

# KIC 008308688

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008308688-01	OBS	No	0.692303	131.662881	22.1	2.167	8.3	7.1	2.22	7981	1.21	51100.81
008308688-02	OBS	No	1.201064	132.498427	17.0	10.860	8.1	5.9	2.22	7981	0.93	24513.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008308688-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
008308688-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

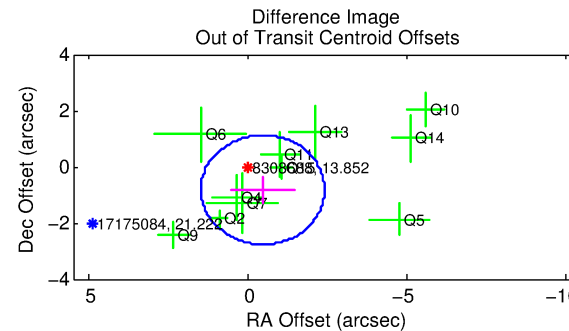
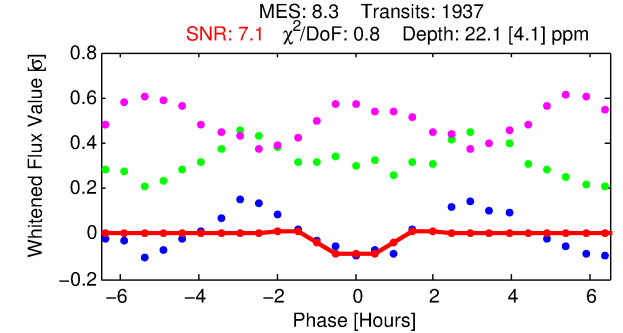
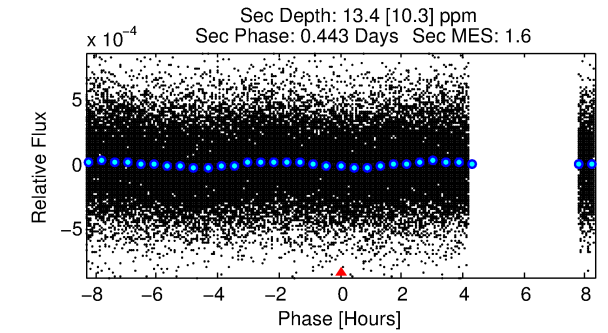
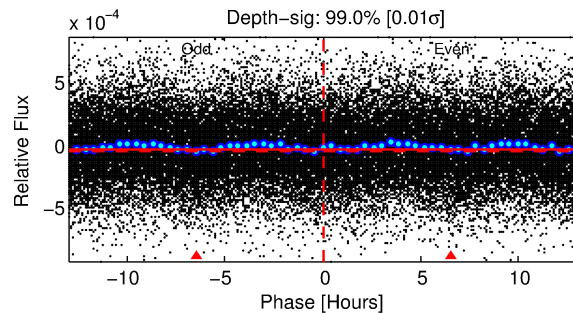
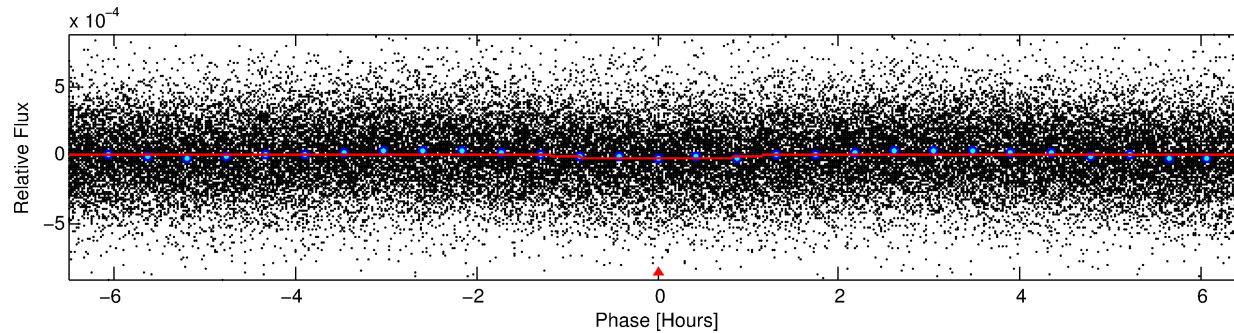
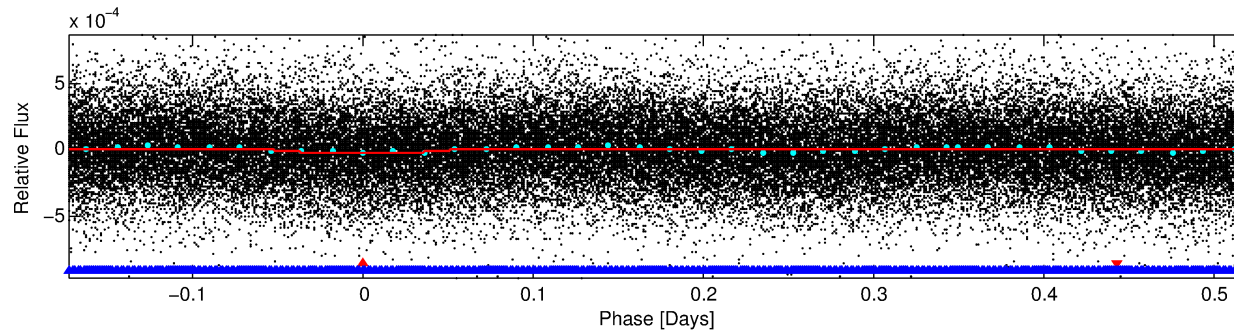
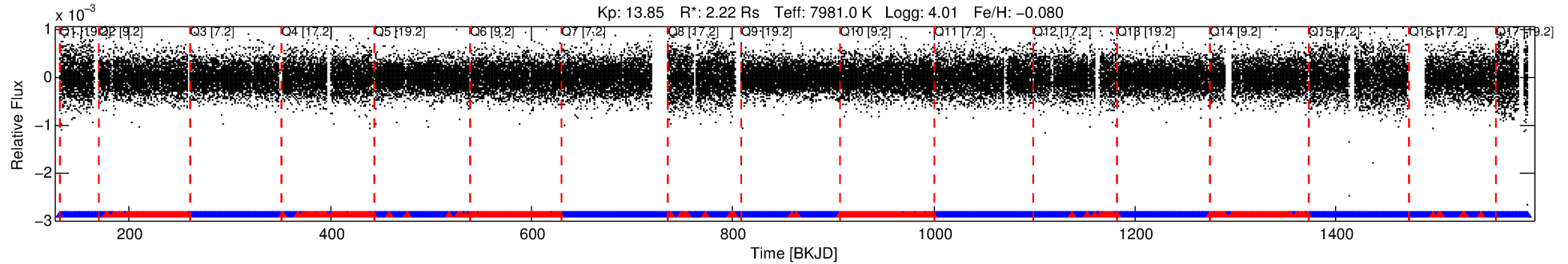
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008308688-01

No Significant Match Found

# DV One-Page Summary

KIC: 8308688 Candidate: 1 of 2 Period: 0.692 d



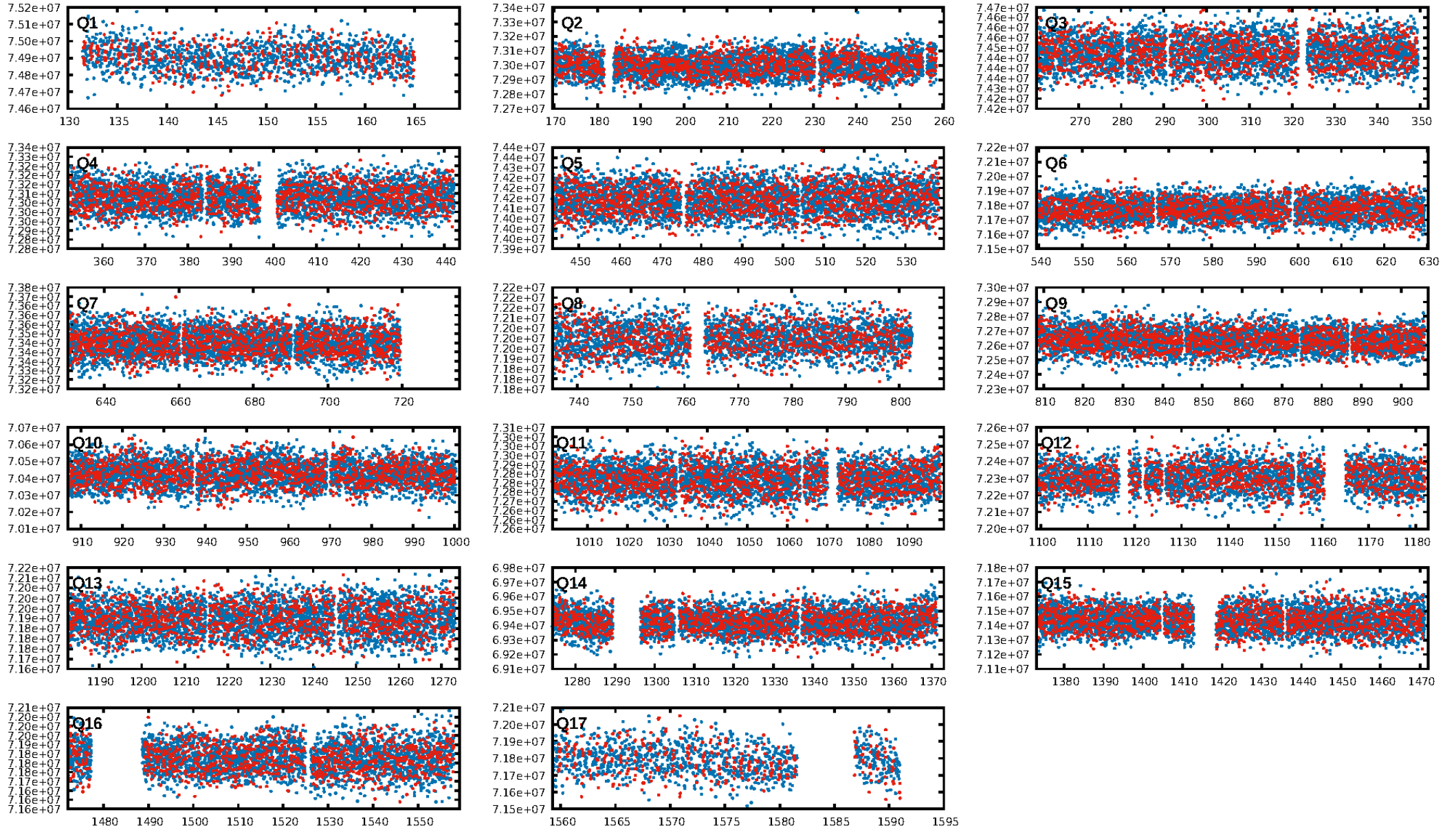
## DV Fit Results:

Period = 0.69230 [0.00001] d  
Epoch = 131.6629 [0.0039] BKJD  
Rp/R\* = 0.0050 [0.0026]  
a/R\* = 1.44 [2.46]  
b = 0.90 [0.71]  
Seff = 51100.81 [21199.68]  
Teq = 3834 [398] K  
Rp = 1.21 [0.72] Re  
a = 0.0187 [0.0047] AU  
Ag = 1.75 [2.37] [0.32σ]  
Teffp = 6821 [2234] K [1.32σ]

## DV Diagnostic Results:

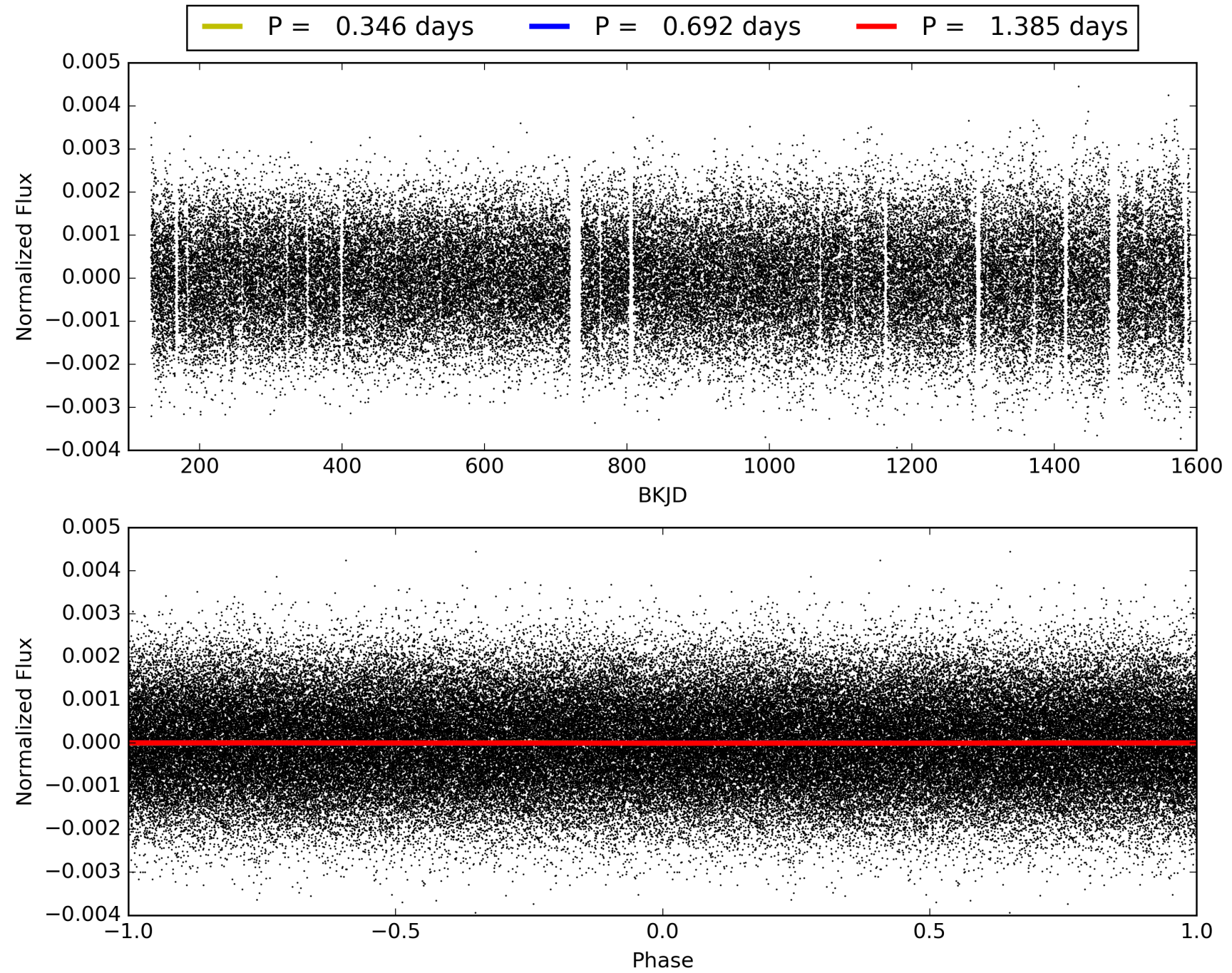
ShortPeriod-sig: N/A  
LongPeriod-sig: 73.0% [1.10σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.71 [1316/1848]  
GhostDiagnostic-chr: 1.703  
Centroid-sig: 19.4%  
Centroid-so: 0.747 arcsec [0.91σ]  
OotOffset-rm: 0.945 arcsec [1.46σ]  
OotOffset-st: 4/3/1/3 [11]  
KicOffset-rm: 0.778 arcsec [0.82σ]  
KicOffset-st: 4/3/1/3 [11]  
DiffImageQuality-fgm: 0.64 [7/11]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008308688-01, PDC Light Curves



