

# KIC 005299904

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005299904-01	OBS	No	0.590189	132.079085	112.4	1.350	9.9	12.5	2.25	6829	2.78	39018.88
005299904-02	OBS	No	0.590163	131.652444	100.4	0.734	8.5	6.2	2.25	6829	2.65	39021.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005299904-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005299904-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

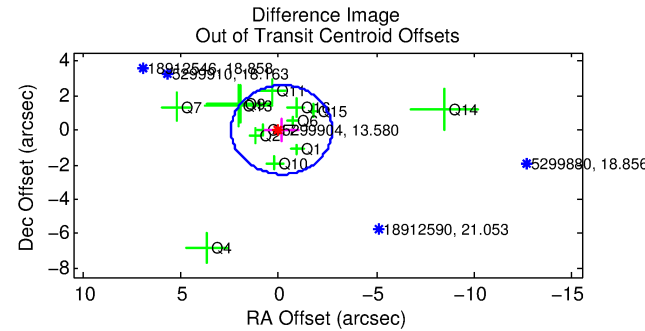
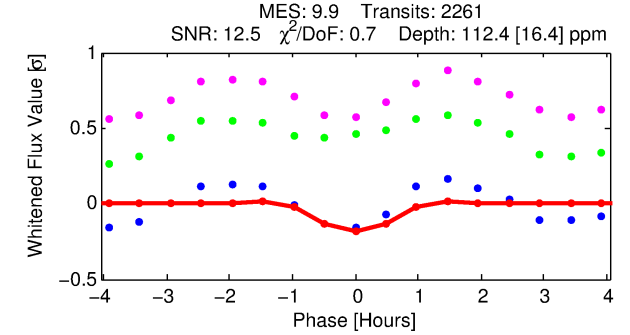
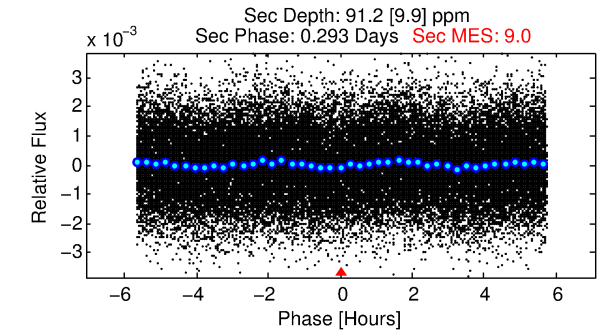
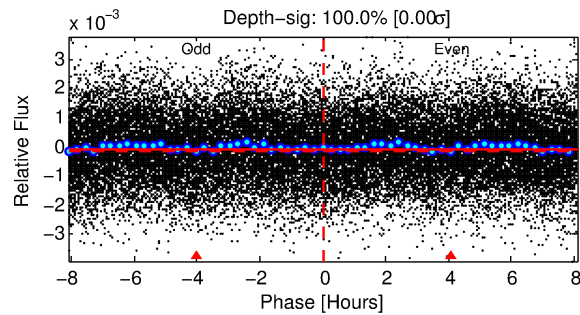
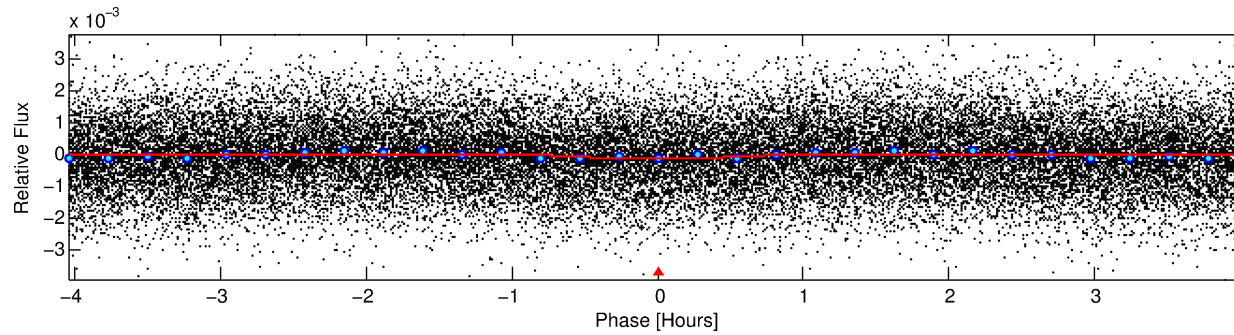
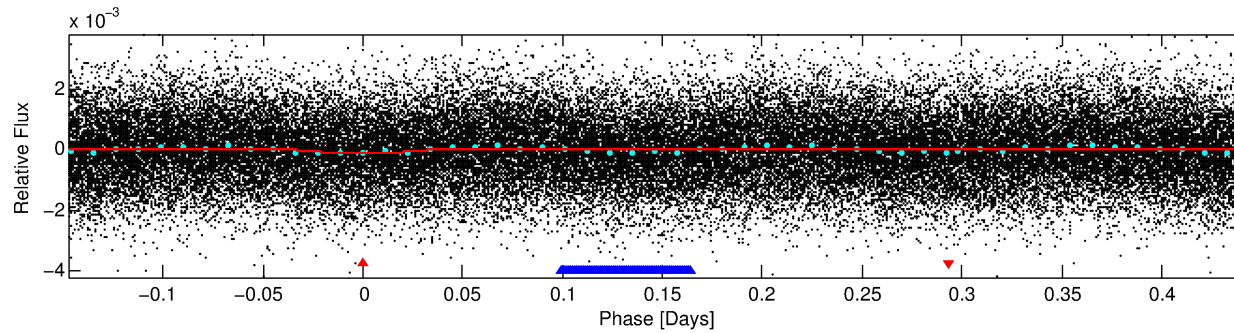
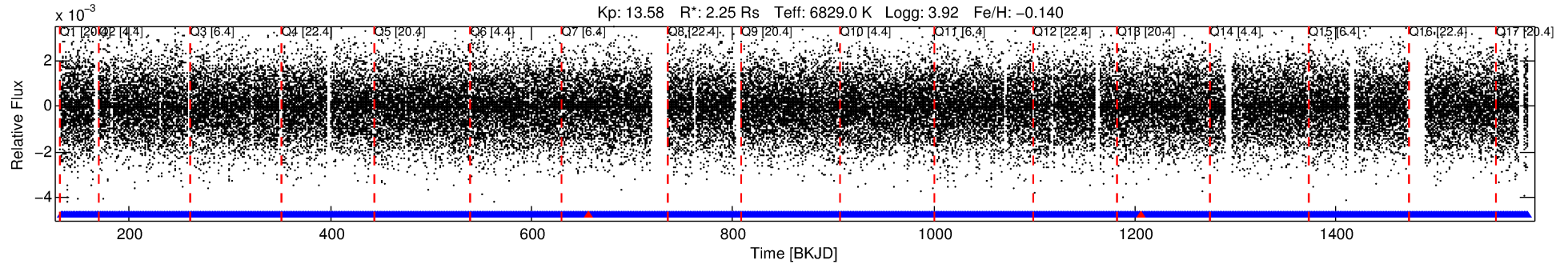
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005299904-01

No Significant Match Found

# DV One-Page Summary

KIC: 5299904 Candidate: 1 of 2 Period: 0.590 d



## DV Fit Results:

Period = 0.59019 [0.00001] d  
Epoch = 132.0791 [0.0020] BKJD  
Rp/R\* = 0.0113 [0.0077]  
a/R\* = 1.80 [5.09]  
b = 0.90 [0.87]  
Seff = 39018.87 [24249.82]  
Teq = 3584 [557] K  
Rp = 2.78 [2.16] Re  
a = 0.0159 [0.0059] AU  
Ag = 1.63 [2.43] [0.26σ]  
Teffp = 6265 [2143] K [1.21σ]

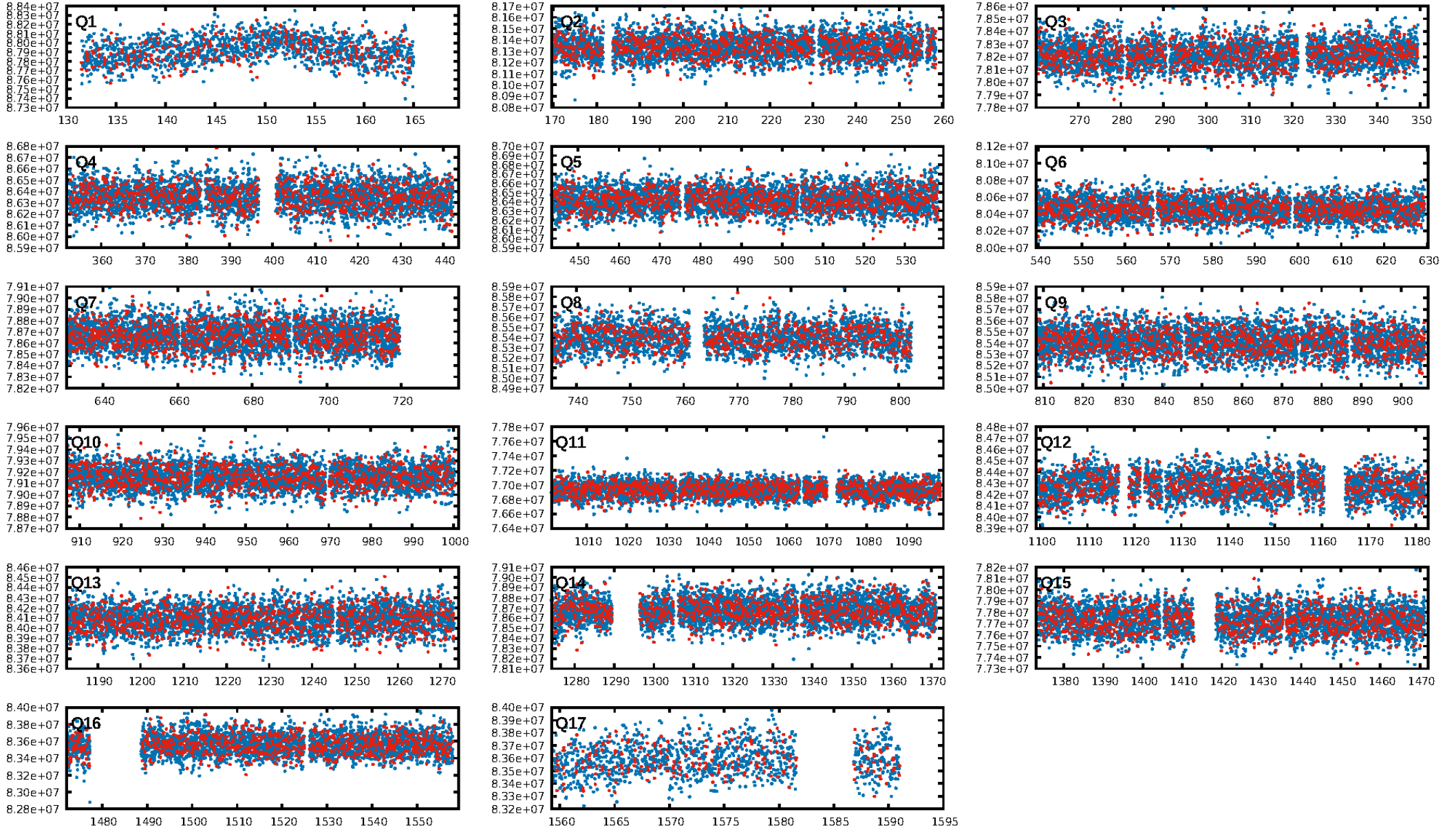
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.04e-31  
RollingBand-fgt: 1.00 [2156/2158]  
GhostDiagnostic-chr: 3.281  
Centroid-sig: 0.1%  
Centroid-so: 0.459 arcsec [1.47σ]  
OotOffset-rm: 0.155 arcsec [0.18σ]  
KicOffset-rm: 0.207 arcsec [0.24σ]  
OotOffset-st: 4/3/2/4 [13]  
KicOffset-st: 4/3/2/4 [13]  
DiffImageQuality-fgm: 0.38 [5/13]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 00:58:22 Z

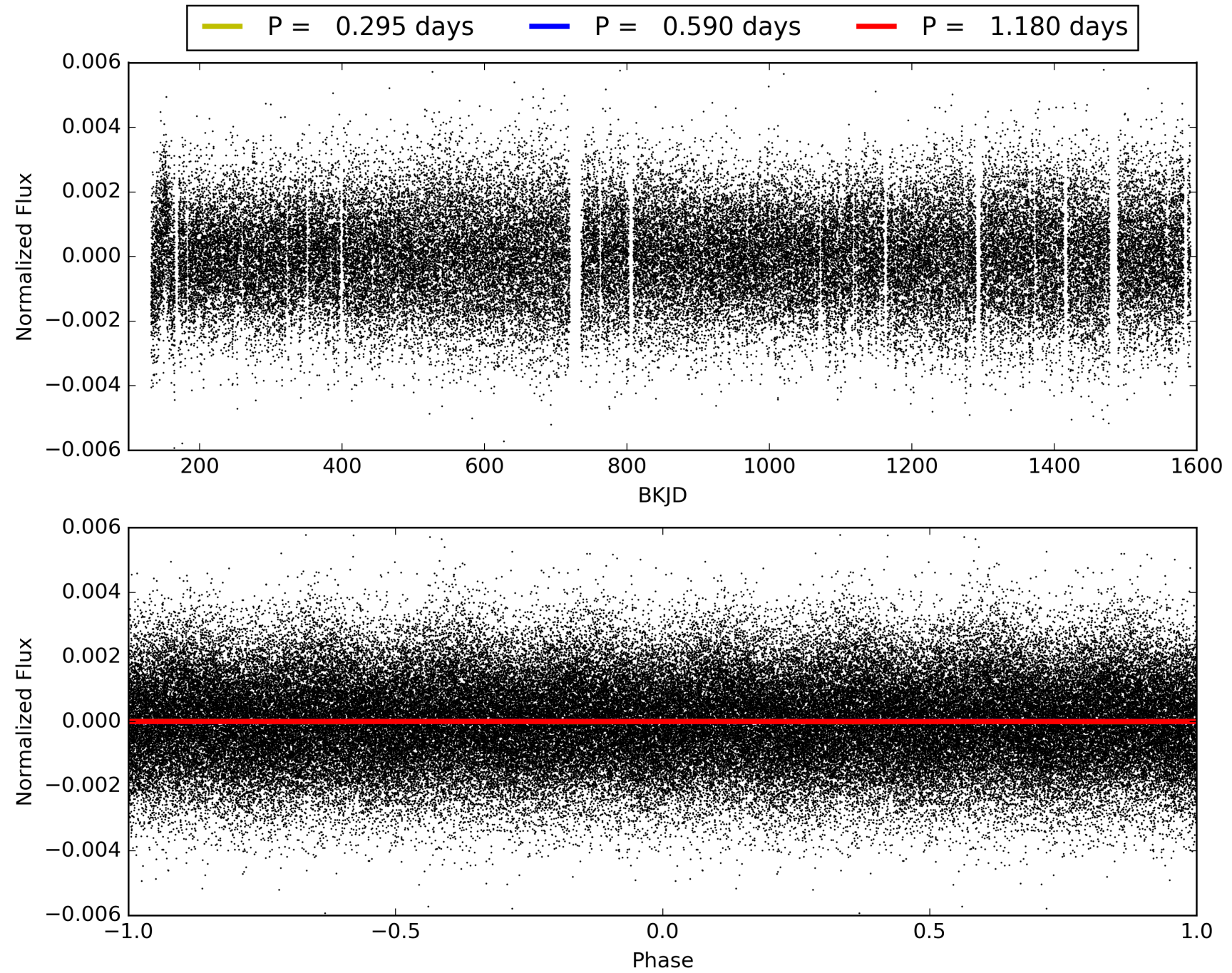
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005299904-01, PDC Light Curves



