

# KIC 007901016

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007901016-01	OBS	4257.01	41.675178	169.797159	134.5	11.921	13.6	14.7	1.76	5745	2.65	53.83

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007901016-01	OBS	PC	0.70	0	0	0	0	NO_COMMENT

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

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

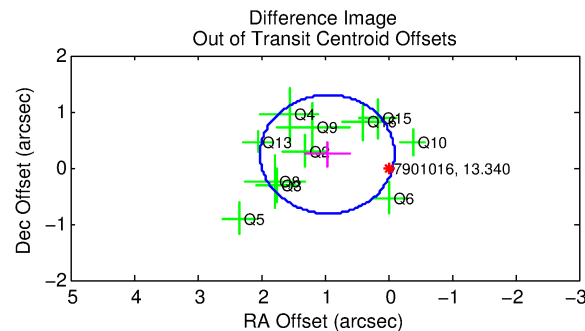
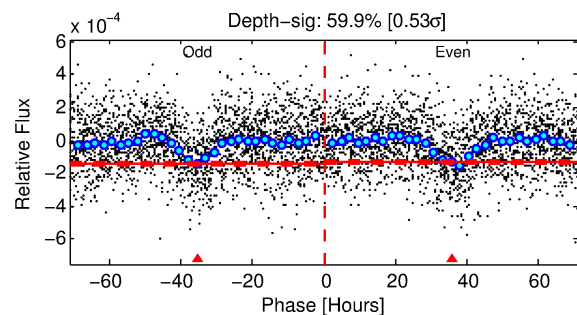
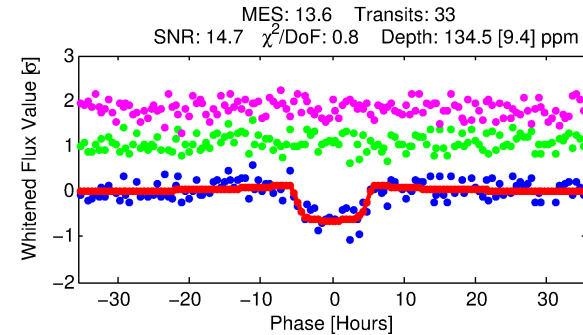
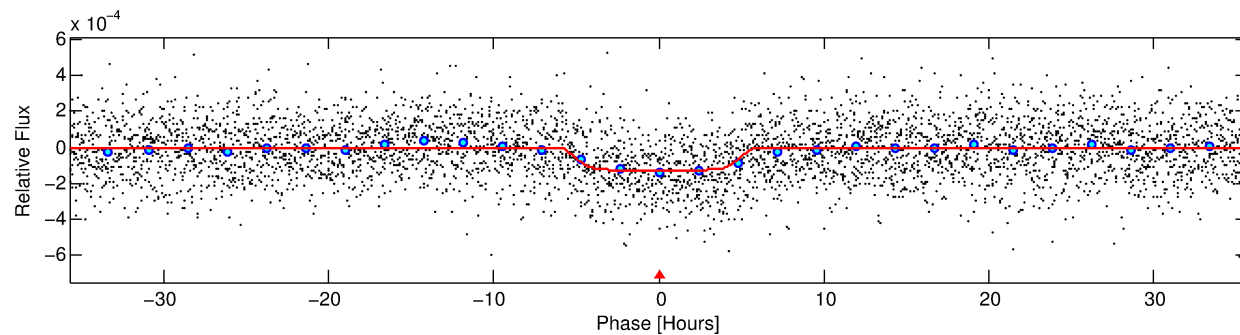
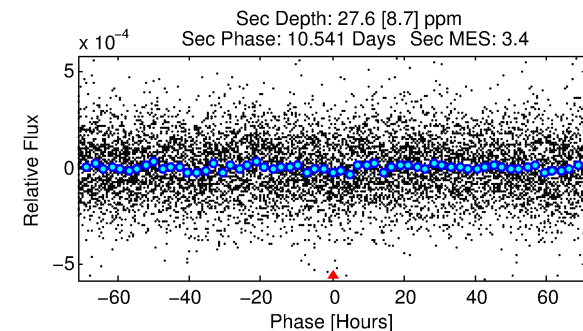
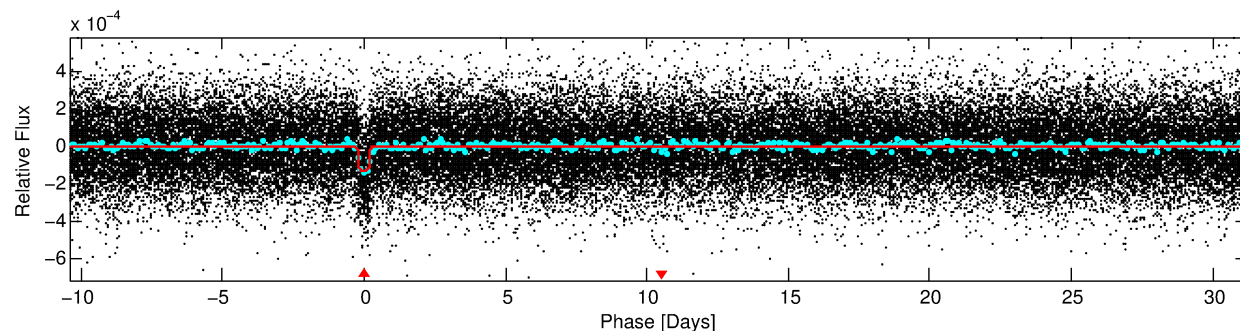
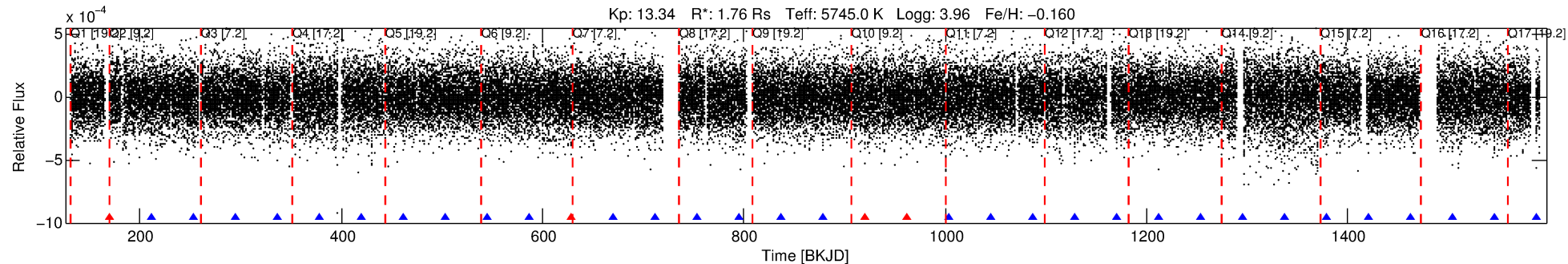
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007901016-01

No Significant Match Found

# DV One-Page Summary

KIC: 7901016 Candidate: 1 of 1 Period: 41.675 d  
KOI: K04257.01 Corr: 0.946



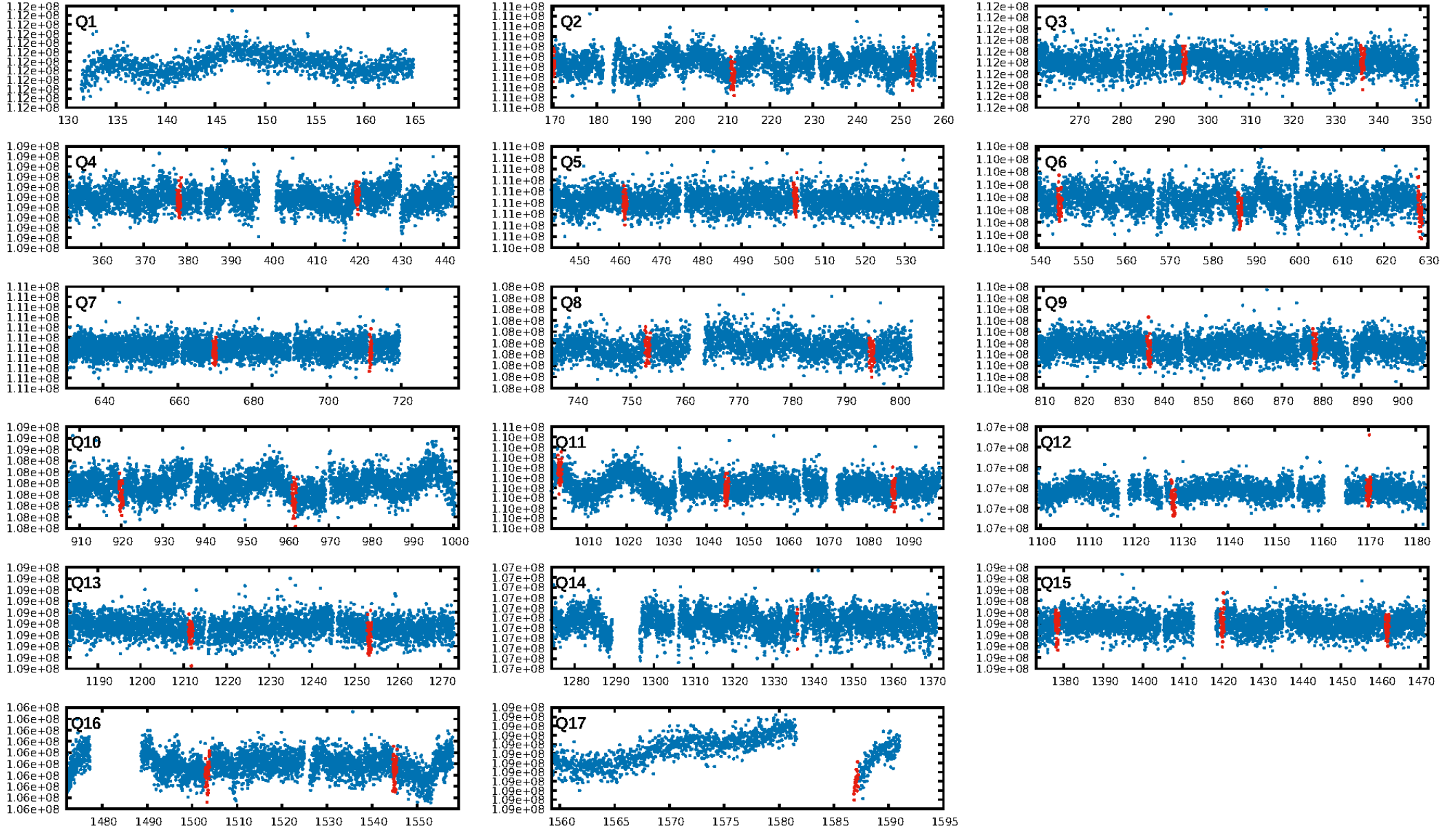
## DV Fit Results:

Period = 41.67518 [0.00073] d  
Epoch = 169.7972 [0.0140] BKJD  
Rp/R\* = 0.0138 [0.0008]  
a/R\* = 8.64 [1.81]  
b = 0.96 [0.02]  
Seff = 53.83 [42.11]  
Teq = 691 [135] K  
Rp = 2.65 [1.20] Re  
a = 0.2374 [0.1108] AU  
Ag = 122.31 [103.14] [1.18σ]  
Teffp = 3551 [311] K [8.43σ]

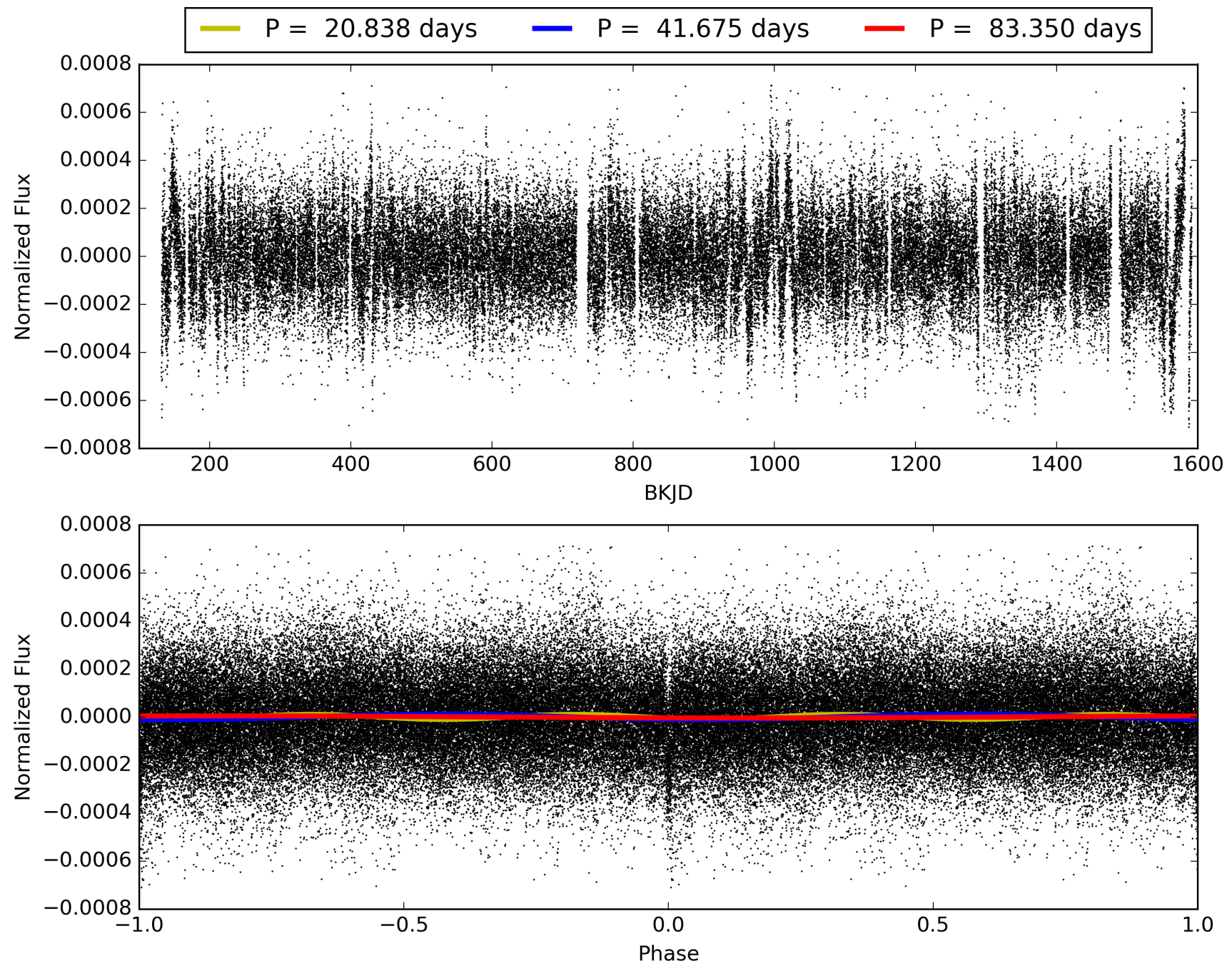
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 94.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.92e-38  
RollingBand-fgt: 0.88 [28/32]  
GhostDiagnostic-chr: 1.291  
Centroid-sig: 77.8%  
Centroid-so: 0.381 arcsec [0.50σ]  
OotOffset-rm: 0.989 arcsec [2.81σ]  
KicOffset-rm: 0.984 arcsec [2.78σ]  
OotOffset-st: 3/2/3/3 [11]  
KicOffset-st: 3/2/3/3 [11]  
DiffImageQuality-fgm: 1.00 [11/11]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 007901016-01, PDC Light Curves



