

# KIC 007431659

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007431659-01	OBS	No	1.049845	131.842700	26499.6	12.598	87.9	110.8	0.33	3422	6.48	69.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007431659-01	OBS	FP	0.00	1	0	1	0	<del>SWEET_NTL</del> —CENT_FEW_DIFFS—HALO_GHOST

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

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

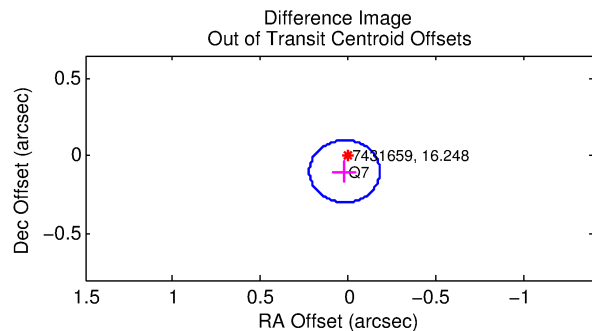
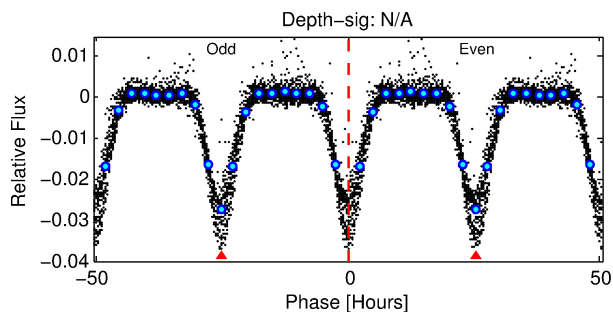
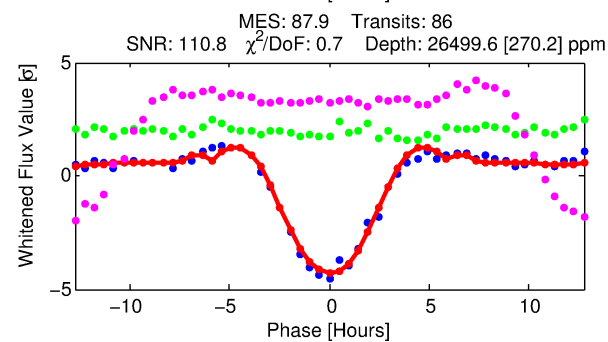
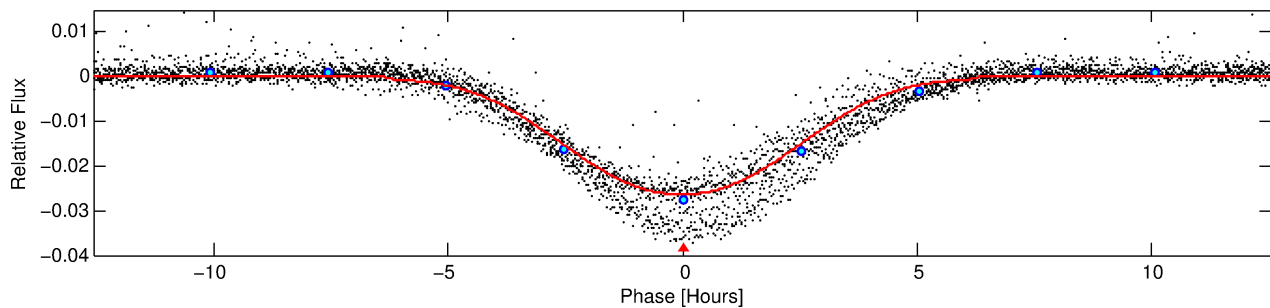
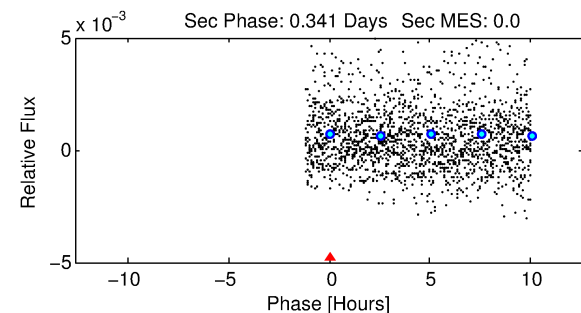
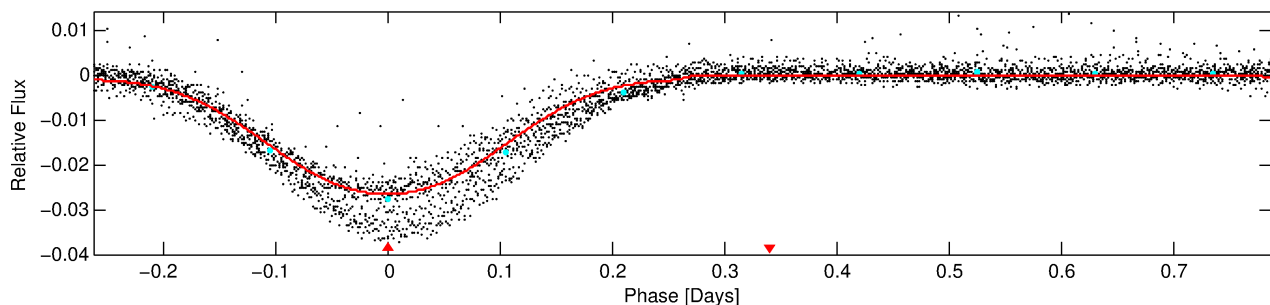
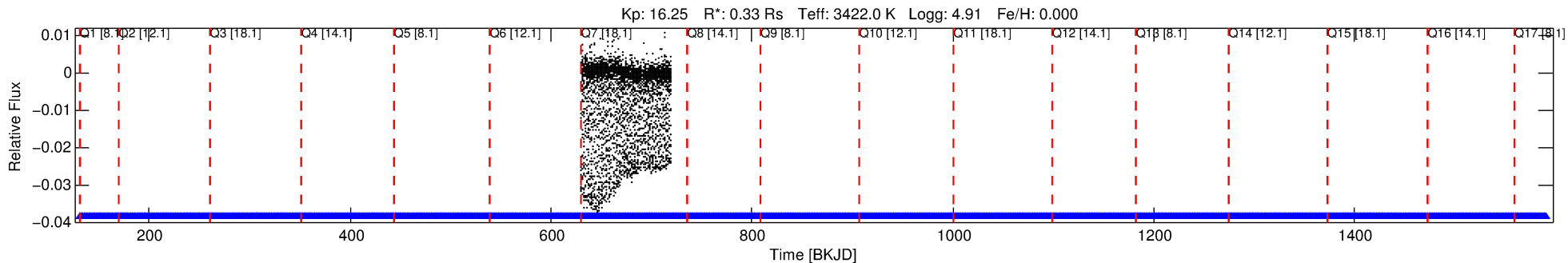
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007431659-01

