

# KIC 005396950

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005396950-01	OBS	No	3.751484	133.303526	55.4	17.165	13.1	11.6	1.68	7303	1.29	2399.88
005396950-02	OBS	No	7.502751	135.928048	397.3	6.000	17.7	-1.0	1.68	7303	3.40	952.43
005396950-03	OBS	No	7.502186	135.232513	0.2	3.347	9.3	0.0	1.68	7303	0.08	952.53
005396950-04	OBS	No	2.500996	132.471041	65.3	17.348	7.8	9.4	1.68	7303	1.38	4120.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005396950-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005396950-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
005396950-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— SAME_NTL_PERIOD—CENT_FEW_DIFFS
005396950-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS—HALO_GHOST

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

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

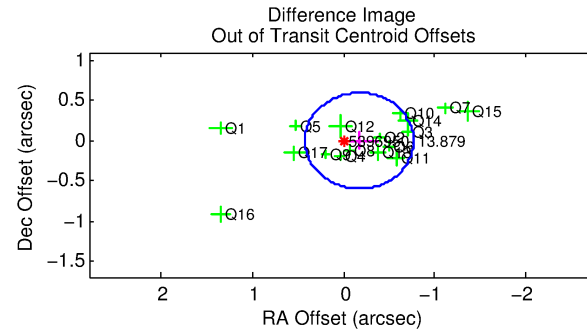
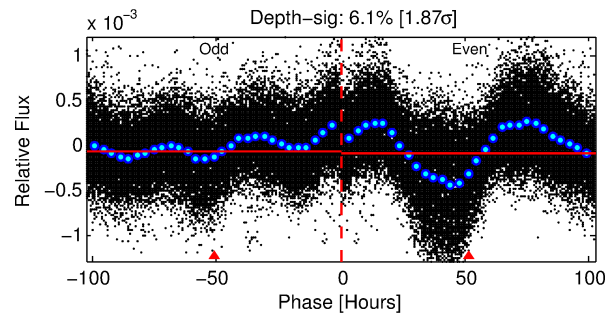
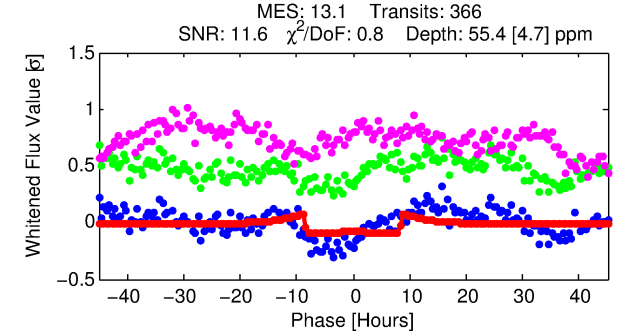
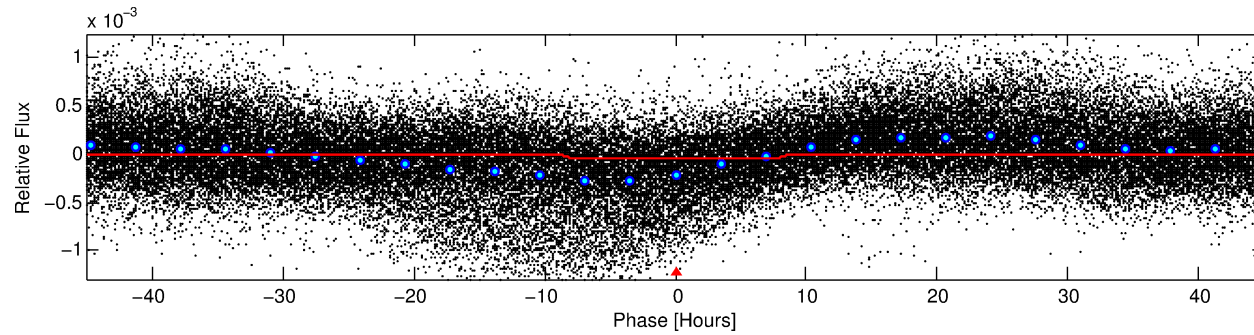
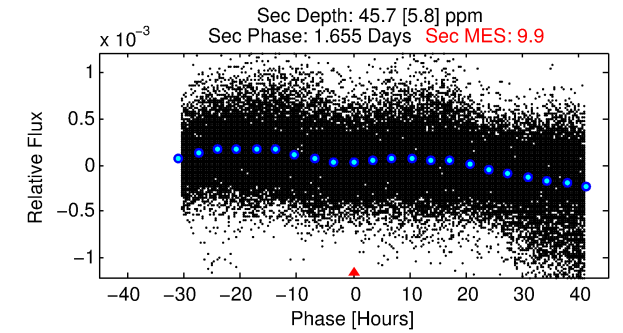
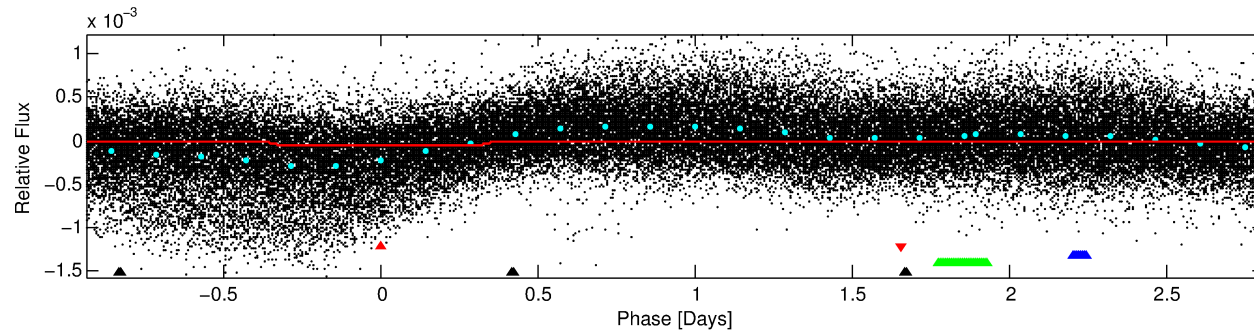
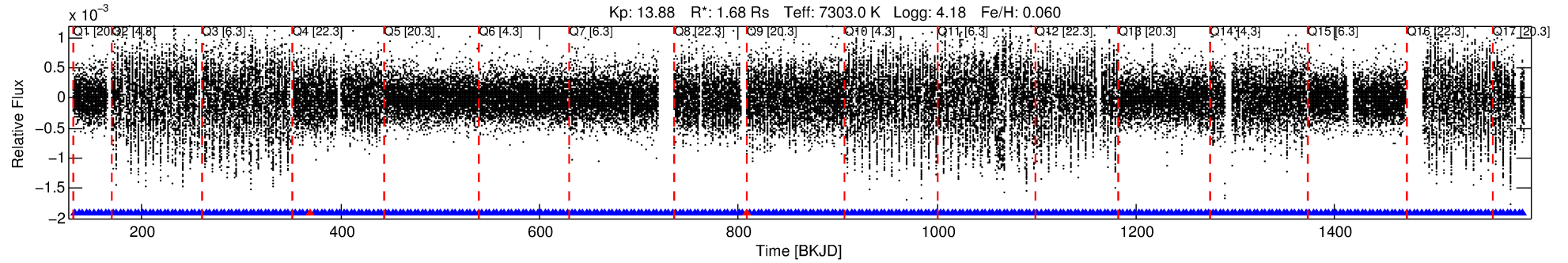
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005396950-01

No Significant Match Found

# DV One-Page Summary

KIC: 5396950 Candidate: 1 of 4 Period: 3.751 d



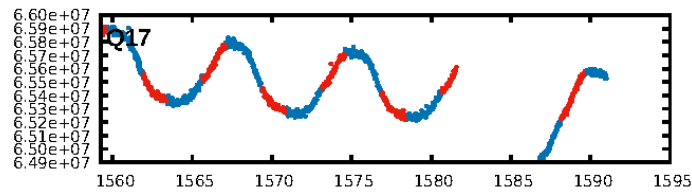
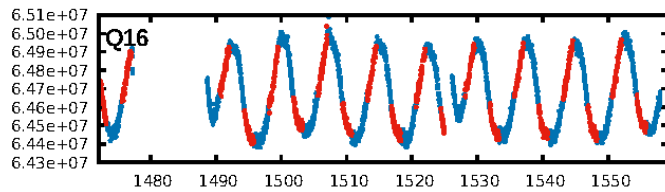
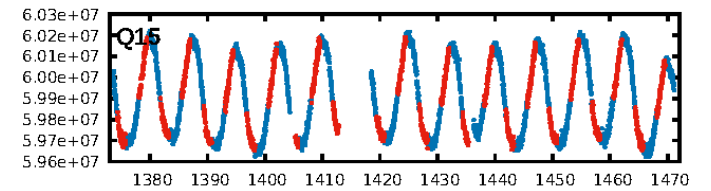
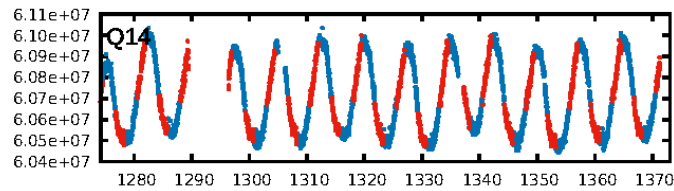
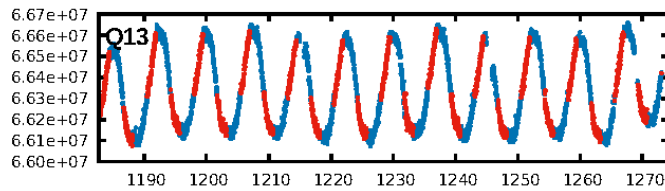
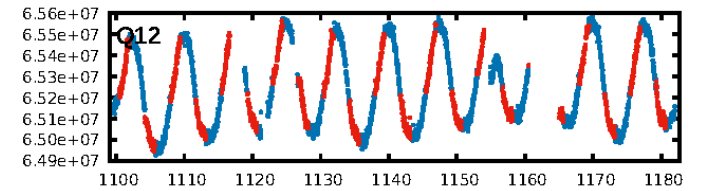
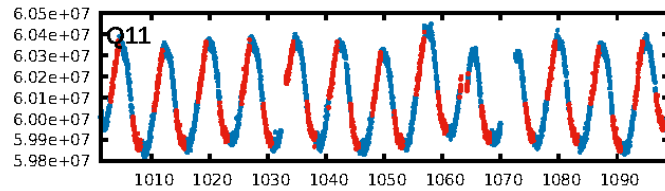
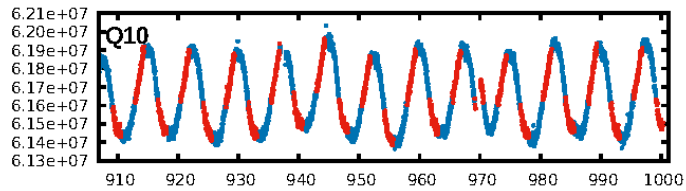
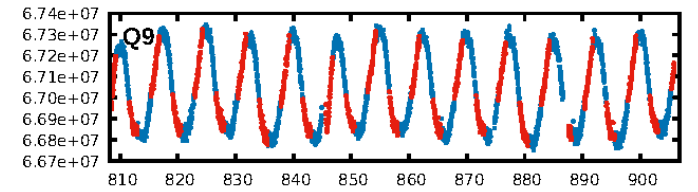
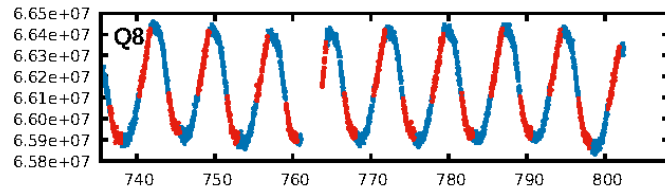
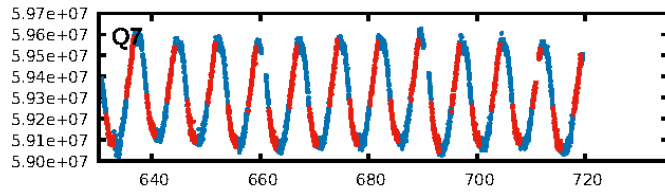
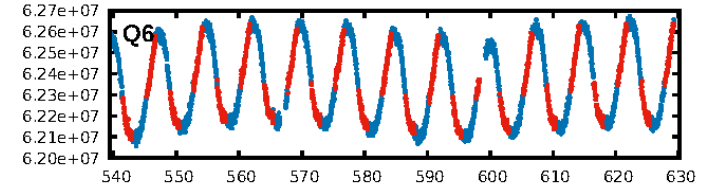
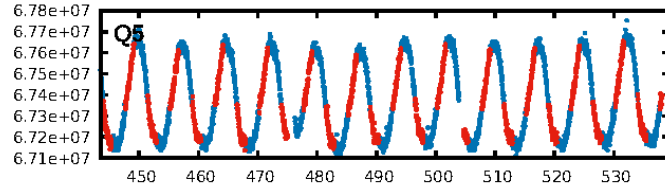
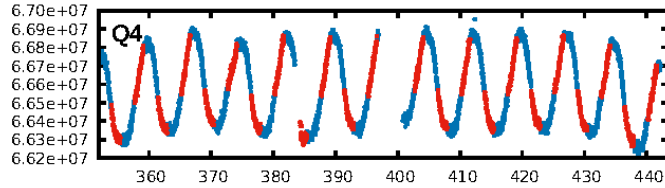
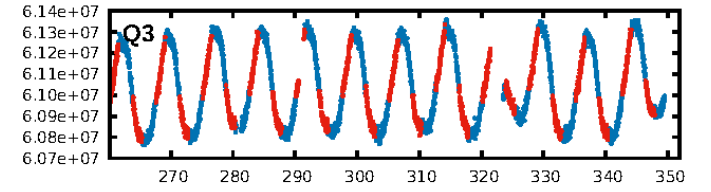
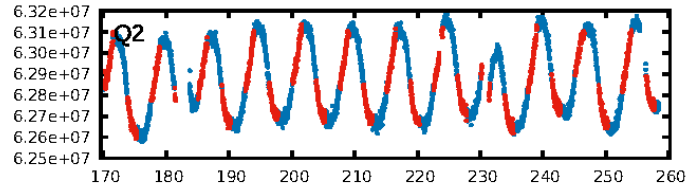
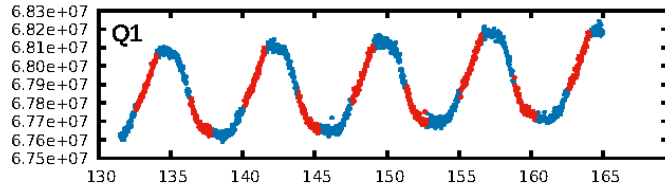
## DV Fit Results:

Period = 3.75148 [0.00004] d  
Epoch = 133.3035 [0.0067] BKJD  
Rp/R\* = 0.0070 [0.0023]  
a/R\* = 1.66 [2.13]  
b = 0.45 [3.58]  
Seff = 2399.88 [998.29]  
Teff = 1785 [186] K  
Rp = 1.29 [0.62] Re  
a = 0.0549 [0.0151] AU  
Ag = 45.24 [35.06] [1.26σ]  
Teffp = 7157 [1251] K [4.25σ]

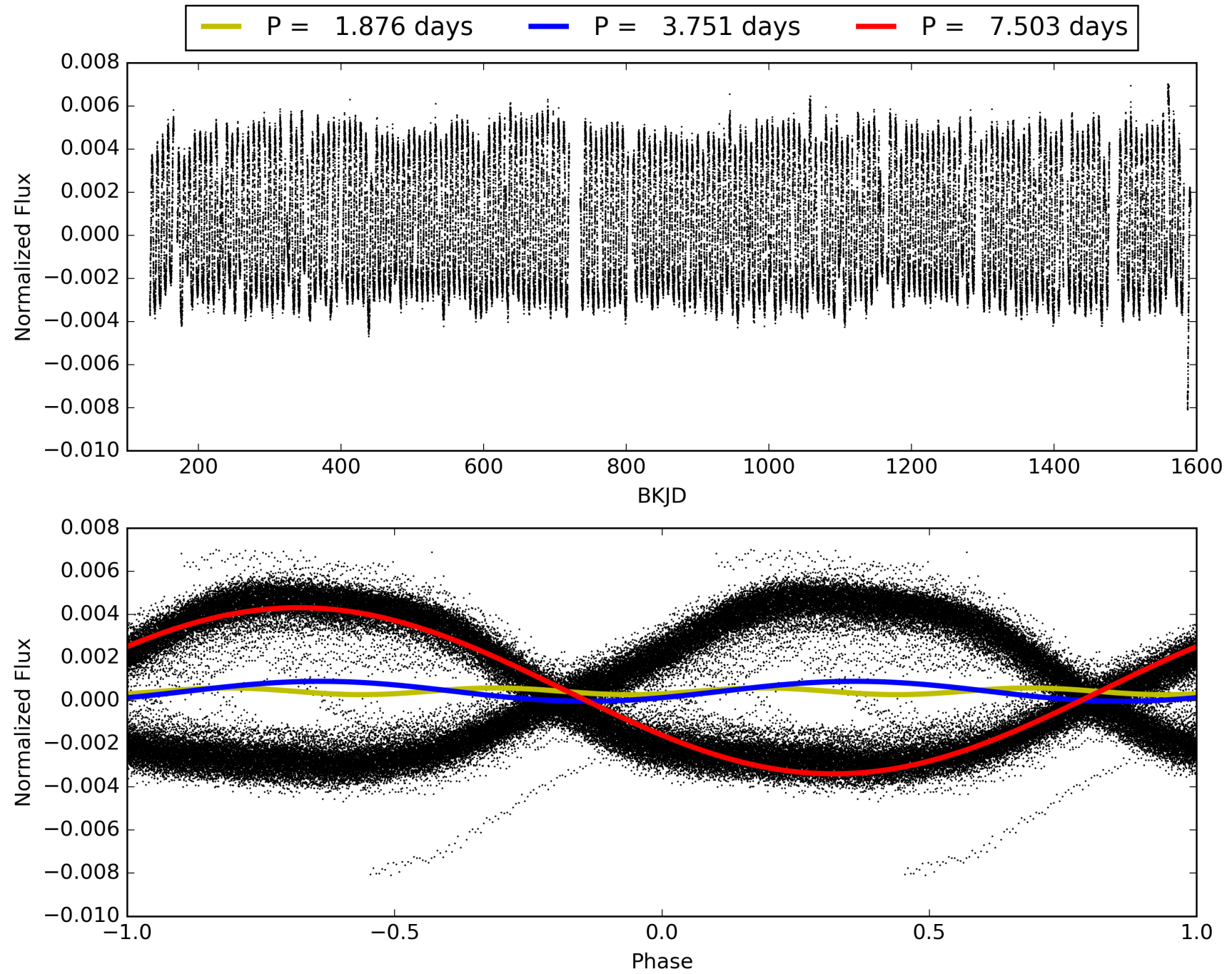
## DV Diagnostic Results:

ShortPeriod-sig: 78.1% [1.23σ]  
LongPeriod-sig: 100.0% [5.15σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [348/350]  
GhostDiagnostic-chr: 0.7397  
Centroid-sig: 18.5%  
Centroid-so: 1.435 arcsec [1.64σ]  
OotOffset-rm: 0.172 arcsec [0.86σ]  
KicOffset-rm: 0.158 arcsec [0.87σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 005396950-01, PDC Light Curves



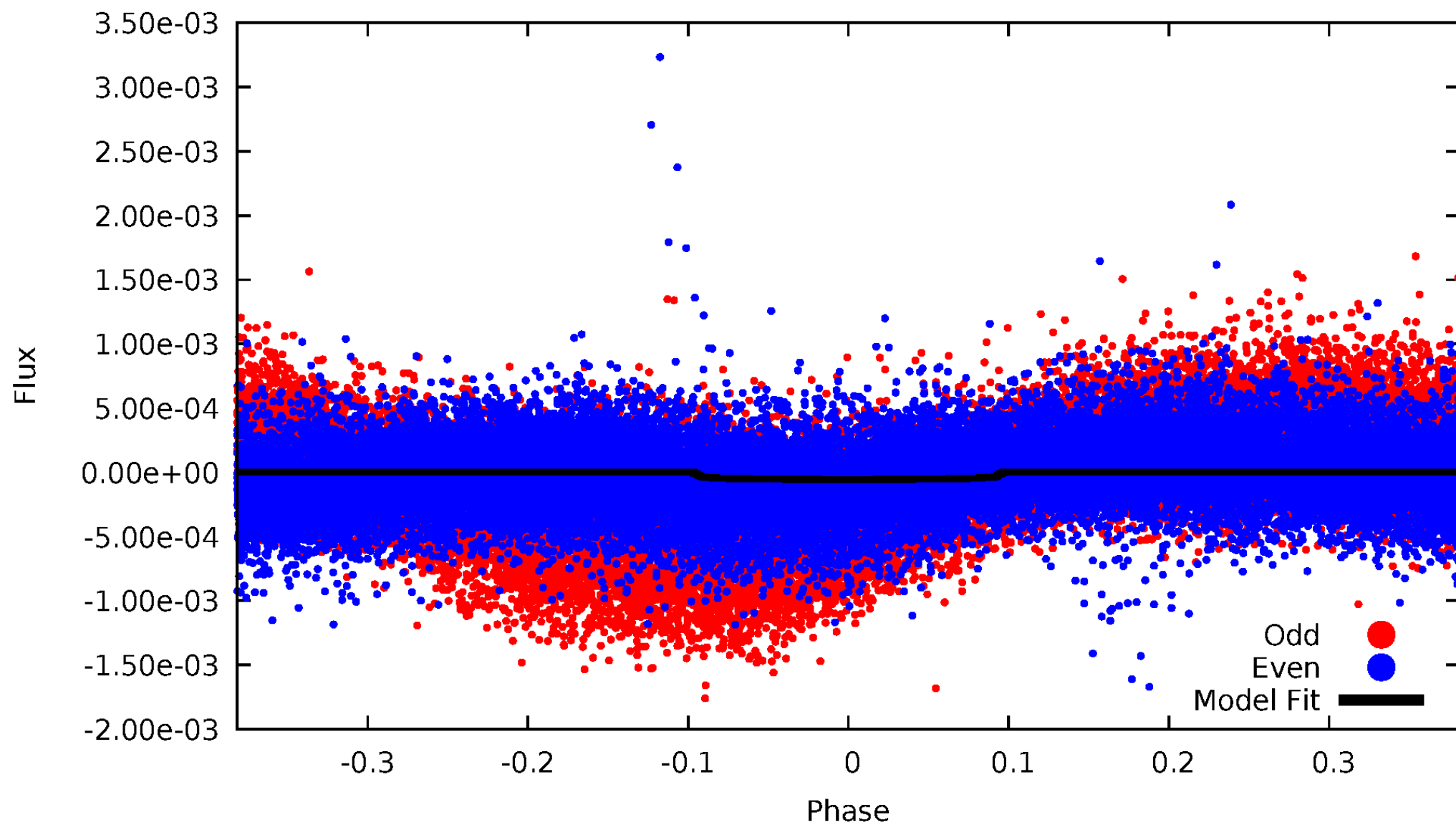
TCE 005396950-01





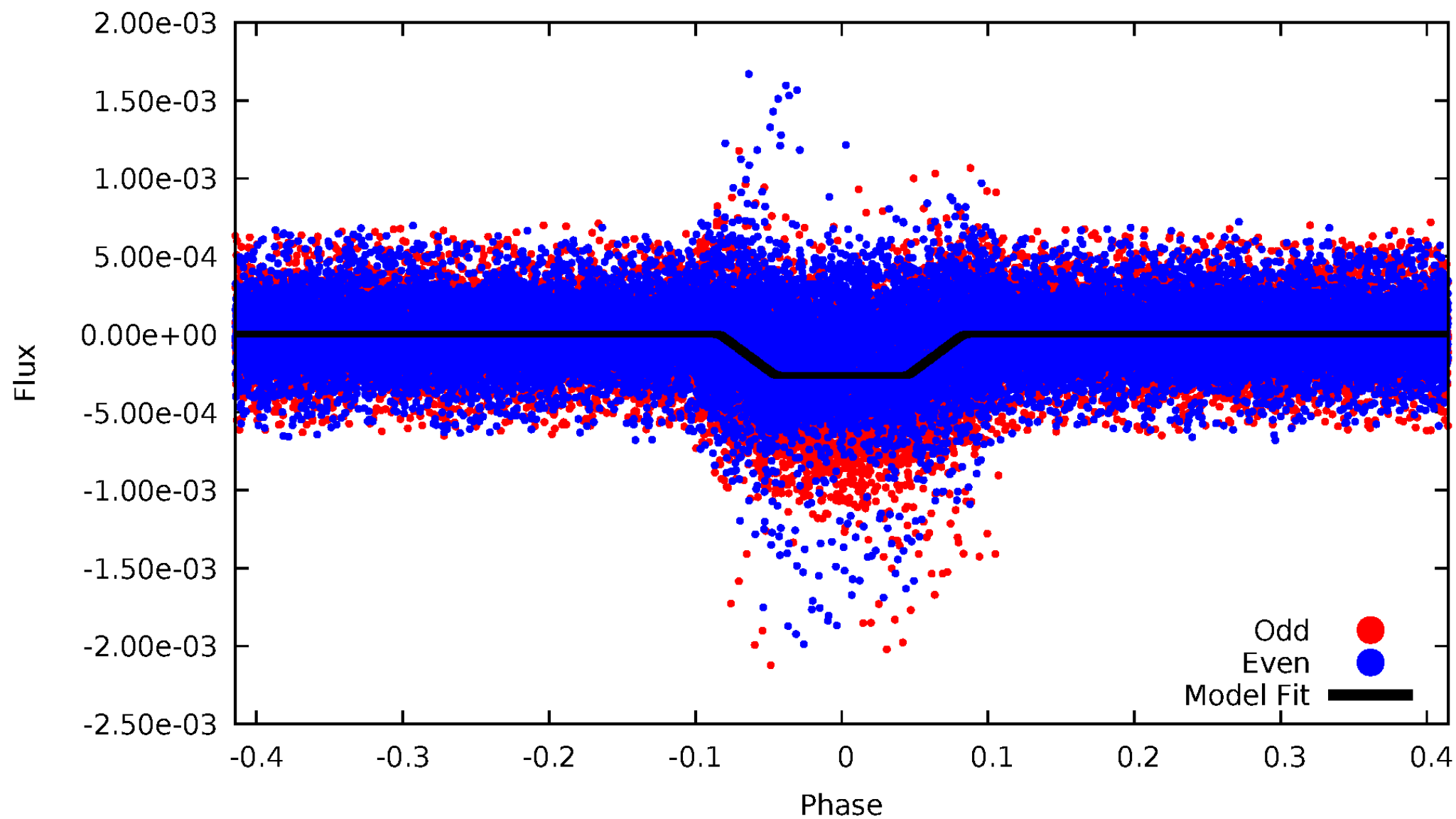
# DV Odd/Even

TCE 005396950-01



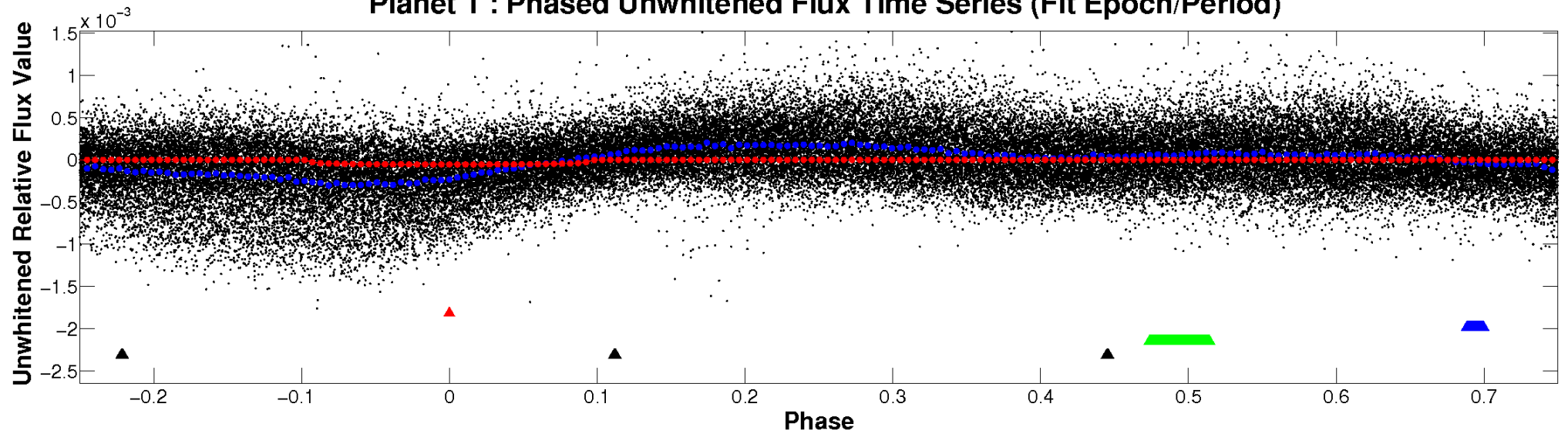
# ALT Odd/Even

TCE 005396950-01

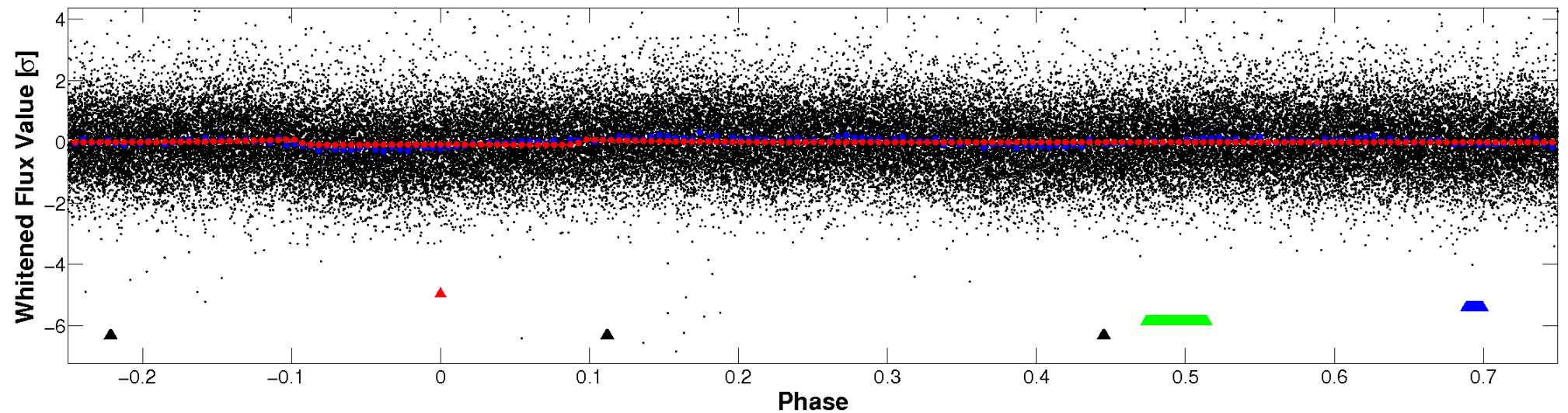


# Non-Whitened Vs. Whitened Light Curve

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

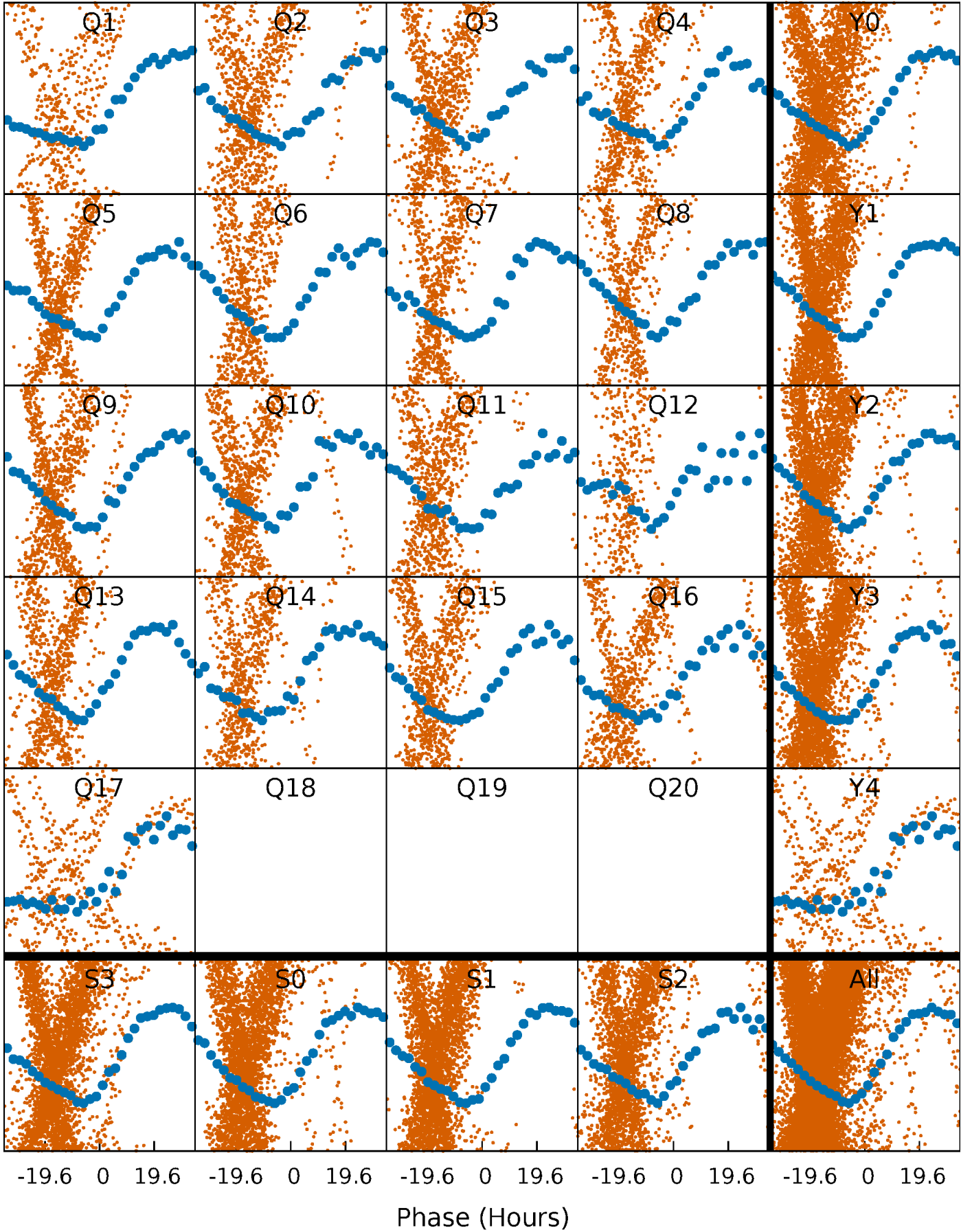


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

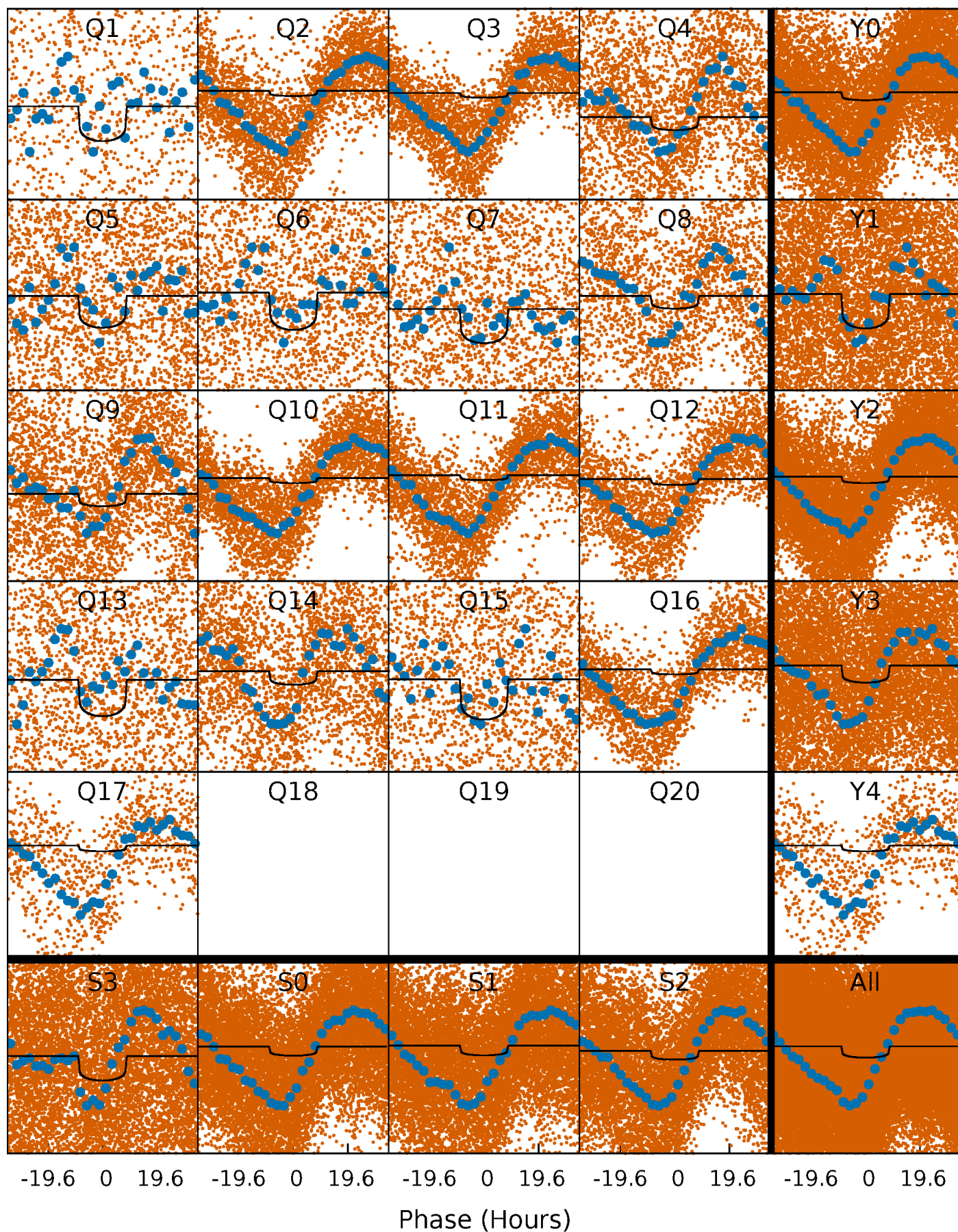
TCE 005396950-01   P= 3.751484 Days    $T_0=133.303526$  (BKJD)





