

# KIC 003733346

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003733346-01	OBS	No	0.681966	131.661932	349.8	3.582	315.7	0.4	2.14	6746	4.29	30822.62
003733346-02	OBS	No	0.681968	132.092244	256.4	1.500	19.8	-1.0	2.14	6746	3.47	30822.51

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003733346-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT
003733346-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

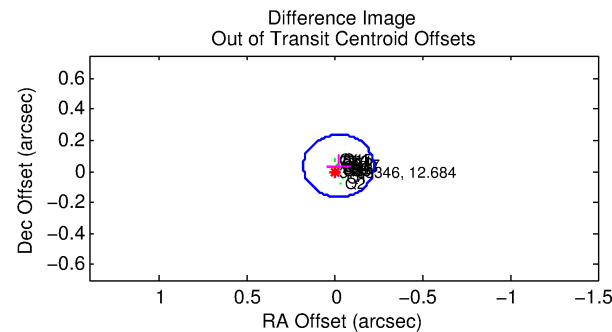
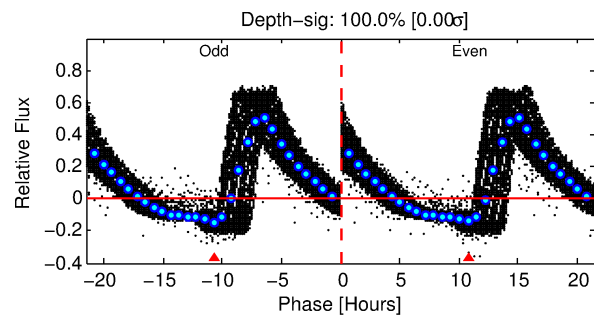
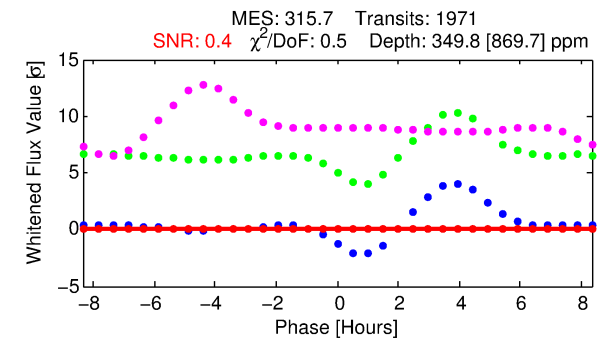
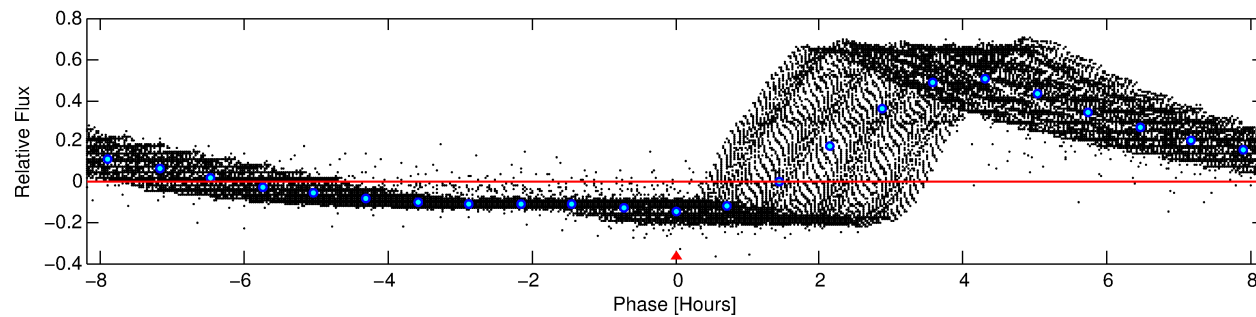
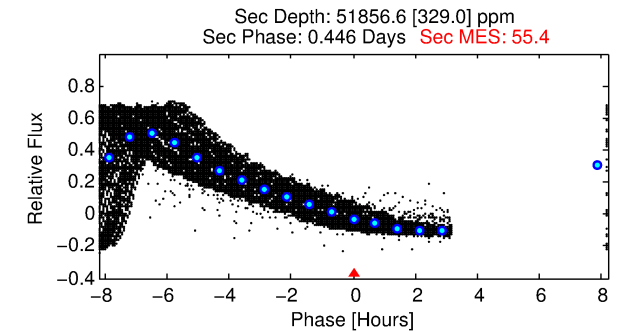
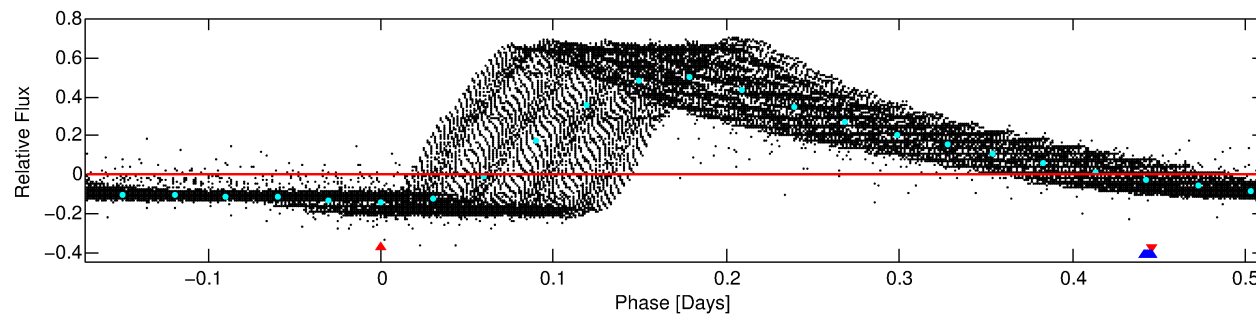
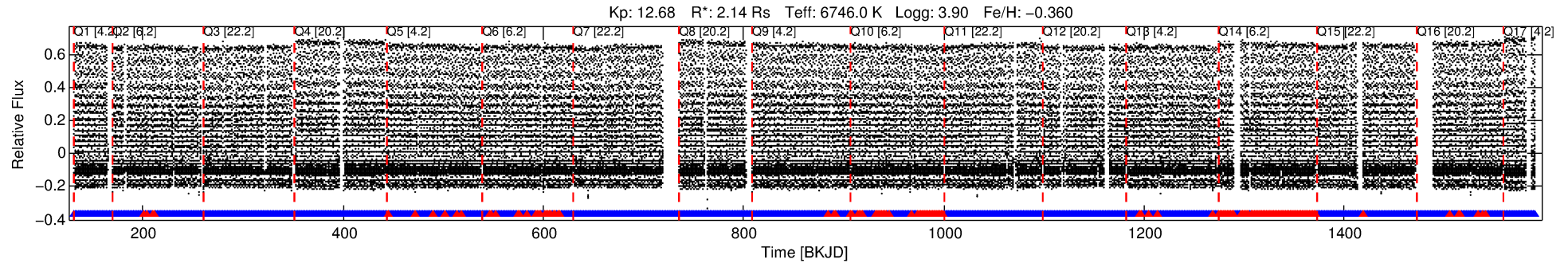
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003733346-01

No Significant Match Found

# DV One-Page Summary

KIC: 3733346 Candidate: 1 of 2 Period: 0.682 d



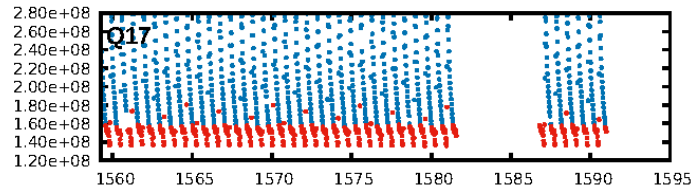
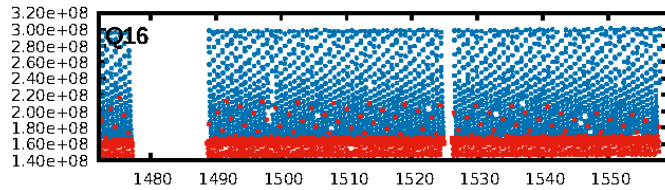
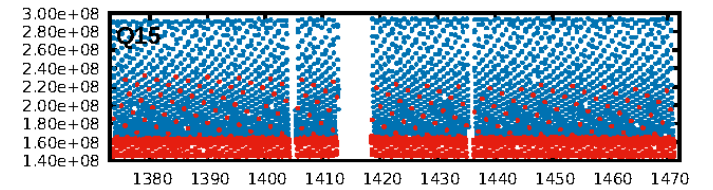
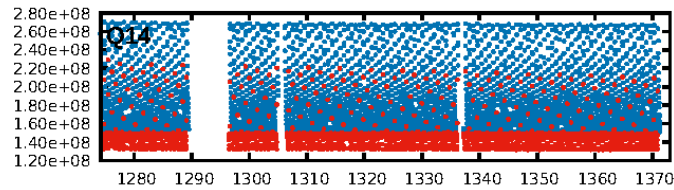
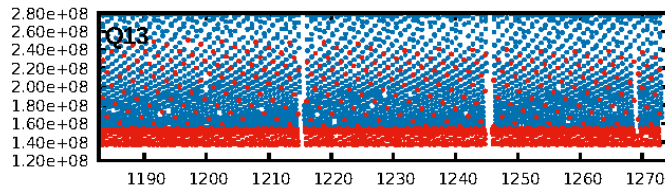
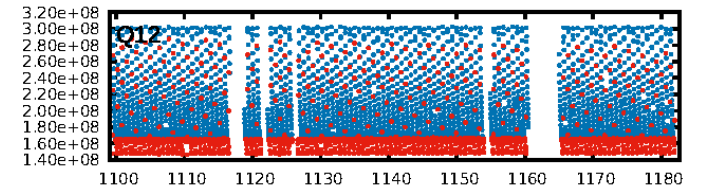
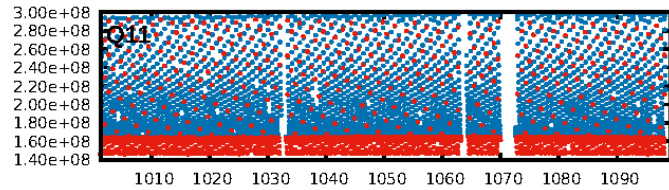
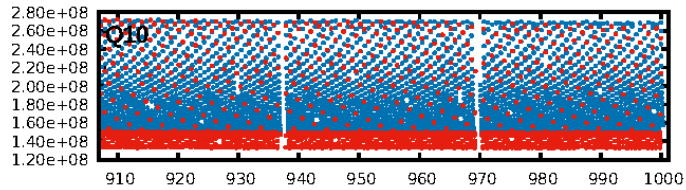
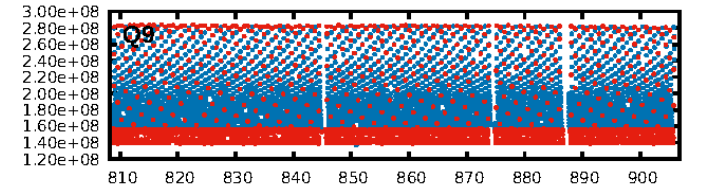
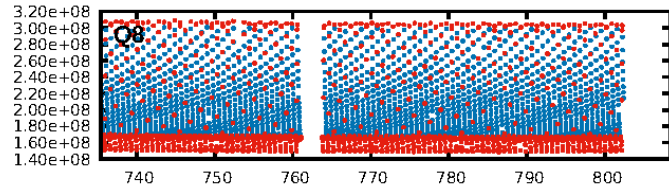
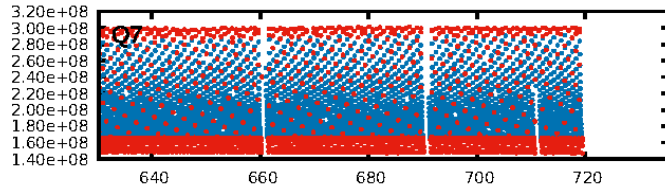
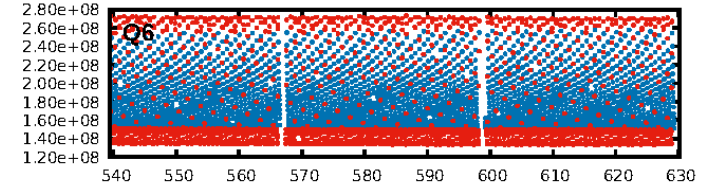
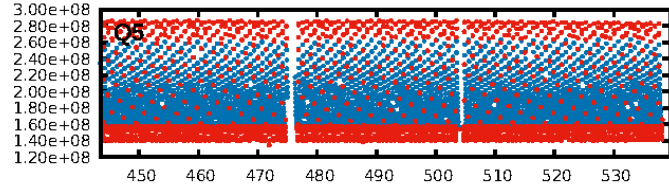
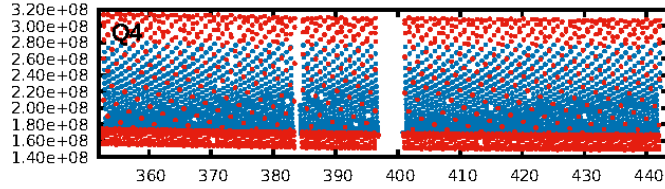
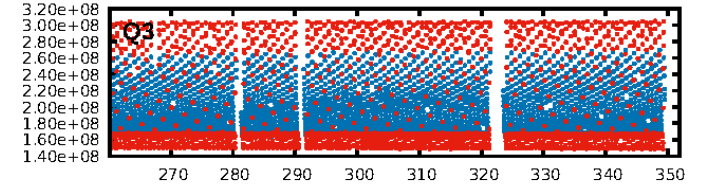
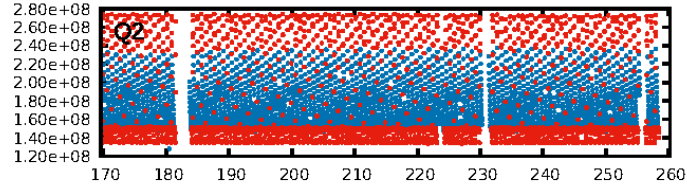
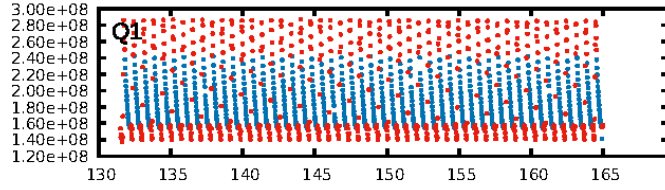
## DV Fit Results:

Period = 0.68197 [0.00018] d  
Epoch = 131.6619 [0.0242] BKJD  
Rp/R\* = 0.0184 [0.0856]  
a/R\* = 1.36 [15.58]  
b = 0.70 [18.34]  
Seff = 30822.63 [20769.35]  
Teff = 3379 [569] K  
Rp = 4.29 [20.06] Re  
a = 0.0166 [0.0067] AU  
Ag = 427.73 [3998.47] [0.11 $\sigma$ ]  
Teffp = 23756 [55390] K [0.37 $\sigma$ ]

## DV Diagnostic Results:

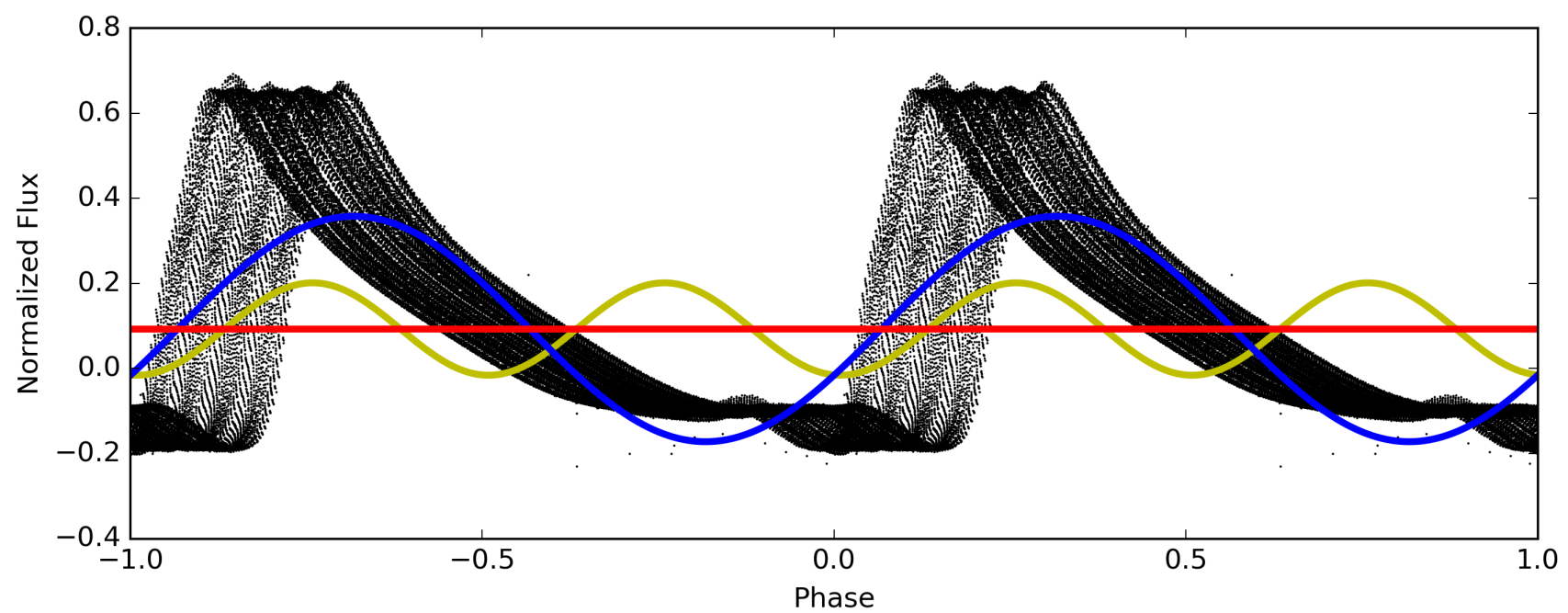
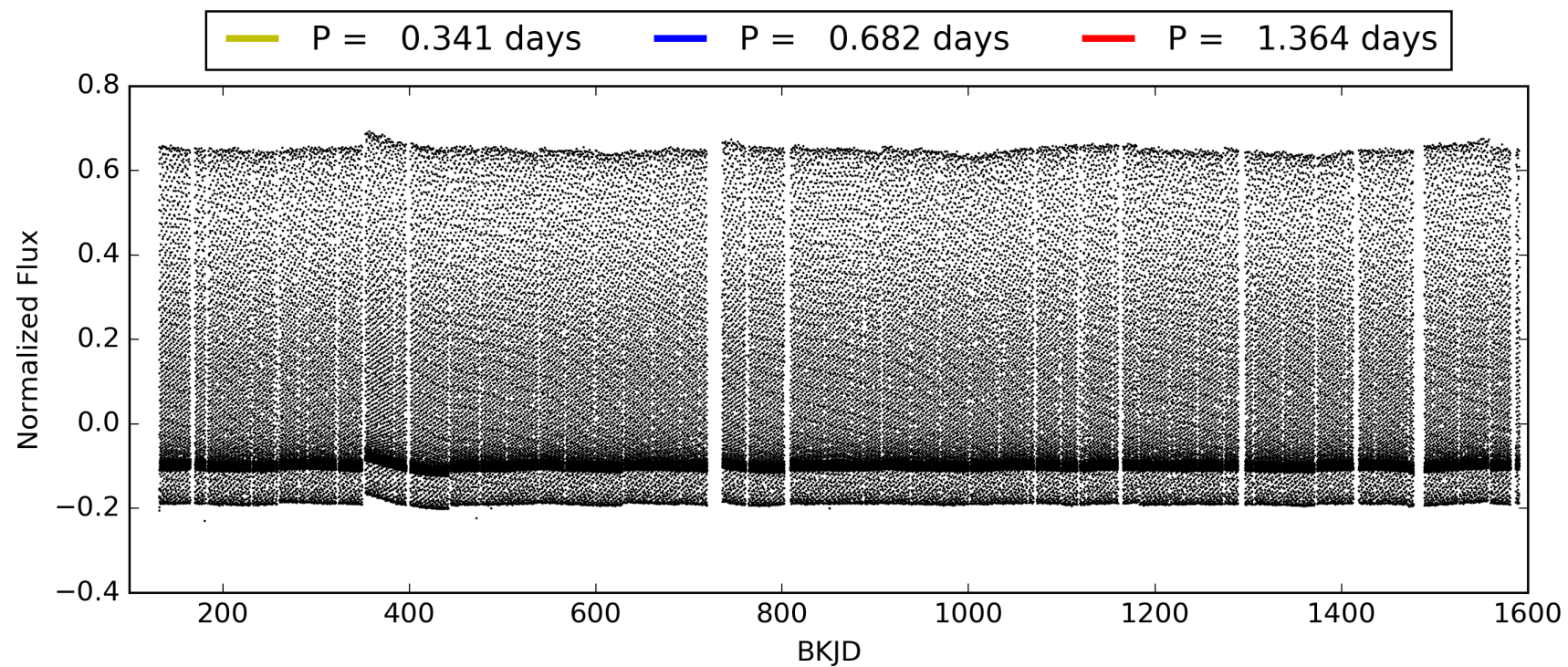
ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00 $\sigma$ ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.88 [1665/1882]  
GhostDiagnostic-chr: 2.207  
**Centroid-sig: 0.0%**  
Centroid-so: N/A  
OotOffset-rm: 0.042 arcsec [0.63 $\sigma$ ]  
KicOffset-rm: 0.163 arcsec [2.38 $\sigma$ ]  
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 003733346-01, PDC Light Curves



