

# KIC 012470041

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012470041-01	OBS	6251.01	14.667695	139.162082	29120.3	2.398	611.1	696.4	3.23	7517	87.45	1373.09

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012470041-01	OBS	FP	0.00	0	1	0	0	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.

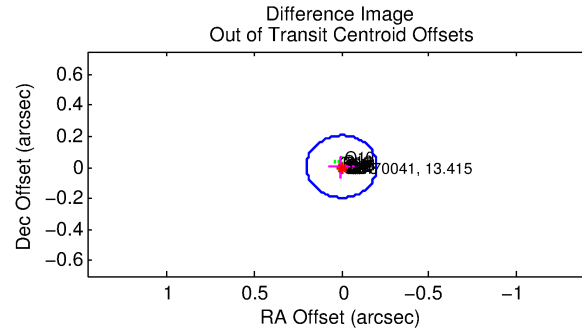
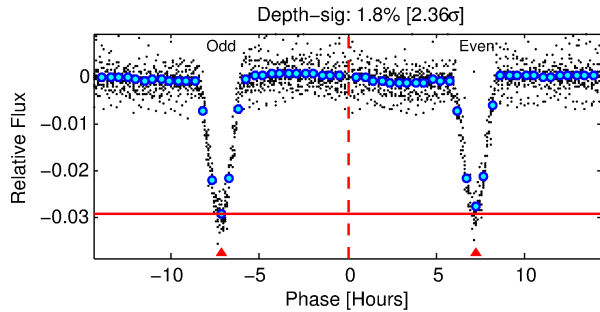
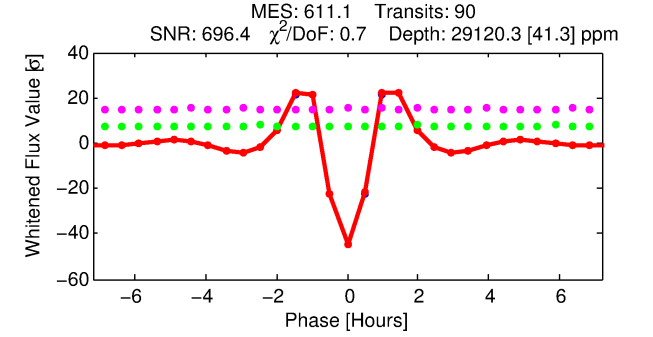
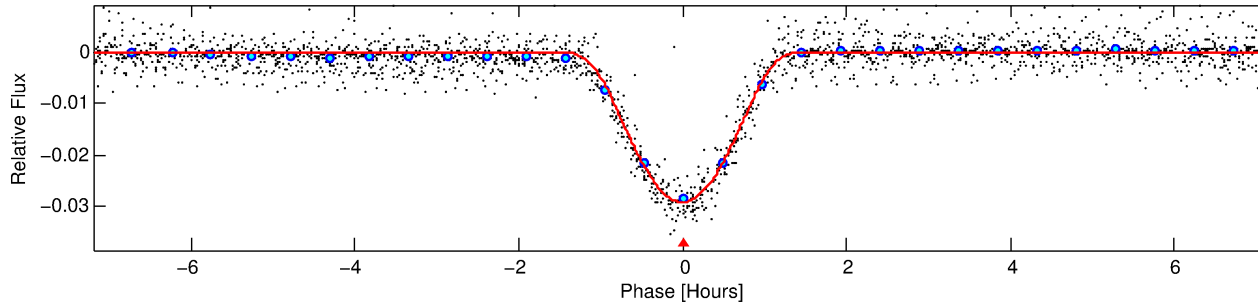
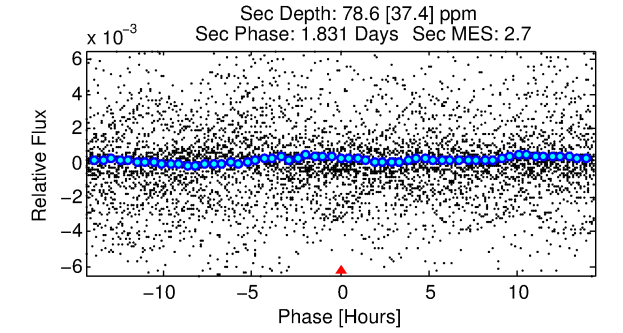
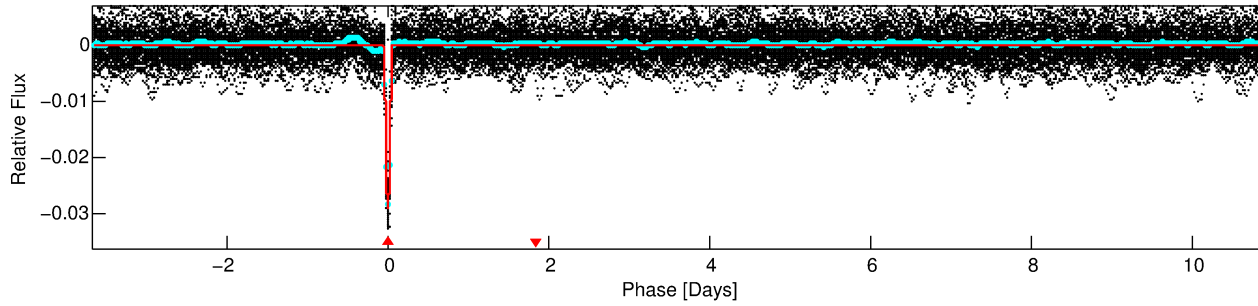
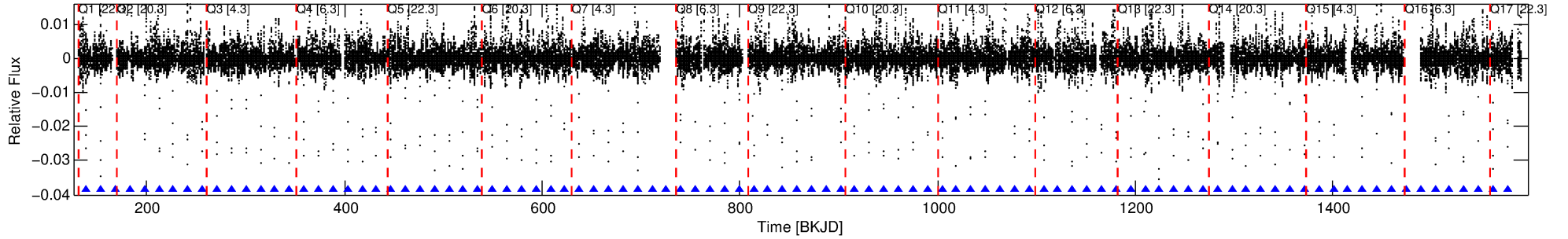
## Ephemeris Match Information For 012470041-01

No Significant Match Found

# DV One-Page Summary

KIC: 12470041 Candidate: 1 of 1 Period: 14.668 d  
KOI: K06251.01 Corr: 0.993

Kp: 13.41 R\*: 3.23 Rs Teff: 7517.0 K Logg: 3.72 Fe/H: -0.160



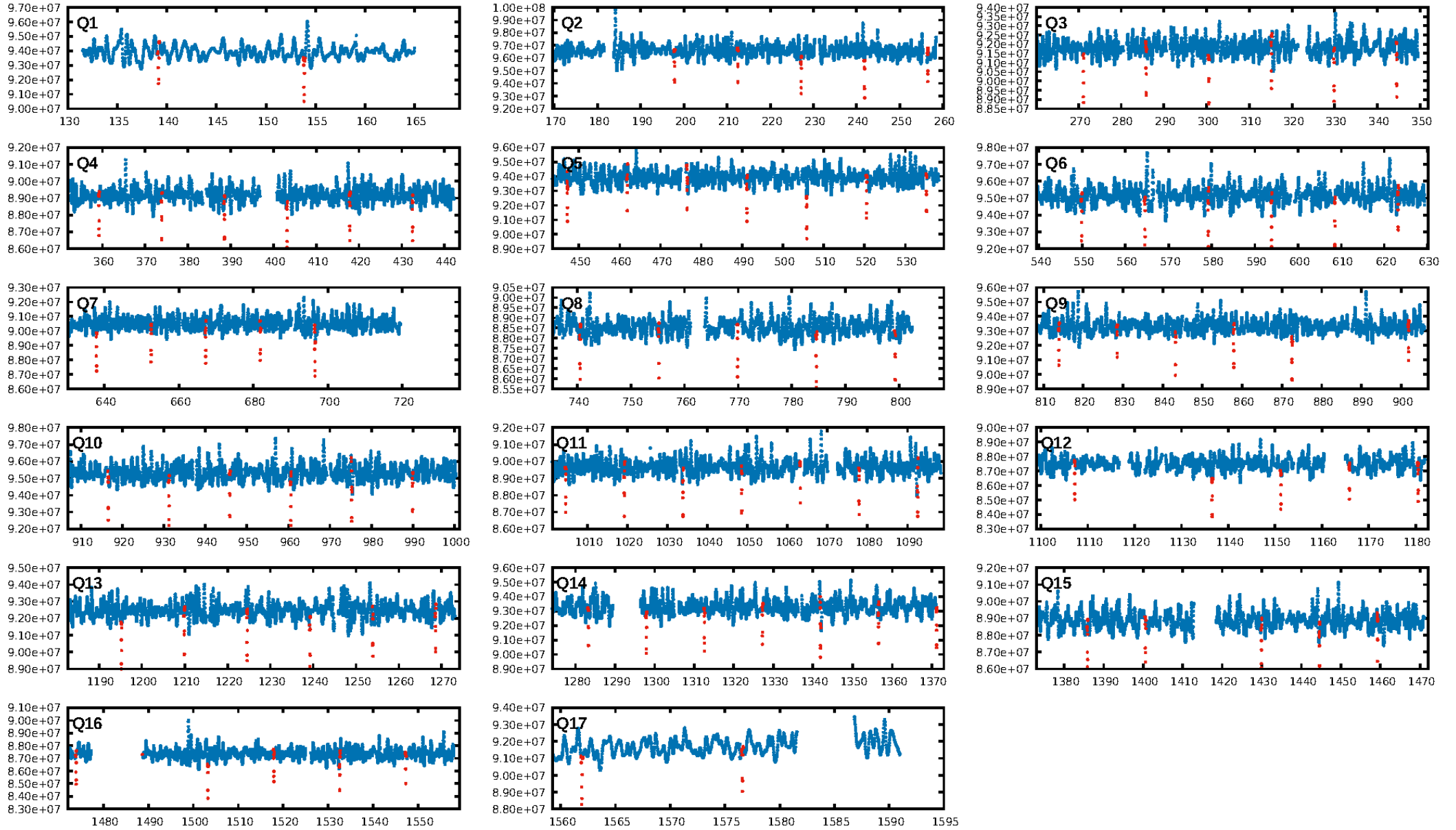
## DV Fit Results:

Period = 14.66770 [0.00000] d  
Epoch = 139.1621 [0.0000] BKJD  
Rp/R\* = 0.2484 [0.0086]  
a/R\* = 36.91 [0.14]  
b = 0.97 [0.01]  
Seff = 1373.09 [1040.38]  
Teff = 1552 [294] K  
**Rp = 87.45 [42.07] Re**  
a = 0.1472 [0.0680] AU  
Ag = 0.12 [0.11] [-8.11σ]  
Teffp = 1420 [181] K [-0.38σ]

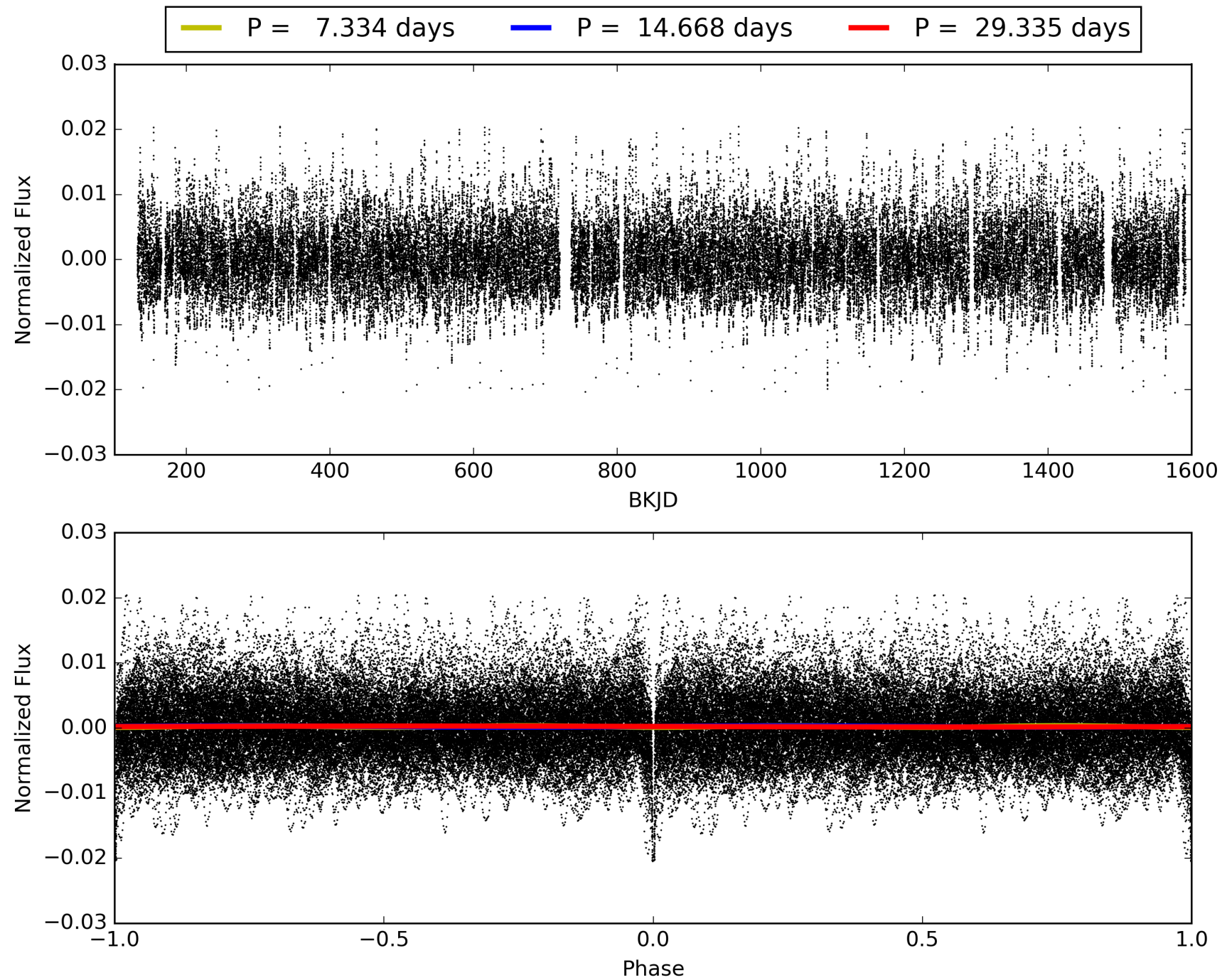
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 98.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [86/86]  
GhostDiagnostic-chr: 2.012  
Centroid-sig: 1.9%  
**Centroid-so: 0.576 arcsec [81.69σ]**  
OotOffset-rm: 0.006 arcsec [0.09σ]  
KicOffset-rm: 0.041 arcsec [0.60σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012470041-01, PDC Light Curves

