

# KIC 008604575

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008604575-01	OBS	No	369.258643	145.313420	2118.1	5.218	13.3	5.4	0.74	4472	3.46	0.24
008604575-02	OBS	No	462.782424	359.446546	4906.5	7.496	15.4	7.7	0.74	4472	10.07	0.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008604575-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008604575-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

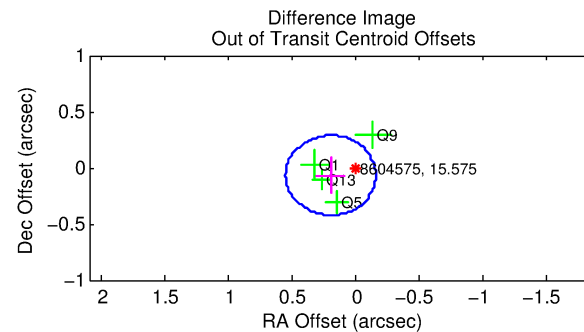
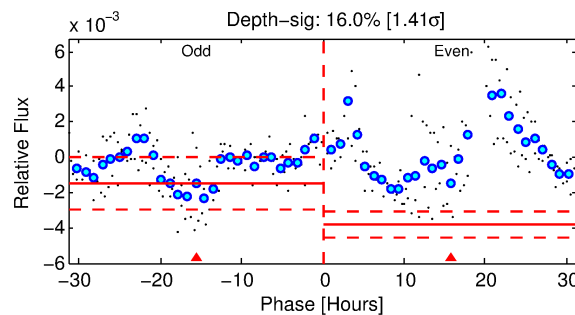
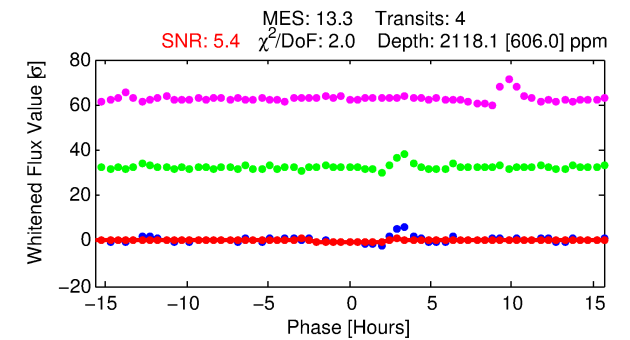
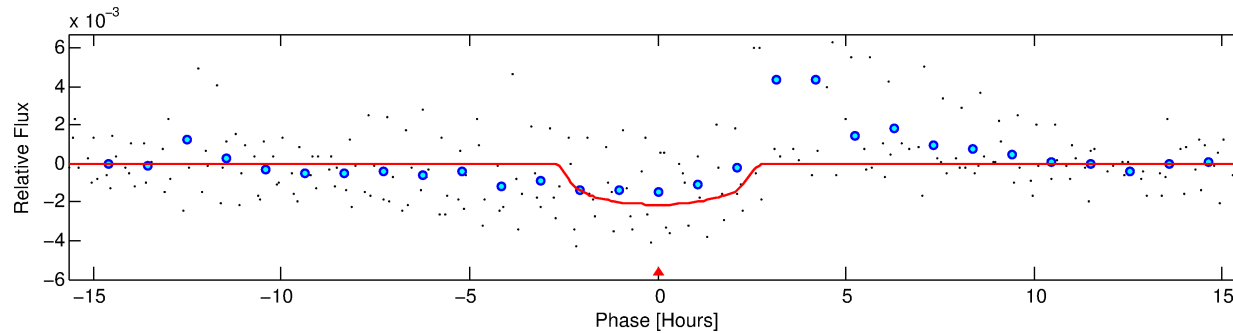
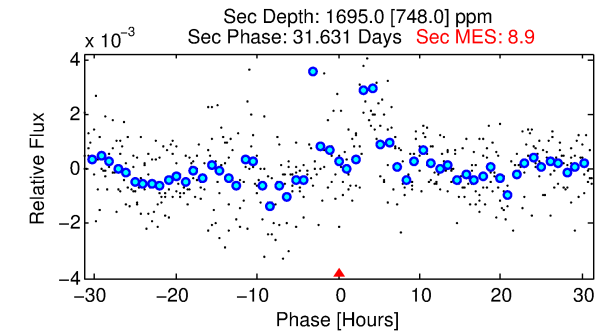
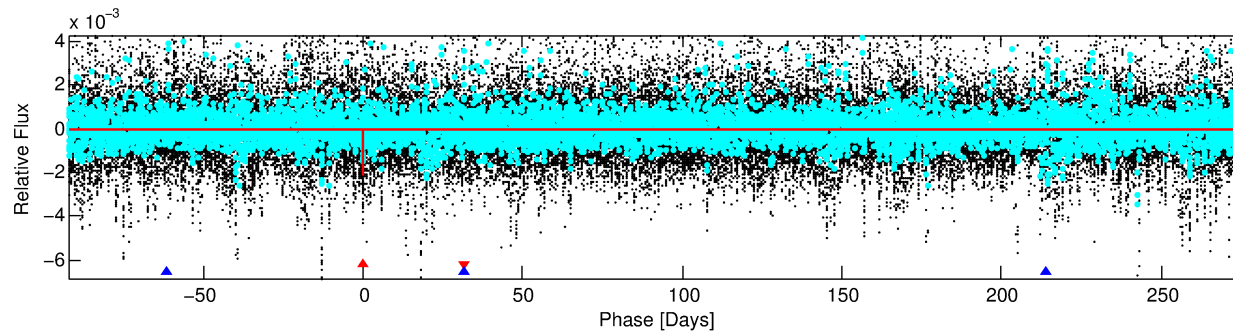
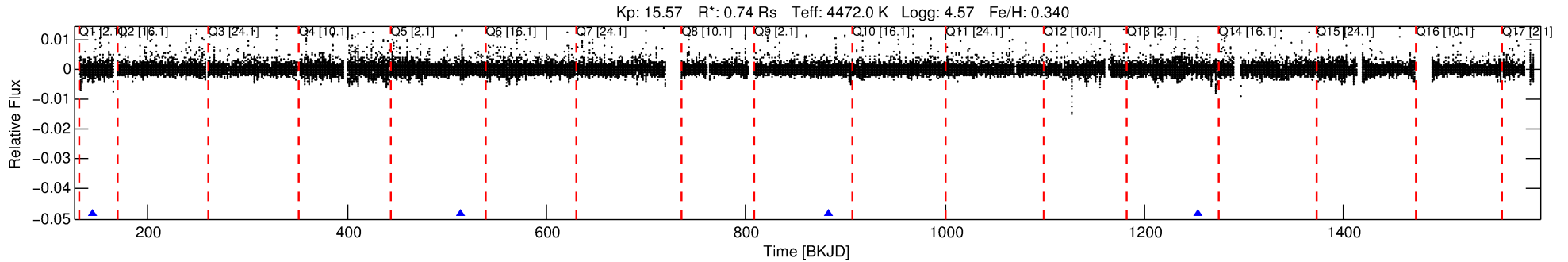
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Ephemeris Match Information For 008604575-01

No Significant Match Found

# DV One-Page Summary

KIC: 8604575 Candidate: 1 of 2 Period: 369.259 d



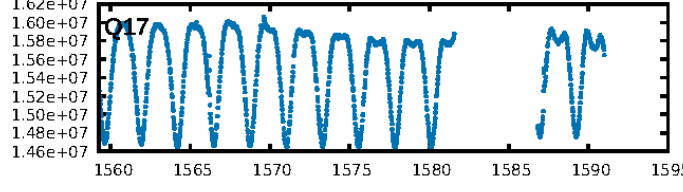
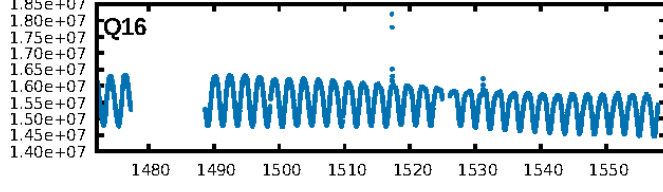
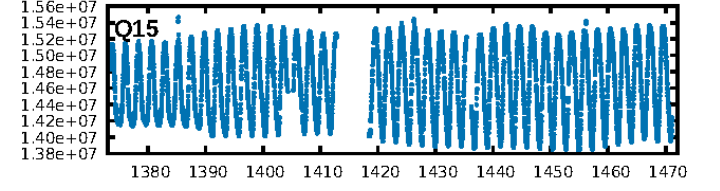
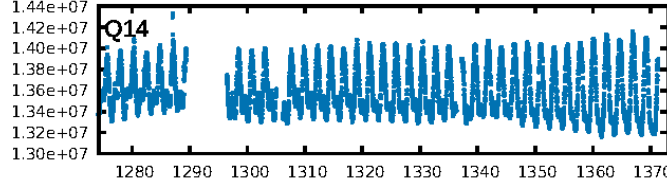
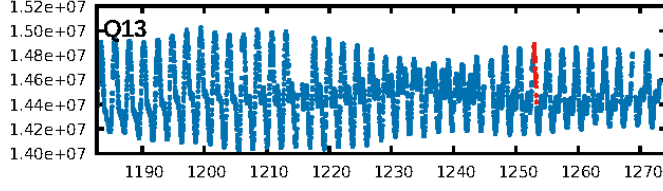
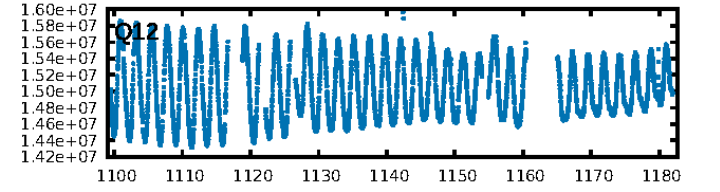
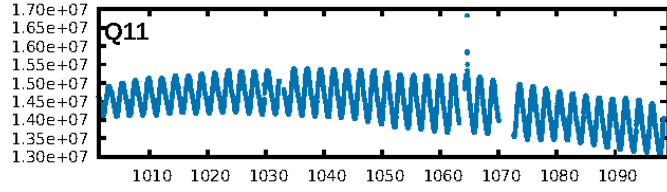
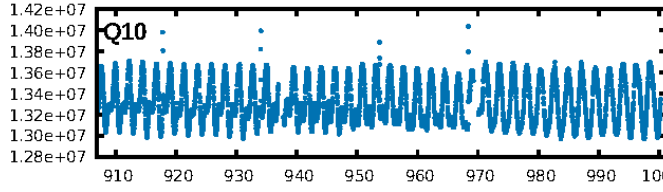
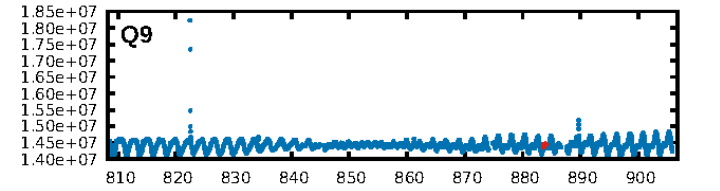
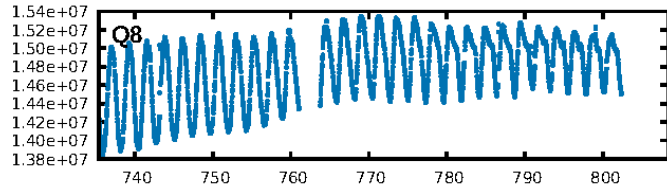
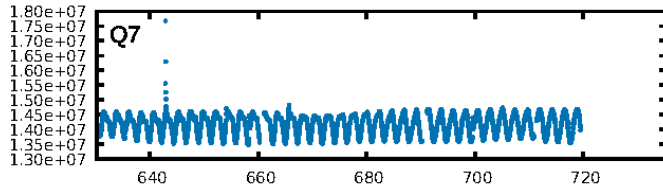
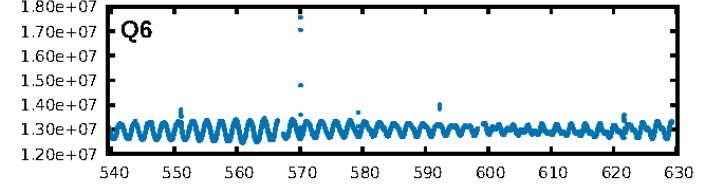
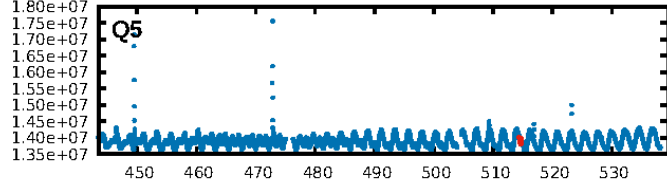
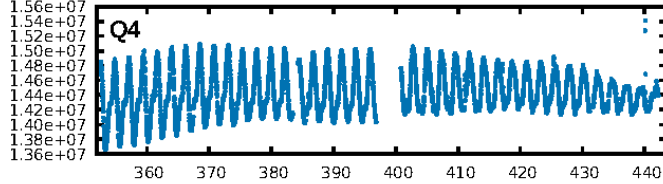
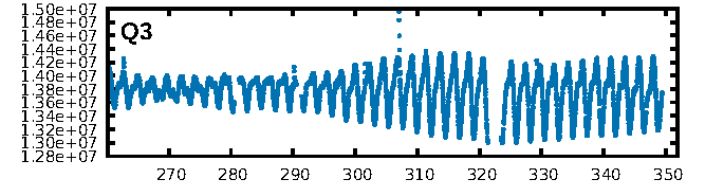
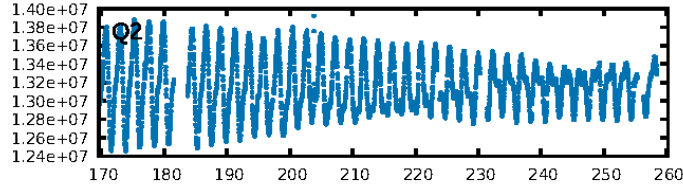
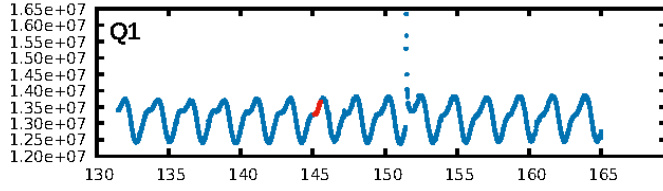
## DV Fit Results:

Period = 369.25864 [0.00721] d  
Epoch = 145.3134 [0.0153] BKJD  
Rp/R\* = 0.0429 [0.0530]  
a/R\* = 473.31 [1645.01]  
b = 0.57 [4.27]  
Seff = 0.24 [0.04]  
Teq = 178 [8] K  
Rp = 3.46 [4.29] Re  
a = 0.9087 [0.0664] AU  
Ag = 64174.53 [161199.39] [0.40σ]  
Teffp = 4381 [2752] K [1.53σ]

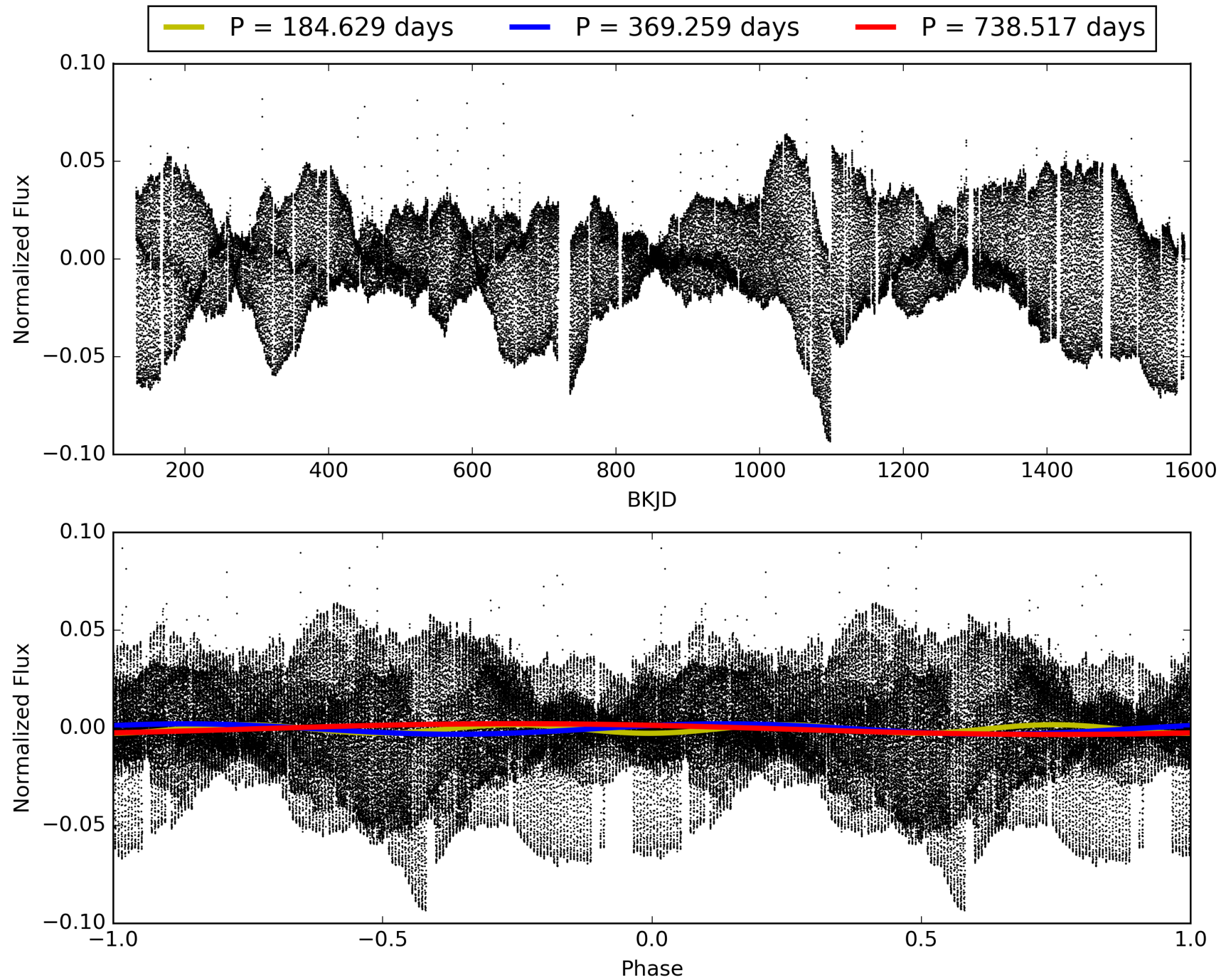
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [245.76σ]  
ModelChiSquare2-sig: 0.7%  
ModelChiSquareGof-sig: 2.5%  
Bootstrap-pfa: 8.79e-13  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.9053**  
Centroid-sig: 8.7%  
Centroid-so: 1.227 arcsec [1.43σ]  
OotOffset-rm: 0.213 arcsec [1.80σ]  
KicOffset-rm: 0.146 arcsec [0.96σ]  
OotOffset-st: 0/0/0/4 [4]  
KicOffset-st: 0/0/0/4 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