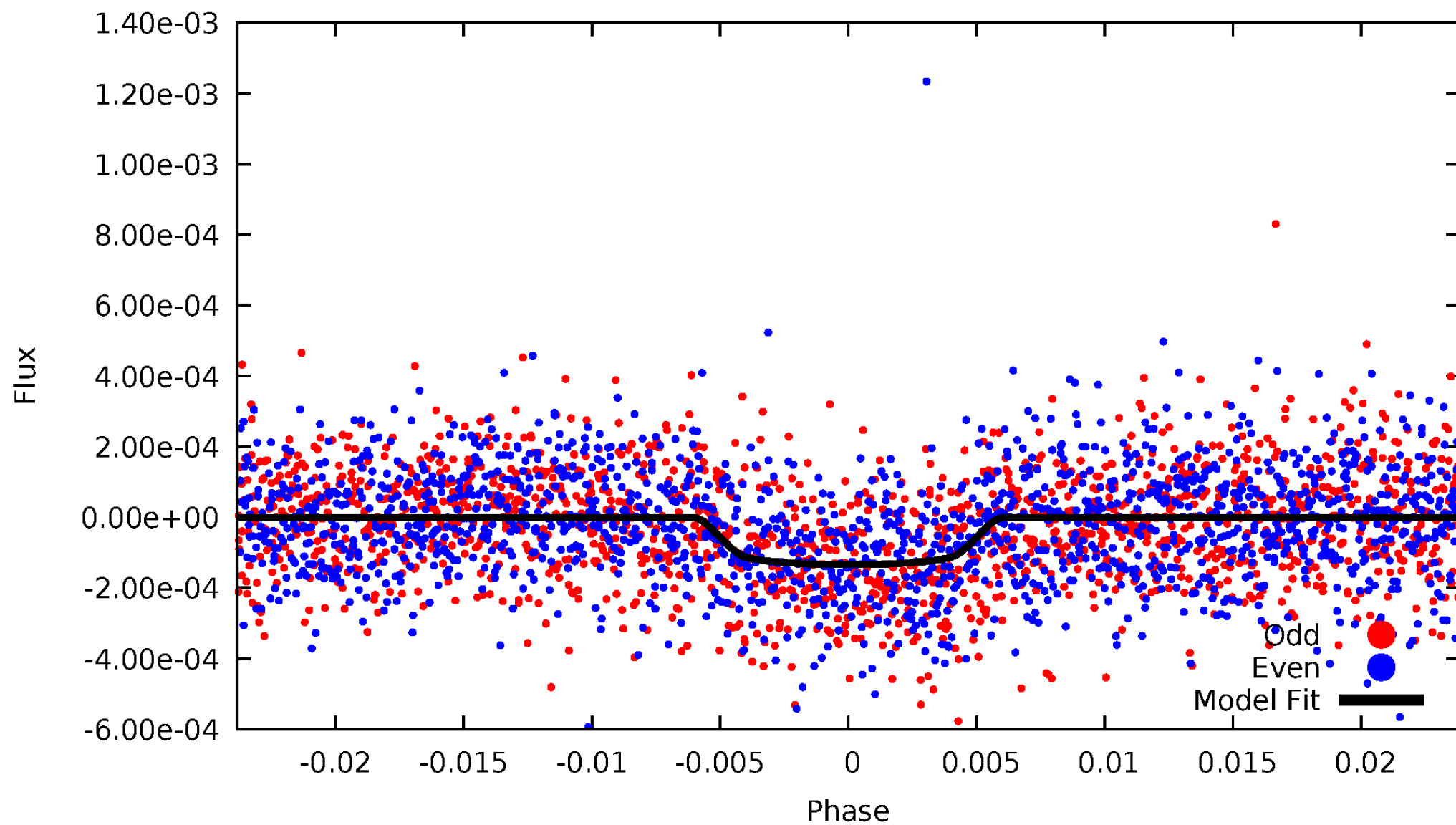
TCE 007901016-01





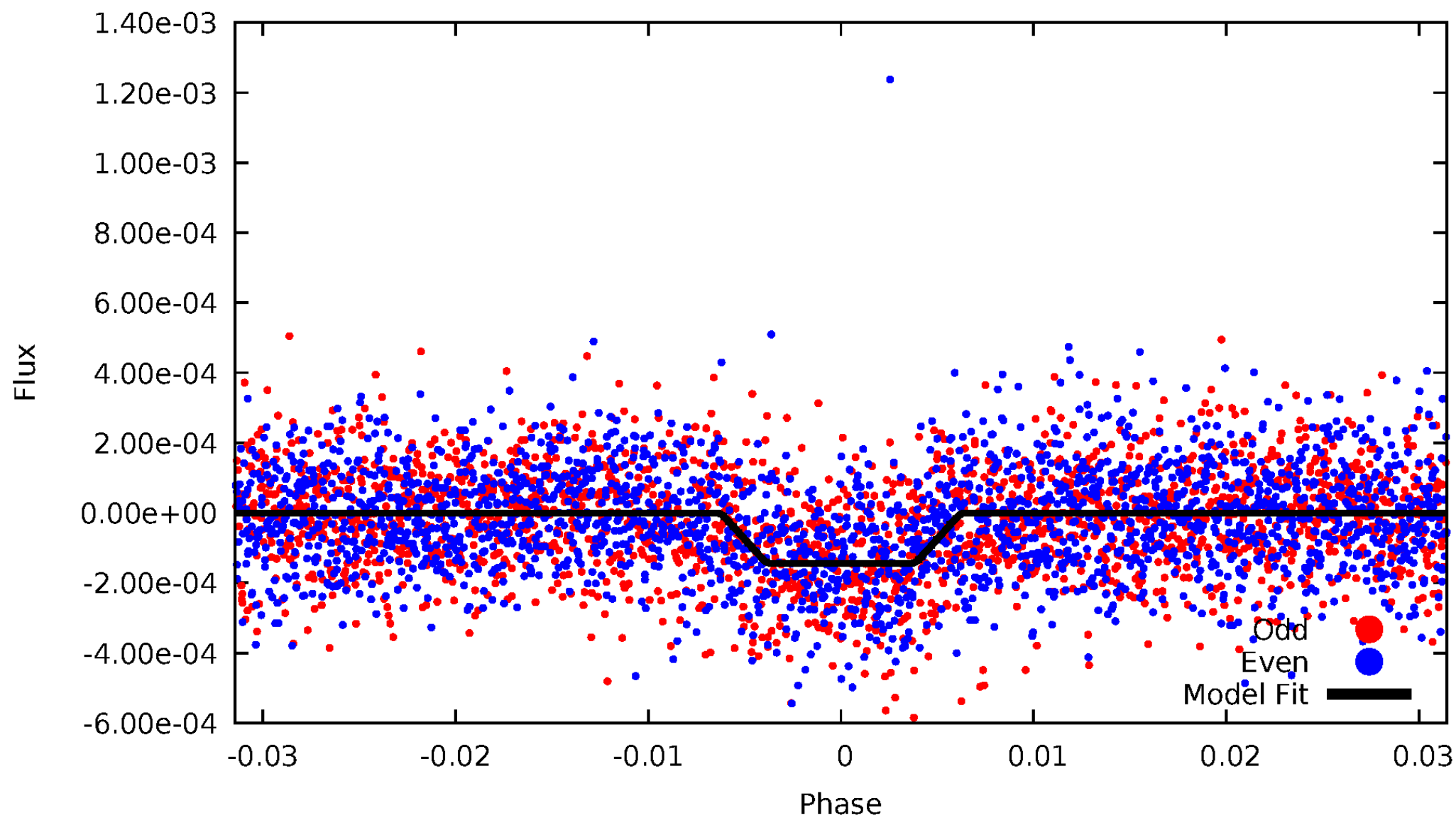
# DV Odd/Even

TCE 007901016-01

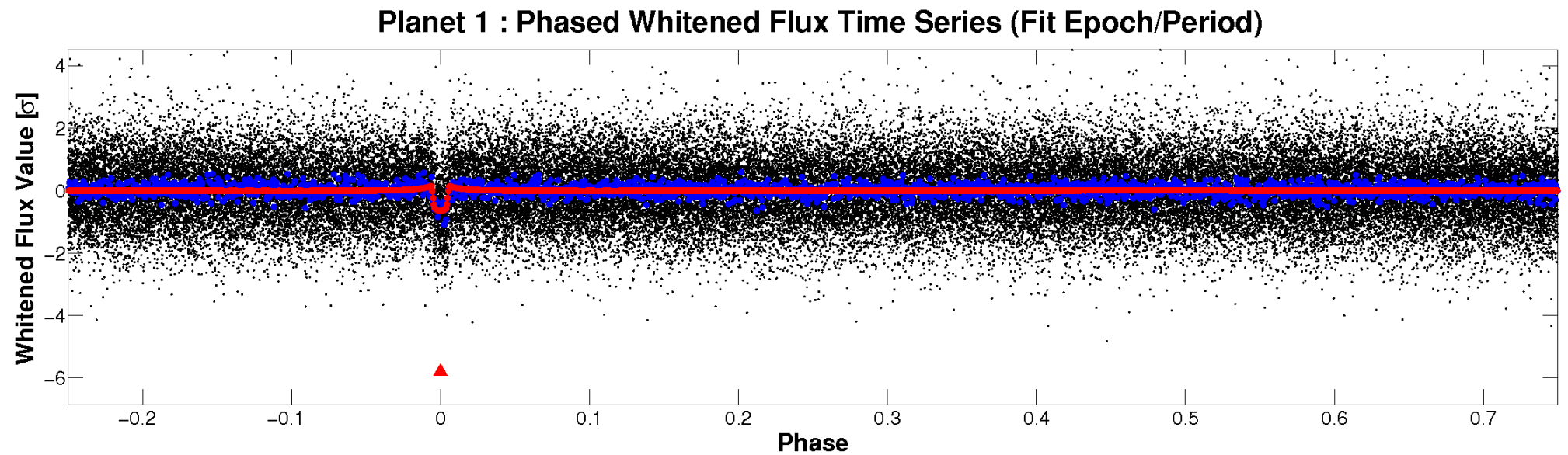
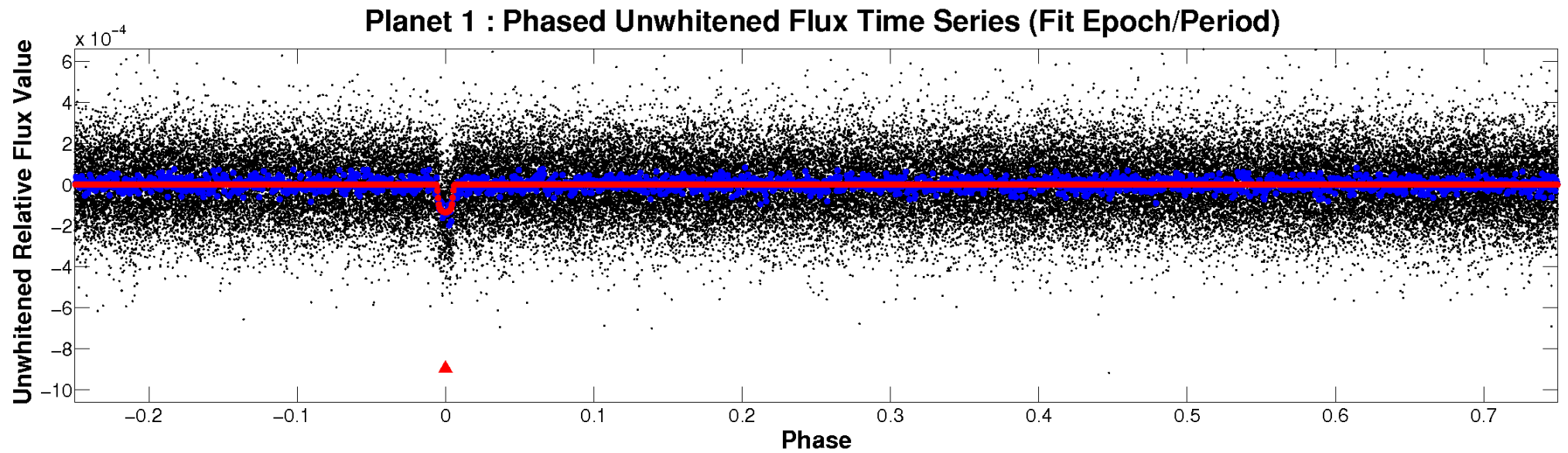