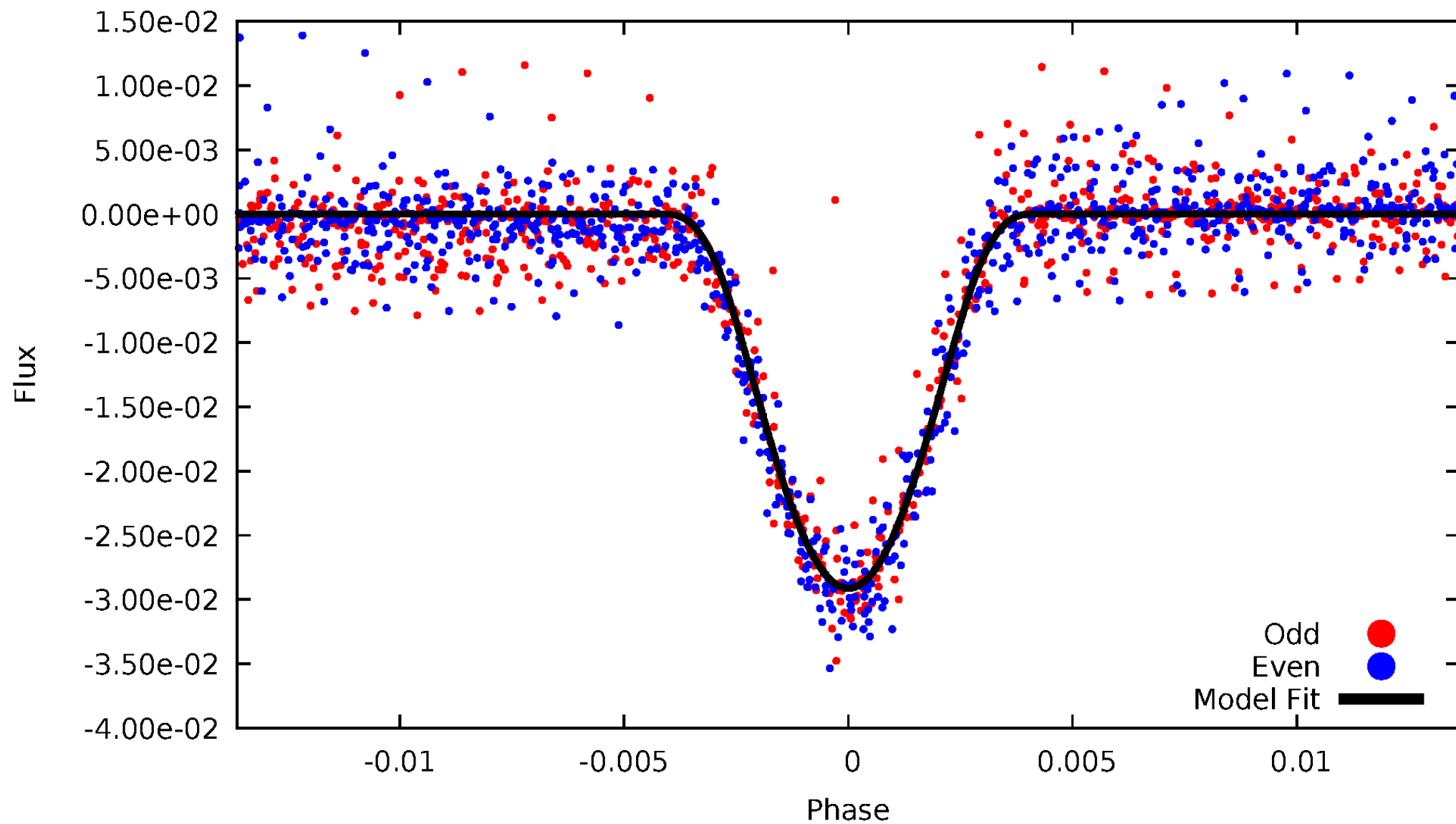


TCE 012470041-01



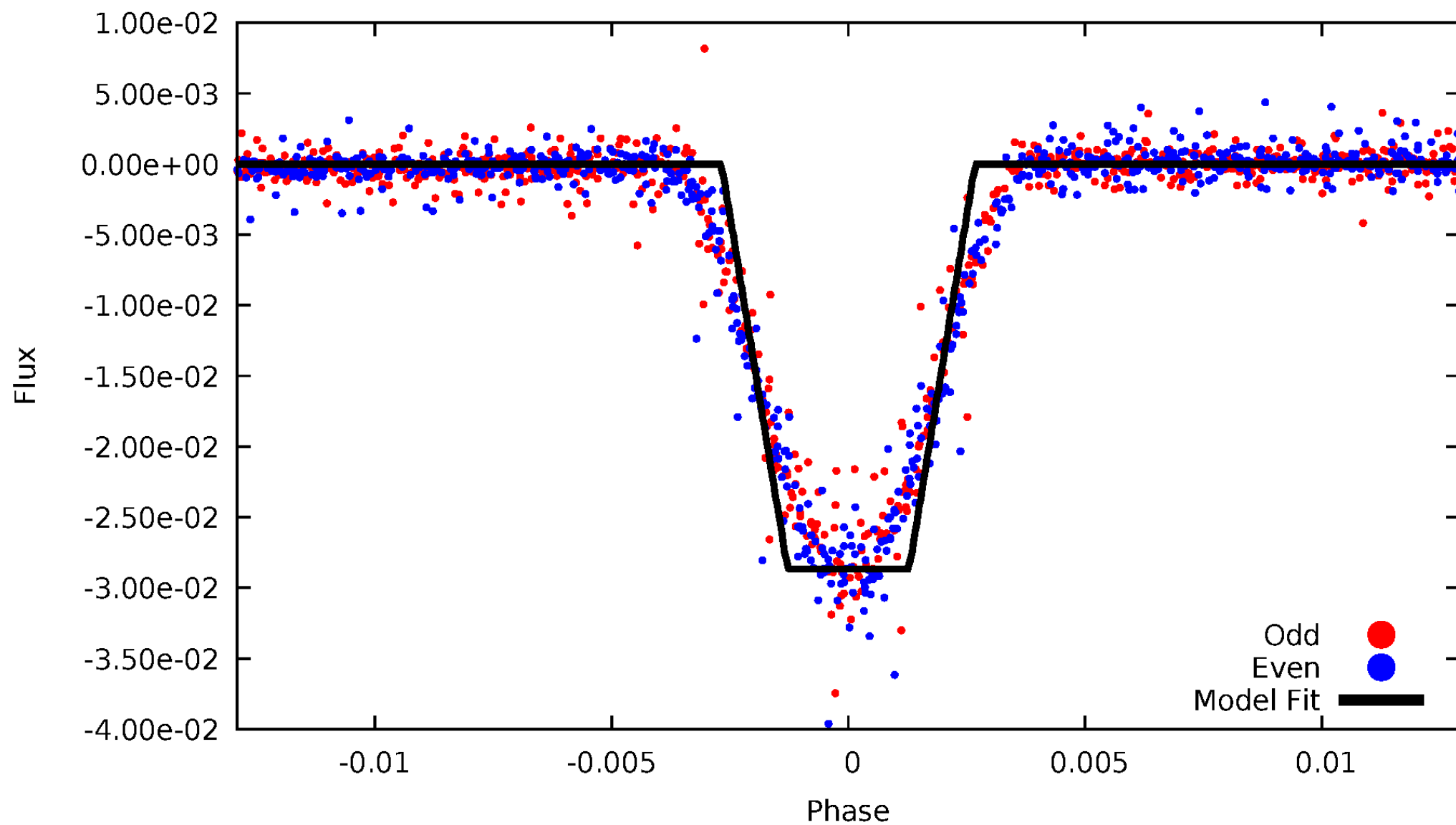
# DV Odd/Even

TCE 012470041-01



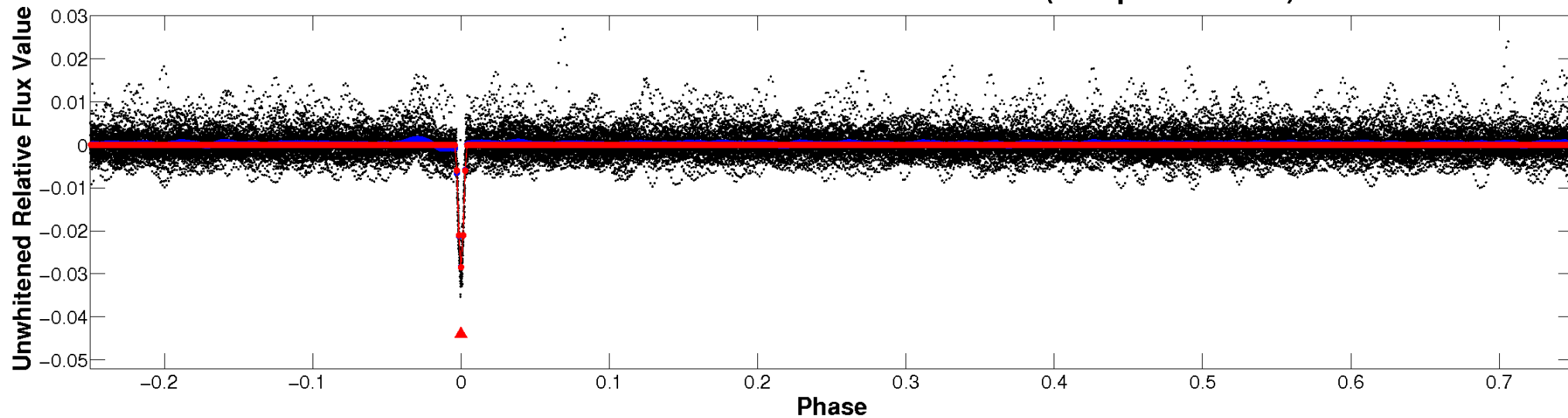
# ALT Odd/Even

TCE 012470041-01

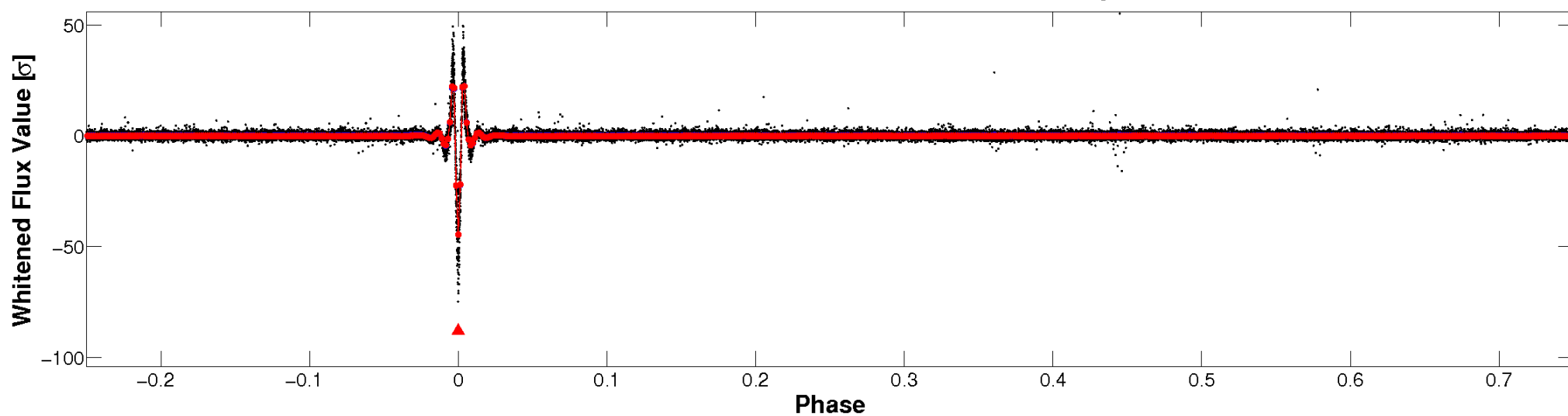