No Significant Match Found

# DV One-Page Summary

KIC: 7431659 Candidate: 1 of 1 Period: 1.050 d



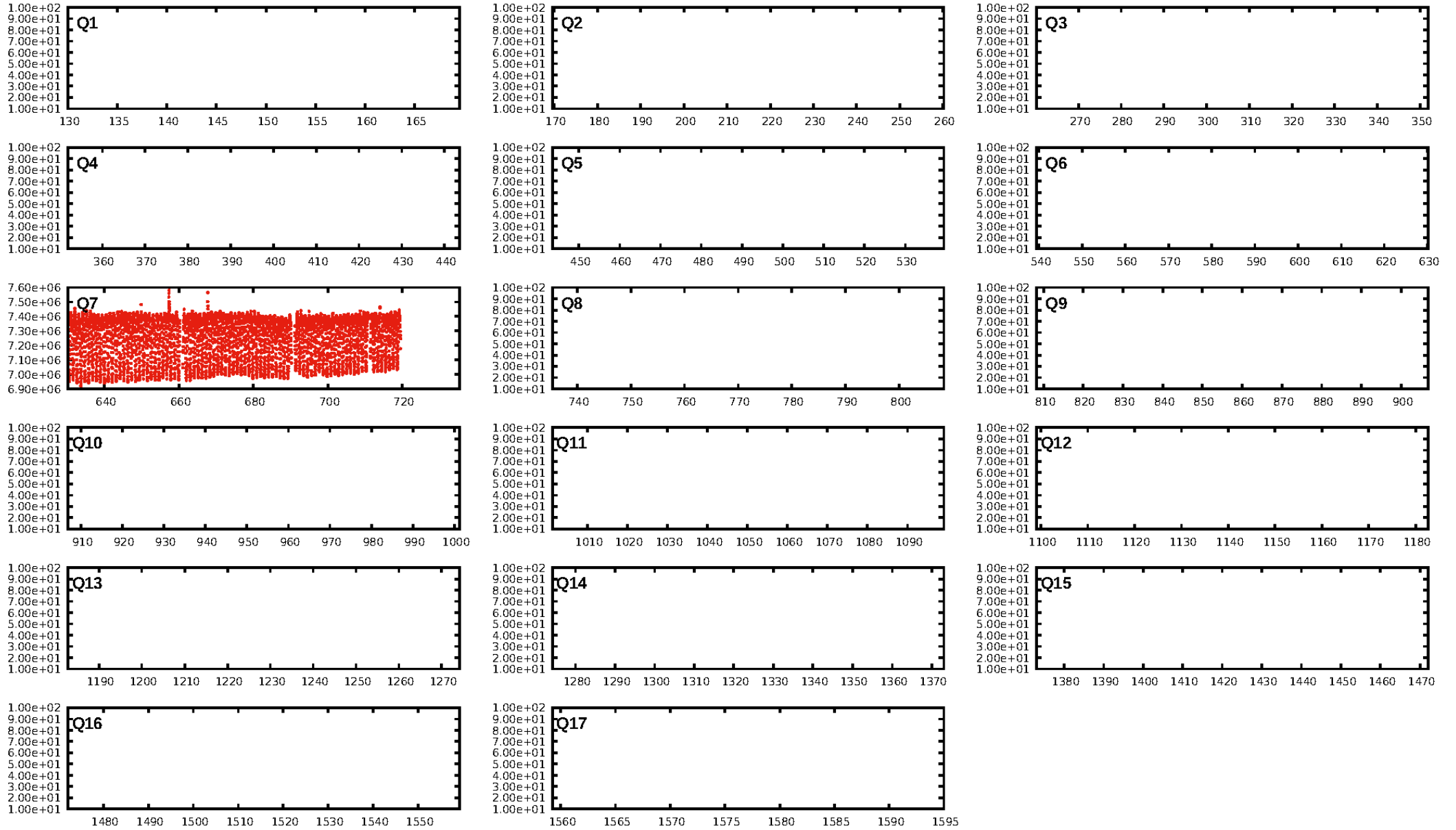
## DV Fit Results:

Period = 1.04984 [0.00000] d  
Epoch = 131.8427 [0.0016] BKJD  
Rp/R\* = 0.1779 [0.0024]  
a/R\* = 1.14 [0.00]  
b = 0.85 [0.01]  
Seff = 69.66 [7.19]  
Teq = 737 [19] K  
Rp = 6.48 [0.67] Re  
a = 0.0140 [0.0010] AU  
Ag = N/A  
Teffp = N/A

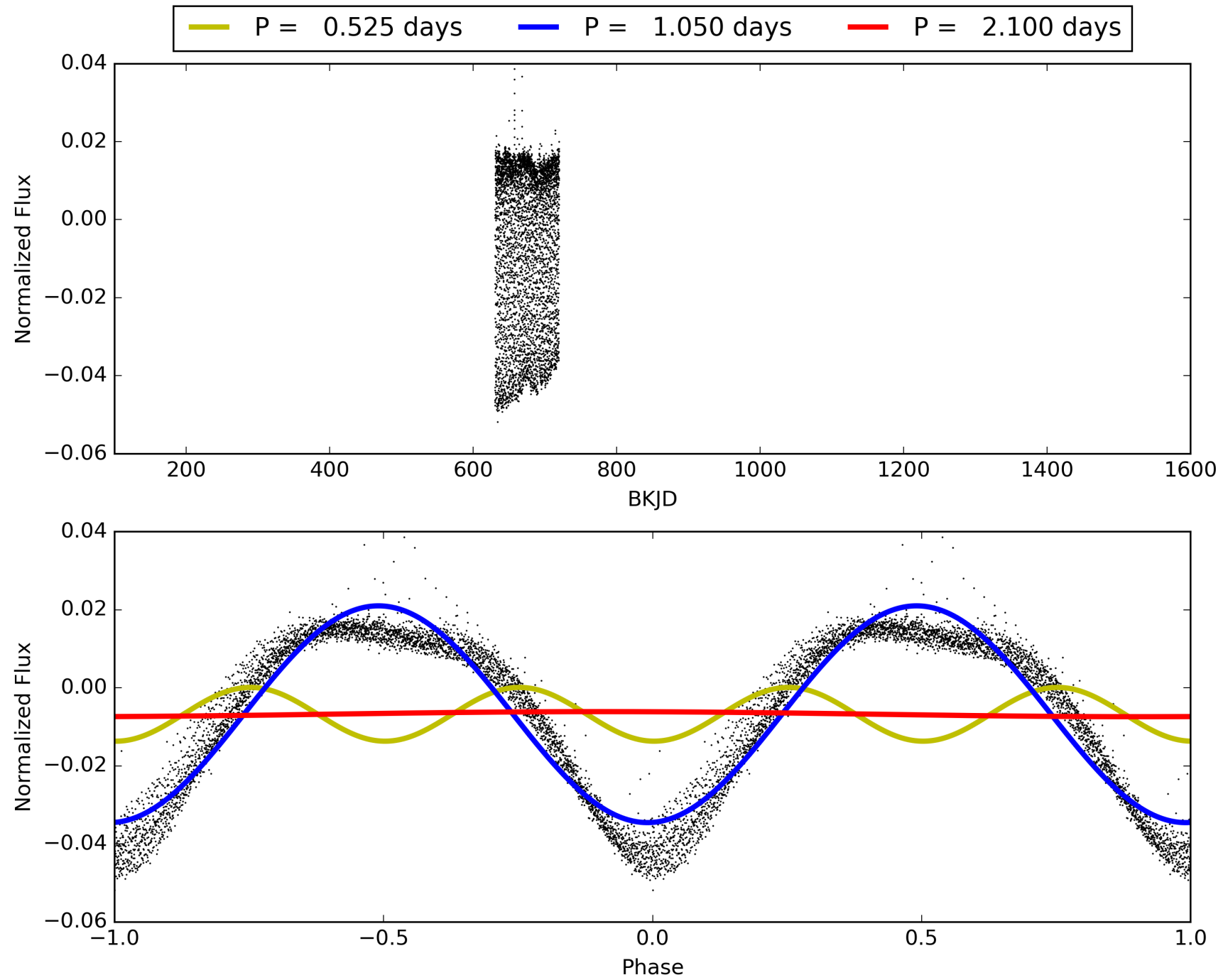
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 82.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [86/86]  
GhostDiagnostic-chr: 0.1751  
Centroid-sig: 29.1%  
Centroid-so: 0.686 arcsec [40.65σ]  
OotOffset-rm: 0.102 arcsec [1.52σ]  
KicOffset-rm: 0.392 arcsec [5.88σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [1/1]

