

# KIC 010140731

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010140731-01	OBS	No	375.157705	252.530121	149.6	14.386	7.2	7.4	2.09	5845	2.87	3.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010140731-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS

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

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

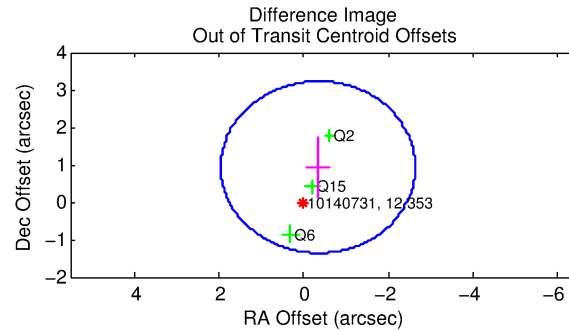
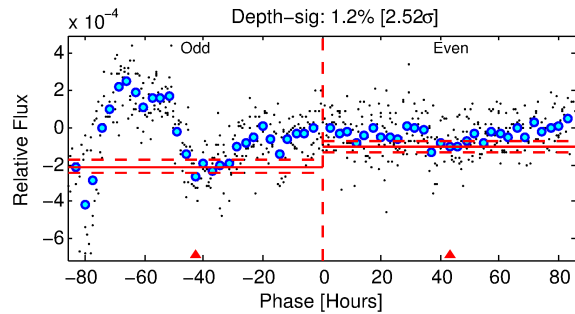
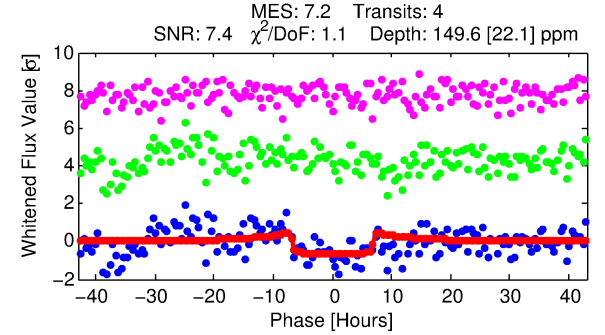
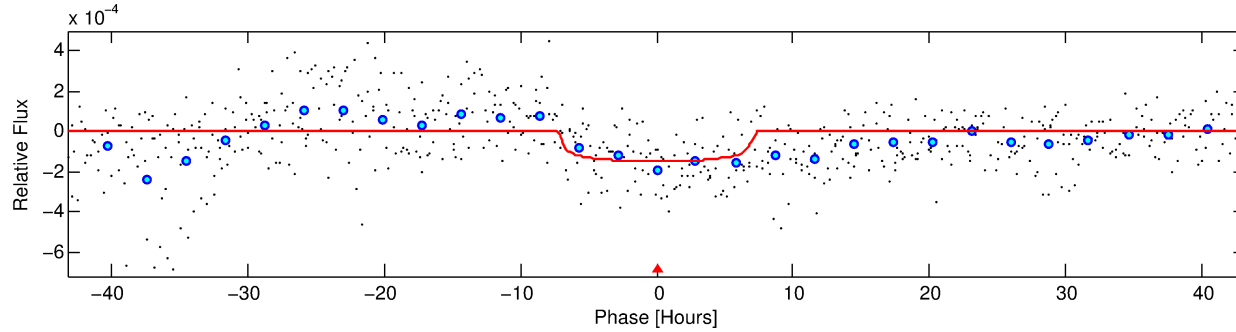
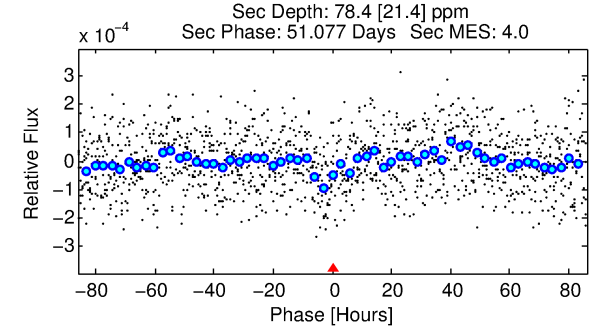
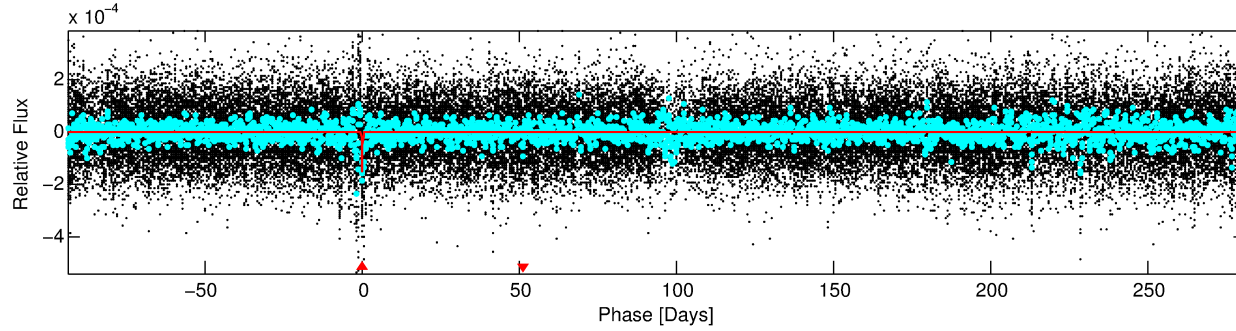
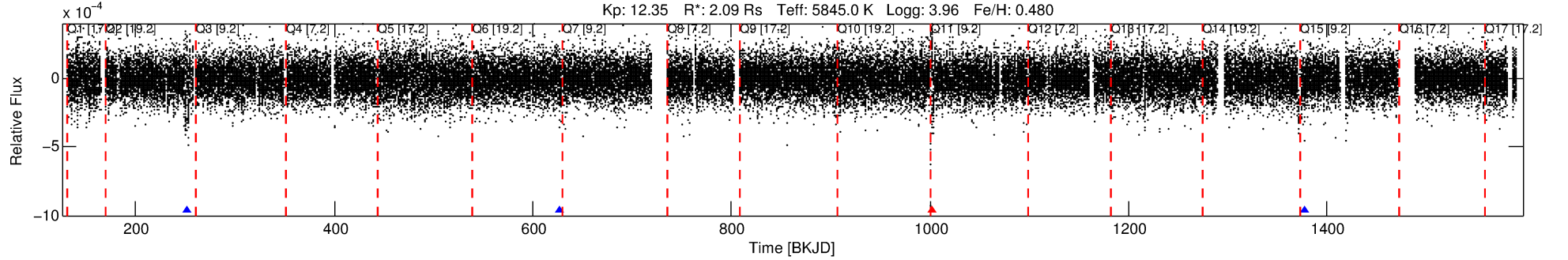
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010140731-01

No Significant Match Found

# DV One-Page Summary

KIC: 10140731 Candidate: 1 of 1 Period: 375.158 d



## DV Fit Results:

Period = 375.15770 [0.00955] d  
Epoch = 252.5301 [0.0202] BKJD  
Rp/R\* = 0.0126 [0.0036]  
a/R\* = 118.05 [141.88]  
b = 0.82 [0.48]  
Seff = 3.45 [1.61]  
Teq = 347 [41] K  
Rp = 2.87 [1.29] Re  
a = 1.1492 [0.3471] AU  
Ag = 6931.31 [5373.76] [1.29σ]  
Teffp = 4901 [787] K [5.78σ]