# Non-Whitened Vs. Whitened Light Curve

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



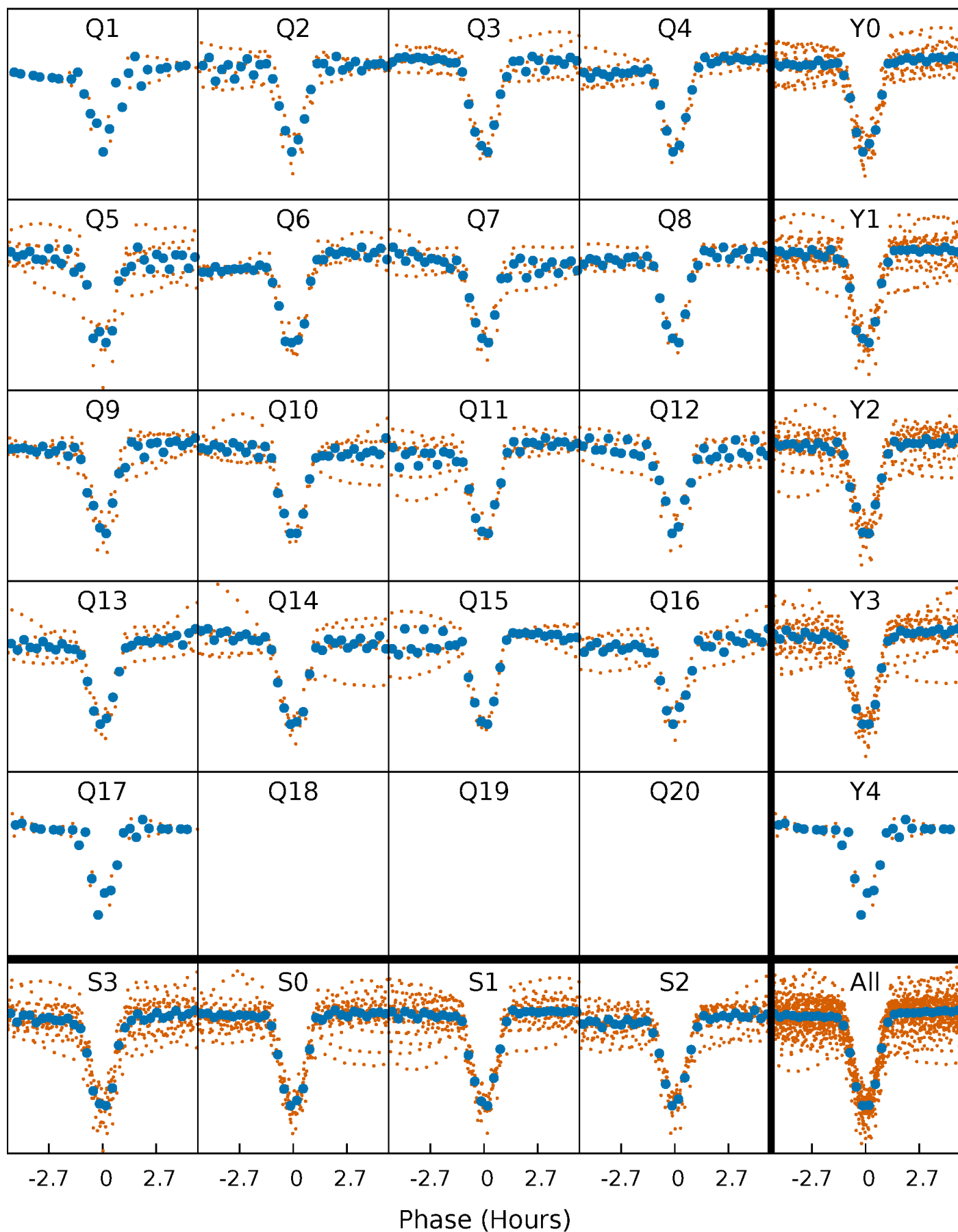
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

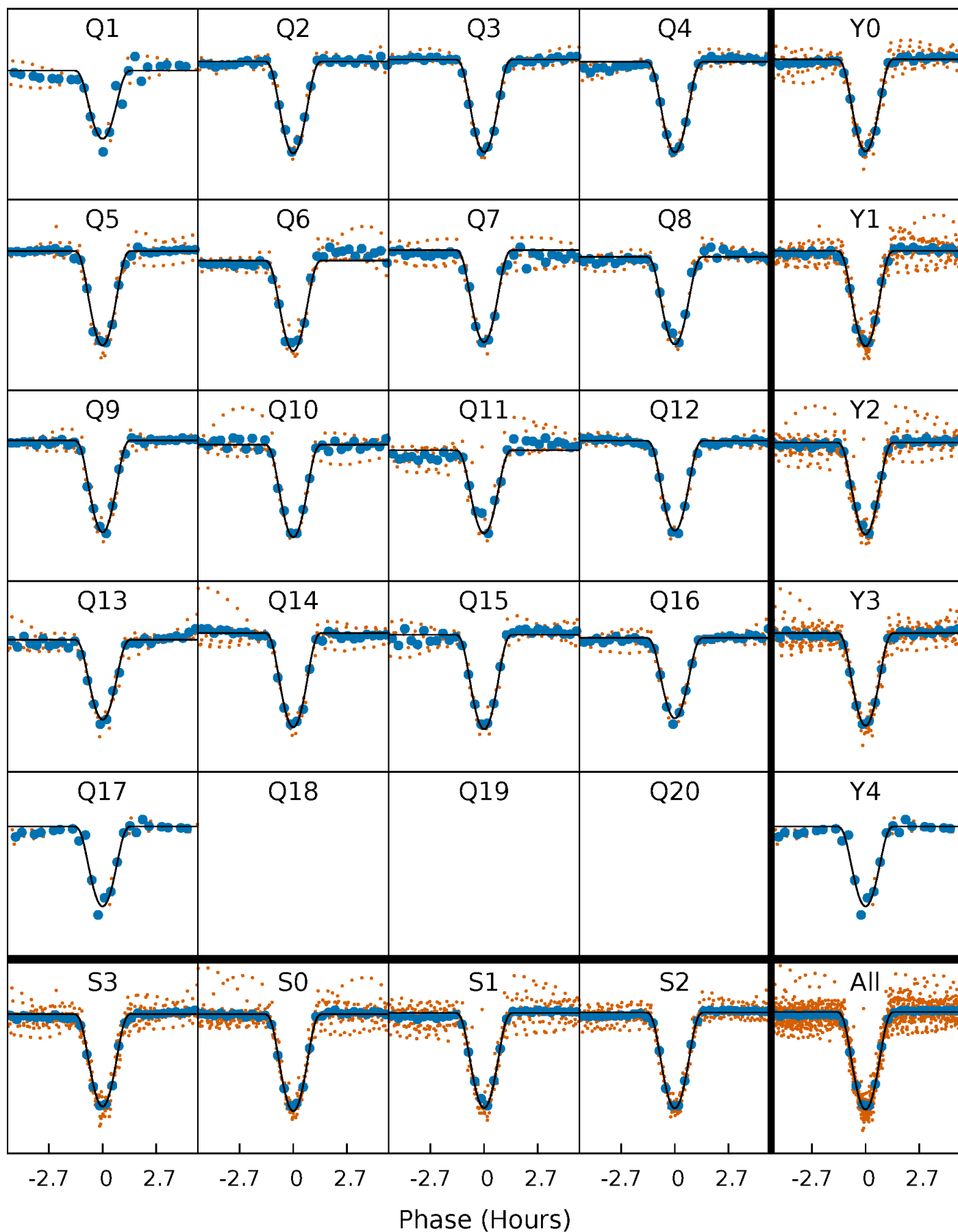
TCE 012470041-01 P= 14.667695 Days  $T_0=139.162082$  (BKJD)