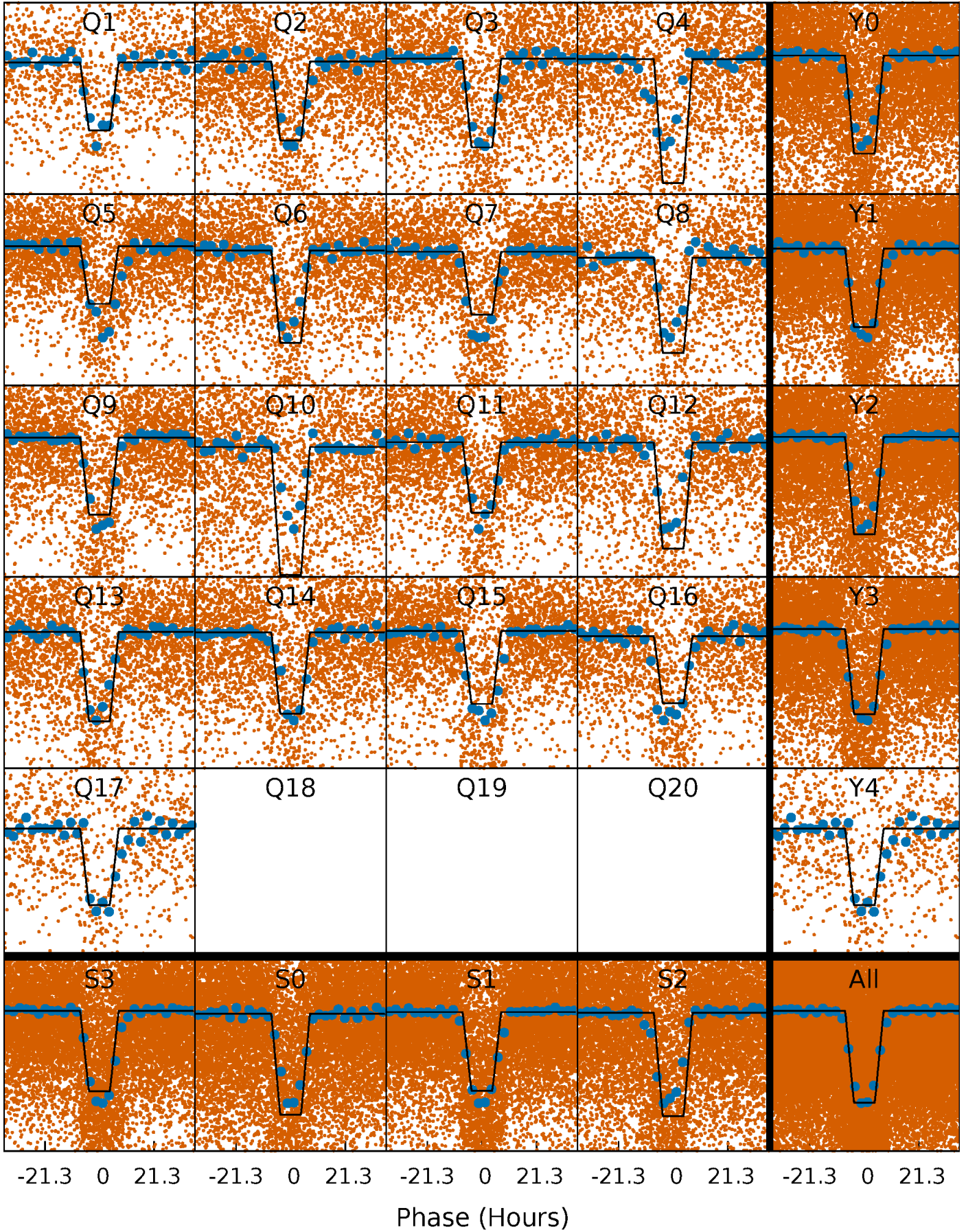
# DV Quarter-Phased Transit Curves

TCE 005396950-01 P= 3.751484 Days  $T_0=133.303526$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005396950-01 P= 3.751325 Days  $T_0=133.173425$  (BKJD)

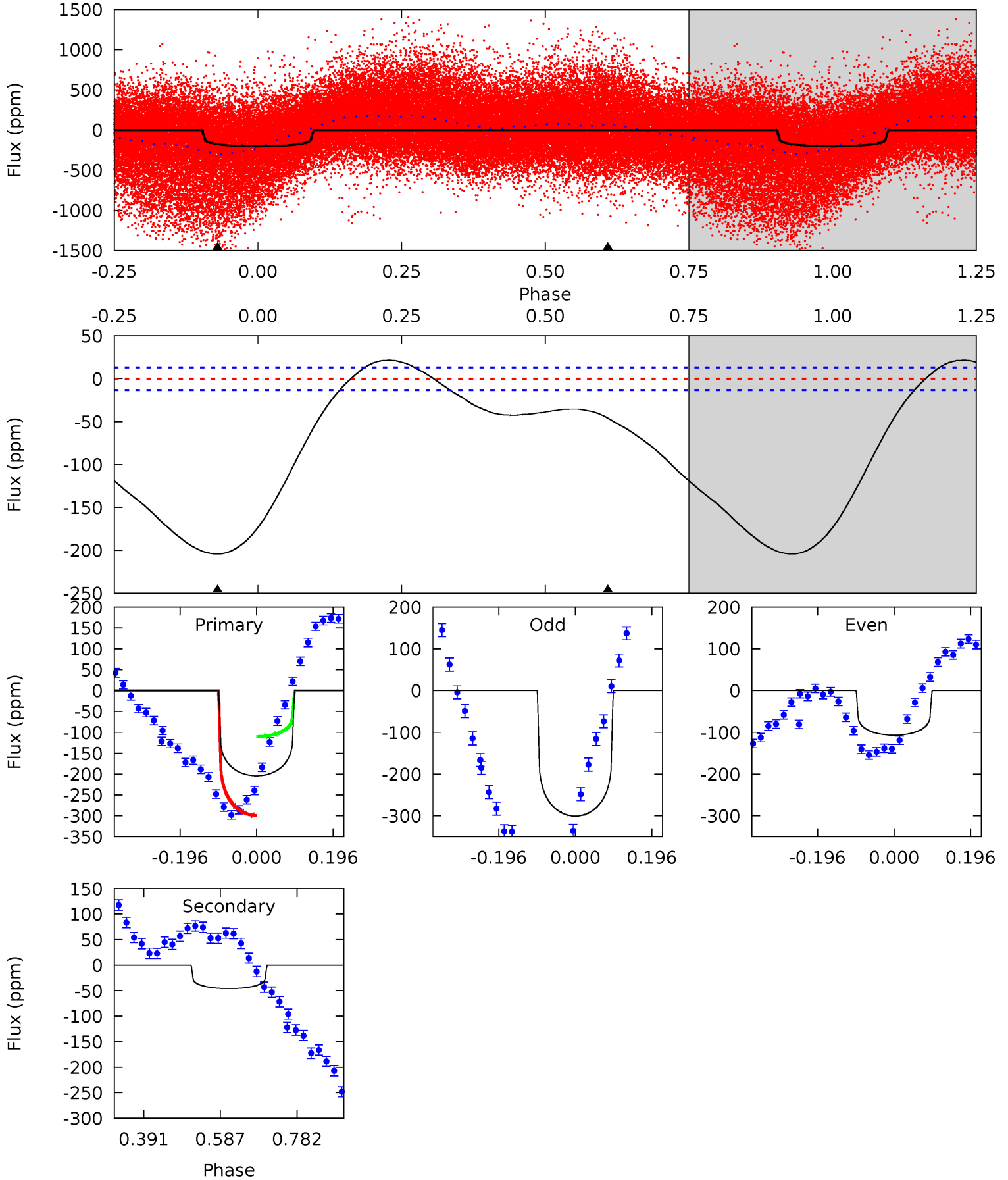




# DV Model-Shift Uniqueness Test

005396950-01, P = 3.751484 Days, E = 129.552042 Days

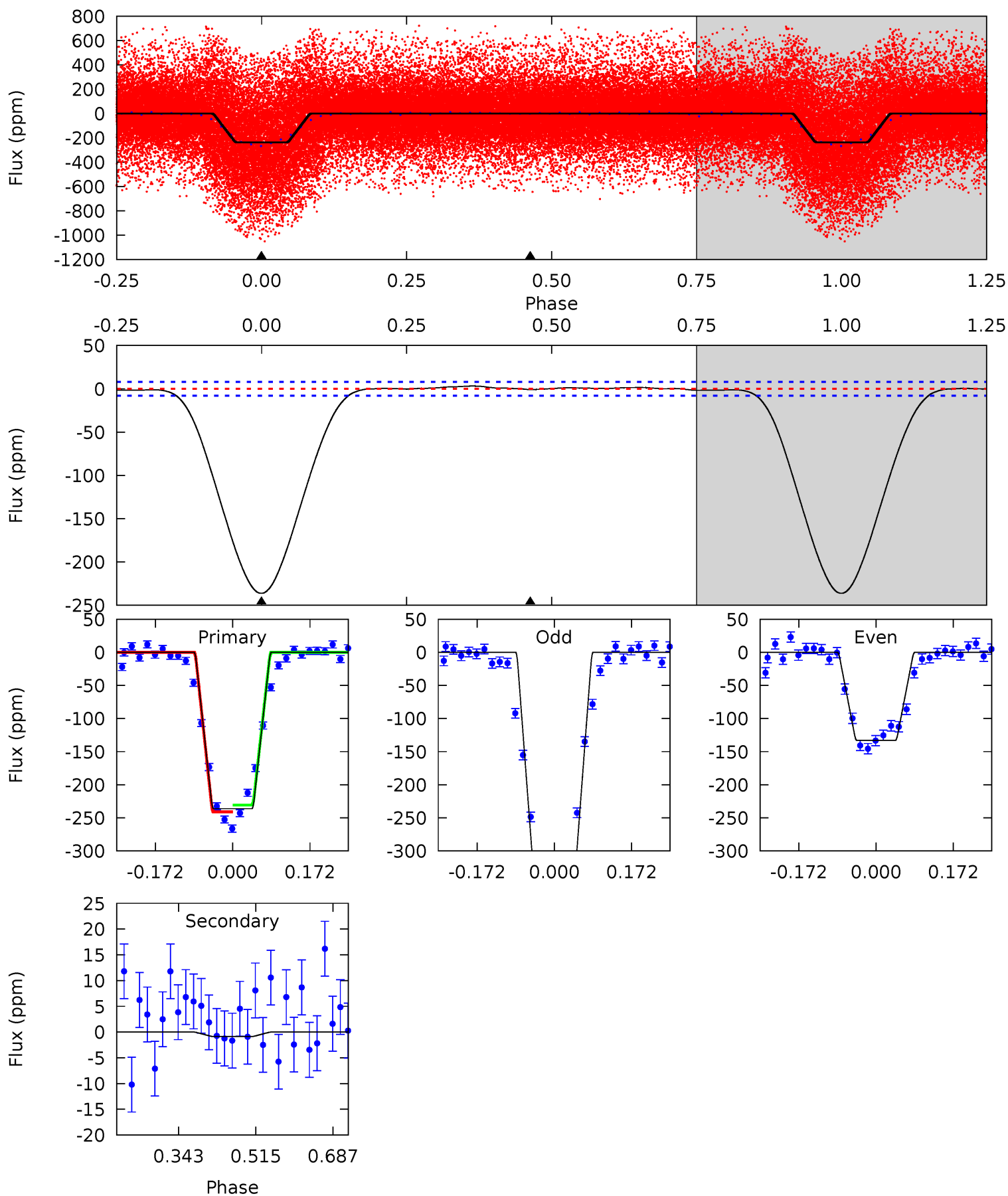
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.4	15.4	0	0	4.42	1.29	6.60	68.4	68.4	15.4	15.4	35.4	1.76	0.10	32.5



# Alt Model-Shift Uniqueness Test

005396950-01, P = 3.751325 Days, E = 129.422100 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
133.3	0.49	0	0	4.45	1.37	0.54	133.3	133.3	0.49	0.49	58.9	1.07	0.01	2.88





### Stellar Parameters For KIC 005396950

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7303^{+203}_{-319}$	$4.180^{+0.090}_{-0.195}$	$0.060^{+0.200}_{-0.350}$	$1.684^{+0.581}_{-0.249}$	$1.563^{+0.211}_{-0.232}$	$0.461^{+0.230}_{-0.245}$
	+3%/-4%	+2%/-5%	+333%/-583%	+35%/-15%	+13%/-15%	+50%/-53%
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 005396950-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-46 \pm 3$	$1.32^{+0.47}_{-0.44}$	$2508^{+190}_{-141}$	$7114^{+1903}_{-1090}$	$43^{+54}_{-20}$
Alt.	$-1 \pm 2$	$3.08^{+0.71}_{-0.57}$	$2522^{+206}_{-163}$	$-2617^{+5189}_{-383}$	$0.116^{+0.340}_{-0.281}$

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

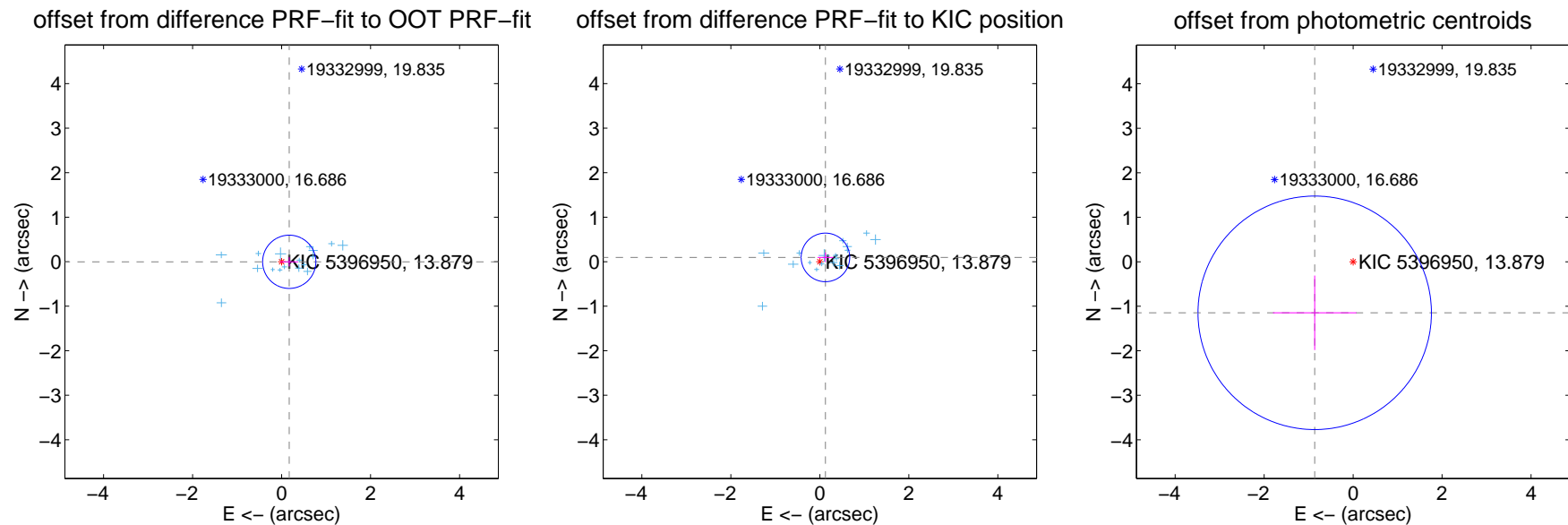
## DV Centroid Data

Supplemental centroid analysis for 005396950-01. Kepler magnitude: 13.88. Transit SNR 11.62

There are 17 quarters with good PRF difference image offsets

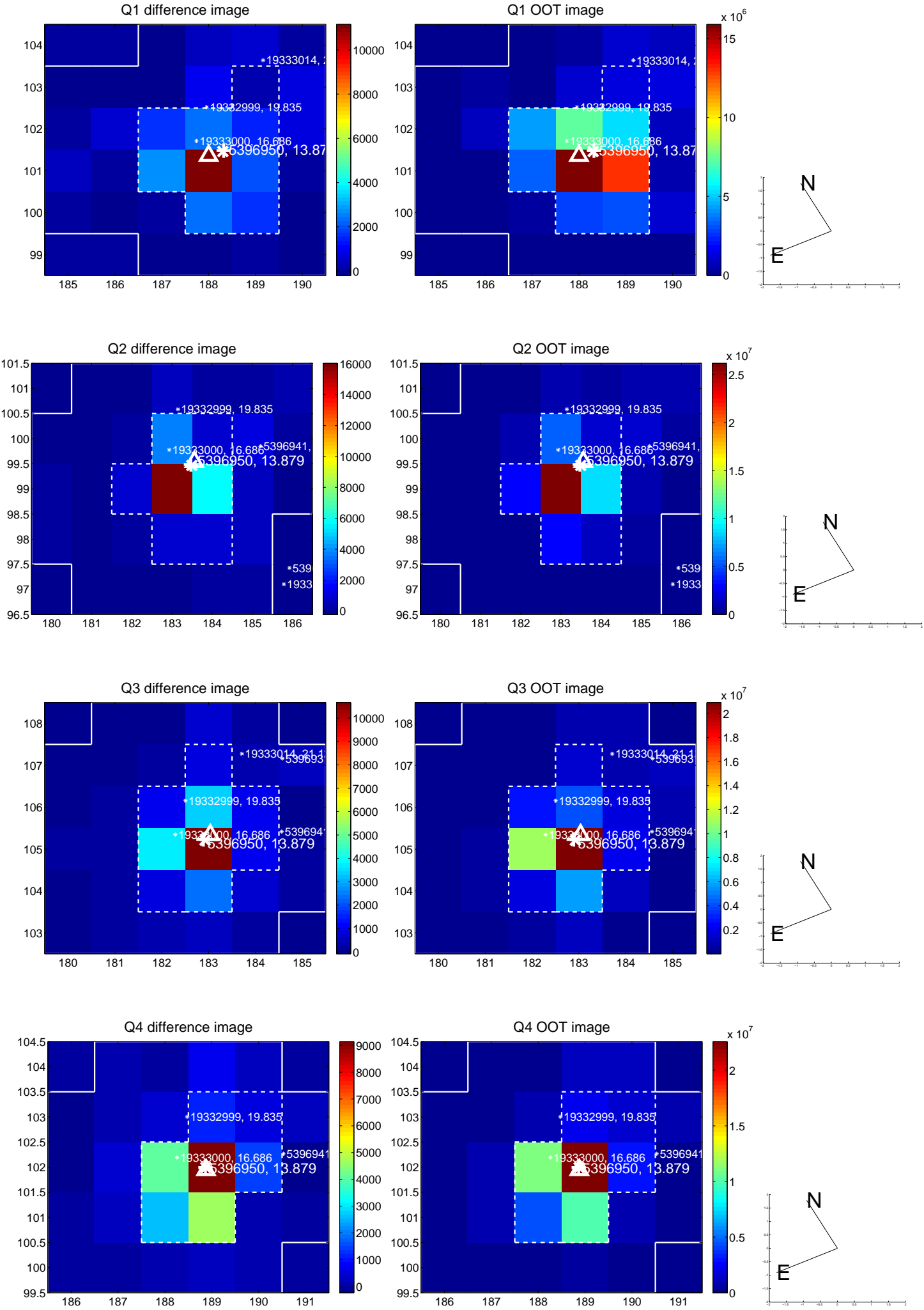
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.172 \pm 0.199$	0.86	$-0.172 \pm 0.200$	$-0.002 \pm 0.102$
PRF-fit source offset from KIC position	$0.158 \pm 0.182$	0.87	$-0.126 \pm 0.177$	$0.096 \pm 0.108$
photometric centroid source offset	$1.44 \pm 0.87$	1.64	$0.86 \pm 0.94$	$-1.15 \pm 0.84$

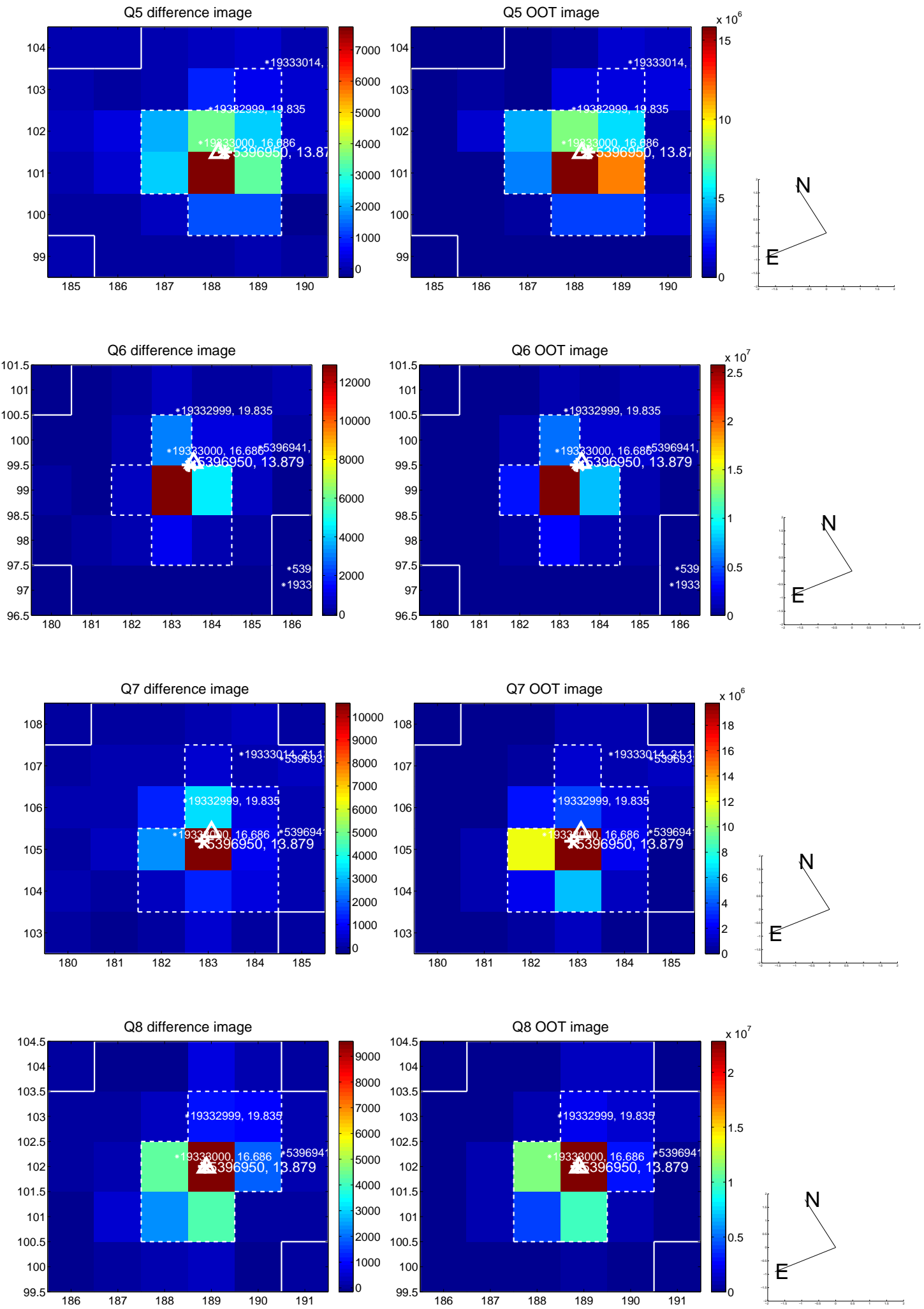


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

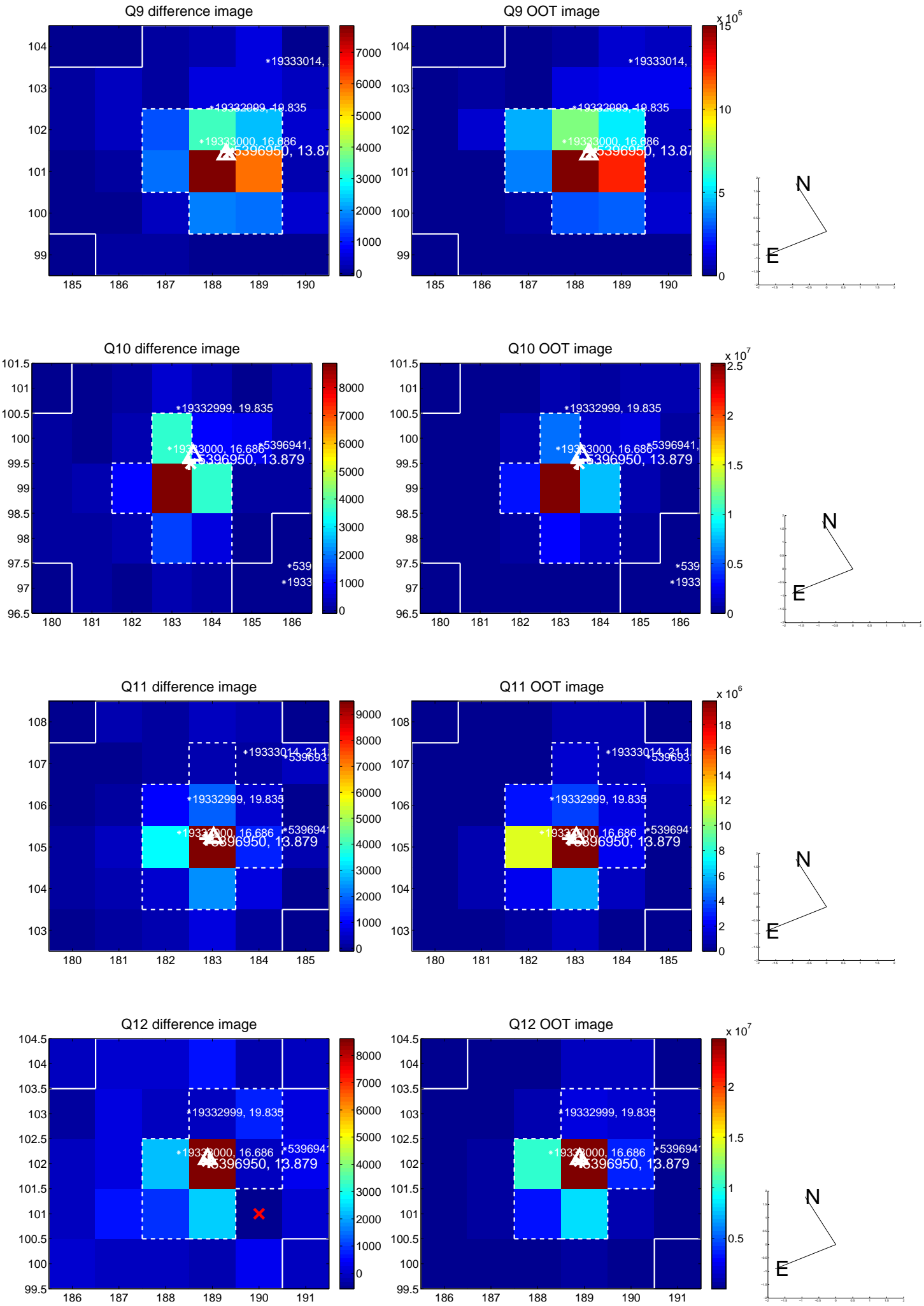


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

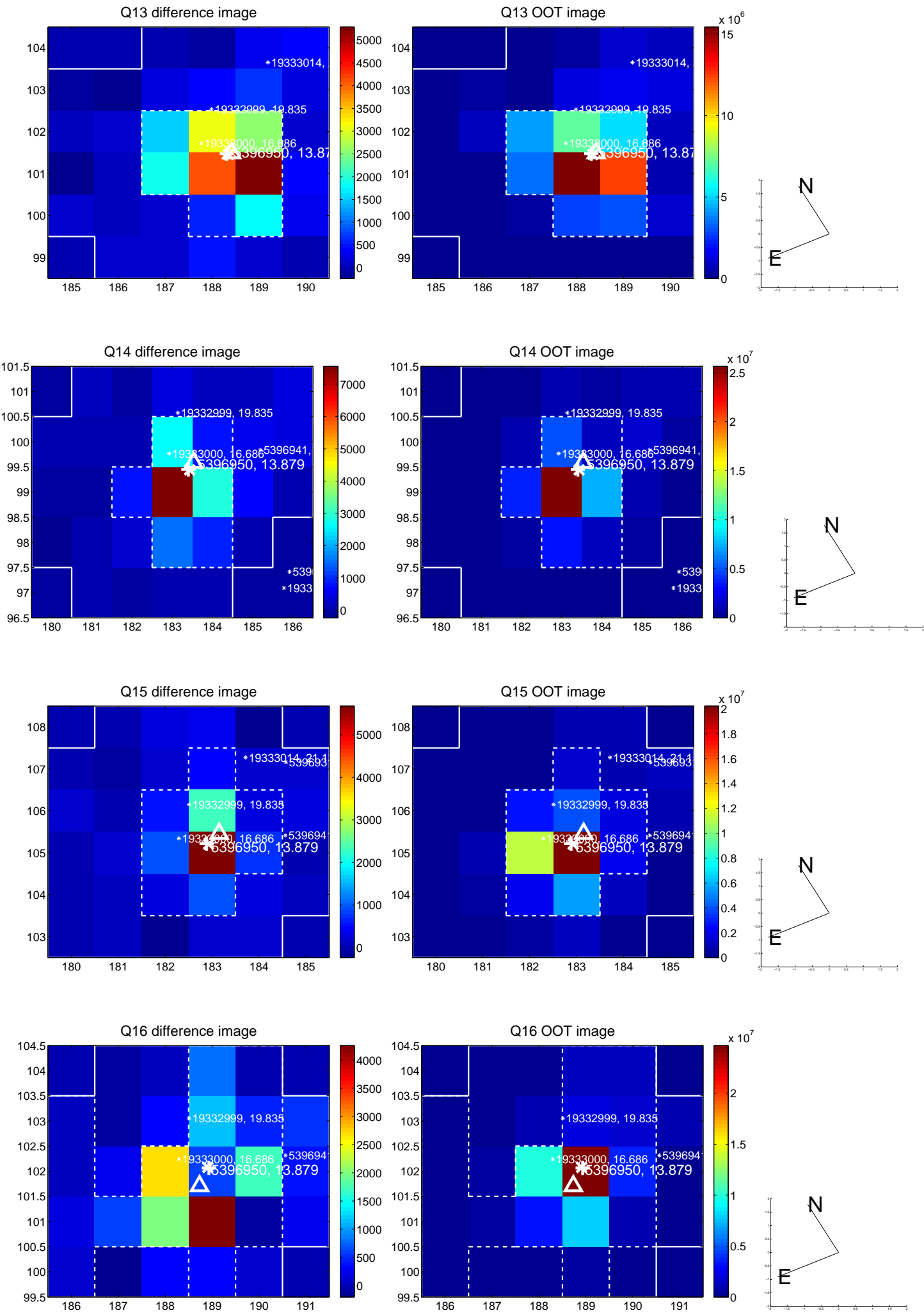




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



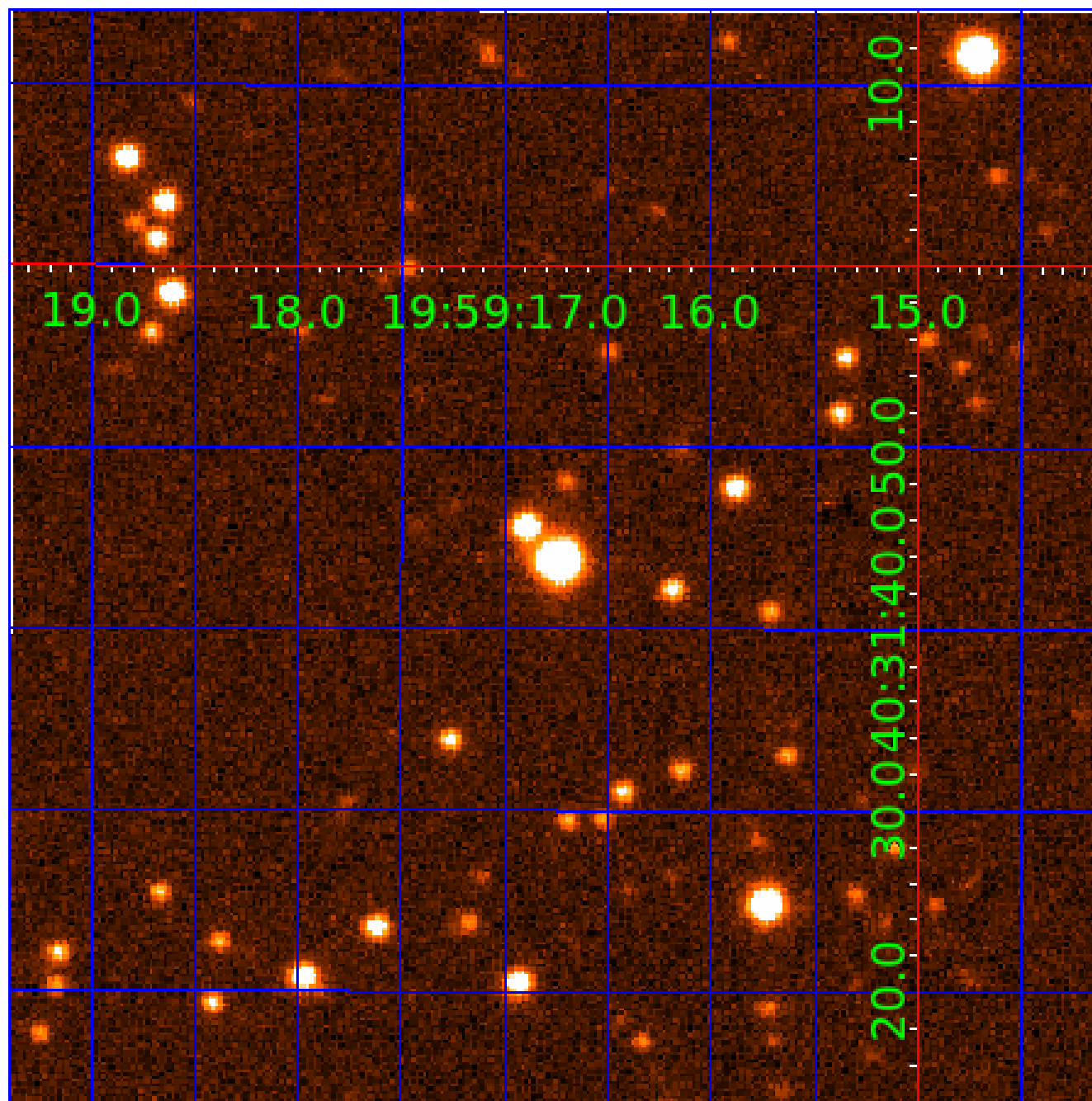
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination





# KIC 005396950

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005396950-01	OBS	No	3.751484	133.303526	55.4	17.165	13.1	11.6	1.68	7303	1.29	2399.88
005396950-02	OBS	No	7.502751	135.928048	397.3	6.000	17.7	-1.0	1.68	7303	3.40	952.43
005396950-03	OBS	No	7.502186	135.232513	0.2	3.347	9.3	0.0	1.68	7303	0.08	952.53
005396950-04	OBS	No	2.500996	132.471041	65.3	17.348	7.8	9.4	1.68	7303	1.38	4120.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005396950-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005396950-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
005396950-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— SAME_NTL_PERIOD—CENT_FEW_DIFFS
005396950-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS—HALO_GHOST

