

# KIC 009245855

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009245855-01	OBS	No	0.606308	131.936718	63.9	4.164	9.2	7.9	1.21	6586	1.04	10937.77
009245855-02	OBS	No	39.828927	150.629523	2079.4	1.909	10.7	11.2	1.21	6586	8.92	41.27
009245855-03	OBS	No	22.876714	146.976476	2046.2	2.156	9.5	13.8	1.21	6586	10.20	86.43
009245855-04	OBS	No	19.115954	142.731498	732.0	4.047	10.6	9.1	1.21	6586	3.49	109.81
009245855-05	OBS	No	35.079209	158.129705	1975.4	1.598	10.2	12.0	1.21	6586	6.52	48.88
009245855-06	OBS	No	23.676899	154.858019	643.1	3.695	11.0	7.4	1.21	6586	3.45	82.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009245855-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009245855-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009245855-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
009245855-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

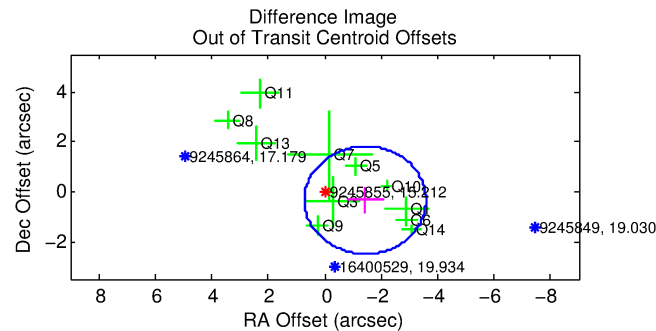
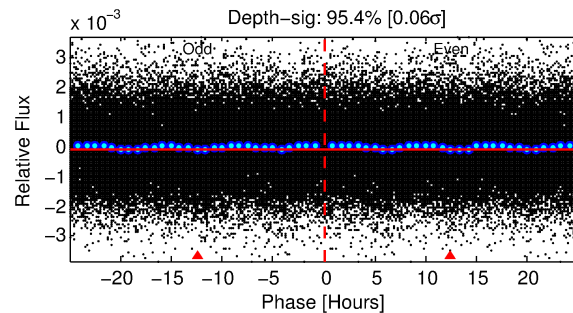
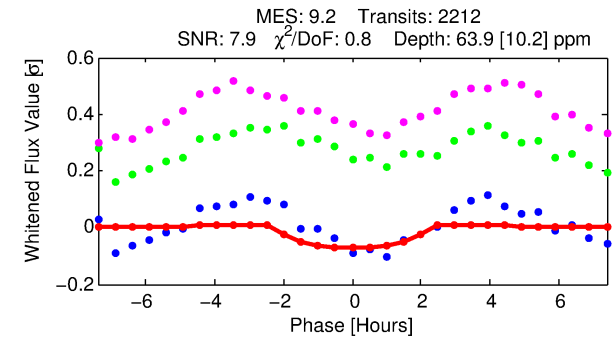
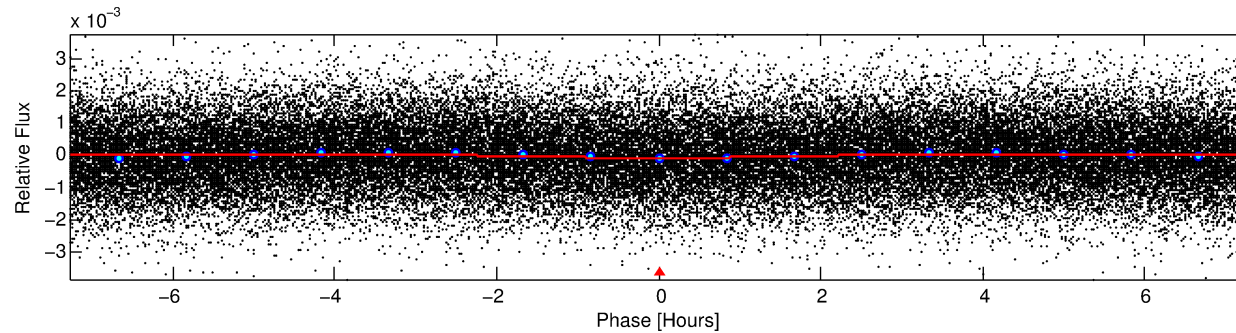
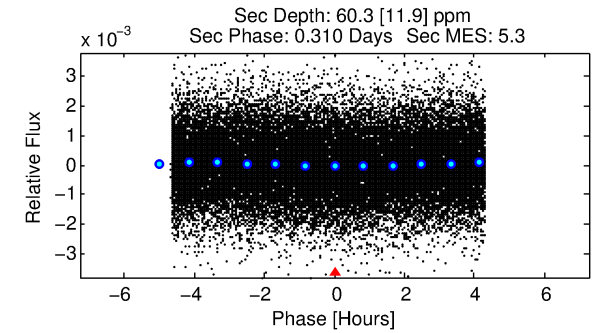
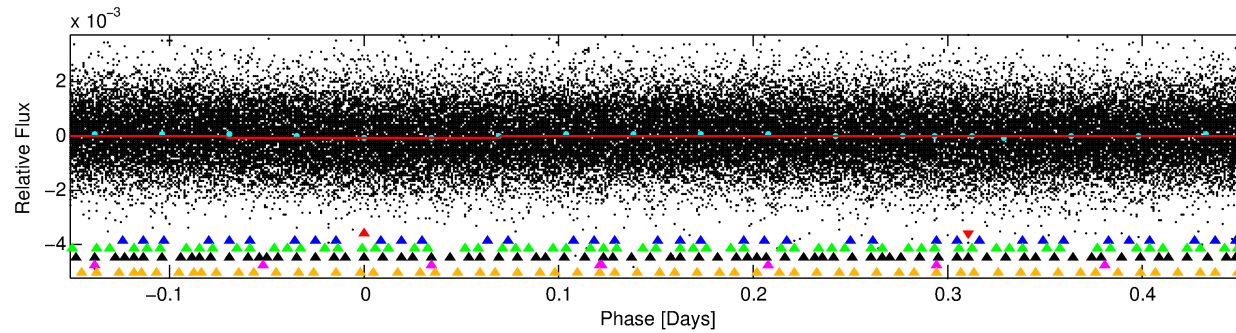
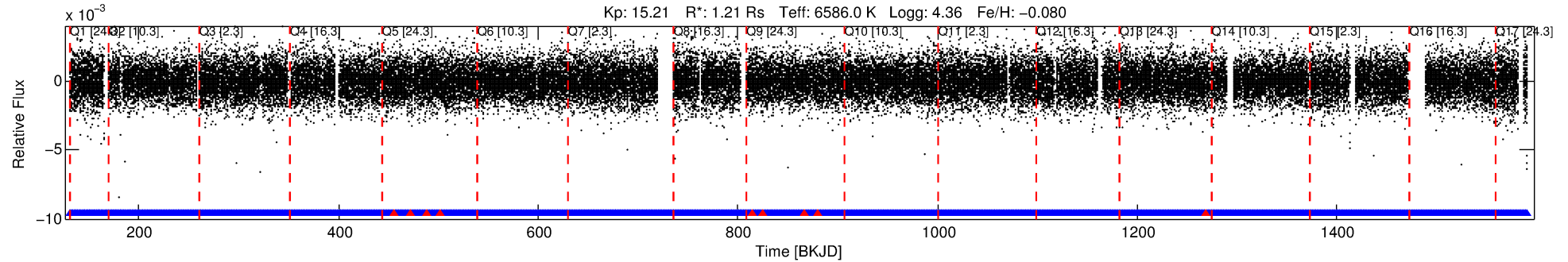
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009245855-01

No Significant Match Found

# DV One-Page Summary

KIC: 9245855 Candidate: 1 of 6 Period: 0.606 d



## DV Fit Results:

Period = 0.60631 [0.00001] d  
Epoch = 131.9367 [0.0058] BKJD  
Rp/R\* = 0.0079 [0.0110]  
a/R\* = 1.15 [2.19]  
b = 0.72 [5.16]  
Seff = 10937.77 [4351.31]  
Teq = 2608 [259] K  
Rp = 1.04 [1.49] Re  
a = 0.0150 [0.0038] AU  
Ag = 6.90 [19.46] [0.30σ]  
Teffp = 6533 [4583] K [0.86σ]

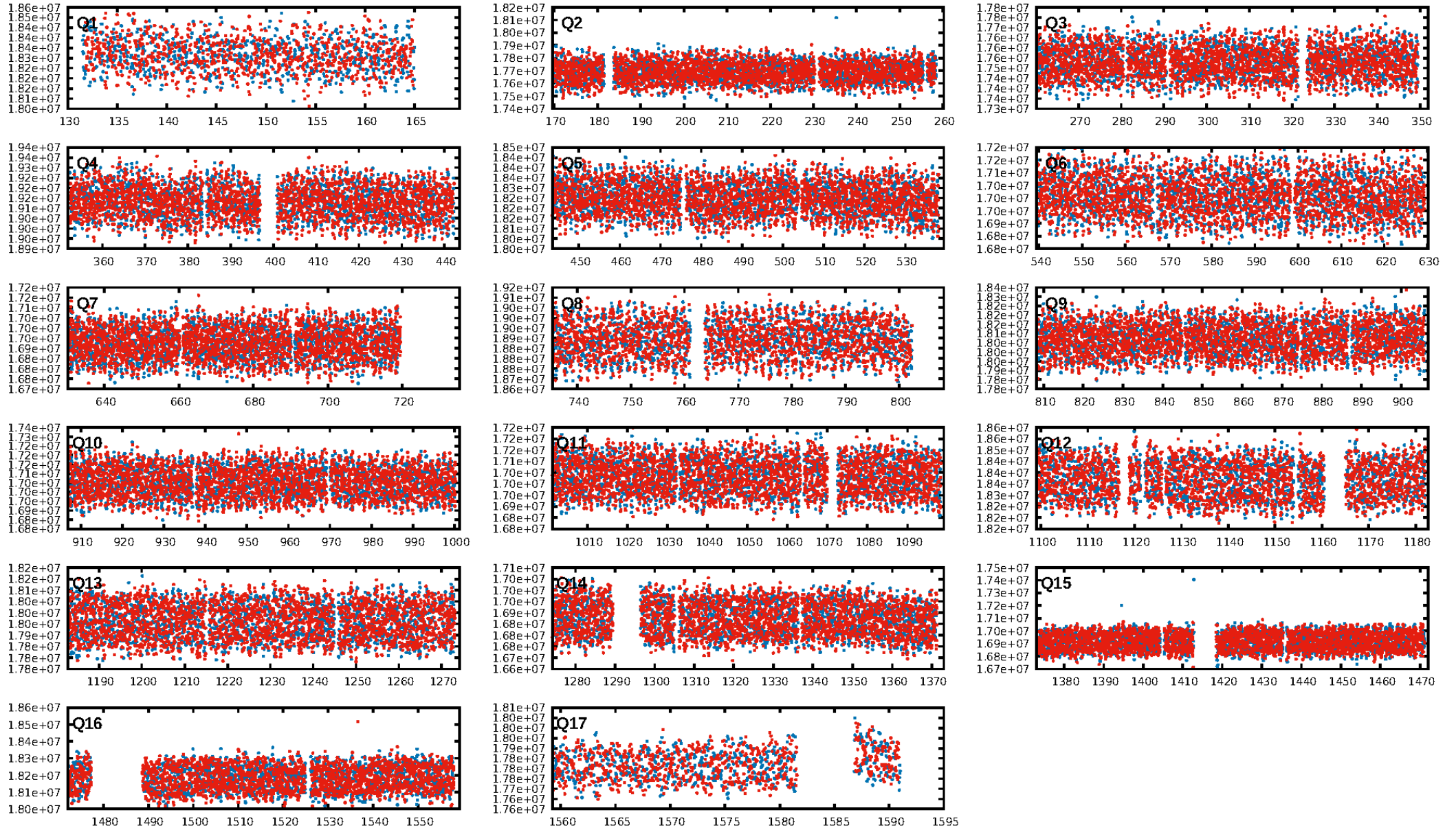
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [76.50σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 9.11e-11**  
RollingBand-fgt: 1.00 [2103/2112]  
GhostDiagnostic-chr: 1.271  
Centroid-sig: 95.1%  
Centroid-so: 1.287 arcsec [1.35σ]  
OotOffset-rm: 1.471 arcsec [2.05σ]  
KicOffset-rm: 1.454 arcsec [2.01σ]  
OotOffset-st: 3/3/1/4 [11]  
KicOffset-st: 3/3/1/4 [11]  
DiffImageQuality-fgm: 0.45 [5/11]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:59:45 Z

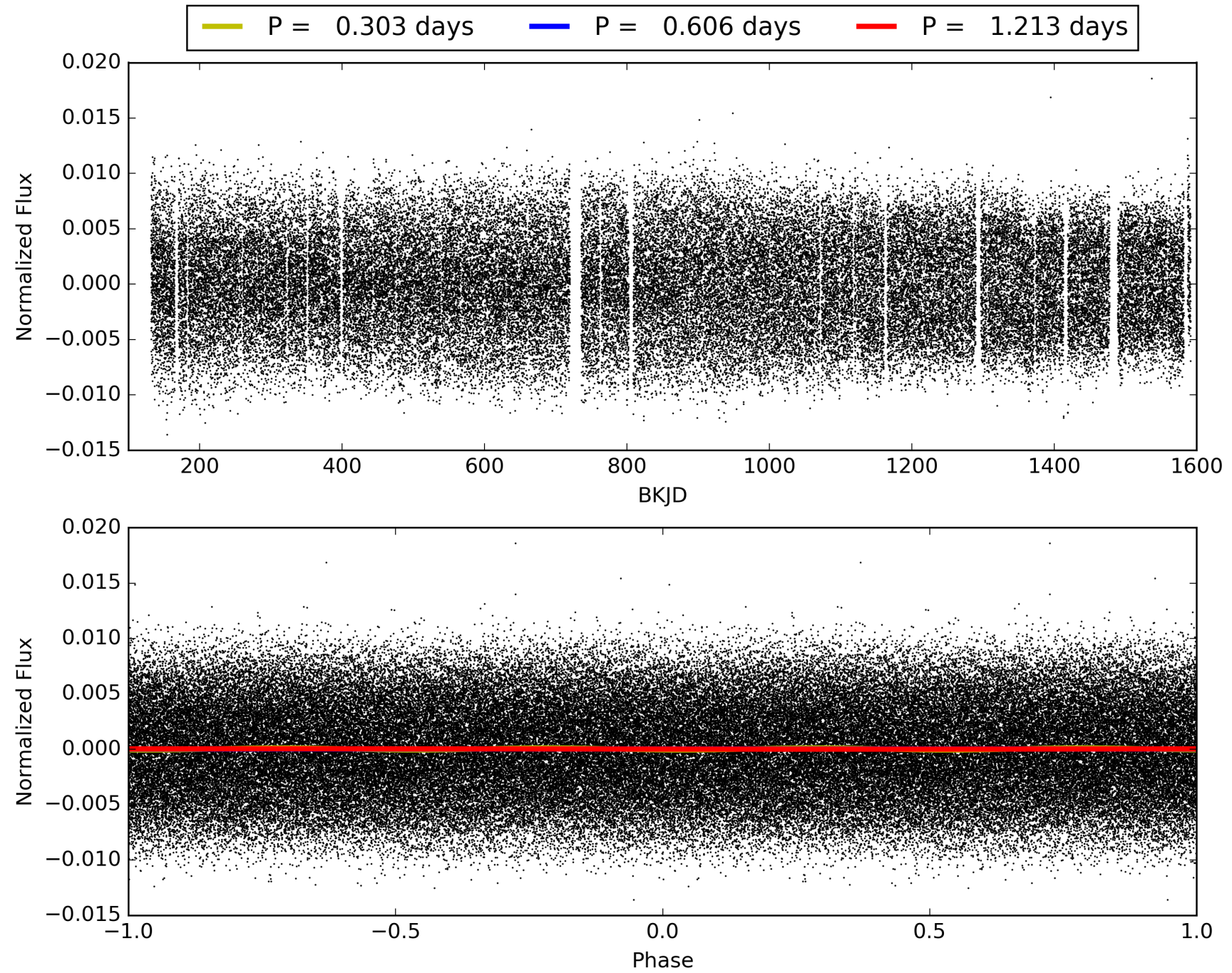
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009245855-01, PDC Light Curves





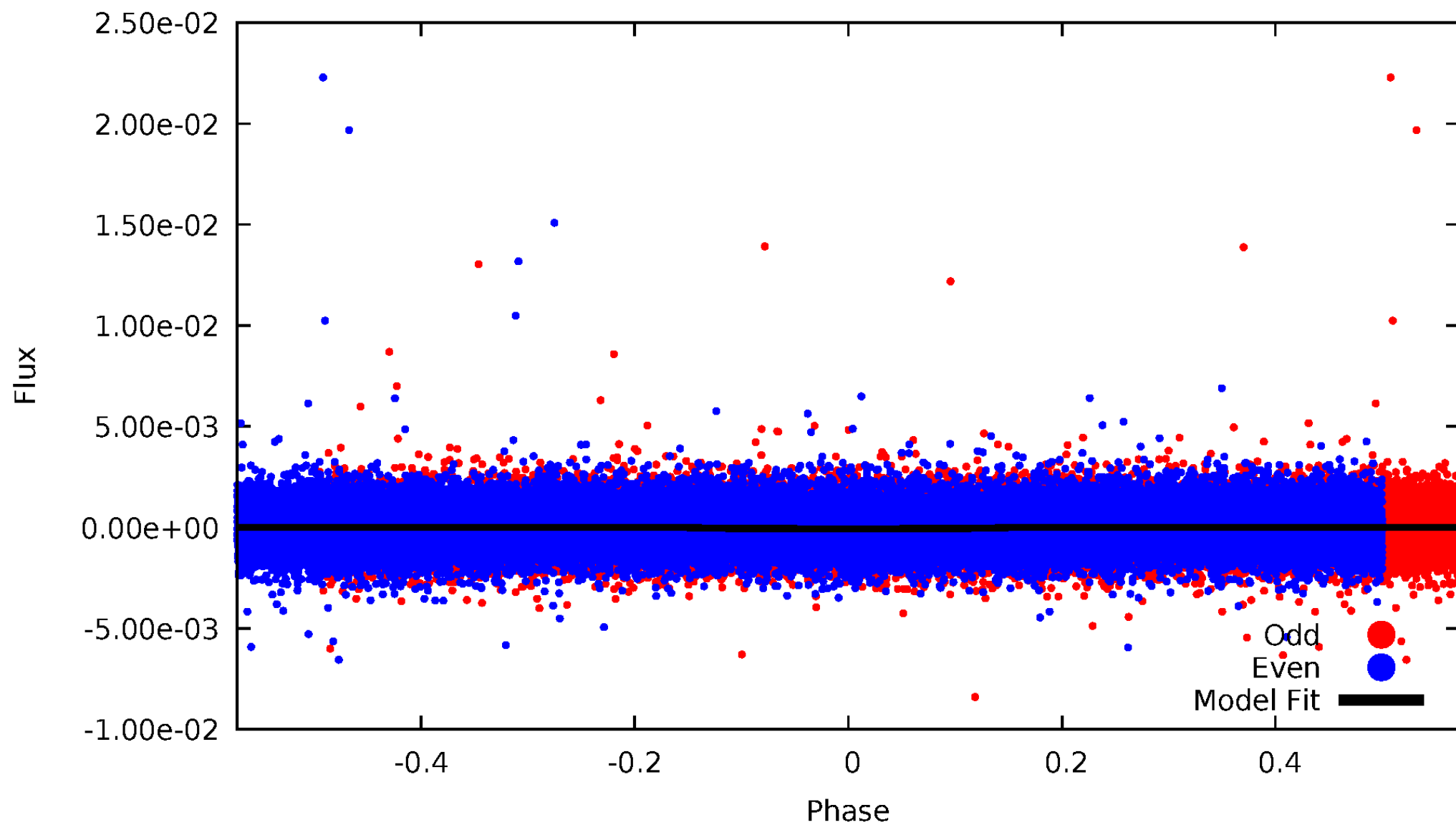
TCE 009245855-01





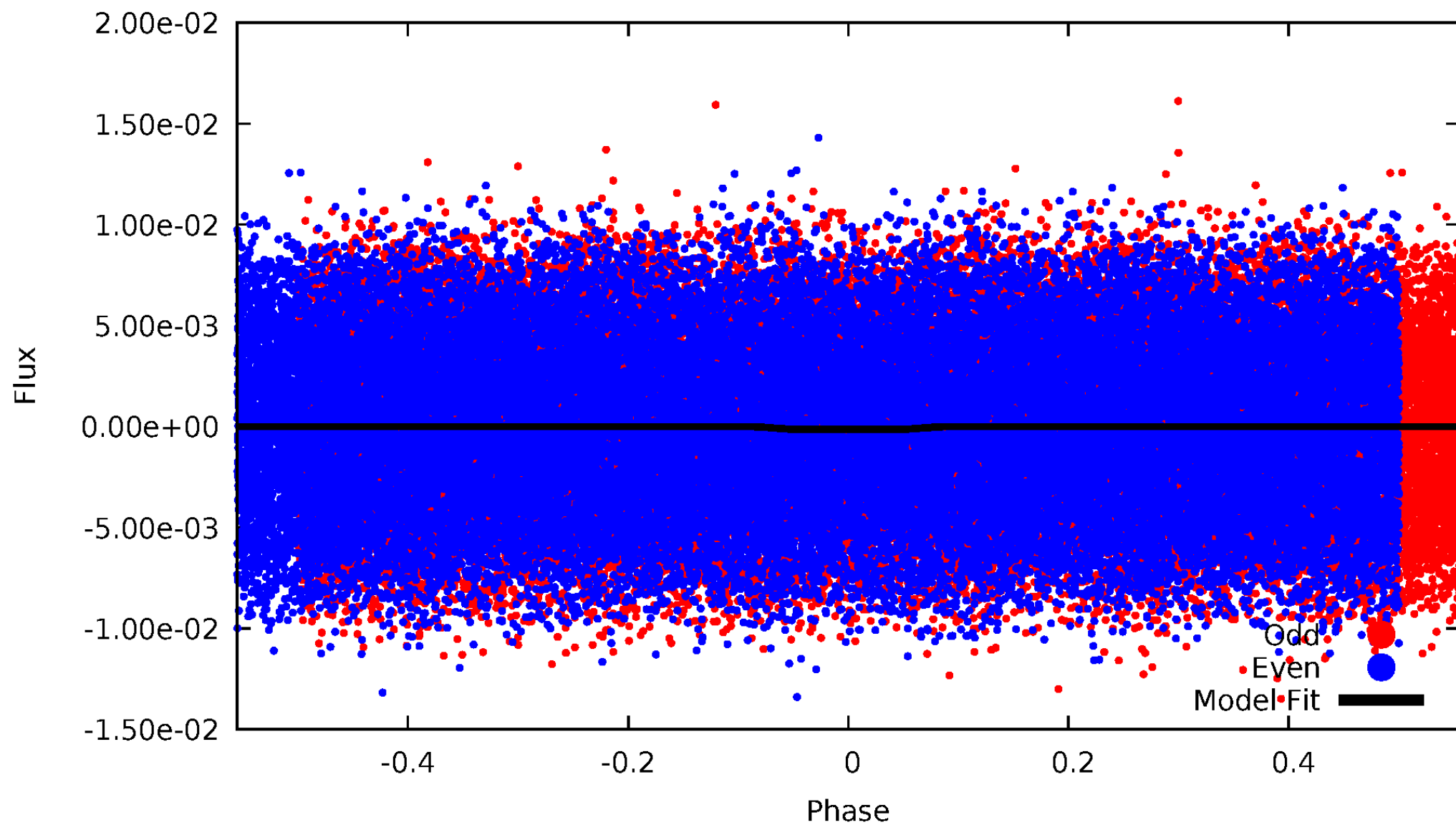
# DV Odd/Even

TCE 009245855-01



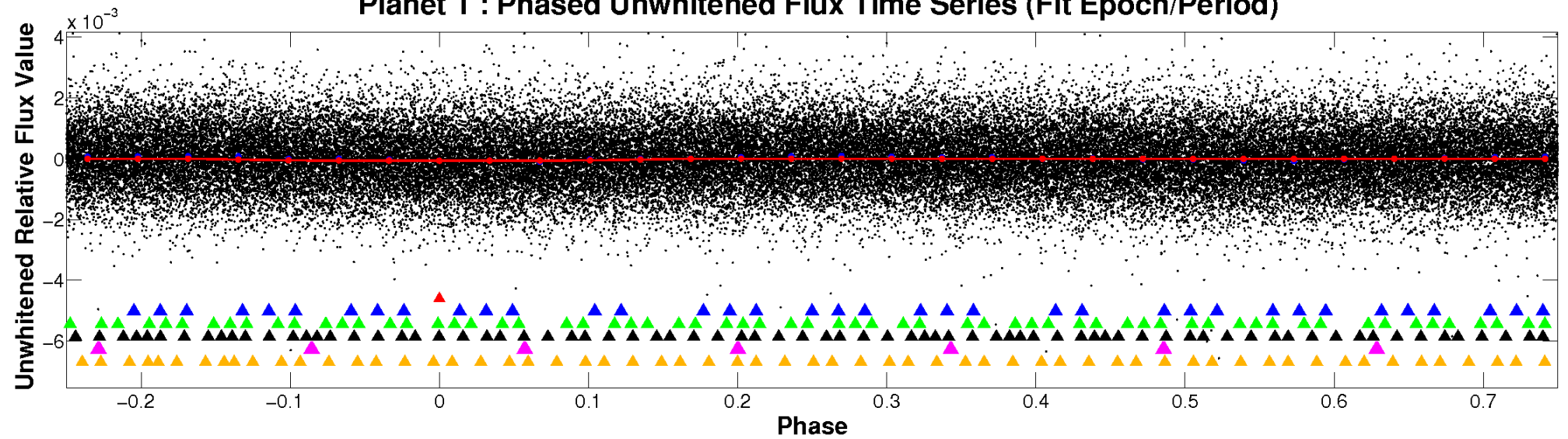
# ALT Odd/Even

TCE 009245855-01

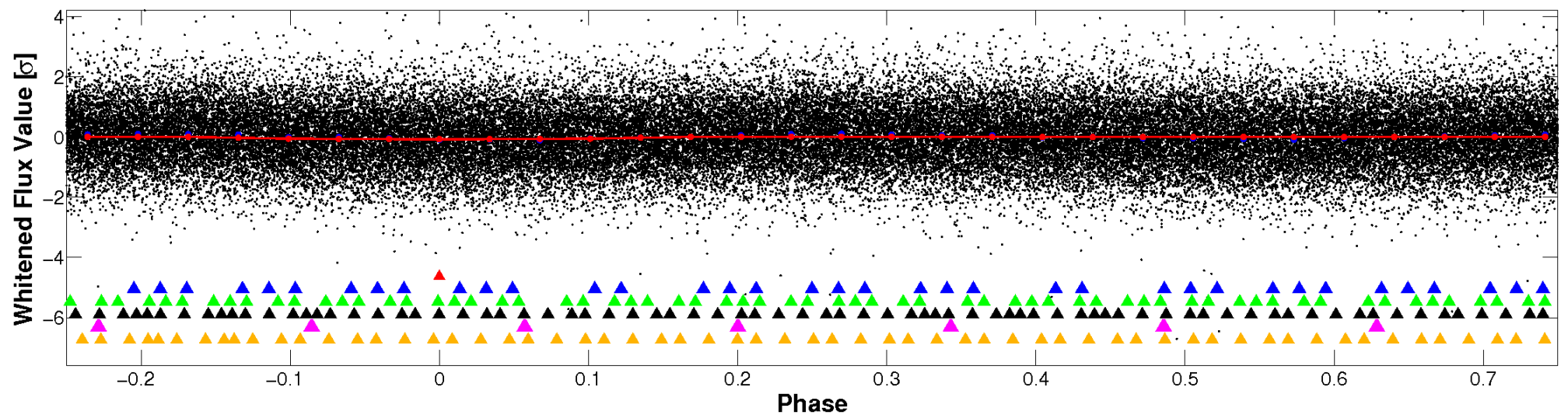


# Non-Whitened Vs. Whitened Light Curve

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



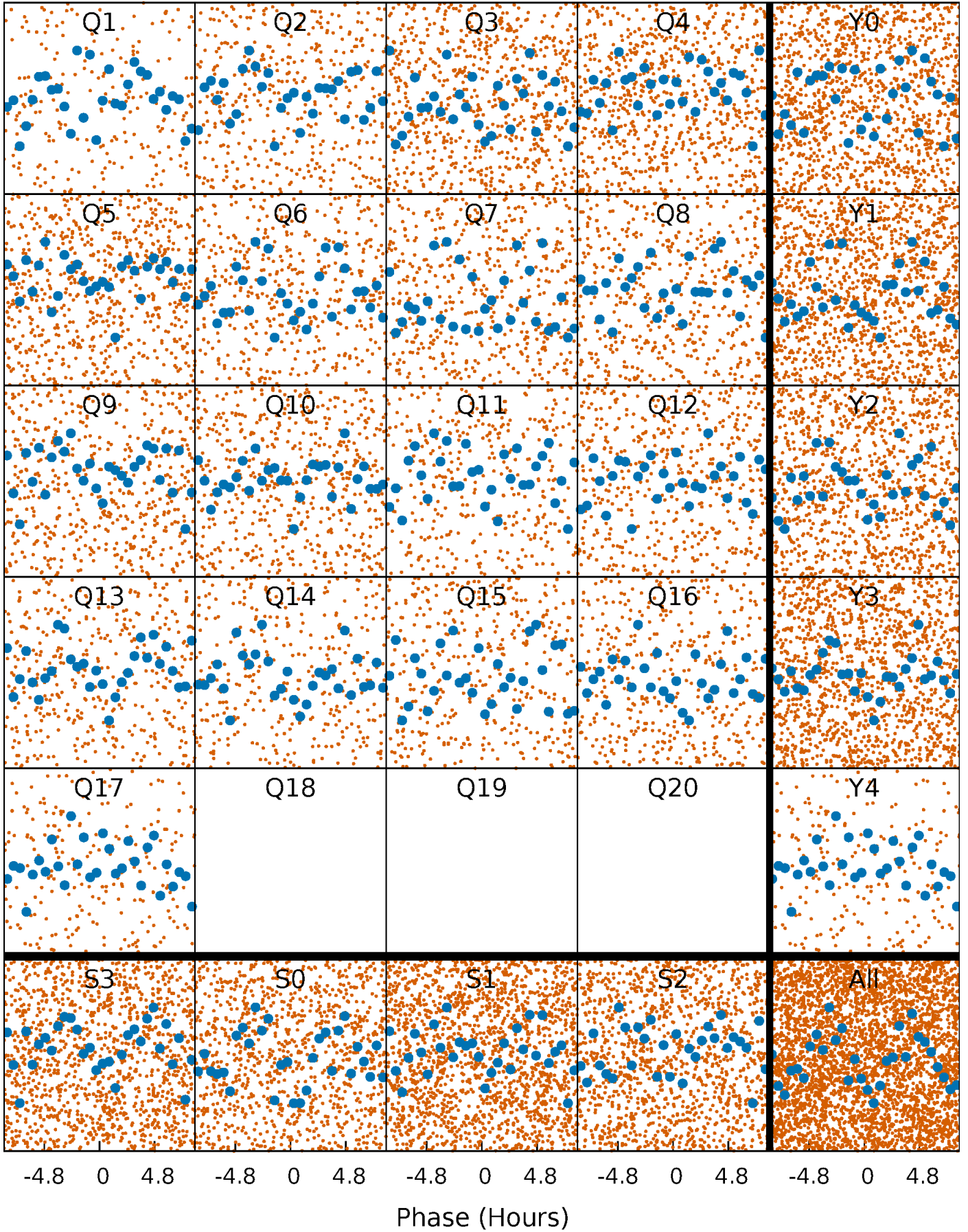
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





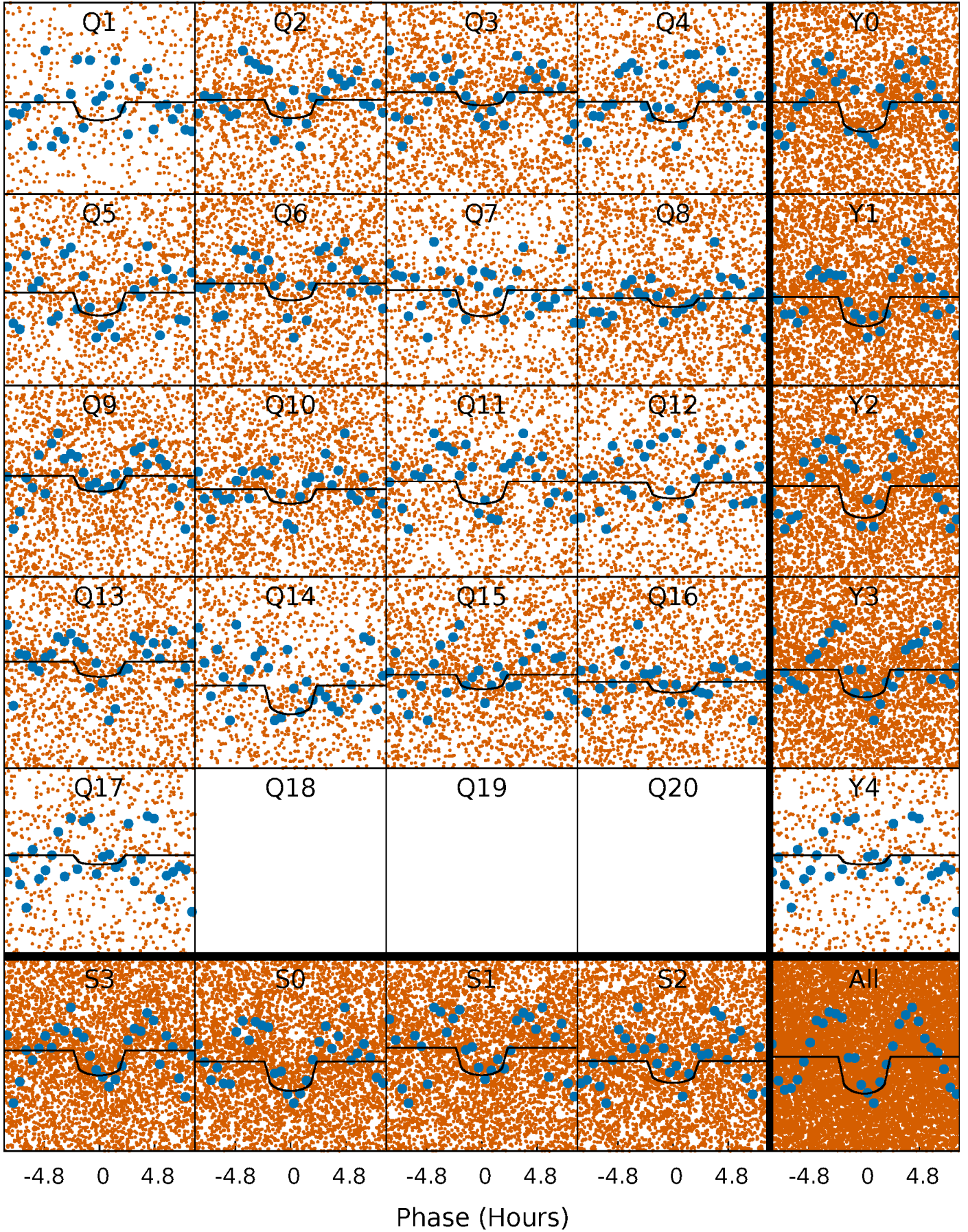
# PDC Quarter-Phased Transit Curves

TCE 009245855-01   P= 0.606308 Days    $T_0=131.936718$  (BKJD)



# DV Quarter-Phased Transit Curves

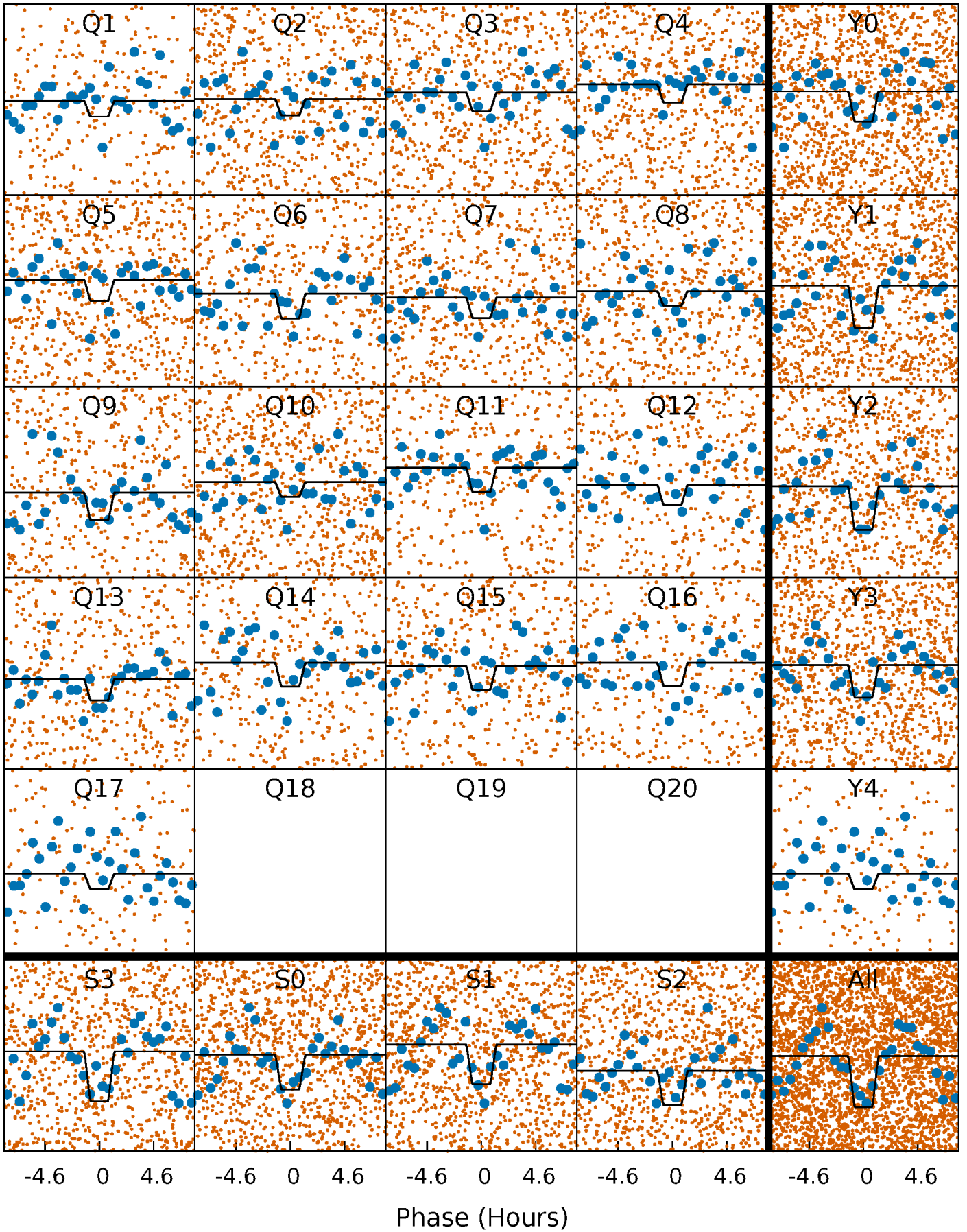
TCE 009245855-01 P= 0.606308 Days  $T_0=131.936718$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009245855-01 P= 0.606331 Days  $T_0=131.930941$  (BKJD)

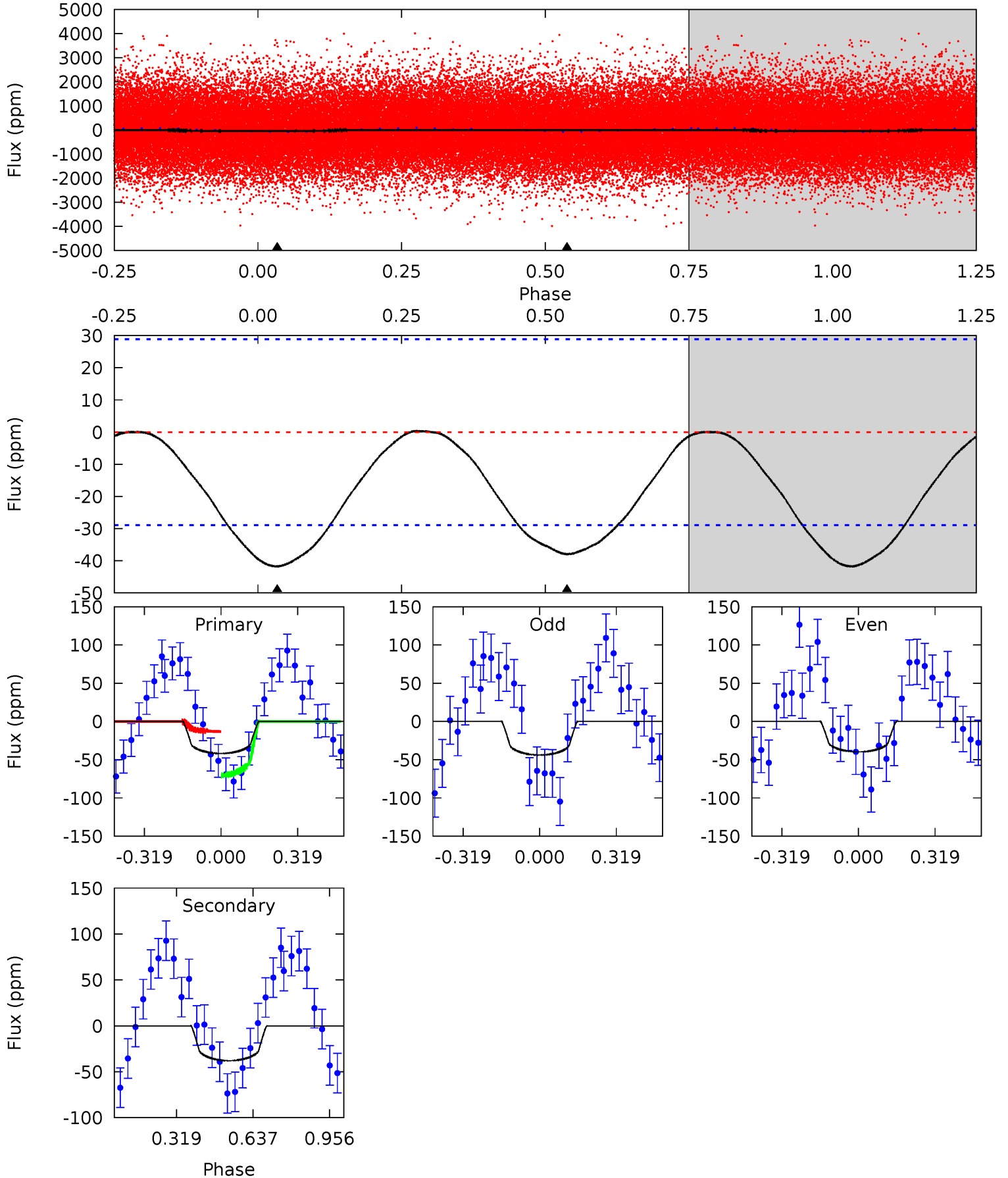




# DV Model-Shift Uniqueness Test

009245855-01, P = 0.606308 Days, E = 131.330410 Days

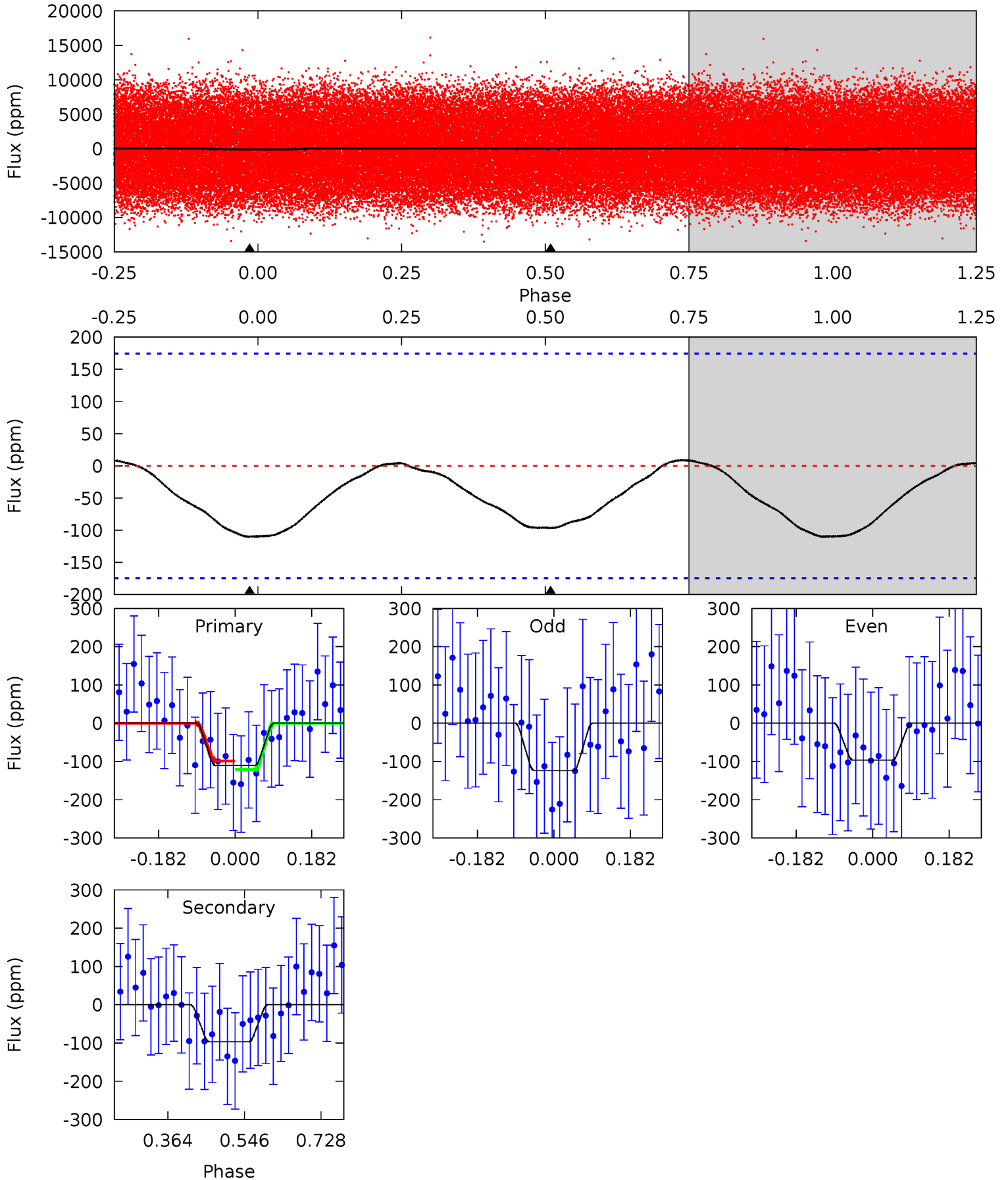
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.24	5.67	0	0	4.32	1.00	0.03	6.24	6.24	5.67	5.67	0.31	1.01	0.01	4.22



# Alt Model-Shift Uniqueness Test

009245855-01, P = 0.606331 Days, E = 131.324610 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
2.80	2.46	0	0	4.44	1.33	0.19	2.80	2.80	2.46	2.46	0.35	0.99	0.07	0.28



### Stellar Parameters For KIC 009245855

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+214}_{-295}$	$4.361^{+0.081}_{-0.189}$	$-0.080^{+0.250}_{-0.300}$	$1.207^{+0.371}_{-0.159}$	$1.226^{+0.168}_{-0.187}$	$0.982^{+0.342}_{-0.489}$
	+3%/-4%	+2%/-4%	+312%/-375%	+31%/-13%	+14%/-15%	+35%/-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 009245855-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-38 \pm 7$	$1.51^{+1.27}_{-0.93}$	$3696^{+275}_{-233}$	$4824^{+3161}_{-1335}$	$1.986^{+12.364}_{-1.403}$
Alt.	$-97 \pm 39$	$1.92^{+1.41}_{-1.22}$	$3689^{+254}_{-226}$	$5340^{+4071}_{-1394}$	$3.121^{+16.911}_{-2.217}$

$T_{max}$  = 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

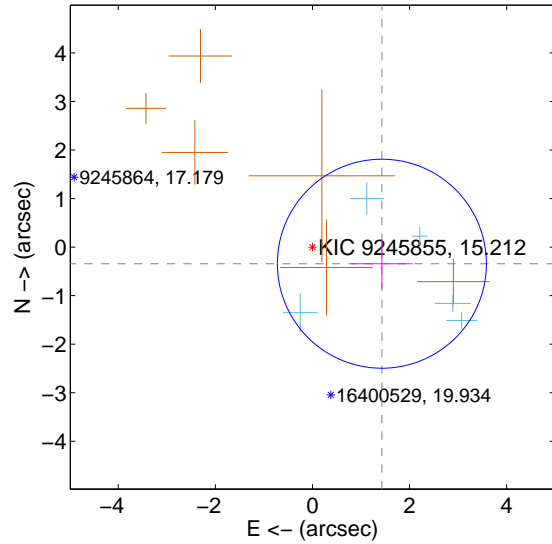
Supplemental centroid analysis for 009245855-01. Kepler magnitude: 15.21. Transit SNR 7.93

There are 5 quarters with good PRF difference image offsets

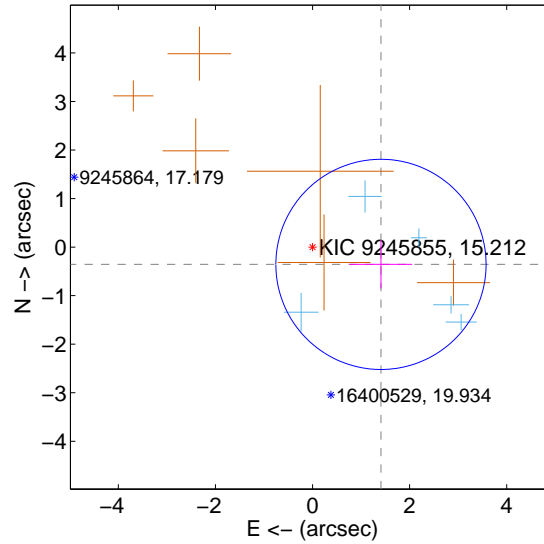
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.471 \pm 0.718$	2.05	$-1.431 \pm 0.635$	$-0.342 \pm 0.509$
PRF-fit source offset from KIC position	$1.454 \pm 0.722$	2.01	$-1.410 \pm 0.643$	$-0.356 \pm 0.493$
photometric centroid source offset	$1.29 \pm 0.96$	1.35	$1.21 \pm 0.94$	$0.45 \pm 1.03$

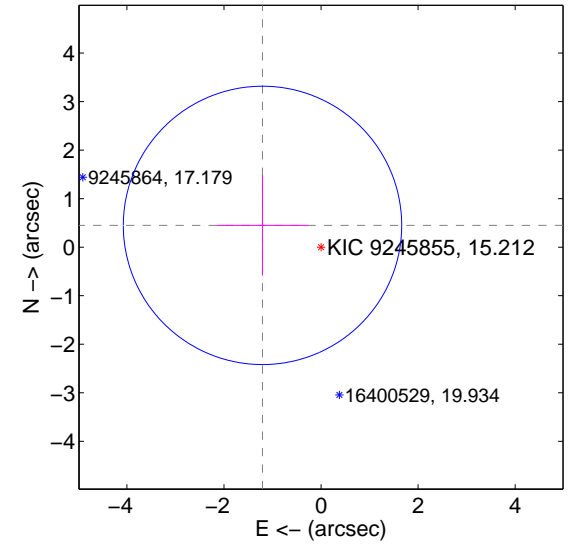
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

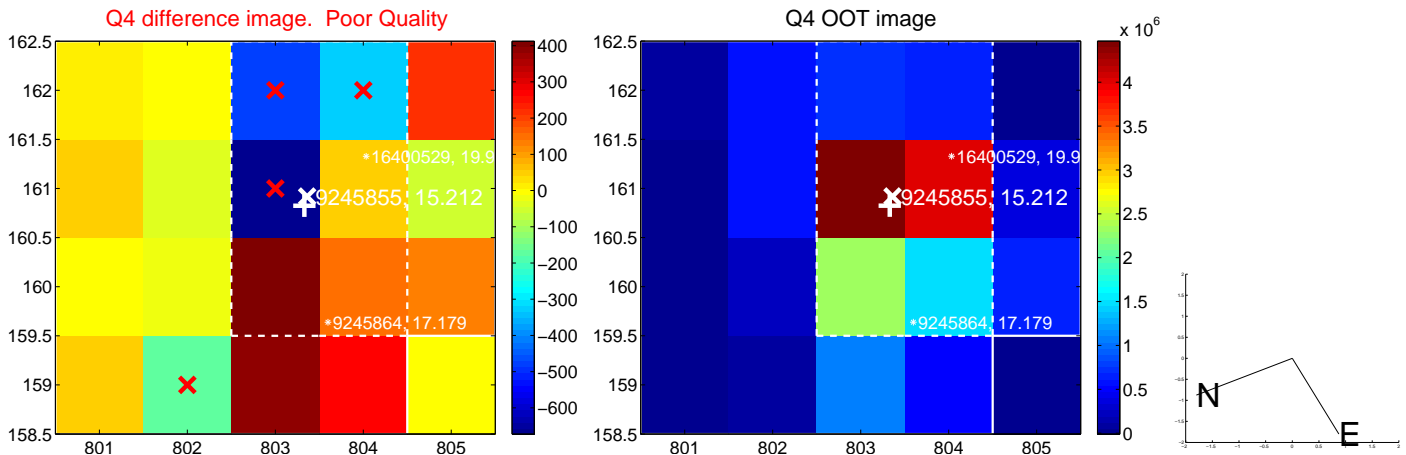
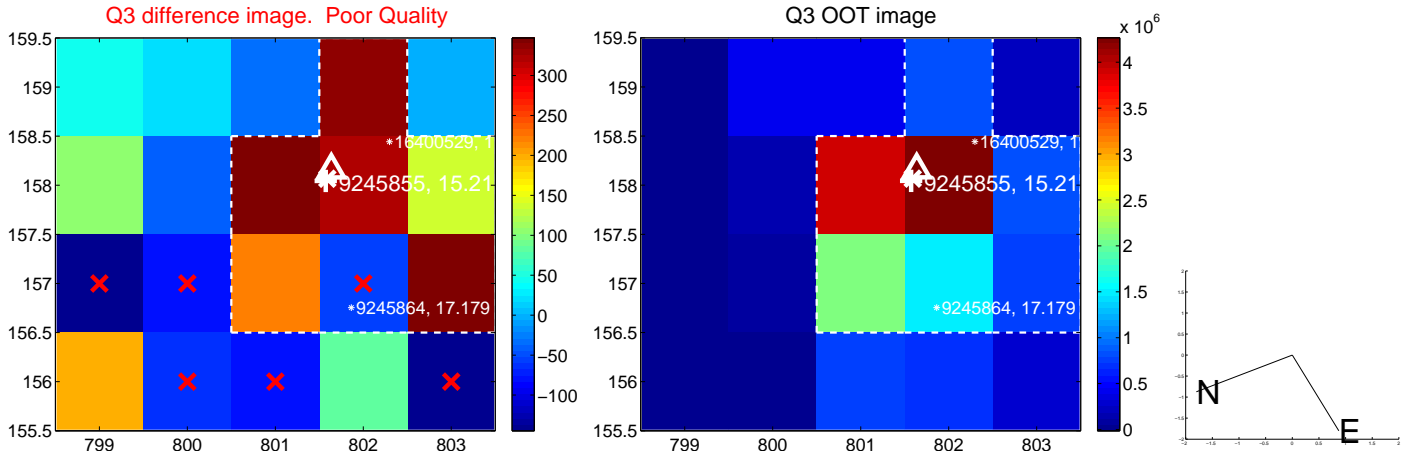
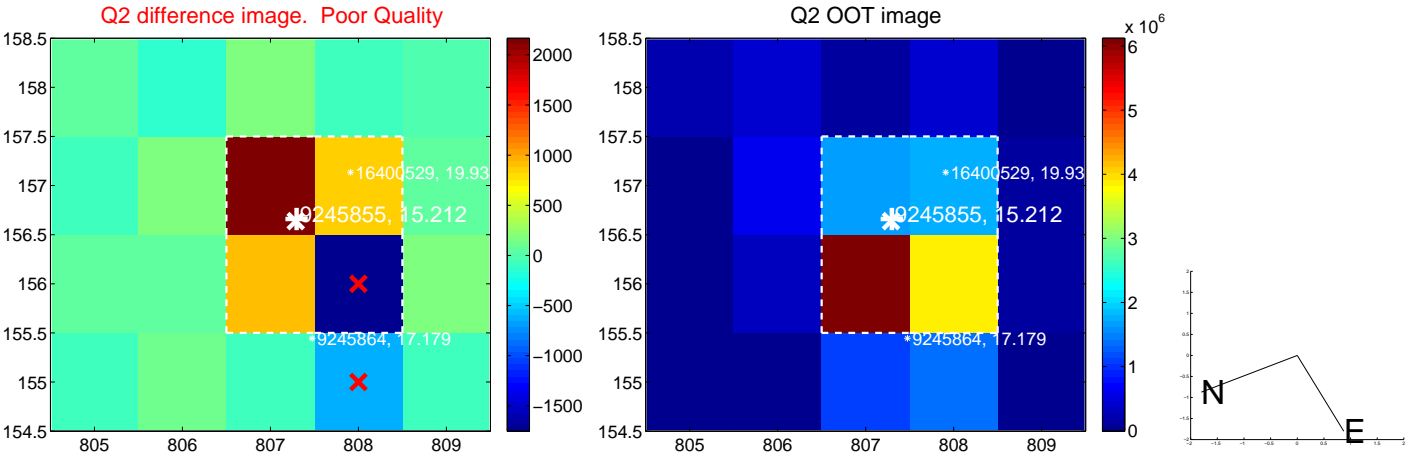
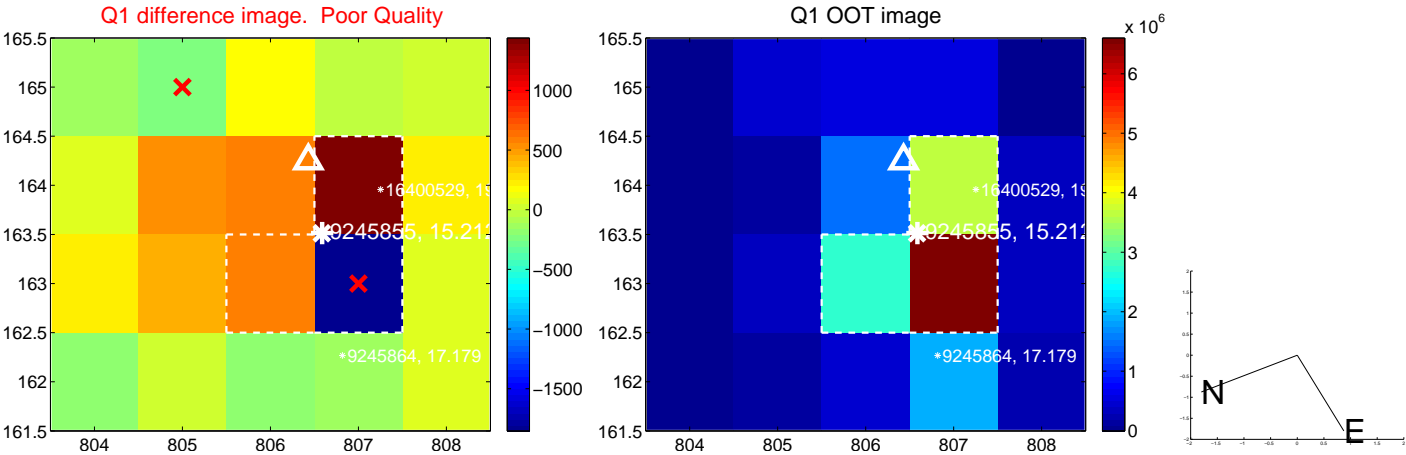


offset from photometric centroids

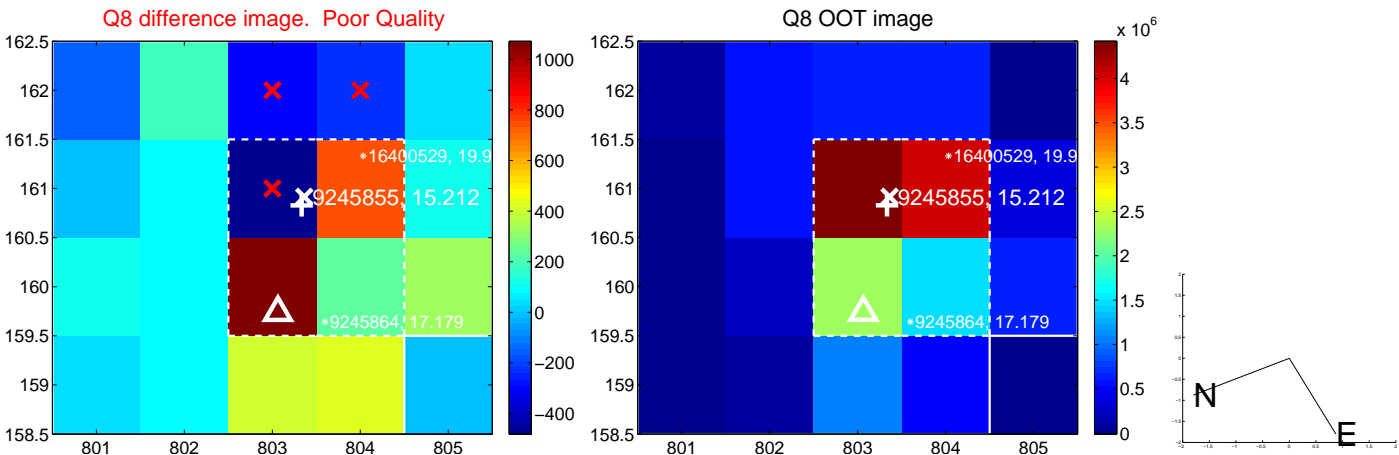
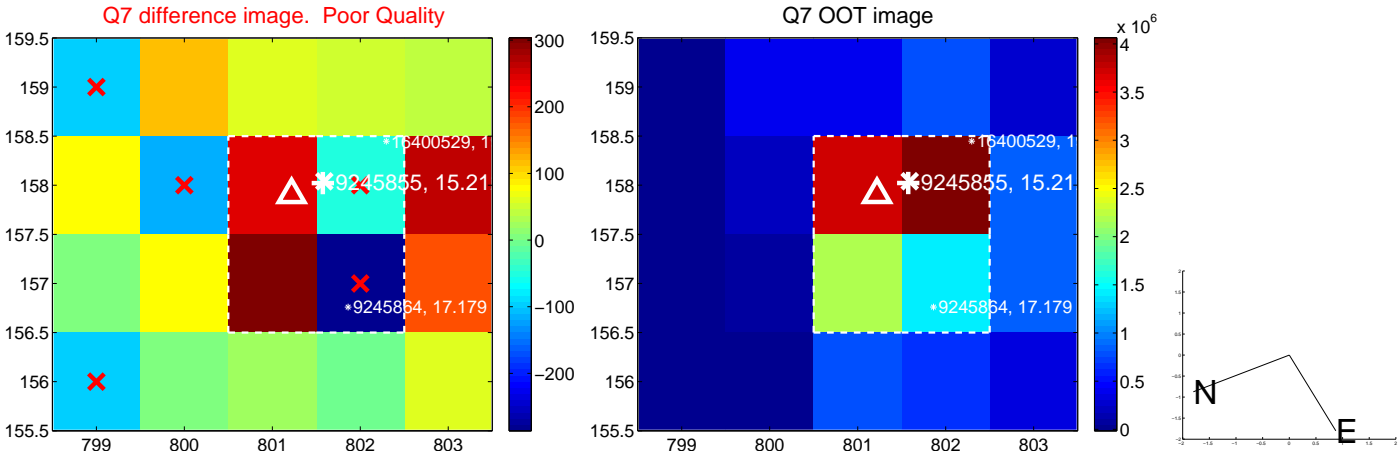
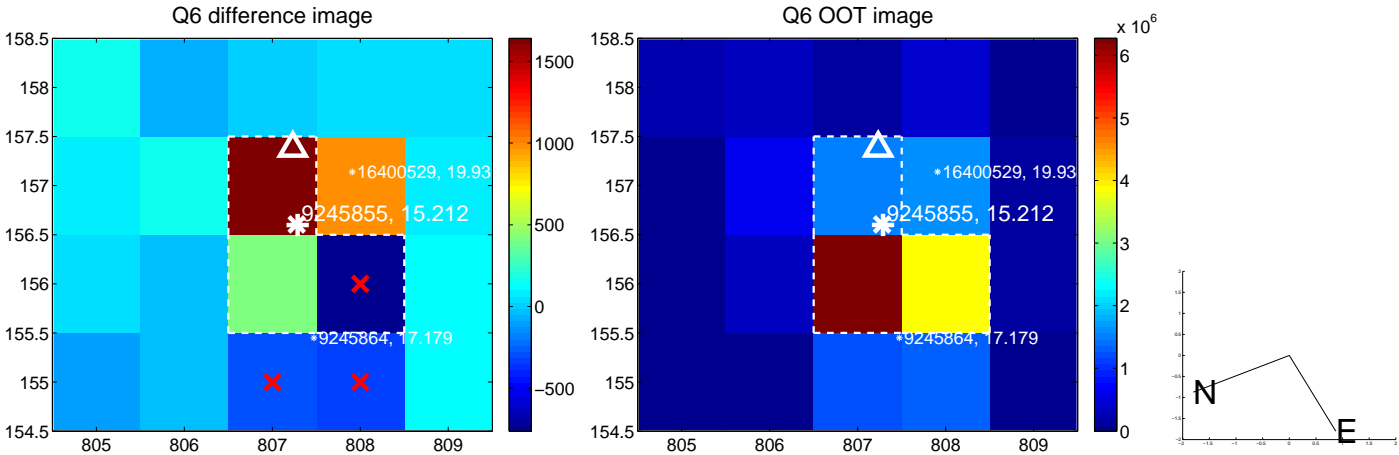
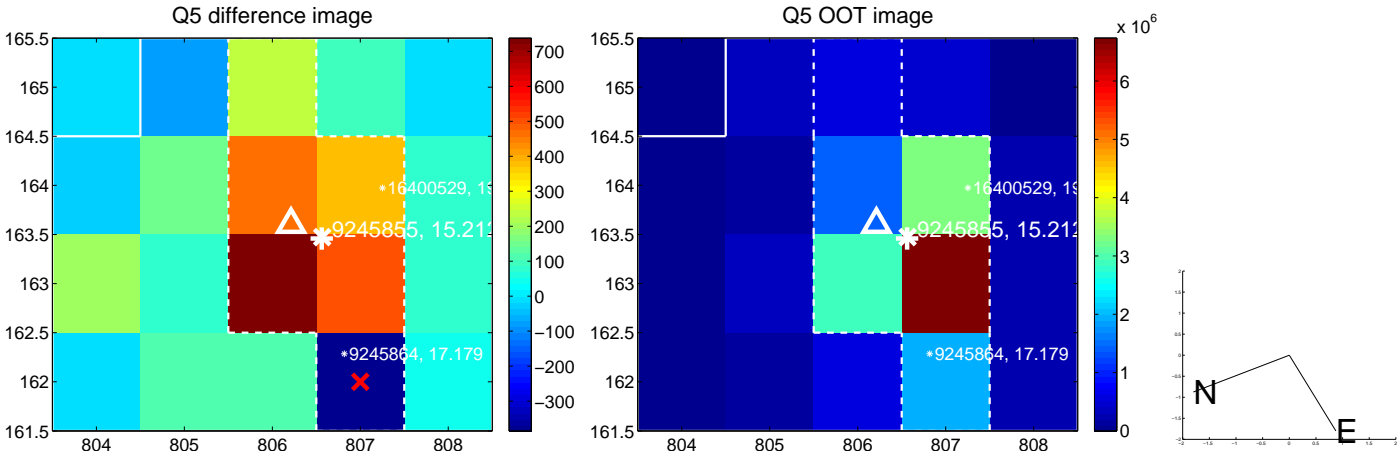