# ALT Odd/Even

TCE 007901016-01

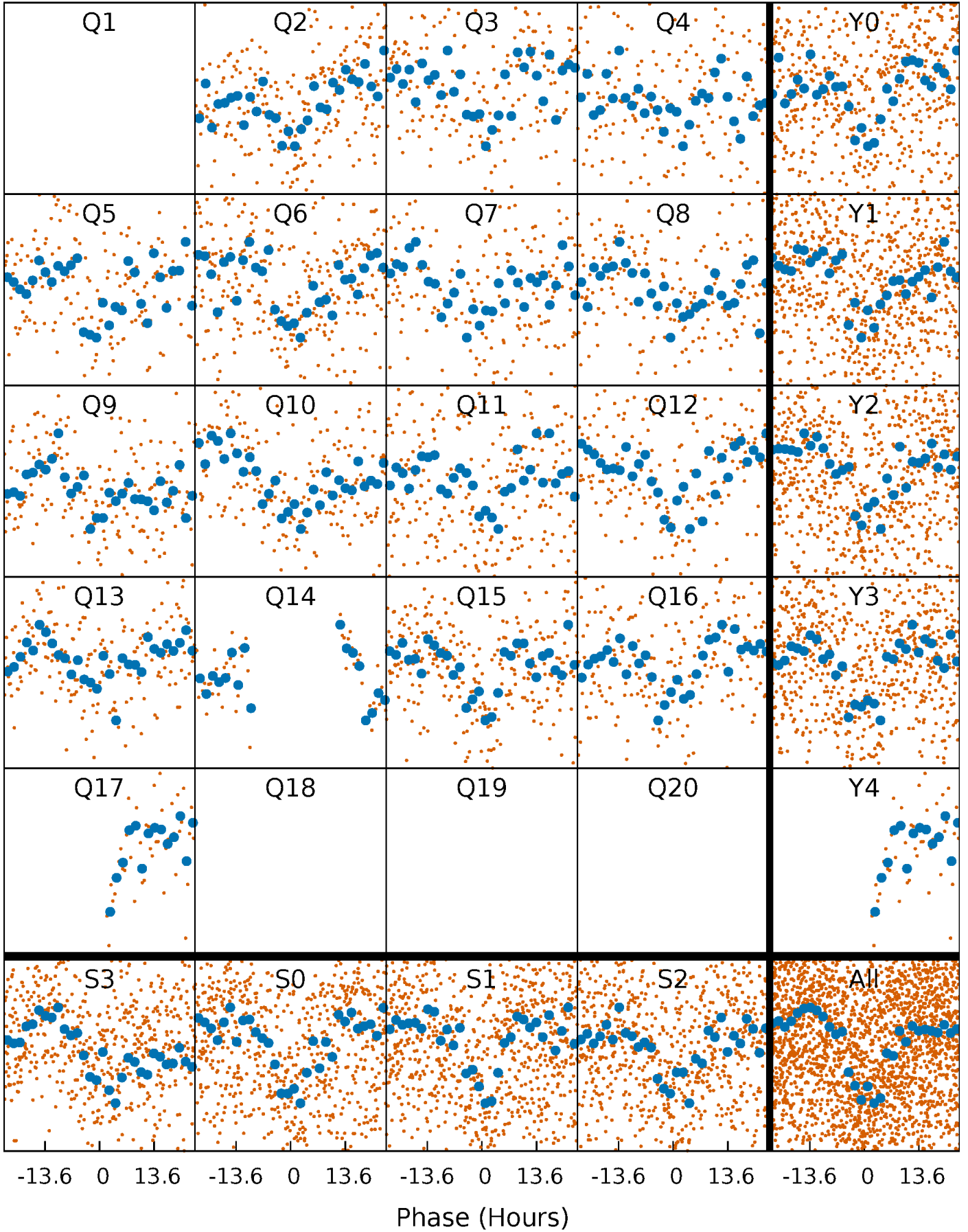


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

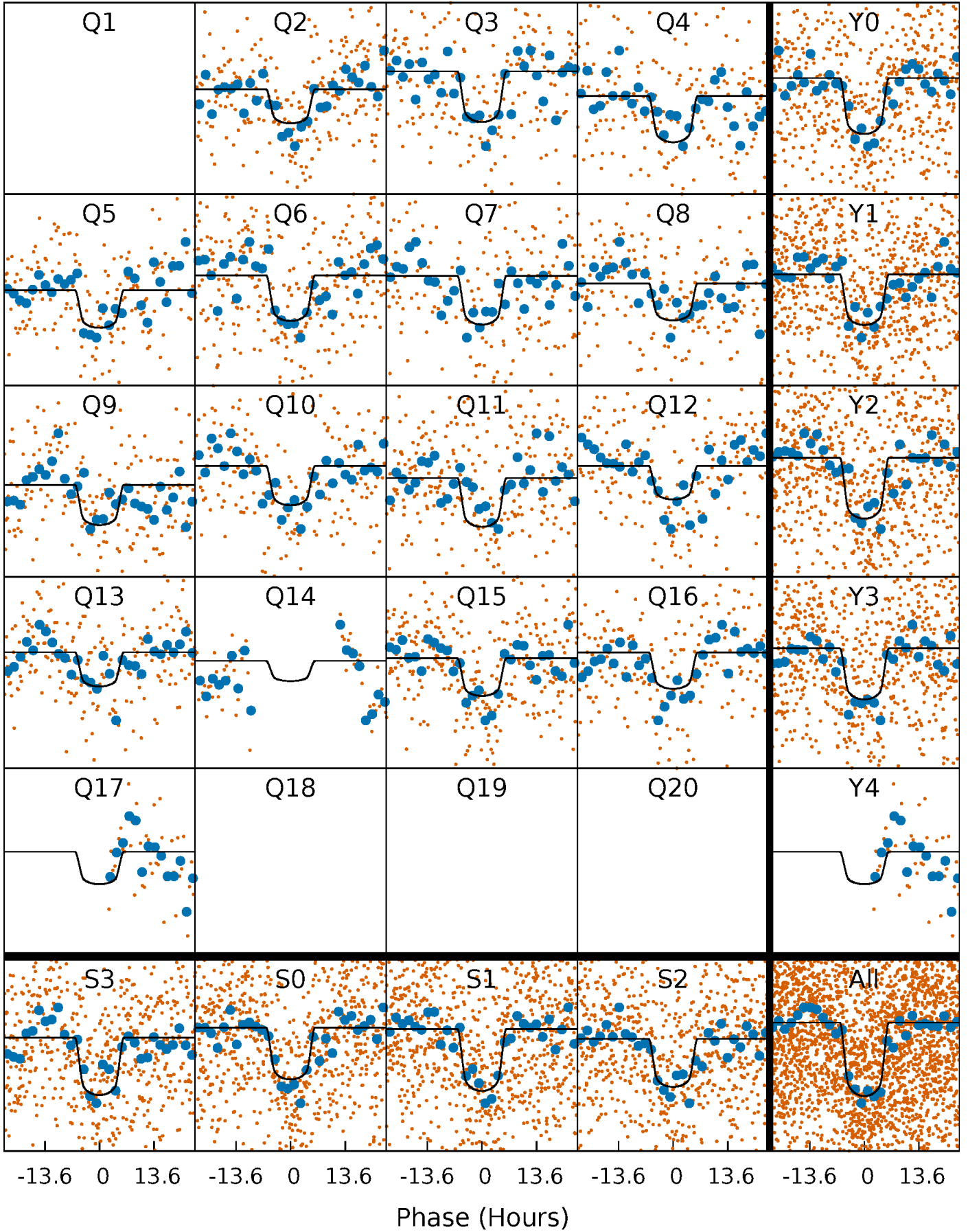
TCE 007901016-01   P= 41.675178 Days    $T_0=169.797158$  (BKJD)





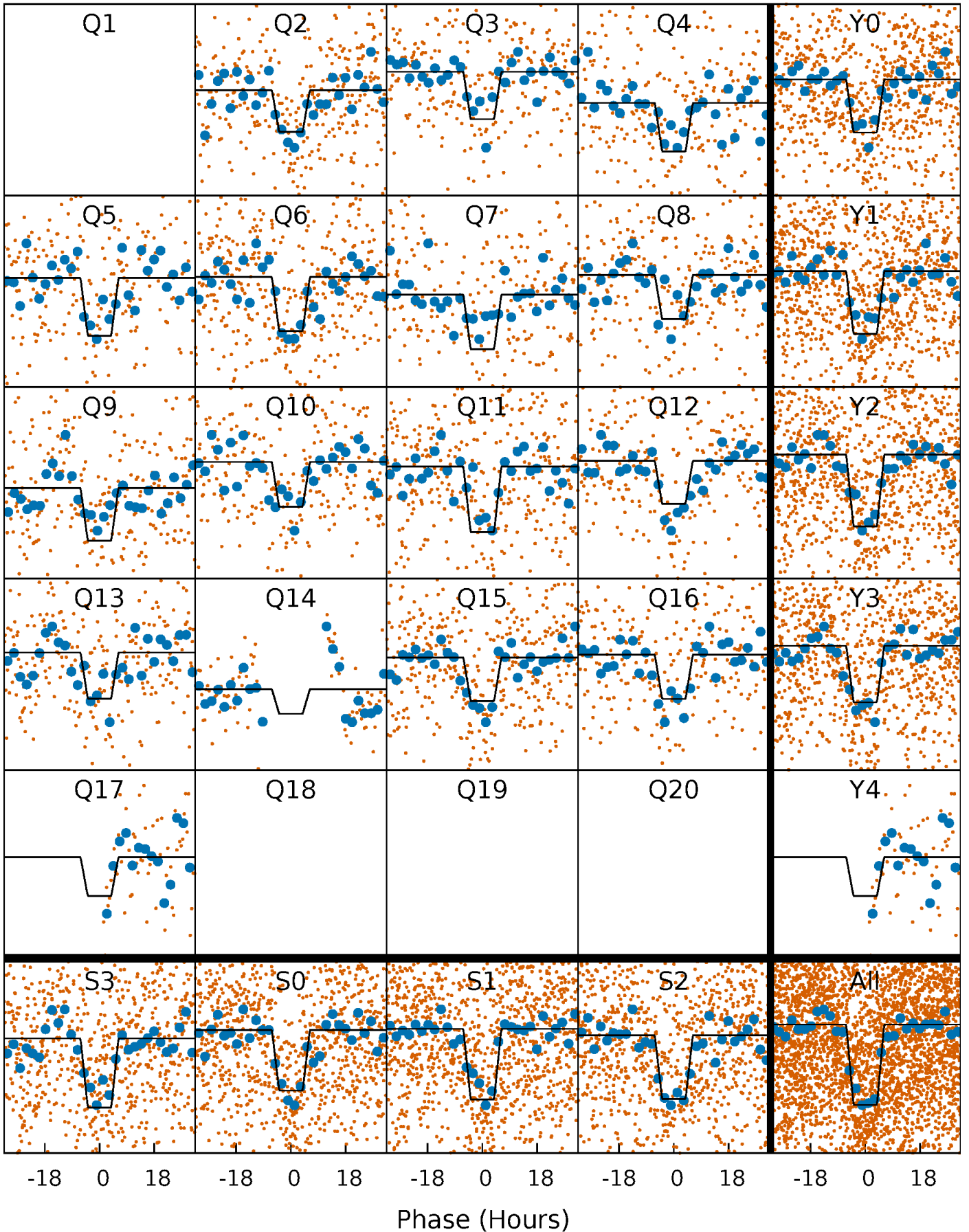
# DV Quarter-Phased Transit Curves

TCE 007901016-01 P= 41.675178 Days  $T_0=169.797158$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

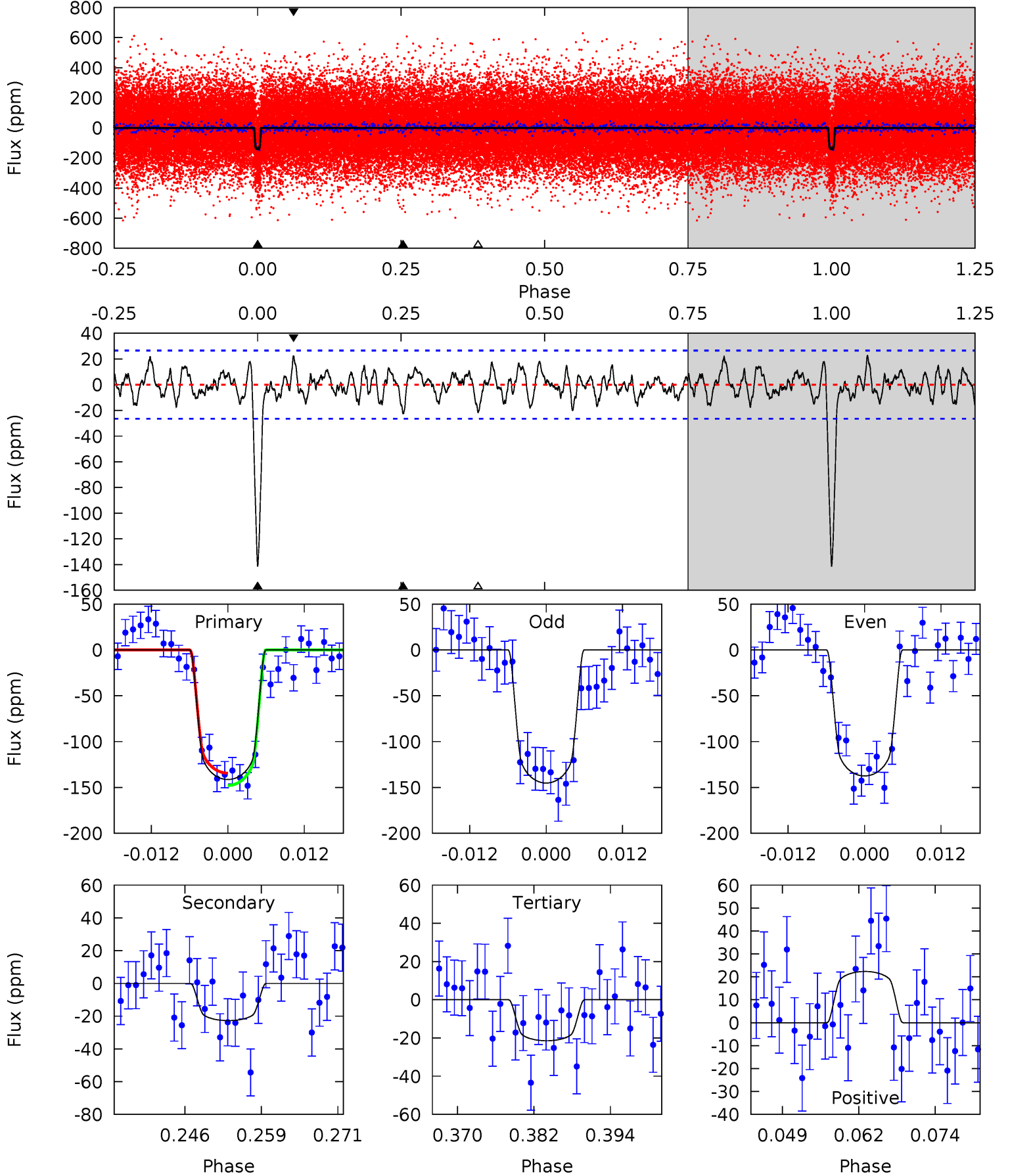
TCE 007901016-01 P= 41.675297 Days  $T_0=169.815320$  (BKJD)



