

# KIC 006188207

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006188207-01	OBS	No	374.570597	412.501382	170.9	4.119	9.8	5.5	2.16	6403	3.15	5.22
006188207-02	OBS	No	202.513995	252.303608	191.4	3.839	8.2	6.7	2.16	6403	3.19	11.85

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006188207-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006188207-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

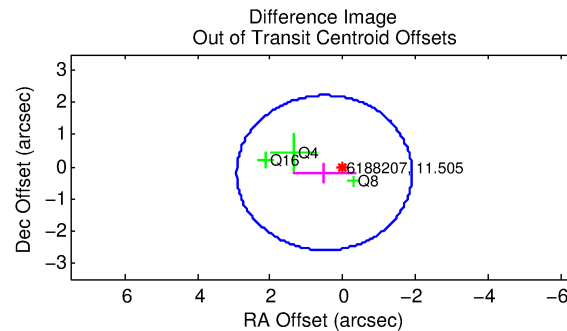
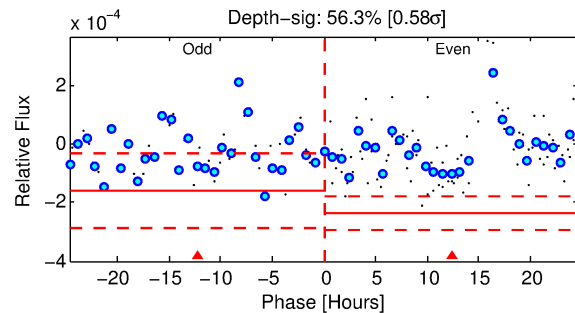
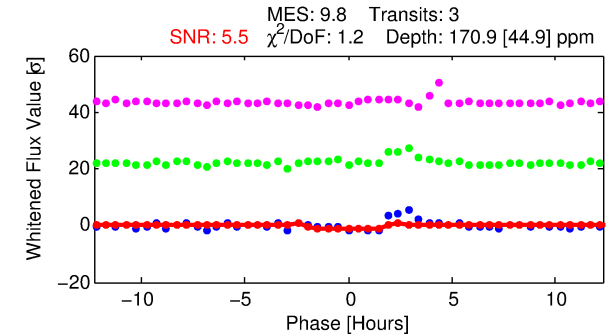
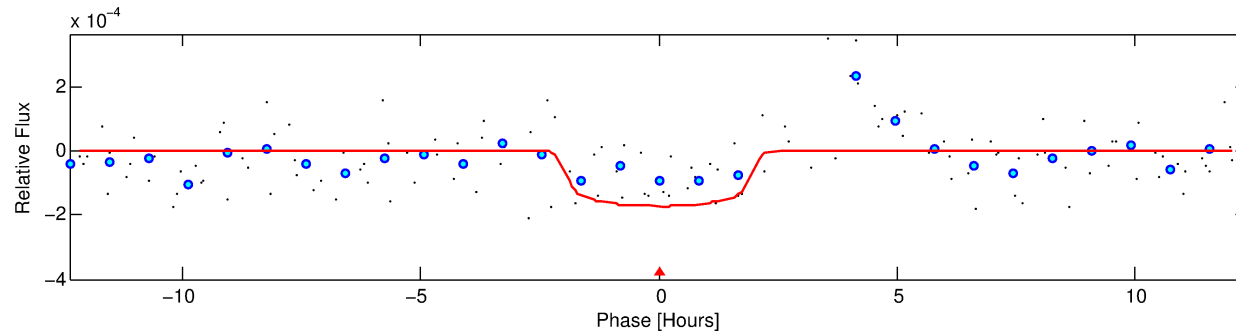
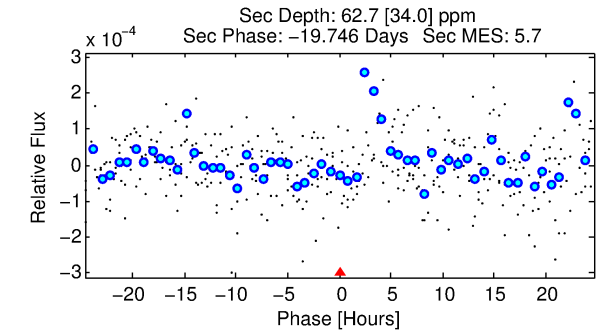
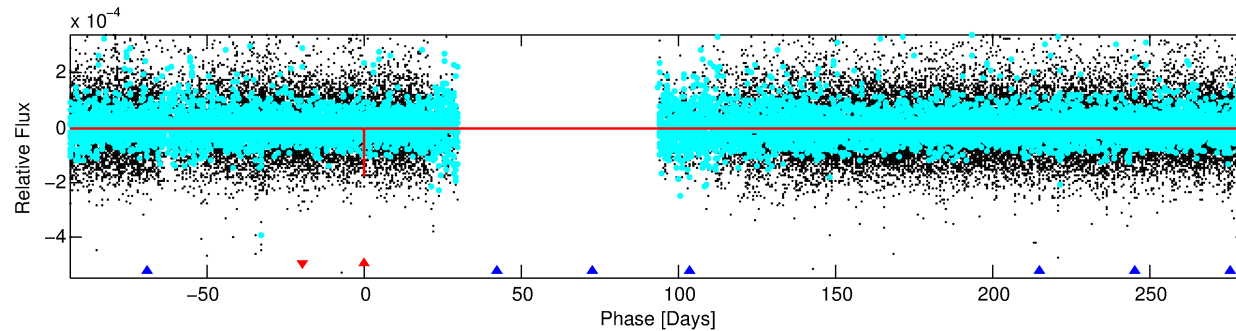
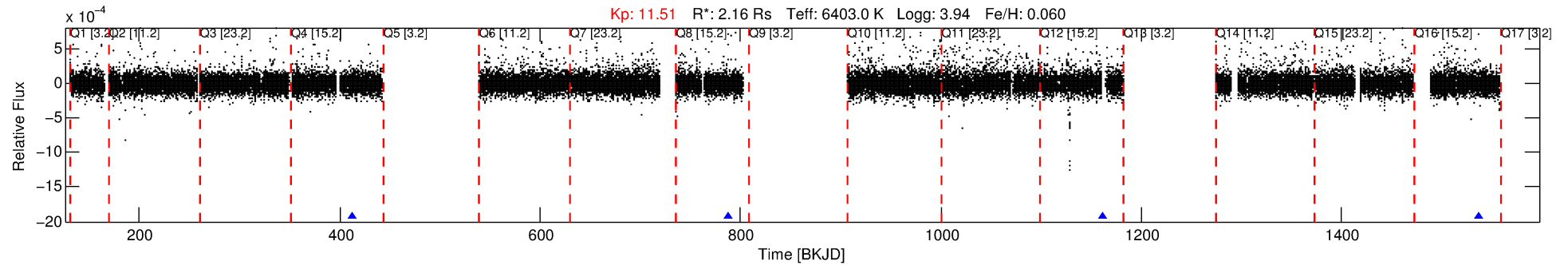
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006188207-01

No Significant Match Found

# DV One-Page Summary

KIC: 6188207 Candidate: 1 of 2 Period: 374.571 d



## DV Fit Results:

Period = 374.57060 [0.00641] d  
Epoch = 412.5014 [0.0138] BKJD  
Rp/R\* = 0.0134 [0.0106]  
a/R\* = 414.89 [1711.88]  
b = 0.82 [1.68]  
Seff = 5.22 [3.23]  
Teff = 385 [60] K  
Rp = 3.15 [2.82] Re  
a = 1.1590 [0.4437] AU  
Ag = 4681.92 [8368.83] [0.56 $\sigma$ ]  
Teffp = 4930 [2081] K [2.18 $\sigma$ ]

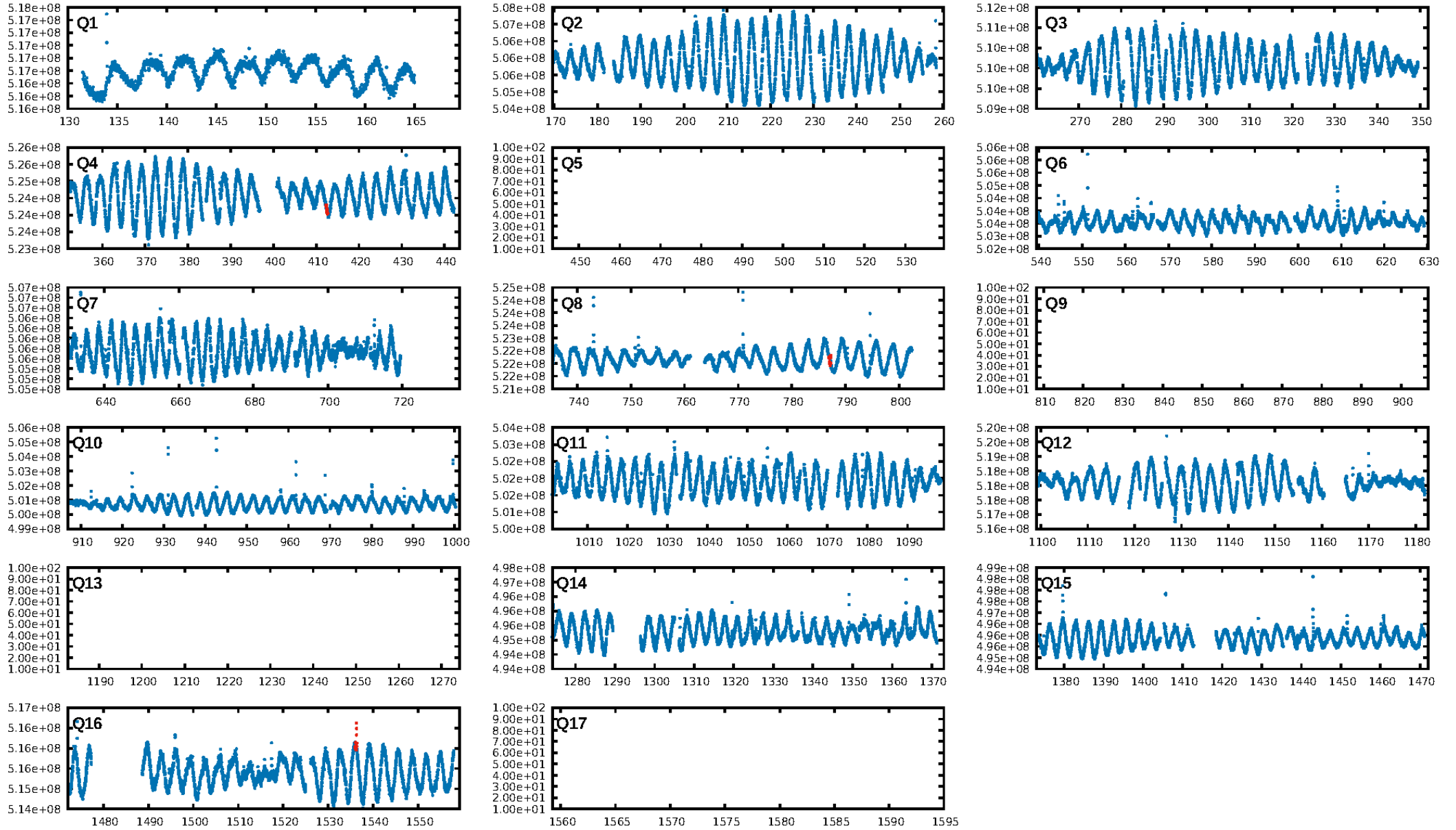
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [733.34 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 26.3%  
ModelChiSquareGof-sig: 78.8%  
**Bootstrap-pfa: 2.58e-11**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 7.511  
Centroid-sig: 75.9%  
Centroid-so: 0.575 arcsec [0.48 $\sigma$ ]  
OotOffset-rm: 0.544 arcsec [0.68 $\sigma$ ]  
OotOffset-st: 0/0/3/0 [3]  
KicOffset-rm: 0.566 arcsec [0.69 $\sigma$ ]  
KicOffset-st: 0/0/3/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

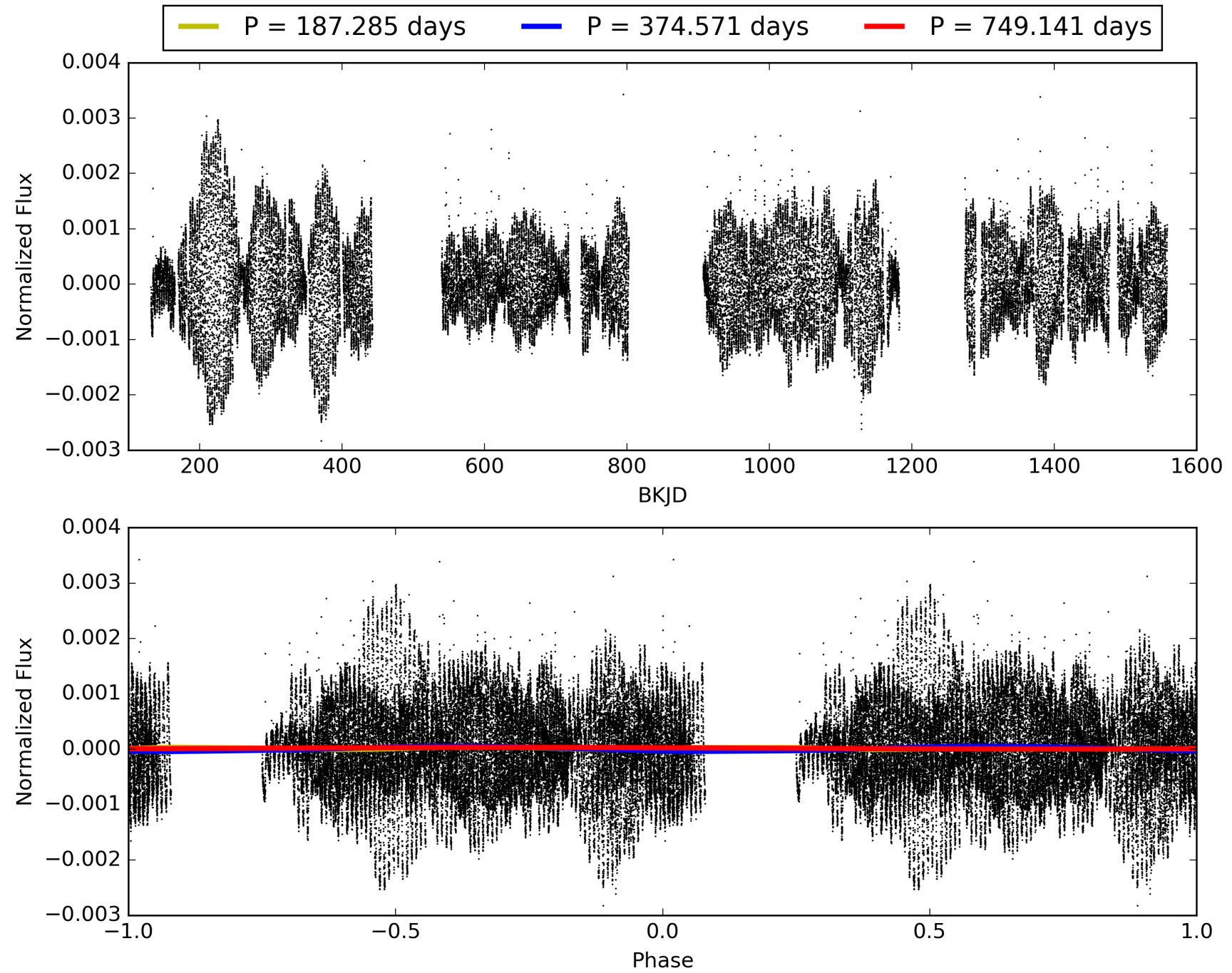
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:13:12 Z