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

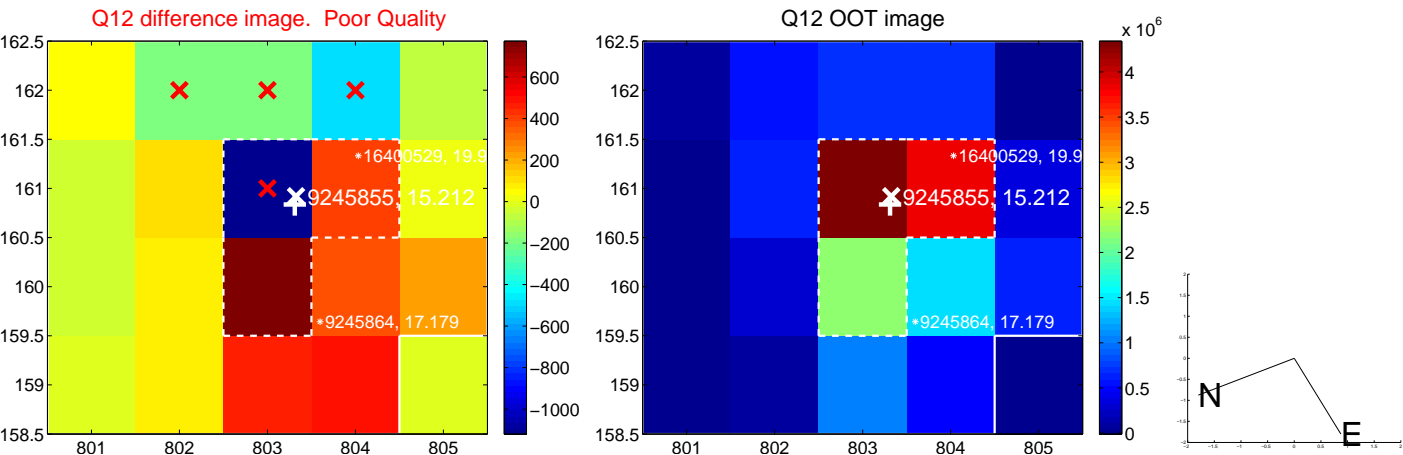
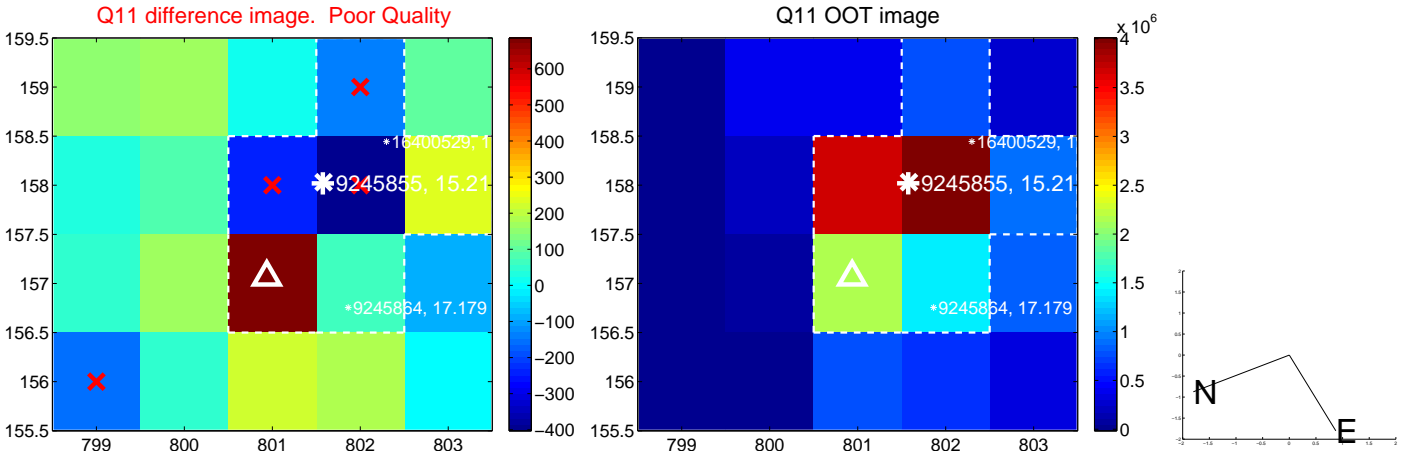
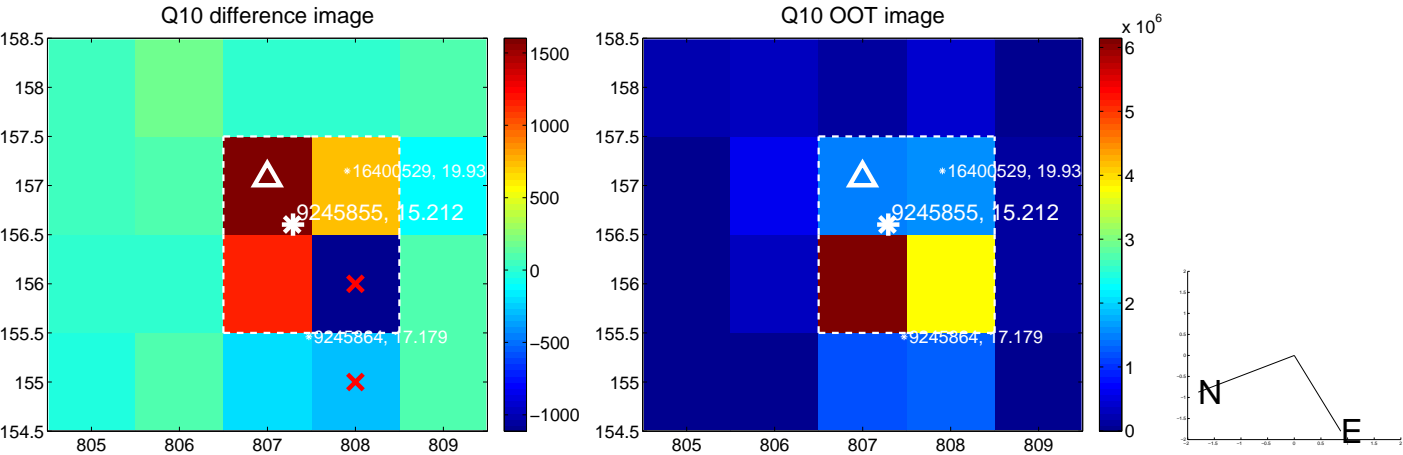
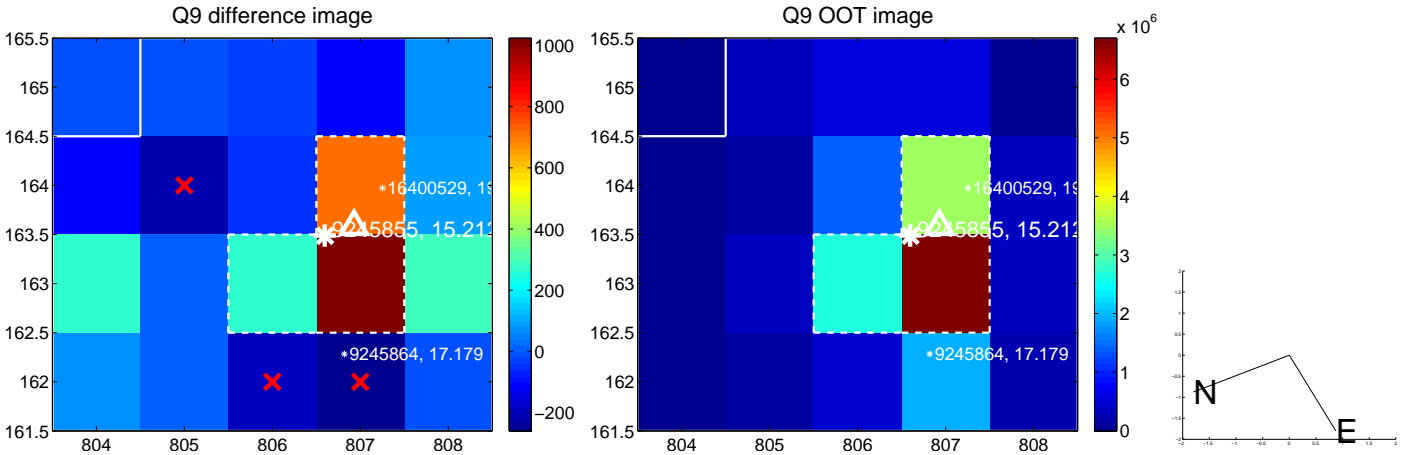


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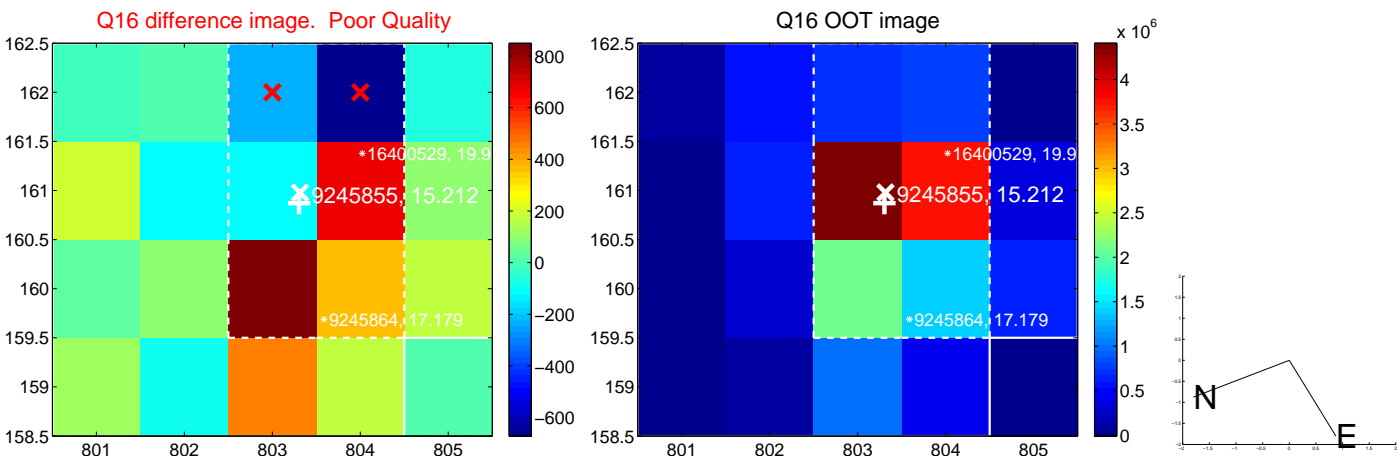
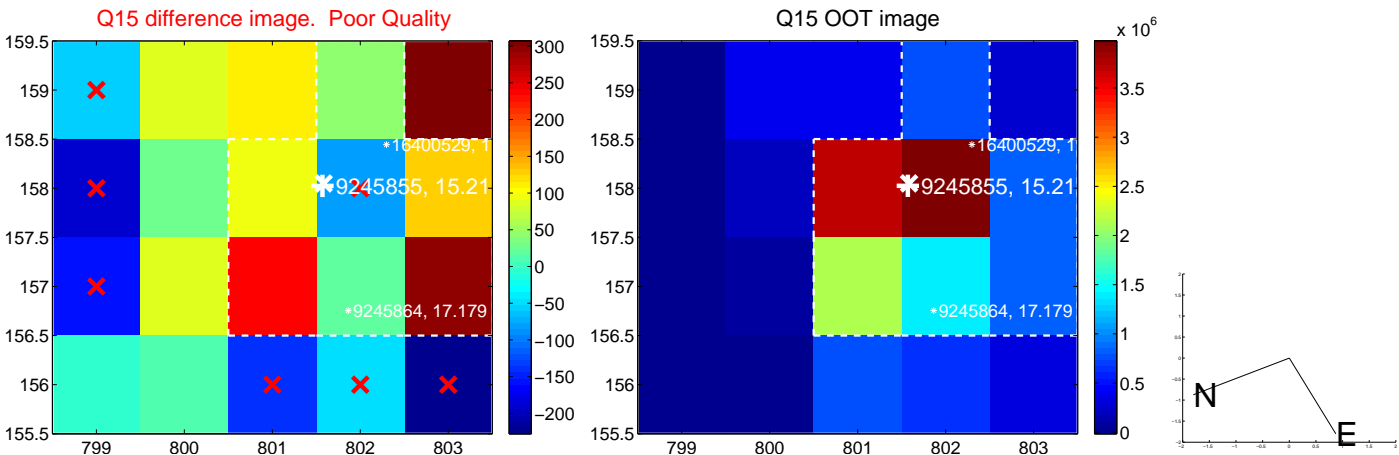
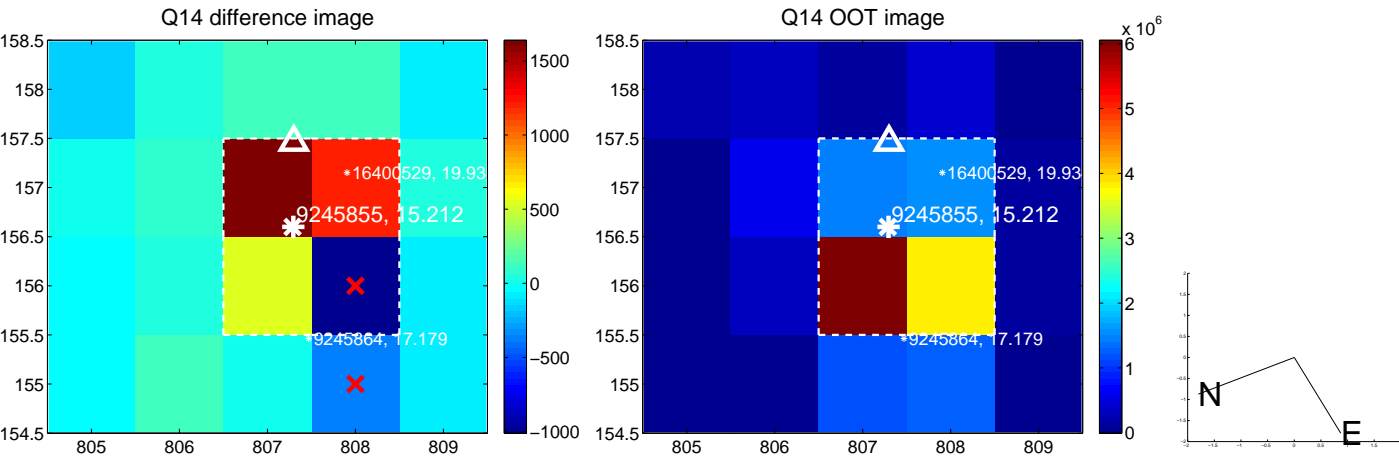
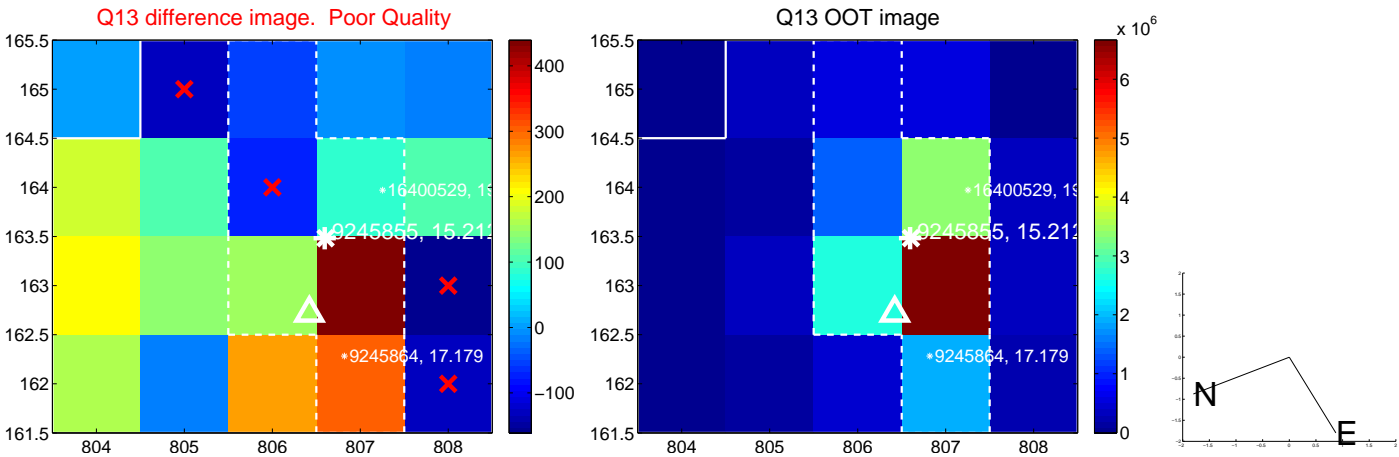




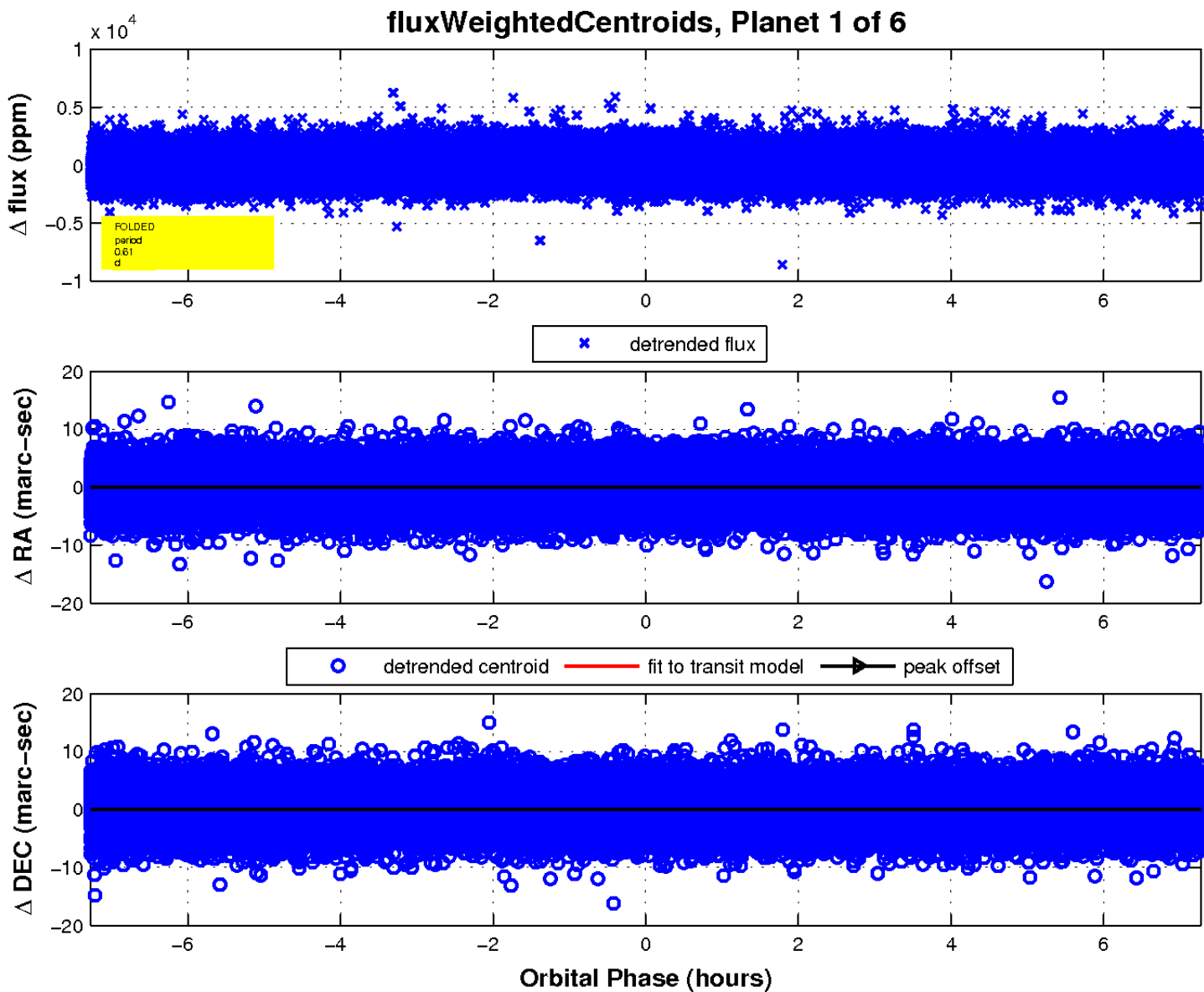
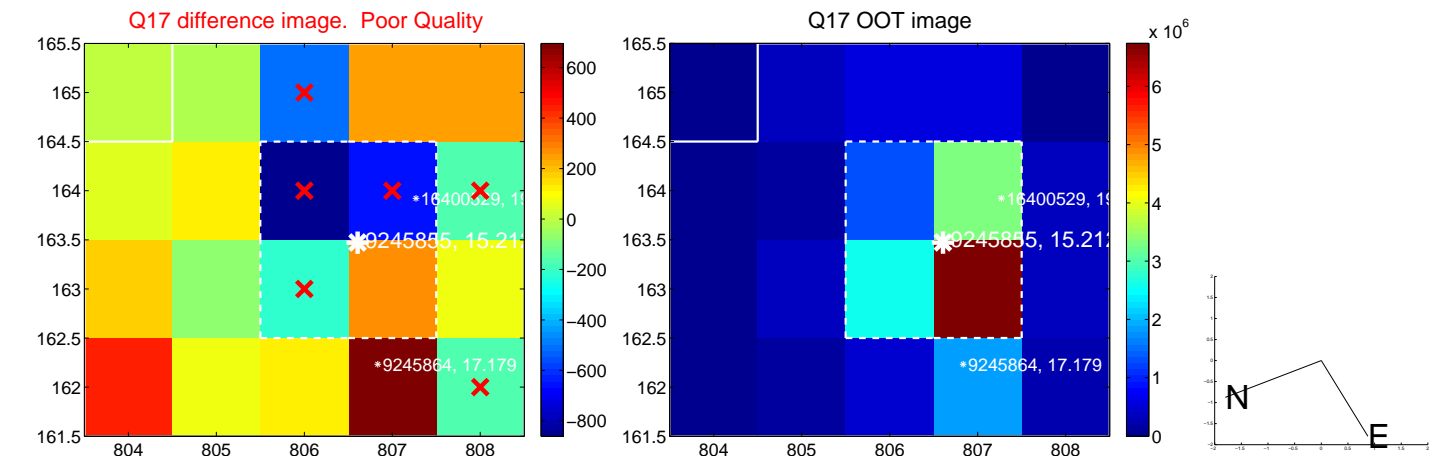
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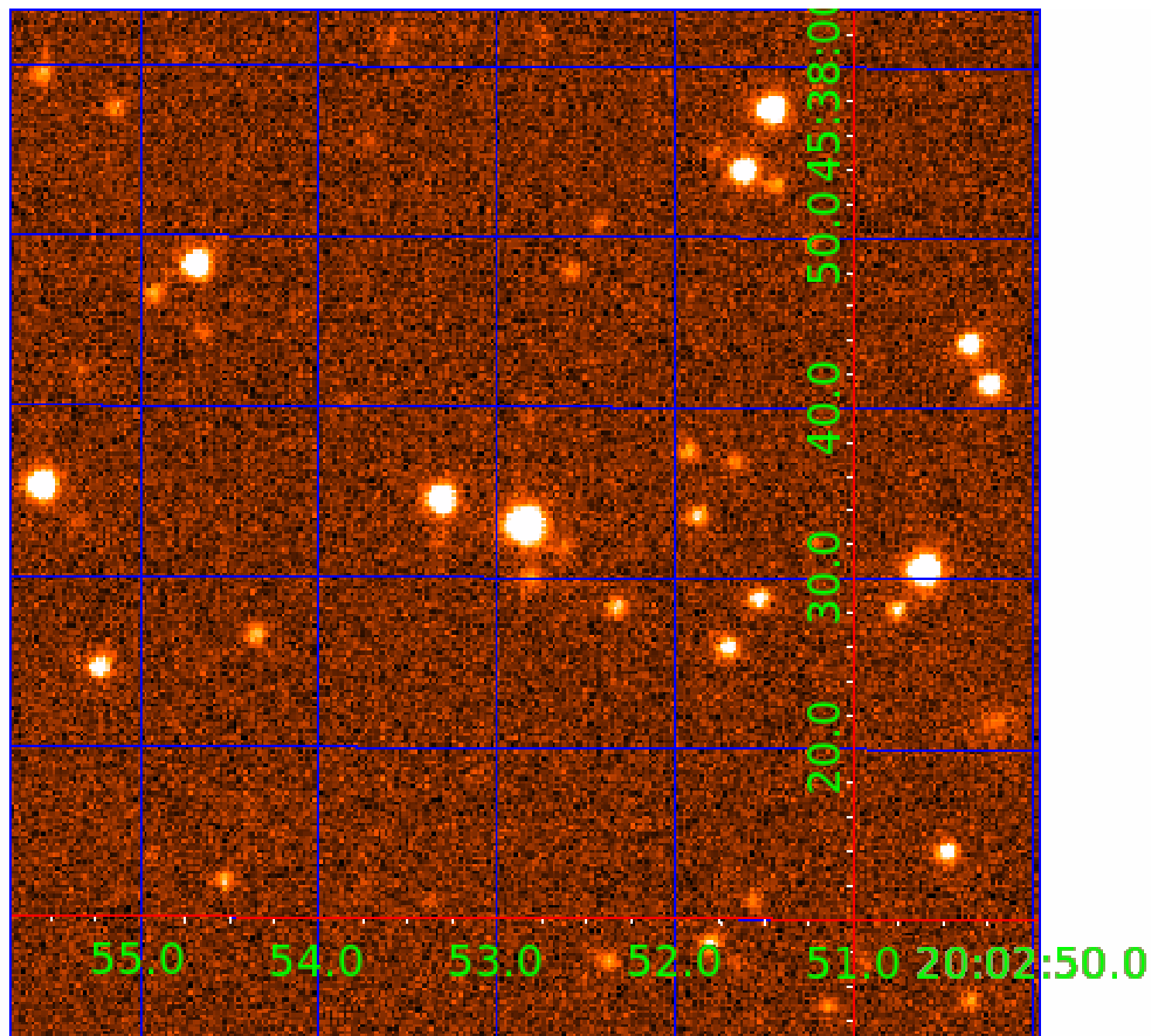


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UKIRT Image

Declination



# KIC 009245855

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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.

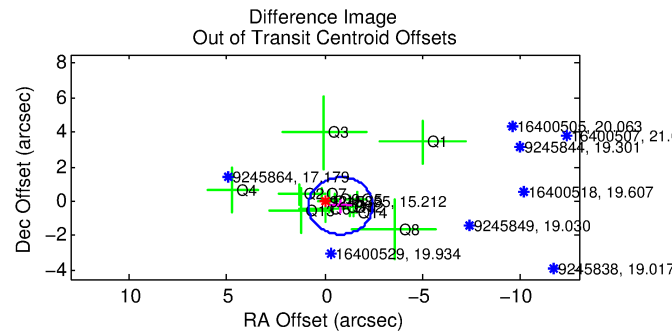
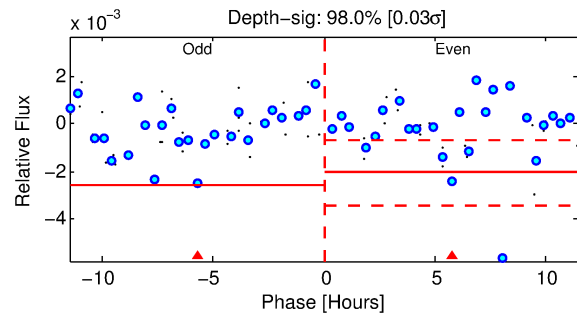
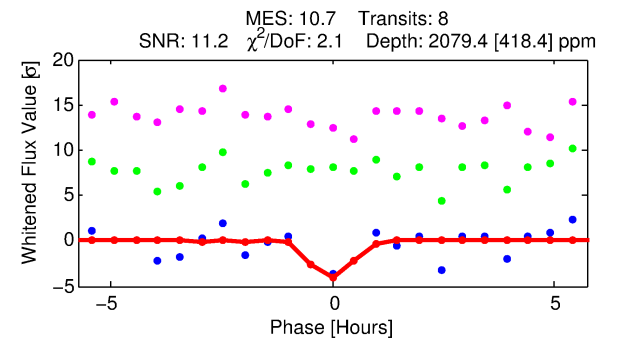
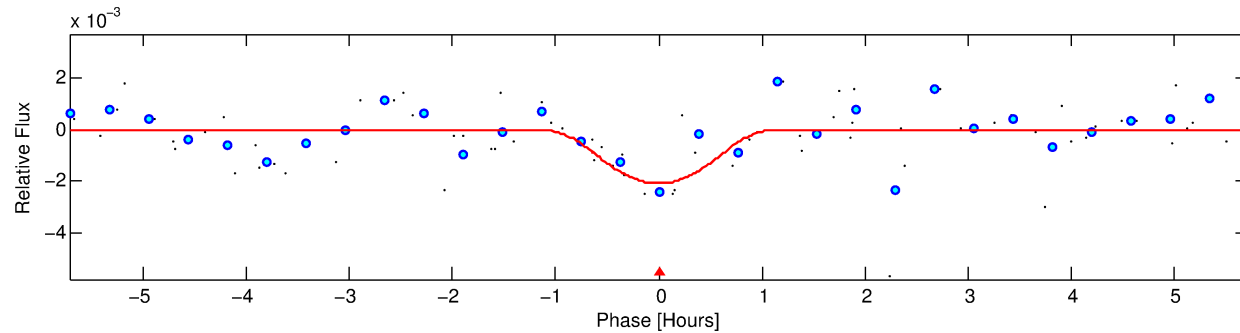
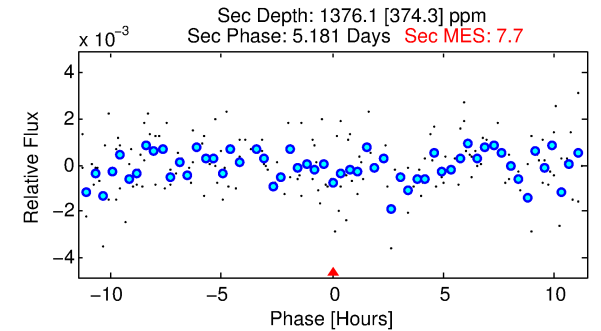
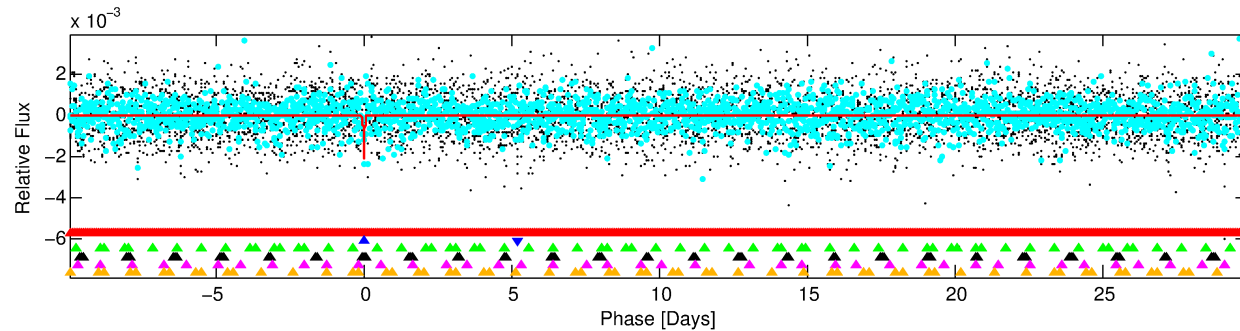
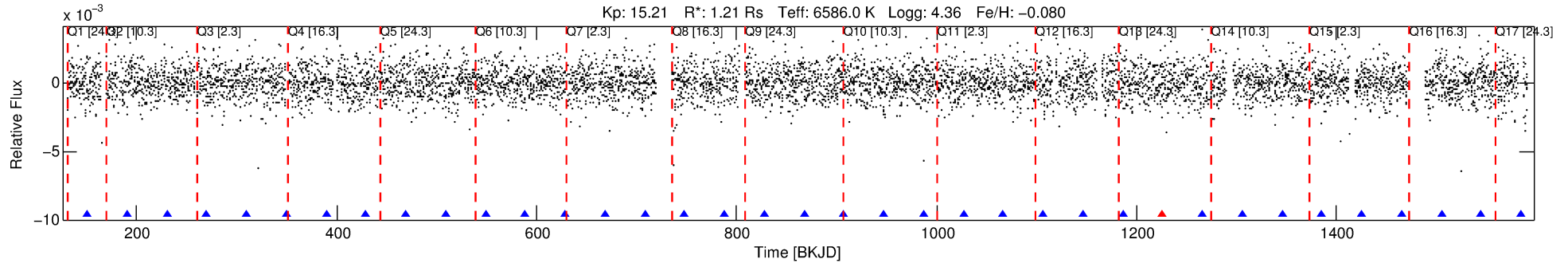
## Ephemeris Match Information For 009245855-02

No Significant Match Found



# DV One-Page Summary

KIC: 9245855 Candidate: 2 of 6 Period: 39.829 d



## DV Fit Results:

Period = 39.82893 [0.00039] d  
Epoch = 150.6295 [0.0072] BKJD  
Rp/R\* = 0.0678 [0.5457]  
a/R\* = 66.22 [153.21]  
b = 0.98 [0.91]  
Seff = 41.27 [16.42]  
Teq = 646 [64] K  
Rp = 8.92 [71.93] Re  
a = 0.2440 [0.0612] AU  
Ag = 565.77 [9117.65] [0.06σ]  
Teffp = 4873 [19630] K [0.22σ]

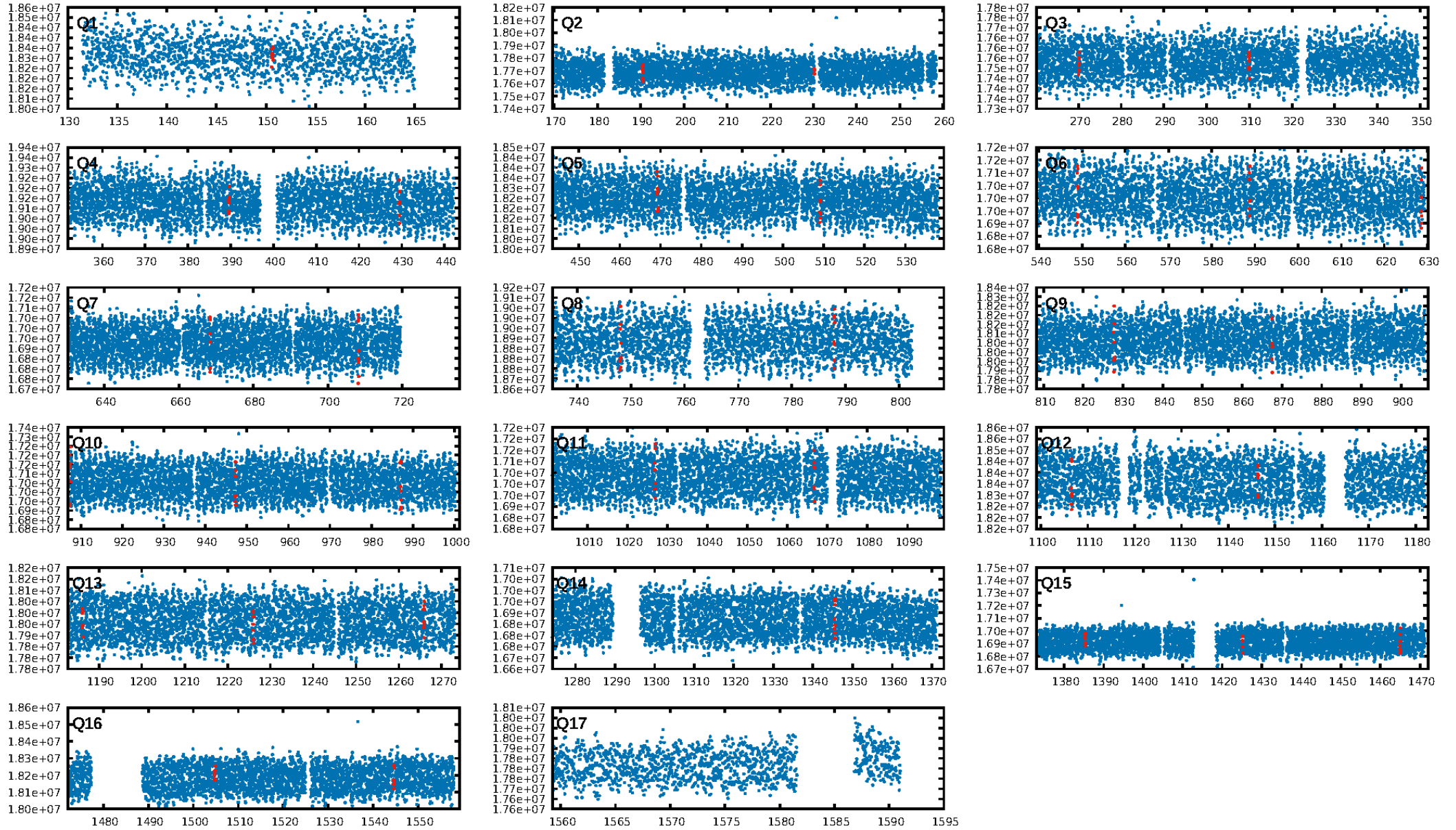
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [45.78σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 48.0%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 1.31e-08**  
RollingBand-fgt: 0.88 [7/8]  
GhostDiagnostic-chr: -0.05007  
Centroid-sig: 2.6%  
**Centroid-so: 2.147 arcsec [4.71σ]**  
OotOffset-rm: 0.845 arcsec [1.54σ]  
KicOffset-rm: 0.300 arcsec [0.48σ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 0.21 [3/14]  
DiffImageOverlap-fno: 0.00 [0/16]

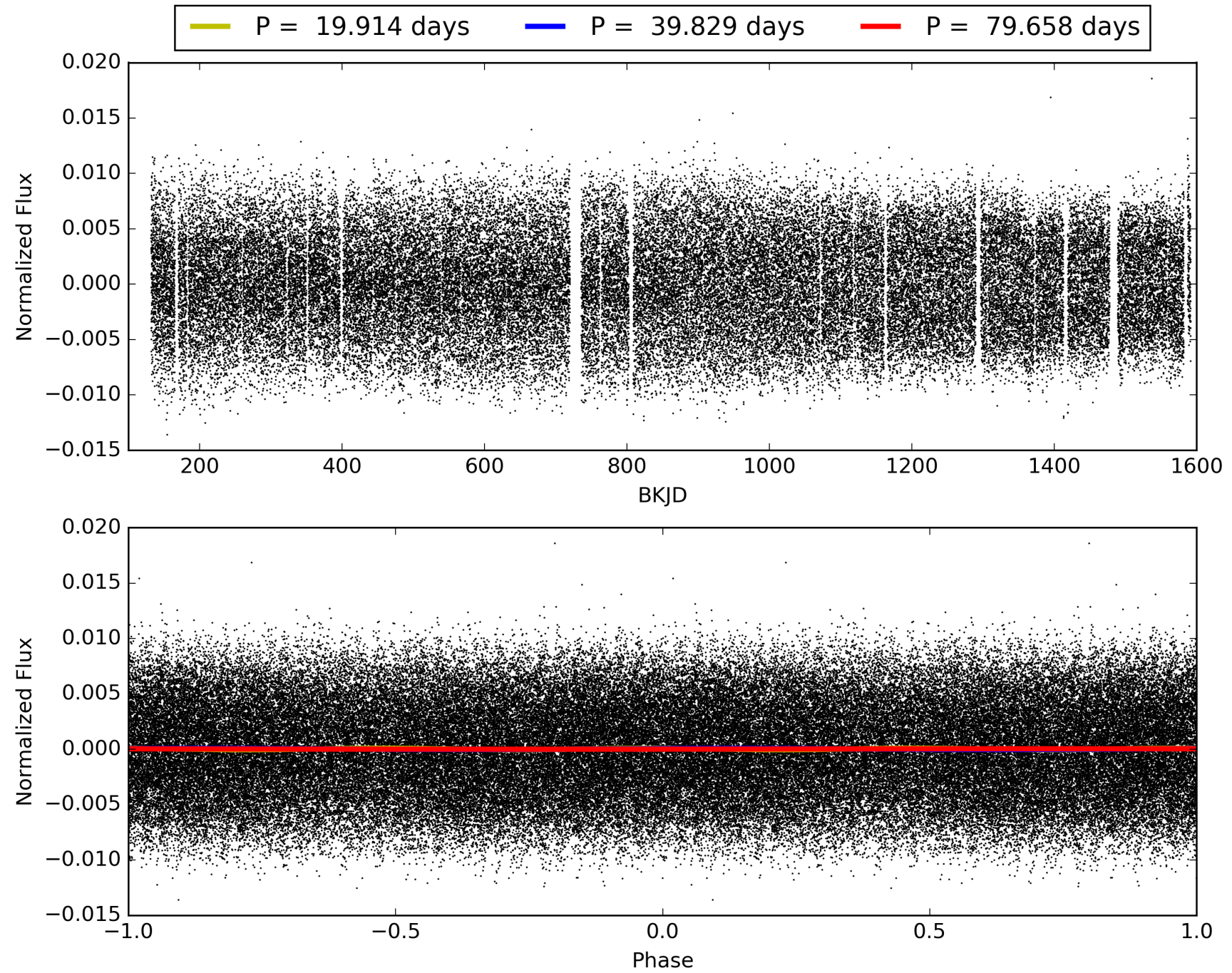
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:59:56 Z

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

# TCE 009245855-02, PDC Light Curves

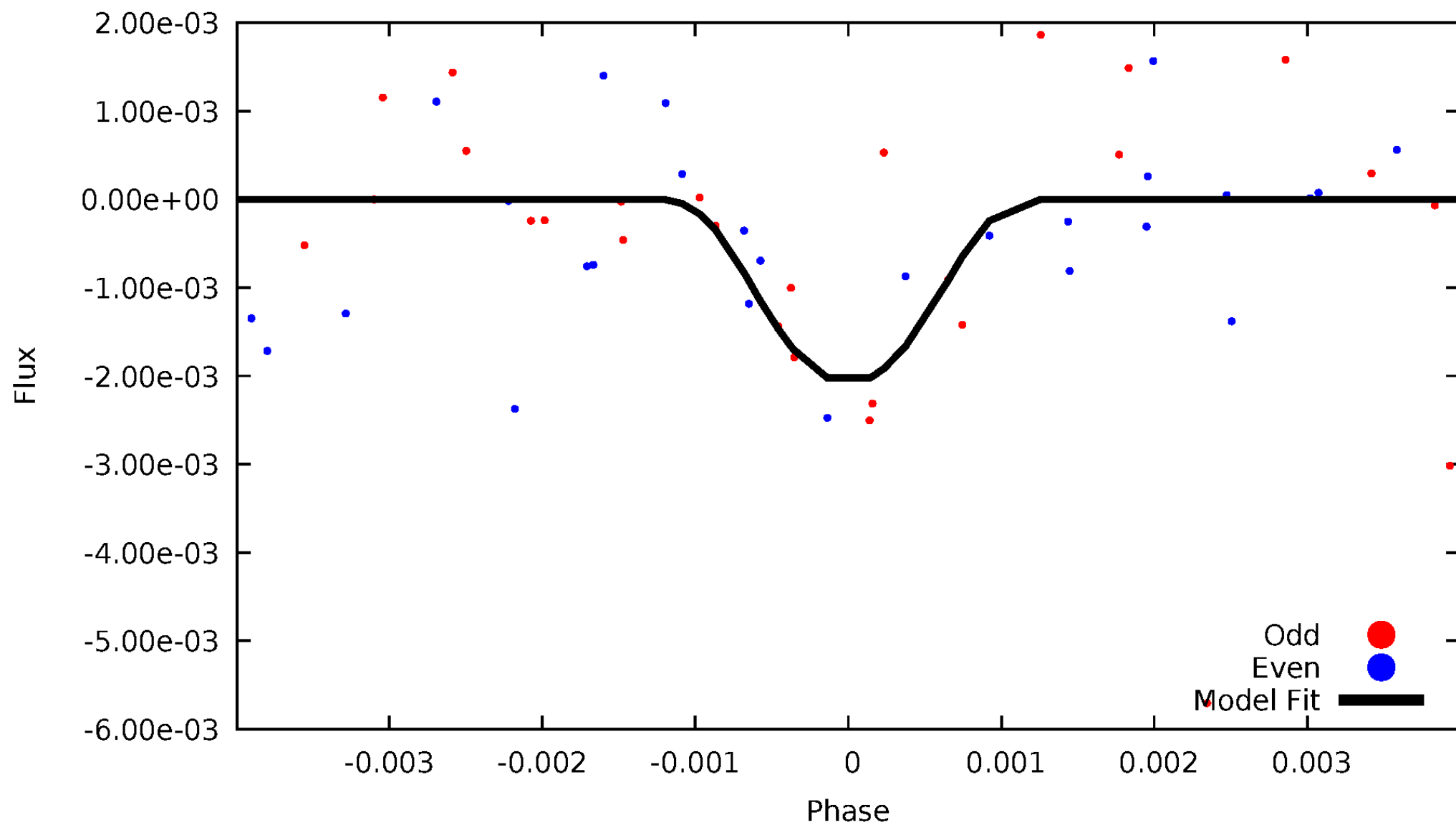


# TCE 009245855-02



# DV Odd/Even

TCE 009245855-02





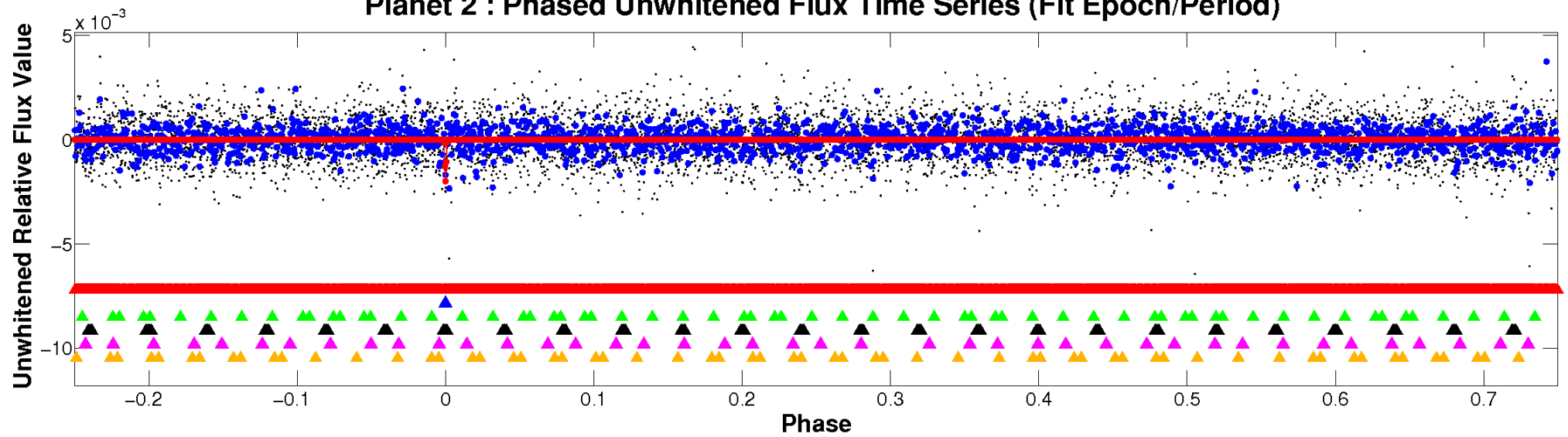
ALT Odd/Even

This plot does not exist for this TCE.

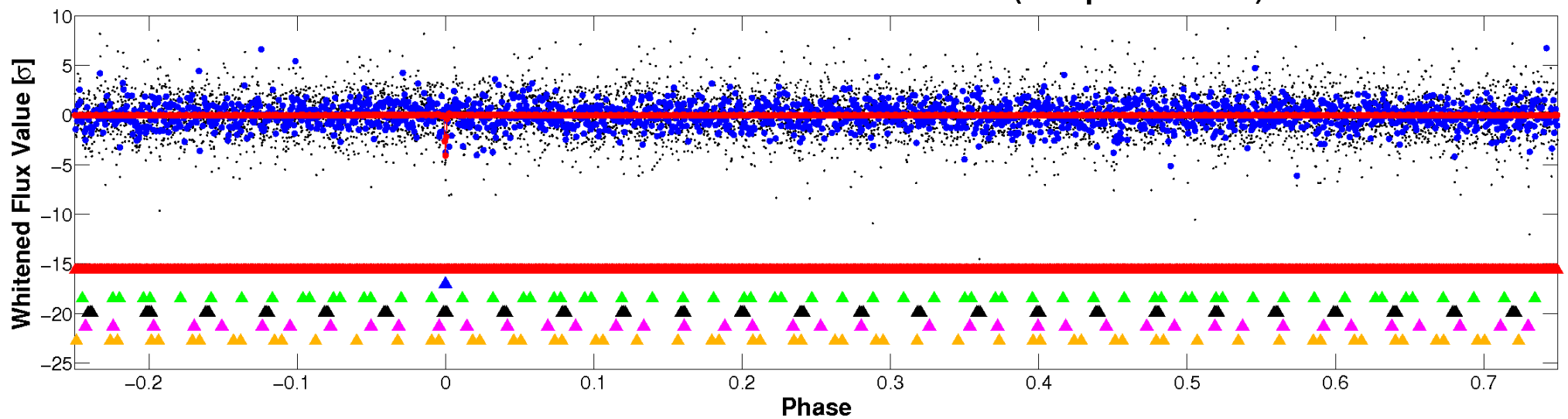


# Non-Whitened Vs. Whitened Light Curve

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

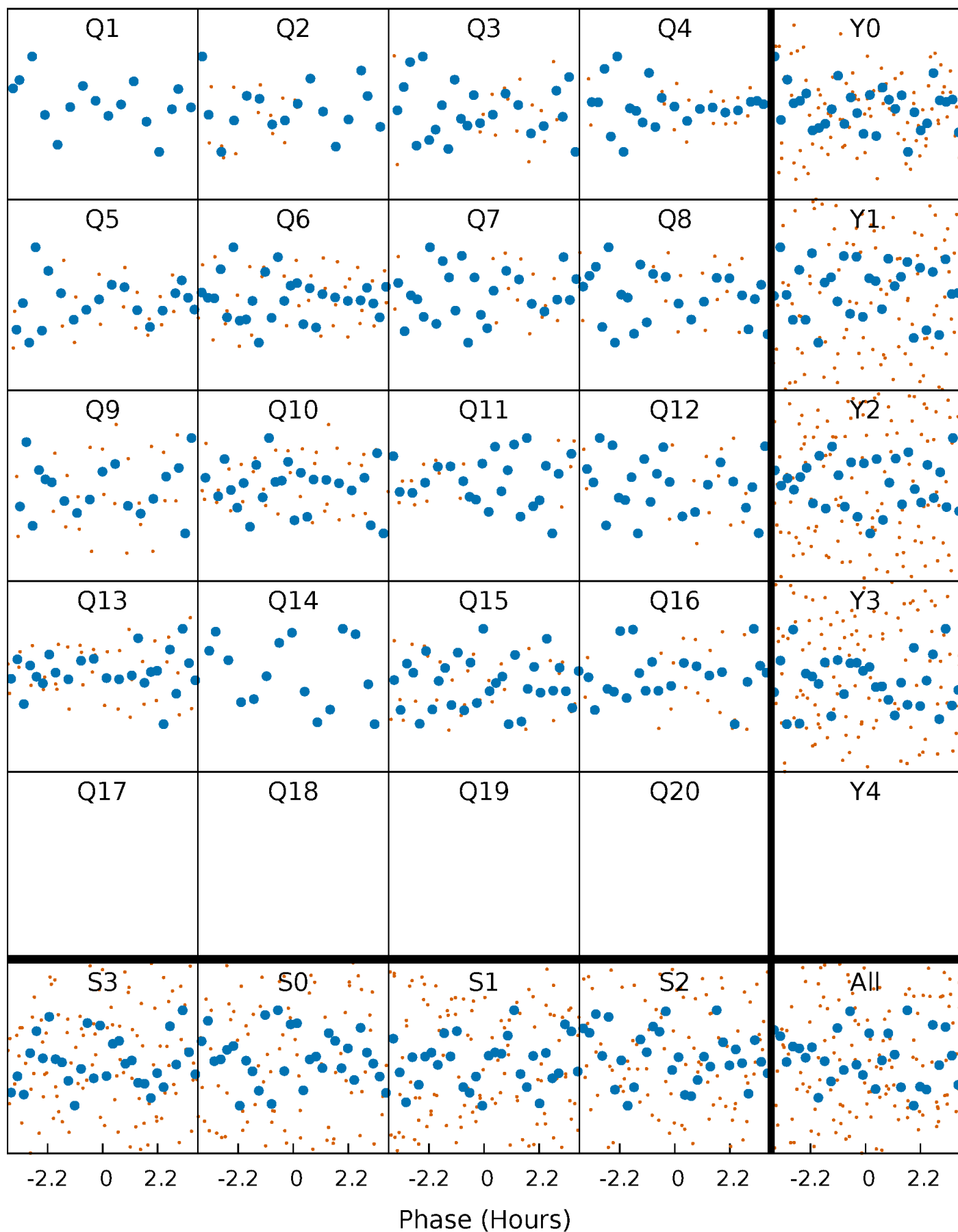


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



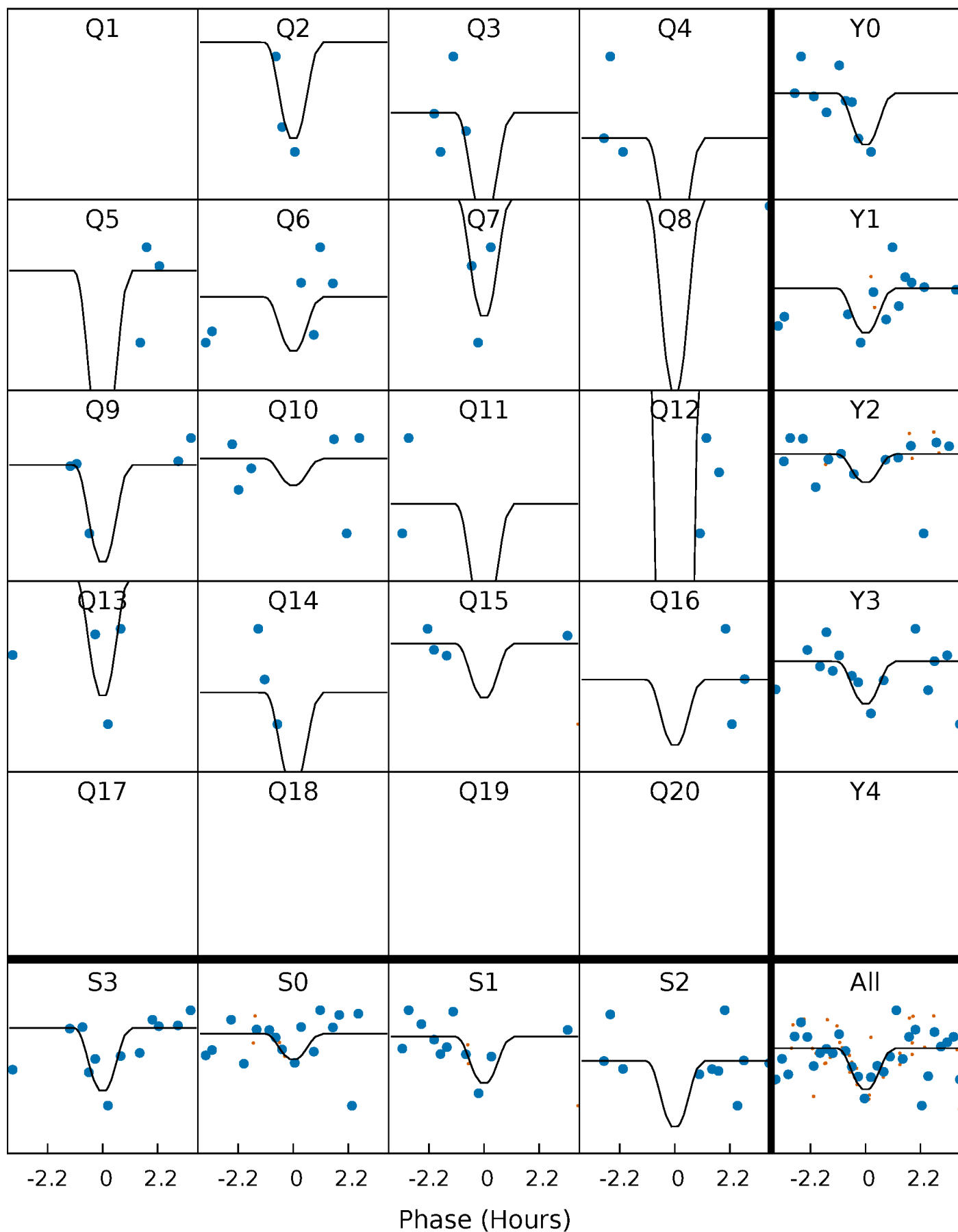
# PDC Quarter-Phased Transit Curves

TCE 009245855-02 P= 39.828927 Days  $T_0=150.629523$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 009245855-02 P= 39.828927 Days  $T_0=150.629523$  (BKJD)



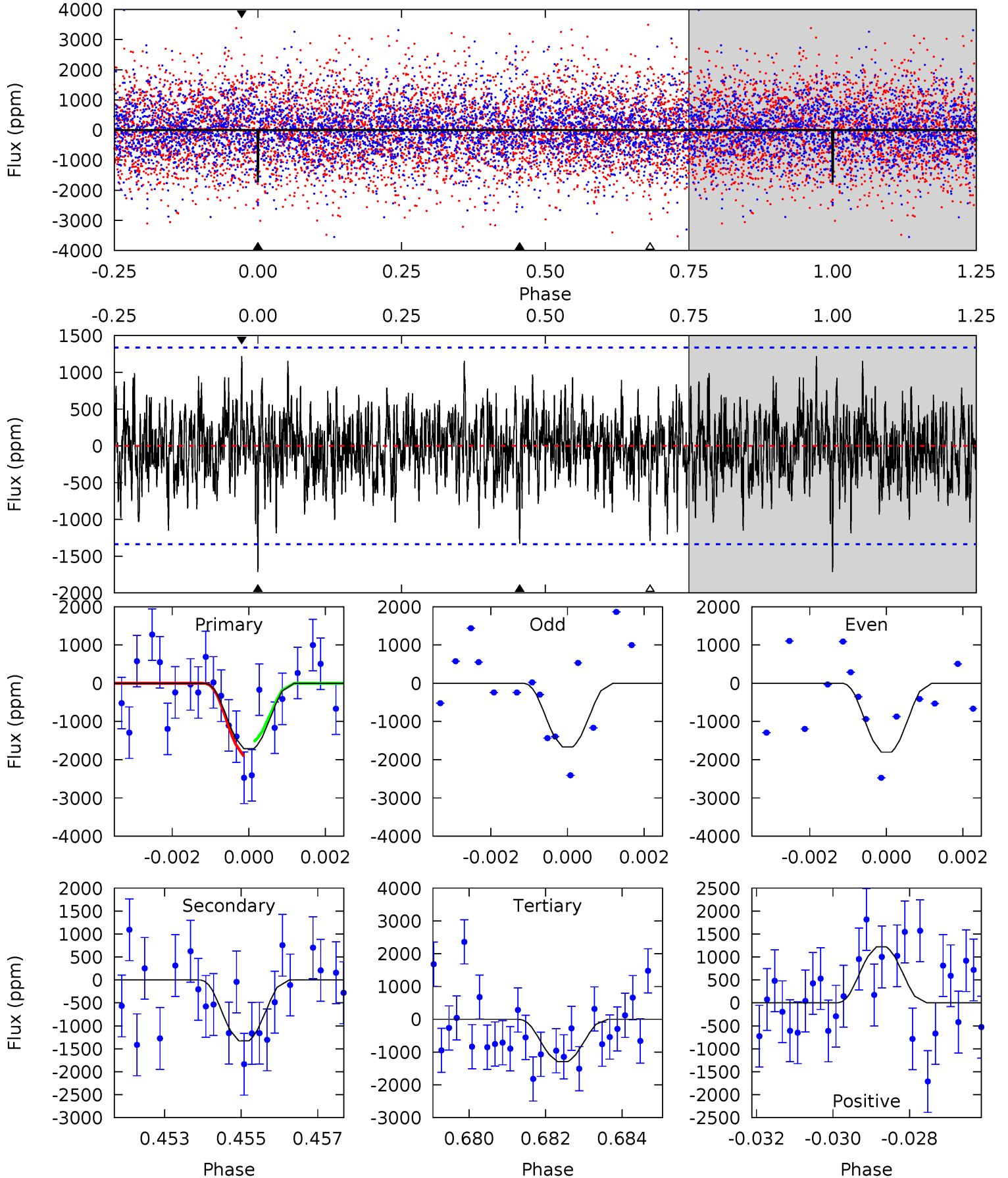
This plot does not exist for this TCE.



