

# KIC 007186665

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007186665-01	OBS	3033.01	8.559343	137.225071	141.2	4.669	17.3	17.7	0.92	6115	1.36	170.13
007186665-02	OBS	No	8.559358	139.984641	123.3	4.713	15.5	16.4	0.92	6115	1.20	170.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007186665-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
007186665-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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

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

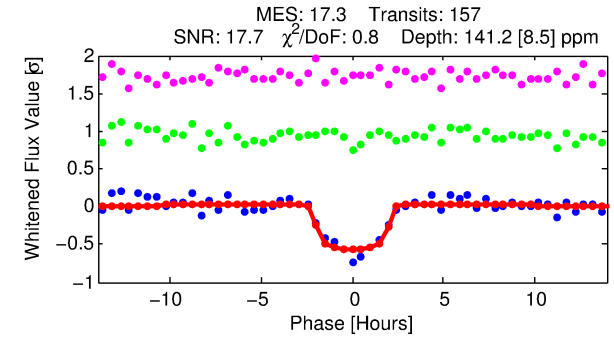
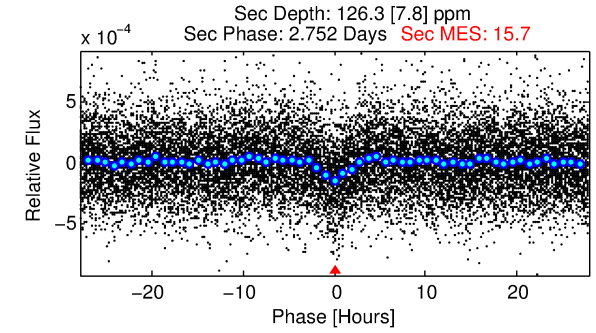
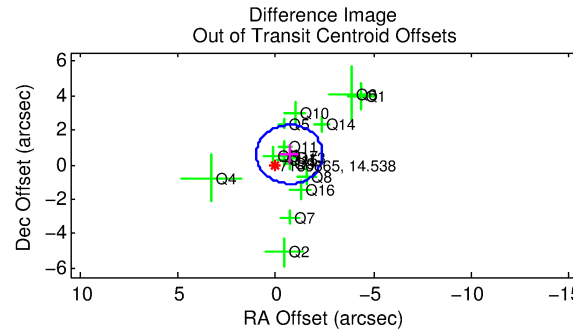
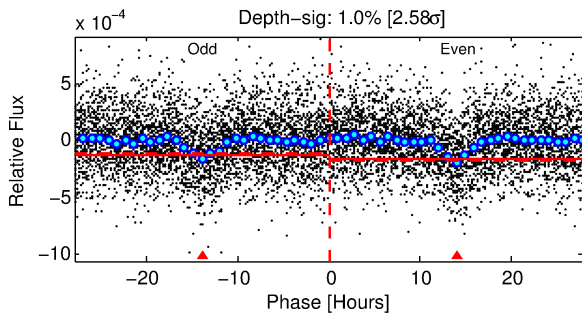
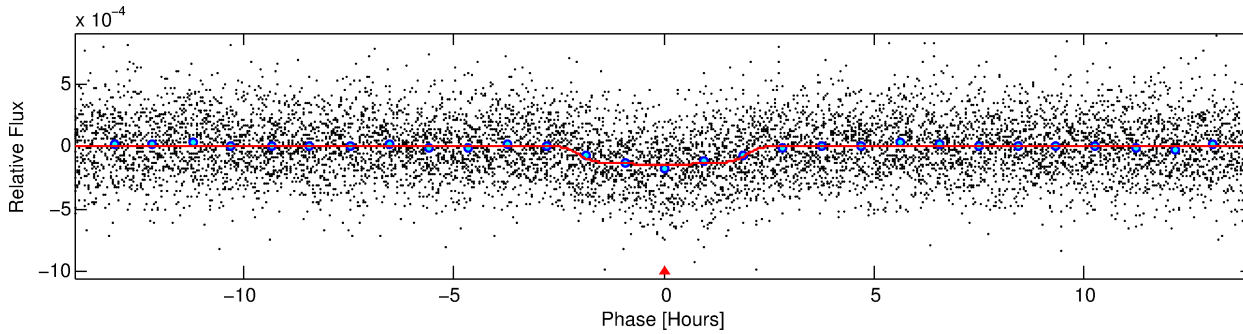
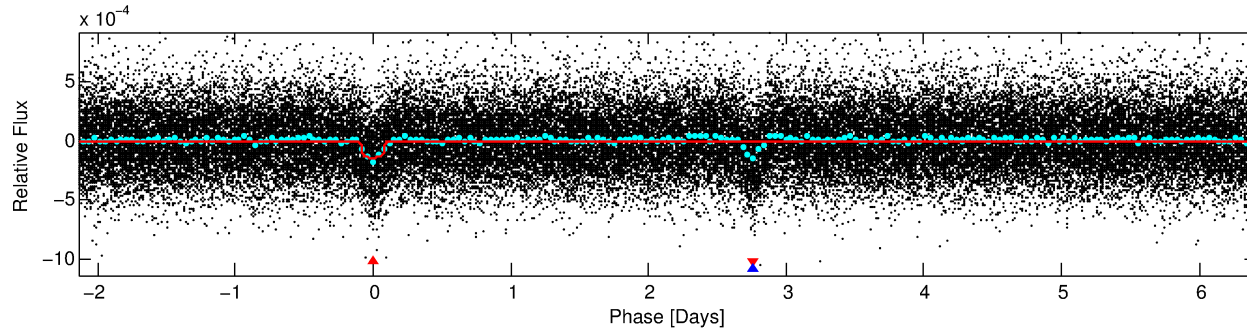
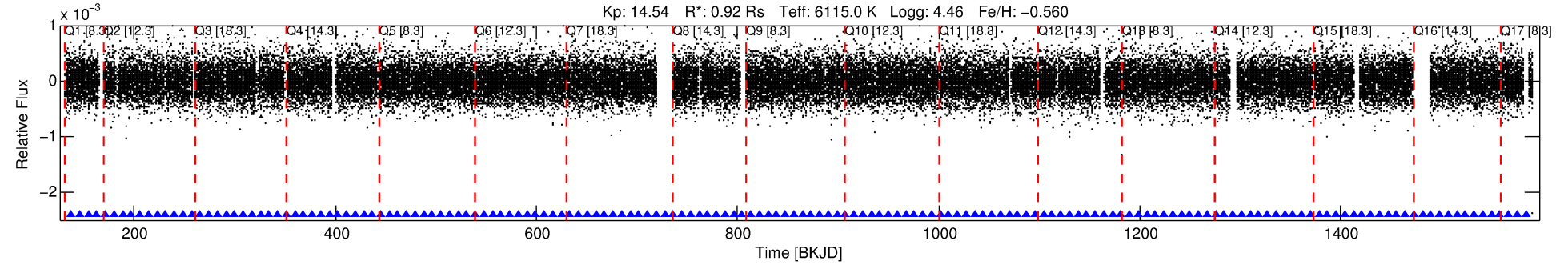
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007186665-01

No Significant Match Found

# DV One-Page Summary

KIC: 7186665 Candidate: 1 of 2 Period: 8.559 d  
KOI: K03033.01 Corr: 0.962



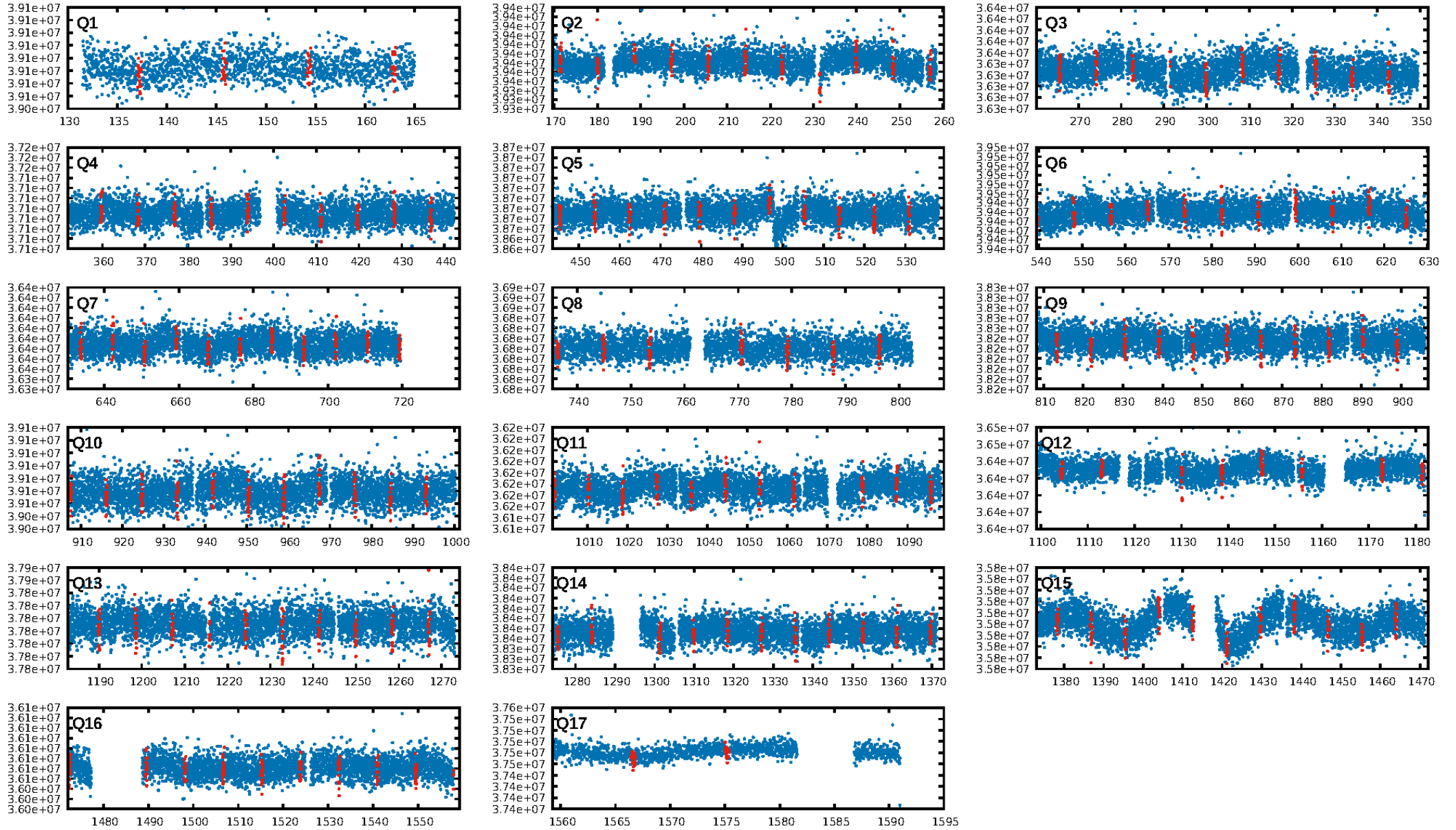
## DV Fit Results:

Period = 8.55934 [0.00006] d  
Epoch = 137.2251 [0.0052] BKJD  
Rp/R\* = 0.0136 [0.0011]  
a/R\* = 4.89 [1.85]  
b = 0.95 [0.04]  
Seff = 170.13 [59.43]  
Teq = 921 [80] K  
Rp = 1.36 [0.37] Re  
a = 0.0789 [0.0175] AU  
Ag = 232.12 [85.47] [2.70 $\sigma$ ]  
Teffp = 5558 [284] K [15.69 $\sigma$ ]

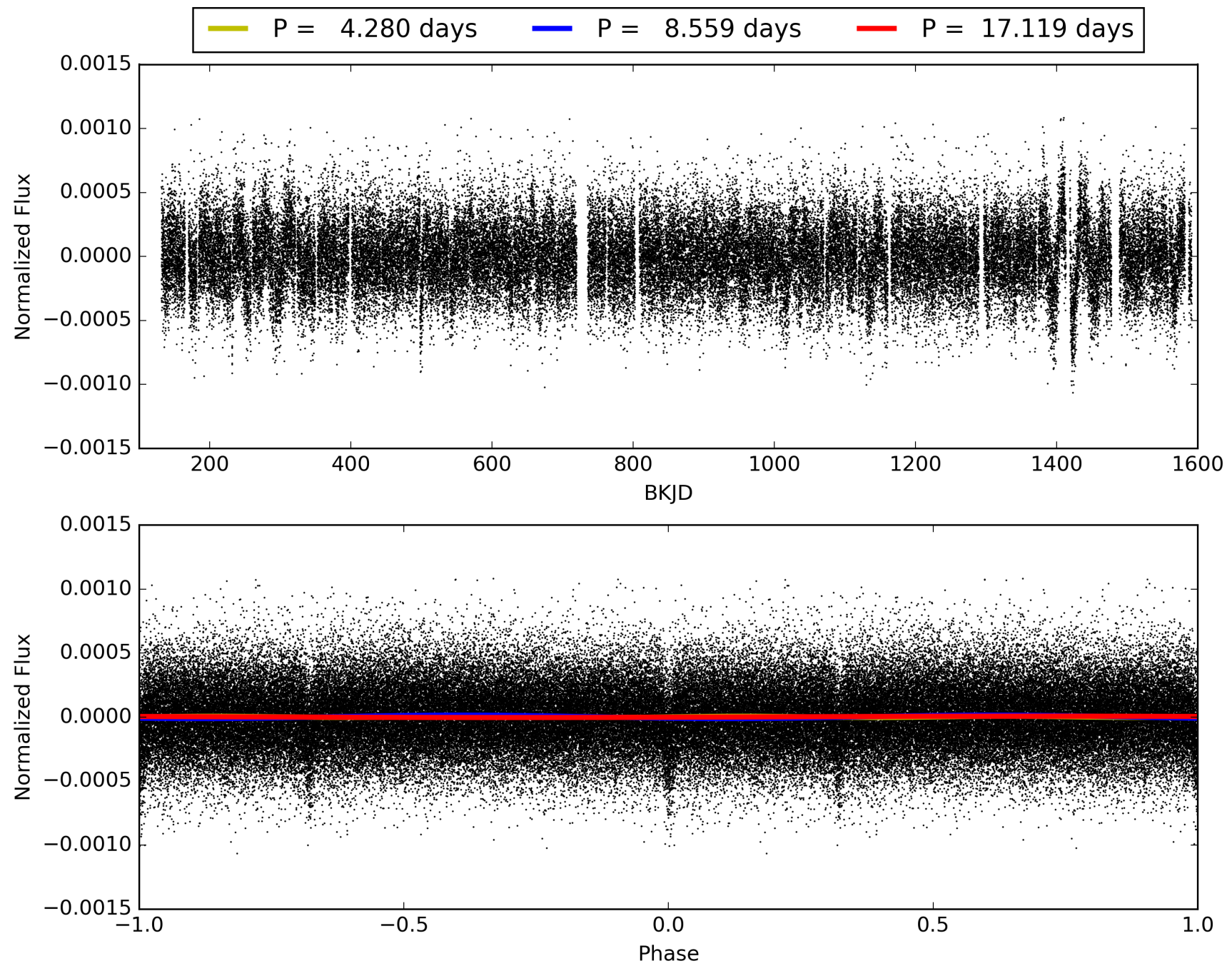
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: 19.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.18e-66  
RollingBand-fgt: 1.00 [151/151]  
GhostDiagnostic-chr: 0.9764  
Centroid-sig: 0.0%  
Centroid-so: 2.740 arcsec [3.46 $\sigma$ ]  
OotOffset-rm: 0.917 arcsec [1.61 $\sigma$ ]  
KicOffset-rm: 0.799 arcsec [1.43 $\sigma$ ]  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.50 [8/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007186665-01, PDC Light Curves