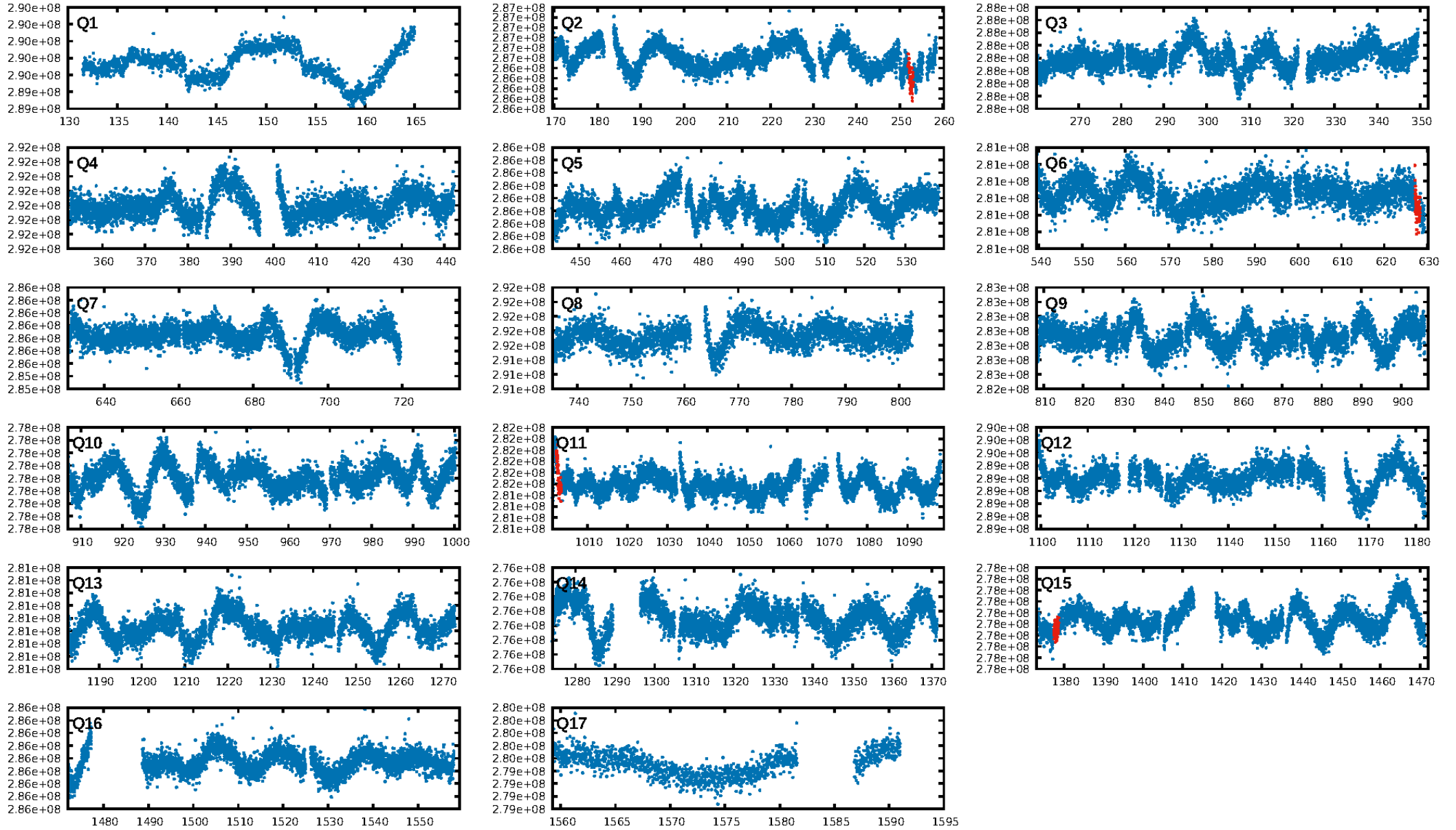
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 22.7%  
ModelChiSquareGof-sig: 99.1%  
**Bootstrap-pfa: 6.71e-09**  
**RollingBand-fgt: 0.75 [3/4]**  
GhostDiagnostic-chr: -13.19  
Centroid-sig: 31.0%  
Centroid-so: 1.717 arcsec [1.32σ]  
OotOffset-rm: 0.994 arcsec [1.30σ]  
OotOffset-st: 2/1/0/0 [3]  
KicOffset-rm: 1.143 arcsec [1.42σ]  
KicOffset-st: 2/1/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

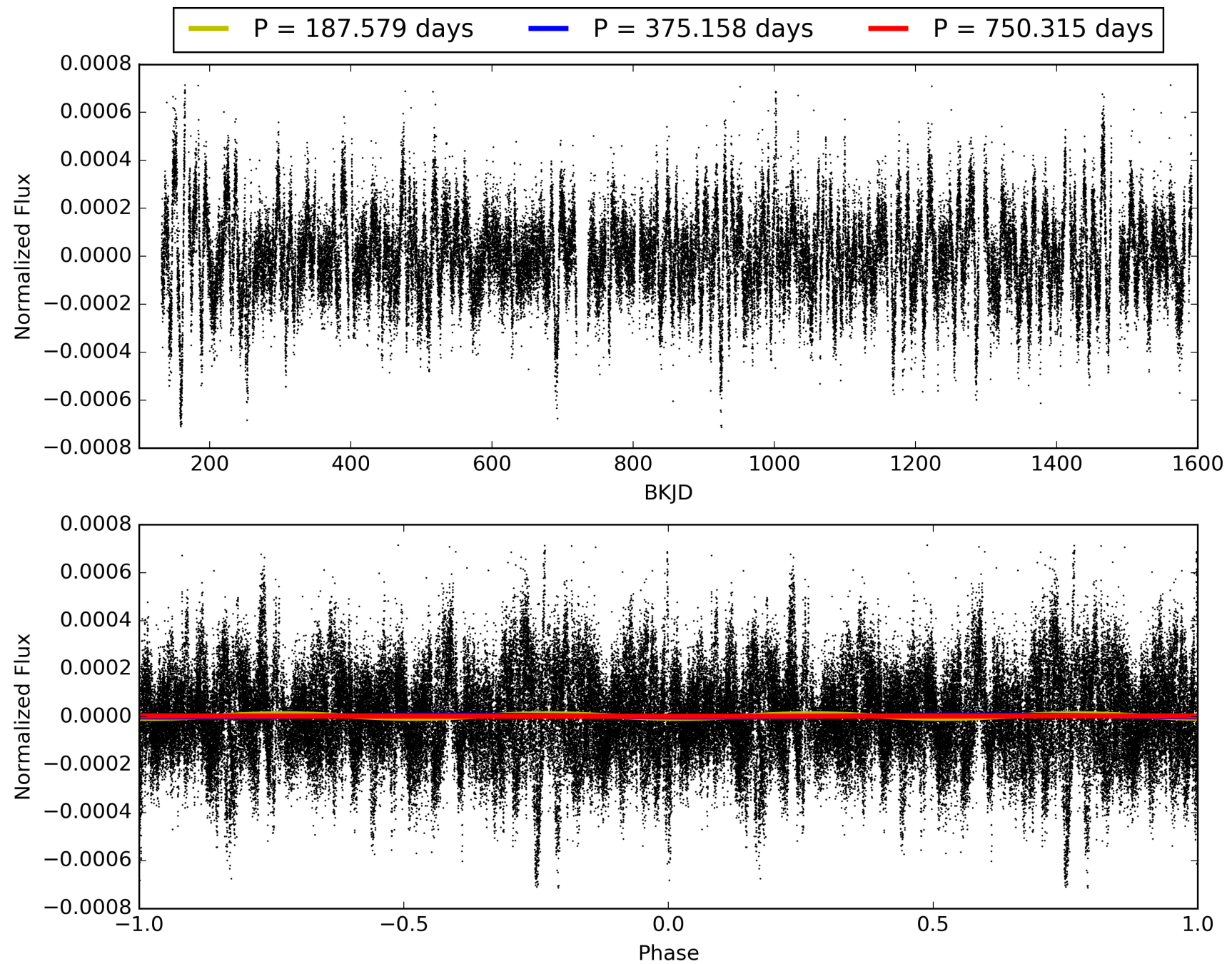
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:58:02 Z

