

# KIC 008499900

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008499900-01	OBS	No	2.019051	132.524333	4.9	10.306	8.2	2.5	1.99	7435	0.52	8415.06
008499900-02	OBS	No	72.051087	173.714016	131.7	2.010	9.1	2.8	1.99	7435	2.34	71.62
008499900-03	OBS	No	226.255274	146.613390	167.1	34.849	8.8	7.8	1.99	7435	2.77	15.58
008499900-04	OBS	No	551.138752	337.584723	175.4	5.889	7.9	7.8	1.99	7435	3.03	4.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008499900-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
008499900-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
008499900-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008499900-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT

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

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

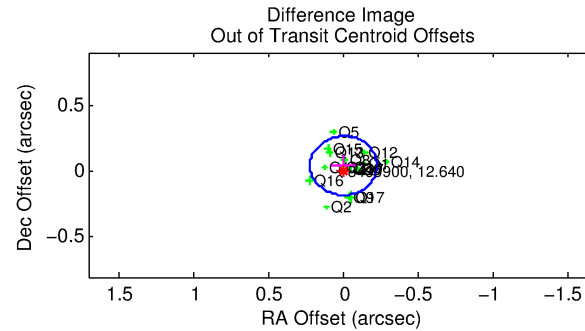
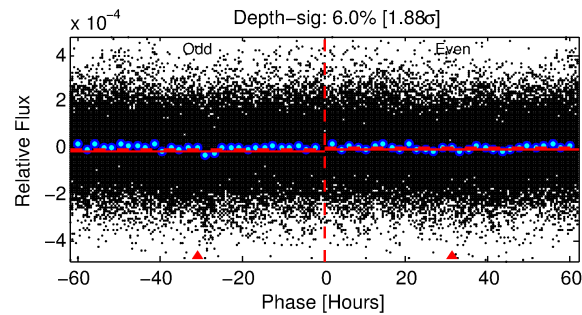
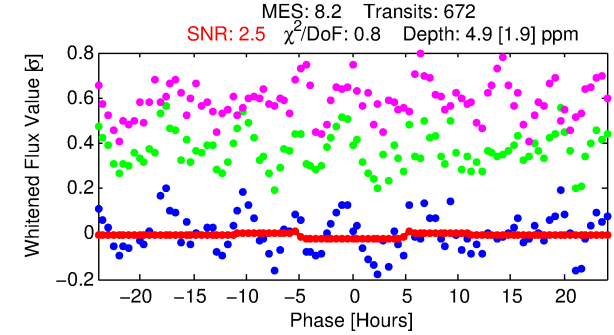
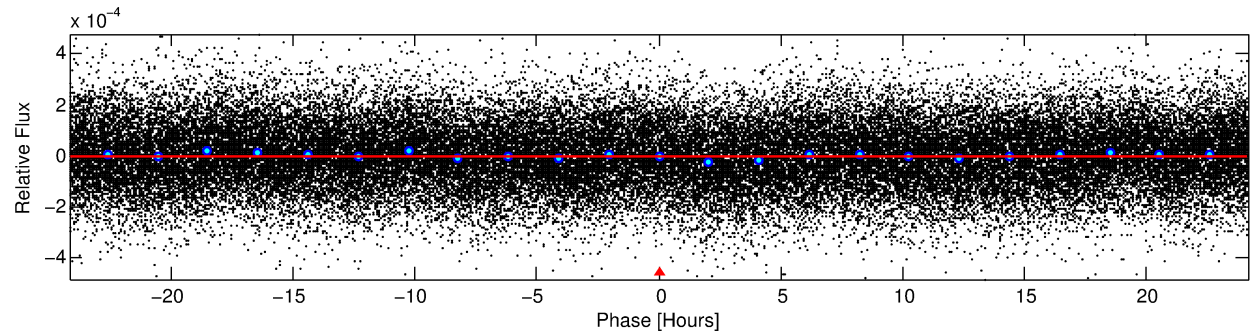
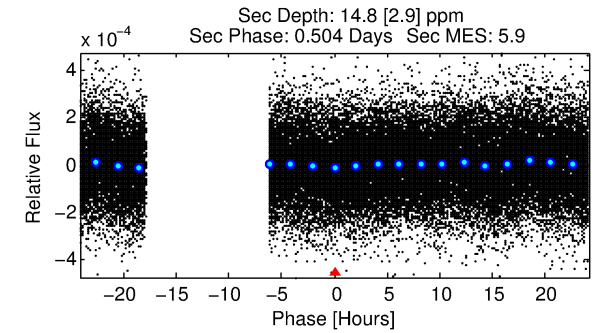
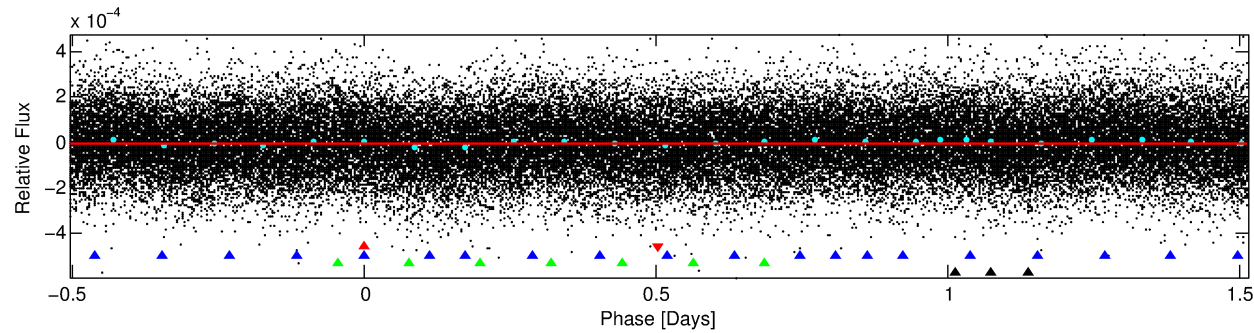
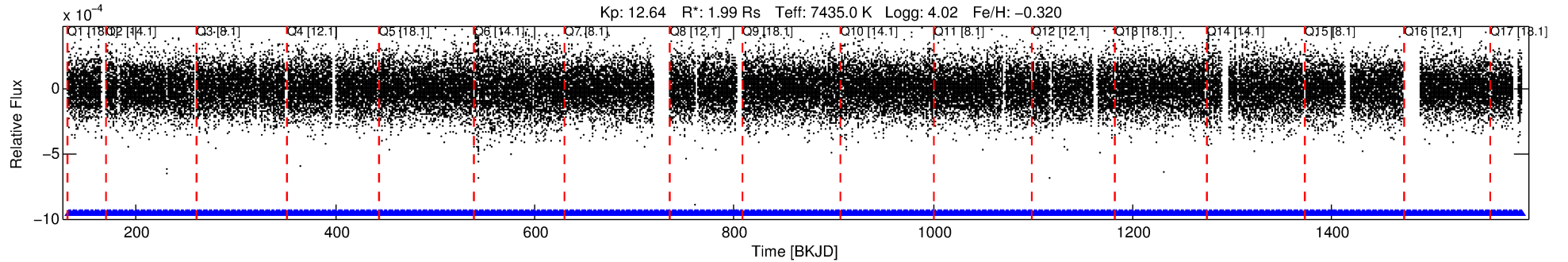
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008499900-01

No Significant Match Found

# DV One-Page Summary

KIC: 8499900 Candidate: 1 of 4 Period: 2.019 d



## DV Fit Results:

Period = 2.01905 [0.00009] d  
Epoch = 132.5243 [0.0204] BKJD  
Rp/R\* = 0.0024 [0.0013]  
a/R\* = 1.12 [0.75]  
b = 0.92 [0.54]  
Seff = 8415.06 [3822.24]  
Teq = 2442 [277] K  
Rp = 0.52 [0.33] Re  
a = 0.0359 [0.0099] AU  
Ag = 38.83 [46.07] [0.82σ]  
Teffp = 9426 [2642] K [2.63σ]

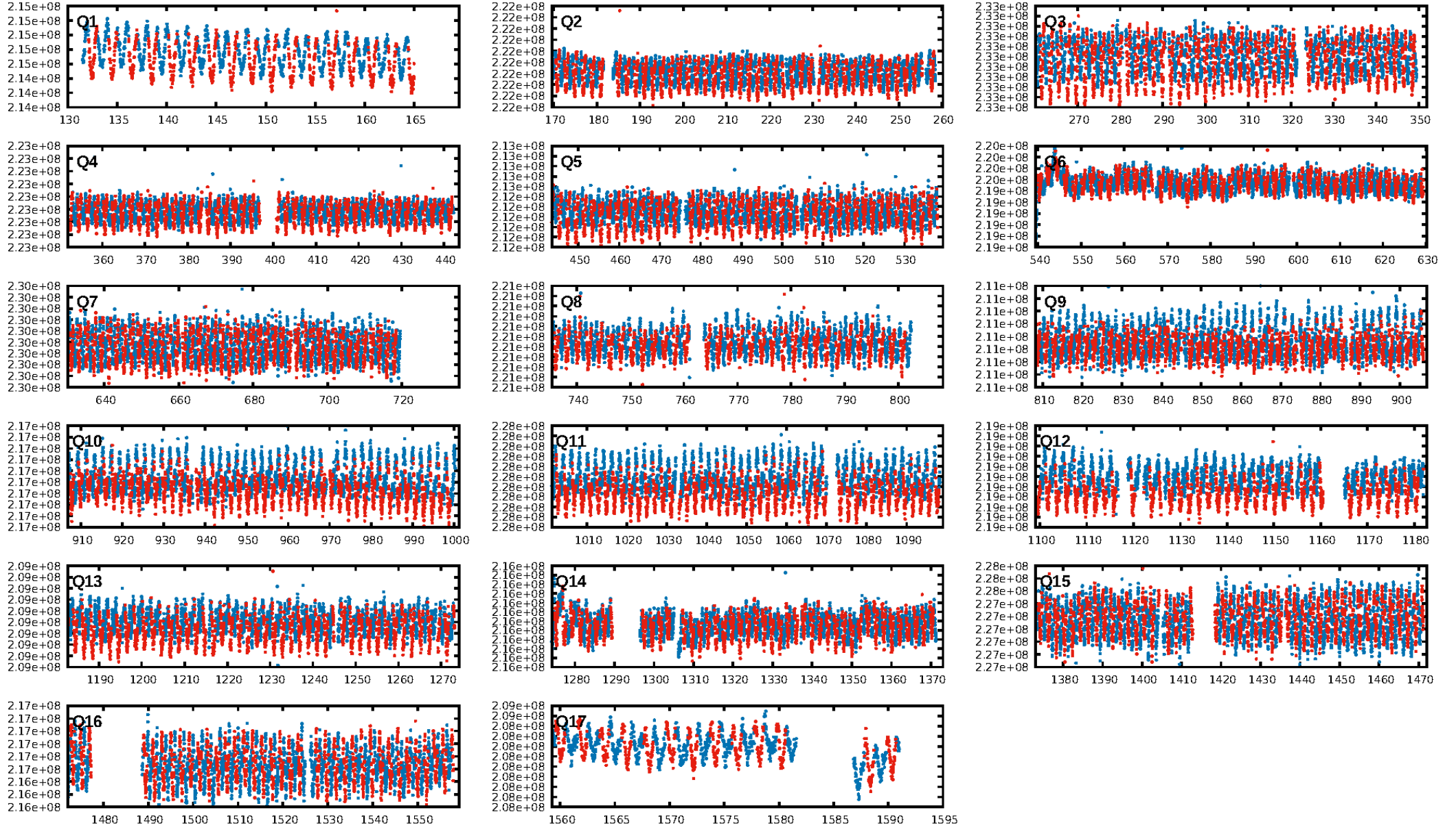
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [160.07σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.48e-10**  
RollingBand-fgt: 1.00 [642/642]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.042 arcsec [0.57σ]  
KicOffset-rm: 0.168 arcsec [2.20σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

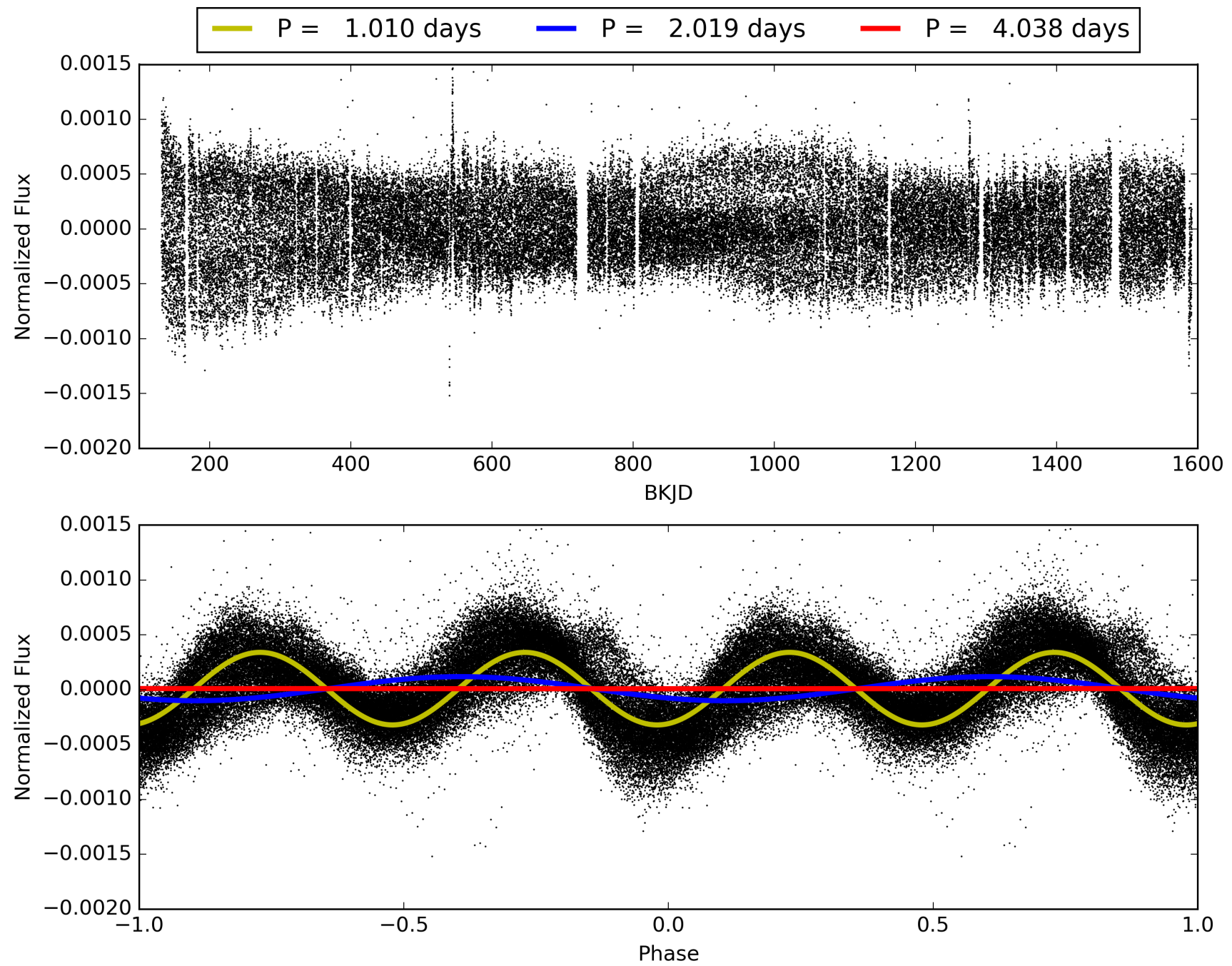
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:37:30 Z

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

# TCE 008499900-01, PDC Light Curves



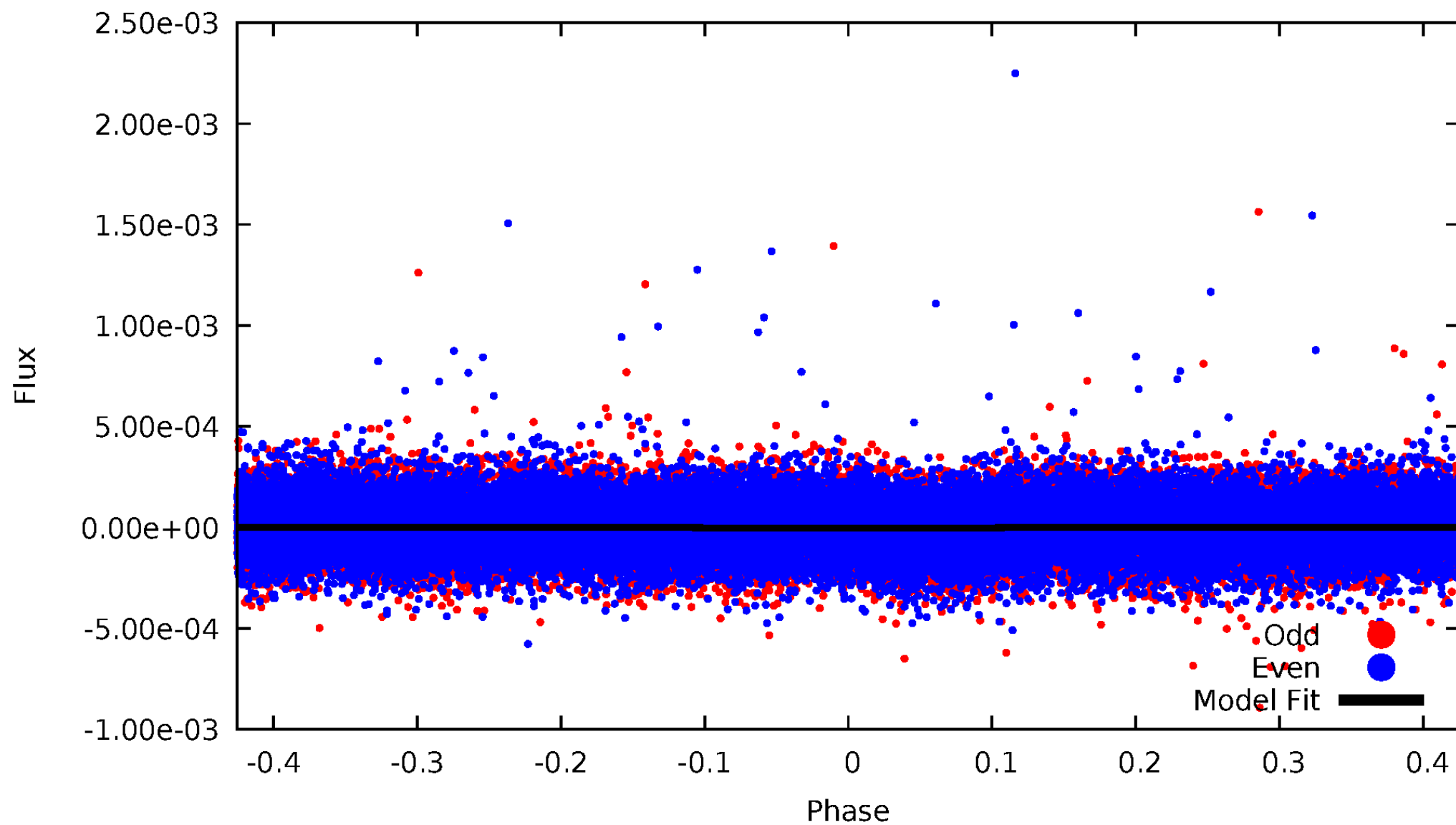
TCE 008499900-01





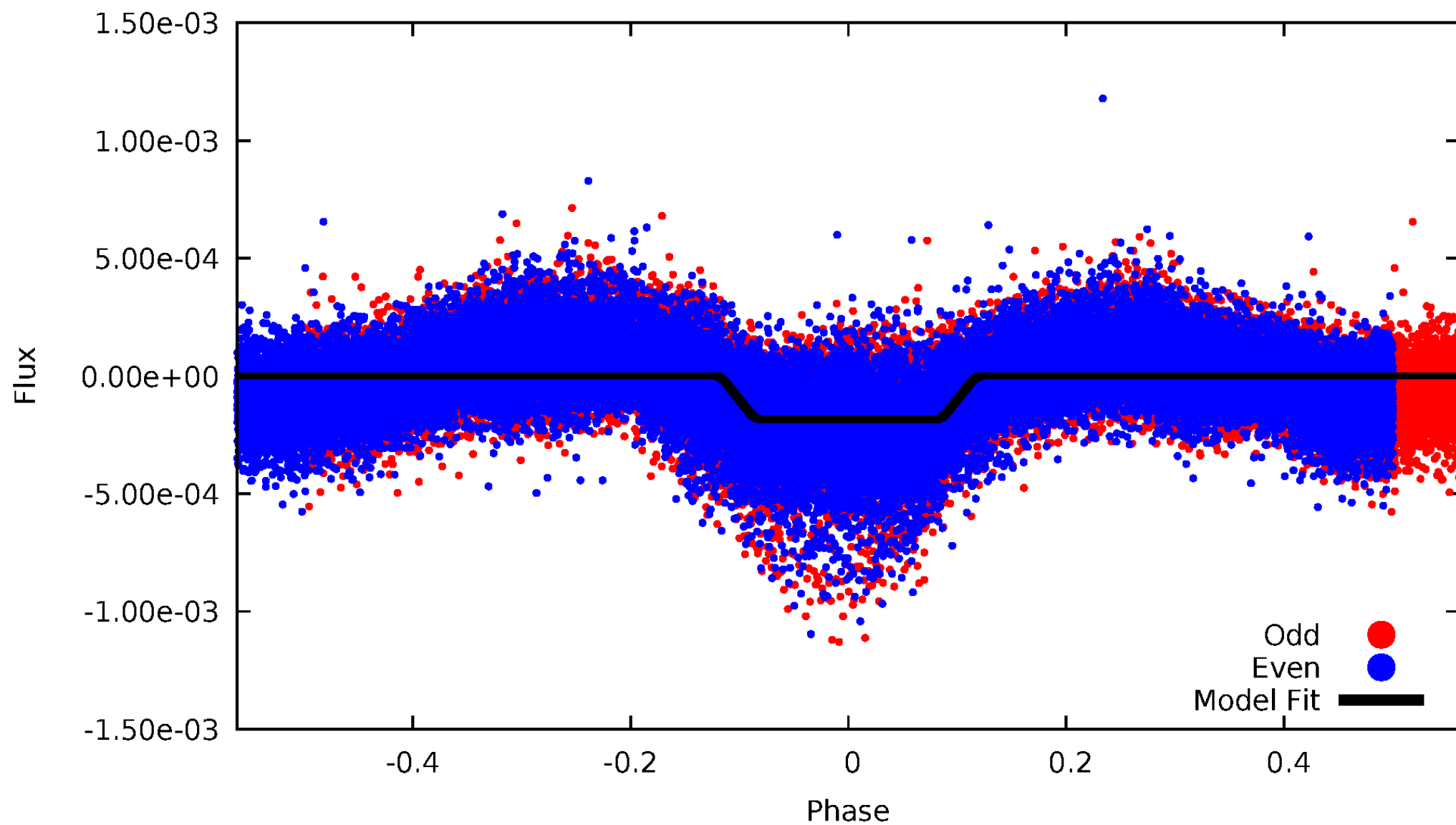
# DV Odd/Even

TCE 008499900-01

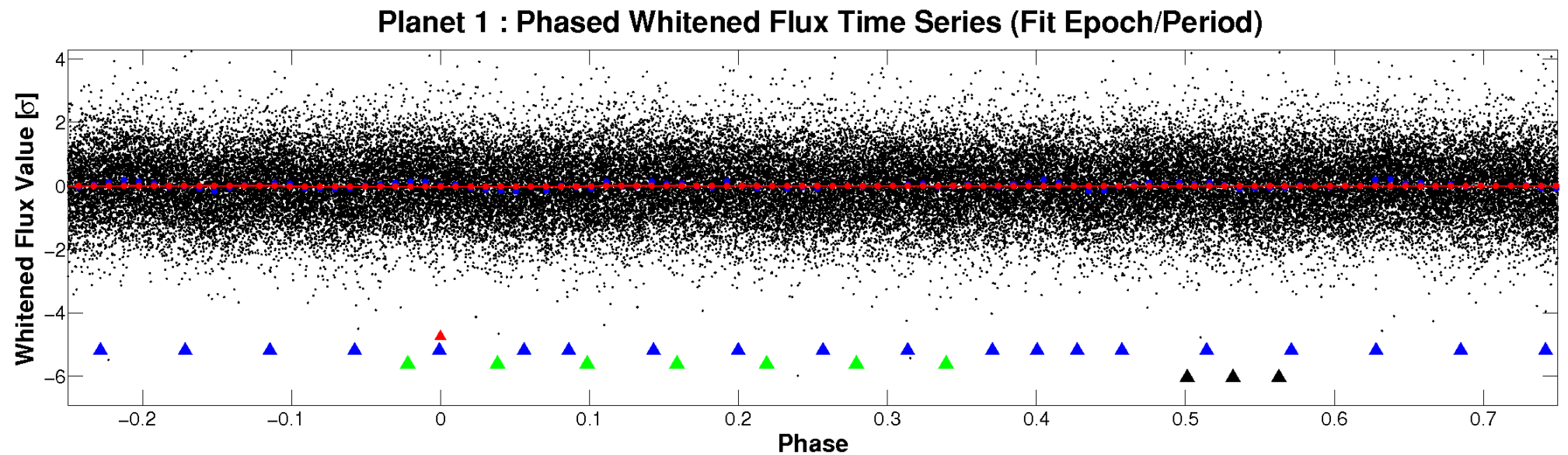
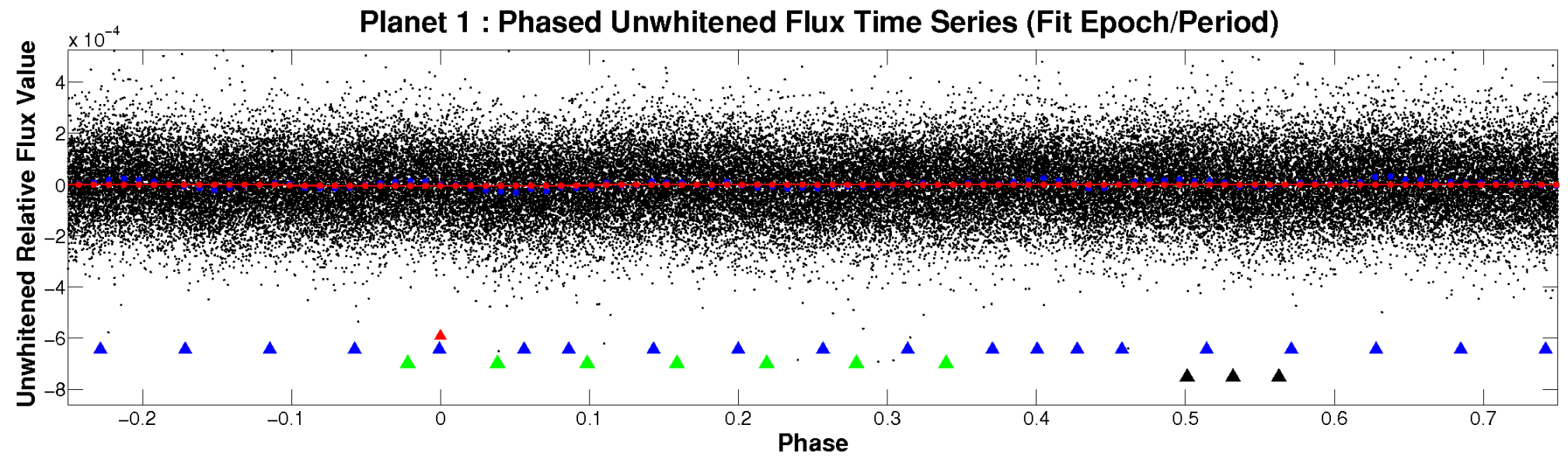


# ALT Odd/Even

TCE 008499900-01

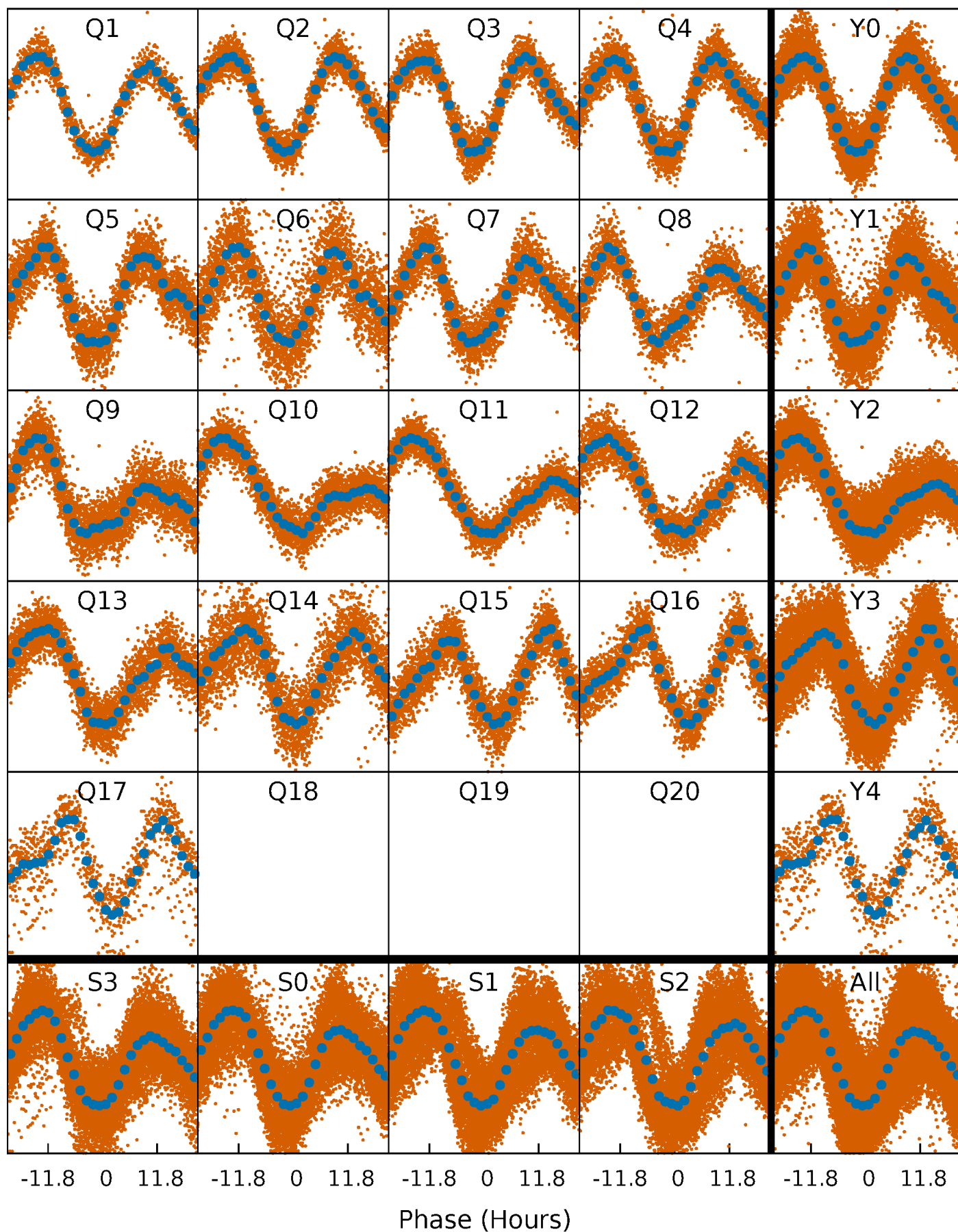


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

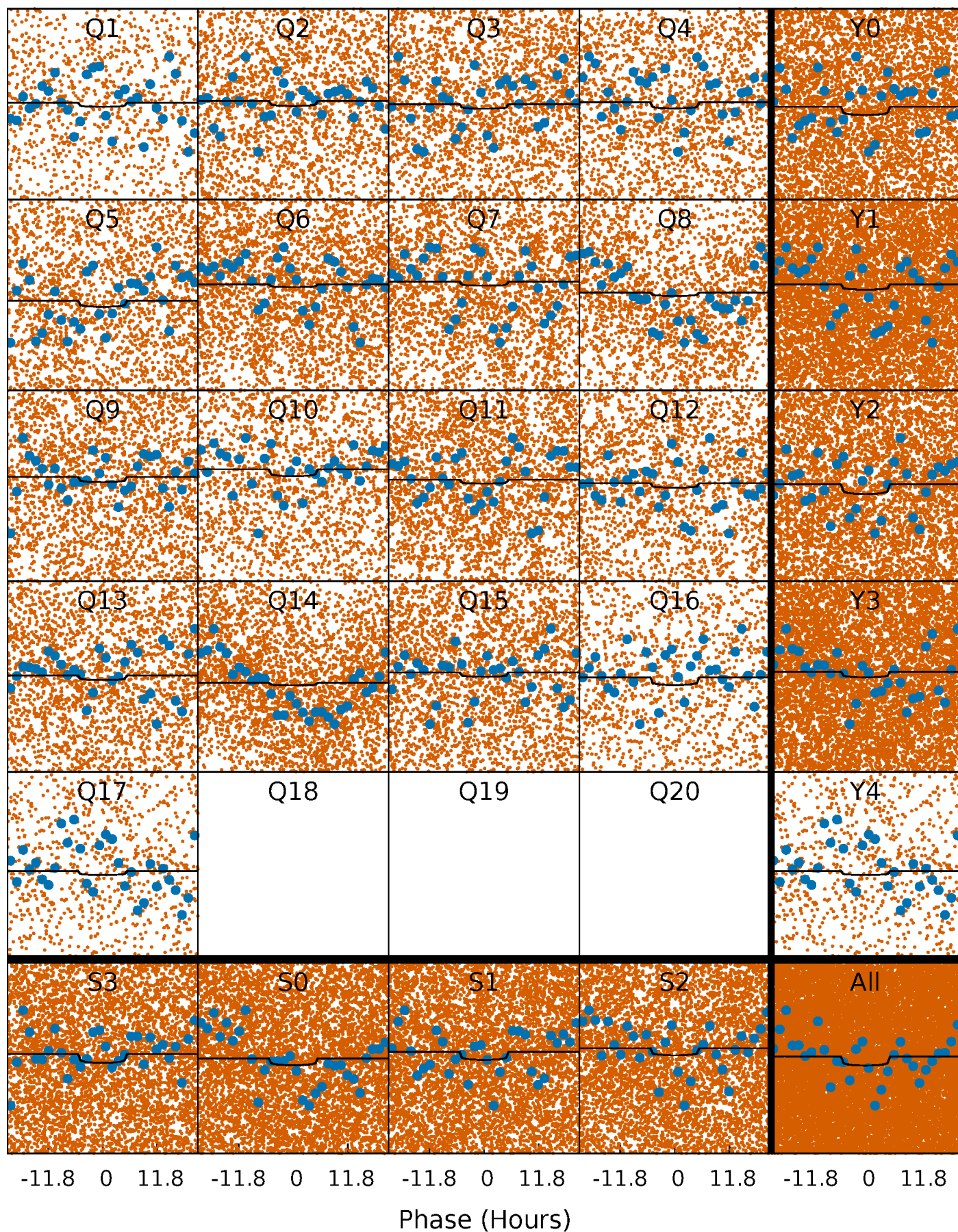
TCE 008499900-01   P= 2.019051 Days    $T_0=132.524333$  (BKJD)





