Even

TCE 004945547-01

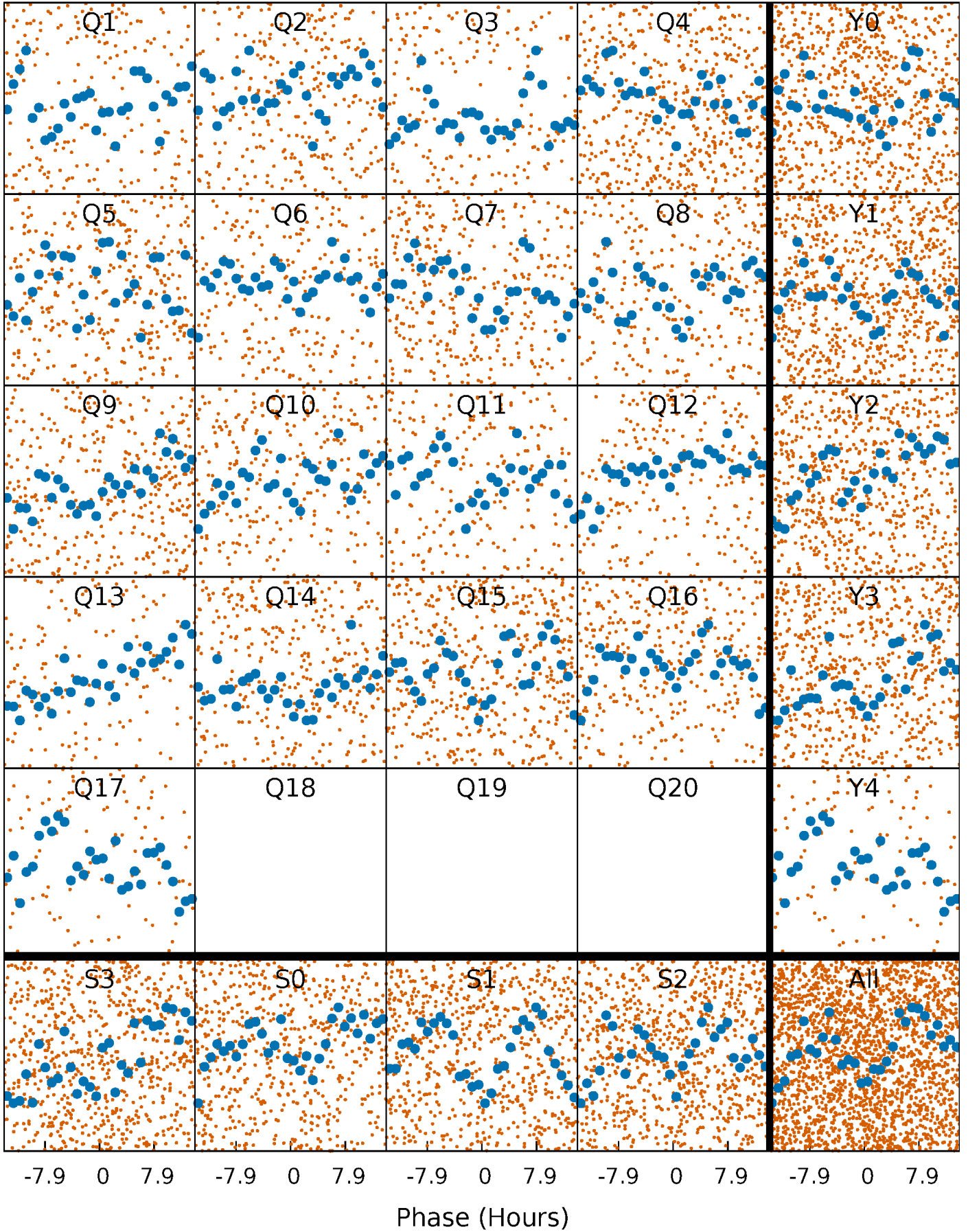


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

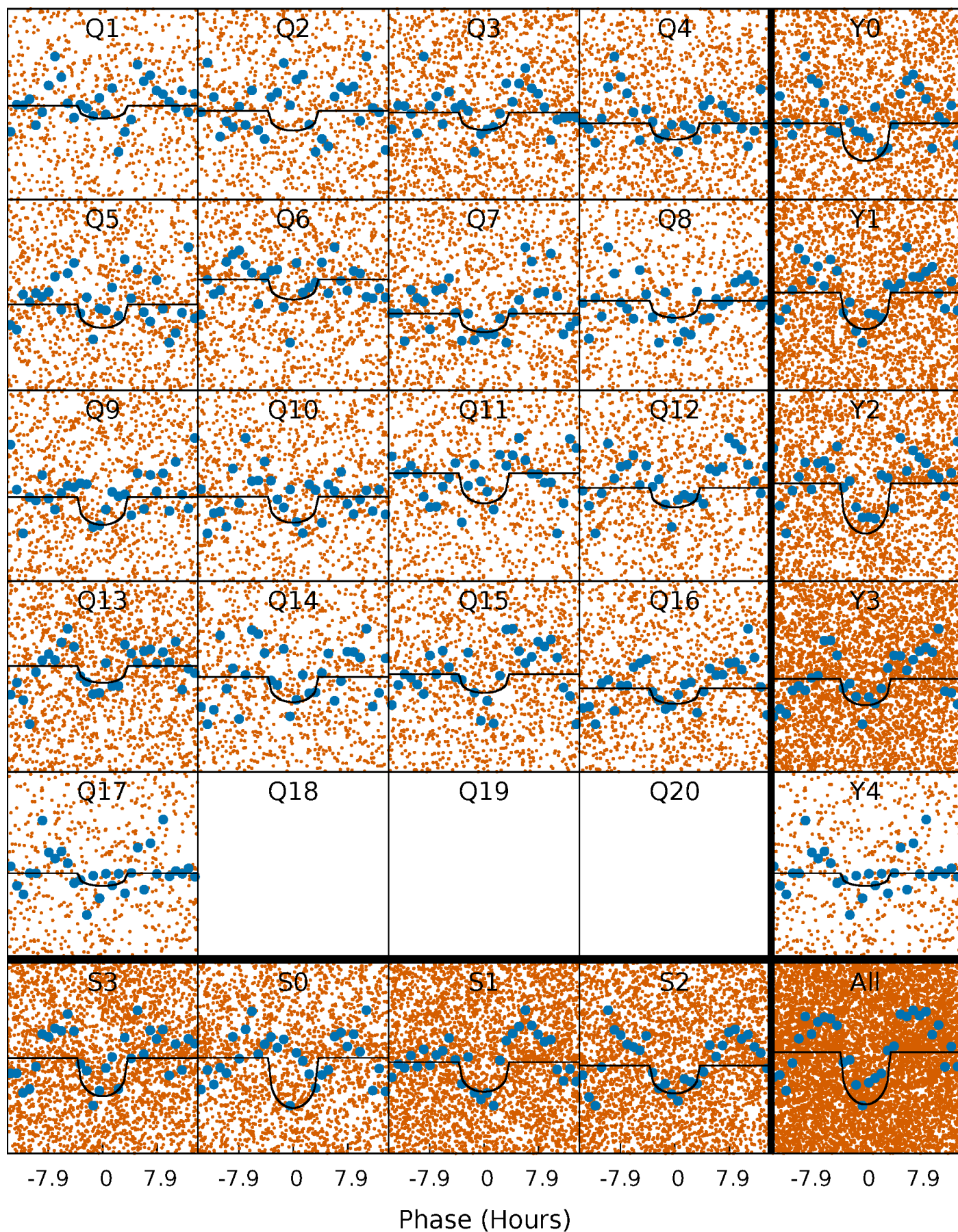
TCE 004945547-01   P= 1.693538 Days    $T_0=131.928235$  (BKJD)





# DV Quarter-Phased Transit Curves

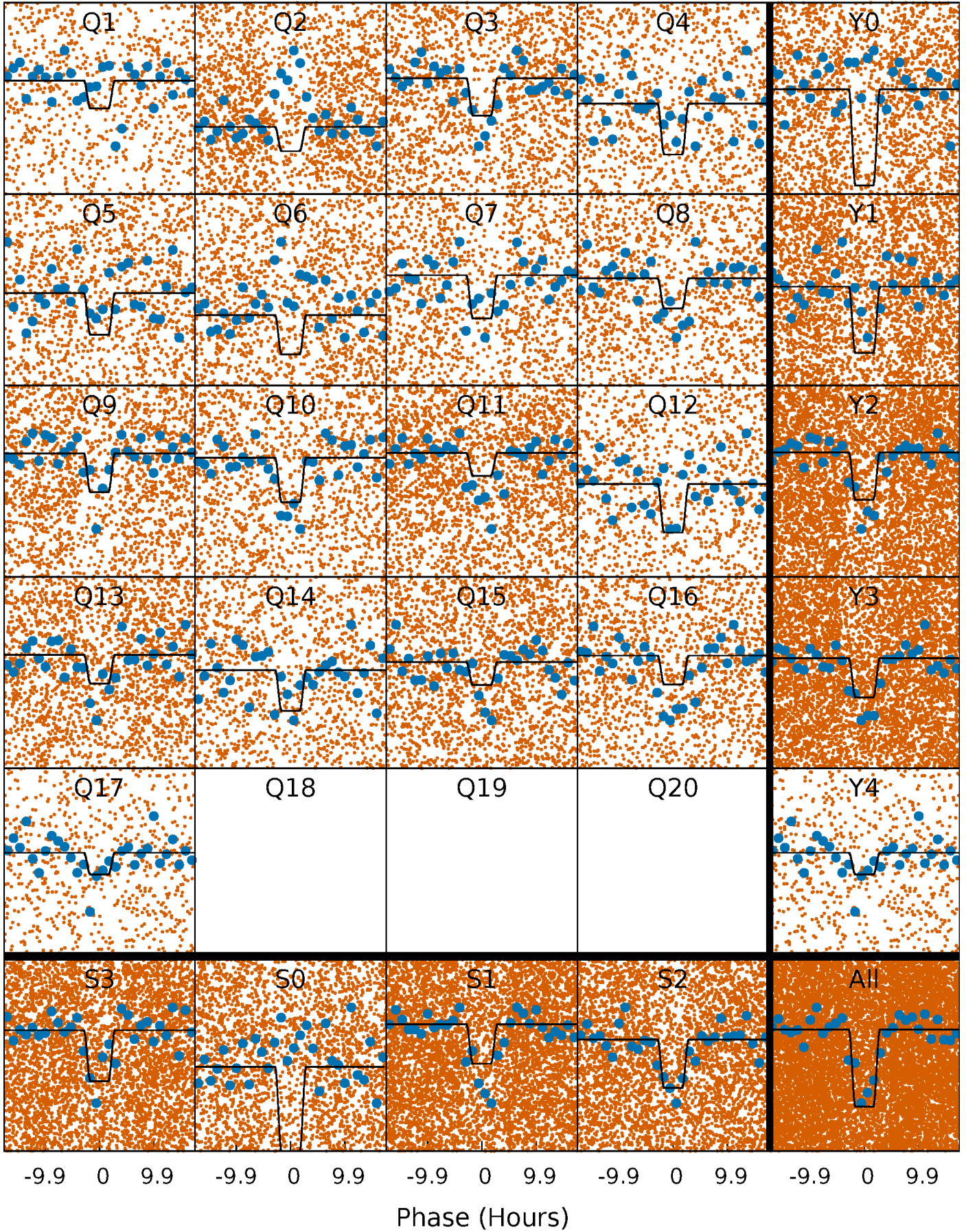
TCE 004945547-01 P= 1.693538 Days  $T_0=131.928235$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

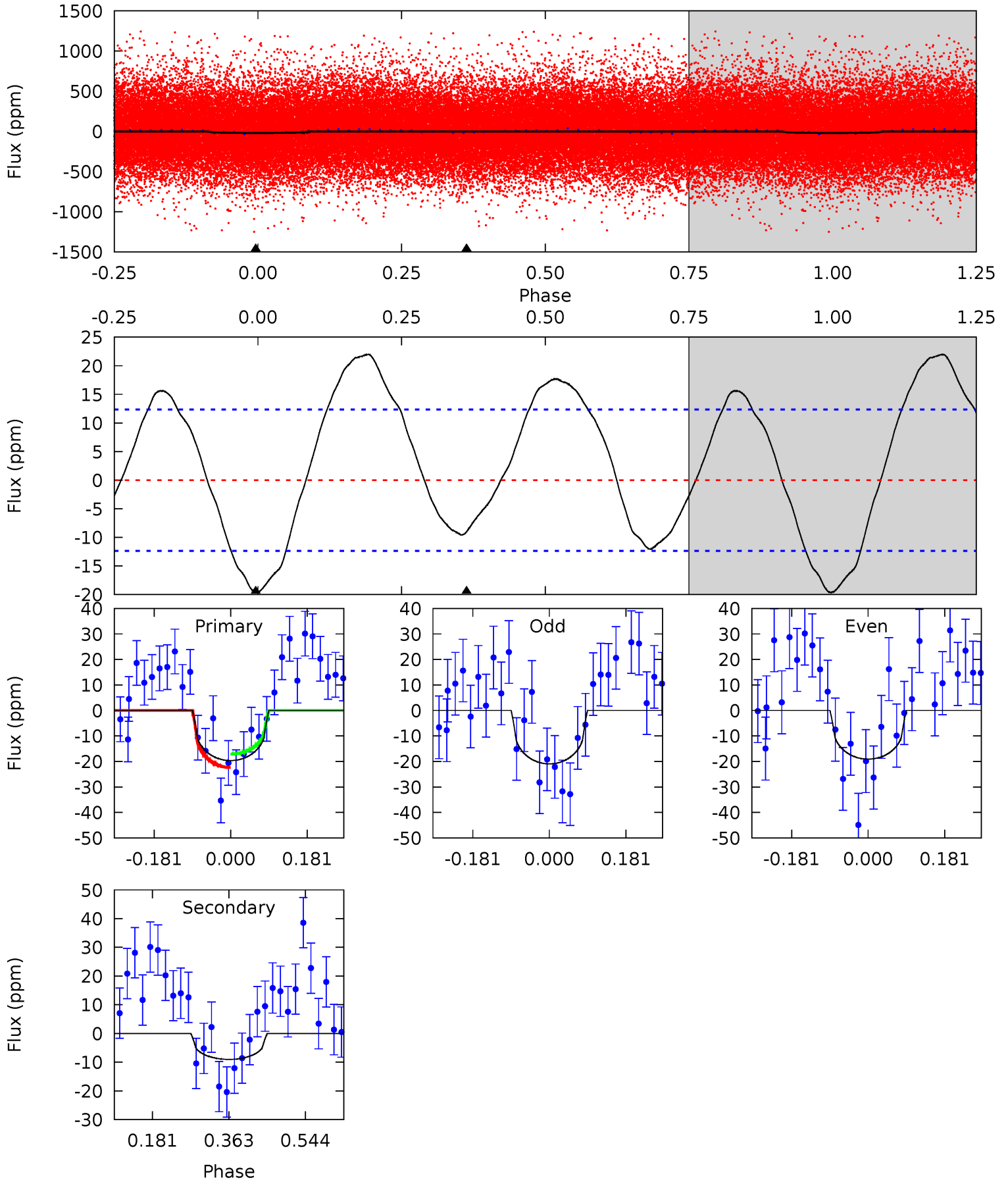
TCE 004945547-01 P= 1.693532 Days  $T_0=131.911328$  (BKJD)



# DV Model-Shift Uniqueness Test

004945547-01, P = 1.693538 Days, E = 130.234697 Days

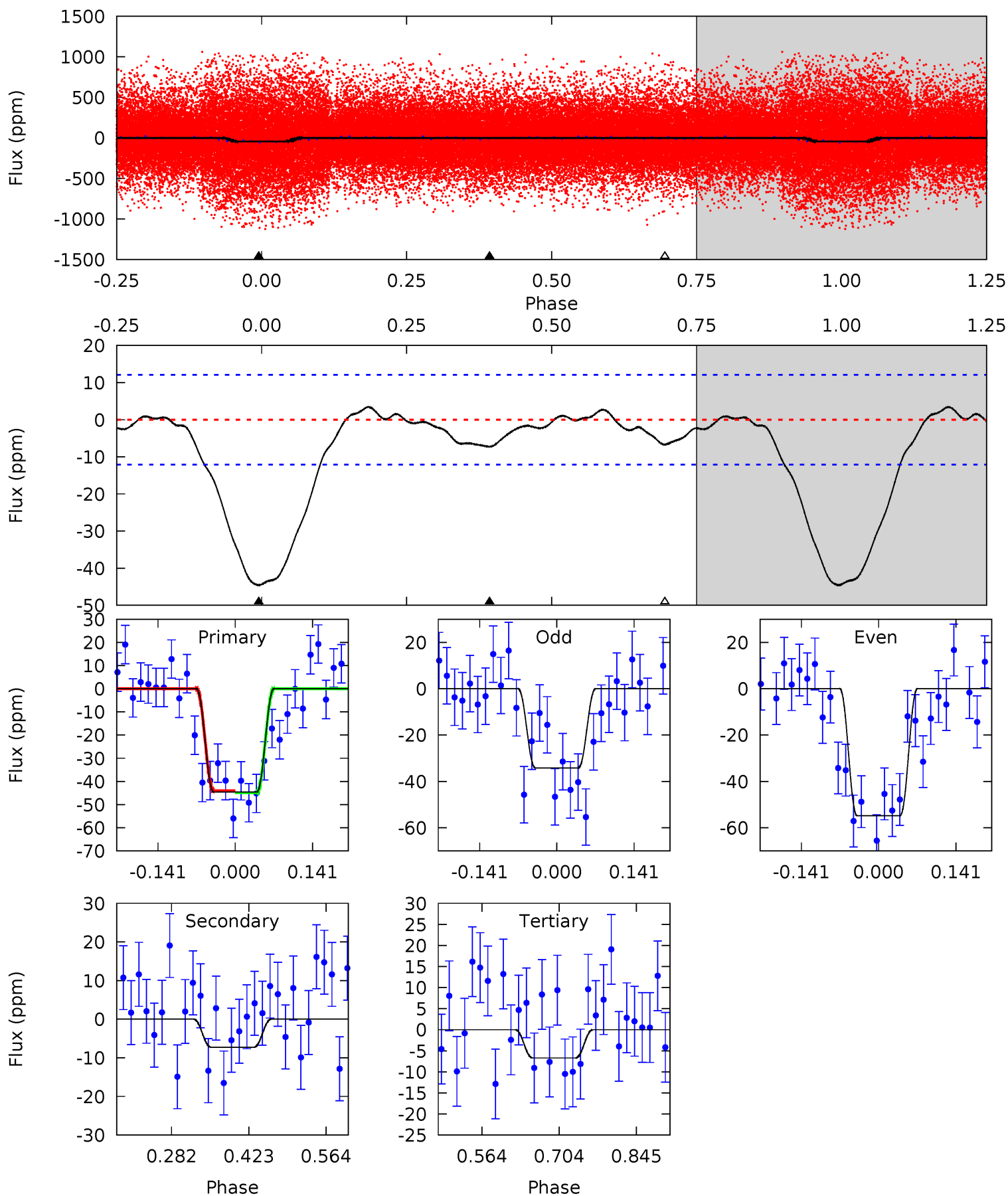
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.06	3.24	0	0	4.44	1.34	3.40	7.06	7.06	3.24	3.24	0.34	0.96	0.53	0.96