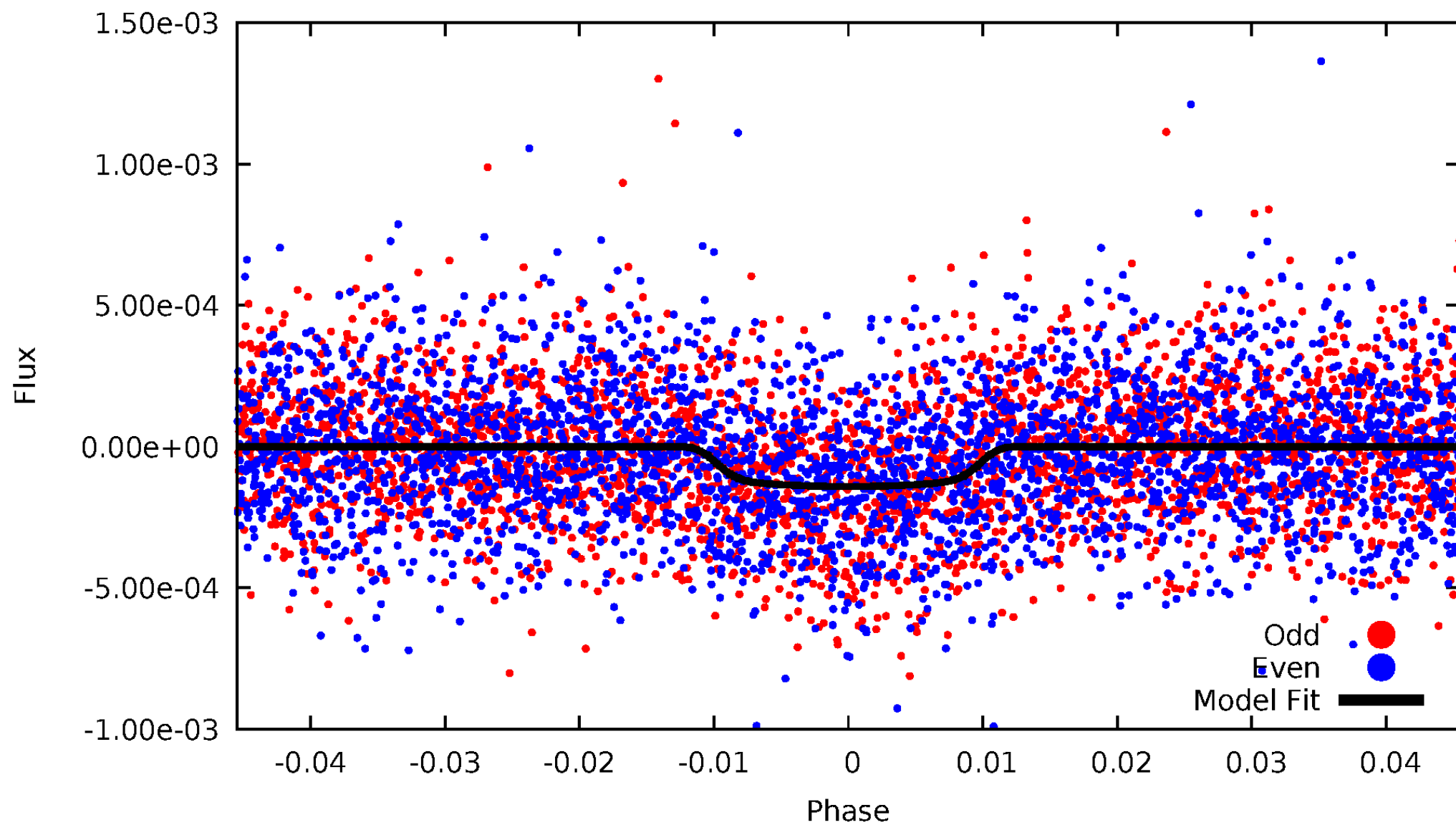


TCE 007186665-01



# DV Odd/Even

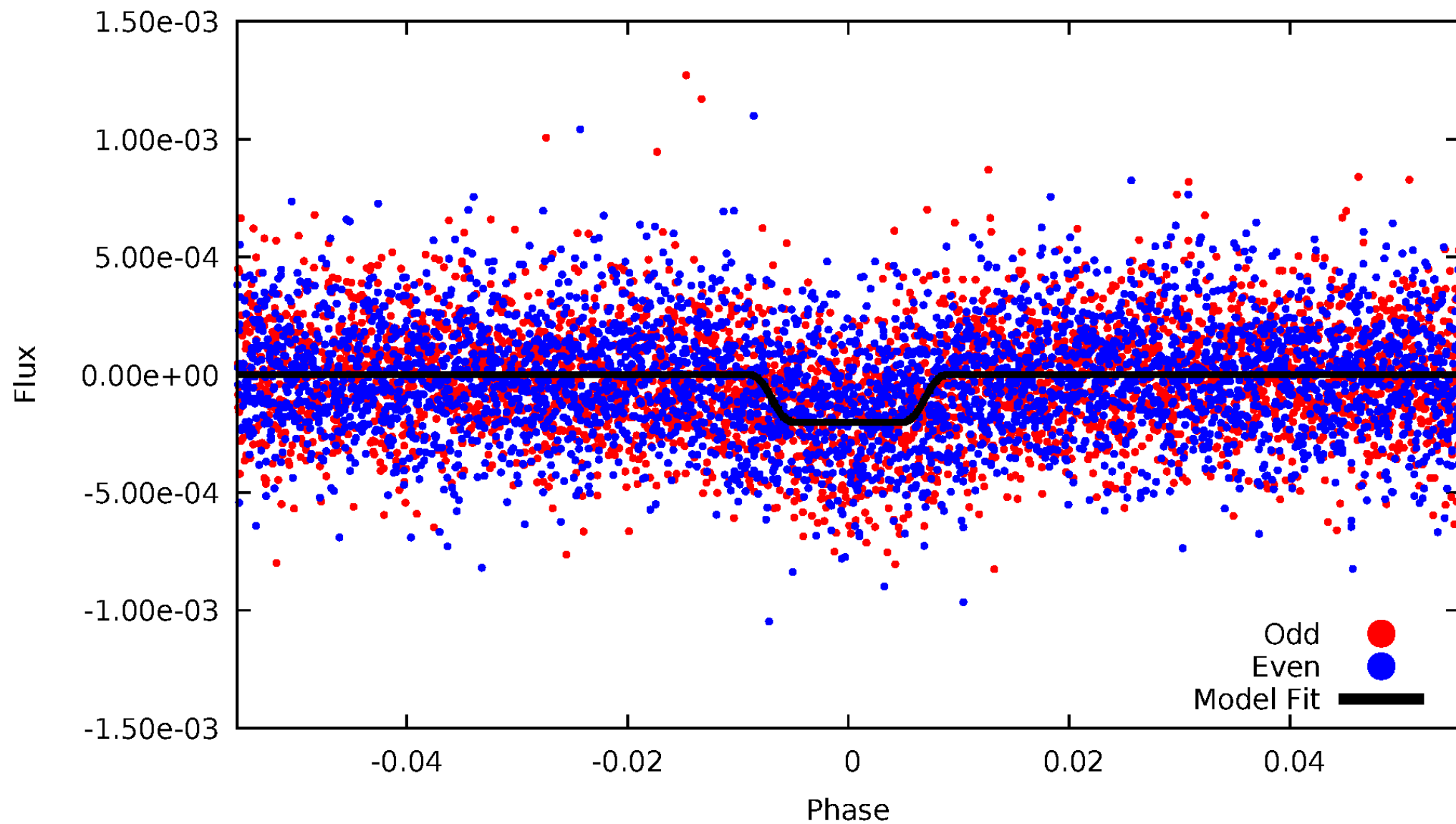
TCE 007186665-01



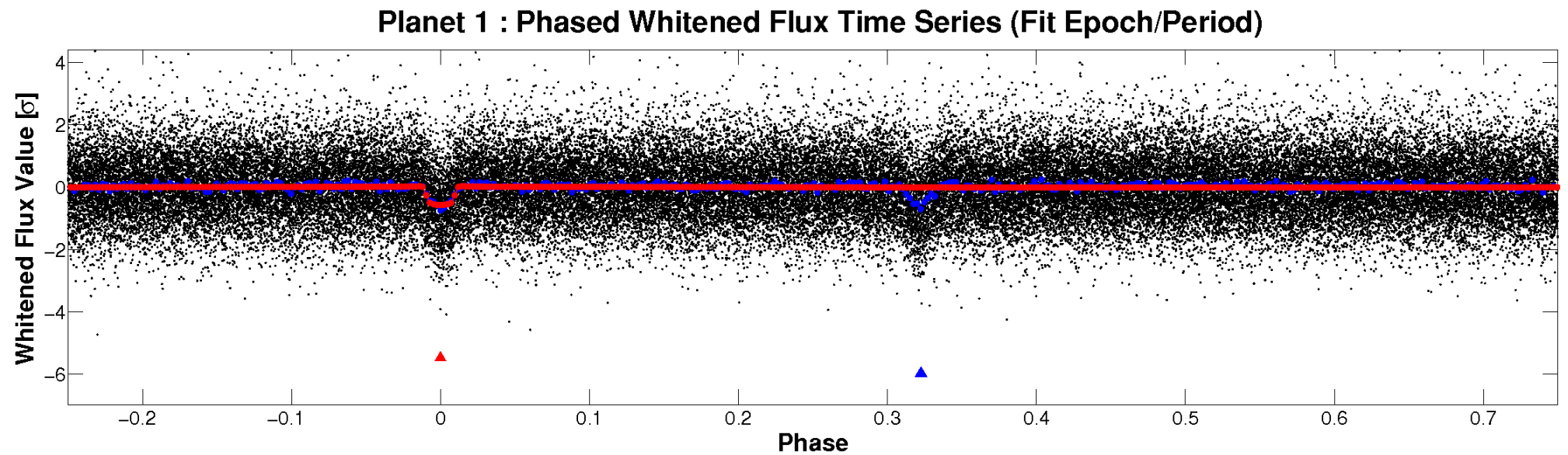
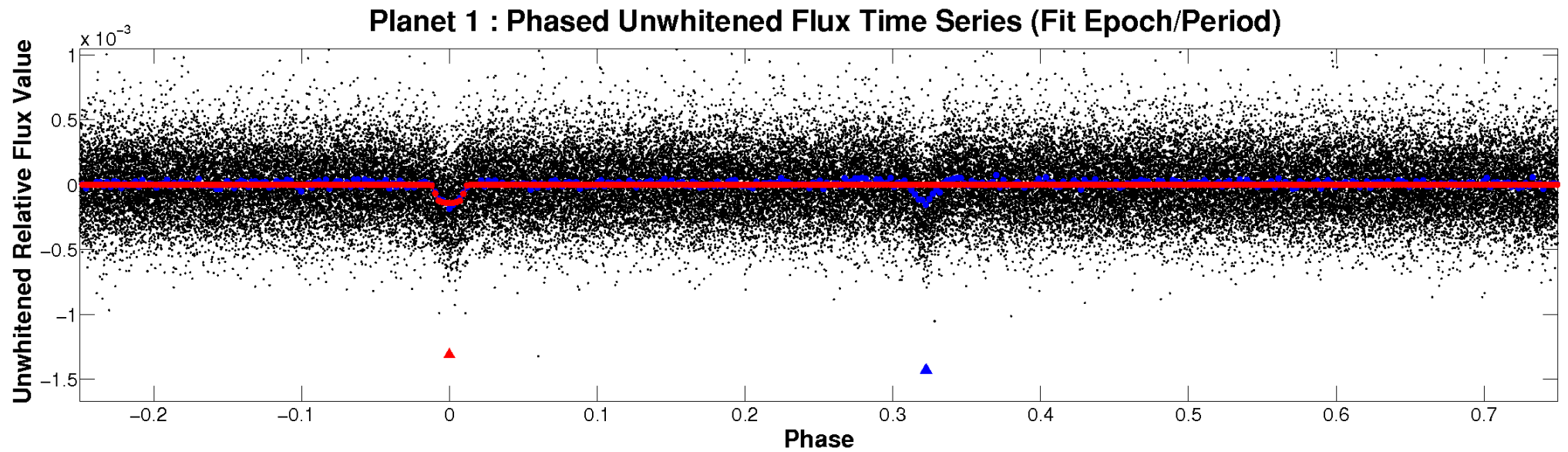


# ALT Odd/Even

TCE 007186665-01

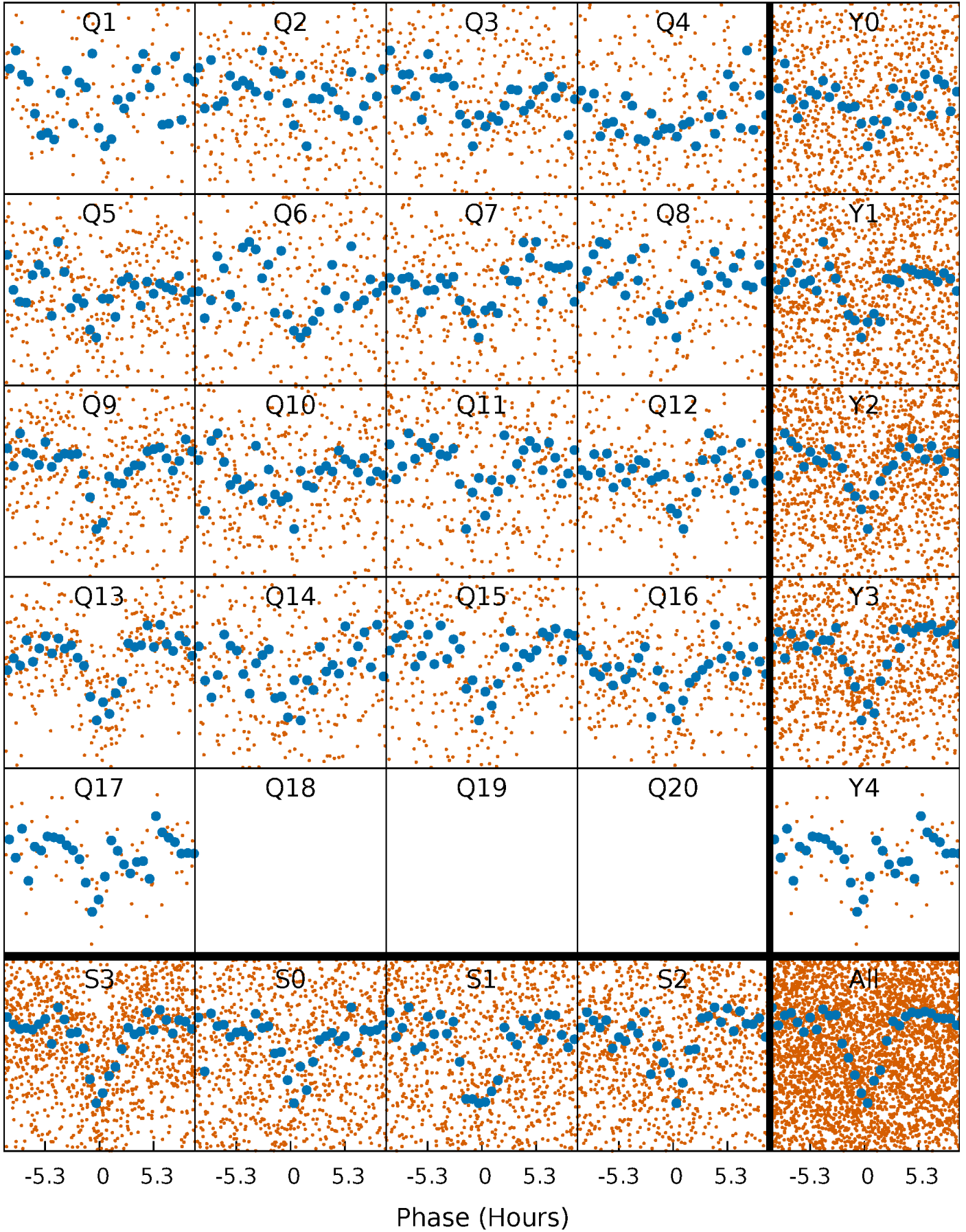


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

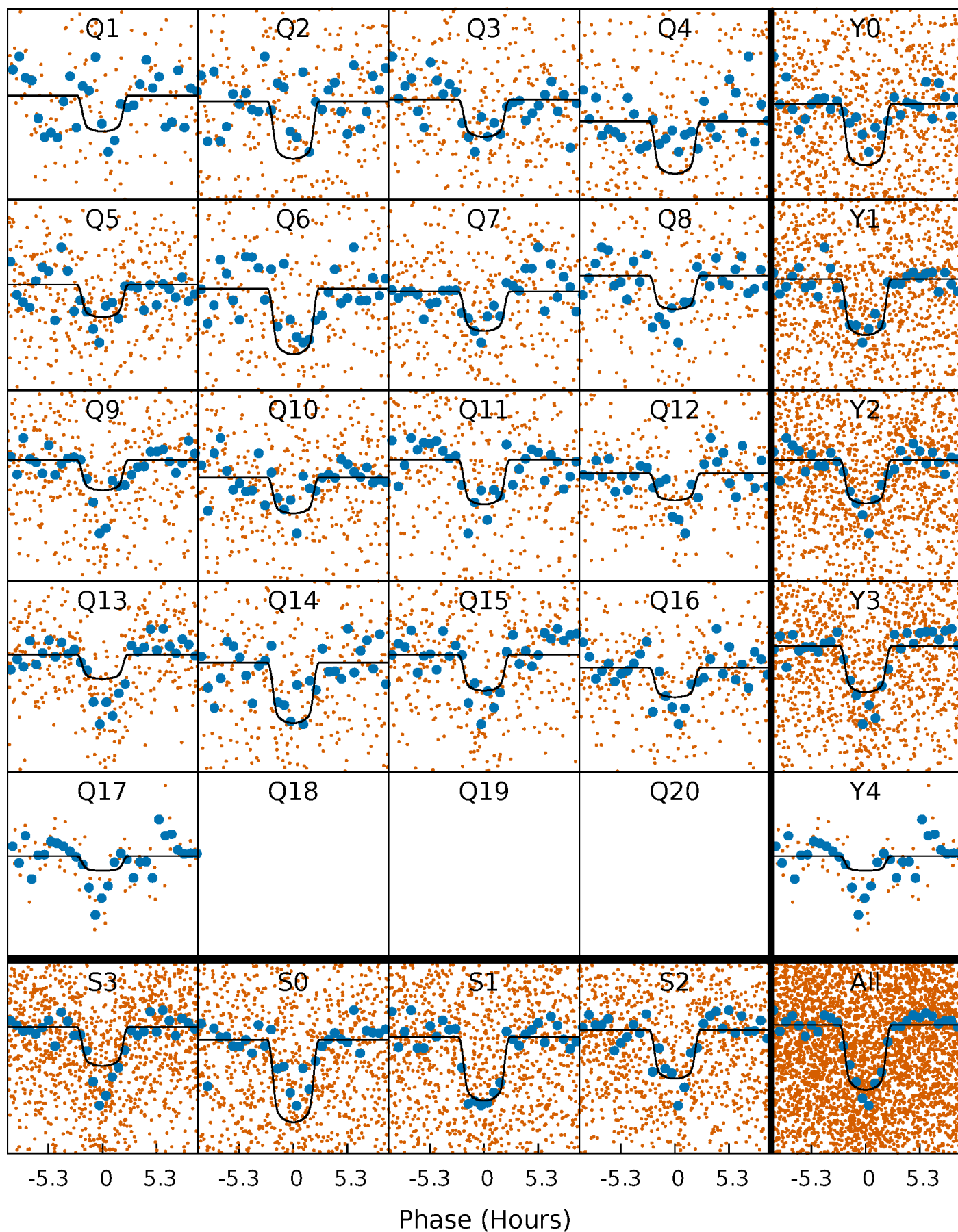
TCE 007186665-01 P= 8.559343 Days  $T_0=137.225071$  (BKJD)





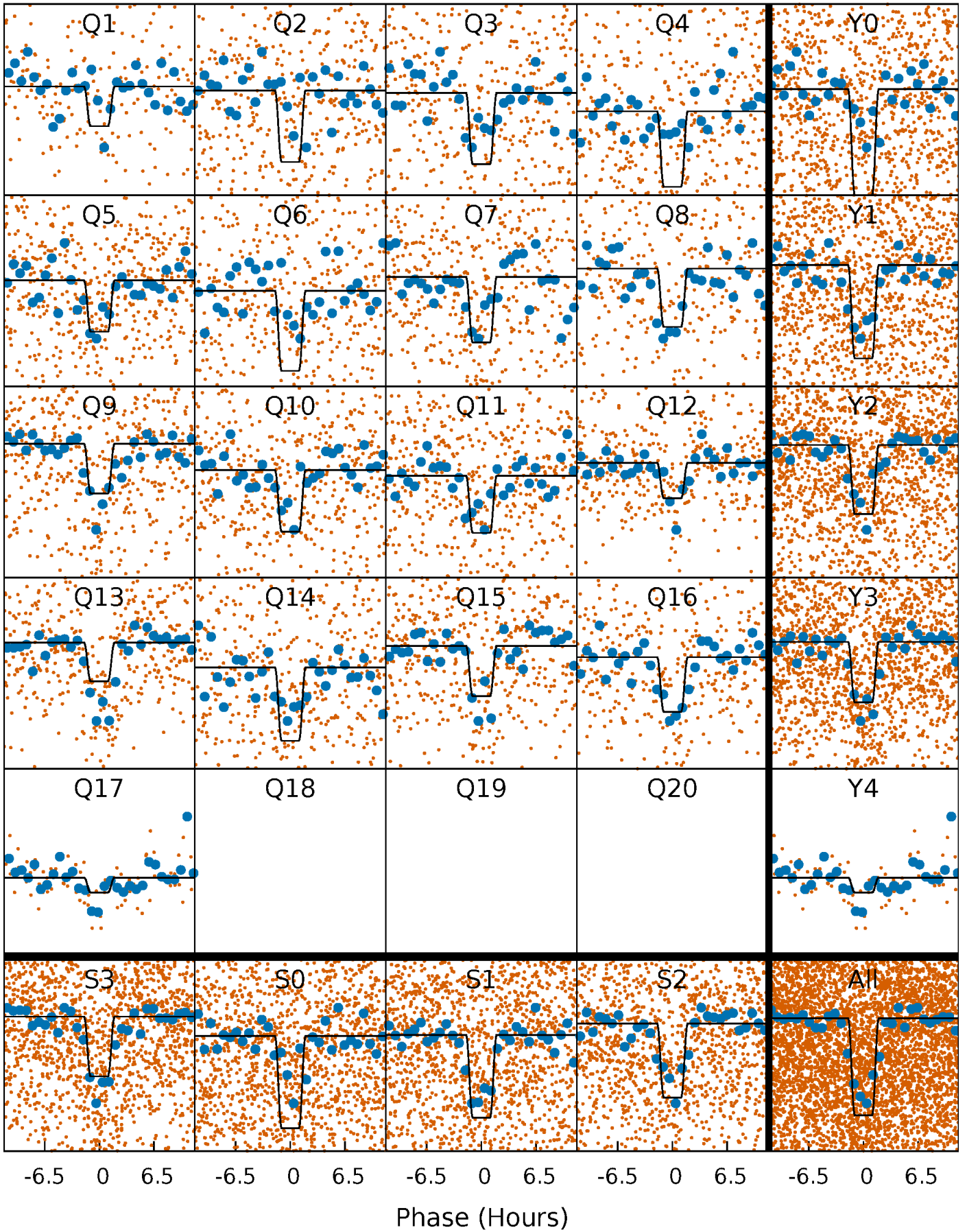
# DV Quarter-Phased Transit Curves

TCE 007186665-01 P= 8.559343 Days  $T_0=137.225071$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

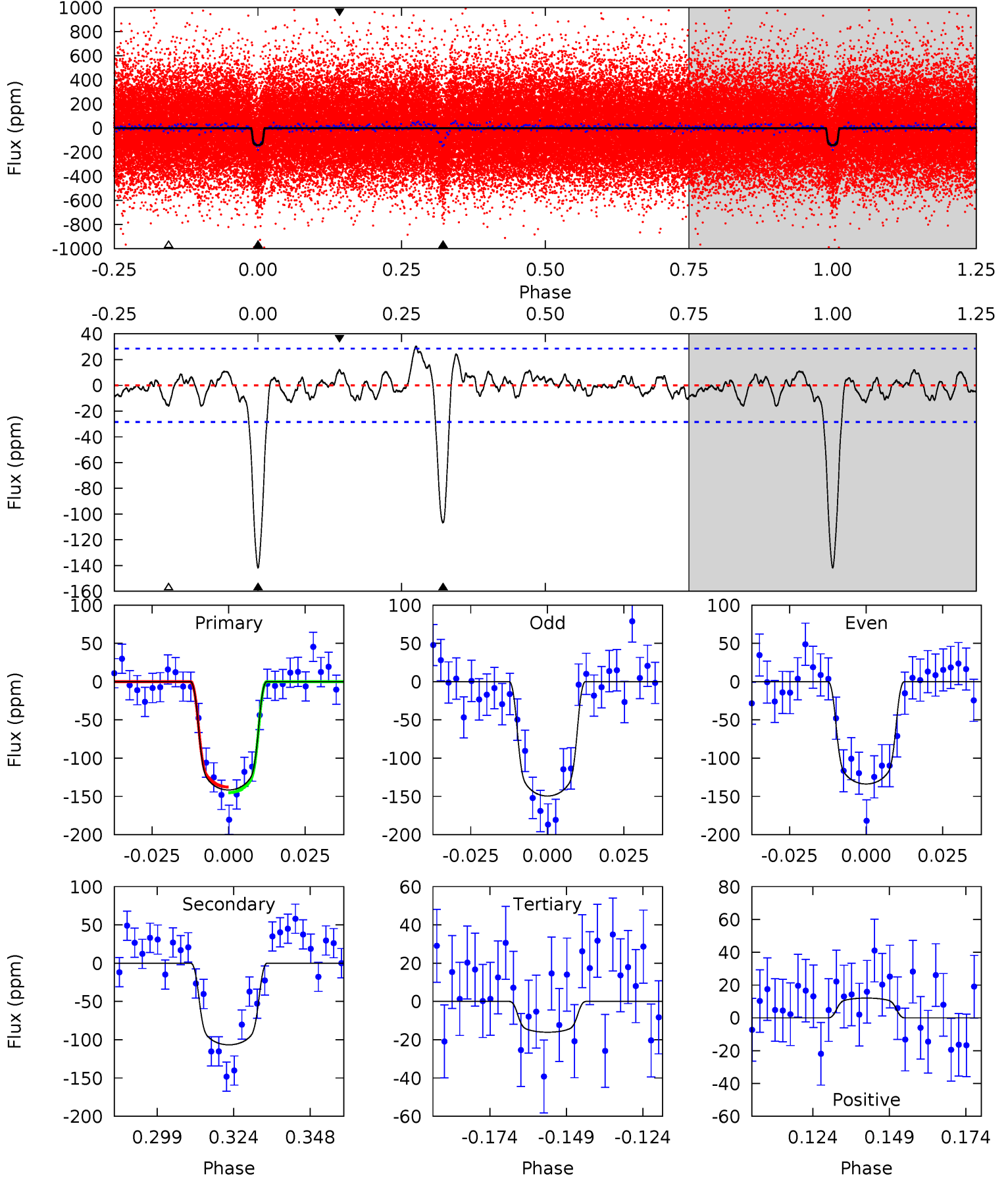
TCE 007186665-01 P= 8.559329 Days  $T_0=137.229987$  (BKJD)



