

# KIC 010722668

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010722668-01	OBS	No	0.889102	131.834217	32.8	4.832	9.8	13.0	2.97	7358	1.78	47771.54
010722668-02	OBS	No	159.517169	255.527364	421.0	9.713	8.8	5.7	2.97	7358	6.87	47.21
010722668-03	OBS	No	125.429929	137.583772	326.3	5.045	7.7	5.1	2.97	7358	5.89	65.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010722668-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010722668-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—HALO_GHOST
010722668-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES

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

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

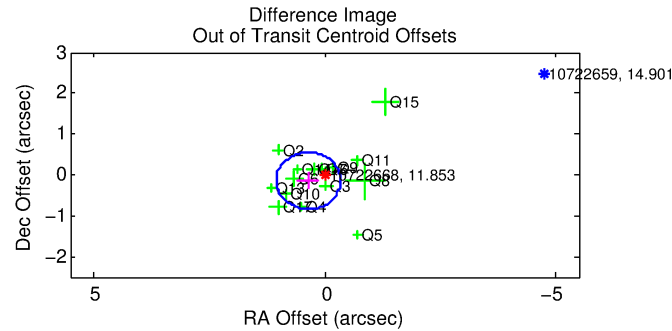
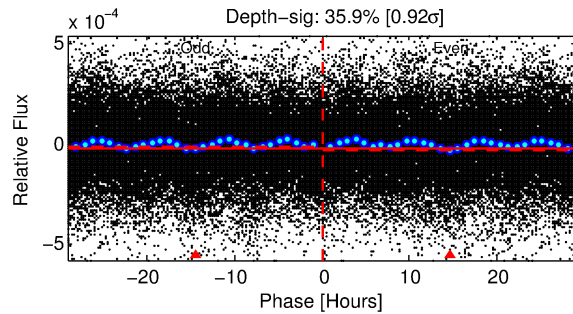
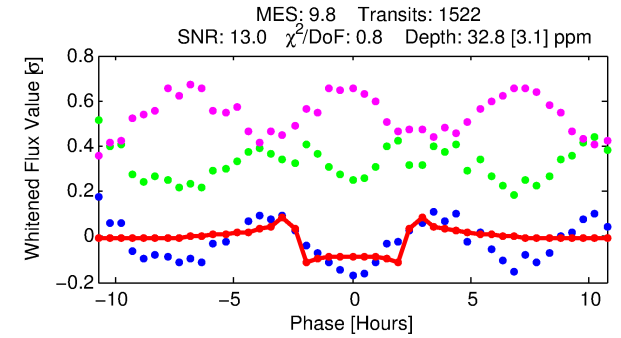
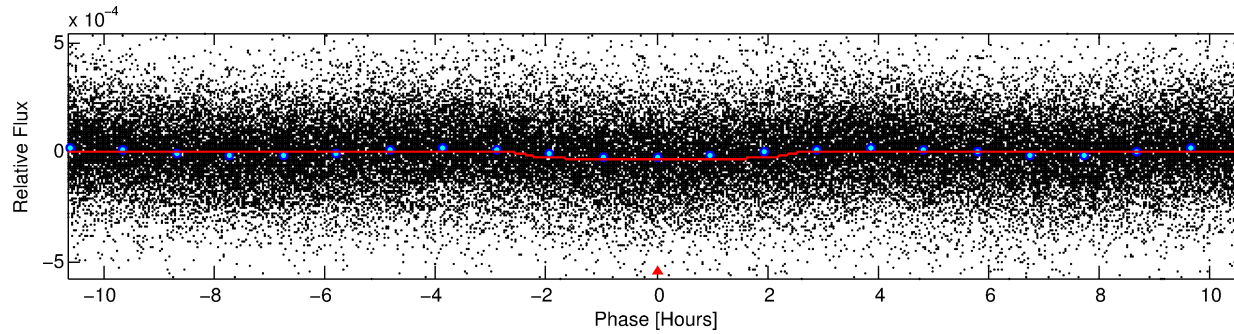
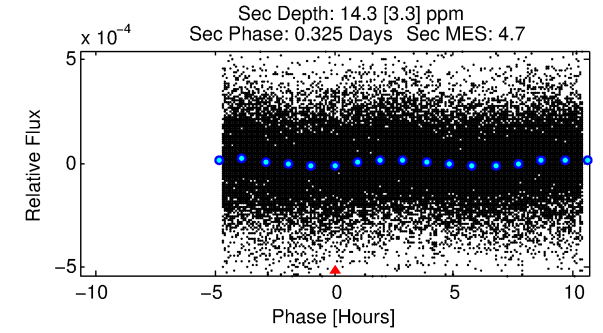
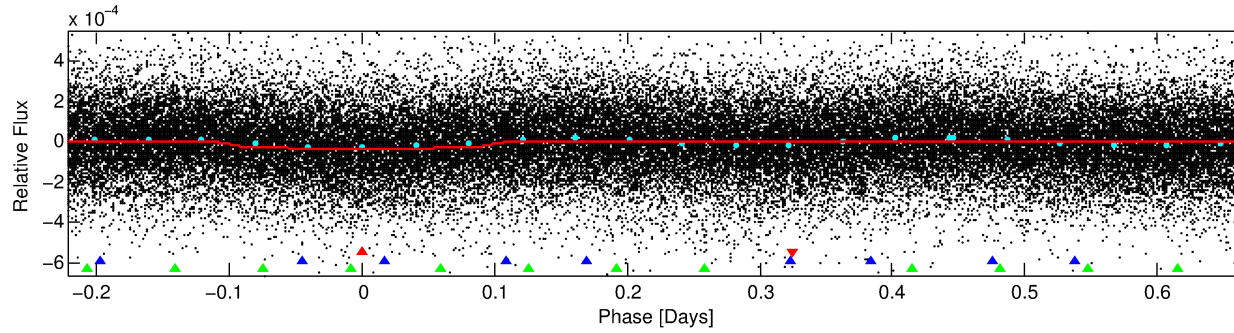
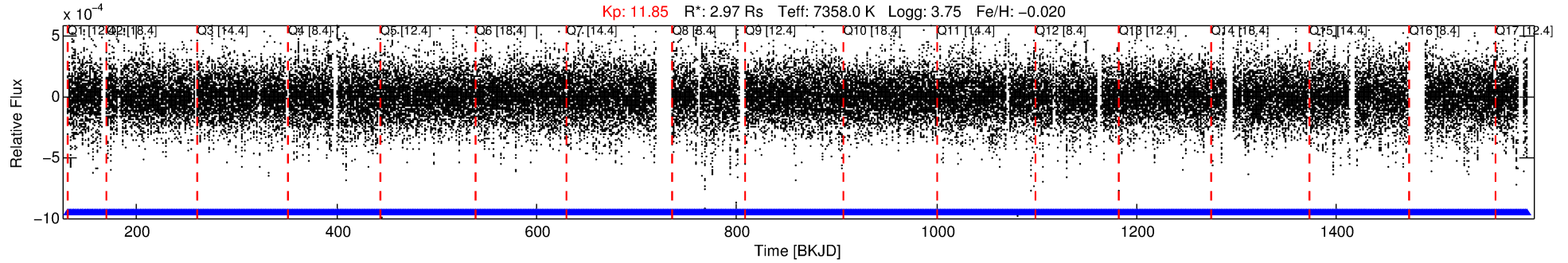
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010722668-01

No Significant Match Found

# DV One-Page Summary

KIC: 10722668 Candidate: 1 of 3 Period: 0.889 d



## DV Fit Results:

Period = 0.88910 [0.00001] d  
Epoch = 131.8342 [0.0016] BKJD  
Rp/R\* = 0.0055 [0.0010]  
a/R\* = 1.40 [0.71]  
b = 0.56 [1.30]  
Seff = 47771.54 [34435.79]  
Teq = 3770 [679] K  
Rp = 1.78 [0.83] Re  
a = 0.0220 [0.0095] AU  
Ag = 1.20 [0.98] [0.21σ]  
Teffp = 6105 [685] K [2.42σ]

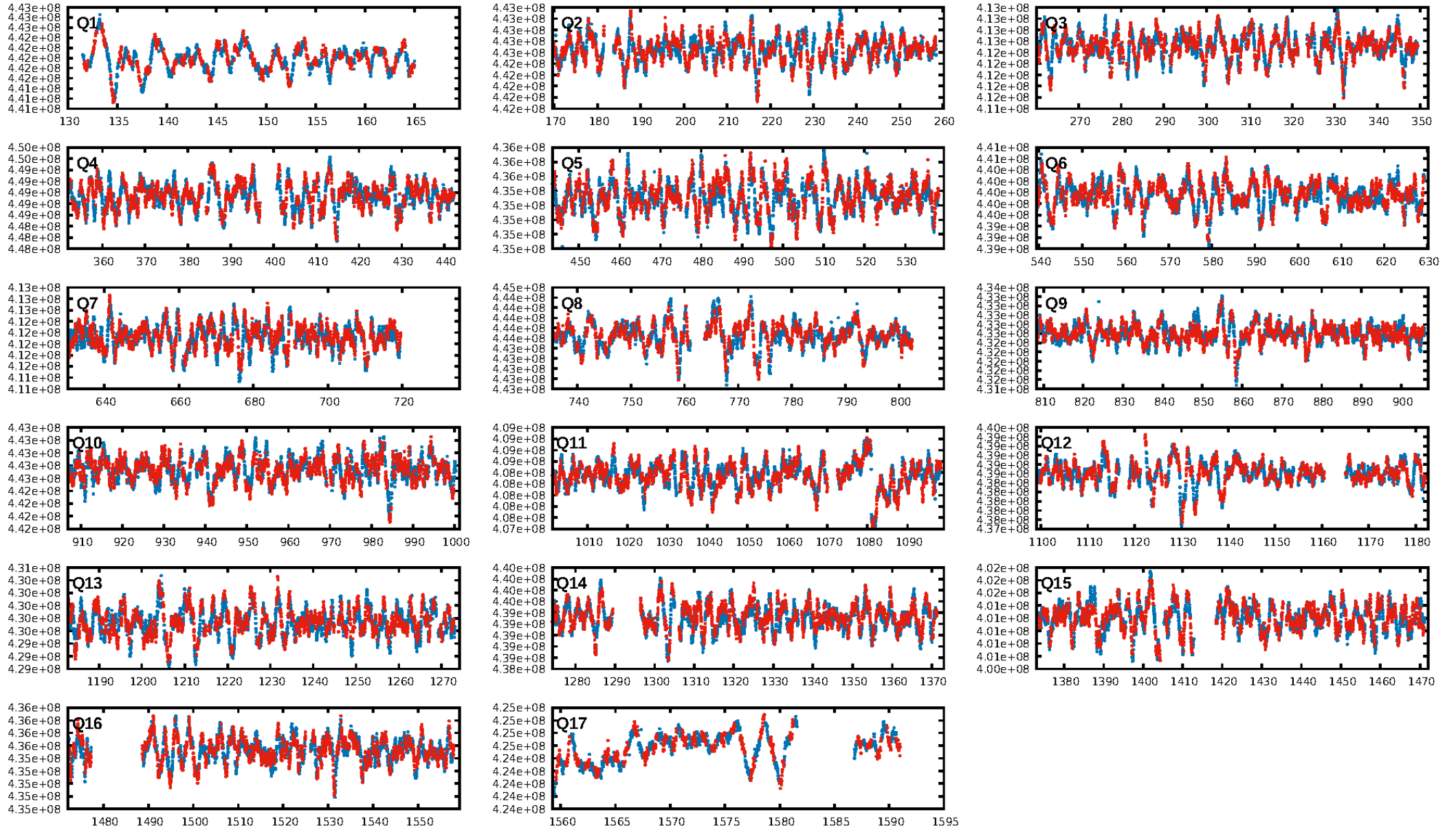
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [427.84σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.77e-24  
RollingBand-fgt: 1.00 [1454/1454]  
GhostDiagnostic-chr: 2.472  
Centroid-sig: 0.2%  
Centroid-so: 0.364 arcsec [1.60σ]  
OotOffset-rm: 0.382 arcsec [1.65σ]  
KicOffset-rm: 0.258 arcsec [1.18σ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.60 [9/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:46:20 Z