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

# TCE 010140731-01, PDC Light Curves

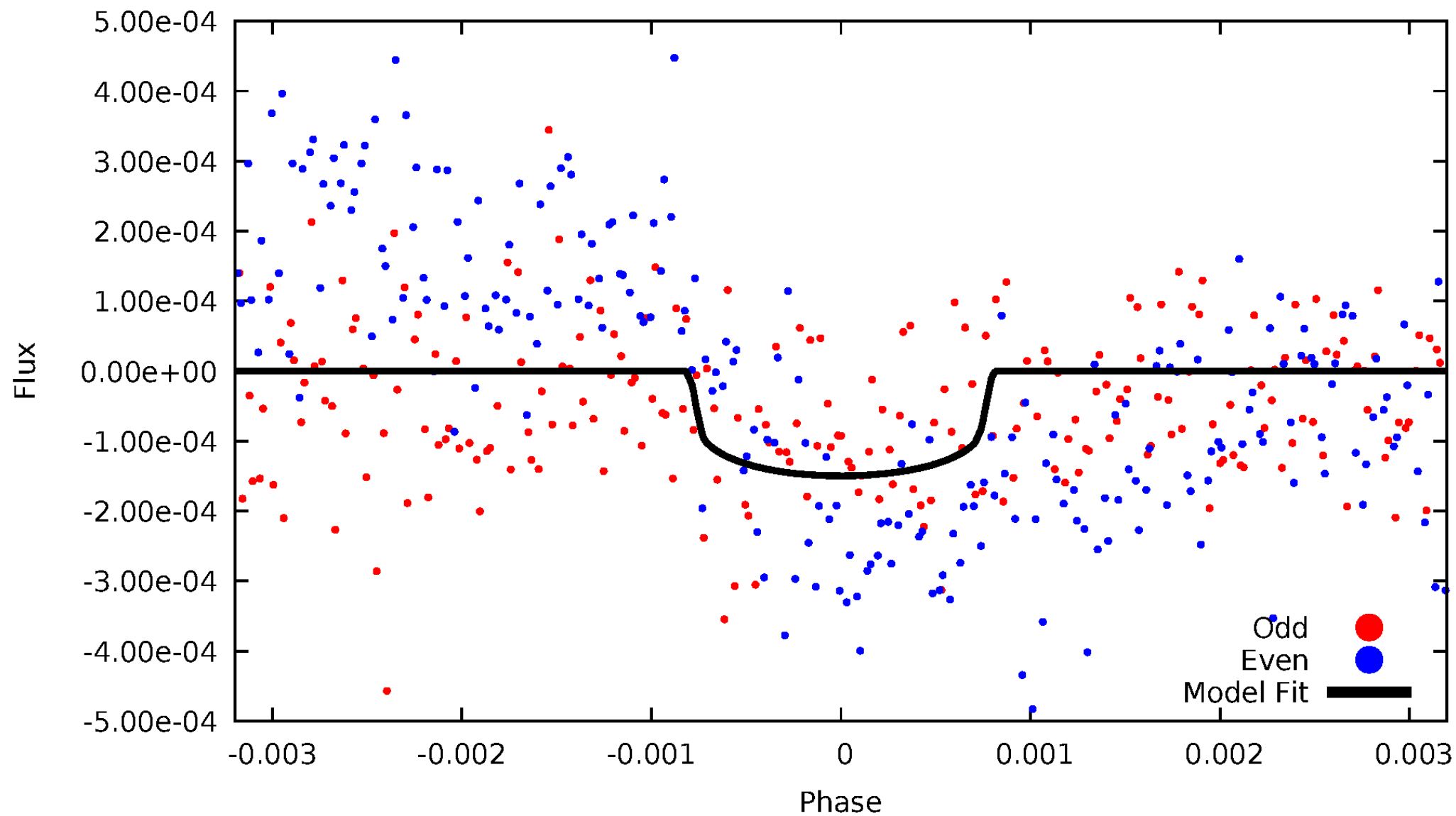


# TCE 010140731-01



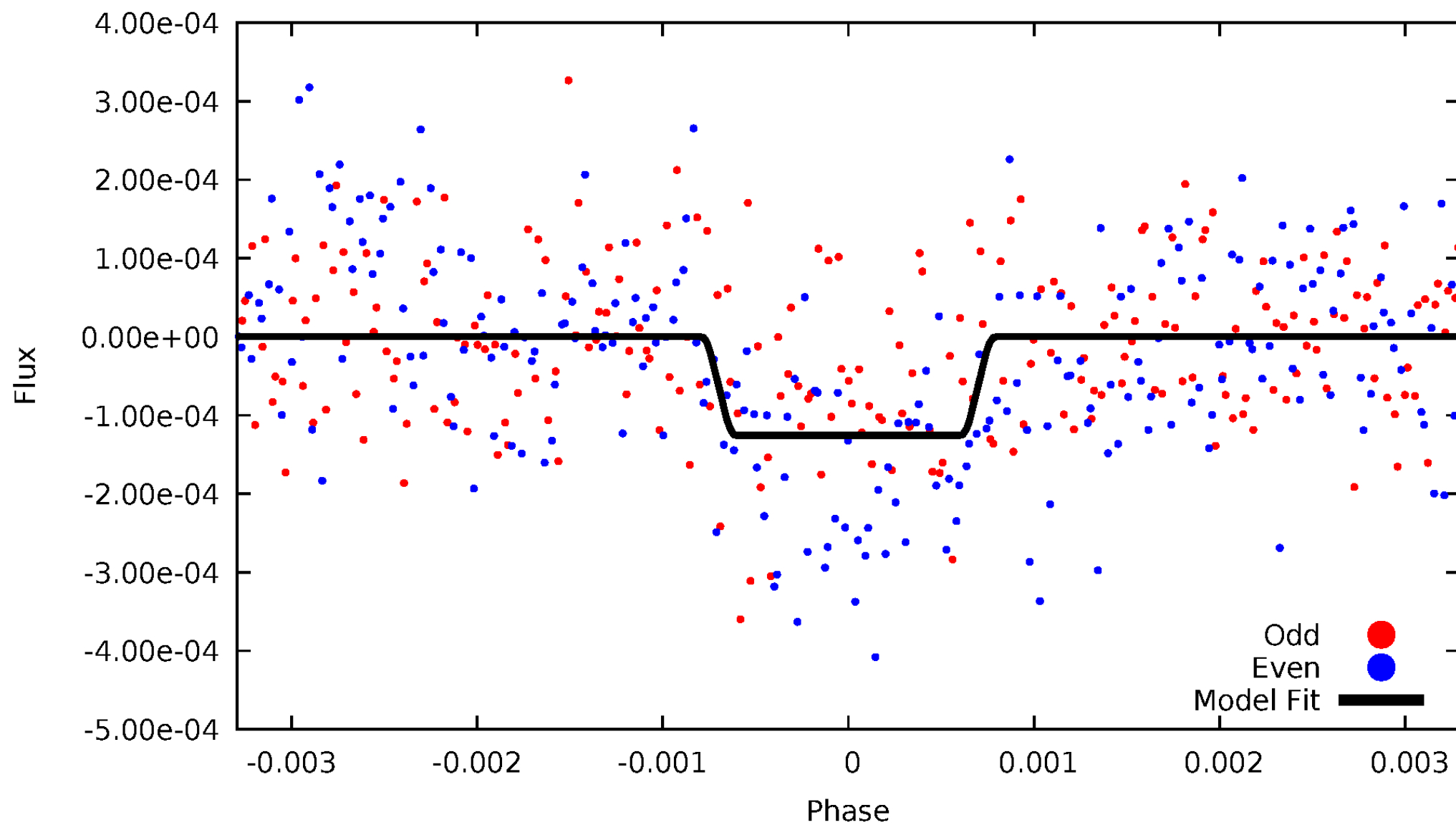
# DV Odd/Even

TCE 010140731-01



# ALT Odd/Even

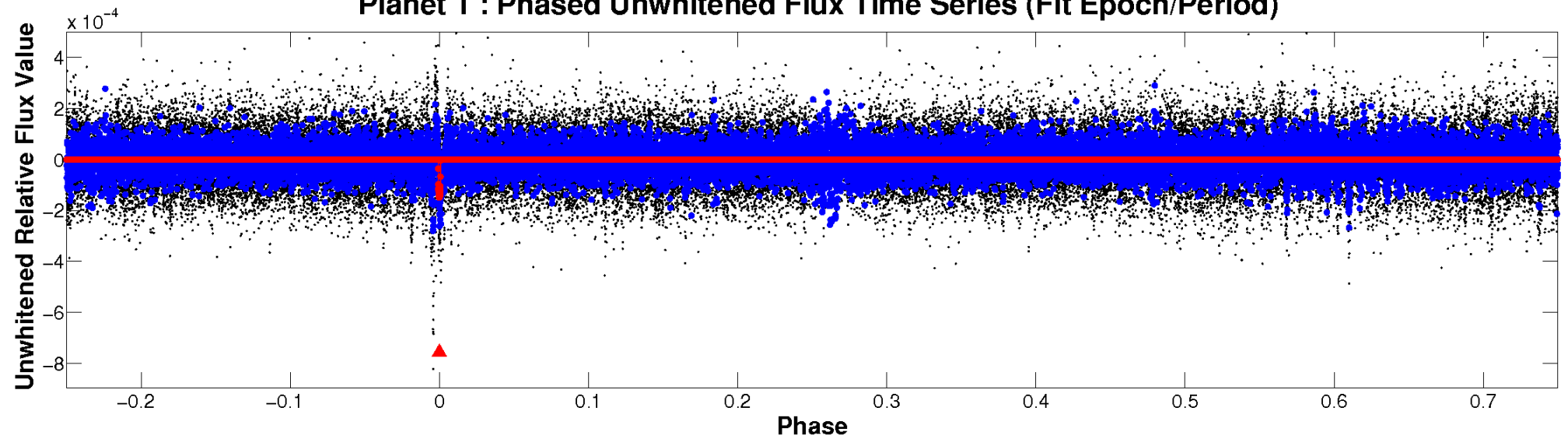
TCE 010140731-01