# DV Model-Shift Uniqueness Test

007186665-01, P = 8.559343 Days, E = 128.665728 Days

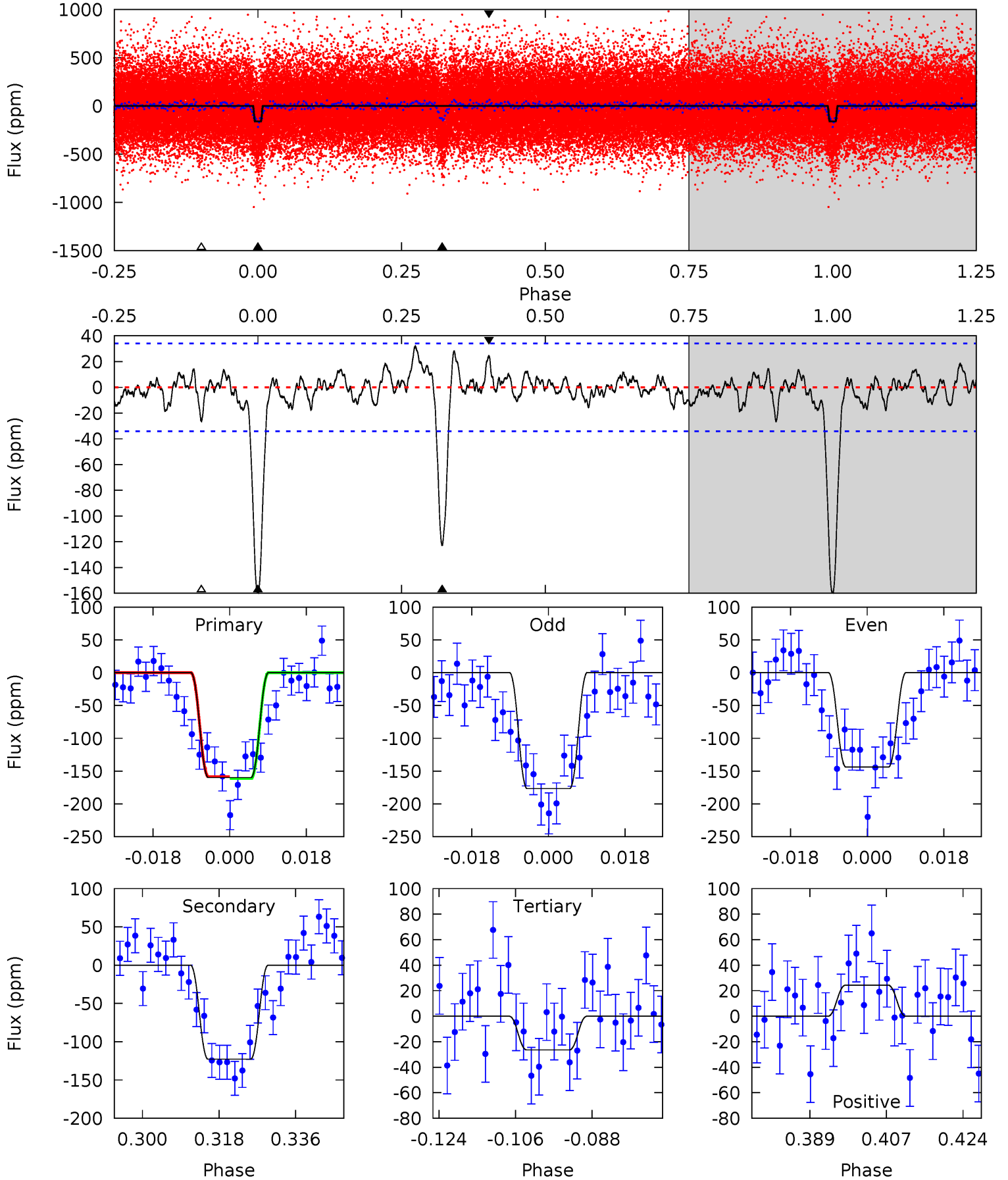
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.0	18.1	2.73	2.04	4.85	2.24	1.25	21.3	22.0	15.4	16.1	1.34	1.09	0.18	0.62



# Alt Model-Shift Uniqueness Test

007186665-01, P = 8.559329 Days, E = 128.670658 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
23.1	17.7	3.81	3.51	4.92	2.37	1.26	19.2	19.5	13.9	14.2	2.36	1.02	0.17	0.22





### Stellar Parameters For KIC 007186665

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6115^{+164}_{-182}$	$4.462^{+0.084}_{-0.182}$	$-0.560^{+0.300}_{-0.300}$	$0.919^{+0.238}_{-0.110}$	$0.892^{+0.109}_{-0.089}$	$1.618^{+0.572}_{-0.784}$
	+3%/-3%	+2%/-4%	+54%/-54%	+26%/-12%	+12%/-10%	+35%/-48%
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 007186665-01 / KOI 3033.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-107 \pm 6$	$1.40^{+0.23}_{-0.16}$	$1301^{+84}_{-65}$	$5359^{+238}_{-219}$	$185^{+49}_{-46}$
Alt.	$-123 \pm 7$	$1.46^{+0.23}_{-0.18}$	$1301^{+88}_{-61}$	$5438^{+272}_{-230}$	$196^{+58}_{-46}$

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

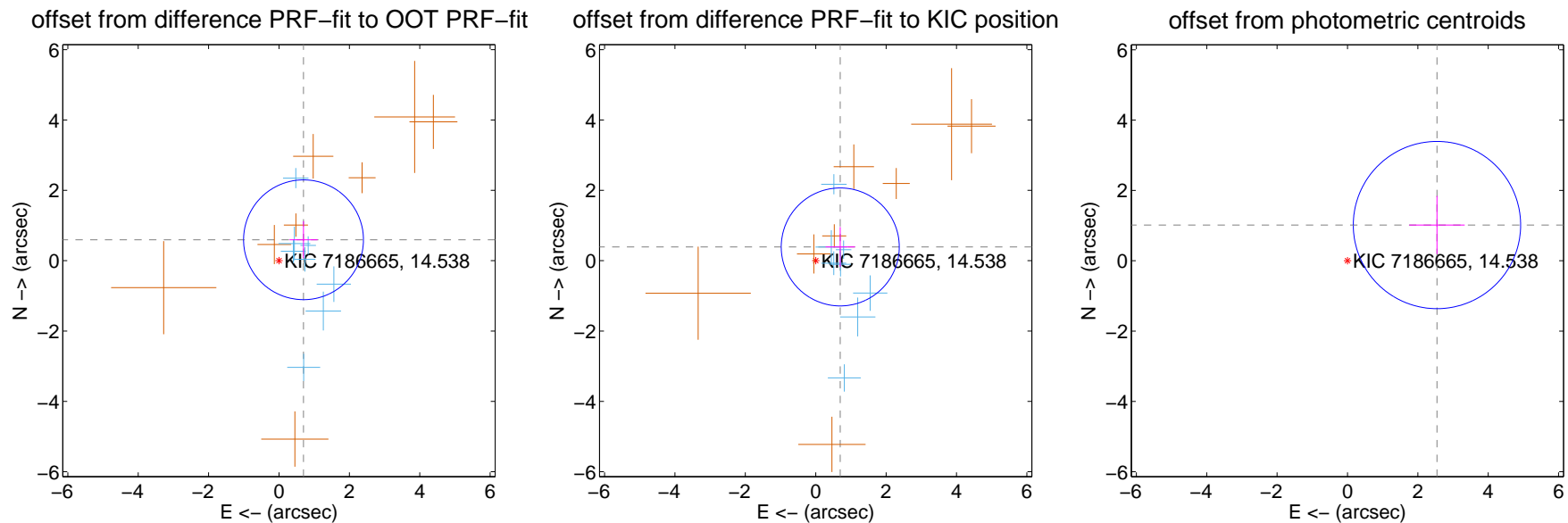
## DV Centroid Data

Supplemental centroid analysis for 007186665-01. Kepler magnitude: 14.54. Transit SNR 17.70

There are 8 quarters with good PRF difference image offsets

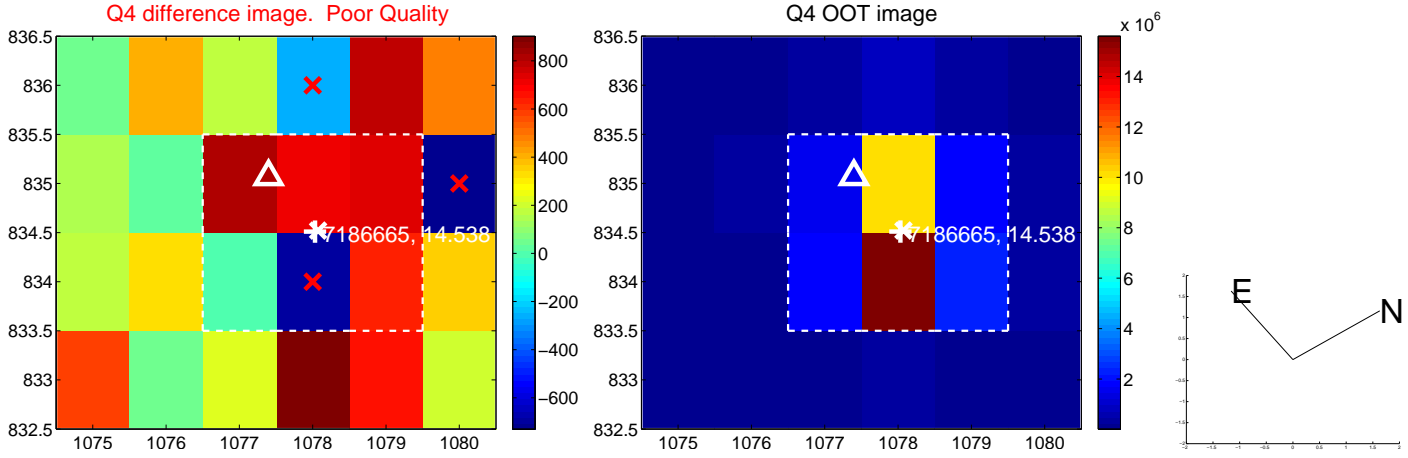
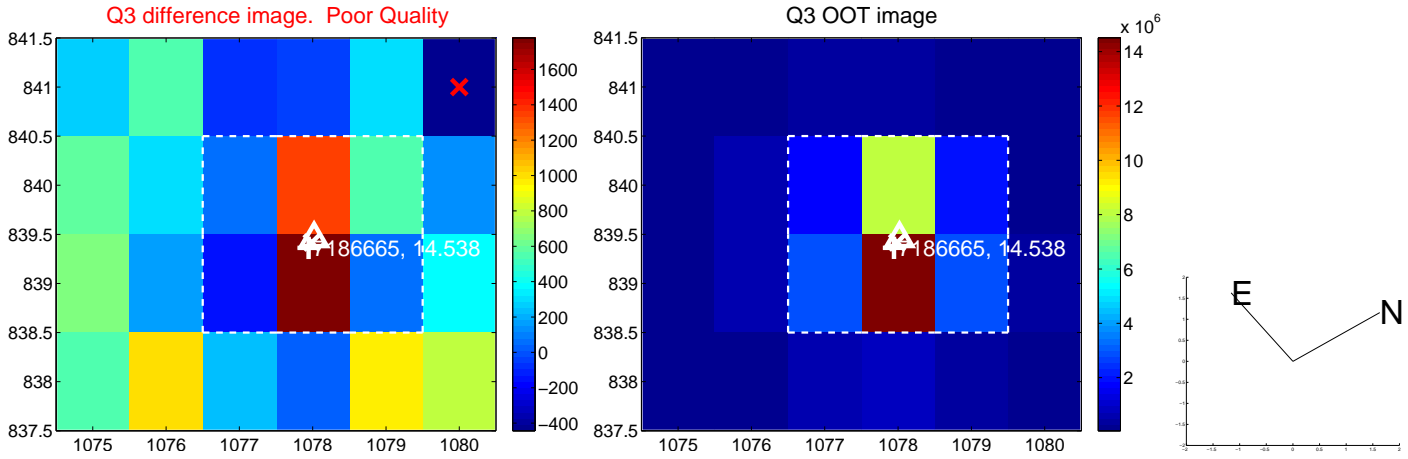
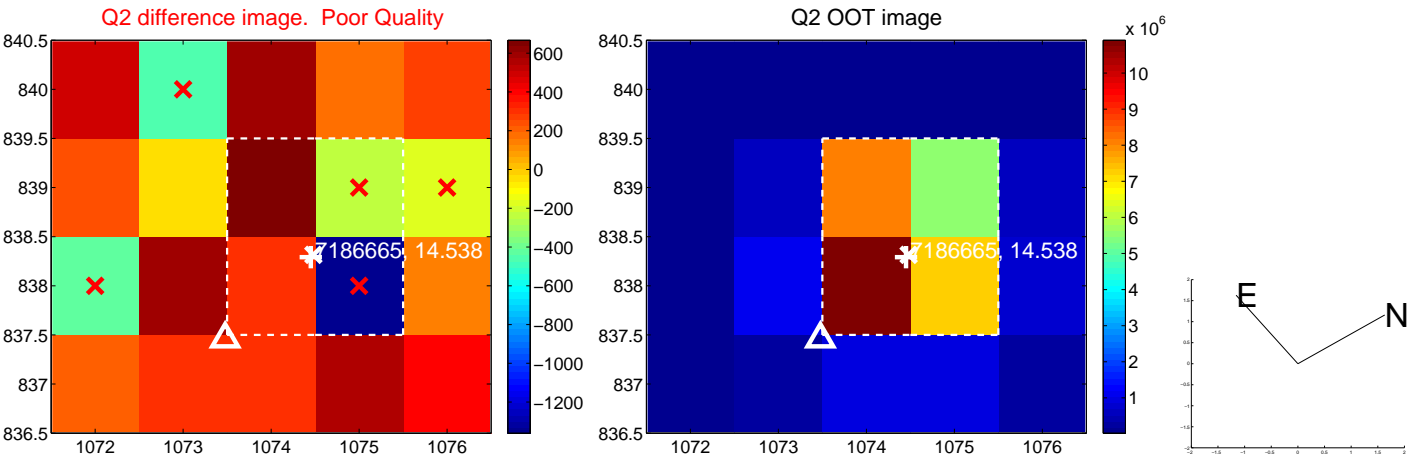
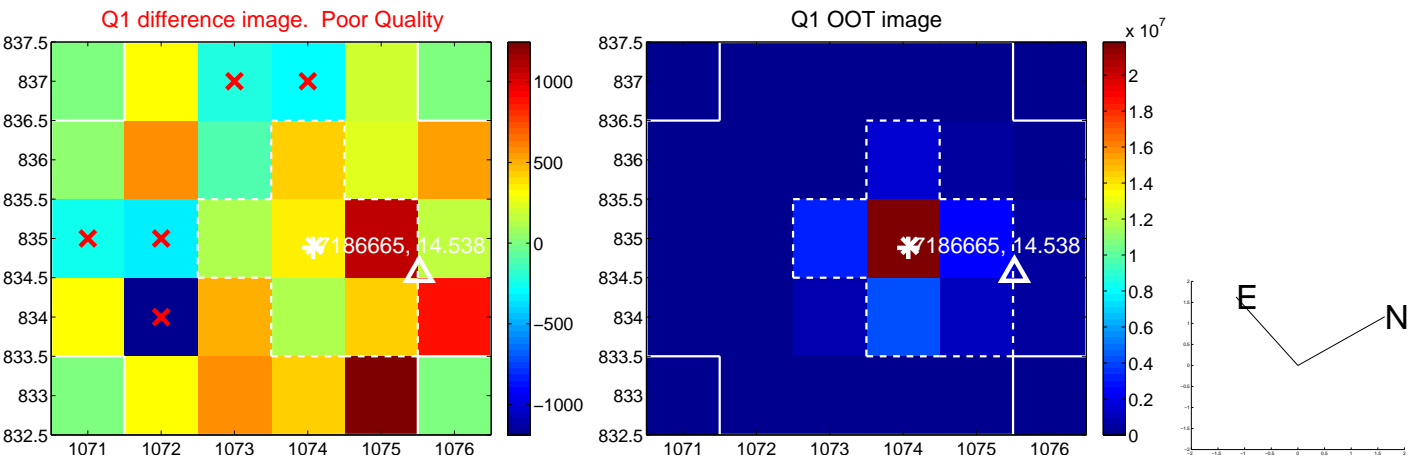
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.917 \pm 0.568$	1.61	$-0.697 \pm 0.398$	$0.595 \pm 0.528$
PRF-fit source offset from KIC position	$0.799 \pm 0.559$	1.43	$-0.697 \pm 0.418$	$0.391 \pm 0.567$
photometric centroid source offset	$2.74 \pm 0.79$	<b>3.46</b>	$-2.54 \pm 0.79$	$1.02 \pm 0.83$

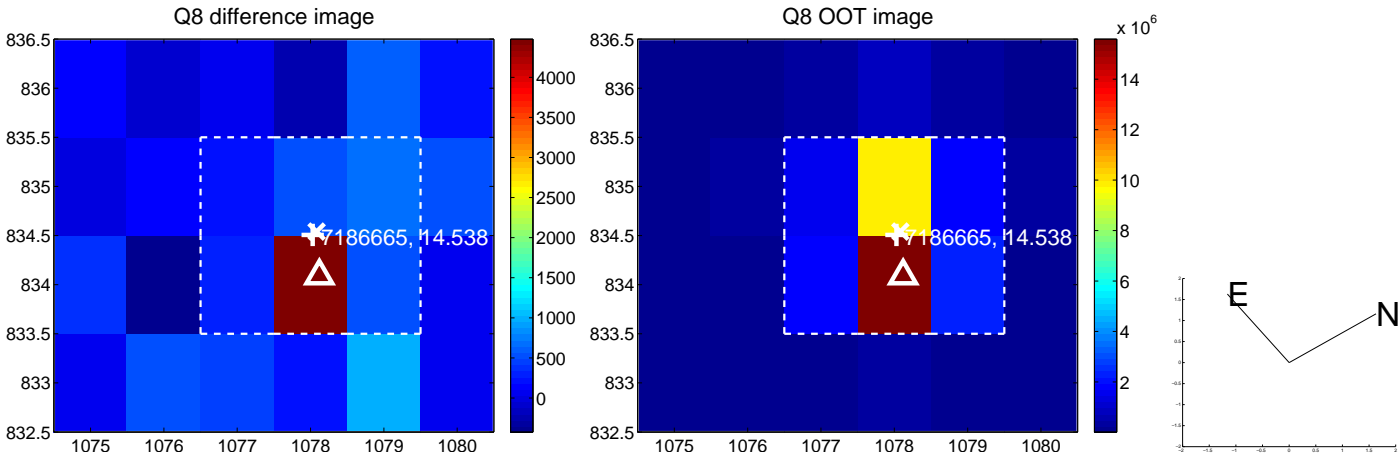
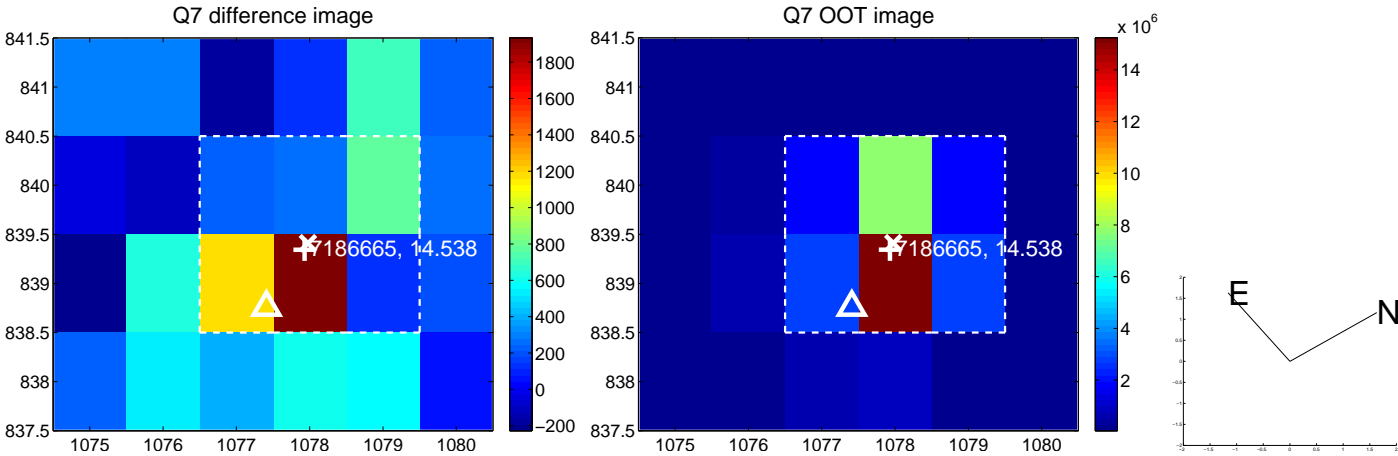
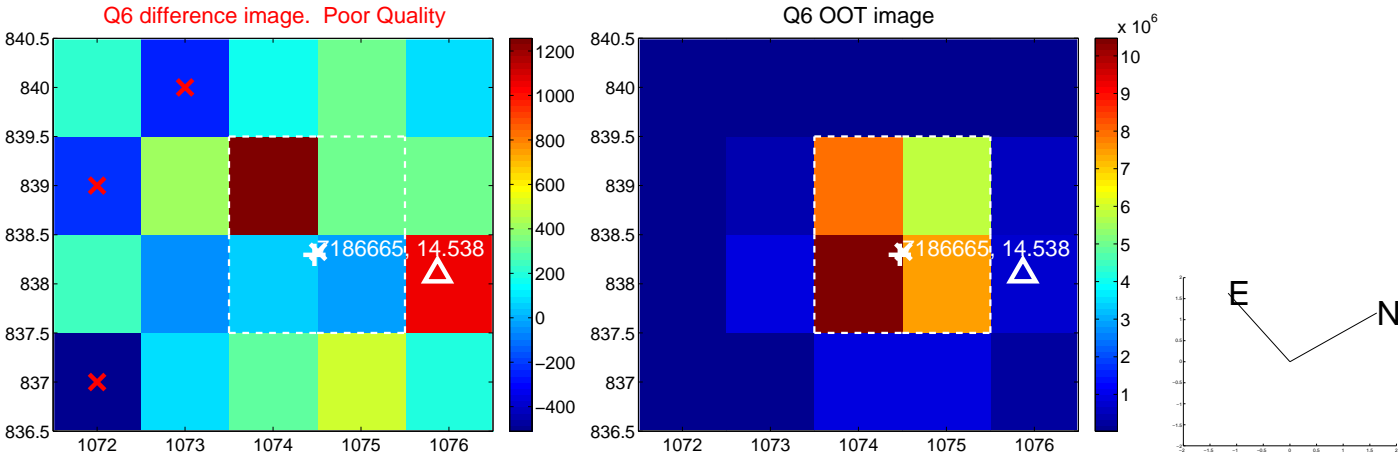
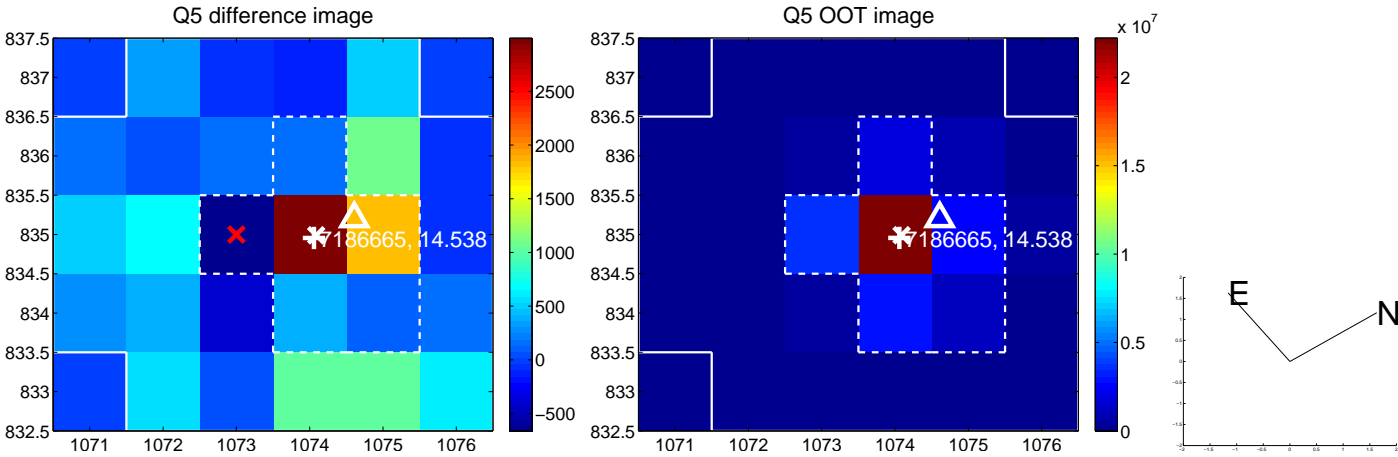