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

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

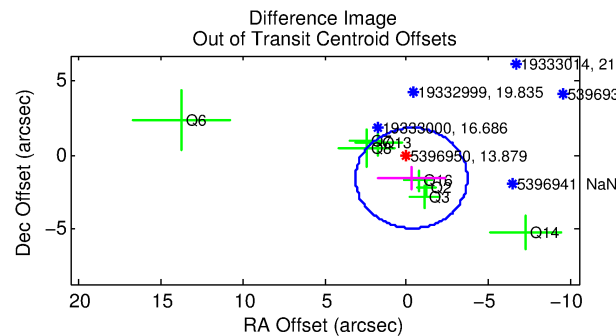
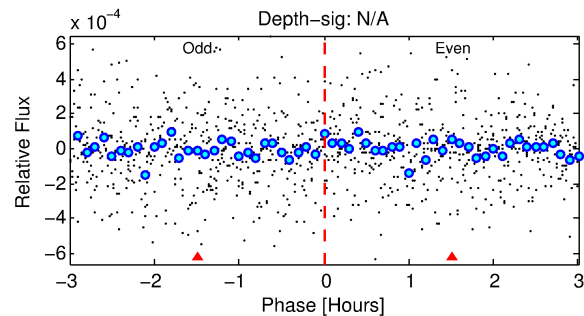
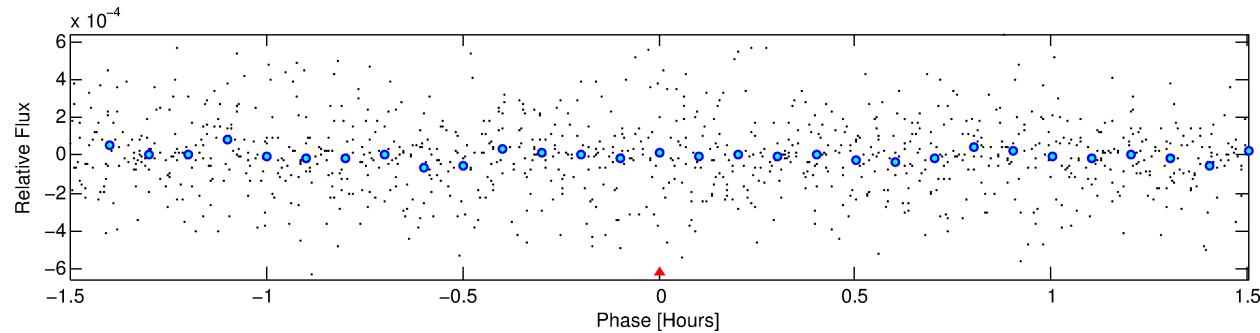
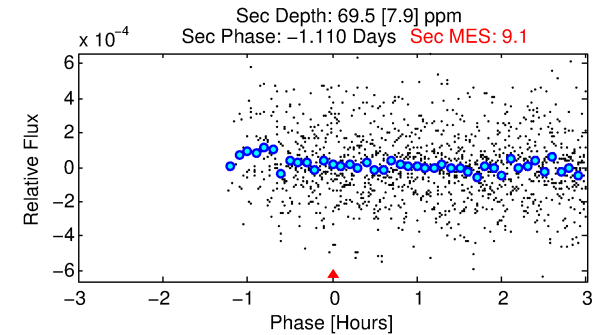
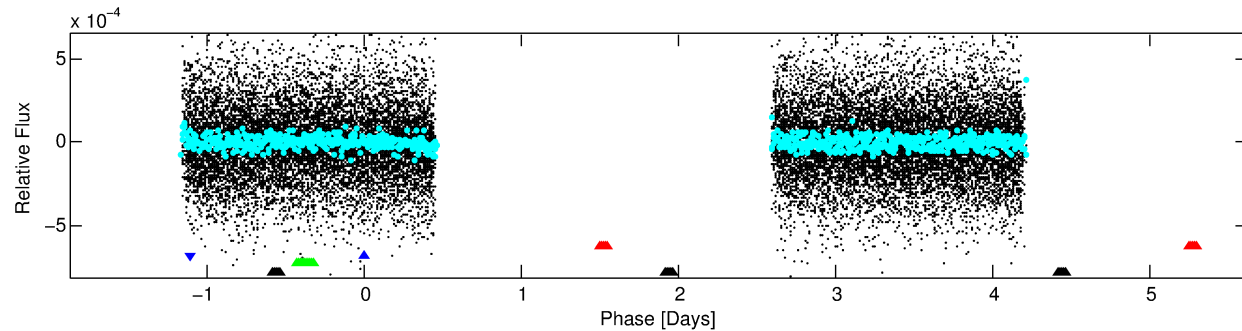
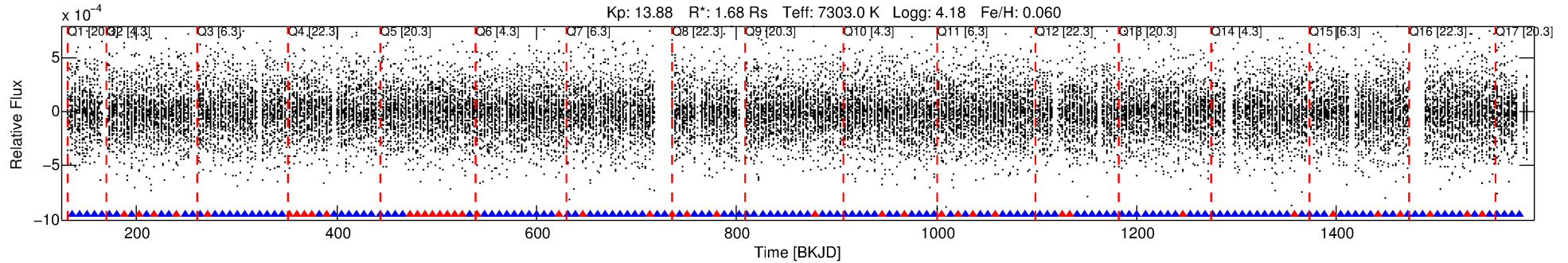
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005396950-02

No Significant Match Found

# DV One-Page Summary

KIC: 5396950 Candidate: 2 of 4 Period: 7.503 d



TPS TCE Results:

Period = 7.50275 d  
Epoch = 135.9280 BKJD

DV fit results are unavailable

DV Diagnostic Results:

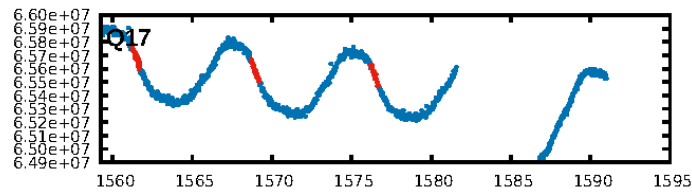
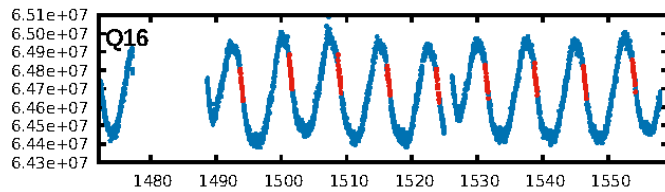
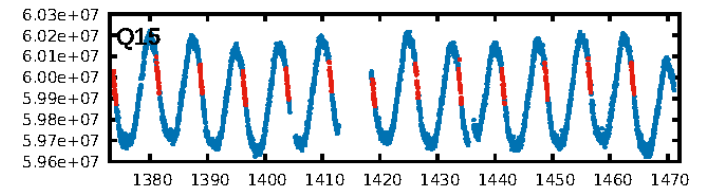
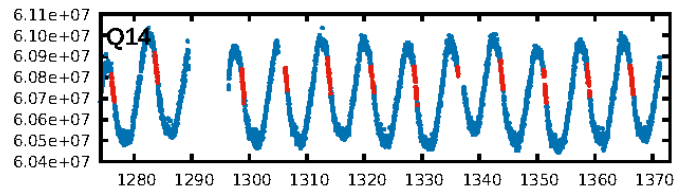
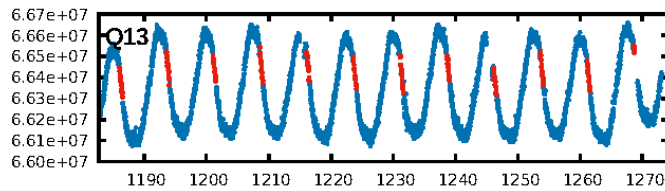
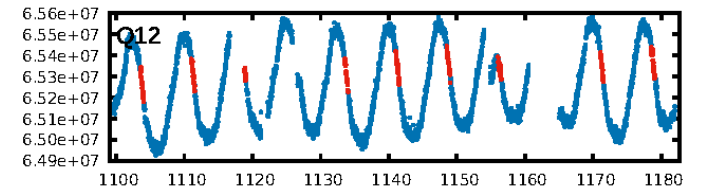
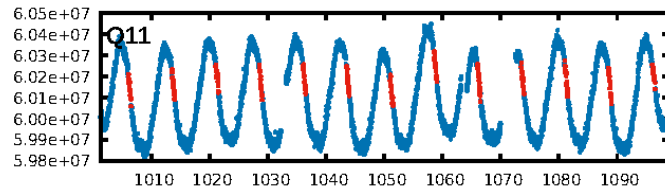
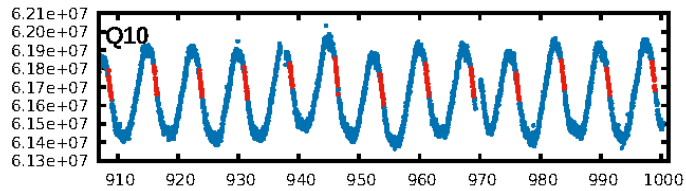
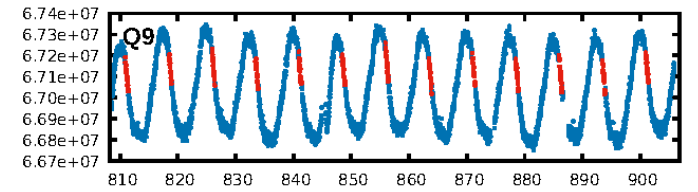
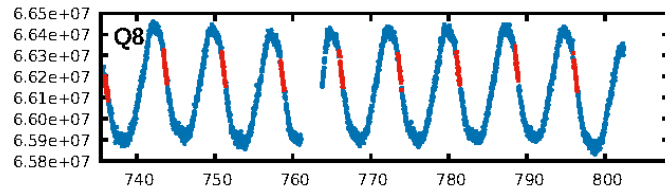
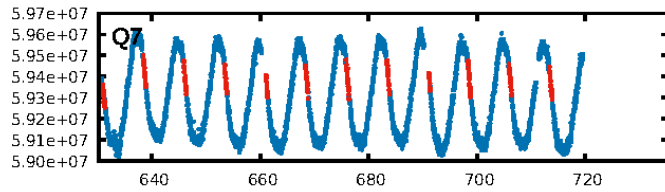
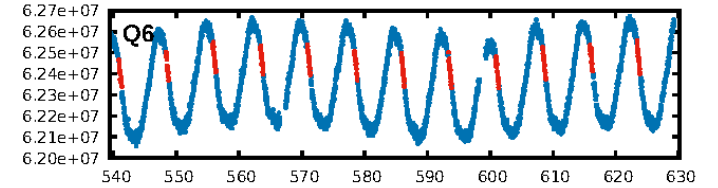
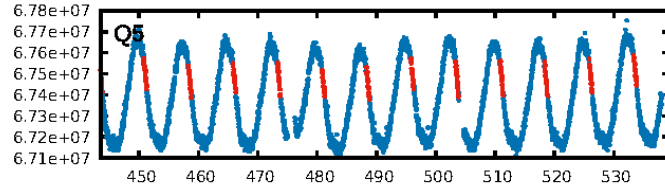
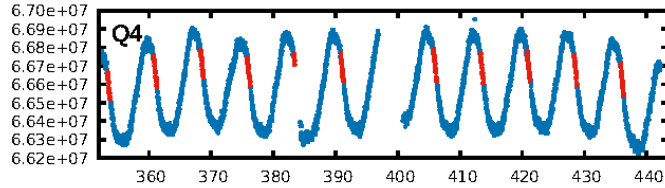
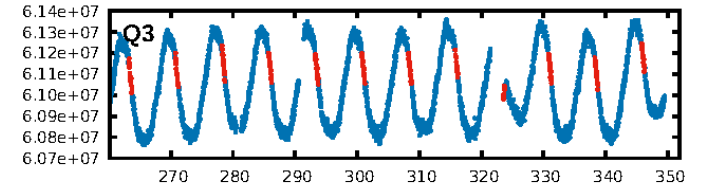
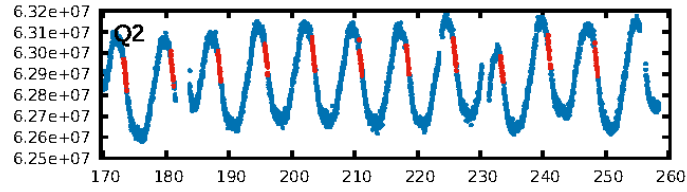
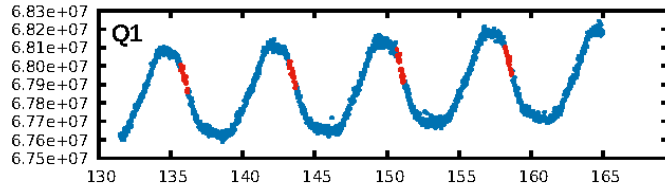
ShortPeriod-sig: 0.2% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.75 [128/170]  
GhostDiagnostic-chr: -3.574

Centroid-sig: 23.8%  
Centroid-so: 25.065 arcsec [0.85 $\sigma$ ]  
OotOffset-rm: 1.596 arcsec [1.41 $\sigma$ ]  
KicOffset-rm: 1.508 arcsec [1.45 $\sigma$ ]  
OotOffset-st: 3/2/2/1 [8]  
KicOffset-st: 3/2/2/1 [8]  
DiffImageQuality-fgm: 0.00 [0/8]  
DiffImageOverlap-fno: 0.00 [0/17]

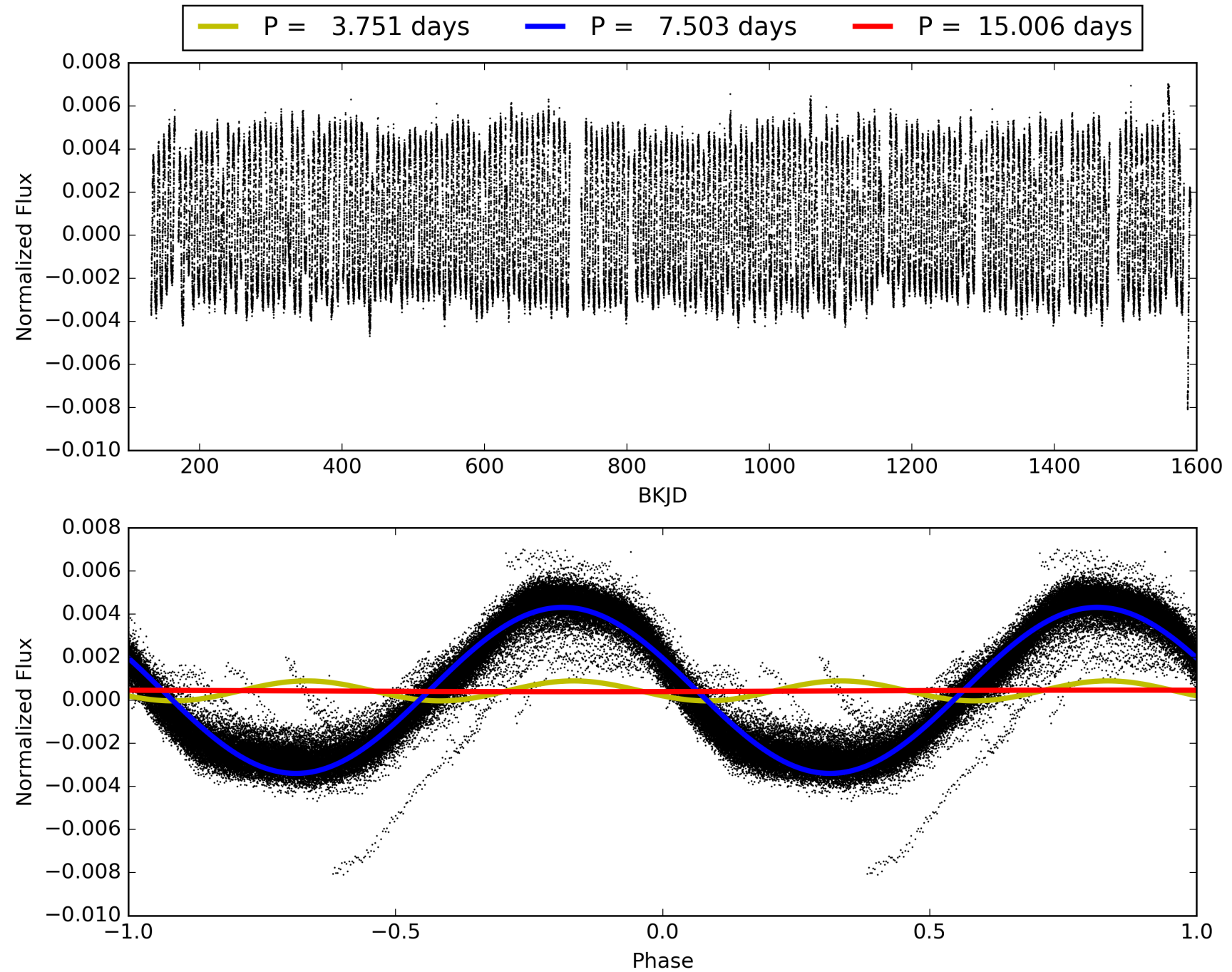
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:30:41 Z

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

# TCE 005396950-02, PDC Light Curves

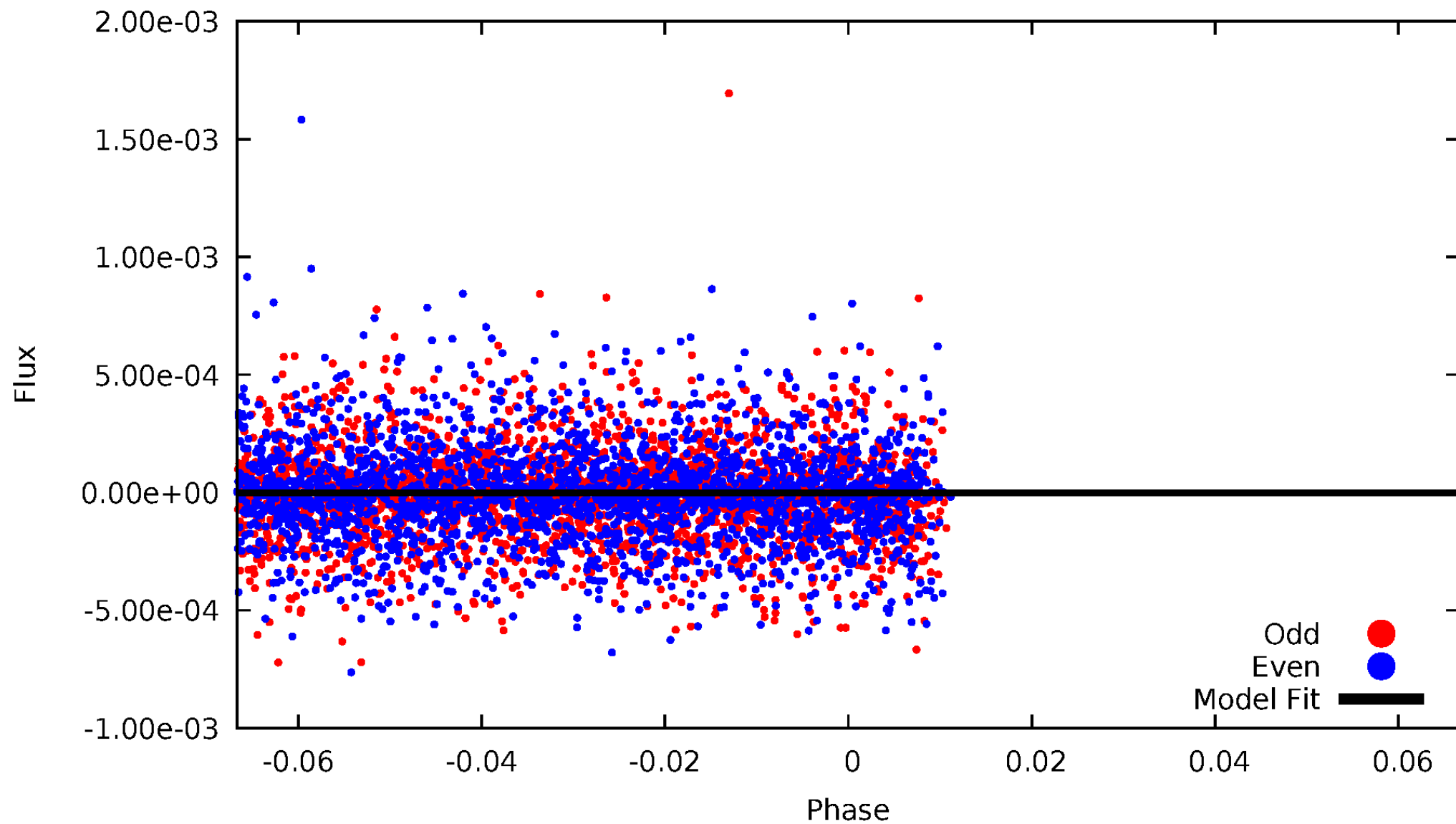


# TCE 005396950-02



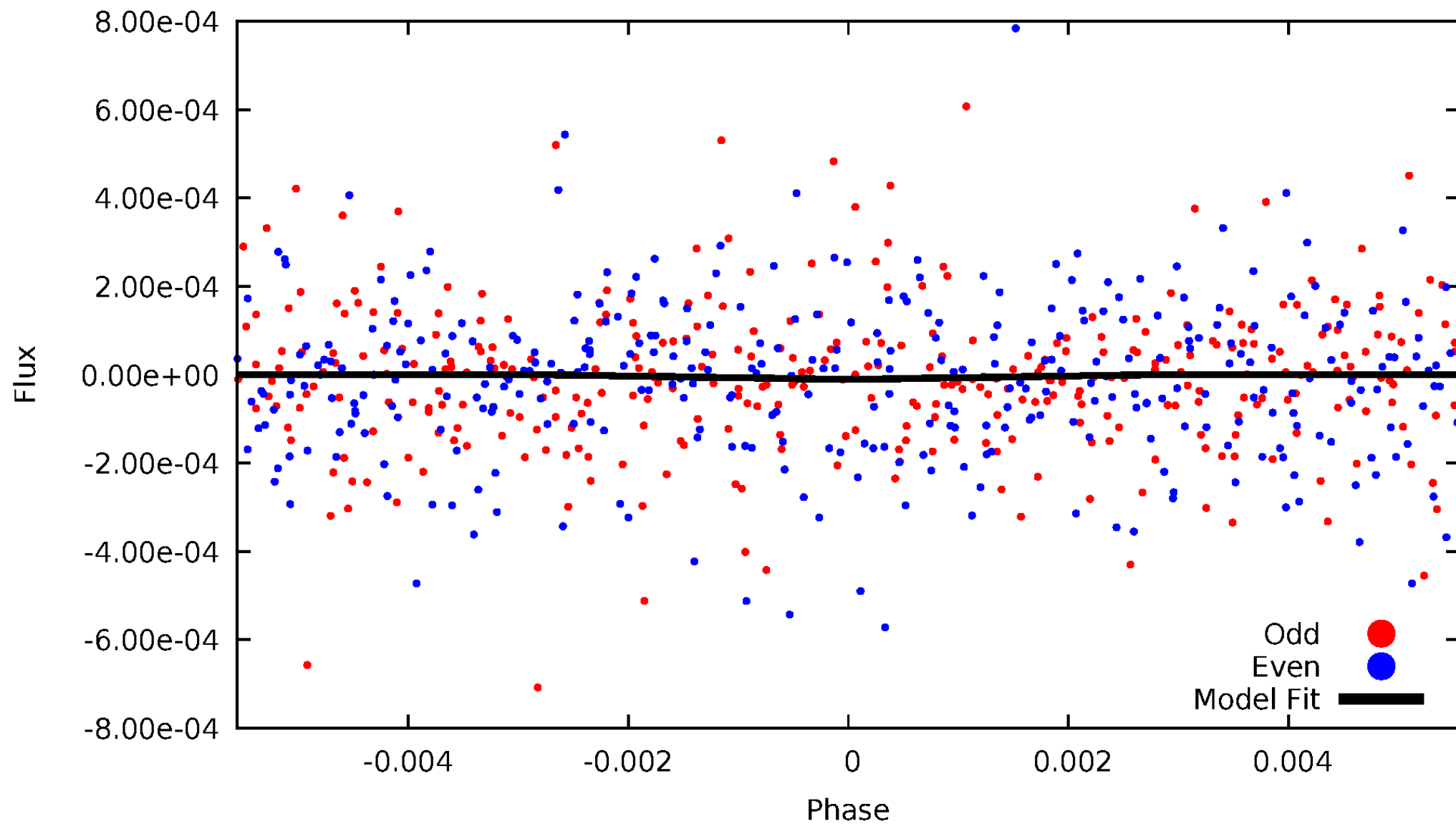
# DV Odd/Even

TCE 005396950-02



# ALT Odd/Even

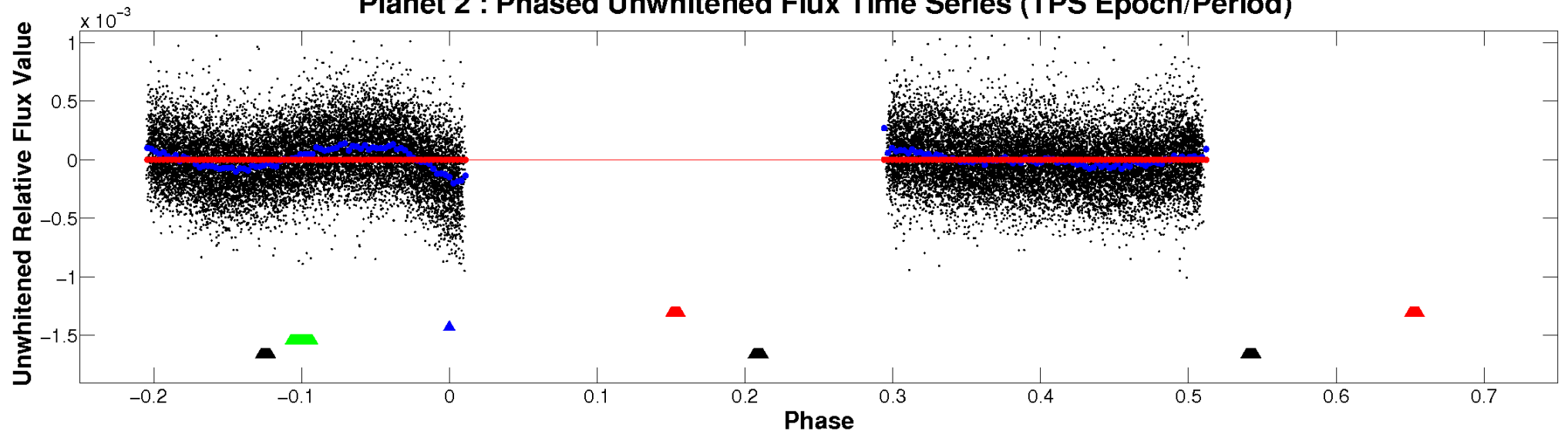
TCE 005396950-02



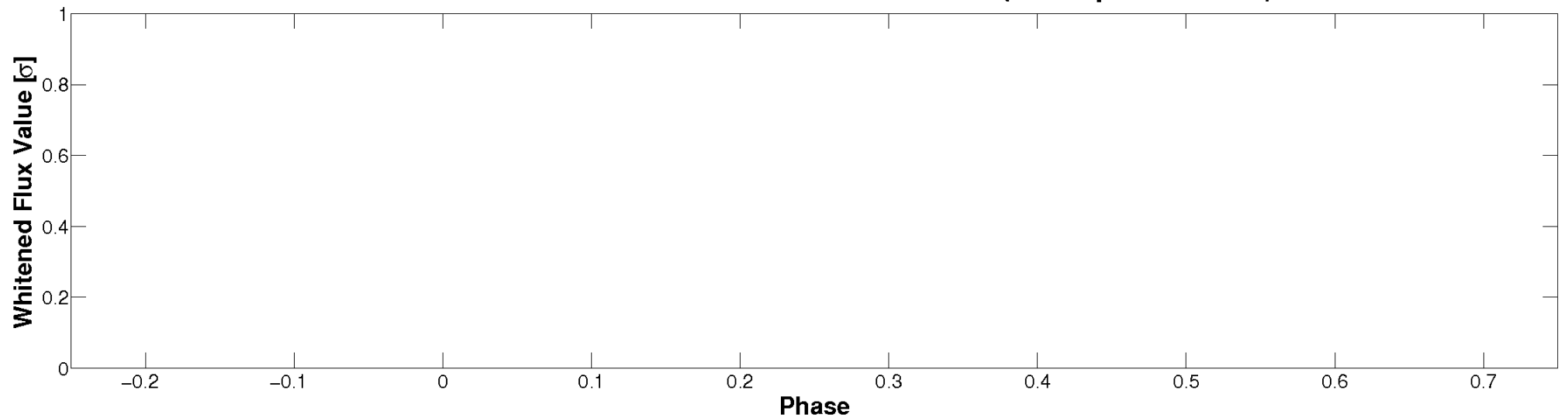


# Non-Whitened Vs. Whitened Light Curve

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

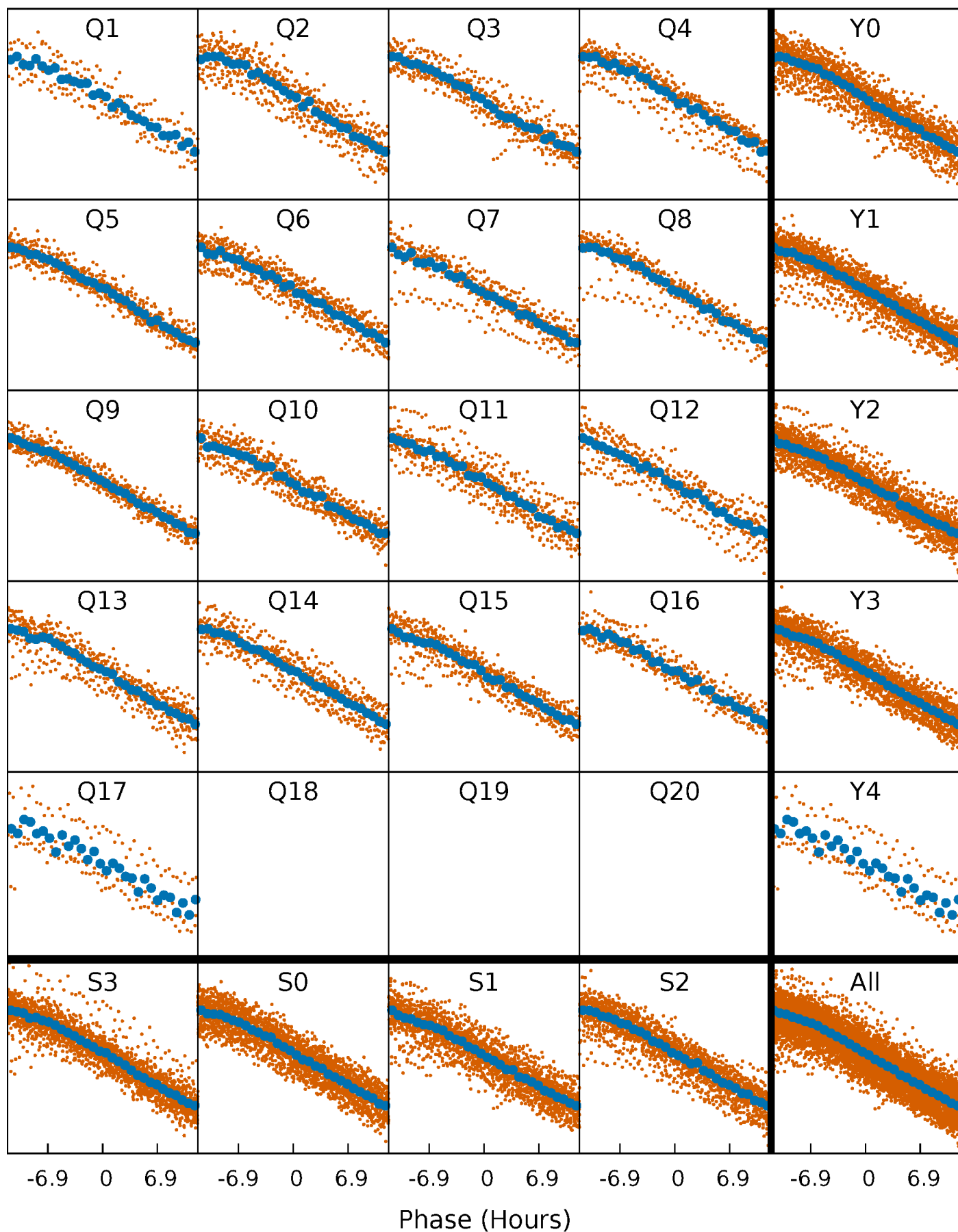


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



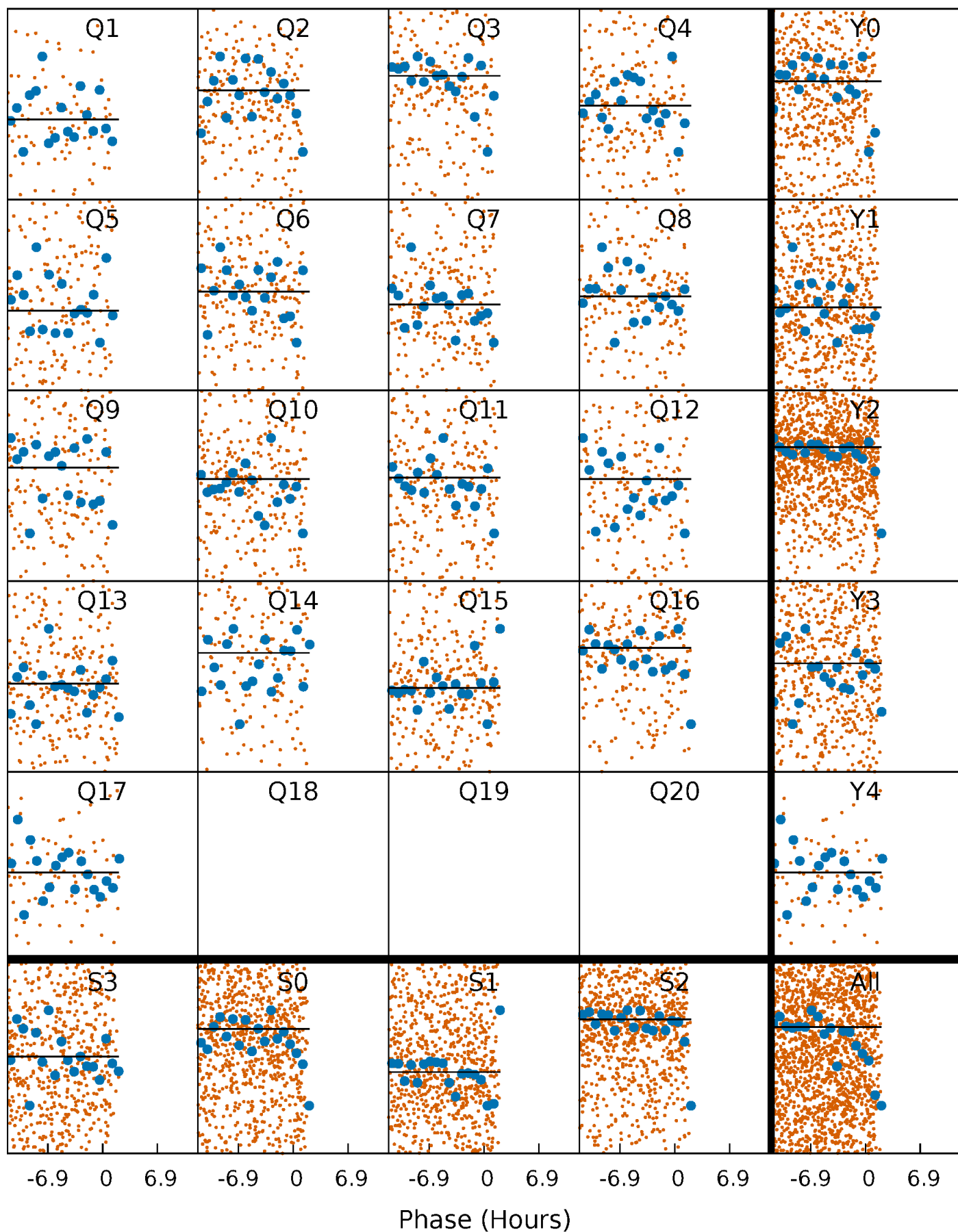
# PDC Quarter-Phased Transit Curves

TCE 005396950-02   P= 7.502751 Days    $T_0=135.928048$  (BKJD)



