

# KIC 010031409

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010031409-01	OBS	7276.01	2.071941	132.836409	189776.7	4.450	16559.0	10146.9	1.25	6140	83.63	1961.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010031409-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED

**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.

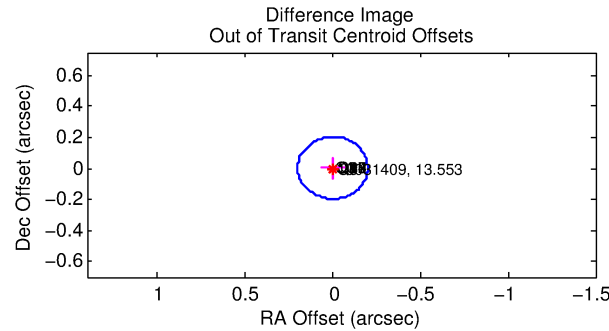
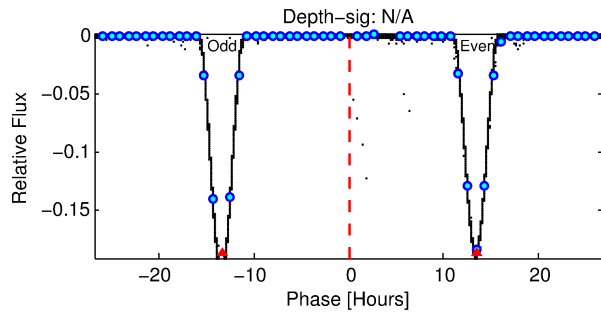
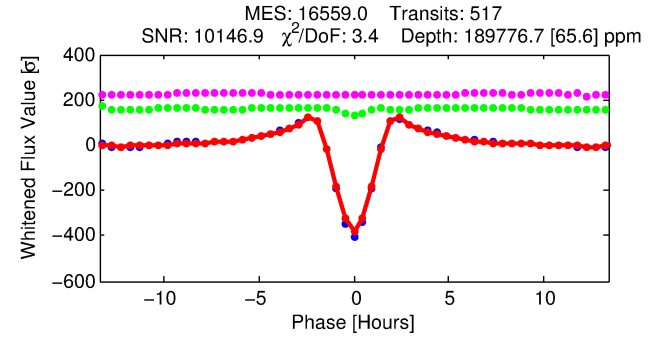
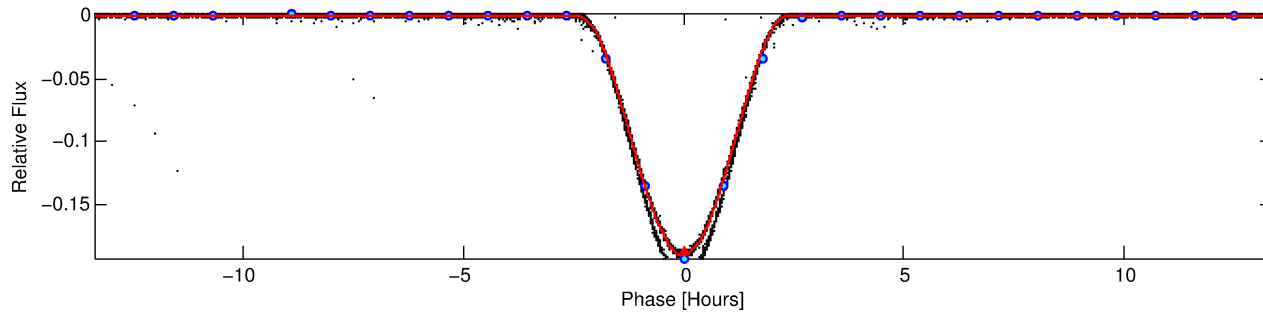
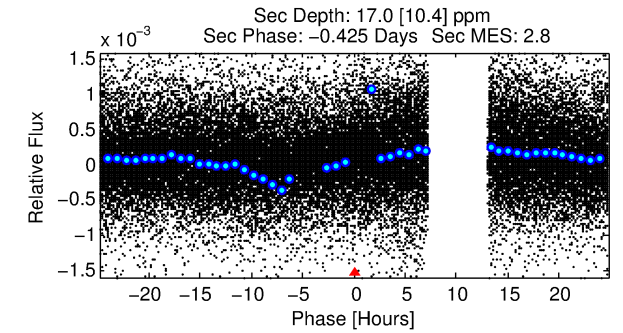
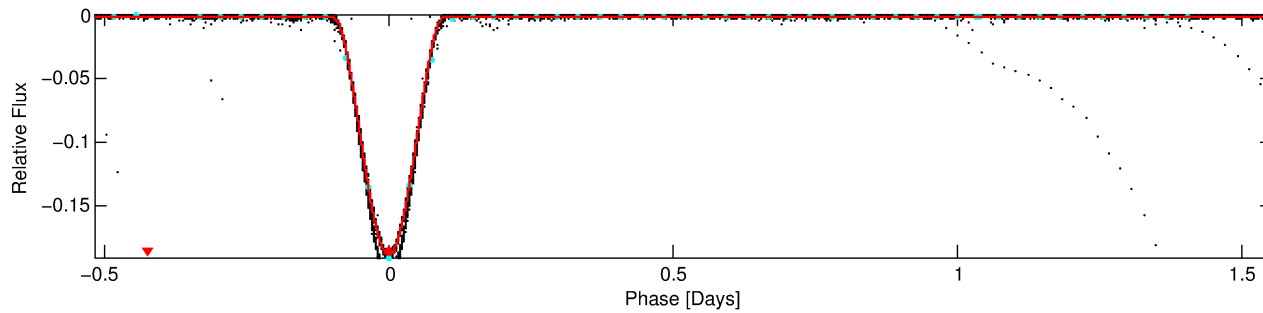
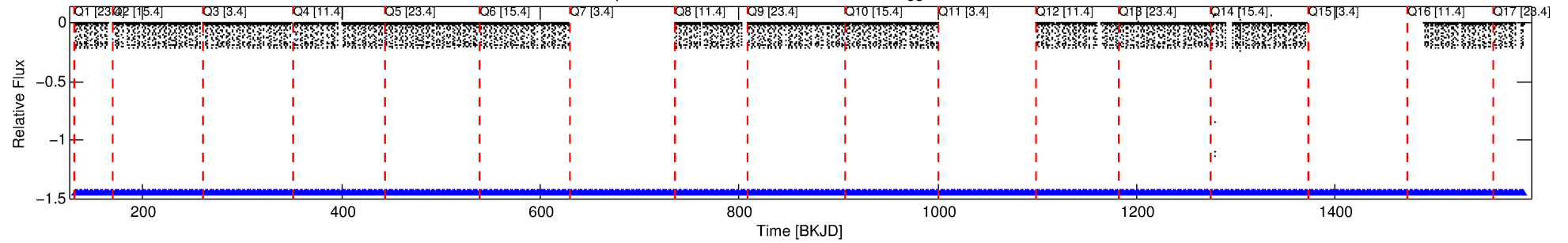
## Ephemeris Match Information For 010031409-01

No Significant Match Found

# DV One-Page Summary

KIC: 10031409 Candidate: 1 of 1 Period: 2.072 d  
KOI: K07276.01 Corr: 0.998

Kp: 13.55 R\*: 1.25 Rs Teff: 6140.0 K Logg: 4.25 Fe/H: -0.220



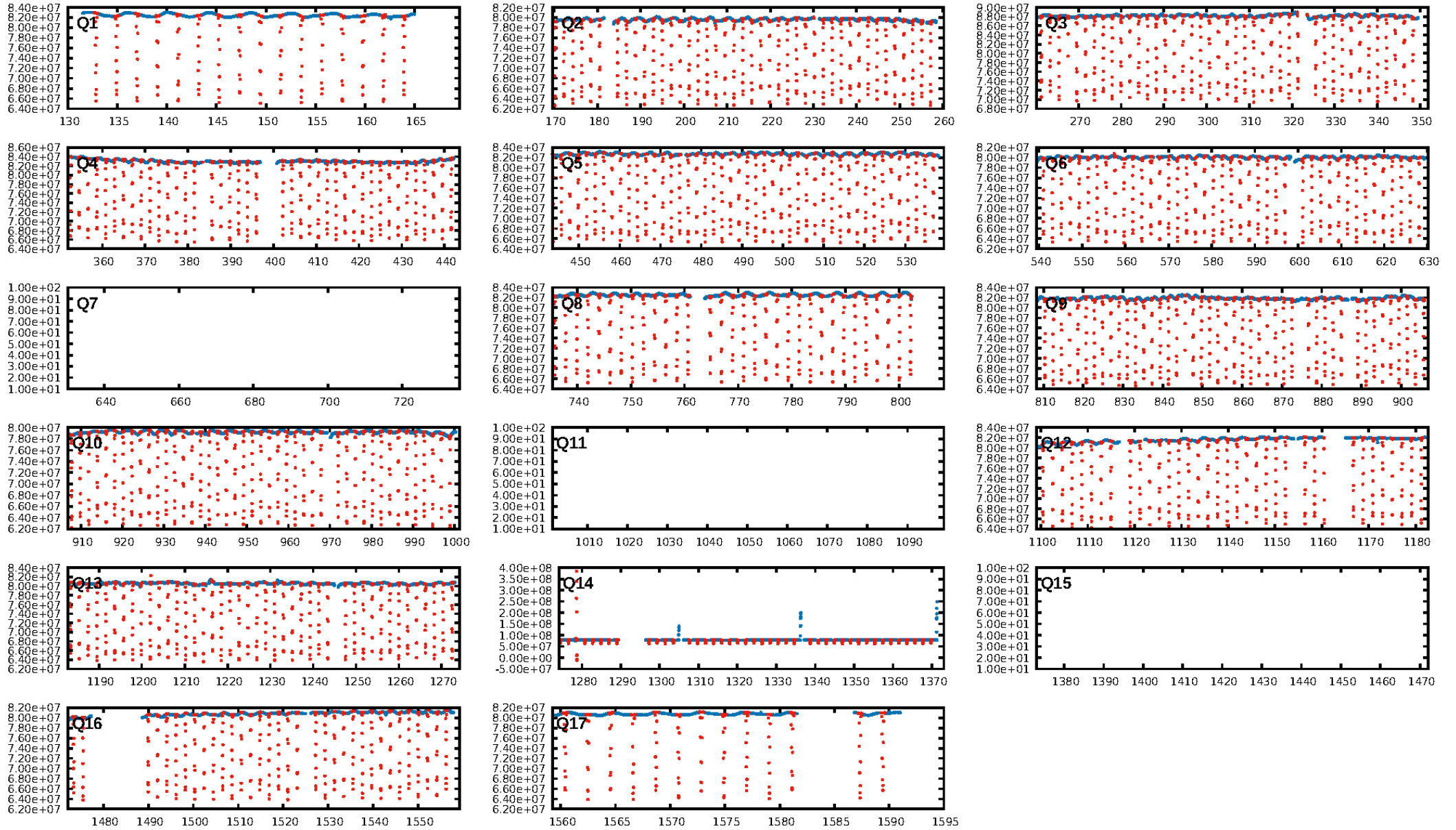
## DV Fit Results:

Period = 2.07194 [0.00000] d  
Epoch = 132.8364 [0.0000] BKJD  
Rp/R\* = 0.6111 [0.0085]  
a/R\* = 4.87 [0.01]  
b = 0.91 [0.01]  
Seff = 1961.54 [731.52]  
Teq = 1697 [158] K  
Rp = 83.63 [24.17] Re  
a = 0.0320 [0.0077] AU  
Ag = 0.00 [0.00] [-1040.37σ]  
Teffp = 504 [79] K [-6.75σ]

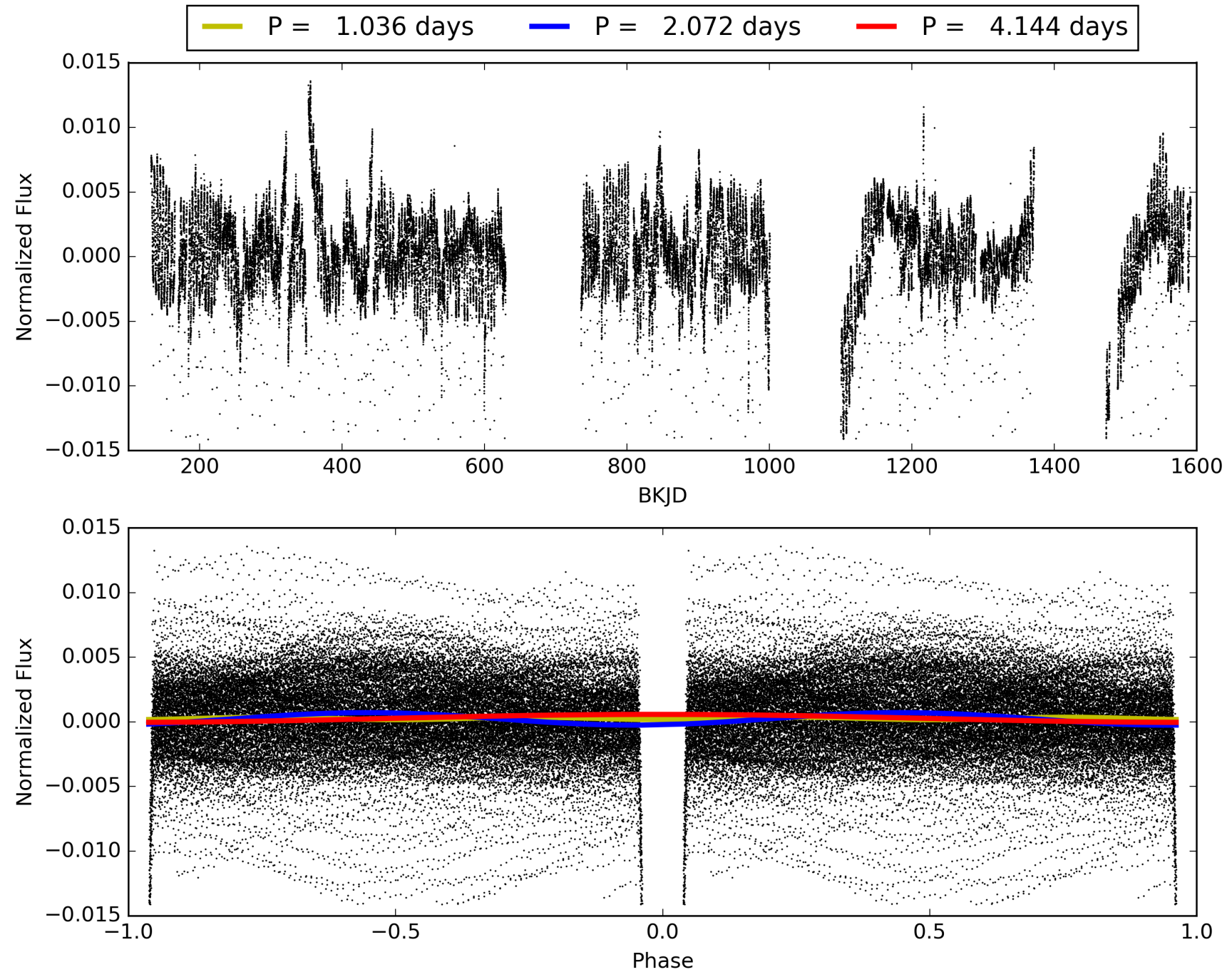
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [488/488]  
GhostDiagnostic-chr: 1.061  
Centroid-sig: 0.0%  
Centroid-so: 0.057 arcsec [123.76σ]  
OotOffset-rm: 0.004 arcsec [0.06σ]  
KicOffset-rm: 0.043 arcsec [0.64σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 010031409-01, PDC Light Curves