# DV Model-Shift Uniqueness Test

009245855-02, P = 39.828927 Days, E = 110.800596 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
6.81	5.29	5.14	4.85	5.32	3.07	1.50	1.67	1.96	0.14	0.44	0.26	0.74	0.42	0.74



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 009245855

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+214}_{-295}$	$4.361^{+0.081}_{-0.189}$	$-0.080^{+0.250}_{-0.300}$	$1.207^{+0.371}_{-0.159}$	$1.226^{+0.168}_{-0.187}$	$0.982^{+0.342}_{-0.489}$
	+3%/-4%	+2%/-4%	+312%/-375%	+31%/-13%	+14%/-15%	+35%/-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 009245855-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1329 \pm 251$	$51.45^{+56.75}_{-34.45}$	$910^{+63}_{-51}$	$2773^{+1054}_{-495}$	$16^{+119}_{-13}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

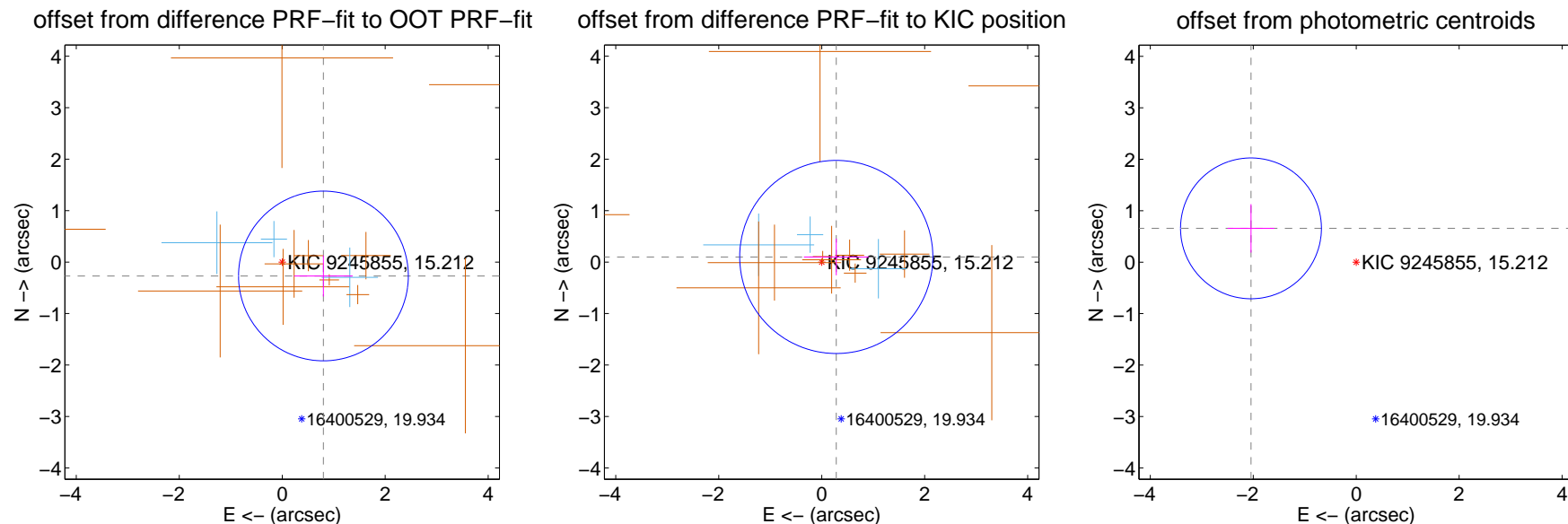
## DV Centroid Data

Supplemental centroid analysis for 009245855-02. Kepler magnitude: 15.21. Transit SNR 11.16

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

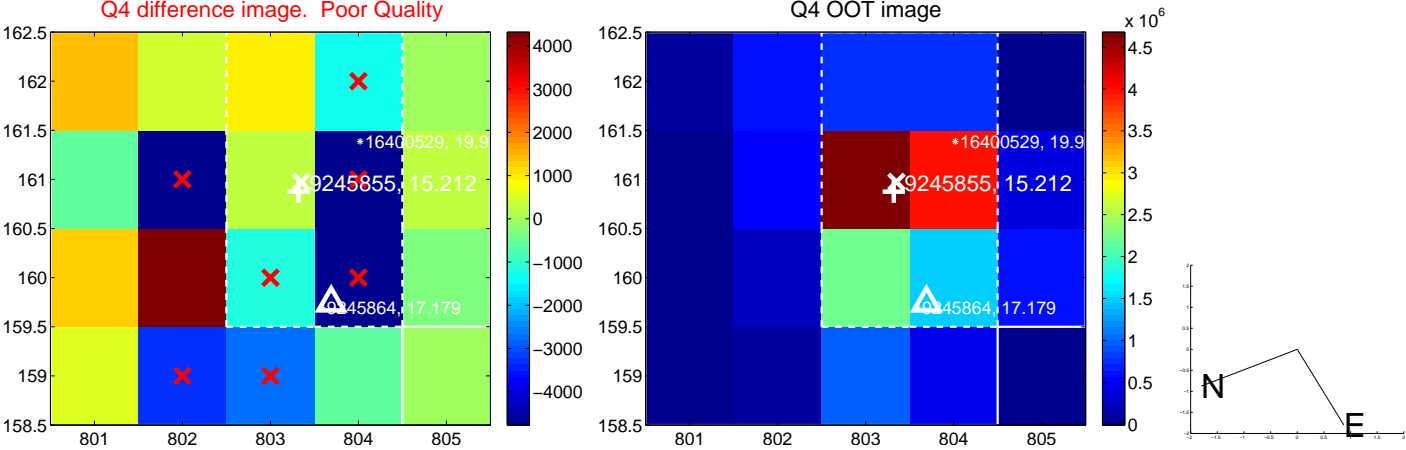
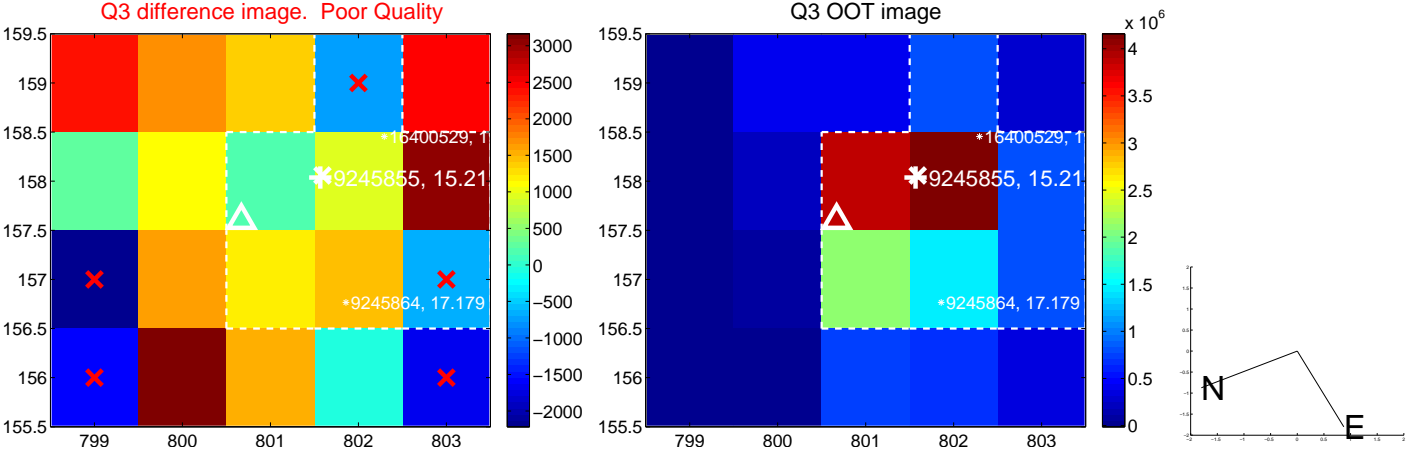
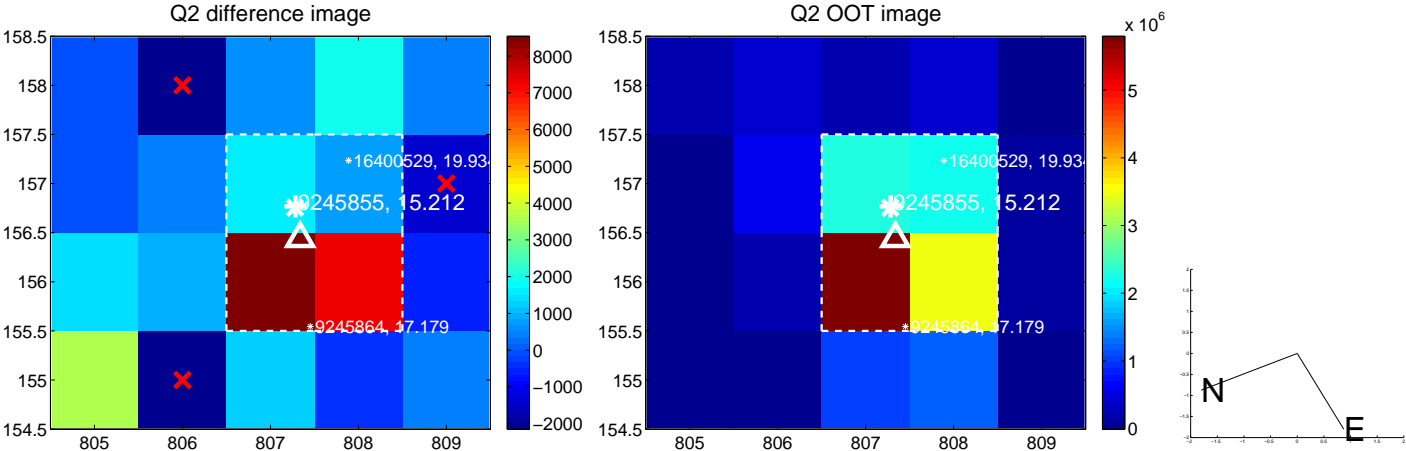
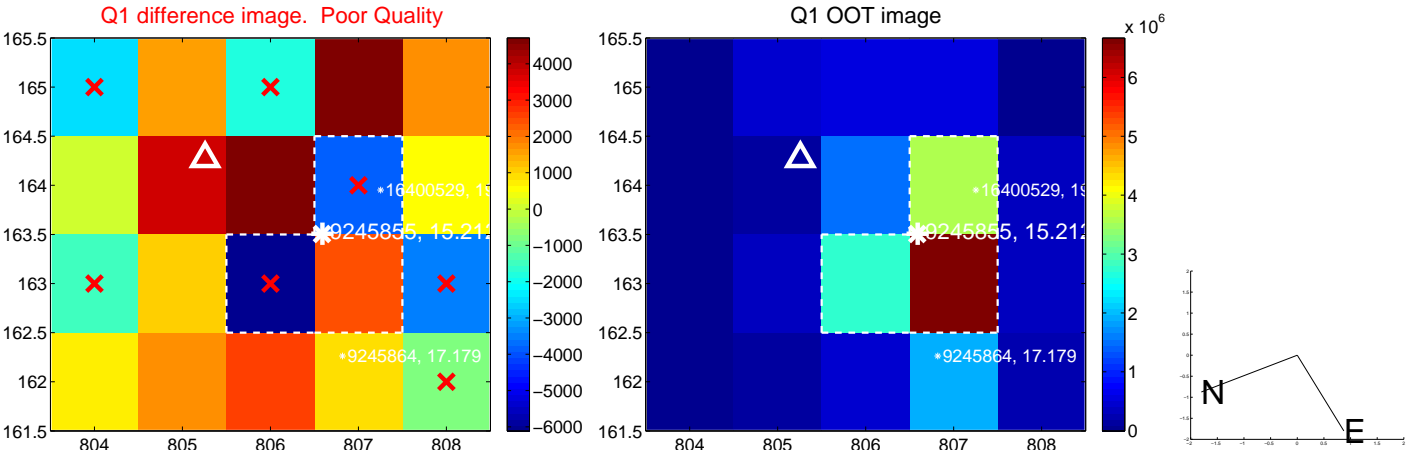
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.845 \pm 0.550$	1.54	$-0.800 \pm 0.569$	$-0.270 \pm 0.399$
PRF-fit source offset from KIC position	$0.300 \pm 0.625$	0.48	$-0.283 \pm 0.628$	$0.100 \pm 0.356$
photometric centroid source offset	$2.15 \pm 0.46$	4.71	$2.04 \pm 0.45$	$0.66 \pm 0.47$



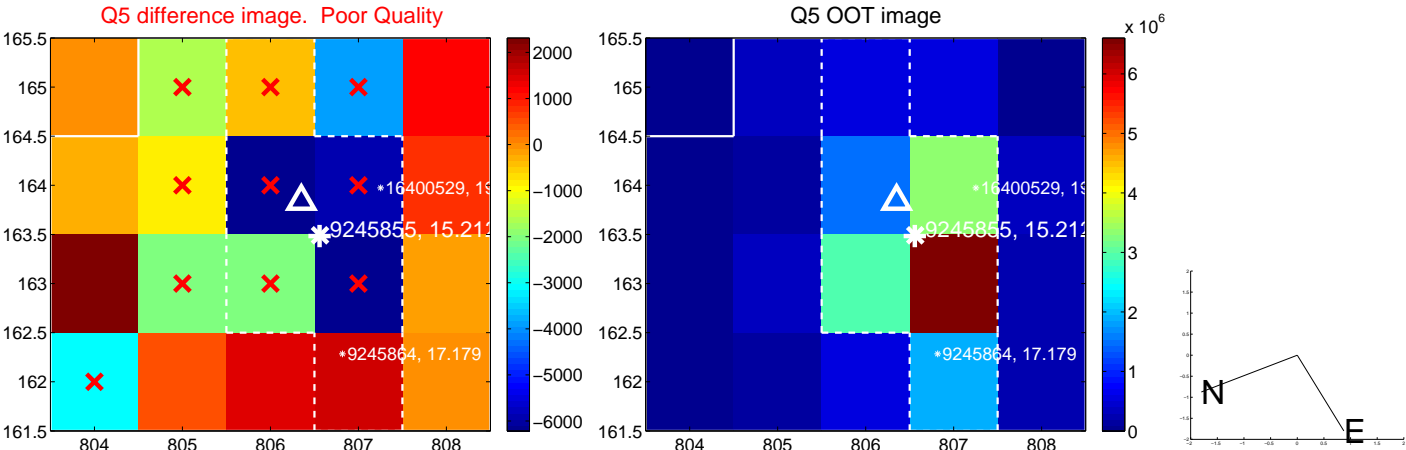
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



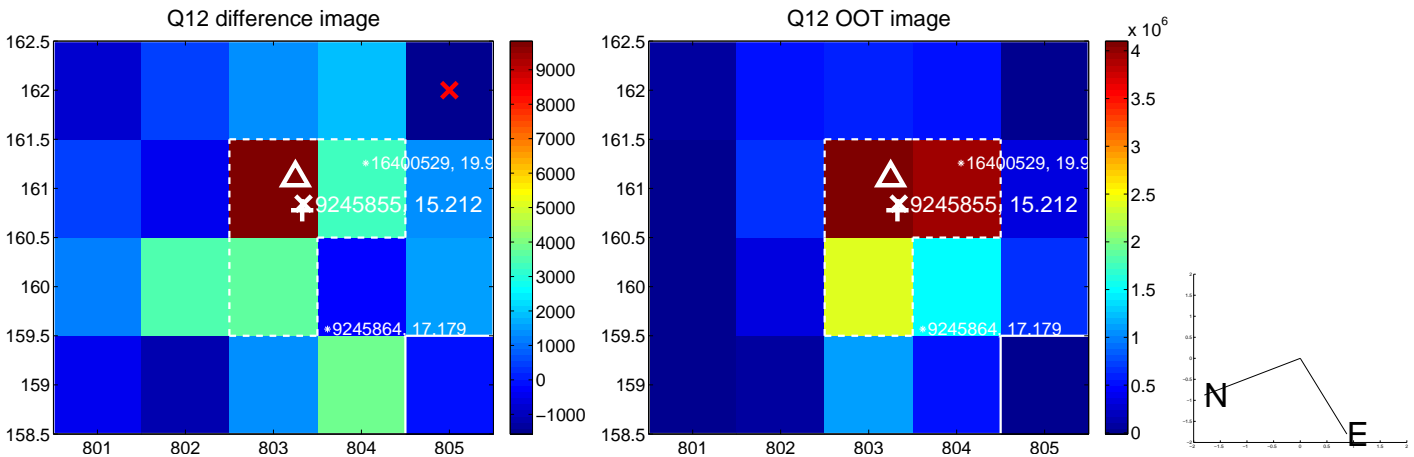
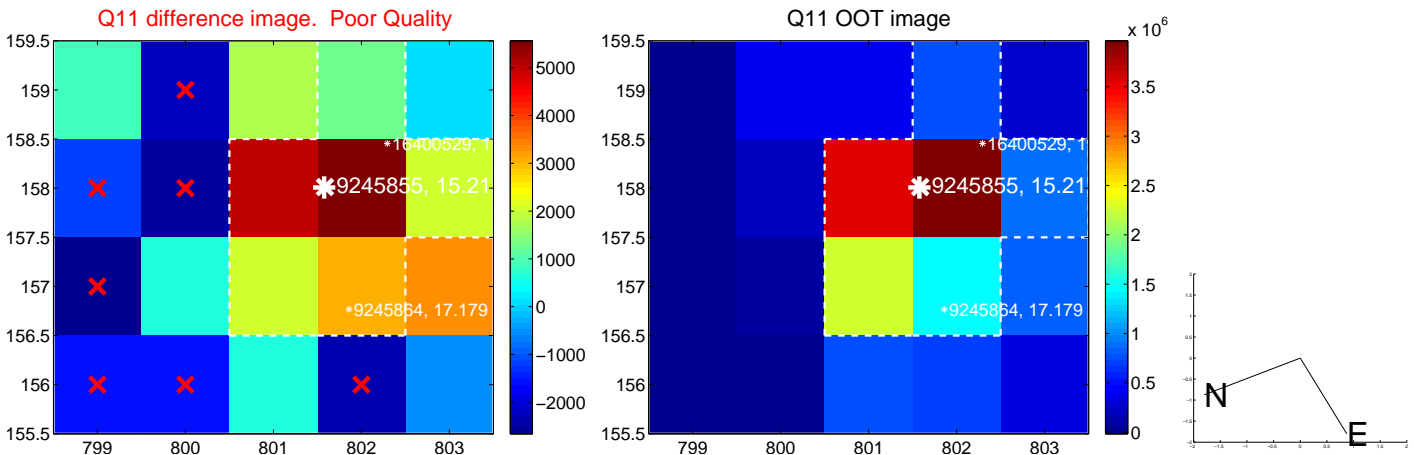
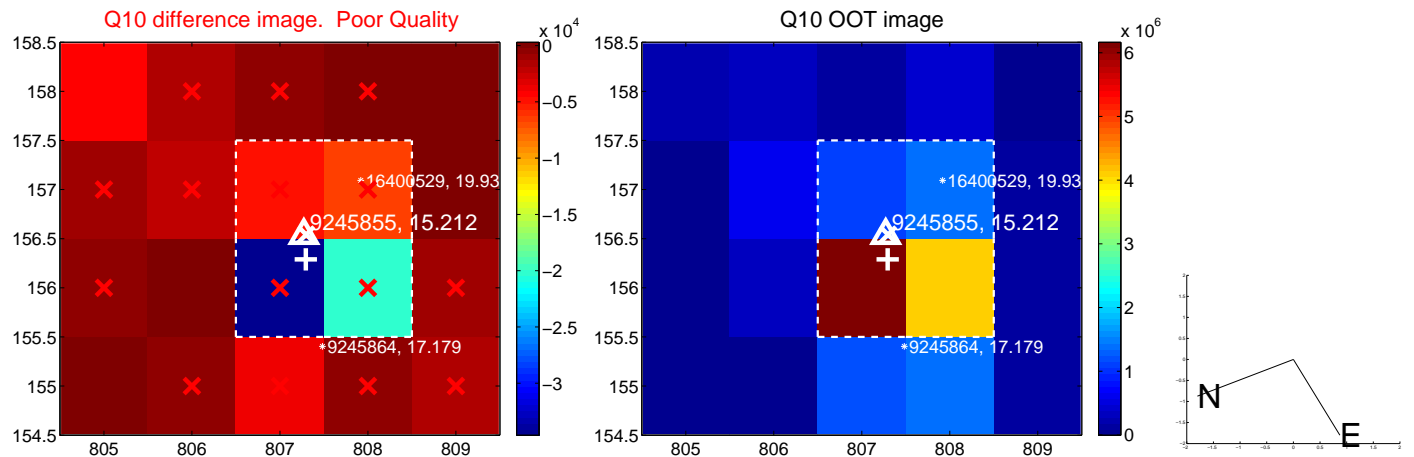
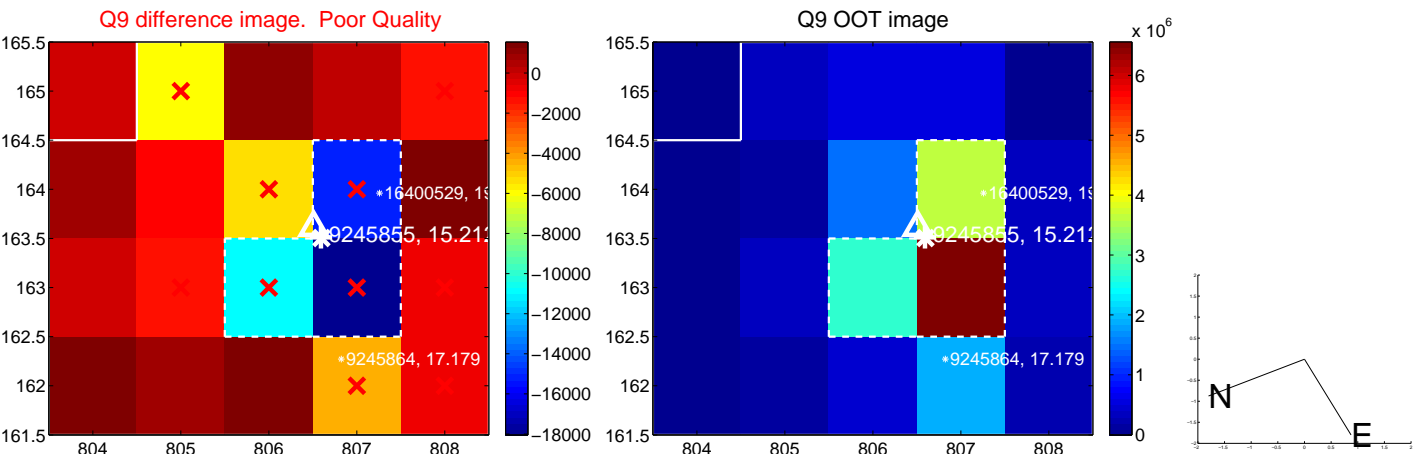
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



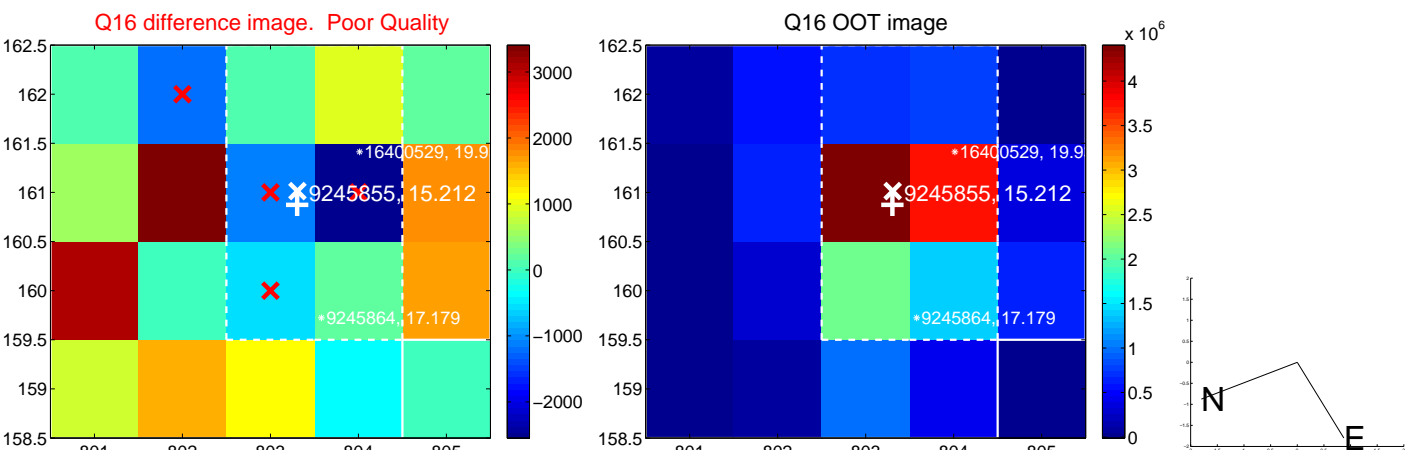
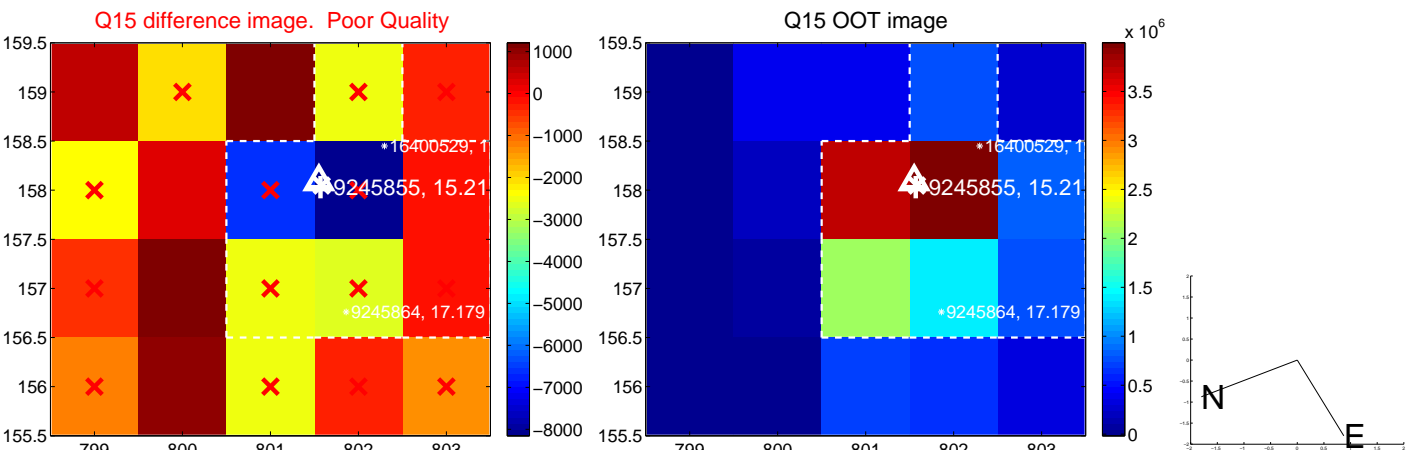
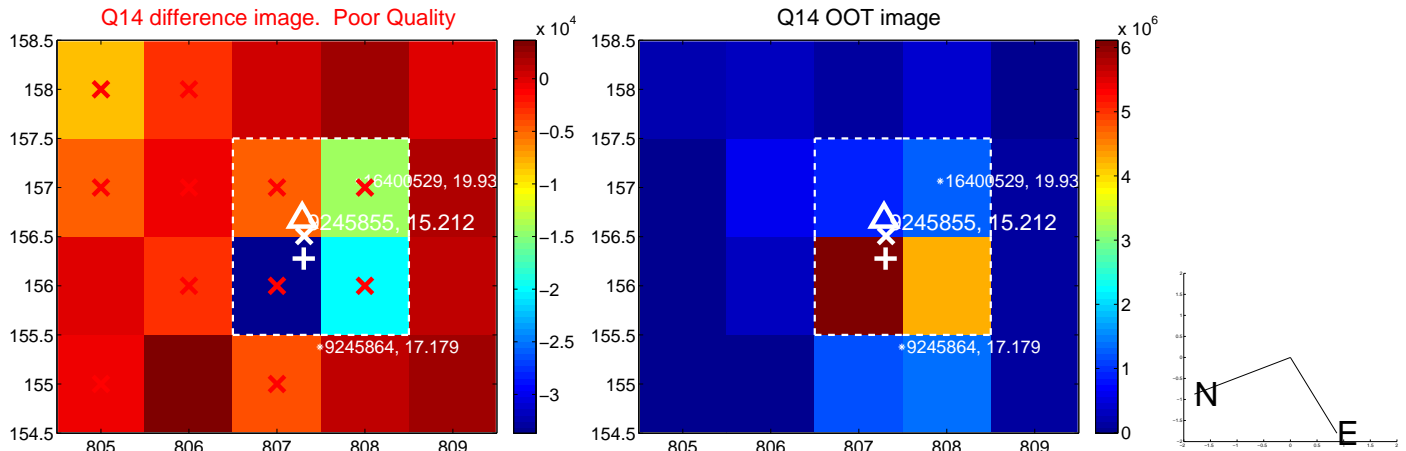
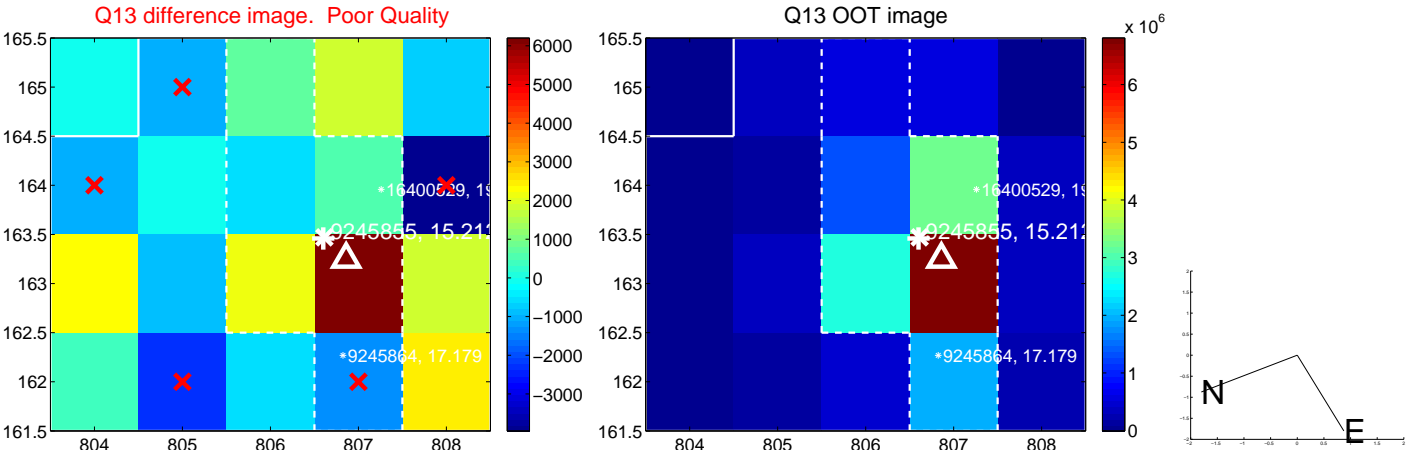
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



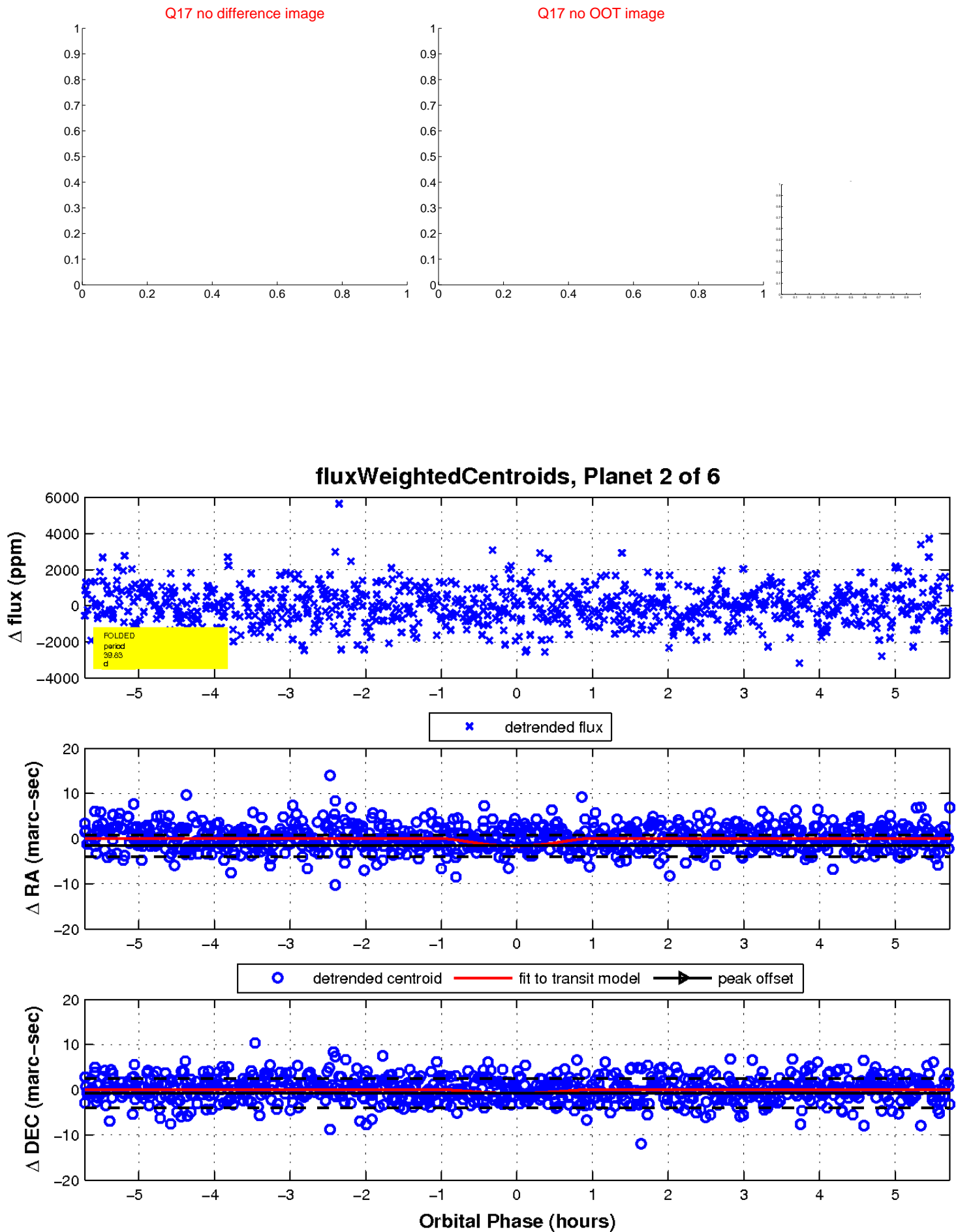
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

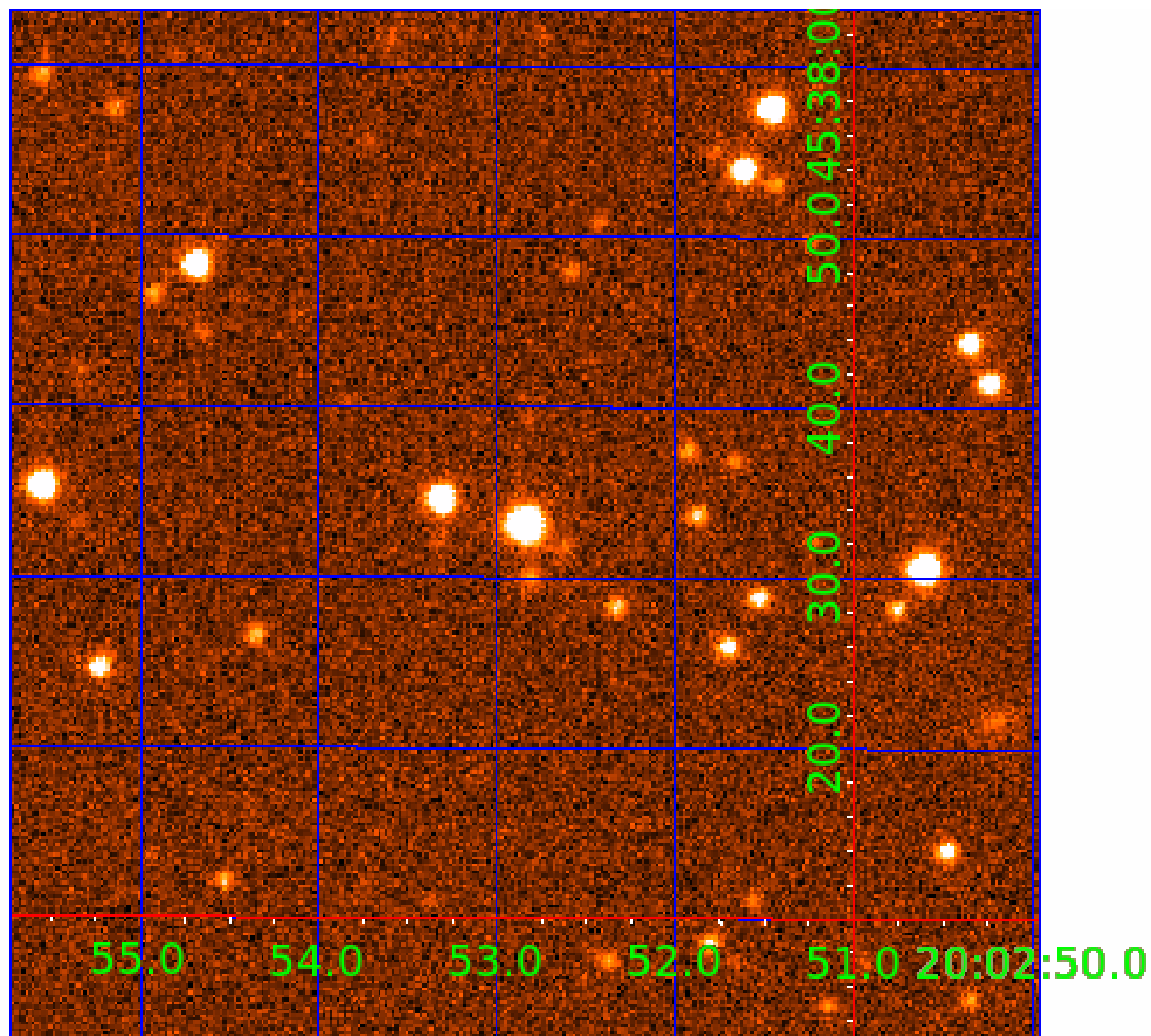


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009245855

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009245855-01	OBS	No	0.606308	131.936718	63.9	4.164	9.2	7.9	1.21	6586	1.04	10937.77
009245855-02	OBS	No	39.828927	150.629523	2079.4	1.909	10.7	11.2	1.21	6586	8.92	41.27
009245855-03	OBS	No	22.876714	146.976476	2046.2	2.156	9.5	13.8	1.21	6586	10.20	86.43
009245855-04	OBS	No	19.115954	142.731498	732.0	4.047	10.6	9.1	1.21	6586	3.49	109.81
009245855-05	OBS	No	35.079209	158.129705	1975.4	1.598	10.2	12.0	1.21	6586	6.52	48.88
009245855-06	OBS	No	23.676899	154.858019	643.1	3.695	11.0	7.4	1.21	6586	3.45	82.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009245855-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009245855-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009245855-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
009245855-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

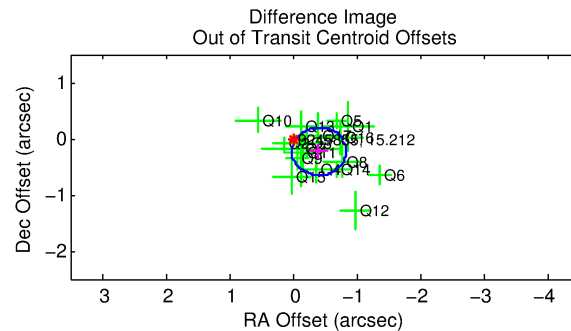
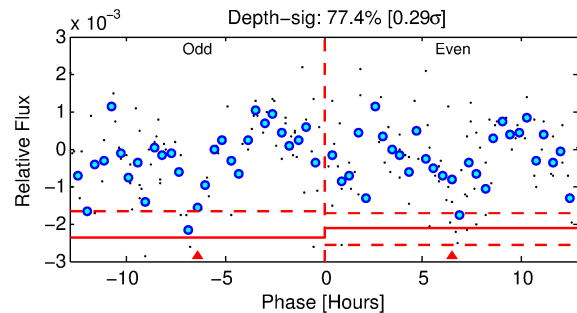
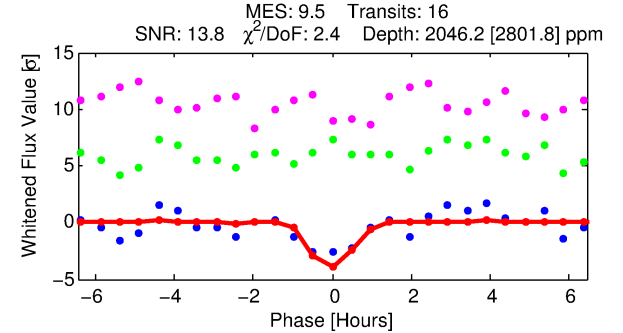
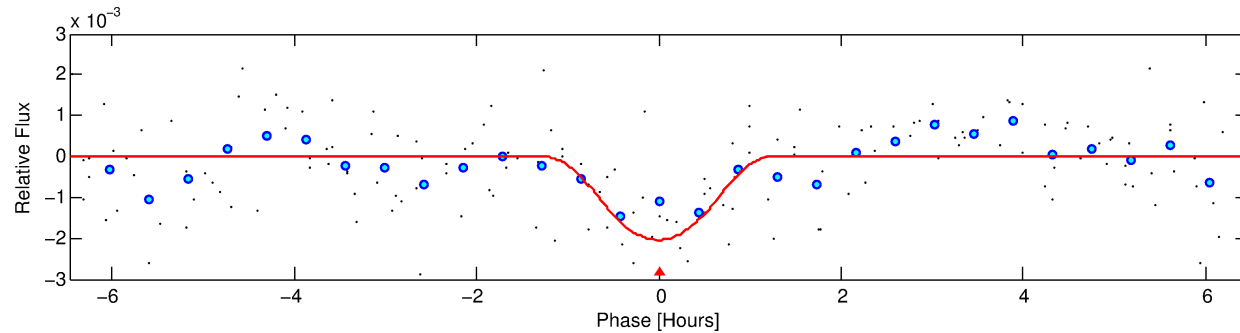
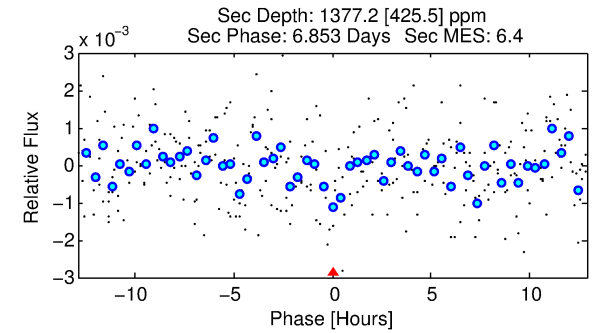
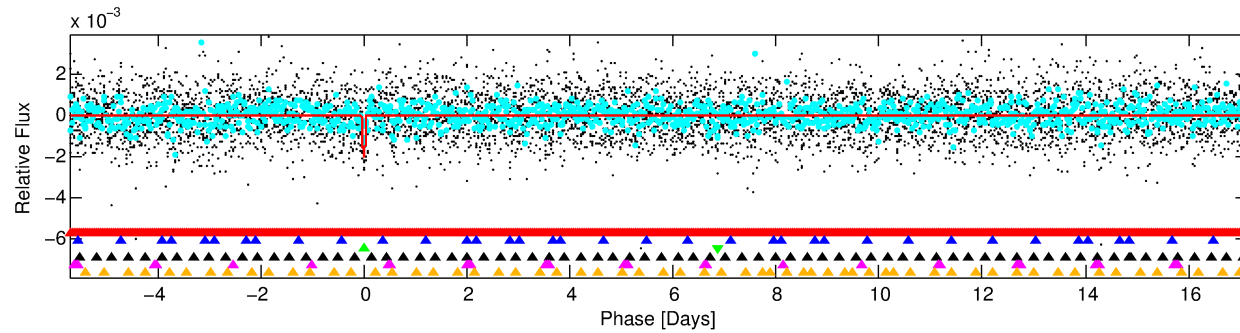
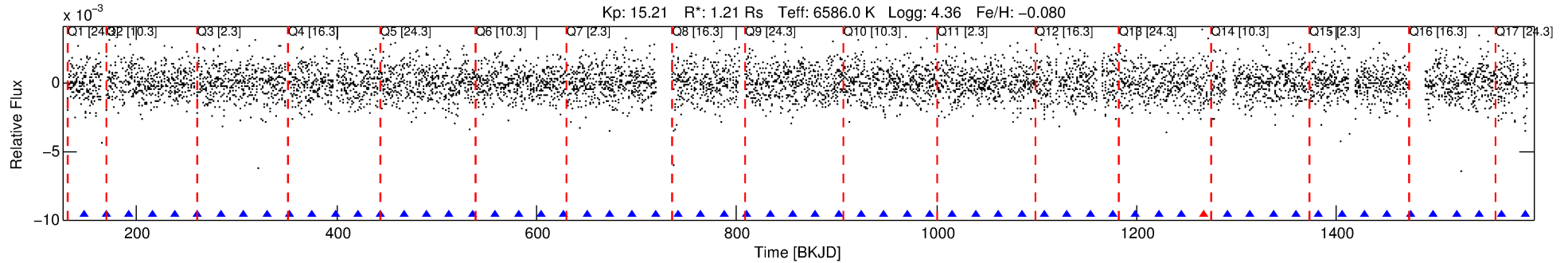
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009245855-03

No Significant Match Found

# DV One-Page Summary

KIC: 9245855 Candidate: 3 of 6 Period: 22.877 d



## DV Fit Results:

Period = 22.87671 [0.00016] d  
Epoch = 146.9765 [0.0060] BKJD  
Rp/R\* = 0.0774 [0.5079]  
a/R\* = 32.53 [48.24]  
b = 1.00 [0.66]  
Seff = 86.43 [34.38]  
Teq = 777 [77] K  
Rp = 10.20 [66.97] Re  
a = 0.1686 [0.0423] AU  
Ag = 207.06 [2718.57] [0.08 $\sigma$ ]  
Teffp = 4560 [14963] K [0.25 $\sigma$ ]

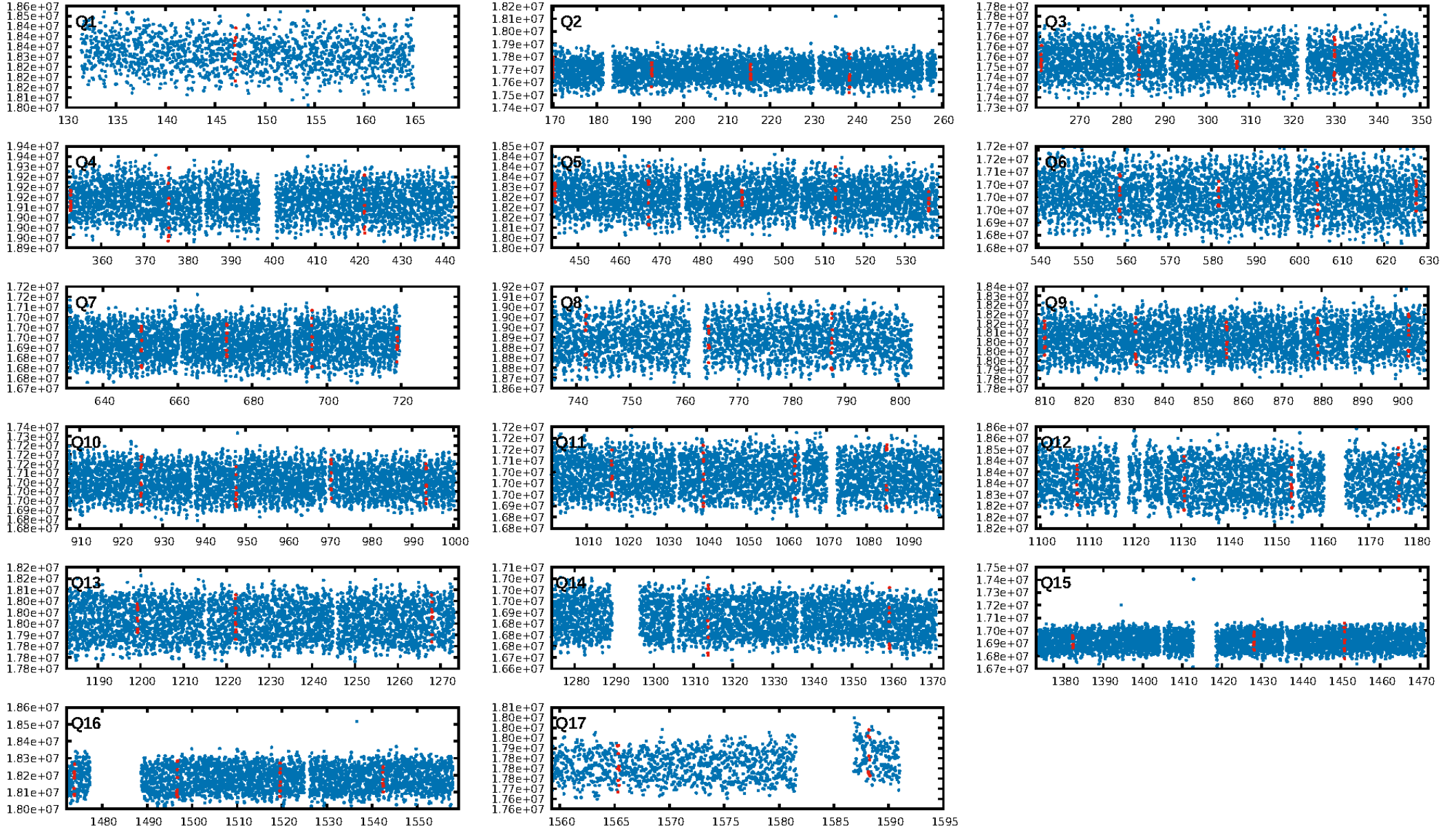
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.68 $\sigma$ ]  
LongPeriod-sig: 100.0% [4.49 $\sigma$ ]  
ModelChiSquare2-sig: 4.3%  
ModelChiSquareGof-sig: 98.6%  
**Bootstrap-pfa: 2.09e-07**  
RollingBand-fgt: 0.94 [15/16]  
GhostDiagnostic-chr: -1.72  
Centroid-sig: 32.5%  
**Centroid-so: 1.516 arcsec [4.57 $\sigma$ ]**  
**OotOffset-rm: 0.468 arcsec [3.30 $\sigma$ ]**  
KicOffset-rm: 0.230 arcsec [2.09 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.41 [7/17]  
DiffImageOverlap-fno: 0.00 [0/17]

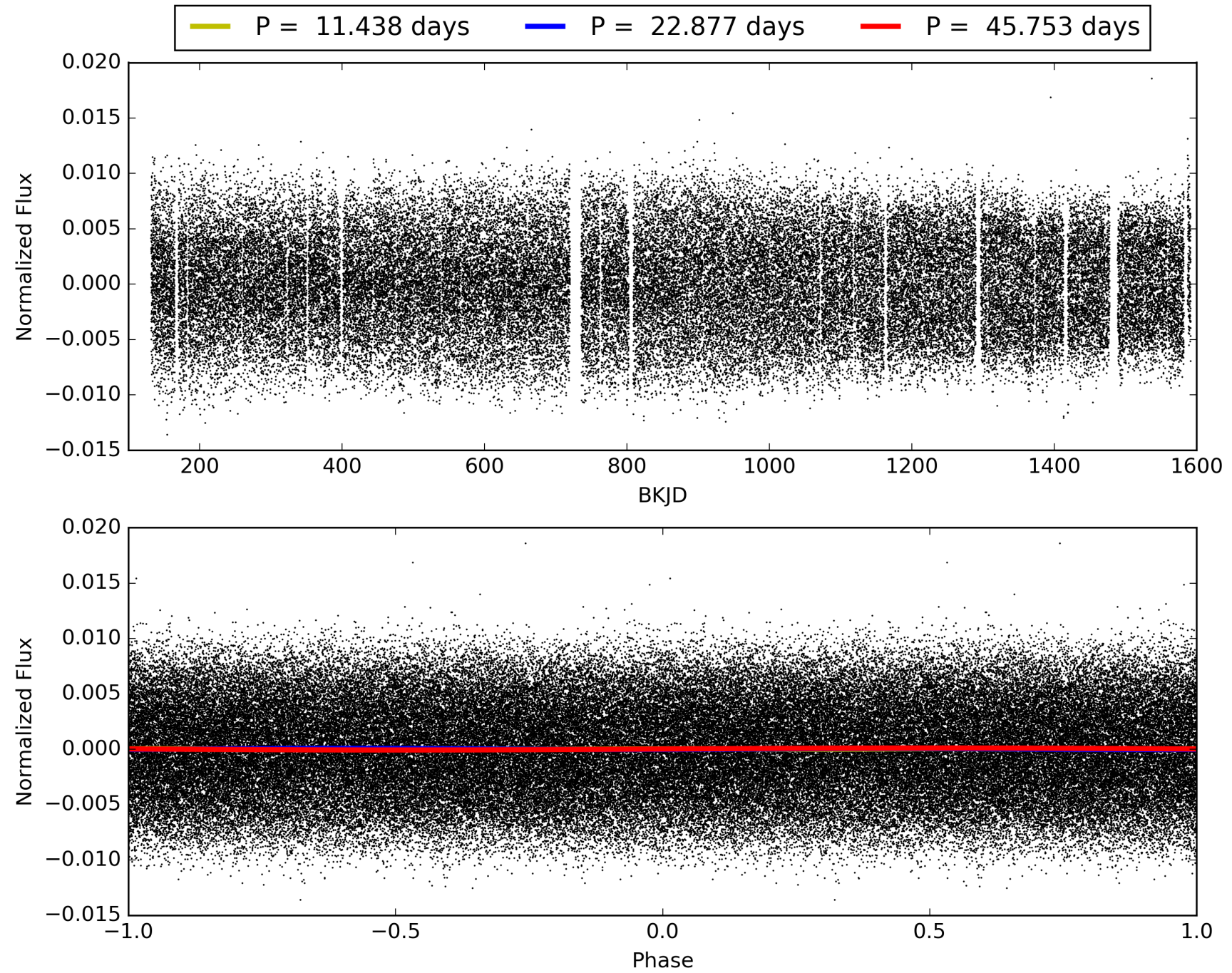
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:59:59 Z

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

# TCE 009245855-03, PDC Light Curves



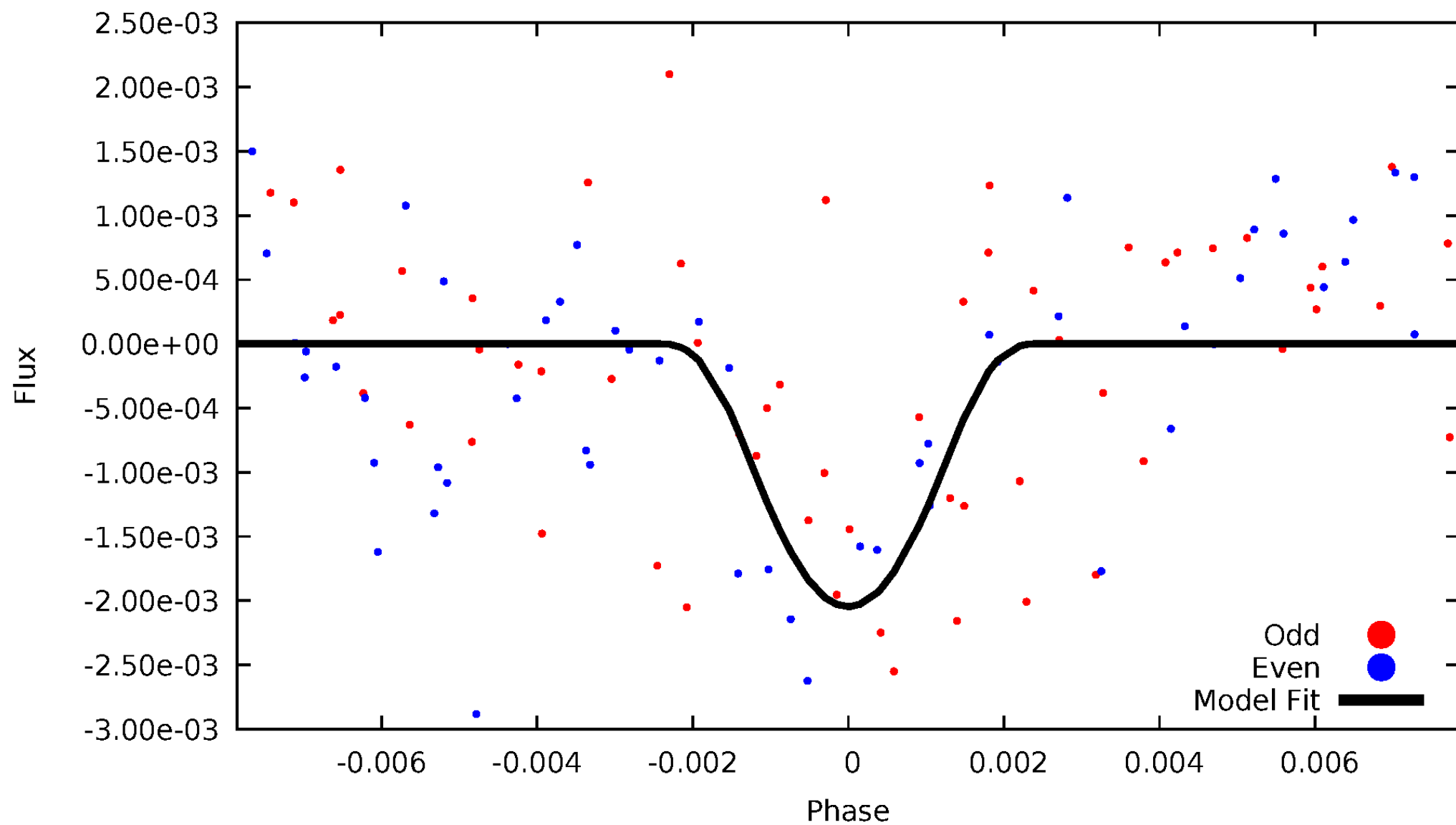
TCE 009245855-03





# DV Odd/Even

TCE 009245855-03





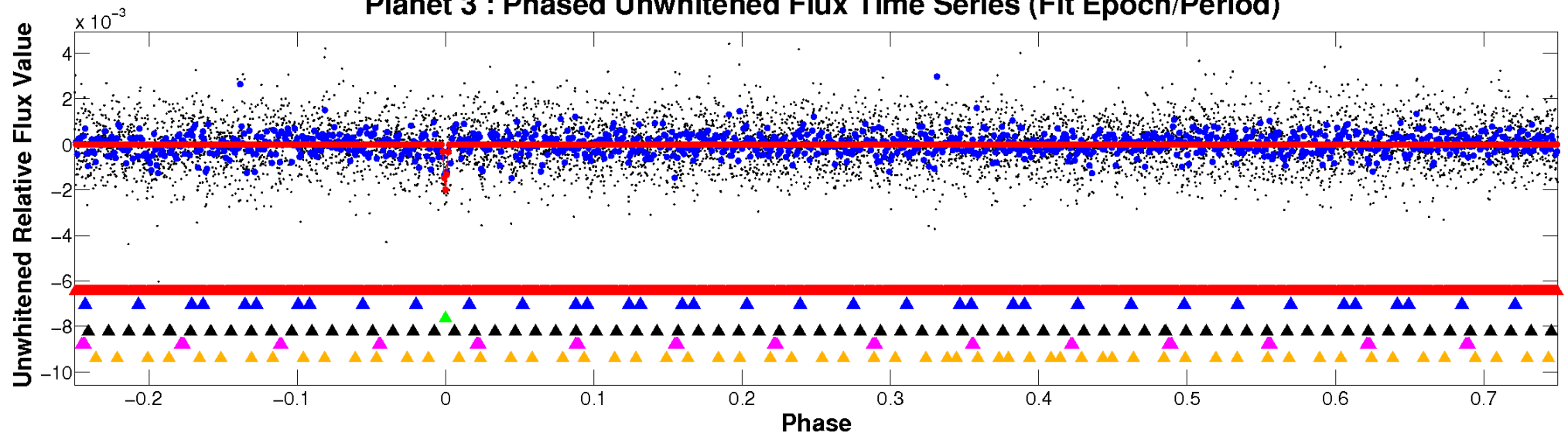


ALT Odd/Even

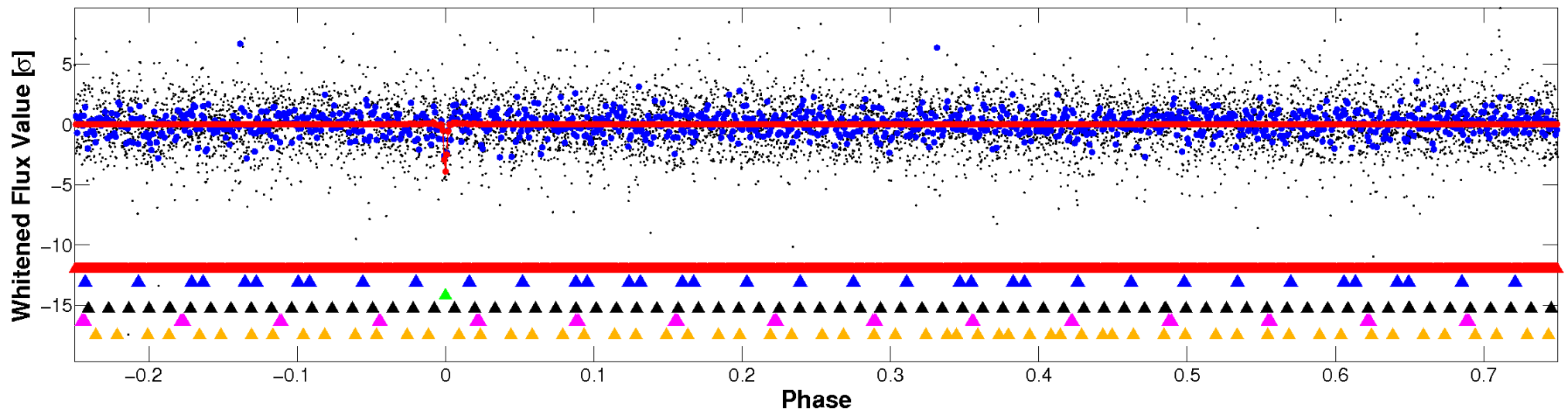
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

