

# KIC 002984505

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002984505-01	OBS	No	1.524891	132.639693	30.6	6.672	7.2	9.2	1.54	6663	0.86	5206.66
002984505-02	OBS	No	122.151172	149.046526	186.8	9.774	8.4	3.5	1.54	6663	2.61	15.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002984505-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002984505-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

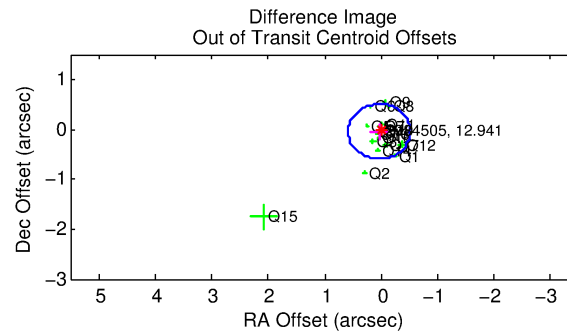
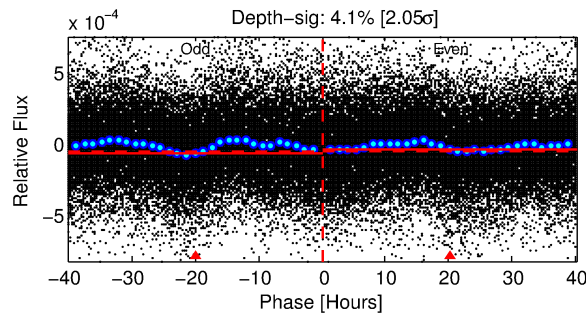
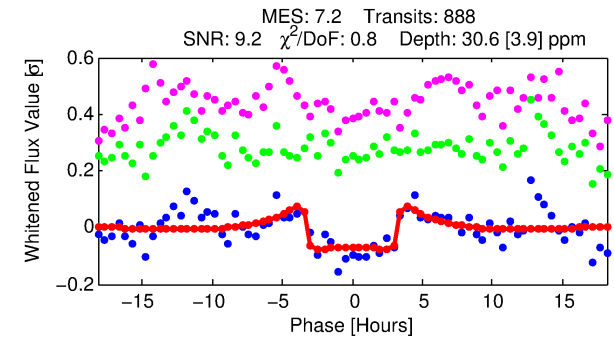
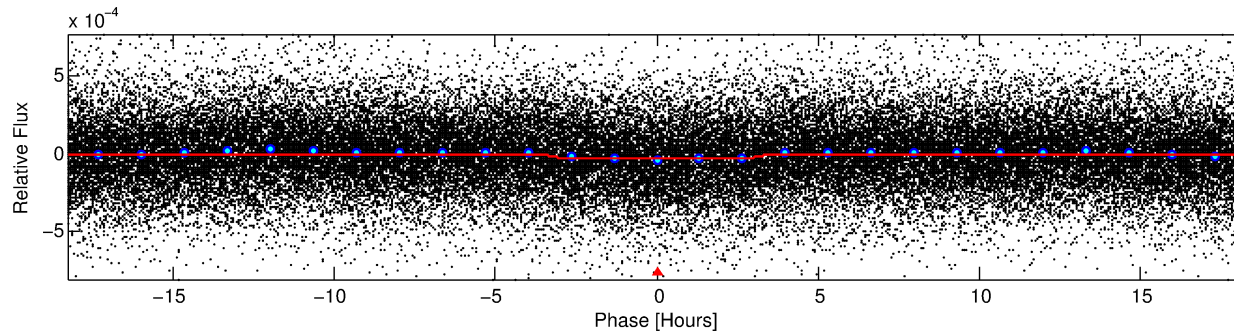
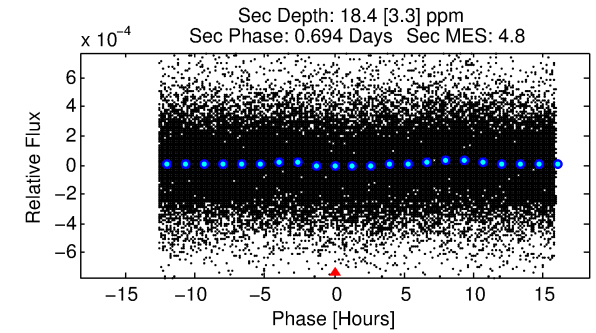
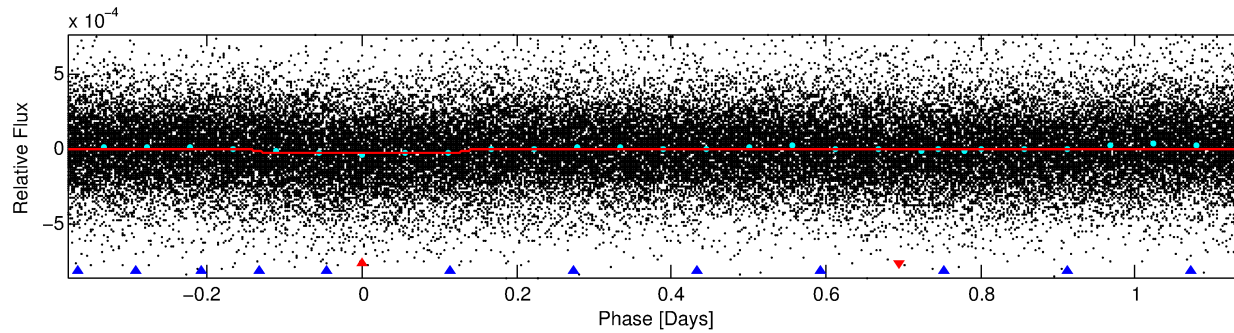
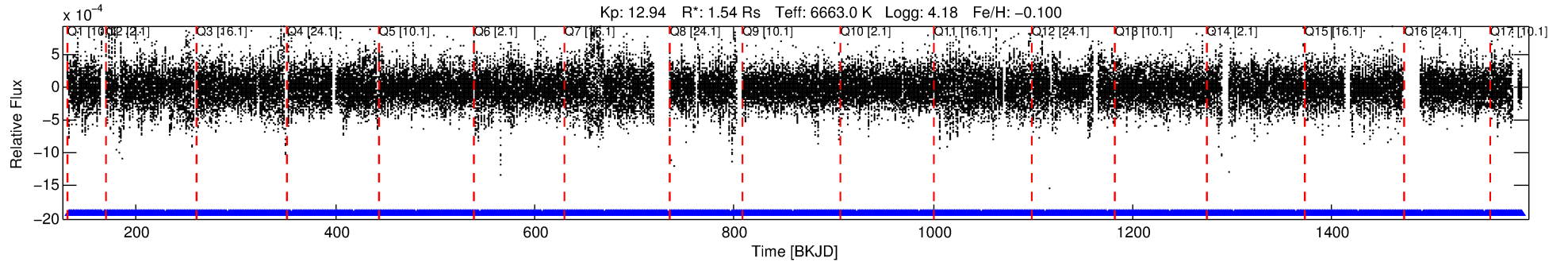
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002984505-01

No Significant Match Found

# DV One-Page Summary

KIC: 2984505 Candidate: 1 of 2 Period: 1.525 d



## DV Fit Results:

Period = 1.52489 [0.00001] d  
Epoch = 132.6397 [0.0034] BKJD  
Rp/R\* = 0.0051 [0.0032]  
a/R\* = 1.85 [4.51]  
b = 0.01 [251.63]  
Seff = 5206.66 [1139.76]  
Teq = 2166 [119] K  
Rp = 0.86 [0.57] Re  
a = 0.0283 [0.0042] AU  
Ag = 11.09 [14.43] [0.70σ]  
Teffp = 6112 [1963] K [2.01σ]

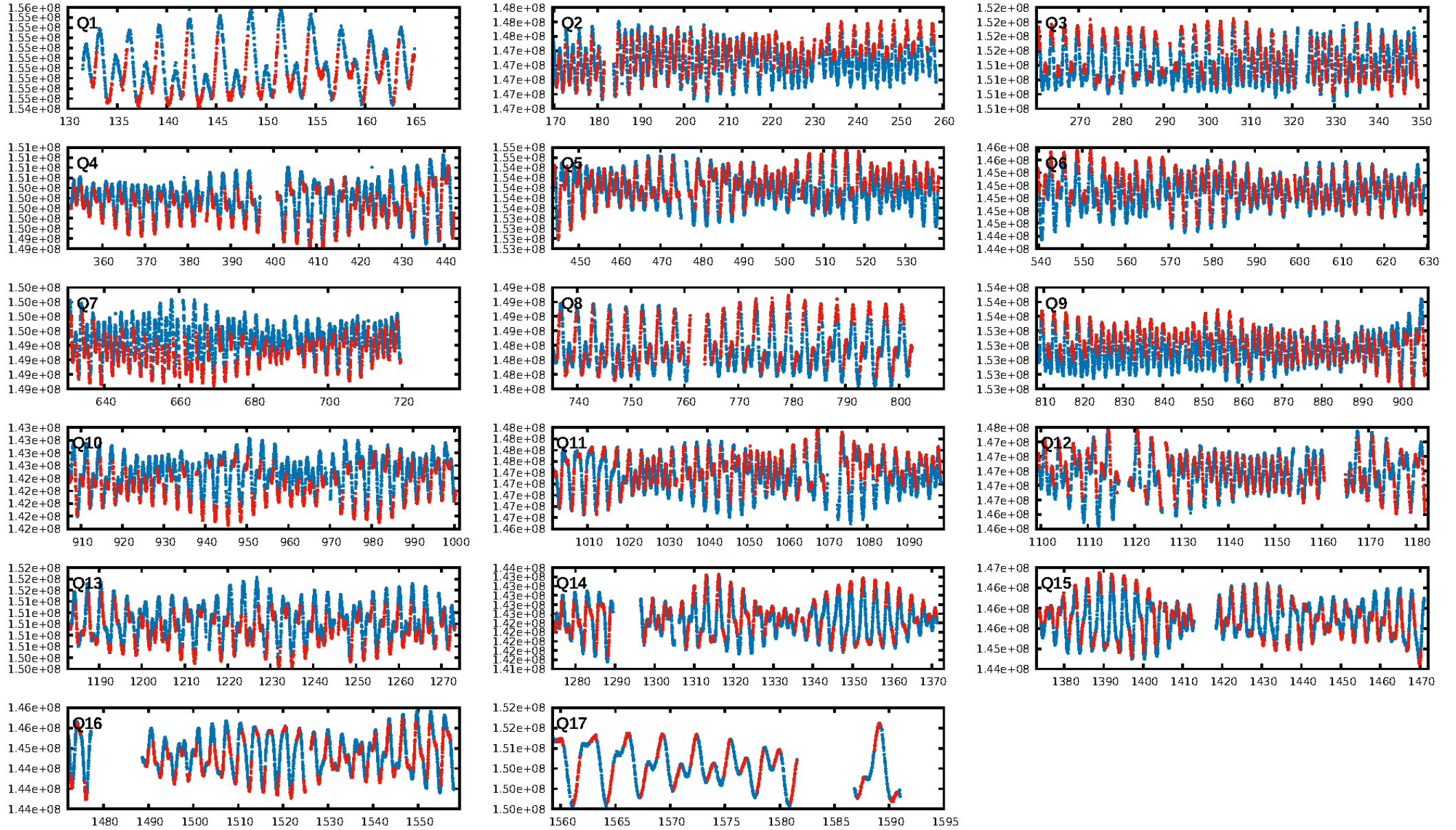
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [244.64σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 2.44e-11**  
RollingBand-fgt: 1.00 [848/848]  
GhostDiagnostic-chr: 1.02  
Centroid-sig: 18.4%  
Centroid-so: 0.783 arcsec [1.27σ]  
OotOffset-rm: 0.059 arcsec [0.32σ]  
KicOffset-rm: 0.088 arcsec [0.53σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.35 [6/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:07:16 Z

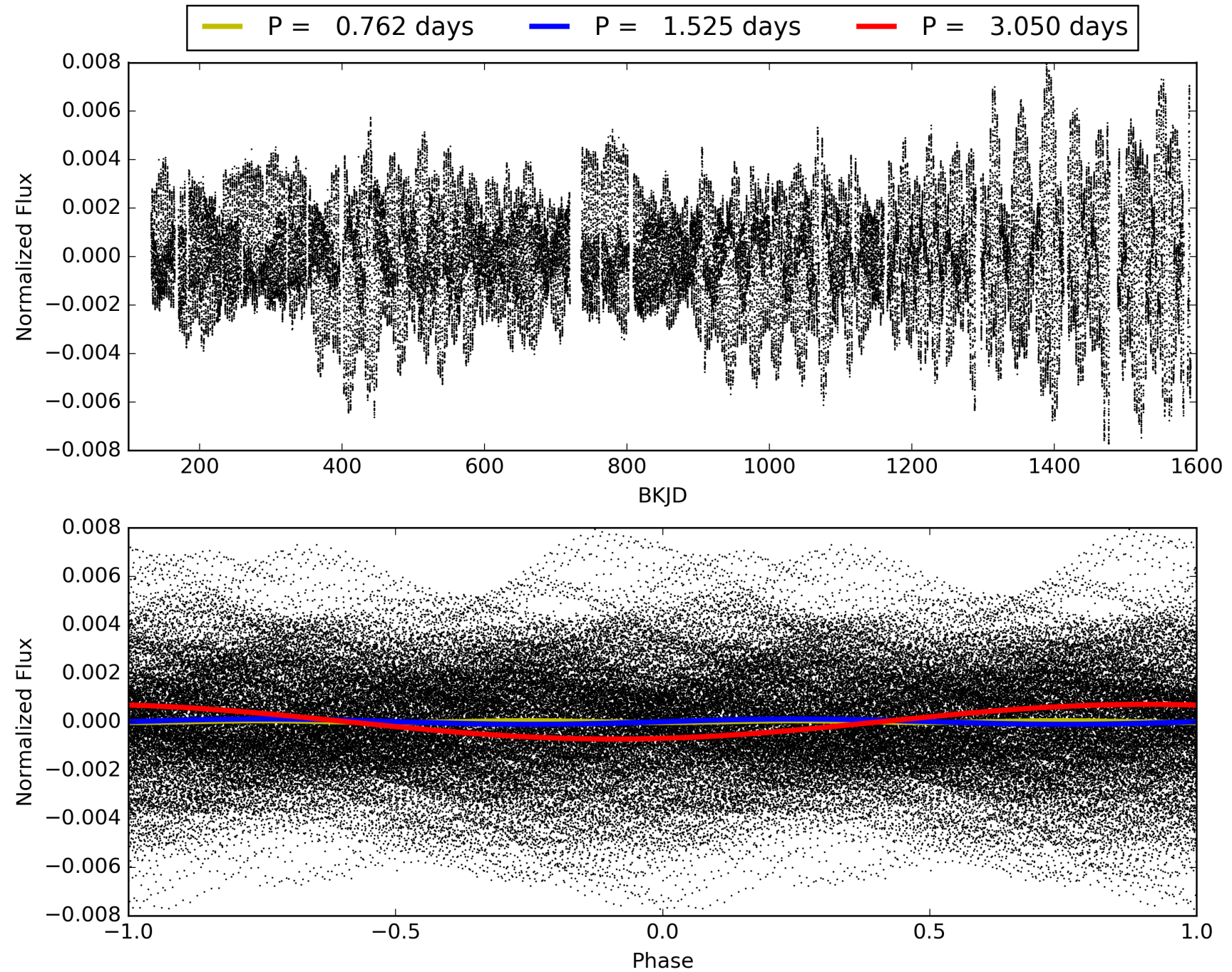
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002984505-01, PDC Light Curves