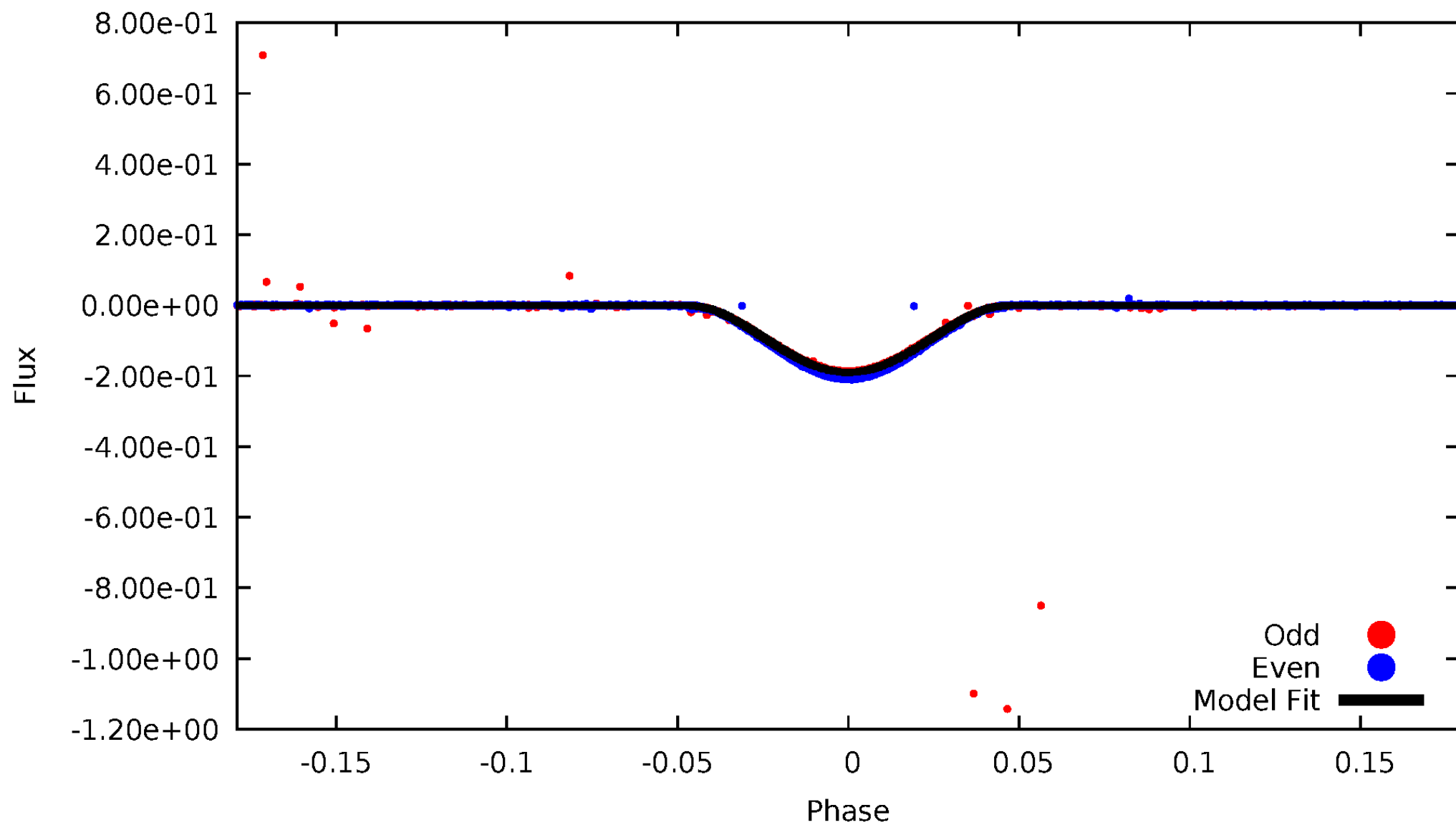


TCE 010031409-01



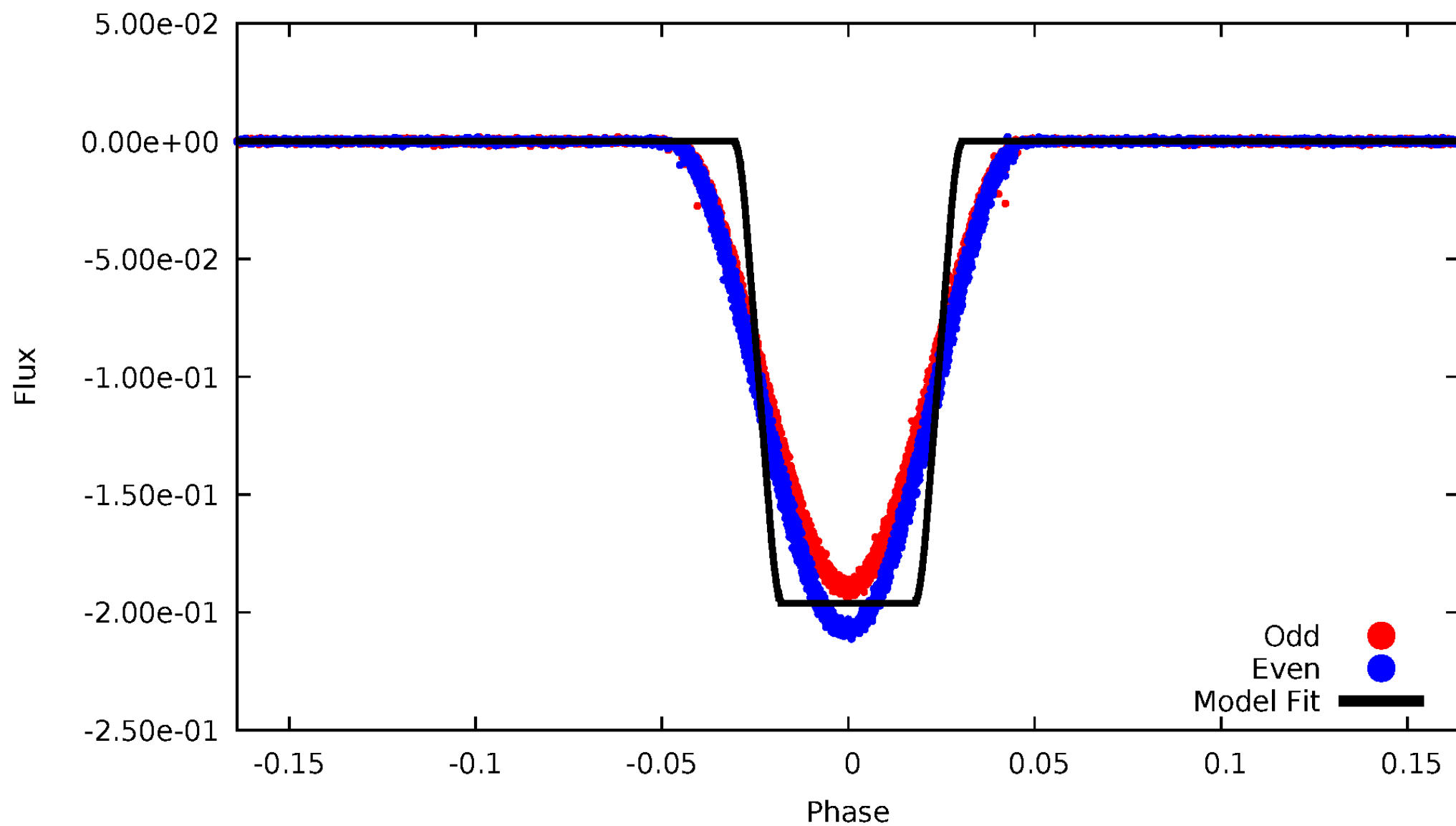
# DV Odd/Even

TCE 010031409-01



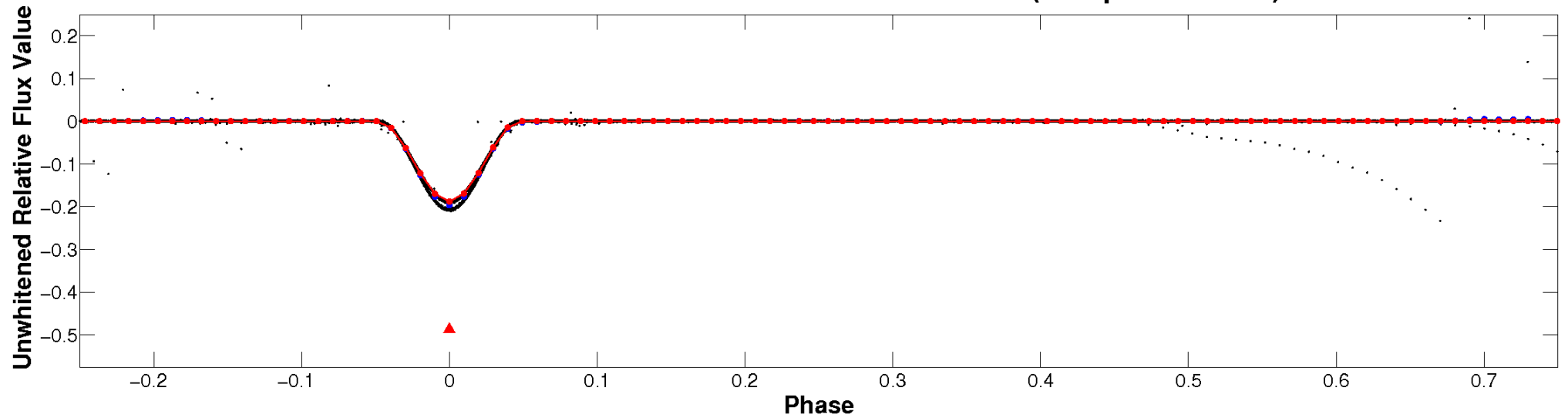
# ALT Odd/Even

TCE 010031409-01

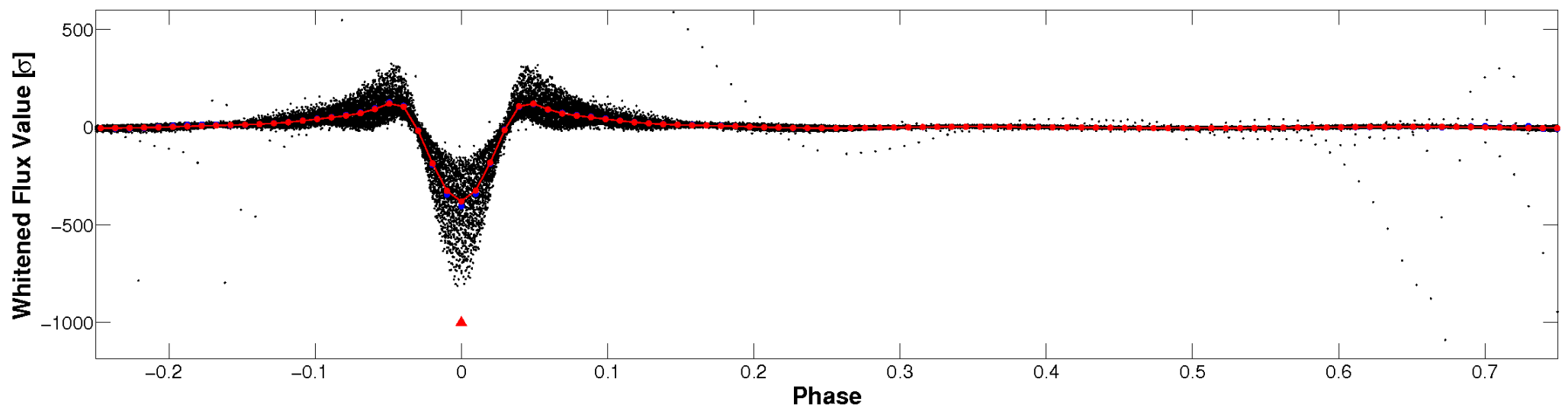


# Non-Whitened Vs. Whitened Light Curve

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

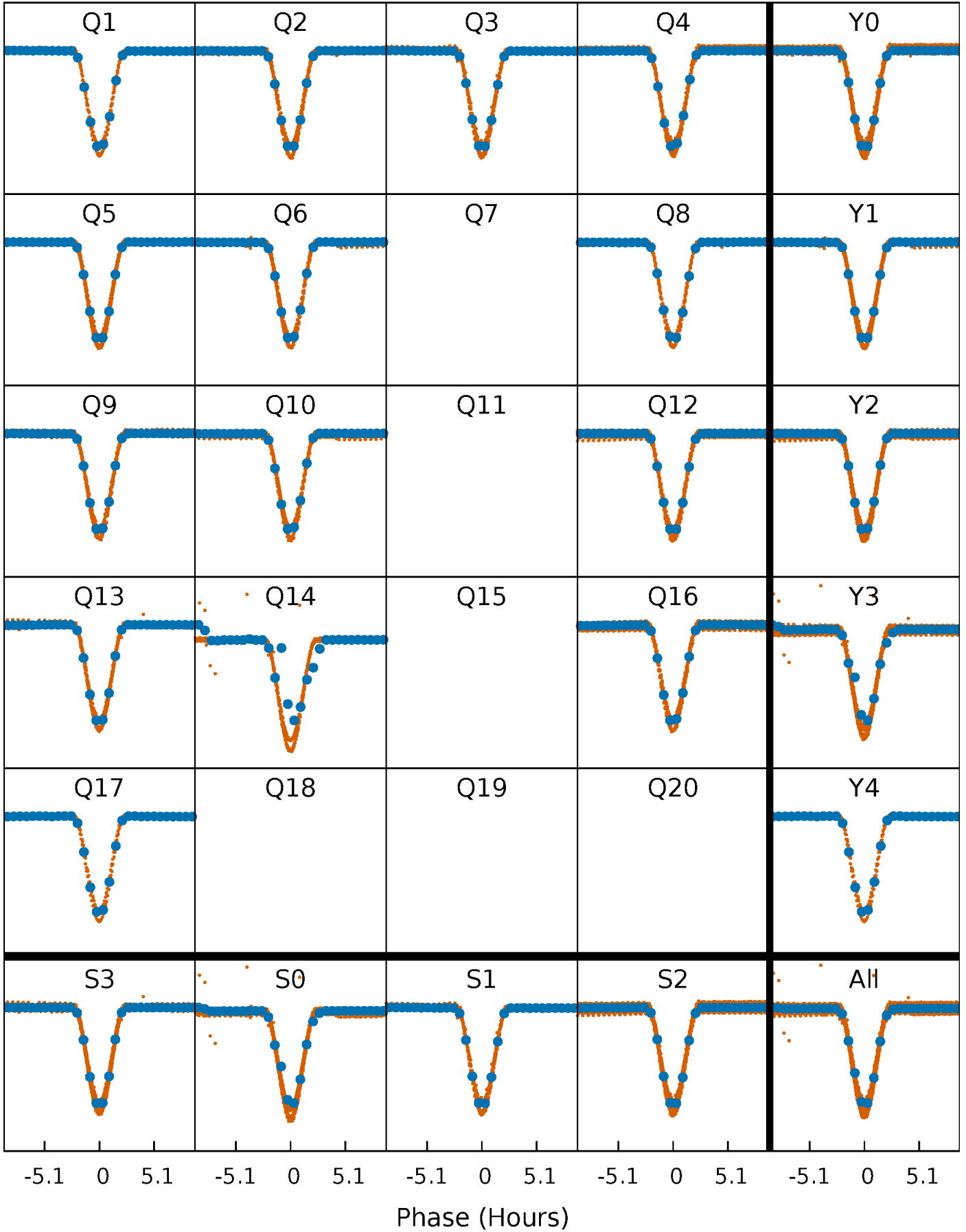


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

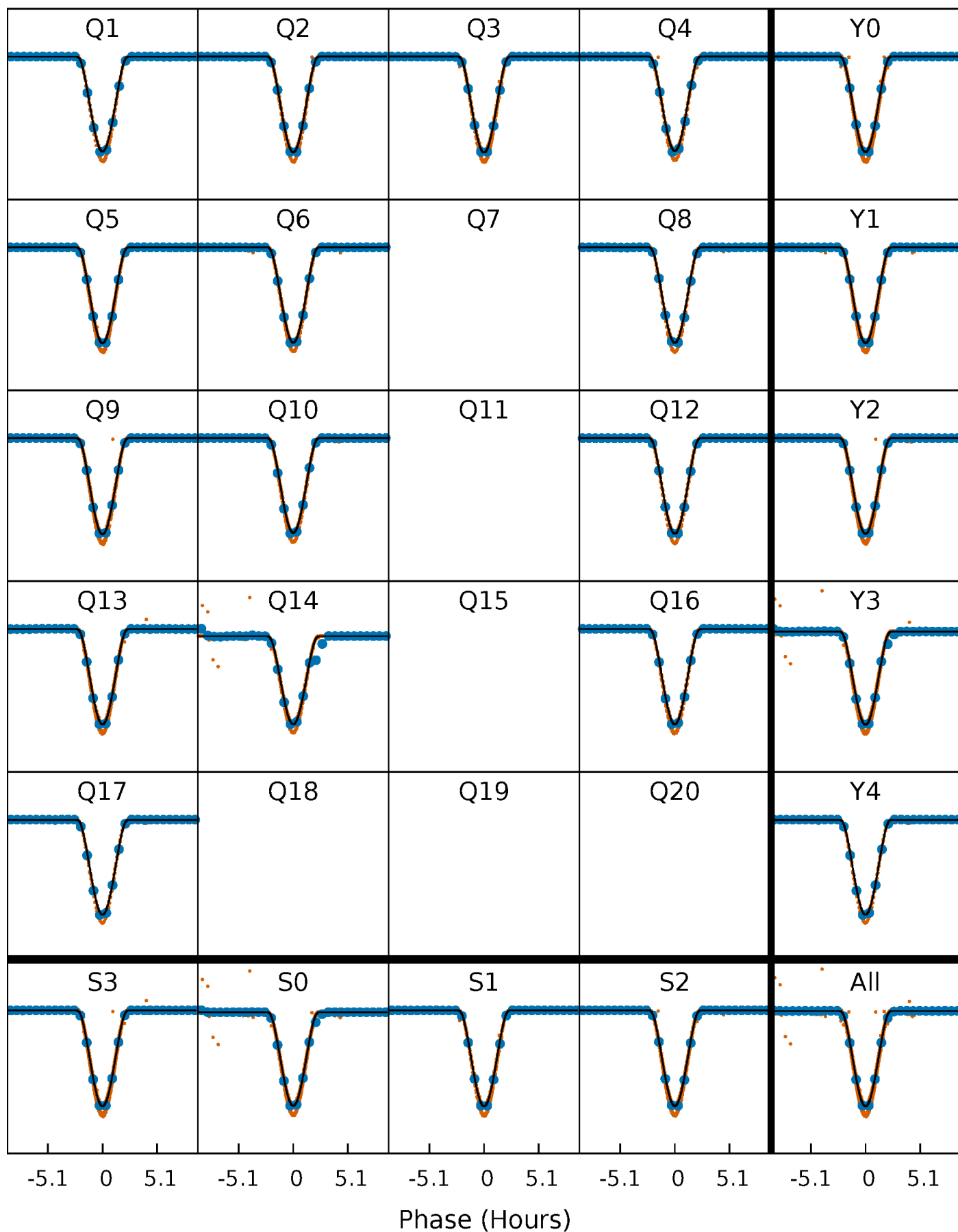
TCE 010031409-01 P= 2.071941 Days  $T_0=132.836409$  (BKJD)