# Alt Model-Shift Uniqueness Test

004945547-01, P = 1.693532 Days, E = 130.217796 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
16.6	2.70	2.49	0	4.49	1.47	0.95	14.1	16.6	0.21	2.70	3.86	0.66	0.07	0.17



### Stellar Parameters For KIC 004945547

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4954^{+149}_{-149}$	$4.526^{+0.071}_{-0.045}$	$0.000^{+0.250}_{-0.300}$	$0.784^{+0.062}_{-0.083}$	$0.754^{+0.087}_{-0.060}$	$2.199^{+0.698}_{-0.369}$
	+3%/-3%	+2%/-1%	+inf%/-inf%	+8%/-11%	+12%/-8%	+32%/-17%
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 004945547-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-9 \pm 3$	$0.65^{+0.53}_{-0.45}$	$1690^{+60}_{-63}$	$3492^{+1954}_{-659}$	$7.430^{+72.044}_{-5.412}$
Alt.	$-7 \pm 3$	$0.70^{+0.59}_{-0.44}$	$1695^{+66}_{-65}$	$3276^{+1425}_{-628}$	$5.044^{+35.025}_{-3.740}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

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



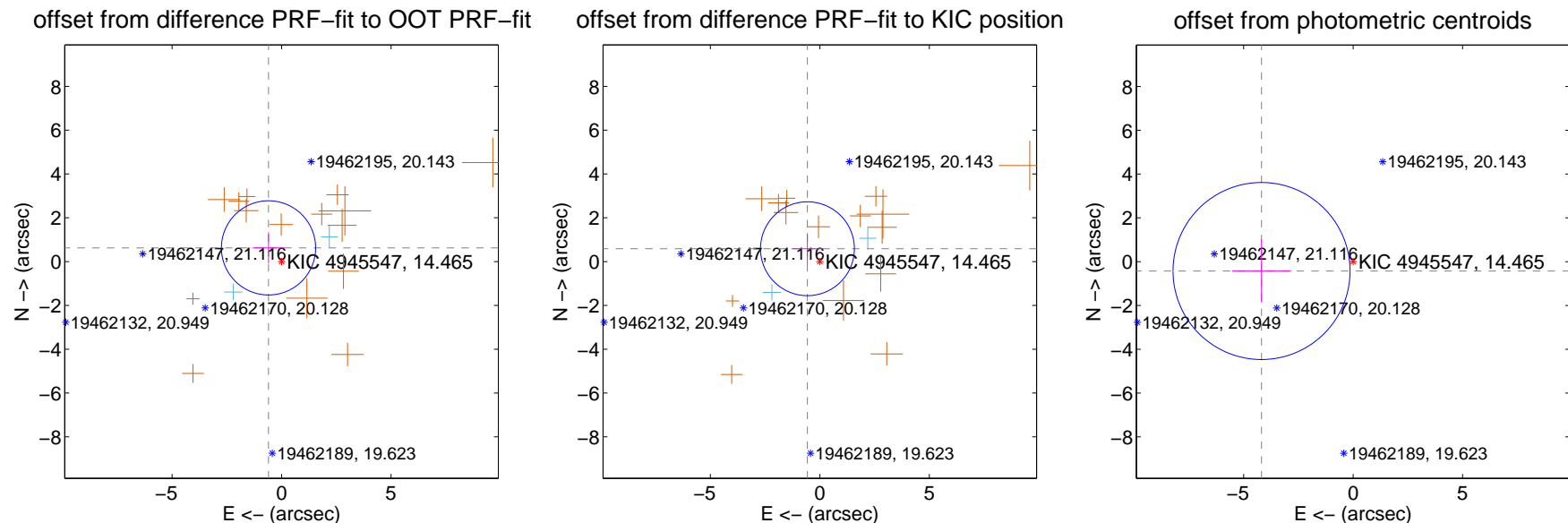
## DV Centroid Data

Supplemental centroid analysis for 004945547-01. Kepler magnitude: 14.46. Transit SNR 6.98

There are 2 quarters with good PRF difference image offsets

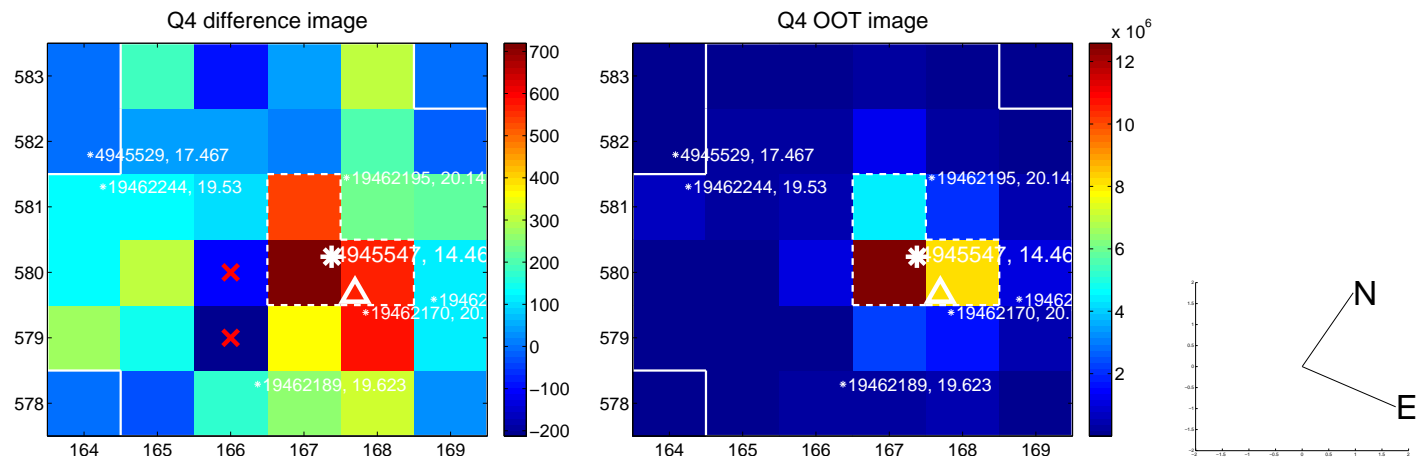
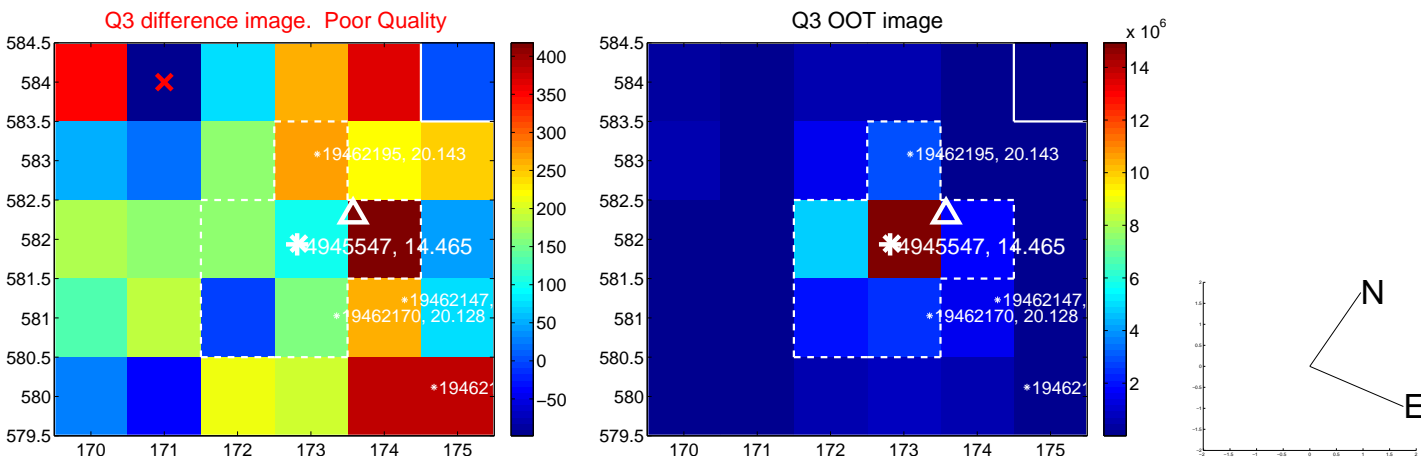
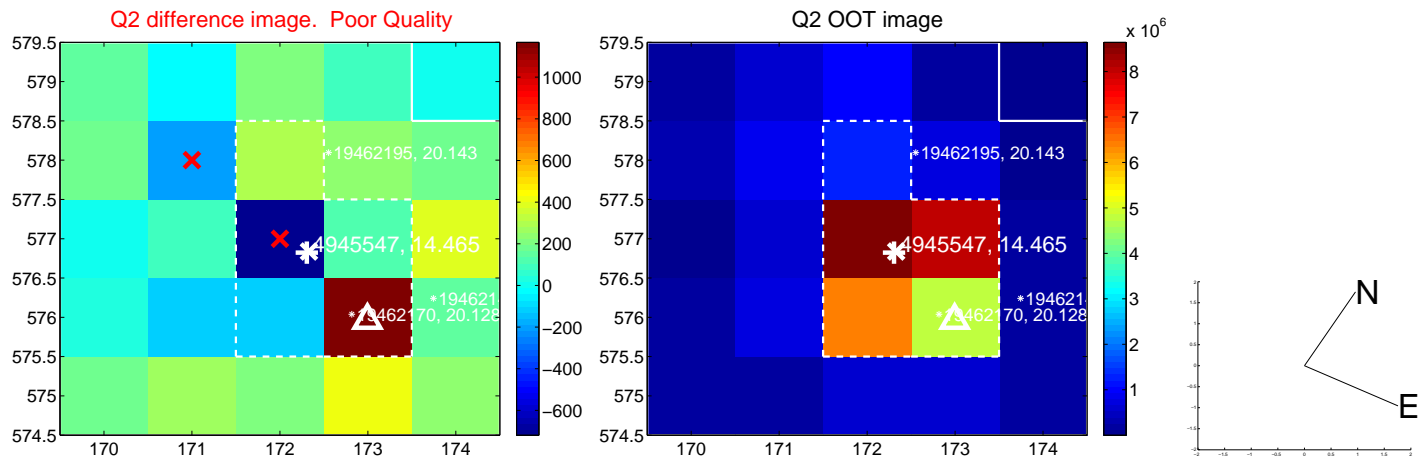
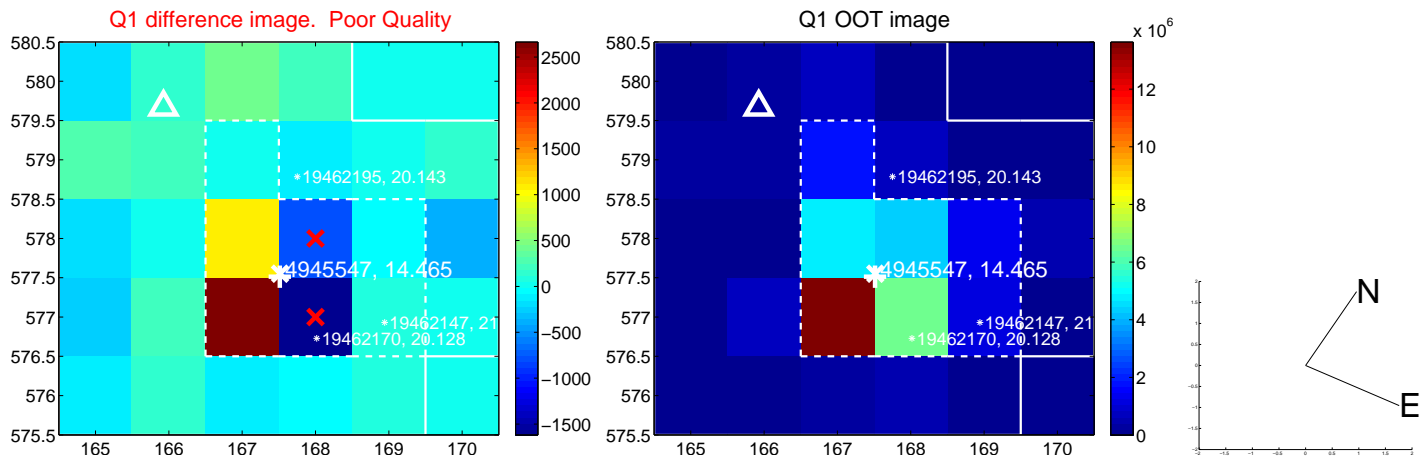
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.865 \pm 0.717$	1.21	$0.596 \pm 0.722$	$0.627 \pm 0.712$
PRF-fit source offset from KIC position	$0.816 \pm 0.714$	1.14	$0.567 \pm 0.719$	$0.587 \pm 0.710$
photometric centroid source offset	$4.20 \pm 1.35$	3.12	$4.18 \pm 1.35$	$-0.43 \pm 1.44$