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

# TCE 006188207-01, PDC Light Curves

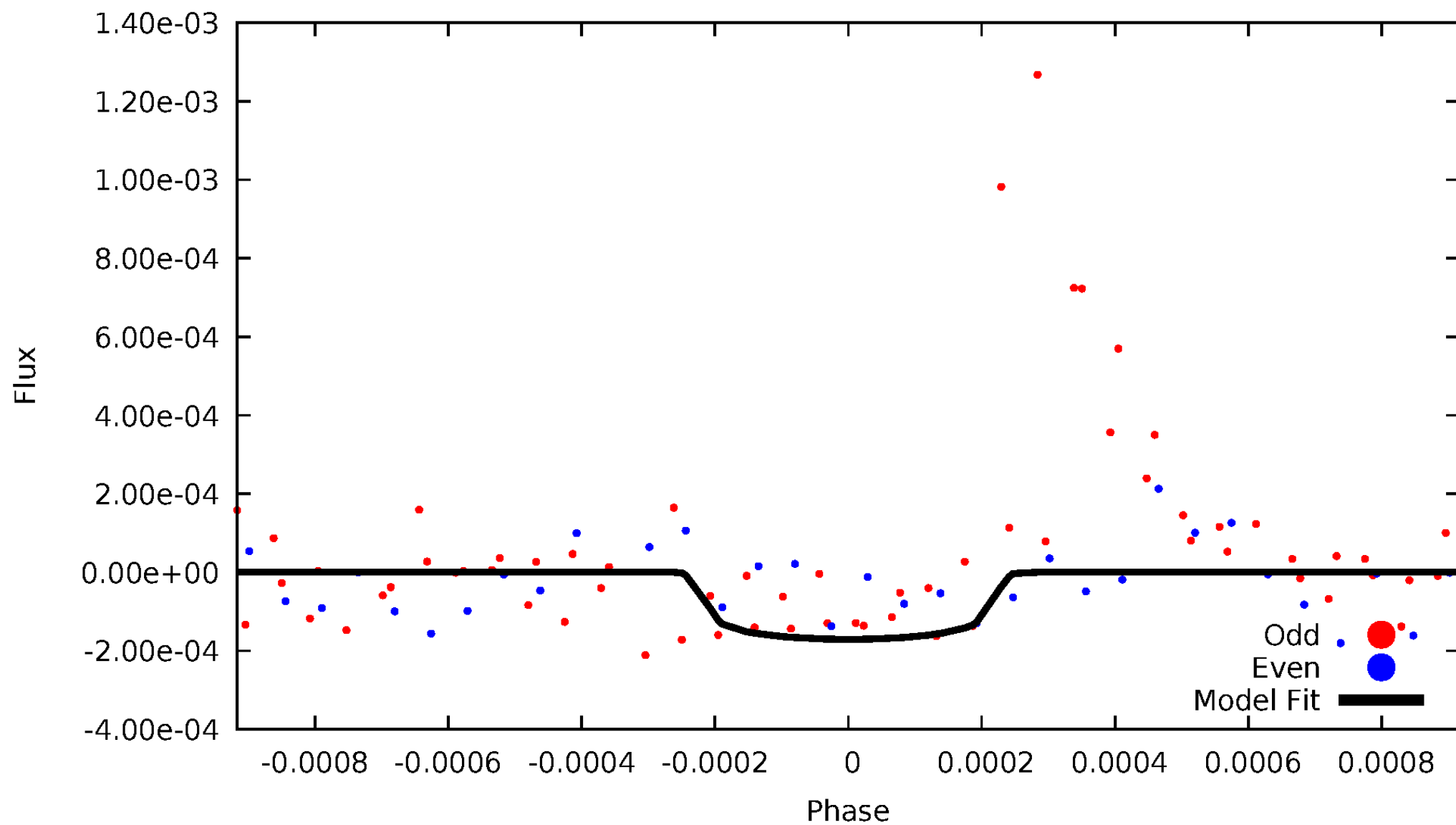


# TCE 006188207-01



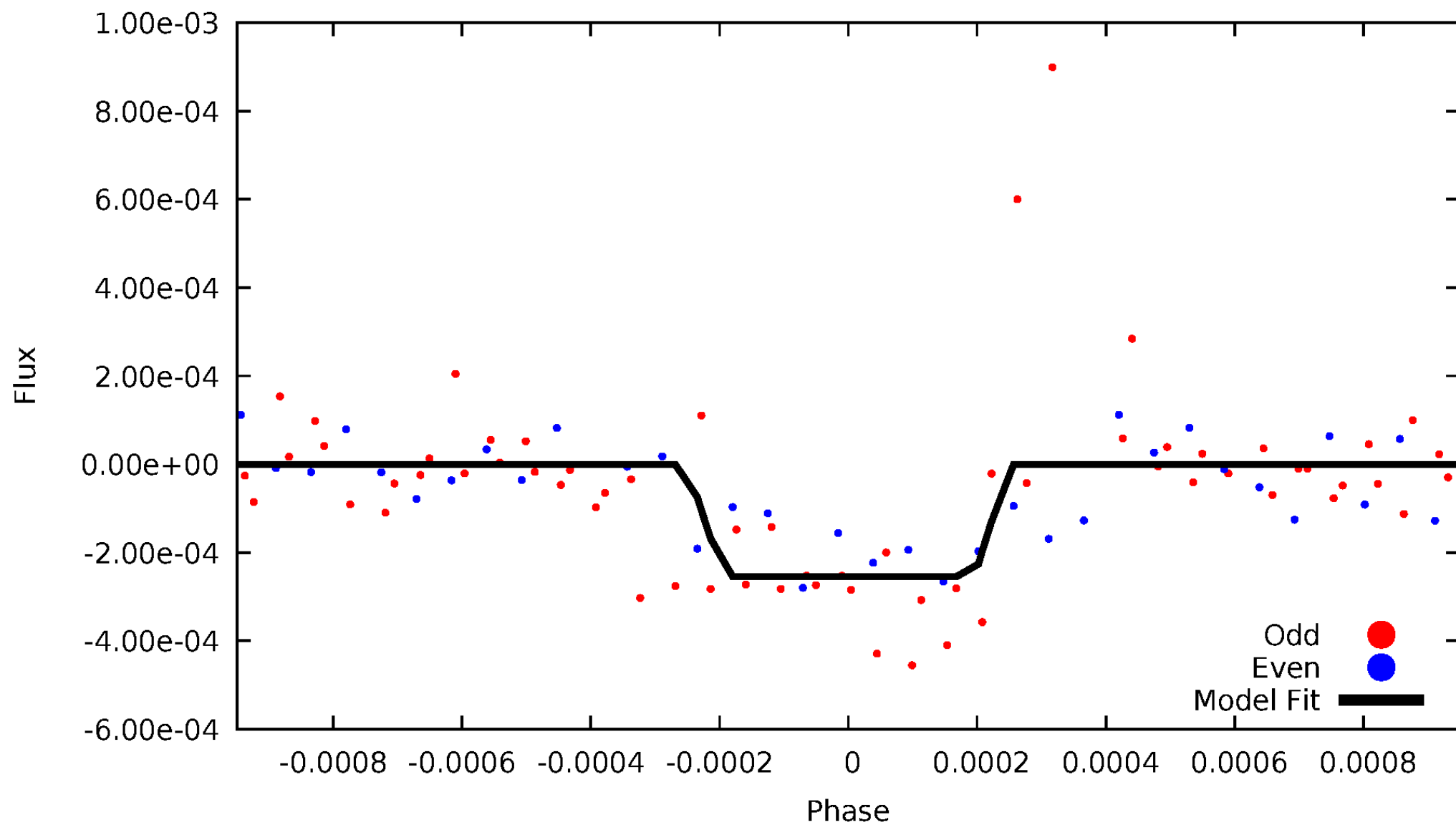
# DV Odd/Even

TCE 006188207-01



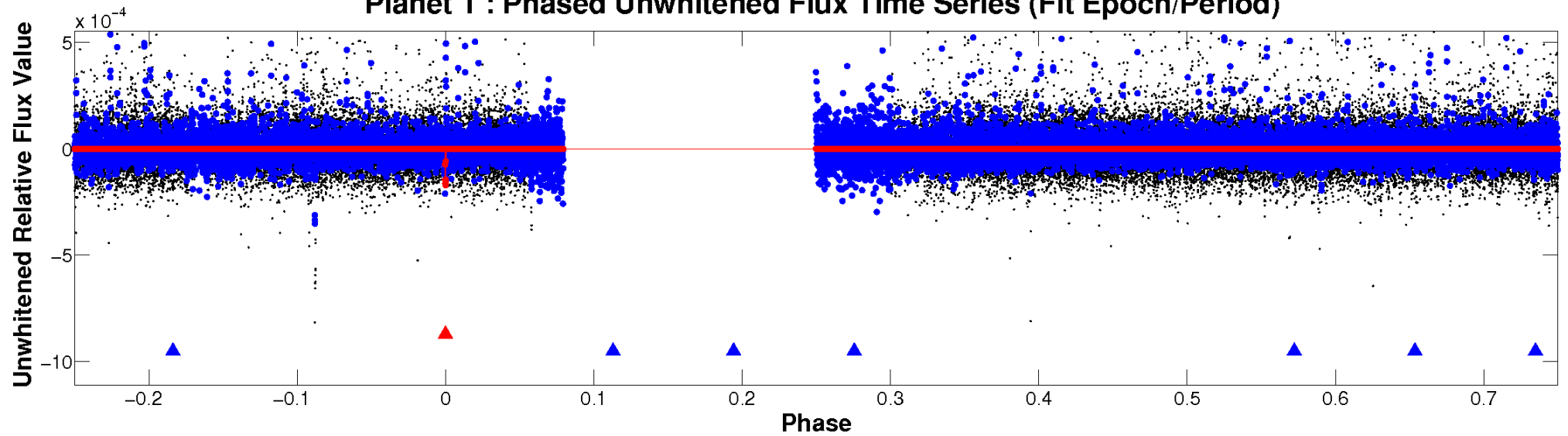
# ALT Odd/Even

TCE 006188207-01

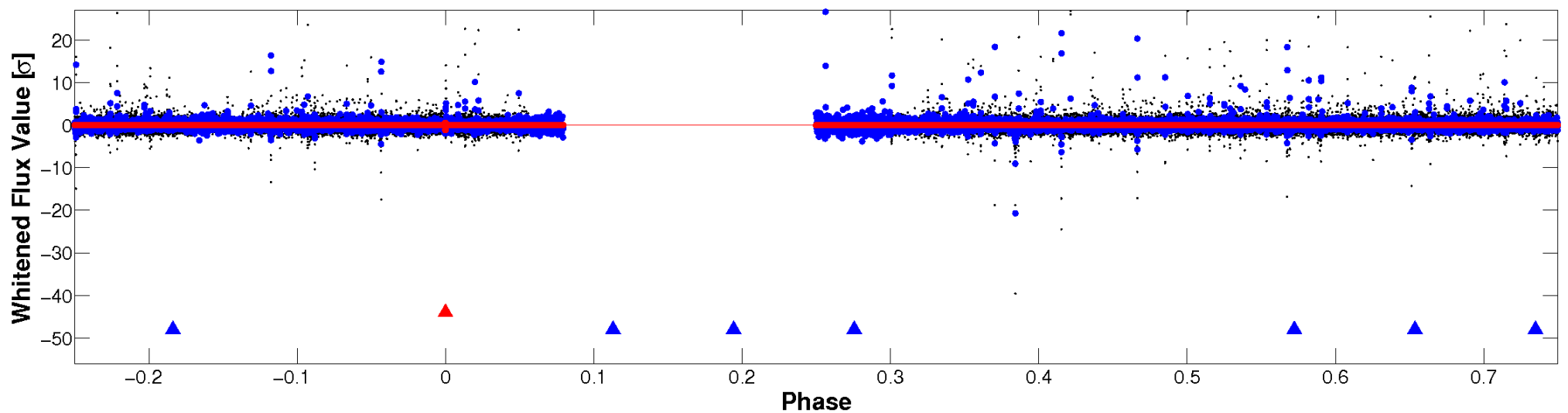


# Non-Whitened Vs. Whitened Light Curve

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

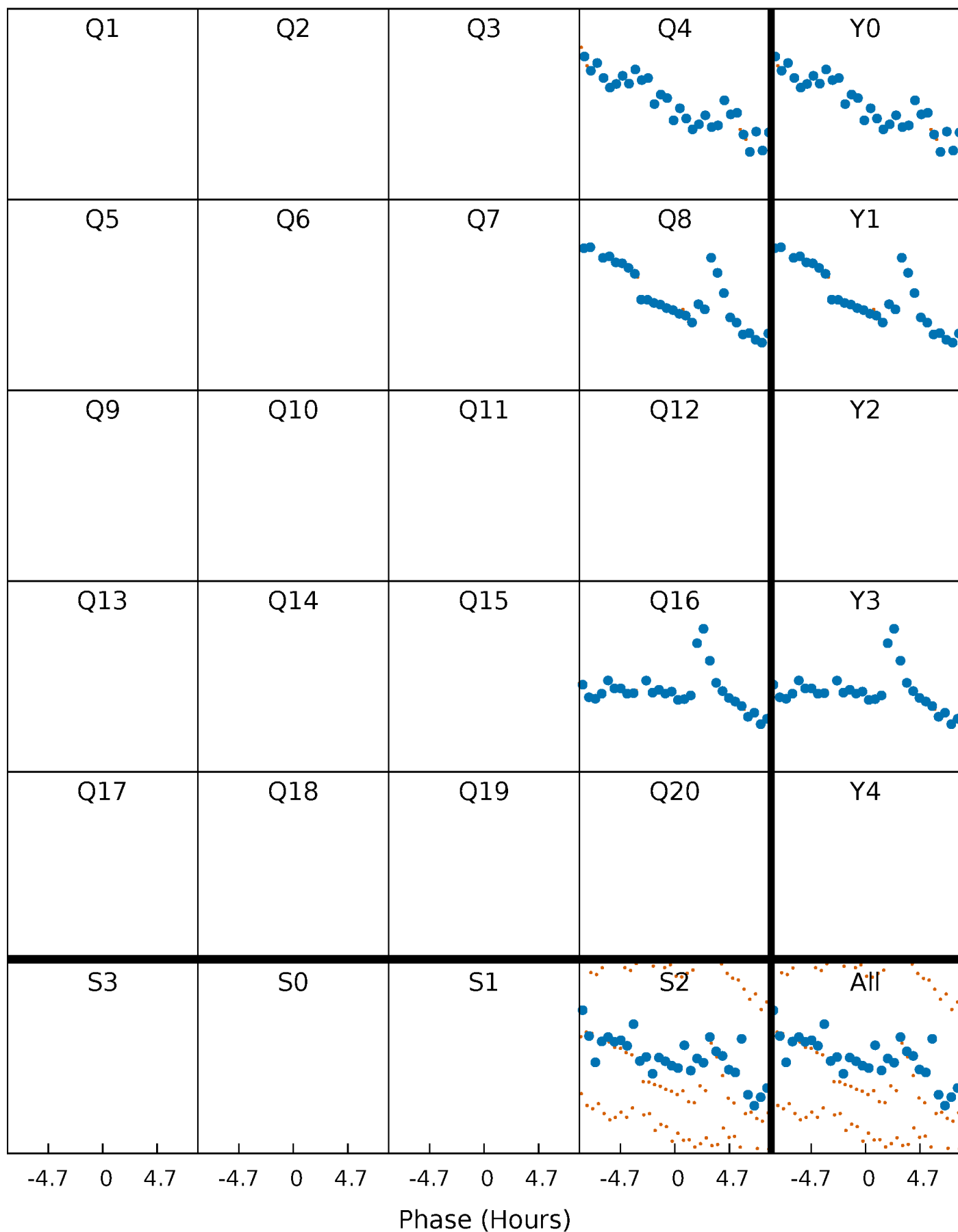


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

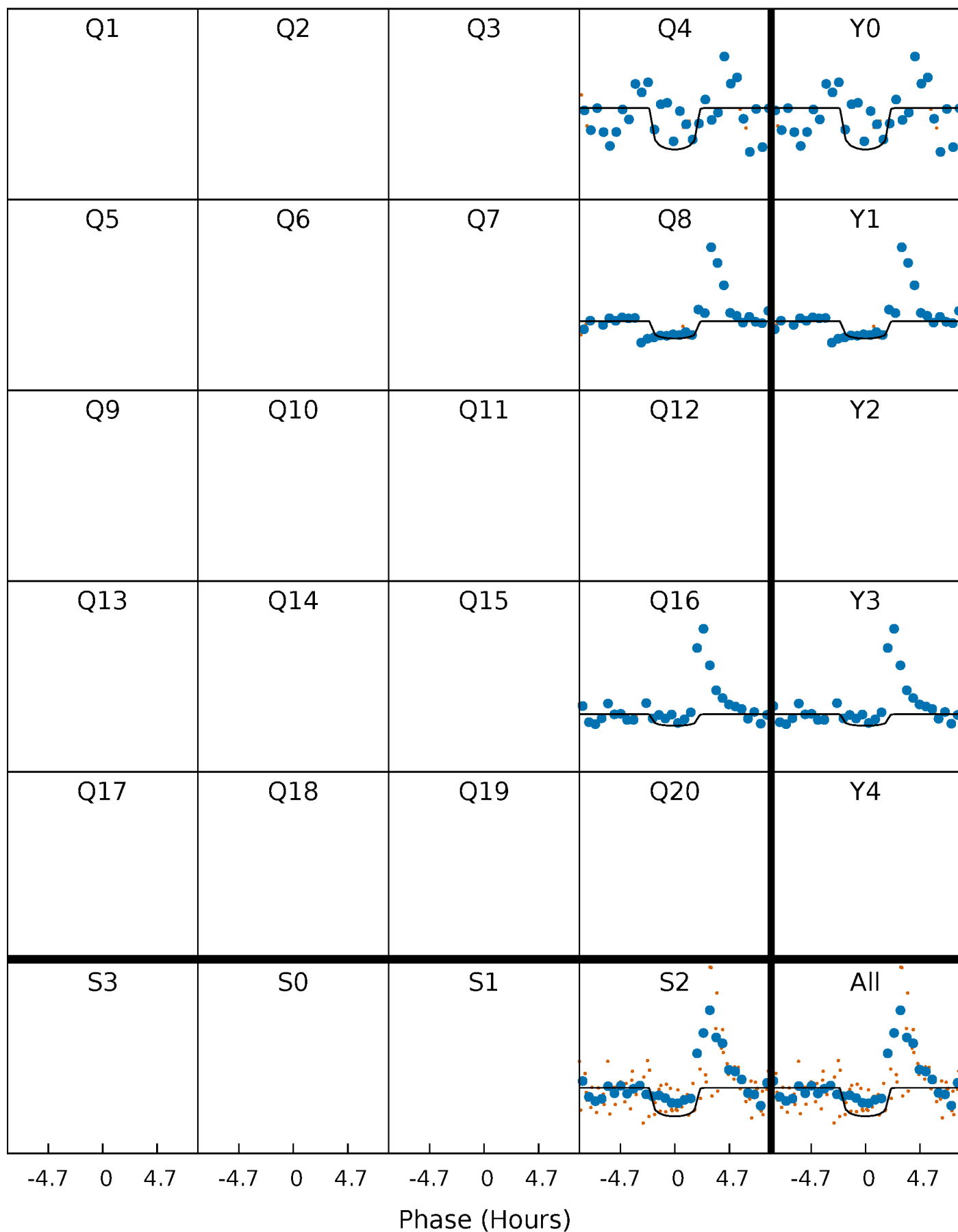
TCE 006188207-01 P=374.570597 Days  $T_0=412.501382$  (BKJD)