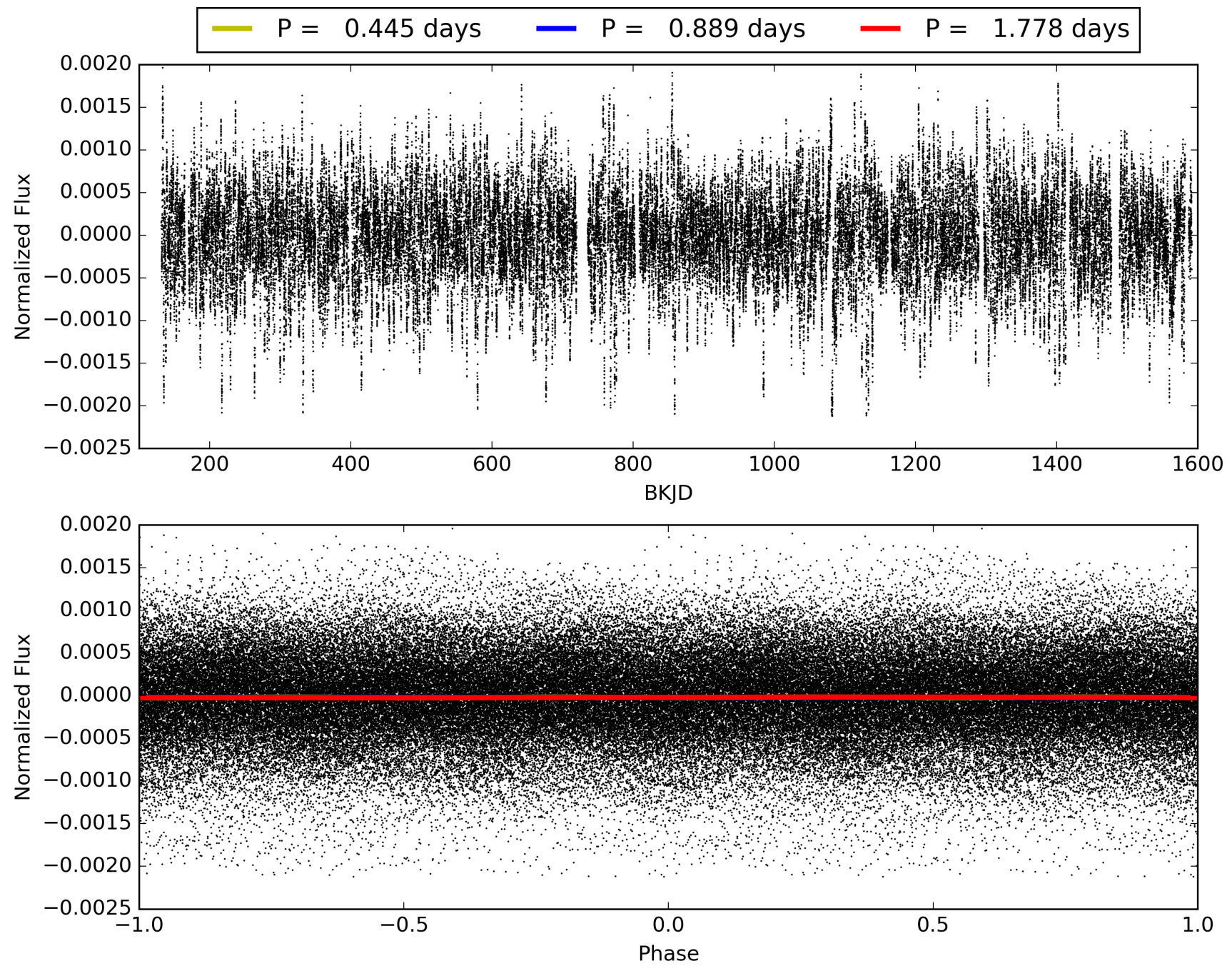
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010722668-01, PDC Light Curves





