

# KIC 011284505

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011284505-01	OBS	No	21.362818	147.503470	1814.5	6.388	37.8	43.2	11.88	4837	100.85	2014.42
011284505-02	OBS	No	10.681491	134.841187	1152.0	6.869	31.2	37.2	11.88	4837	81.77	5075.96
011284505-03	OBS	No	528.617651	515.508370	732.7	9.524	14.6	4.5	11.88	4837	33.70	27.94
011284505-04	OBS	No	21.362881	136.650034	147.8	12.000	13.0	-1.0	11.88	4837	13.97	2014.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011284505-01	OBS	FP	0.00	1	0	0	0	LPP_DV
011284505-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
011284505-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011284505-04	OBS	FP	0.00	1	0	0	0	LPP_DV—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.

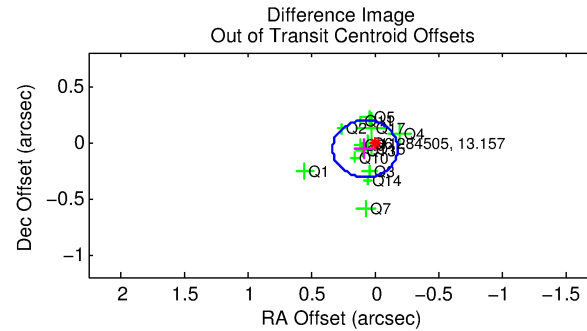
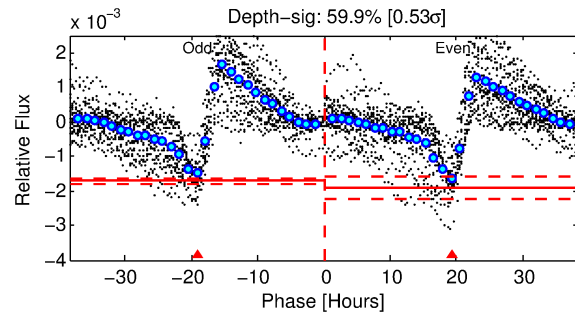
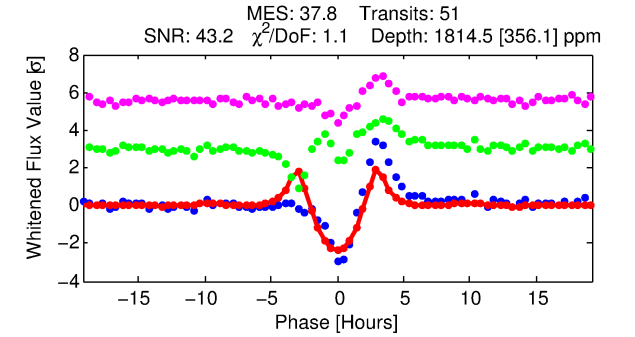
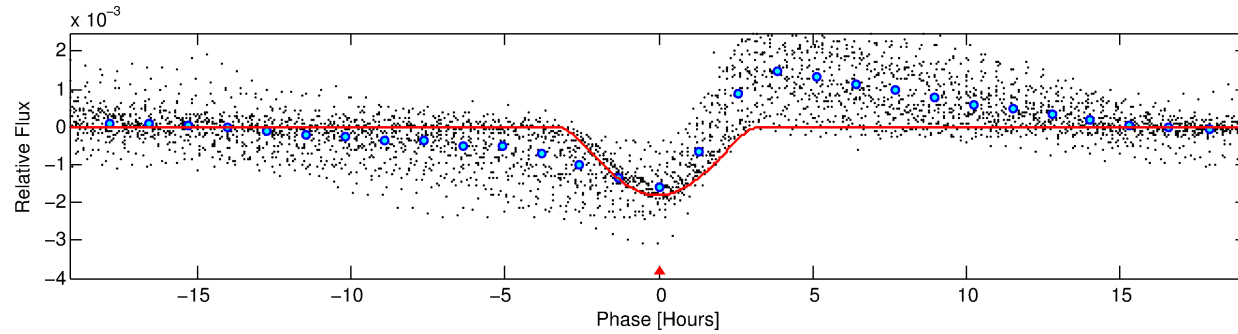
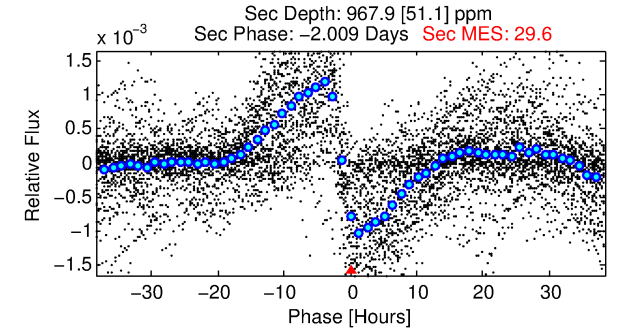
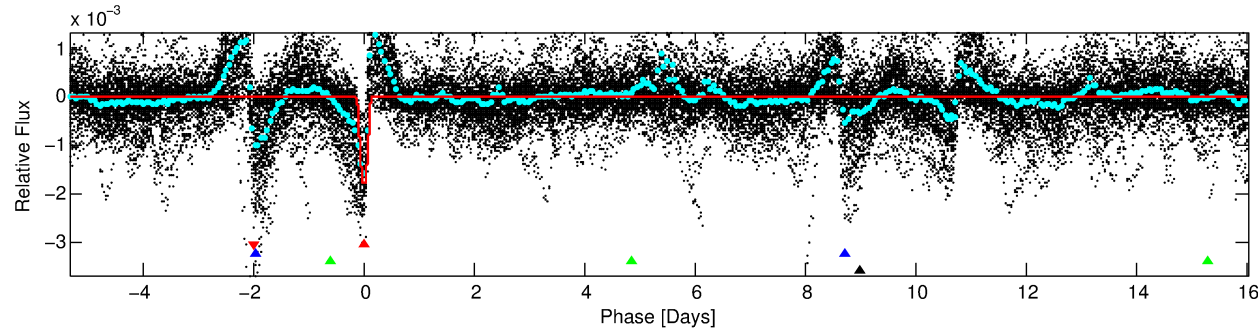
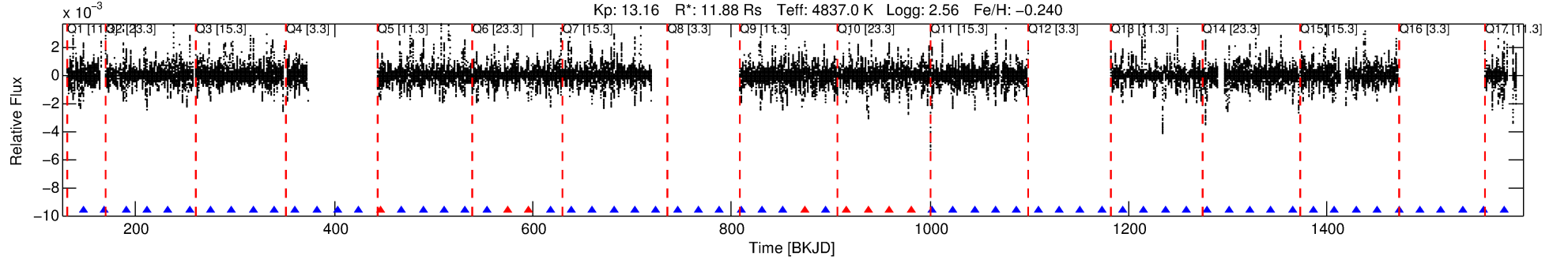
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011284505-01

No Significant Match Found

# DV One-Page Summary

KIC: 11284505 Candidate: 1 of 4 Period: 21.363 d



## DV Fit Results:

Period = 21.36282 [0.00006] d  
Epoch = 147.5035 [0.0021] BKJD  
Rp/R\* = 0.0778 [0.0242]  
a/R\* = 10.32 [0.65]  
b = 1.00 [0.02]  
Seff = 2014.42 [1611.44]  
Teff = 1708 [342] K  
Rp = 100.85 [59.08] Re  
a = 0.1853 [0.0907] AU  
Ag = 1.80 [1.81] [0.44σ]  
Teffp = 3059 [484] K [2.28σ]

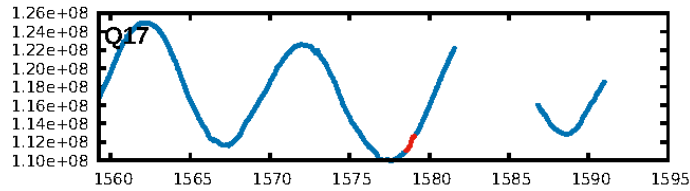
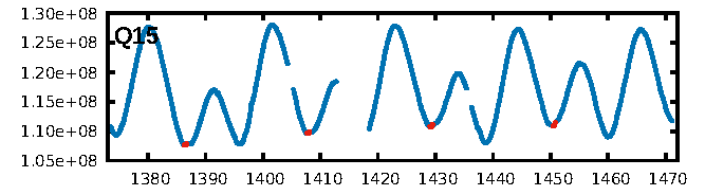
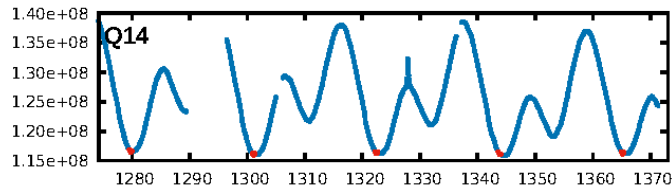
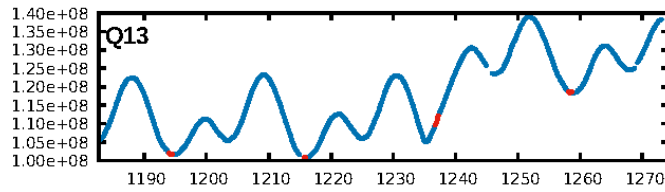
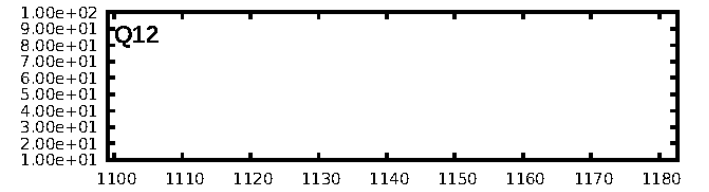
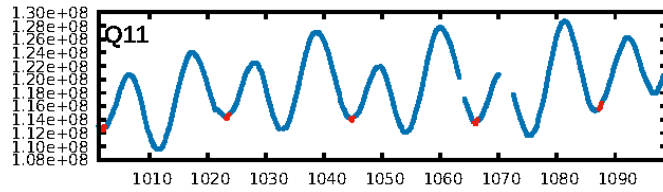
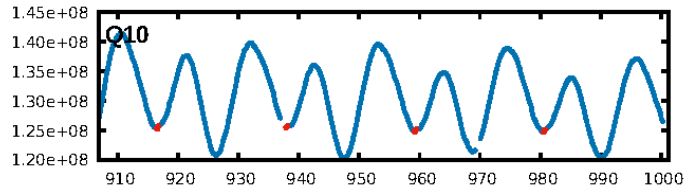
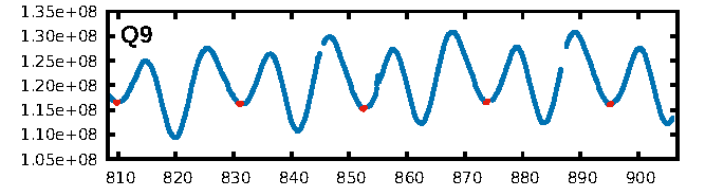
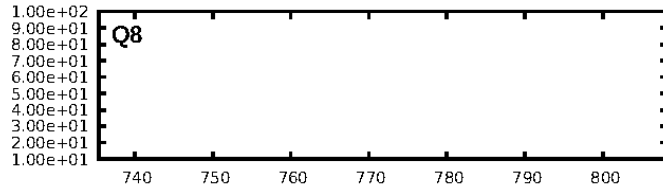
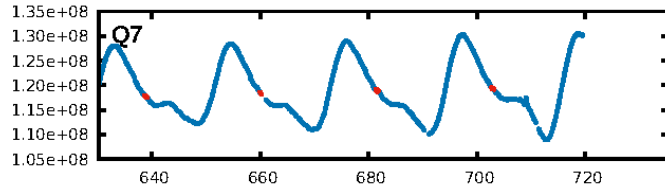
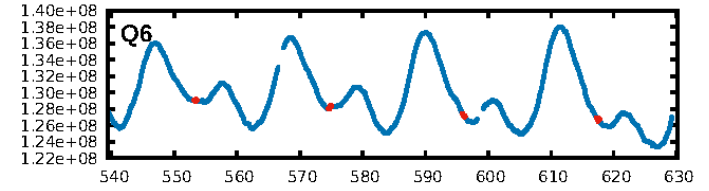
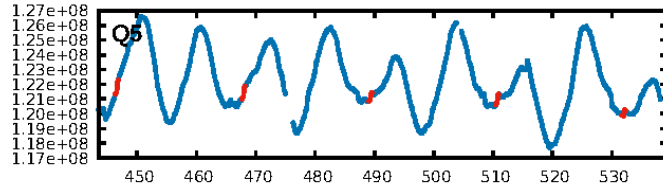
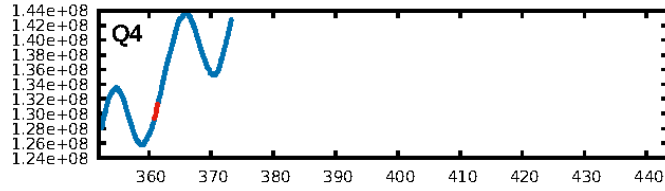
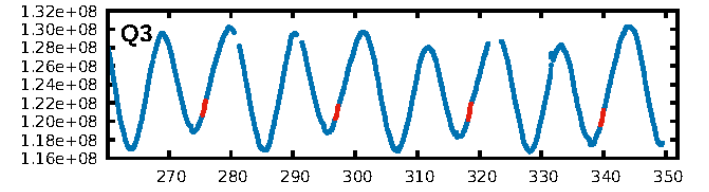
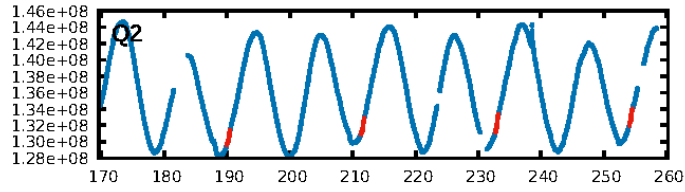
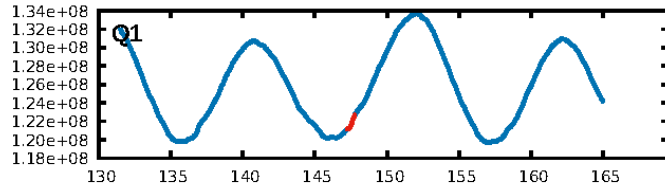
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.33σ]  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 99.5%  
ModelChiSquareGof-sig: 49.0%  
Bootstrap-pfa: 6.21e-239  
RollingBand-fgt: 0.83 [40/48]  
GhostDiagnostic-chr: 1.055  
Centroid-sig: N/A  
Centroid-so: 0.149 arcsec [0.52σ]  
OotOffset-rm: 0.094 arcsec [1.10σ]  
KicOffset-rm: 0.140 arcsec [1.38σ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

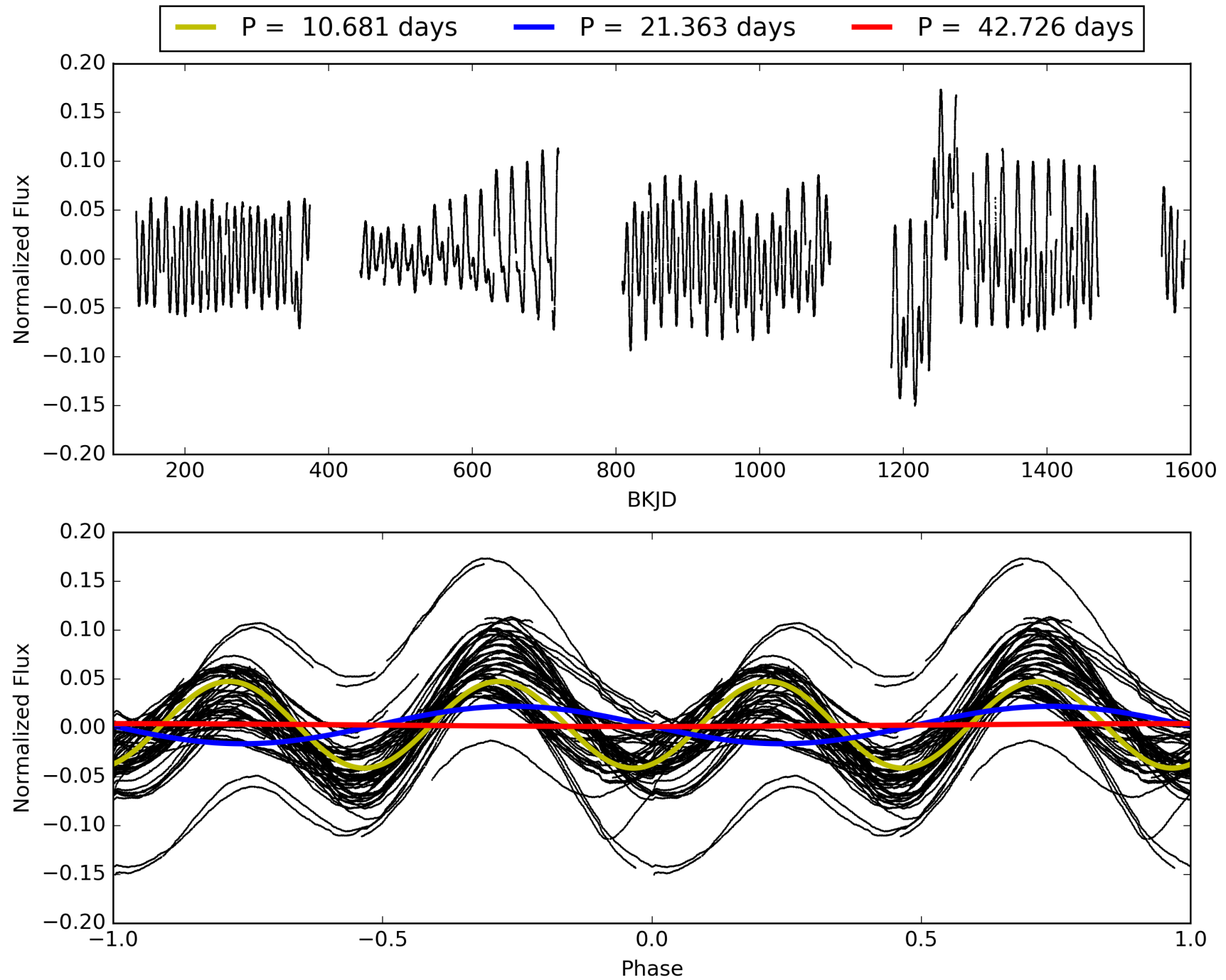
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:38:10 Z

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

# TCE 011284505-01, PDC Light Curves



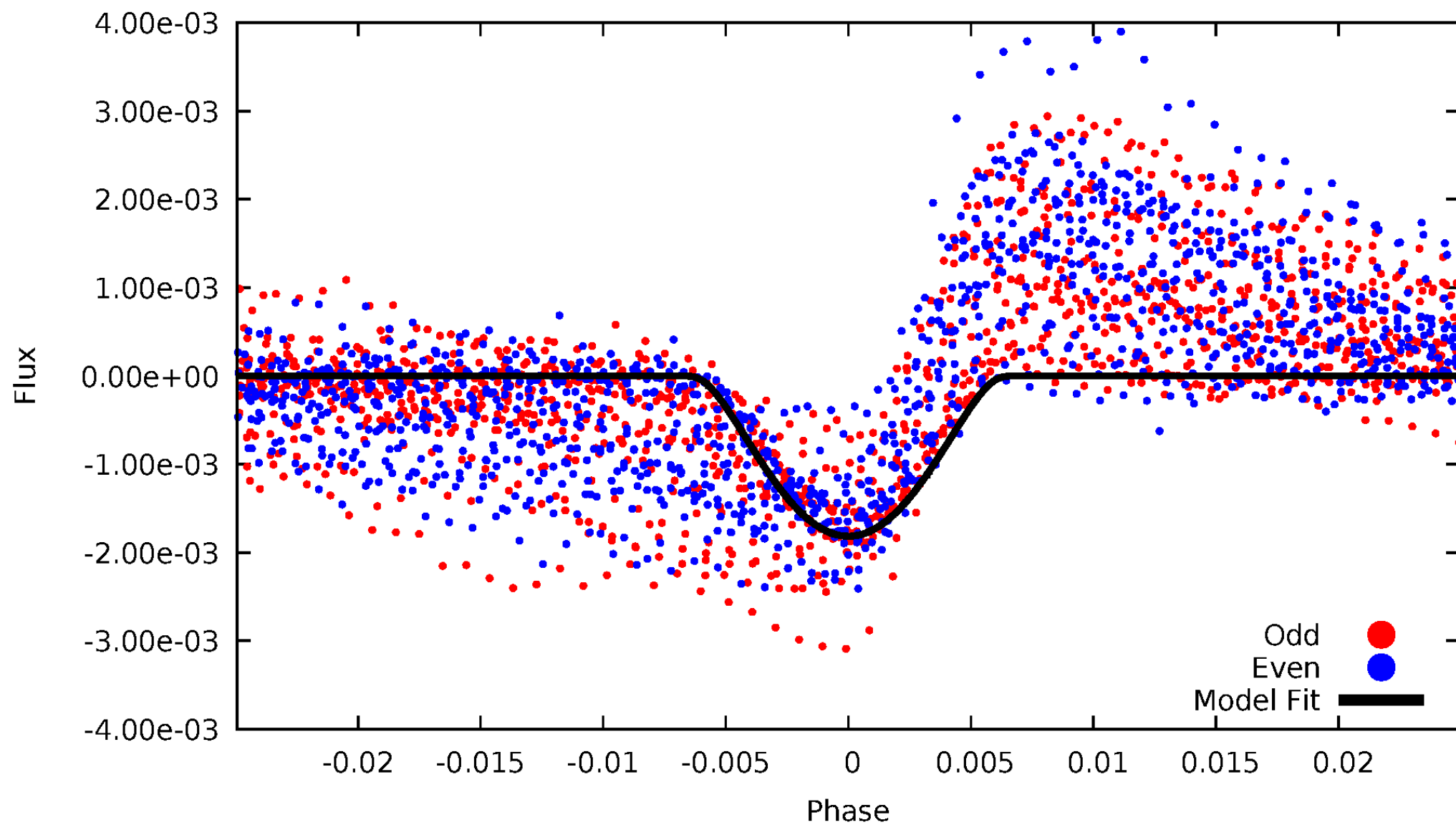
# TCE 011284505-01





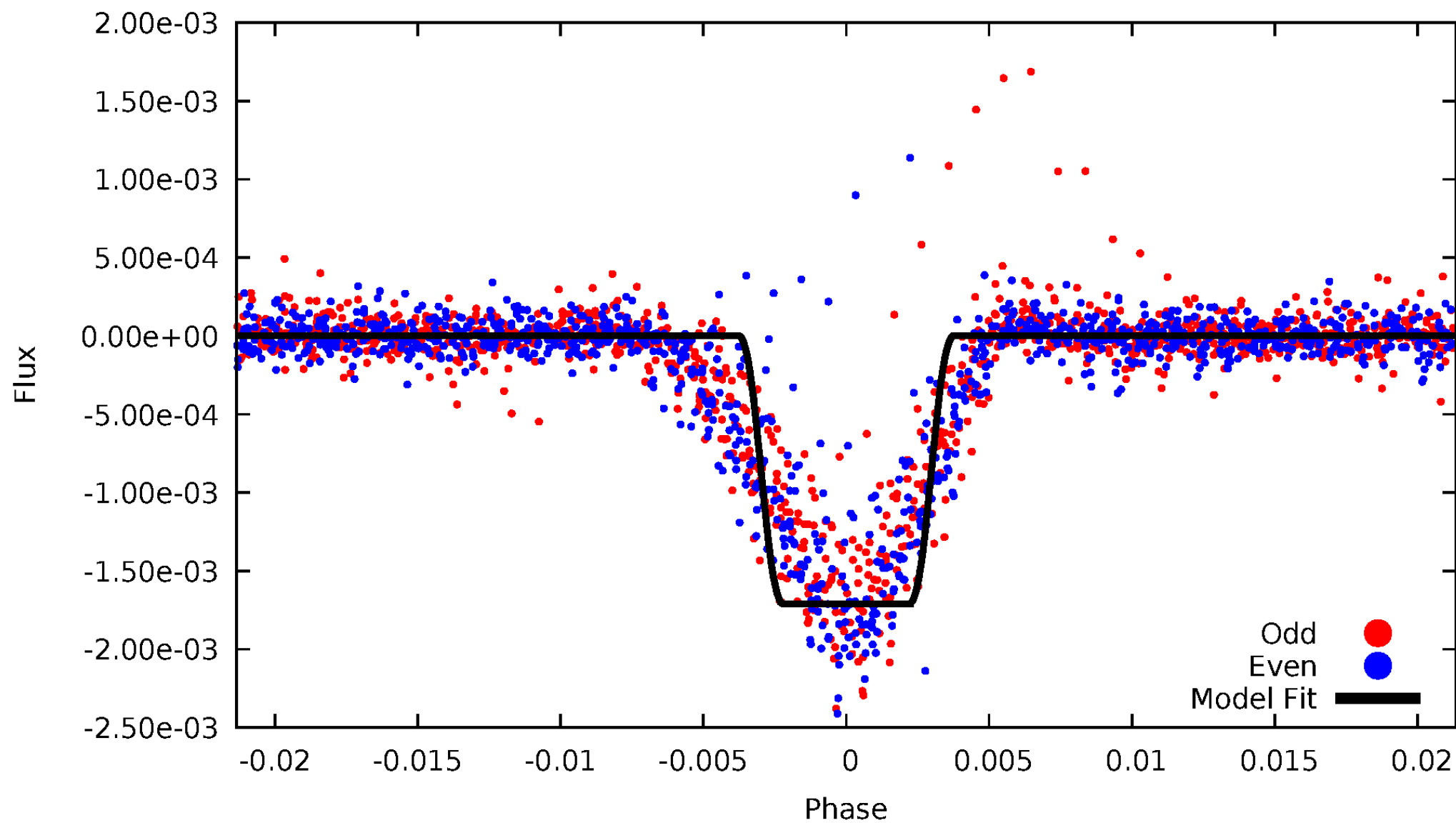
# DV Odd/Even

TCE 011284505-01



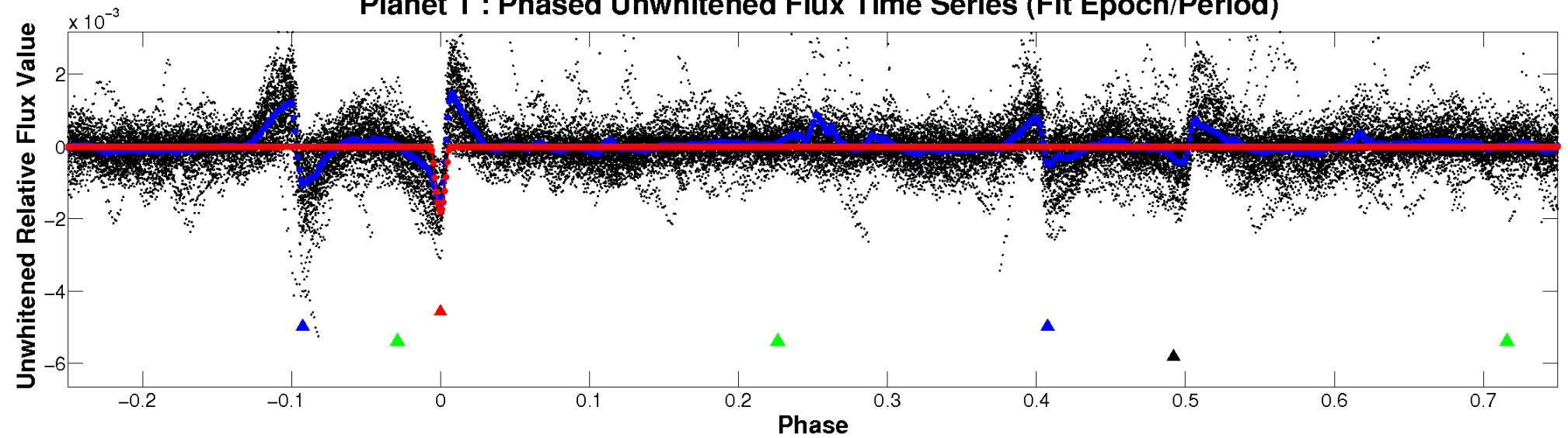
# ALT Odd/Even

TCE 011284505-01

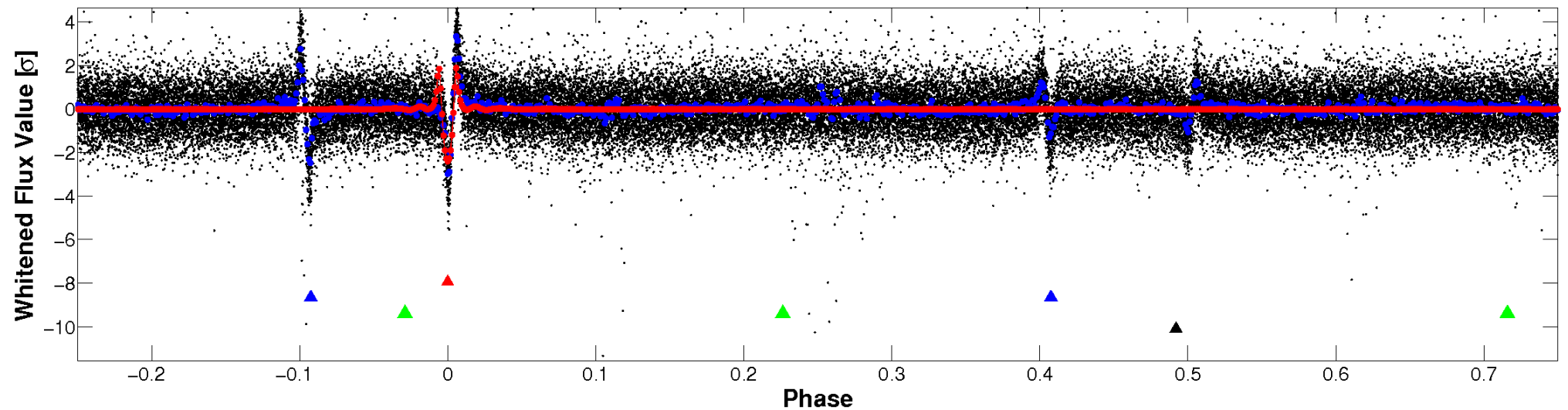


# Non-Whitened Vs. Whitened Light Curve

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

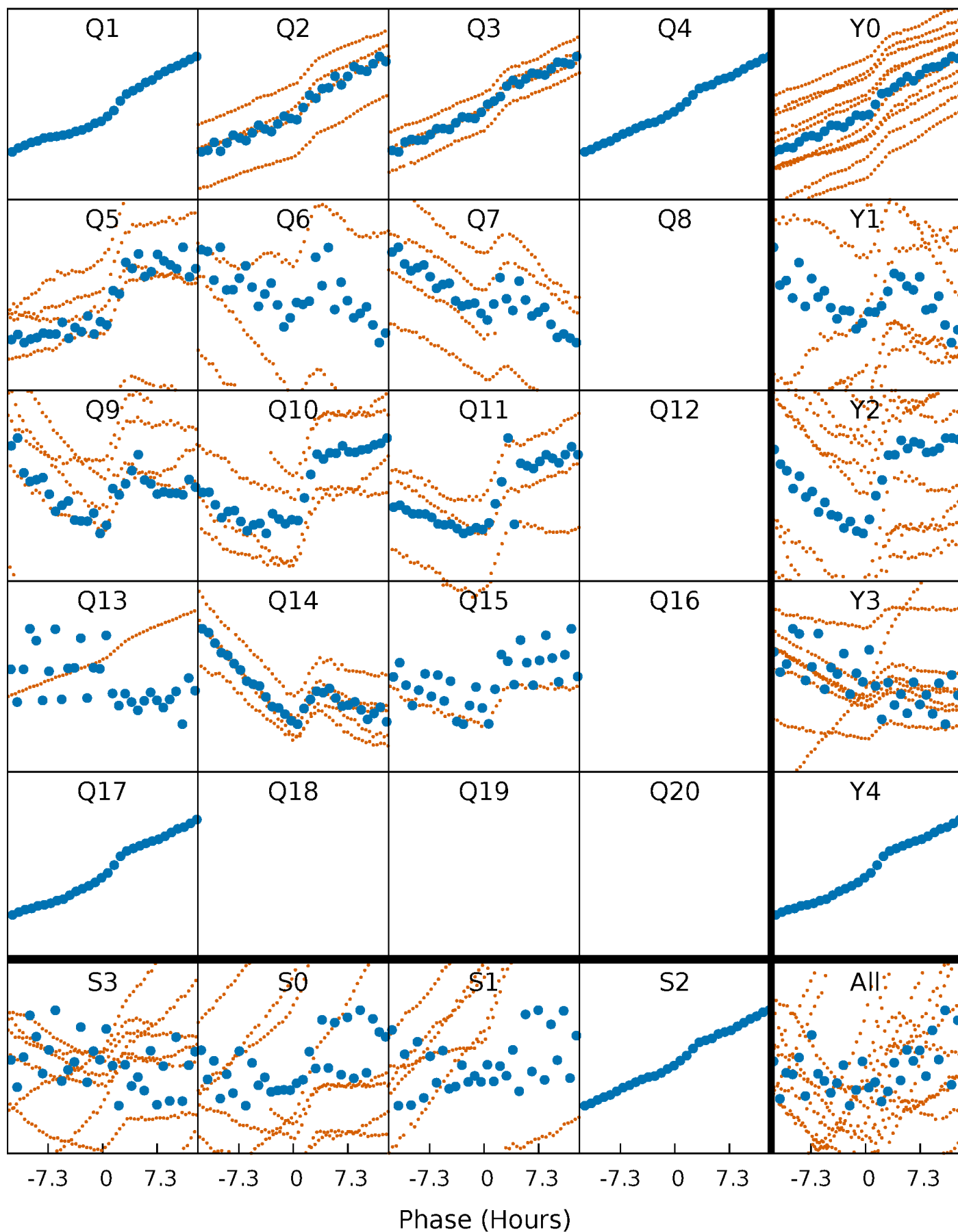


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



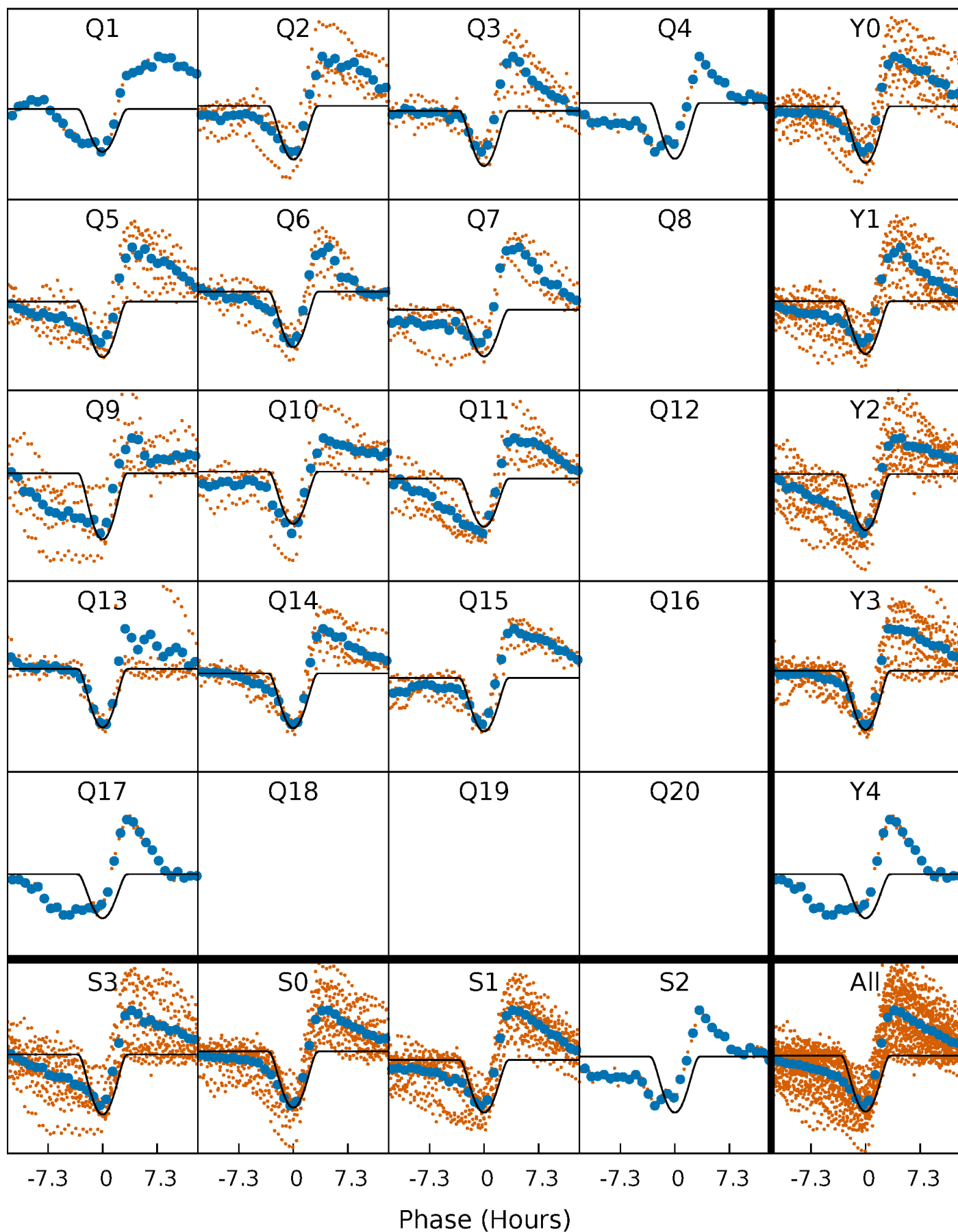
# PDC Quarter-Phased Transit Curves

TCE 011284505-01 P= 21.362818 Days  $T_0=147.503469$  (BKJD)