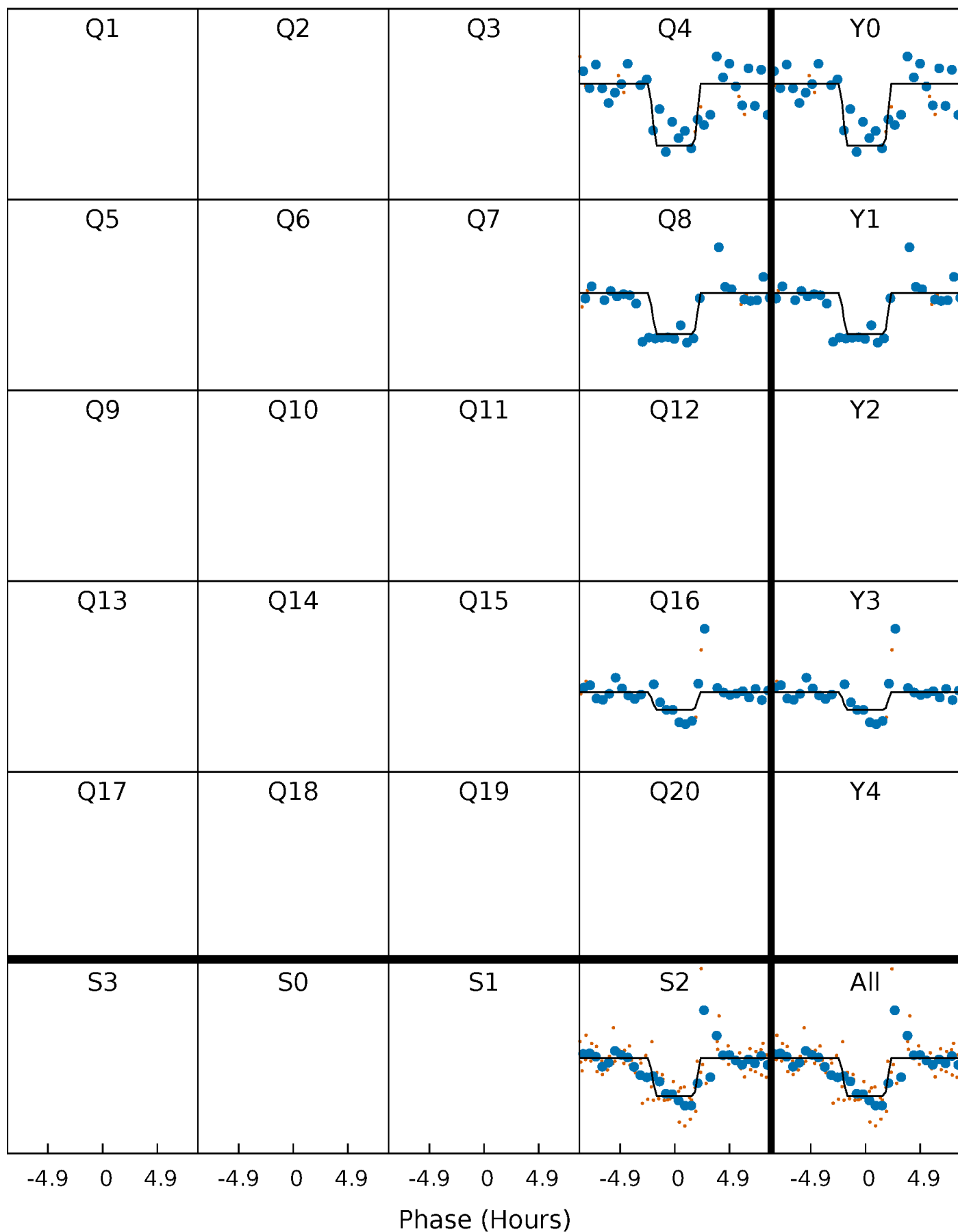
# DV Quarter-Phased Transit Curves

TCE 006188207-01 P=374.570597 Days  $T_0=412.501382$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

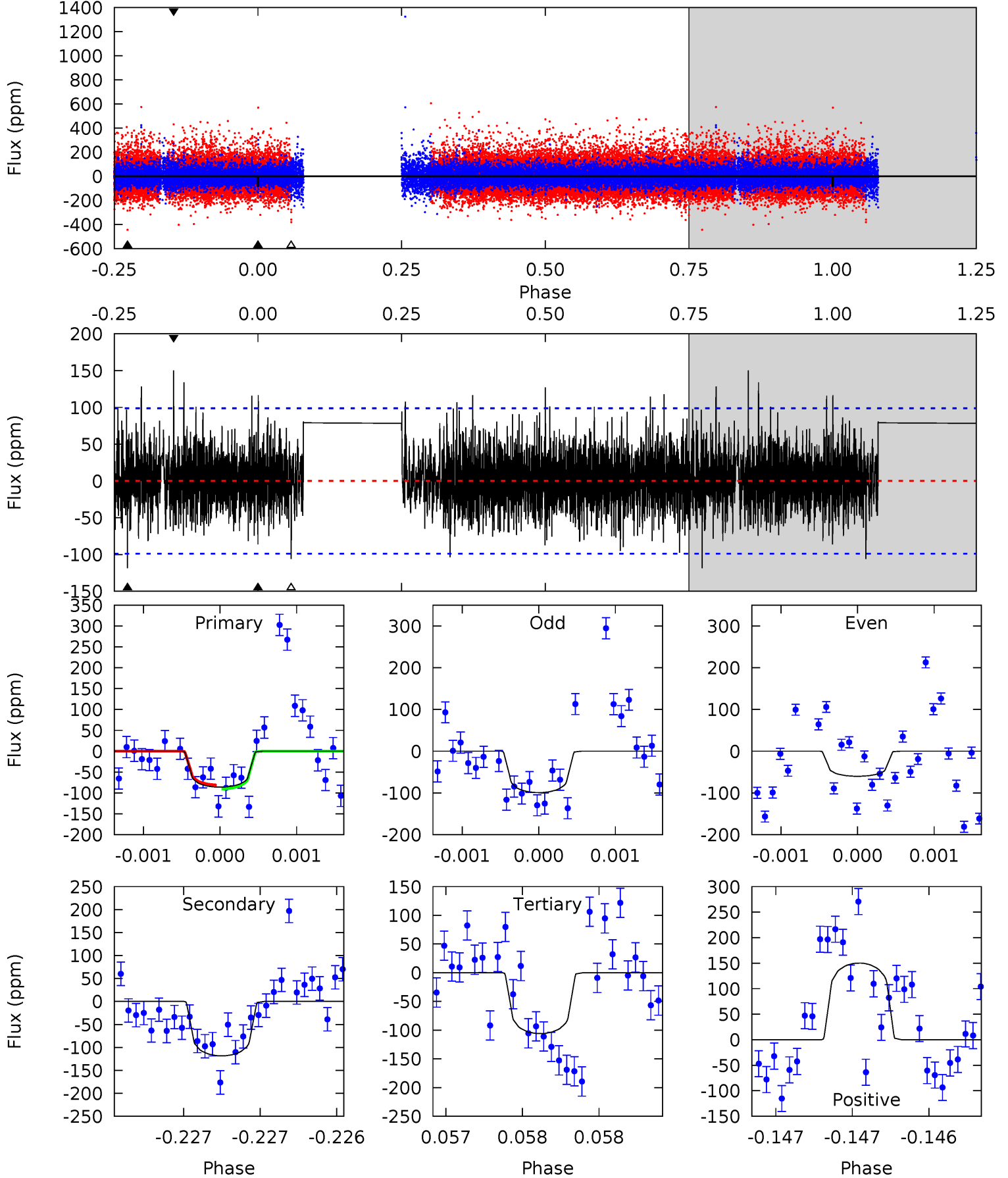
TCE 006188207-01 P=374.560777 Days  $T_0=412.518335$  (BKJD)



# DV Model-Shift Uniqueness Test

006188207-01,  $P = 374.570597$  Days,  $E = 37.930785$  Days

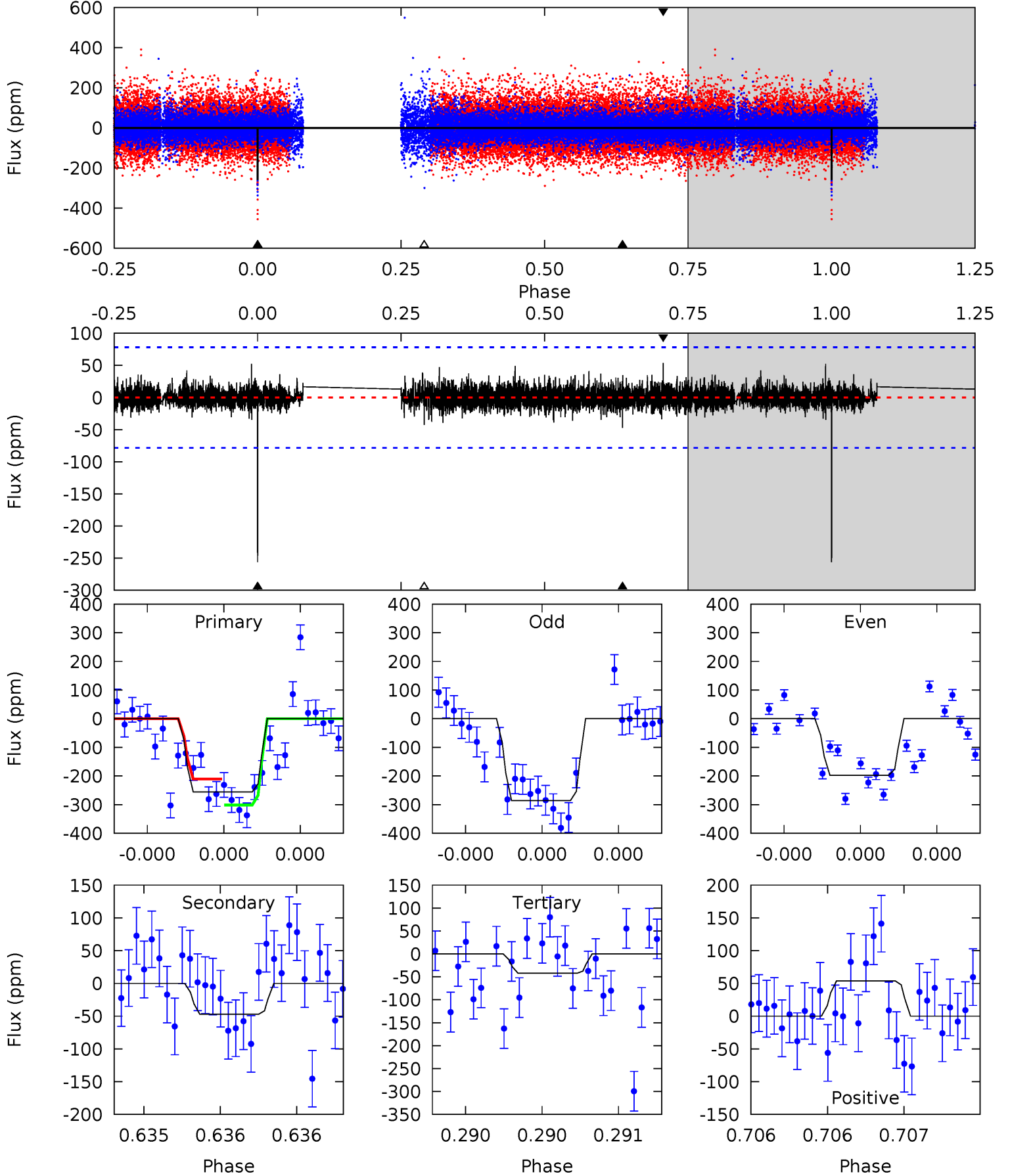
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.84	6.66	5.96	8.45	5.56	3.46	1.69	-1.12	-3.61	0.70	-1.79	0.94	1.25	0.56	0.27



# Alt Model-Shift Uniqueness Test

006188207-01,  $P = 374.560777$  Days,  $E = 37.957558$  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
18.3	3.36	3.02	3.83	5.59	3.51	0.73	15.3	14.5	0.34	-0.47	2.96	0.94	0.17	3.24



### Stellar Parameters For KIC 006188207

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6403^{+179}_{-224}$	$3.940^{+0.350}_{-0.150}$	$0.060^{+0.250}_{-0.300}$	$2.158^{+0.589}_{-0.883}$	$1.479^{+0.192}_{-0.356}$	$0.207^{+0.566}_{-0.088}$
	+3%/-3%	+9%/-4%	+417%/-500%	+27%/-41%	+13%/-24%	+273%/-42%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 006188207-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-118 \pm 18$	$3.28^{+2.28}_{-1.94}$	$528^{+42}_{-53}$	$5426^{+3477}_{-1026}$	$8083^{+41553}_{-5417}$
Alt.	$-47 \pm 14$	$3.66^{+2.46}_{-2.12}$	$527^{+44}_{-54}$	$4289^{+1686}_{-697}$	$2522^{+10911}_{-1683}$

$T_{max}$  = 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

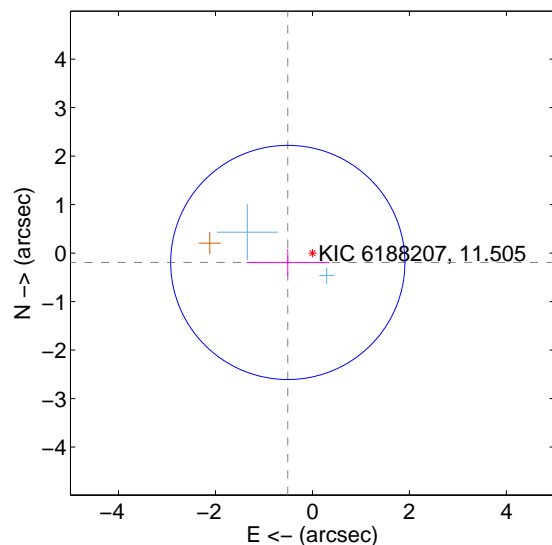
Supplemental centroid analysis for 006188207-01. **Kepler magnitude: 11.51.** Transit SNR 5.47

**There are 2 quarters with good PRF difference image offsets**

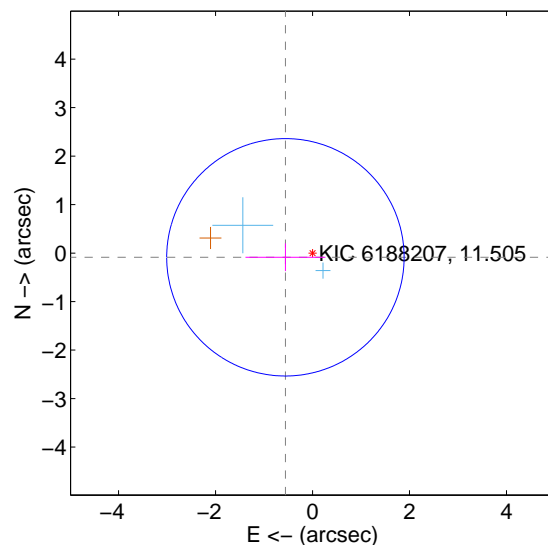
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.544 \pm 0.805$	0.68	$0.508 \pm 0.854$	$-0.193 \pm 0.280$
PRF-fit source offset from KIC position	$0.566 \pm 0.816$	0.69	$0.559 \pm 0.824$	$-0.087 \pm 0.286$
photometric centroid source offset	$0.58 \pm 1.19$	0.48	$-0.56 \pm 1.20$	$0.11 \pm 0.96$

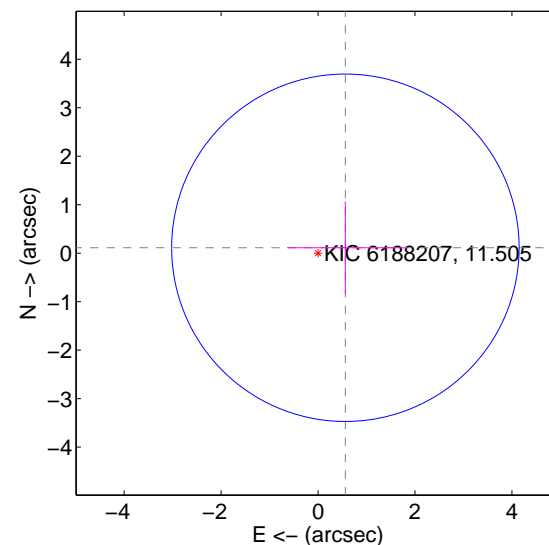
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