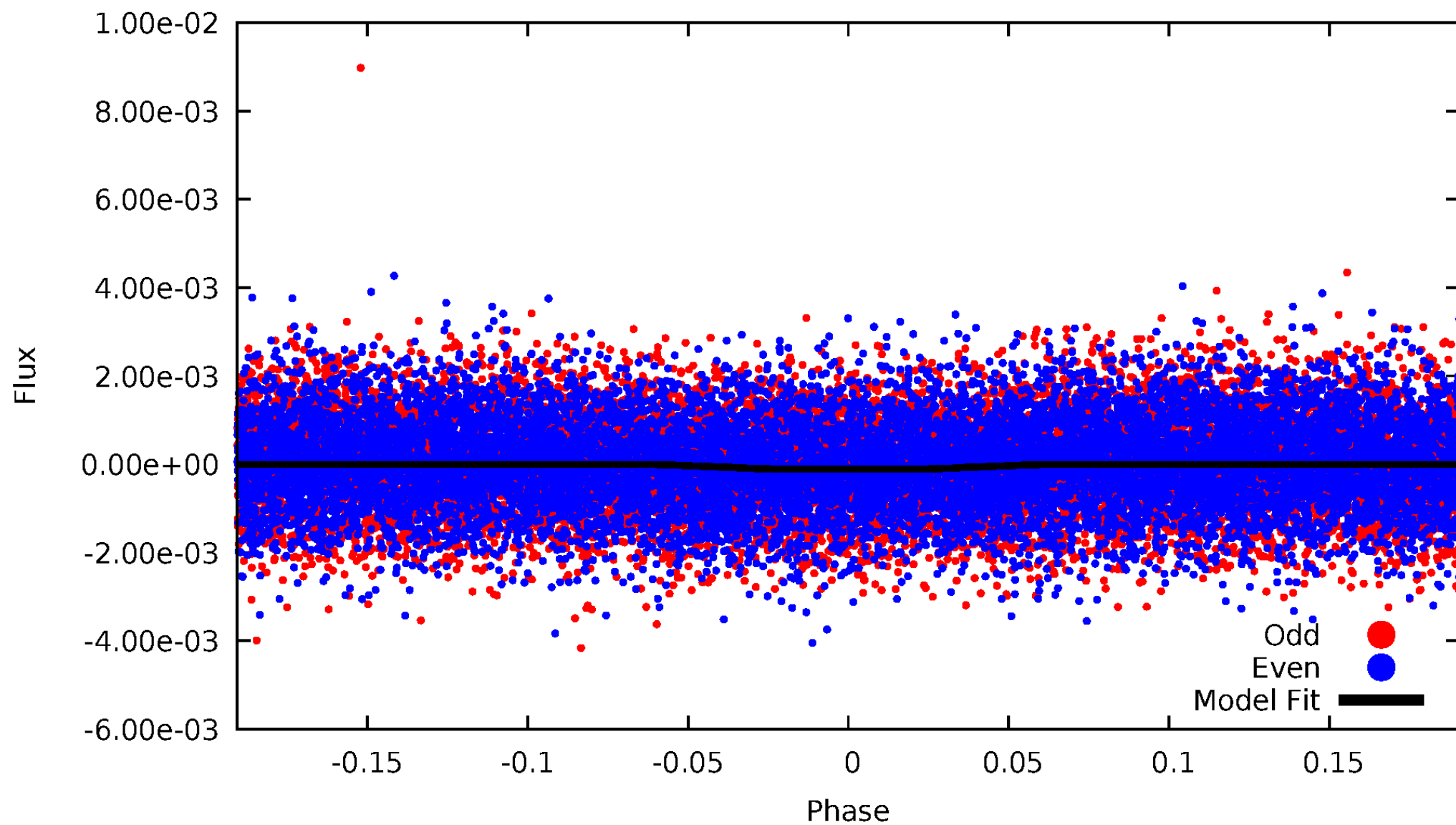


TCE 005299904-01



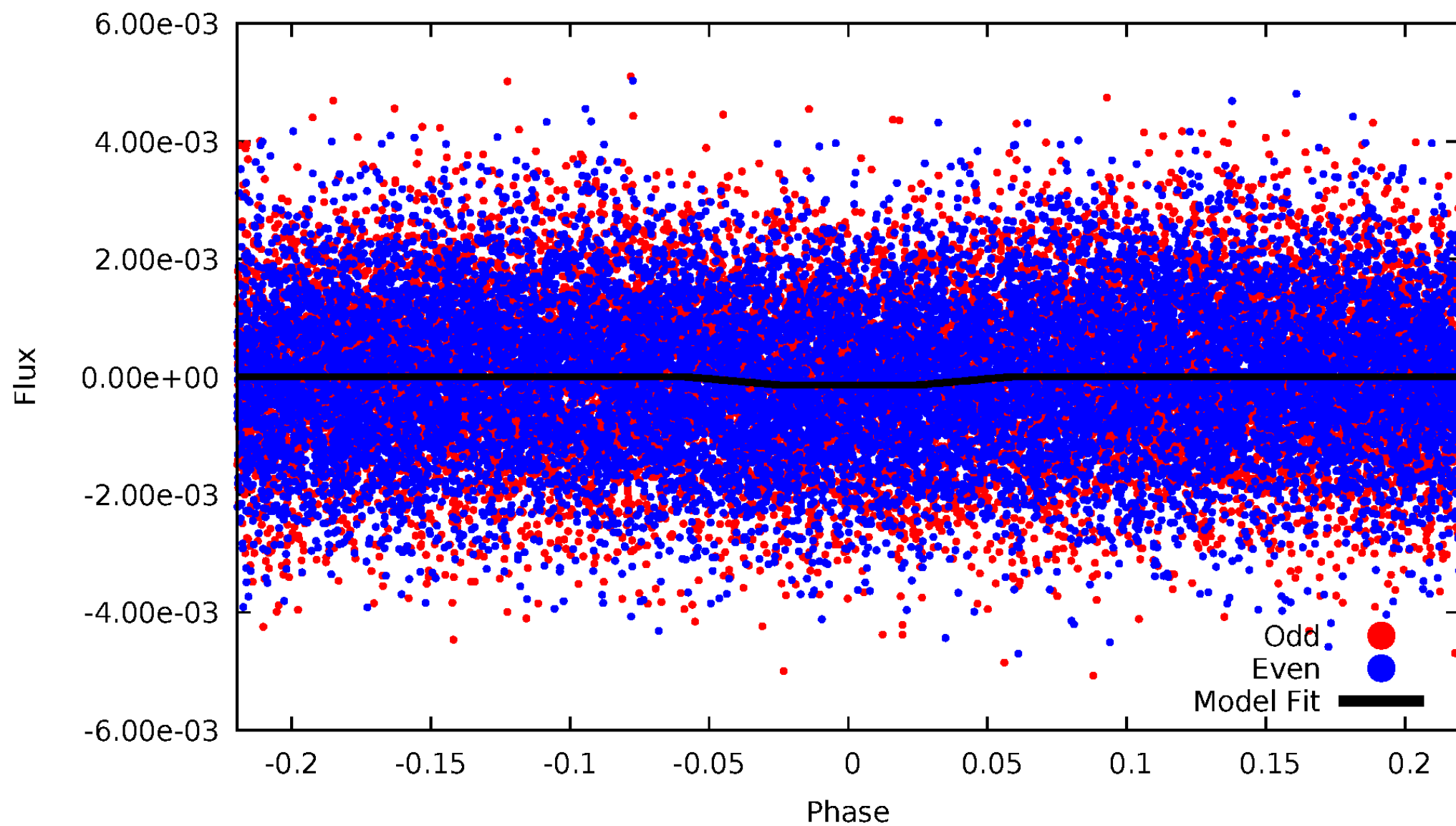
# DV Odd/Even

TCE 005299904-01



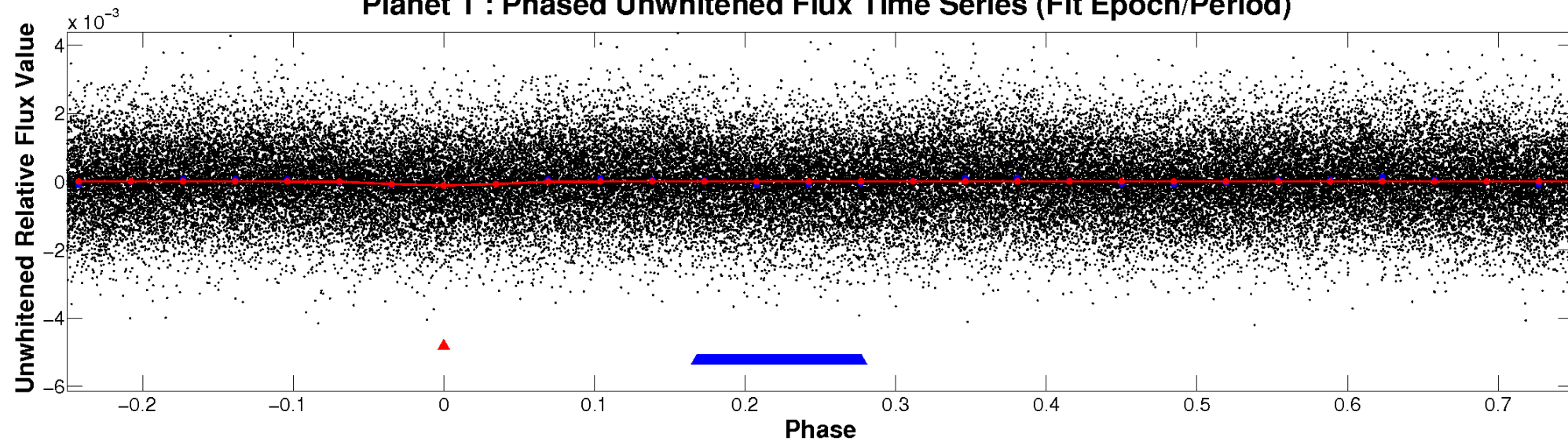
# ALT Odd/Even

TCE 005299904-01

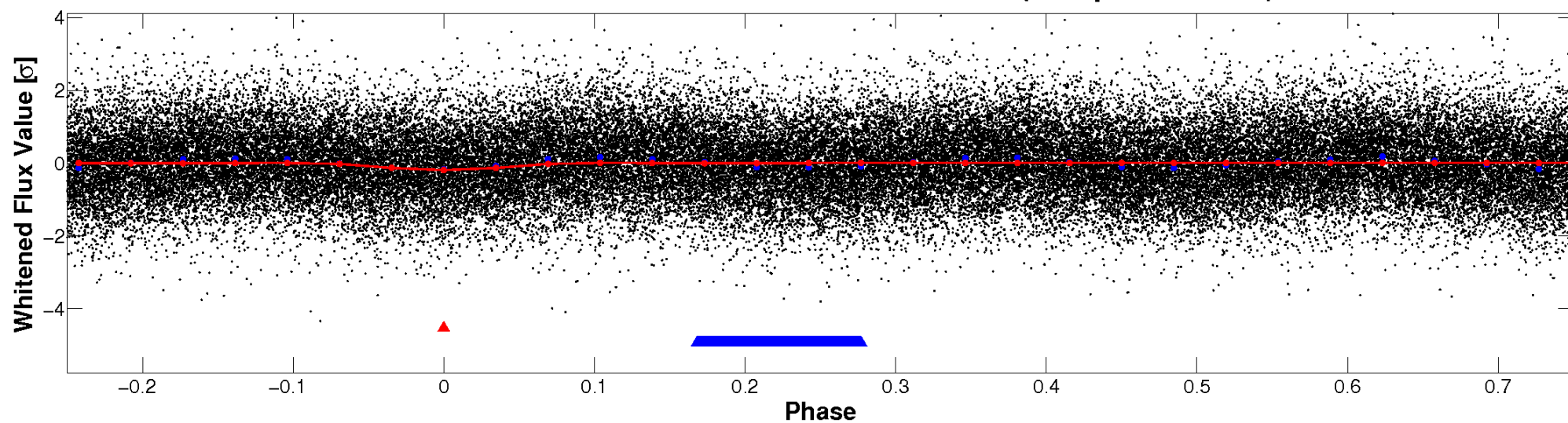


# Non-Whitened Vs. Whitened Light Curve

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



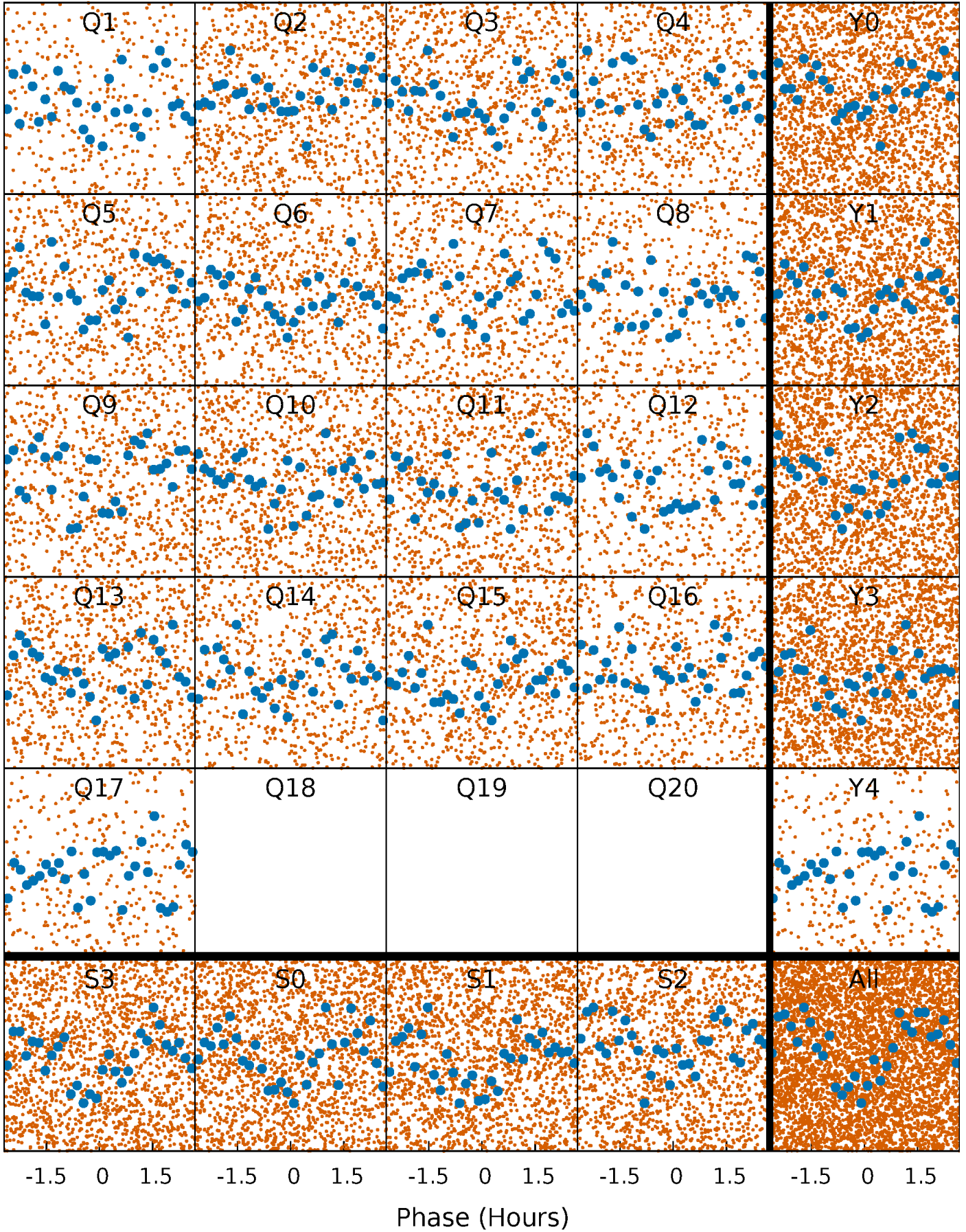
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

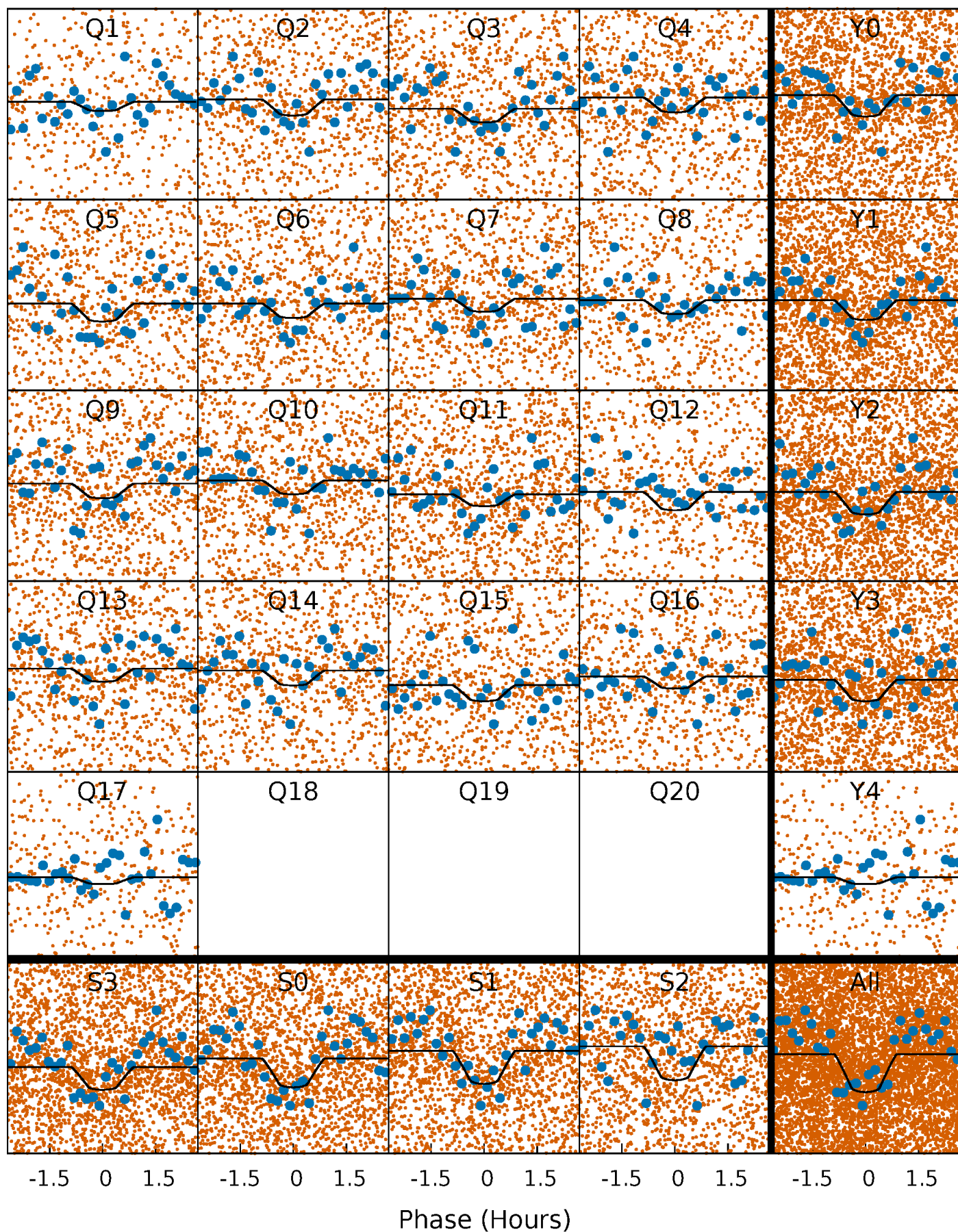
TCE 005299904-01 P= 0.590189 Days  $T_0=132.079085$  (BKJD)





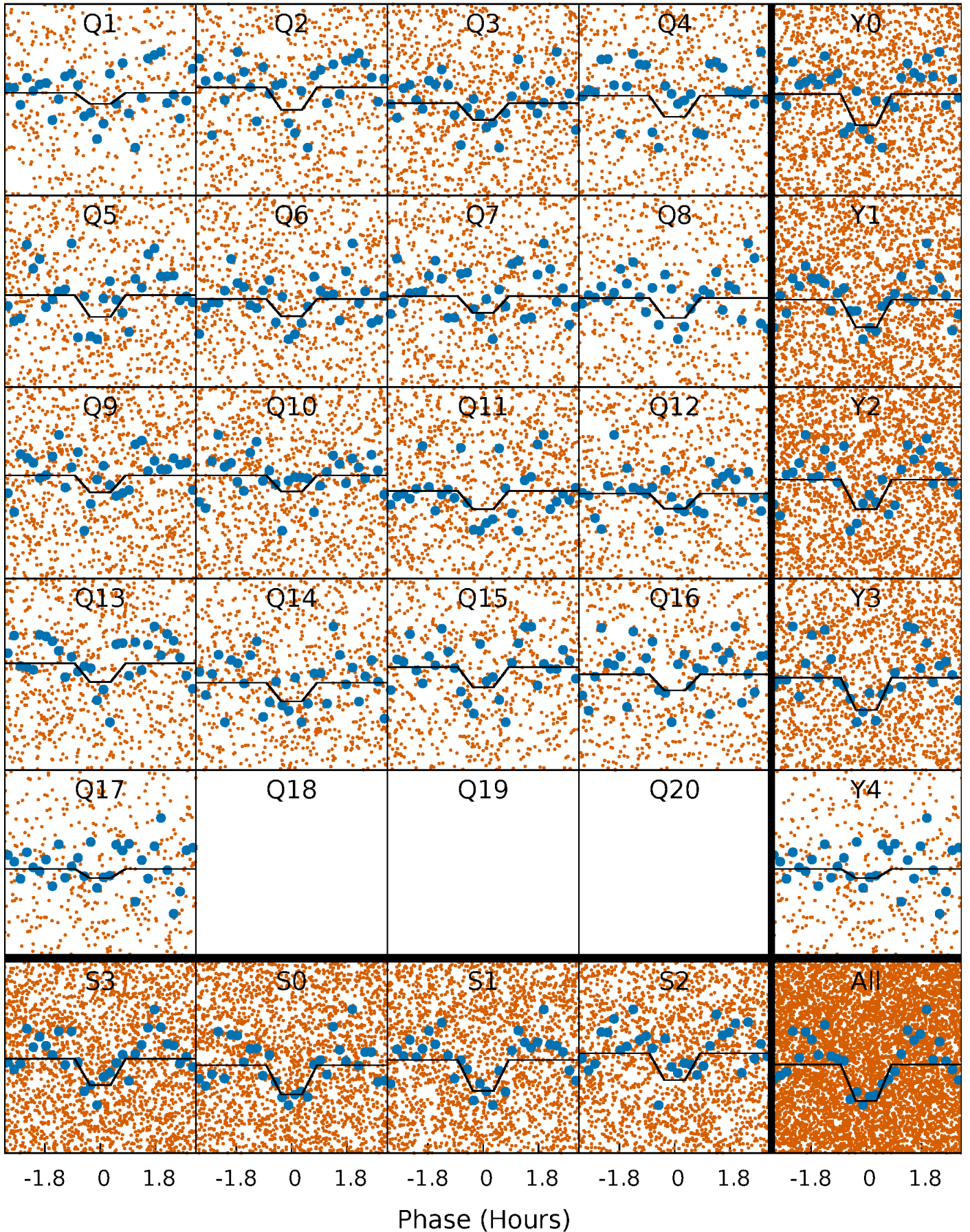
# DV Quarter-Phased Transit Curves

TCE 005299904-01 P= 0.590189 Days  $T_0=132.079085$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005299904-01 P= 0.590181 Days  $T_0=132.078338$  (BKJD)

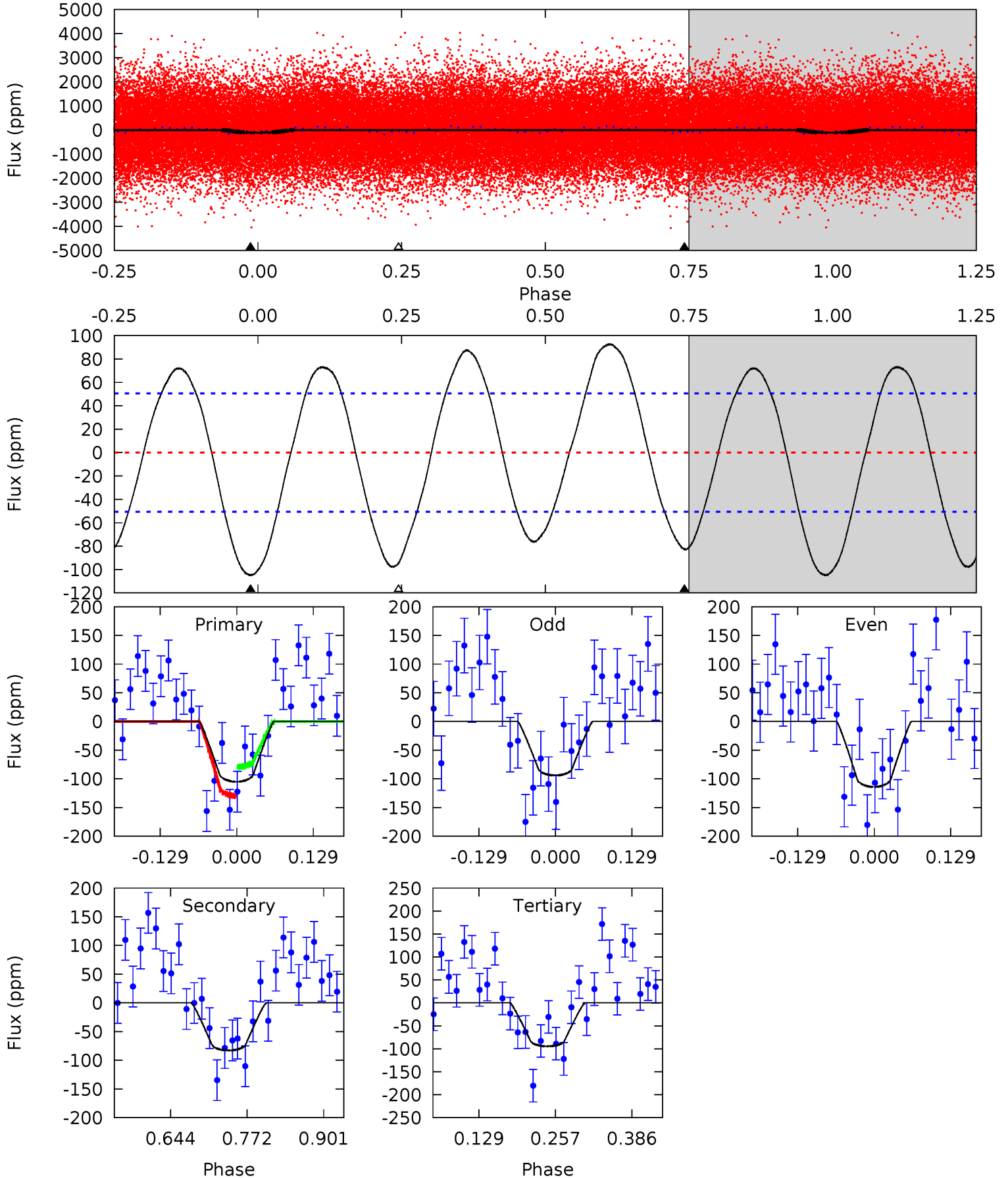




# DV Model-Shift Uniqueness Test

005299904-01, P = 0.590189 Days, E = 131.488896 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
9.37	7.39	8.44	0	4.51	1.52	5.42	0.93	9.37	-1.05	7.39	0.91	1.01	0.47	2.28