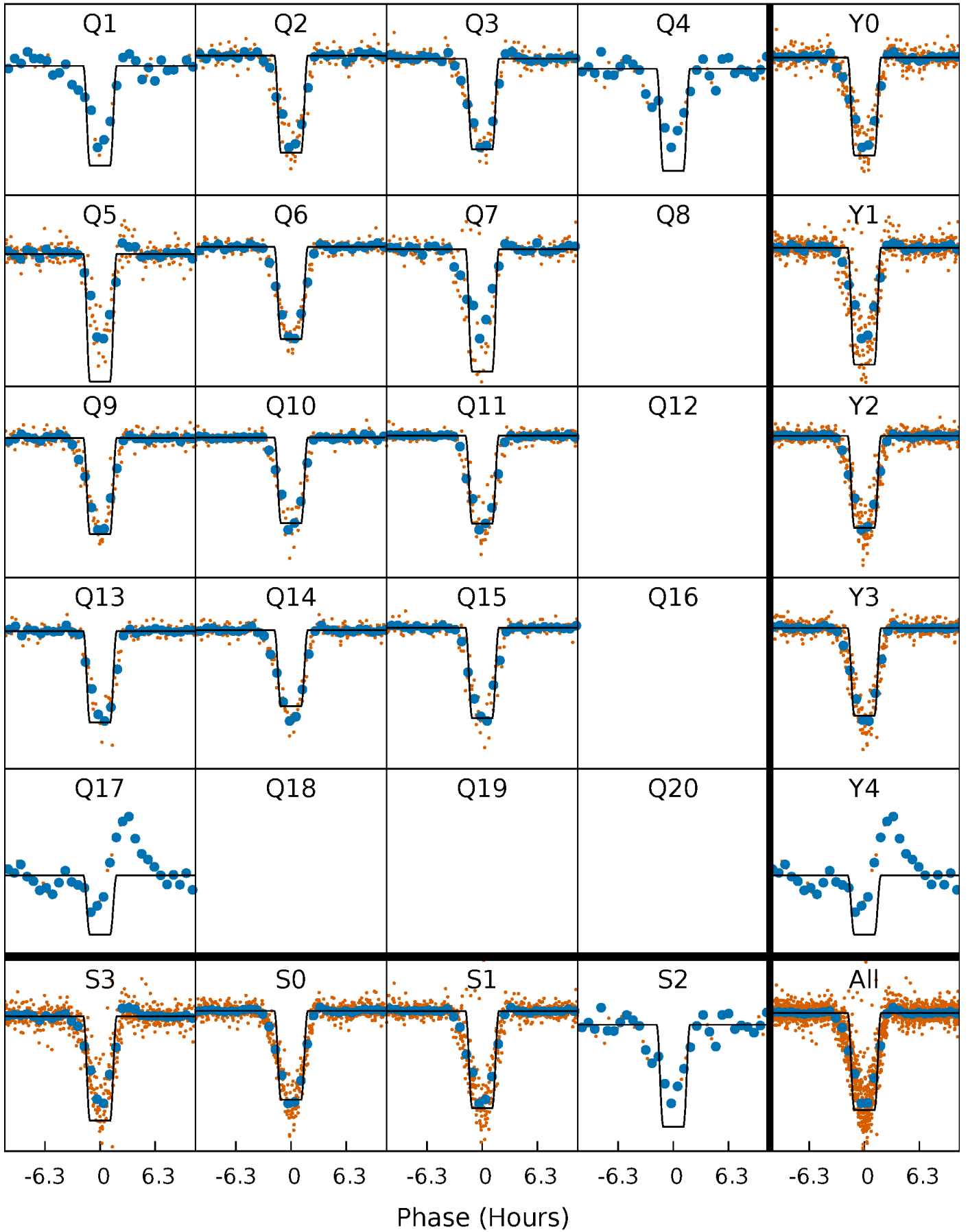
# DV Quarter-Phased Transit Curves

TCE 011284505-01 P= 21.362818 Days  $T_0=147.503469$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011284505-01   P= 21.362875 Days    $T_0=147.515404$  (BKJD)

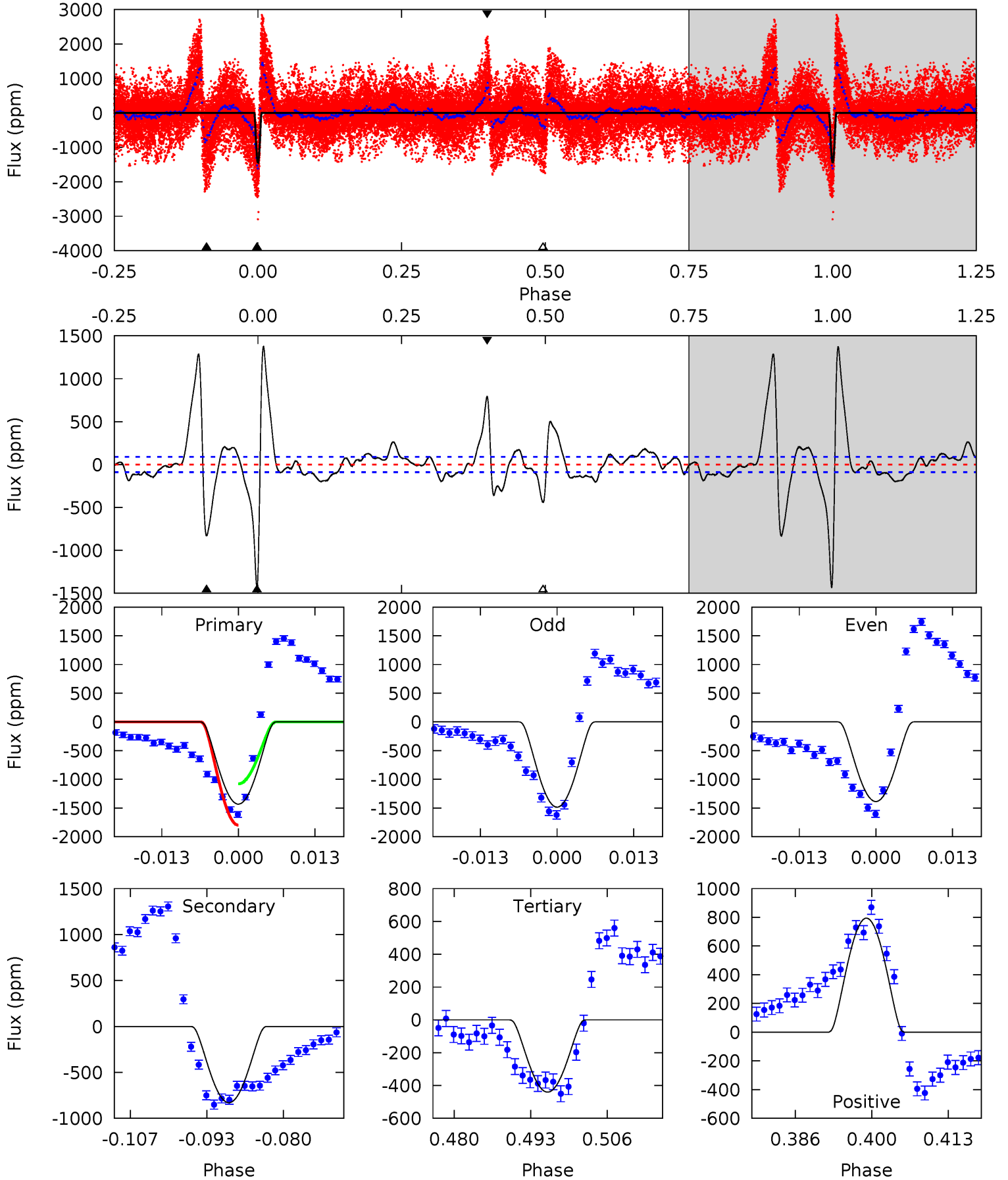




# DV Model-Shift Uniqueness Test

011284505-01, P = 21.362818 Days, E = 126.140651 Days

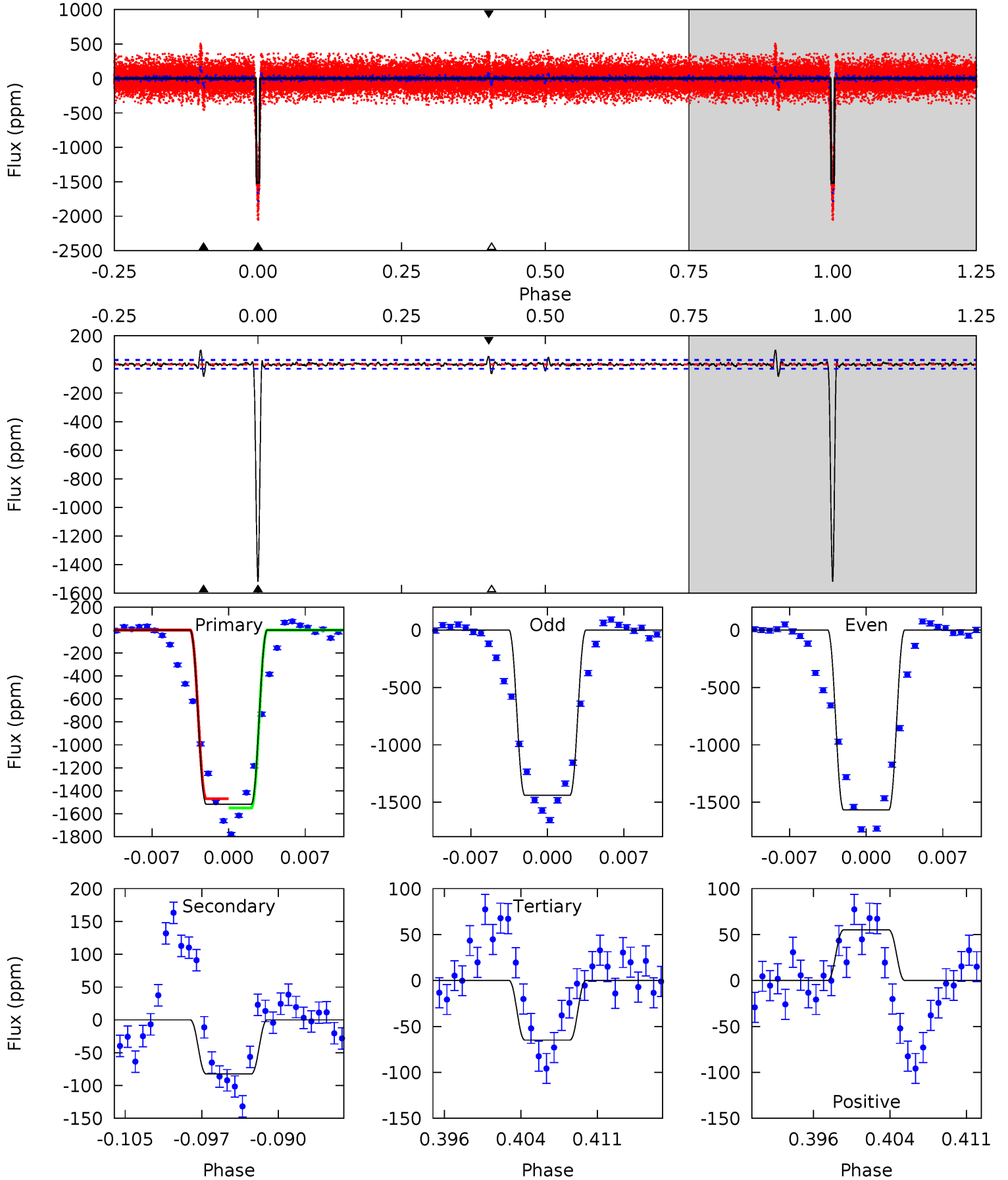
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
79.6	46.1	24.5	44.1	4.97	2.47	12.3	55.1	35.5	21.6	2.01	2.73	0.87	0.49	19.6



# Alt Model-Shift Uniqueness Test

011284505-01, P = 21.362875 Days, E = 126.152529 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
252.8	13.7	10.8	9.19	5.08	2.67	1.33	242.0	243.6	2.93	4.55	10.5	0.94	0.06	6.54



### Stellar Parameters For KIC 011284505

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4837^{+120}_{-132}$	$2.558^{+0.469}_{-0.201}$	$-0.240^{+0.250}_{-0.250}$	$11.878^{+3.178}_{-5.901}$	$1.858^{+0.892}_{-0.811}$	$0.002^{+0.007}_{-0.001}$
	+2%/-3%	+18%/-8%	+104%/-104%	+27%/-50%	+48%/-44%	+438%/-51%
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 011284505-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-830 \pm 18$	$94.21^{+42.91}_{-32.98}$	$2341^{+205}_{-273}$	$3295^{+476}_{-337}$	$1.797^{+2.419}_{-0.902}$
Alt.	$-82 \pm 6$	$54.11^{+36.39}_{-29.97}$	$2364^{+204}_{-273}$	$2603^{+871}_{-4961}$	$0.566^{+2.054}_{-0.367}$

$T_{max}$  = 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

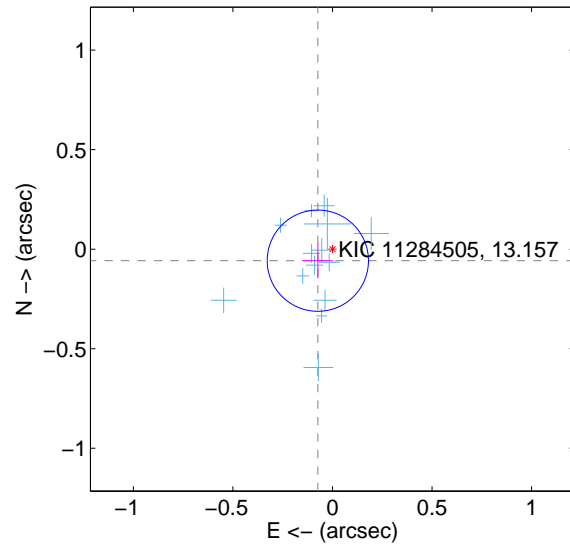
Supplemental centroid analysis for 011284505-01. Kepler magnitude: 13.16. Transit SNR 43.19

There are 14 quarters with good PRF difference image offsets

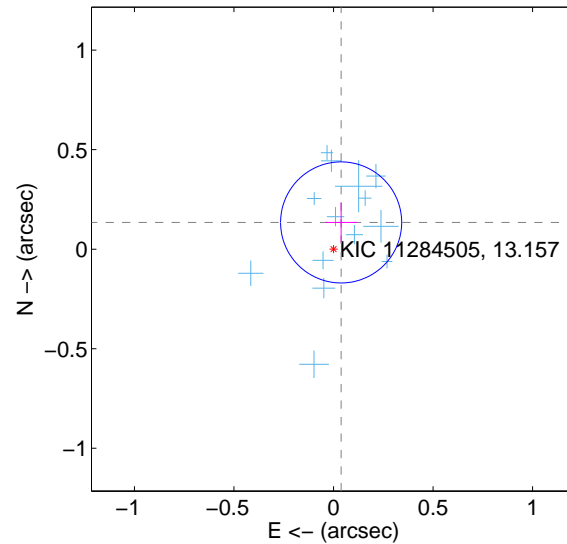
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.094 \pm 0.085$	1.10	$0.074 \pm 0.077$	$-0.058 \pm 0.089$
PRF-fit source offset from KIC position	$0.140 \pm 0.101$	1.38	$-0.038 \pm 0.080$	$0.134 \pm 0.101$
photometric centroid source offset	$0.15 \pm 0.29$	0.52	$-0.15 \pm 0.29$	$0.01 \pm 0.19$

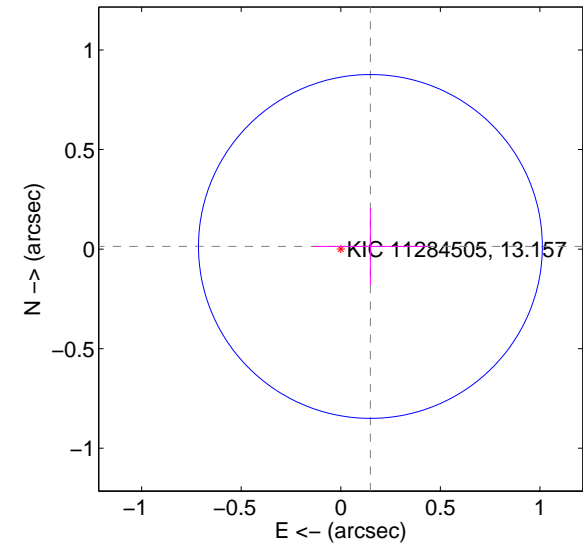
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

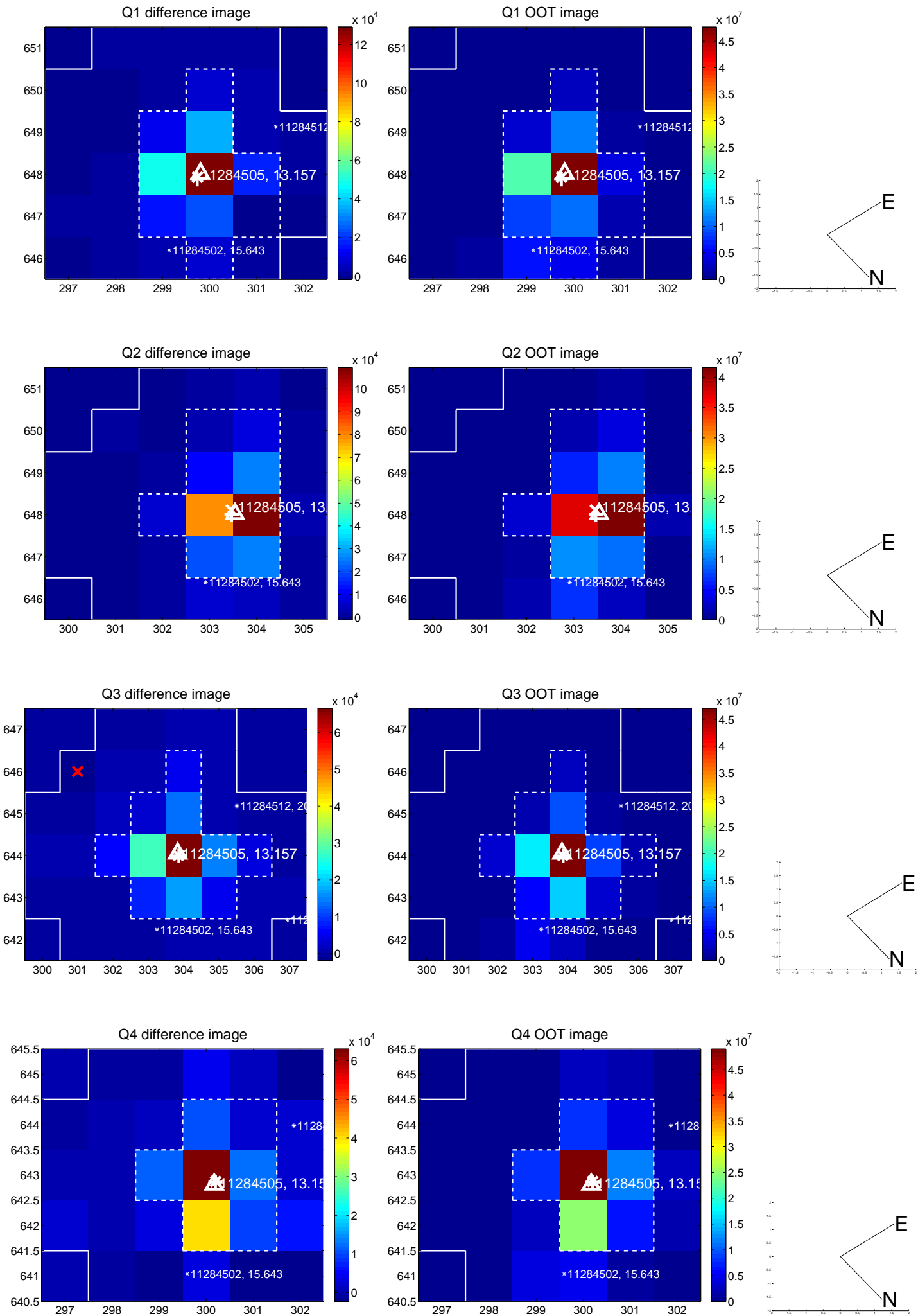


offset from photometric centroids

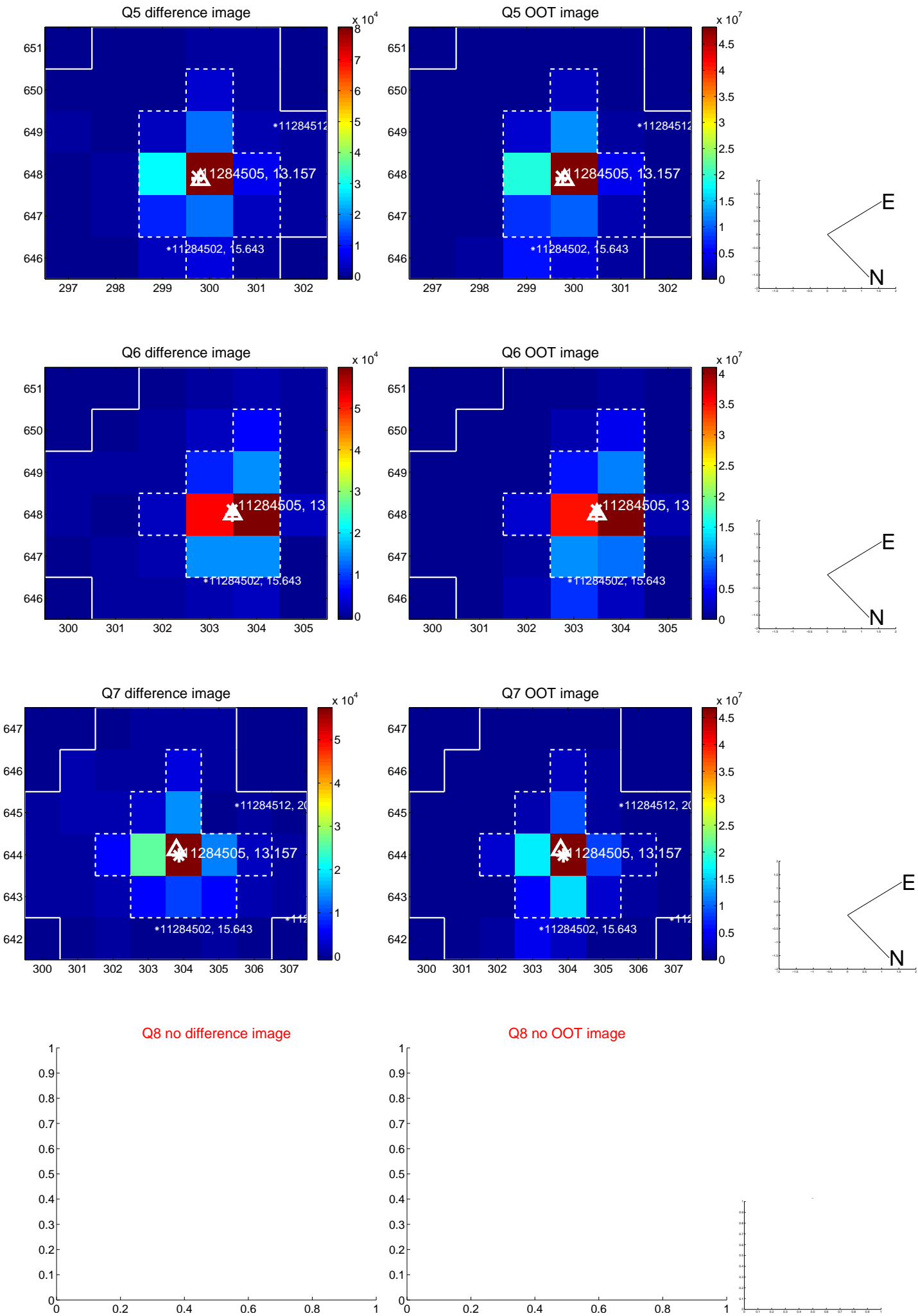


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

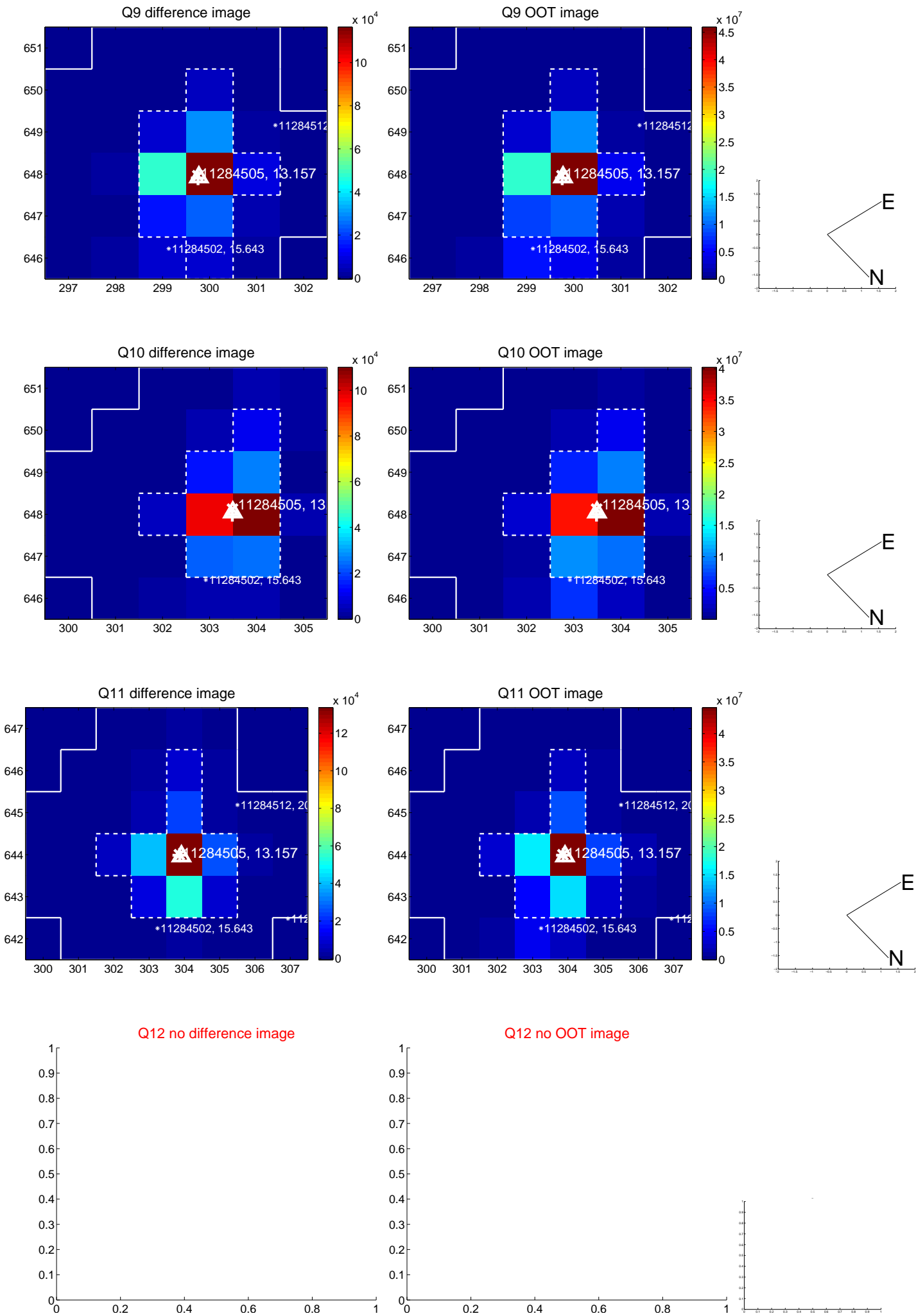


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

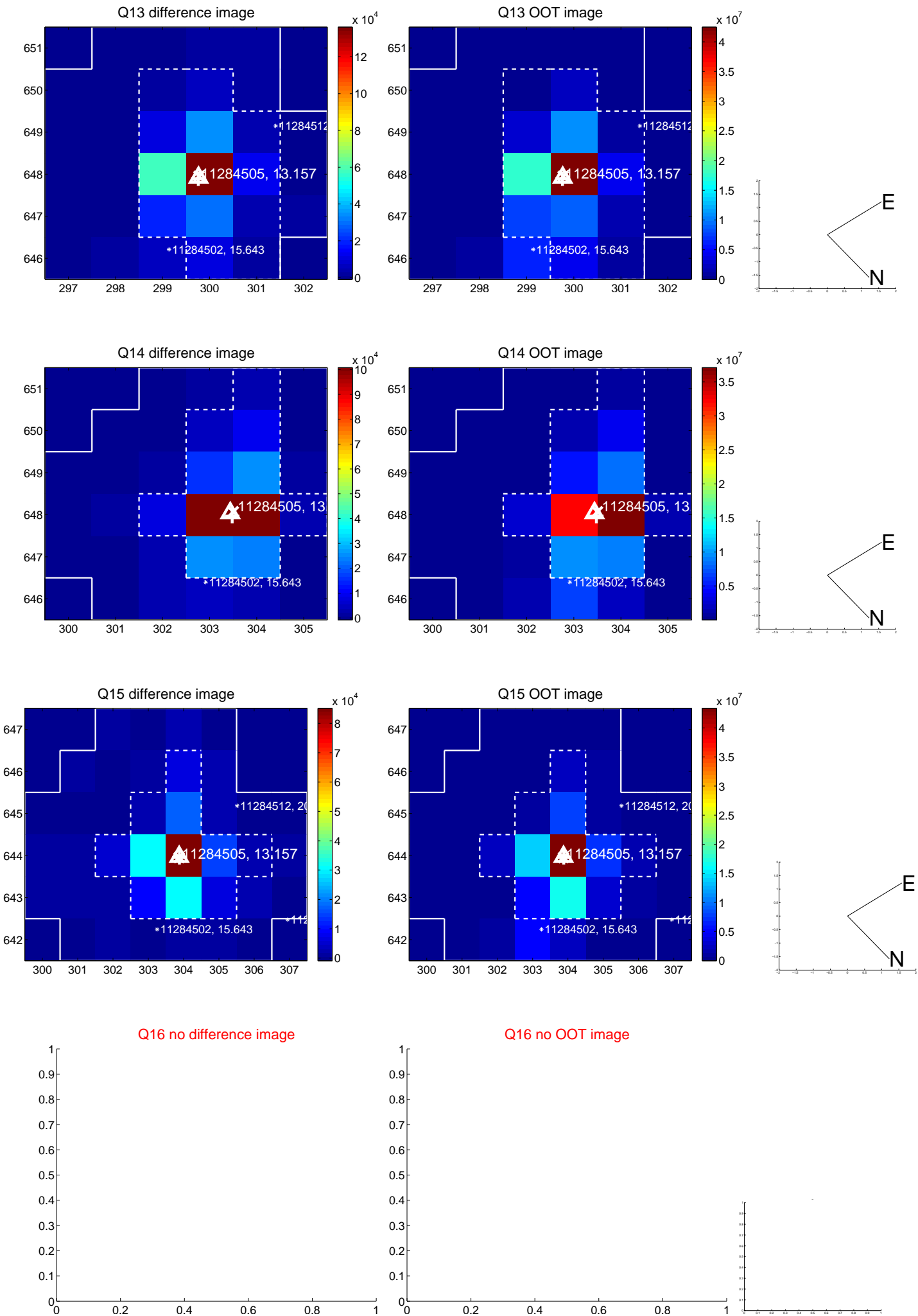




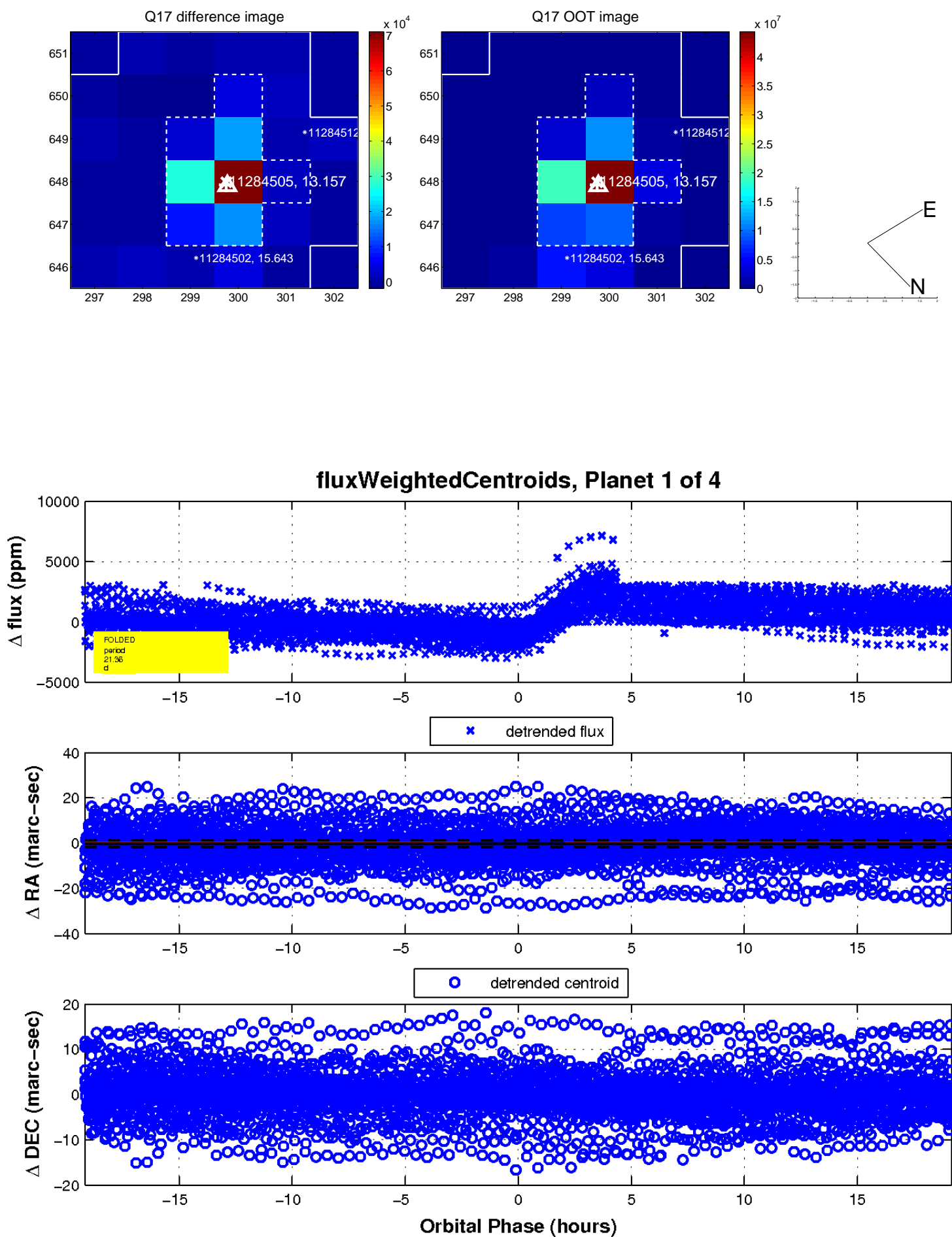
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

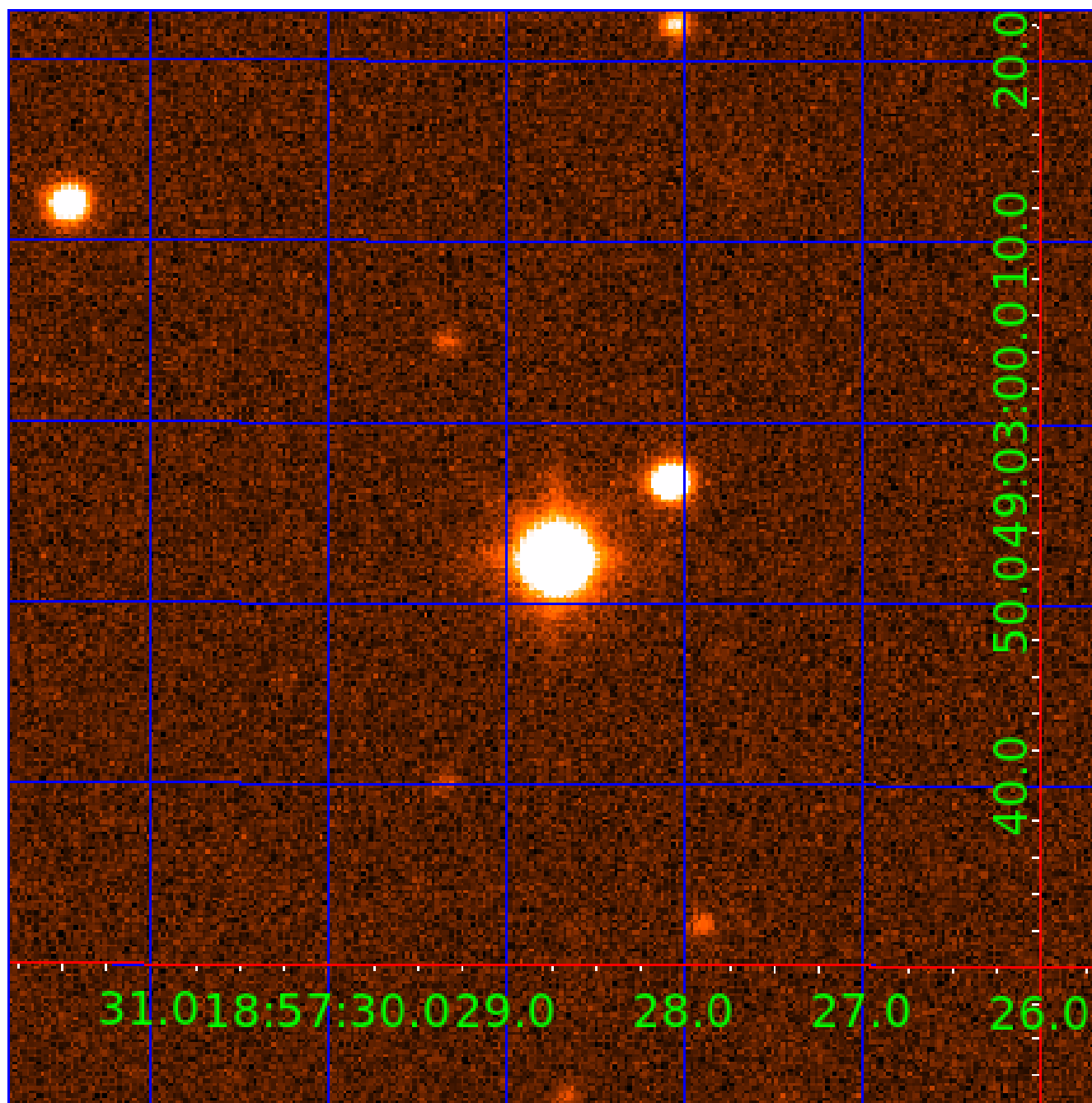


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011284505

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011284505-01	OBS	No	21.362818	147.503470	1814.5	6.388	37.8	43.2	11.88	4837	100.85	2014.42
011284505-02	OBS	No	10.681491	134.841187	1152.0	6.869	31.2	37.2	11.88	4837	81.77	5075.96
011284505-03	OBS	No	528.617651	515.508370	732.7	9.524	14.6	4.5	11.88	4837	33.70	27.94
011284505-04	OBS	No	21.362881	136.650034	147.8	12.000	13.0	-1.0	11.88	4837	13.97	2014.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011284505-01	OBS	FP	0.00	1	0	0	0	LPP_DV
011284505-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
011284505-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011284505-04	OBS	FP	0.00	1	0	0	0	LPP_DV—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.