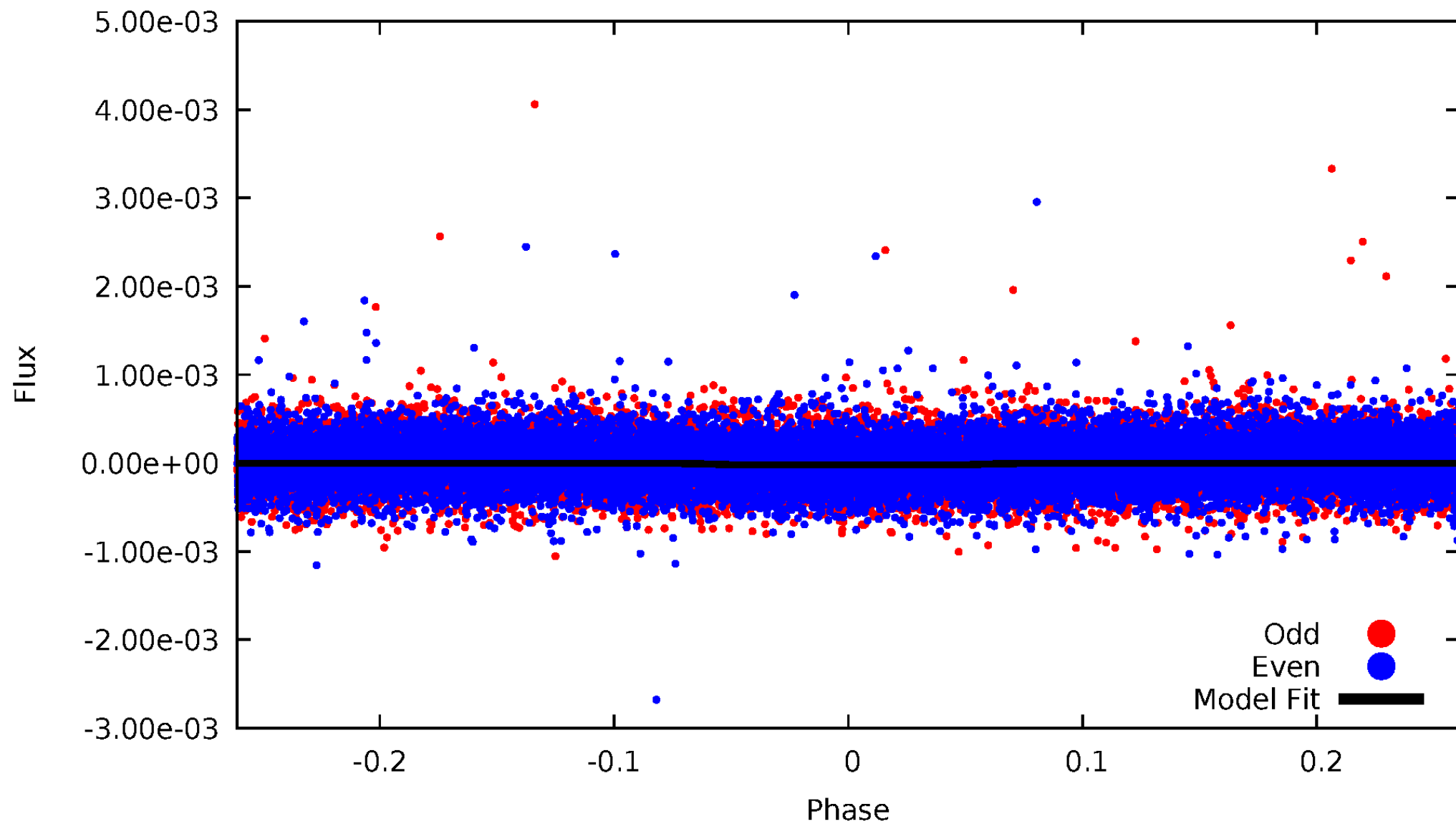


TCE 008308688-01



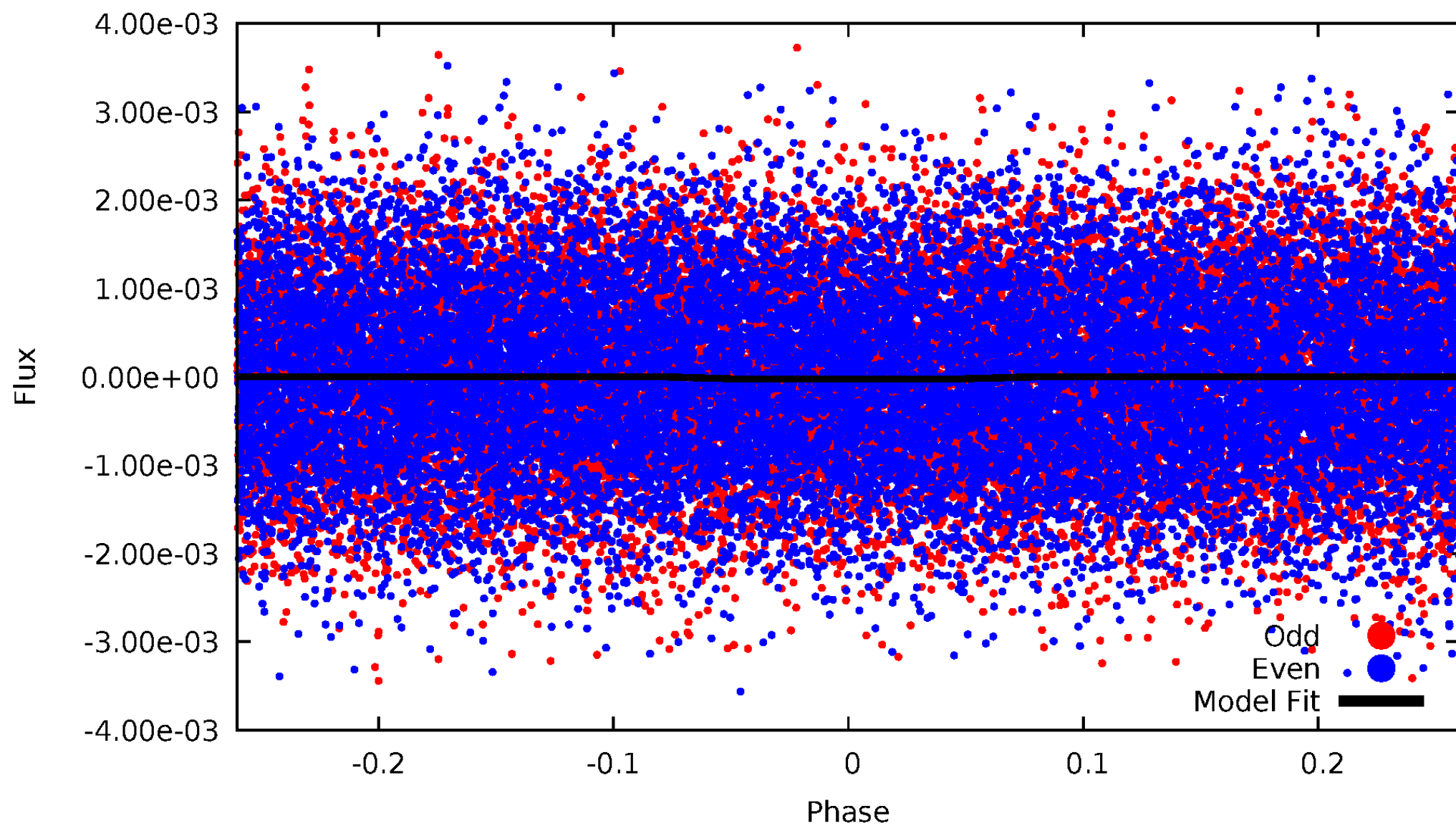
# DV Odd/Even

TCE 008308688-01



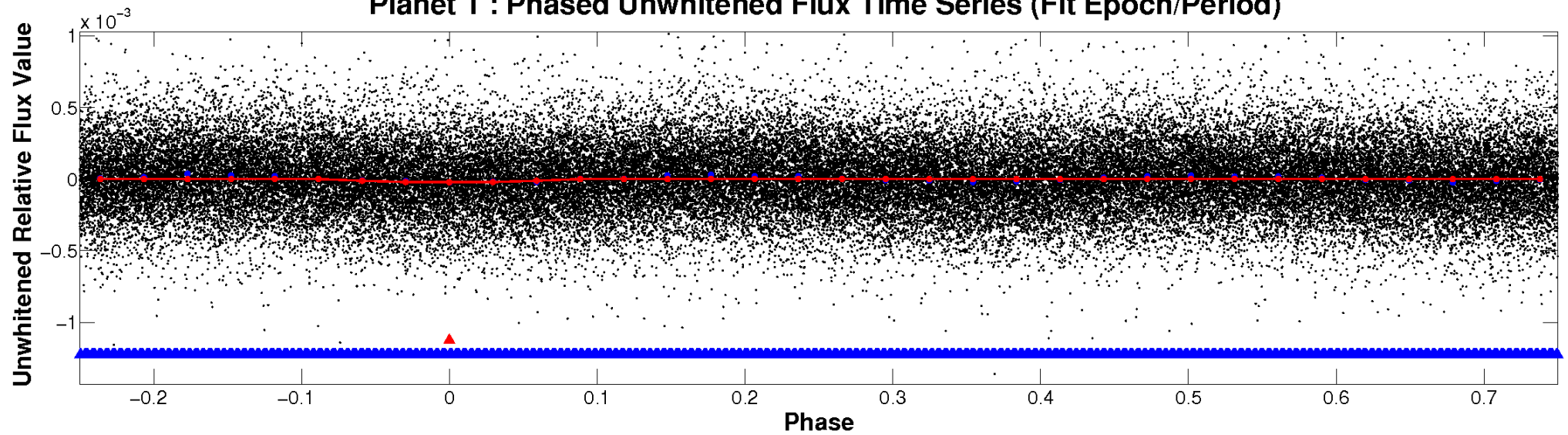
# ALT Odd/Even

TCE 008308688-01

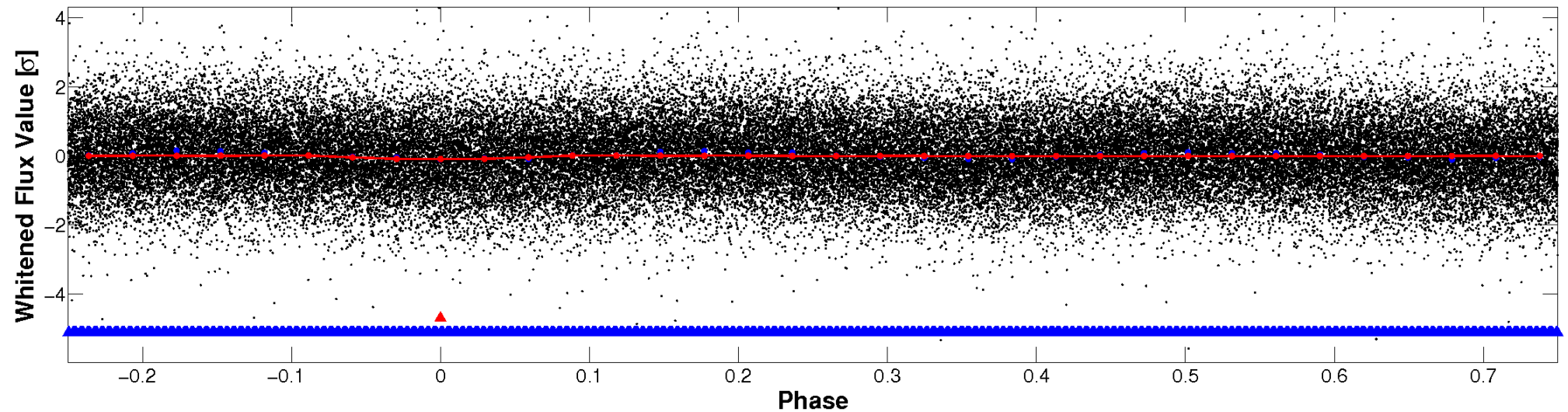


# Non-Whitened Vs. Whitened Light Curve

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



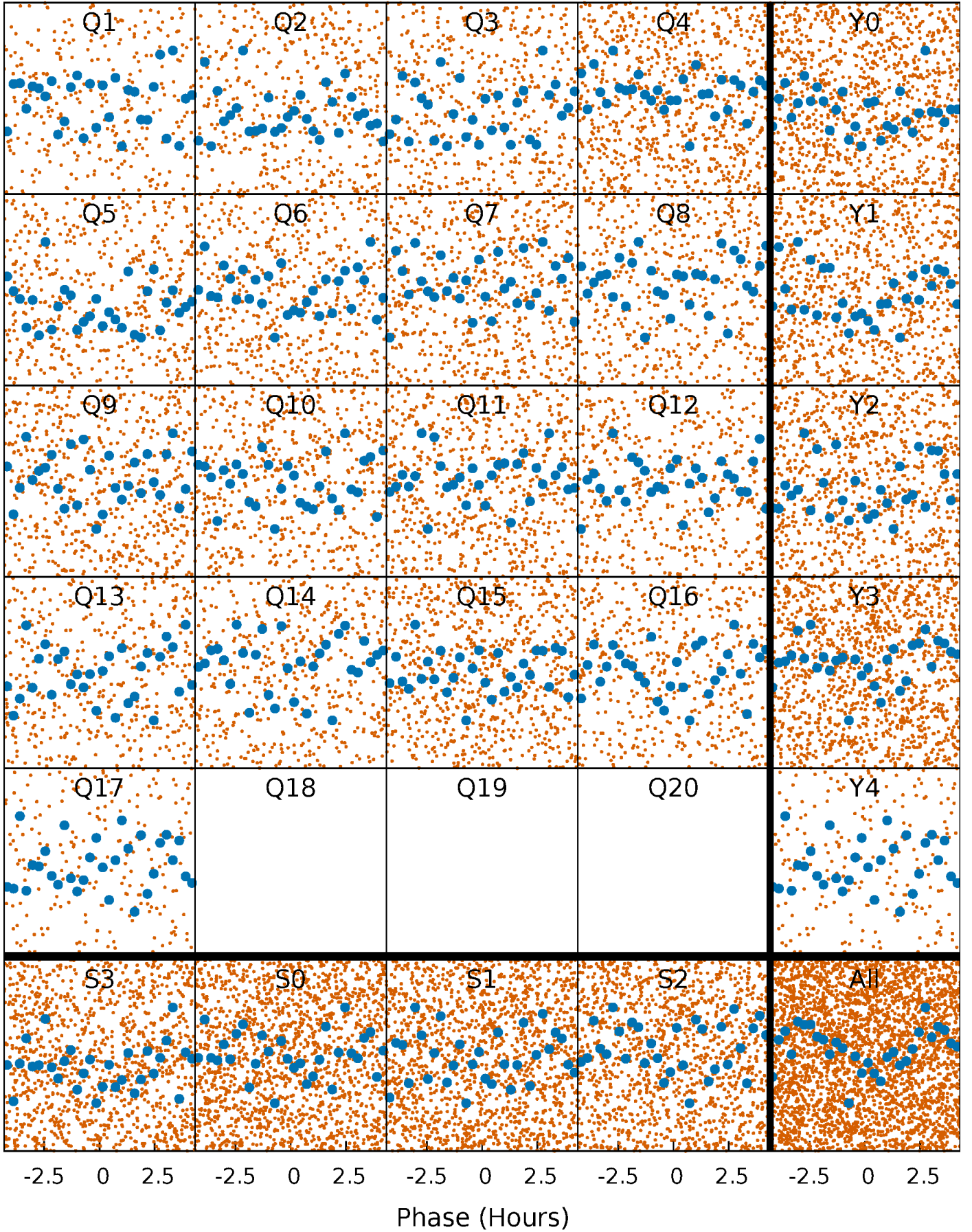
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

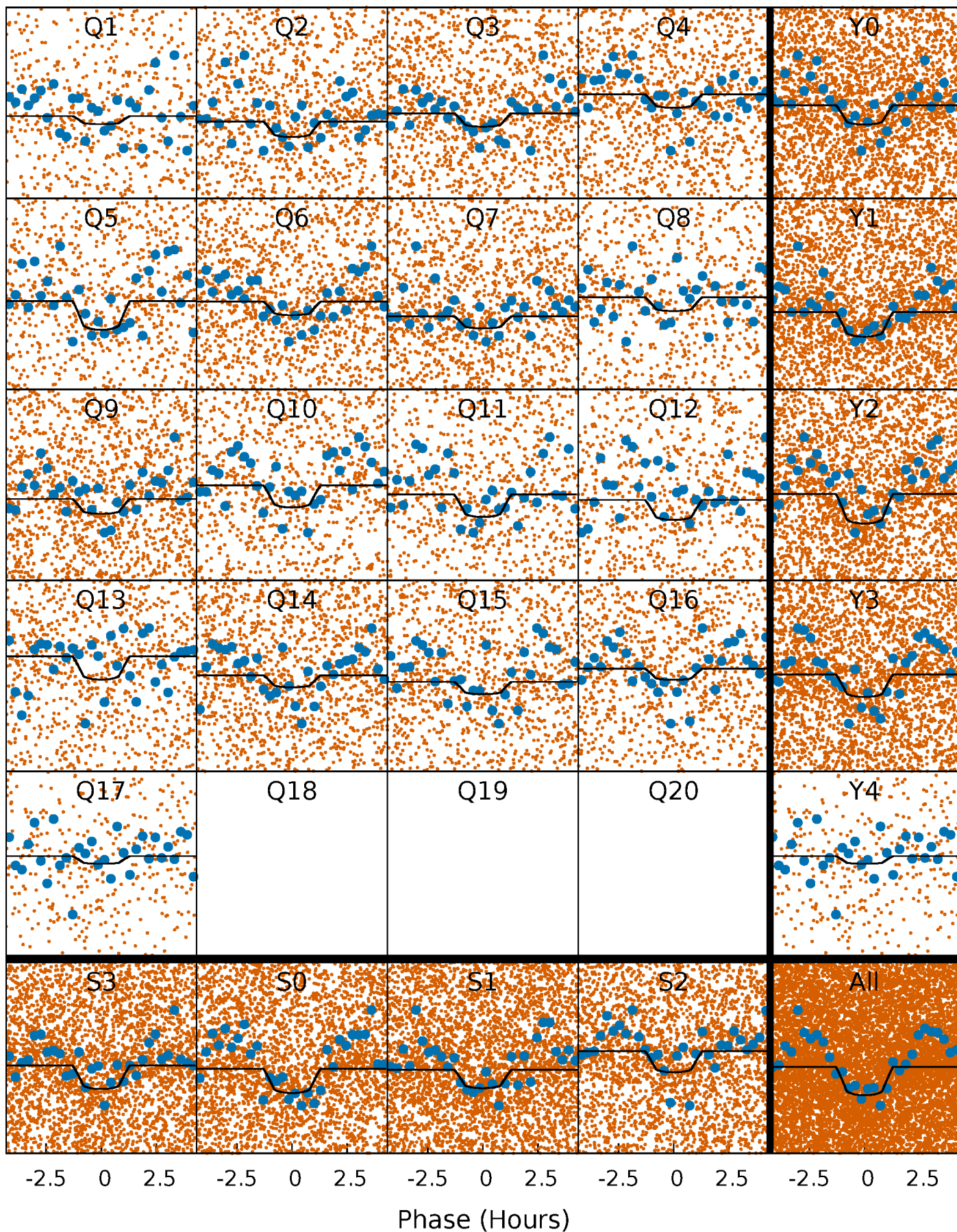
TCE 008308688-01   P= 0.692303 Days    $T_0=131.662881$  (BKJD)





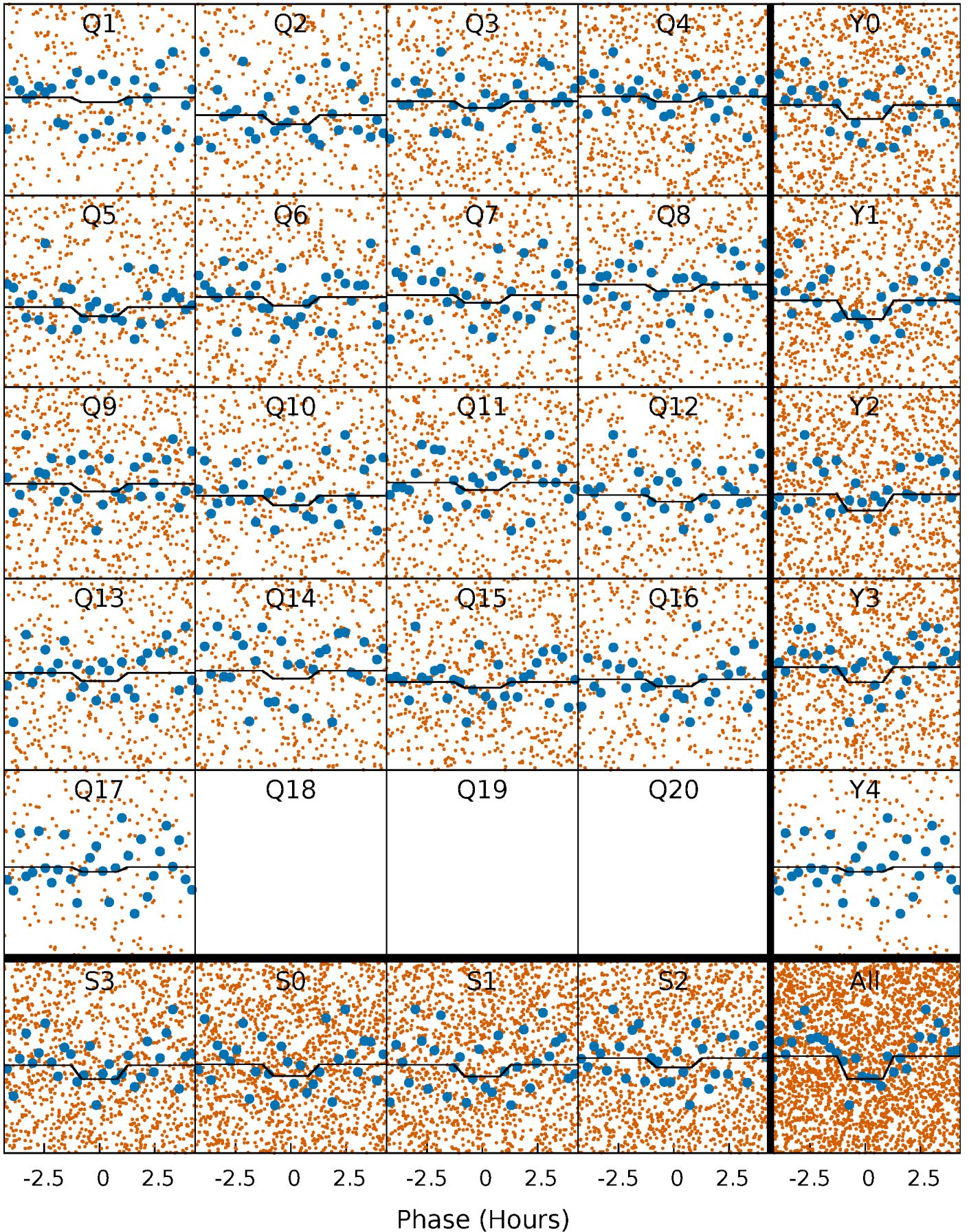
# DV Quarter-Phased Transit Curves

TCE 008308688-01 P= 0.692303 Days  $T_0=131.662881$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

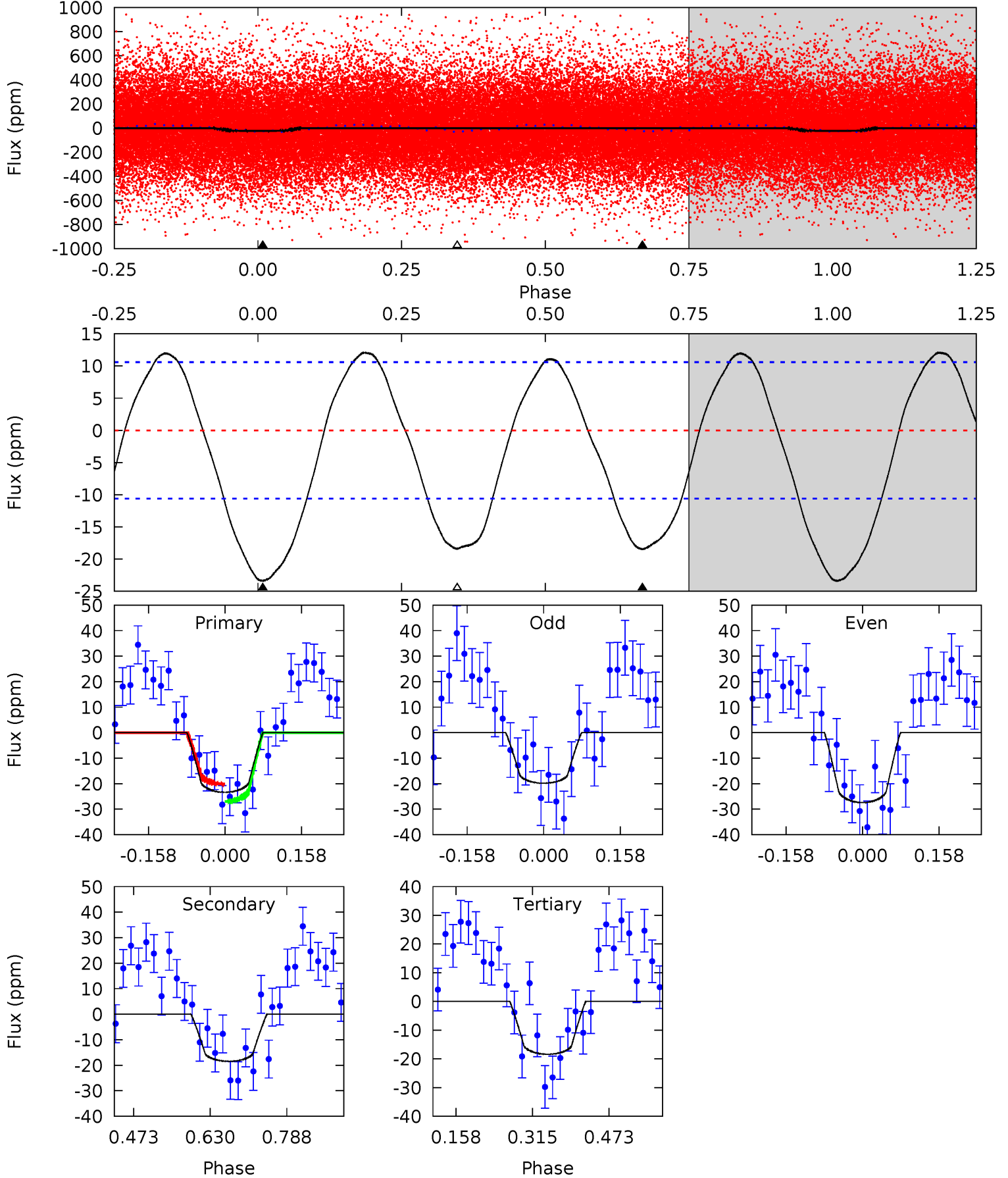
TCE 008308688-01 P= 0.692303 Days  $T_0=131.662832$  (BKJD)