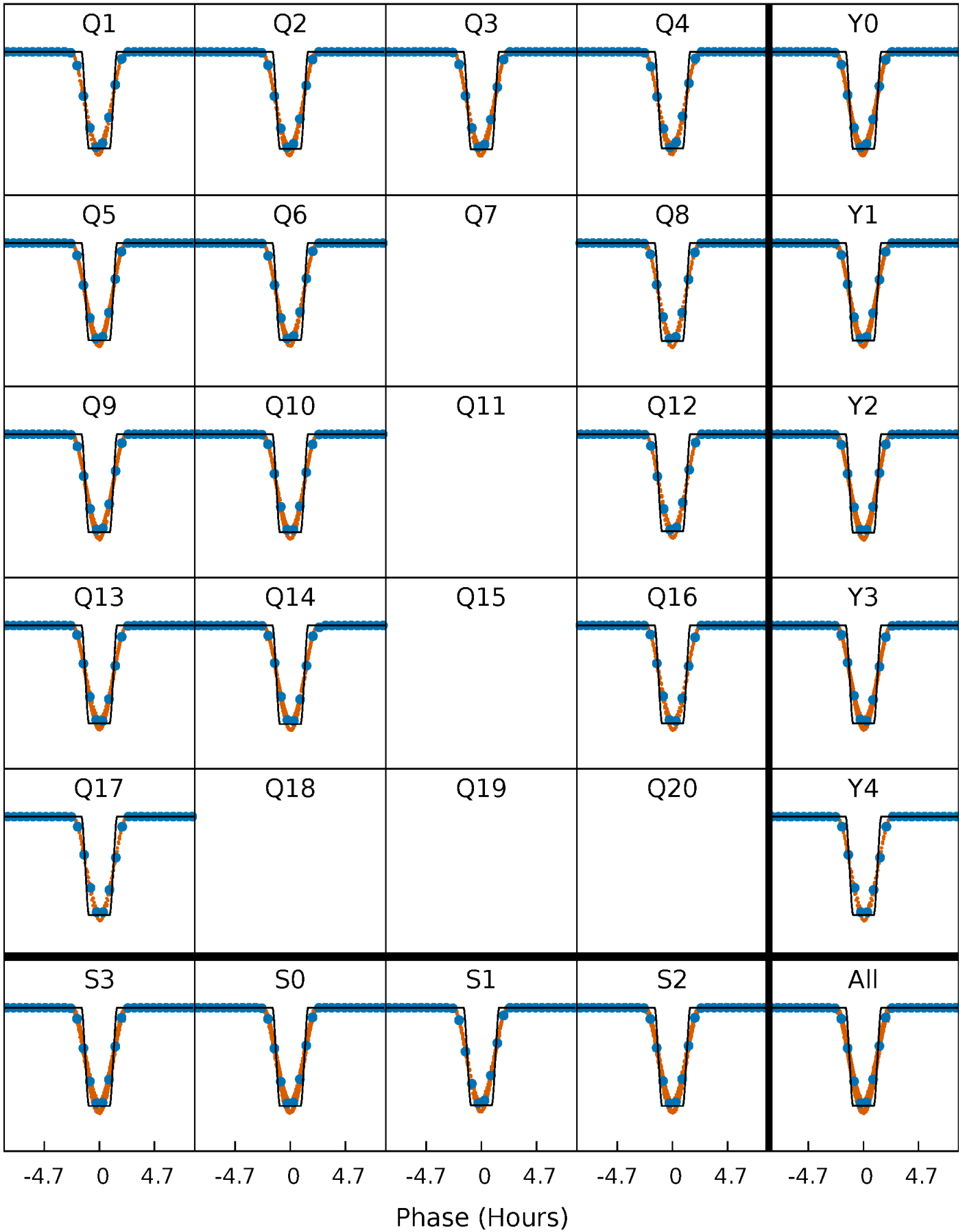
# DV Quarter-Phased Transit Curves

TCE 010031409-01 P= 2.071941 Days  $T_0=132.836409$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

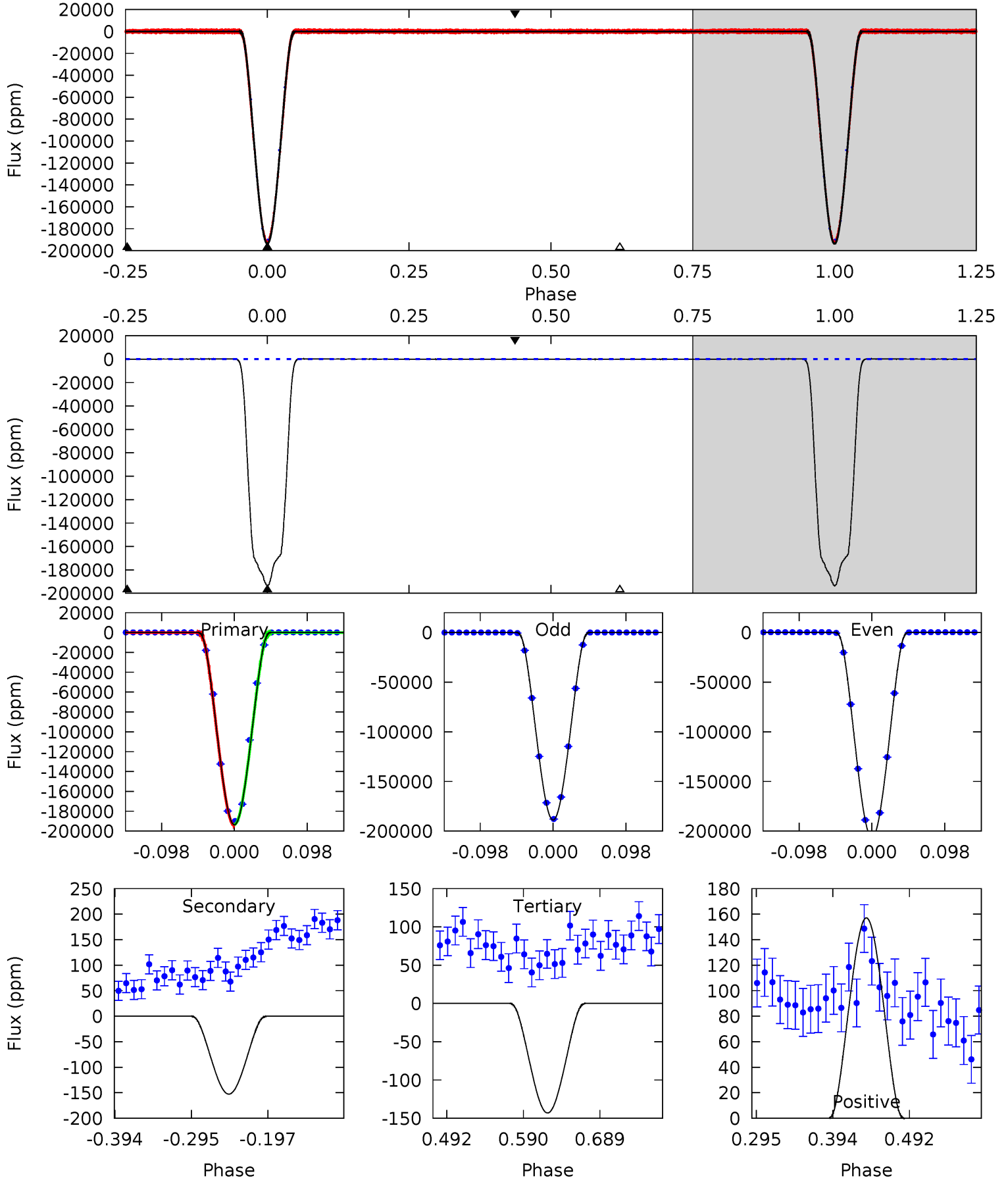
TCE 010031409-01 P= 2.071931 Days  $T_0=132.840516$  (BKJD)