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

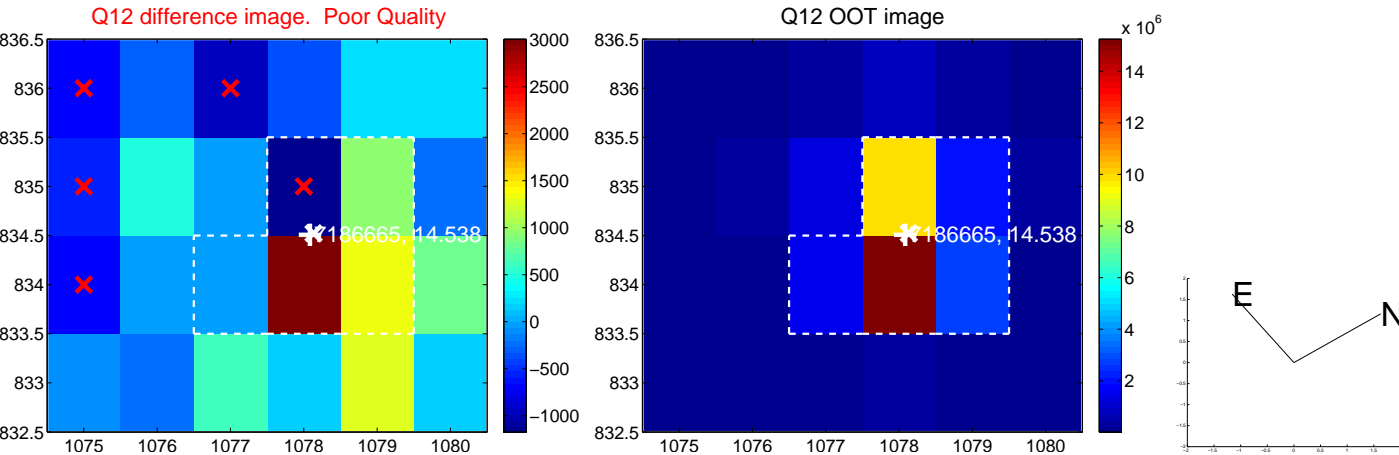
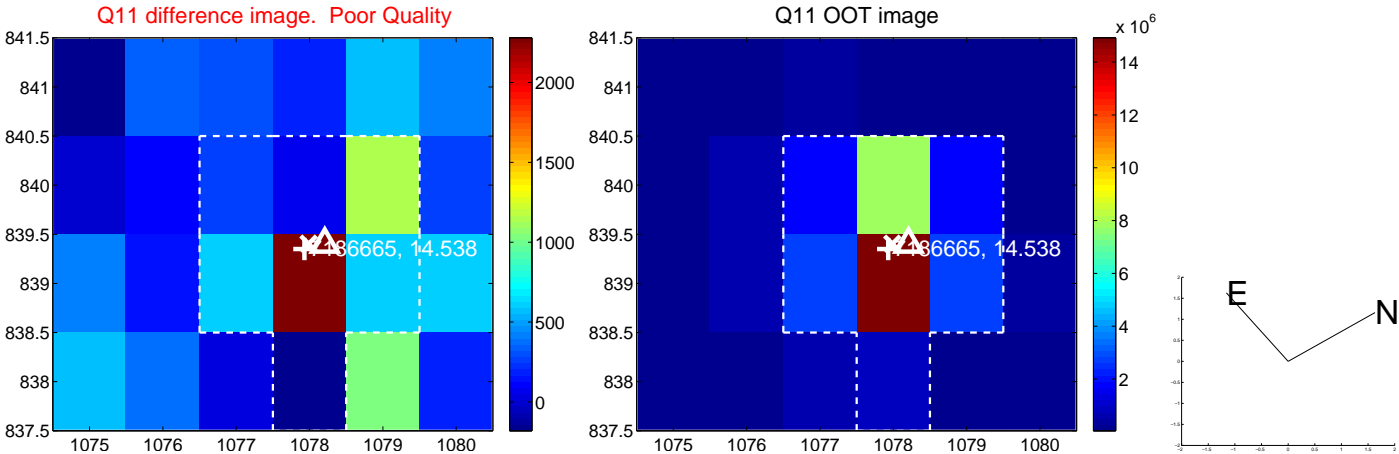
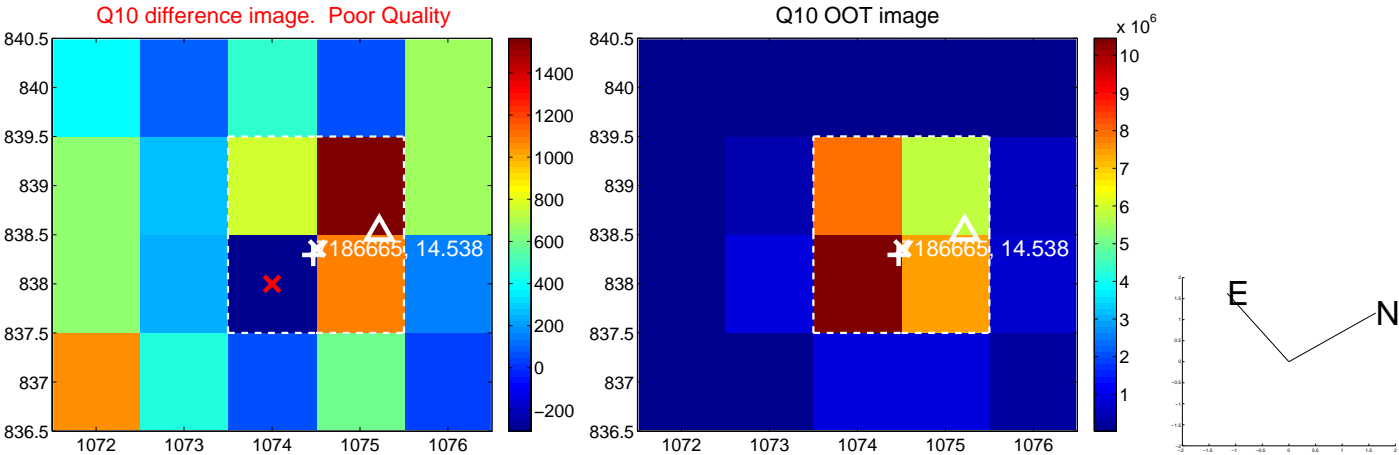
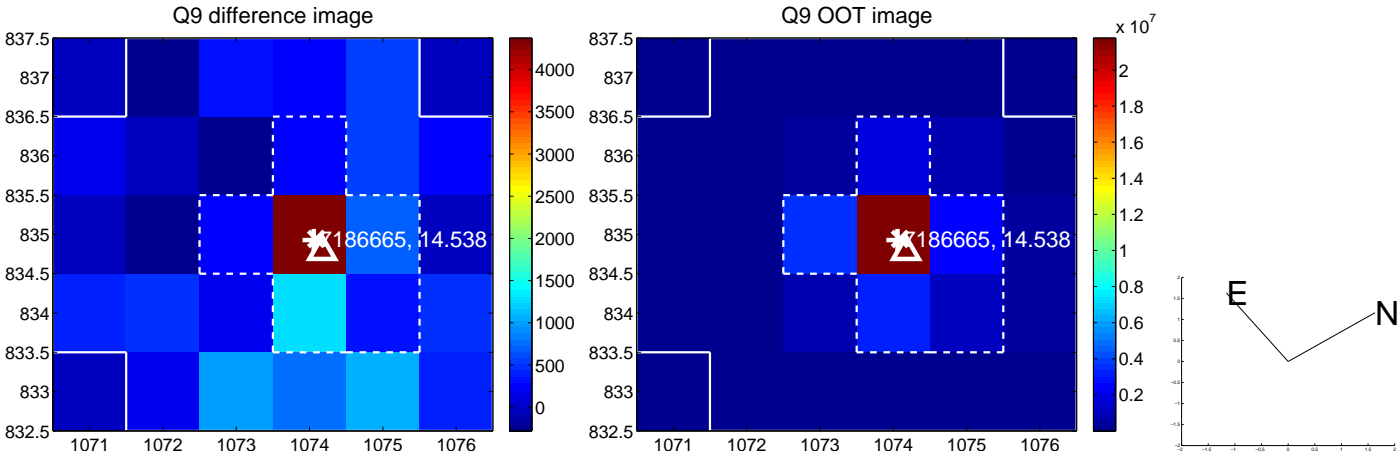


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

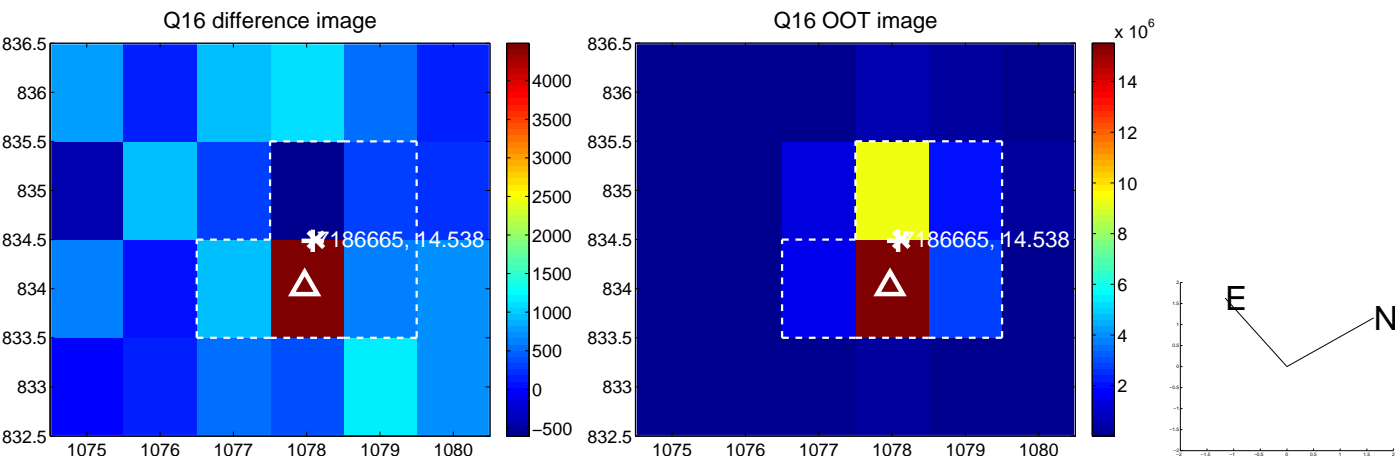
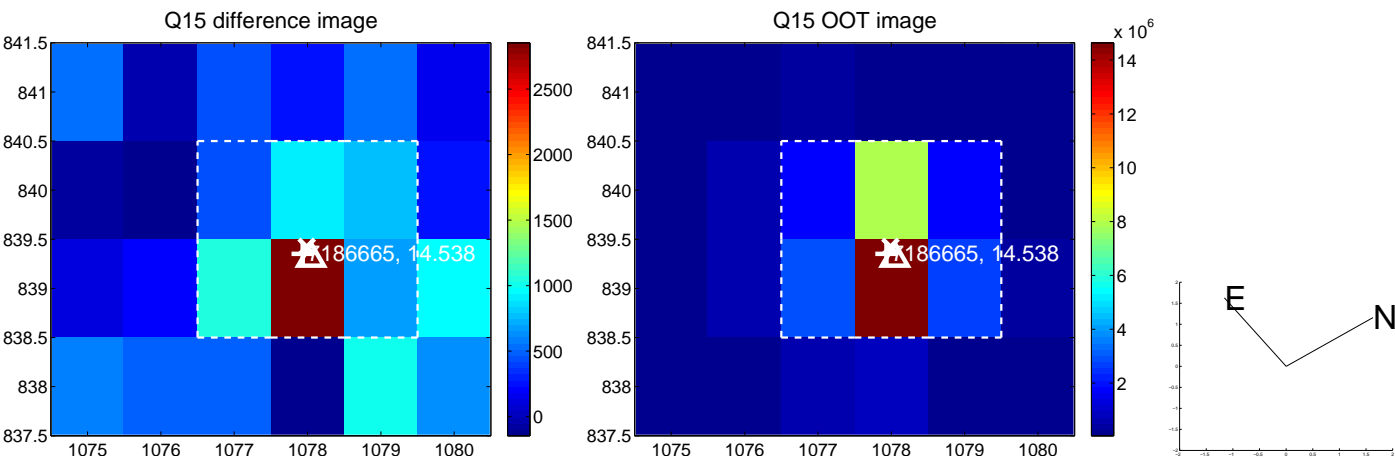
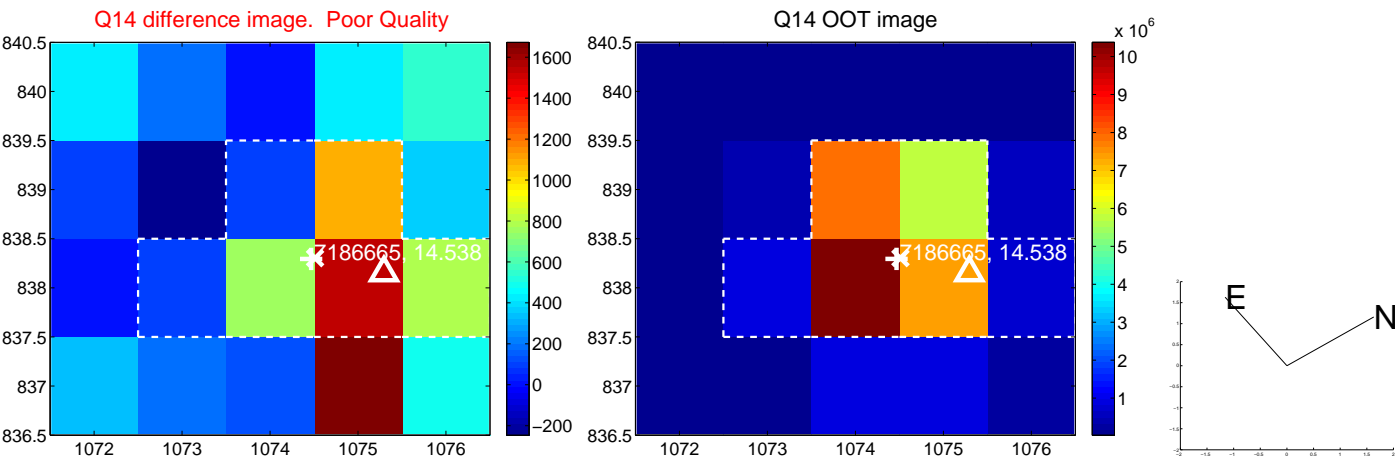
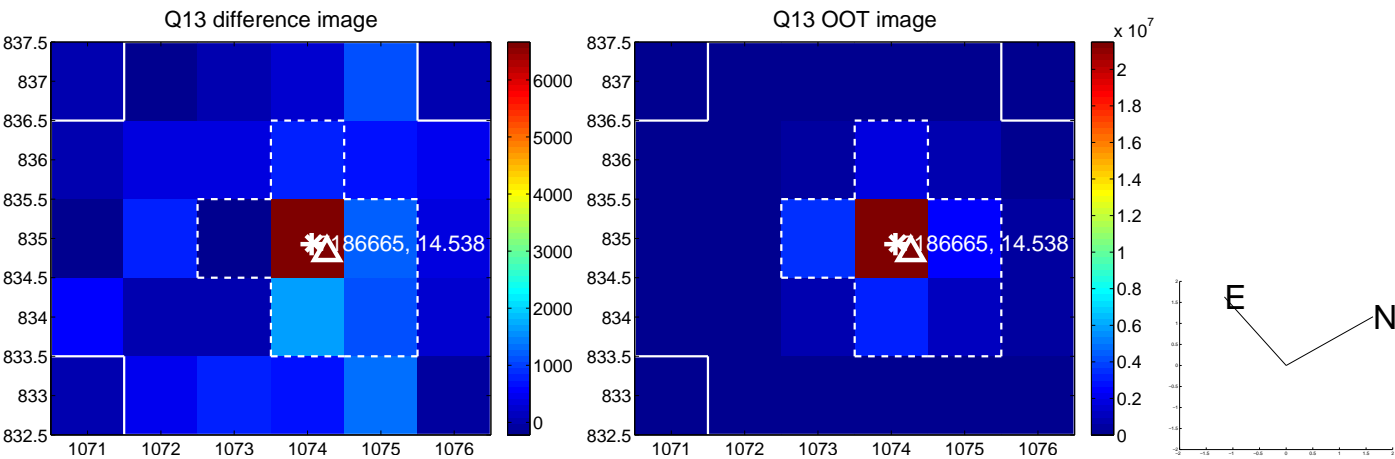




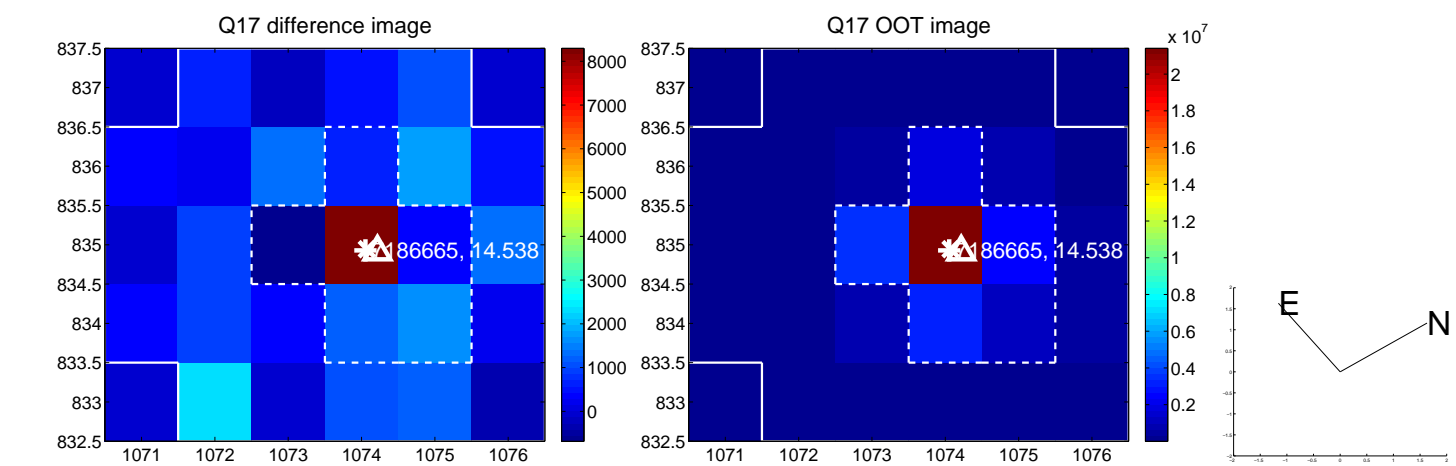
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