# TCE 008604575-01, PDC Light Curves

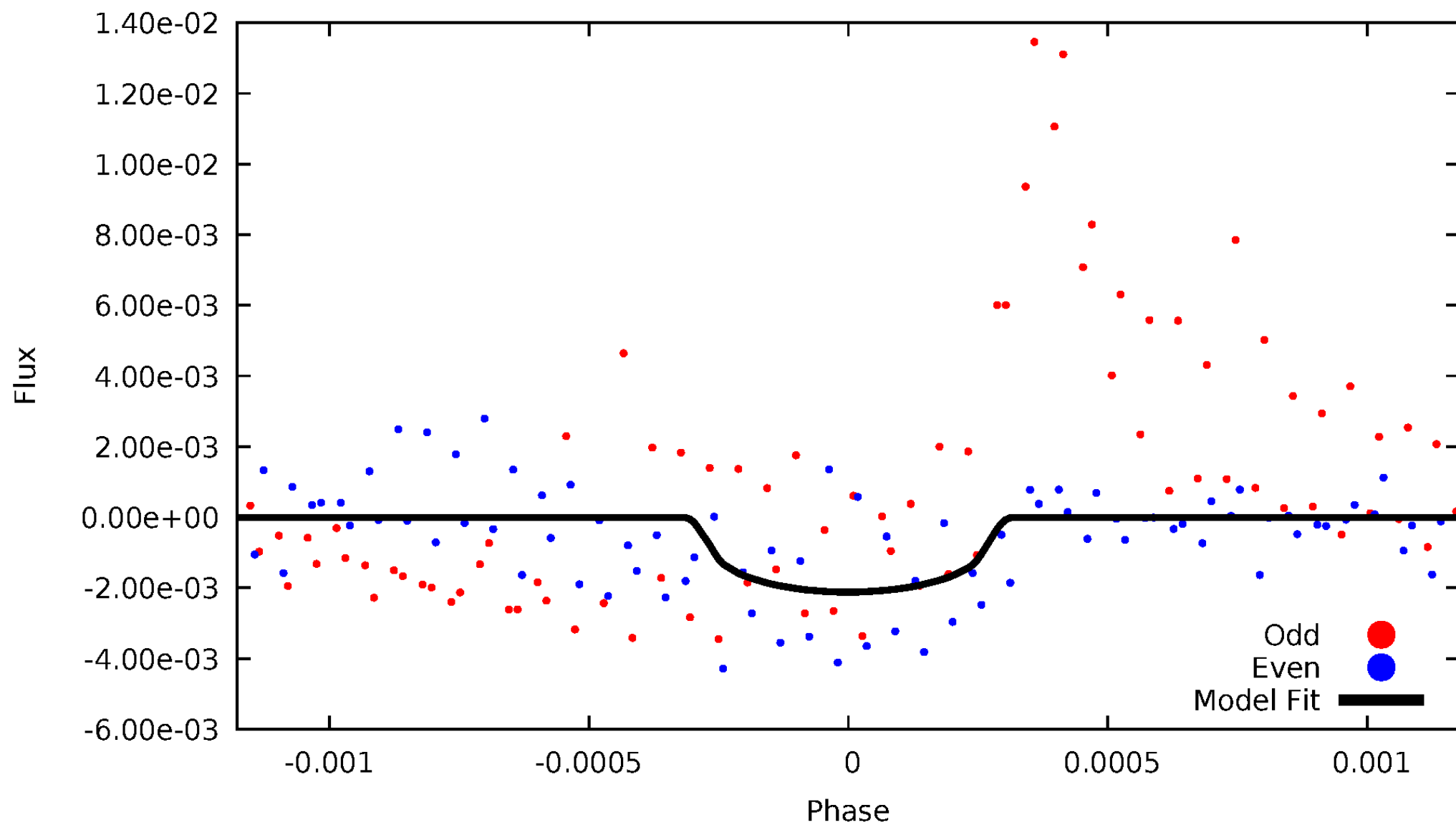


TCE 008604575-01



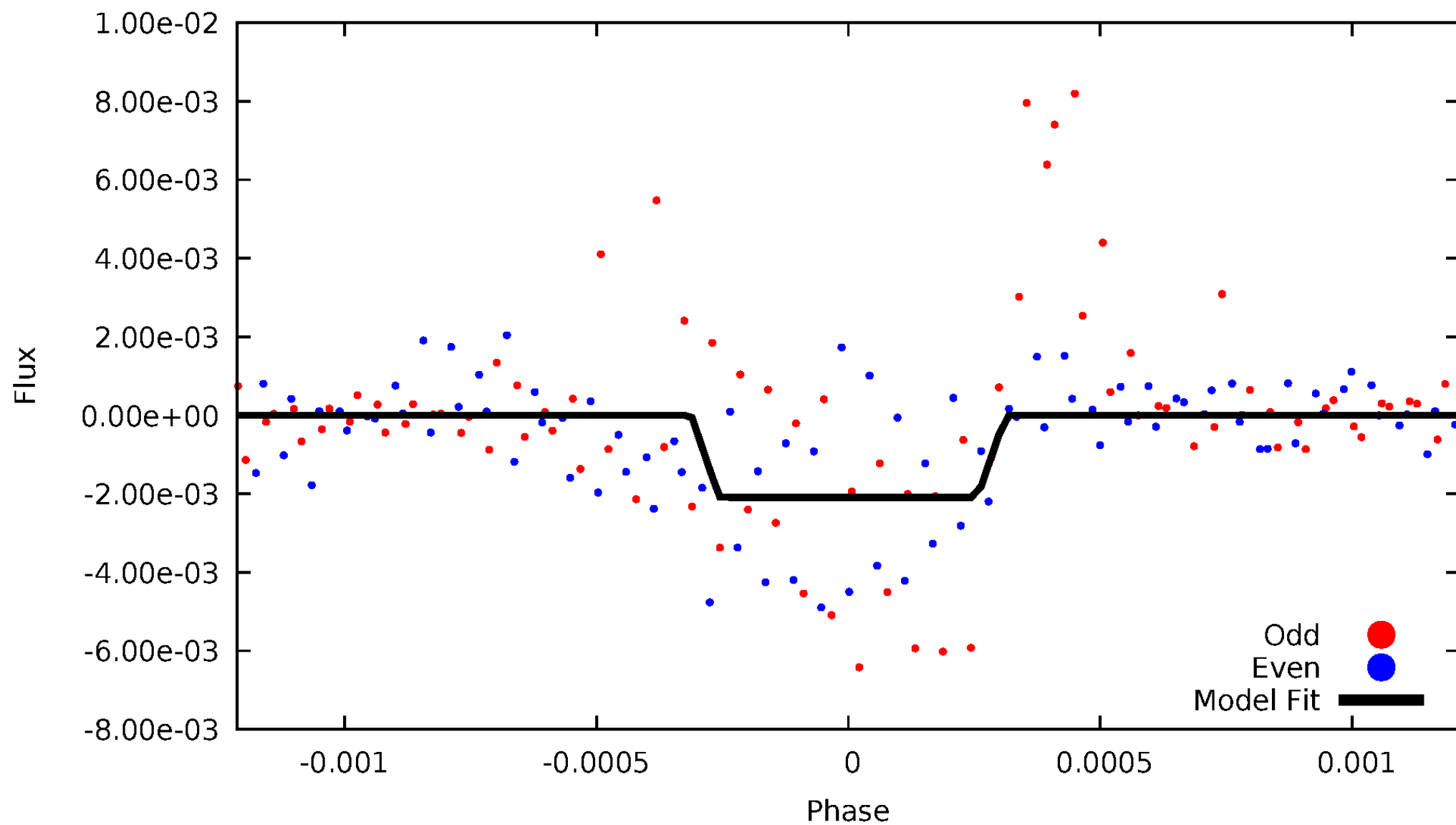
# DV Odd/Even

TCE 008604575-01

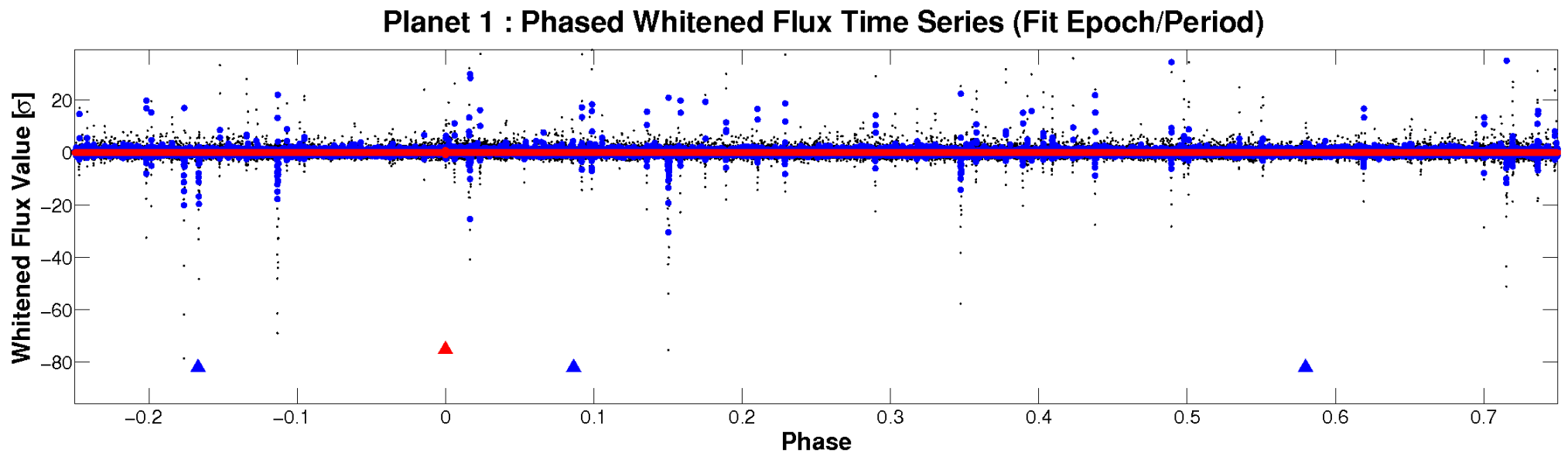
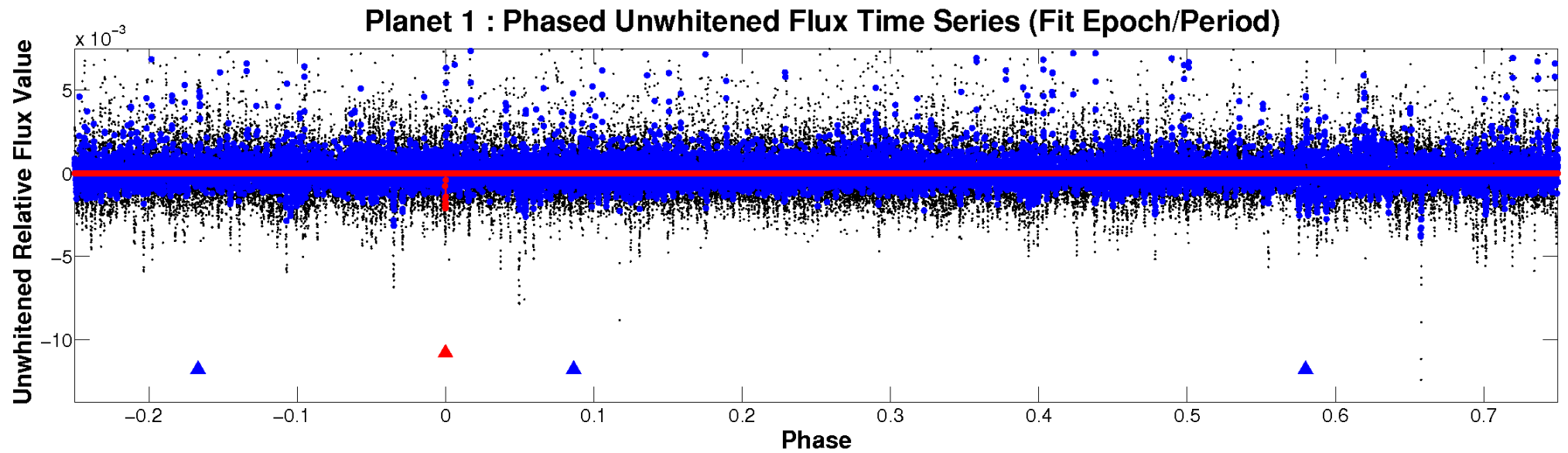


# ALT Odd/Even

TCE 008604575-01

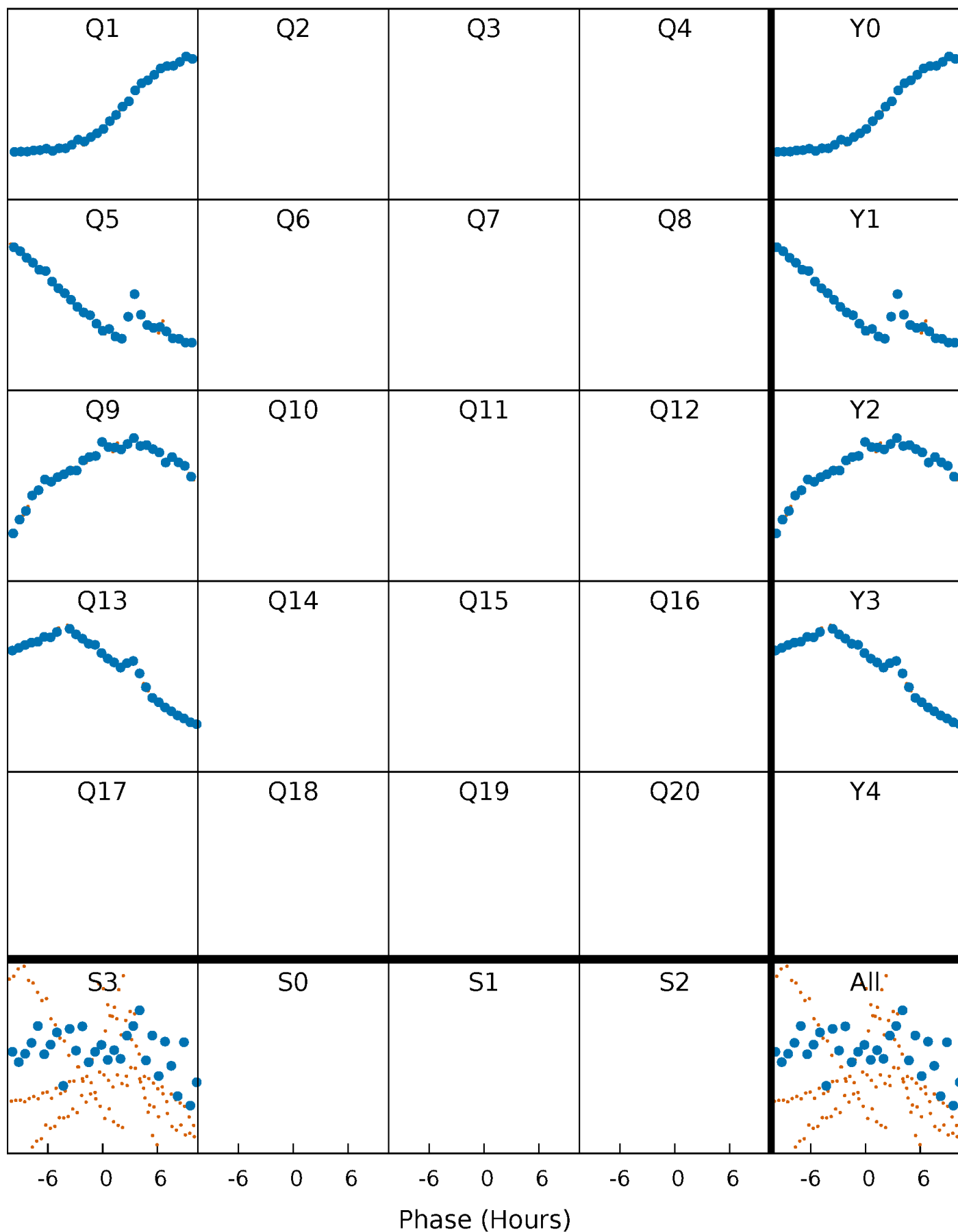


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

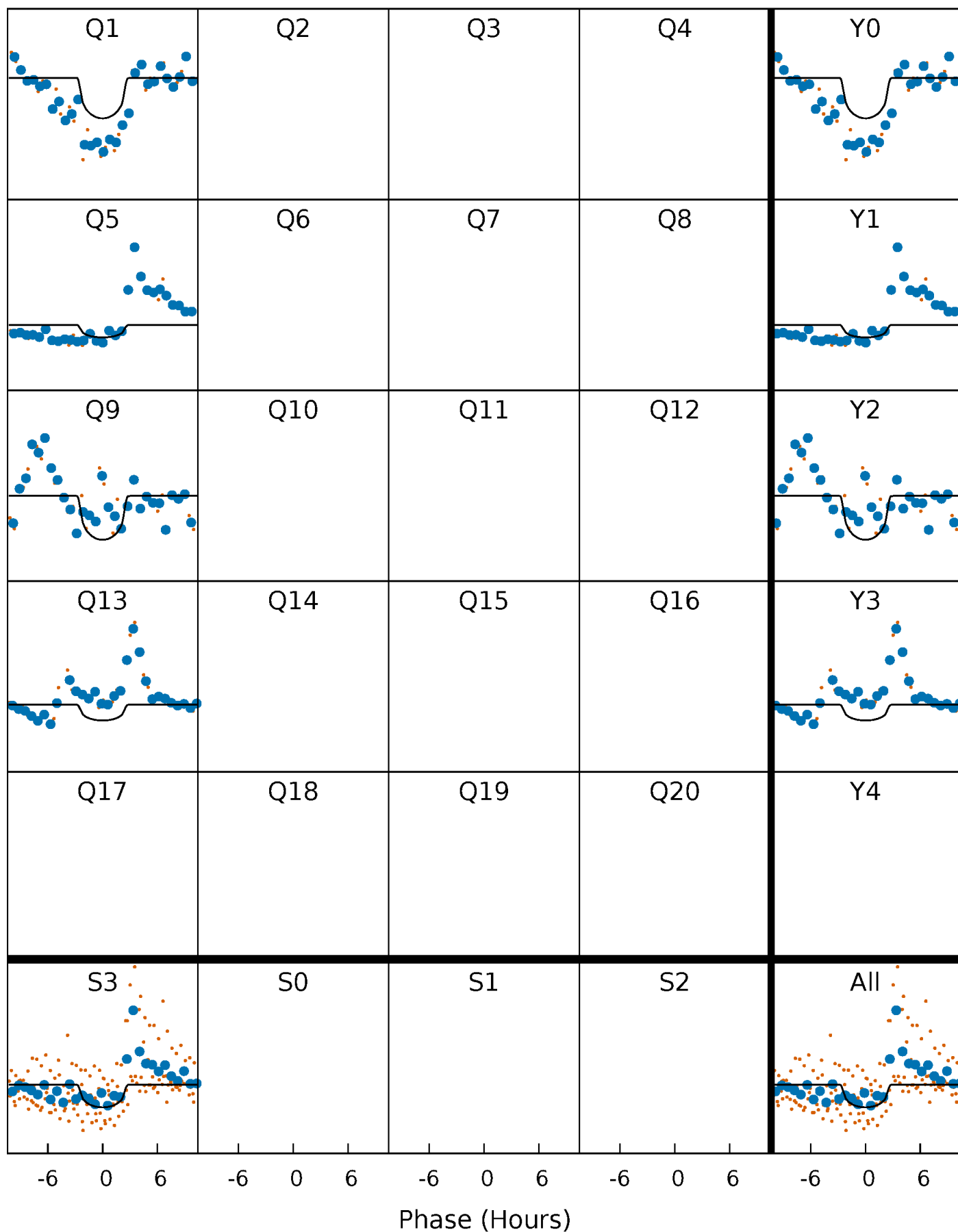
TCE 008604575-01 P=369.258644 Days  $T_0=145.313420$  (BKJD)