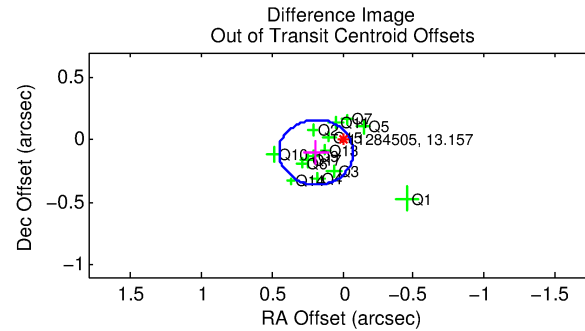
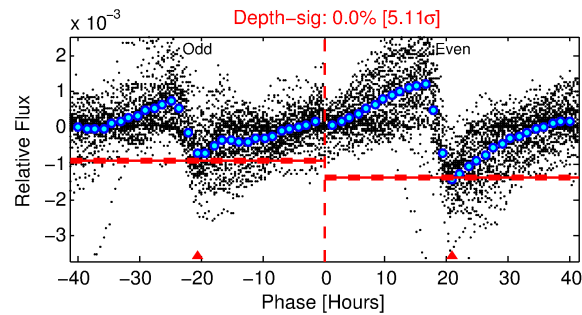
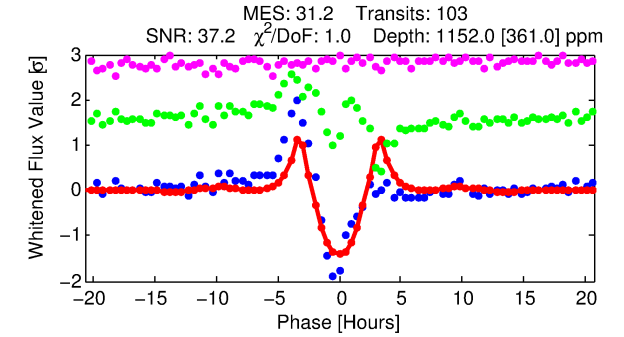
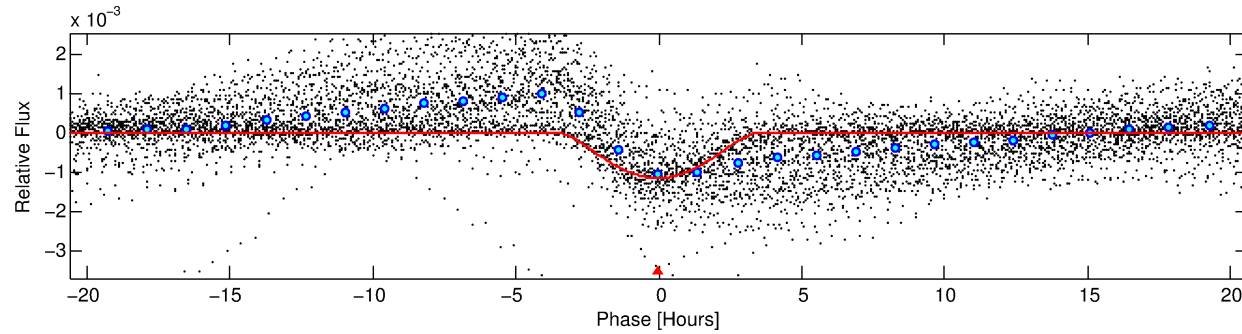
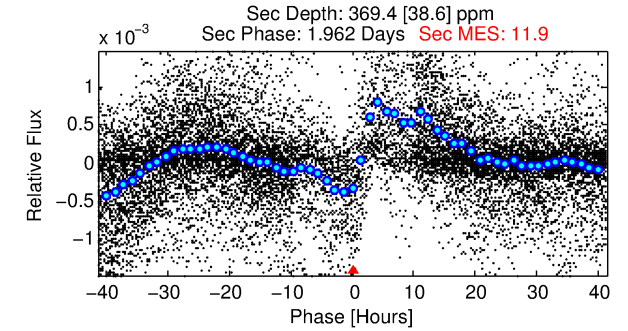
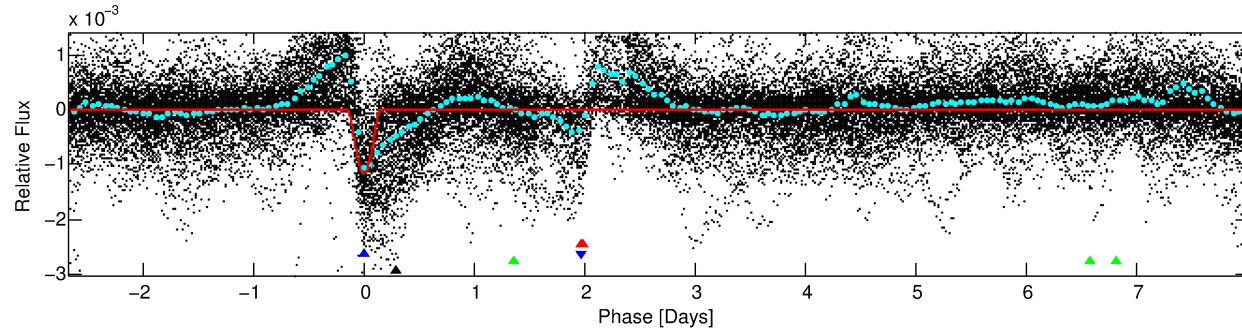
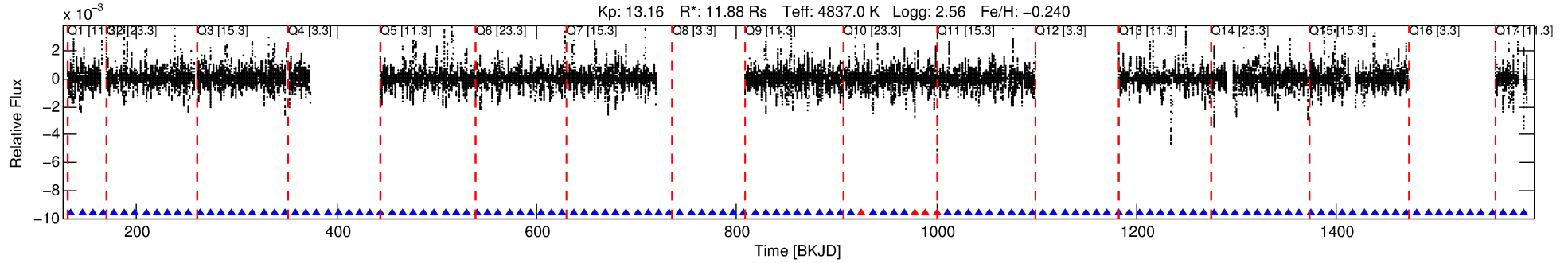
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011284505-02

No Significant Match Found

# DV One-Page Summary

KIC: 11284505 Candidate: 2 of 4 Period: 10.681 d



## DV Fit Results:

Period = 10.68149 [0.00003] d  
Epoch = 134.8412 [0.0023] BKJD  
Rp/R\* = 0.0631 [0.0191]  
a/R\* = 4.41 [0.27]  
b = 1.00 [0.01]  
Seff = 5075.96 [4060.53]  
Teq = 2152 [430] K  
**Rp = 81.77 [47.61] Re**  
a = 0.1168 [0.0571] AU  
Ag = 0.41 [0.42] [-1.41 $\sigma$ ]  
Teffp = 2670 [418] K [0.86 $\sigma$ ]

## DV Diagnostic Results:

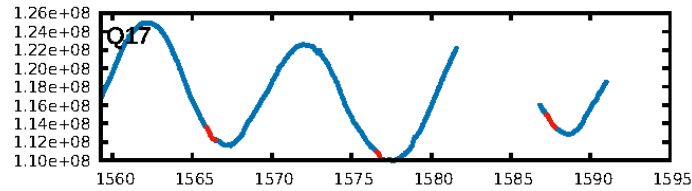
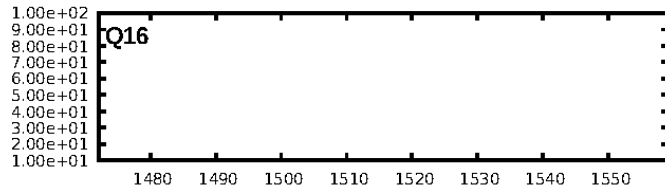
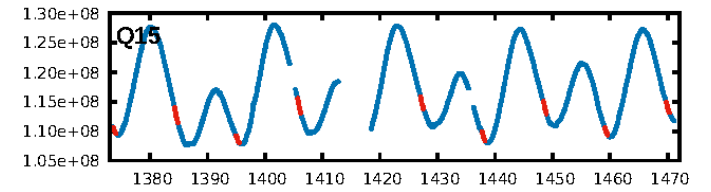
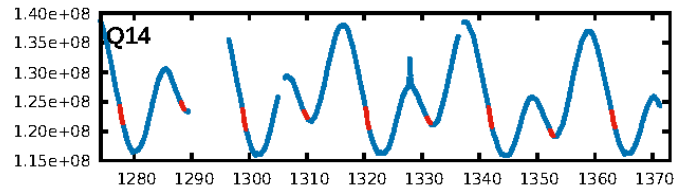
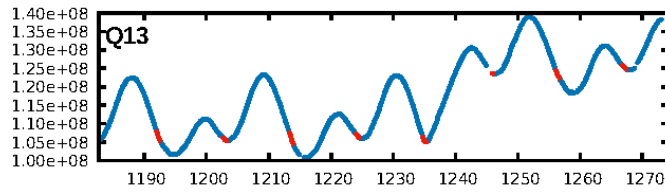
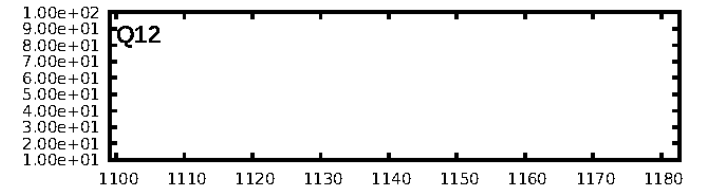
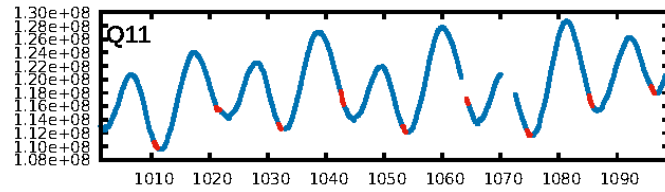
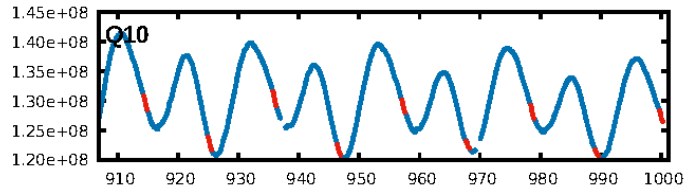
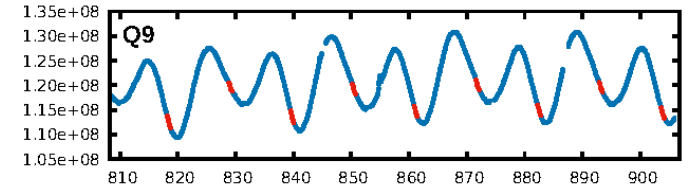
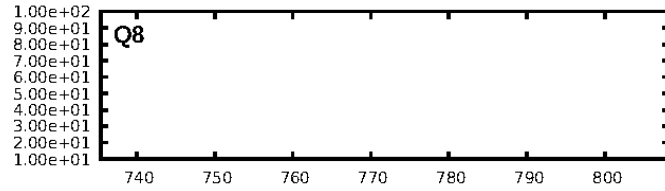
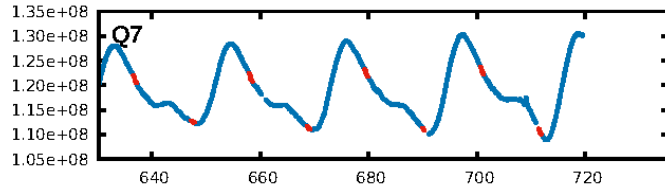
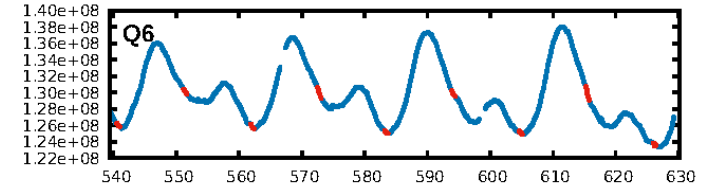
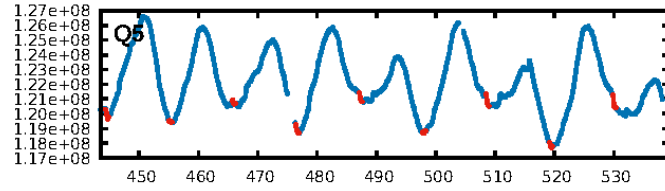
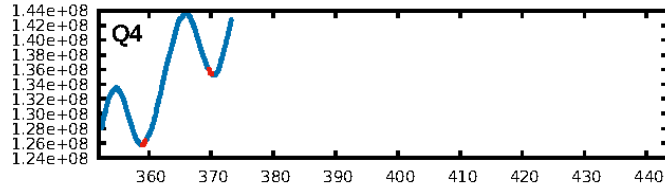
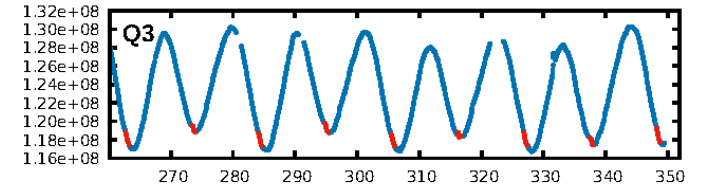
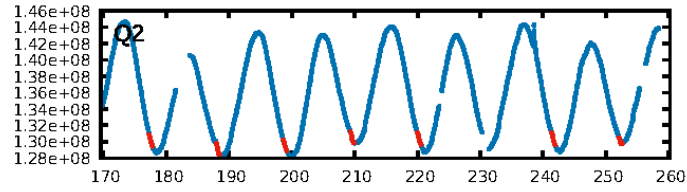
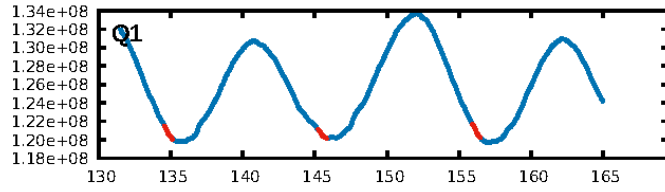
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [27.33 $\sigma$ ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.74e-165  
RollingBand-fgt: 0.96 [91/95]  
GhostDiagnostic-chr: 1.014  
Centroid-sig: N/A  
**Centroid-so: 1.042 arcsec [3.54 $\sigma$ ]**  
OotOffset-rm: 0.214 arcsec [2.46 $\sigma$ ]  
KicOffset-rm: 0.083 arcsec [0.93 $\sigma$ ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:38:16 Z

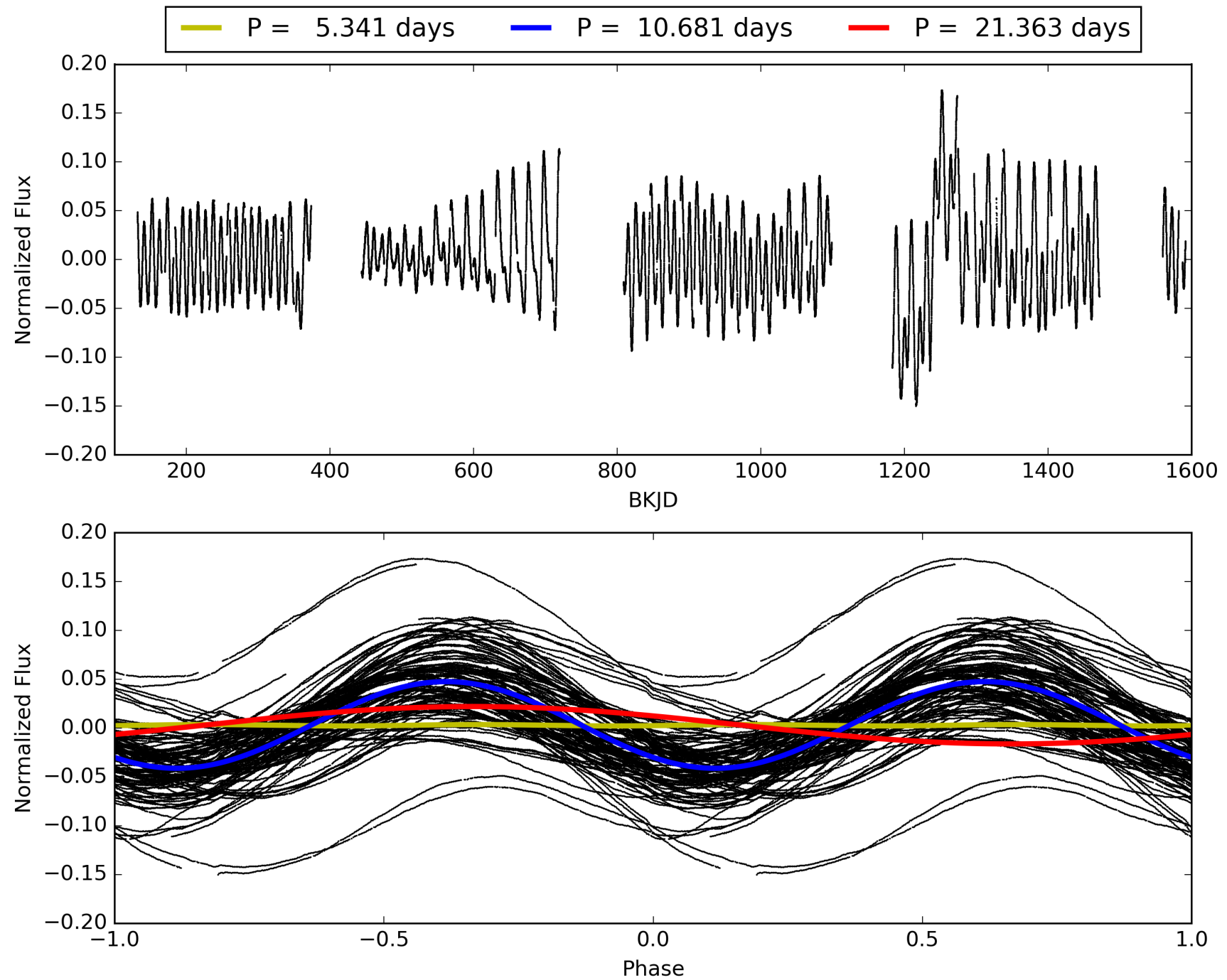
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011284505-02, PDC Light Curves

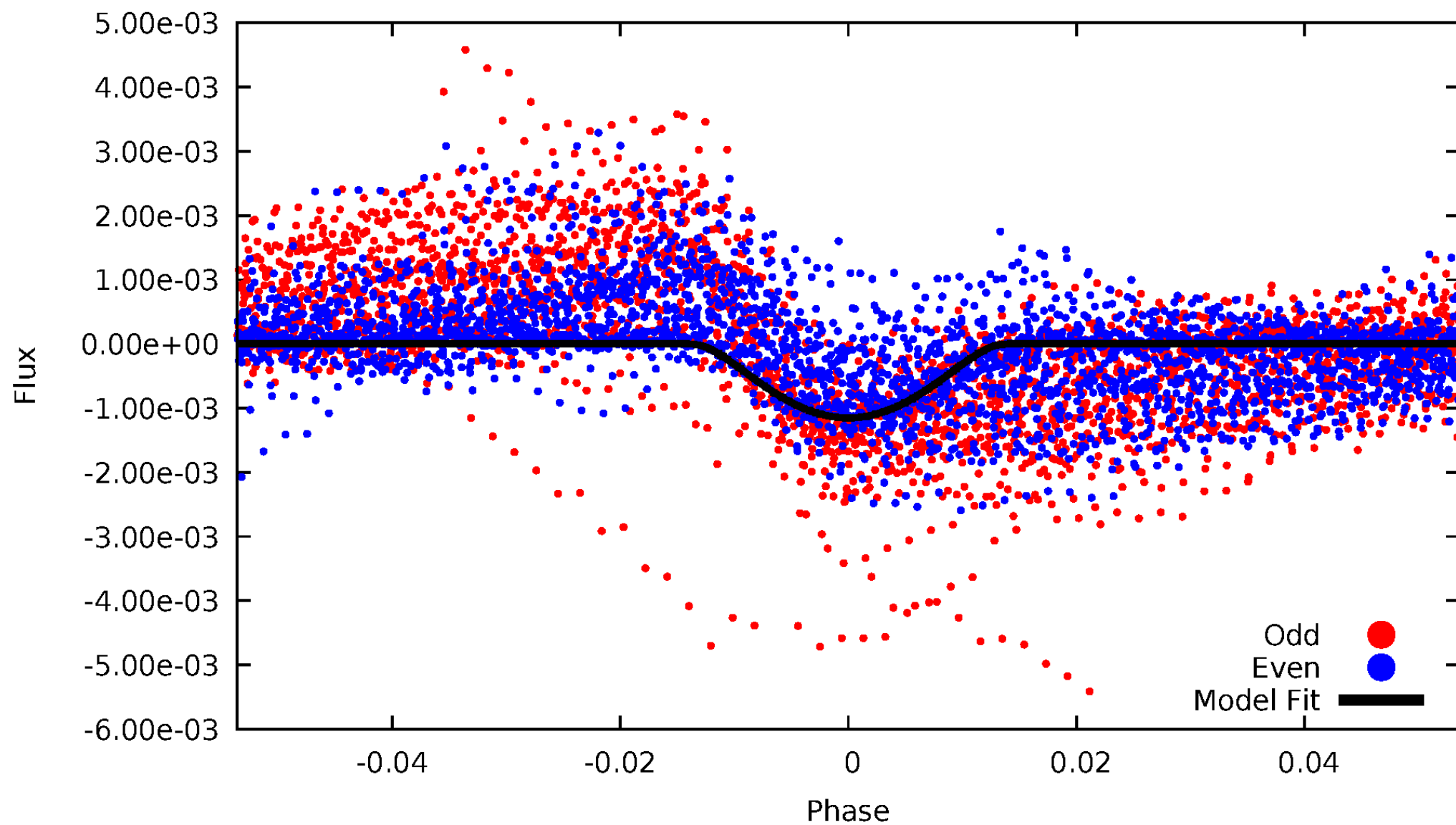


# TCE 011284505-02



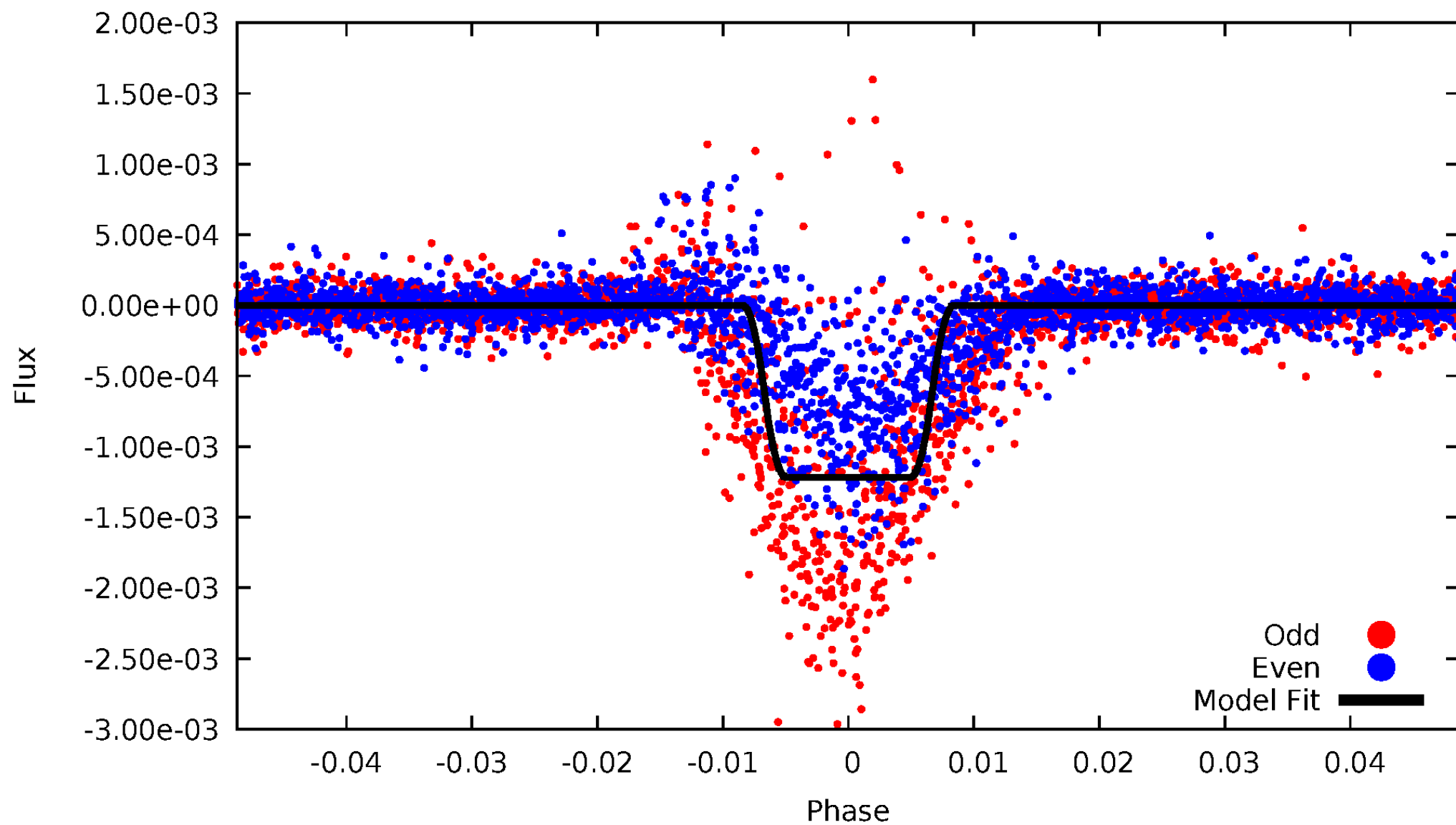
# DV Odd/Even

TCE 011284505-02



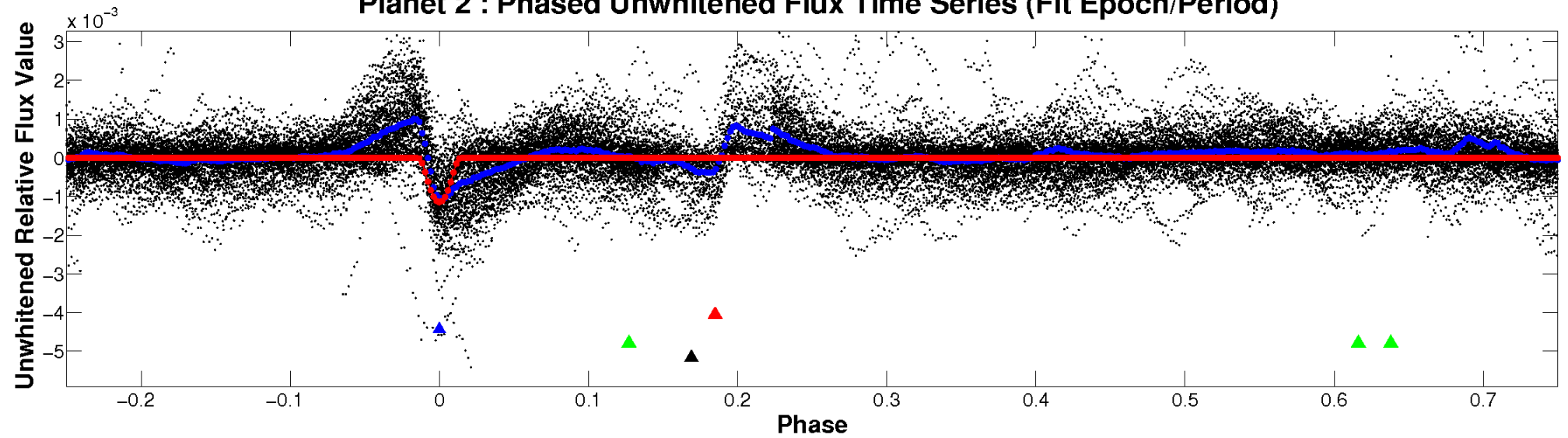
# ALT Odd/Even

TCE 011284505-02

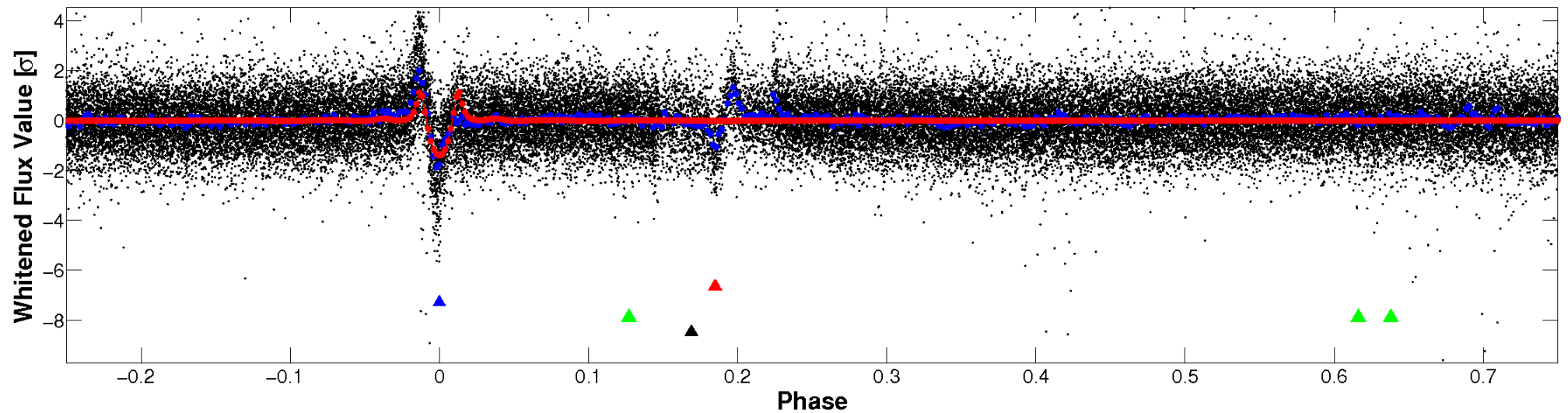


# Non-Whitened Vs. Whitened Light Curve

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

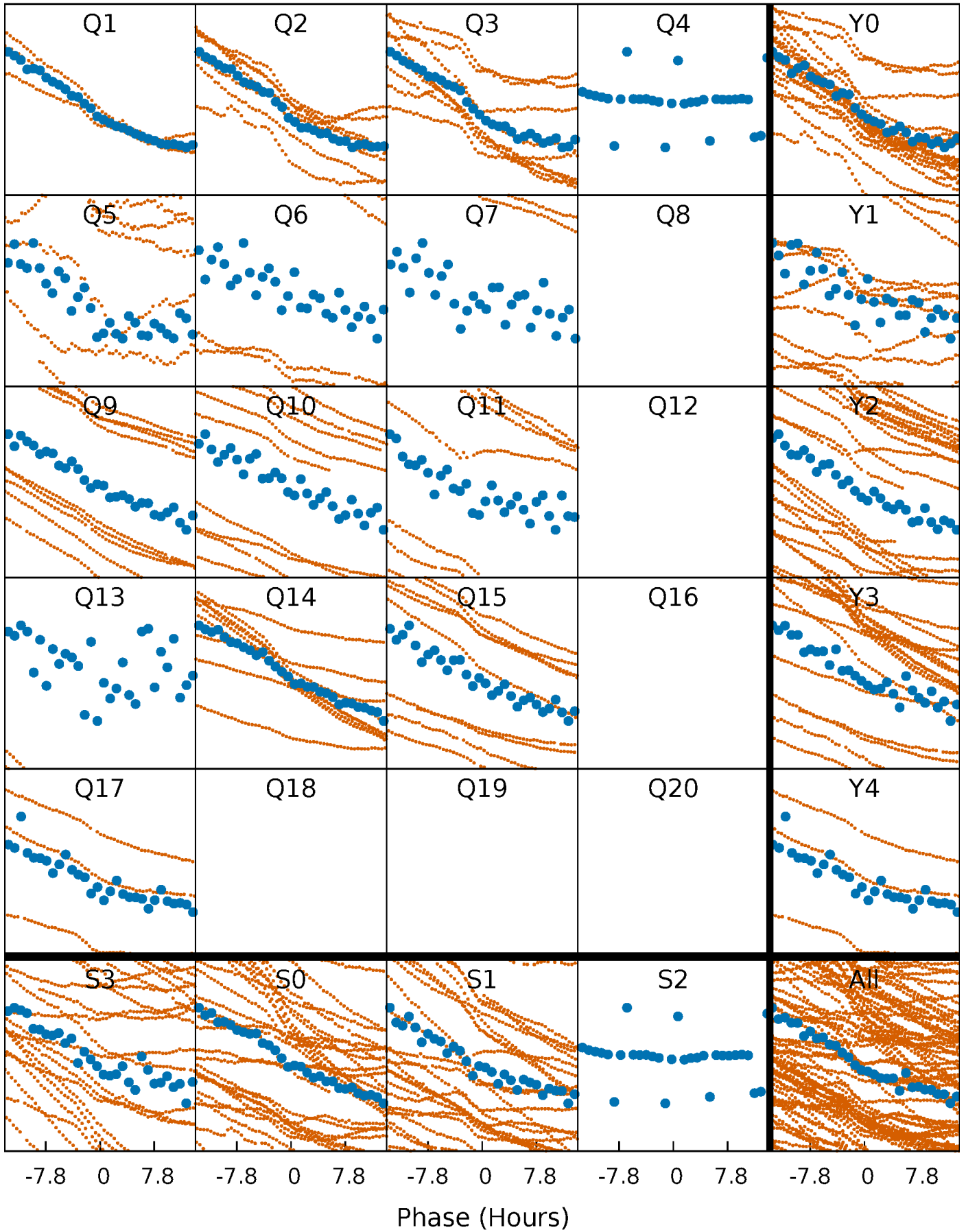


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

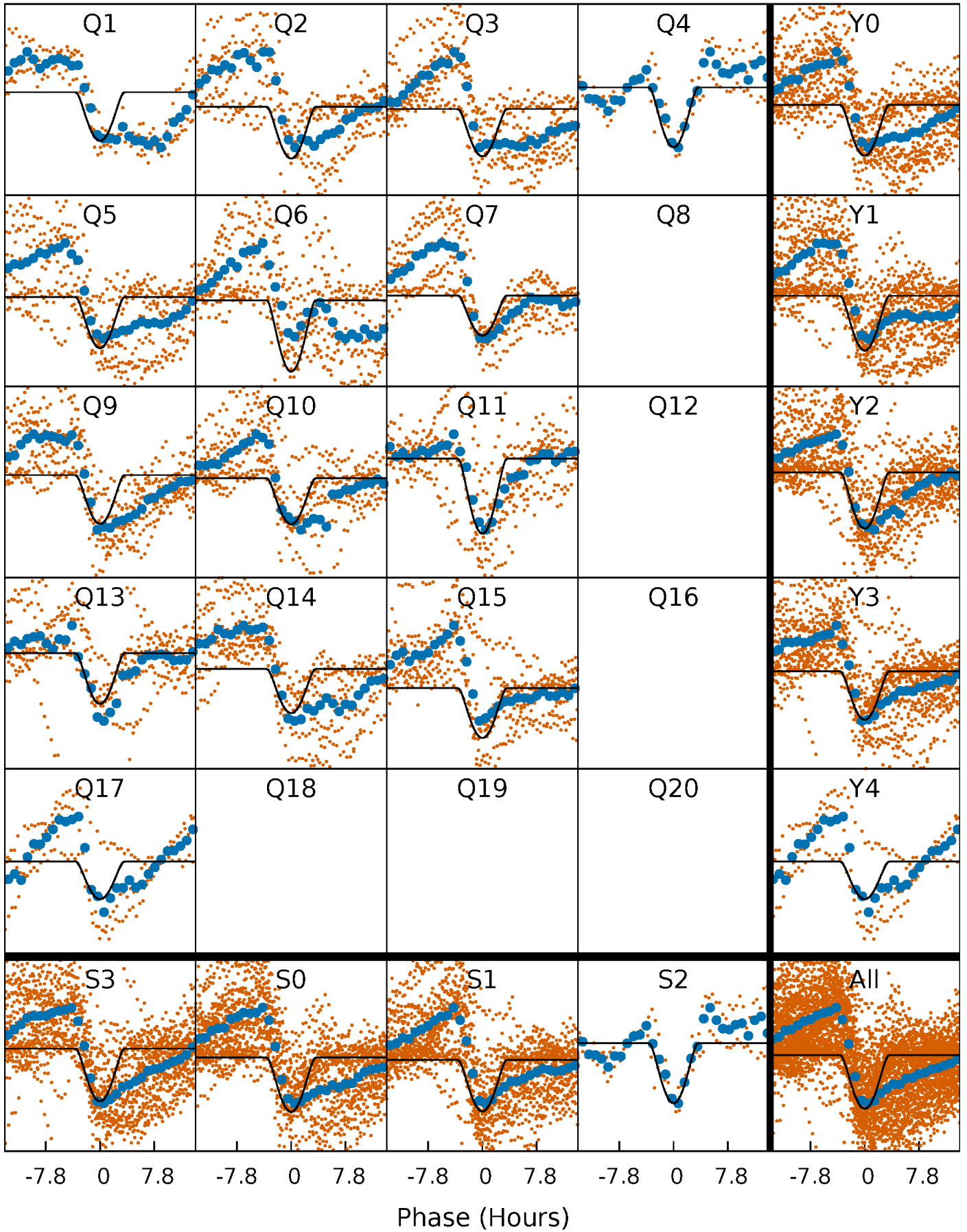
TCE 011284505-02 P= 10.681491 Days  $T_0=134.841187$  (BKJD)