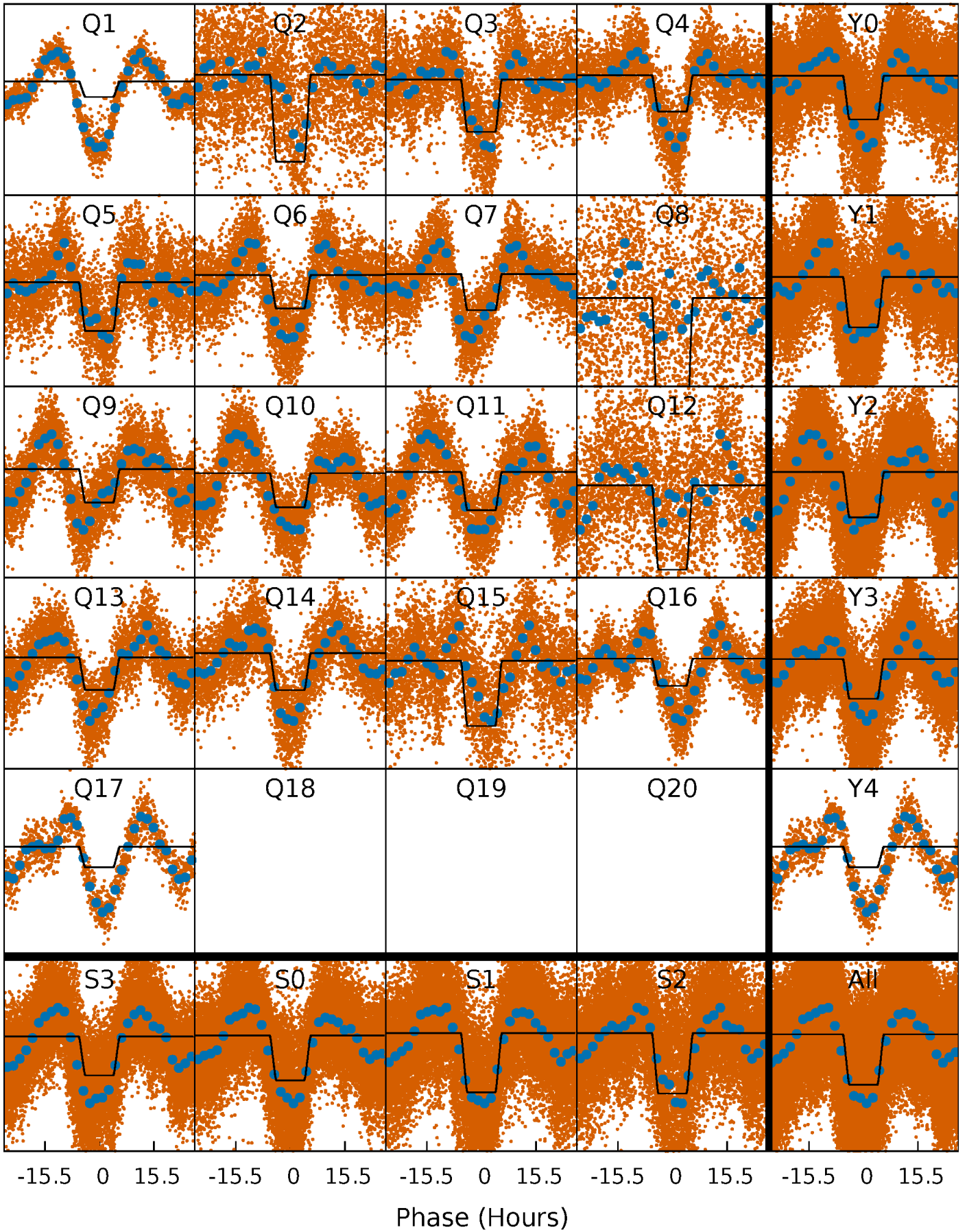
# DV Quarter-Phased Transit Curves

TCE 008499900-01 P= 2.019051 Days  $T_0=132.524333$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

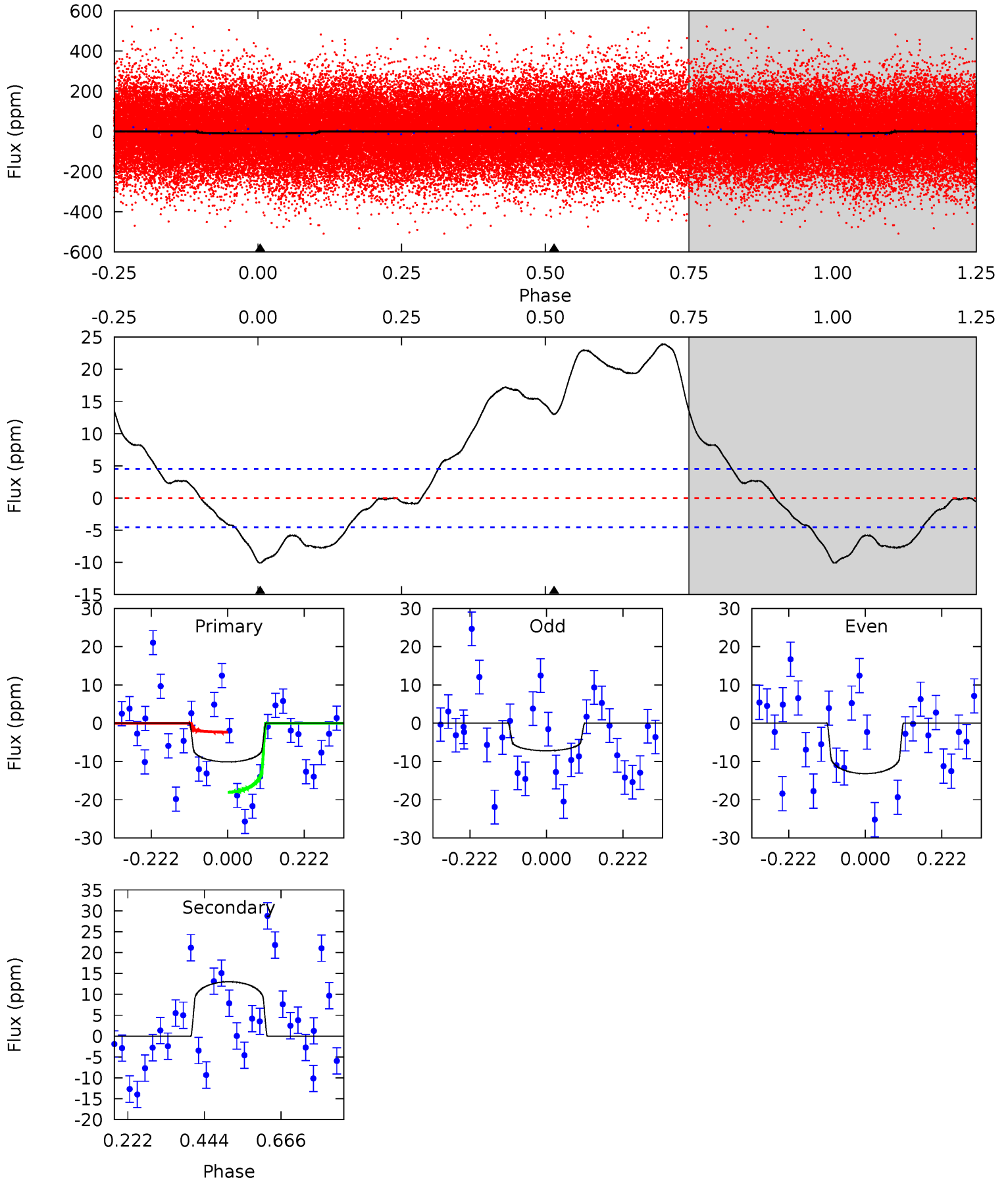
TCE 008499900-01   P= 2.019205 Days    $T_0=132.455119$  (BKJD)



# DV Model-Shift Uniqueness Test

008499900-01, P = 2.019051 Days, E = 130.505282 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
9.82	-12.6	0	0	4.39	1.22	6.07	9.82	9.82	-12.6	-12.6	2.90	0.85	0.70	7.61

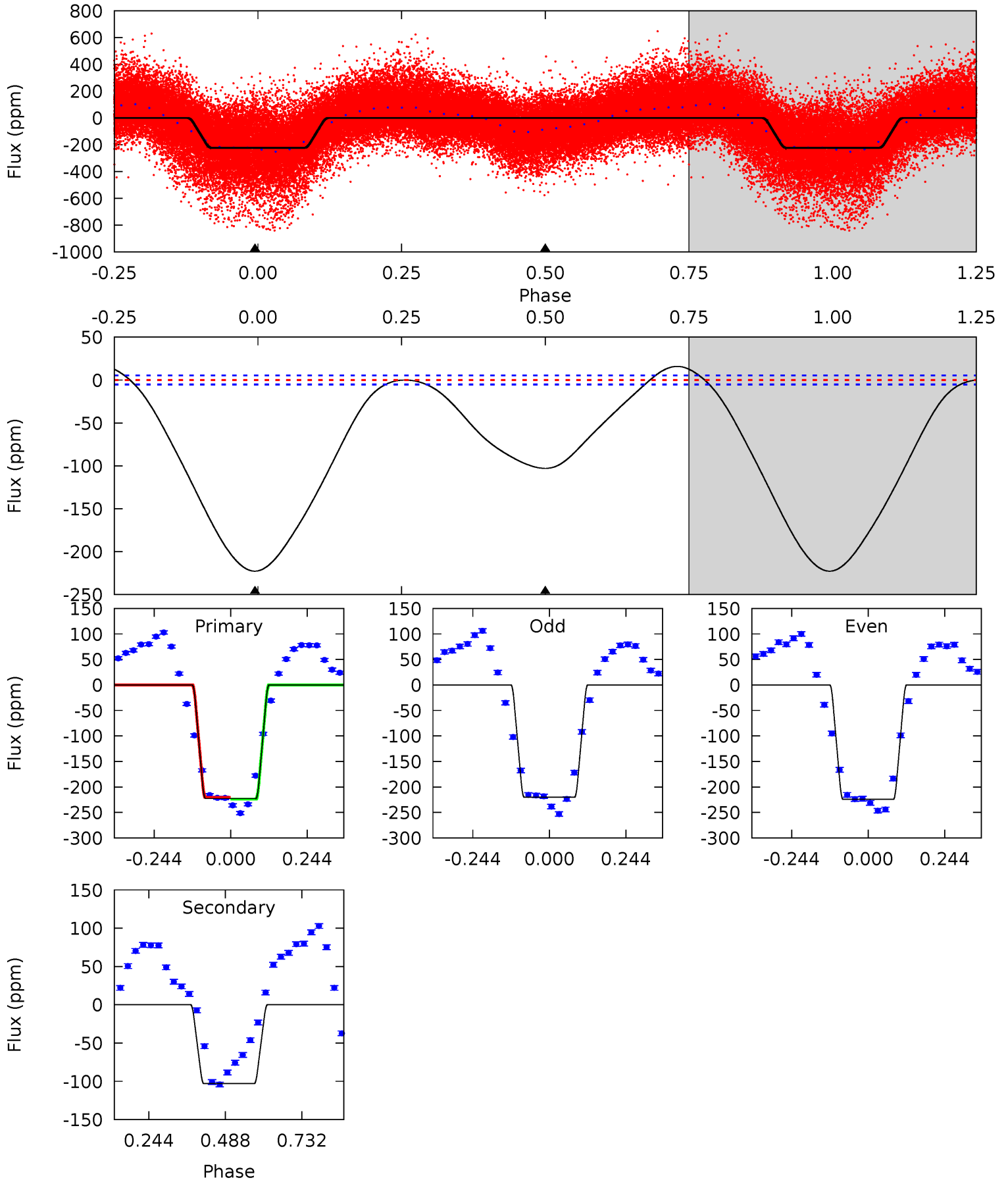




# Alt Model-Shift Uniqueness Test

008499900-01, P = 2.019205 Days, E = 130.435914 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
182.6	84.4	0	0	4.37	1.16	5.98	182.6	182.6	84.4	84.4	1.75	1.01	0.07	1.33





### Stellar Parameters For KIC 008499900

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7435^{+233}_{-311}$	$4.020^{+0.240}_{-0.160}$	$-0.320^{+0.250}_{-0.350}$	$1.990^{+0.504}_{-0.616}$	$1.510^{+0.198}_{-0.296}$	$0.270^{+0.441}_{-0.108}$
	+3%/-4%	+6%/-4%	+78%/-109%	+25%/-31%	+13%/-20%	+163%/-40%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008499900-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$13 \pm 1$	$0.50^{+0.31}_{-0.26}$	$3392^{+276}_{-310}$	$-9470^{+2149}_{-8745}$	$-36.050^{+22.564}_{-124.003}$
Alt.	$-103 \pm 1$	$2.89^{+0.58}_{-0.55}$	$3378^{+267}_{-293}$	$6281^{+396}_{-371}$	$8.764^{+4.170}_{-2.651}$

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

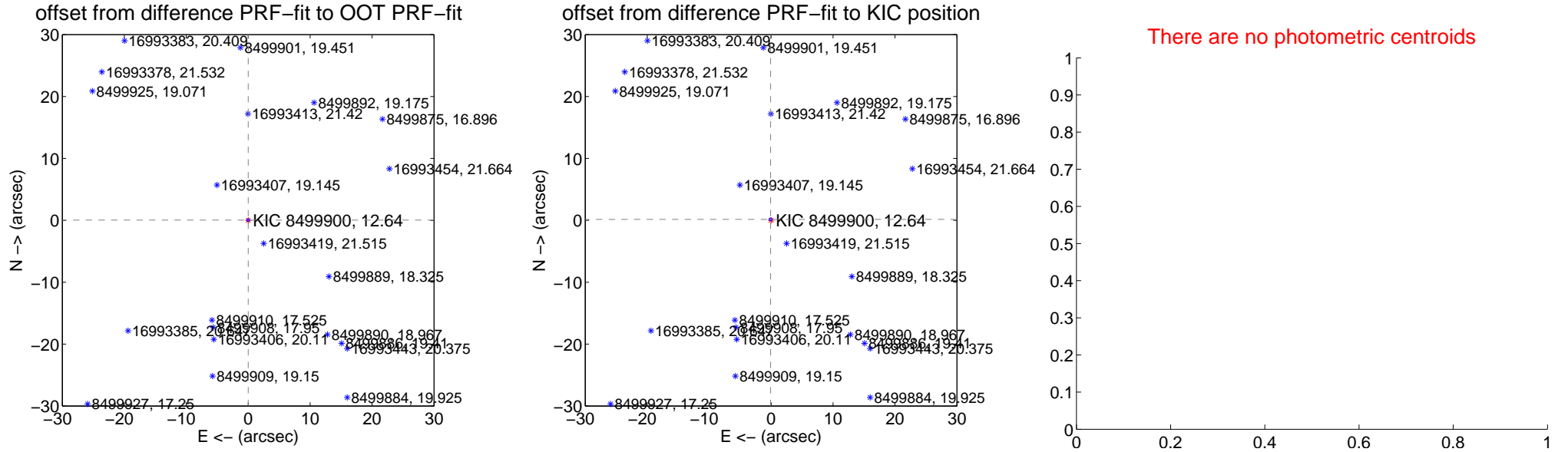
## DV Centroid Data

Supplemental centroid analysis for 008499900-01. Kepler magnitude: 12.64. Transit SNR 2.49

There are 17 quarters with good PRF difference image offsets

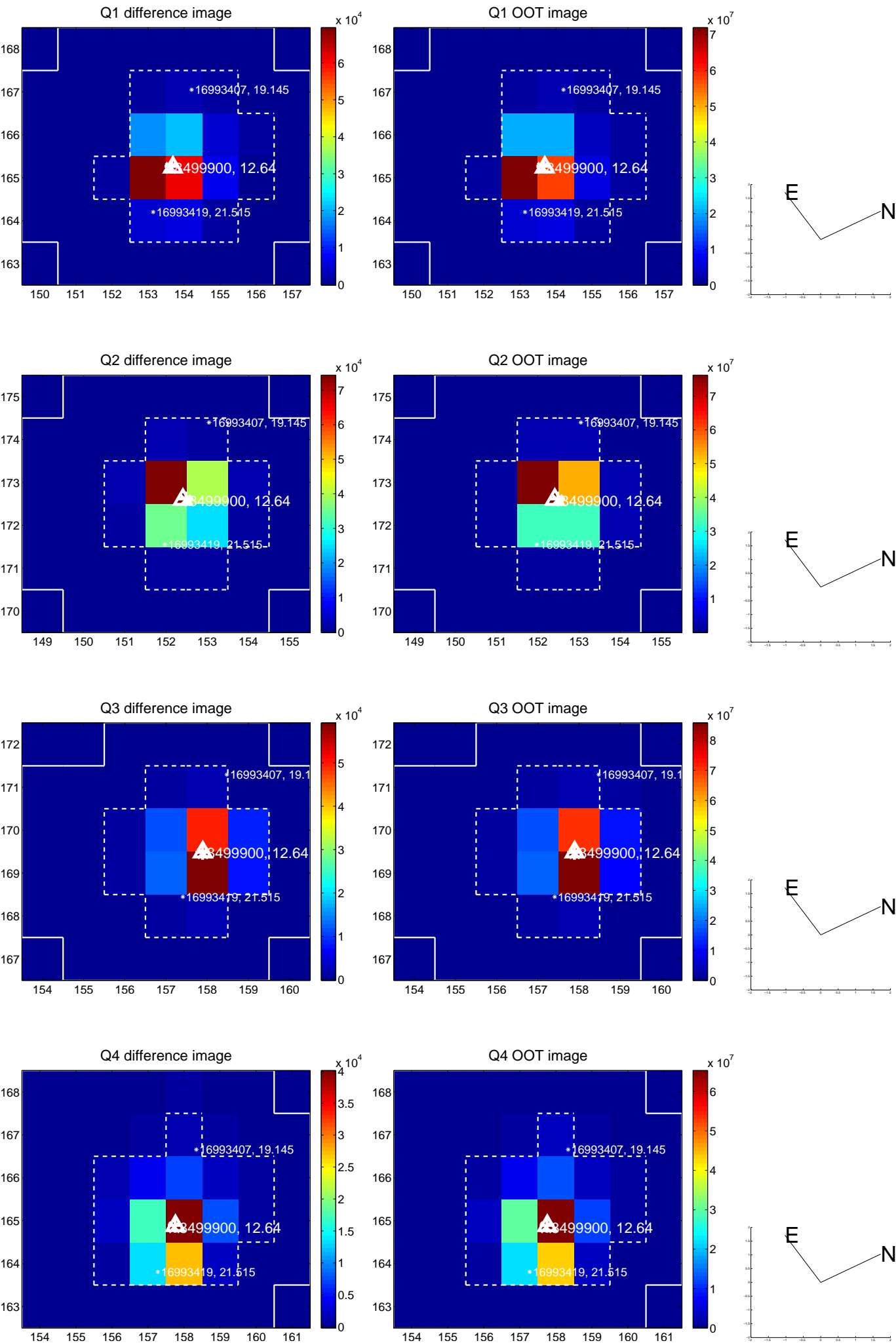
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.042 \pm 0.074$	0.57	$-0.005 \pm 0.072$	$0.042 \pm 0.074$
PRF-fit source offset from KIC position	$0.168 \pm 0.076$	2.20	$0.079 \pm 0.076$	$0.148 \pm 0.076$
photometric centroid source offset	—	—	—	—

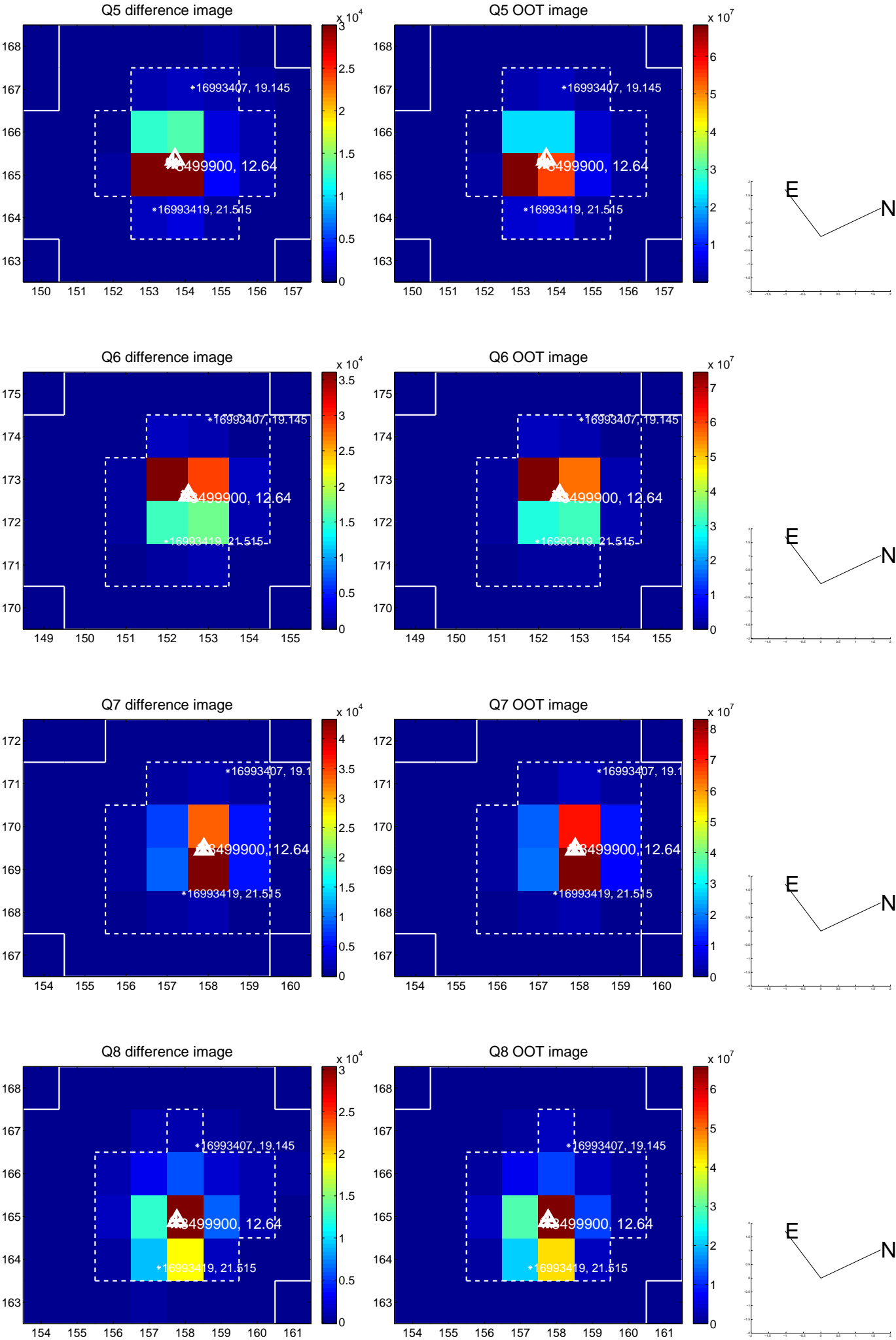


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

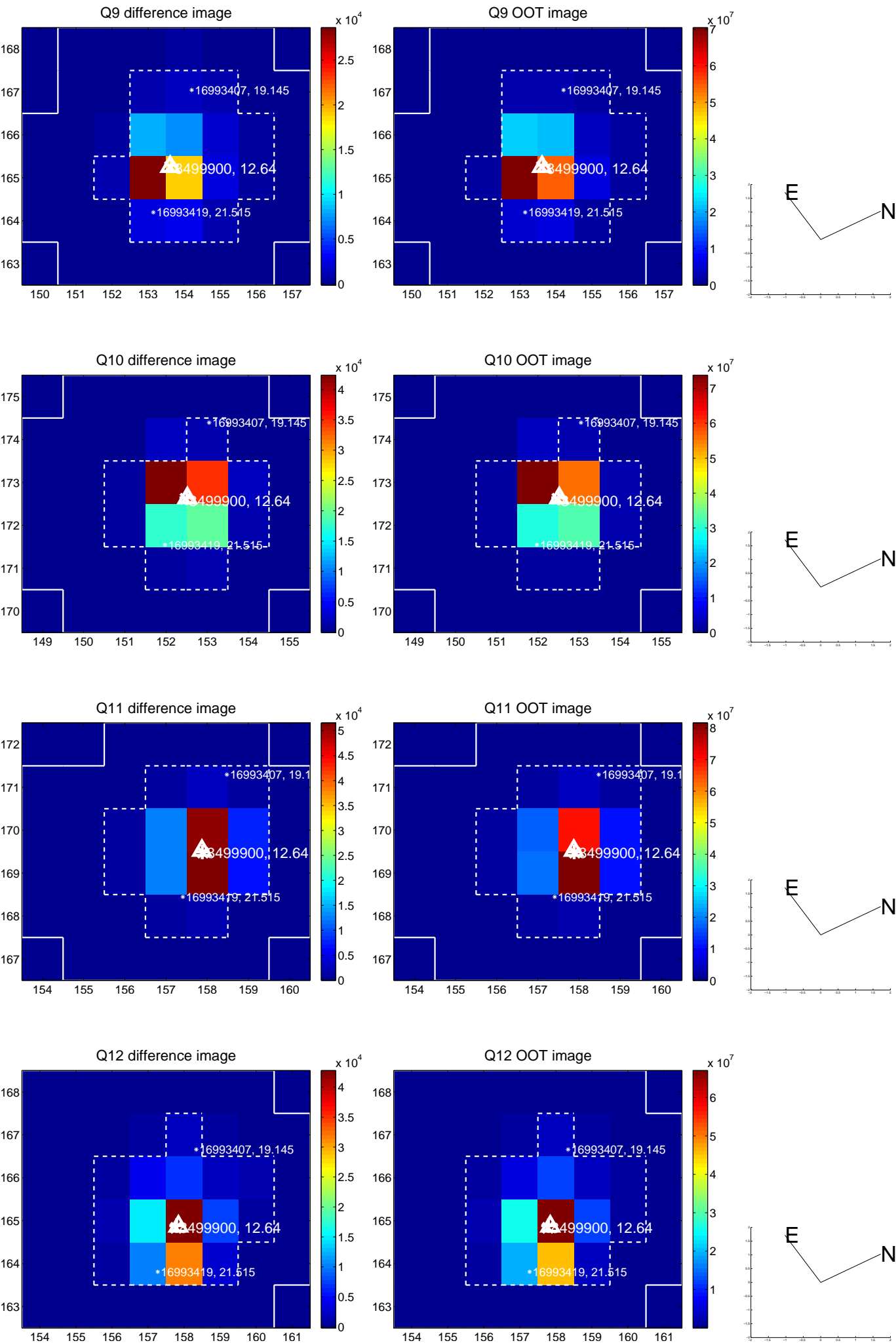


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

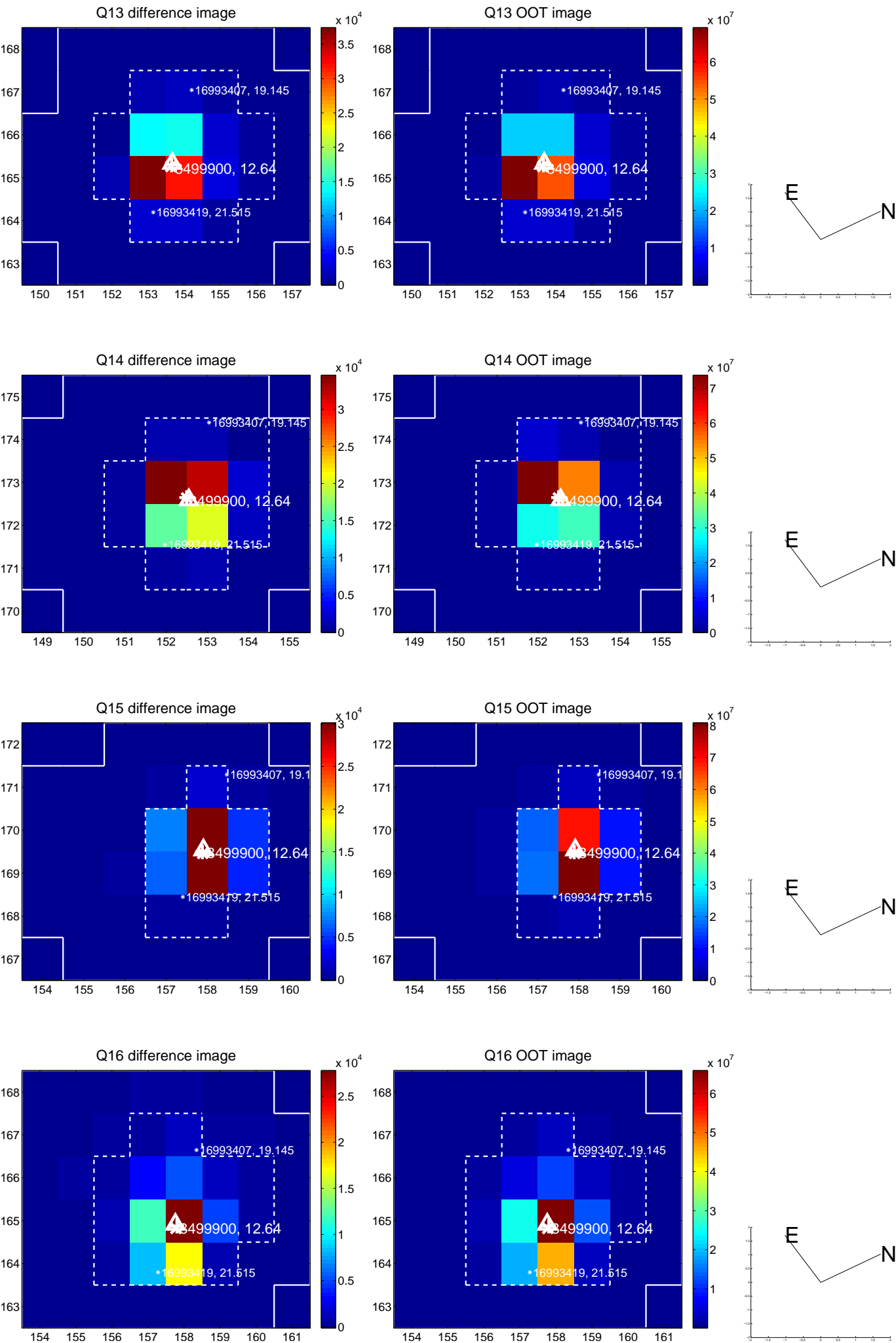




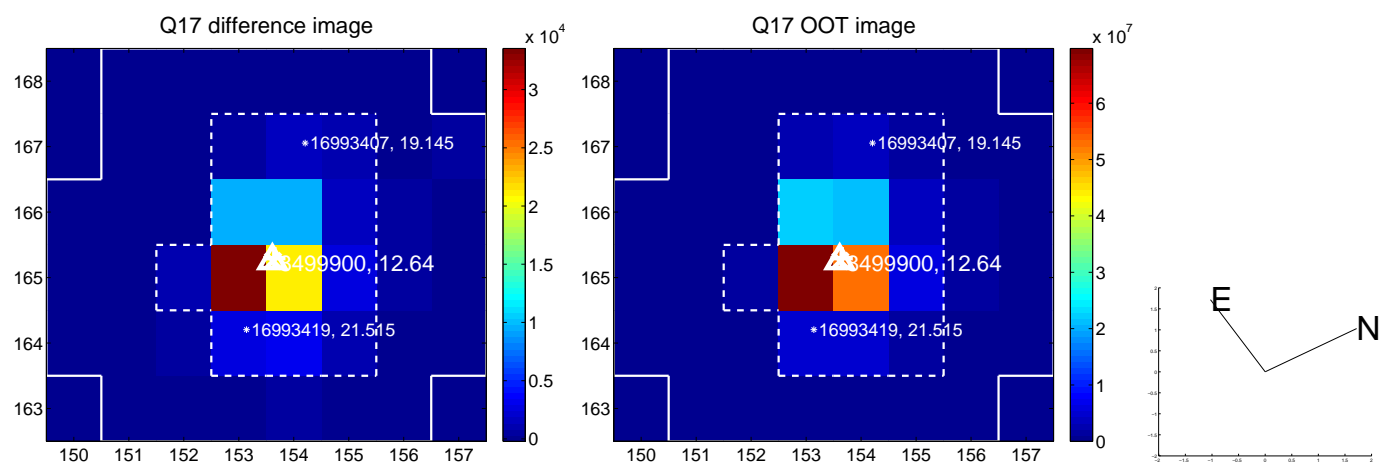
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



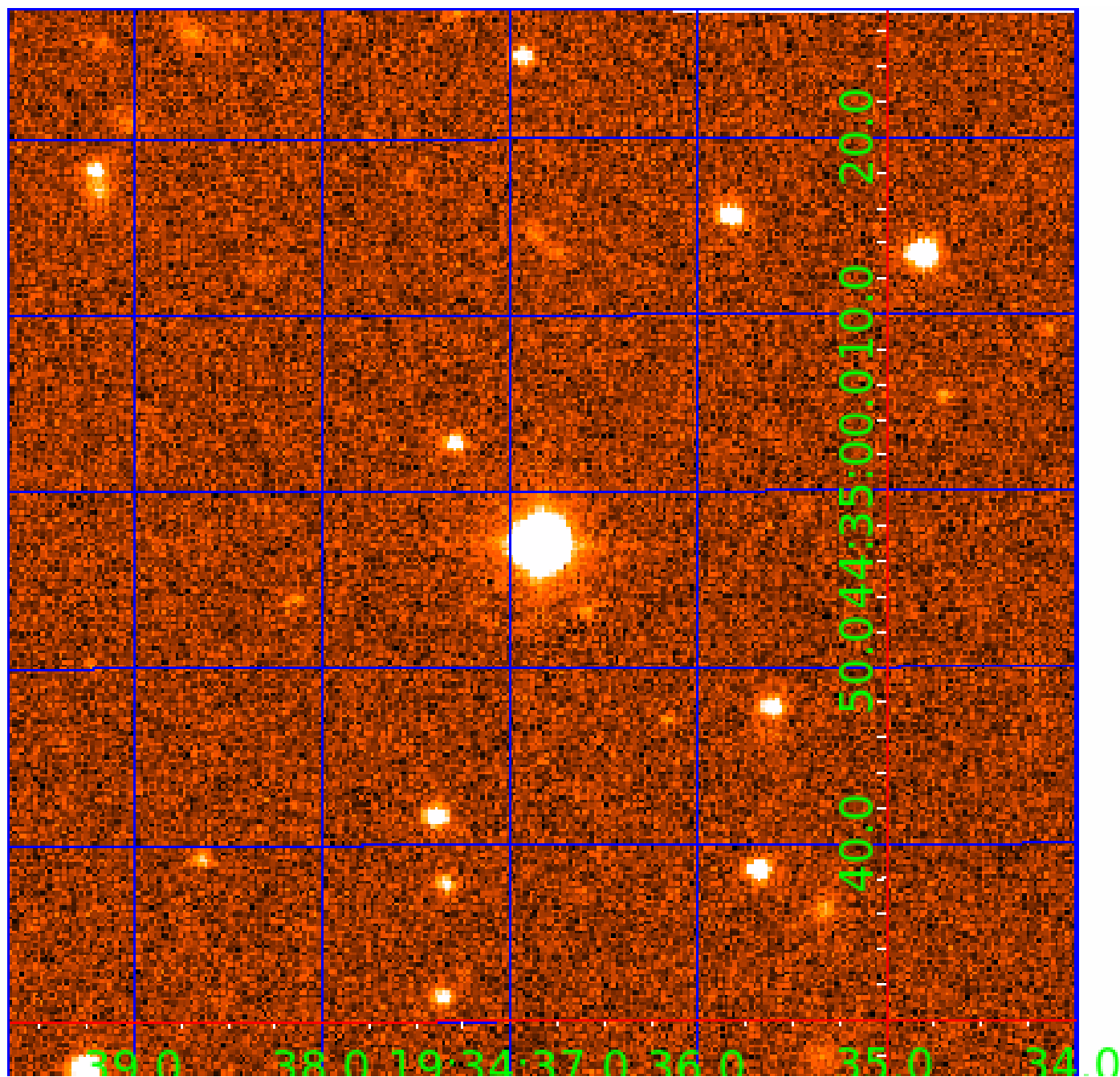
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination





# KIC 008499900

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008499900-01	OBS	No	2.019051	132.524333	4.9	10.306	8.2	2.5	1.99	7435	0.52	8415.06
008499900-02	OBS	No	72.051087	173.714016	131.7	2.010	9.1	2.8	1.99	7435	2.34	71.62
008499900-03	OBS	No	226.255274	146.613390	167.1	34.849	8.8	7.8	1.99	7435	2.77	15.58
008499900-04	OBS	No	551.138752	337.584723	175.4	5.889	7.9	7.8	1.99	7435	3.03	4.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008499900-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
008499900-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
008499900-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008499900-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT