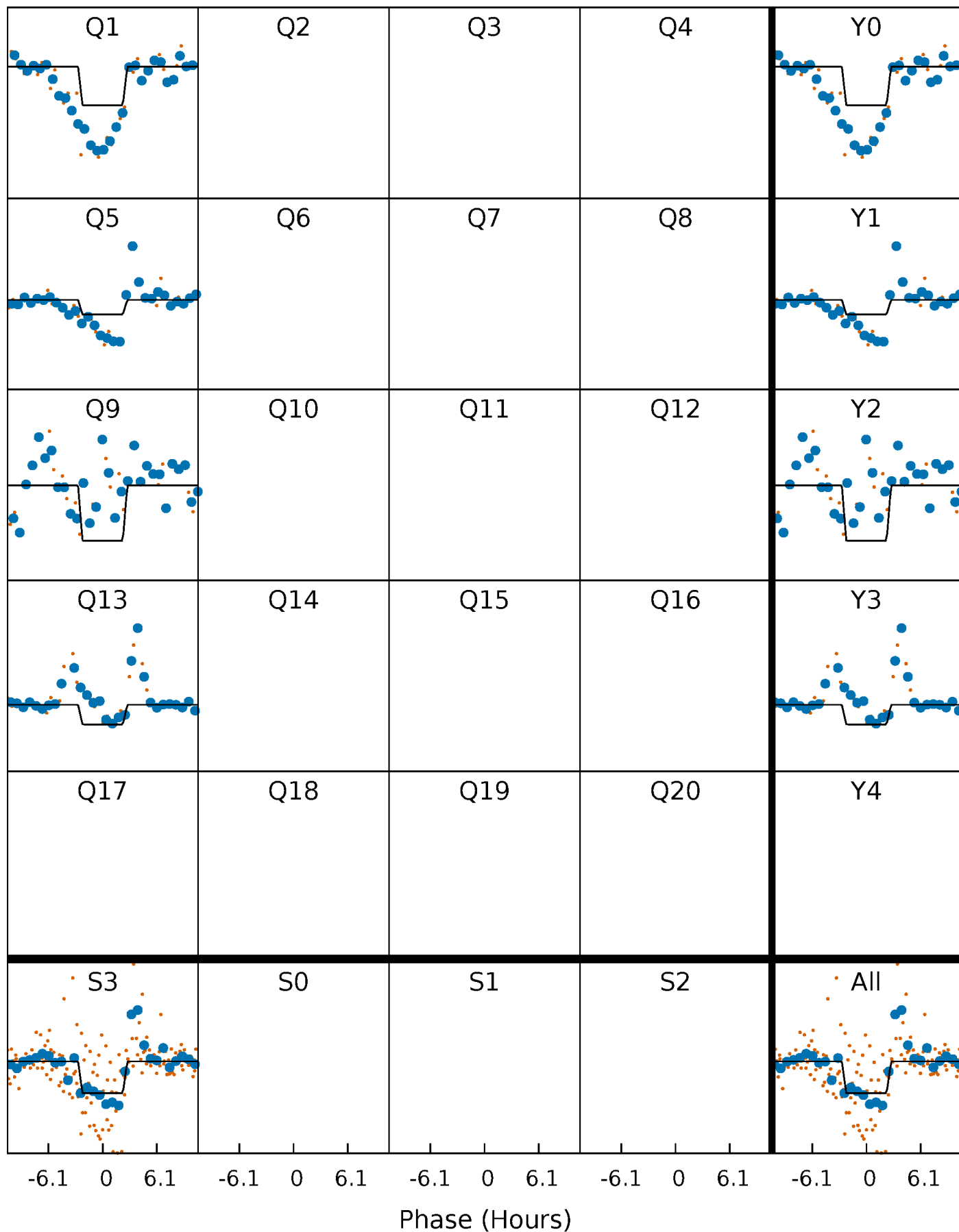
# DV Quarter-Phased Transit Curves

TCE 008604575-01 P=369.258644 Days  $T_0=145.313420$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

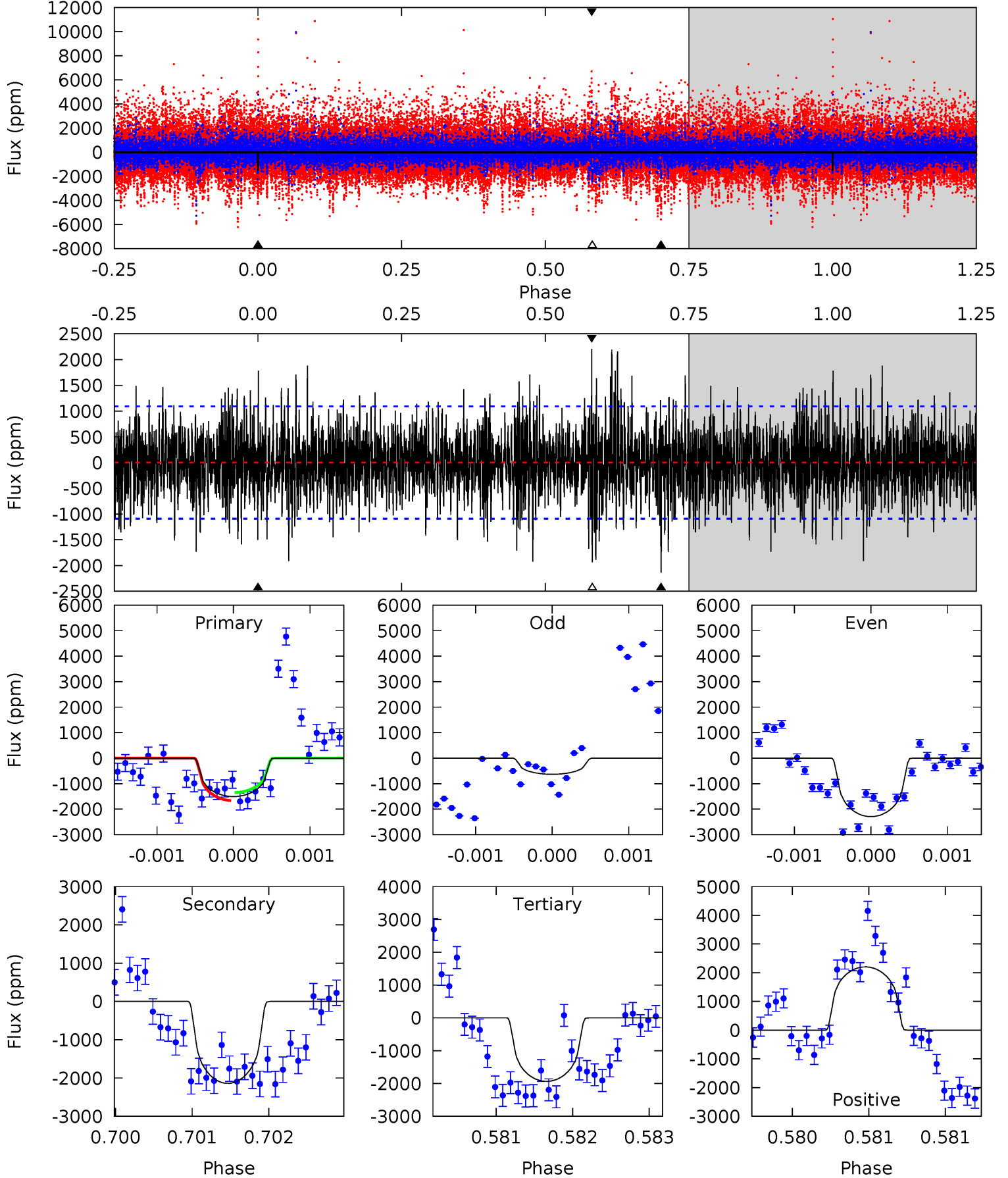
TCE 008604575-01 P=369.248052 Days  $T_0=145.325793$  (BKJD)



# DV Model-Shift Uniqueness Test

008604575-01, P = 369.258644 Days, E = 145.313420 Days

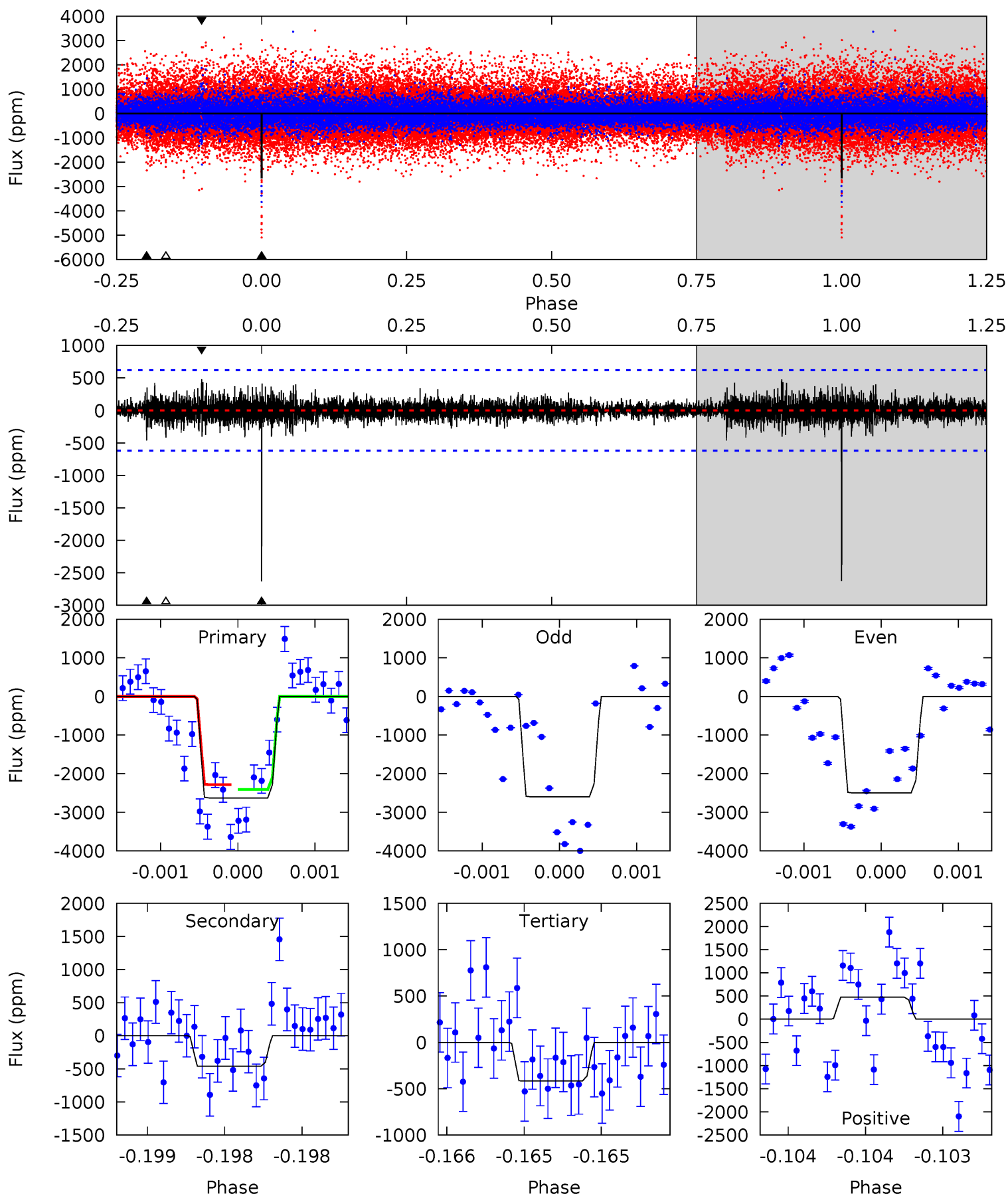
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.62	10.9	9.81	11.2	5.54	3.42	2.63	-2.19	-3.55	1.04	-0.32	3.75	0.96	0.51	0.80



# Alt Model-Shift Uniqueness Test

008604575-01, P = 369.248052 Days, E = 145.325793 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
23.5	4.13	3.73	4.28	5.54	3.44	0.78	19.8	19.2	0.40	-0.14	0.49	1.04	0.15	0



### Stellar Parameters For KIC 008604575

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4472^{+145}_{-145}$	$4.565^{+0.060}_{-0.020}$	$0.340^{+0.100}_{-0.300}$	$0.740^{+0.024}_{-0.063}$	$0.733^{+0.041}_{-0.050}$	$2.545^{+0.686}_{-0.183}$
	+3%/-3%	+1%/-0%	+29%/-88%	+3%/-9%	+6%/-7%	+27%/-7%
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 008604575-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2140 \pm 197$	$4.45^{+3.86}_{-2.86}$	$248^{+9}_{-10}$	$4155^{+2394}_{-767}$	$48791^{+323827}_{-34384}$
Alt.	$-462 \pm 112$	$5.00^{+3.57}_{-3.06}$	$247^{+9}_{-9}$	$3131^{+1148}_{-476}$	$8508^{+46192}_{-5924}$

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

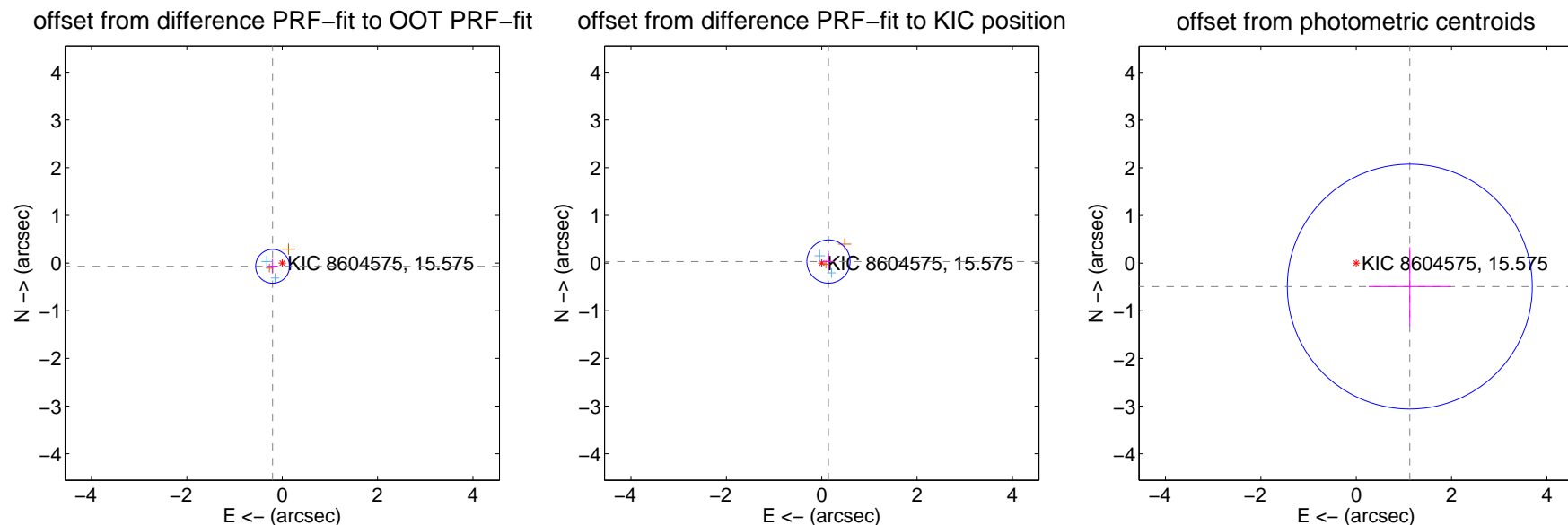
## DV Centroid Data

Supplemental centroid analysis for 008604575-01. Kepler magnitude: 15.57. Transit SNR 5.44