# TCE 007431659-01, PDC Light Curves

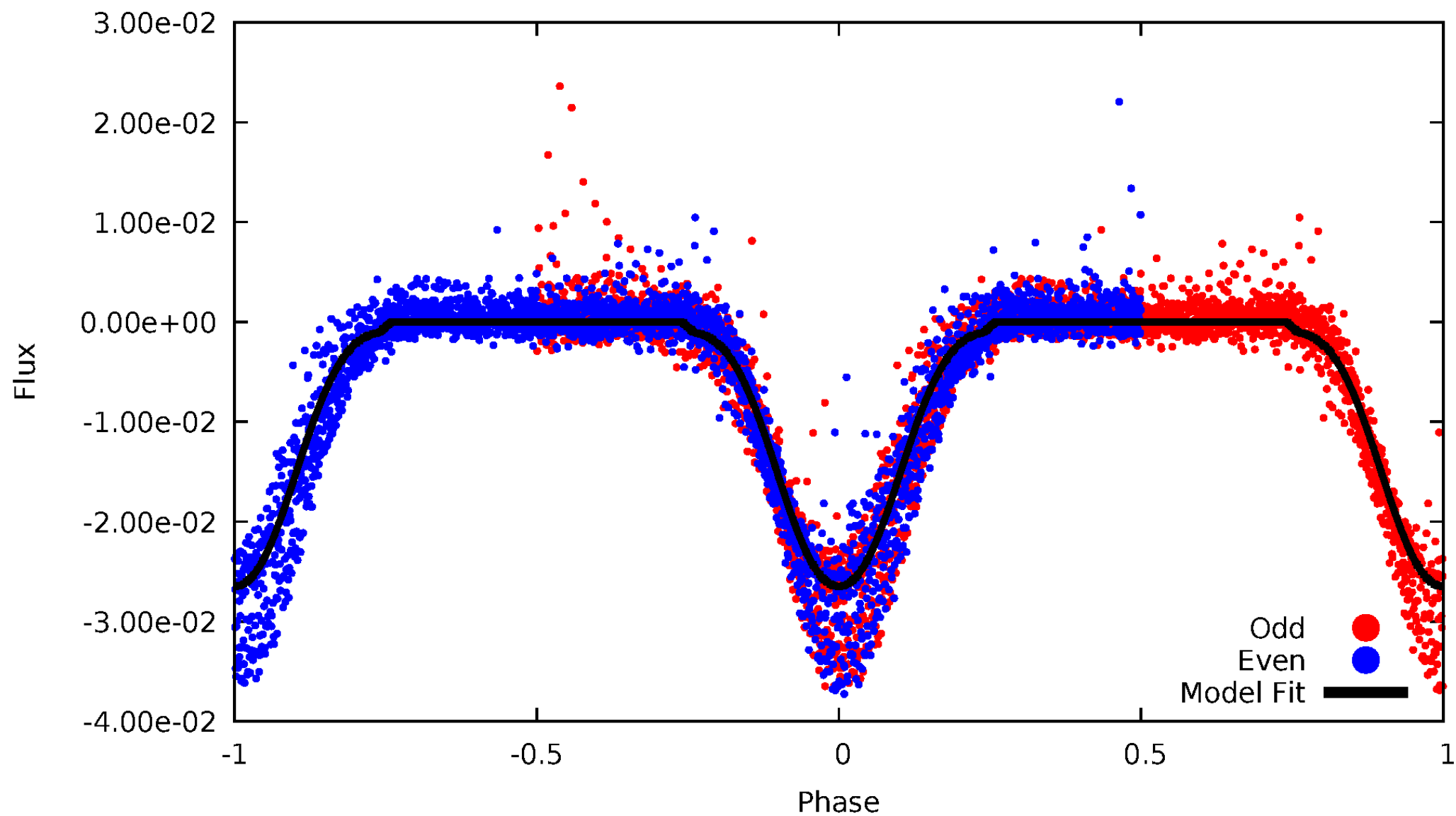


# TCE 007431659-01



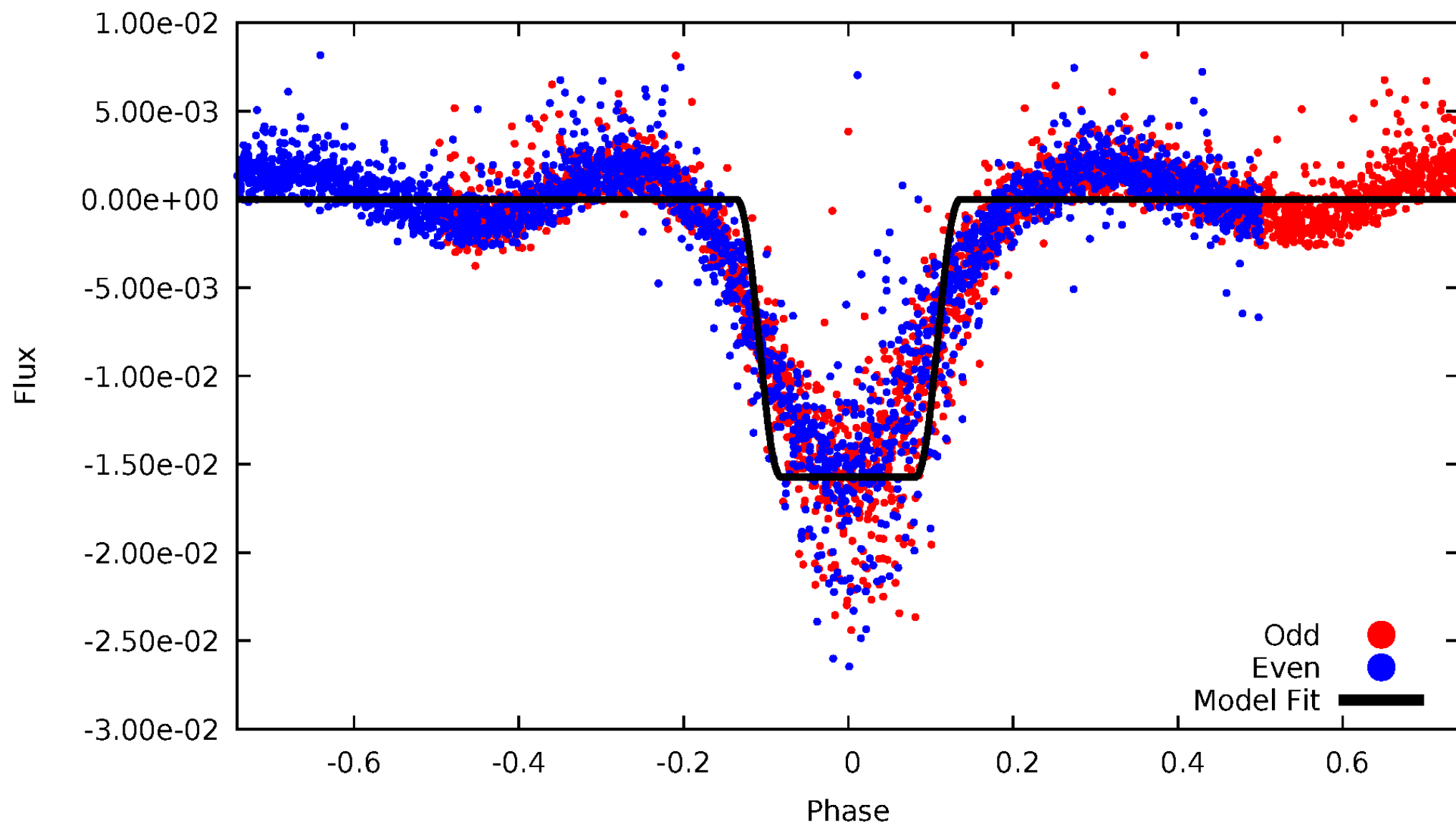
# DV Odd/Even

TCE 007431659-01



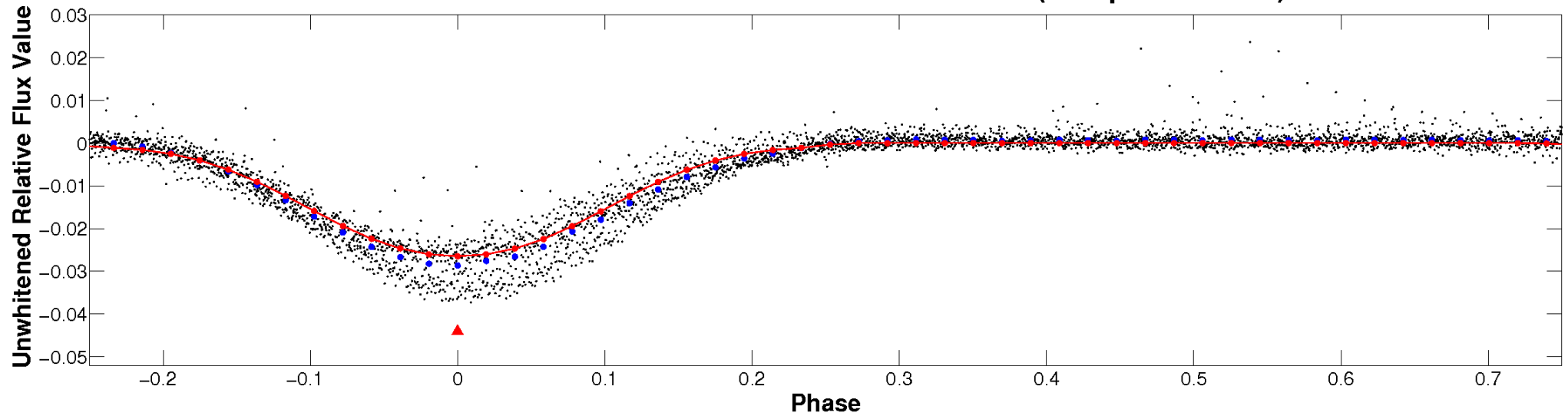