# DV Model-Shift Uniqueness Test

008308688-01, P = 0.692303 Days, E = 130.970578 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
9.84	7.77	7.74	0	4.47	1.41	4.73	2.10	9.84	0.03	7.77	1.62	0.83	0.34	1.46

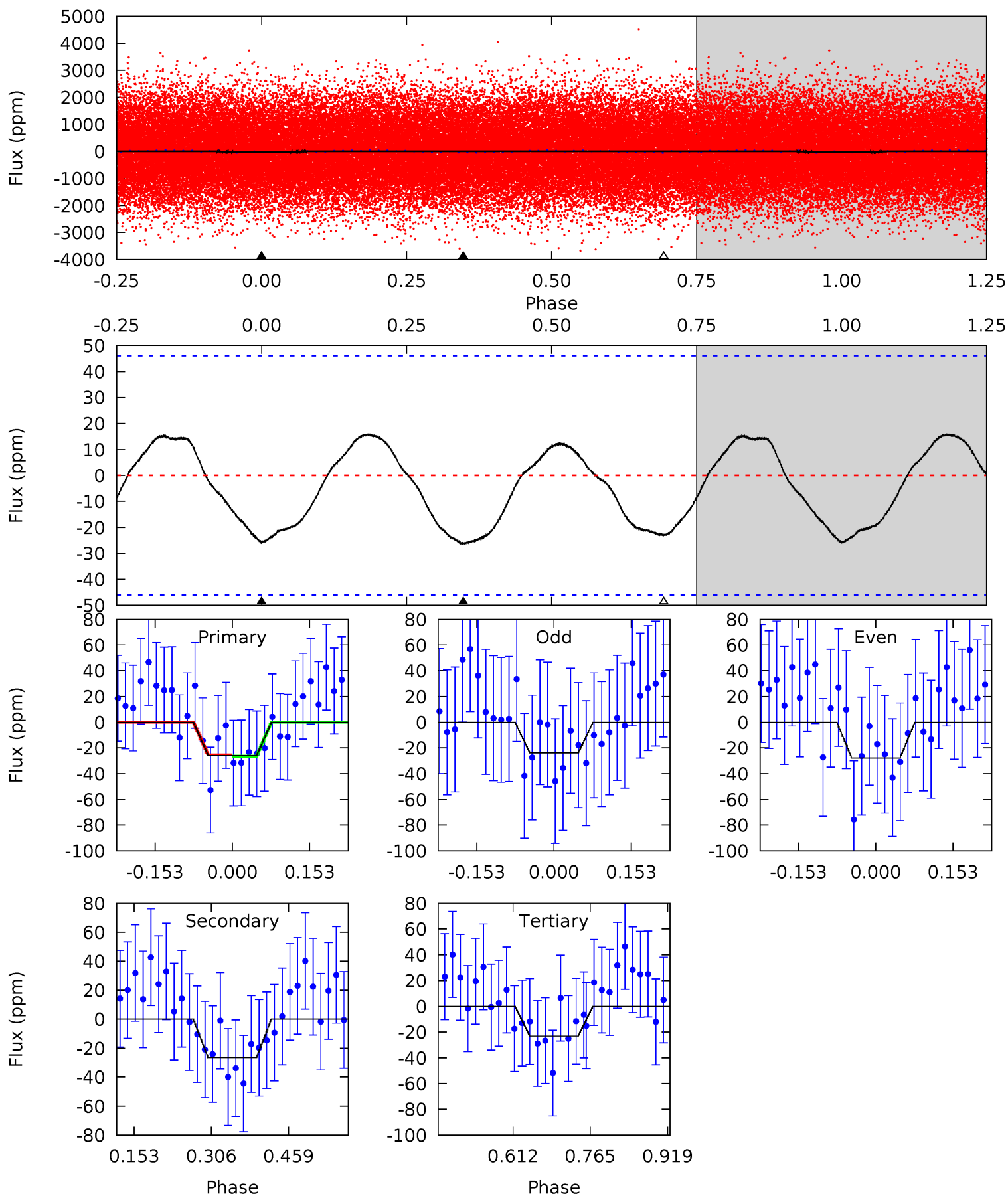




# Alt Model-Shift Uniqueness Test

008308688-01, P = 0.692303 Days, E = 130.970529 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
2.52	2.57	2.24	0	4.47	1.43	1.33	0.28	2.52	0.33	2.57	0.19	0.65	0.38	0.05





### Stellar Parameters For KIC 008308688

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7981^{+221}_{-331}$	$4.007^{+0.214}_{-0.132}$	$-0.080^{+0.200}_{-0.350}$	$2.221^{+0.425}_{-0.638}$	$1.827^{+0.114}_{-0.363}$	$0.235^{+0.271}_{-0.094}$
	+3%/-4%	+5%/-3%	+250%/-438%	+19%/-29%	+6%/-20%	+115%/-40%
Source	KIC0	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 008308688-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-18 \pm 2$	$1.18^{+0.67}_{-0.58}$	$5302^{+351}_{-434}$	$6944^{+3931}_{-1679}$	$2.433^{+6.793}_{-1.433}$
Alt.	$-26 \pm 10$	$1.17^{+0.60}_{-0.56}$	$5276^{+384}_{-370}$	$7742^{+5144}_{-1984}$	$3.546^{+10.078}_{-2.248}$

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

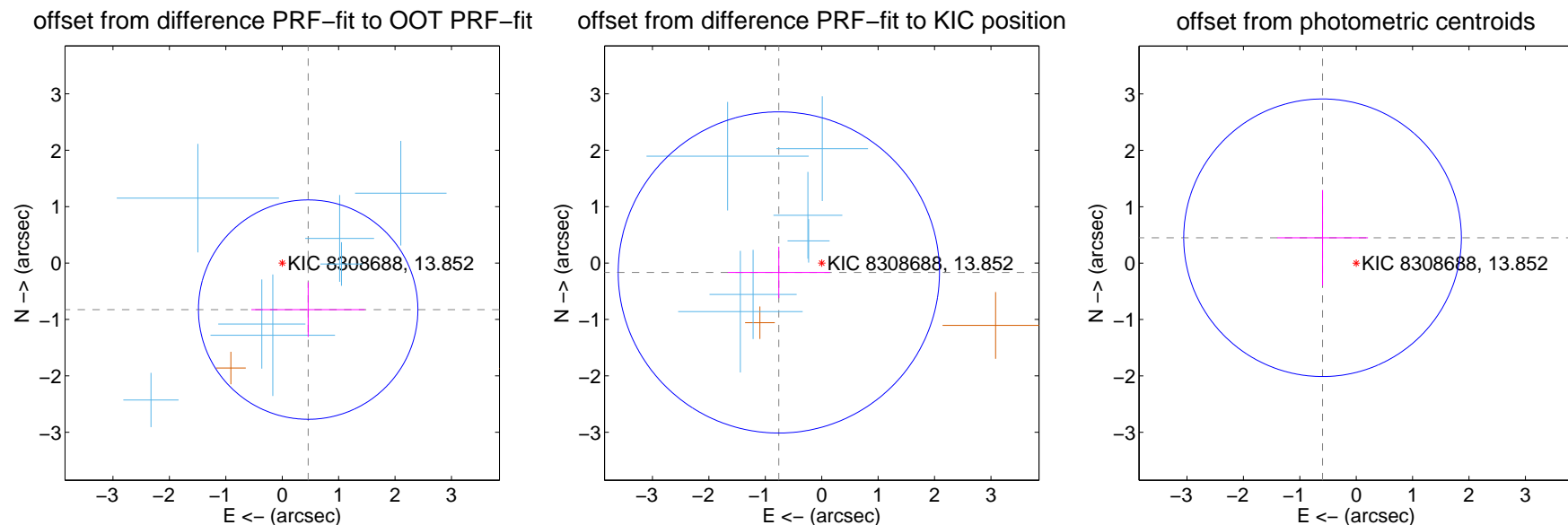
## DV Centroid Data

Supplemental centroid analysis for 008308688-01. Kepler magnitude: 13.85. Transit SNR 7.07

There are 7 quarters with good PRF difference image offsets

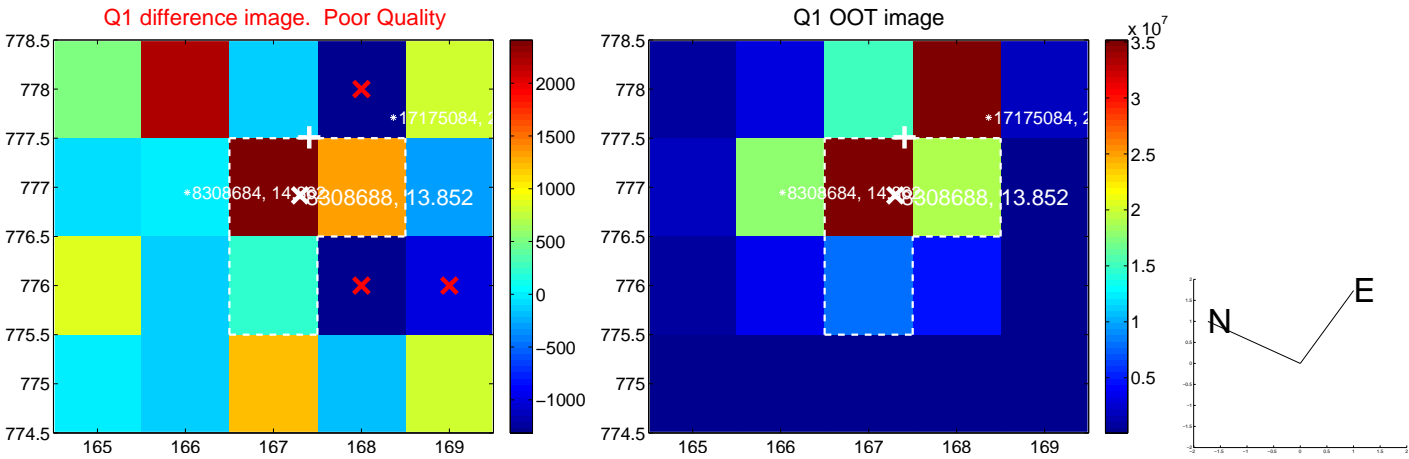
The direct PRF centroid is offset from the target star catalog position by about 1.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.945 \pm 0.648$	1.46	$-0.460 \pm 1.006$	$-0.826 \pm 0.486$
PRF-fit source offset from KIC position	$0.778 \pm 0.949$	0.82	$0.760 \pm 0.906$	$-0.167 \pm 0.456$
photometric centroid source offset	$0.75 \pm 0.82$	0.91	$0.60 \pm 0.80$	$0.45 \pm 0.85$

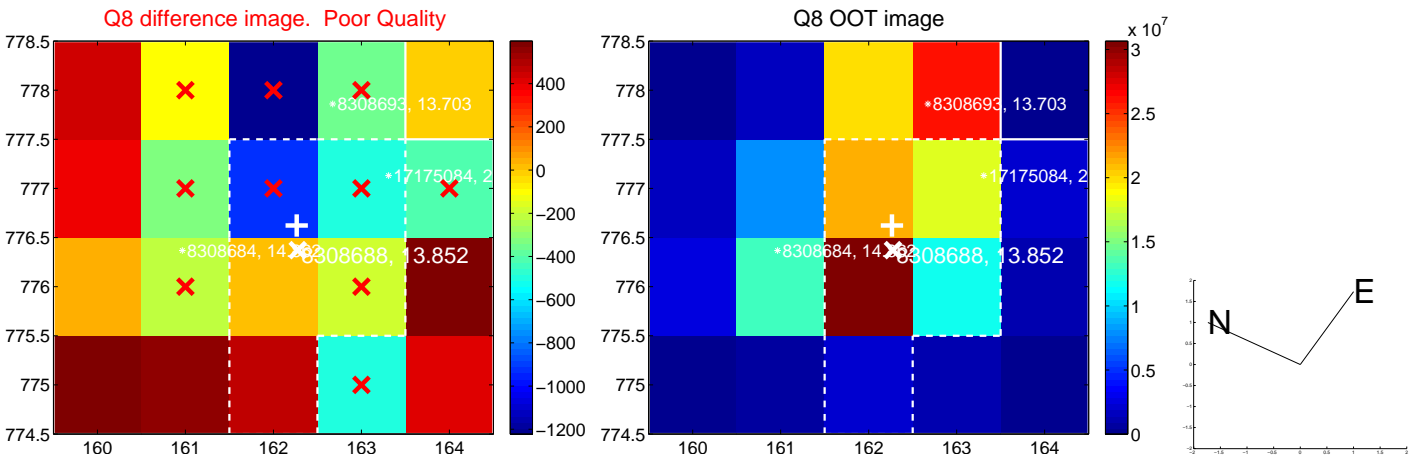
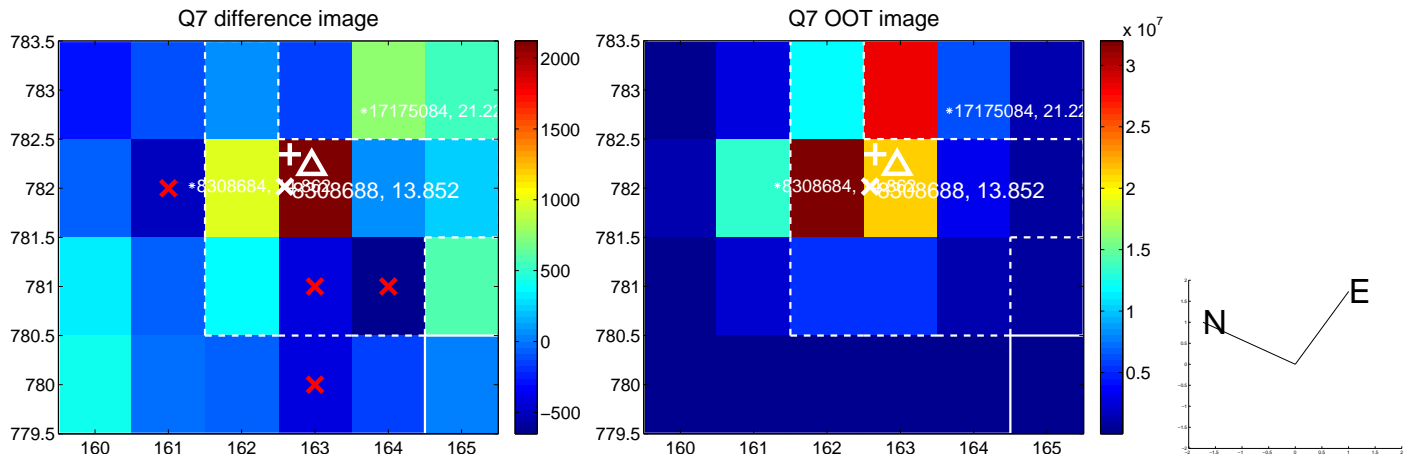
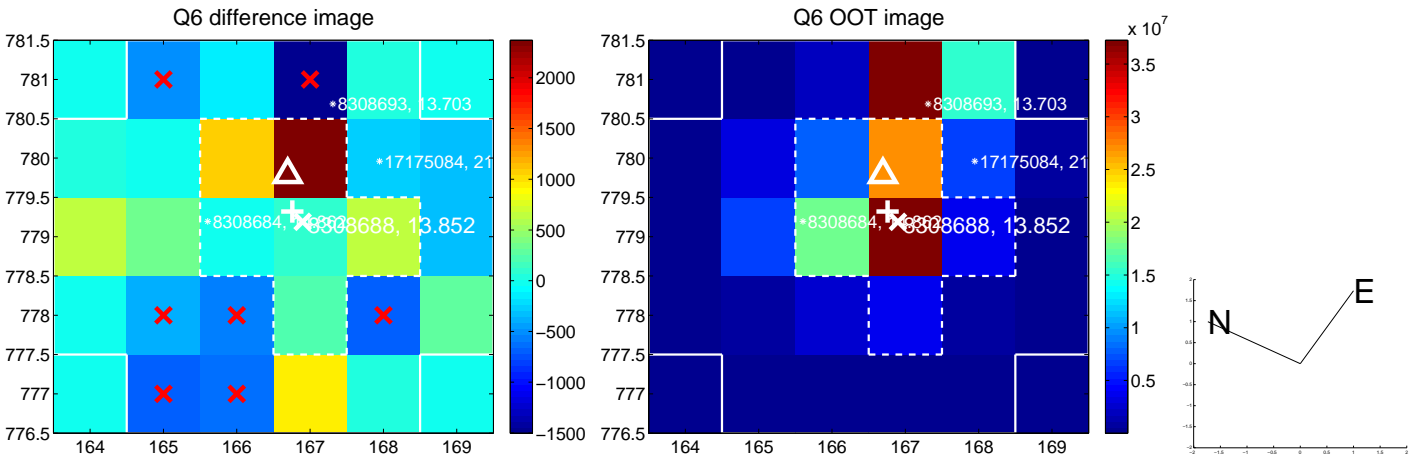
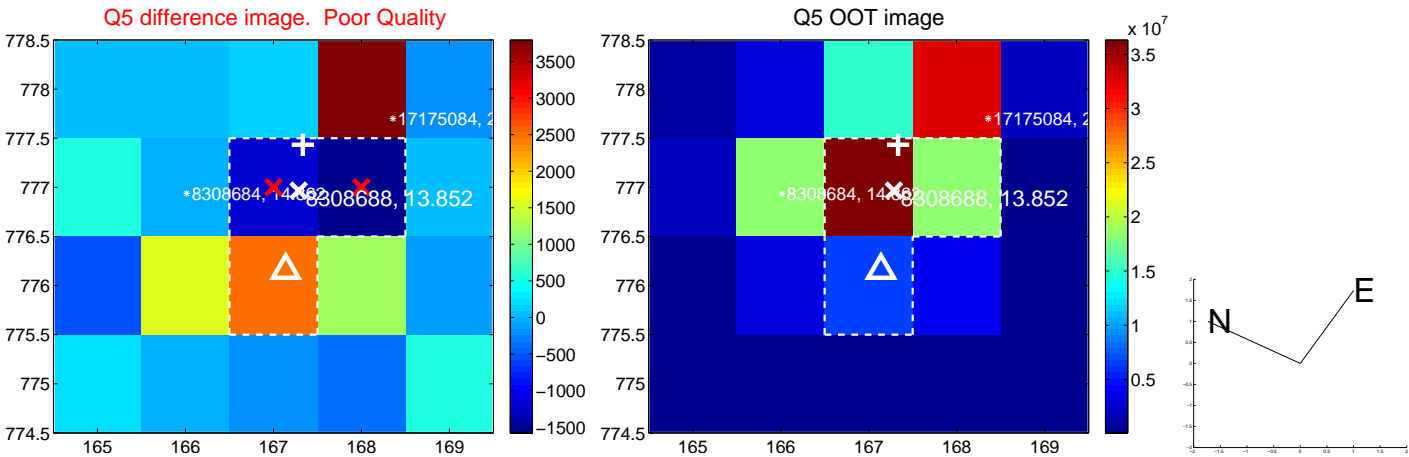