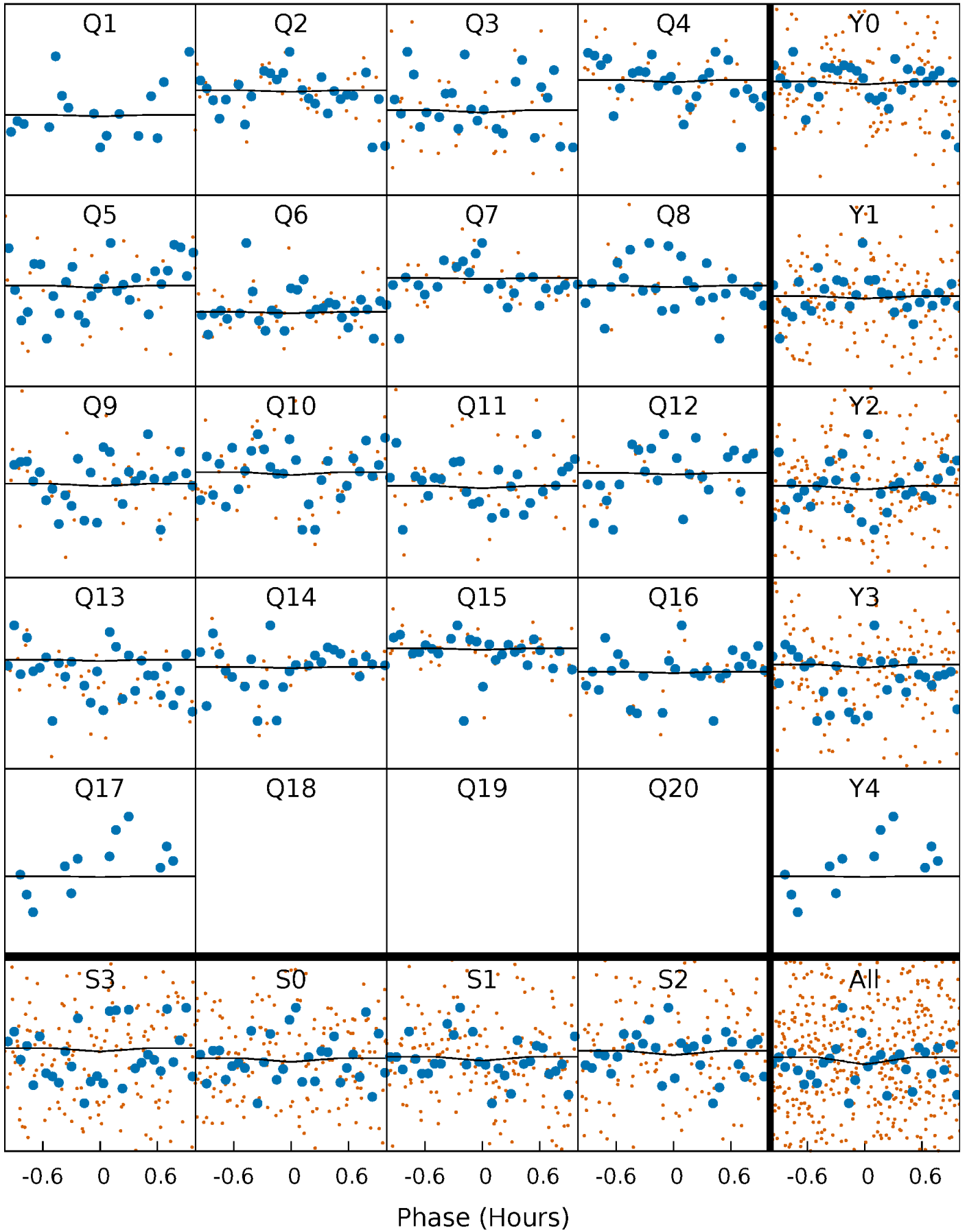
# DV Quarter-Phased Transit Curves

TCE 005396950-02   P= 7.502751 Days    $T_0=135.928048$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

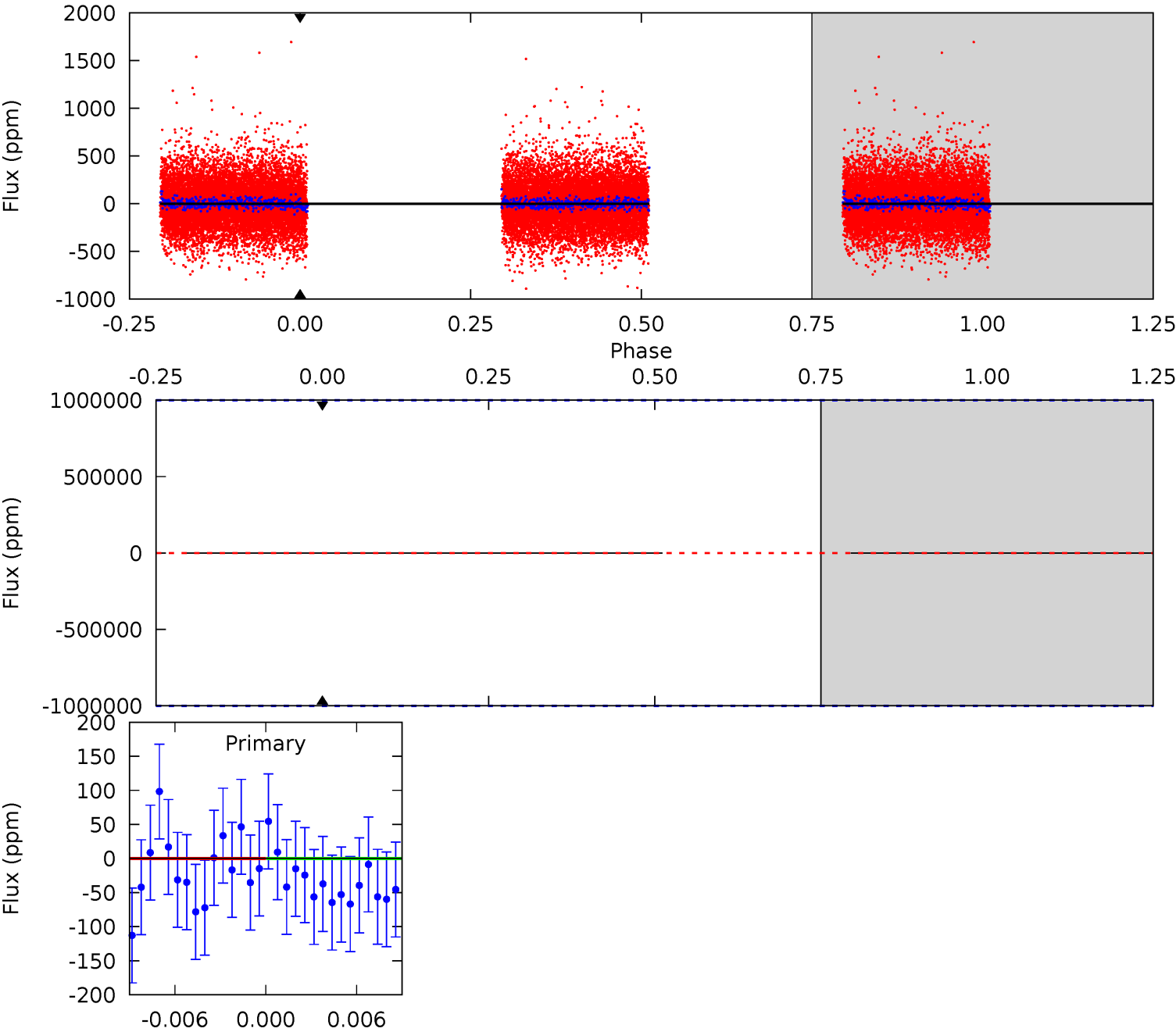
TCE 005396950-02   P= 7.502751 Days    $T_0=135.550791$  (BKJD)



DV Model-Shift Uniqueness Test

005396950-02, P = 7.502751 Days, E = 128.425297 Days

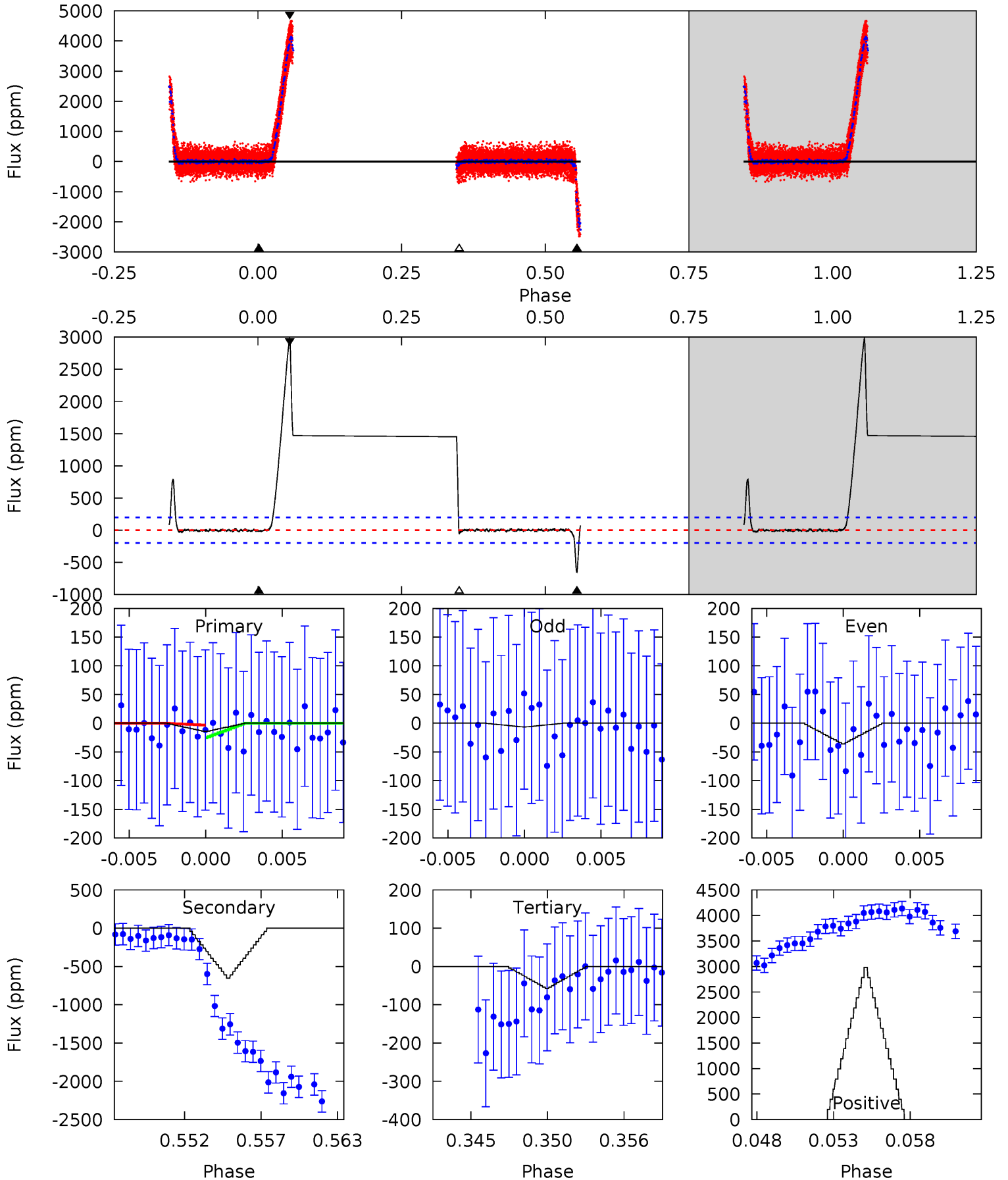
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005396950-02, P = 7.502751 Days, E = 128.048040 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
0.38	16.9	1.50	77.3	5.15	2.79	12.2	-1.12	-76.9	15.4	-60.4	0.44	0.90	0.82	0.28





### Stellar Parameters For KIC 005396950

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7303^{+203}_{-319}$	$4.180^{+0.090}_{-0.195}$	$0.060^{+0.200}_{-0.350}$	$1.684^{+0.581}_{-0.249}$	$1.563^{+0.211}_{-0.232}$	$0.461^{+0.230}_{-0.245}$
	+3%/-4%	+2%/-5%	+333%/-583%	+35%/-15%	+13%/-15%	+50%/-53%
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 005396950-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$14.04^{+14.51}_{-9.43}$	$1999^{+138}_{-125}$	$5348^{+33043}_{-38765}$	$38^{+4117}_{-3616}$
Alt.	$-652 \pm 39$	$12.39^{+14.25}_{-9.14}$	$2000^{+136}_{-120}$	$4642^{+4529}_{-1169}$	$17^{+244}_{-14}$

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

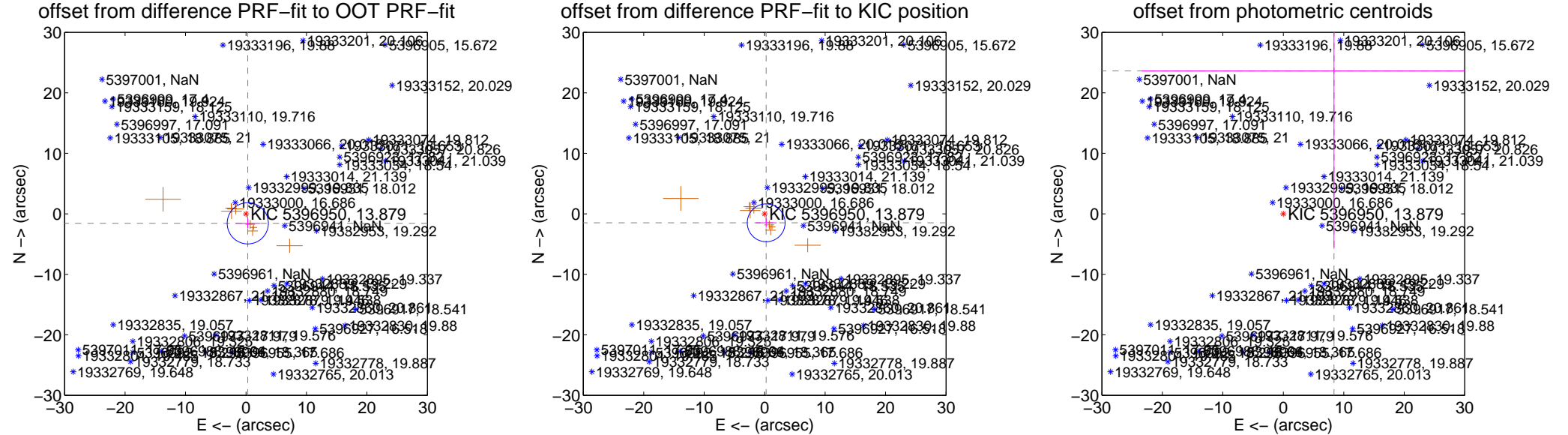
## DV Centroid Data

Supplemental centroid analysis for 005396950-02. Kepler magnitude: 13.88. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

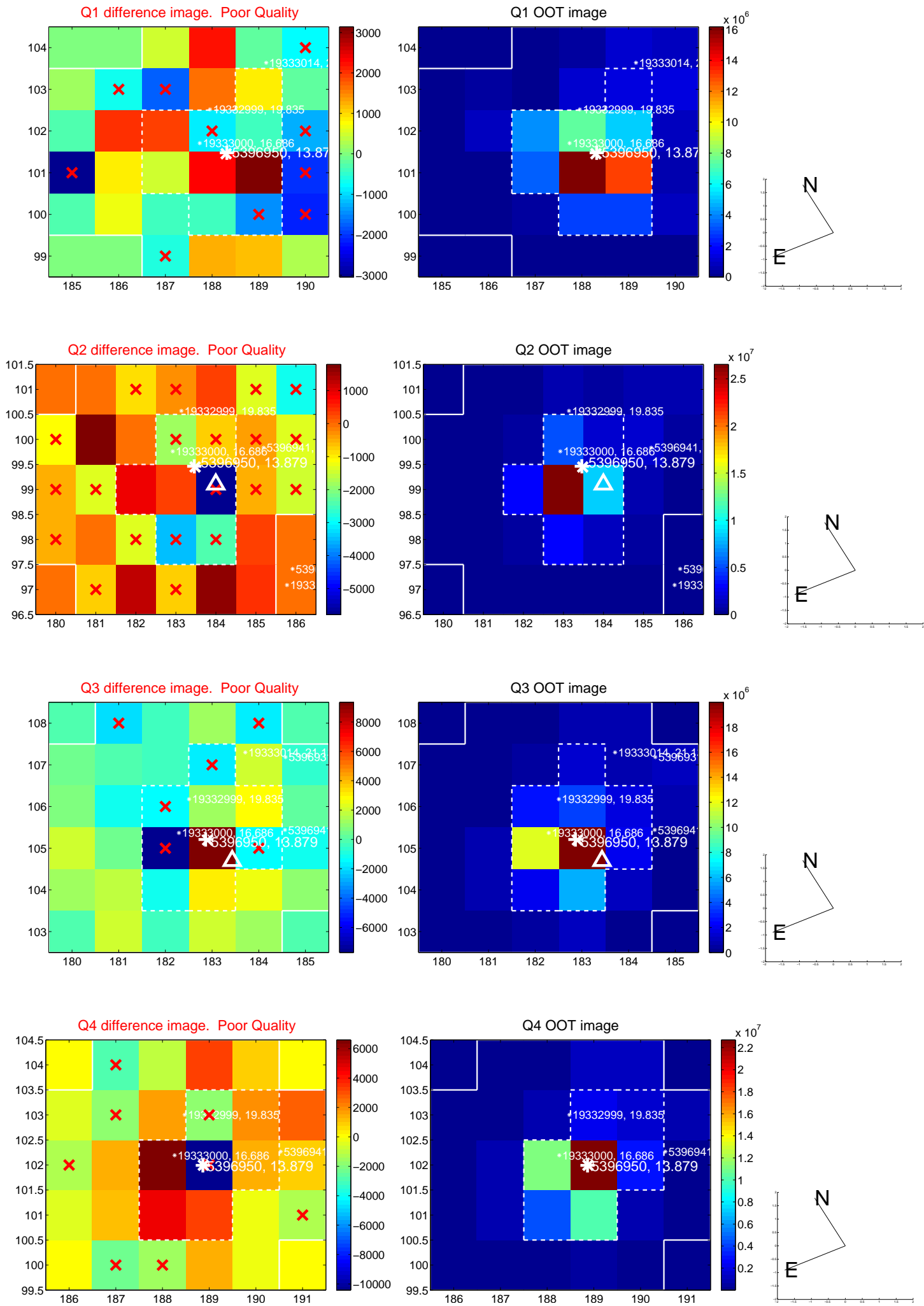
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.596 \pm 1.135$	1.41	$-0.294 \pm 2.060$	$-1.569 \pm 0.802$
PRF-fit source offset from KIC position	$1.508 \pm 1.043$	1.45	$-0.253 \pm 1.725$	$-1.486 \pm 0.786$
photometric centroid source offset	$25.06 \pm 29.66$	0.85	$-8.39 \pm 31.82$	$23.62 \pm 29.37$

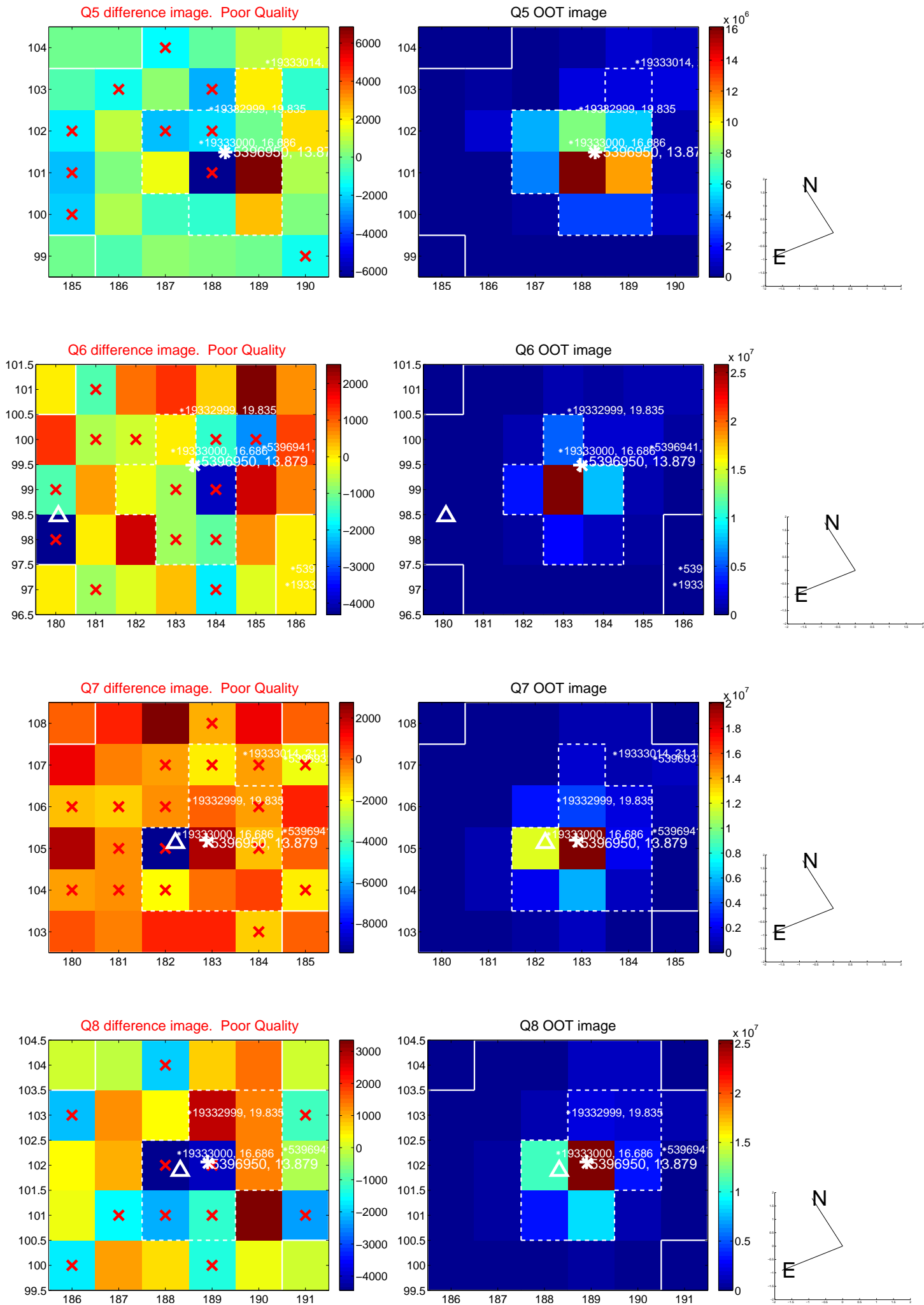


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

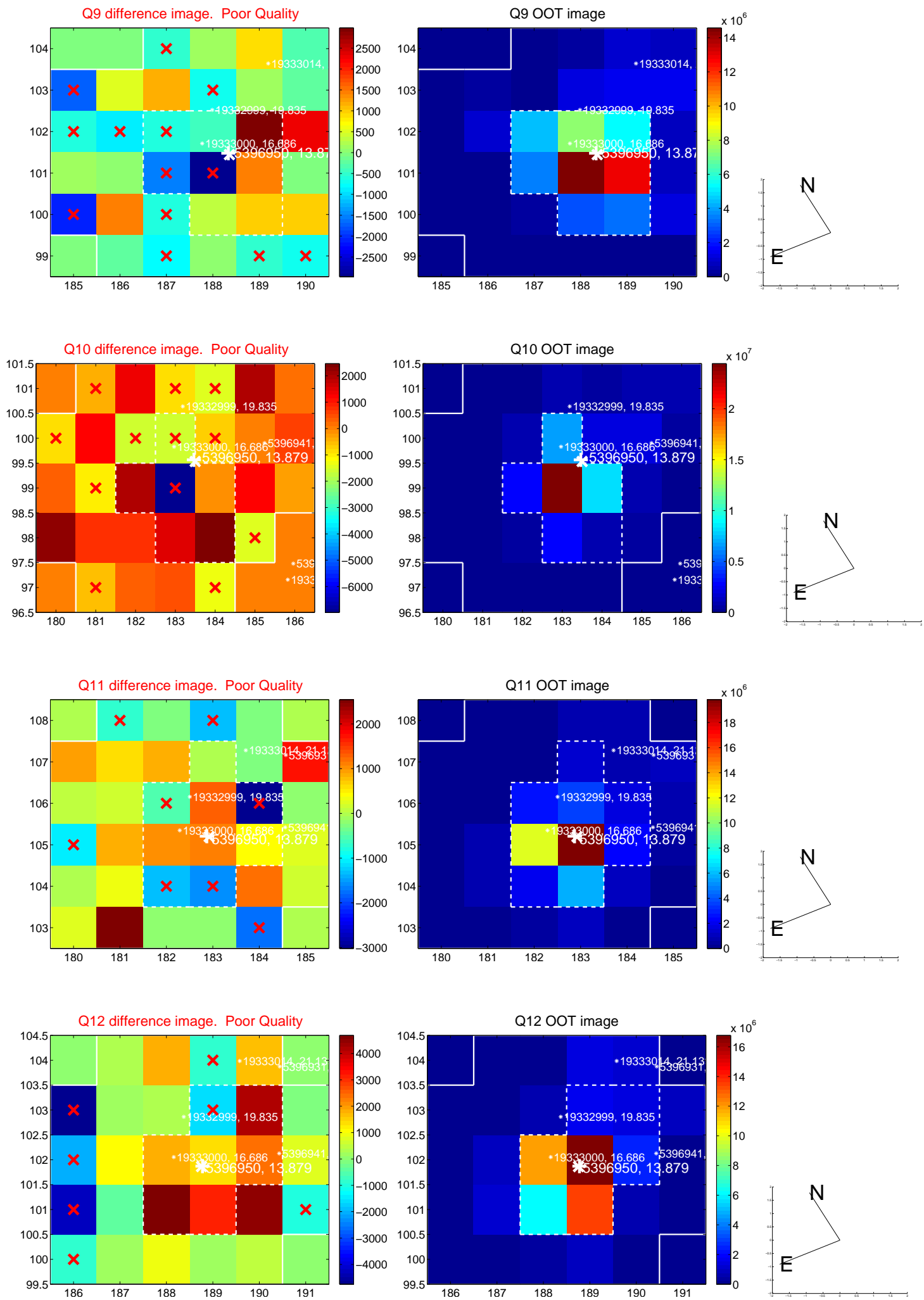
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



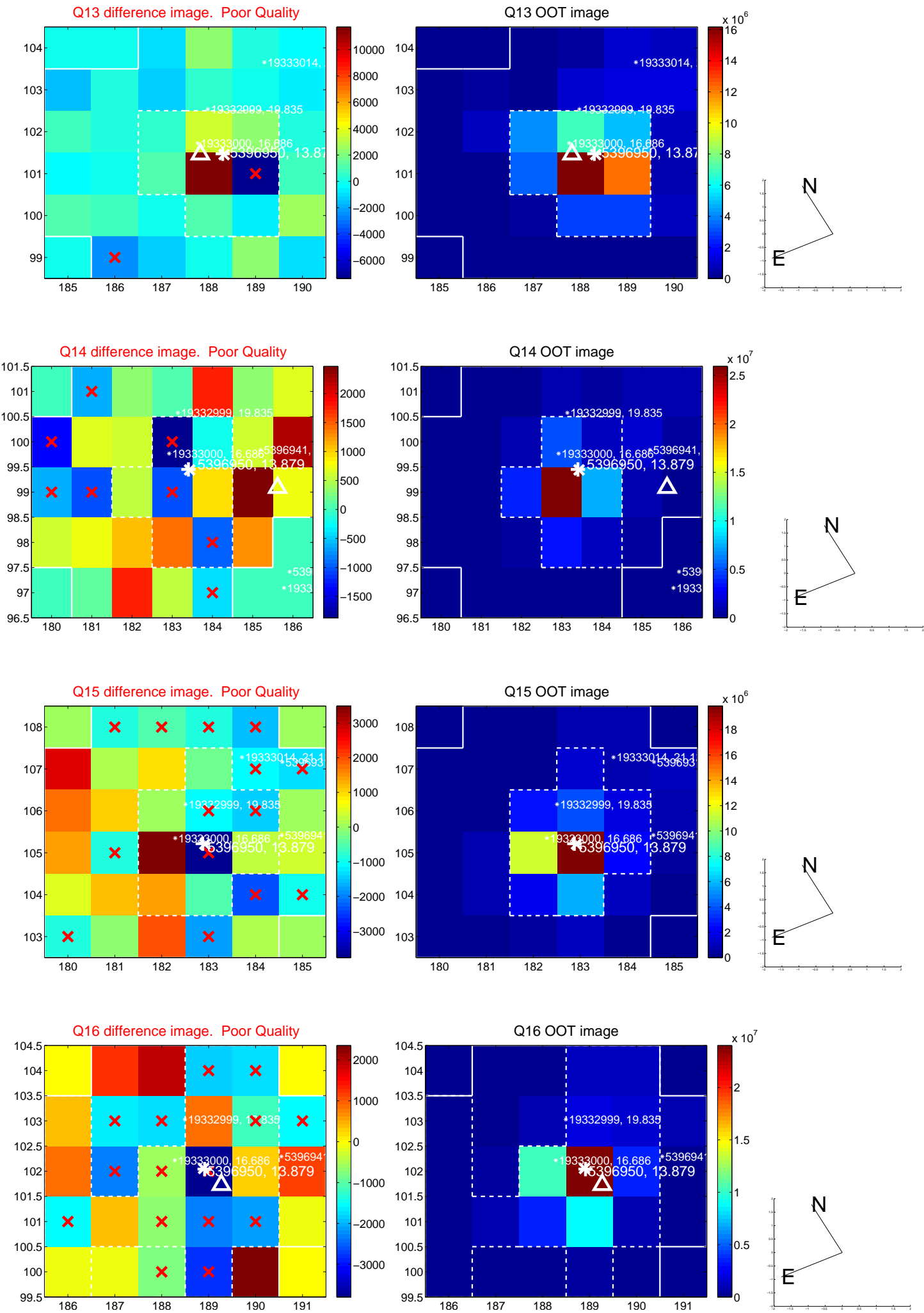
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

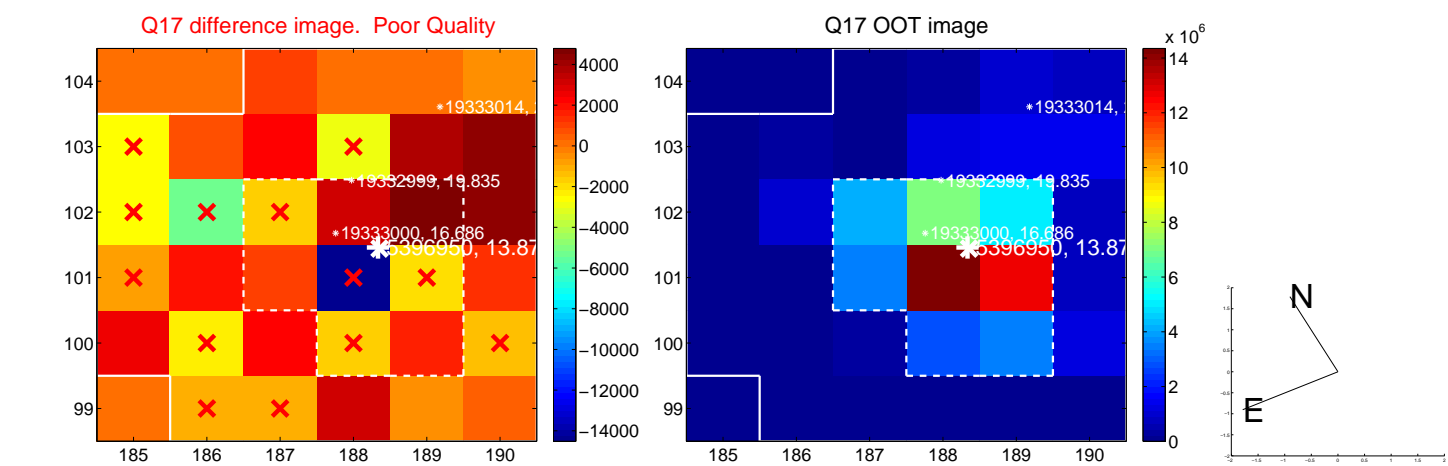


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

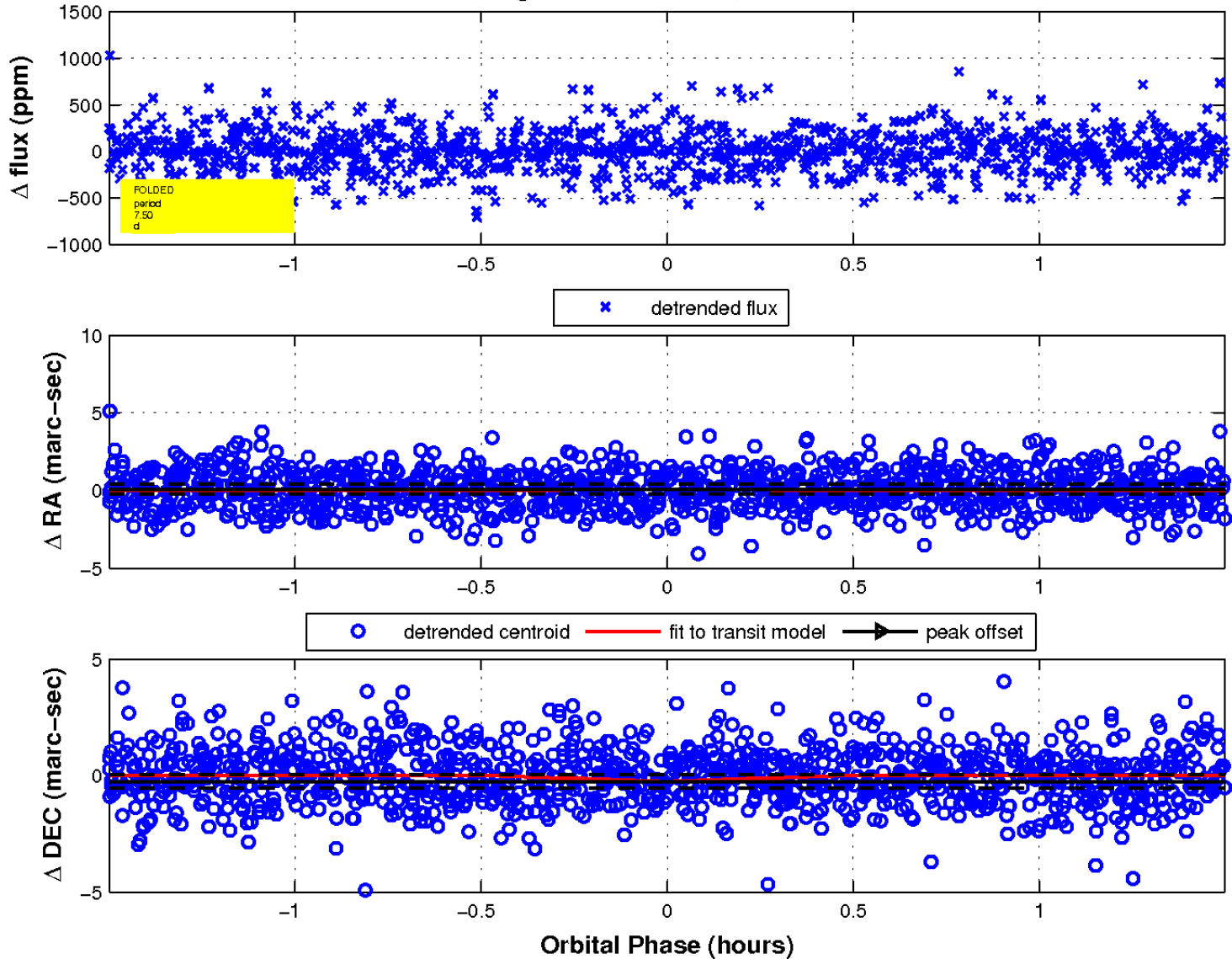




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

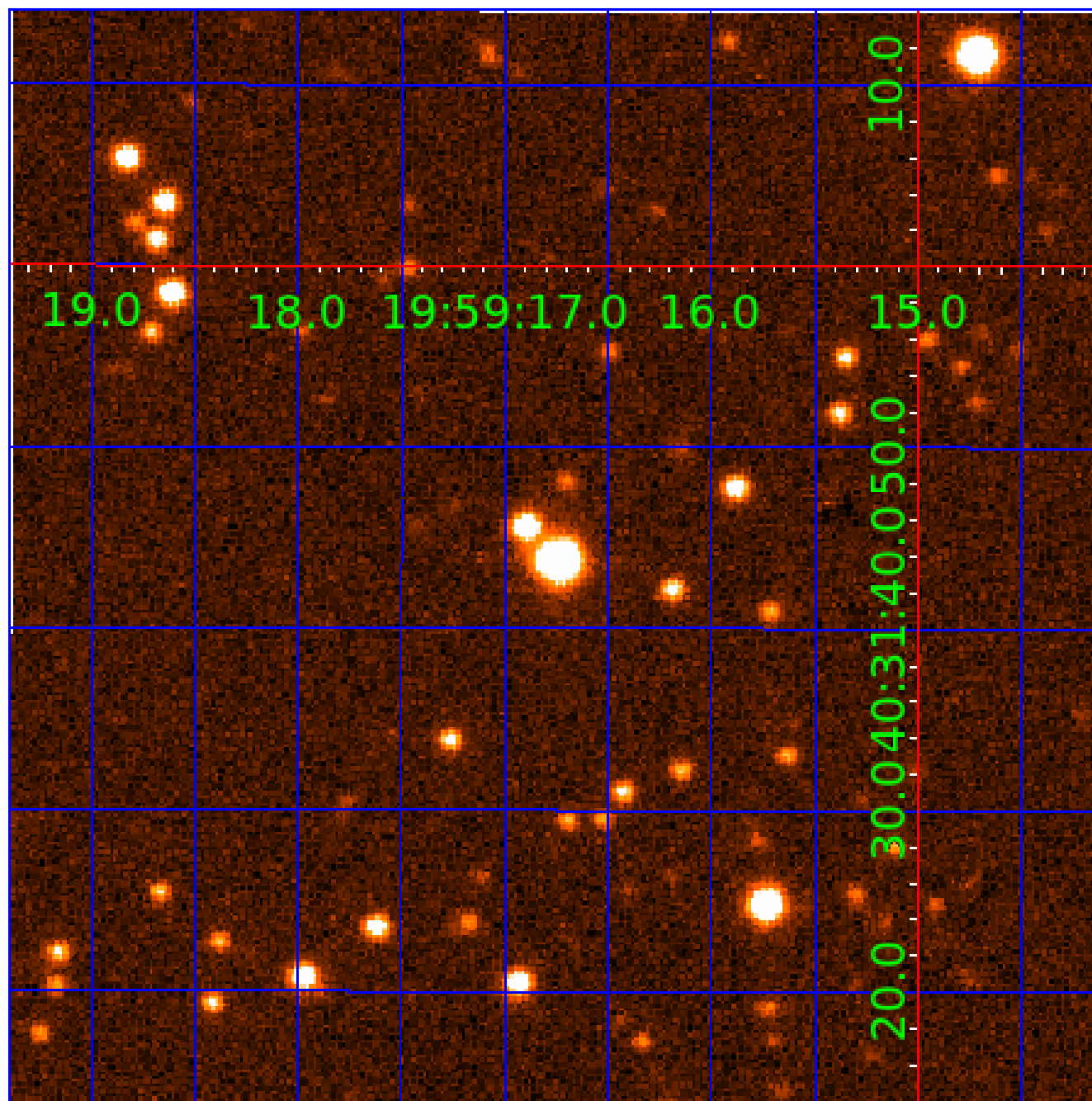


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



# KIC 005396950

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005396950-01	OBS	No	3.751484	133.303526	55.4	17.165	13.1	11.6	1.68	7303	1.29	2399.88
005396950-02	OBS	No	7.502751	135.928048	397.3	6.000	17.7	-1.0	1.68	7303	3.40	952.43
005396950-03	OBS	No	7.502186	135.232513	0.2	3.347	9.3	0.0	1.68	7303	0.08	952.53
005396950-04	OBS	No	2.500996	132.471041	65.3	17.348	7.8	9.4	1.68	7303	1.38	4120.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005396950-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005396950-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
005396950-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— SAME_NTL_PERIOD—CENT_FEW_DIFFS
005396950-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS—HALO_GHOST