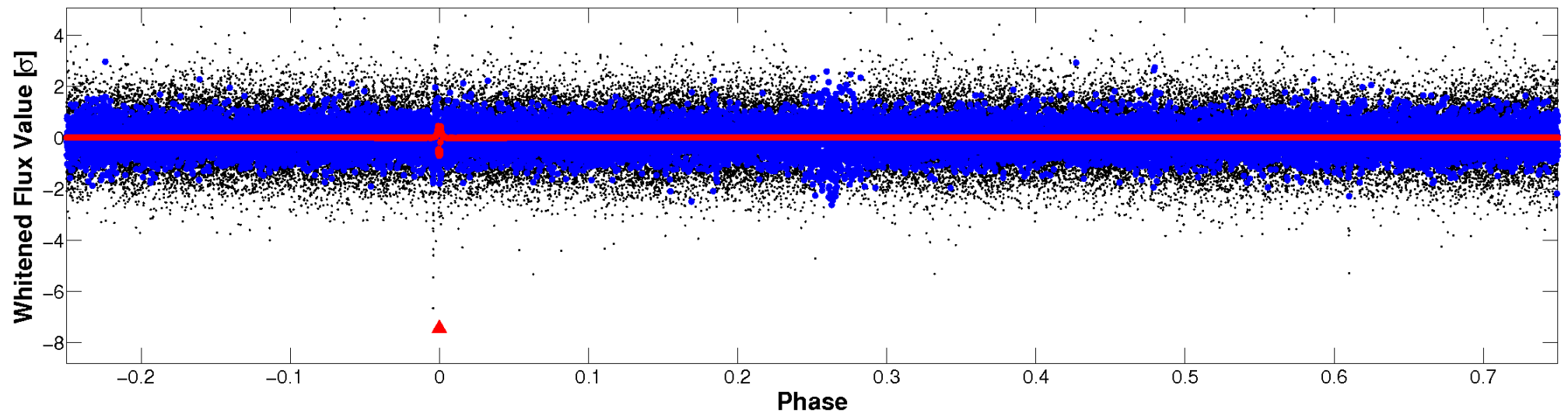


# Non-Whitened Vs. Whitened Light Curve

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

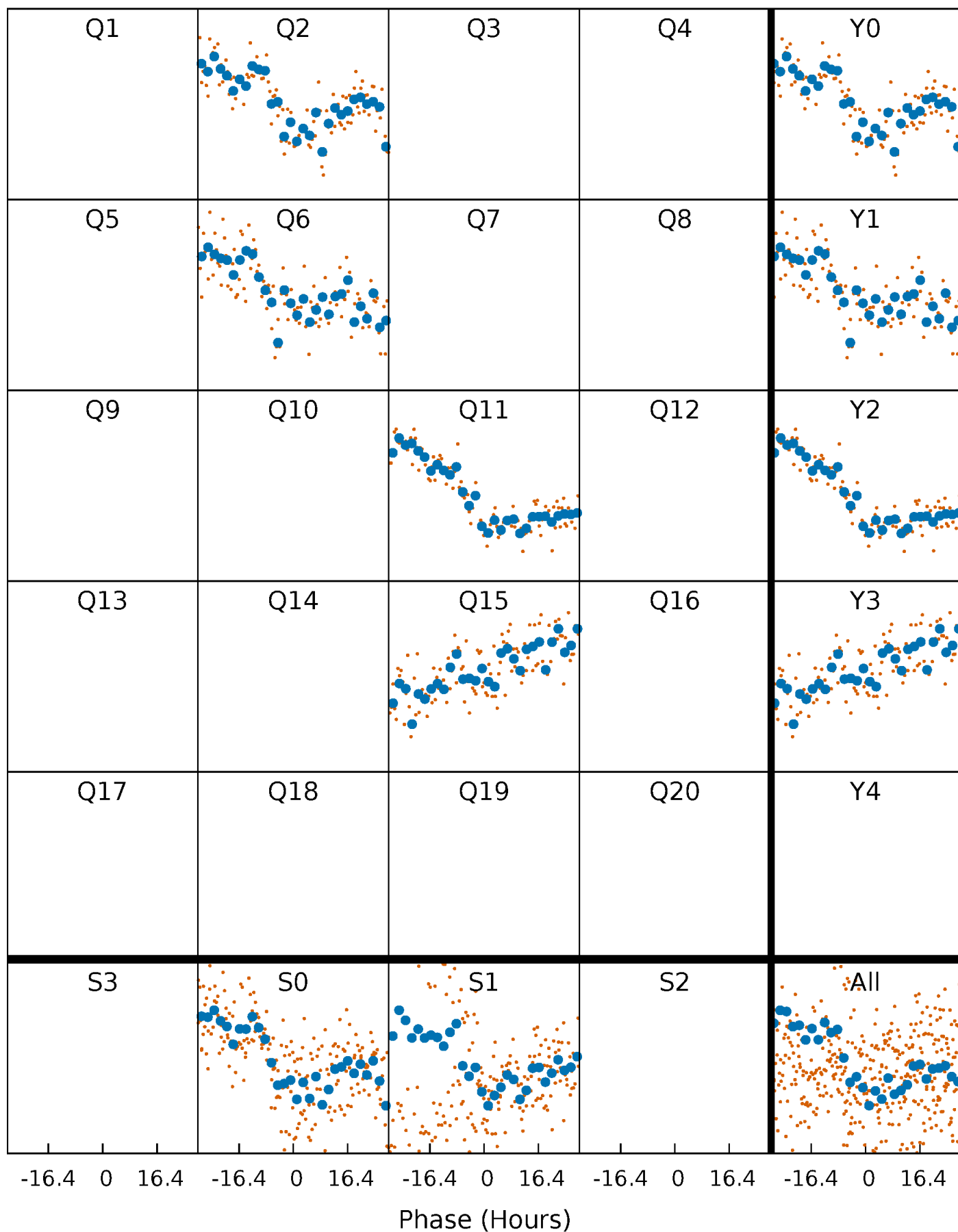


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

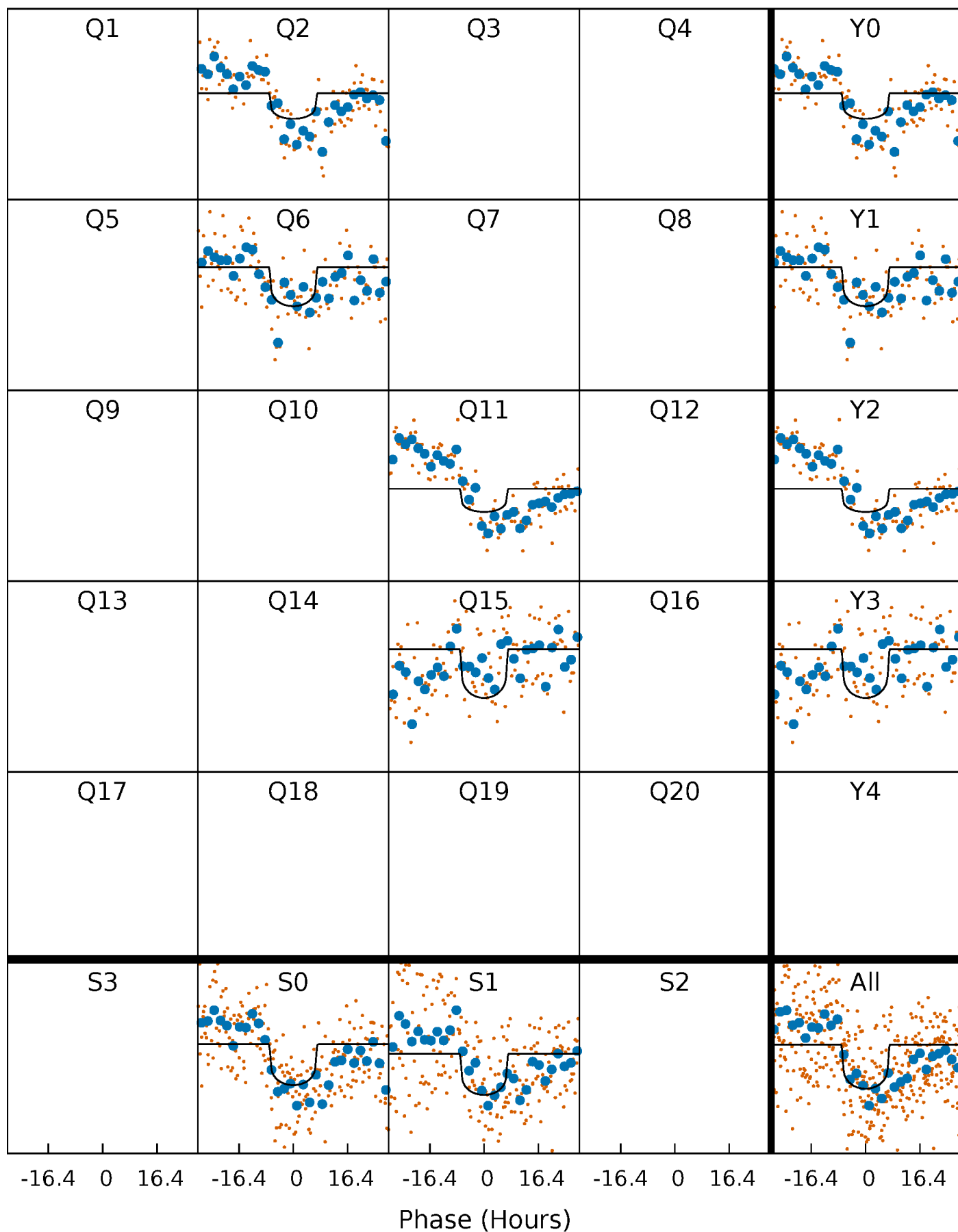
TCE 010140731-01 P=375.157705 Days  $T_0=252.530121$  (BKJD)





