

# KIC 007841986

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007841986-01	OBS	6045.01	10.733697	141.112522	6326.2	7.616	525.4	451.4	2.00	5971	18.98	445.87
007841986-02	OBS	No	10.733690	137.075353	5023.2	8.941	444.8	392.4	2.00	5971	16.72	445.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007841986-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—CENT_UNRESOLVED_OFFSET
007841986-02	OBS	FP	0.00	1	0	1	0	SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET

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

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

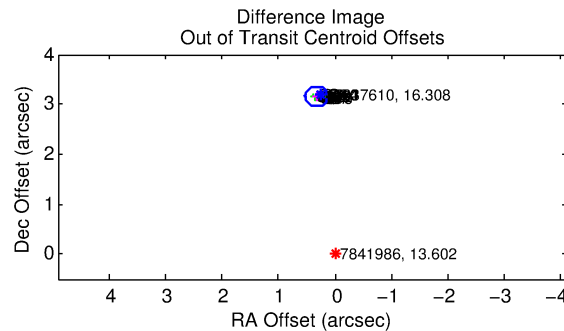
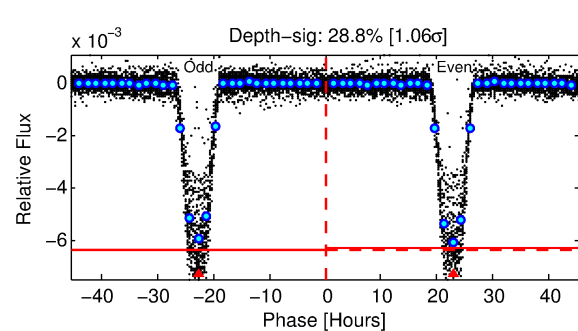
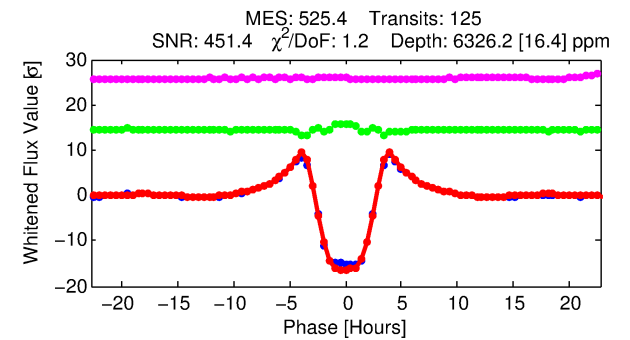
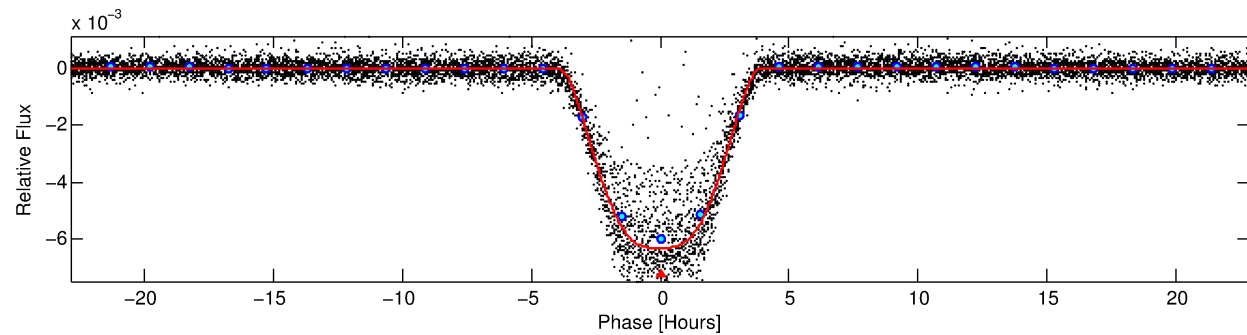
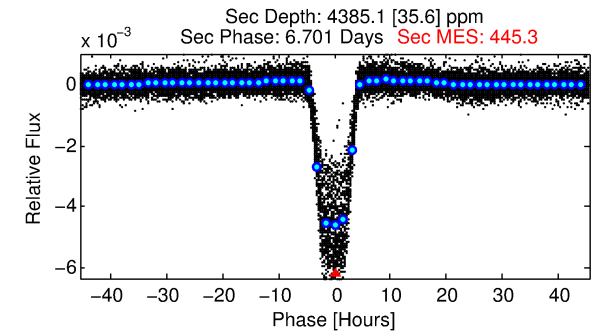
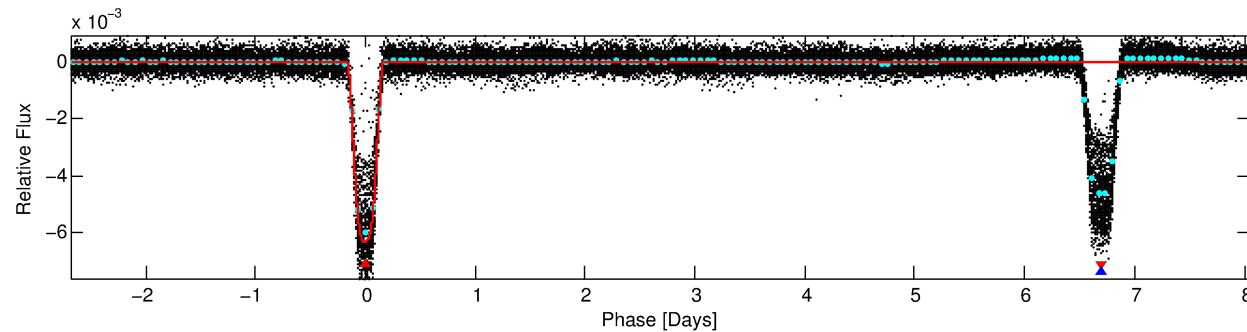
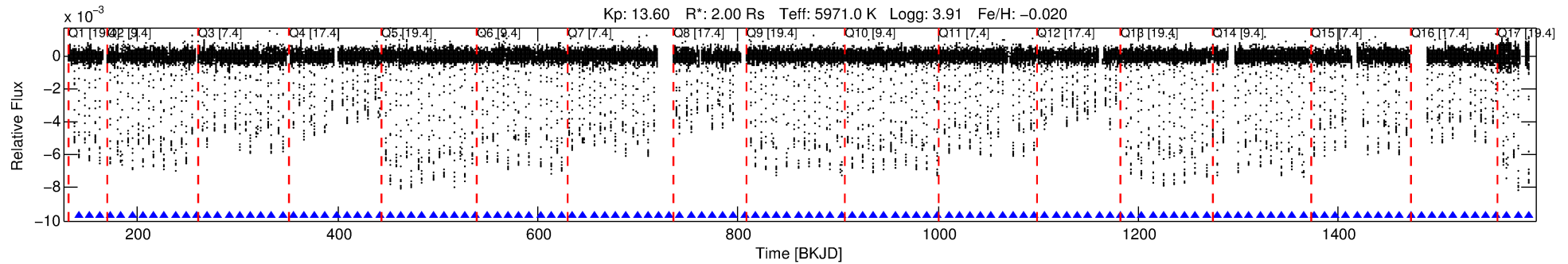
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007841986-01

No Significant Match Found

# DV One-Page Summary

KIC: 7841986 Candidate: 1 of 2 Period: 10.734 d  
KOI: K06045.01 Corr: 0.999



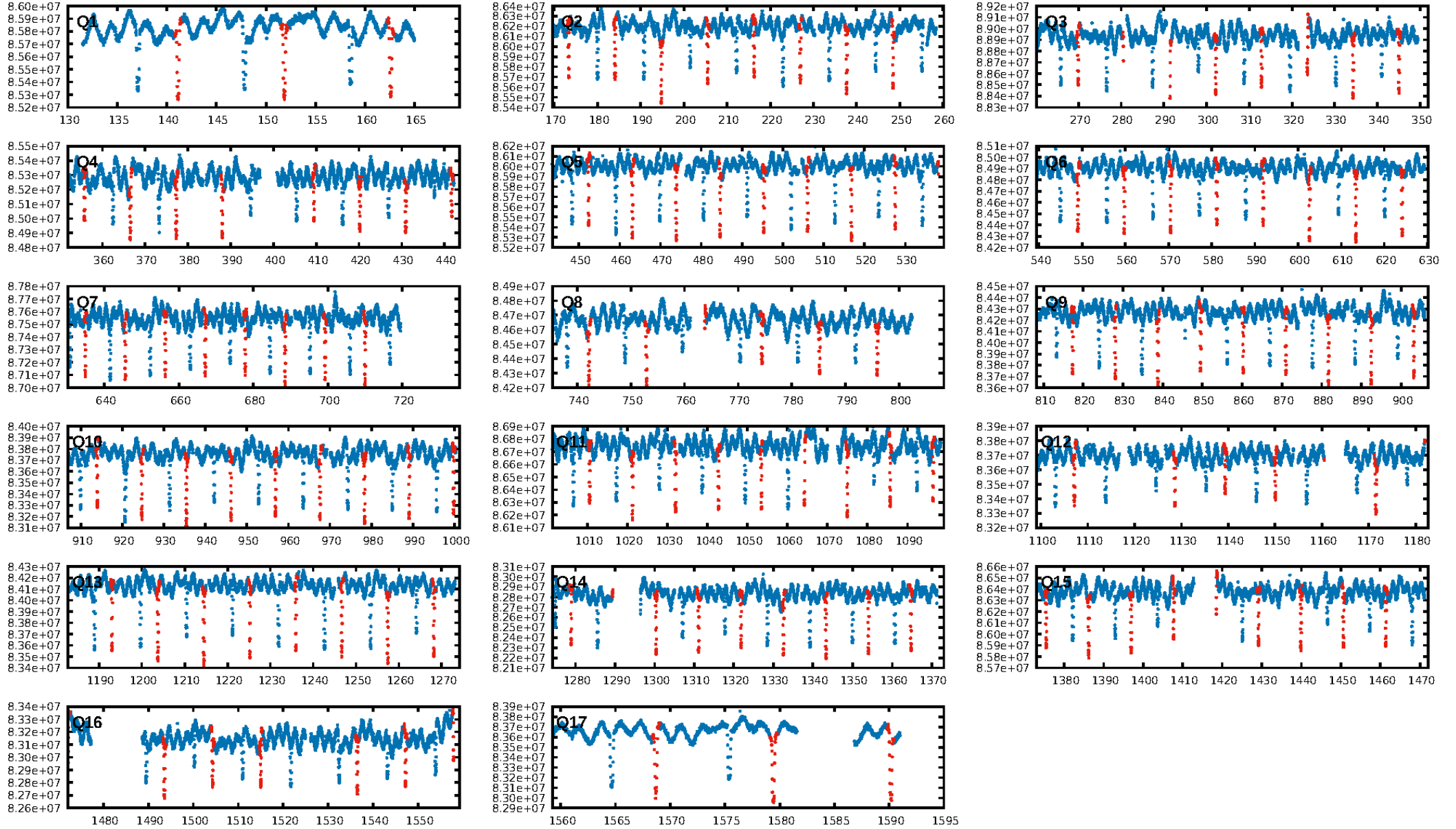
## DV Fit Results:

Period = 10.73370 [0.00000] d  
Epoch = 141.1125 [0.0003] BKJD  
Rp/R\* = 0.0868 [0.0001]  
a/R\* = 6.63 [0.02]  
b = 0.90 [0.00]  
Seff = 445.87 [337.96]  
Teq = 1172 [222] K  
Rp = 18.98 [8.23] Re  
a = 0.1012 [0.0455] AU  
Ag = 68.61 [51.18] [1.32σ]  
Teffp = 5214 [176] K [14.27σ]

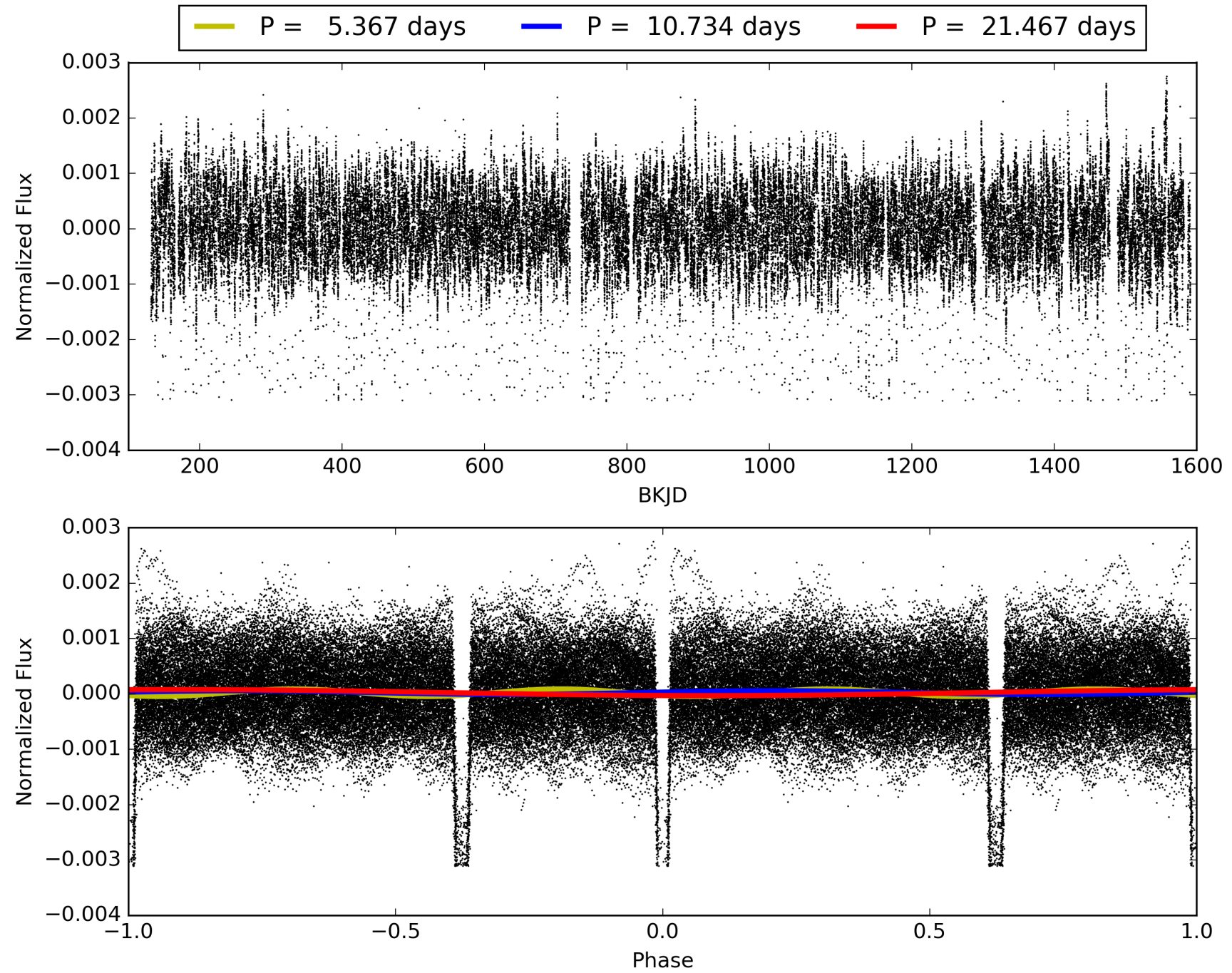
## DV Diagnostic Results:

**ShortPeriod-sig: 0.0% [0.00σ]**  
LongPeriod-sig: N/A  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 46.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [119/119]  
**GhostDiagnostic-chr: 0.8853**  
  
Centroid-sig: 0.0%  
Centroid-so: 3.861 arcsec [274.67σ]  
OotOffset-rm: 3.178 arcsec [47.35σ]  
KicOffset-rm: 3.179 arcsec [47.26σ]  
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 007841986-01, PDC Light Curves