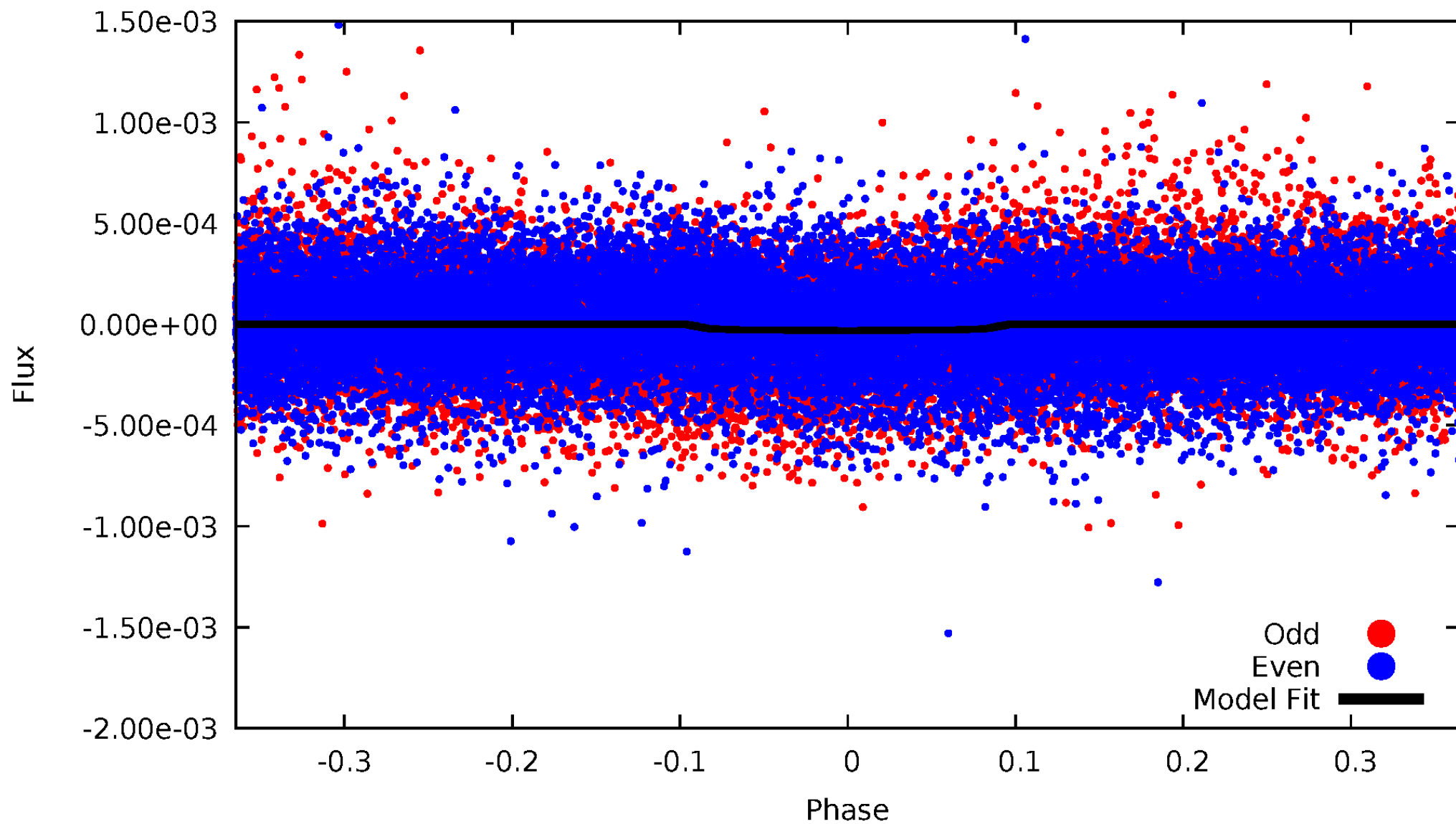


TCE 002984505-01



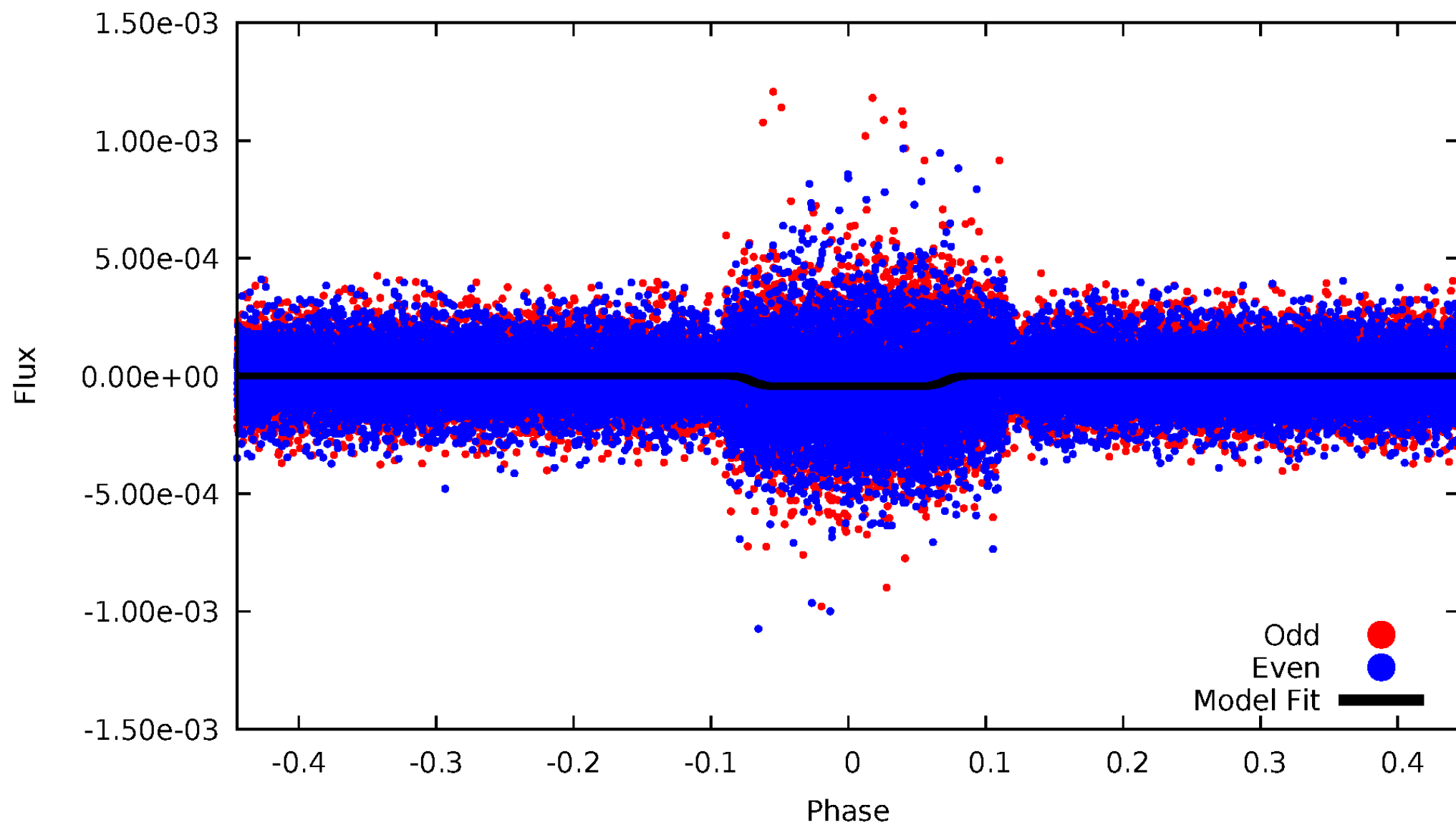
# DV Odd/Even

TCE 002984505-01



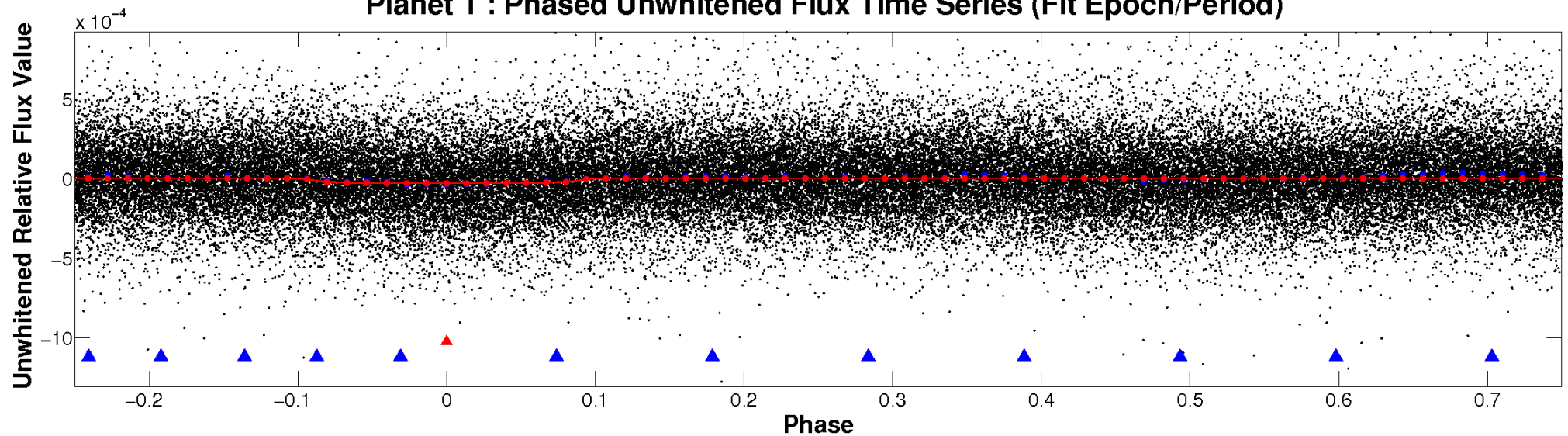
# ALT Odd/Even

TCE 002984505-01

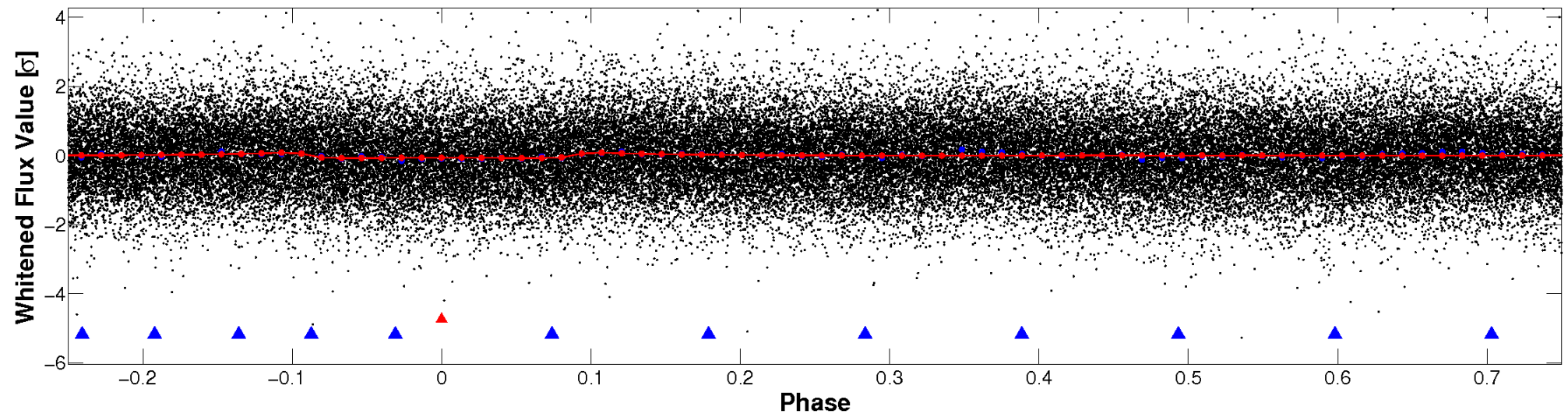


# Non-Whitened Vs. Whitened Light Curve

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



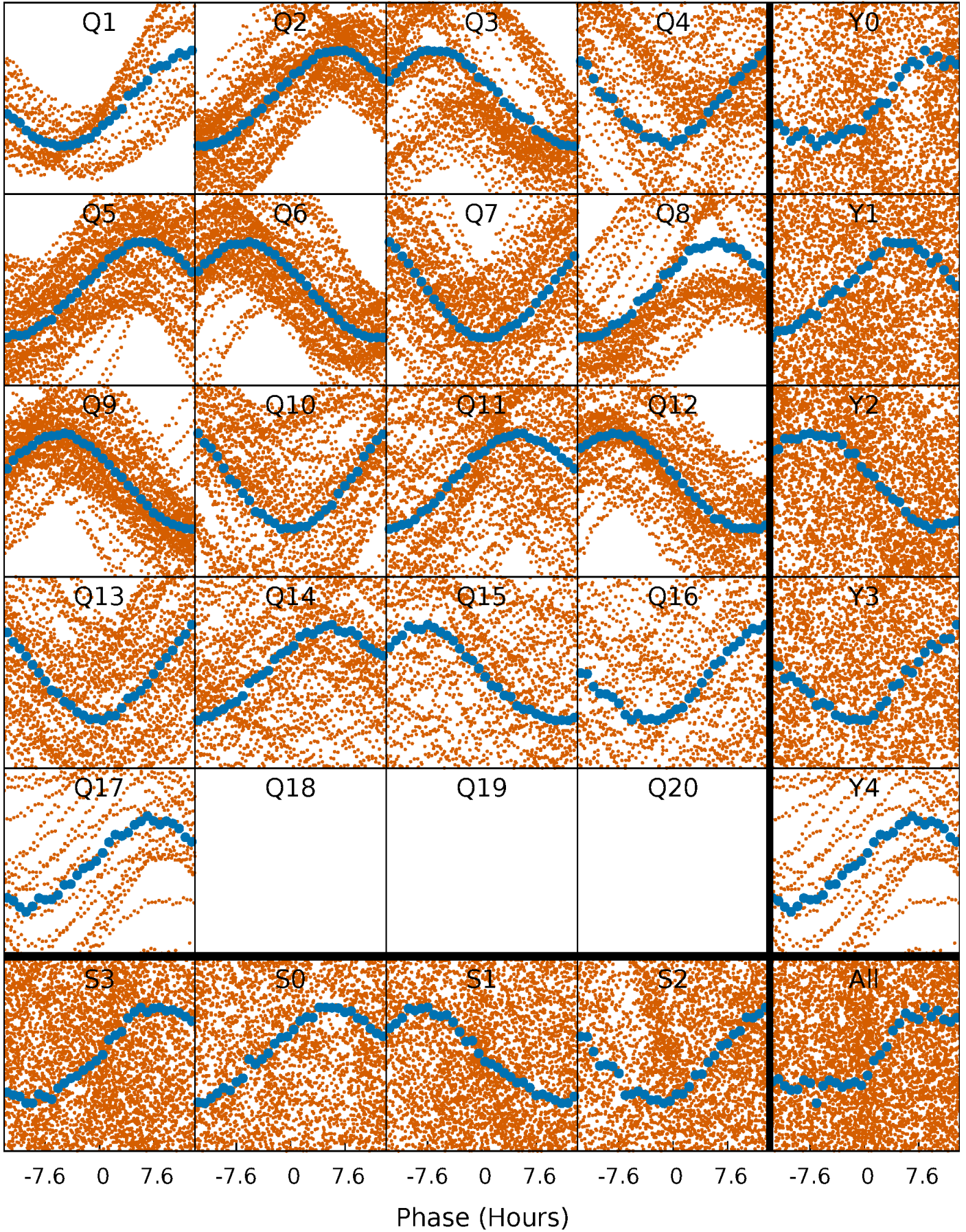
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

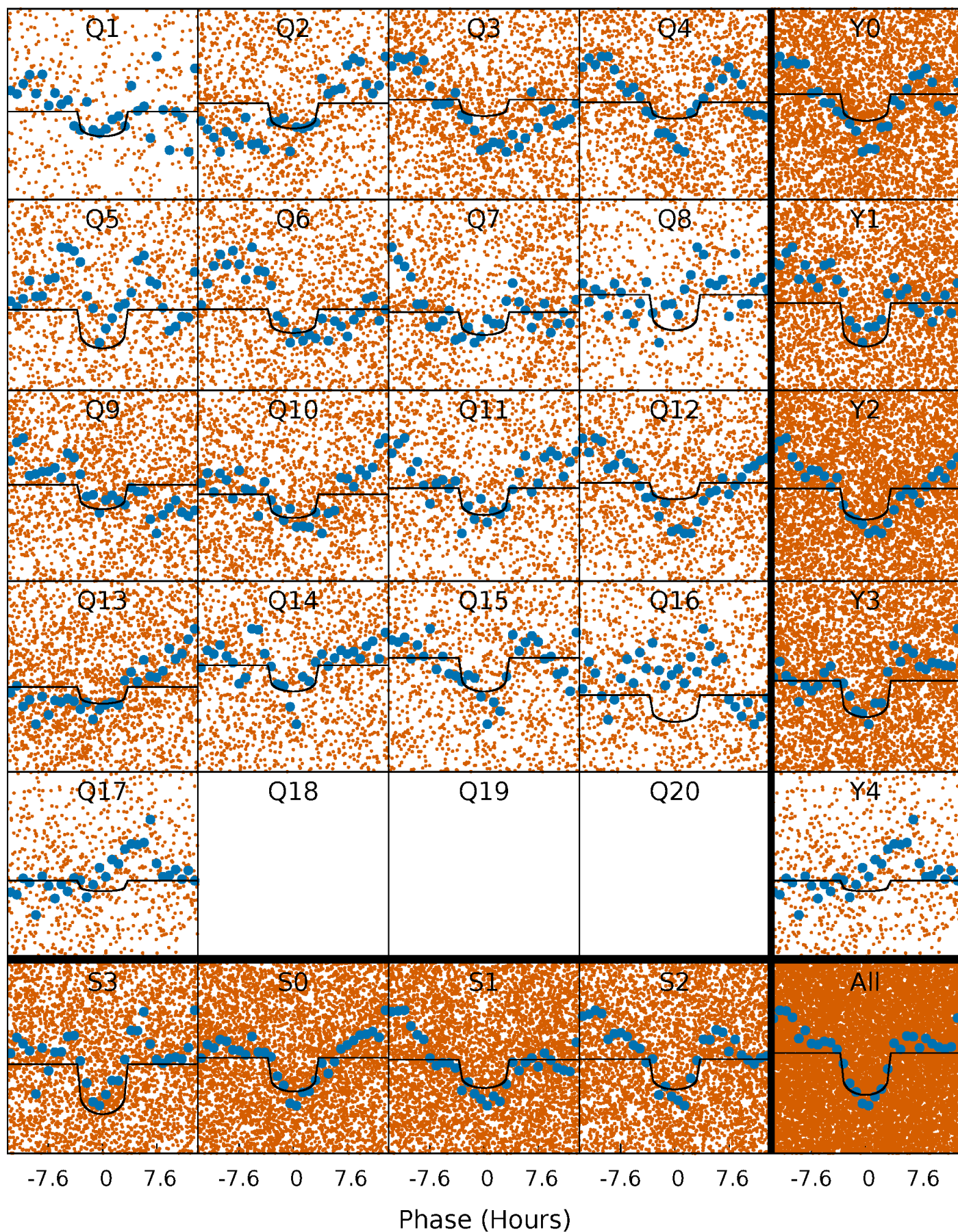
TCE 002984505-01 P= 1.524891 Days  $T_0=132.639693$  (BKJD)





# DV Quarter-Phased Transit Curves

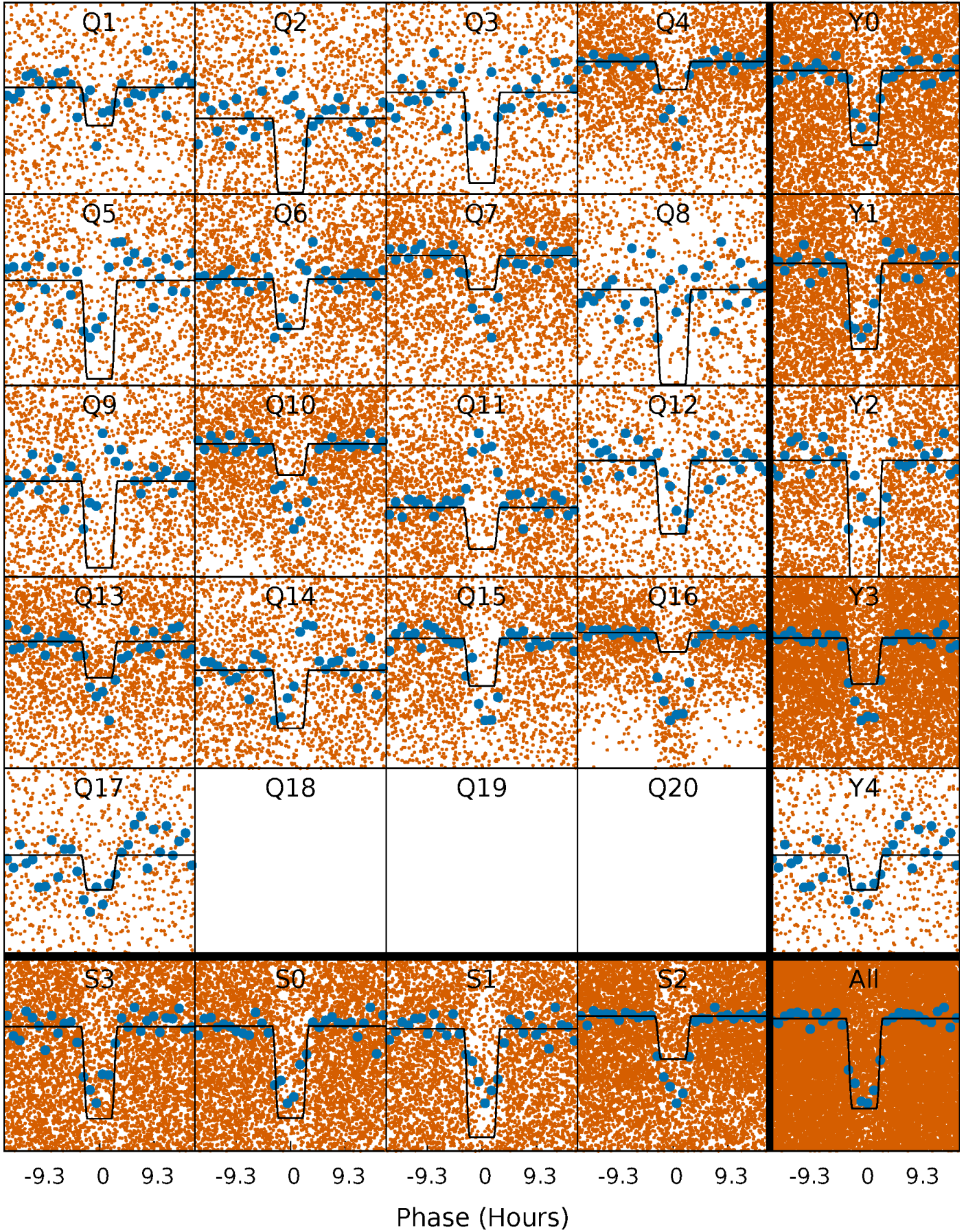
TCE 002984505-01 P= 1.524891 Days  $T_0=132.639693$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

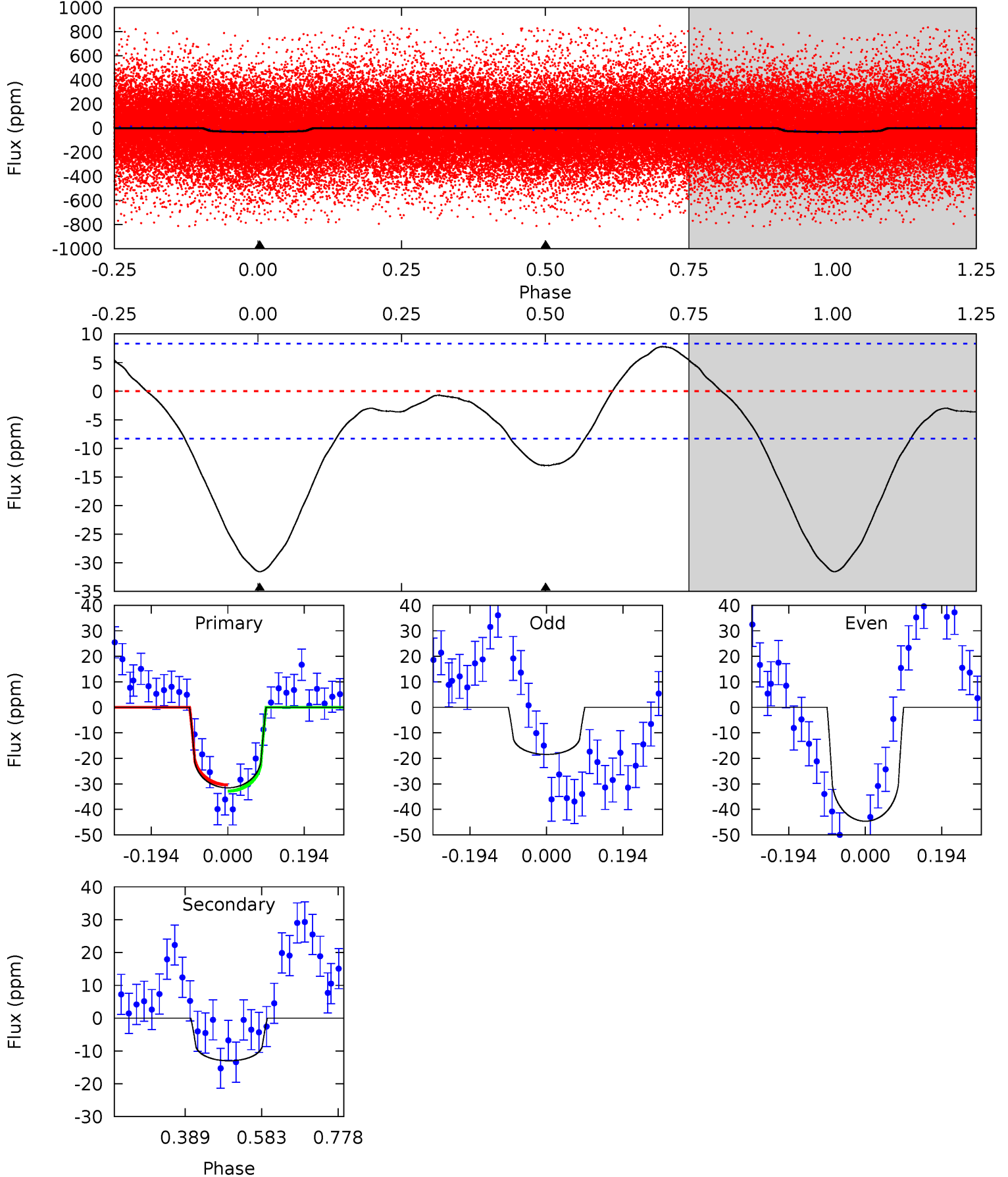
TCE 002984505-01 P= 1.524903 Days  $T_0=132.636972$  (BKJD)