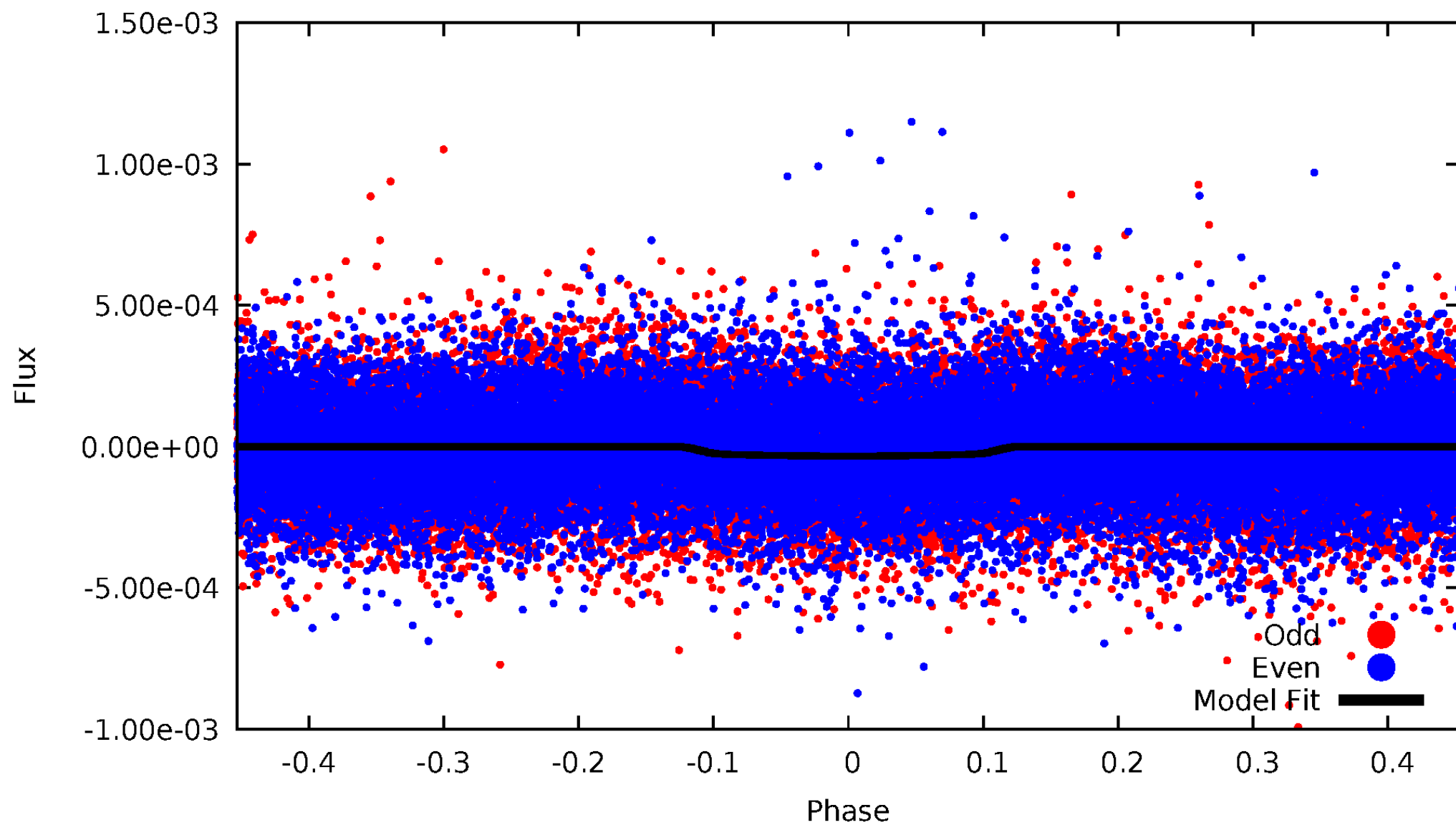
# TCE 010722668-01





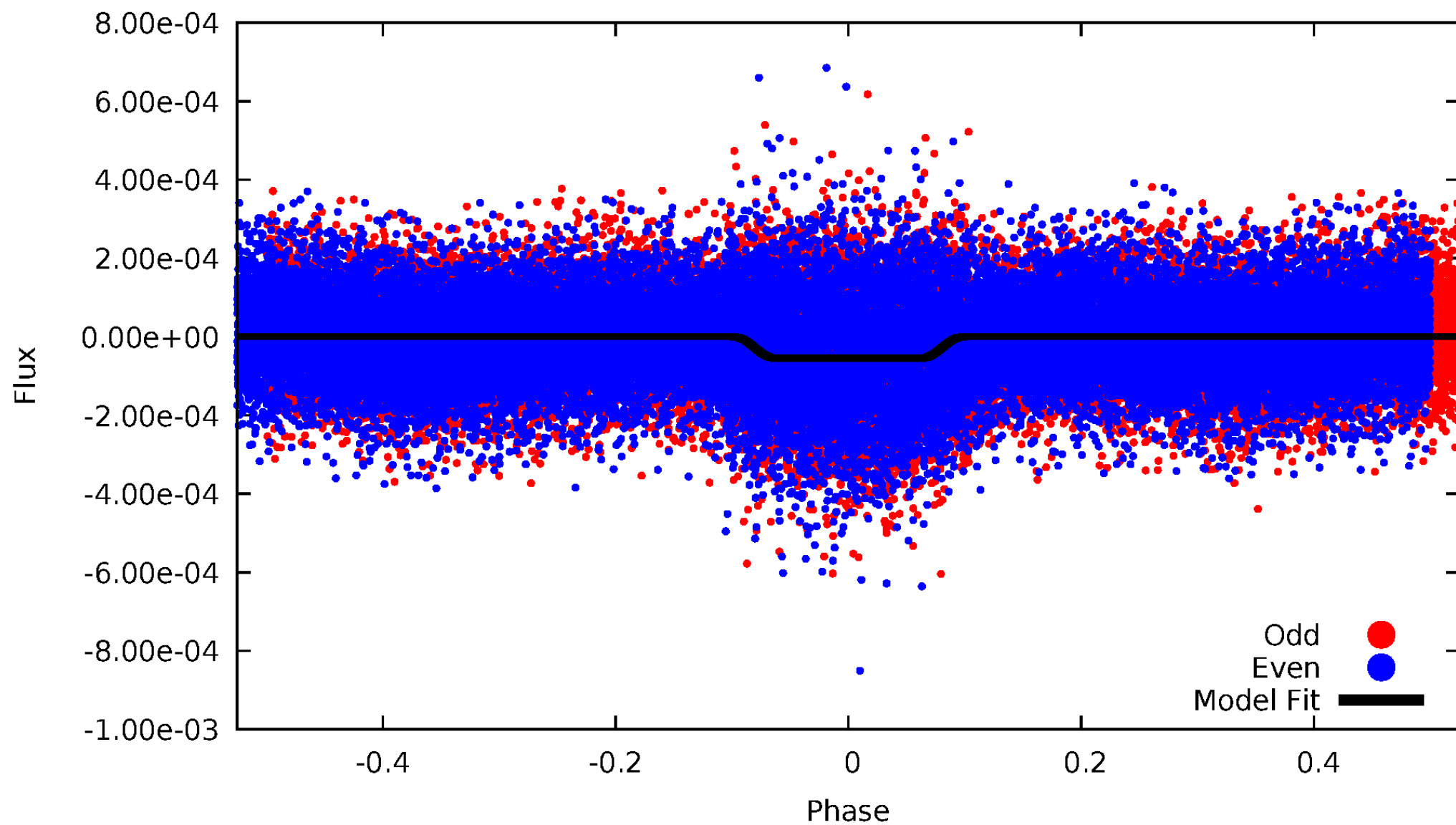
# DV Odd/Even

TCE 010722668-01



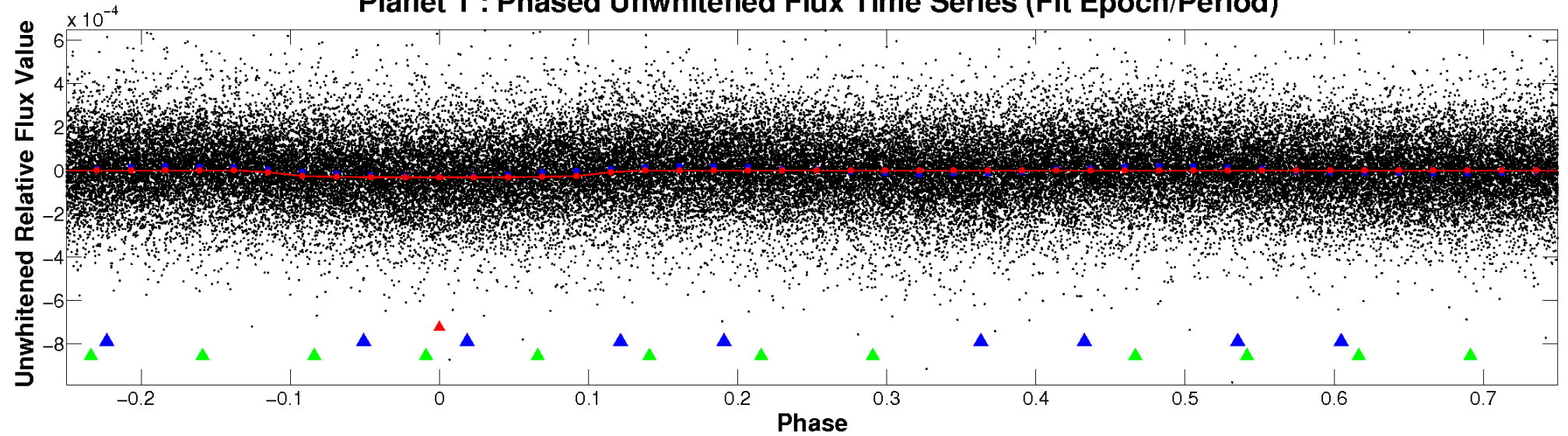
# ALT Odd/Even

TCE 010722668-01

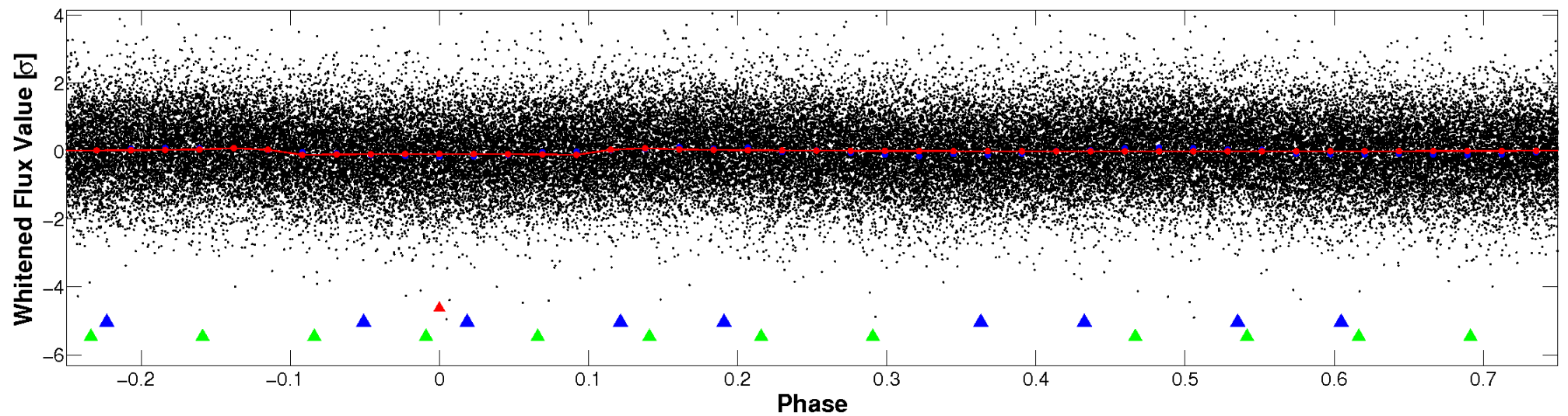


# Non-Whitened Vs. Whitened Light Curve

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



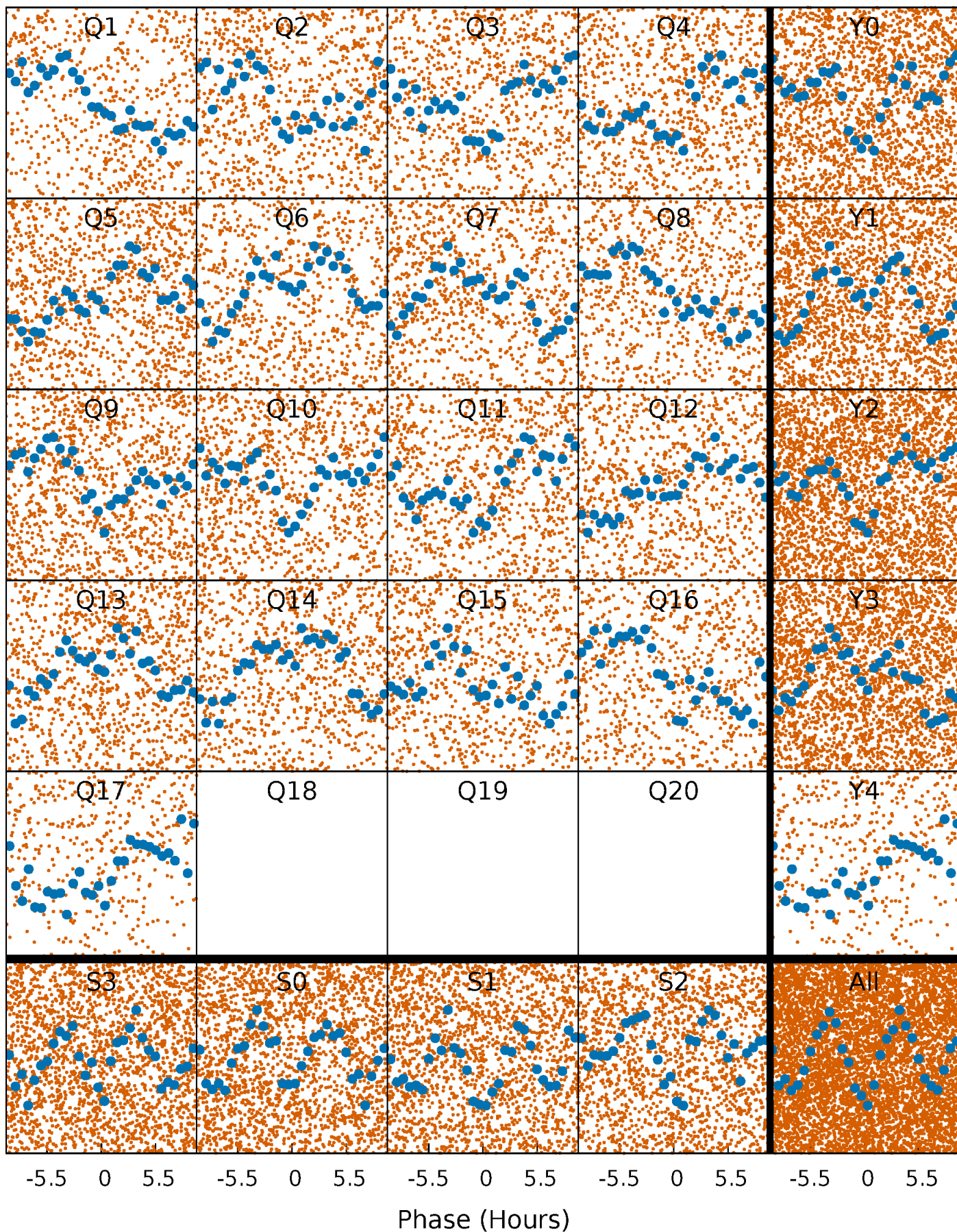
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





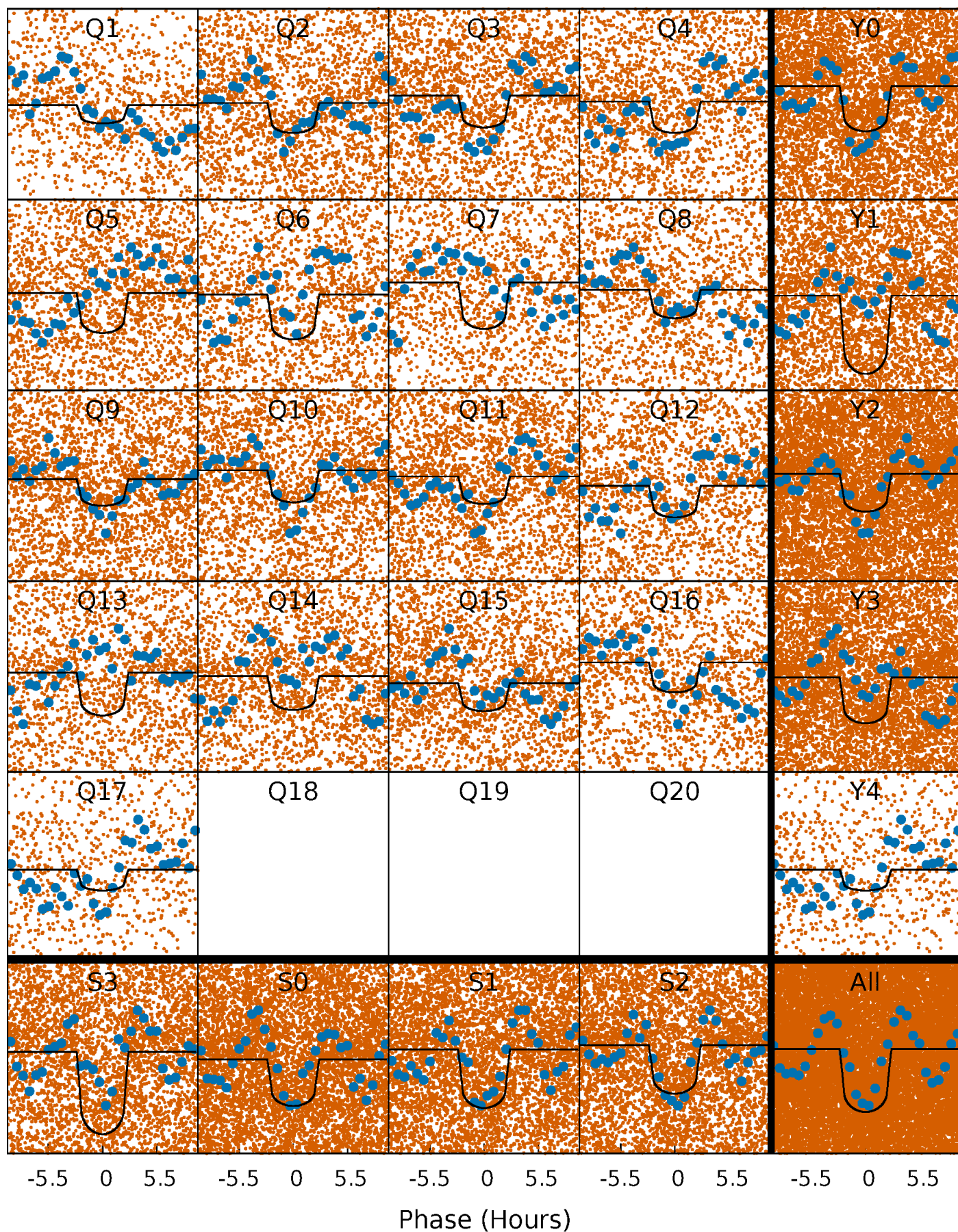
# PDC Quarter-Phased Transit Curves

TCE 010722668-01 P= 0.889102 Days  $T_0=131.834217$  (BKJD)



# DV Quarter-Phased Transit Curves

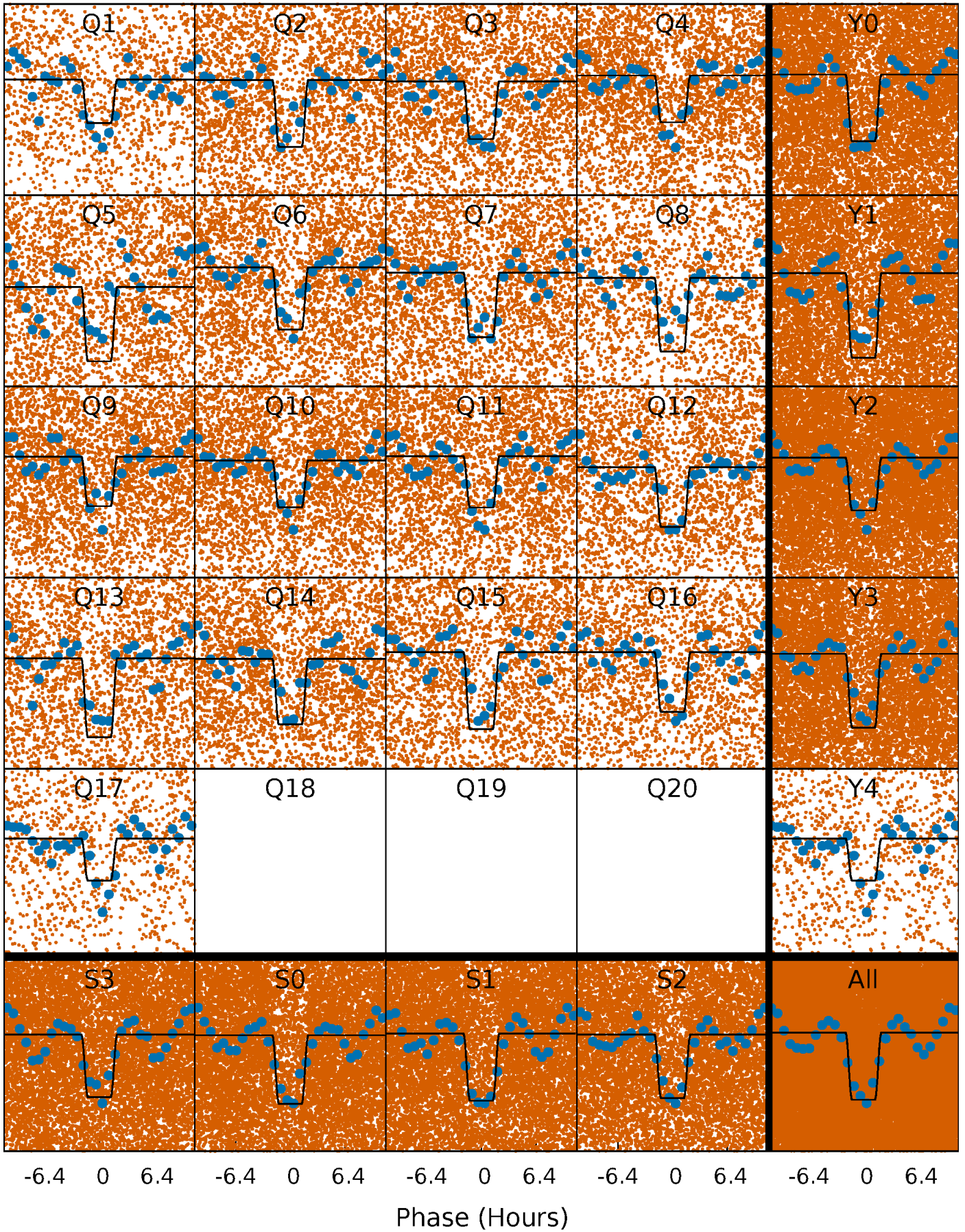
TCE 010722668-01 P= 0.889102 Days  $T_0=131.834217$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010722668-01 P= 0.889090 Days  $T_0=131.840099$  (BKJD)