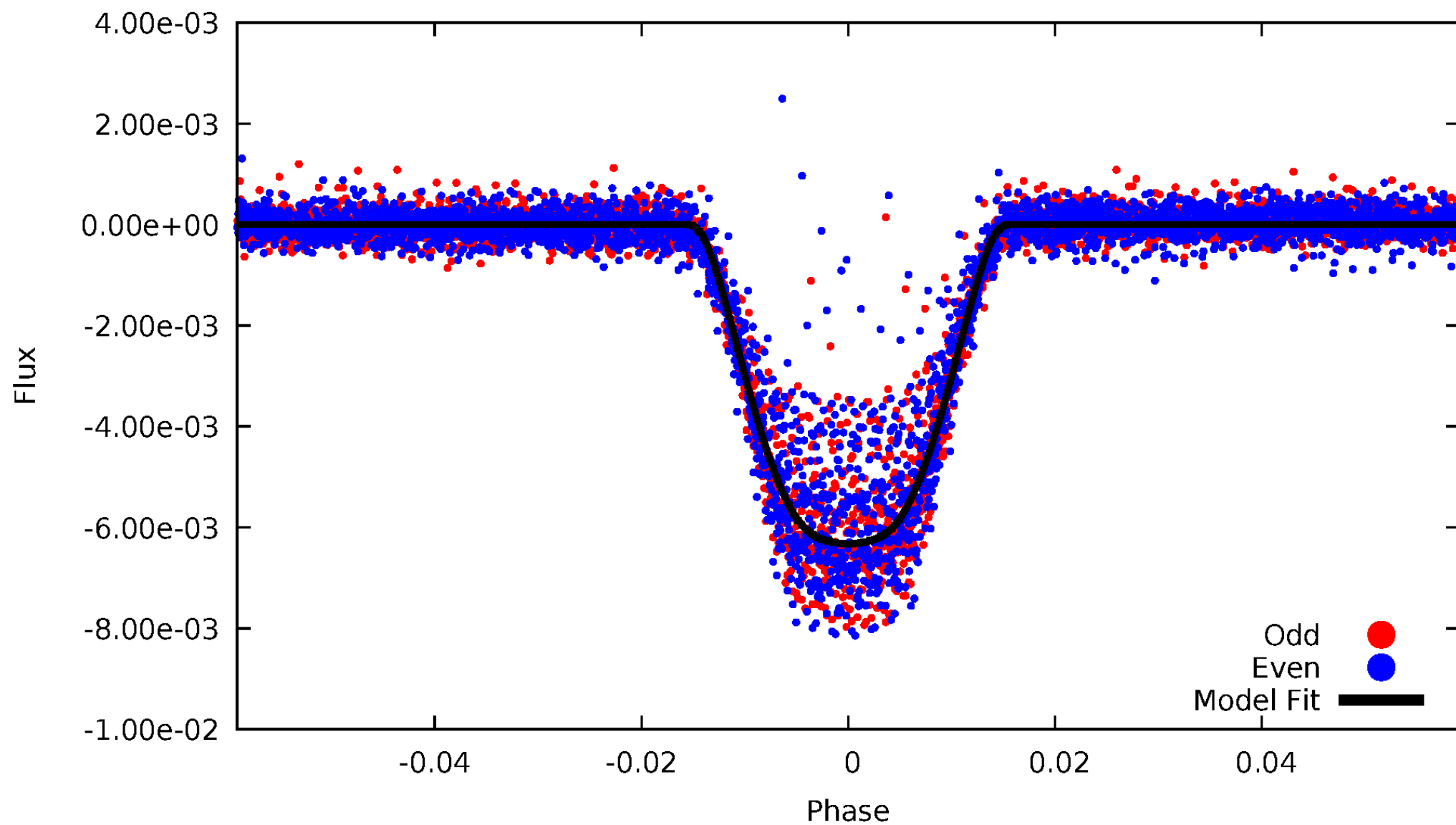


TCE 007841986-01



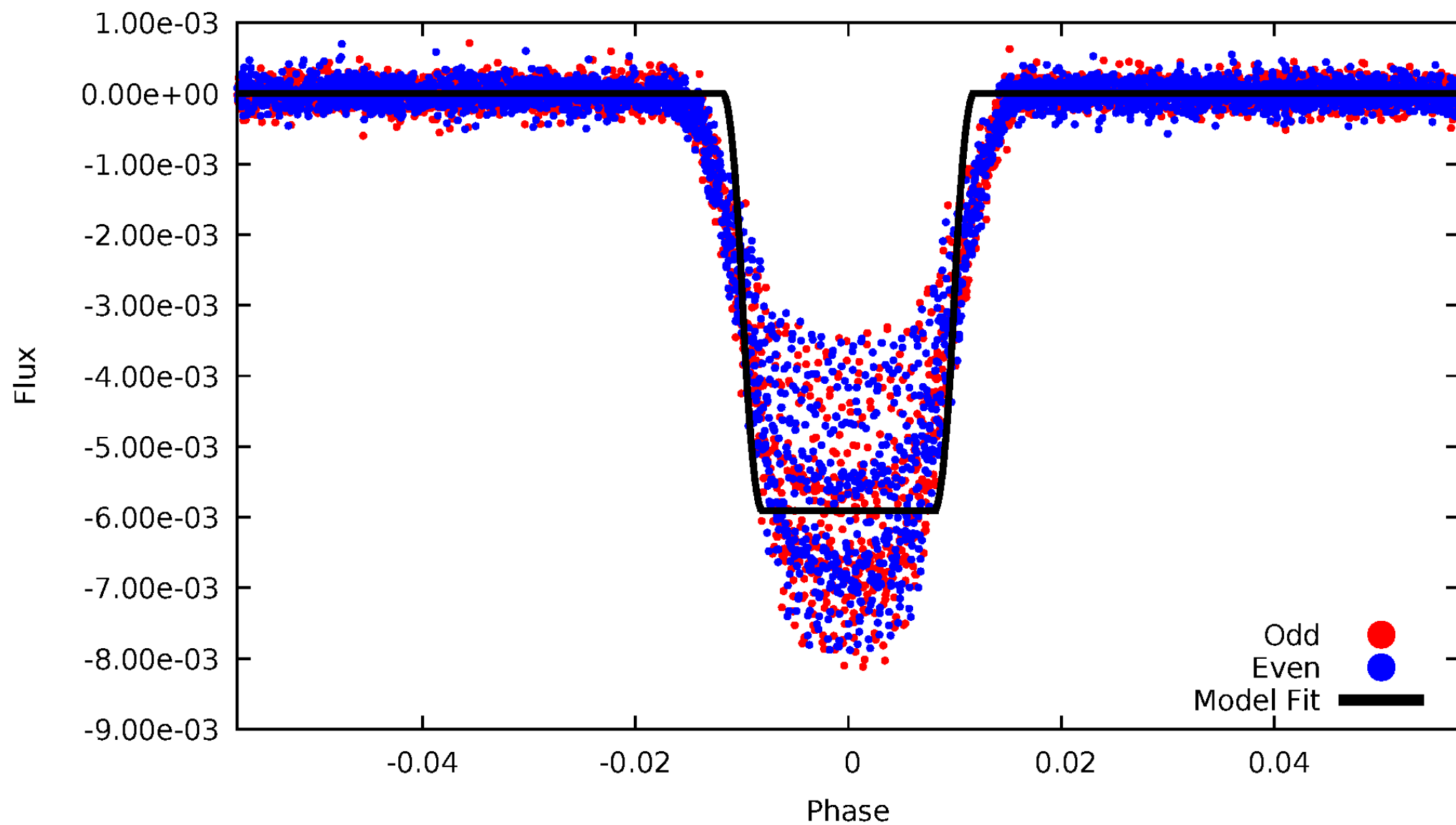
# DV Odd/Even

TCE 007841986-01



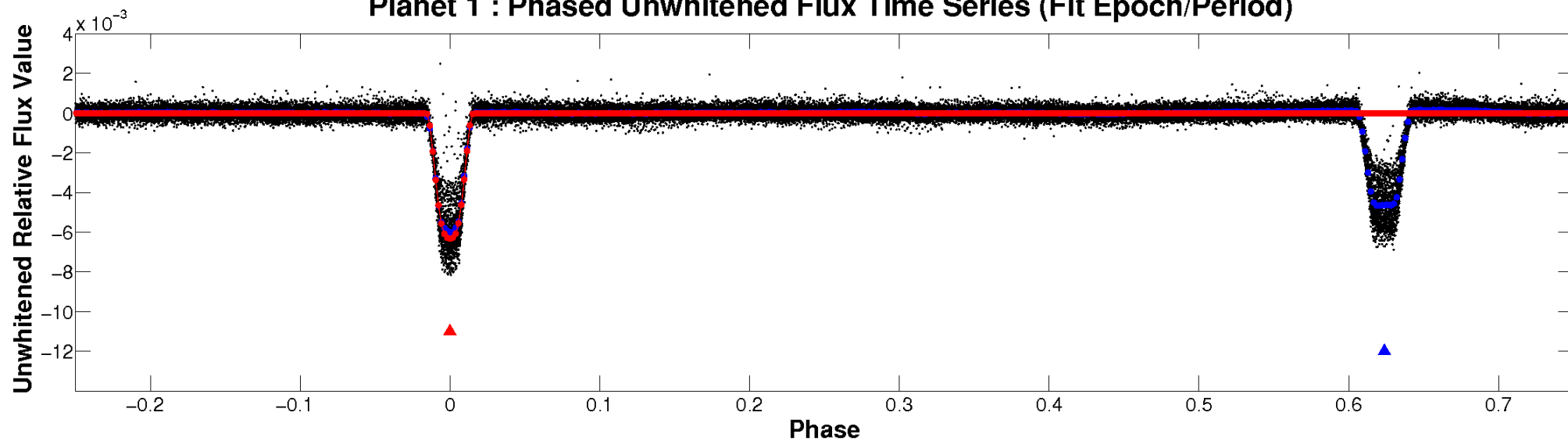
# ALT Odd/Even

TCE 007841986-01

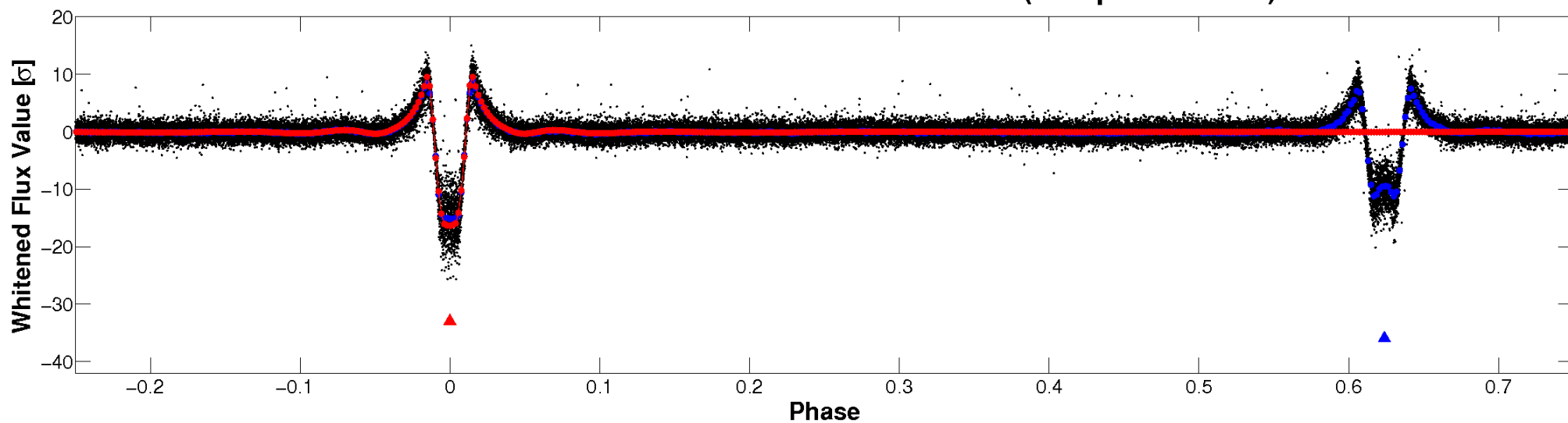


# Non-Whitened Vs. Whitened Light Curve

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



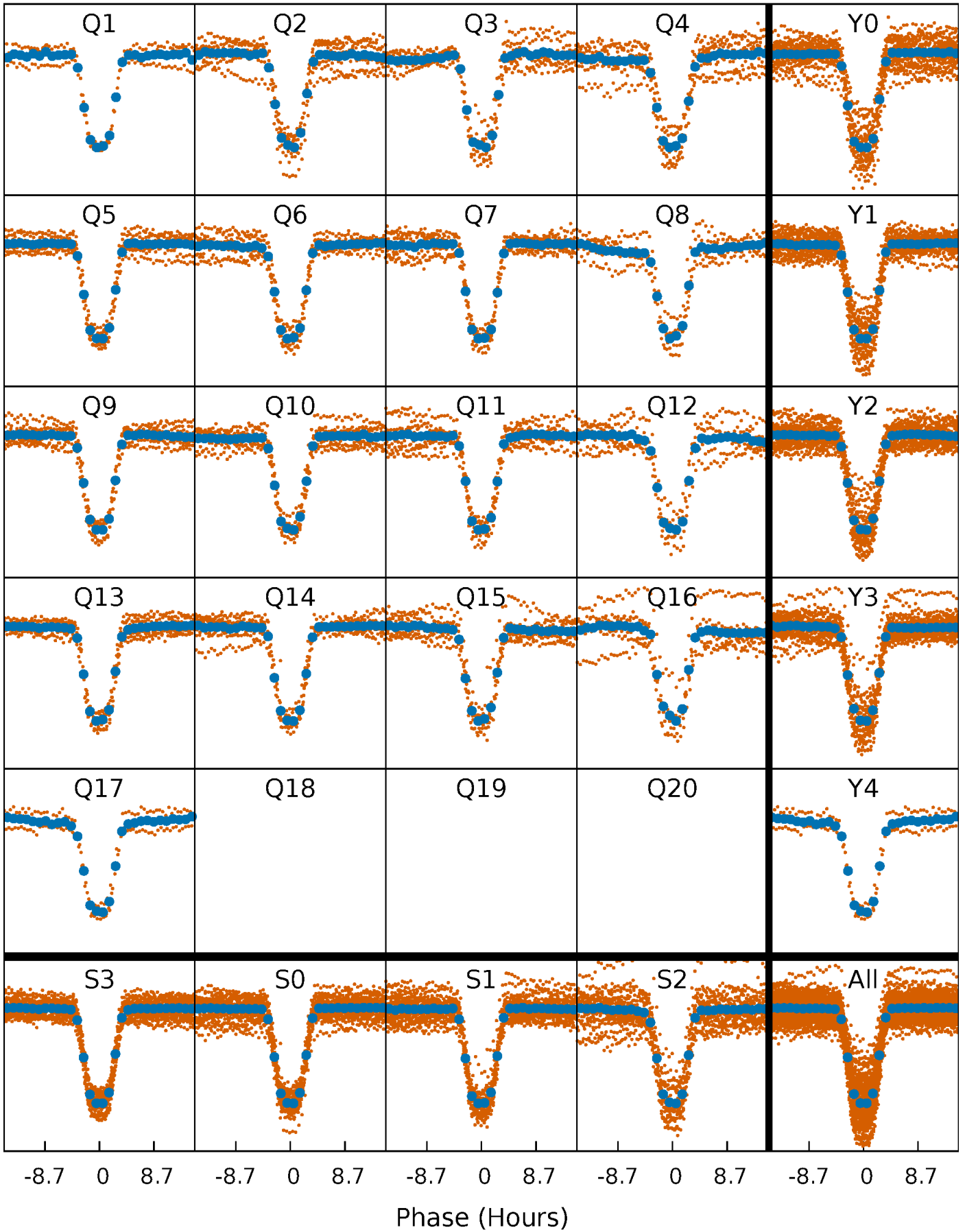
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

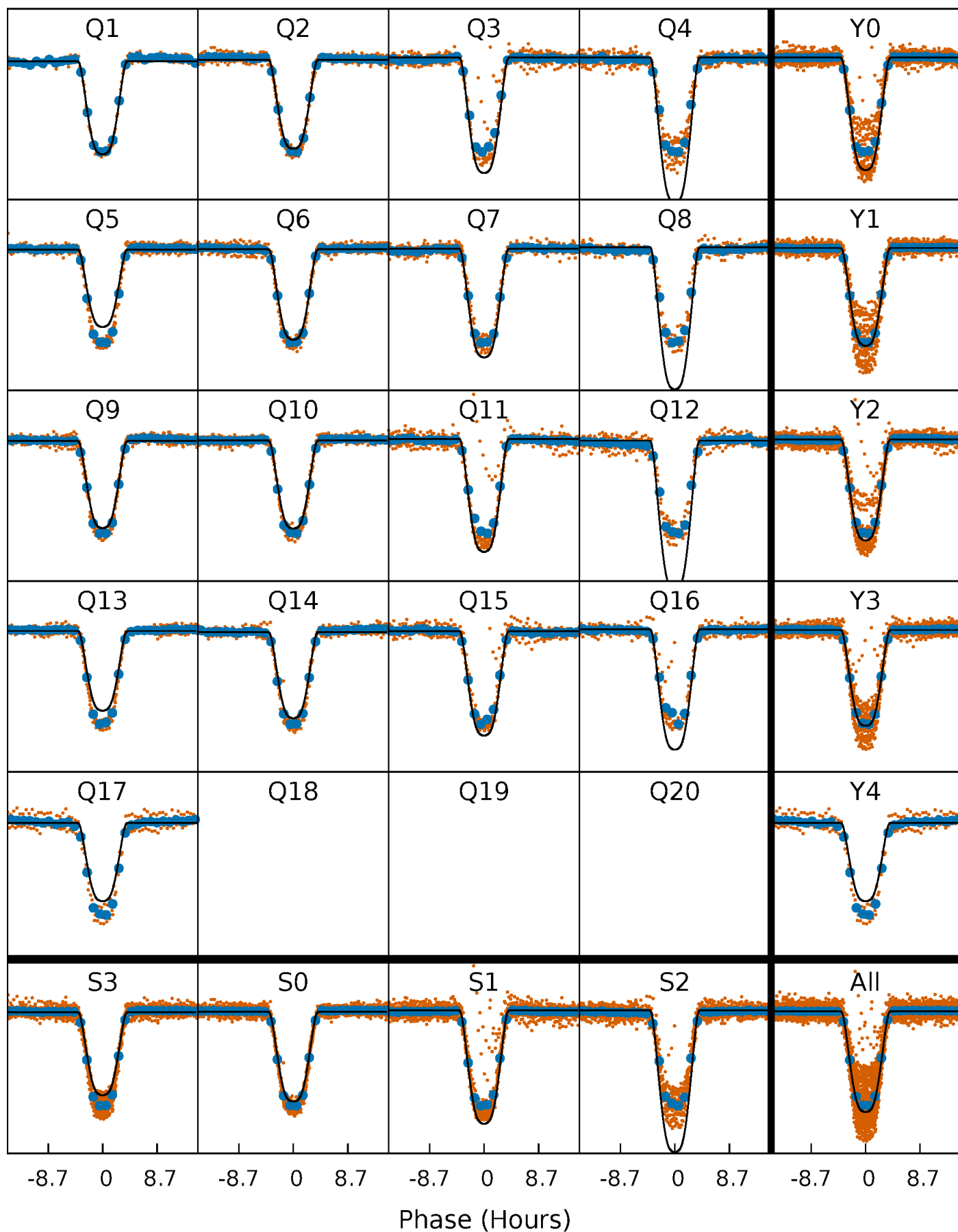
TCE 007841986-01 P= 10.733697 Days  $T_0=141.112522$  (BKJD)





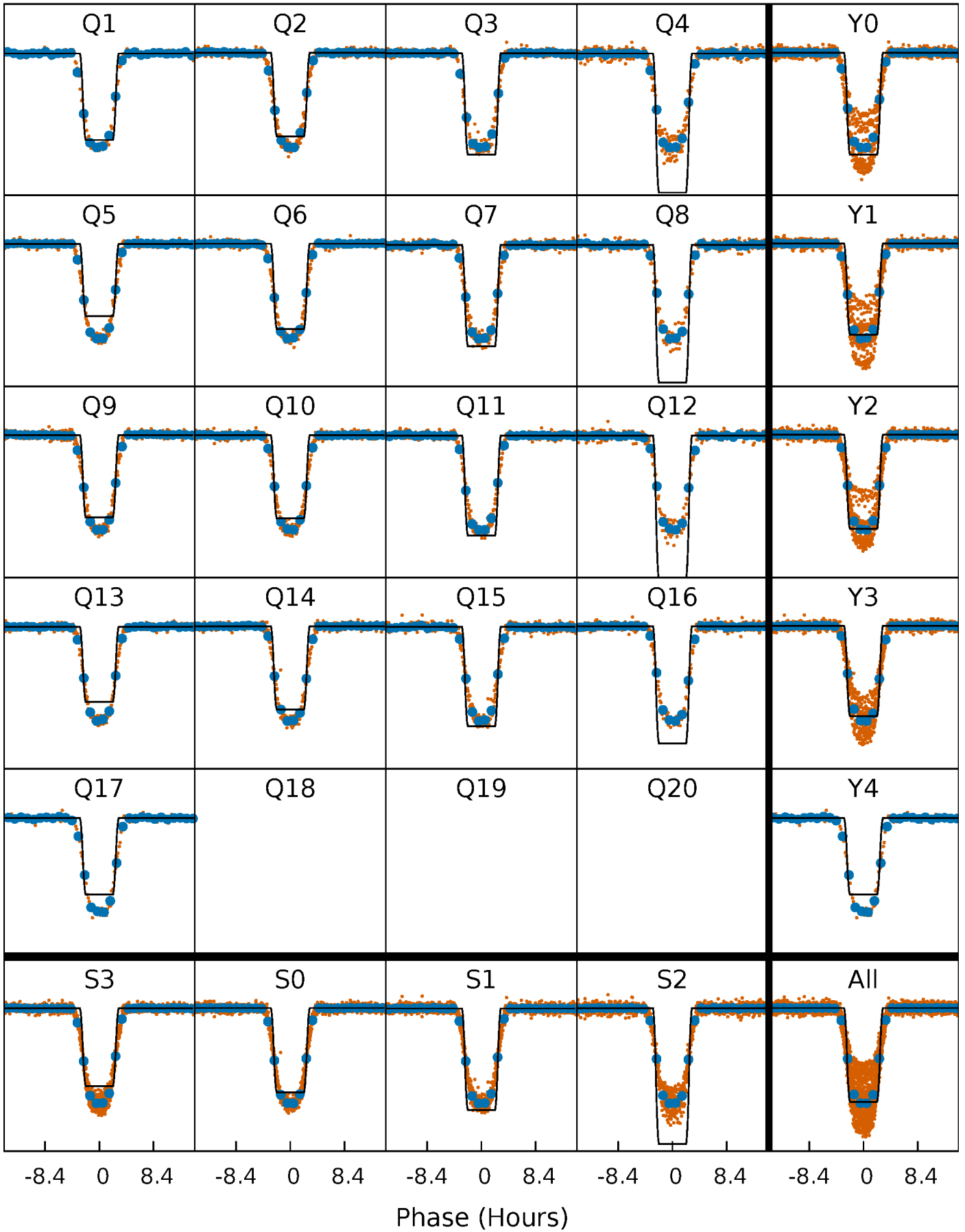
# DV Quarter-Phased Transit Curves

TCE 007841986-01 P= 10.733697 Days  $T_0=141.112522$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