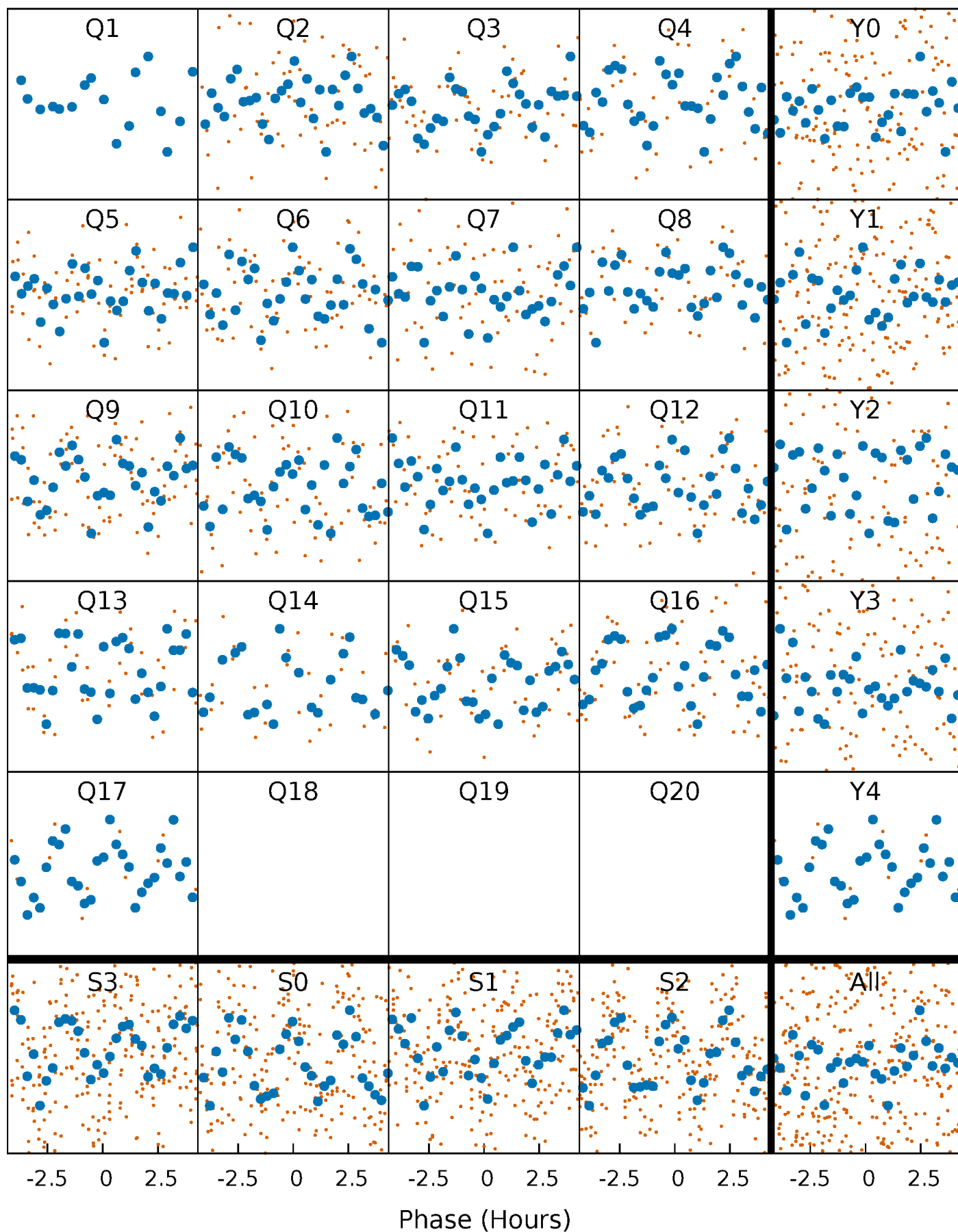


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



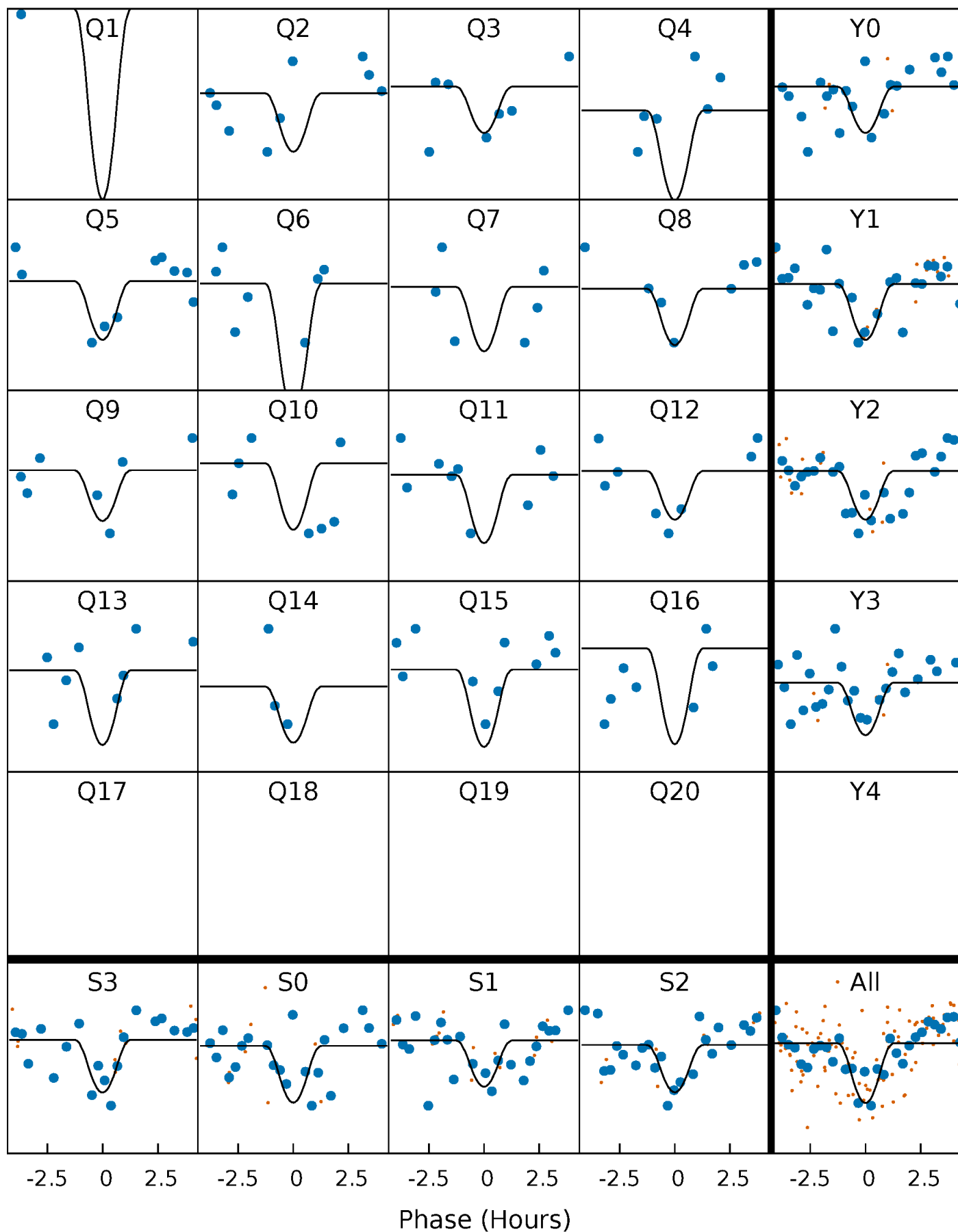
# PDC Quarter-Phased Transit Curves

TCE 009245855-03 P= 22.876714 Days  $T_0=146.976476$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 009245855-03   P= 22.876714 Days    $T_0=146.976476$  (BKJD)

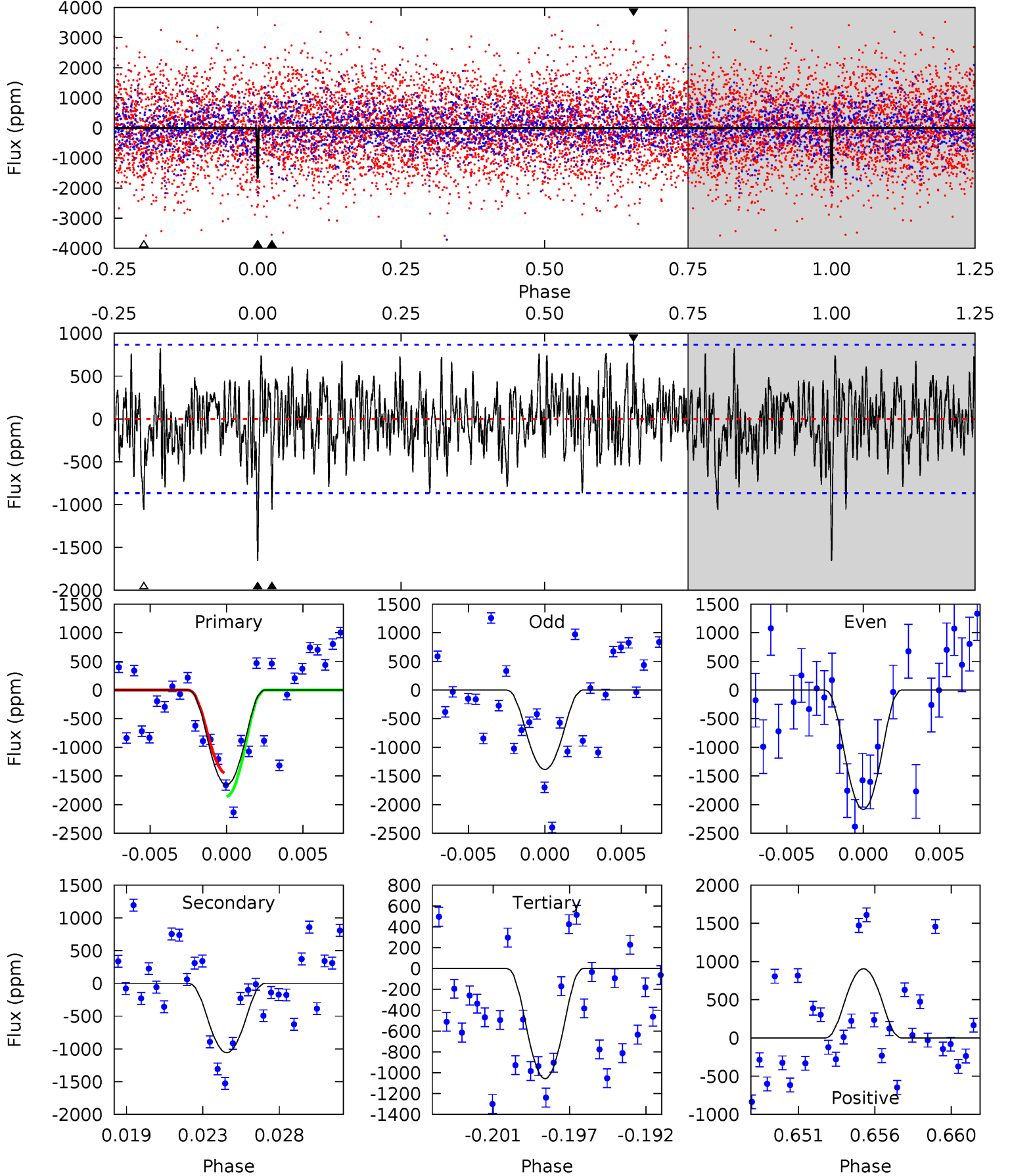


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

009245855-03, P = 22.876714 Days, E = 124.099762 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
9.89	6.32	6.32	5.41	5.17	2.83	1.76	3.57	4.48	0.00	0.91	2.00	1.18	0.35	1.22





## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 009245855

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+214}_{-295}$	$4.361^{+0.081}_{-0.189}$	$-0.080^{+0.250}_{-0.300}$	$1.207^{+0.371}_{-0.159}$	$1.226^{+0.168}_{-0.187}$	$0.982^{+0.342}_{-0.489}$
	+3%/-4%	+2%/-4%	+312%/-375%	+31%/-13%	+14%/-15%	+35%/-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 009245855-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1059 \pm 168$	$51.63^{+56.15}_{-35.65}$	$1100^{+76}_{-66}$	$2682^{+1214}_{-491}$	$6.017^{+62.327}_{-4.619}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = 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

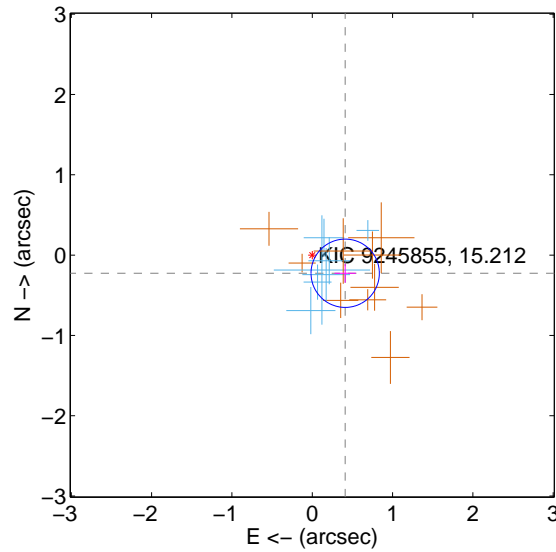
Supplemental centroid analysis for 009245855-03. Kepler magnitude: 15.21. Transit SNR 13.80

There are 7 quarters with good PRF difference image offsets

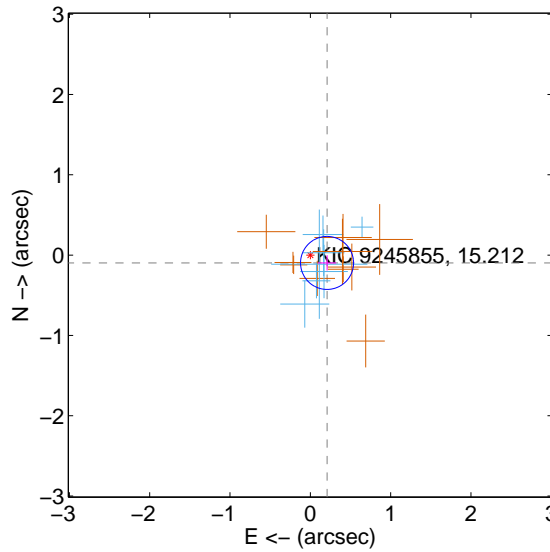
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.468 \pm 0.142$	3.30	$-0.410 \pm 0.132$	$-0.226 \pm 0.118$
PRF-fit source offset from KIC position	$0.230 \pm 0.110$	2.09	$-0.208 \pm 0.113$	$-0.097 \pm 0.095$
photometric centroid source offset	$1.52 \pm 0.33$	4.57	$1.42 \pm 0.33$	$0.54 \pm 0.36$

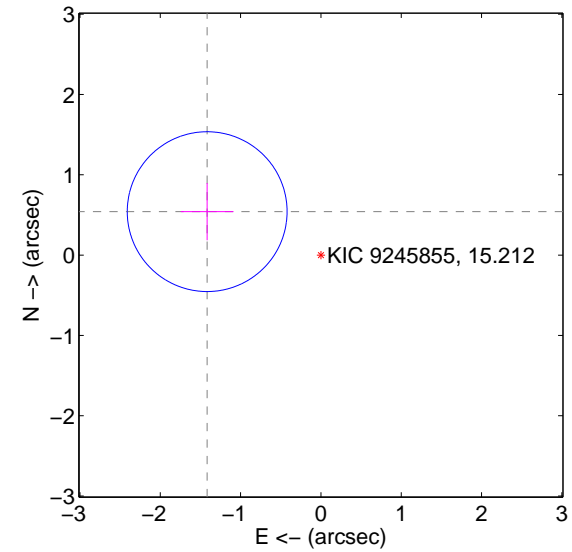
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

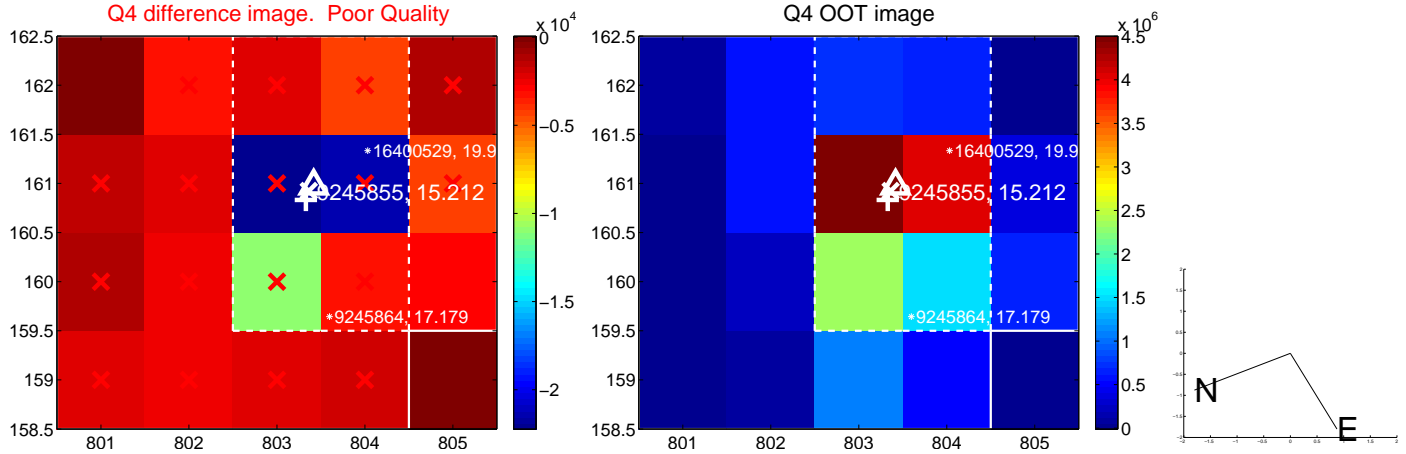
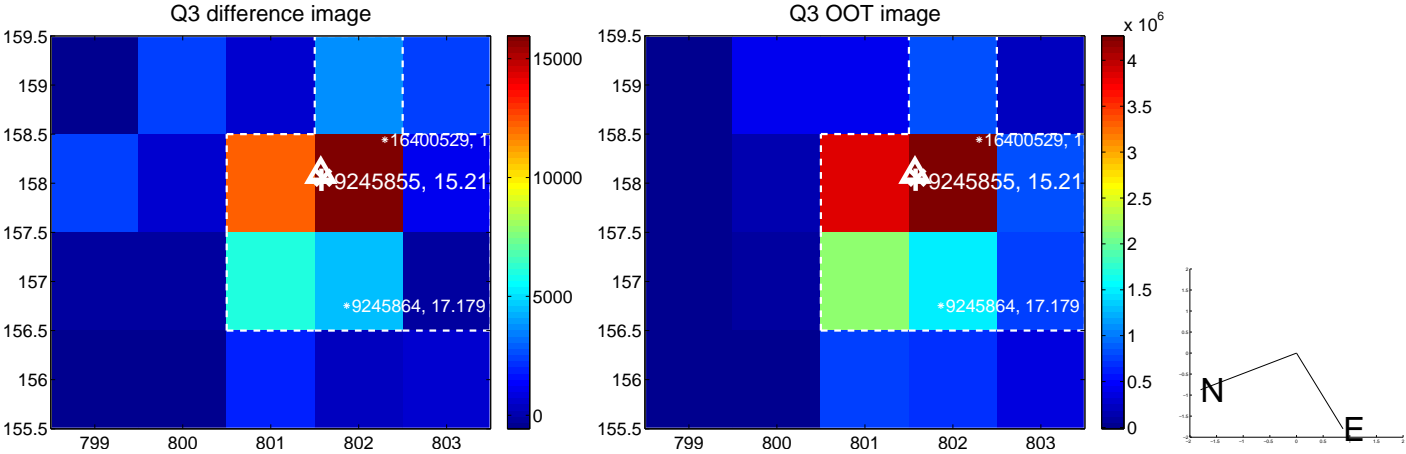
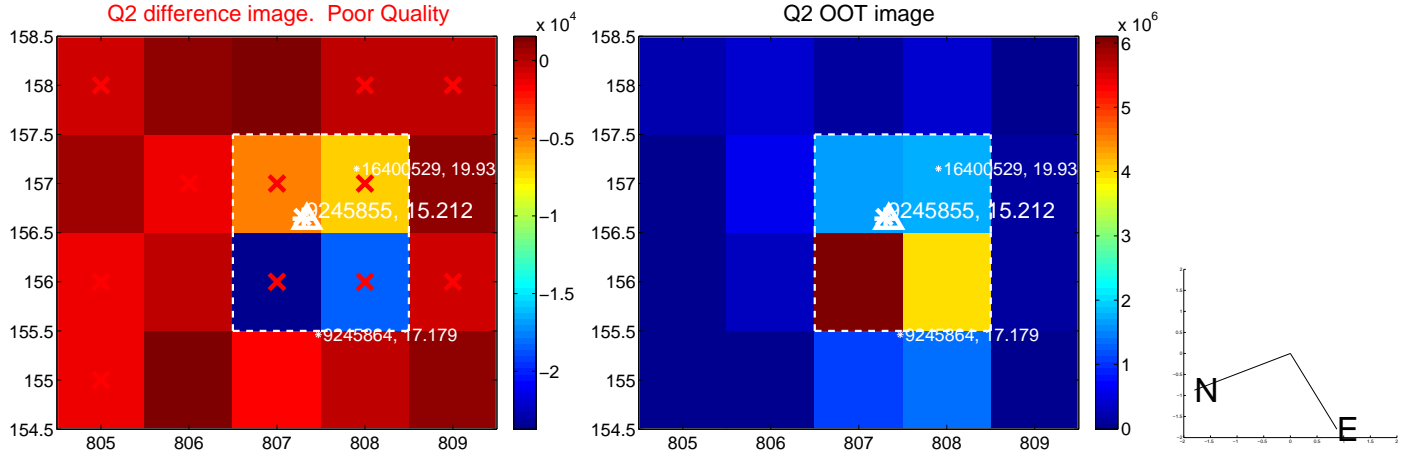
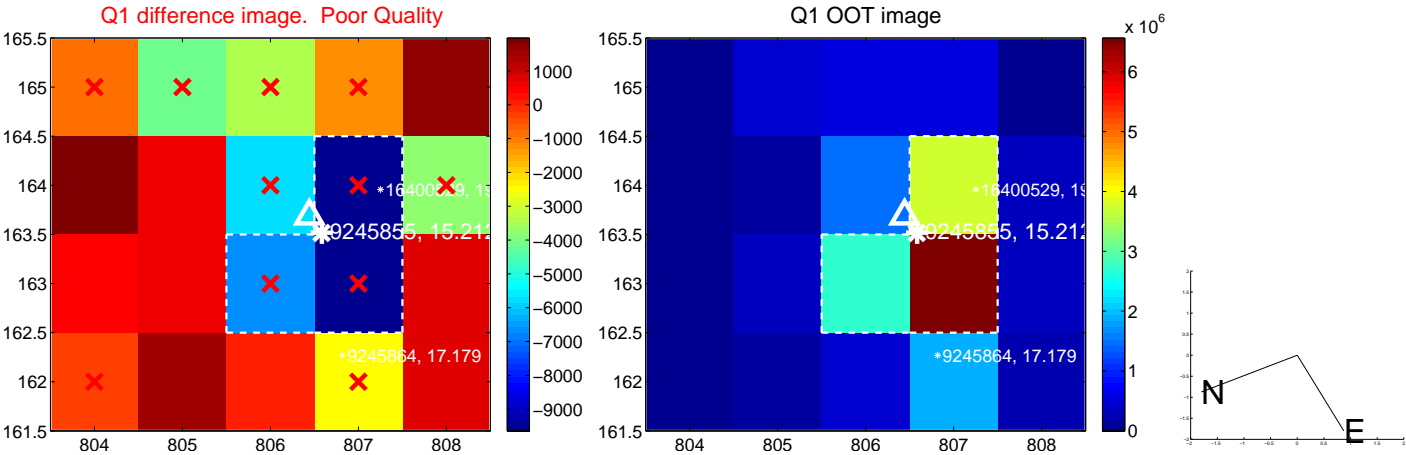


offset from photometric centroids

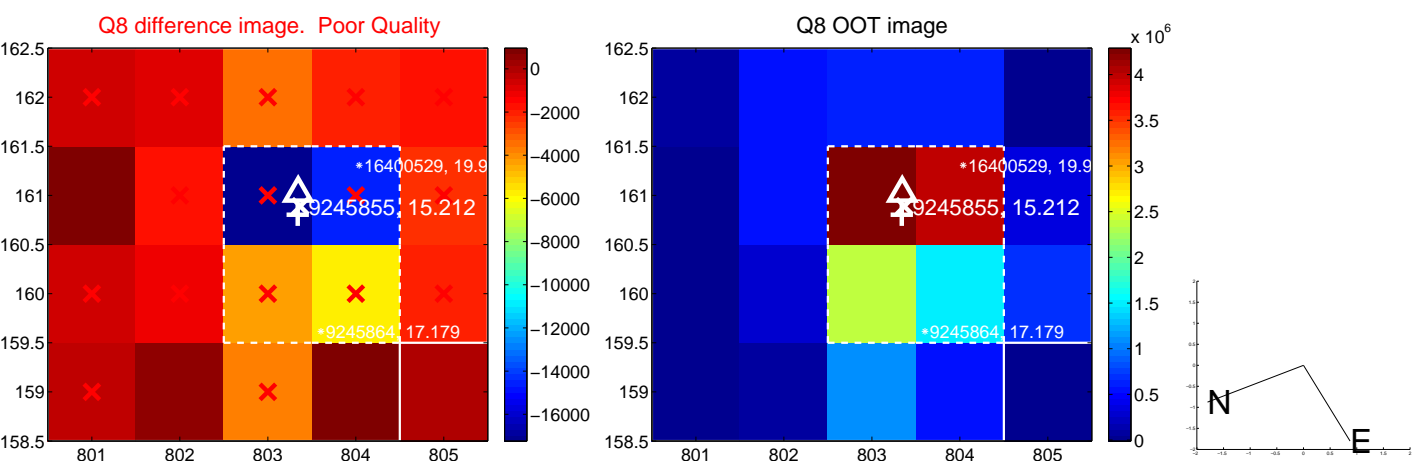
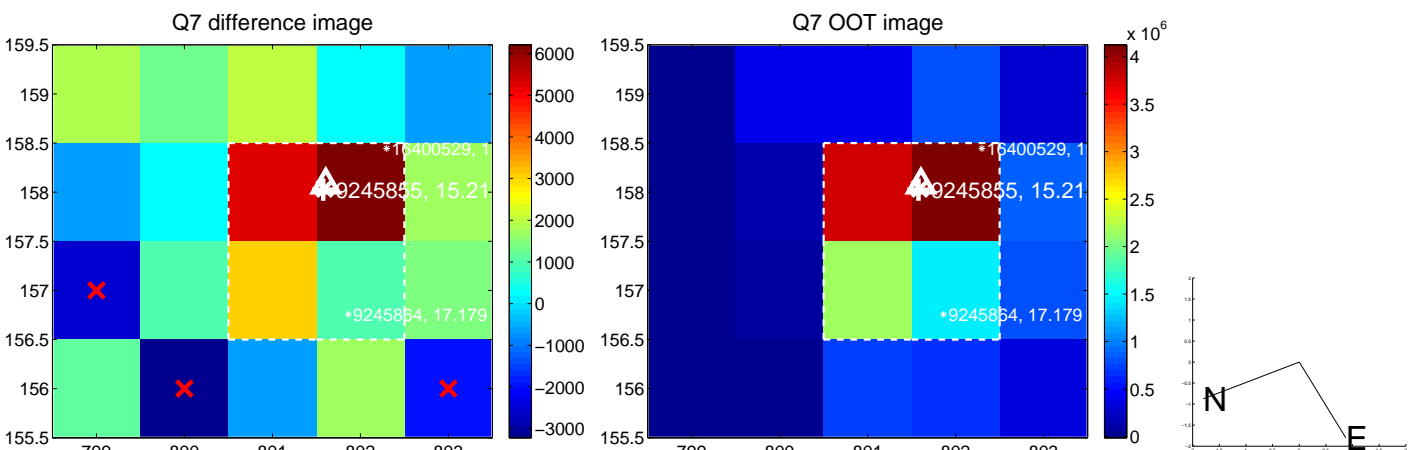
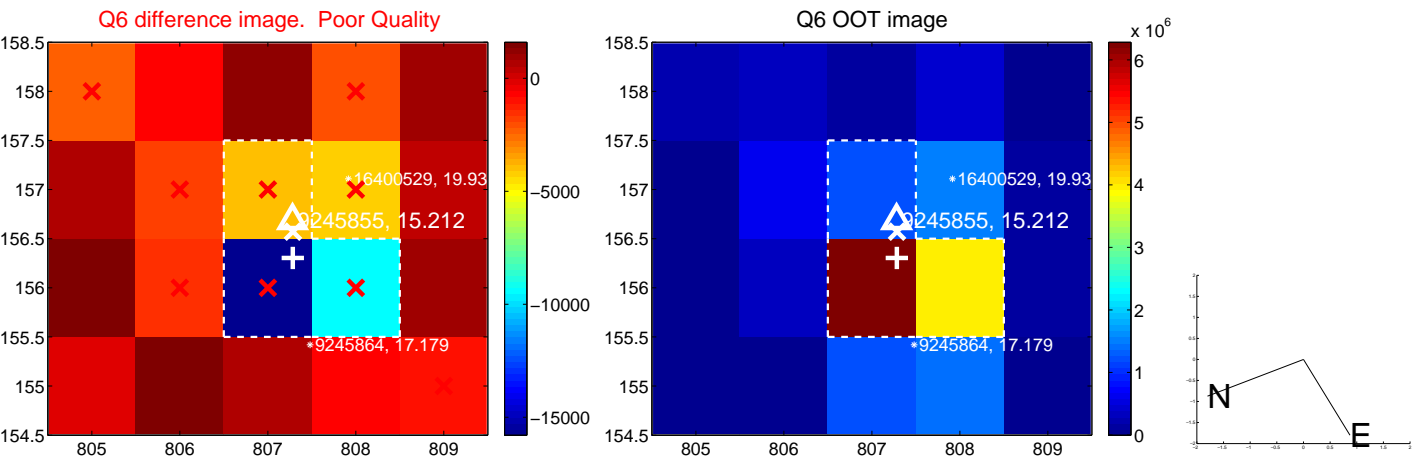
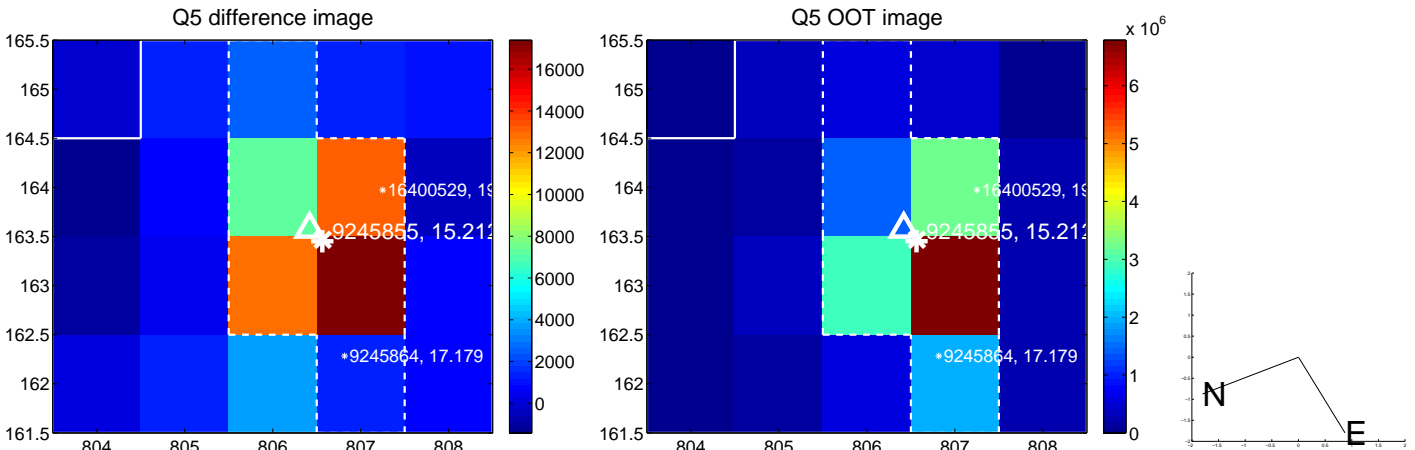


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

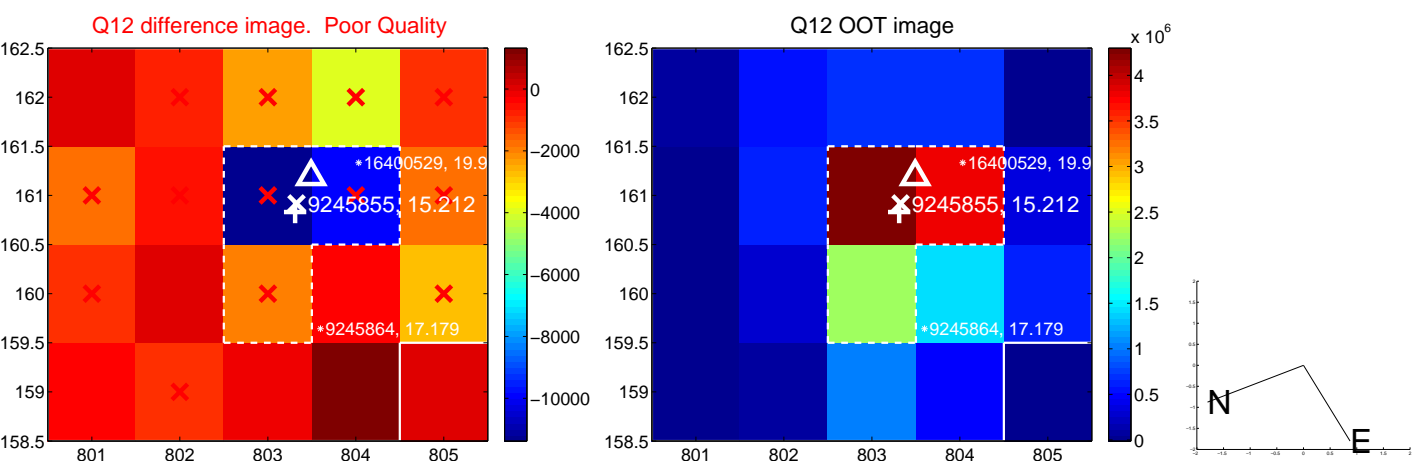
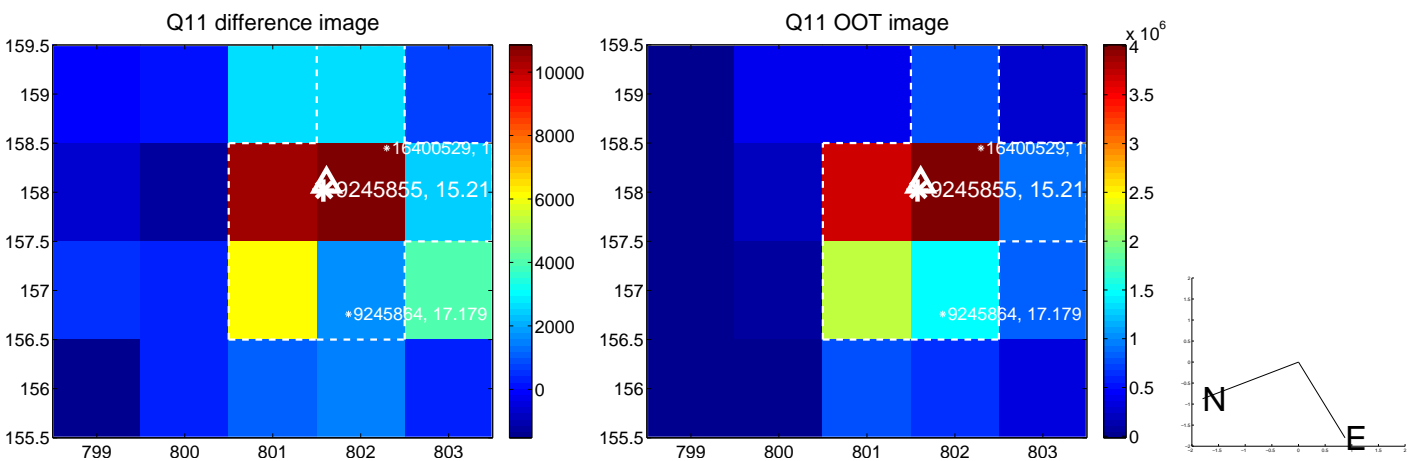
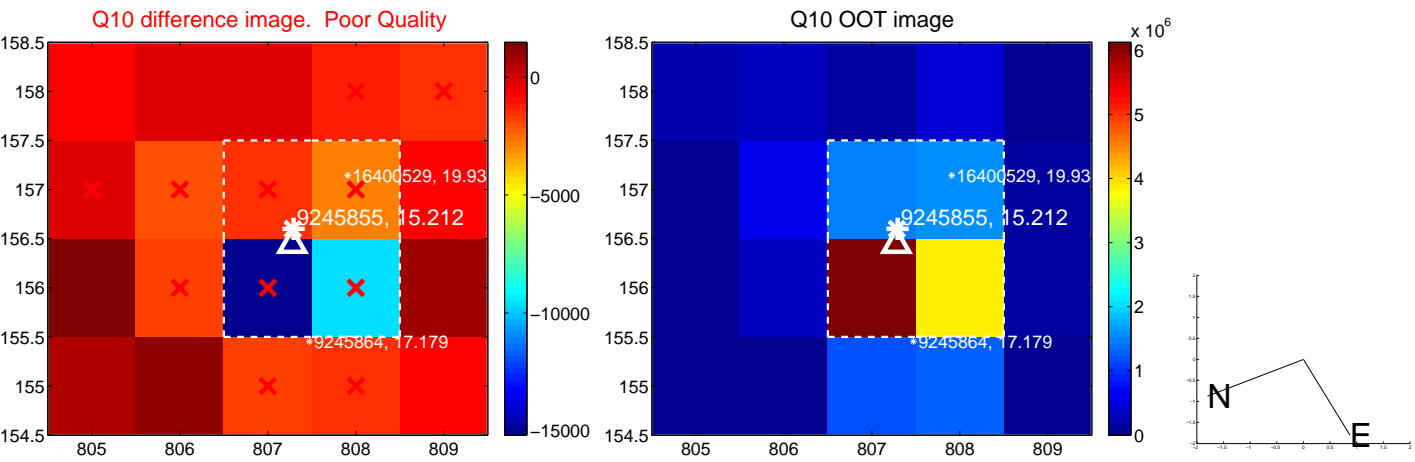
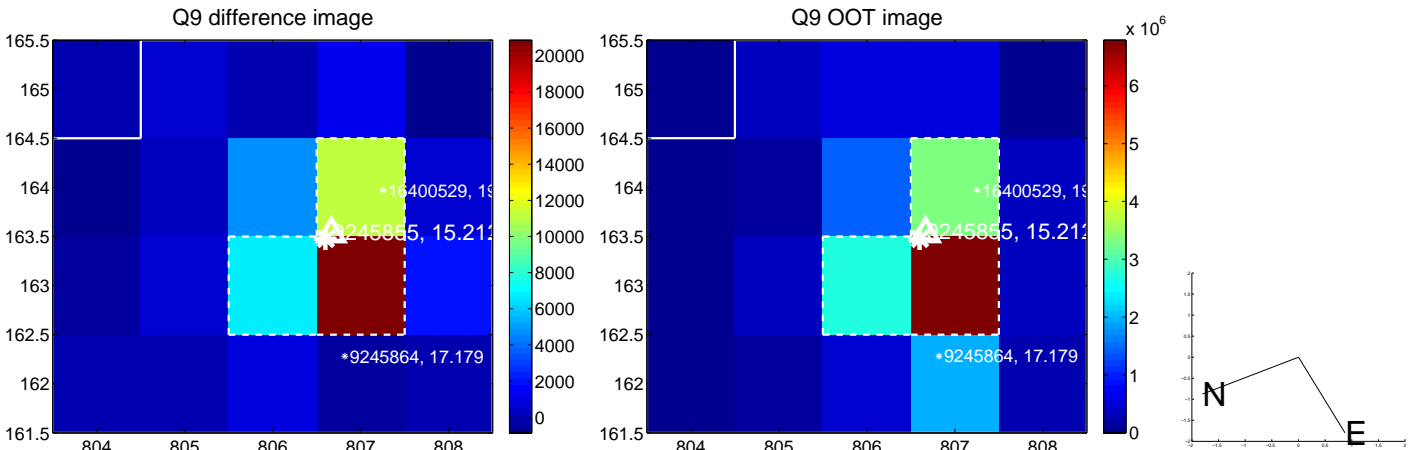
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



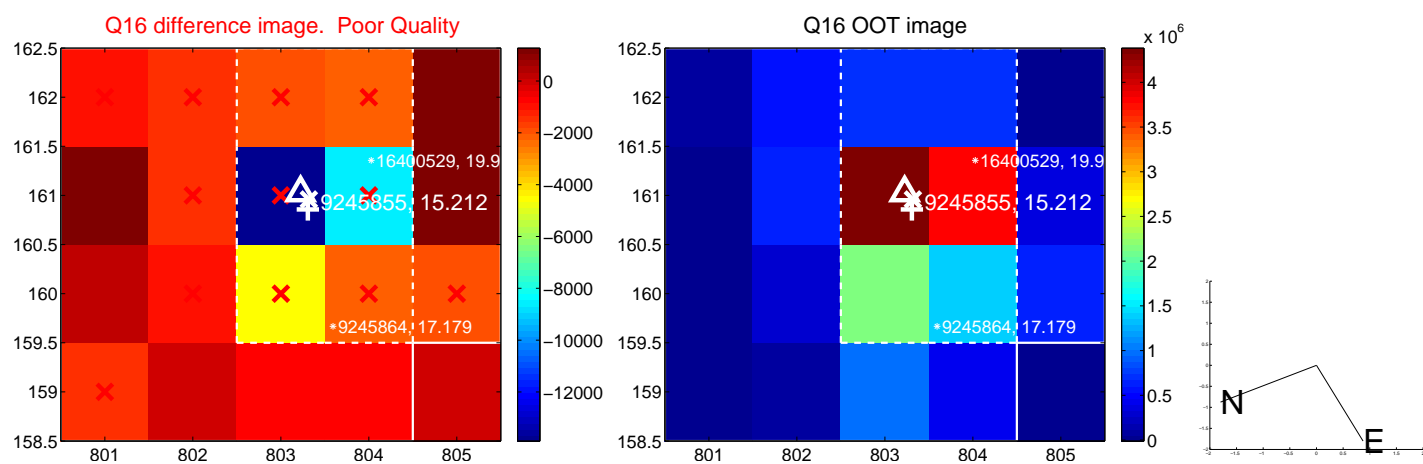
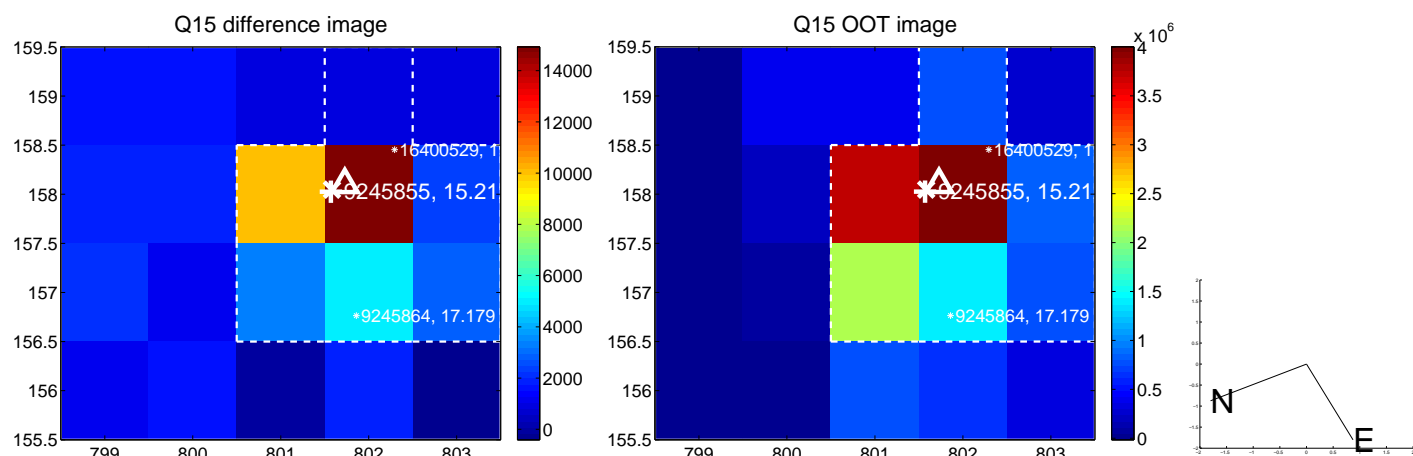
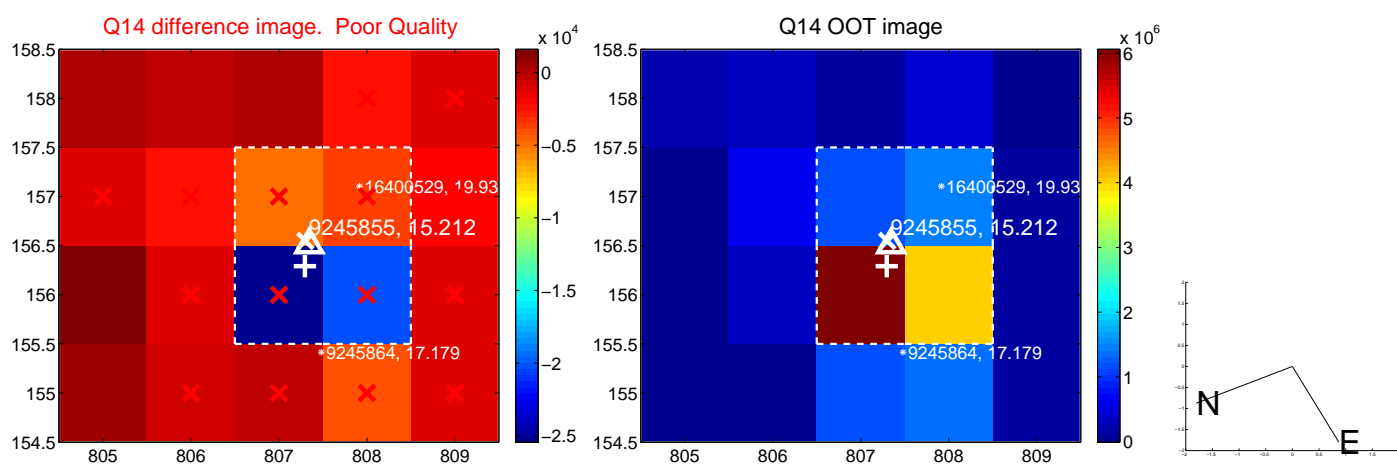
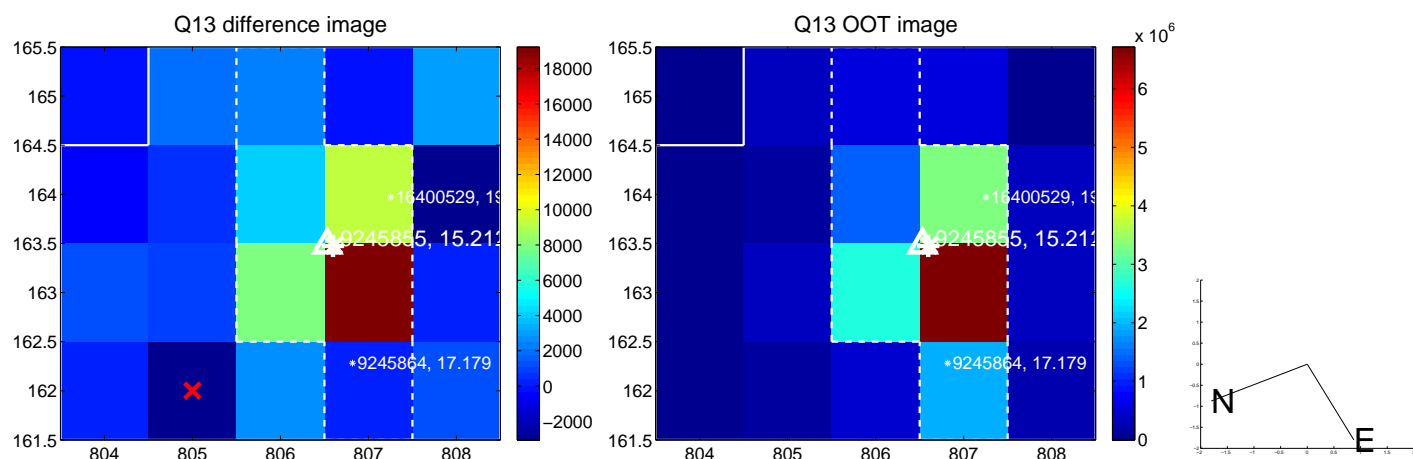
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

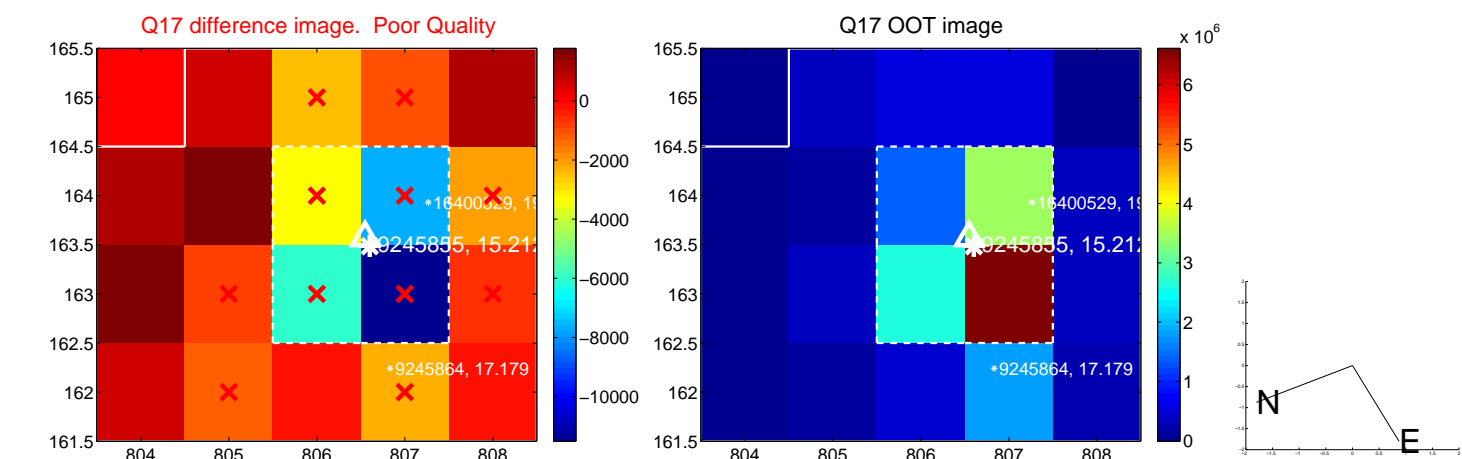


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

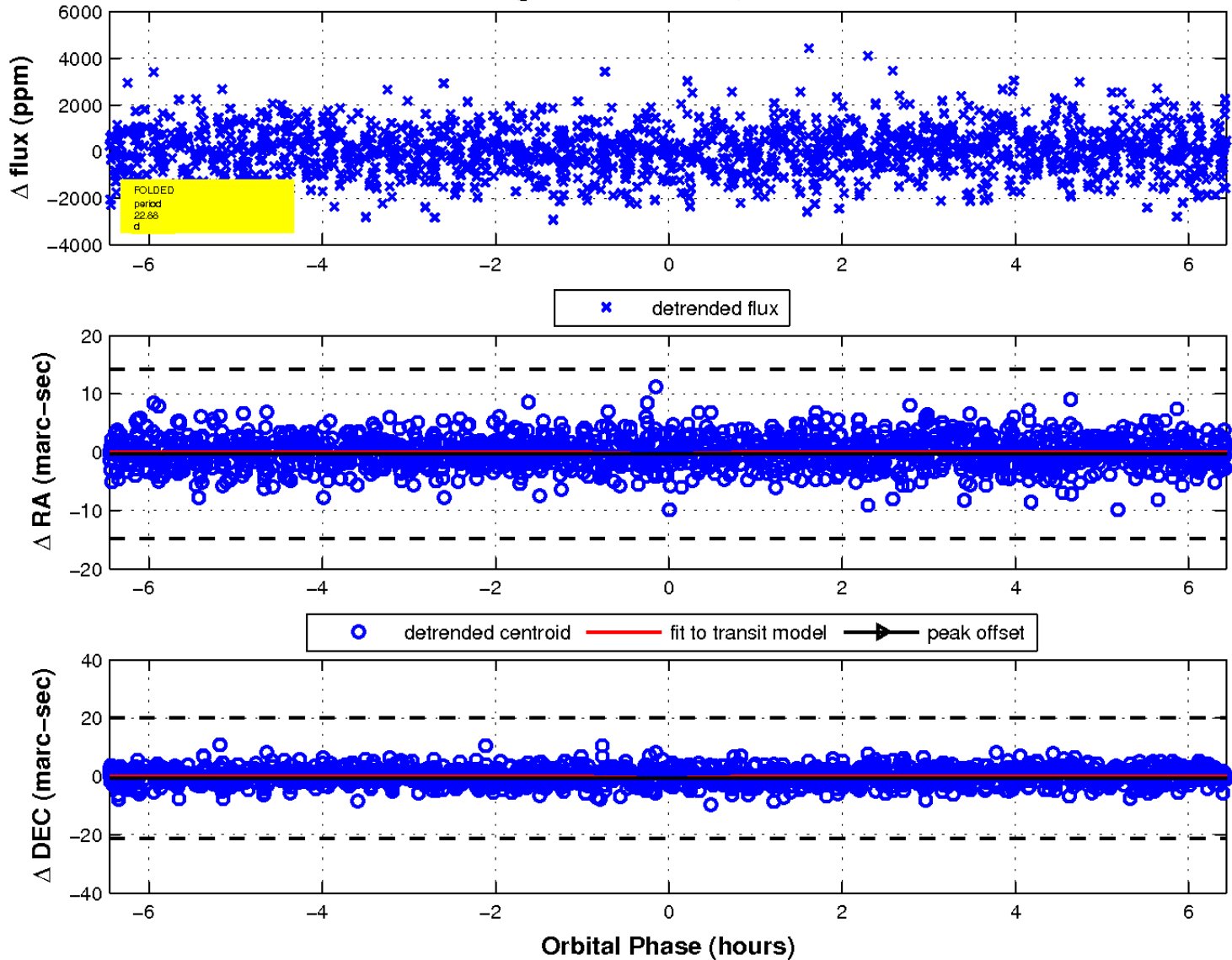




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

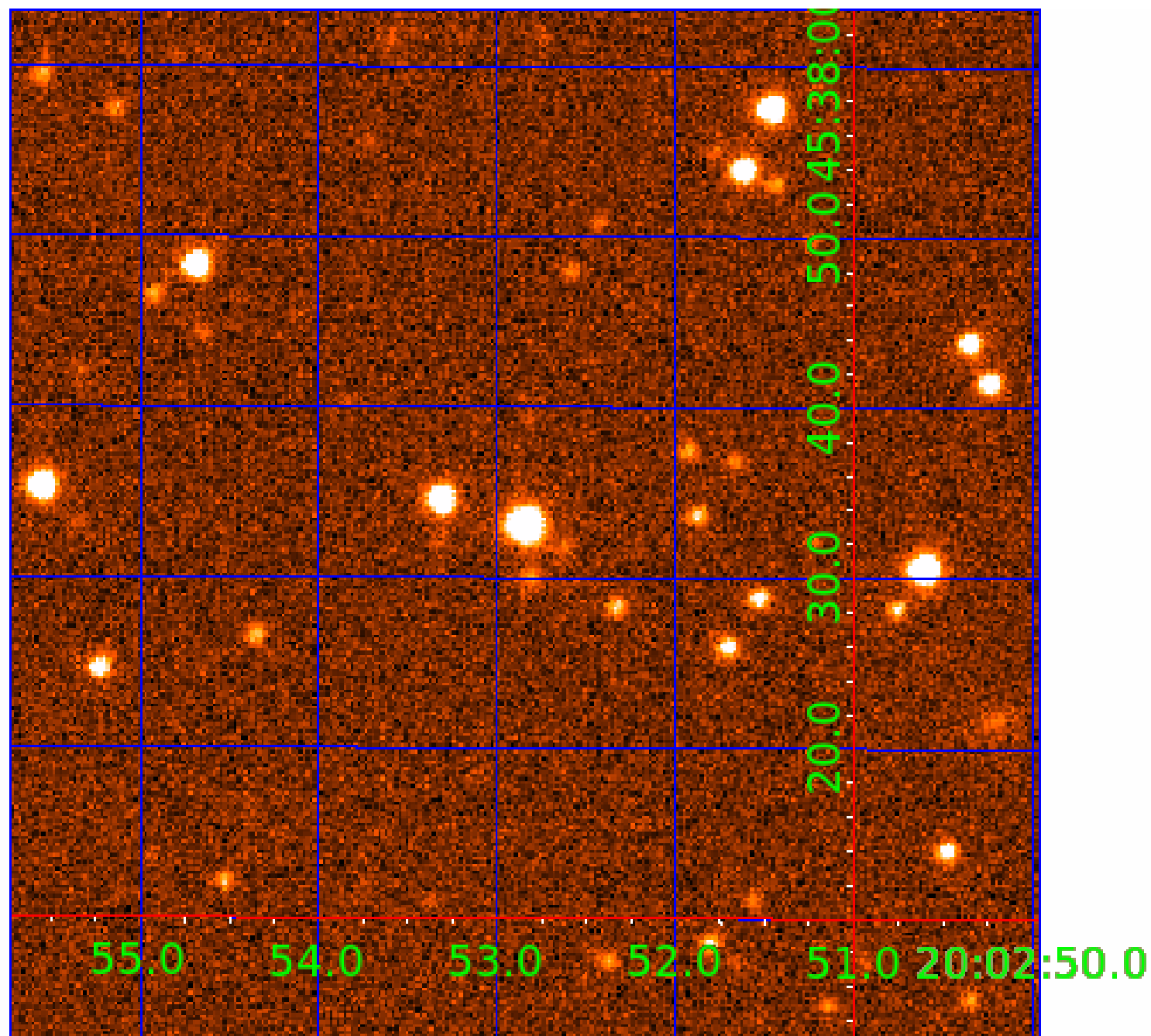


fluxWeightedCentroids, Planet 3 of 6



UKIRT Image

Declination



# KIC 009245855

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009245855-01	OBS	No	0.606308	131.936718	63.9	4.164	9.2	7.9	1.21	6586	1.04	10937.77
009245855-02	OBS	No	39.828927	150.629523	2079.4	1.909	10.7	11.2	1.21	6586	8.92	41.27
009245855-03	OBS	No	22.876714	146.976476	2046.2	2.156	9.5	13.8	1.21	6586	10.20	86.43
009245855-04	OBS	No	19.115954	142.731498	732.0	4.047	10.6	9.1	1.21	6586	3.49	109.81
009245855-05	OBS	No	35.079209	158.129705	1975.4	1.598	10.2	12.0	1.21	6586	6.52	48.88
009245855-06	OBS	No	23.676899	154.858019	643.1	3.695	11.0	7.4	1.21	6586	3.45	82.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009245855-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009245855-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009245855-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
009245855-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

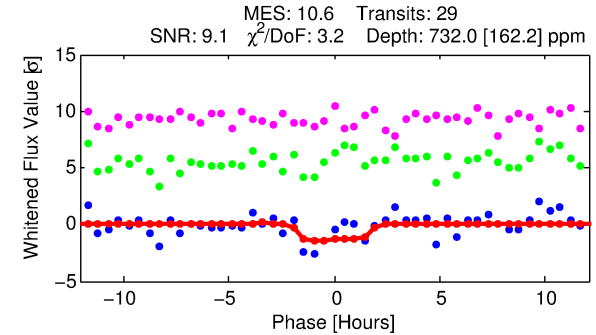
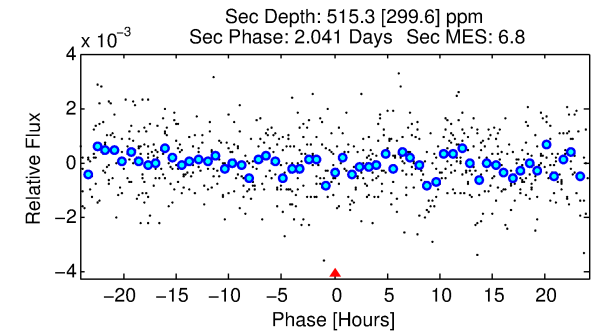
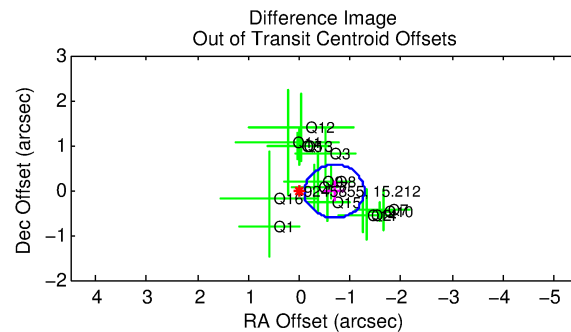
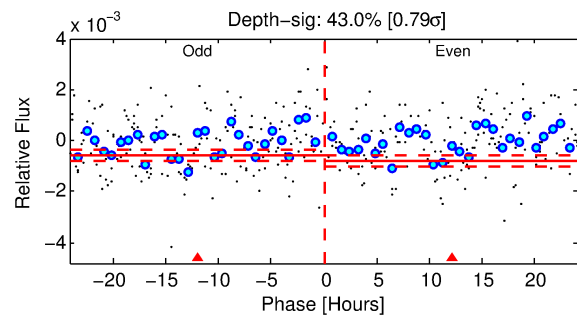
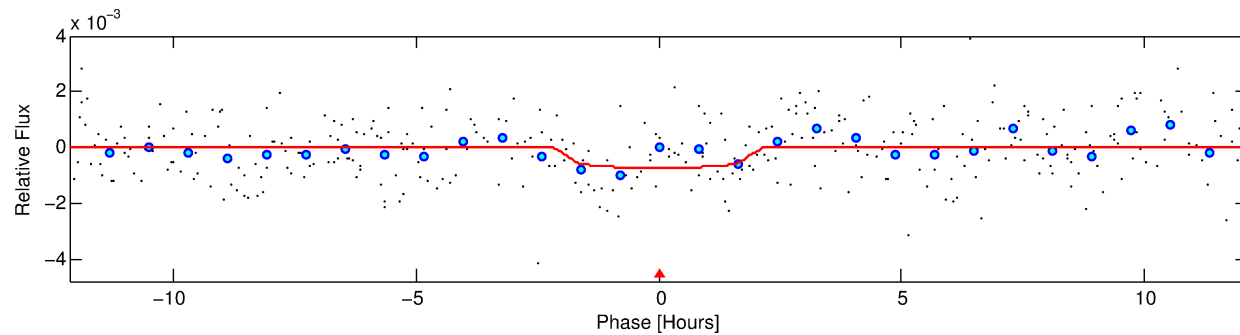
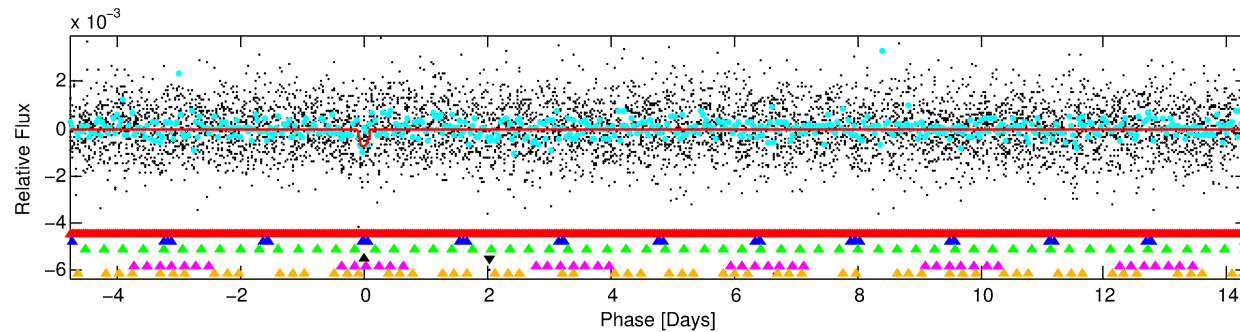
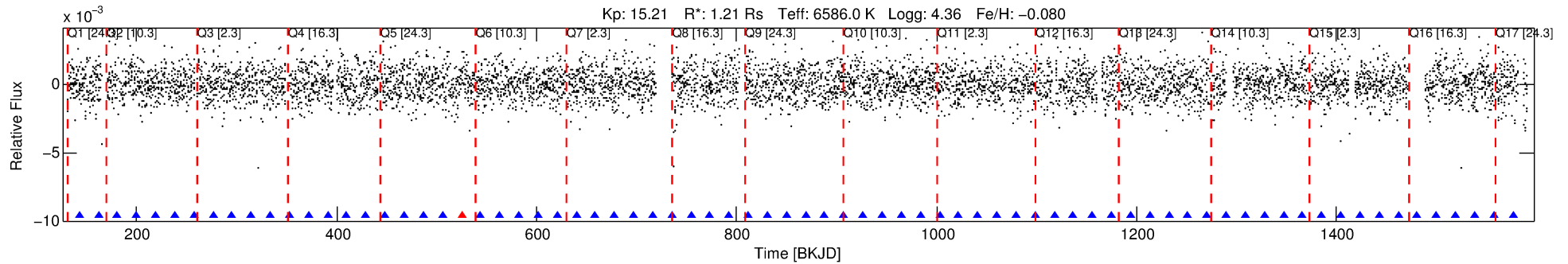
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009245855-04

No Significant Match Found

# DV One-Page Summary

KIC: 9245855 Candidate: 4 of 6 Period: 19.116 d



## DV Fit Results:

Period = 19.11595 [0.00045] d  
Epoch = 142.7315 [0.0205] BKJD  
Rp/R\* = 0.0265 [0.0358]  
a/R\* = 27.30 [199.50]  
b = 0.69 [5.51]  
Seff = 109.81 [43.69]  
Teq = 825 [82] K  
Rp = 3.49 [4.83] Re  
a = 0.1495 [0.0375] AU  
Ag = 520.11 [1447.17] [0.36 $\sigma$ ]  
Teffp = 6095 [4214] K [1.25 $\sigma$ ]