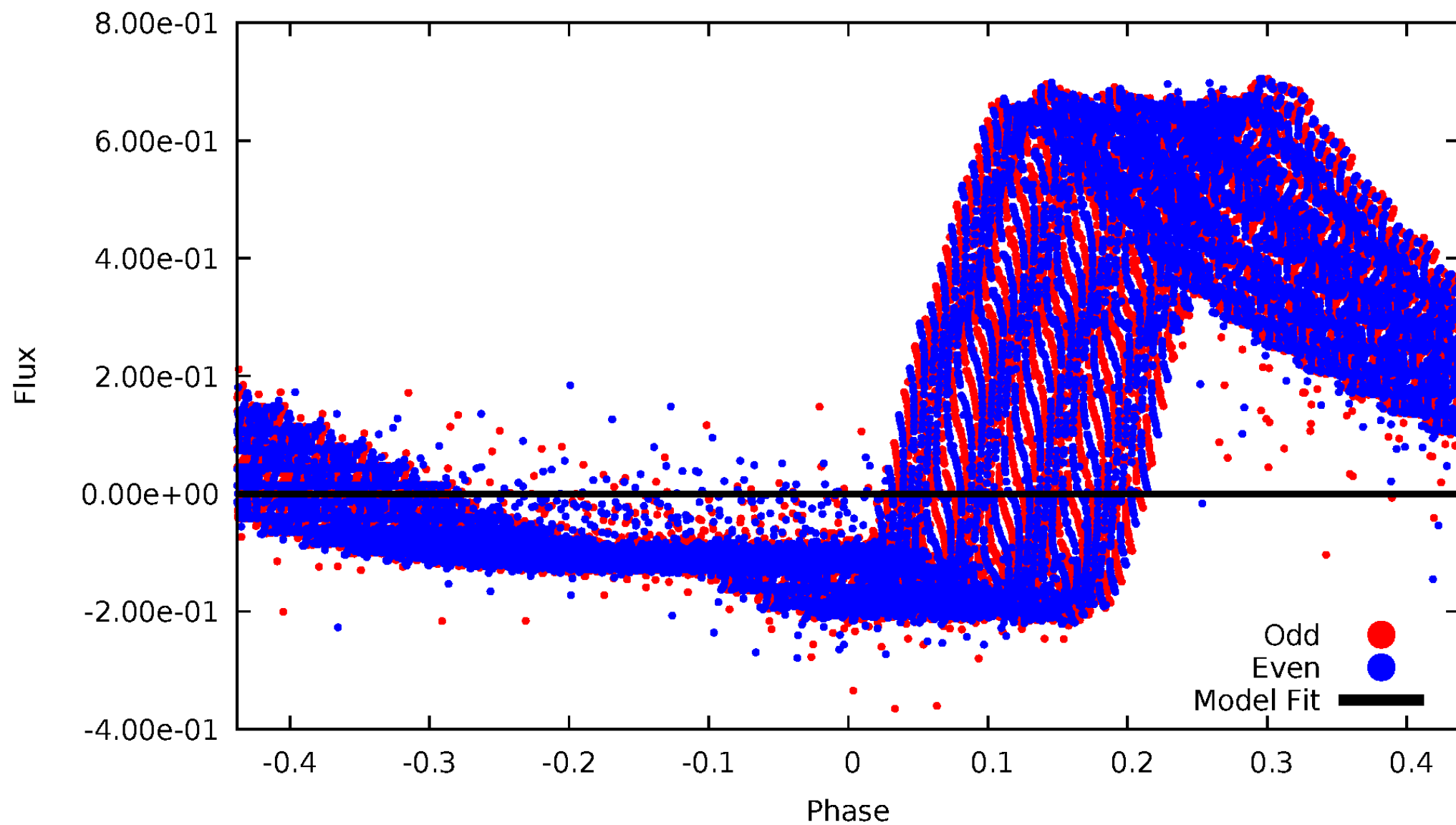


TCE 003733346-01



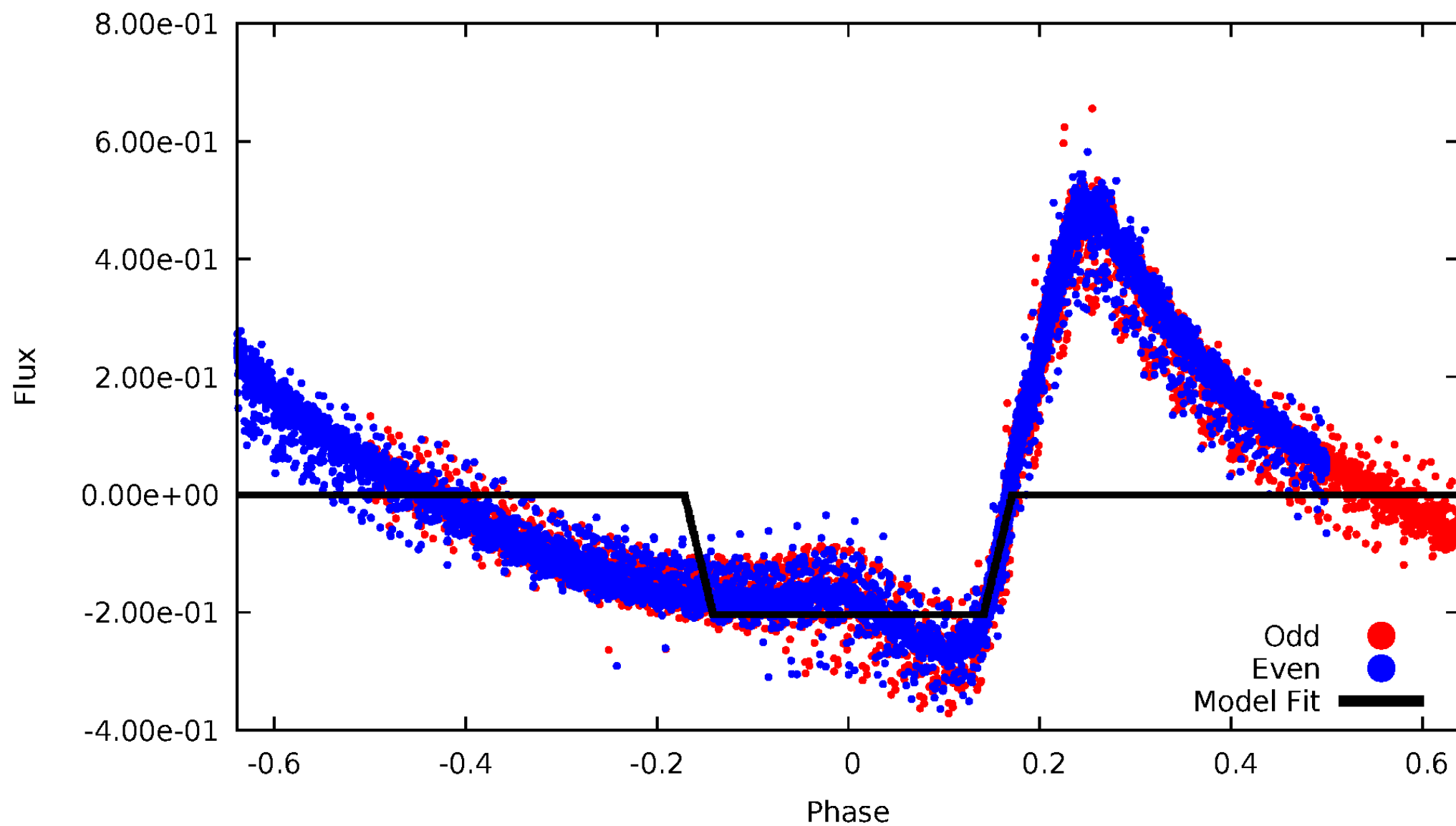
# DV Odd/Even

TCE 003733346-01



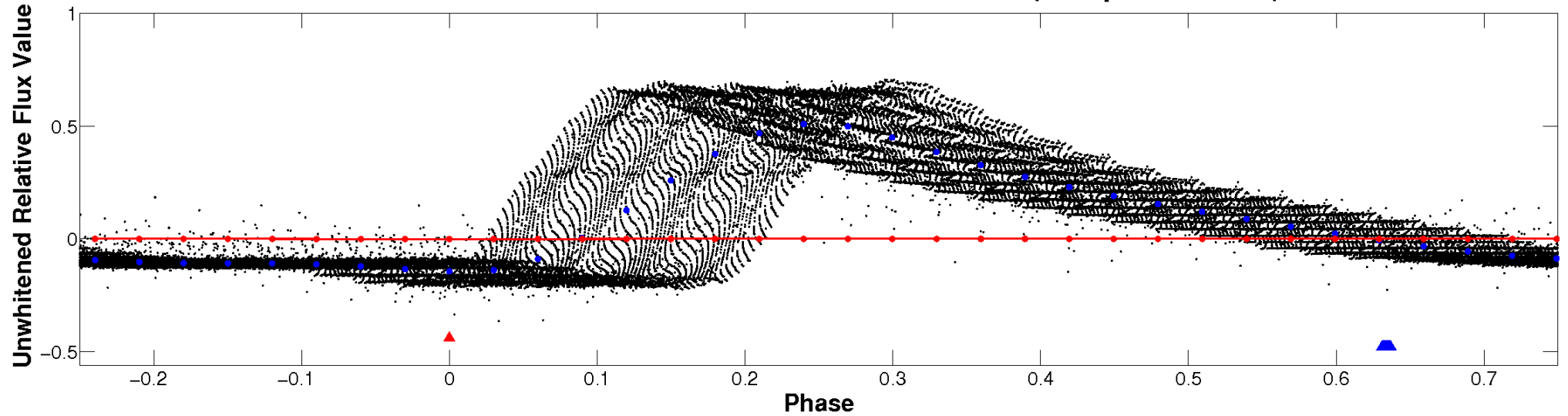
# ALT Odd/Even

TCE 003733346-01

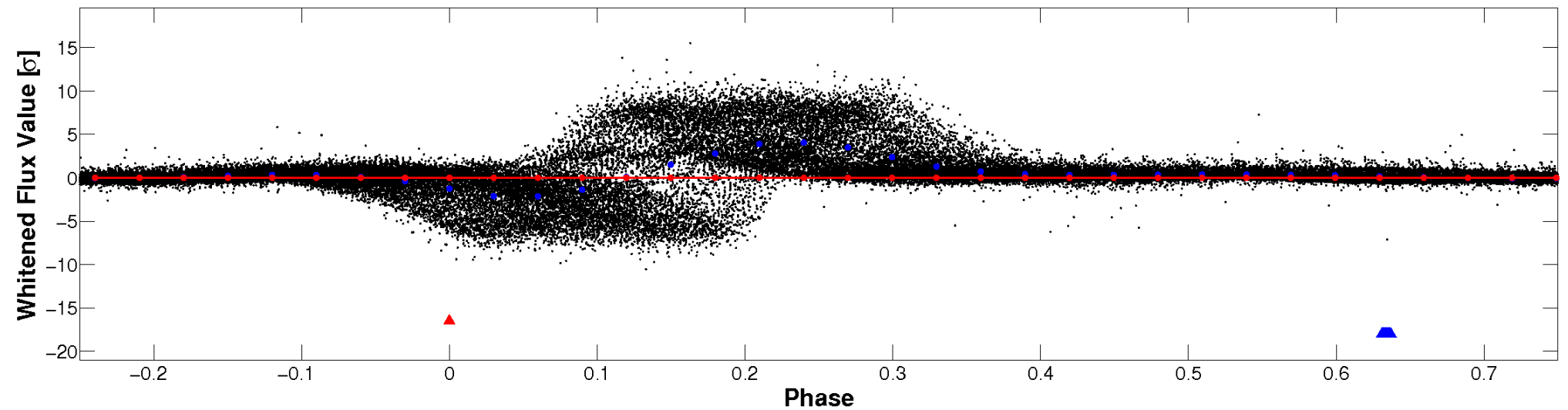


# Non-Whitened Vs. Whitened Light Curve

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

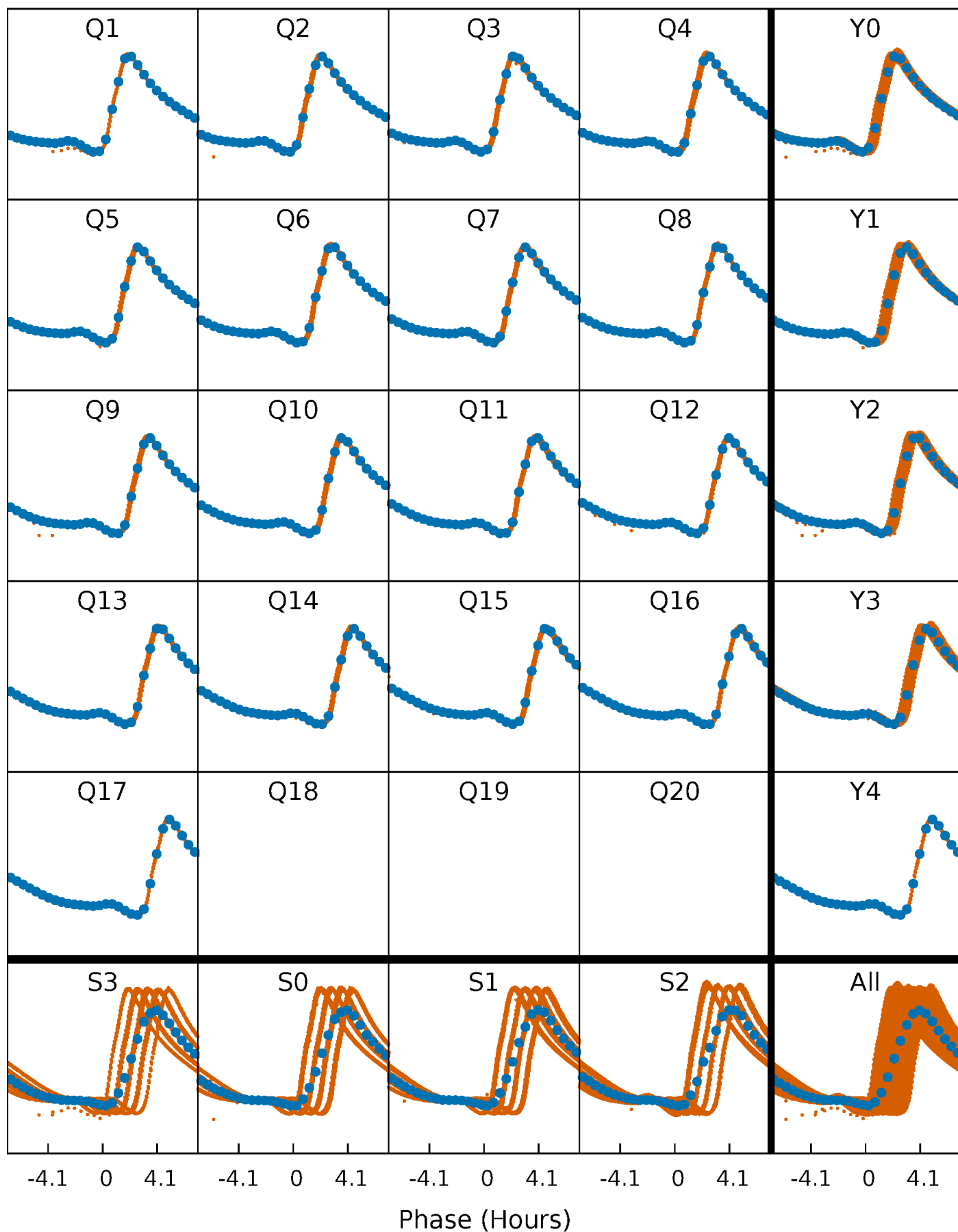


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

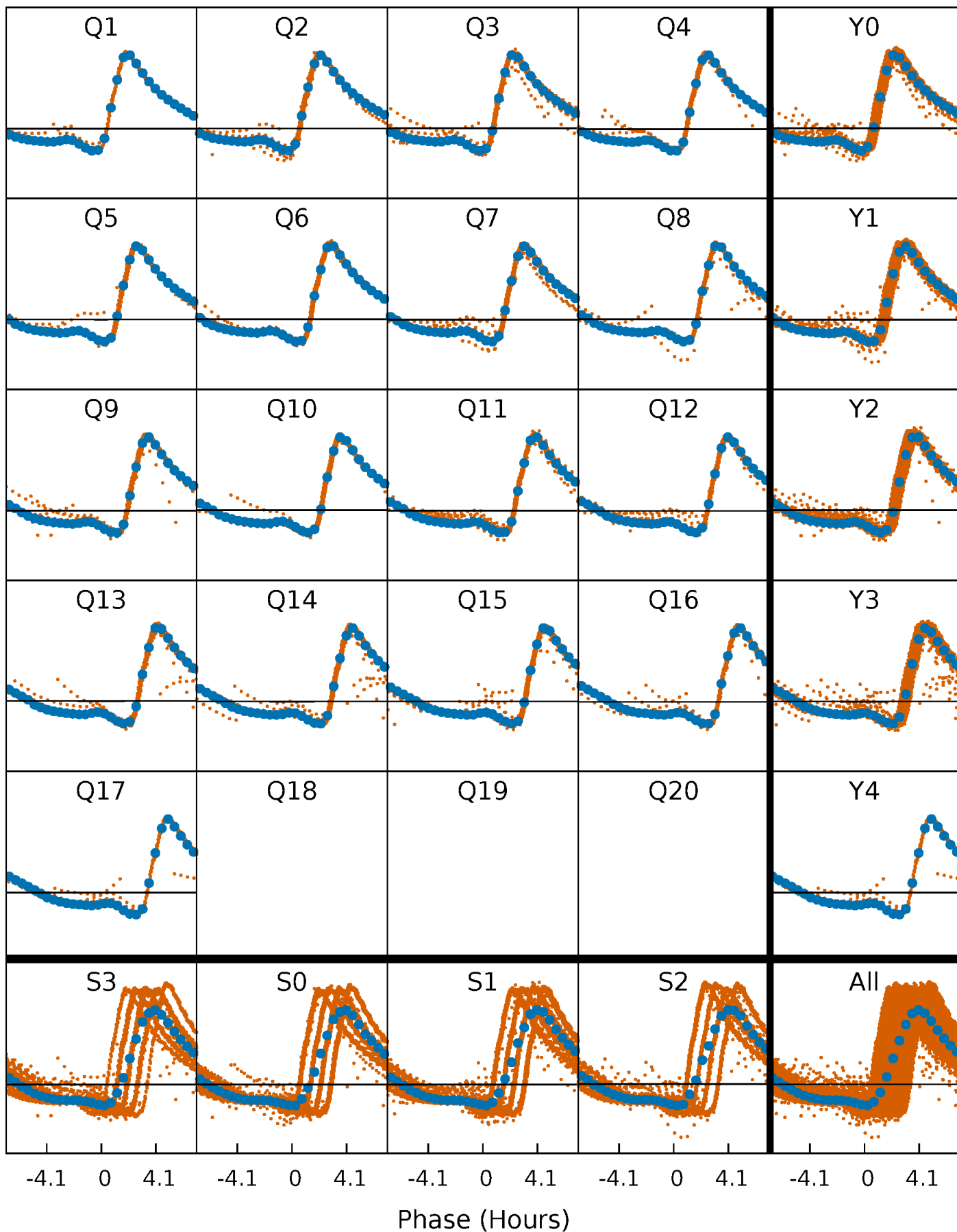
TCE 003733346-01 P= 0.681966 Days  $T_0=131.661932$  (BKJD)