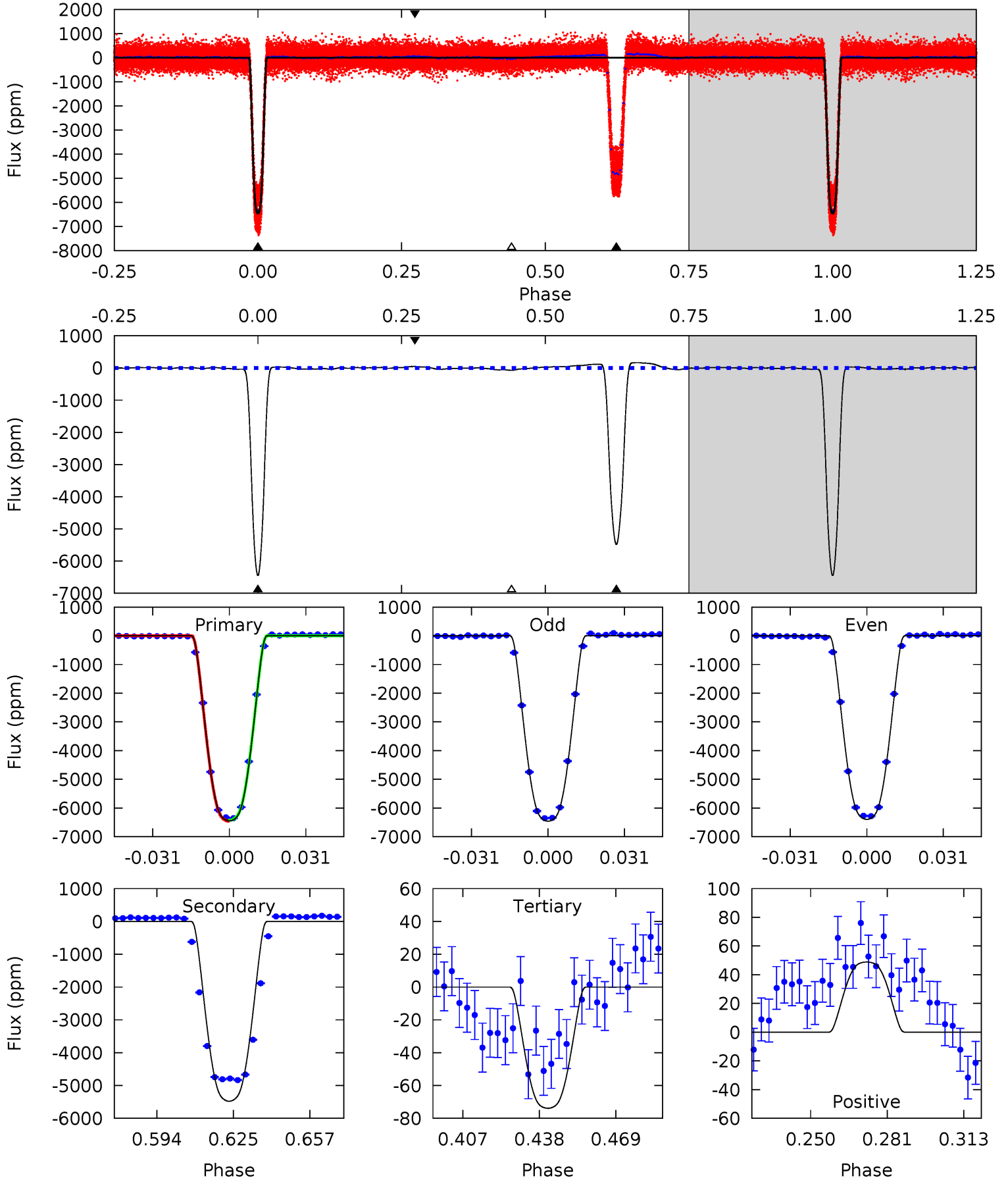
TCE 007841986-01 P= 10.733635 Days  $T_0=141.116468$  (BKJD)



# DV Model-Shift Uniqueness Test

007841986-01, P = 10.733697 Days, E = 130.378825 Days

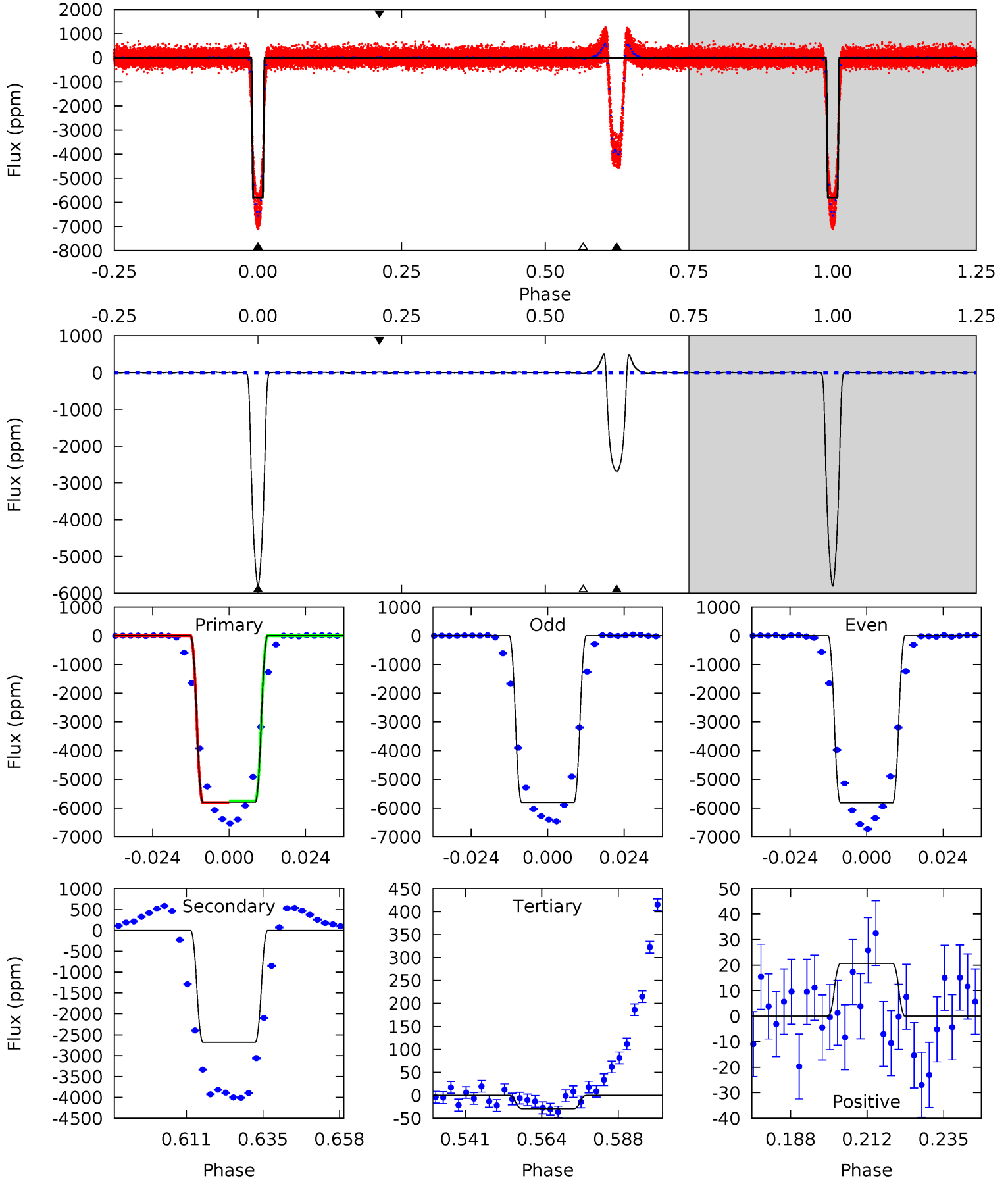
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1088	924.7	12.5	8.24	4.80	2.15	7.51	1076	1080	912.3	916.5	5.28	0.93	0.03	0.99



# Alt Model-Shift Uniqueness Test

007841986-01, P = 10.733635 Days, E = 130.382833 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
995.6	459.6	4.96	3.54	4.86	2.27	7.65	990.6	992.0	454.6	456.0	1.23	0.94	0.08	0



### Stellar Parameters For KIC 007841986

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5971^{+183}_{-201}$	$3.914^{+0.448}_{-0.112}$	$-0.020^{+0.250}_{-0.300}$	$2.003^{+0.400}_{-0.868}$	$1.202^{+0.169}_{-0.232}$	$0.211^{+0.898}_{-0.071}$
	+3%/-3%	+11%/-3%	+1250%/-1500%	+20%/-43%	+14%/-19%	+426%/-34%
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 007841986-01 / KOI 6045.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-5479 \pm 6$	$18.40^{+2.57}_{-4.29}$	$1595^{+124}_{-184}$	$5535^{+168}_{-166}$	$94^{+56}_{-21}$
Alt.	$-2679 \pm 6$	$16.43^{+2.01}_{-3.91}$	$1601^{+116}_{-185}$	$4995^{+138}_{-147}$	$57^{+37}_{-11}$

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

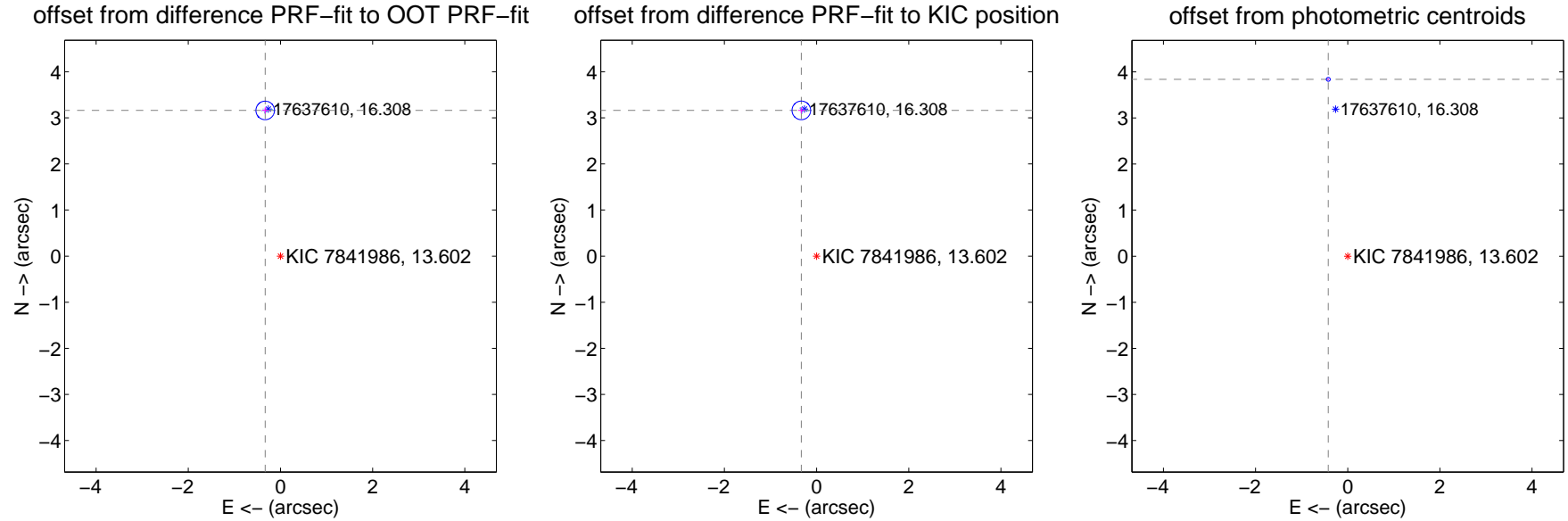
## DV Centroid Data

Supplemental centroid analysis for 007841986-01. Kepler magnitude: 13.60. Transit SNR 451.38

There are 17 quarters with good PRF difference image offsets

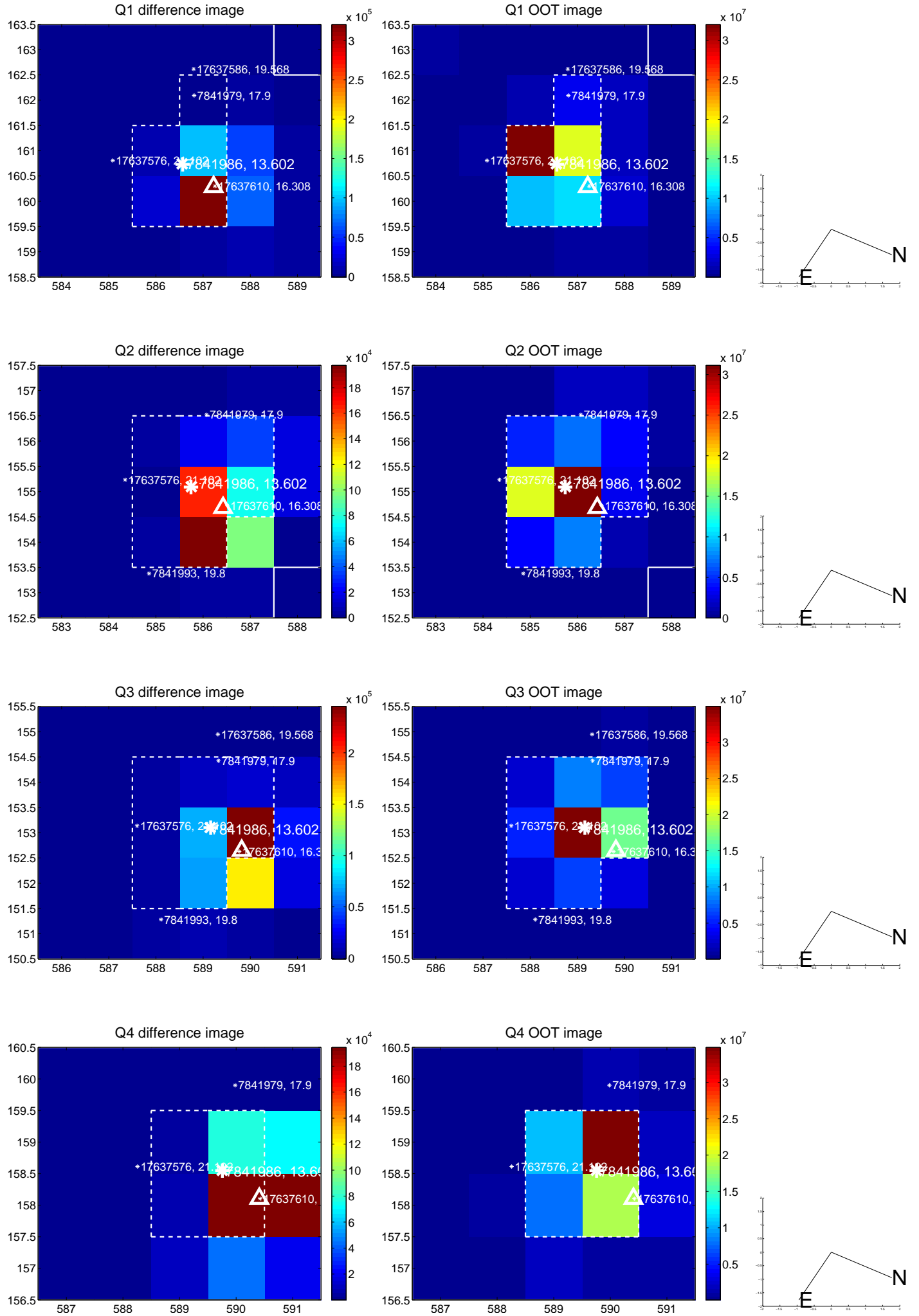
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.178 \pm 0.067$	47.35	$0.331 \pm 0.068$	$3.161 \pm 0.067$
PRF-fit source offset from KIC position	$3.179 \pm 0.067$	47.26	$0.331 \pm 0.068$	$3.162 \pm 0.067$
photometric centroid source offset	$3.86 \pm 0.01$	274.67	$0.42 \pm 0.01$	$3.84 \pm 0.01$



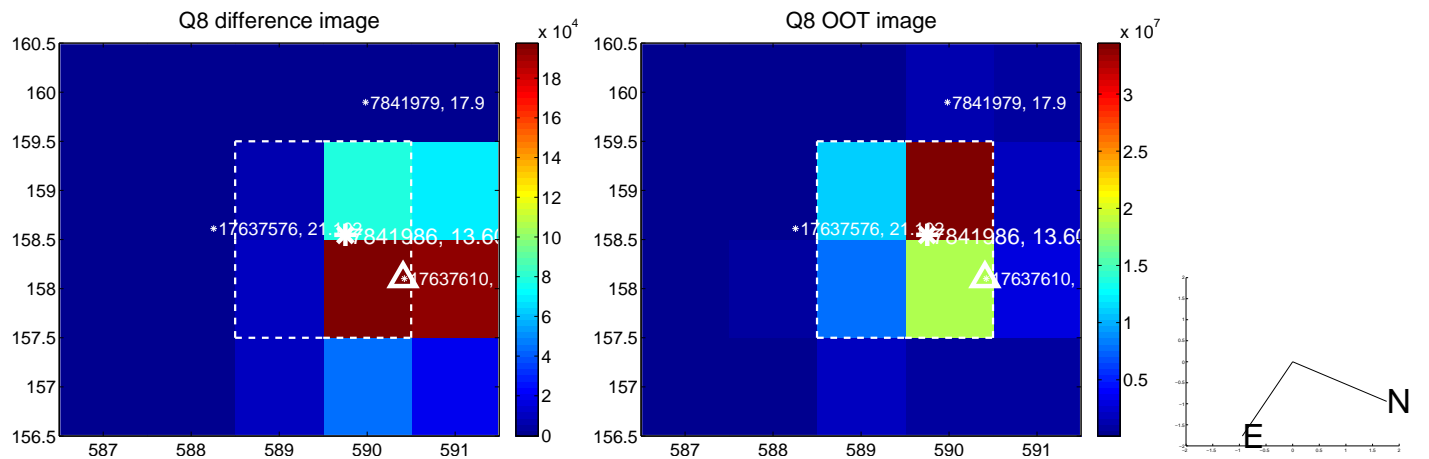
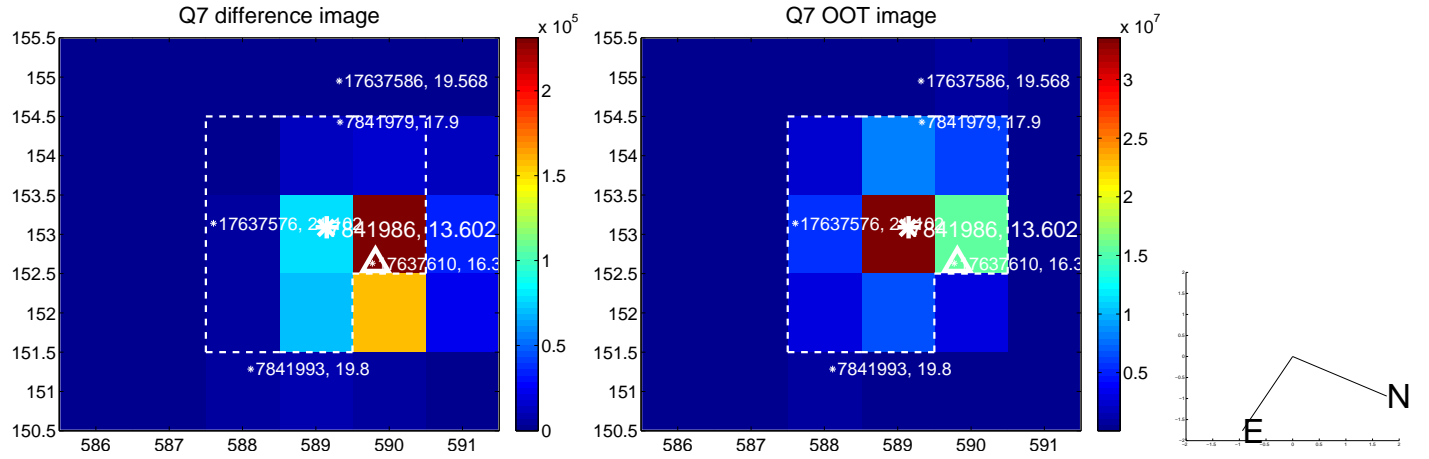
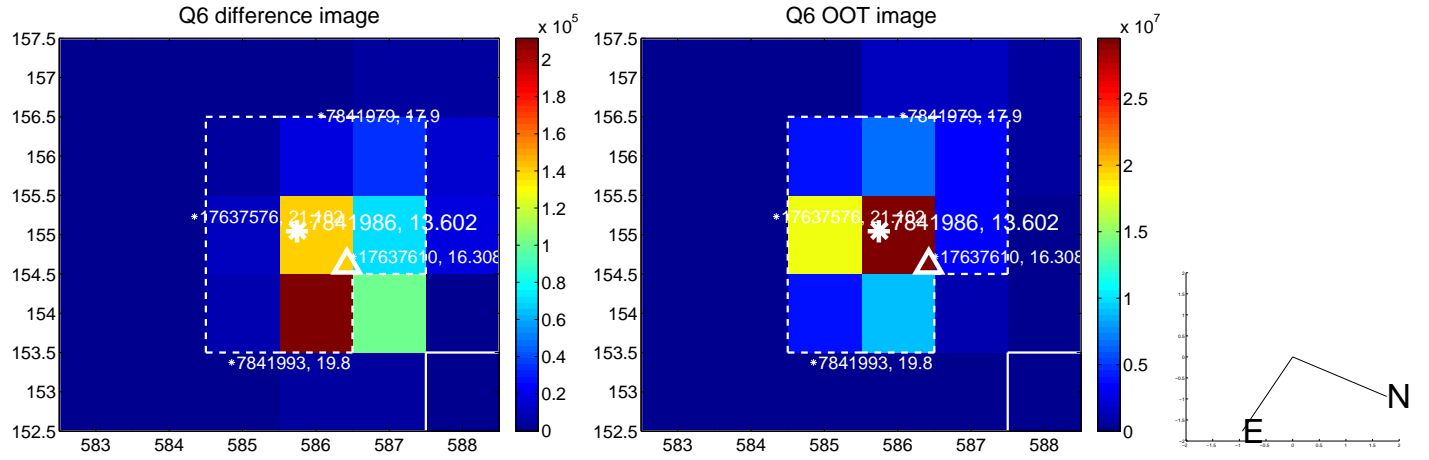
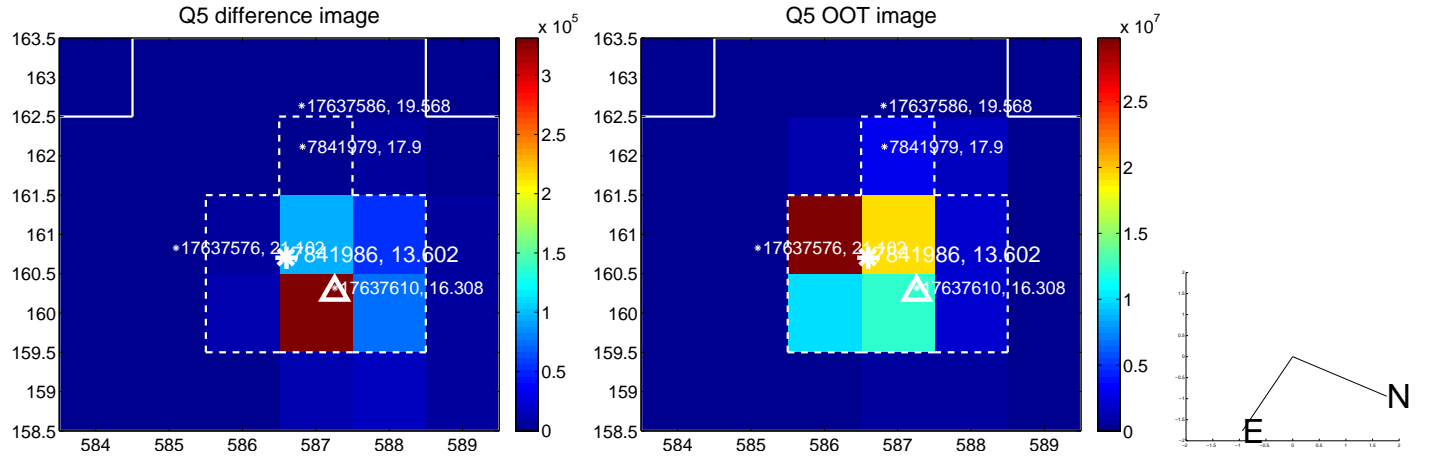
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