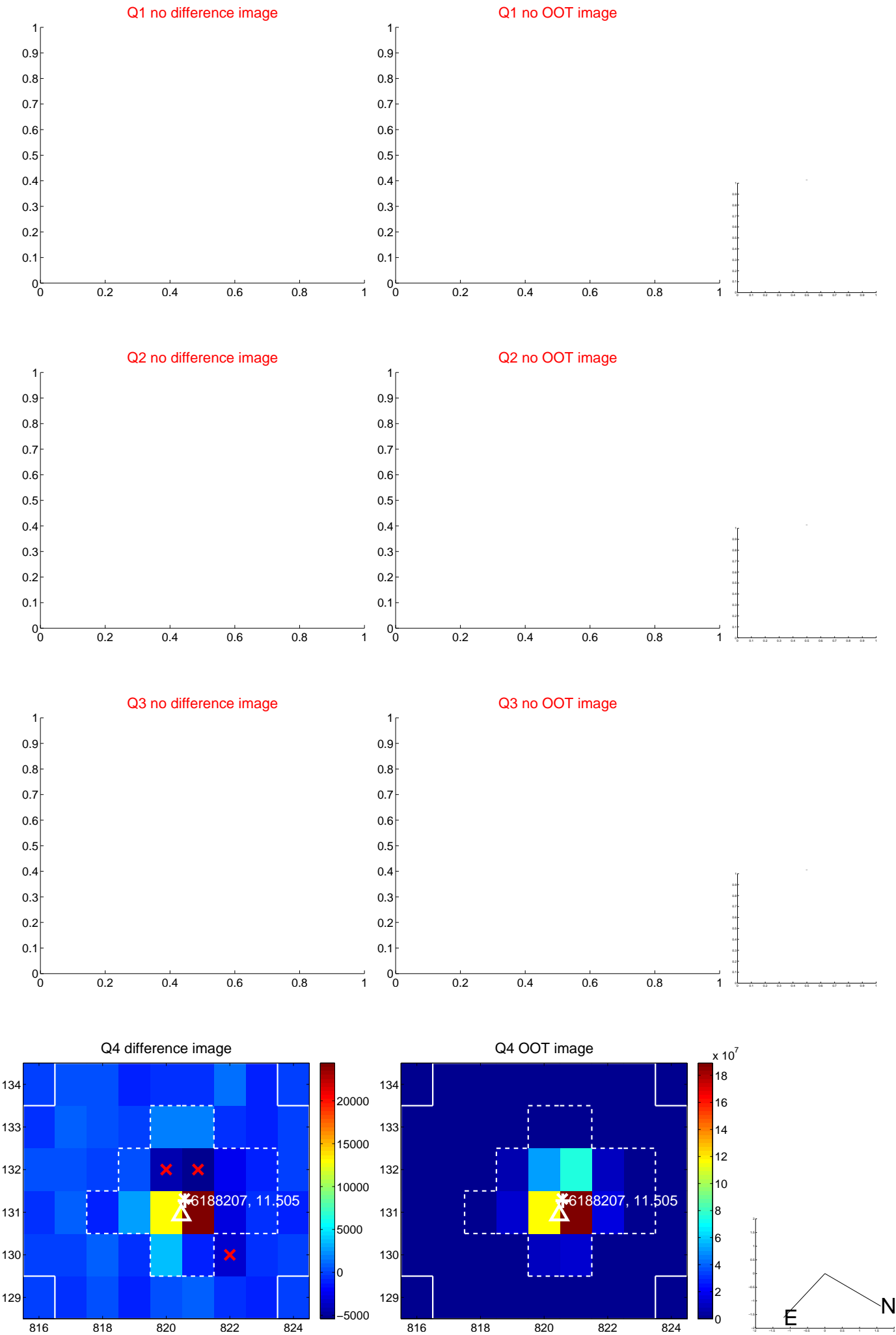


offset from photometric centroids

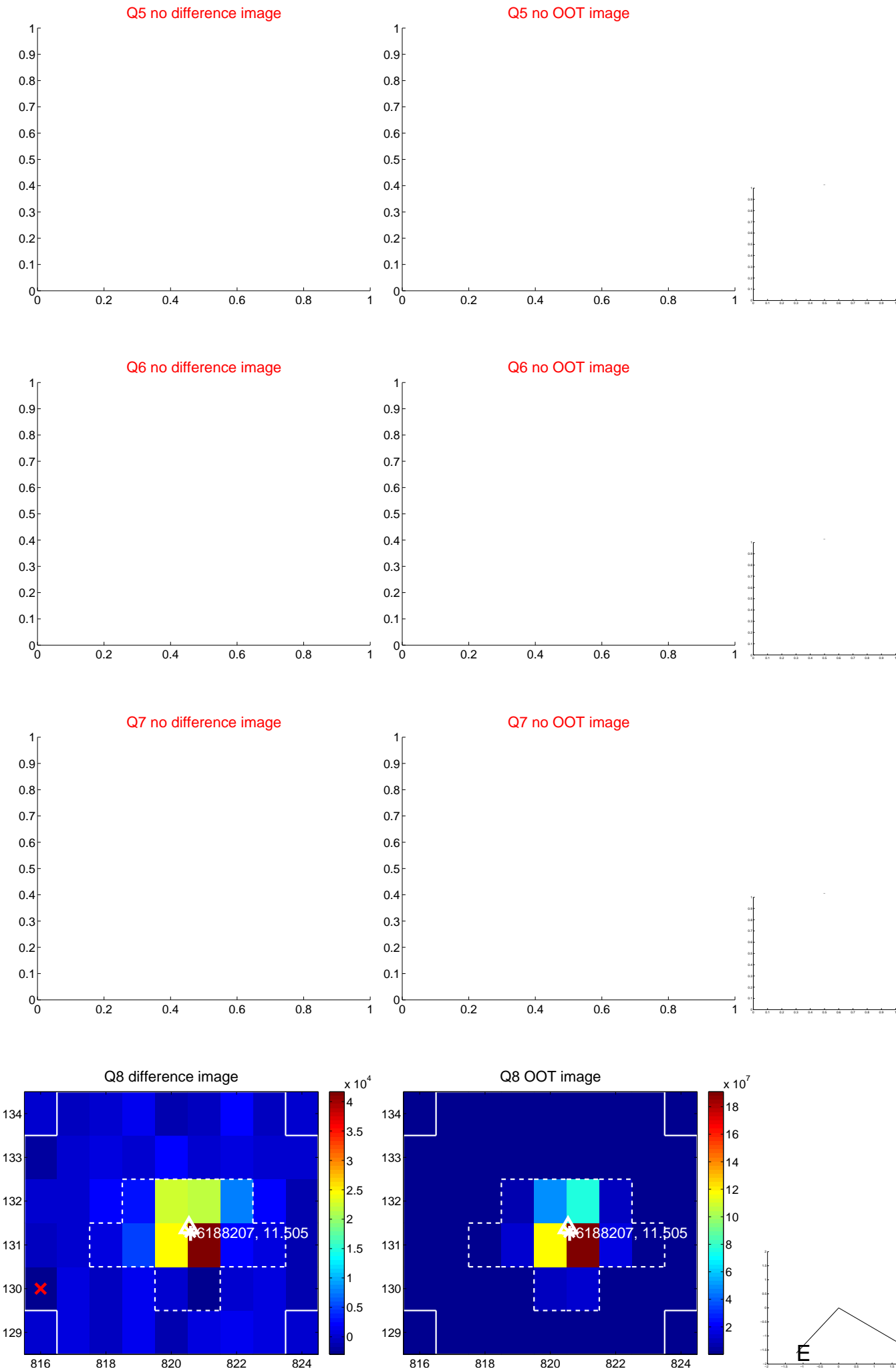


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

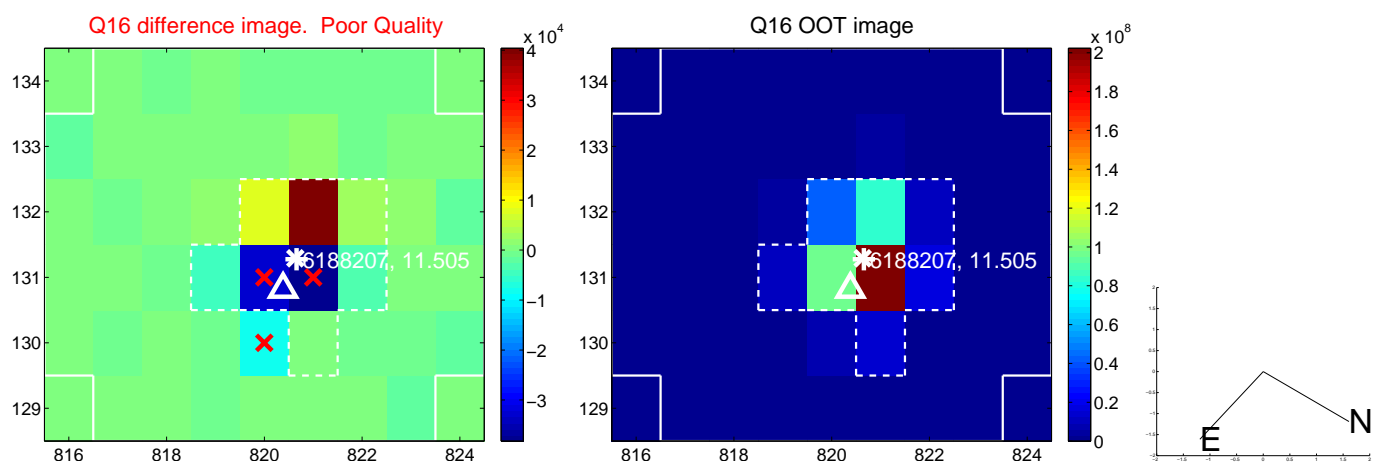
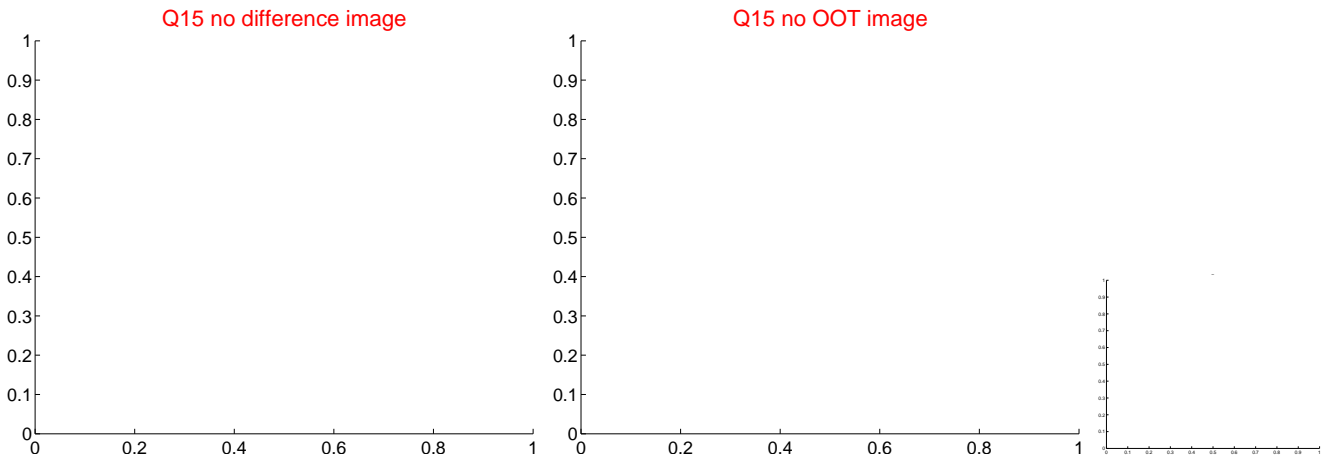
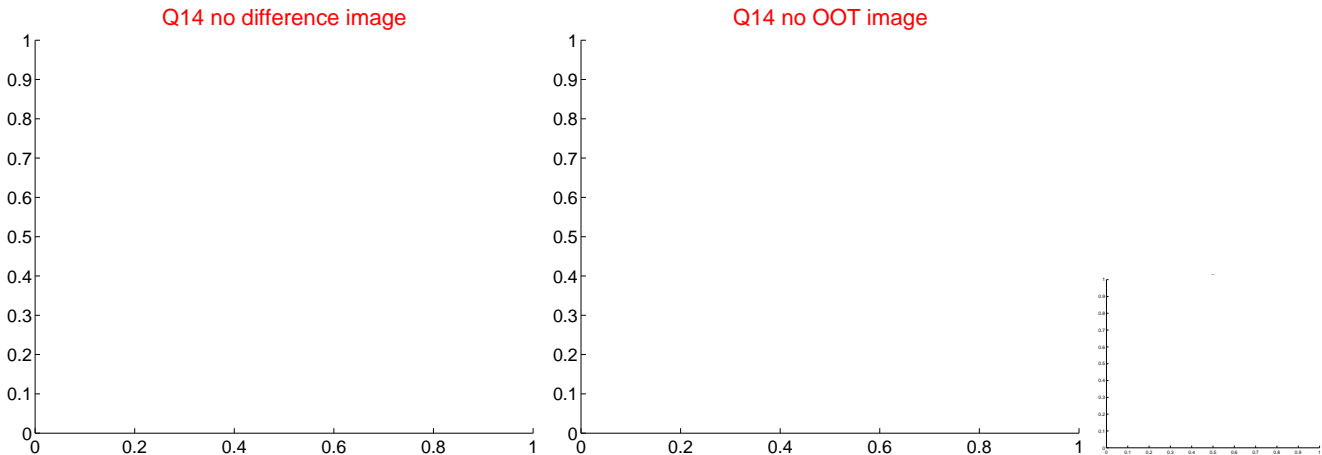
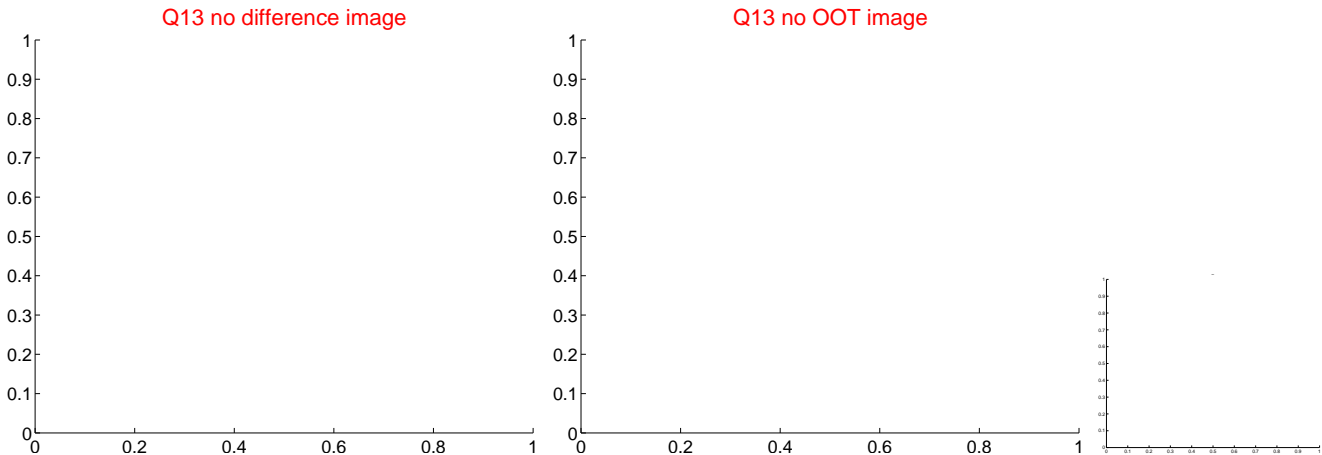




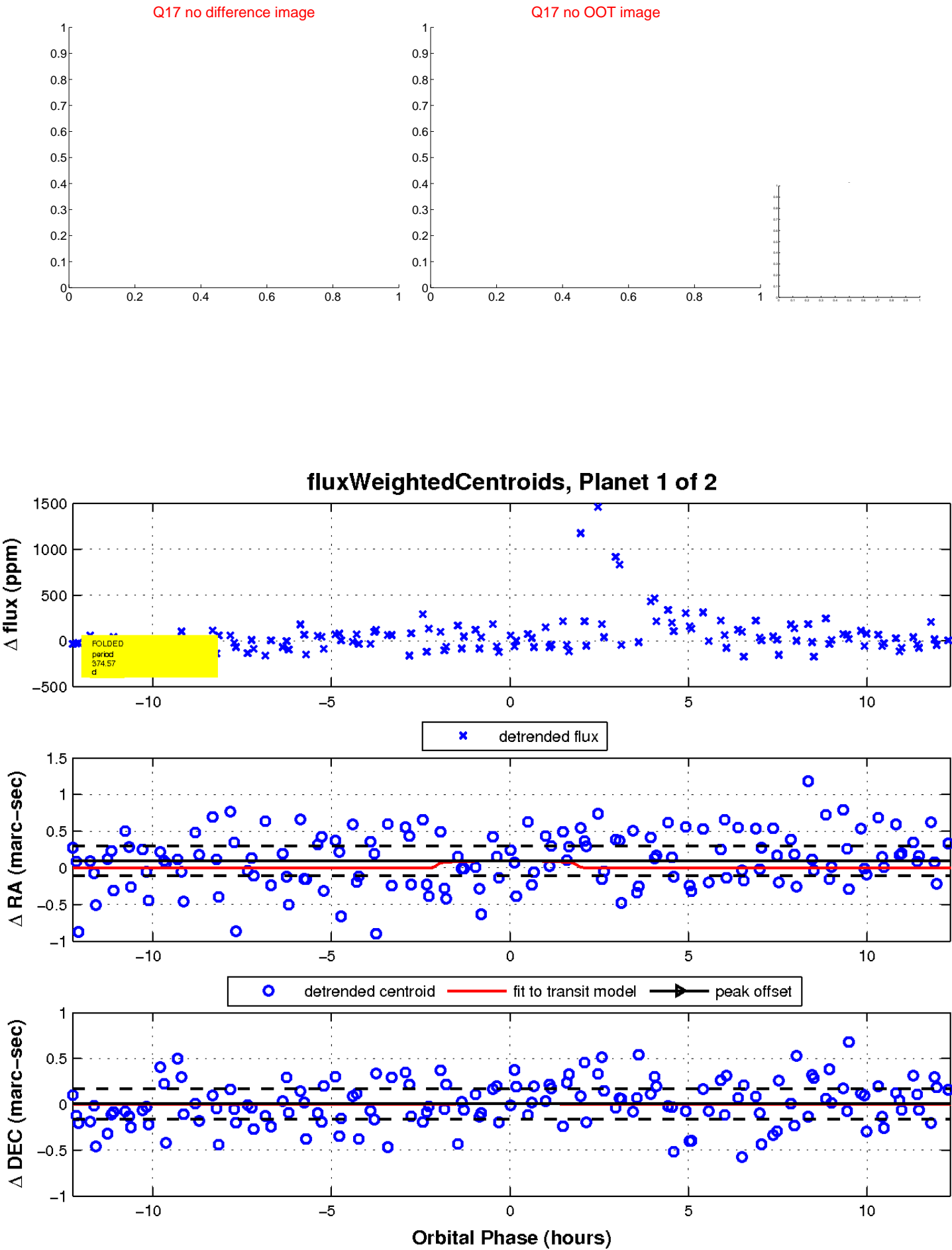
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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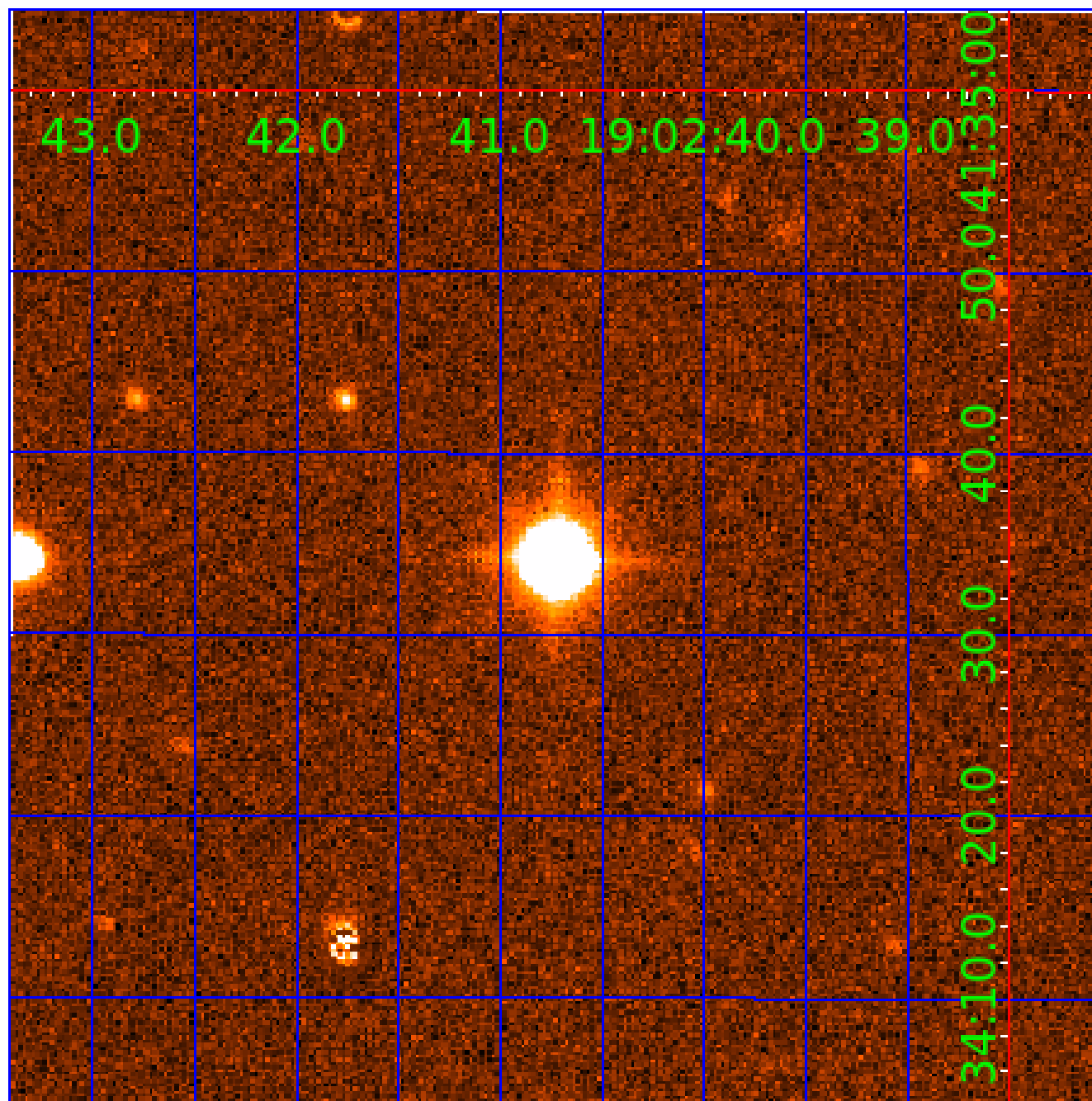