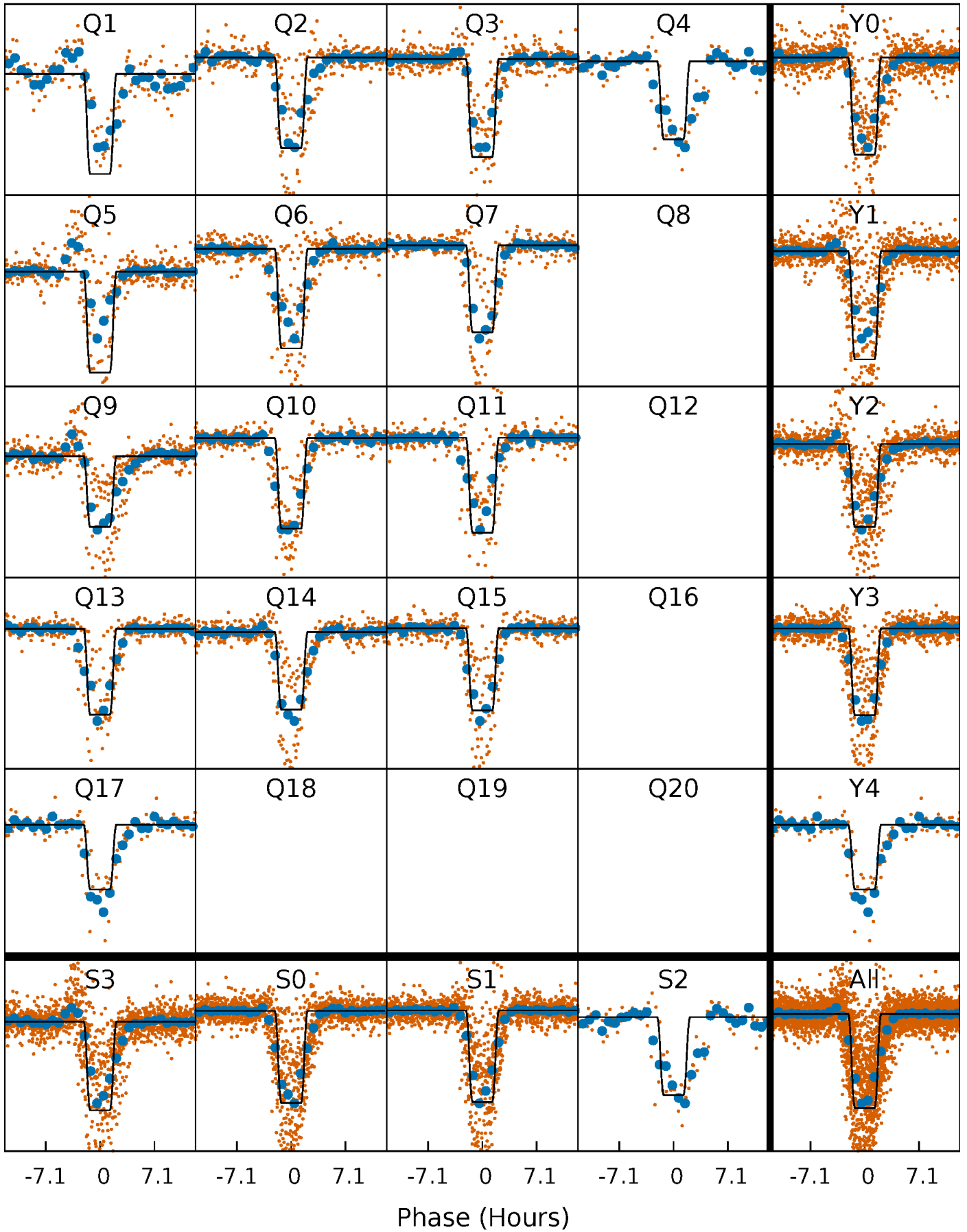
# DV Quarter-Phased Transit Curves

TCE 011284505-02 P= 10.681491 Days  $T_0=134.841187$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

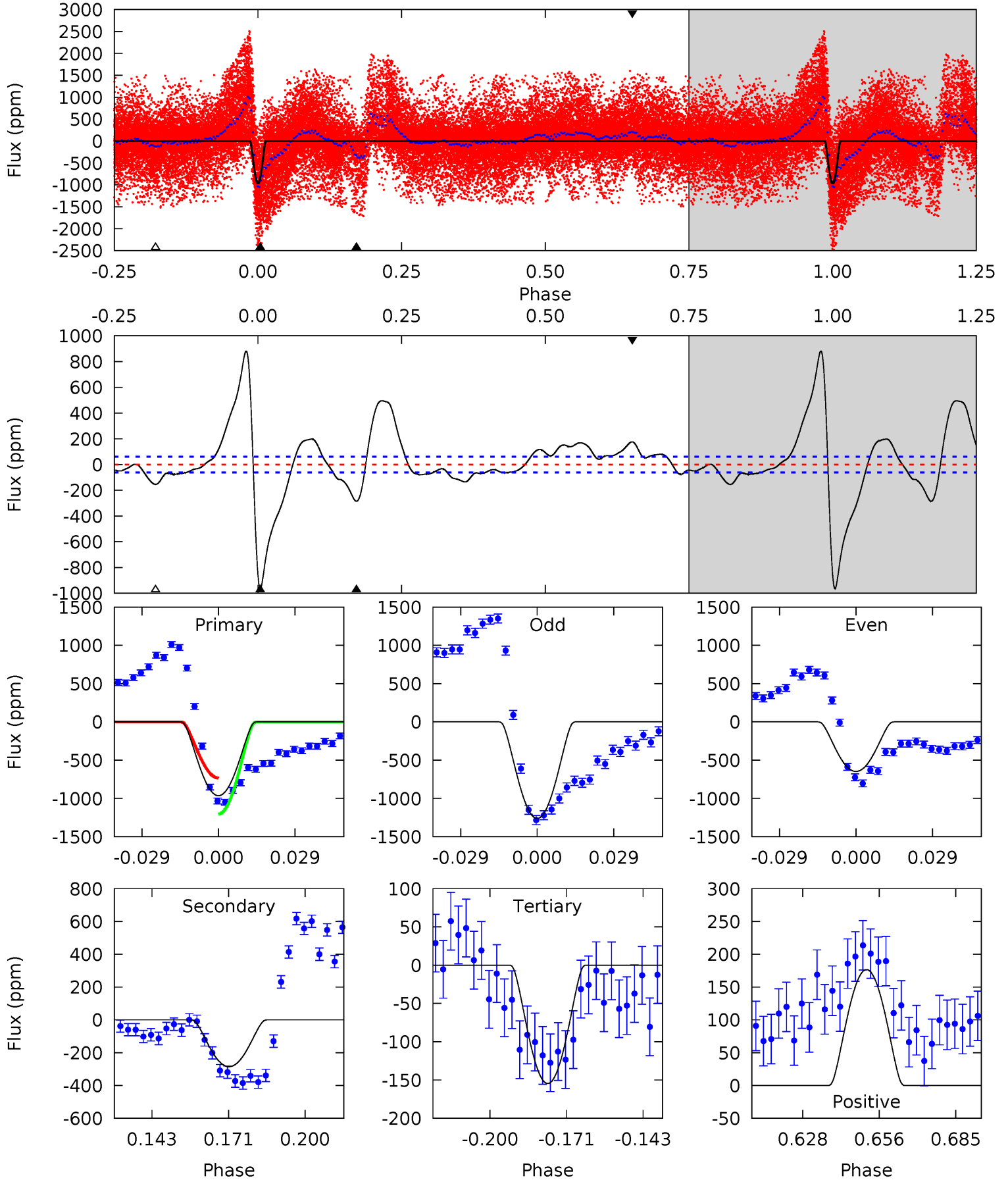
TCE 011284505-02 P= 10.681534 Days  $T_0=134.827130$  (BKJD)



# DV Model-Shift Uniqueness Test

011284505-02, P = 10.681491 Days, E = 124.159696 Days

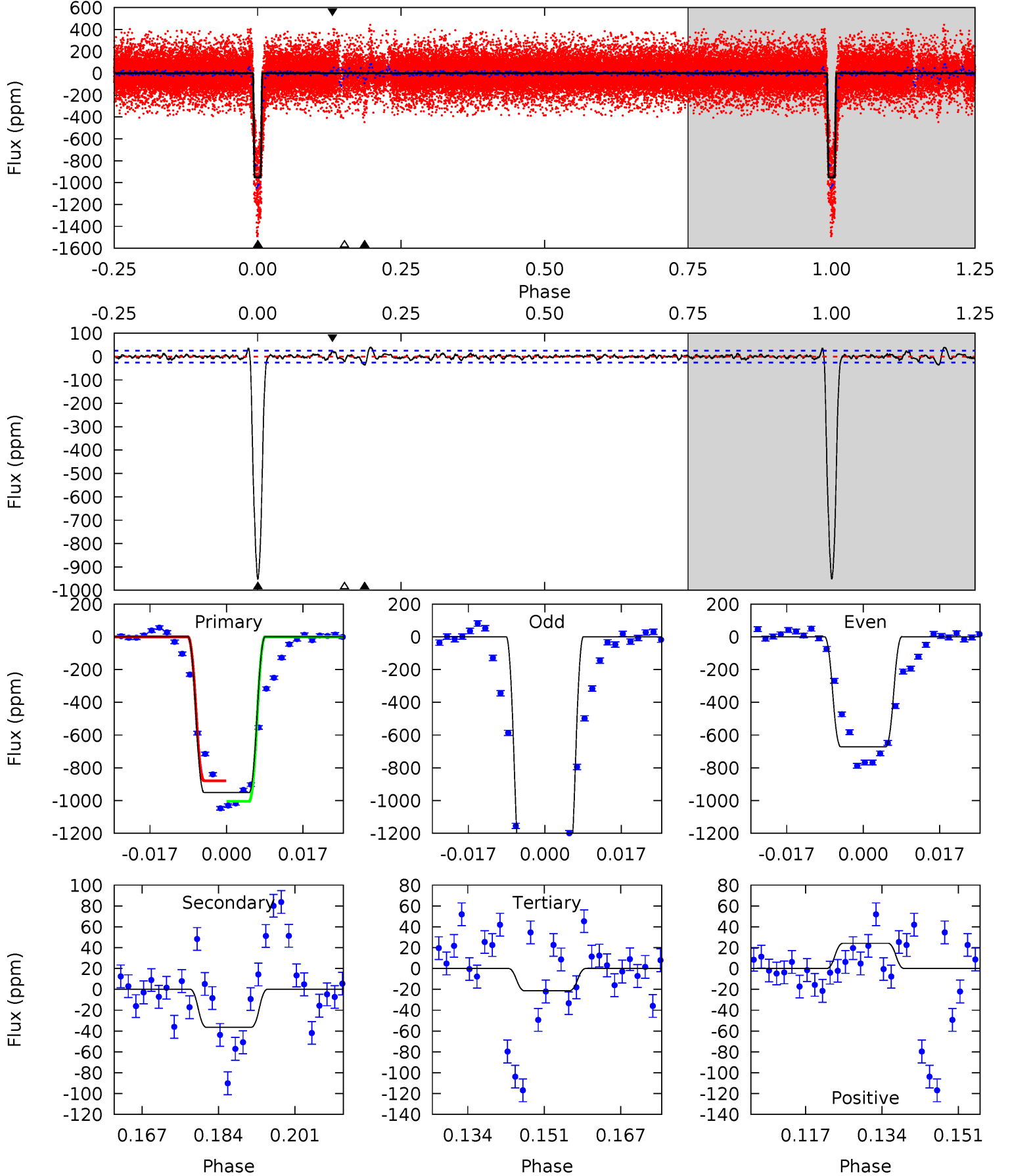
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
76.1	22.5	12.2	13.9	4.82	2.19	12.4	63.9	62.2	10.3	8.60	24.3	0.96	0.48	18.5



# Alt Model-Shift Uniqueness Test

011284505-02, P = 10.681534 Days, E = 124.145596 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
183.0	7.00	4.11	4.66	4.93	2.39	1.12	178.9	178.3	2.89	2.34	96.6	1.07	0.04	0



### Stellar Parameters For KIC 011284505

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4837^{+120}_{-132}$	$2.558^{+0.469}_{-0.201}$	$-0.240^{+0.250}_{-0.250}$	$11.878^{+3.178}_{-5.901}$	$1.858^{+0.892}_{-0.811}$	$0.002^{+0.007}_{-0.001}$
	+2%/-3%	+18%/-8%	+104%/-104%	+27%/-50%	+48%/-44%	+438%/-51%
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 011284505-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-286 \pm 13$	$79.28^{+36.01}_{-29.42}$	$2962^{+257}_{-363}$	$2432^{+758}_{-5154}$	$0.359^{+0.523}_{-0.176}$
Alt.	$-36 \pm 5$	$42.18^{+30.06}_{-23.21}$	$2942^{+293}_{-355}$	$-2667^{+5754}_{-336}$	$0.159^{+0.628}_{-0.104}$

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

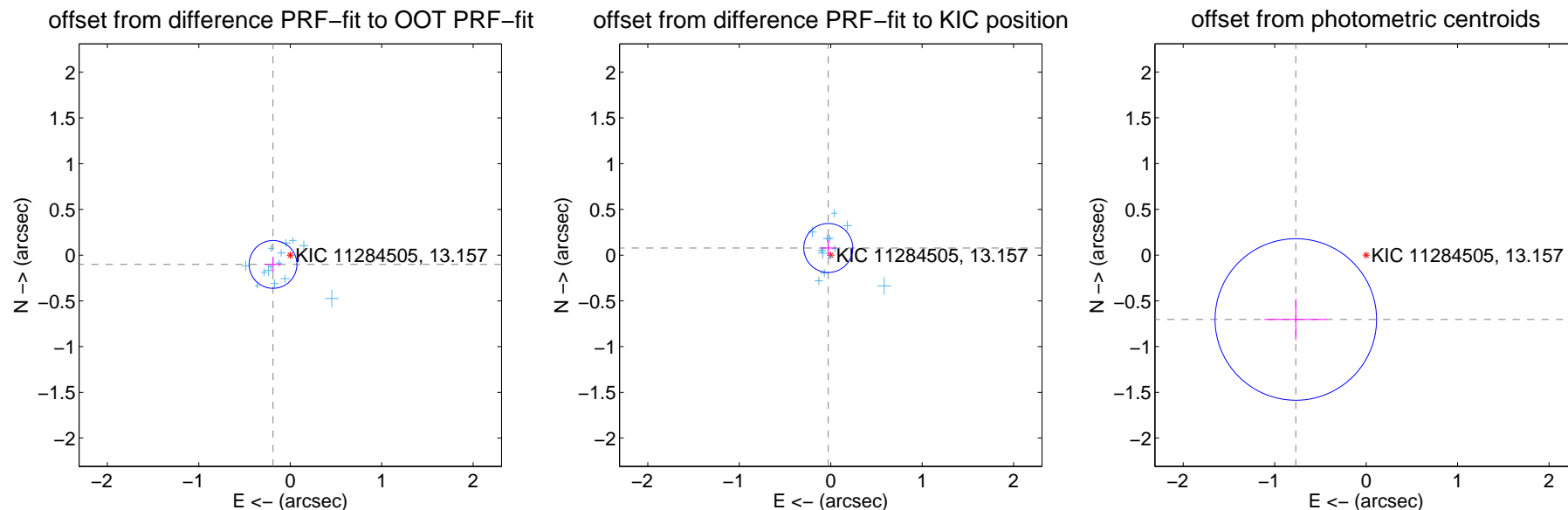
## DV Centroid Data

Supplemental centroid analysis for 011284505-02. Kepler magnitude: 13.16. Transit SNR 37.17

There are 14 quarters with good PRF difference image offsets

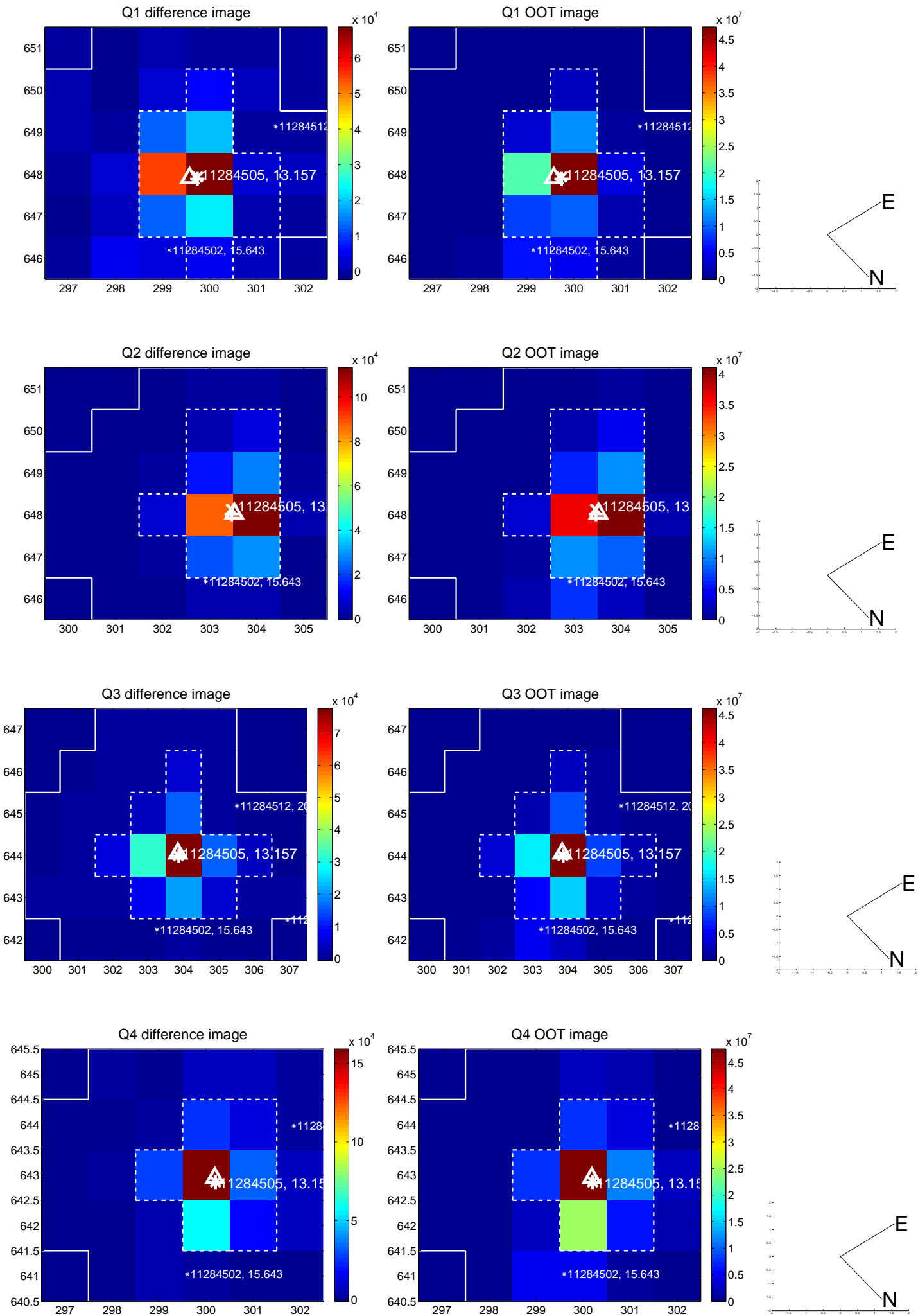
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.214 \pm 0.087$	2.46	$0.189 \pm 0.088$	$-0.101 \pm 0.084$
PRF-fit source offset from KIC position	$0.083 \pm 0.089$	0.93	$0.027 \pm 0.083$	$0.079 \pm 0.088$
photometric centroid source offset	$1.04 \pm 0.29$	3.54	$0.77 \pm 0.34$	$-0.70 \pm 0.22$

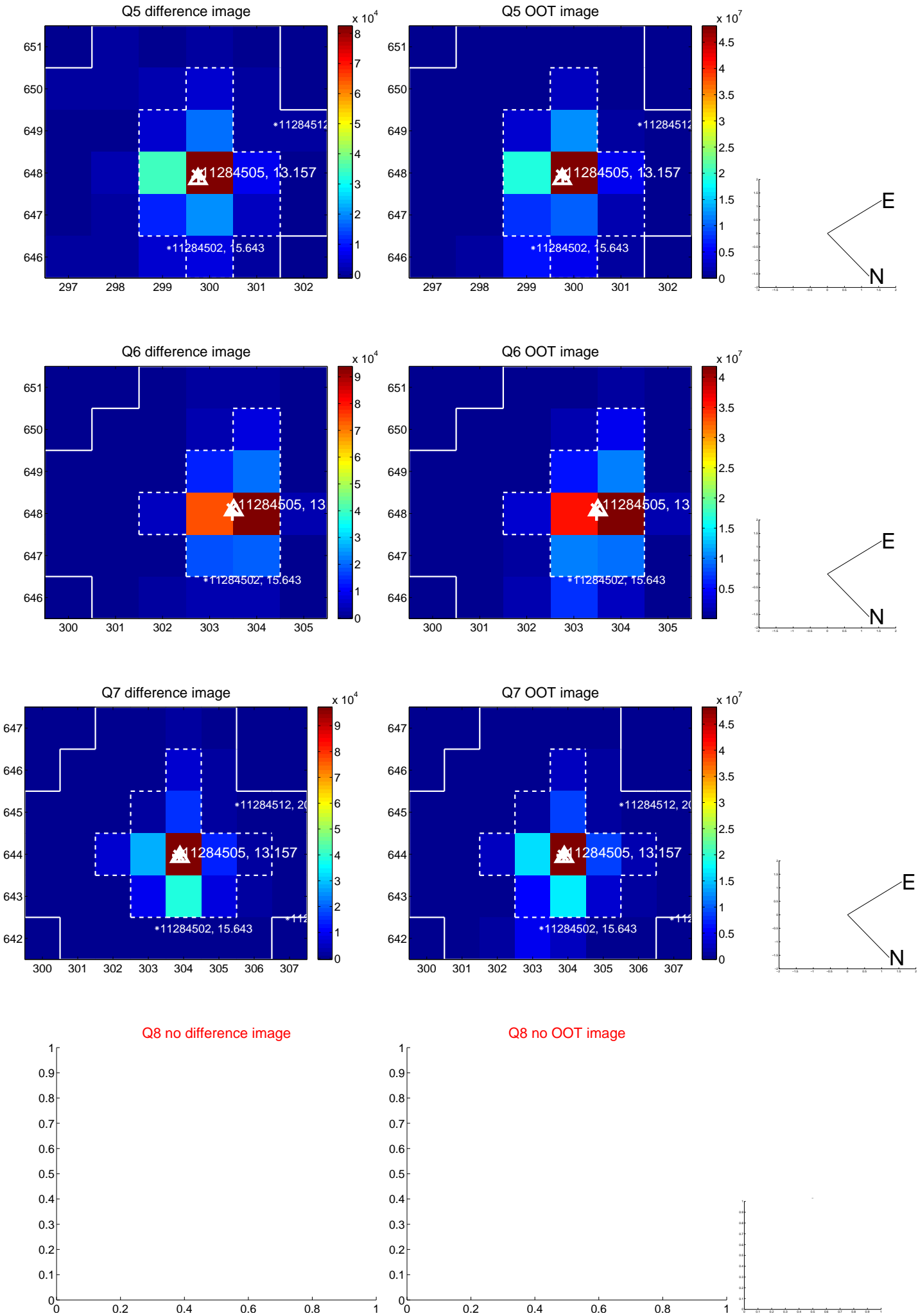


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

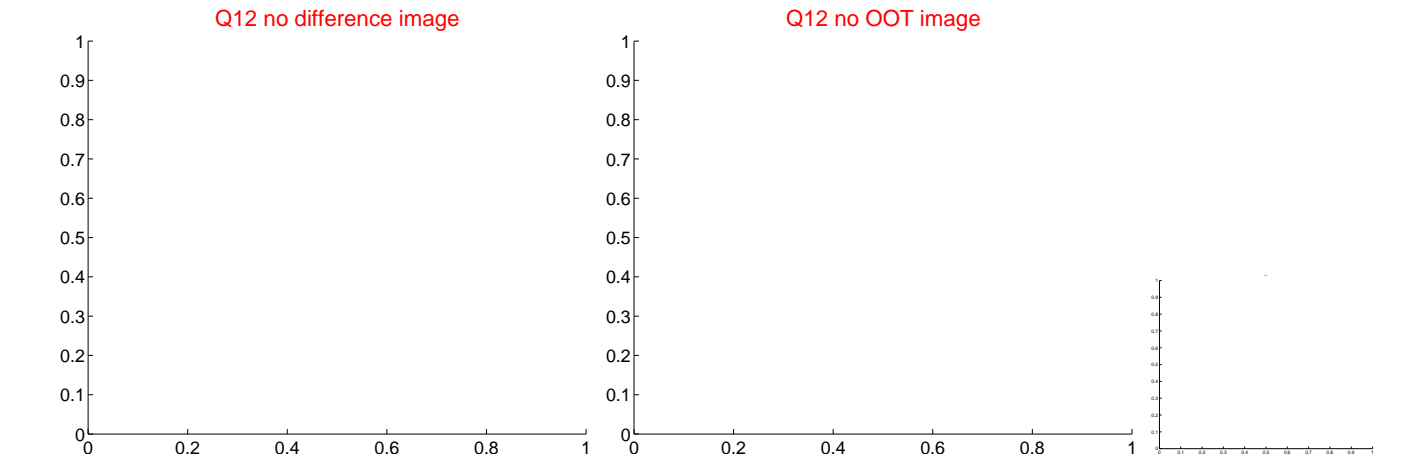
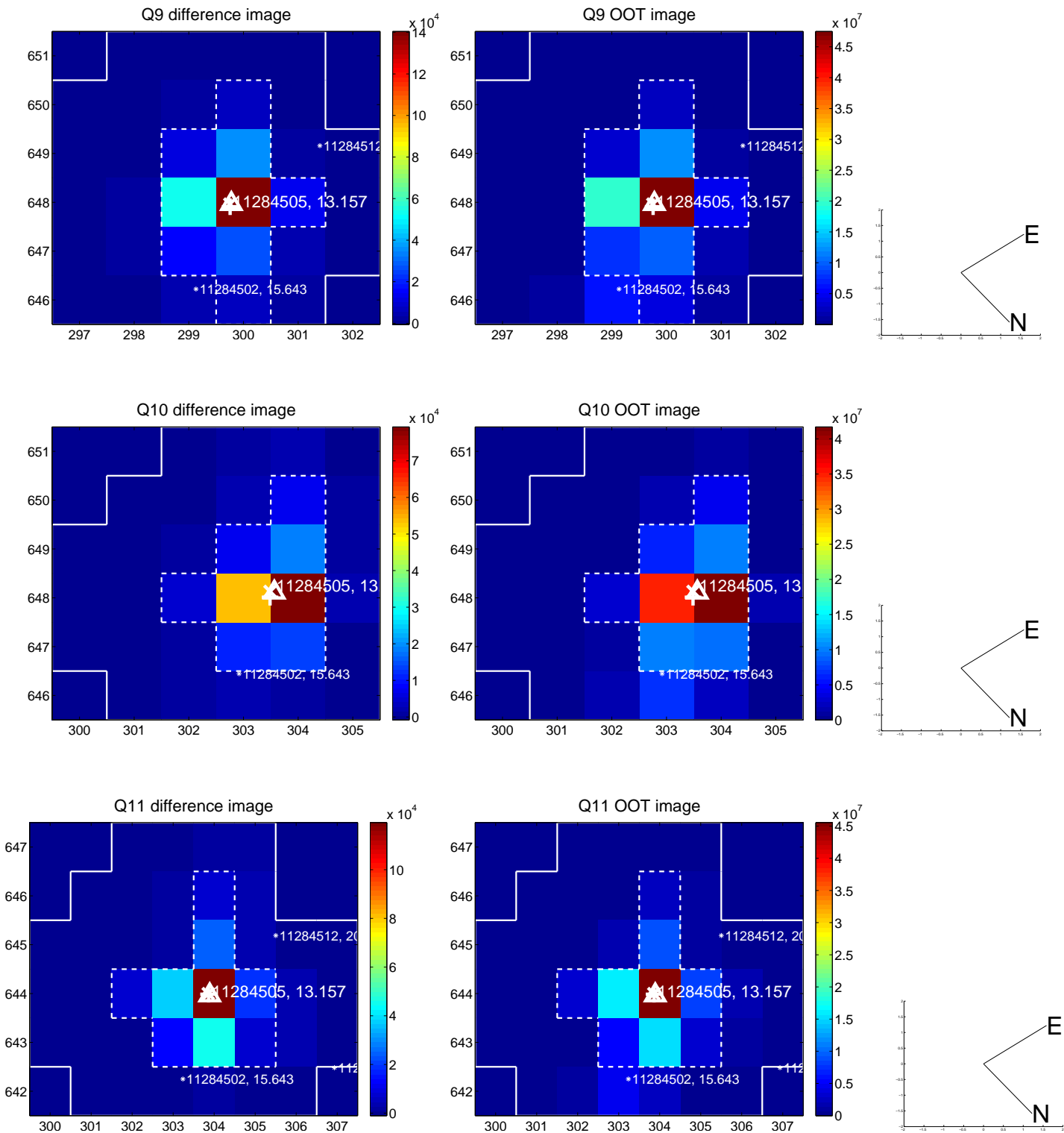


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

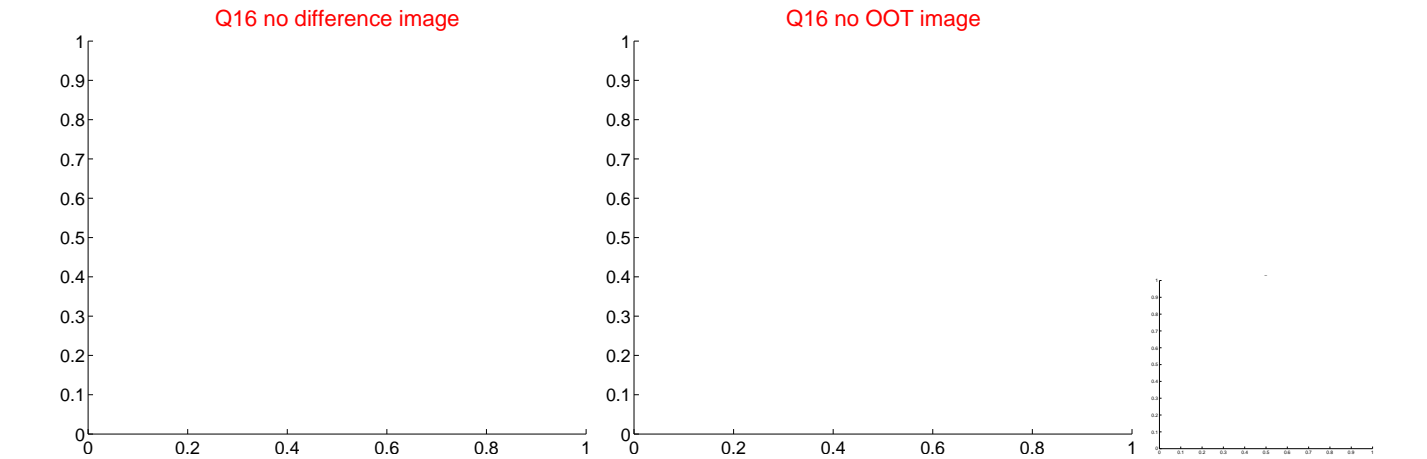
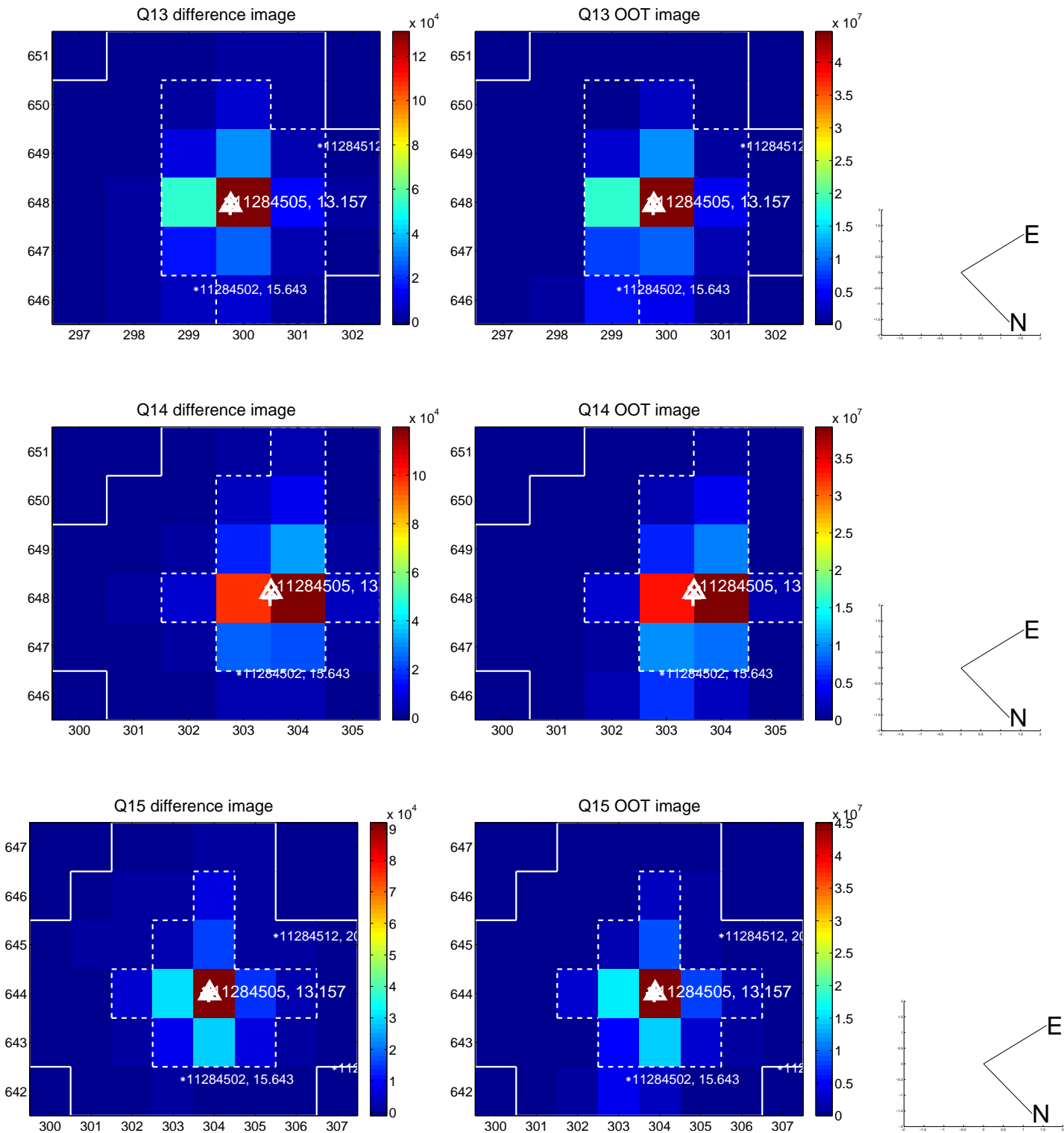




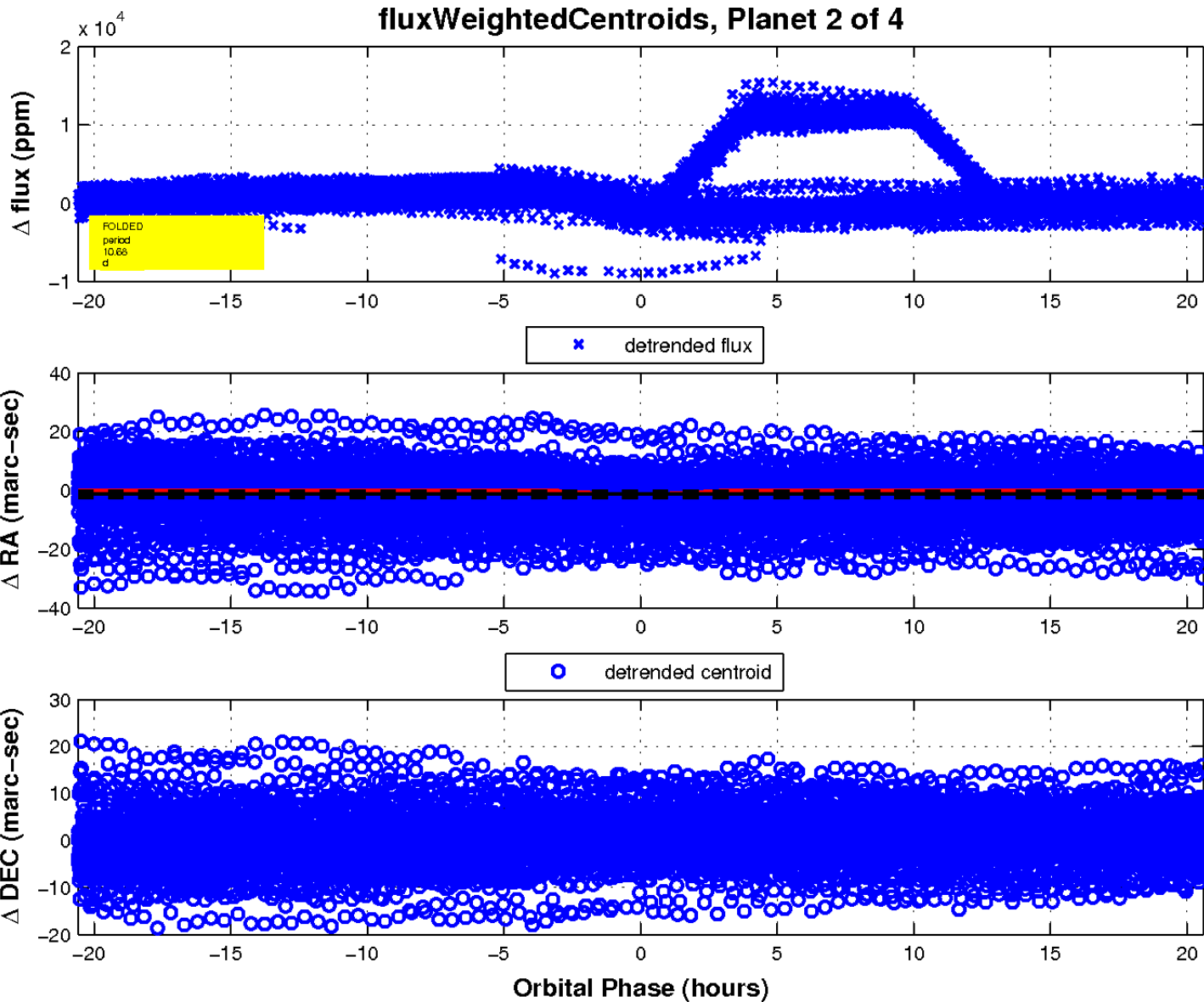
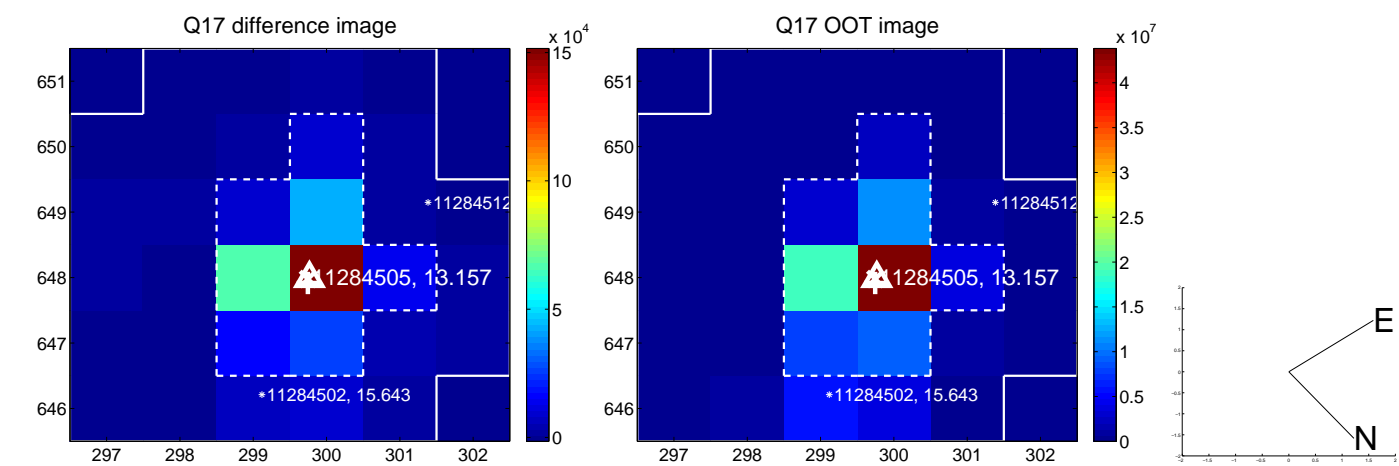
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