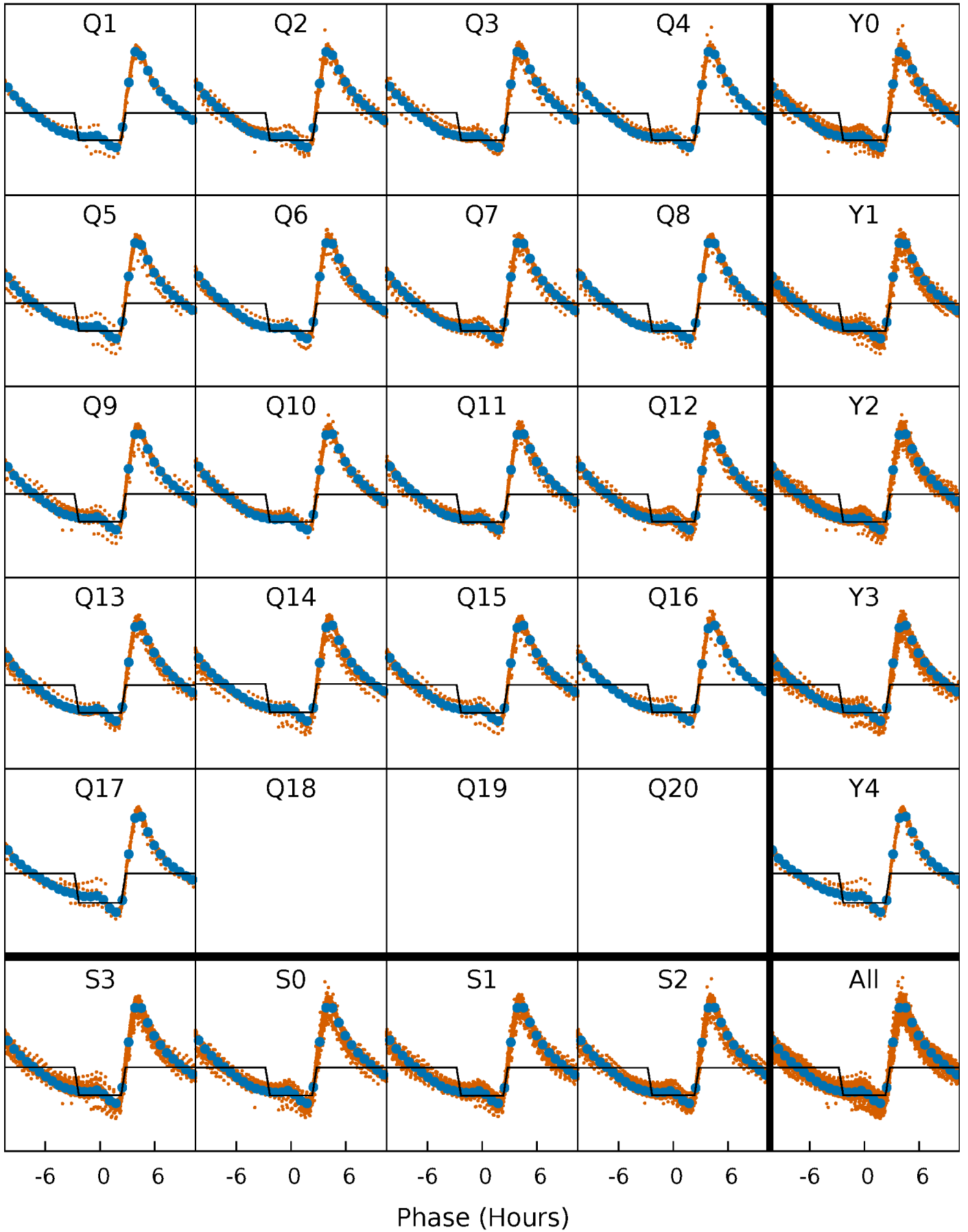
# DV Quarter-Phased Transit Curves

TCE 003733346-01 P= 0.681966 Days  $T_0=131.661932$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

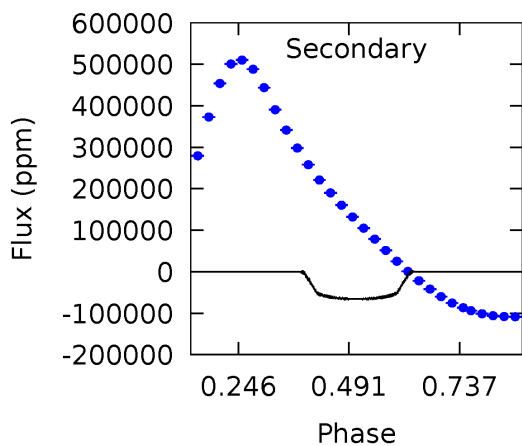
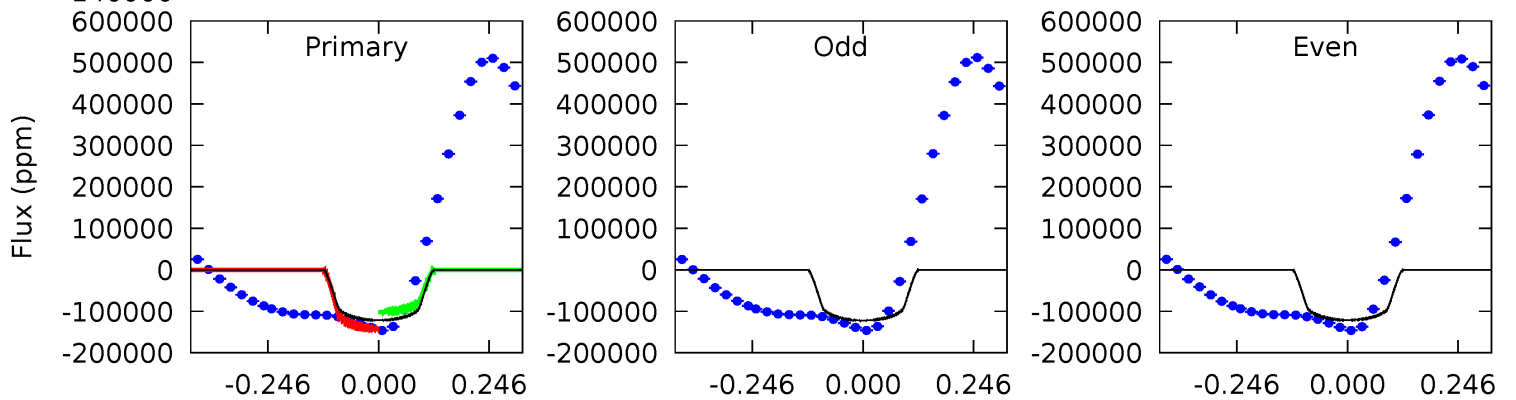
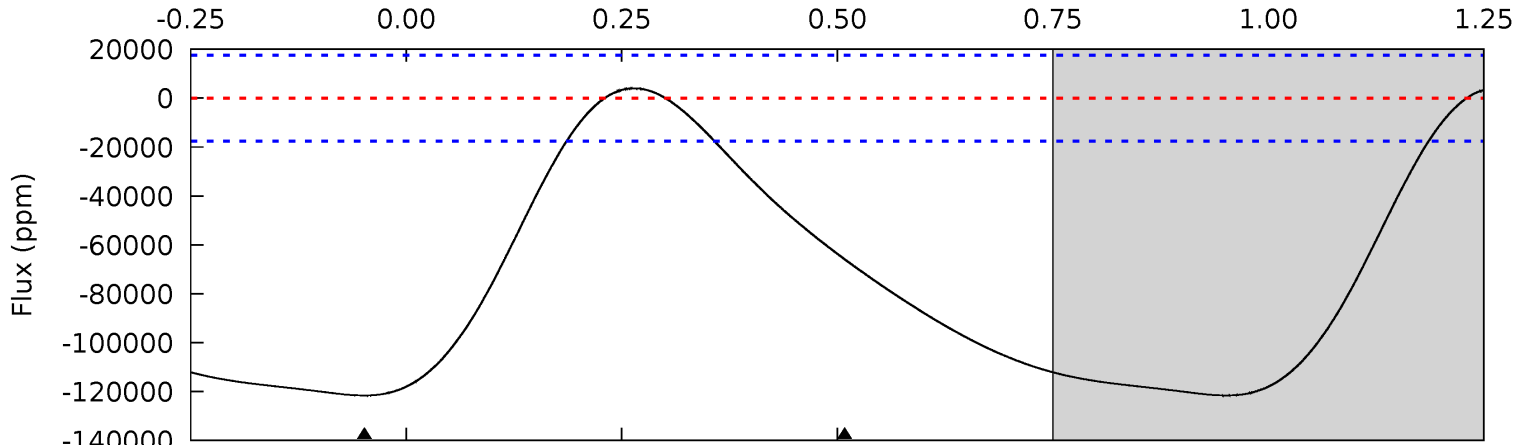
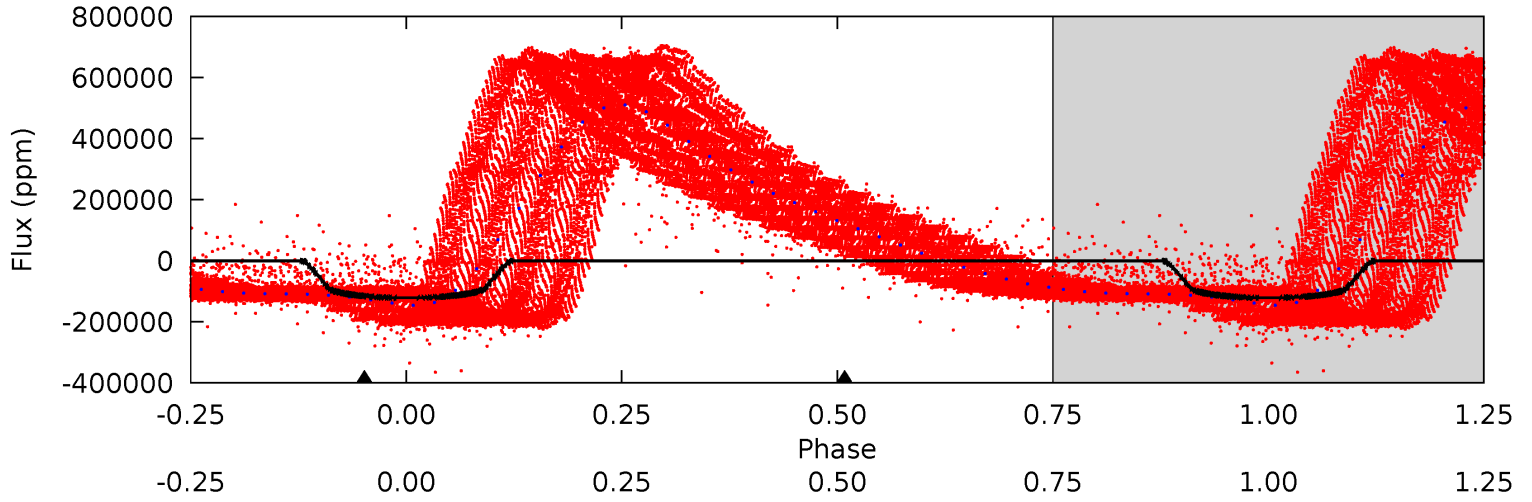
TCE 003733346-01 P= 0.682024 Days  $T_0=131.573628$  (BKJD)



# DV Model-Shift Uniqueness Test

003733346-01, P = 0.681966 Days, E = 130.979966 Days

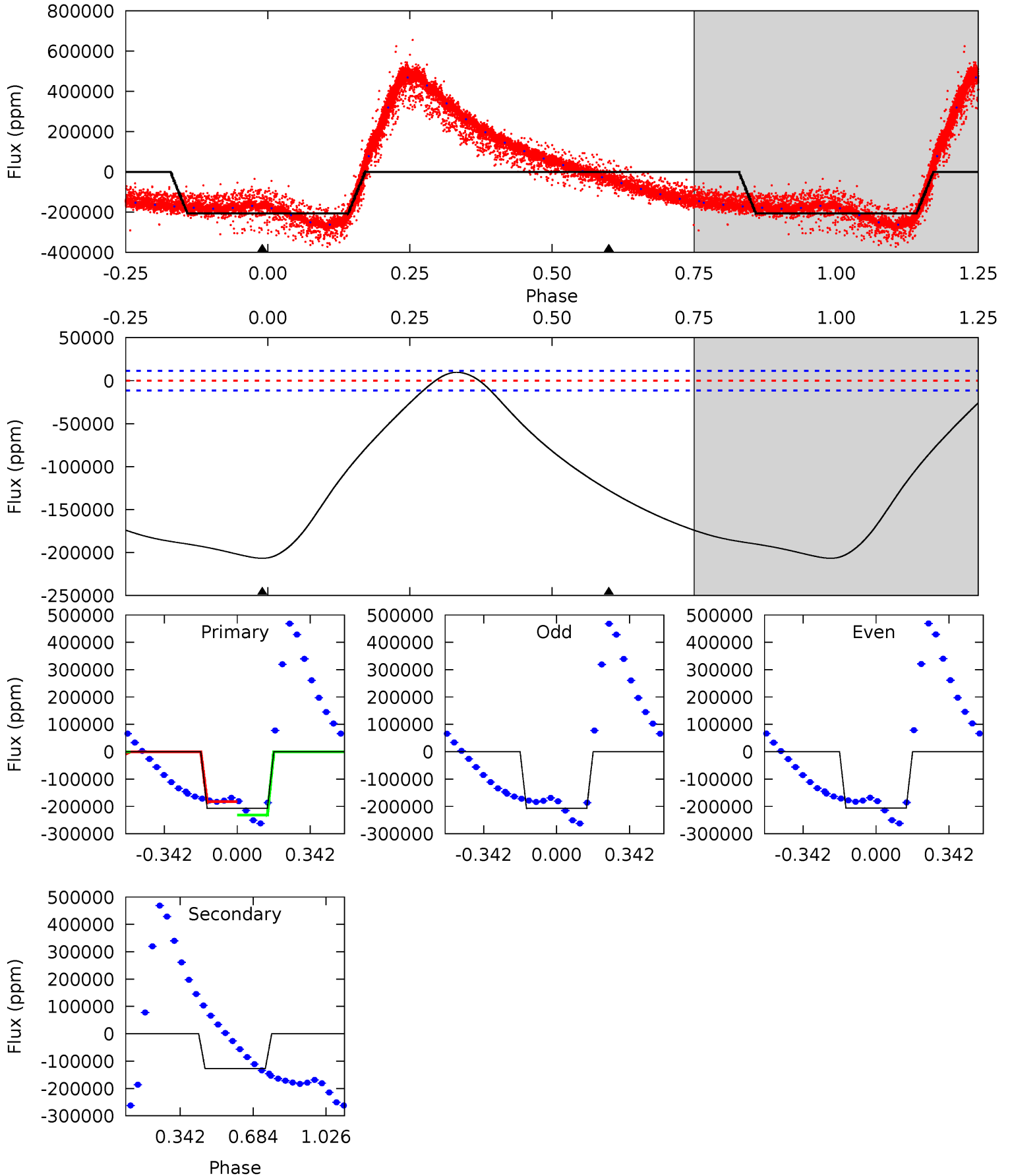
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.3	16.4	0	0	4.37	1.16	1.91	30.3	30.3	16.4	16.4	0.10	0.87	0.03	6.77



# Alt Model-Shift Uniqueness Test

003733346-01, P = 0.682024 Days, E = 130.891604 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
78.2	48.3	0	0	4.30	0.95	4.77	78.2	78.2	48.3	48.3	0.14	1.00	0.04	10.7



### Stellar Parameters For KIC 003733346

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6746^{+214}_{-262}$	$3.895^{+0.390}_{-0.130}$	$-0.360^{+0.300}_{-0.300}$	$2.139^{+0.500}_{-0.858}$	$1.313^{+0.195}_{-0.259}$	$0.189^{+0.601}_{-0.071}$
	+3%/-4%	+10%/-3%	+83%/-83%	+23%/-40%	+15%/-20%	+318%/-37%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003733346-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-65922 \pm 4019$	$14.80^{+13.26}_{-10.82}$	$4616^{+370}_{-498}$	$19097^{+118391}_{-8497}$	$50^{+609}_{-36}$
Alt.	$-127509 \pm 2642$	$96.60^{+29.09}_{-25.47}$	$4605^{+385}_{-527}$	$5969^{+810}_{-586}$	$2.342^{+1.892}_{-0.939}$

$T_{\text{max}}$  = 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

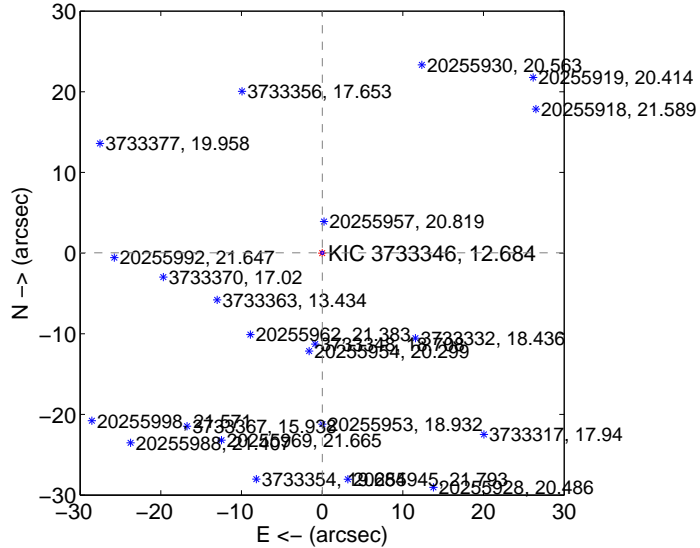
Supplemental centroid analysis for 003733346-01. Kepler magnitude: 12.68. Transit SNR 0.42