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

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

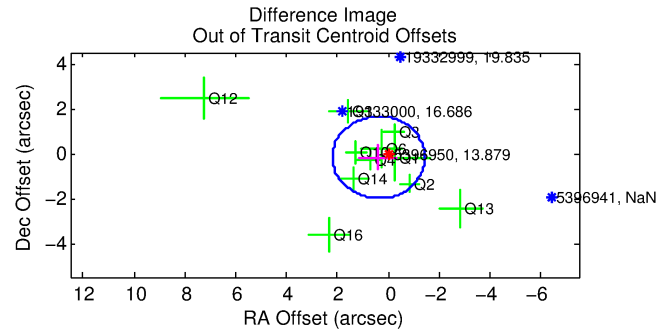
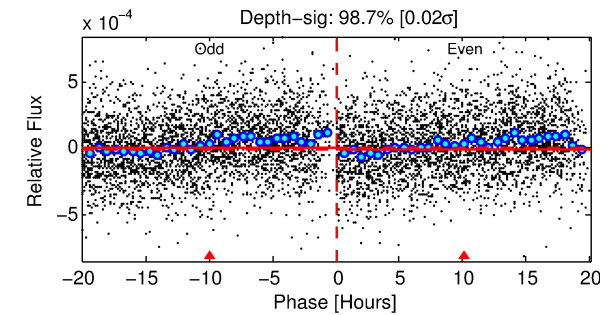
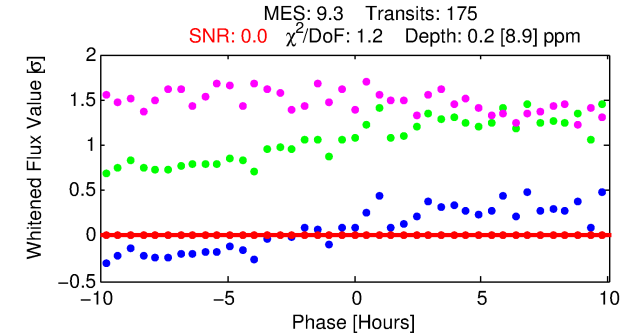
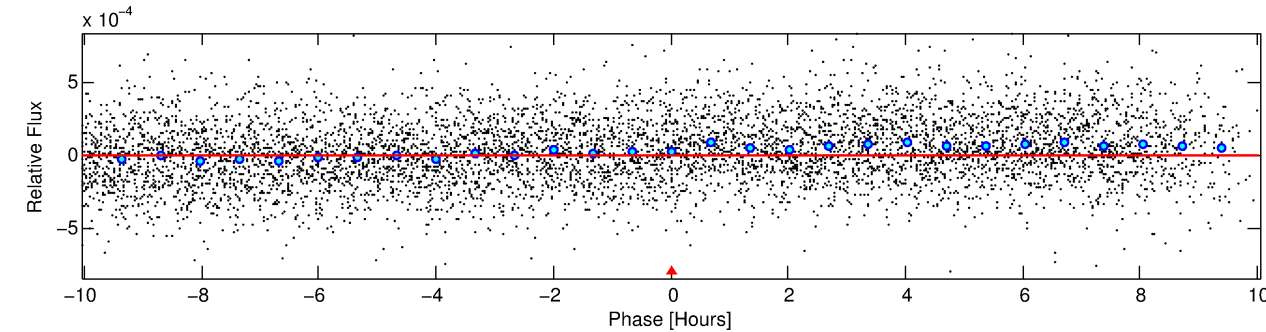
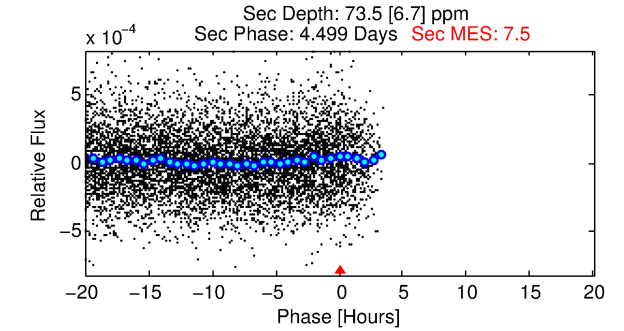
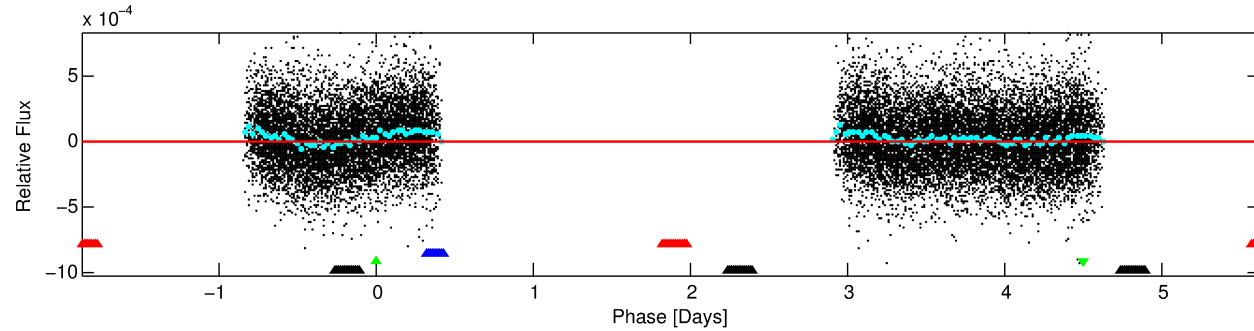
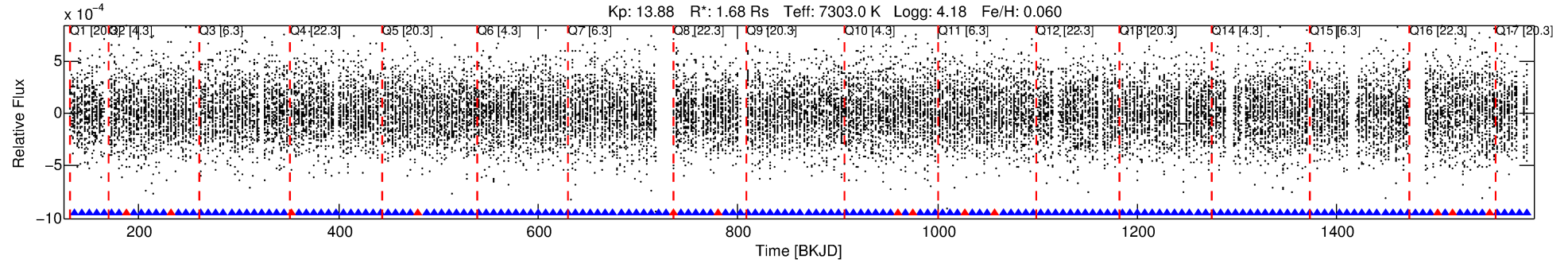
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005396950-03

No Significant Match Found

# DV One-Page Summary

KIC: 5396950 Candidate: 3 of 4 Period: 7.502 d



## DV Fit Results:

Period = 7.50219 [0.02926] d  
Epoch = 135.2325 [2.8945] BKJD  
Rp/R\* = 0.0005 [0.0122]  
a/R\* = 5.99 [217.62]  
b = 0.94 [4.90]  
Seff = 952.53 [396.26]  
Teff = 1417 [147] K  
Rp = 0.08 [2.24] Re  
a = 0.0871 [0.0239] AU  
Ag = 43240.26 [2298471.16] [0.02σ]  
Teffp = 31583 [419708] K [0.07σ]

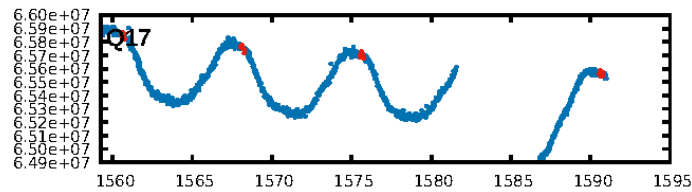
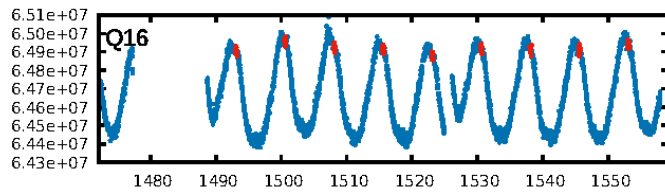
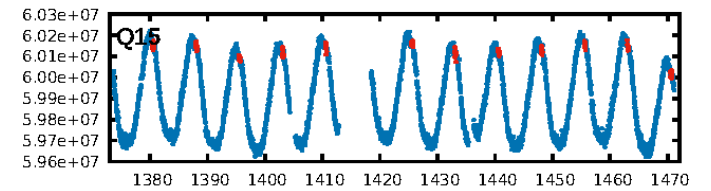
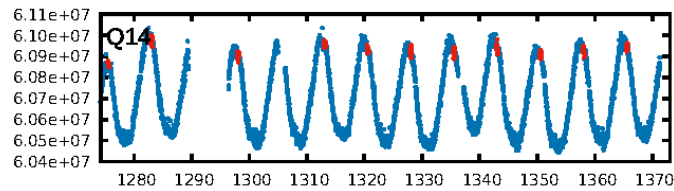
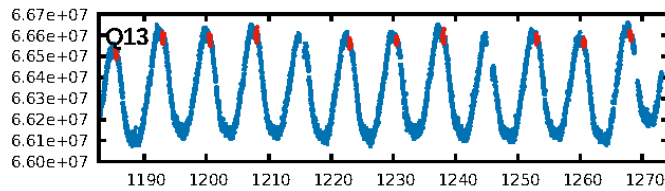
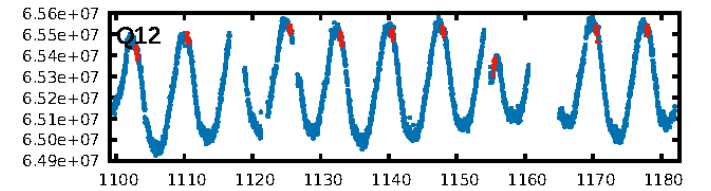
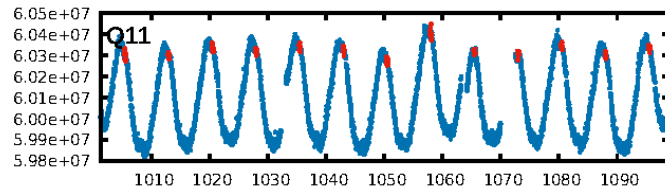
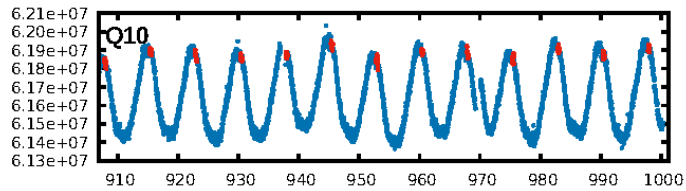
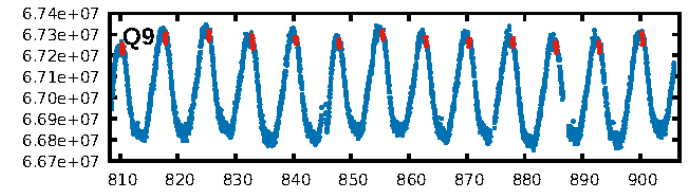
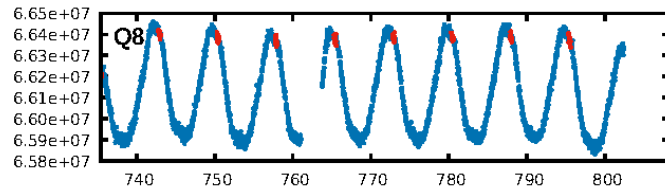
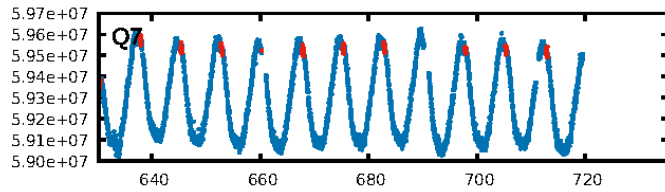
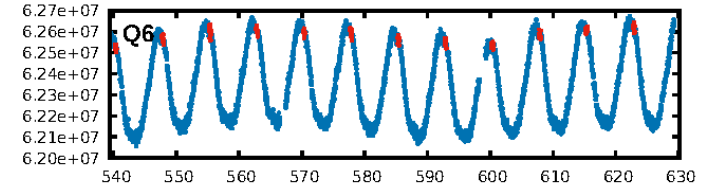
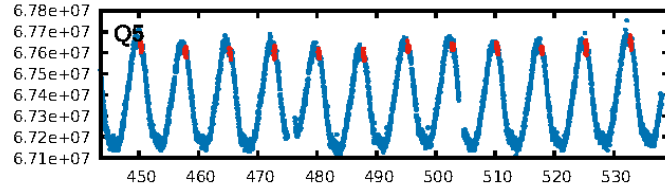
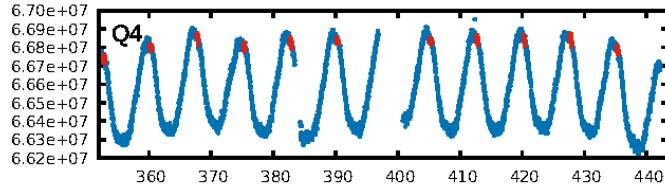
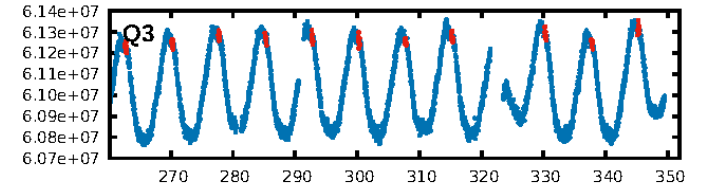
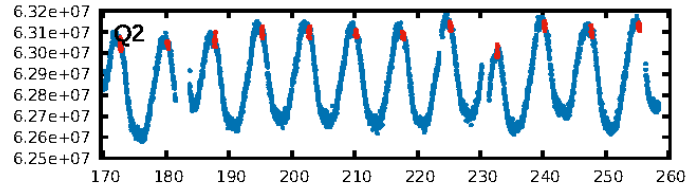
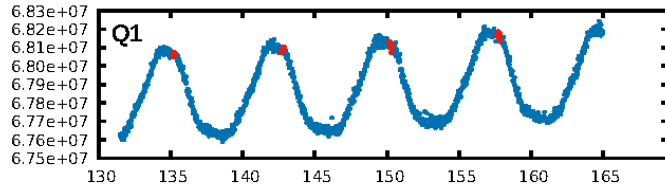
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.15σ]  
**LongPeriod-sig: 0.2% [0.00σ]**  
ModelChiSquare2-sig: 59.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.92 [154/167]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.416 arcsec [0.69σ]  
KicOffset-rm: 0.466 arcsec [0.72σ]  
OotOffset-st: 4/2/3/2 [11]  
KicOffset-st: 4/2/3/2 [11]  
DiffImageQuality-fgm: 0.00 [0/11]  
DiffImageOverlap-fno: 0.00 [0/17]

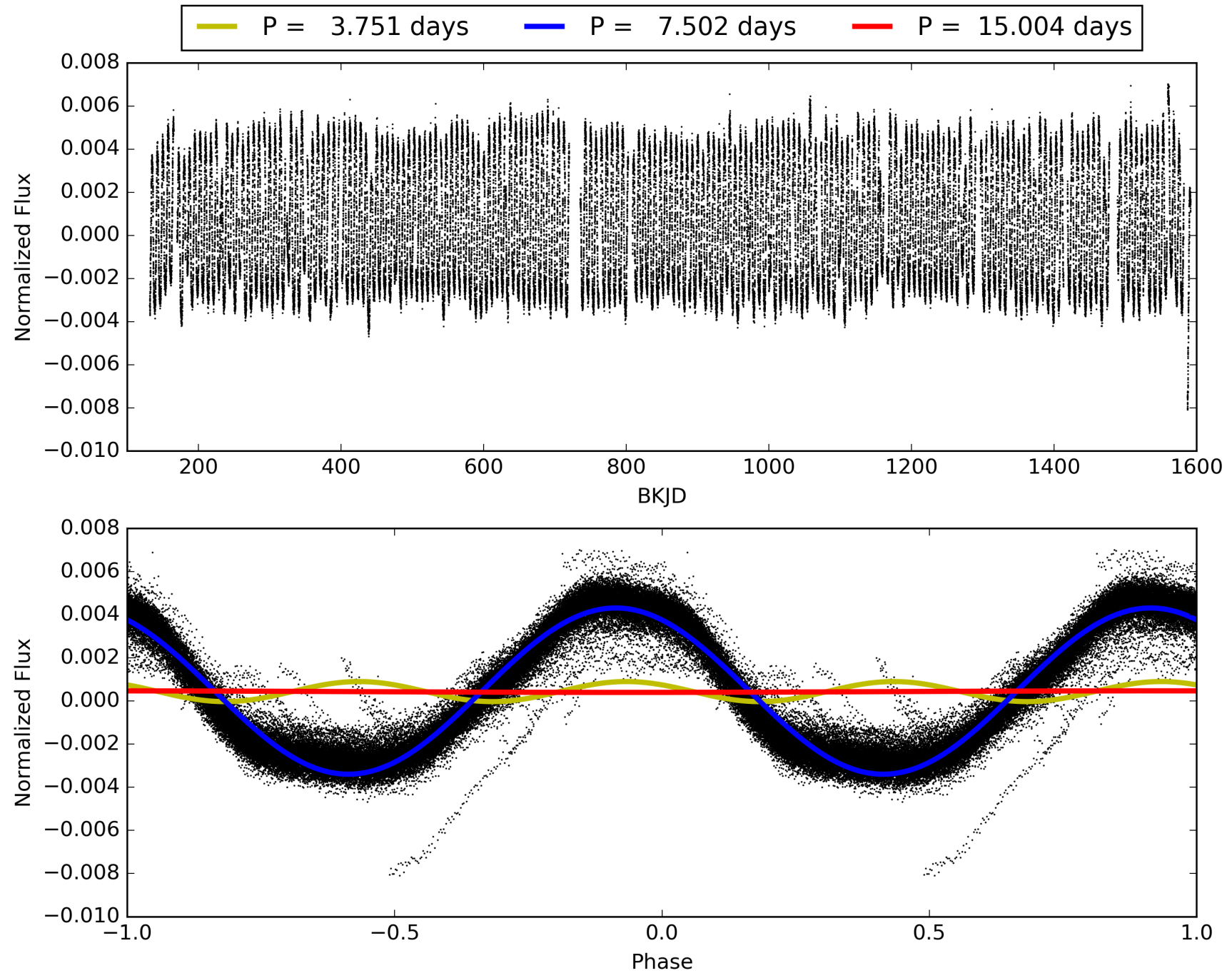
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:30:45 Z

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

# TCE 005396950-03, PDC Light Curves



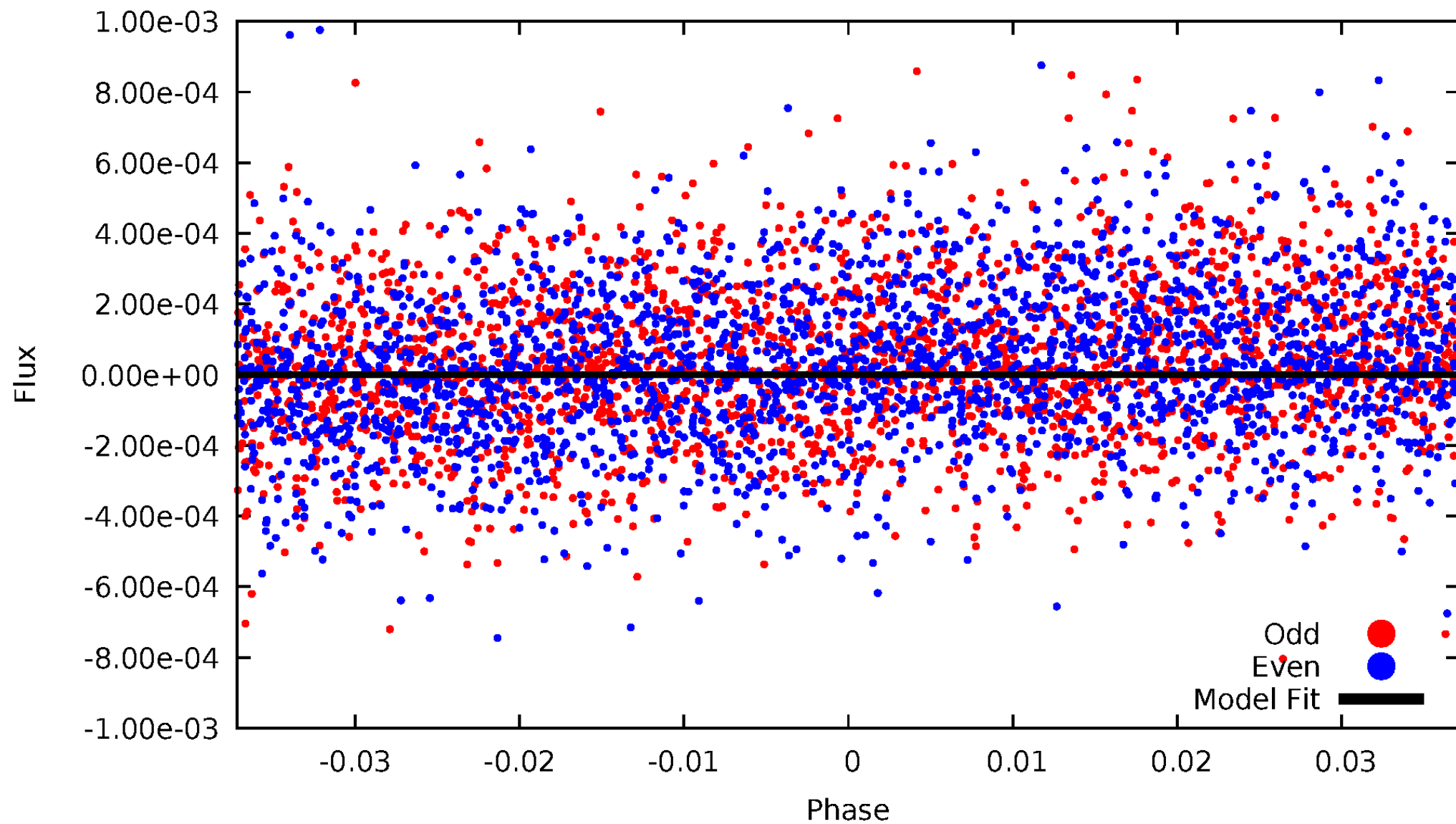
TCE 005396950-03





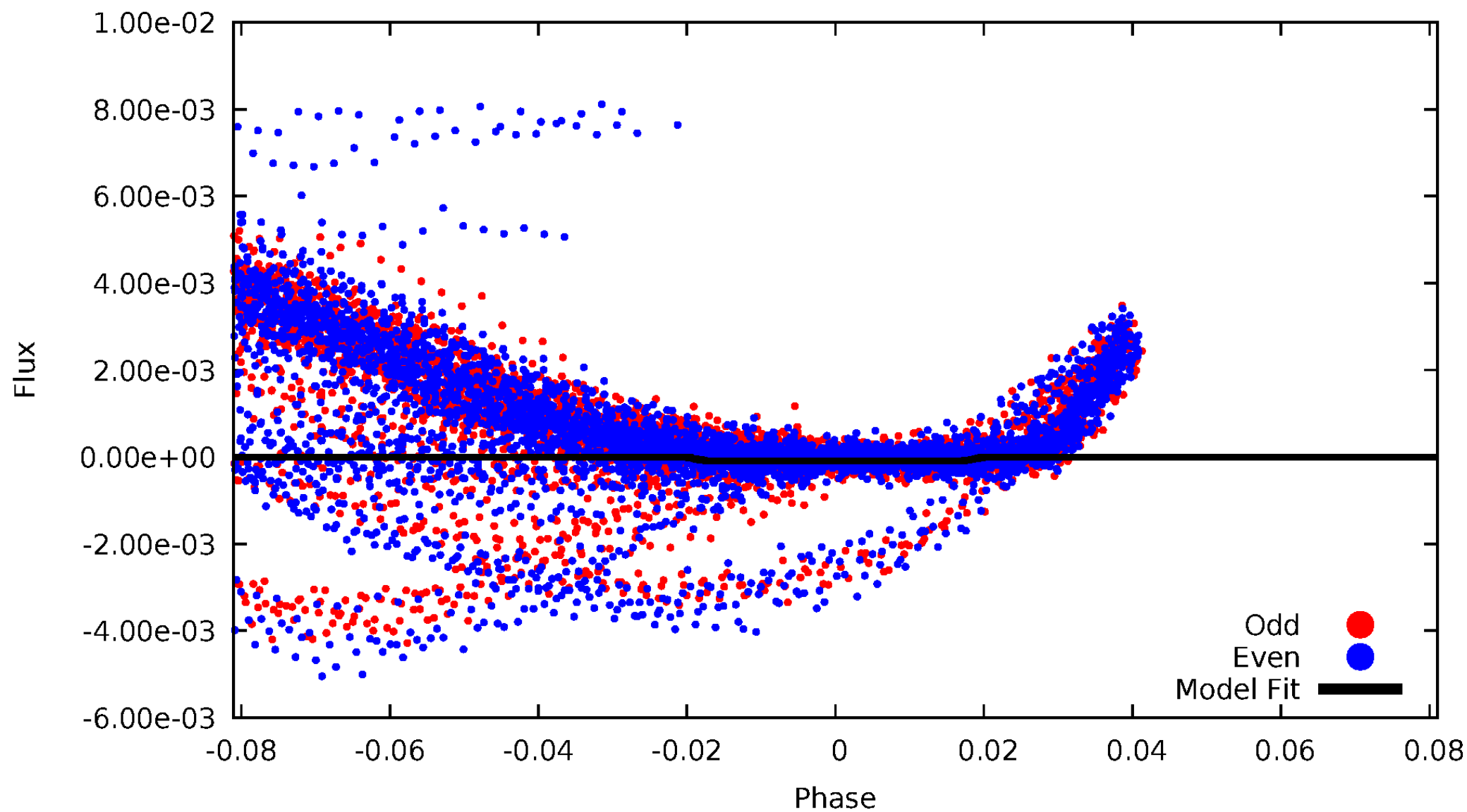
# DV Odd/Even

TCE 005396950-03

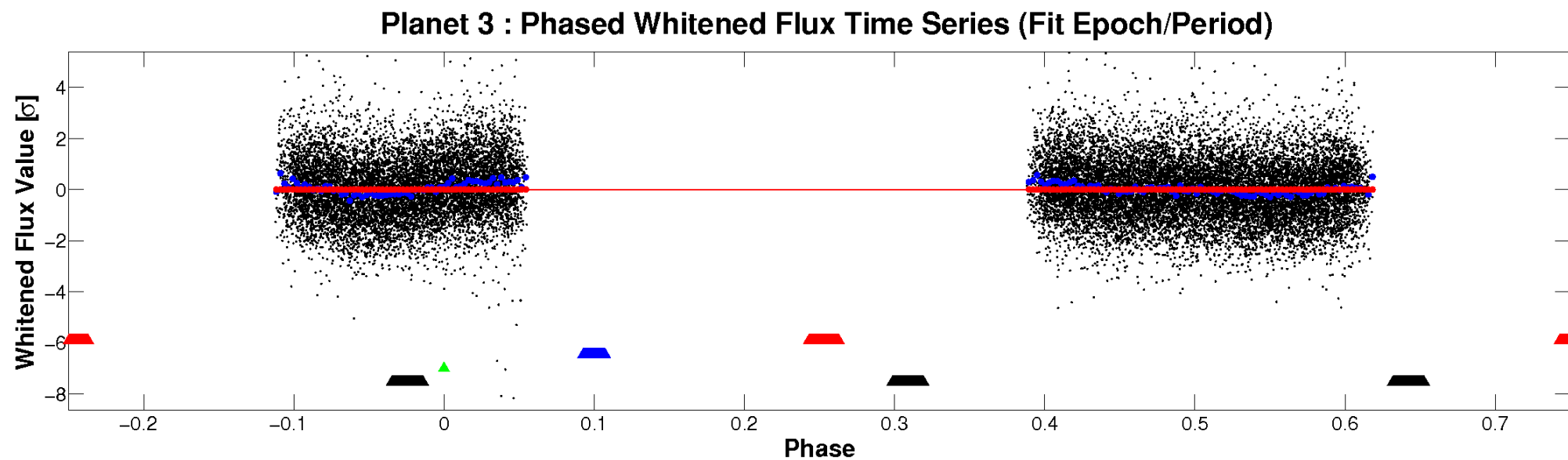
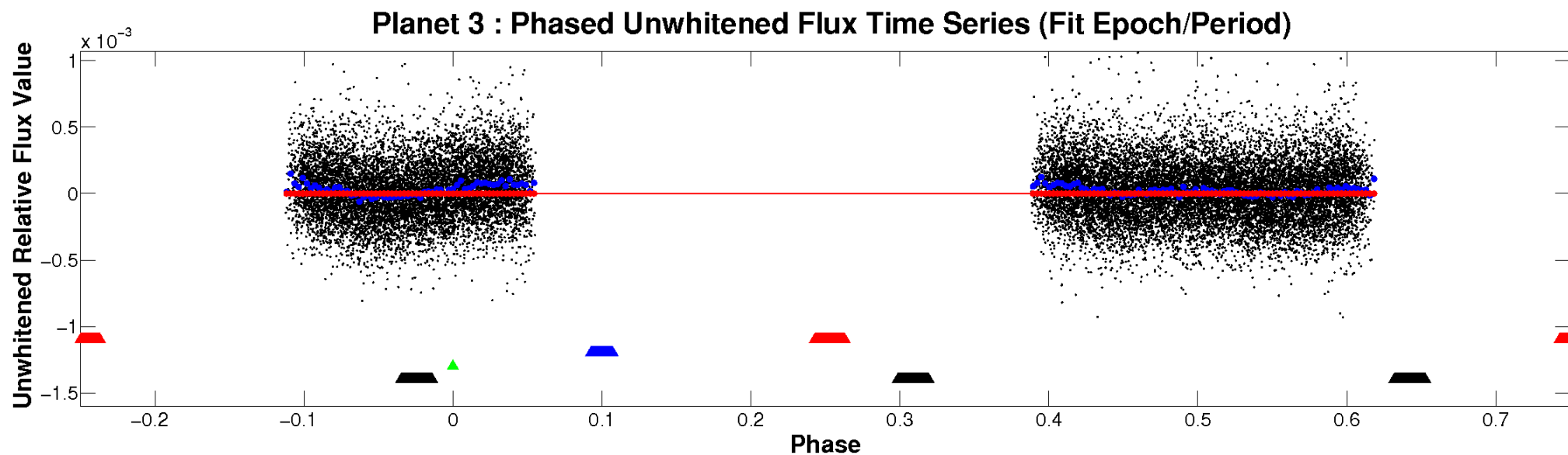


# ALT Odd/Even

TCE 005396950-03

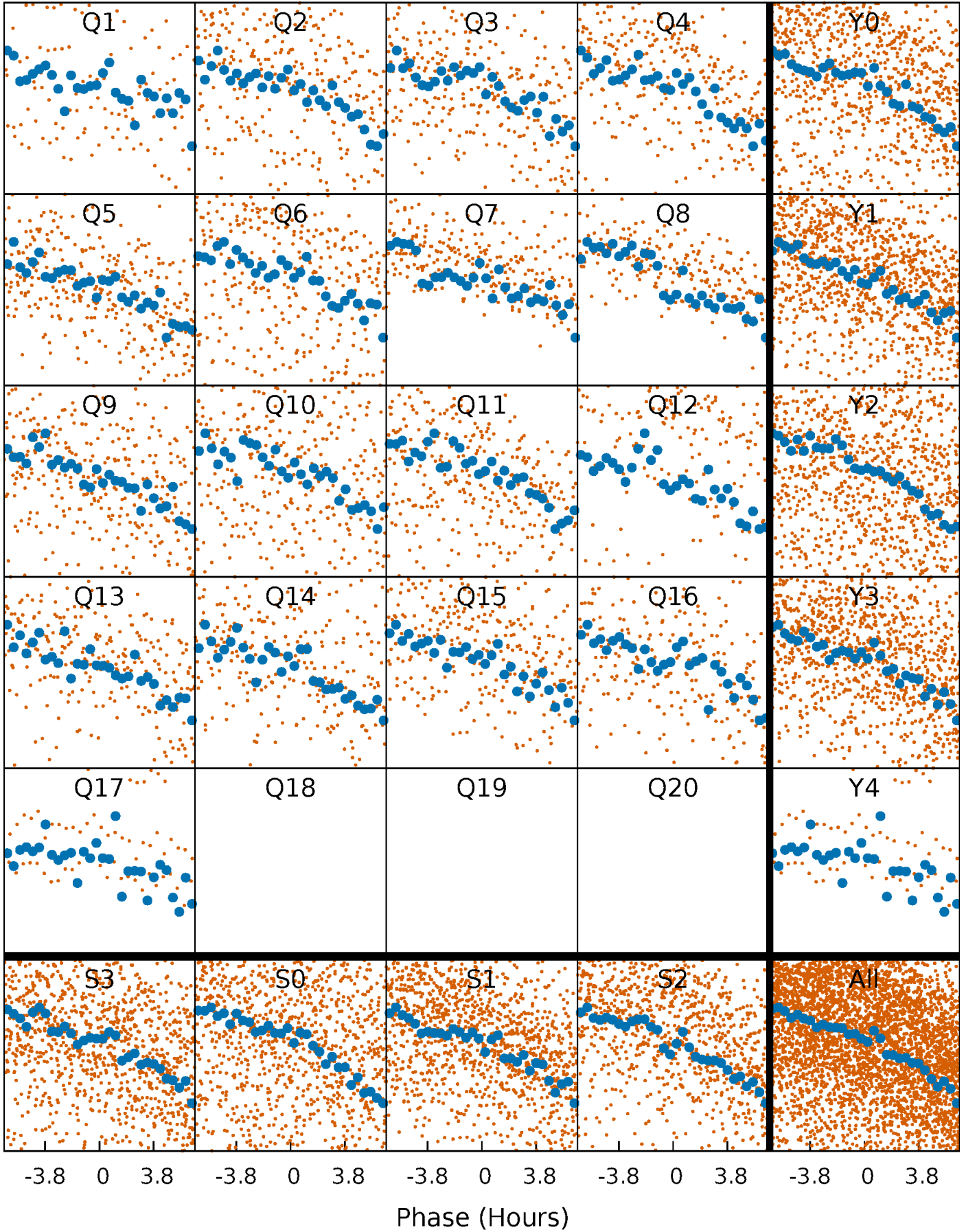


# Non-Whitened Vs. Whitened Light Curve



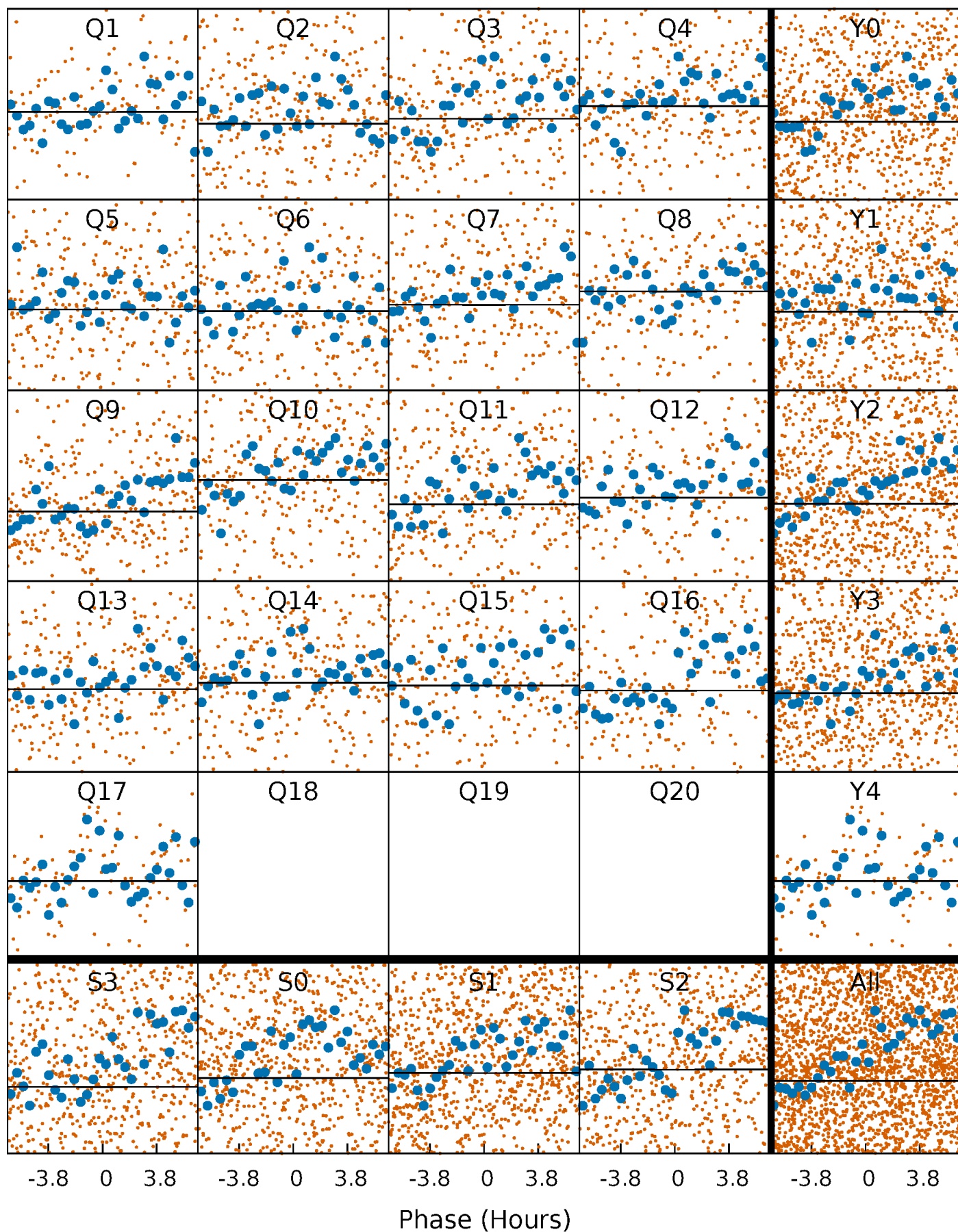
# PDC Quarter-Phased Transit Curves

TCE 005396950-03 P= 7.502186 Days  $T_0=135.232513$  (BKJD)