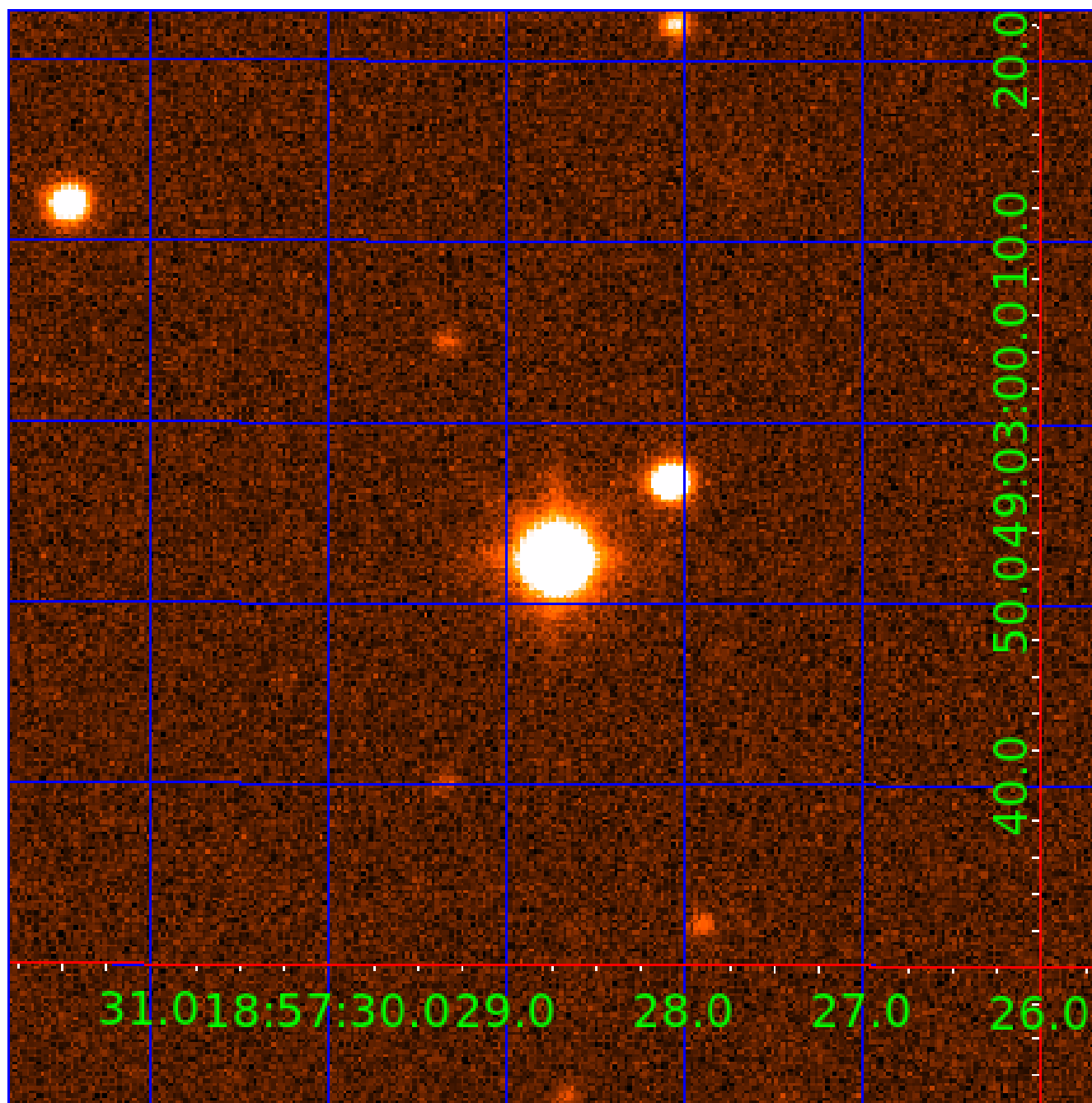


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011284505

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011284505-01	OBS	No	21.362818	147.503470	1814.5	6.388	37.8	43.2	11.88	4837	100.85	2014.42
011284505-02	OBS	No	10.681491	134.841187	1152.0	6.869	31.2	37.2	11.88	4837	81.77	5075.96
011284505-03	OBS	No	528.617651	515.508370	732.7	9.524	14.6	4.5	11.88	4837	33.70	27.94
011284505-04	OBS	No	21.362881	136.650034	147.8	12.000	13.0	-1.0	11.88	4837	13.97	2014.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011284505-01	OBS	FP	0.00	1	0	0	0	LPP_DV
011284505-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
011284505-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011284505-04	OBS	FP	0.00	1	0	0	0	LPP_DV—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.

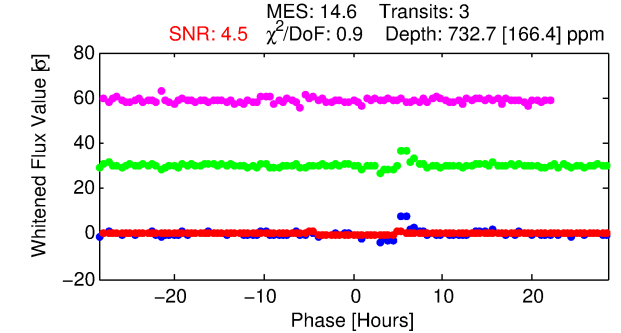
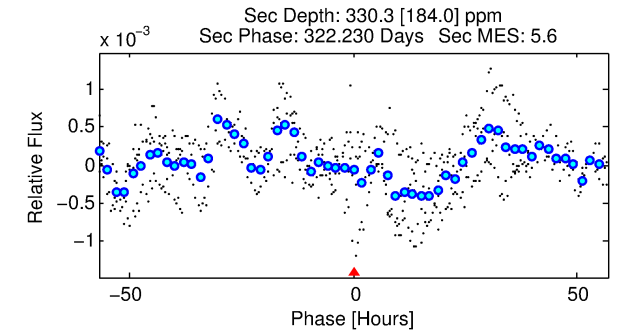
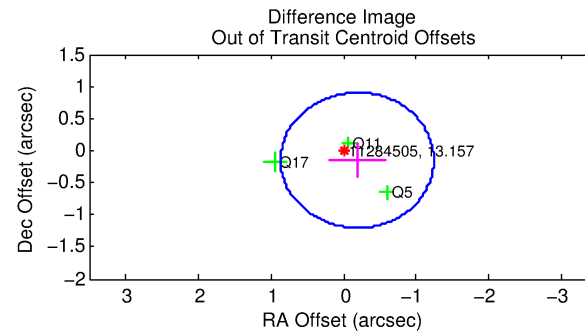
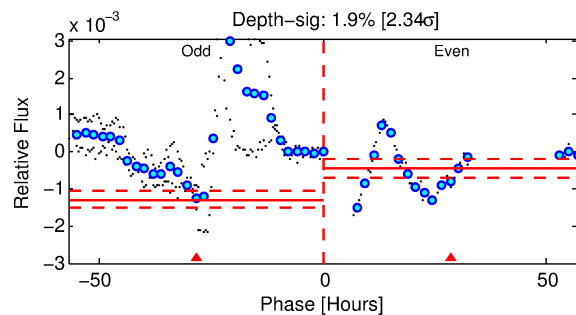
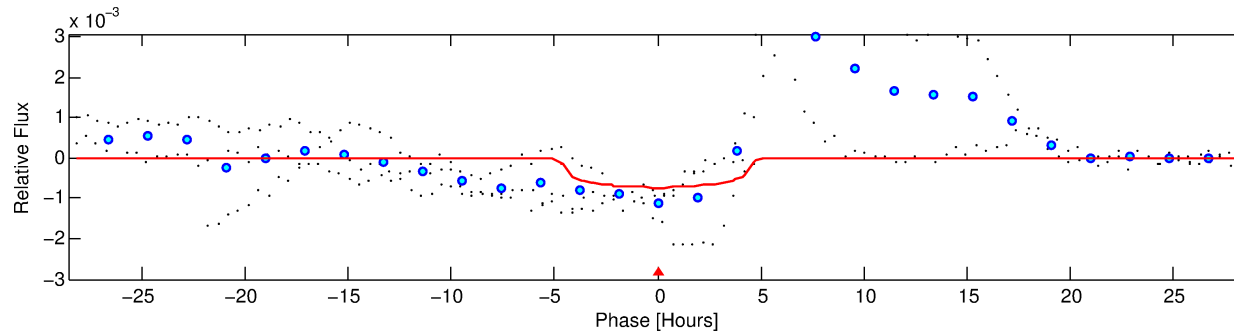
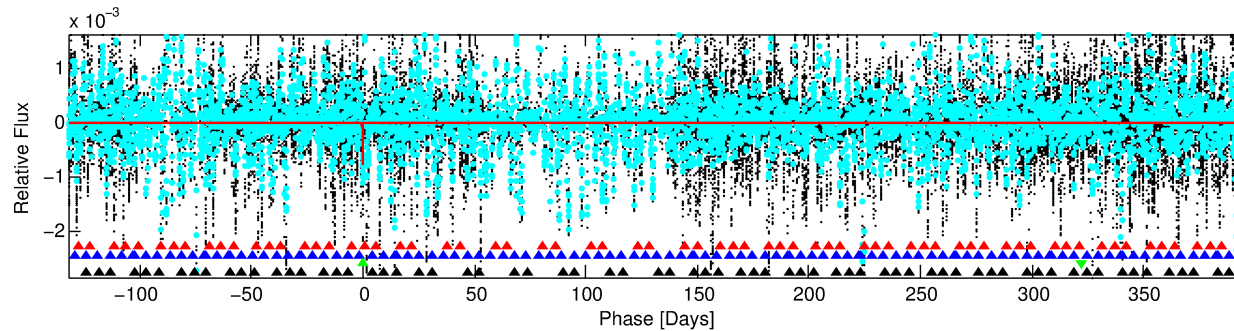
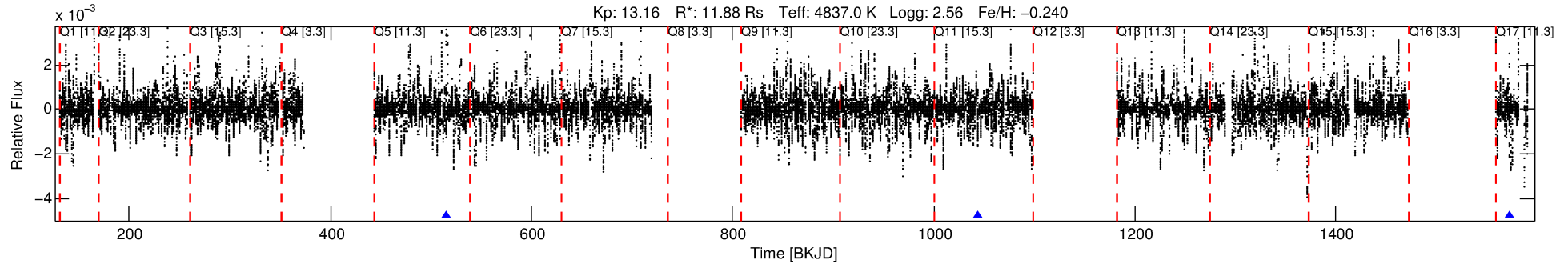
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011284505-03

No Significant Match Found

# DV One-Page Summary

KIC: 11284505 Candidate: 3 of 4 Period: 528.618 d



## DV Fit Results:

Period = 528.61765 [0.00554] d  
Epoch = 515.5084 [0.0077] BKJD  
Rp/R\* = 0.0260 [0.0112]  
a/R\* = 335.77 [474.97]  
b = 0.65 [1.27]  
Seff = 27.94 [22.35]  
Teq = 586 [117] K  
Rp = 33.70 [22.16] Re  
a = 1.5738 [0.7698] AU  
Ag = 396.35 [513.95] [0.77 $\sigma$ ]  
Teffp = 4044 [1044] K [3.29 $\sigma$ ]

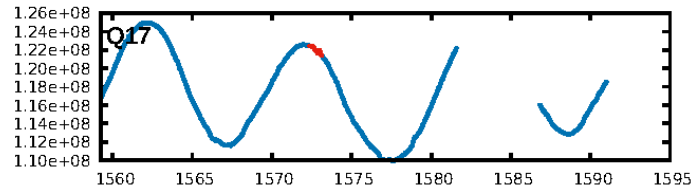
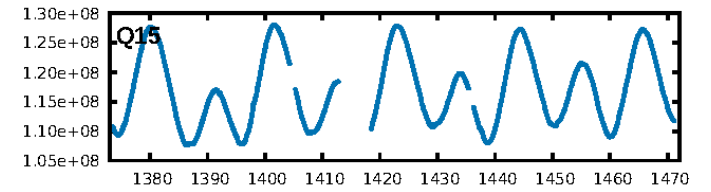
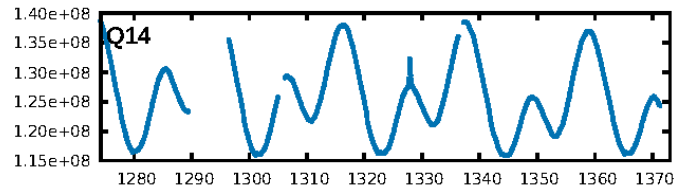
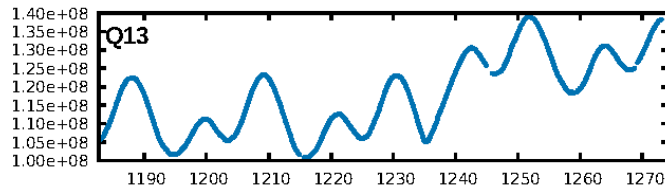
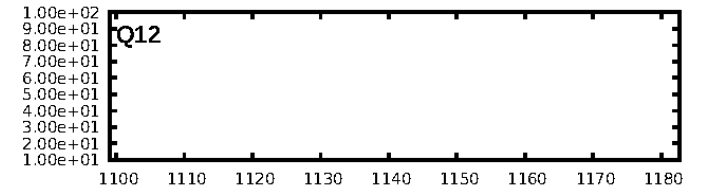
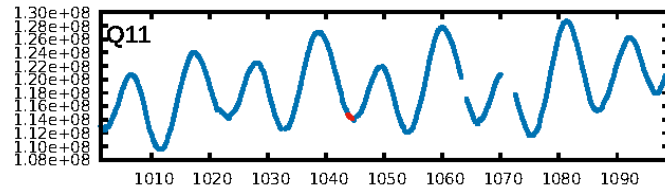
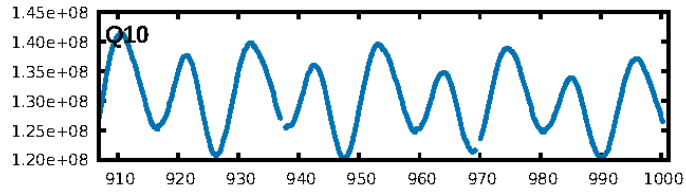
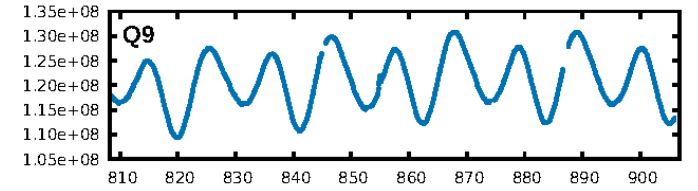
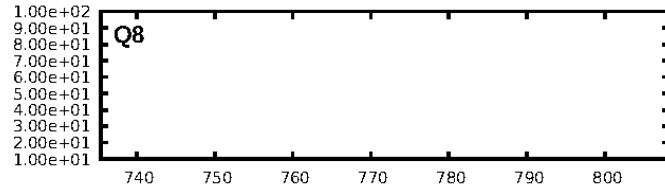
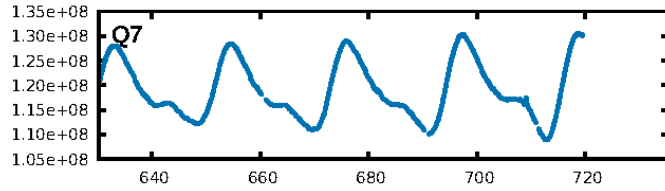
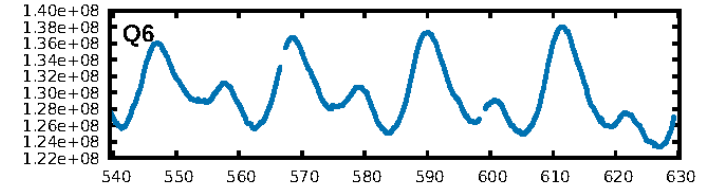
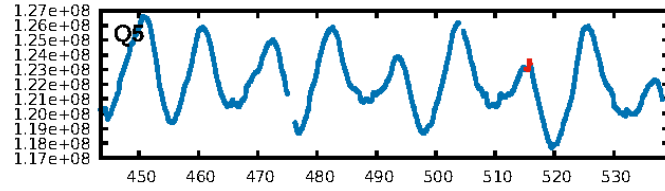
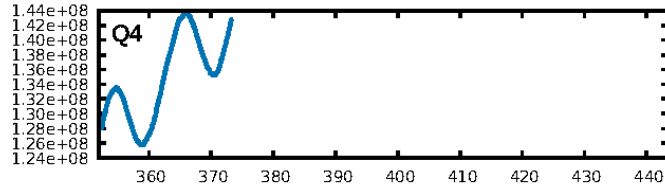
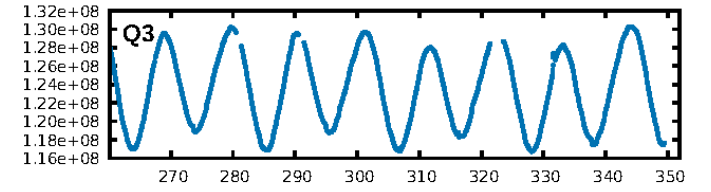
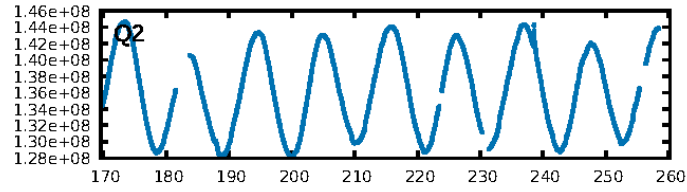
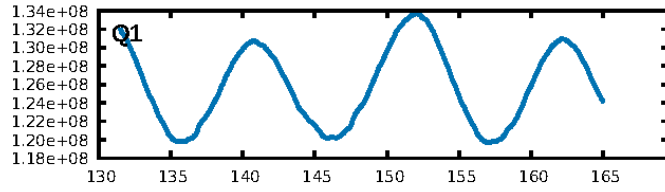
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [794.66 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 10.5%  
ModelChiSquareGof-sig: 96.7%  
Bootstrap-pfa: 8.24e-15  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -0.1471  
Centroid-sig: N/A  
Centroid-so: 1.419 arcsec [0.66 $\sigma$ ]  
OotOffset-rm: 0.241 arcsec [0.69 $\sigma$ ]  
OotOffset-st: 0/1/0/2 [3]  
KicOffset-rm: 0.225 arcsec [0.59 $\sigma$ ]  
KicOffset-st: 0/1/0/2 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.67 [2/3]

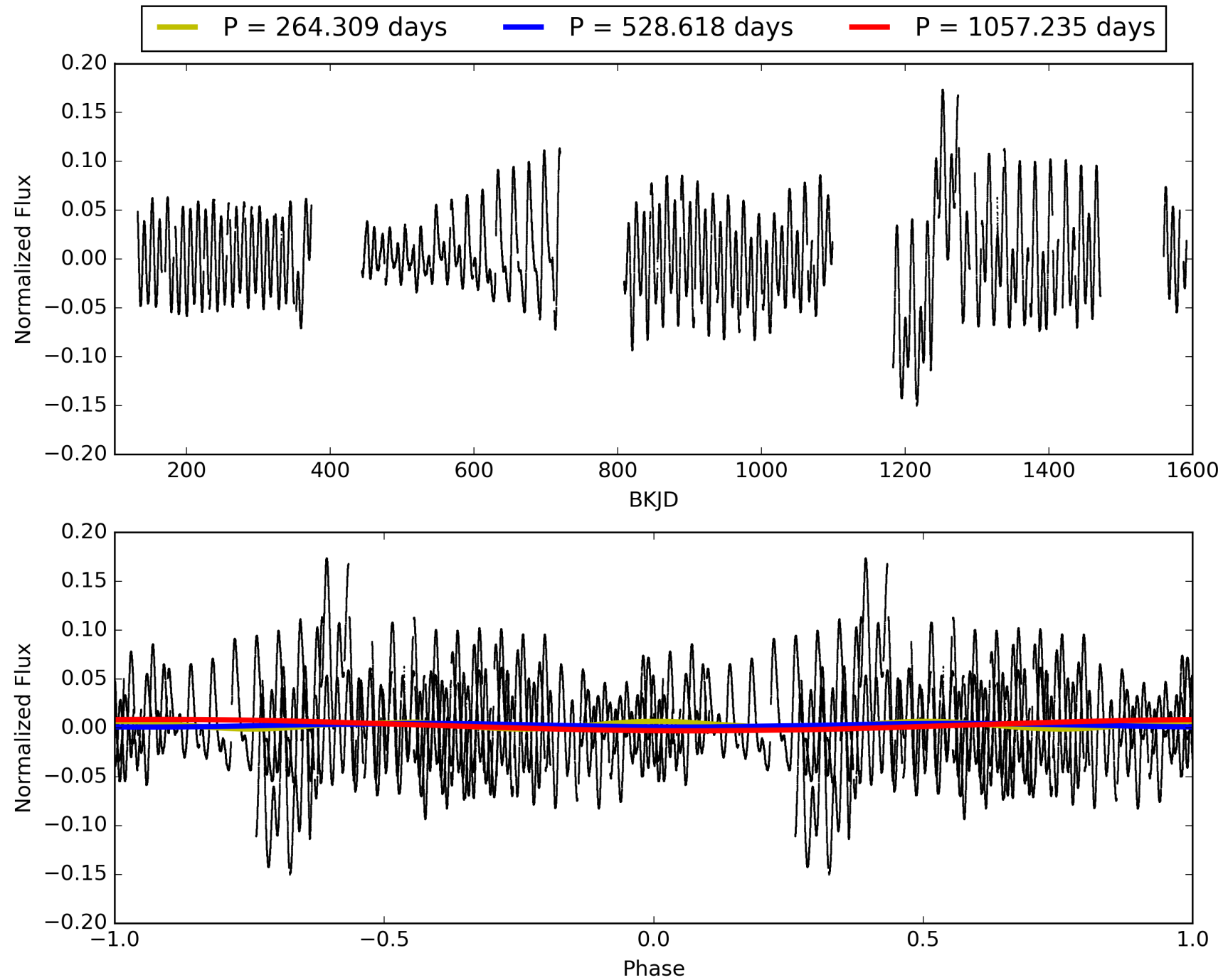
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:38:25 Z

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

# TCE 011284505-03, PDC Light Curves



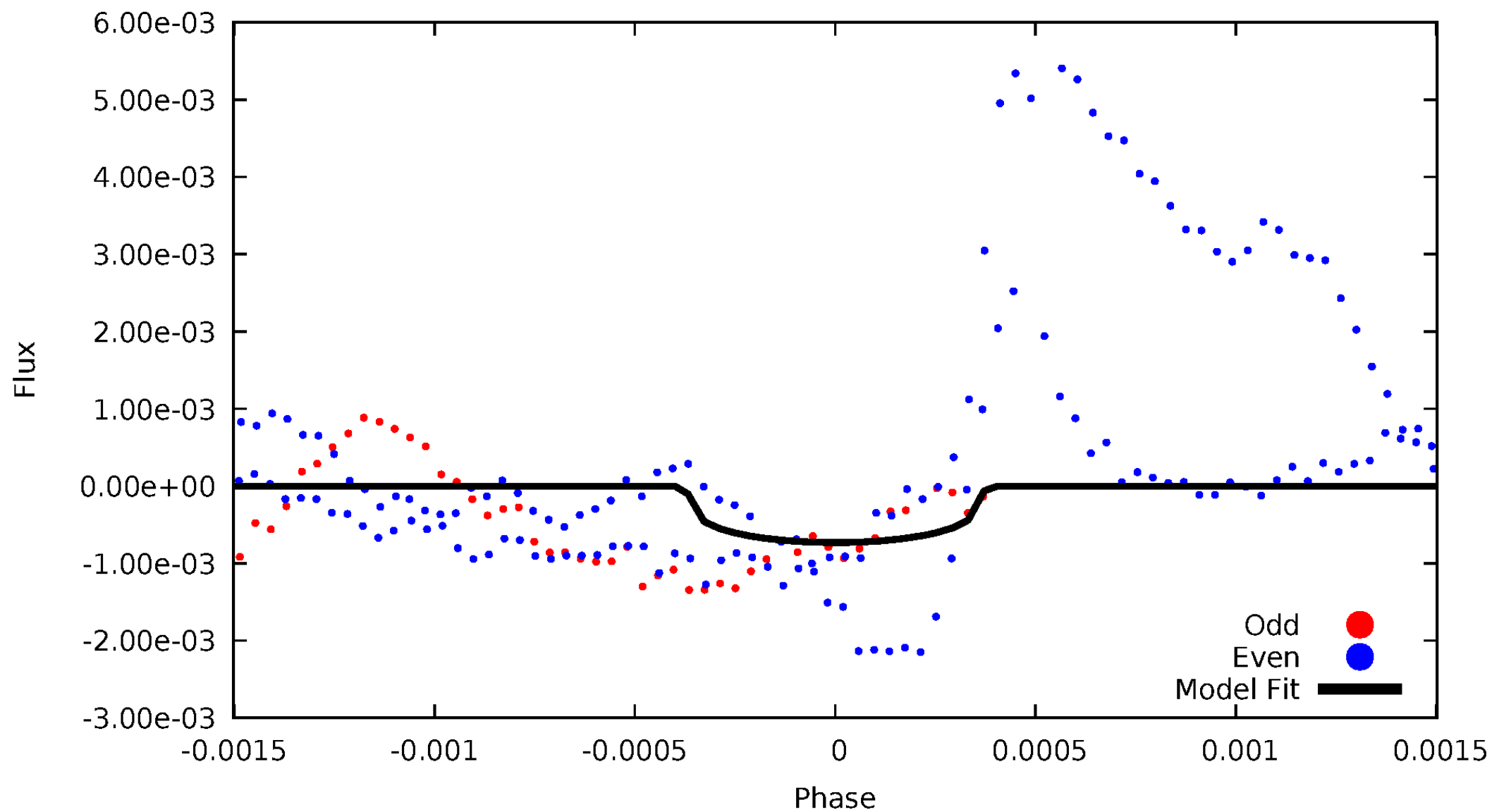
# TCE 011284505-03





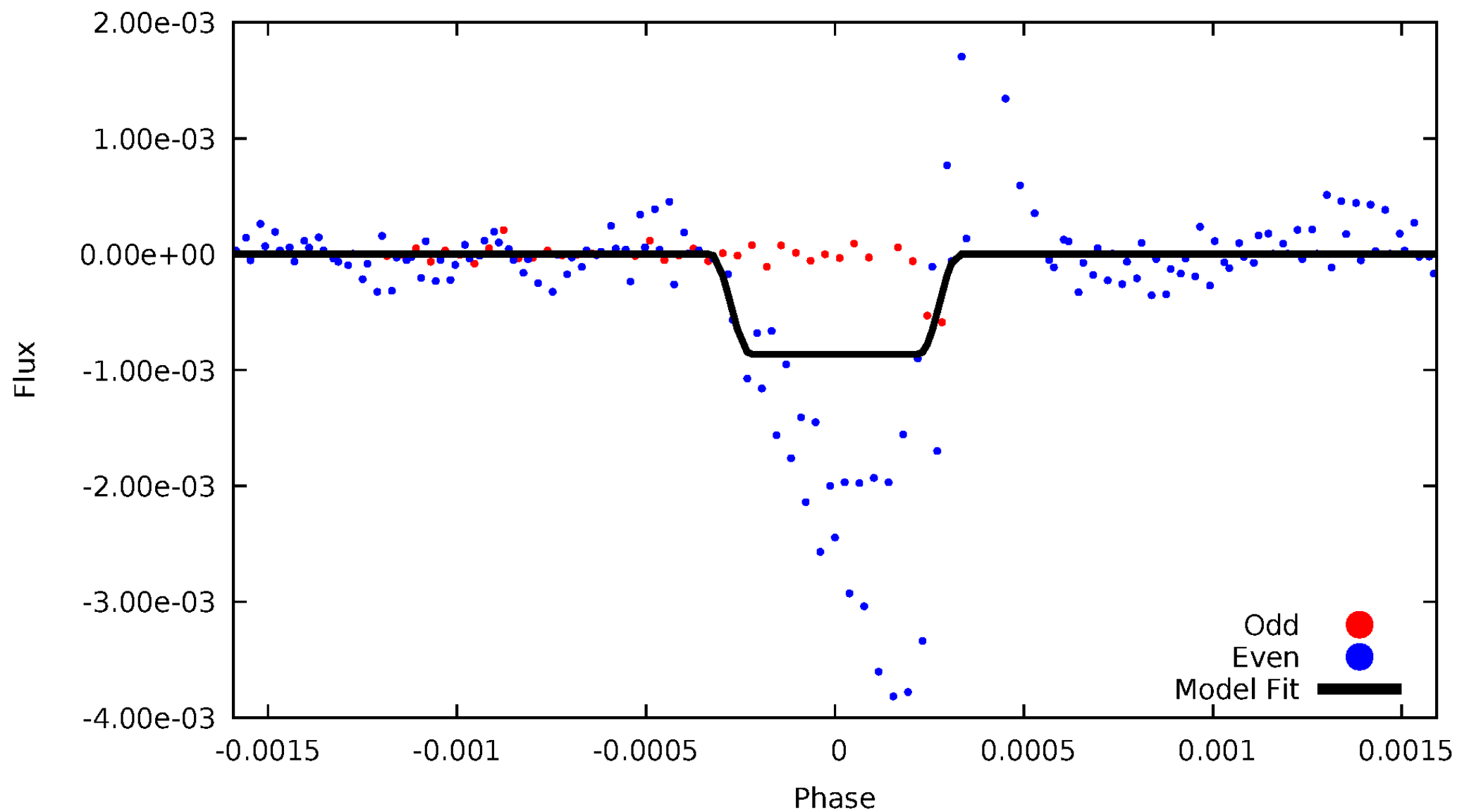
# DV Odd/Even

TCE 011284505-03



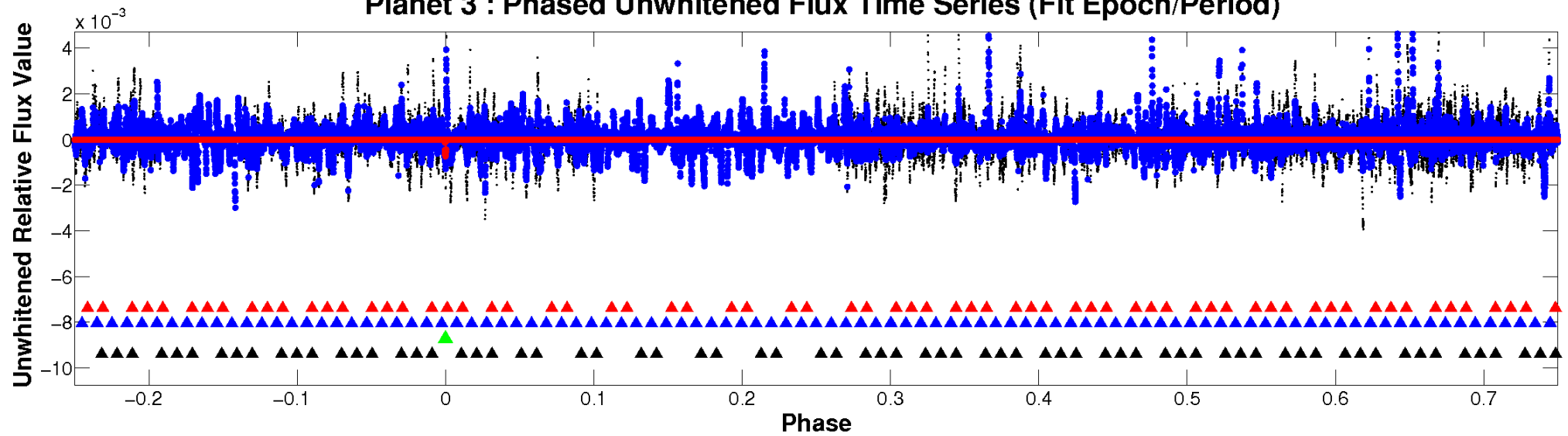
# ALT Odd/Even

TCE 011284505-03

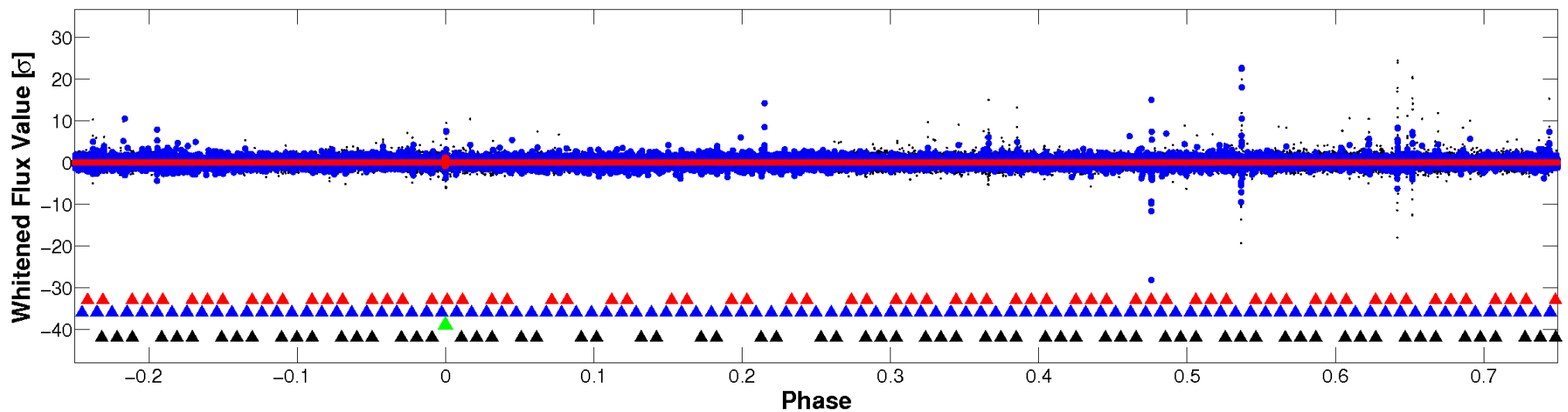


# Non-Whitened Vs. Whitened Light Curve

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

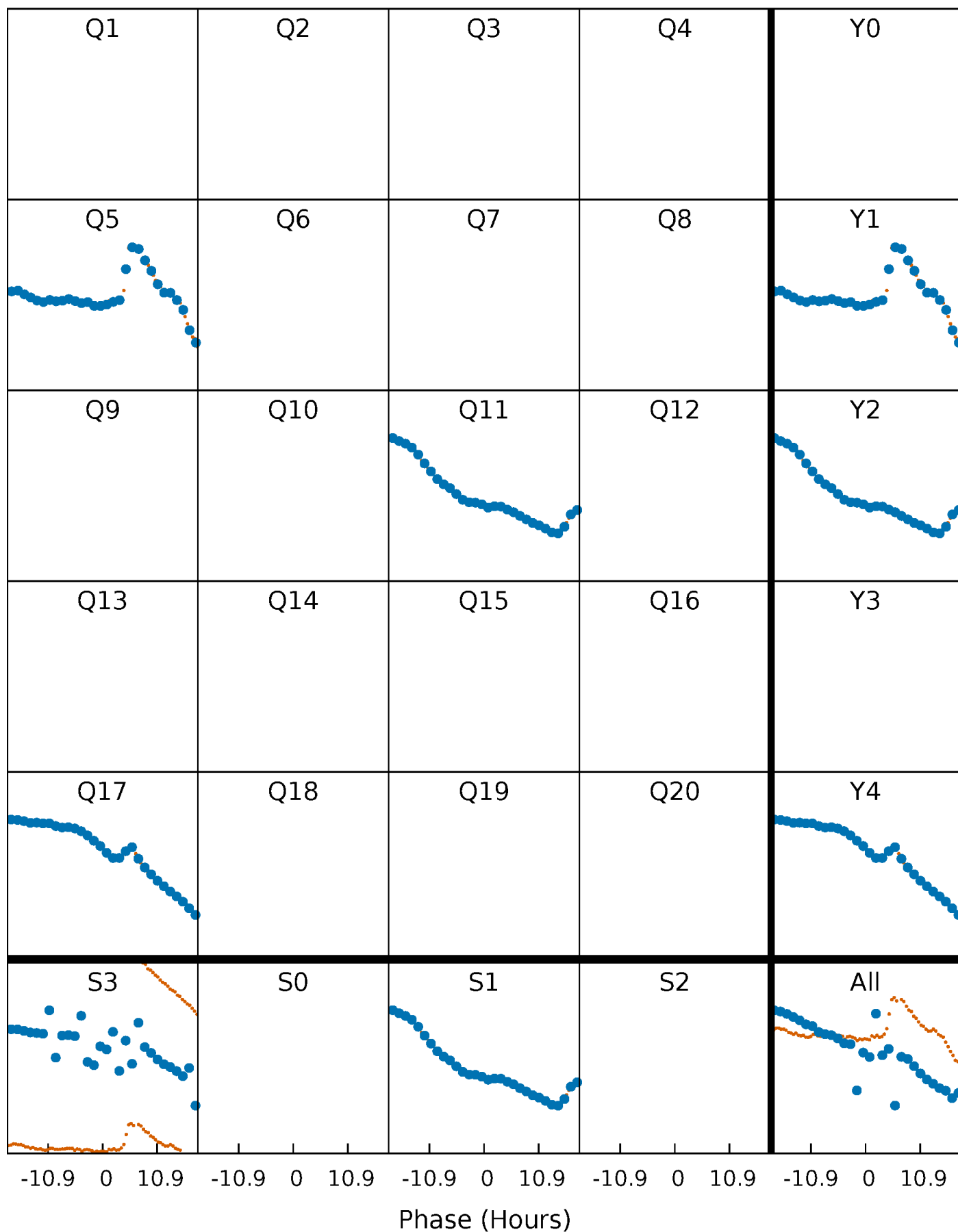


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



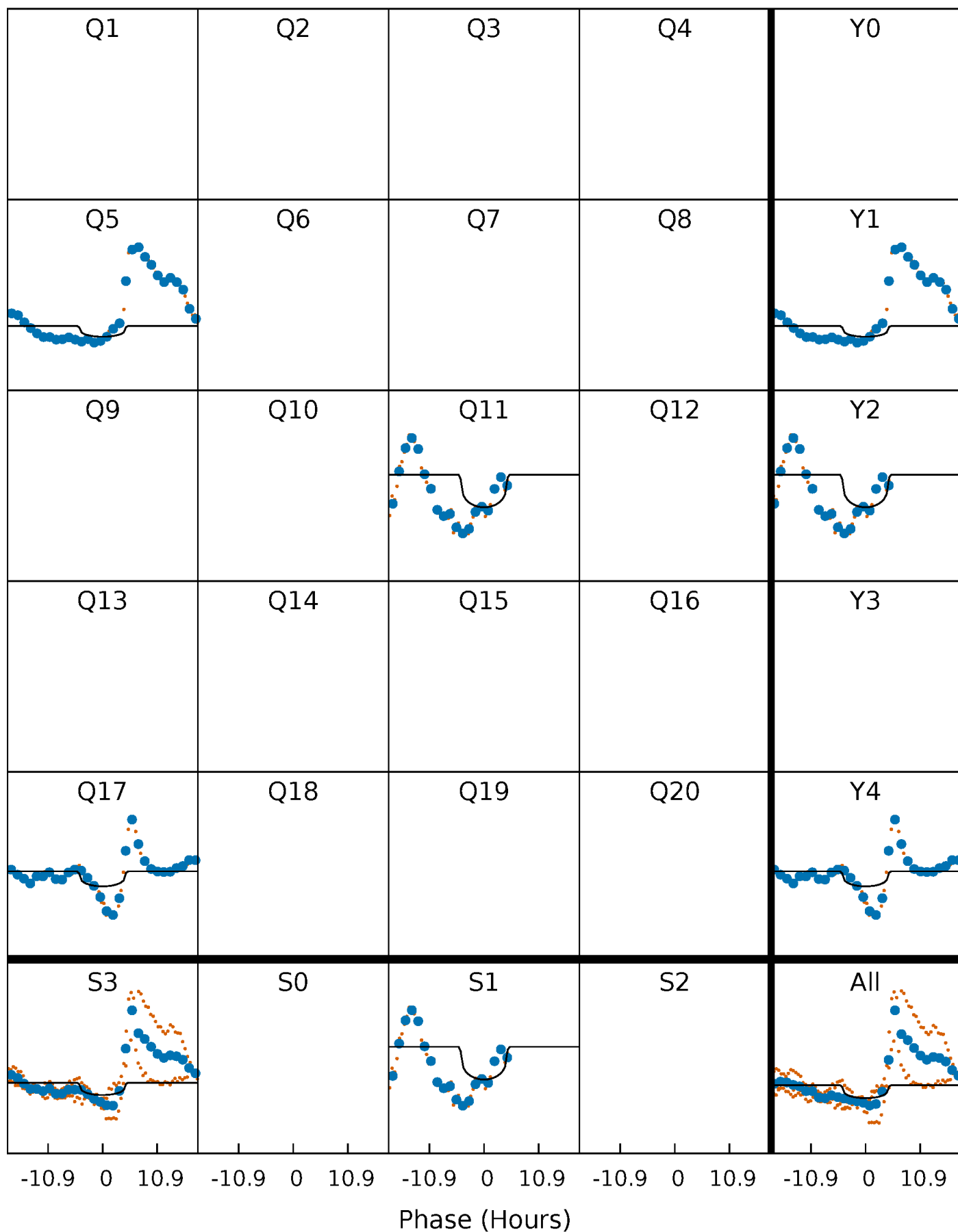
# PDC Quarter-Phased Transit Curves

TCE 011284505-03 P=528.617651 Days  $T_0=515.508370$  (BKJD)