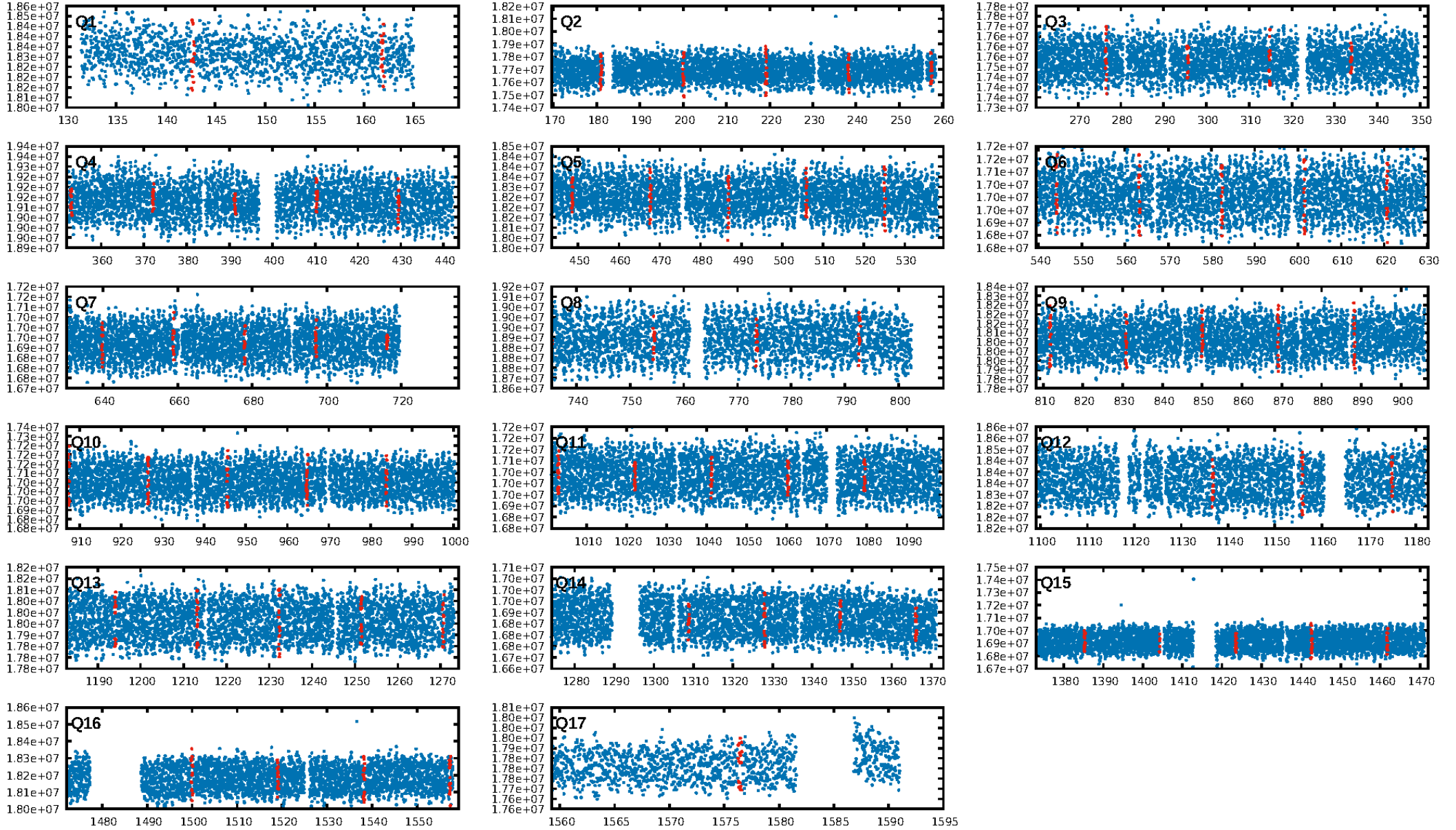
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [76.50 $\sigma$ ]  
LongPeriod-sig: 100.0% [19.68 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.21e-08  
RollingBand-fgt: 0.96 [26/27]  
GhostDiagnostic-chr: 2.003  
Centroid-sig: 2.7%  
Centroid-so: 1.577 arcsec [3.22 $\sigma$ ]  
OotOffset-rm: 0.691 arcsec [3.52 $\sigma$ ]  
KicOffset-rm: 0.512 arcsec [2.89 $\sigma$ ]  
OotOffset-st: 3/4/3/5 [15]  
KicOffset-st: 3/4/3/5 [15]  
DiffImageQuality-fgm: 0.53 [8/15]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:00:02 Z

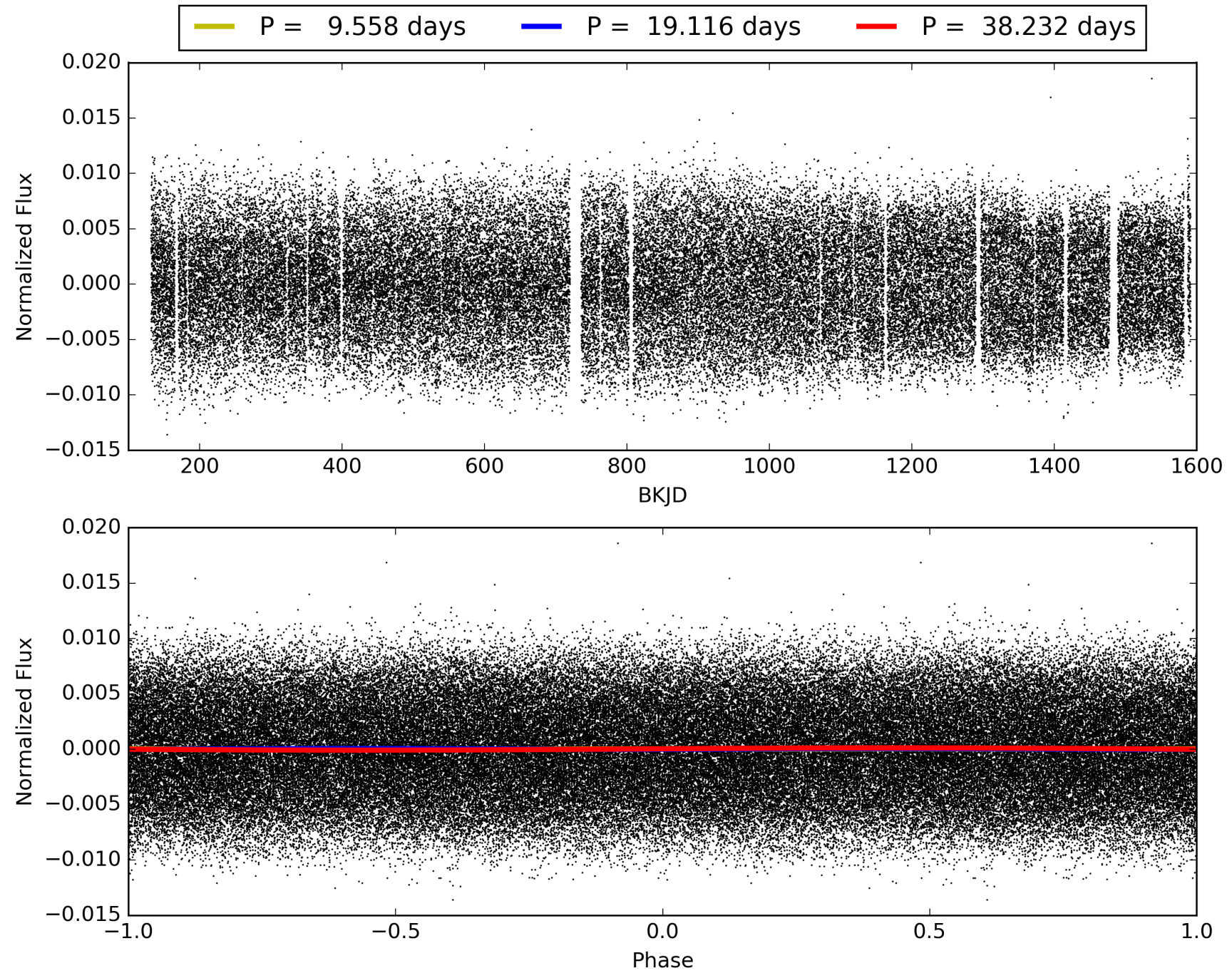
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009245855-04, PDC Light Curves



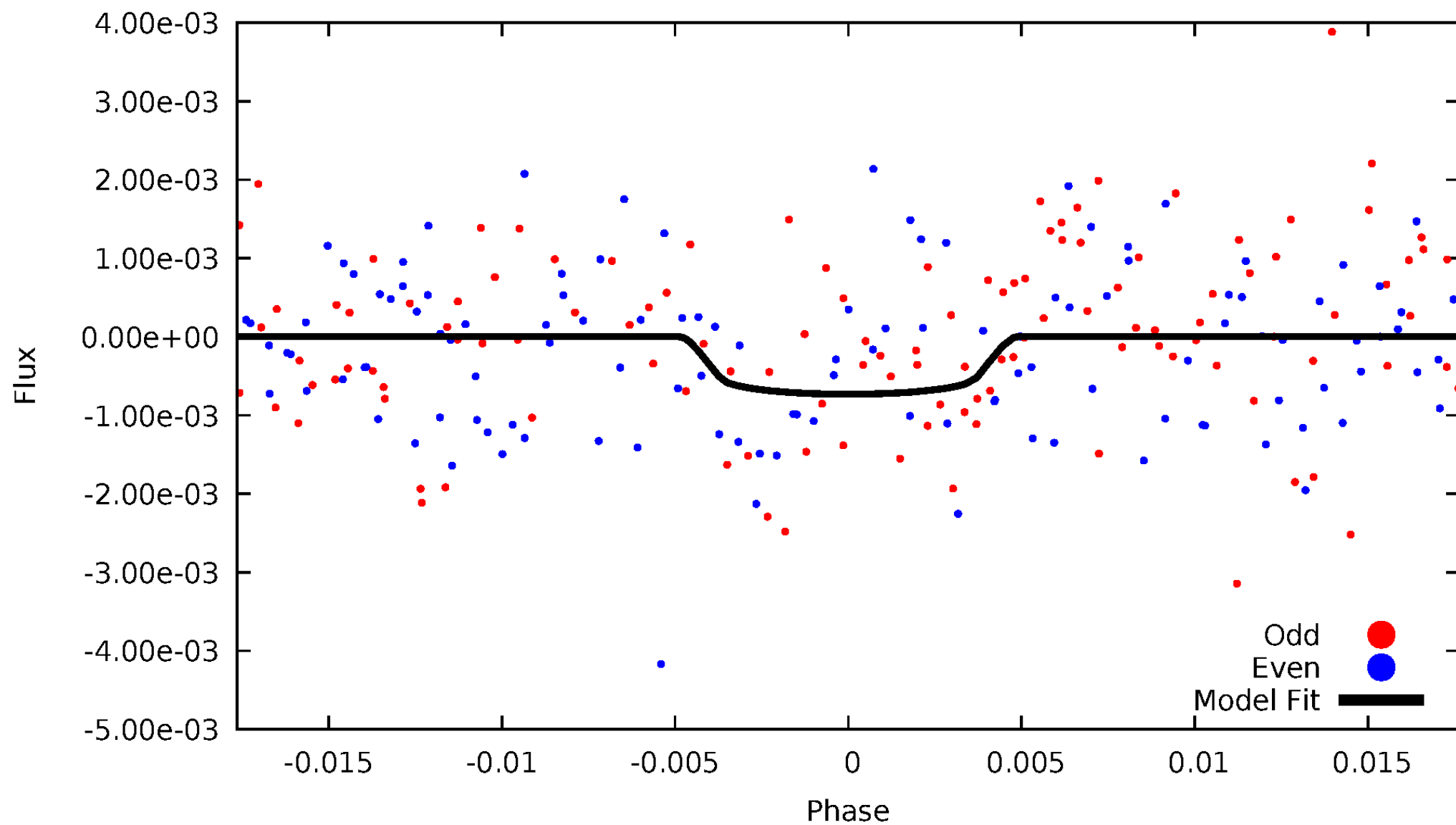


TCE 009245855-04



# DV Odd/Even

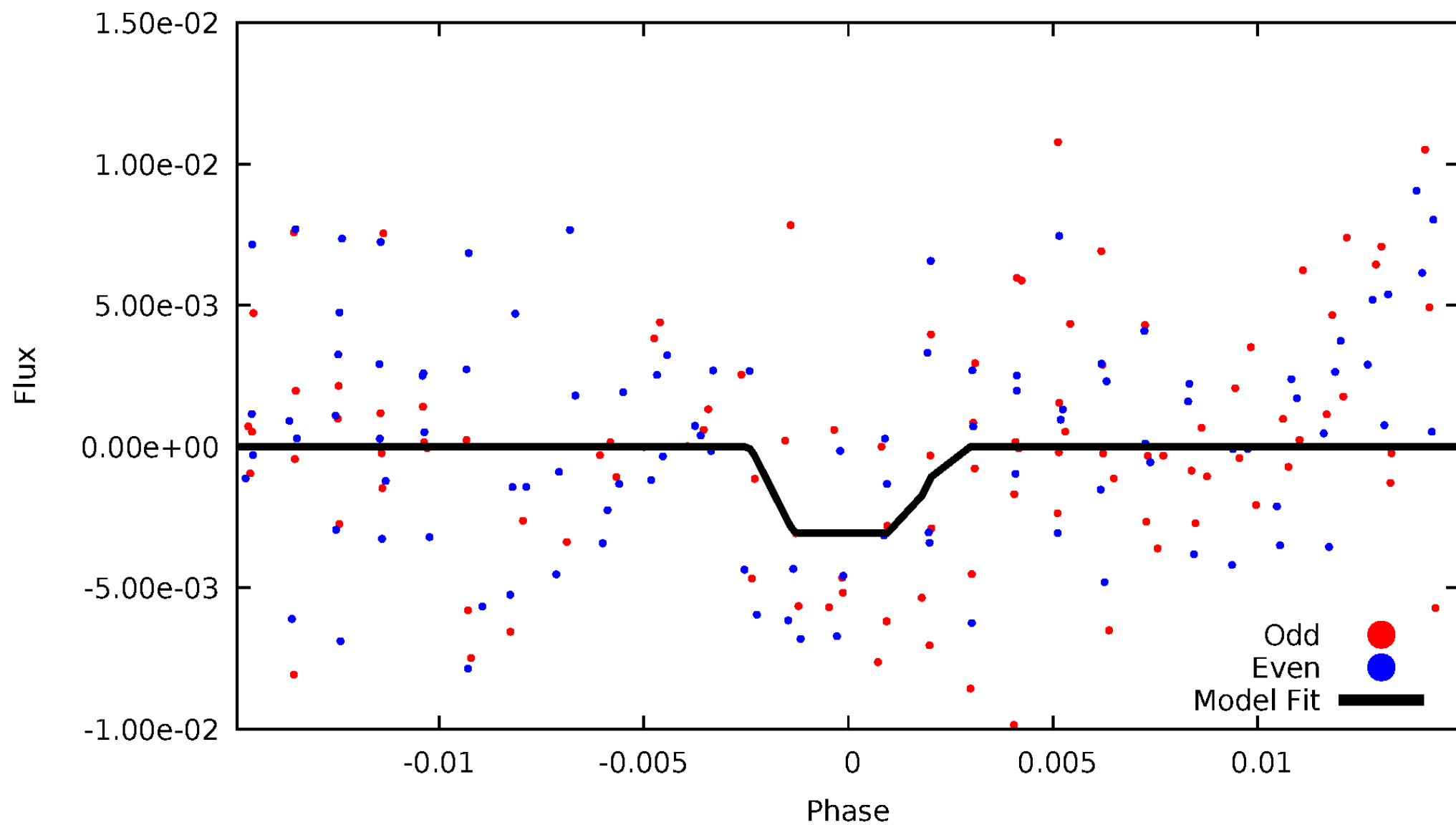
TCE 009245855-04





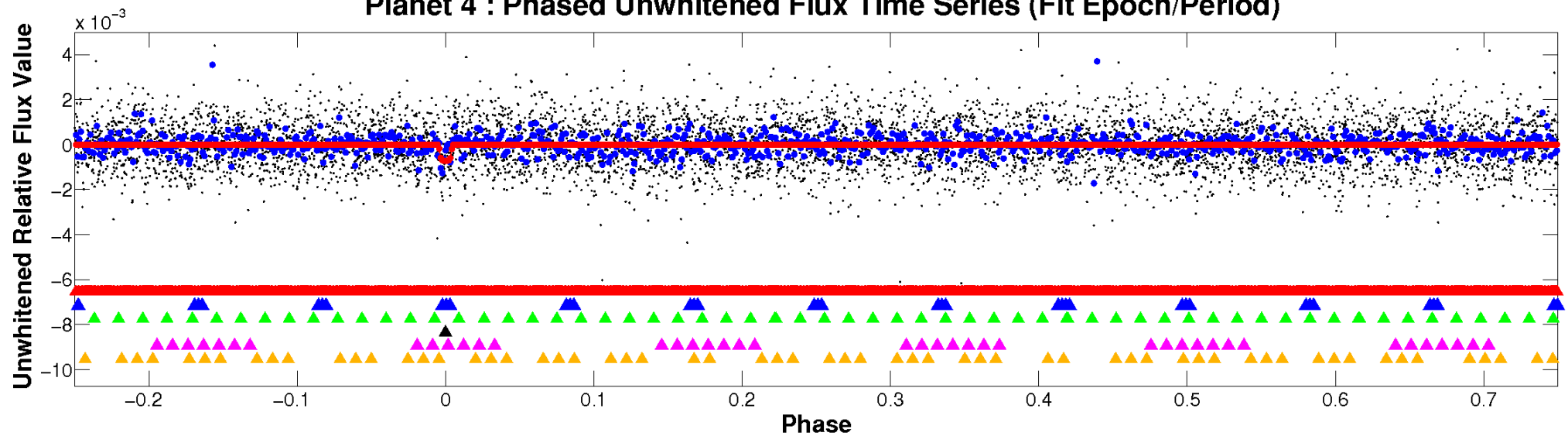
# ALT Odd/Even

TCE 009245855-04

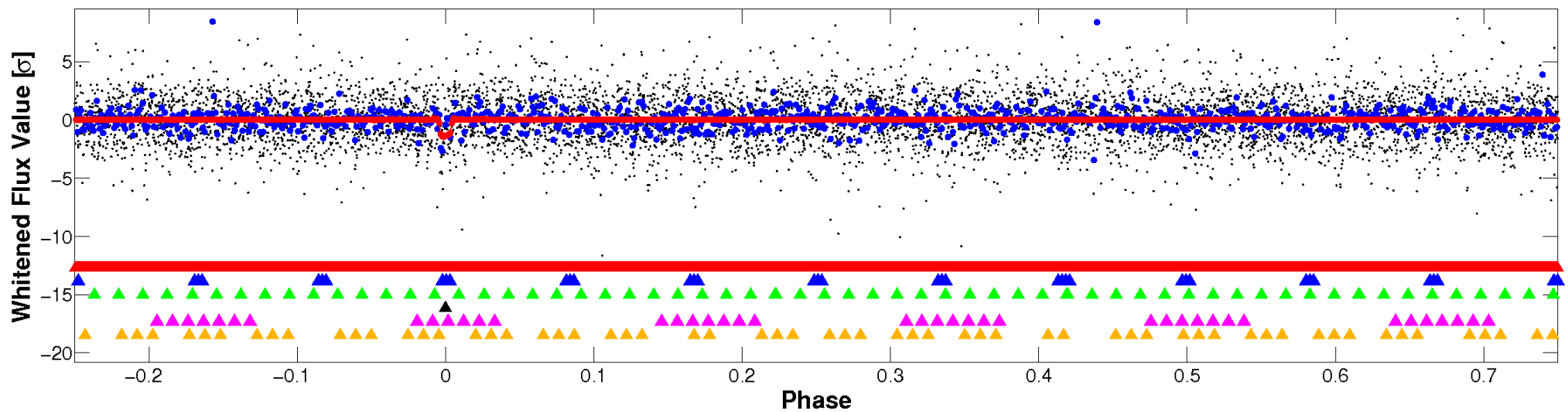


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

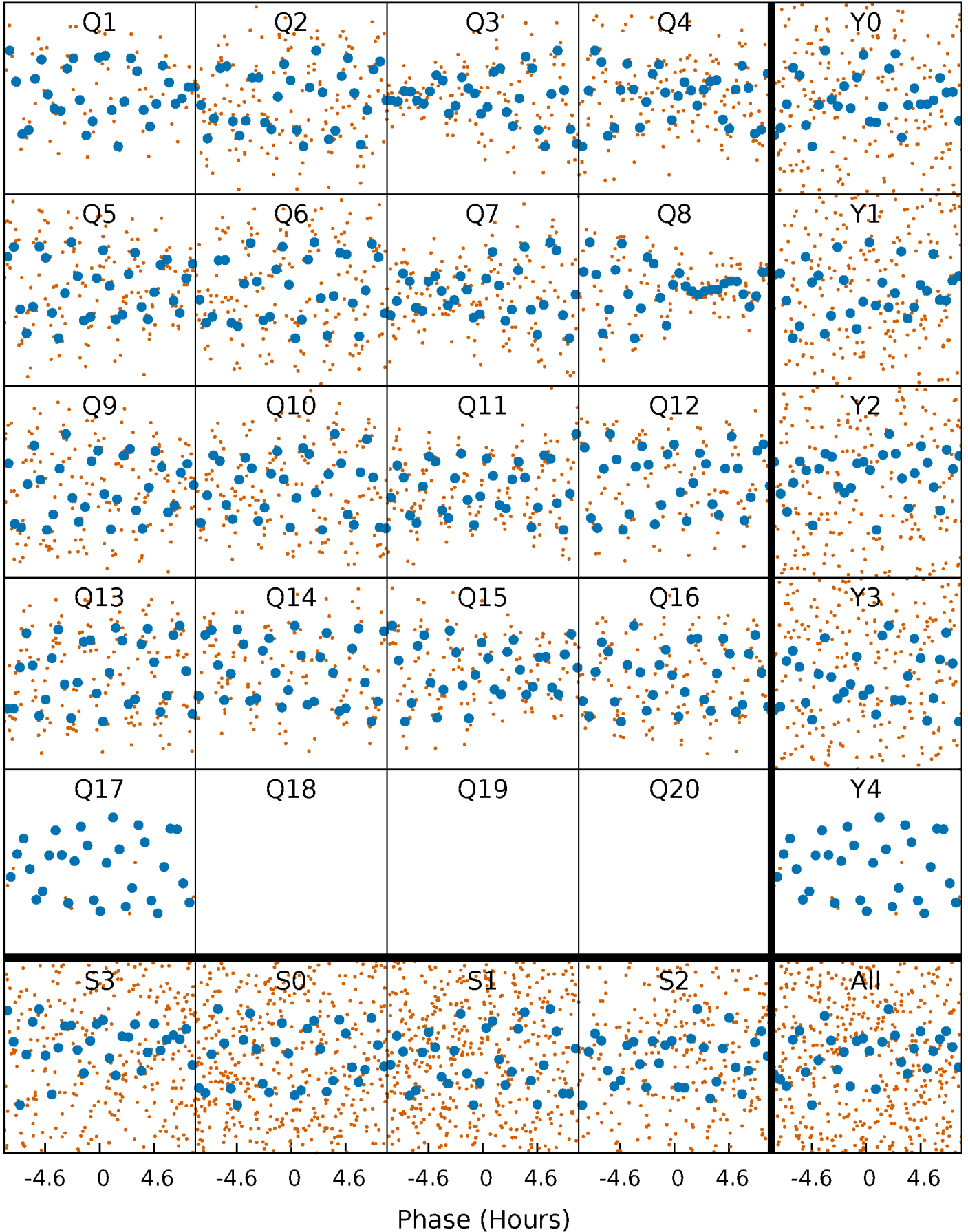


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



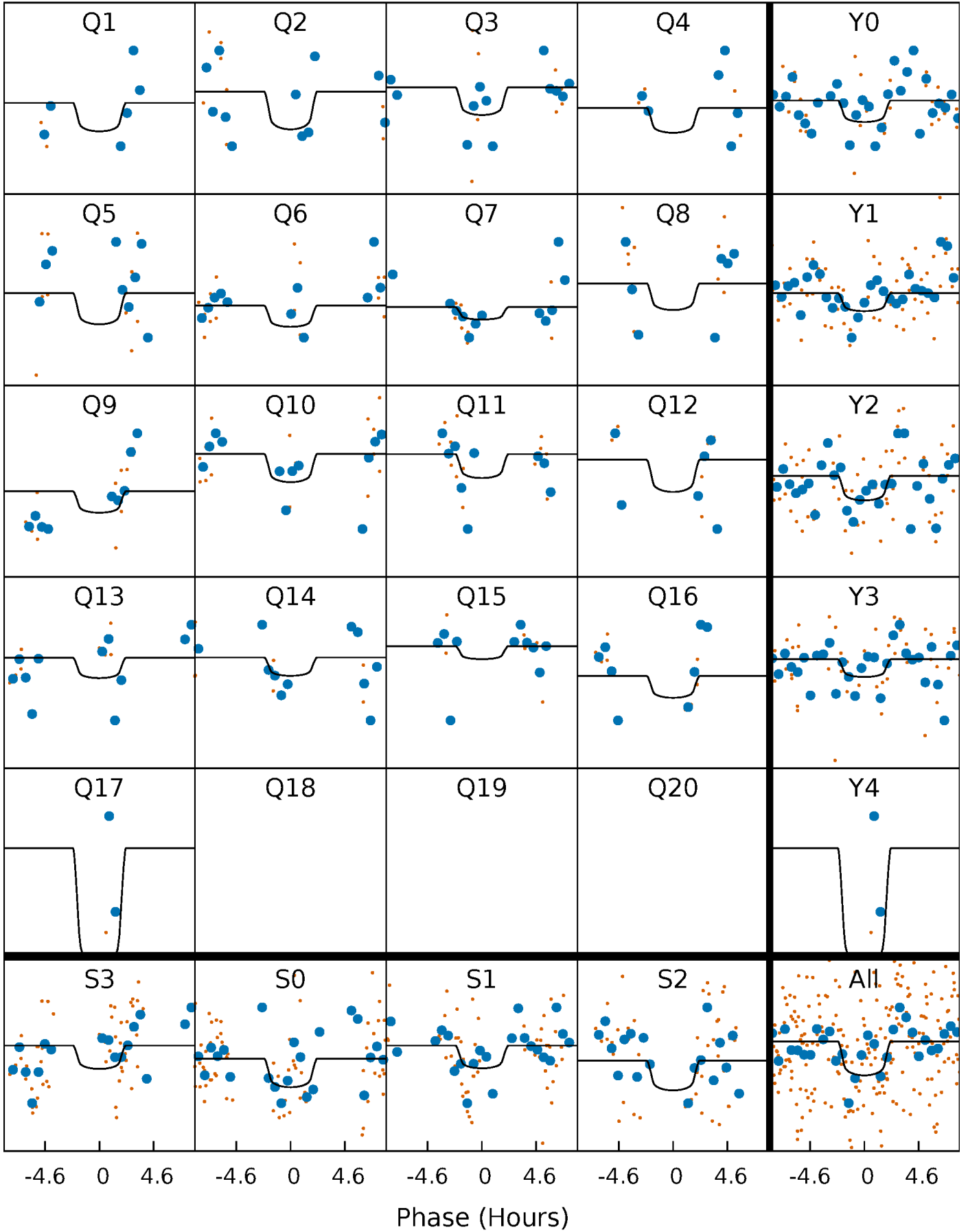
# PDC Quarter-Phased Transit Curves

TCE 009245855-04   P= 19.115954 Days    $T_0=142.731497$  (BKJD)



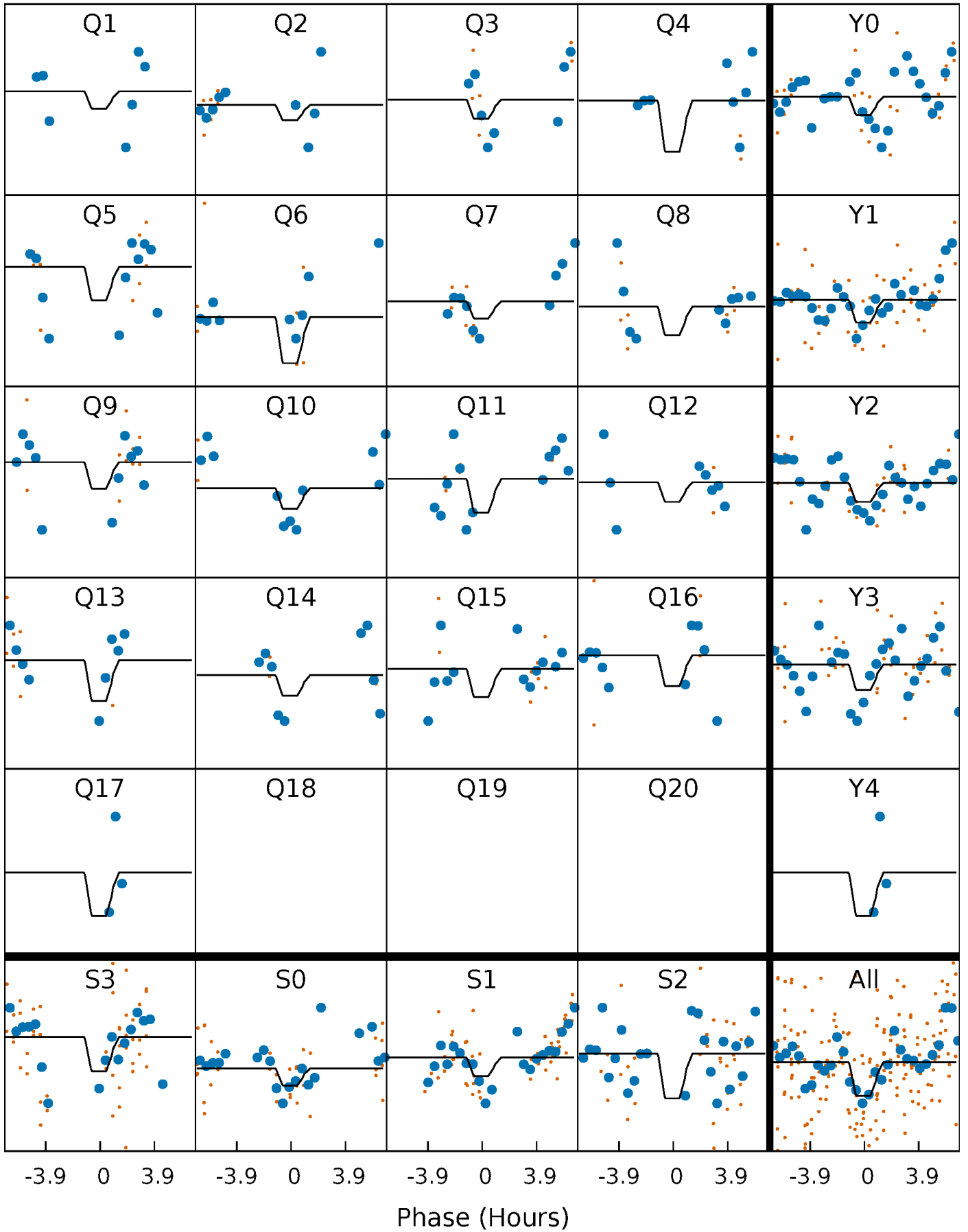
# DV Quarter-Phased Transit Curves

TCE 009245855-04     $P = 19.115954$  Days     $T_0 = 142.731497$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

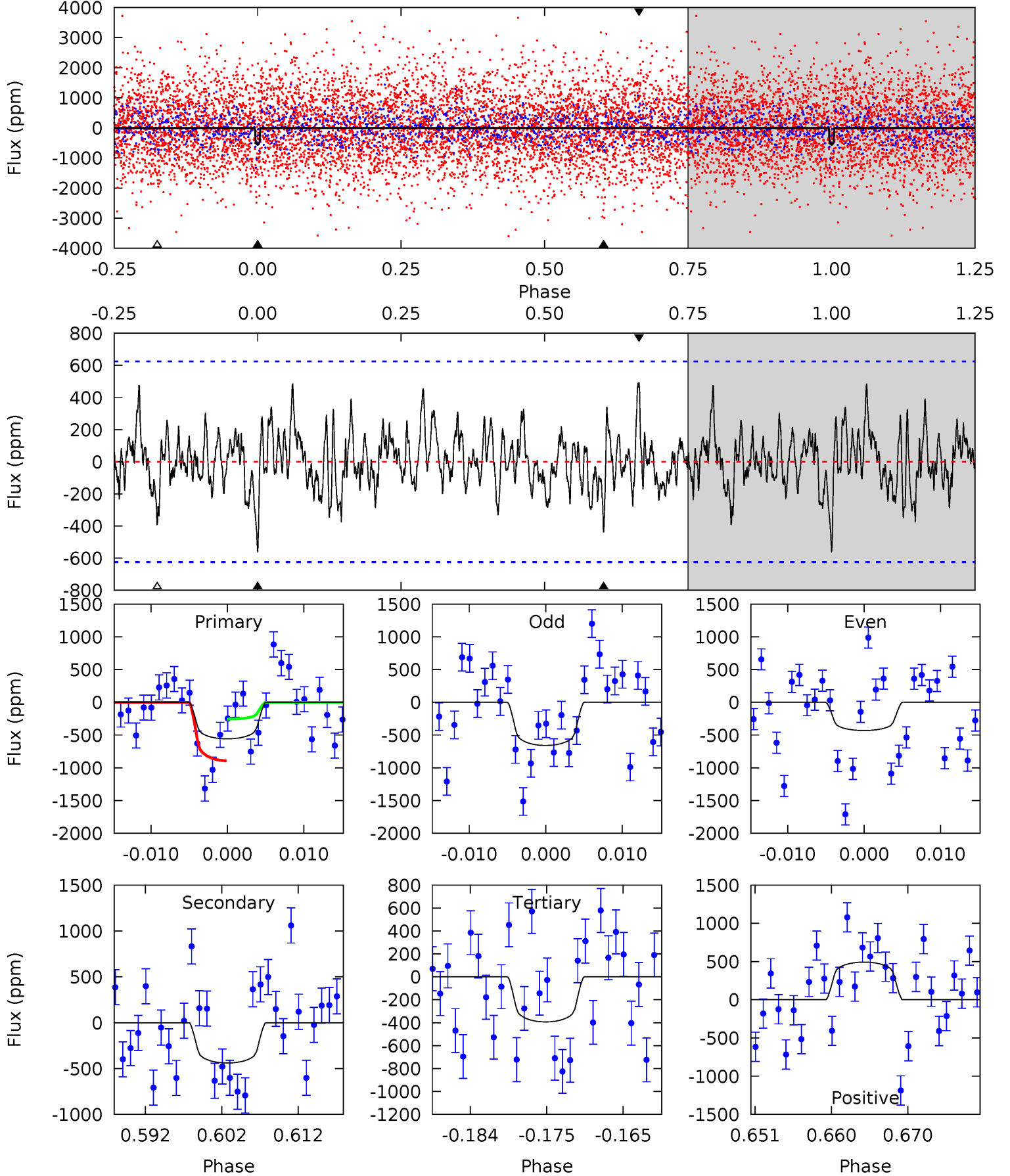
TCE 009245855-04 P= 19.116115 Days  $T_0=142.724656$  (BKJD)



# DV Model-Shift Uniqueness Test

009245855-04, P = 19.115954 Days, E = 123.615543 Days

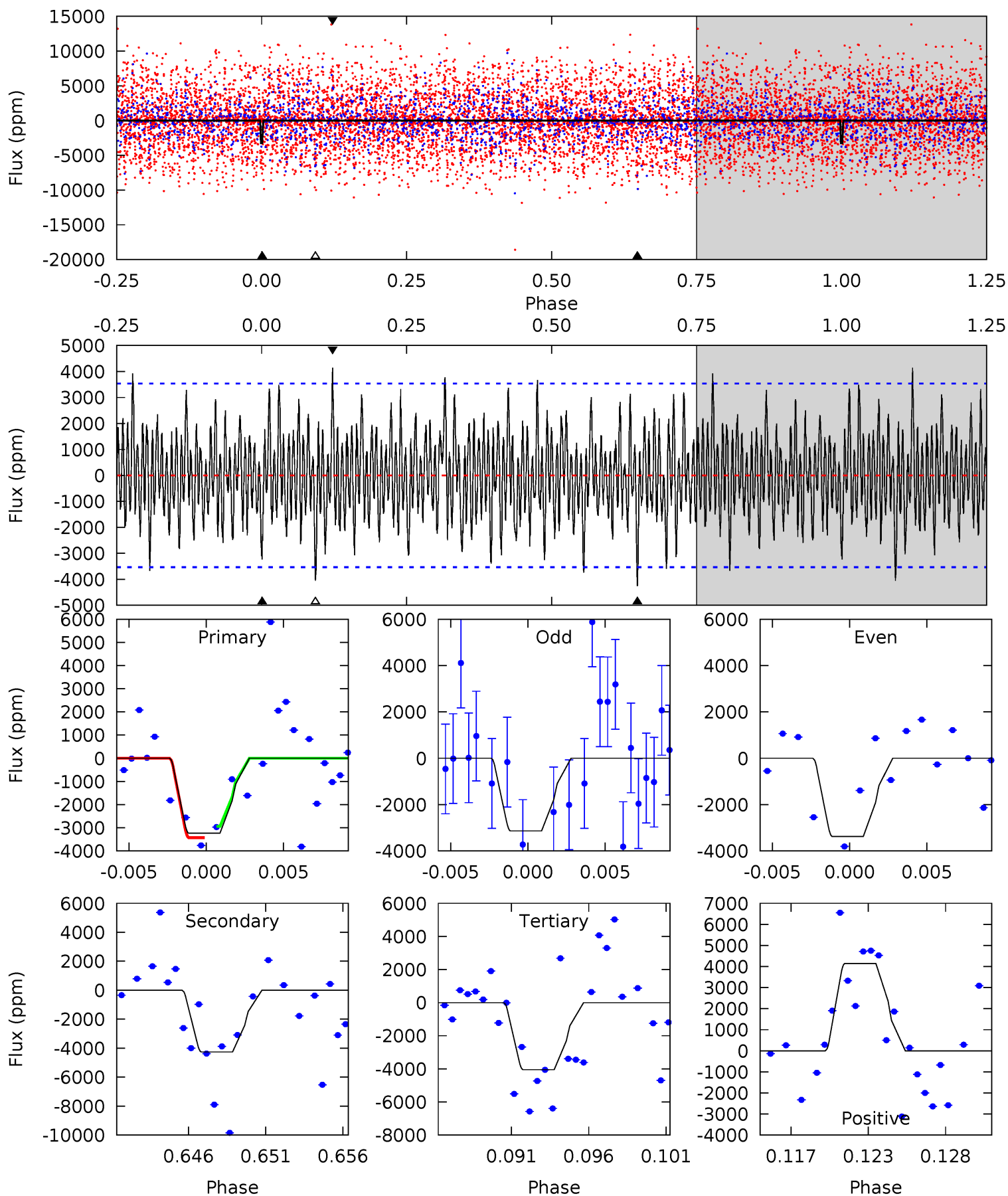
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.49	3.54	3.17	3.96	5.03	2.59	1.20	1.32	0.53	0.37	-0.42	0.91	0.68	0.47	2.56



# Alt Model-Shift Uniqueness Test

009245855-04, P = 19.116115 Days, E = 123.608541 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
4.71	6.20	5.89	6.02	5.15	2.79	2.01	-1.18	-1.31	0.31	0.18	0.17	0.97	0.49	0.35





### Stellar Parameters For KIC 009245855

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+214}_{-295}$	$4.361^{+0.081}_{-0.189}$	$-0.080^{+0.250}_{-0.300}$	$1.207^{+0.371}_{-0.159}$	$1.226^{+0.168}_{-0.187}$	$0.982^{+0.342}_{-0.489}$
	+3%/-4%	+2%/-4%	+312%/-375%	+31%/-13%	+14%/-15%	+35%/-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 009245855-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-440 \pm 124$	$5.05^{+4.15}_{-3.38}$	$1167^{+84}_{-71}$	$4982^{+3804}_{-1038}$	$204^{+1553}_{-147}$
Alt.	$-4262 \pm 687$	$7.90^{+4.83}_{-4.29}$	$1167^{+80}_{-66}$	$7006^{+4609}_{-1567}$	$825^{+3287}_{-514}$

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

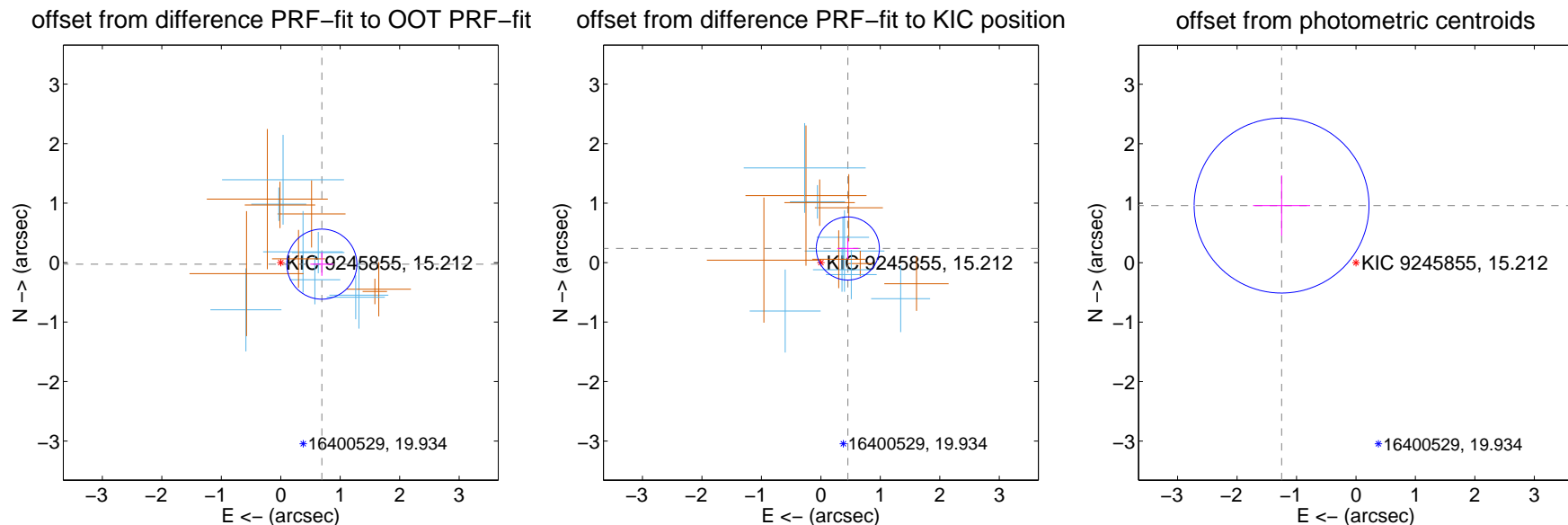
## DV Centroid Data

Supplemental centroid analysis for 009245855-04. Kepler magnitude: 15.21. Transit SNR 9.05

There are 8 quarters with good PRF difference image offsets

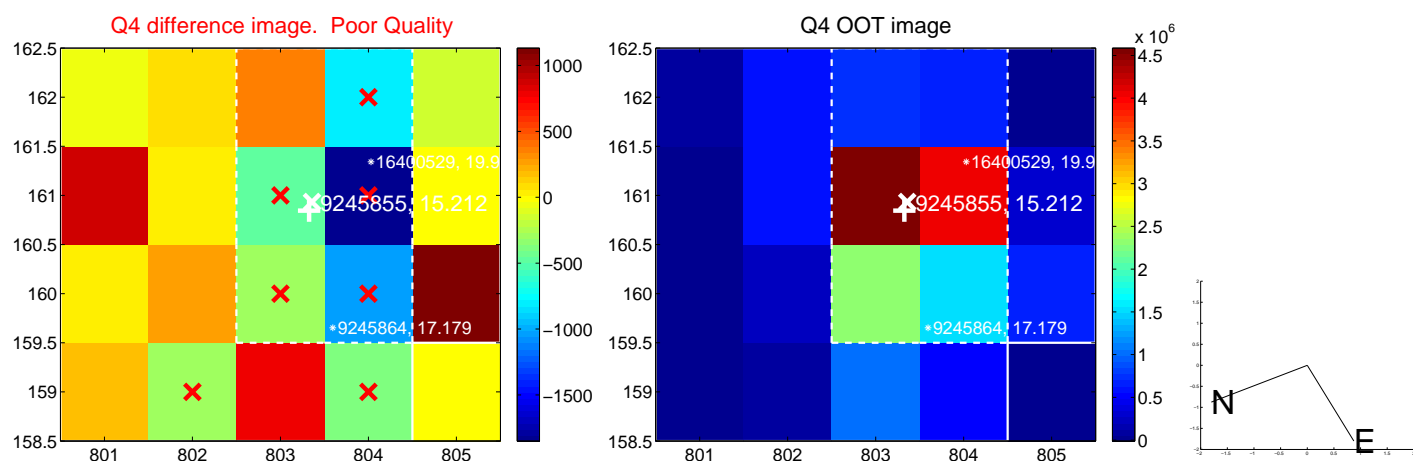
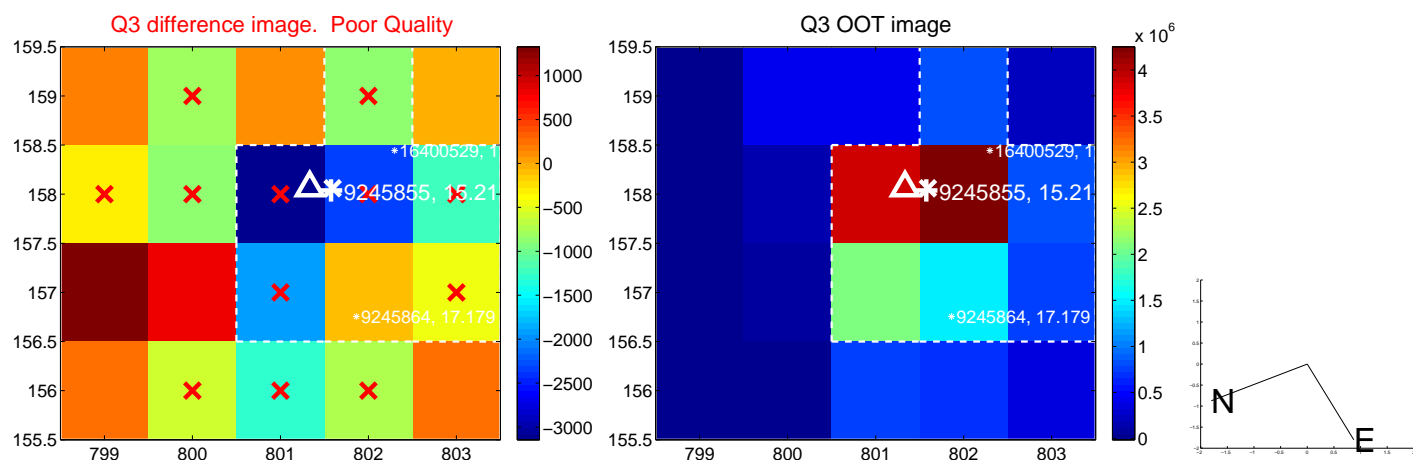
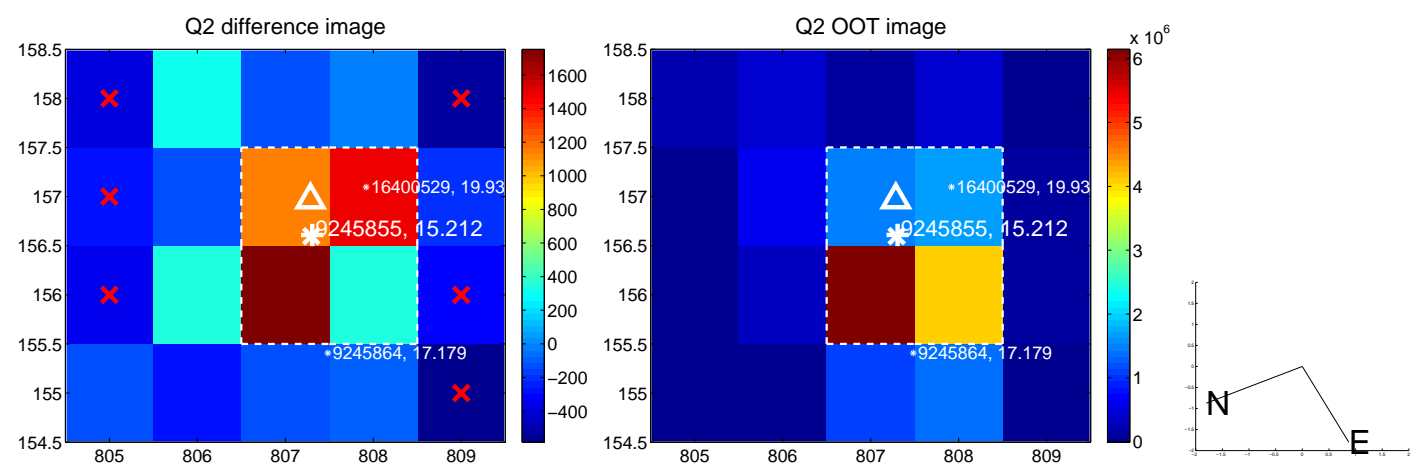
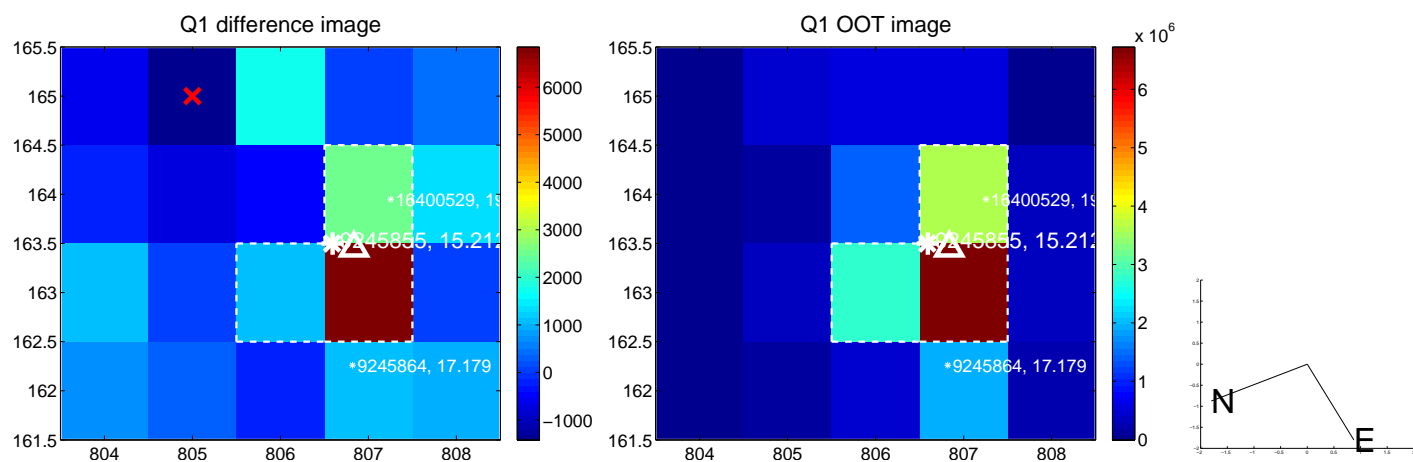
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.691 \pm 0.196$	<b>3.52</b>	$-0.691 \pm 0.193$	$-0.026 \pm 0.196$
PRF-fit source offset from KIC position	$0.512 \pm 0.177$	2.89	$-0.453 \pm 0.178$	$0.237 \pm 0.174$
photometric centroid source offset	$1.58 \pm 0.49$	<b>3.22</b>	$1.25 \pm 0.48$	$0.96 \pm 0.51$



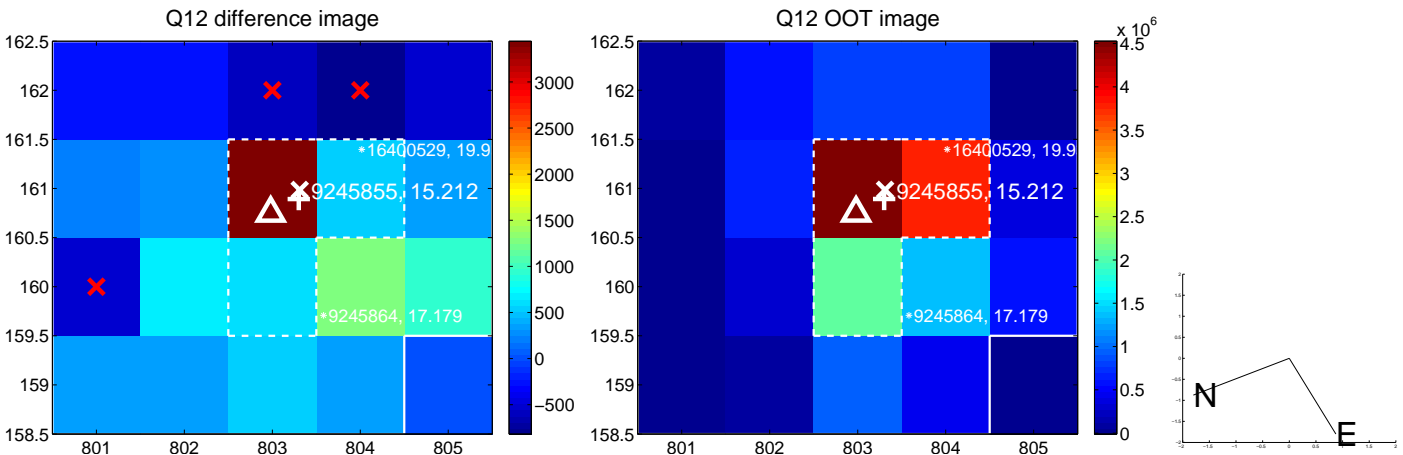
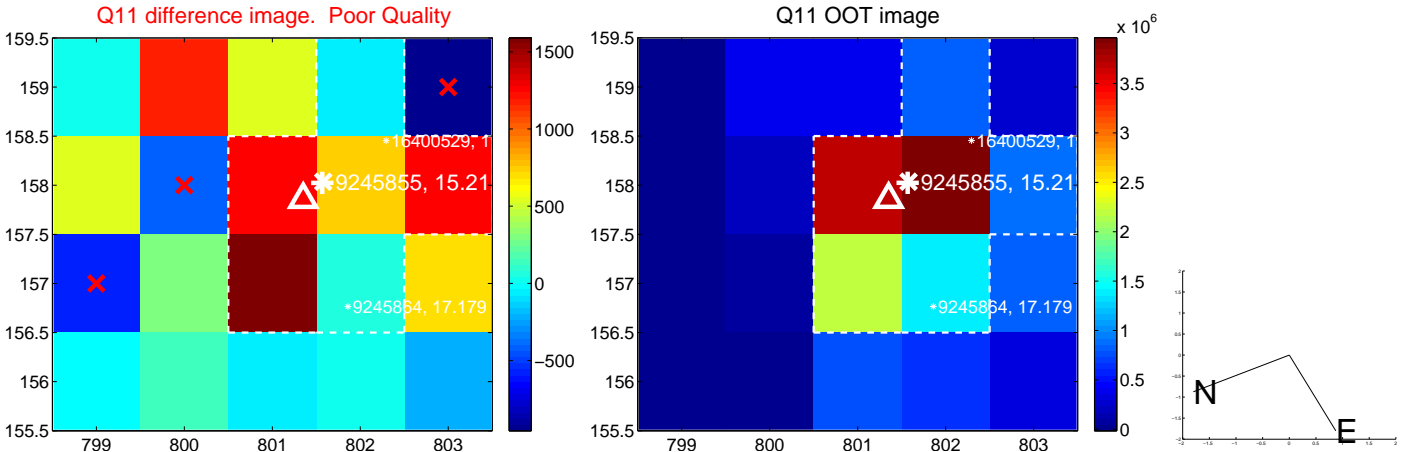
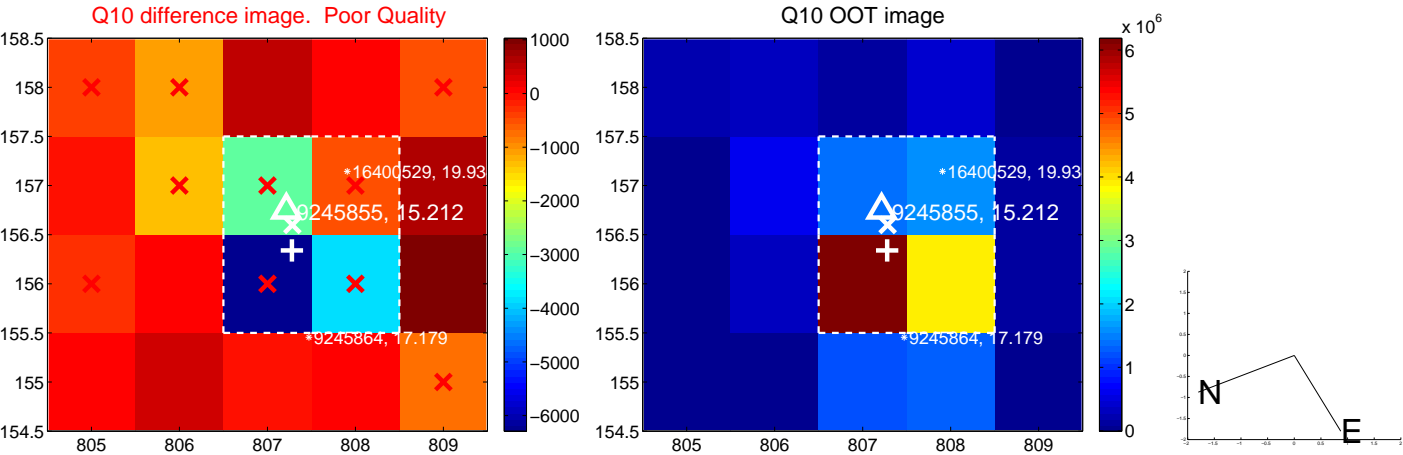
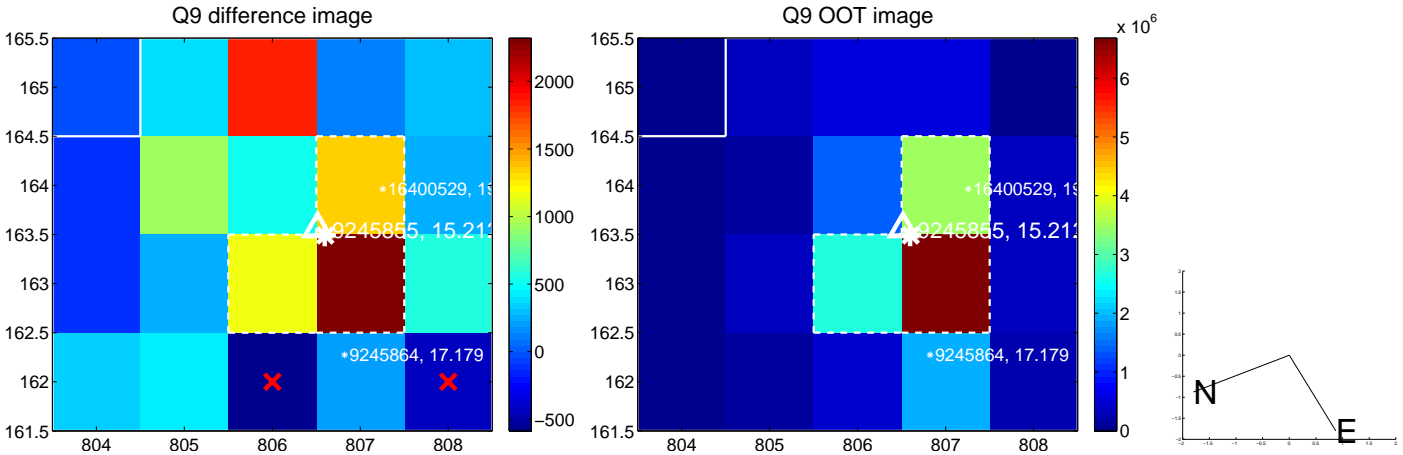
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

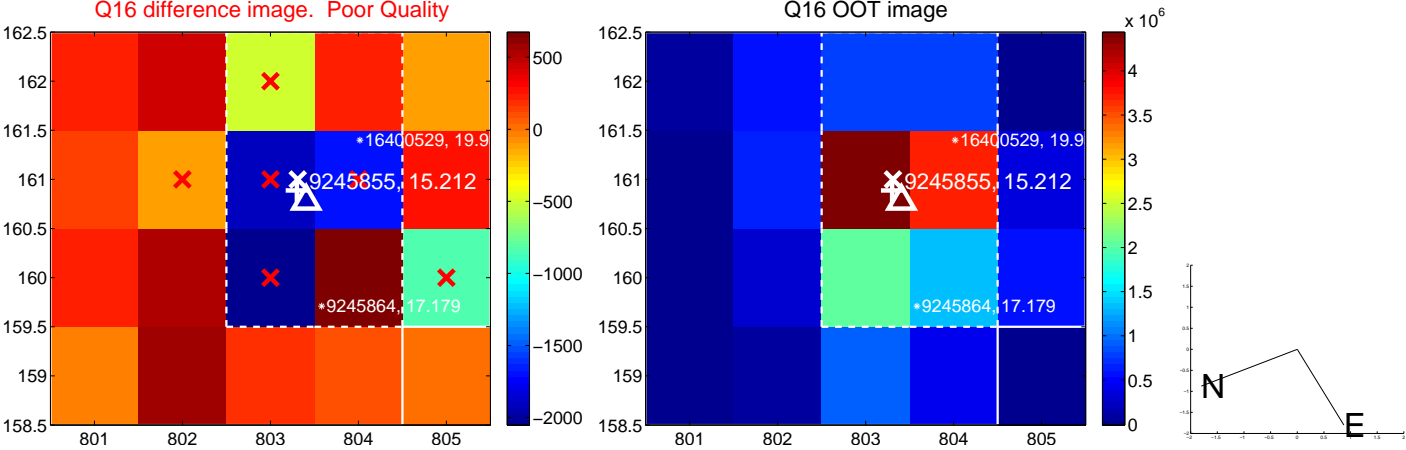
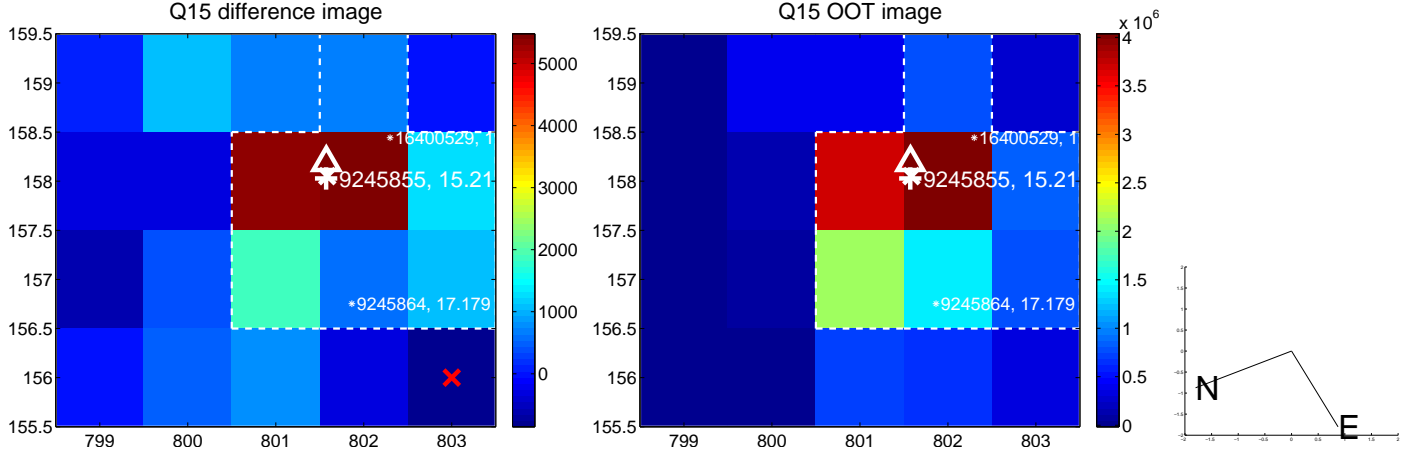
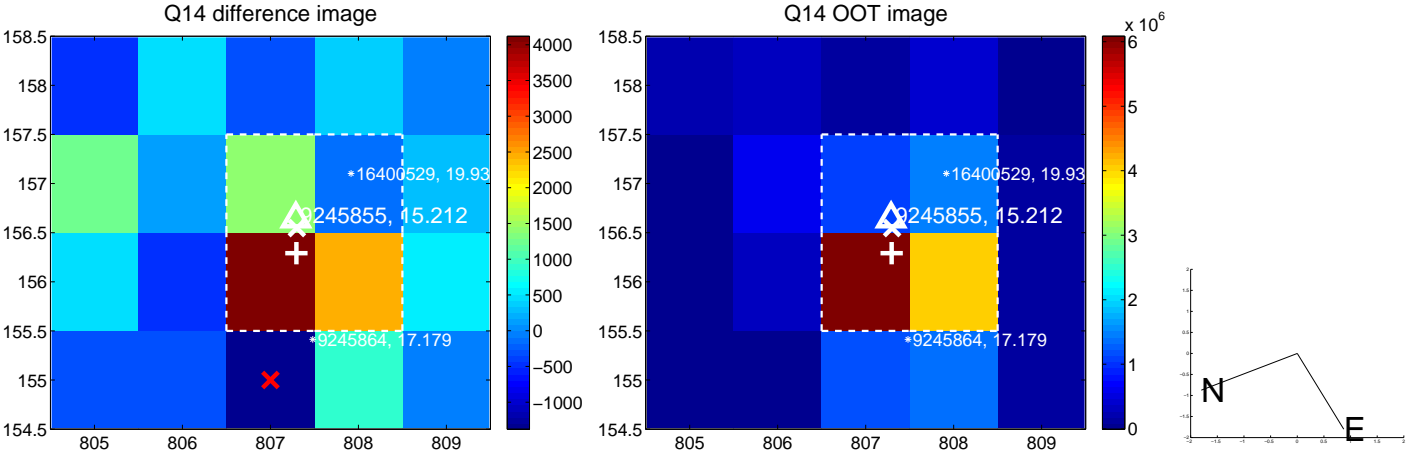
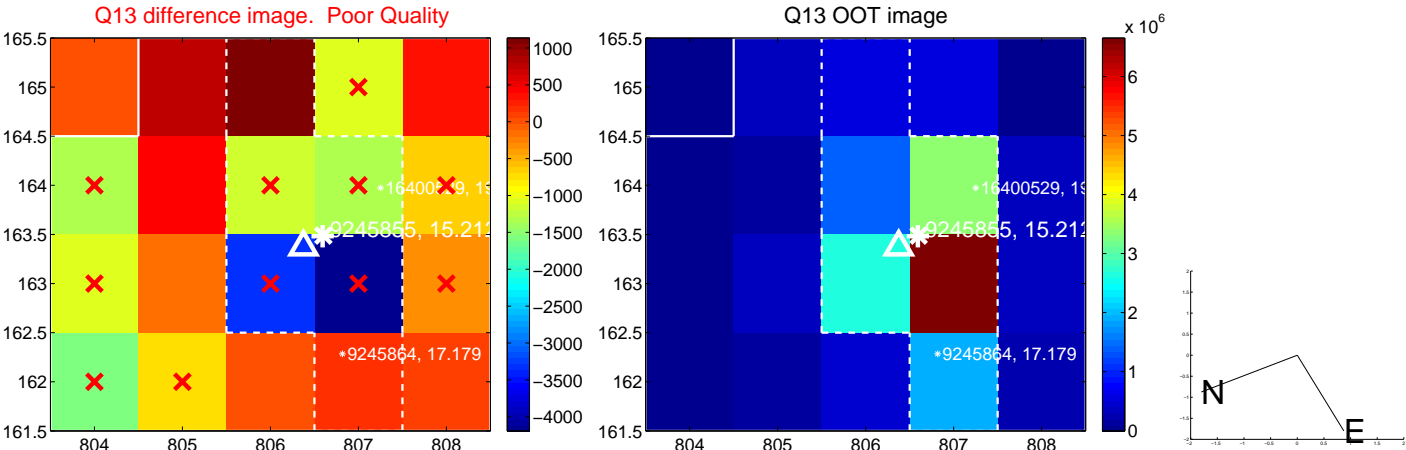