# DV Model-Shift Uniqueness Test

007901016-01,  $P = 41.675178$  Days,  $E = 128.121980$  Days

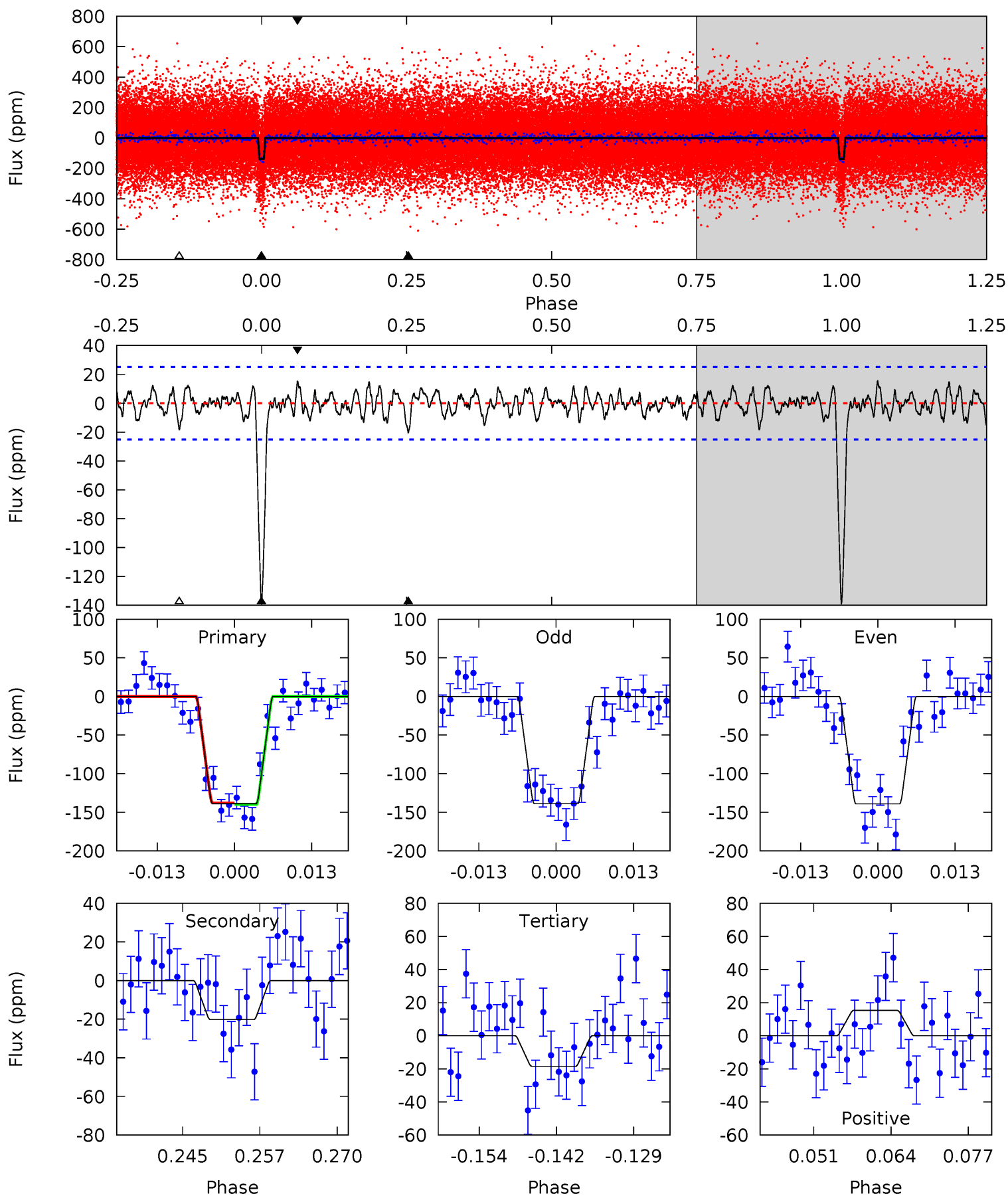
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.6	4.27	4.03	4.20	4.99	2.50	1.48	22.5	22.4	0.24	0.07	0.72	1.01	0.14	1.26



# Alt Model-Shift Uniqueness Test

007901016-01,  $P = 41.675297$  Days,  $E = 128.140023$  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
27.5	3.99	3.66	3.03	4.98	2.49	1.17	23.8	24.4	0.33	0.96	0.03	0.98	0.10	0.18



### Stellar Parameters For KIC 007901016

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5745^{+156}_{-156}$	$3.957^{+0.465}_{-0.155}$	$-0.160^{+0.300}_{-0.250}$	$1.763^{+0.428}_{-0.796}$	$1.027^{+0.130}_{-0.159}$	$0.264^{+1.147}_{-0.110}$
	+3%/-3%	+12%/-4%	+188%/-156%	+24%/-45%	+13%/-15%	+434%/-42%
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 007901016-01 / KOI 4257.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-23 \pm 5$	$2.56^{+0.46}_{-0.59}$	$948^{+76}_{-108}$	$3754^{+178}_{-194}$	$108^{+70}_{-37}$
Alt.	$-20 \pm 5$	$2.23^{+0.42}_{-0.54}$	$949^{+71}_{-113}$	$3852^{+198}_{-221}$	$125^{+91}_{-44}$

$T_{\text{max}}$  = 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

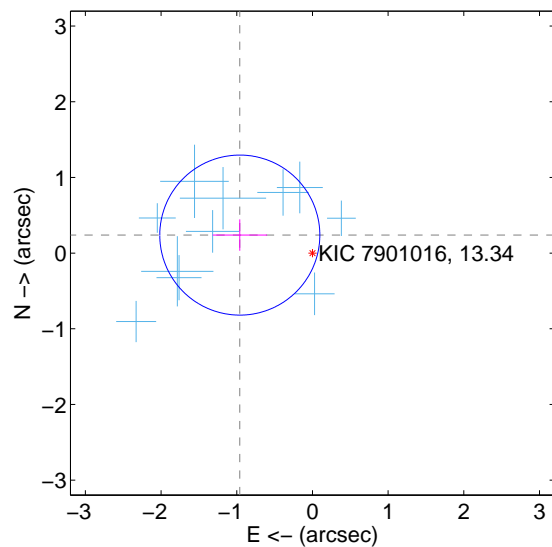
Supplemental centroid analysis for 007901016-01. Kepler magnitude: 13.34. Transit SNR 14.73

There are 11 quarters with good PRF difference image offsets

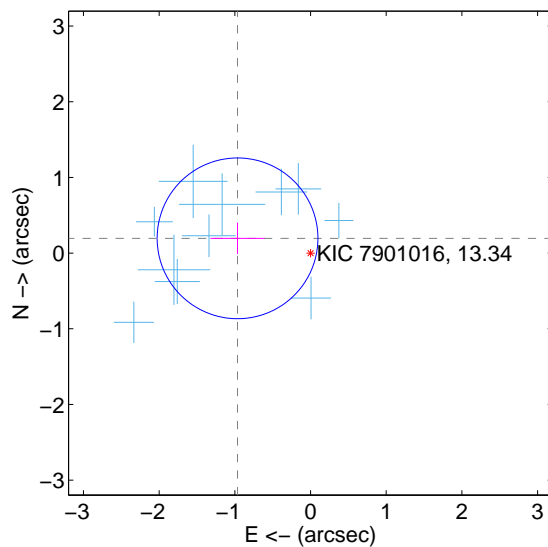
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.989 \pm 0.352$	2.81	$0.960 \pm 0.359$	$0.238 \pm 0.207$
PRF-fit source offset from KIC position	$0.984 \pm 0.354$	2.78	$0.964 \pm 0.359$	$0.195 \pm 0.207$
photometric centroid source offset	$0.38 \pm 0.76$	0.50	$-0.28 \pm 0.72$	$0.26 \pm 0.80$

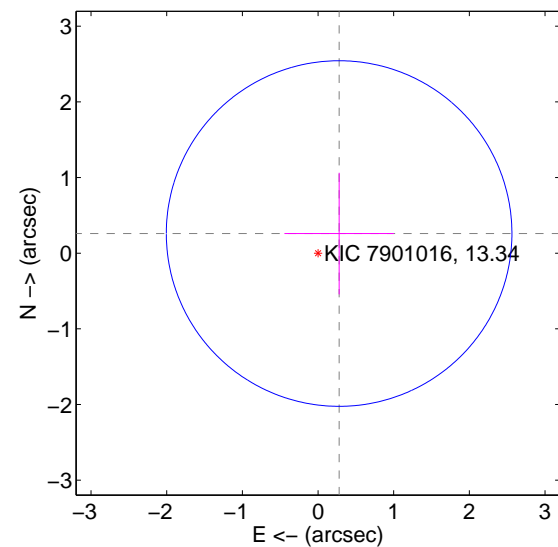
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