# ALT Odd/Even

TCE 007431659-01

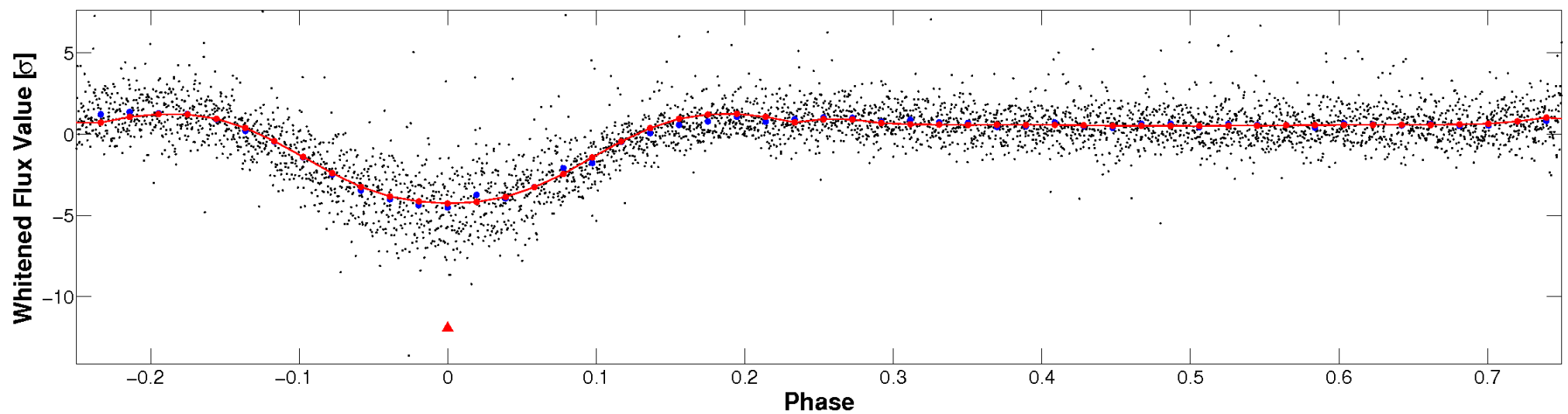


# Non-Whitened Vs. Whitened Light Curve

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