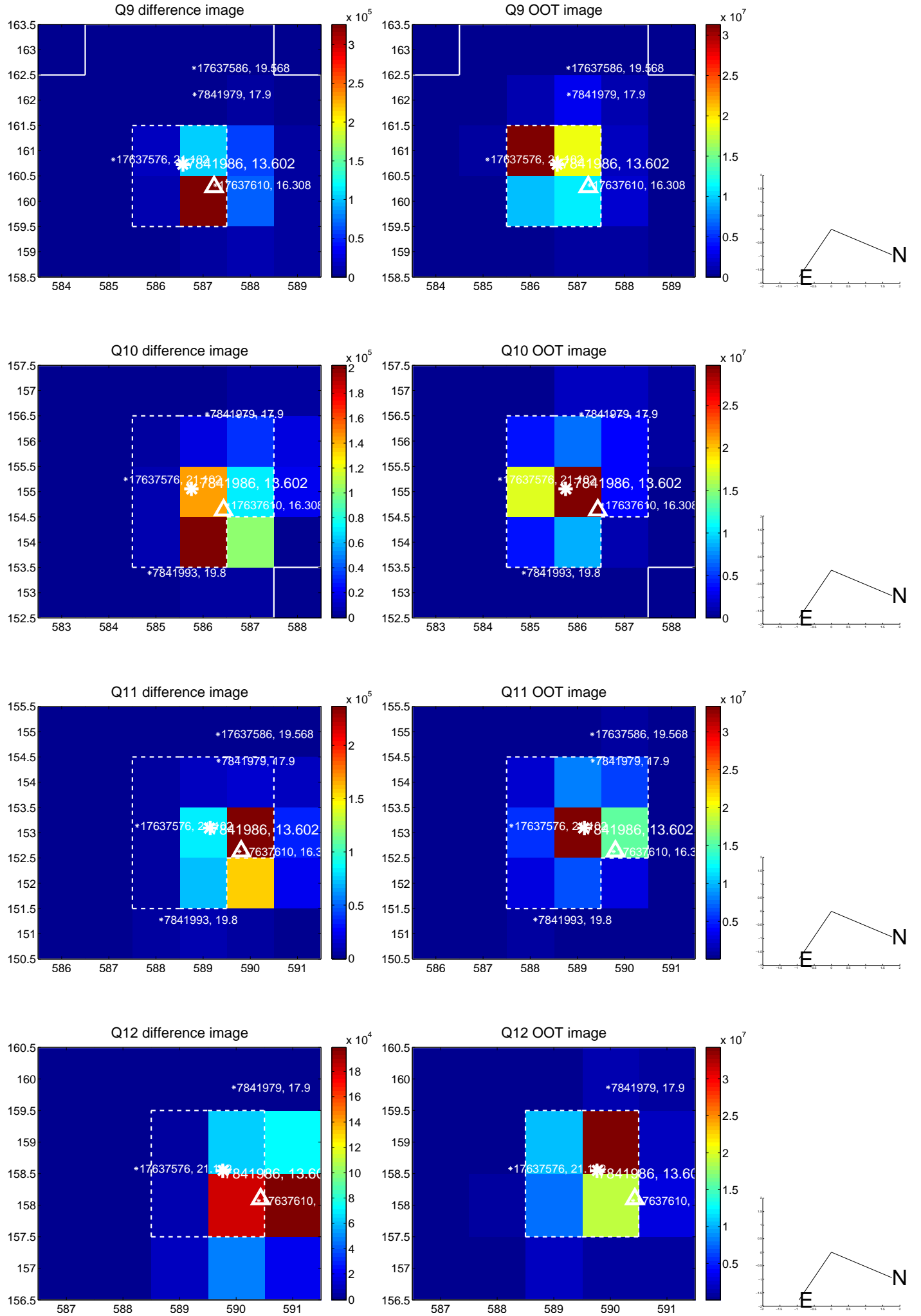




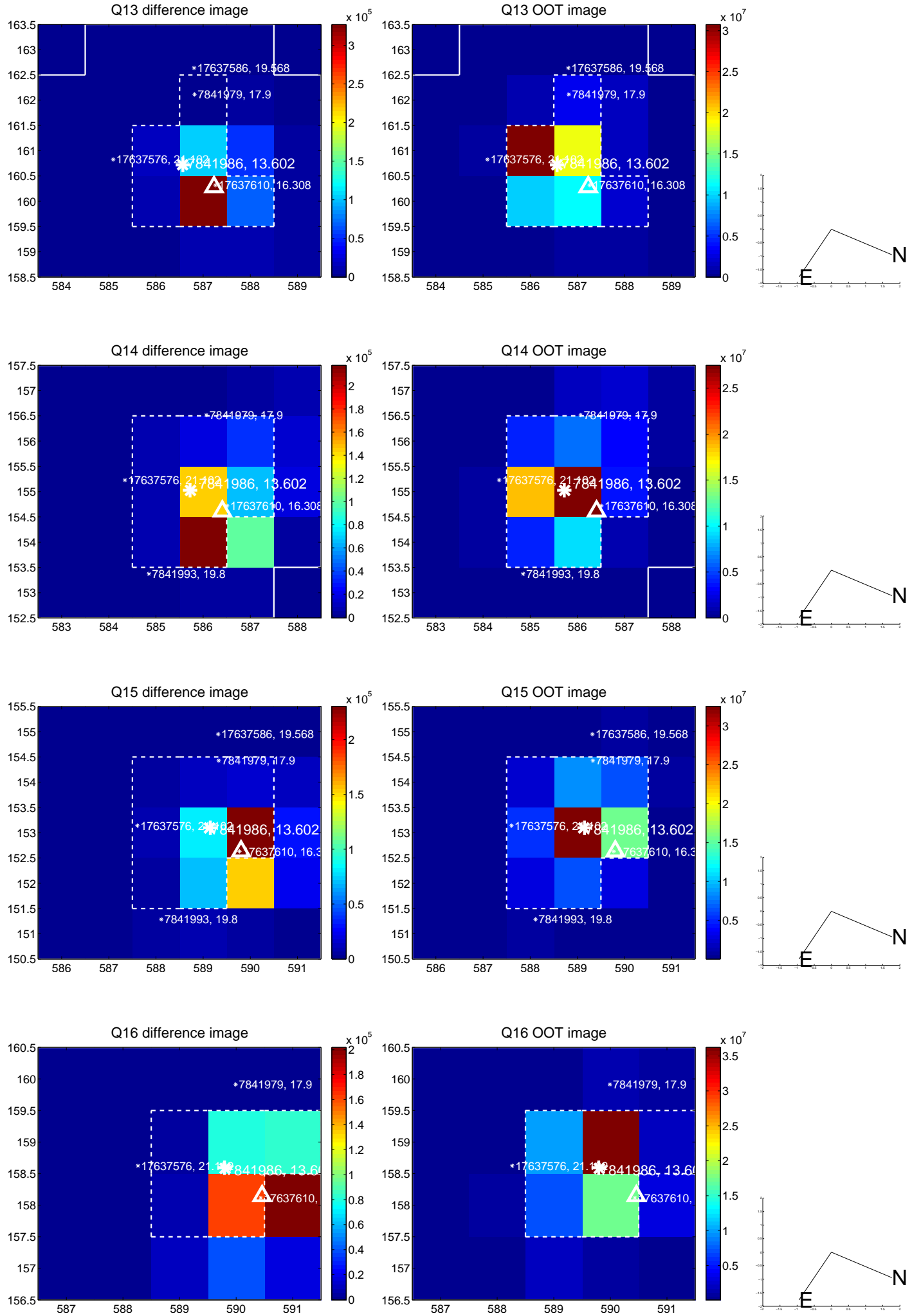
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



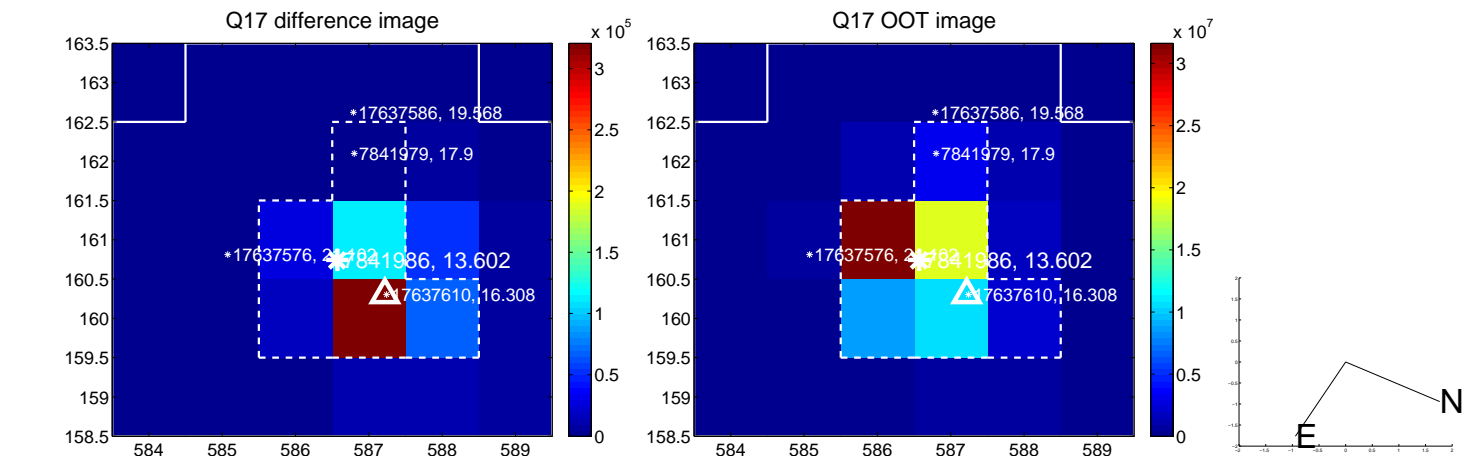
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



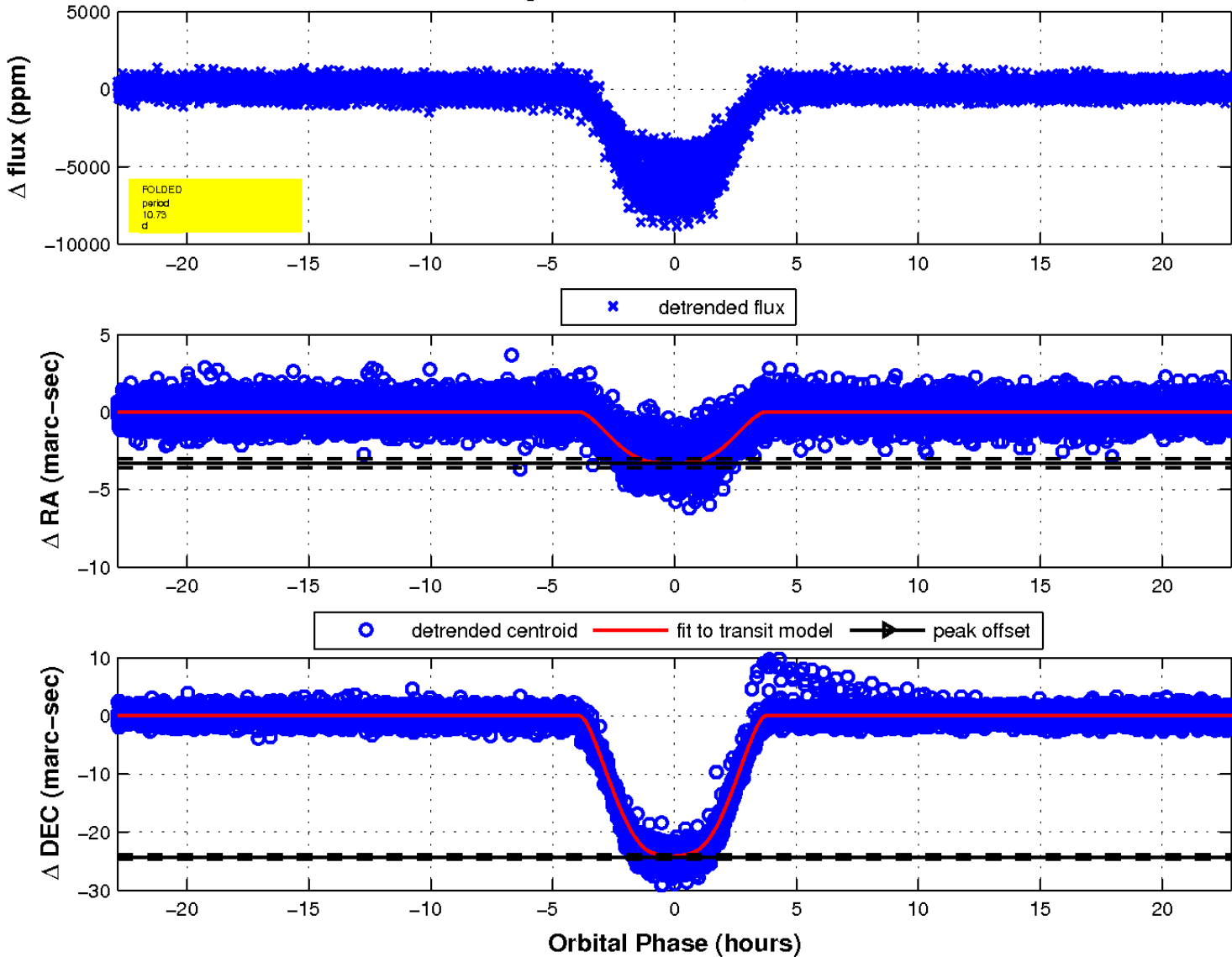
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



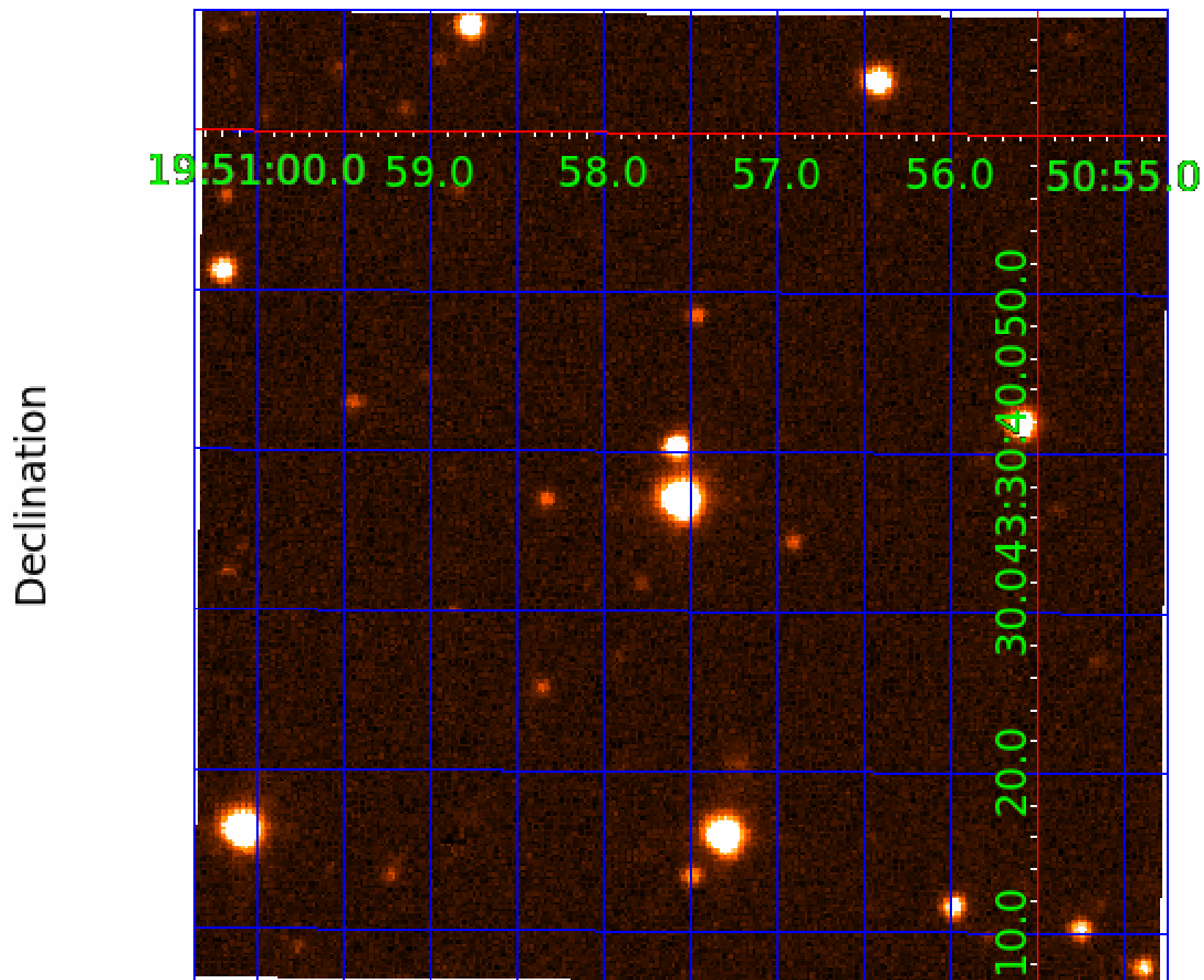
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