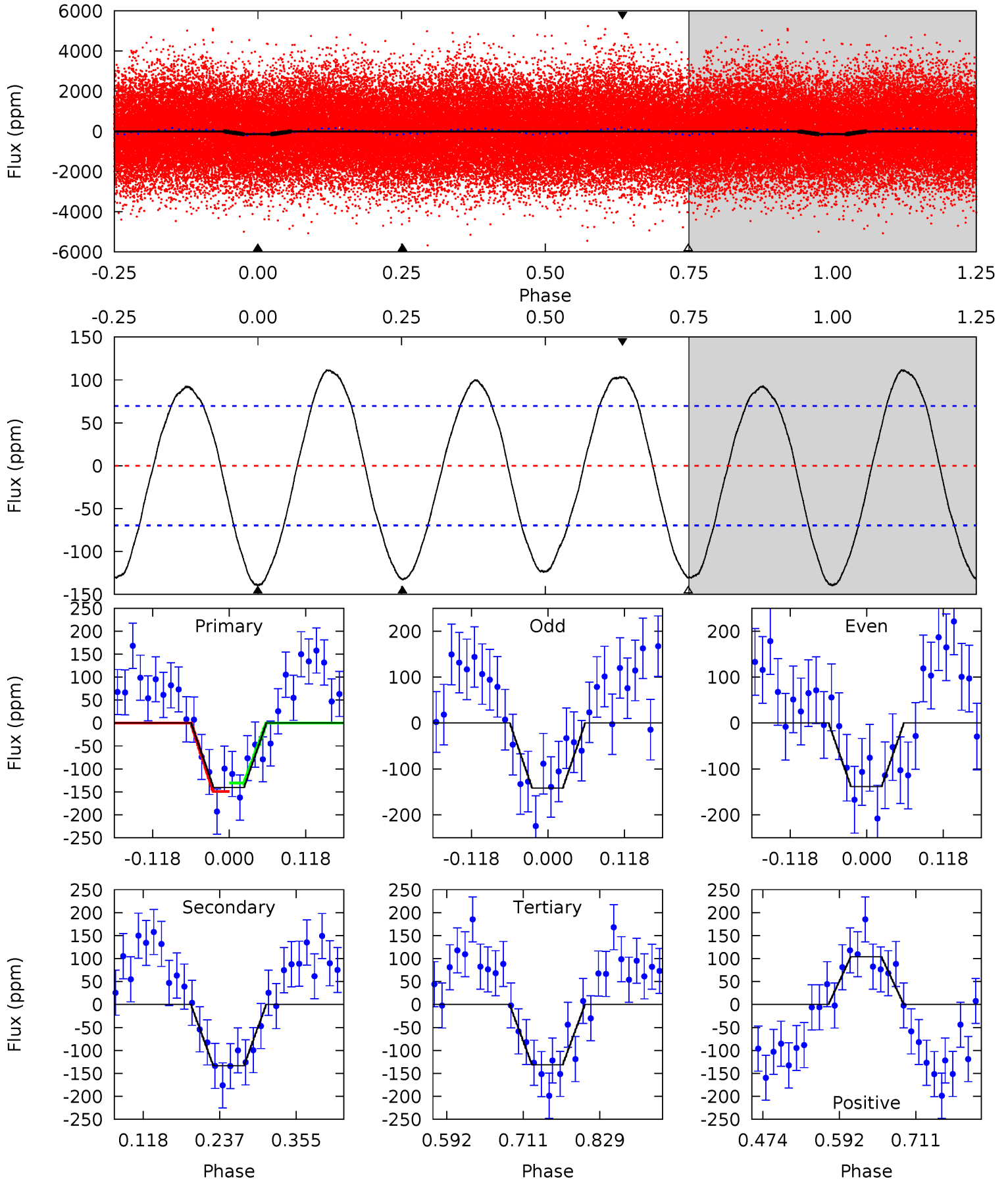




# Alt Model-Shift Uniqueness Test

005299904-01, P = 0.590181 Days, E = 131.488157 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
9.11	8.67	8.54	6.75	4.53	1.56	5.36	0.57	2.37	0.13	1.92	0.11	0.99	0.44	0.61



### Stellar Parameters For KIC 005299904

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6829^{+214}_{-286}$	$3.920^{+0.353}_{-0.141}$	$-0.140^{+0.250}_{-0.300}$	$2.246^{+0.570}_{-0.856}$	$1.527^{+0.200}_{-0.372}$	$0.190^{+0.477}_{-0.077}$
	+3%/-4%	+9%/-4%	+179%/-214%	+25%/-38%	+13%/-24%	+251%/-41%
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 005299904-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-83 \pm 11$	$2.74^{+1.82}_{-1.52}$	$4868^{+420}_{-480}$	$5524^{+3345}_{-1466}$	$1.527^{+6.109}_{-0.999}$
Alt.	$-133 \pm 15$	$2.94^{+1.87}_{-1.59}$	$4911^{+384}_{-529}$	$6143^{+3666}_{-1465}$	$2.081^{+7.180}_{-1.281}$

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

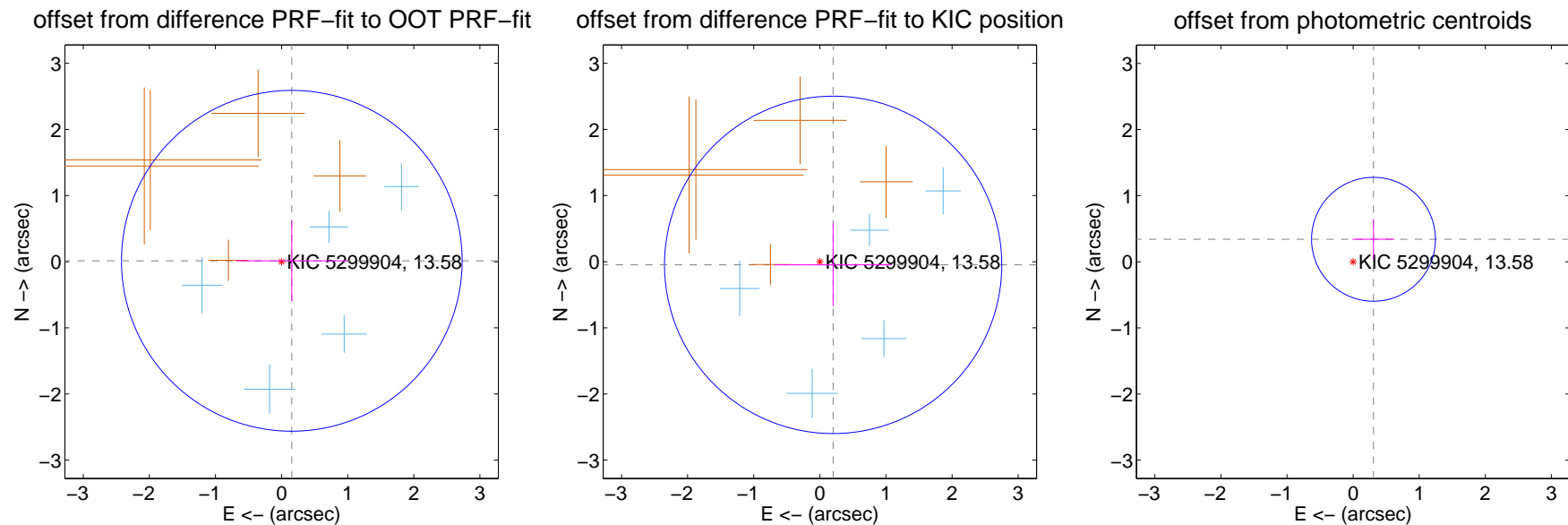
## DV Centroid Data

Supplemental centroid analysis for 005299904-01. Kepler magnitude: 13.58. Transit SNR 12.45

There are 5 quarters with good PRF difference image offsets

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

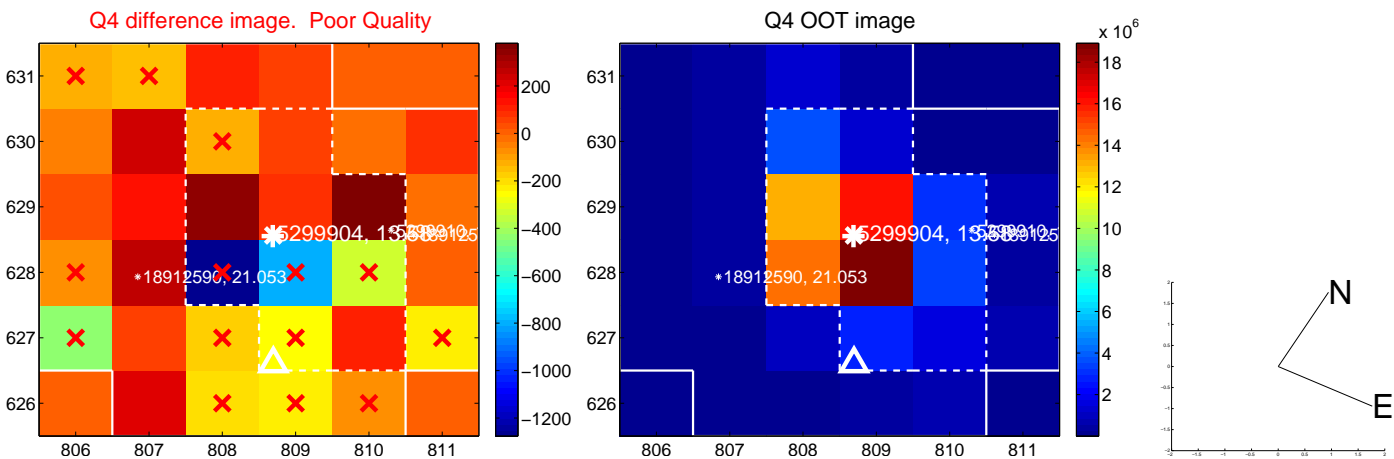
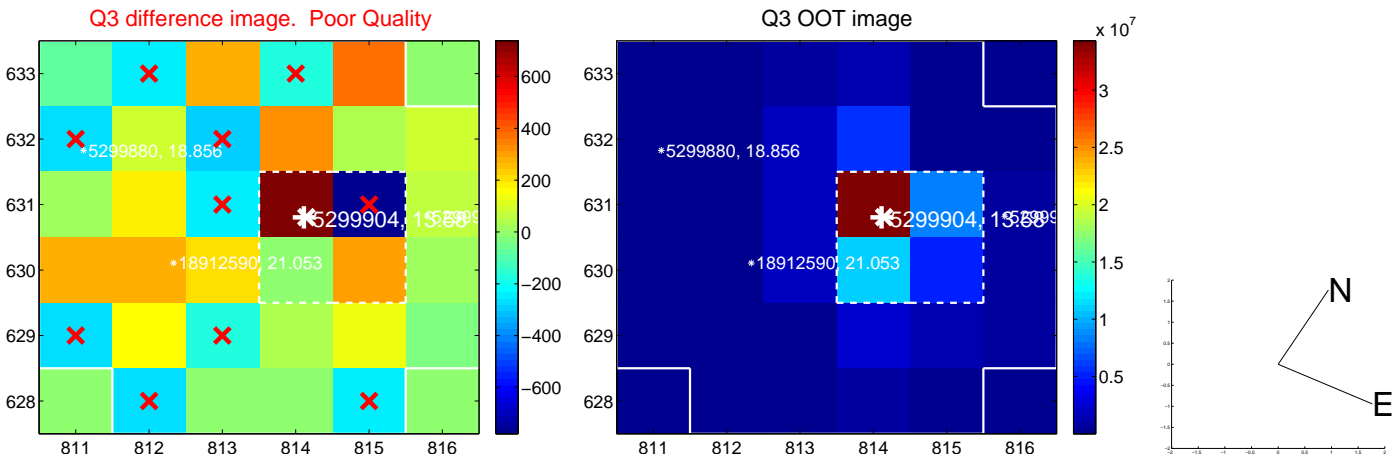
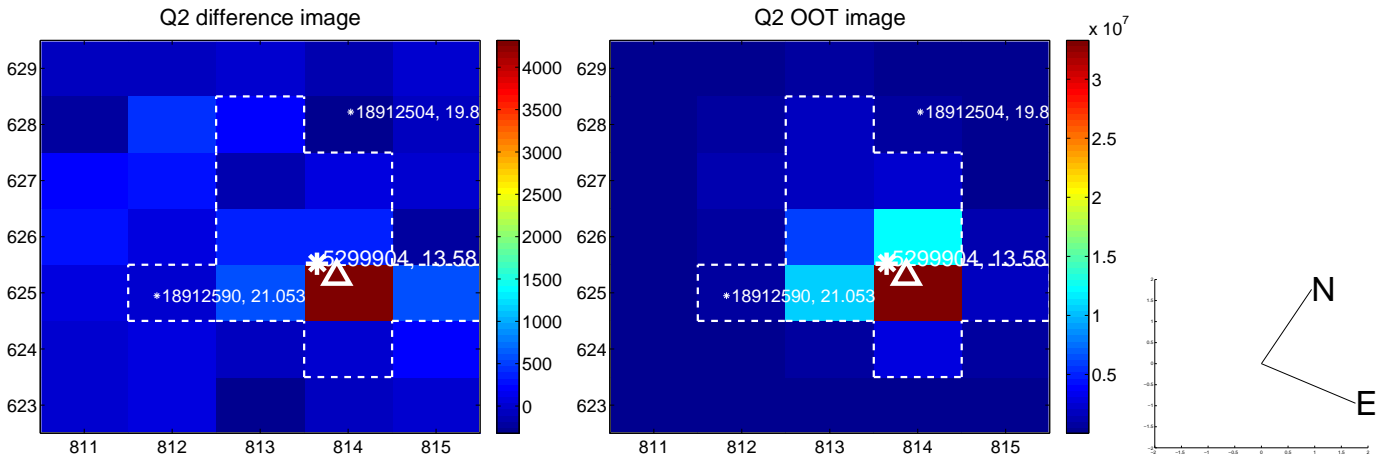
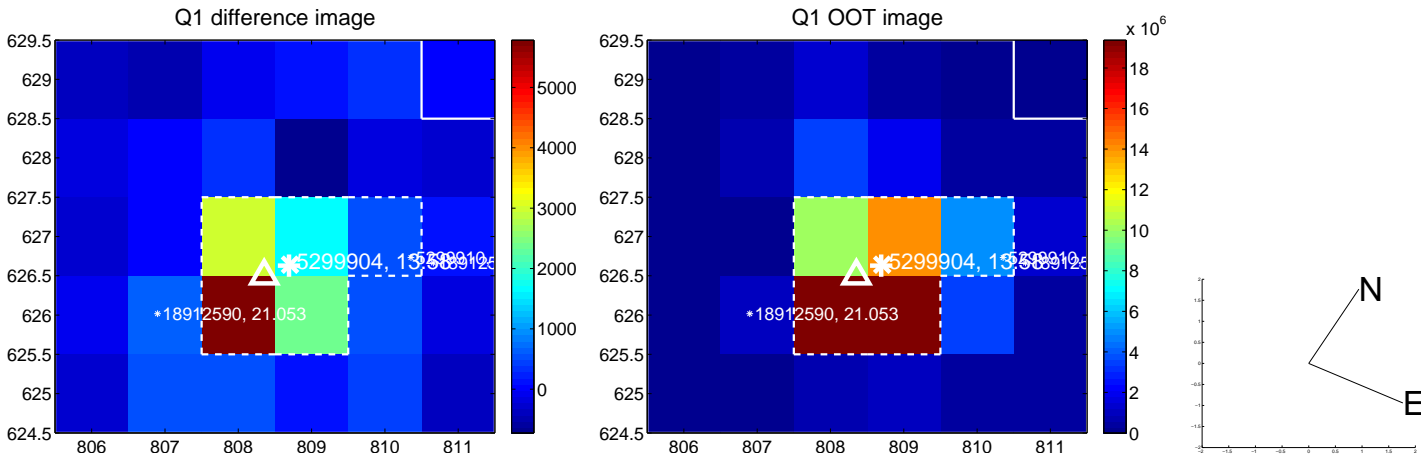
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.155 \pm 0.859$	0.18	$-0.155 \pm 0.842$	$0.013 \pm 0.611$
PRF-fit source offset from KIC position	$0.207 \pm 0.850$	0.24	$-0.201 \pm 0.886$	$-0.048 \pm 0.627$
photometric centroid source offset	$0.46 \pm 0.31$	1.47	$-0.31 \pm 0.32$	$0.34 \pm 0.31$



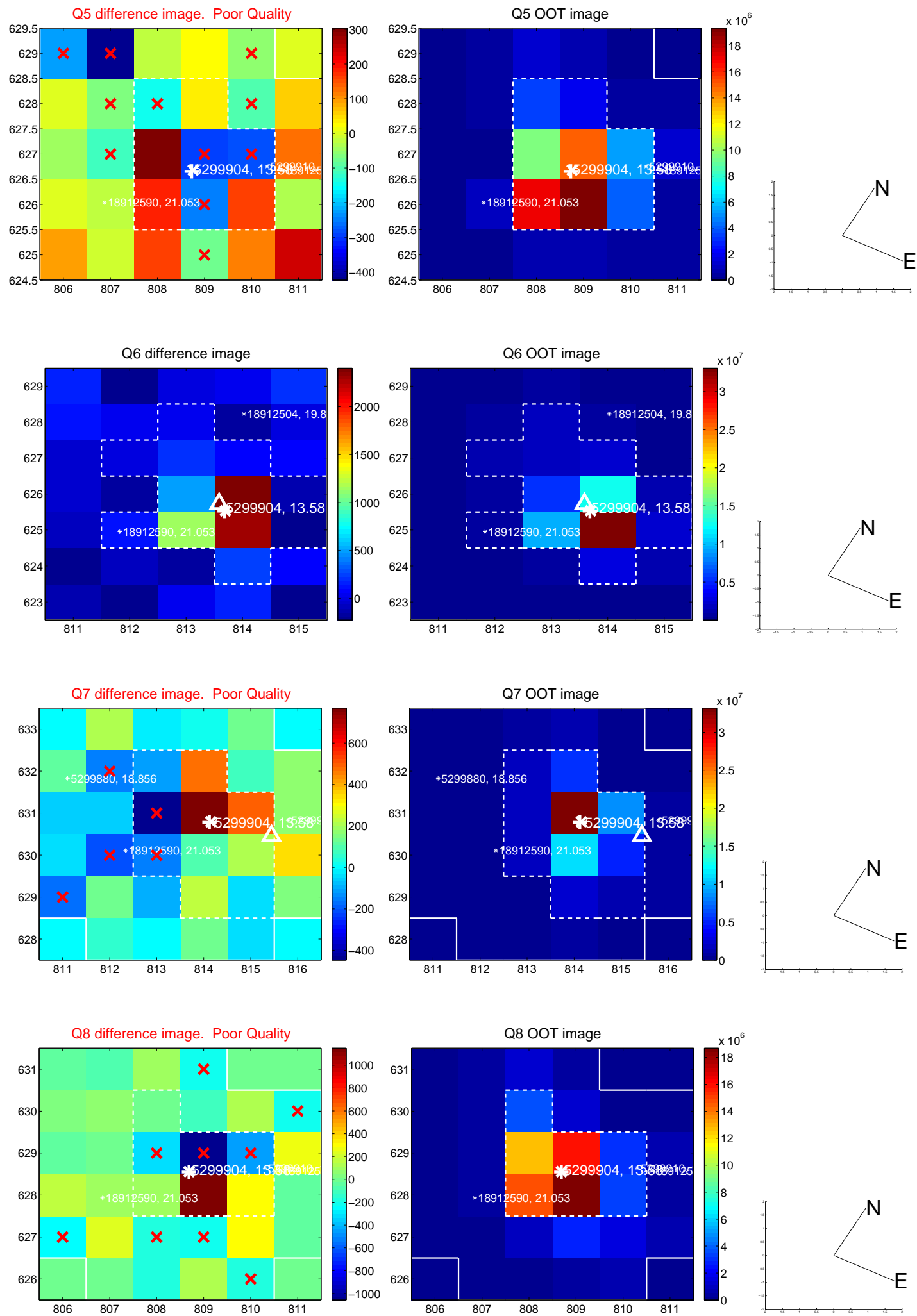
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



