

# KIC 008458207

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008458207-01	OBS	6057.01	3.530162	134.776035	69805.2	4.107	5444.7	4243.5	1.34	6208	35.61	1089.54
008458207-02	OBS	No	3.530143	133.014514	1547.4	3.981	114.7	119.9	1.34	6208	6.11	1089.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008458207-01	OBS	FP	0.02	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
008458207-02	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.

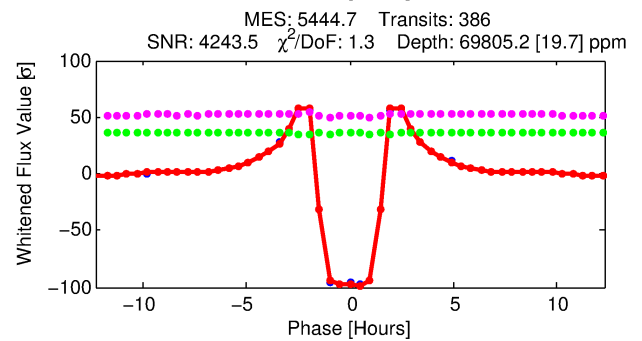
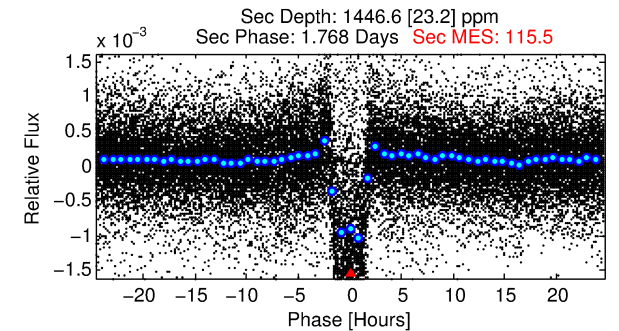
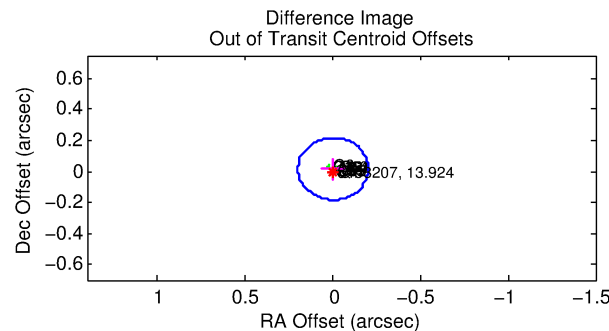
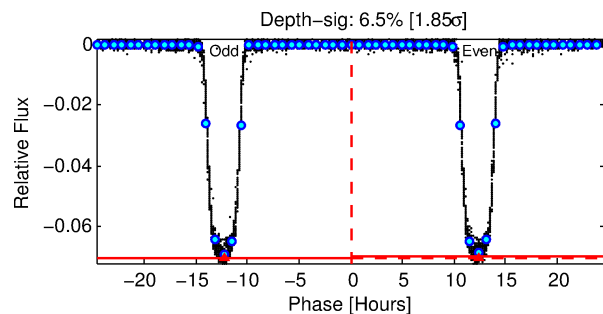
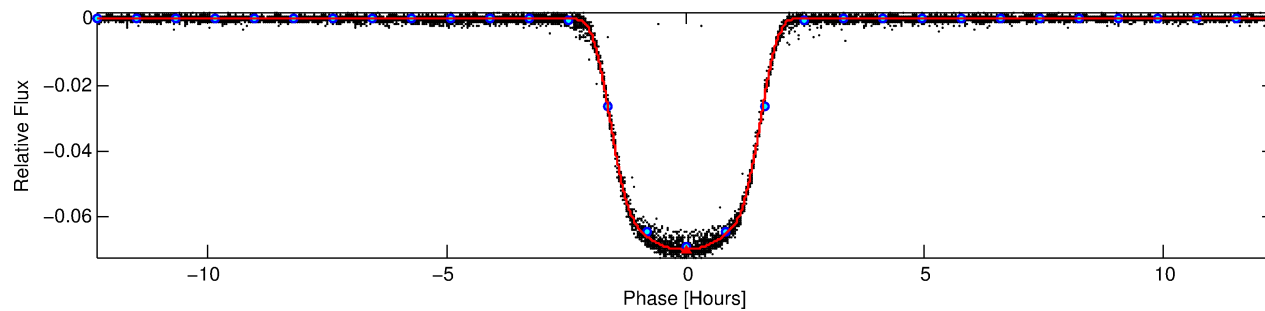
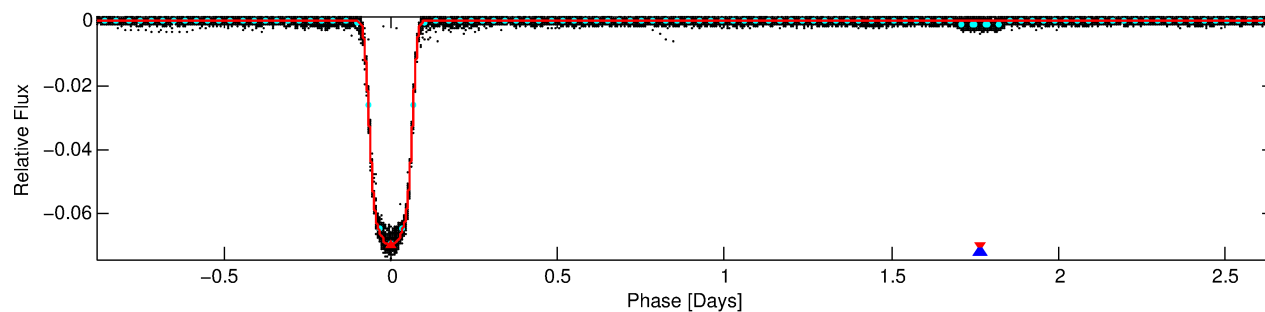
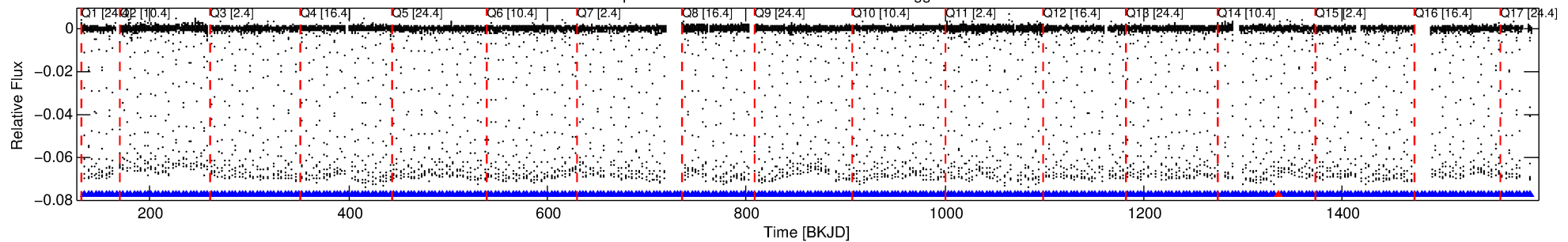
## Ephemeris Match Information For 008458207-01

No Significant Match Found

# DV One-Page Summary

KIC: 8458207 Candidate: 1 of 2 Period: 3.530 d  
KOI: K06057.01 Corr: 0.995

Kp: 13.92 R\*: 1.34 Rs Teff: 6208.0 K Logg: 4.23 Fe/H: -0.040



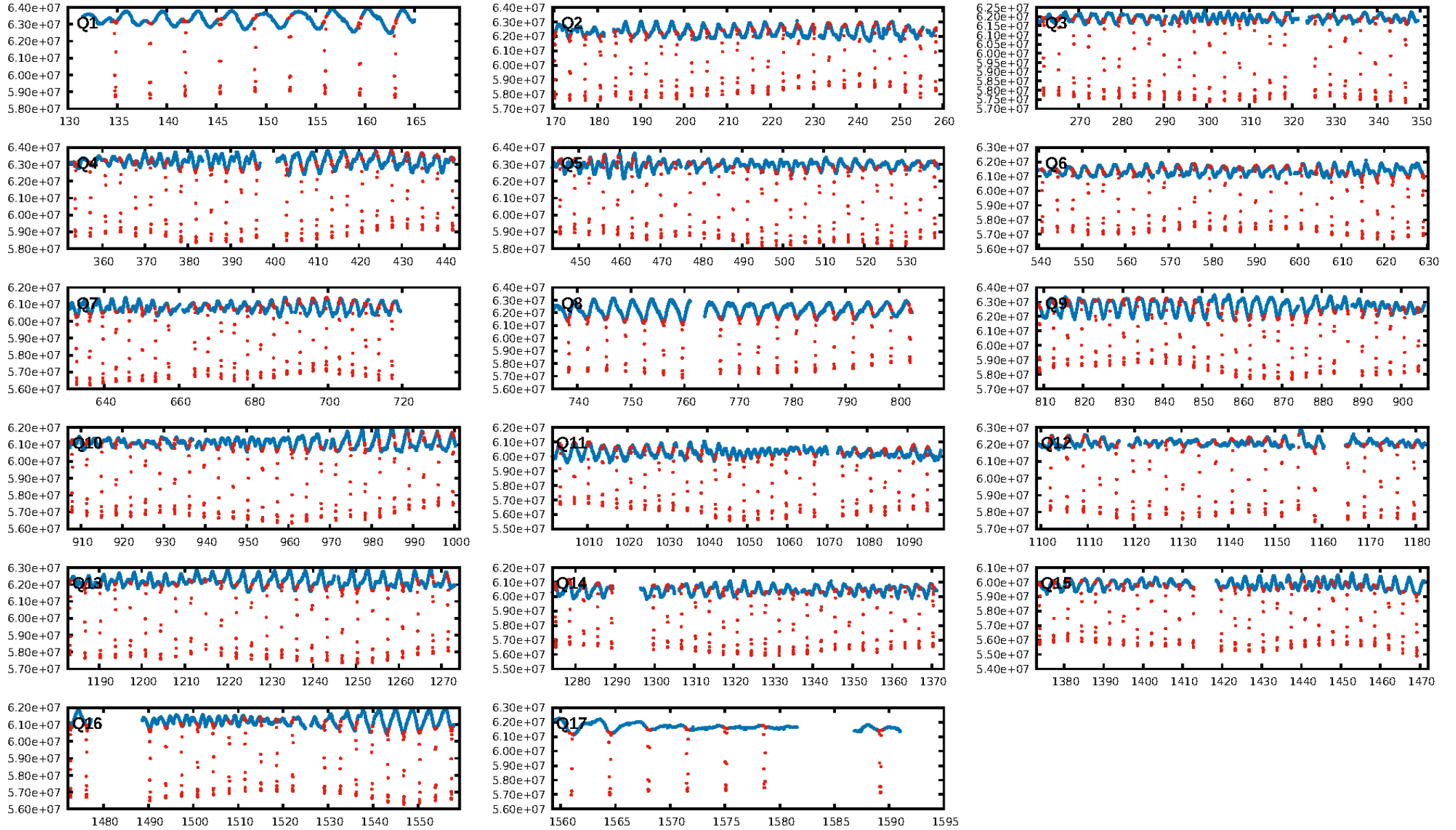
## DV Fit Results:

Period = 3.53016 [0.00000] d  
Epoch = 134.7760 [0.0000] BKJD  
Rp/R\* = 0.2428 [0.0001]  
a/R\* = 8.19 [0.01]  
b = 0.00 [1.39]  
Seff = 1089.54 [415.64]  
Teff = 1465 [140] K  
Rp = 35.61 [11.23] Re  
a = 0.0470 [0.0119] AU  
Ag = 1.38 [0.49] [0.79σ]  
Teffp = 2457 [89] K [5.99σ]

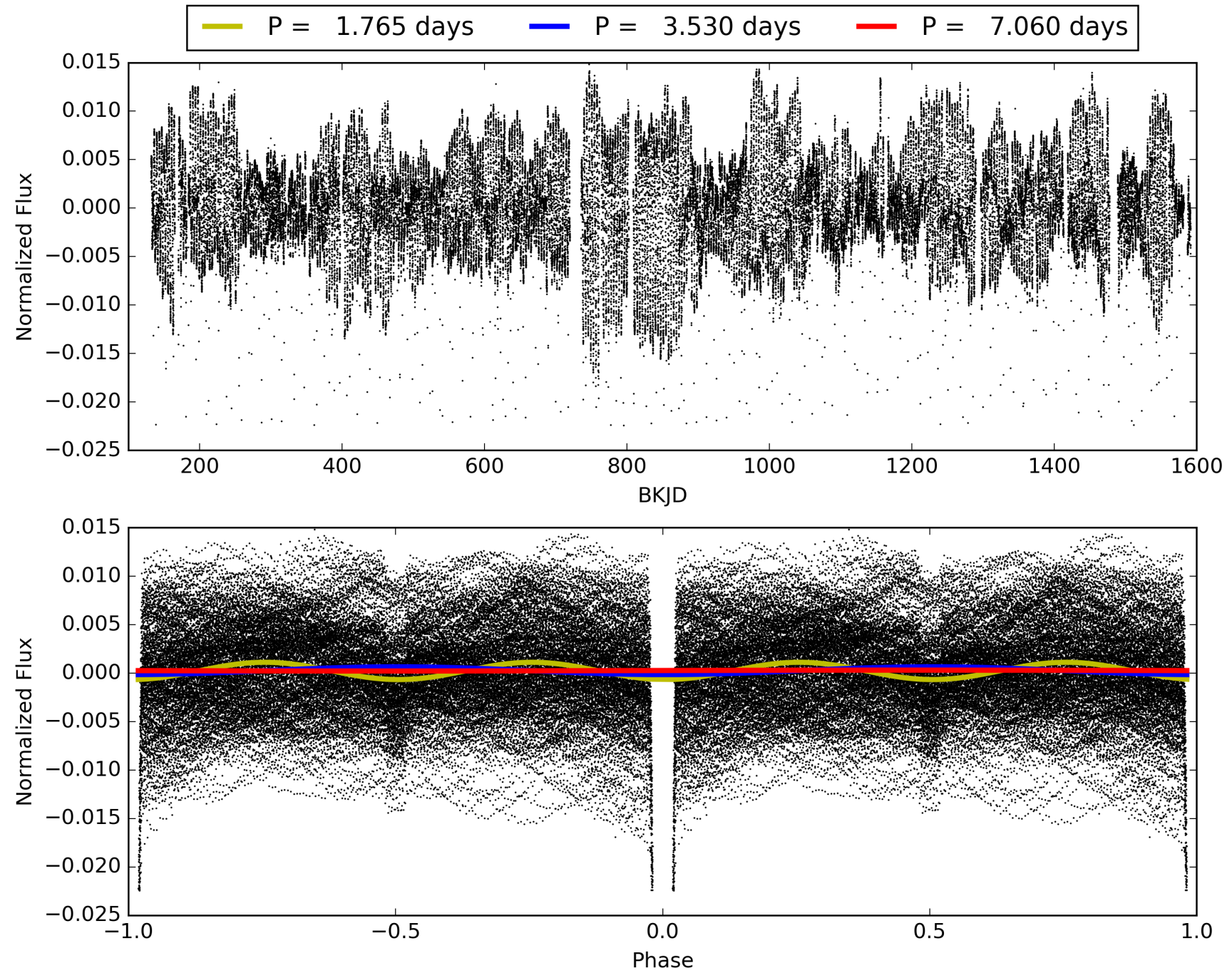
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [369/370]  
GhostDiagnostic-chr: 2.259  
Centroid-sig: N/A  
Centroid-so: 0.536 arcsec [412.90σ]  
OotOffset-rm: 0.018 arcsec [0.27σ]  
KicOffset-rm: 0.154 arcsec [2.17σ]  
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 008458207-01, PDC Light Curves