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

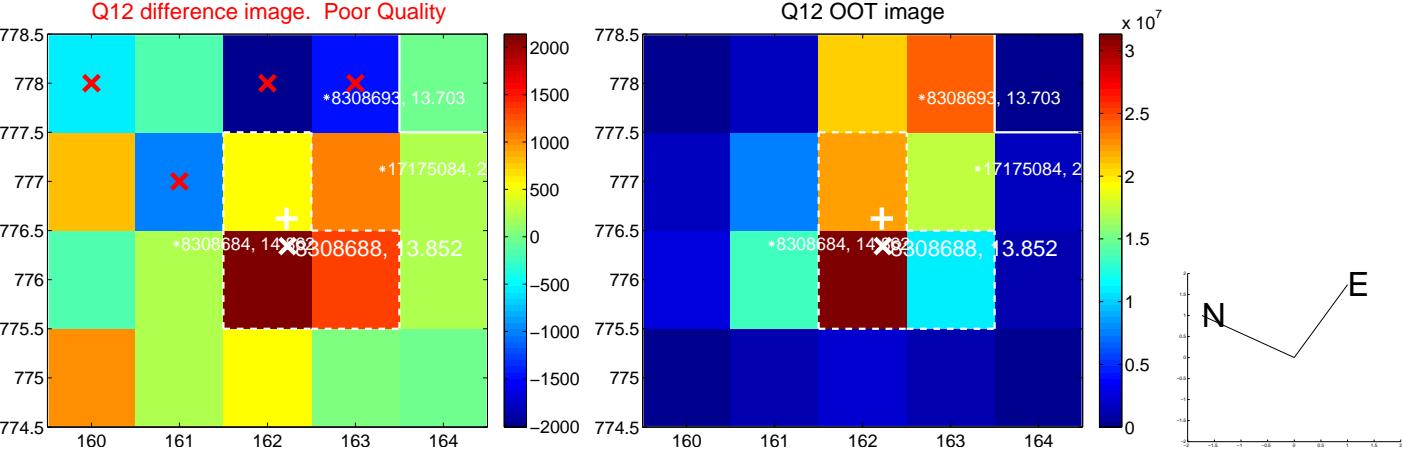
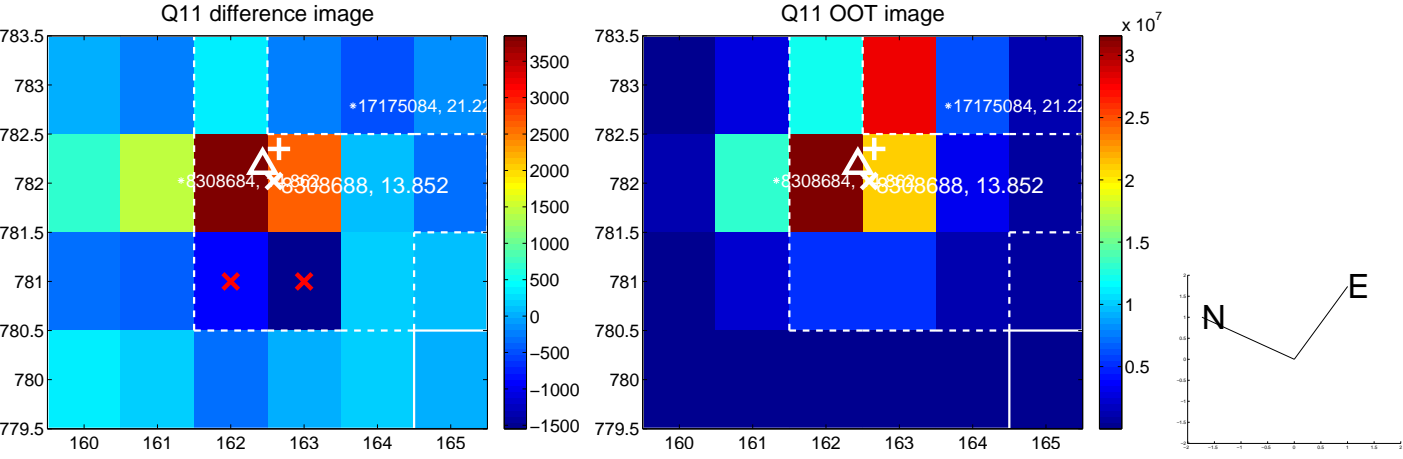
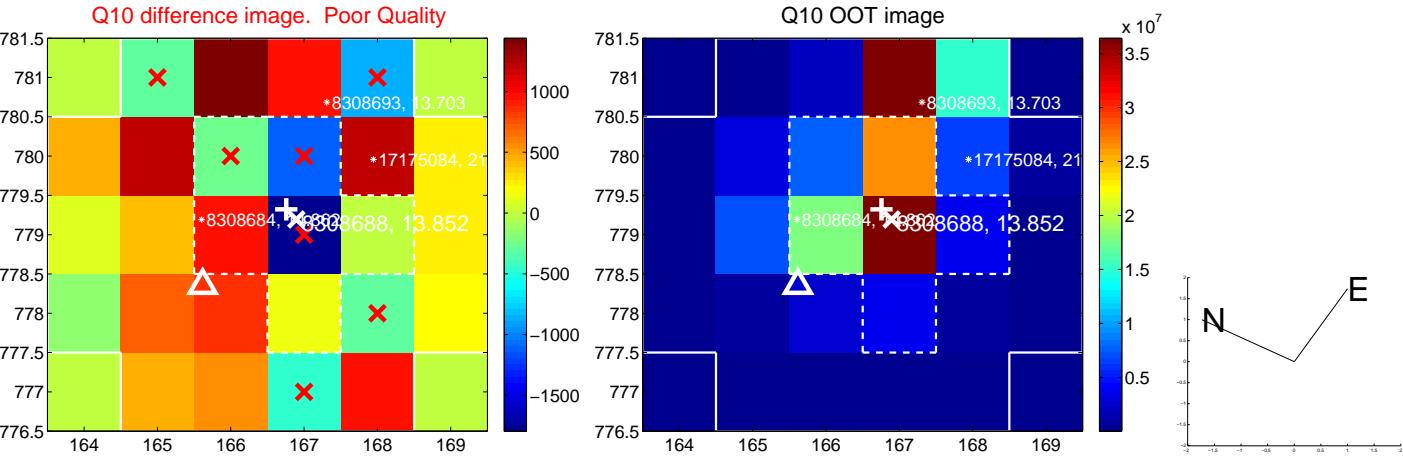
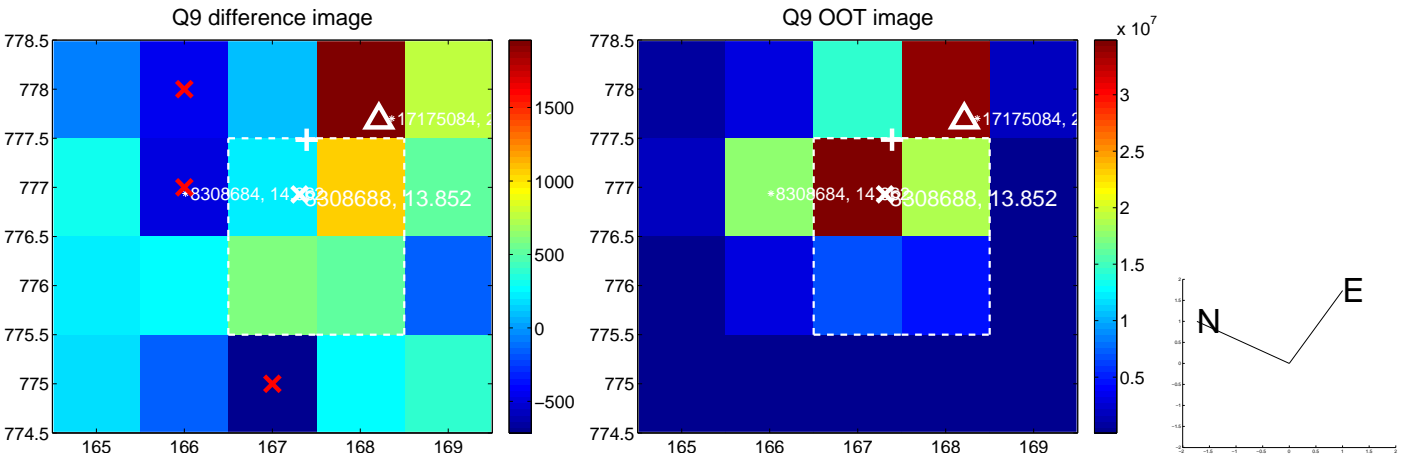


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

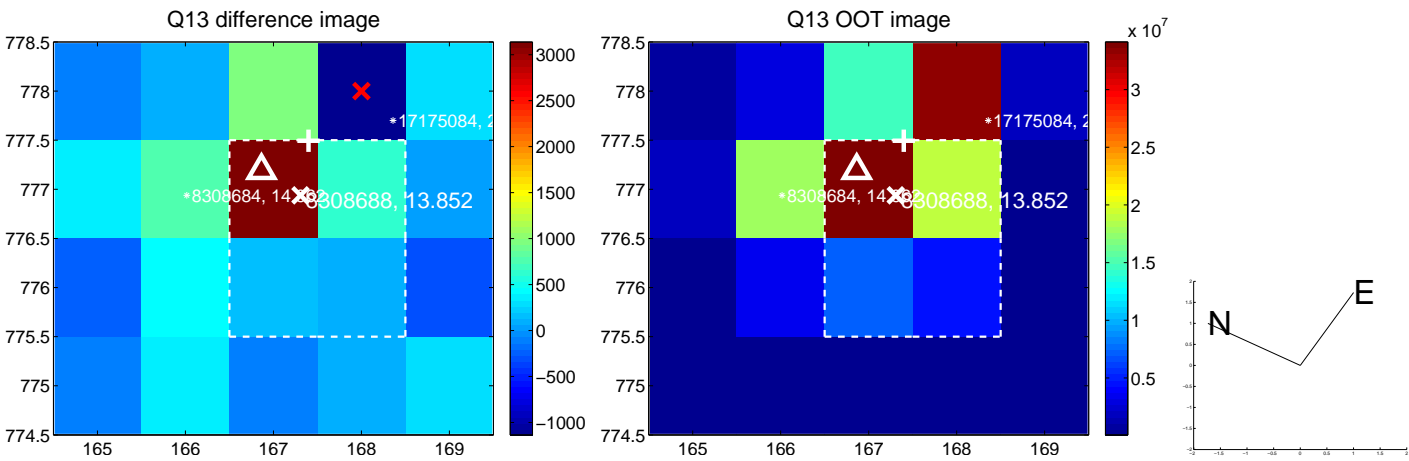




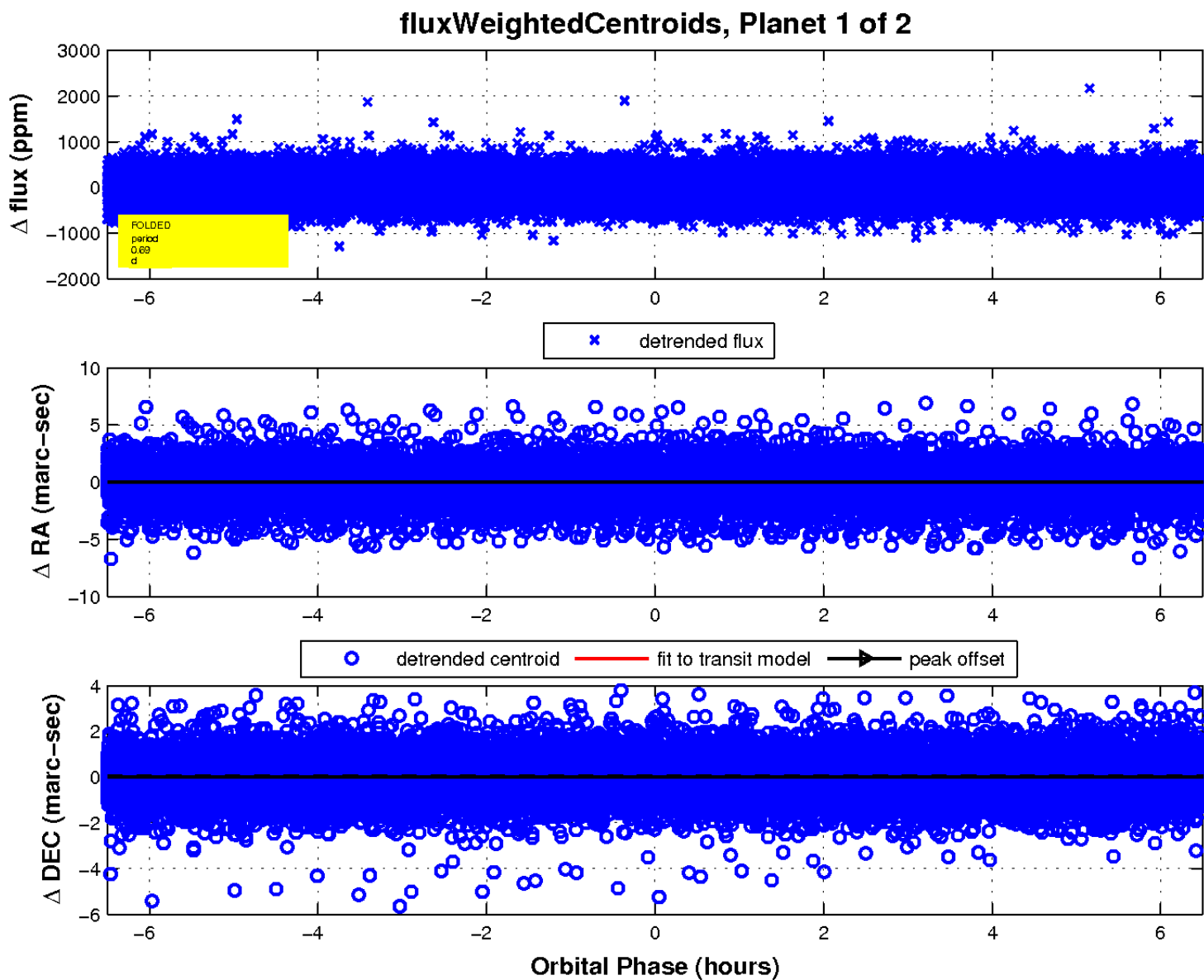
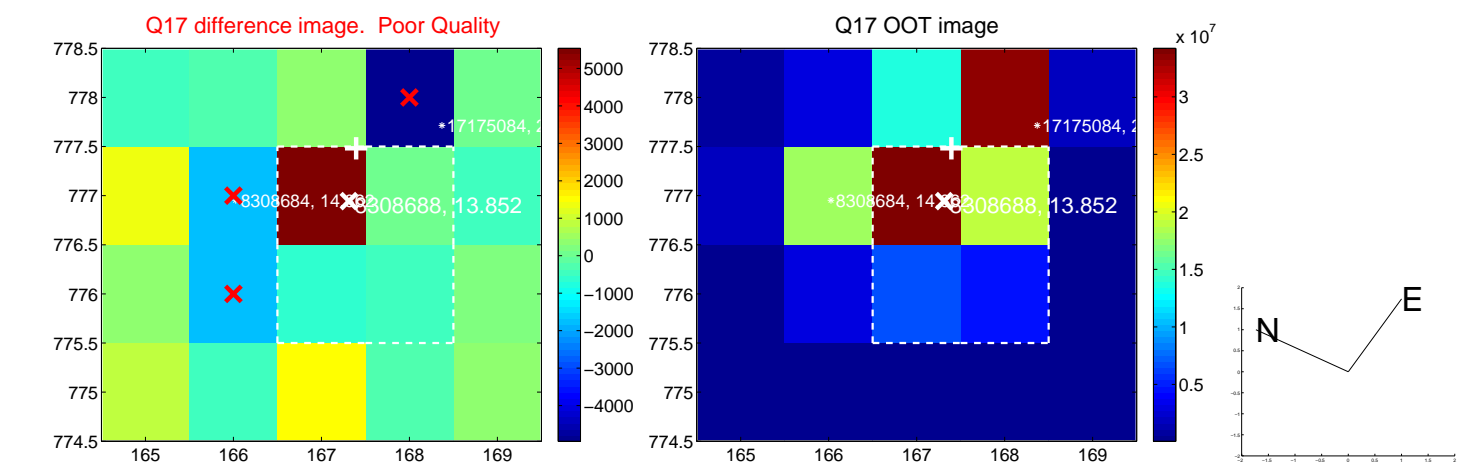
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



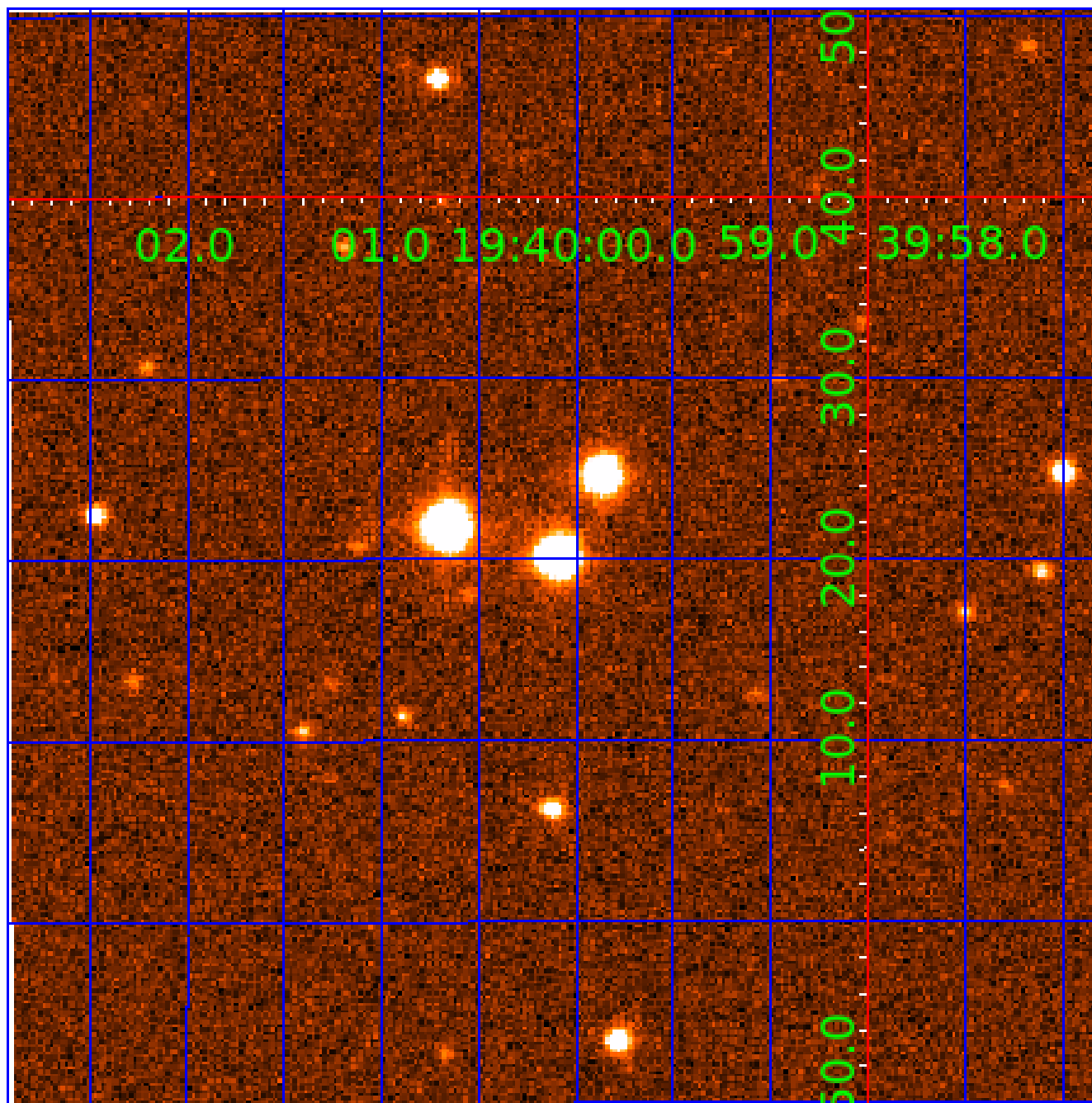
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



## UKIRT Image





# KIC 008308688

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008308688-01	OBS	No	0.692303	131.662881	22.1	2.167	8.3	7.1	2.22	7981	1.21	51100.81
008308688-02	OBS	No	1.201064	132.498427	17.0	10.860	8.1	5.9	2.22	7981	0.93	24513.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008308688-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
008308688-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