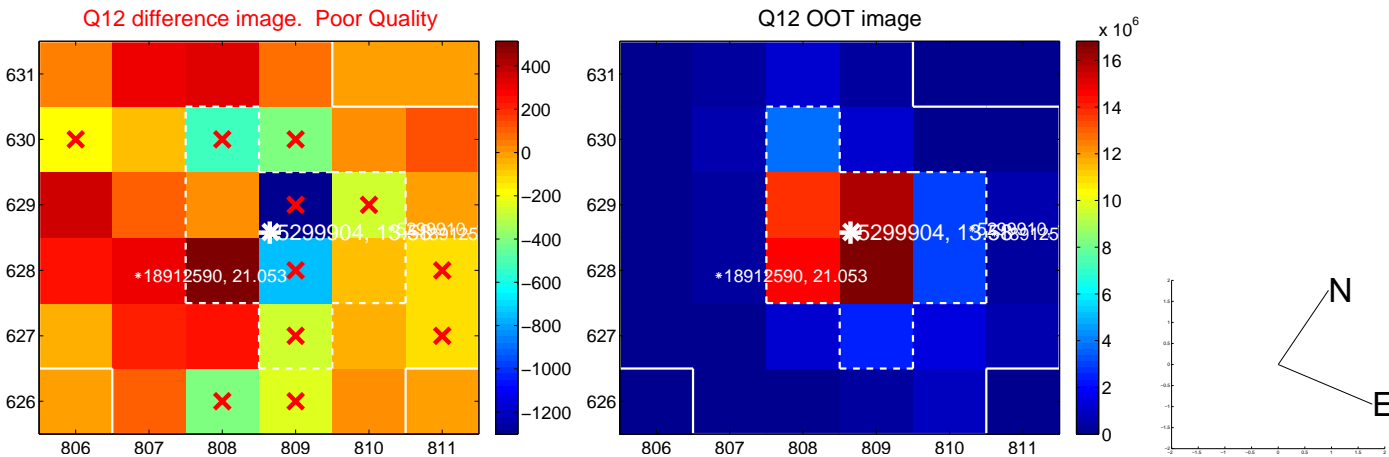
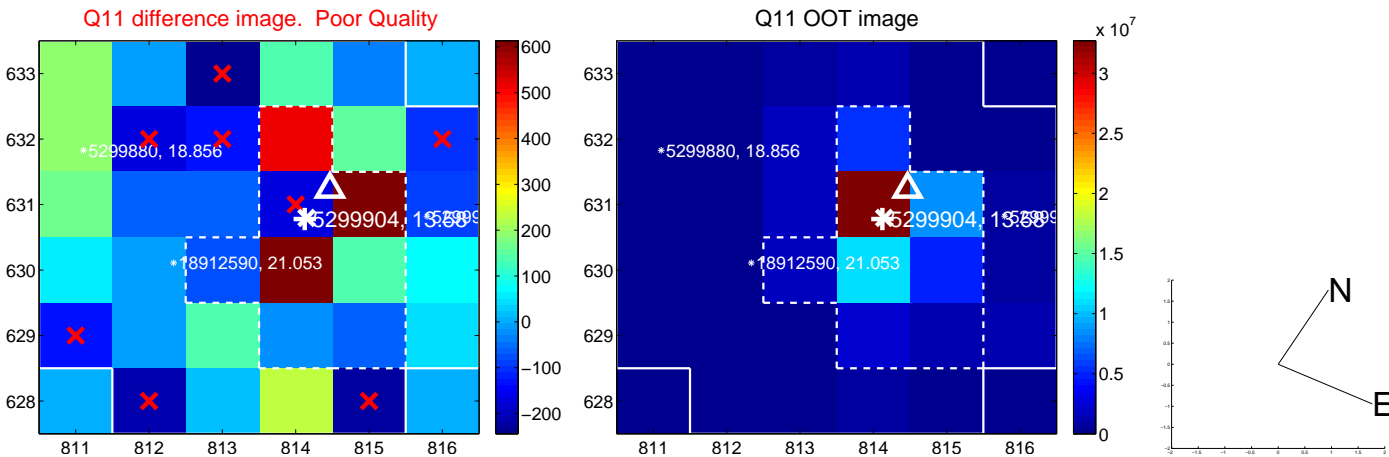
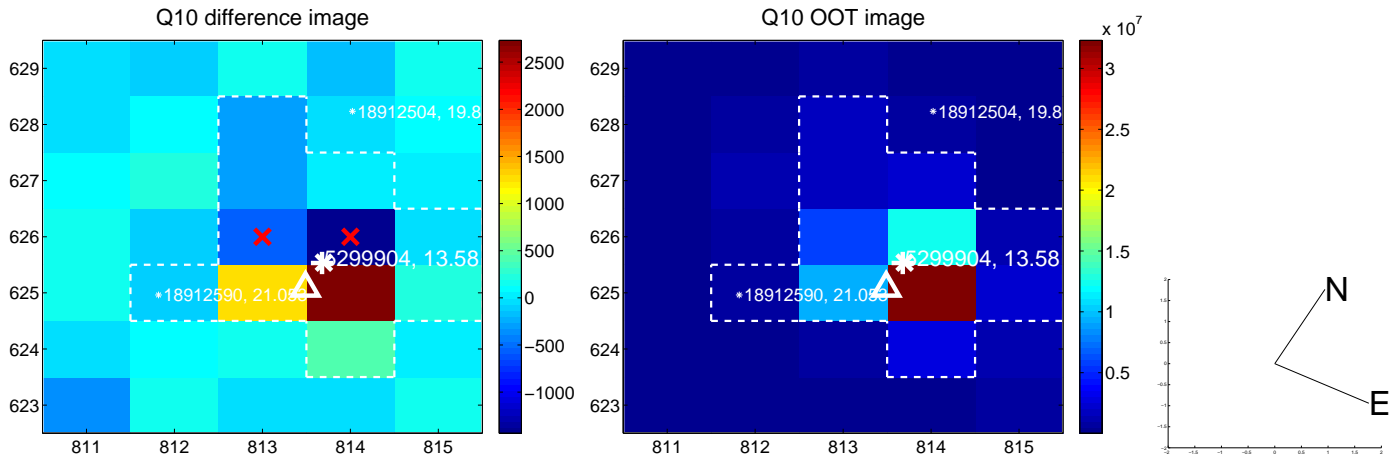
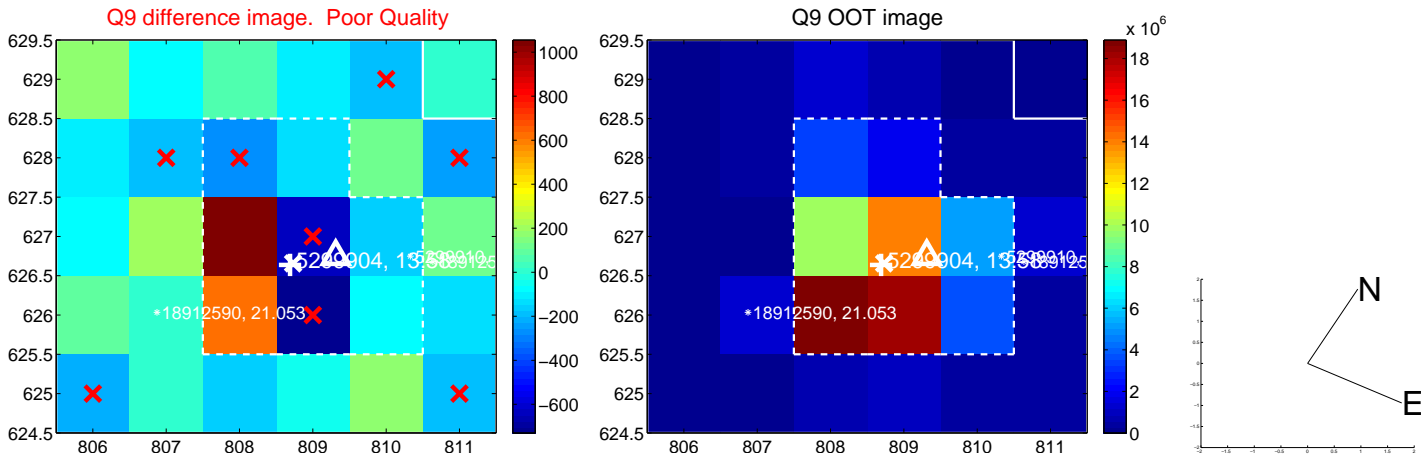
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

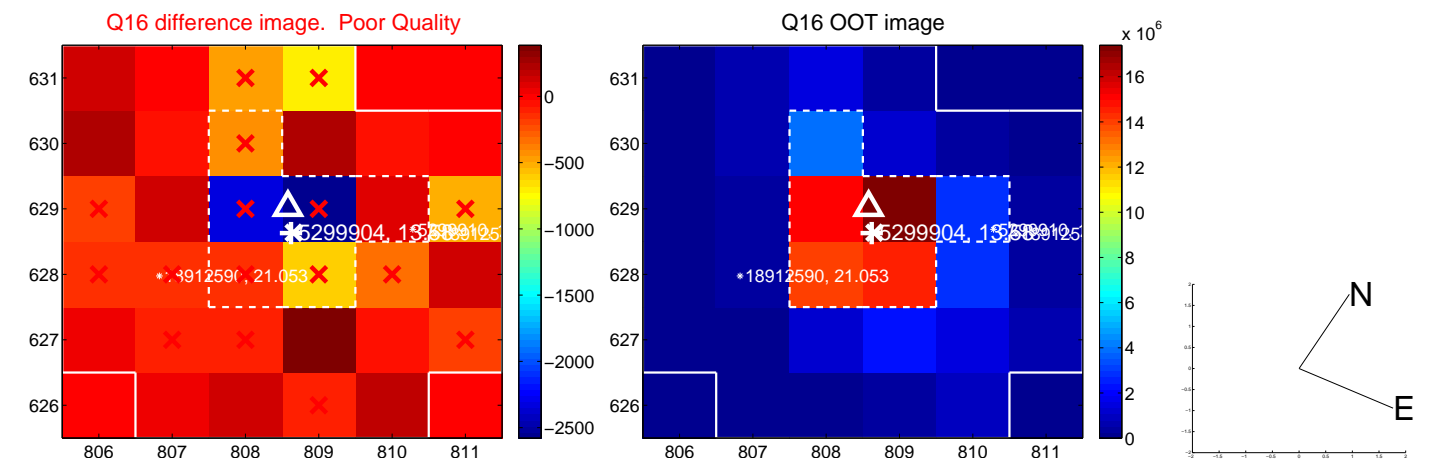
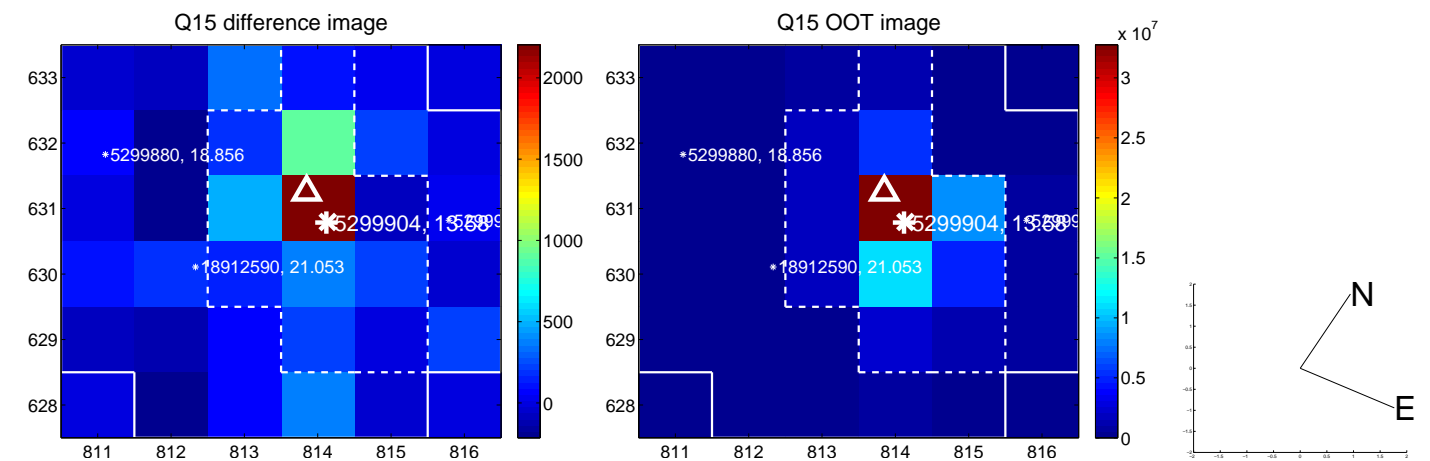
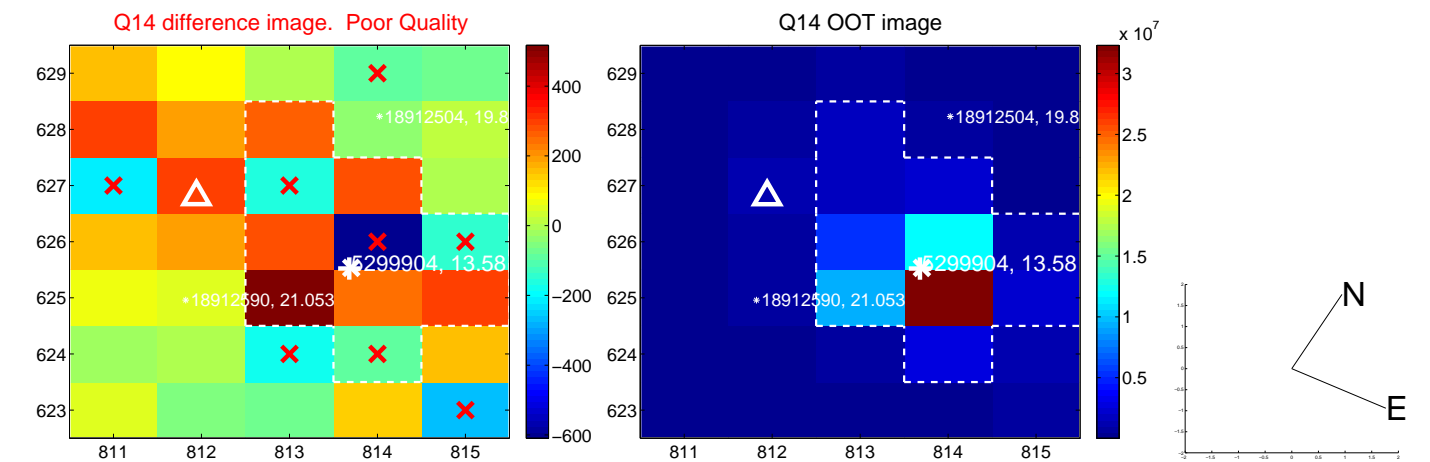
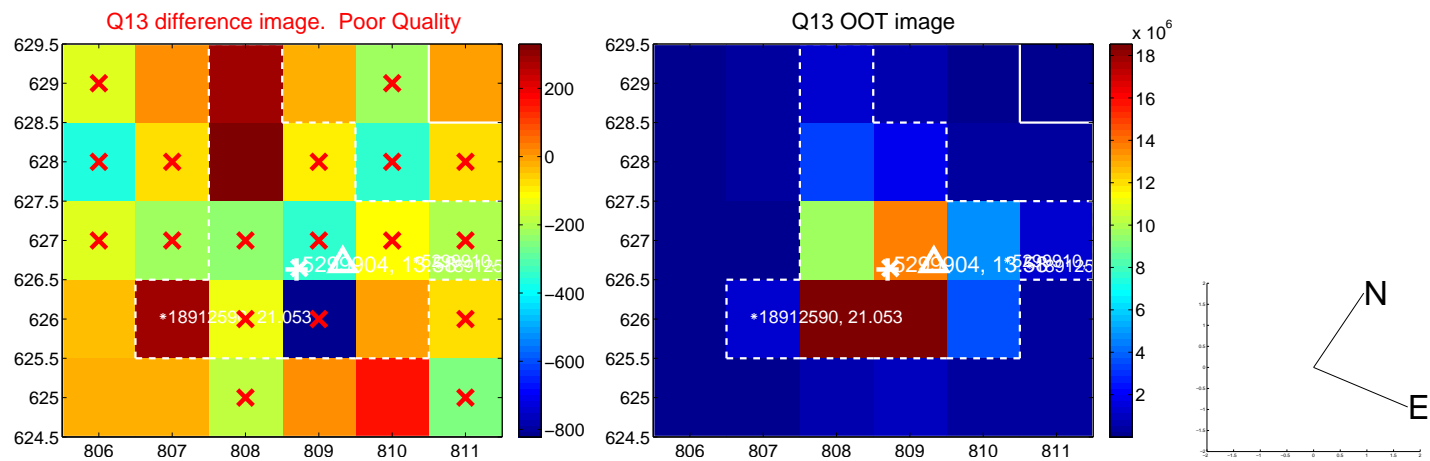


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

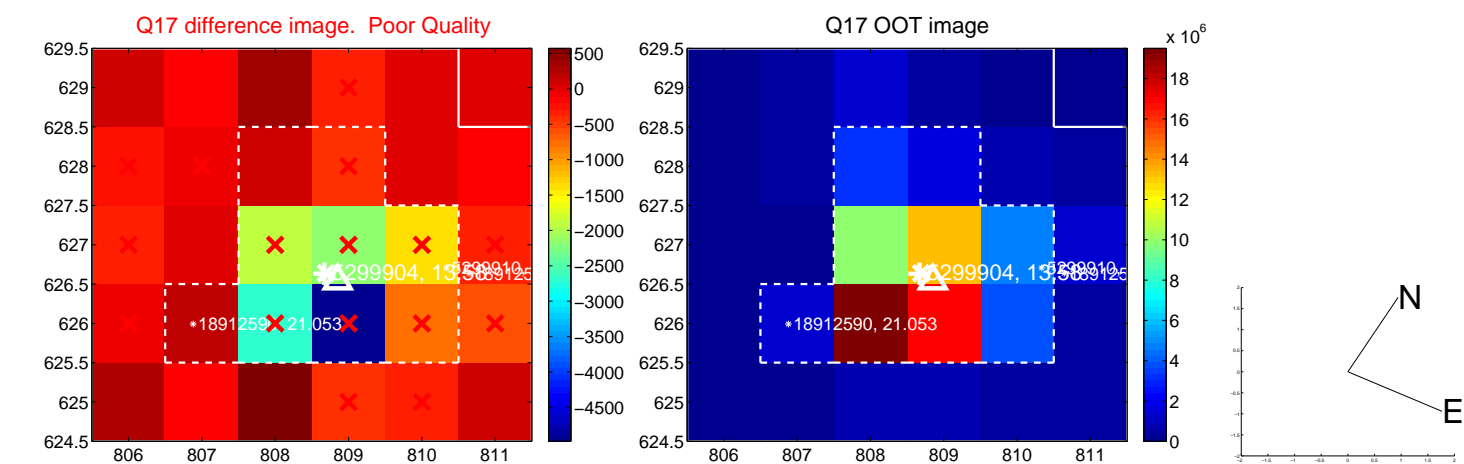




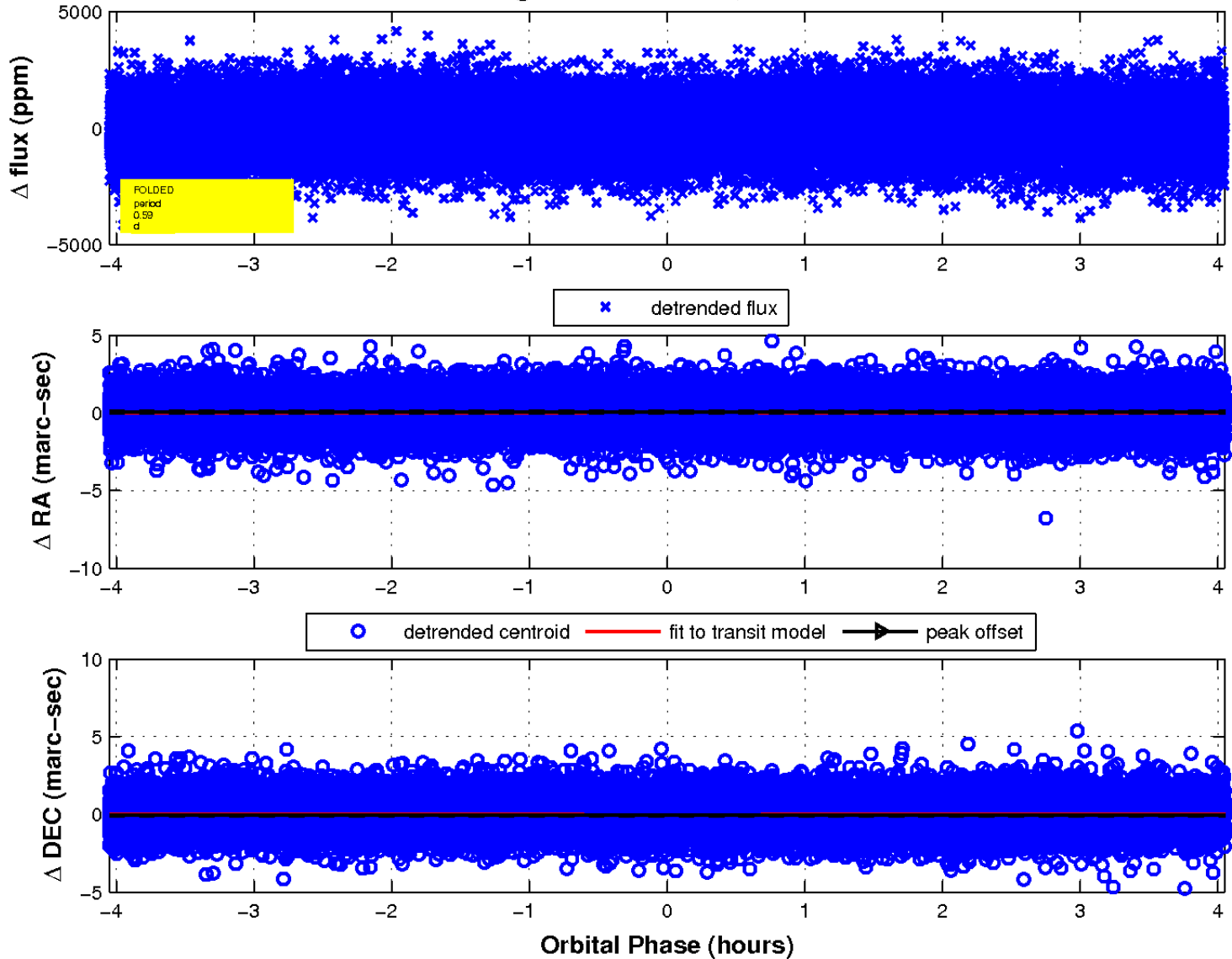
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