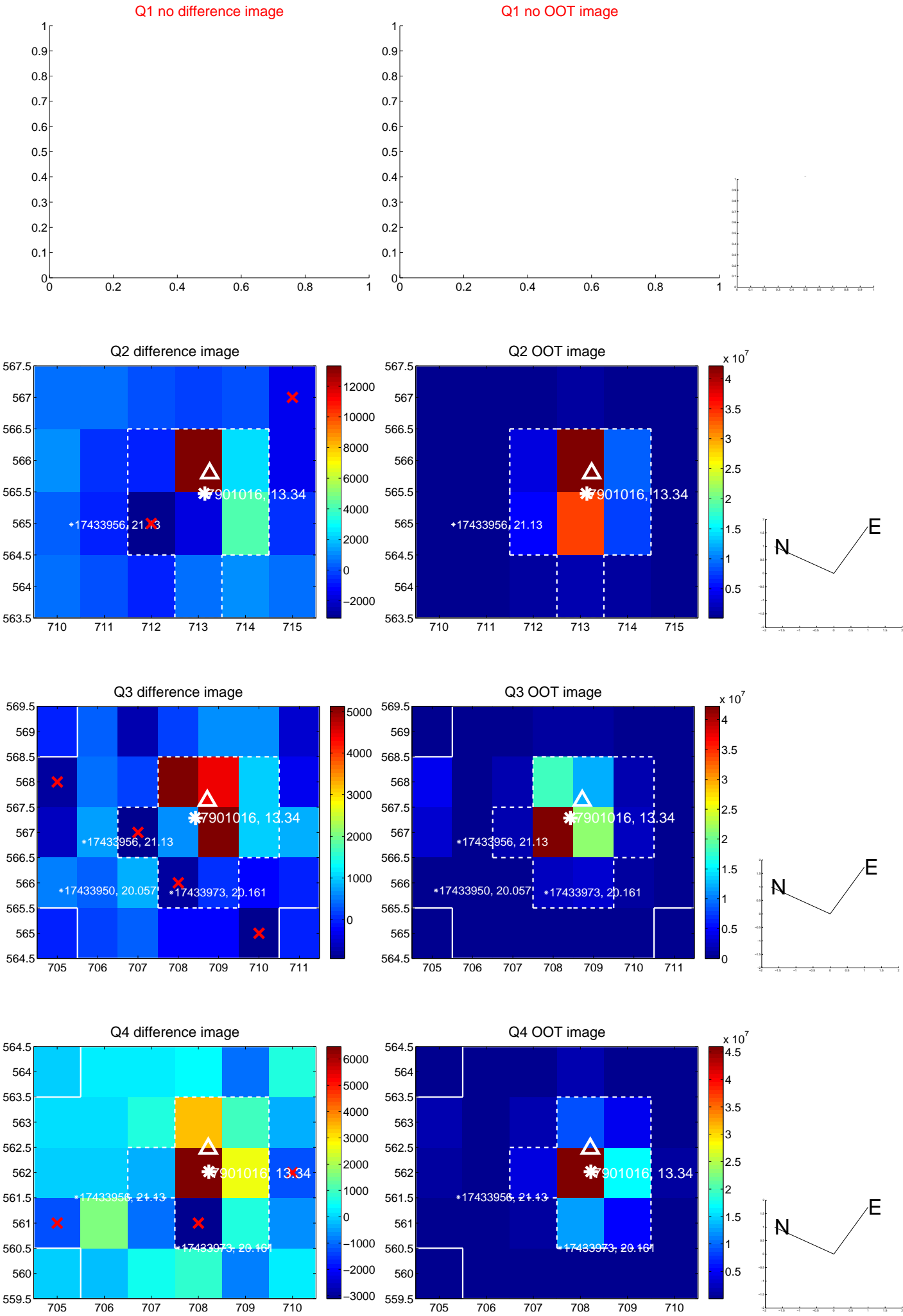


offset from photometric centroids

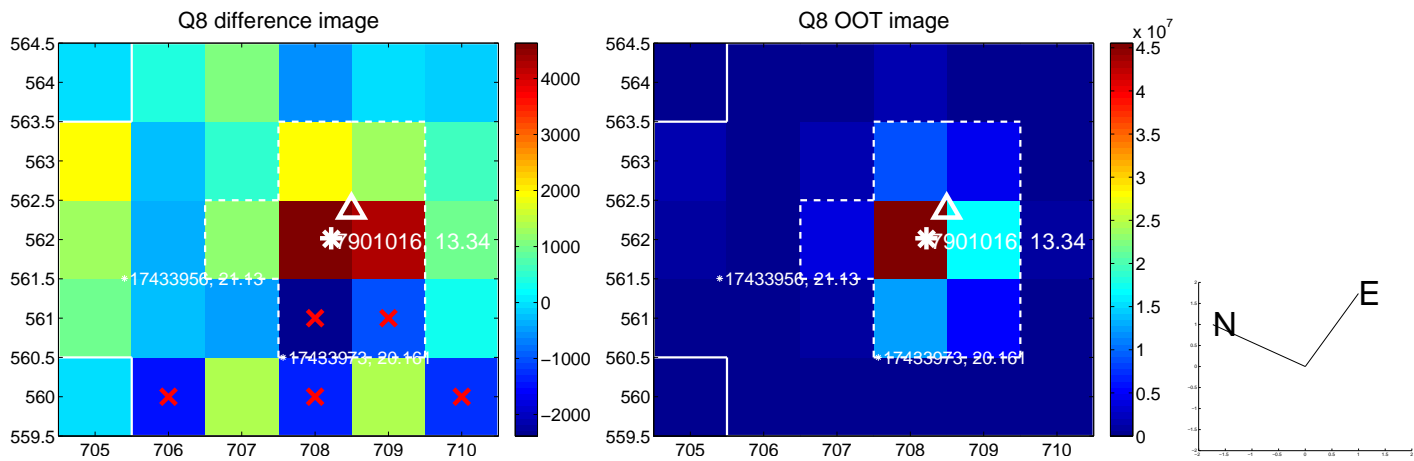
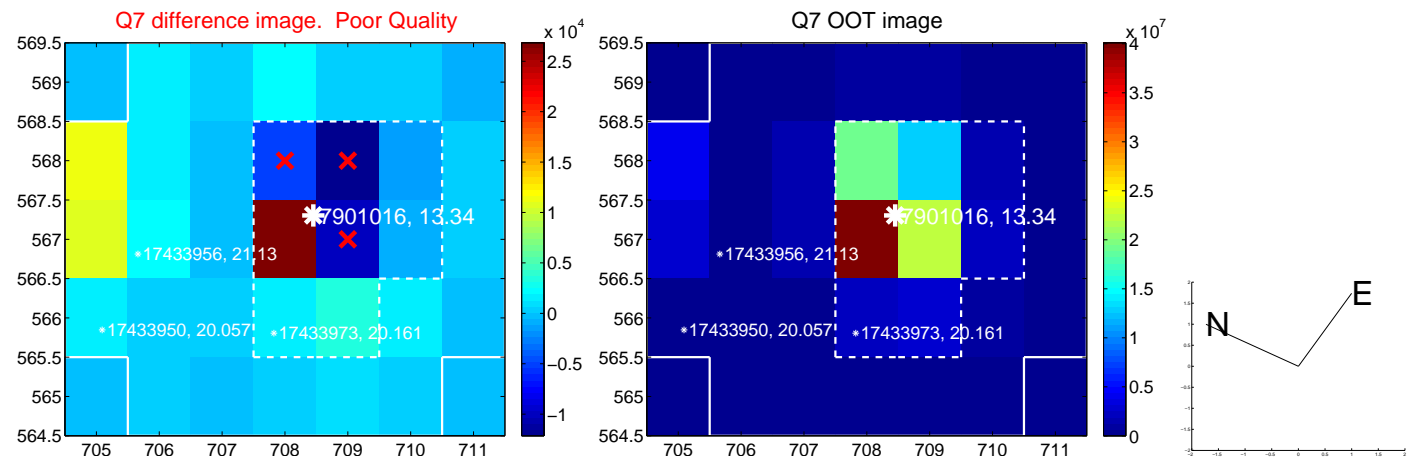
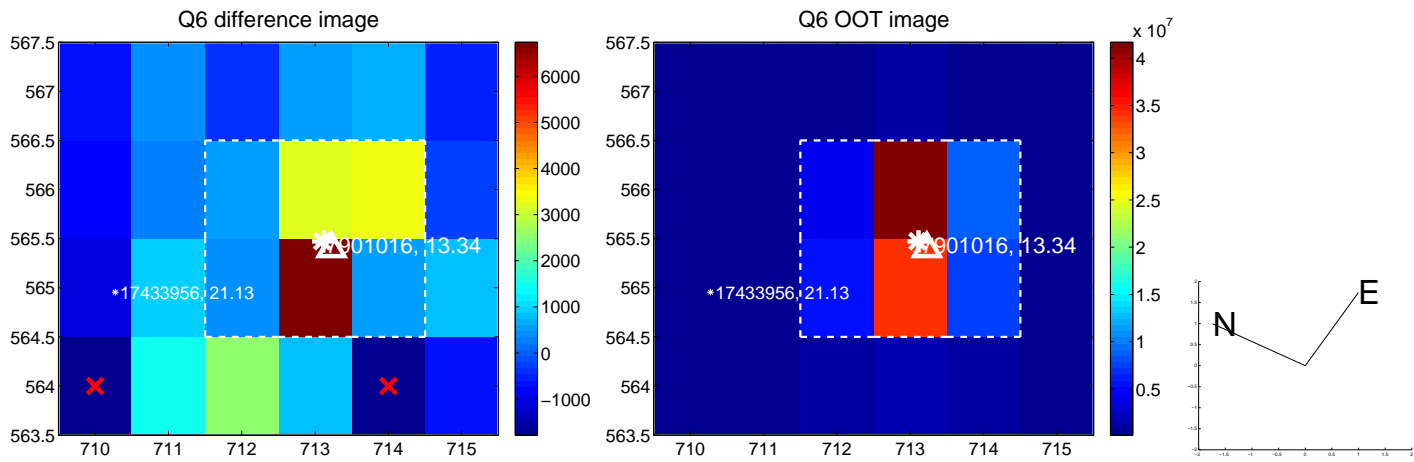
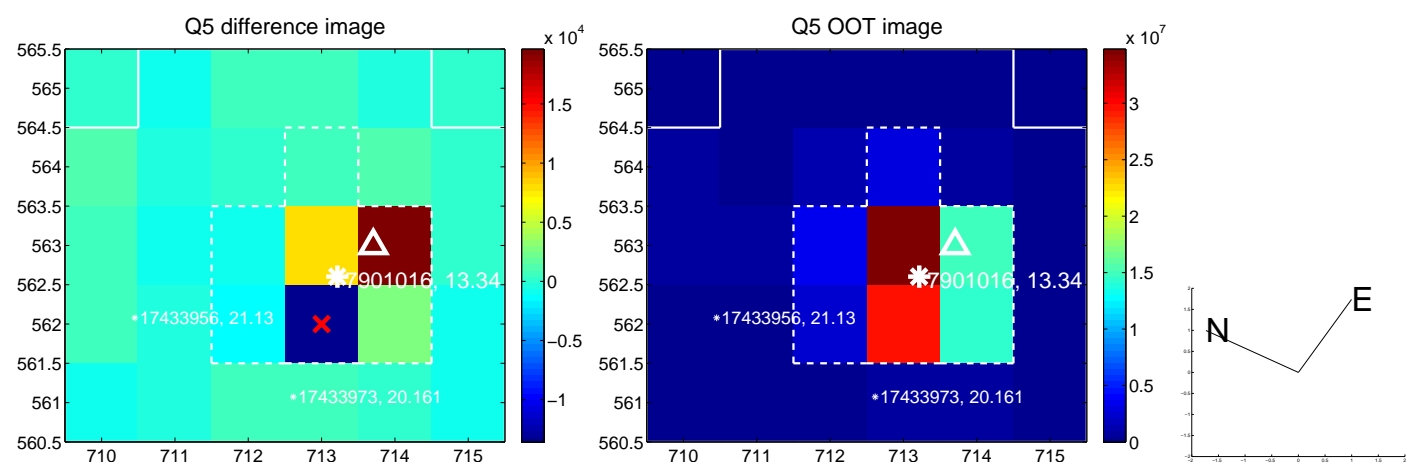