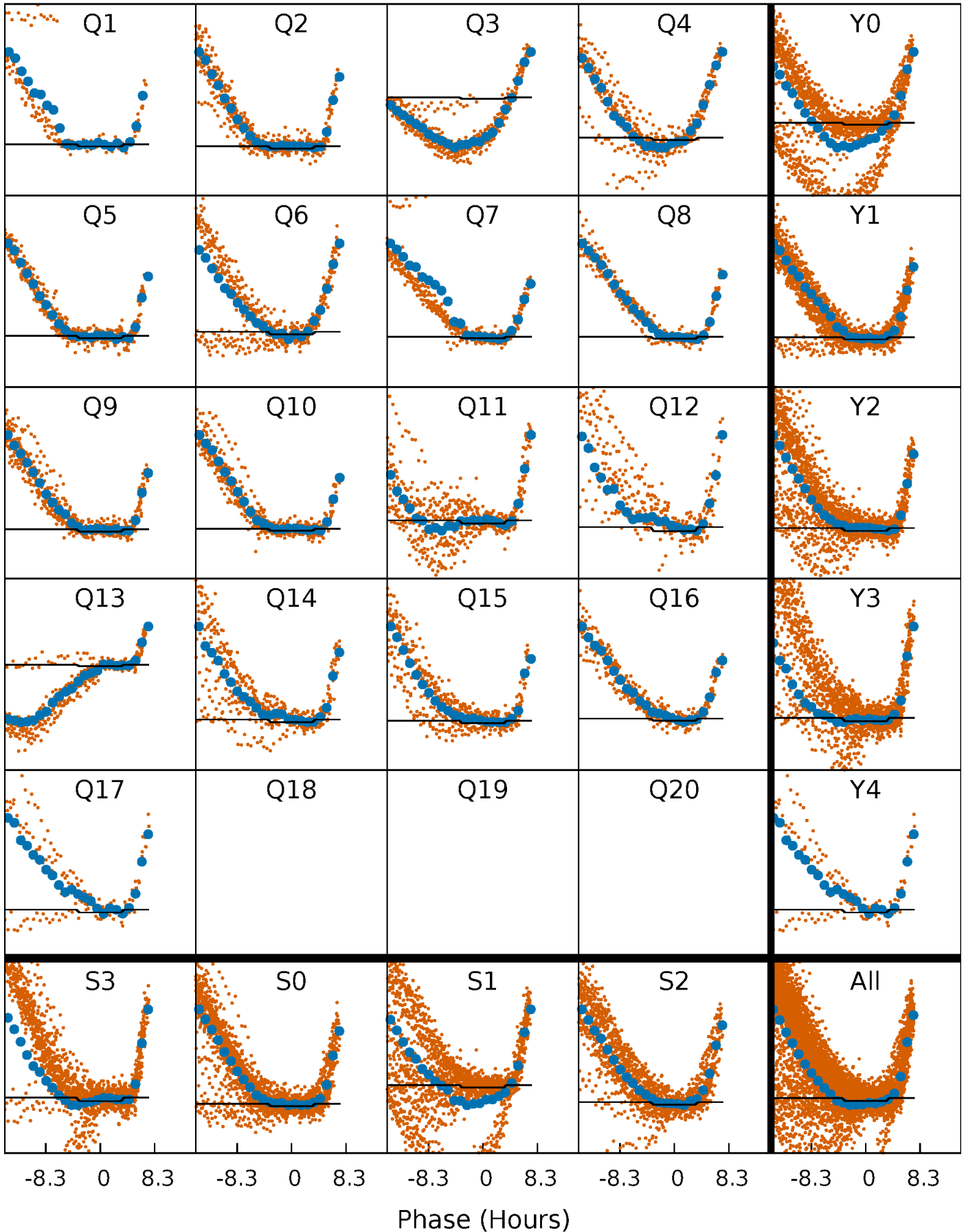
# DV Quarter-Phased Transit Curves

TCE 005396950-03 P= 7.502186 Days  $T_0=135.232513$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005396950-03   P= 7.502656 Days    $T_0=135.246808$  (BKJD)

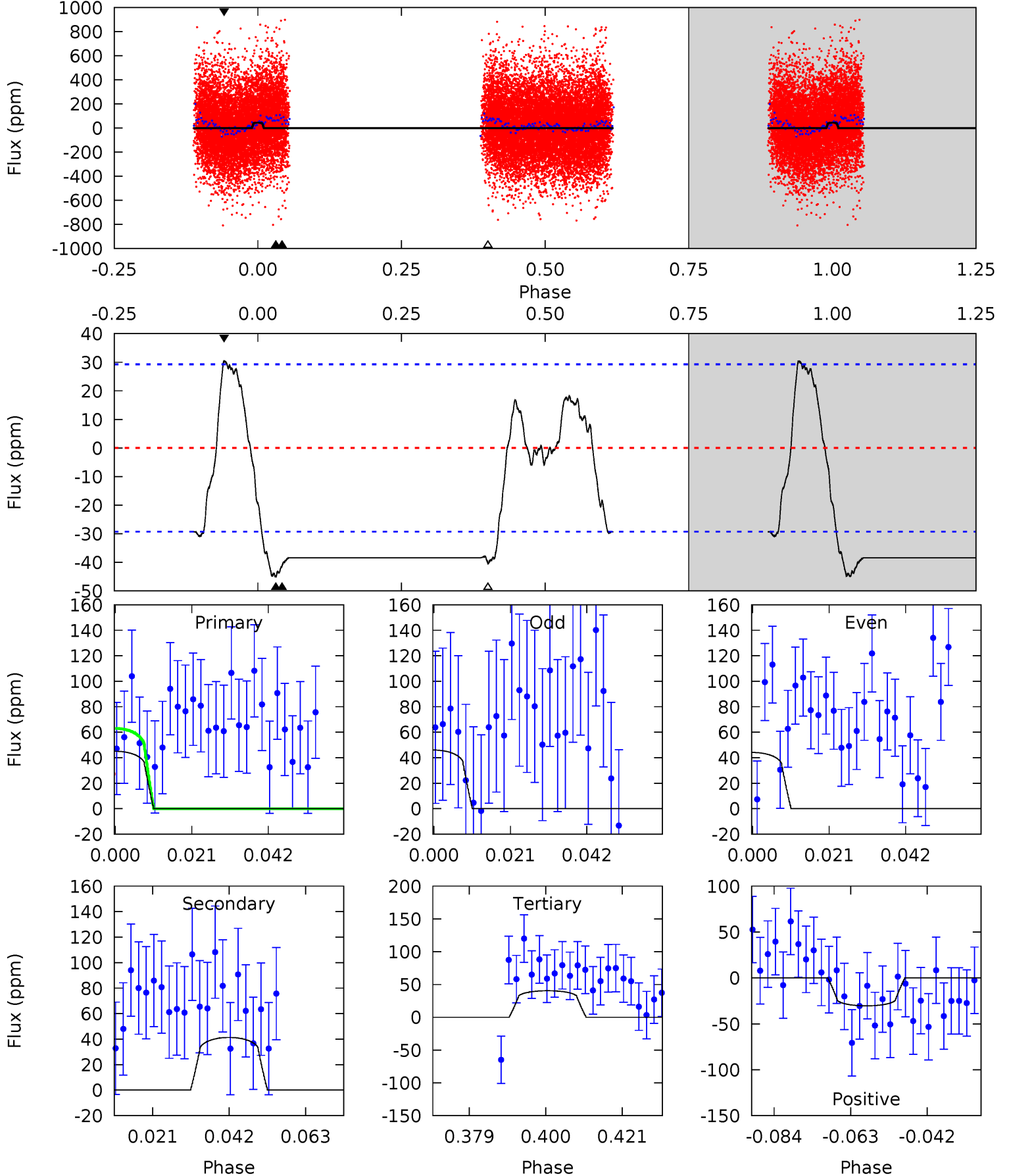




# DV Model-Shift Uniqueness Test

005396950-03, P = 7.502186 Days, E = 127.730327 Days

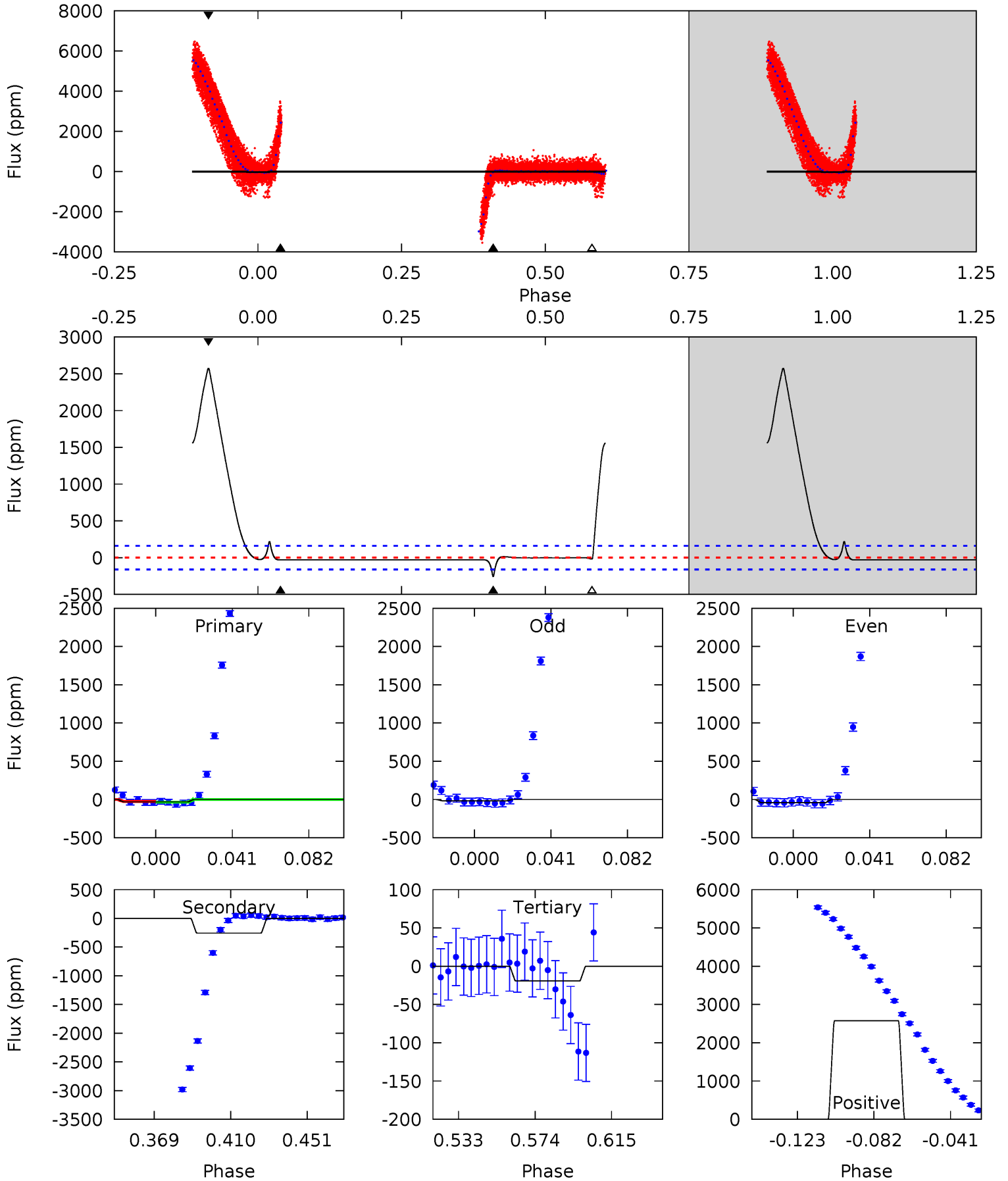
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.51	6.89	6.75	5.07	4.88	2.31	3.06	0.76	2.44	0.14	1.82	0.16	0.98	0.40	2.99



# Alt Model-Shift Uniqueness Test

005396950-03, P = 7.502656 Days, E = 127.744152 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
0.91	7.56	0.56	76.0	4.75	2.04	22.7	0.34	-75.1	7.00	-68.5	0.36	16.0	0.91	0.14



### Stellar Parameters For KIC 005396950

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7303^{+203}_{-319}$	$4.180^{+0.090}_{-0.195}$	$0.060^{+0.200}_{-0.350}$	$1.684^{+0.581}_{-0.249}$	$1.563^{+0.211}_{-0.232}$	$0.461^{+0.230}_{-0.245}$
	+3%/-4%	+2%/-5%	+333%/-583%	+35%/-15%	+13%/-15%	+50%/-53%
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 005396950-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-41 \pm 6$	$1.55^{+1.56}_{-1.08}$	$1998^{+157}_{-116}$	$6382^{+8239}_{-1754}$	$70^{+674}_{-53}$
Alt.	$-256 \pm 34$	$2.33^{+2.00}_{-1.48}$	$2005^{+152}_{-114}$	$8529^{+12186}_{-2511}$	$196^{+1210}_{-141}$

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

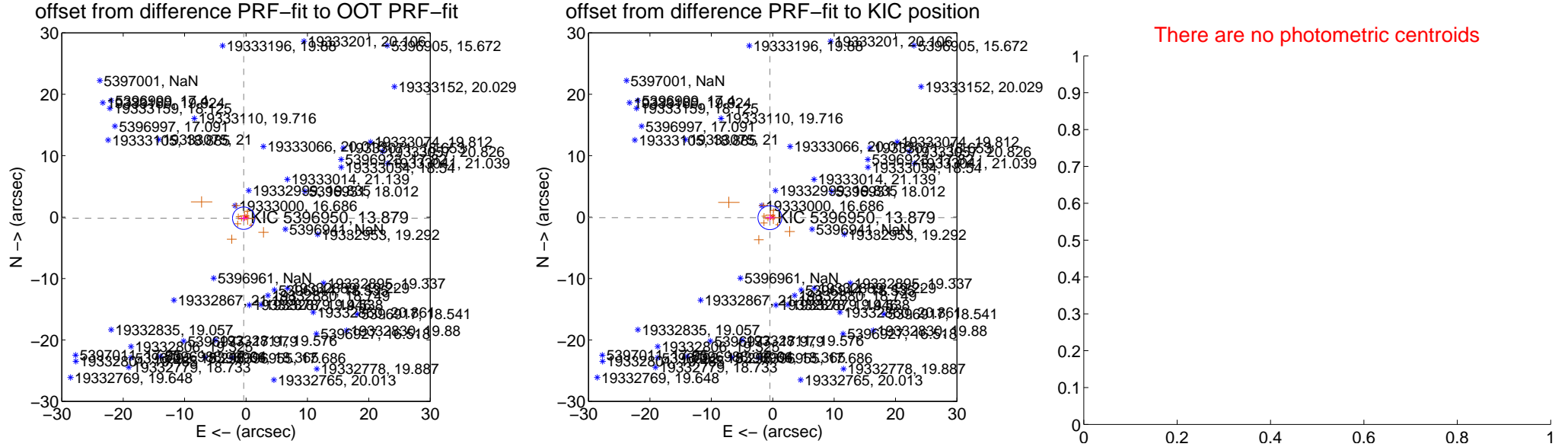
## DV Centroid Data

Supplemental centroid analysis for 005396950-03. Kepler magnitude: 13.88. Transit SNR 0.02

There are 0 quarters with good PRF difference image offsets

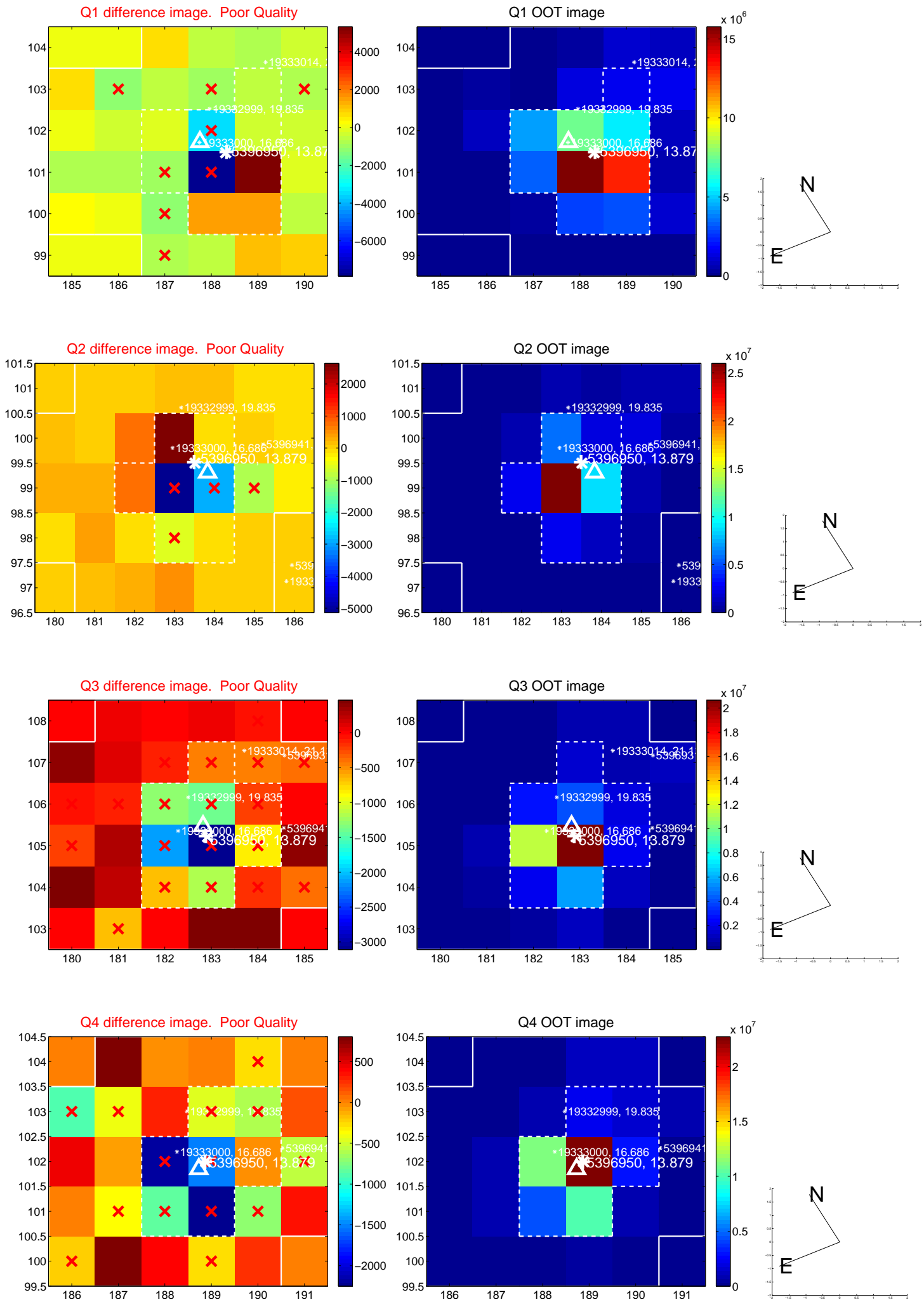
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.416 \pm 0.607$	0.69	$0.377 \pm 0.735$	$-0.176 \pm 0.512$
PRF-fit source offset from KIC position	$0.466 \pm 0.650$	0.72	$0.457 \pm 0.699$	$-0.092 \pm 0.524$
photometric centroid source offset	—	—	—	—

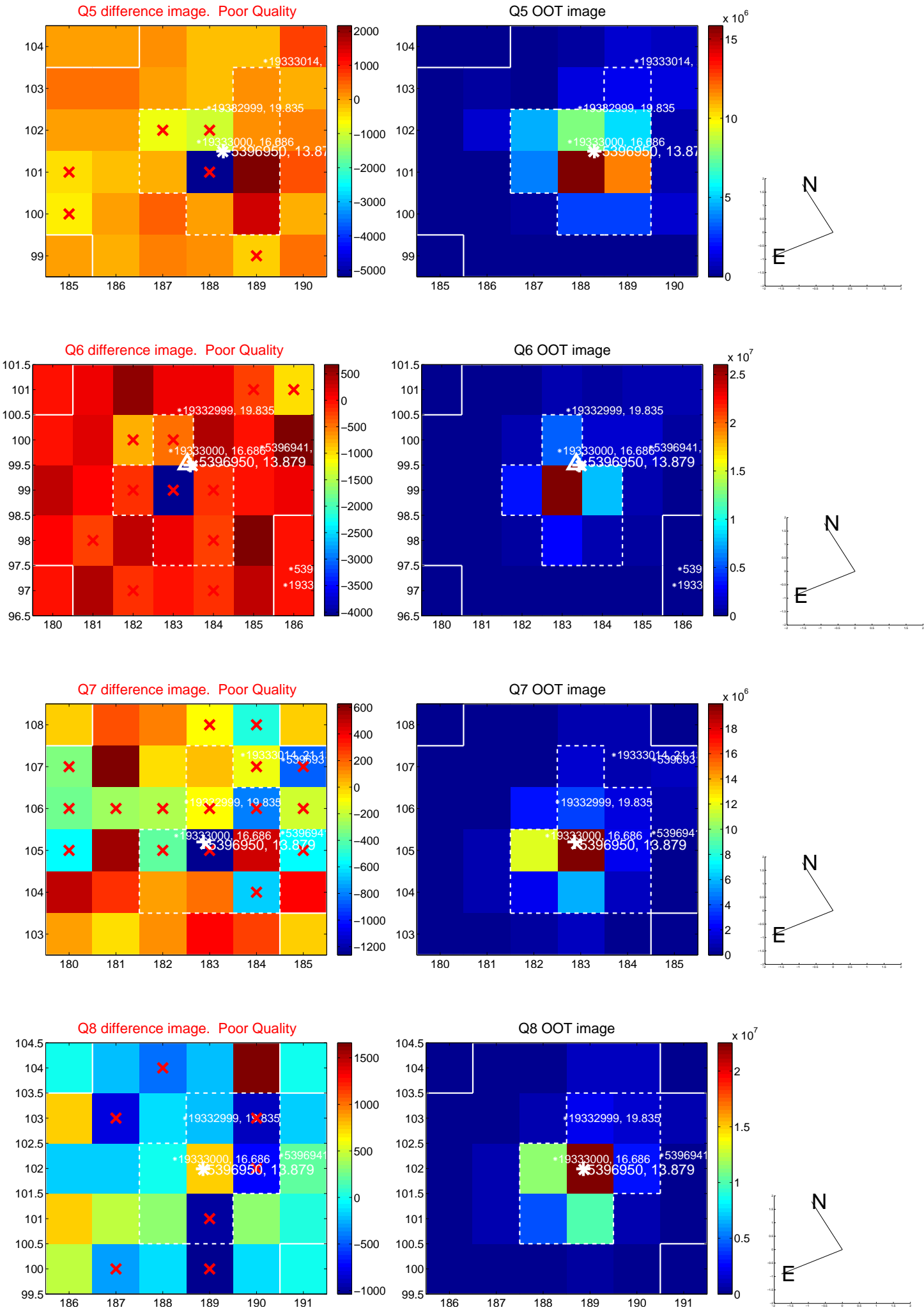


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

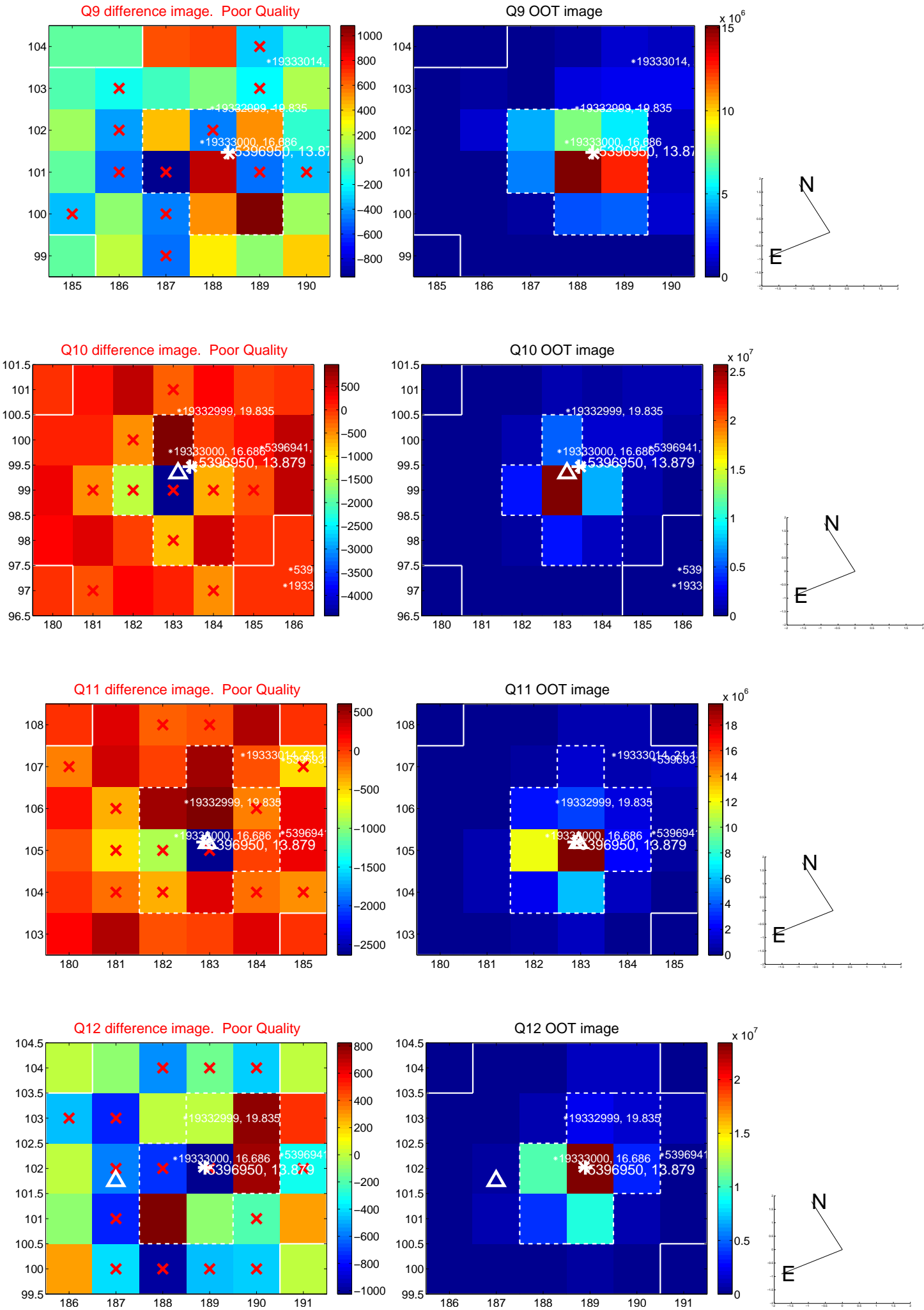


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

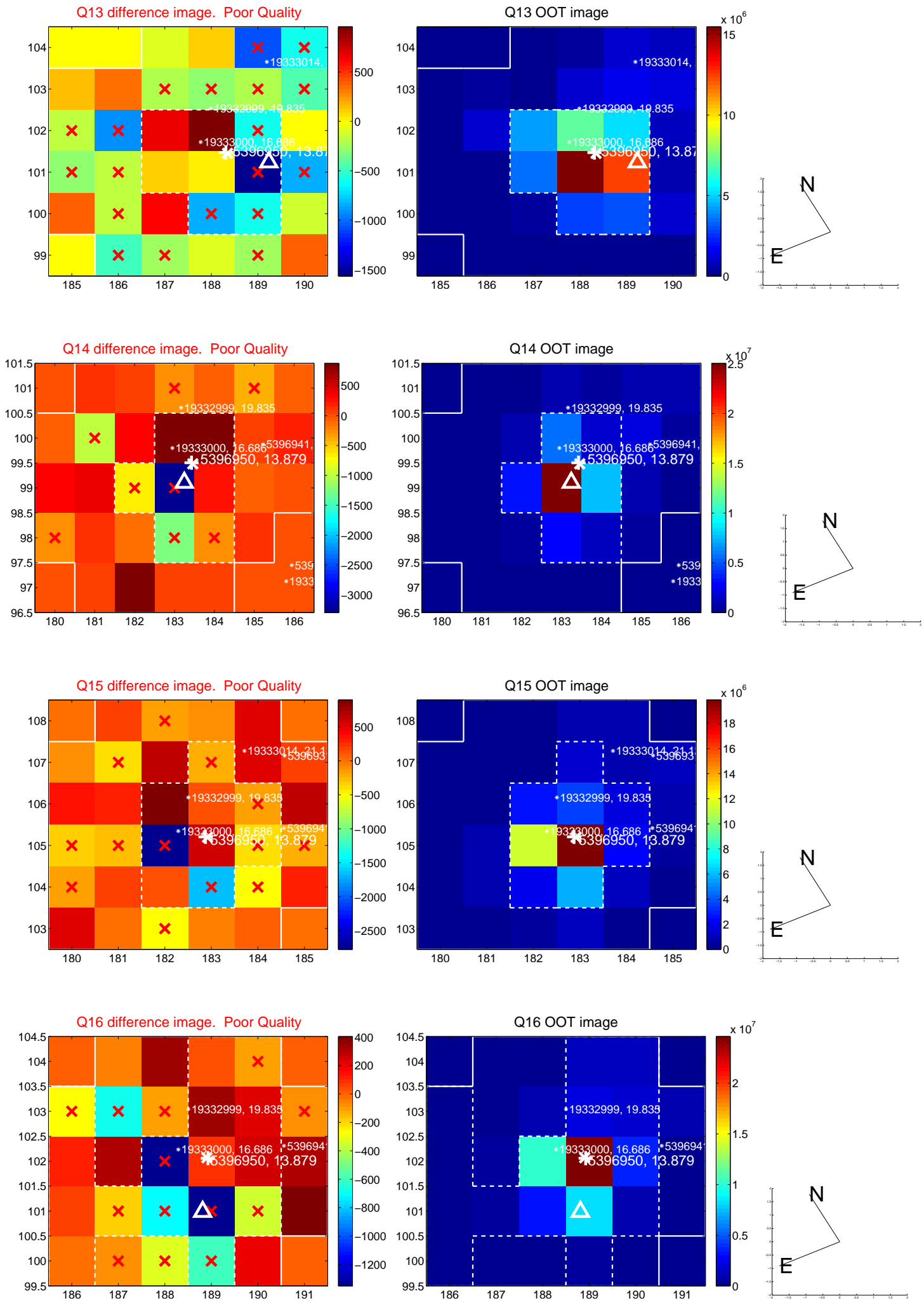




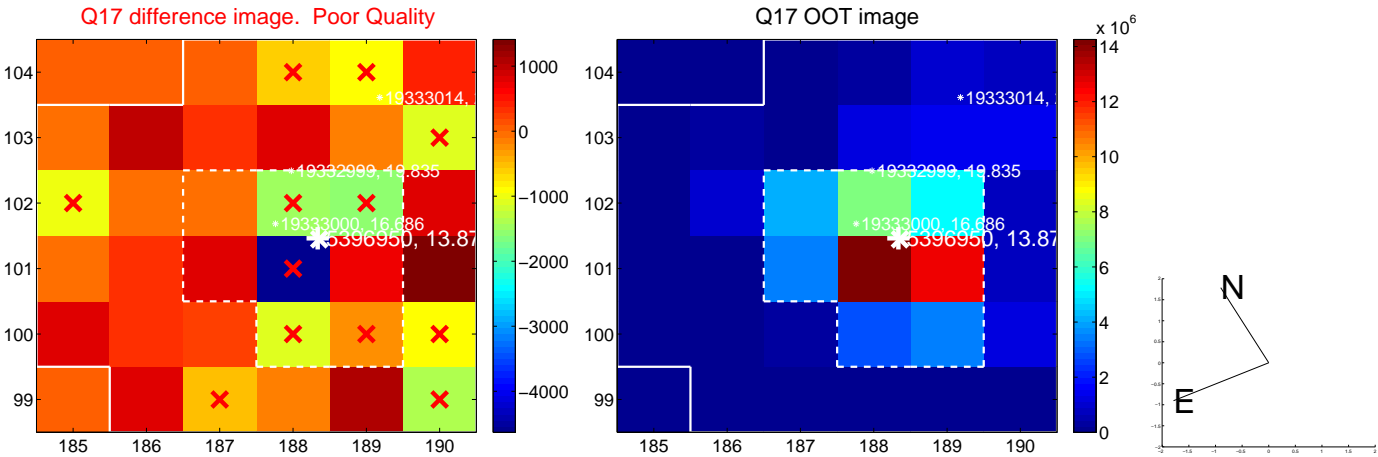
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



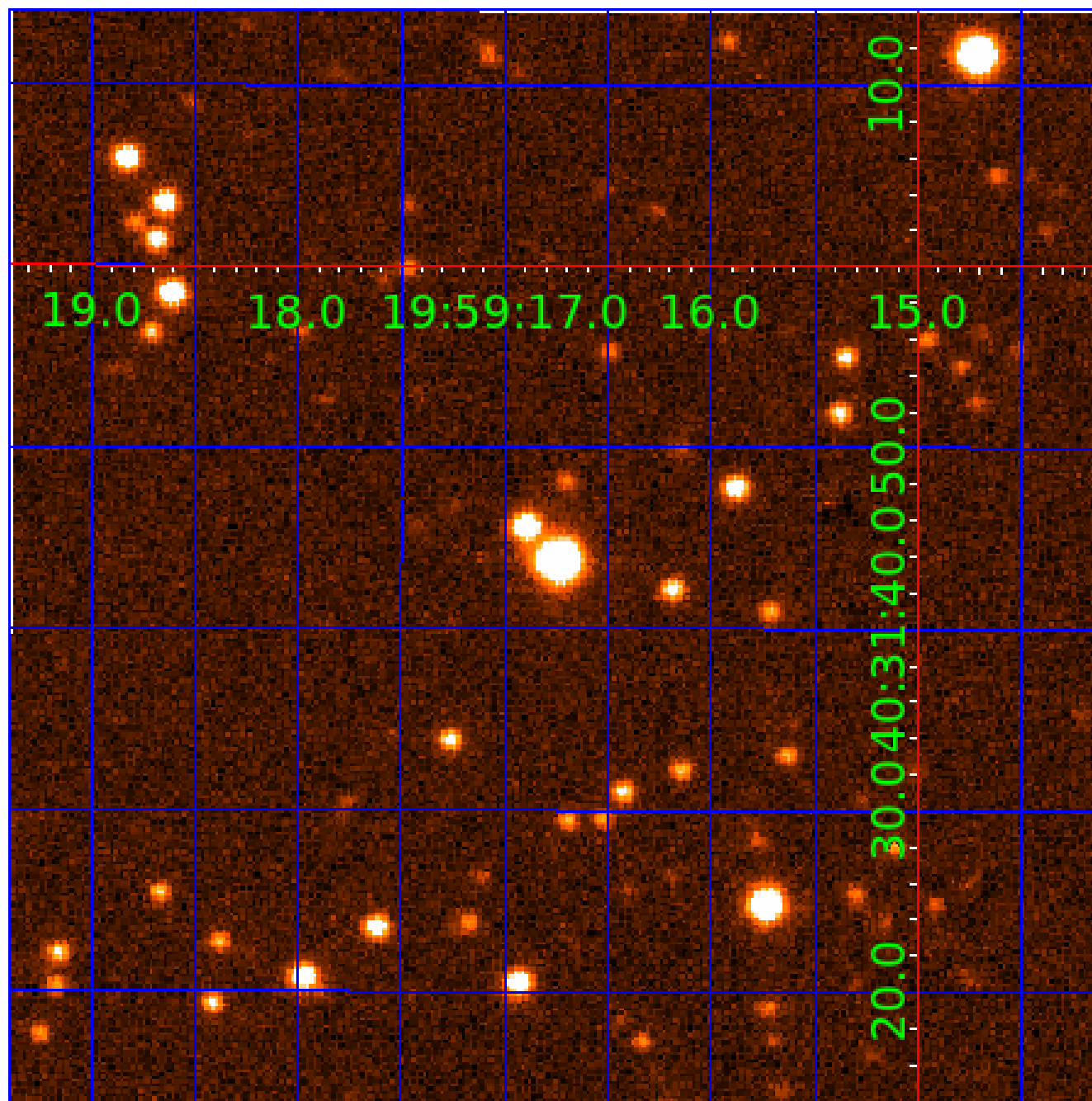
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 005396950