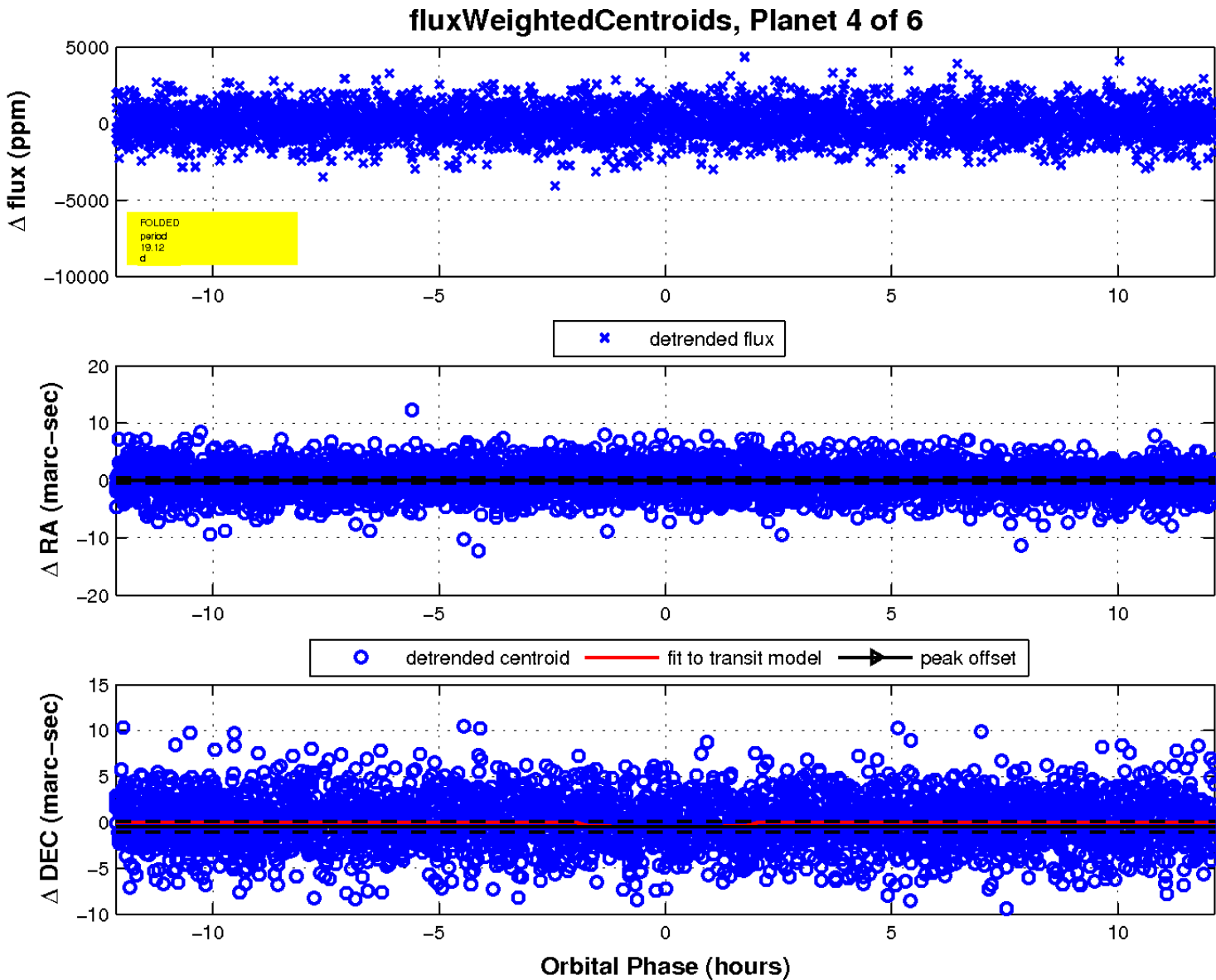
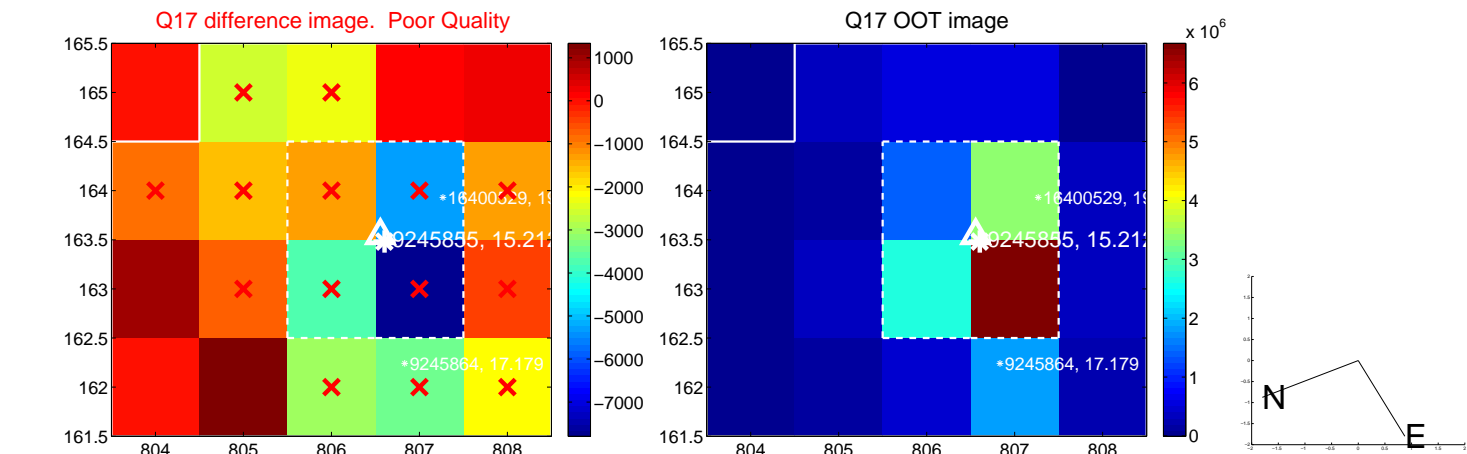
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



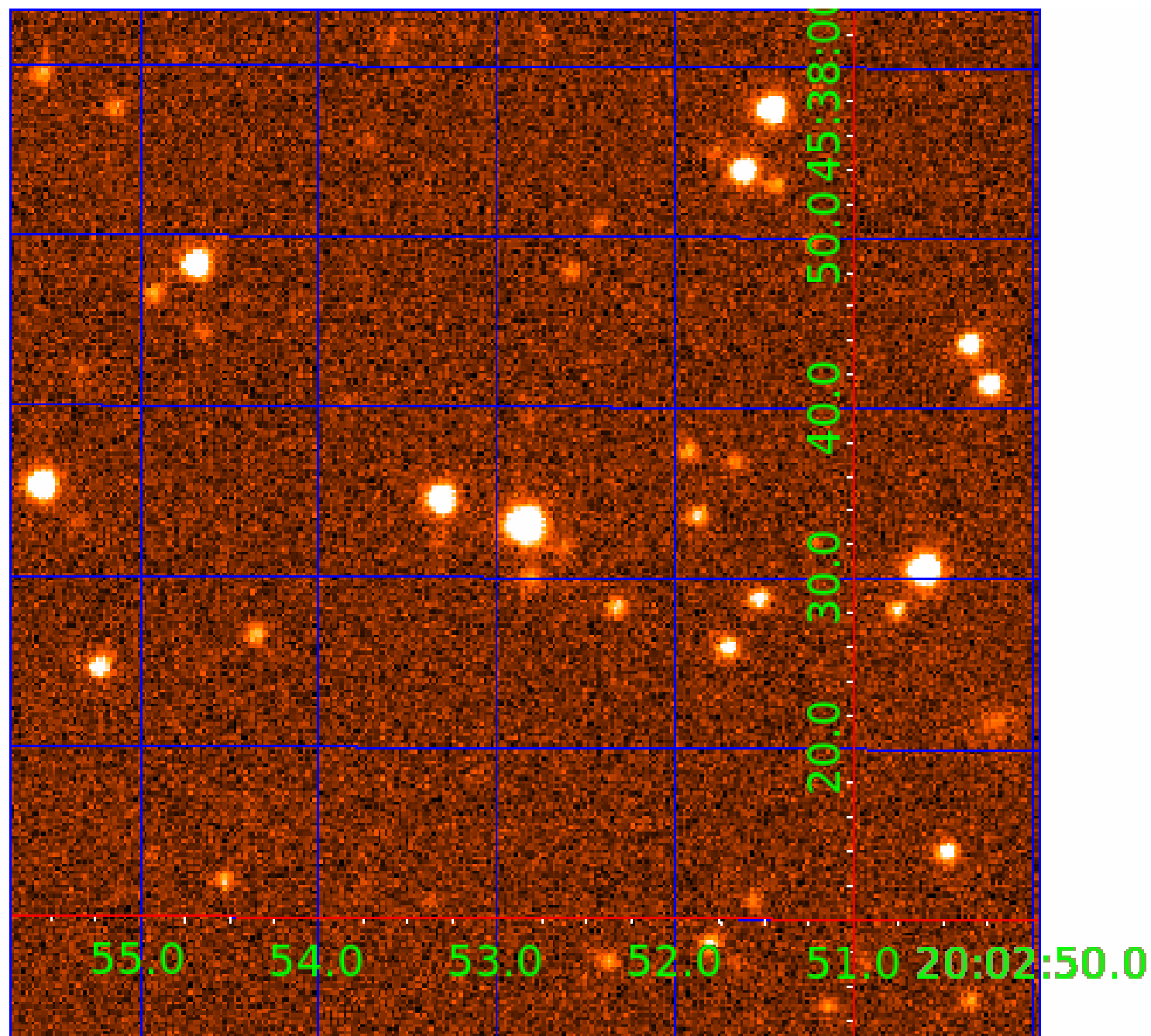
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 009245855

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009245855-01	OBS	No	0.606308	131.936718	63.9	4.164	9.2	7.9	1.21	6586	1.04	10937.77
009245855-02	OBS	No	39.828927	150.629523	2079.4	1.909	10.7	11.2	1.21	6586	8.92	41.27
009245855-03	OBS	No	22.876714	146.976476	2046.2	2.156	9.5	13.8	1.21	6586	10.20	86.43
009245855-04	OBS	No	19.115954	142.731498	732.0	4.047	10.6	9.1	1.21	6586	3.49	109.81
009245855-05	OBS	No	35.079209	158.129705	1975.4	1.598	10.2	12.0	1.21	6586	6.52	48.88
009245855-06	OBS	No	23.676899	154.858019	643.1	3.695	11.0	7.4	1.21	6586	3.45	82.56

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009245855-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009245855-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009245855-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
009245855-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

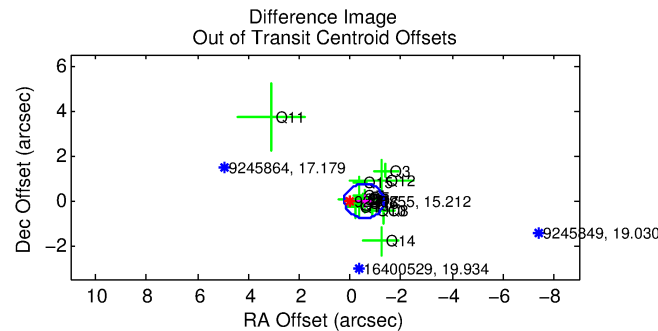
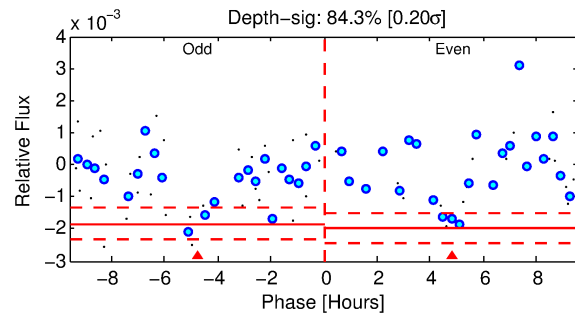
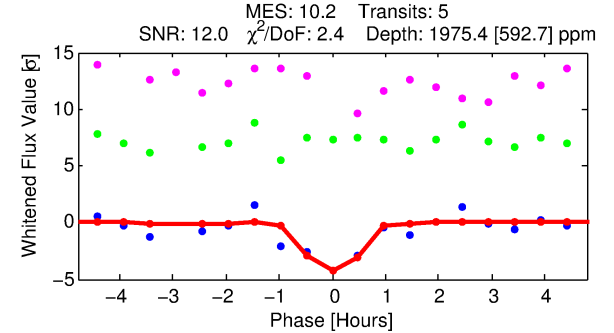
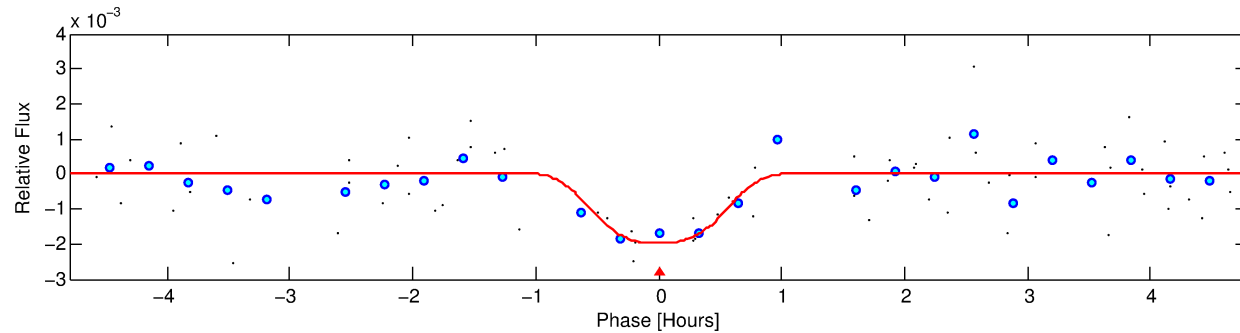
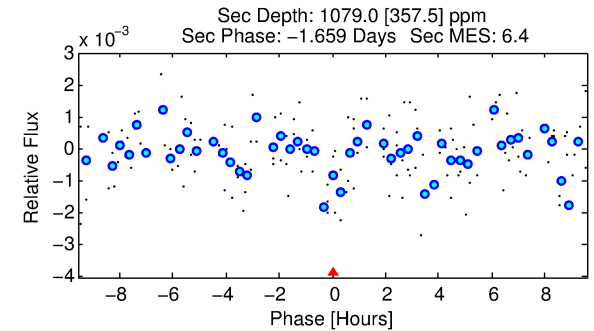
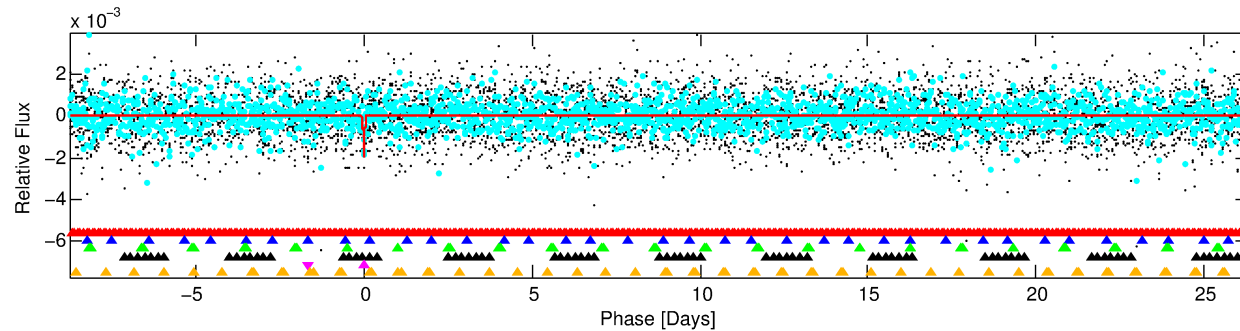
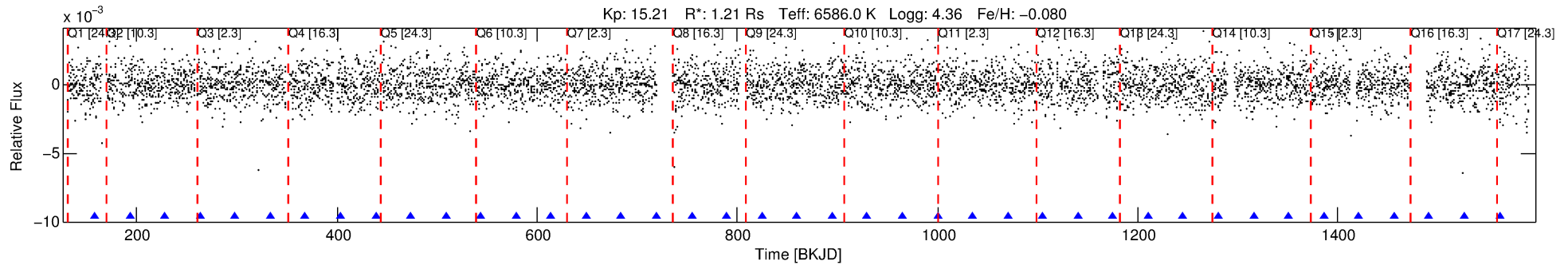
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009245855-05

No Significant Match Found

# DV One-Page Summary

KIC: 9245855 Candidate: 5 of 6 Period: 35.079 d



## DV Fit Results:

Period = 35.07921 [0.00032] d  
Epoch = 158.1297 [0.0091] BKJD  
Rp/R\* = 0.0495 [0.0176]  
a/R\* = 80.99 [95.67]  
b = 0.93 [0.18]  
Seff = 48.88 [19.45]  
Teq = 674 [67] K  
Rp = 6.52 [3.06] Re  
a = 0.2241 [0.0563] AU  
Ag = 701.06 [602.41] [1.16σ]  
Teffp = 5364 [1076] K [4.35σ]

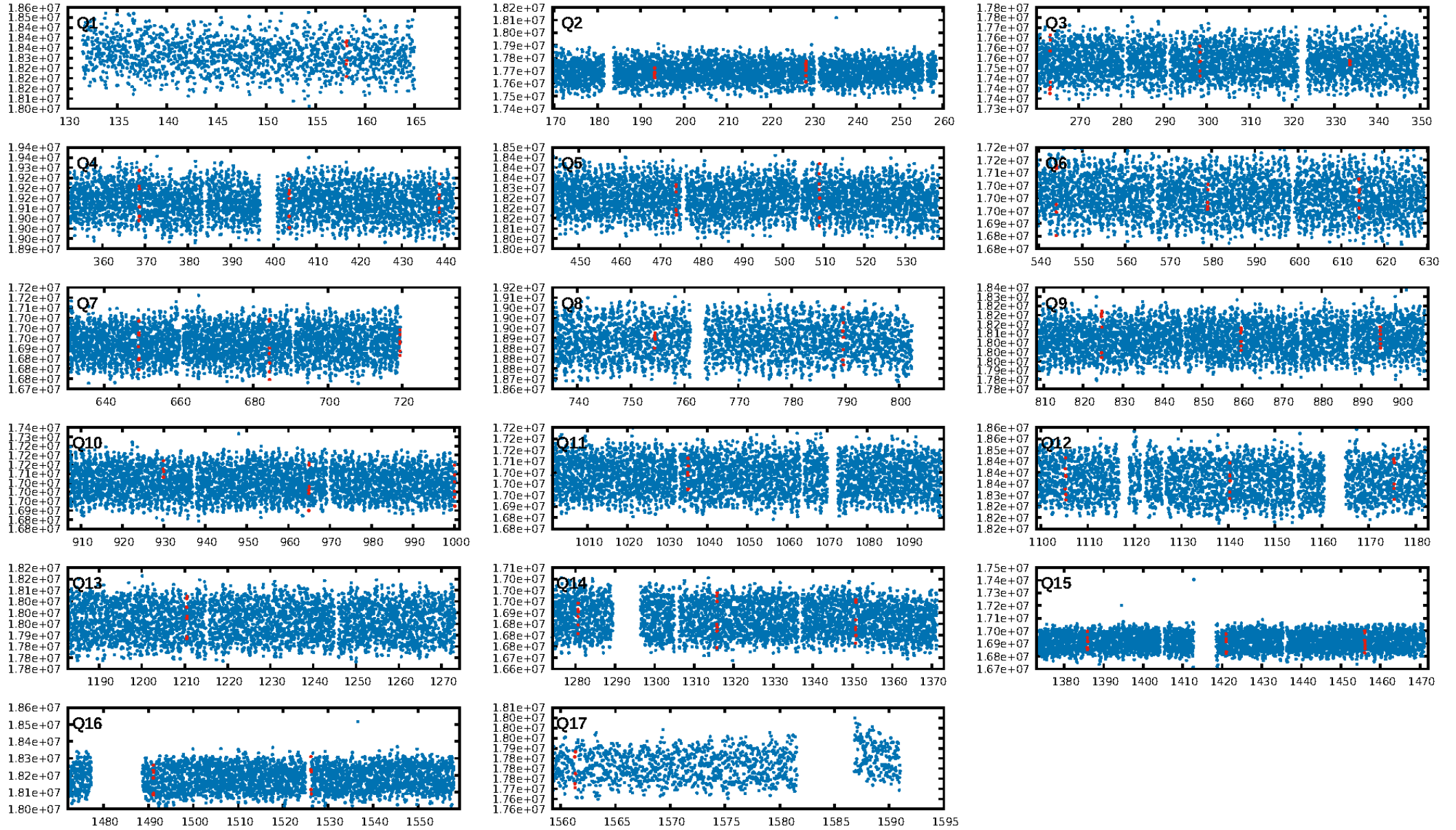
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.97σ]  
LongPeriod-sig: 100.0% [45.78σ]  
ModelChiSquare2-sig: 88.8%  
ModelChiSquareGof-sig: 94.5%  
**Bootstrap-pfa: 4.02e-08**  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 0.4542**  
Centroid-sig: 4.8%  
Centroid-so: 1.080 arcsec [2.36σ]  
OotOffset-rm: 0.554 arcsec [2.15σ]  
KicOffset-rm: 0.499 arcsec [2.03σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.44 [7/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:00:06 Z

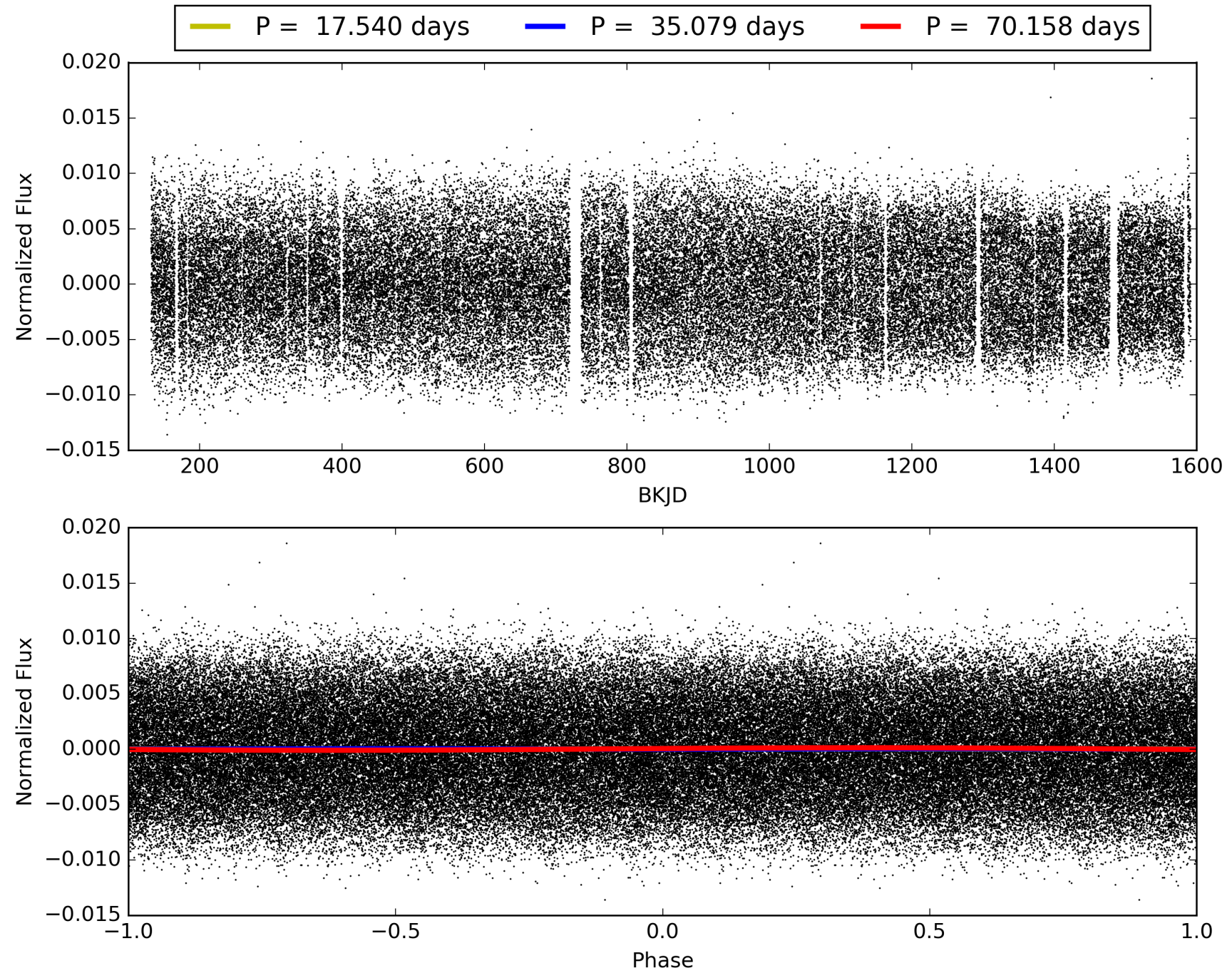
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009245855-05, PDC Light Curves



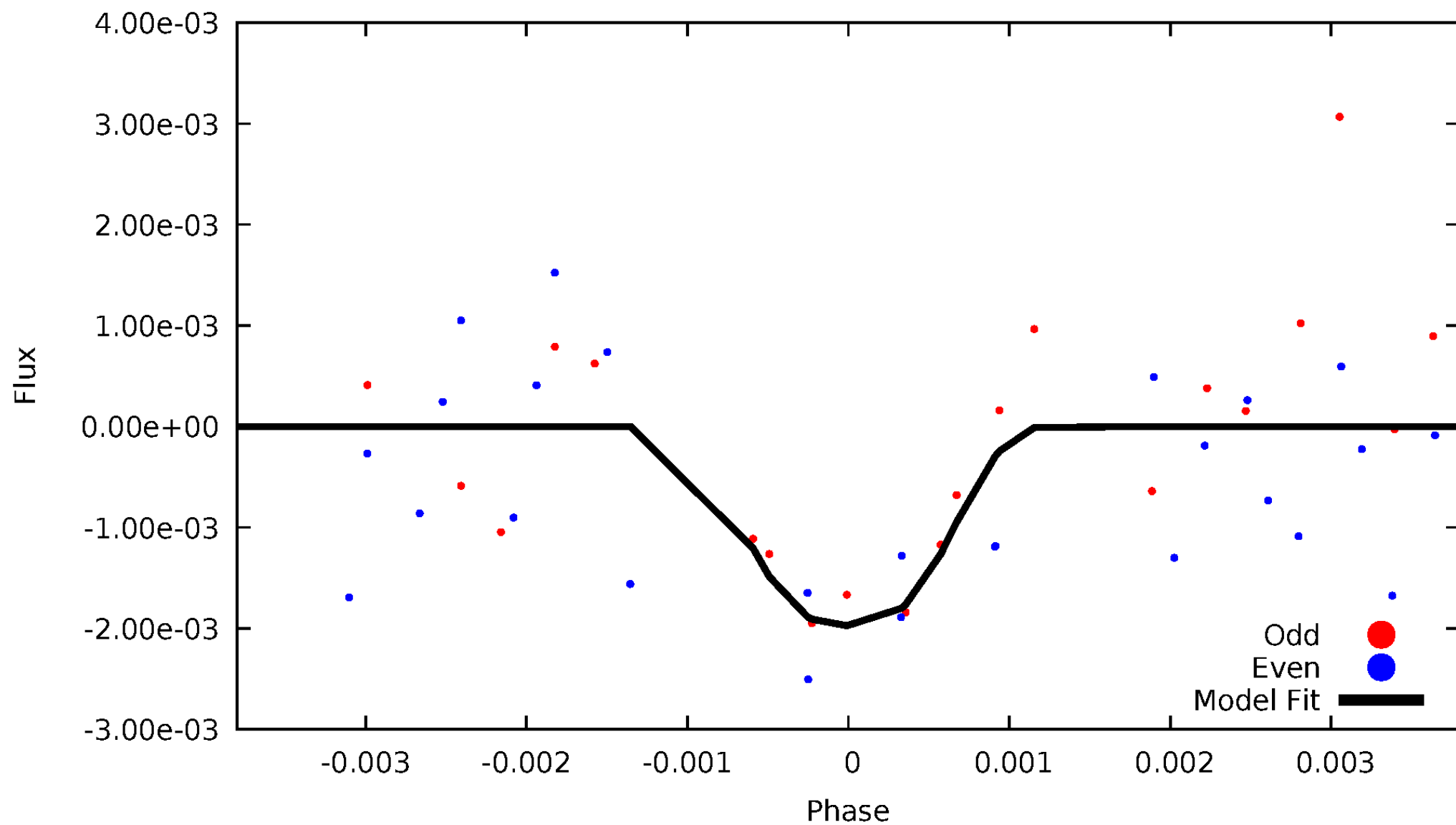


TCE 009245855-05



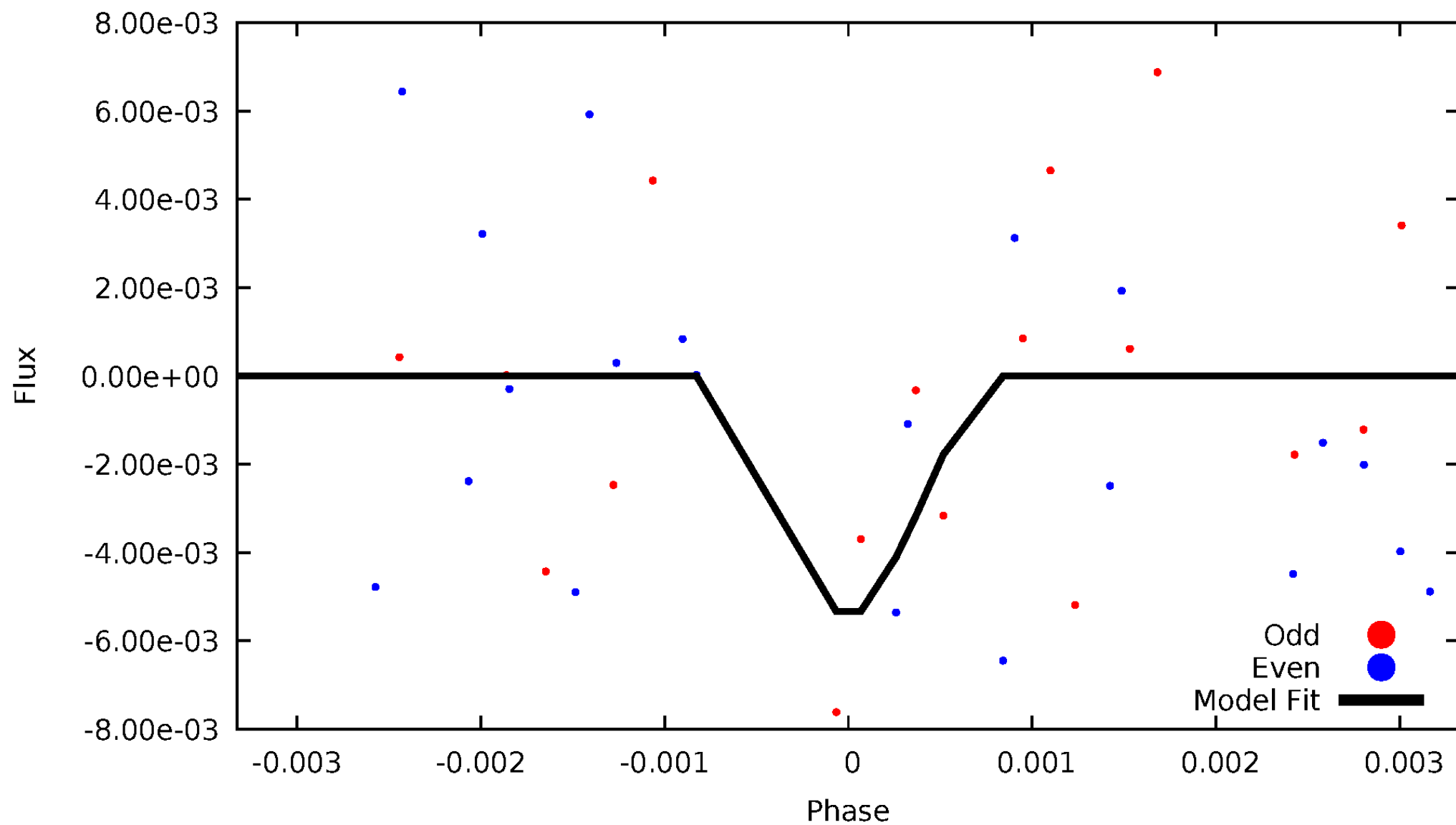
# DV Odd/Even

TCE 009245855-05



# ALT Odd/Even

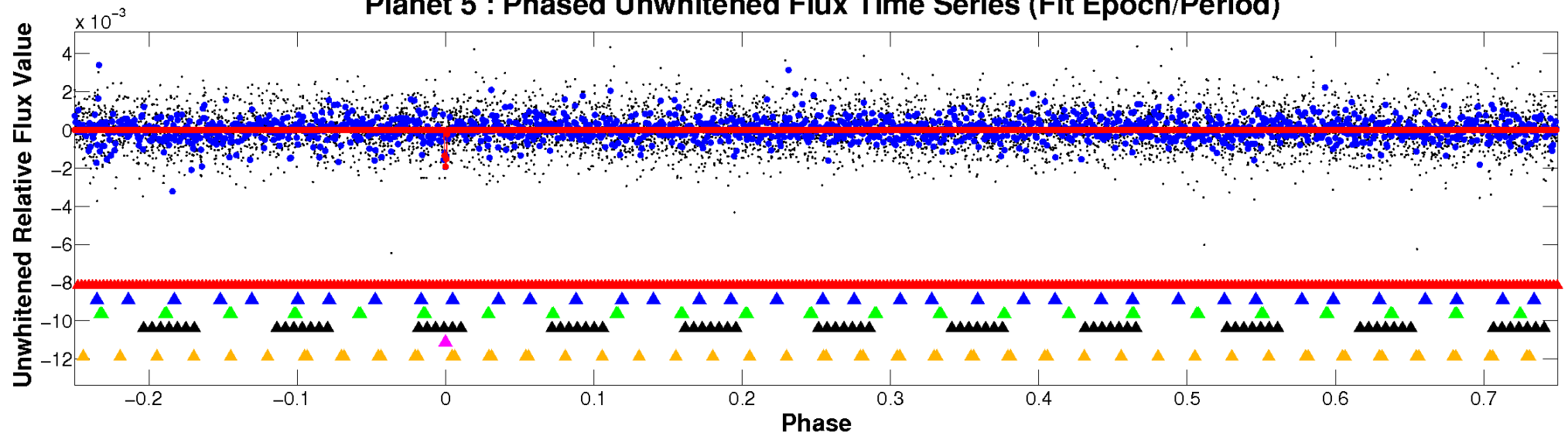
TCE 009245855-05



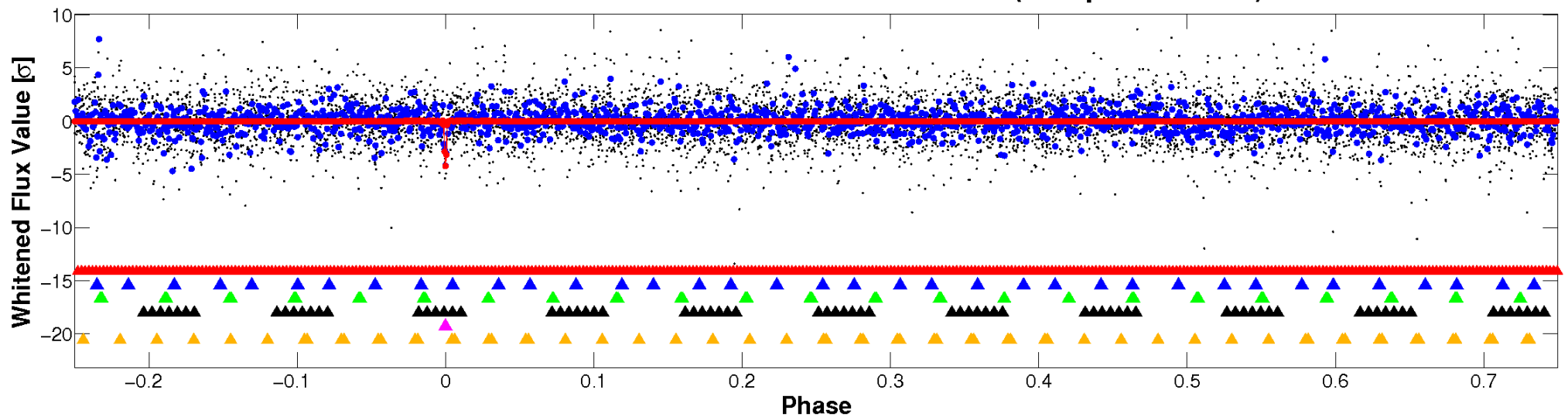


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

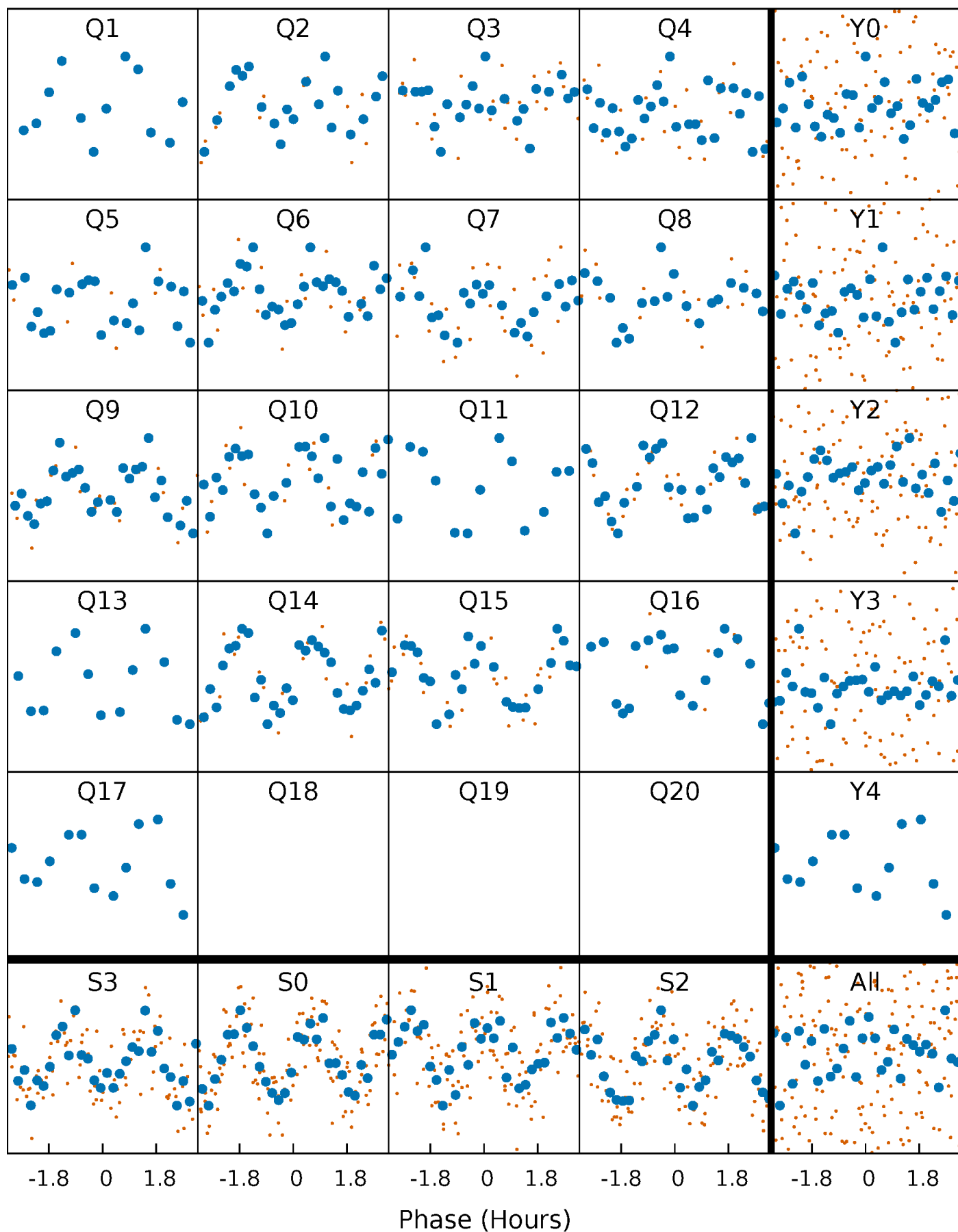


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



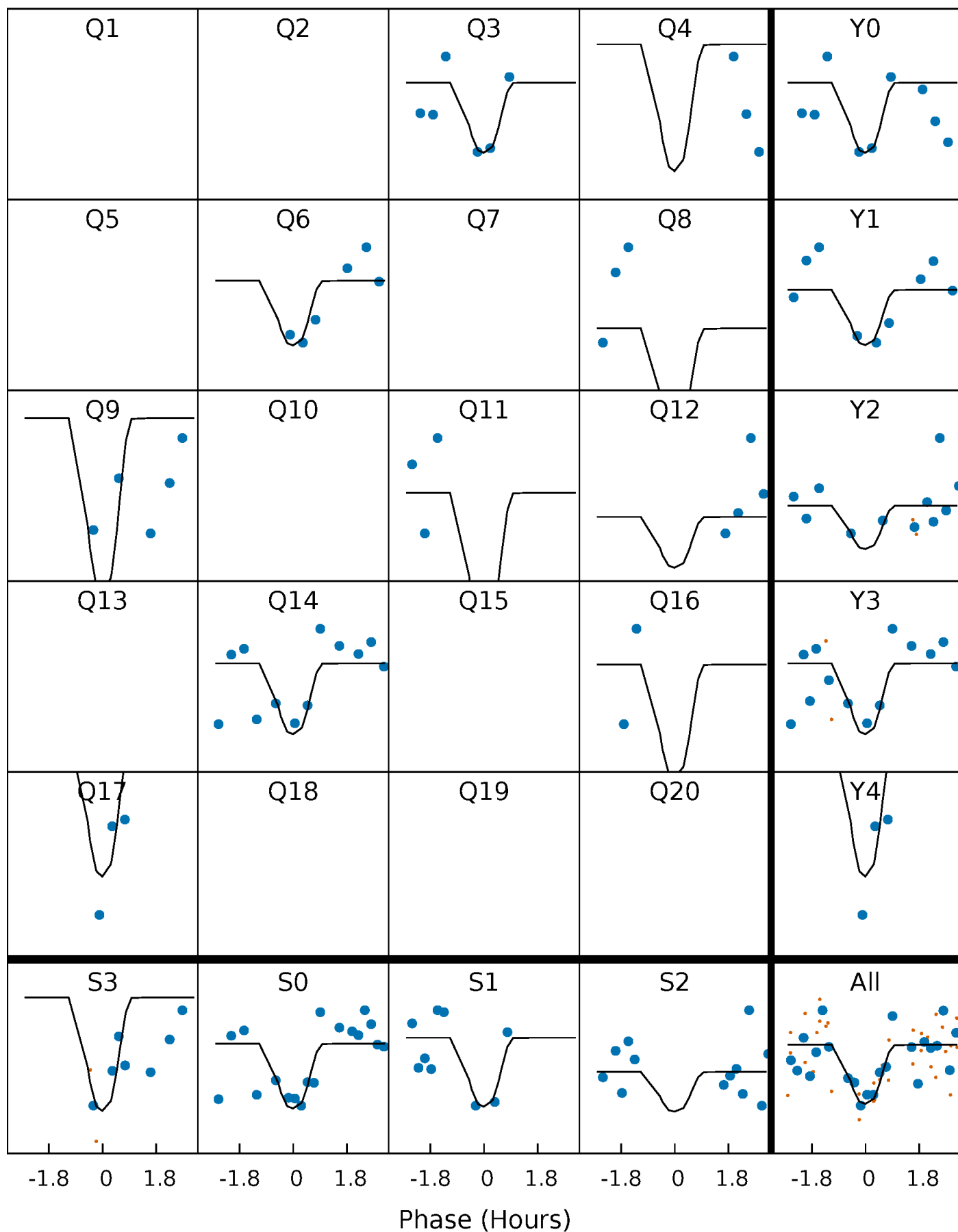
# PDC Quarter-Phased Transit Curves

TCE 009245855-05   P= 35.079209 Days    $T_0=158.129705$  (BKJD)



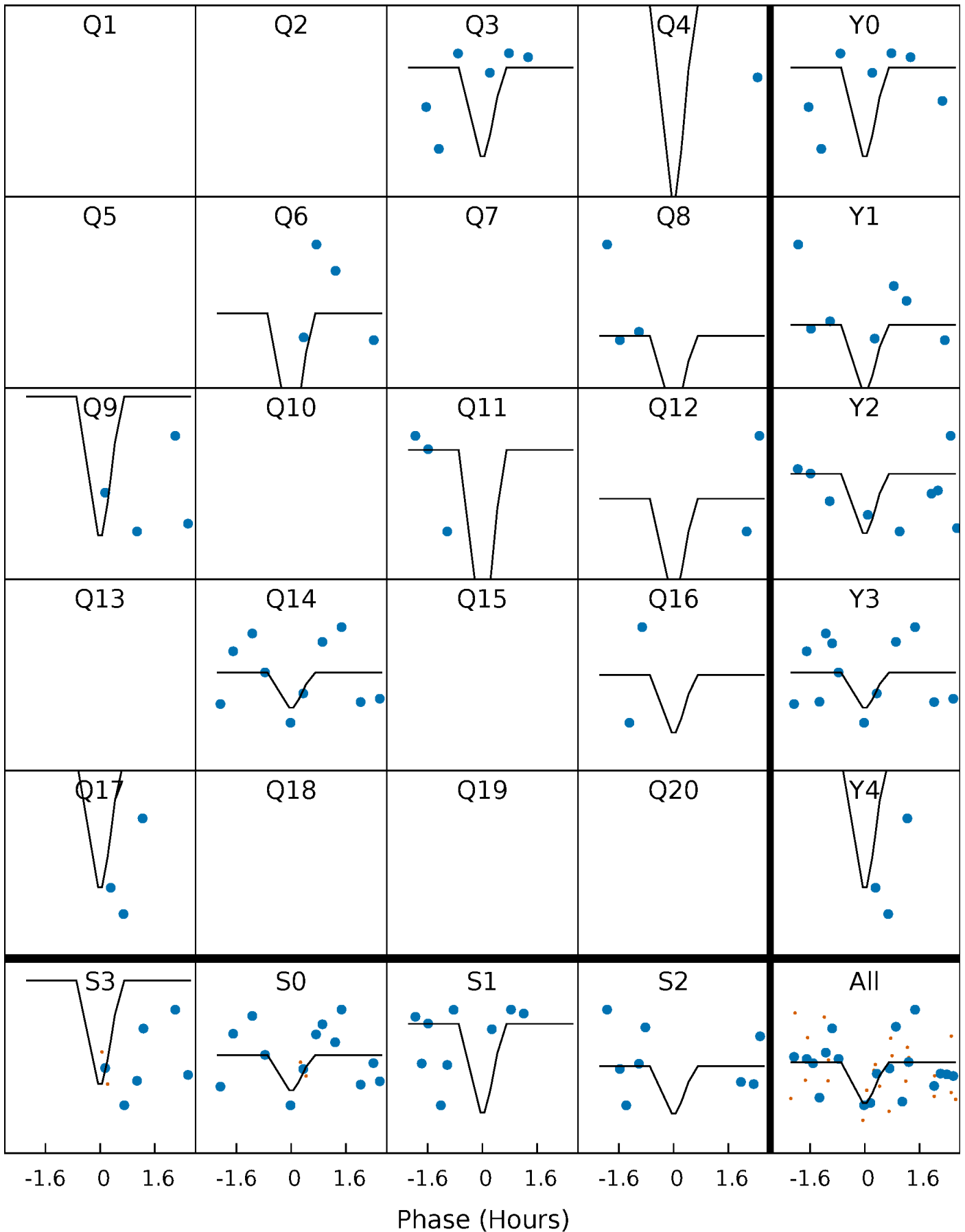
# DV Quarter-Phased Transit Curves

TCE 009245855-05     $P = 35.079209$  Days     $T_0 = 158.129705$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

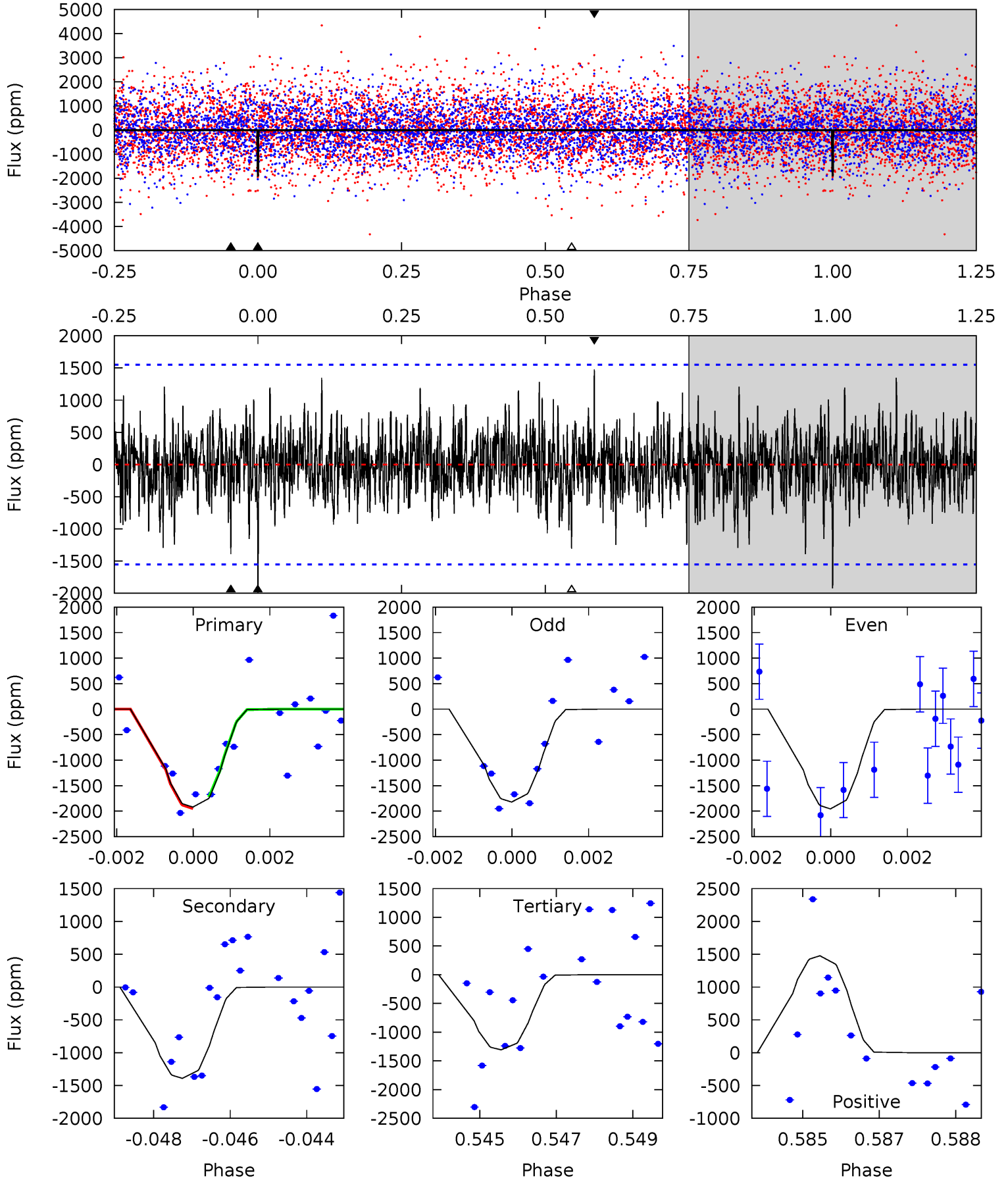
TCE 009245855-05   P= 35.079293 Days    $T_0=158.108480$  (BKJD)



# DV Model-Shift Uniqueness Test

009245855-05,  $P = 35.079209$  Days,  $E = 123.050496$  Days

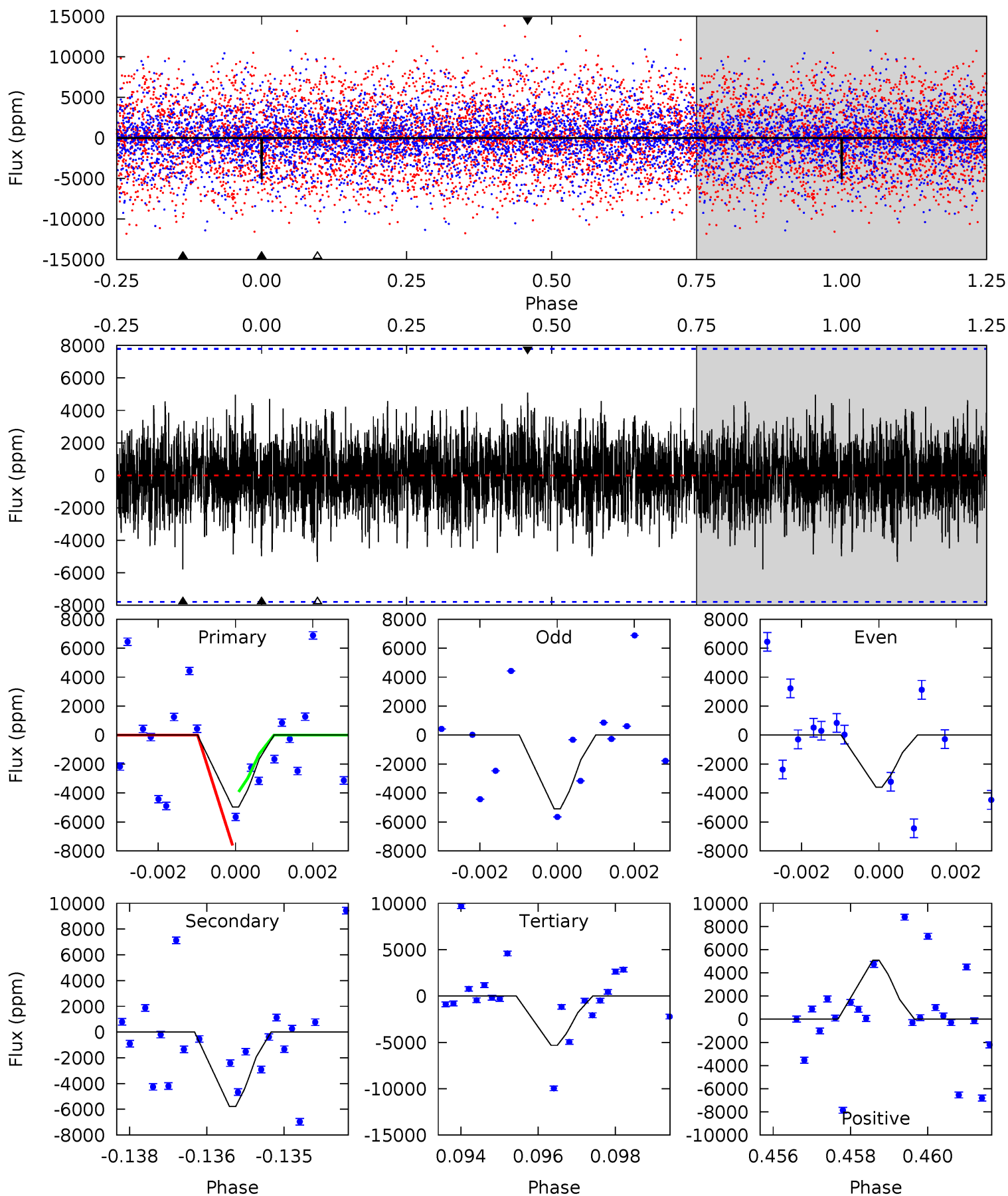
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.63	4.81	4.52	5.10	5.36	3.15	1.33	2.12	1.53	0.29	-0.30	0.23	0.96	0.43	0.37



# Alt Model-Shift Uniqueness Test

009245855-05,  $P = 35.079293$  Days,  $E = 123.029187$  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
3.42	3.98	3.67	3.50	5.36	3.14	1.04	-0.25	-0.08	0.32	0.48	0.55	1.00	0.47	1.15



### Stellar Parameters For KIC 009245855

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+214}_{-295}$	$4.361^{+0.081}_{-0.189}$	$-0.080^{+0.250}_{-0.300}$	$1.207^{+0.371}_{-0.159}$	$1.226^{+0.168}_{-0.187}$	$0.982^{+0.342}_{-0.489}$
	+3%/-4%	+2%/-4%	+312%/-375%	+31%/-13%	+14%/-15%	+35%/-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 009245855-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1391 \pm 289$	$6.74^{+2.40}_{-2.29}$	$954^{+69}_{-53}$	$5719^{+1370}_{-763}$	$843^{+1076}_{-402}$
Alt.	$-5787 \pm 1453$	$10.10^{+2.93}_{-2.67}$	$957^{+64}_{-58}$	$6653^{+1233}_{-892}$	$1561^{+1278}_{-727}$

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



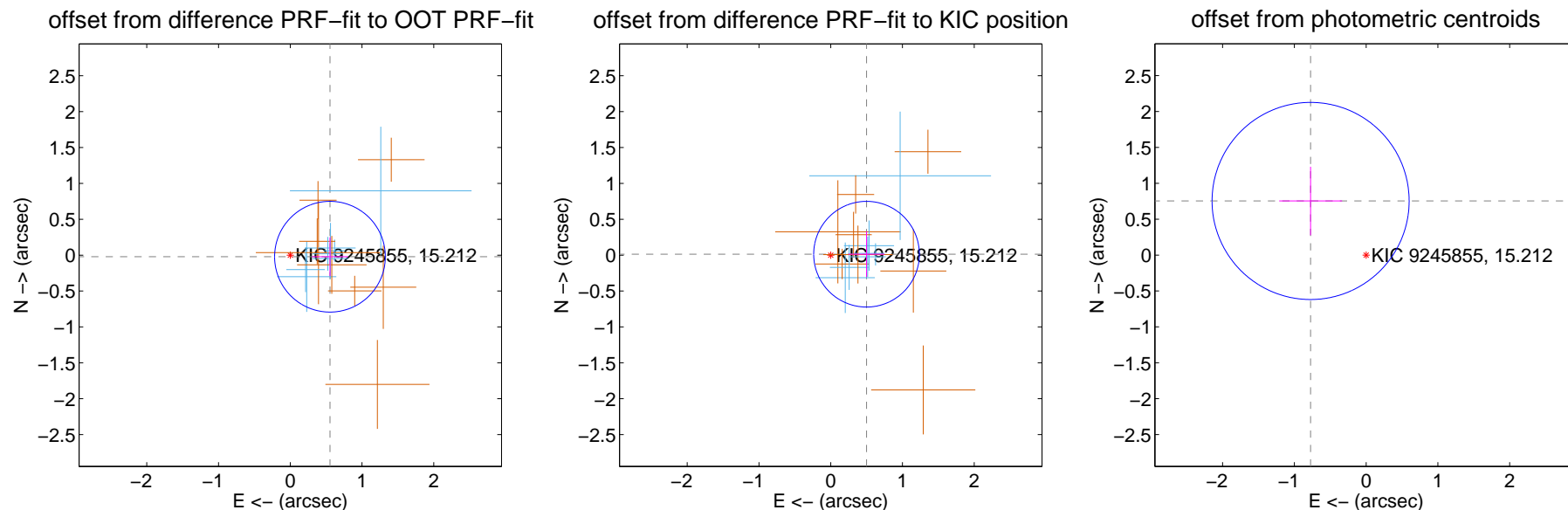
## DV Centroid Data

Supplemental centroid analysis for 009245855-05. Kepler magnitude: 15.21. Transit SNR 11.99