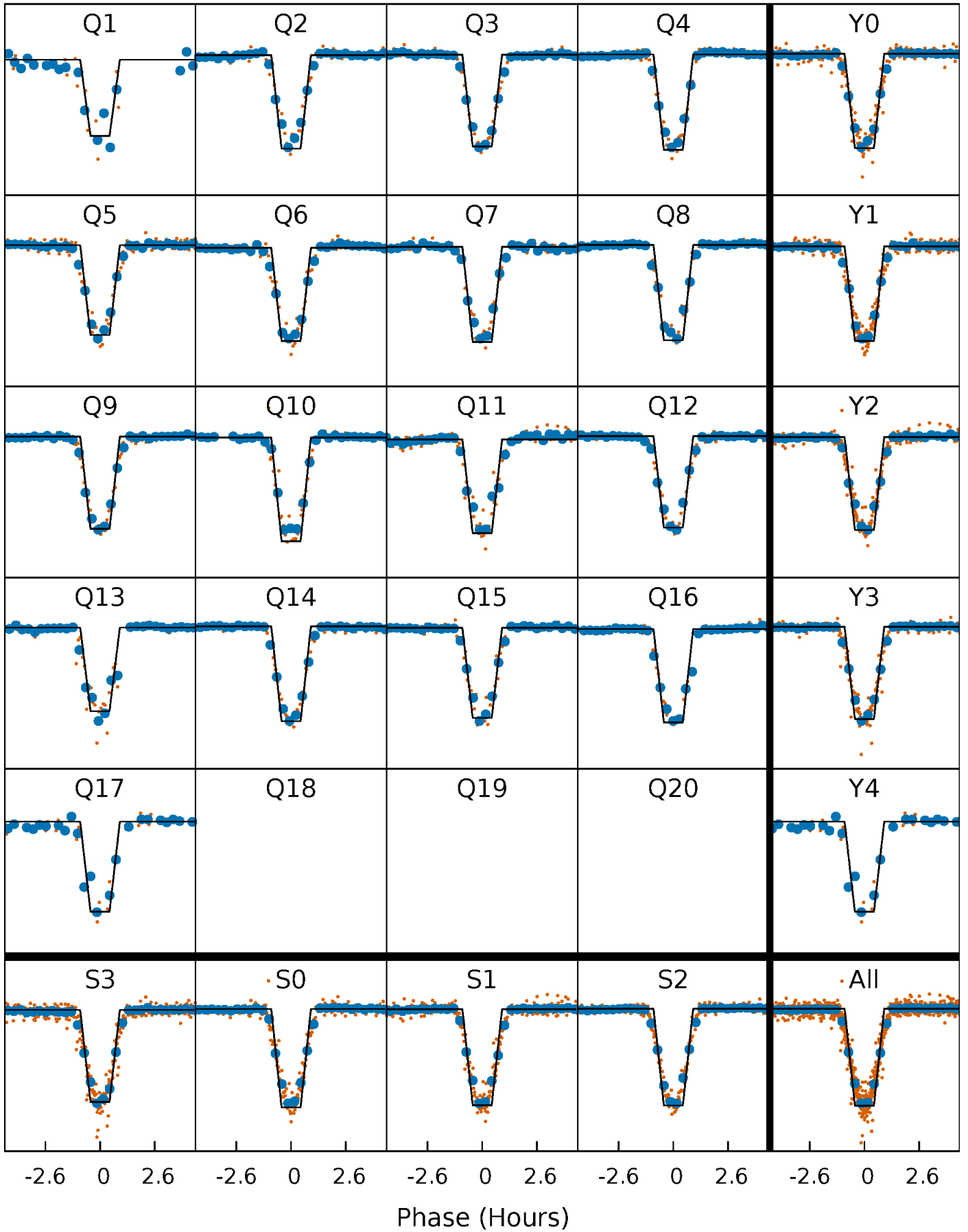
# DV Quarter-Phased Transit Curves

TCE 012470041-01 P= 14.667695 Days  $T_0=139.162082$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

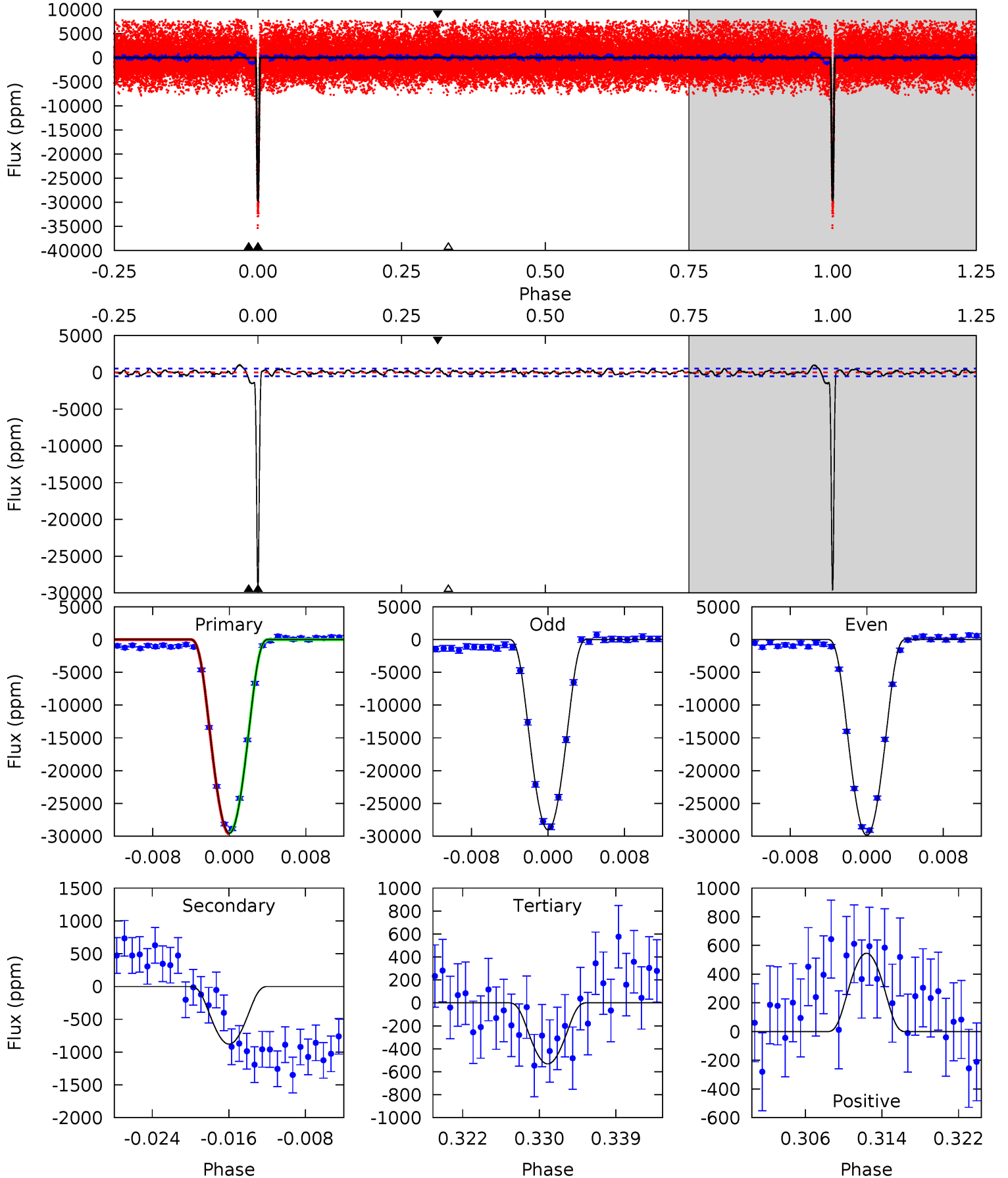
TCE 012470041-01 P= 14.667695 Days  $T_0=139.162197$  (BKJD)



# DV Model-Shift Uniqueness Test

012470041-01, P = 14.667695 Days, E = 124.494387 Days

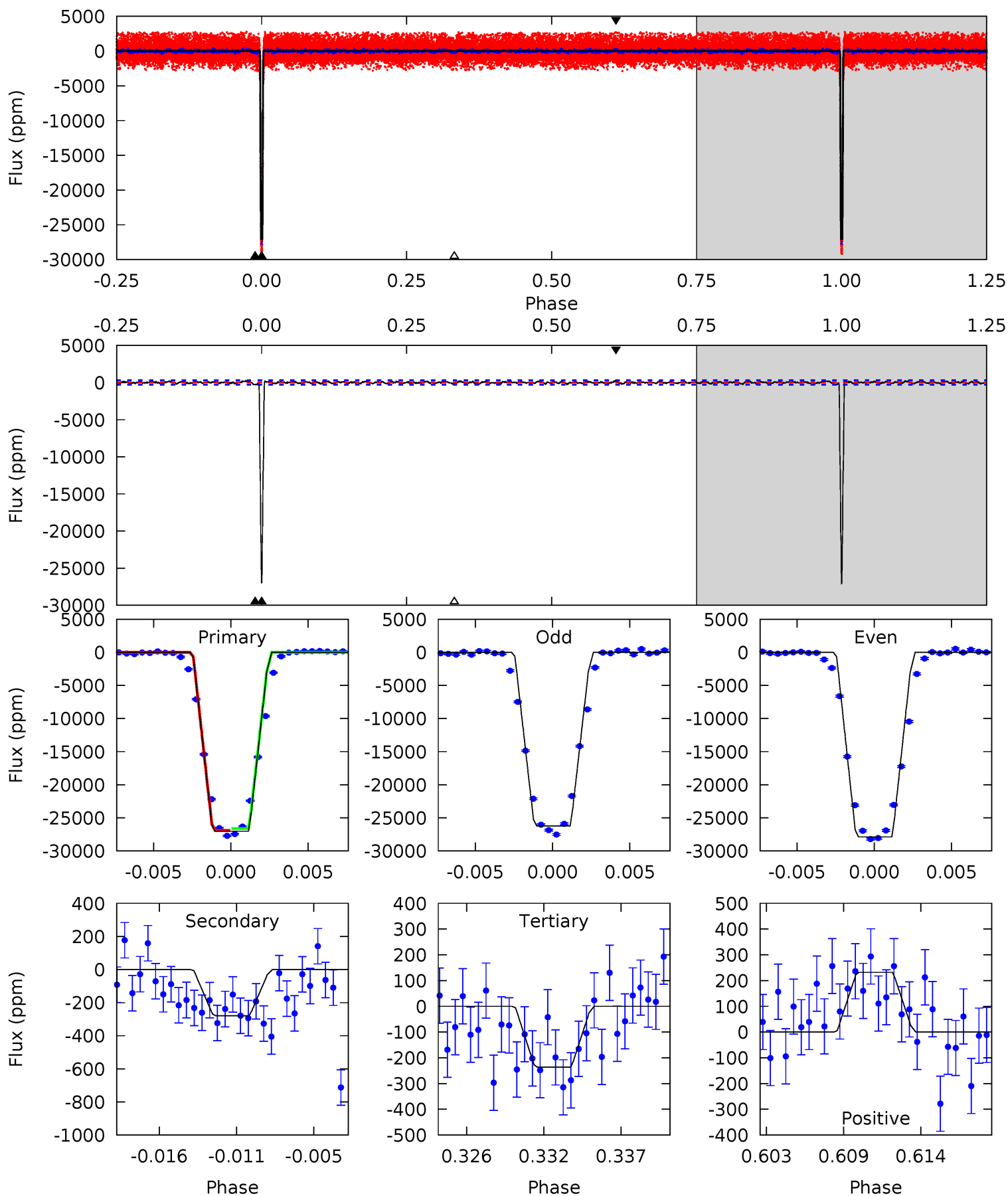
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
282.2	8.39	5.08	5.21	5.07	2.65	2.07	277.1	277.0	3.31	3.18	4.03	0.99	0.03	0.72