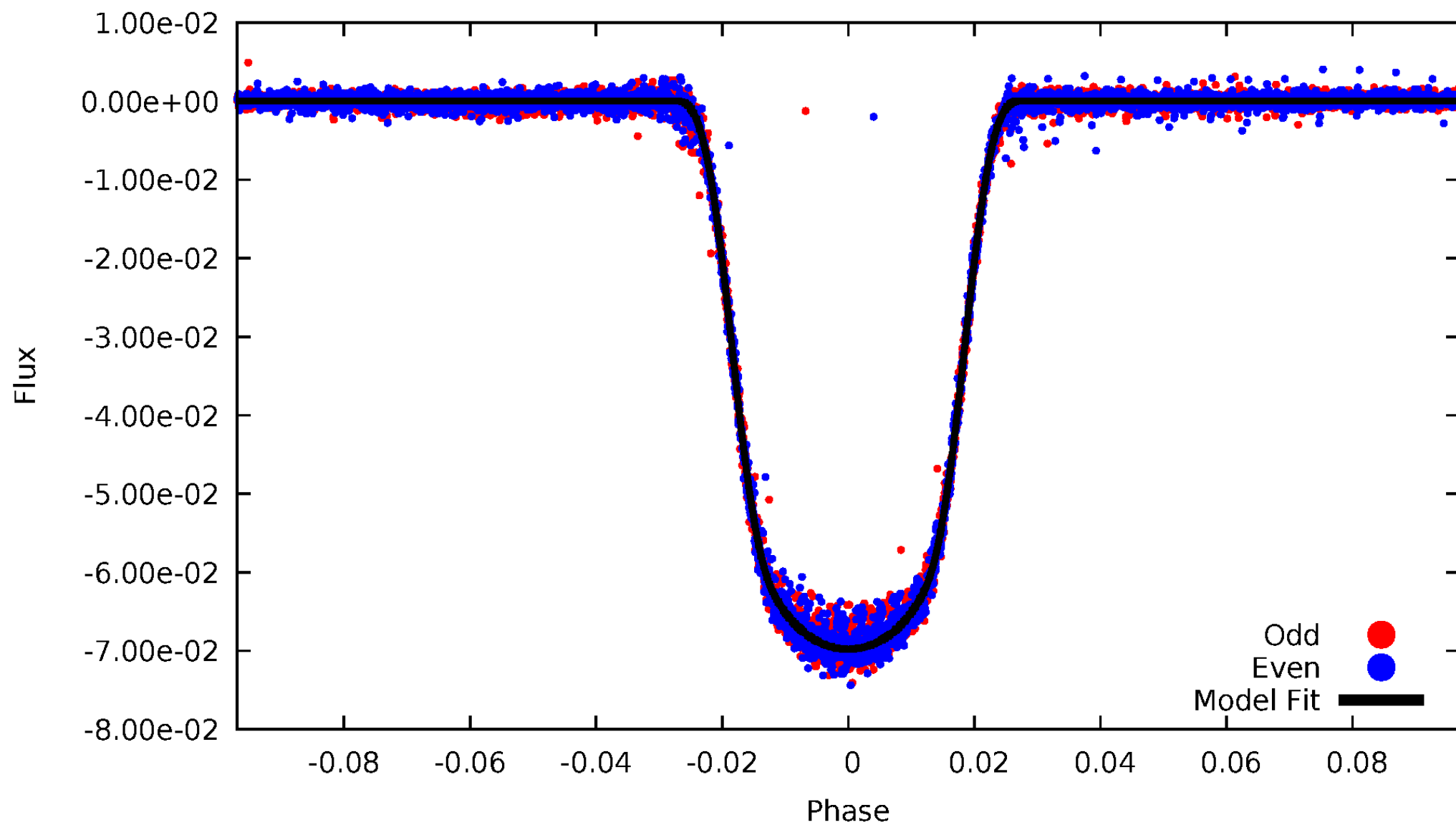


TCE 008458207-01



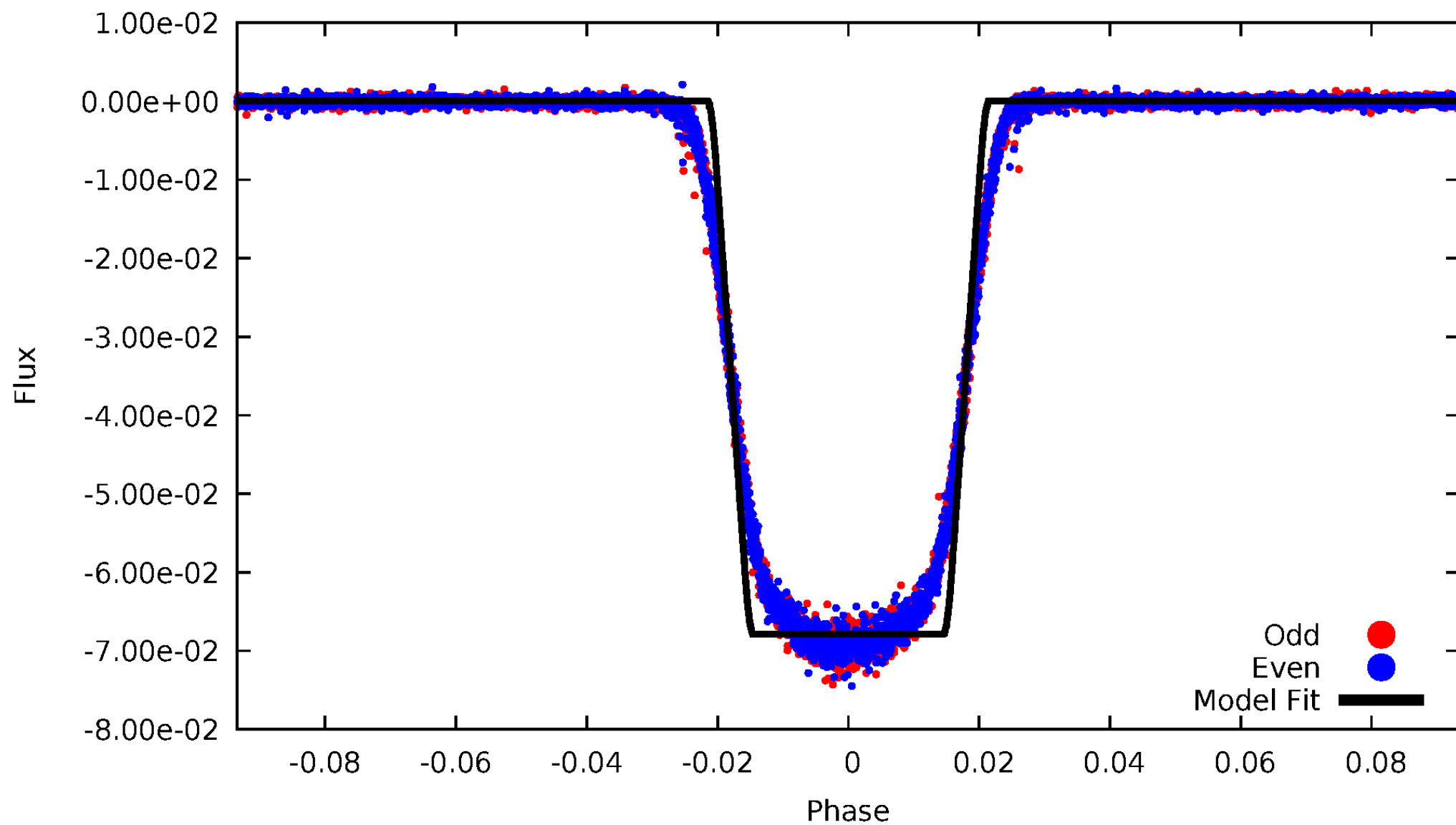
# DV Odd/Even

TCE 008458207-01



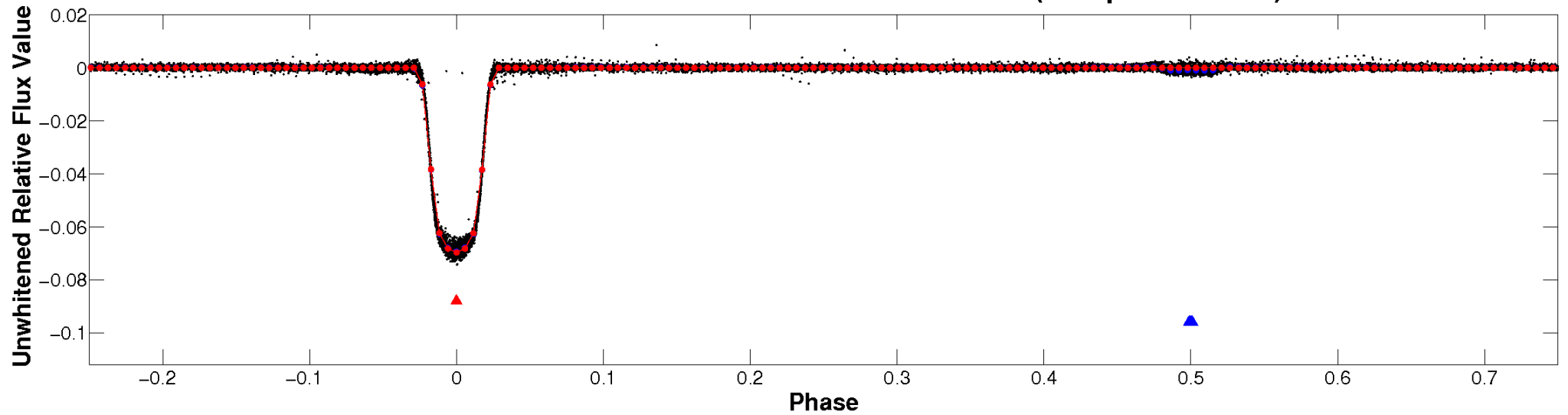
# ALT Odd/Even

TCE 008458207-01

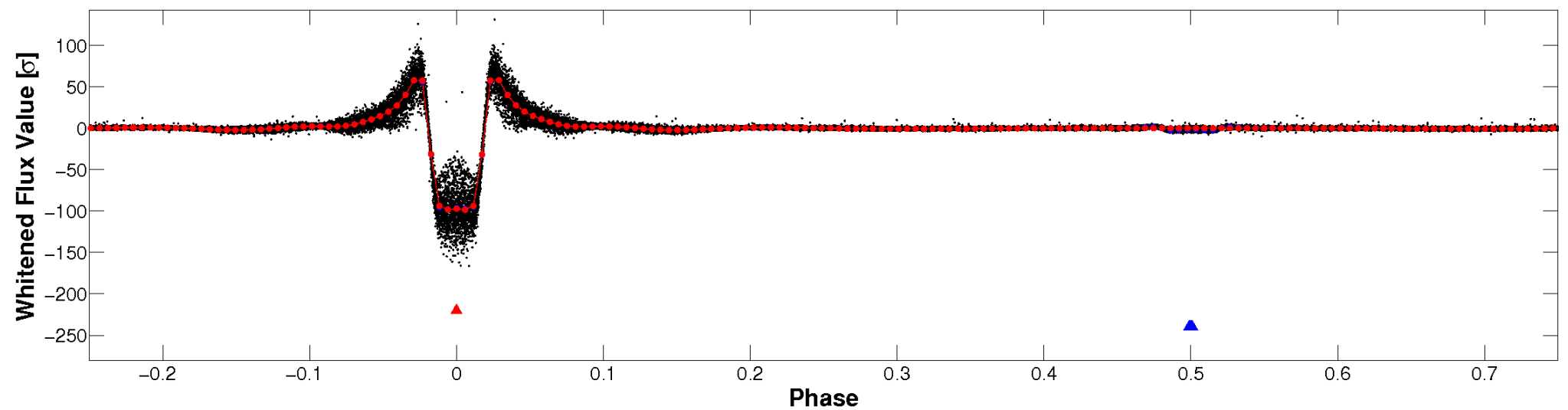


# Non-Whitened Vs. Whitened Light Curve

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



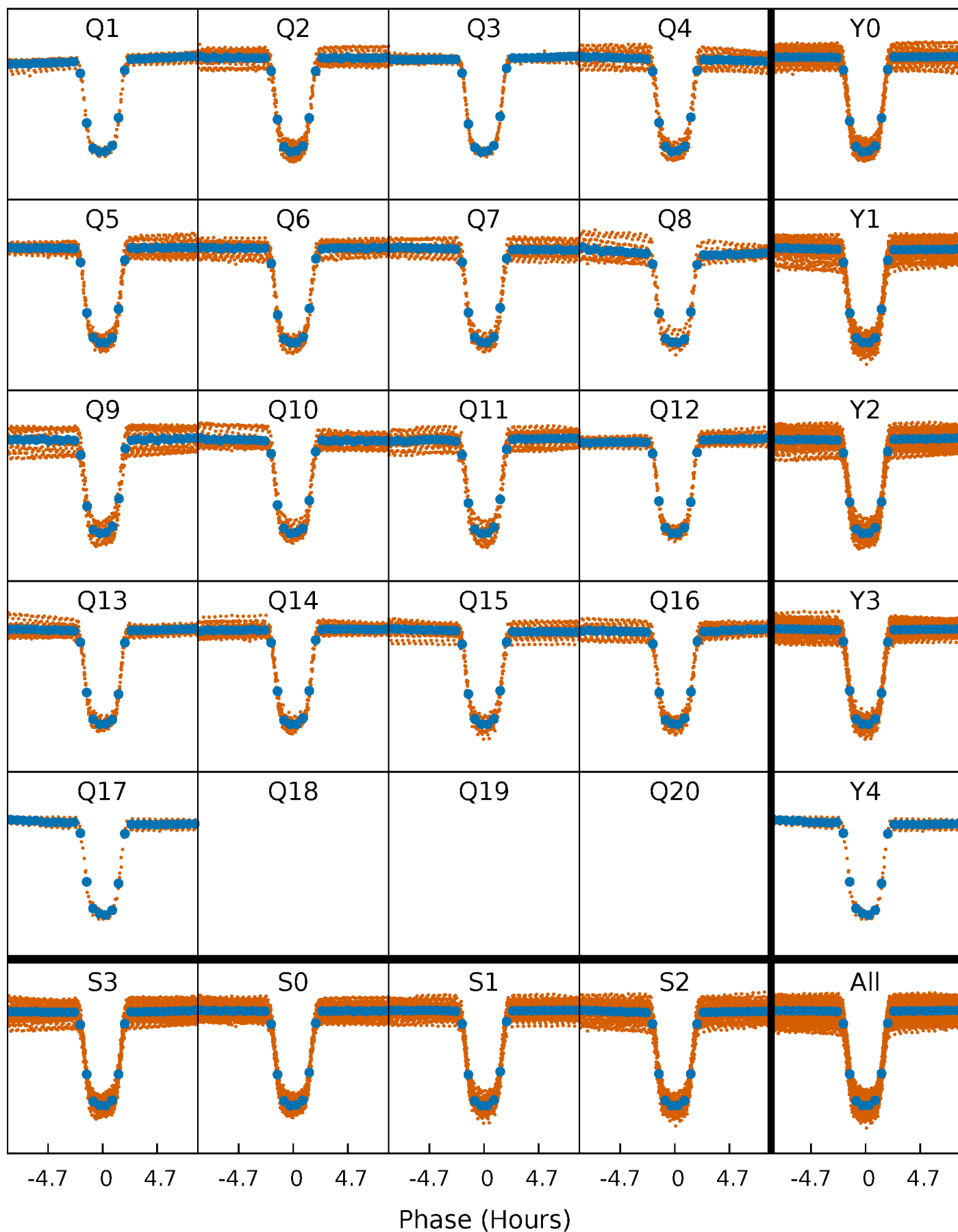
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

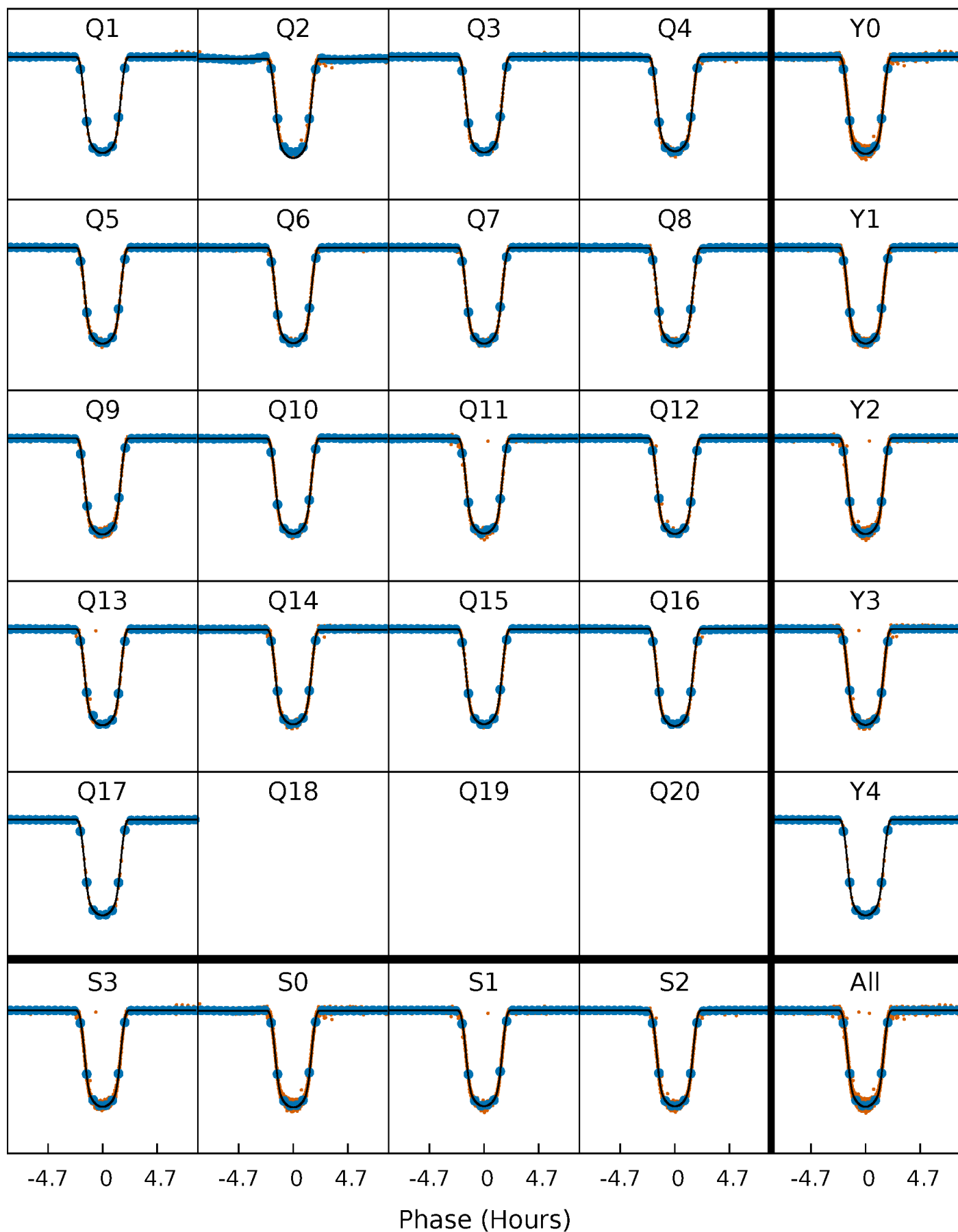
TCE 008458207-01 P= 3.530162 Days  $T_0=134.776035$  (BKJD)





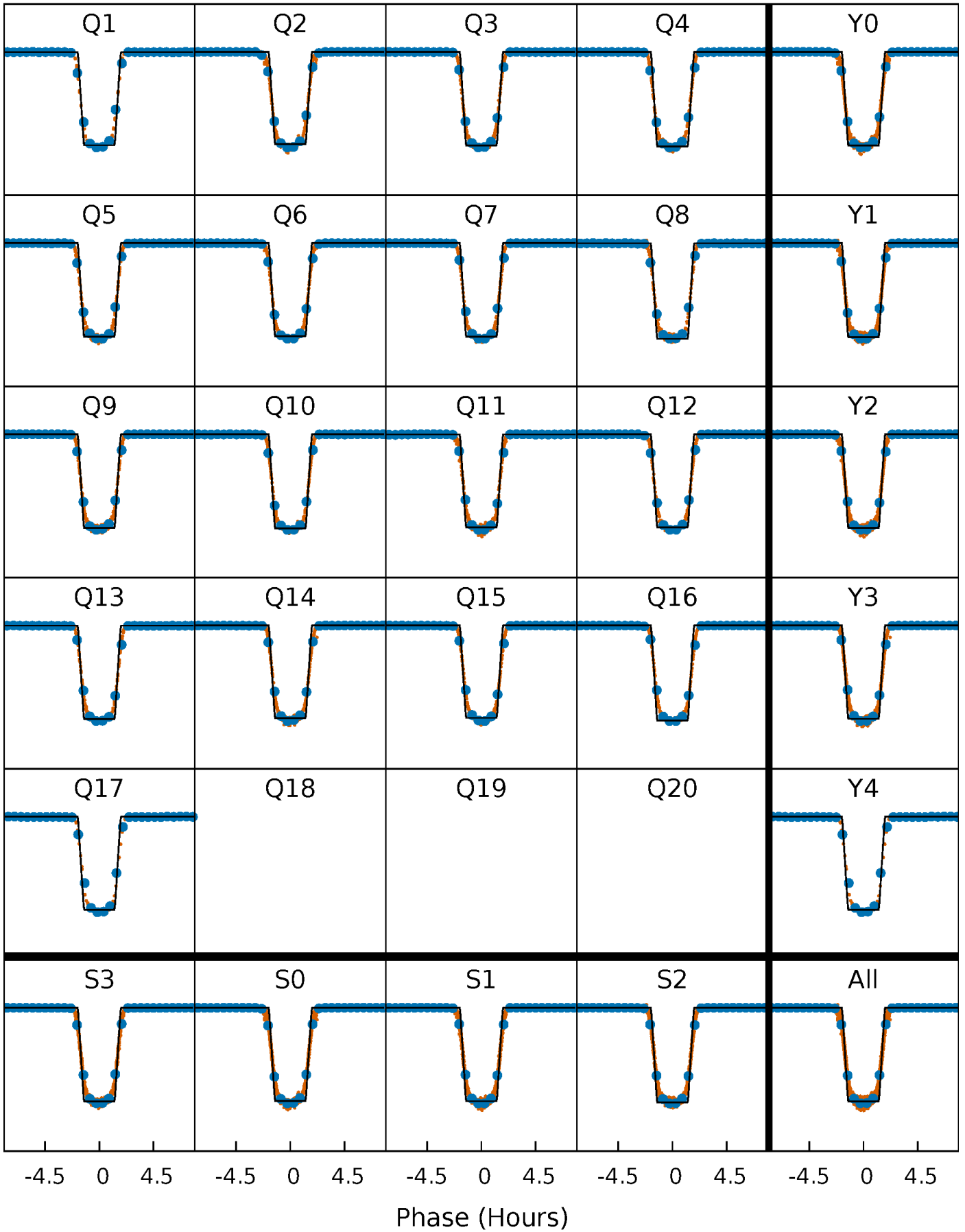
# DV Quarter-Phased Transit Curves

TCE 008458207-01 P= 3.530162 Days  $T_0=134.776035$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

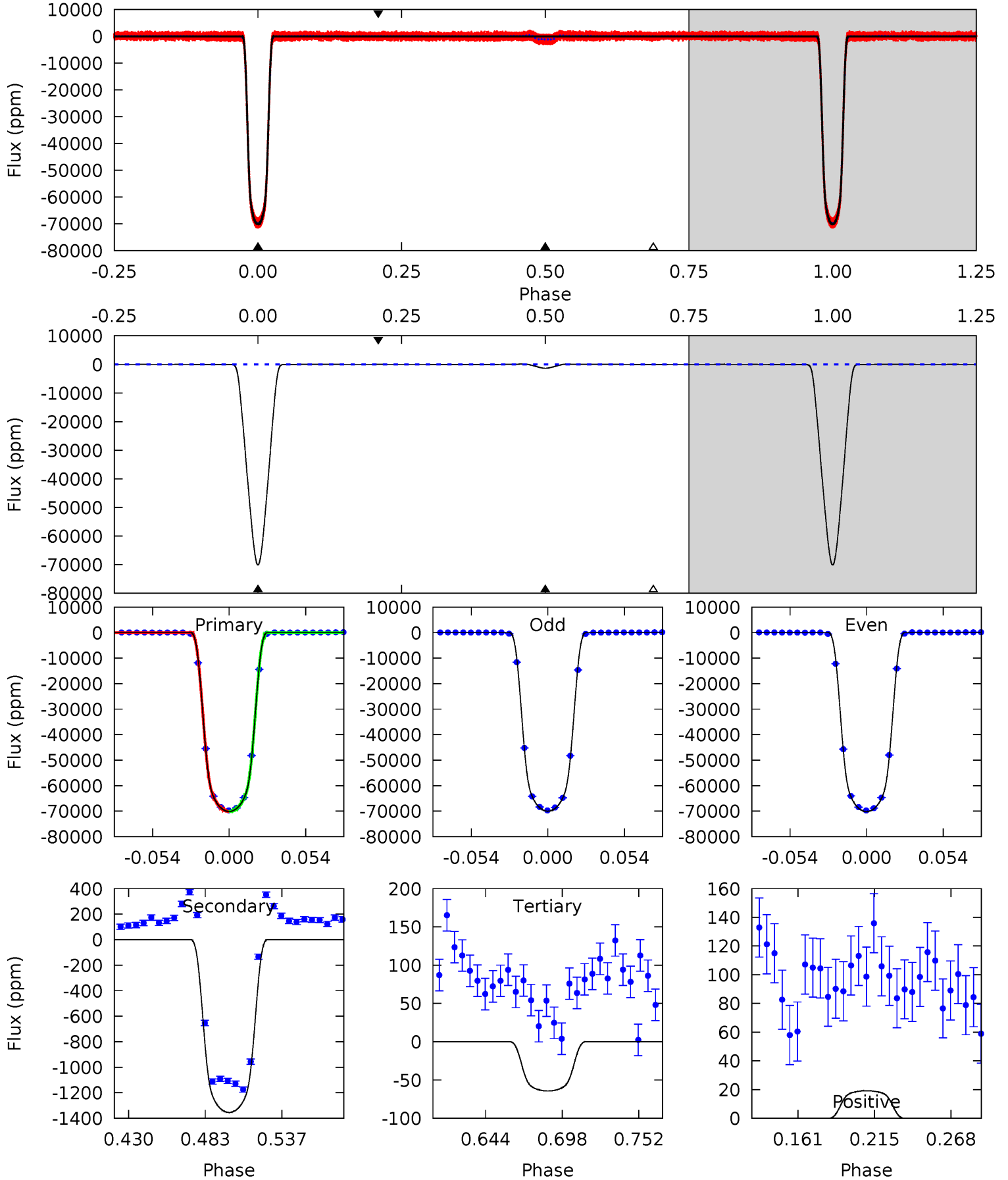
TCE 008458207-01   P= 3.530156 Days    $T_0=134.777209$  (BKJD)