# DV Model-Shift Uniqueness Test

002984505-01, P = 1.524891 Days, E = 131.114802 Days

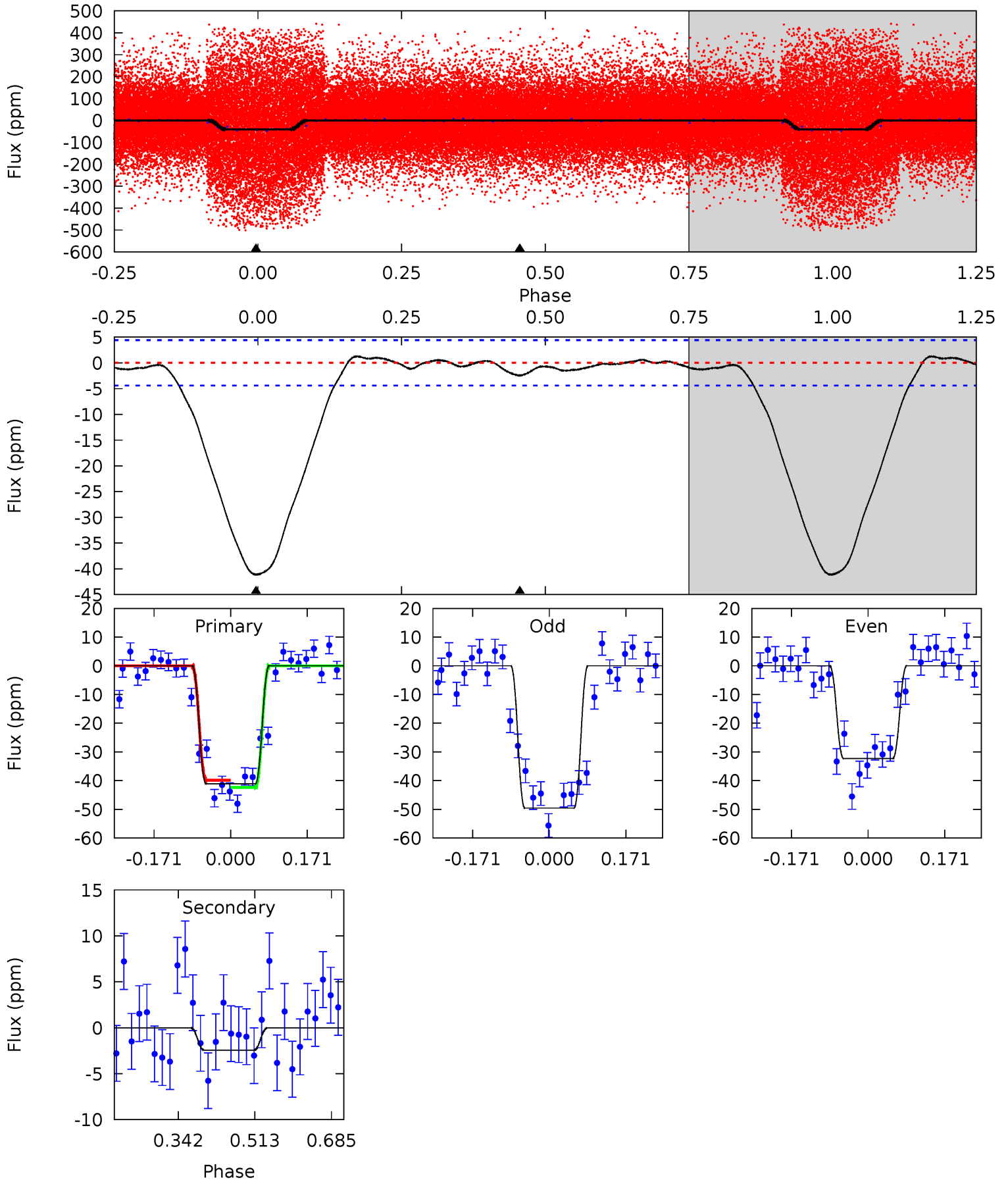
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.8	6.93	0	0	4.42	1.30	2.27	16.8	16.8	6.93	6.93	7.00	1.15	0.20	0.65



# Alt Model-Shift Uniqueness Test

002984505-01, P = 1.524903 Days, E = 131.112069 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
41.5	2.48	0	0	4.45	1.37	0.74	41.5	41.5	2.48	2.48	8.68	0.91	0.03	1.26





### Stellar Parameters For KIC 002984505

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6663^{+69}_{-89}$	$4.179^{+0.115}_{-0.115}$	$-0.100^{+0.150}_{-0.150}$	$1.538^{+0.272}_{-0.222}$	$1.309^{+0.095}_{-0.105}$	$0.507^{+0.242}_{-0.180}$
	+1%/-1%	+3%/-3%	+150%/-150%	+18%/-14%	+7%/-8%	+48%/-35%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 002984505-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-13 \pm 2$	$0.88^{+0.53}_{-0.46}$	$3027^{+135}_{-133}$	$5443^{+2632}_{-1027}$	$7.413^{+23.970}_{-4.620}$
Alt.	$-2 \pm 1$	$1.11^{+0.56}_{-0.50}$	$3025^{+131}_{-120}$	$3403^{+1018}_{-5285}$	$0.835^{+2.070}_{-0.539}$

$T_{max}$  = 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

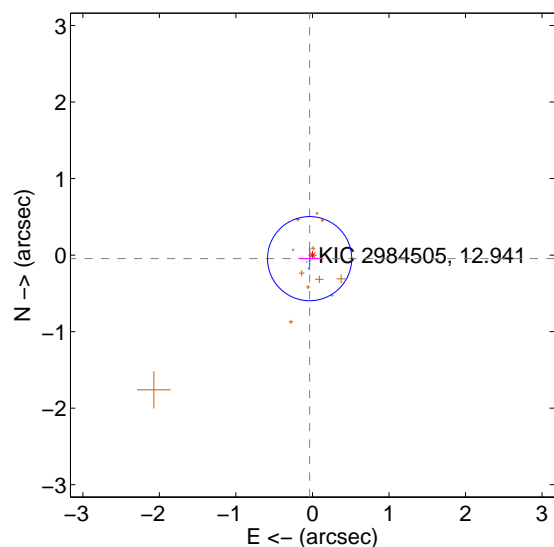
Supplemental centroid analysis for 002984505-01. Kepler magnitude: 12.94. Transit SNR 9.21

There are 6 quarters with good PRF difference image offsets

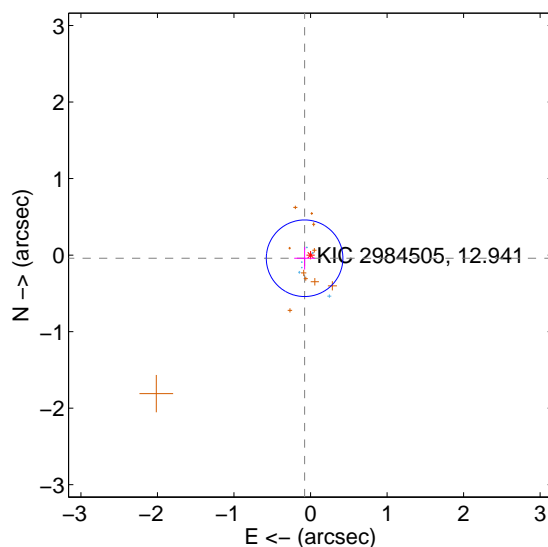
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.059 \pm 0.183$	0.32	$0.037 \pm 0.146$	$-0.046 \pm 0.146$
PRF-fit source offset from KIC position	$0.088 \pm 0.167$	0.53	$0.078 \pm 0.136$	$-0.041 \pm 0.149$
photometric centroid source offset	$0.78 \pm 0.62$	1.27	$-0.78 \pm 0.62$	$0.04 \pm 0.78$

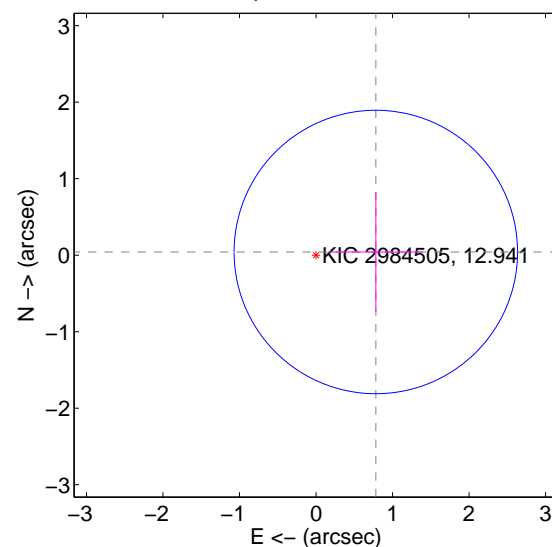
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

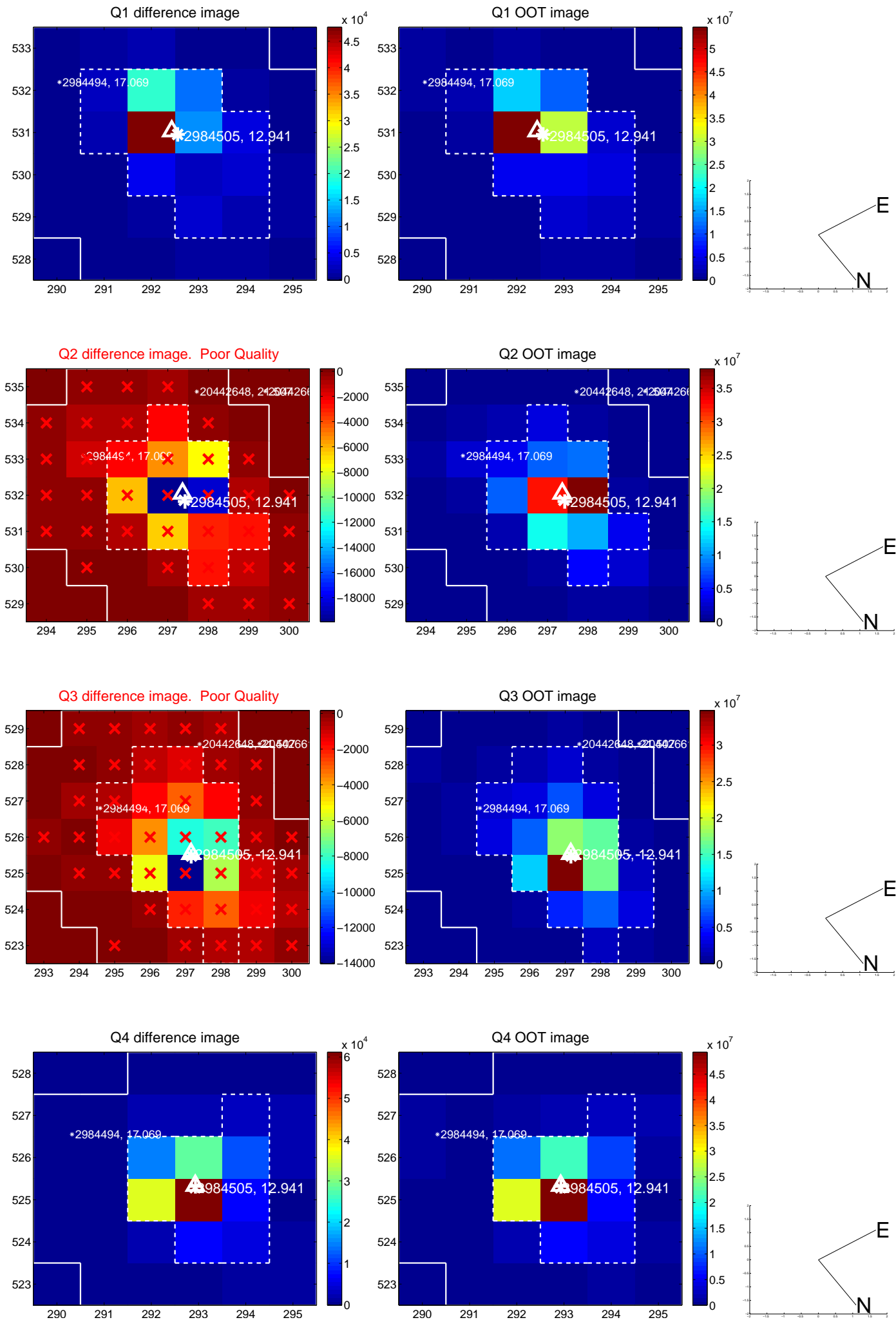


offset from photometric centroids

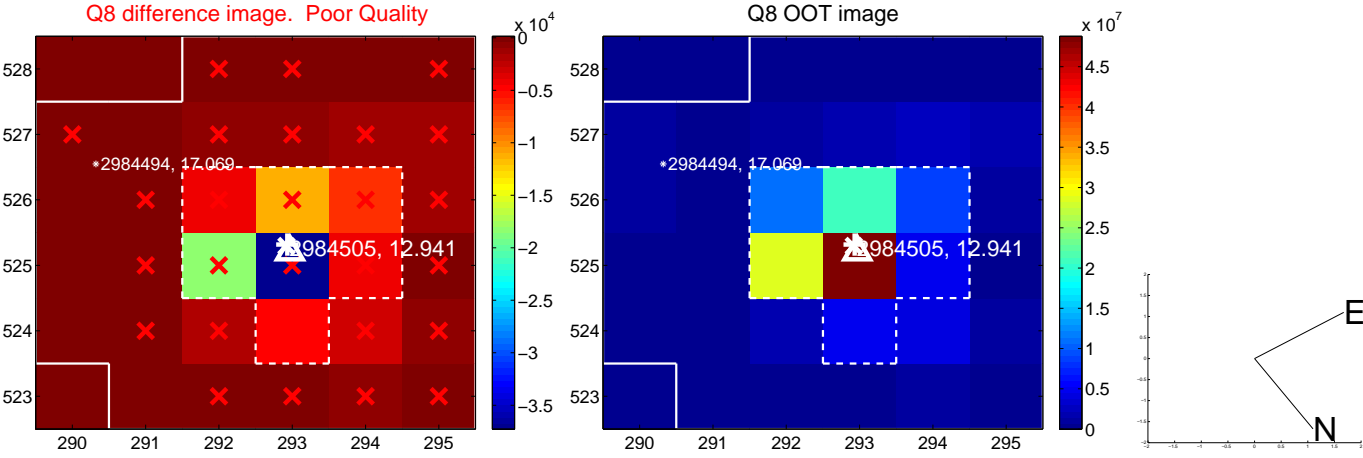
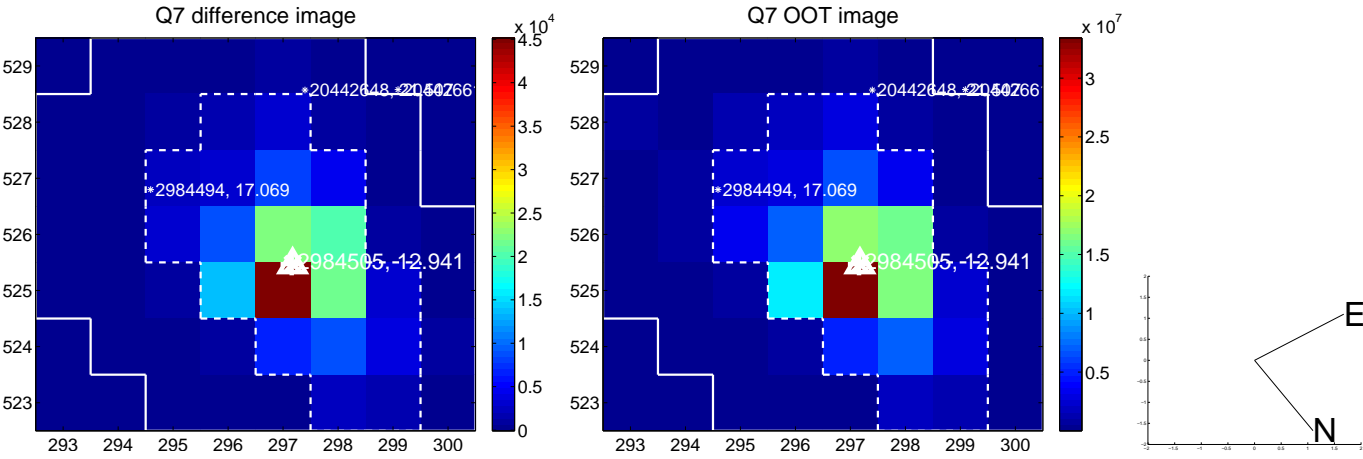
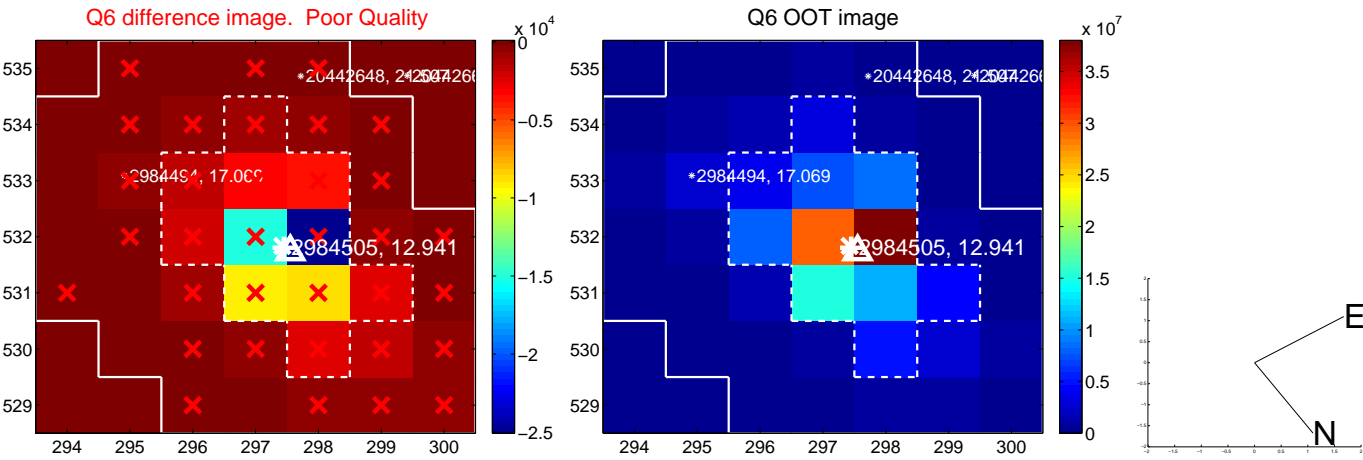
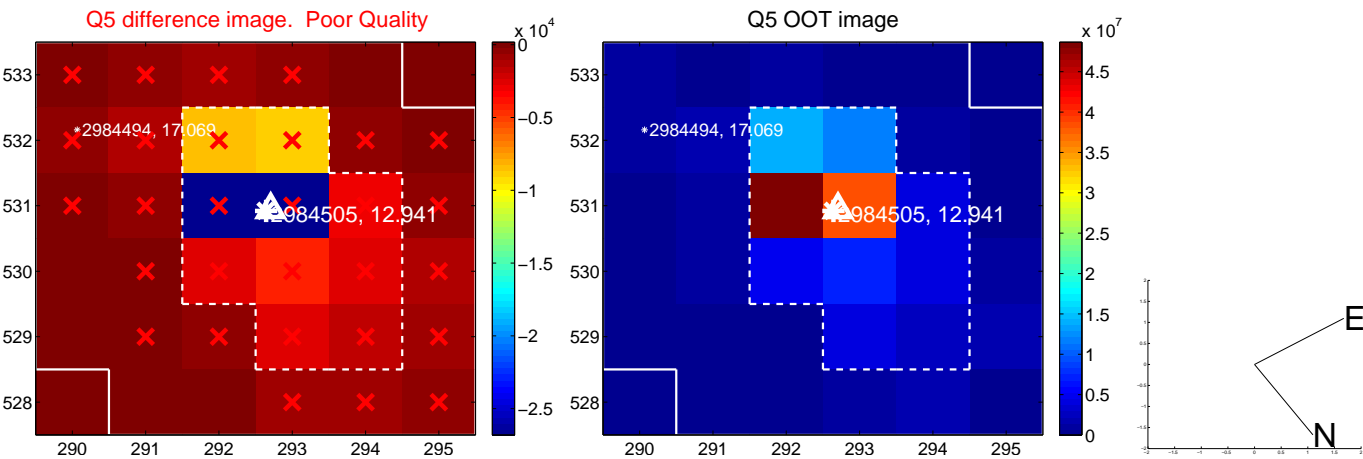