# Alt Model-Shift Uniqueness Test

012470041-01, P = 14.667695 Days, E = 124.494502 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
478.3	4.93	4.18	4.10	5.14	2.78	1.37	474.1	474.2	0.75	0.83	15.3	1.00	0.01	2.57



### Stellar Parameters For KIC 012470041

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7517^{+235}_{-314}$	$3.717^{+0.434}_{-0.077}$	$-0.160^{+0.250}_{-0.350}$	$3.226^{+0.387}_{-1.548}$	$1.980^{+0.061}_{-0.575}$	$0.083^{+0.359}_{-0.022}$
	+3%/-4%	+12%/-2%	+156%/-219%	+12%/-48%	+3%/-29%	+432%/-26%
Source	KIC0	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 012470041-01 / KOI 6251.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-878 \pm 105$	$82.20^{+10.73}_{-20.15}$	$2085^{+155}_{-236}$	$3065^{+96}_{-102}$	$1.563^{+0.964}_{-0.374}$
Alt.	$-279 \pm 57$	$56.24^{+7.24}_{-14.85}$	$2101^{+147}_{-253}$	$2851^{+133}_{-146}$	$1.037^{+0.736}_{-0.282}$

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

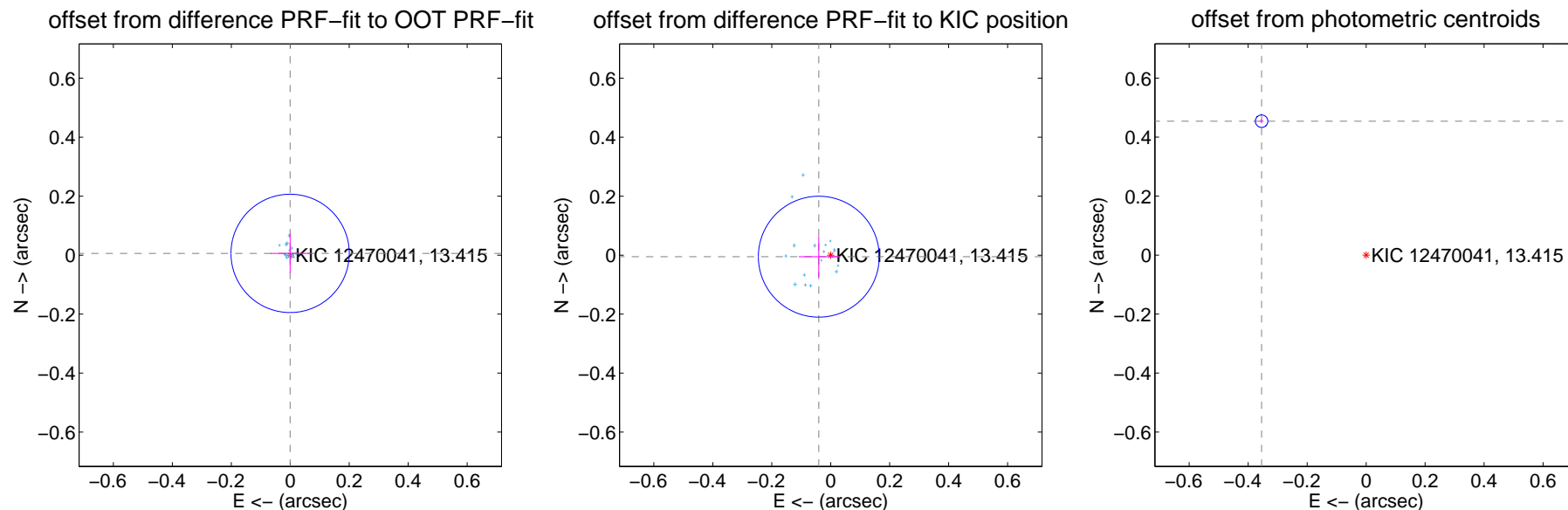
## DV Centroid Data

Supplemental centroid analysis for 012470041-01. Kepler magnitude: 13.41. Transit SNR 696.39

There are 17 quarters with good PRF difference image offsets

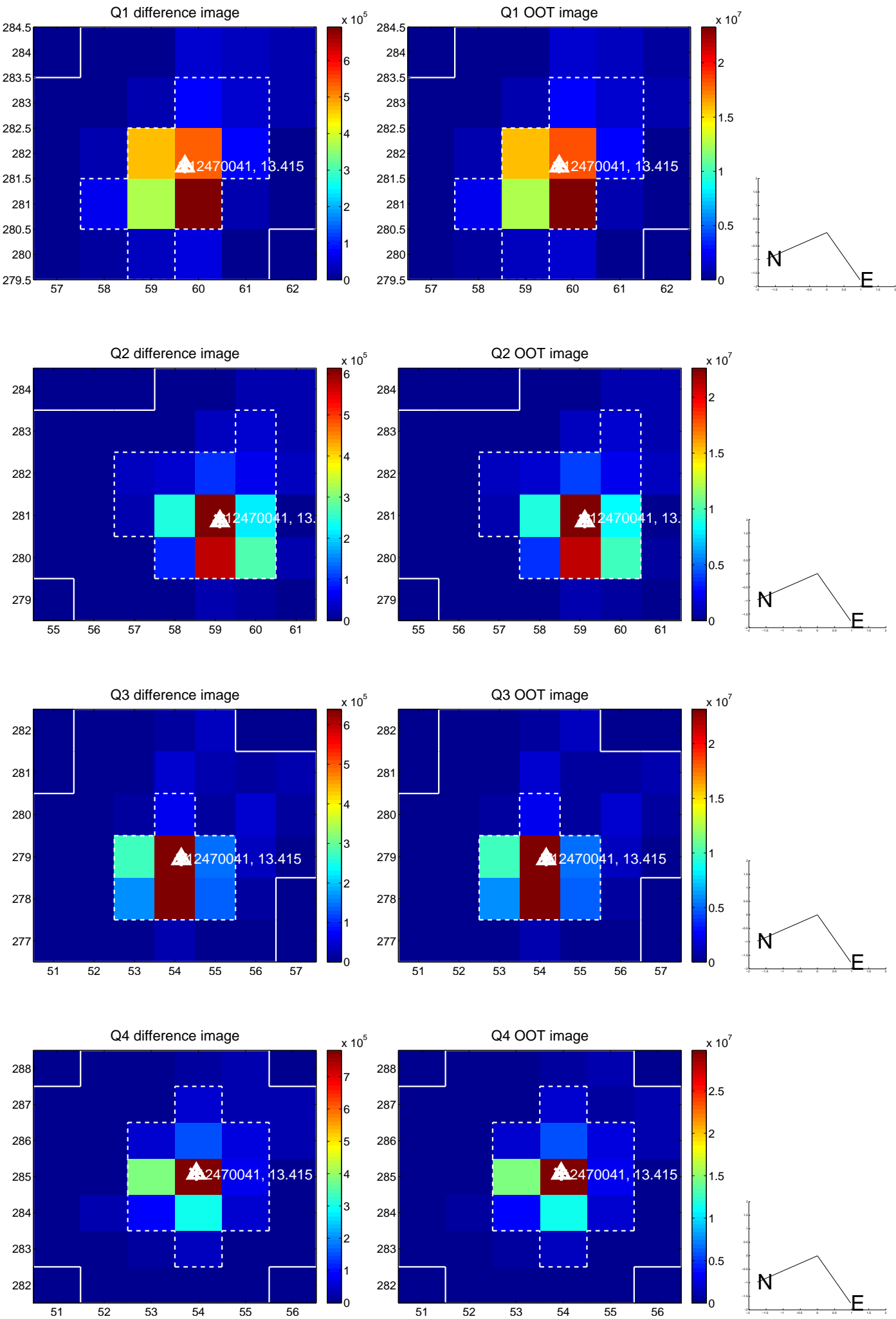
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.006 \pm 0.067$	0.09	$0.000 \pm 0.067$	$0.006 \pm 0.067$
PRF-fit source offset from KIC position	$0.041 \pm 0.068$	0.60	$0.040 \pm 0.068$	$-0.005 \pm 0.069$
photometric centroid source offset	$0.58 \pm 0.01$	81.69	$0.35 \pm 0.01$	$0.45 \pm 0.01$