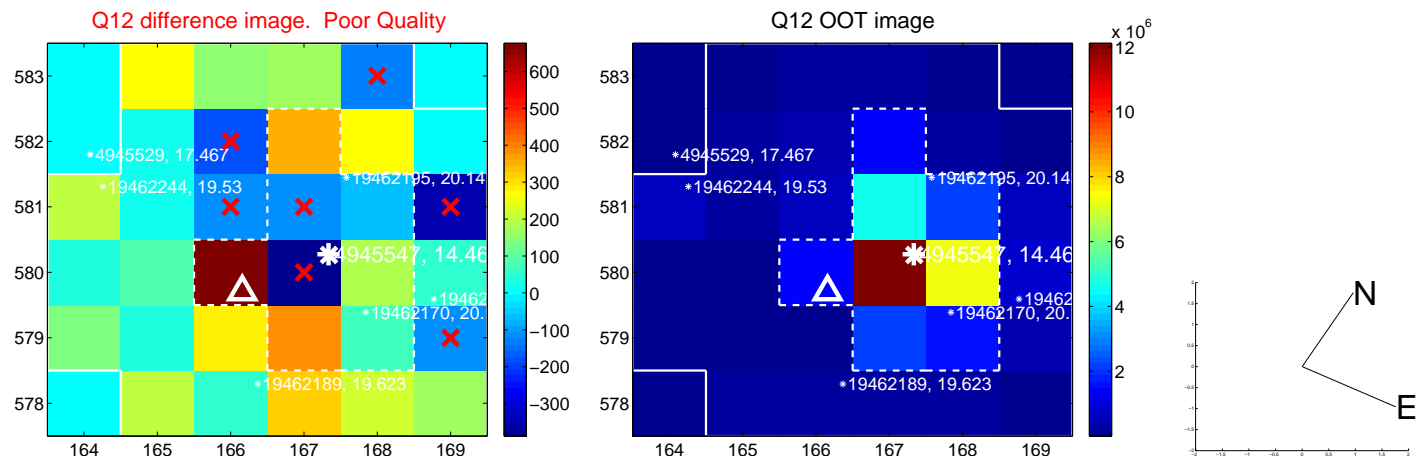
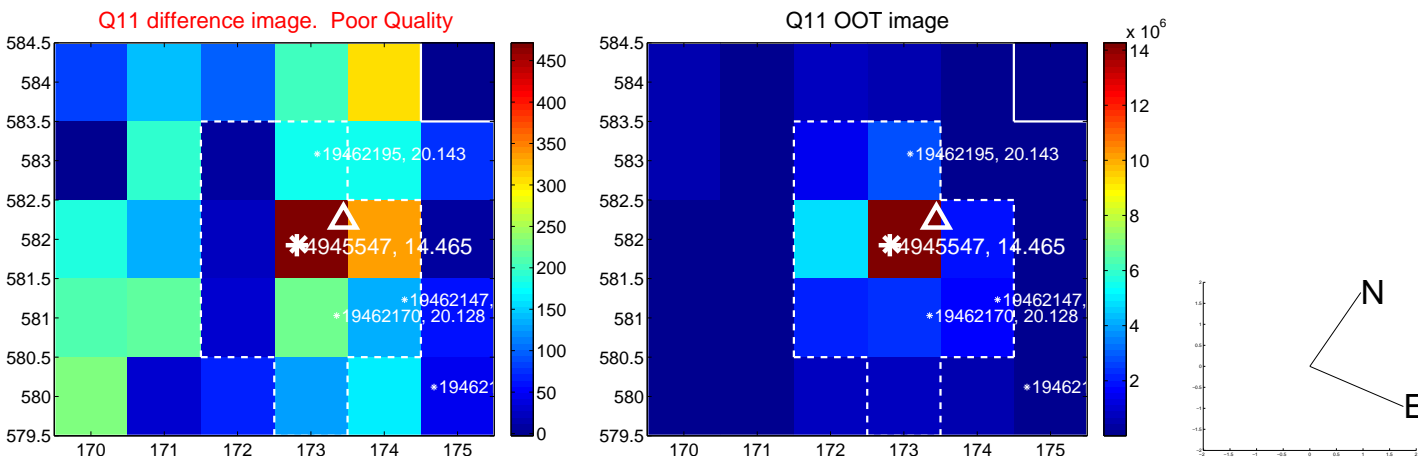
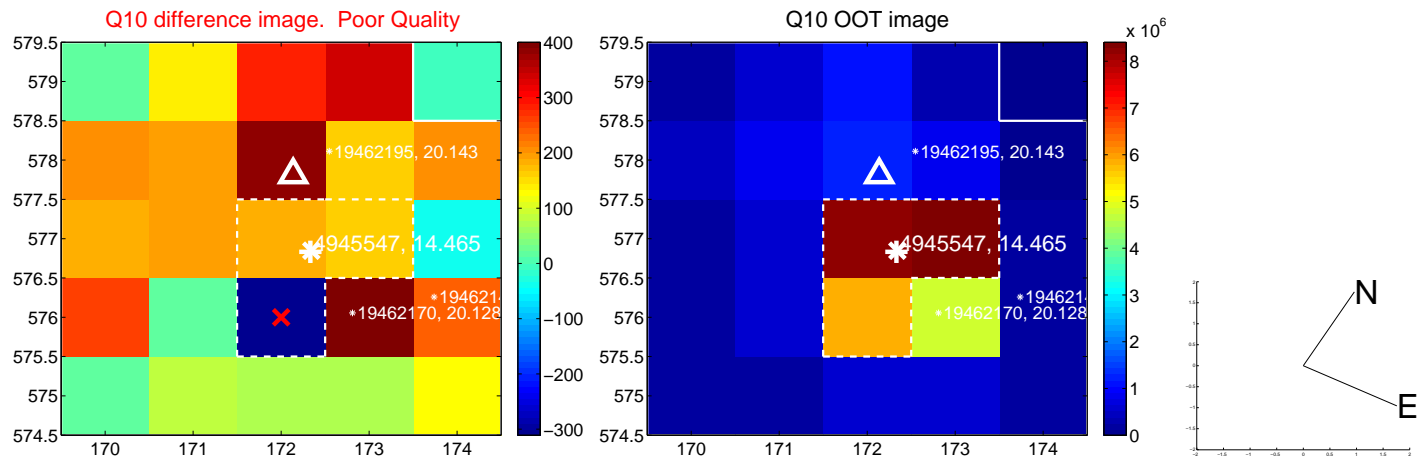
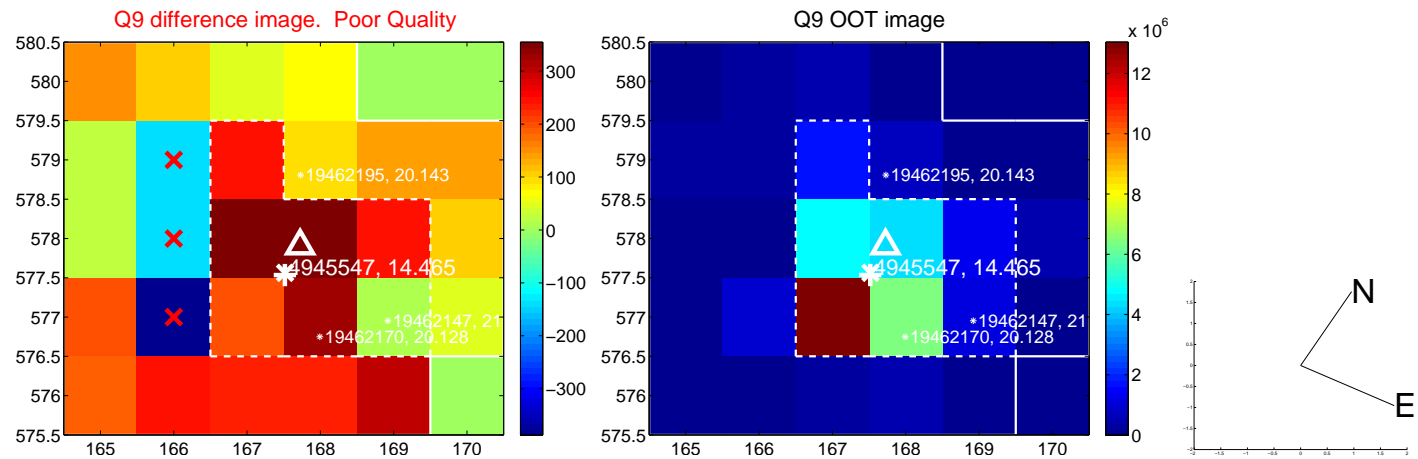
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

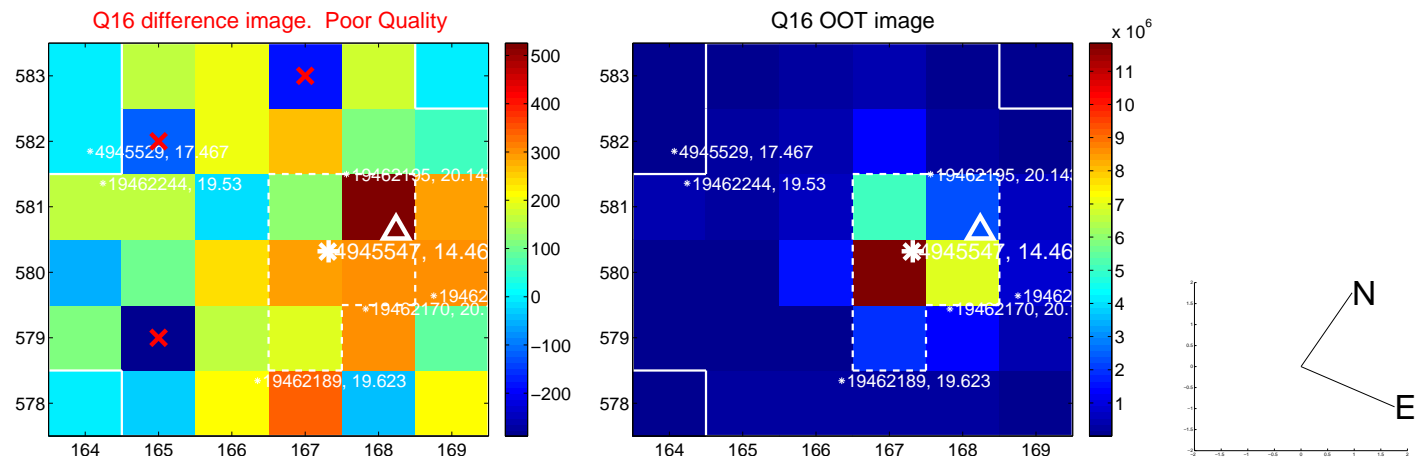
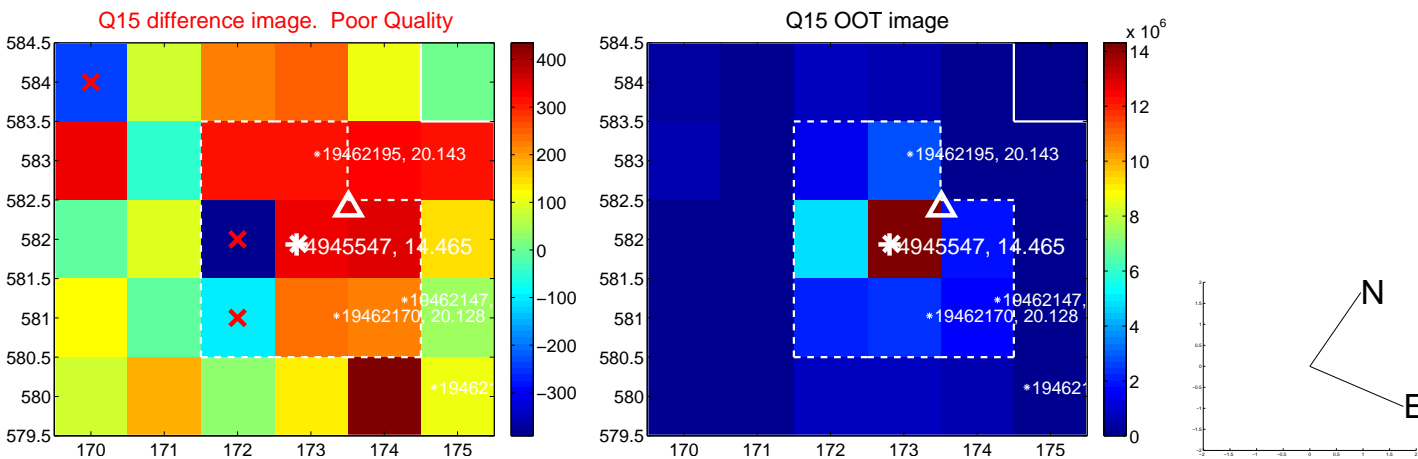
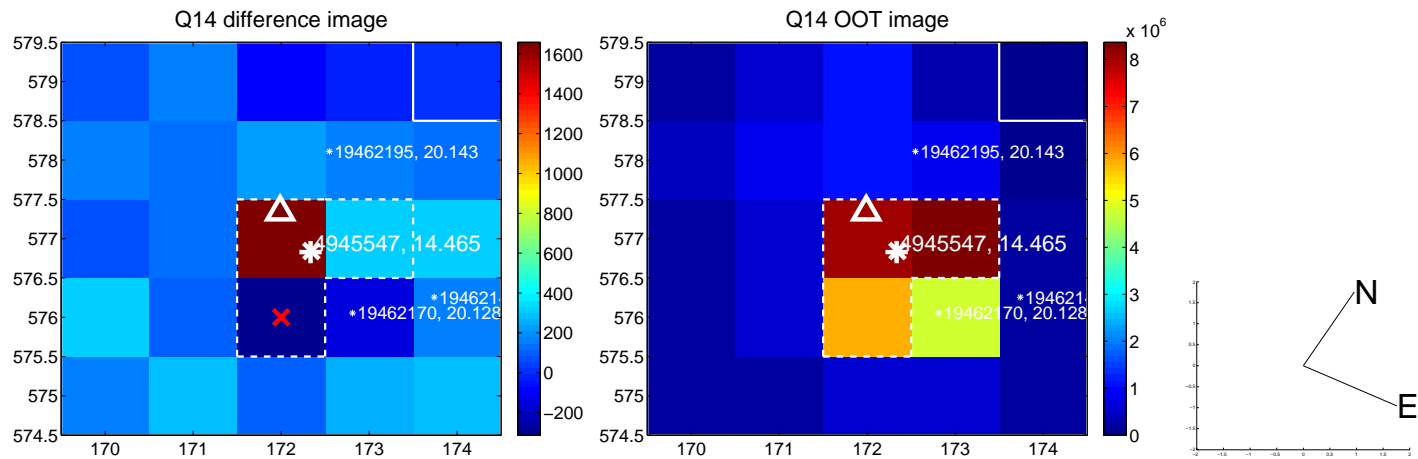
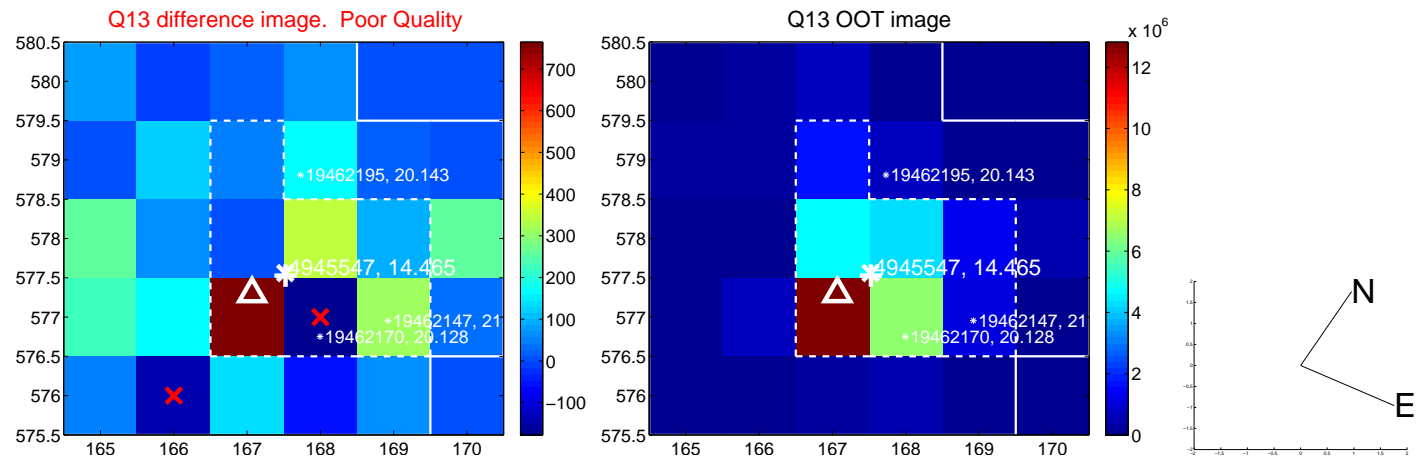




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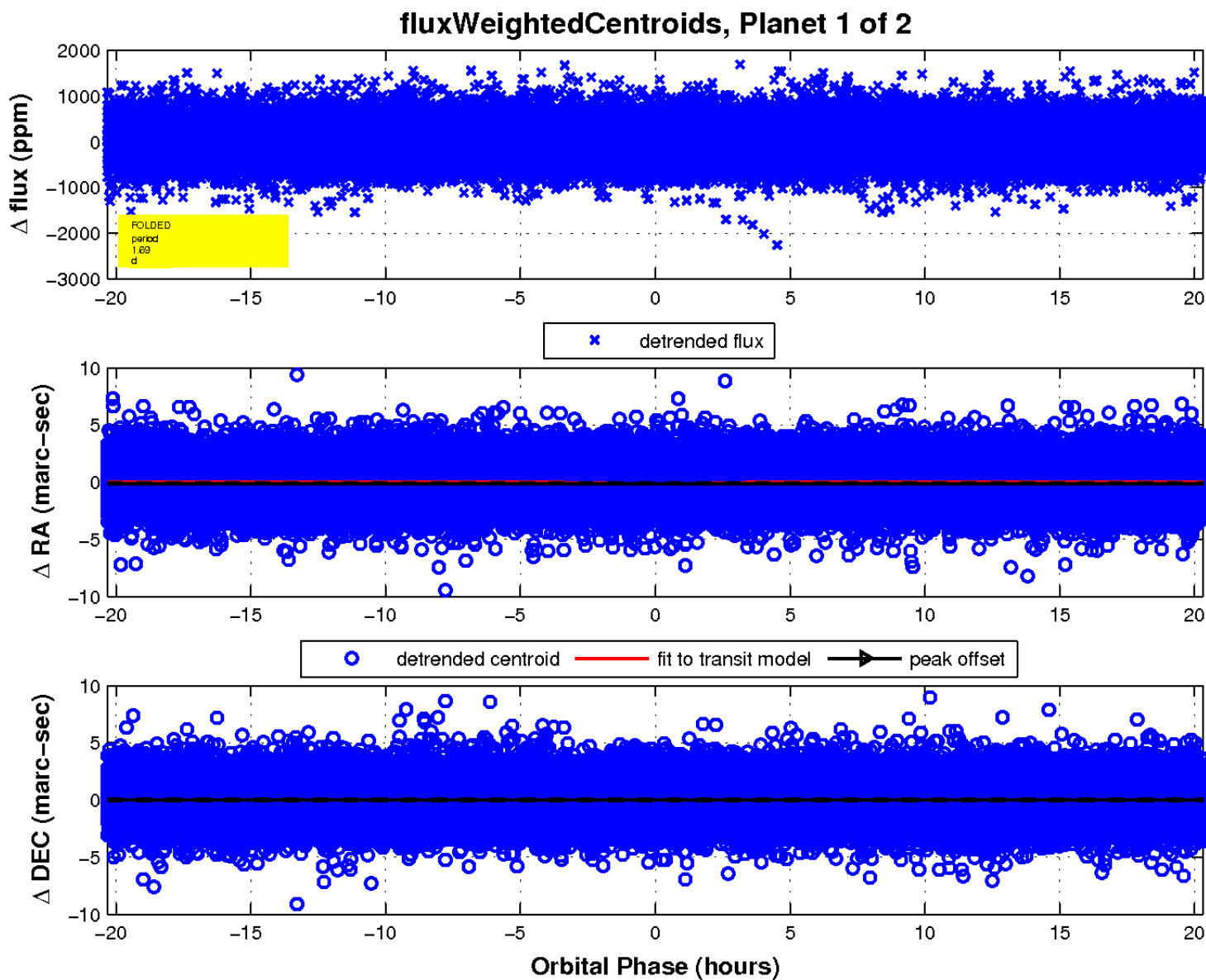
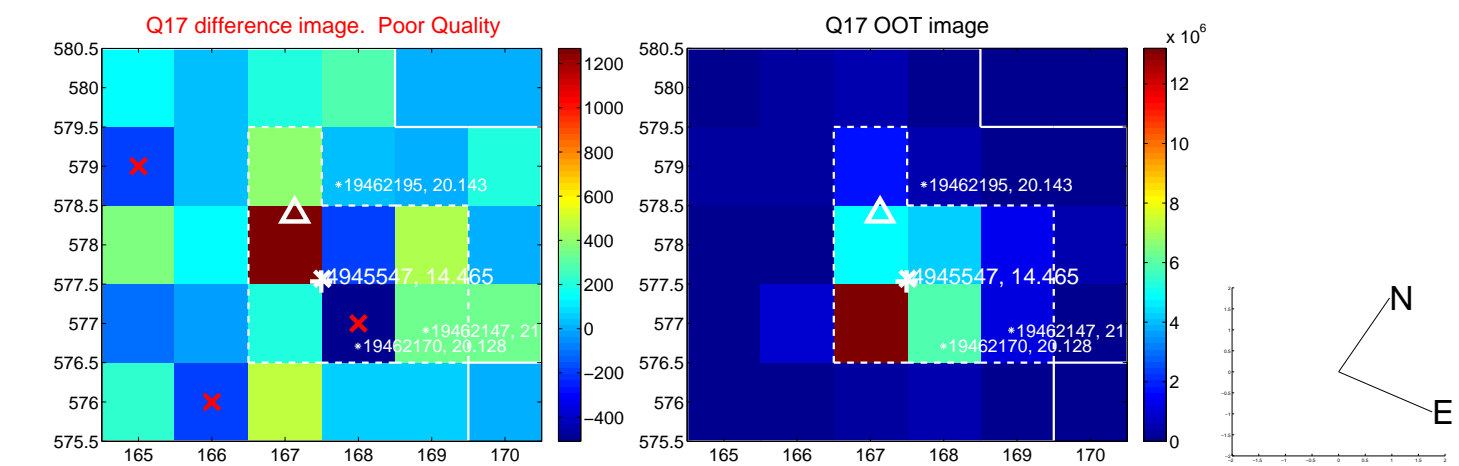