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UKIRT Image

Declination



# KIC 006188207

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006188207-01	OBS	No	374.570597	412.501382	170.9	4.119	9.8	5.5	2.16	6403	3.15	5.22
006188207-02	OBS	No	202.513995	252.303608	191.4	3.839	8.2	6.7	2.16	6403	3.19	11.85

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006188207-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006188207-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS

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

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

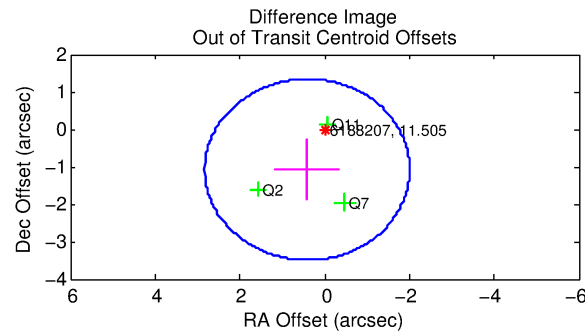
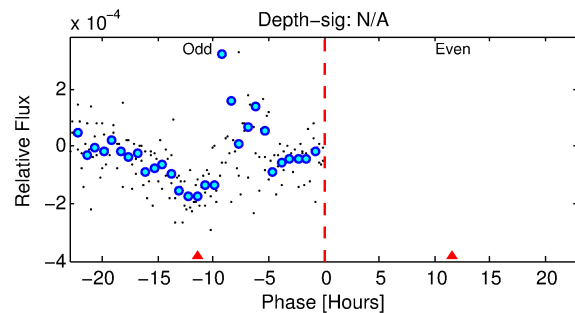
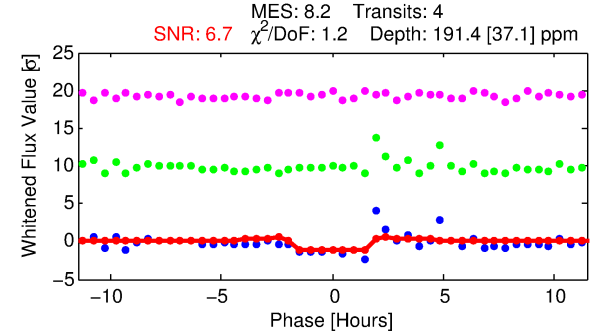
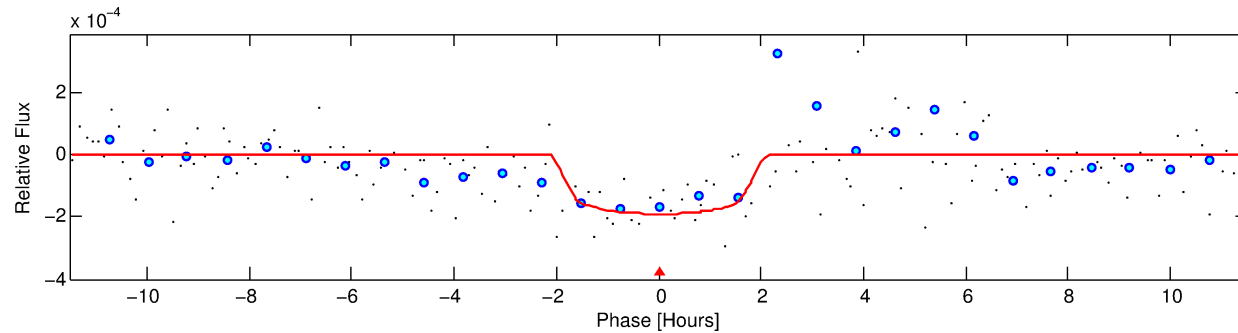
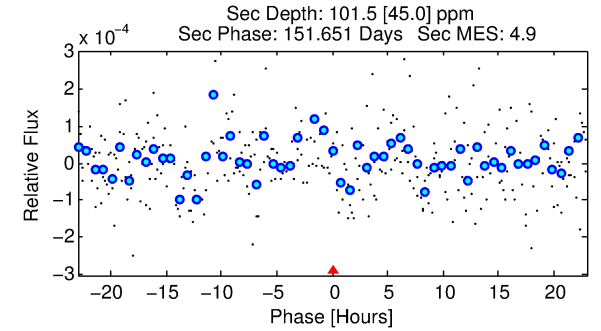
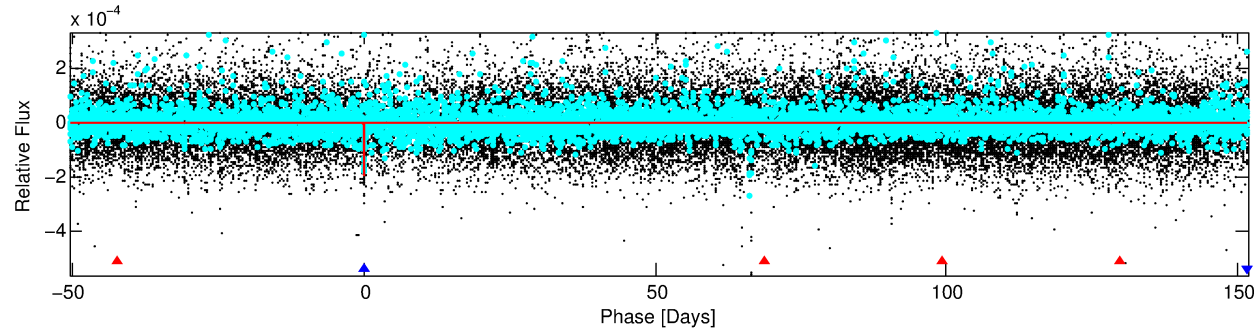
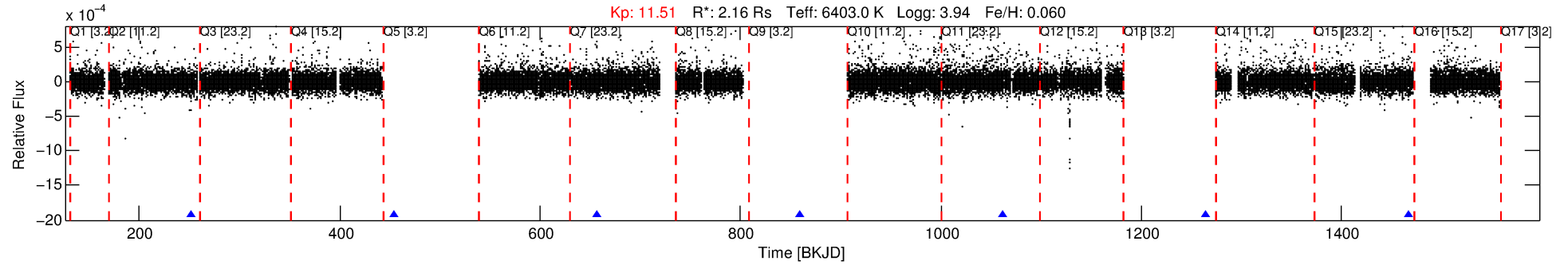
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006188207-02

No Significant Match Found

# DV One-Page Summary

KIC: 6188207 Candidate: 2 of 2 Period: 202.514 d



## DV Fit Results:

Period = 202.51399 [0.00174] d  
Epoch = 252.3036 [0.0074] BKJD  
Rp/R\* = 0.0136 [0.0137]  
a/R\* = 296.68 [1561.45]  
b = 0.70 [3.91]  
Seff = 11.85 [7.33]  
Teq = 473 [73] K  
Rp = 3.19 [3.48] Re  
a = 0.7692 [0.2945] AU  
Ag = 3243.86 [6991.96] [0.46σ]  
Teffp = 5521 [2863] K [1.76σ]

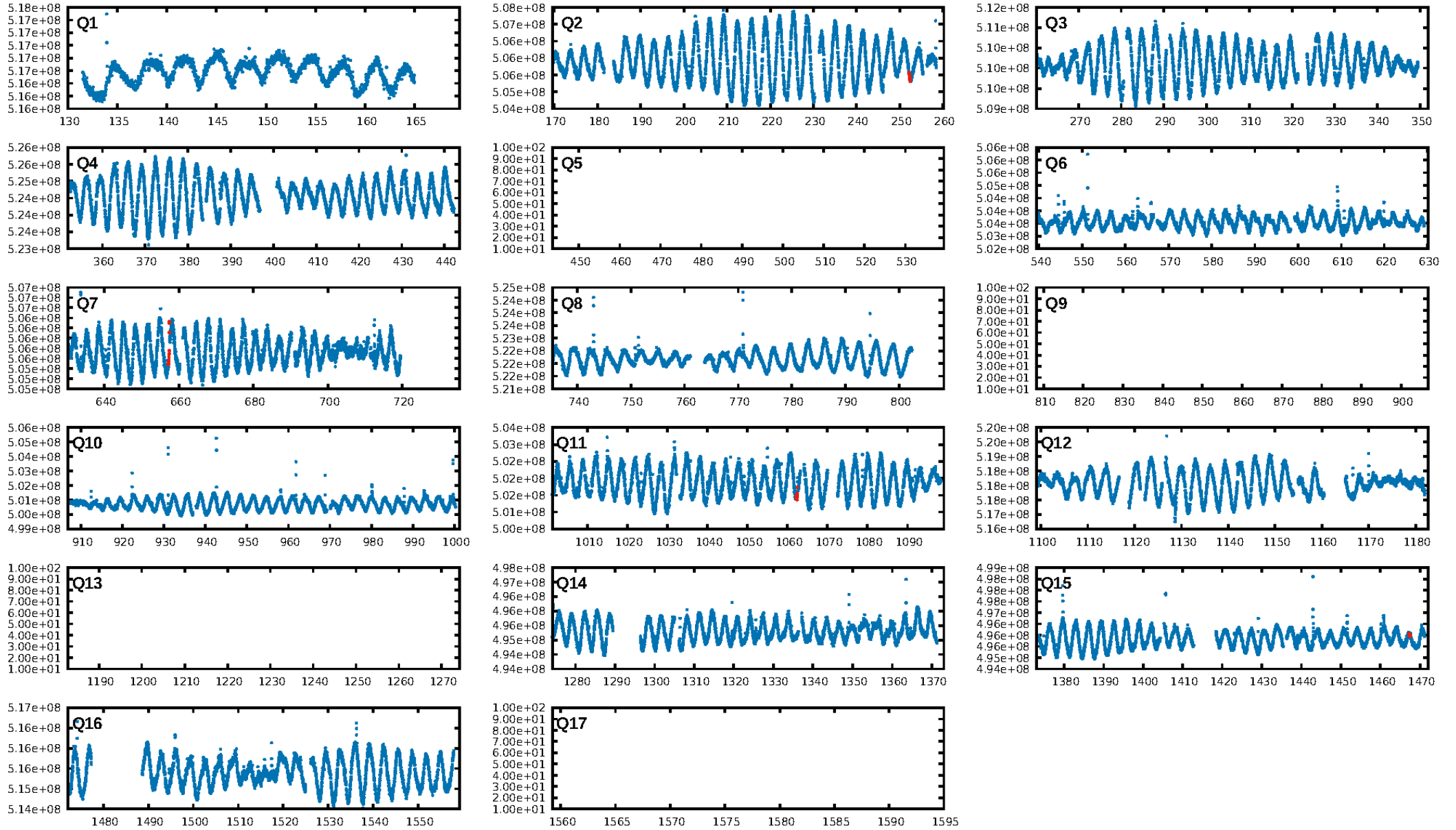
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [733.34σ]  
ModelChiSquare2-sig: 44.9%  
ModelChiSquareGof-sig: 97.1%  
Bootstrap-pfa: 5.44e-10  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.9487  
Centroid-sig: 35.5%  
Centroid-so: 0.777 arcsec [0.91σ]  
OotOffset-rm: 1.155 arcsec [1.43σ]  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-rm: 1.048 arcsec [1.25σ]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [4/4]

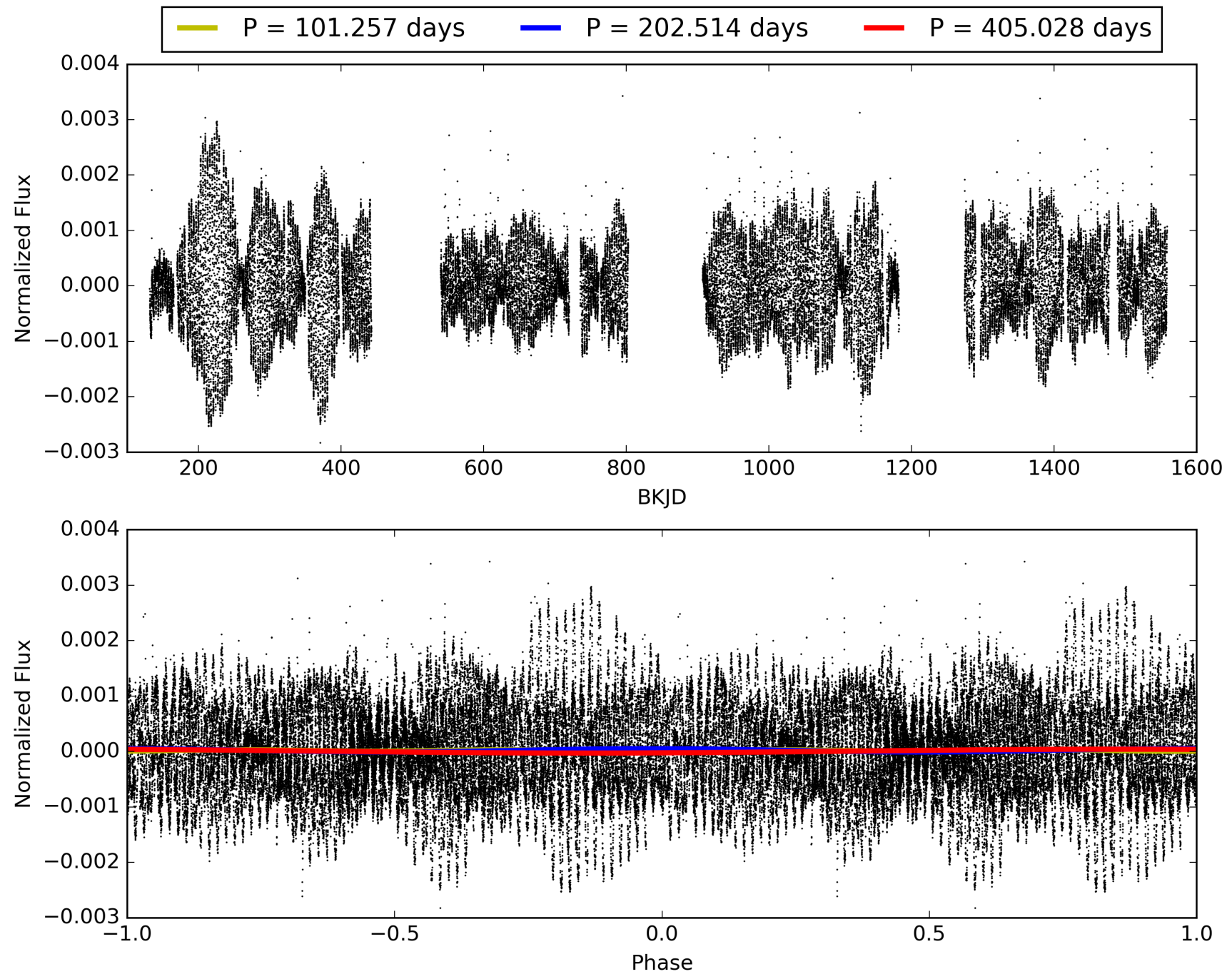
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:13:24 Z