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

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

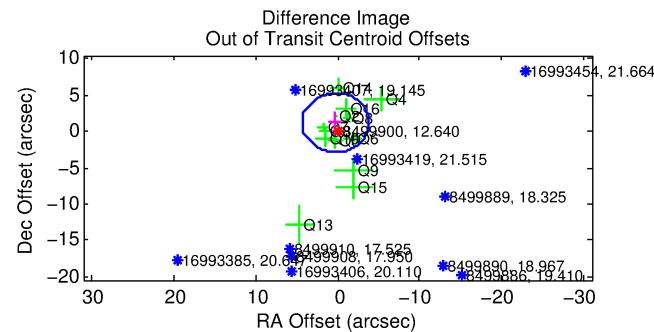
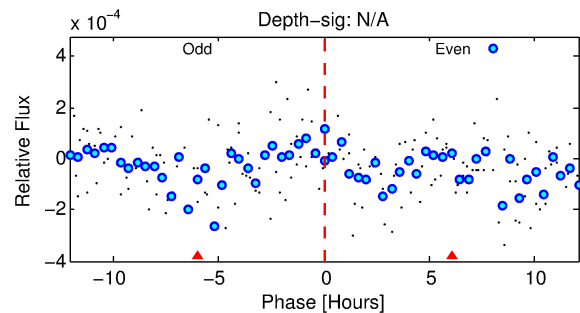
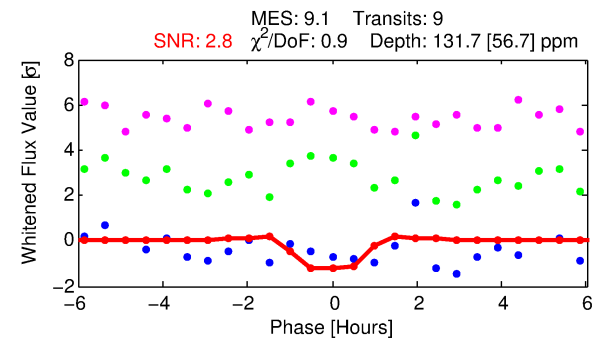
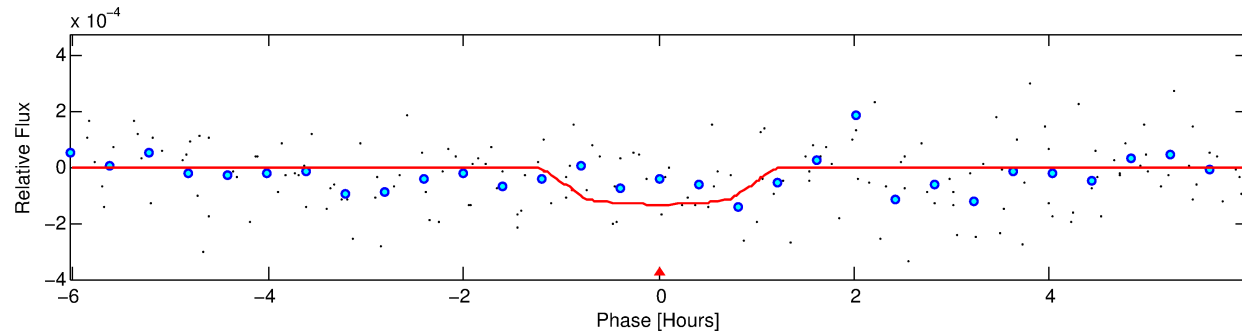
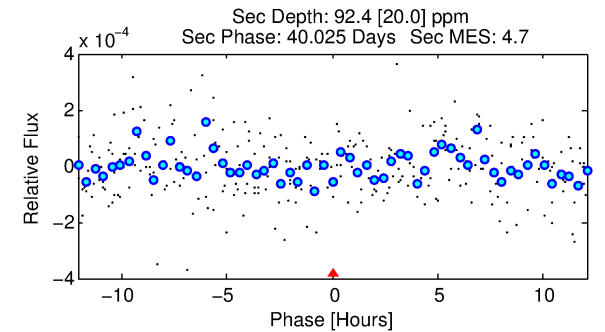
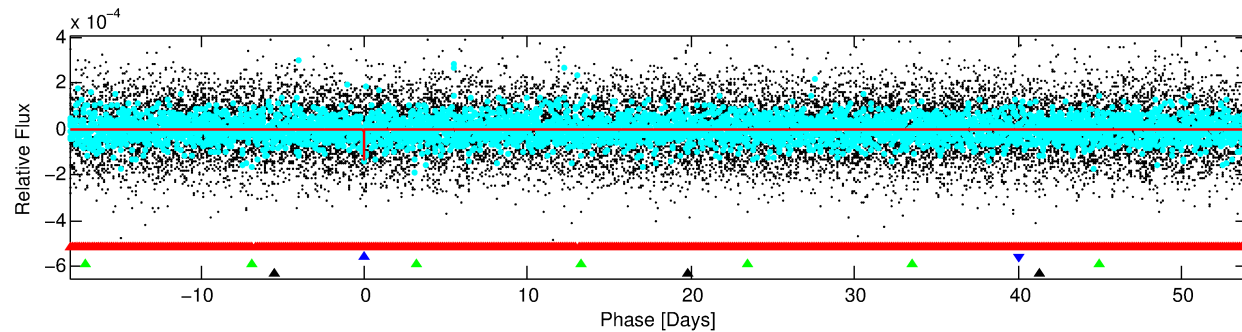
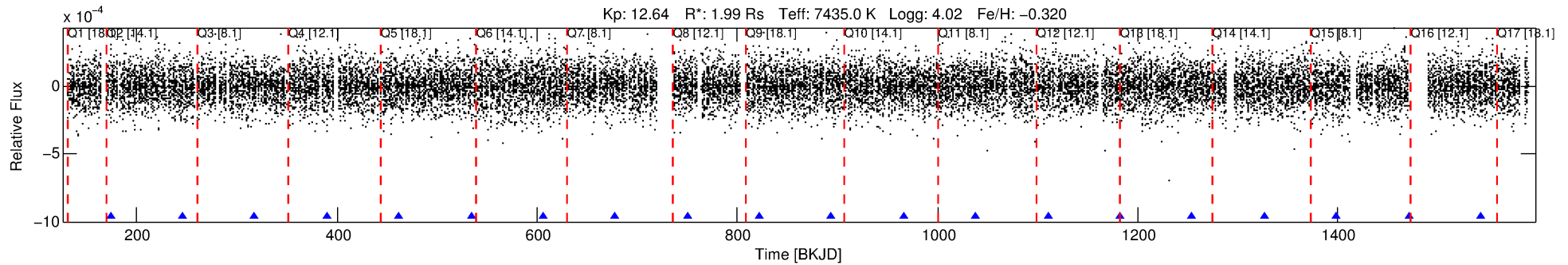
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008499900-02

No Significant Match Found

# DV One-Page Summary

KIC: 8499900 Candidate: 2 of 4 Period: 72.051 d



## DV Fit Results:

Period = 72.05109 [0.00898] d  
Epoch = 173.7140 [0.1691] BKJD  
Rp/R\* = 0.0108 [0.1846]  
a/R\* = 260.04 [26367.99]  
b = 0.35 [262.21]  
Seff = 71.63 [32.53]  
Teq = 742 [84] K  
Rp = 2.34 [40.09] Re  
a = 0.3891 [0.1076] AU  
Ag = 1400.61 [47897.18] [0.03σ]  
Teffp = 7016 [59981] K [0.10σ]

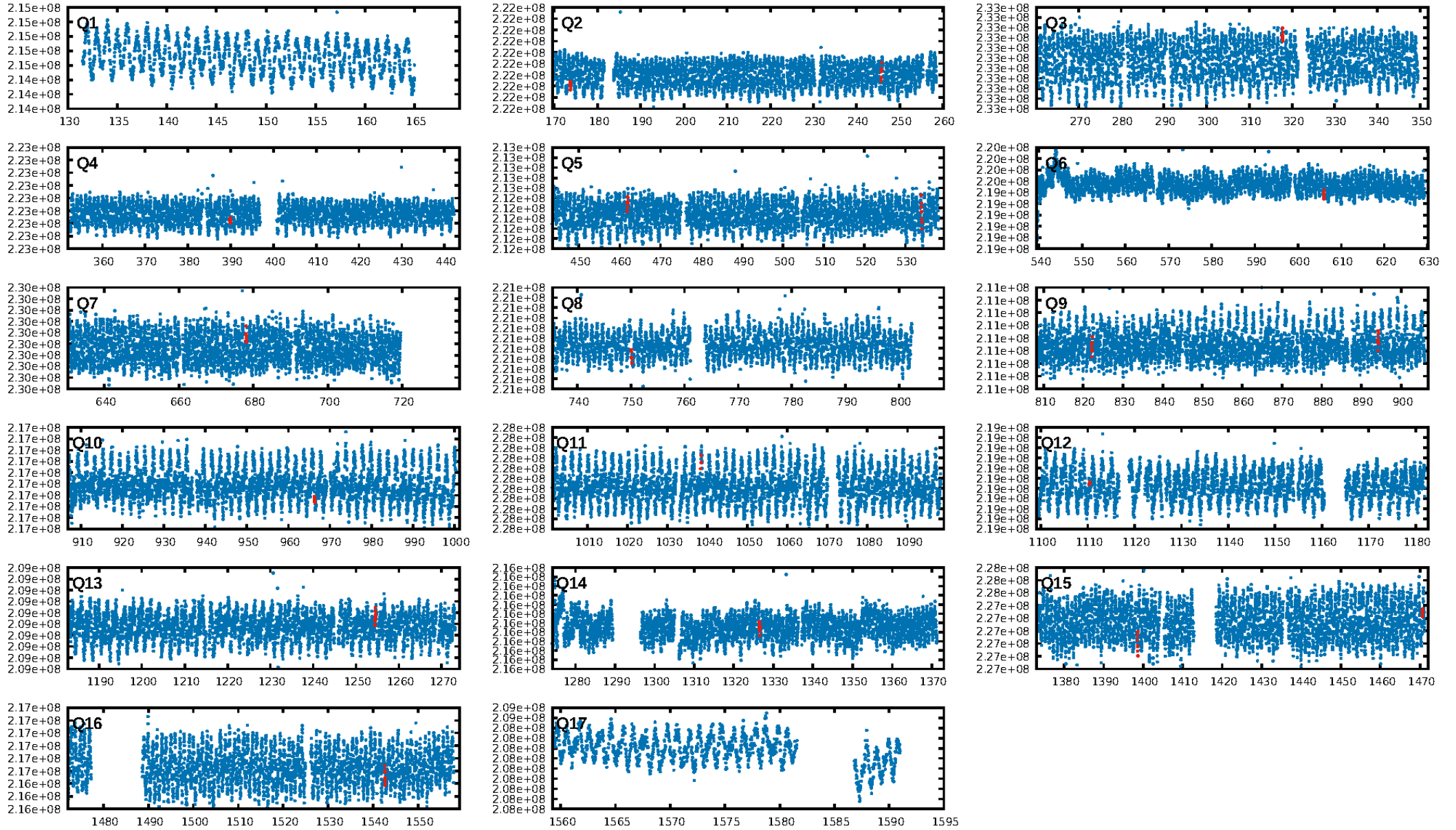
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [160.07σ]  
LongPeriod-sig: 100.0% [106.02σ]  
ModelChiSquare2-sig: 26.7%  
ModelChiSquareGof-sig: 99.0%  
**Bootstrap-pfa: 9.99e-11**  
RollingBand-fgt: 1.00 [9/9]  
**GhostDiagnostic-chr: -0.0307**  
Centroid-sig: 55.7%  
Centroid-so: 0.659 arcsec [0.54σ]  
OotOffset-rm: 1.236 arcsec [0.91σ]  
KicOffset-rm: 1.341 arcsec [1.02σ]  
OotOffset-st: 4/3/3/3 [13]  
KicOffset-st: 4/3/3/3 [13]  
DiffImageQuality-fgm: 0.31 [4/13]  
DiffImageOverlap-fno: 0.62 [8/13]

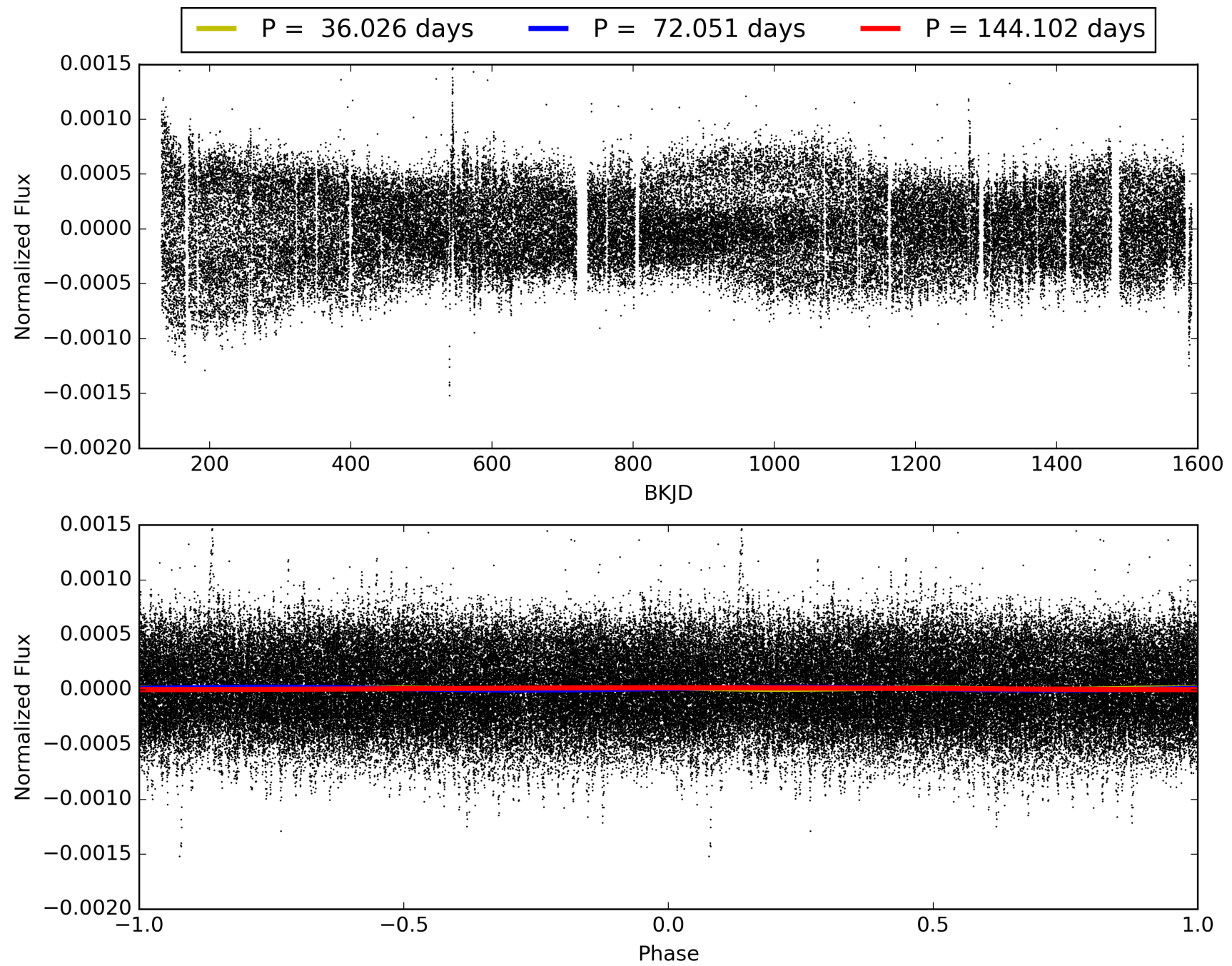
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:37:41 Z

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

# TCE 008499900-02, PDC Light Curves

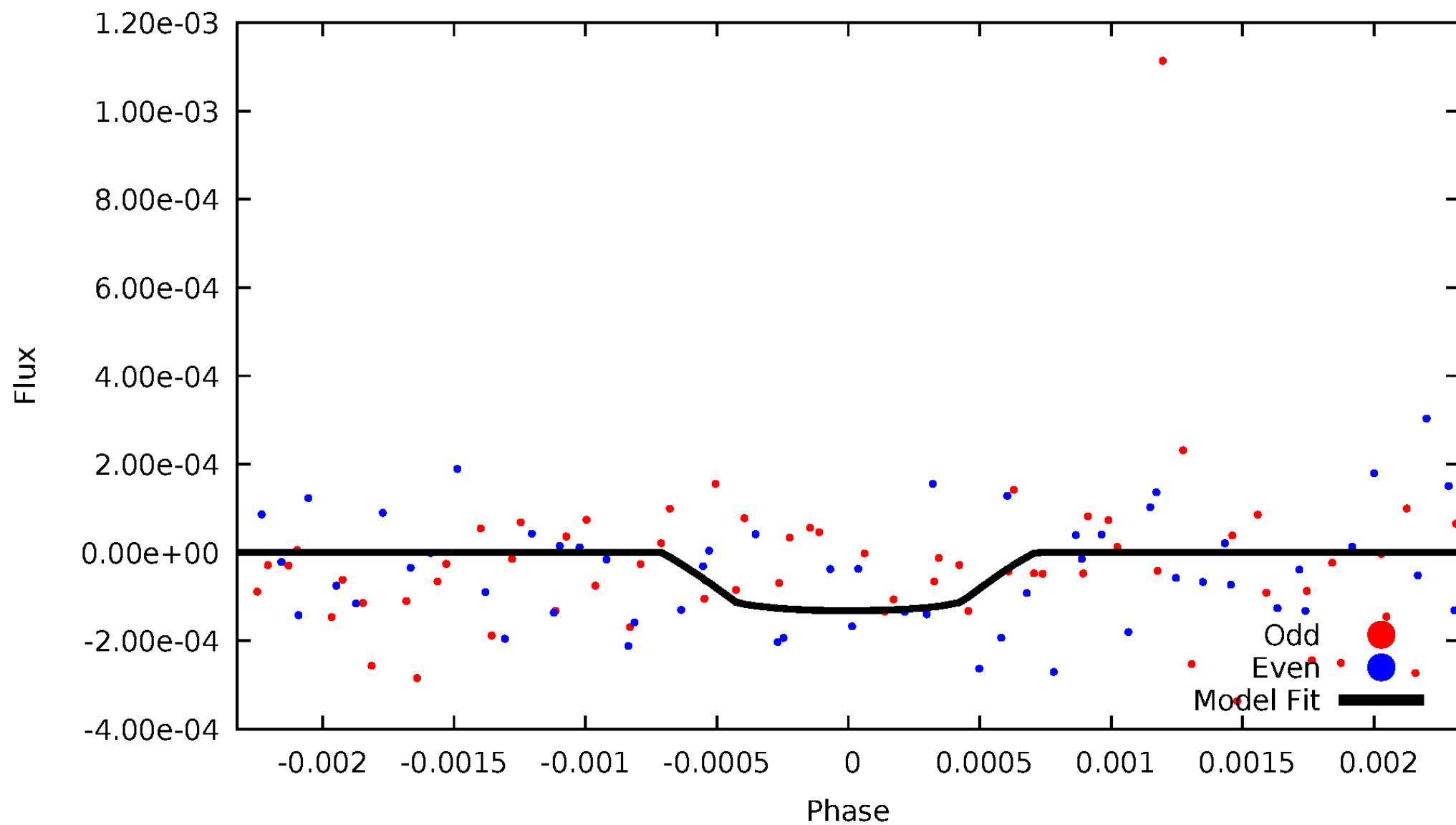


TCE 008499900-02



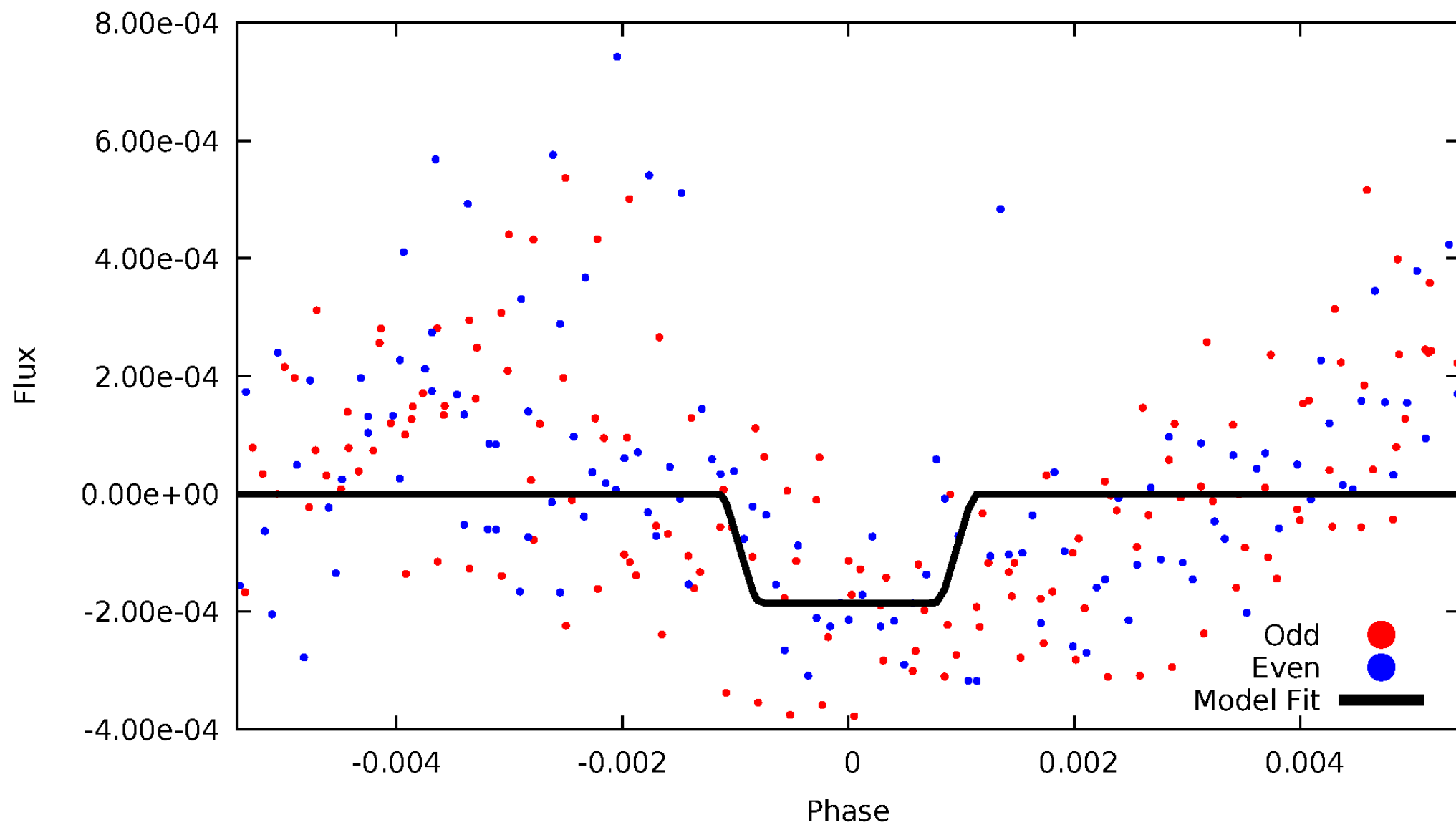
# DV Odd/Even

TCE 008499900-02



# ALT Odd/Even

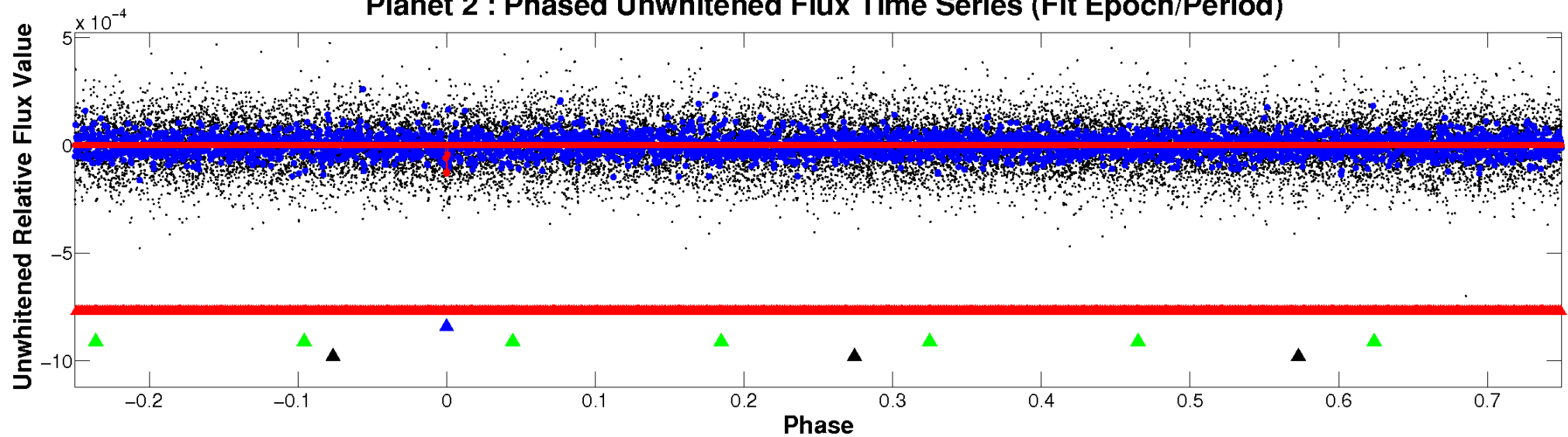
TCE 008499900-02



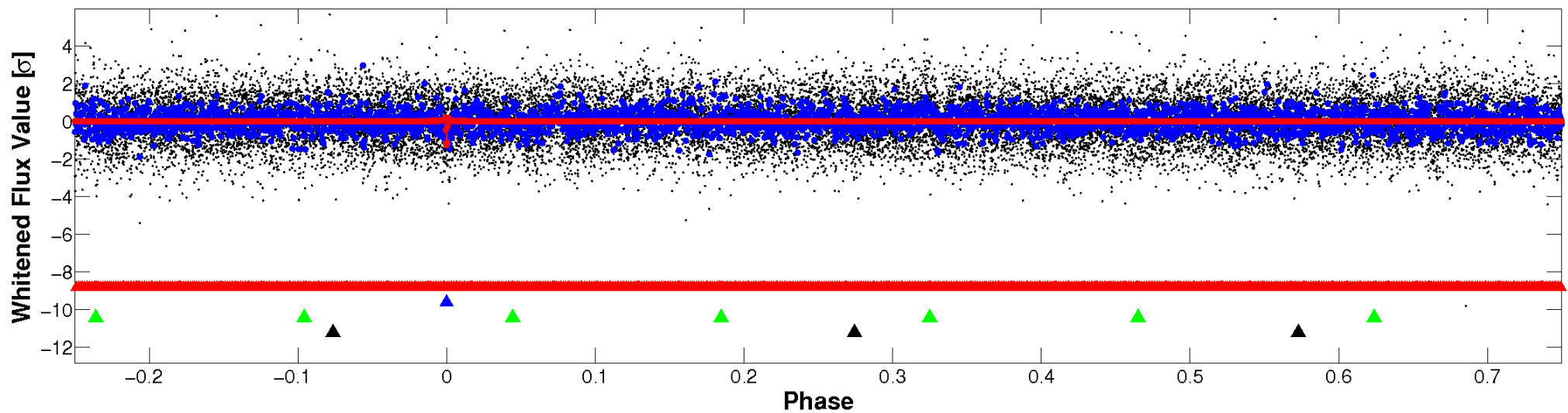


# Non-Whitened Vs. Whitened Light Curve

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



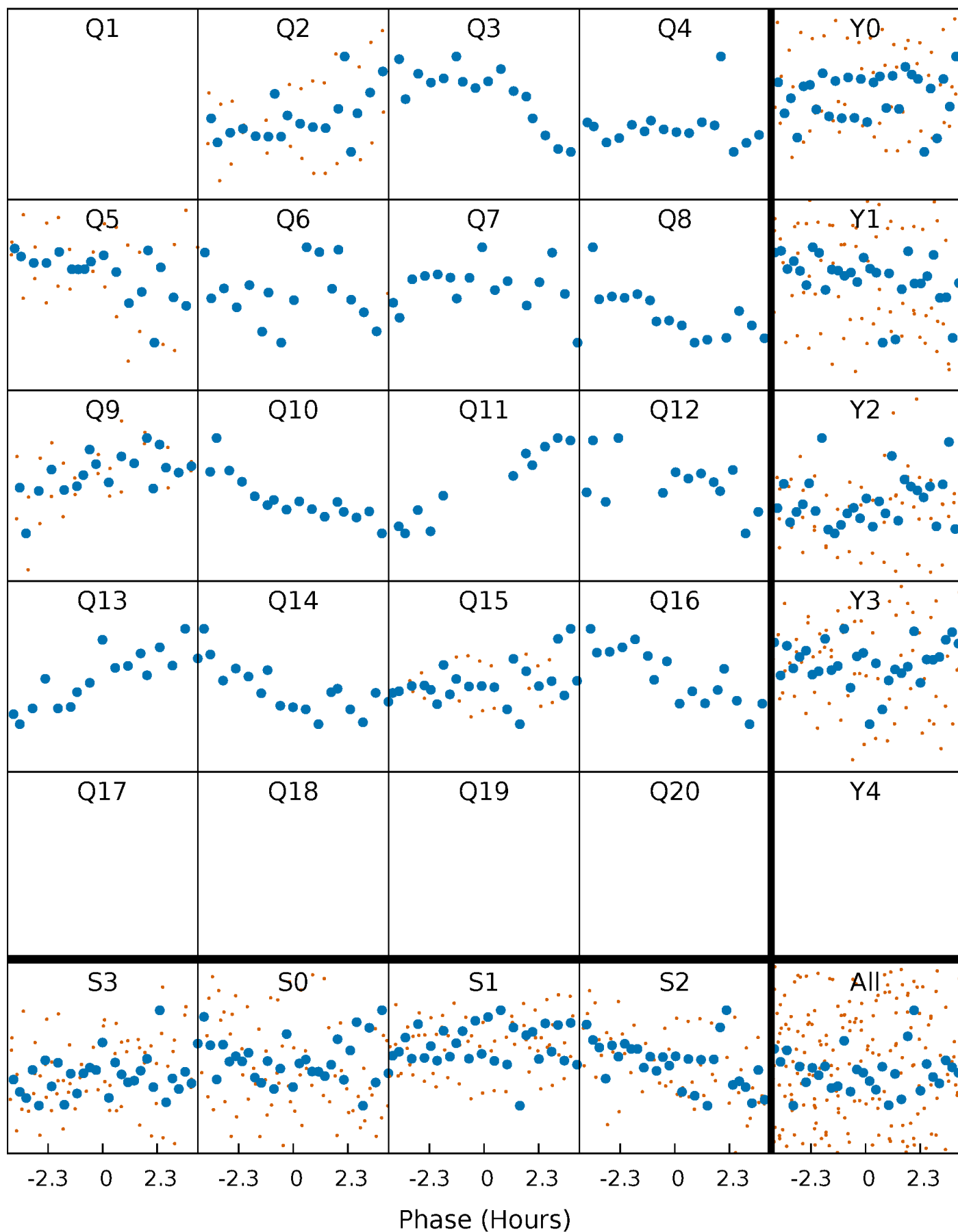
Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





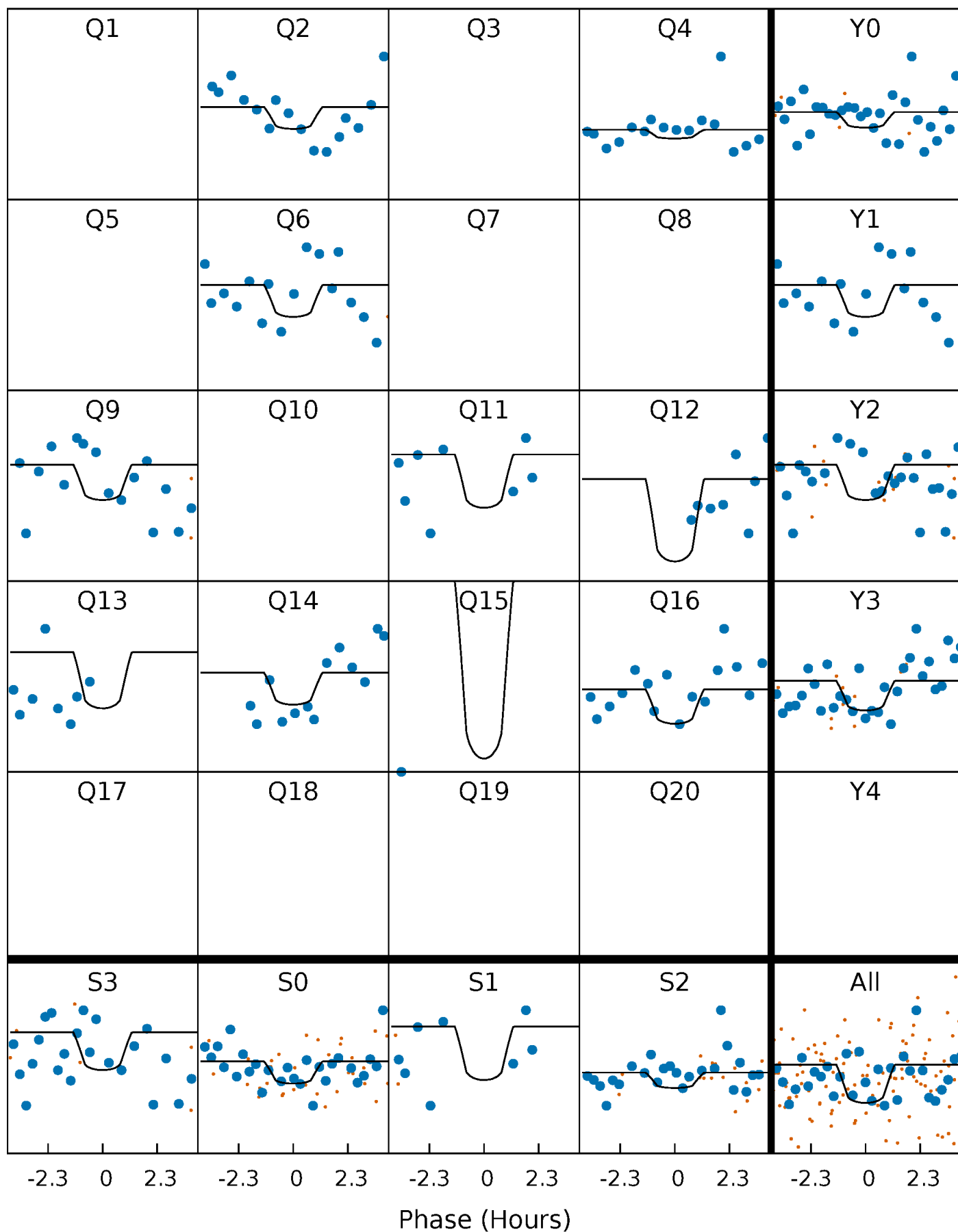
# PDC Quarter-Phased Transit Curves

TCE 008499900-02 P= 72.051087 Days  $T_0=173.714016$  (BKJD)



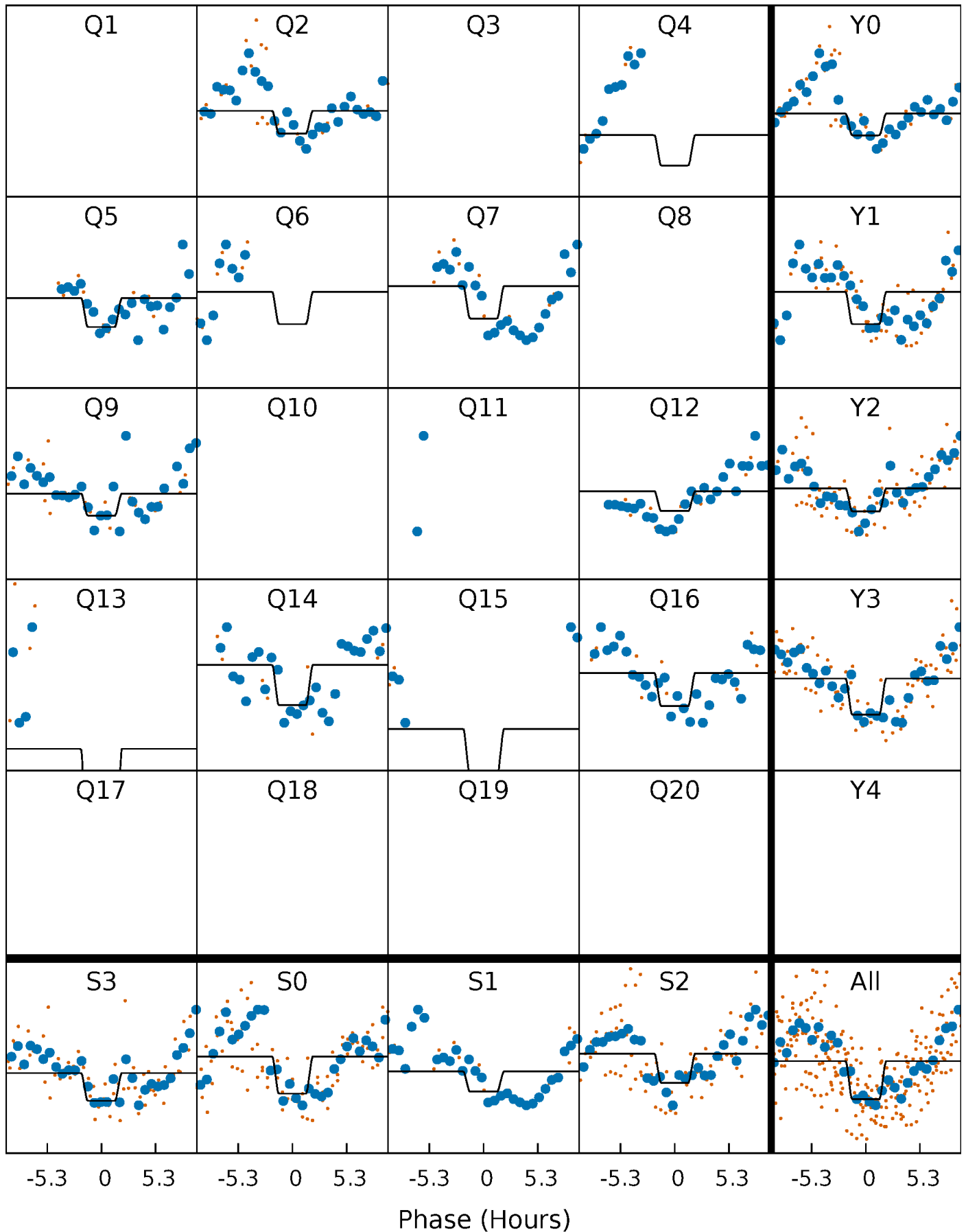
# DV Quarter-Phased Transit Curves

TCE 008499900-02     $P = 72.051087$  Days     $T_0 = 173.714016$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