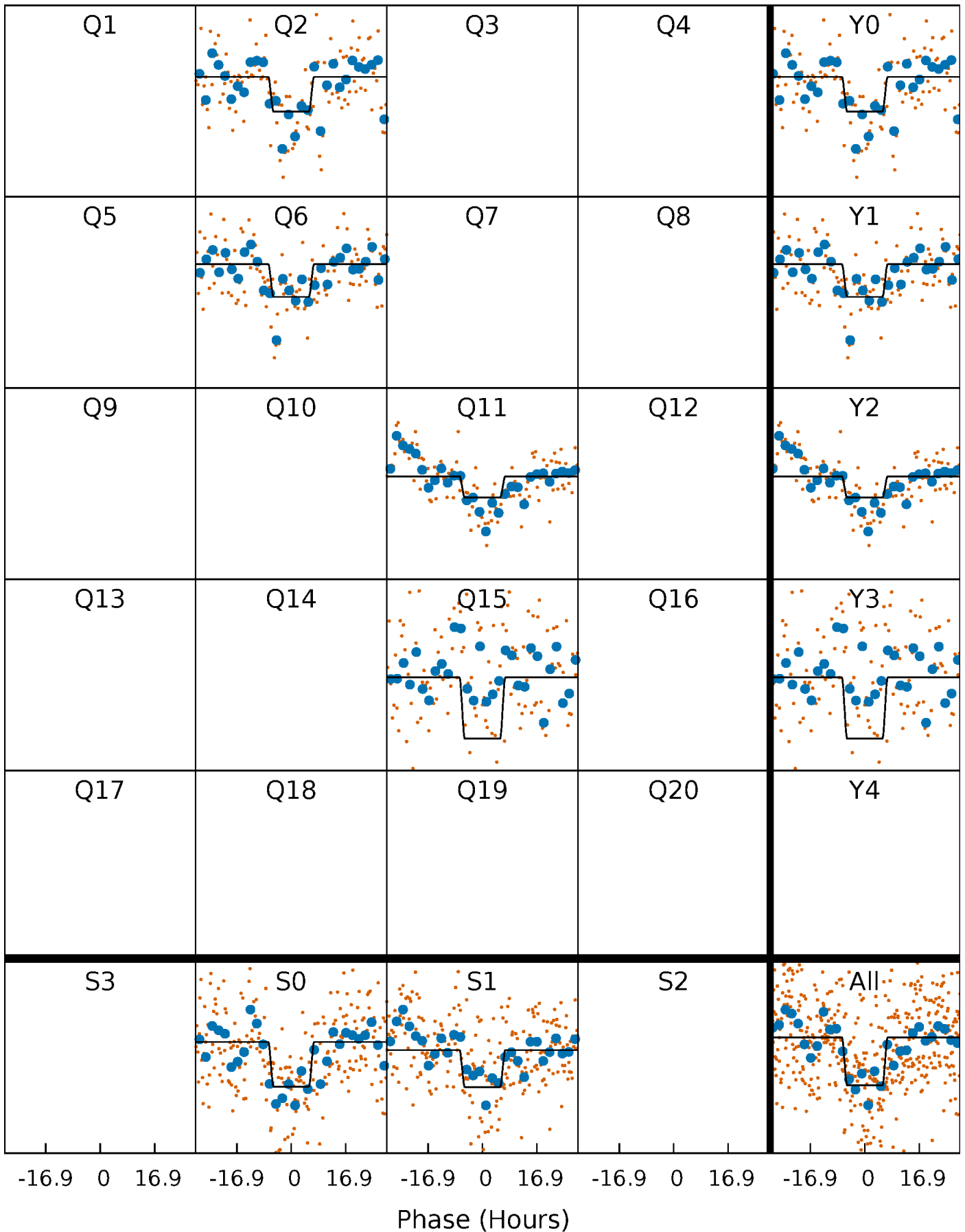
# DV Quarter-Phased Transit Curves

TCE 010140731-01 P=375.157705 Days  $T_0=252.530121$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

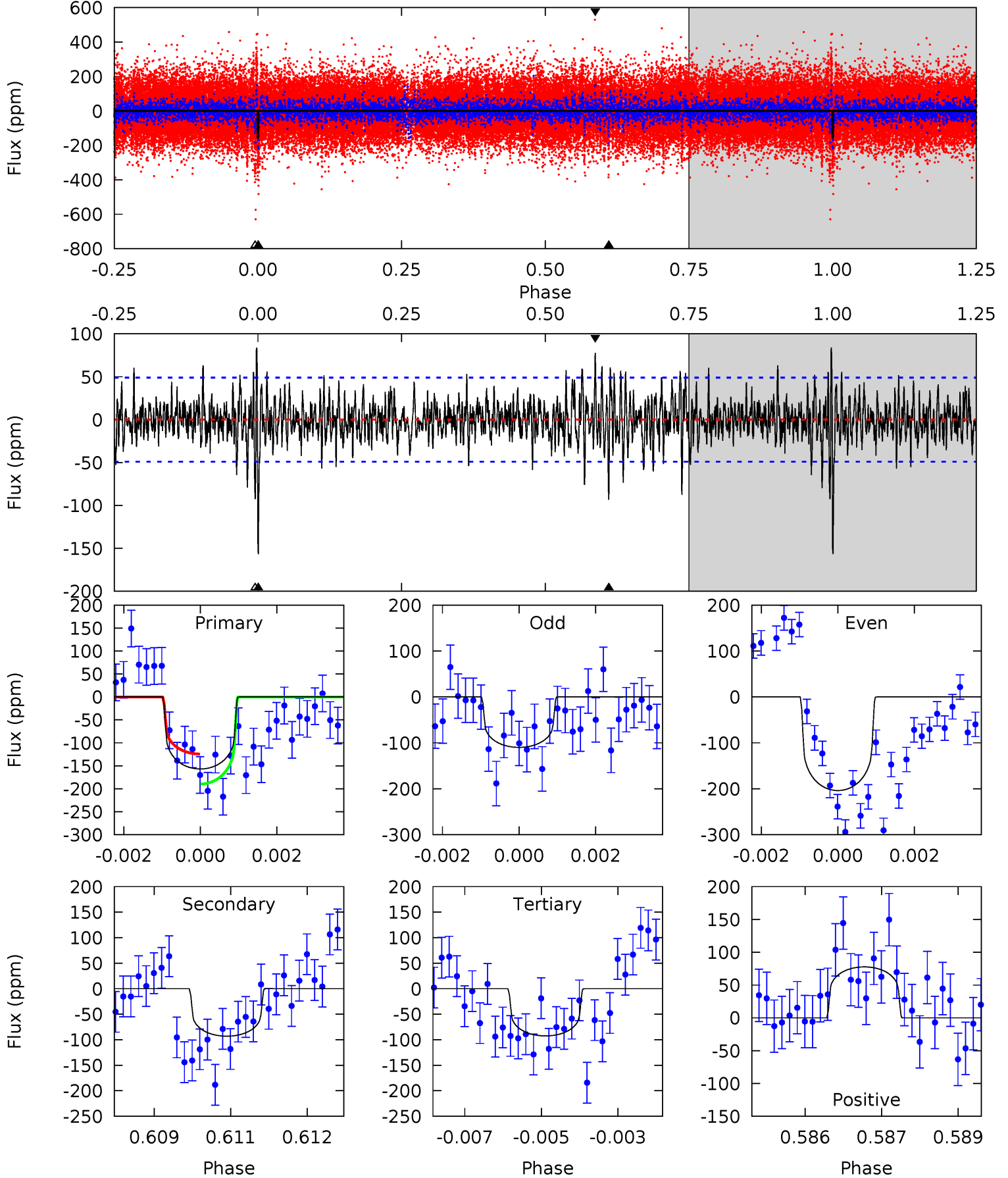
TCE 010140731-01   P=375.153350 Days    $T_0=252.522236$  (BKJD)



# DV Model-Shift Uniqueness Test

010140731-01,  $P = 375.157705$  Days,  $E = 252.530121$  Days

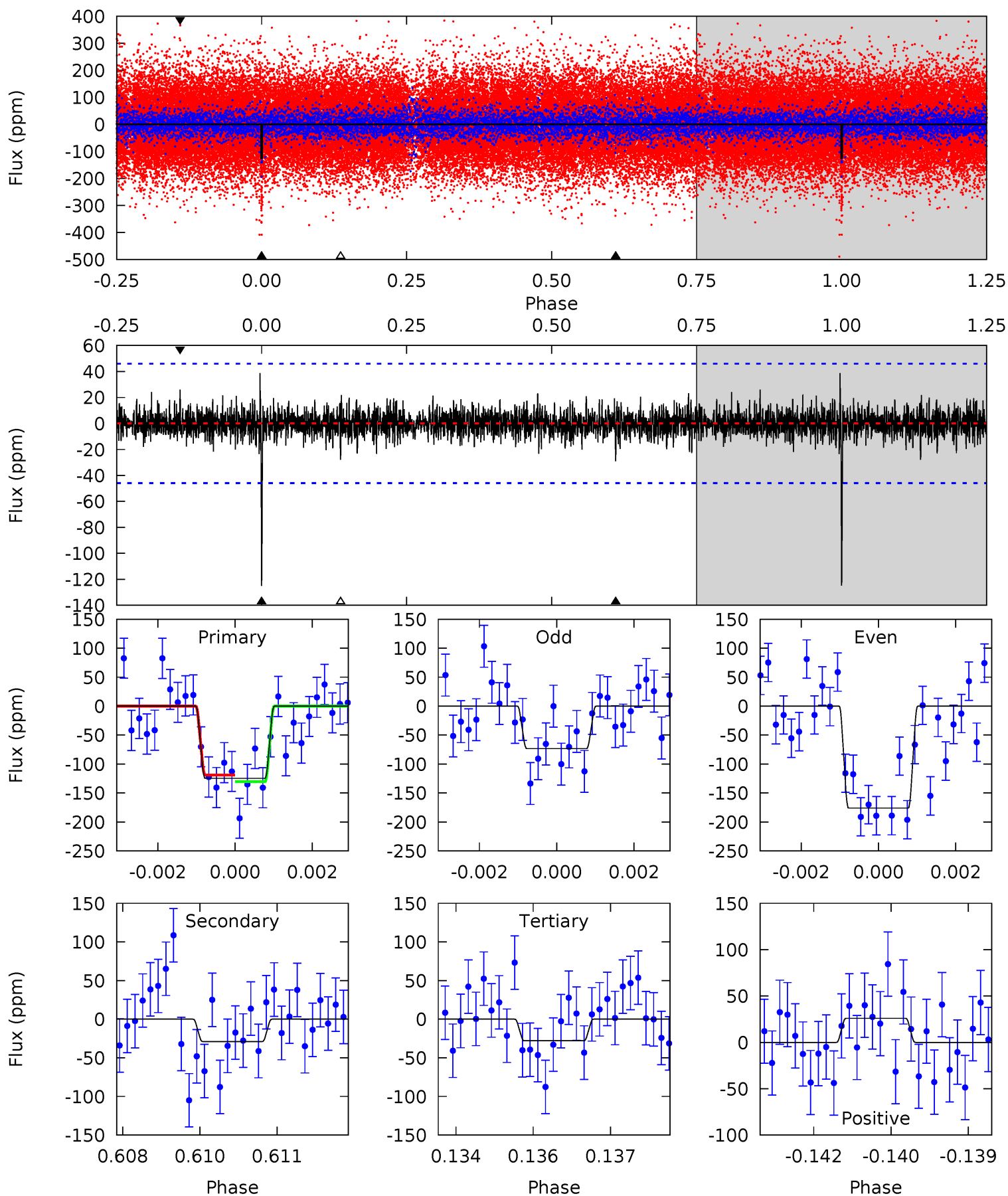
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	10.2	10.1	8.52	5.36	3.14	2.24	7.05	8.68	0.06	1.69	5.17	0.96	0.35	3.58