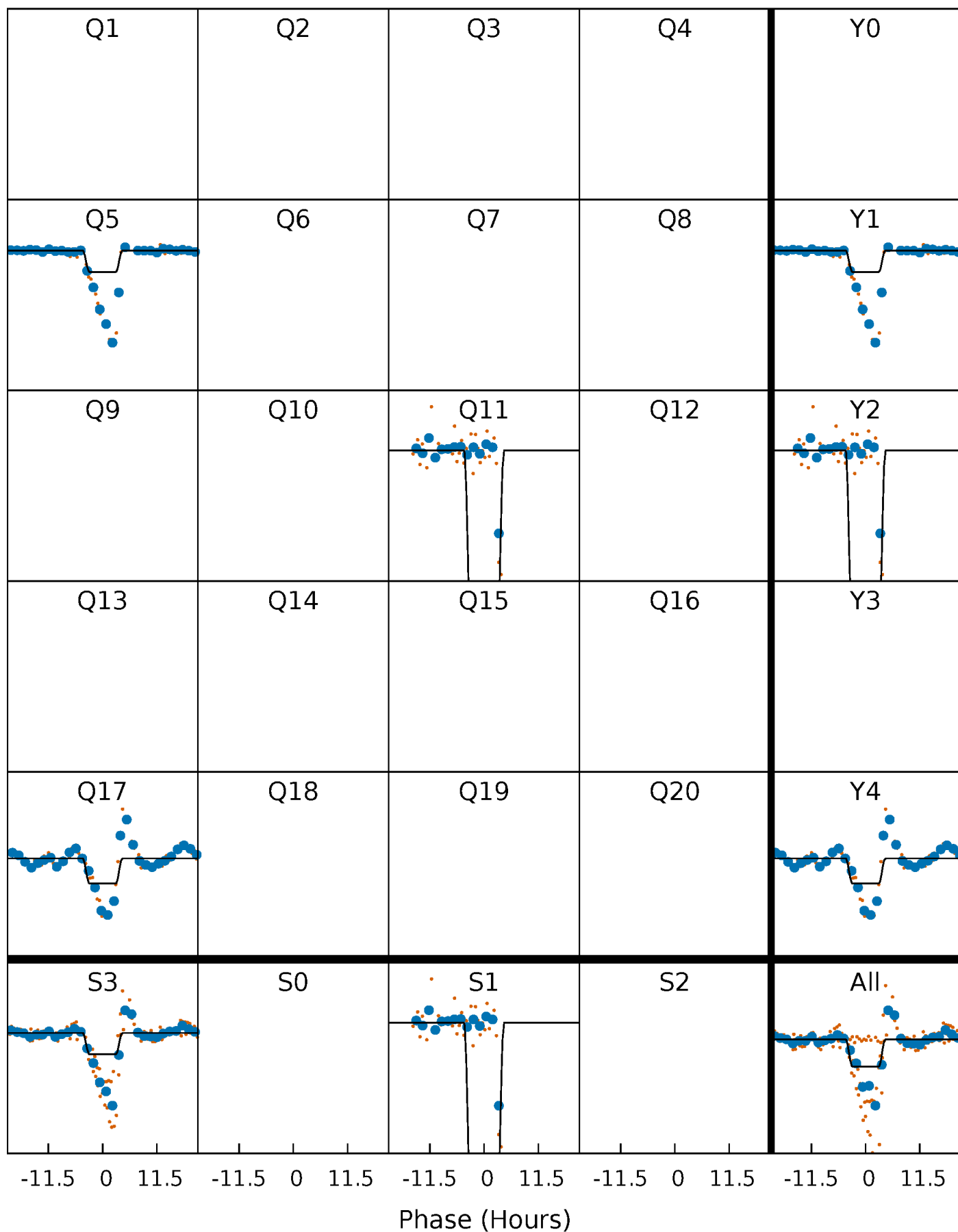
# DV Quarter-Phased Transit Curves

TCE 011284505-03     $P=528.617651$  Days     $T_0=515.508370$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

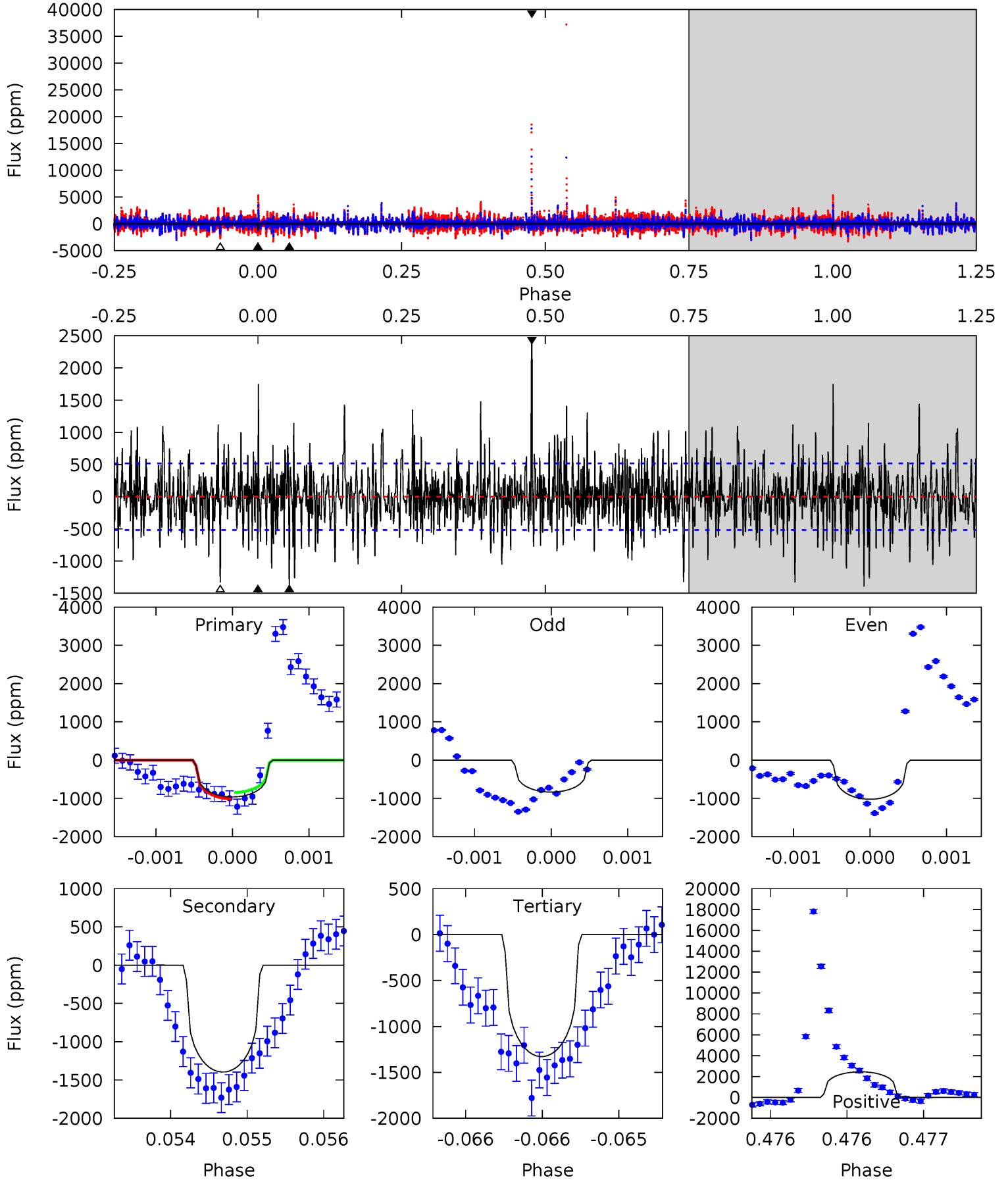
TCE 011284505-03     $P=528.609386$  Days     $T_0=515.562415$  (BKJD)



# DV Model-Shift Uniqueness Test

011284505-03, P = 528.617651 Days, E = 515.508370 Days

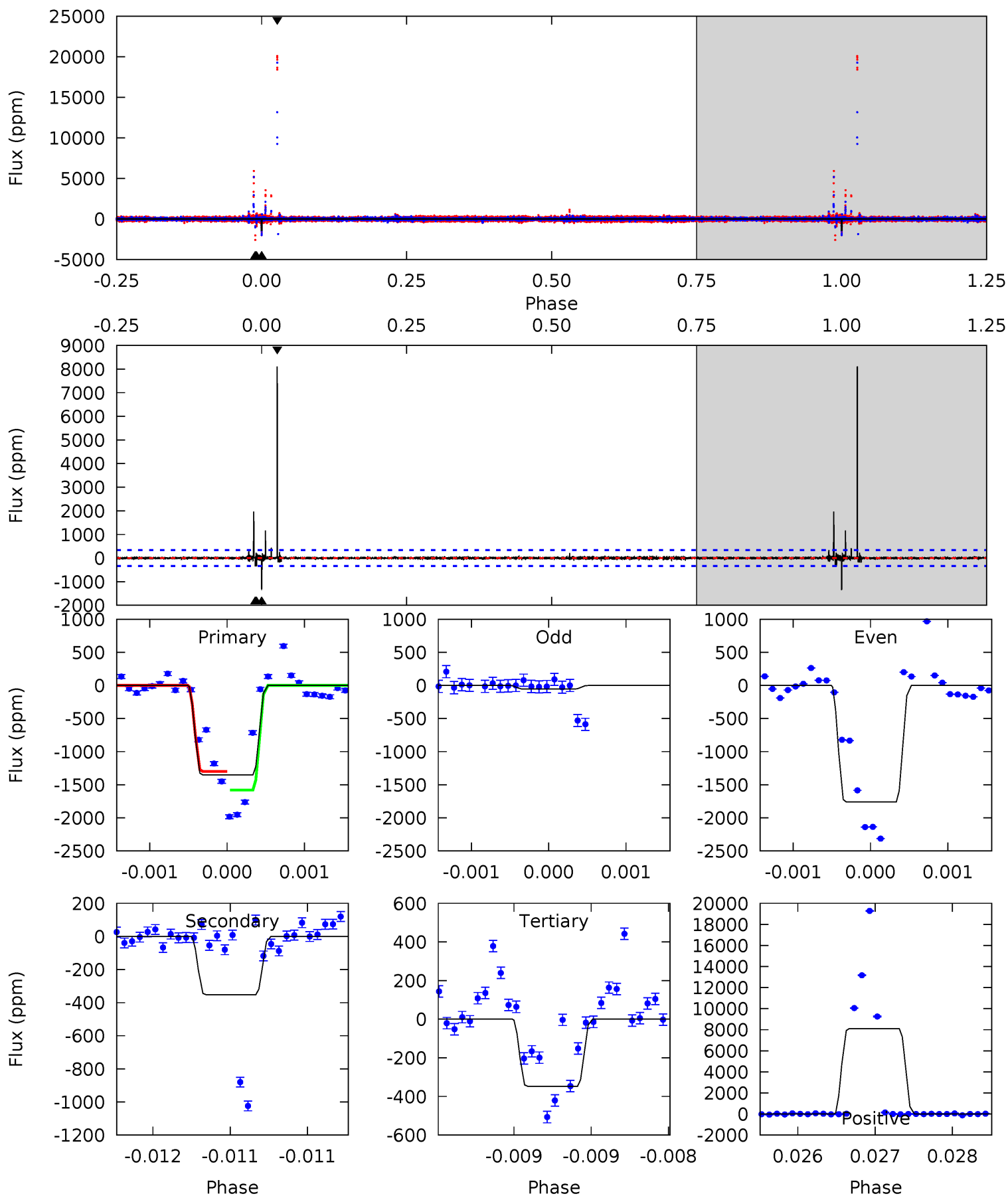
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	14.8	14.1	26.0	5.50	3.36	3.70	-3.90	-15.8	0.71	-11.2	0.81	1.16	0.64	0.89



# Alt Model-Shift Uniqueness Test

011284505-03, P = 528.609386 Days, E = 515.562415 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.1	5.76	5.68	132.6	5.53	3.41	2.38	16.5	-110.5	0.08	-126.9	14.8	0.97	0.86	2.13





### Stellar Parameters For KIC 011284505

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4837^{+120}_{-132}$	$2.558^{+0.469}_{-0.201}$	$-0.240^{+0.250}_{-0.250}$	$11.878^{+3.178}_{-5.901}$	$1.858^{+0.892}_{-0.811}$	$0.002^{+0.007}_{-0.001}$
	+2%/-3%	+18%/-8%	+104%/-104%	+27%/-50%	+48%/-44%	+438%/-51%
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 011284505-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1395 \pm 94$	$31.72^{+18.70}_{-15.24}$	$806^{+72}_{-102}$	$5627^{+1931}_{-839}$	$1929^{+4424}_{-1095}$
Alt.	$-352 \pm 61$	$36.89^{+19.08}_{-17.06}$	$806^{+78}_{-105}$	$4038^{+895}_{-433}$	$381^{+805}_{-221}$

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

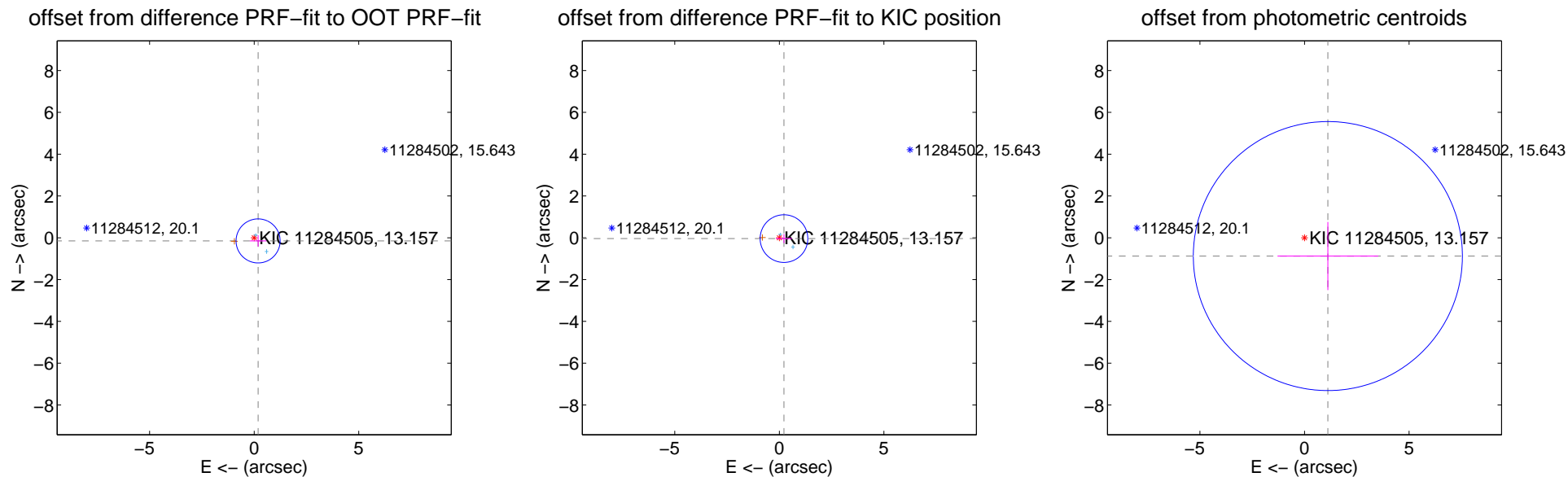
## DV Centroid Data

Supplemental centroid analysis for 011284505-03. Kepler magnitude: 13.16. Transit SNR 4.50

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.241 \pm 0.351$	0.69	$-0.188 \pm 0.394$	$-0.151 \pm 0.272$
PRF-fit source offset from KIC position	$0.225 \pm 0.380$	0.59	$-0.221 \pm 0.384$	$-0.040 \pm 0.215$
photometric centroid source offset	$1.42 \pm 2.14$	0.66	$-1.12 \pm 2.41$	$-0.87 \pm 1.63$

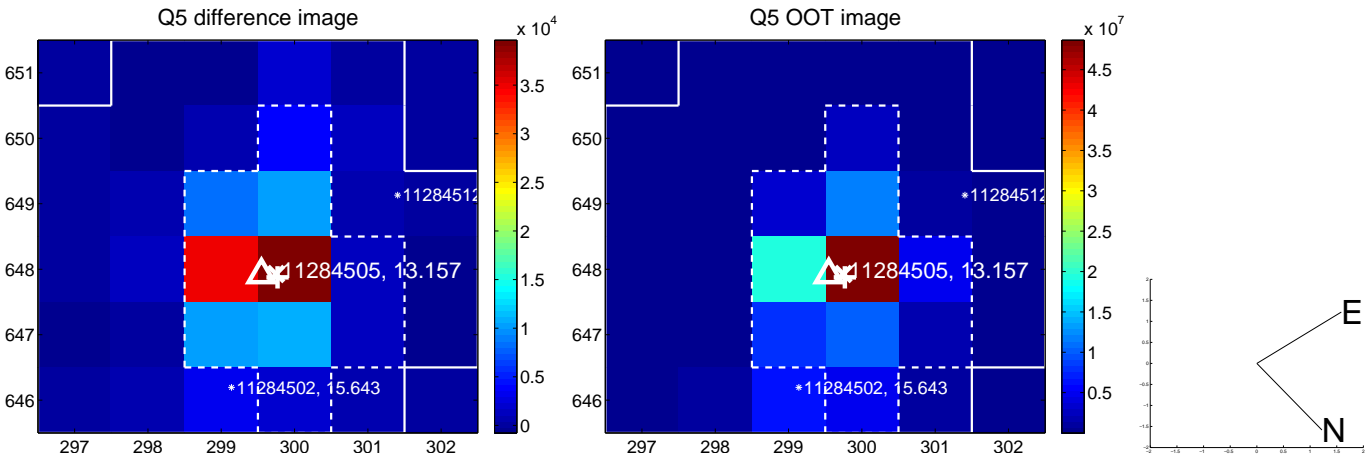


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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



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



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

Q9 no difference image



Q9 no OOT image



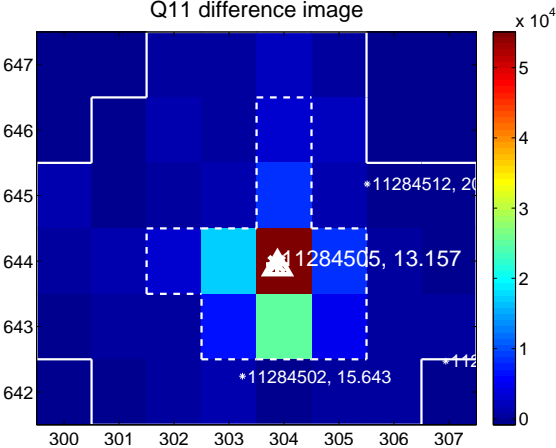
Q10 no difference image



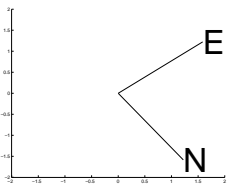
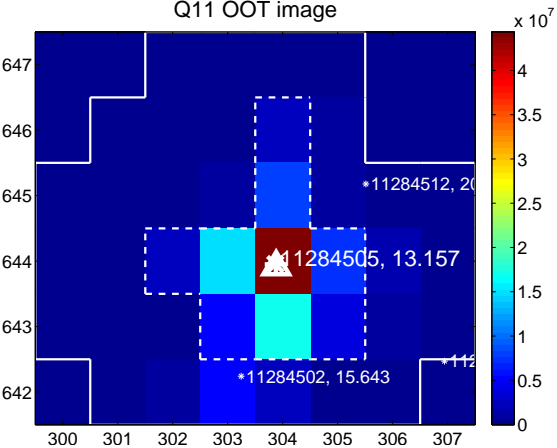
Q10 no OOT image



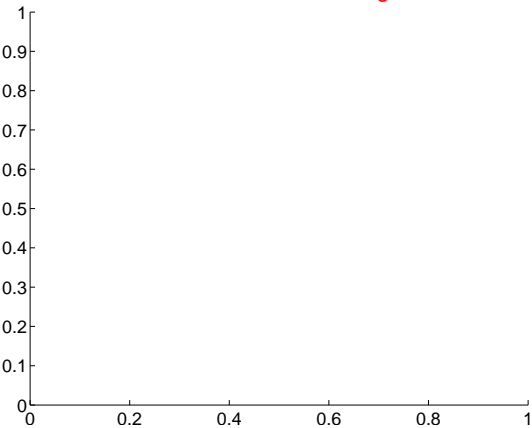
Q11 difference image



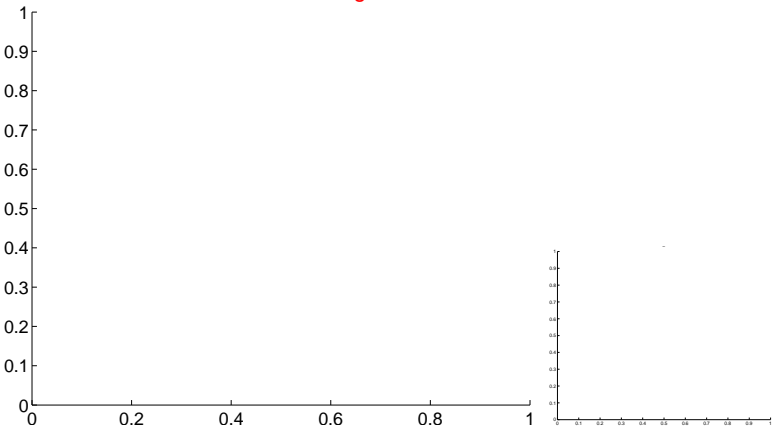
Q11 OOT image



Q12 no difference image



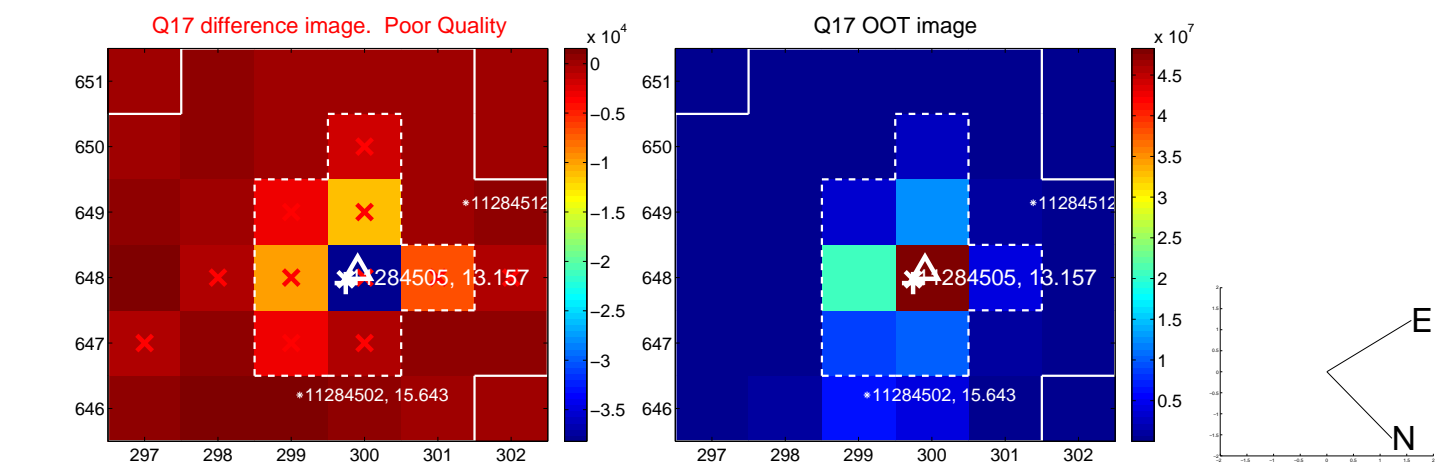
Q12 no OOT image



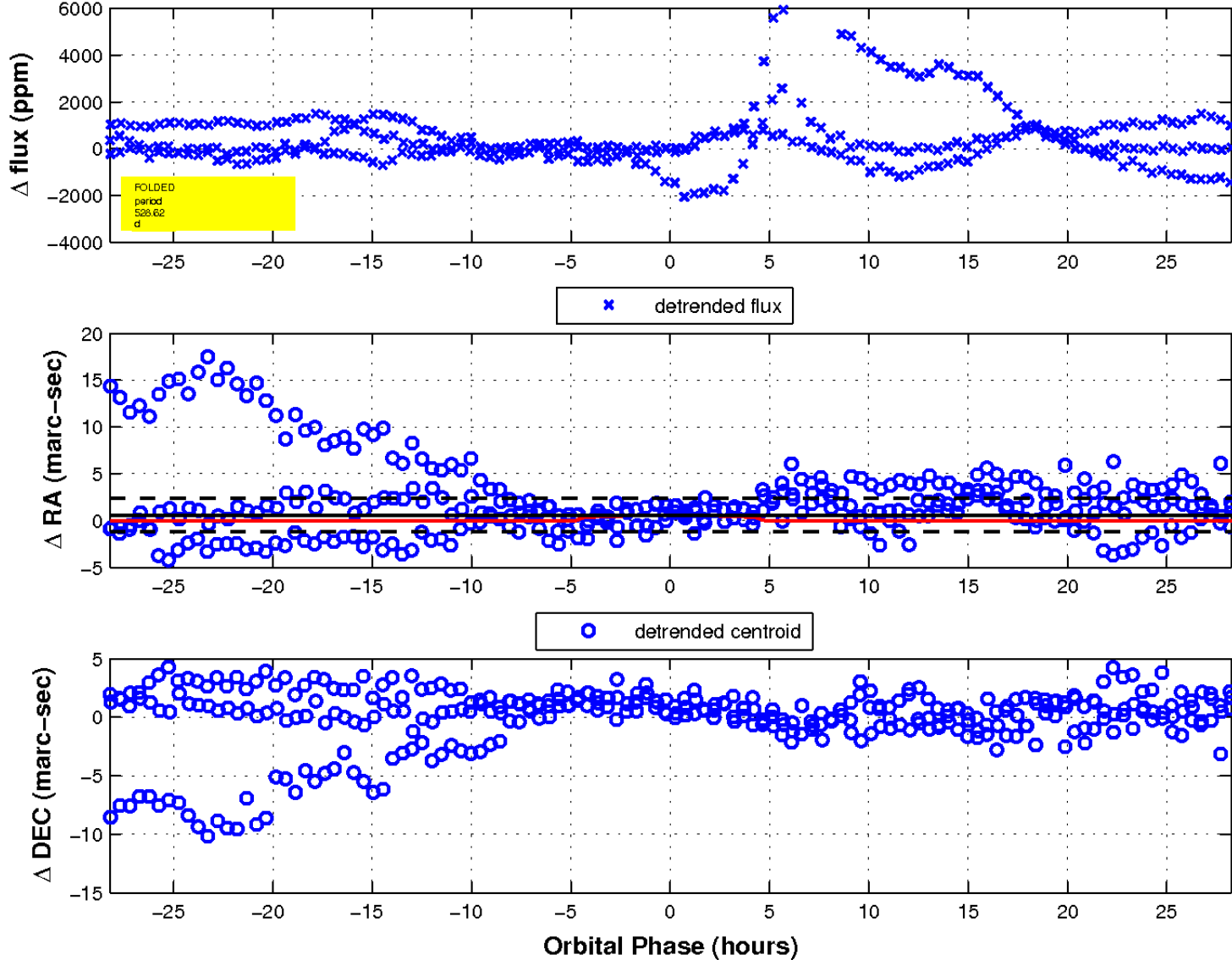
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

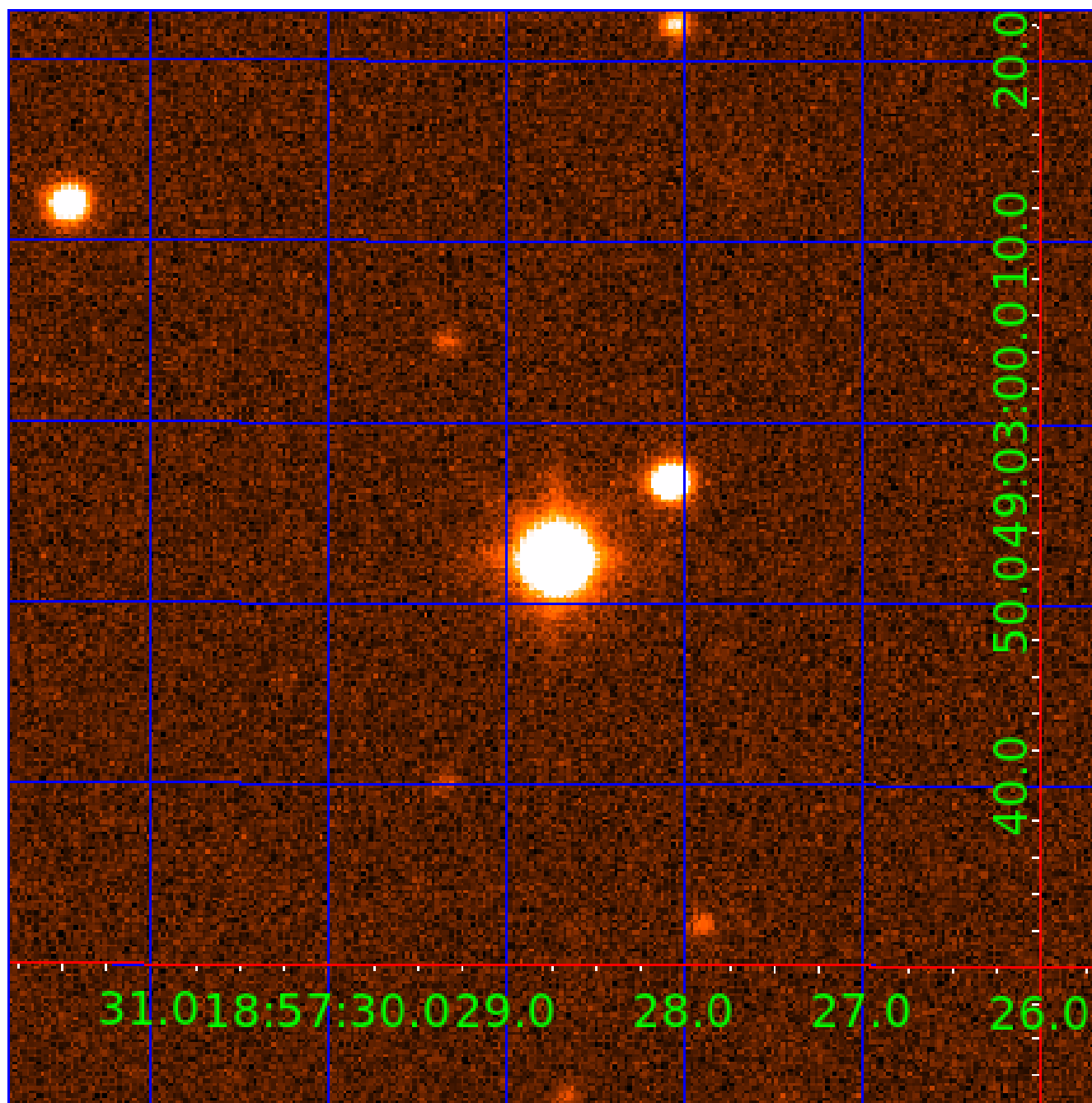


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination





# KIC 011284505

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011284505-01	OBS	No	21.362818	147.503470	1814.5	6.388	37.8	43.2	11.88	4837	100.85	2014.42
011284505-02	OBS	No	10.681491	134.841187	1152.0	6.869	31.2	37.2	11.88	4837	81.77	5075.96
011284505-03	OBS	No	528.617651	515.508370	732.7	9.524	14.6	4.5	11.88	4837	33.70	27.94
011284505-04	OBS	No	21.362881	136.650034	147.8	12.000	13.0	-1.0	11.88	4837	13.97	2014.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011284505-01	OBS	FP	0.00	1	0	0	0	LPP_DV
011284505-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
011284505-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
011284505-04	OBS	FP	0.00	1	0	0	0	LPP_DV—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.