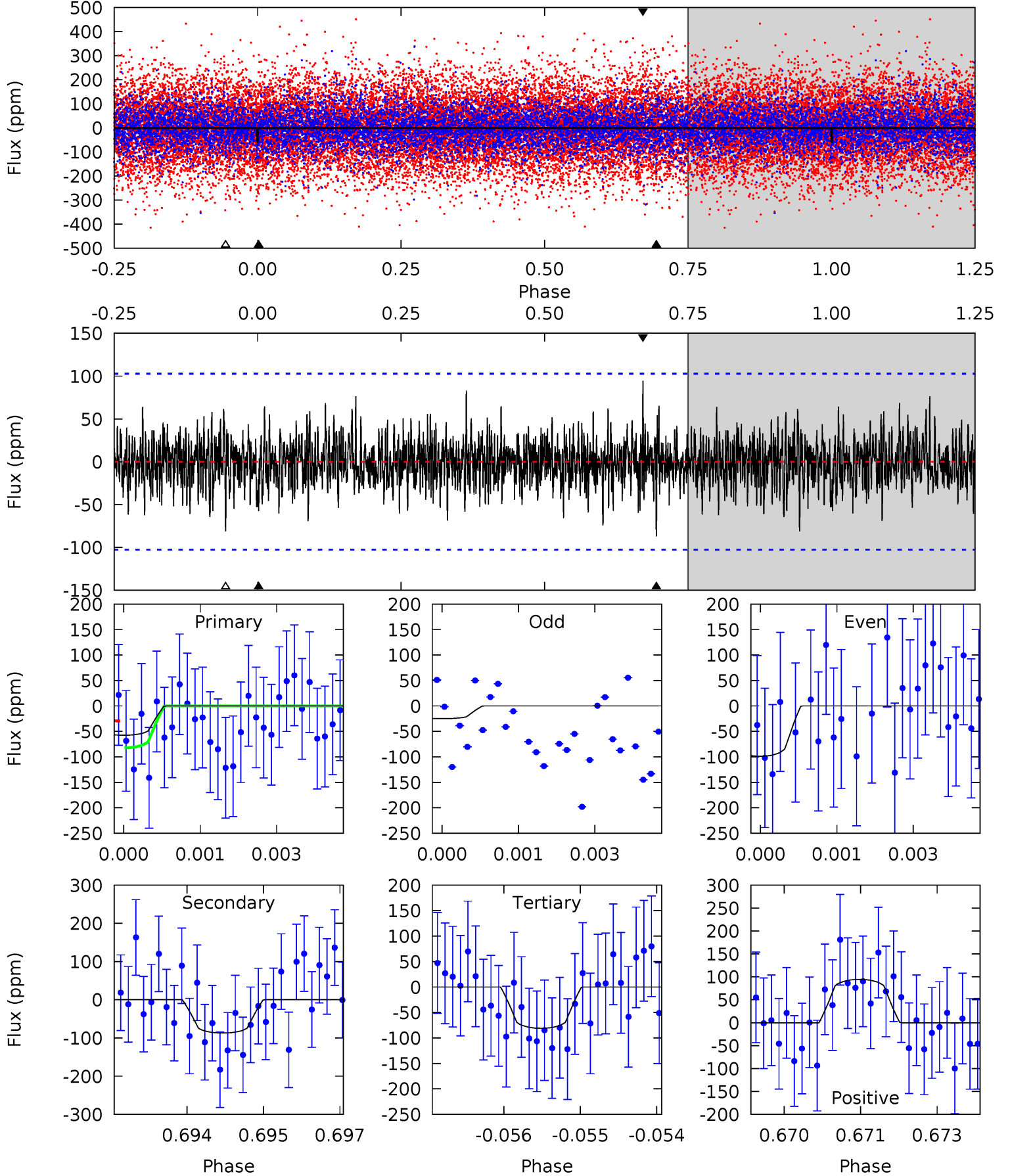
TCE 008499900-02     $P = 72.024360$  Days     $T_0 = 174.367265$  (BKJD)



# DV Model-Shift Uniqueness Test

008499900-02,  $P = 72.051087$  Days,  $E = 101.662929$  Days

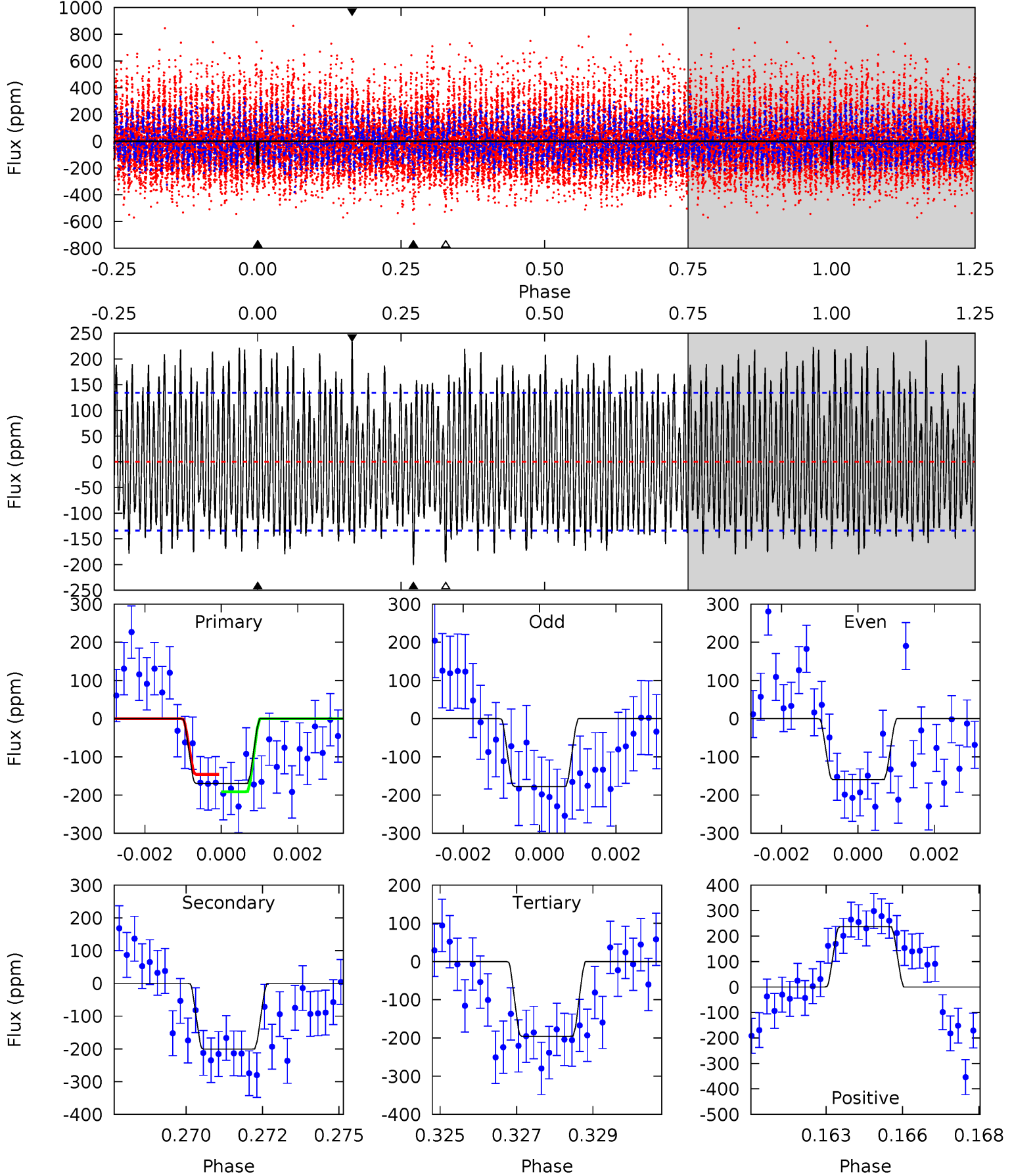
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.03	4.57	4.26	4.96	5.40	3.21	1.16	-1.23	-1.94	0.31	-0.39	1.94	0.99	0.52	1.38



# Alt Model-Shift Uniqueness Test

008499900-02, P = 72.024360 Days, E = 102.342905 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
6.72	7.95	7.75	9.38	5.30	3.05	4.02	-1.03	-2.65	0.20	-1.43	0.36	1.04	0.54	0.90



### Stellar Parameters For KIC 008499900

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7435^{+233}_{-311}$	$4.020^{+0.240}_{-0.160}$	$-0.320^{+0.250}_{-0.350}$	$1.990^{+0.504}_{-0.616}$	$1.510^{+0.198}_{-0.296}$	$0.270^{+0.441}_{-0.108}$
	+3%/-4%	+6%/-4%	+78%/-109%	+25%/-31%	+13%/-20%	+163%/-40%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008499900-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-87 \pm 19$	$26.67^{+32.29}_{-19.63}$	$1023^{+87}_{-88}$	$2740^{+1262}_{-502}$	$10^{+116}_{-8}$
Alt.	$-201 \pm 25$	$26.35^{+30.56}_{-18.24}$	$1030^{+76}_{-84}$	$3067^{+1559}_{-557}$	$23^{+232}_{-18}$

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

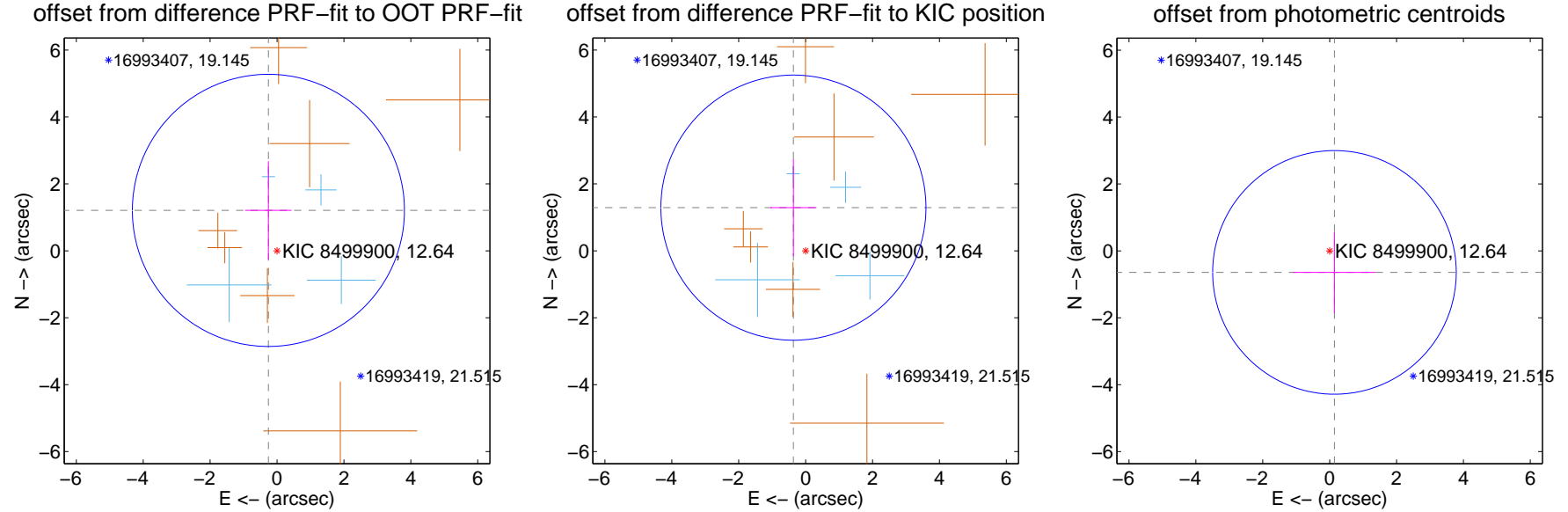
## DV Centroid Data

Supplemental centroid analysis for 008499900-02. Kepler magnitude: 12.64. Transit SNR 2.84

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

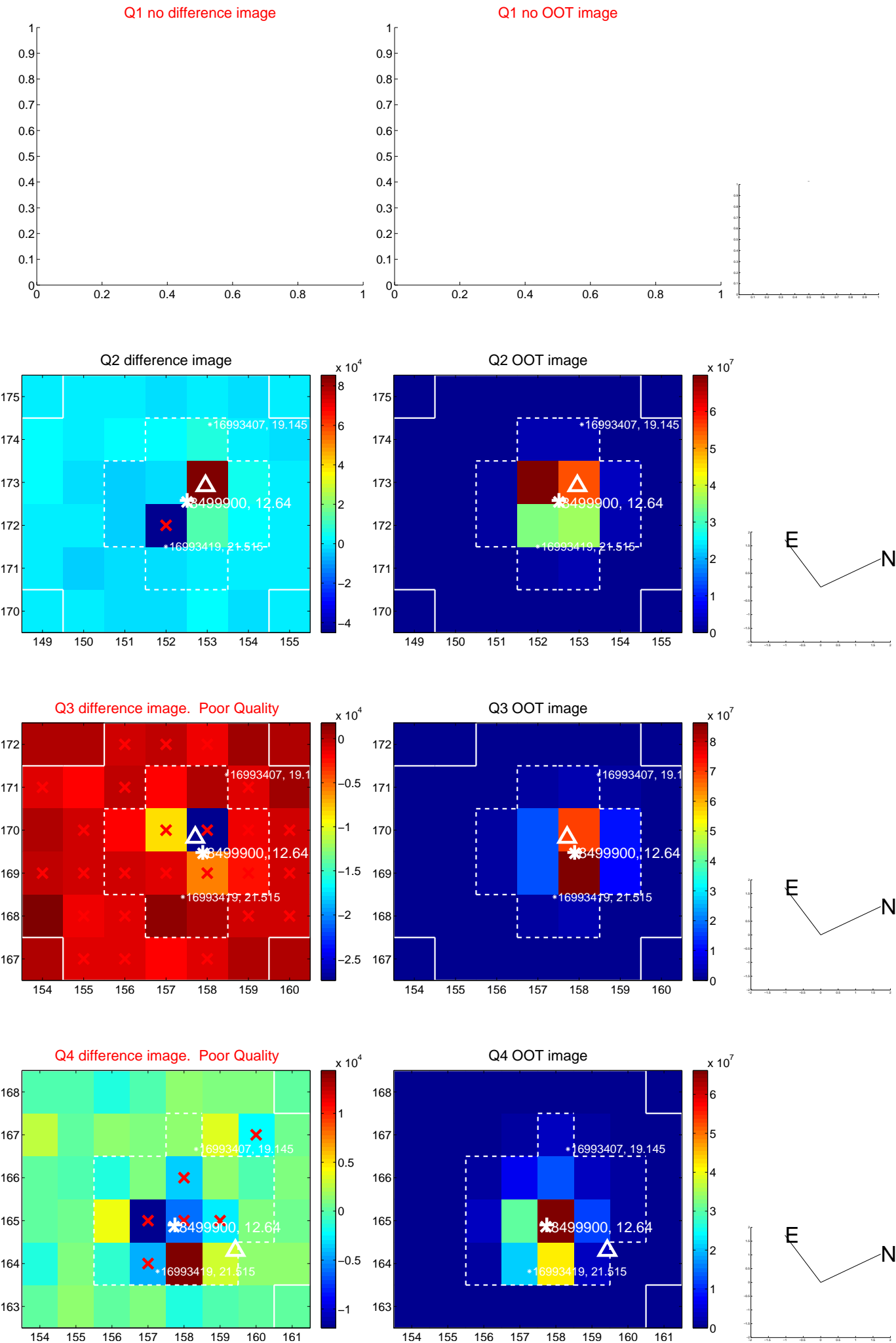
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.236 \pm 1.356$	0.91	$0.258 \pm 0.694$	$1.208 \pm 1.471$
PRF-fit source offset from KIC position	$1.341 \pm 1.321$	1.02	$0.366 \pm 0.691$	$1.290 \pm 1.450$
photometric centroid source offset	$0.66 \pm 1.21$	0.54	$-0.14 \pm 1.23$	$-0.64 \pm 1.21$



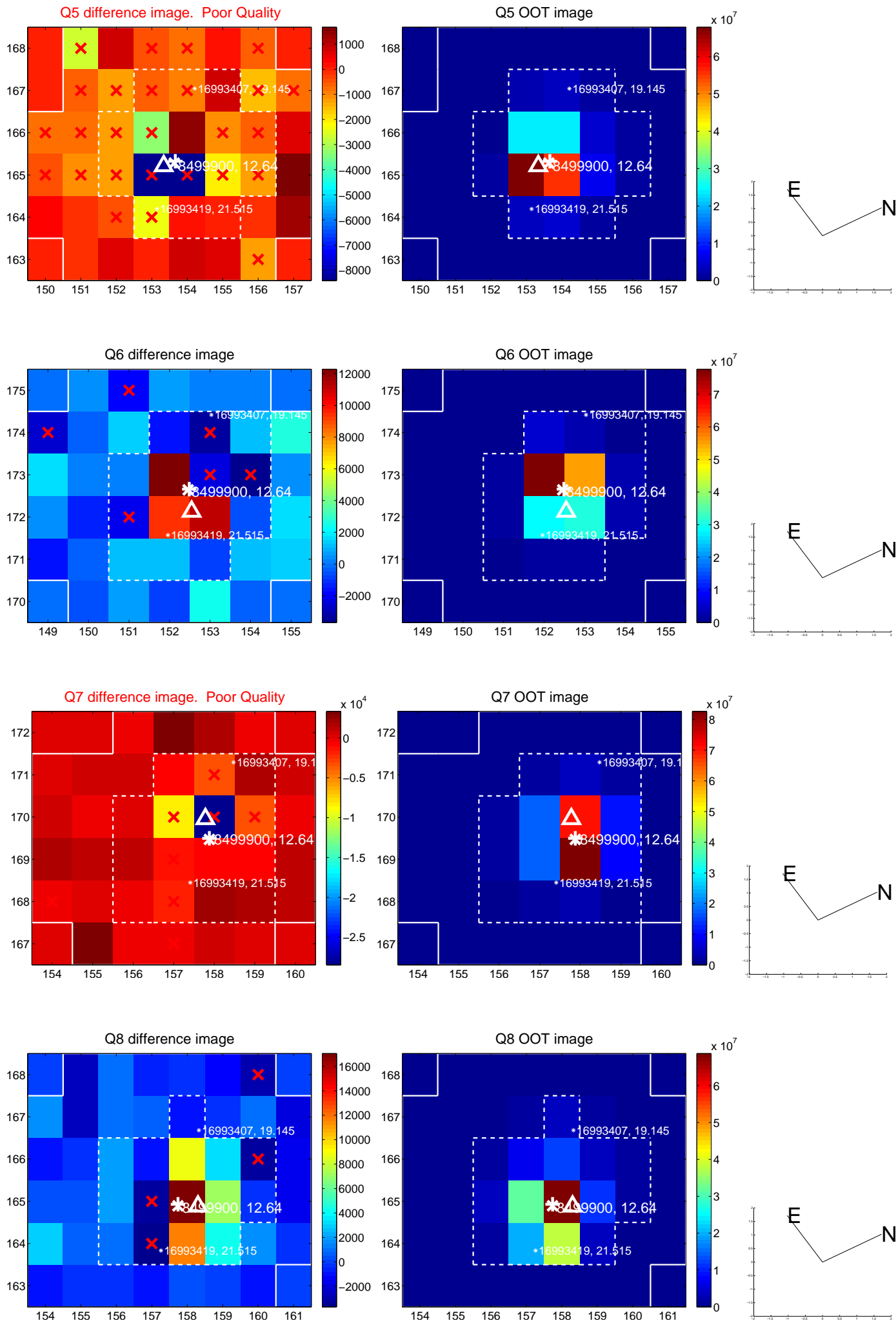
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



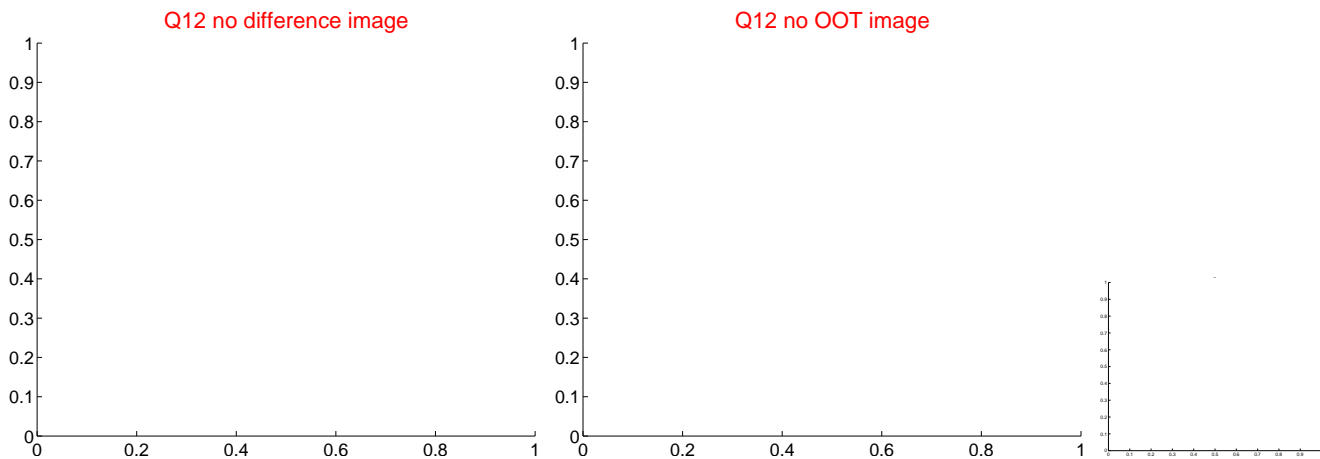
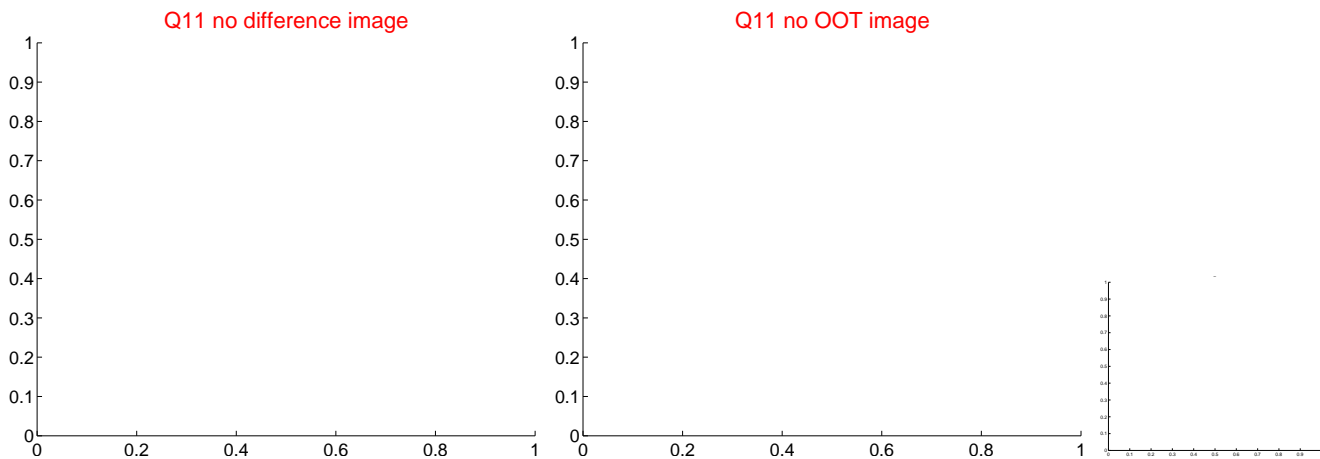
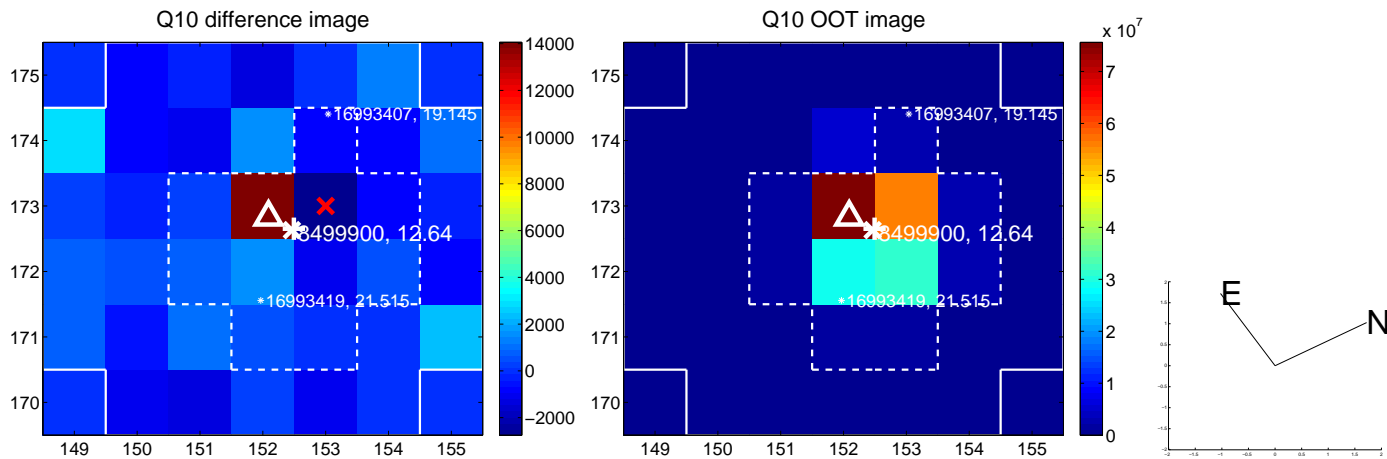
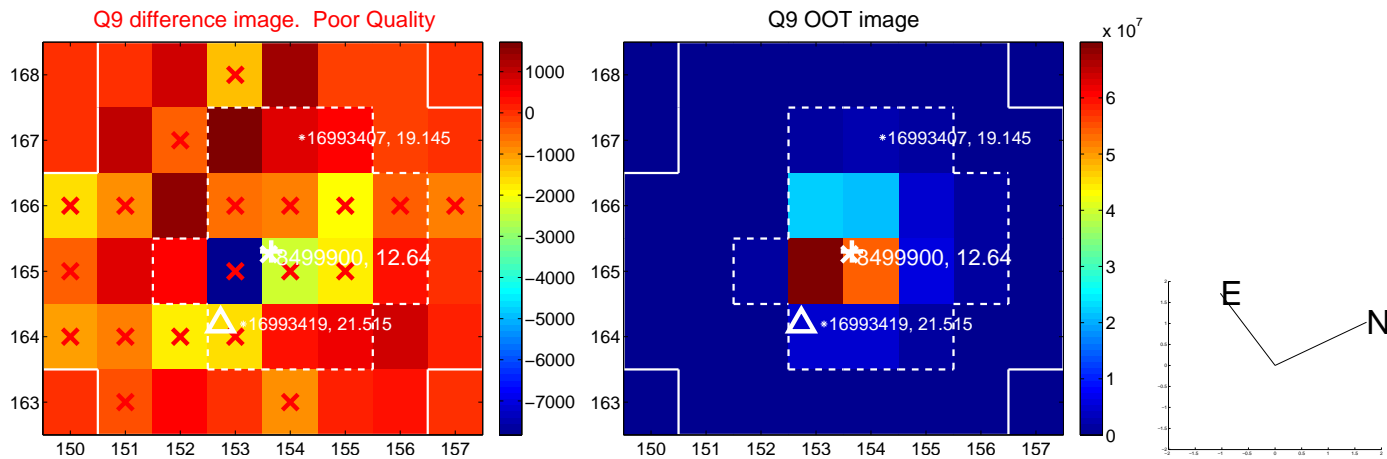
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

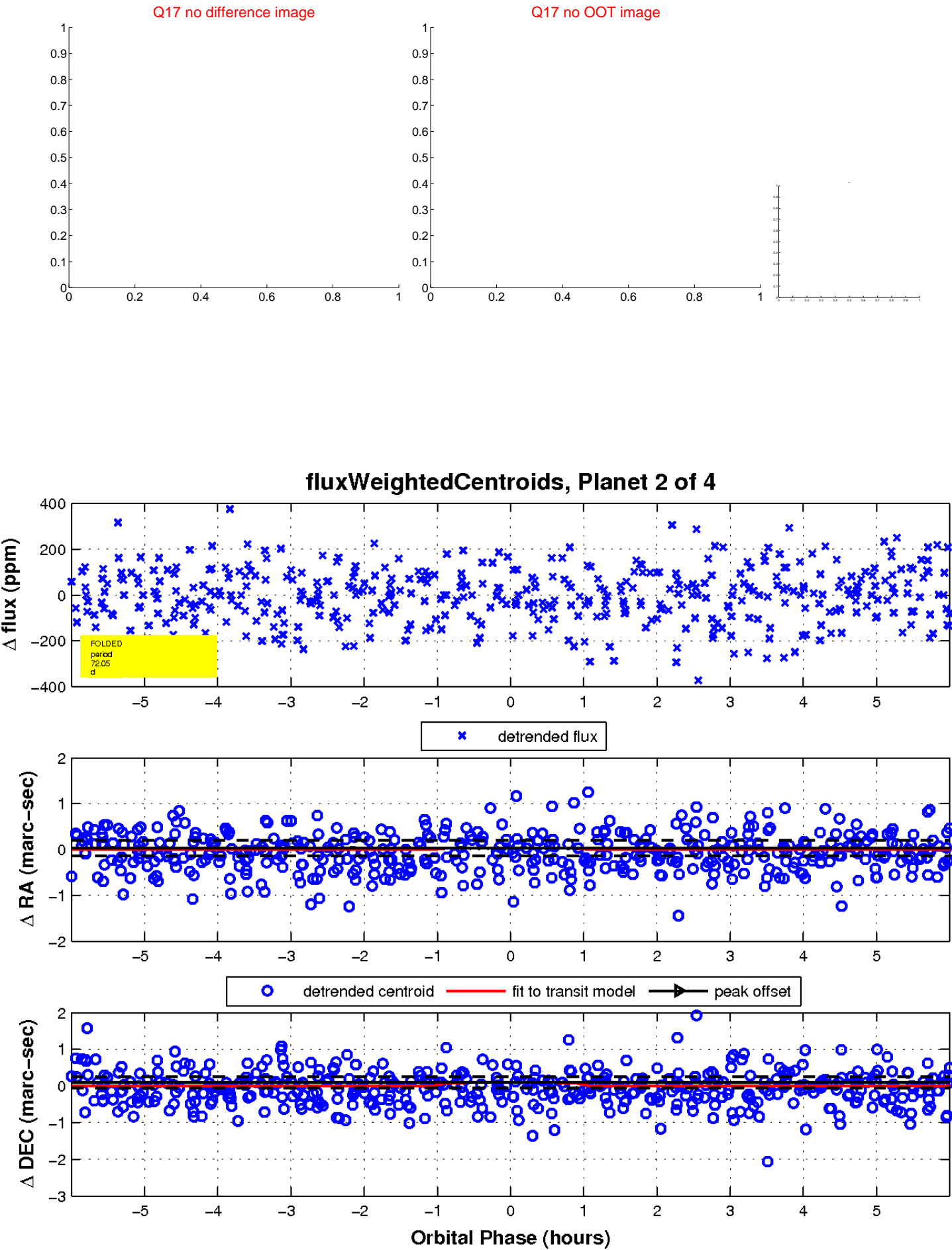


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



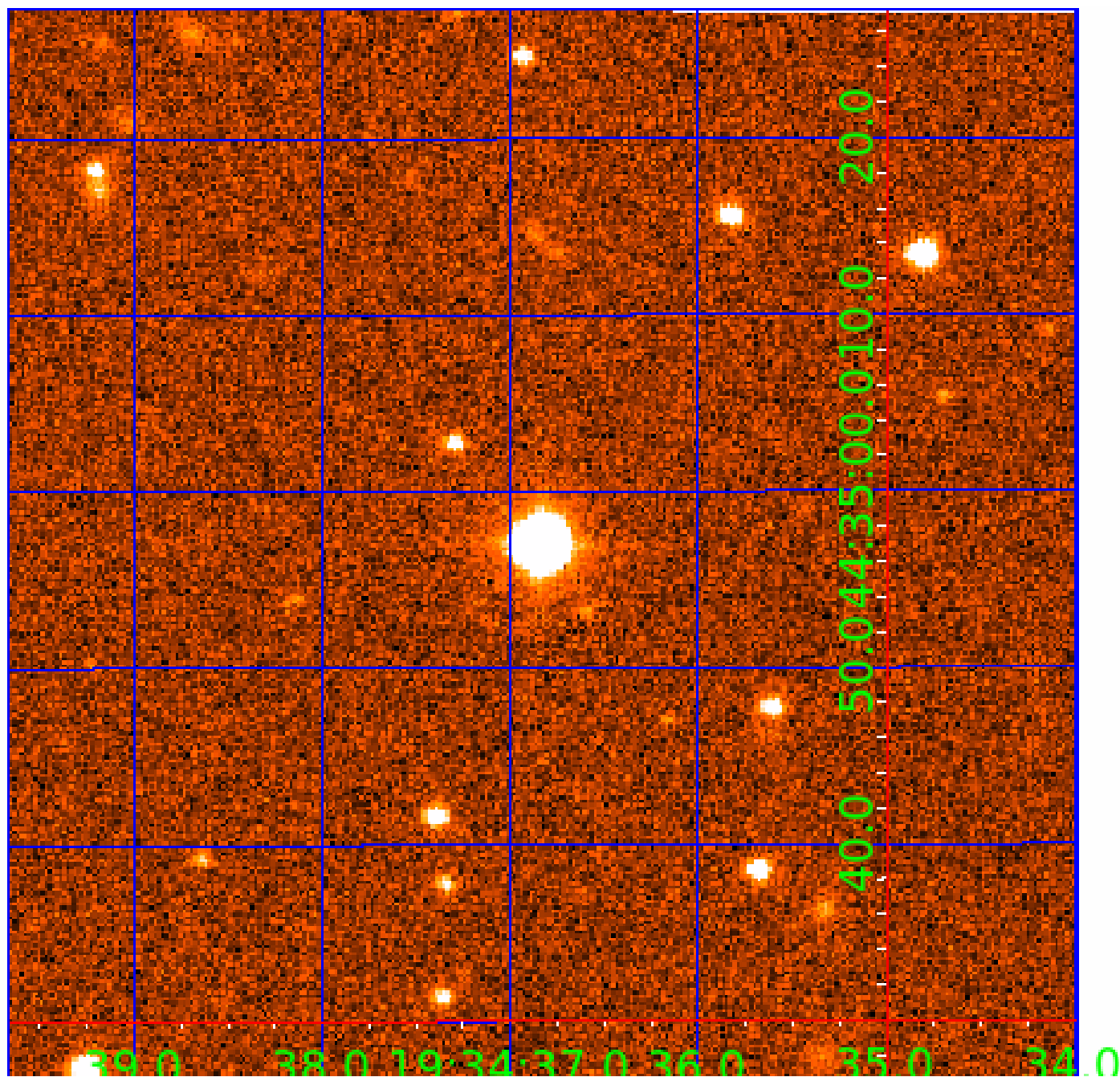


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008499900

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008499900-01	OBS	No	2.019051	132.524333	4.9	10.306	8.2	2.5	1.99	7435	0.52	8415.06
008499900-02	OBS	No	72.051087	173.714016	131.7	2.010	9.1	2.8	1.99	7435	2.34	71.62
008499900-03	OBS	No	226.255274	146.613390	167.1	34.849	8.8	7.8	1.99	7435	2.77	15.58
008499900-04	OBS	No	551.138752	337.584723	175.4	5.889	7.9	7.8	1.99	7435	3.03	4.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008499900-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
008499900-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
008499900-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008499900-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT