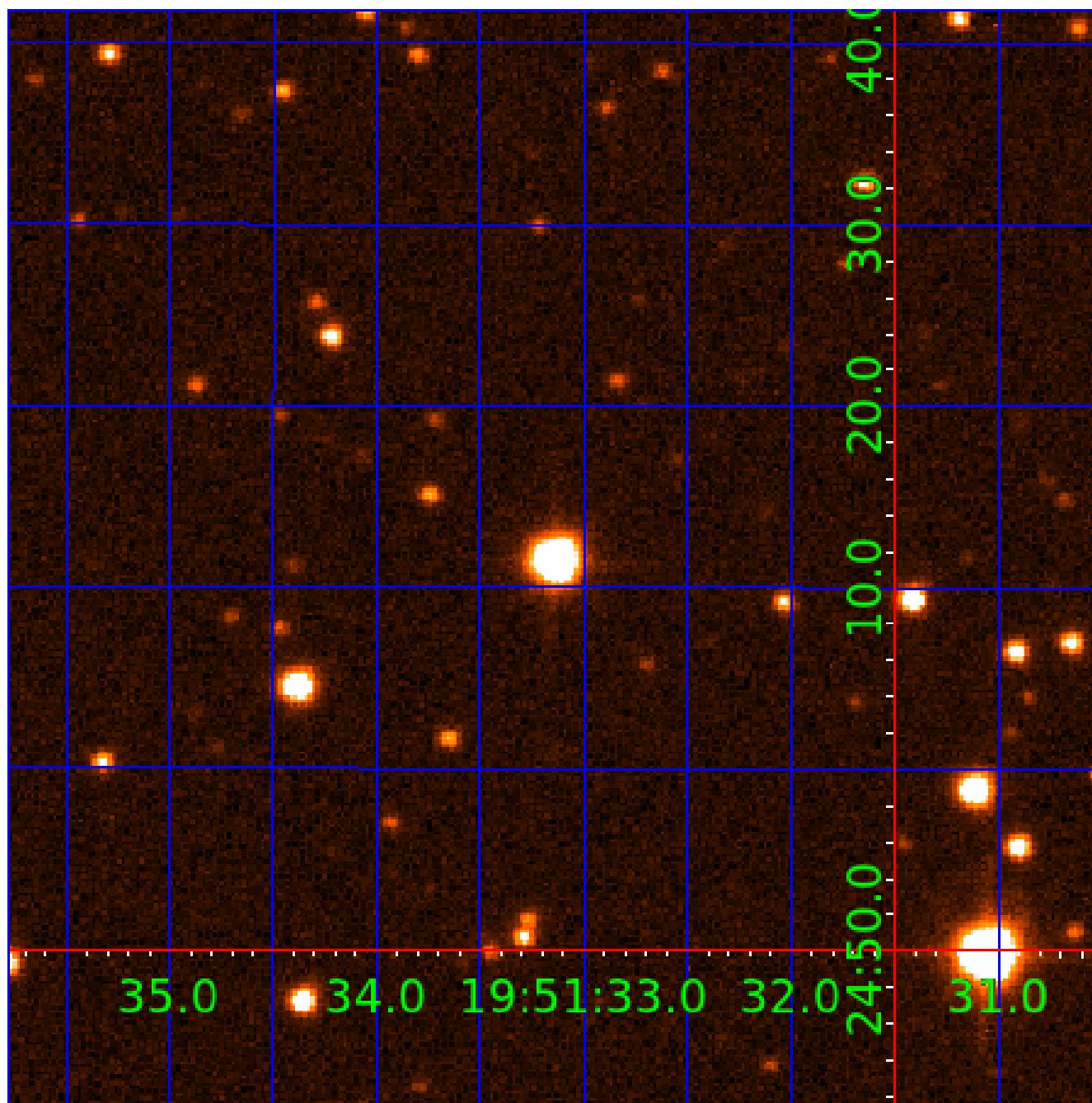


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005299904

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005299904-01	OBS	No	0.590189	132.079085	112.4	1.350	9.9	12.5	2.25	6829	2.78	39018.88
005299904-02	OBS	No	0.590163	131.652444	100.4	0.734	8.5	6.2	2.25	6829	2.65	39021.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005299904-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005299904-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

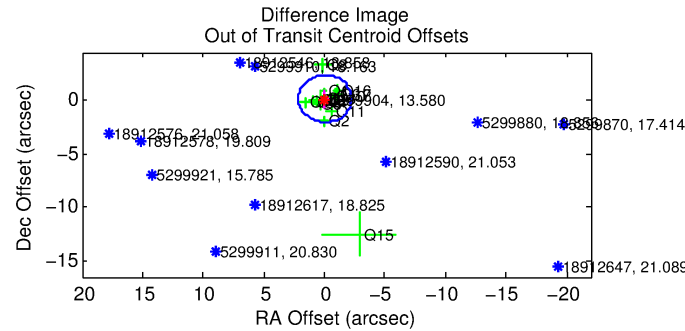
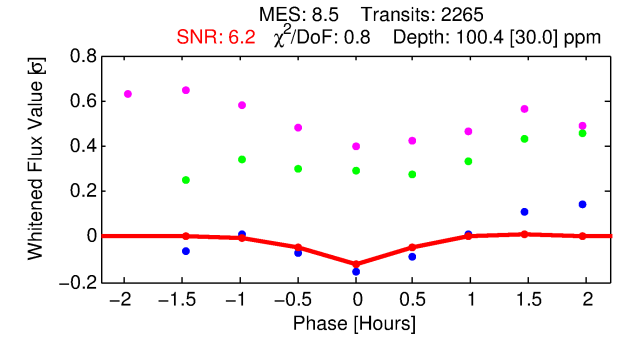
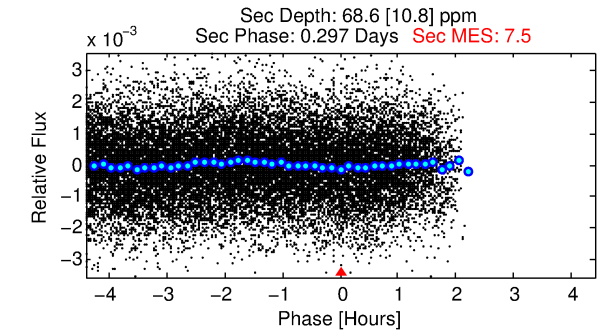
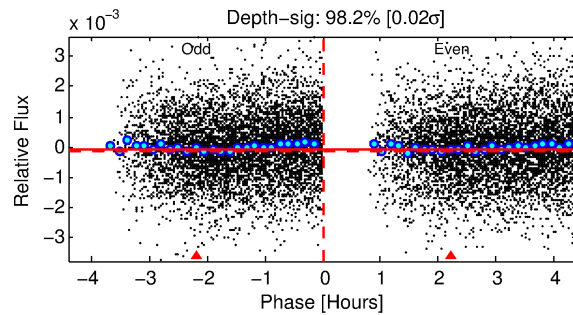
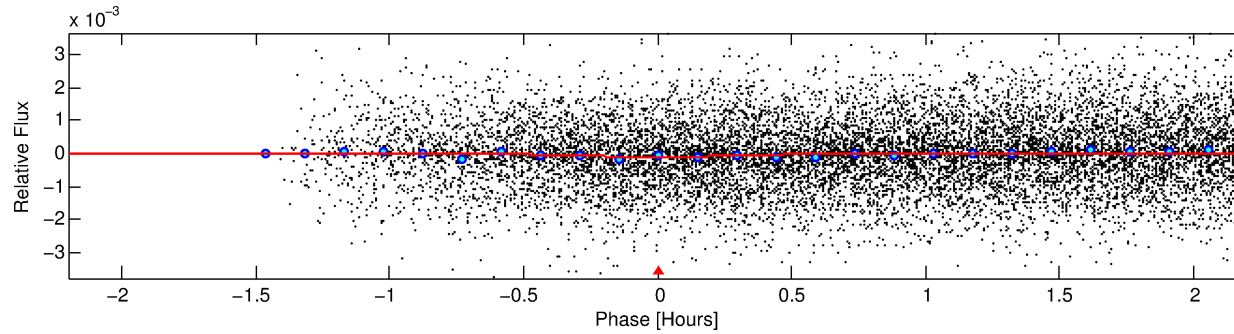
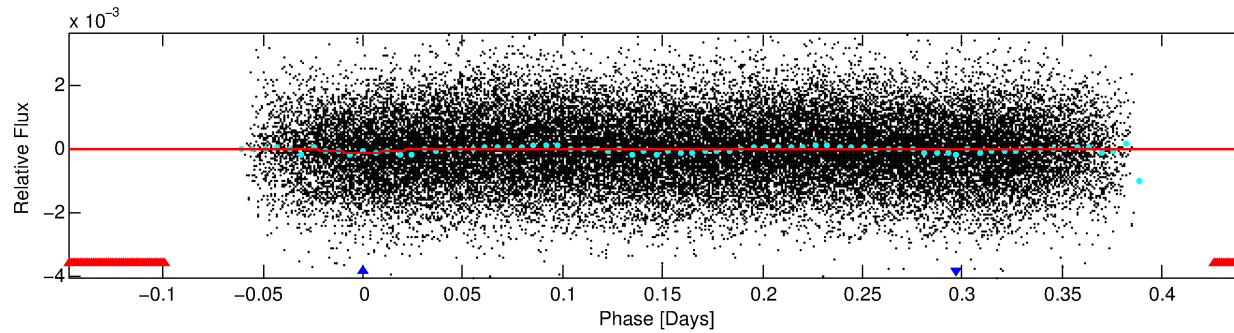
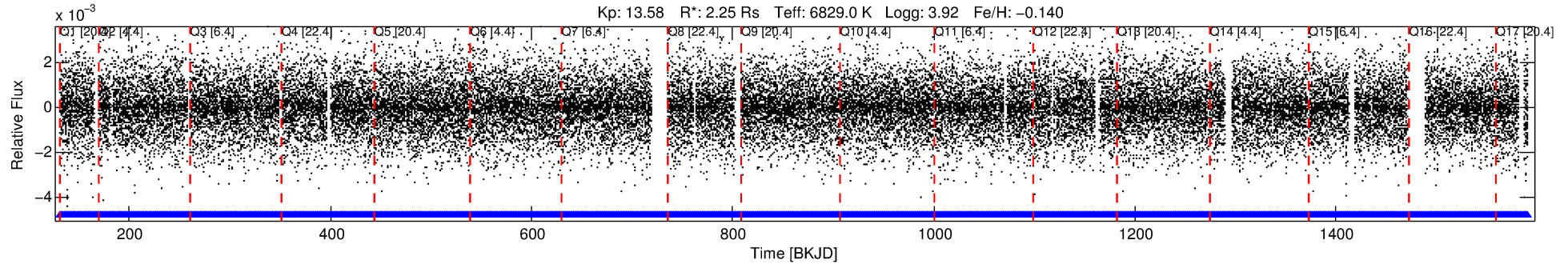
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005299904-02

No Significant Match Found

# DV One-Page Summary

KIC: 5299904 Candidate: 2 of 2 Period: 0.590 d



## DV Fit Results:

Period = 0.59016 [0.00002] d  
Epoch = 131.6524 [0.0028] BKJD  
Rp/R\* = 0.0108 [0.0056]  
a/R\* = 3.05 [8.15]  
b = 0.89 [0.69]  
Seff = 39021.17 [24251.24]  
Teff = 3584 [557] K  
Rp = 2.65 [1.71] Re  
a = 0.0159 [0.0059] AU  
Ag = 1.36 [1.65] [0.22 $\sigma$ ]  
Teffp = 5981 [1596] K [1.42 $\sigma$ ]

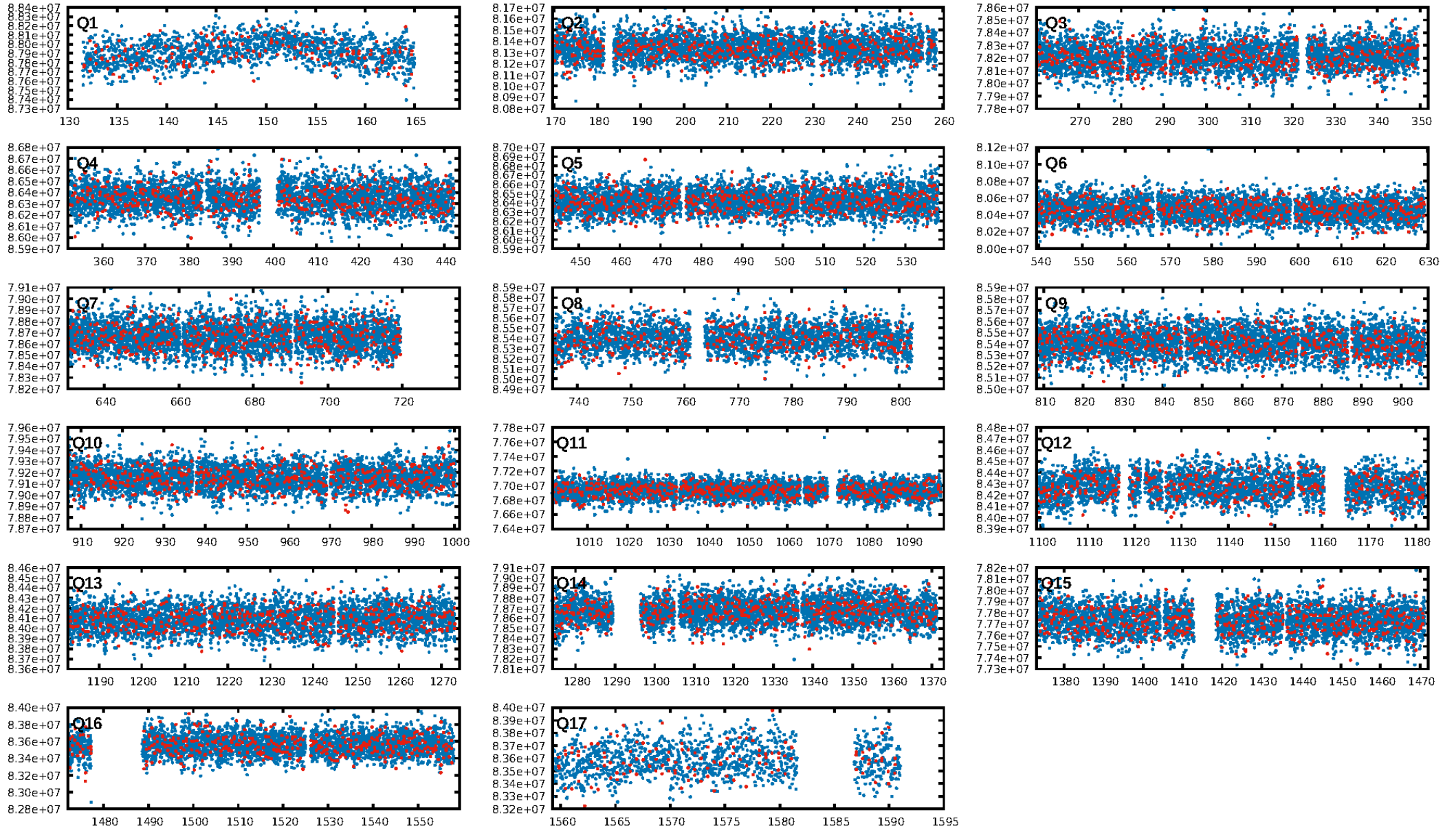
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.09e-23  
RollingBand-fgt: 1.00 [2163/2163]  
GhostDiagnostic-chr: 2.399  
Centroid-sig: 1.4%  
Centroid-so: 0.702 arcsec [1.42 $\sigma$ ]  
OotOffset-rm: 0.176 arcsec [0.24 $\sigma$ ]  
KicOffset-rm: 0.131 arcsec [0.31 $\sigma$ ]  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.50 [8/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 00:58:32 Z

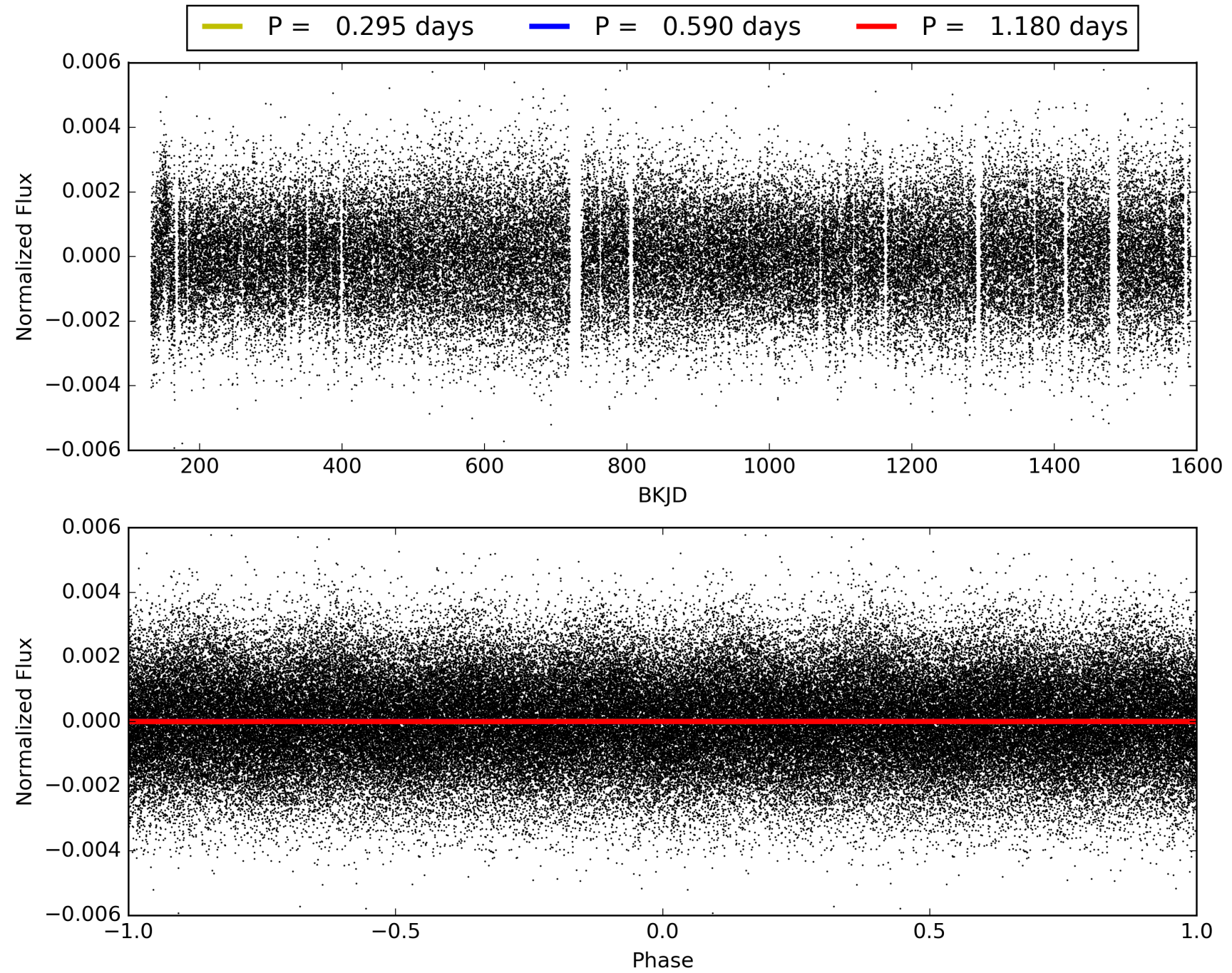
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005299904-02, PDC Light Curves