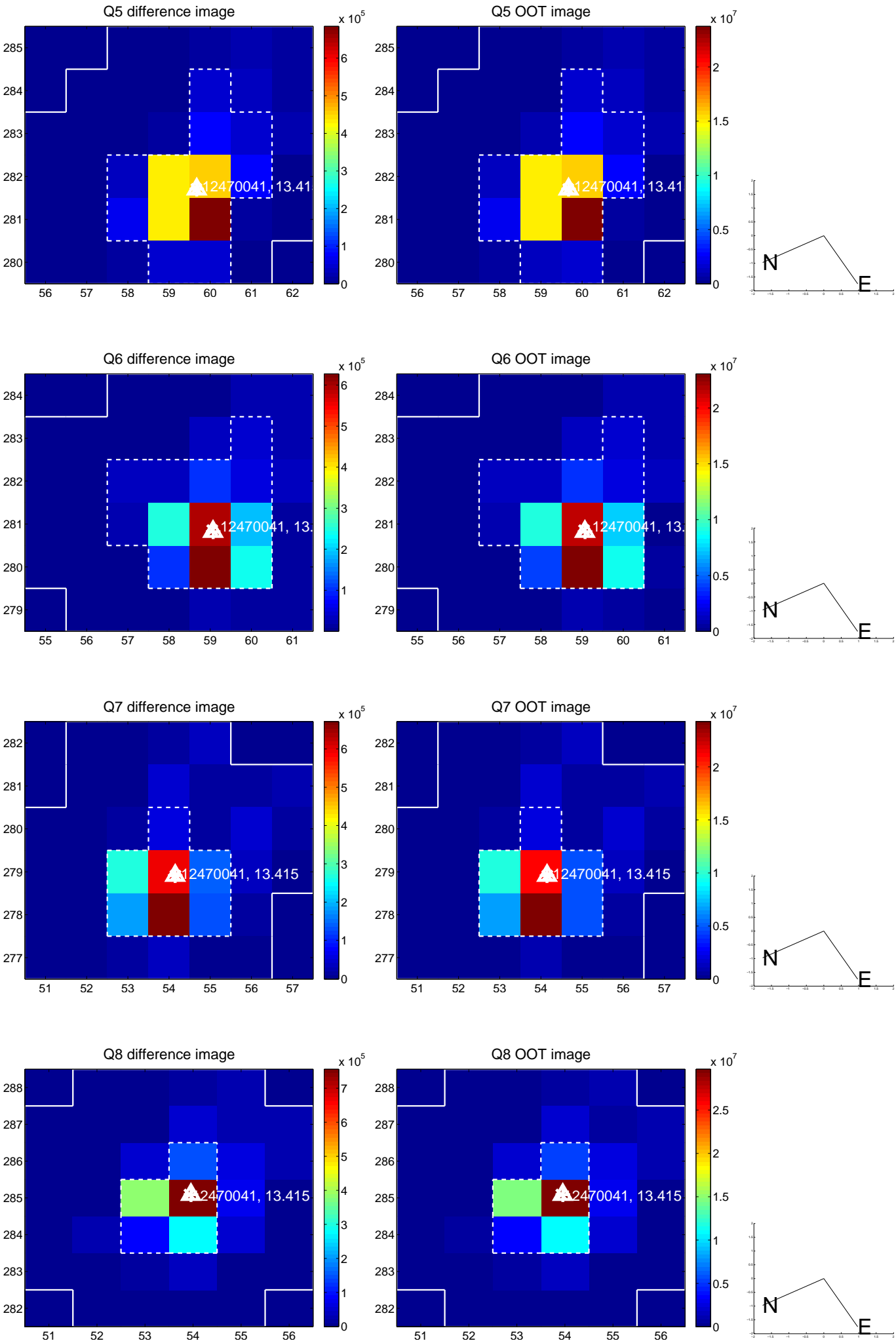
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