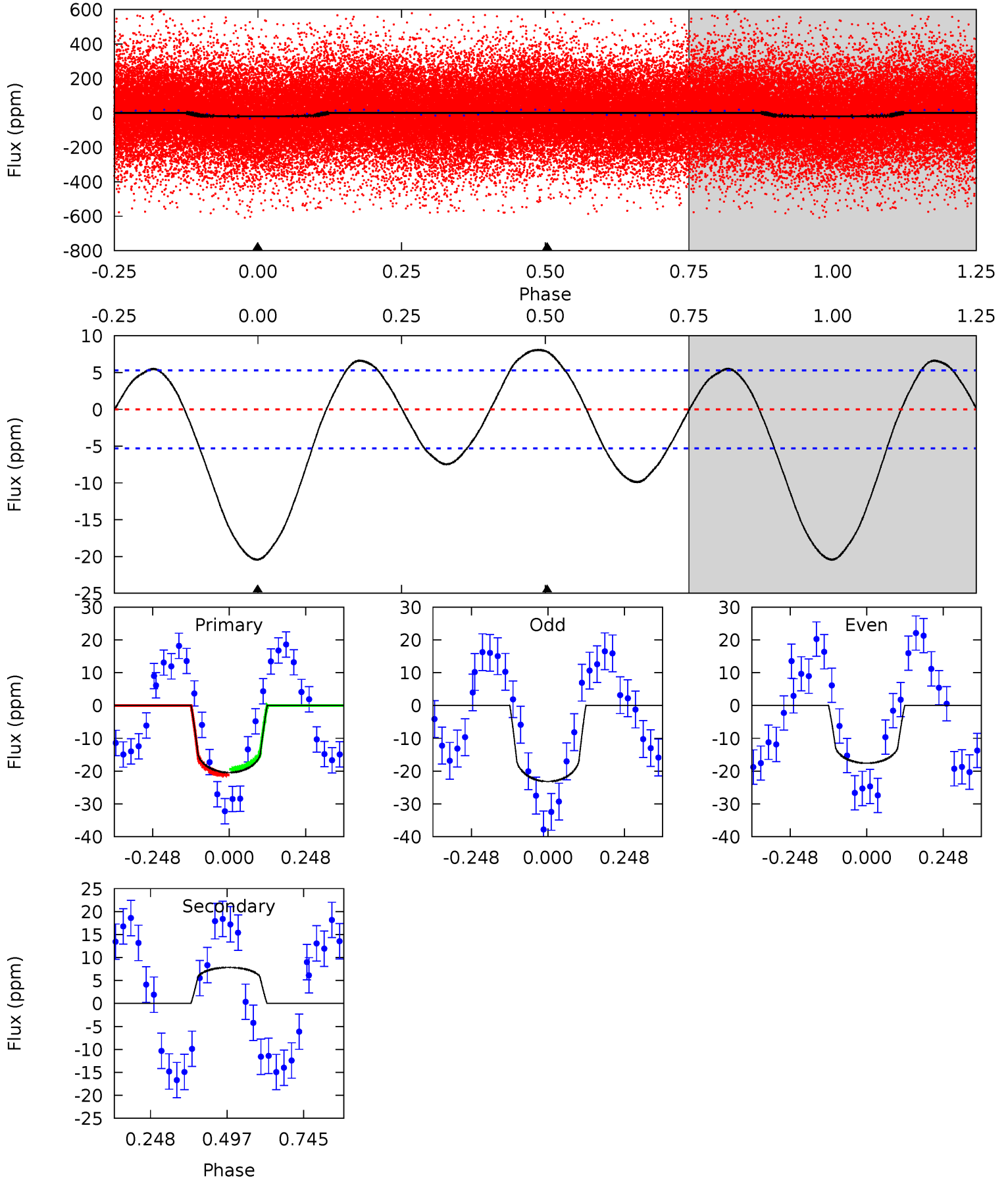




# DV Model-Shift Uniqueness Test

010722668-01, P = 0.889102 Days, E = 130.945115 Days

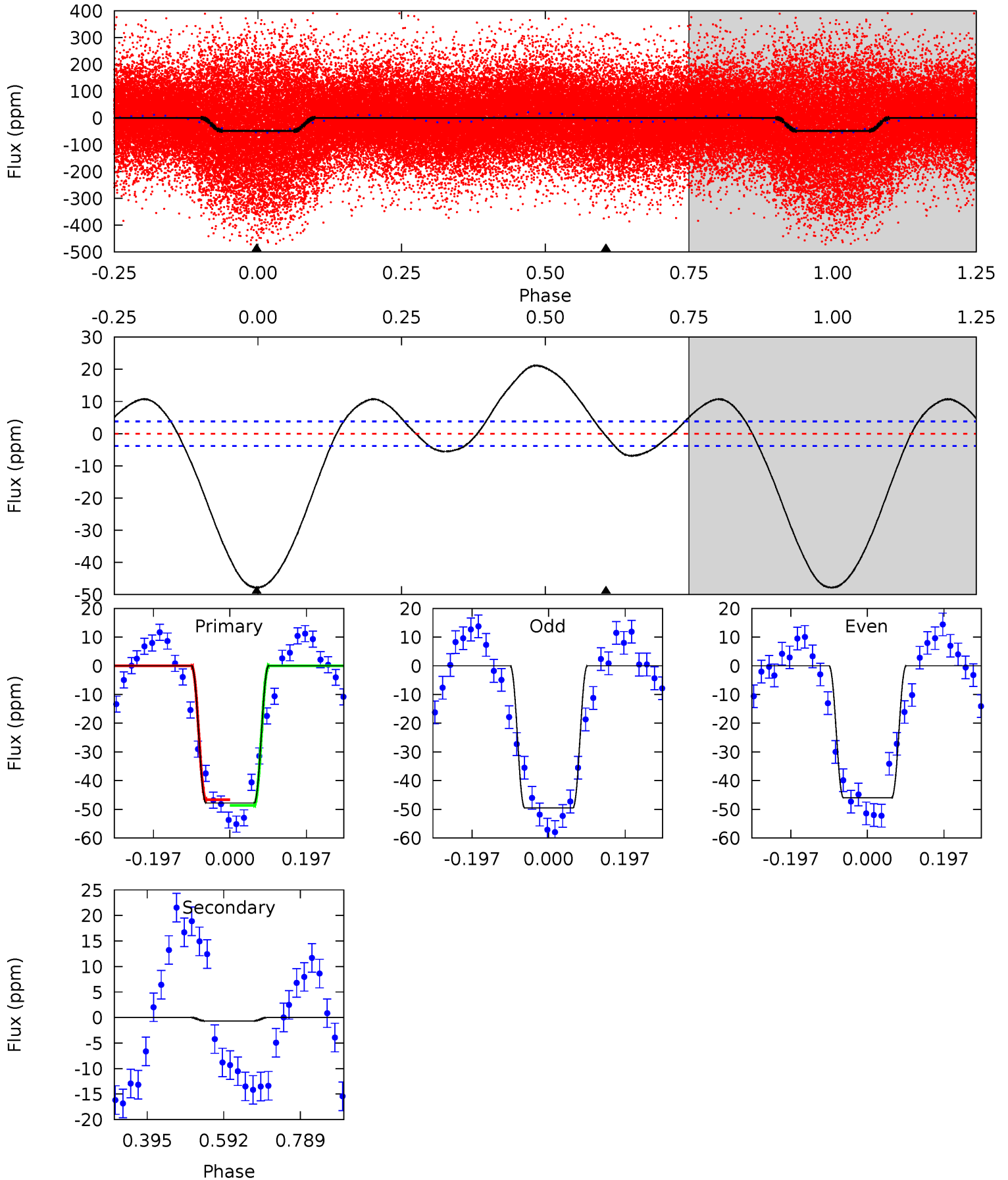
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	-6.47	0	0	4.37	1.15	1.71	16.9	16.9	-6.47	-6.47	2.31	0.88	0.28	0.71



# Alt Model-Shift Uniqueness Test

010722668-01, P = 0.889090 Days, E = 130.951009 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
55.3	0.78	0	0	4.42	1.29	6.41	55.3	55.3	0.78	0.78	2.03	1.03	0.31	1.15



### Stellar Parameters For KIC 010722668

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7358^{+228}_{-304}$	$3.748^{+0.417}_{-0.074}$	$-0.020^{+0.200}_{-0.350}$	$2.970^{+0.427}_{-1.280}$	$1.799^{+0.194}_{-0.389}$	$0.097^{+0.351}_{-0.029}$
	+3%/-4%	+11%/-2%	+1000%/-1750%	+14%/-43%	+11%/-22%	+363%/-30%
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 010722668-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$8 \pm 1$	$1.60^{+0.44}_{-0.42}$	$5078^{+357}_{-555}$	$-5649^{+378}_{-451}$	$-0.785^{+0.287}_{-0.645}$
Alt.	$-1 \pm 1$	$2.21^{+0.49}_{-0.53}$	$5097^{+339}_{-553}$	$-4241^{+462}_{-245}$	$0.039^{+0.061}_{-0.046}$

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



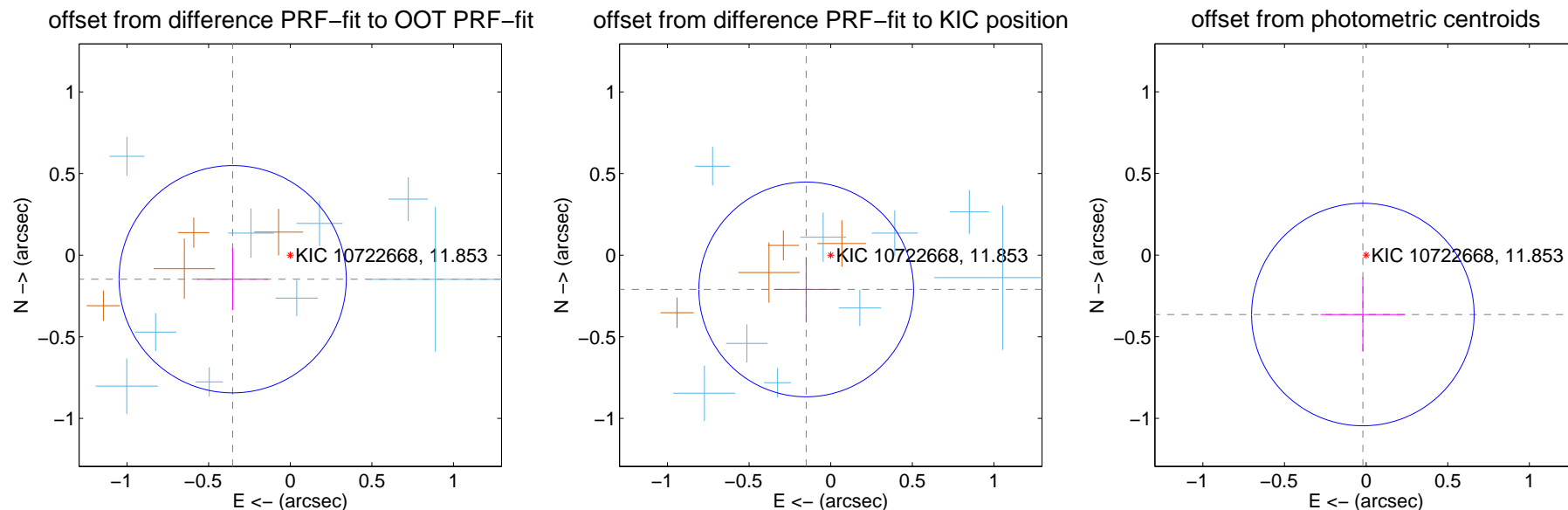
## DV Centroid Data

Supplemental centroid analysis for 010722668-01. **Kepler magnitude: 11.85.** Transit SNR 13.02