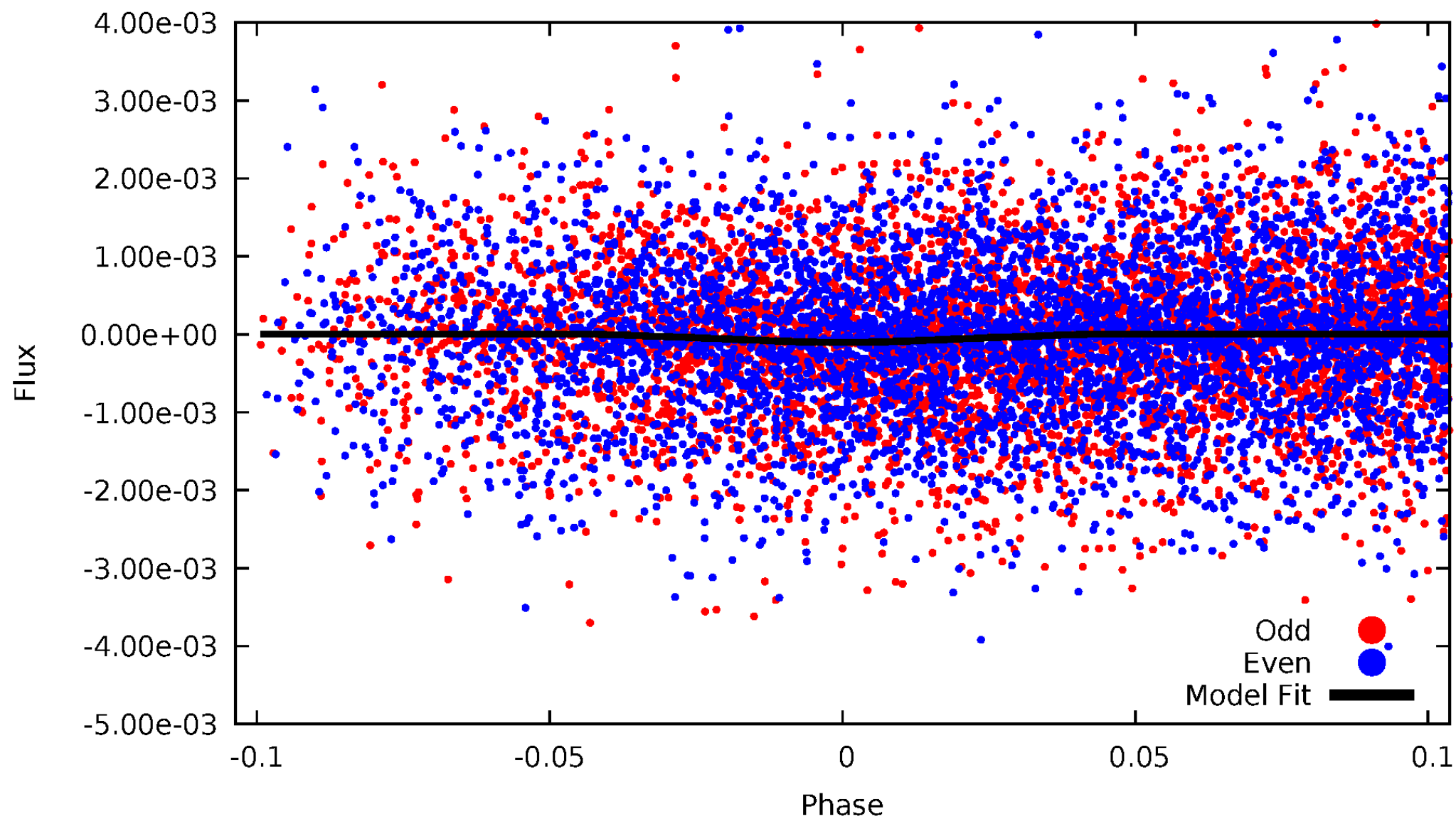


TCE 005299904-02



DV Odd/Even

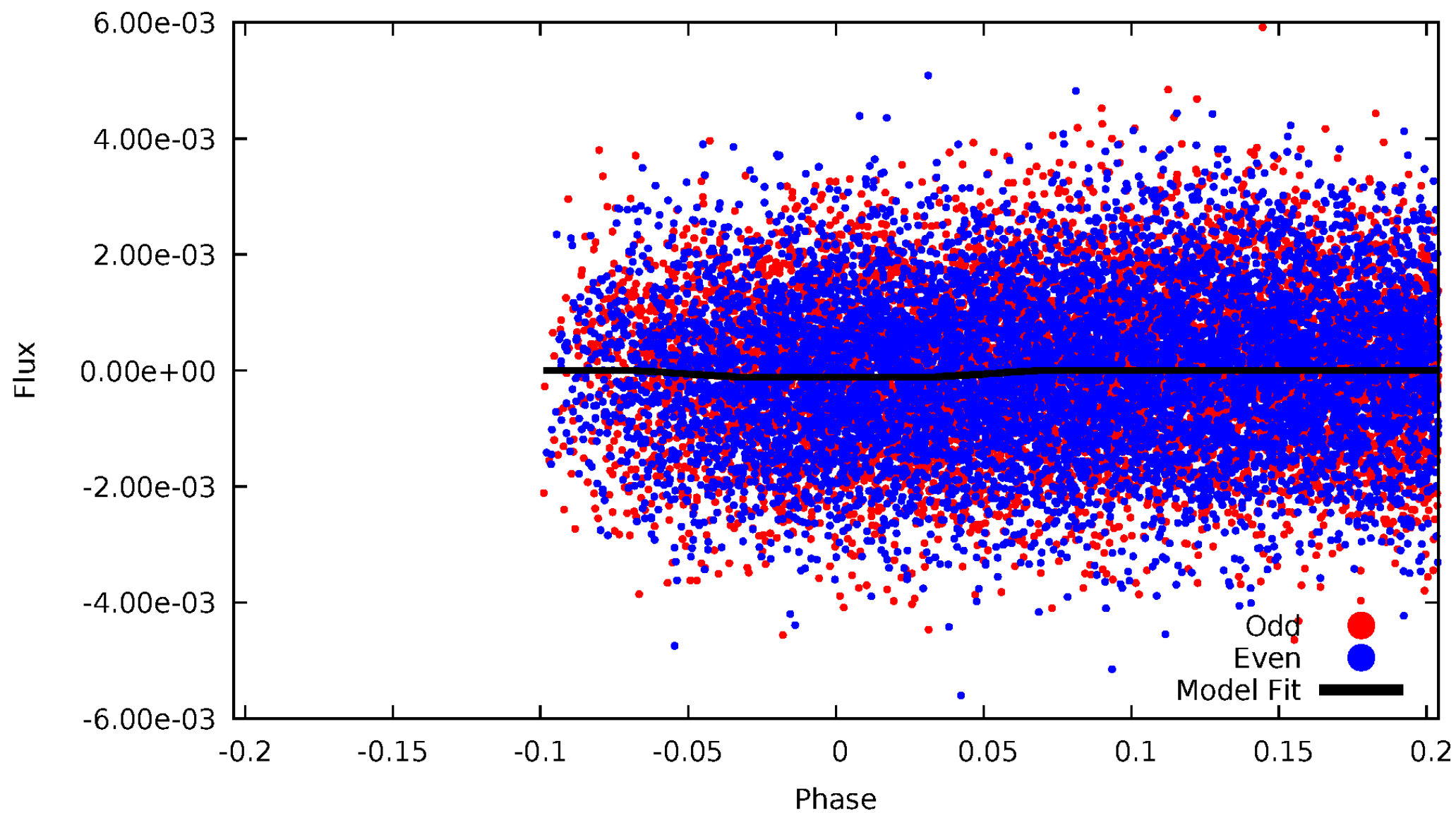
TCE 005299904-02





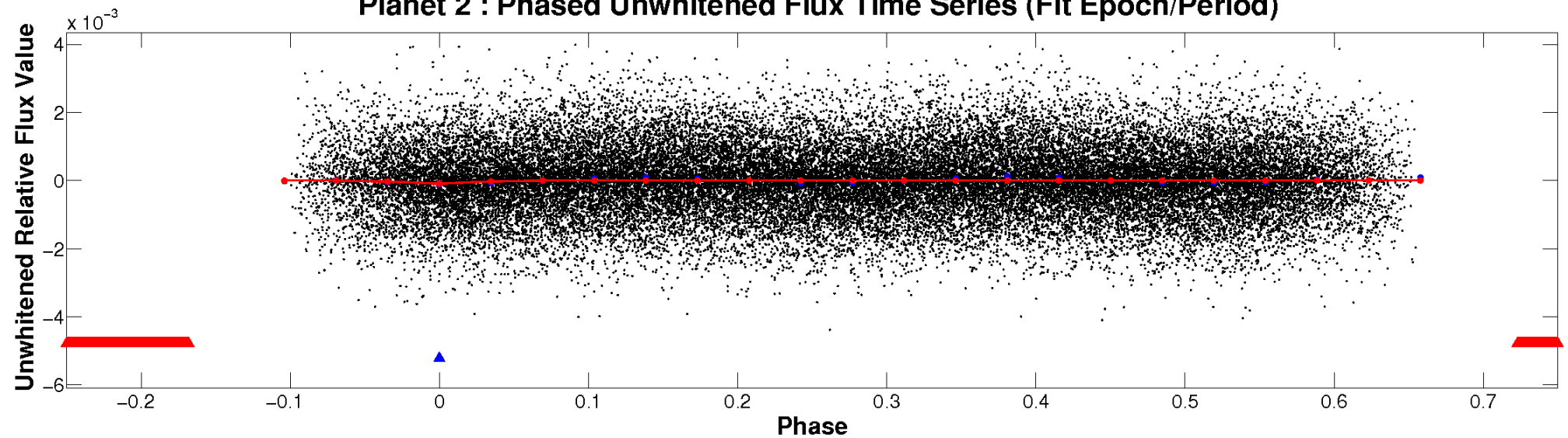
# ALT Odd/Even

TCE 005299904-02

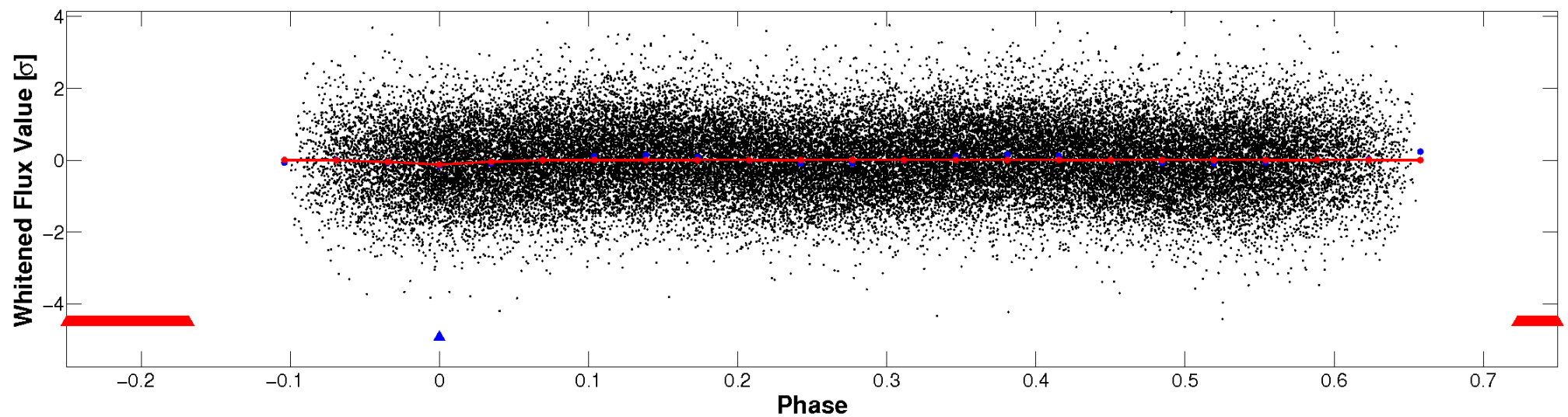


# Non-Whitened Vs. Whitened Light Curve

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

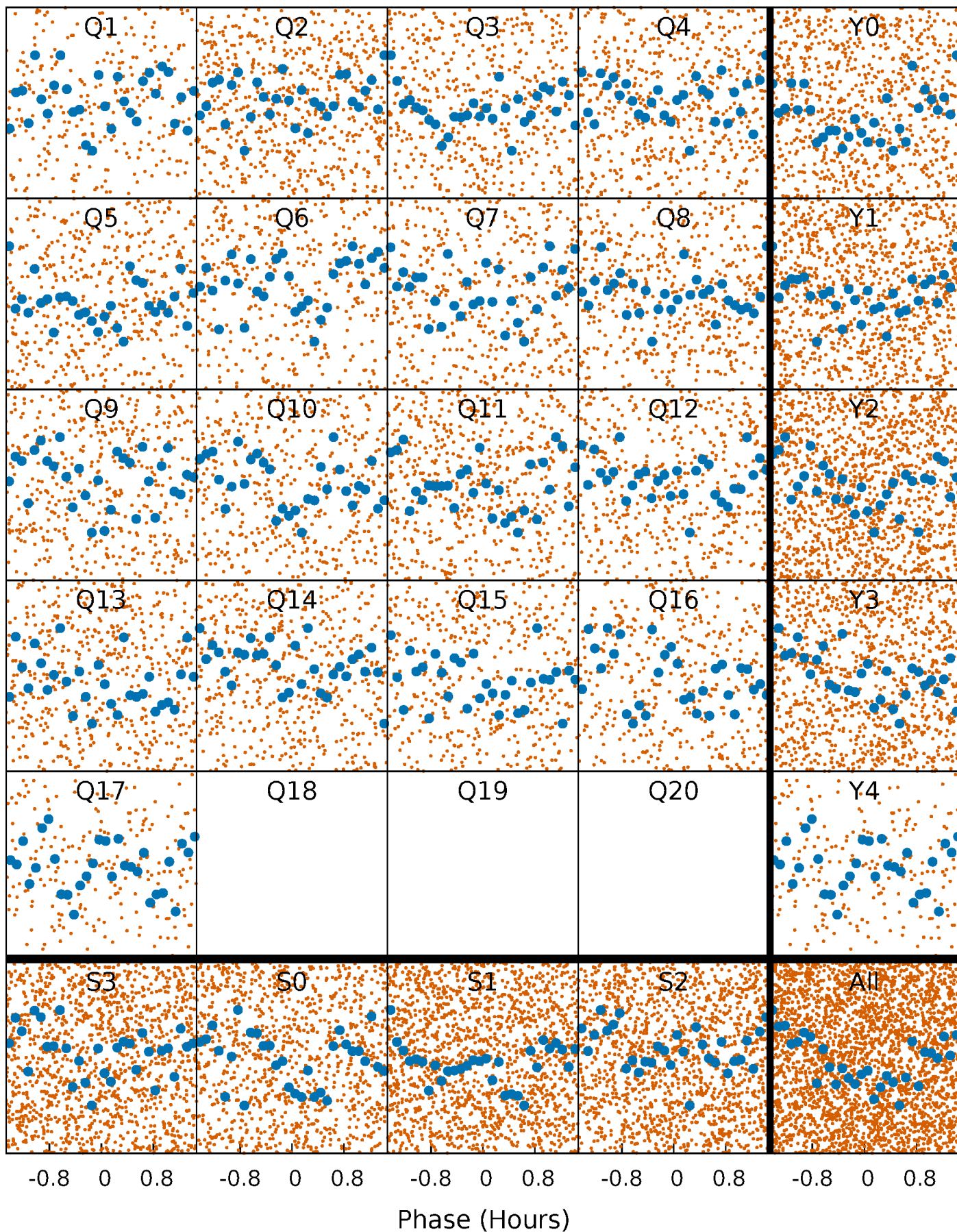


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



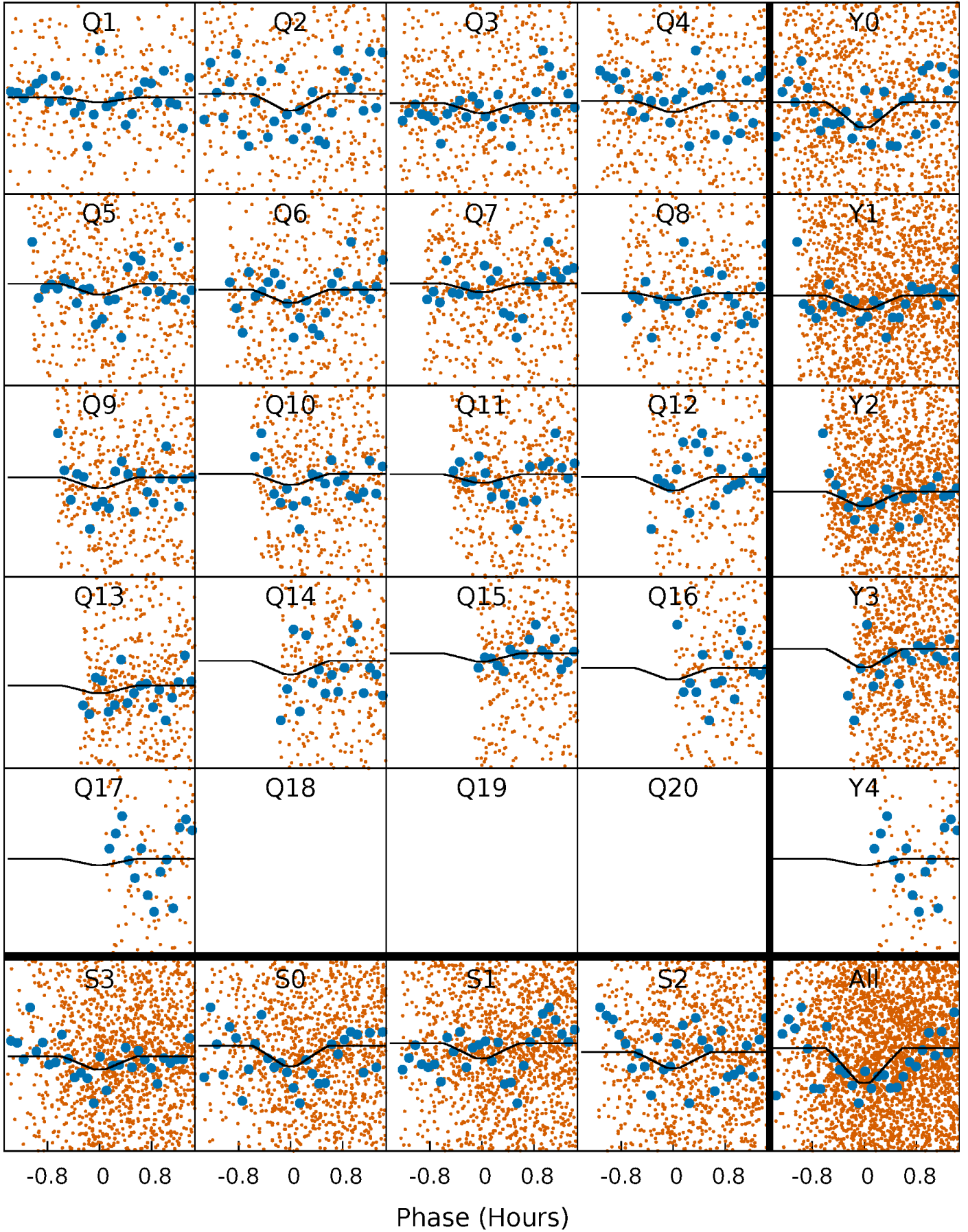
# PDC Quarter-Phased Transit Curves

TCE 005299904-02     $P = 0.590163$  Days     $T_0 = 131.652444$  (BKJD)