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

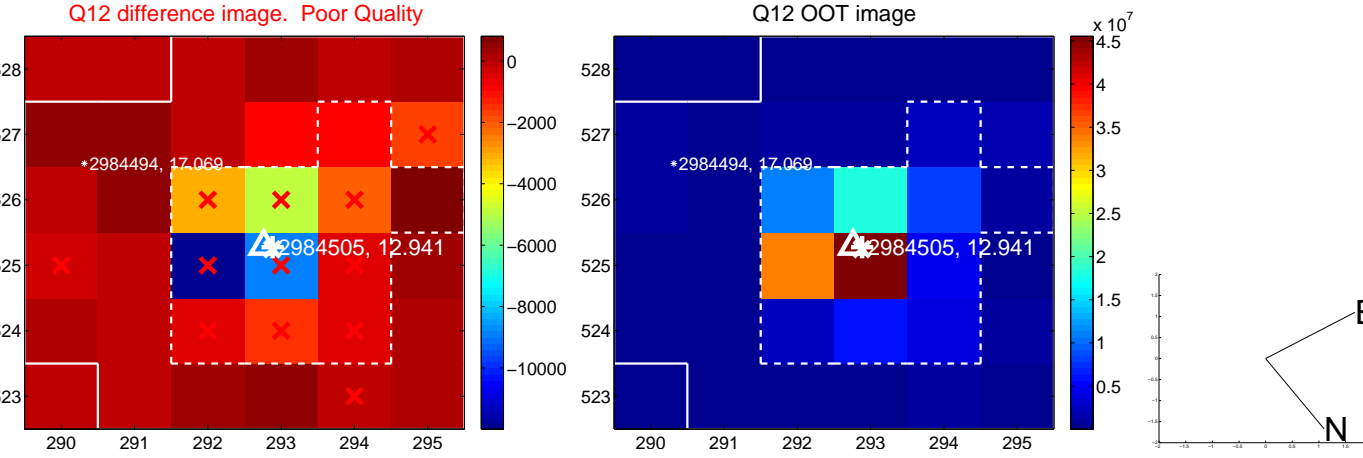
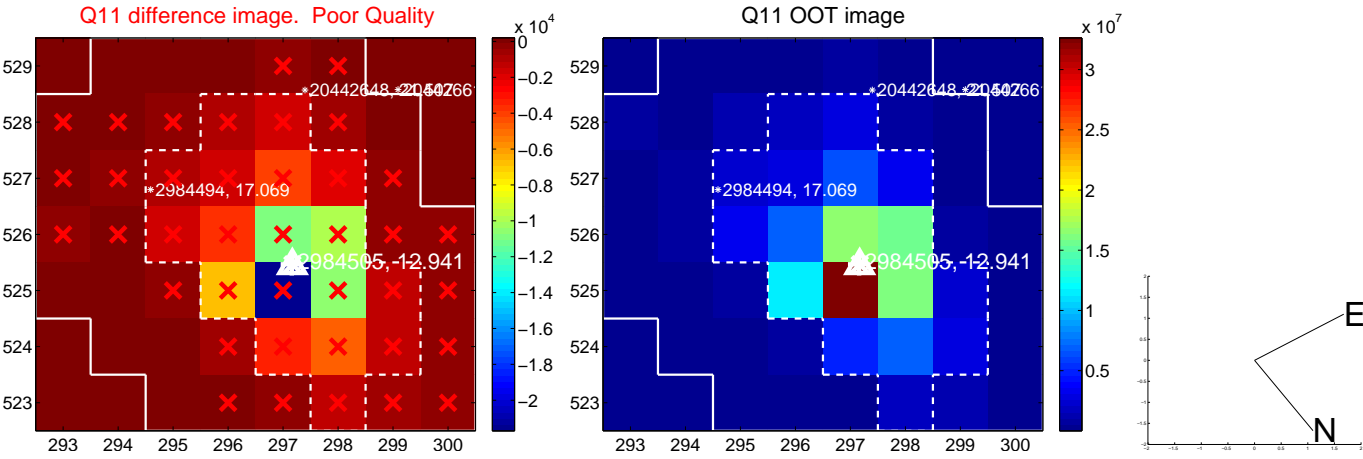
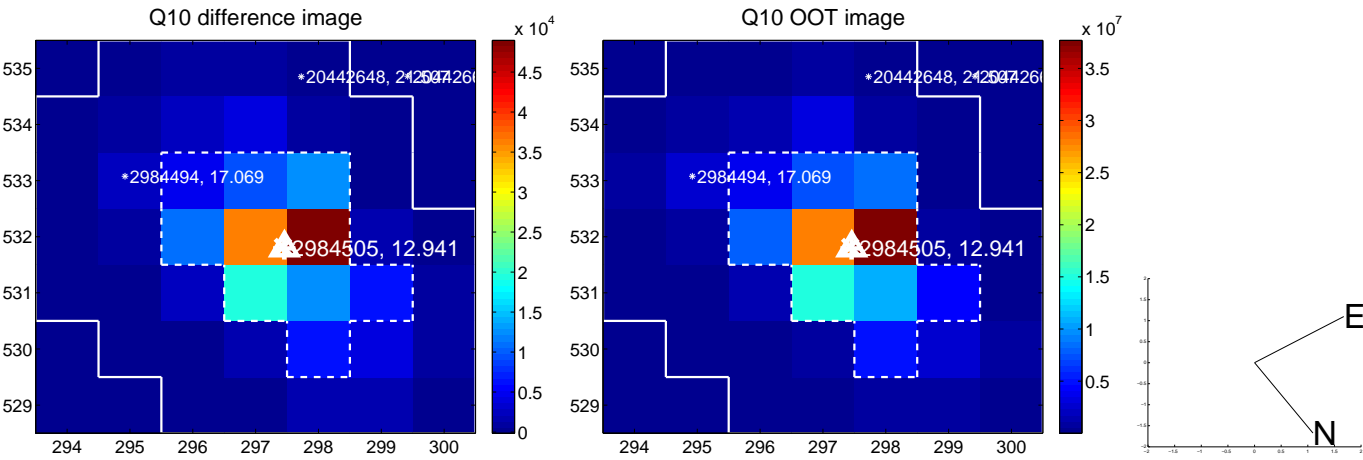
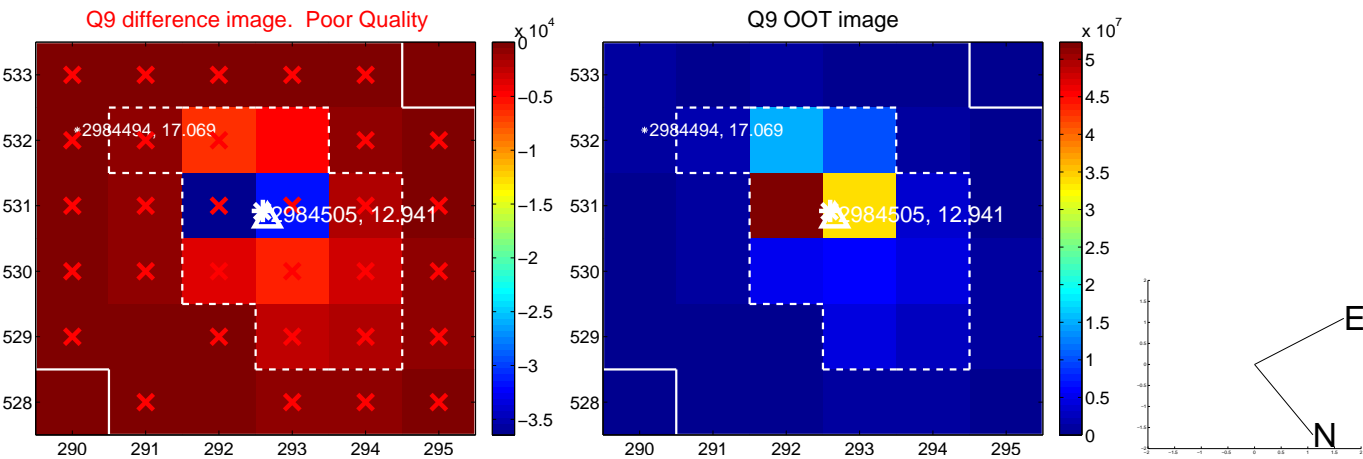


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

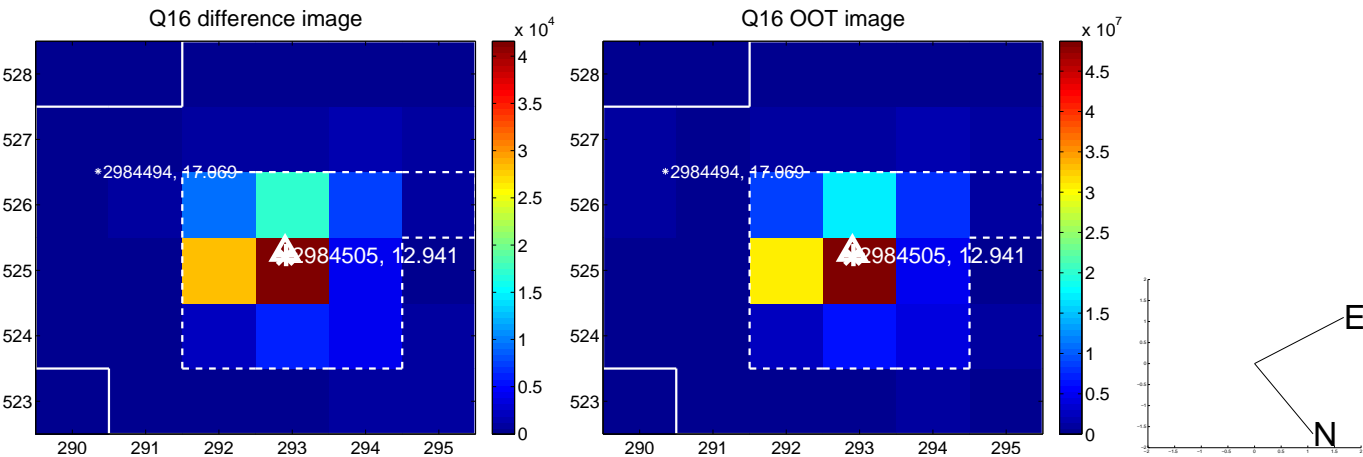
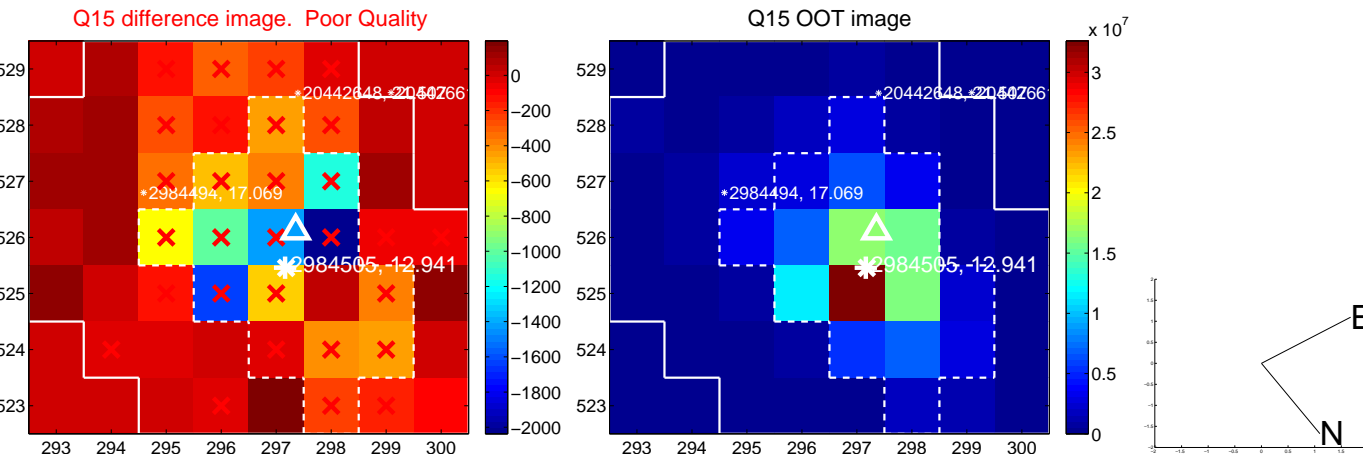
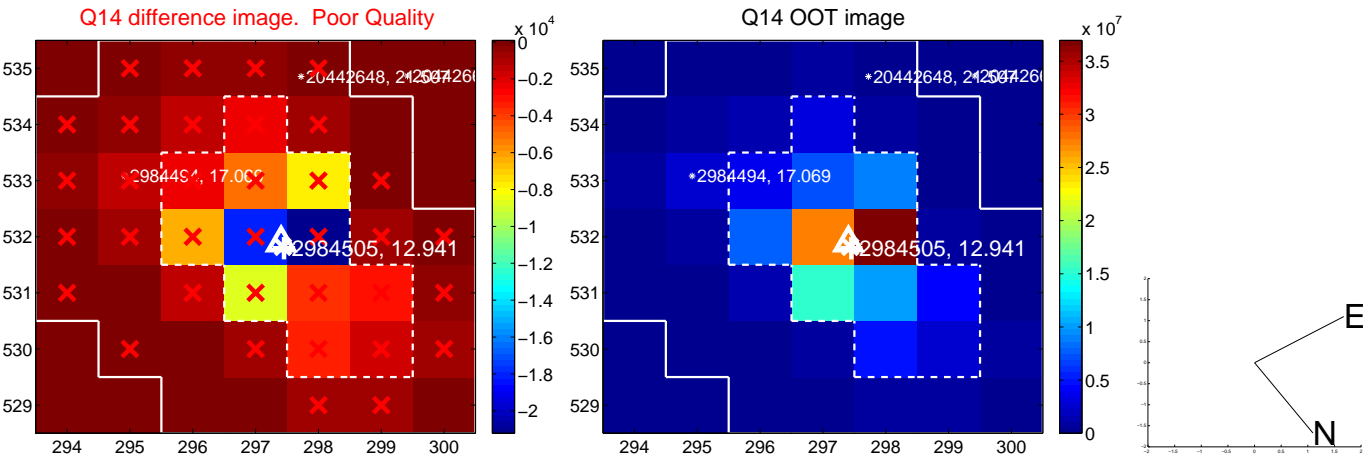
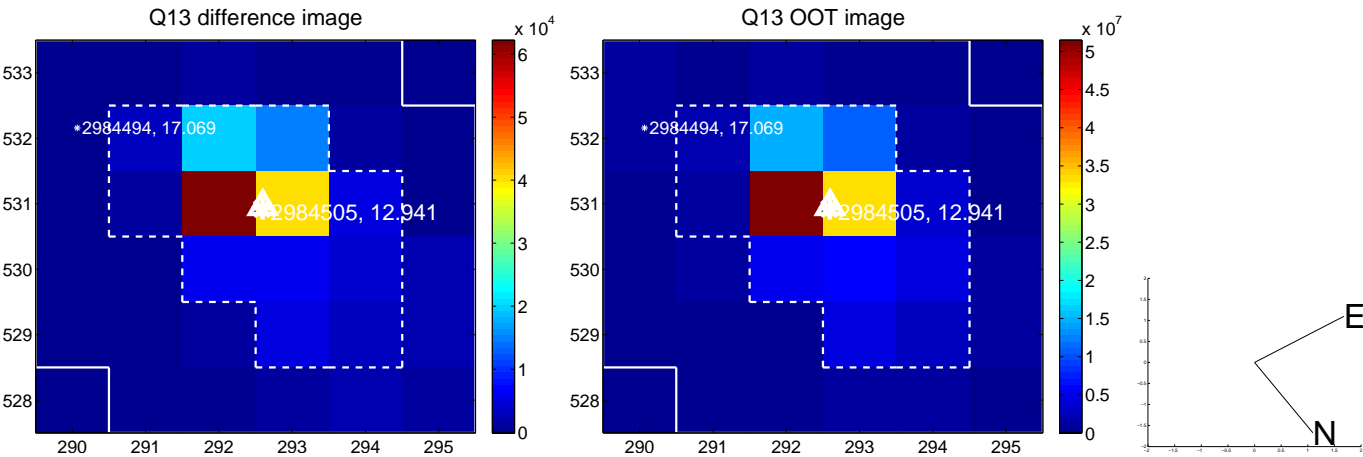




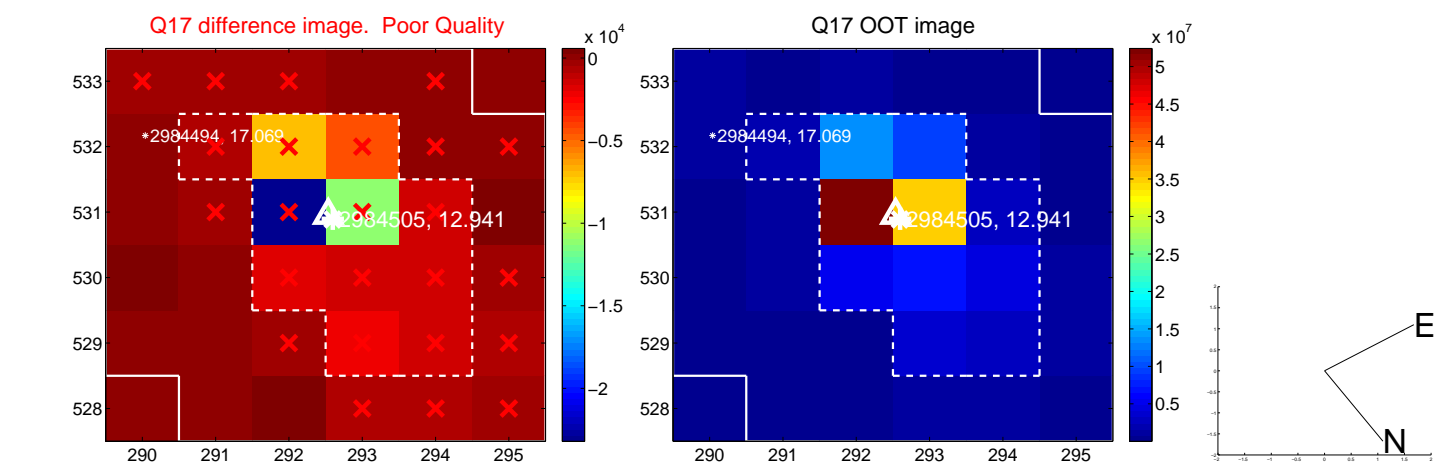
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



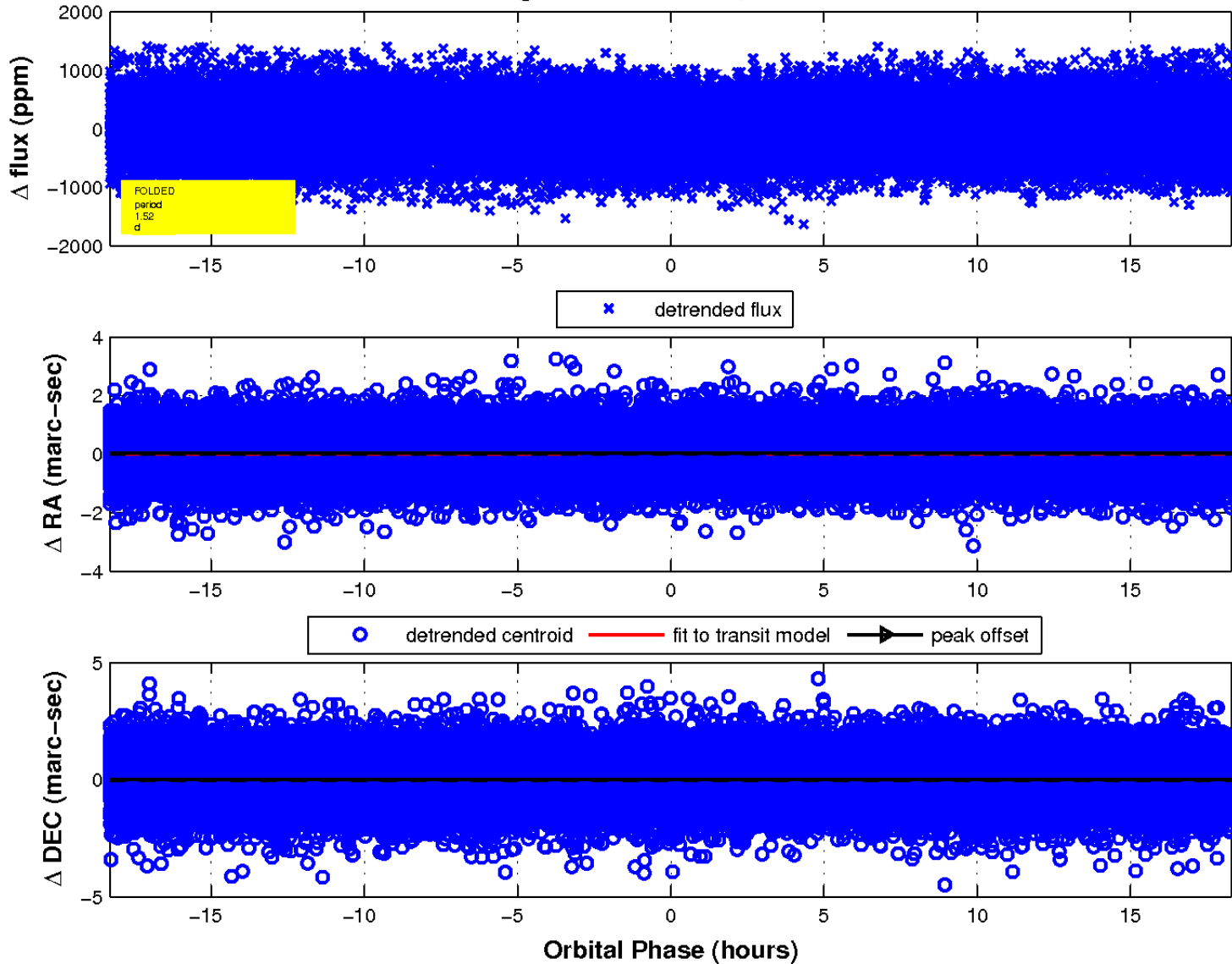
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