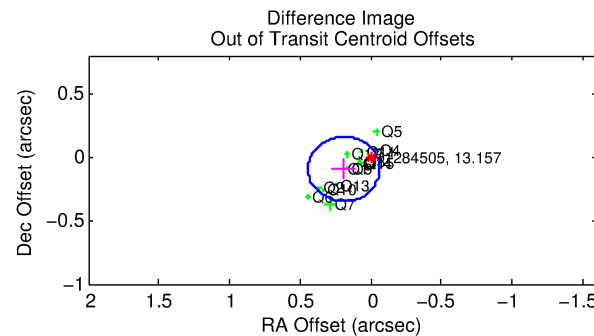
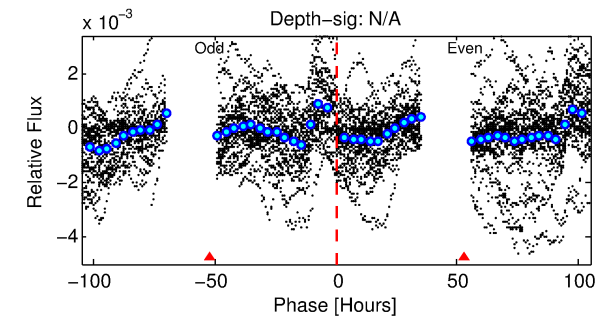
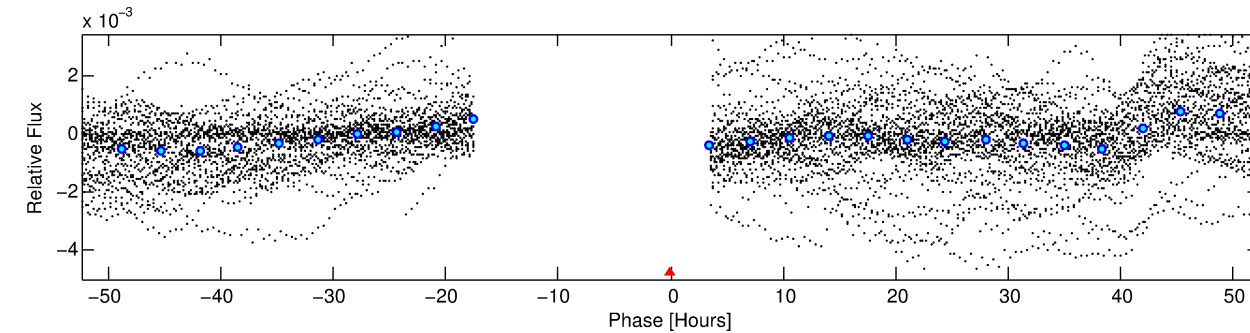
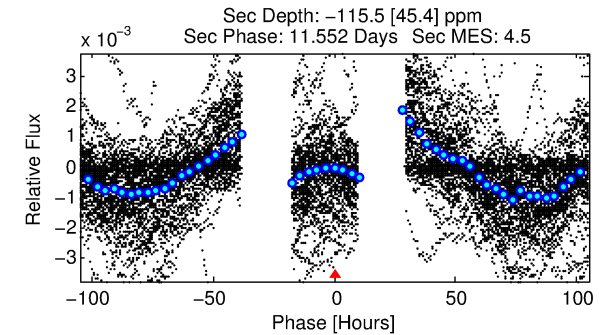
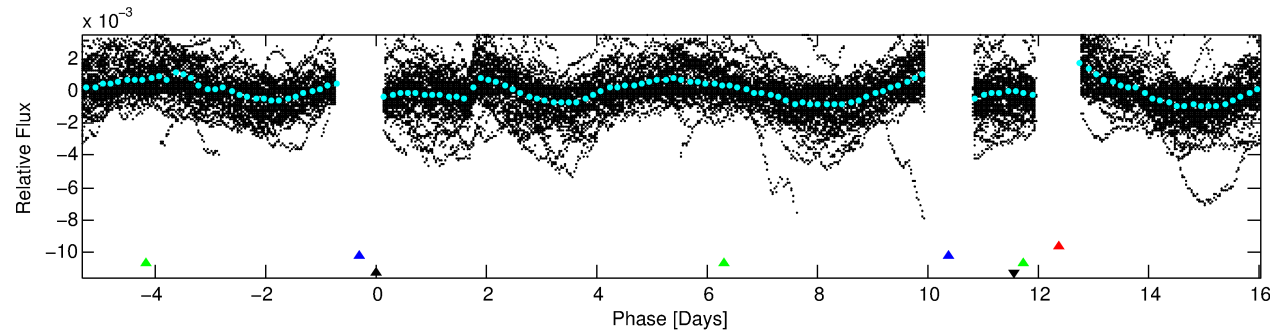
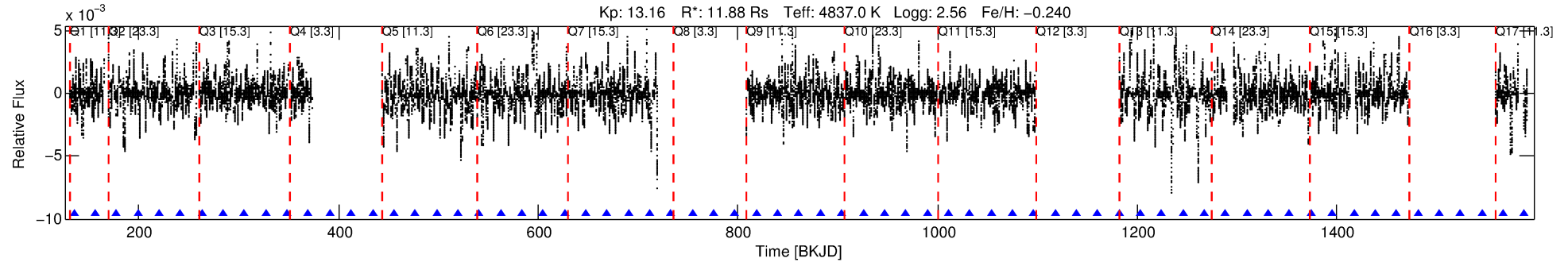
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011284505-04

No Significant Match Found

# DV One-Page Summary

KIC: 11284505 Candidate: 4 of 4 Period: 21.363 d



## TPS TCE Results:

Period = 21.36288 d  
Epoch = 136.6500 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

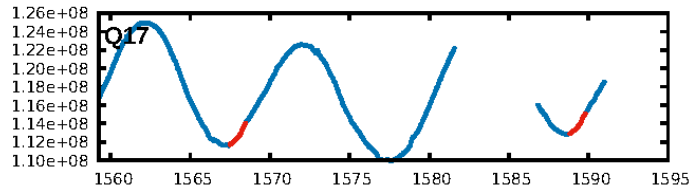
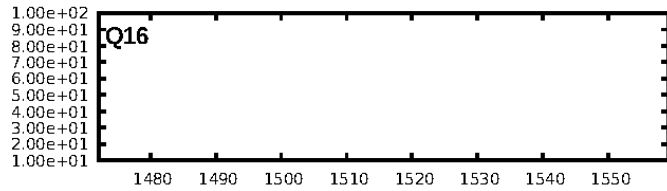
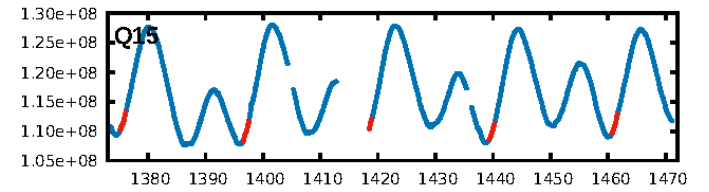
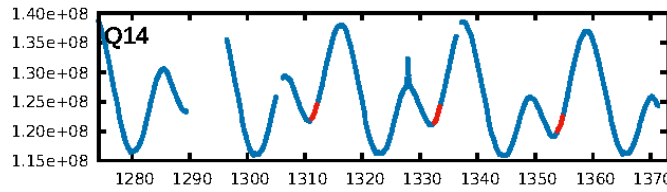
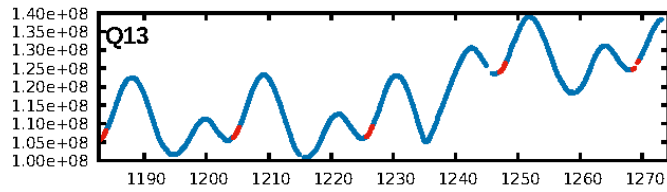
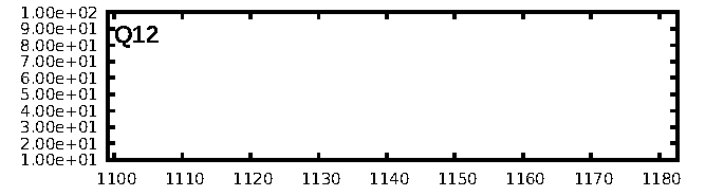
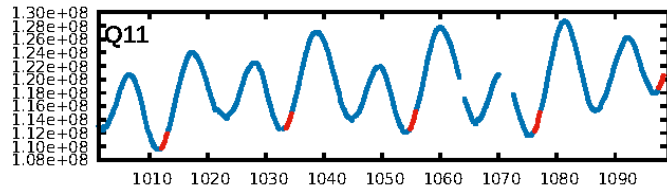
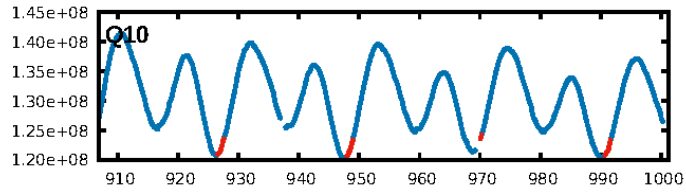
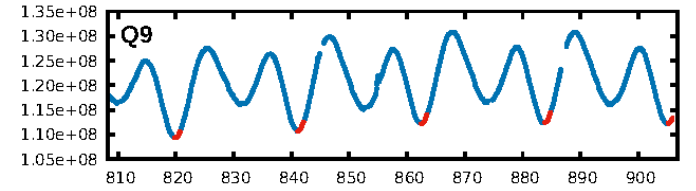
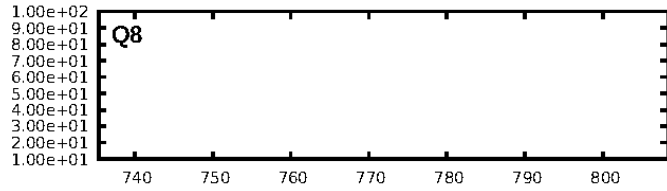
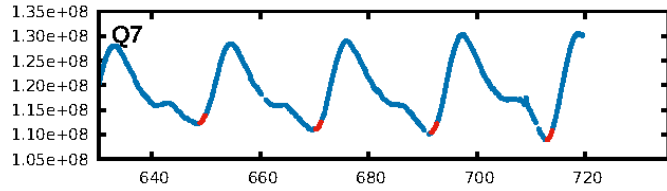
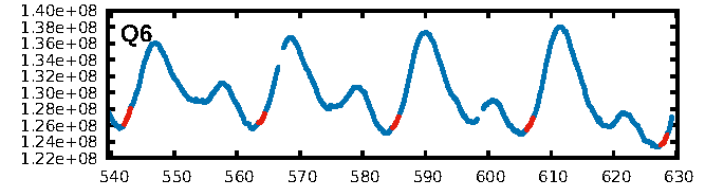
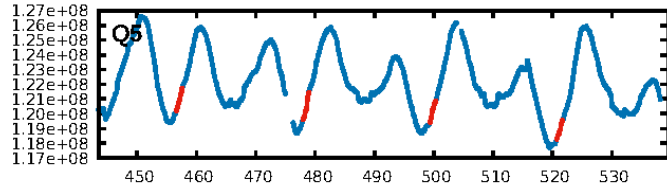
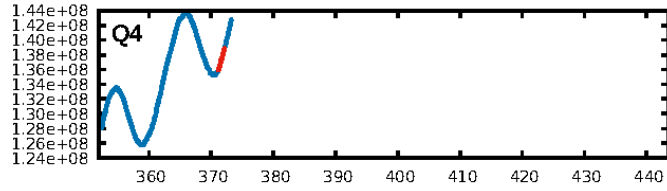
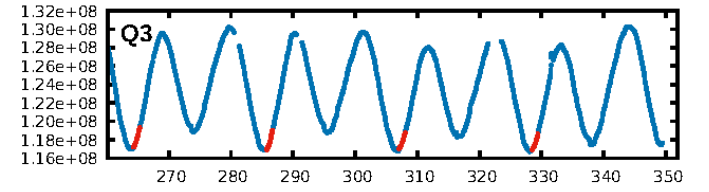
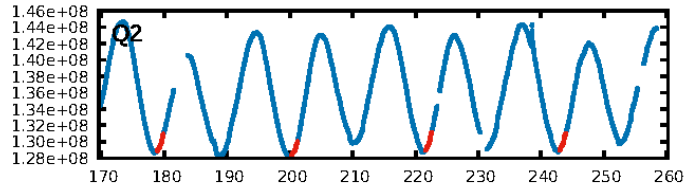
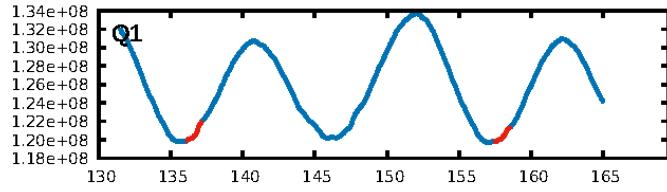
ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [794.66 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.14e-29  
RollingBand-fgt: 1.00 [46/46]  
GhostDiagnostic-chr: 2.796

Centroid-sig: N/A  
Centroid-so: 0.440 arcsec [10.73 $\sigma$ ]  
OotOffset-rm: 0.214 arcsec [2.53 $\sigma$ ]  
KicOffset-rm: 0.104 arcsec [1.47 $\sigma$ ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/14]

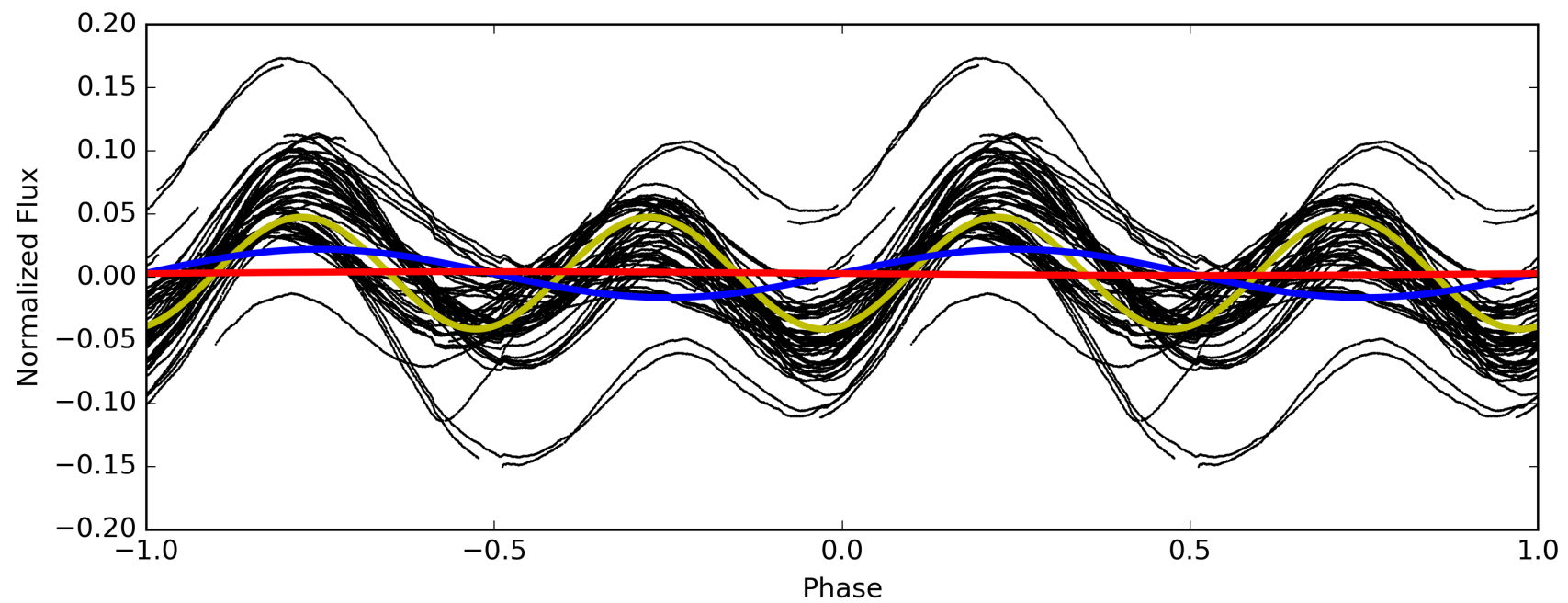
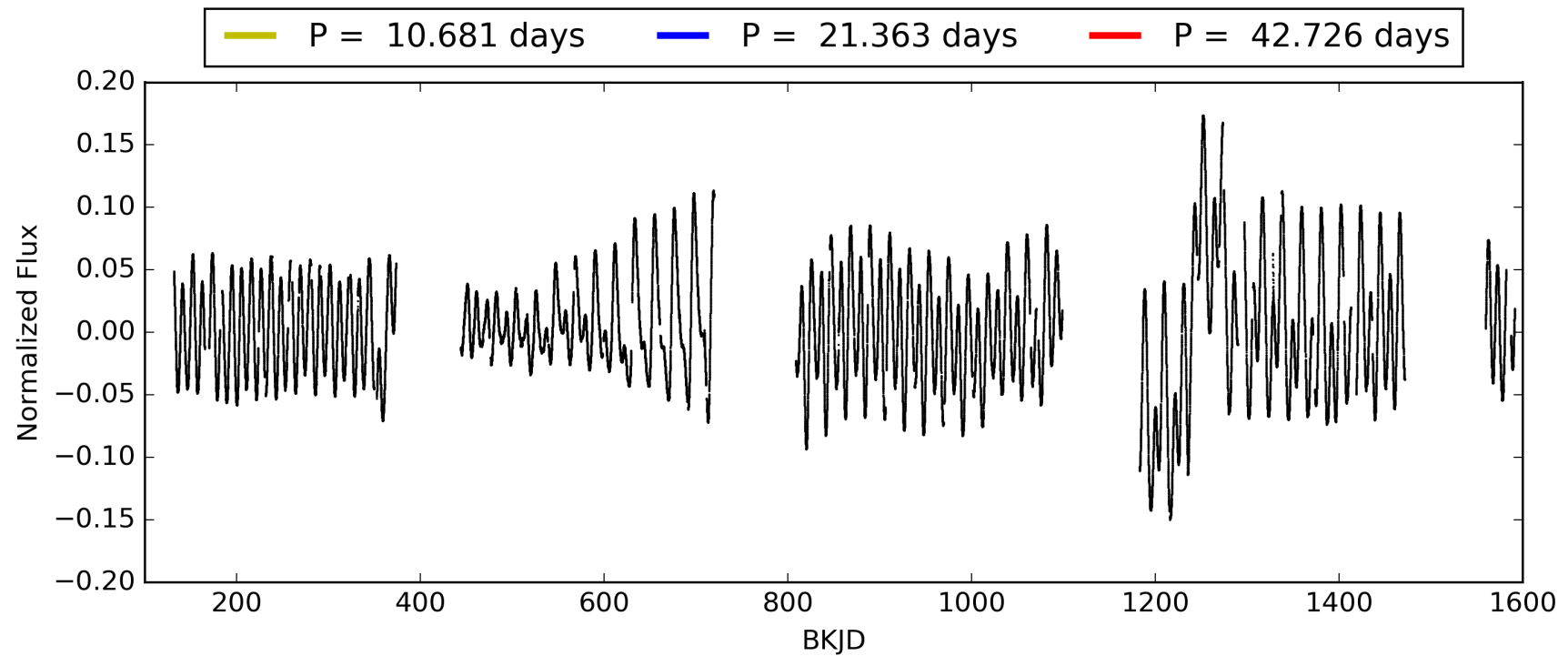
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:38:31 Z

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

# TCE 011284505-04, PDC Light Curves

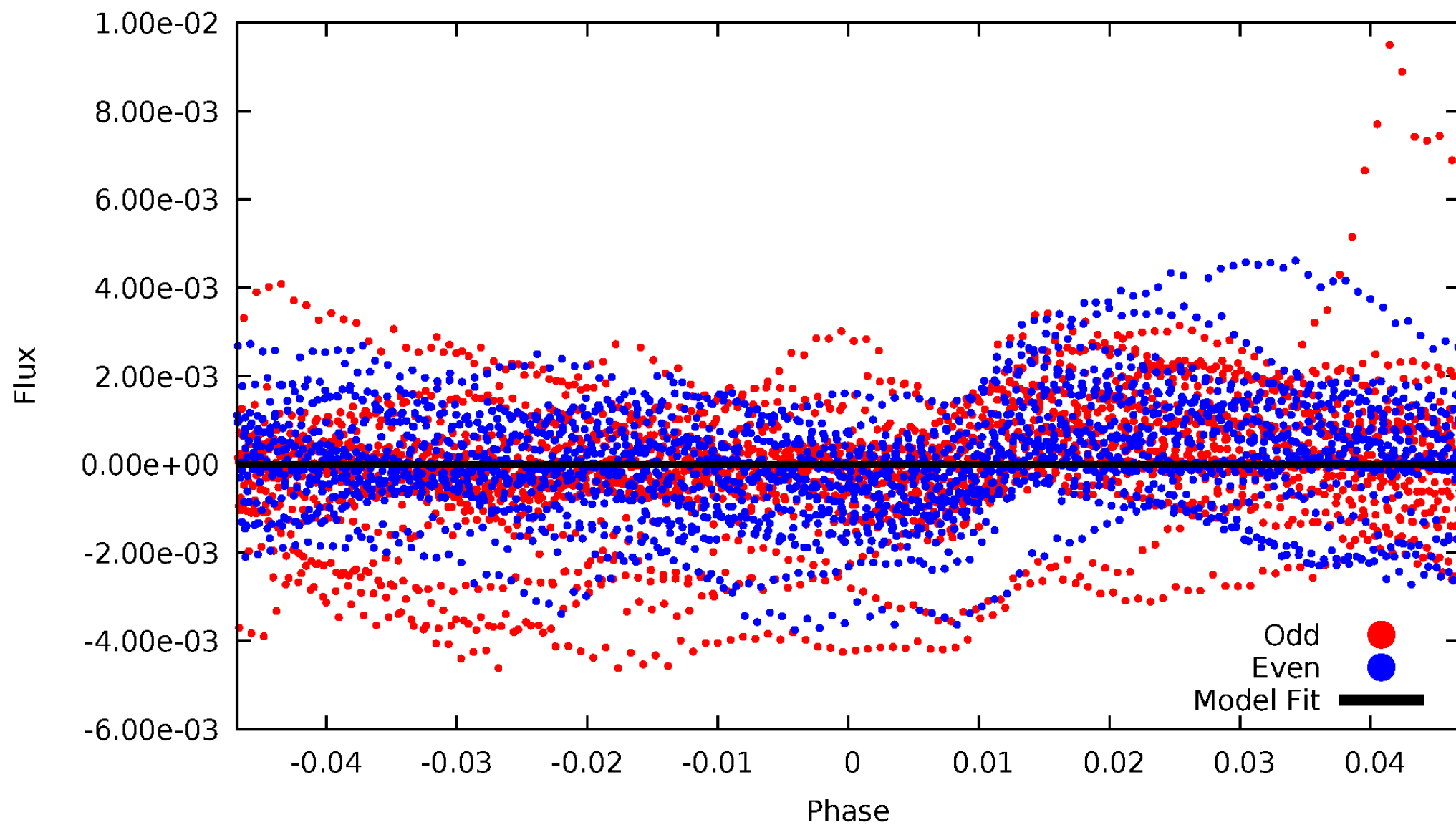


TCE 011284505-04



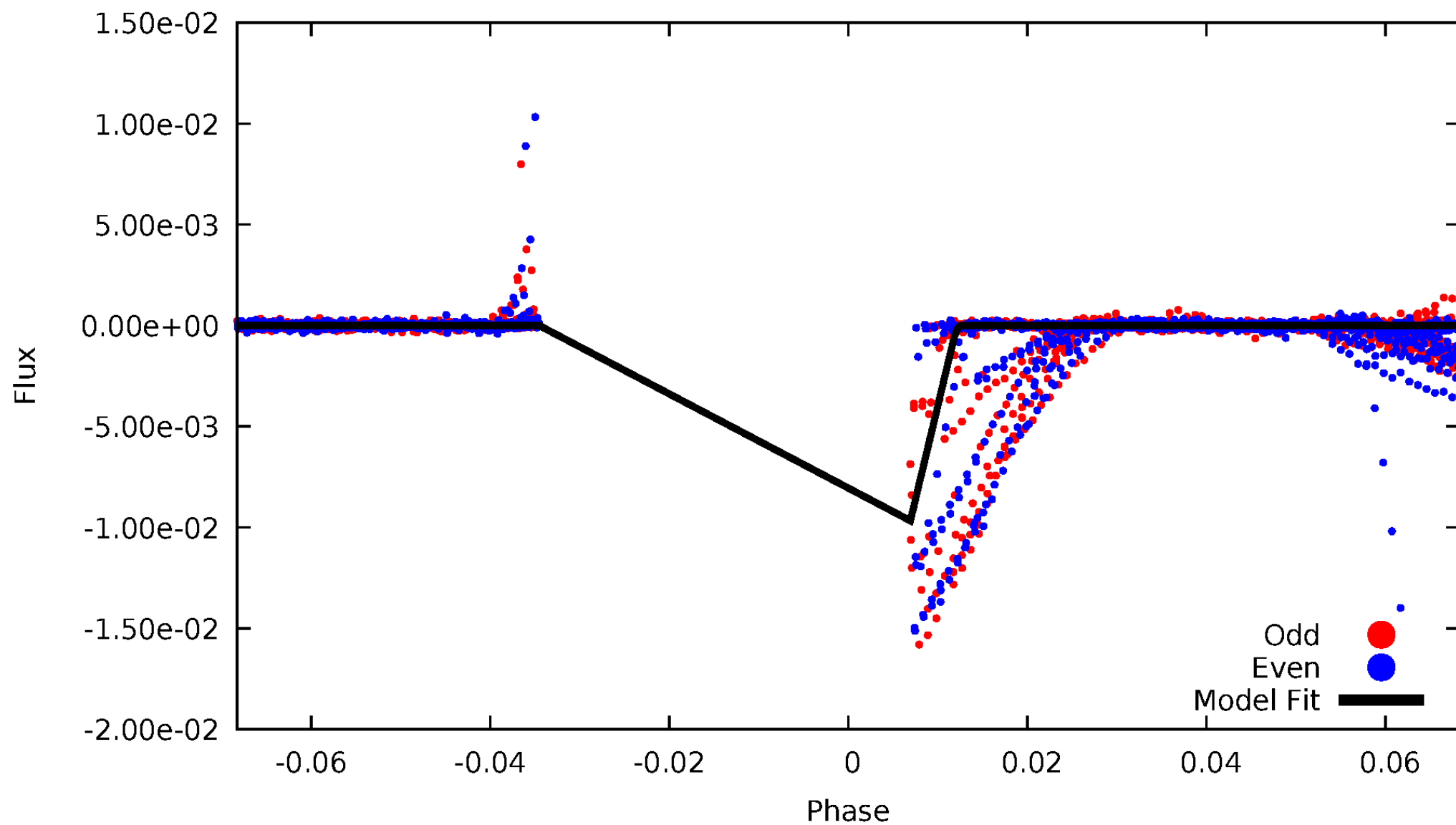
# DV Odd/Even

TCE 011284505-04



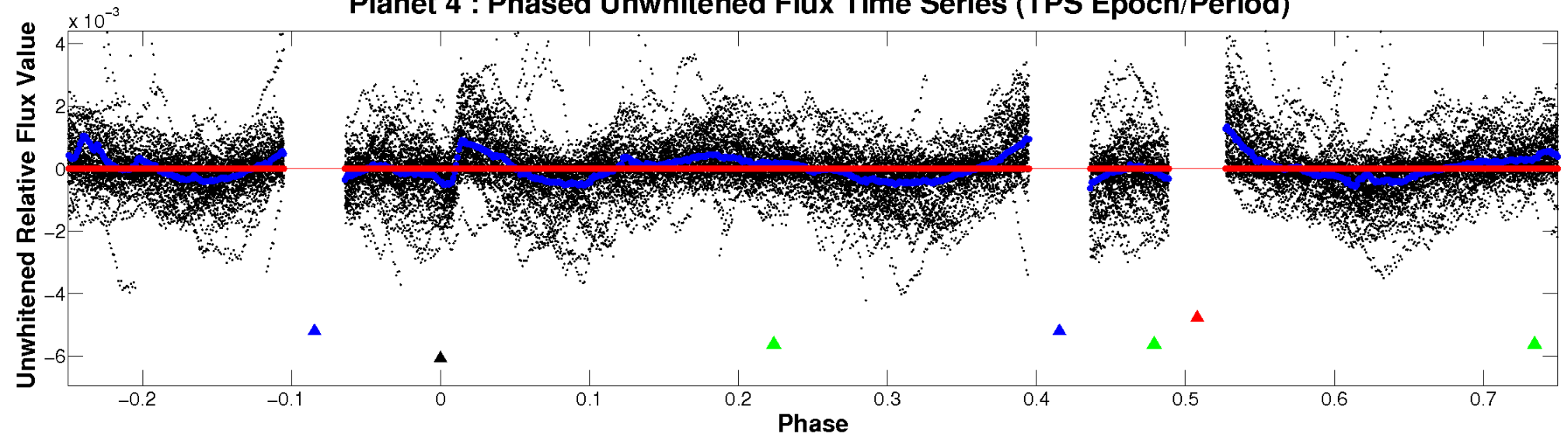
# ALT Odd/Even

TCE 011284505-04

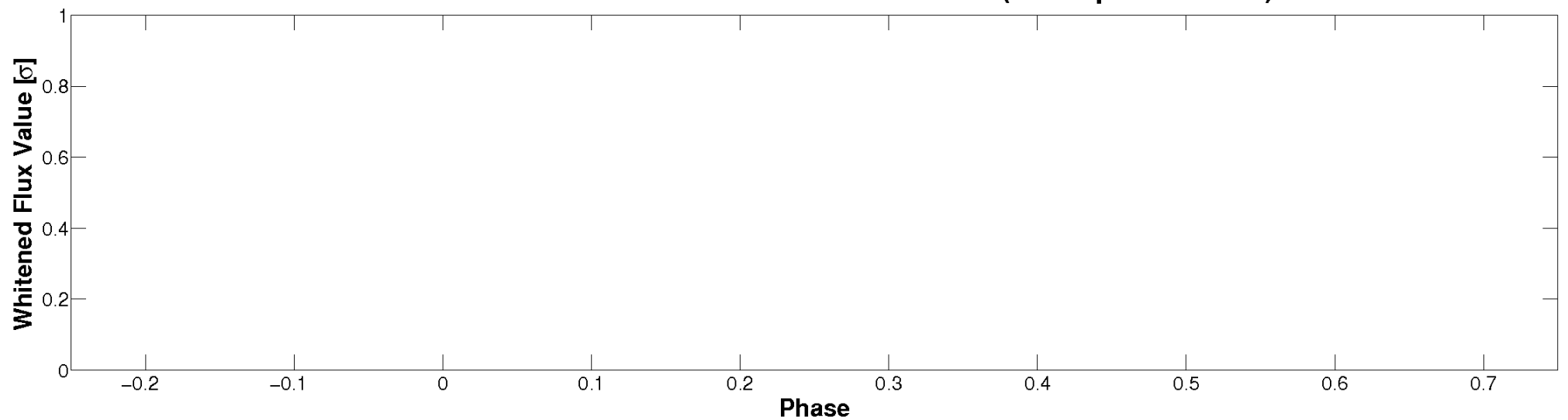


# Non-Whitened Vs. Whitened Light Curve

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

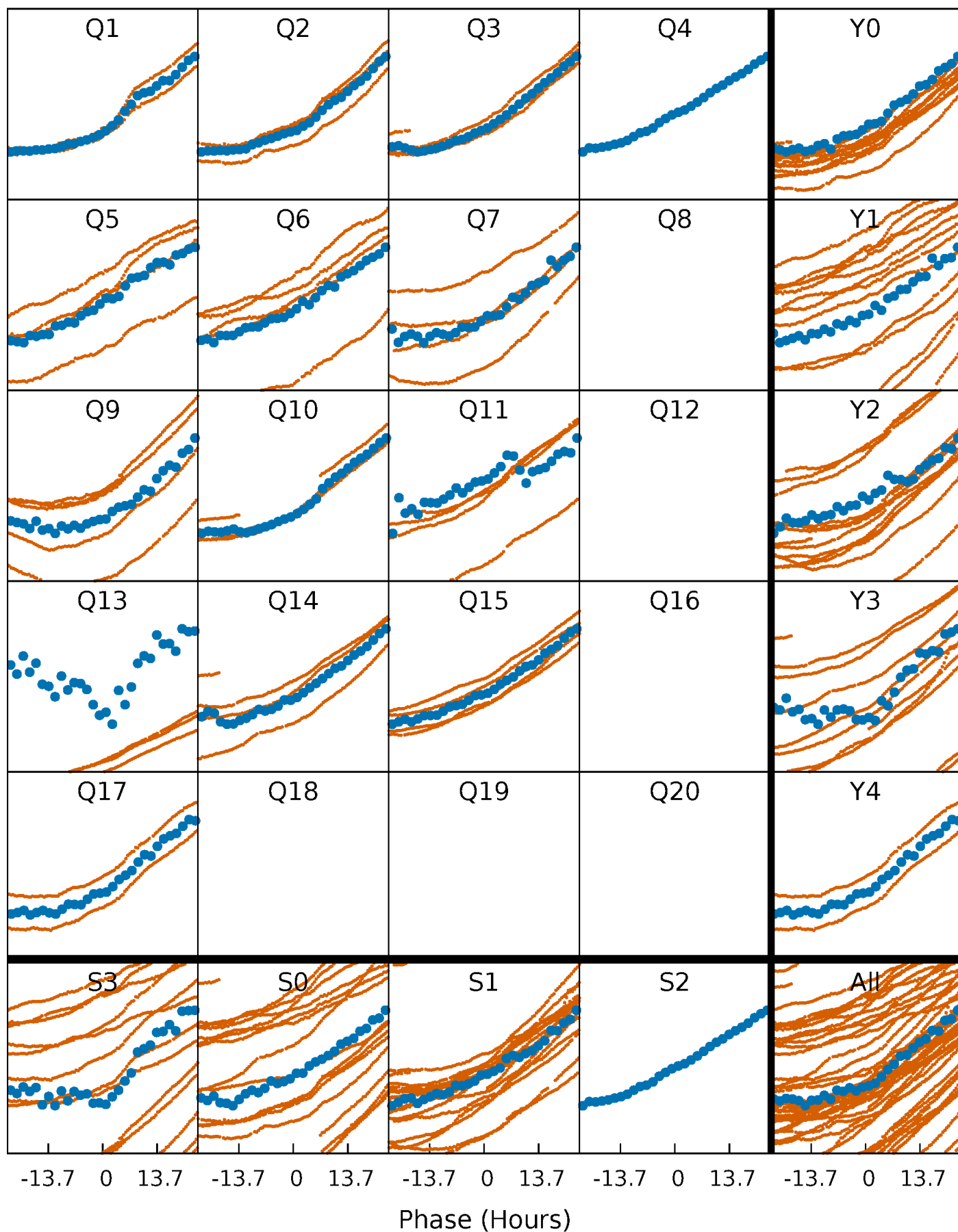


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

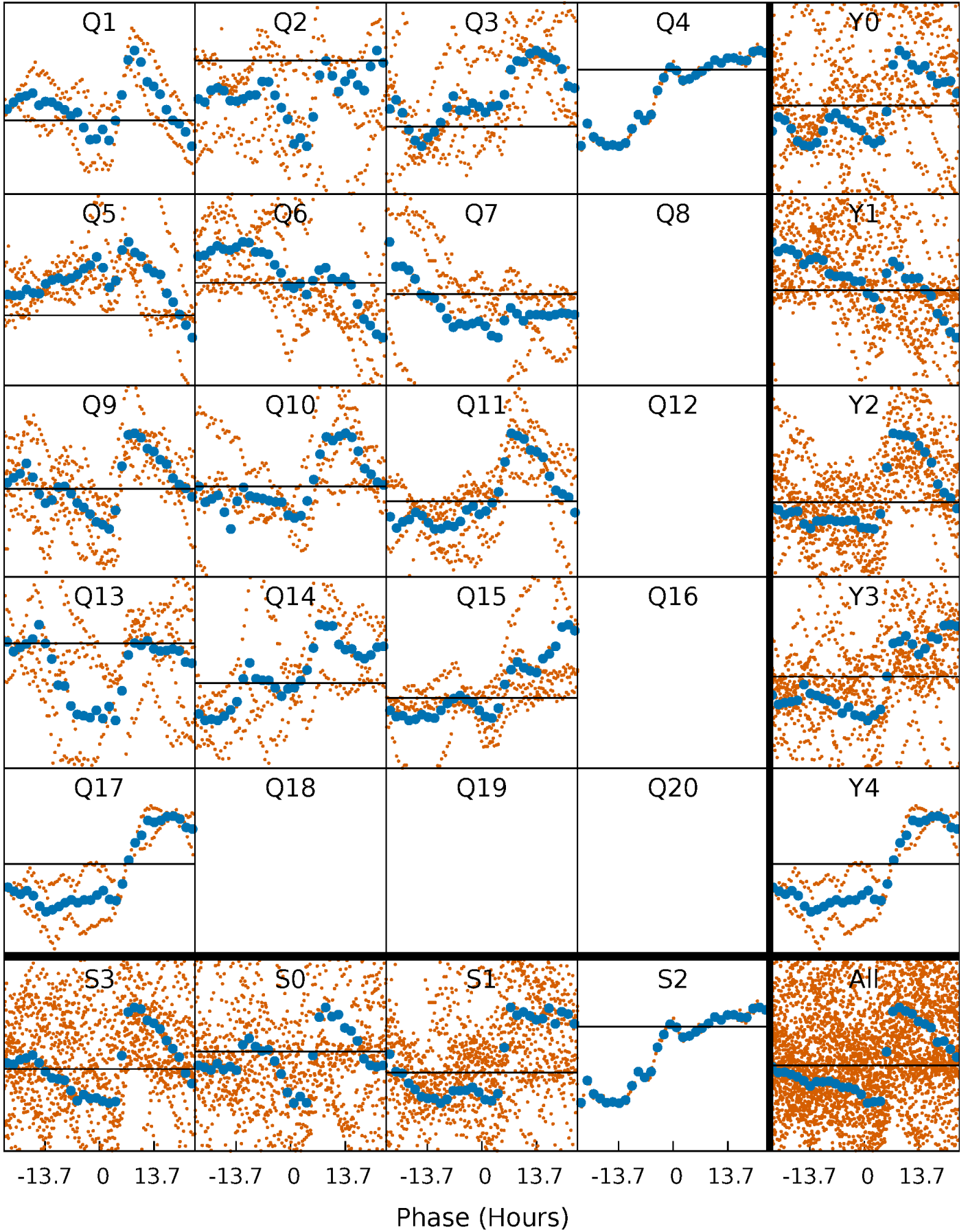
TCE 011284505-04   P= 21.362881 Days    $T_0=136.650034$  (BKJD)