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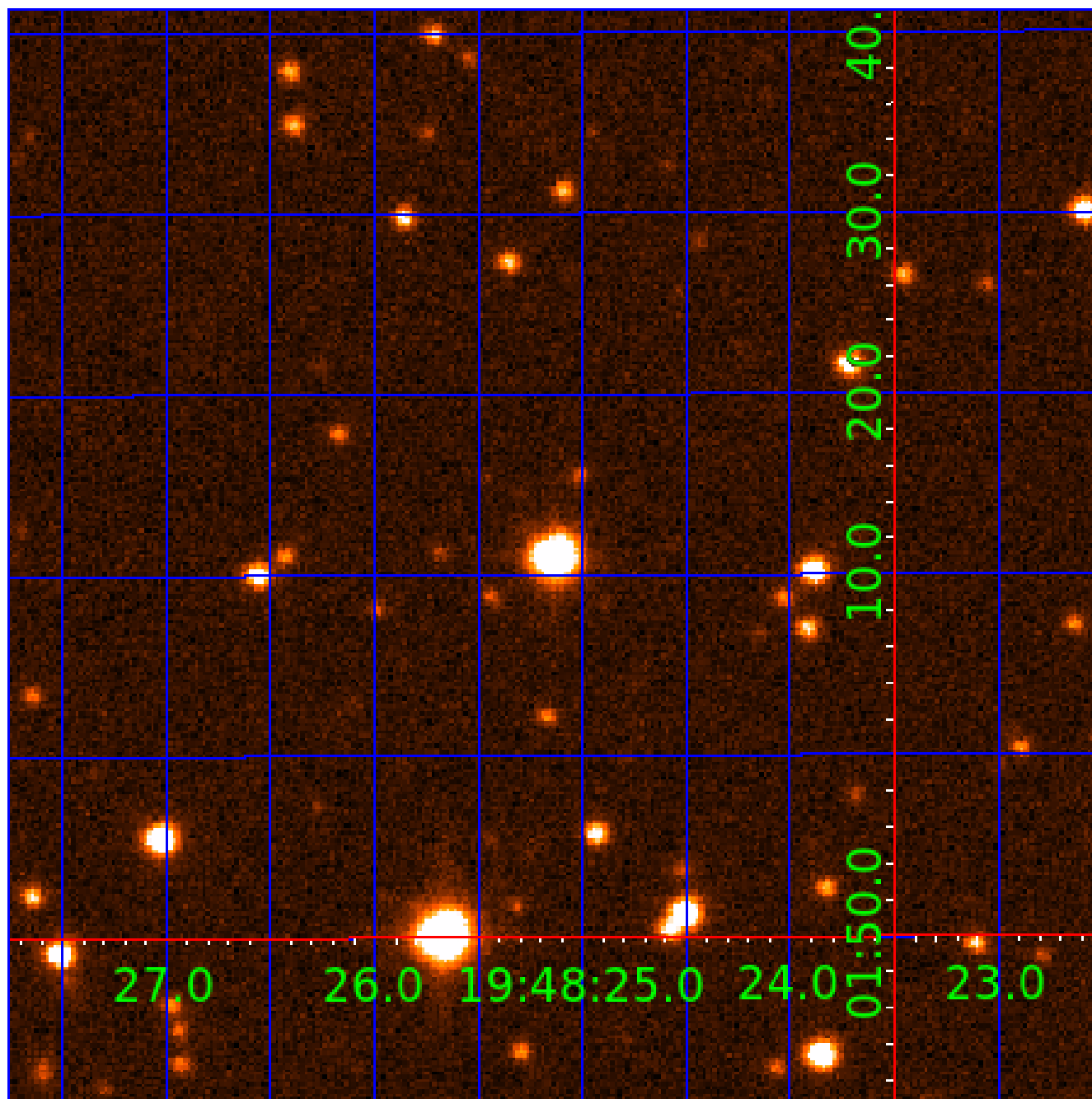


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 004945547

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004945547-01	OBS	No	1.693538	131.928235	32.2	6.926	7.2	7.0	0.78	4954	0.43	518.25
004945547-02	OBS	No	208.487165	251.341938	779.0	9.293	7.9	9.0	0.78	4954	2.23	0.85

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004945547-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
004945547-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

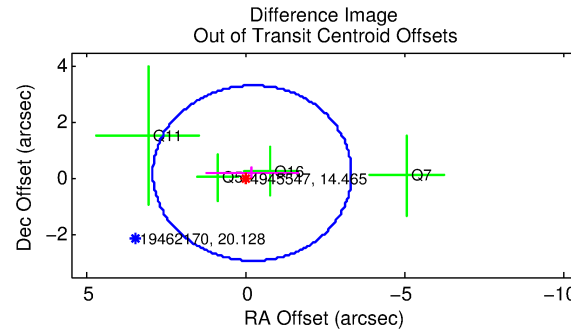
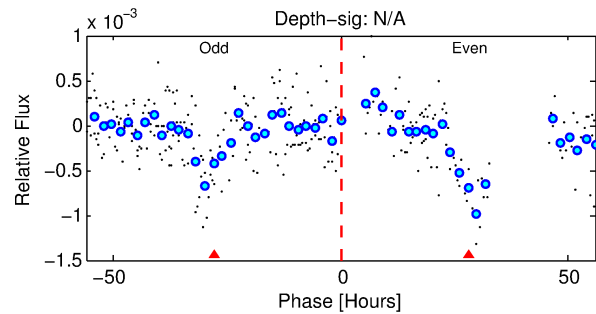
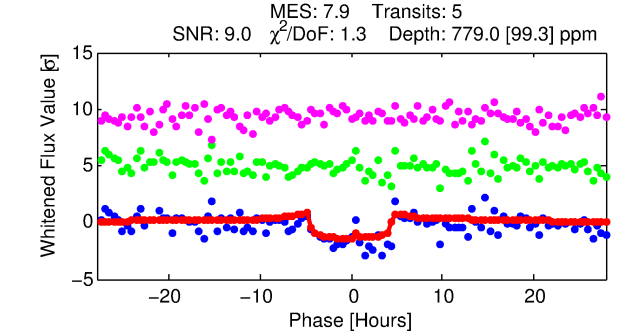
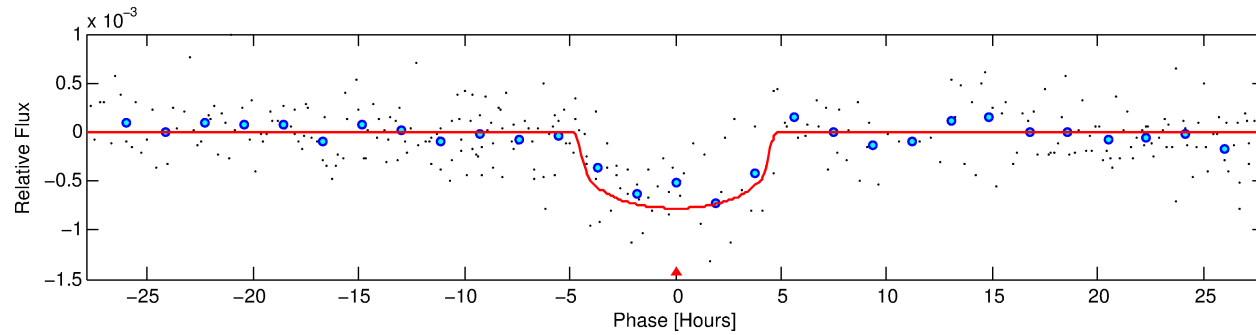
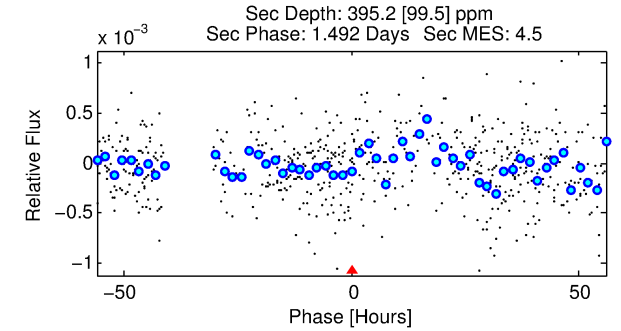
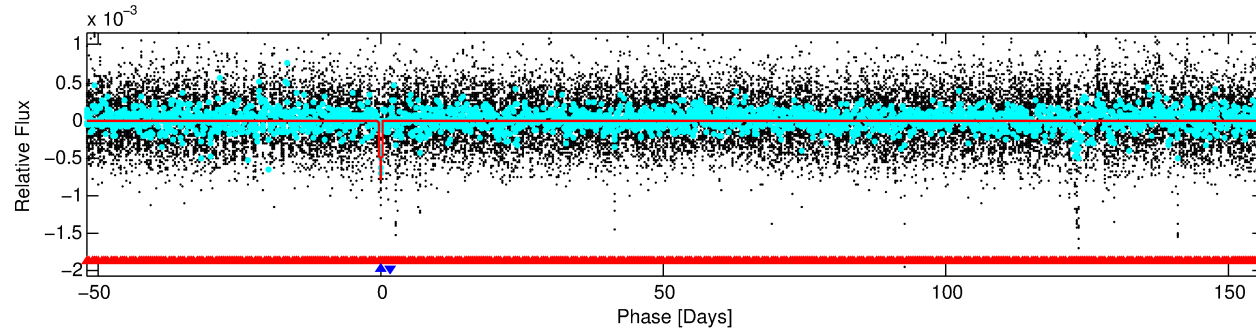
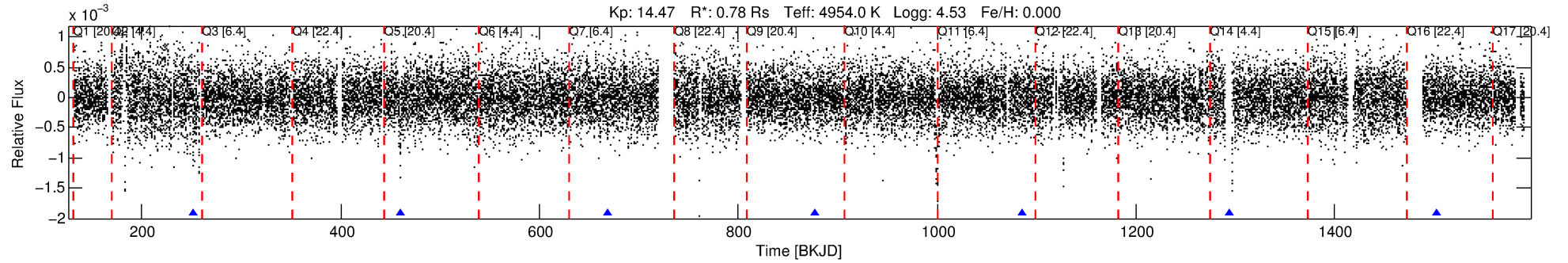
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004945547-02

No Significant Match Found

# DV One-Page Summary

KIC: 4945547 Candidate: 2 of 2 Period: 208.487 d



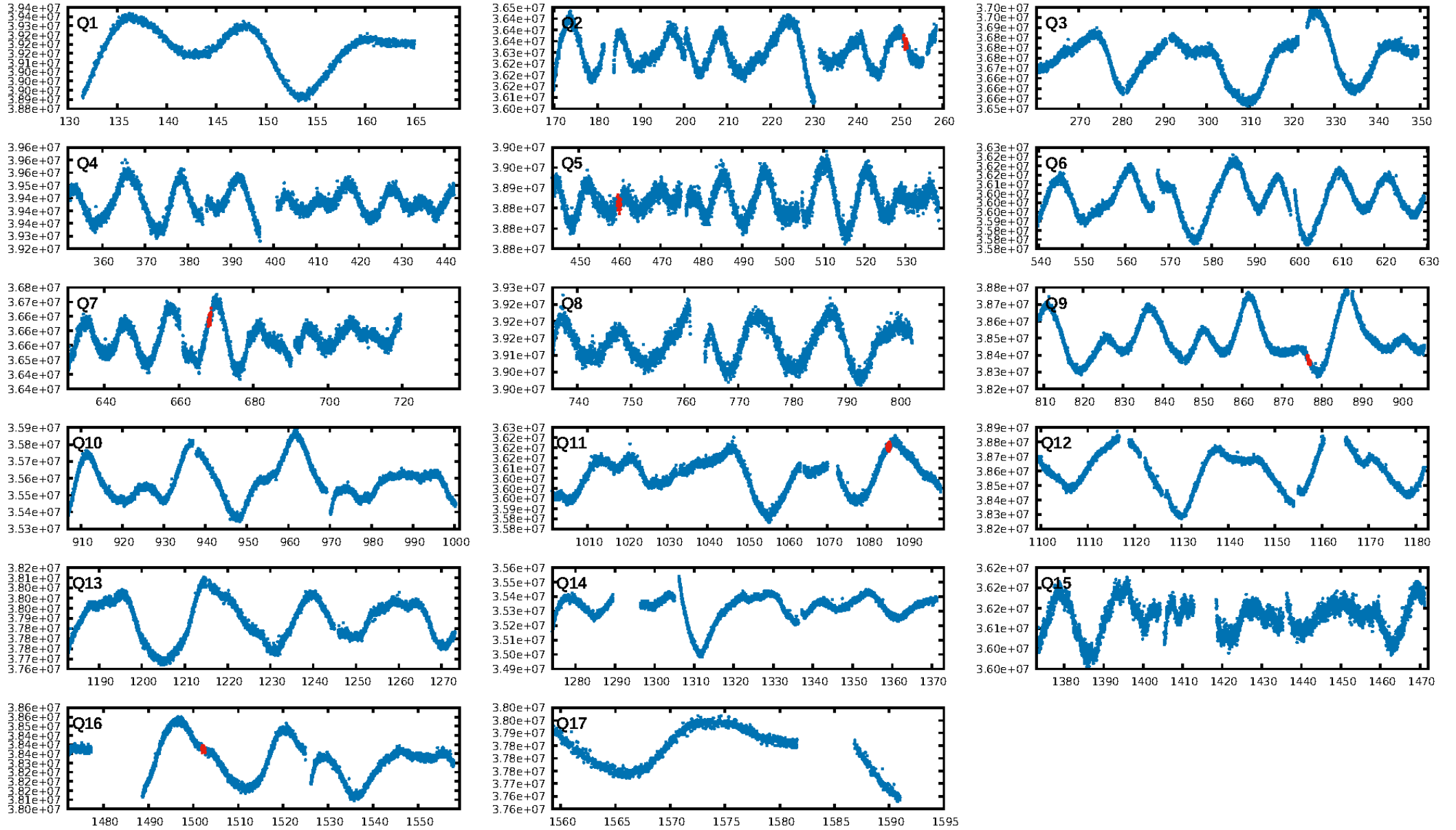
## DV Fit Results:

Period = 208.48717 [0.00480] d  
Epoch = 251.3419 [0.0101] BKJD  
Rp/R\* = 0.0261 [0.0154]  
a/R\* = 147.18 [289.50]  
b = 0.56 [2.44]  
Seff = 0.85 [0.15]  
Teff = 245 [11] K  
Rp = 2.23 [1.34] Re  
a = 0.6261 [0.0558] AU  
Ag = 17069.97 [20729.11] [0.82 $\sigma$ ]  
Teffp = 4322 [1311] K [3.11 $\sigma$ ]