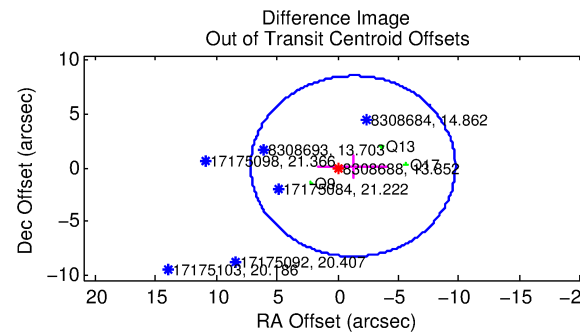
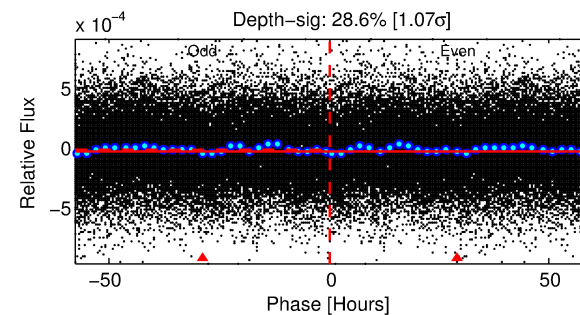
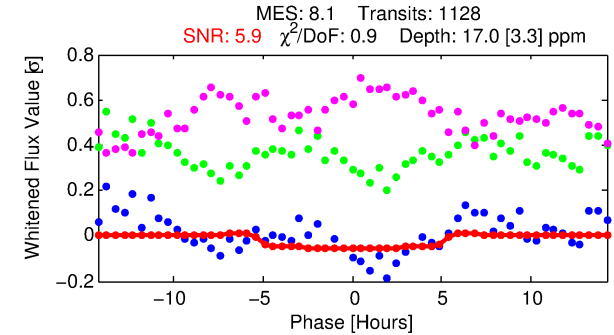
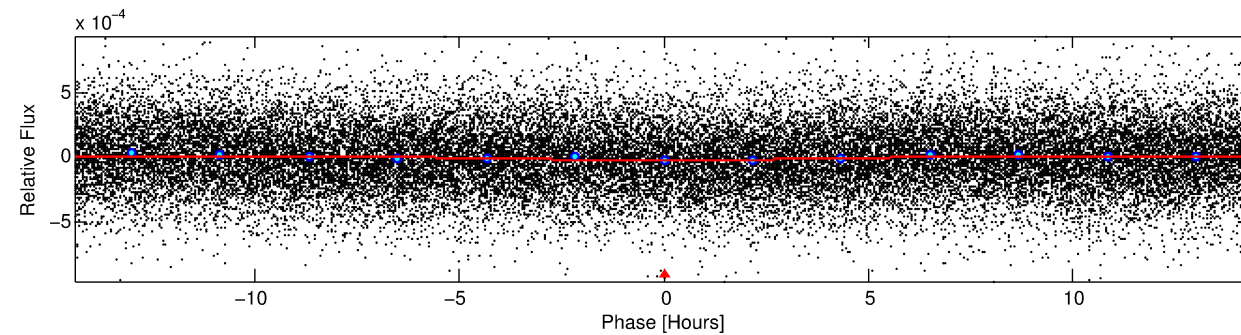
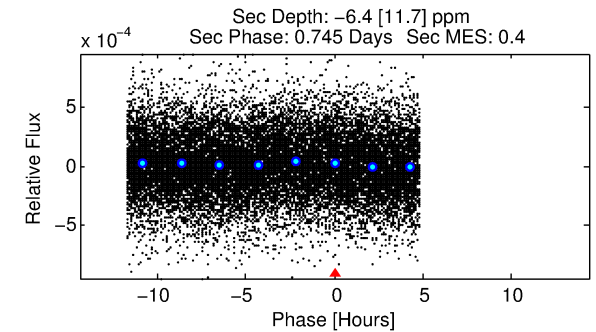
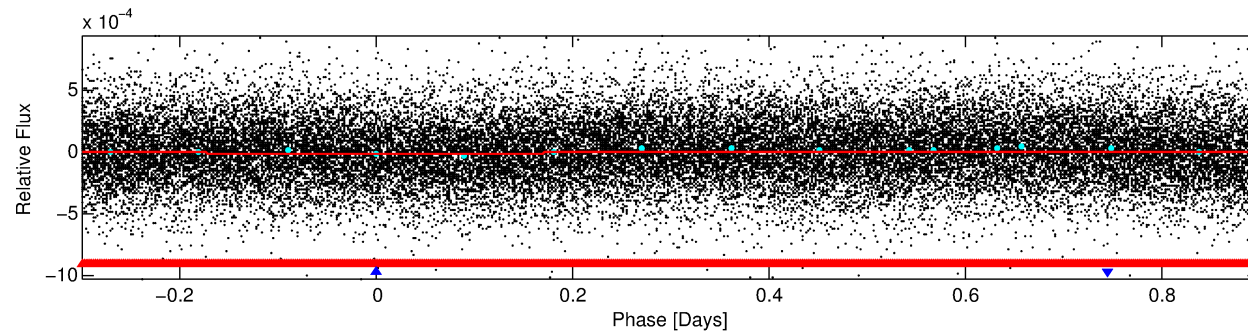
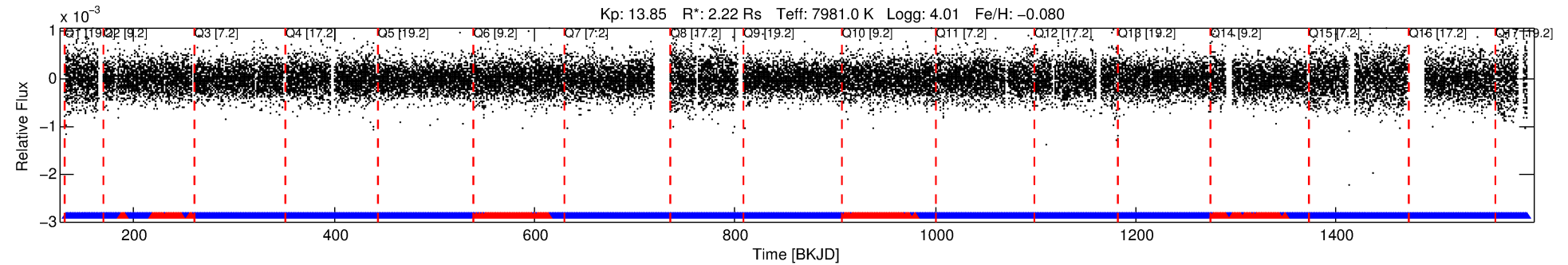
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008308688-02

No Significant Match Found

# DV One-Page Summary

KIC: 8308688 Candidate: 2 of 2 Period: 1.201 d



## DV Fit Results:

Period = 1.20106 [0.00004] d  
Epoch = 132.4984 [0.0140] BKJD  
Rp/R\* = 0.0038 [0.0072]  
a/R\* = 1.08 [1.78]  
b = 0.05 [235.31]  
Seff = 24513.27 [10169.57]  
Teff = 3191 [331] K  
Rp = 0.93 [1.77] Re  
a = 0.0270 [0.0068] AU  
Ag = N/A  
Teffp = N/A

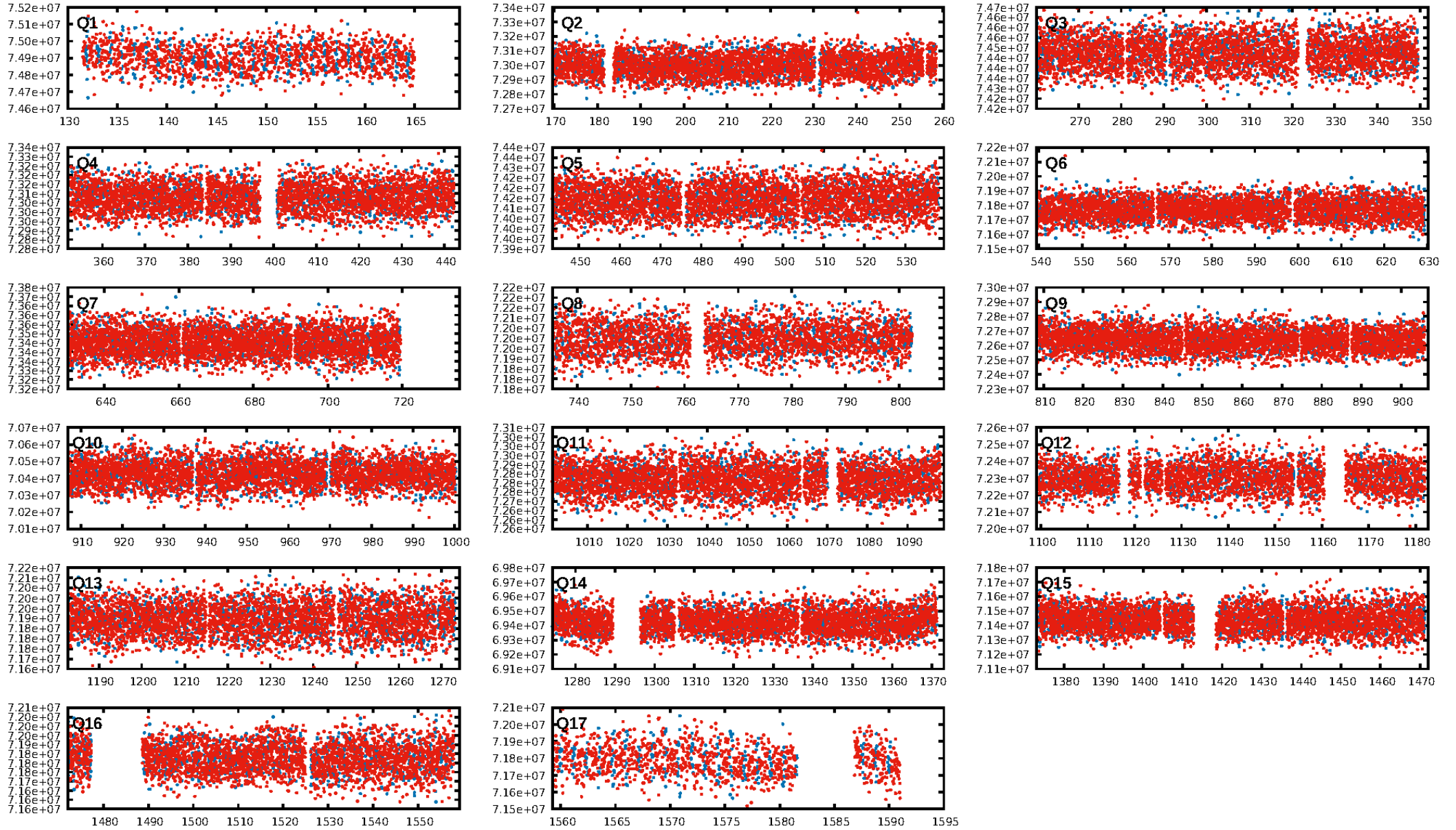
## DV Diagnostic Results:

ShortPeriod-sig: 73.0% [1.10σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.84 [902/1076]  
GhostDiagnostic-chr: 0.3976  
Centroid-sig: 0.0%  
Centroid-so: 1.083 arcsec [1.55σ]  
OotOffset-rm: 1.290 arcsec [0.46σ]  
KicOffset-rm: 1.226 arcsec [0.62σ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:36:23 Z

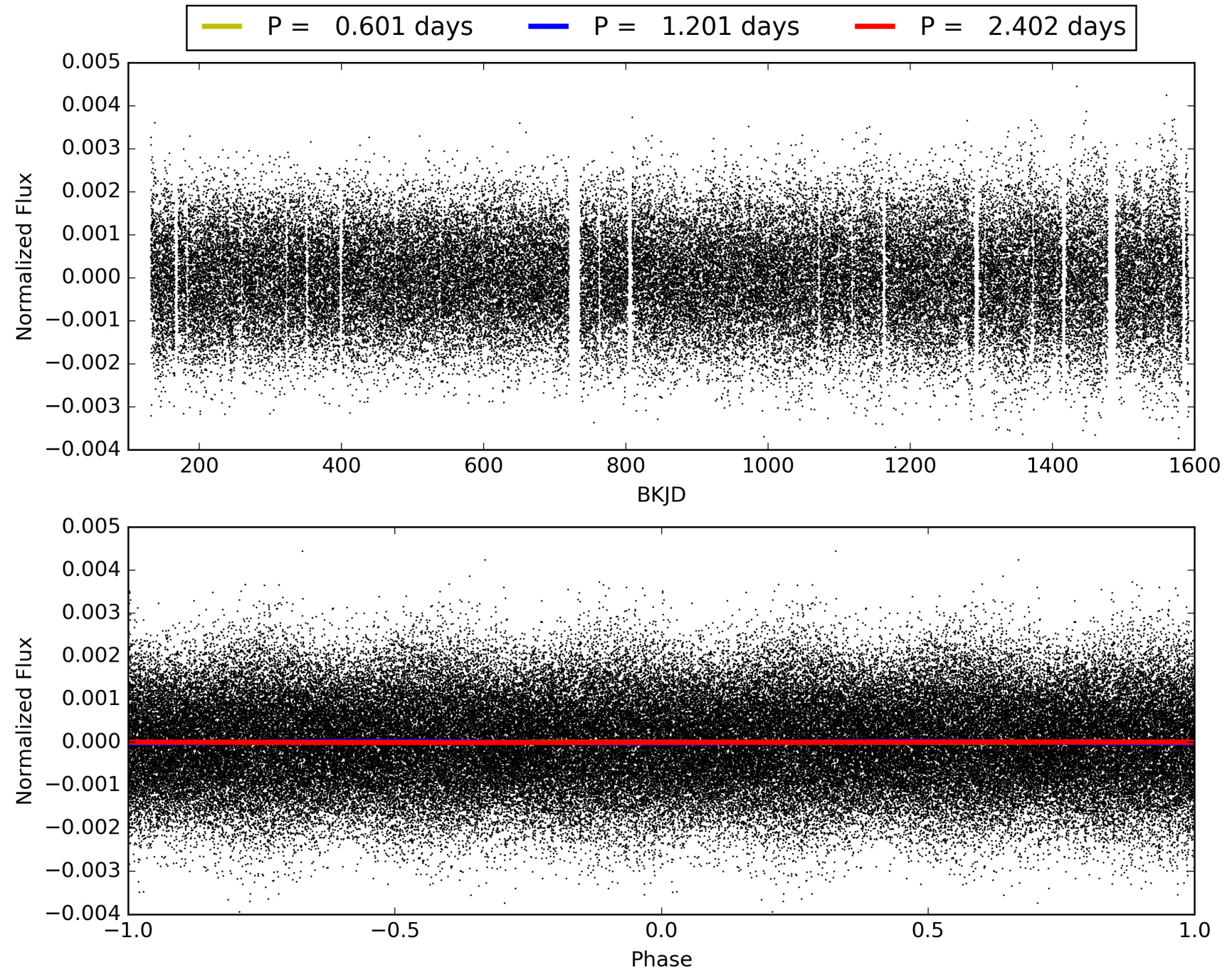
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008308688-02, PDC Light Curves





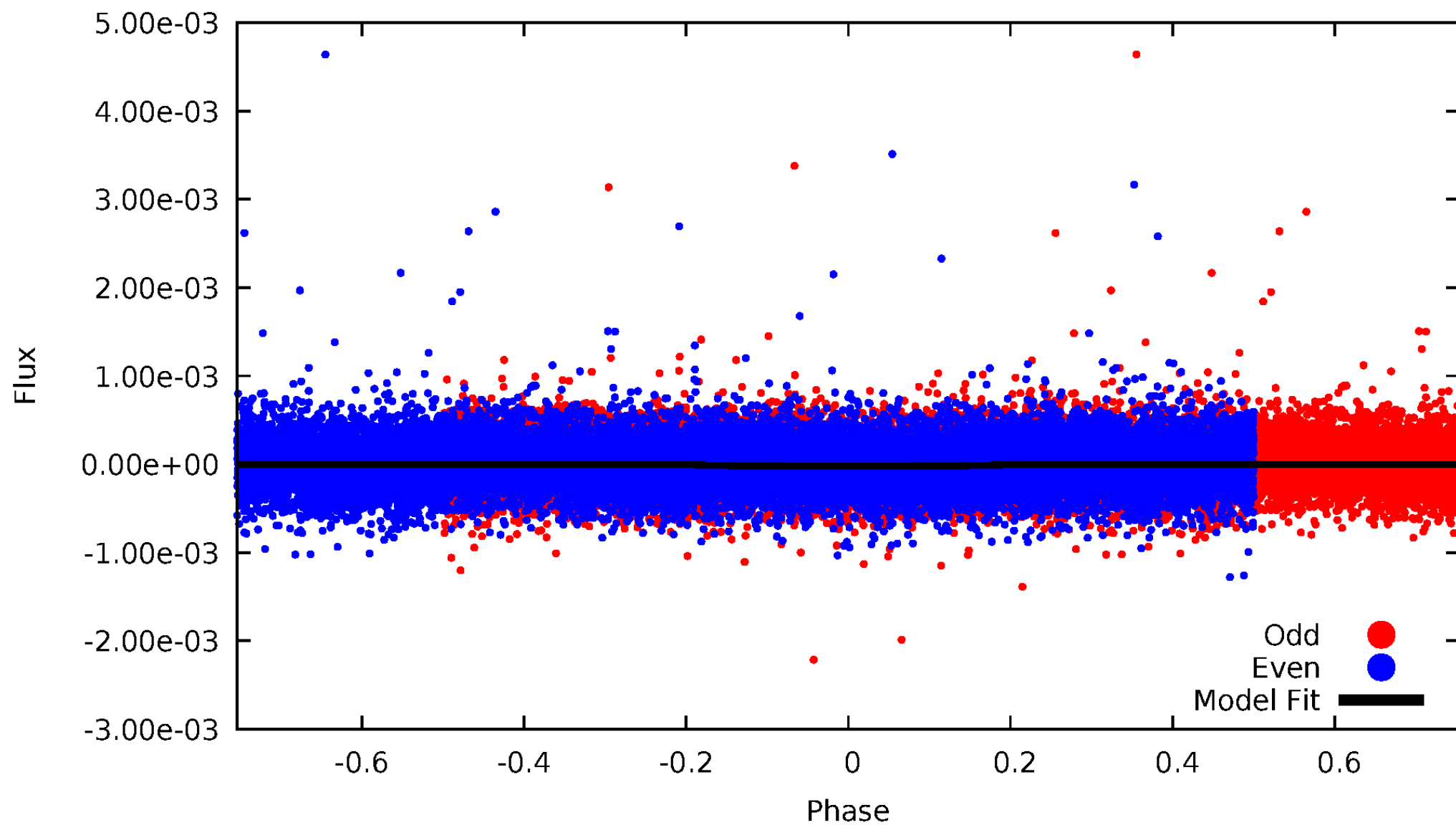
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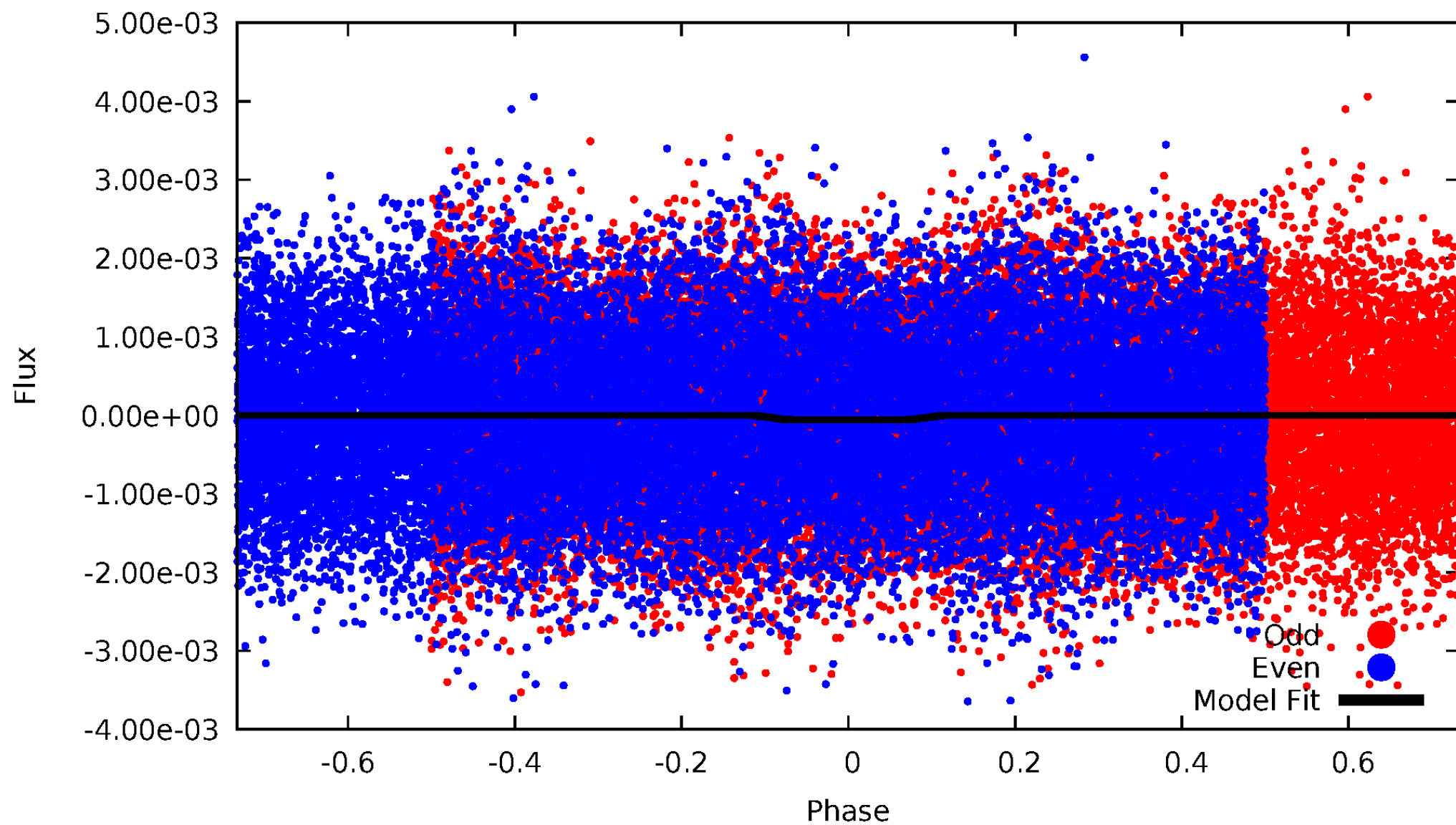
# DV Odd/Even