# DV Model-Shift Uniqueness Test

008458207-01, P = 3.530162 Days, E = 131.245873 Days

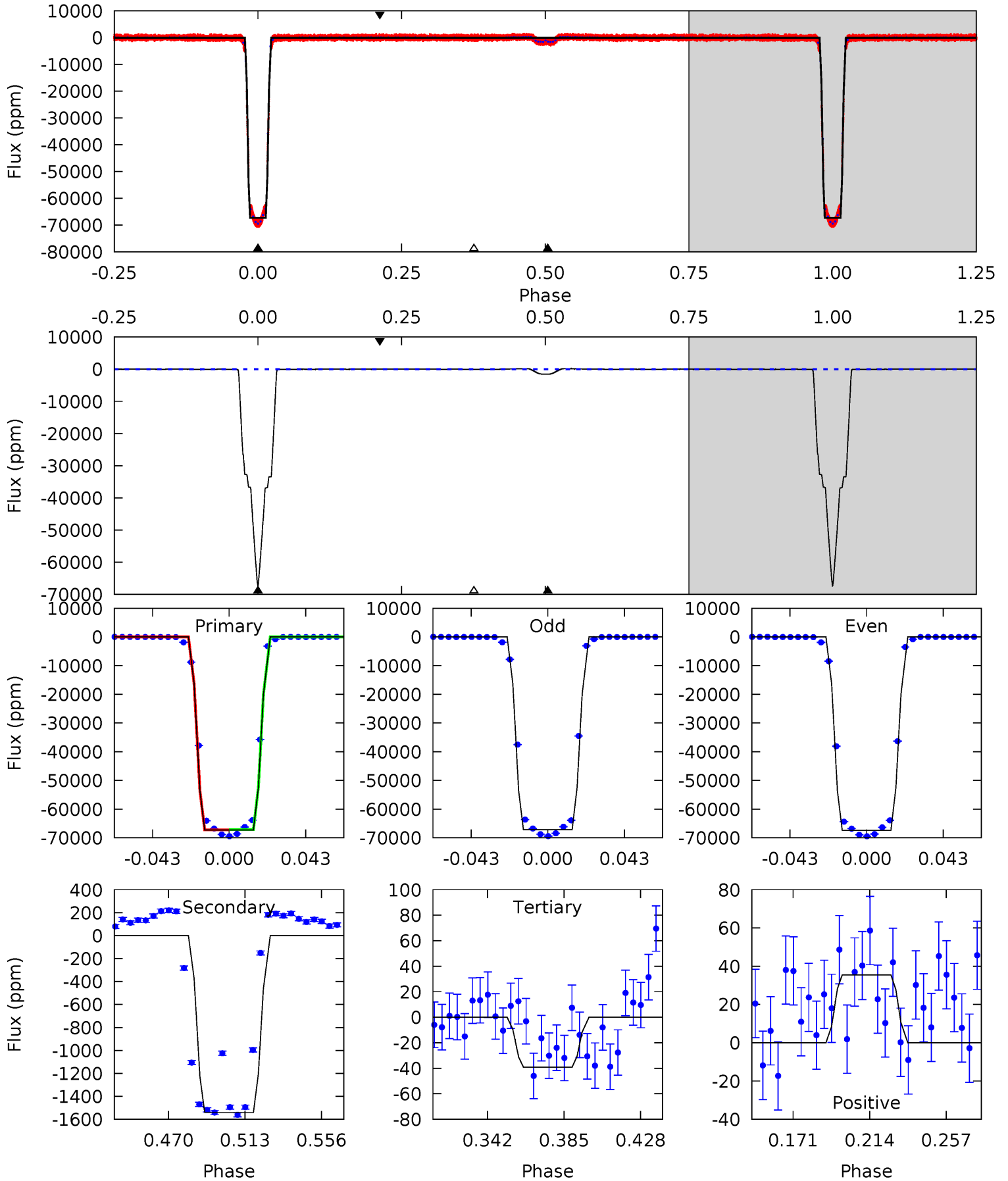
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8426	162.8	7.73	2.30	4.69	1.93	3.60	8418	8424	155.1	160.5	9.17	1.00	0.00	2.51



# Alt Model-Shift Uniqueness Test

008458207-01, P = 3.530156 Days, E = 131.247053 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
7644	175.1	4.44	4.03	4.74	2.03	3.53	7640	7640	170.7	171.1	10.5	1.00	0.00	5.14



### Stellar Parameters For KIC 008458207

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6208^{+167}_{-223}$	$4.226^{+0.185}_{-0.185}$	$-0.040^{+0.250}_{-0.300}$	$1.344^{+0.424}_{-0.283}$	$1.107^{+0.189}_{-0.142}$	$0.642^{+0.551}_{-0.323}$
	+3%/-4%	+4%/-4%	+625%/-750%	+32%/-21%	+17%/-13%	+86%/-50%
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 008458207-01 / KOI 6057.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1355 \pm 8$	$35.33^{+6.35}_{-4.10}$	$2036^{+159}_{-141}$	$2946^{+60}_{-69}$	$1.308^{+0.376}_{-0.323}$
Alt.	$-1541 \pm 9$	$38.20^{+6.21}_{-4.89}$	$2046^{+158}_{-143}$	$2942^{+55}_{-73}$	$1.281^{+0.364}_{-0.316}$

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

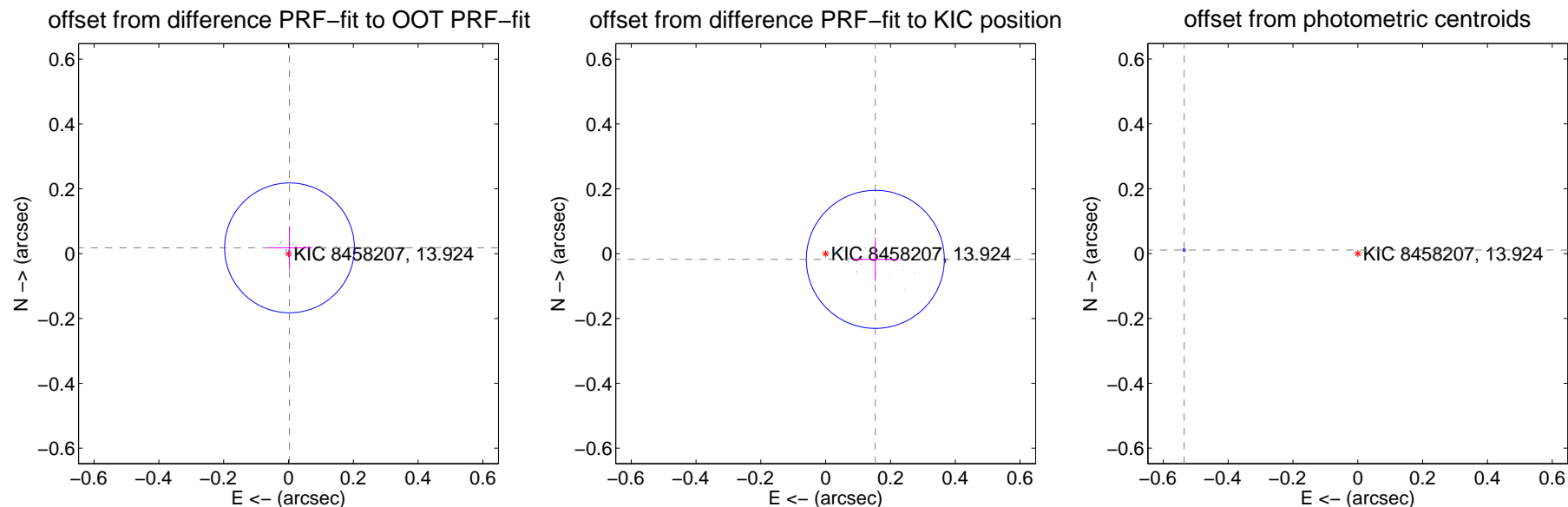
## DV Centroid Data

Supplemental centroid analysis for 008458207-01. Kepler magnitude: 13.92. Transit SNR 4243.49

There are 17 quarters with good PRF difference image offsets

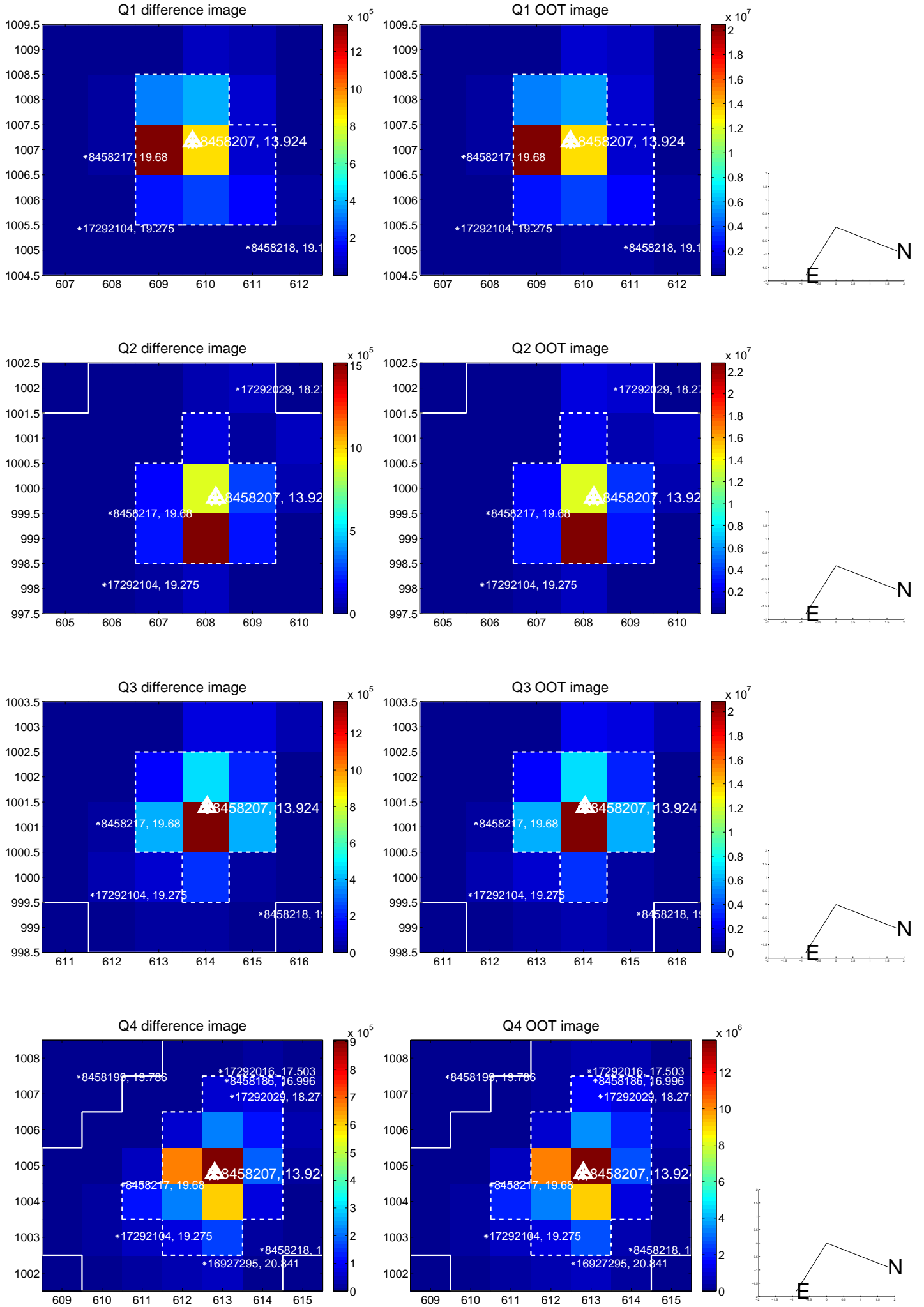
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.018 \pm 0.067$	0.27	$-0.003 \pm 0.067$	$0.018 \pm 0.067$
PRF-fit source offset from KIC position	$0.154 \pm 0.071$	2.17	$-0.153 \pm 0.071$	$-0.018 \pm 0.067$
photometric centroid source offset	$0.54 \pm 0.00$	412.90	$0.54 \pm 0.00$	$0.01 \pm 0.00$



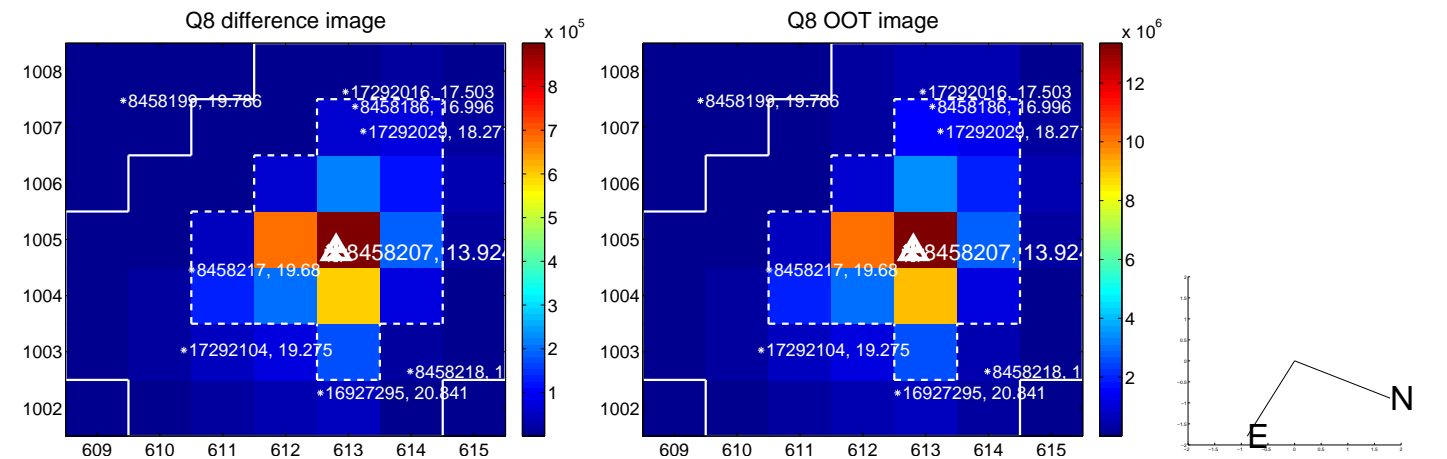
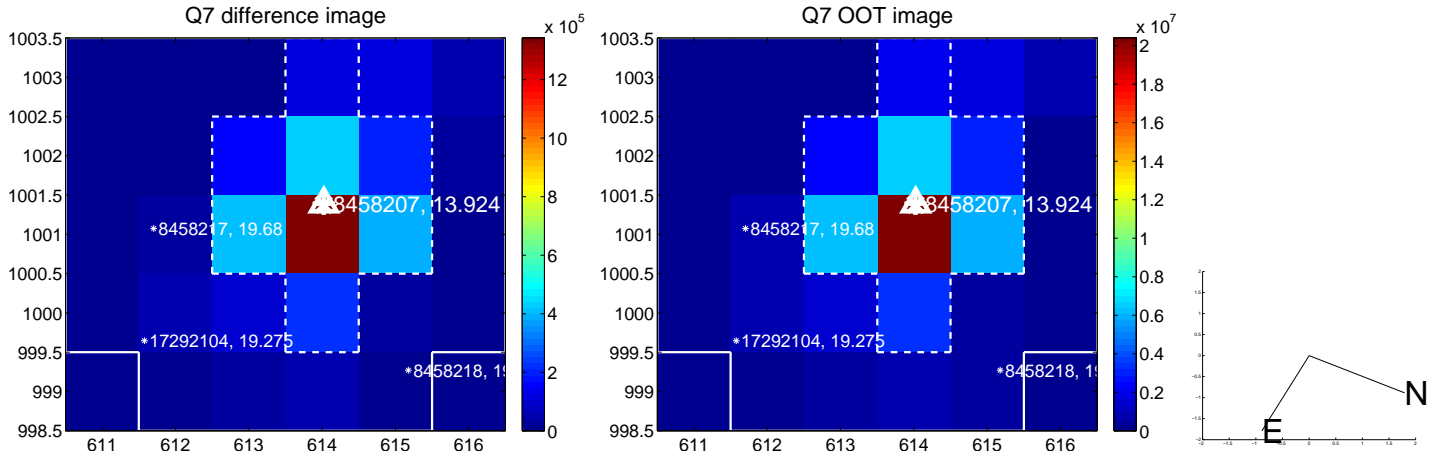
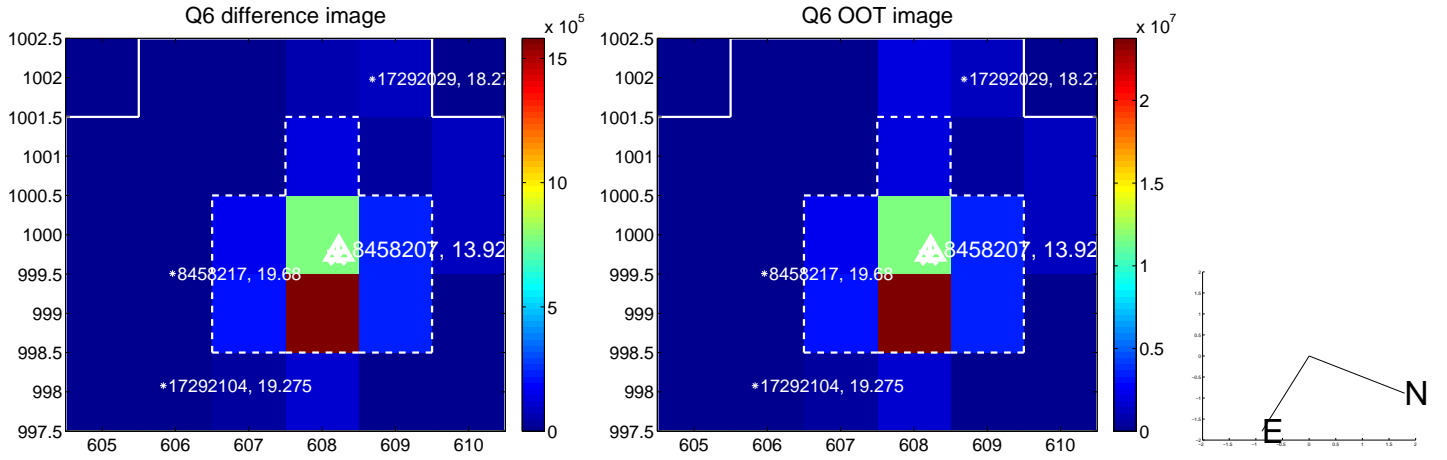
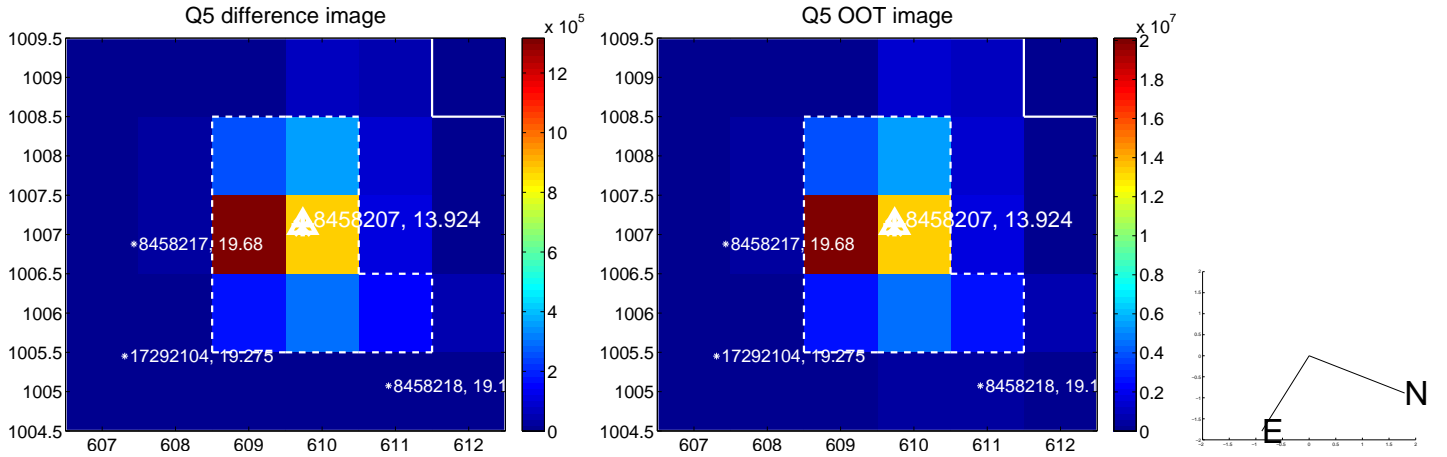
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