There are 17 quarters with good PRF difference image offsets

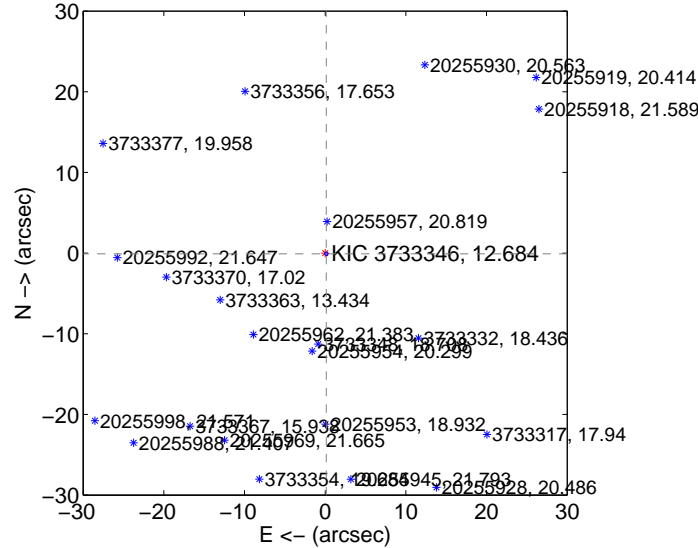
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.042 \pm 0.067$	0.63	$-0.022 \pm 0.067$	$0.036 \pm 0.067$
PRF-fit source offset from KIC position	$0.163 \pm 0.068$	2.38	$-0.137 \pm 0.067$	$-0.087 \pm 0.069$
photometric centroid source offset	—	—	—	—

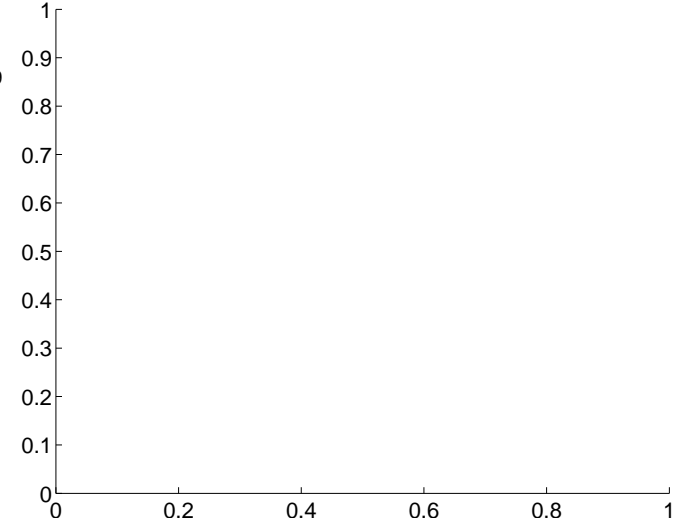
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

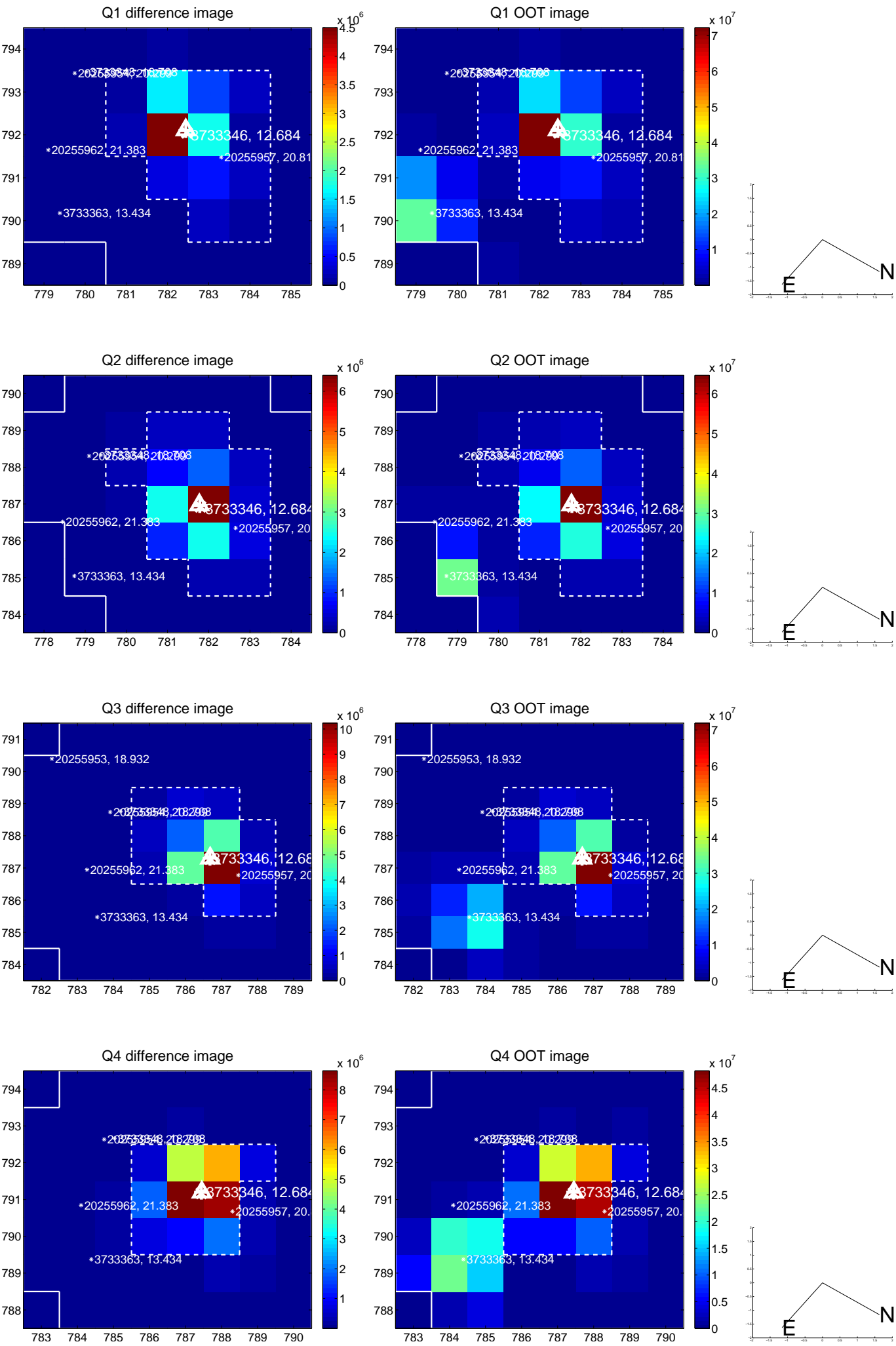


There are no photometric centroids

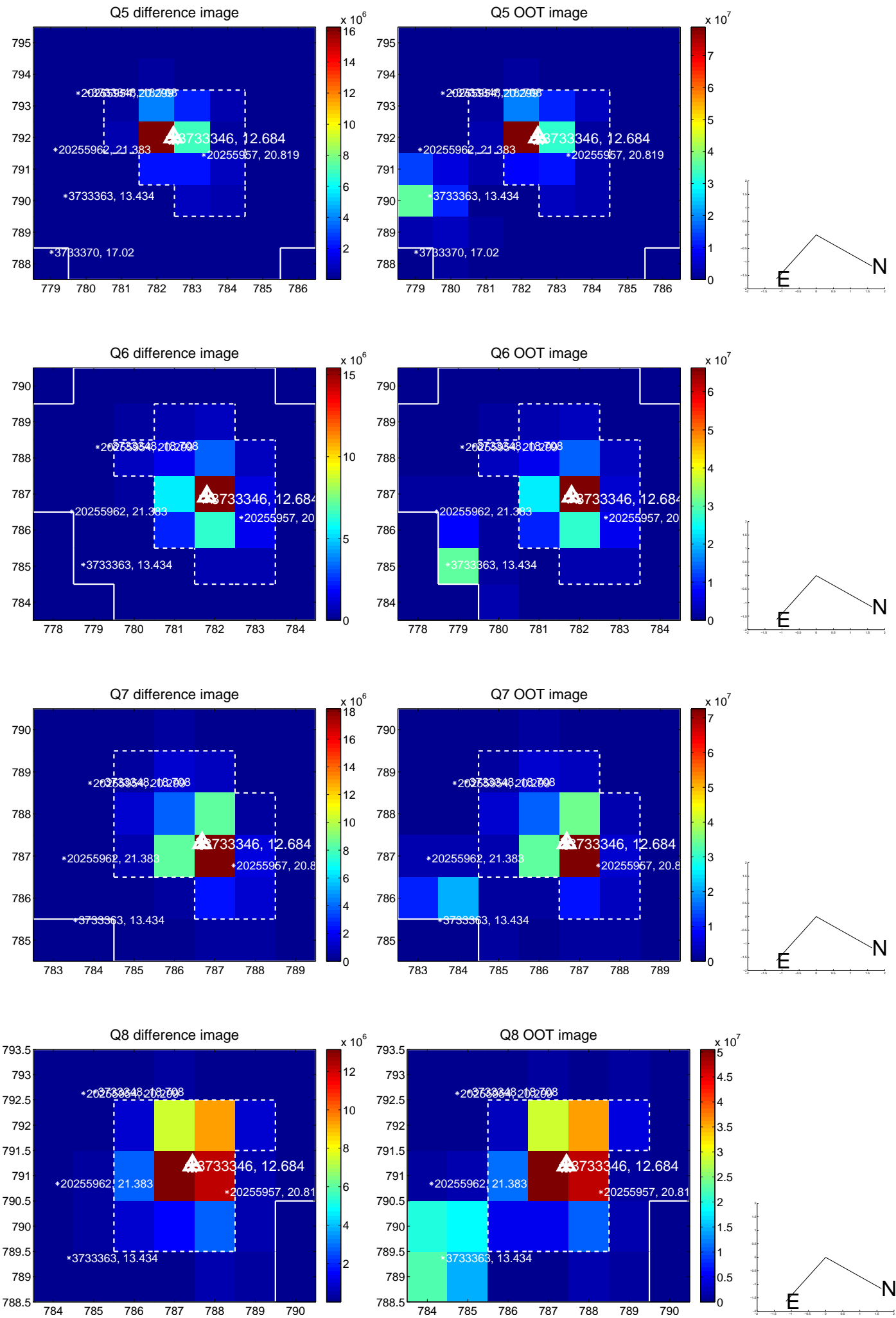


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

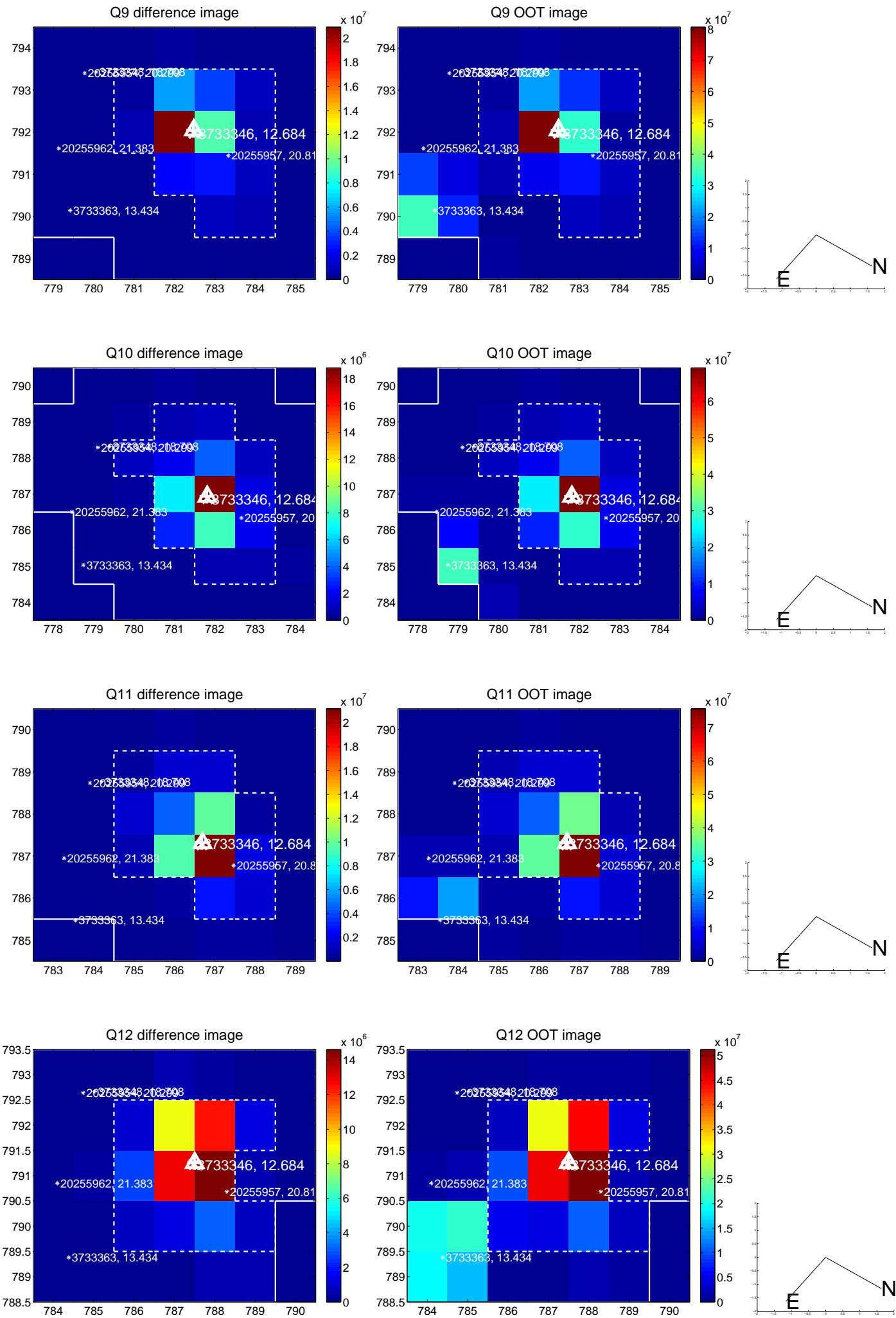
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



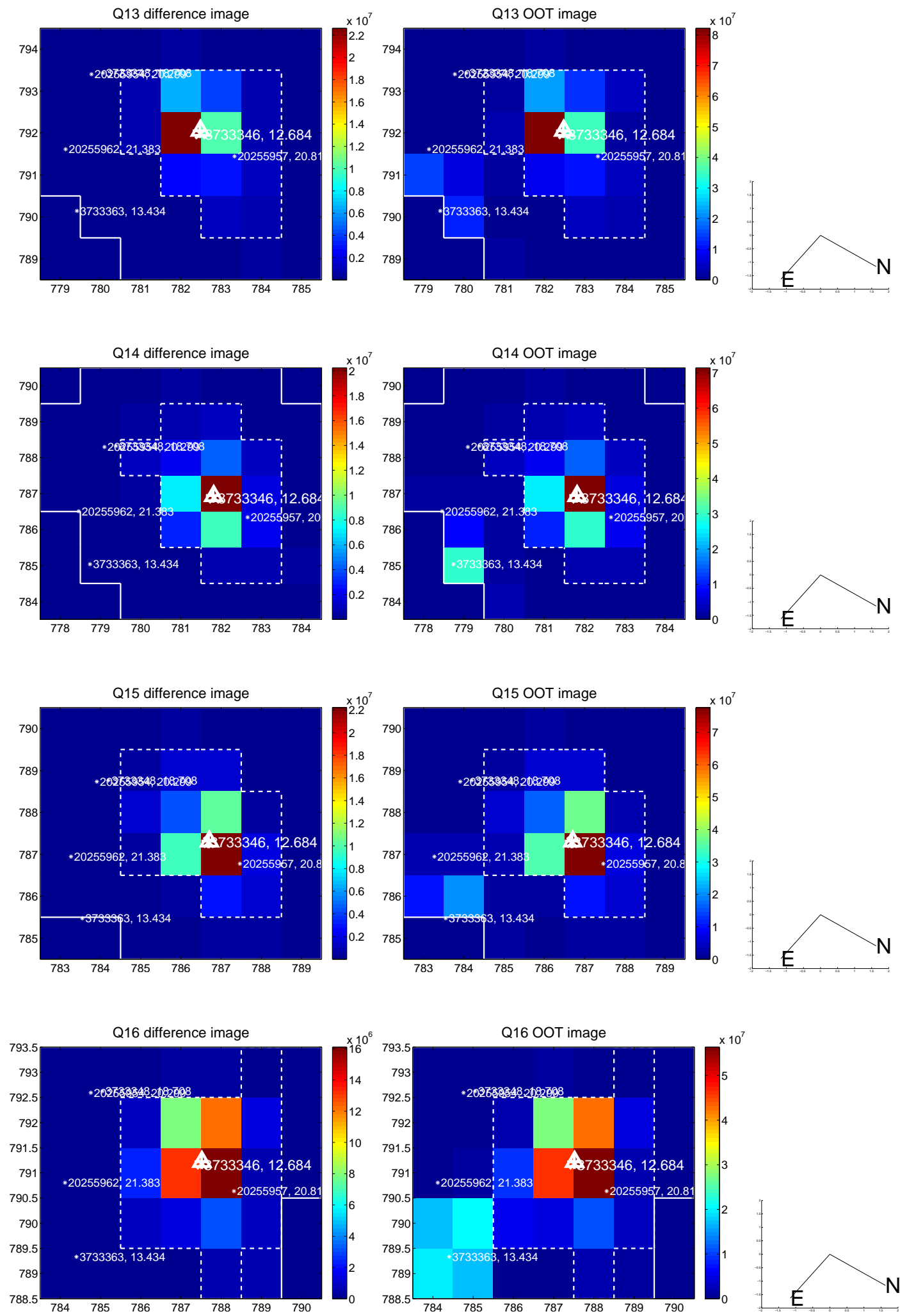
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