TCE 008308688-02



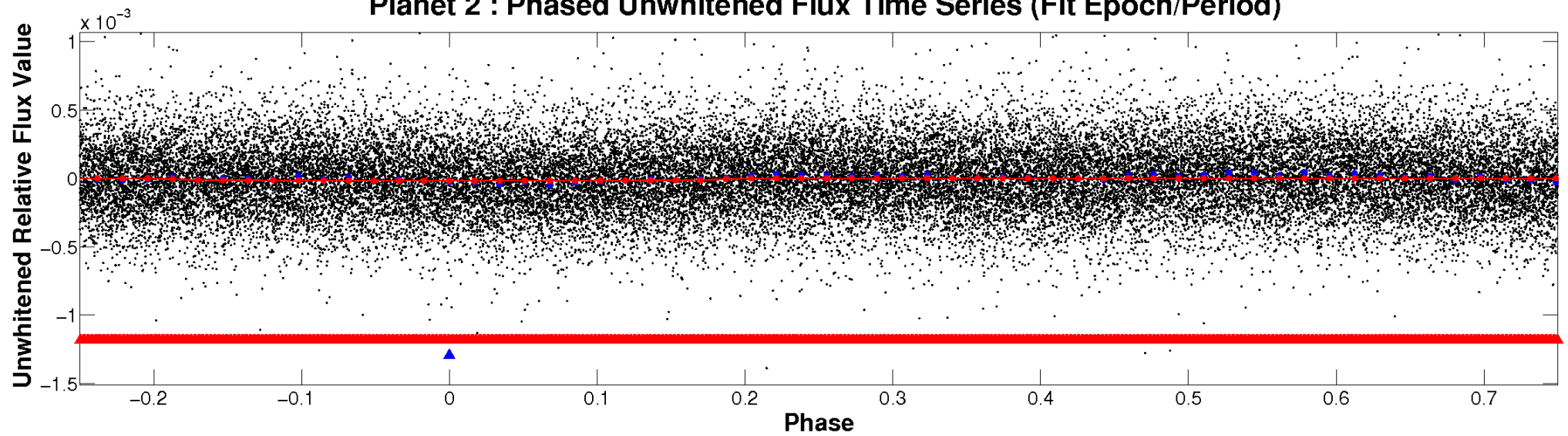
# ALT Odd/Even

TCE 008308688-02

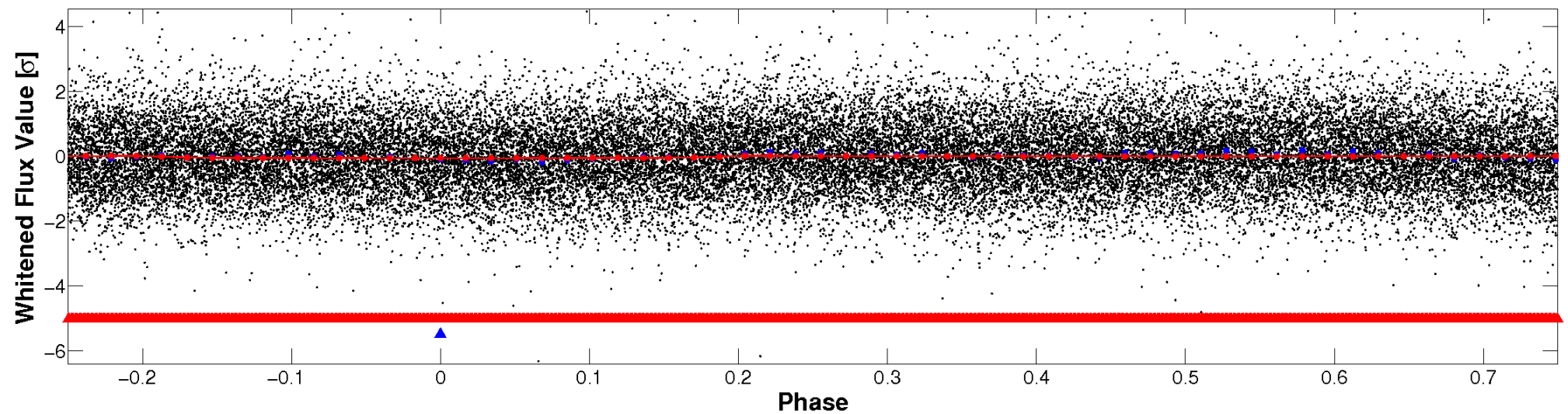


# Non-Whitened Vs. Whitened Light Curve

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

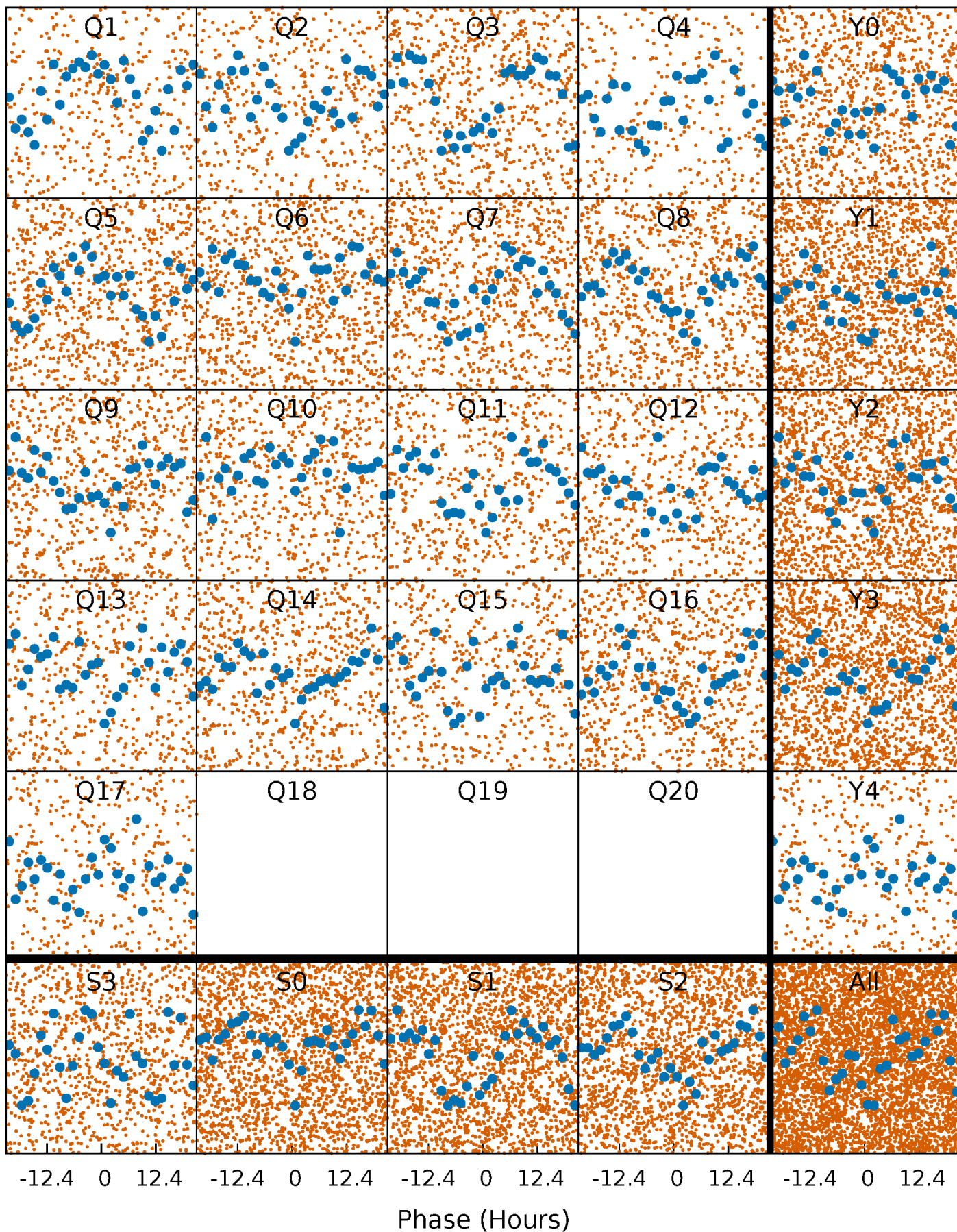


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

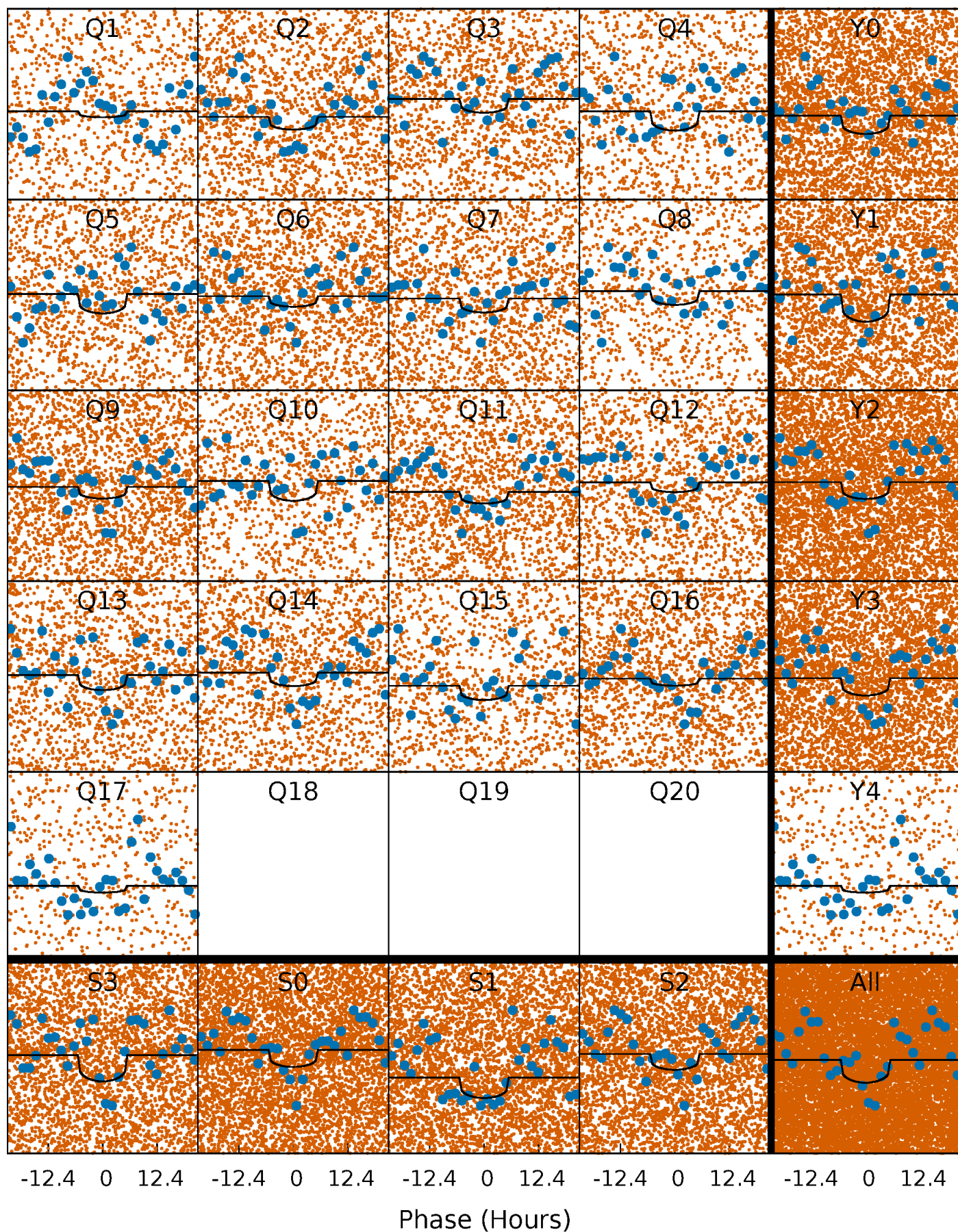
TCE 008308688-02 P= 1.201064 Days  $T_0=132.498427$  (BKJD)





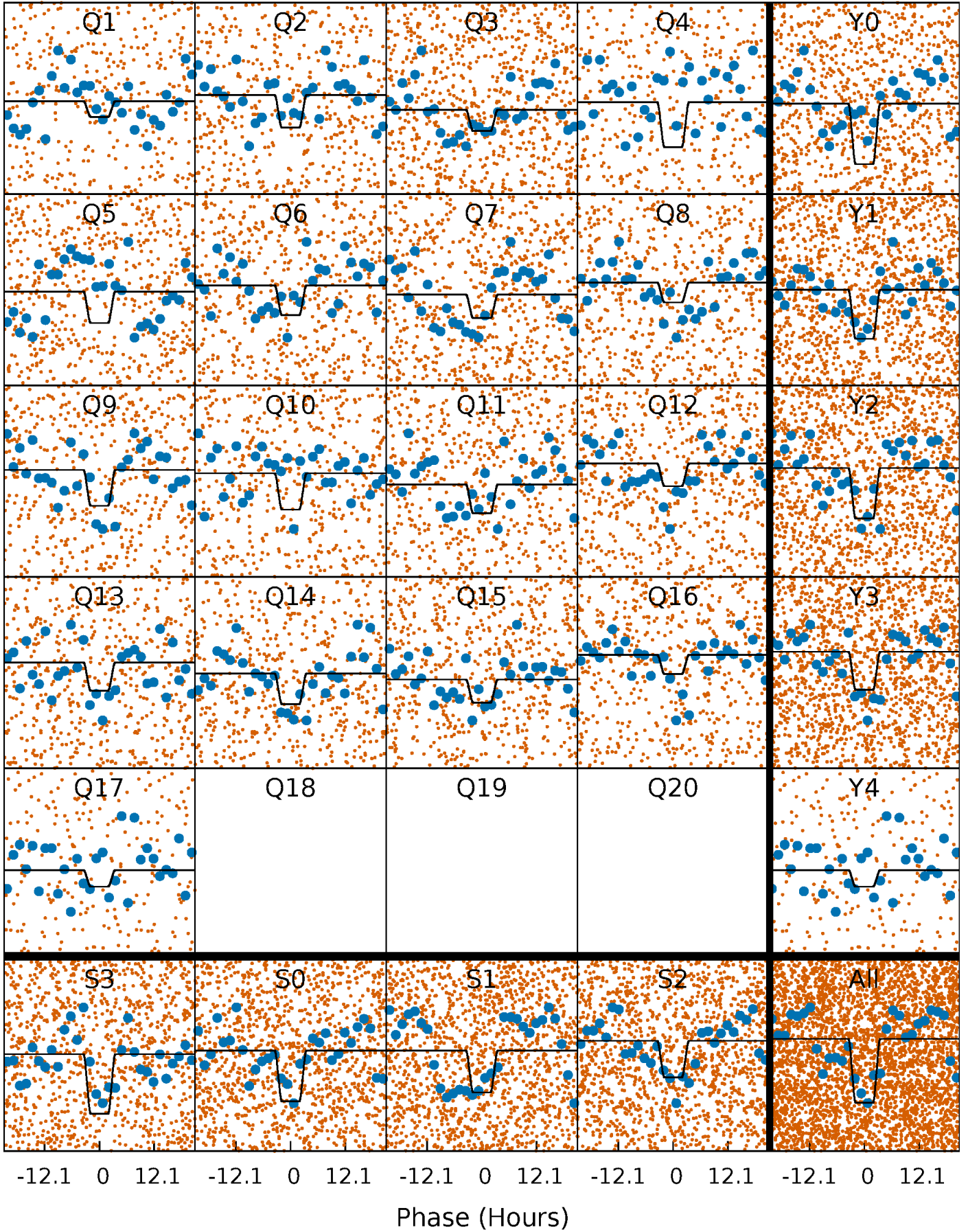
# DV Quarter-Phased Transit Curves

TCE 008308688-02   P= 1.201064 Days    $T_0=132.498427$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008308688-02 P= 1.201096 Days  $T_0=132.514919$  (BKJD)