**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.

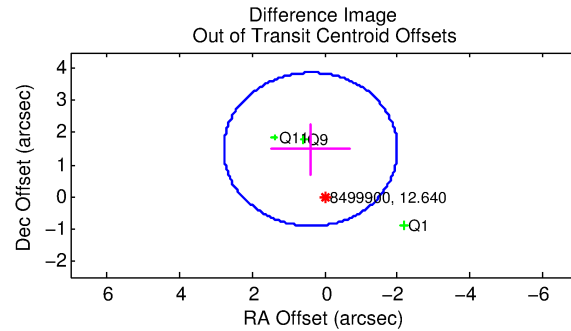
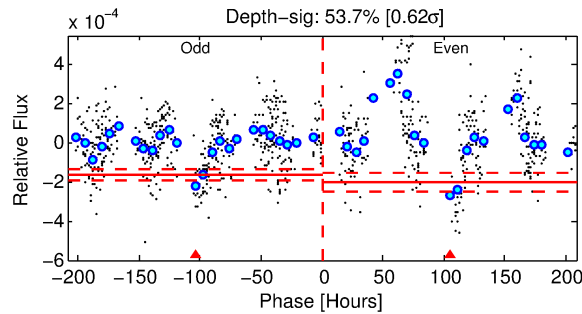
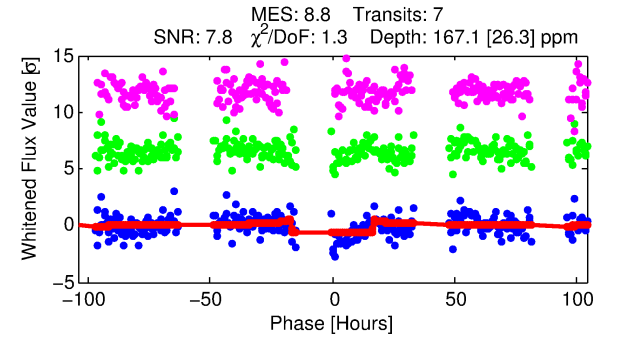
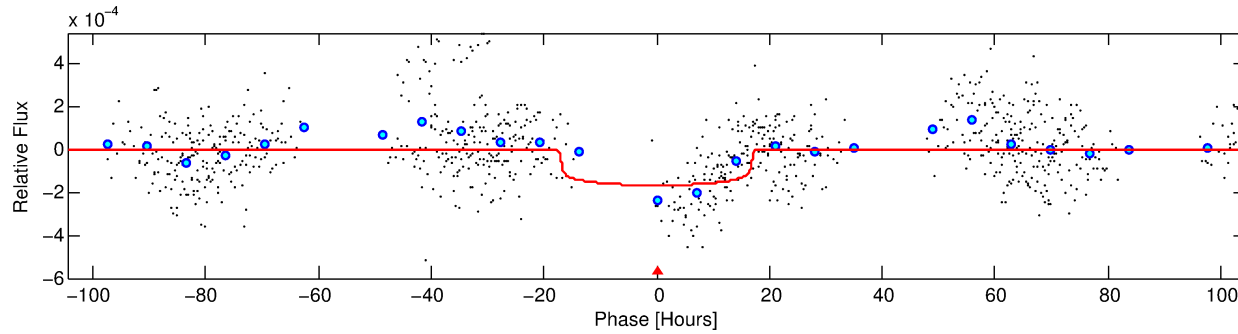
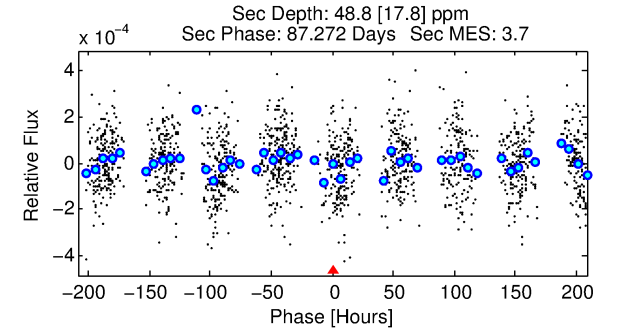
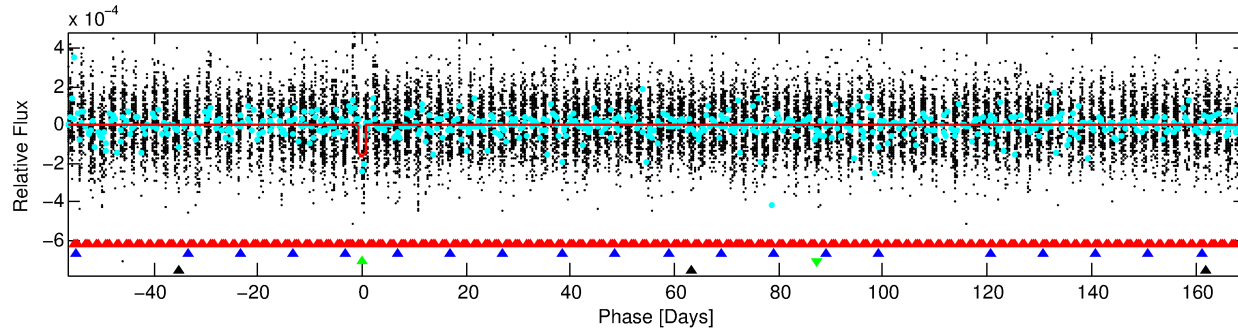
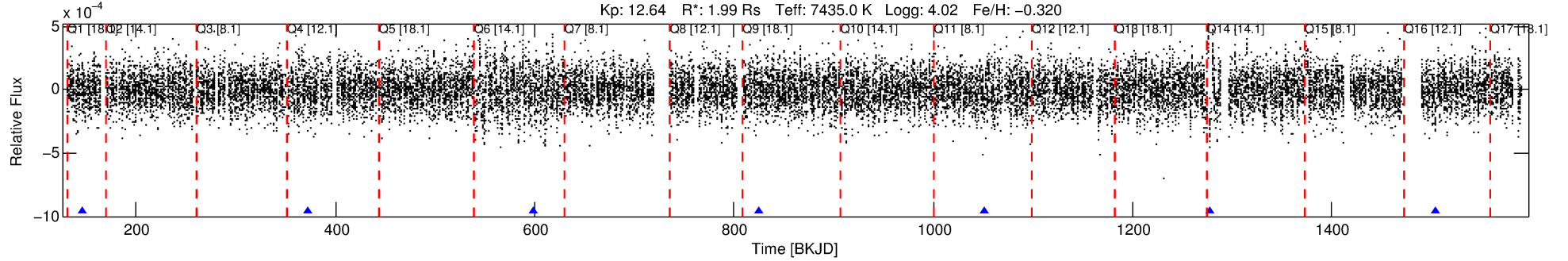
## Ephemeris Match Information For 008499900-03

No Significant Match Found



# DV One-Page Summary

KIC: 8499900 Candidate: 3 of 4 Period: 226.255 d



## DV Fit Results:

Period = 226.25527 [0.01144] d  
Epoch = 146.6134 [0.0223] BKJD  
Rp/R\* = 0.0128 [0.0015]  
a/R\* = 34.99 [18.00]  
b = 0.73 [0.34]  
Seff = 15.58 [7.07]  
Teq = 507 [58] K  
Rp = 2.77 [0.92] Re  
a = 0.8343 [0.2308] AU  
Ag = 2430.79 [1473.53] [1.65 $\sigma$ ]  
Teffp = 5499 [641] K [7.76 $\sigma$ ]

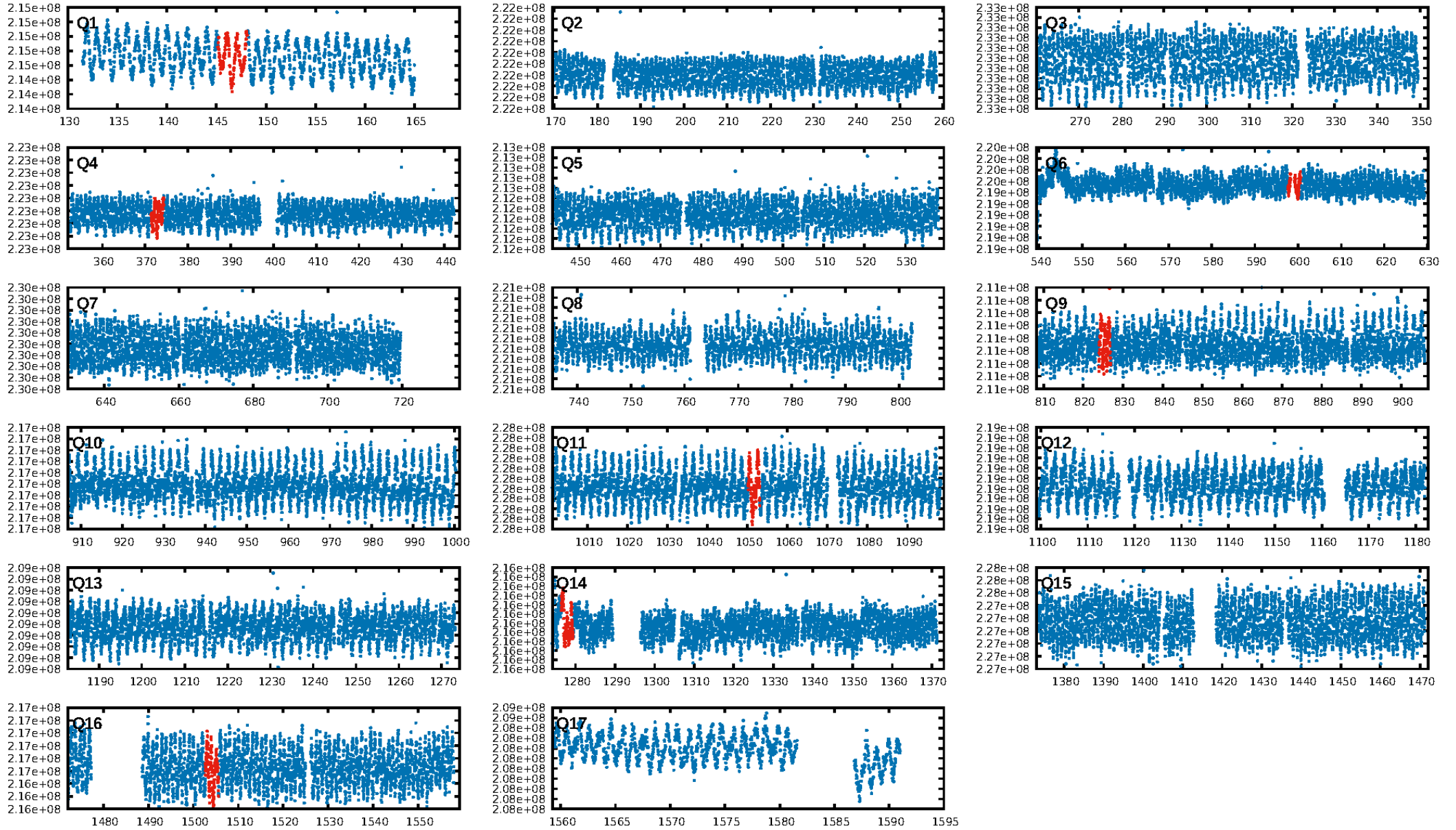
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [106.02 $\sigma$ ]  
LongPeriod-sig: 100.0% [220.62 $\sigma$ ]  
ModelChiSquare2-sig: 2.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 4.08e-10**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 2.92  
Centroid-sig: 0.9%  
Centroid-so: 1.059 arcsec [1.97 $\sigma$ ]  
OotOffset-rm: 1.525 arcsec [1.91 $\sigma$ ]  
KicOffset-rm: 1.622 arcsec [1.31 $\sigma$ ]  
OotOffset-st: 0/1/0/2 [3]  
KicOffset-st: 0/1/0/2 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

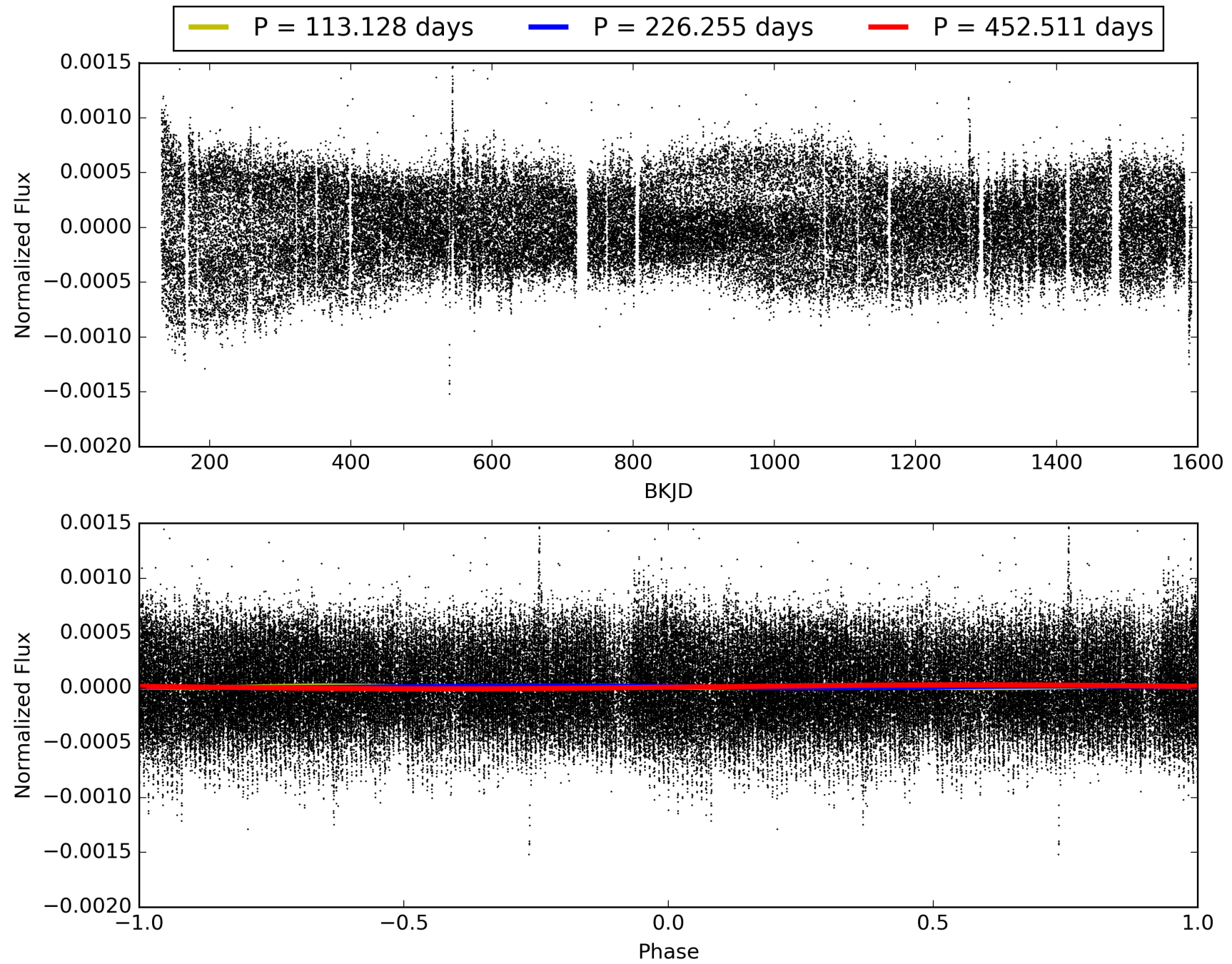
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:37:47 Z

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

# TCE 008499900-03, PDC Light Curves

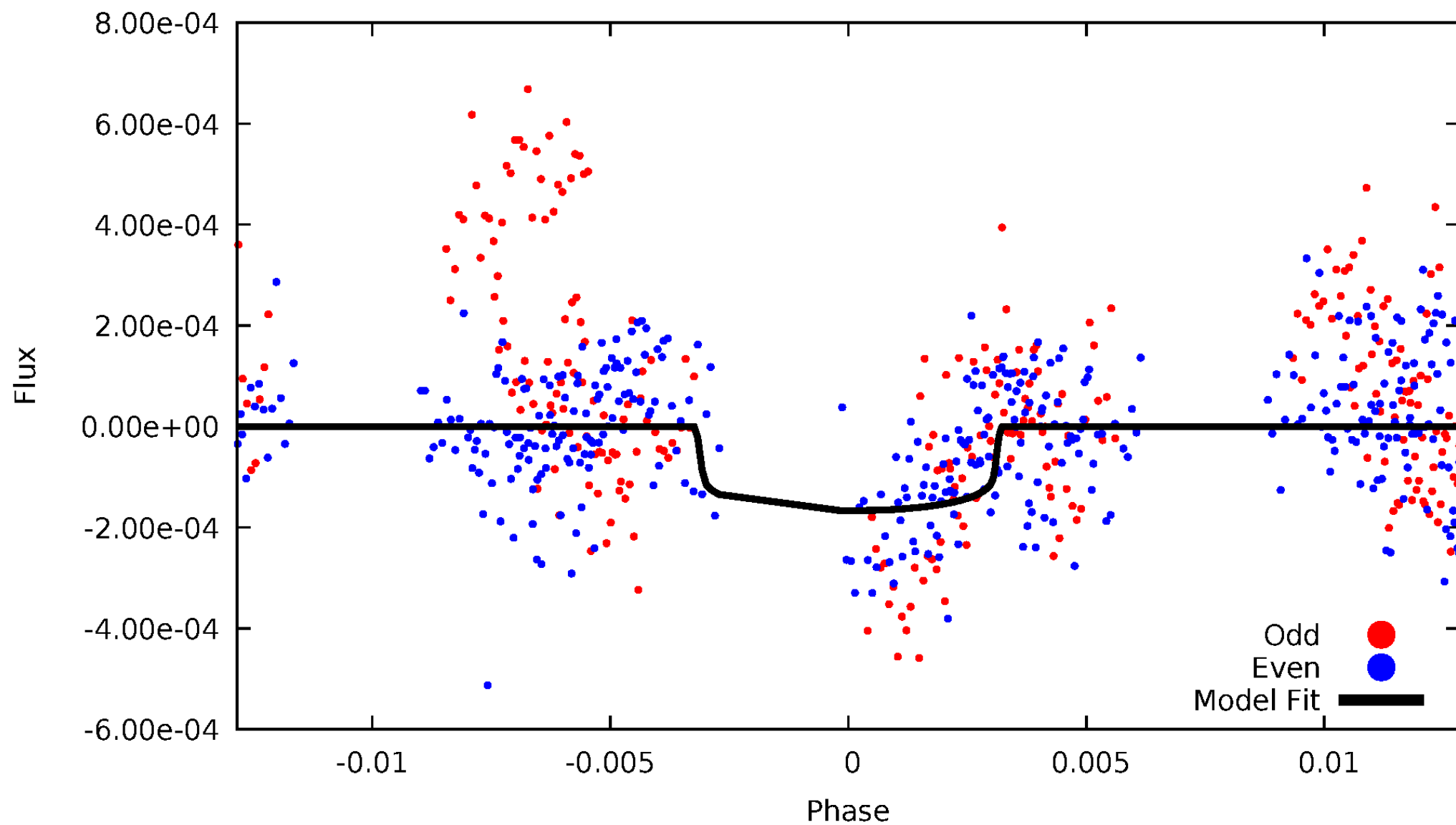


TCE 008499900-03



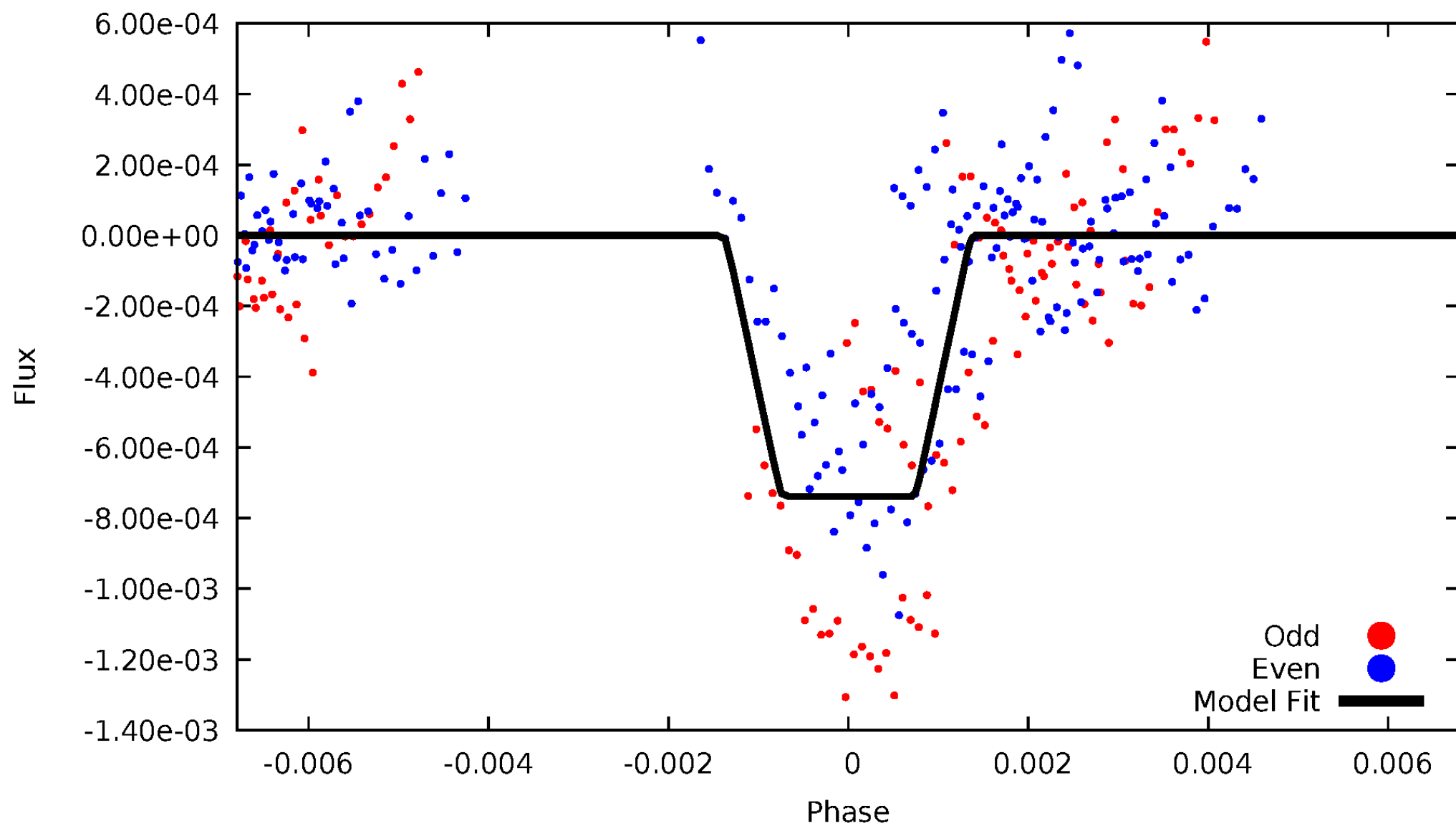
# DV Odd/Even

TCE 008499900-03



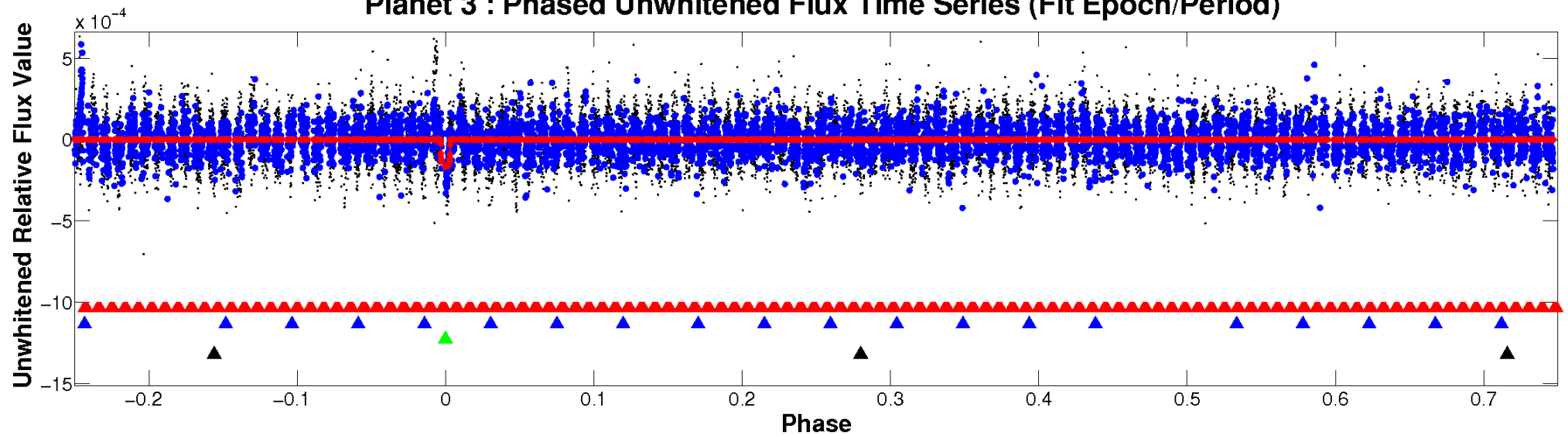
# ALT Odd/Even

TCE 008499900-03

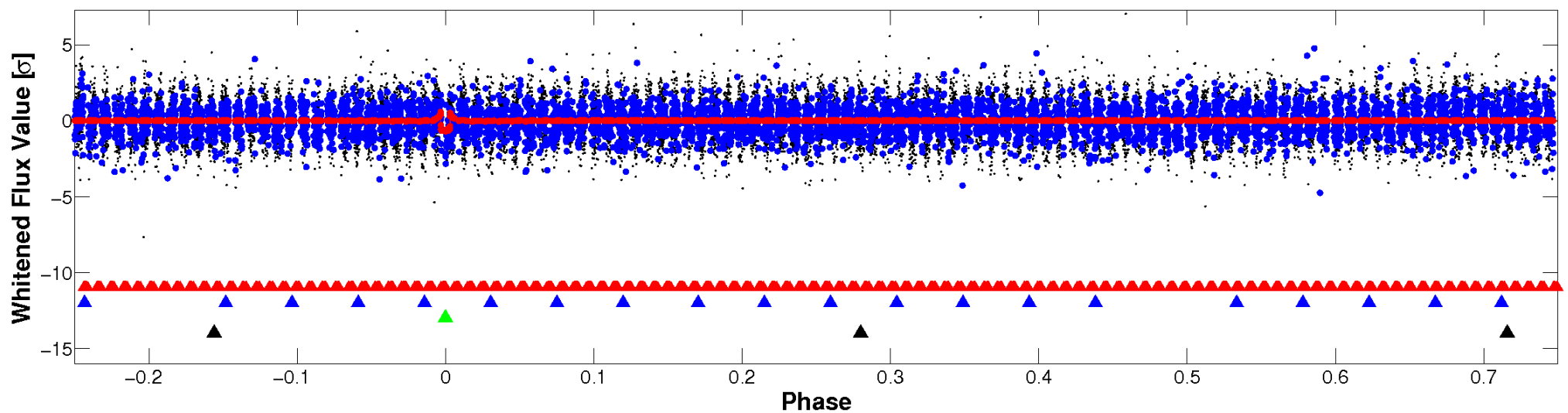


# Non-Whitened Vs. Whitened Light Curve

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



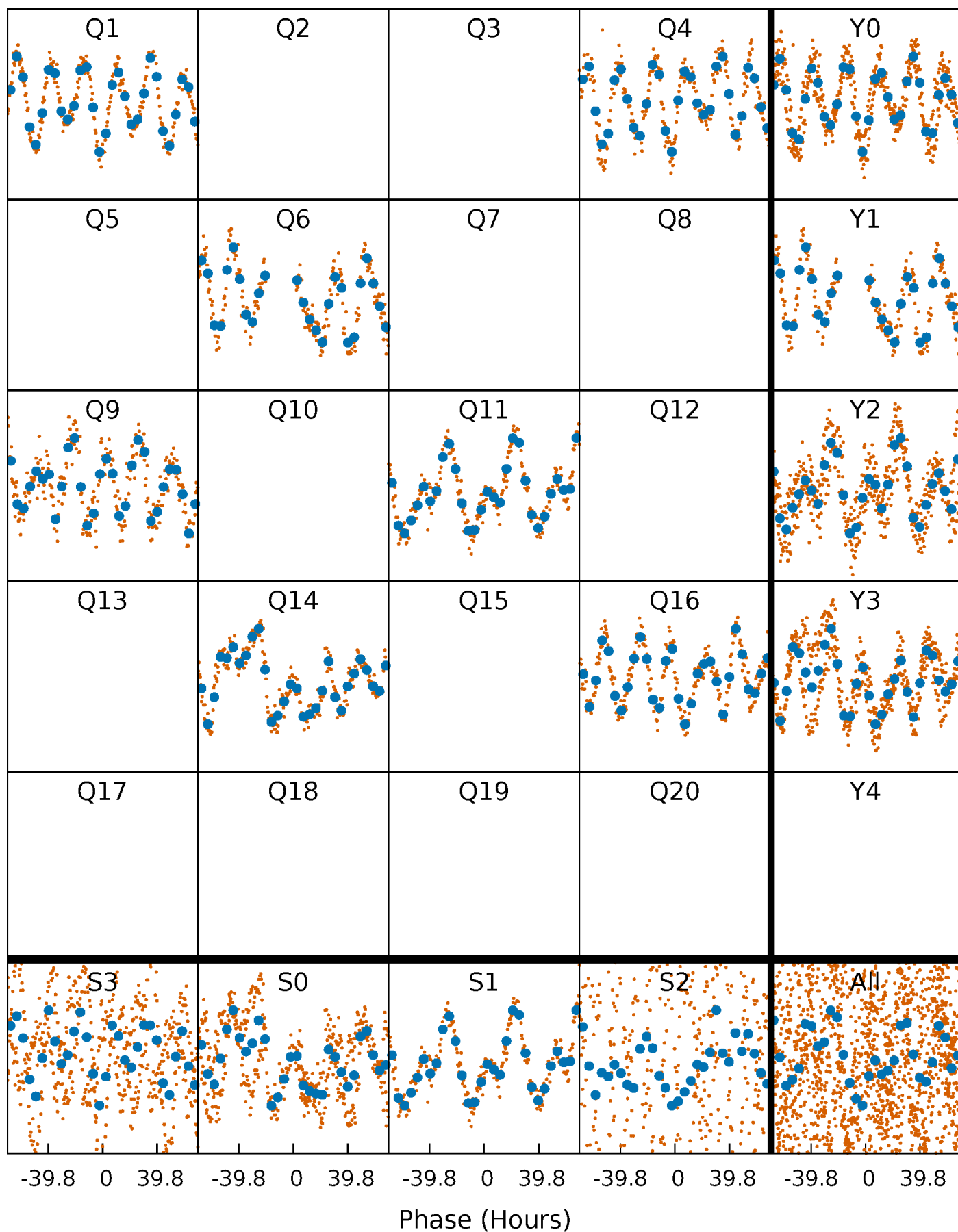
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





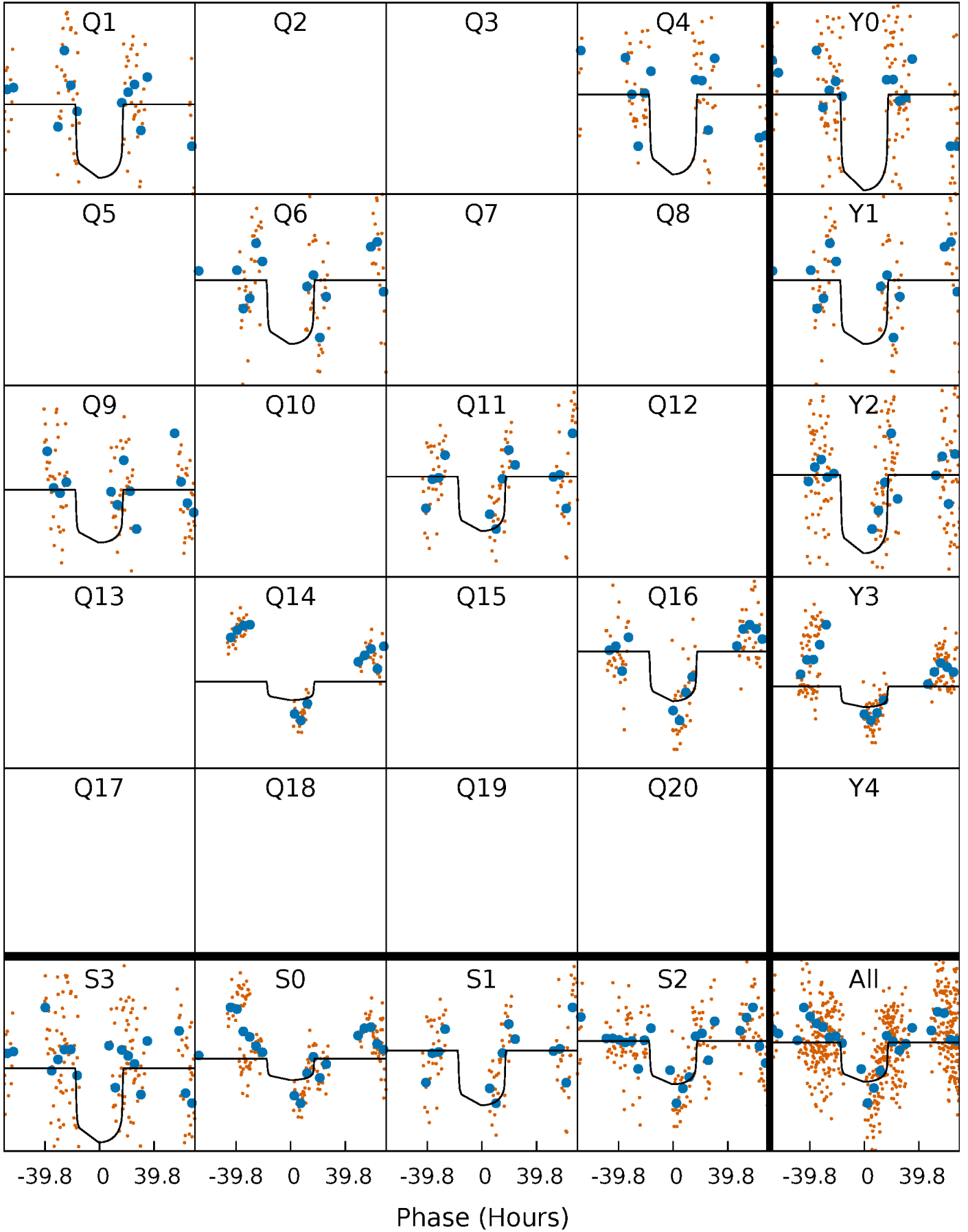
# PDC Quarter-Phased Transit Curves

TCE 008499900-03 P=226.255274 Days  $T_0=146.613390$  (BKJD)



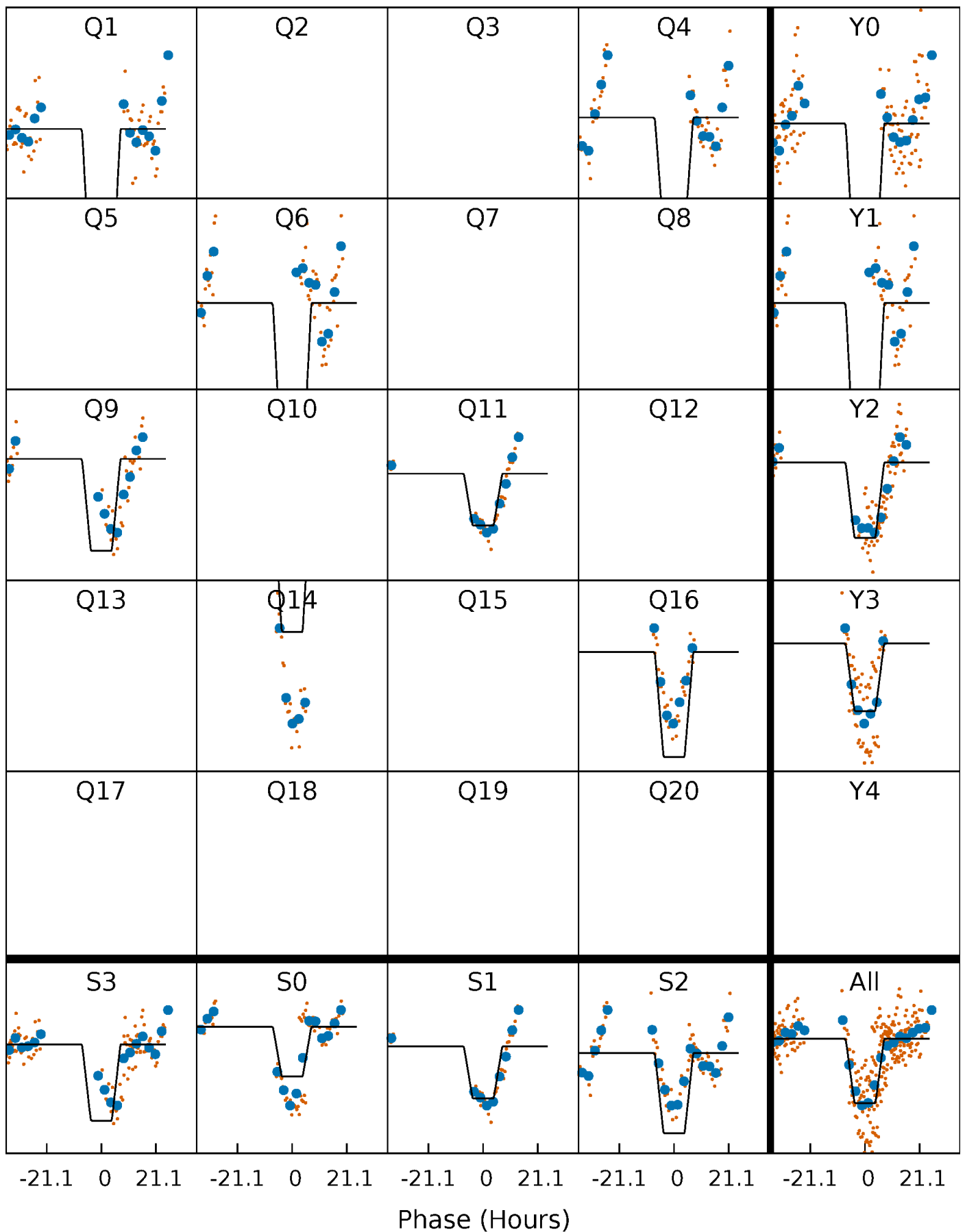
# DV Quarter-Phased Transit Curves

TCE 008499900-03 P=226.255274 Days  $T_0=146.613390$  (BKJD)