## DV Diagnostic Results:

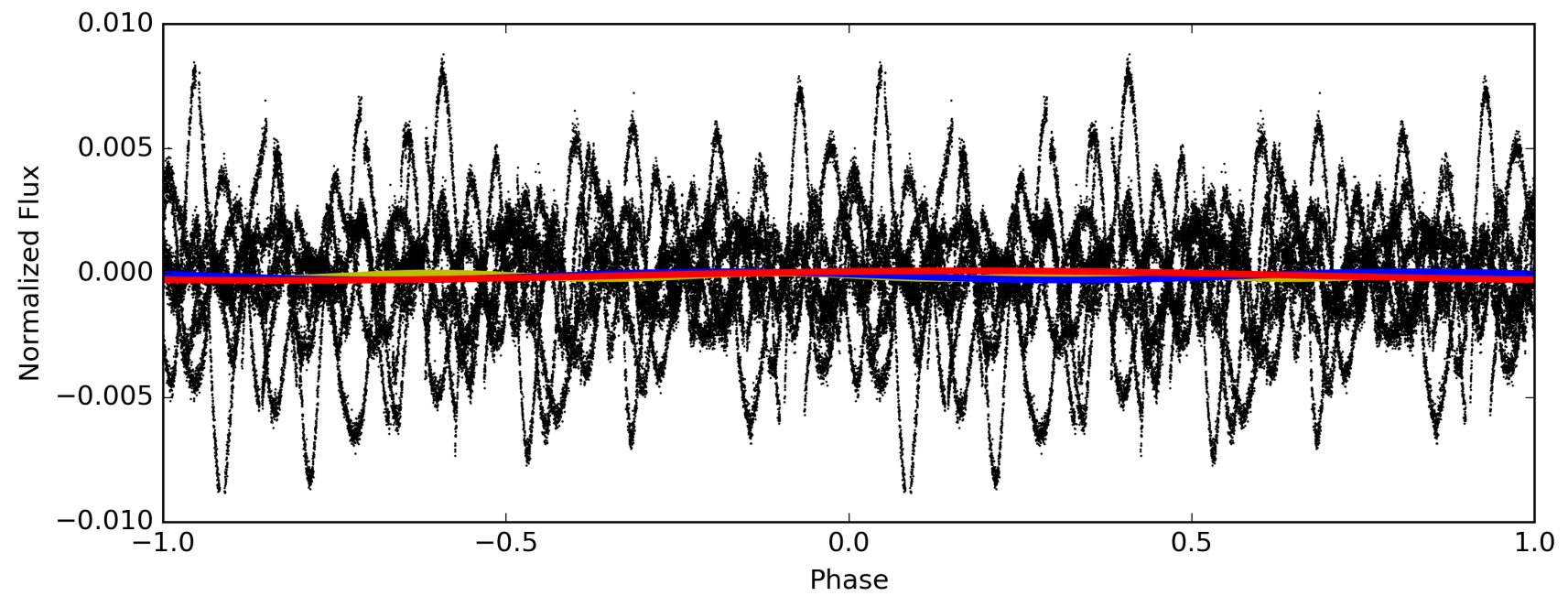
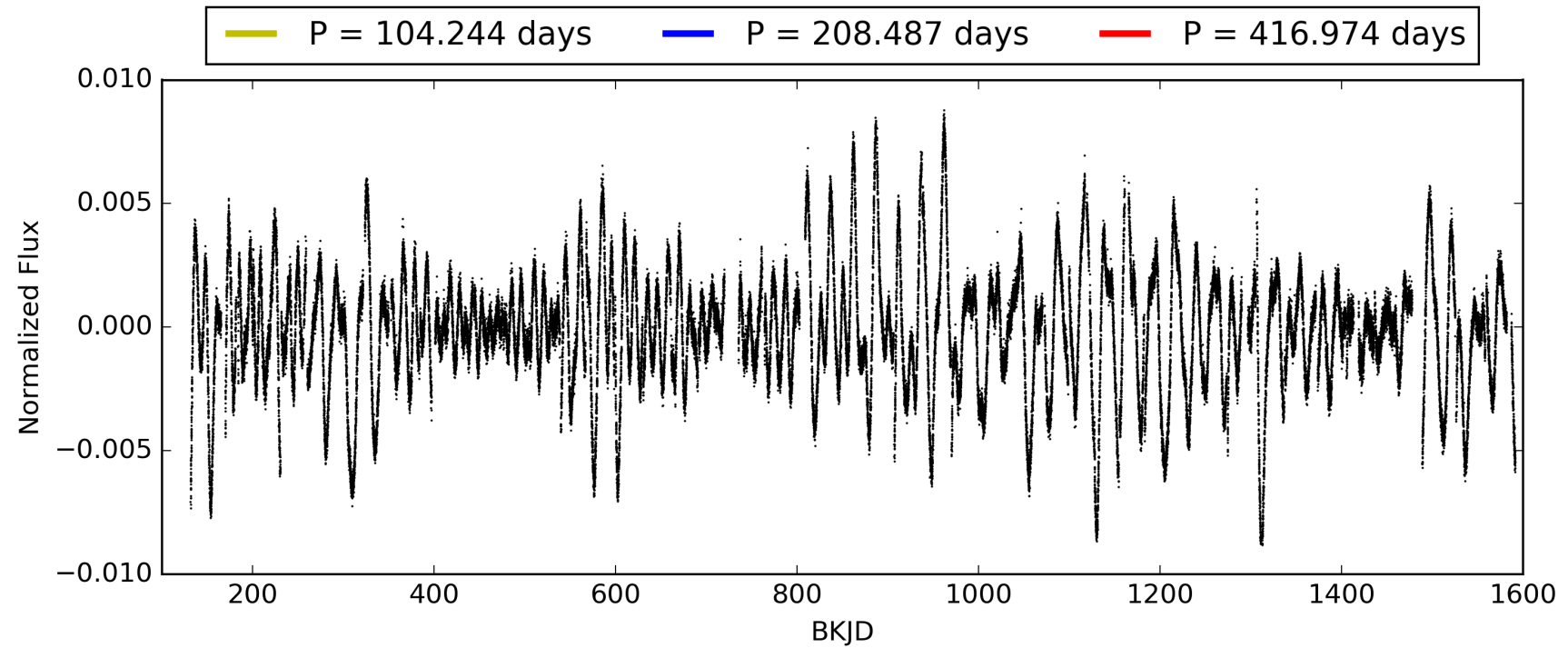
ShortPeriod-sig: 100.0% [428.23 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.20e-10  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -1.224  
Centroid-sig: 9.2%  
Centroid-so: 1.170 arcsec [1.85 $\sigma$ ]  
OotOffset-rm: 0.281 arcsec [0.27 $\sigma$ ]  
KicOffset-rm: 0.221 arcsec [0.16 $\sigma$ ]  
OotOffset-st: 0/2/1/1 [4]  
KicOffset-st: 0/2/1/1 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 0.00 [0/6]