There are 9 quarters with good PRF difference image offsets

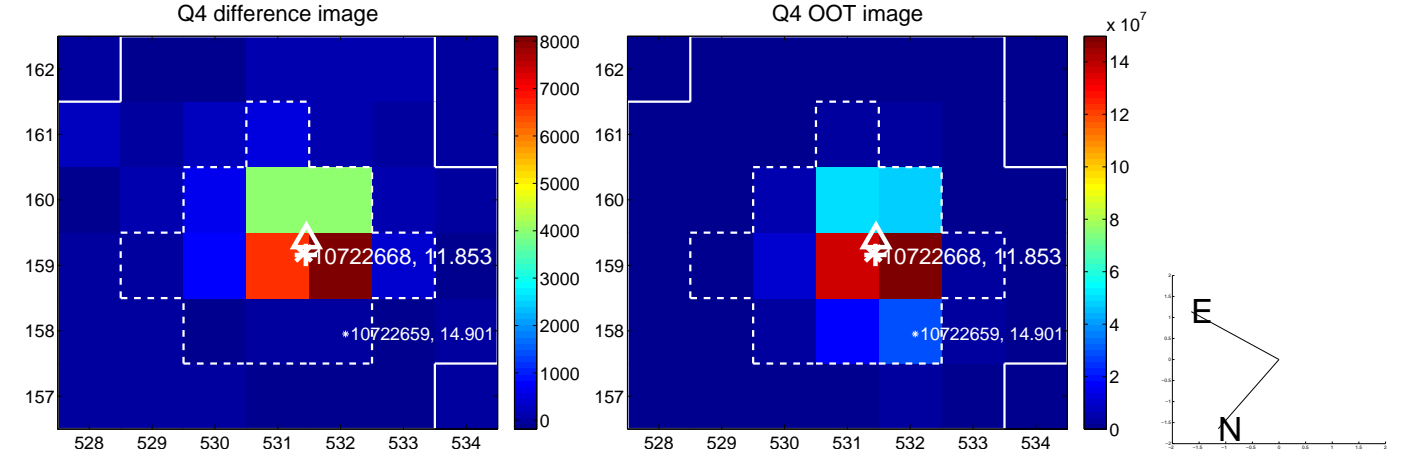
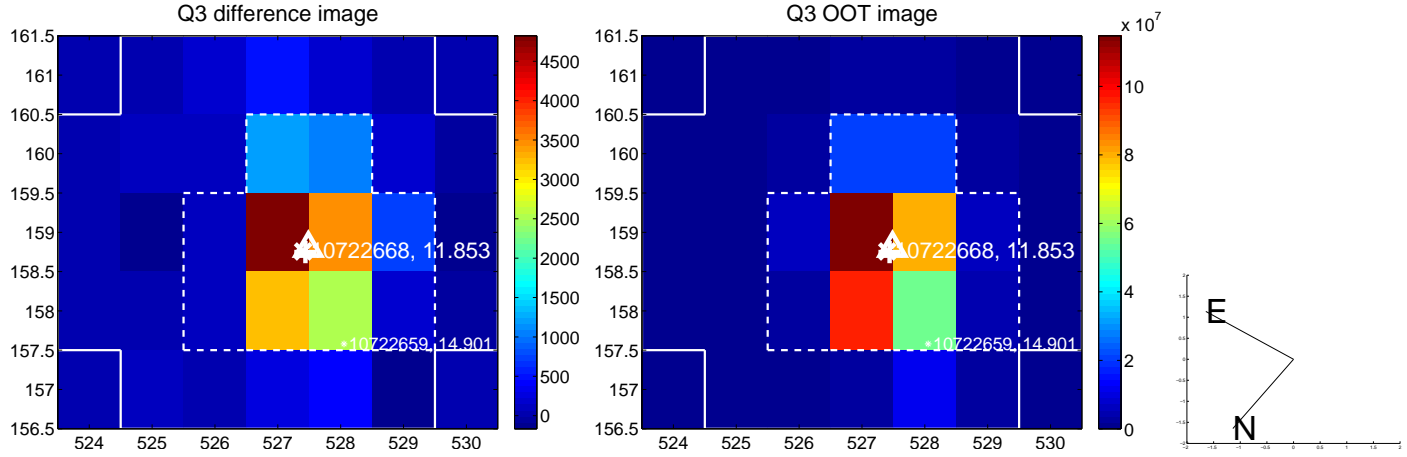
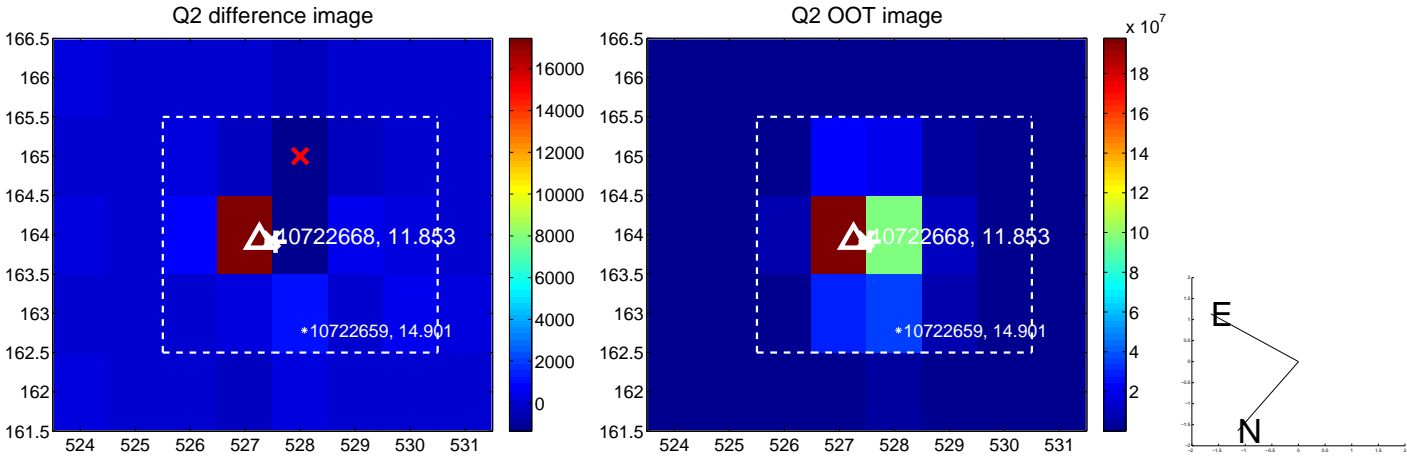
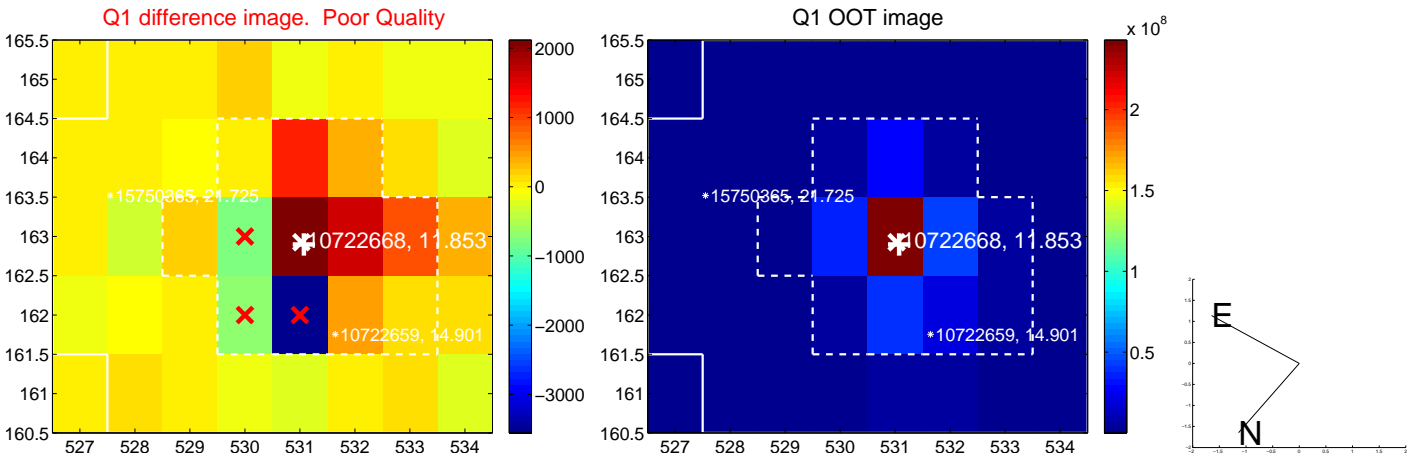
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.382 \pm 0.232$	1.65	$0.353 \pm 0.216$	$-0.147 \pm 0.189$
PRF-fit source offset from KIC position	$0.258 \pm 0.219$	1.18	$0.150 \pm 0.197$	$-0.210 \pm 0.198$
photometric centroid source offset	$0.36 \pm 0.23$	1.60	$0.02 \pm 0.26$	$-0.36 \pm 0.23$

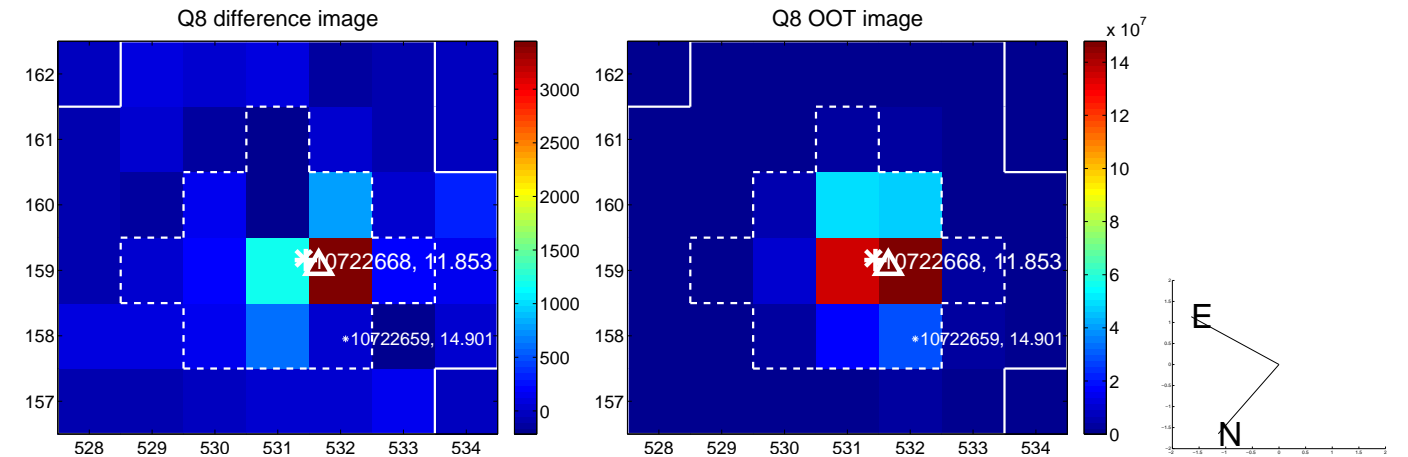
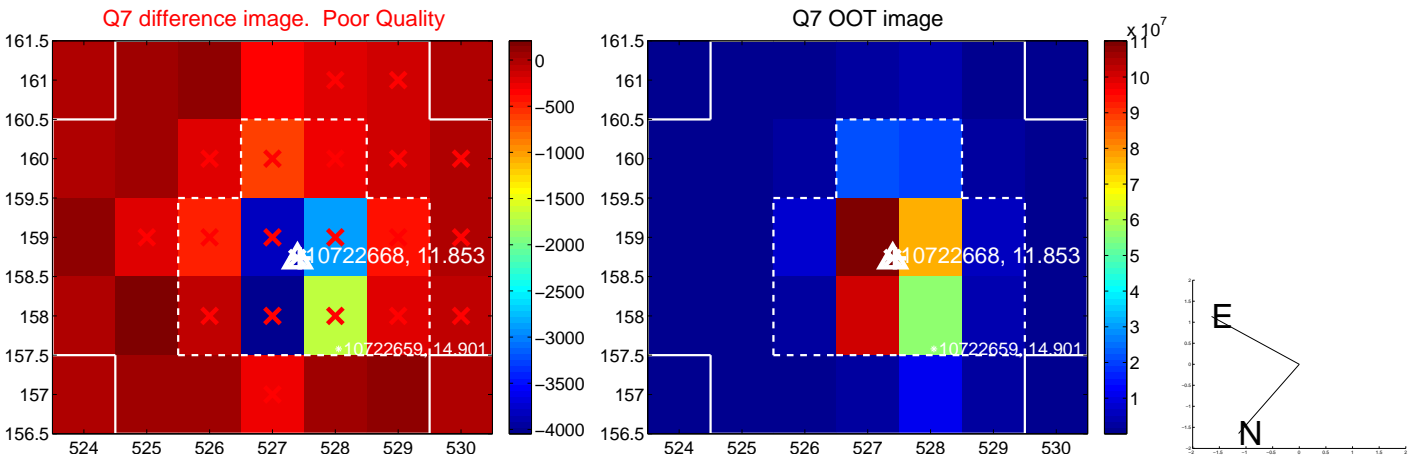
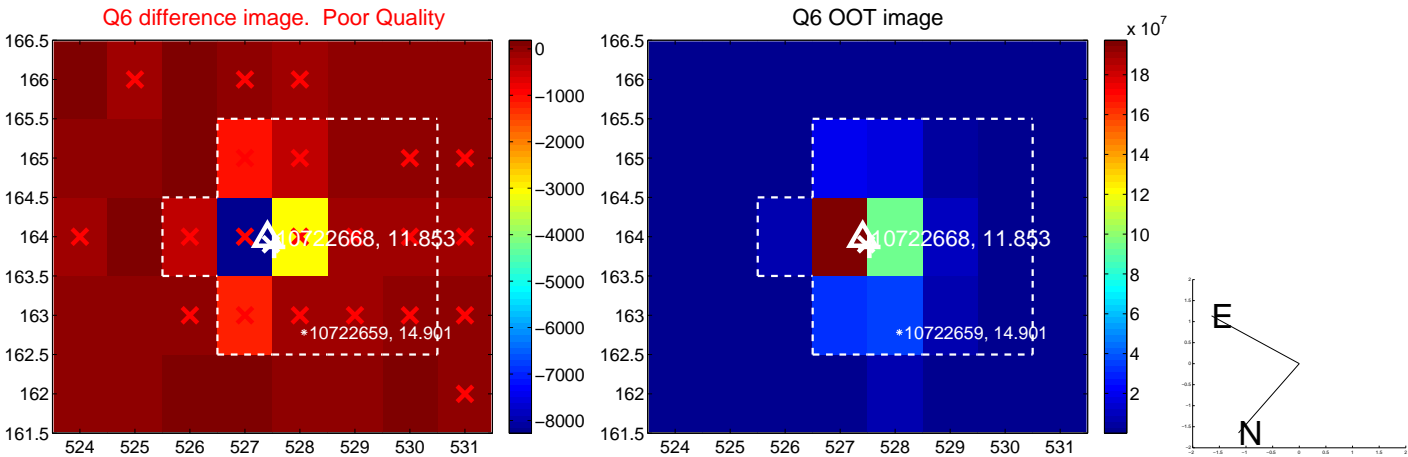
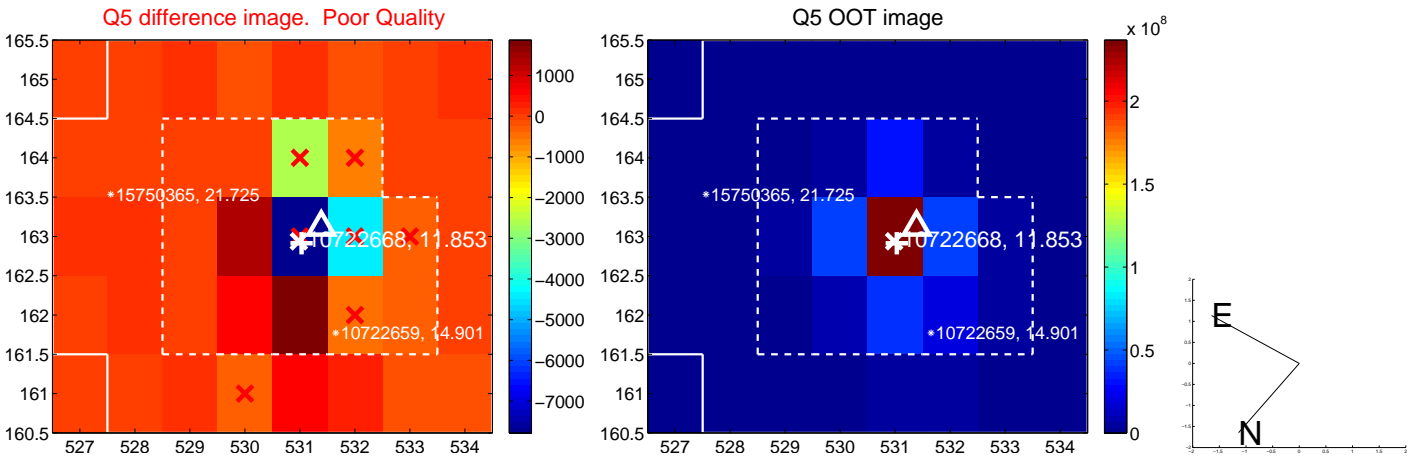