### Alt. Detrend Quarter-Phased Transit Curves

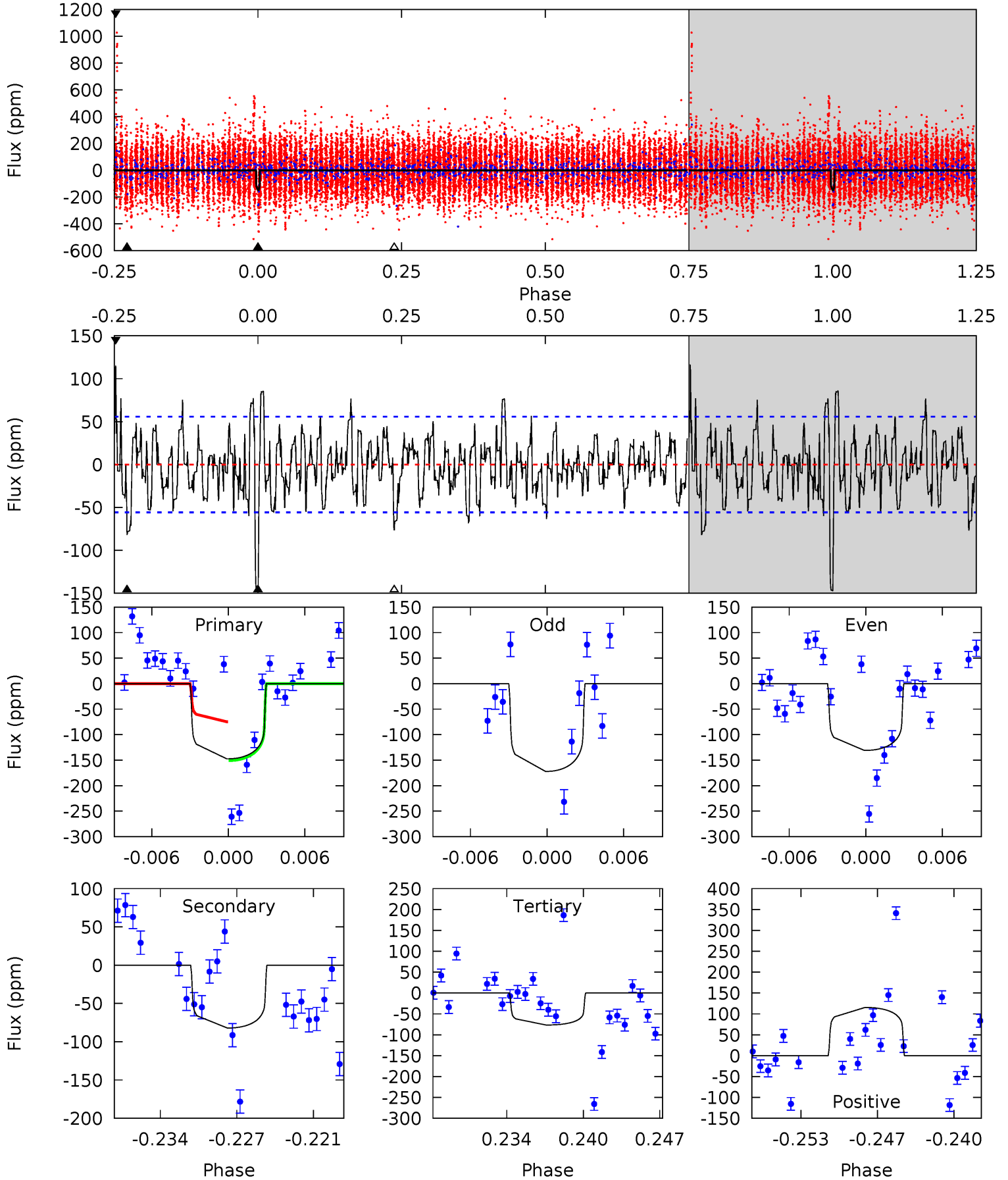
TCE 008499900-03 P=226.253999 Days  $T_0=146.963207$  (BKJD)



# DV Model-Shift Uniqueness Test

008499900-03, P = 226.255274 Days, E = 146.613390 Days

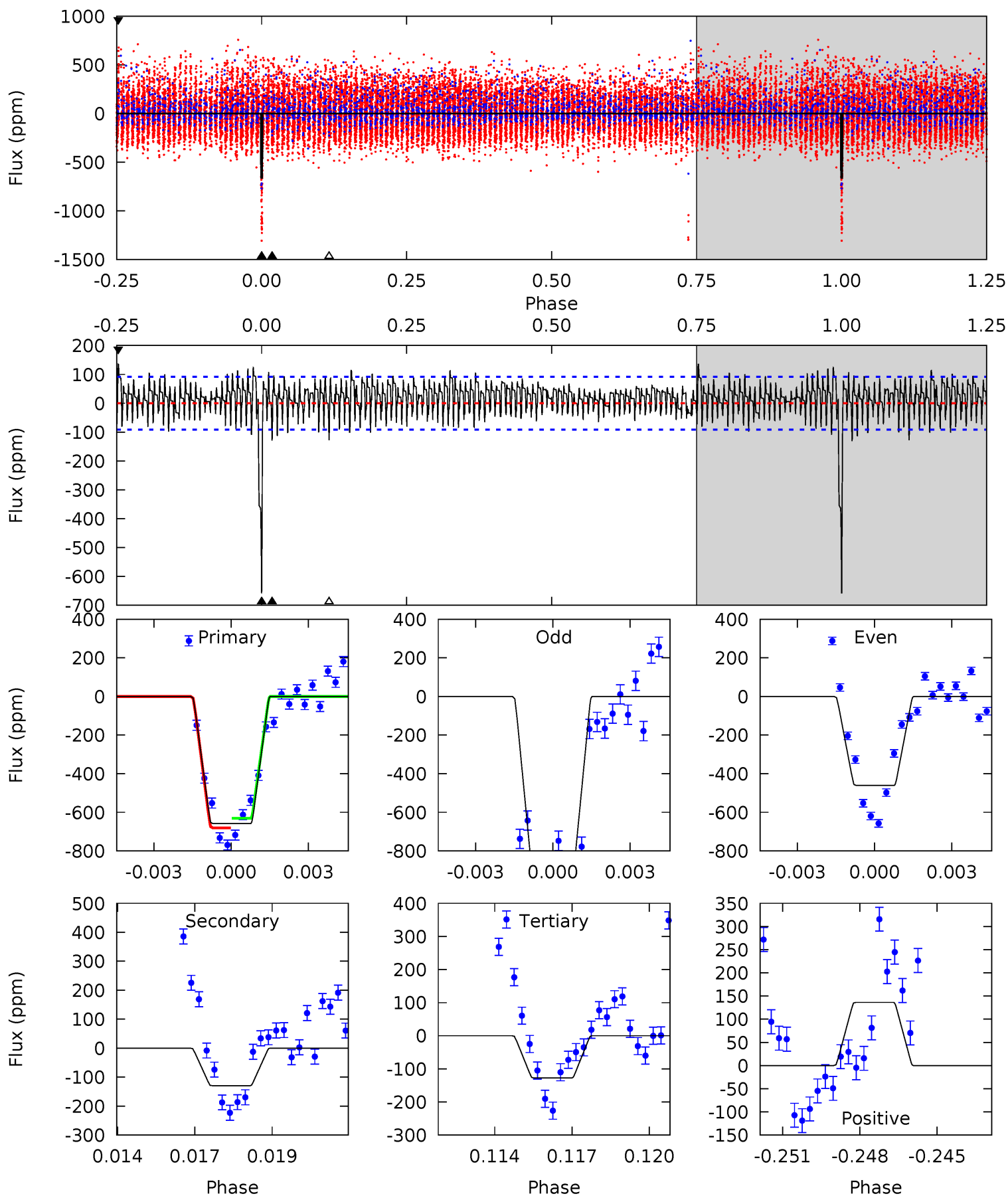
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	7.51	7.02	10.6	5.11	2.72	2.41	6.47	2.93	0.49	-3.05	1.81	1.84	0.44	1.66



# Alt Model-Shift Uniqueness Test

008499900-03, P = 226.253999 Days, E = 146.963207 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
37.9	7.45	7.32	7.83	5.27	2.99	2.52	30.6	30.1	0.13	-0.38	12.9	0.80	0.17	1.34



### Stellar Parameters For KIC 008499900

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7435^{+233}_{-311}$	$4.020^{+0.240}_{-0.160}$	$-0.320^{+0.250}_{-0.350}$	$1.990^{+0.504}_{-0.616}$	$1.510^{+0.198}_{-0.296}$	$0.270^{+0.441}_{-0.108}$
	+3%/-4%	+6%/-4%	+78%/-109%	+25%/-31%	+13%/-20%	+163%/-40%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008499900-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-82 \pm 11$	$2.73^{+0.55}_{-0.55}$	$699^{+58}_{-53}$	$6146^{+520}_{-395}$	$4135^{+2324}_{-1255}$
Alt.	$-130 \pm 17$	$5.82^{+0.92}_{-1.06}$	$703^{+52}_{-64}$	$4852^{+206}_{-221}$	$1436^{+675}_{-379}$

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

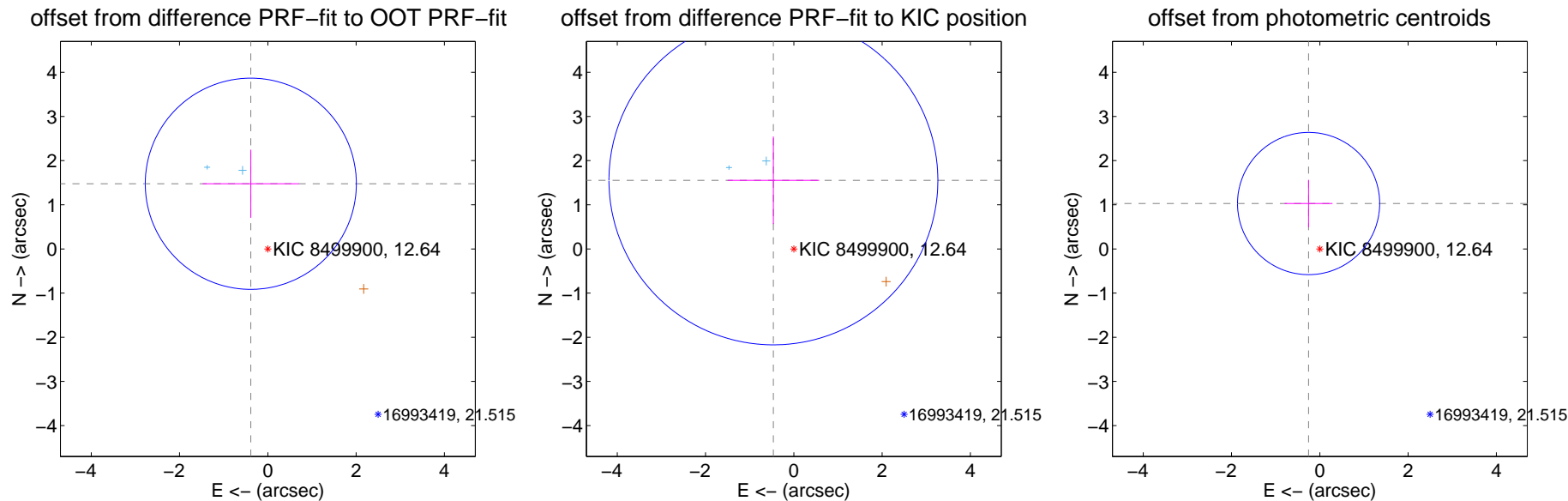
## DV Centroid Data

Supplemental centroid analysis for 008499900-03. Kepler magnitude: 12.64. Transit SNR 7.81

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

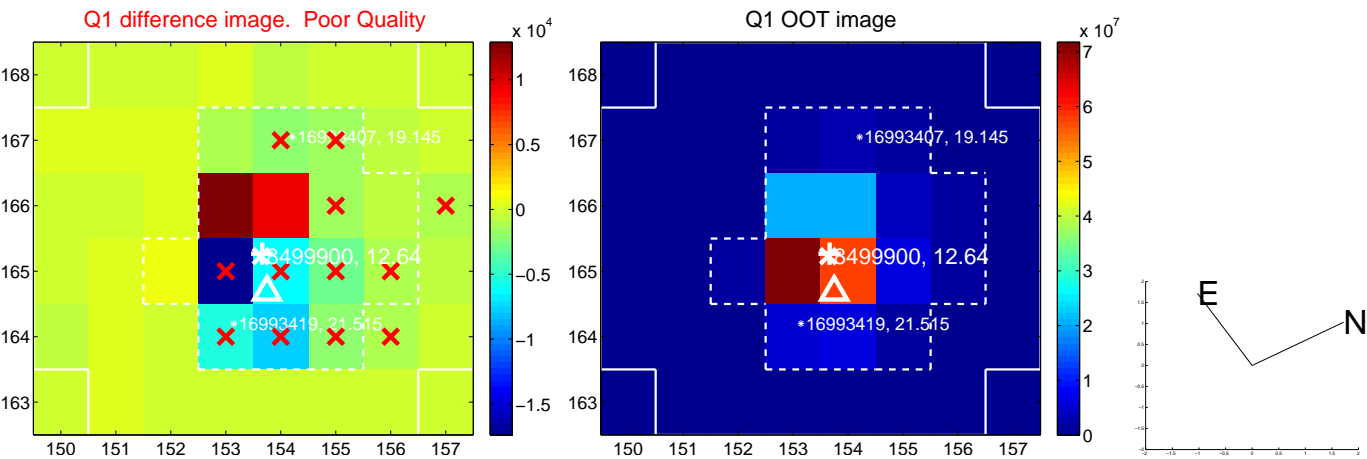
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.525 \pm 0.797$	1.91	$0.386 \pm 1.092$	$1.476 \pm 0.773$
PRF-fit source offset from KIC position	$1.622 \pm 1.242$	1.31	$0.463 \pm 1.037$	$1.554 \pm 0.991$
photometric centroid source offset	$1.06 \pm 0.54$	1.97	$0.25 \pm 0.54$	$1.03 \pm 0.54$



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.



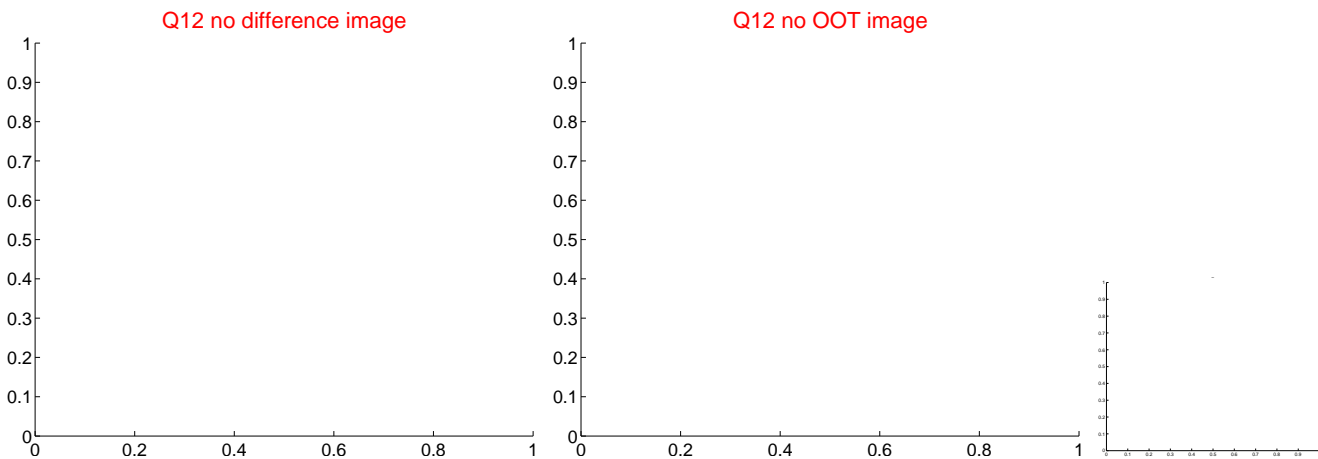
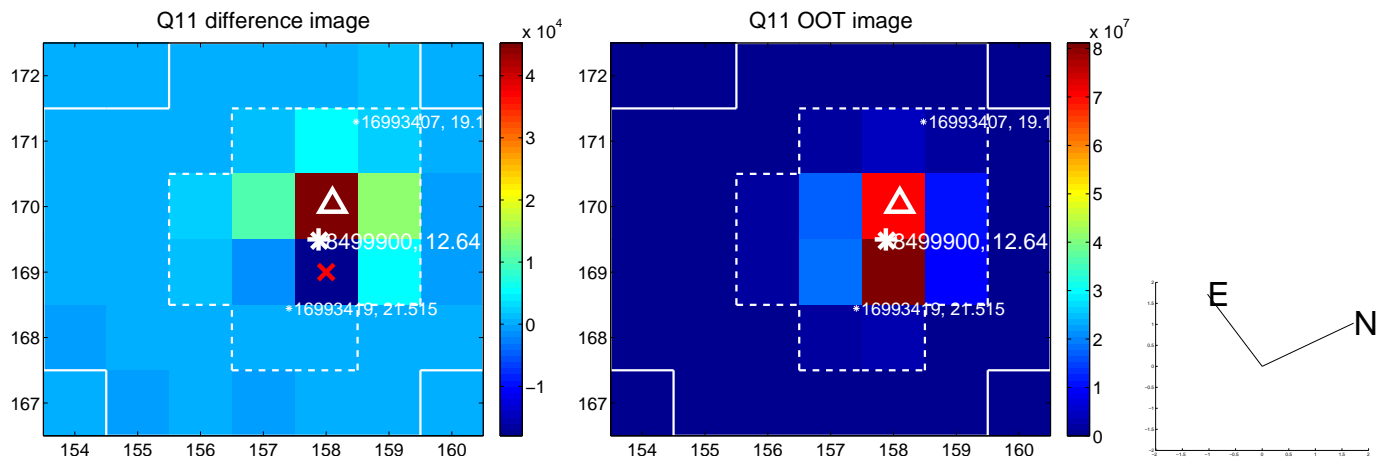
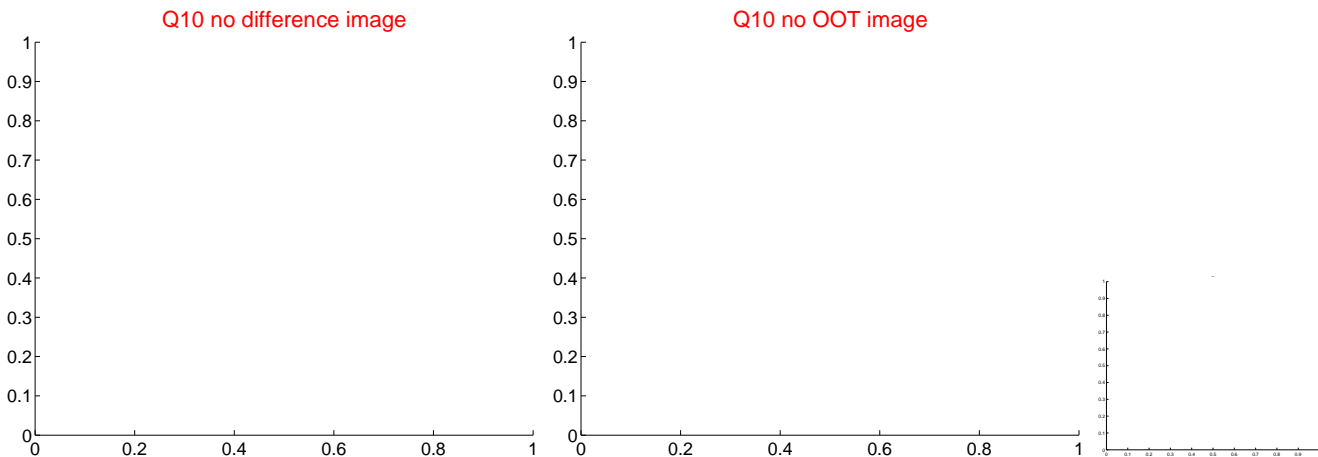
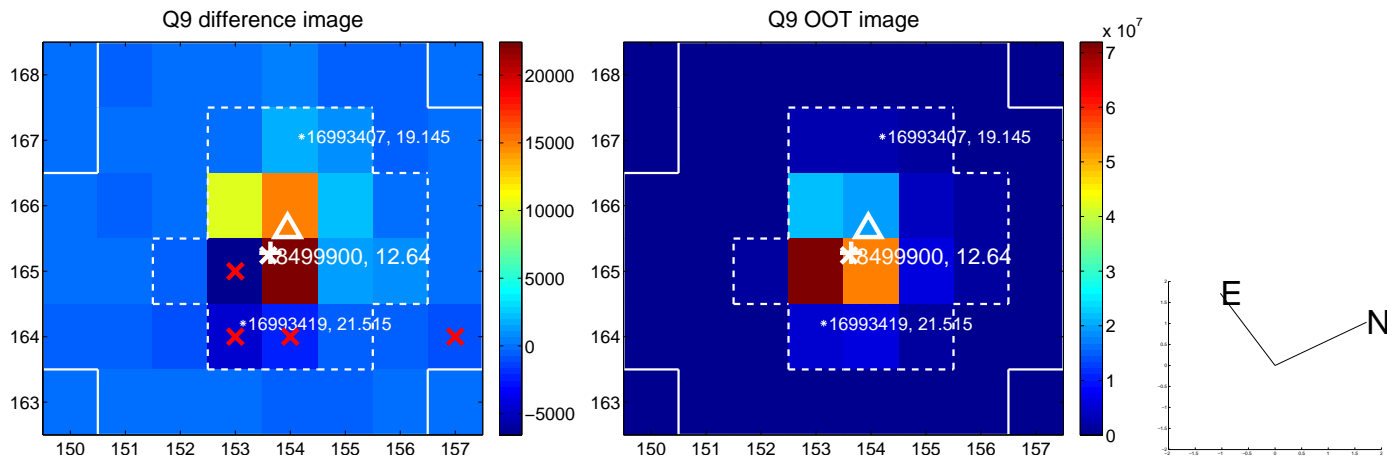
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



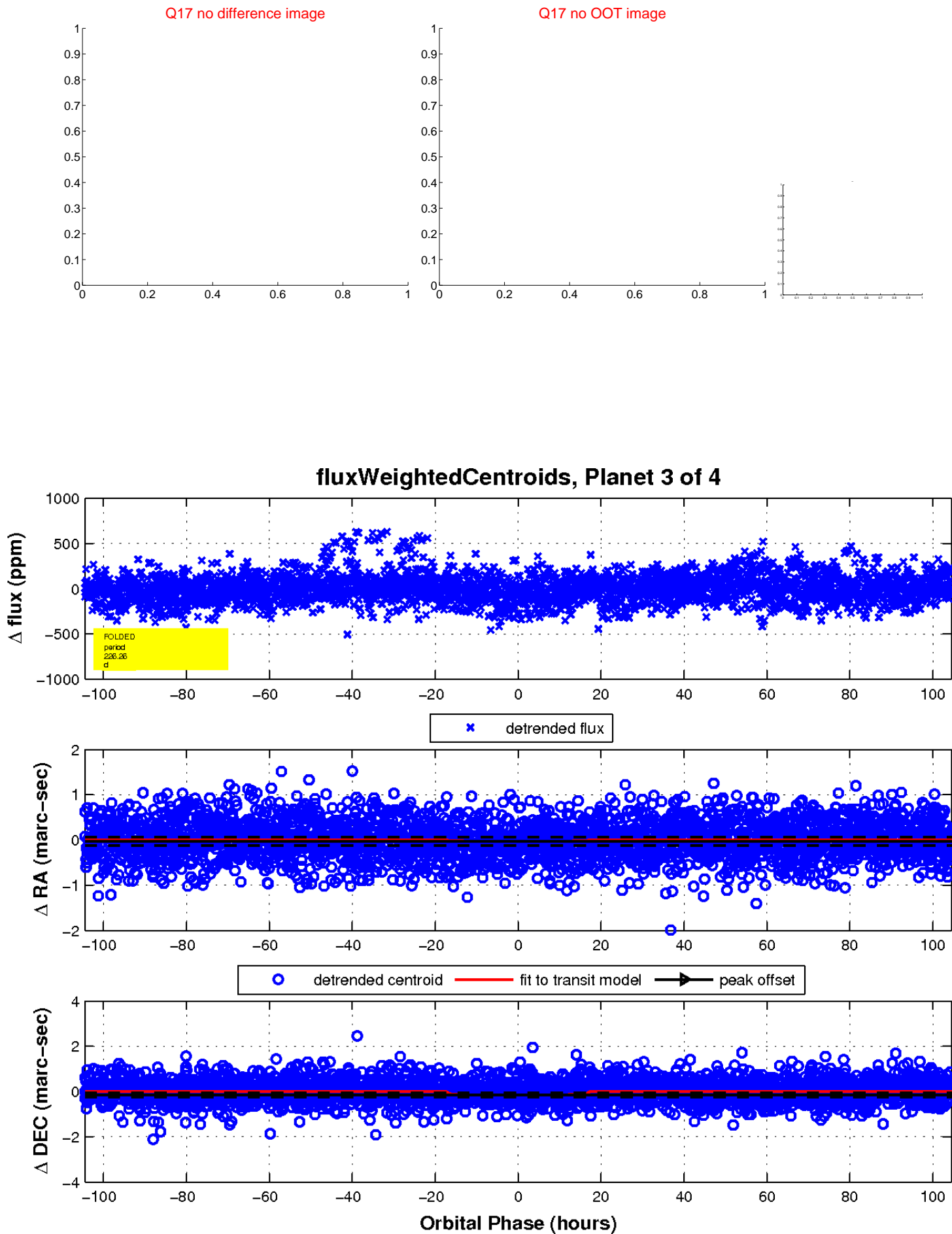
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

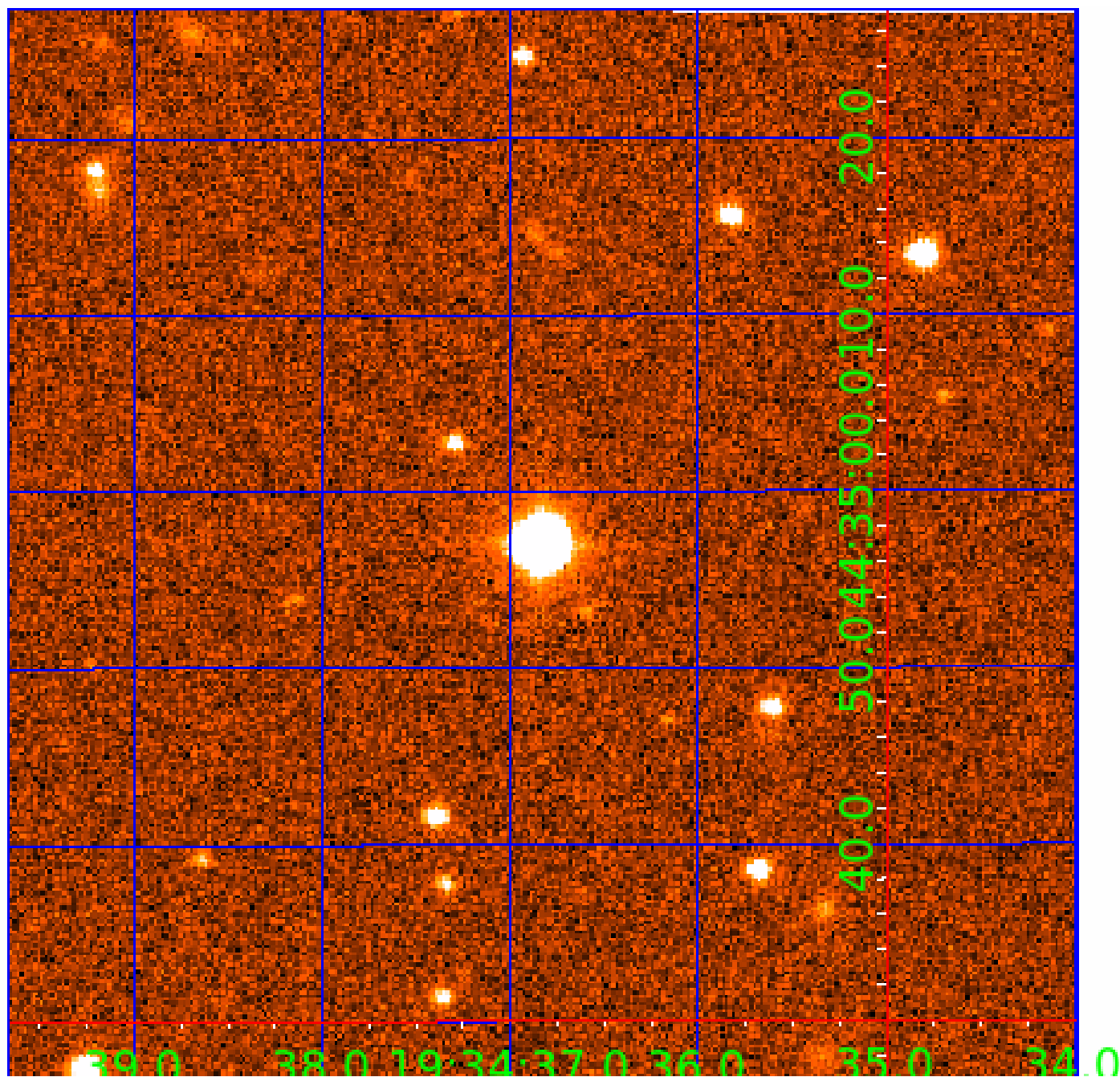


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008499900

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008499900-01	OBS	No	2.019051	132.524333	4.9	10.306	8.2	2.5	1.99	7435	0.52	8415.06
008499900-02	OBS	No	72.051087	173.714016	131.7	2.010	9.1	2.8	1.99	7435	2.34	71.62
008499900-03	OBS	No	226.255274	146.613390	167.1	34.849	8.8	7.8	1.99	7435	2.77	15.58
008499900-04	OBS	No	551.138752	337.584723	175.4	5.889	7.9	7.8	1.99	7435	3.03	4.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008499900-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
008499900-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
008499900-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008499900-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT

**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.

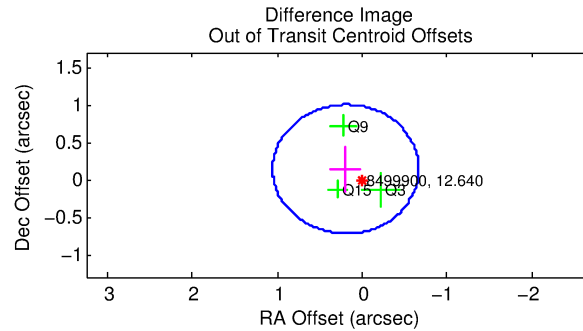
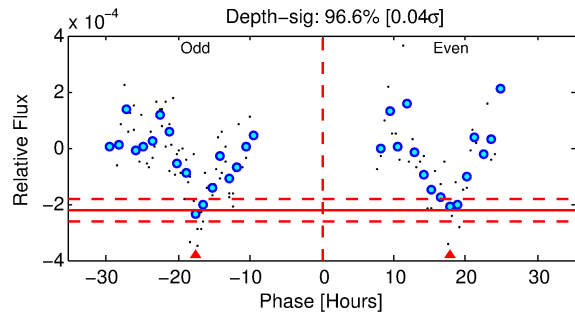
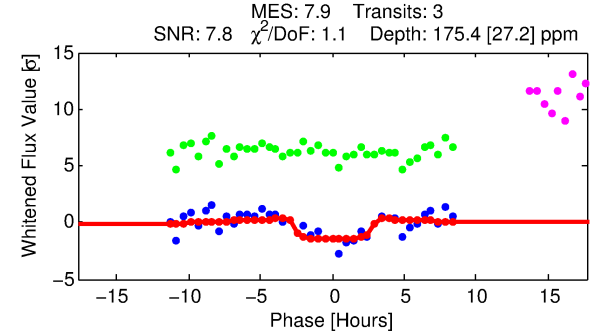
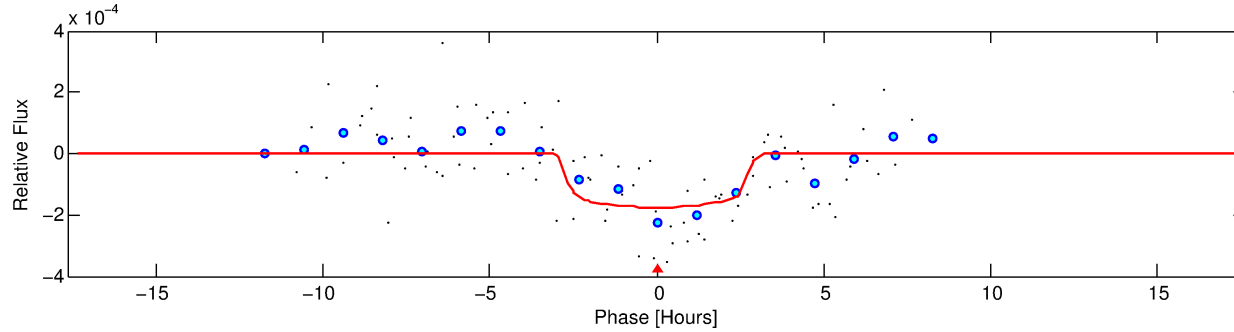
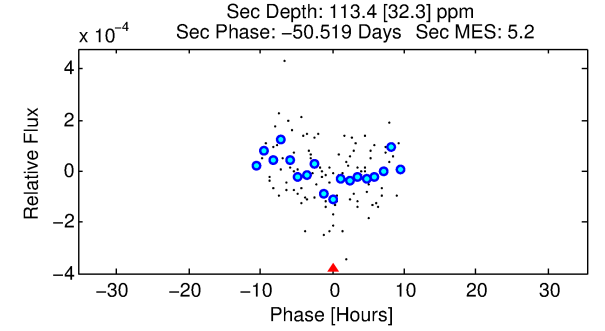
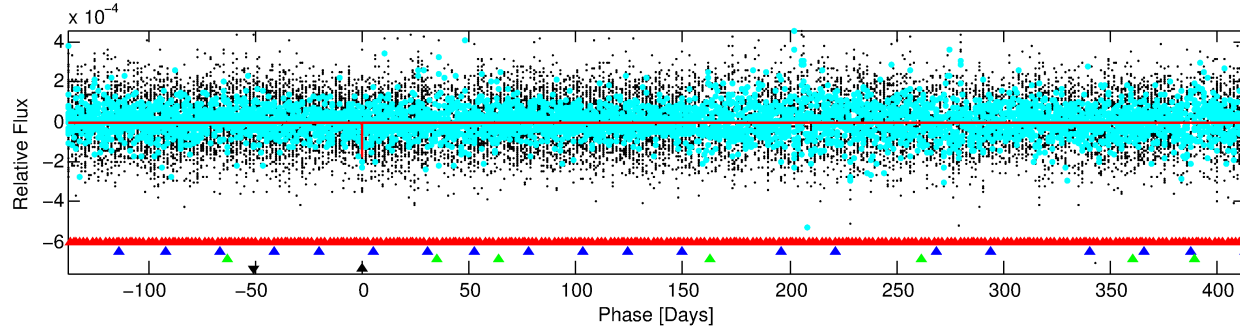
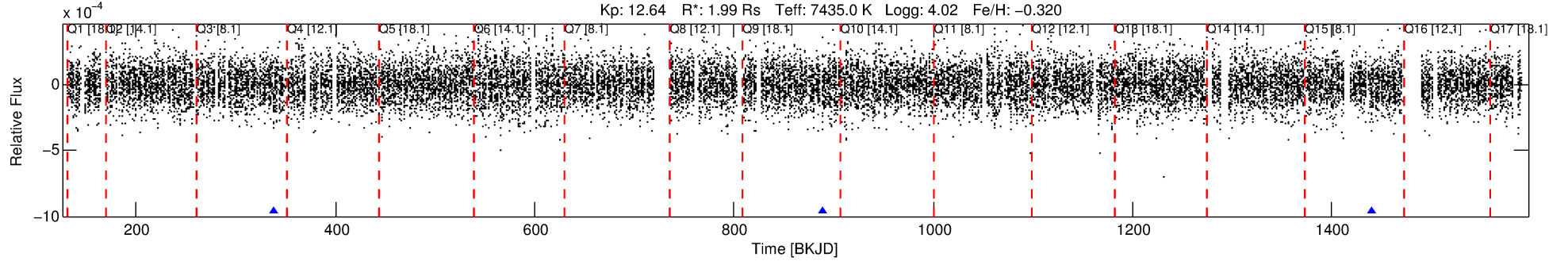
## Ephemeris Match Information For 008499900-04