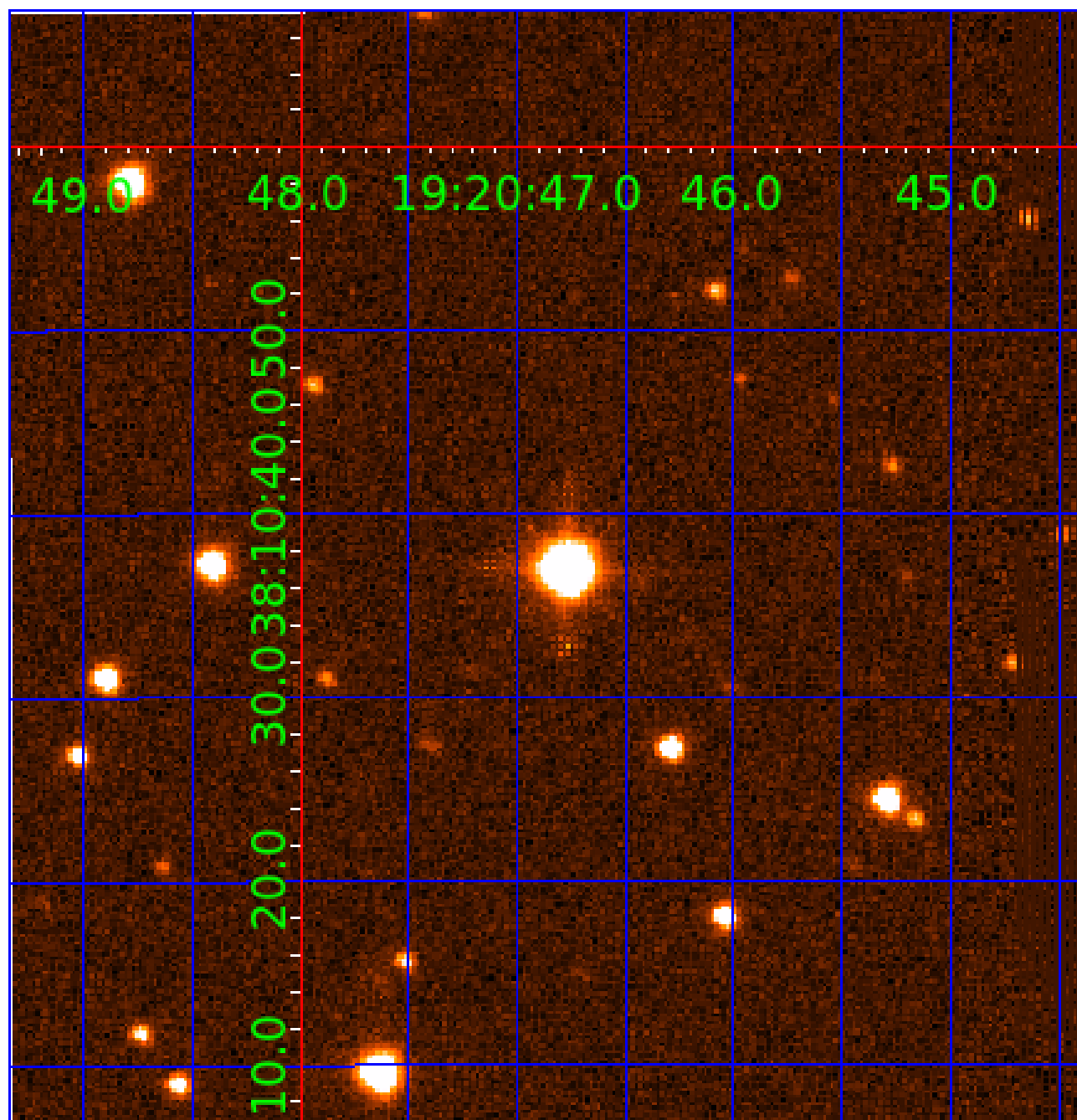


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 002984505

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002984505-01	OBS	No	1.524891	132.639693	30.6	6.672	7.2	9.2	1.54	6663	0.86	5206.66
002984505-02	OBS	No	122.151172	149.046526	186.8	9.774	8.4	3.5	1.54	6663	2.61	15.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002984505-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002984505-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

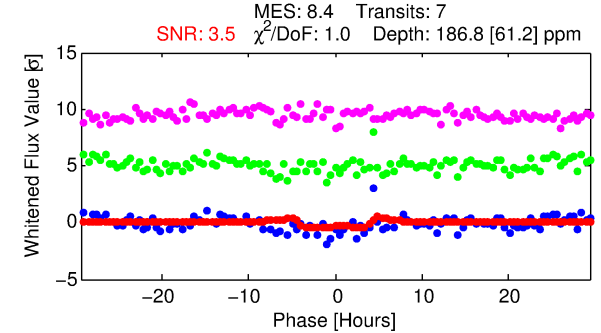
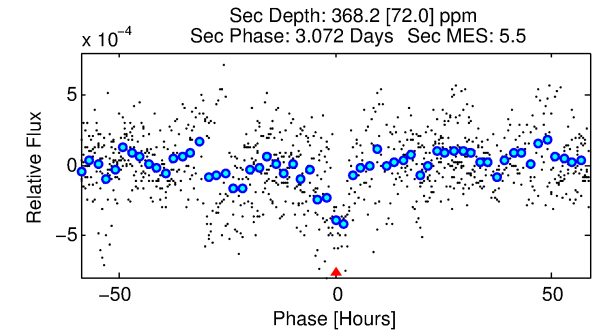
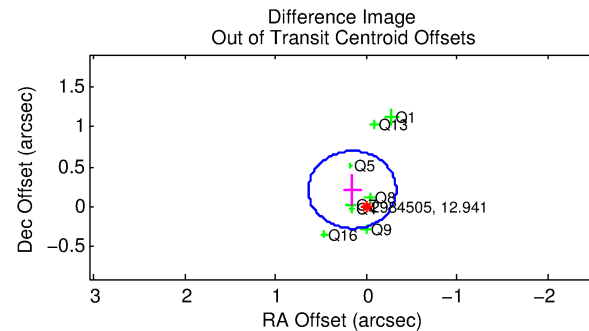
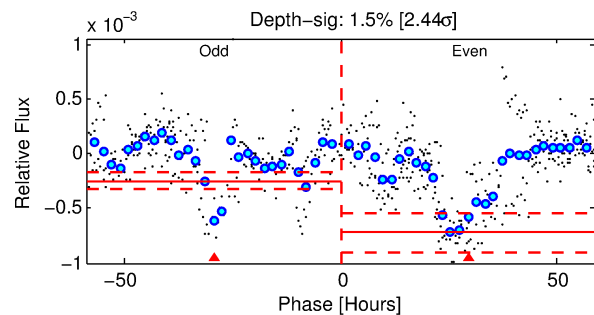
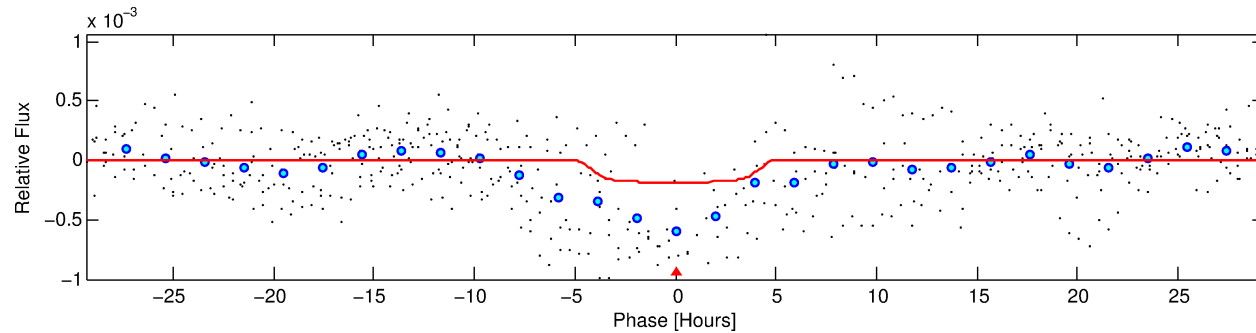
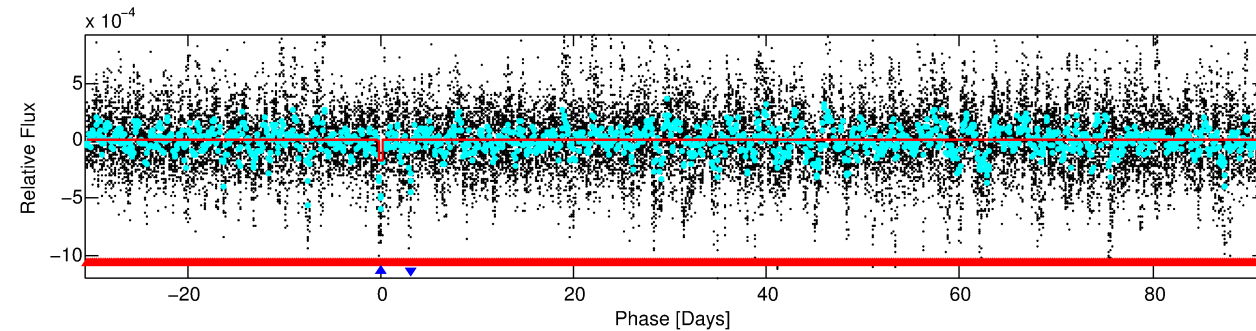
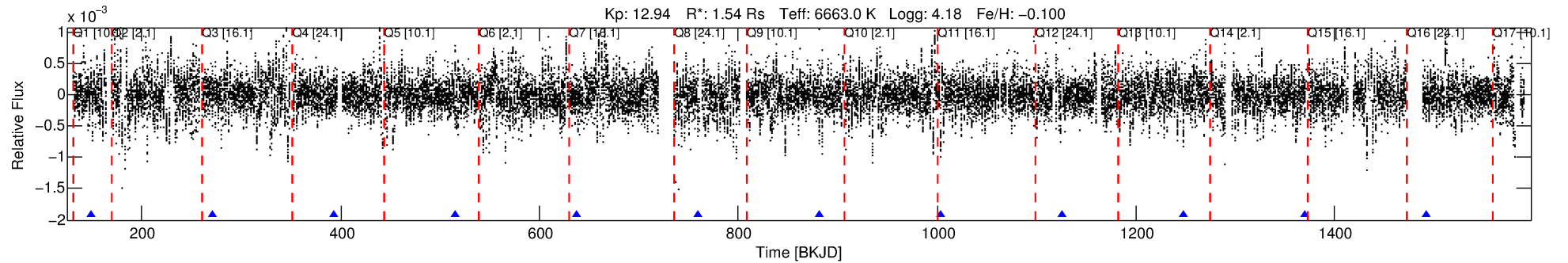
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002984505-02

No Significant Match Found

# DV One-Page Summary

KIC: 2984505 Candidate: 2 of 2 Period: 122.151 d



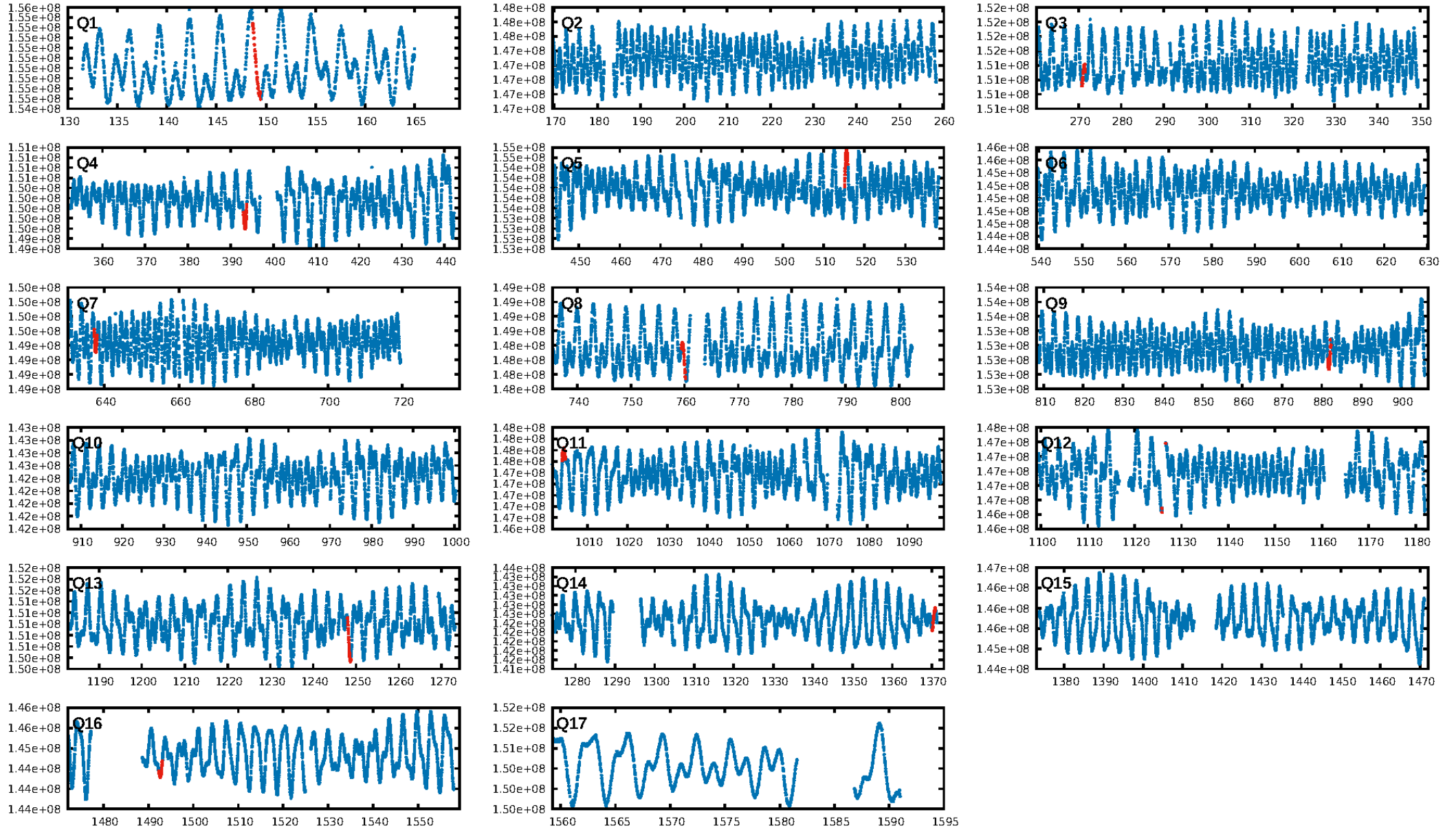
## DV Fit Results:

Period = 122.15117 [0.00482] d  
Epoch = 149.0465 [0.0313] BKJD  
Rp/R\* = 0.0155 [0.0031]  
a/R\* = 33.03 [16.34]  
b = 0.95 [0.05]  
Seff = 15.08 [3.30]  
Teff = 502 [27] K  
Rp = 2.61 [0.69] Re  
a = 0.5263 [0.0775] AU  
Ag = 8244.28 [4047.78] [2.04 $\sigma$ ]  
Teffp = 7403 [825] K [8.36 $\sigma$ ]

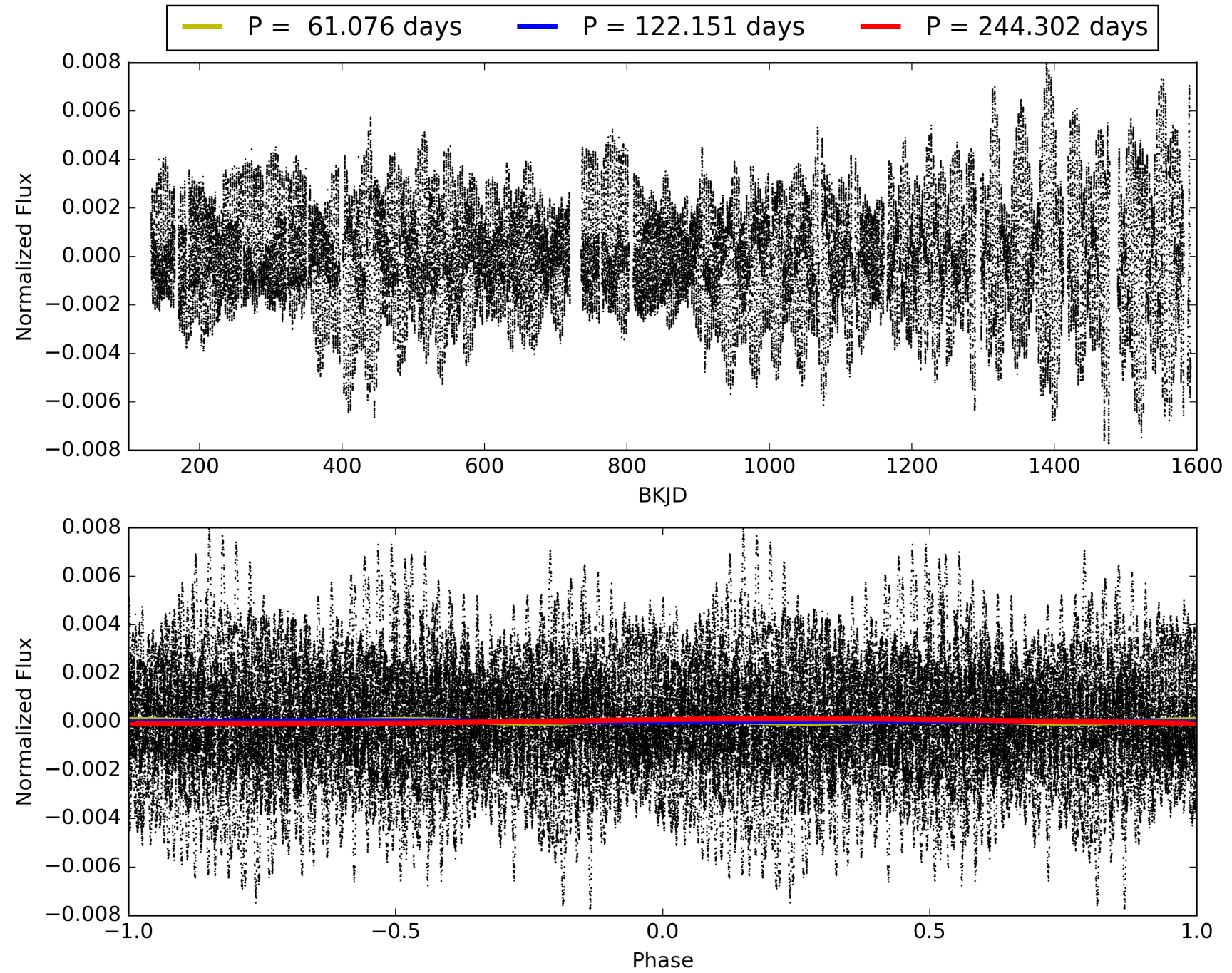
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [244.64 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 6.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.53e-11  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 0.2825  
Centroid-sig: 48.5%  
Centroid-so: 0.515 arcsec [0.49 $\sigma$ ]  
OotOffset-rm: 0.261 arcsec [1.62 $\sigma$ ]  
KicOffset-rm: 0.256 arcsec [1.61 $\sigma$ ]  
OotOffset-st: 0/1/3/4 [8]  
KicOffset-st: 0/1/3/4 [8]  
DiffImageQuality-fgm: 0.75 [6/8]  
DiffImageOverlap-fno: 0.00 [0/8]