# DV Model-Shift Uniqueness Test

010031409-01, P = 2.071941 Days, E = 130.764468 Days

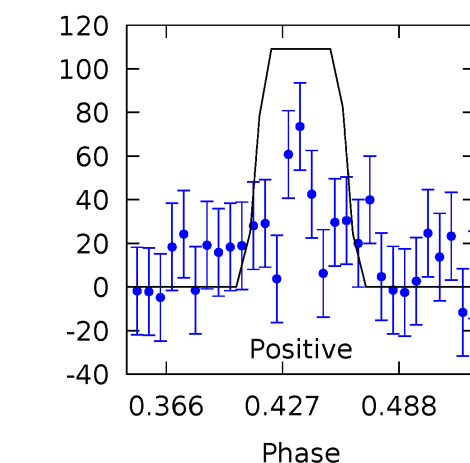
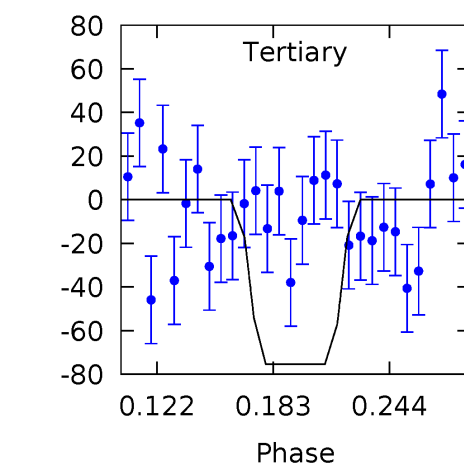
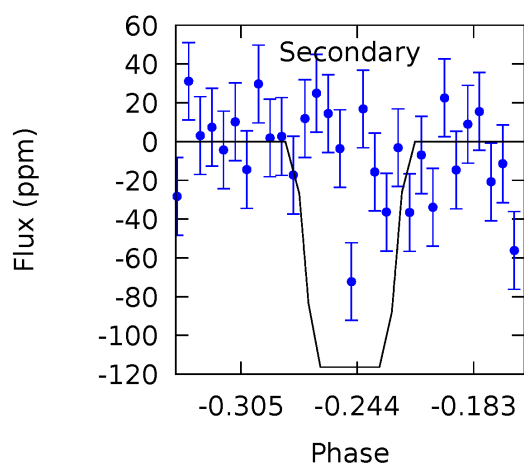
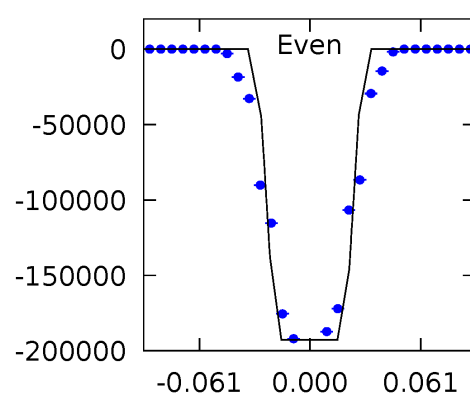
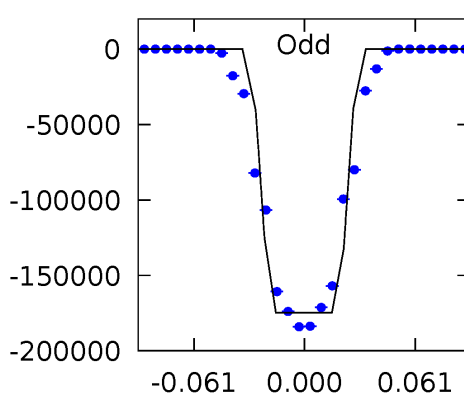
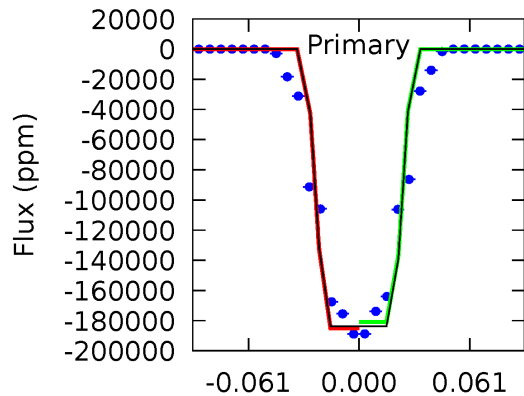
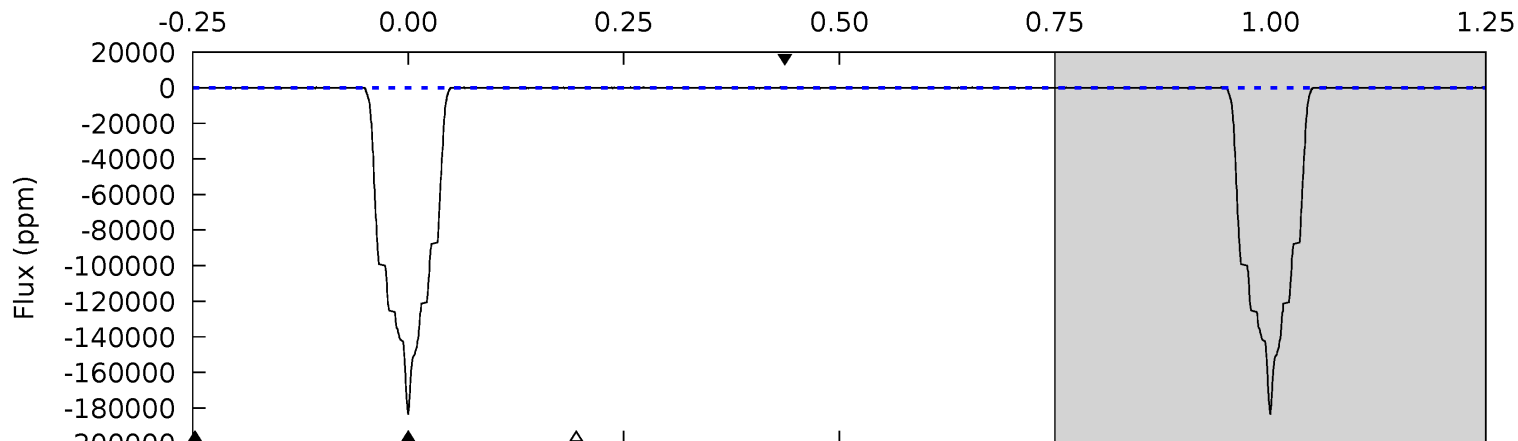
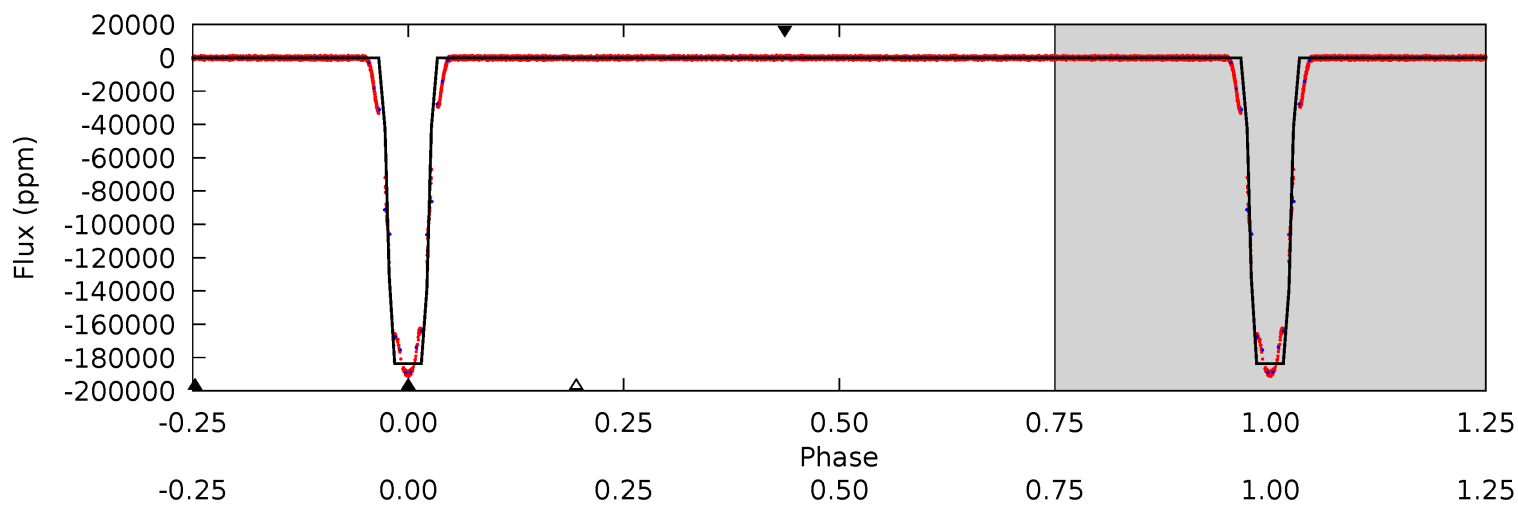
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17109	13.5	12.6	13.9	4.57	1.65	7.99	17097	17096	0.85	-0.38	1194	1.11	0.00	53.8



# Alt Model-Shift Uniqueness Test

010031409-01, P = 2.071931 Days, E = 130.768585 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
7985	5.06	3.28	4.74	4.67	1.87	1.19	7981	7980	1.77	0.32	477.2	1.01	0.00	95.3



### Stellar Parameters For KIC 010031409

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6140^{+182}_{-200}$	$4.247^{+0.190}_{-0.190}$	$-0.220^{+0.300}_{-0.300}$	$1.254^{+0.362}_{-0.263}$	$1.014^{+0.166}_{-0.124}$	$0.724^{+0.703}_{-0.356}$
	+3%/-3%	+4%/-4%	+136%/-136%	+29%/-21%	+16%/-12%	+97%/-49%
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 010031409-01 / KOI 7276.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-153 \pm 11$	$83.69^{+13.63}_{-10.87}$	$2371^{+180}_{-166}$	$-2704^{+100}_{-110}$	$0.012^{+0.004}_{-0.003}$
Alt.	$-116 \pm 23$	$60.78^{+9.51}_{-7.26}$	$2369^{+182}_{-157}$	$-2698^{+98}_{-114}$	$0.017^{+0.006}_{-0.005}$

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

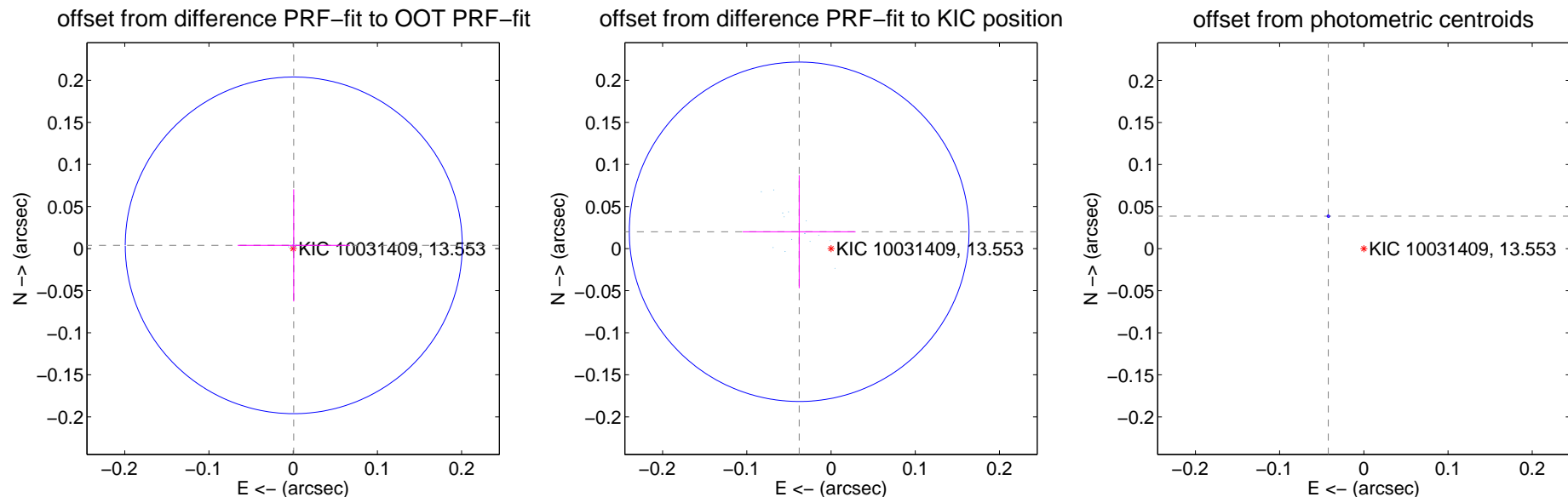
## DV Centroid Data

Supplemental centroid analysis for 010031409-01. Kepler magnitude: 13.55. Transit SNR 10146.91