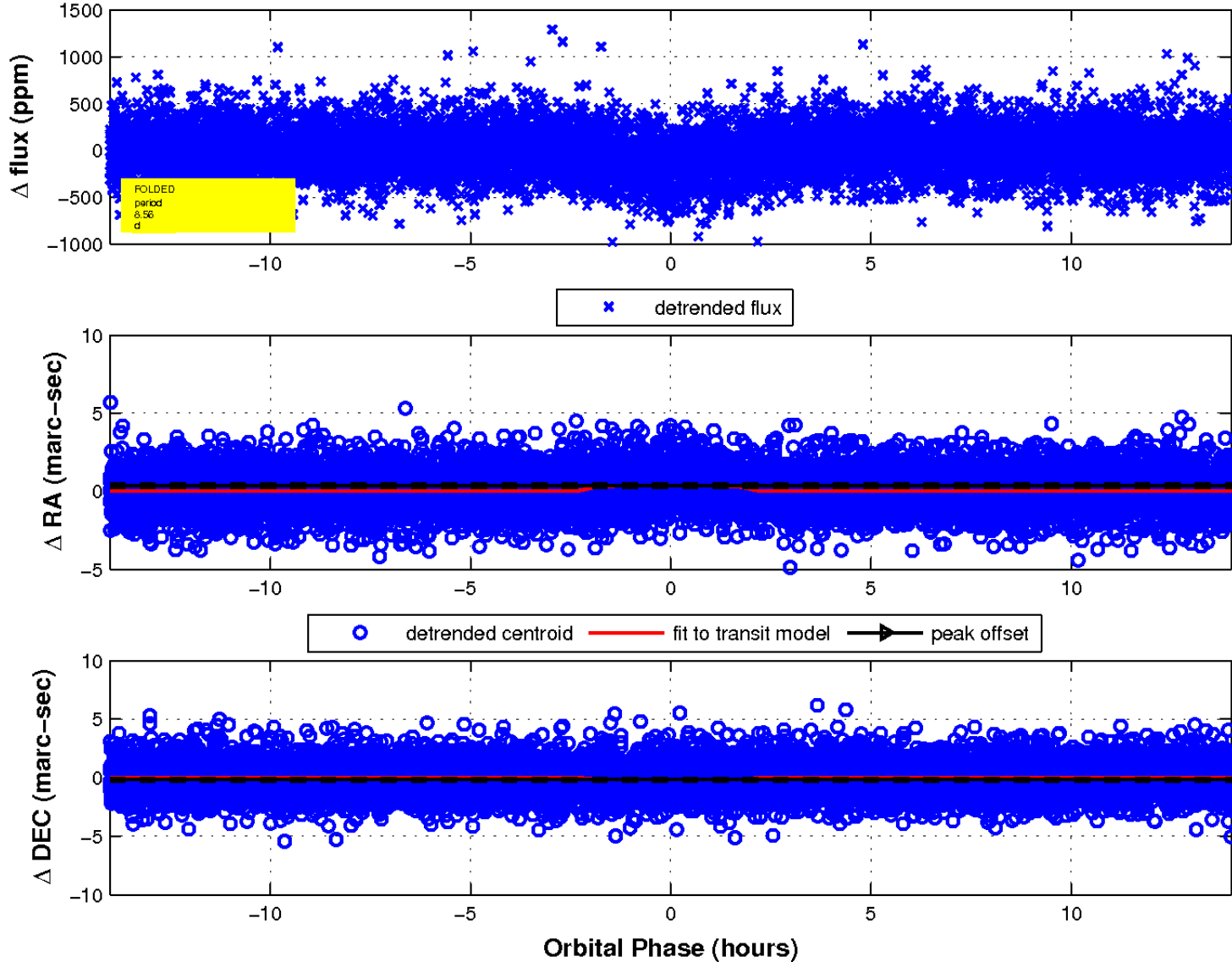
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

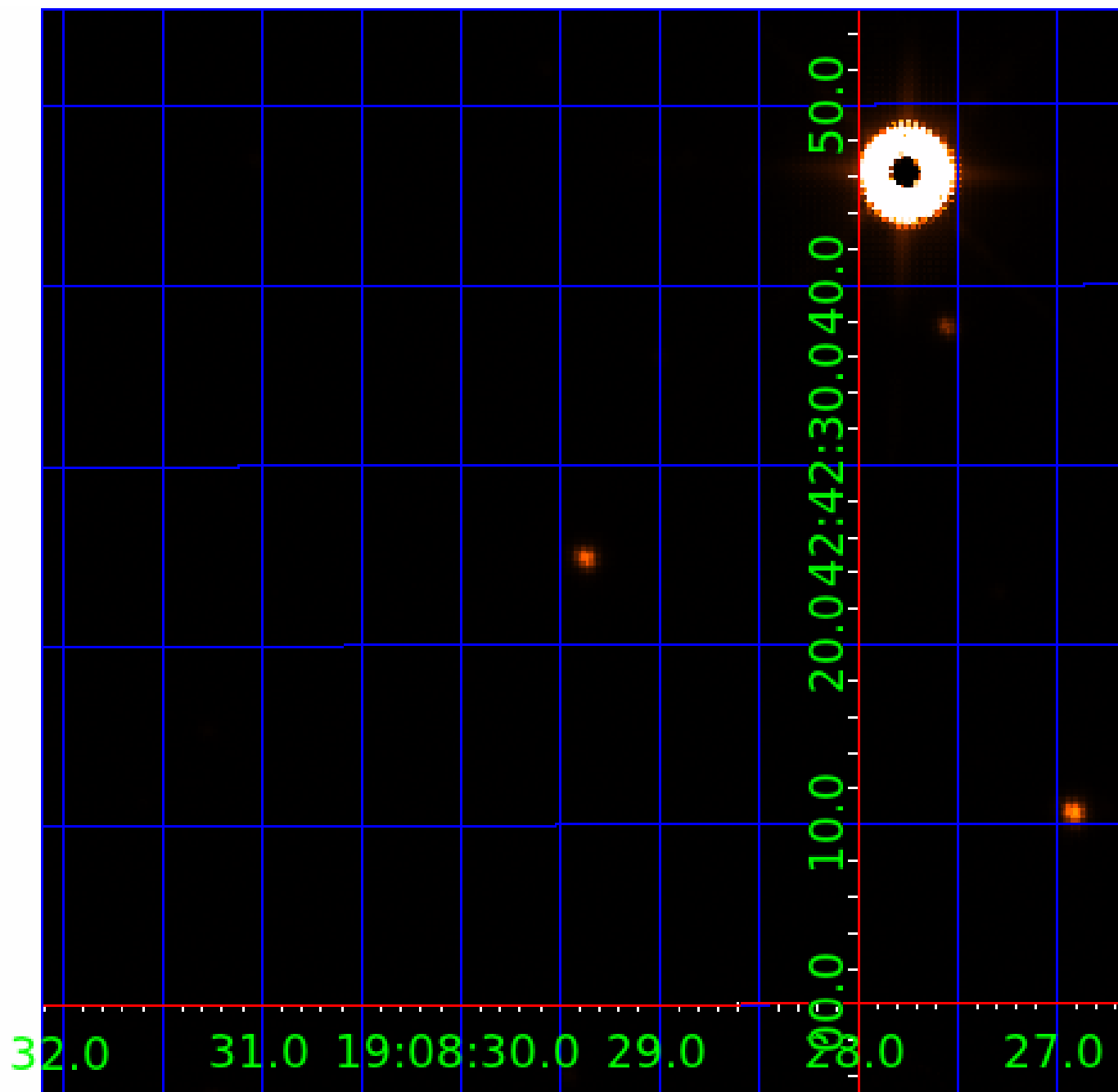


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 007186665

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007186665-01	OBS	3033.01	8.559343	137.225071	141.2	4.669	17.3	17.7	0.92	6115	1.36	170.13
007186665-02	OBS	No	8.559358	139.984641	123.3	4.713	15.5	16.4	0.92	6115	1.20	170.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007186665-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
007186665-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 007186665-02

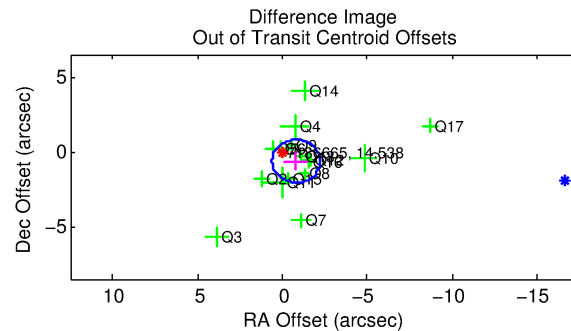
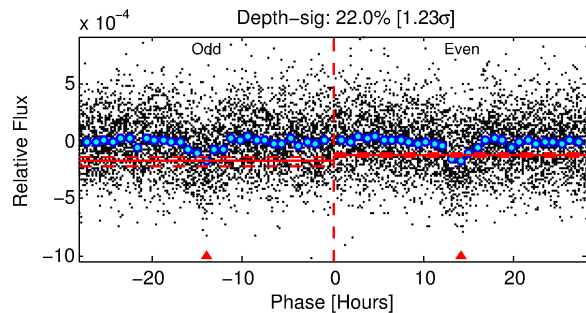
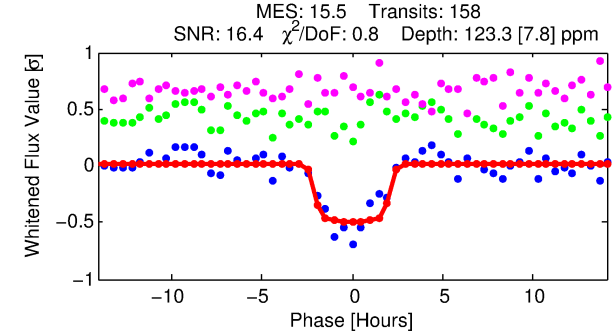
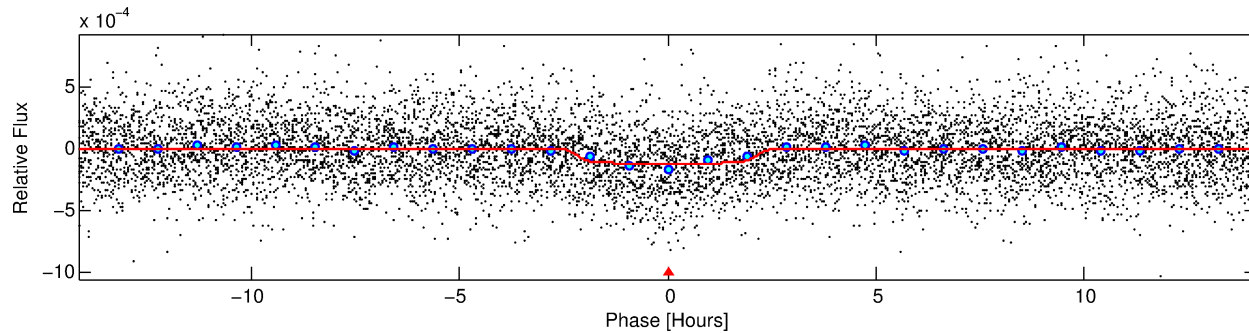
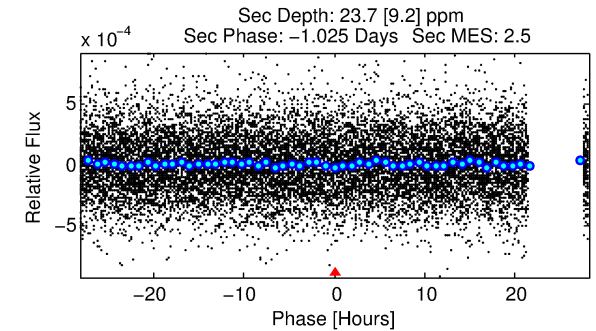
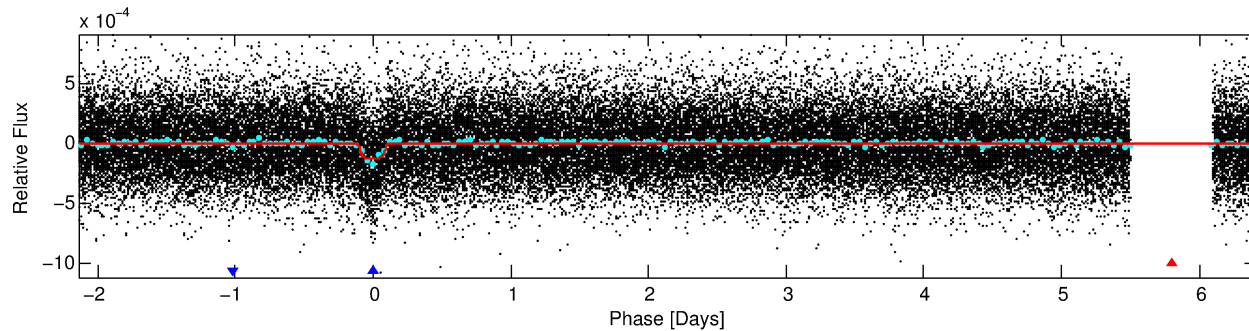
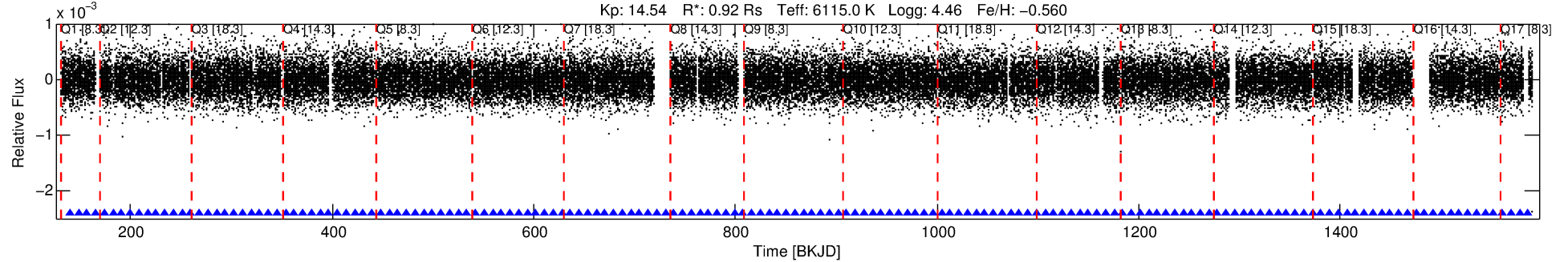
No Significant Match Found

# DV One-Page Summary

KIC: 7186665 Candidate: 2 of 2 Period: 8.559 d

KOI: K03033 Corr: No Ephemeris Match

Kp: 14.54 R\*: 0.92 Rs Teff: 6115.0 K Logg: 4.46 Fe/H: -0.560



## DV Fit Results:

Period = 8.55936 [0.00006] d  
Epoch = 139.9846 [0.0054] BKJD  
Rp/R\* = 0.0120 [0.0028]  
a/R\* = 6.35 [8.14]  
b = 0.91 [0.27]  
Seff = 170.13 [59.43]  
Teq = 921 [80] K  
Rp = 1.20 [0.42] Re  
a = 0.0789 [0.0175] AU  
Ag = 56.21 [39.07] [1.41σ]  
Teffp = 3899 [608] K [4.85σ]

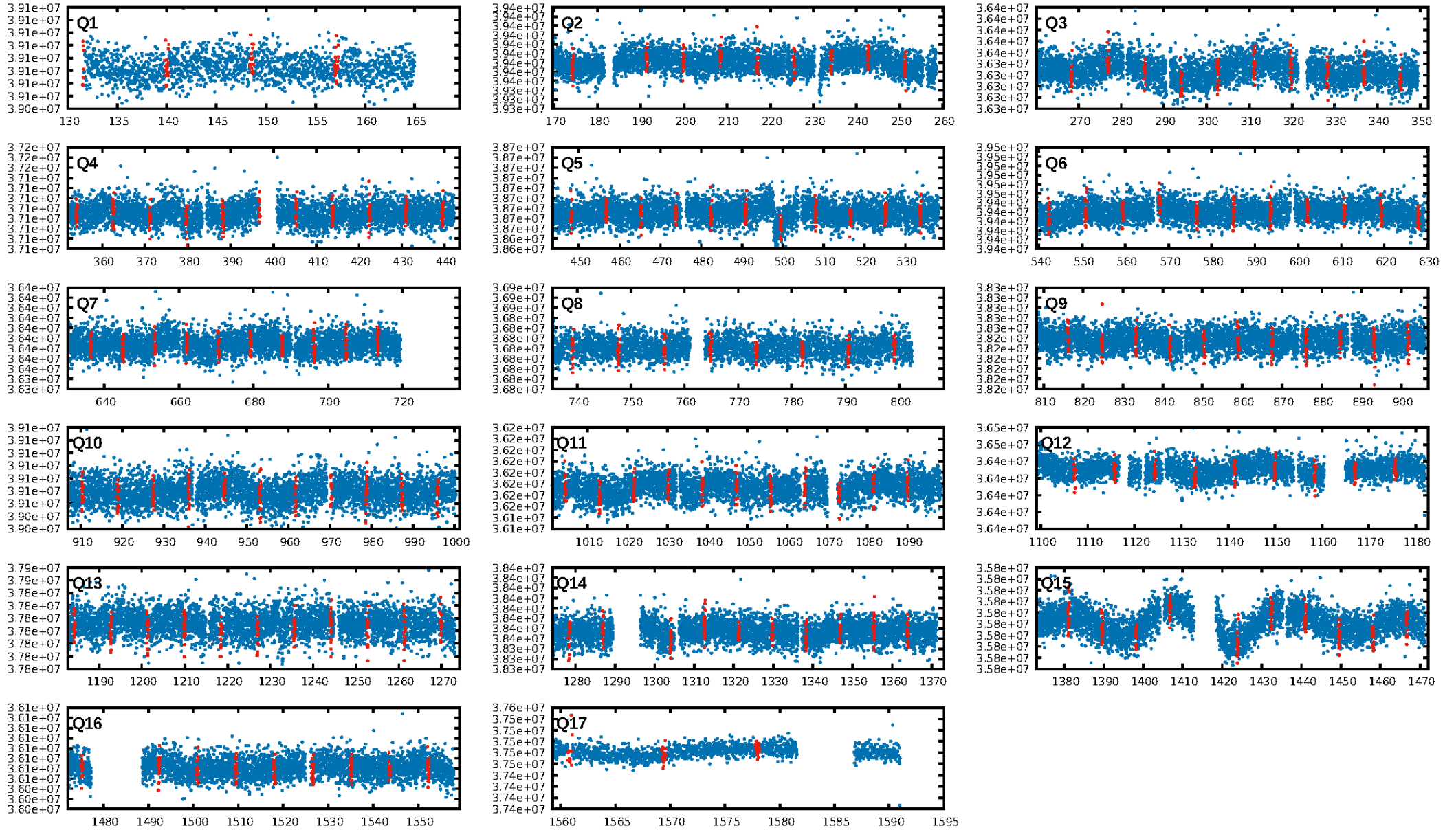
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 46.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.02e-54  
RollingBand-fgt: 1.00 [151/151]  
GhostDiagnostic-chr: 0.7014  
Centroid-sig: 0.1%  
Centroid-so: 2.260 arcsec [2.59σ]  
OotOffset-rm: 1.039 arcsec [2.19σ]  
KicOffset-rm: 1.161 arcsec [2.47σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.50 [8/16]  
DiffImageOverlap-fno: 1.00 [17/17]

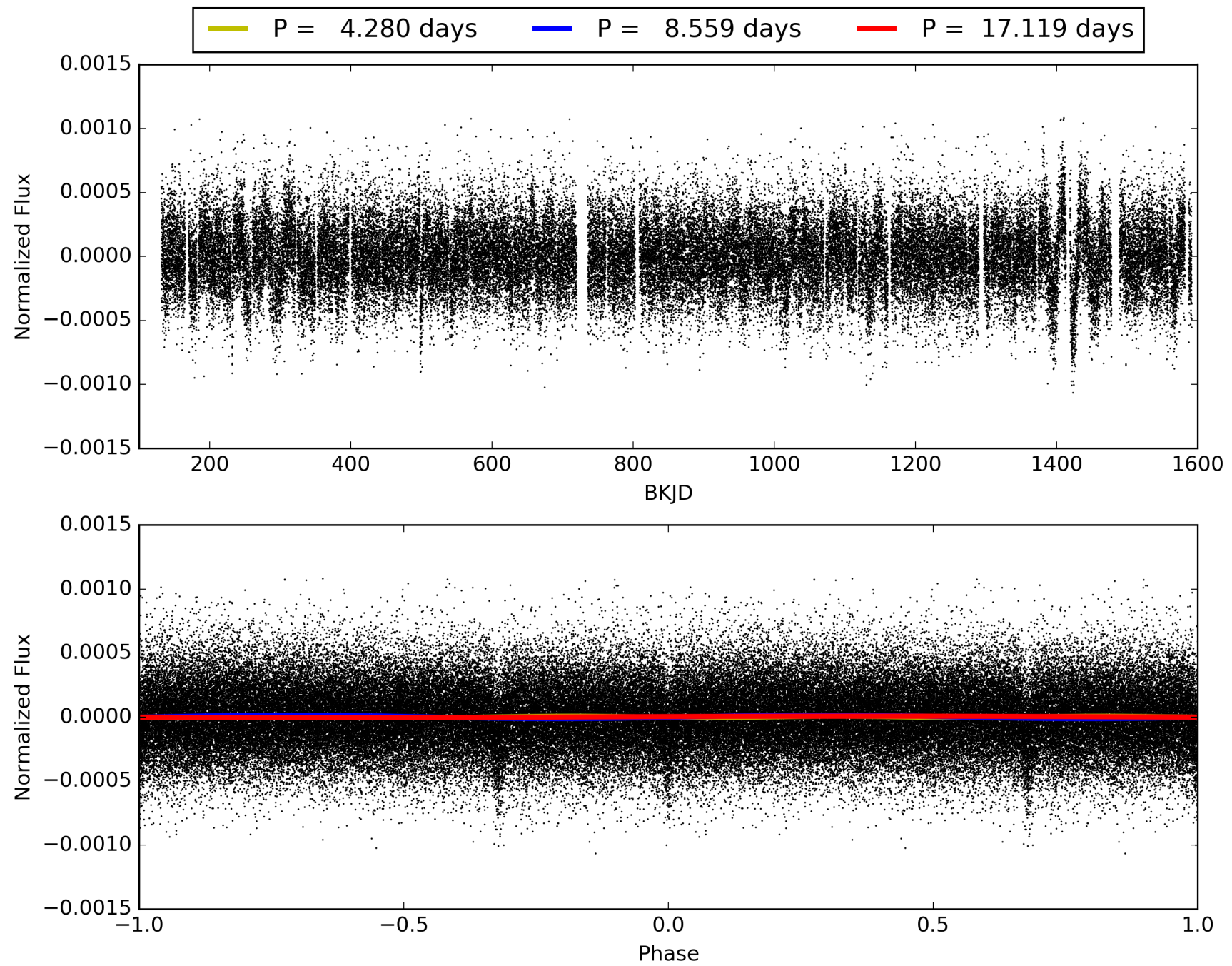
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:13:03 Z