# Alt Model-Shift Uniqueness Test

010140731-01, P = 375.153350 Days, E = 252.522236 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
14.6	3.38	3.27	3.03	5.37	3.16	0.83	11.3	11.5	0.12	0.35	6.03	0.86	0.24	0.66



### Stellar Parameters For KIC 010140731

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5845^{+176}_{-176}$	$3.957^{+0.252}_{-0.090}$	$0.480^{+0.050}_{-0.250}$	$2.086^{+0.311}_{-0.726}$	$1.437^{+0.115}_{-0.345}$	$0.223^{+0.406}_{-0.064}$
	+3%/-3%	+6%/-2%	+10%/-52%	+15%/-35%	+8%/-24%	+182%/-29%
Source	PHO1	FLK73	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 010140731-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-93 \pm 9$	$2.64^{+1.01}_{-0.84}$	$478^{+30}_{-39}$	$5182^{+926}_{-534}$	$9247^{+10970}_{-4200}$
Alt.	$-29 \pm 9$	$2.39^{+0.85}_{-0.83}$	$478^{+30}_{-40}$	$4302^{+730}_{-477}$	$3576^{+5004}_{-1730}$

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

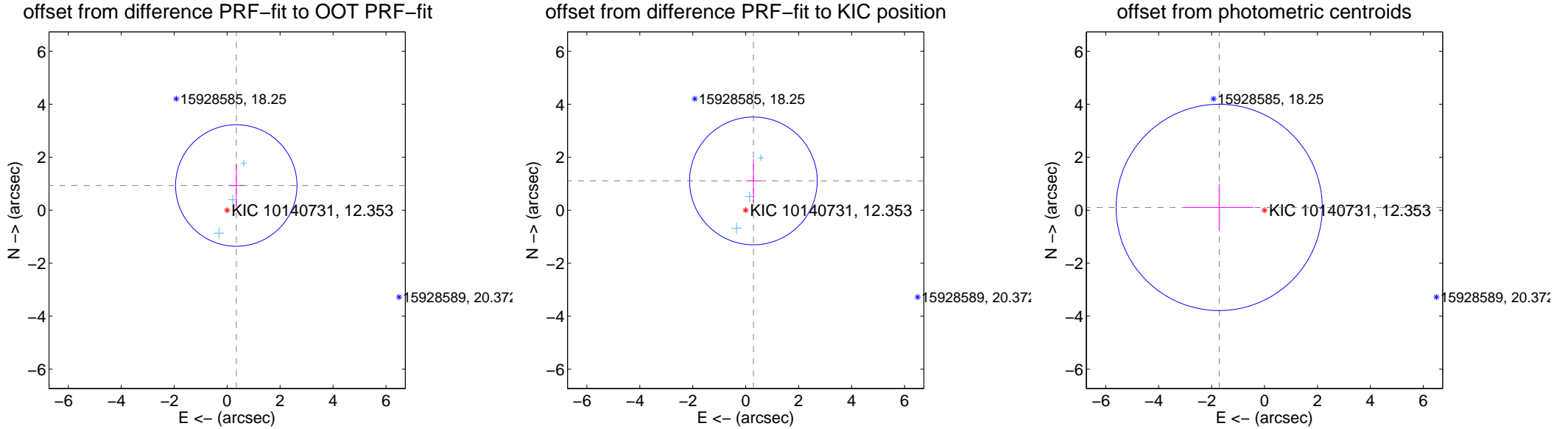
## DV Centroid Data

Supplemental centroid analysis for 010140731-01. Kepler magnitude: 12.35. Transit SNR 7.44

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

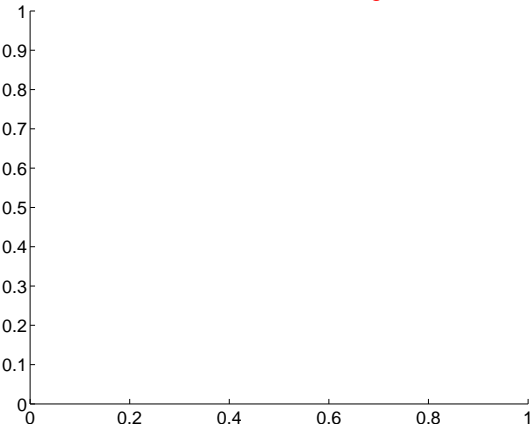
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.994 \pm 0.765$	1.30	$-0.345 \pm 0.284$	$0.932 \pm 0.808$
PRF-fit source offset from KIC position	$1.143 \pm 0.804$	1.42	$-0.291 \pm 0.280$	$1.106 \pm 0.828$
photometric centroid source offset	$1.72 \pm 1.30$	1.32	$1.71 \pm 1.30$	$0.11 \pm 0.89$



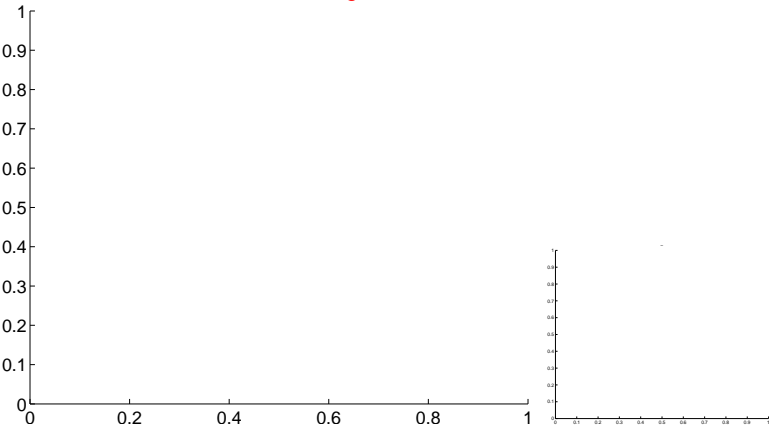
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