There are 14 quarters with good PRF difference image offsets

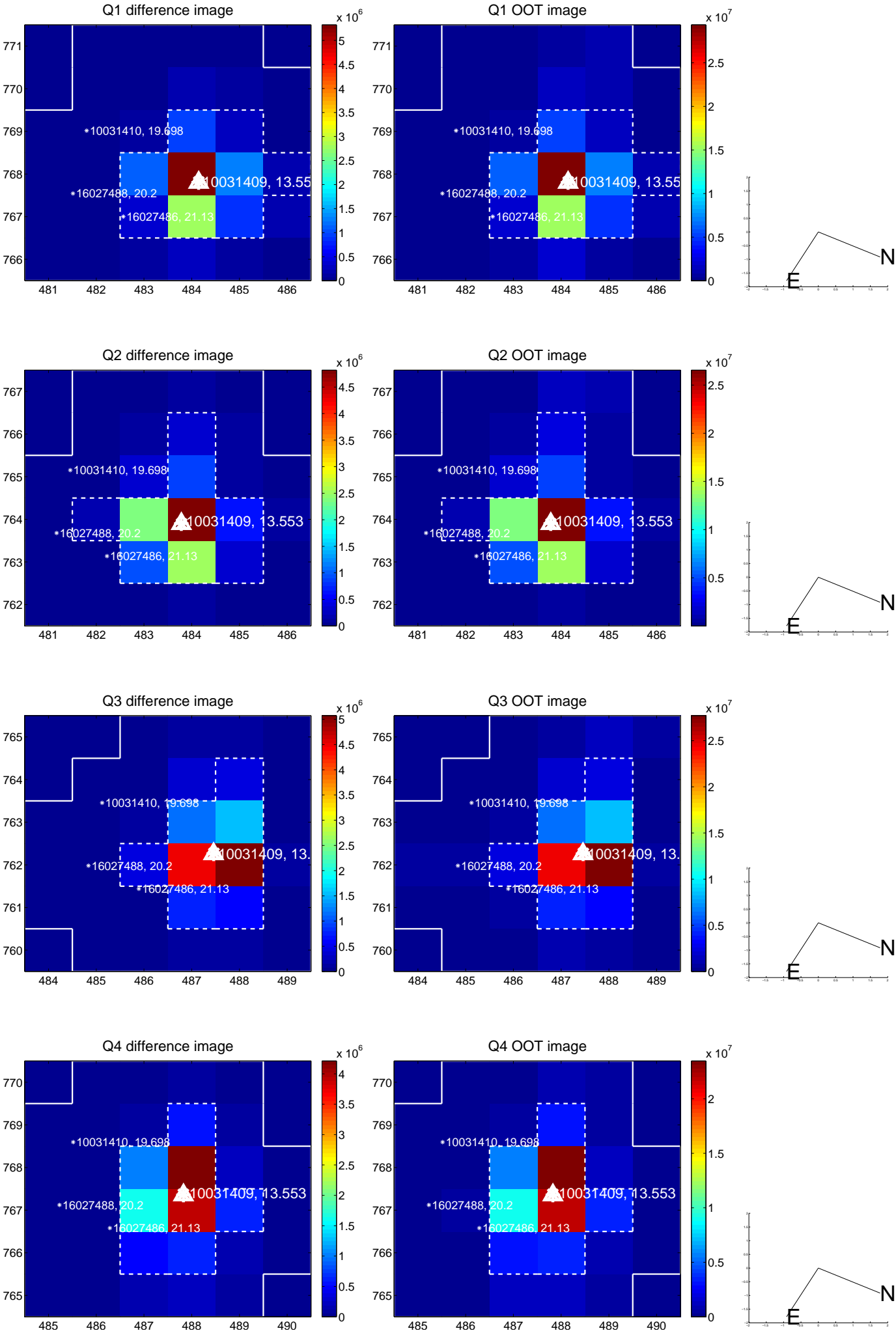
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.004 \pm 0.067$	0.06	$-0.001 \pm 0.067$	$0.004 \pm 0.067$
PRF-fit source offset from KIC position	$0.043 \pm 0.067$	0.64	$0.038 \pm 0.067$	$0.020 \pm 0.067$
photometric centroid source offset	$0.06 \pm 0.00$	123.76	$0.04 \pm 0.00$	$0.04 \pm 0.00$

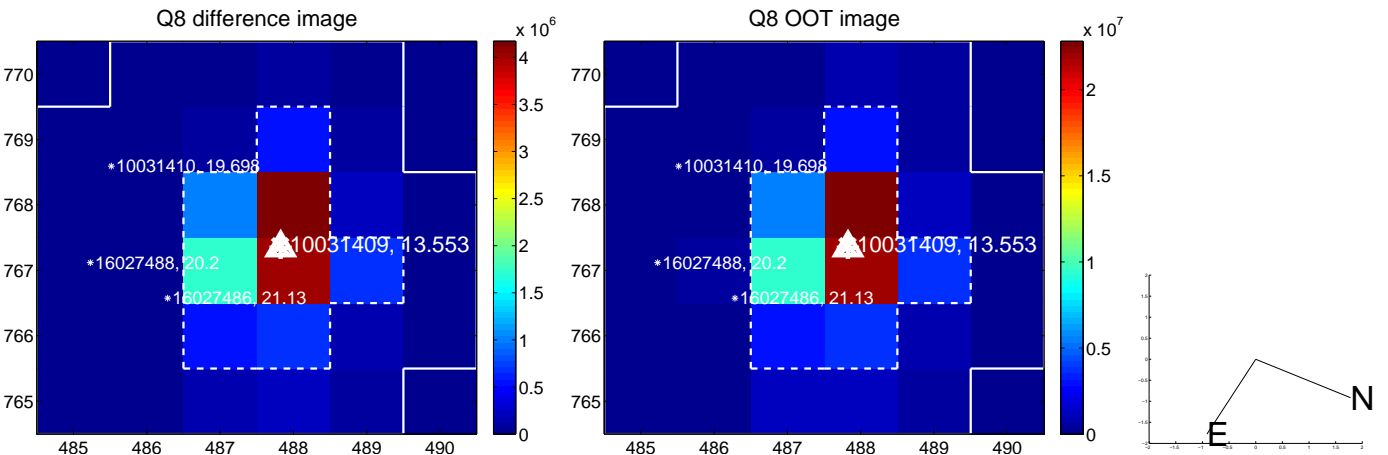
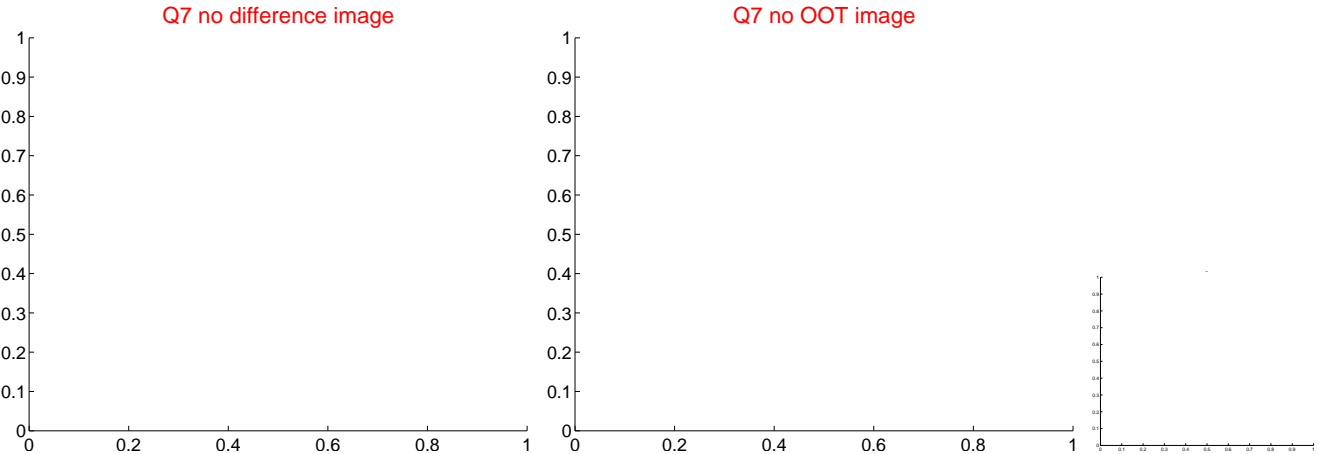
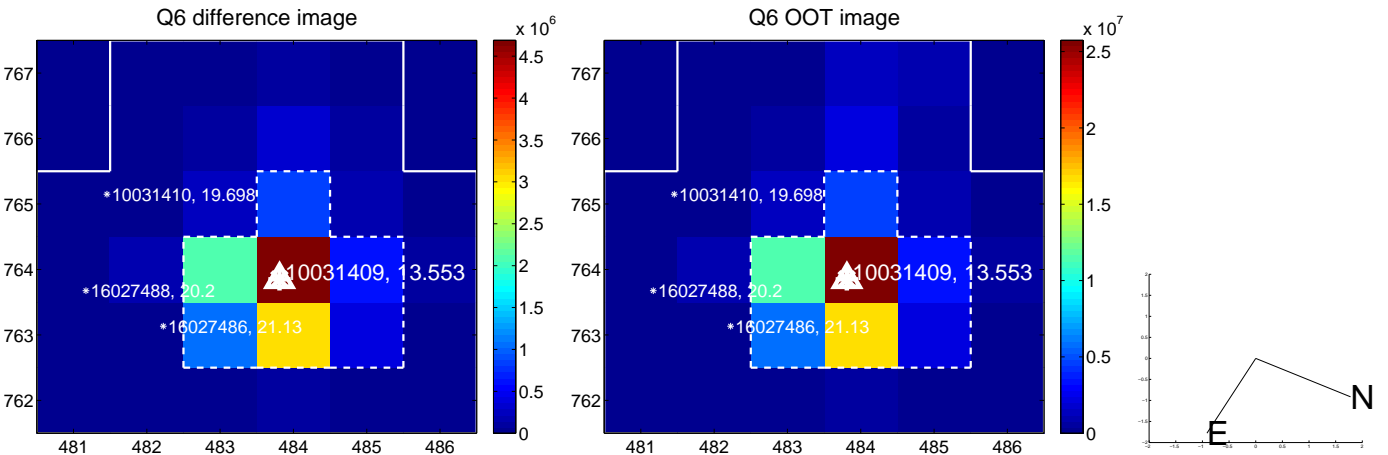
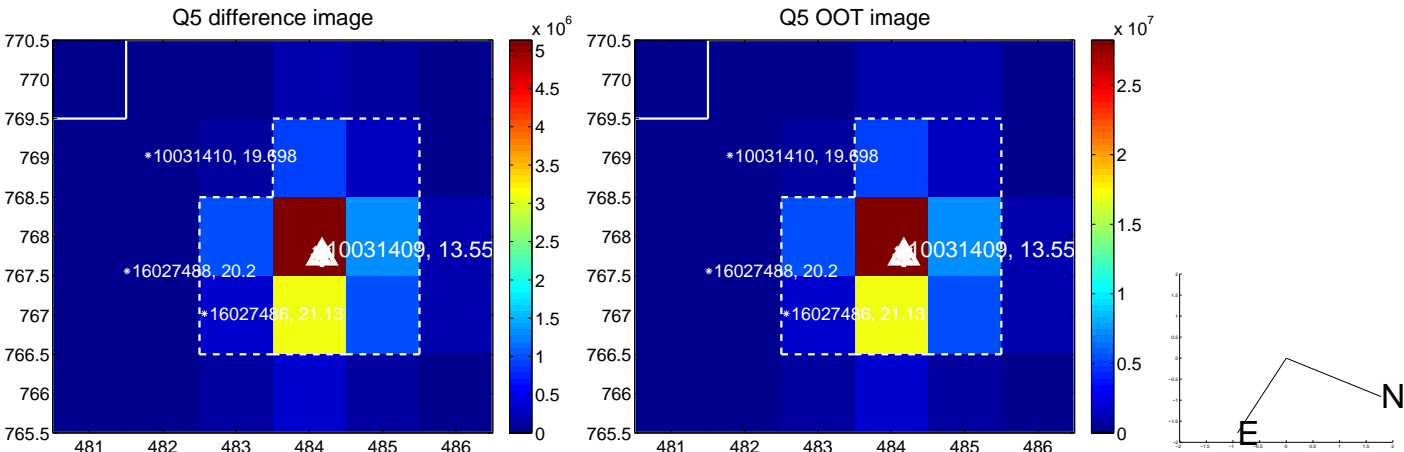