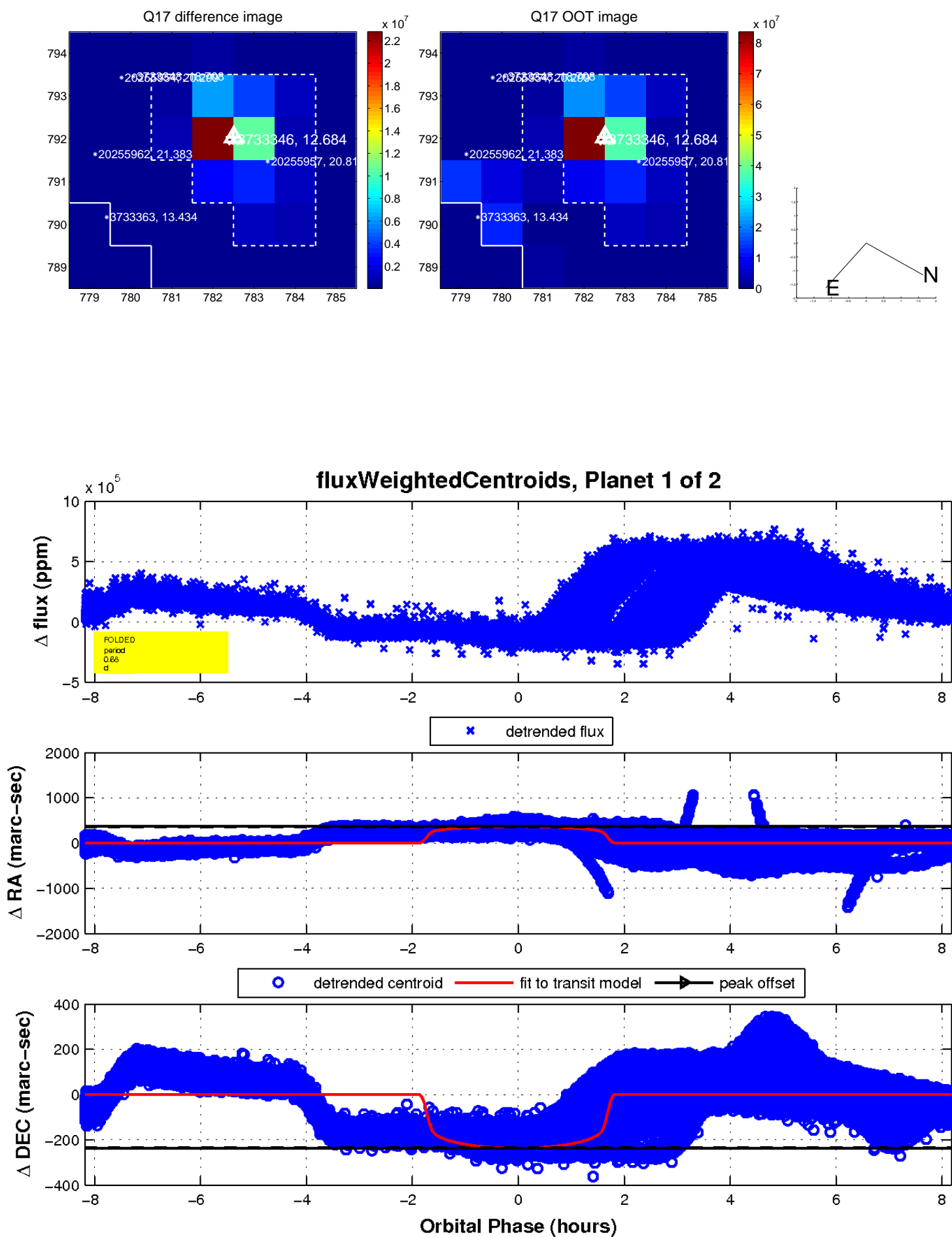


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



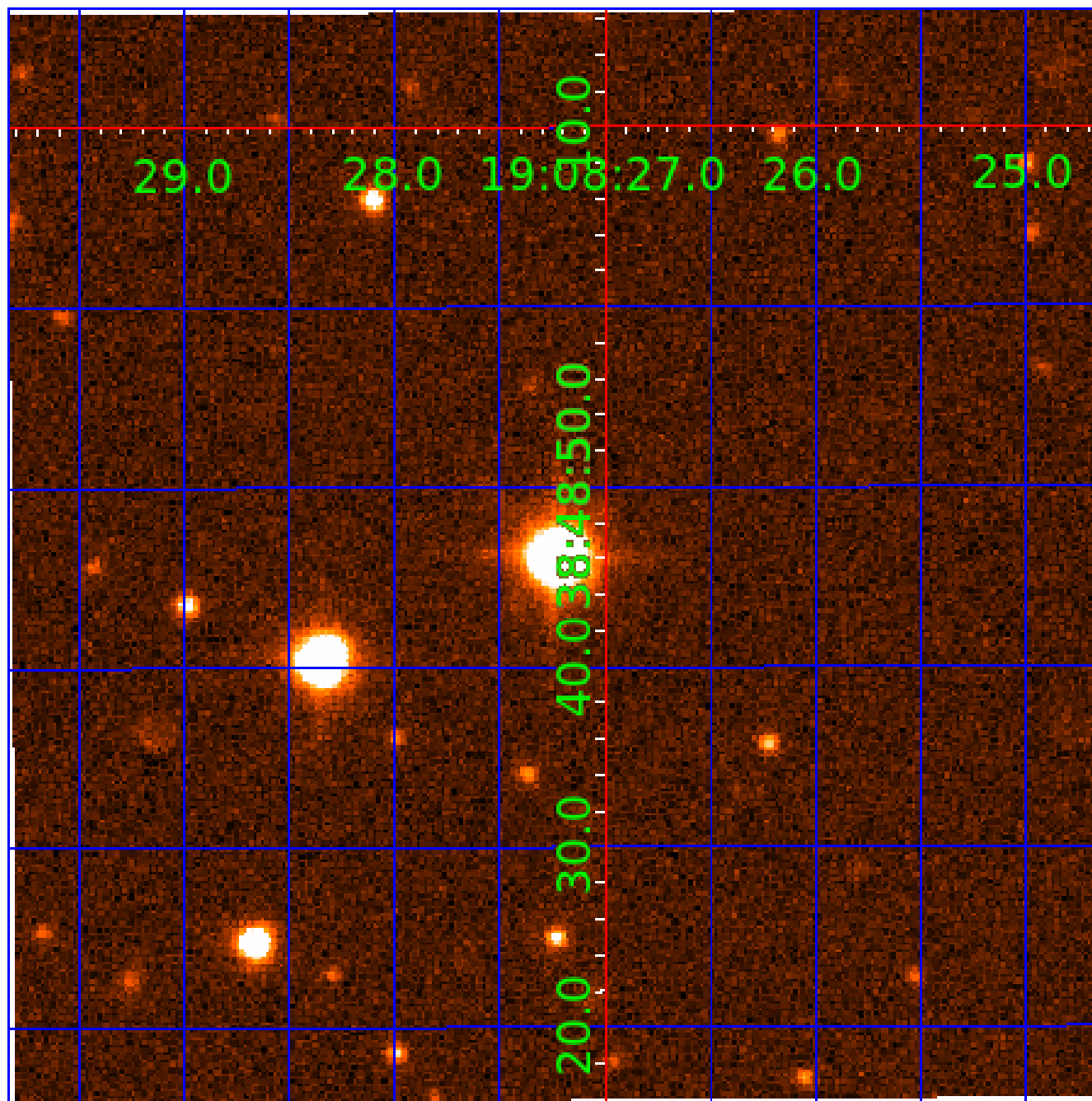


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003733346

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003733346-01	OBS	No	0.681966	131.661932	349.8	3.582	315.7	0.4	2.14	6746	4.29	30822.62
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003733346-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT
003733346-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

**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.

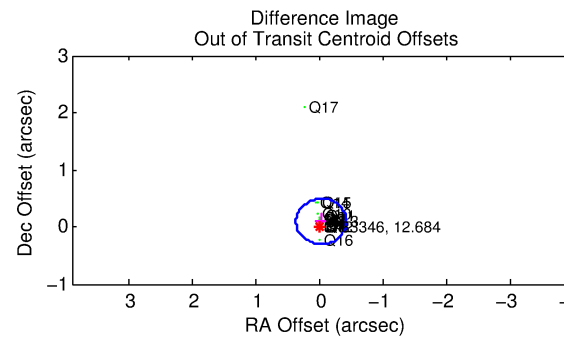
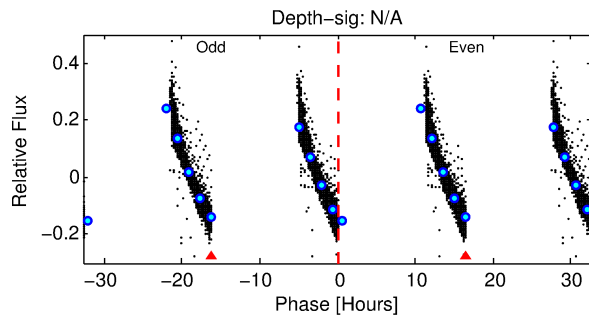
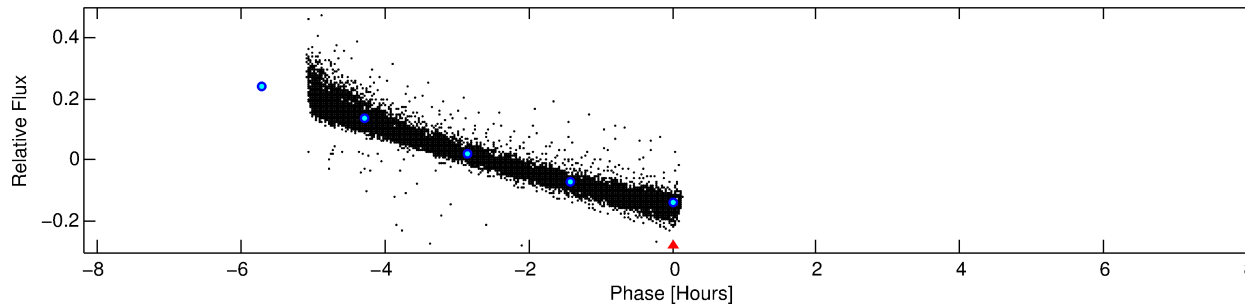
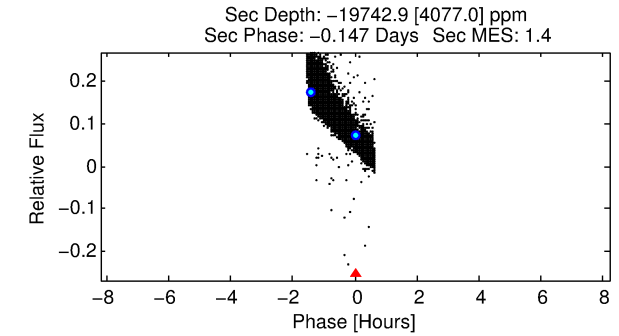
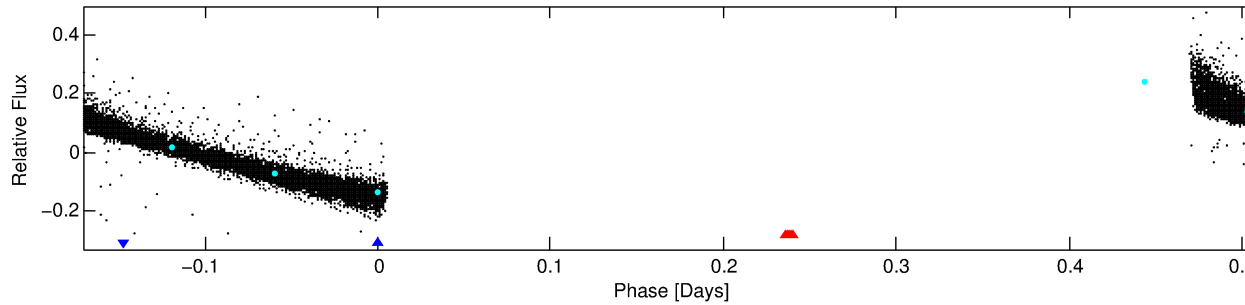
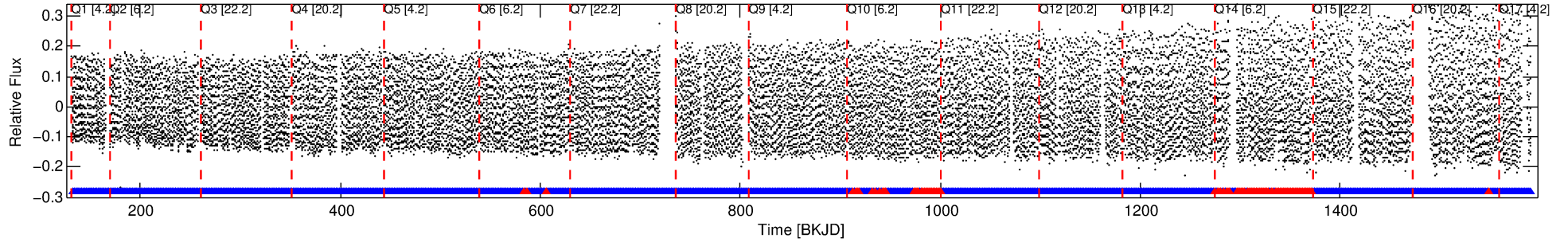
## Ephemeris Match Information For 003733346-02

No Significant Match Found

# DV One-Page Summary

KIC: 3733346 Candidate: 2 of 2 Period: 0.682 d

Kp: 12.68 R\*: 2.14 Rs Teff: 6746.0 K Logg: 3.90 Fe/H: -0.360



## TPS TCE Results:

Period = 0.68197 d  
Epoch = 132.0922 BKJD

DV fit results are unavailable

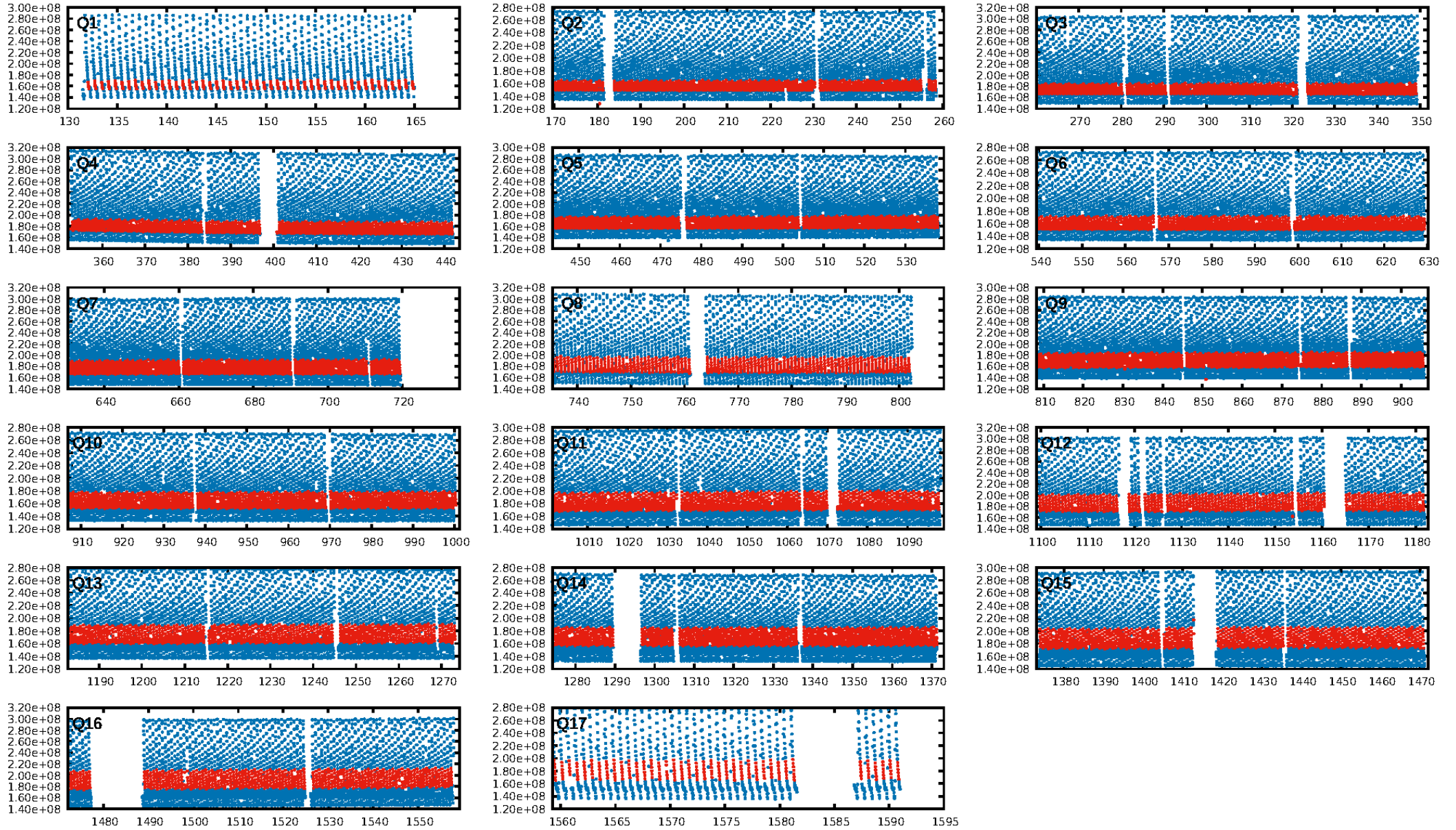
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.92 [1733/1878]  
GhostDiagnostic-chr: 1.608  
Centroid-sig: 0.0%  
Centroid-so: 1.392 arcsec [208.69 $\sigma$ ]  
OotOffset-rm: 0.097 arcsec [0.74 $\sigma$ ]  
KicOffset-rm: 0.121 arcsec [1.64 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 02:32:53 Z