There are 2 quarters with good PRF difference image offsets

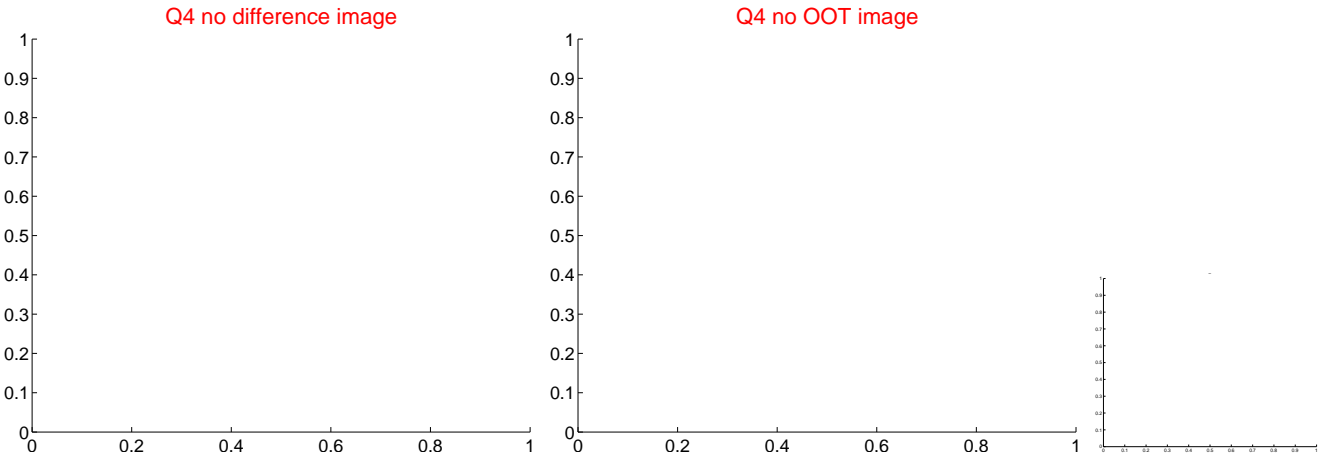
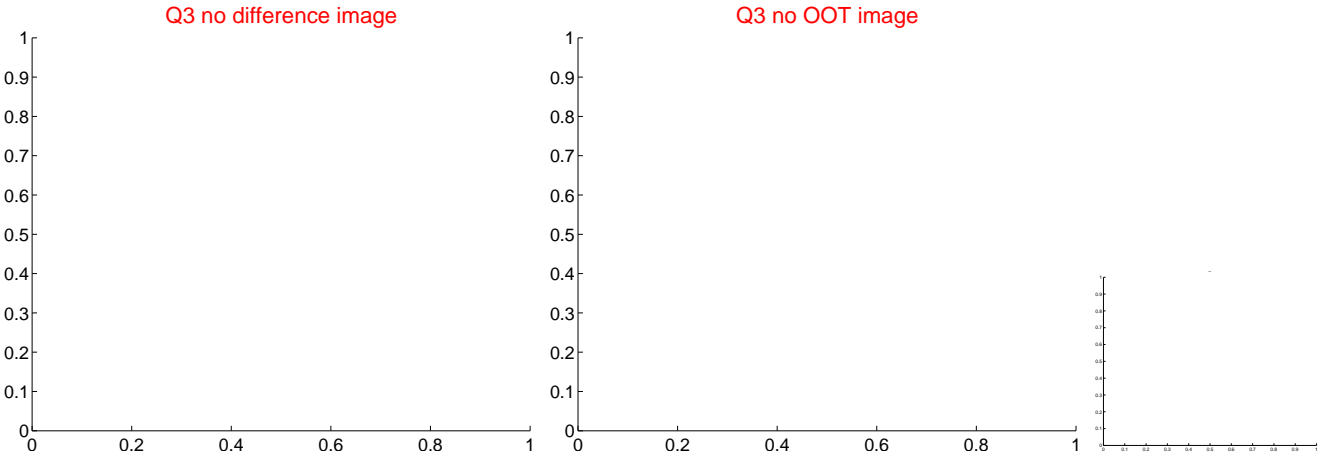
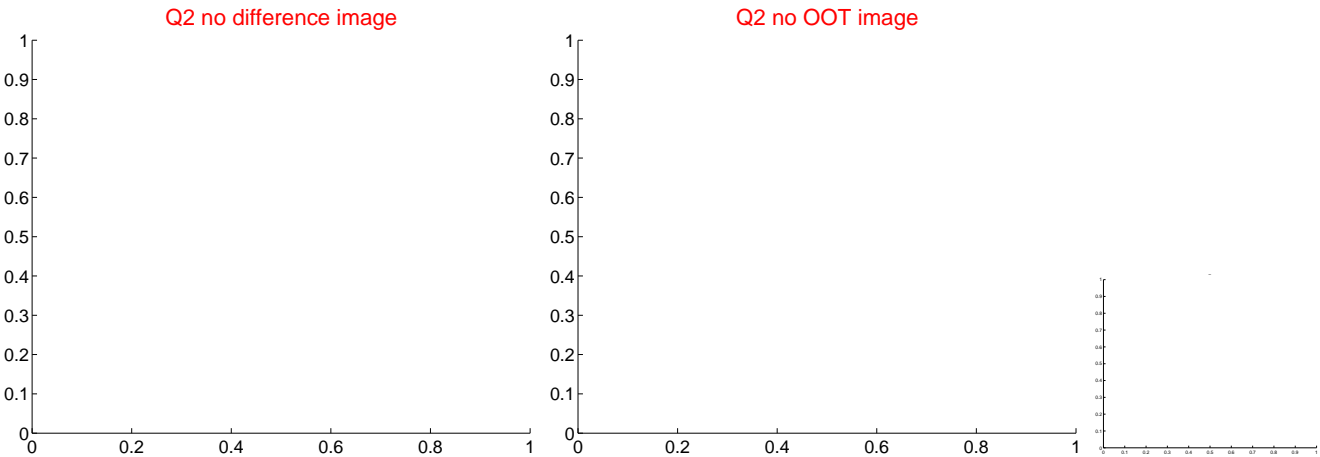
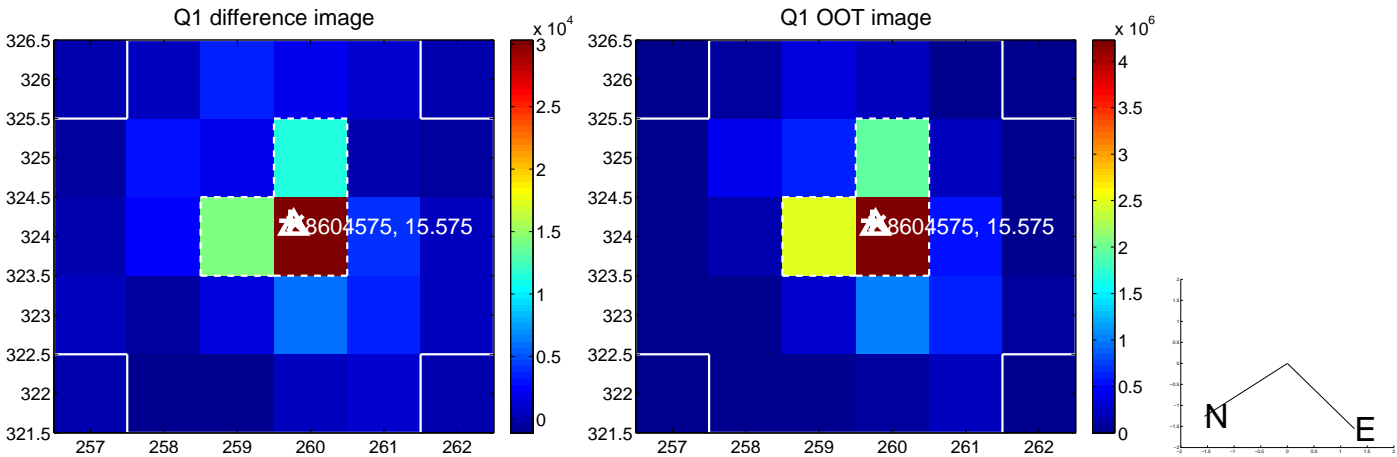
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.213 \pm 0.118$	1.80	$0.202 \pm 0.114$	$-0.068 \pm 0.152$
PRF-fit source offset from KIC position	$0.146 \pm 0.151$	0.96	$-0.142 \pm 0.130$	$0.032 \pm 0.171$
photometric centroid source offset	$1.23 \pm 0.86$	1.43	$-1.12 \pm 0.86$	$-0.49 \pm 0.83$

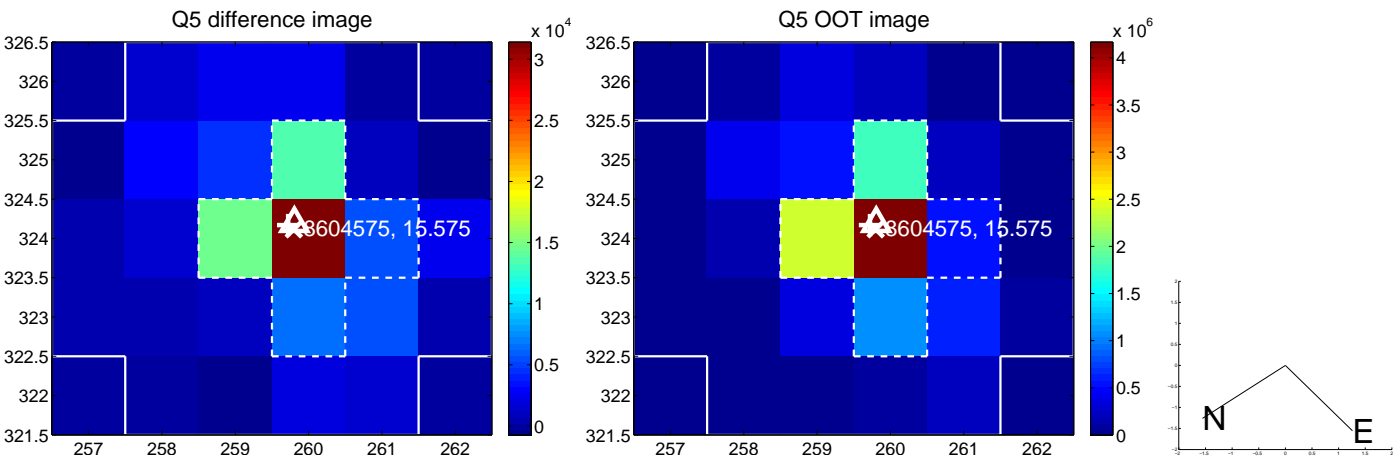


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

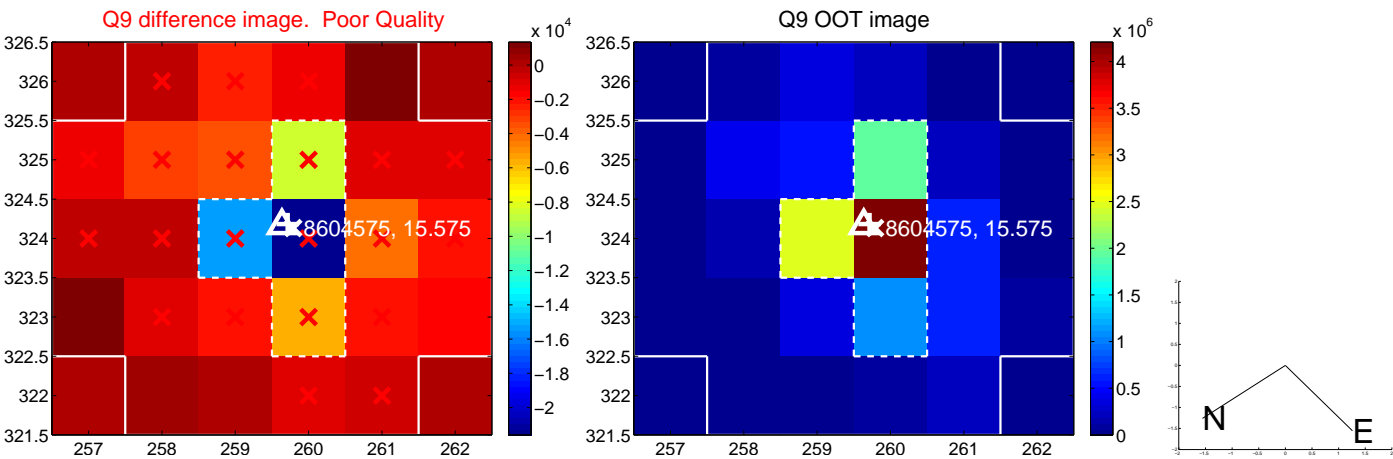


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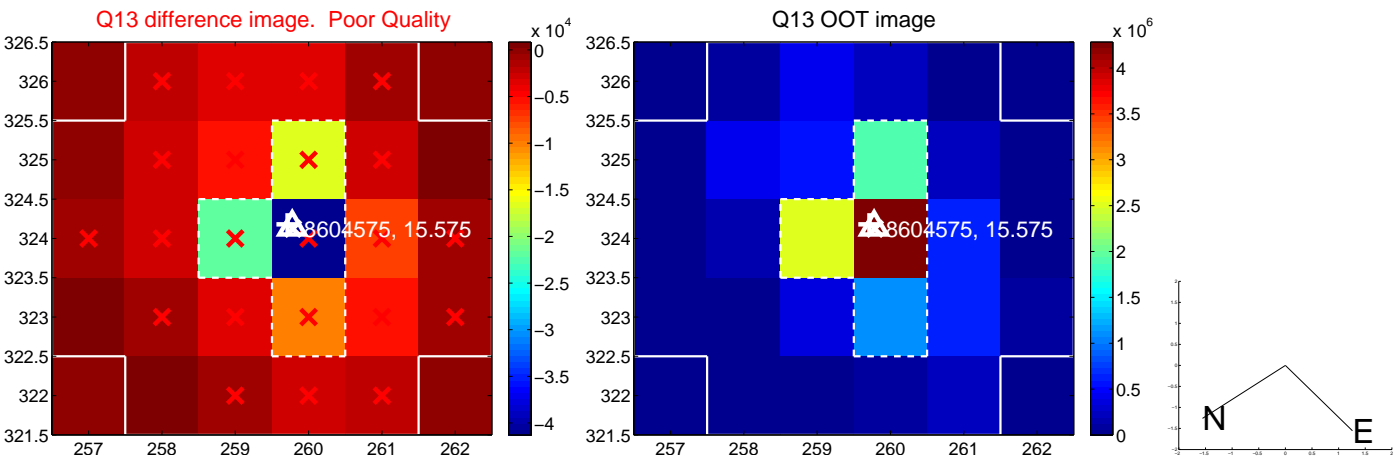




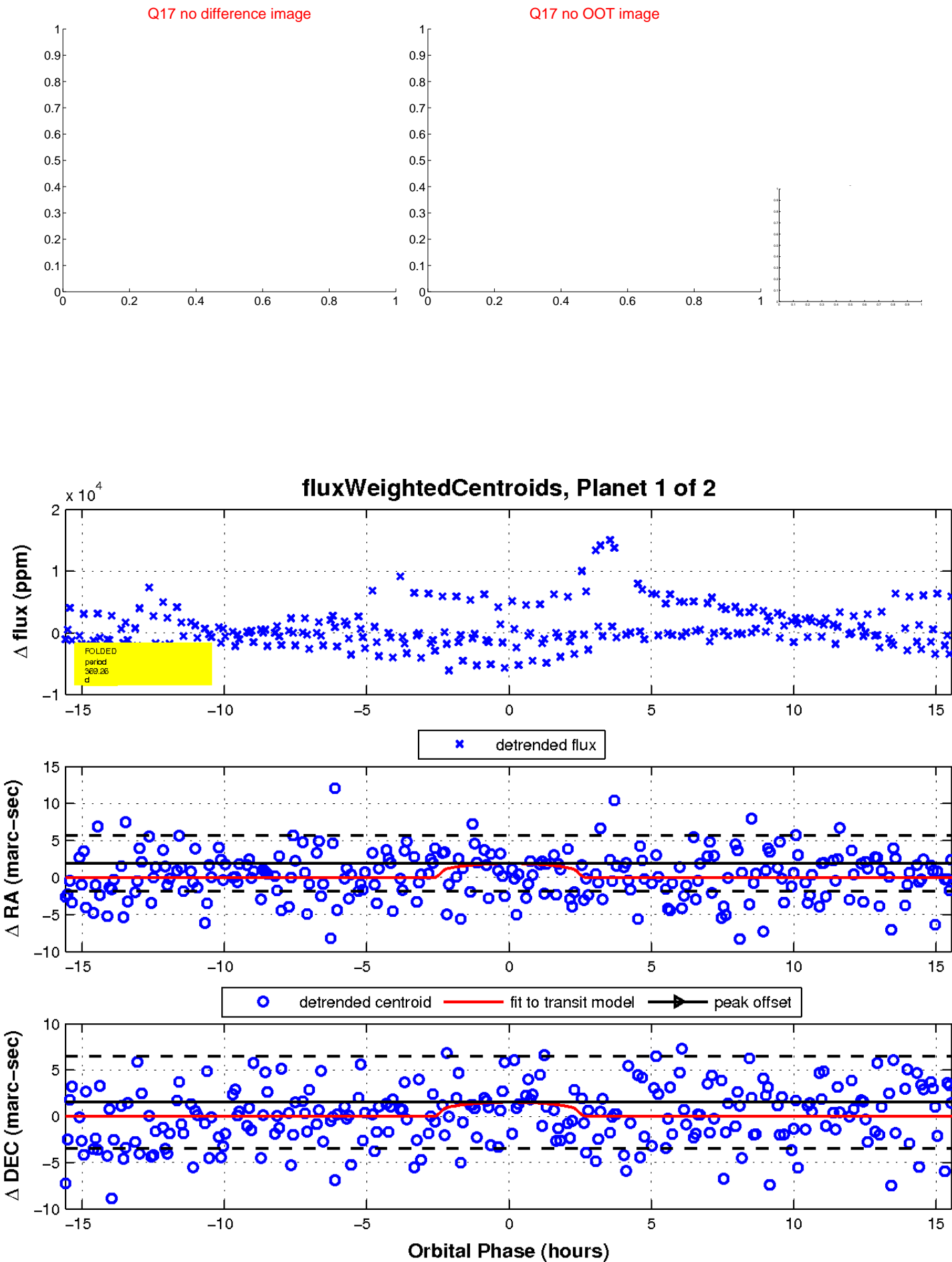
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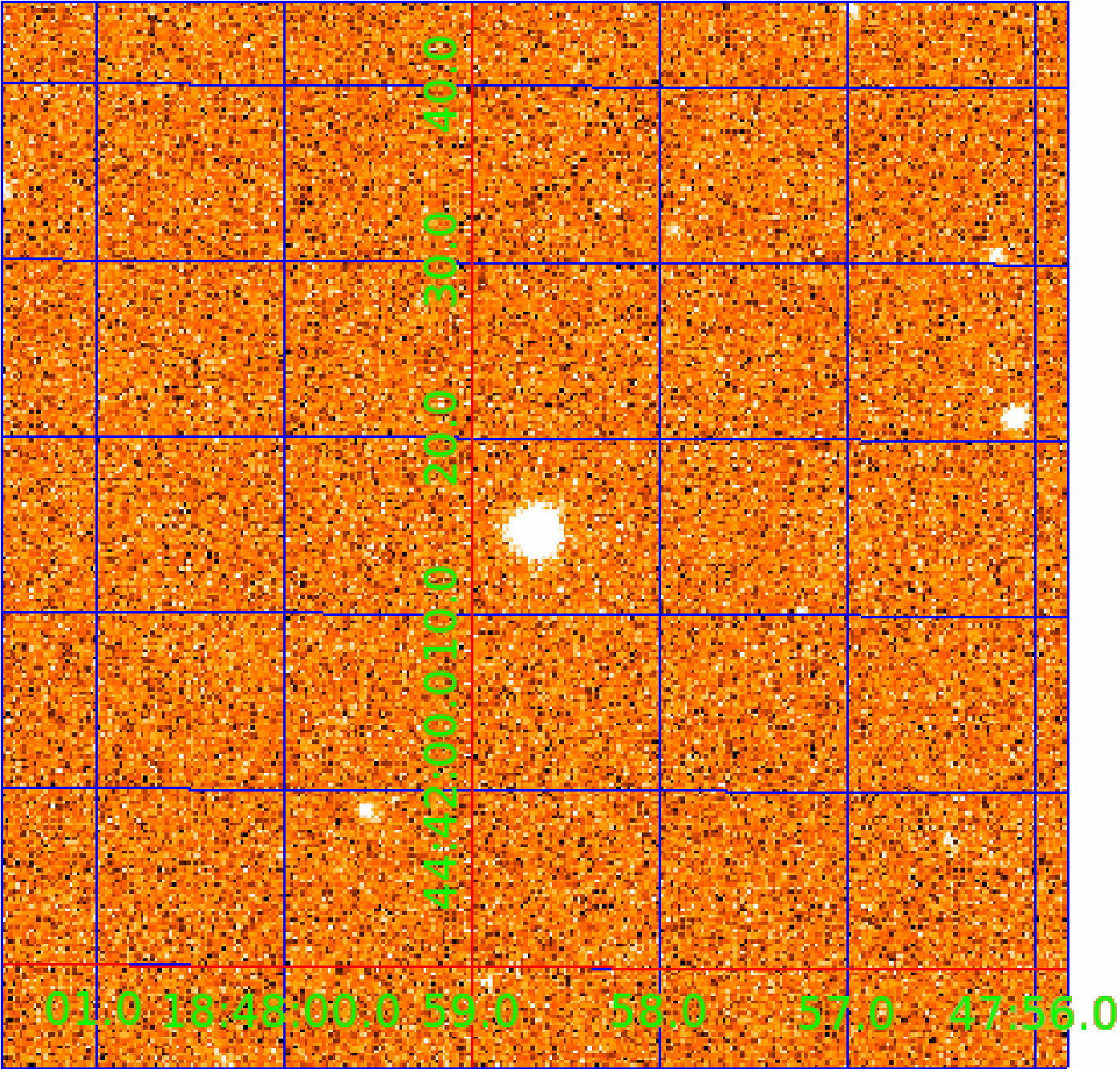