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

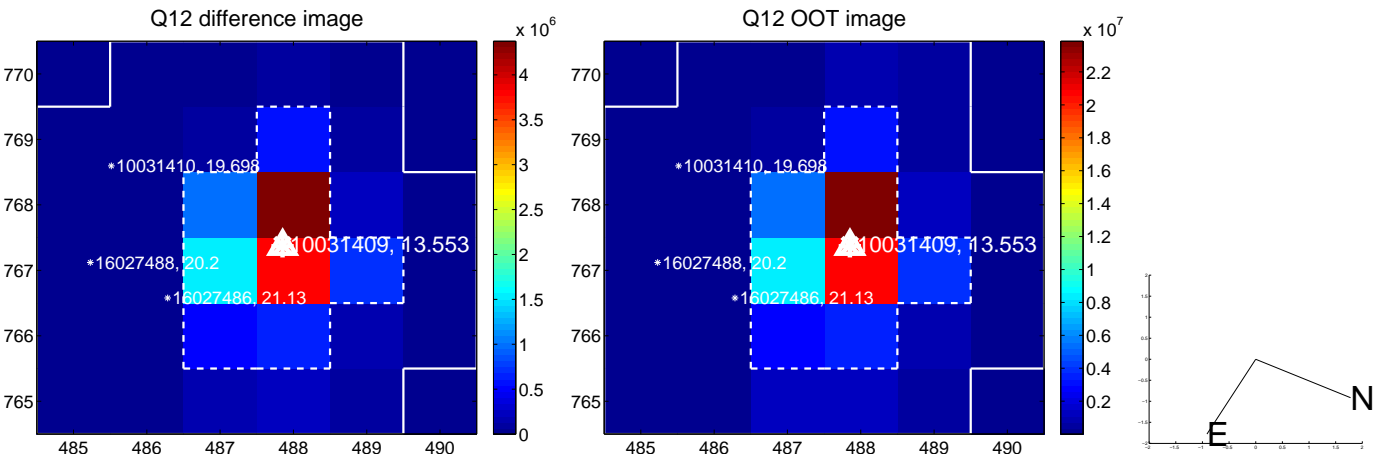
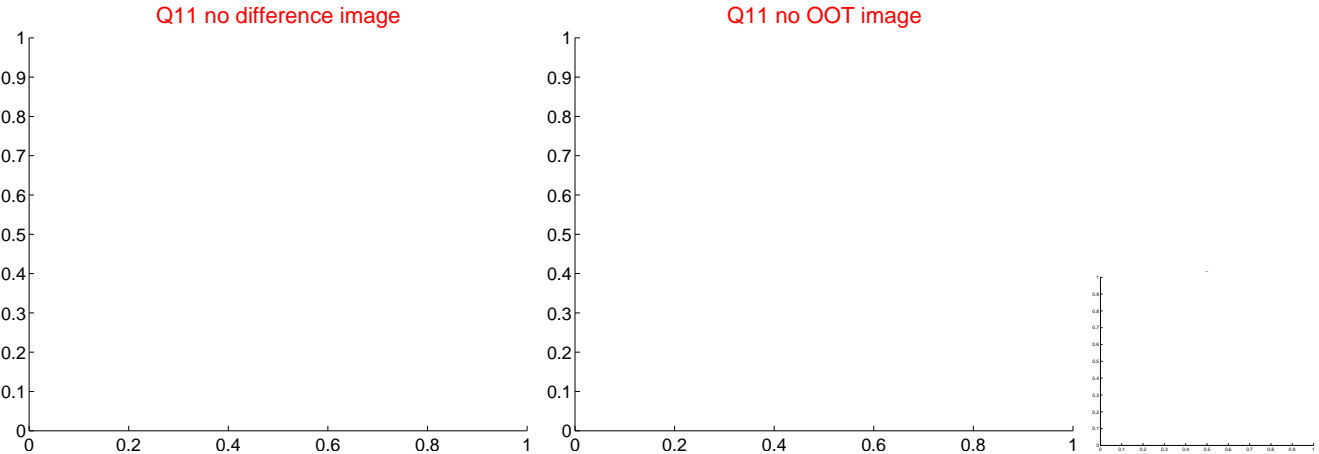
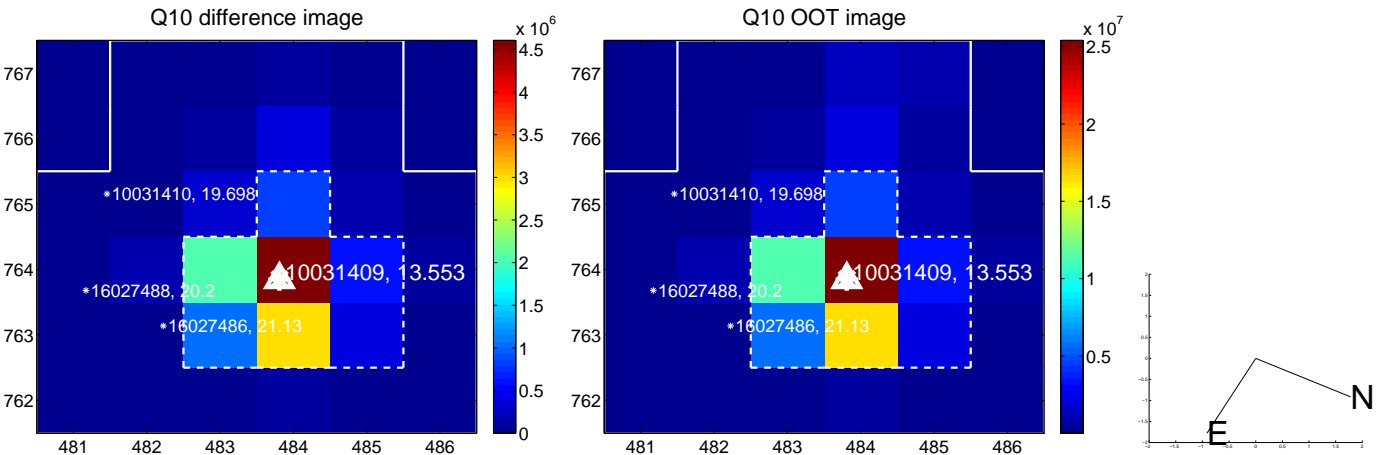
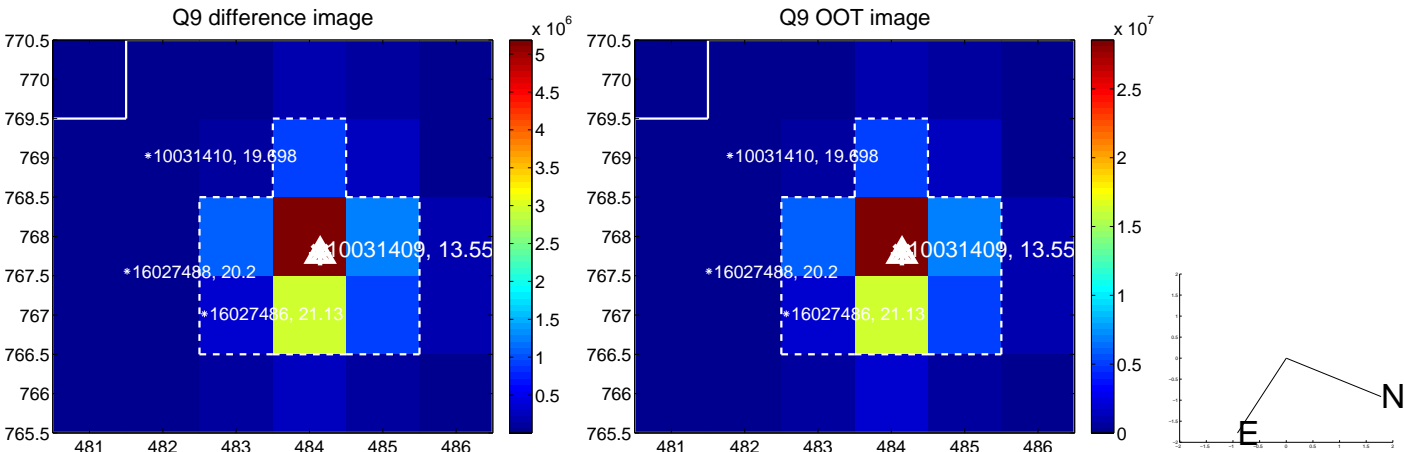