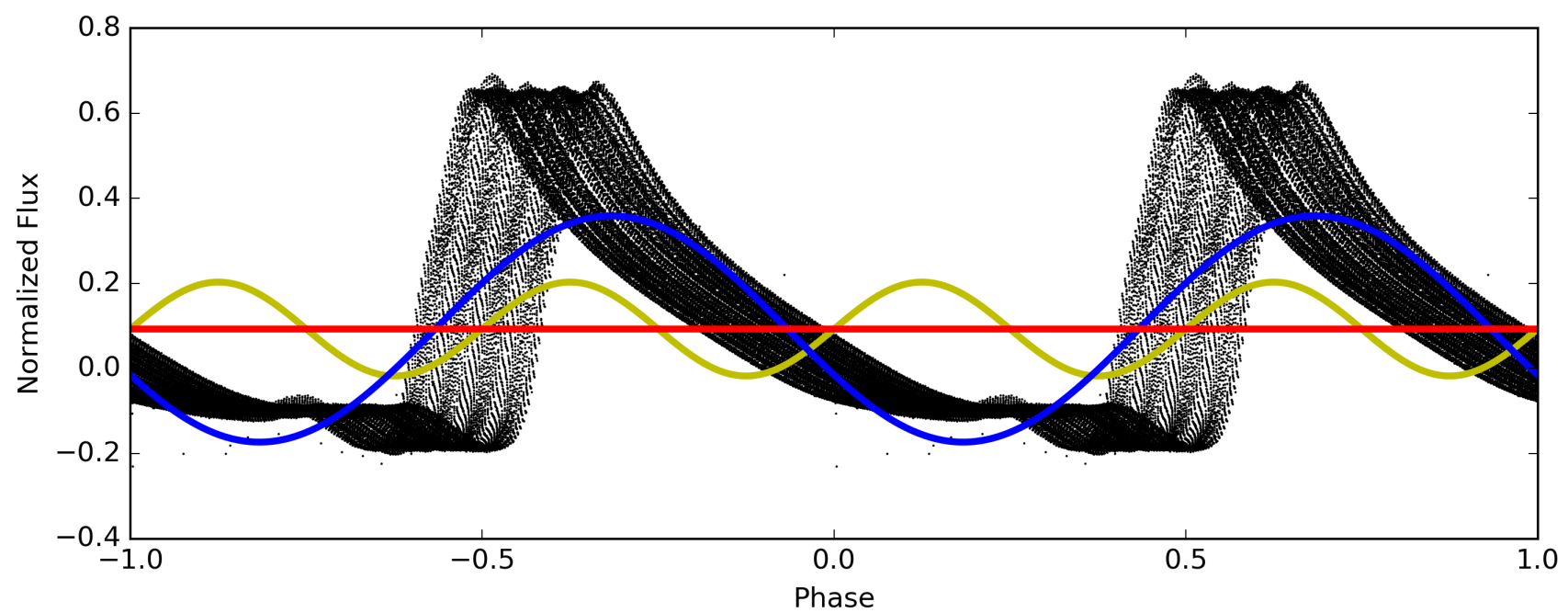
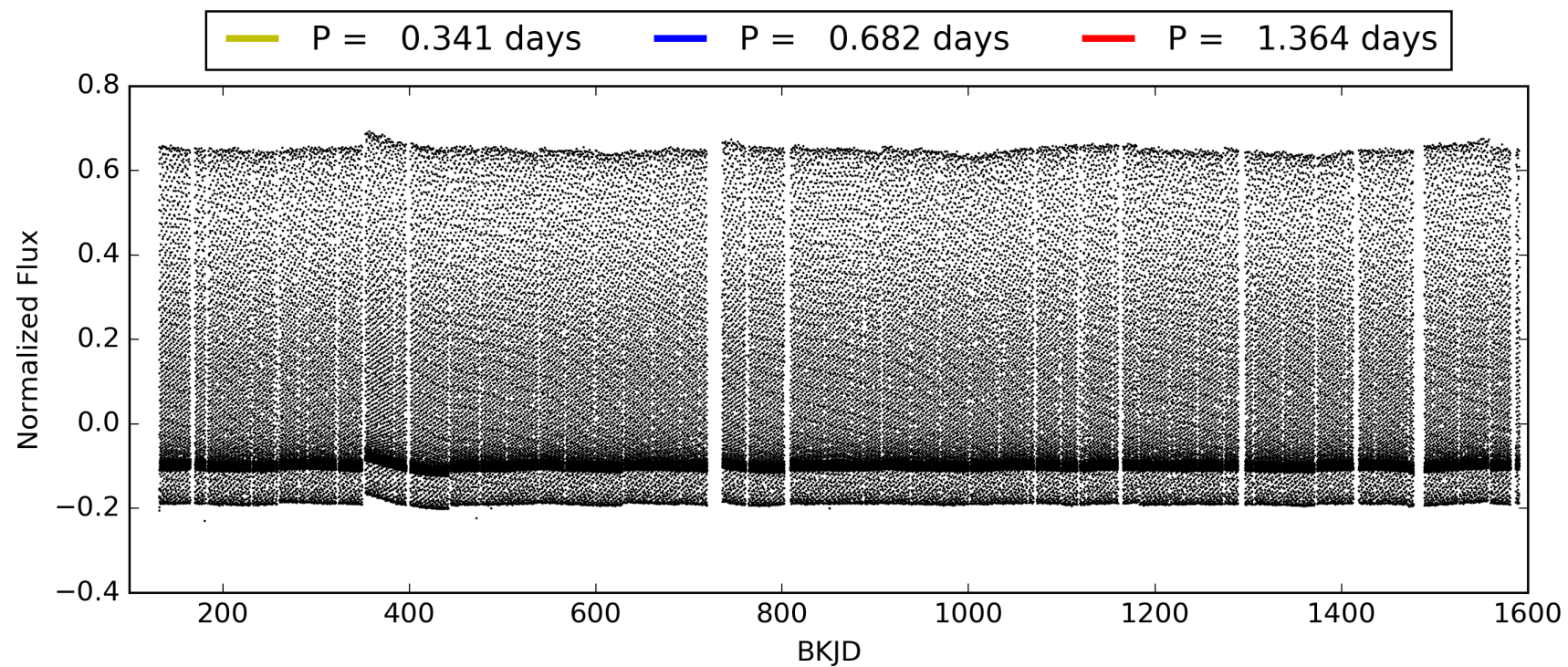
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003733346-02, PDC Light Curves