# DV Quarter-Phased Transit Curves

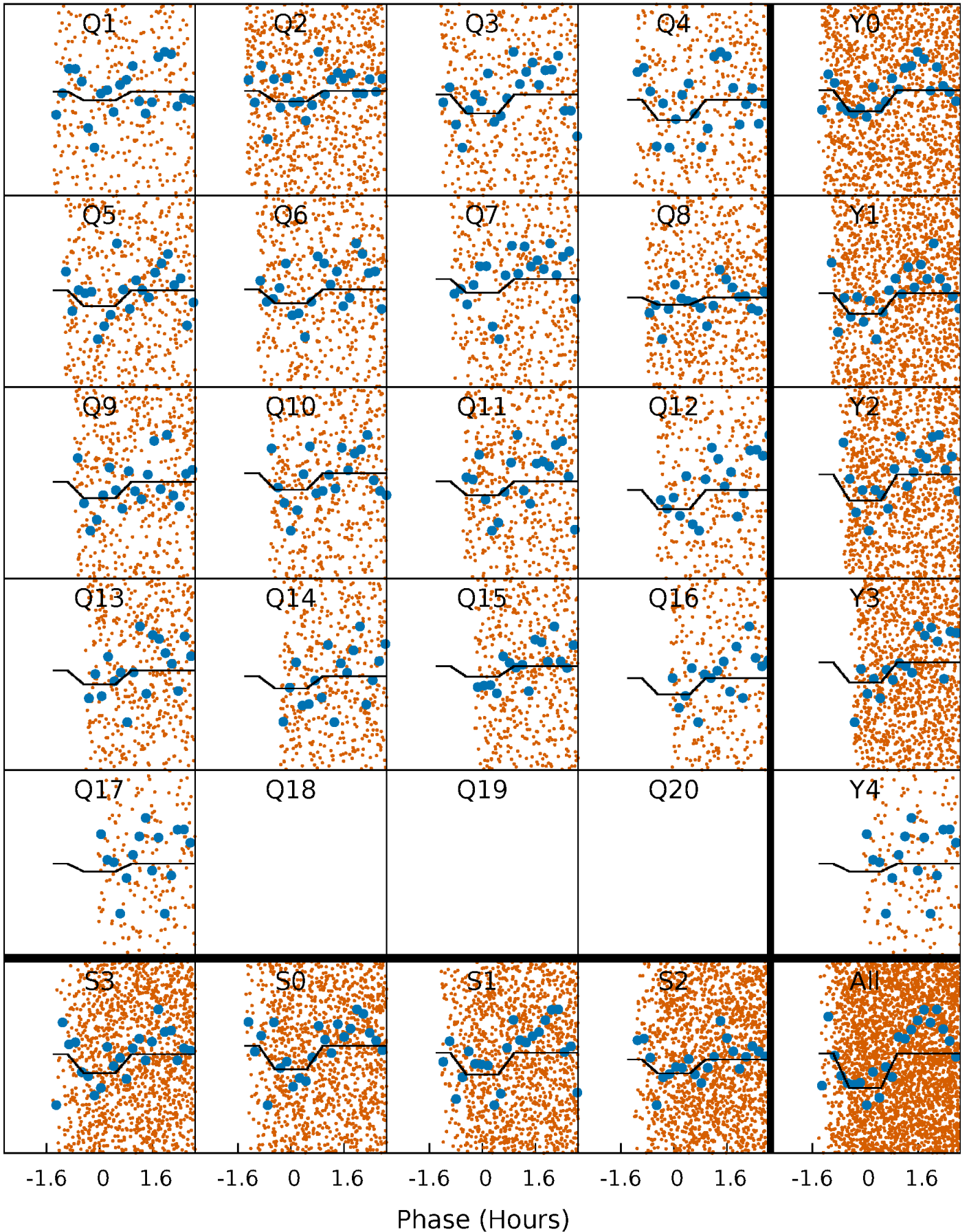
TCE 005299904-02     $P = 0.590163$  Days     $T_0 = 131.652444$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005299904-02     $P = 0.590165$  Days     $T_0 = 131.652170$  (BKJD)

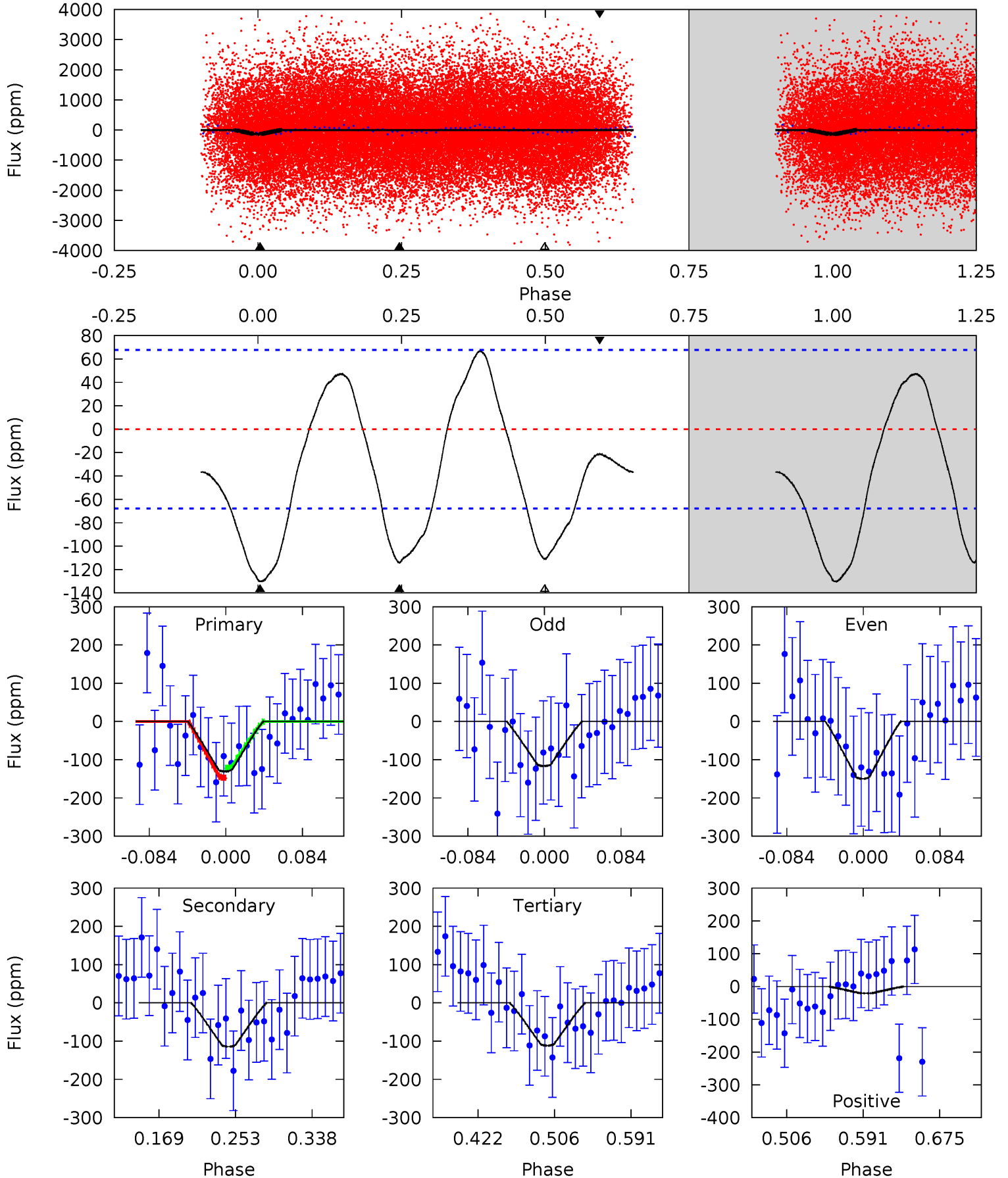




# DV Model-Shift Uniqueness Test

005299904-02, P = 0.590163 Days, E = 131.062281 Days

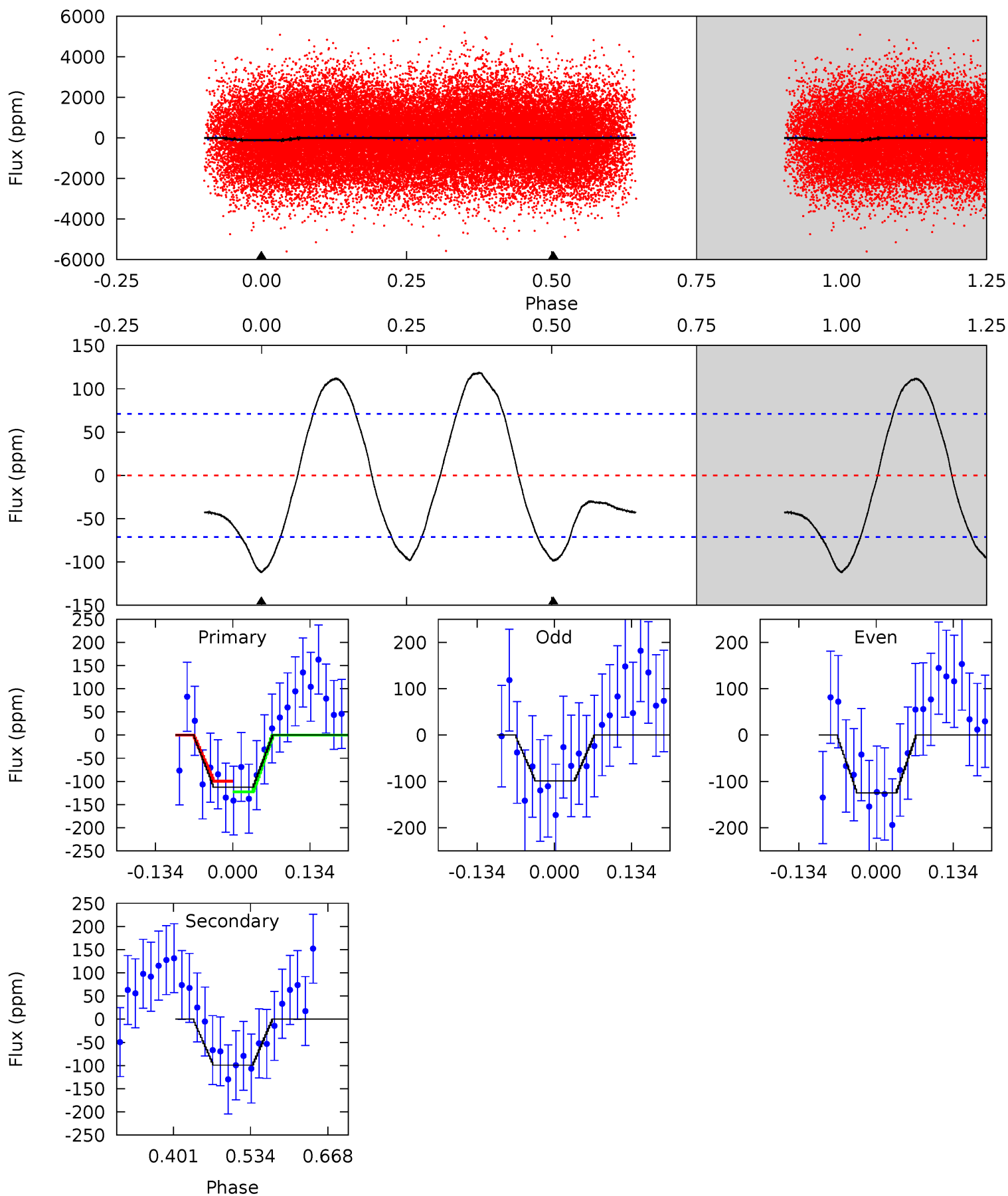
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.87	7.77	7.58	-1.40	4.60	1.73	3.83	1.29	10.3	0.19	9.17	1.13	1.14	0.34	0.88



# Alt Model-Shift Uniqueness Test

005299904-02, P = 0.590165 Days, E = 131.062005 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
7.14	6.28	0	0	4.50	1.50	4.56	7.14	7.14	6.28	6.28	0.82	0.98	0.51	0.71



### Stellar Parameters For KIC 005299904

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6829^{+214}_{-286}$	$3.920^{+0.353}_{-0.141}$	$-0.140^{+0.250}_{-0.300}$	$2.246^{+0.570}_{-0.856}$	$1.527^{+0.200}_{-0.372}$	$0.190^{+0.477}_{-0.077}$
	+3%/-4%	+9%/-4%	+179%/-214%	+25%/-38%	+13%/-24%	+251%/-41%
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 005299904-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-114 \pm 15$	$2.55^{+1.51}_{-1.21}$	$4873^{+456}_{-465}$	$6351^{+3354}_{-1382}$	$2.389^{+6.455}_{-1.443}$
Alt.	$-99 \pm 16$	$2.41^{+1.60}_{-1.22}$	$4898^{+381}_{-566}$	$6209^{+3761}_{-1378}$	$2.287^{+7.585}_{-1.434}$

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

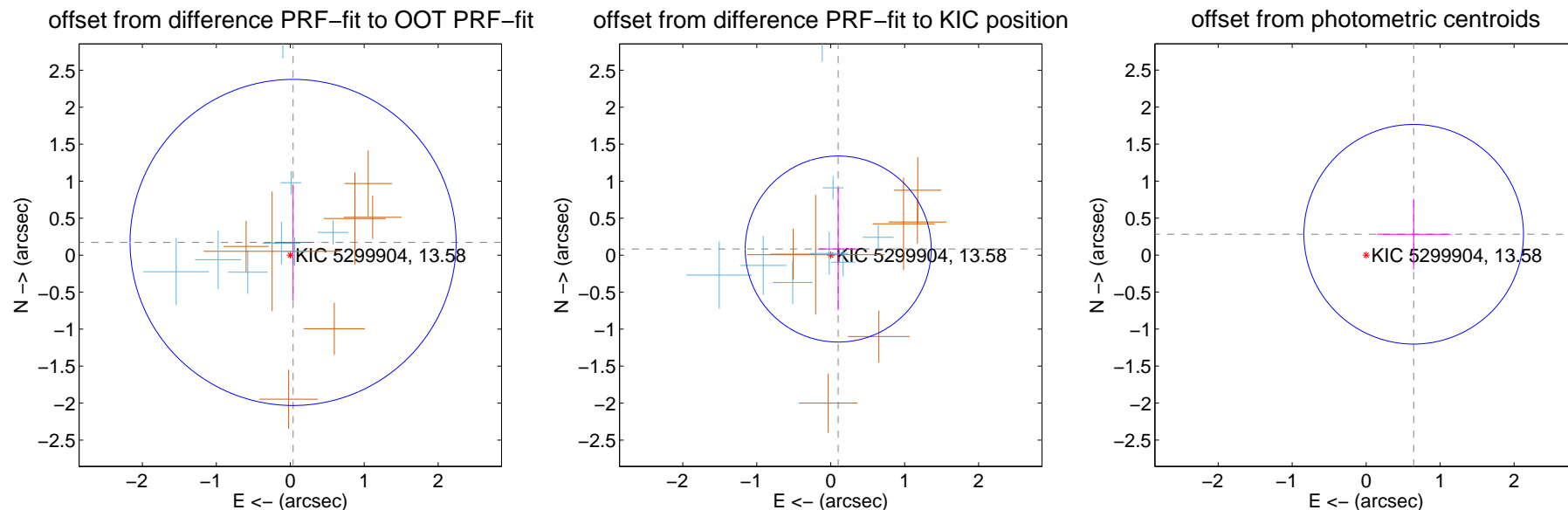
## DV Centroid Data

Supplemental centroid analysis for 005299904-02. Kepler magnitude: 13.58. Transit SNR 6.22

There are 8 quarters with good PRF difference image offsets

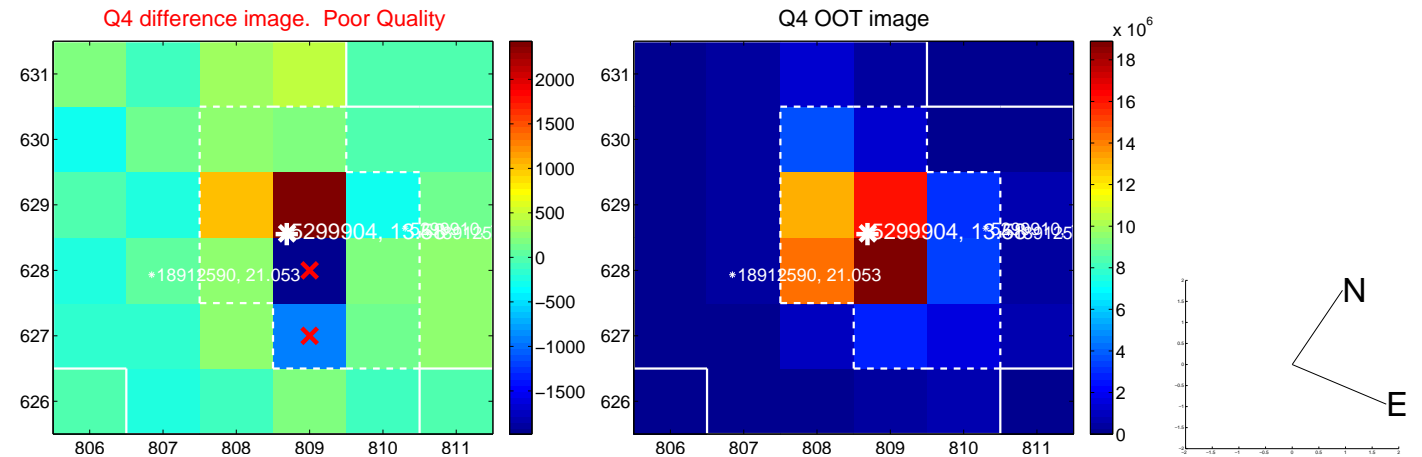
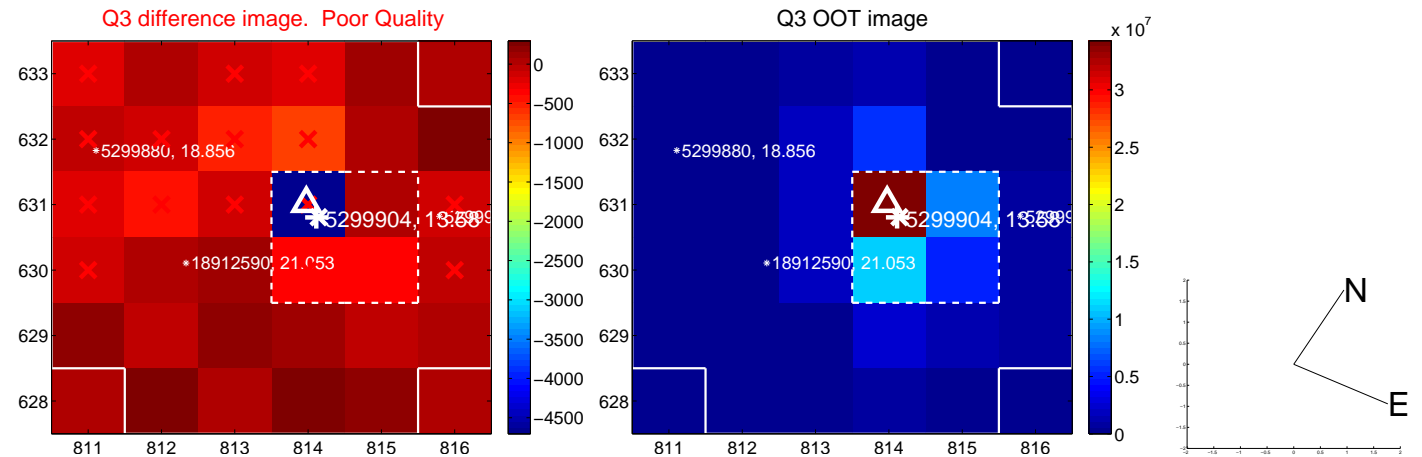
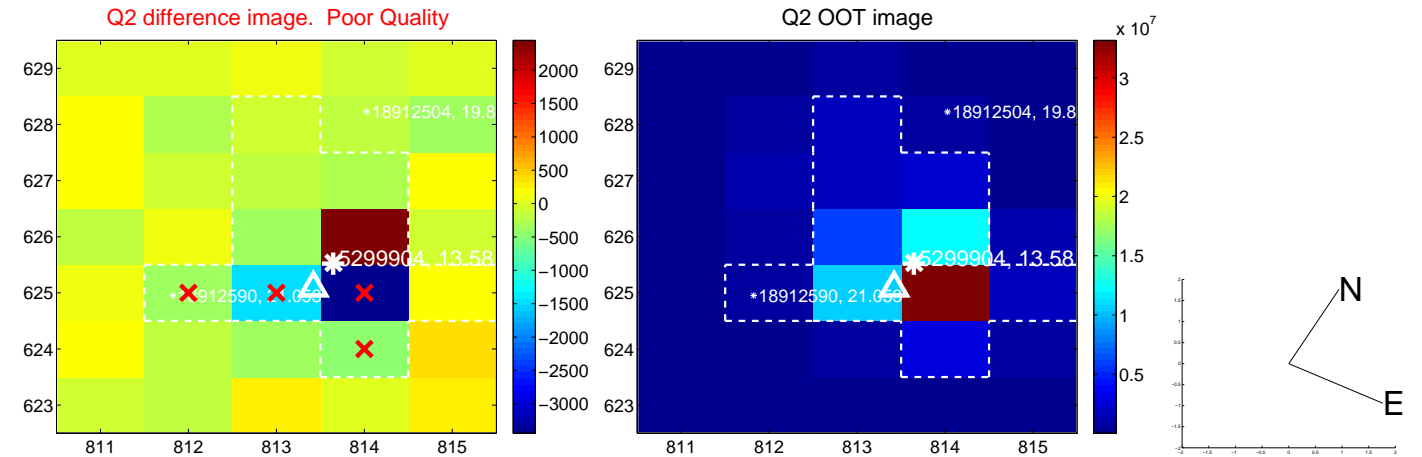
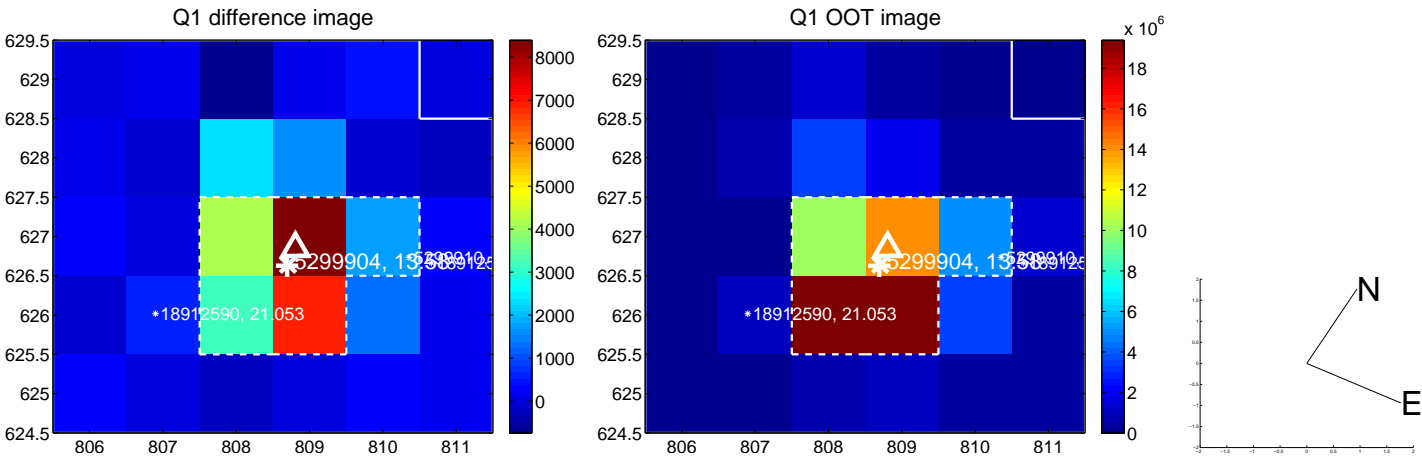
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.176 \pm 0.735$	0.24	$-0.038 \pm 0.251$	$0.172 \pm 0.787$
PRF-fit source offset from KIC position	$0.131 \pm 0.419$	0.31	$-0.101 \pm 0.273$	$0.083 \pm 0.825$
photometric centroid source offset	$0.70 \pm 0.49$	1.42	$-0.64 \pm 0.50$	$0.28 \pm 0.48$