# TCE 004945547-02, PDC Light Curves



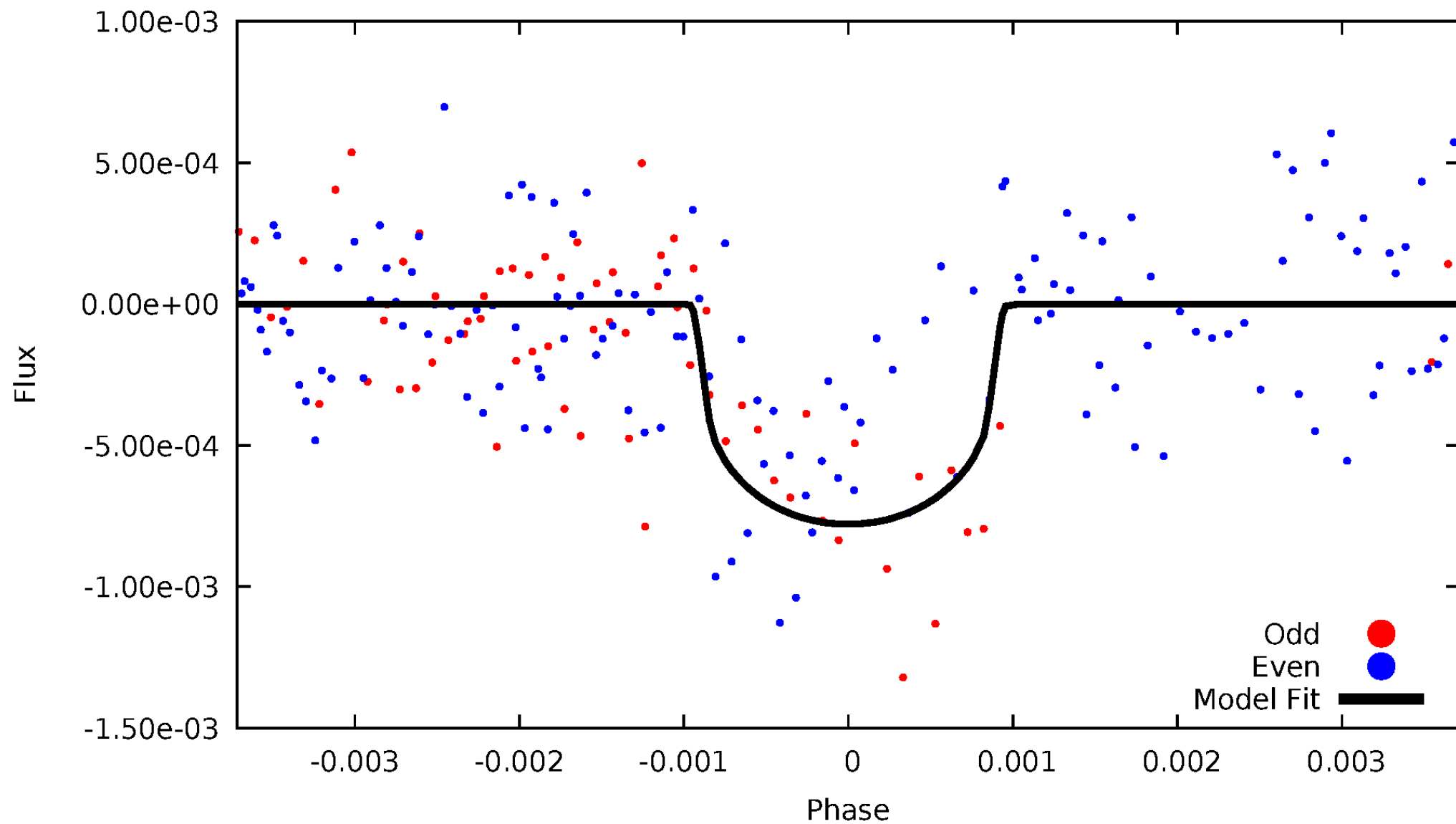


TCE 004945547-02



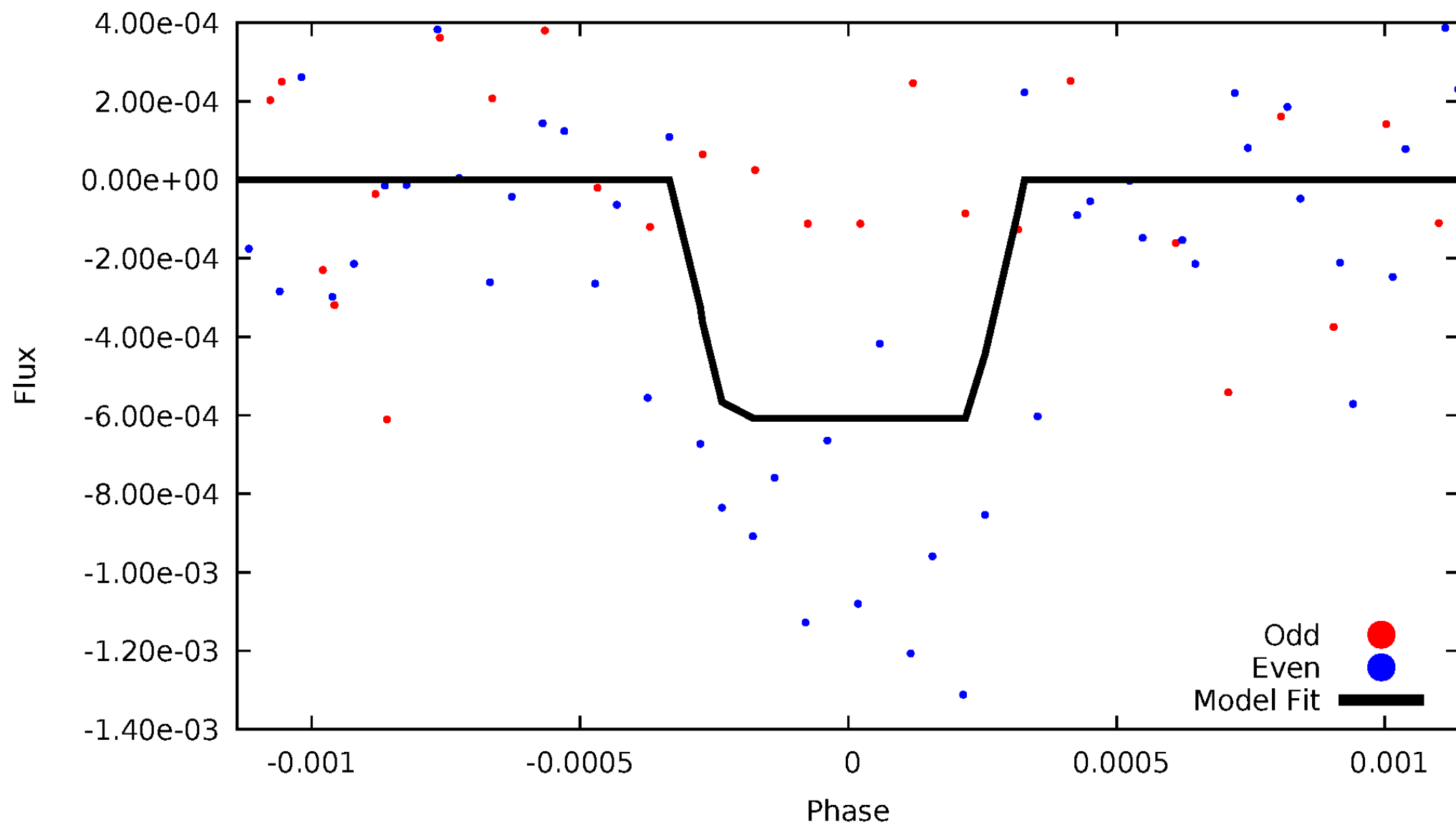
# DV Odd/Even

TCE 004945547-02



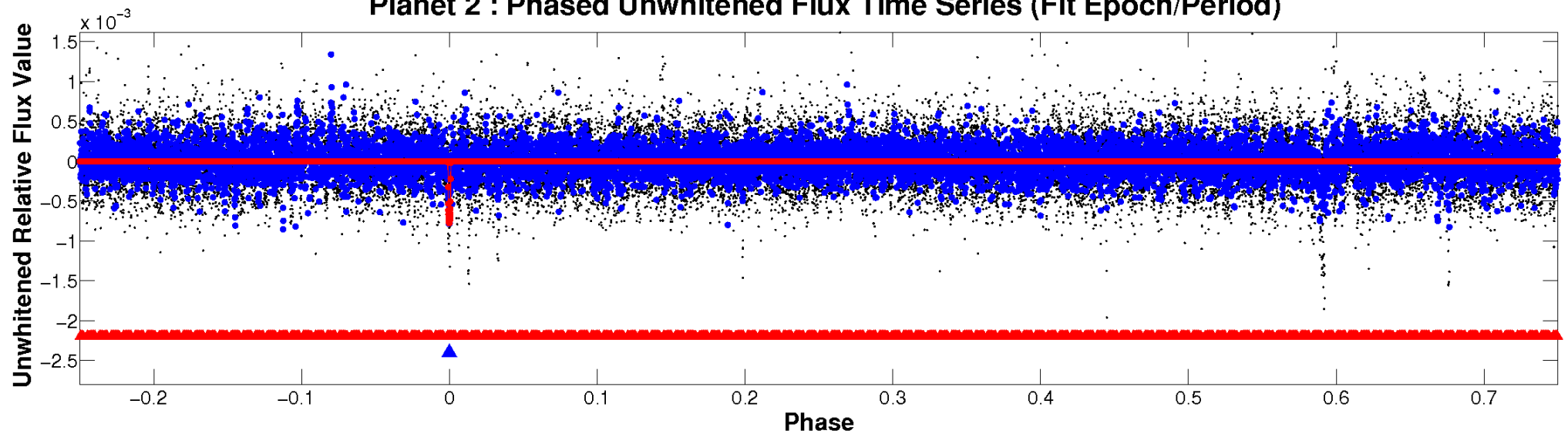
# ALT Odd/Even

TCE 004945547-02

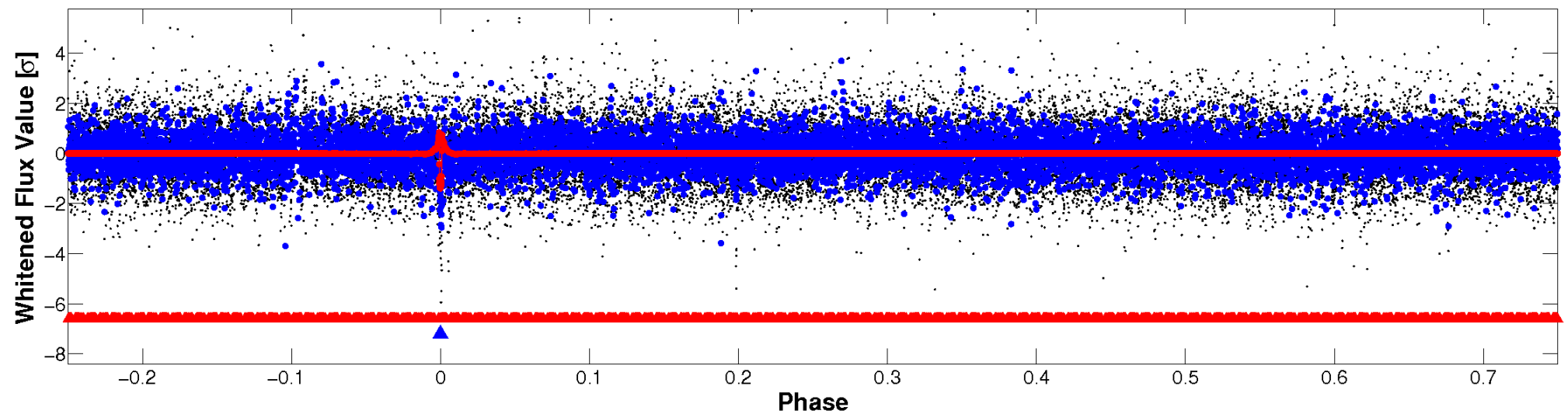


# Non-Whitened Vs. Whitened Light Curve

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

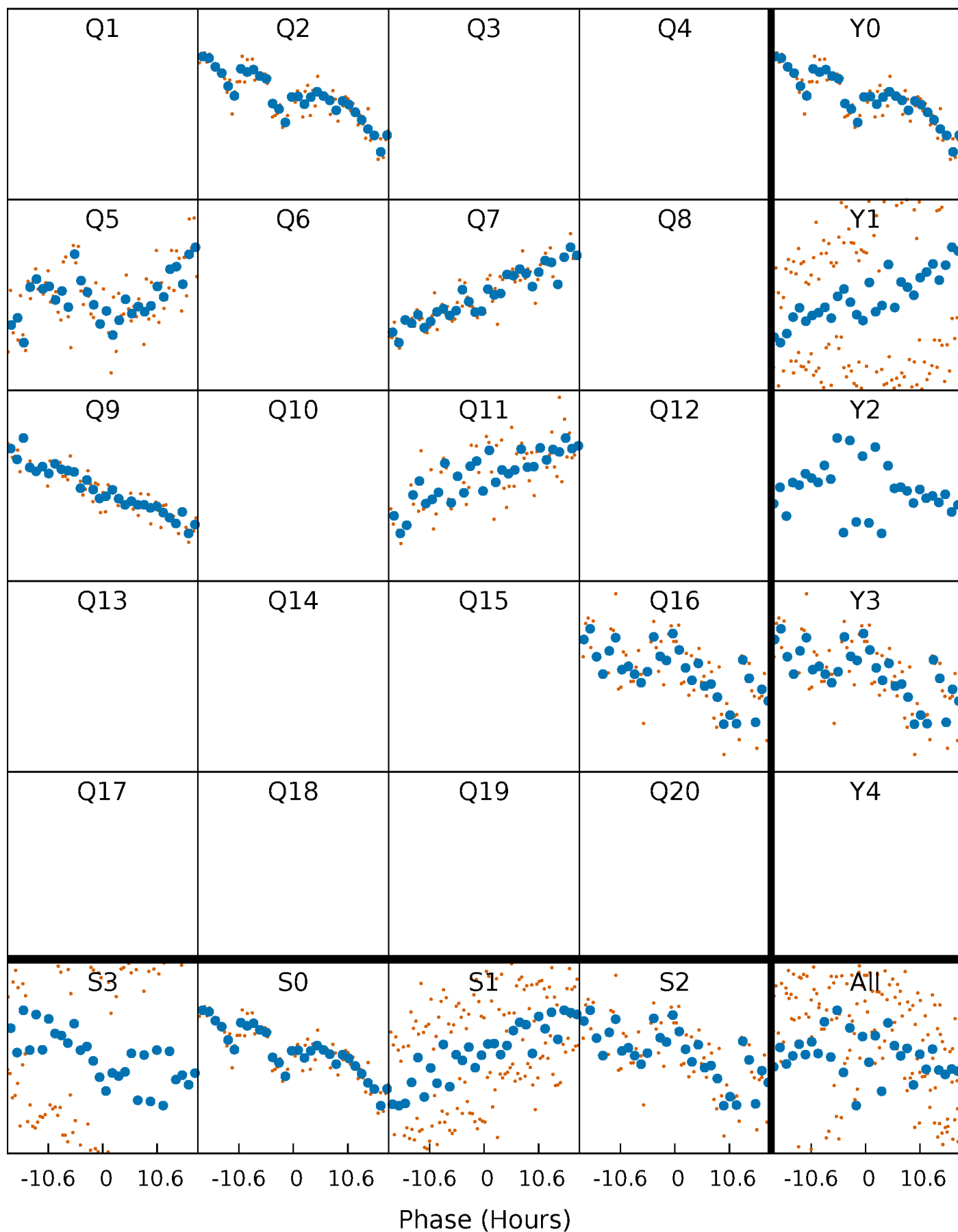


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

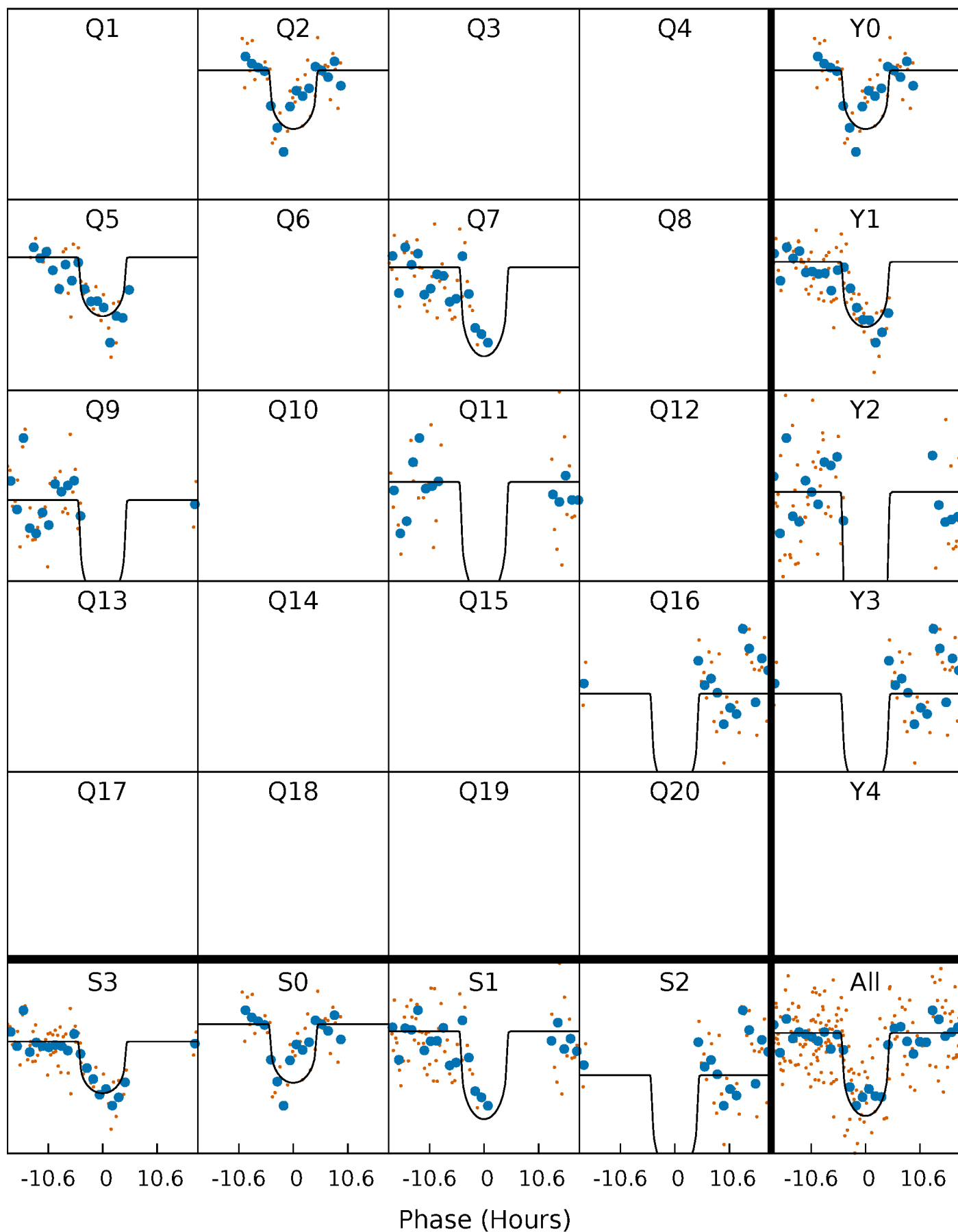
TCE 004945547-02 P=208.487165 Days  $T_0=251.341938$  (BKJD)





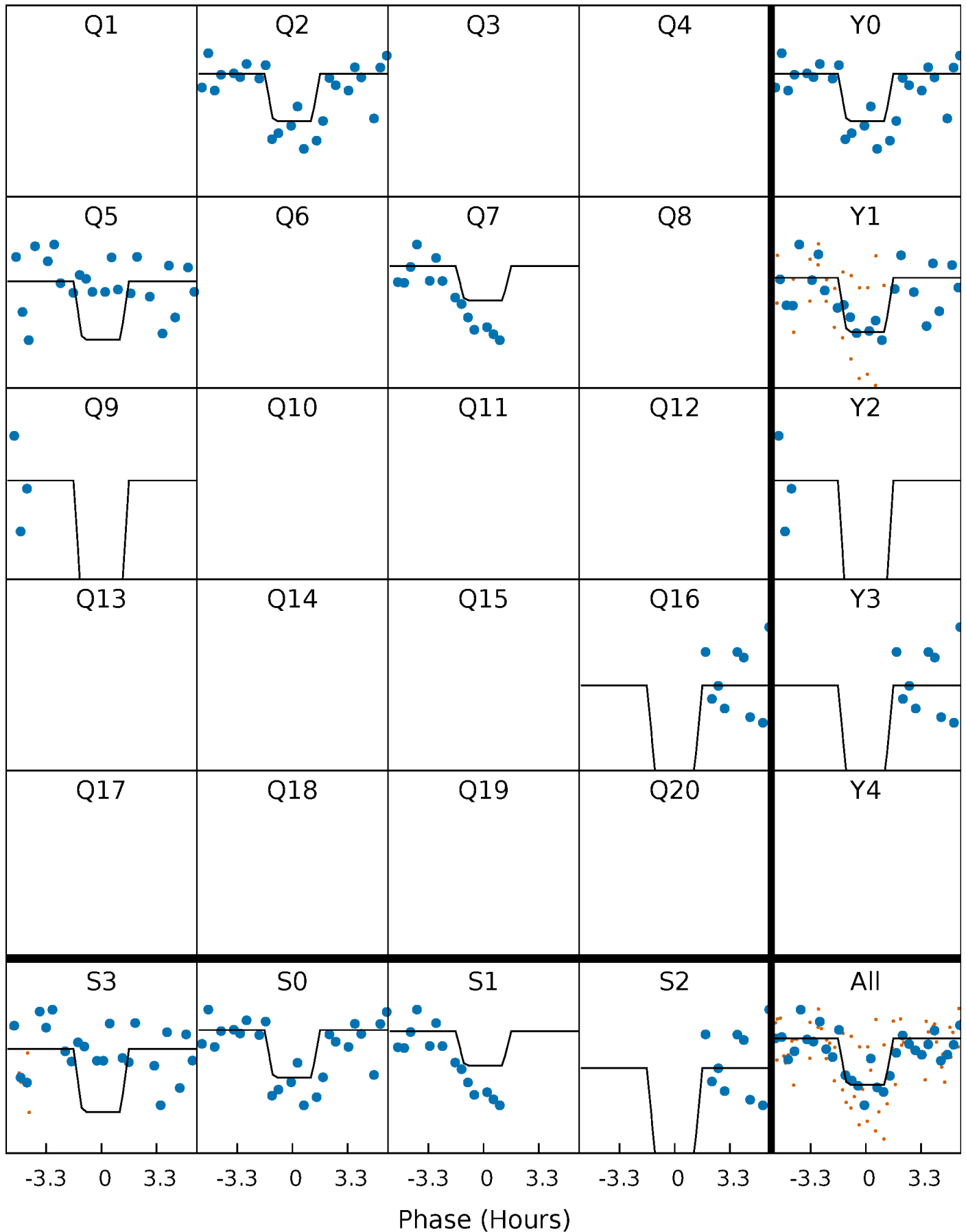
# DV Quarter-Phased Transit Curves

TCE 004945547-02   P=208.487165 Days    $T_0=251.341938$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

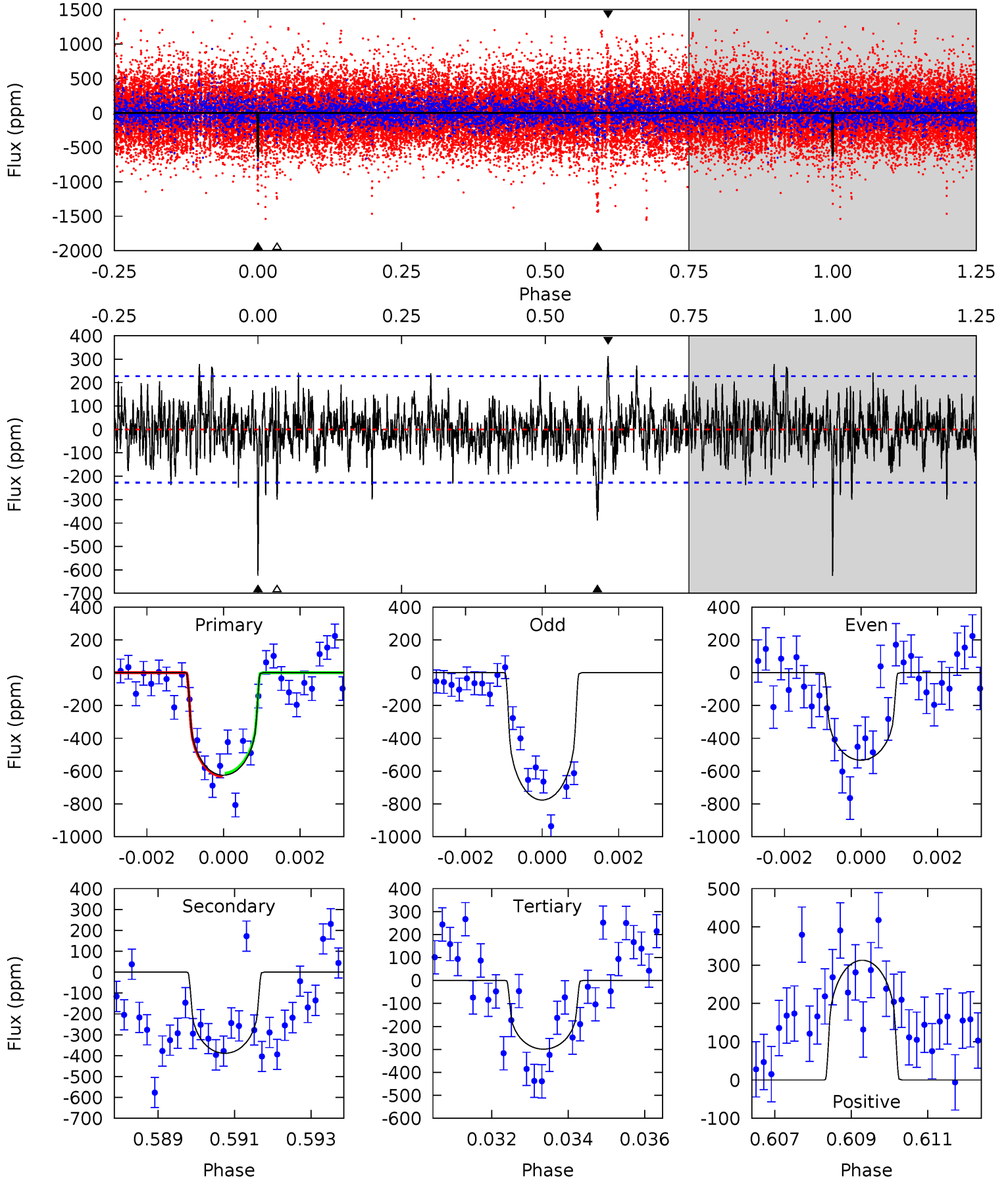
TCE 004945547-02   P=208.528210 Days    $T_0=251.222591$  (BKJD)



# DV Model-Shift Uniqueness Test

004945547-02, P = 208.487165 Days, E = 42.854773 Days

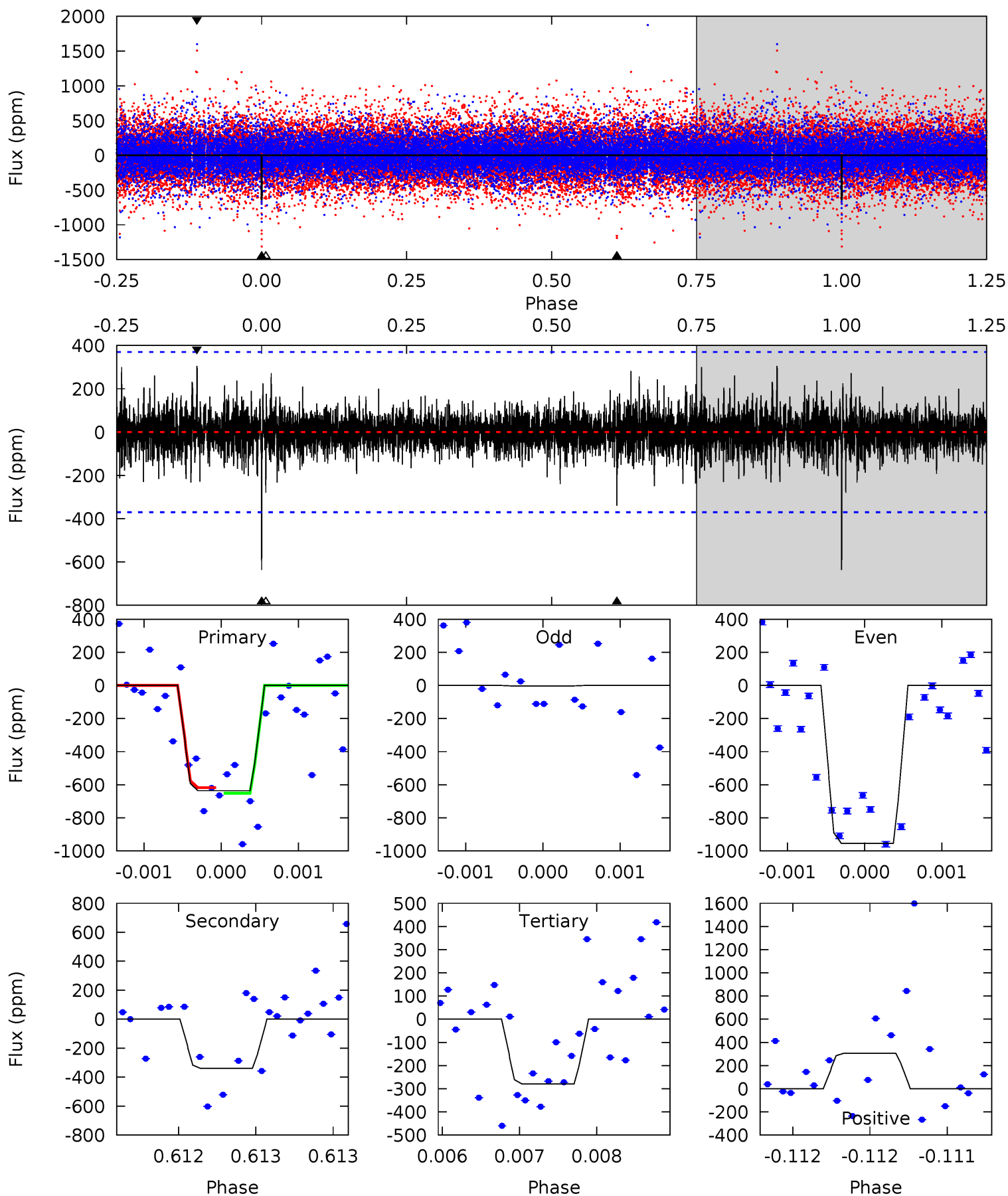
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	9.11	7.01	7.33	5.33	3.09	1.79	7.64	7.32	2.10	1.78	2.81	0.91	0.33	0.23