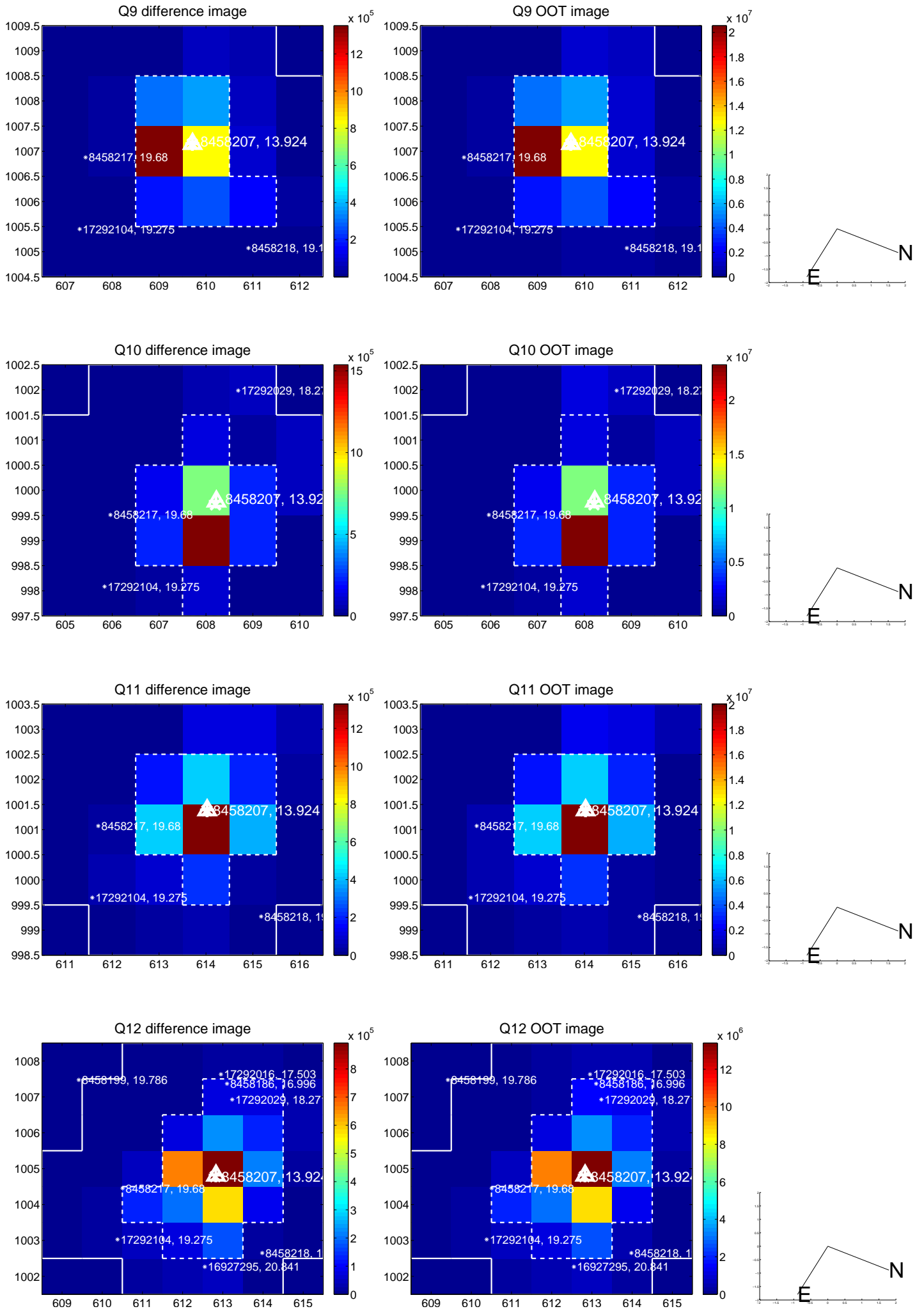




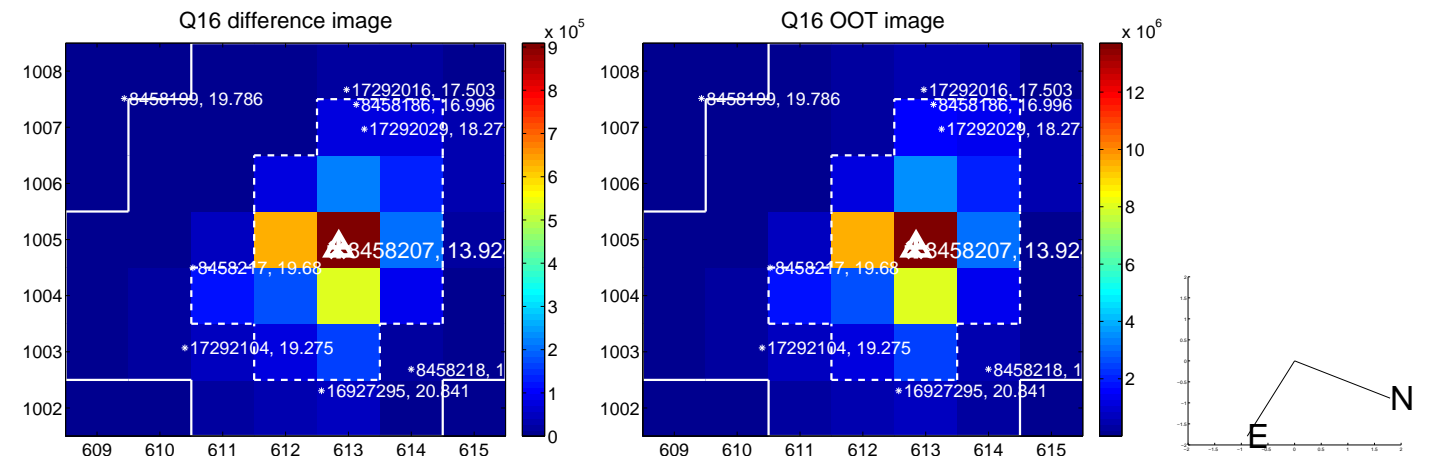
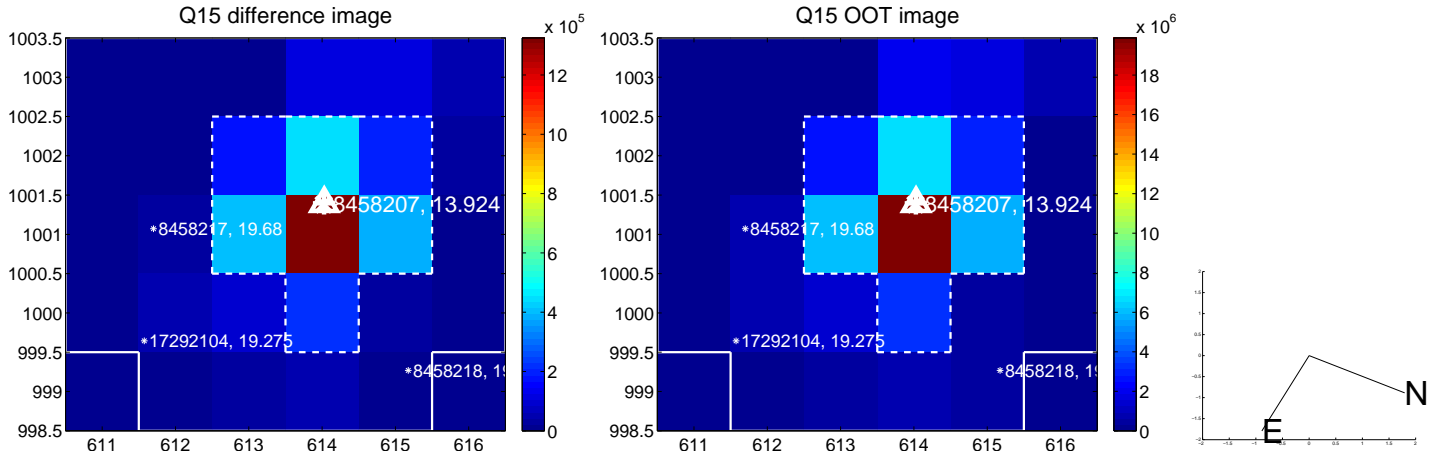
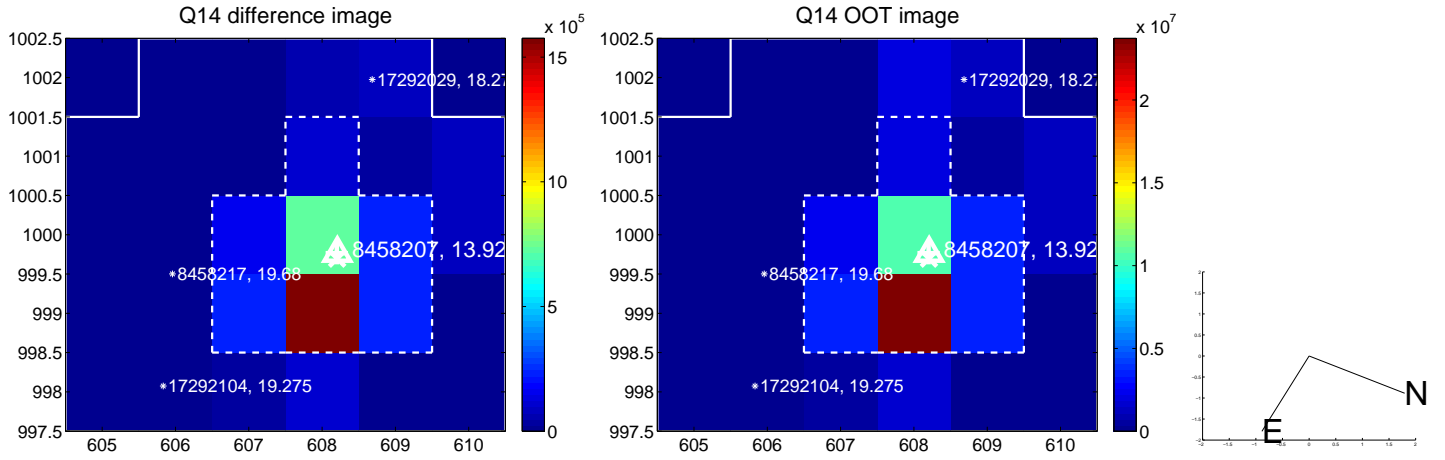
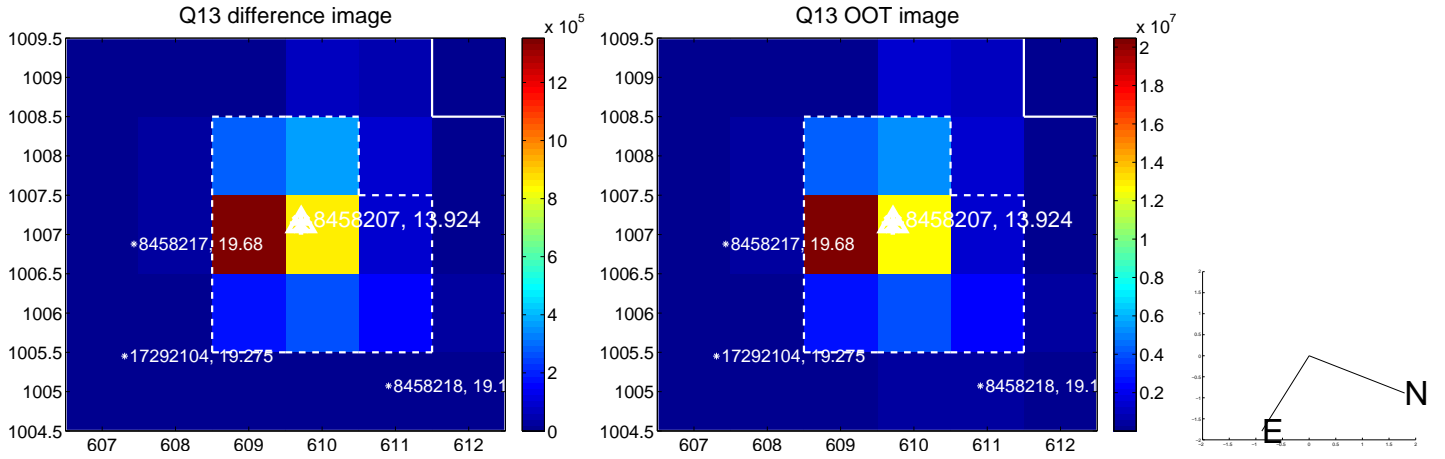
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



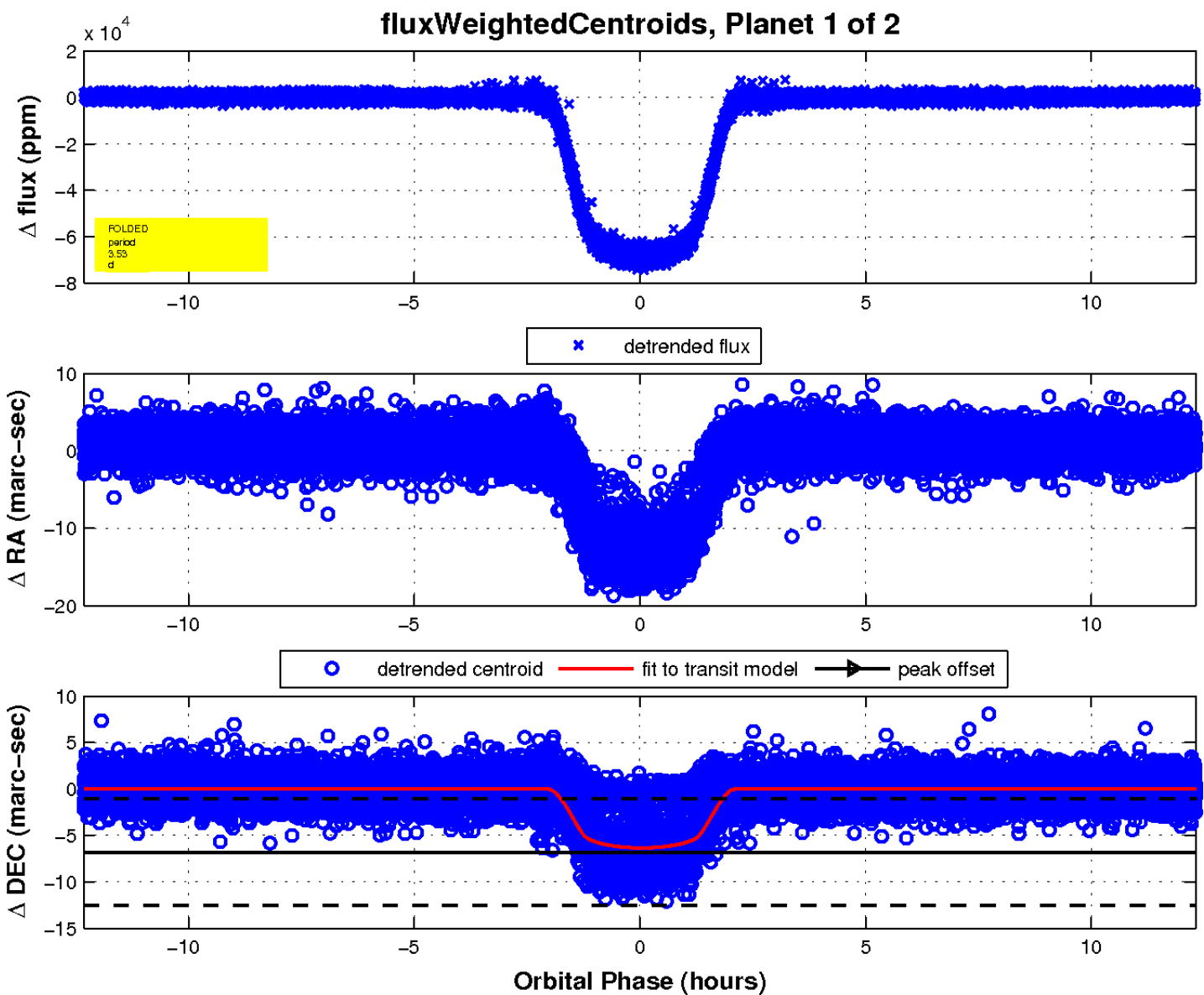
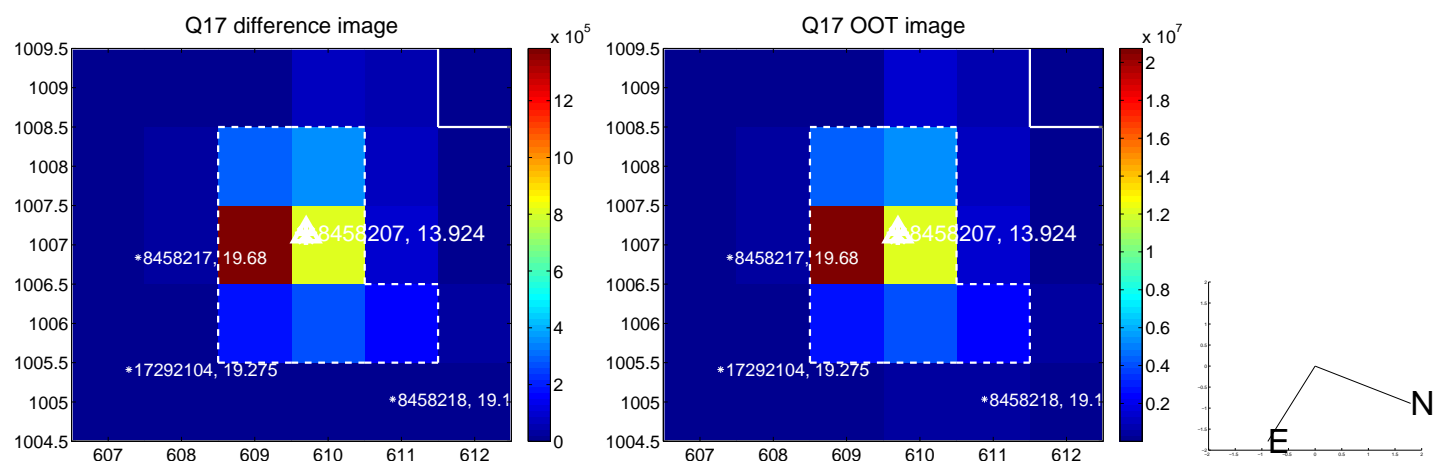
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



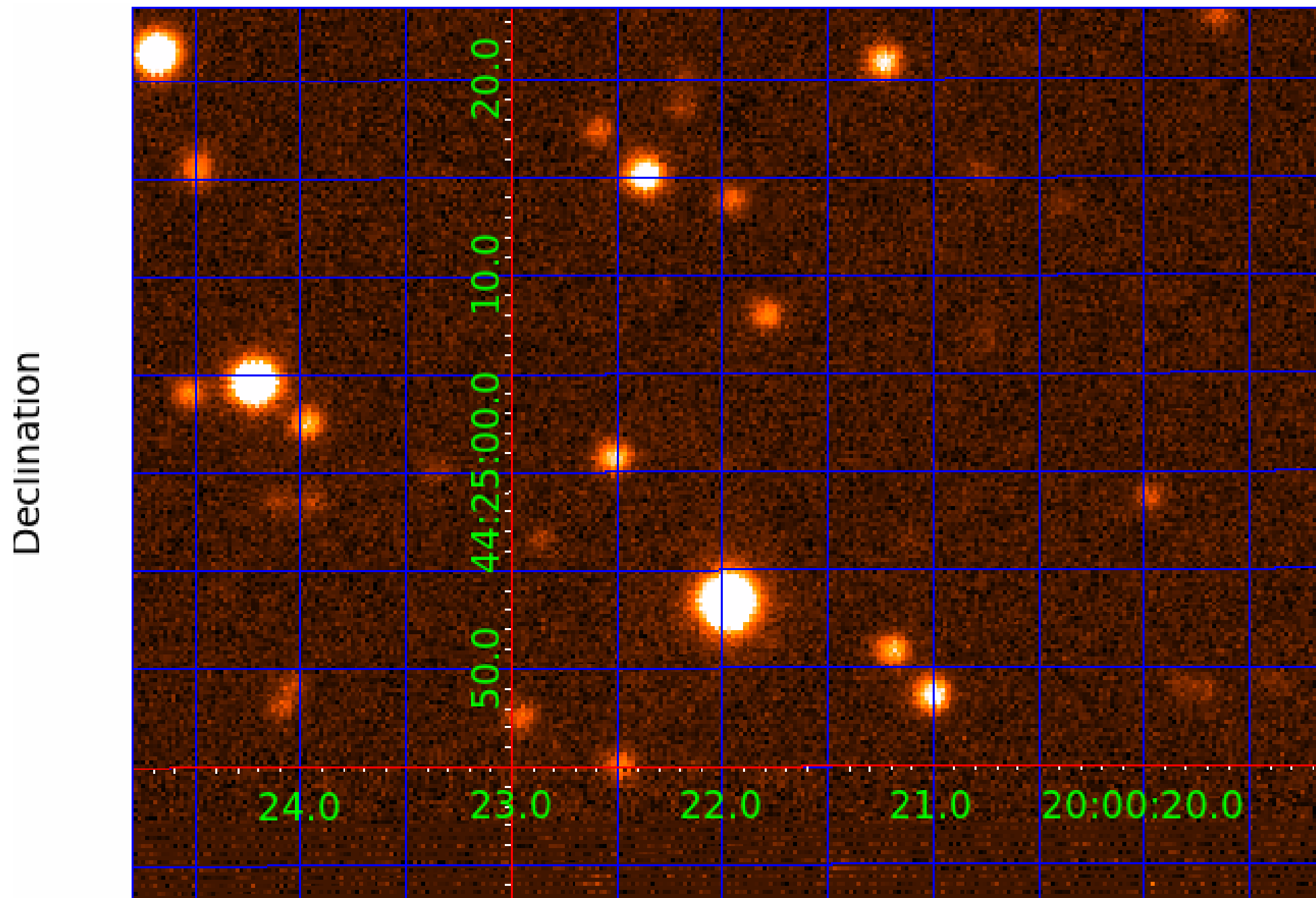
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 008458207

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008458207-01	OBS	6057.01	3.530162	134.776035	69805.2	4.107	5444.7	4243.5	1.34	6208	35.61	1089.54
008458207-02	OBS	No	3.530143	133.014514	1547.4	3.981	114.7	119.9	1.34	6208	6.11	1089.54

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008458207-01	OBS	FP	0.02	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
008458207-02	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.