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UKIRT Image

Declination



# KIC 008604575

## Q1-17 DR25 TCE Parameters

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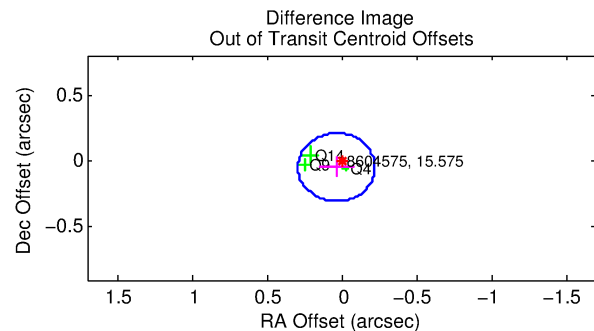
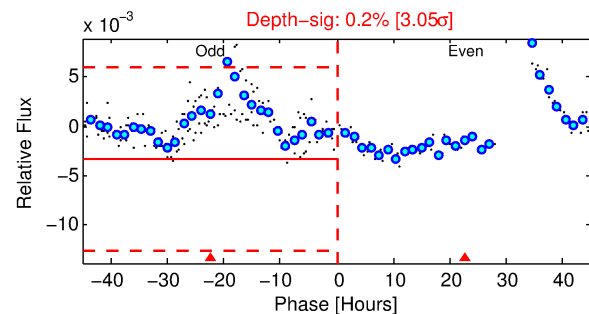
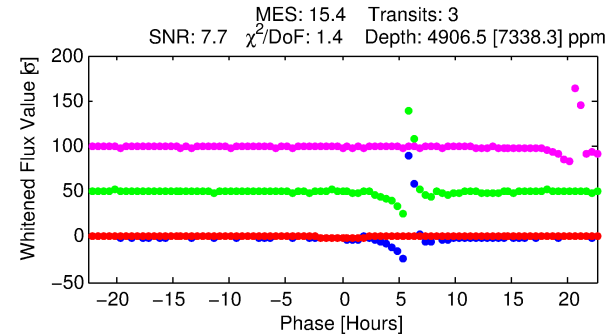
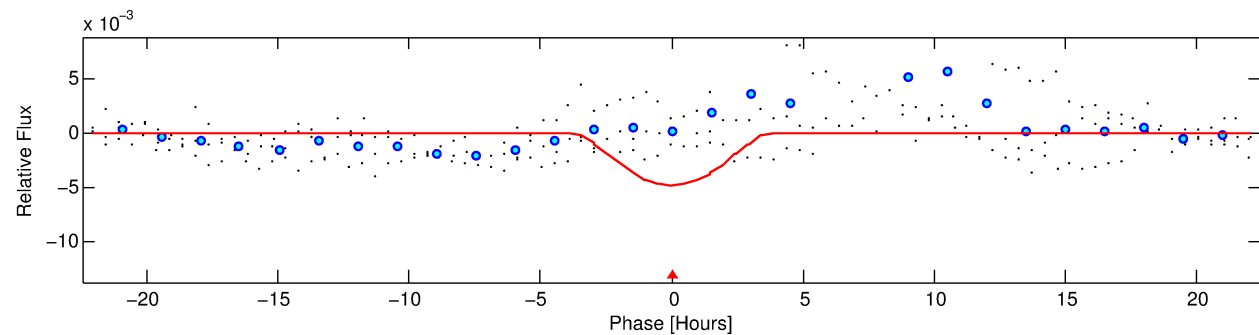
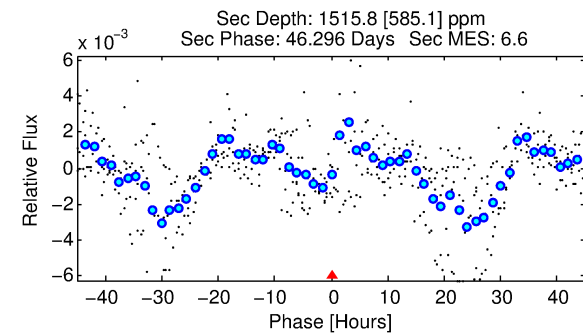
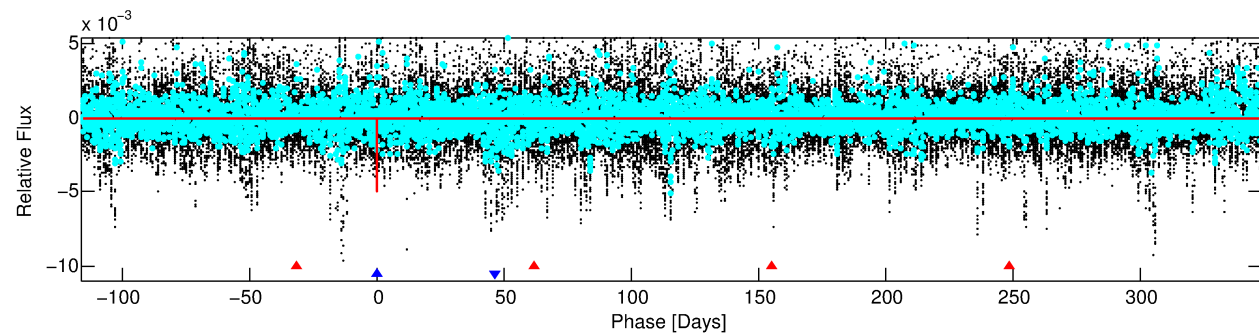
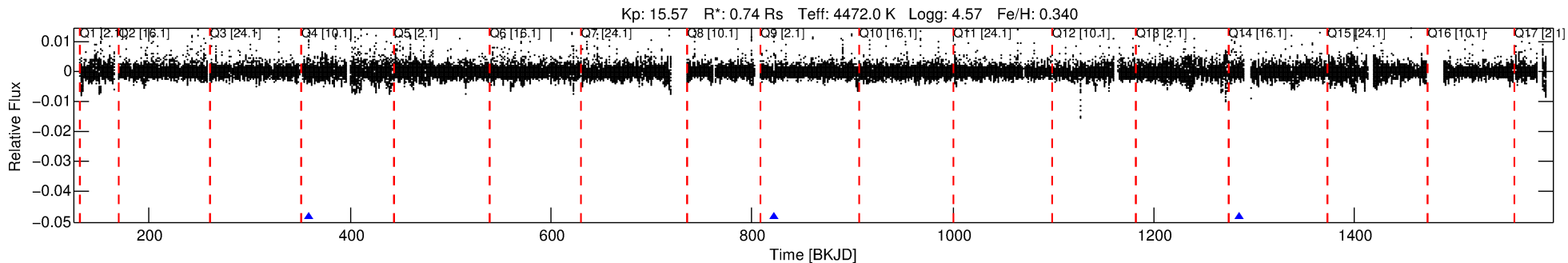
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## Ephemeris Match Information For 008604575-02

No Significant Match Found

# DV One-Page Summary

KIC: 8604575 Candidate: 2 of 2 Period: 462.782 d



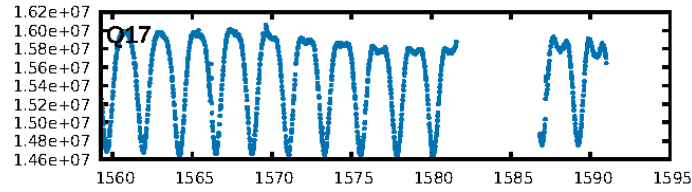
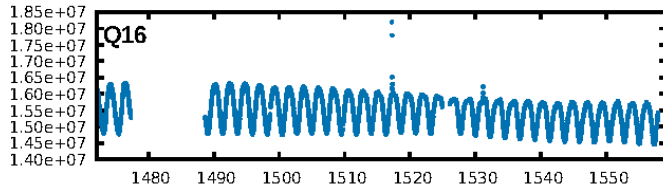
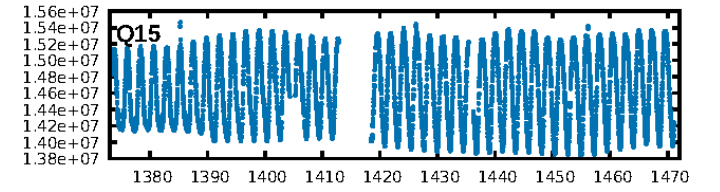
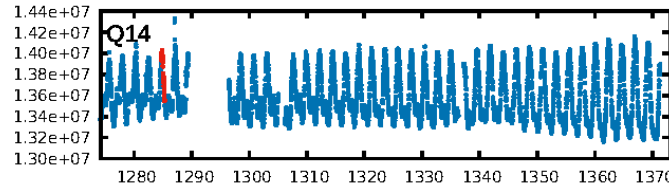
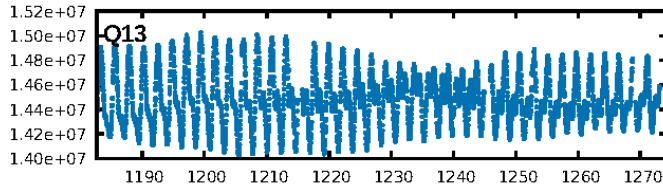
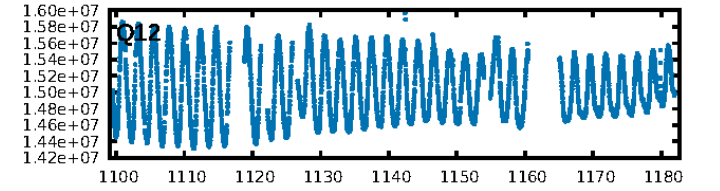
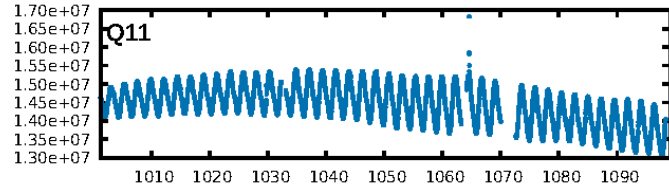
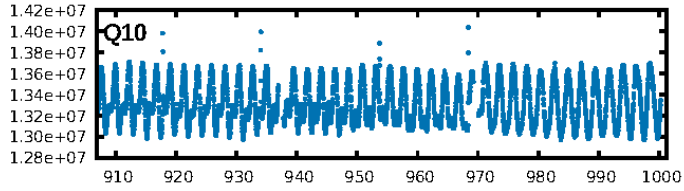
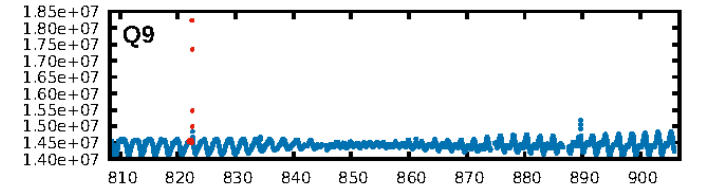
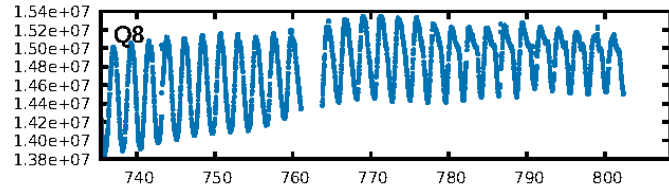
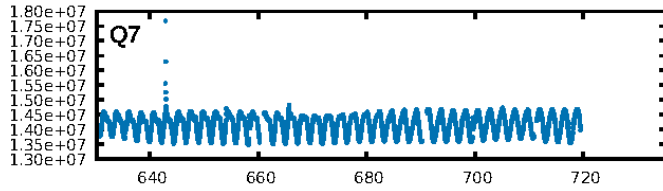
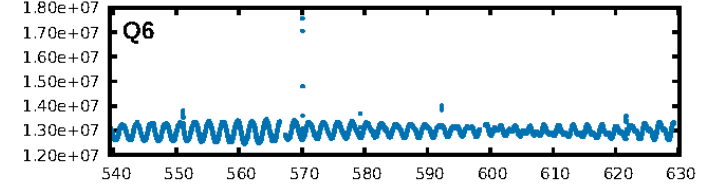
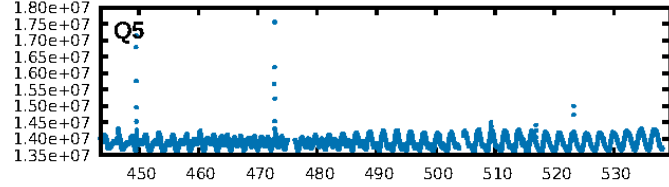
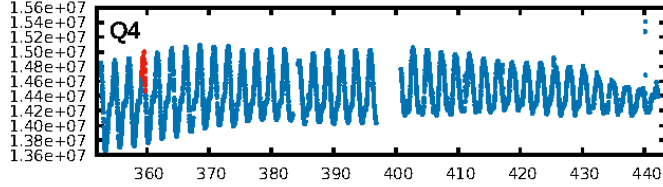
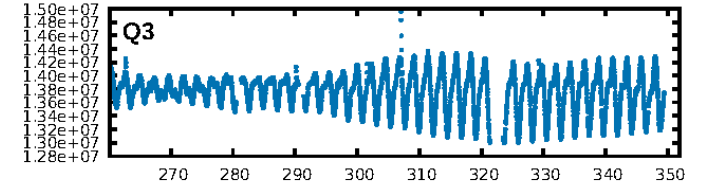
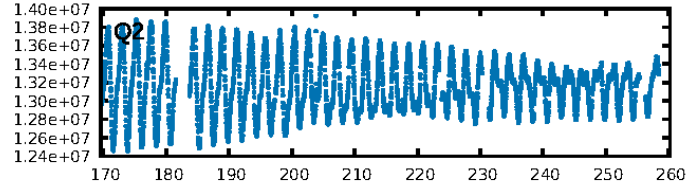
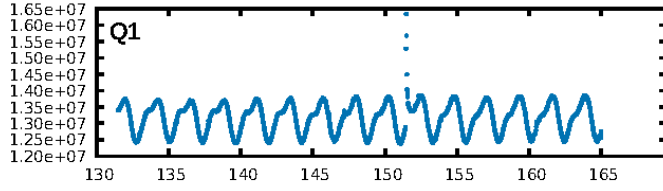
## DV Fit Results:

Period = 462.78242 [0.07568] d  
Epoch = 359.4465 [0.0868] BKJD  
Rp/R\* = 0.1247 [2.4013]  
a/R\* = 243.96 [774.77]  
b = 1.00 [3.43]  
Seff = 0.18 [0.03]  
Teq = 165 [7] K  
Rp = 10.07 [193.91] Re  
a = 1.0563 [0.0772] AU  
Ag = 9179.95 [353658.04] [0.03σ]  
Teffp = 2499 [24069] K [0.10σ]