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# TCE 006188207-02, PDC Light Curves



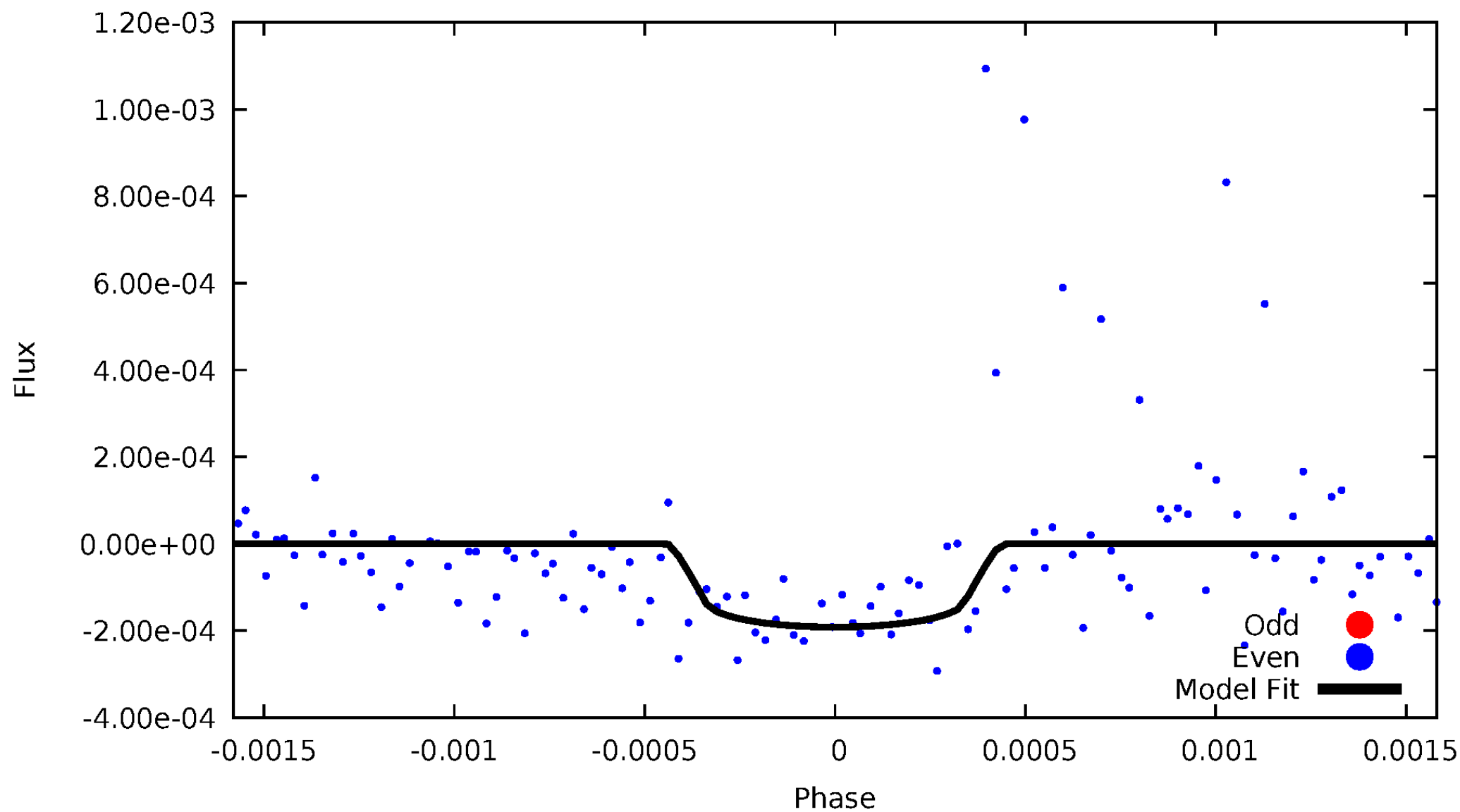
TCE 006188207-02





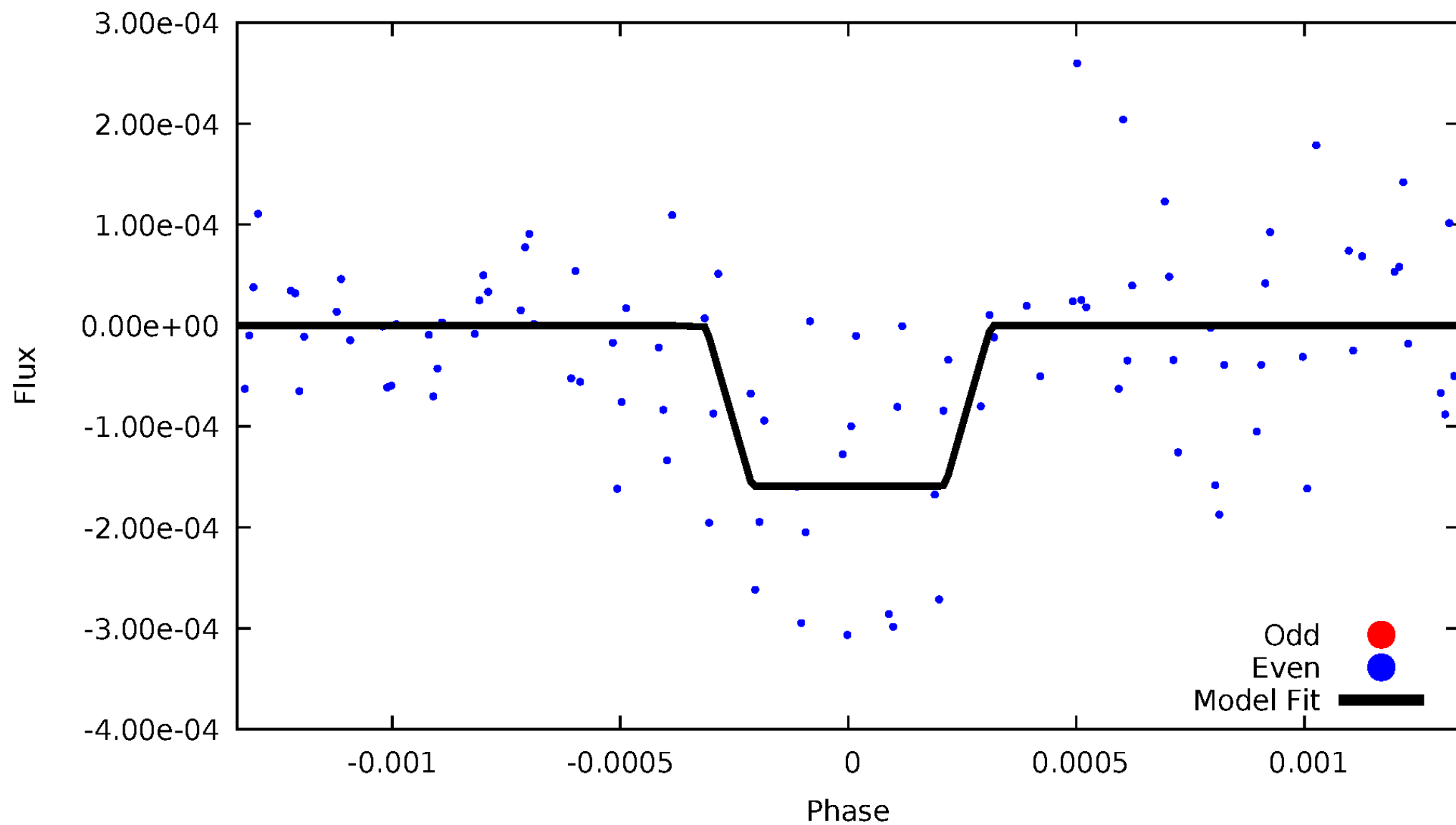
# DV Odd/Even

TCE 006188207-02



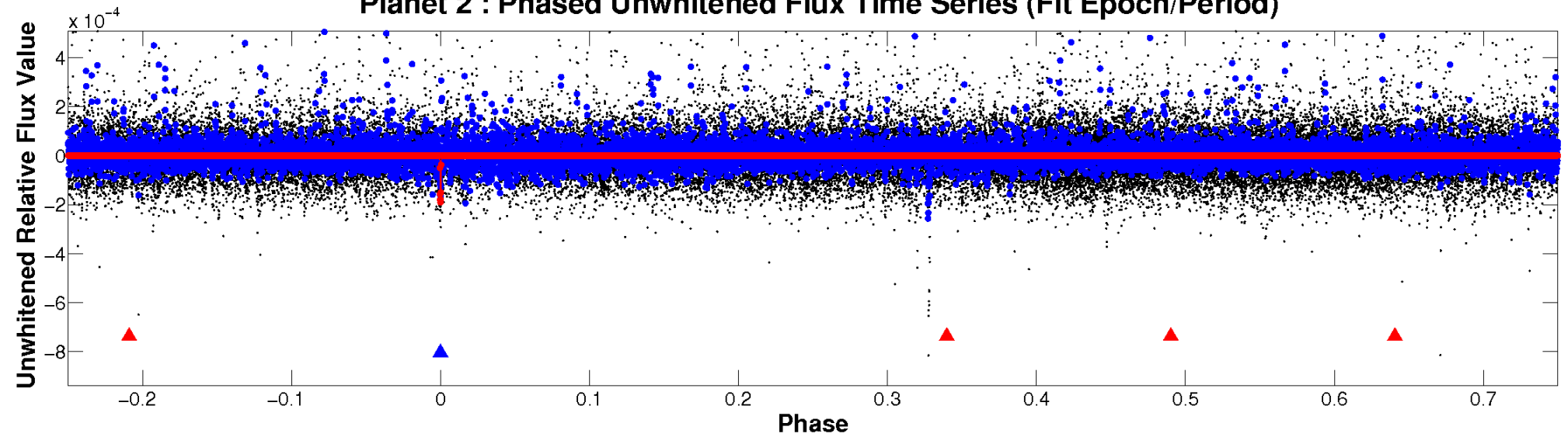
# ALT Odd/Even

TCE 006188207-02

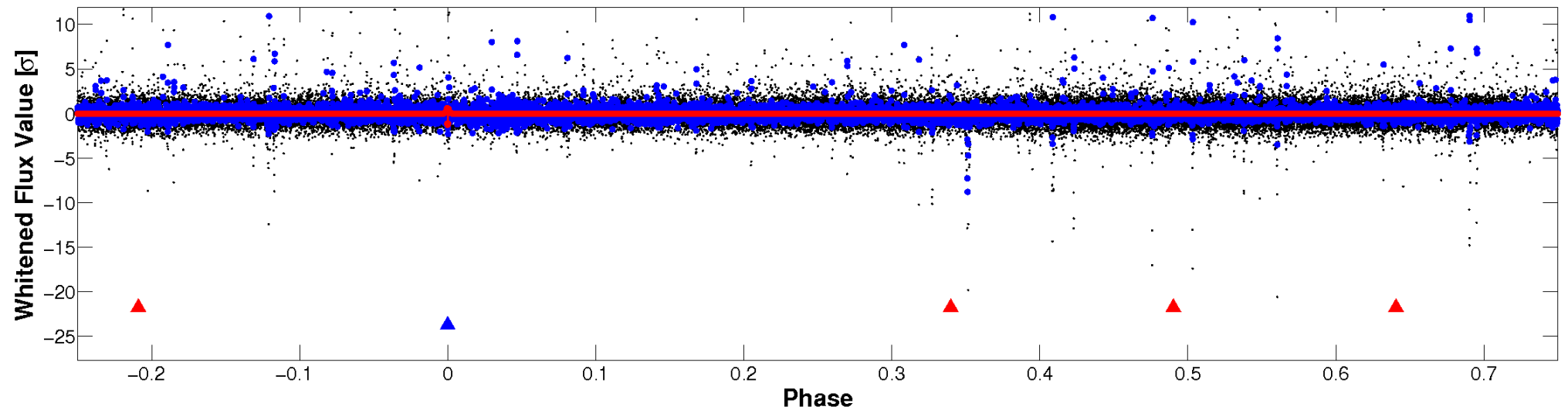


# Non-Whitened Vs. Whitened Light Curve

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

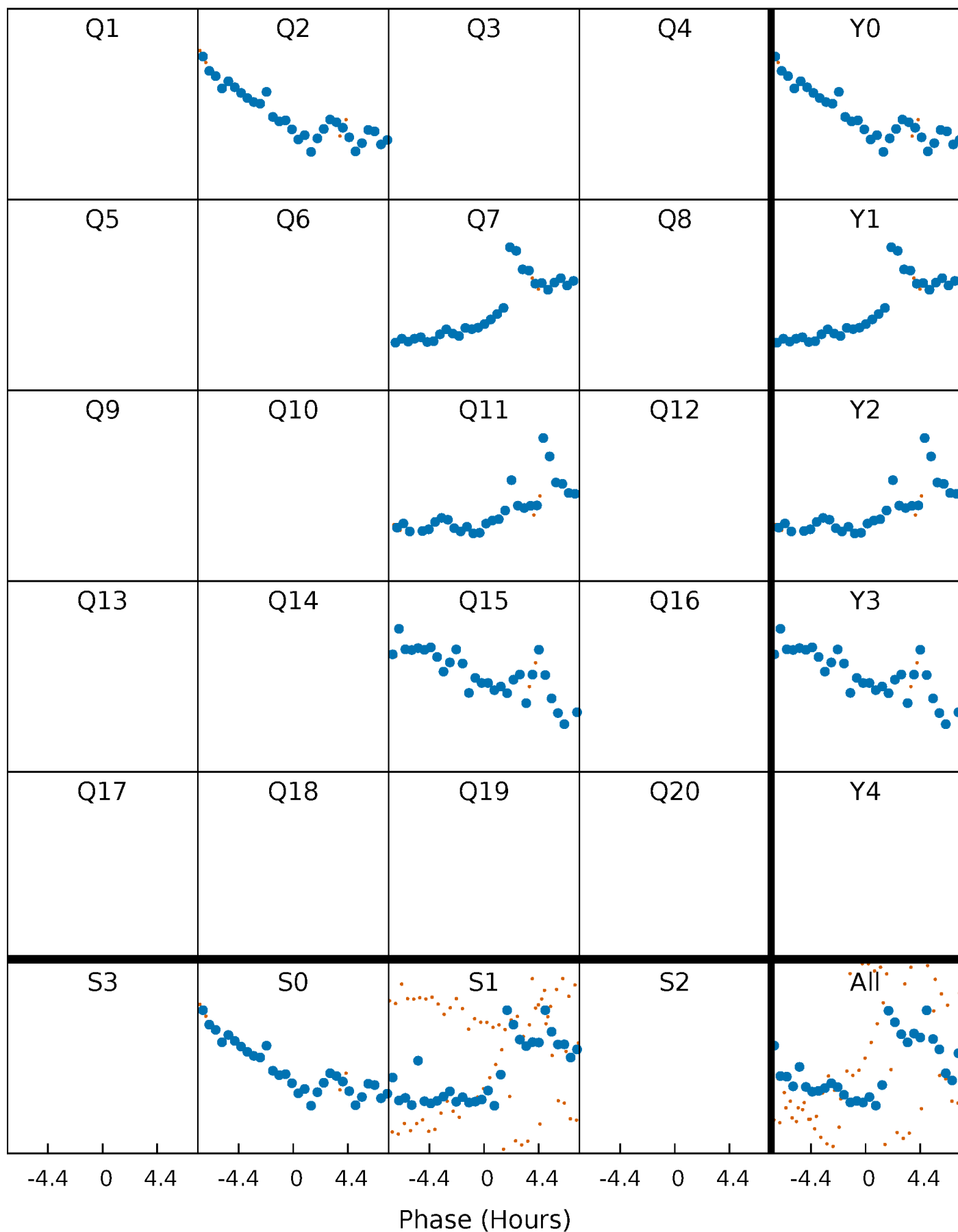


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



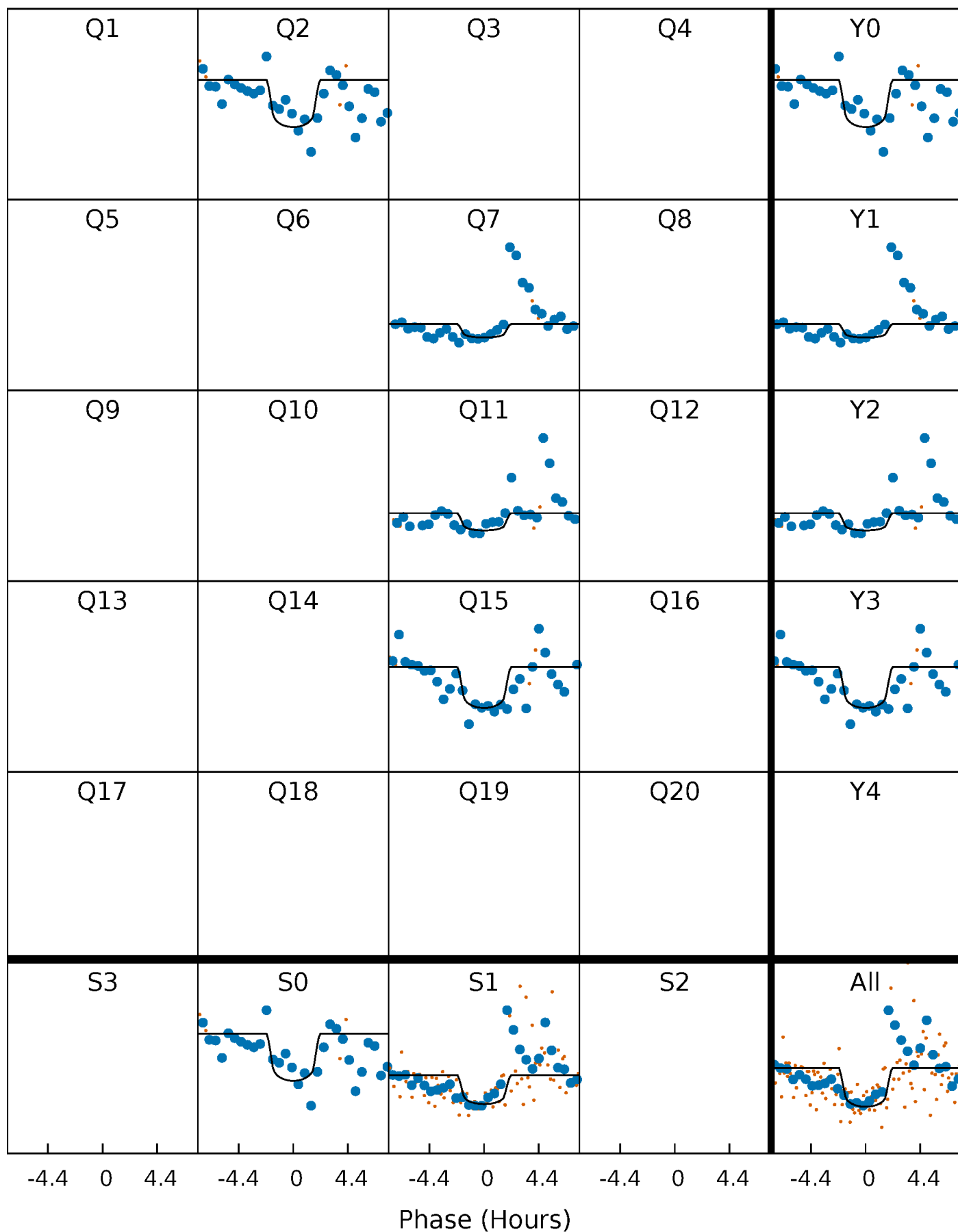
# PDC Quarter-Phased Transit Curves

TCE 006188207-02 P=202.513995 Days  $T_0=252.303608$  (BKJD)