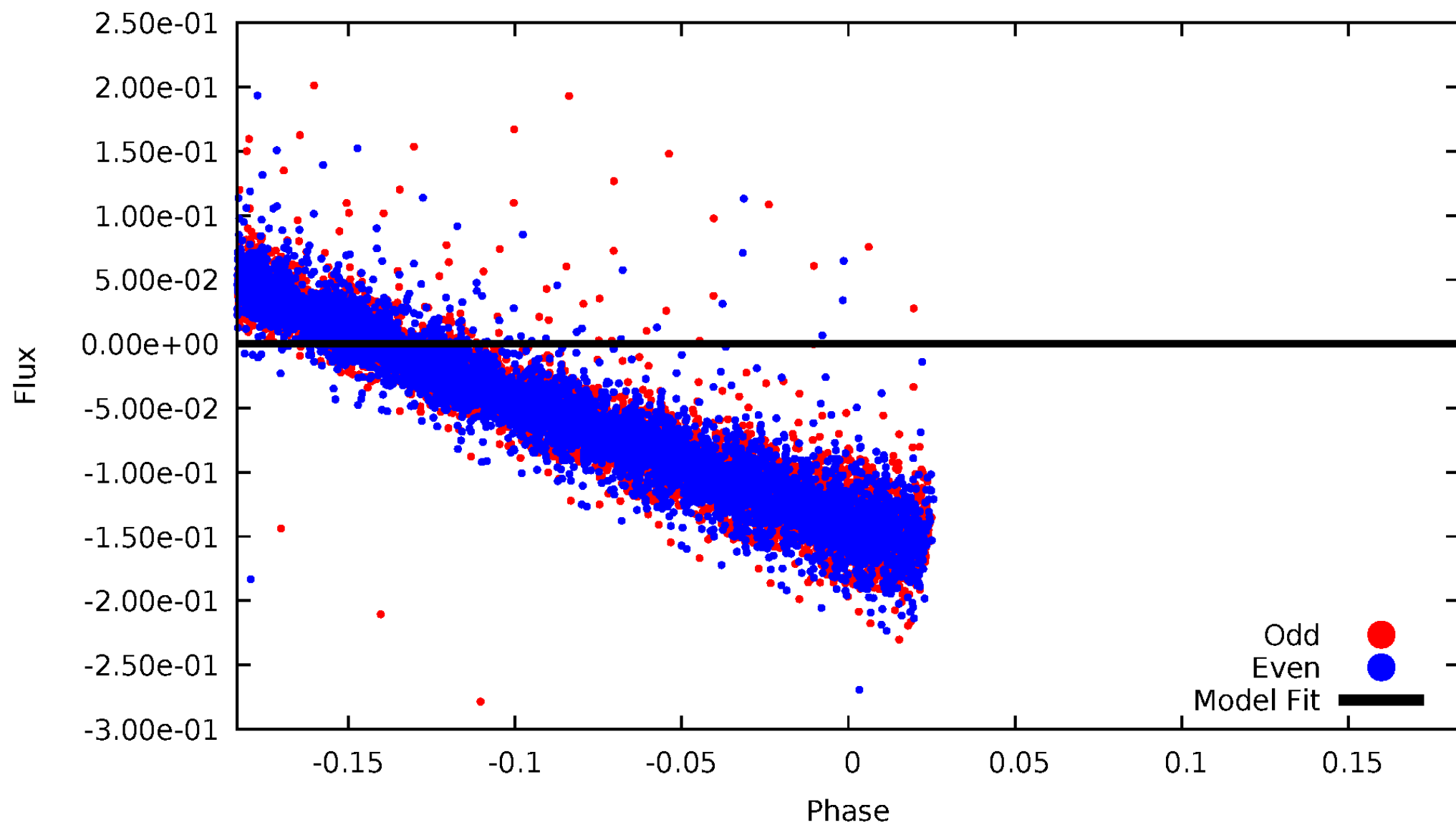


TCE 003733346-02



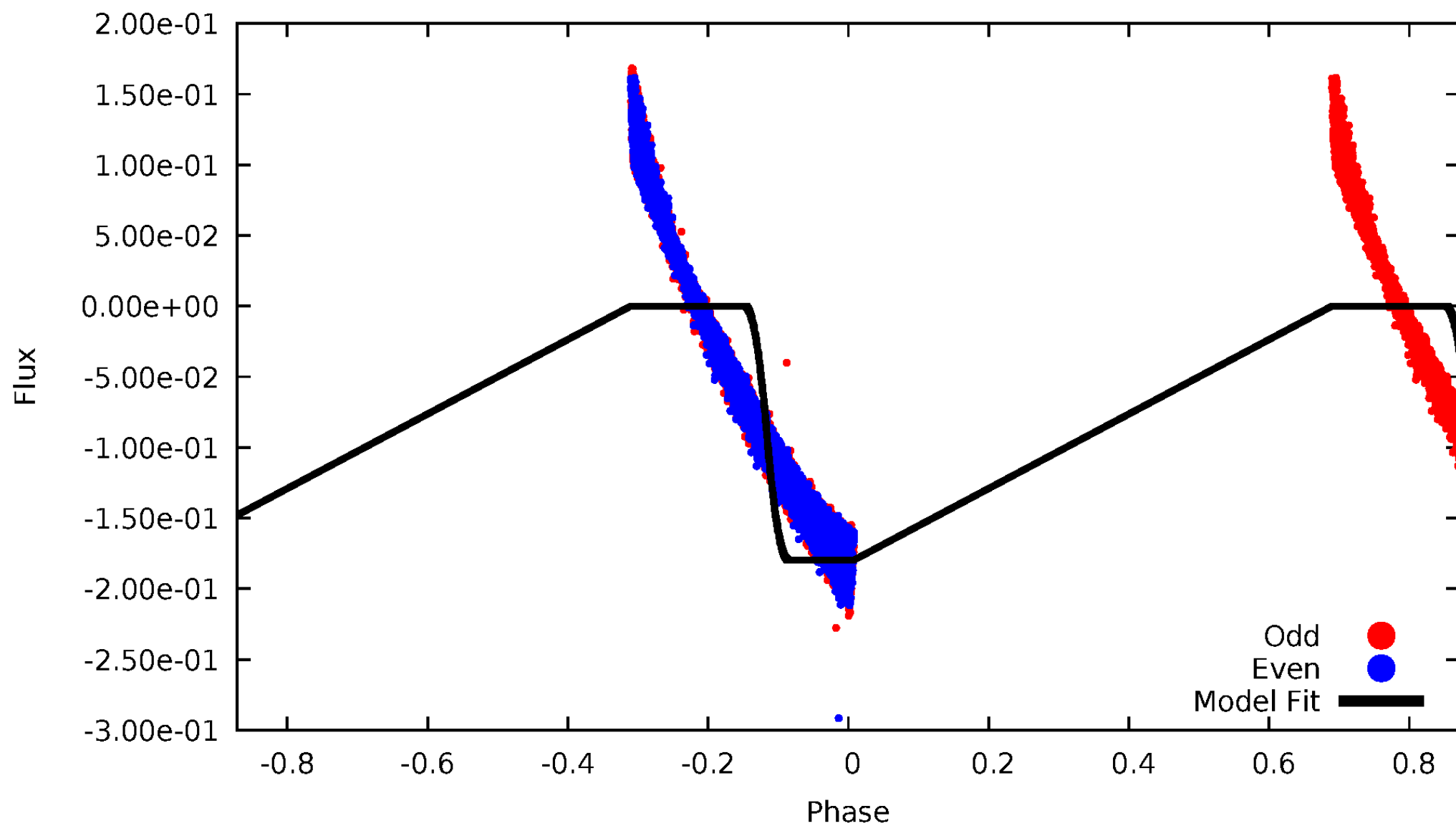
DV Odd/Even

TCE 003733346-02



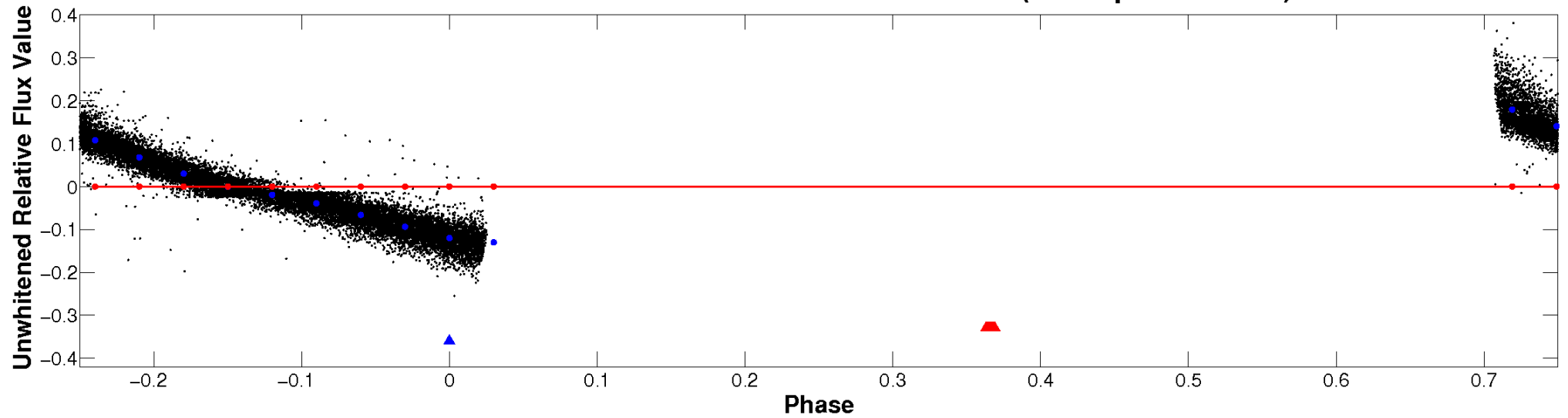
# ALT Odd/Even

TCE 003733346-02

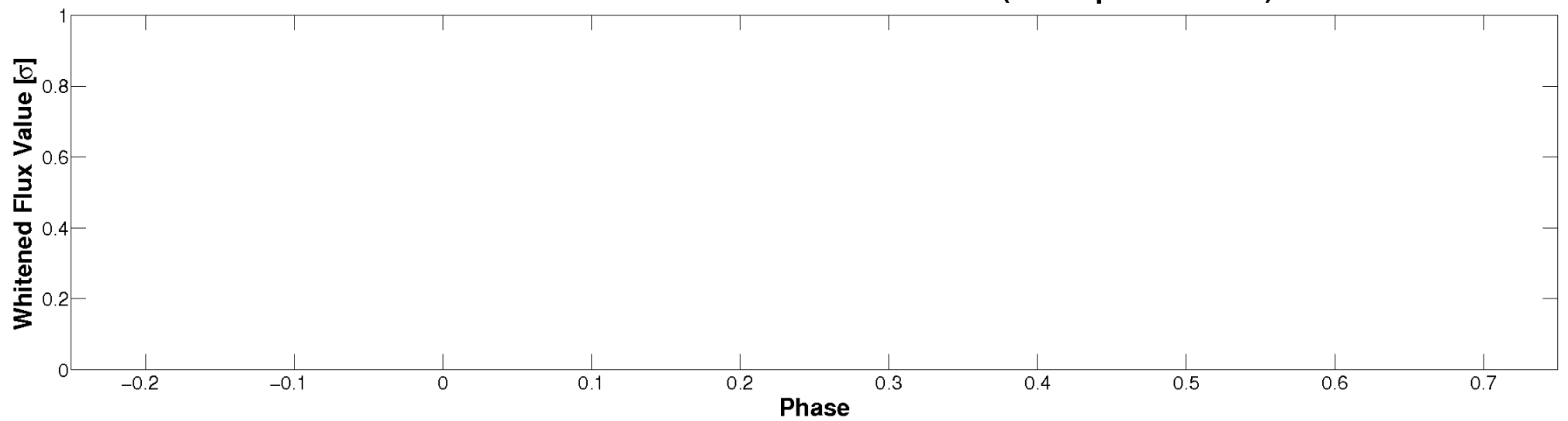


# Non-Whitened Vs. Whitened Light Curve

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

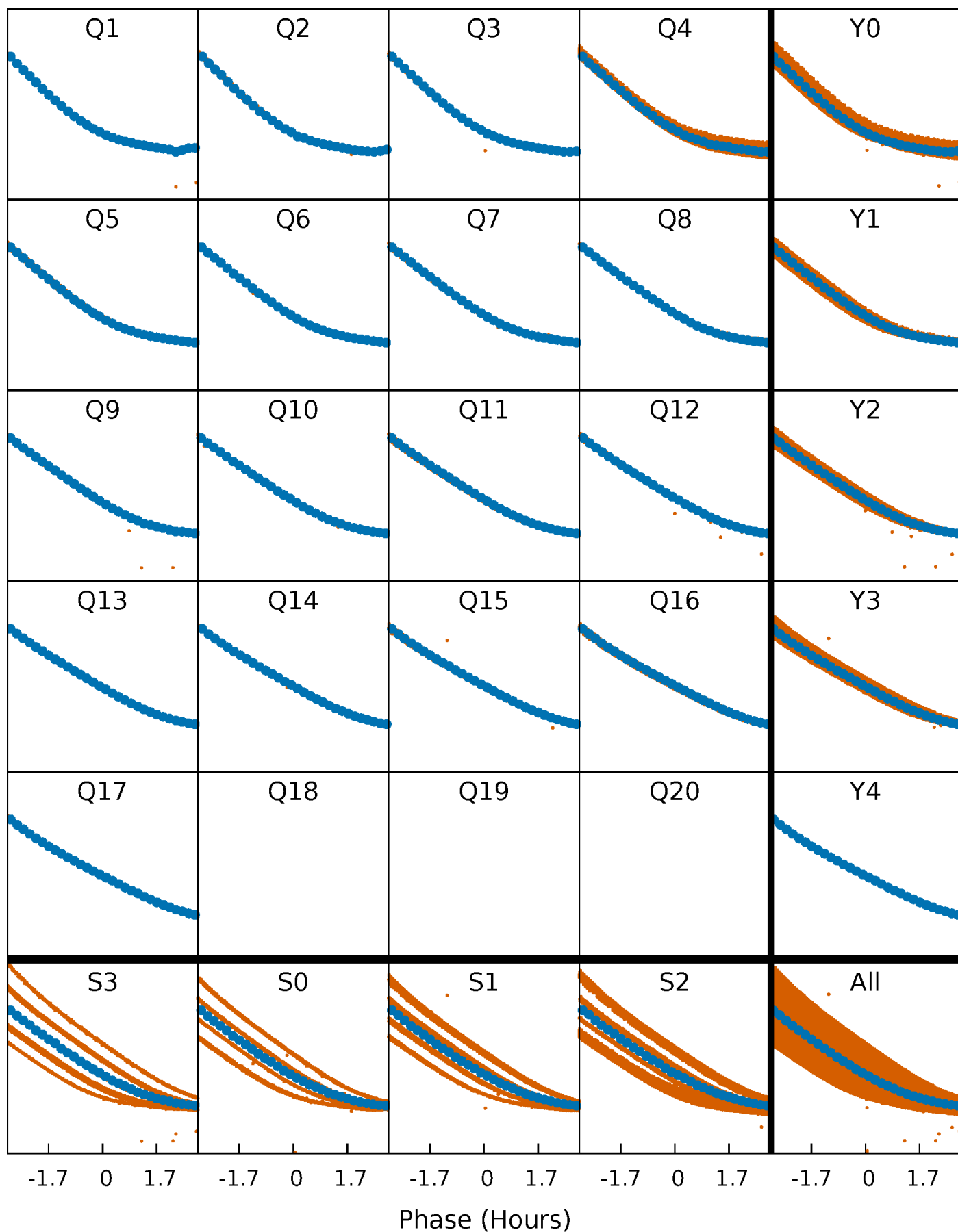


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

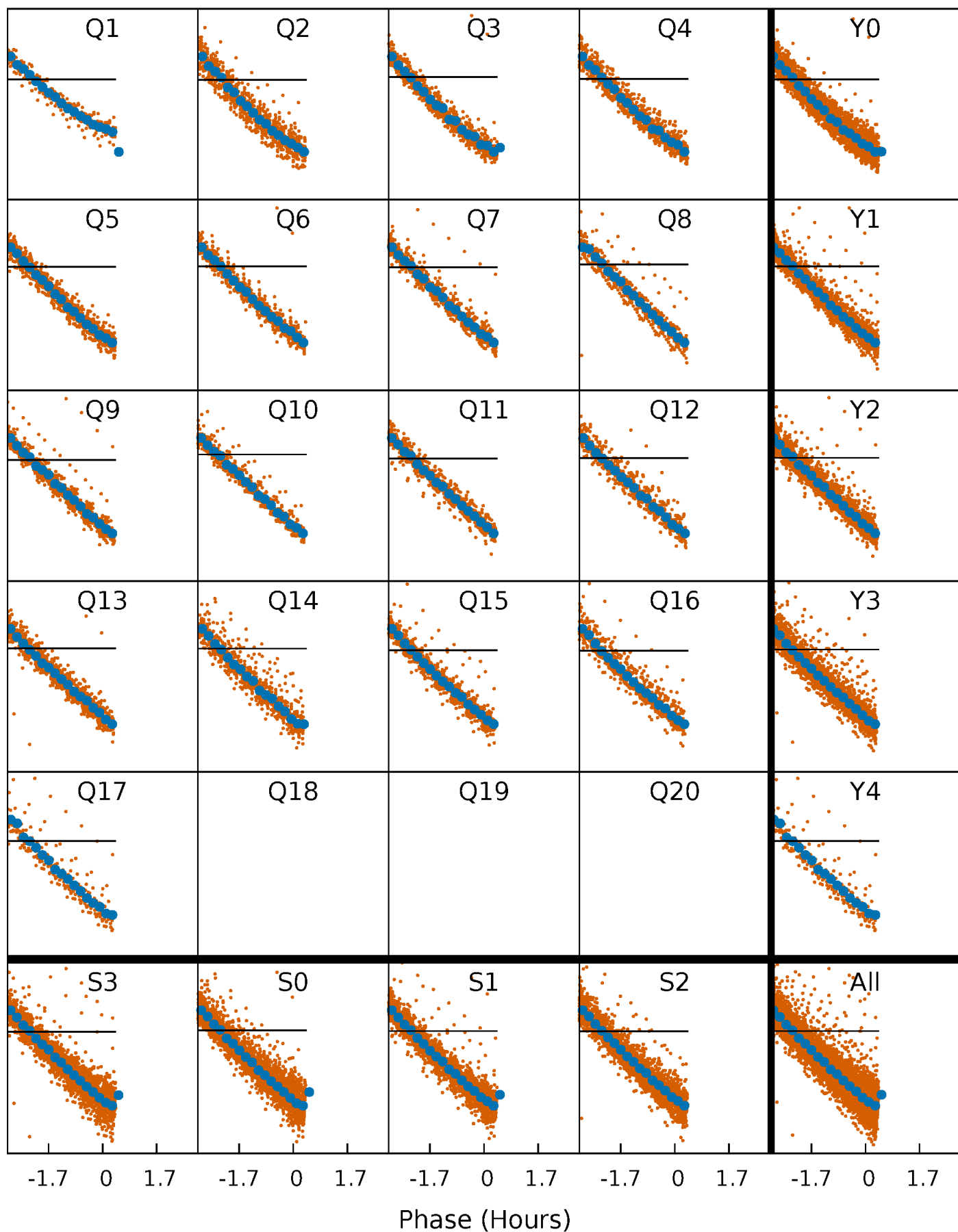
TCE 003733346-02     $P = 0.681968$  Days     $T_0 = 132.092244$  (BKJD)





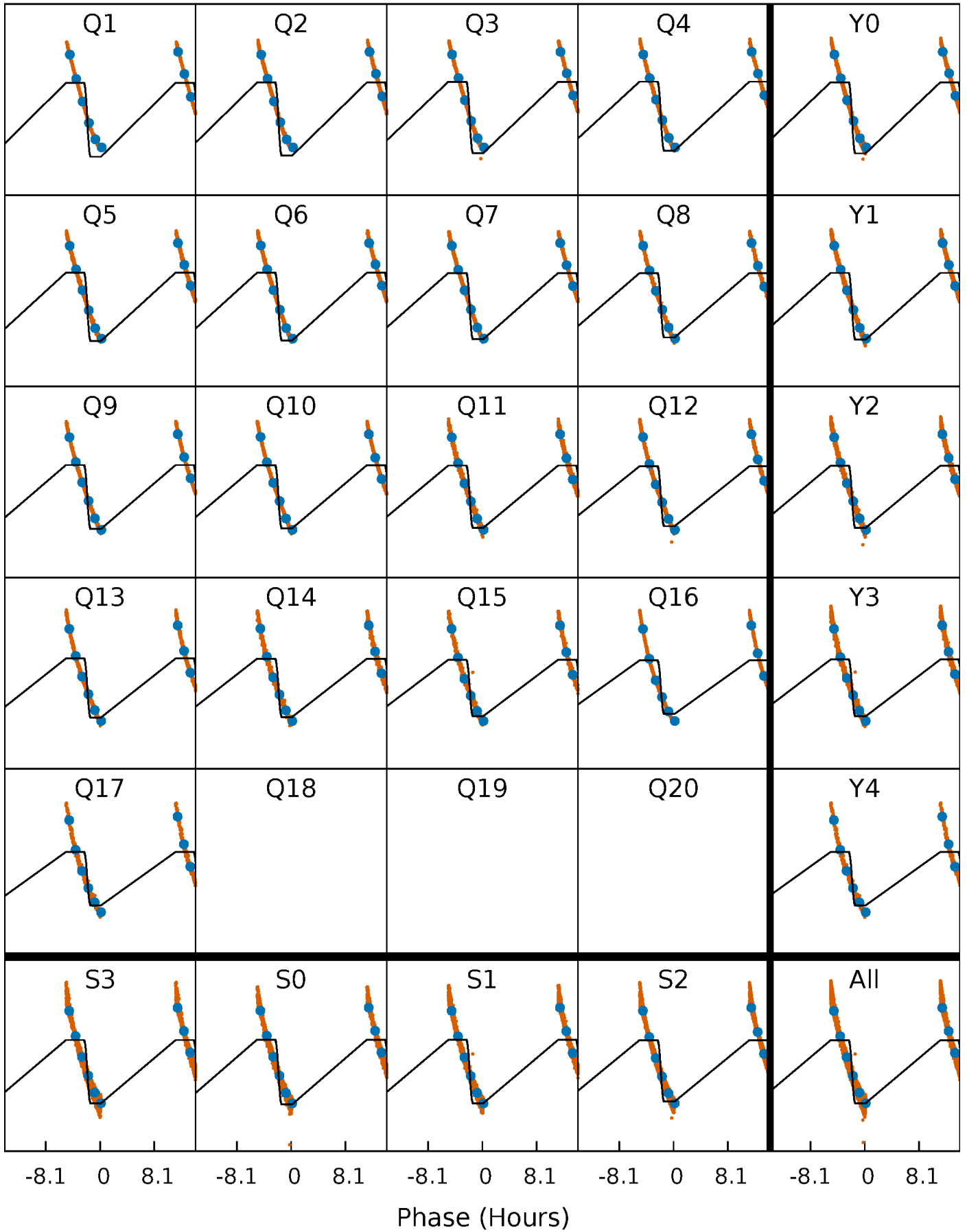
# DV Quarter-Phased Transit Curves

TCE 003733346-02   P= 0.681968 Days    $T_0=132.092244$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

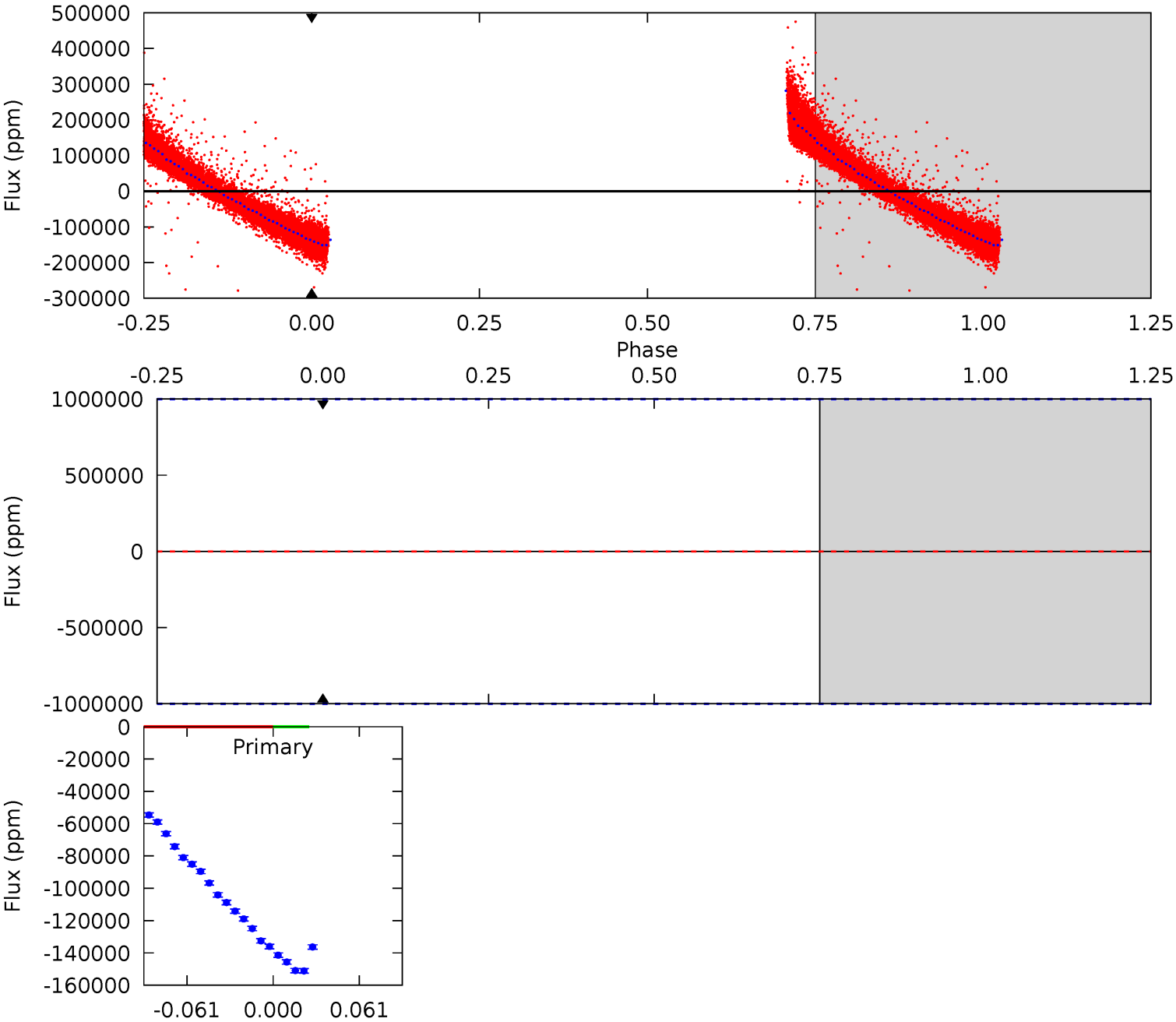
TCE 003733346-02     $P = 0.681968$  Days     $T_0 = 132.103927$  (BKJD)



# DV Model-Shift Uniqueness Test

003733346-02, P = 0.681968 Days, E = 131.410276 Days

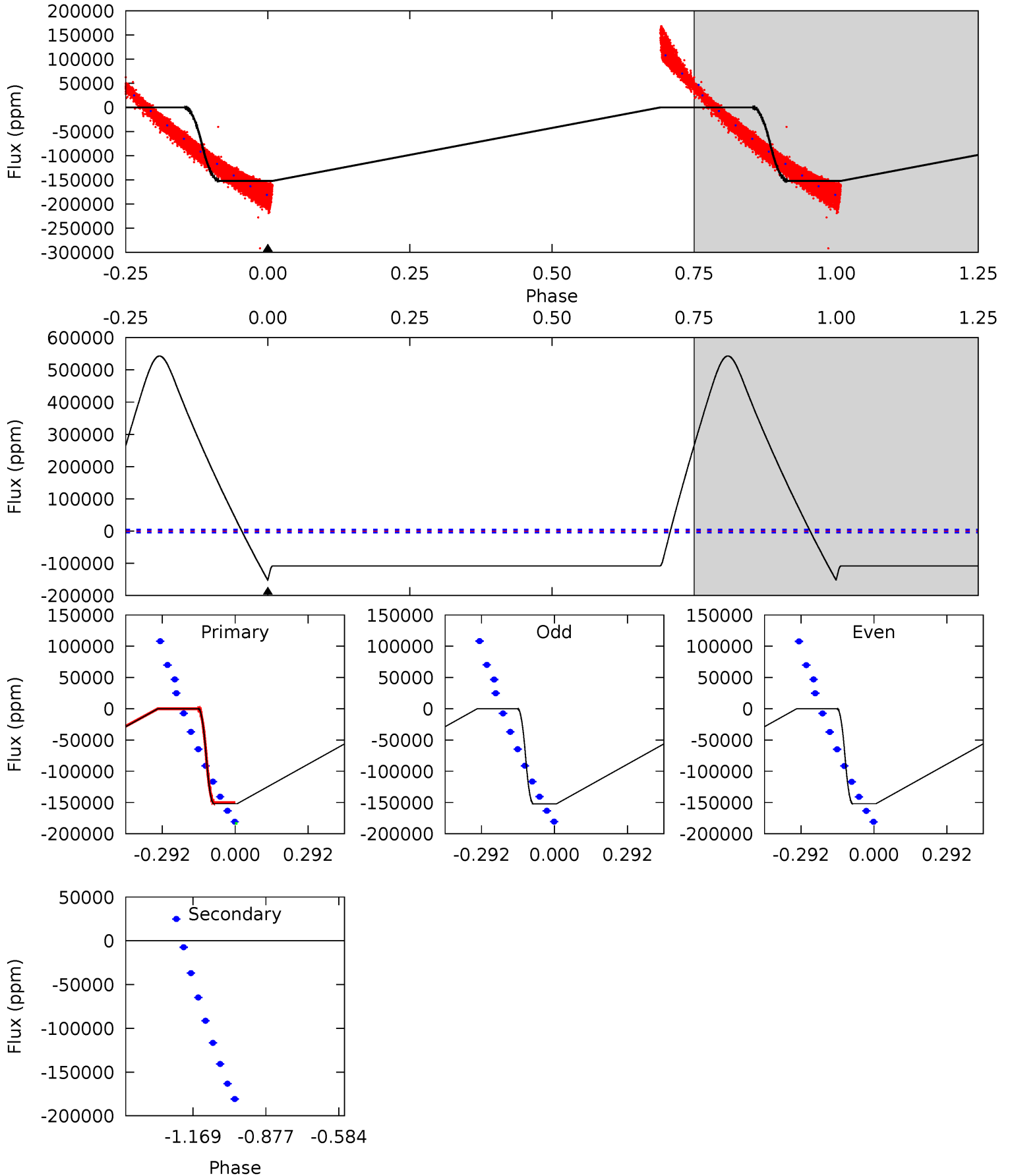
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003733346-02, P = 0.681968 Days, E = 131.421959 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
146.4	0	0	0	4.33	1.05	58.7	146.4	146.4	0	0	0.06	1.01	0.78	26.9



### Stellar Parameters For KIC 003733346

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6746^{+214}_{-262}$	$3.895^{+0.390}_{-0.130}$	$-0.360^{+0.300}_{-0.300}$	$2.139^{+0.500}_{-0.858}$	$1.313^{+0.195}_{-0.259}$	$0.189^{+0.601}_{-0.071}$
	+3%/-4%	+10%/-3%	+83%/-83%	+23%/-40%	+15%/-20%	+318%/-37%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003733346-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$15.13^{+17.82}_{-10.76}$	$4602^{+338}_{-467}$	$3610^{+26247}_{-37193}$	$0.657^{+106.085}_{-120.087}$
Alt.	$0 \pm 1038$	$91.91^{+31.59}_{-27.47}$	$4601^{+381}_{-502}$	$-4057^{+307}_{-245}$	$0.001^{+0.021}_{-0.021}$

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

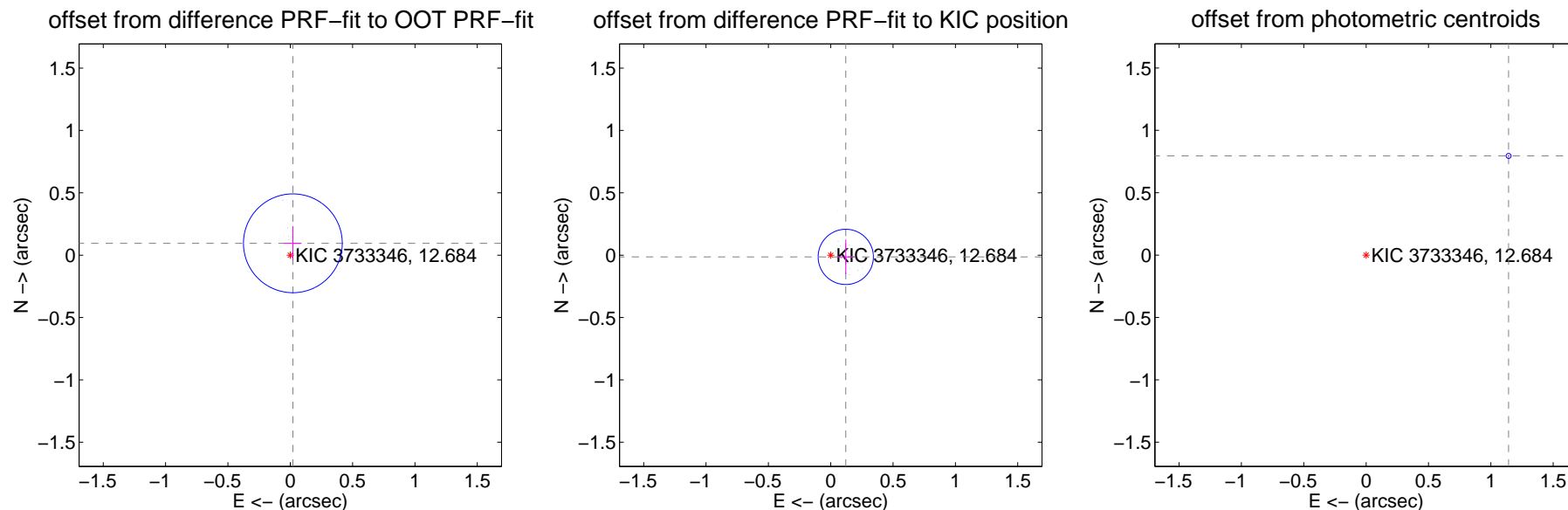
## DV Centroid Data

Supplemental centroid analysis for 003733346-02. Kepler magnitude: 12.68. Transit SNR -1.00