# KIC 007841986

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007841986-01	OBS	6045.01	10.733697	141.112522	6326.2	7.616	525.4	451.4	2.00	5971	18.98	445.87
007841986-02	OBS	No	10.733690	137.075353	5023.2	8.941	444.8	392.4	2.00	5971	16.72	445.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007841986-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—CENT_UNRESOLVED_OFFSET
007841986-02	OBS	FP	0.00	1	0	1	0	SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET

**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.

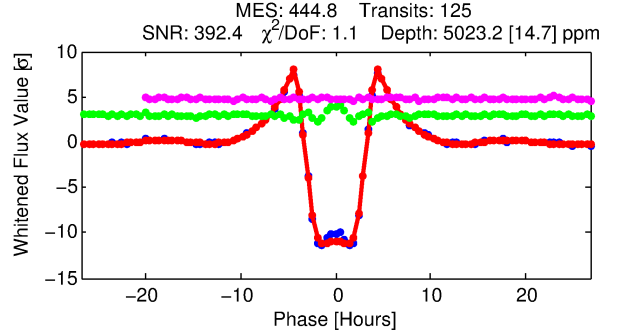
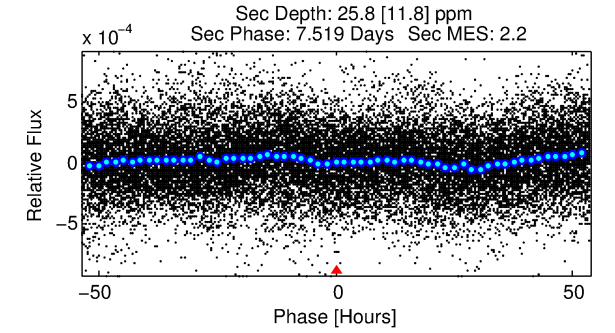
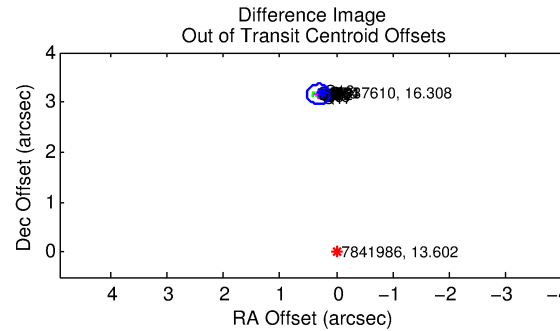
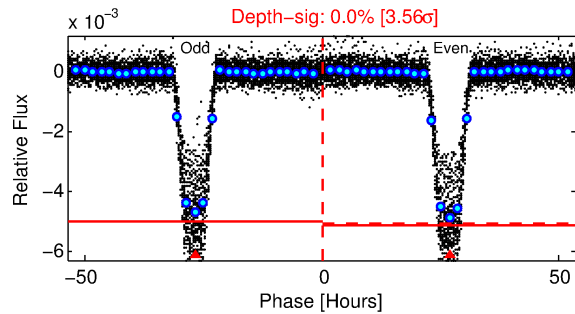
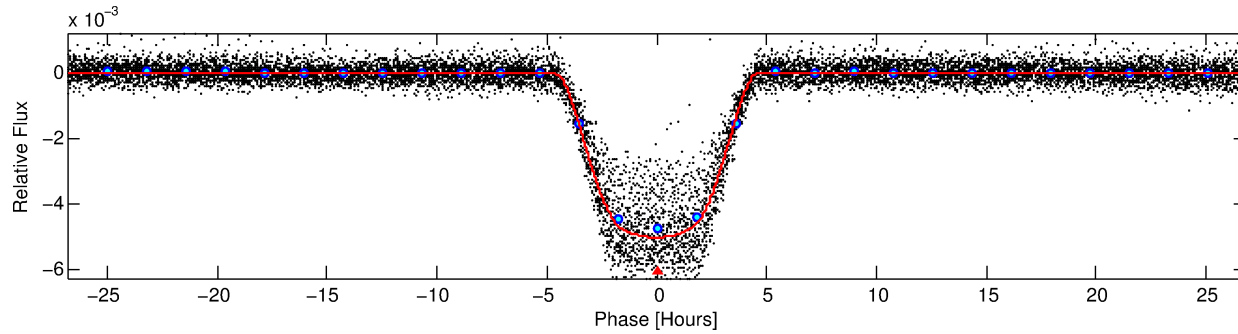
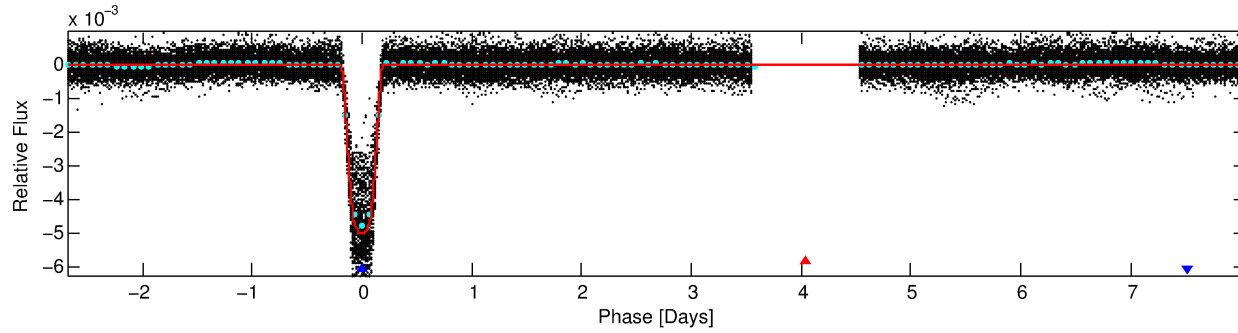
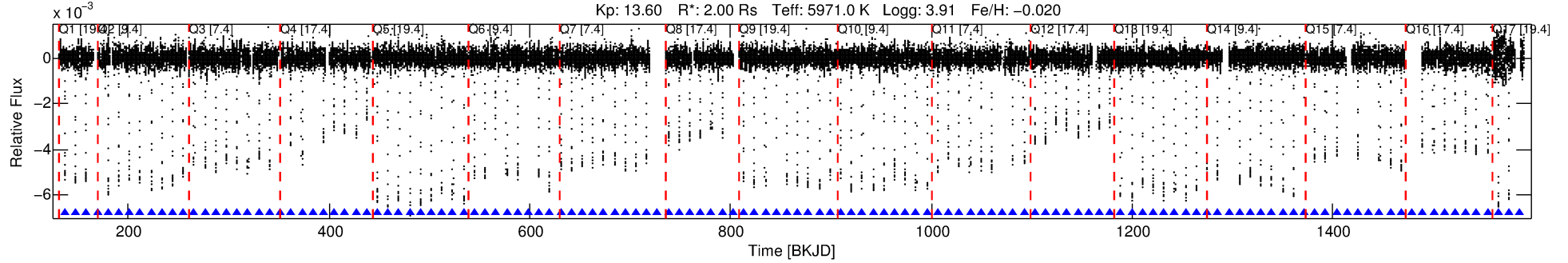
## Ephemeris Match Information For 007841986-02

No Significant Match Found

# DV One-Page Summary

KIC: 7841986 Candidate: 2 of 2 Period: 10.734 d  
KOI: K06045 Corr: No Ephemeris Match

Kp: 13.60 R\*: 2.00 Rs Teff: 5971.0 K Logg: 3.91 Fe/H: -0.020



## DV Fit Results:

Period = 10.73369 [0.00000] d  
Epoch = 137.0754 [0.0003] BKJD  
Rp/R\* = 0.0765 [0.0001]  
a/R\* = 5.62 [0.02]  
b = 0.89 [0.00]  
Seff = 445.87 [337.96]  
Teq = 1172 [222] K  
Rp = 16.72 [7.25] Re  
a = 0.1012 [0.0455] AU  
Ag = 0.52 [0.46] [-1.05σ]  
Teff = 1539 [183] K [1.28σ]

## DV Diagnostic Results:

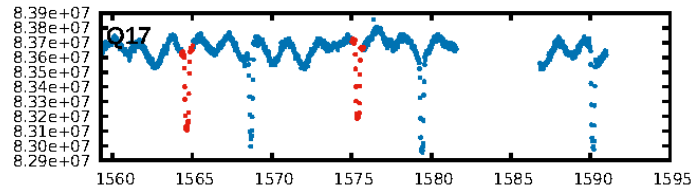
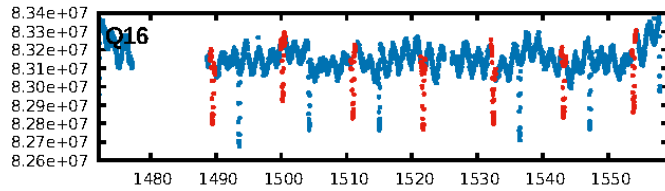
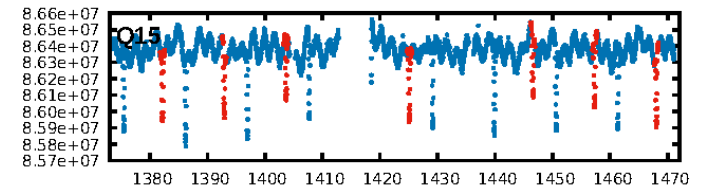
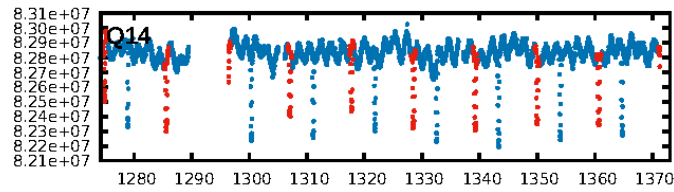
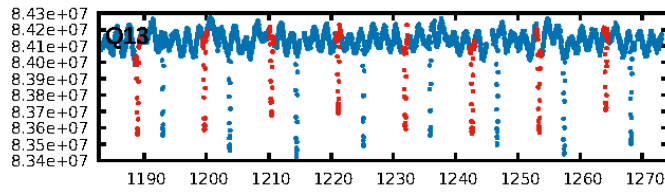
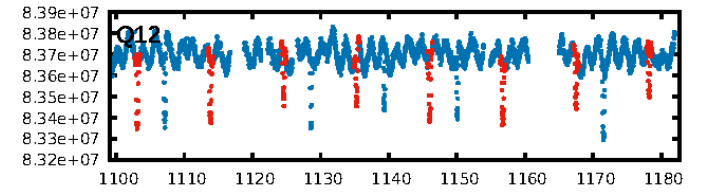
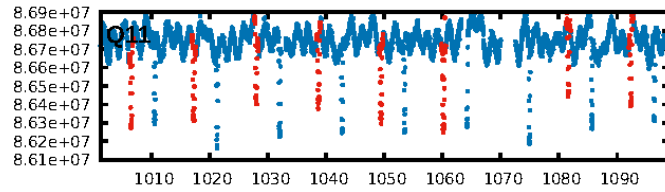
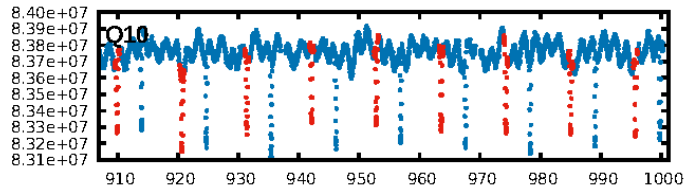
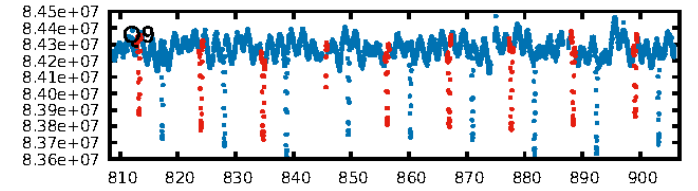
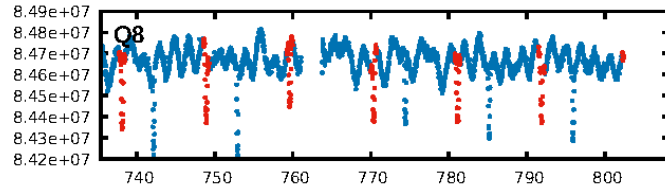
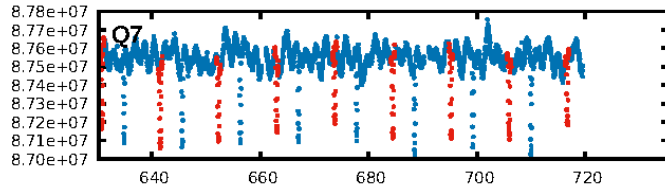
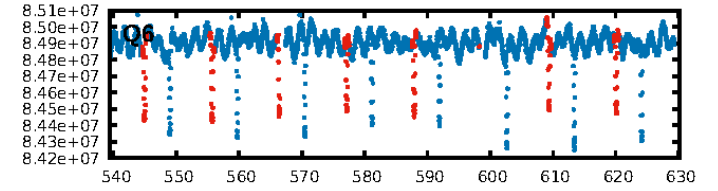
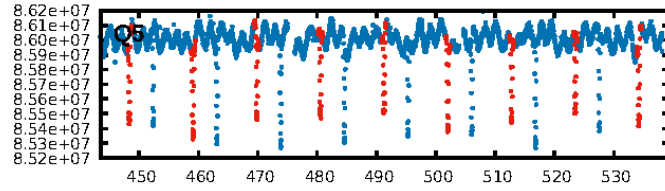
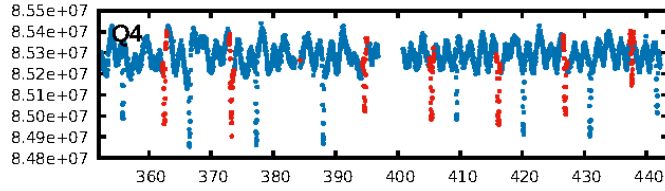
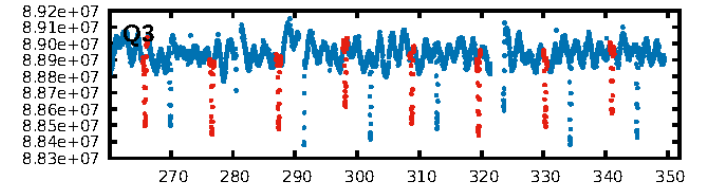
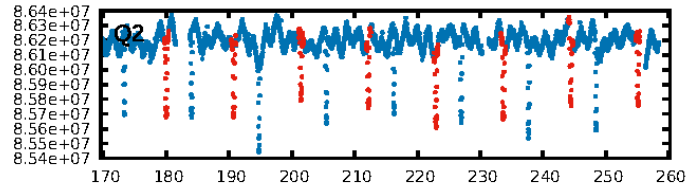
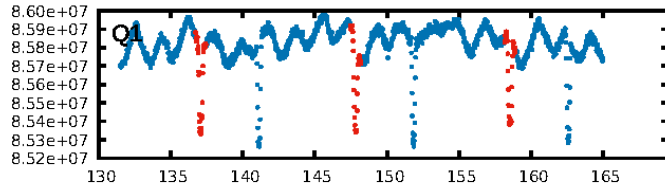
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 31.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [120/120]  
GhostDiagnostic-chr: 0.8612  
Centroid-sig: 0.0%  
Centroid-so: 3.981 arcsec [241.91σ]  
OotOffset-rm: 3.180 arcsec [47.32σ]  
KicOffset-rm: 3.184 arcsec [47.23σ]  
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]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:18:56 Z

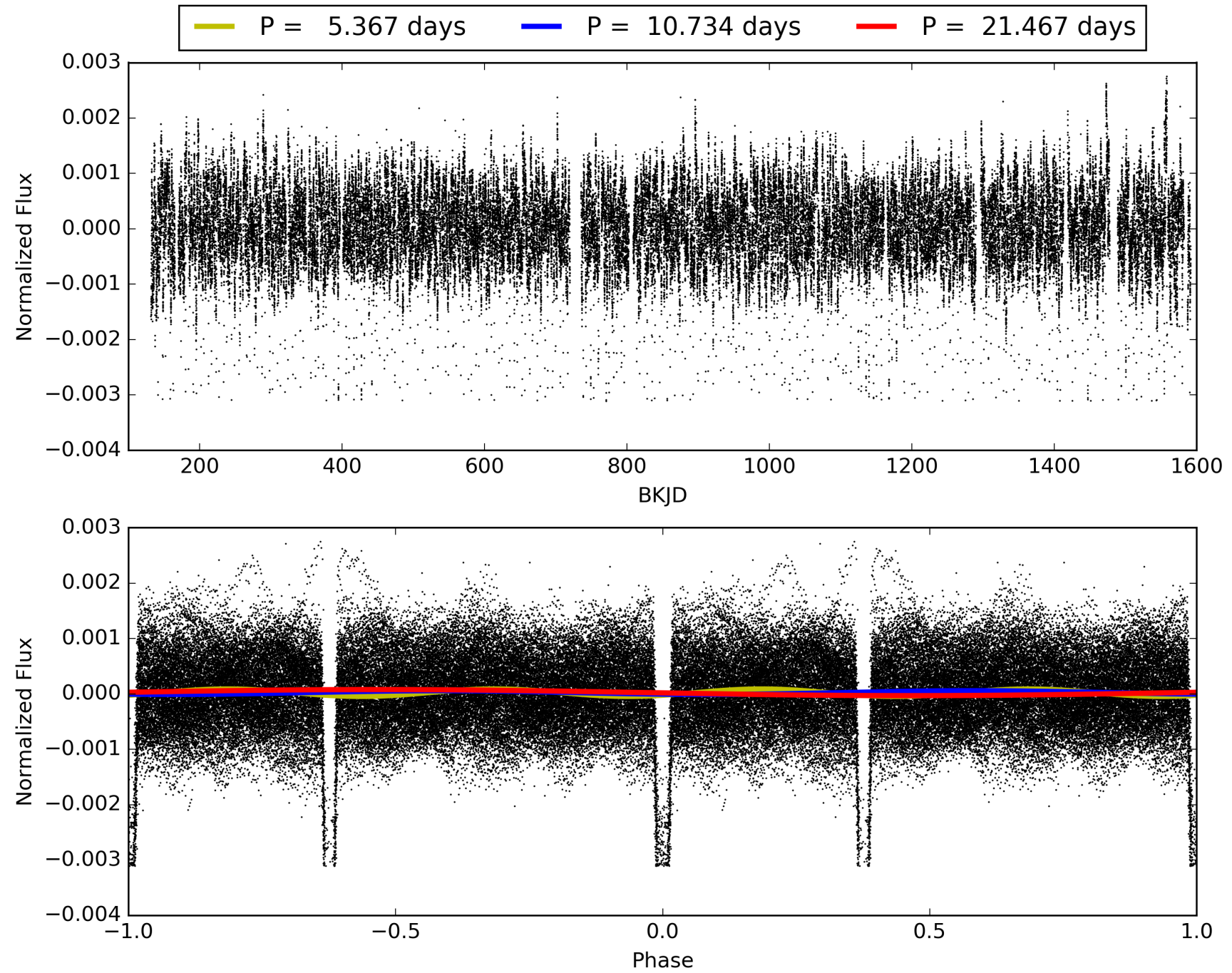
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007841986-02, PDC Light Curves