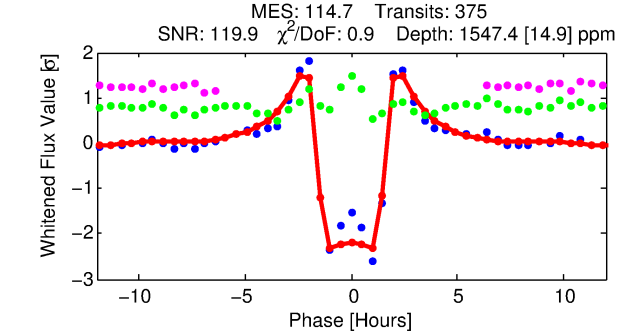
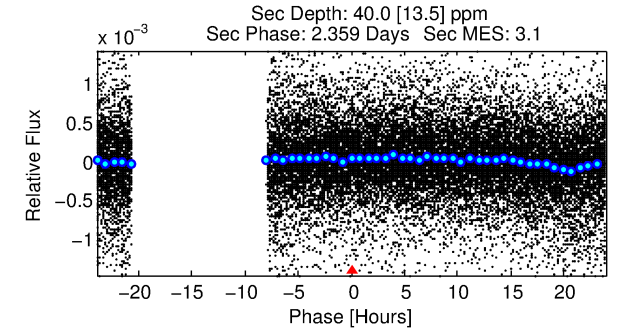
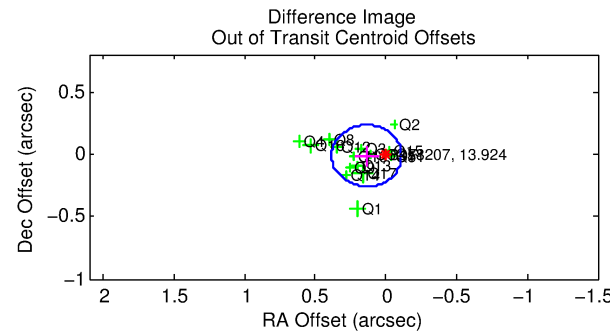
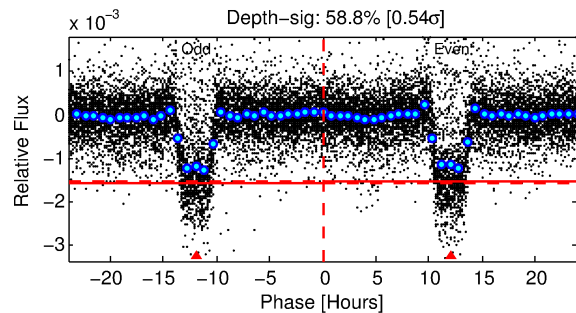
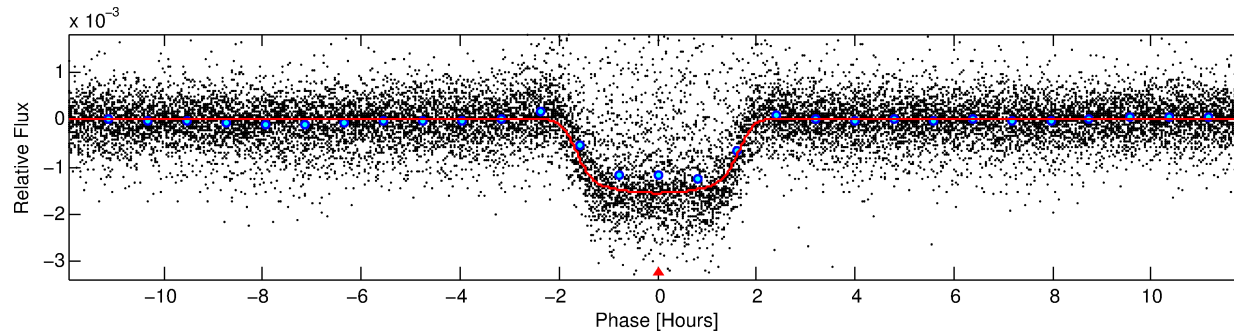
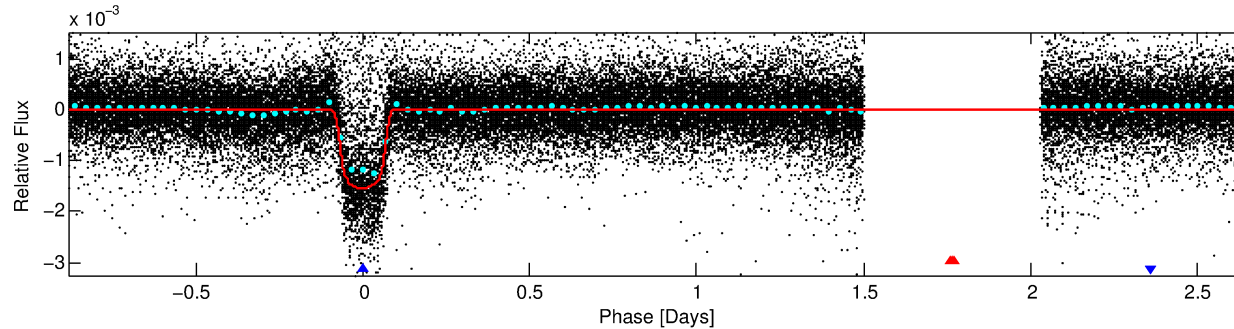
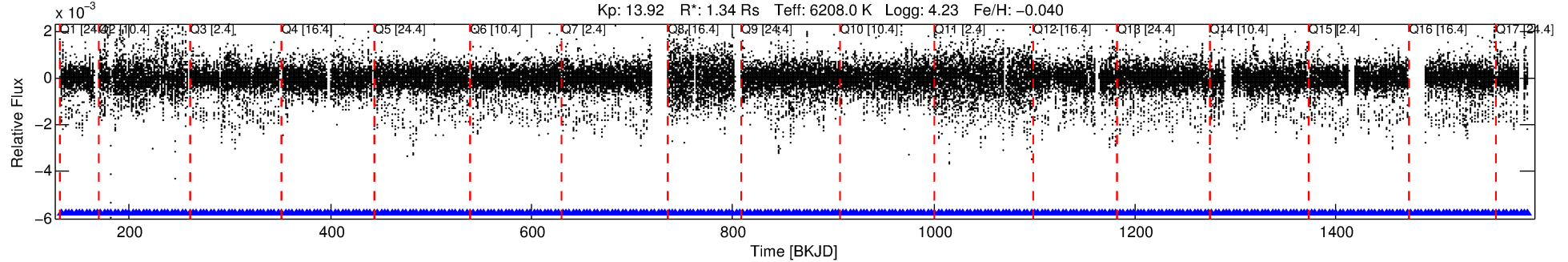
## Ephemeris Match Information For 008458207-02

No Significant Match Found

# DV One-Page Summary

KIC: 8458207 Candidate: 2 of 2 Period: 3.530 d  
KOI: K06057 Corr: No Ephemeris Match

Kp: 13.92 R\*: 1.34 Rs Teff: 6208.0 K Logg: 4.23 Fe/H: -0.040



## DV Fit Results:

Period = 3.53014 [0.00000] d  
Epoch = 133.0145 [0.0003] BKJD  
Rp/R\* = 0.0417 [0.0004]  
a/R\* = 3.91 [0.12]  
b = 0.88 [0.01]  
Seff = 1089.54 [415.64]  
Teq = 1465 [140] K  
Rp = 6.11 [1.93] Re  
a = 0.0470 [0.0119] AU  
Ag = 1.30 [0.64] [0.47σ]  
Teffp = 2418 [223] K [3.62σ]

## DV Diagnostic Results:

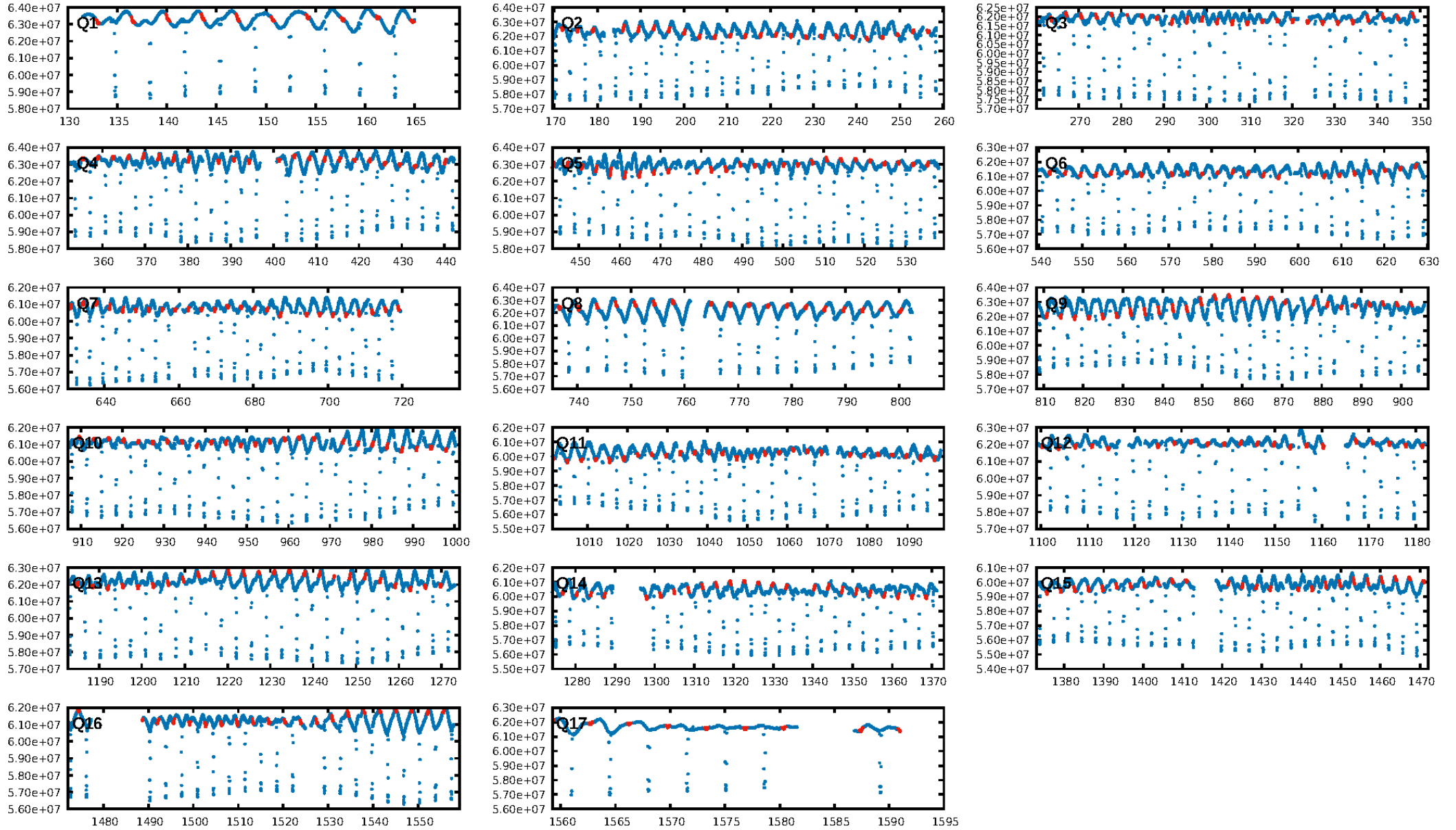
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [356/356]  
GhostDiagnostic-chr: 1.697  
Centroid-sig: N/A  
Centroid-so: 0.412 arcsec [7.38σ]  
OotOffset-rm: 0.138 arcsec [1.67σ]  
KicOffset-rm: 0.041 arcsec [0.54σ]  
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: 30-Jan-2016 13:04:37 Z

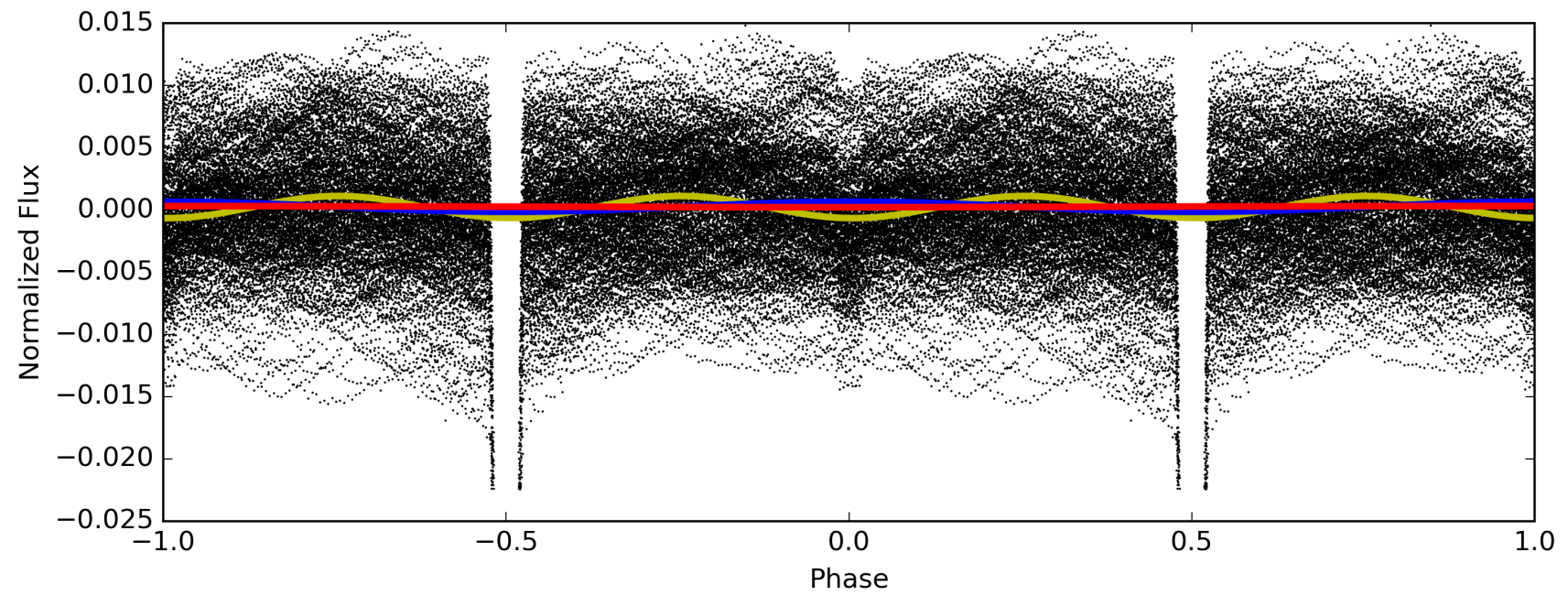
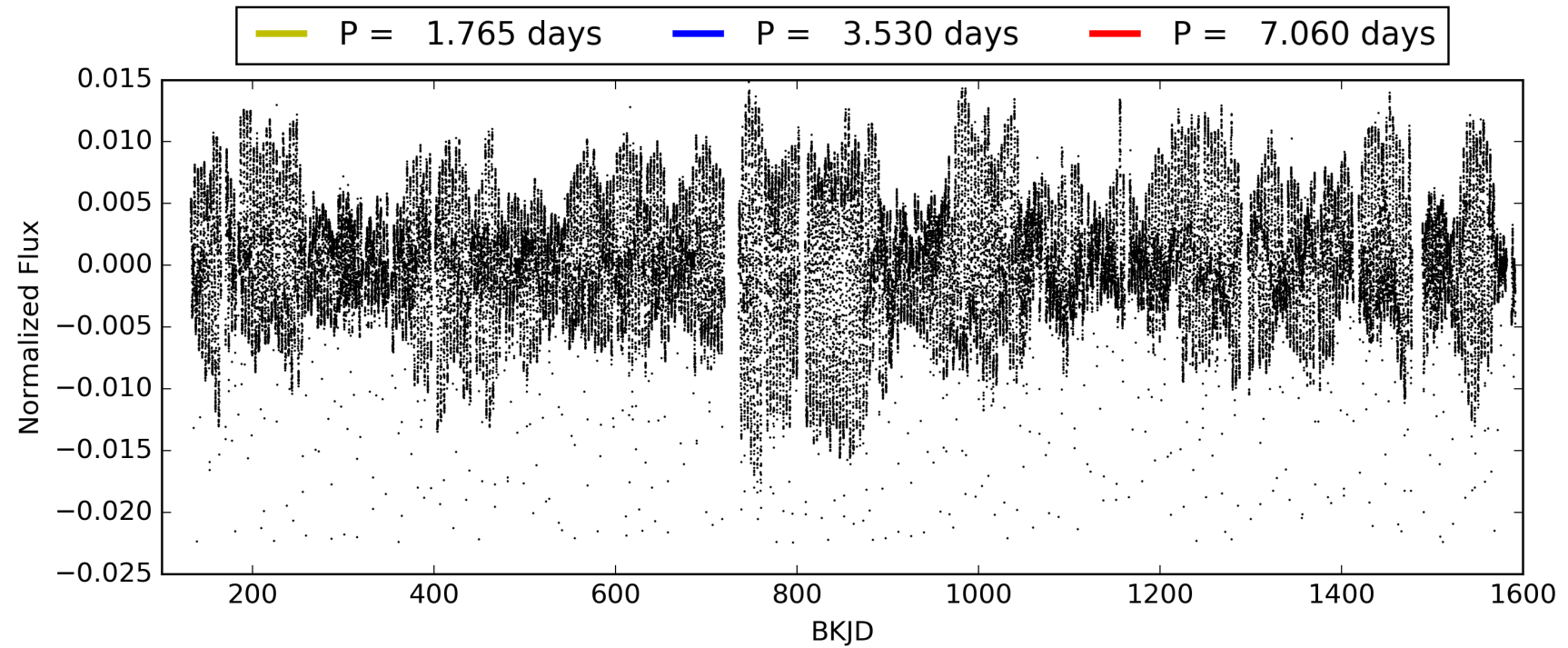
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008458207-02, PDC Light Curves