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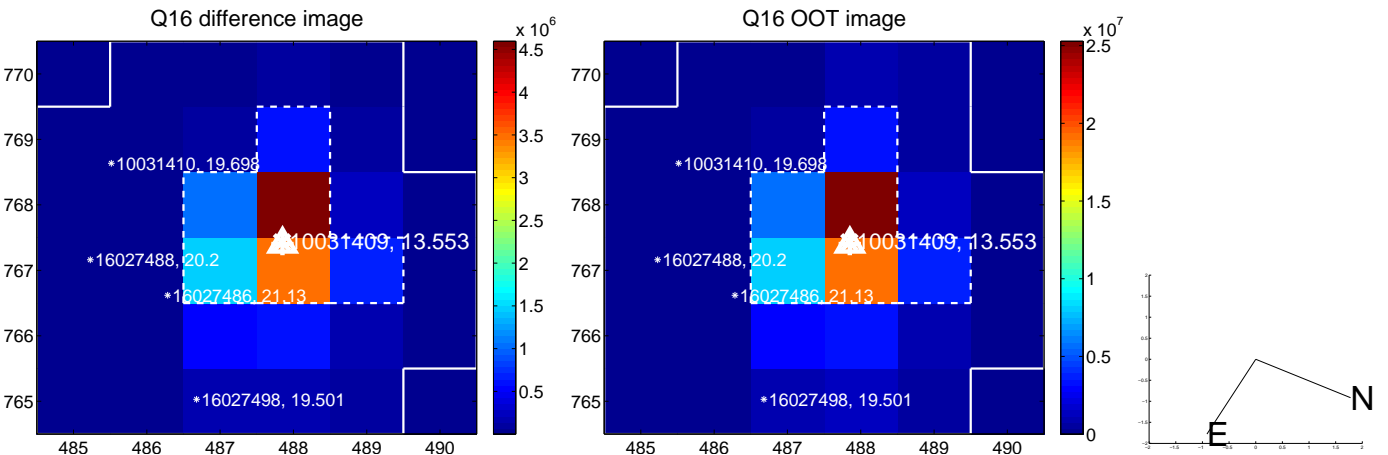
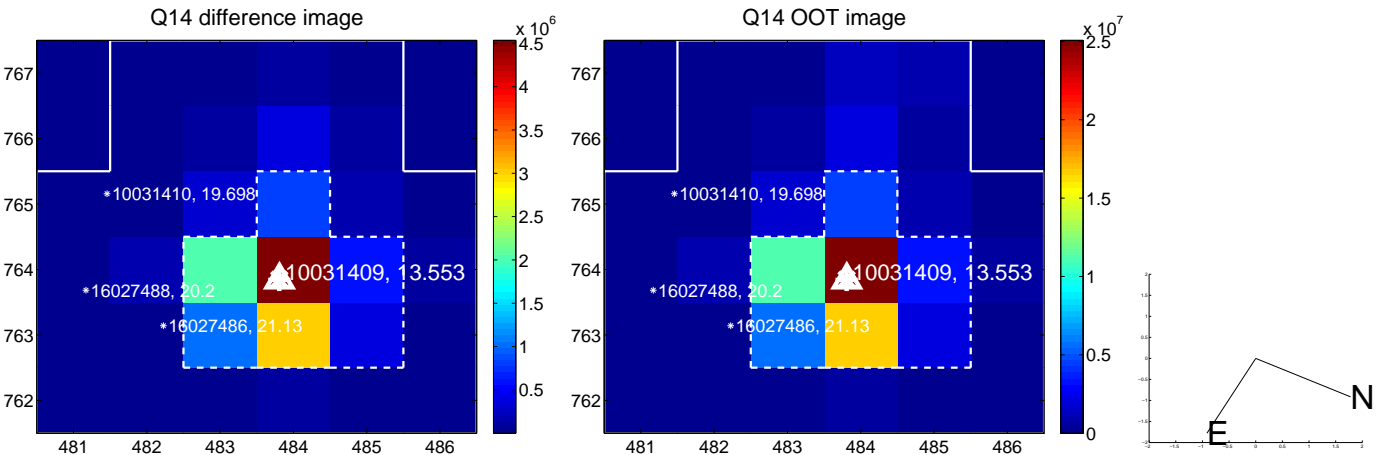
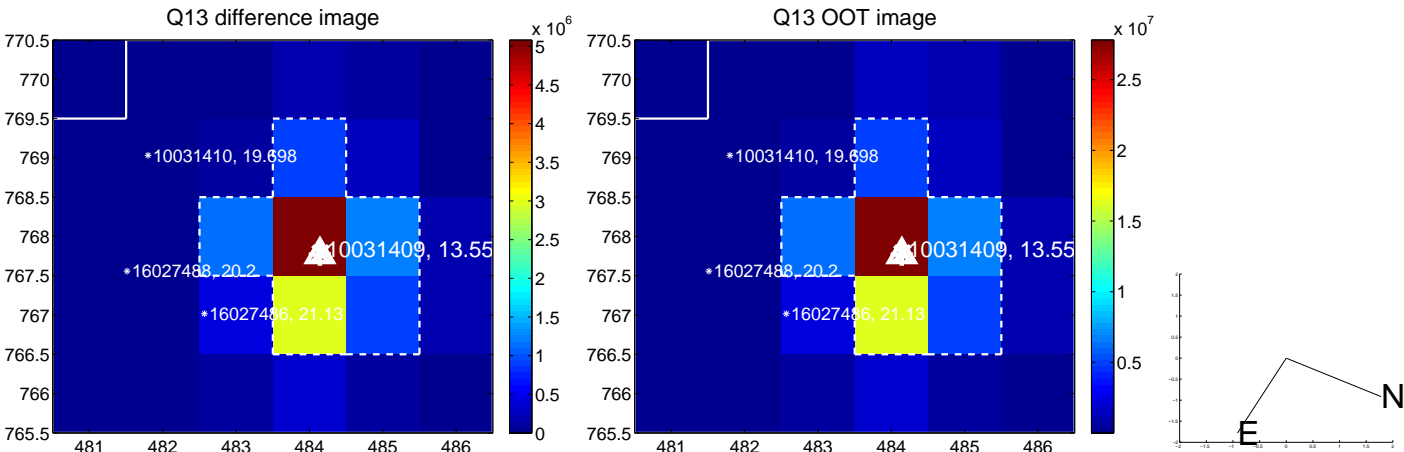




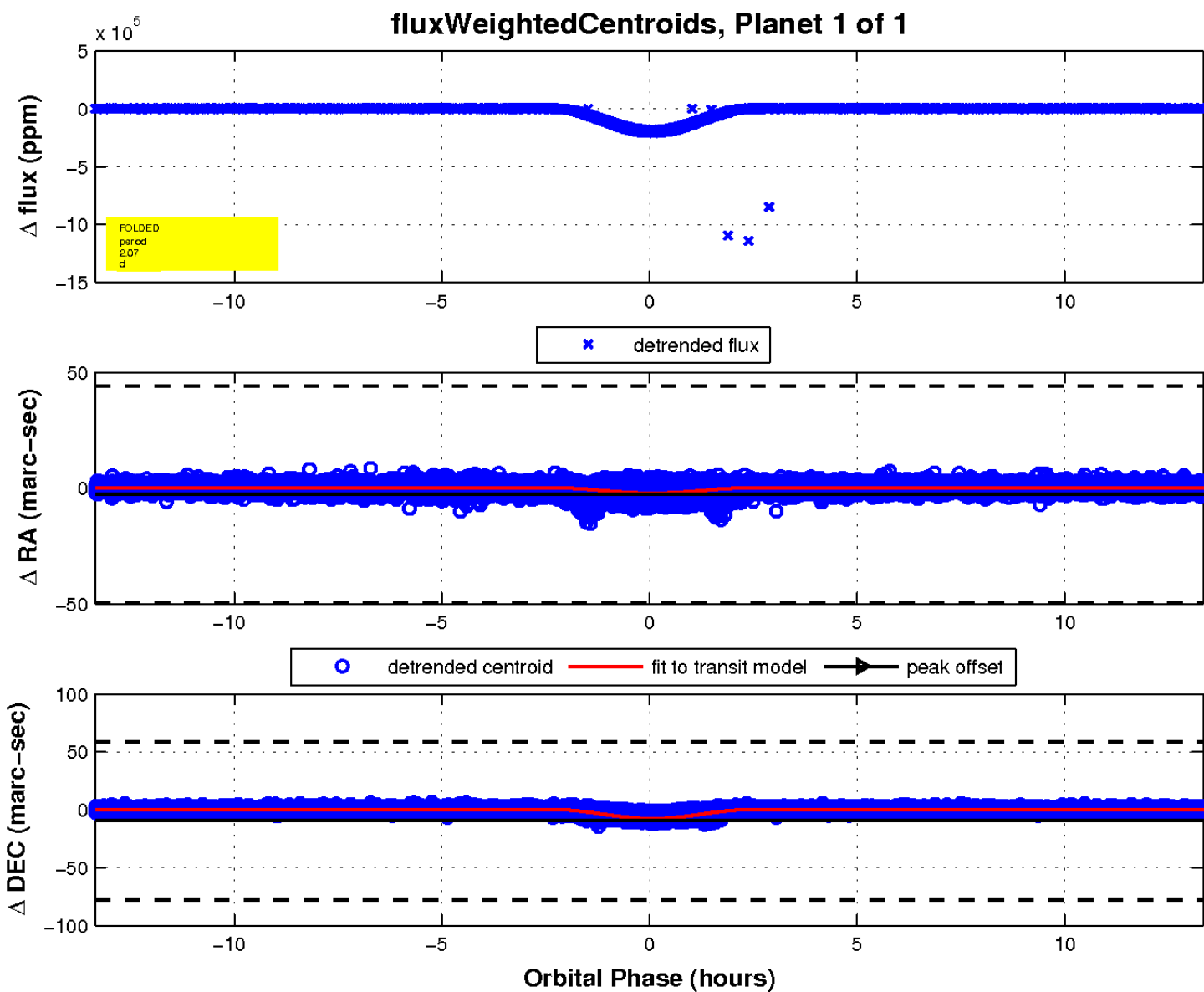
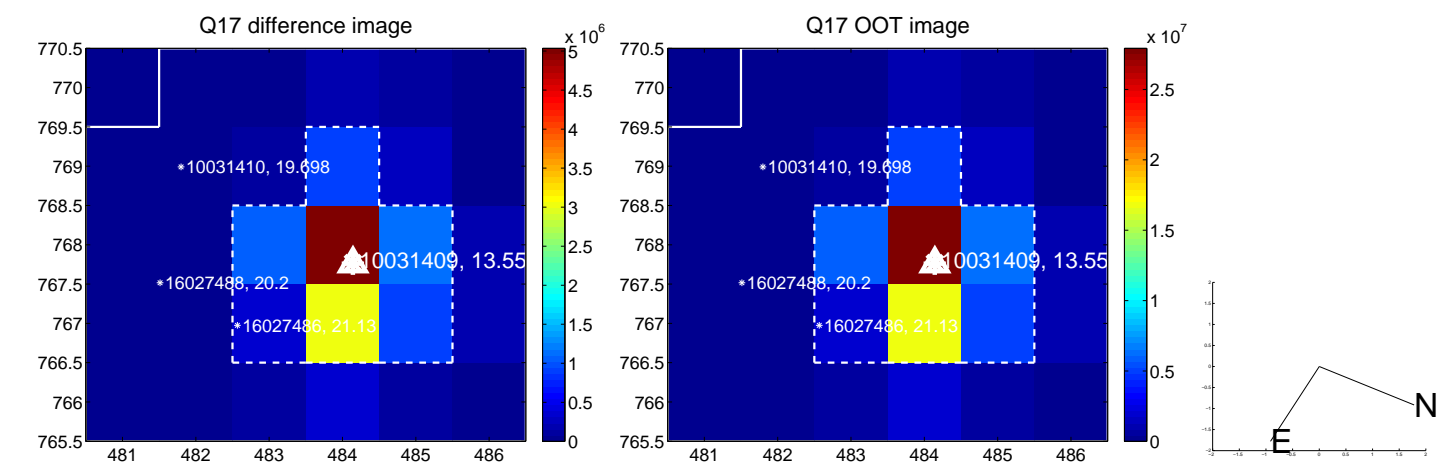
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UKIRT Image

Declination