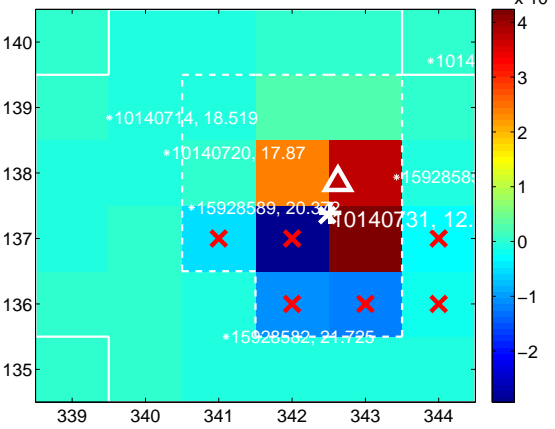
Q1 no difference image



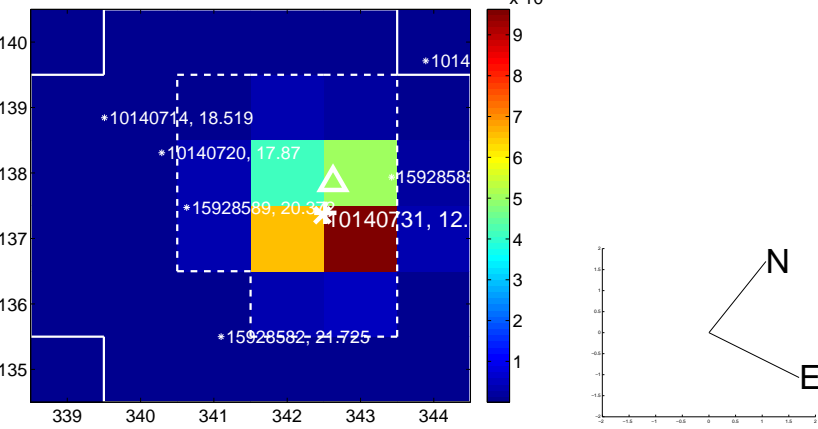
Q1 no OOT image



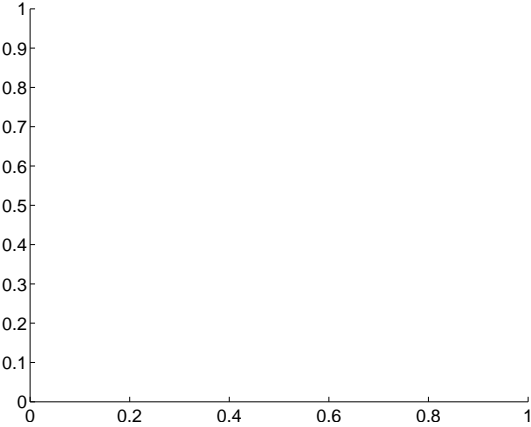
Q2 difference image



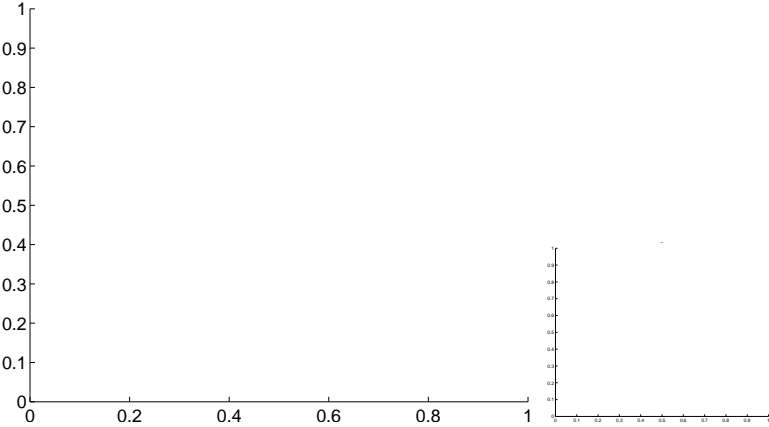
Q2 OOT image



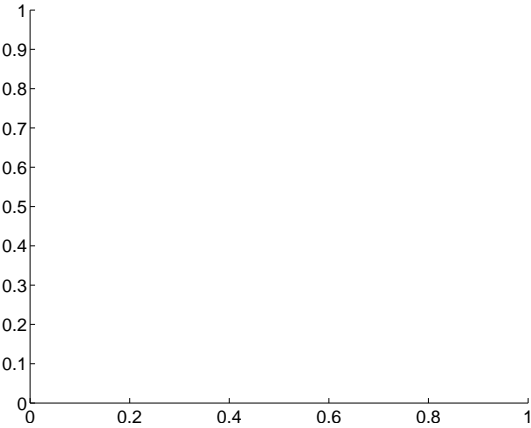
Q3 no difference image



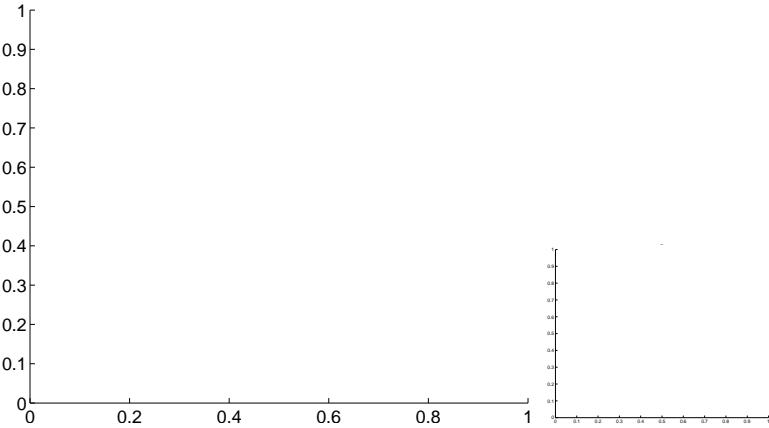
Q3 no OOT image



Q4 no difference image



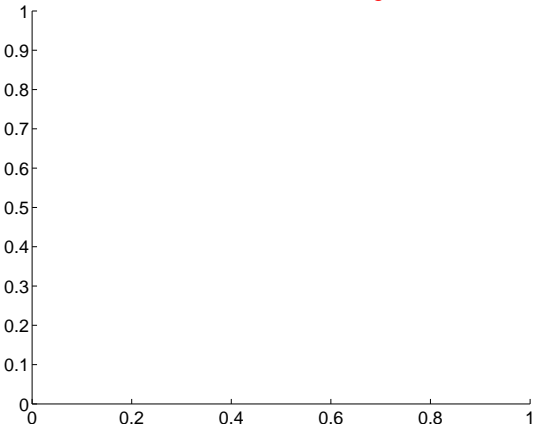
Q4 no OOT image





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