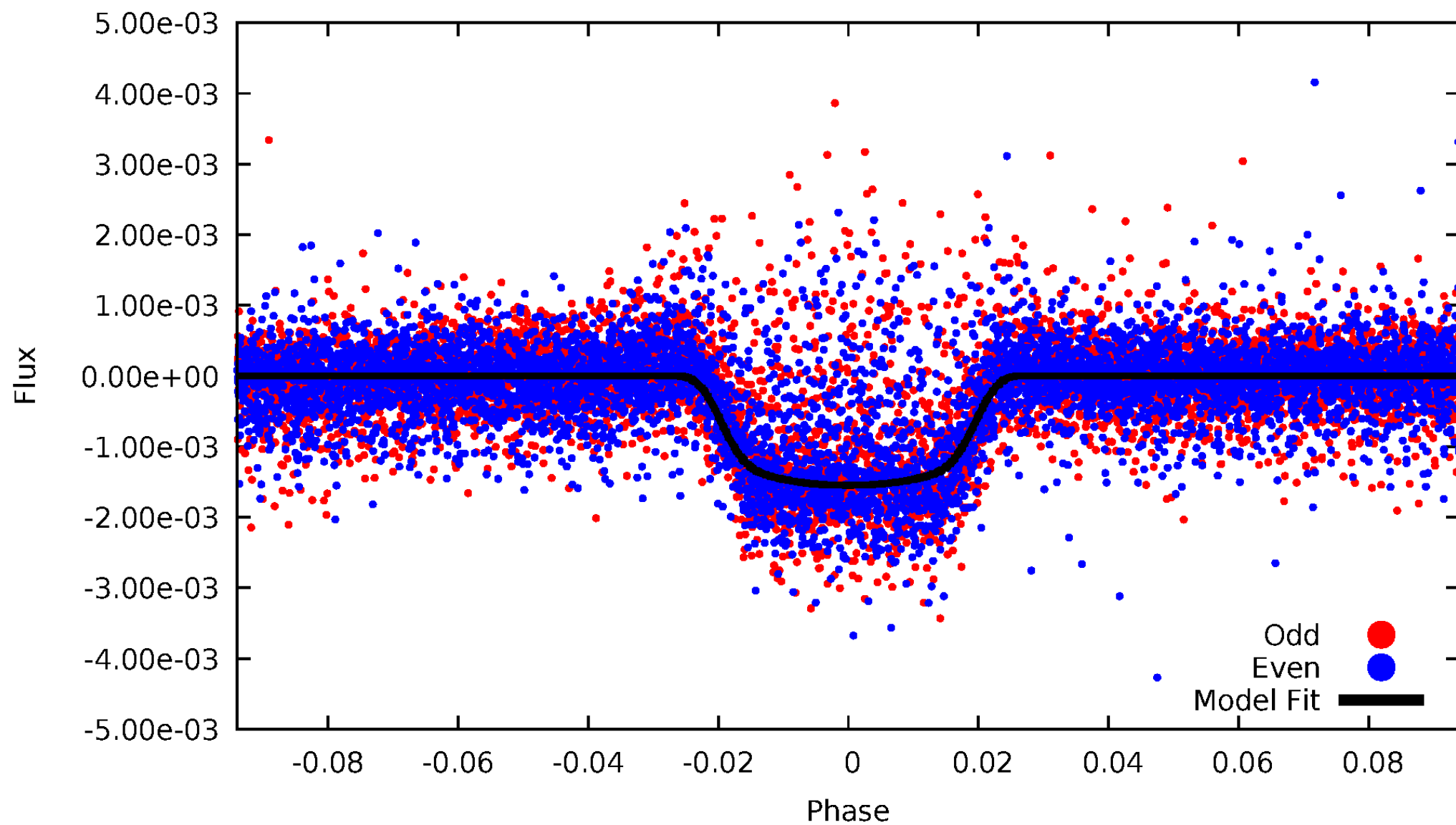


TCE 008458207-02



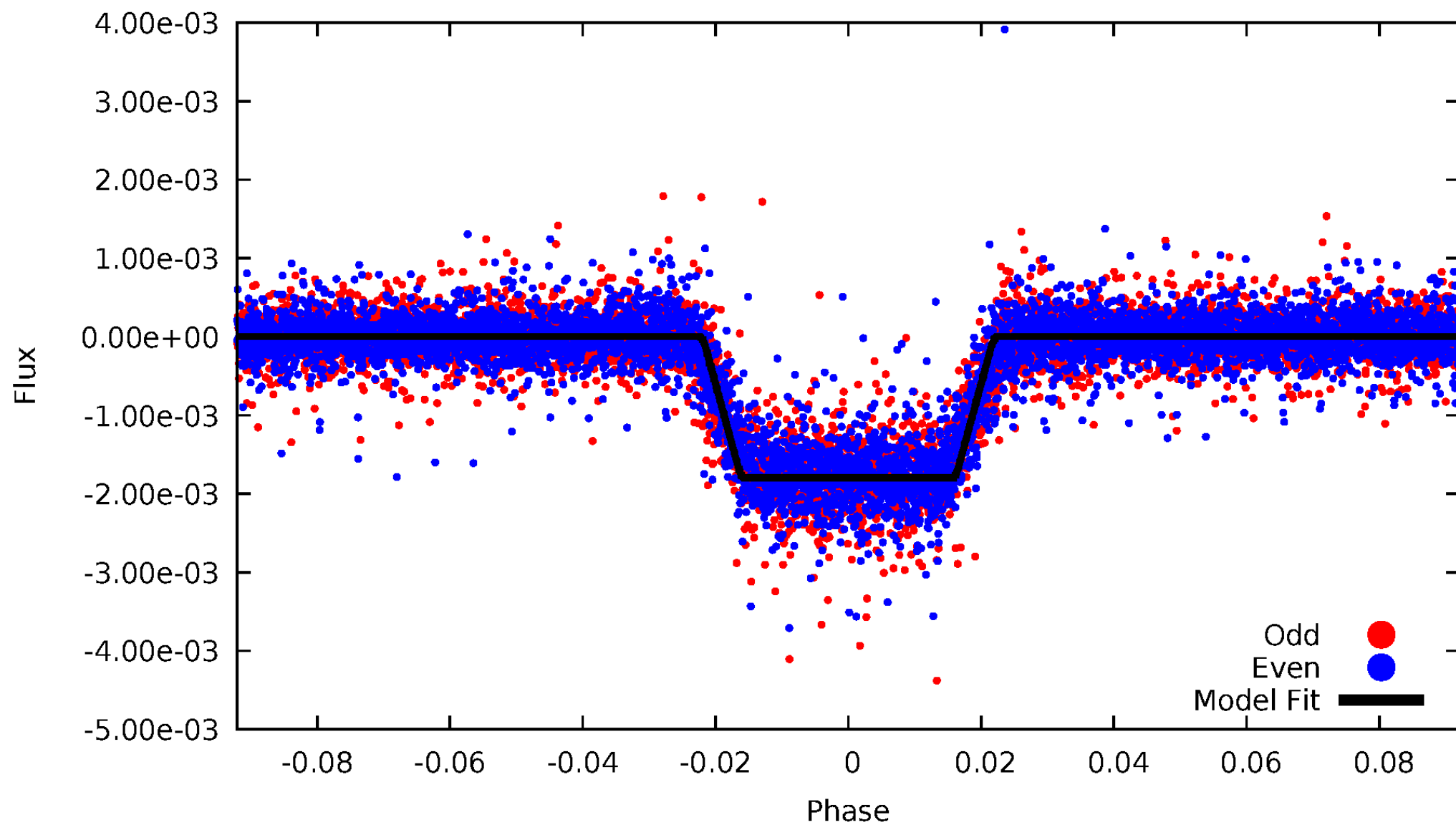
# DV Odd/Even

TCE 008458207-02



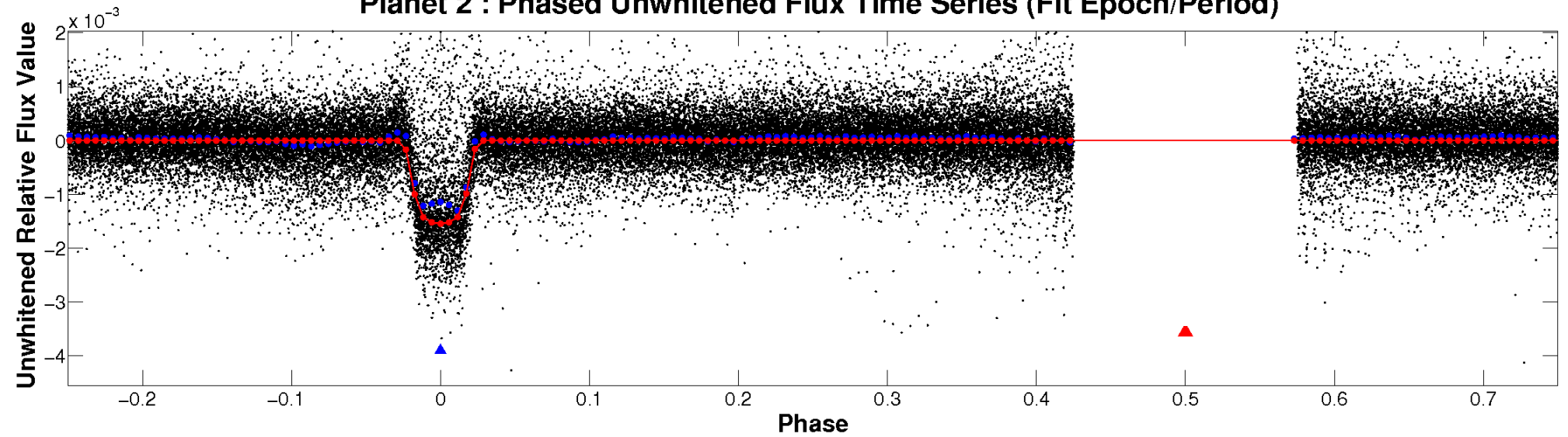
# ALT Odd/Even

TCE 008458207-02

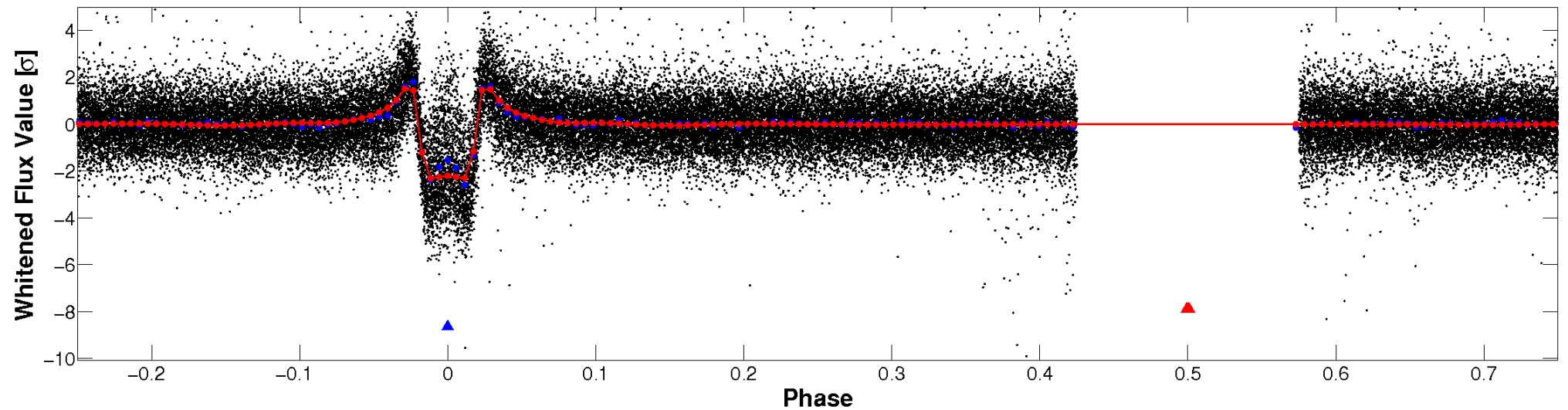


# Non-Whitened Vs. Whitened Light Curve

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



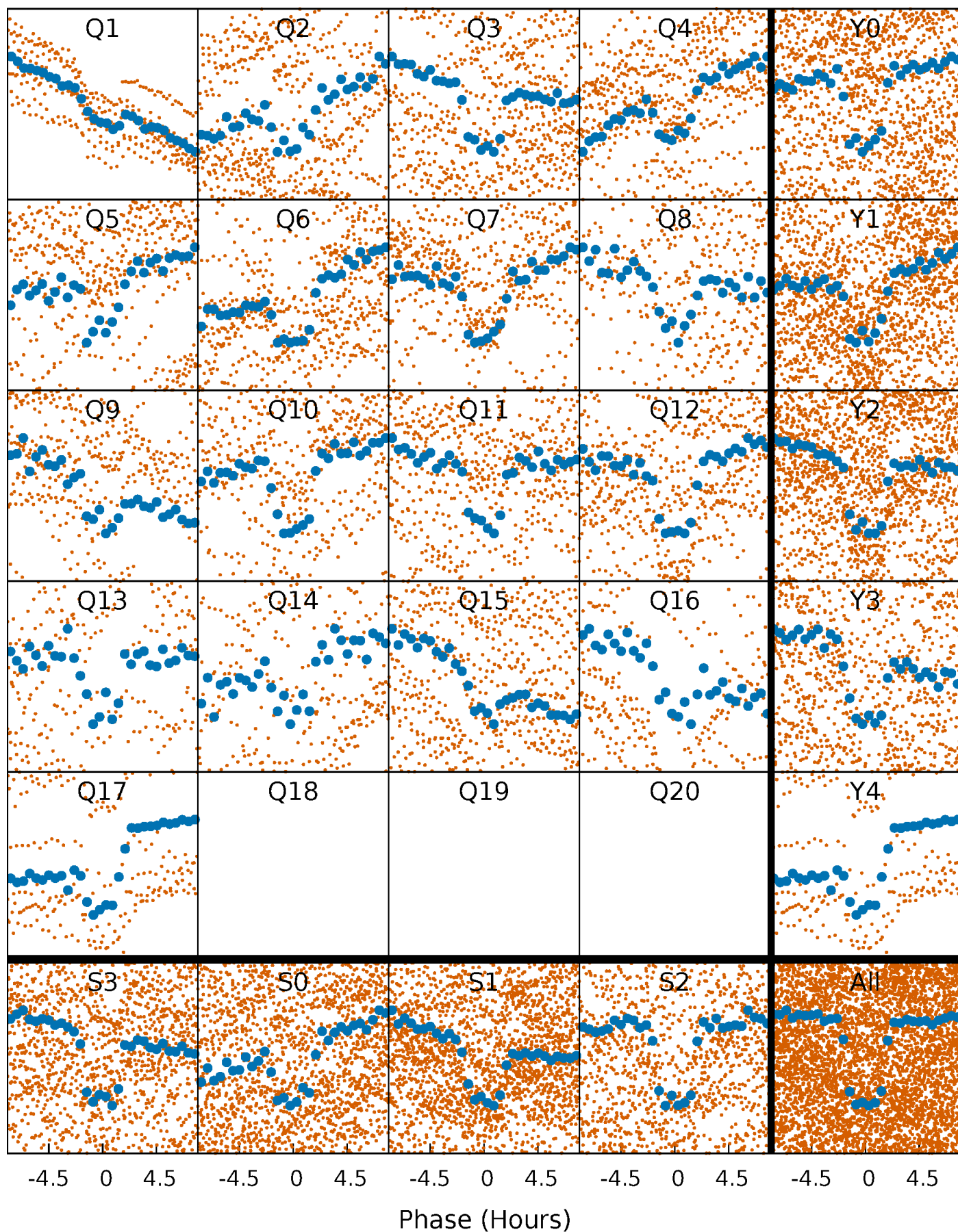
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





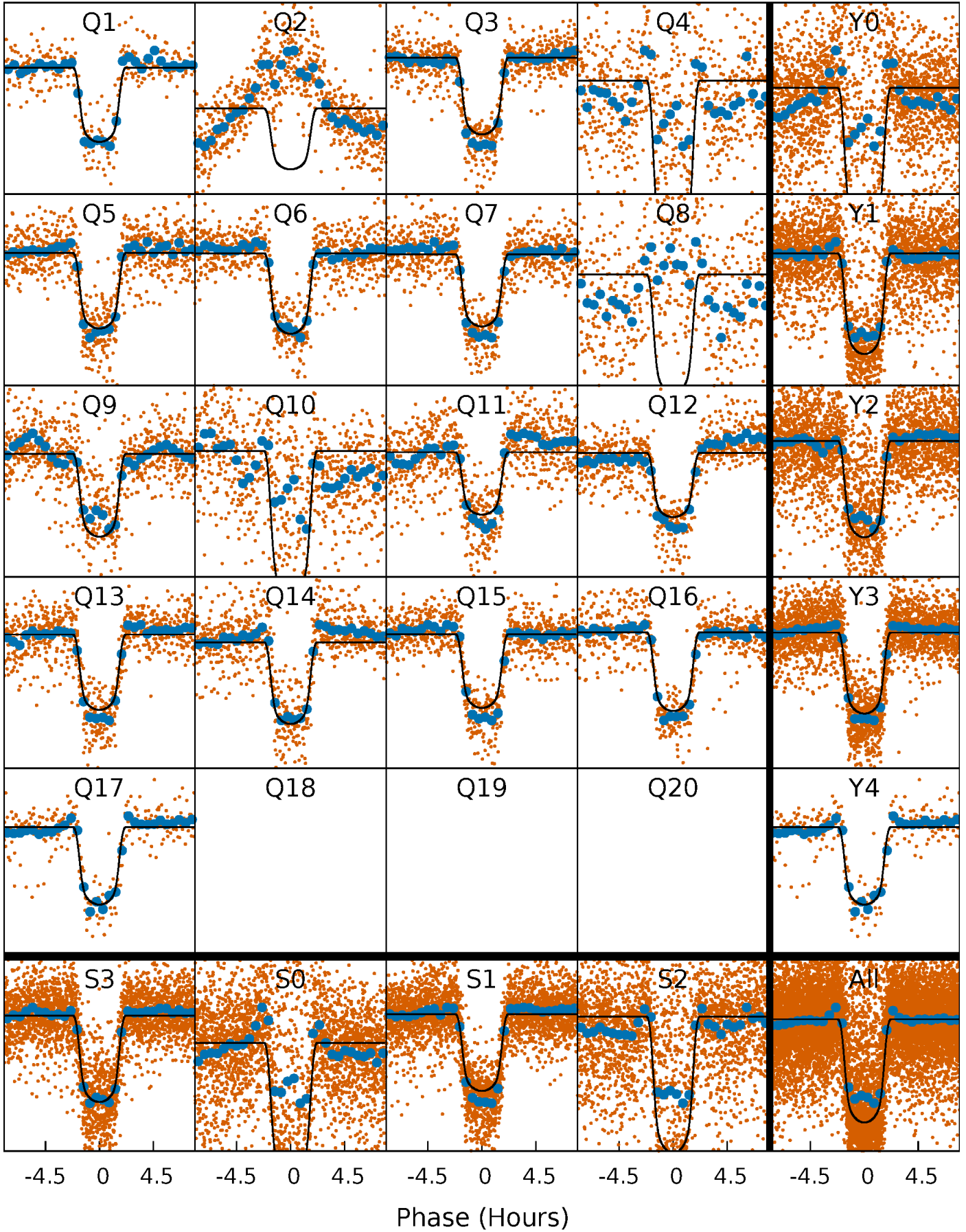
# PDC Quarter-Phased Transit Curves

TCE 008458207-02 P= 3.530143 Days  $T_0=133.014514$  (BKJD)



# DV Quarter-Phased Transit Curves

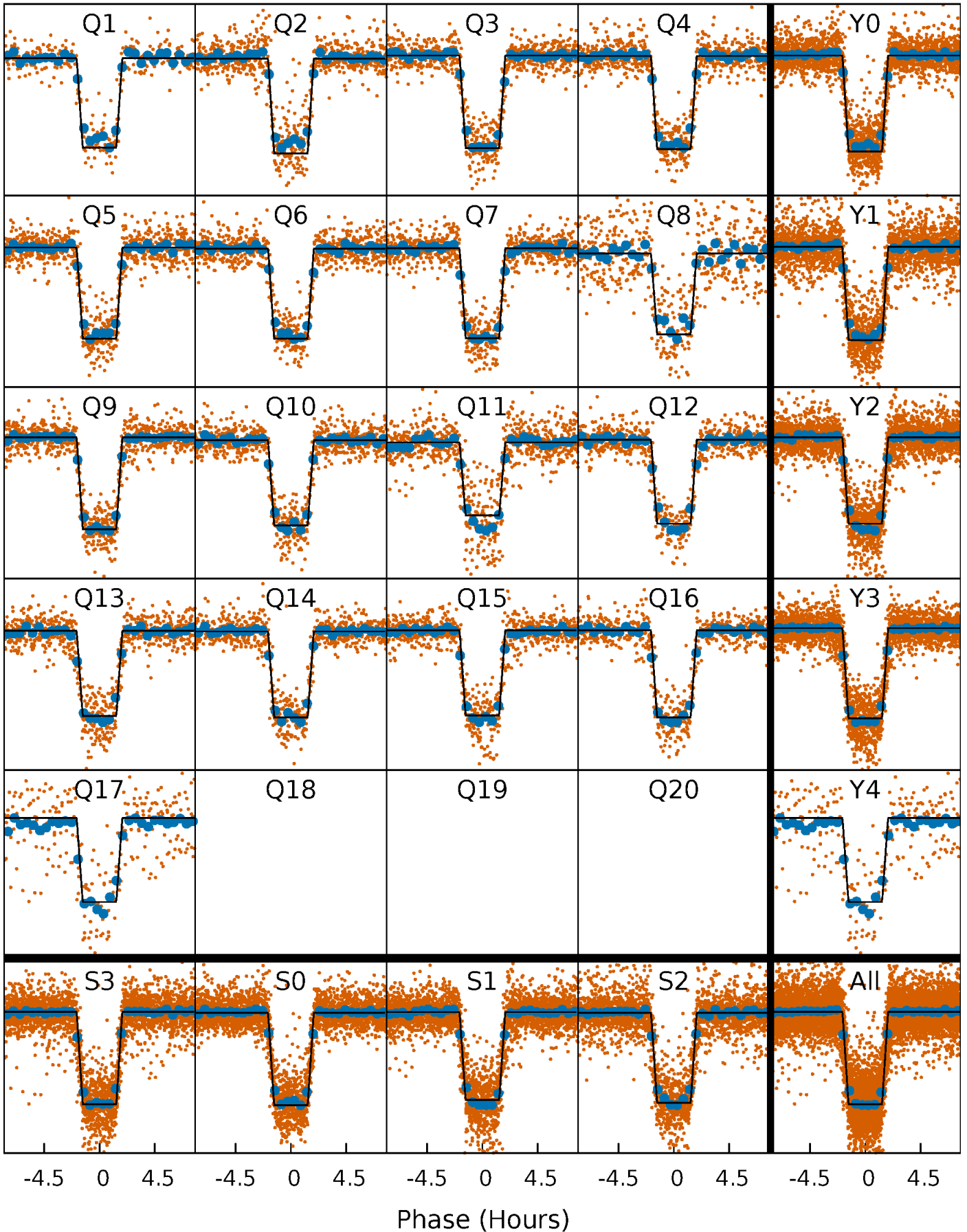
TCE 008458207-02 P= 3.530143 Days  $T_0=133.014514$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