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005396950-01	OBS	No	3.751484	133.303526	55.4	17.165	13.1	11.6	1.68	7303	1.29	2399.88
005396950-02	OBS	No	7.502751	135.928048	397.3	6.000	17.7	-1.0	1.68	7303	3.40	952.43
005396950-03	OBS	No	7.502186	135.232513	0.2	3.347	9.3	0.0	1.68	7303	0.08	952.53
005396950-04	OBS	No	2.500996	132.471041	65.3	17.348	7.8	9.4	1.68	7303	1.38	4120.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005396950-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
005396950-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
005396950-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— SAME_NTL_PERIOD—CENT_FEW_DIFFS
005396950-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS—HALO_GHOST

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

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

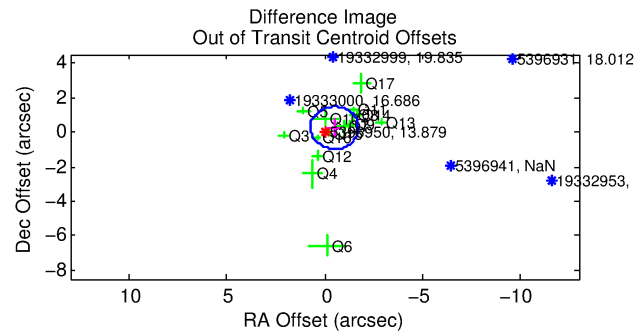
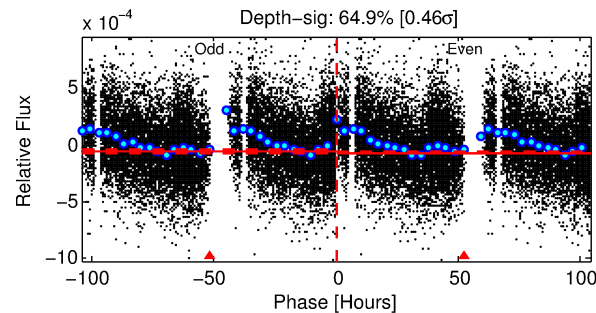
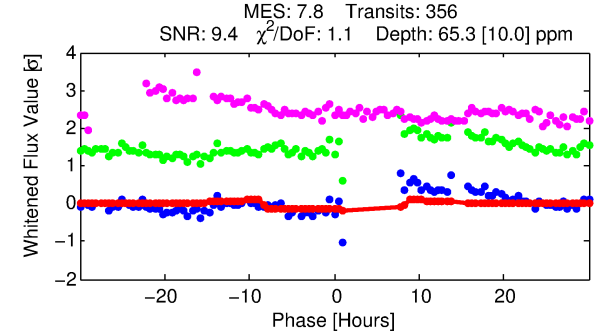
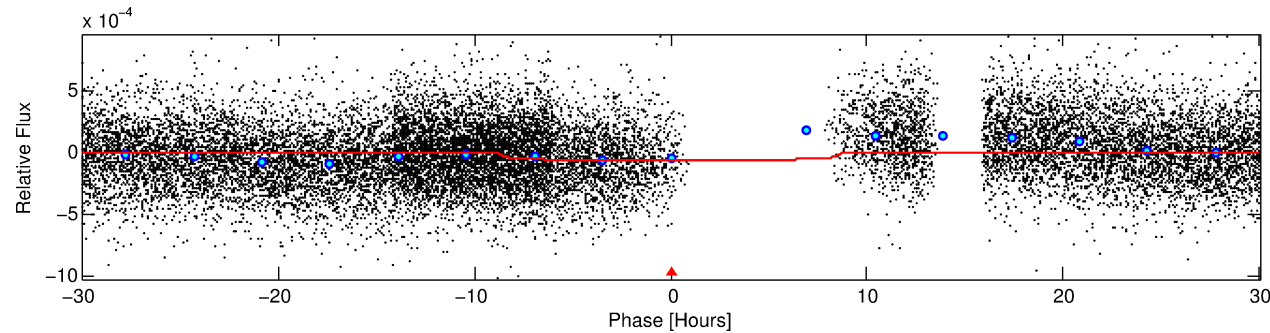
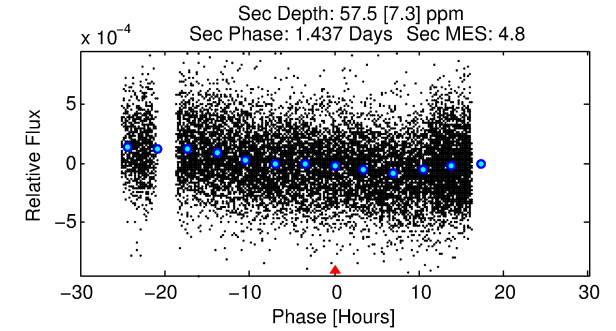
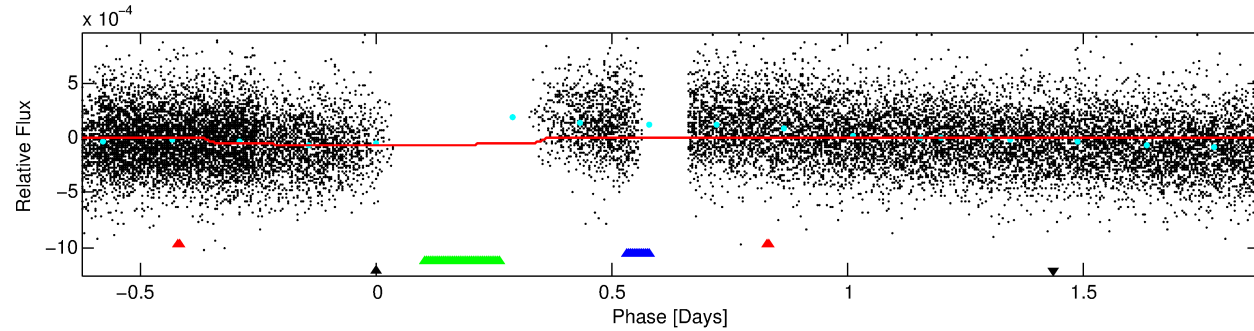
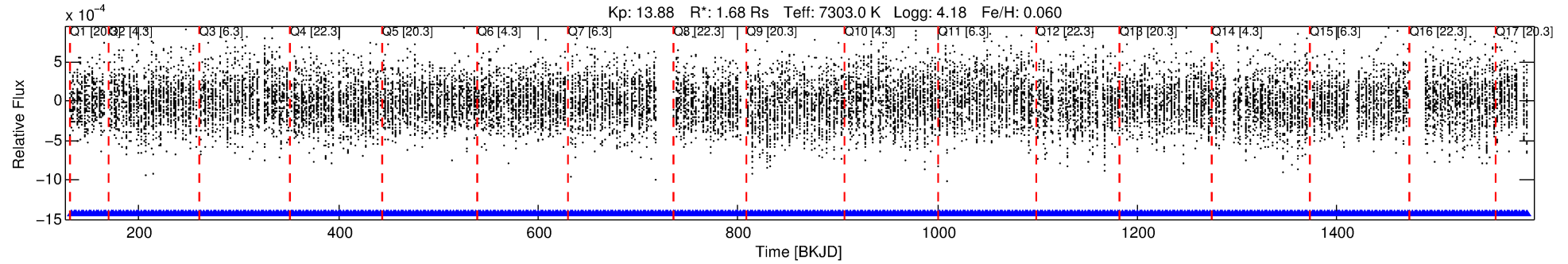
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005396950-04

No Significant Match Found

# DV One-Page Summary

KIC: 5396950 Candidate: 4 of 4 Period: 2.501 d



## DV Fit Results:

Period = 2.50100 [0.00003] d  
Epoch = 132.4710 [0.0121] BKJD  
Rp/R\* = 0.0075 [0.0059]  
a/R\* = 1.28 [2.36]  
b = 0.09 [55.08]  
Seff = 4120.76 [1714.12]  
Teff = 2043 [212] K  
Rp = 1.38 [1.19] Re  
a = 0.0419 [0.0115] AU  
Ag = 29.16 [47.37] [0.59σ]  
Teffp = 7340 [2917] K [1.81σ]

## DV Diagnostic Results:

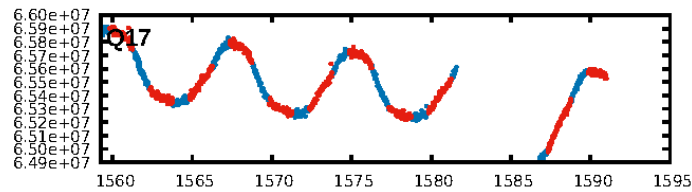
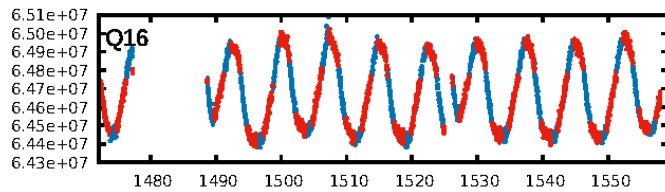
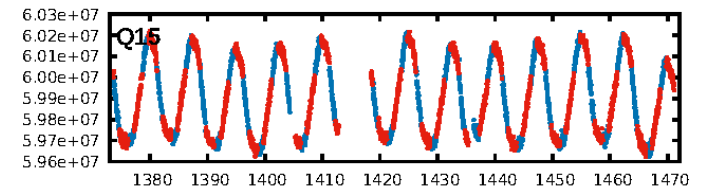
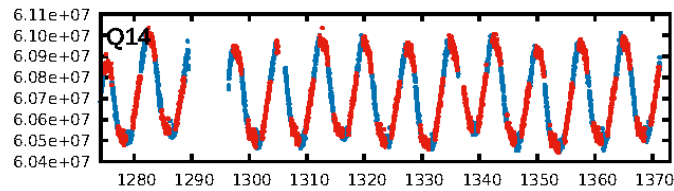
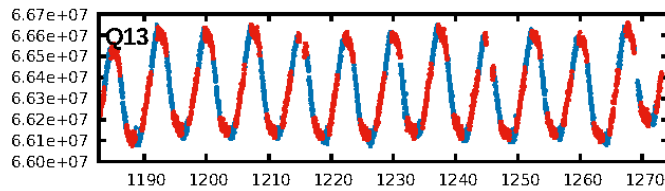
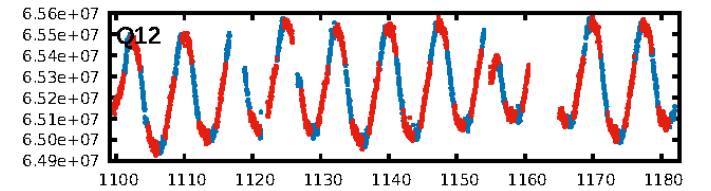
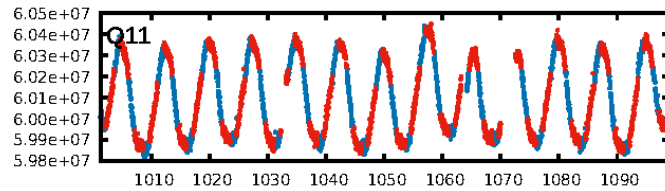
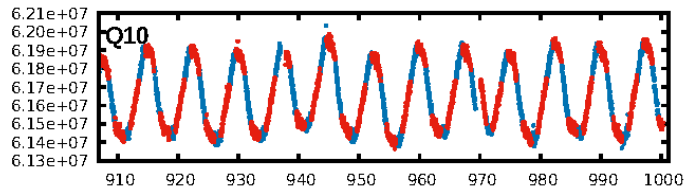
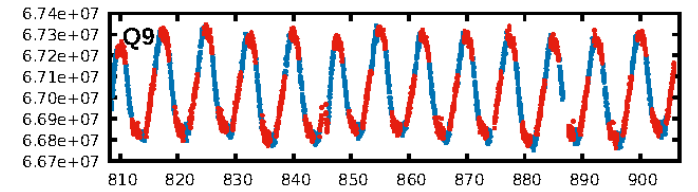
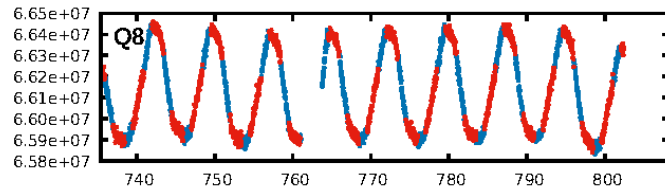
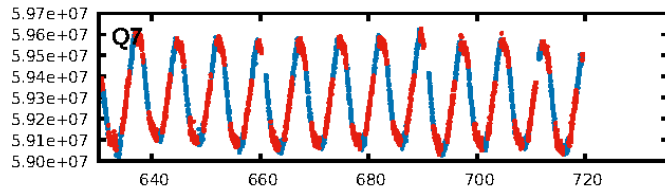
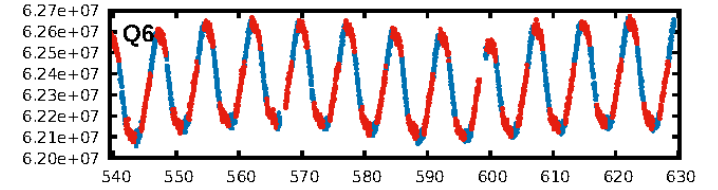
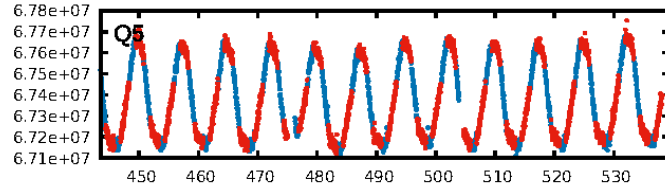
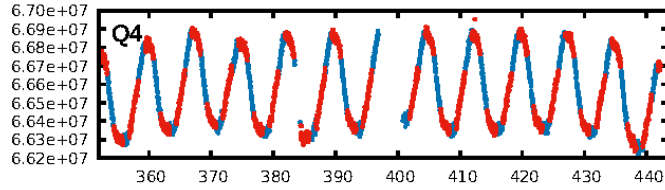
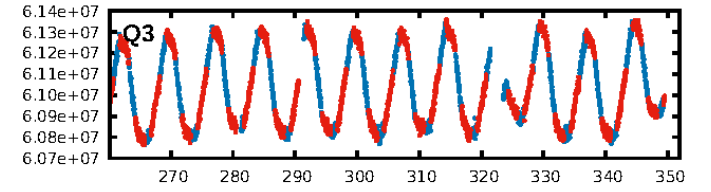
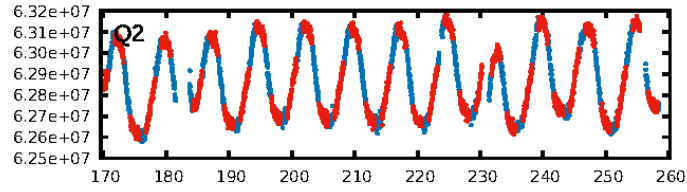
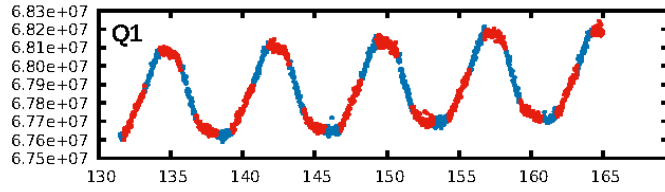
ShortPeriod-sig: N/A  
LongPeriod-sig: 78.1% [1.23σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [338/338]  
**GhostDiagnostic-chr: 0.01339**  
Centroid-sig: 0.6%  
Centroid-so: 0.456 arcsec [0.80σ]  
OotOffset-rm: 0.556 arcsec [1.36σ]  
KicOffset-rm: 0.560 arcsec [1.12σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.00 [0/15]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:30:54 Z

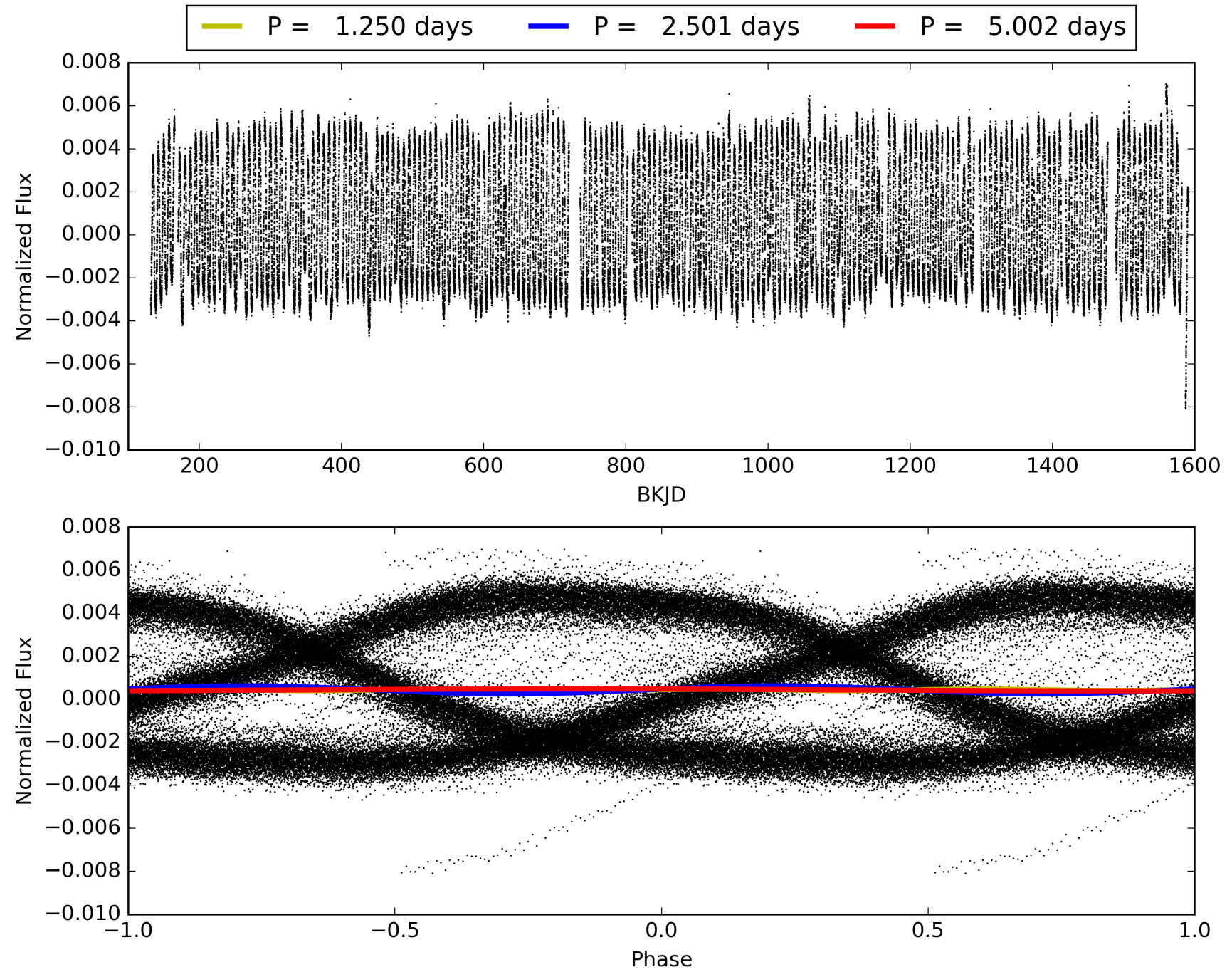
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005396950-04, PDC Light Curves

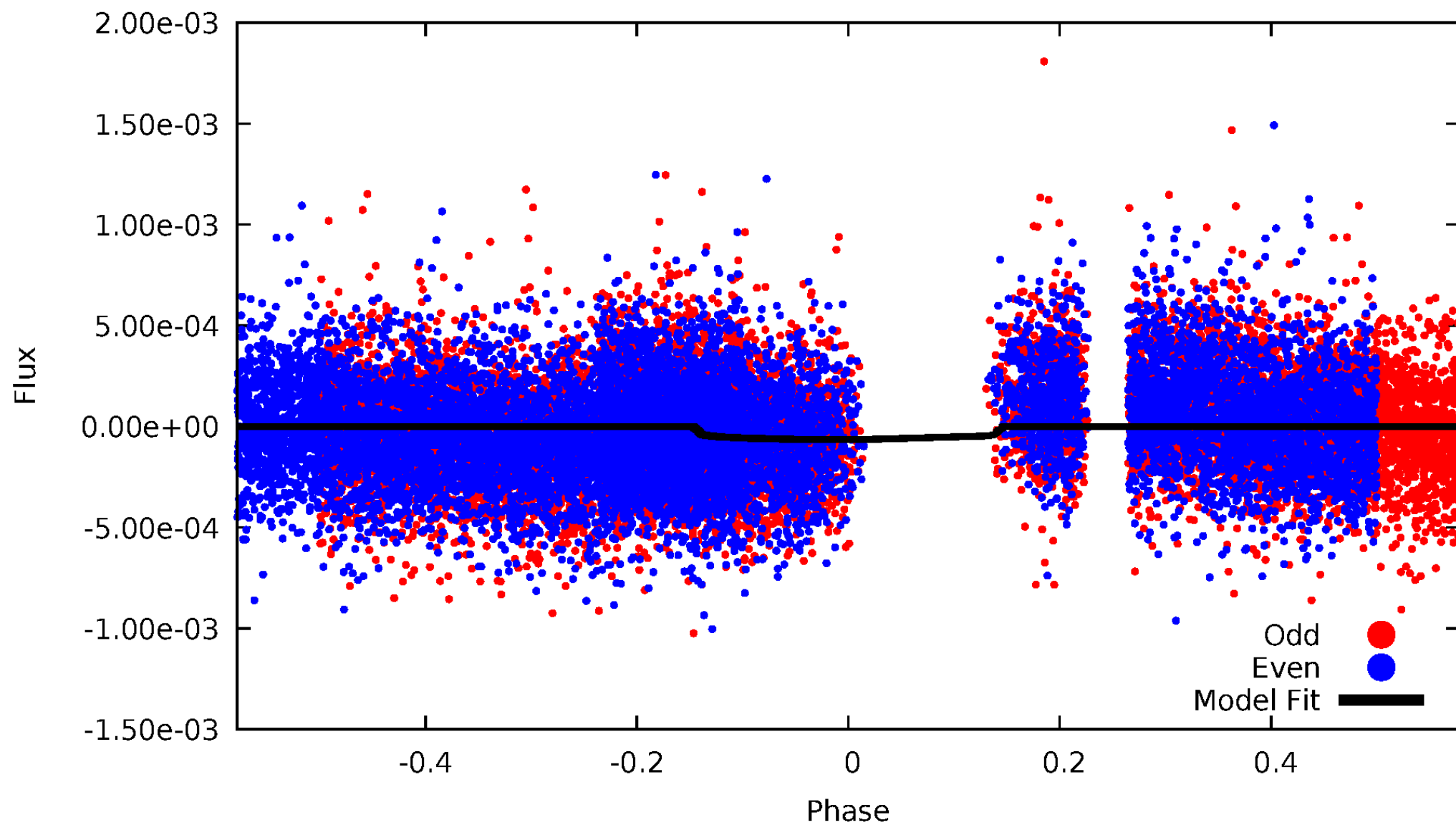


# TCE 005396950-04



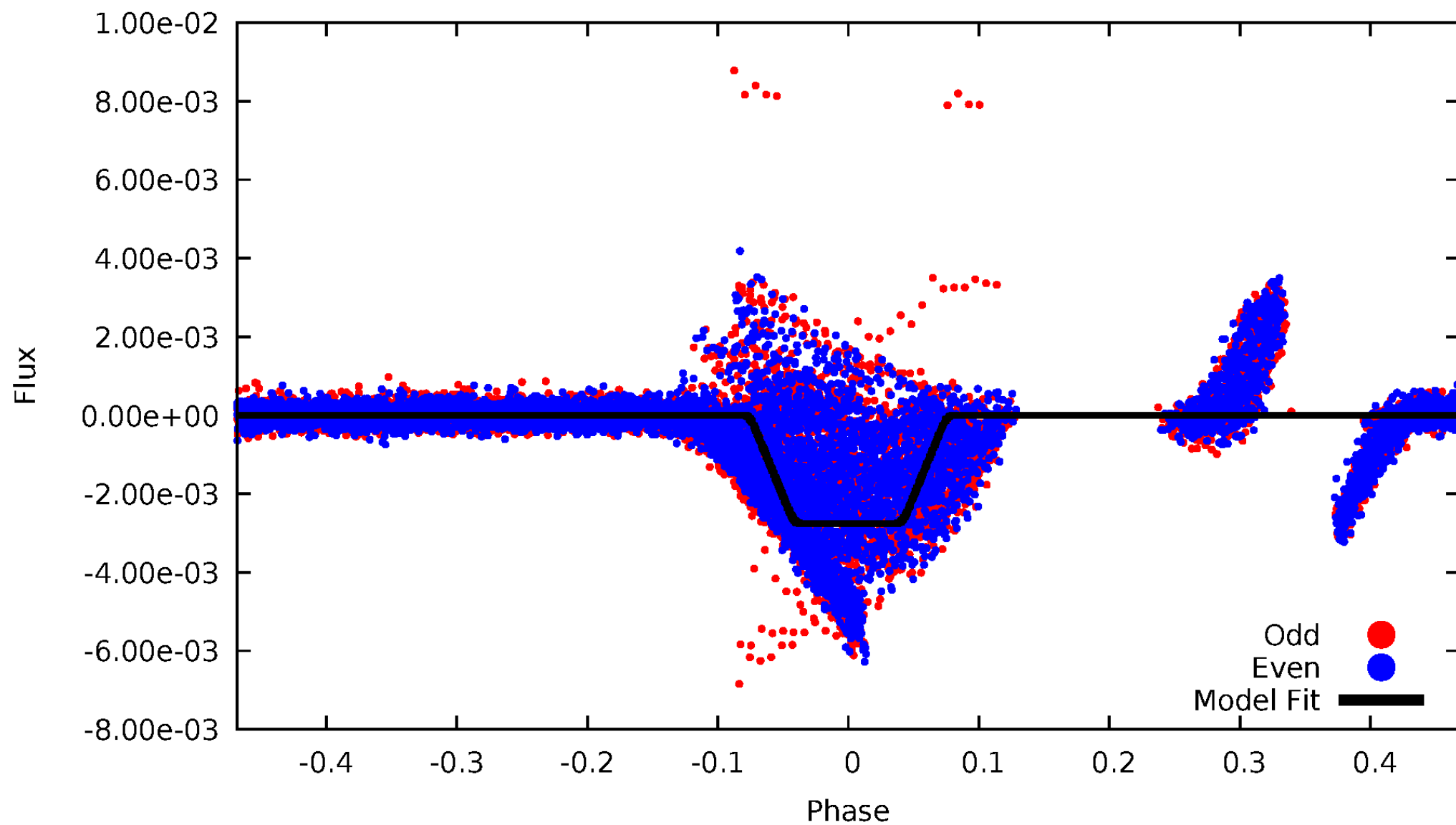
# DV Odd/Even

TCE 005396950-04



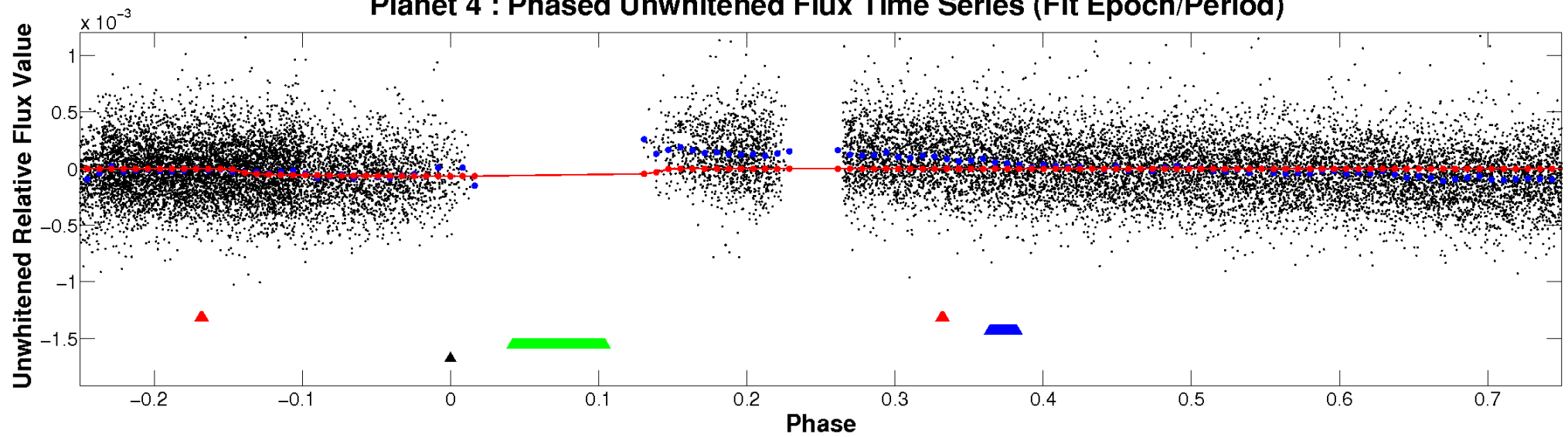
# ALT Odd/Even

TCE 005396950-04

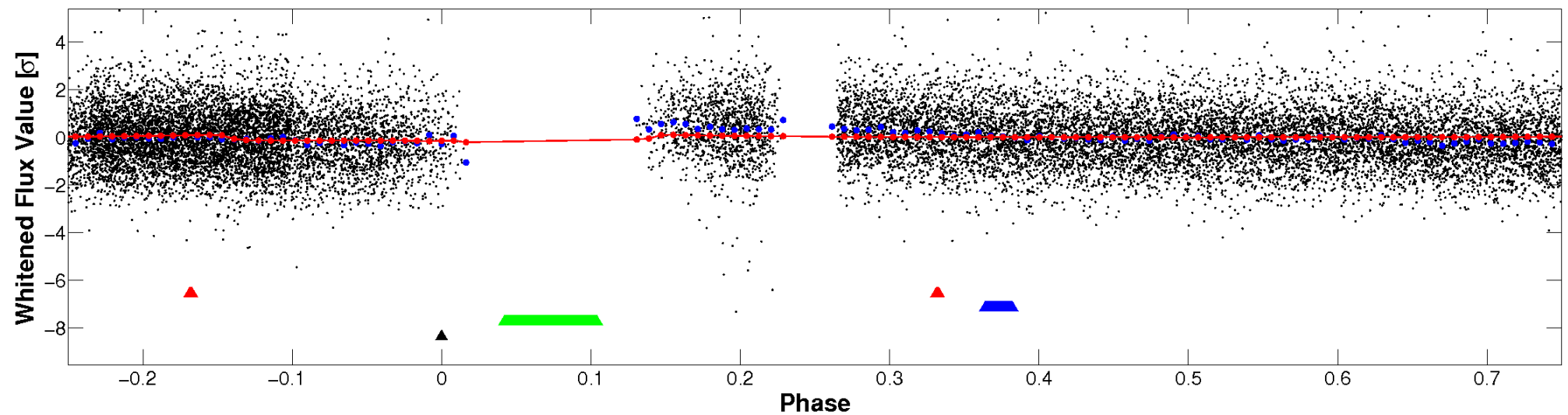


# Non-Whitened Vs. Whitened Light Curve

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



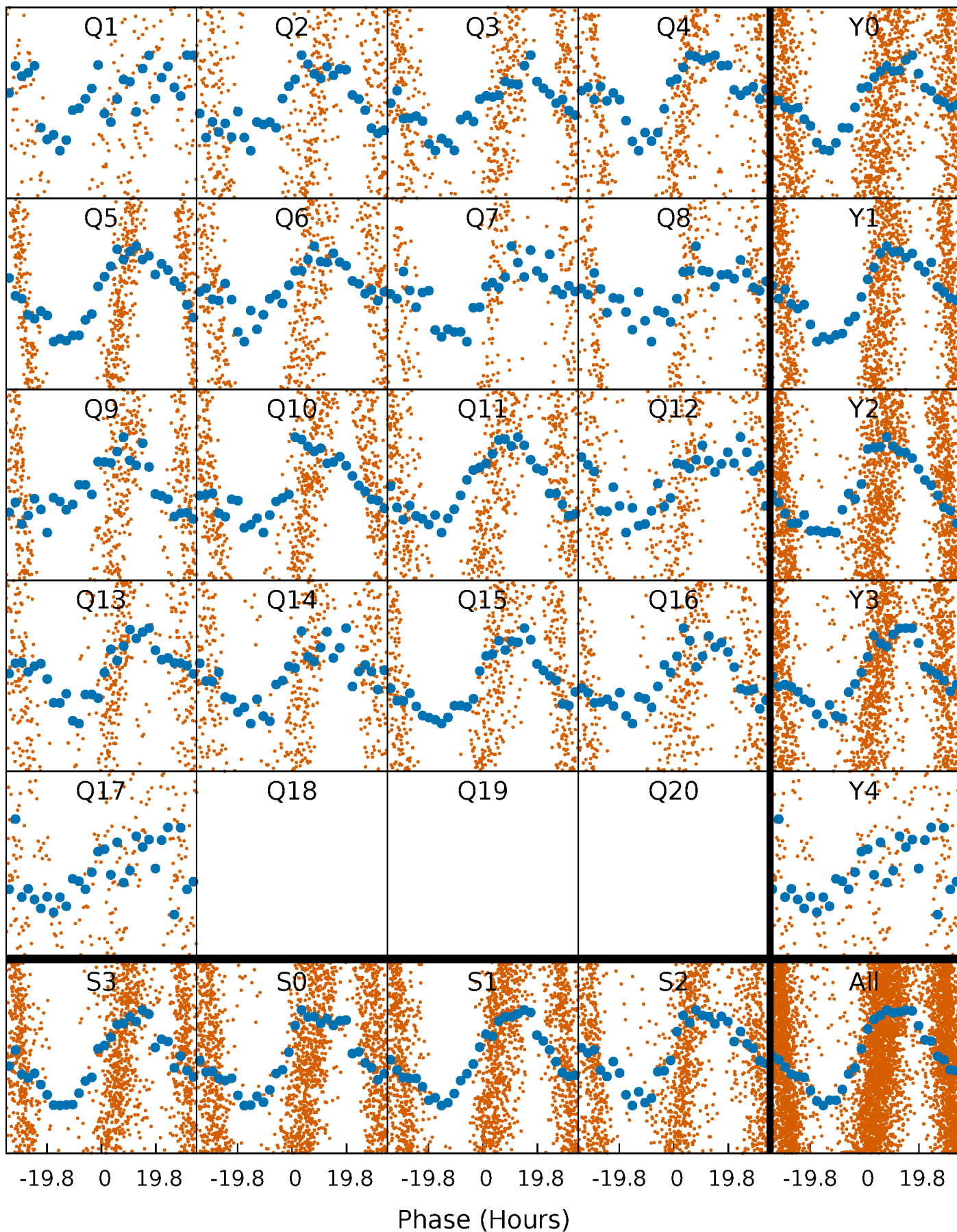
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