# TCE 002984505-02, PDC Light Curves



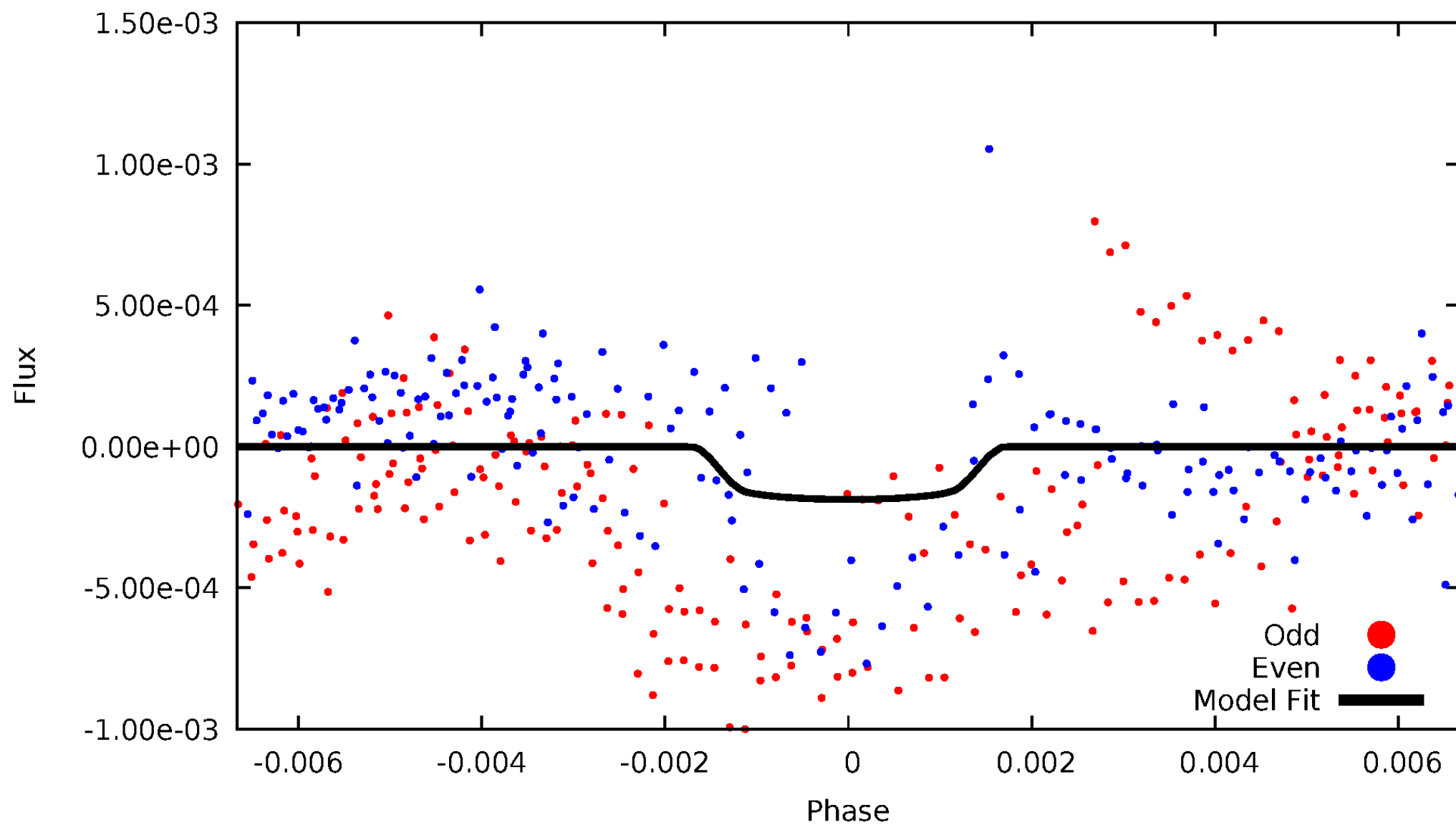
TCE 002984505-02





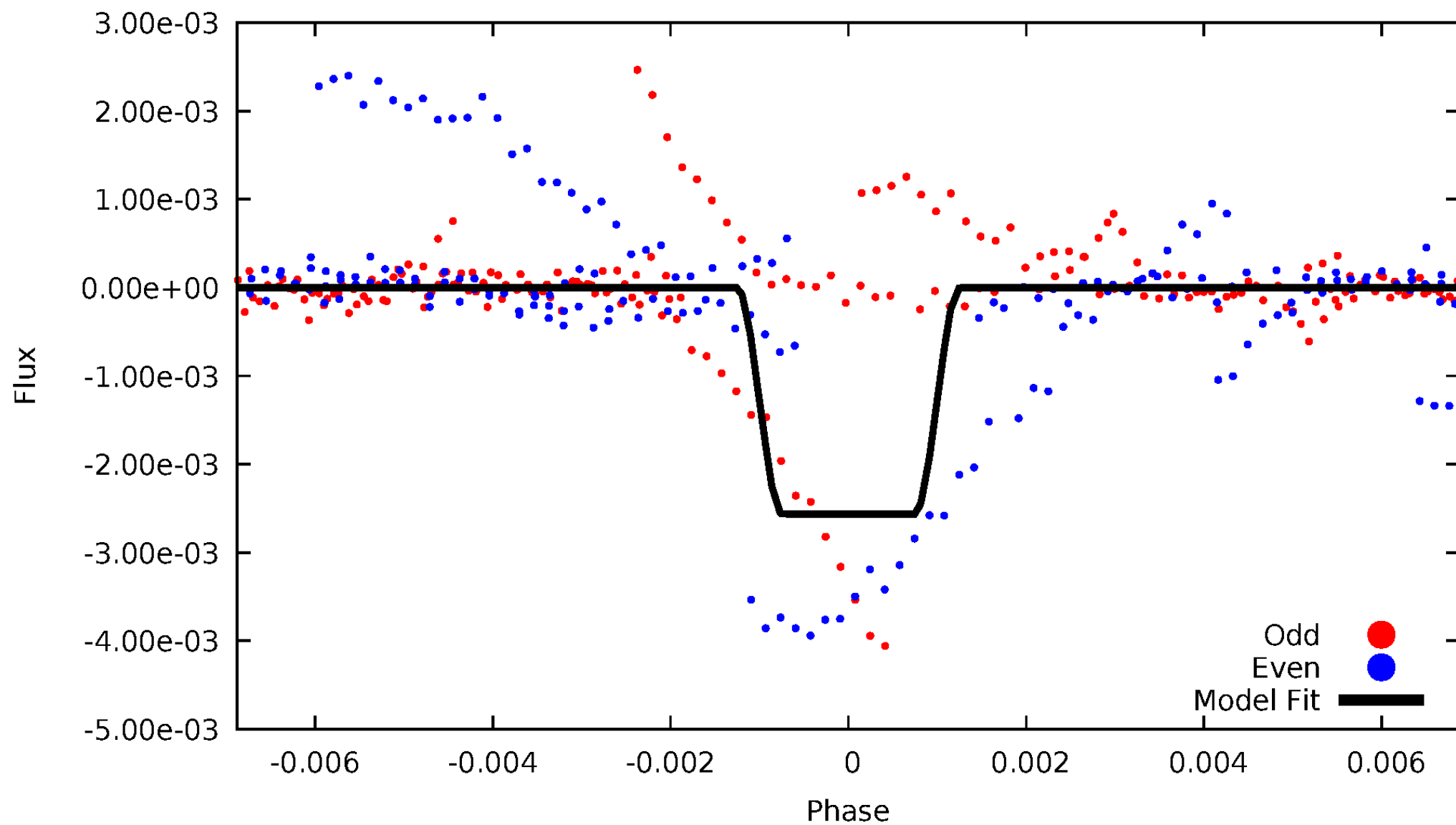
# DV Odd/Even

TCE 002984505-02



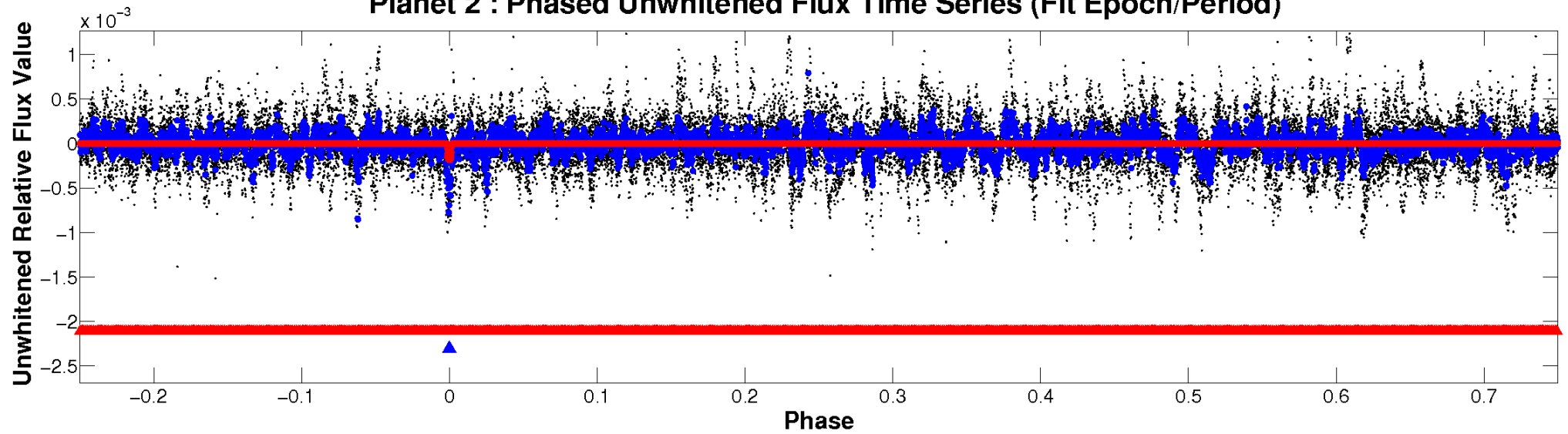
# ALT Odd/Even

TCE 002984505-02

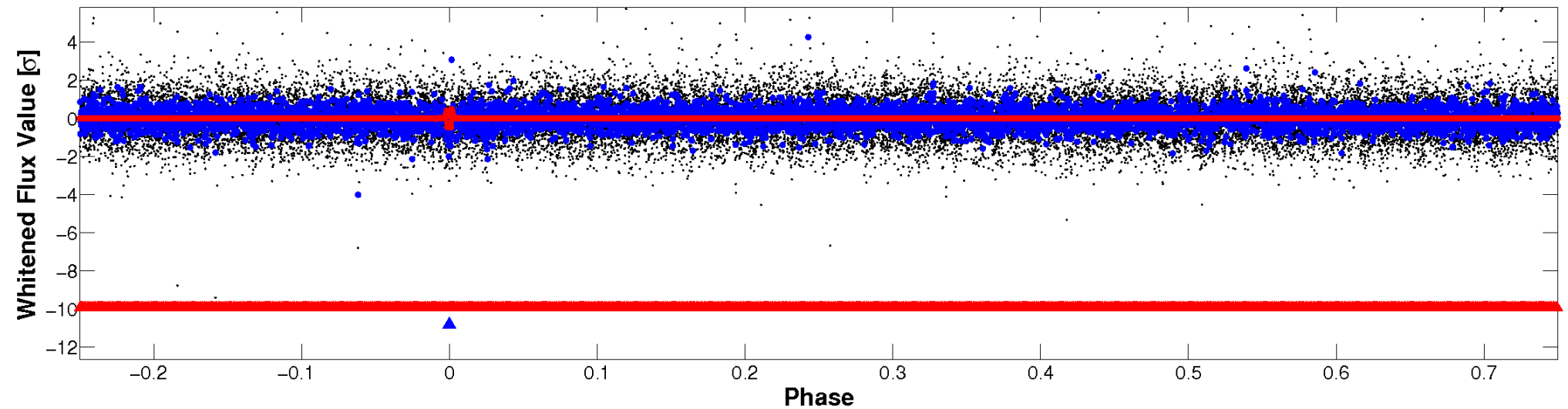


# Non-Whitened Vs. Whitened Light Curve

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

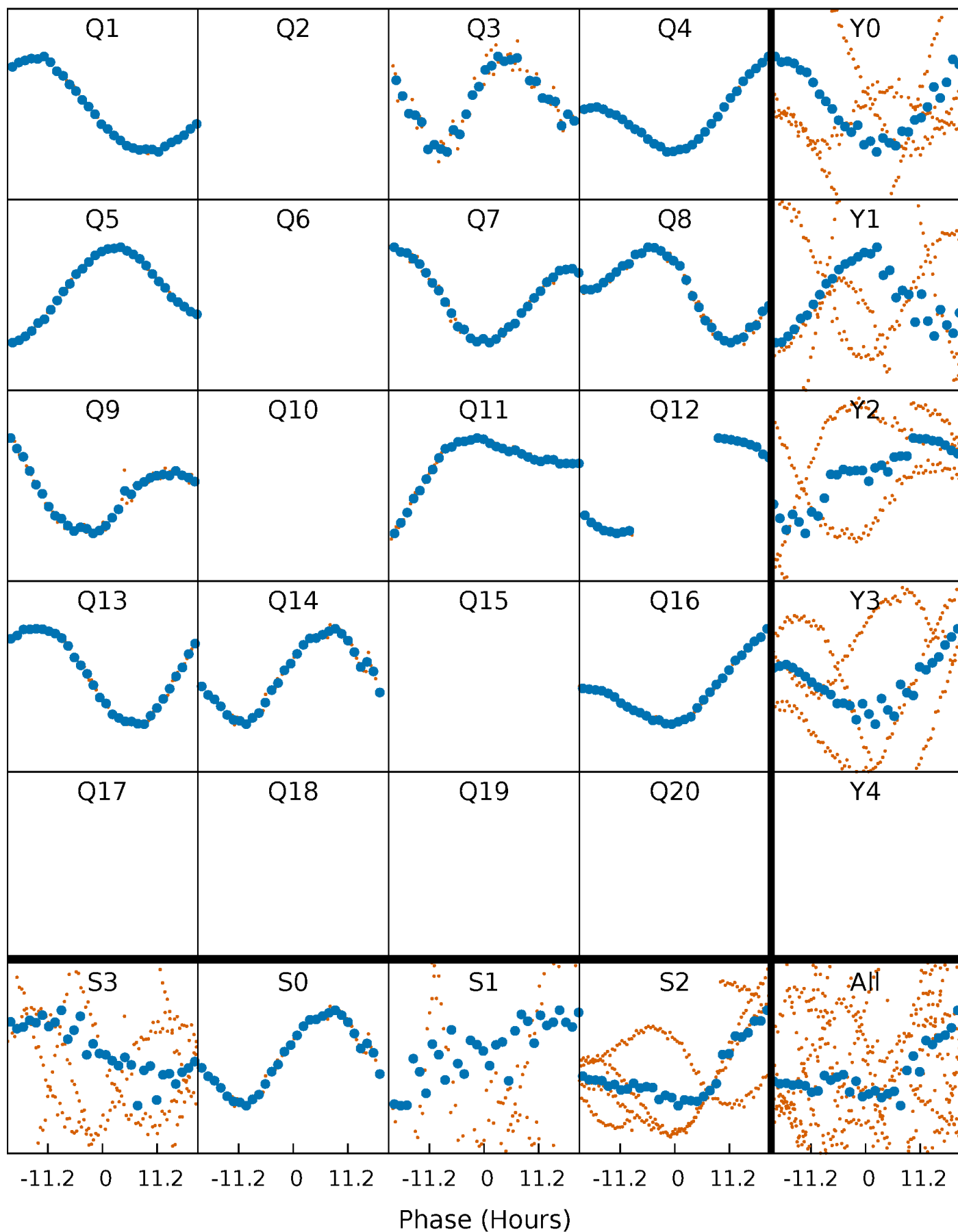


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



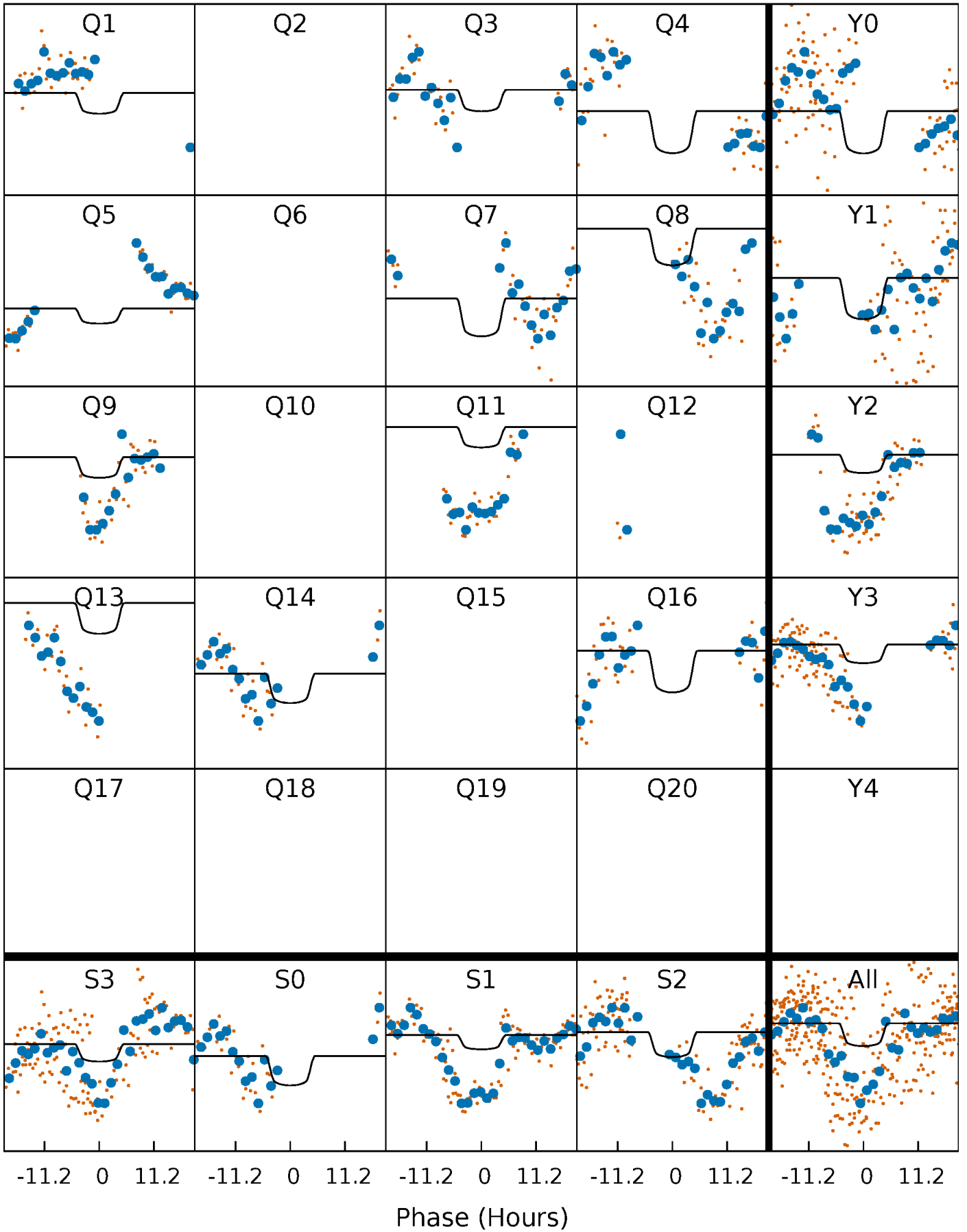
# PDC Quarter-Phased Transit Curves

TCE 002984505-02 P=122.151172 Days  $T_0=149.046526$  (BKJD)



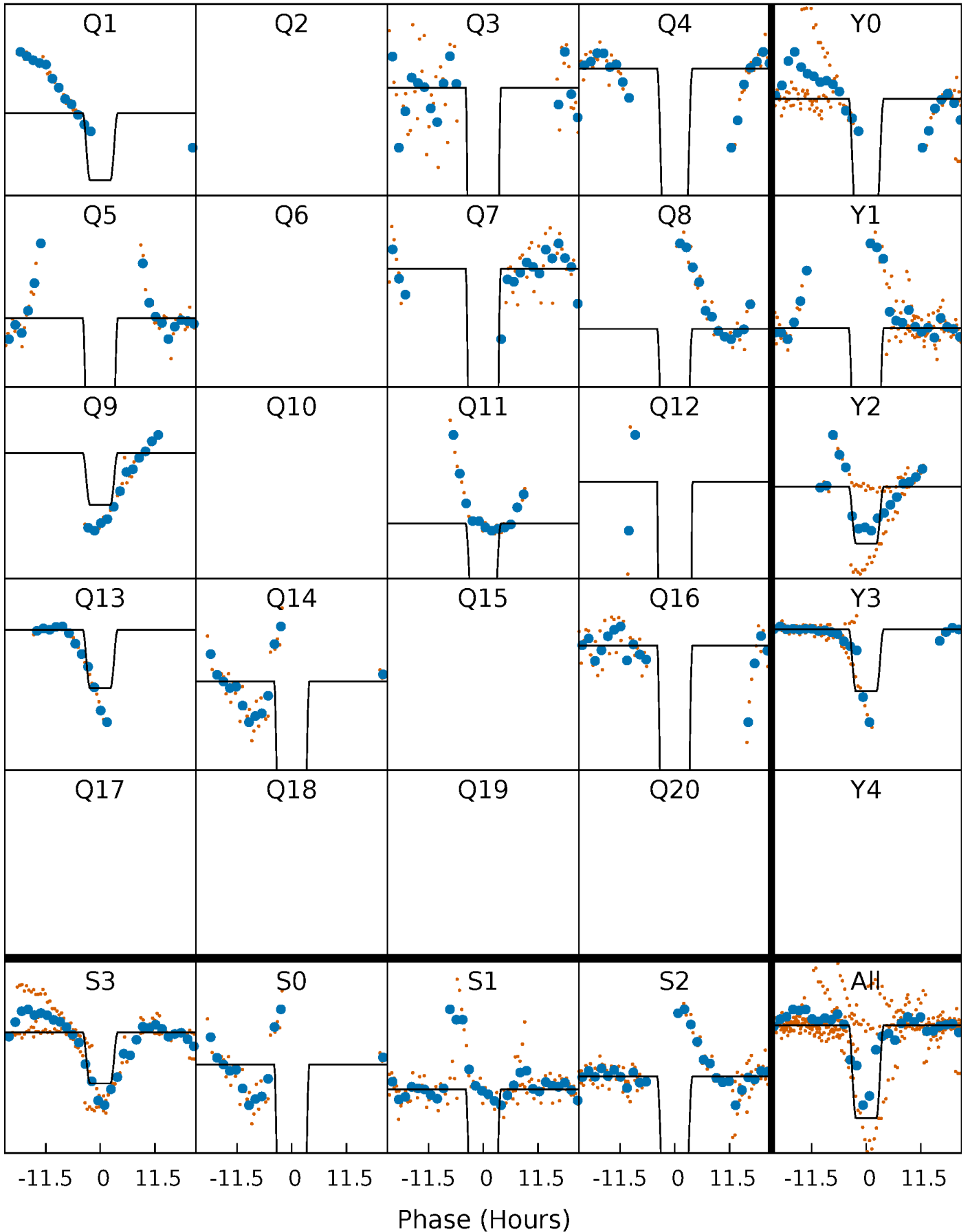
# DV Quarter-Phased Transit Curves

TCE 002984505-02   P=122.151172 Days    $T_0=149.046526$  (BKJD)