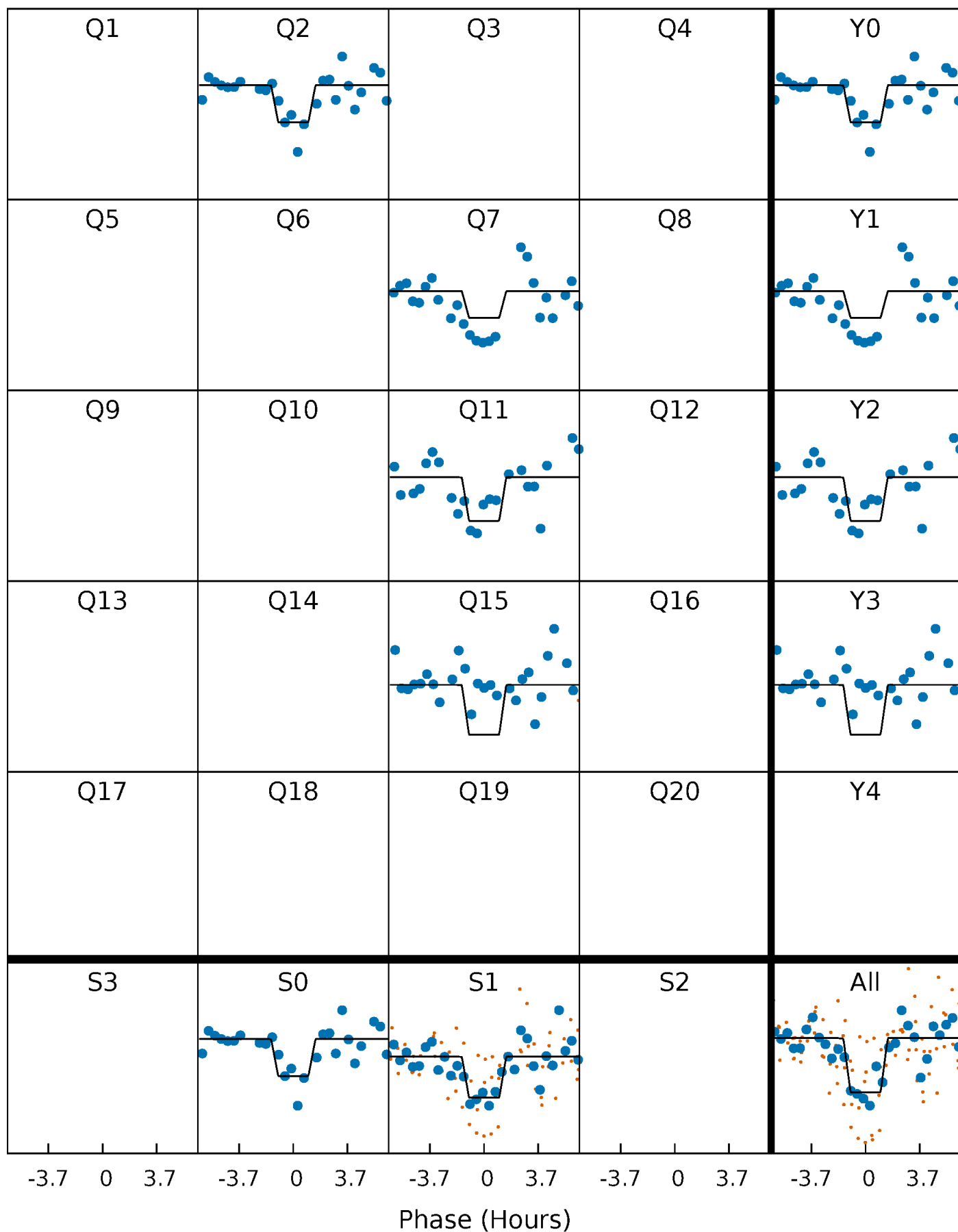
# DV Quarter-Phased Transit Curves

TCE 006188207-02     $P=202.513995$  Days     $T_0=252.303608$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

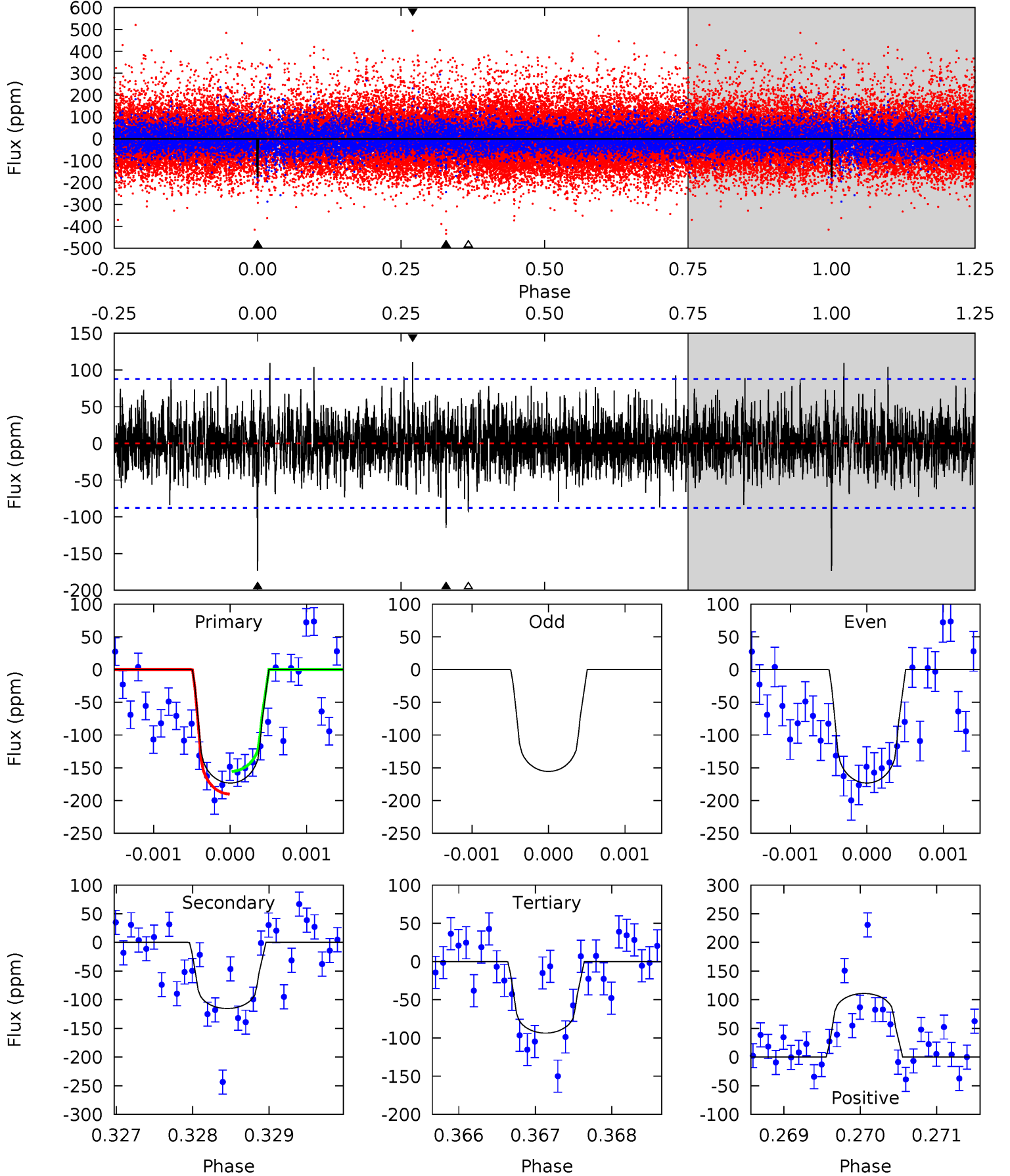
TCE 006188207-02 P=202.505534 Days  $T_0=252.339922$  (BKJD)



# DV Model-Shift Uniqueness Test

006188207-02, P = 202.513995 Days, E = 49.789613 Days

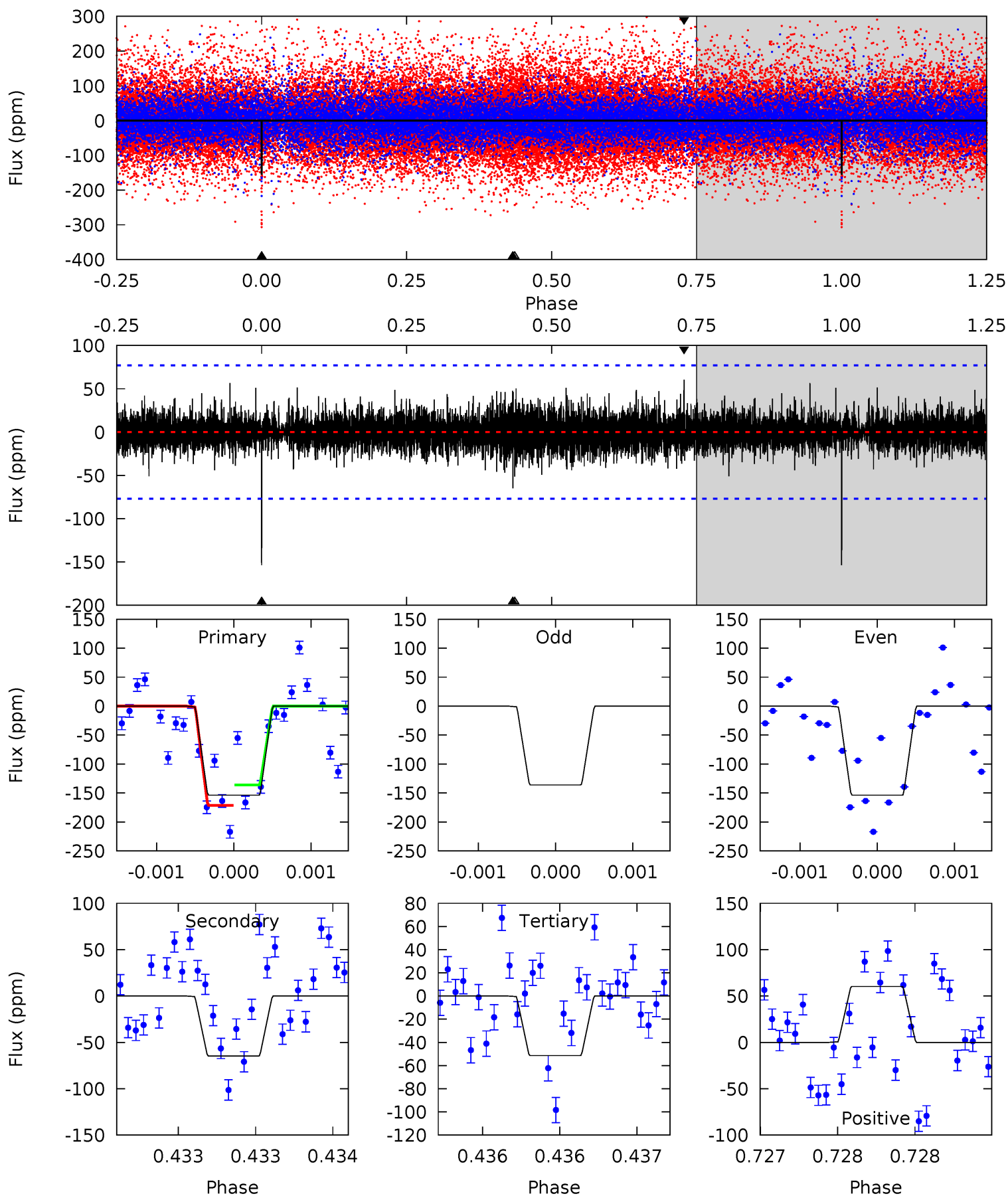
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	7.18	5.83	6.91	5.47	3.32	1.57	4.96	3.88	1.35	0.27	0.62	1.02	0.39	1.08



# Alt Model-Shift Uniqueness Test

006188207-02, P = 202.505534 Days, E = 49.834388 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
11.1	4.65	3.69	4.33	5.53	3.42	0.95	7.36	6.72	0.96	0.32	0.72	1.02	0.28	1.26





### Stellar Parameters For KIC 006188207

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6403^{+179}_{-224}$	$3.940^{+0.350}_{-0.150}$	$0.060^{+0.250}_{-0.300}$	$2.158^{+0.589}_{-0.883}$	$1.479^{+0.192}_{-0.356}$	$0.207^{+0.566}_{-0.088}$
	+3%/-3%	+9%/-4%	+417%/-500%	+27%/-41%	+13%/-24%	+273%/-42%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 006188207-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-115 \pm 16$	$3.46^{+2.89}_{-2.08}$	$648^{+54}_{-70}$	$5262^{+3251}_{-1088}$	$3062^{+15441}_{-2176}$
Alt.	$-65 \pm 14$	$3.41^{+3.01}_{-2.11}$	$651^{+52}_{-65}$	$4726^{+2839}_{-896}$	$1840^{+10309}_{-1332}$

$T_{max}$  = 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

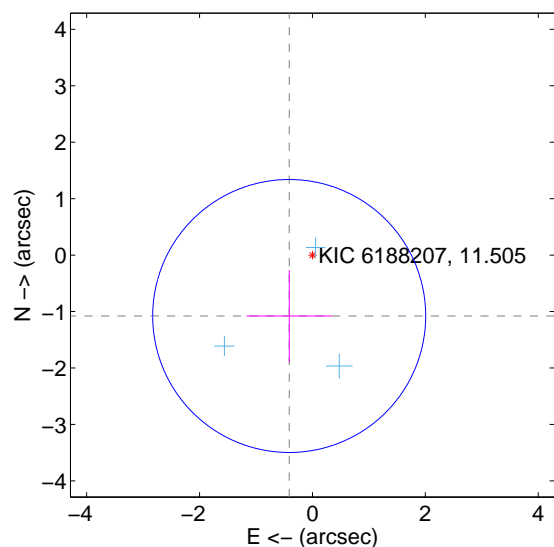
Supplemental centroid analysis for 006188207-02. **Kepler magnitude: 11.51.** Transit SNR 6.71

**There are 3 quarters with good PRF difference image offsets**

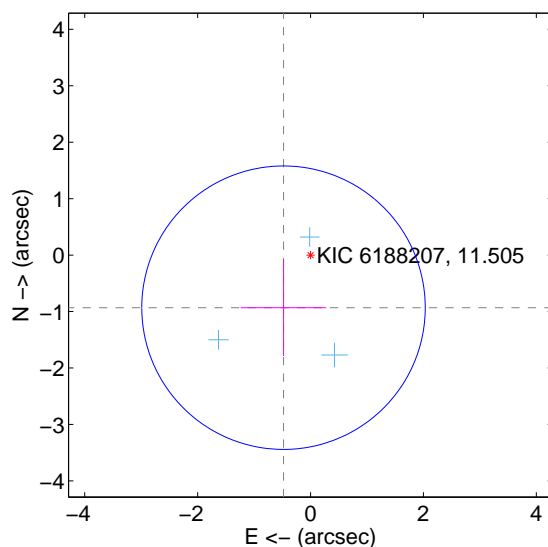
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.155 \pm 0.806$	1.43	$0.412 \pm 0.758$	$-1.079 \pm 0.813$
PRF-fit source offset from KIC position	$1.048 \pm 0.837$	1.25	$0.479 \pm 0.758$	$-0.932 \pm 0.857$
photometric centroid source offset	$0.78 \pm 0.85$	0.91	$-0.32 \pm 1.00$	$0.71 \pm 0.82$