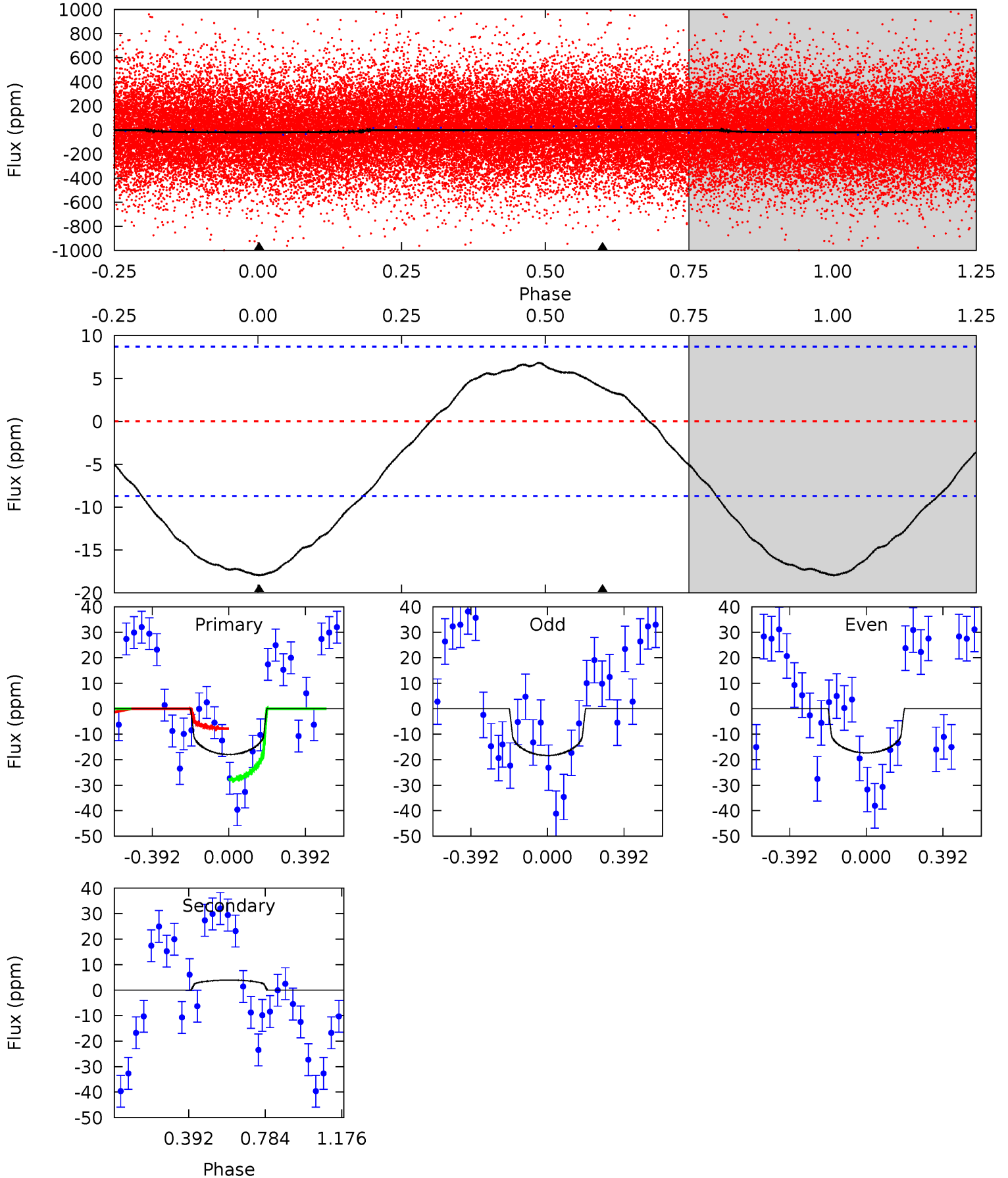




# DV Model-Shift Uniqueness Test

008308688-02, P = 1.201064 Days, E = 131.297363 Days

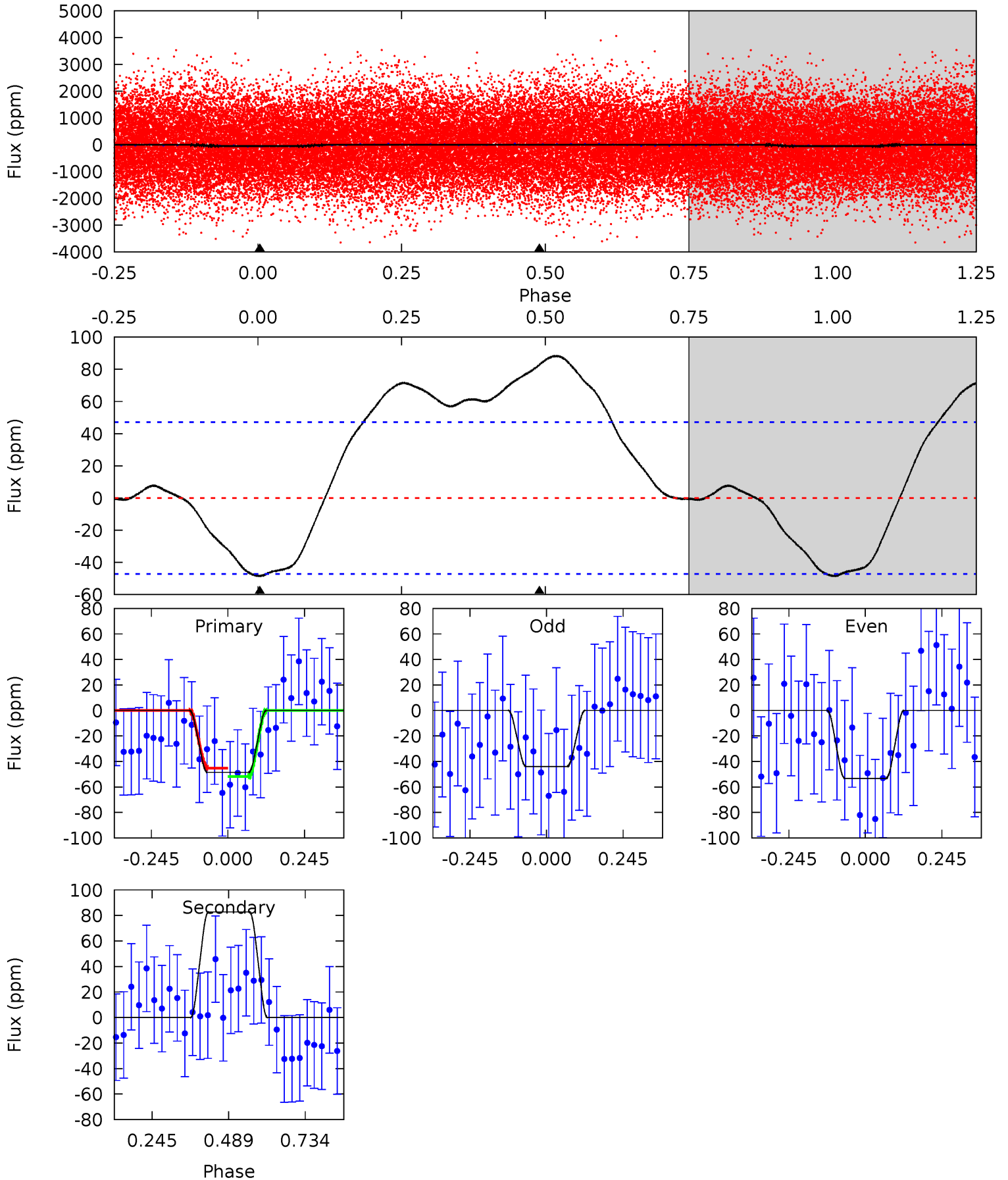
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.79	-1.92	0	0	4.27	0.86	0.96	8.79	8.79	-1.92	-1.92	0.25	1.06	0.28	5.00



# Alt Model-Shift Uniqueness Test

008308688-02, P = 1.201096 Days, E = 131.313823 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
4.50	-7.67	0	0	4.37	1.16	3.15	4.50	4.50	-7.67	-7.67	0.43	1.31	0.65	0.30



### Stellar Parameters For KIC 008308688

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7981^{+221}_{-331}$	$4.007^{+0.214}_{-0.132}$	$-0.080^{+0.200}_{-0.350}$	$2.221^{+0.425}_{-0.638}$	$1.827^{+0.114}_{-0.363}$	$0.235^{+0.271}_{-0.094}$
	+3%/-4%	+5%/-3%	+250%/-438%	+19%/-29%	+6%/-20%	+115%/-40%
Source	KIC0	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 008308688-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$4 \pm 2$	$1.66^{+1.38}_{-1.15}$	$4432^{+280}_{-336}$	$-4649^{+549}_{-2443}$	$-0.488^{+0.379}_{-4.088}$
Alt.	$83 \pm 11$	$2.09^{+1.57}_{-1.29}$	$4414^{+318}_{-315}$	$-8133^{+2144}_{-9204}$	$-7.422^{+5.065}_{-42.377}$

$T_{\text{max}}$  = 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

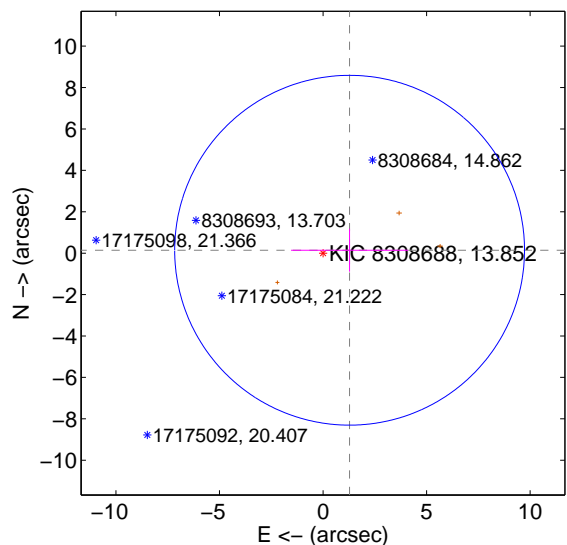
Supplemental centroid analysis for 008308688-02. Kepler magnitude: 13.85. Transit SNR 5.92

There are 0 quarters with good PRF difference image offsets

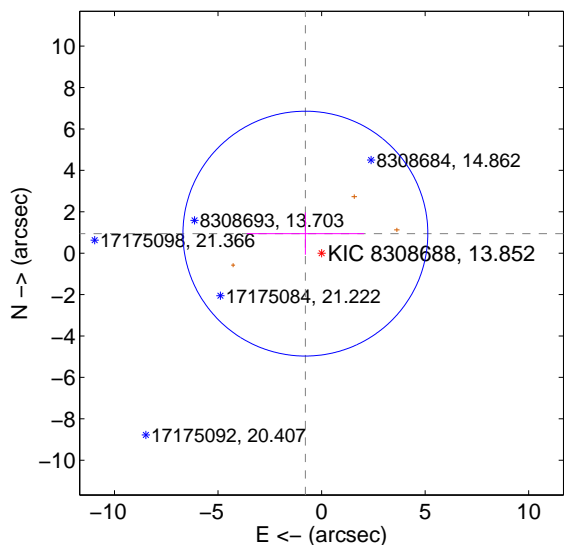
The OOT PRF centroid is offset from the target star catalog position by about 2.16 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.290 \pm 2.816$	0.46	$-1.283 \pm 2.830$	$0.141 \pm 1.037$
PRF-fit source offset from KIC position	$1.226 \pm 1.971$	0.62	$0.782 \pm 2.833$	$0.944 \pm 1.021$
photometric centroid source offset	$1.08 \pm 0.70$	1.55	$-1.08 \pm 0.70$	$-0.08 \pm 0.78$

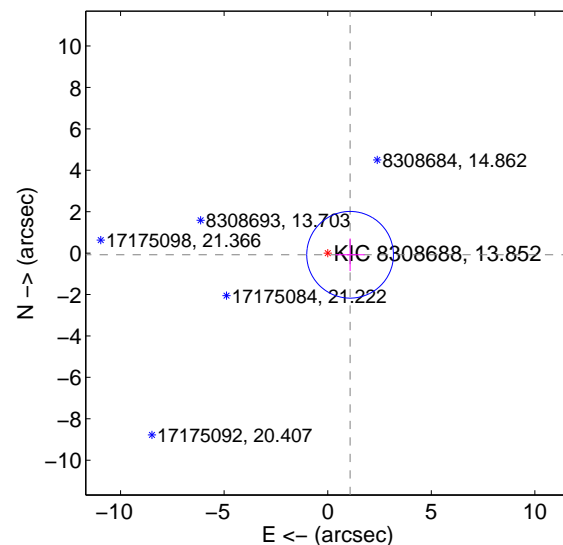
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

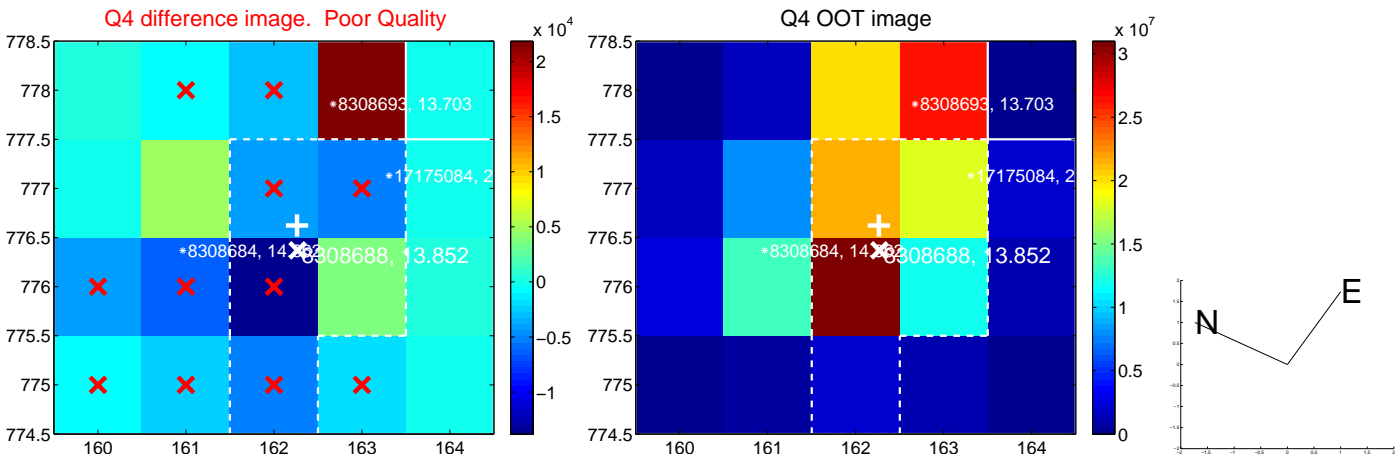
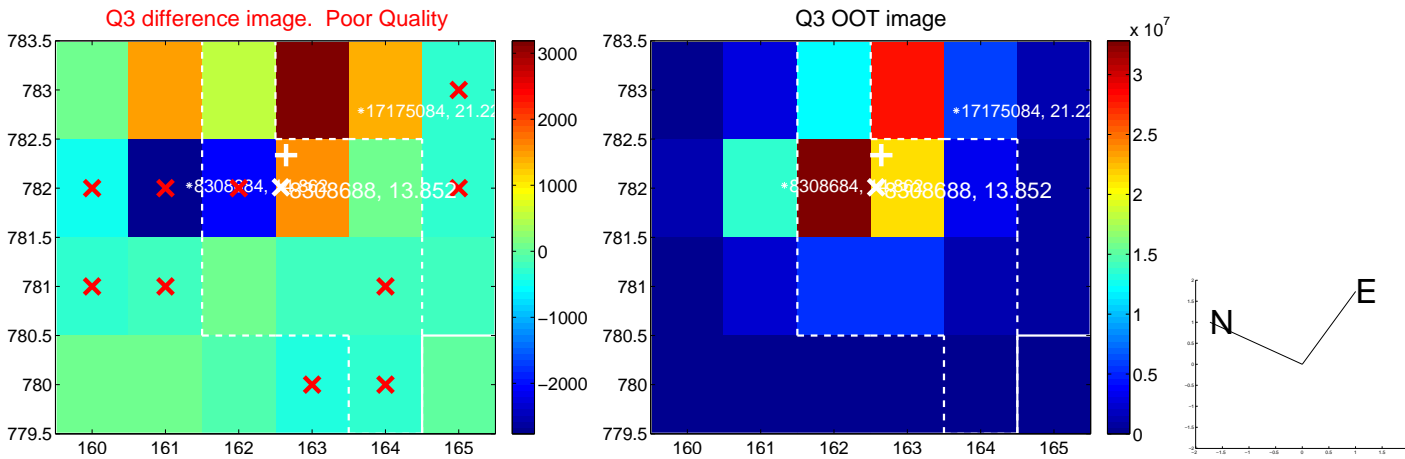
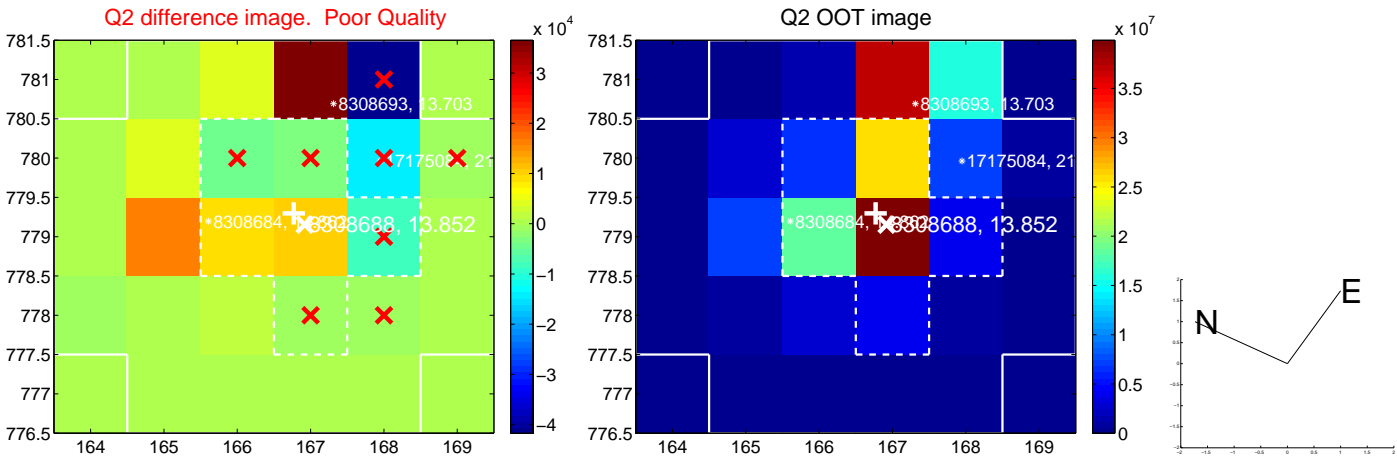
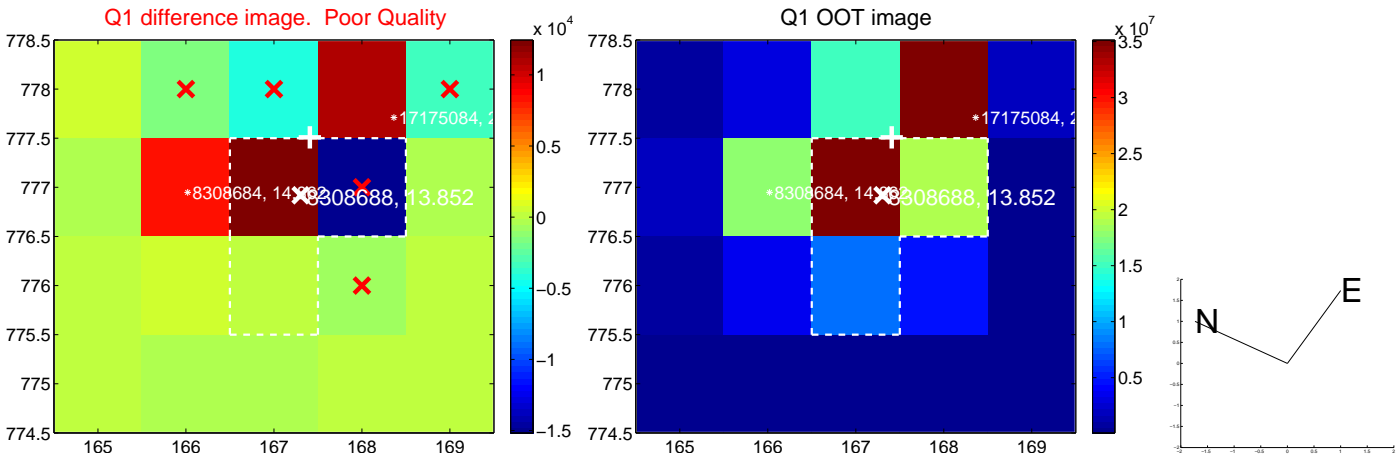


offset from photometric centroids



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.