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

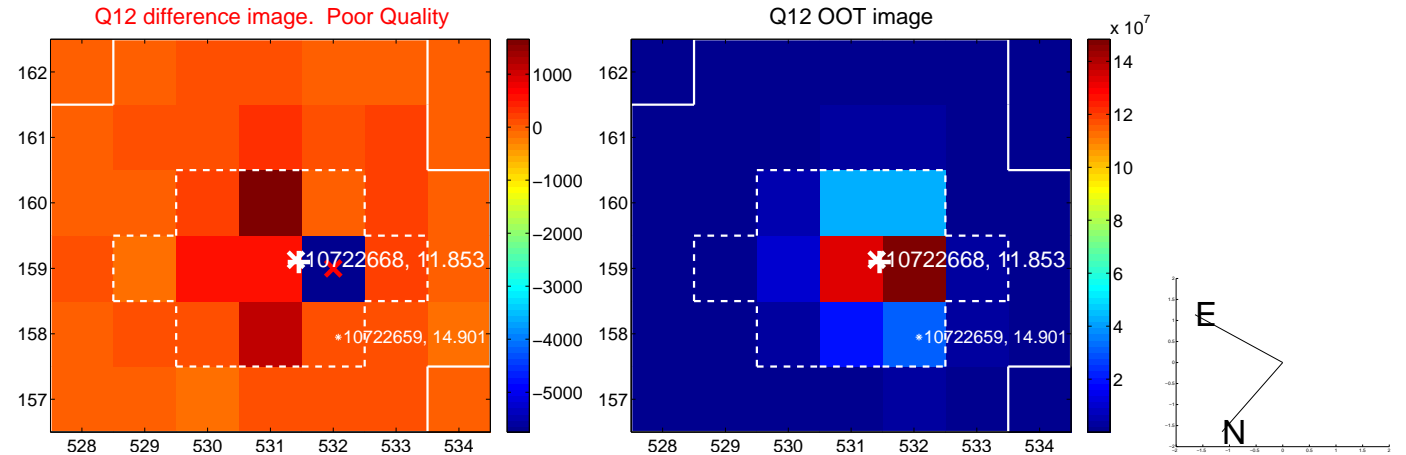
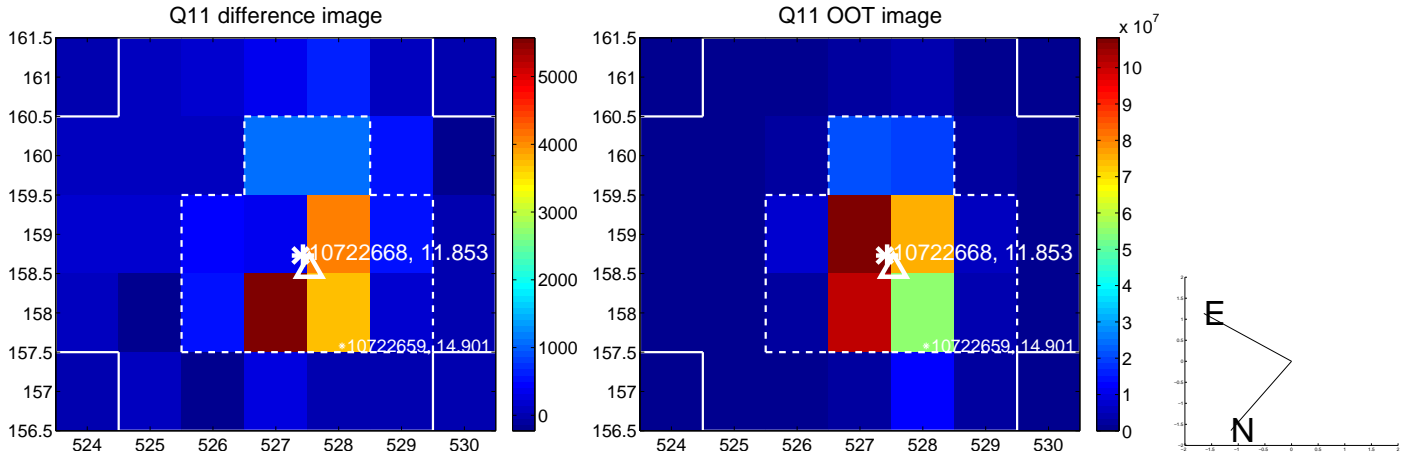
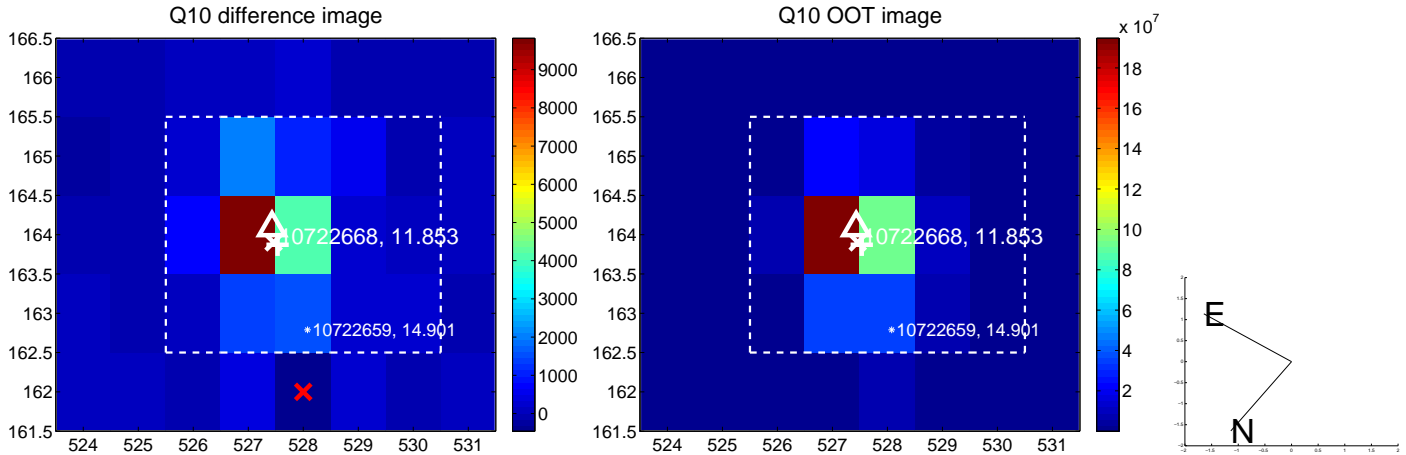
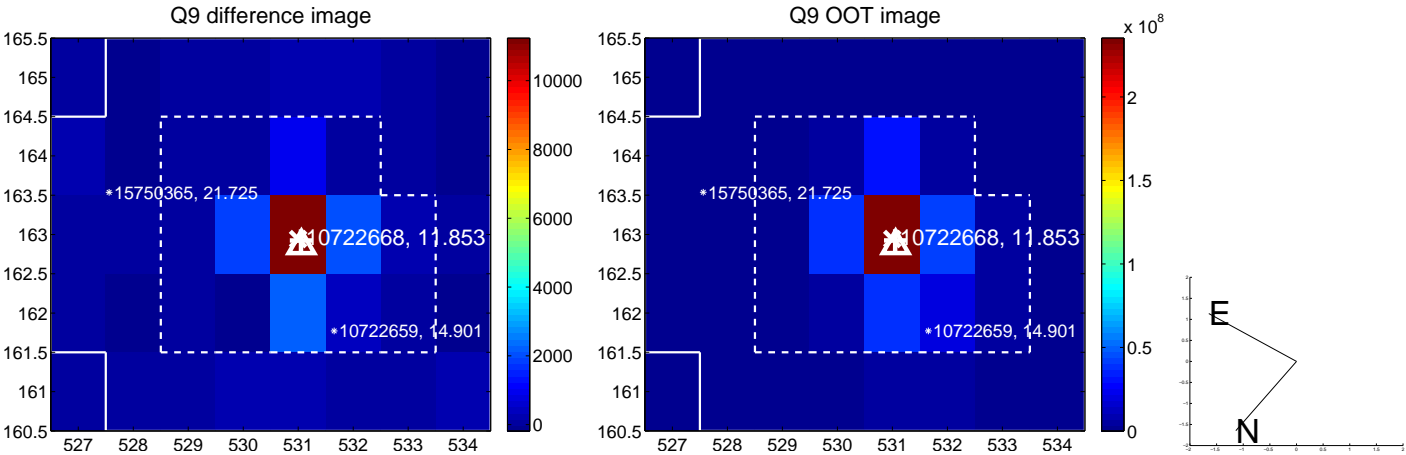