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

# TCE 007186665-02, PDC Light Curves



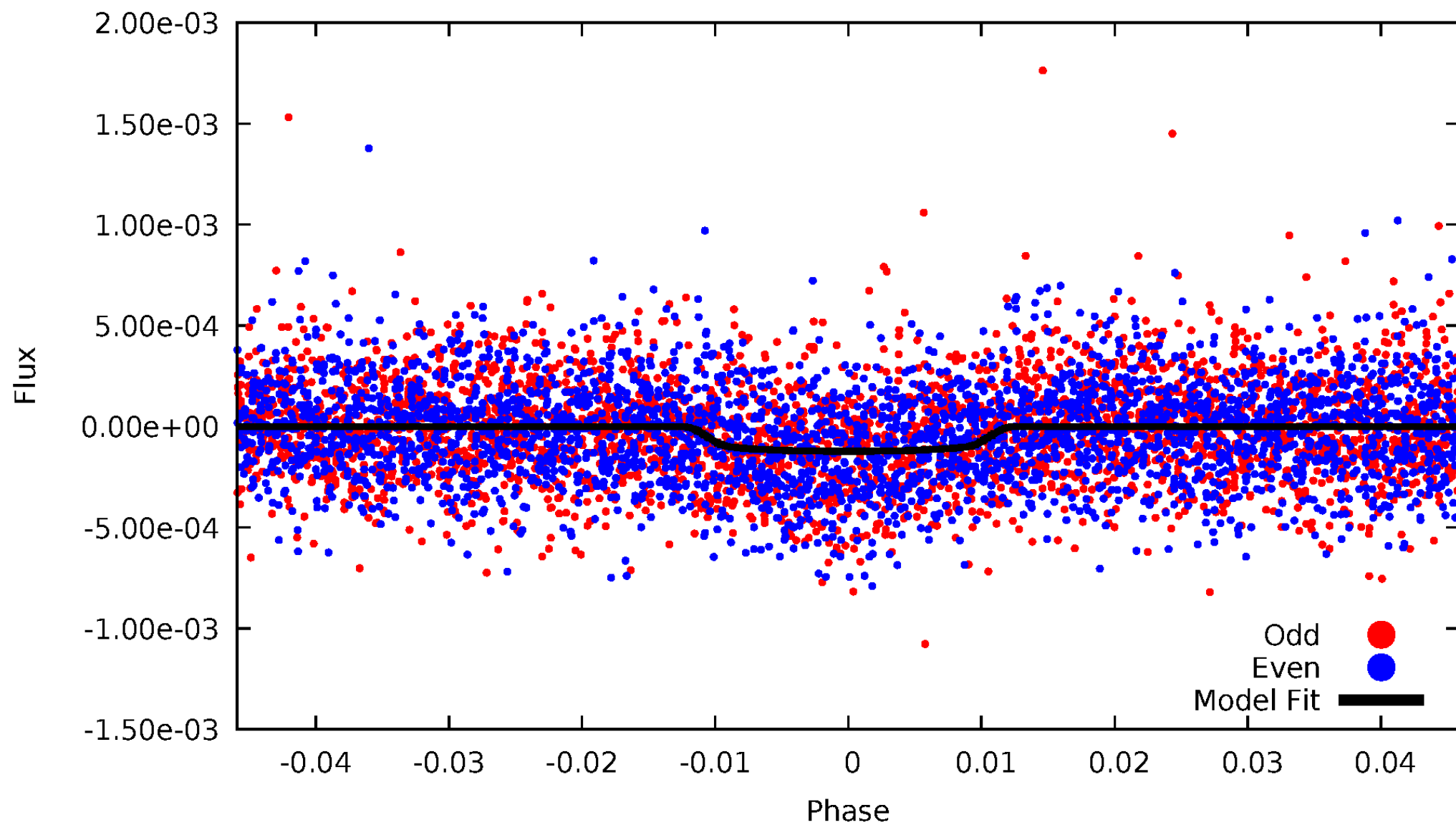
TCE 007186665-02





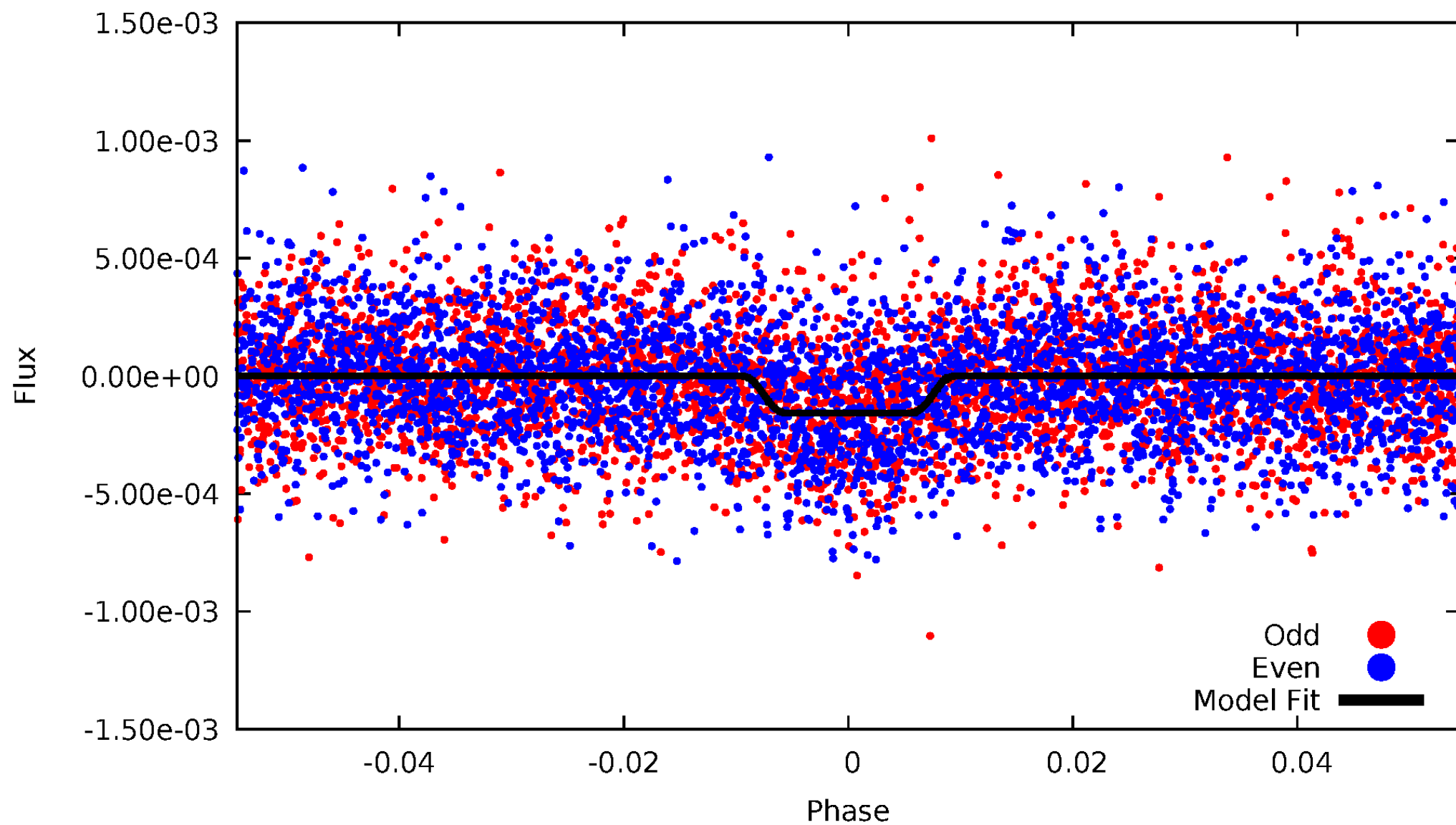
# DV Odd/Even

TCE 007186665-02



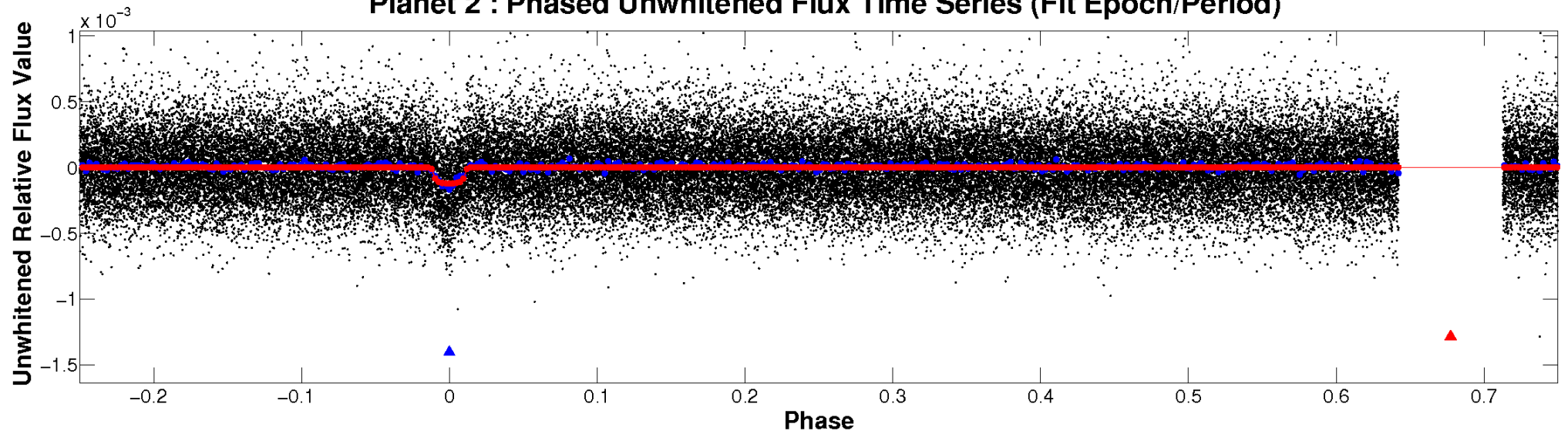
# ALT Odd/Even

TCE 007186665-02

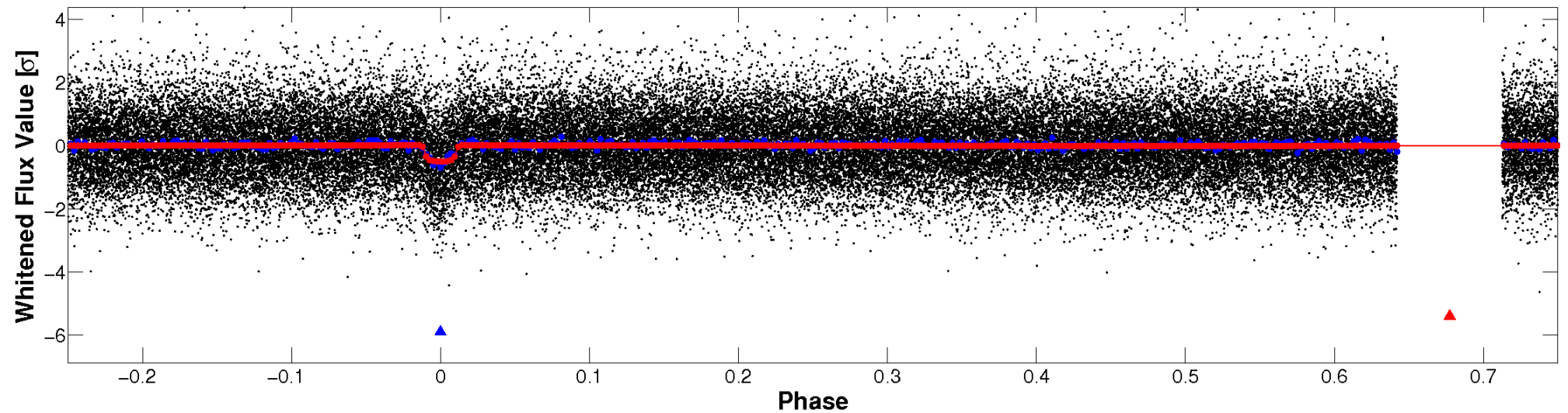


# Non-Whitened Vs. Whitened Light Curve

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

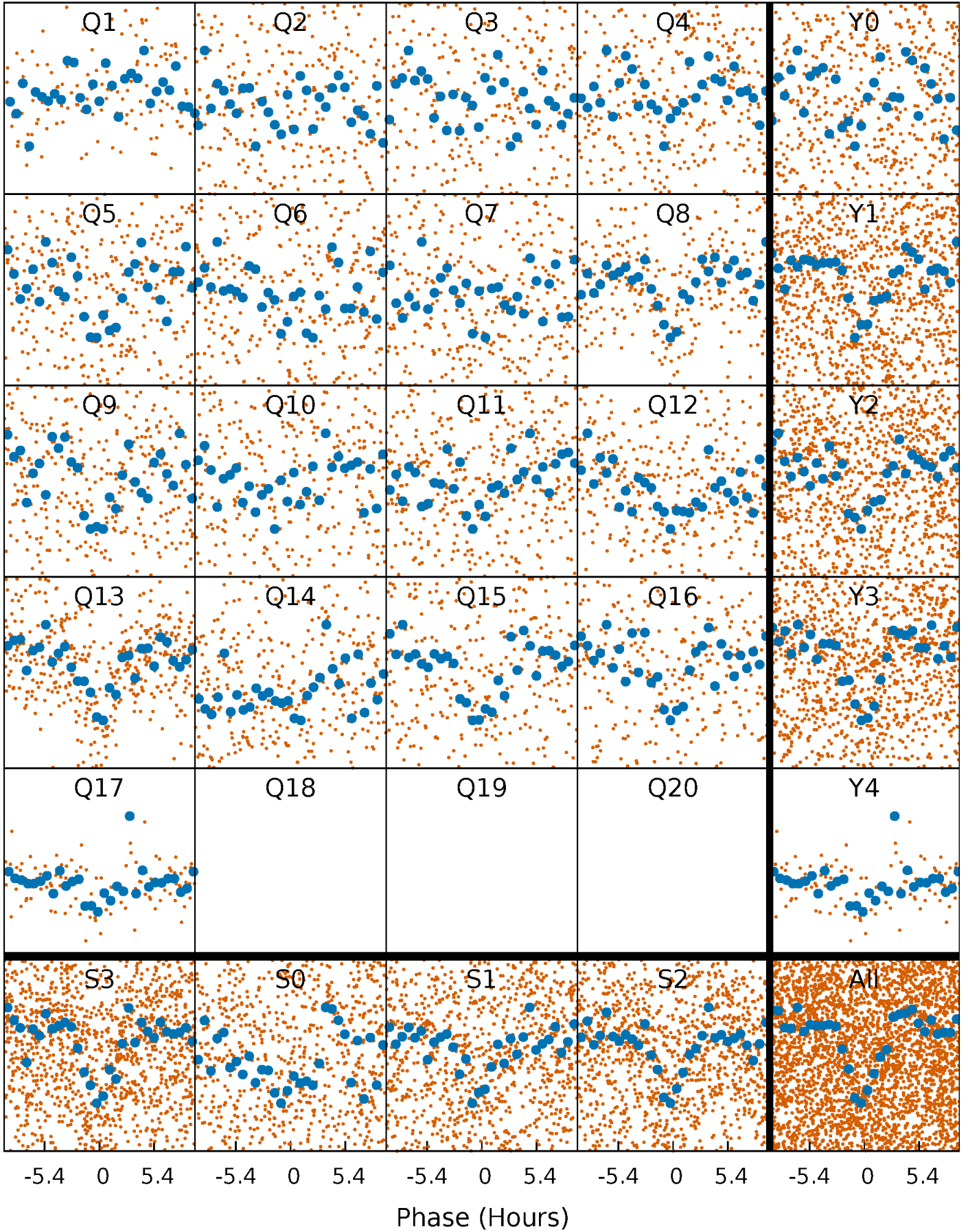


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



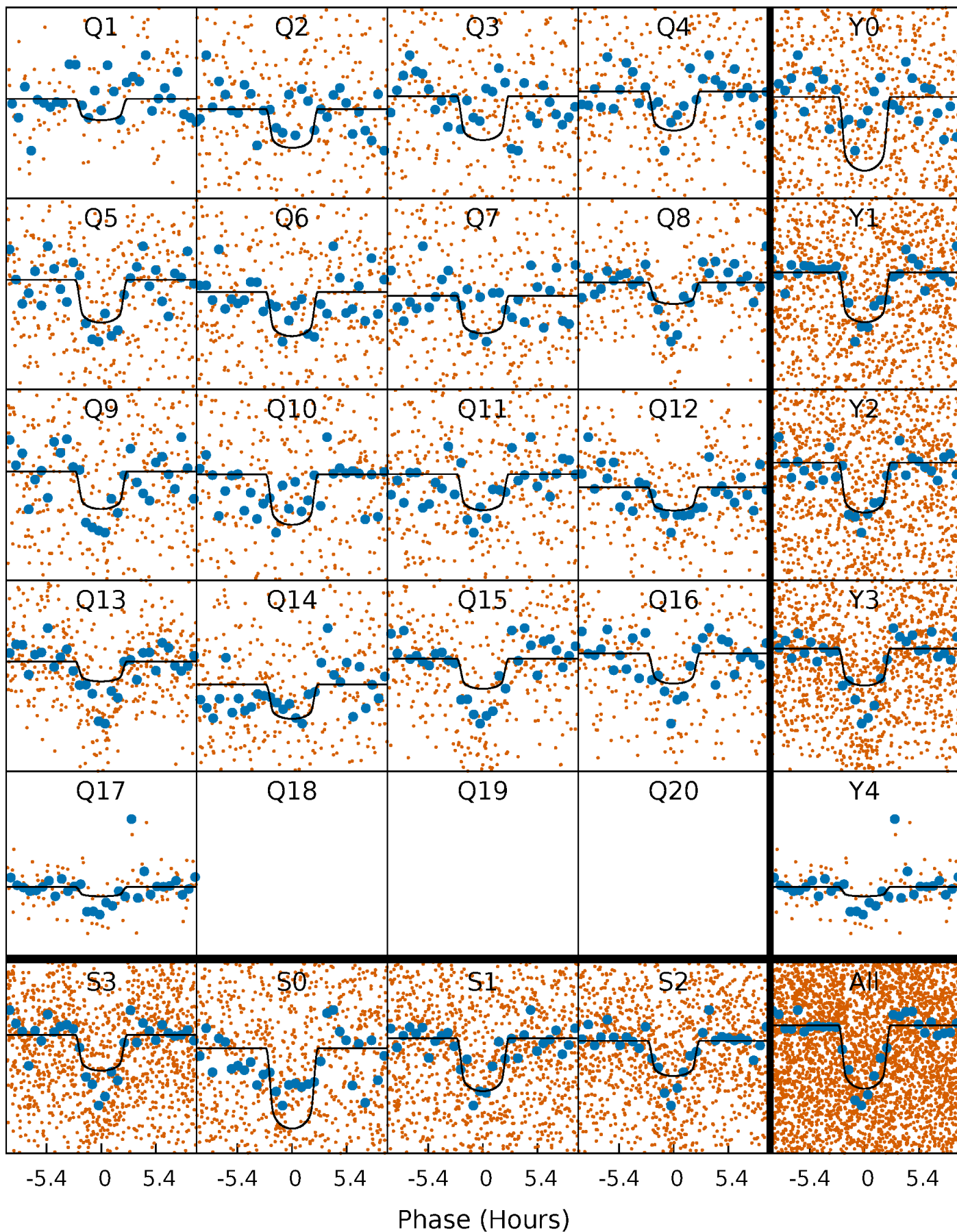
# PDC Quarter-Phased Transit Curves

TCE 007186665-02   P= 8.559358 Days    $T_0=139.984641$  (BKJD)



# DV Quarter-Phased Transit Curves

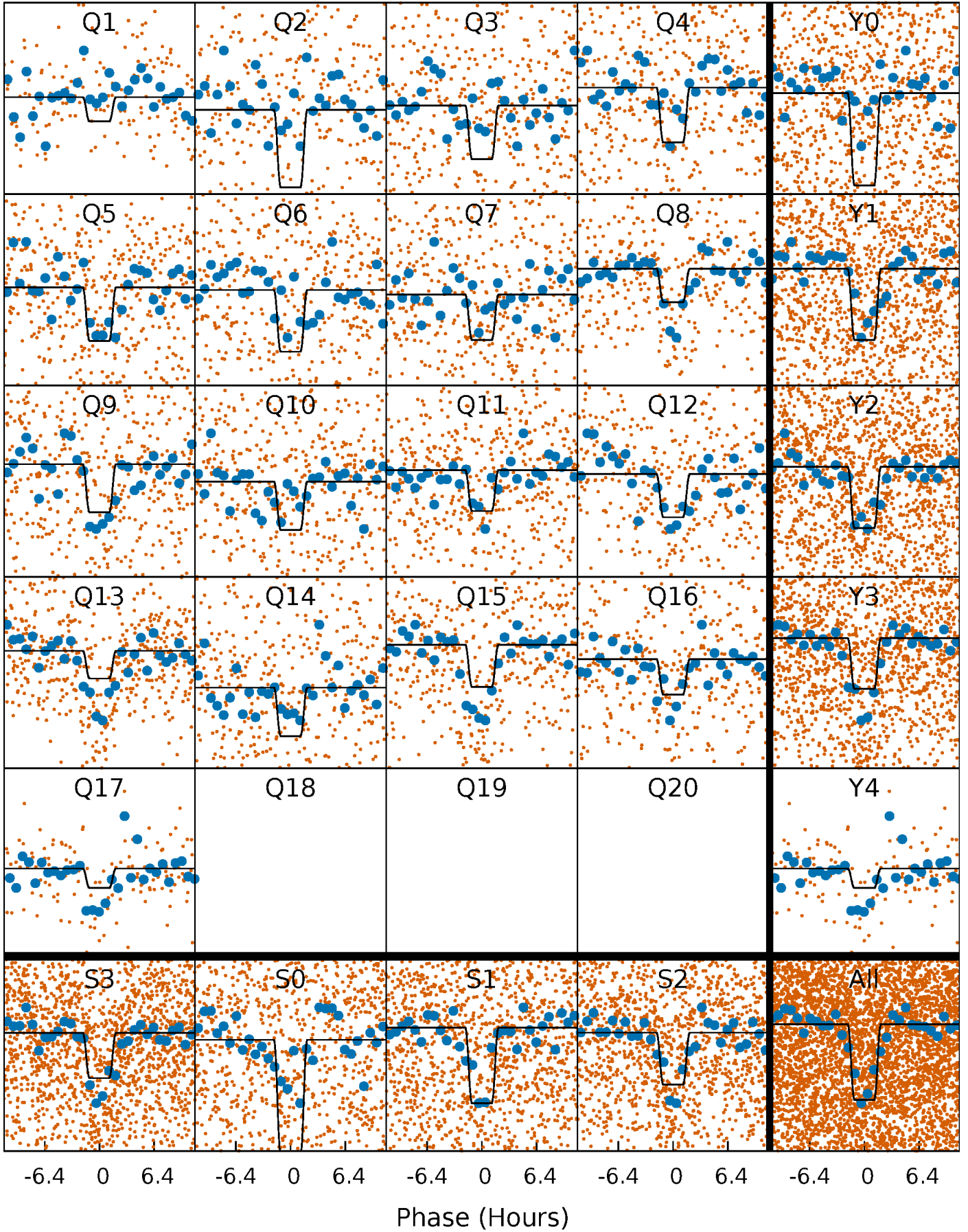
TCE 007186665-02 P= 8.559358 Days  $T_0=139.984641$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