## DV Diagnostic Results:

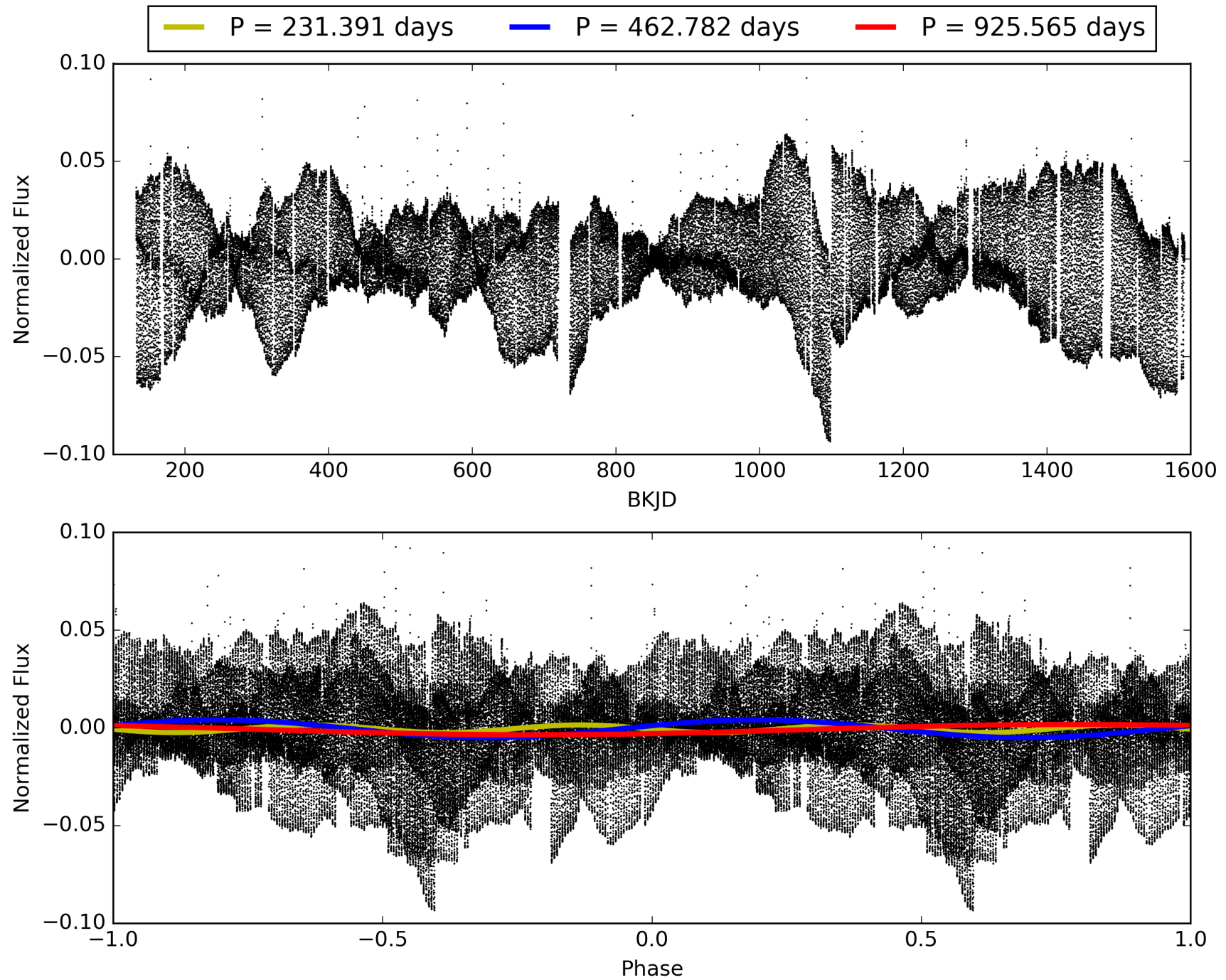
ShortPeriod-sig: 100.0% [245.76σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.2%  
ModelChiSquareGof-sig: 76.8%  
Bootstrap-pfa: 1.41e-14  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.425  
Centroid-sig: 7.8%  
Centroid-so: 1.026 arcsec [2.34σ]  
OotOffset-rm: 0.059 arcsec [0.68σ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-rm: 0.080 arcsec [0.94σ]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 008604575-02, PDC Light Curves