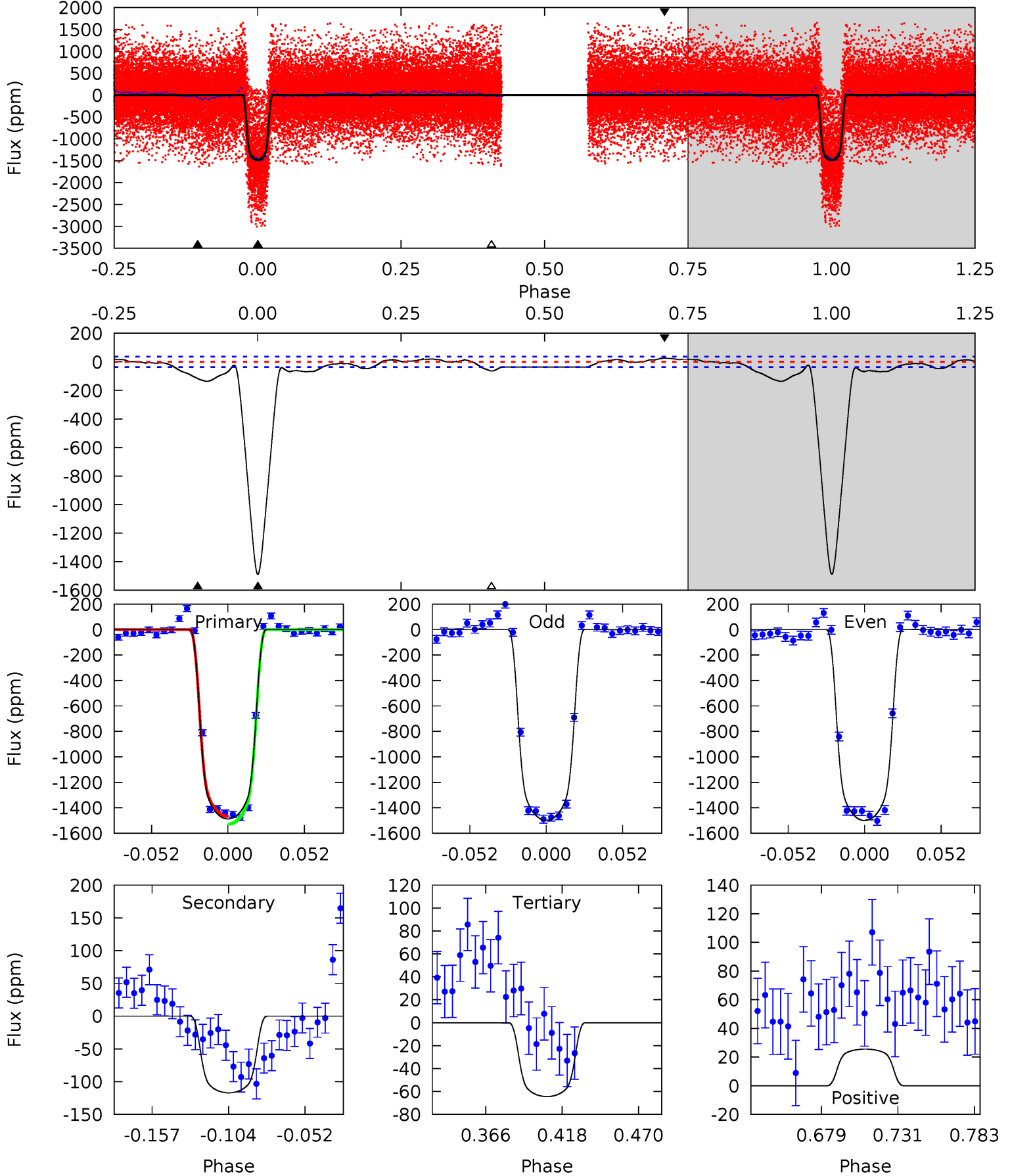
TCE 008458207-02   P= 3.530170 Days    $T_0=133.009923$  (BKJD)



# DV Model-Shift Uniqueness Test

008458207-02, P = 3.530143 Days, E = 129.484371 Days

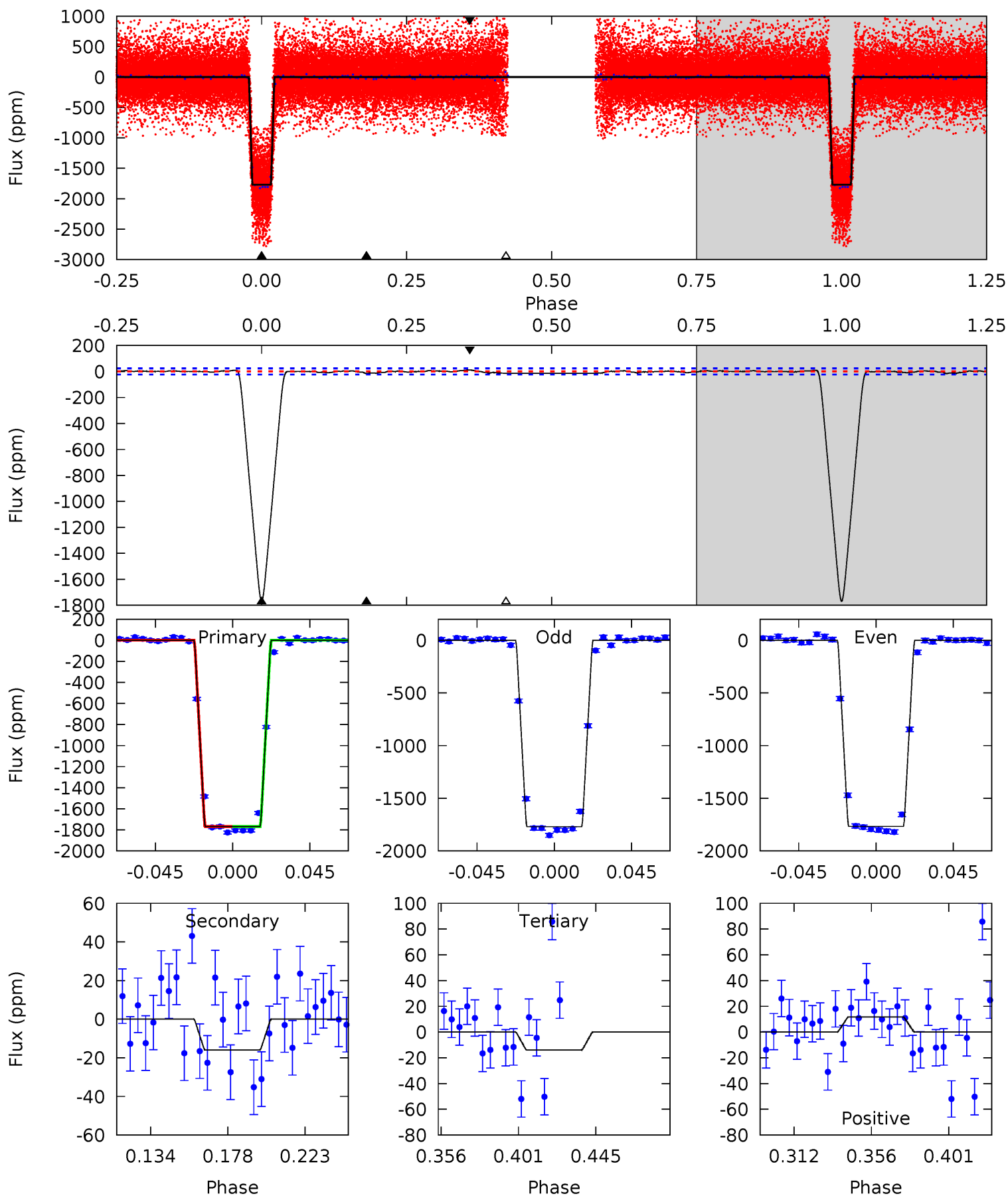
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
190.9	15.0	8.27	3.28	4.70	1.94	3.39	182.6	187.6	6.75	11.7	0.12	0.82	0.02	4.03



# Alt Model-Shift Uniqueness Test

008458207-02, P = 3.530170 Days, E = 129.479753 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
356.4	3.22	2.82	2.36	4.73	2.01	0.96	353.6	354.0	0.40	0.87	0.27	1.00	0.01	0.03



### Stellar Parameters For KIC 008458207

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6208^{+167}_{-223}$	$4.226^{+0.185}_{-0.185}$	$-0.040^{+0.250}_{-0.300}$	$1.344^{+0.424}_{-0.283}$	$1.107^{+0.189}_{-0.142}$	$0.642^{+0.551}_{-0.323}$
	+3%/-4%	+4%/-4%	+625%/-750%	+32%/-21%	+17%/-13%	+86%/-50%
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 008458207-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-117 \pm 8$	$6.09^{+1.13}_{-0.74}$	$2045^{+170}_{-133}$	$3552^{+85}_{-84}$	$3.754^{+1.214}_{-0.979}$
Alt.	$-16 \pm 5$	$6.15^{+1.01}_{-0.72}$	$2033^{+155}_{-126}$	$2390^{+185}_{-557}$	$0.492^{+0.229}_{-0.178}$

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

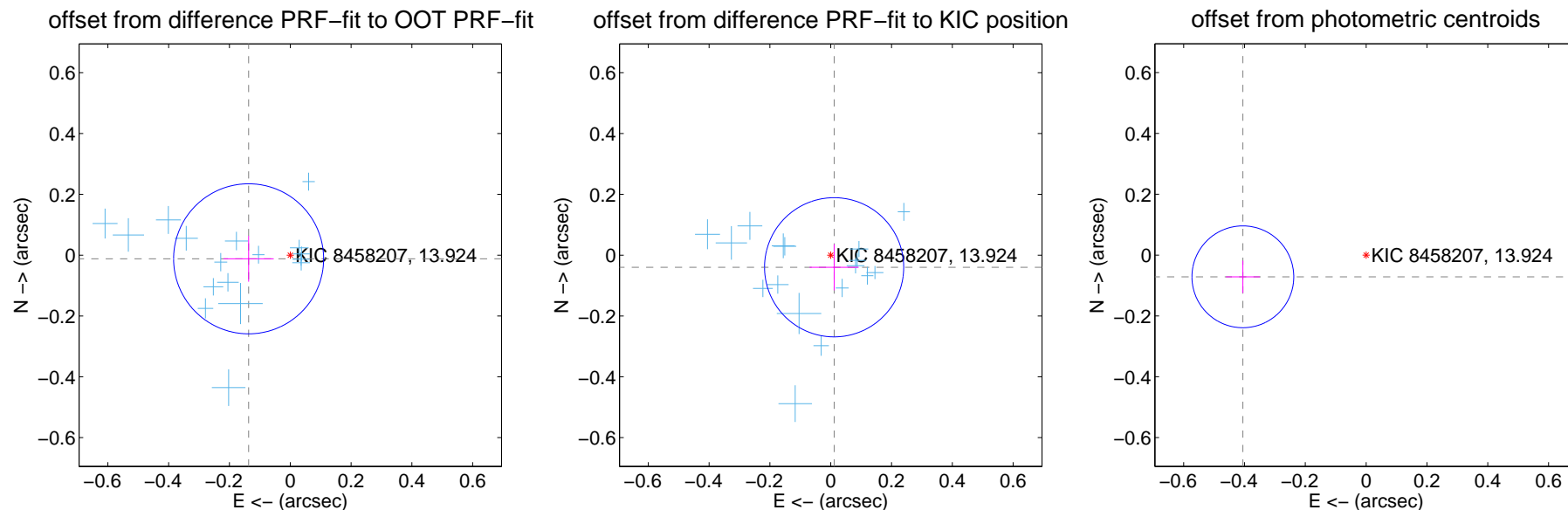
## DV Centroid Data

Supplemental centroid analysis for 008458207-02. Kepler magnitude: 13.92. Transit SNR 119.86

There are 17 quarters with good PRF difference image offsets

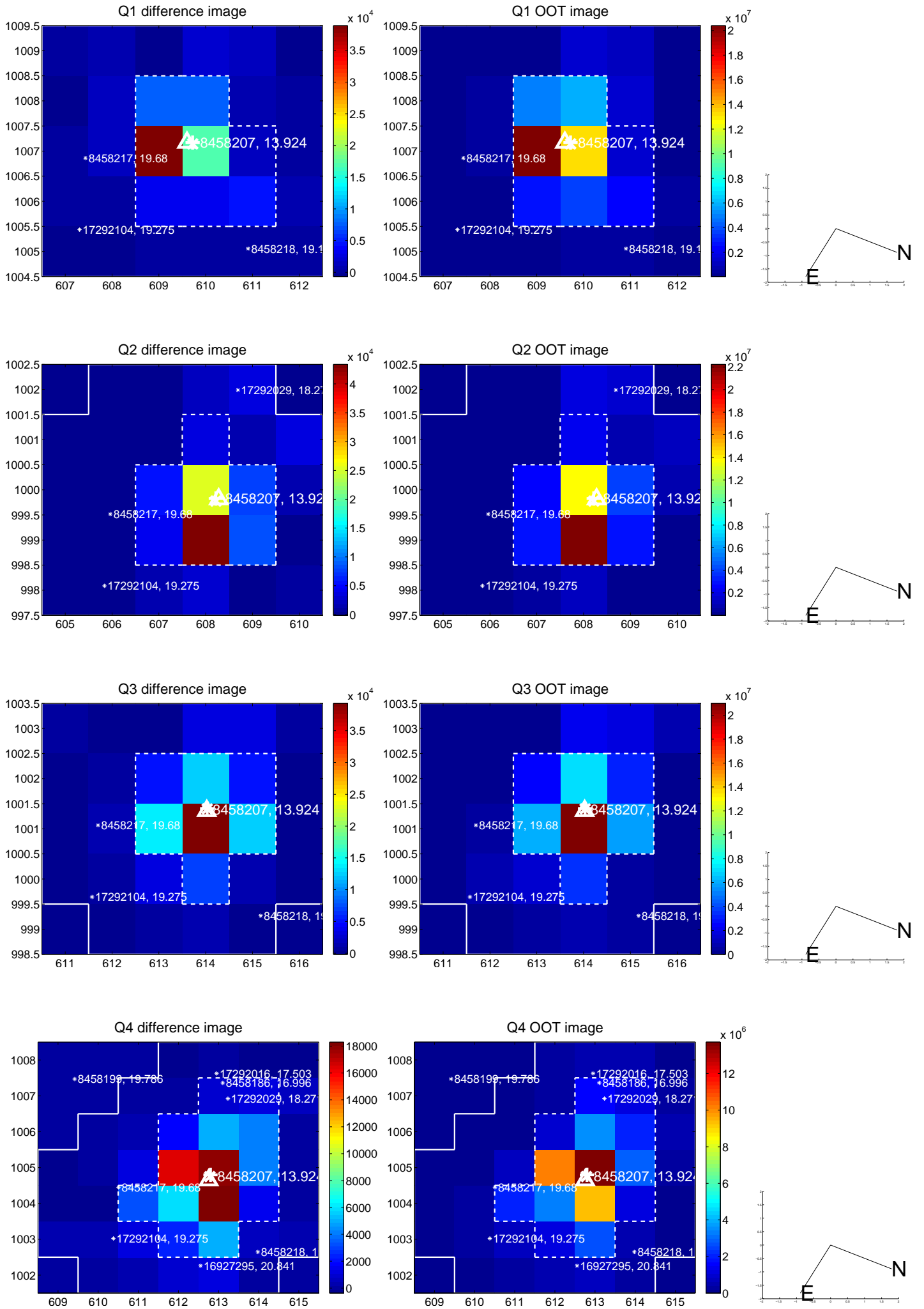
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.138 \pm 0.082$	1.67	$0.137 \pm 0.082$	$-0.012 \pm 0.075$
PRF-fit source offset from KIC position	$0.041 \pm 0.076$	0.54	$-0.011 \pm 0.081$	$-0.040 \pm 0.076$
photometric centroid source offset	$0.41 \pm 0.06$	7.38	$0.41 \pm 0.06$	$-0.07 \pm 0.05$

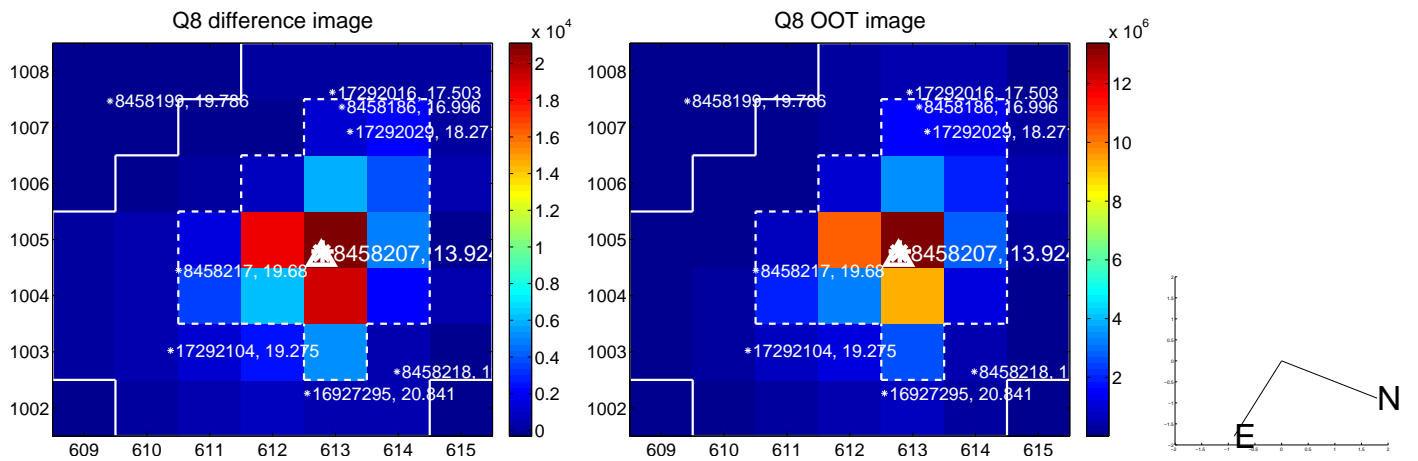
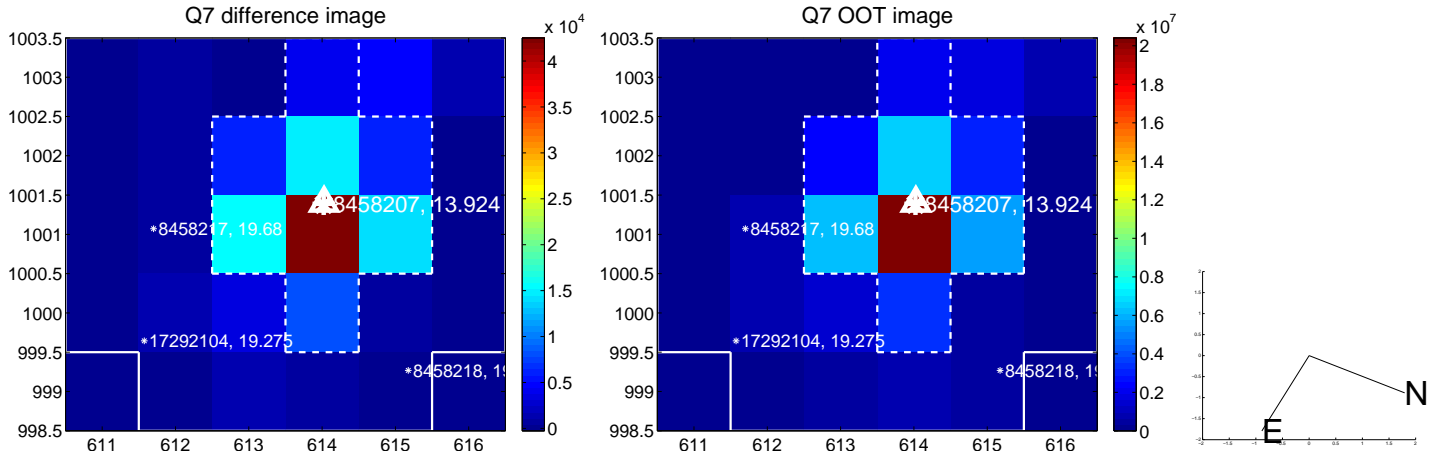
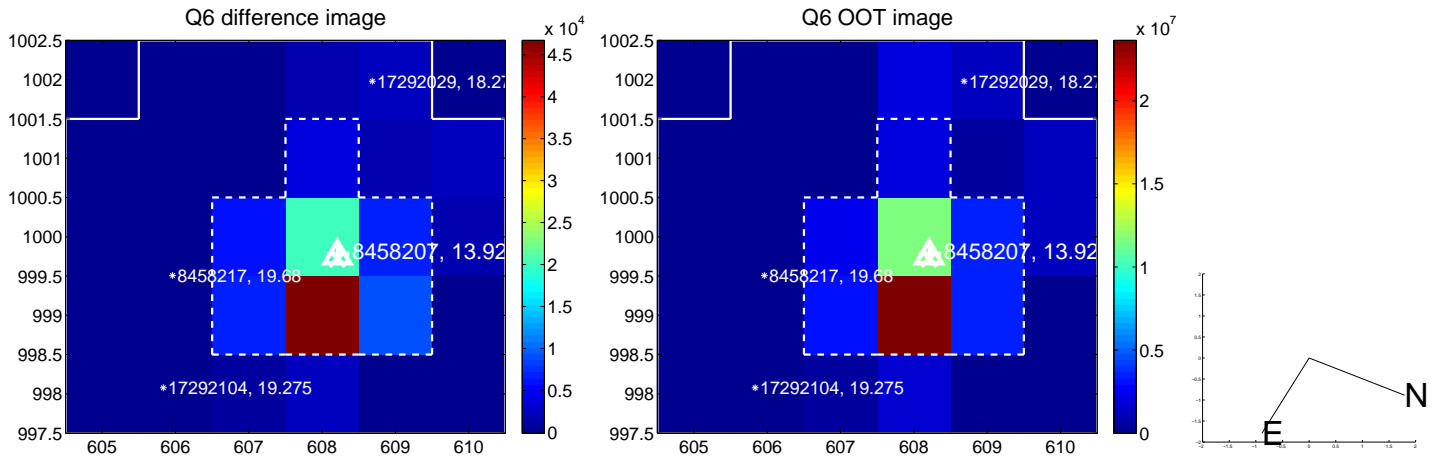
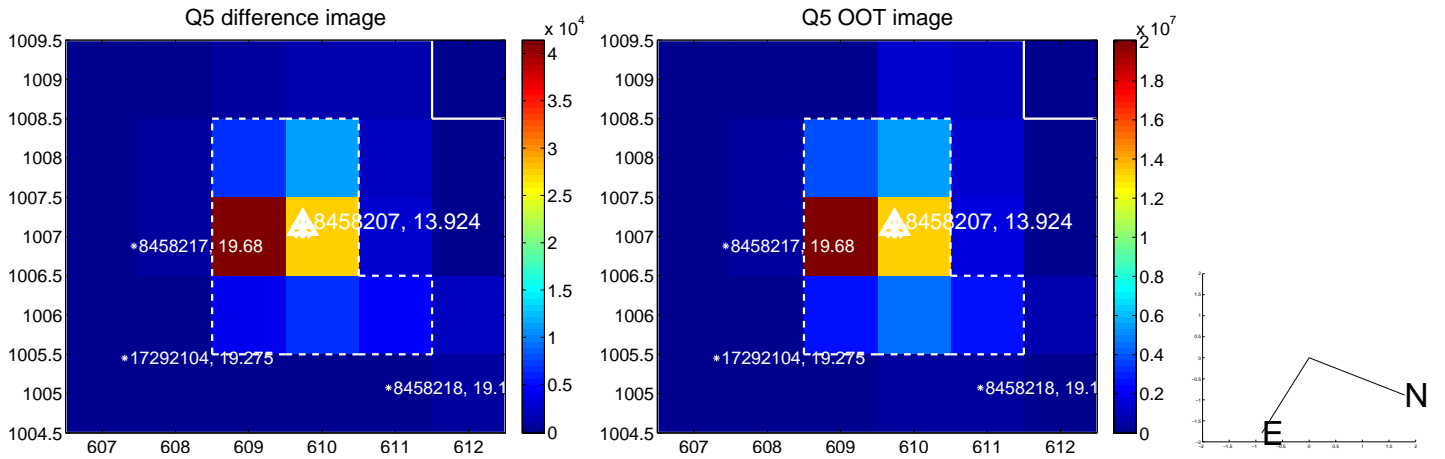