# Alt Model-Shift Uniqueness Test

004945547-02, P = 208.528210 Days, E = 42.694381 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
9.53	5.09	4.19	4.58	5.54	3.44	0.91	5.34	4.95	0.89	0.51	6.68	0.82	0.32	0.24



### Stellar Parameters For KIC 004945547

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4954^{+149}_{-149}$	$4.526^{+0.071}_{-0.045}$	$0.000^{+0.250}_{-0.300}$	$0.784^{+0.062}_{-0.083}$	$0.754^{+0.087}_{-0.060}$	$2.199^{+0.698}_{-0.369}$
	+3%/-3%	+2%/-1%	+inf%/-inf%	+8%/-11%	+12%/-8%	+32%/-17%
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 004945547-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-389 \pm 43$	$2.27^{+1.40}_{-1.20}$	$340^{+13}_{-12}$	$4368^{+1768}_{-659}$	$16303^{+57262}_{-10116}$
Alt.	$-339 \pm 67$	$2.16^{+1.33}_{-1.23}$	$341^{+13}_{-13}$	$4340^{+1897}_{-667}$	$15103^{+65343}_{-9080}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

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

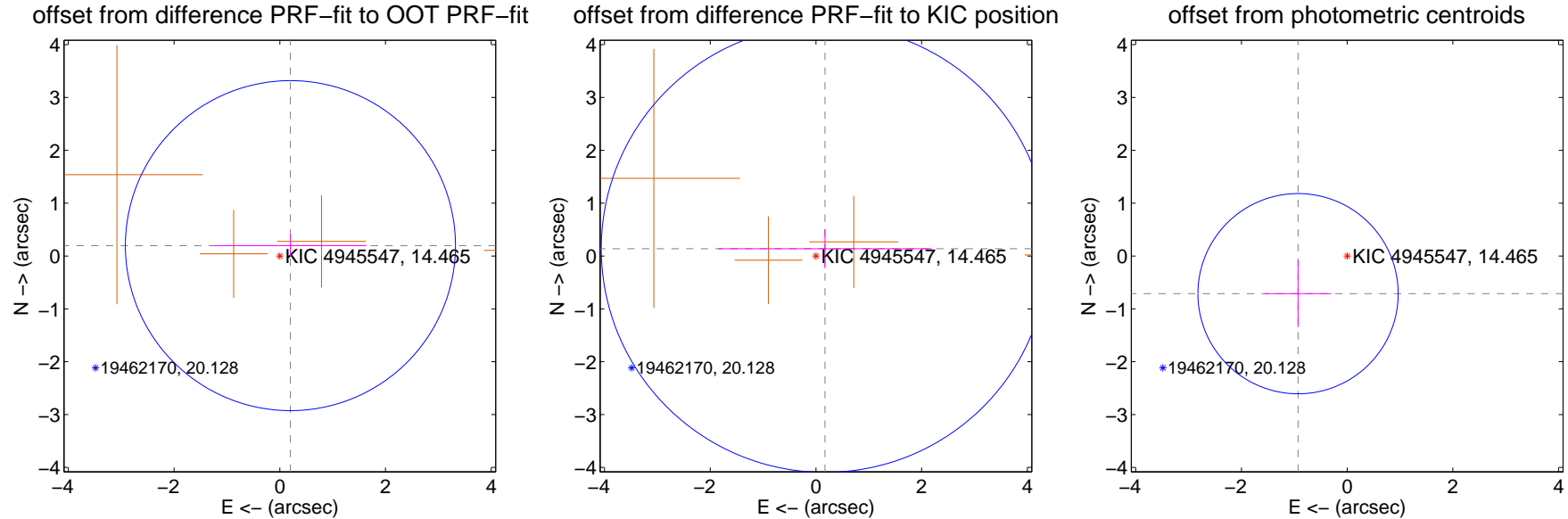
## DV Centroid Data

Supplemental centroid analysis for 004945547-02. Kepler magnitude: 14.46. Transit SNR 9.04

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.281 \pm 1.041$	0.27	$-0.201 \pm 1.440$	$0.197 \pm 0.220$
PRF-fit source offset from KIC position	$0.221 \pm 1.411$	0.16	$-0.172 \pm 2.019$	$0.139 \pm 0.372$
photometric centroid source offset	$1.17 \pm 0.63$	1.85	$0.93 \pm 0.63$	$-0.71 \pm 0.63$



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.

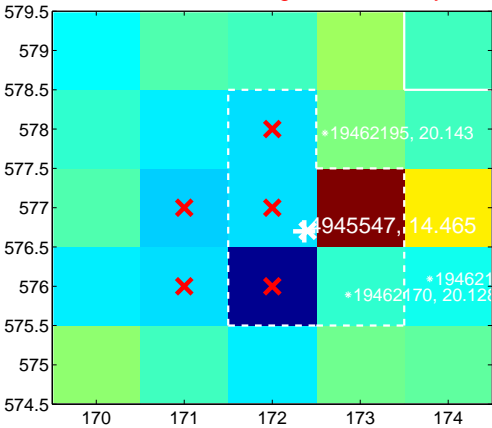
Q1 no difference image



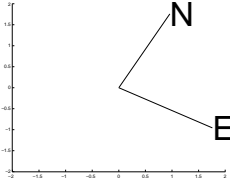
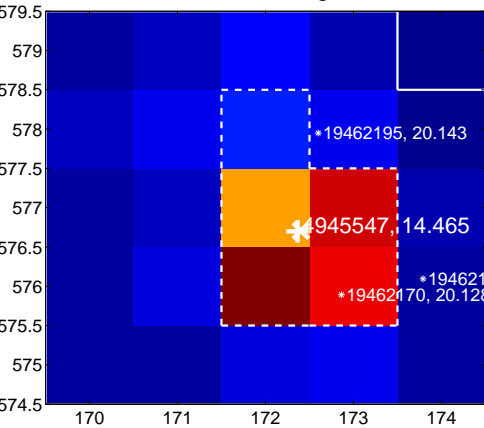
Q1 no OOT image



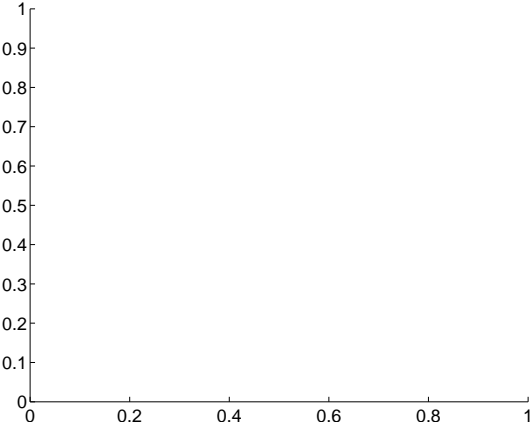
Q2 difference image. Poor Quality



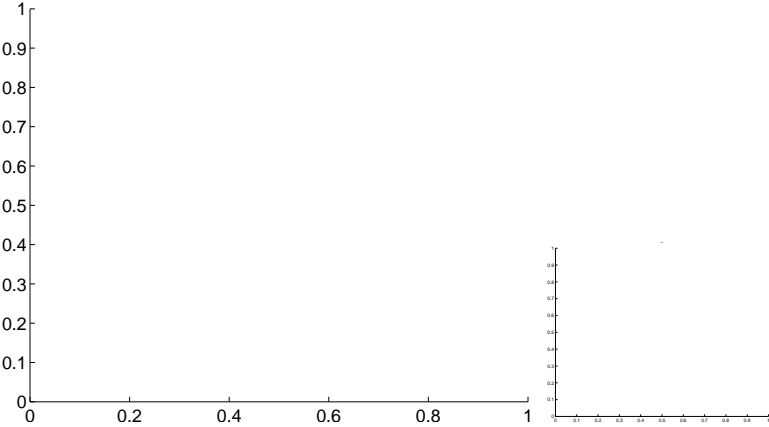
Q2 OOT image



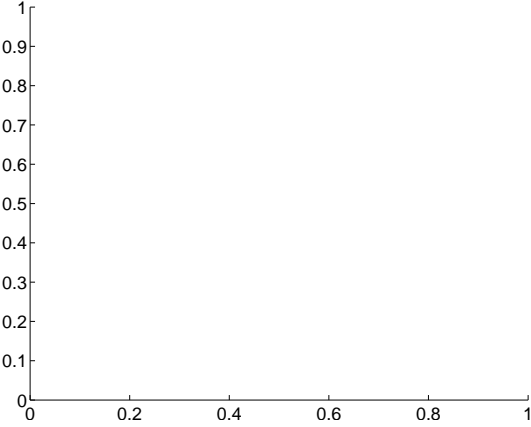
Q3 no difference image



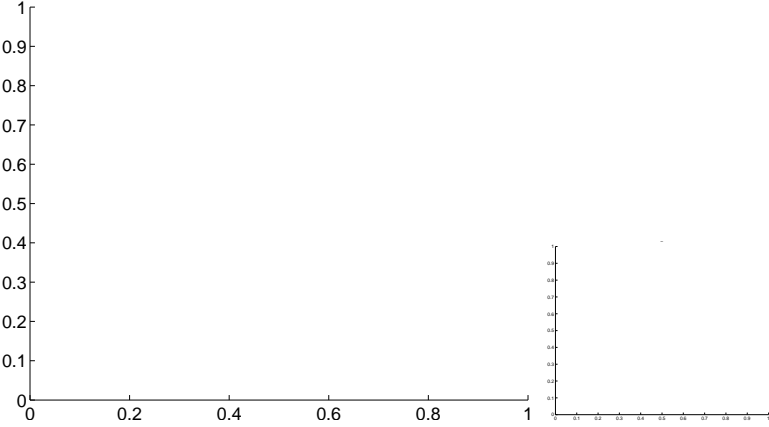
Q3 no OOT image



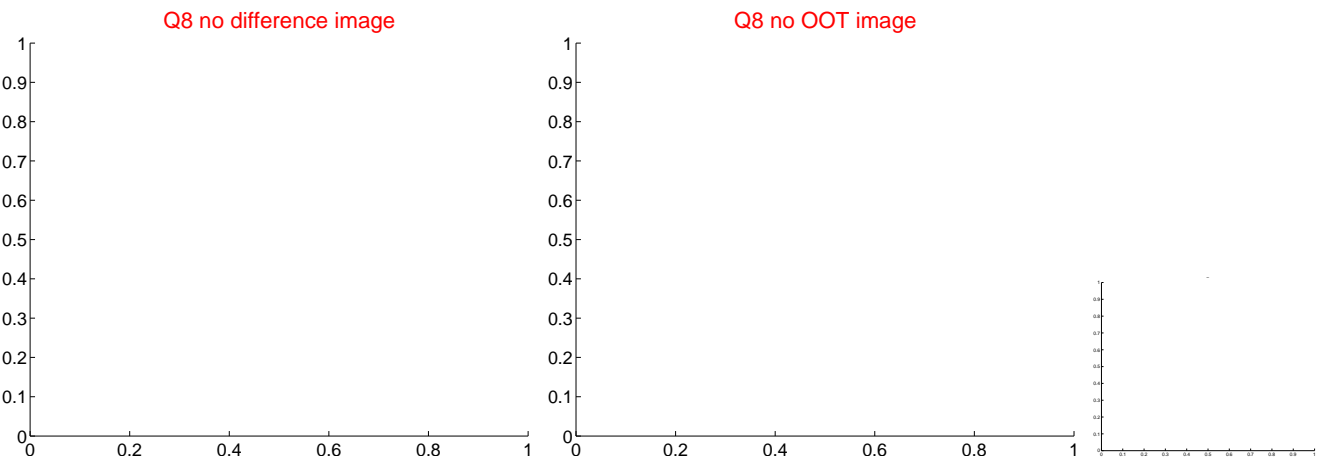
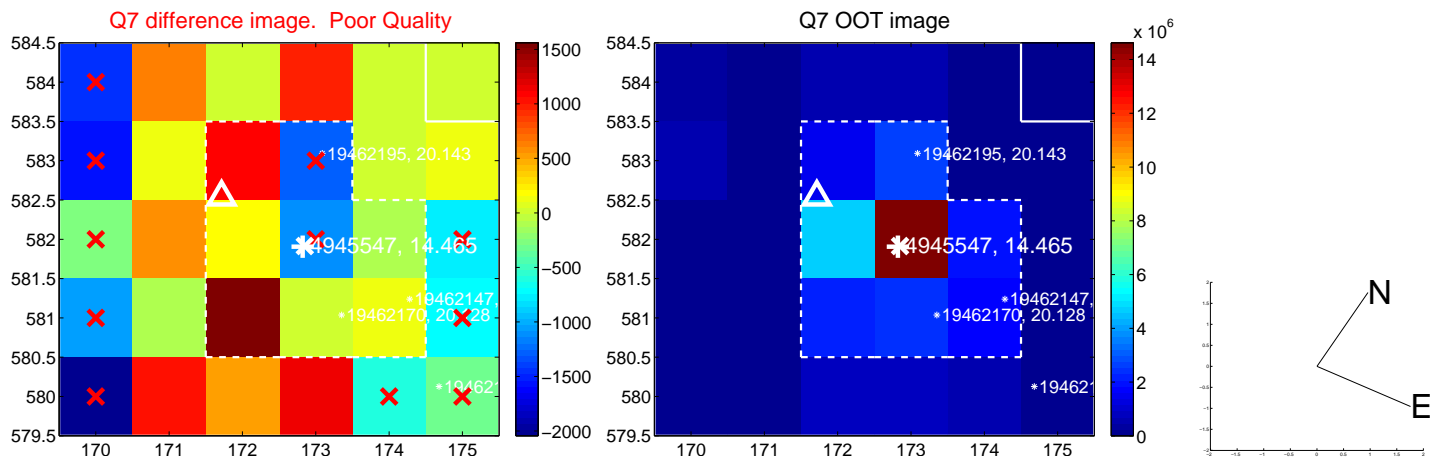
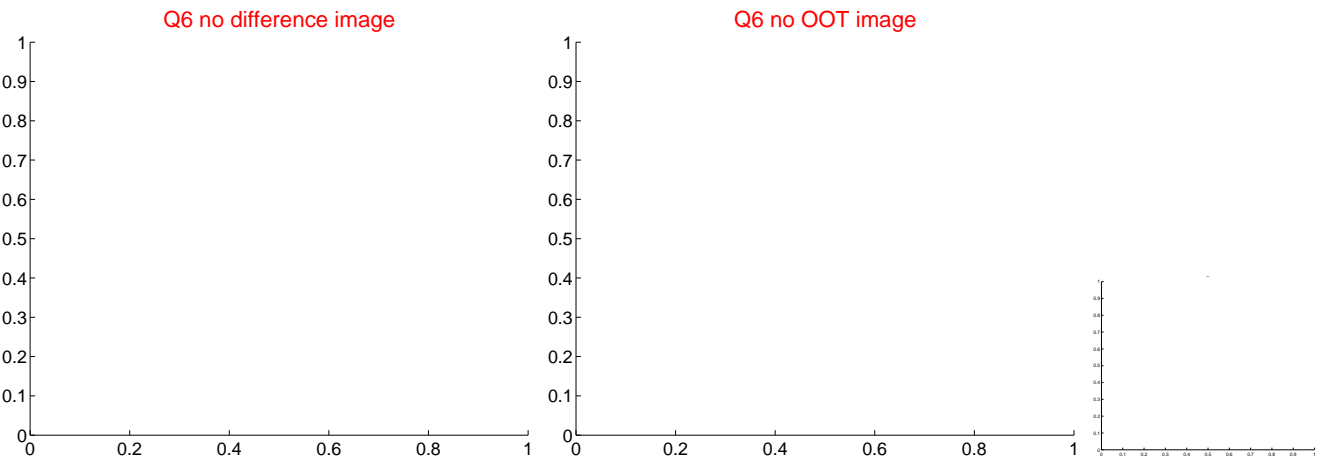
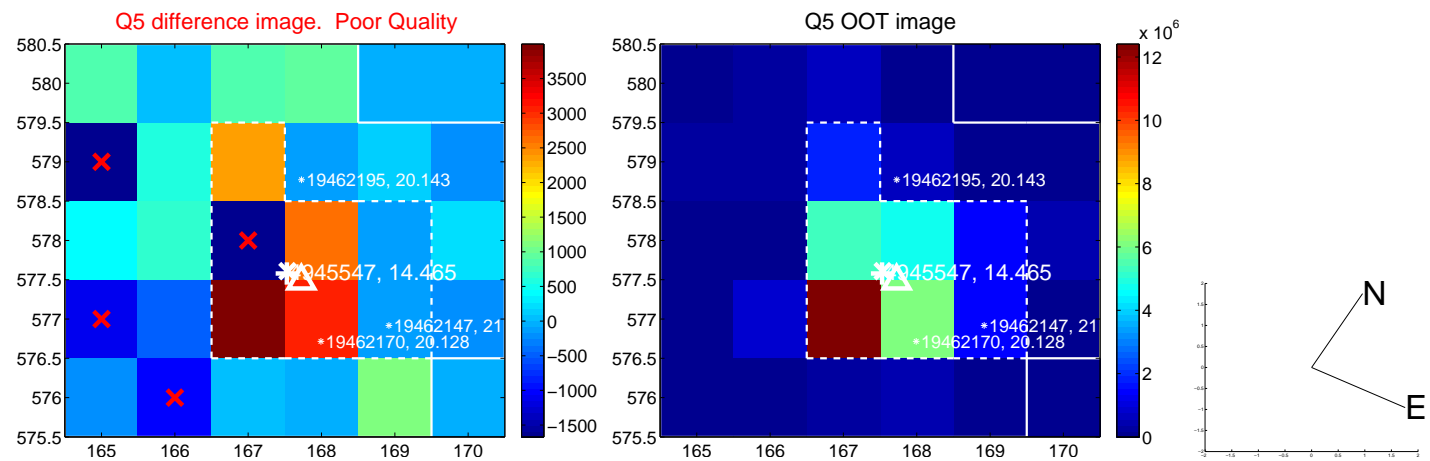
Q4 no difference image