## Alt. Detrend Quarter-Phased Transit Curves

TCE 002984505-02   P=122.145010 Days    $T_0=149.057743$  (BKJD)

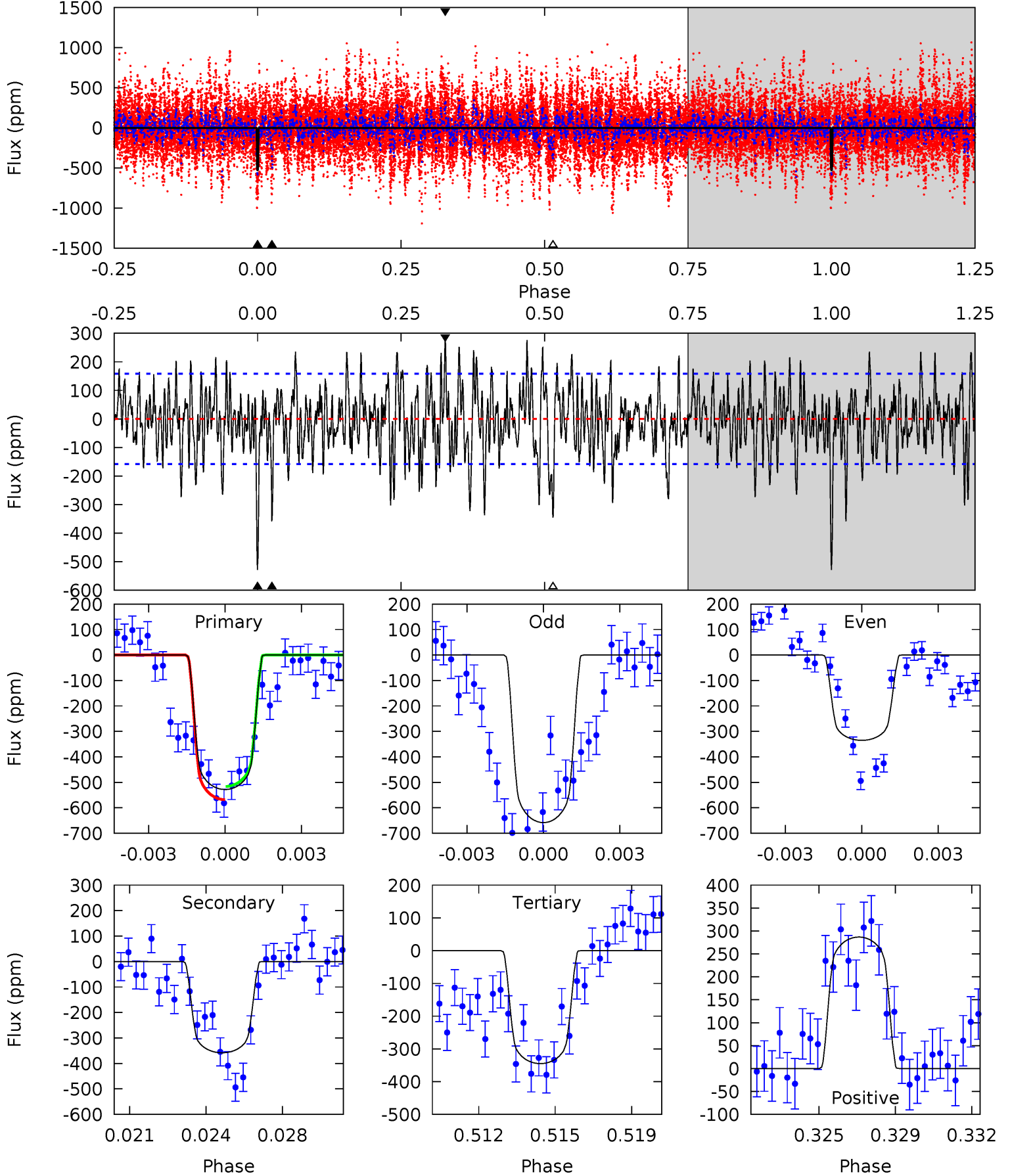




# DV Model-Shift Uniqueness Test

002984505-02, P = 122.151172 Days, E = 26.895354 Days

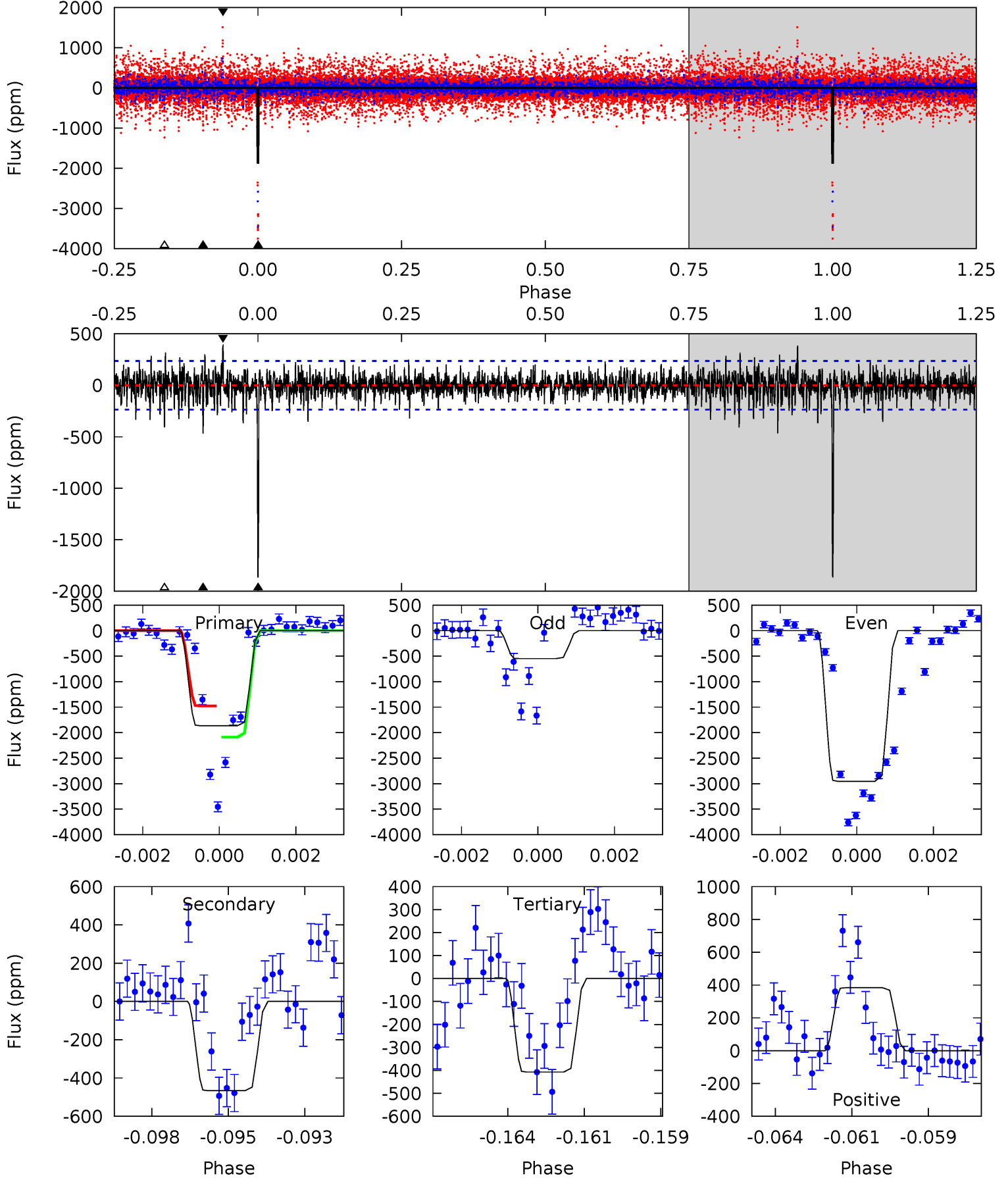
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.5	11.8	11.4	9.48	5.23	2.92	3.35	6.06	7.98	0.44	2.36	5.32	1.19	0.35	0.85



# Alt Model-Shift Uniqueness Test

002984505-02, P = 122.145010 Days, E = 26.912733 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
41.8	10.5	9.14	8.61	5.29	3.03	1.80	32.7	33.2	1.32	1.85	24.4	2.57	0.17	0



### Stellar Parameters For KIC 002984505

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6663^{+69}_{-89}$	$4.179^{+0.115}_{-0.115}$	$-0.100^{+0.150}_{-0.150}$	$1.538^{+0.272}_{-0.222}$	$1.309^{+0.095}_{-0.105}$	$0.507^{+0.242}_{-0.180}$
	+1%/-1%	+3%/-3%	+150%/-150%	+18%/-14%	+7%/-8%	+48%/-35%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 002984505-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-358 \pm 30$	$2.54^{+0.63}_{-0.53}$	$699^{+30}_{-30}$	$7486^{+1065}_{-789}$	$8473^{+4932}_{-3040}$
Alt.	$-466 \pm 45$	$8.53^{+0.95}_{-0.87}$	$703^{+32}_{-29}$	$4517^{+151}_{-127}$	$976^{+259}_{-199}$

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

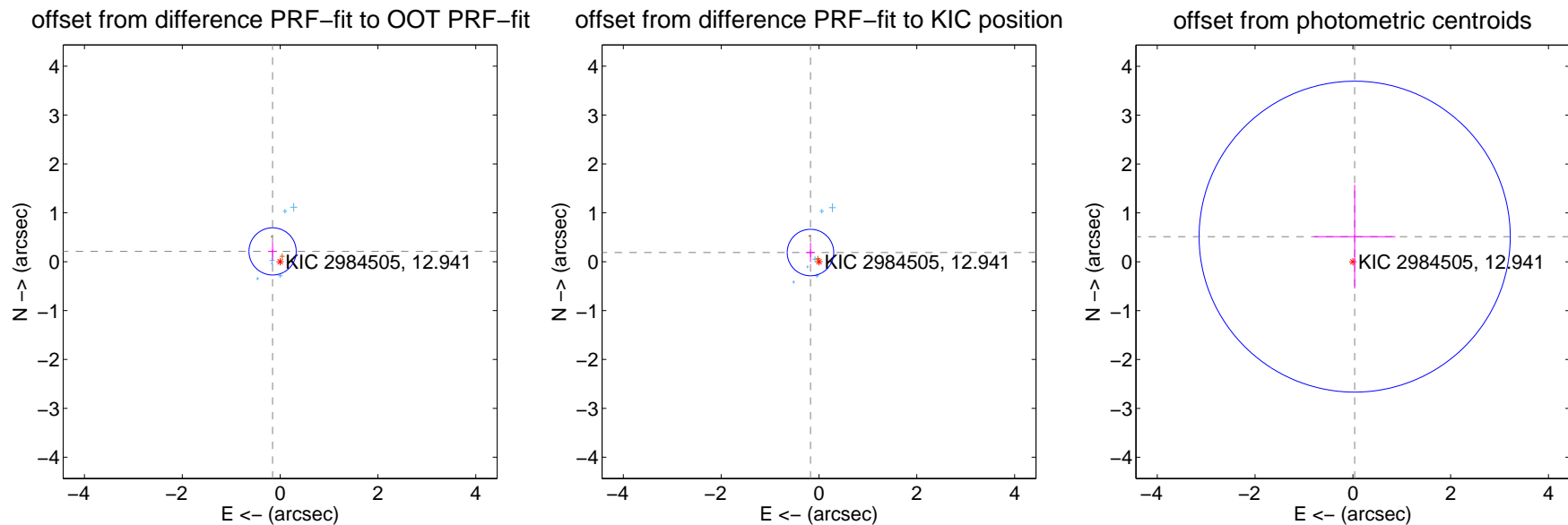
## DV Centroid Data

Supplemental centroid analysis for 002984505-02. Kepler magnitude: 12.94. Transit SNR 3.50

There are 6 quarters with good PRF difference image offsets

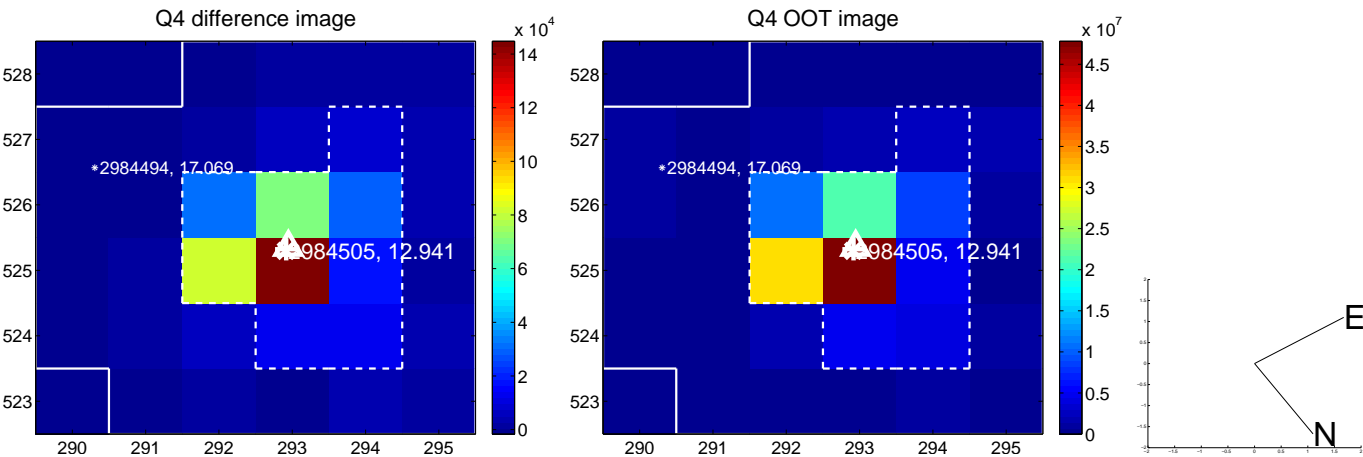
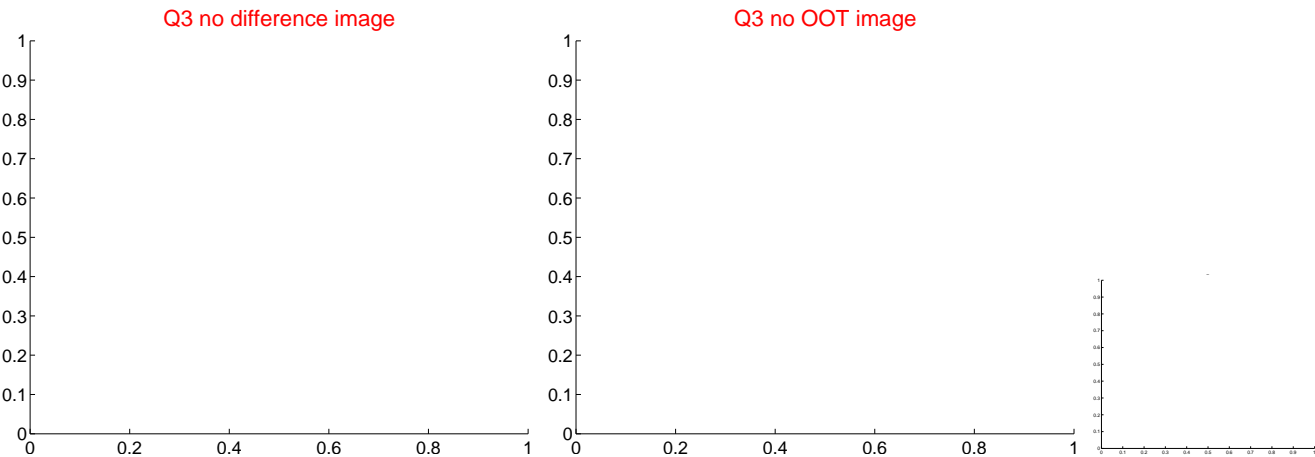
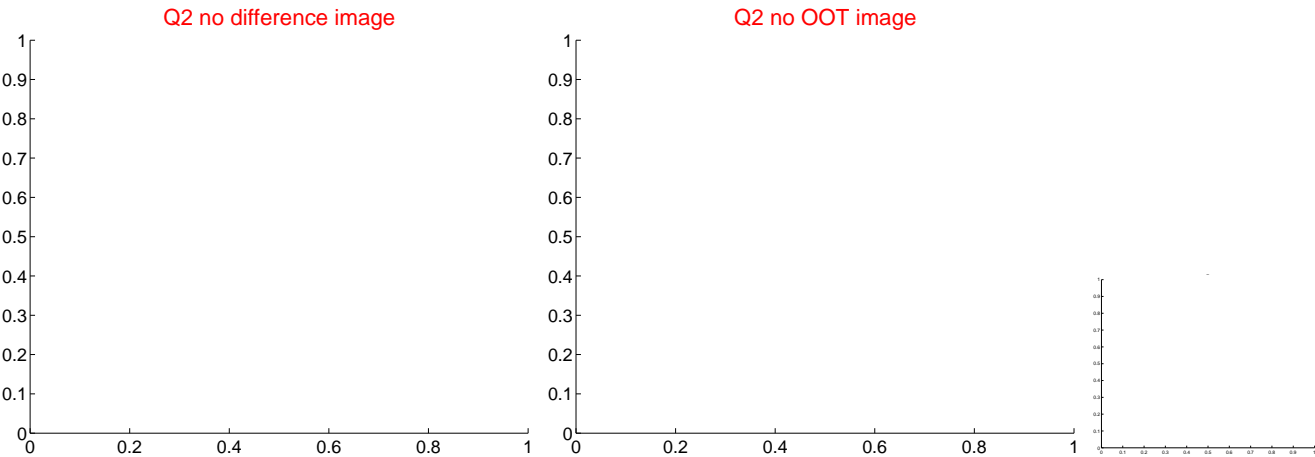
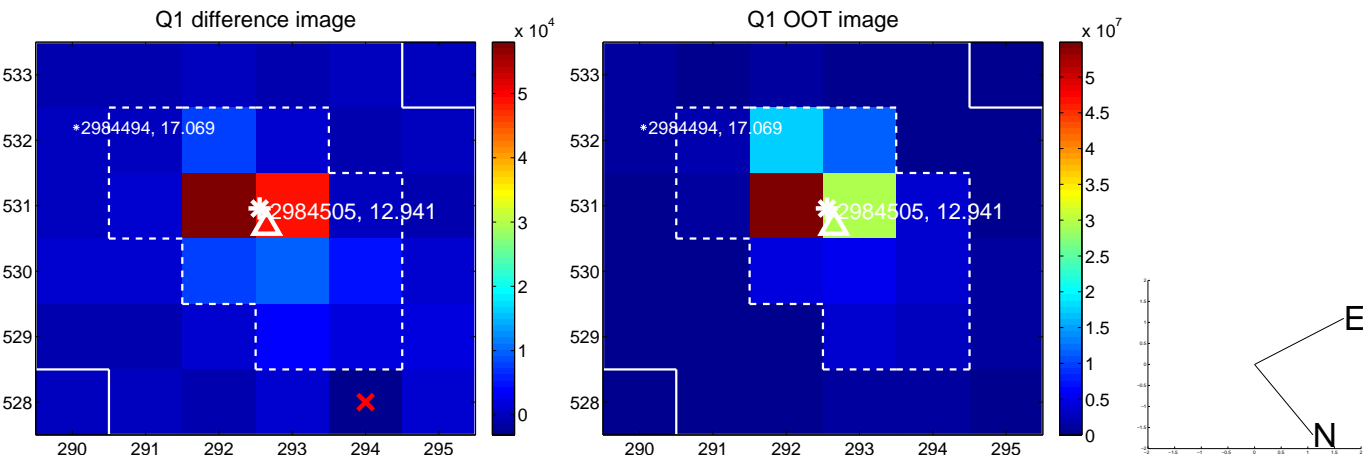
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.261 \pm 0.161$	1.62	$0.154 \pm 0.092$	$0.211 \pm 0.188$
PRF-fit source offset from KIC position	$0.256 \pm 0.159$	1.61	$0.174 \pm 0.093$	$0.188 \pm 0.198$
photometric centroid source offset	$0.52 \pm 1.06$	0.49	$-0.04 \pm 0.83$	$0.51 \pm 1.06$