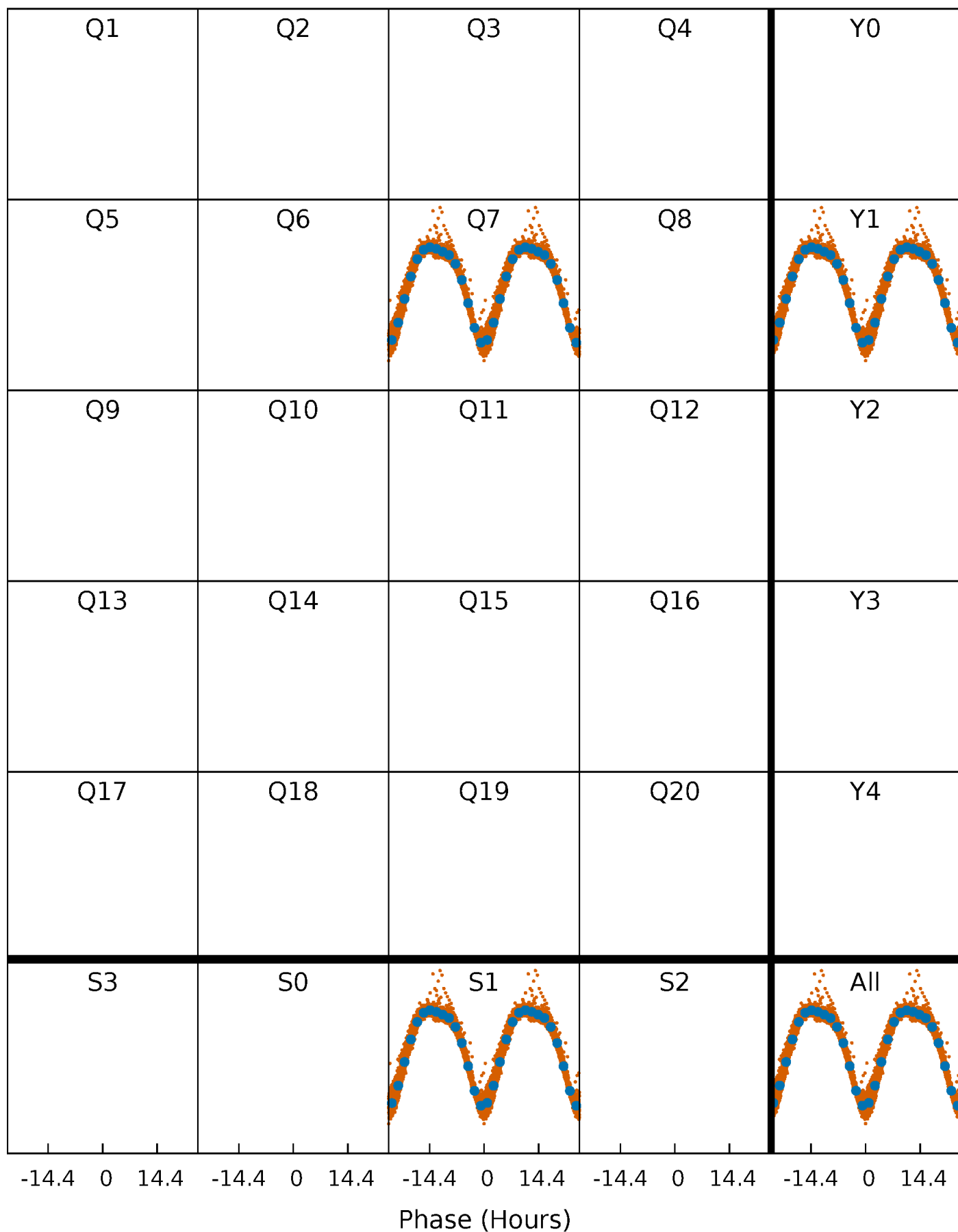


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

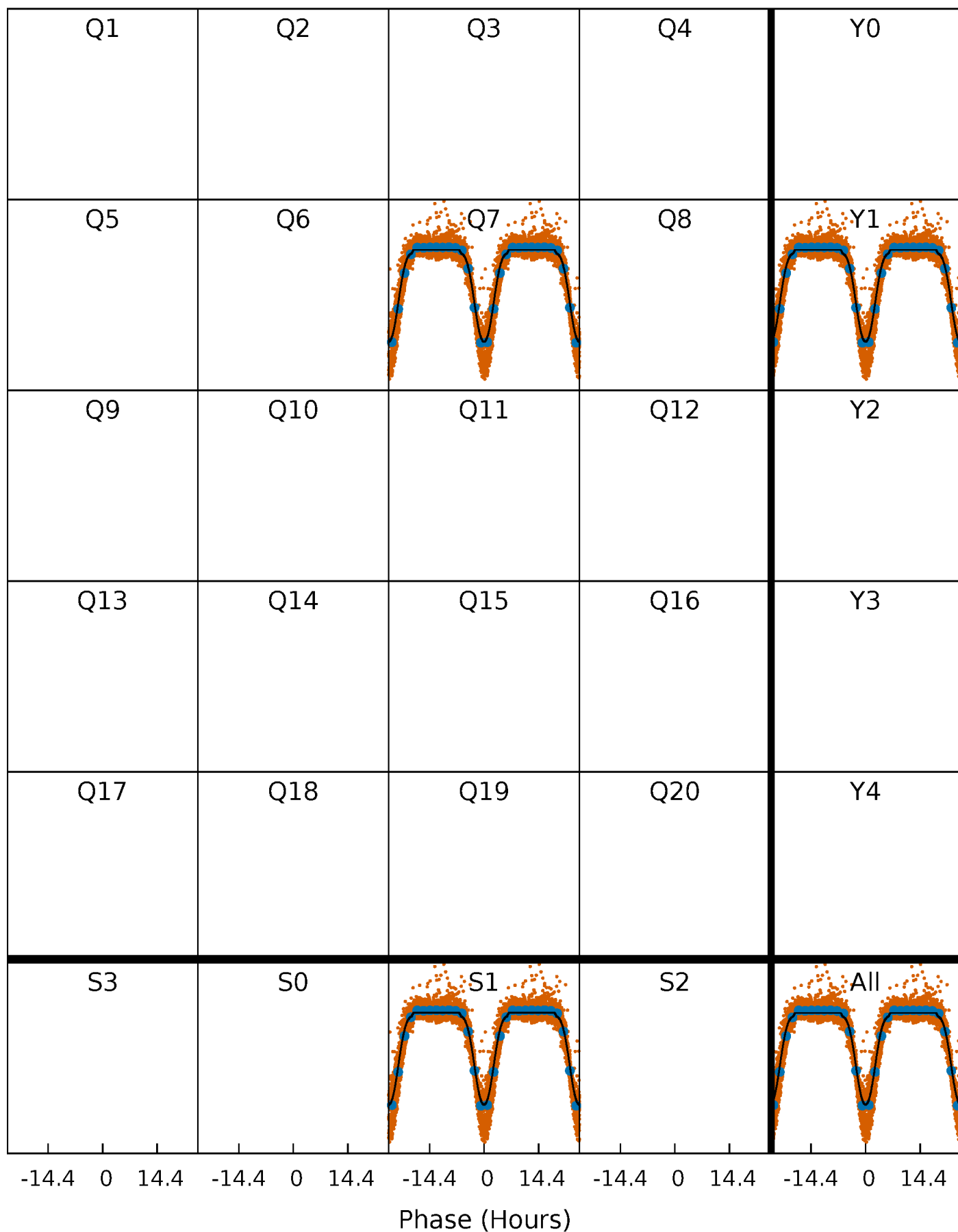
TCE 007431659-01   P= 1.049845 Days    $T_0=131.842700$  (BKJD)