There are 7 quarters with good PRF difference image offsets

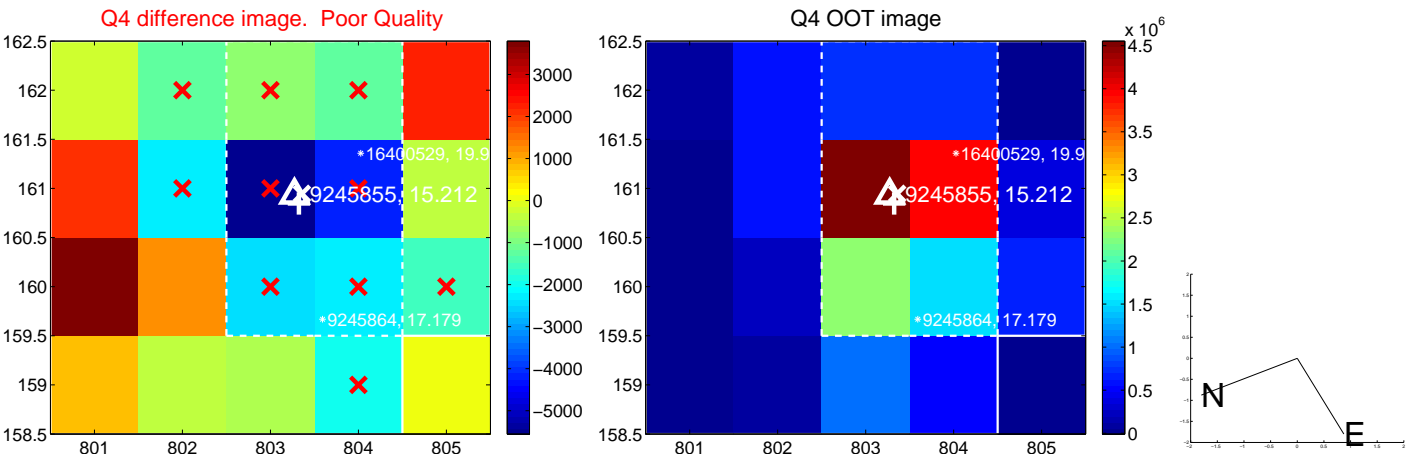
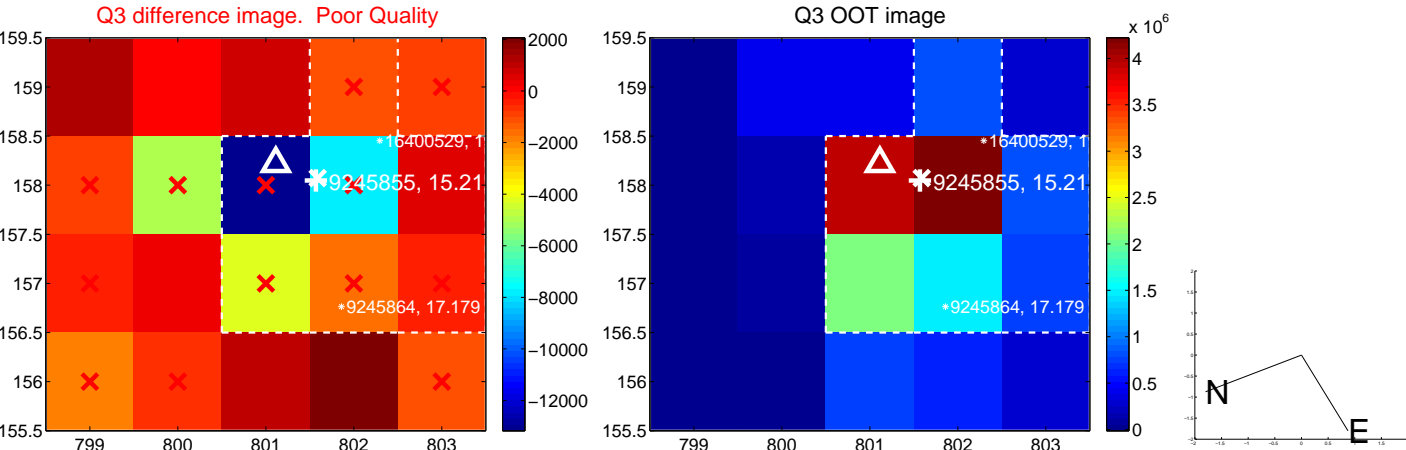
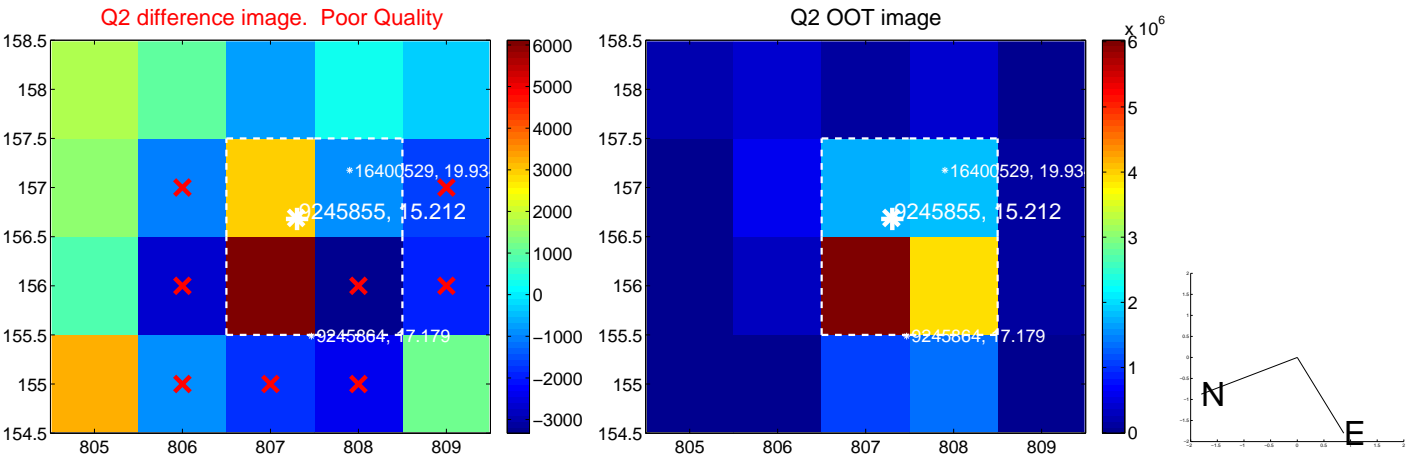
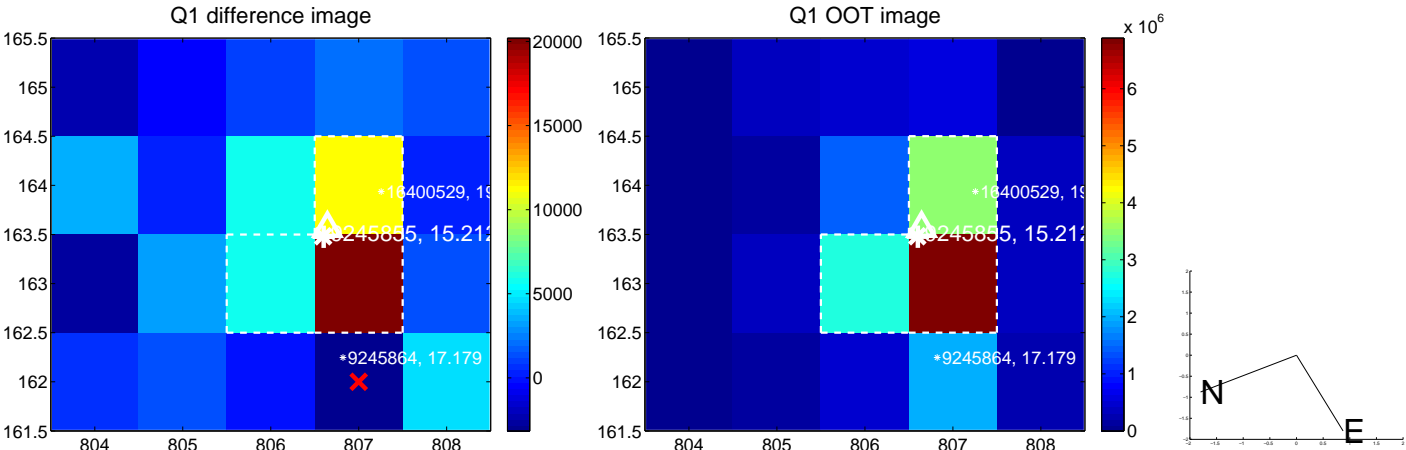
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.554 \pm 0.257$	2.15	$-0.553 \pm 0.250$	$-0.022 \pm 0.270$
PRF-fit source offset from KIC position	$0.499 \pm 0.245$	2.03	$-0.499 \pm 0.251$	$0.013 \pm 0.317$
photometric centroid source offset	$1.08 \pm 0.46$	2.36	$0.77 \pm 0.44$	$0.75 \pm 0.48$

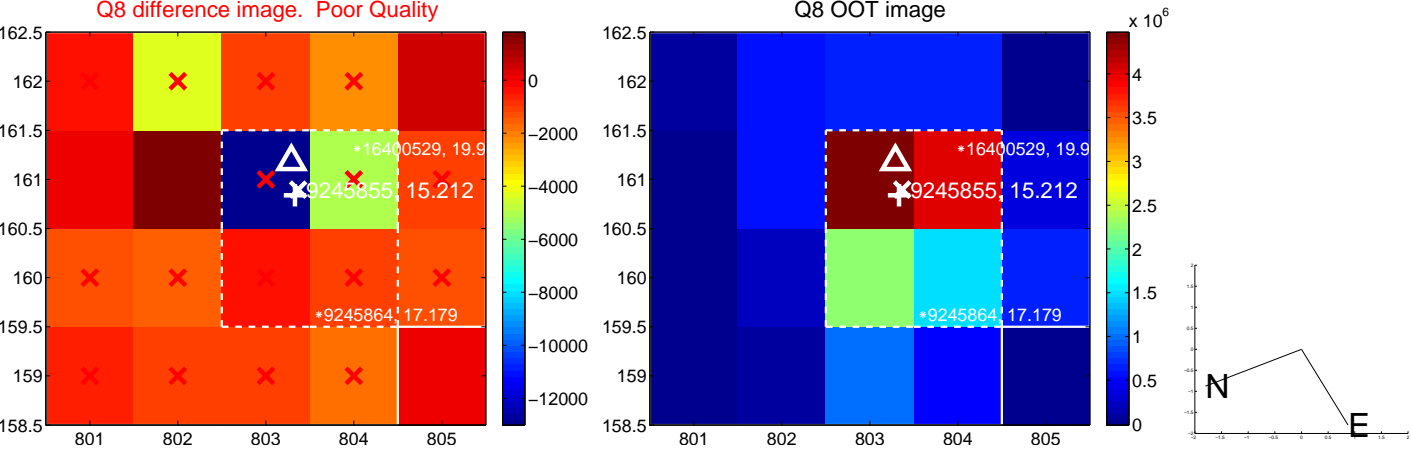
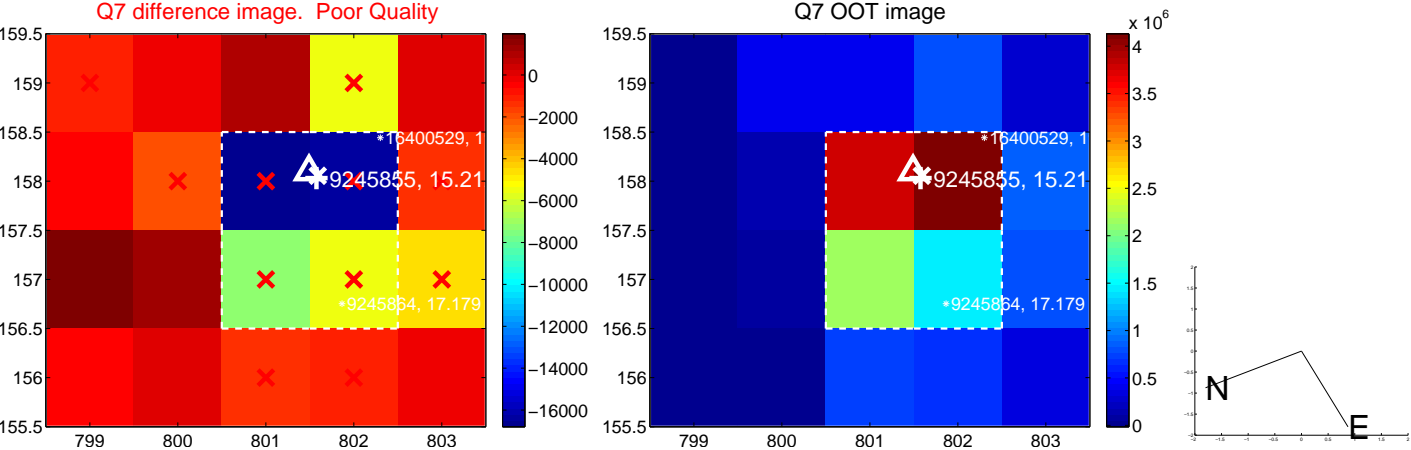
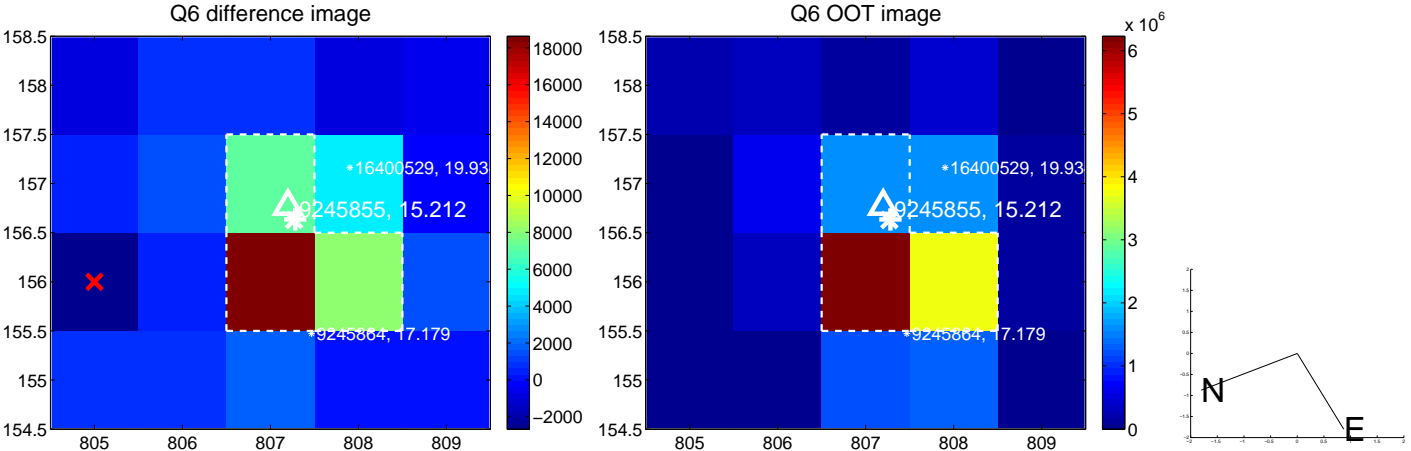
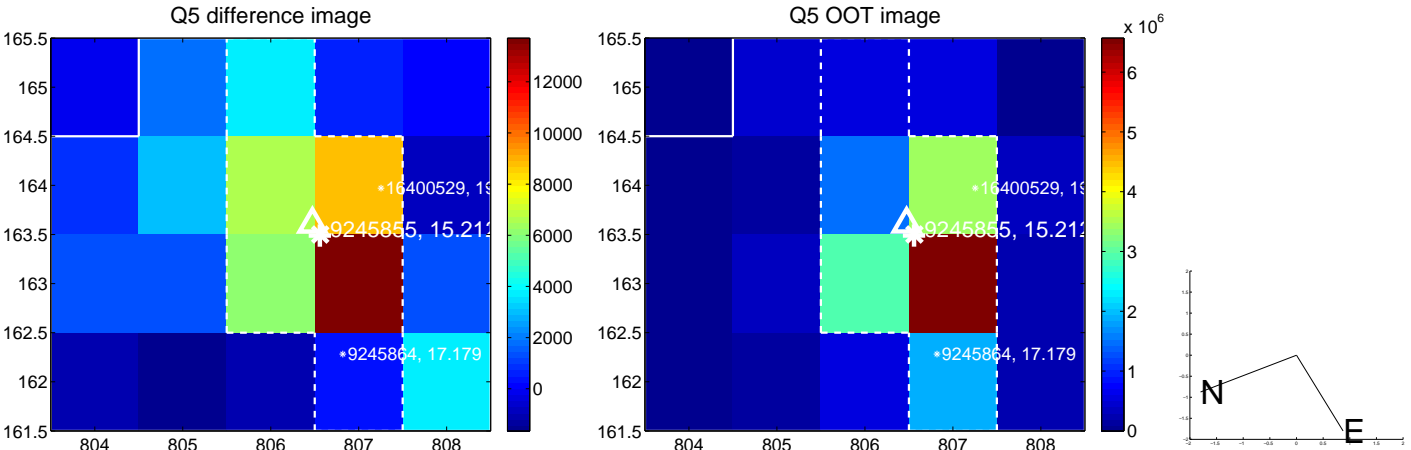


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

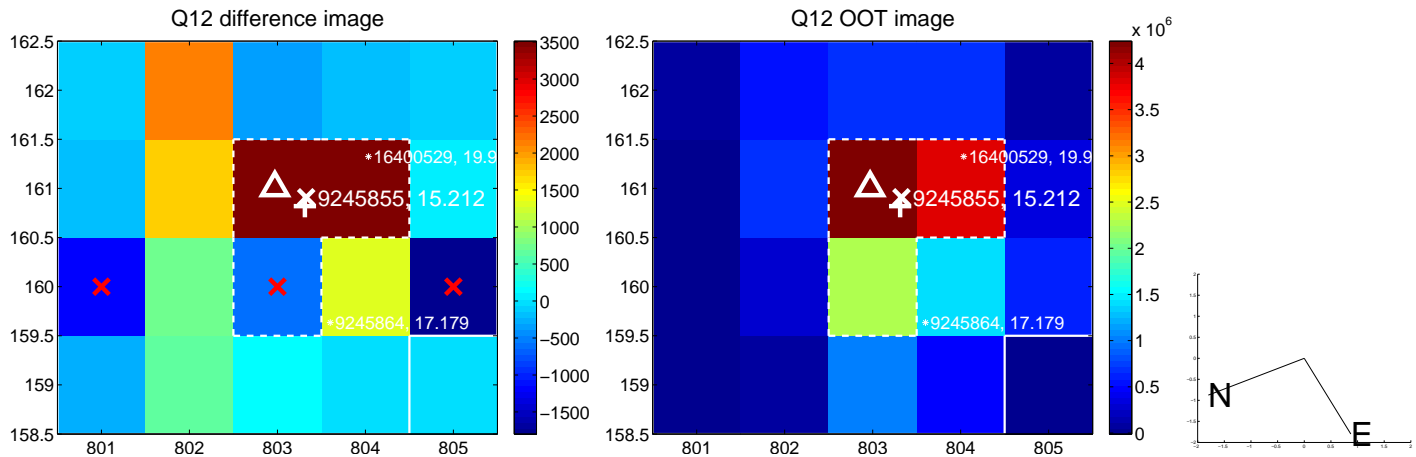
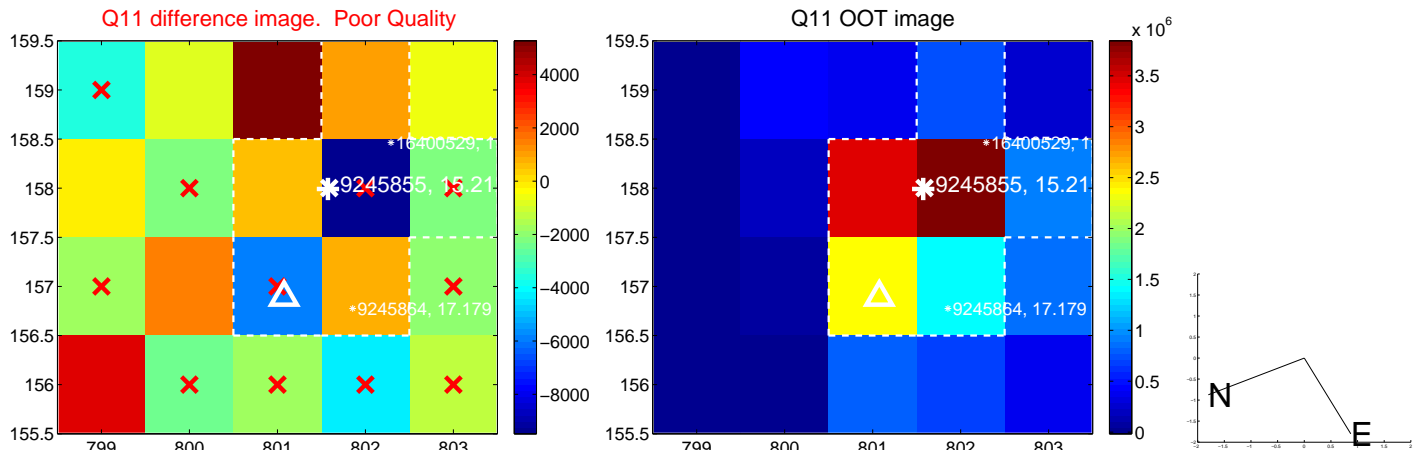
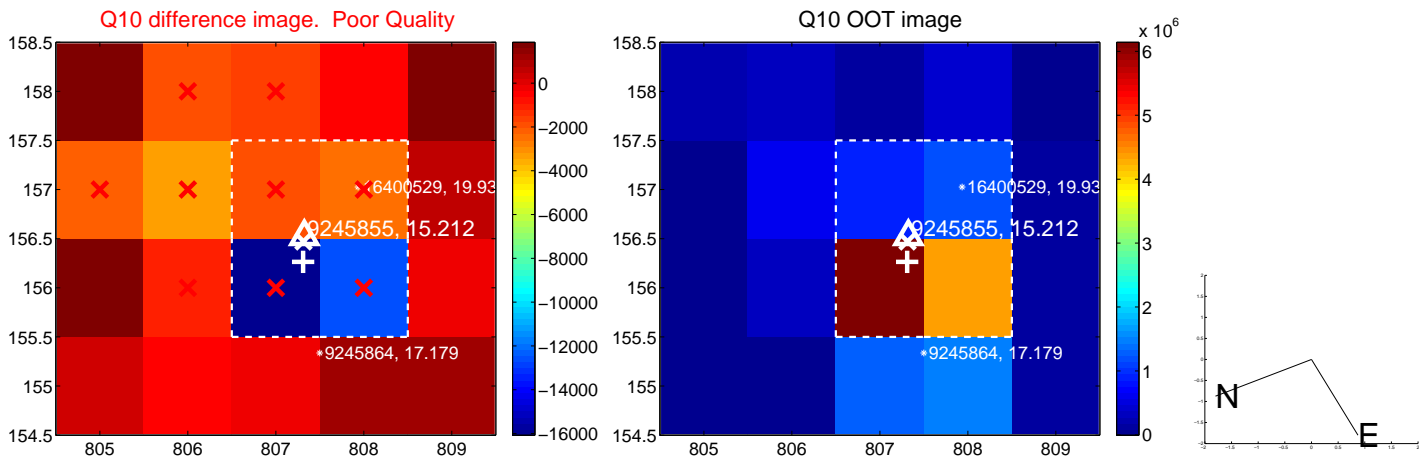
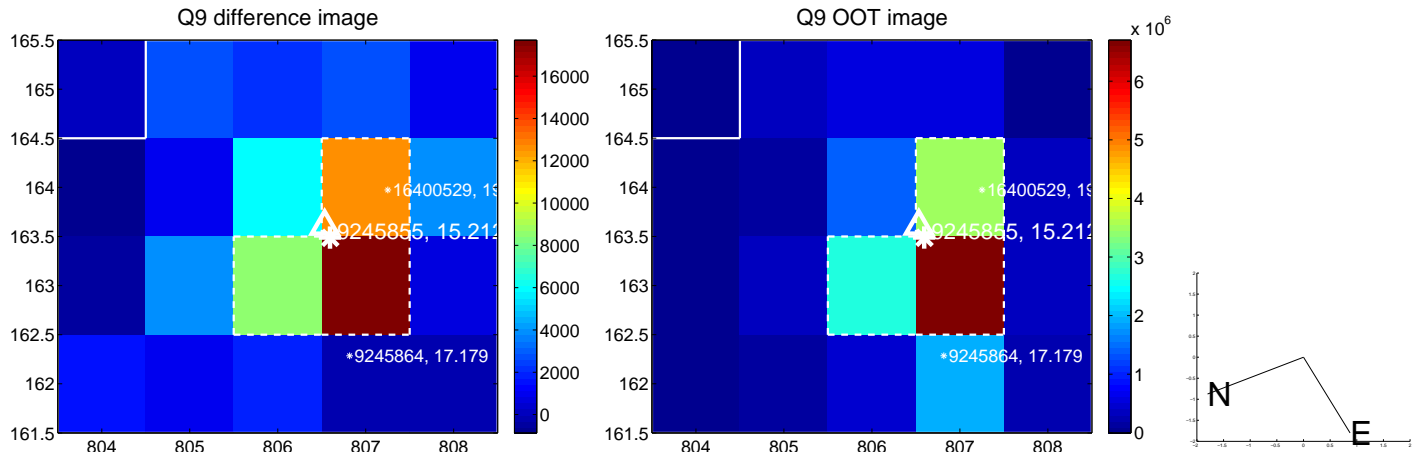
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



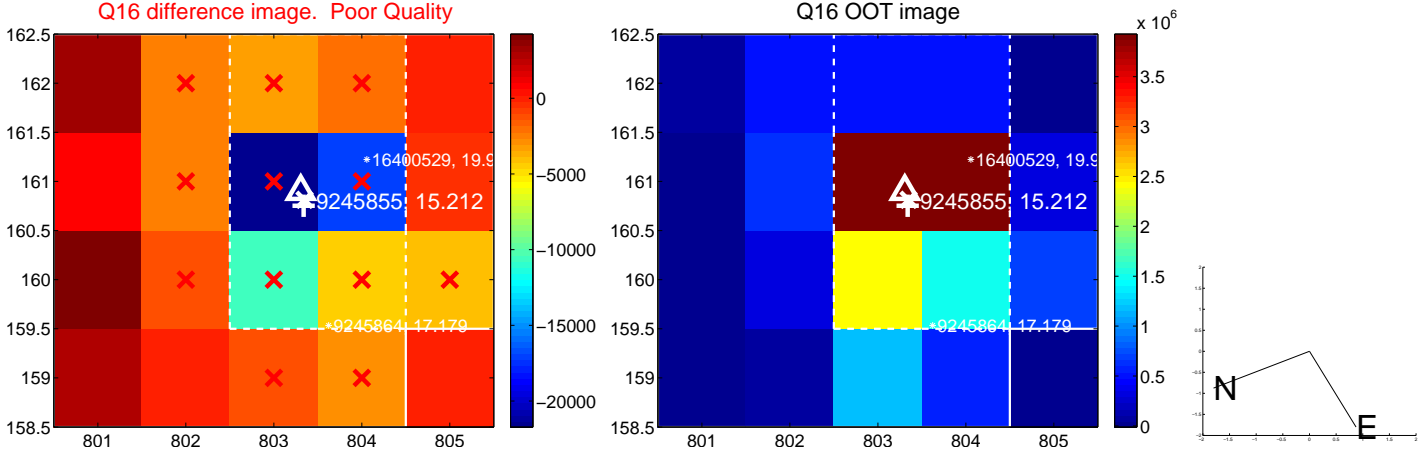
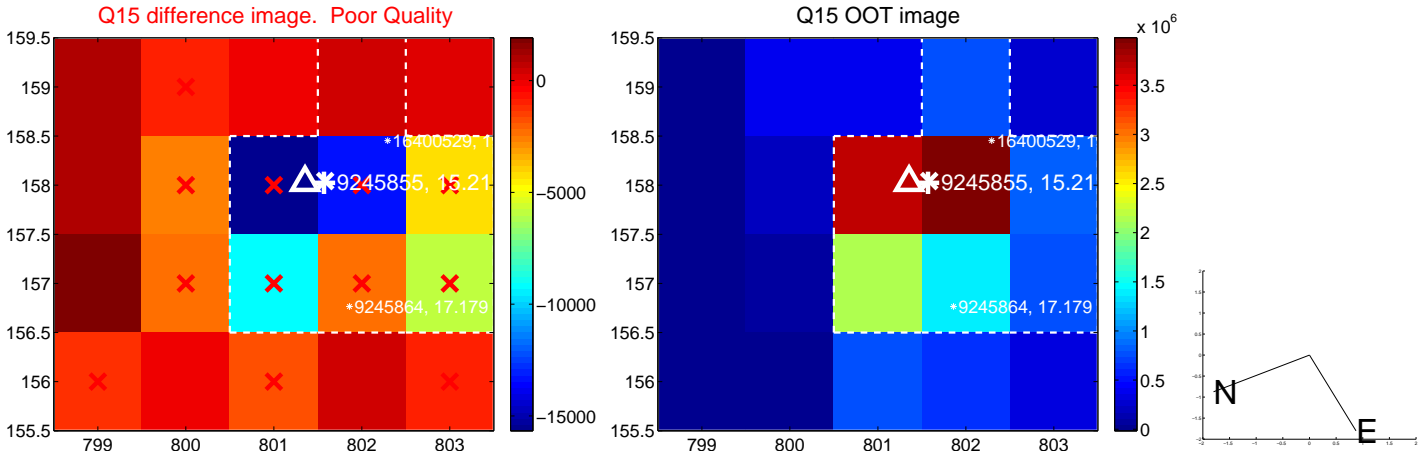
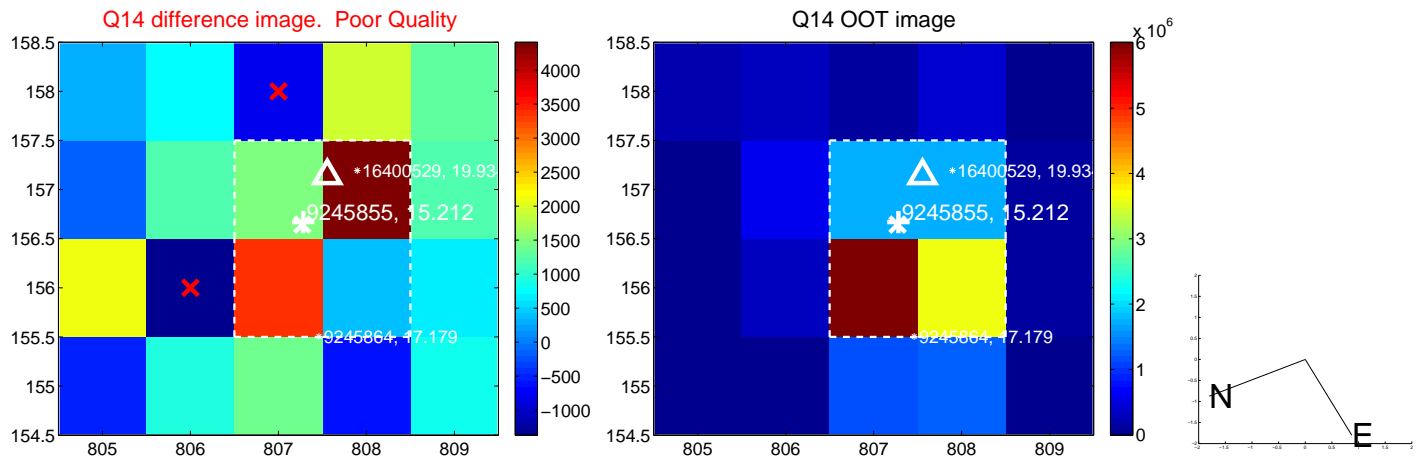
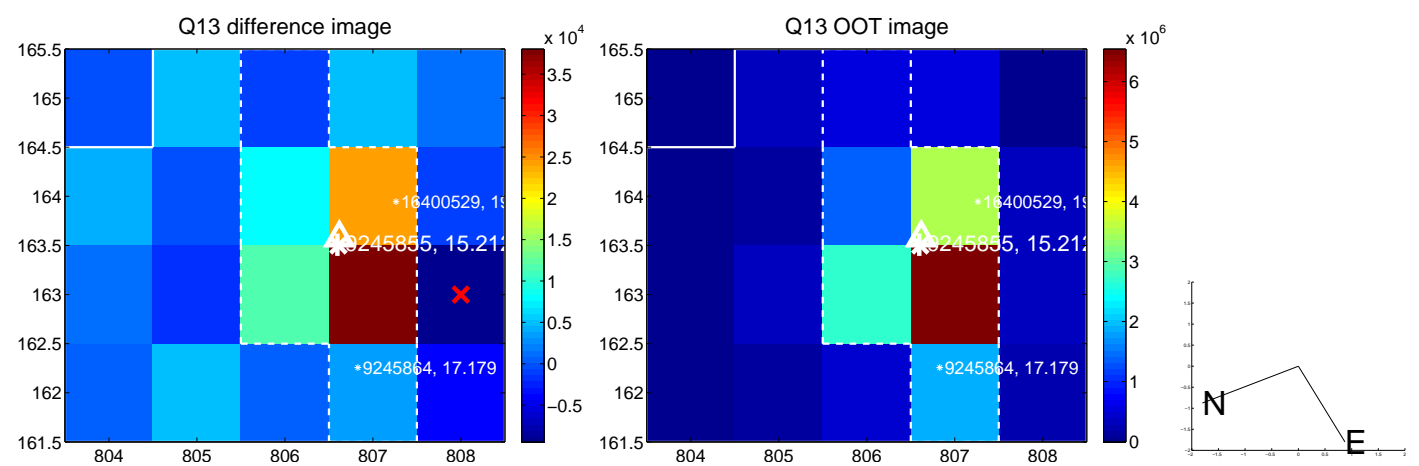
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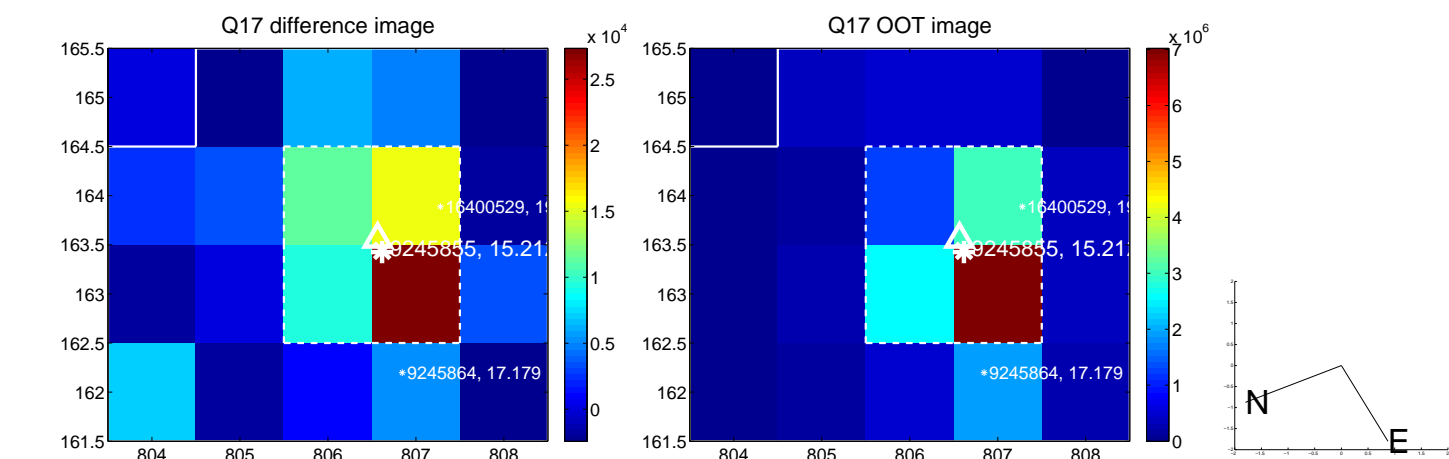
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



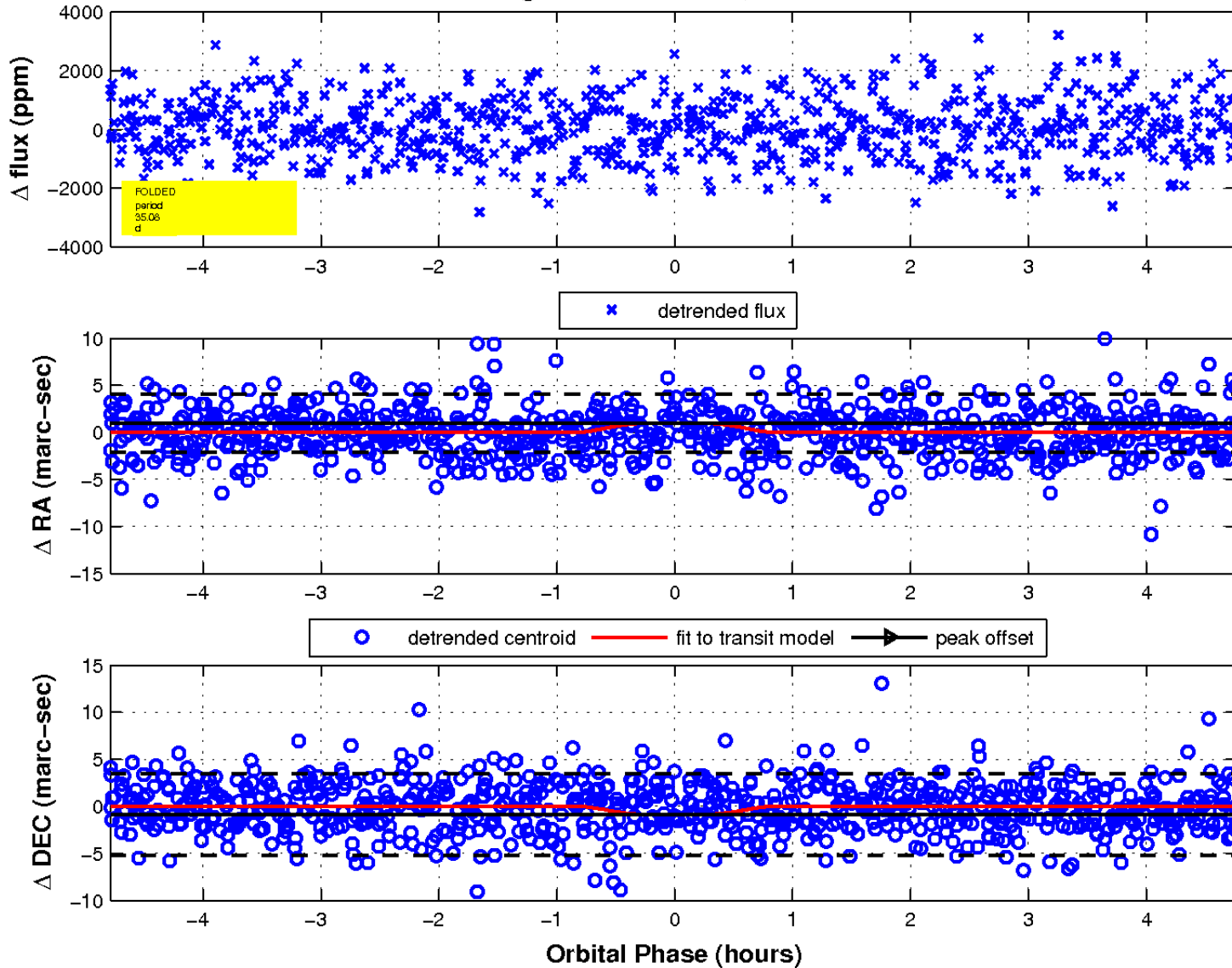
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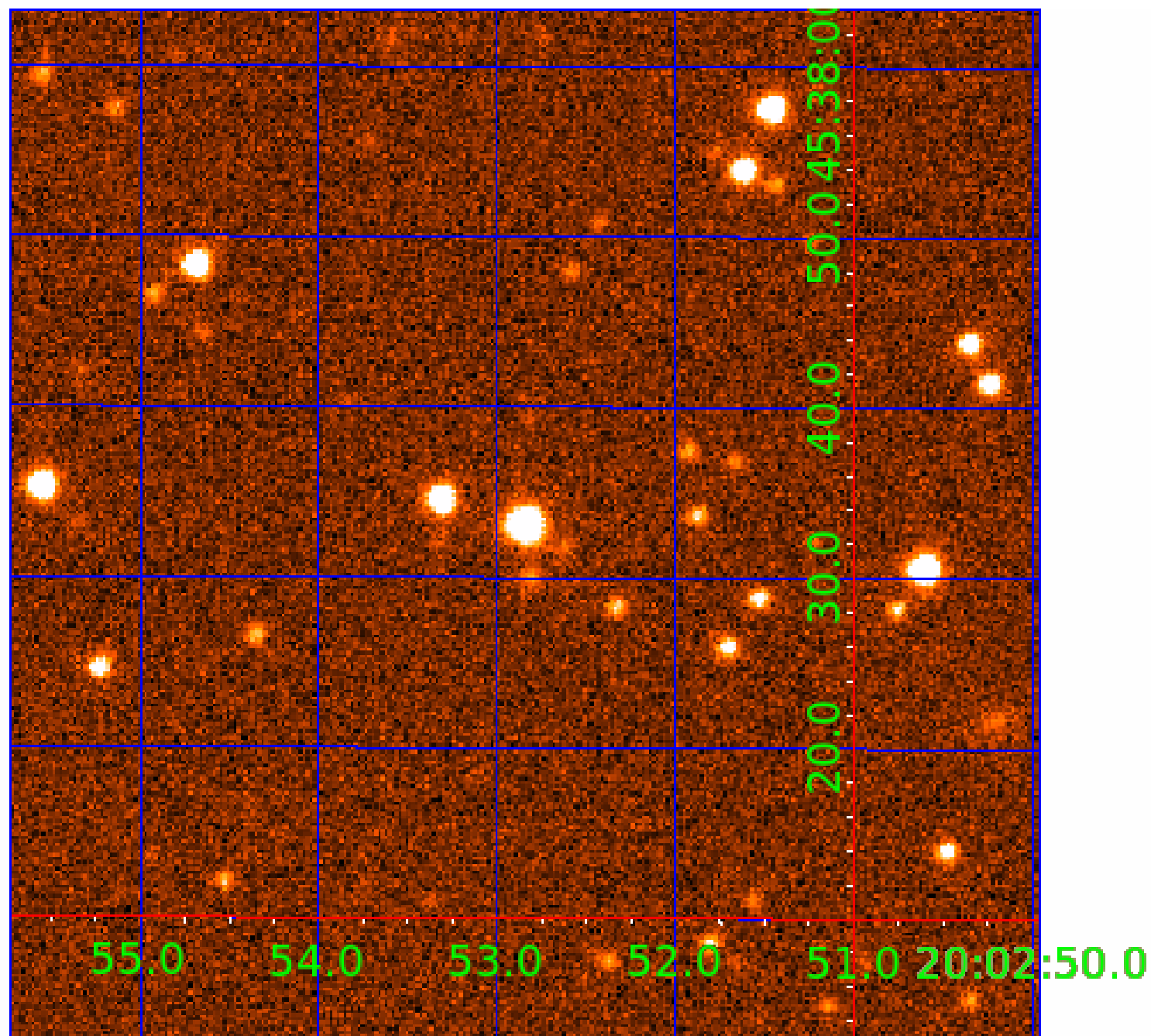


fluxWeightedCentroids, Planet 5 of 6



UKIRT Image

Declination





# KIC 009245855

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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TCE	Run Type	Disp	Score	N	S	C	E	Comments
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009245855-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009245855-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
009245855-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009245855-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

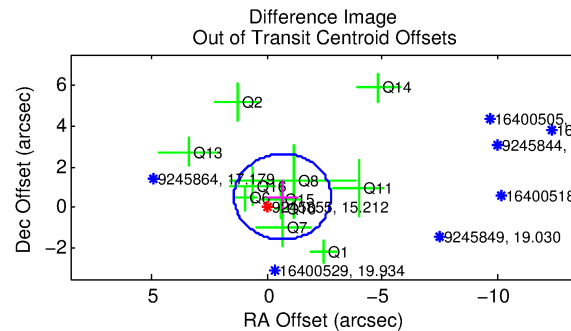
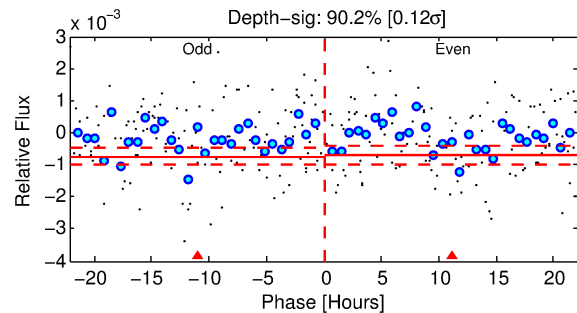
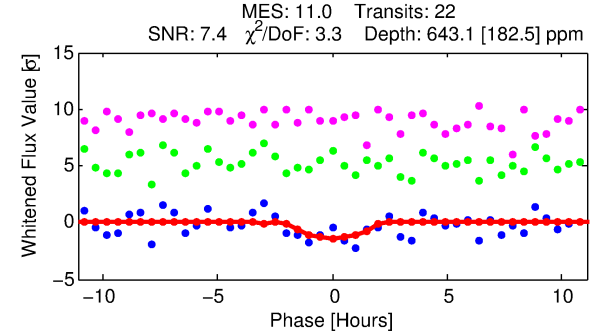
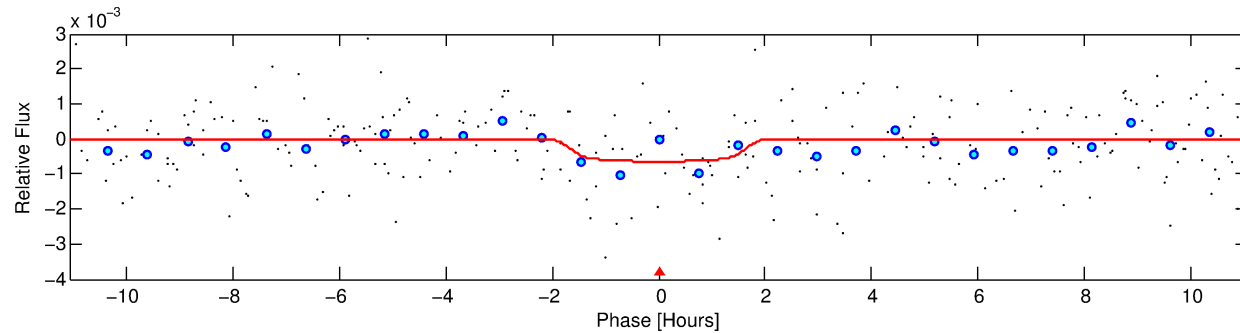
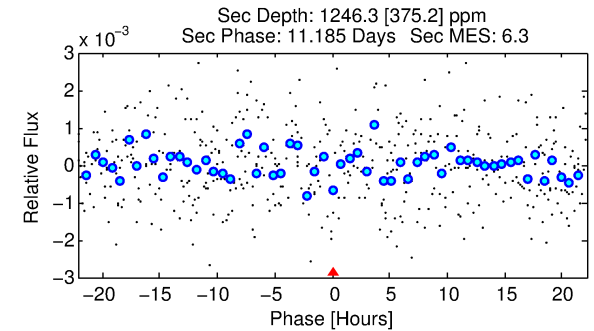
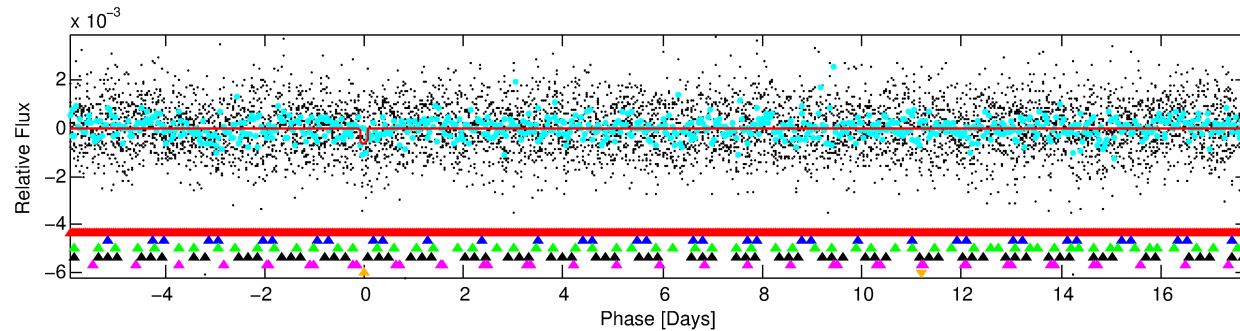
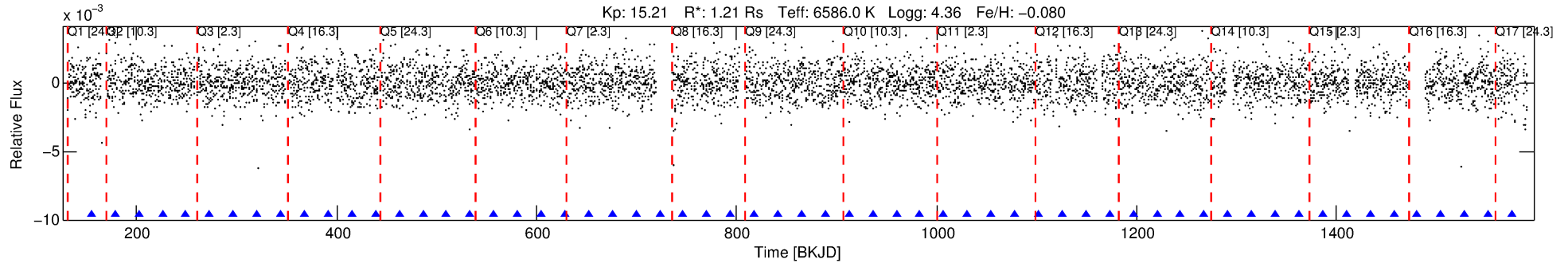
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## Ephemeris Match Information For 009245855-06

No Significant Match Found

# DV One-Page Summary

KIC: 9245855 Candidate: 6 of 6 Period: 23.677 d



## DV Fit Results:

Period = 23.67690 [0.00082] d  
Epoch = 154.8580 [0.0292] BKJD  
Rp/R\* = 0.0262 [0.0362]  
a/R\* = 28.49 [217.46]  
b = 0.85 [2.62]  
Seff = 82.56 [32.84]  
Teq = 769 [76] K  
Rp = 3.45 [4.89] Re  
a = 0.1725 [0.0433] AU  
Ag = 1710.98 [4793.56] [0.36σ]  
Teffp = 7643 [5321] K [1.29σ]

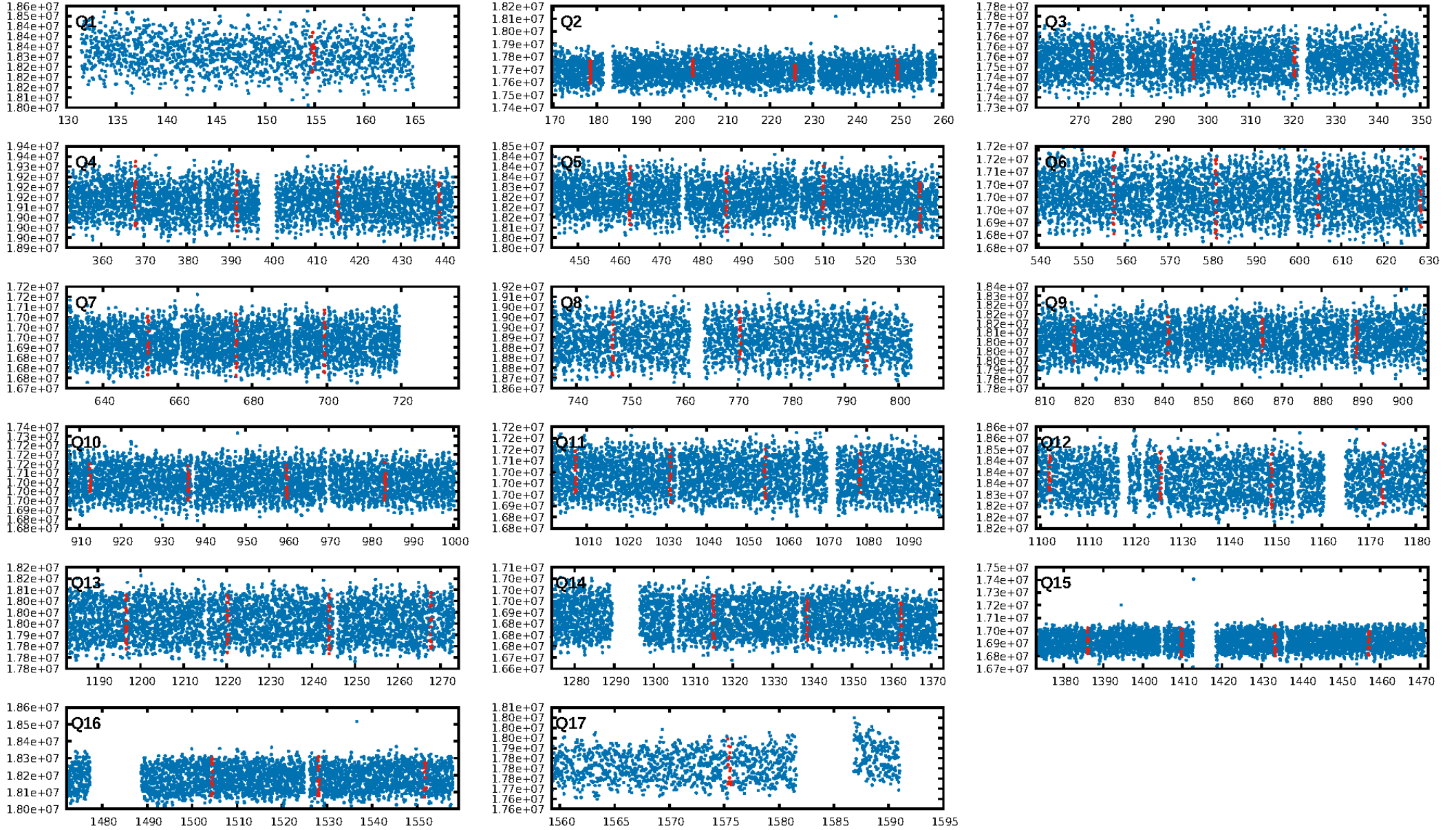
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.49σ]  
LongPeriod-sig: 100.0% [67.97σ]  
ModelChiSquare2-sig: 0.6%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.82e-09**  
RollingBand-fgt: 1.00 [22/22]  
GhostDiagnostic-chr: -2.077  
Centroid-sig: 91.5%  
Centroid-so: 1.483 arcsec [2.33σ]  
OotOffset-rm: 0.857 arcsec [1.22σ]  
OotOffset-st: 4/3/2/2 [11]  
KicOffset-rm: 0.790 arcsec [1.15σ]  
KicOffset-st: 4/3/2/2 [11]  
DiffImageQuality-fgm: 0.27 [3/11]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:00:09 Z

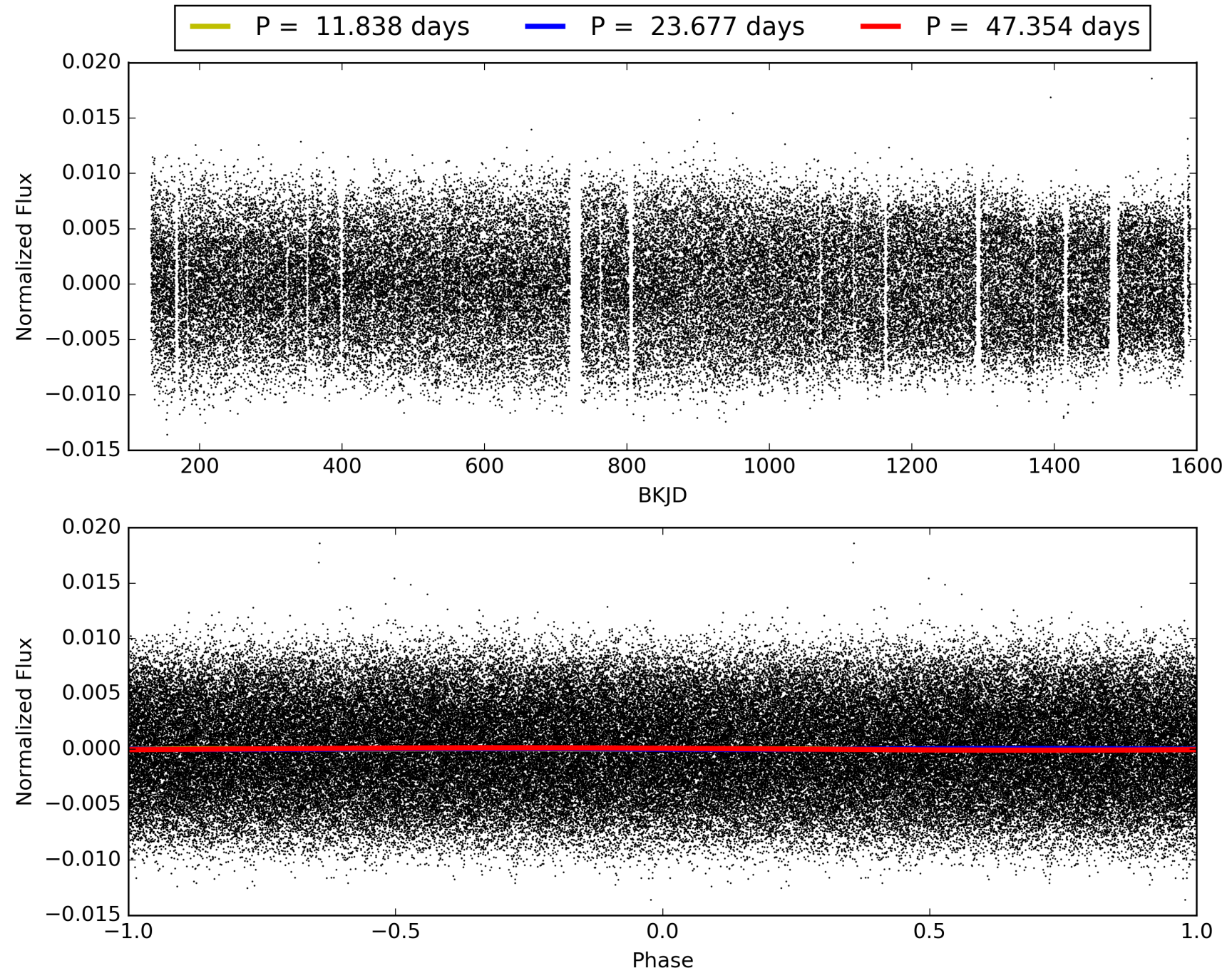
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009245855-06, PDC Light Curves