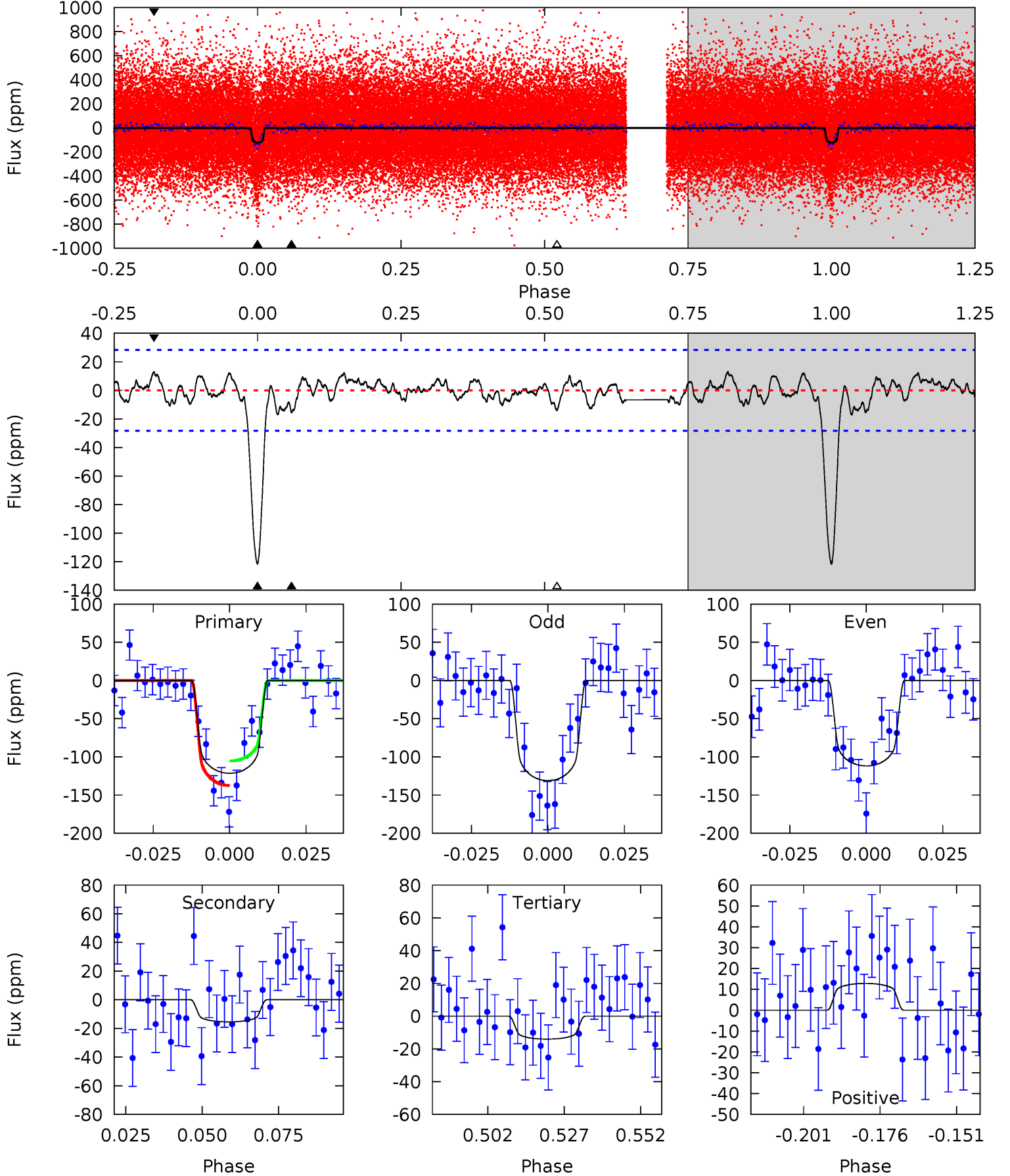
TCE 007186665-02 P= 8.559592 Days  $T_0=139.951066$  (BKJD)



# DV Model-Shift Uniqueness Test

007186665-02, P = 8.559358 Days, E = 131.425283 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
20.8	2.65	2.41	2.20	4.85	2.24	0.95	18.4	18.6	0.24	0.45	1.65	1.03	0.10	2.75

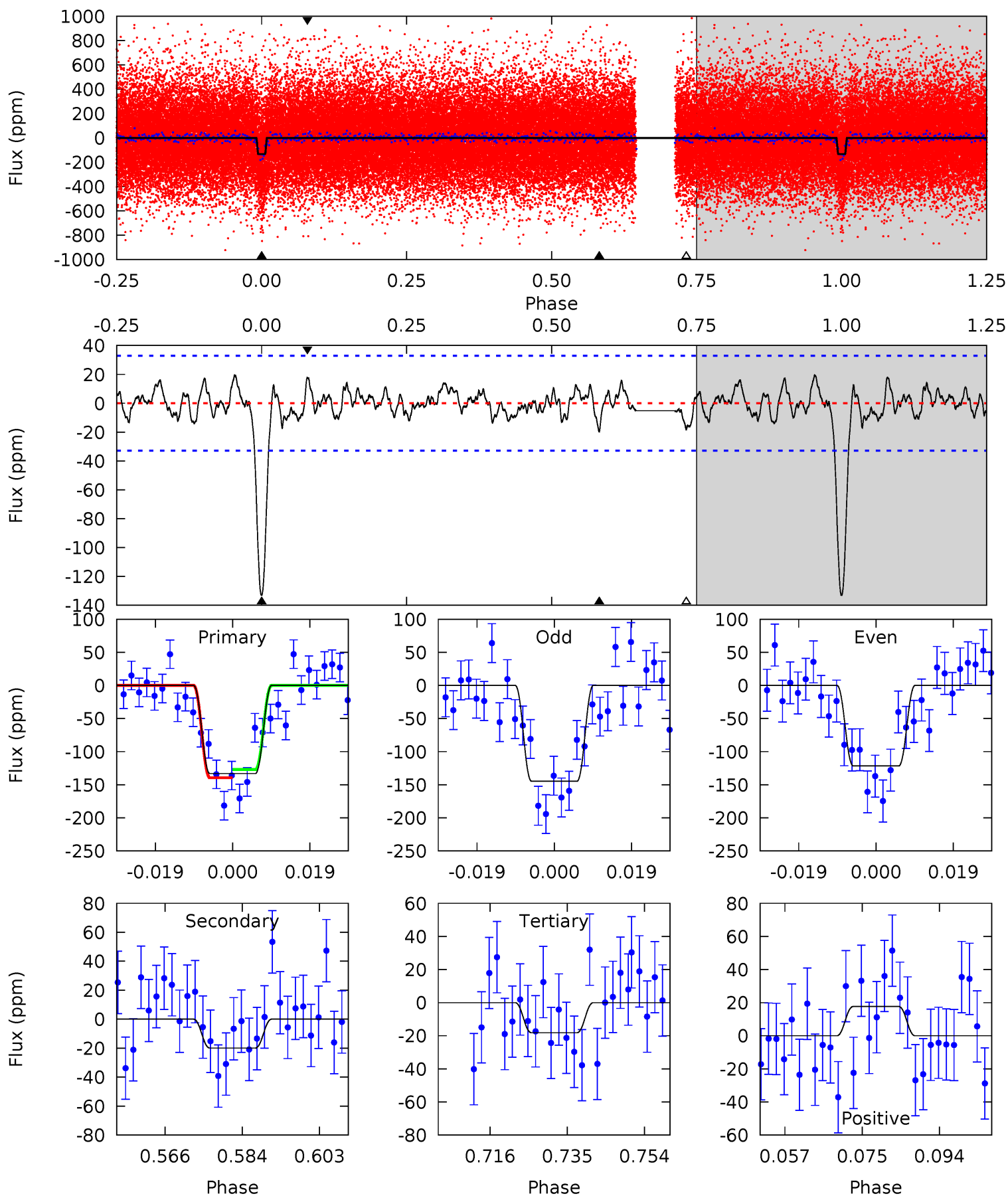




# Alt Model-Shift Uniqueness Test

007186665-02, P = 8.559592 Days, E = 131.391474 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
19.9	2.97	2.71	2.64	4.90	2.35	1.08	17.2	17.2	0.26	0.34	1.72	1.13	0.13	0.93



### Stellar Parameters For KIC 007186665

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6115^{+164}_{-182}$	$4.462^{+0.084}_{-0.182}$	$-0.560^{+0.300}_{-0.300}$	$0.919^{+0.238}_{-0.110}$	$0.892^{+0.109}_{-0.089}$	$1.618^{+0.572}_{-0.784}$
	+3%/-3%	+2%/-4%	+54%/-54%	+26%/-12%	+12%/-10%	+35%/-48%
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 007186665-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-15 \pm 6$	$1.23^{+0.34}_{-0.30}$	$1306^{+90}_{-64}$	$3843^{+530}_{-407}$	$33^{+32}_{-16}$
Alt.	$-20 \pm 7$	$1.28^{+0.34}_{-0.30}$	$1300^{+80}_{-65}$	$3978^{+455}_{-388}$	$41^{+33}_{-19}$

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

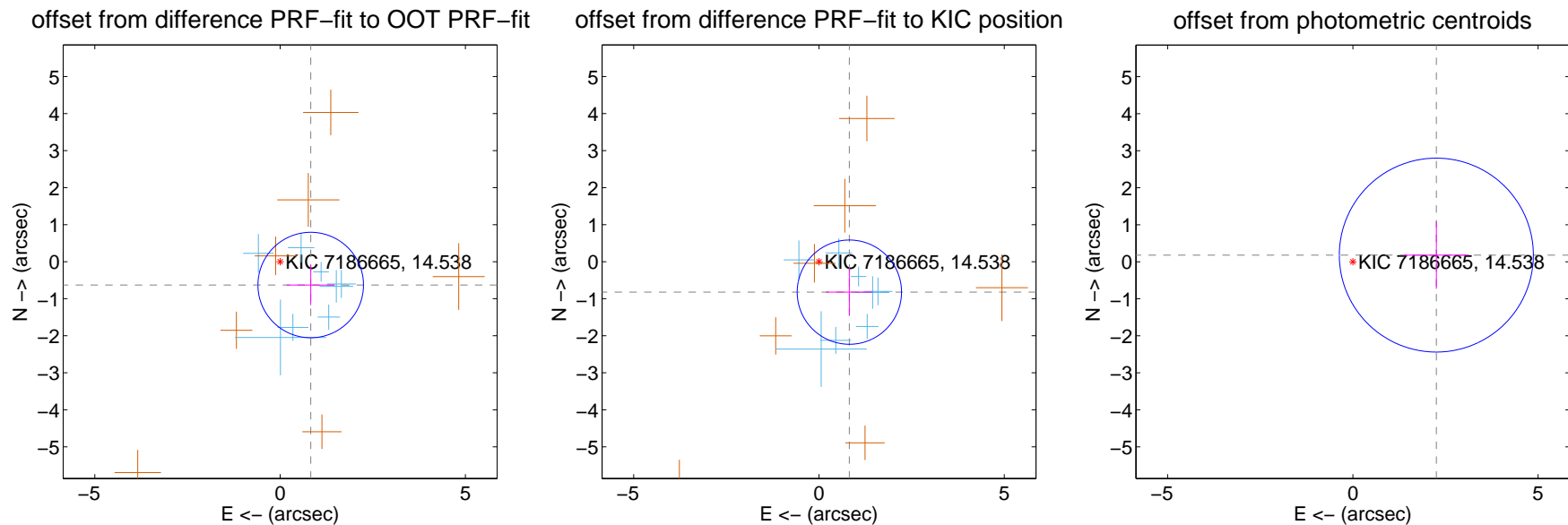
## DV Centroid Data

Supplemental centroid analysis for 007186665-02. Kepler magnitude: 14.54. Transit SNR 16.45

There are 8 quarters with good PRF difference image offsets

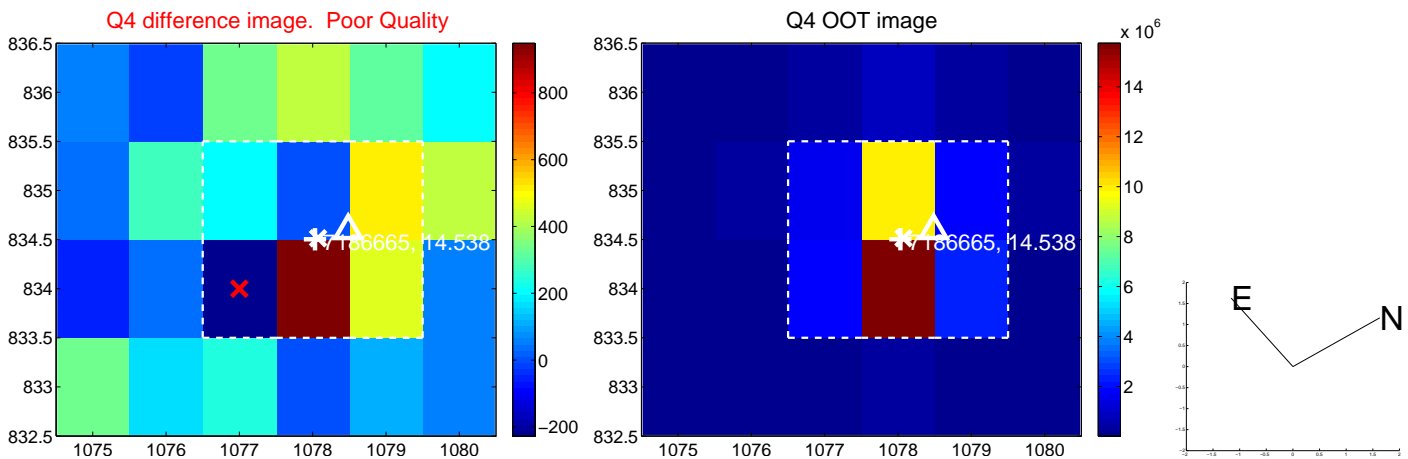
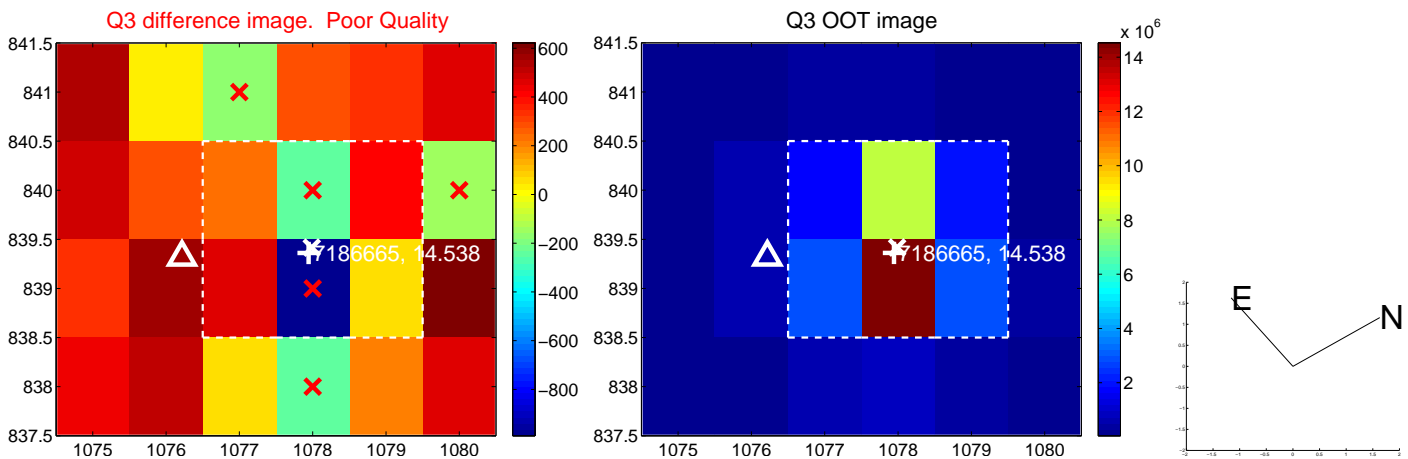
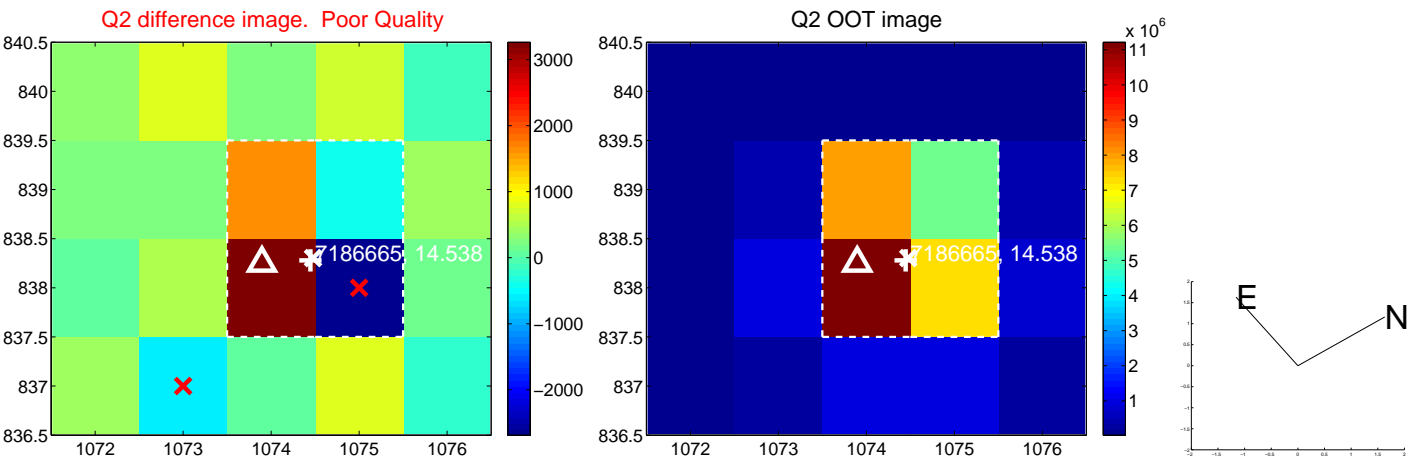
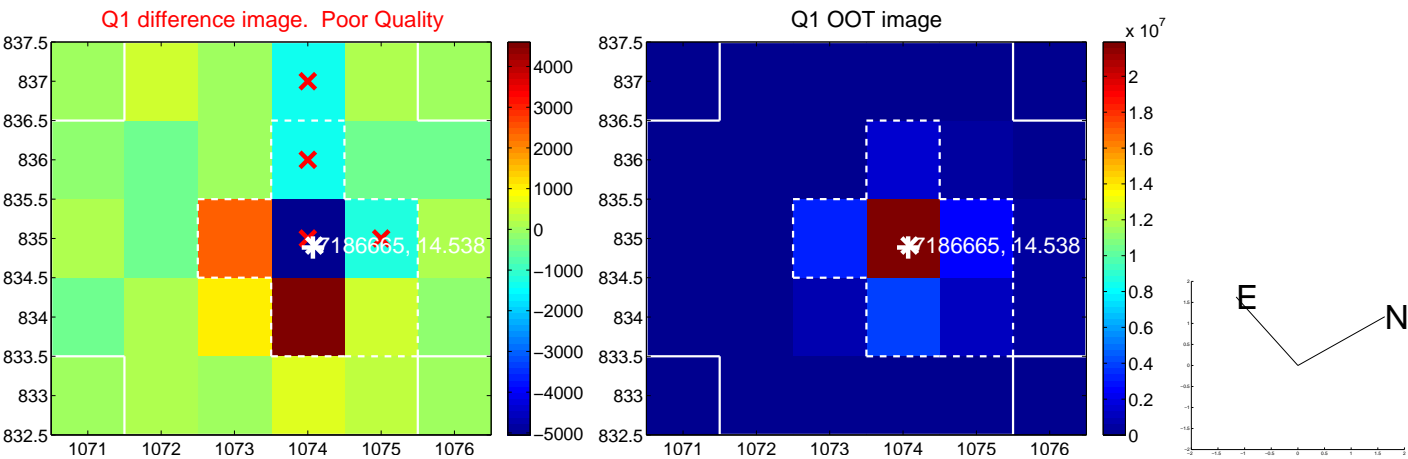
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.039 \pm 0.475$	2.19	$-0.826 \pm 0.650$	$-0.630 \pm 0.543$
PRF-fit source offset from KIC position	$1.161 \pm 0.469$	2.47	$-0.820 \pm 0.629$	$-0.822 \pm 0.622$
photometric centroid source offset	$2.26 \pm 0.87$	2.59	$-2.25 \pm 0.87$	$0.18 \pm 0.91$