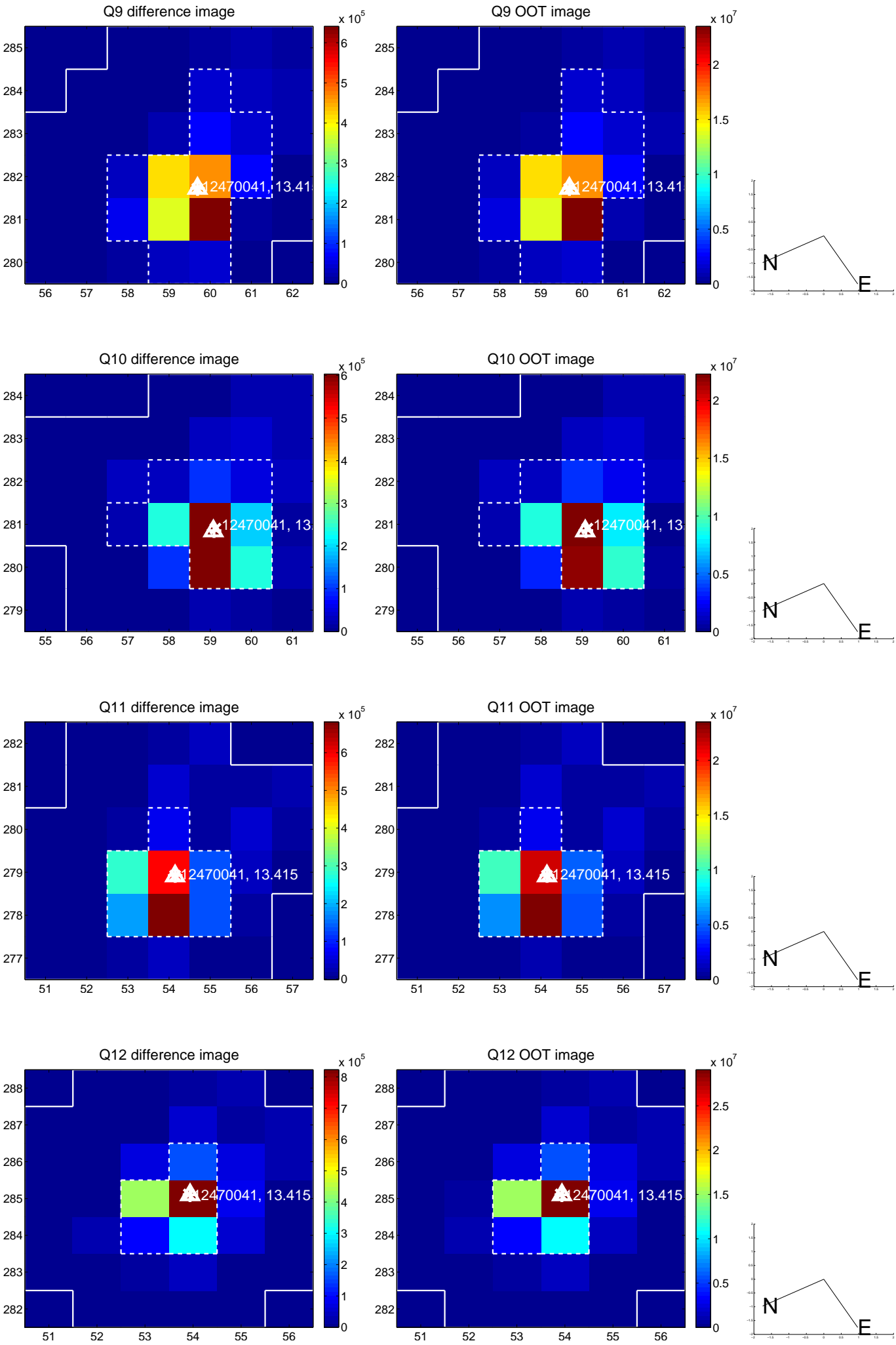




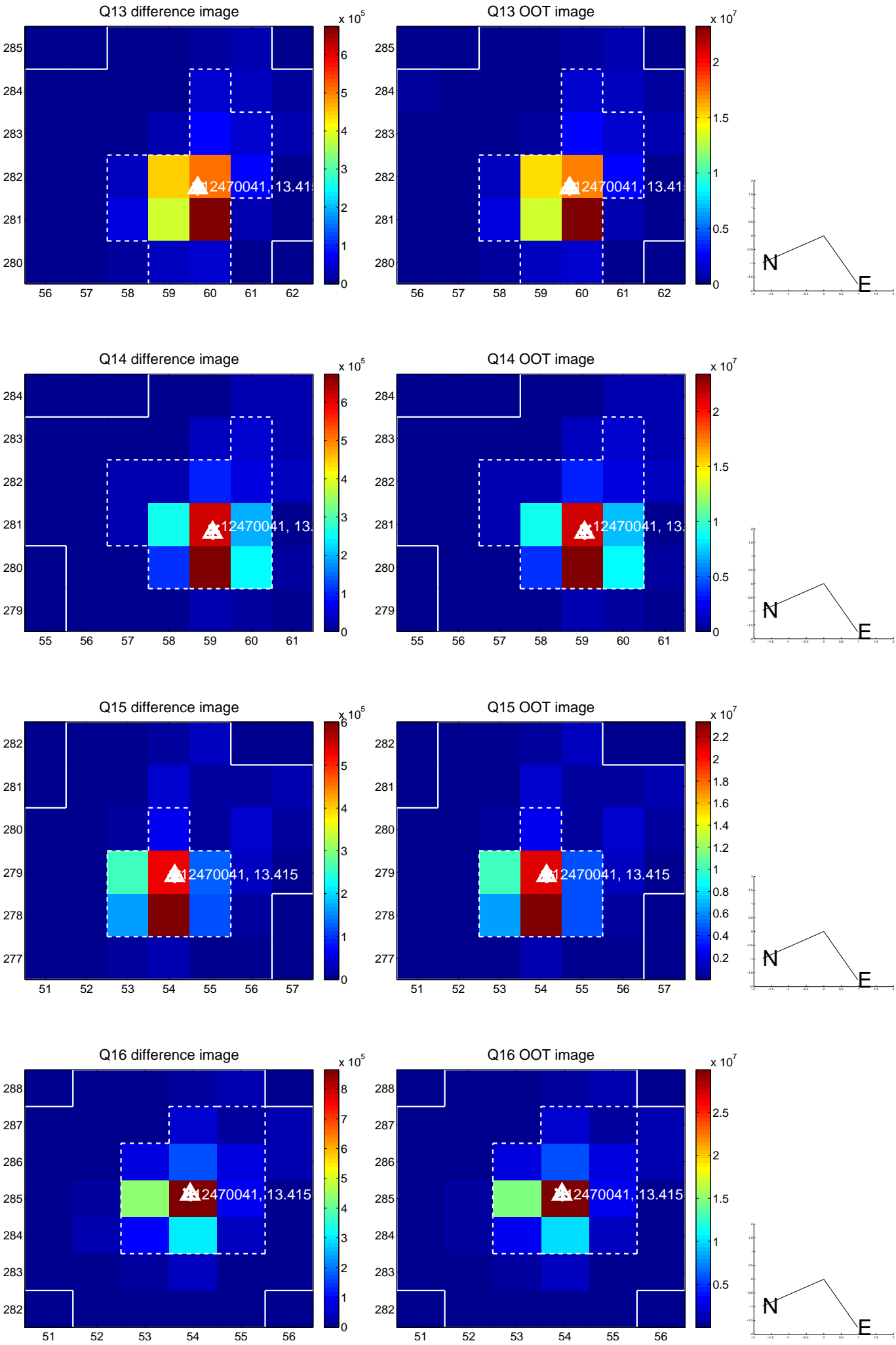
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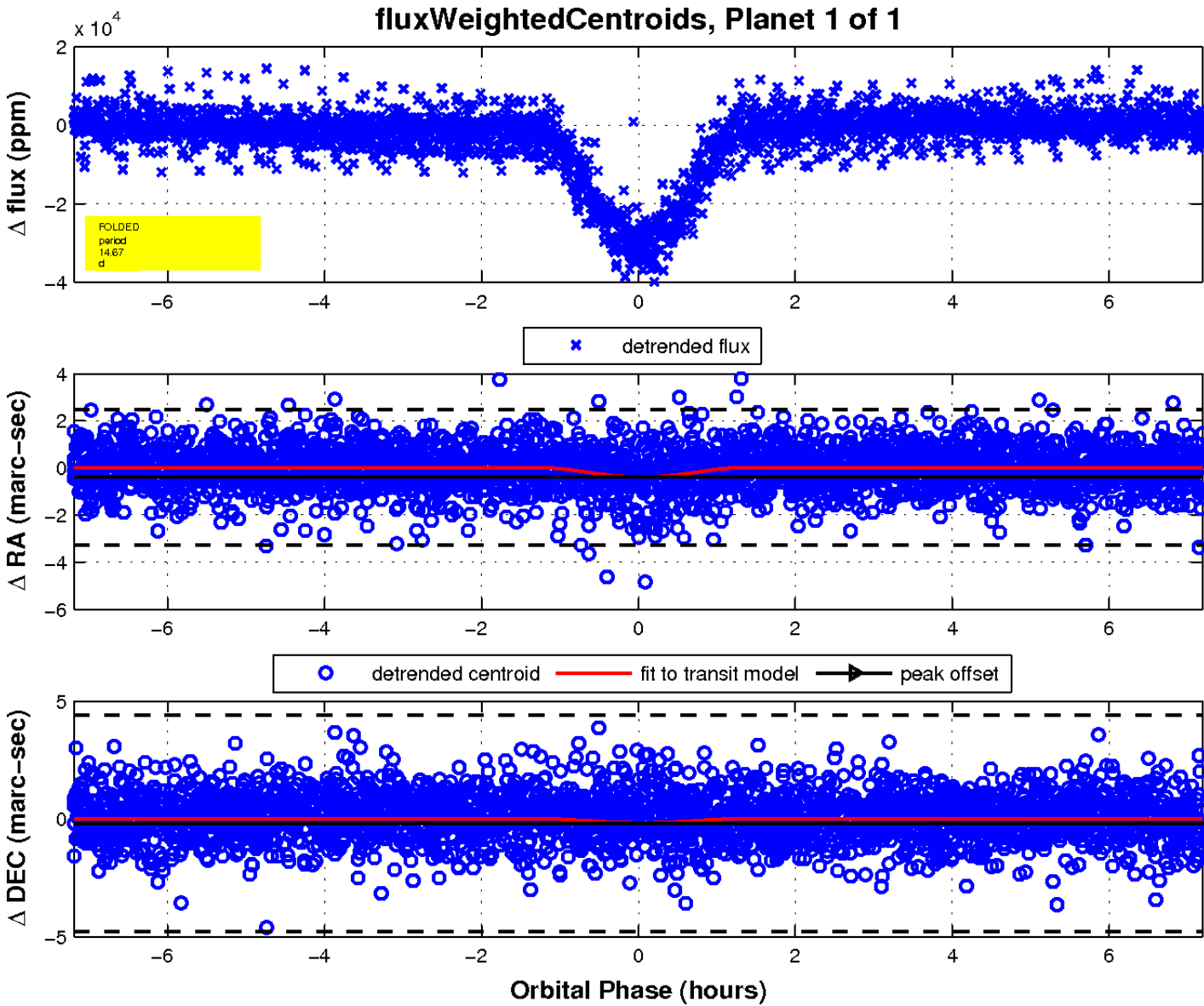
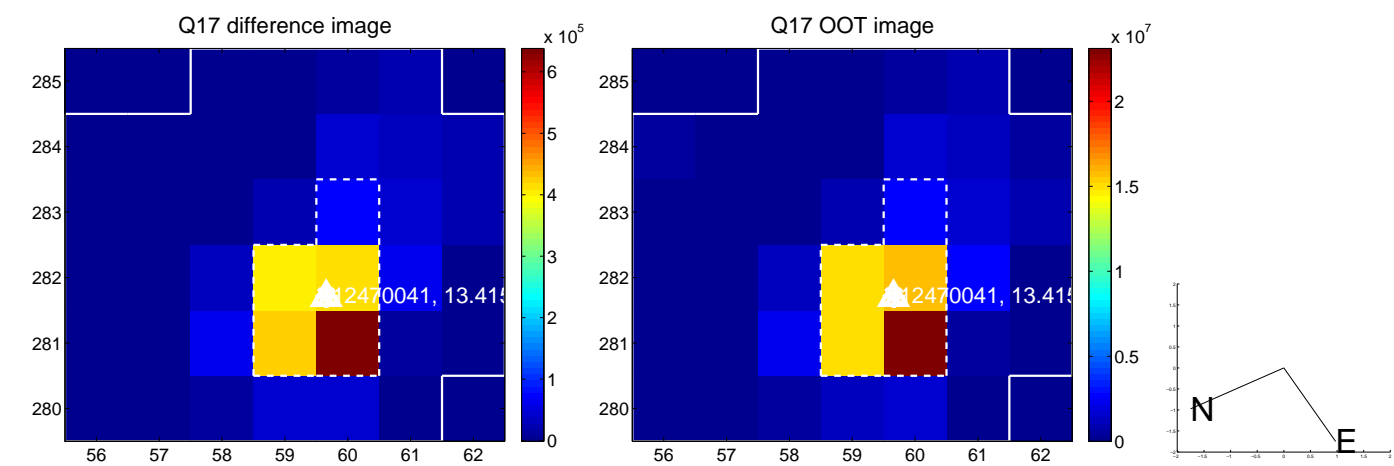
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