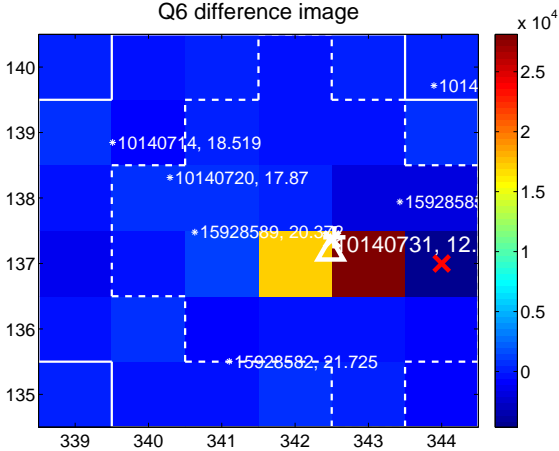
Q5 no difference image



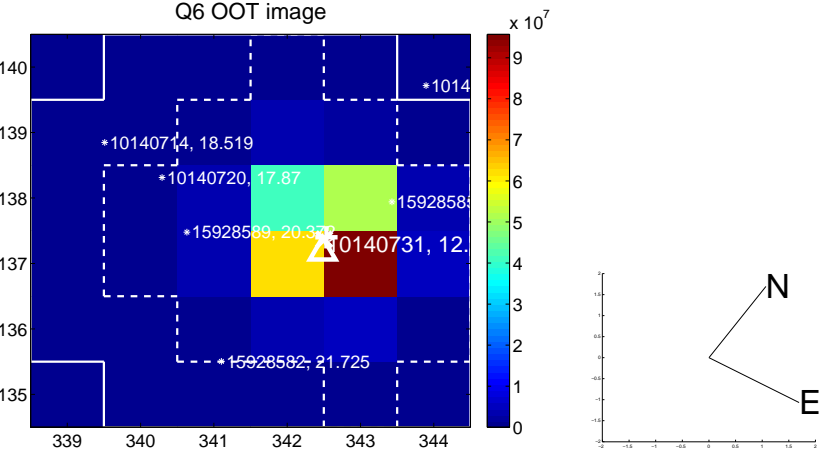
Q5 no OOT image



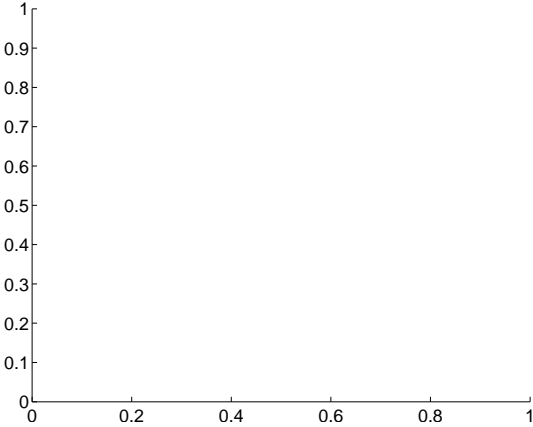
Q6 difference image



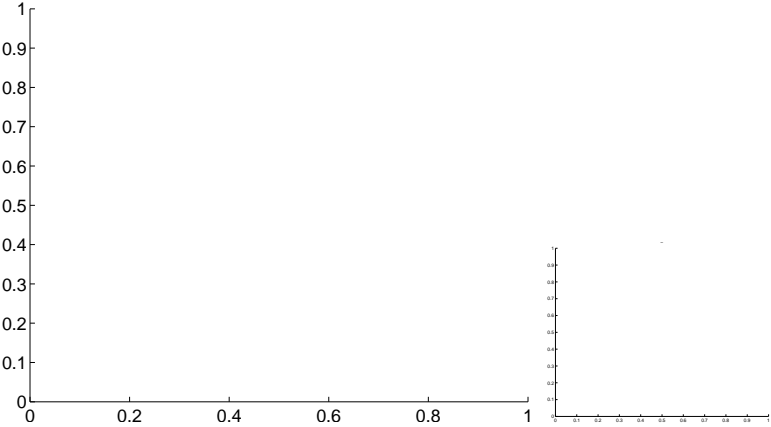
Q6 OOT image



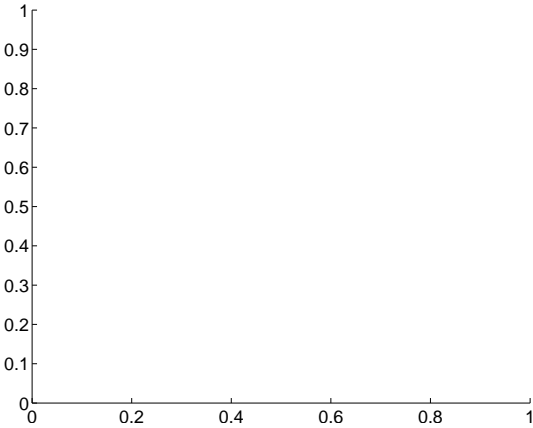
Q7 no difference image



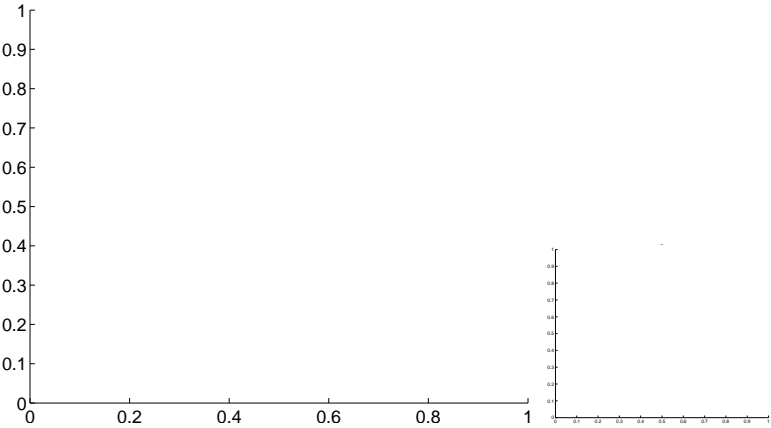
Q7 no OOT image



Q8 no difference image



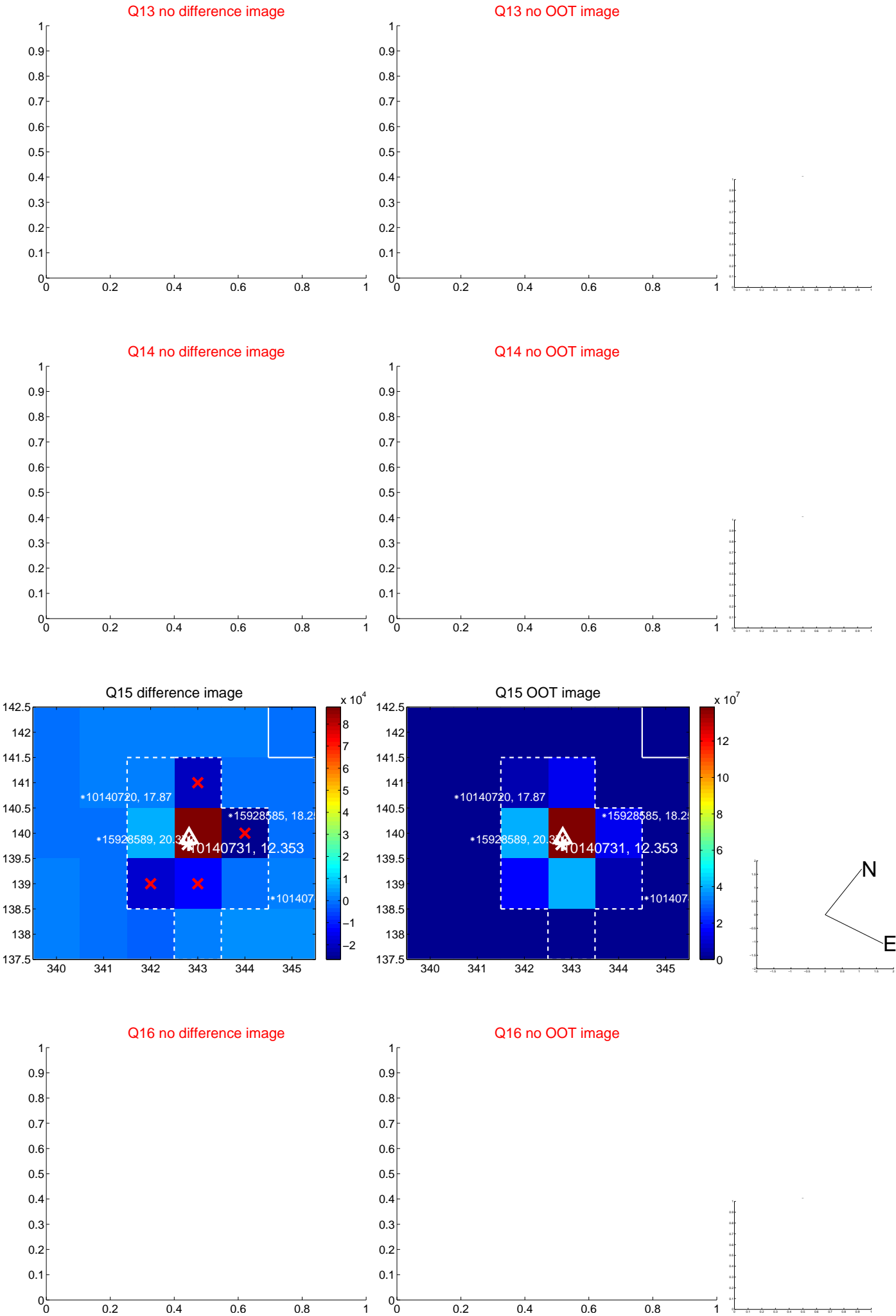
Q8 no OOT image



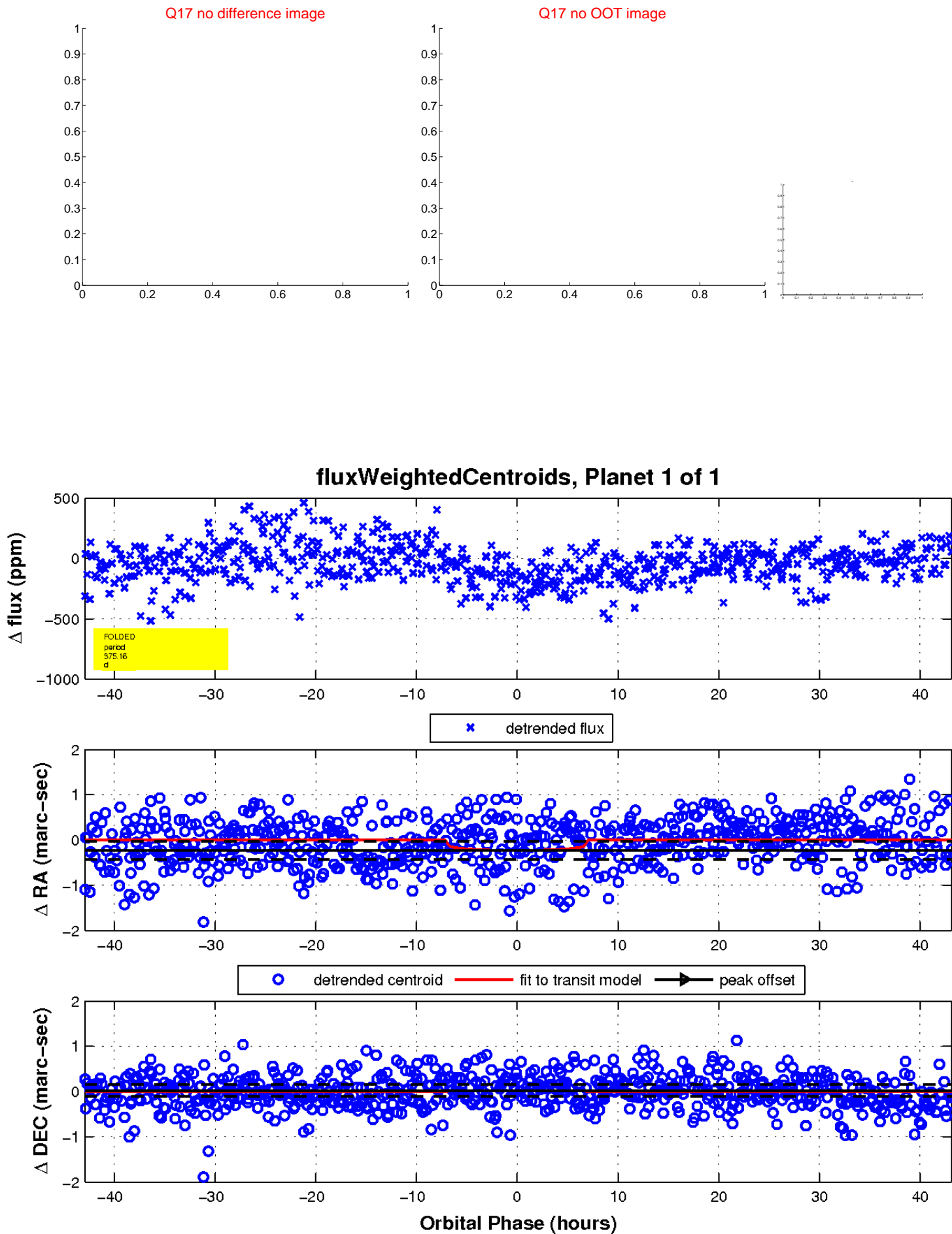
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