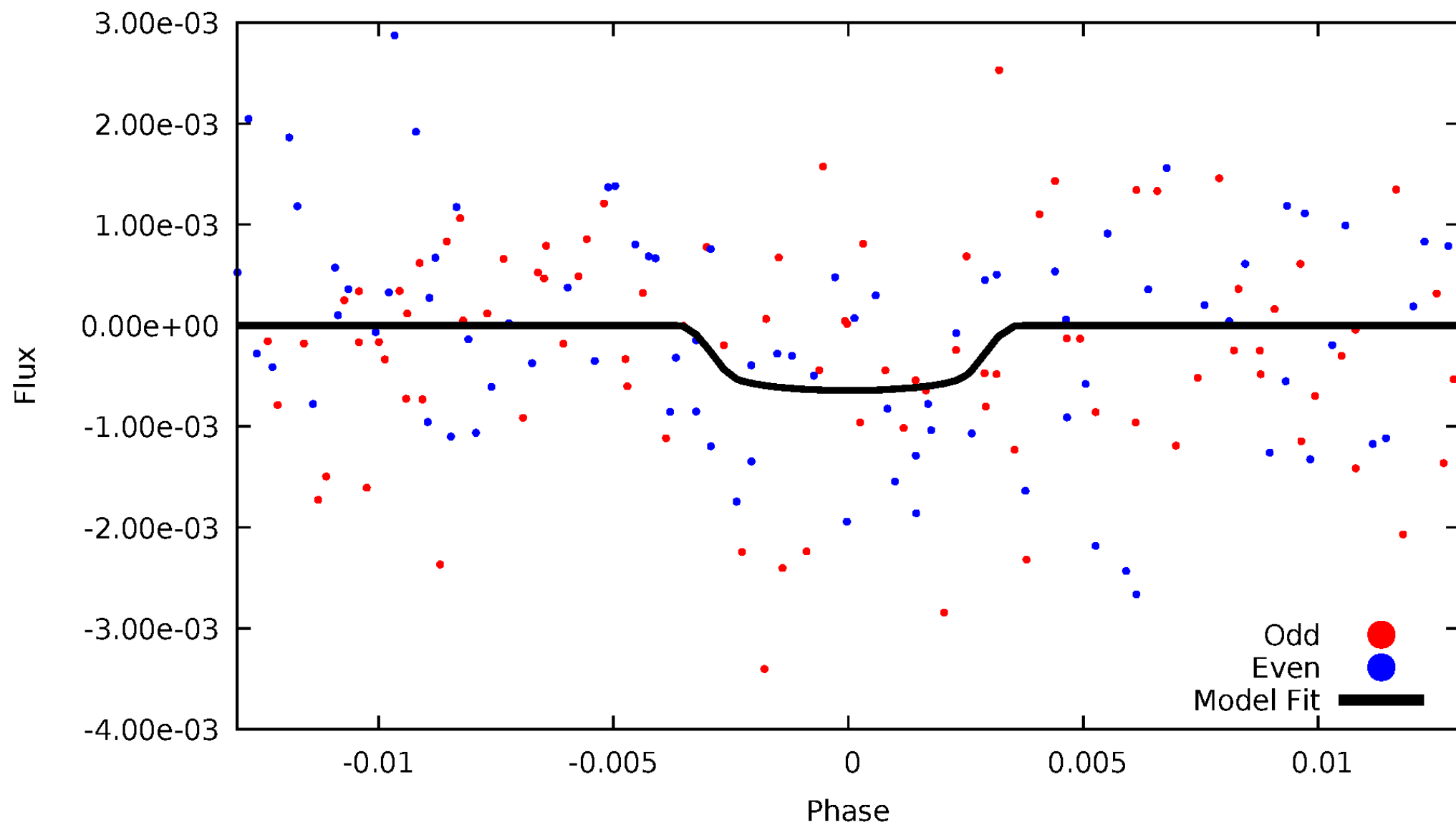


TCE 009245855-06



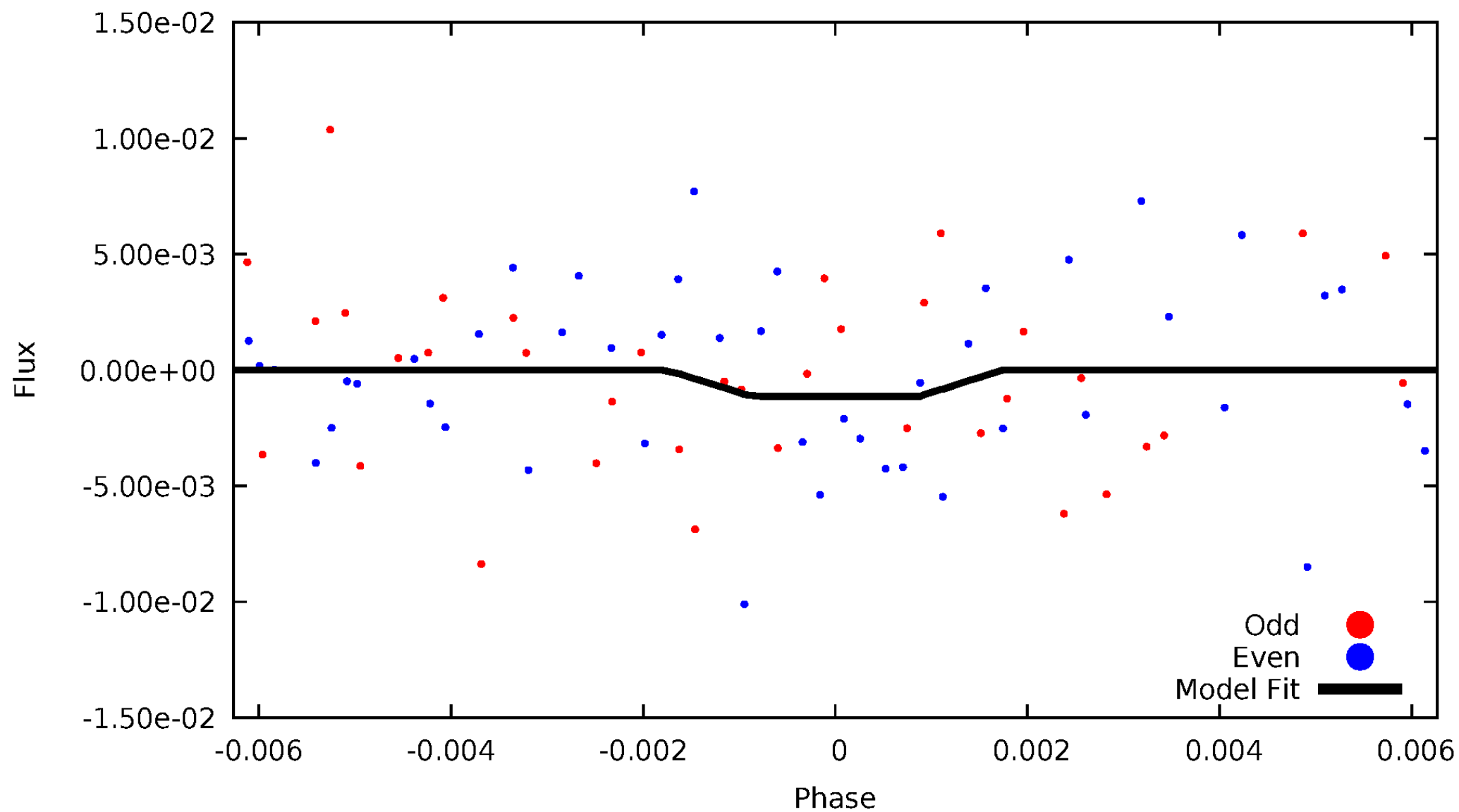
# DV Odd/Even

TCE 009245855-06



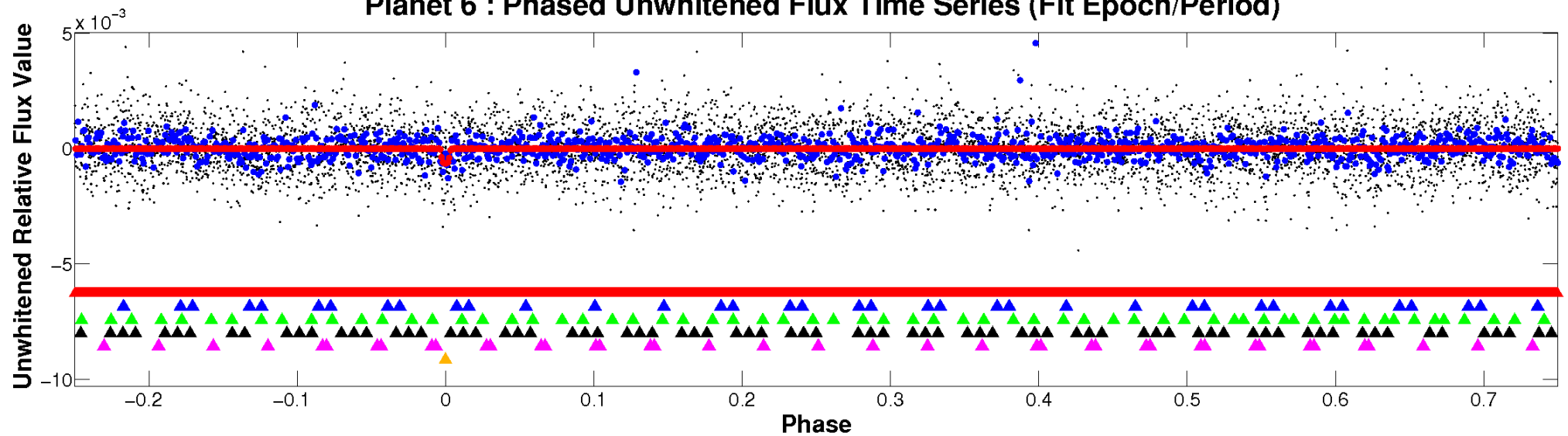
# ALT Odd/Even

TCE 009245855-06

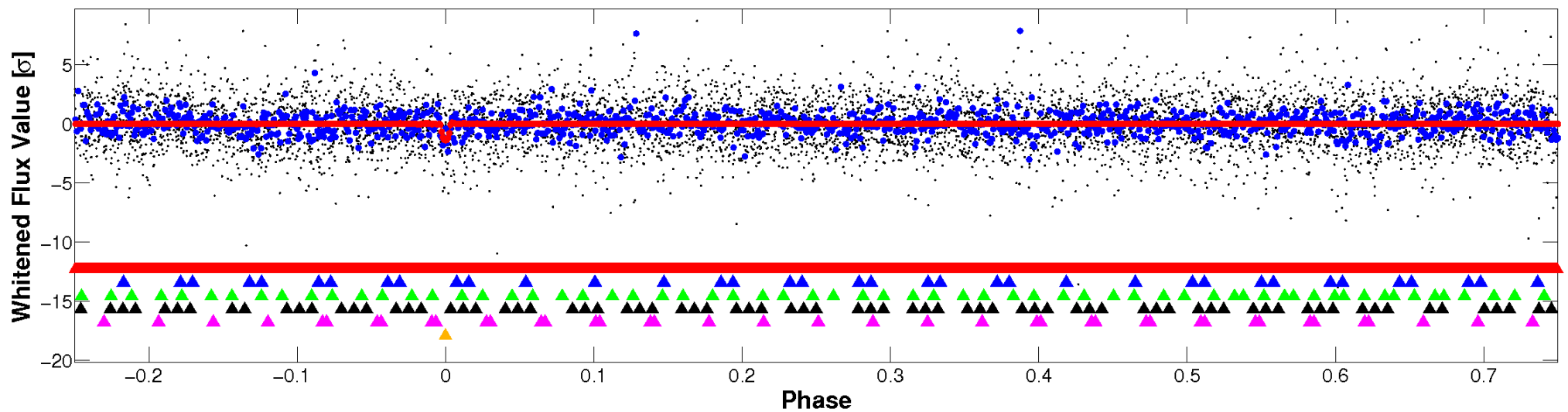


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

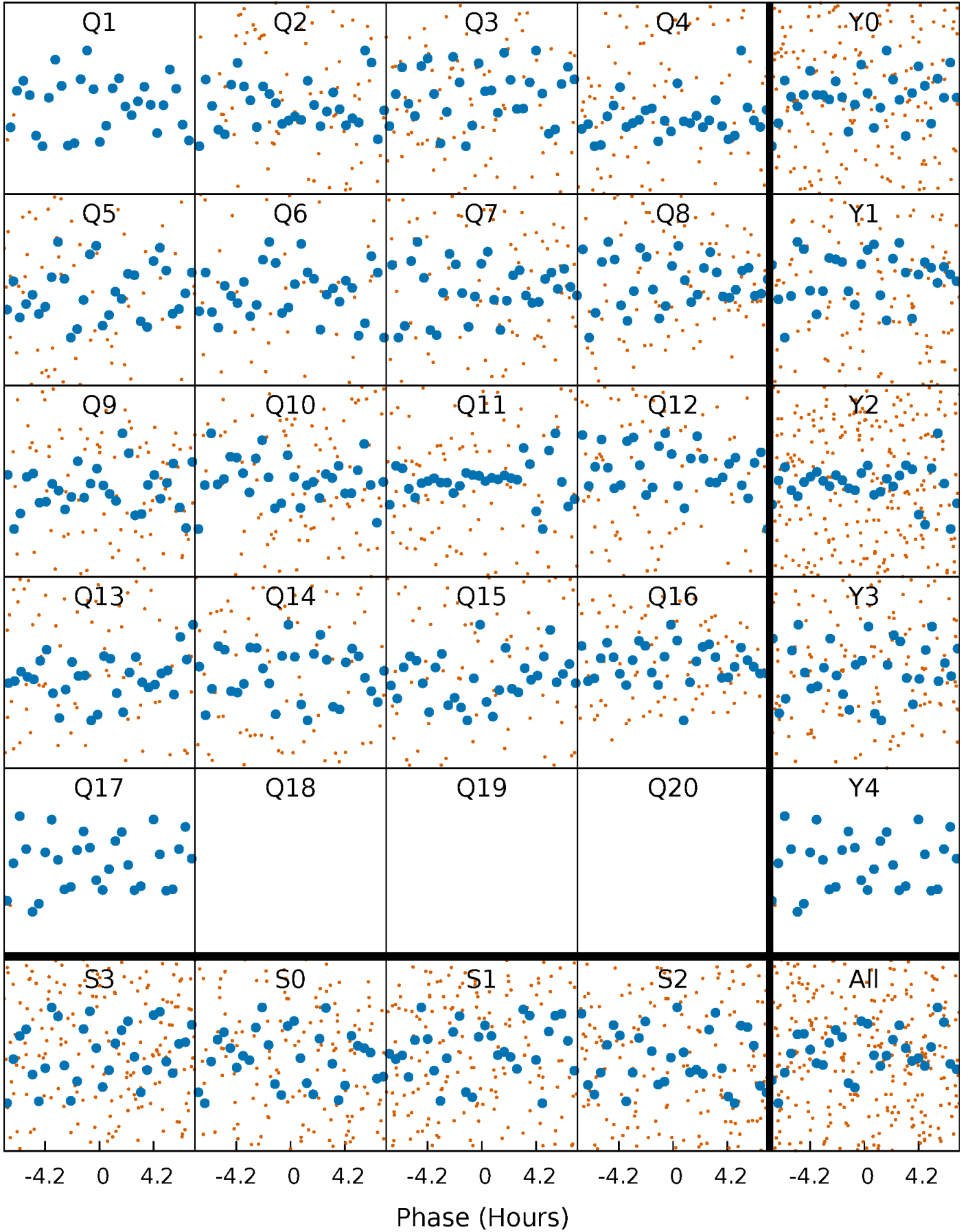


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

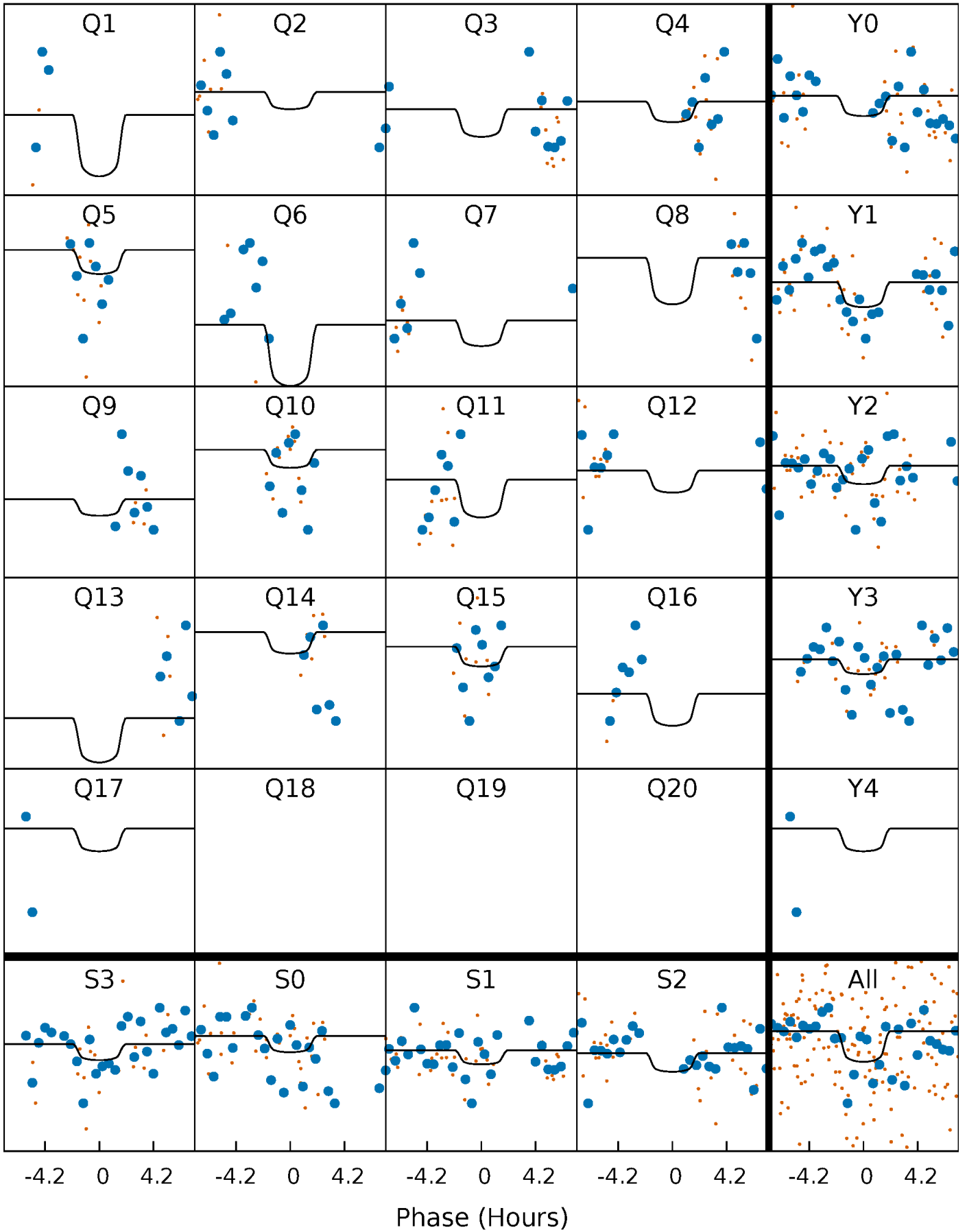
TCE 009245855-06 P= 23.676899 Days  $T_0=154.858019$  (BKJD)





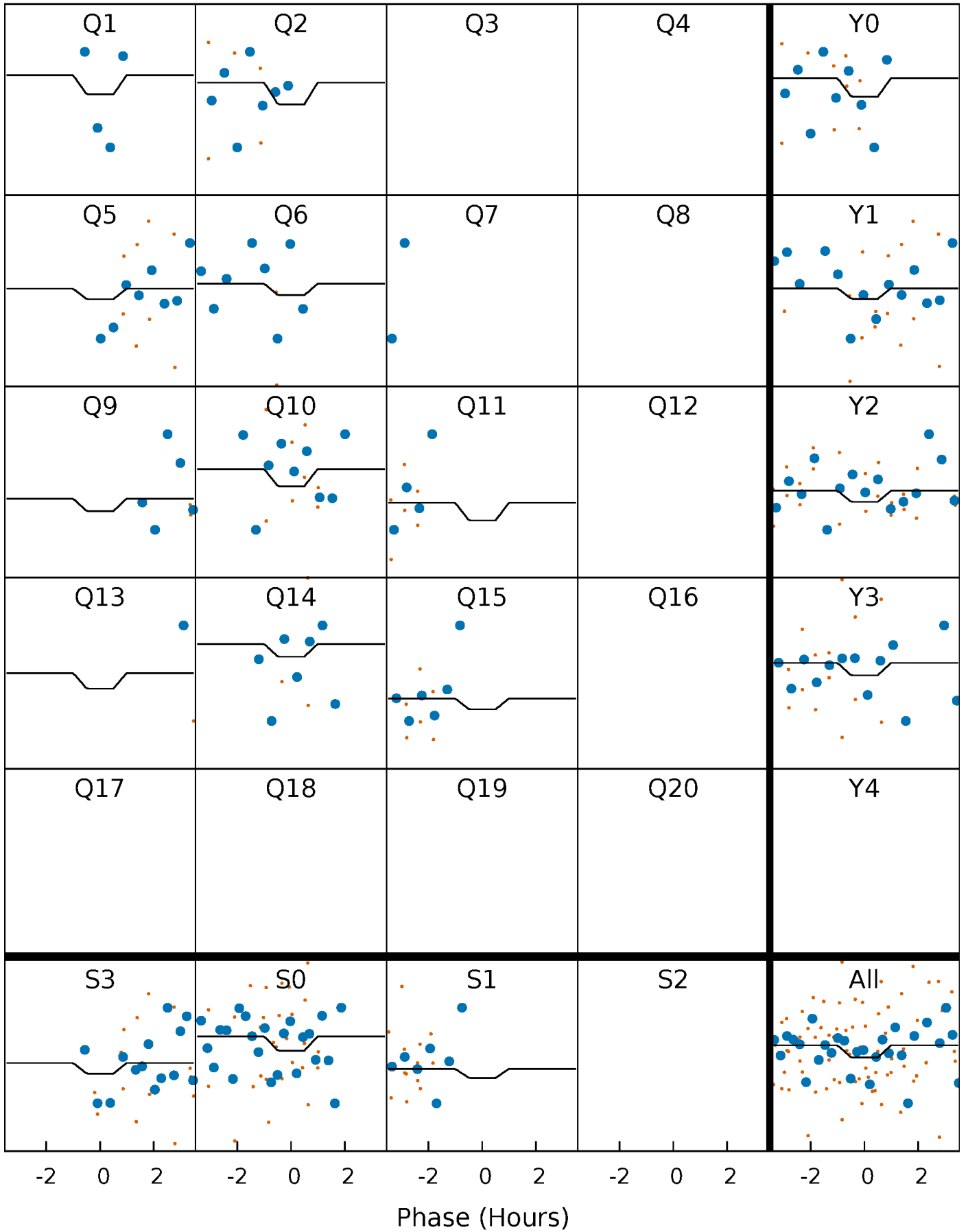
# DV Quarter-Phased Transit Curves

TCE 009245855-06 P= 23.676899 Days  $T_0=154.858019$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

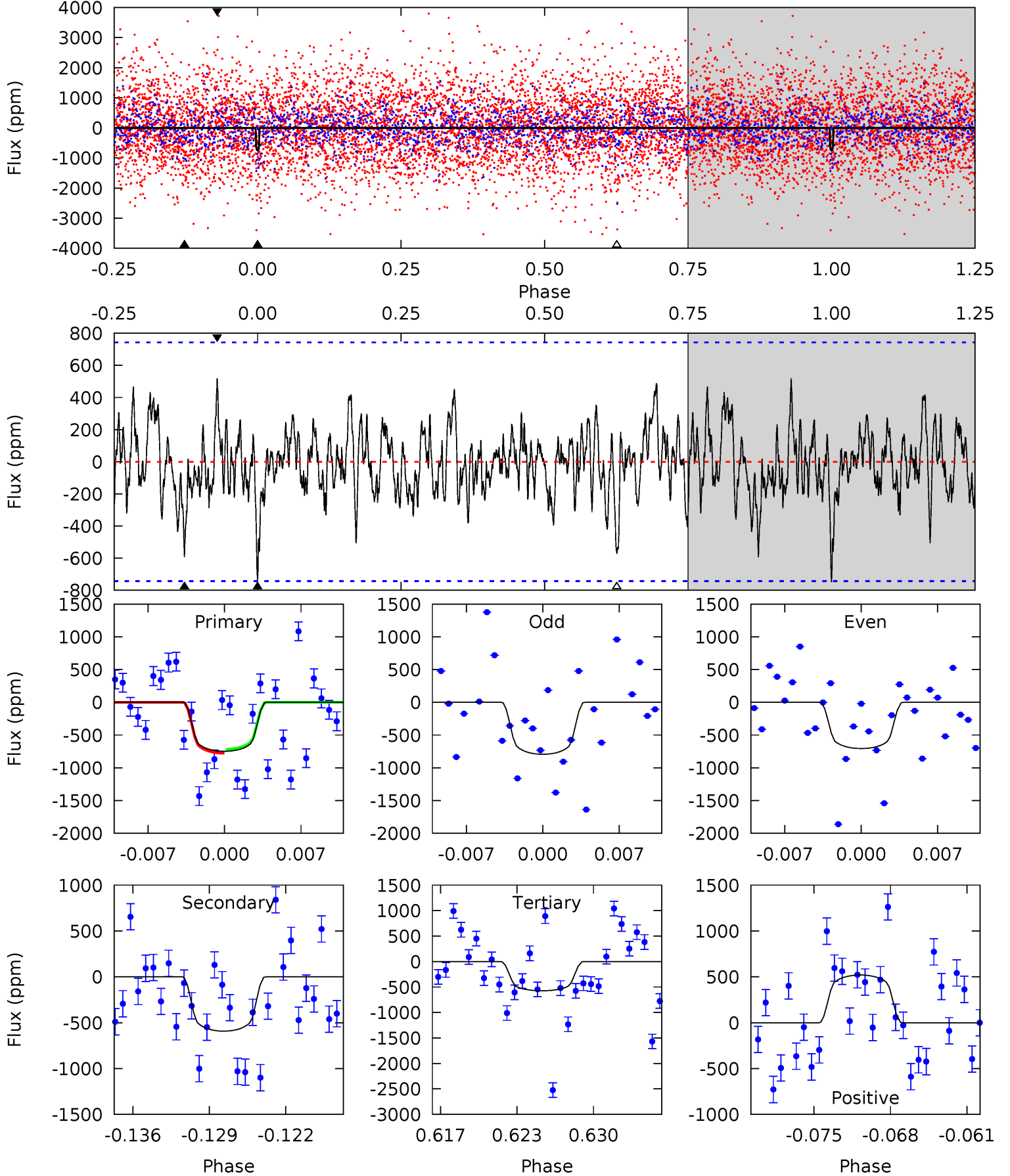
TCE 009245855-06 P= 23.682292 Days  $T_0=154.671924$  (BKJD)



# DV Model-Shift Uniqueness Test

009245855-06, P = 23.676899 Days, E = 131.181120 Days

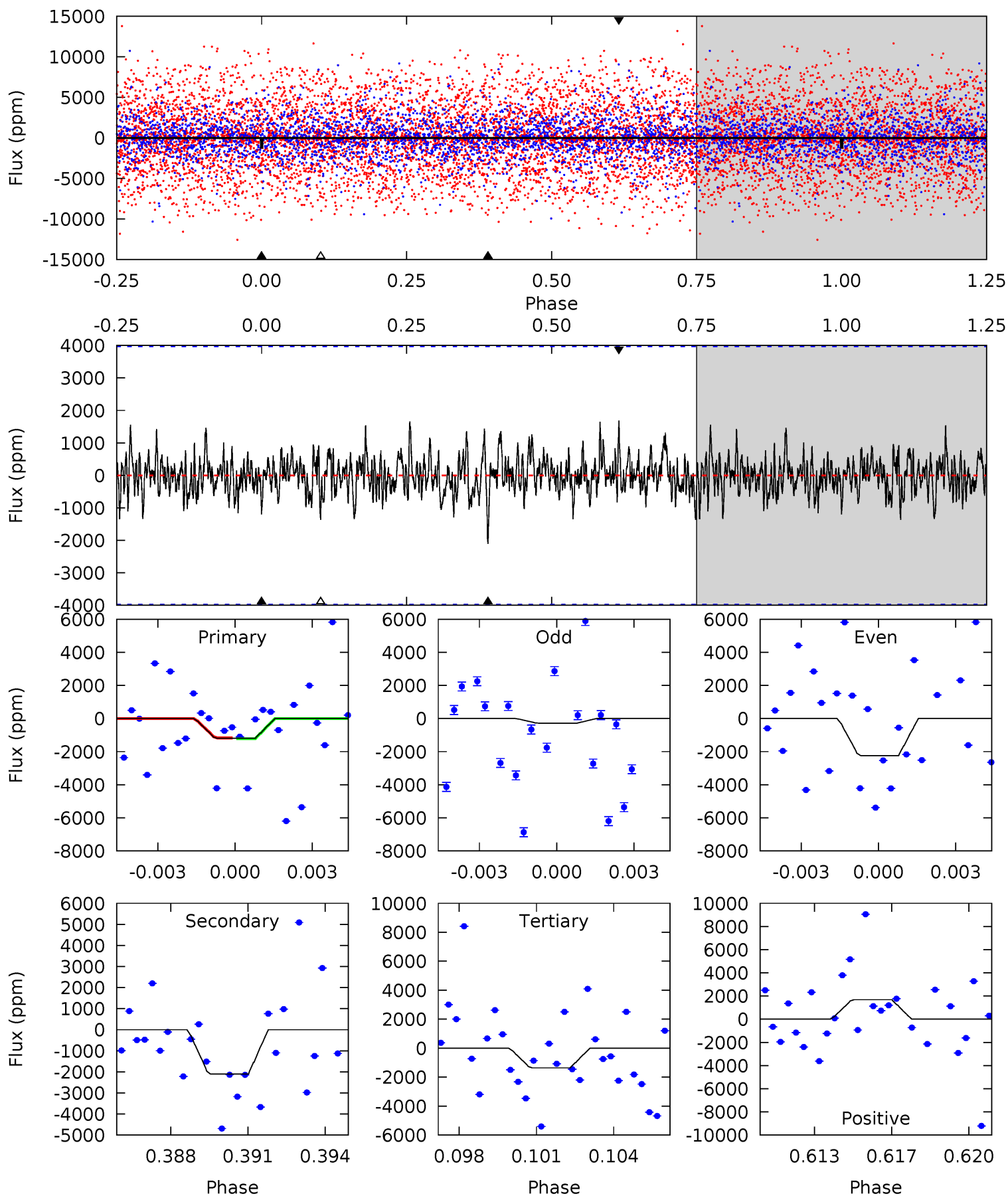
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.13	4.06	3.93	3.56	5.10	2.71	1.21	1.20	1.57	0.13	0.50	0.30	1.12	0.41	0.20



# Alt Model-Shift Uniqueness Test

009245855-06, P = 23.682292 Days, E = 130.989632 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.58	2.77	1.79	2.21	5.23	2.93	0.65	-0.22	-0.64	0.97	0.56	1.28	1.87	0.44	0.03



### Stellar Parameters For KIC 009245855

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+214}_{-295}$	$4.361^{+0.081}_{-0.189}$	$-0.080^{+0.250}_{-0.300}$	$1.207^{+0.371}_{-0.159}$	$1.226^{+0.168}_{-0.187}$	$0.982^{+0.342}_{-0.489}$
	+3%/-4%	+2%/-4%	+312%/-375%	+31%/-13%	+14%/-15%	+35%/-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 009245855-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-593 \pm 146$	$5.43^{+4.31}_{-3.63}$	$1087^{+80}_{-61}$	$5194^{+4334}_{-1126}$	$334^{+2437}_{-240}$
Alt.	$-2106 \pm 761$	$5.72^{+4.32}_{-3.55}$	$1090^{+75}_{-66}$	$6724^{+6434}_{-1632}$	$965^{+5852}_{-665}$

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

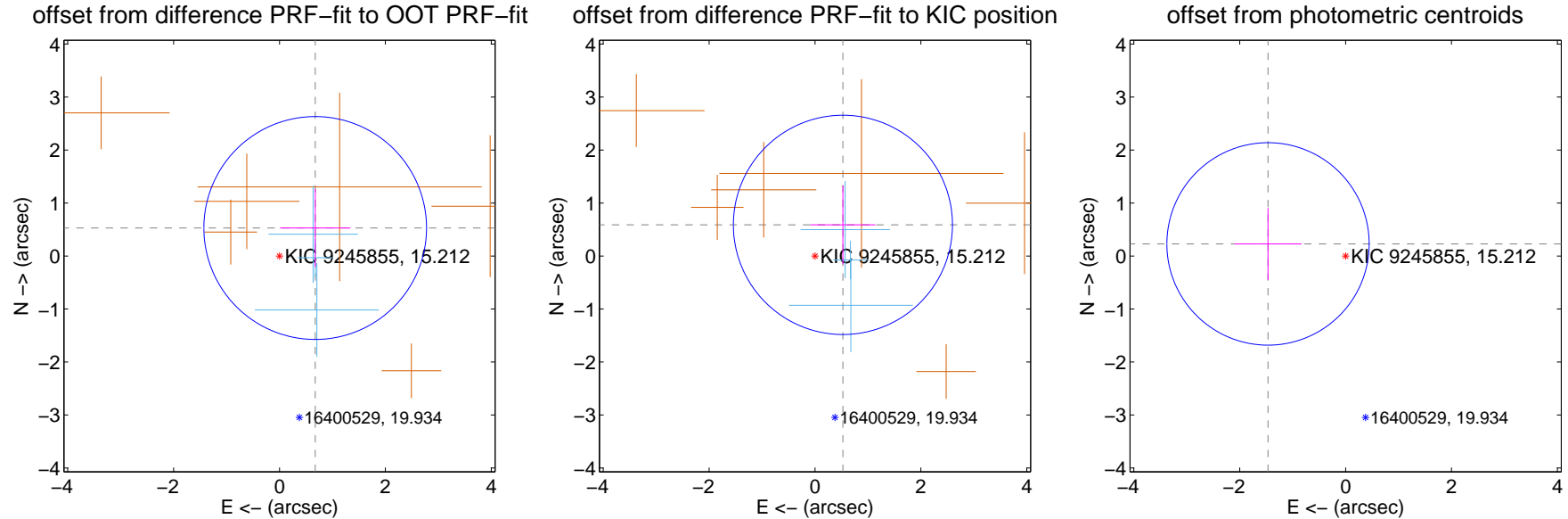
## DV Centroid Data

Supplemental centroid analysis for 009245855-06. Kepler magnitude: 15.21. Transit SNR 7.38

There are 3 quarters with good PRF difference image offsets

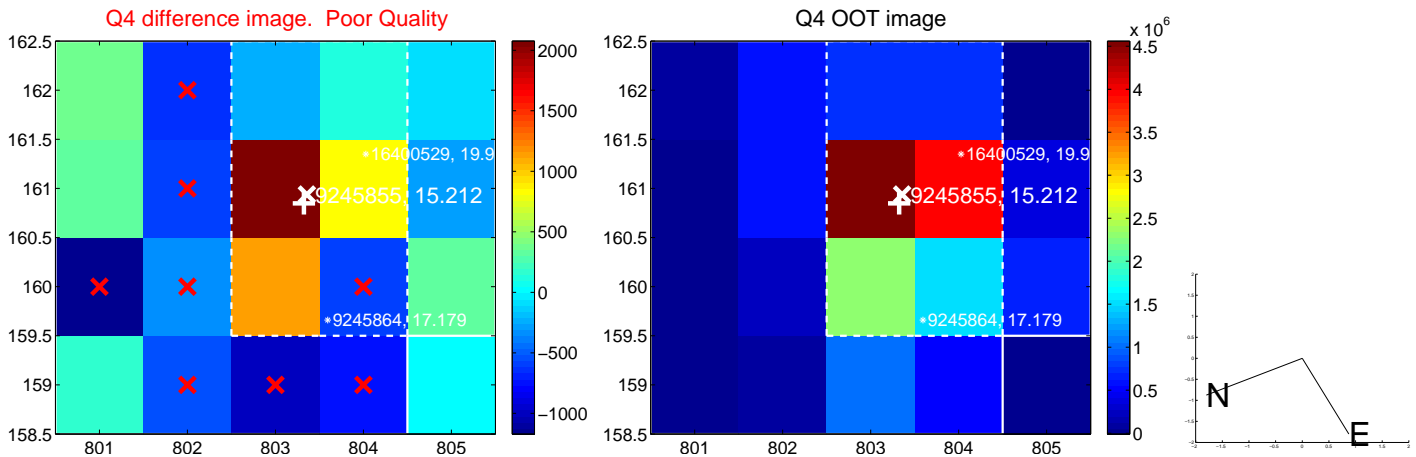
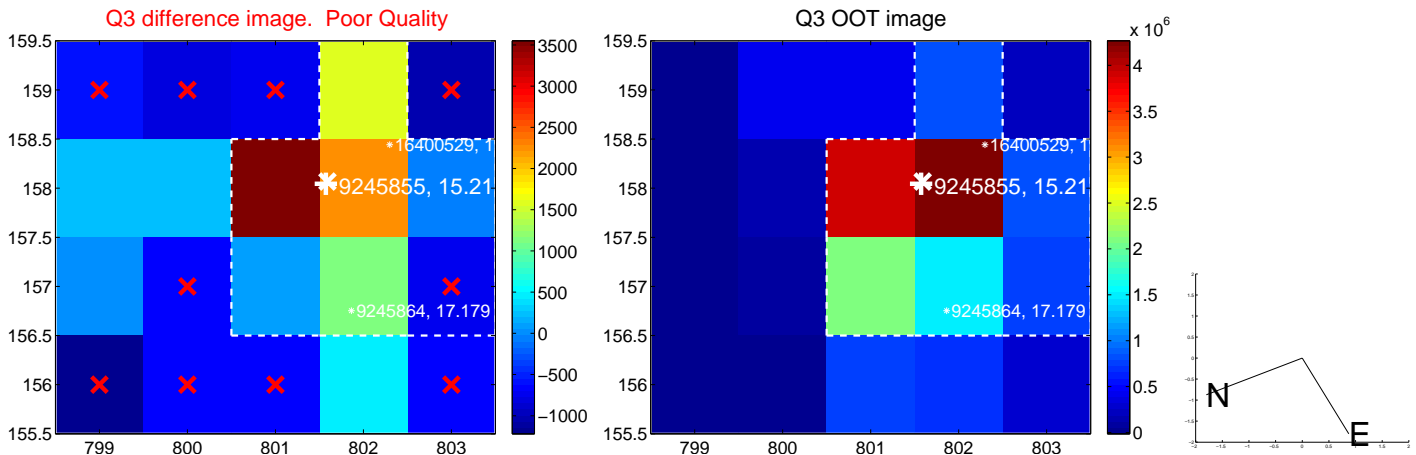
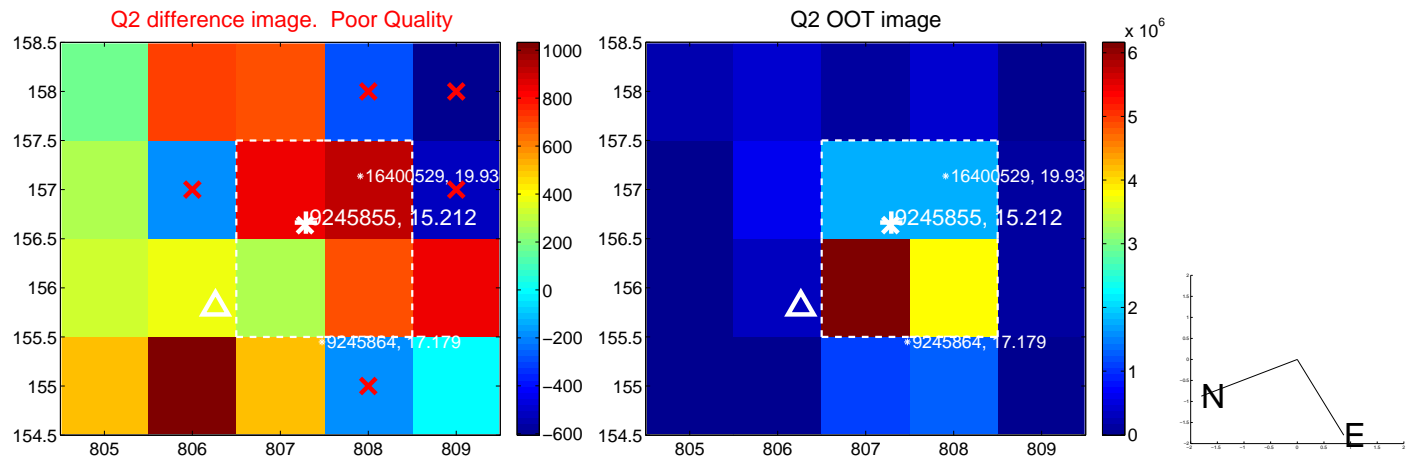
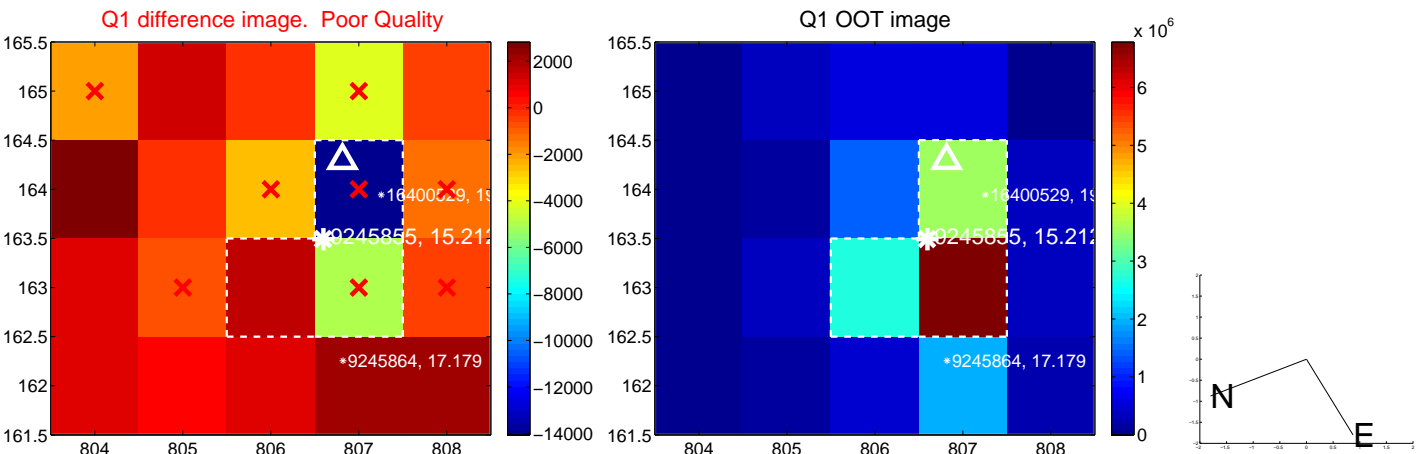
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.857 \pm 0.701$	1.22	$-0.675 \pm 0.666$	$0.529 \pm 0.740$
PRF-fit source offset from KIC position	$0.790 \pm 0.689$	1.15	$-0.527 \pm 0.615$	$0.588 \pm 0.744$
photometric centroid source offset	$1.48 \pm 0.64$	2.33	$1.47 \pm 0.64$	$0.23 \pm 0.68$



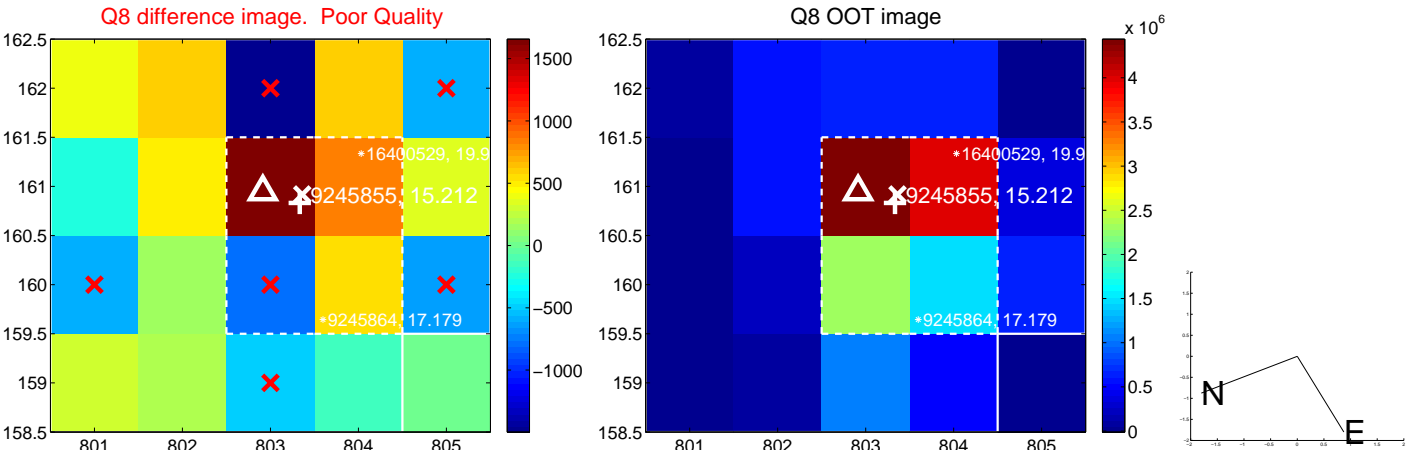
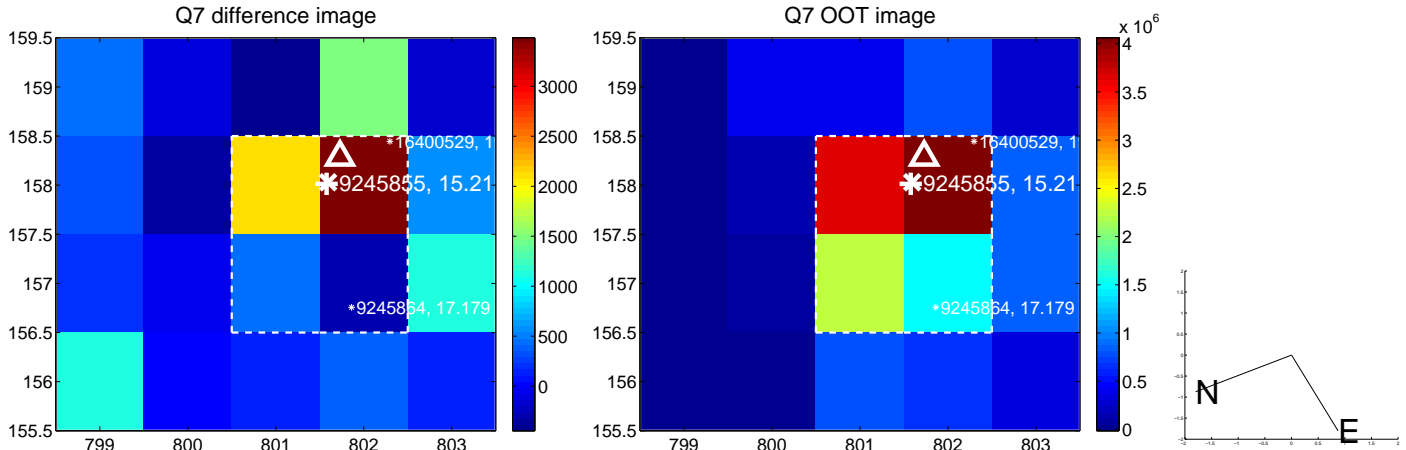
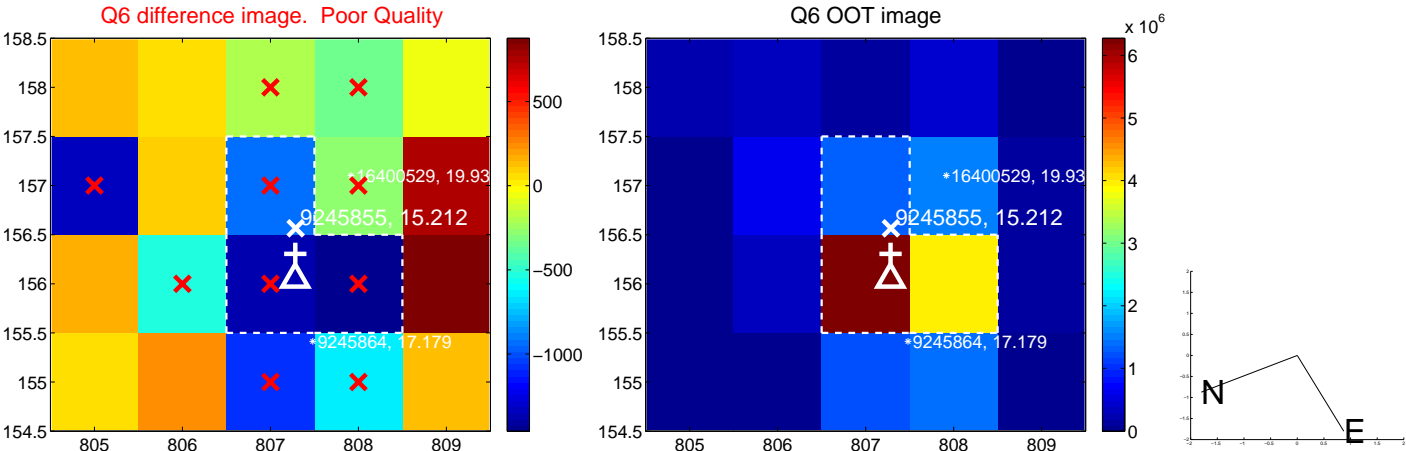
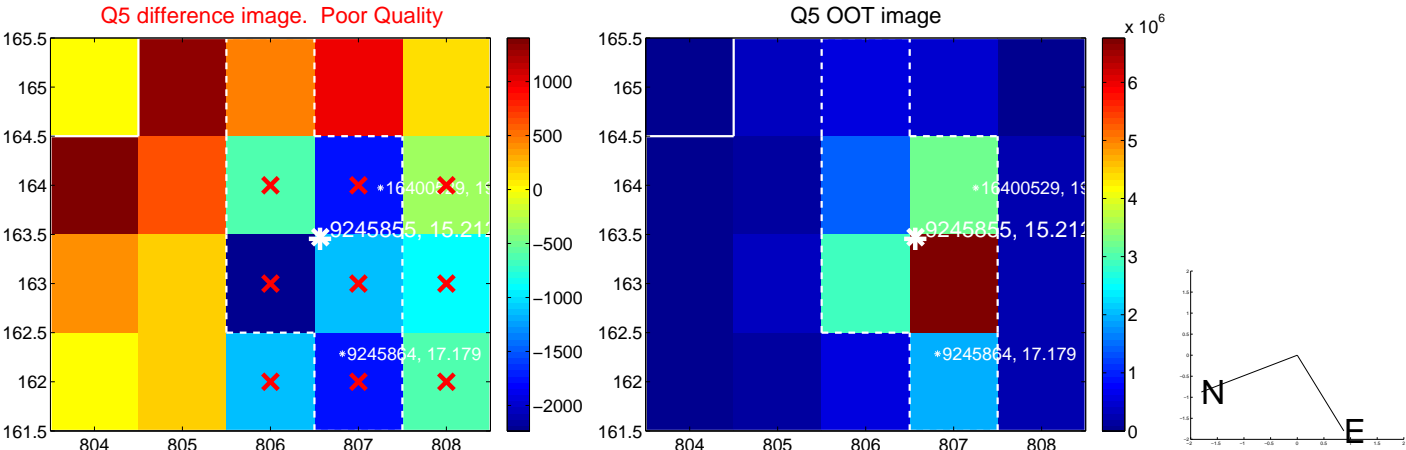
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

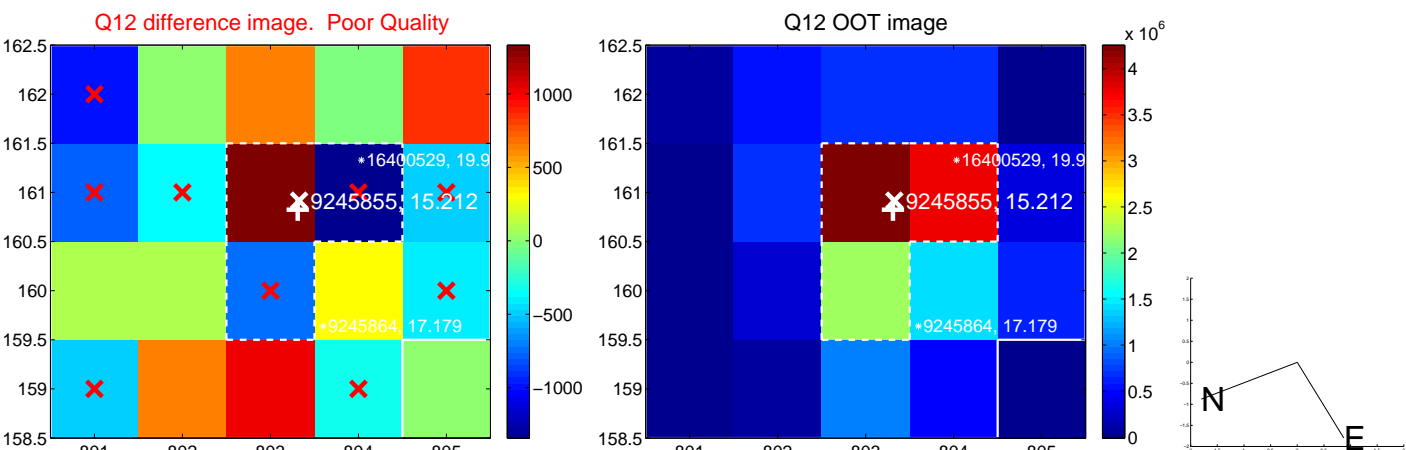
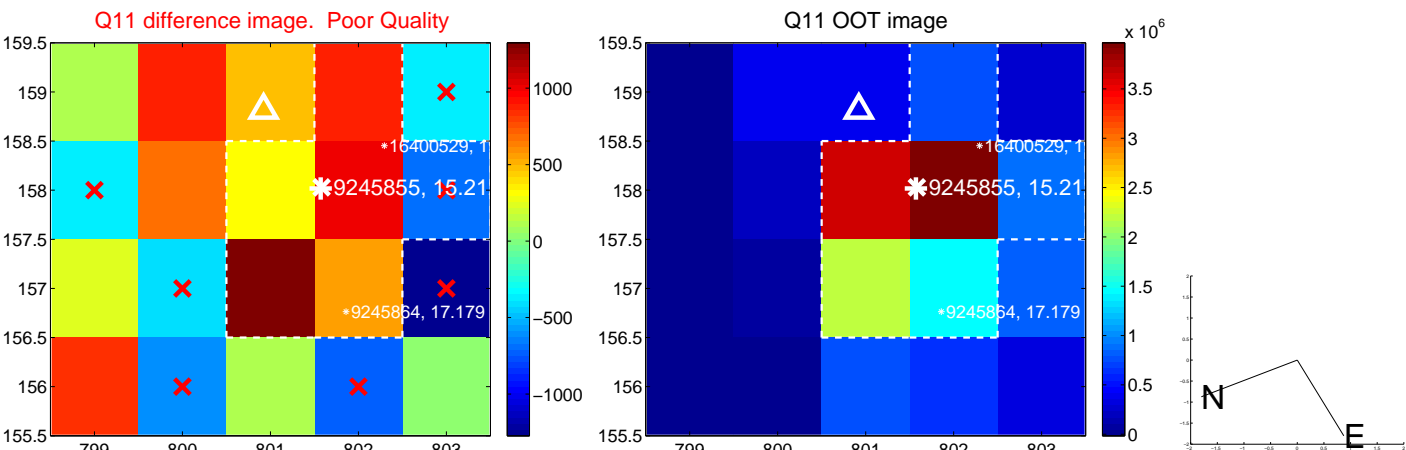
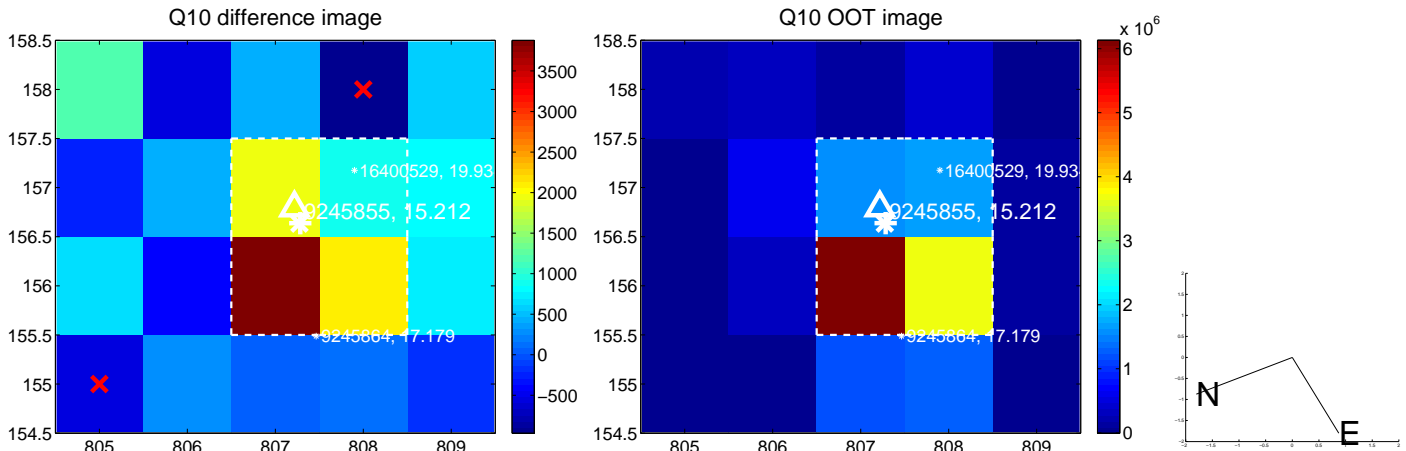
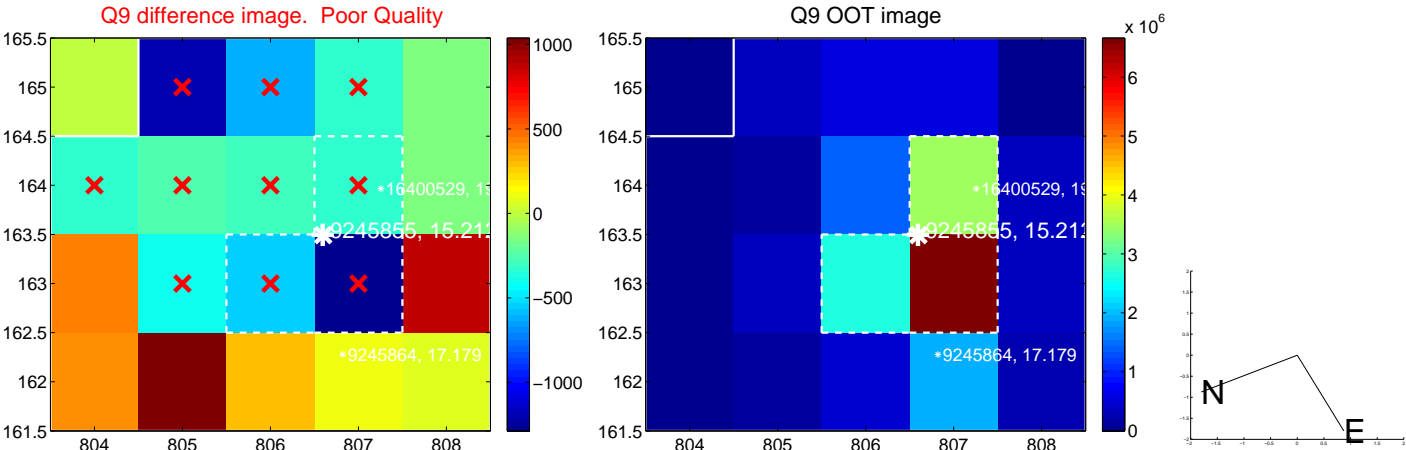




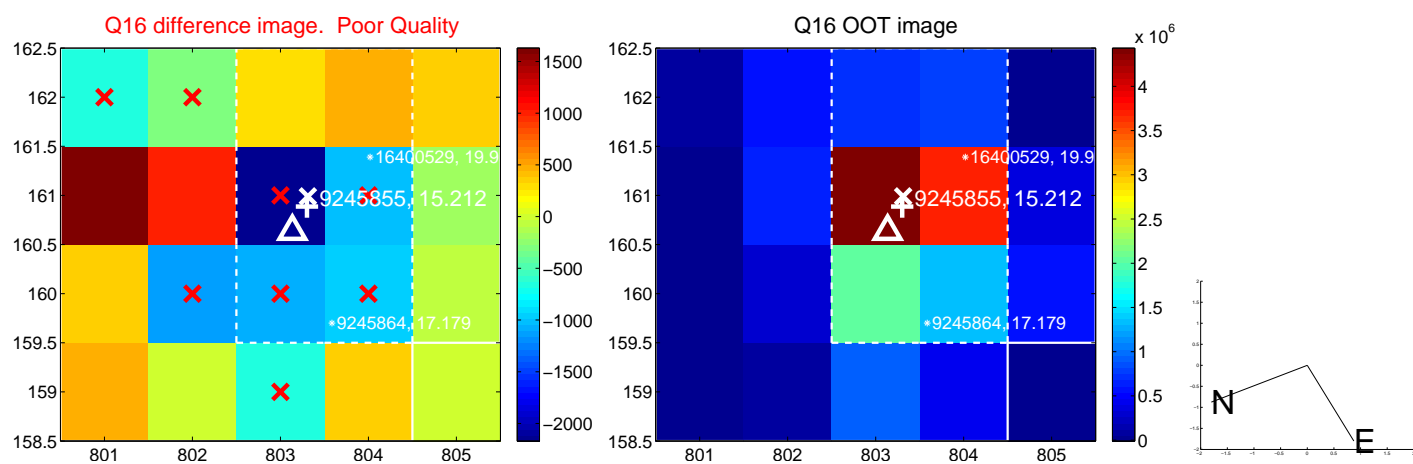
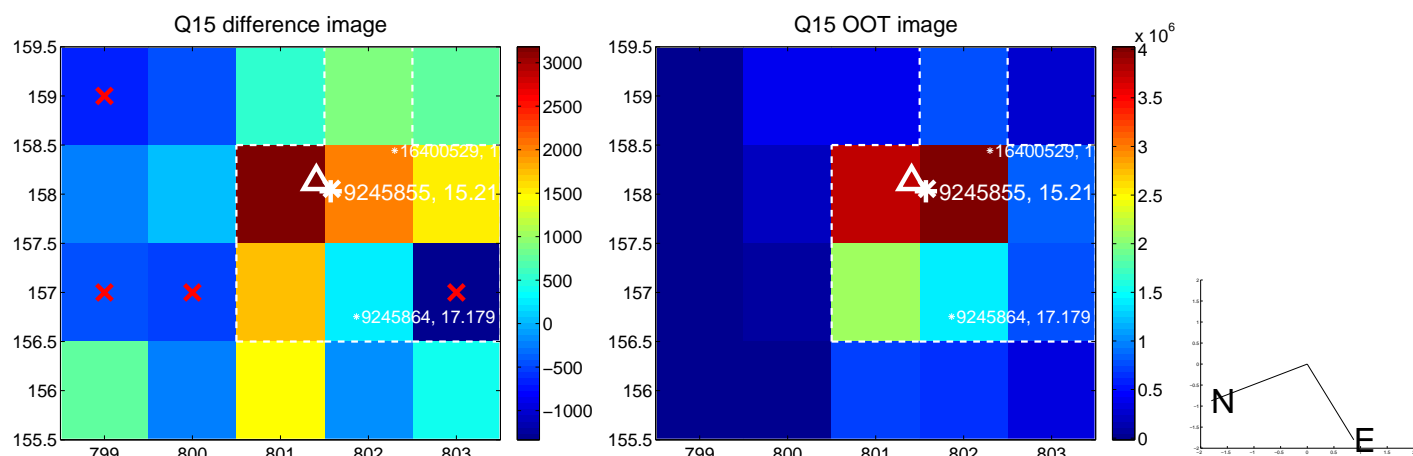
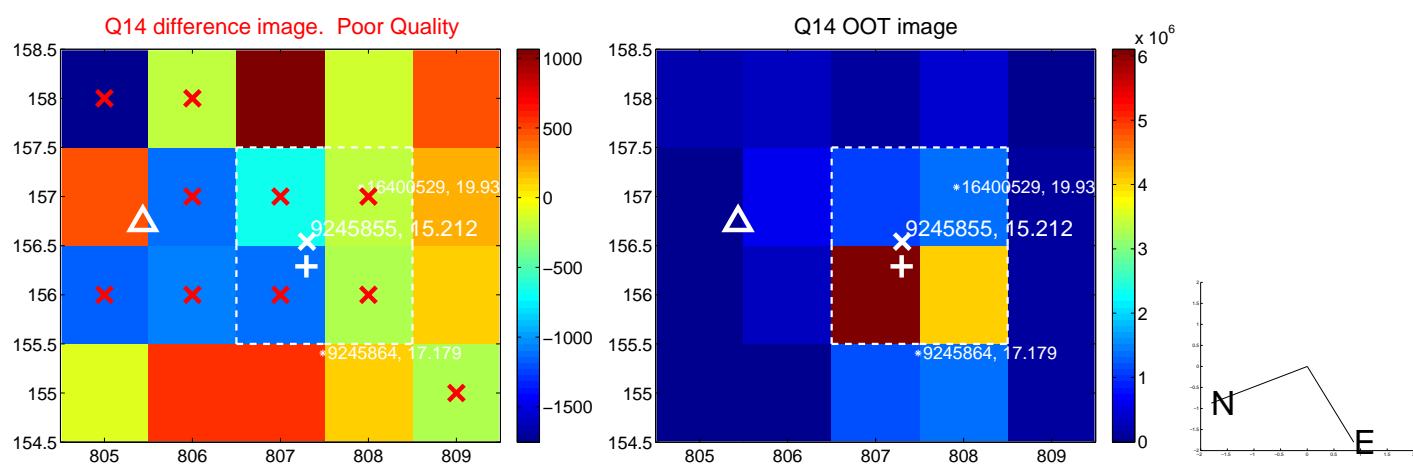
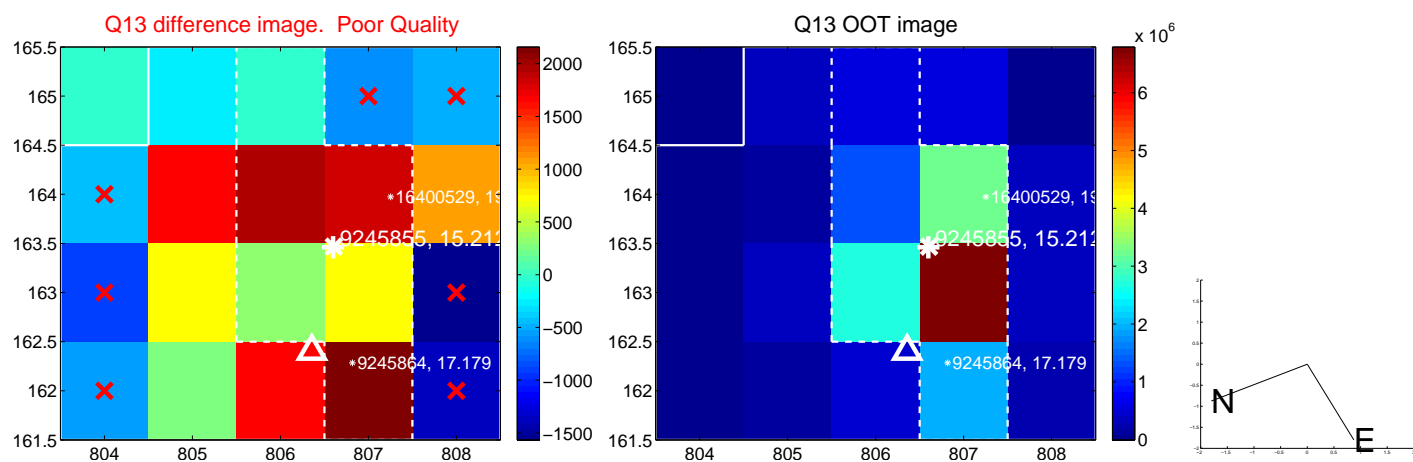
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



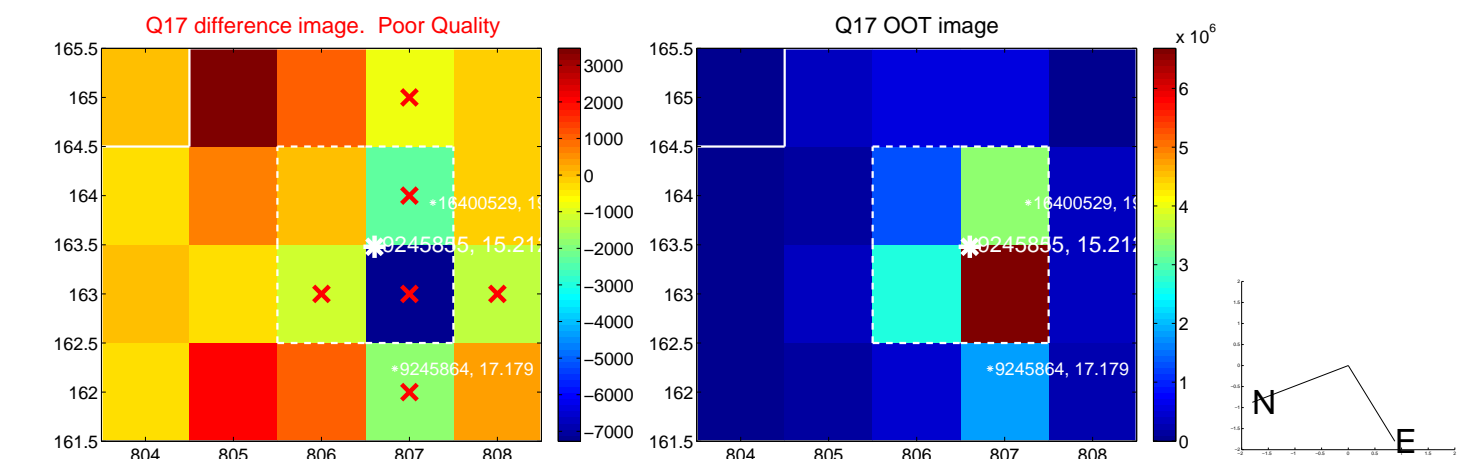
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



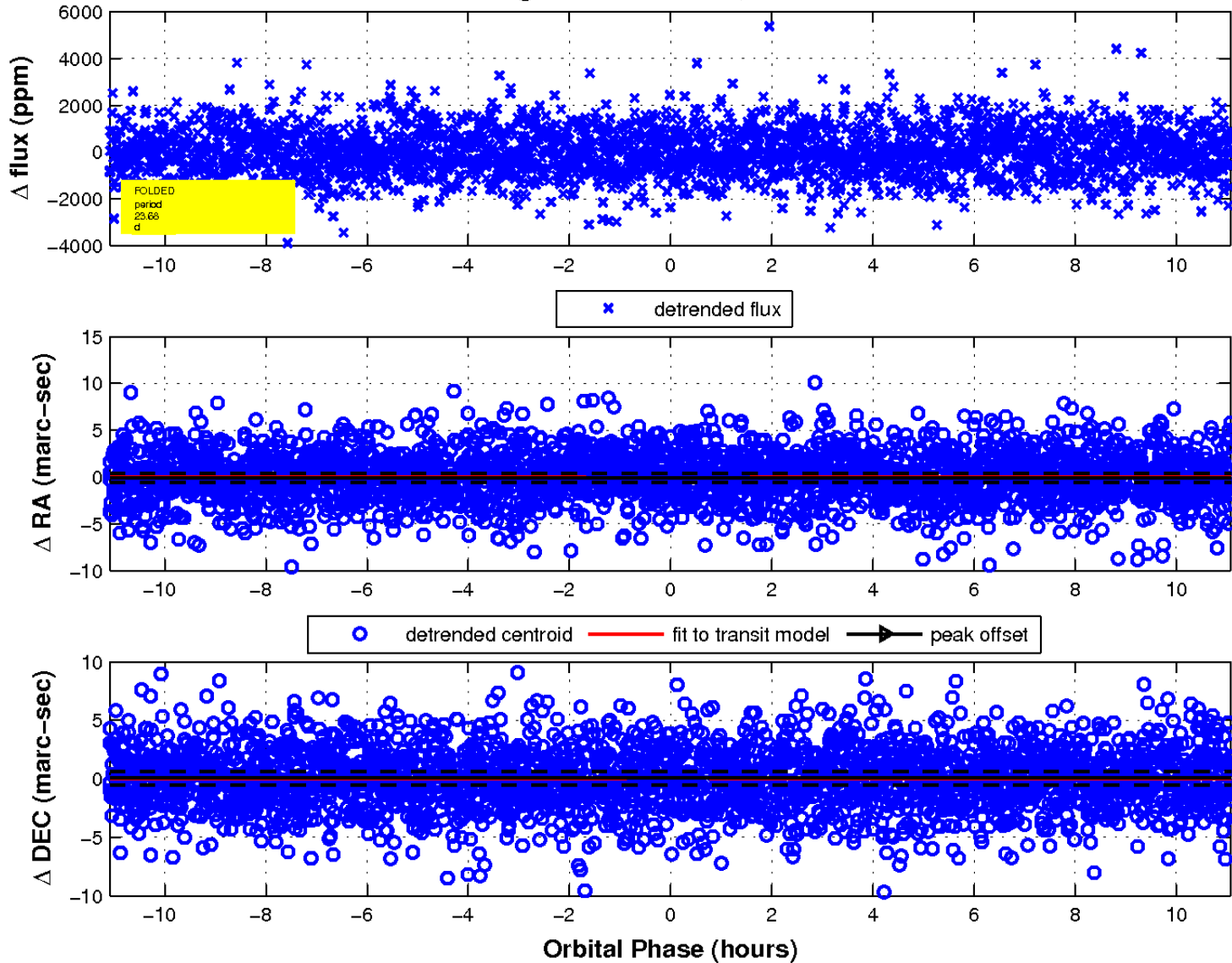
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 6 of 6



UKIRT Image

Declination