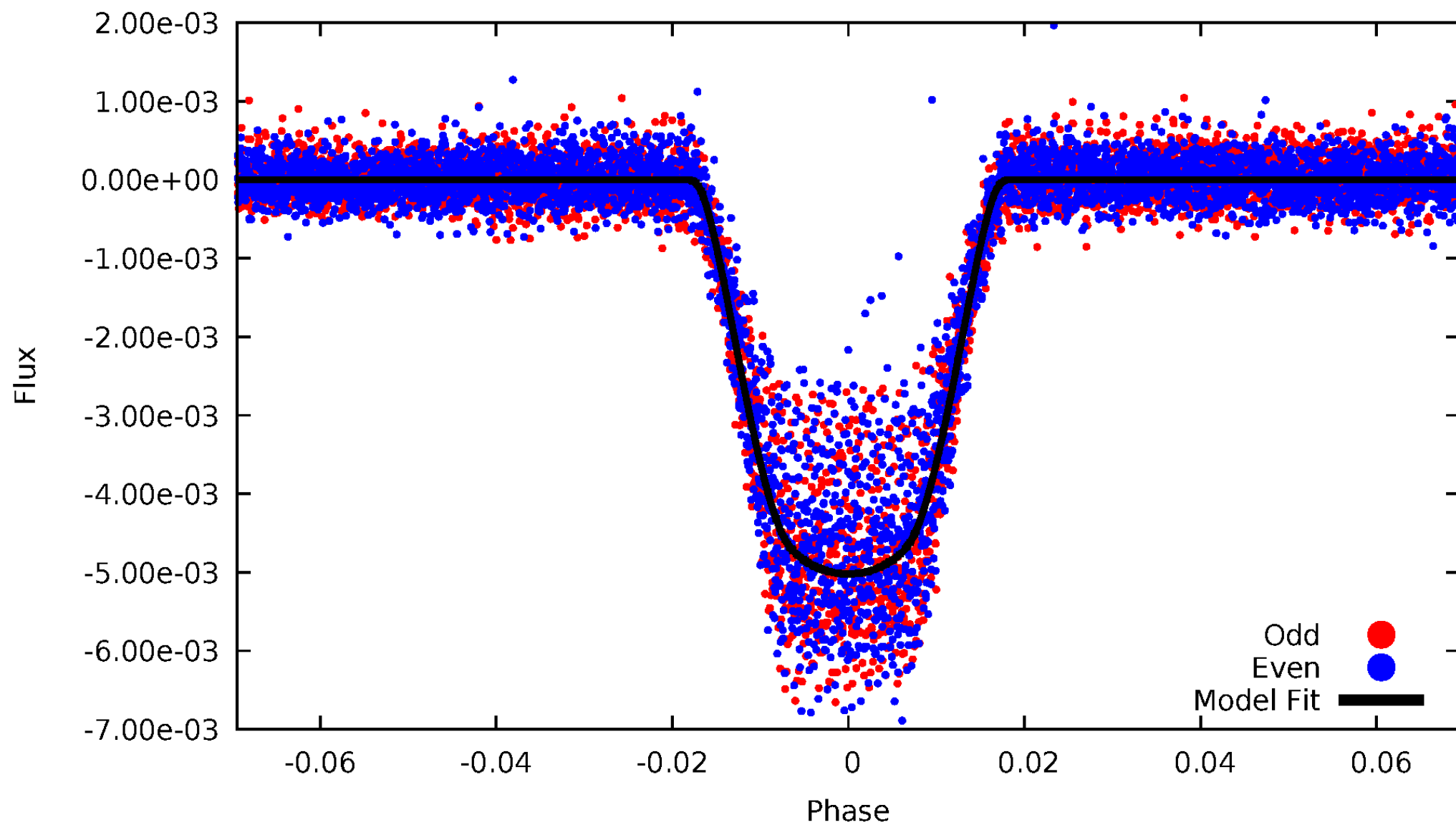


TCE 007841986-02



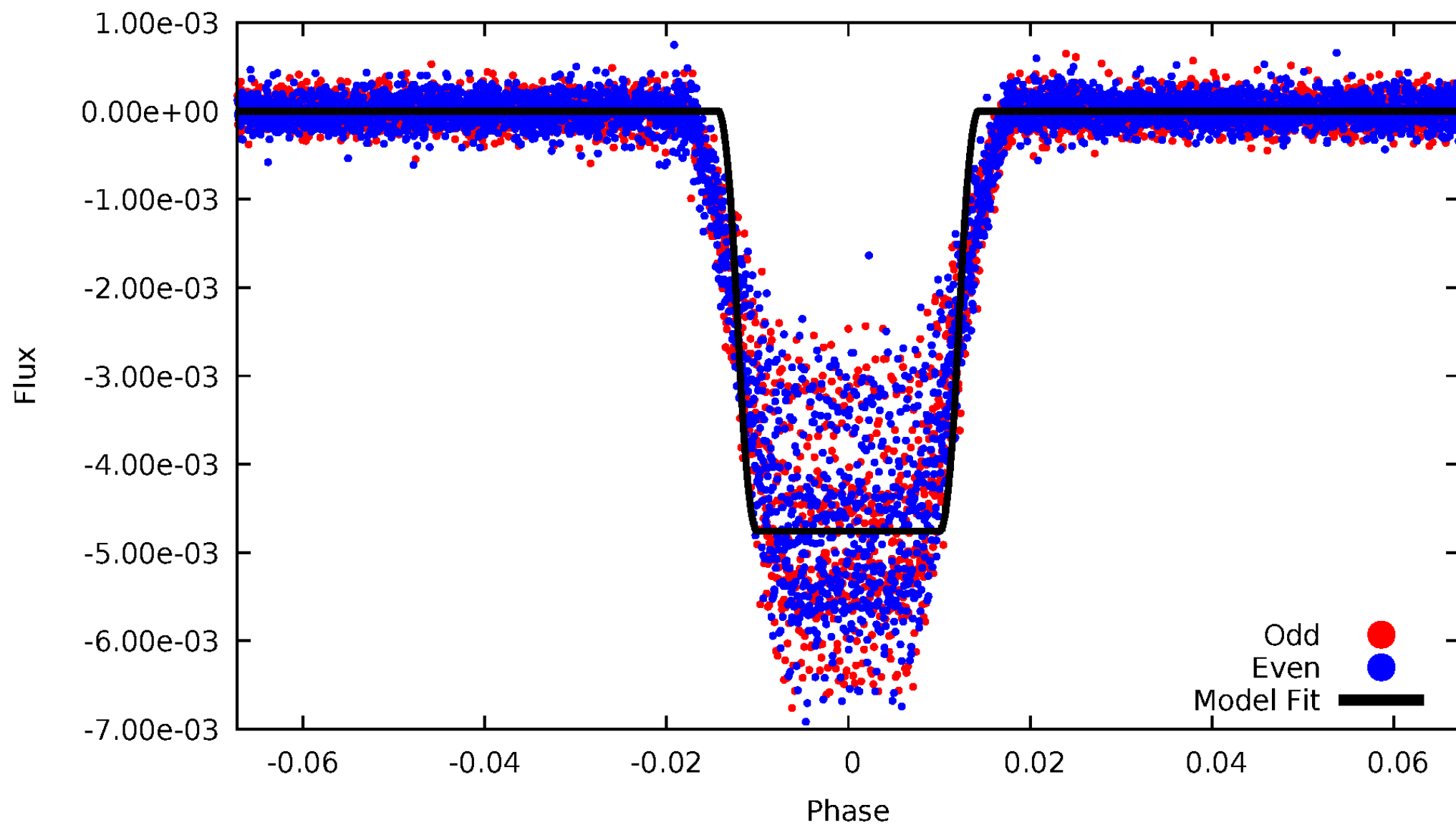
# DV Odd/Even

TCE 007841986-02



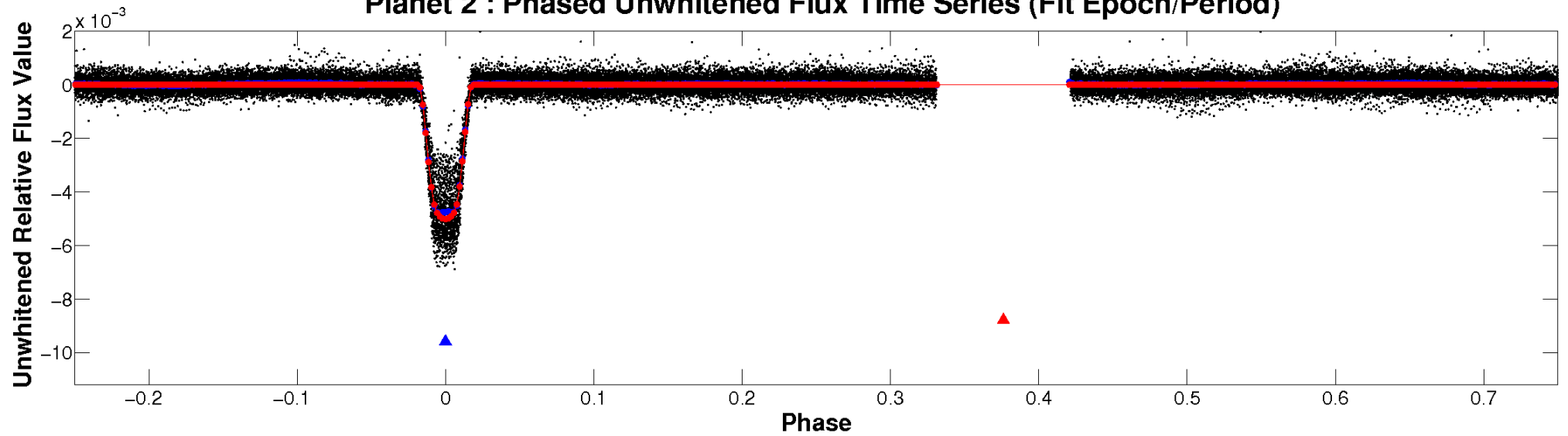
# ALT Odd/Even

TCE 007841986-02

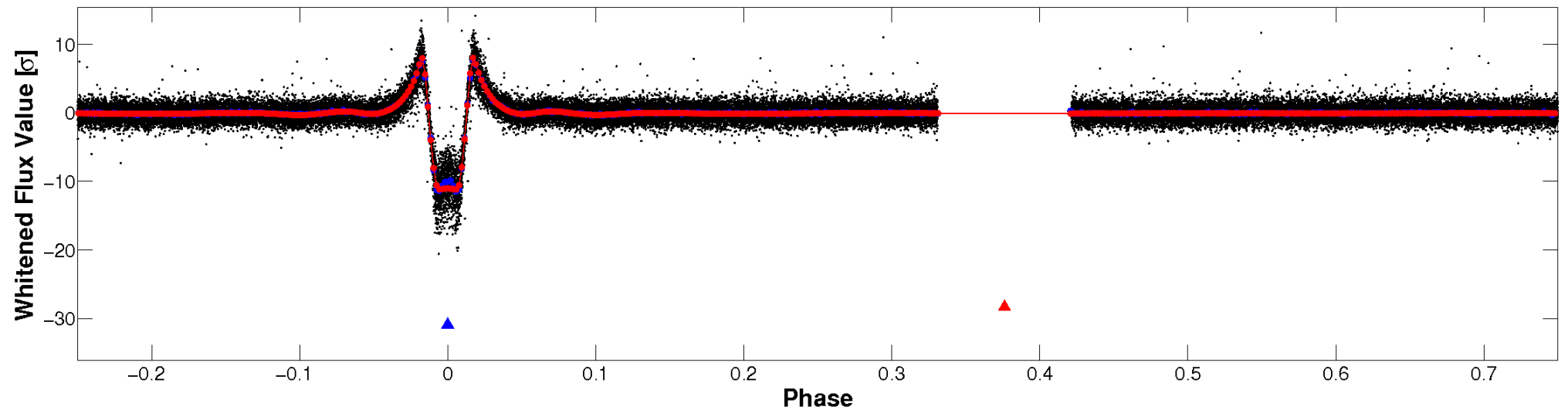


# Non-Whitened Vs. Whitened Light Curve

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

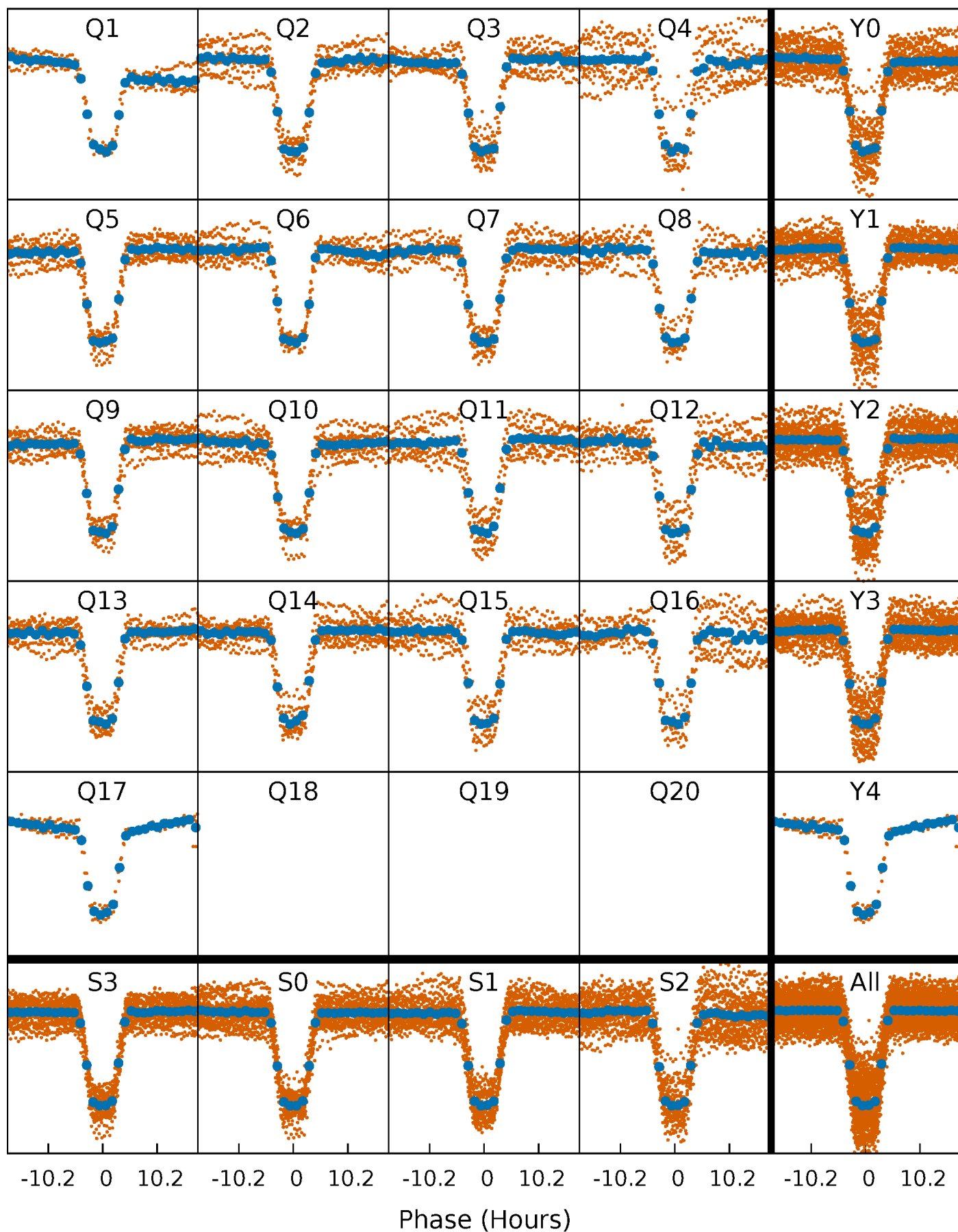


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

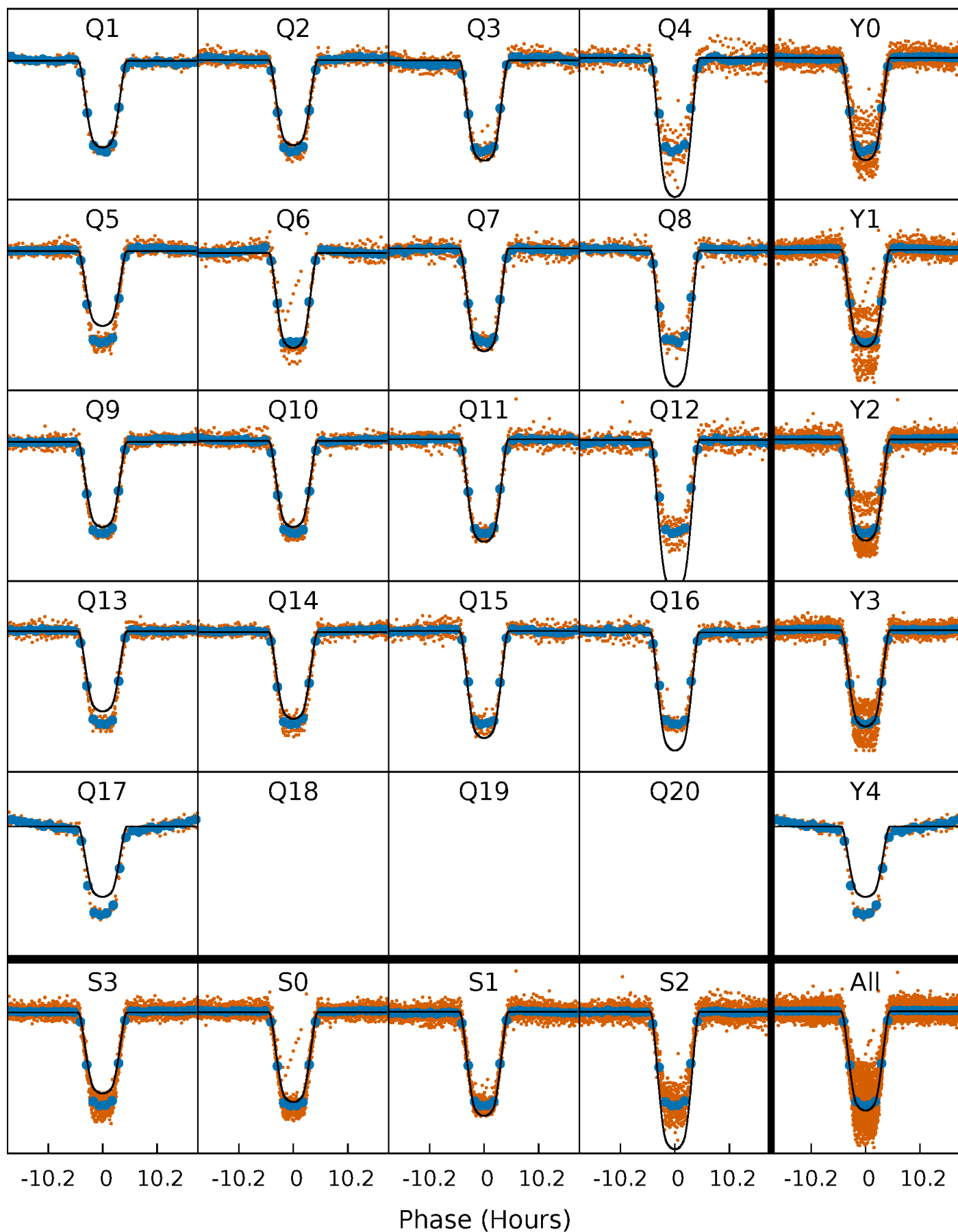
TCE 007841986-02 P= 10.733690 Days  $T_0=137.075353$  (BKJD)