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

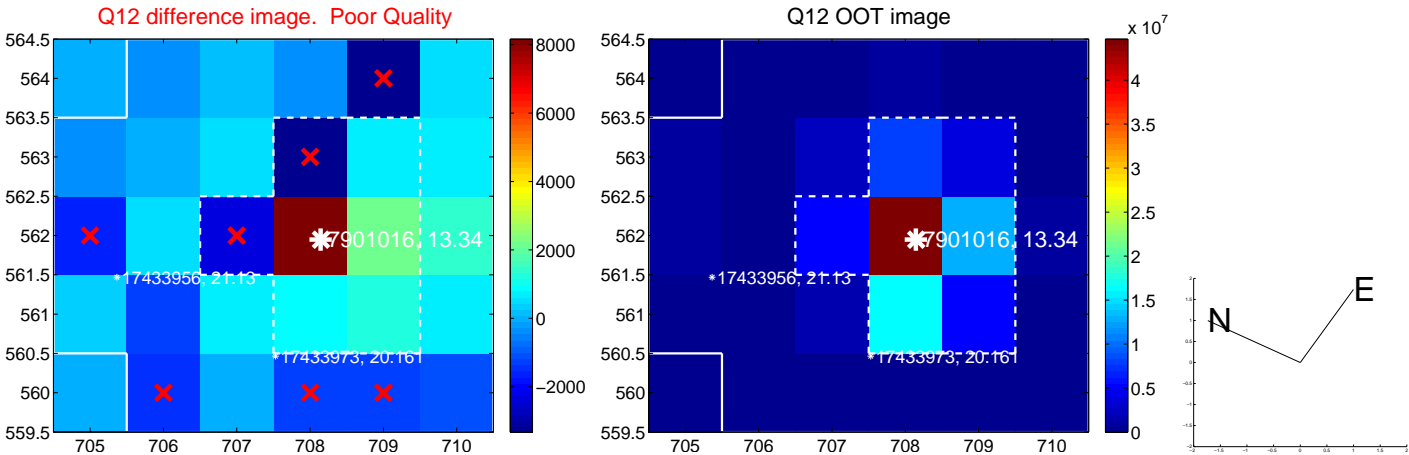
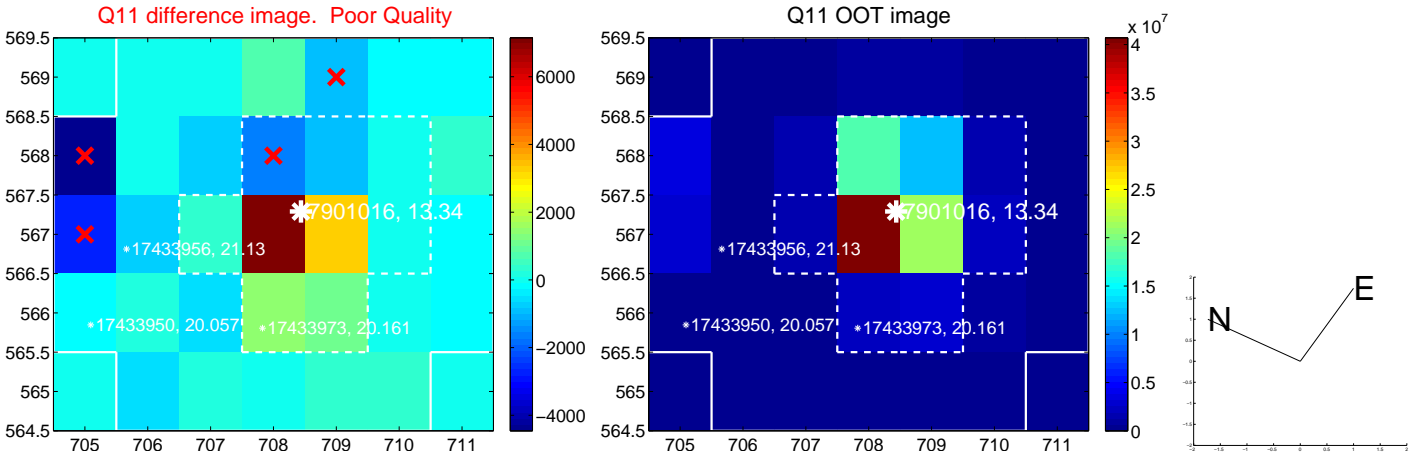
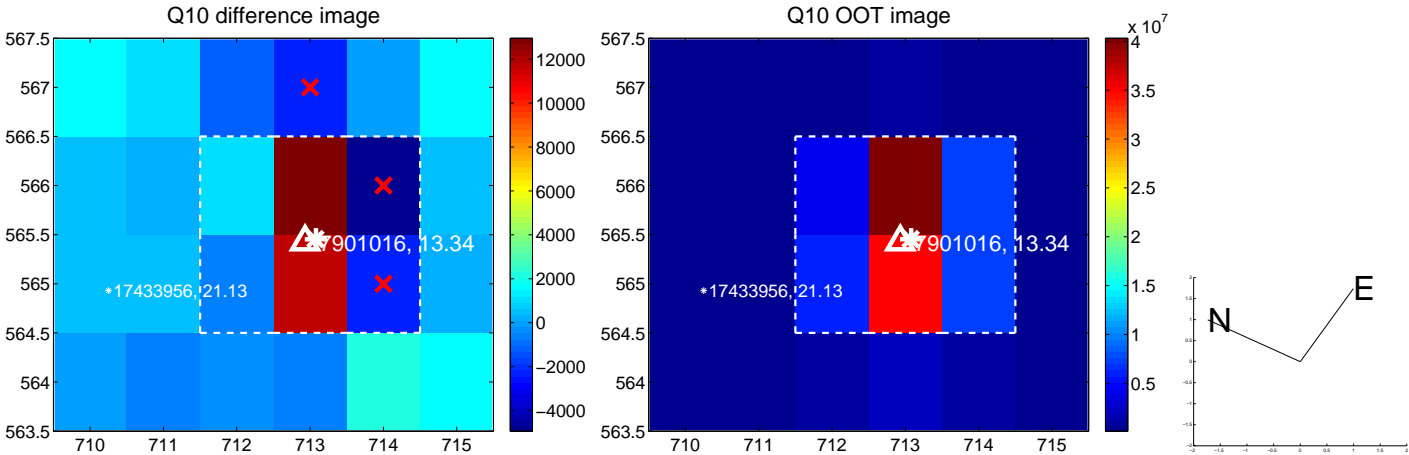
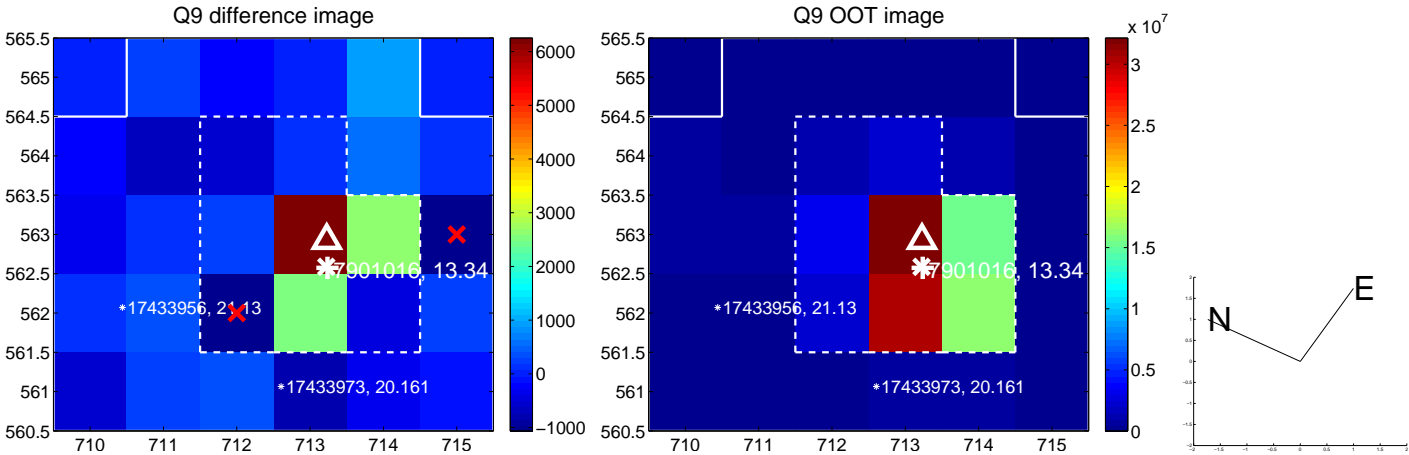
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