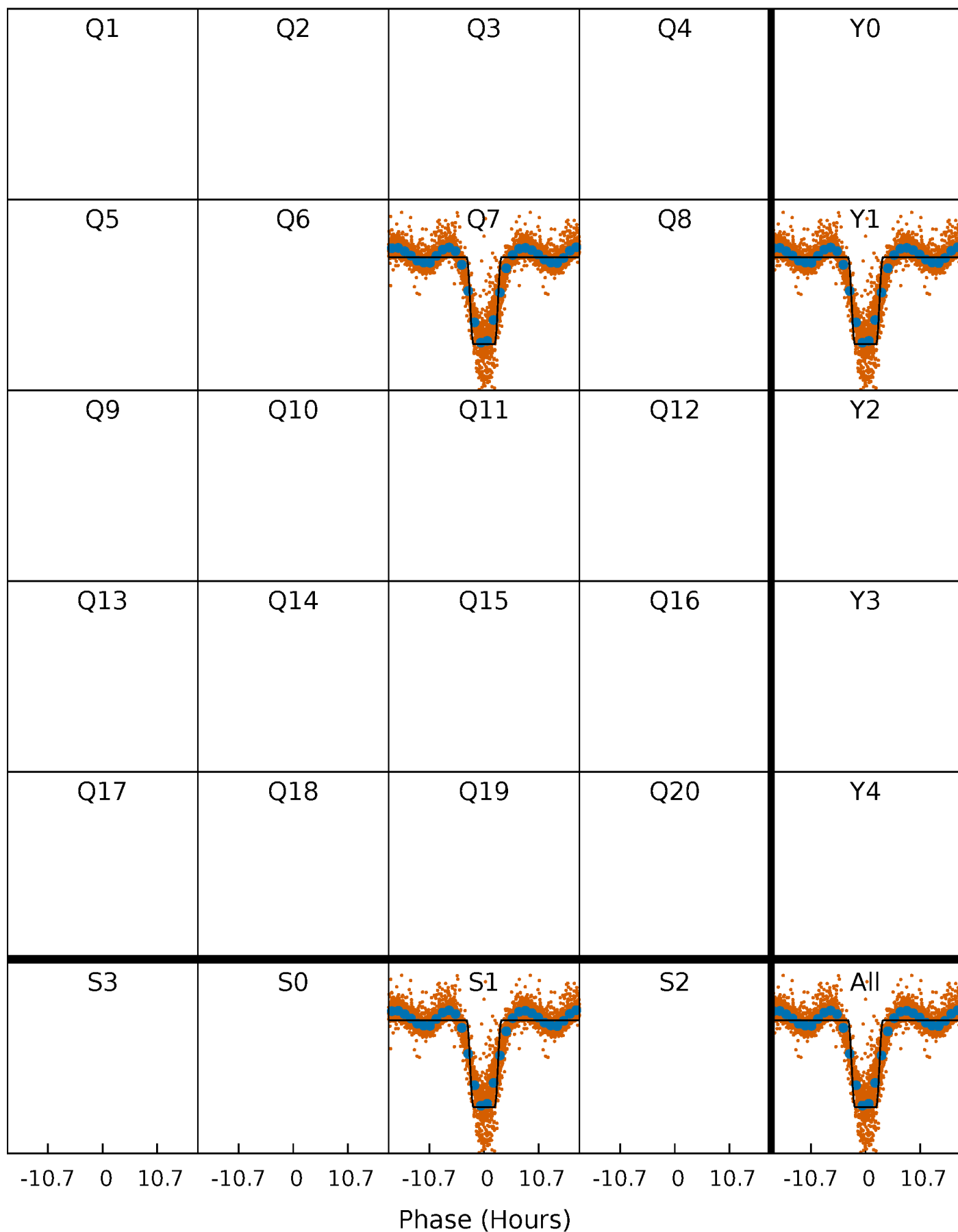
# DV Quarter-Phased Transit Curves

TCE 007431659-01   P= 1.049845 Days    $T_0=131.842700$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

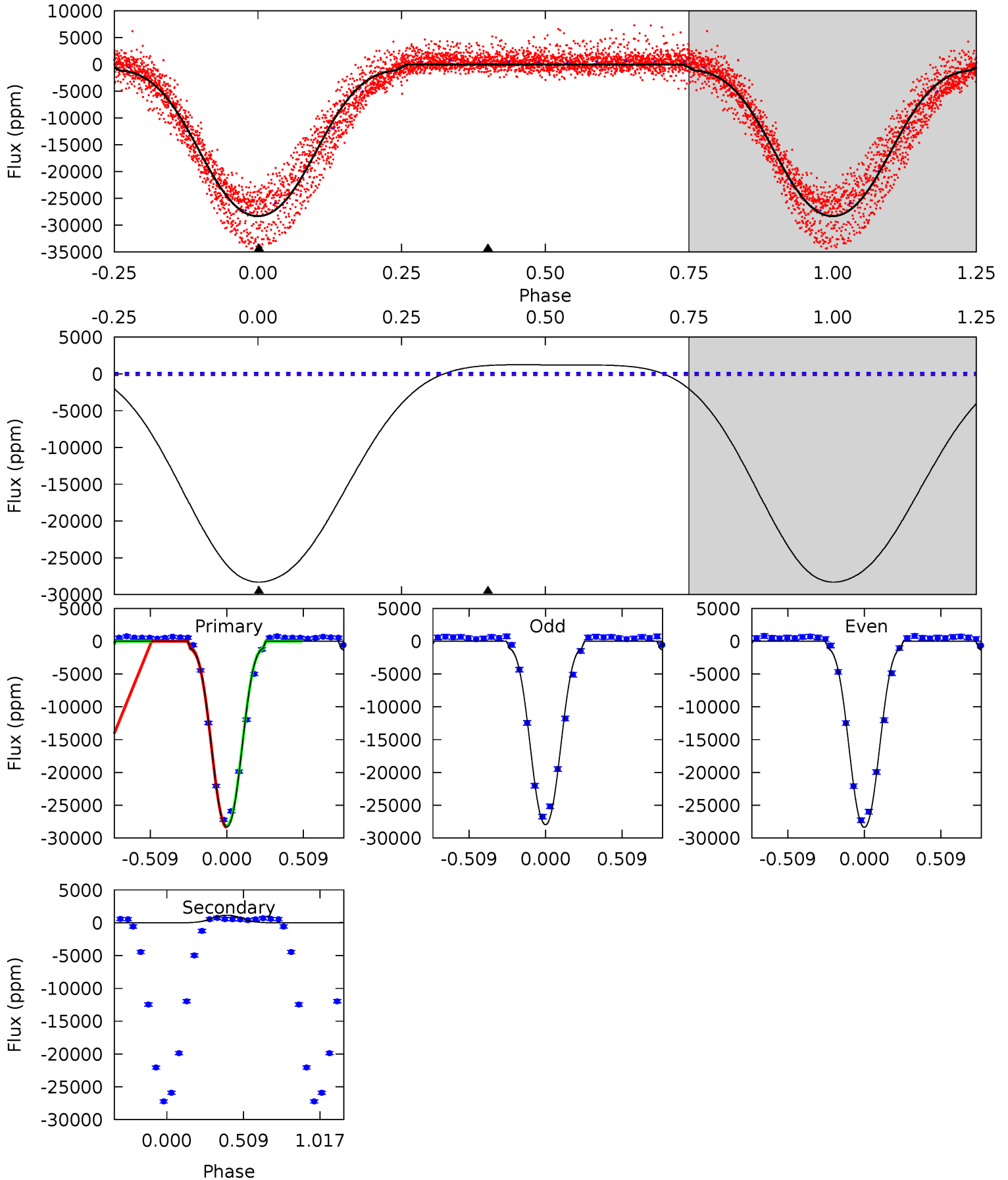
TCE 007431659-01   P= 1.049704 Days    $T_0=131.894380$  (BKJD)