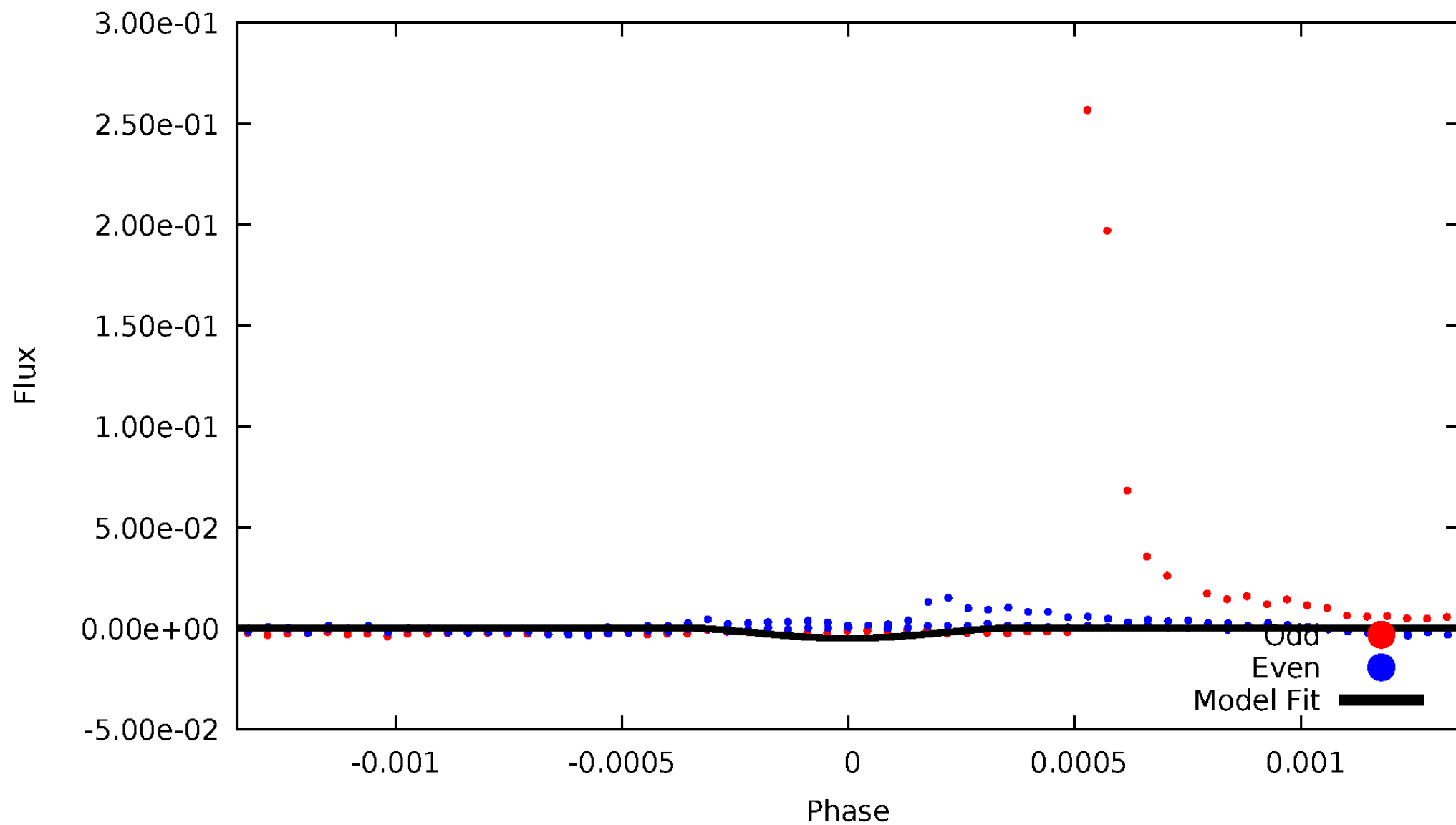
TCE 008604575-02





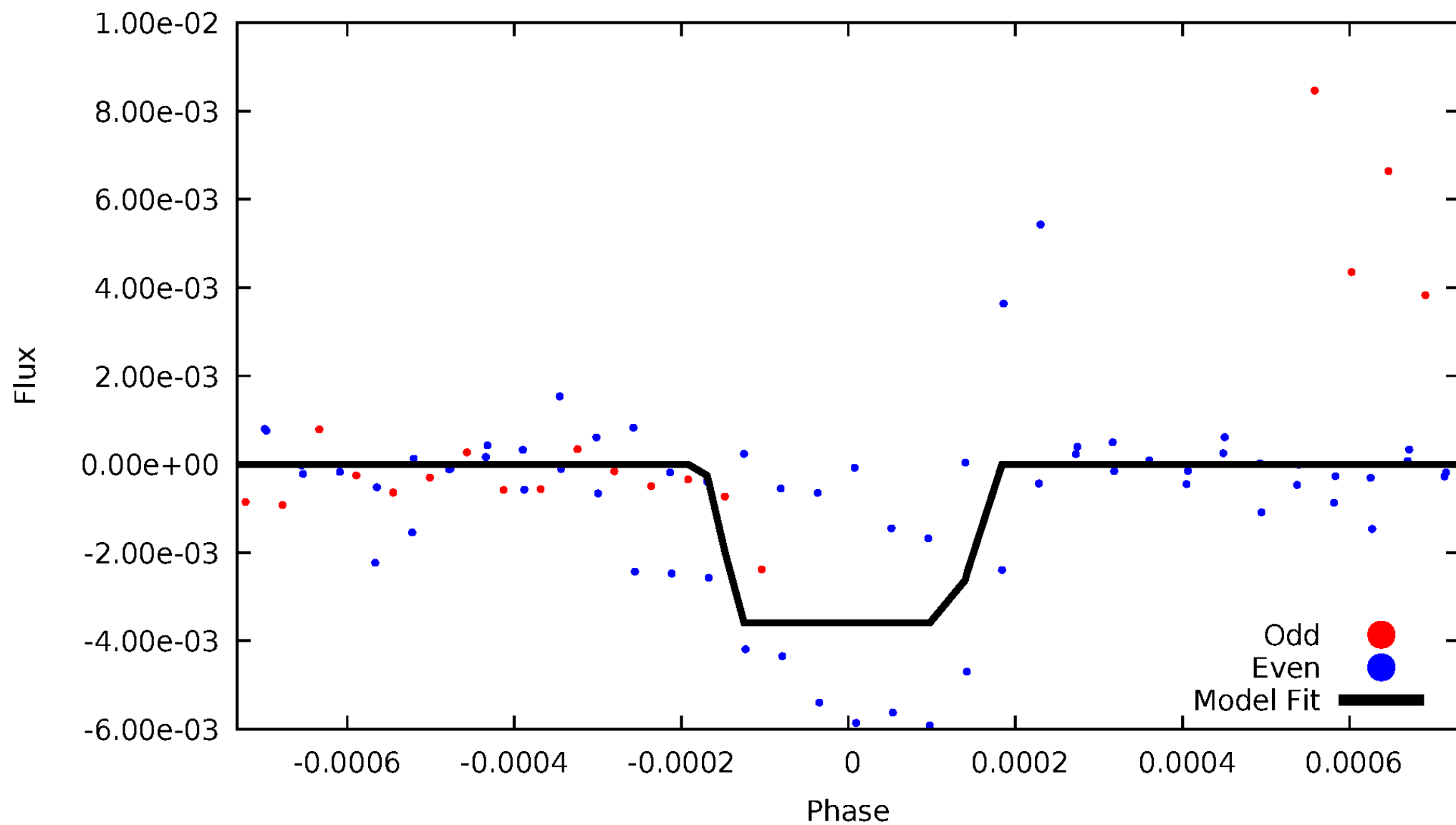
# DV Odd/Even

TCE 008604575-02



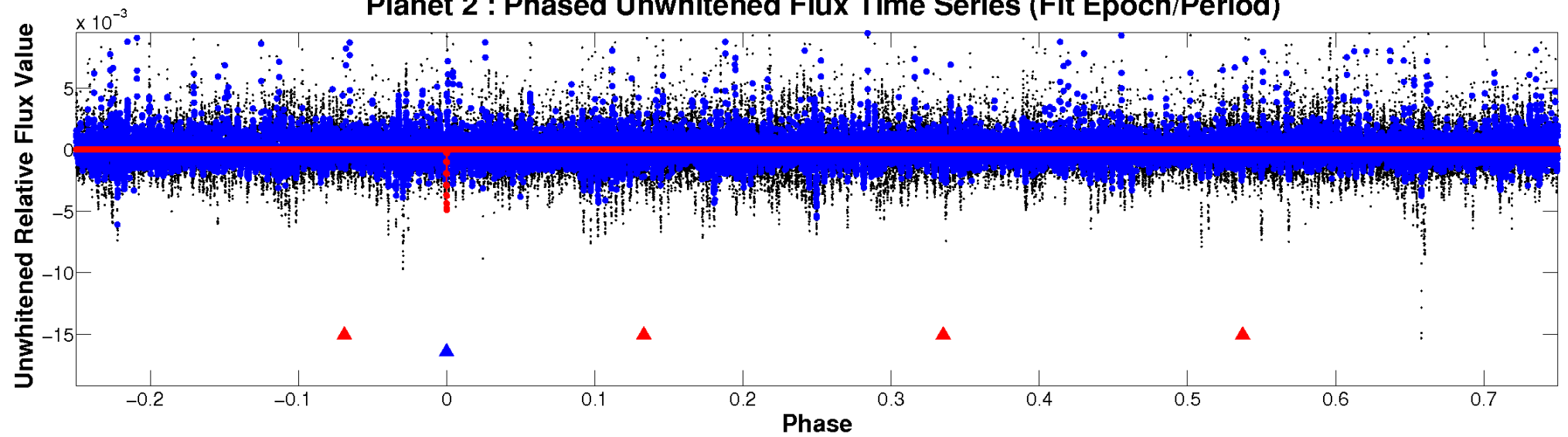
# ALT Odd/Even

TCE 008604575-02

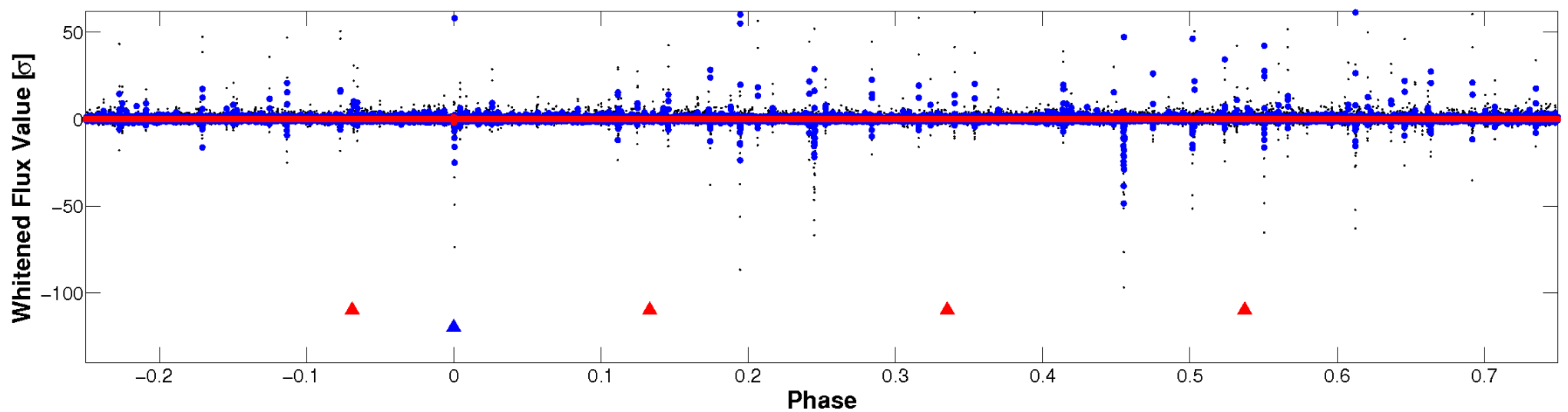


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

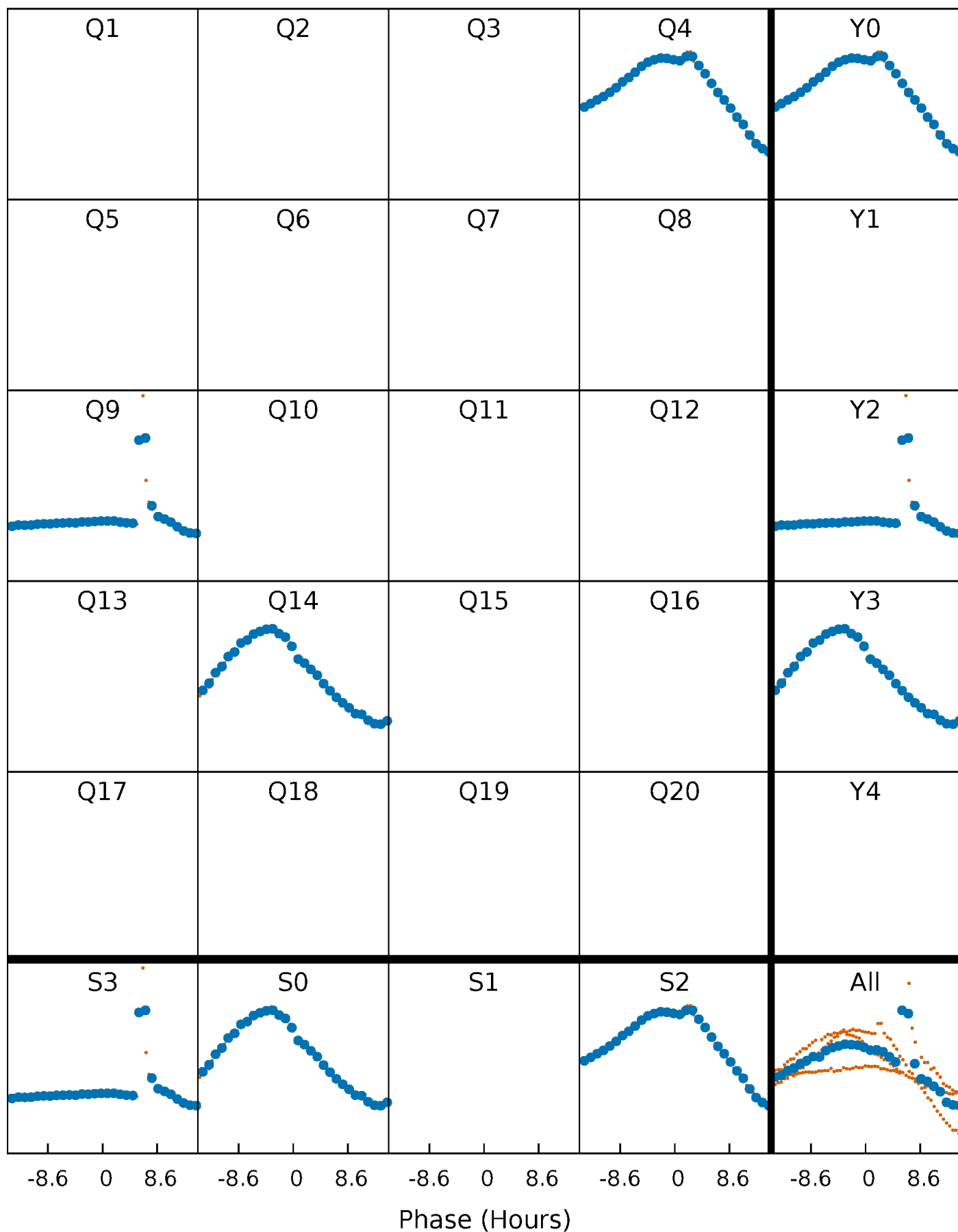


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



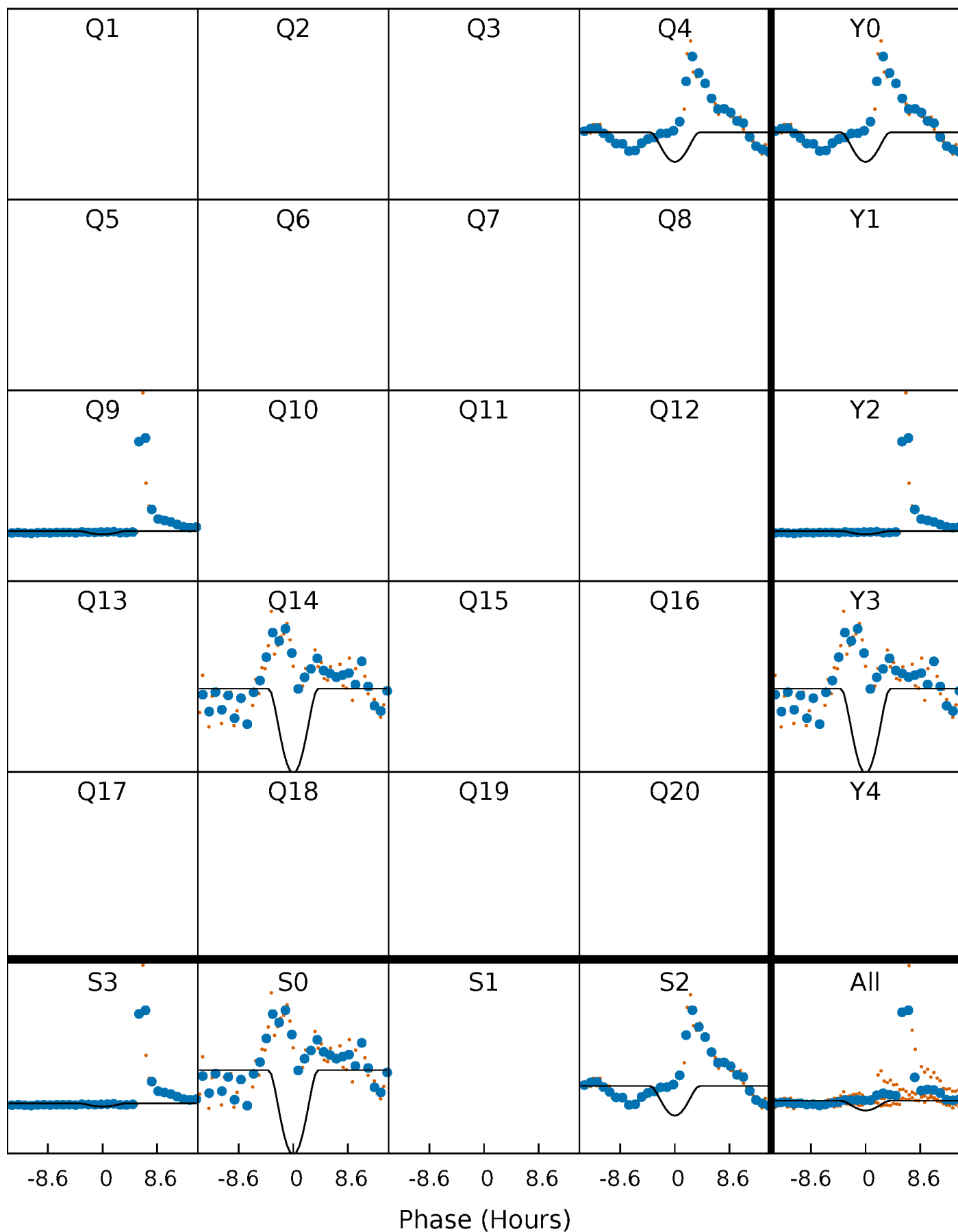
# PDC Quarter-Phased Transit Curves

TCE 008604575-02 P=462.782424 Days  $T_0=359.446546$  (BKJD)



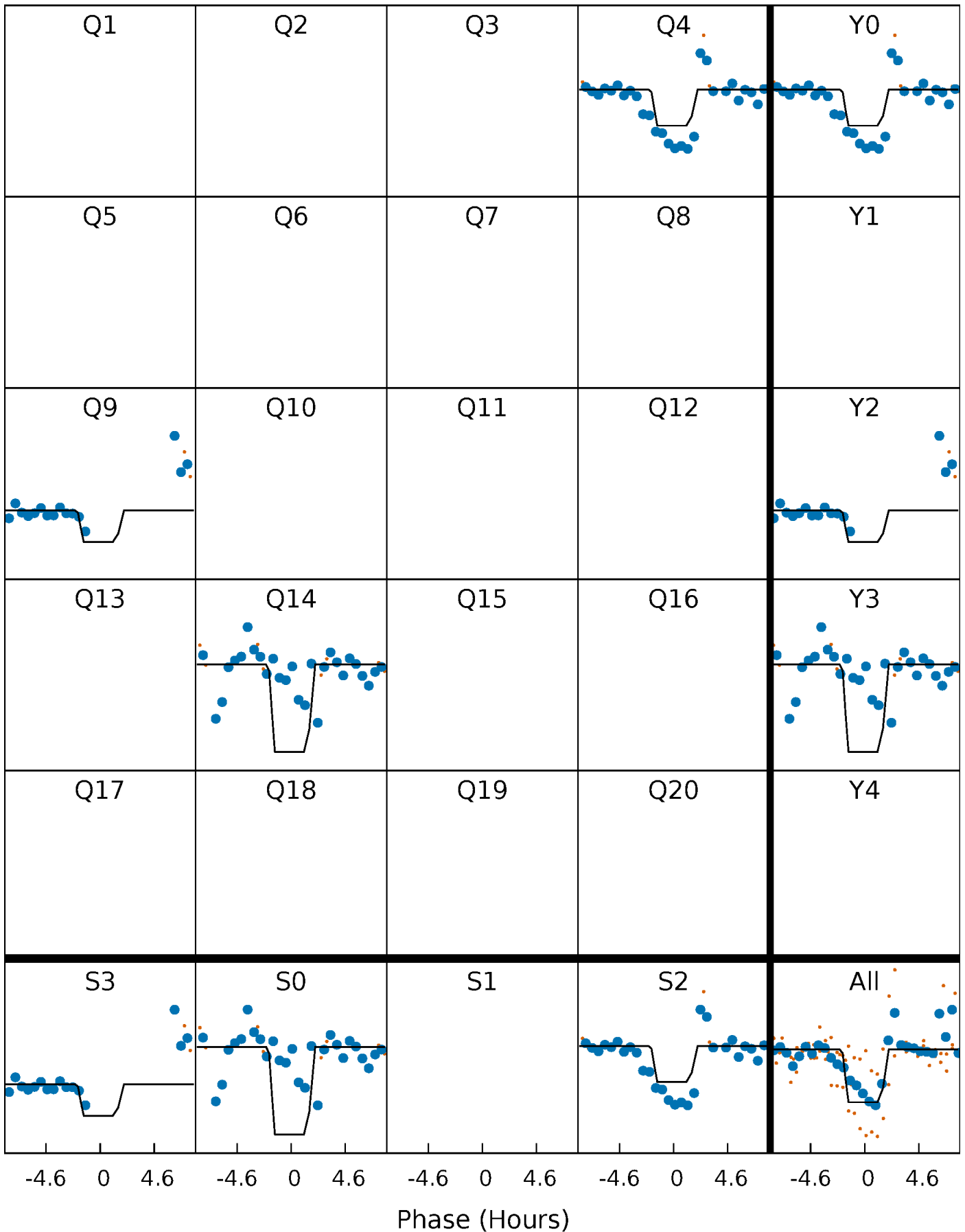
# DV Quarter-Phased Transit Curves

TCE 008604575-02     $P=462.782424$  Days     $T_0=359.446546$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

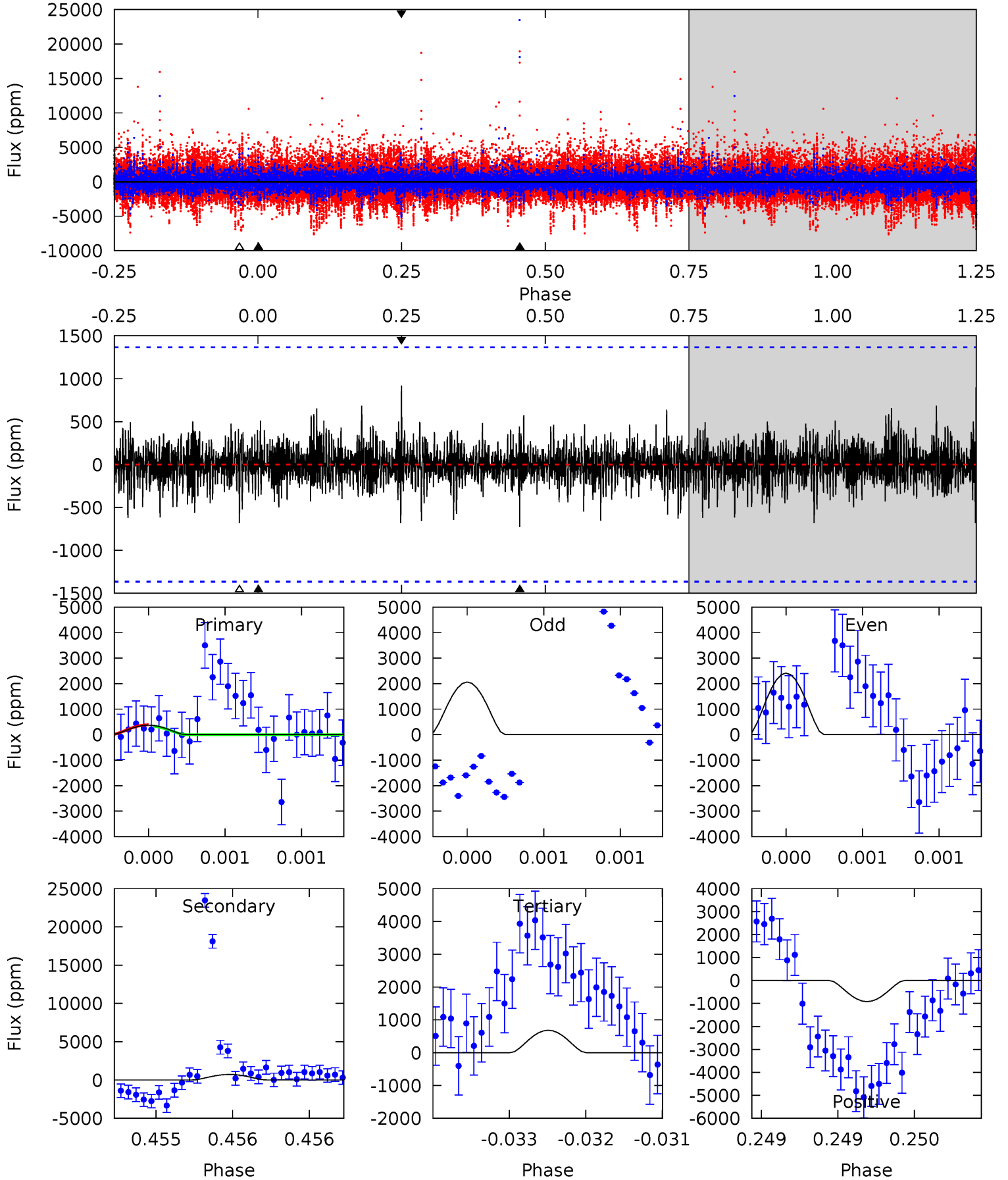
TCE 008604575-02 P=462.935924 Days  $T_0=359.442136$  (BKJD)



# DV Model-Shift Uniqueness Test

008604575-02, P = 462.782424 Days, E = 359.446546 Days

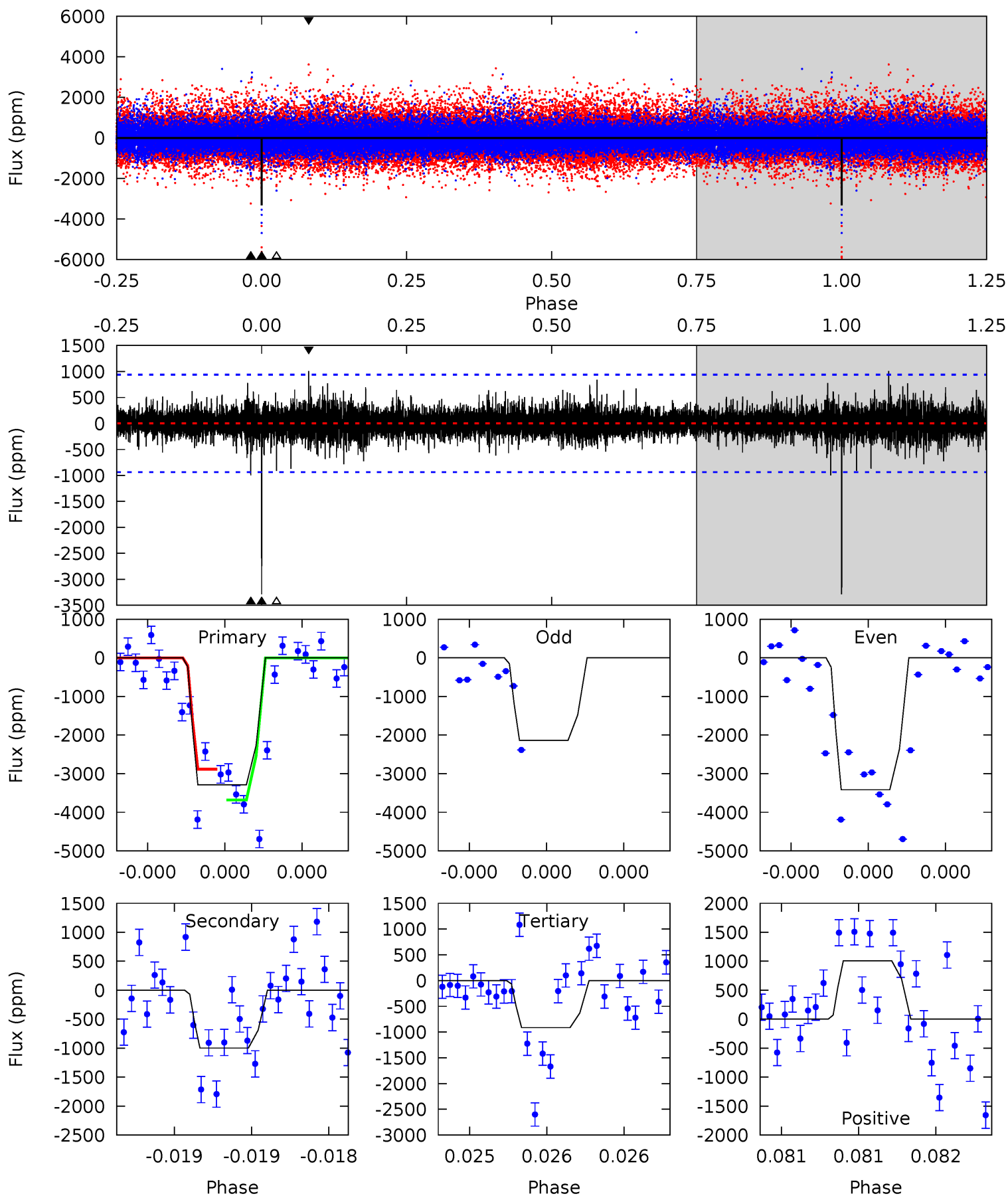
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.50	2.93	2.76	3.71	5.51	3.39	0.69	-1.26	-2.22	0.17	-0.78	0.51	0.49	0.56	0.11



# Alt Model-Shift Uniqueness Test

008604575-02, P = 462.935924 Days, E = 359.442136 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
19.7	6.00	5.49	6.05	5.63	3.57	0.93	14.3	13.7	0.51	-0.05	2.49	1.27	0.23	2.41





### Stellar Parameters For KIC 008604575

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4472^{+145}_{-145}$	$4.565^{+0.060}_{-0.020}$	$0.340^{+0.100}_{-0.300}$	$0.740^{+0.024}_{-0.063}$	$0.733^{+0.041}_{-0.050}$	$2.545^{+0.686}_{-0.183}$
	+3%/-3%	+1%/-0%	+29%/-88%	+3%/-9%	+6%/-7%	+27%/-7%
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 008604575-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-726 \pm 248$	$139.15^{+150.41}_{-98.37}$	$229^{+8}_{-8}$	$1571^{+409}_{-191}$	$22^{+223}_{-17}$
Alt.	$-998 \pm 166$	$128.30^{+144.79}_{-87.97}$	$229^{+9}_{-9}$	$1650^{+402}_{-194}$	$37^{+342}_{-29}$

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

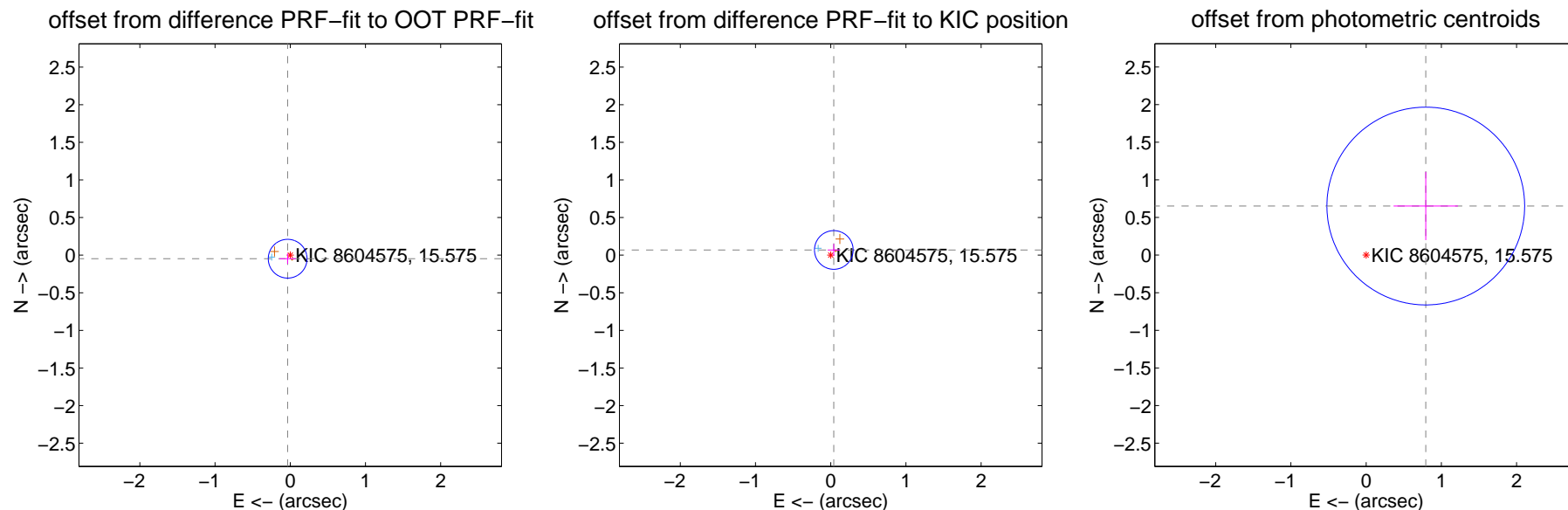
## DV Centroid Data

Supplemental centroid analysis for 008604575-02. Kepler magnitude: 15.57. Transit SNR 7.73