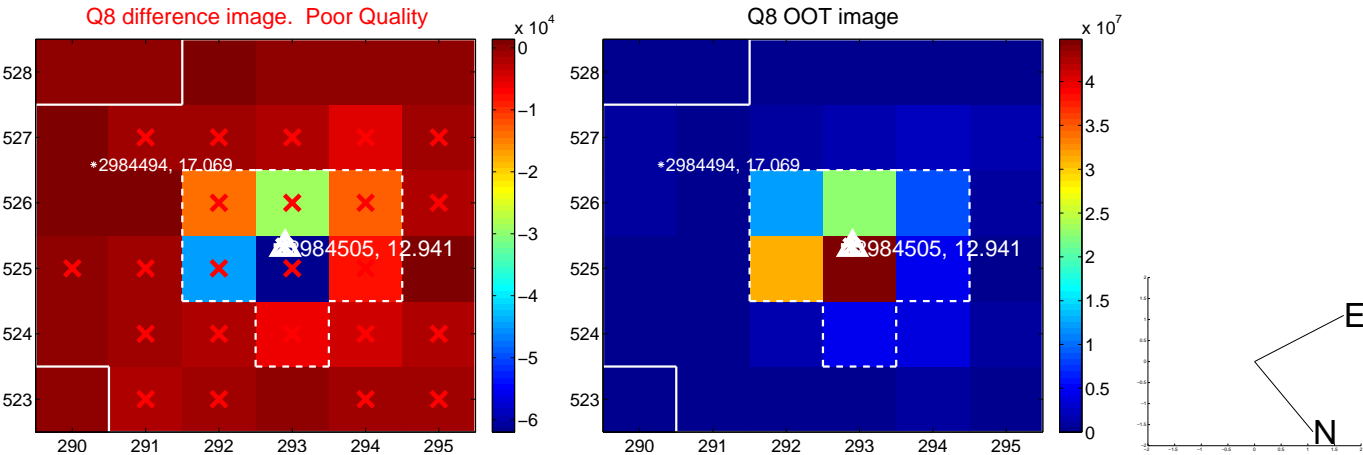
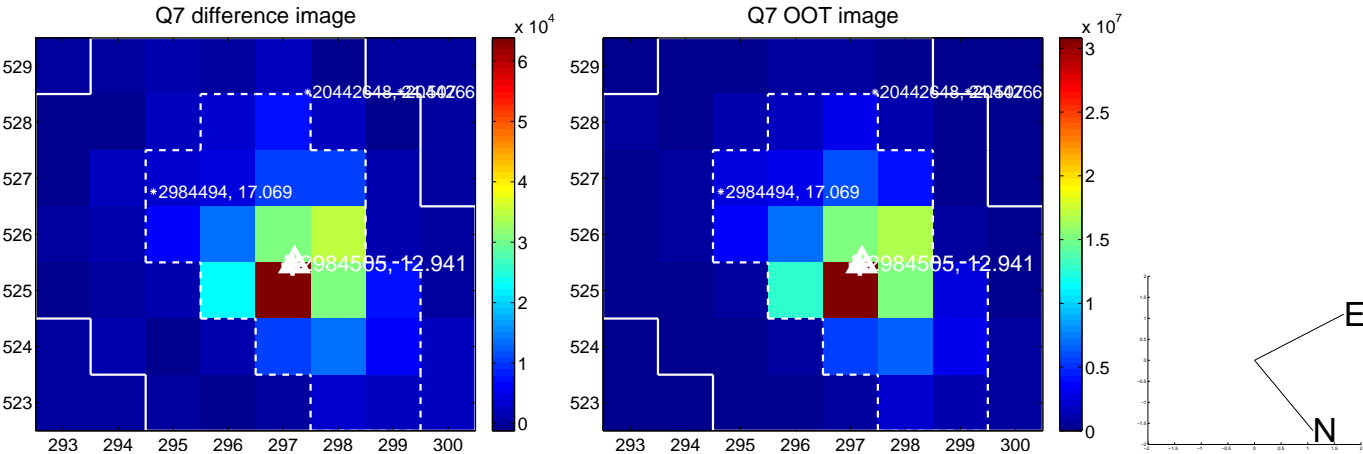
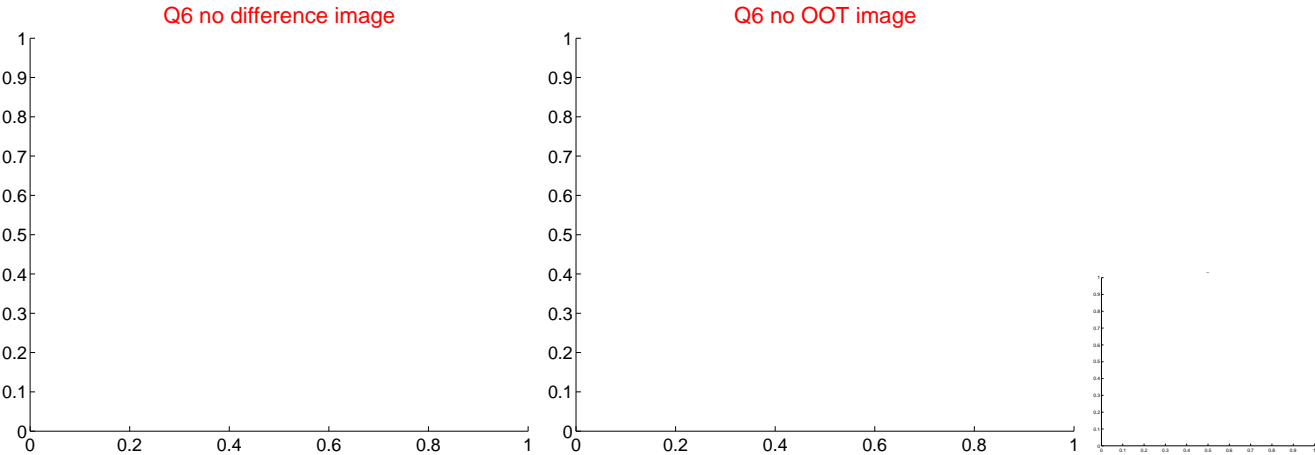
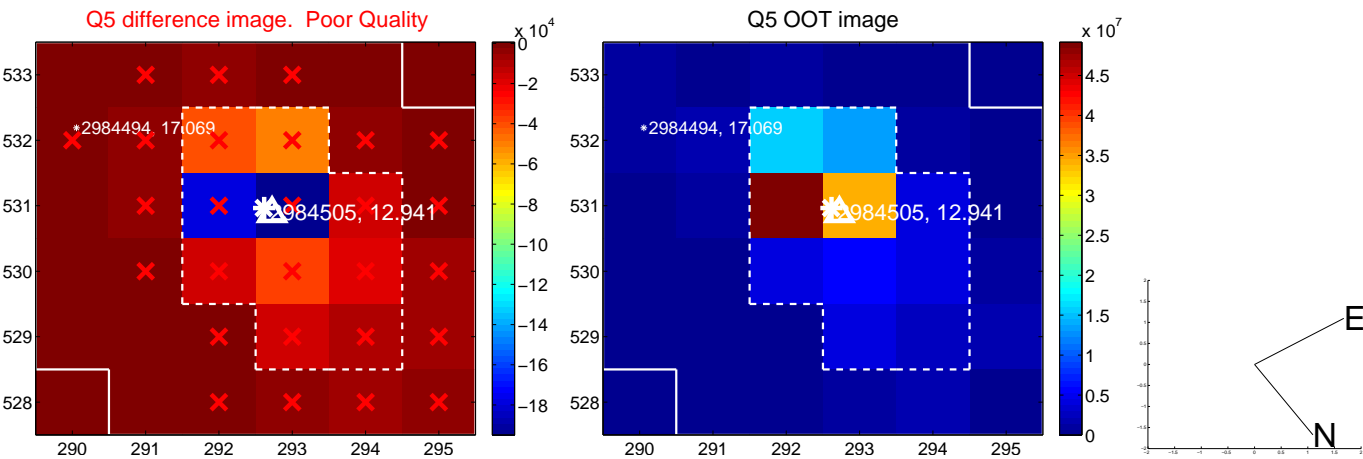


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

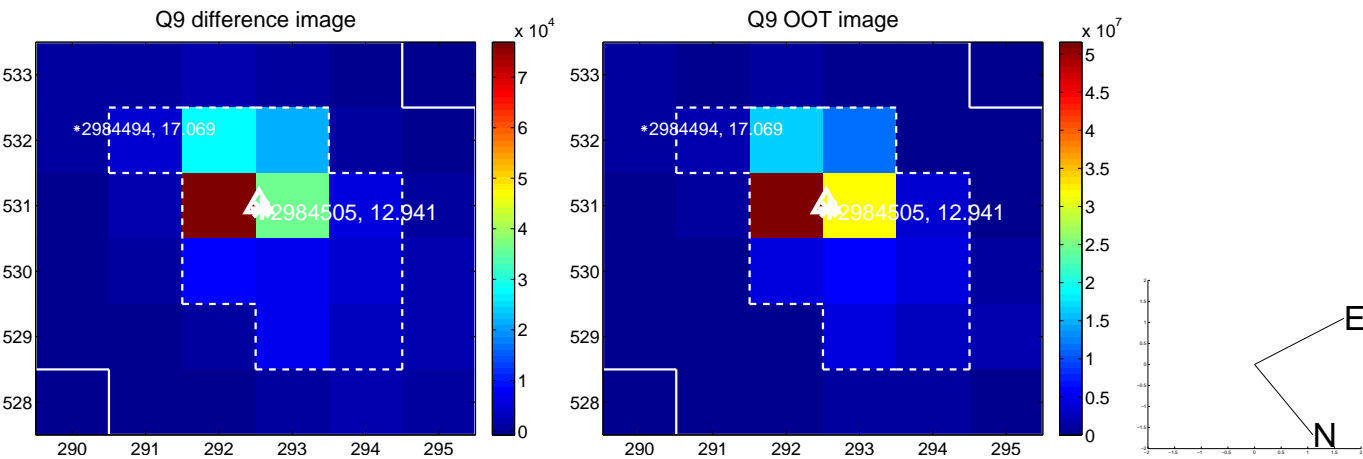


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

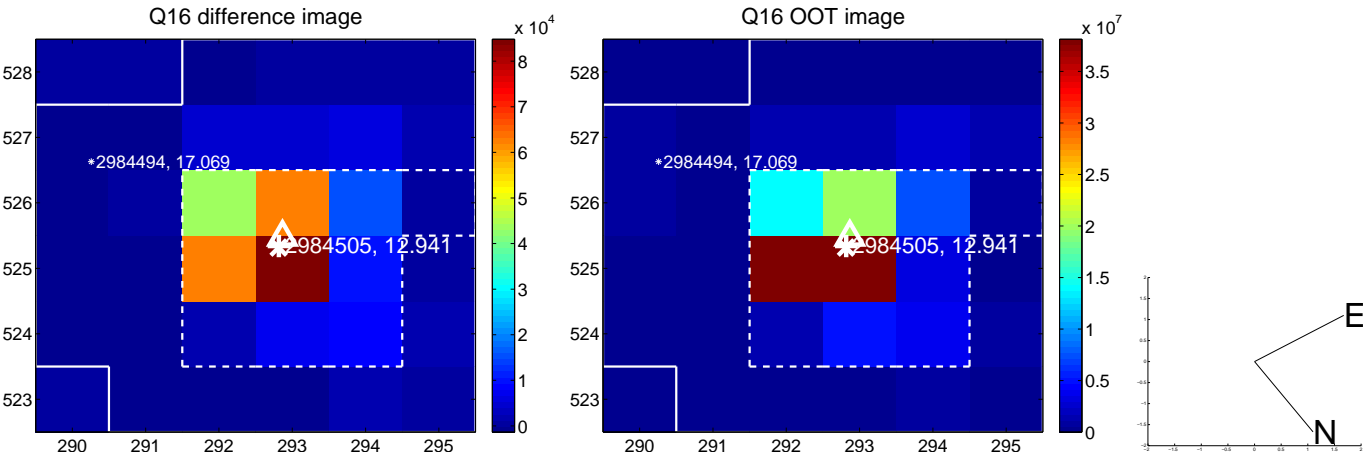
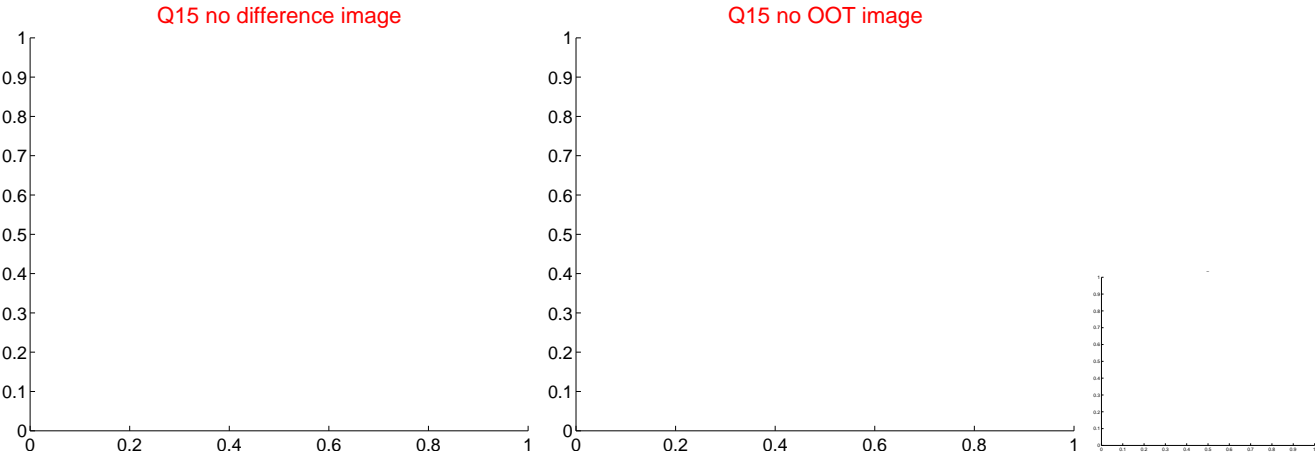
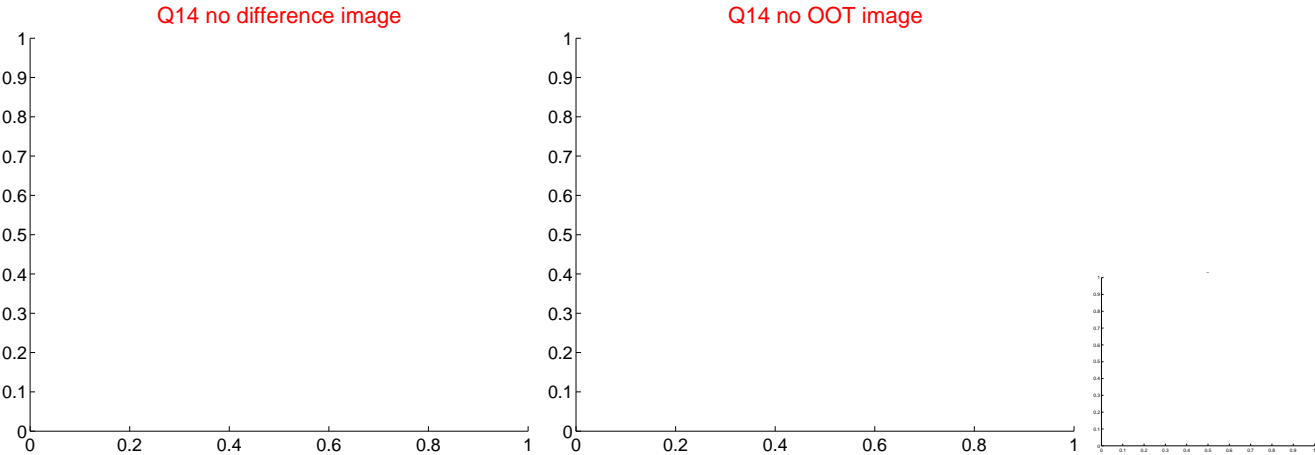
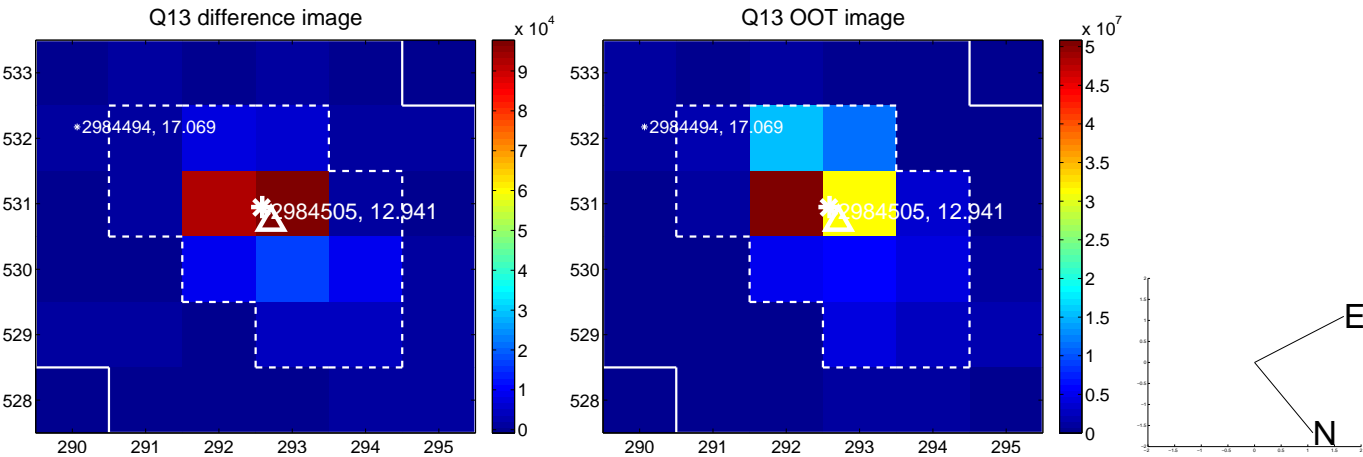




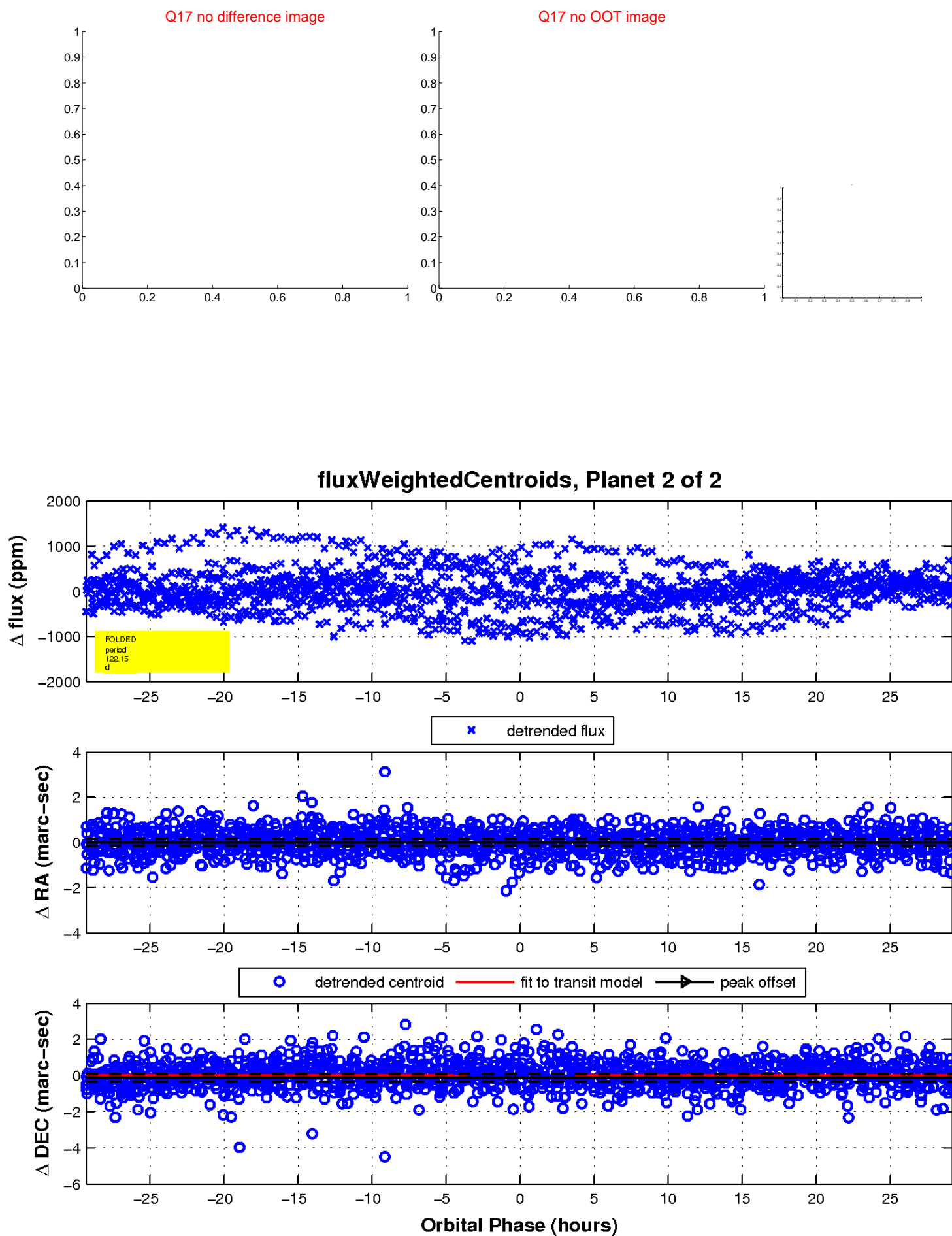
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UKIRT Image

Declination