No Significant Match Found



# DV One-Page Summary

KIC: 8499900 Candidate: 4 of 4 Period: 551.139 d



## DV Fit Results:

Period = 551.13875 [0.00883] d  
Epoch = 337.5847 [0.0122] BKJD  
Rp/R\* = 0.0139 [0.0048]  
a/R\* = 349.82 [728.63]  
b = 0.89 [0.50]  
Seff = 4.75 [2.16]  
Teff = 376 [43] K  
Rp = 3.03 [1.41] Re  
a = 1.5105 [0.4178] AU  
Ag = 15544.99 [13367.37] [1.16σ]  
Teffp = 6500 [1247] K [4.91σ]

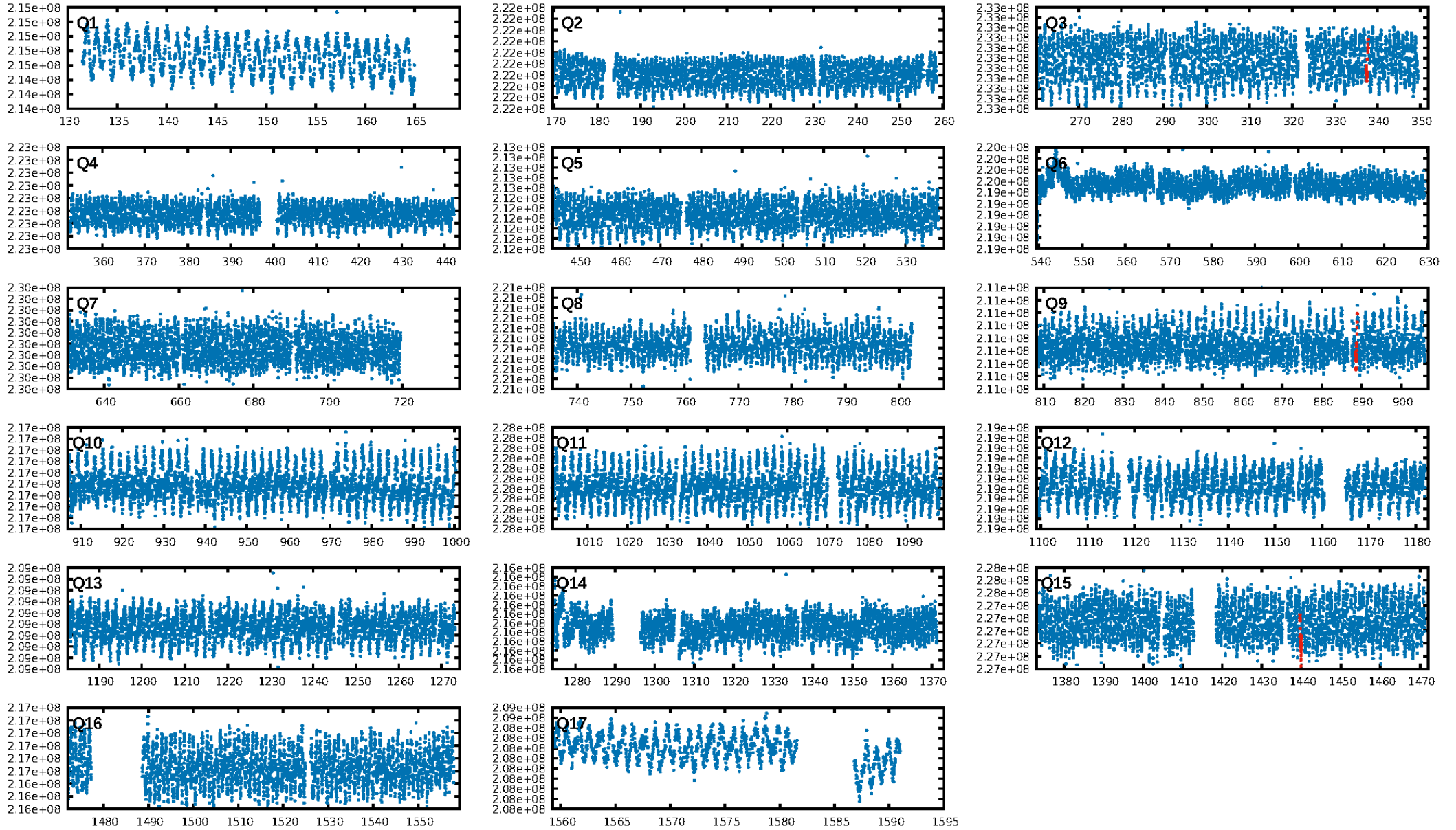
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [220.62σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 50.5%  
ModelChiSquareGof-sig: 86.6%  
**Bootstrap-pfa: 1.05e-08**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 7.543  
Centroid-sig: 8.5%  
Centroid-so: 1.522 arcsec [1.21σ]  
OotOffset-rm: 0.236 arcsec [0.82σ]  
OotOffset-st: 0/2/0/1 [3]  
KicOffset-rm: 0.378 arcsec [1.32σ]  
KicOffset-st: 0/2/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

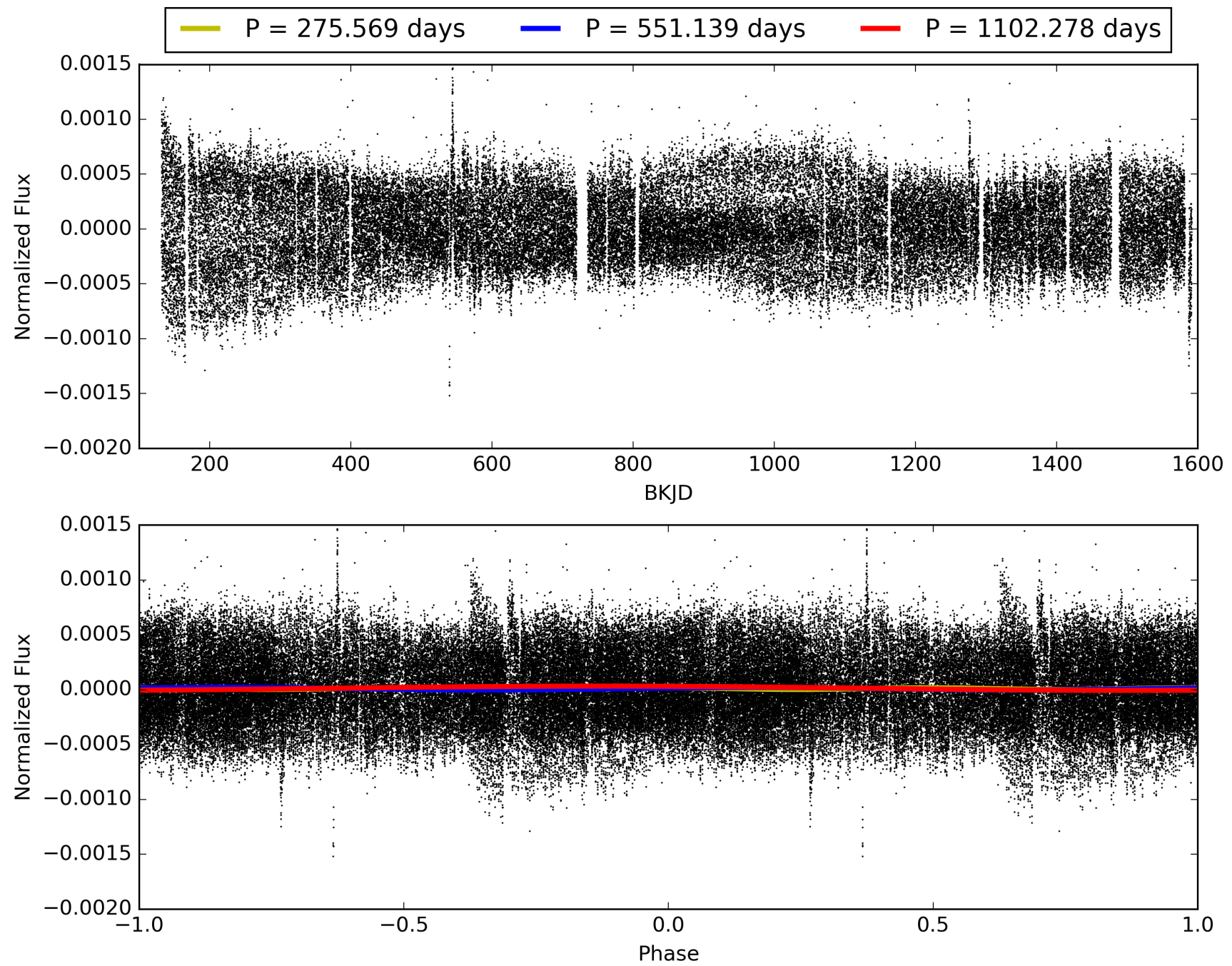
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:37:54 Z

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

# TCE 008499900-04, PDC Light Curves

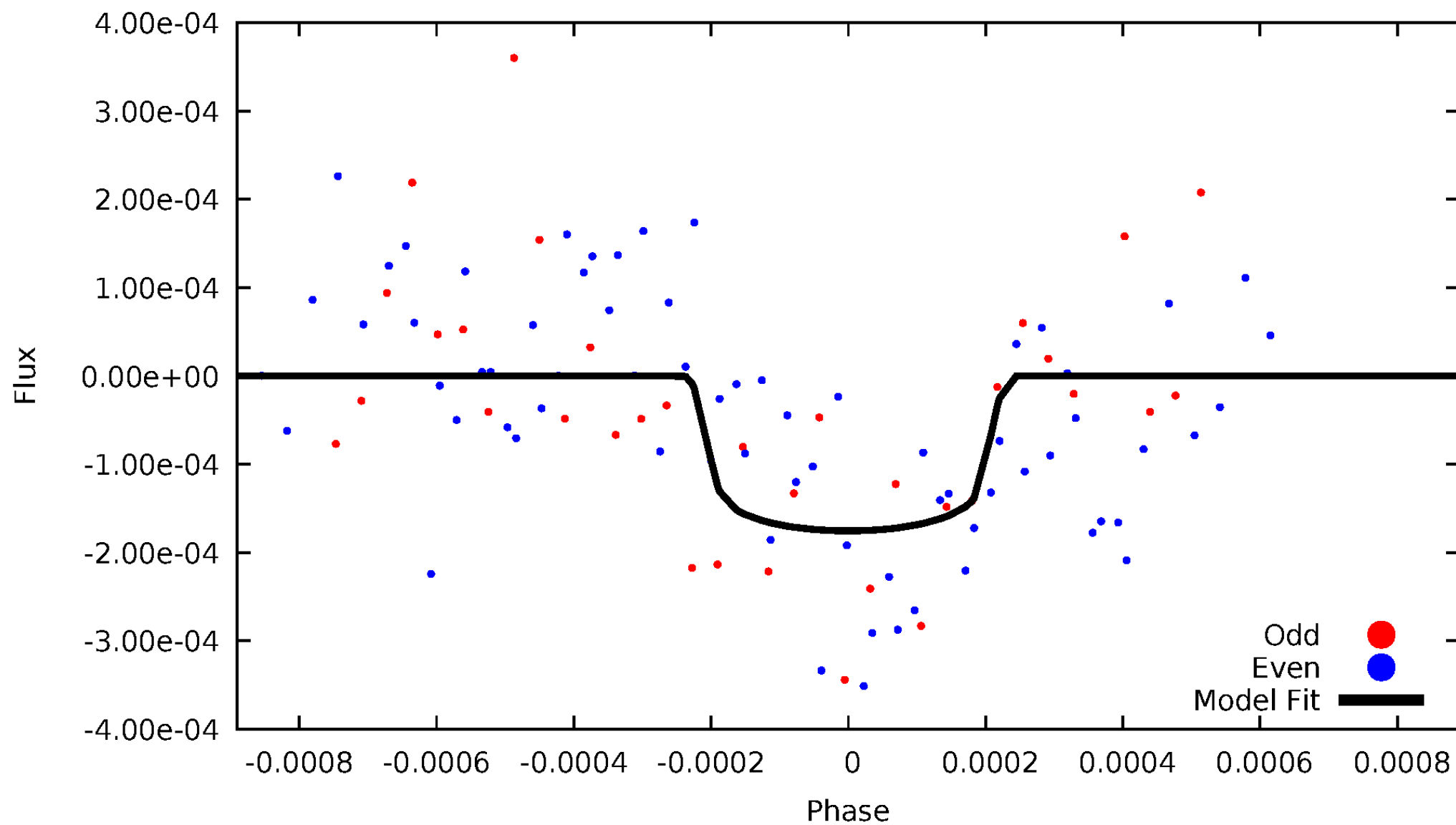


TCE 008499900-04



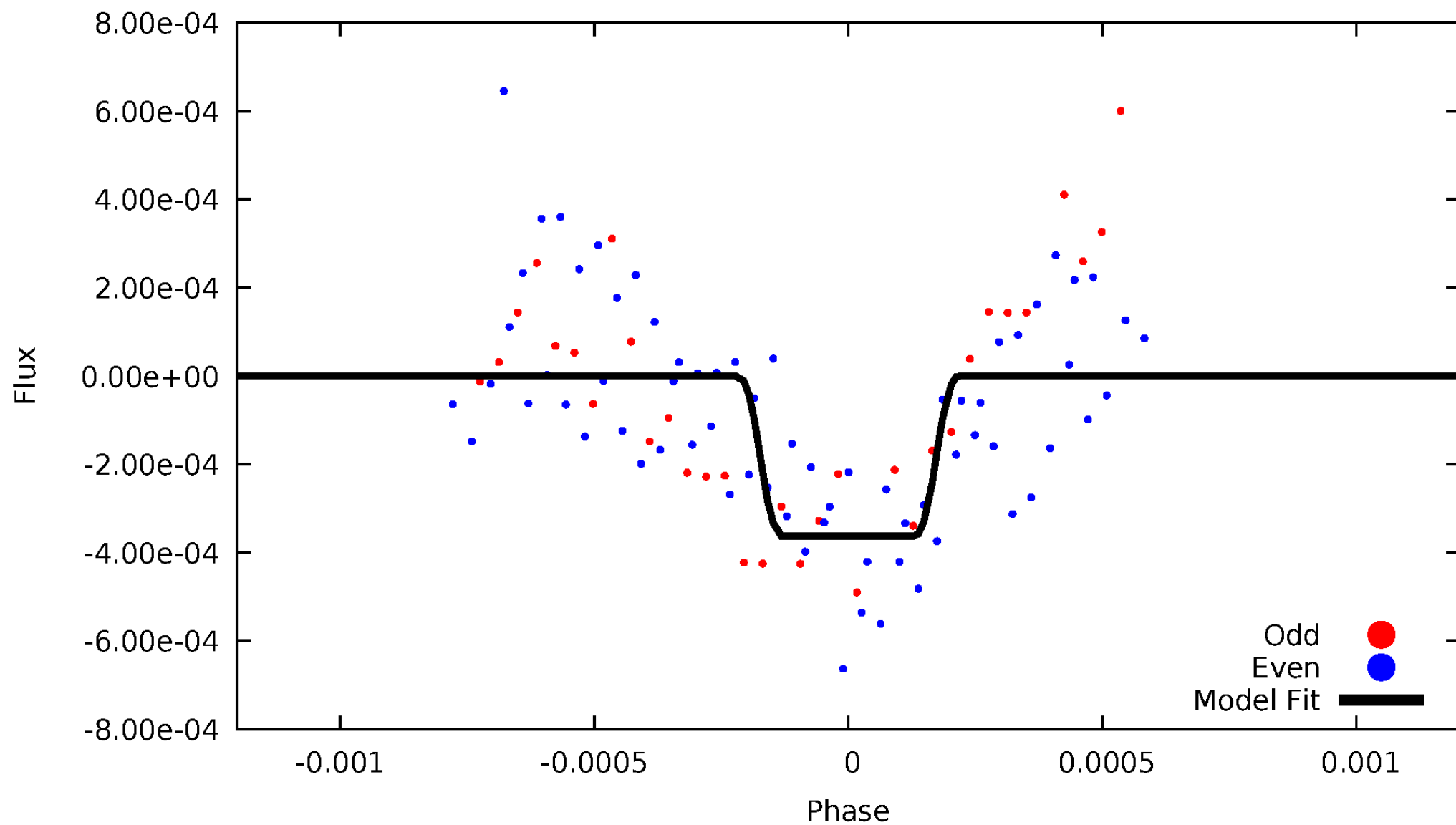
# DV Odd/Even

TCE 008499900-04



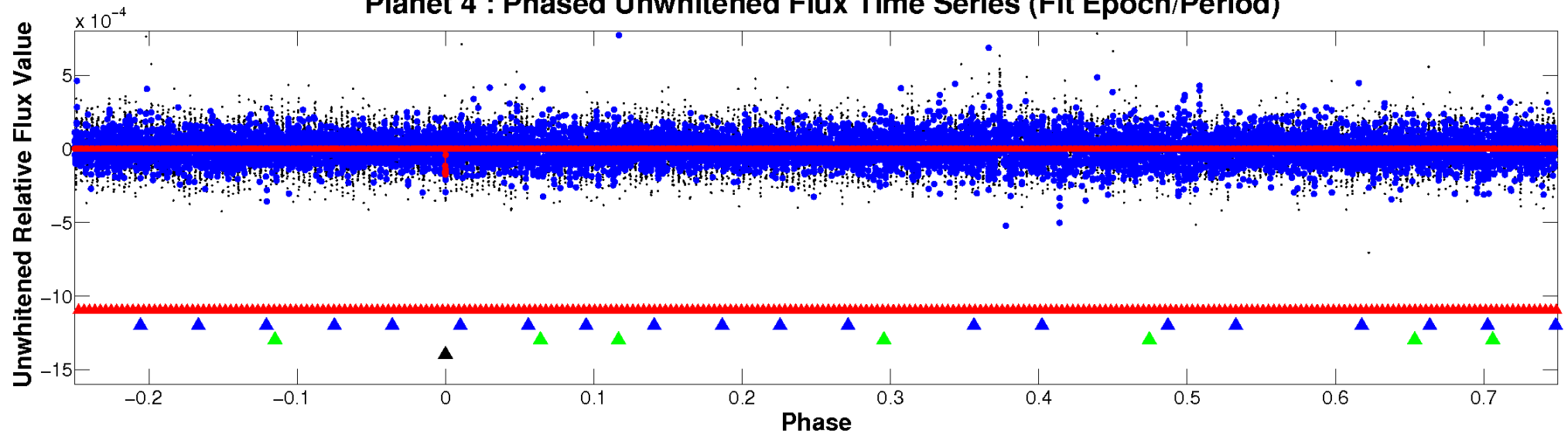
# ALT Odd/Even

TCE 008499900-04

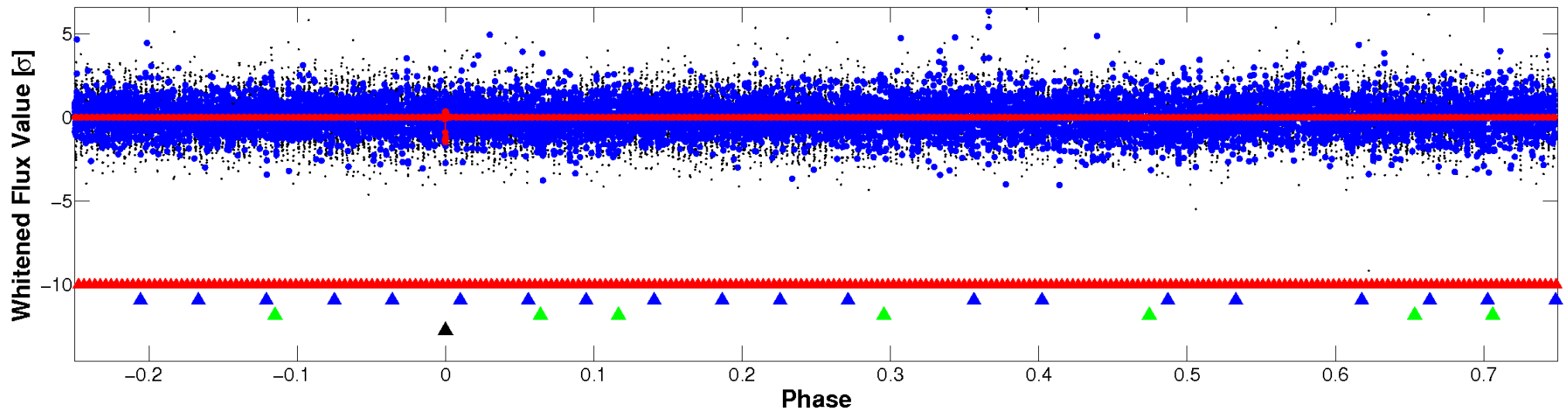


# Non-Whitened Vs. Whitened Light Curve

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

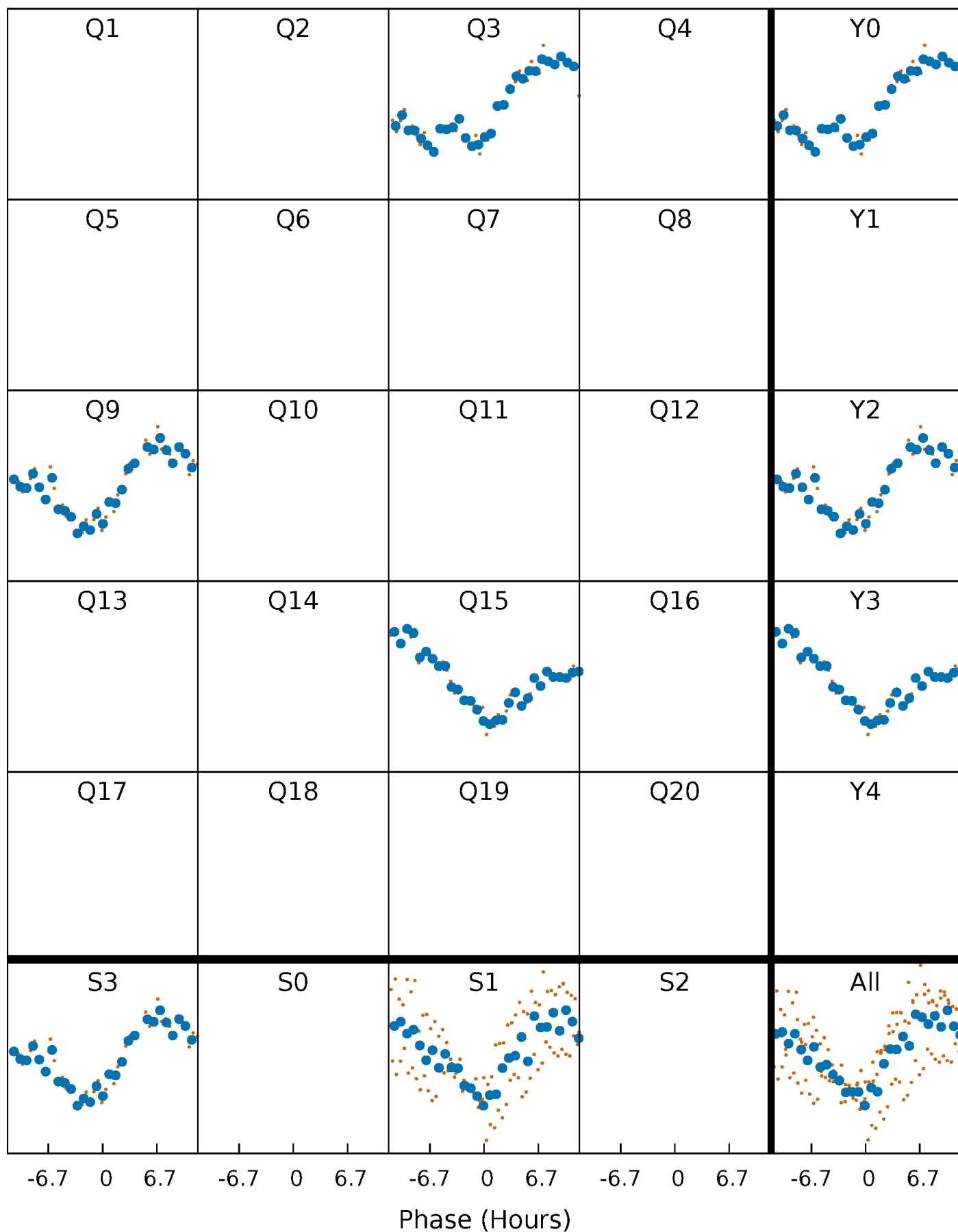


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

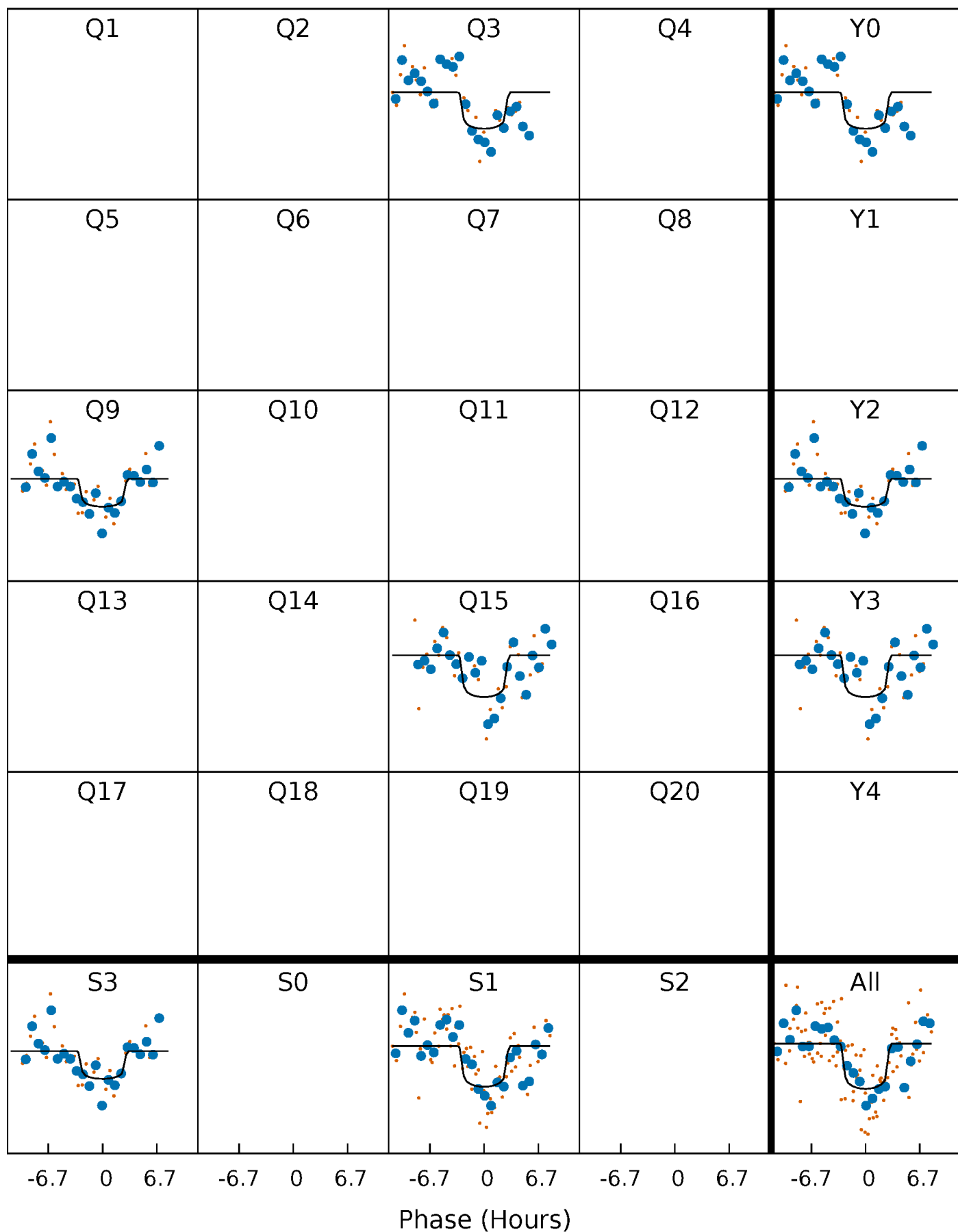
TCE 008499900-04     $P=551.138752$  Days     $T_0=337.584723$  (BKJD)





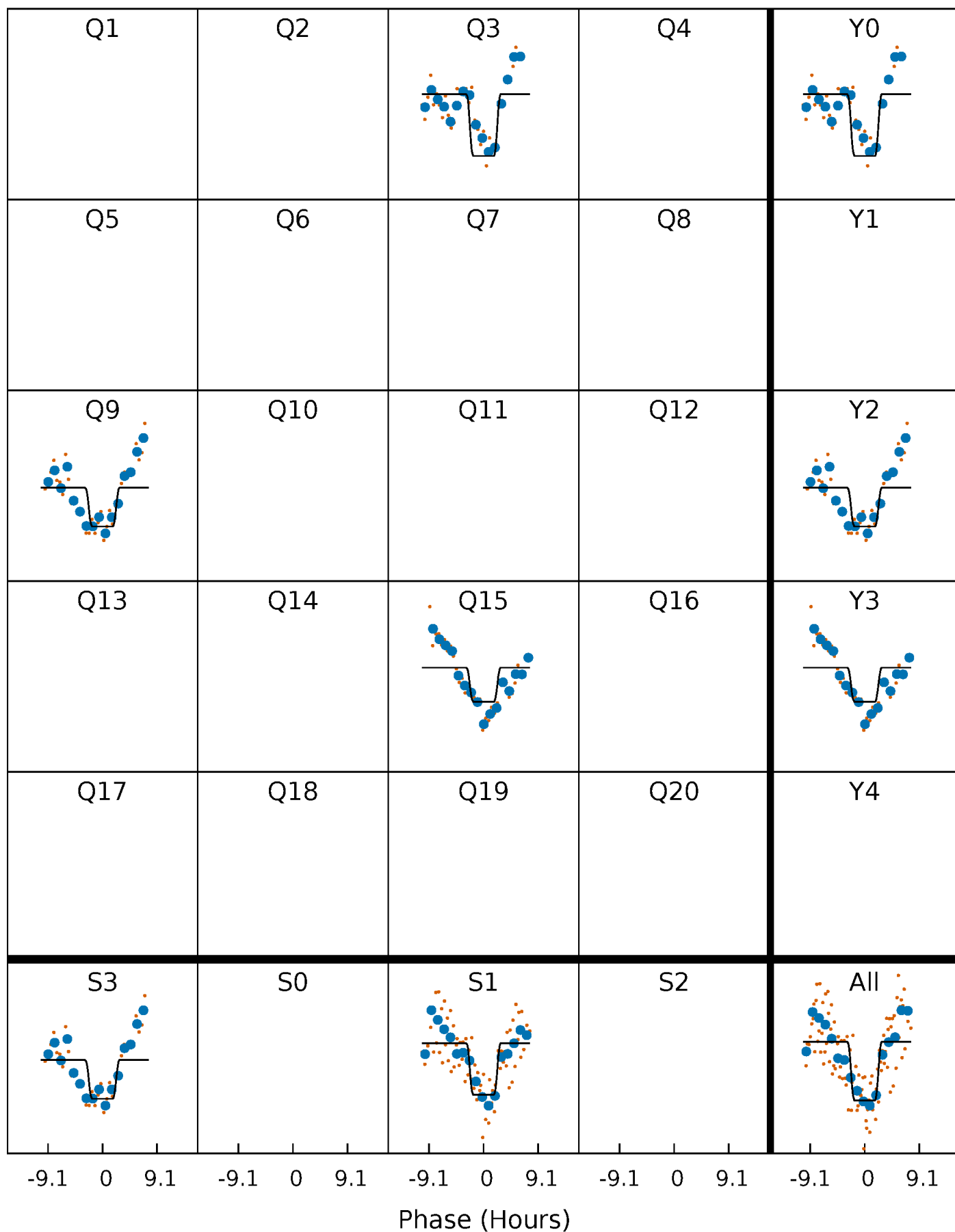
# DV Quarter-Phased Transit Curves

TCE 008499900-04     $P=551.138752$  Days     $T_0=337.584723$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

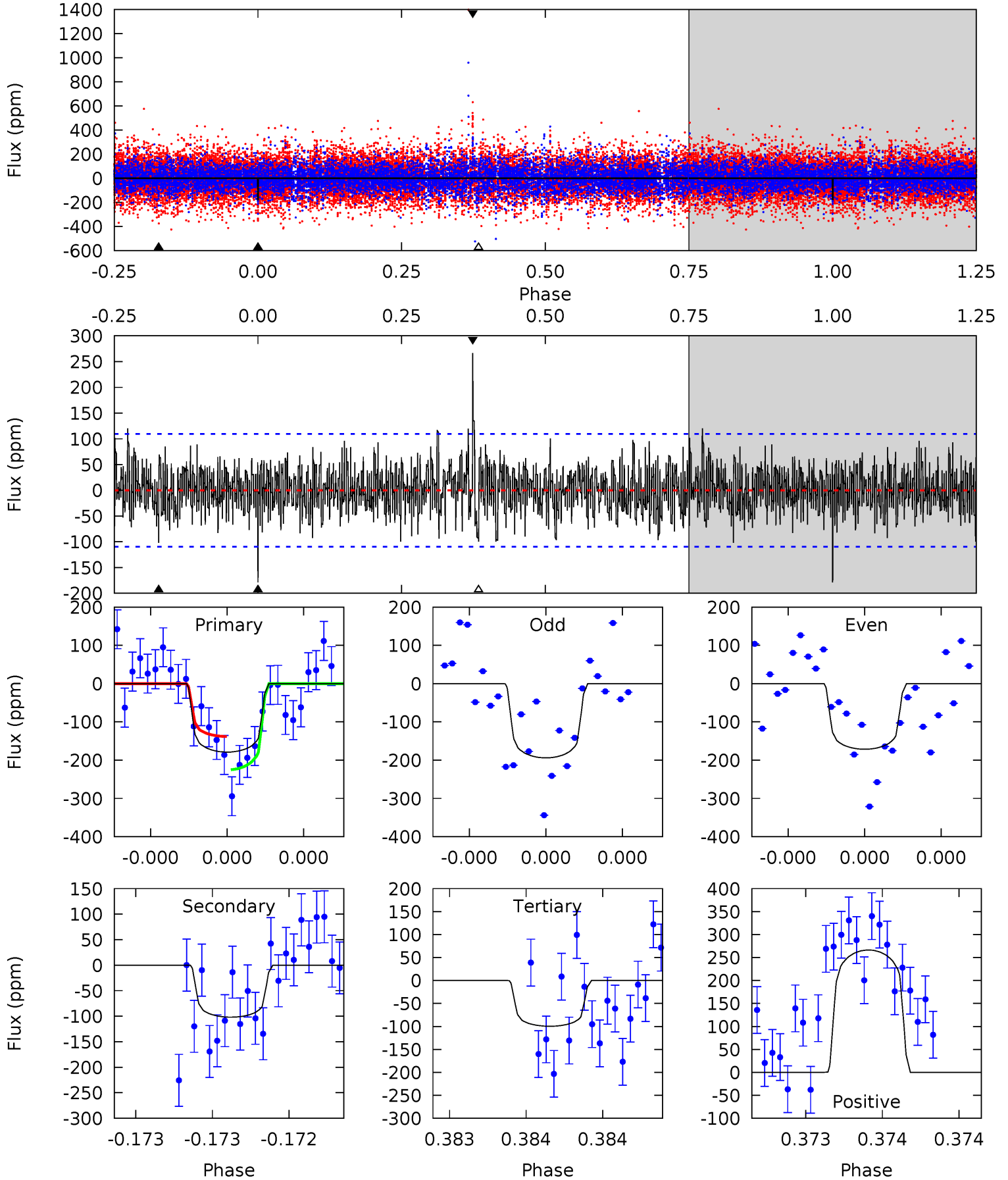
TCE 008499900-04 P=551.168951 Days  $T_0=337.542418$  (BKJD)