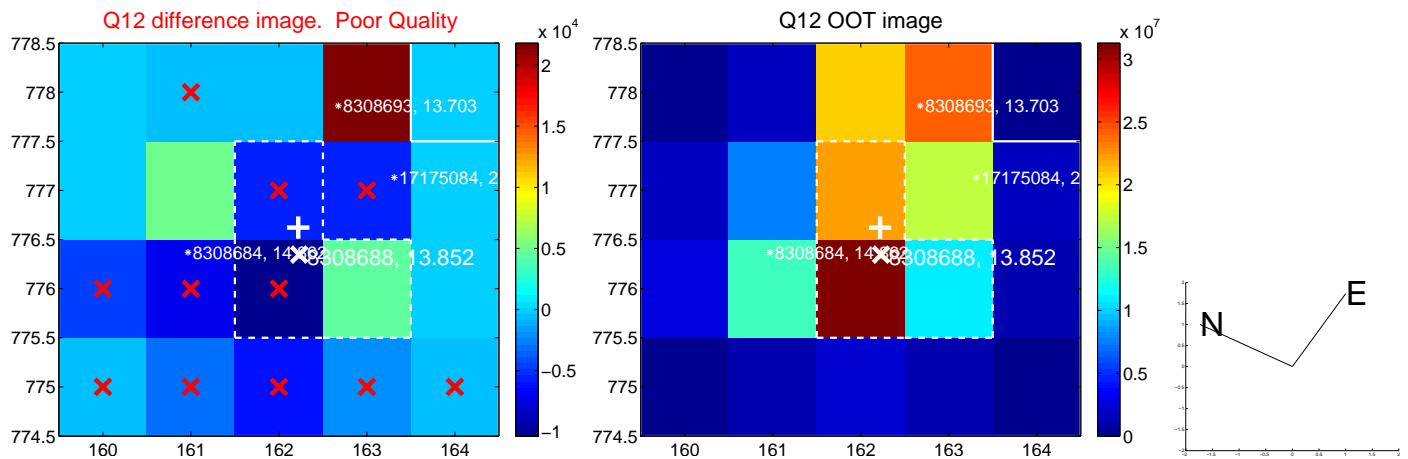
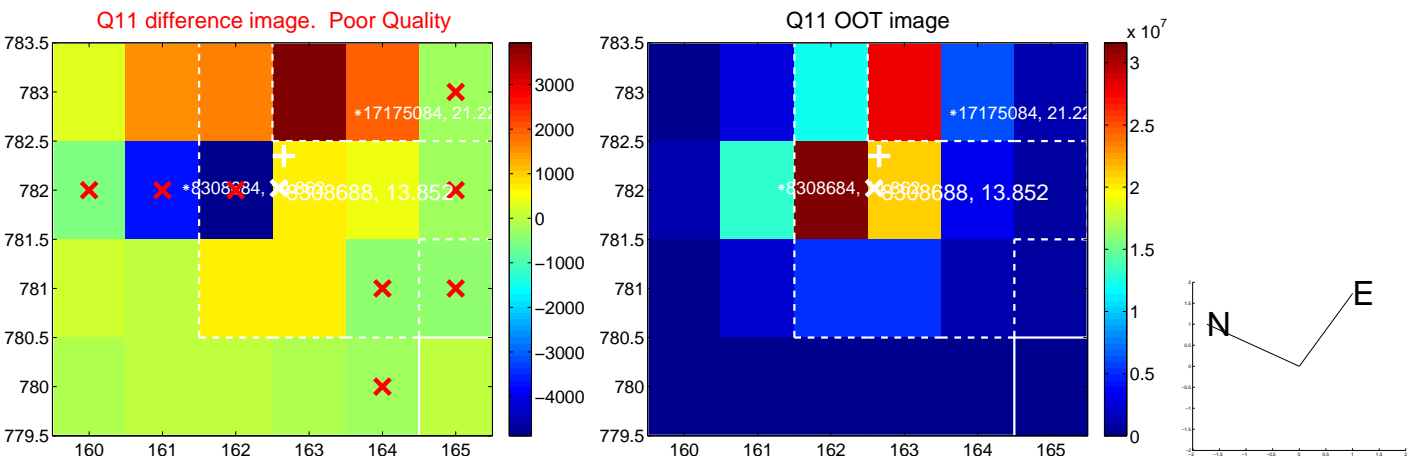
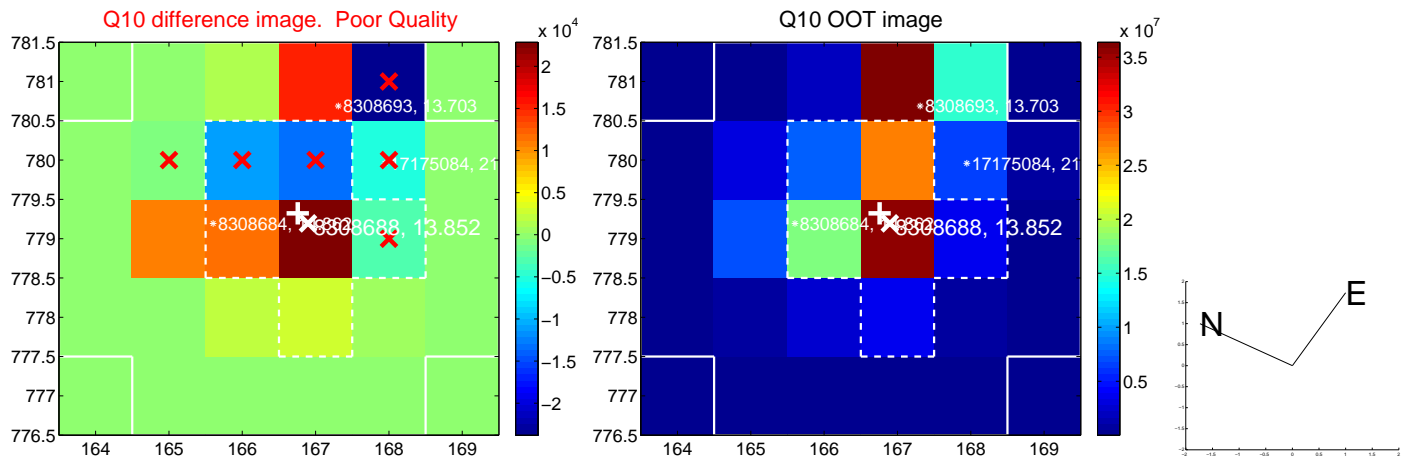
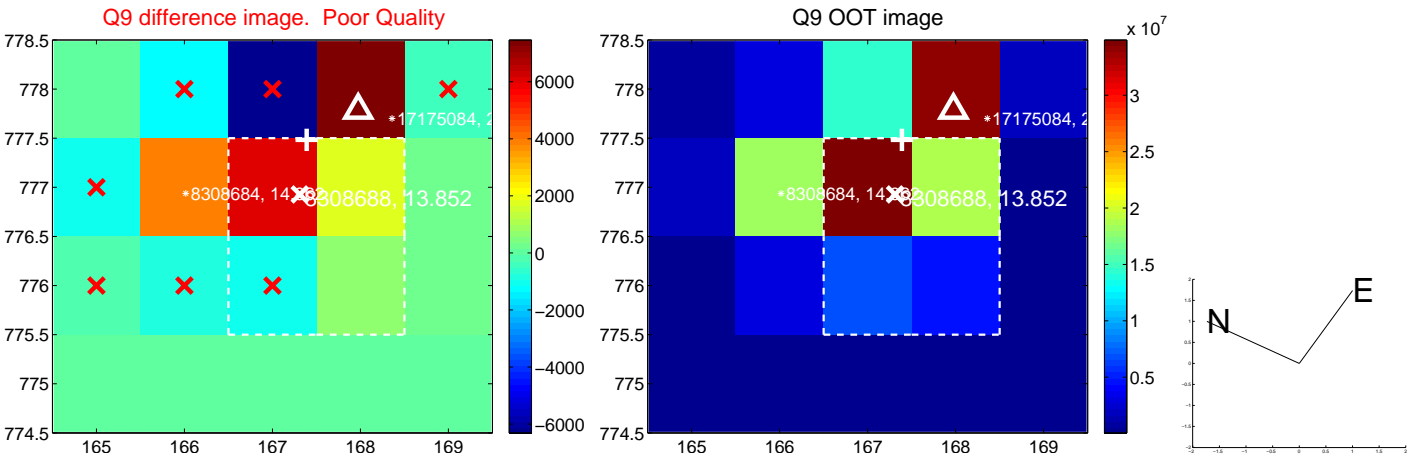
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



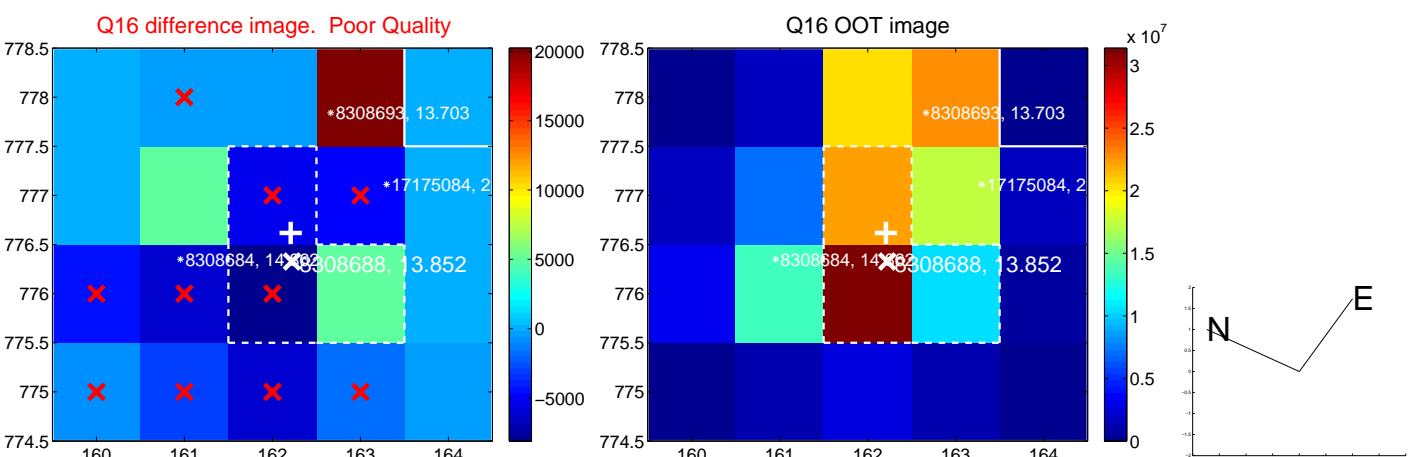
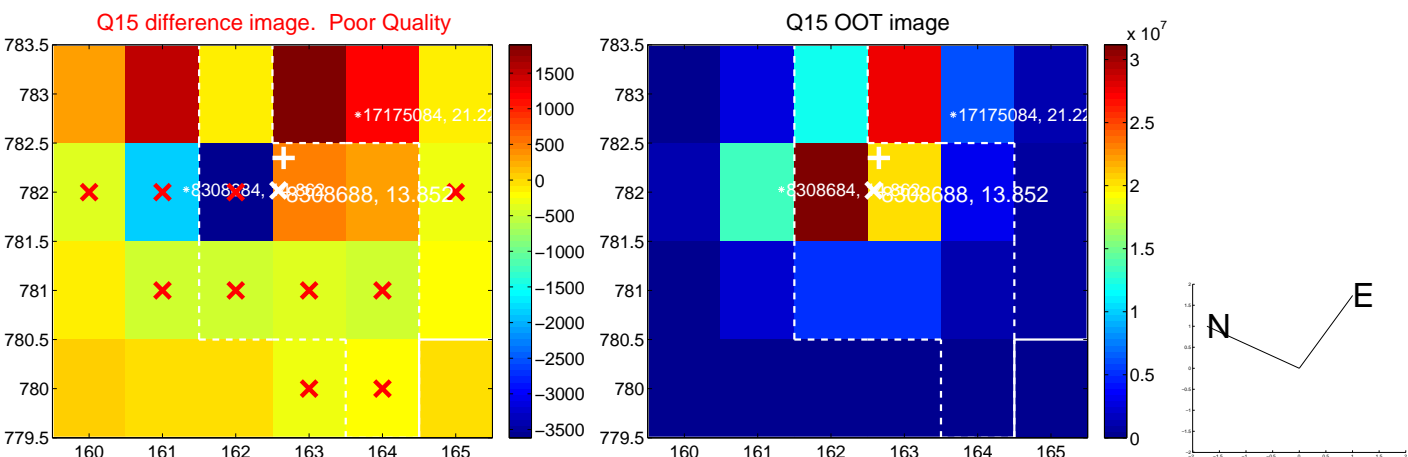
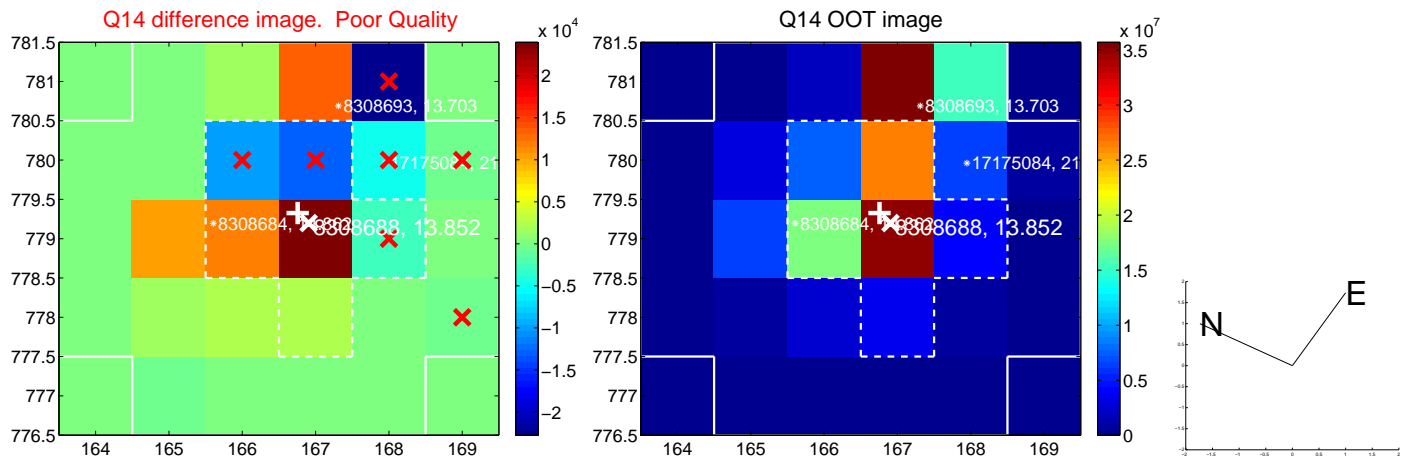
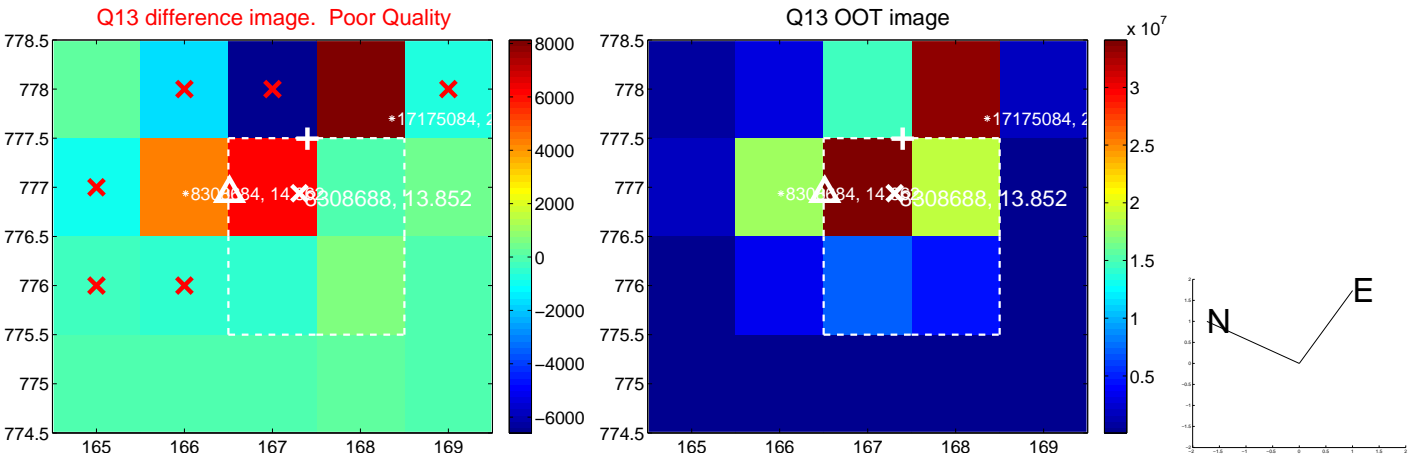




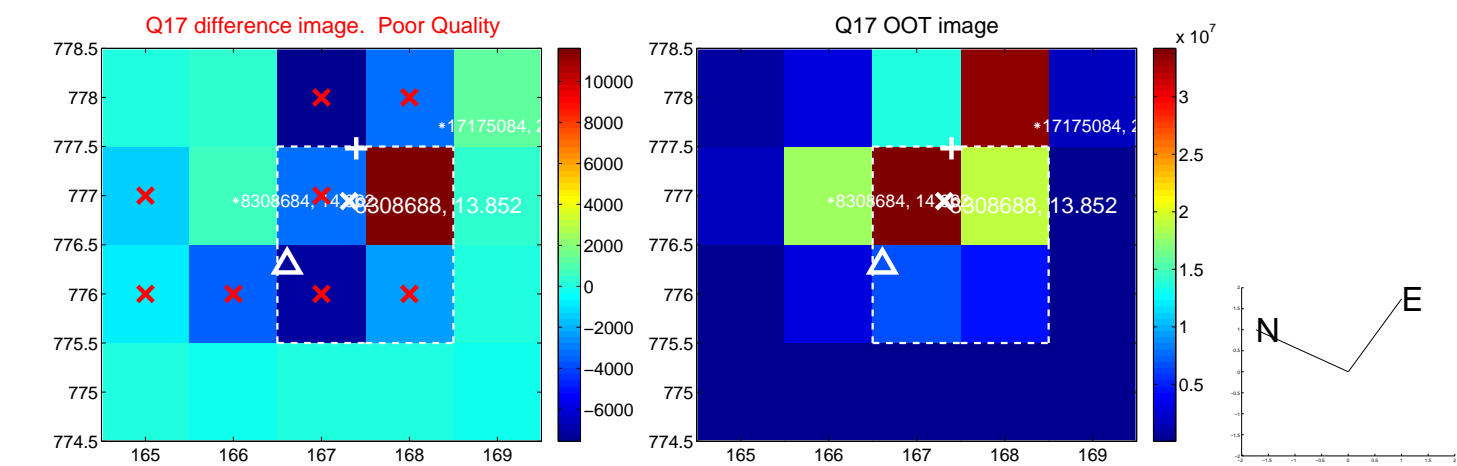
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



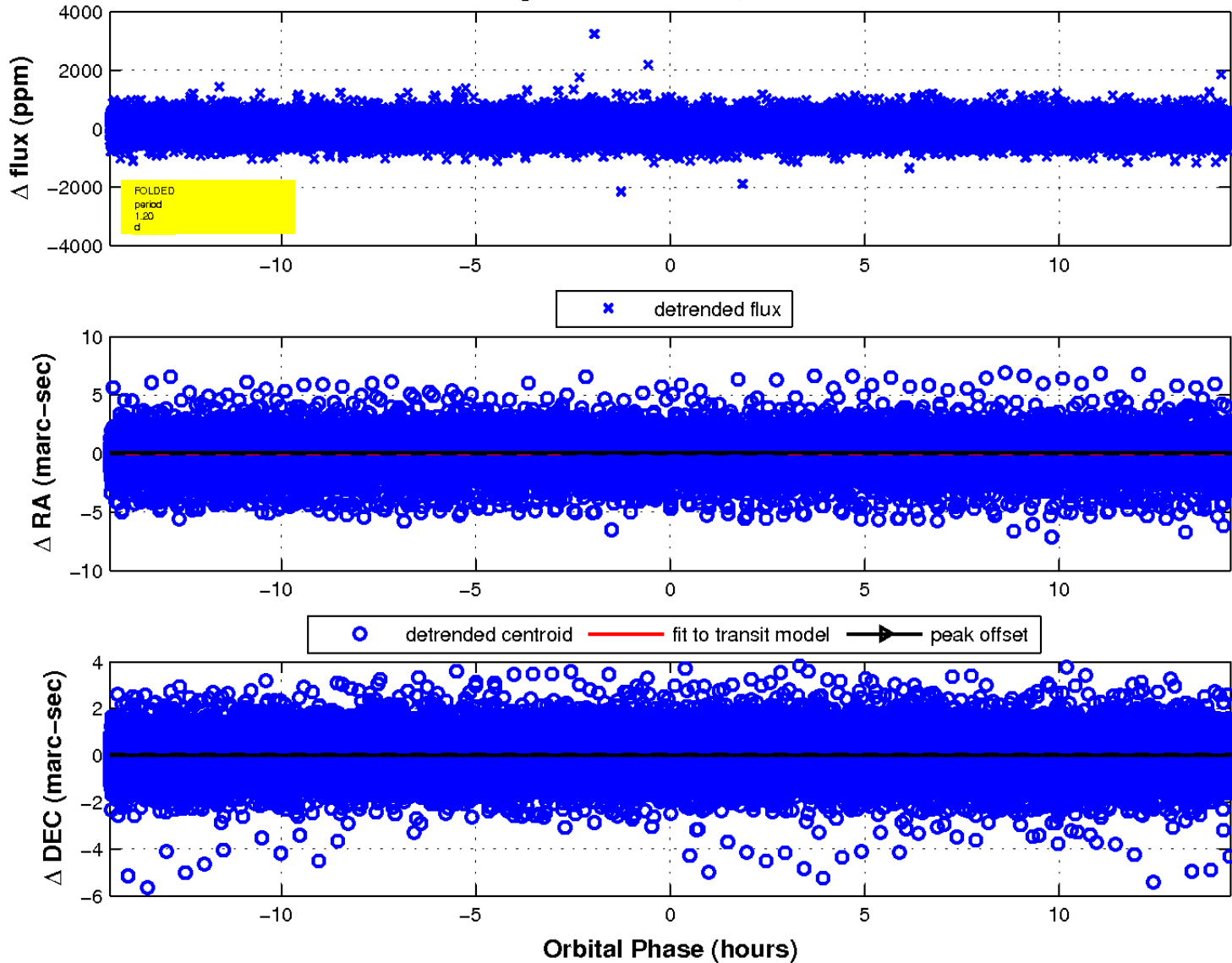
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