# DV Quarter-Phased Transit Curves

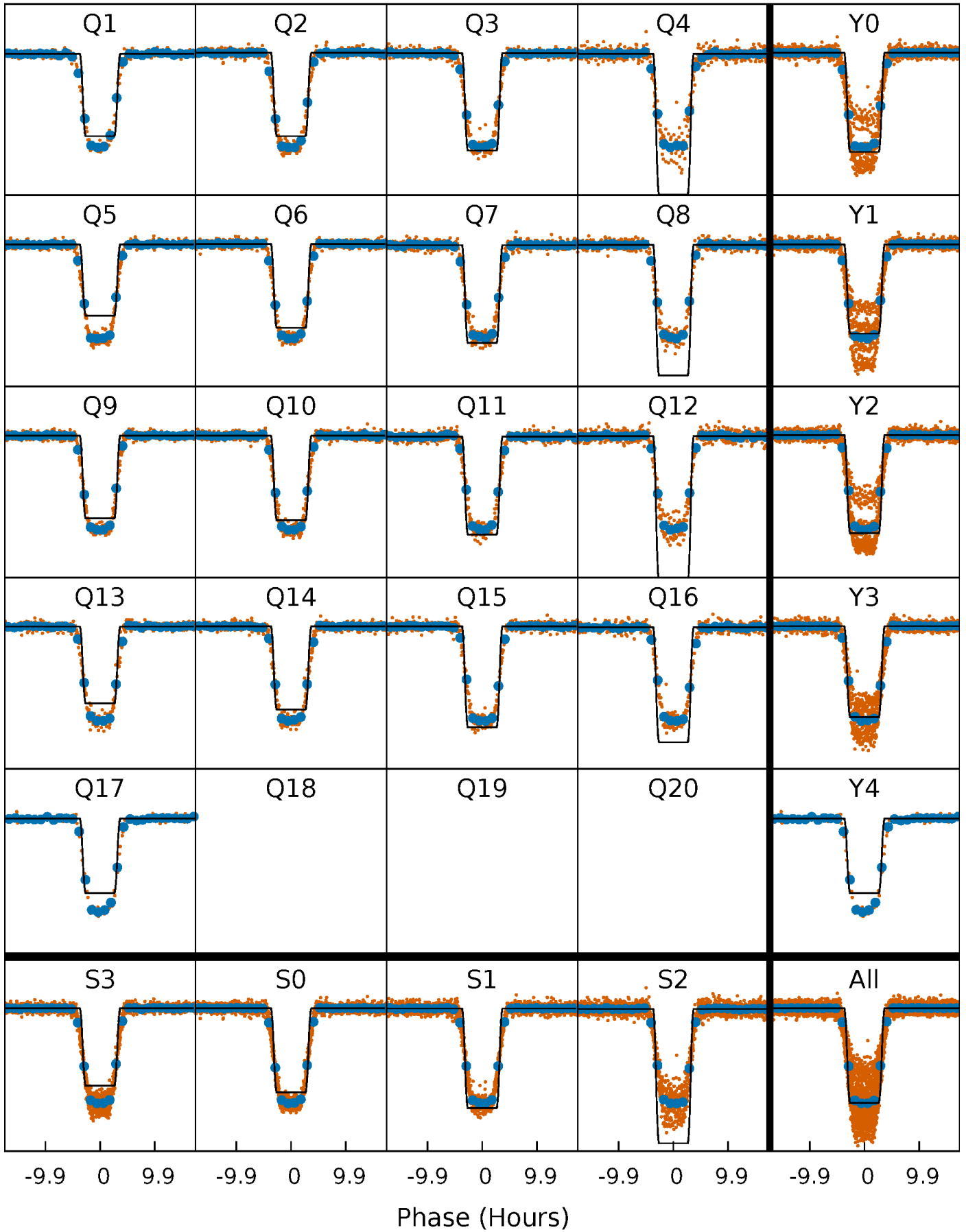
TCE 007841986-02   P= 10.733690 Days    $T_0=137.075353$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

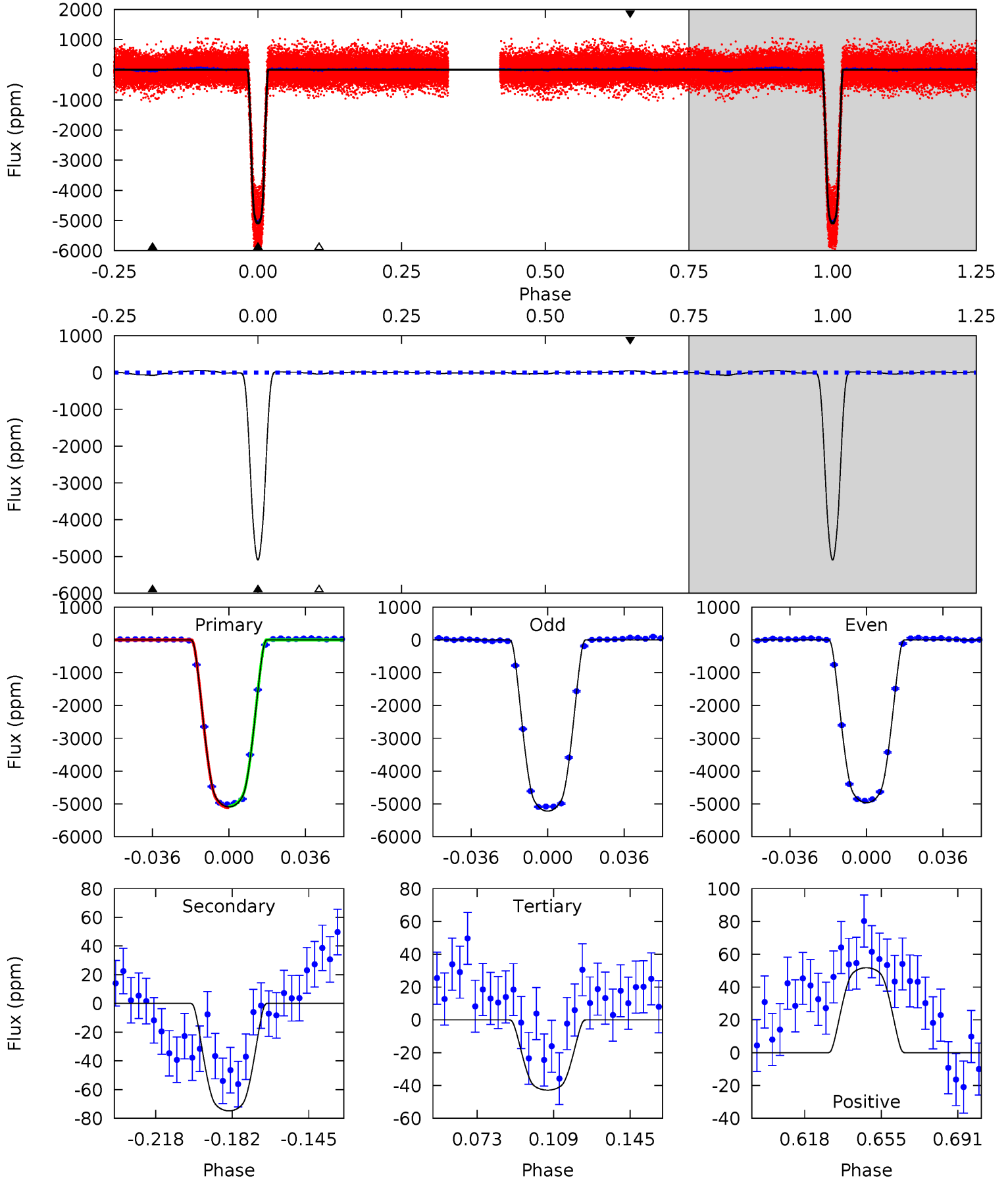
TCE 007841986-02 P= 10.733616 Days  $T_0=137.080136$  (BKJD)



# DV Model-Shift Uniqueness Test

007841986-02, P = 10.733690 Days, E = 126.341663 Days

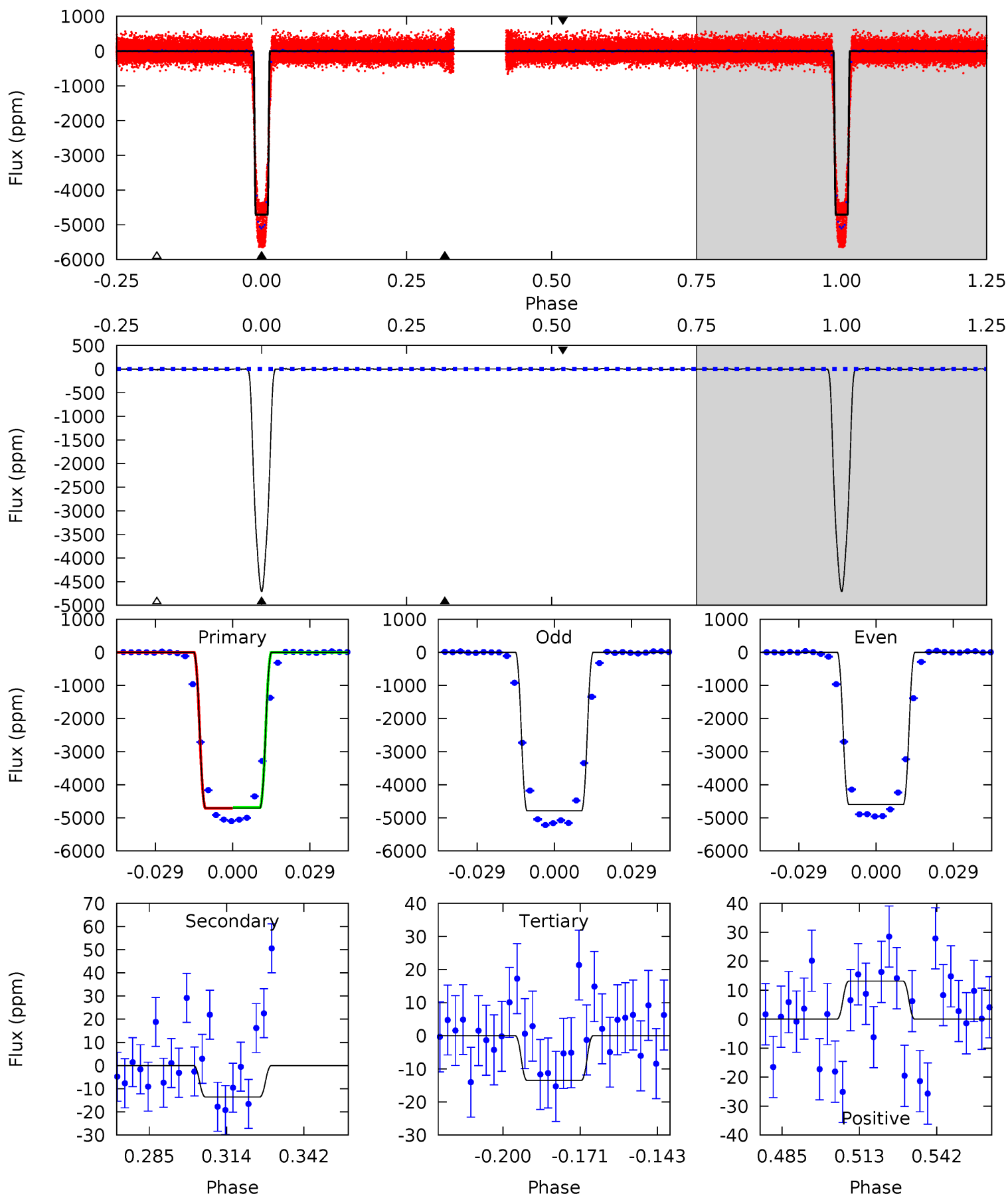
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
888.6	13.1	7.48	9.04	4.77	2.09	3.85	881.1	879.5	5.58	4.02	22.3	0.97	0.01	0



# Alt Model-Shift Uniqueness Test

007841986-02, P = 10.733616 Days, E = 126.346520 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
1025	2.96	2.94	2.86	4.82	2.19	0.98	1022	1022	0.02	0.09	20.3	0.97	0.00	1.98



### Stellar Parameters For KIC 007841986

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5971^{+183}_{-201}$	$3.914^{+0.448}_{-0.112}$	$-0.020^{+0.250}_{-0.300}$	$2.003^{+0.400}_{-0.868}$	$1.202^{+0.169}_{-0.232}$	$0.211^{+0.898}_{-0.071}$
	+3%/-3%	+11%/-3%	+1250%/-1500%	+20%/-43%	+14%/-19%	+426%/-34%
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 007841986-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-75 \pm 6$	$16.05^{+2.37}_{-3.62}$	$1597^{+119}_{-191}$	$2695^{+64}_{-61}$	$1.653^{+0.981}_{-0.385}$
Alt.	$-14 \pm 5$	$14.40^{+1.98}_{-3.20}$	$1588^{+114}_{-185}$	$1945^{+255}_{-3893}$	$0.381^{+0.265}_{-0.152}$

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

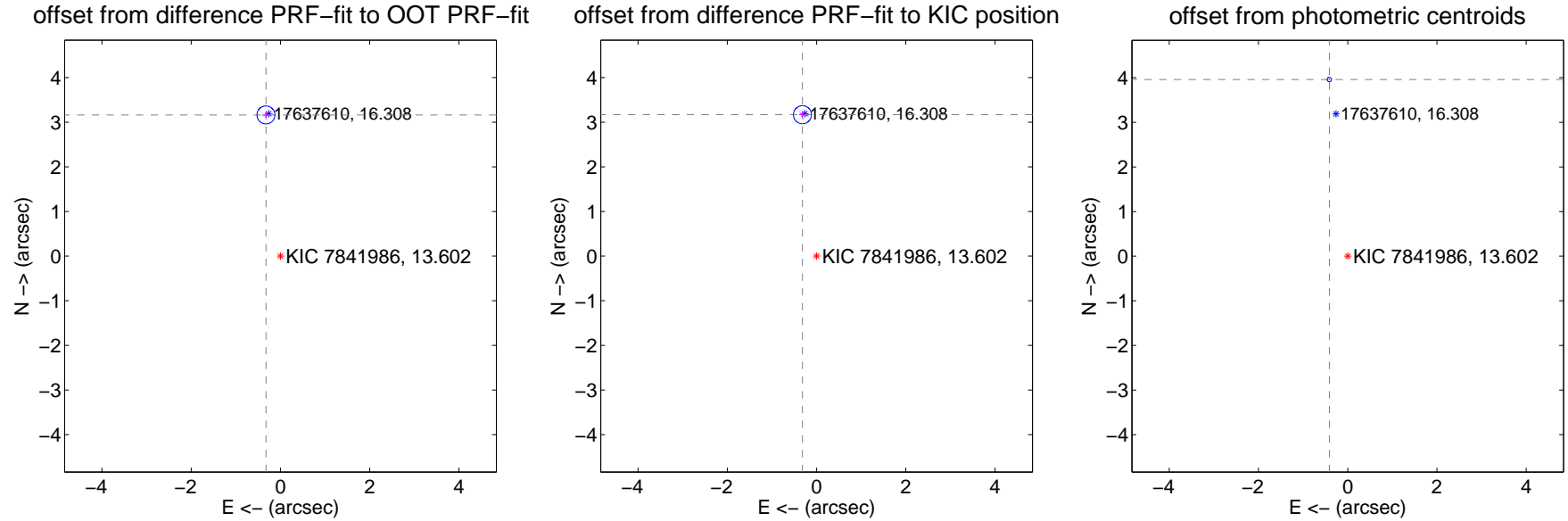
## DV Centroid Data

Supplemental centroid analysis for 007841986-02. Kepler magnitude: 13.60. Transit SNR 392.40

There are 17 quarters with good PRF difference image offsets

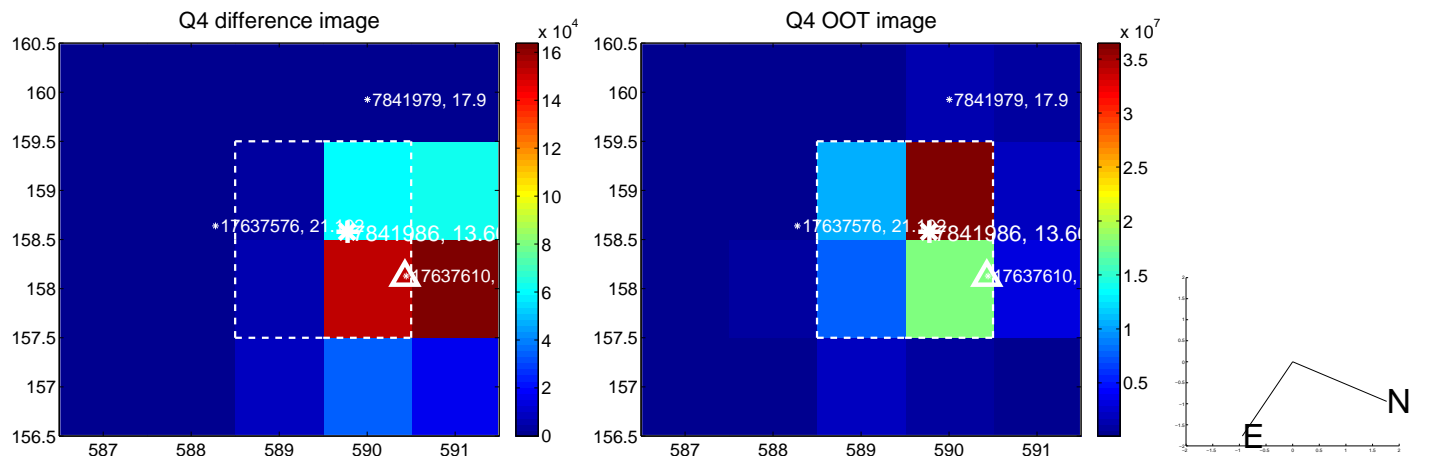
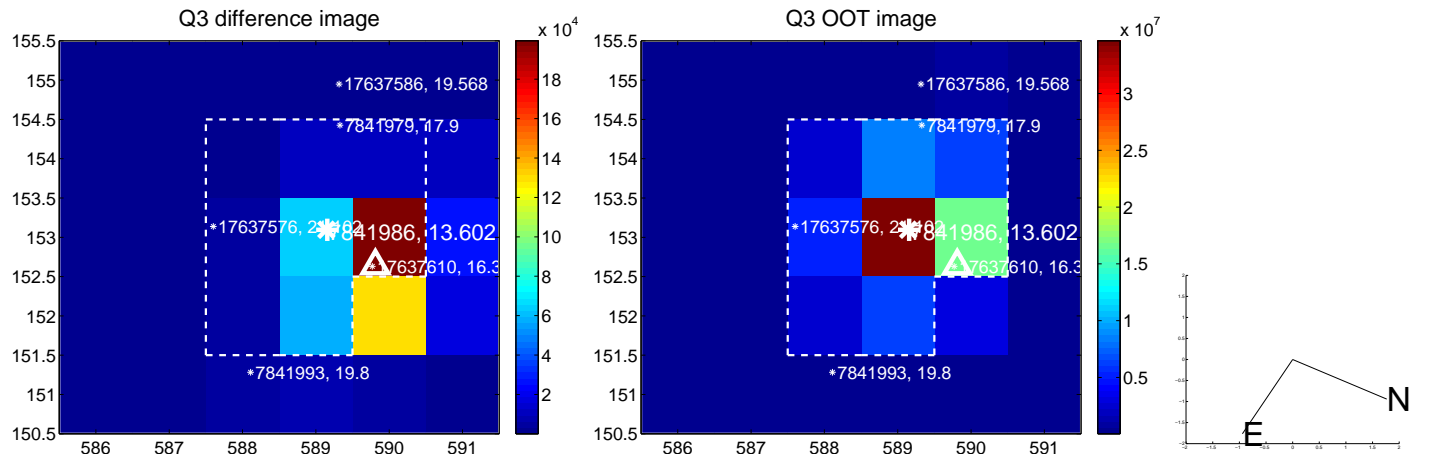
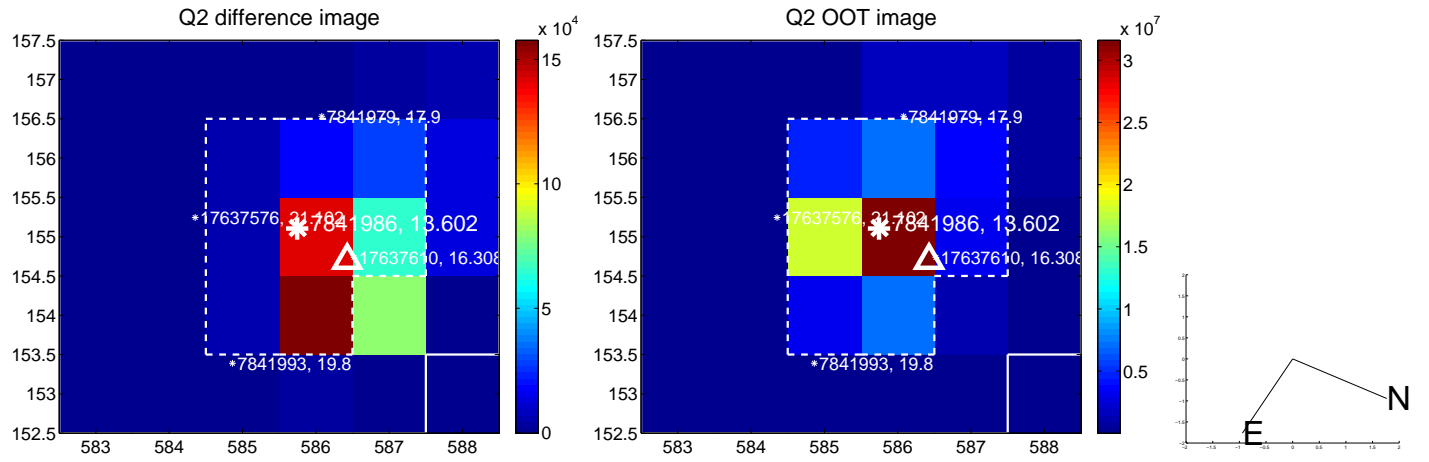
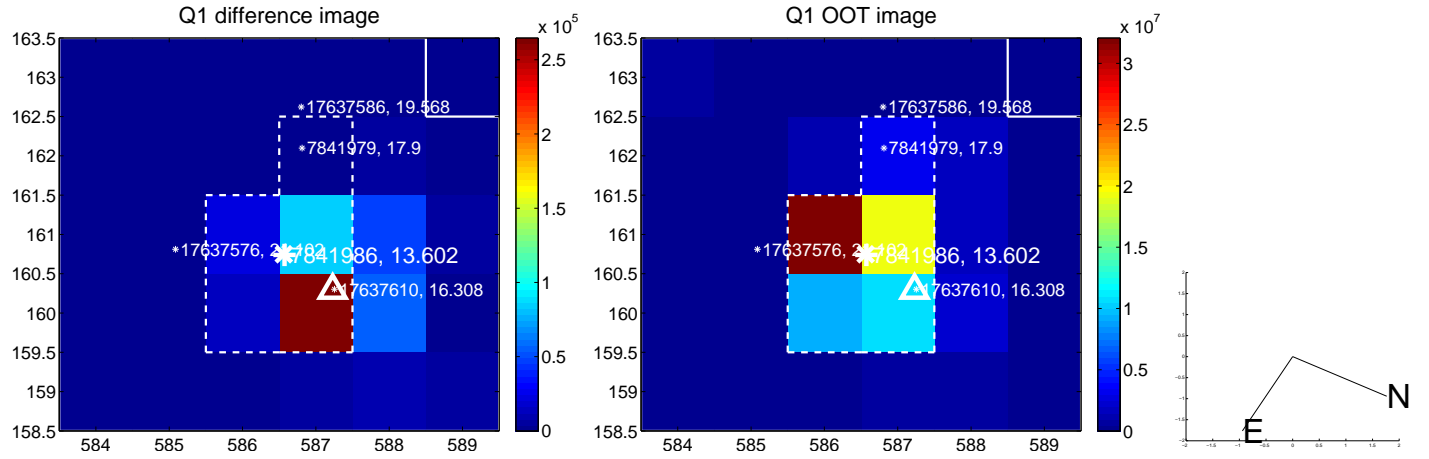
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.180 \pm 0.067$	47.32	$0.325 \pm 0.069$	$3.163 \pm 0.067$
PRF-fit source offset from KIC position	$3.184 \pm 0.067$	47.23	$0.317 \pm 0.069$	$3.168 \pm 0.067$
photometric centroid source offset	$3.98 \pm 0.02$	241.91	$0.41 \pm 0.01$	$3.96 \pm 0.02$