There are 16 quarters with good PRF difference image offsets

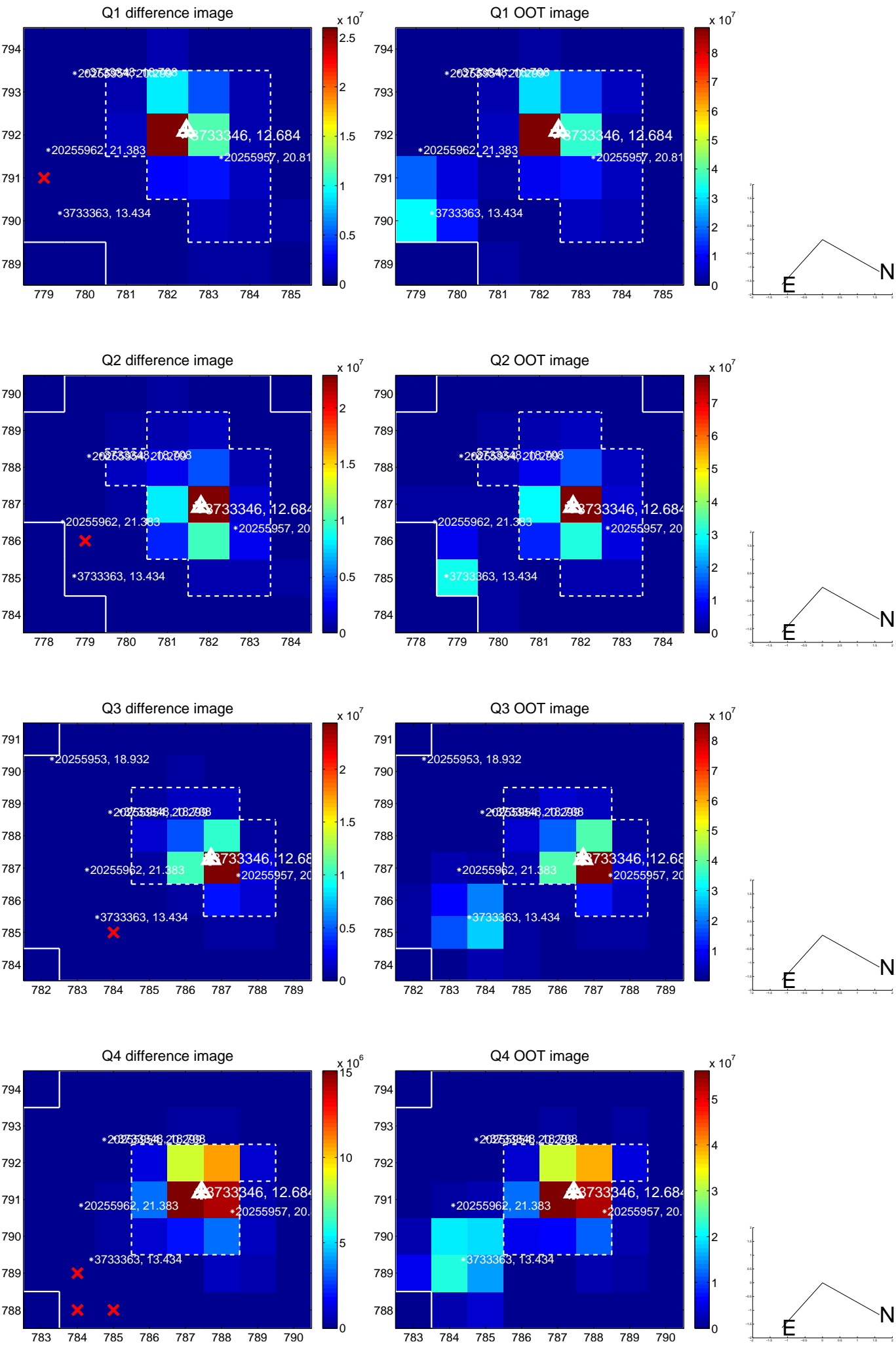
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.097 \pm 0.132$	0.74	$-0.021 \pm 0.069$	$0.095 \pm 0.138$
PRF-fit source offset from KIC position	$0.121 \pm 0.074$	1.64	$-0.121 \pm 0.069$	$-0.014 \pm 0.139$
photometric centroid source offset	$1.39 \pm 0.01$	208.69	$-1.14 \pm 0.01$	$0.79 \pm 0.00$



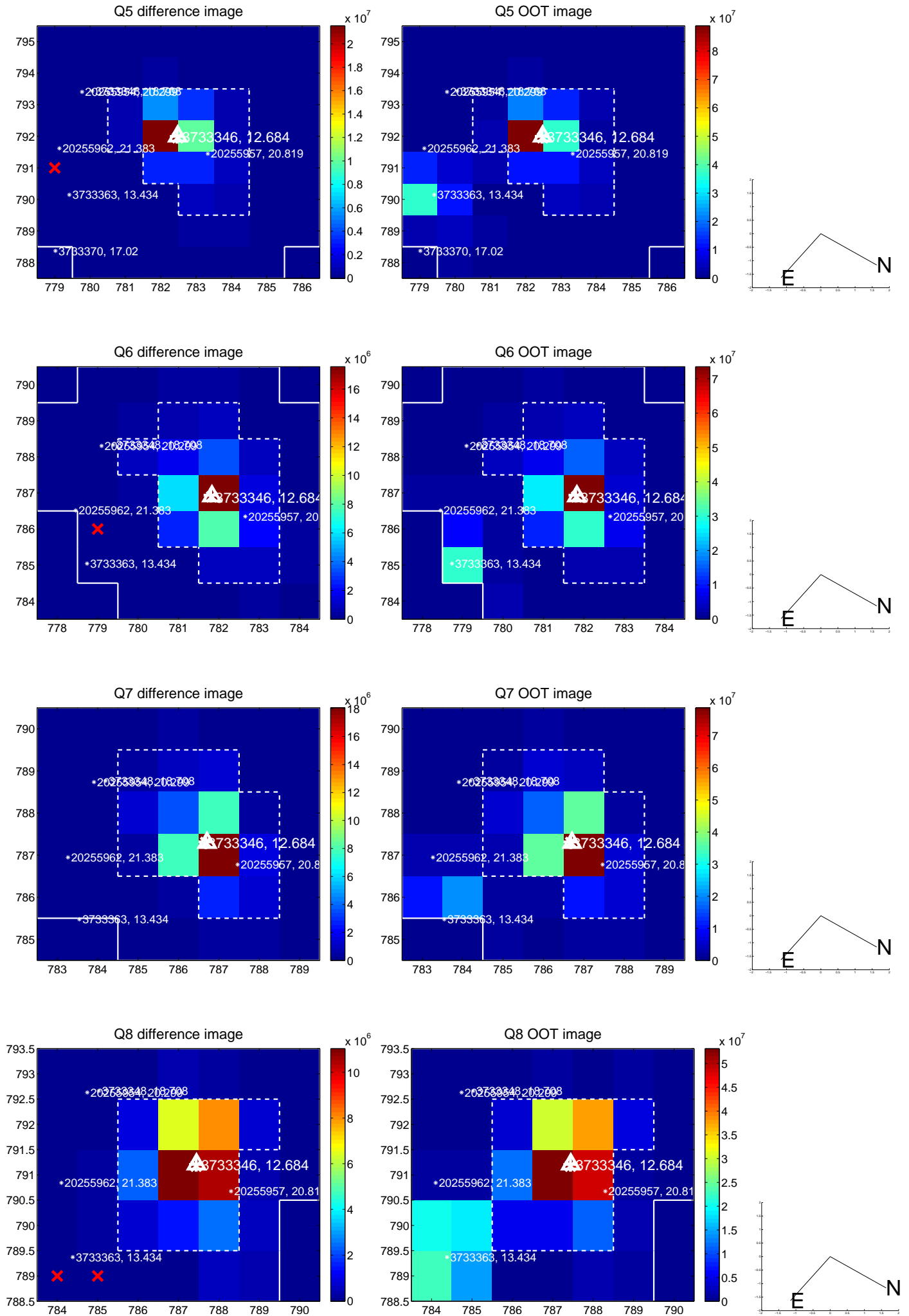
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

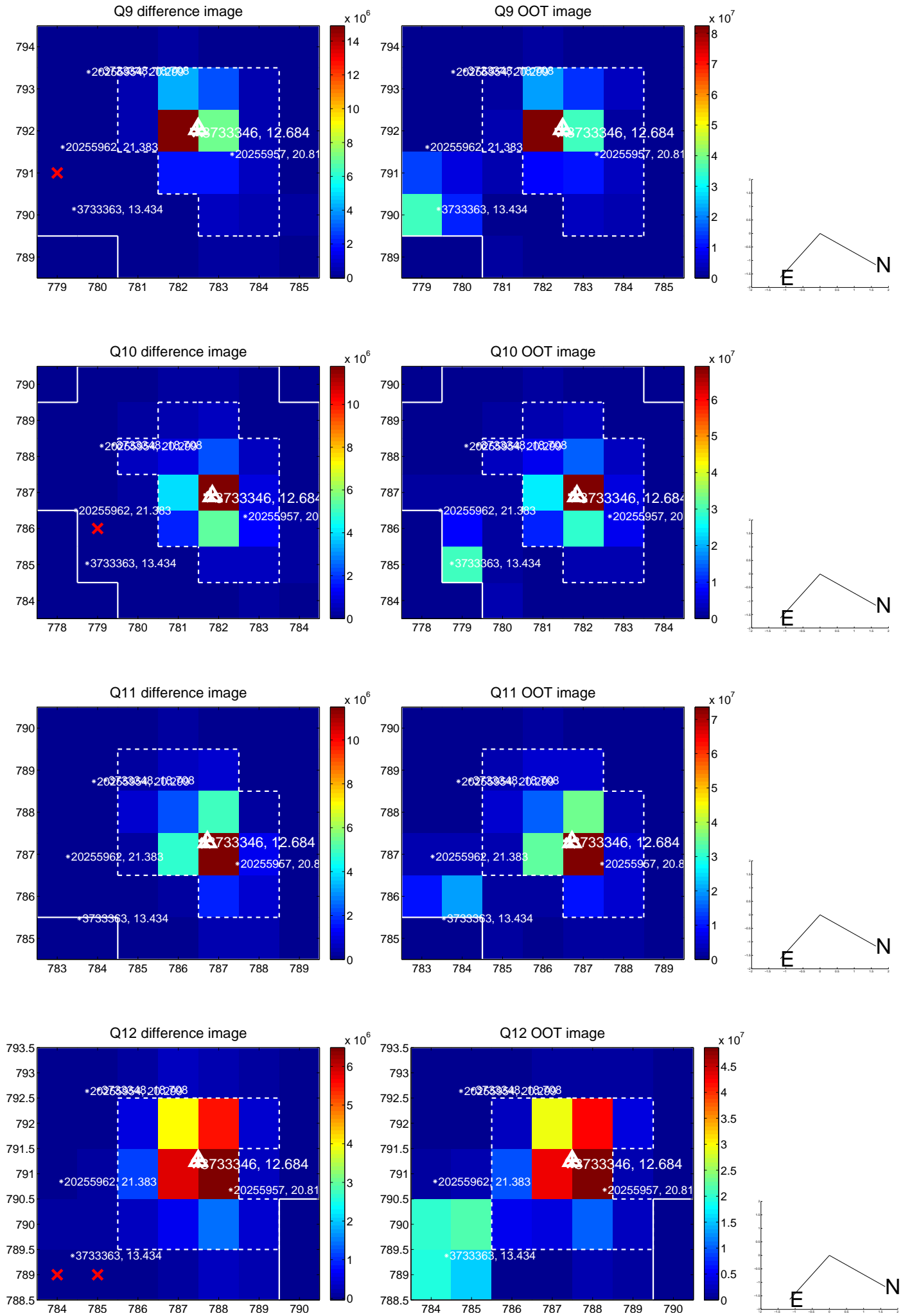




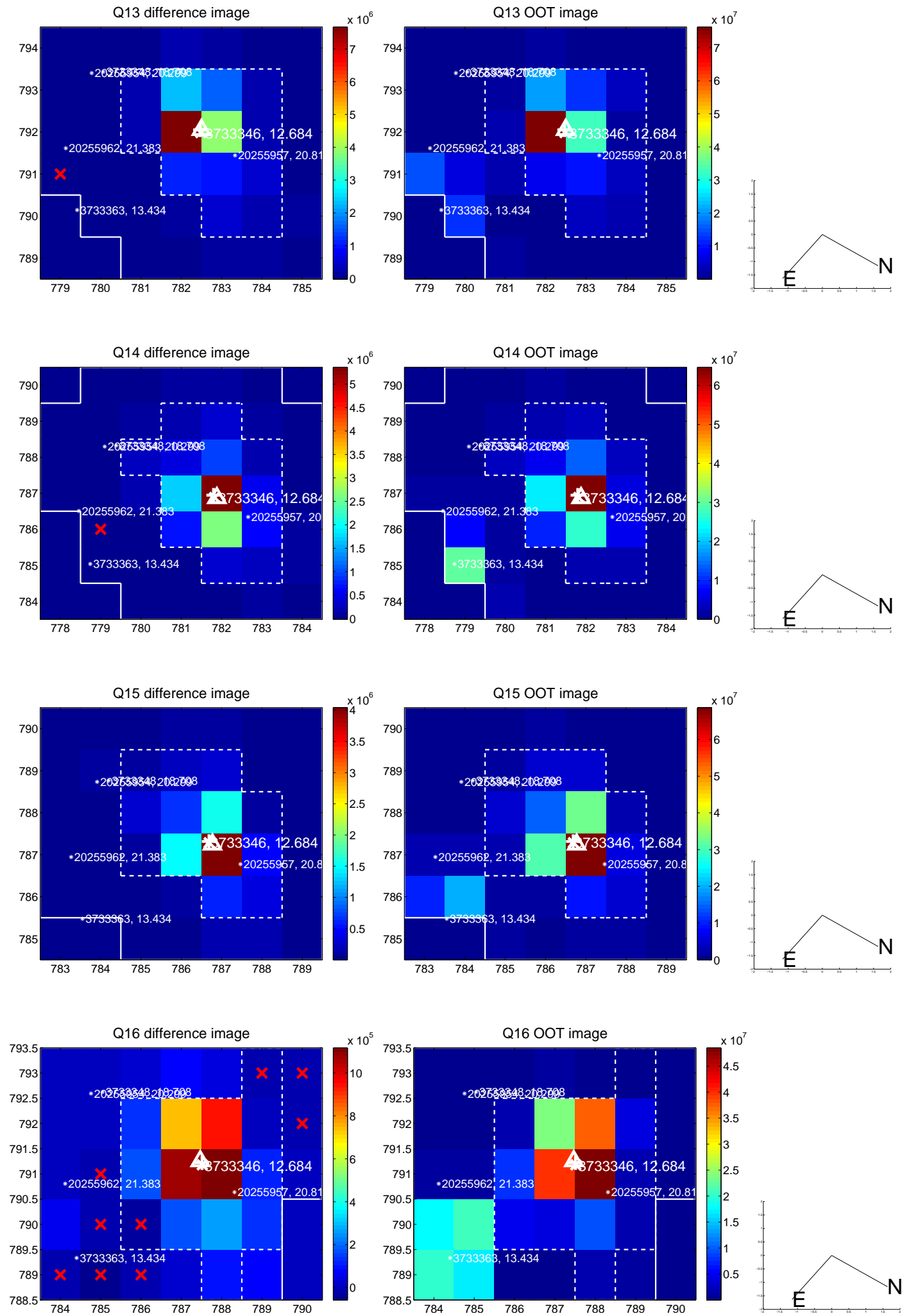
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



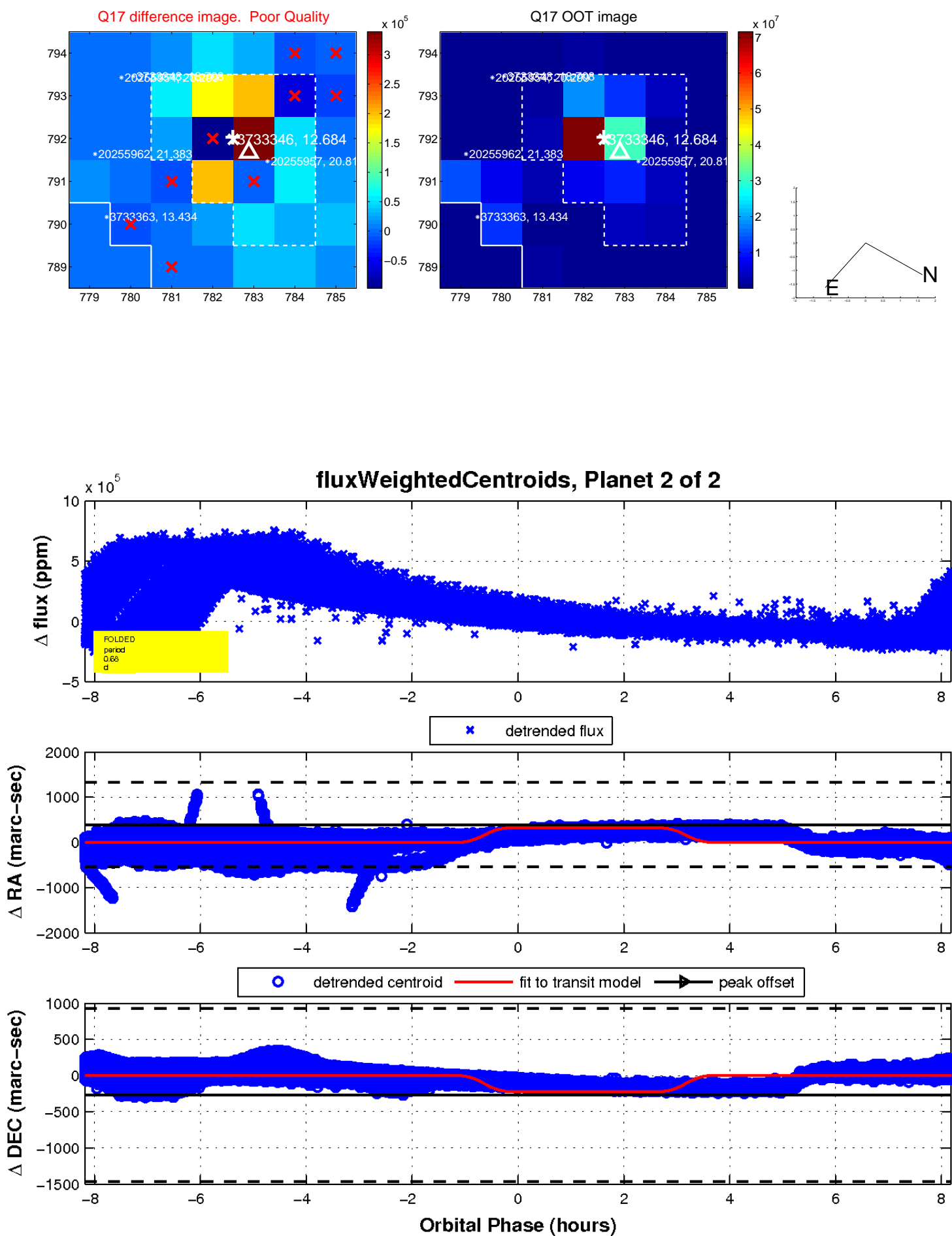
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