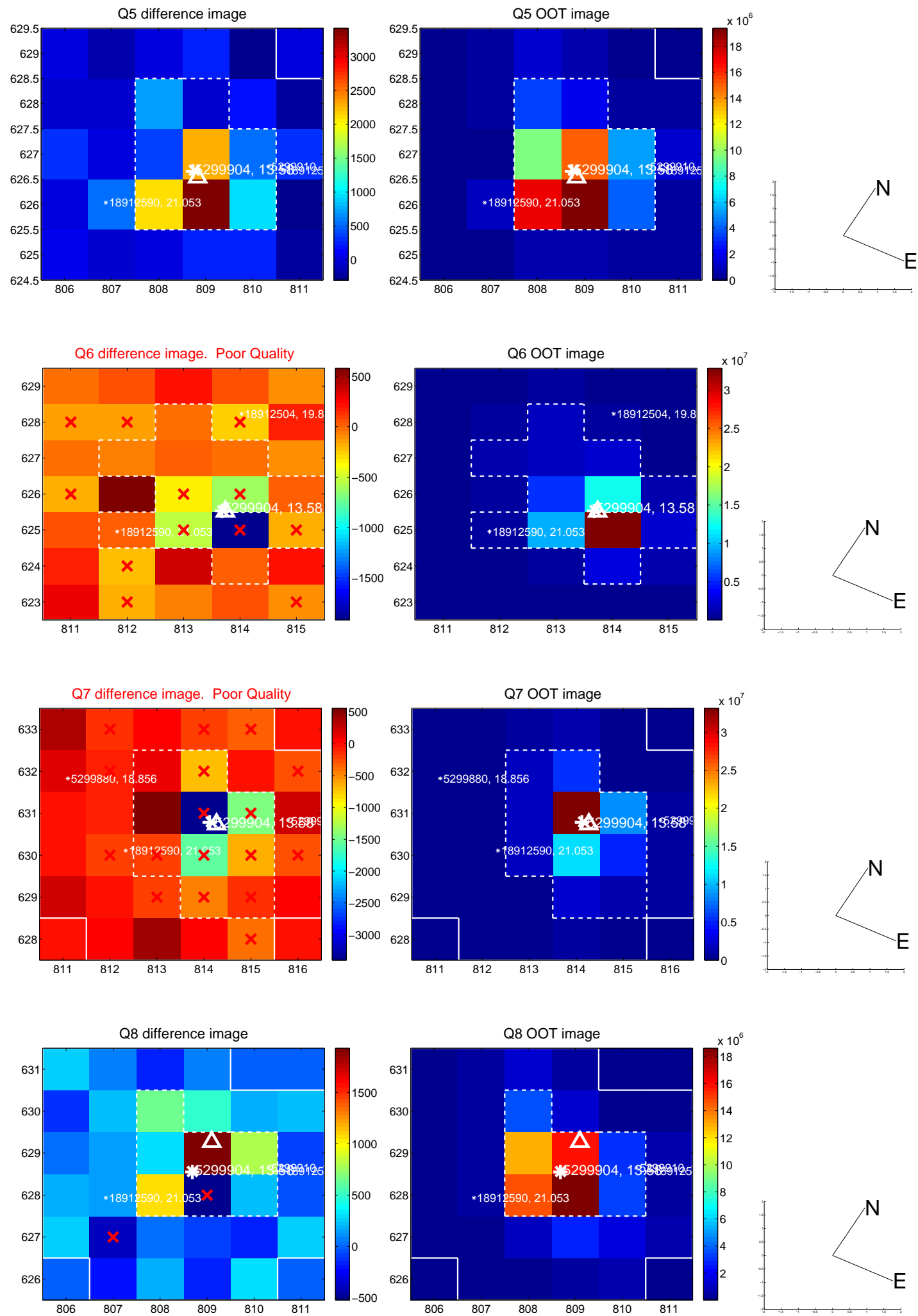
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

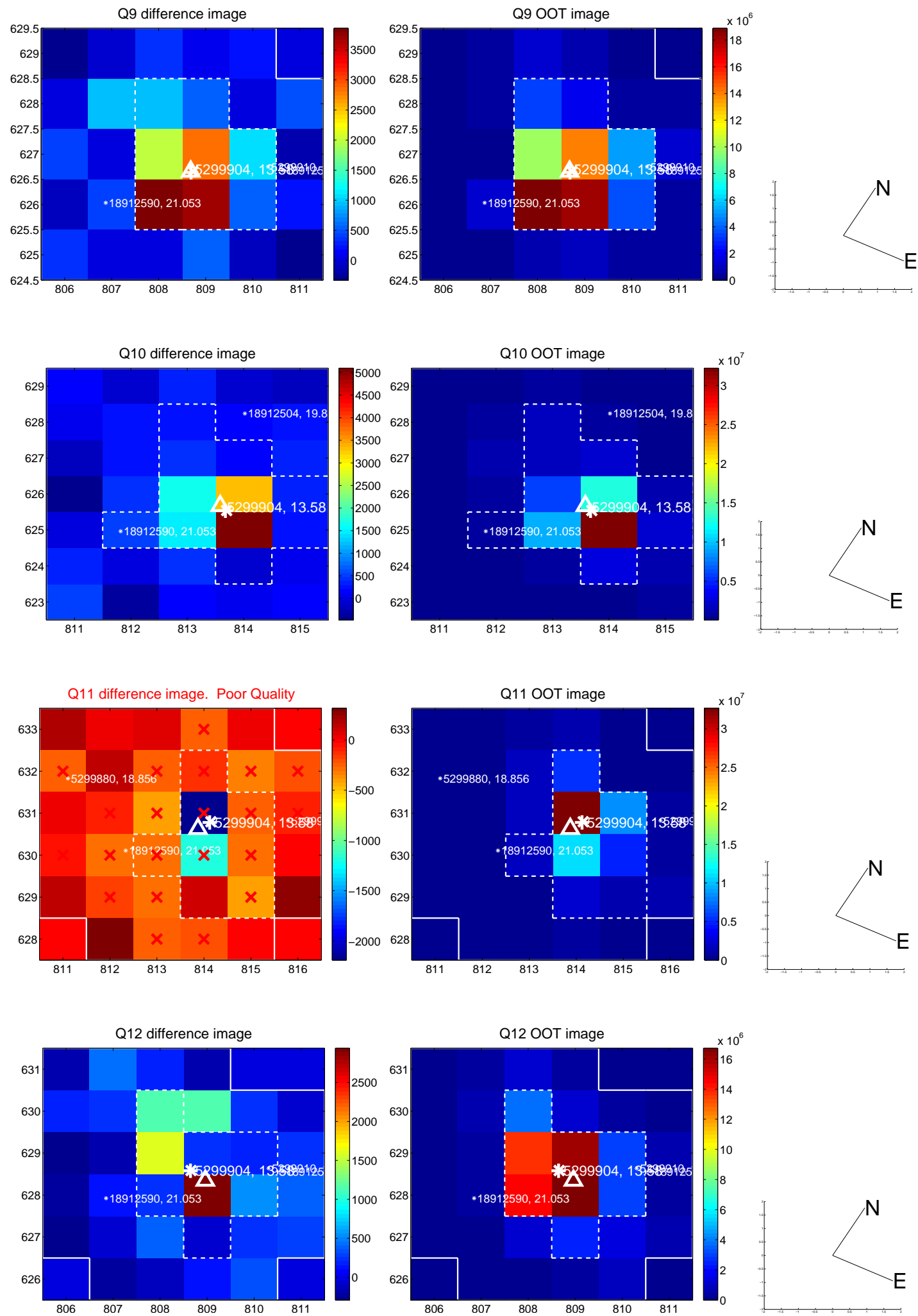




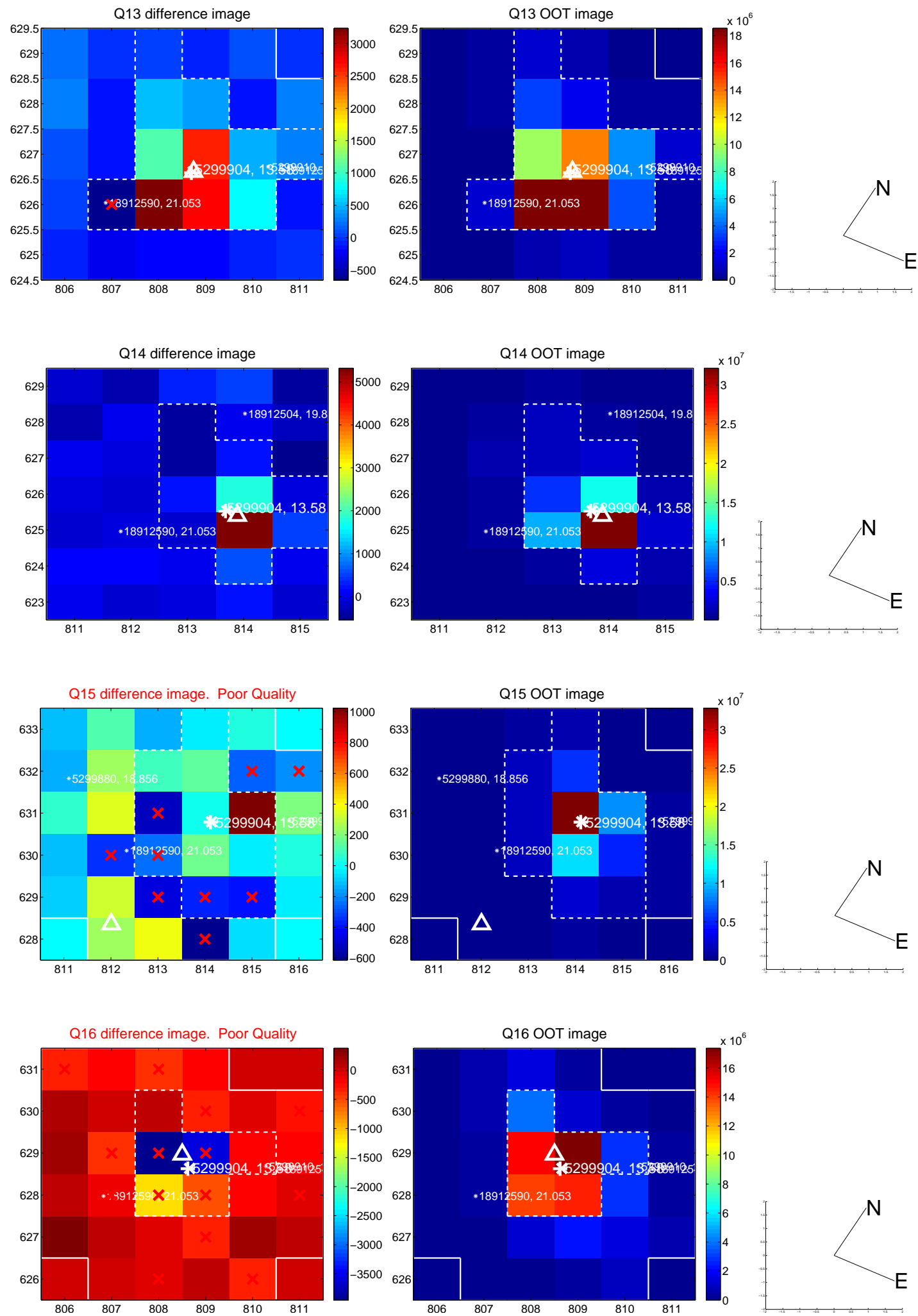
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



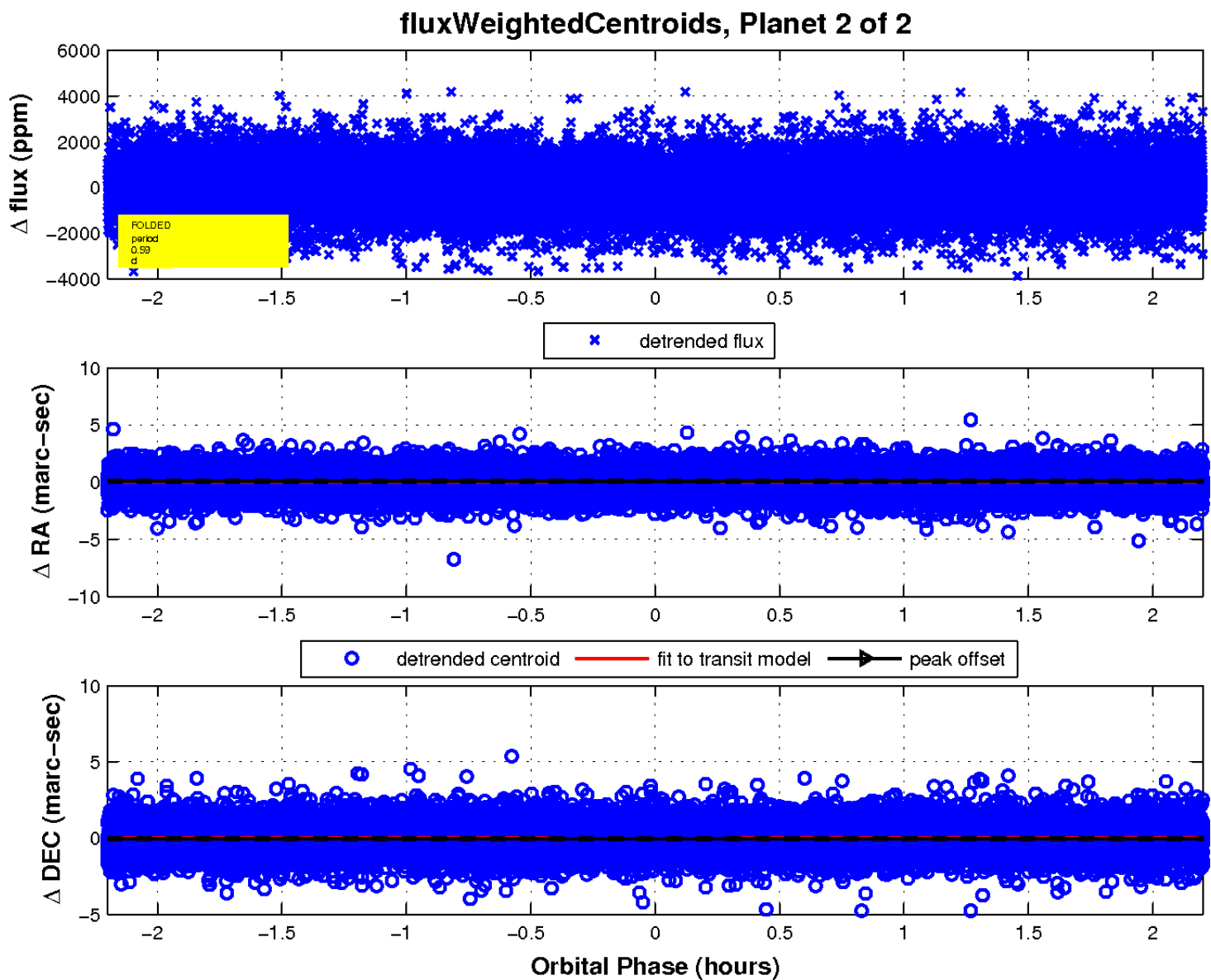
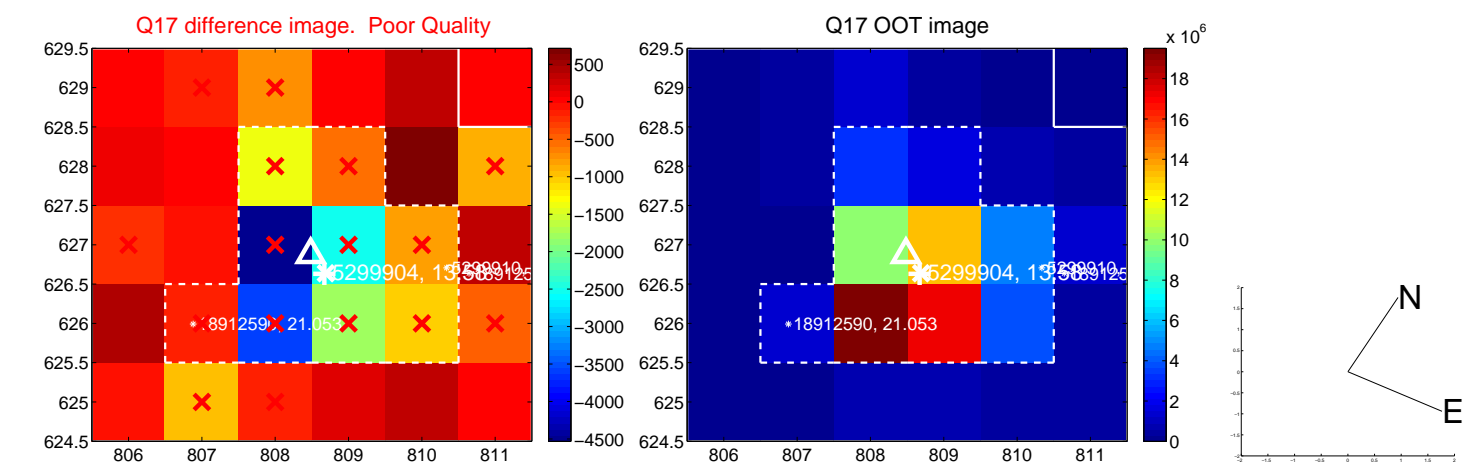
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