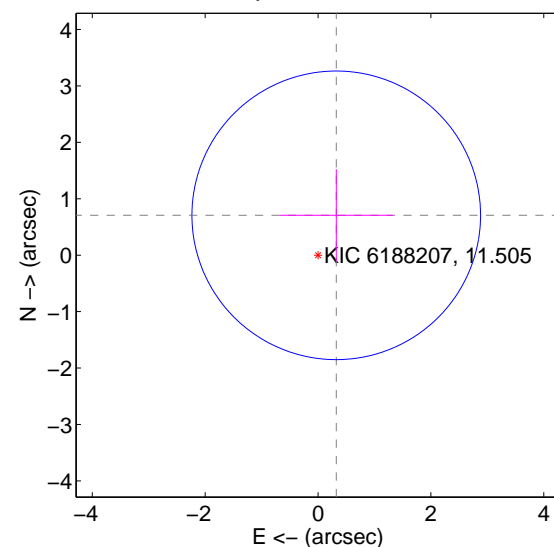
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

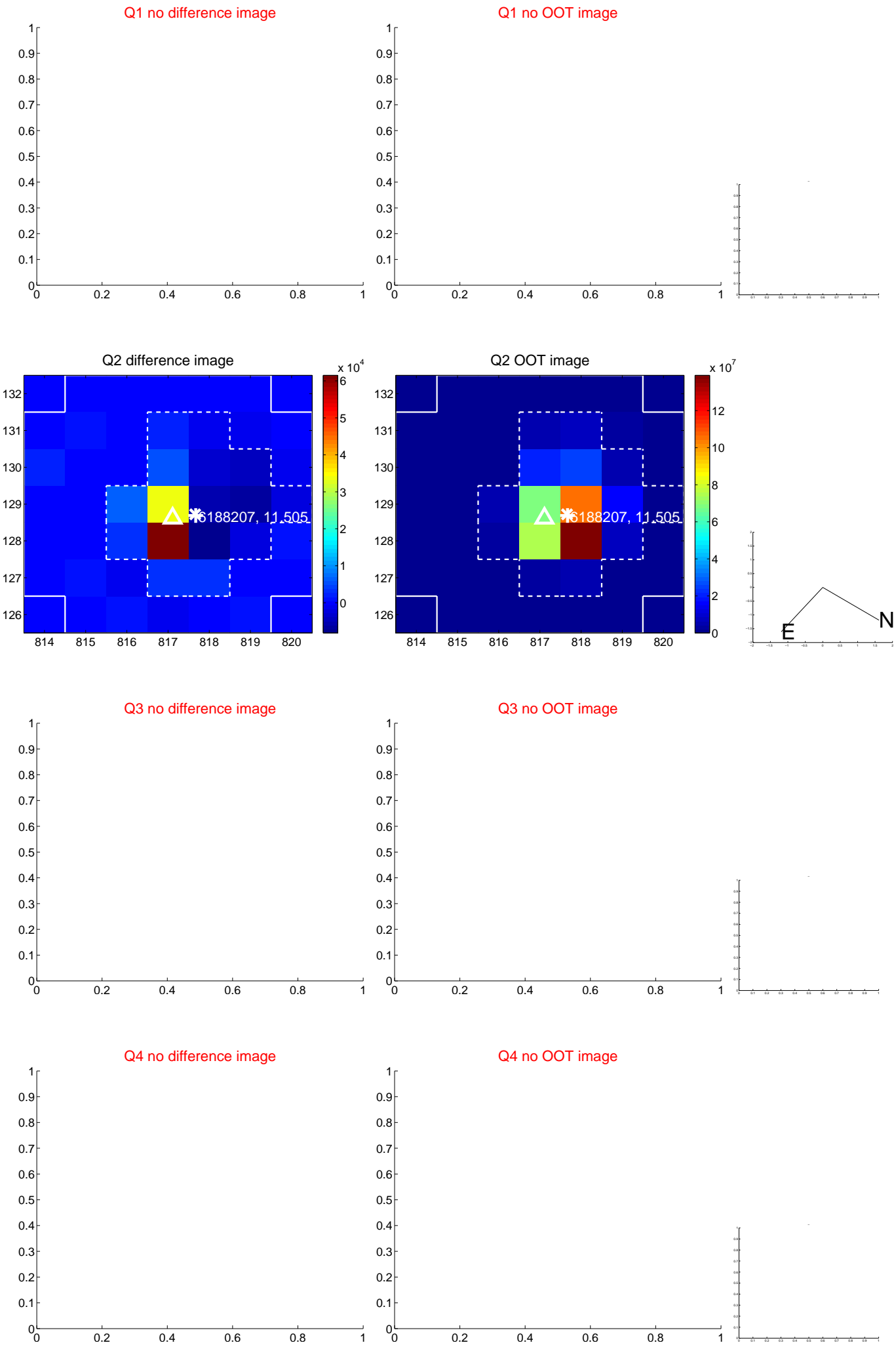


offset from photometric centroids

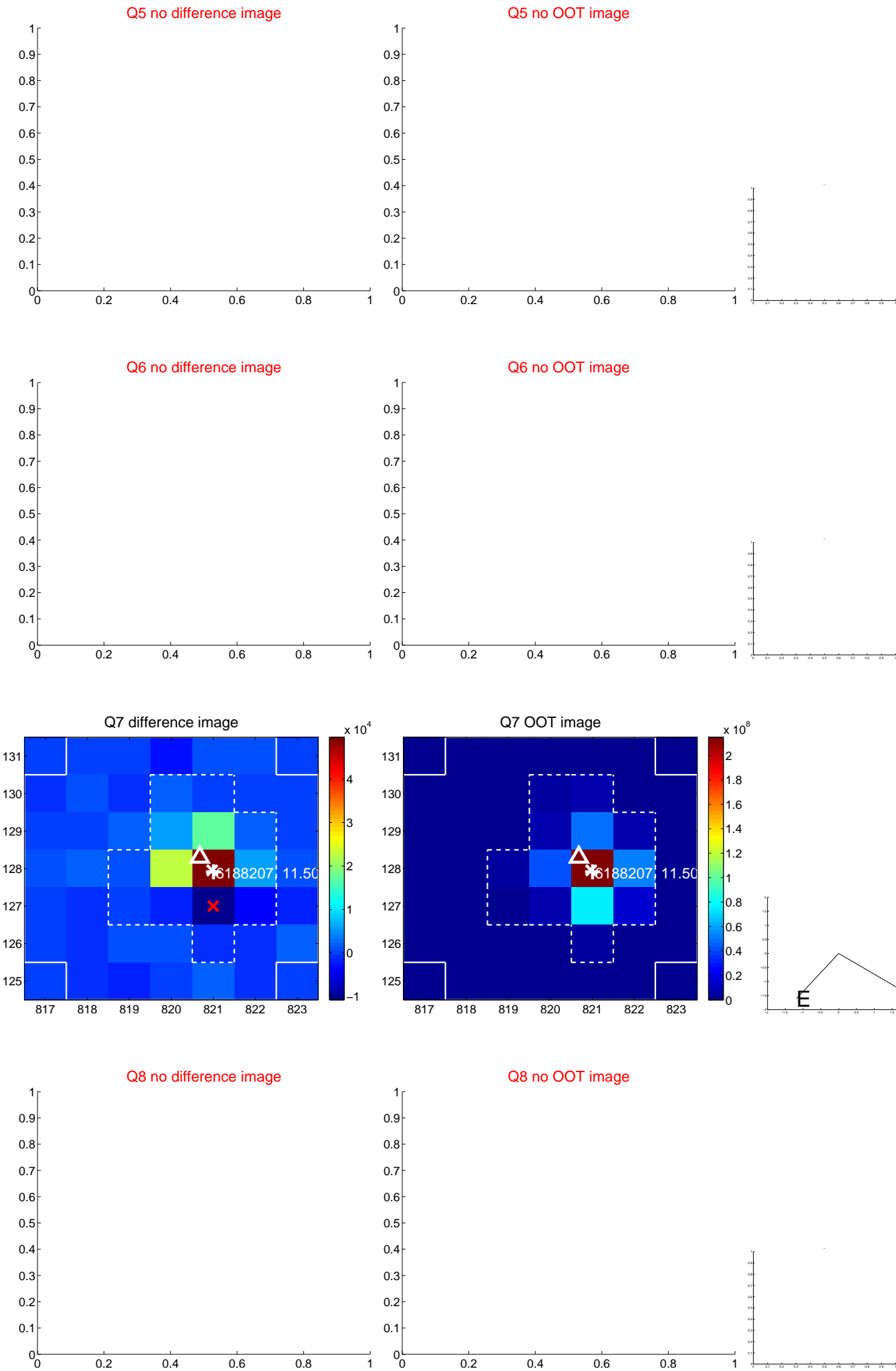


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

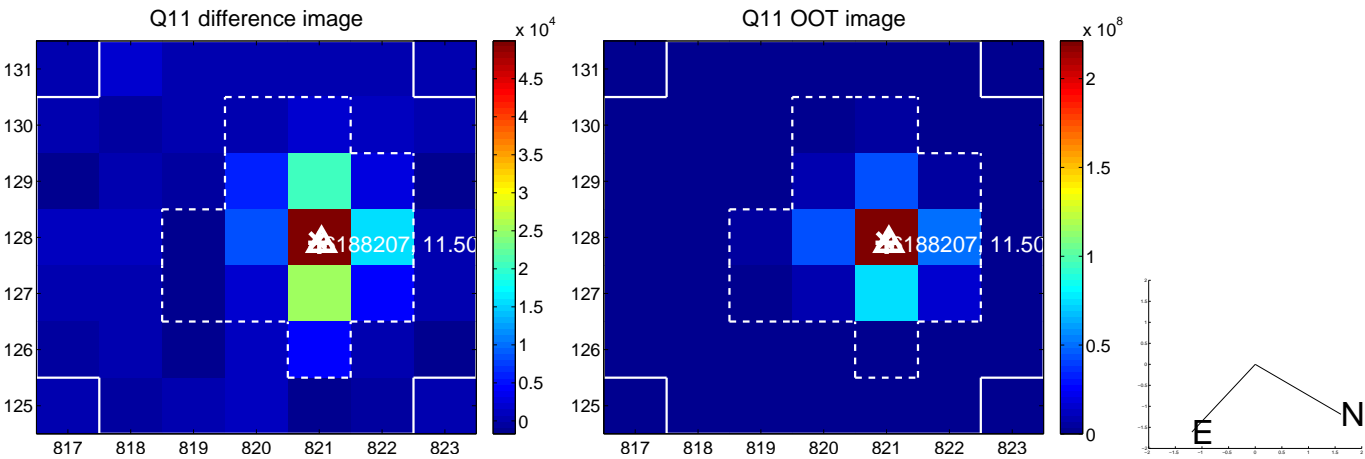
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



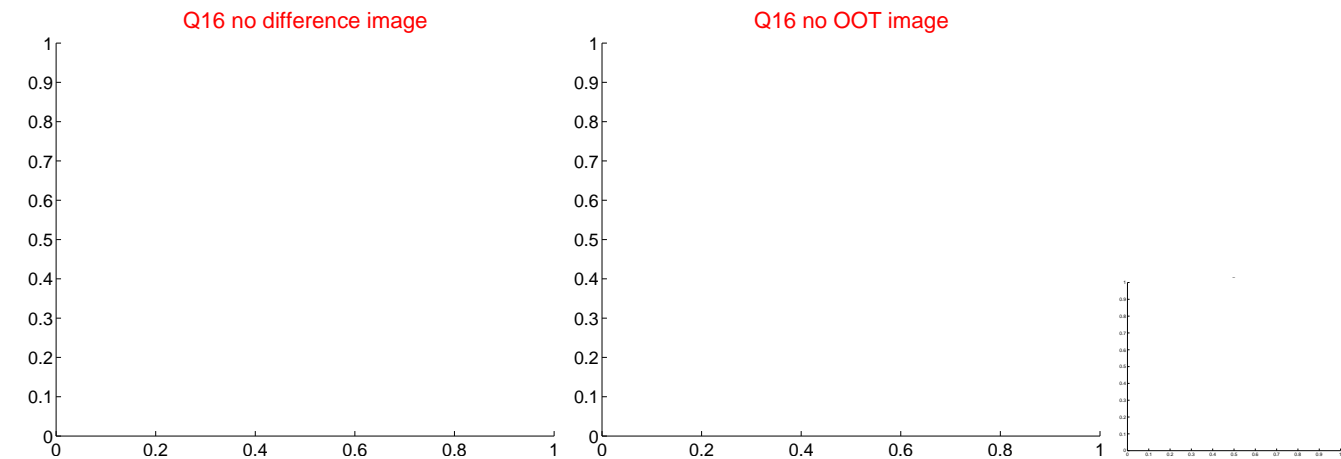
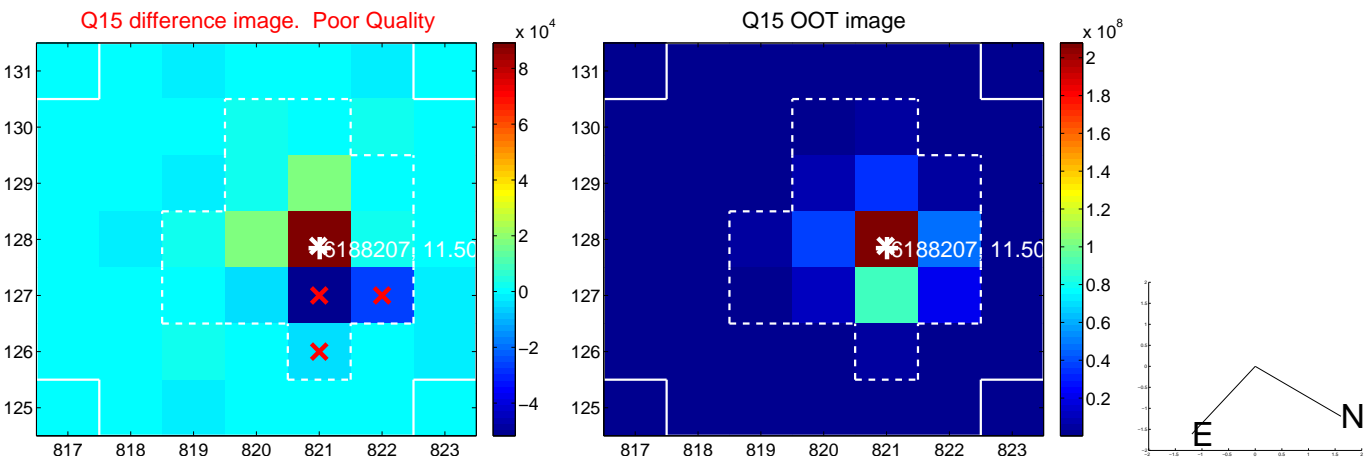
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



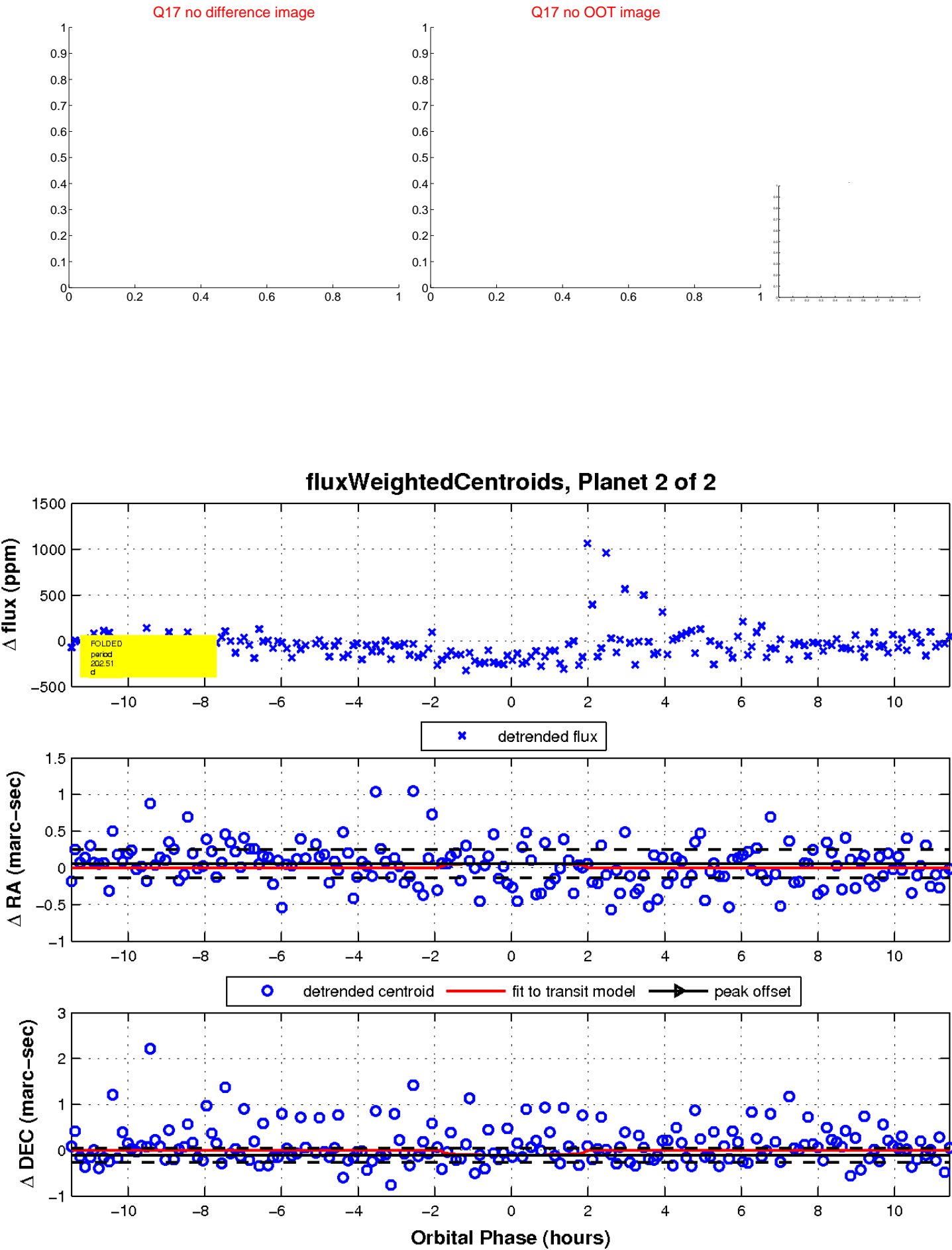
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image

Declination