# DV Model-Shift Uniqueness Test

008499900-04, P = 551.138752 Days, E = 337.584723 Days

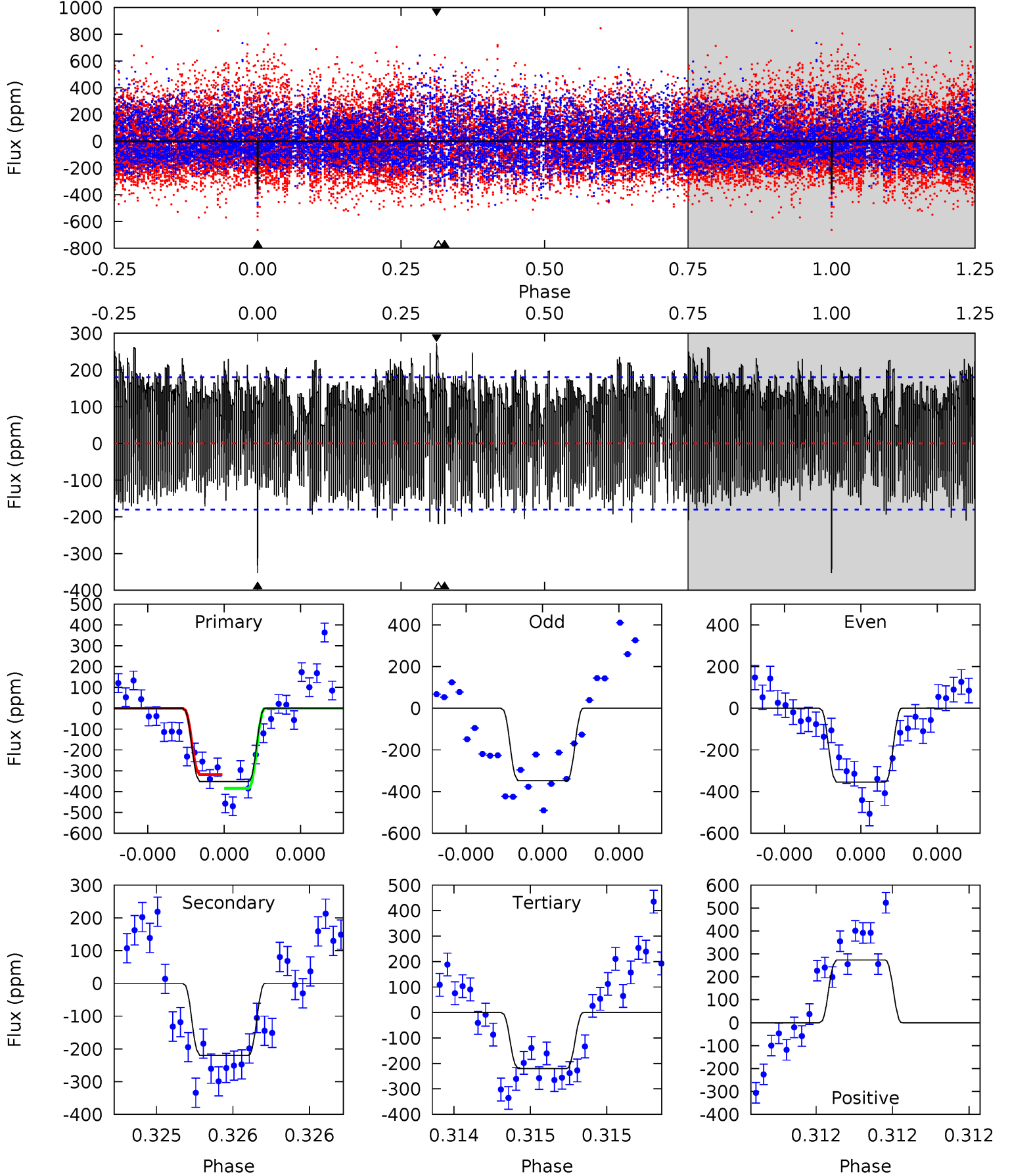
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.14	5.20	5.09	13.6	5.59	3.51	1.78	4.05	-4.46	0.11	-8.39	0.55	0.94	0.60	2.21



# Alt Model-Shift Uniqueness Test

008499900-04, P = 551.168951 Days, E = 337.542418 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
10.9	6.83	6.83	8.50	5.61	3.53	3.29	4.12	2.45	0.00	-1.67	0.10	1.01	0.44	1.03



### Stellar Parameters For KIC 008499900

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7435^{+233}_{-311}$	$4.020^{+0.240}_{-0.160}$	$-0.320^{+0.250}_{-0.350}$	$1.990^{+0.504}_{-0.616}$	$1.510^{+0.198}_{-0.296}$	$0.270^{+0.441}_{-0.108}$
	+3%/-4%	+6%/-4%	+78%/-109%	+25%/-31%	+13%/-20%	+163%/-40%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008499900-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-102 \pm 20$	$2.86^{+1.21}_{-1.07}$	$518^{+42}_{-43}$	$6218^{+1791}_{-919}$	$15724^{+24361}_{-8304}$
Alt.	$-220 \pm 32$	$3.91^{+1.33}_{-1.11}$	$521^{+40}_{-46}$	$6486^{+1110}_{-791}$	$17428^{+17478}_{-7855}$

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

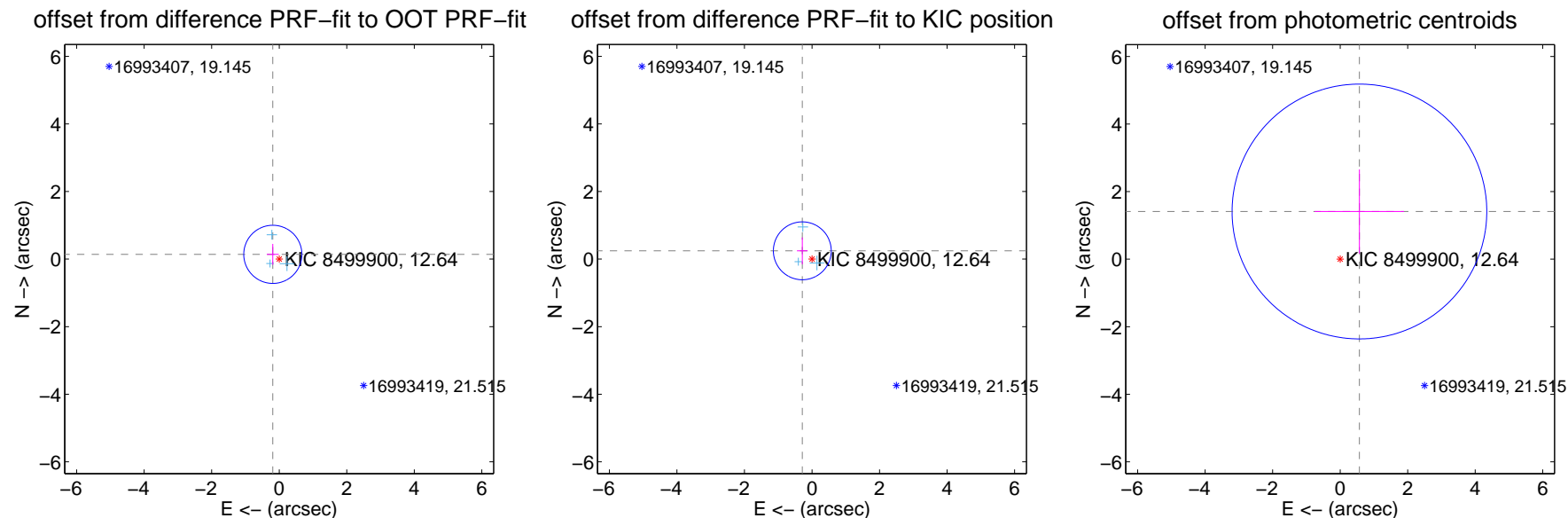
## DV Centroid Data

Supplemental centroid analysis for 008499900-04. Kepler magnitude: 12.64. Transit SNR 7.79

There are 3 quarters with good PRF difference image offsets

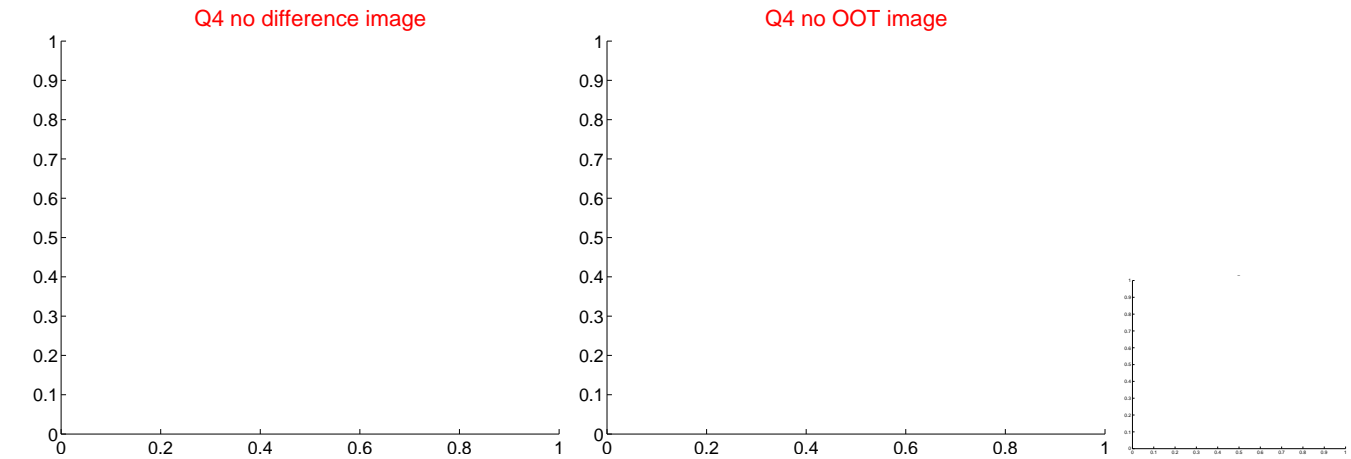
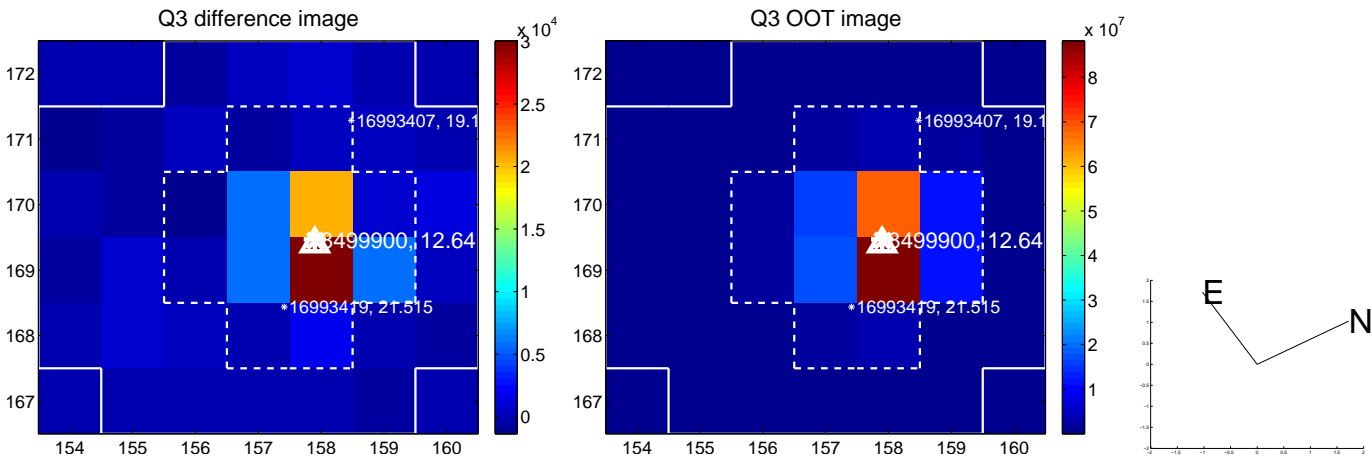
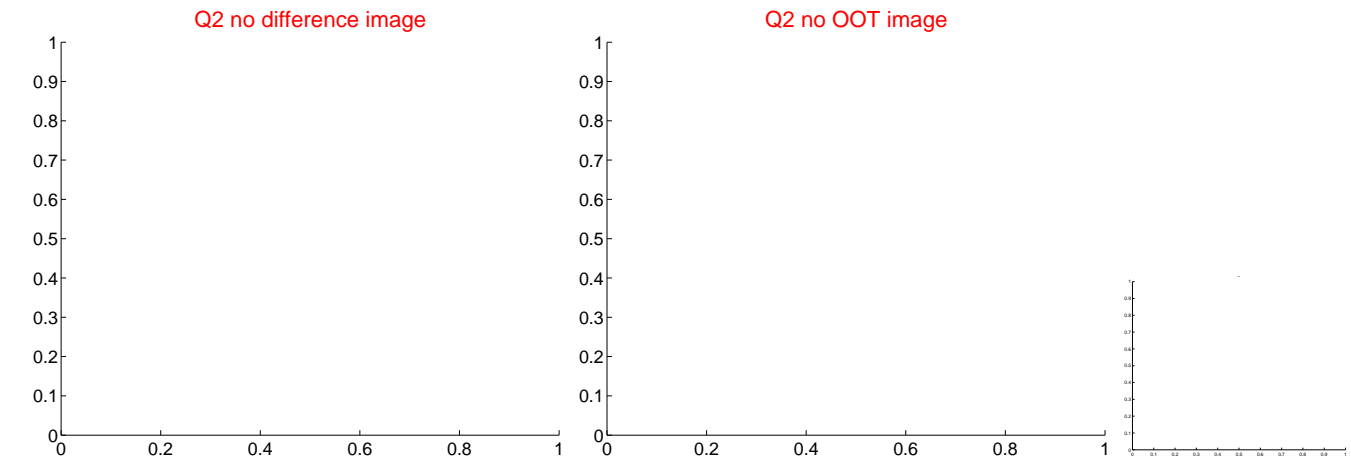
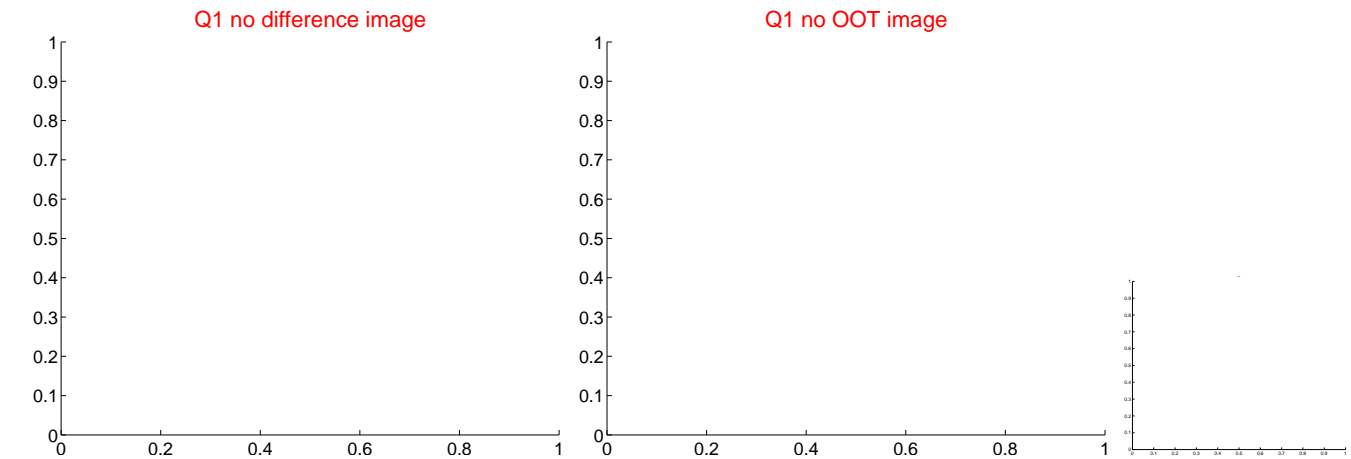
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.236 \pm 0.287$	0.82	$0.190 \pm 0.177$	$0.140 \pm 0.308$
PRF-fit source offset from KIC position	$0.378 \pm 0.286$	1.32	$0.287 \pm 0.161$	$0.245 \pm 0.398$
photometric centroid source offset	$1.52 \pm 1.26$	1.21	$-0.57 \pm 1.32$	$1.41 \pm 1.25$



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.

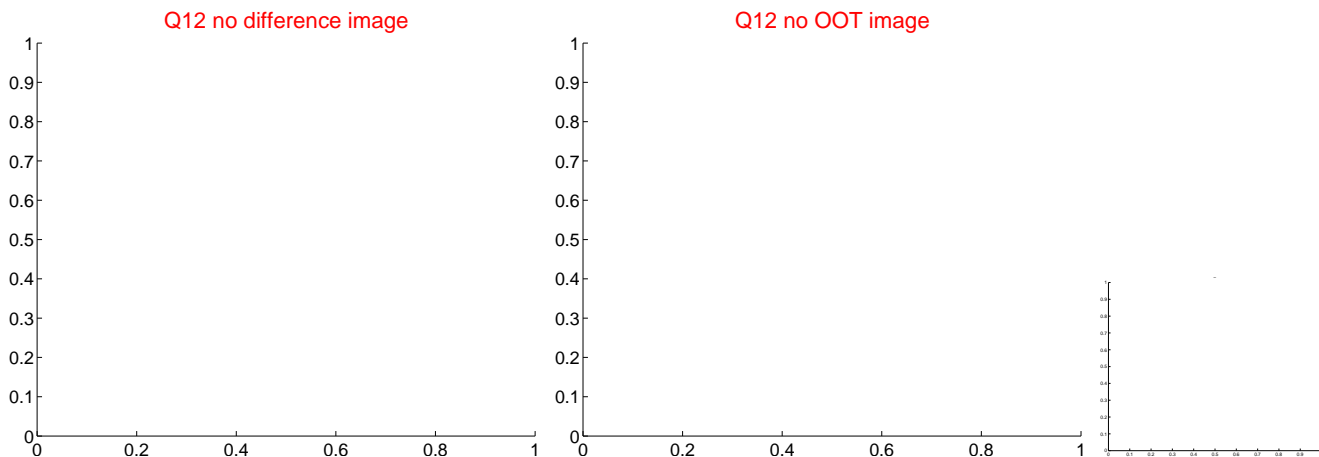
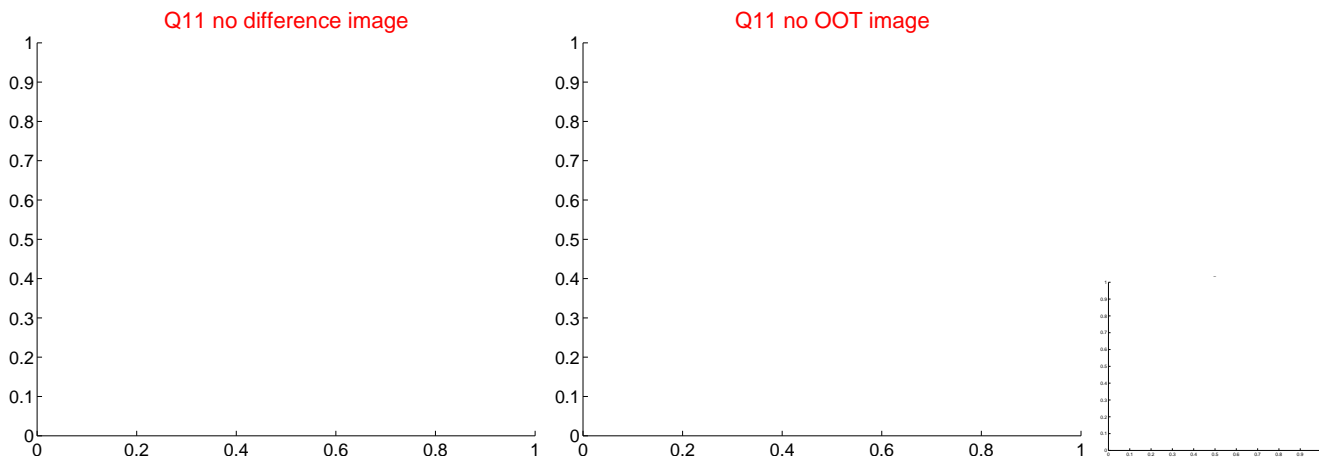
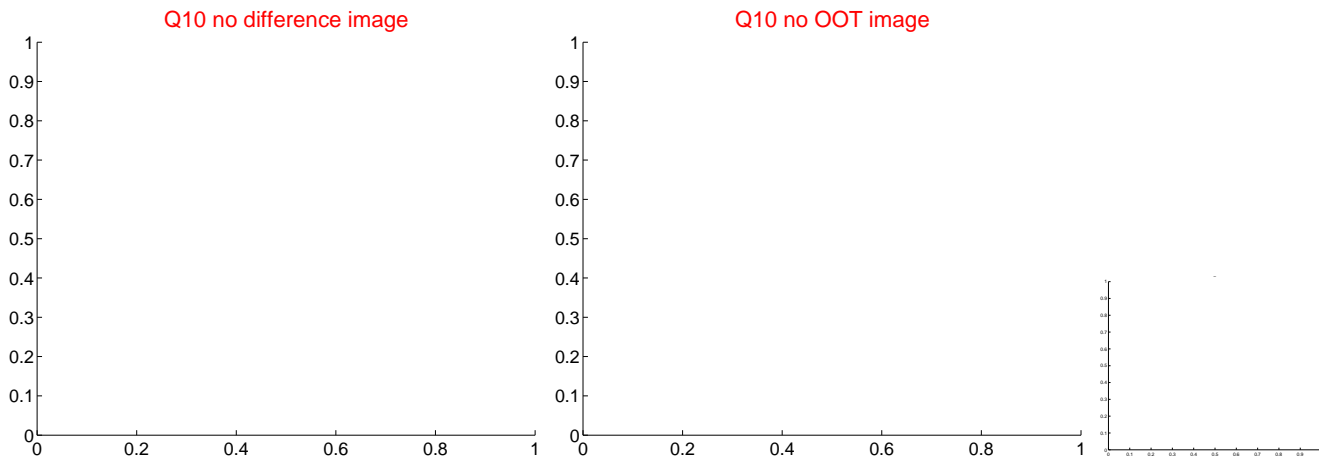
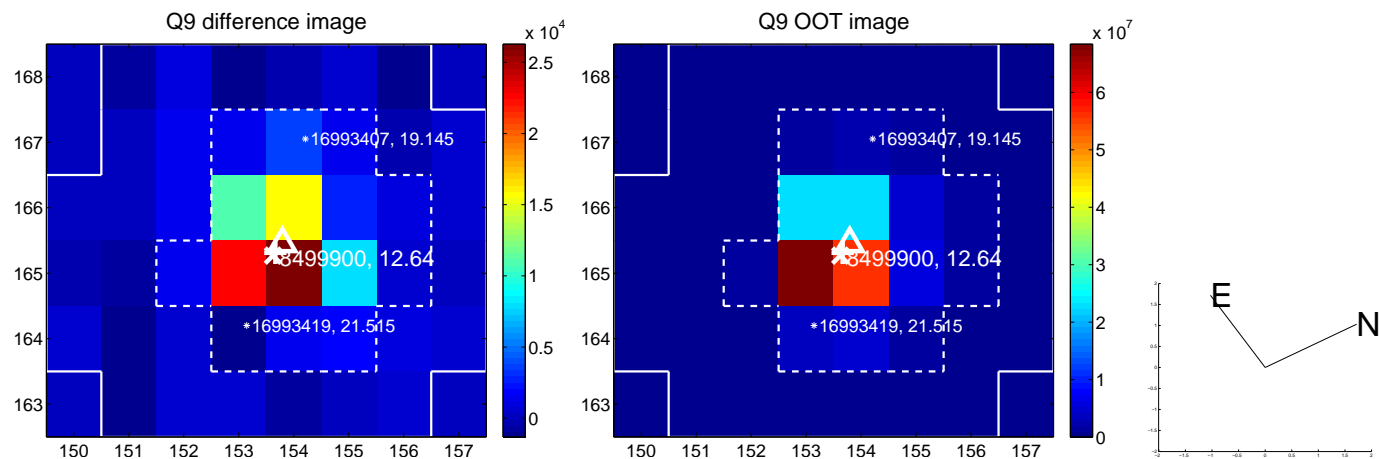




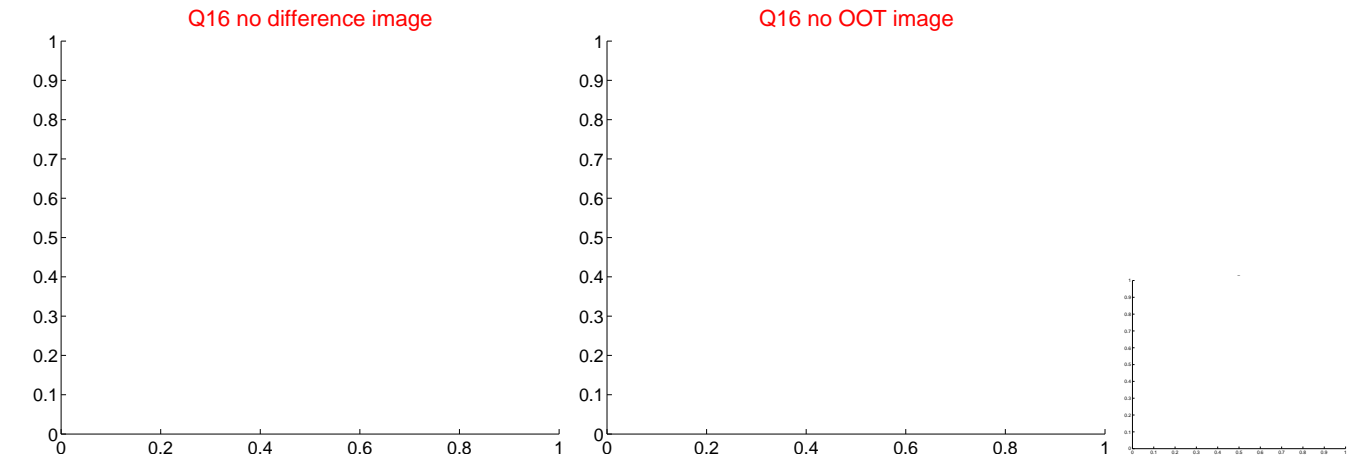
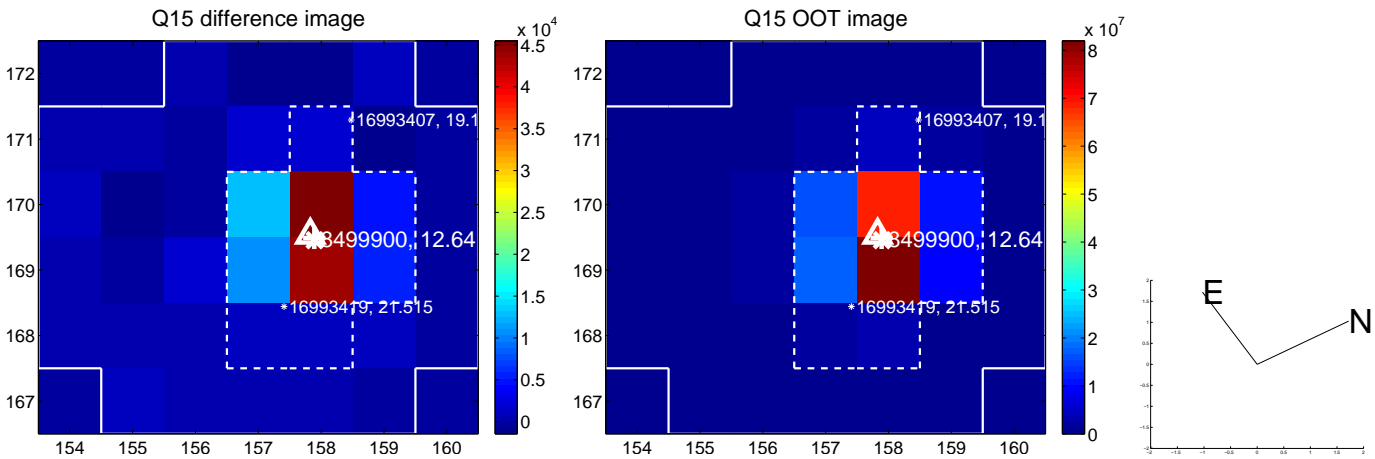
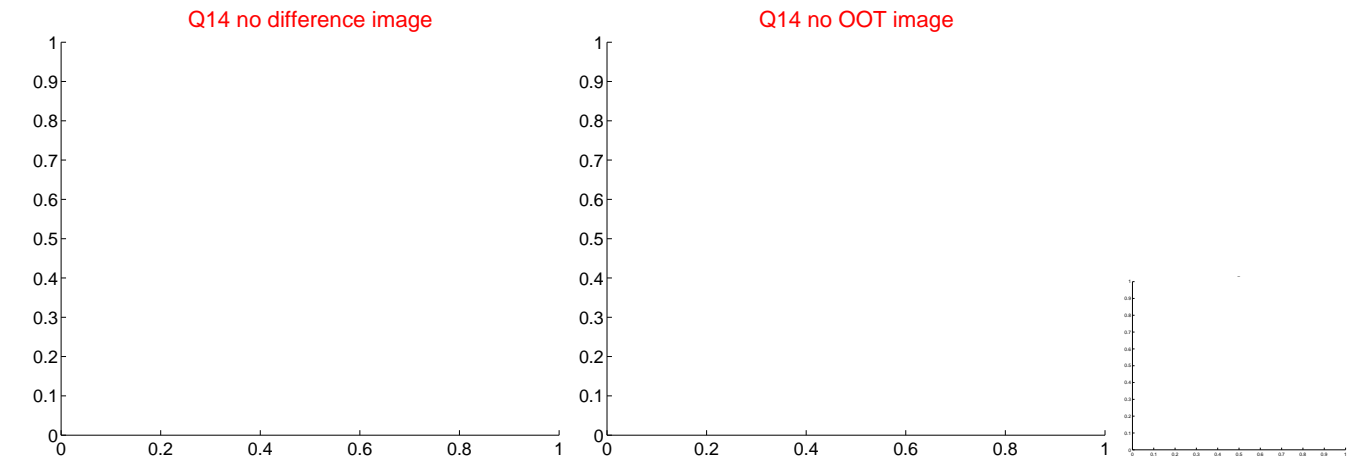
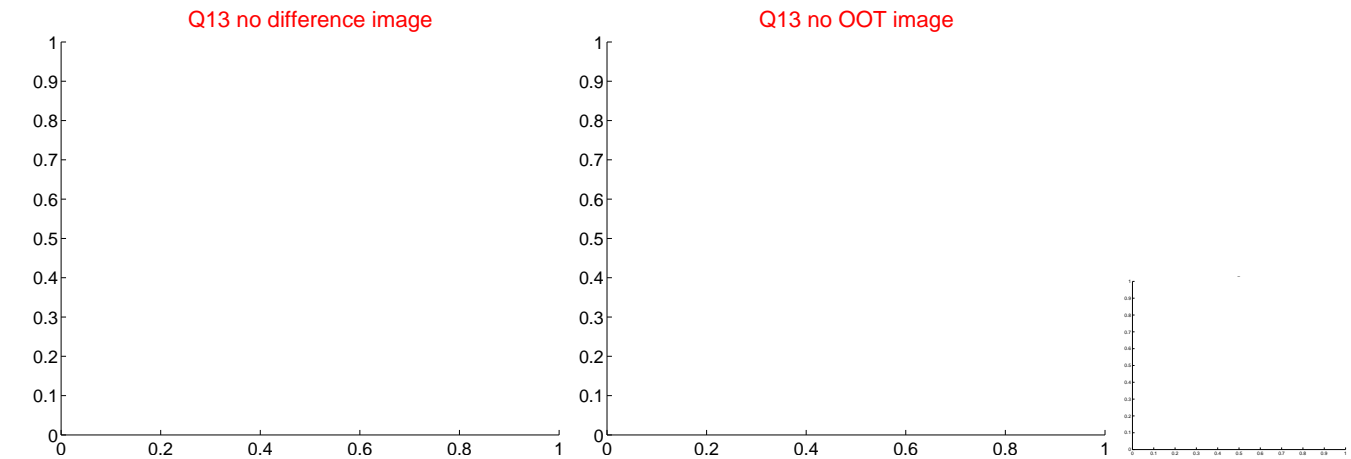
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



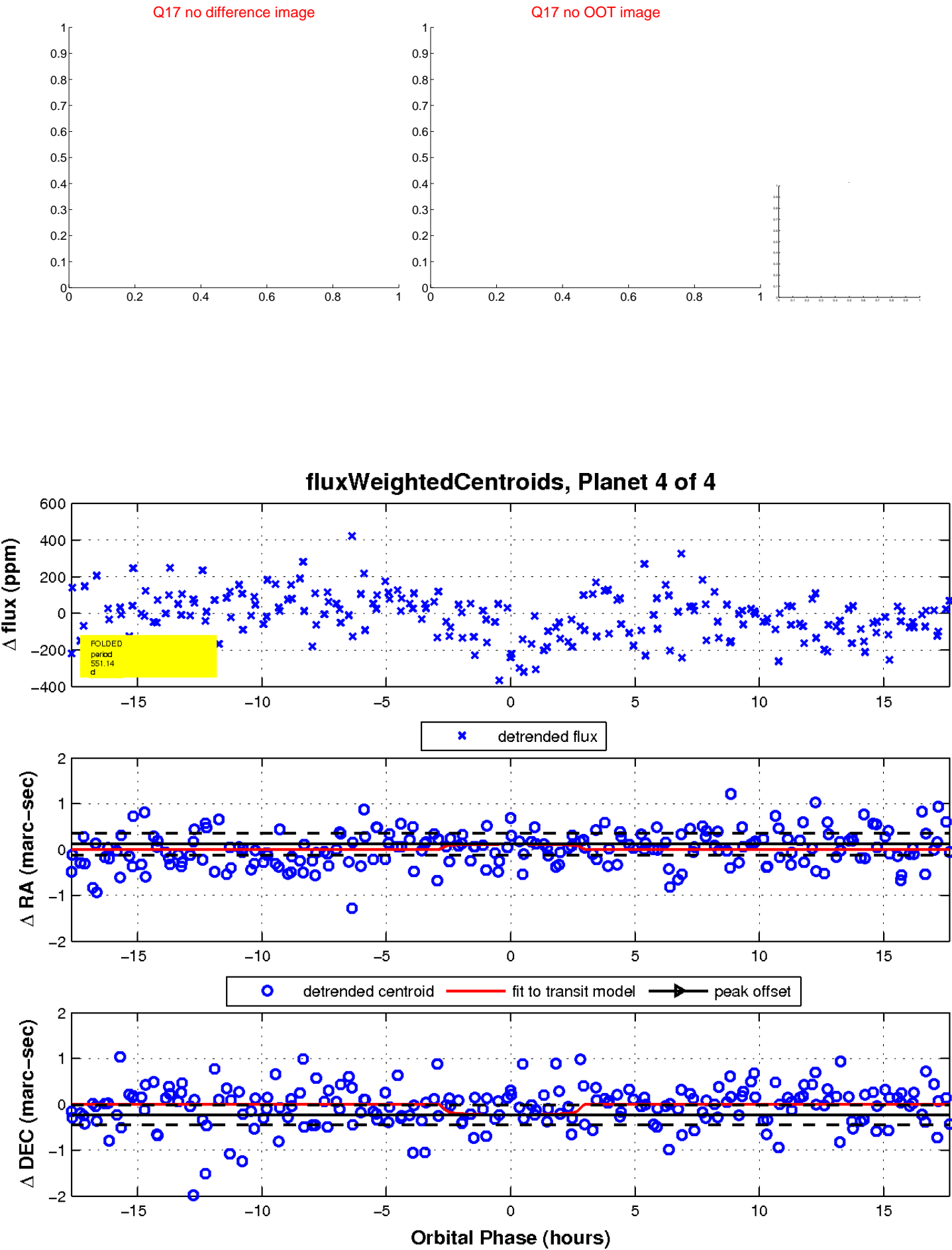
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