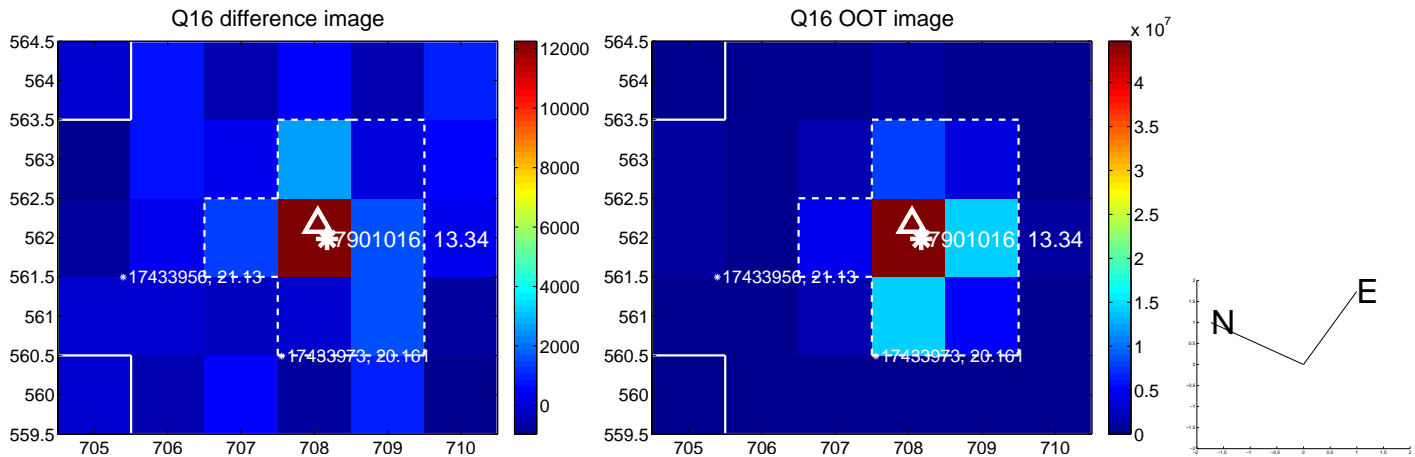
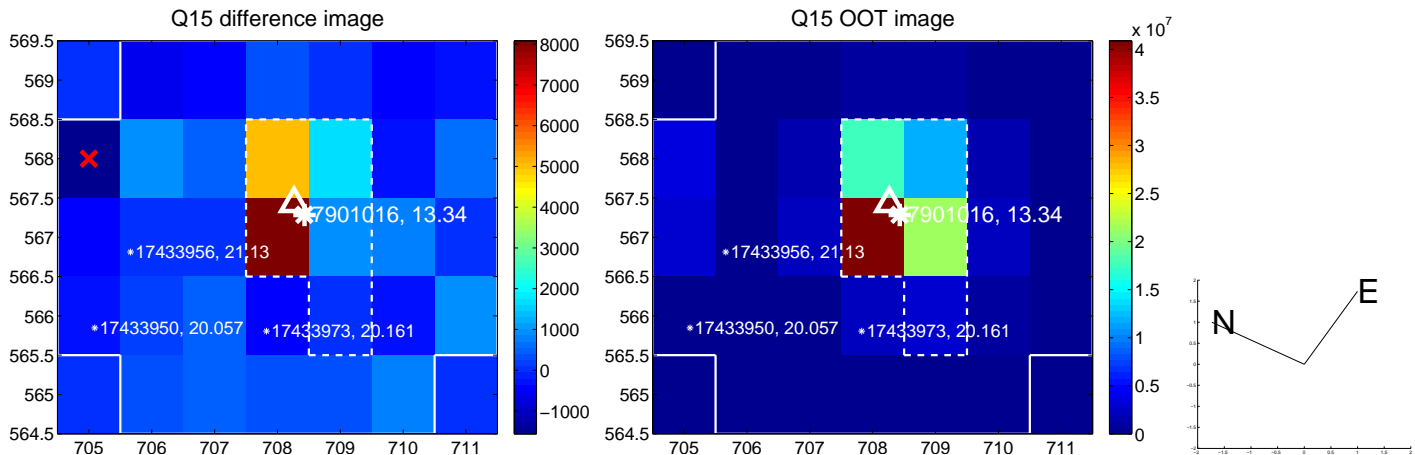
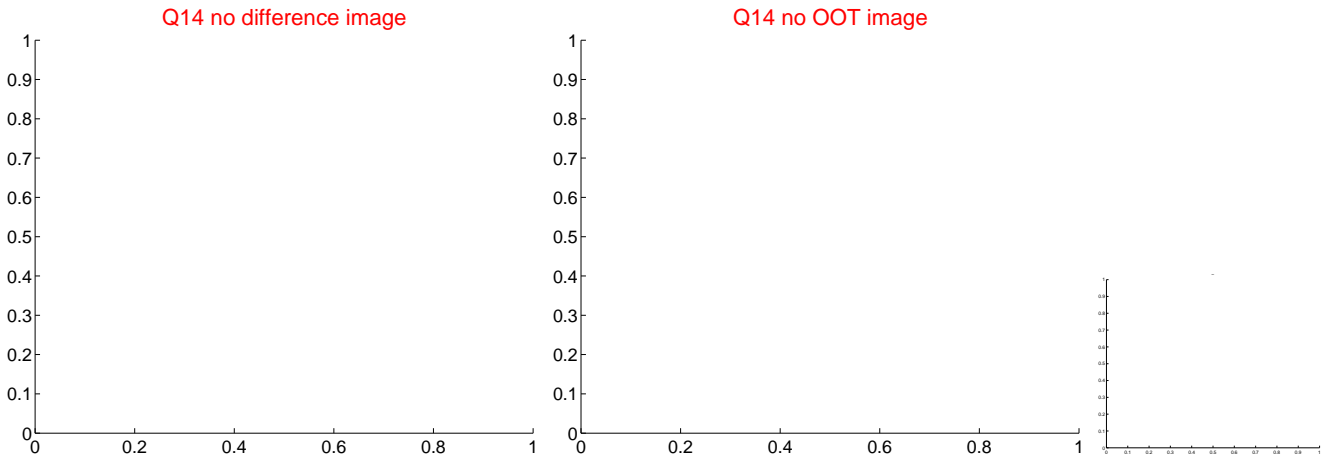
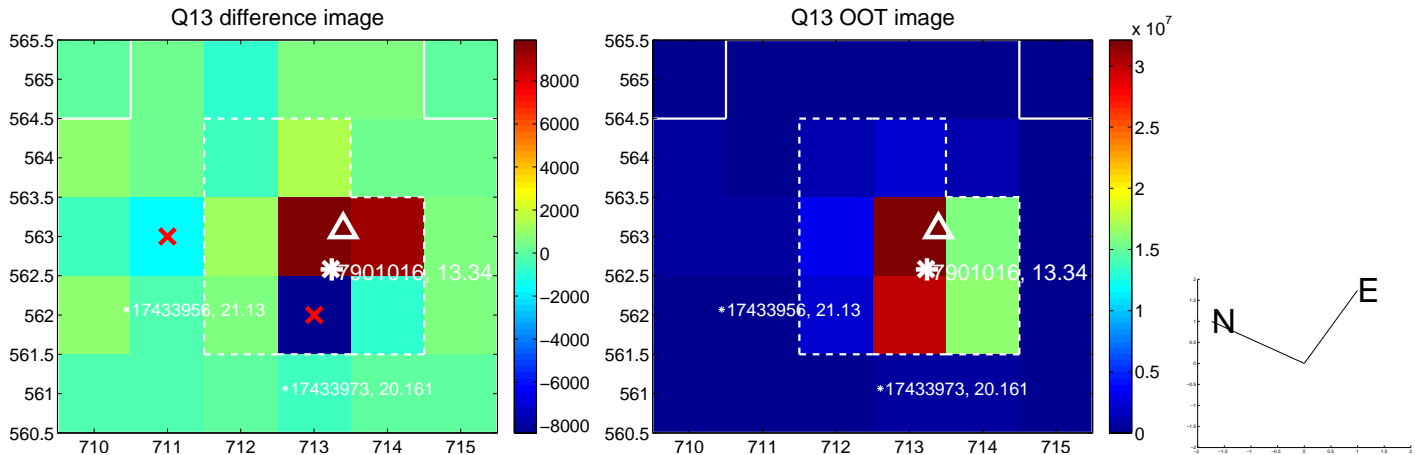
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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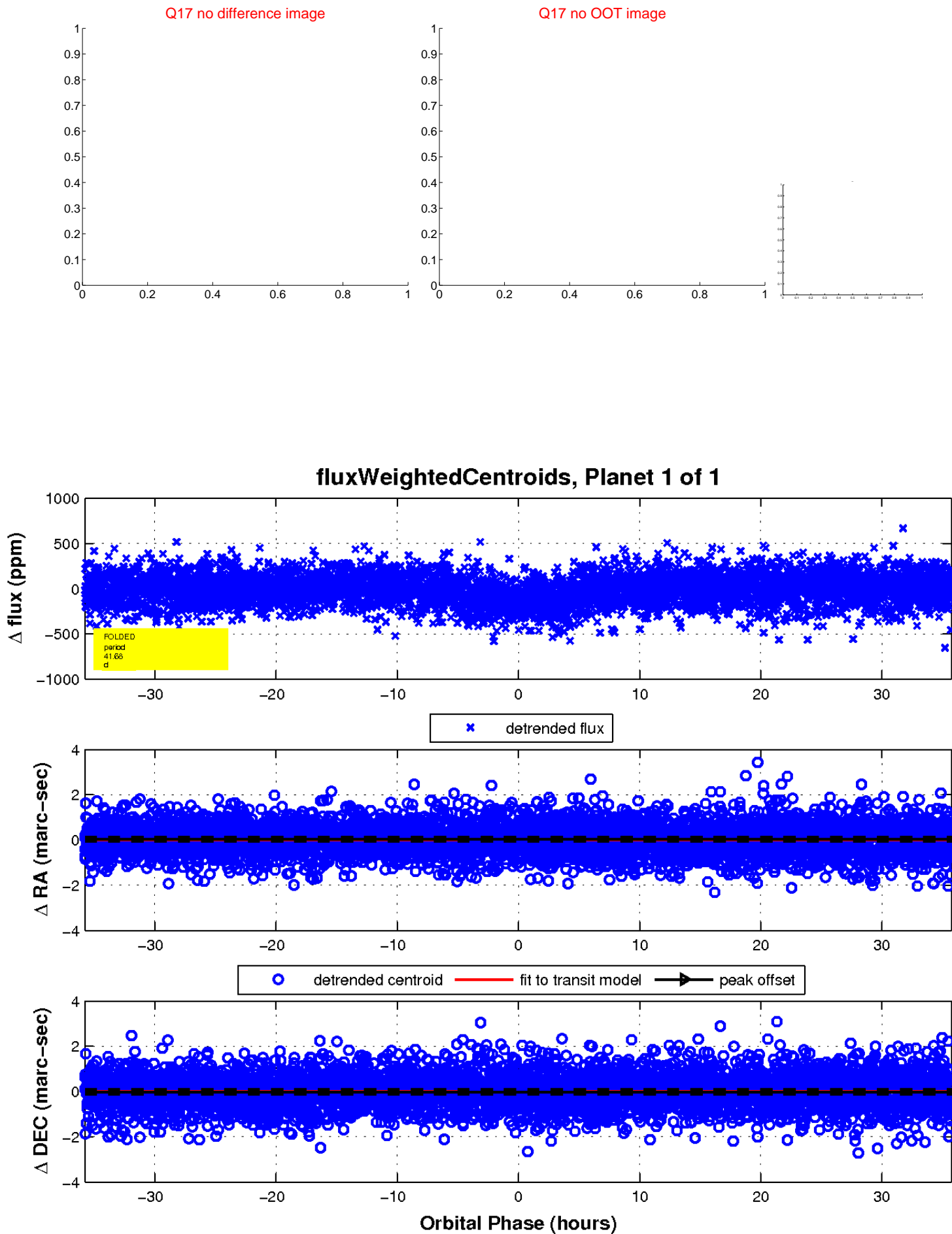


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