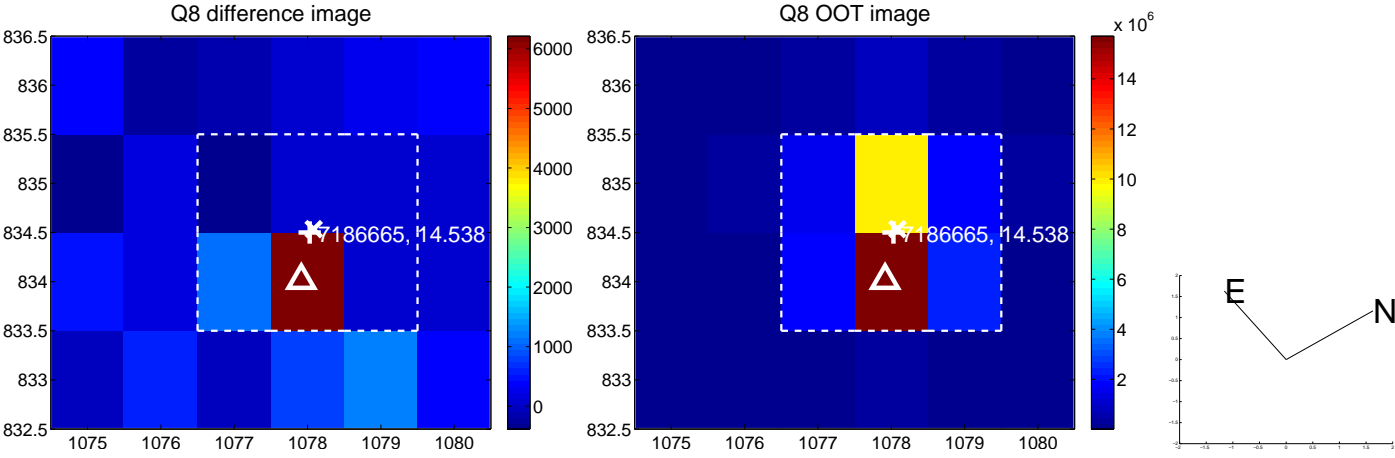
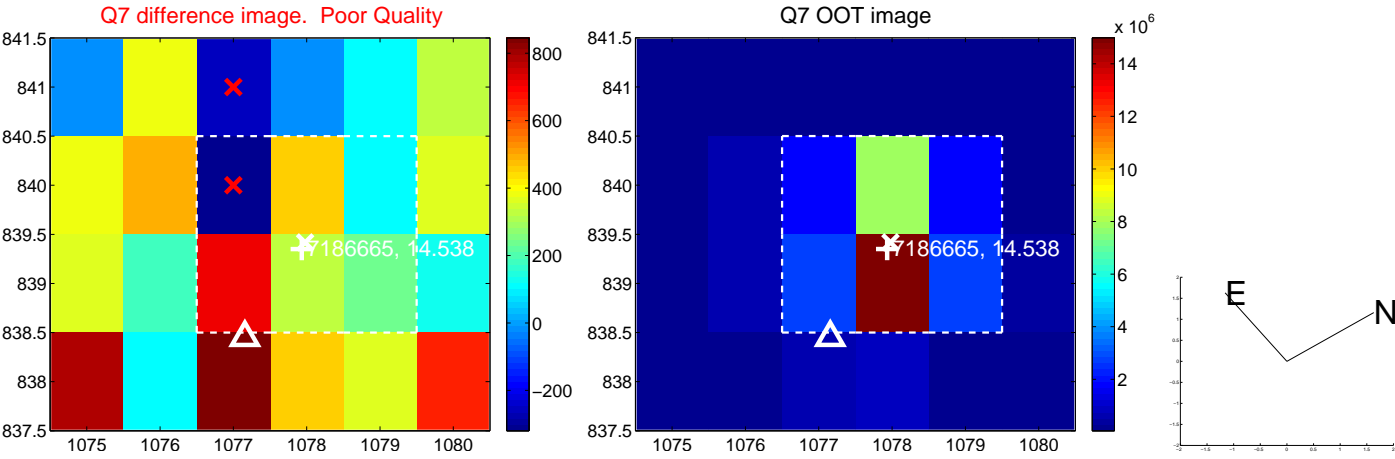
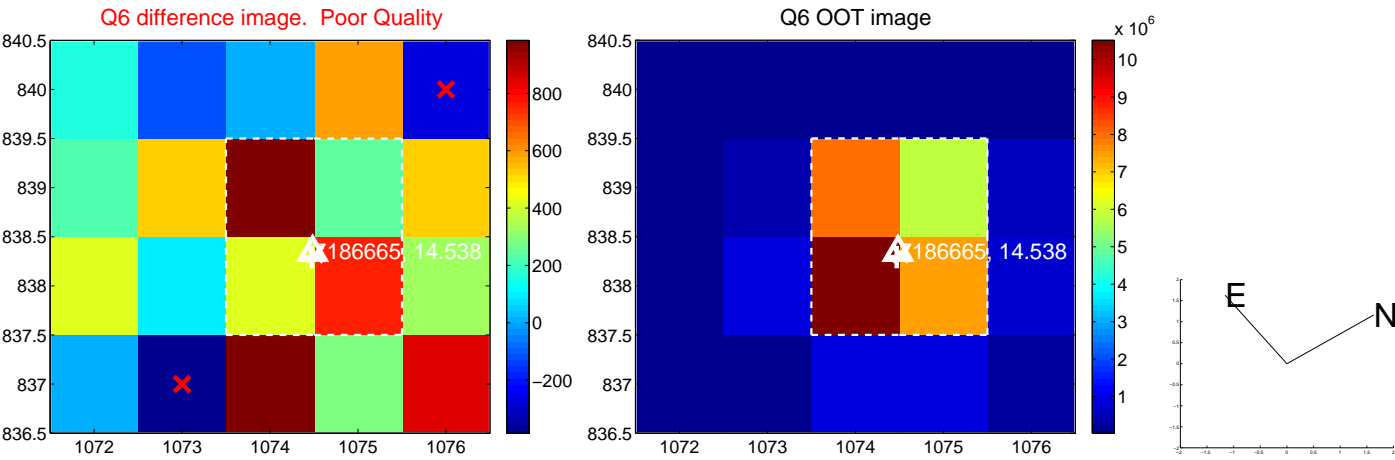
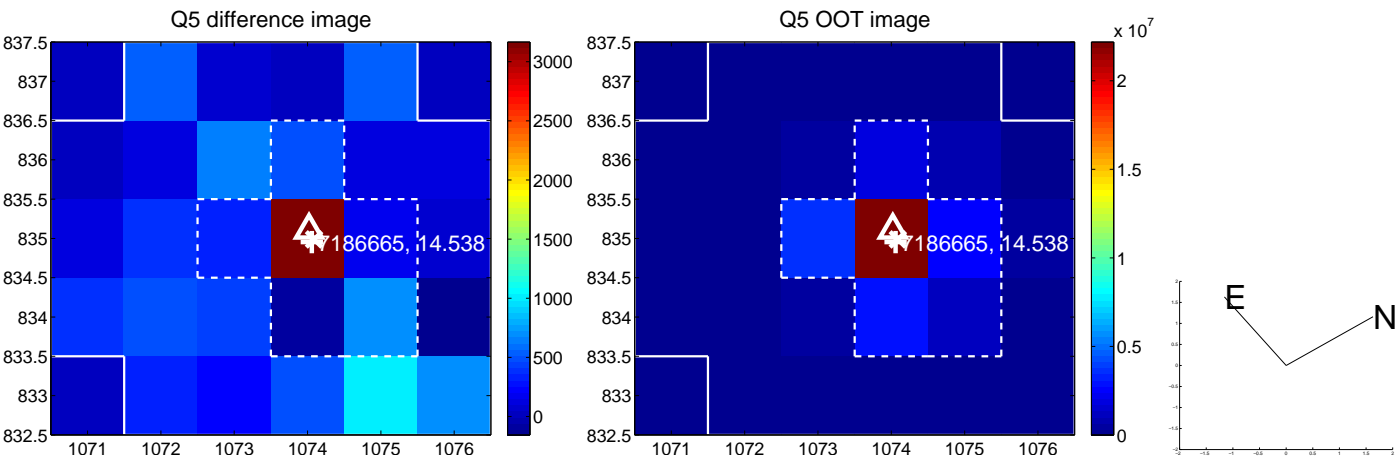


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

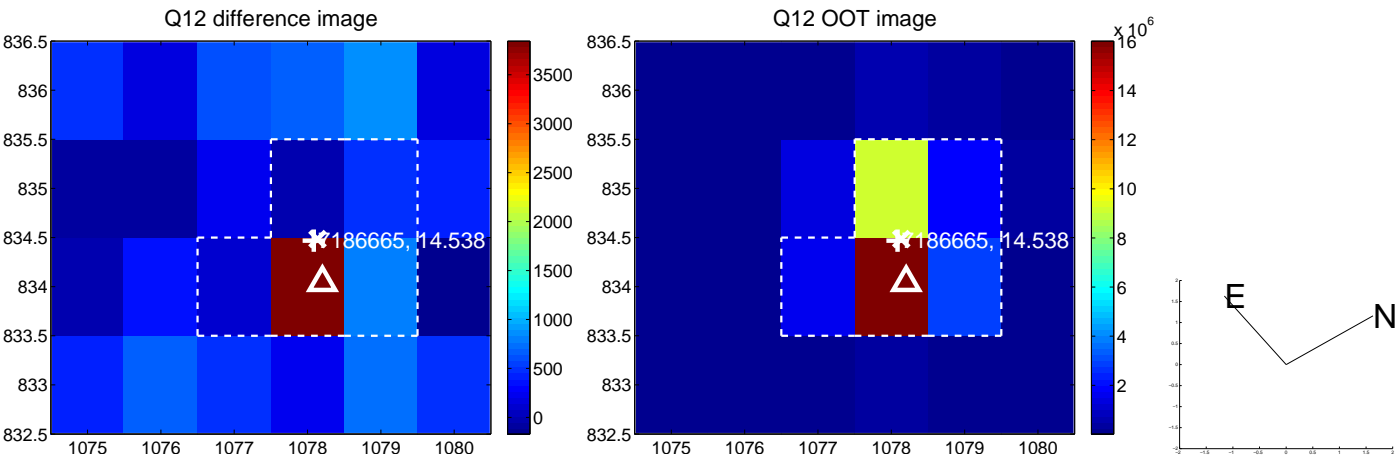
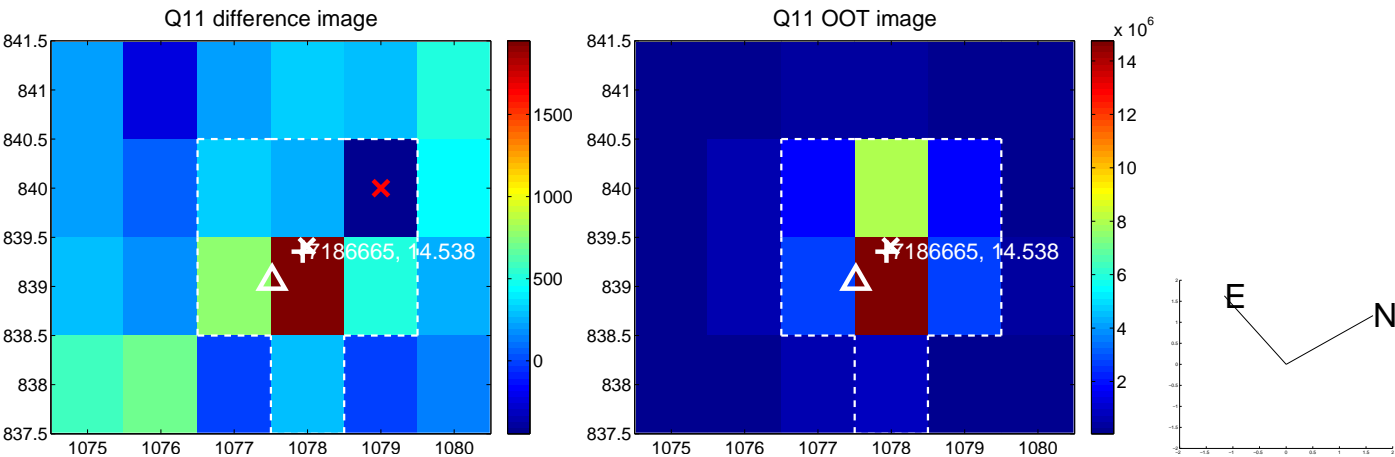
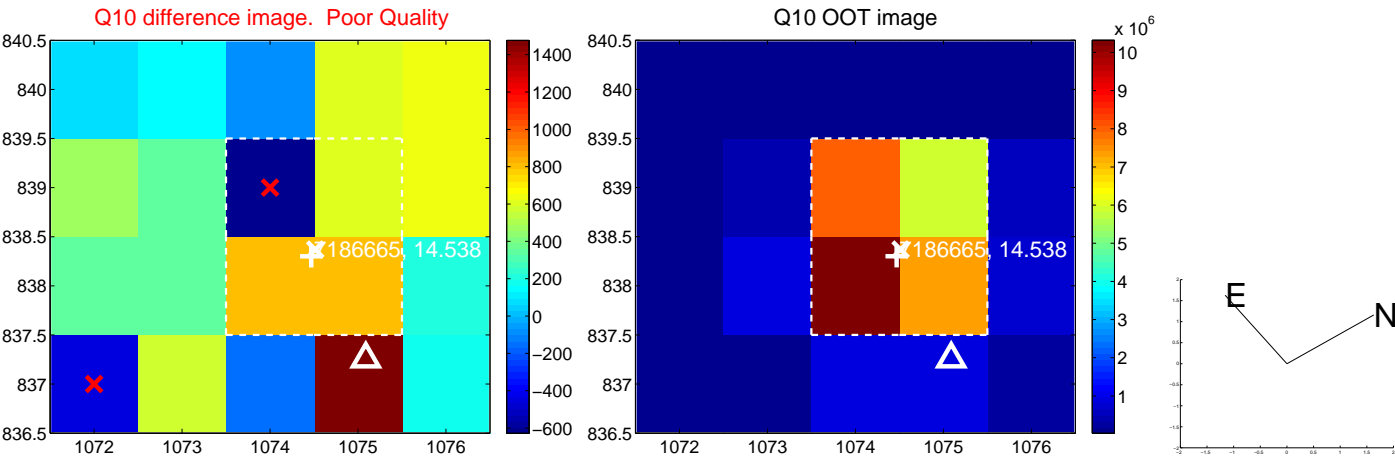
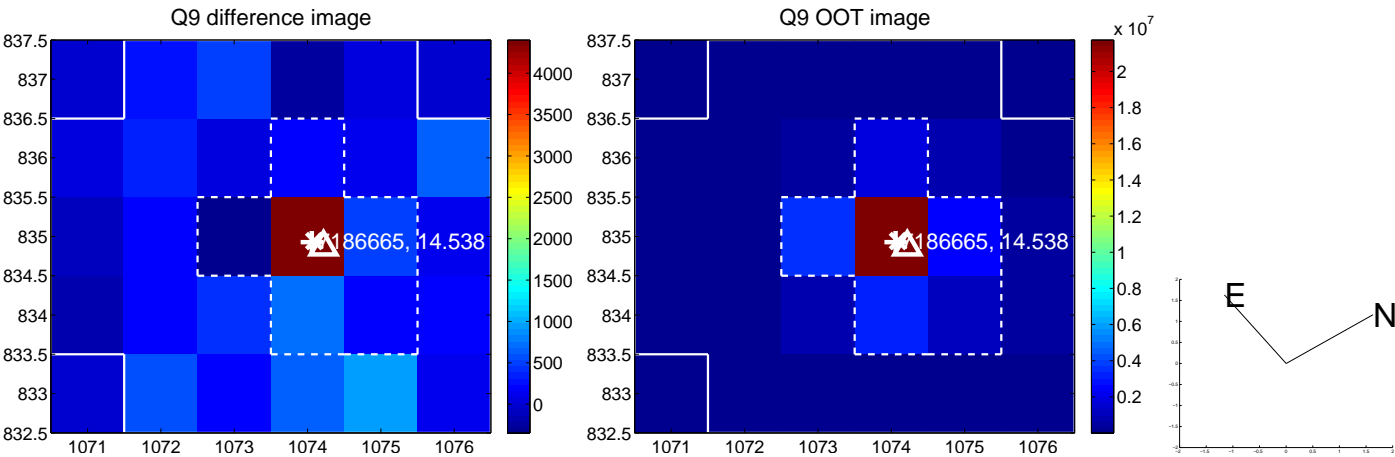
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



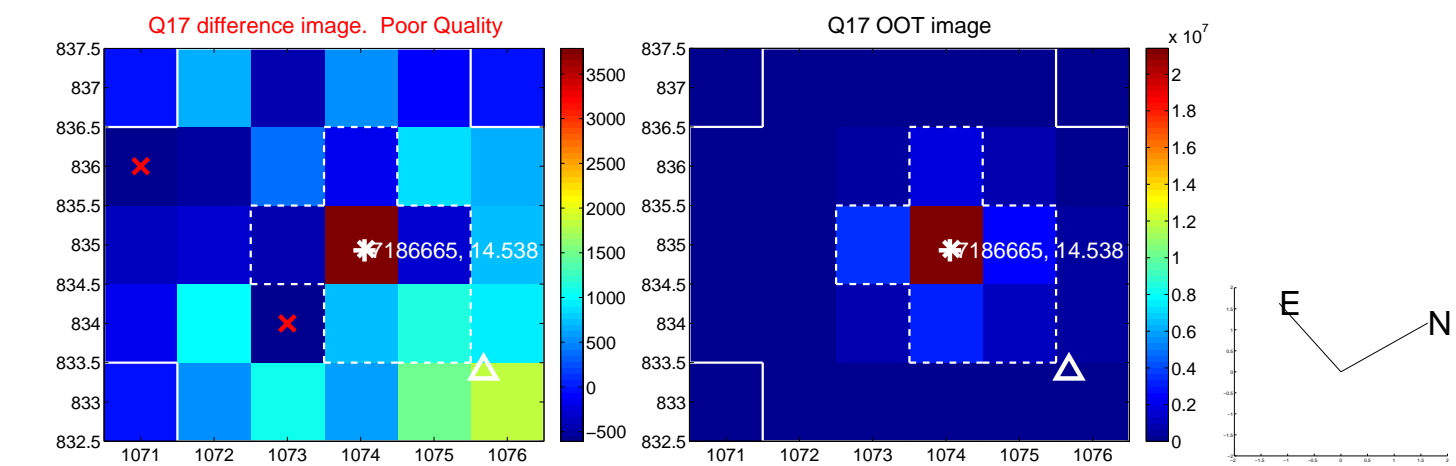
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



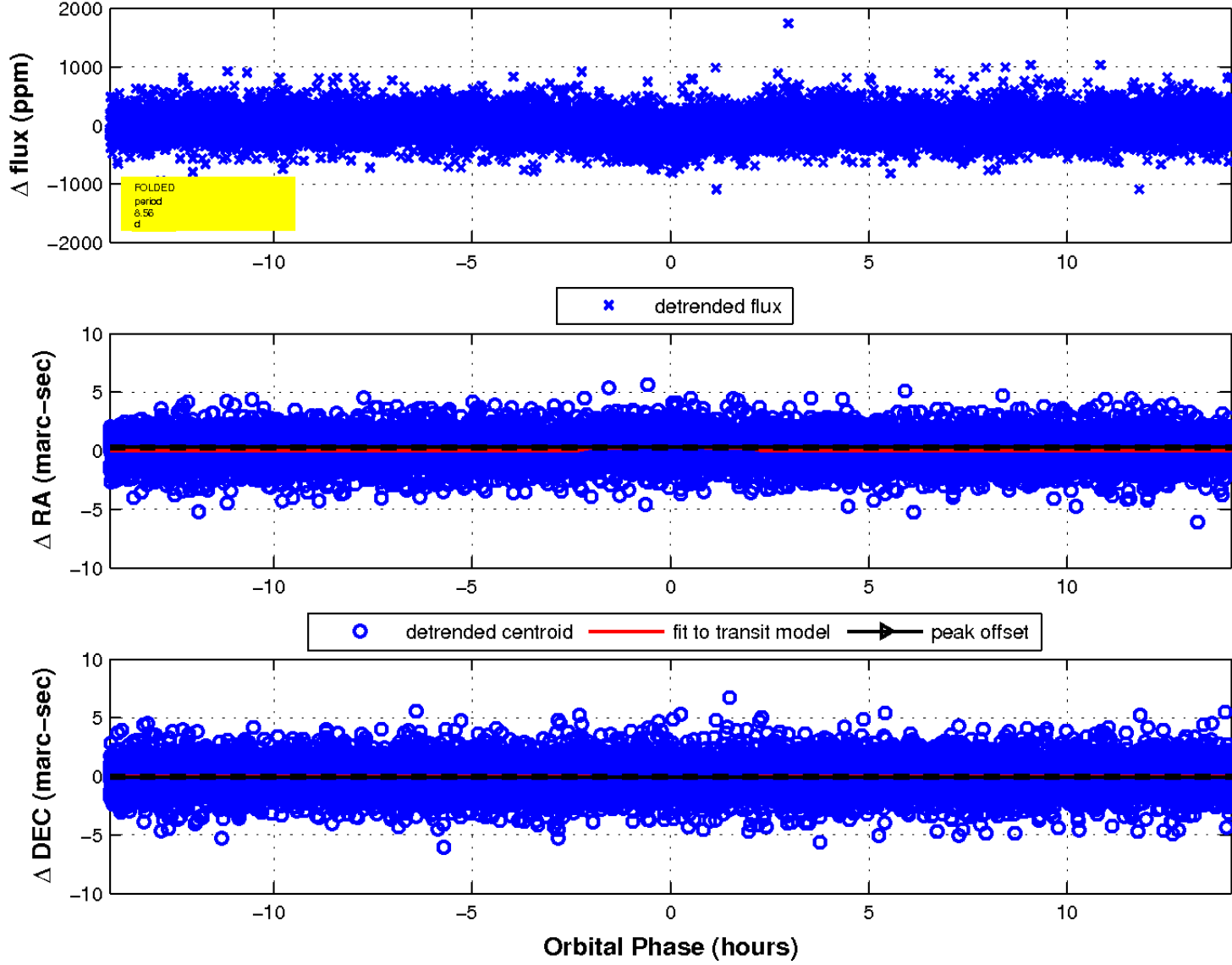




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