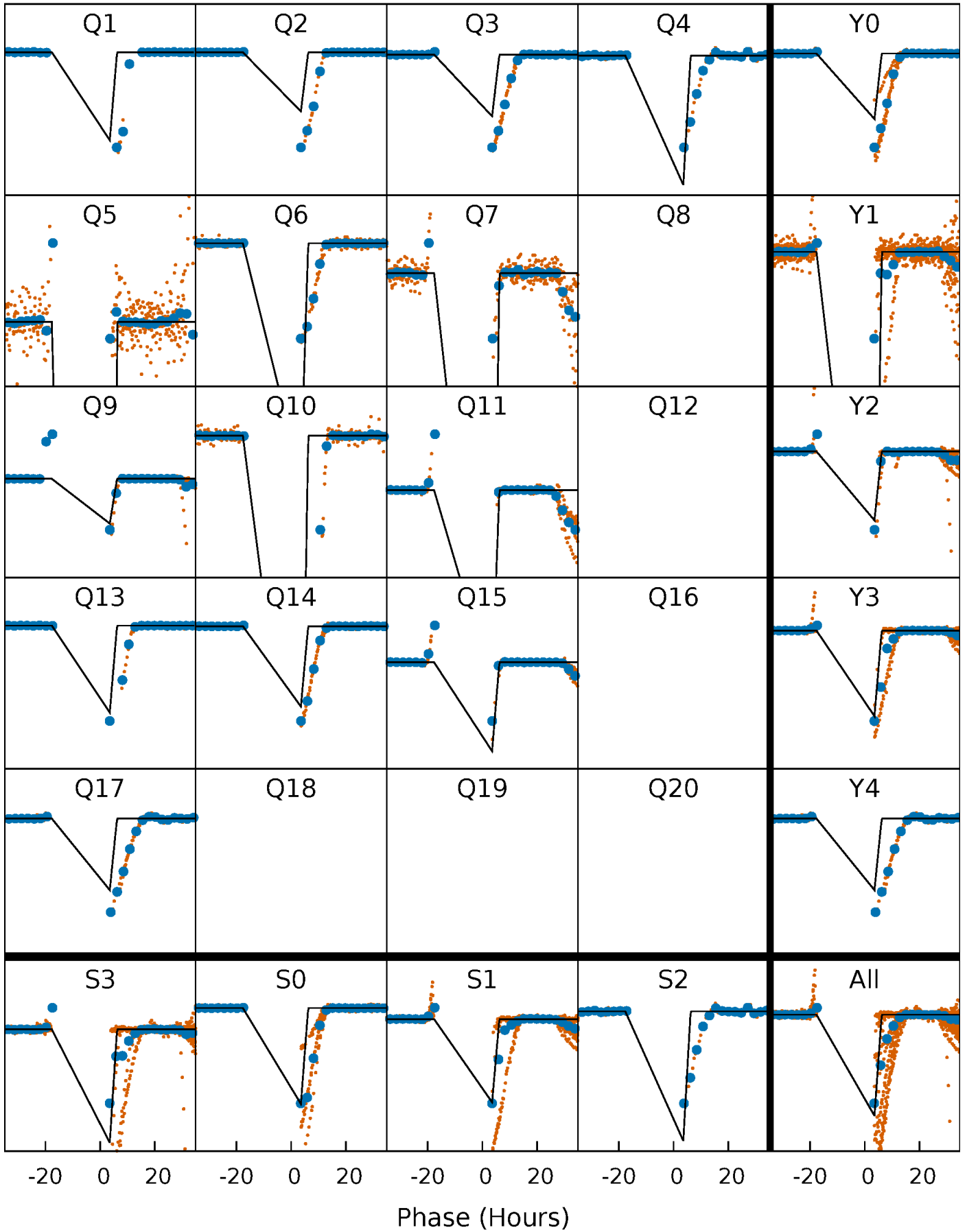
# DV Quarter-Phased Transit Curves

TCE 011284505-04 P= 21.362881 Days  $T_0=136.650034$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

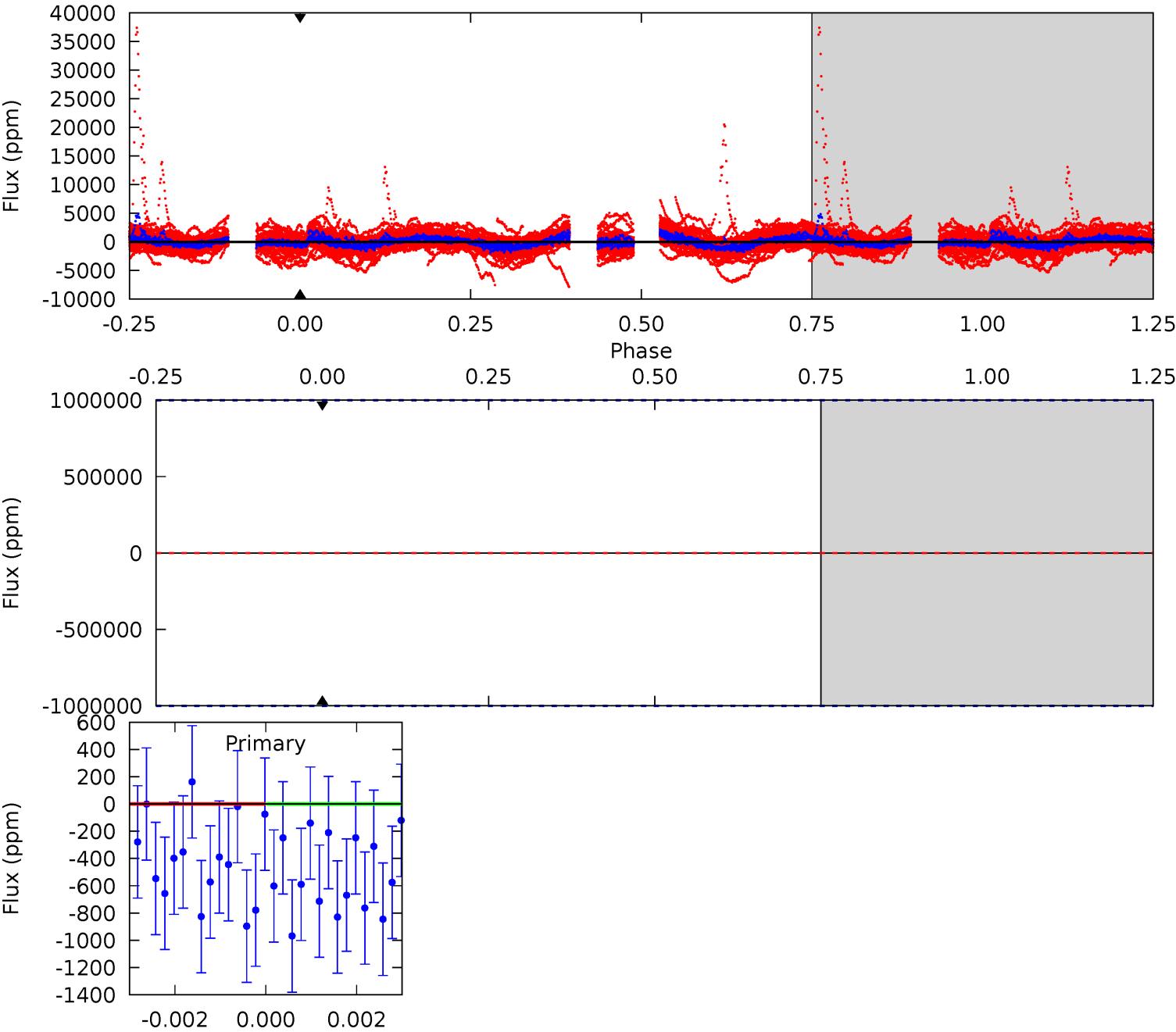
TCE 011284505-04   P= 21.362881 Days    $T_0=135.136802$  (BKJD)



DV Model-Shift Uniqueness Test

011284505-04, P = 21.362881 Days, E = 115.287153 Days

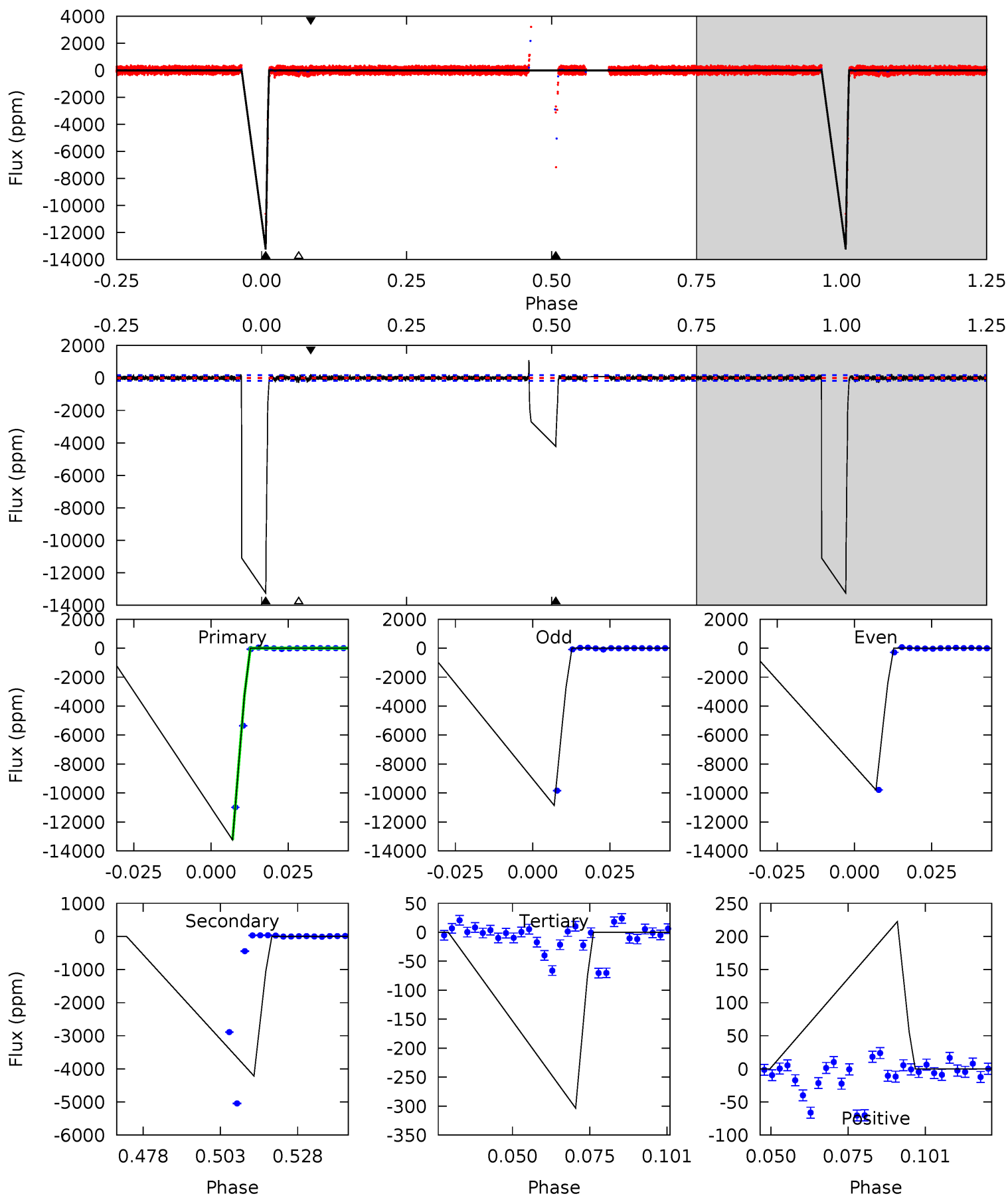
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

011284505-04, P = 21.362881 Days, E = 113.773921 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
374.3	119.2	8.58	6.29	4.85	2.24	2.86	365.7	368.0	110.6	112.9	9.50	1.42	0.08	0



### Stellar Parameters For KIC 011284505

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4837^{+120}_{-132}$	$2.558^{+0.469}_{-0.201}$	$-0.240^{+0.250}_{-0.250}$	$11.878^{+3.178}_{-5.901}$	$1.858^{+0.892}_{-0.811}$	$0.002^{+0.007}_{-0.001}$
	+2%/-3%	+18%/-8%	+104%/-104%	+27%/-50%	+48%/-44%	+438%/-51%
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 011284505-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$86.43^{+99.82}_{-59.57}$	$2348^{+220}_{-289}$	$4353^{+11795}_{-16480}$	$6.552^{+561.483}_{-329.499}$
Alt.	$-4217 \pm 35$	$151.40^{+138.04}_{-93.89}$	$2351^{+209}_{-305}$	$3763^{+1871}_{-729}$	$3.630^{+21.826}_{-2.557}$

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

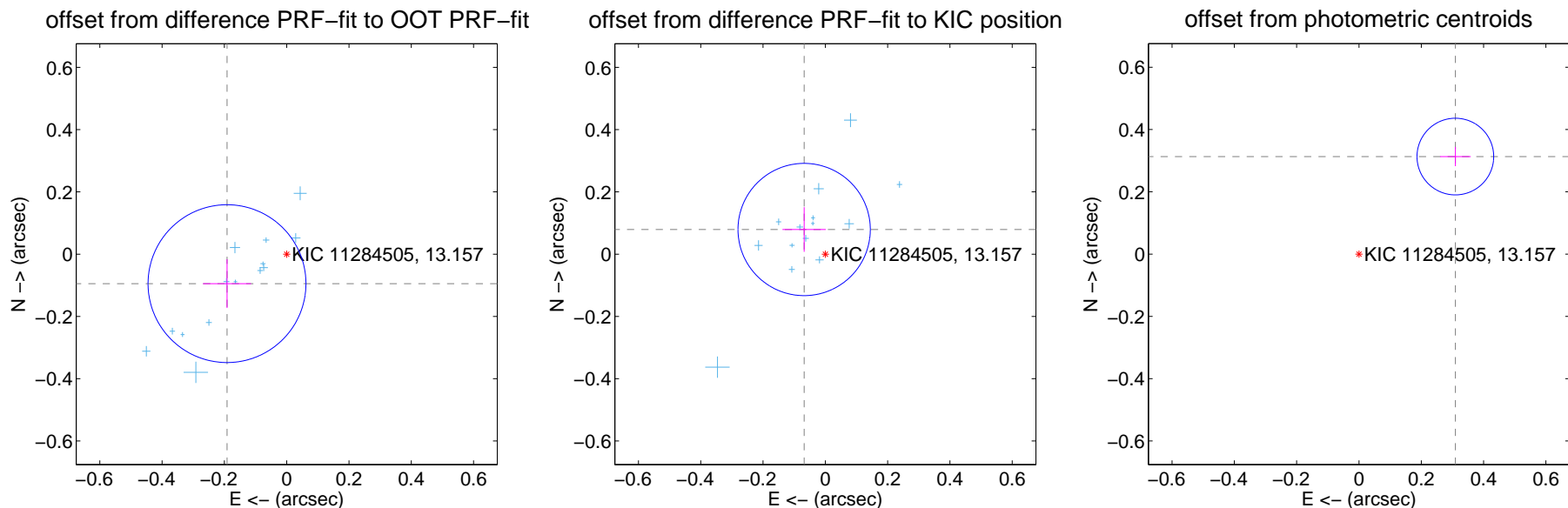
## DV Centroid Data

Supplemental centroid analysis for 011284505-04. Kepler magnitude: 13.16. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

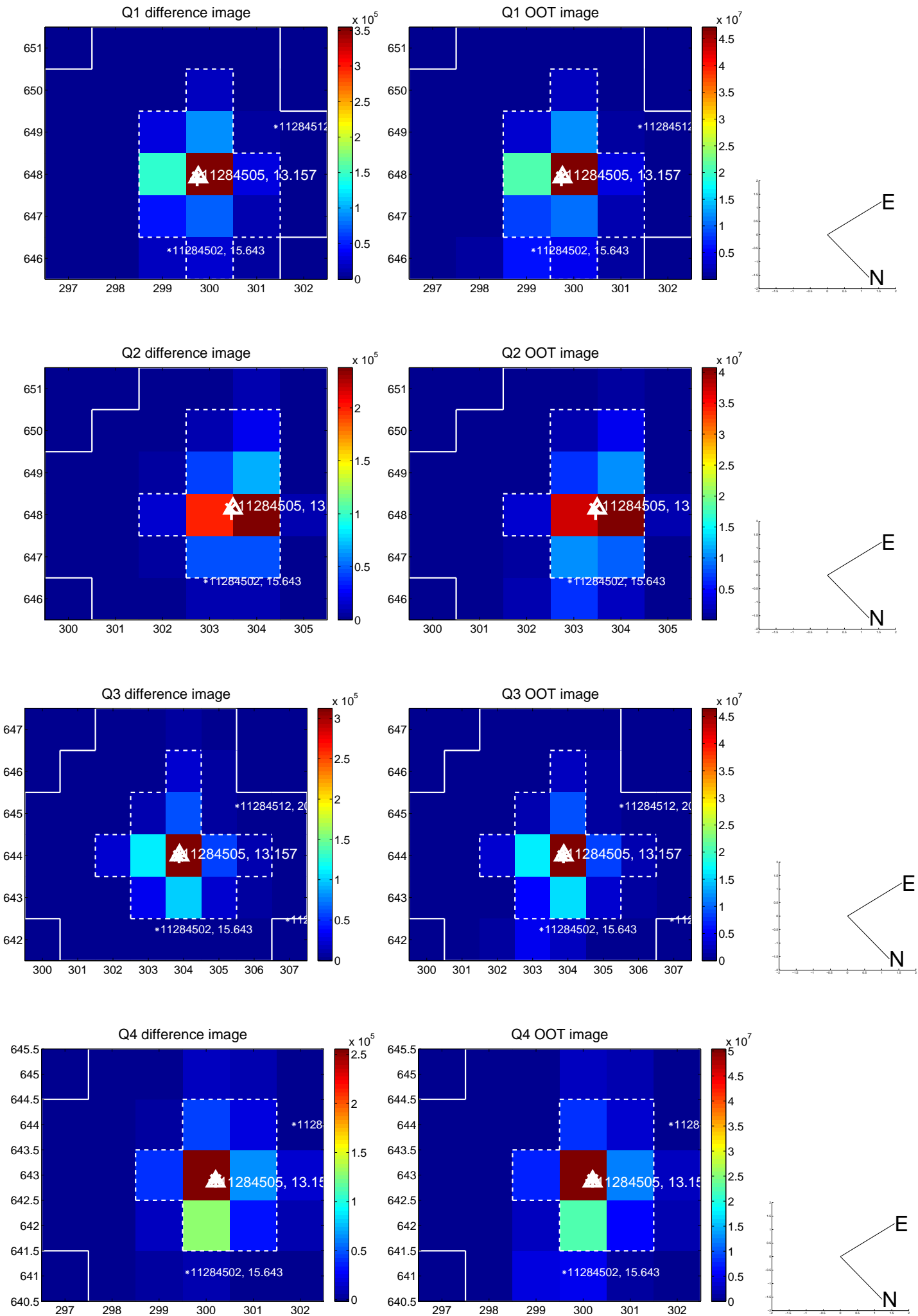
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.214 \pm 0.084$	2.53	$0.192 \pm 0.077$	$-0.095 \pm 0.078$
PRF-fit source offset from KIC position	$0.104 \pm 0.071$	1.47	$0.068 \pm 0.070$	$0.079 \pm 0.072$
photometric centroid source offset	$0.44 \pm 0.04$	10.73	$-0.31 \pm 0.05$	$0.31 \pm 0.03$

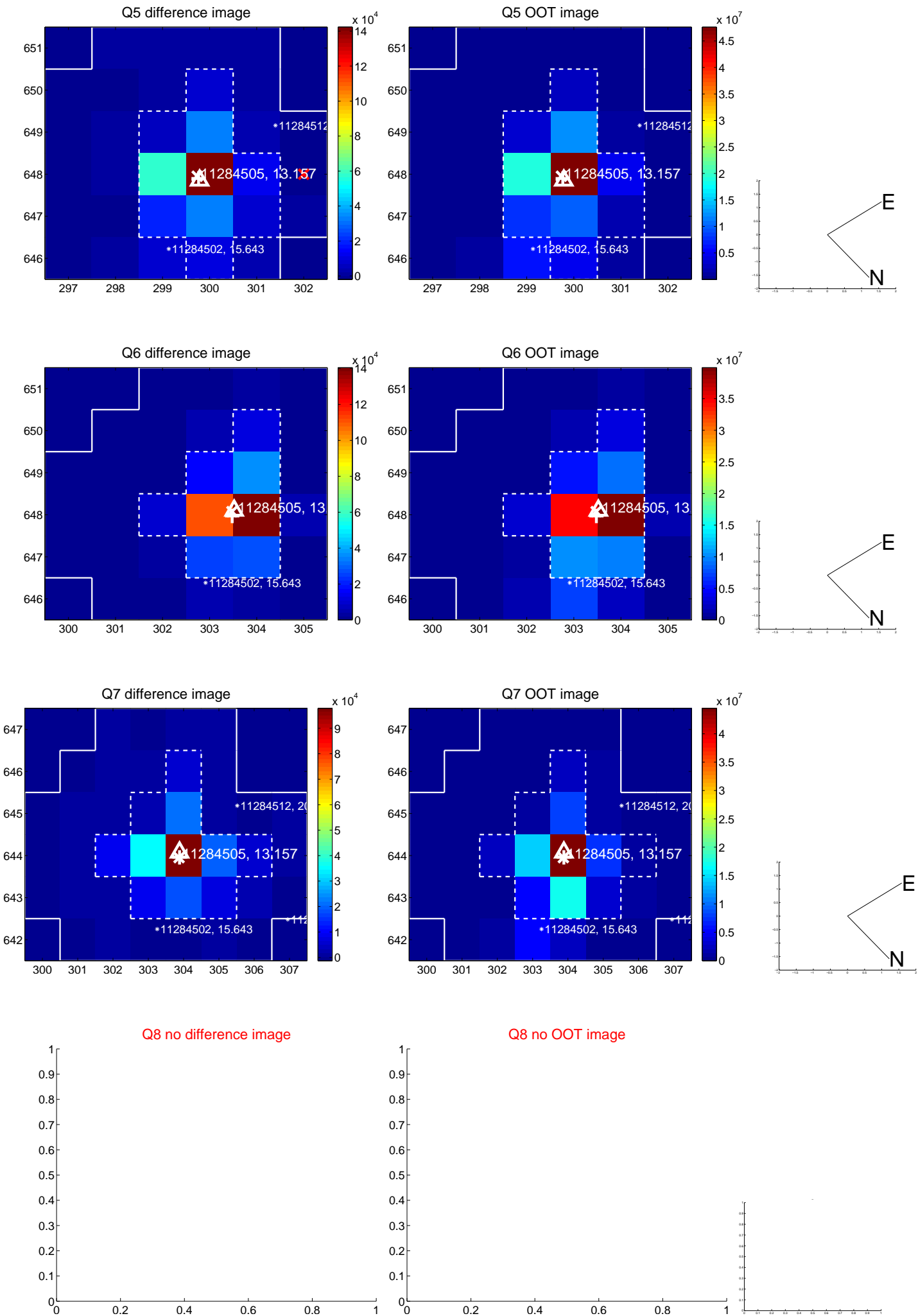


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

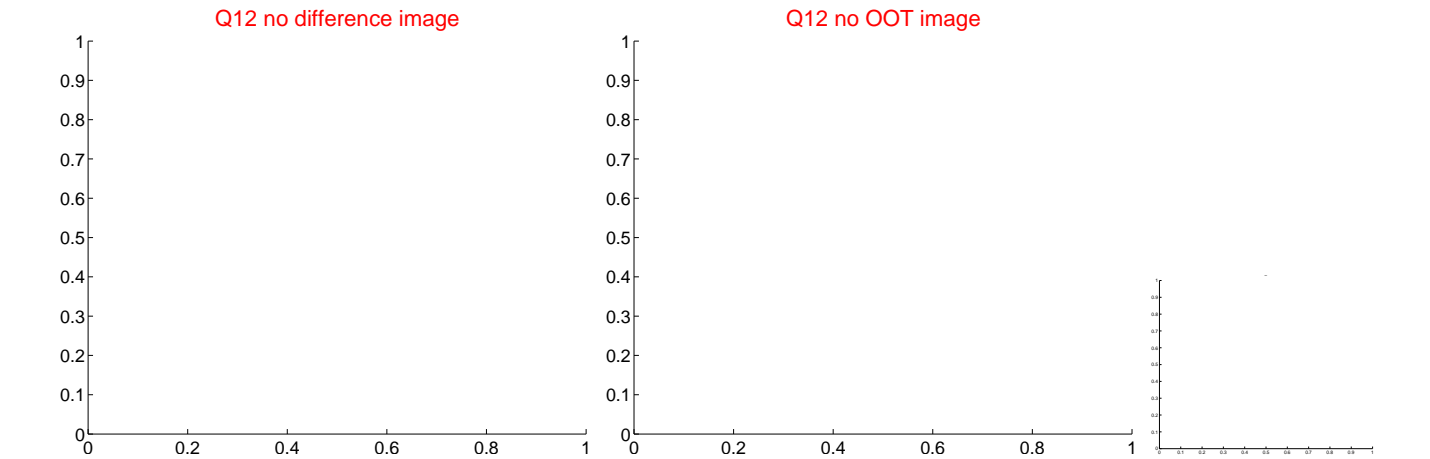
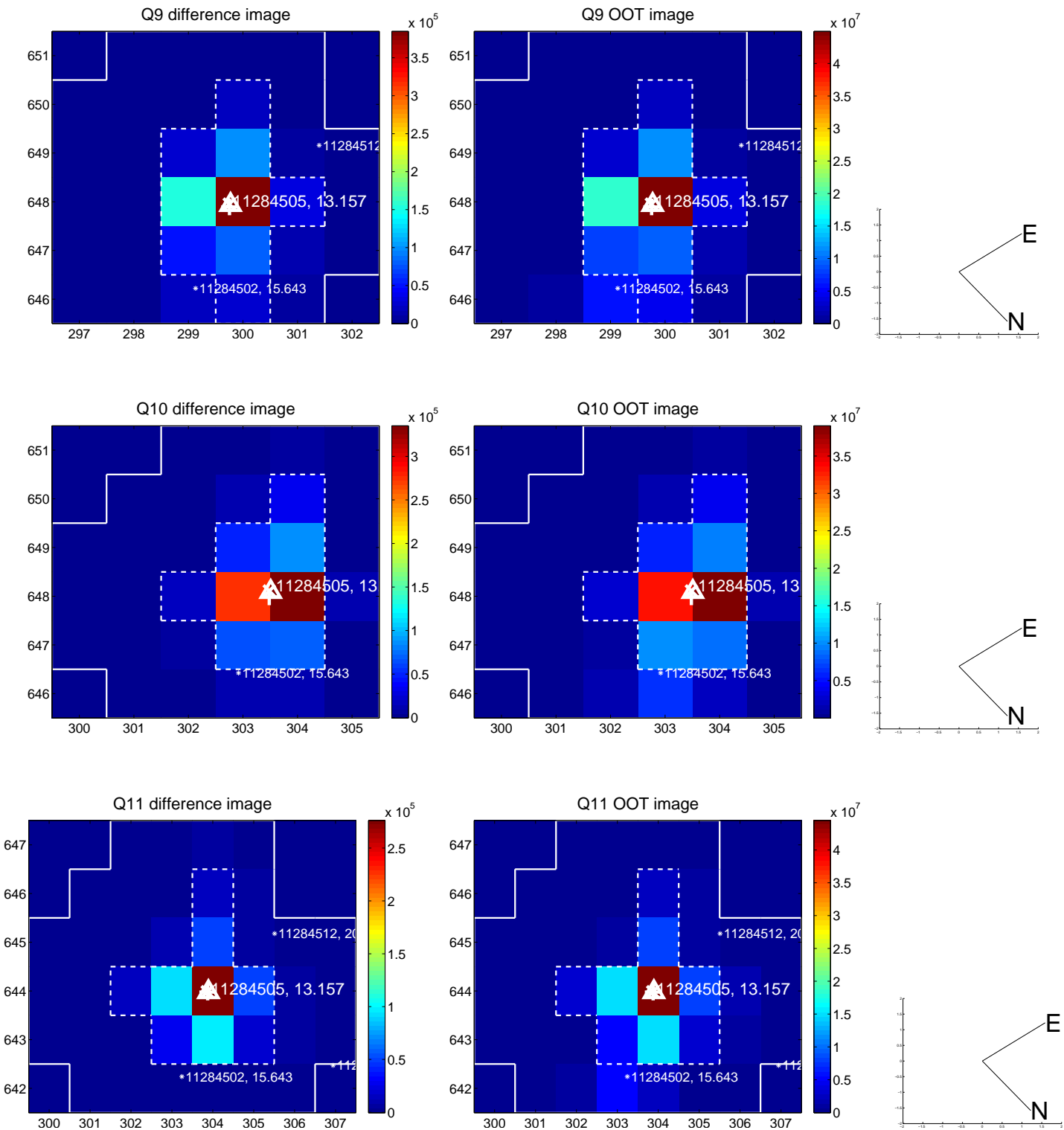


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

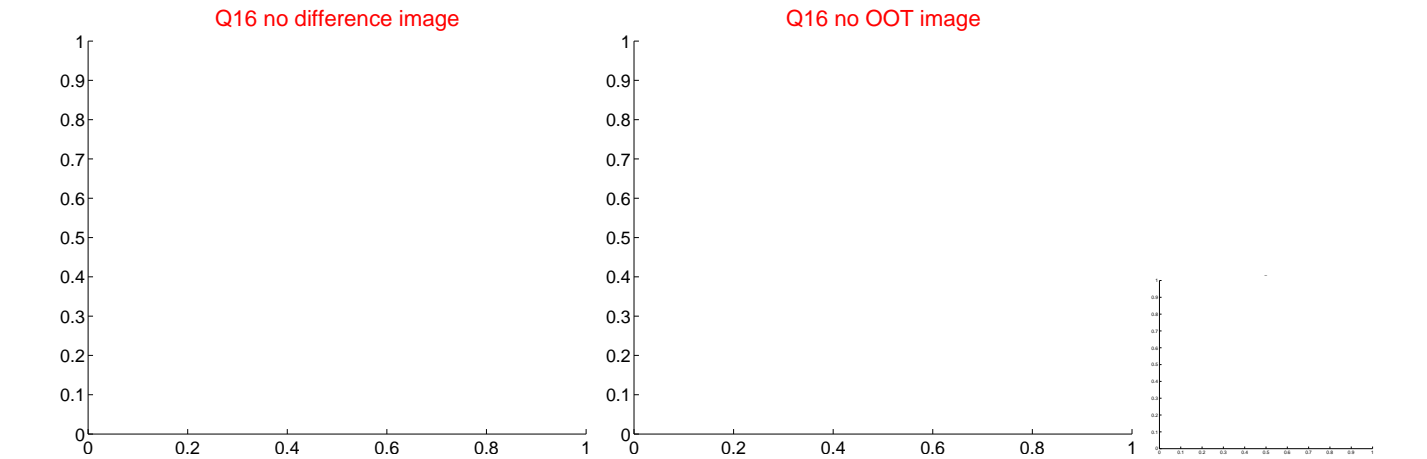
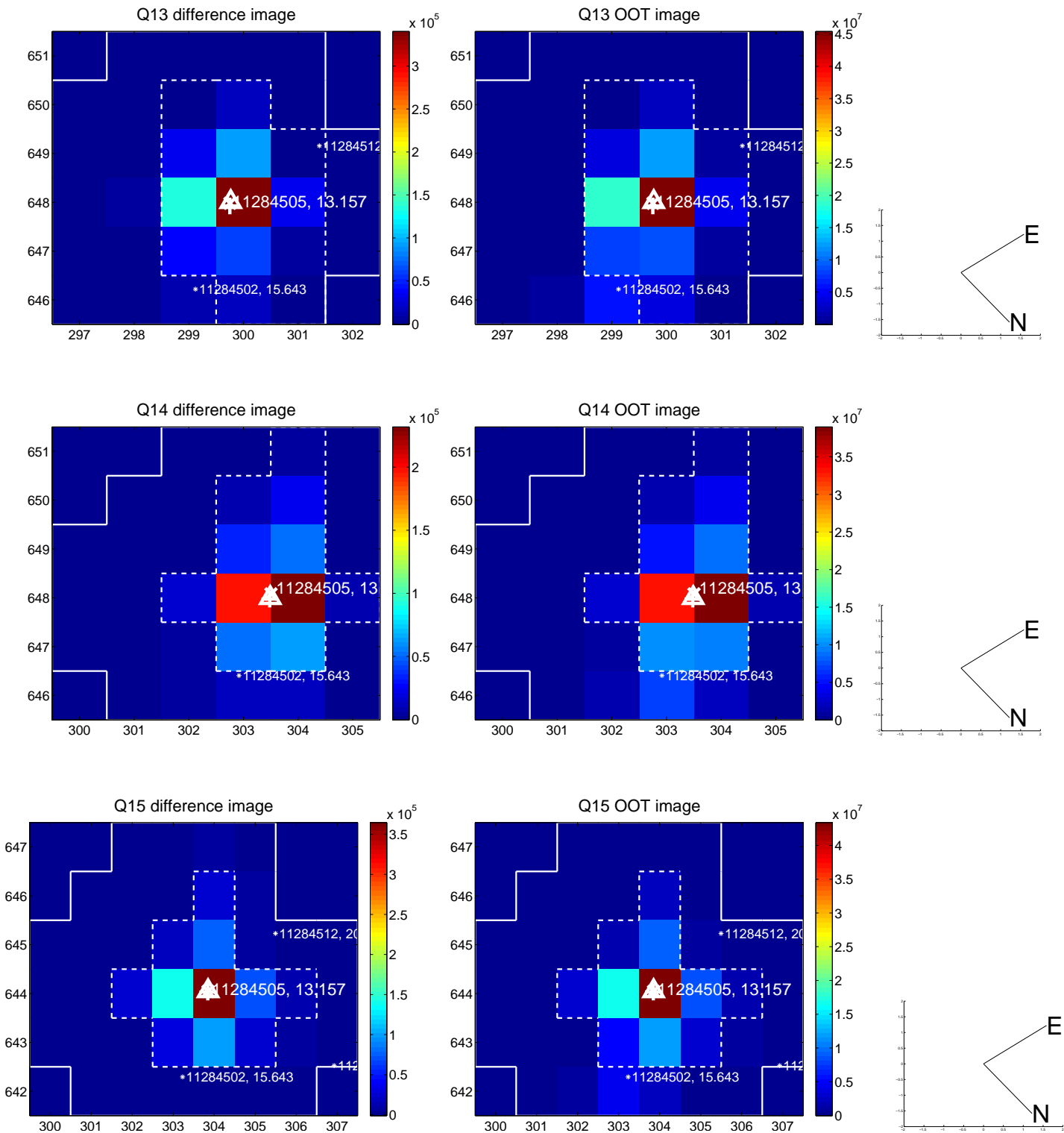




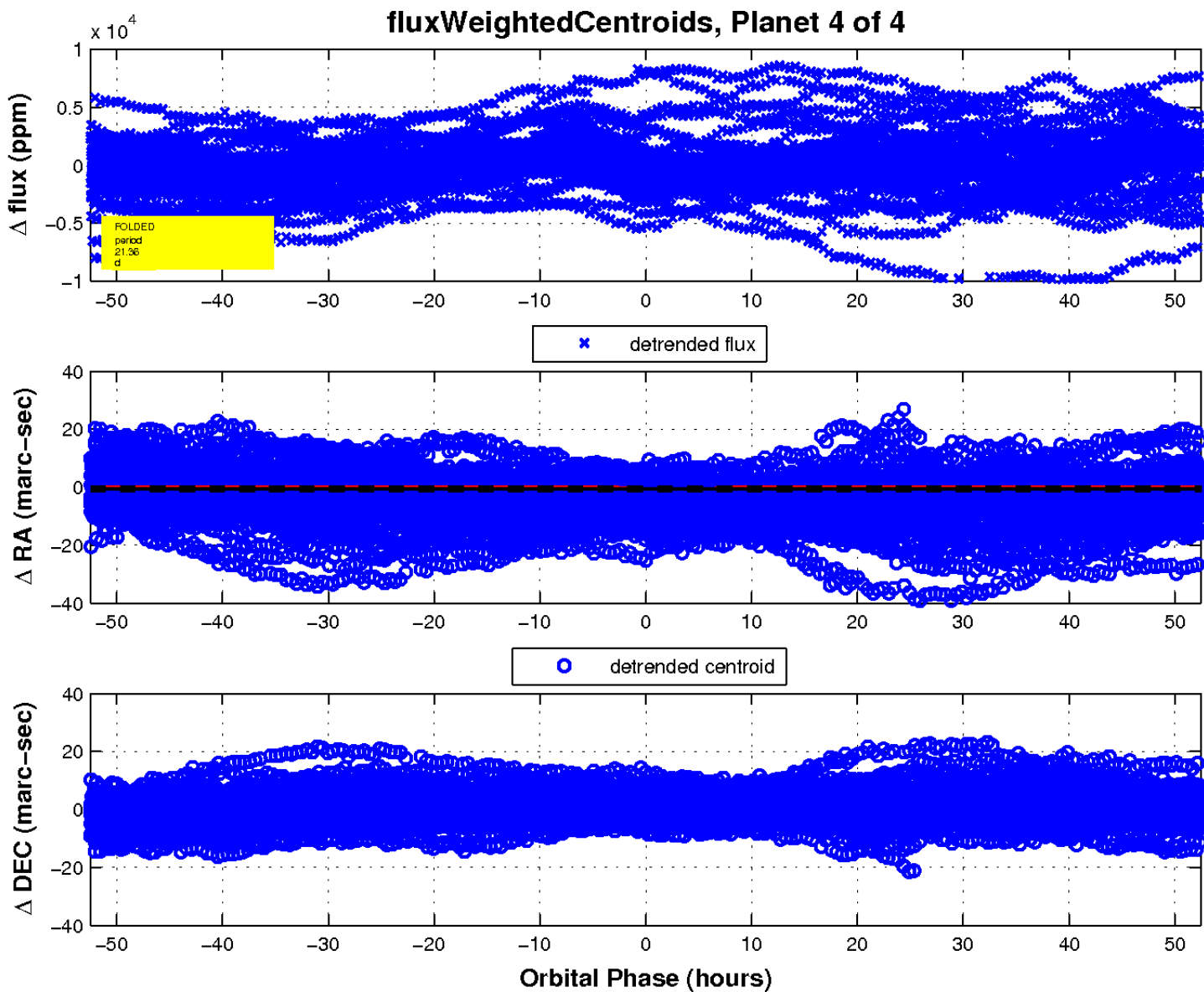
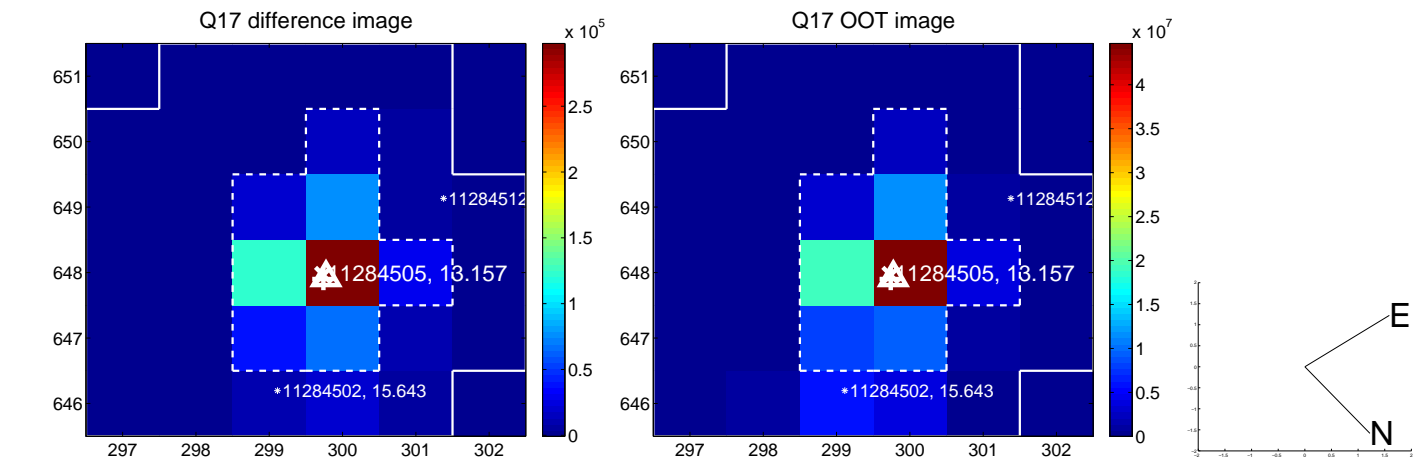
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