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

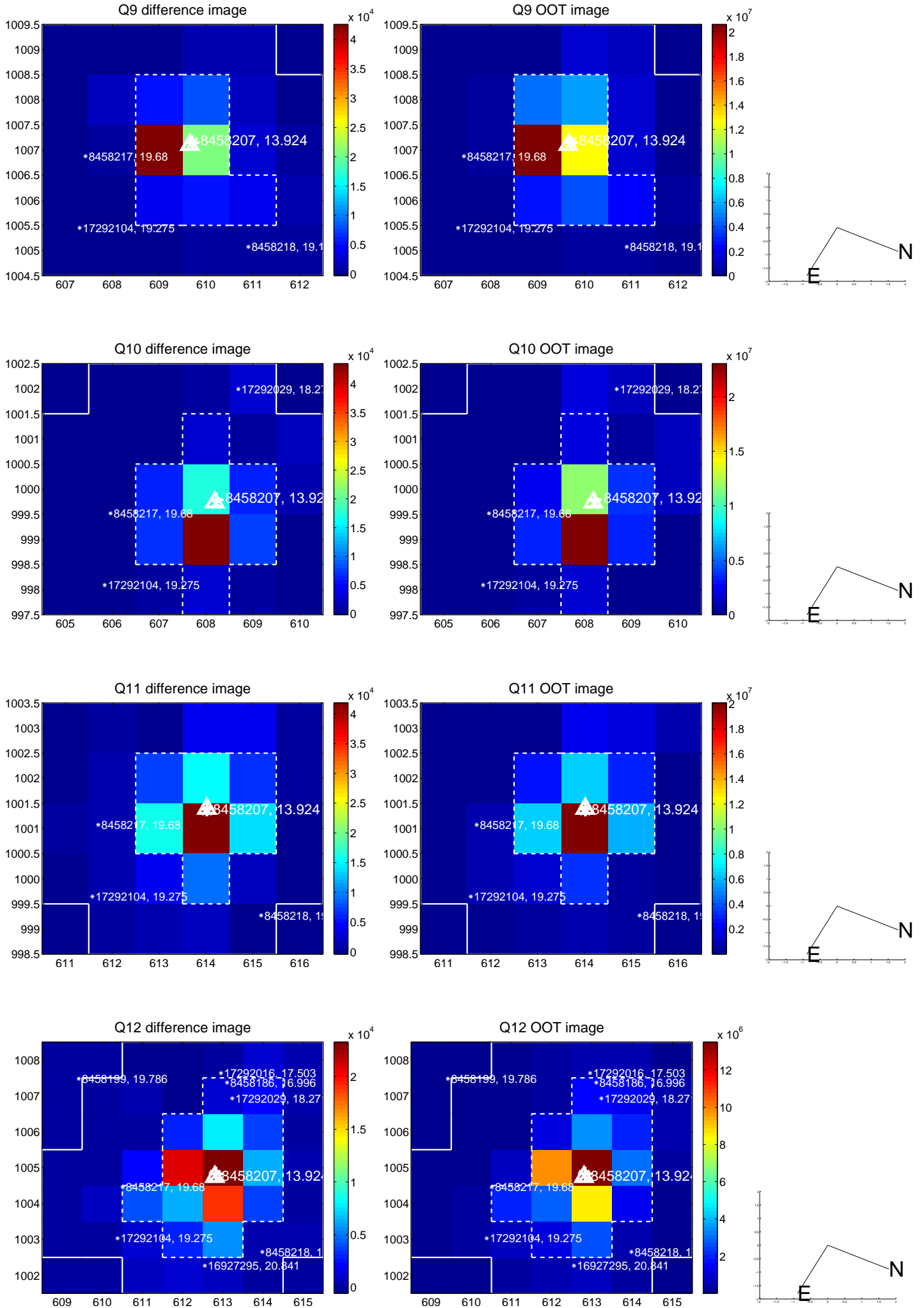


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

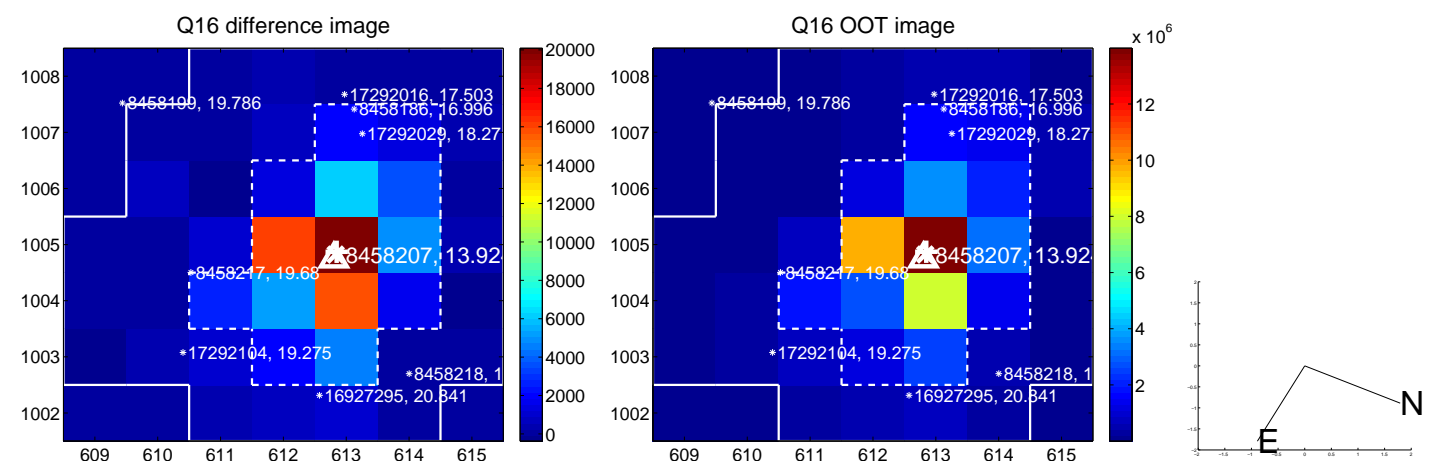
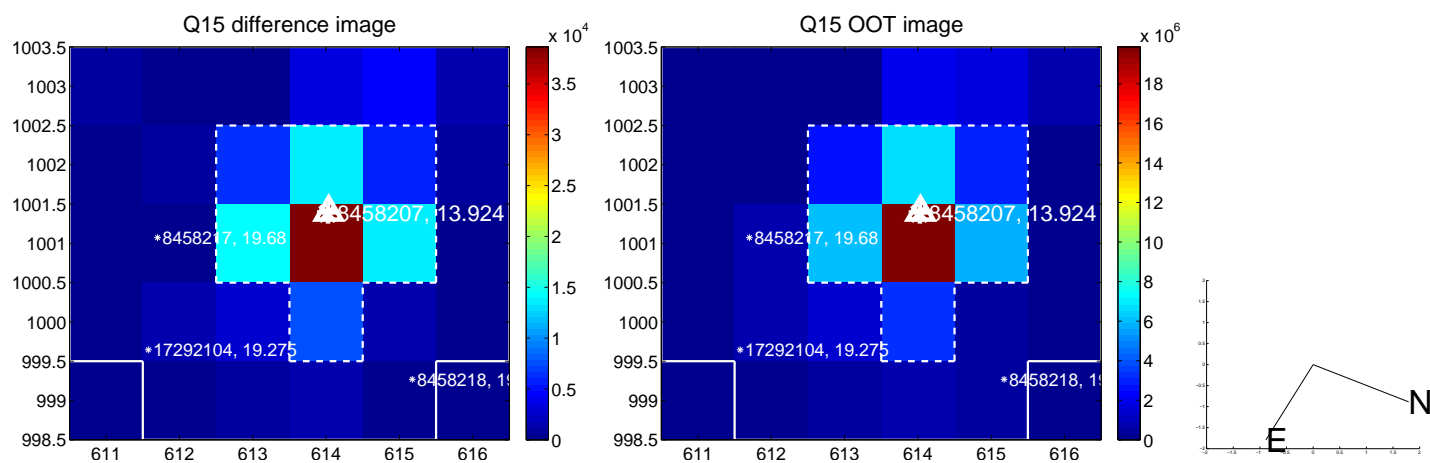
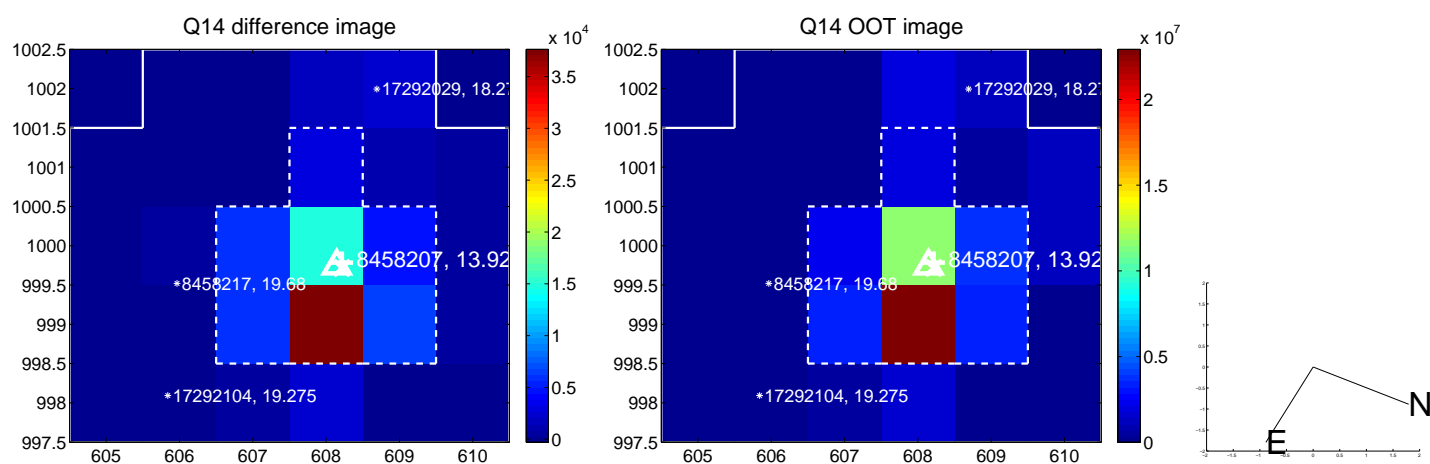
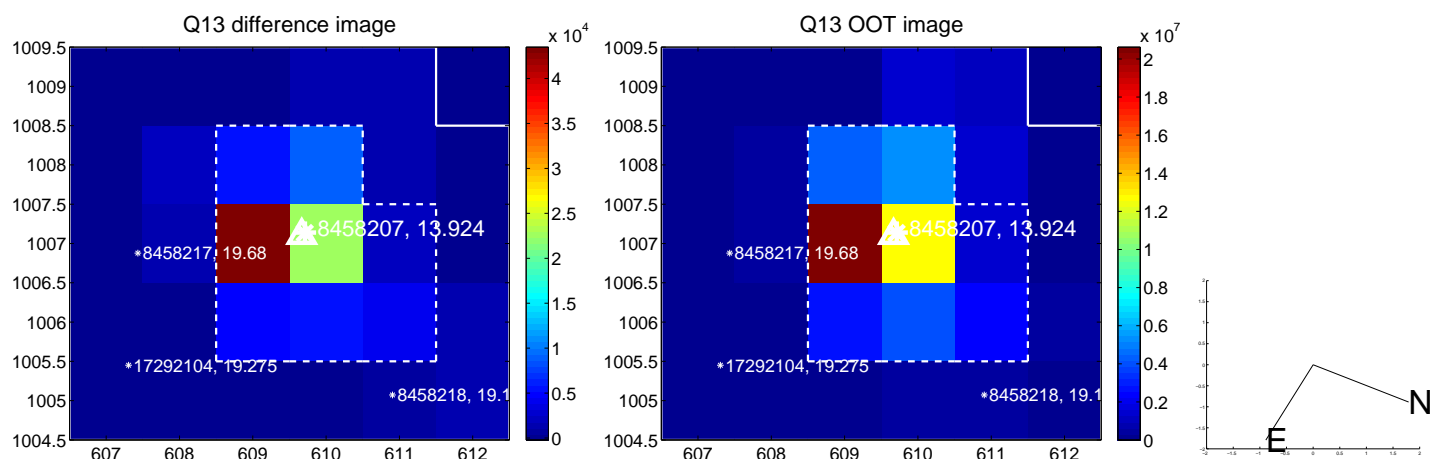




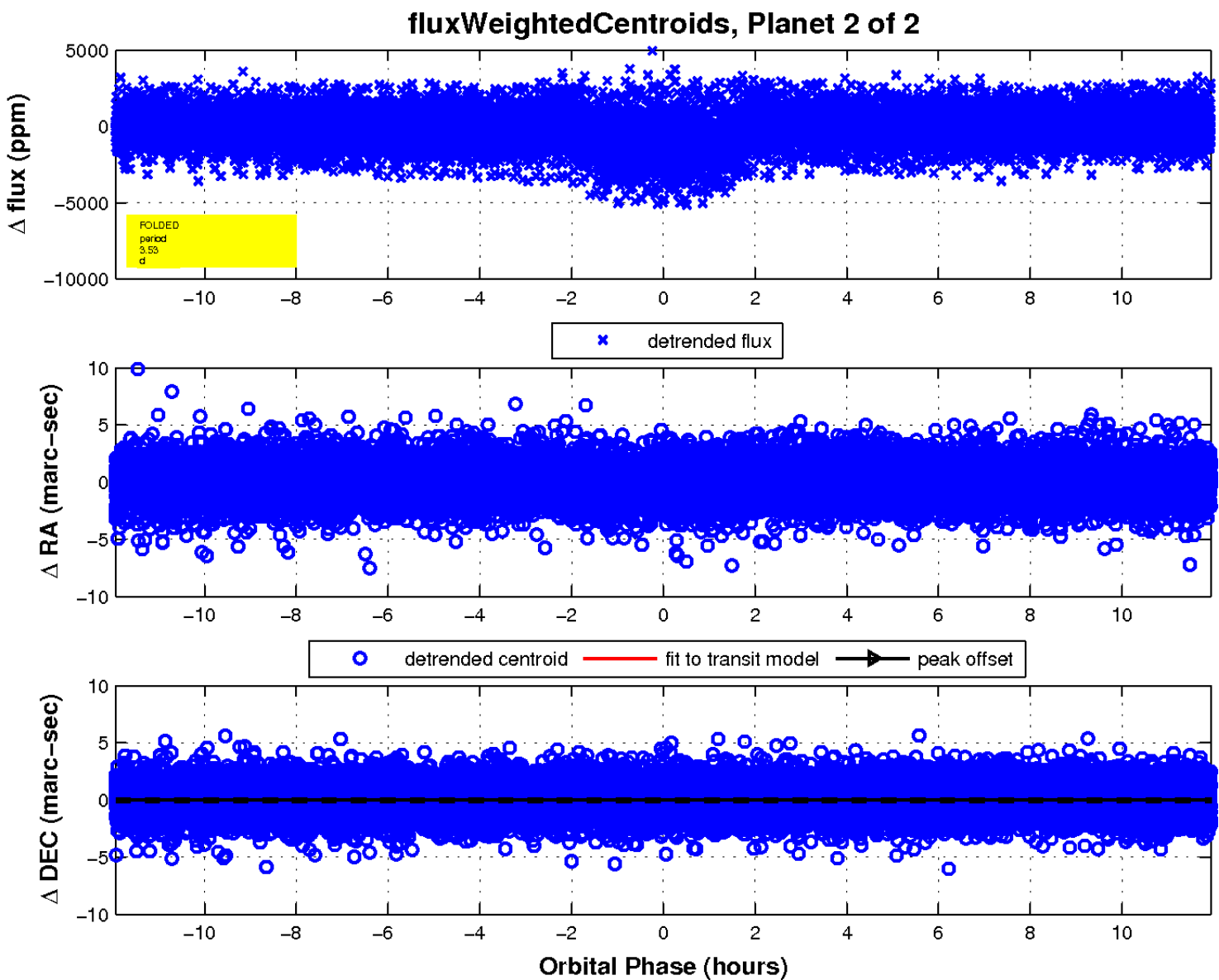
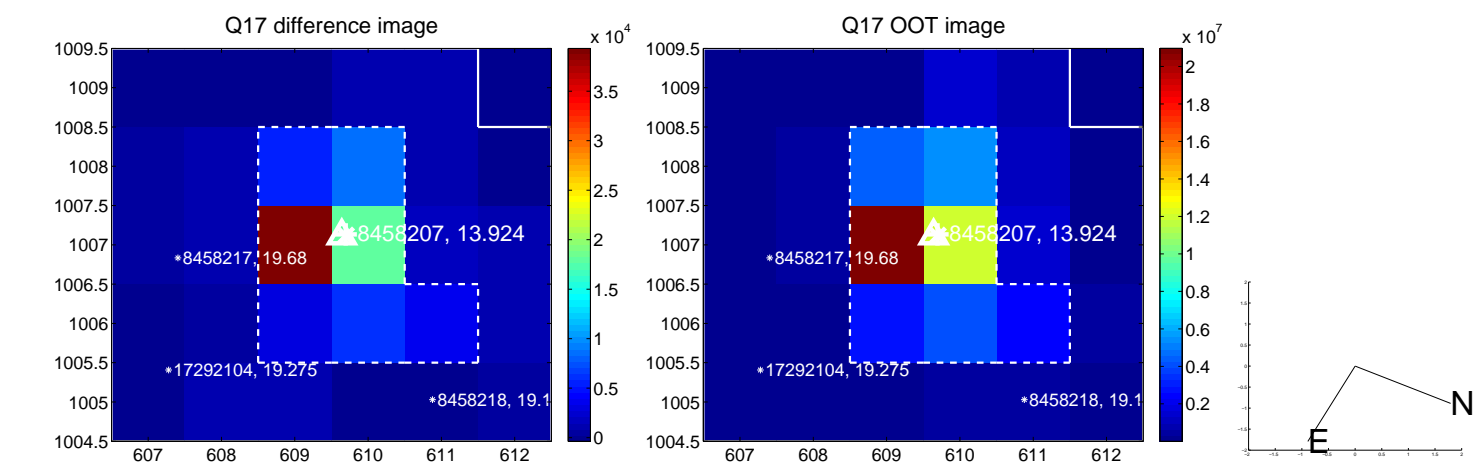
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UKIRT Image