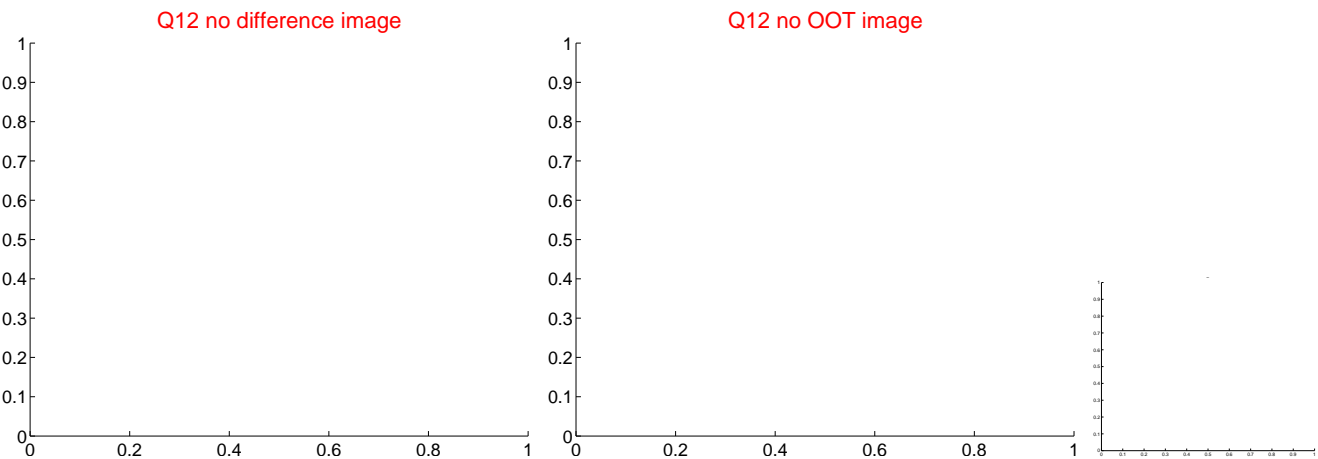
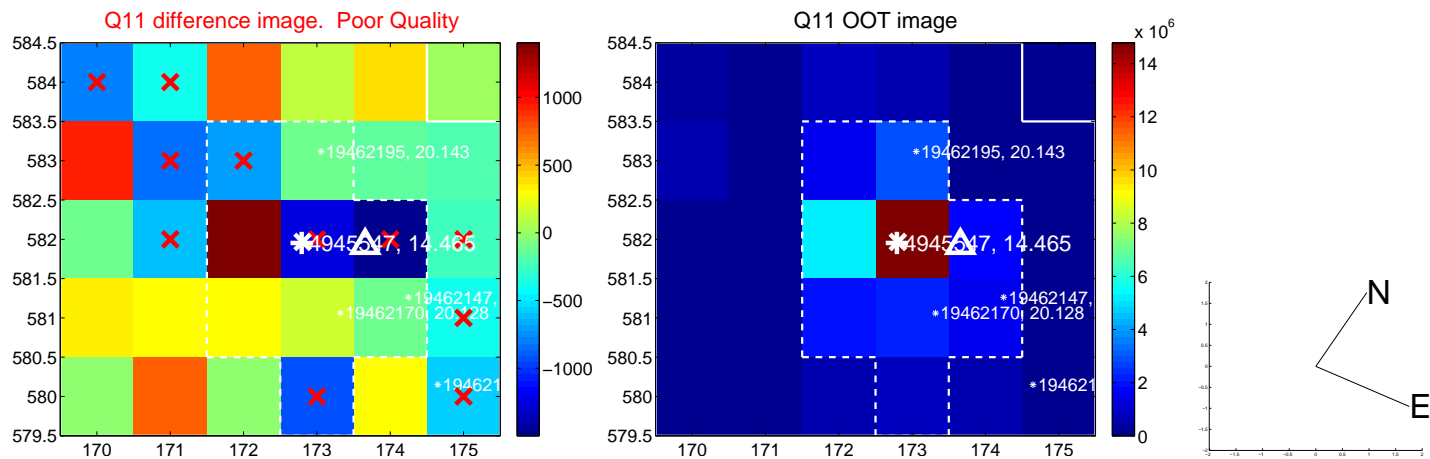
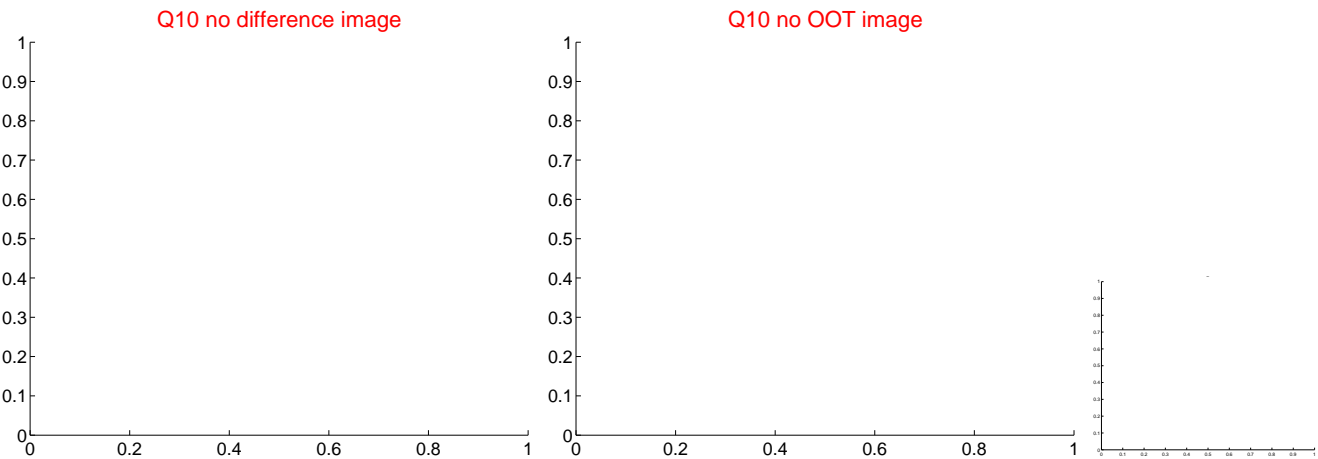
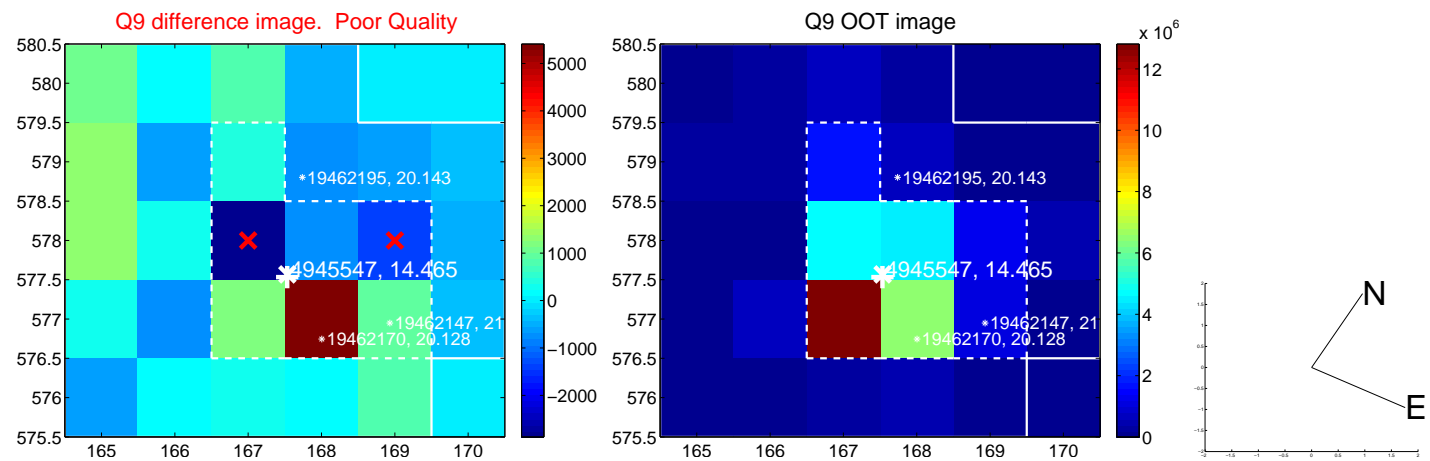
Q4 no OOT image



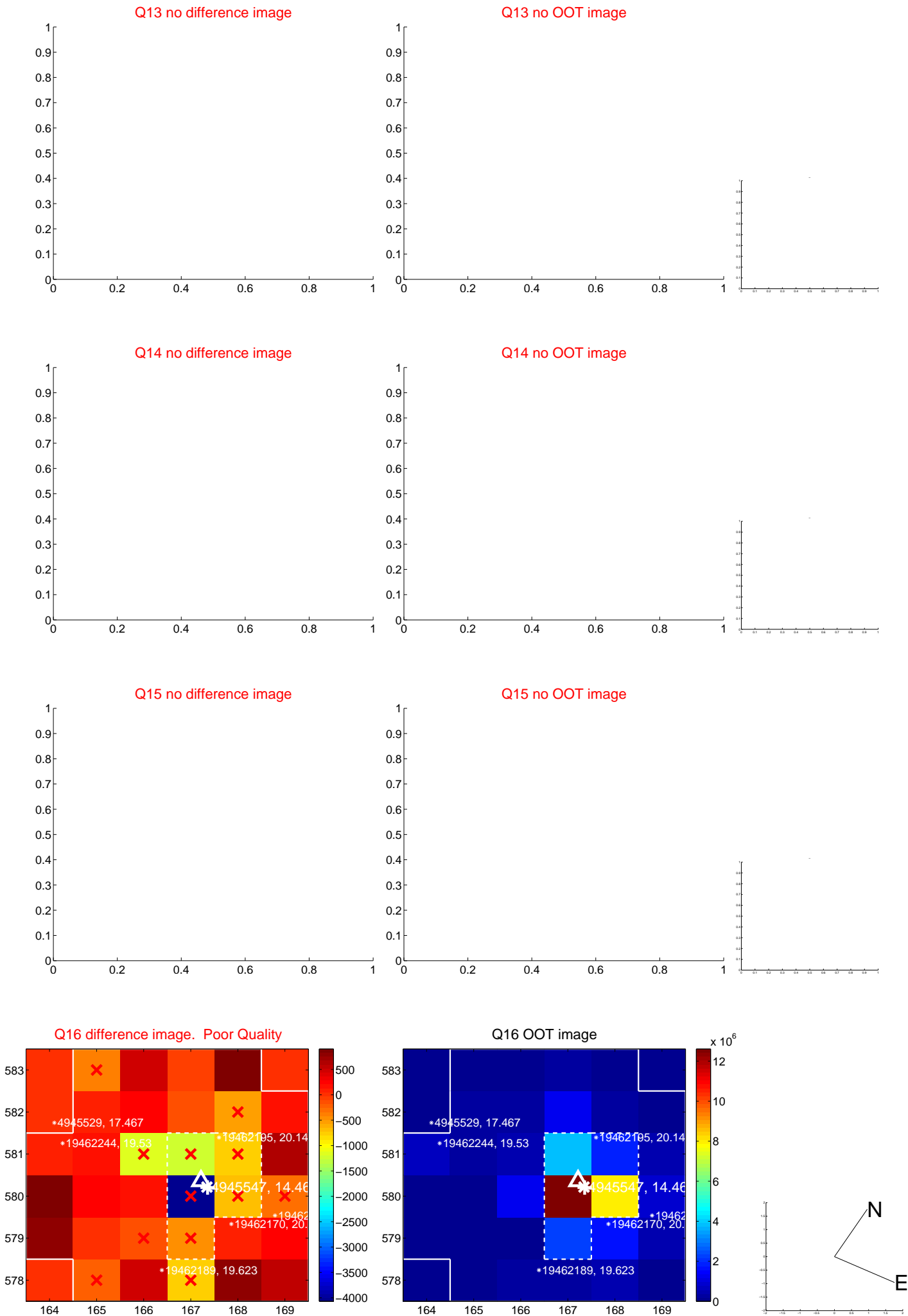
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



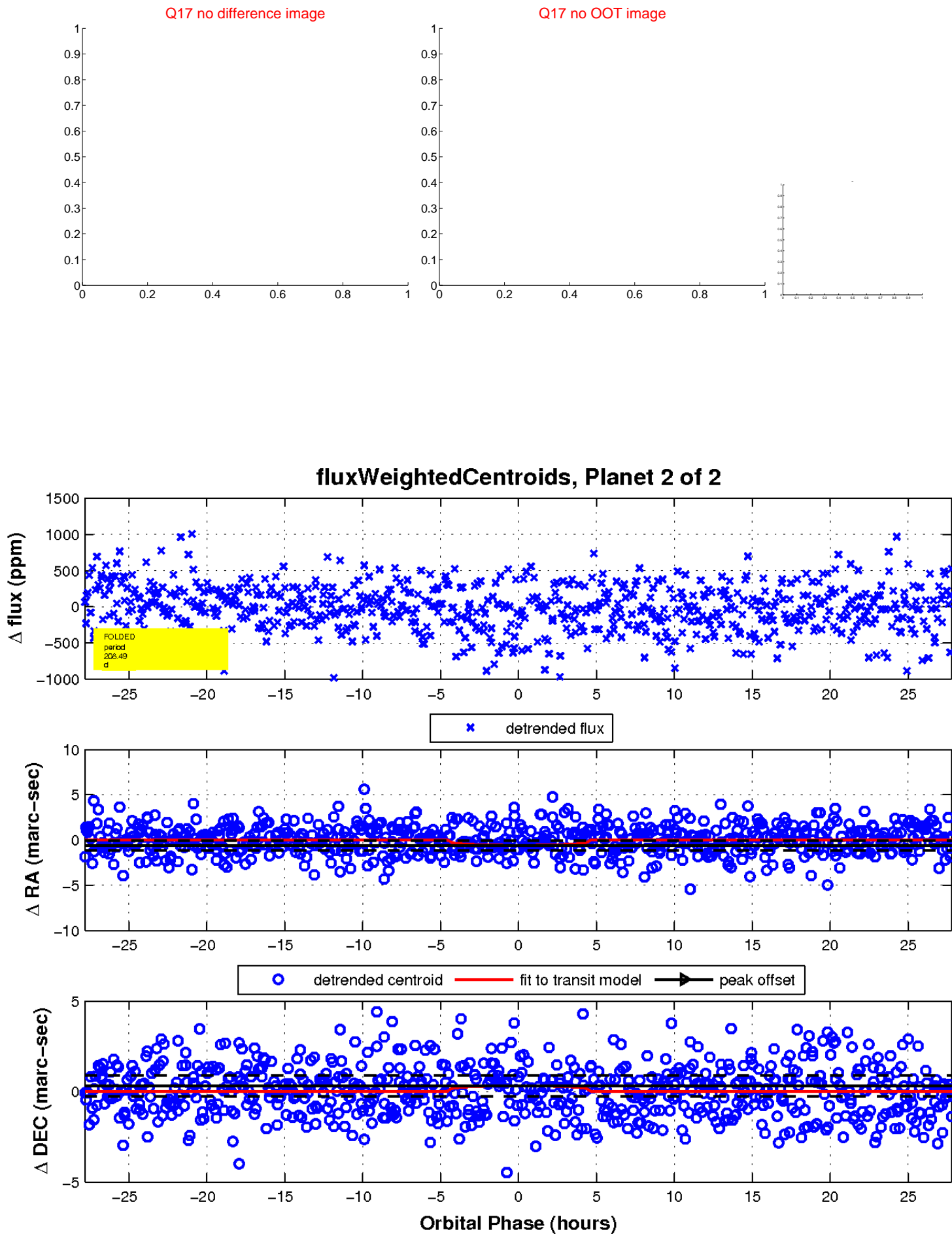
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



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



UKIRT Image

Declination