# DV Model-Shift Uniqueness Test

007431659-01, P = 1.049845 Days, E = 131.842700 Days

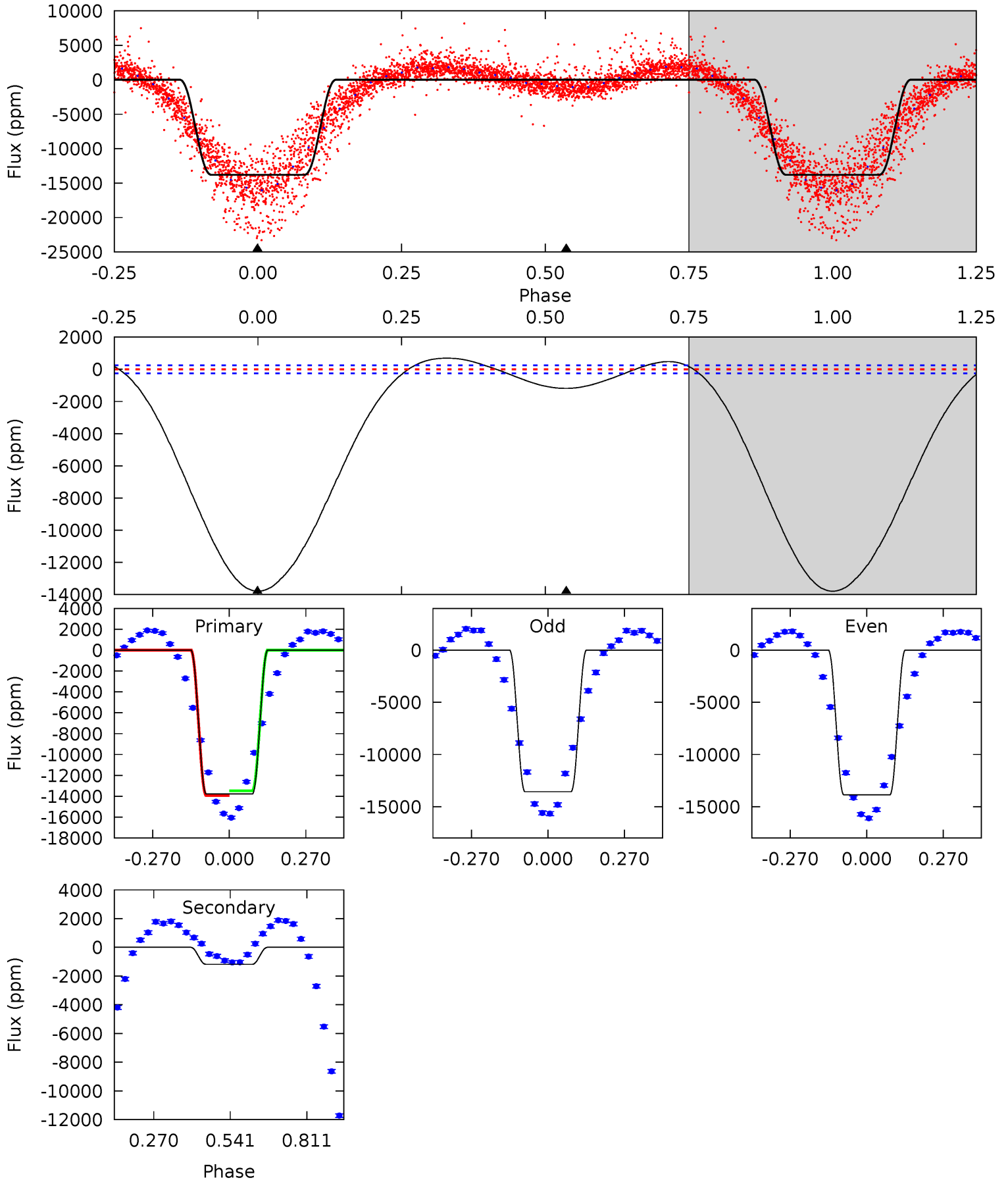
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
744.8	-30.0	0	0	4.21	0.66	24.6	744.8	744.8	-30.0	-30.0	5.55	1.07	0.04	3.06



# Alt Model-Shift Uniqueness Test

007431659-01, P = 1.049704 Days, E = 131.894380 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
240.9	20.7	0	0	4.35	1.10	9.31	240.9	240.9	20.7	20.7	2.55	1.04	0.05	0



### Stellar Parameters For KIC 007431659

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3422^{+44}_{-41}$	$4.914^{+0.038}_{-0.031}$	$0.000^{+0.100}_{-0.100}$	$0.334^{+0.034}_{-0.034}$	$0.334^{+0.041}_{-0.037}$	$12.620^{+2.825}_{-1.723}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+10%/-10%	+12%/-11%	+22%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 007431659-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$1140 \pm 38$	$6.51^{+0.37}_{-0.34}$	$1030^{+20}_{-21}$	$-2240^{+21}_{-22}$	$-2.919^{+0.190}_{-0.243}$
Alt.	$-1185 \pm 57$	$4.56^{+0.28}_{-0.25}$	$1027^{+22}_{-20}$	$2396^{+31}_{-28}$	$6.182^{+0.559}_{-0.534}$

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

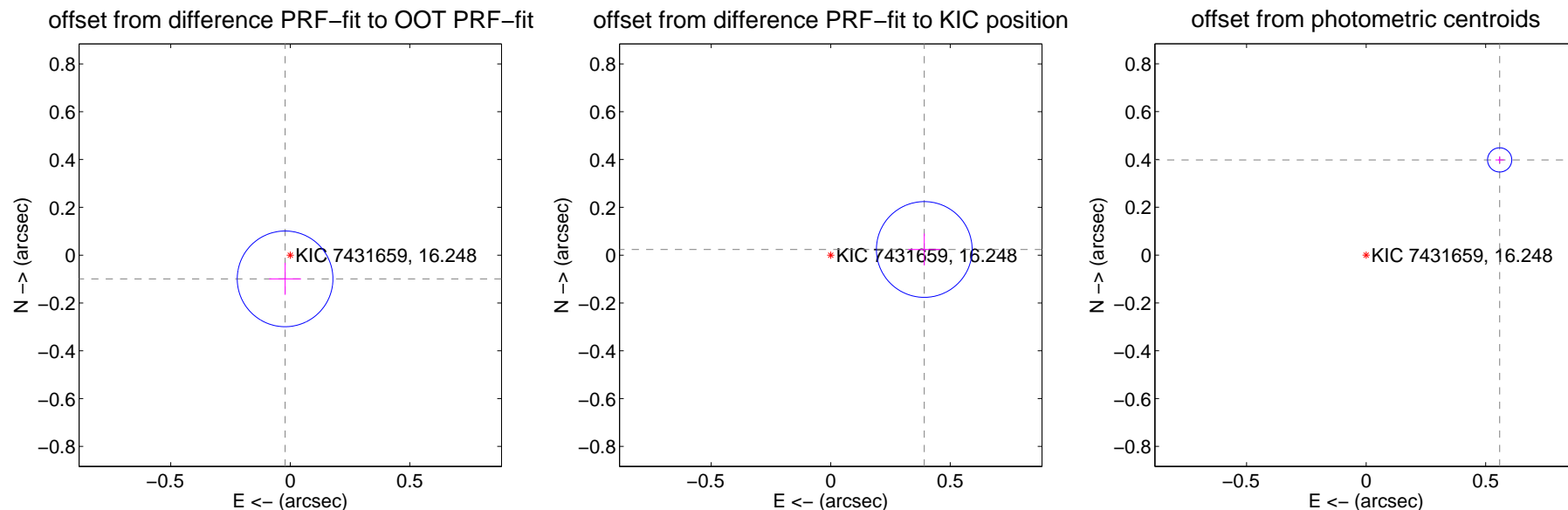
## DV Centroid Data

Supplemental centroid analysis for 007431659-01. Kepler magnitude: 16.25. Transit SNR 110.84

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.102 \pm 0.067$	1.52	$0.022 \pm 0.067$	$-0.099 \pm 0.067$
PRF-fit source offset from KIC position	$0.392 \pm 0.067$	5.88	$-0.392 \pm 0.067$	$0.024 \pm 0.067$
photometric centroid source offset	$0.69 \pm 0.02$	40.65	$-0.56 \pm 0.02$	$0.40 \pm 0.01$