There are 1 quarters with good PRF difference image offsets

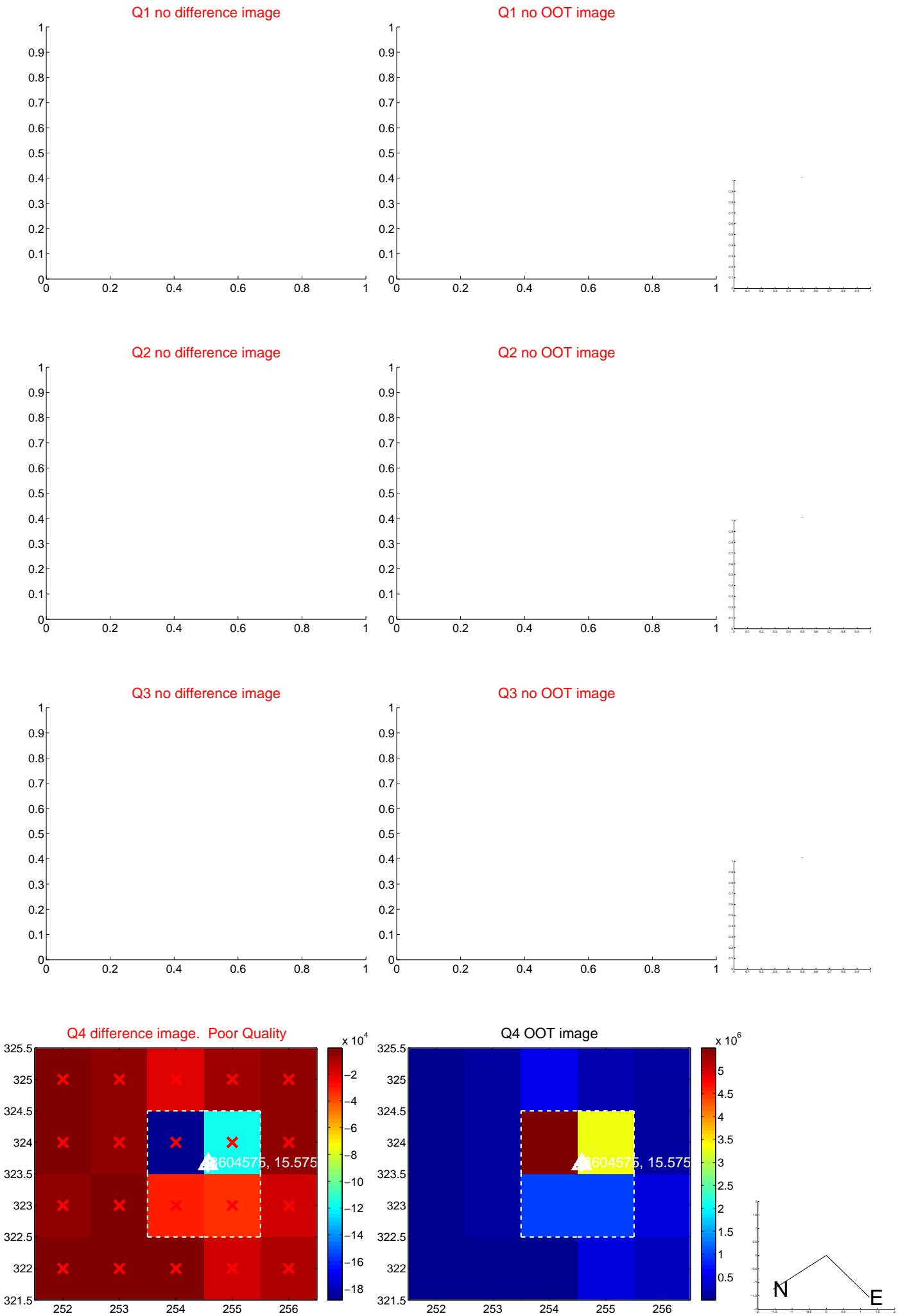
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.059 \pm 0.086$	0.68	$0.035 \pm 0.110$	$-0.047 \pm 0.069$
PRF-fit source offset from KIC position	$0.080 \pm 0.086$	0.94	$-0.041 \pm 0.081$	$0.069 \pm 0.080$
photometric centroid source offset	$1.03 \pm 0.44$	2.34	$-0.79 \pm 0.43$	$0.65 \pm 0.45$



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.

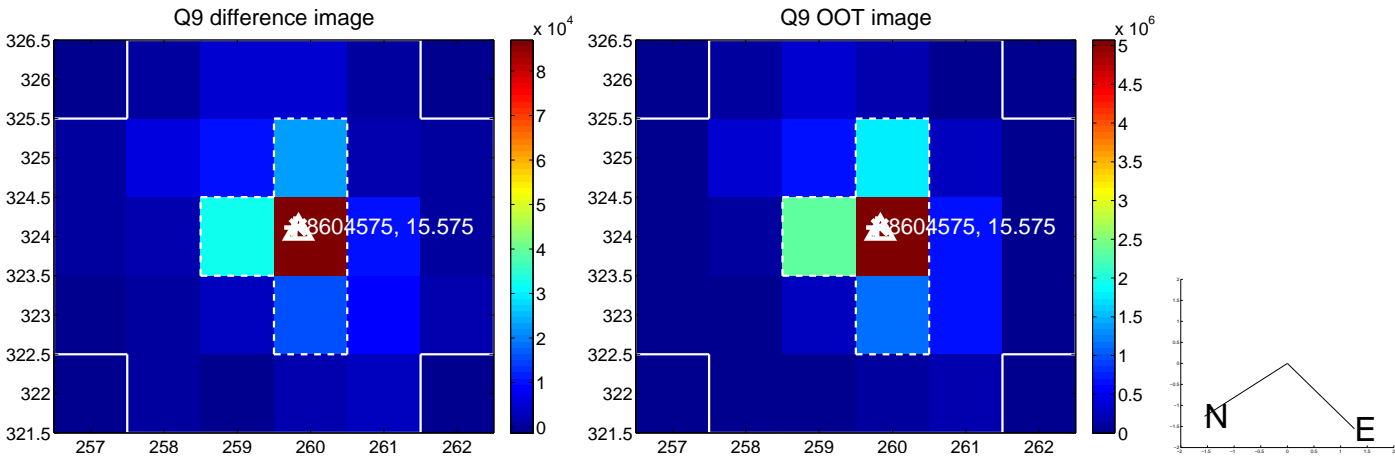
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



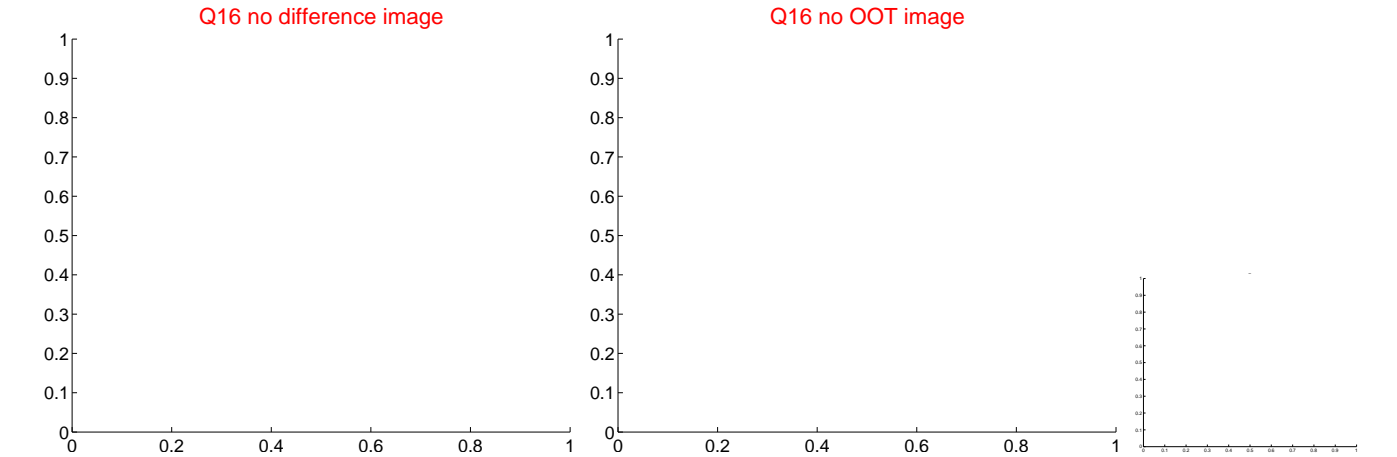
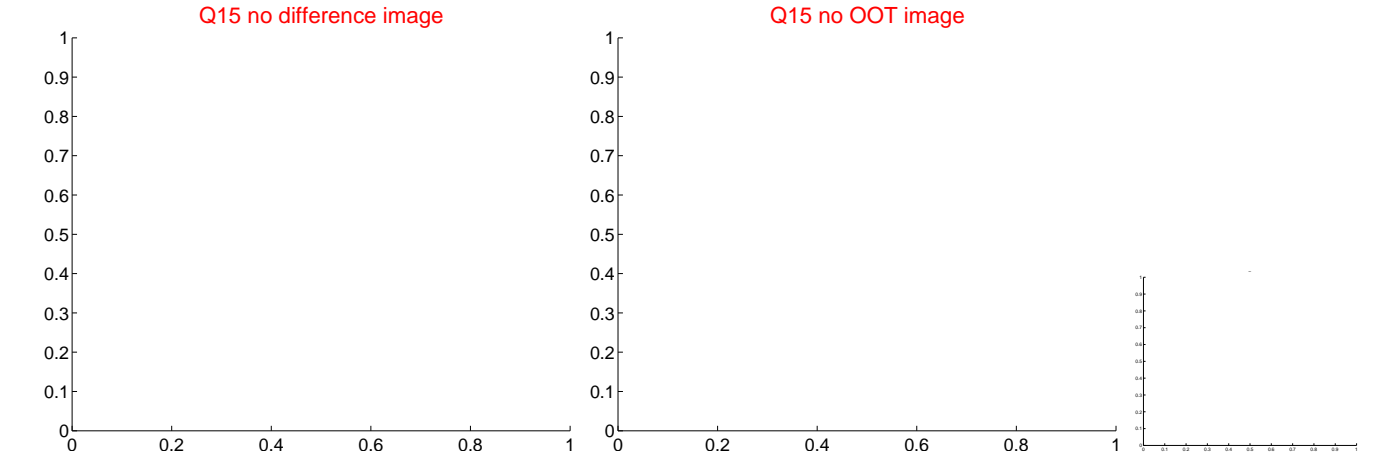
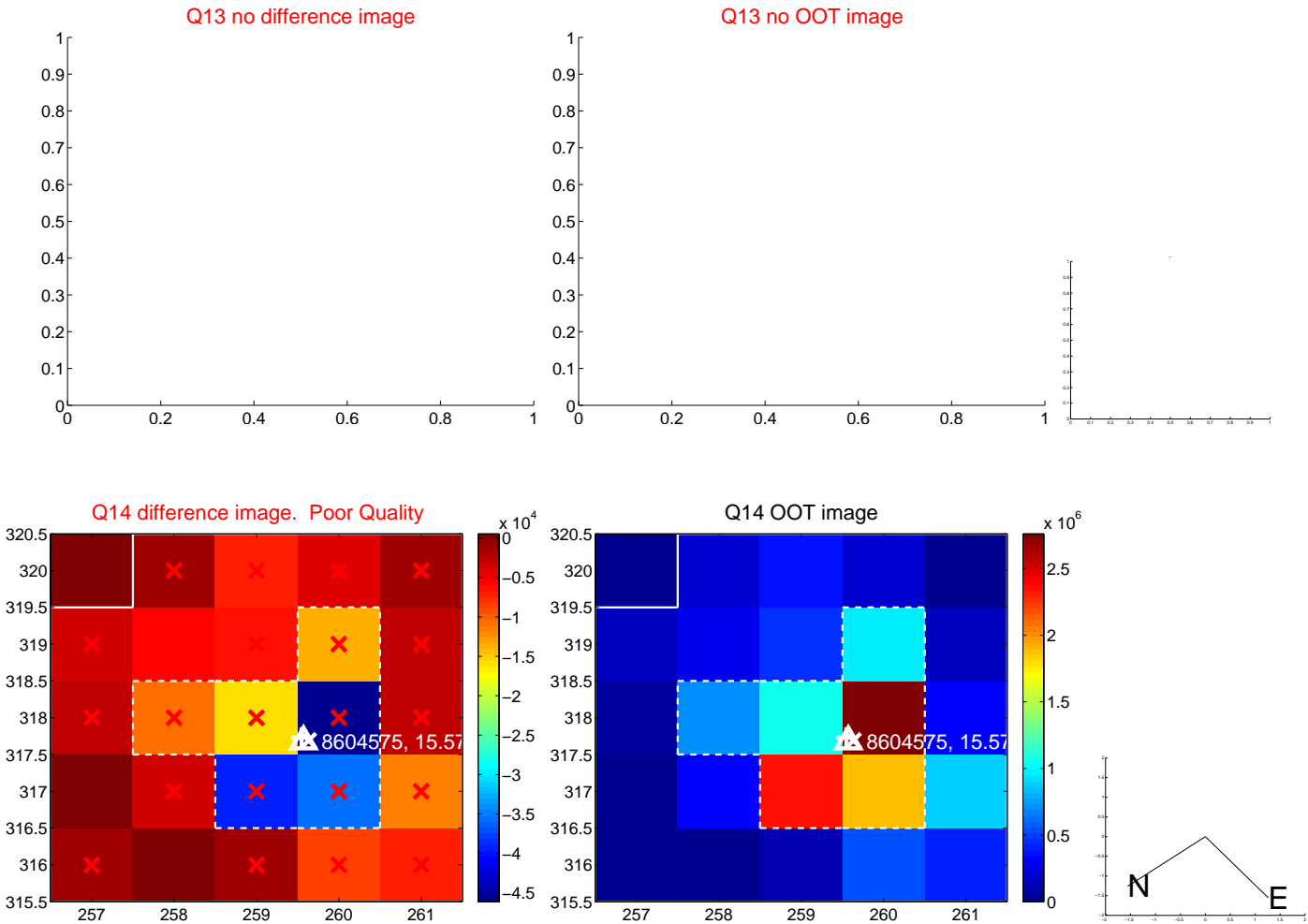
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



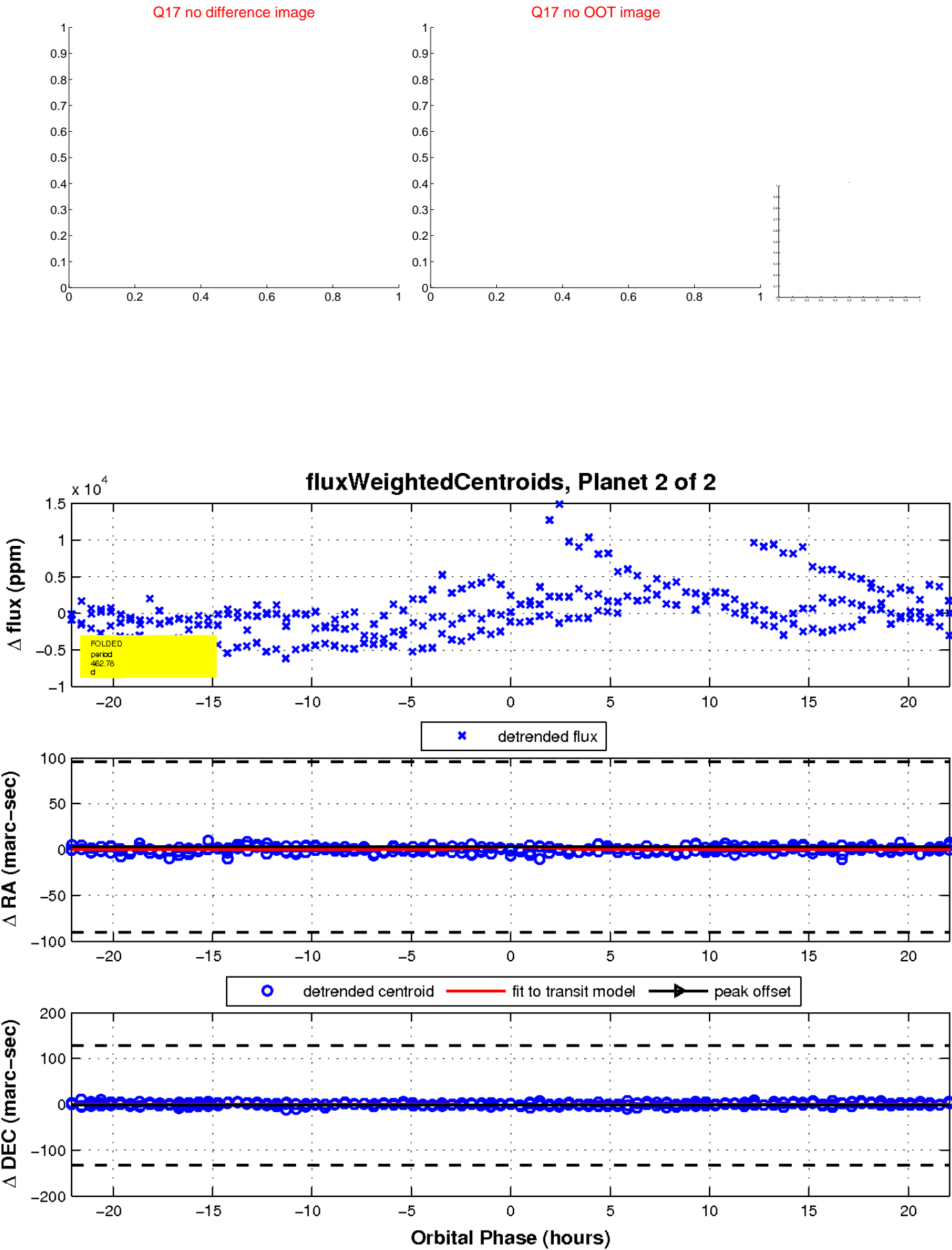
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