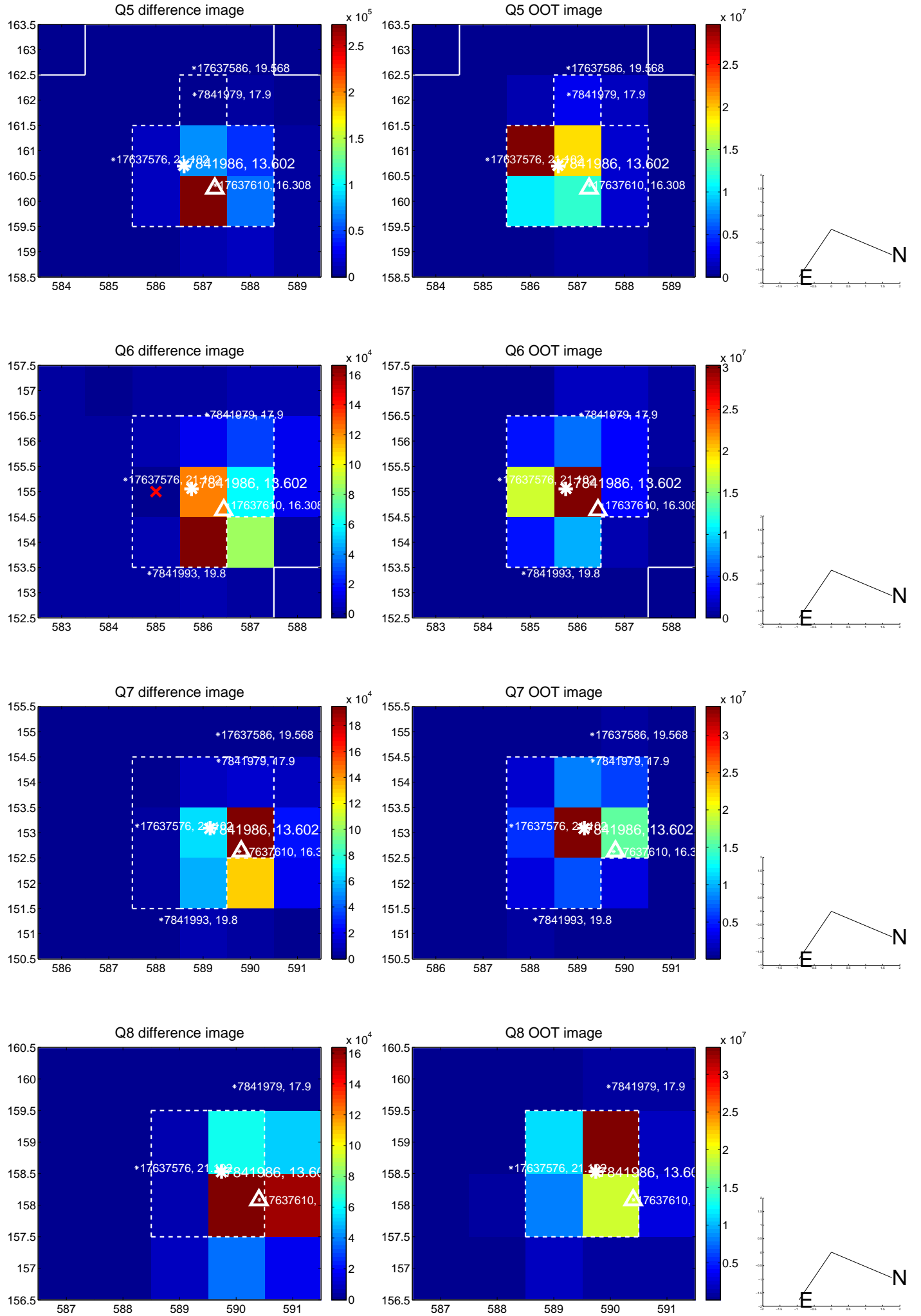


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

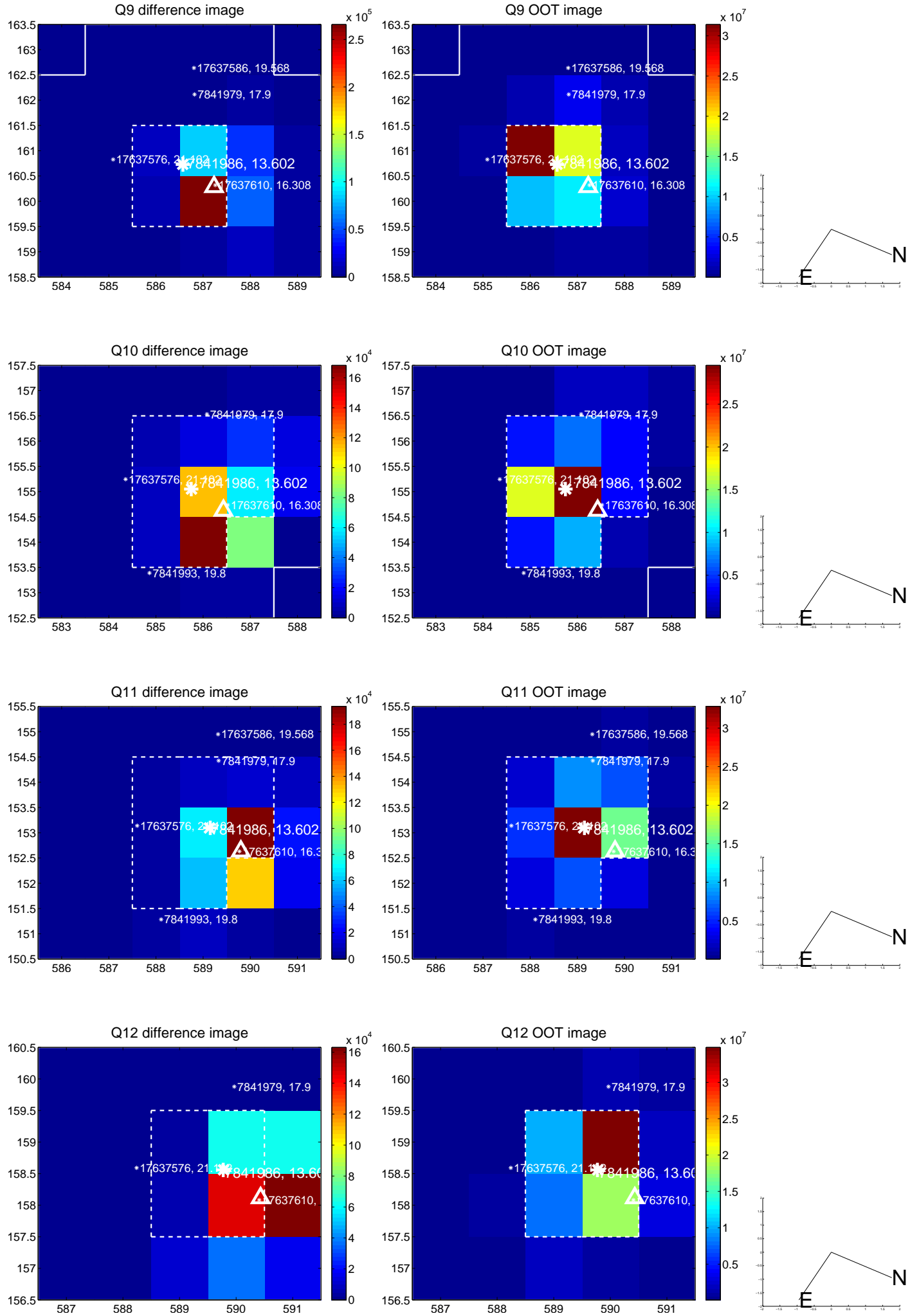


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

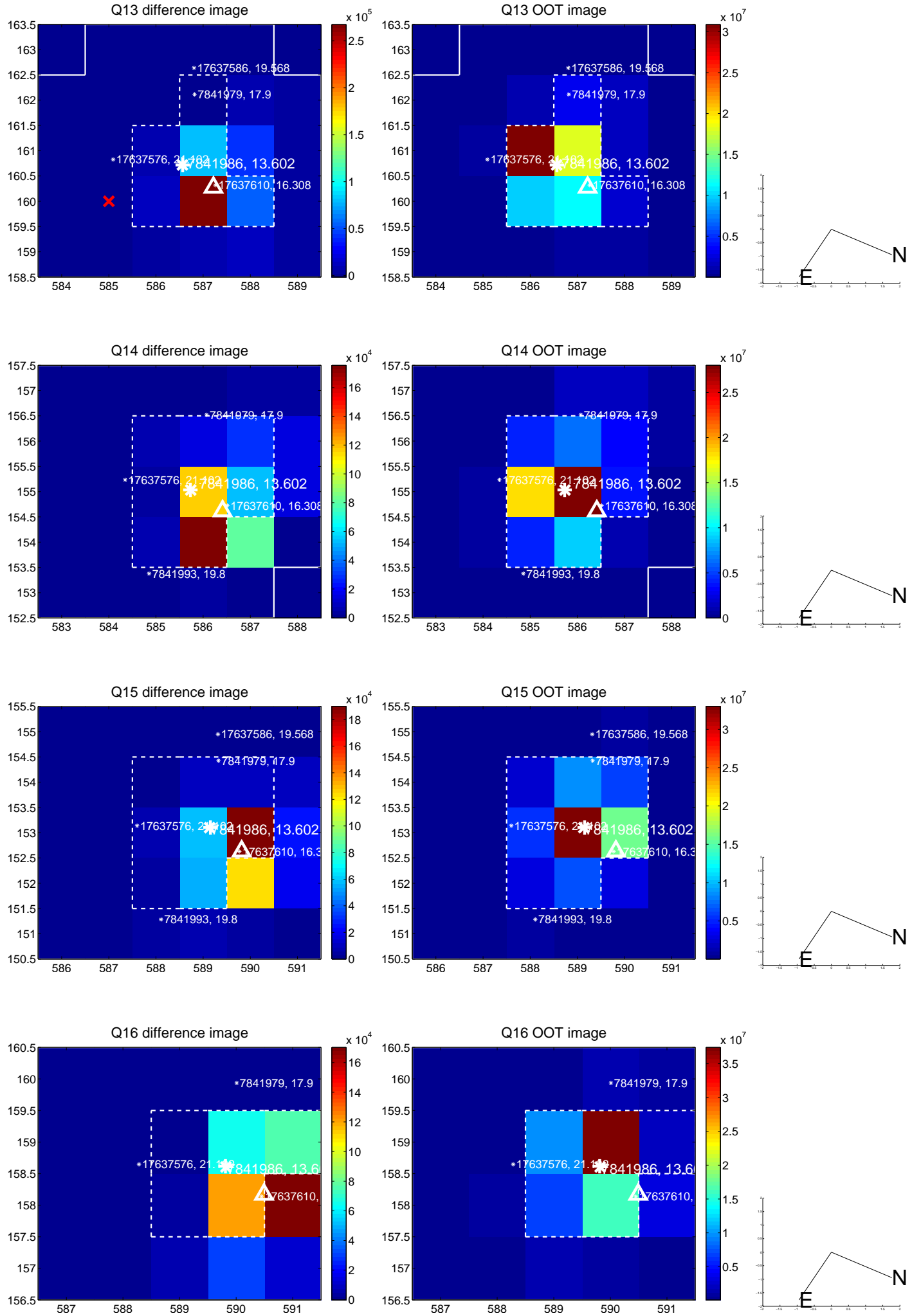




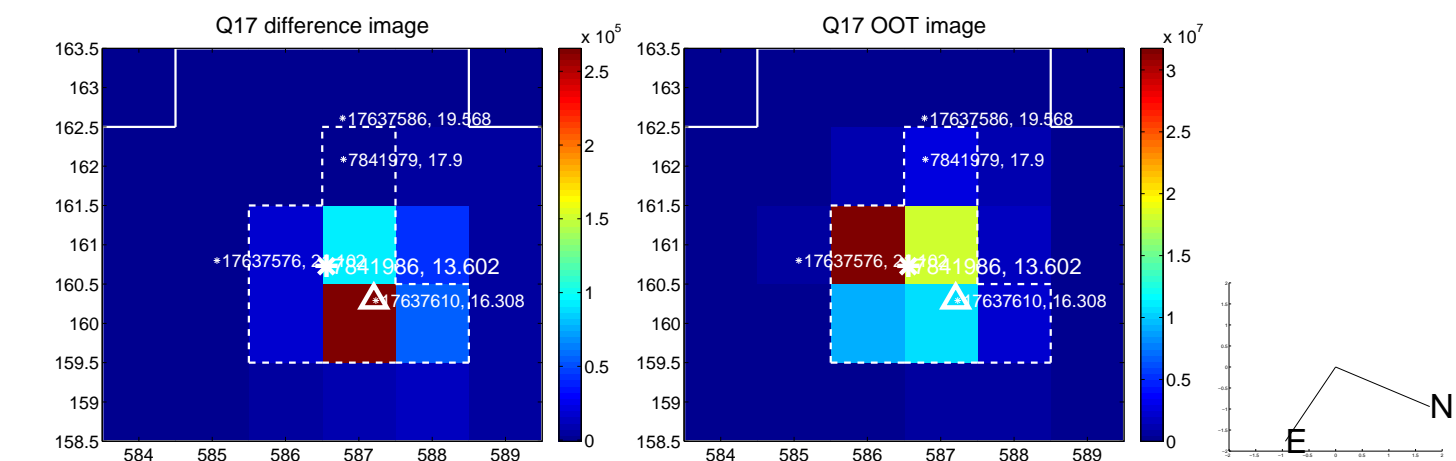
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



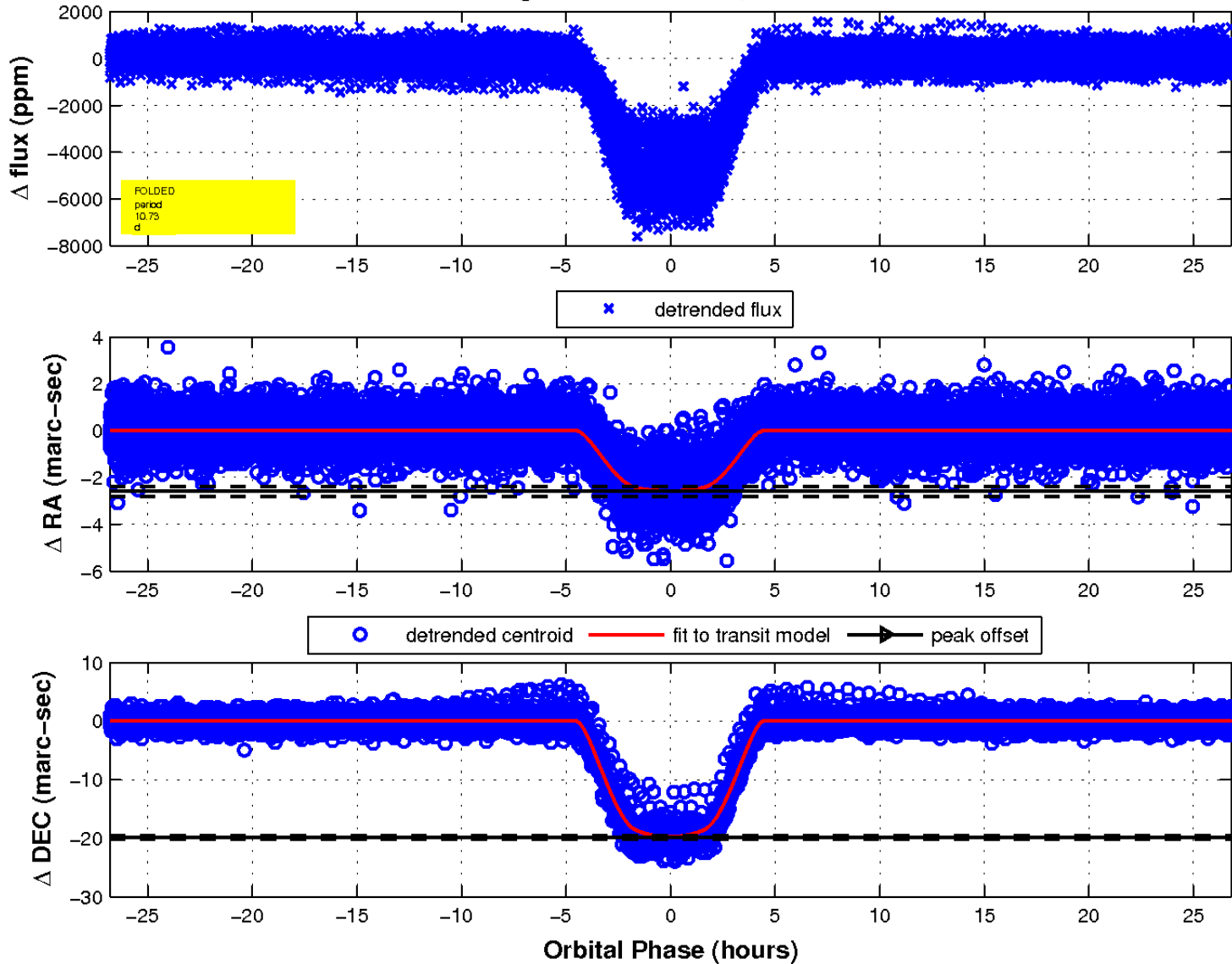
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



# UKIRT Image

Declination