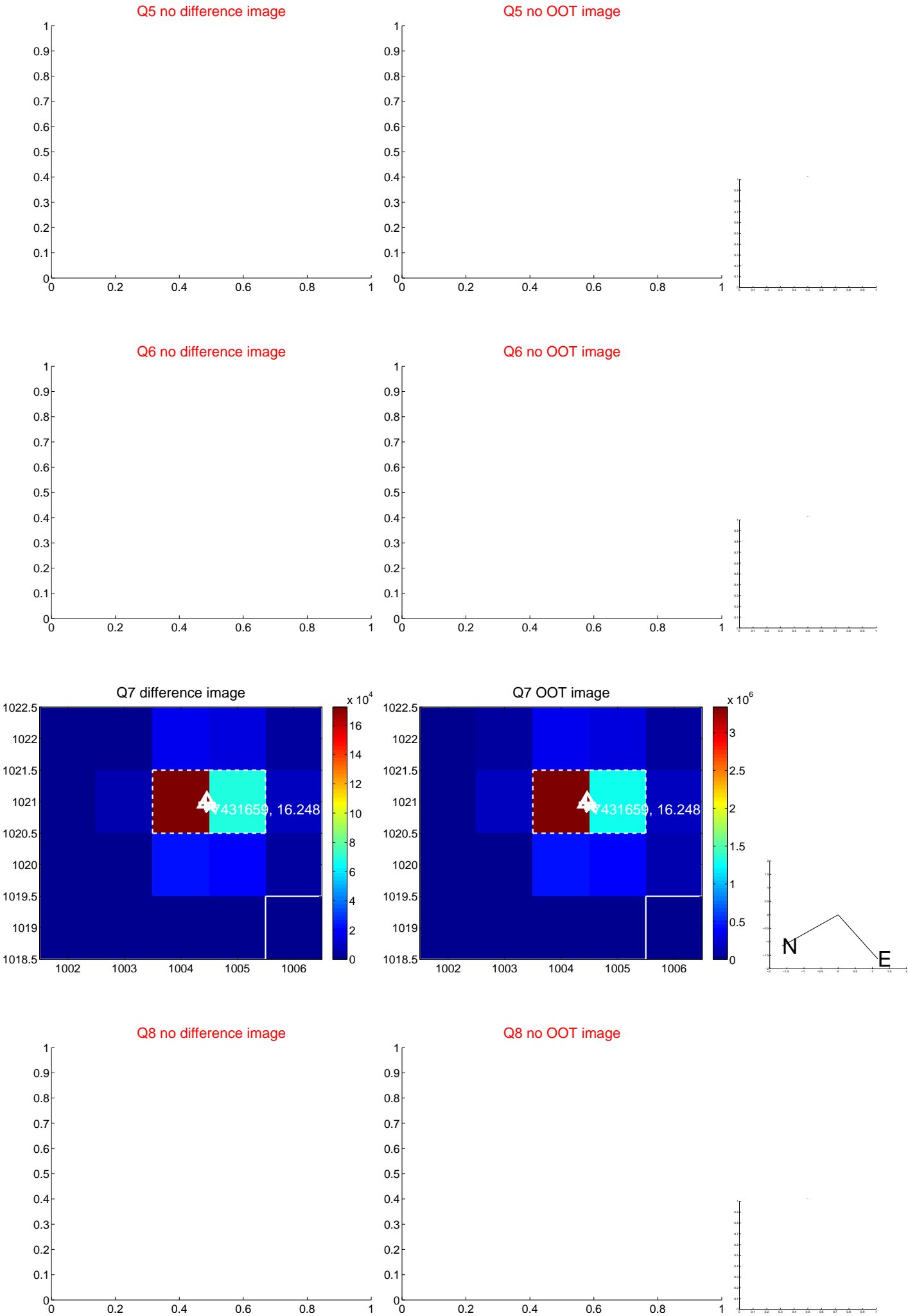


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



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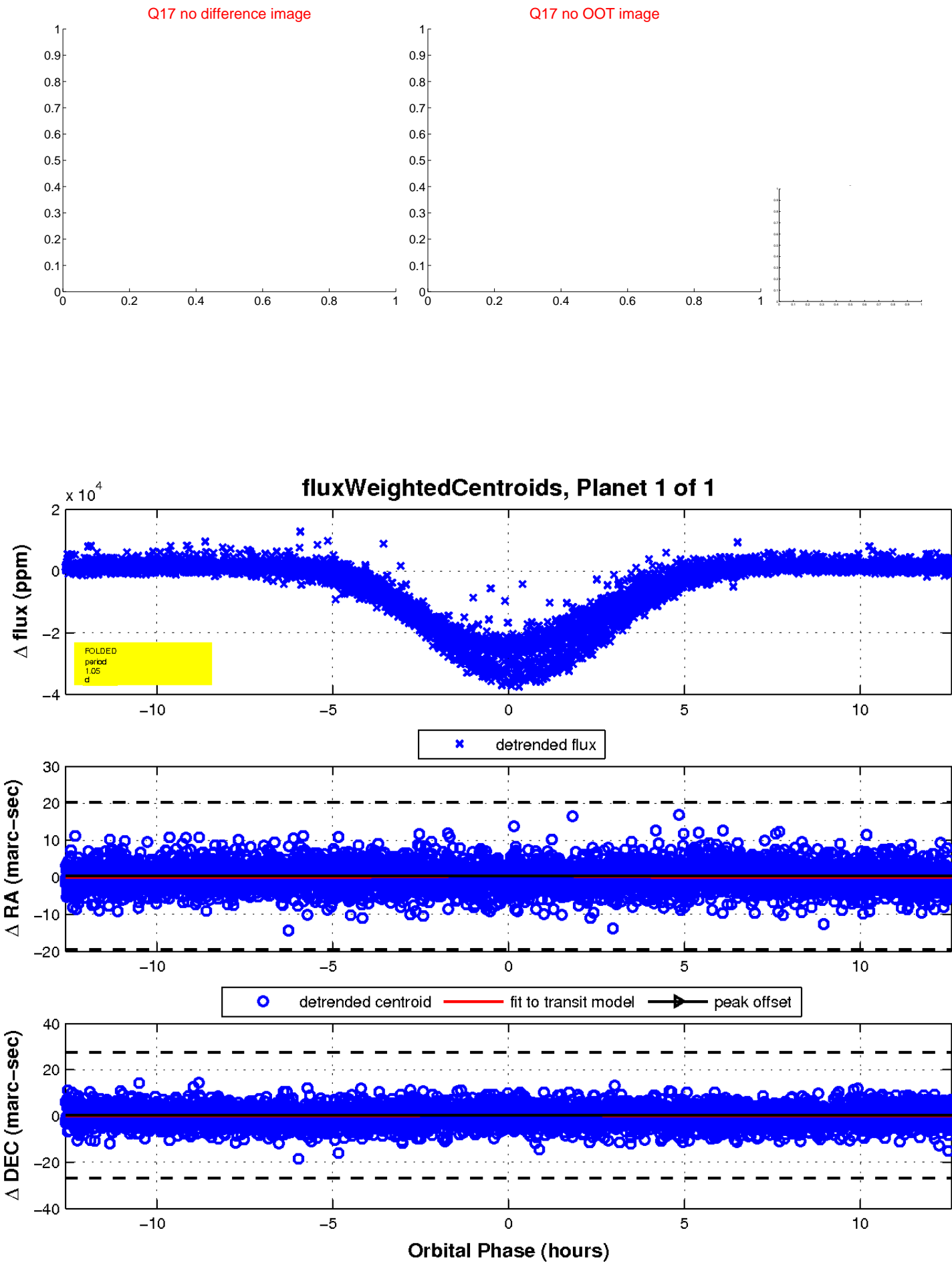
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# UKIRT Image

Declination