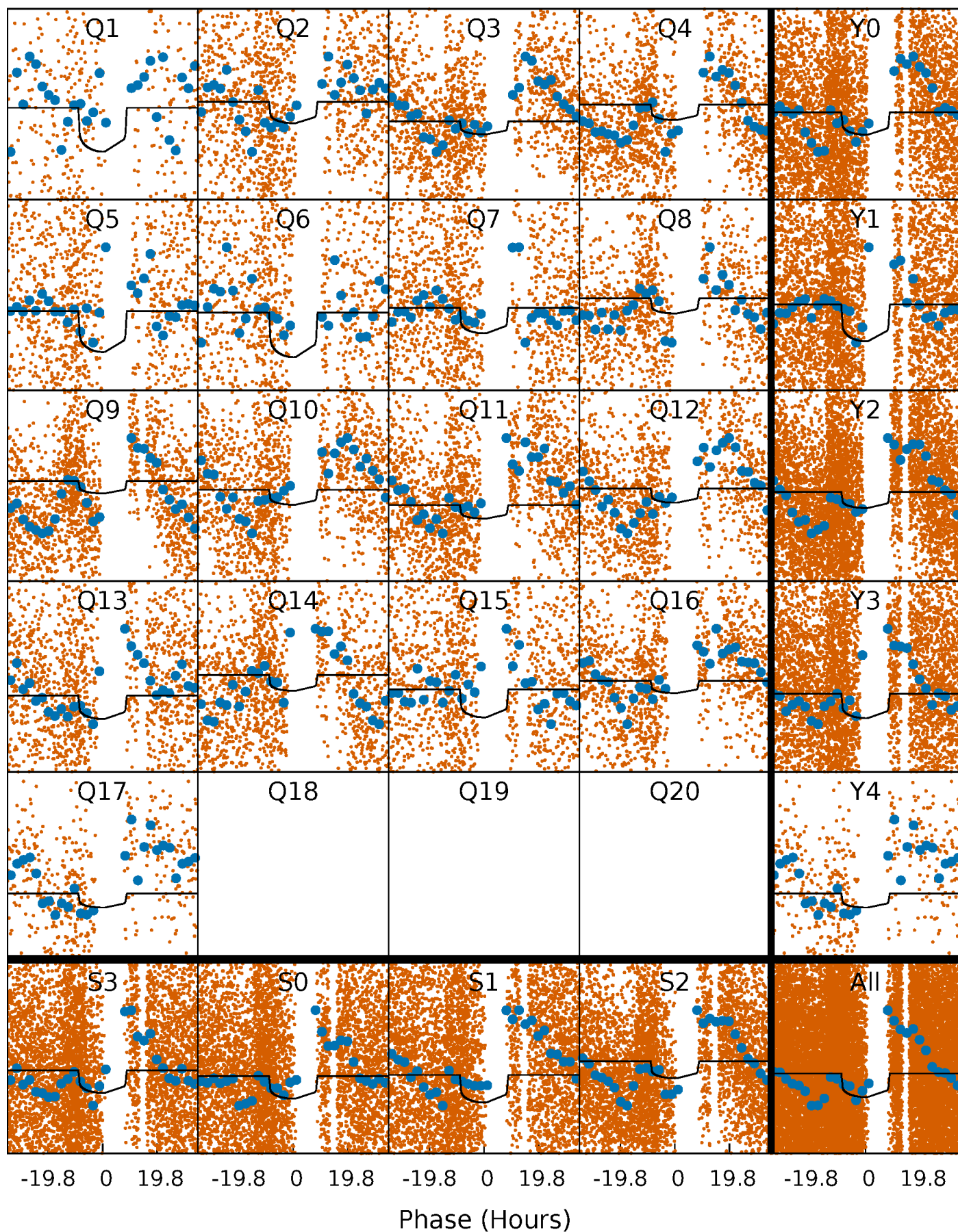
TCE 005396950-04 P= 2.500996 Days  $T_0=132.471041$  (BKJD)





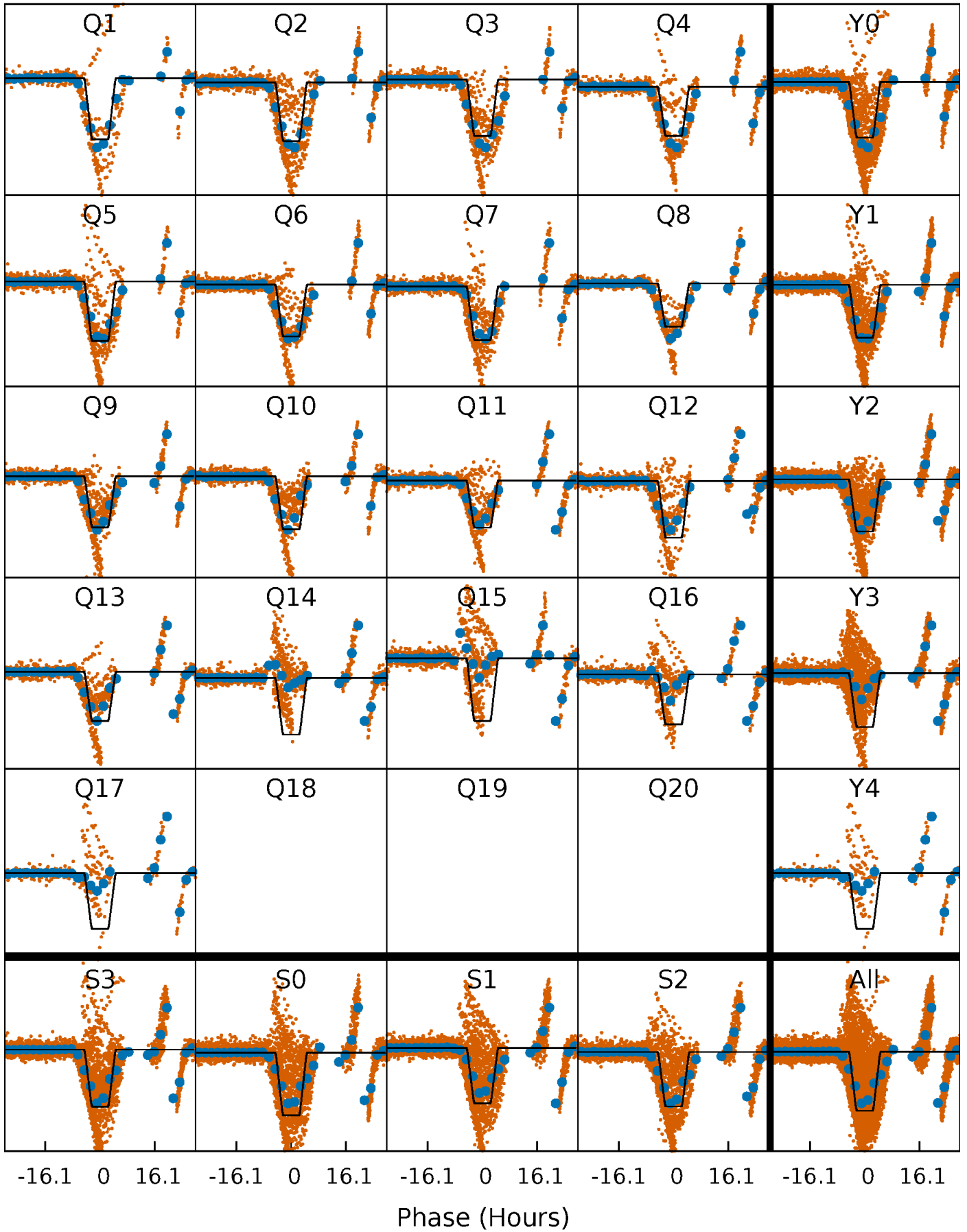
# DV Quarter-Phased Transit Curves

TCE 005396950-04   P= 2.500996 Days    $T_0=132.471041$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

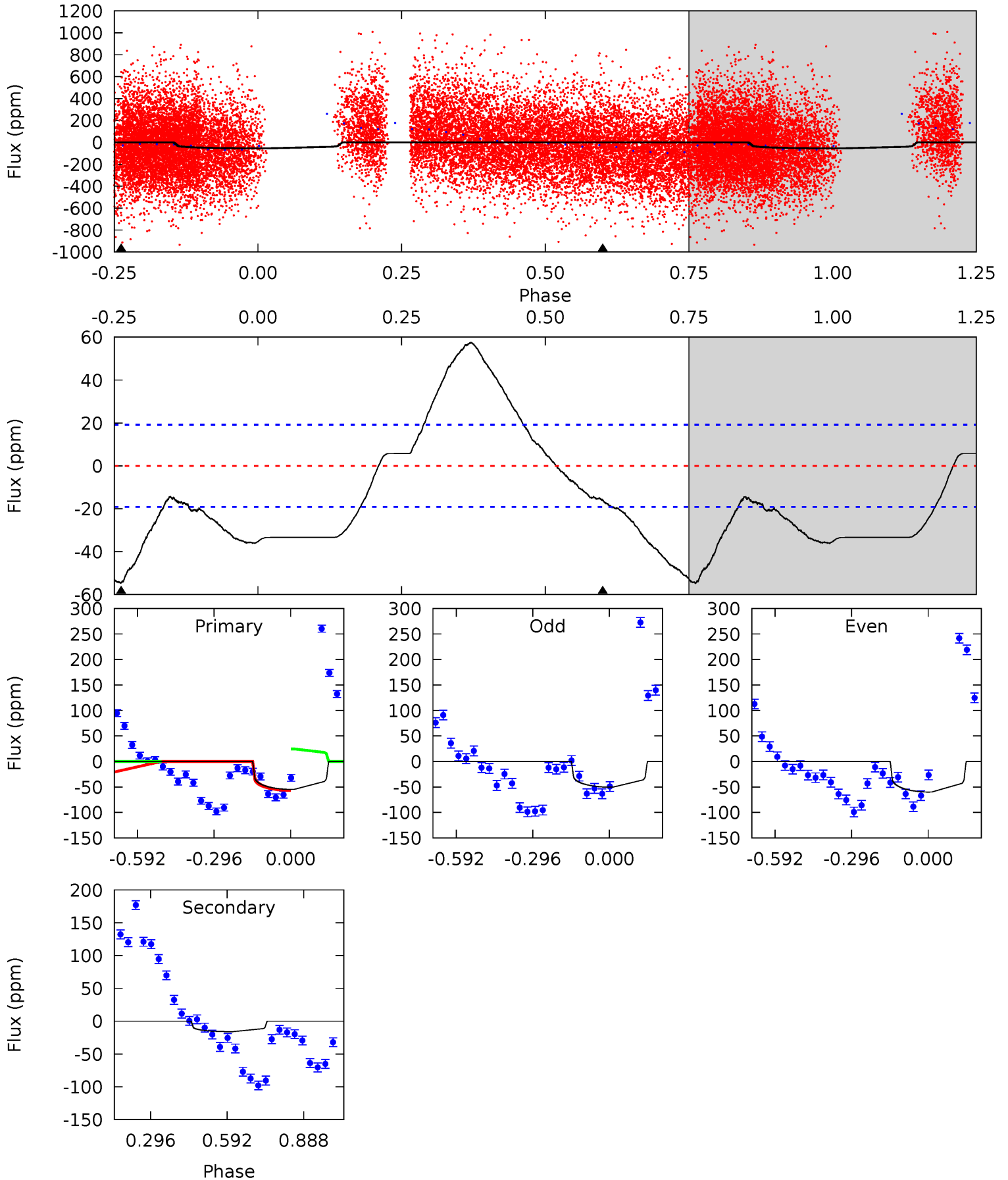
TCE 005396950-04   P= 2.501027 Days    $T_0=132.185999$  (BKJD)



# DV Model-Shift Uniqueness Test

005396950-04, P = 2.500996 Days, E = 129.970045 Days

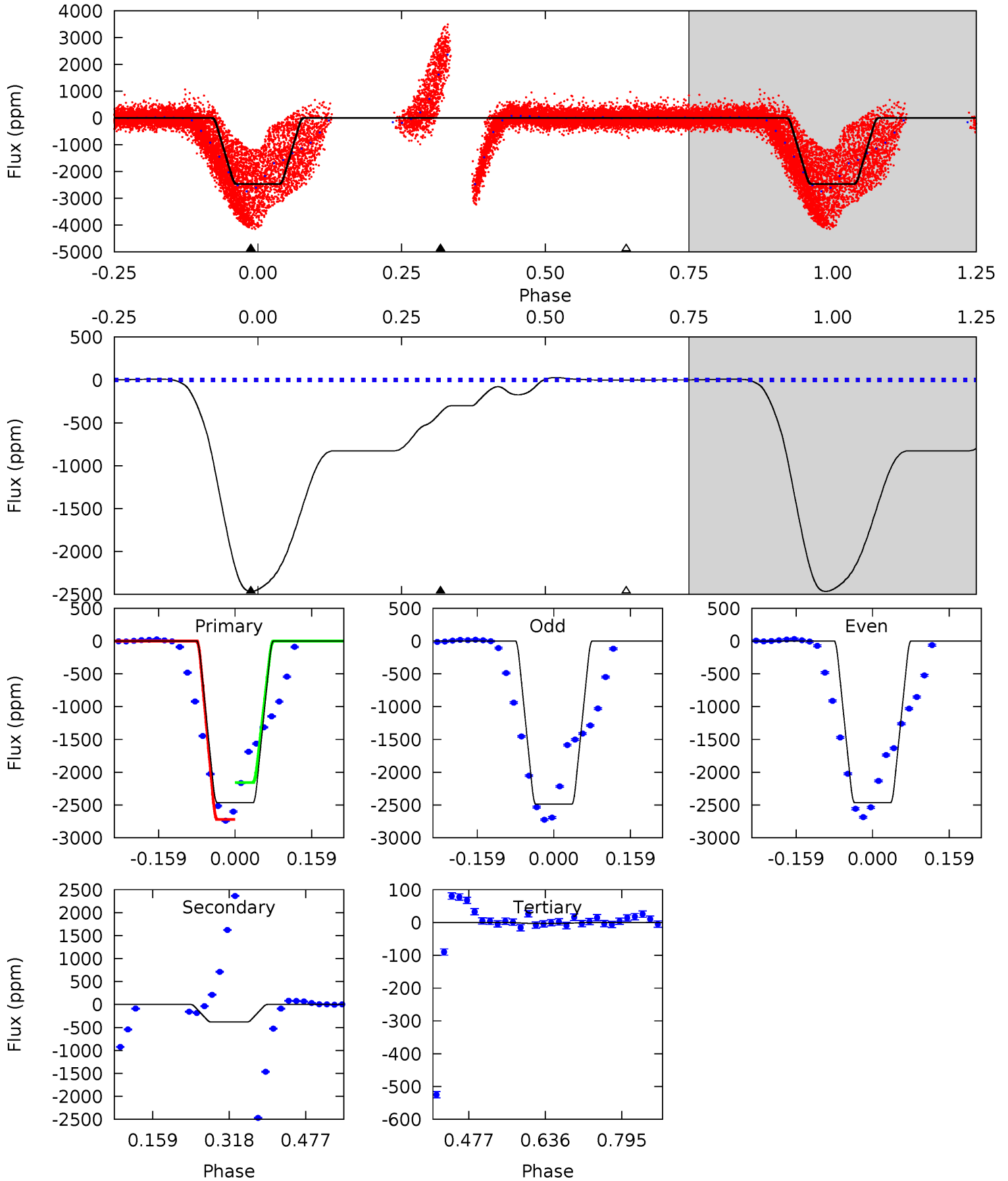
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	3.61	0	0	4.33	1.04	3.94	12.4	12.4	3.61	3.61	1.08	0.77	0.51	1.19



# Alt Model-Shift Uniqueness Test

005396950-04, P = 2.501027 Days, E = 129.684972 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
774.5	120.0	0.80	0	4.47	1.41	5.53	773.7	774.5	119.2	120.0	3.76	0.91	0.01	0



### Stellar Parameters For KIC 005396950

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7303^{+203}_{-319}$	$4.180^{+0.090}_{-0.195}$	$0.060^{+0.200}_{-0.350}$	$1.684^{+0.581}_{-0.249}$	$1.563^{+0.211}_{-0.232}$	$0.461^{+0.230}_{-0.245}$
	+3%/-4%	+2%/-5%	+333%/-583%	+35%/-15%	+13%/-15%	+50%/-53%
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 005396950-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 4$	$1.61^{+1.15}_{-0.88}$	$2878^{+209}_{-157}$	$4963^{+2656}_{-1063}$	$5.574^{+25.000}_{-3.648}$
Alt.	$-382 \pm 3$	$9.73^{+1.93}_{-1.41}$	$2866^{+193}_{-159}$	$4480^{+259}_{-219}$	$3.809^{+1.315}_{-1.104}$

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

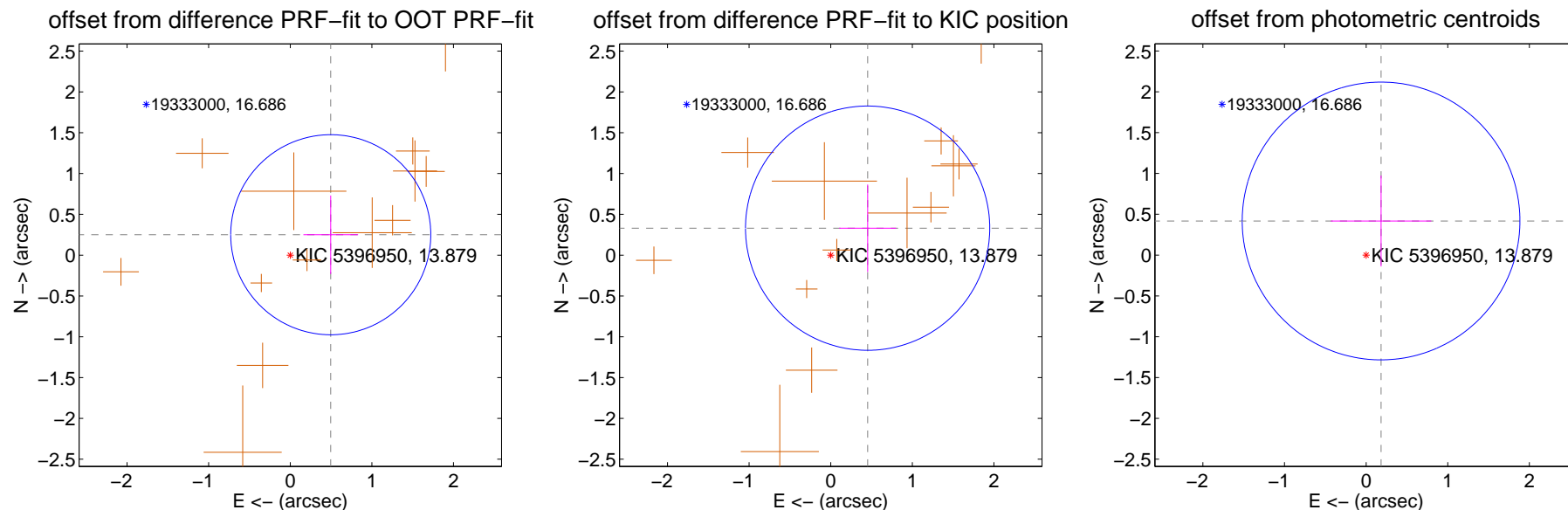
## DV Centroid Data

Supplemental centroid analysis for 005396950-04. Kepler magnitude: 13.88. Transit SNR 9.44

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

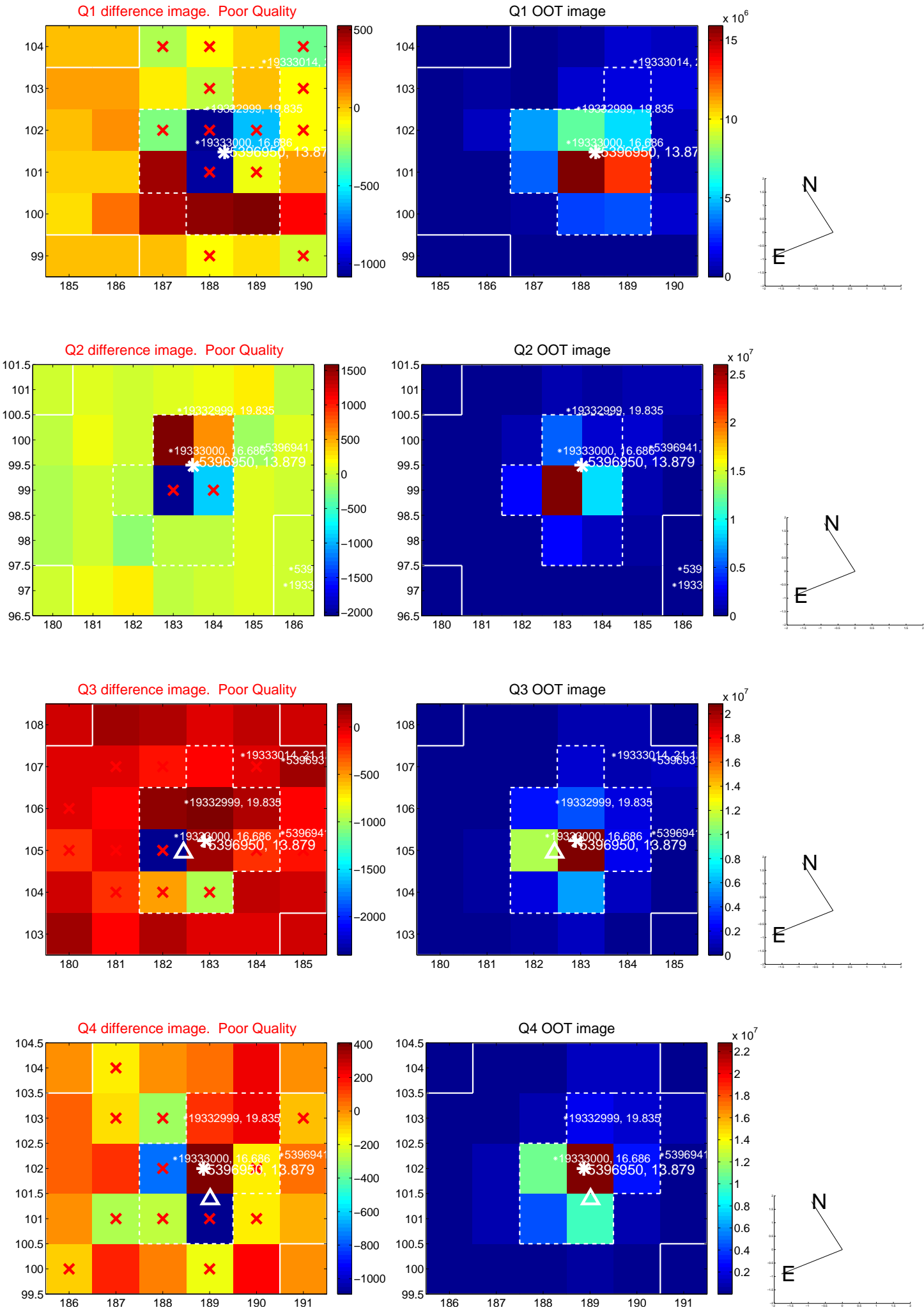
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.556 \pm 0.409$	1.36	$-0.496 \pm 0.335$	$0.250 \pm 0.481$
PRF-fit source offset from KIC position	$0.560 \pm 0.499$	1.12	$-0.452 \pm 0.349$	$0.331 \pm 0.536$
photometric centroid source offset	$0.46 \pm 0.57$	0.80	$-0.18 \pm 0.62$	$0.42 \pm 0.56$



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.

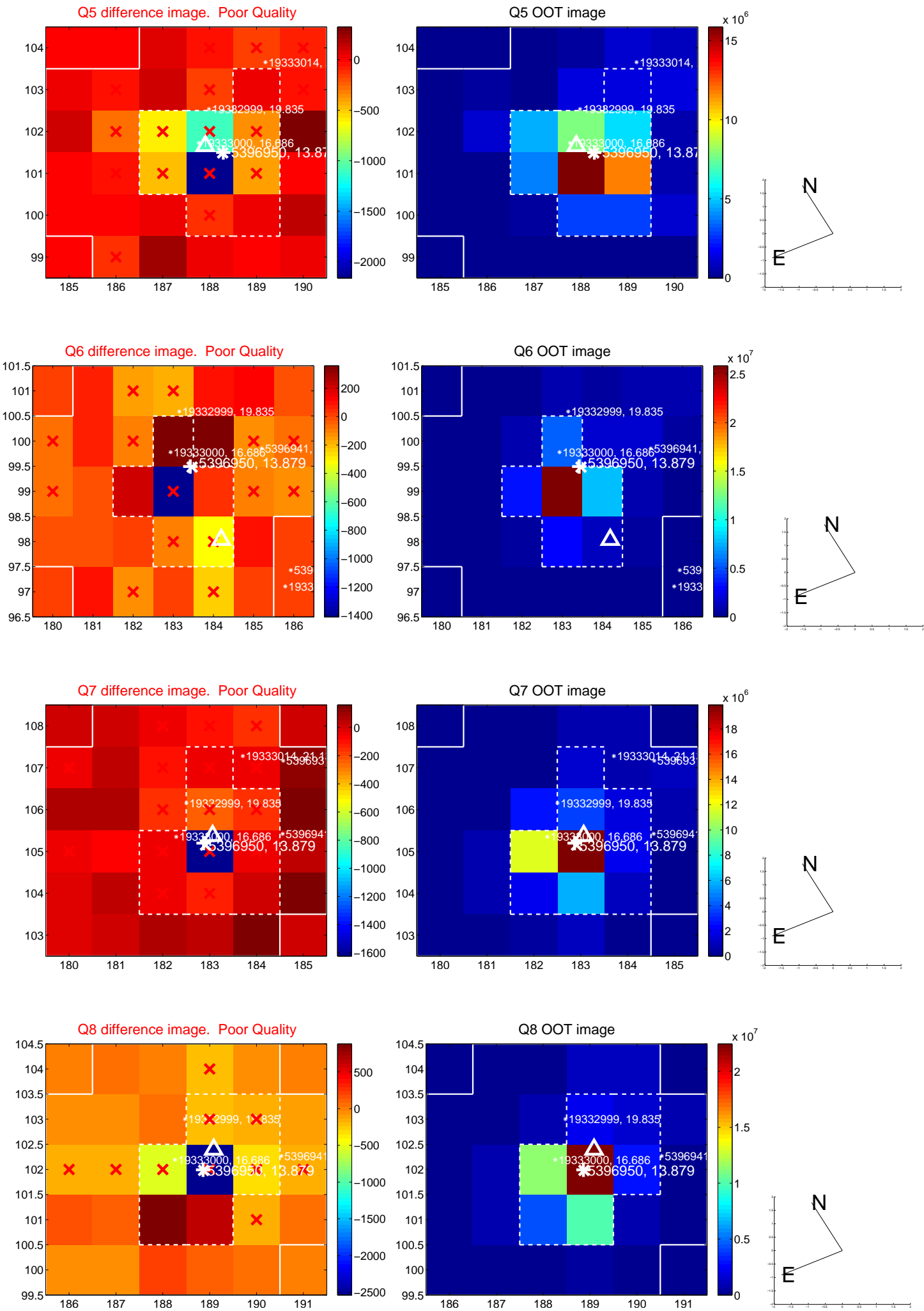


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

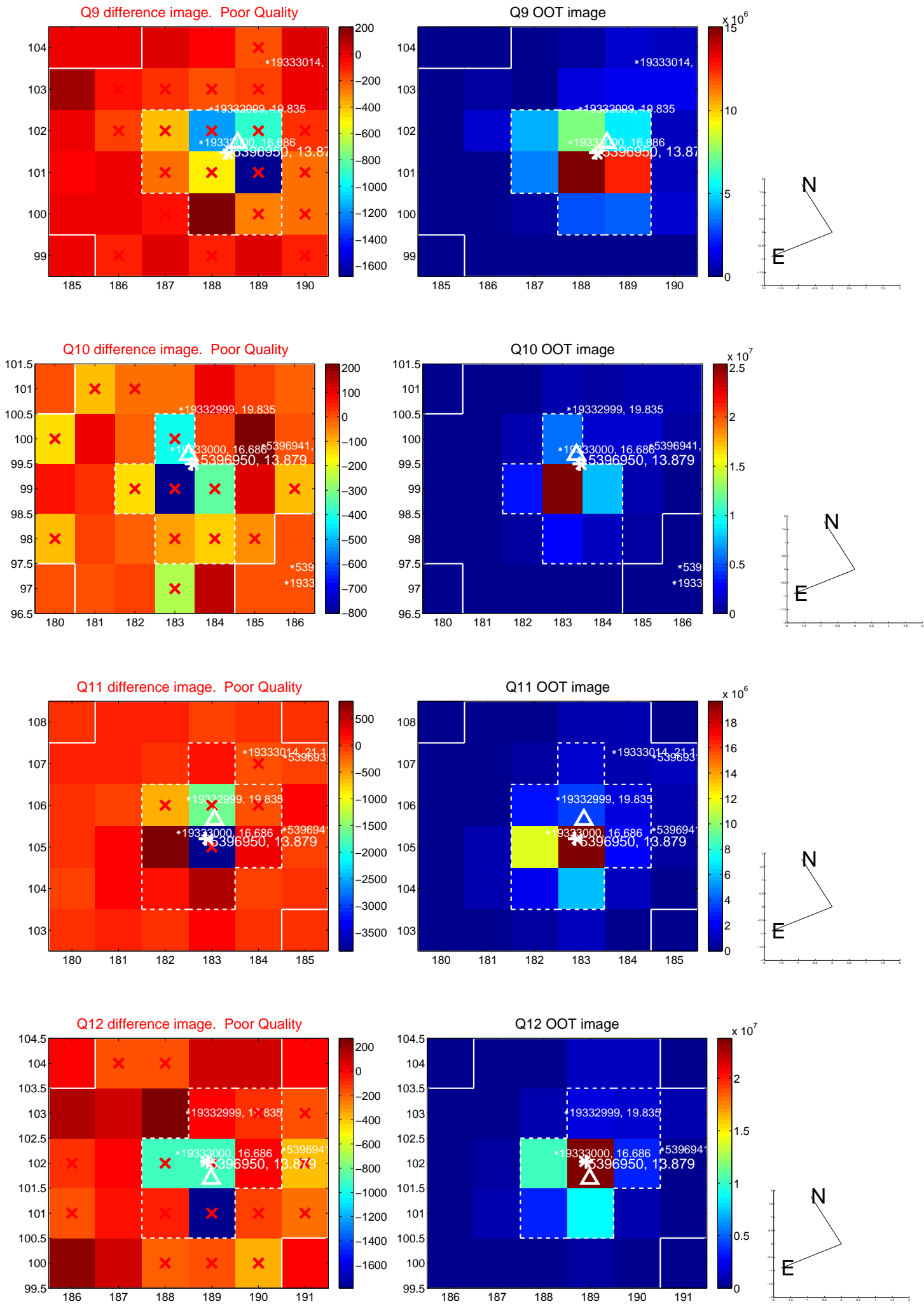




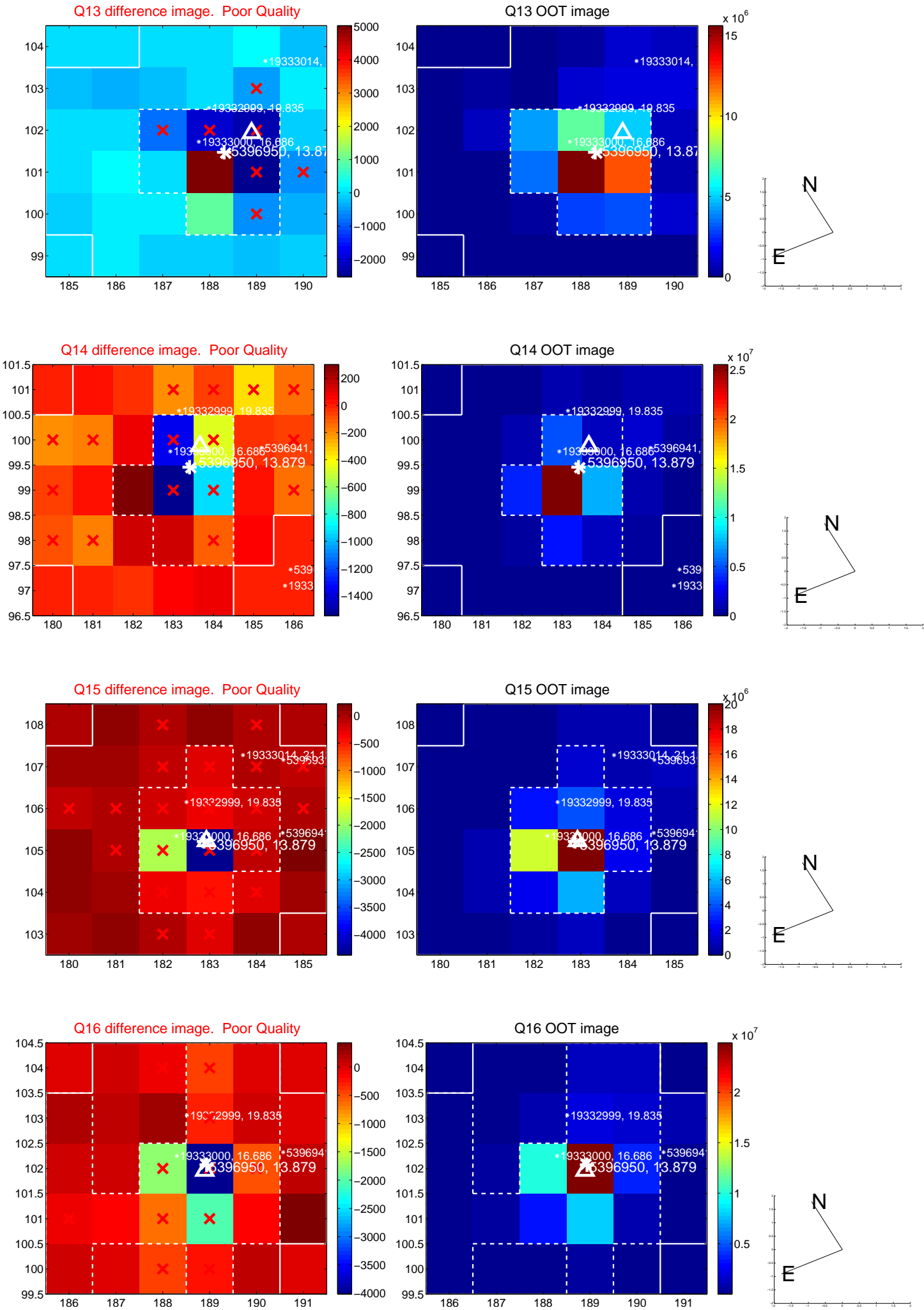
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



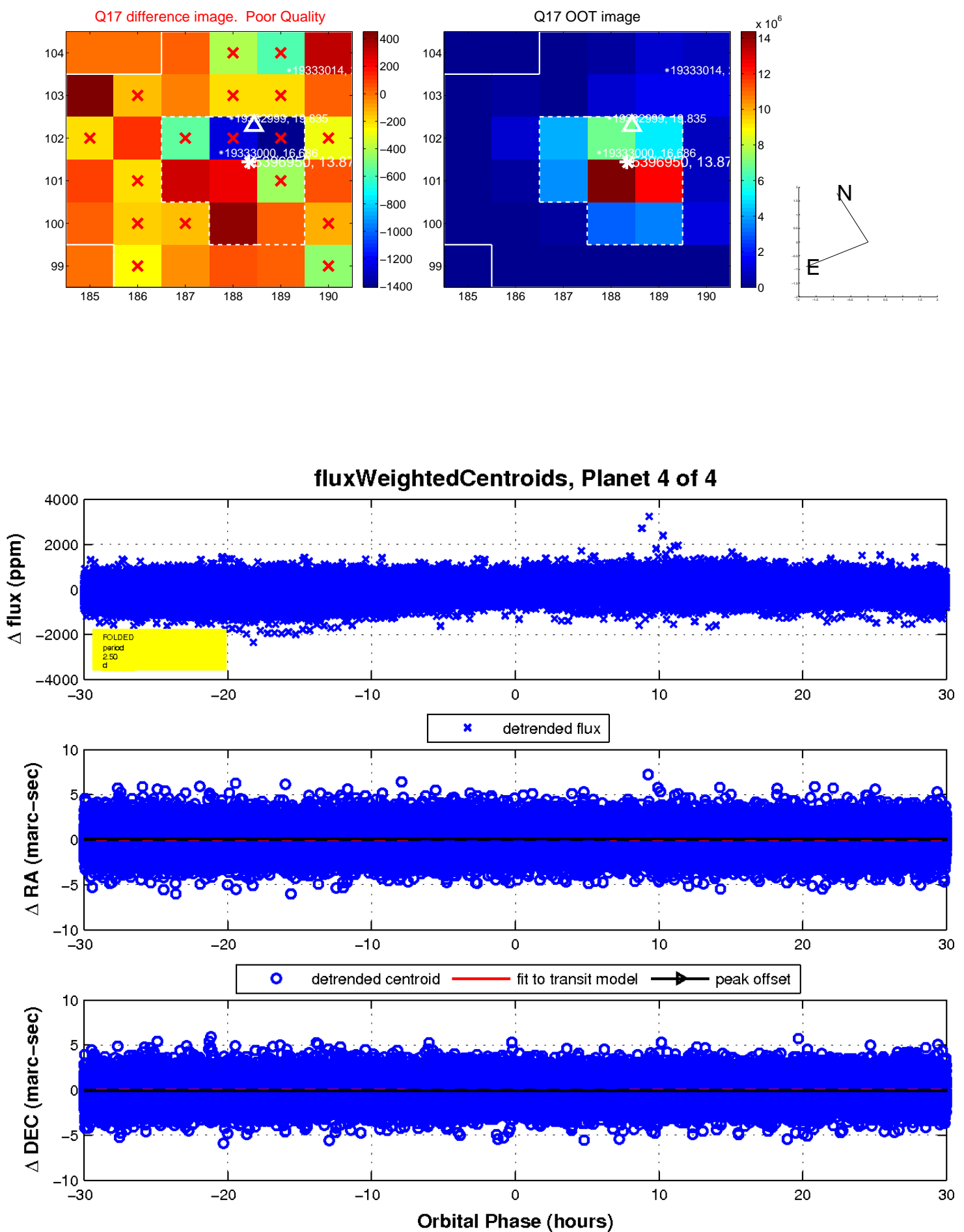
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