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

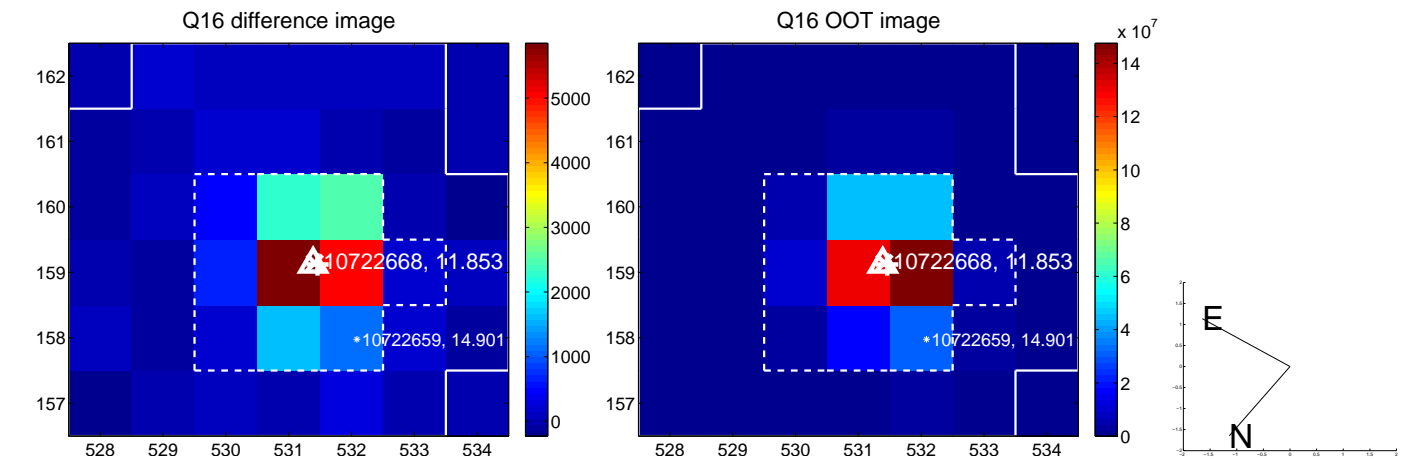
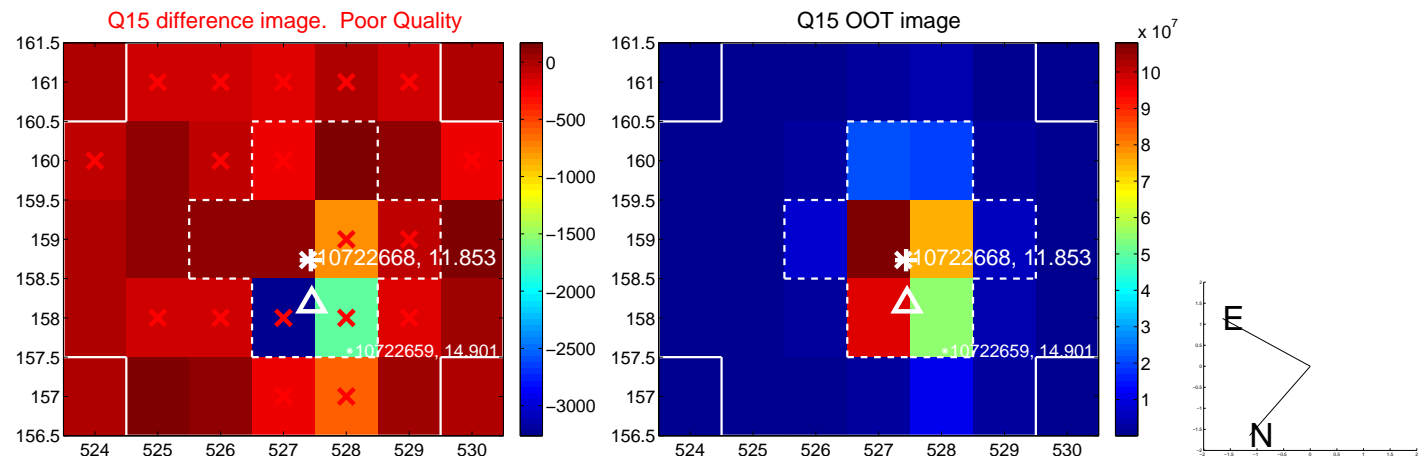
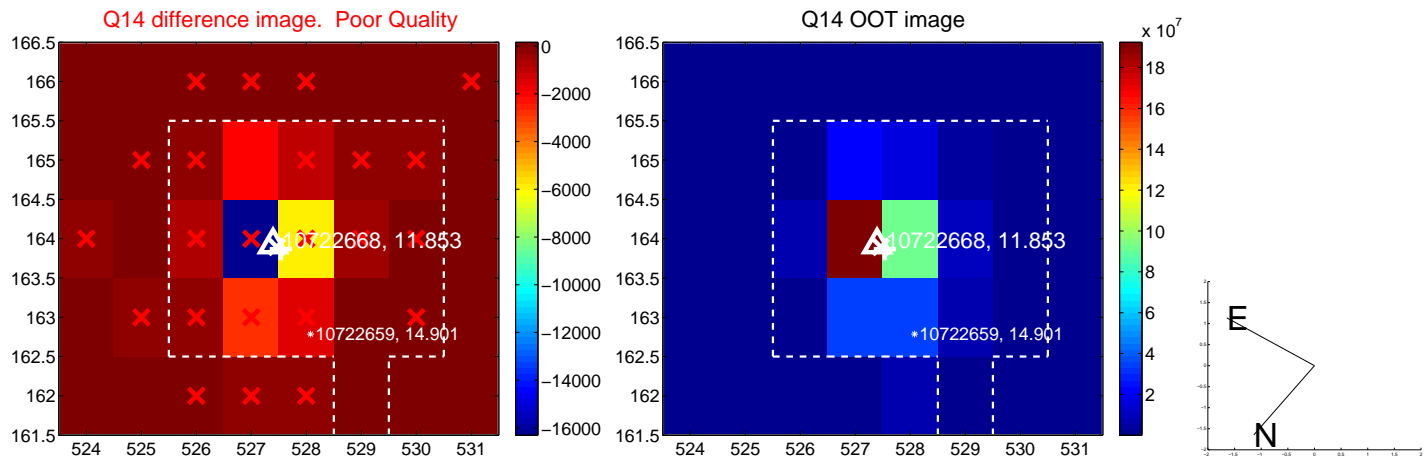
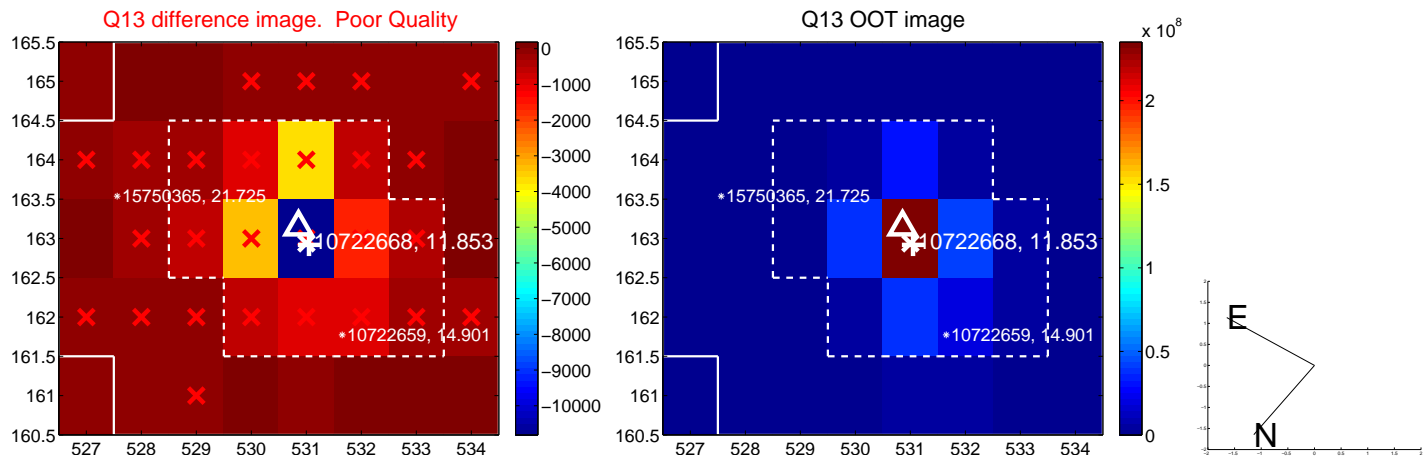




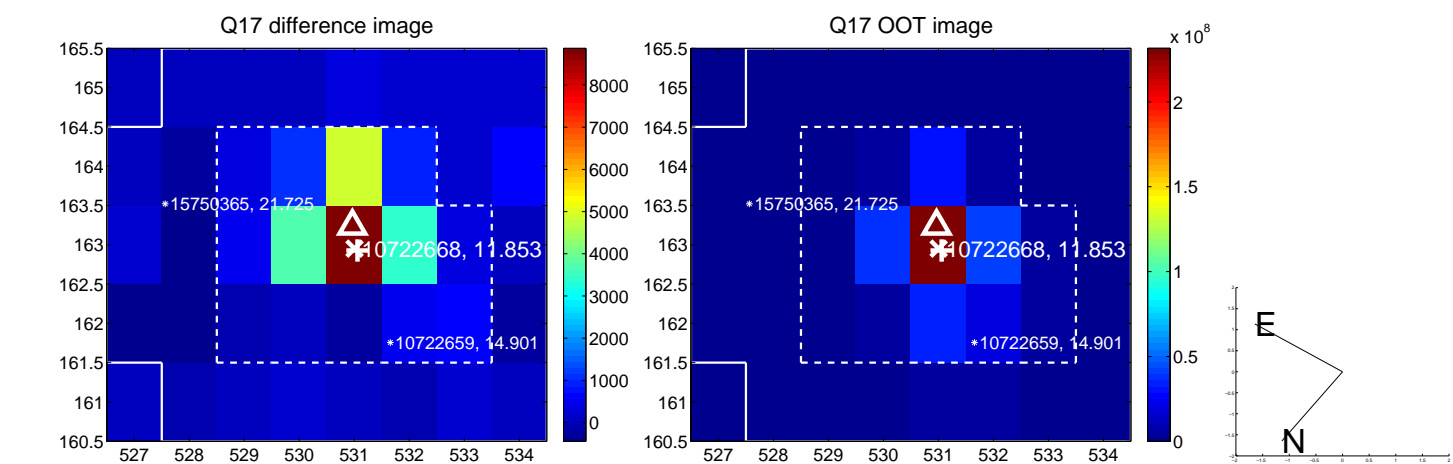
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



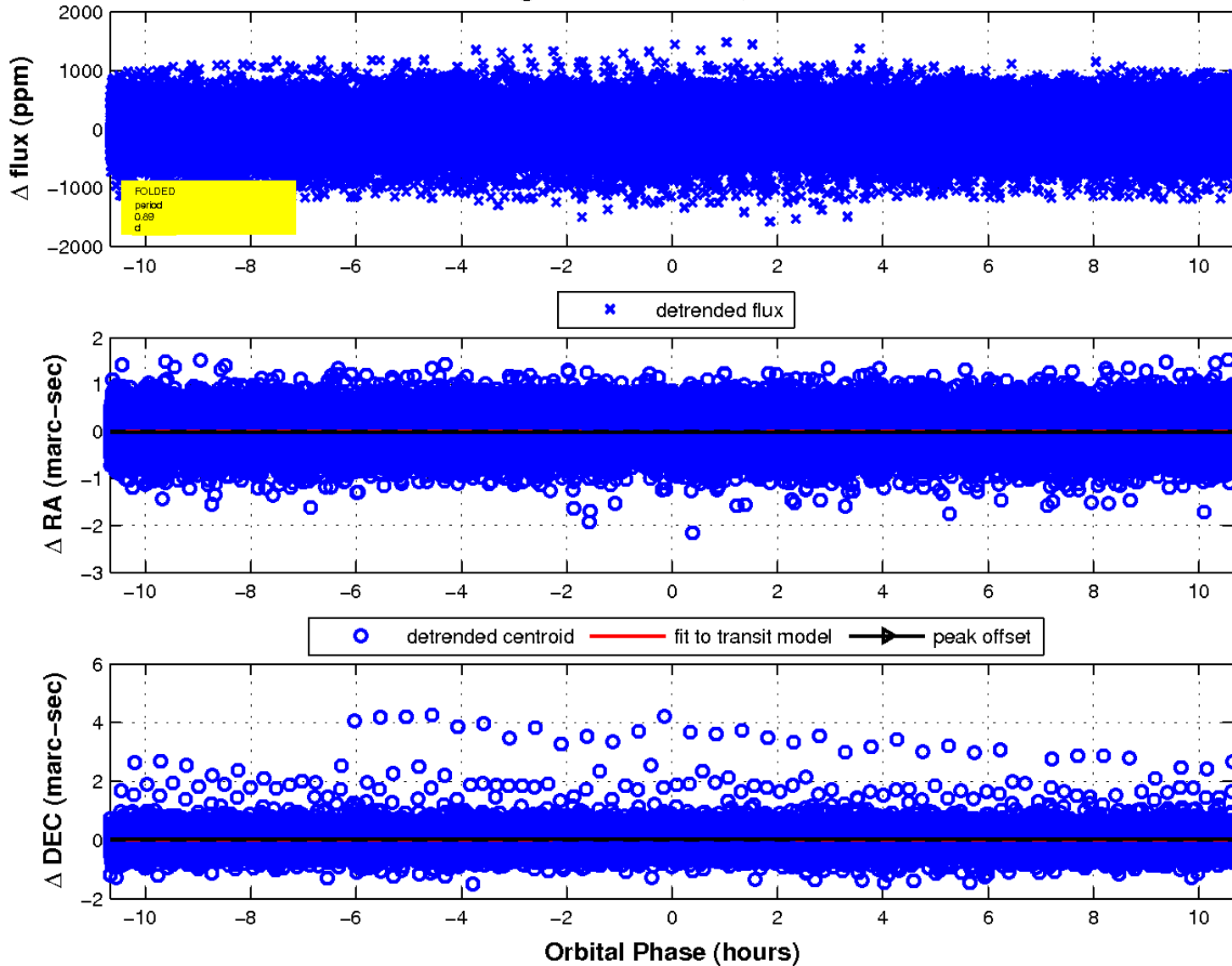
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

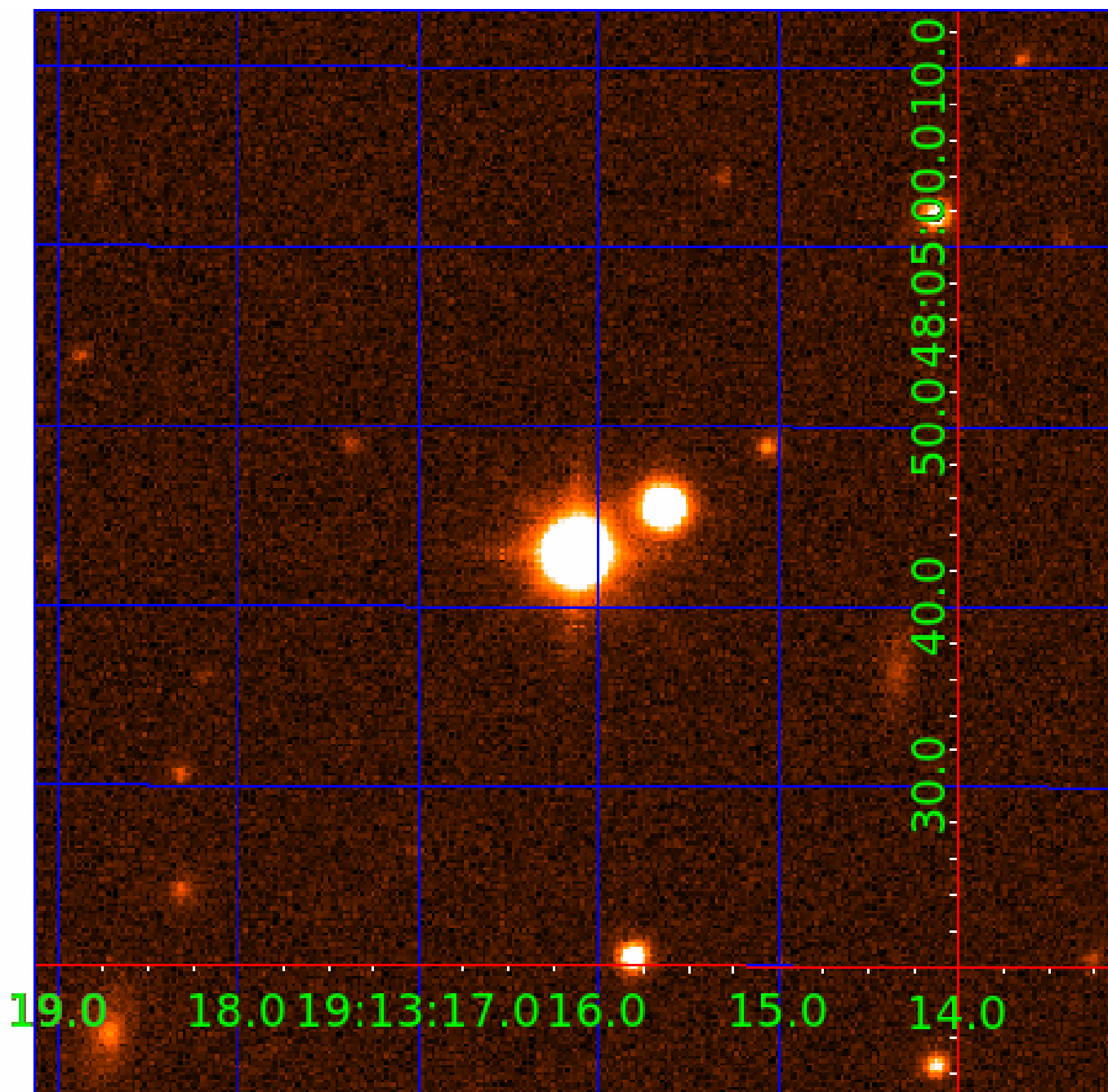


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



# KIC 010722668

## 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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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010722668-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010722668-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—HALO_GHOST
010722668-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES

**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.

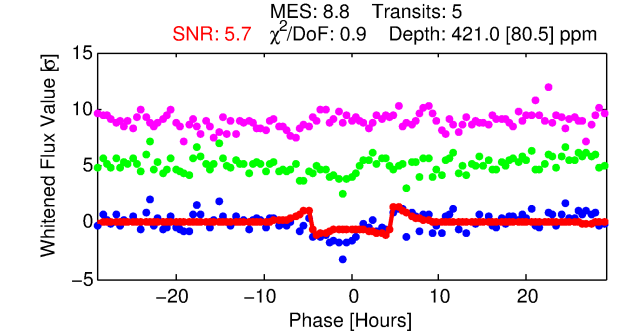
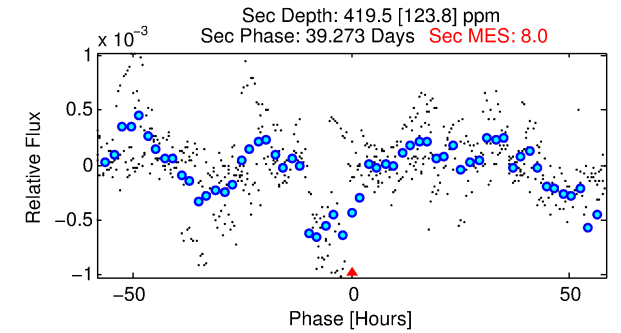
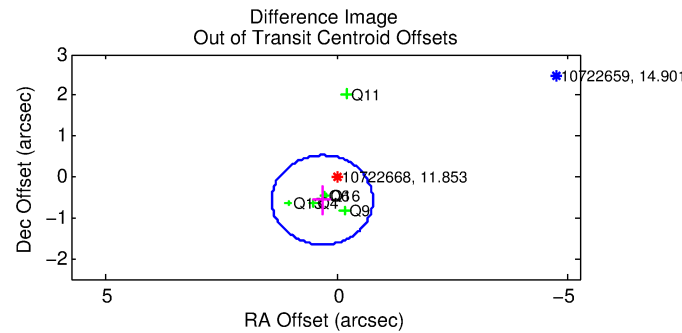
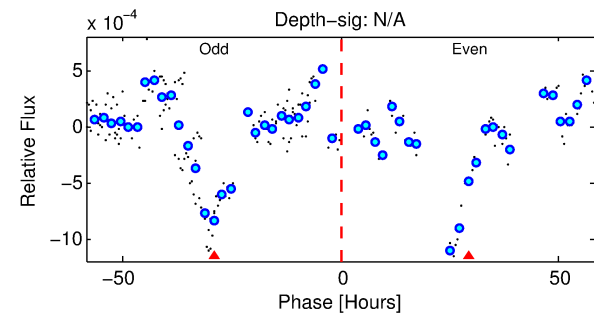
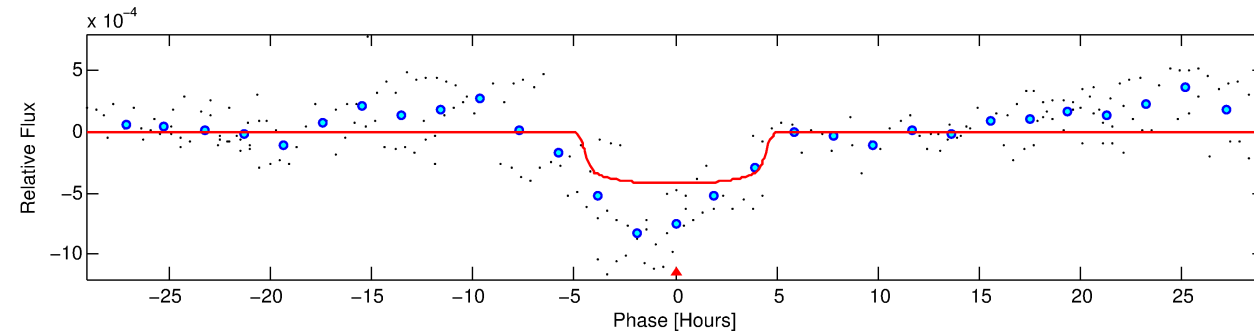
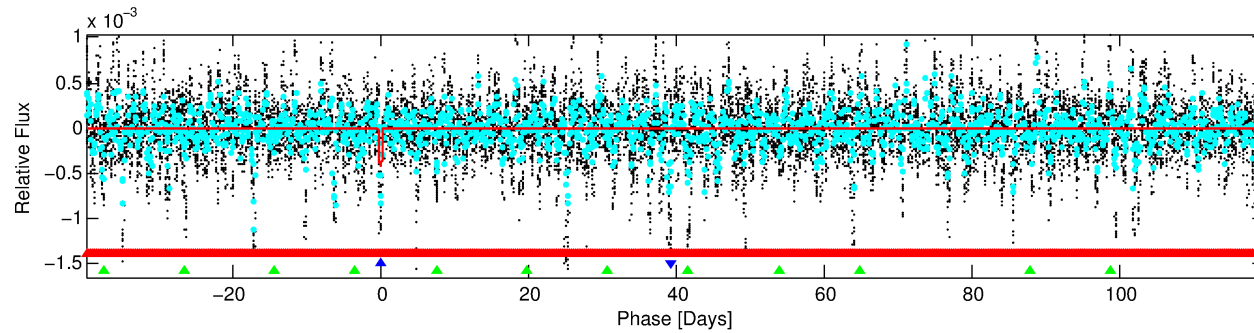
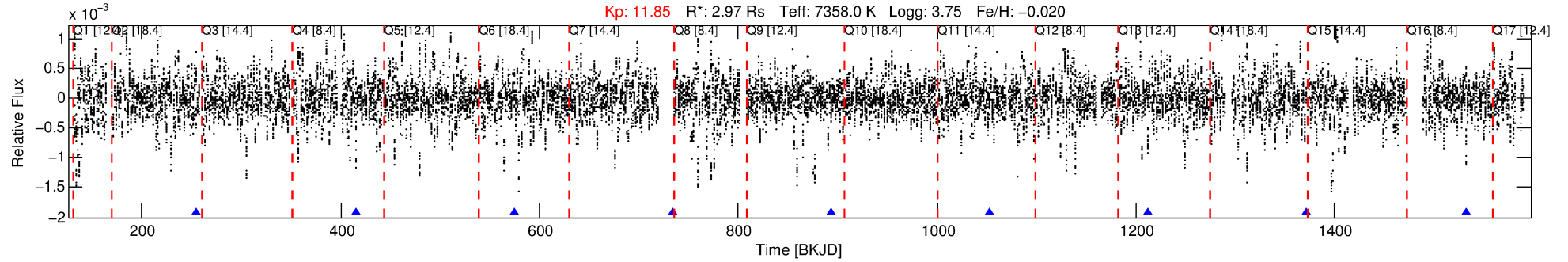
## Ephemeris Match Information For 010722668-02

No Significant Match Found



# DV One-Page Summary

KIC: 10722668 Candidate: 2 of 3 Period: 159.517 d



## DV Fit Results:

Period = 159.51717 [0.00484] d  
Epoch = 255.5274 [0.0276] BKJD  
Rp/R\* = 0.0212 [0.0029]  
a/R\* = 69.98 [36.49]  
b = 0.86 [0.16]  
Seff = 47.21 [34.03]  
Teff = 668 [120] K  
Rp = 6.87 [3.11] Re  
a = 0.7005 [0.3013] AU  
Ag = 2397.51 [1938.97] [1.24σ]  
Teffp = 7231 [786] K [8.25σ]

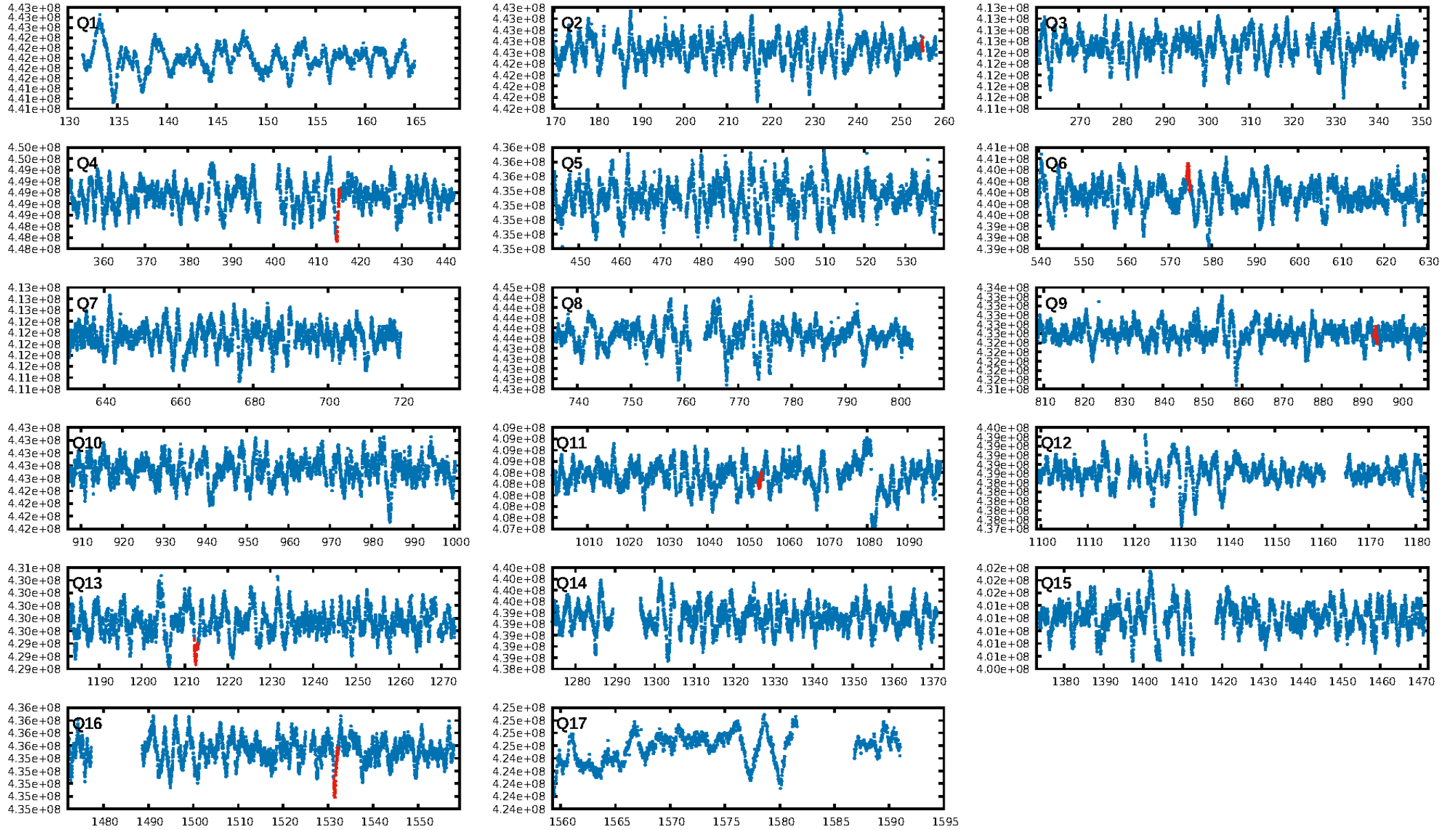
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [74.75σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 5.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.33e-11  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.226  
Centroid-sig: 22.7%  
Centroid-so: 0.376 arcsec [1.28σ]  
OotOffset-rm: 0.650 arcsec [1.78σ]  
KicOffset-rm: 0.616 arcsec [1.47σ]  
OotOffset-st: 1/1/2/2 [6]  
KicOffset-st: 1/1/2/2 [6]  
DiffImageQuality-fgm: 0.67 [4/6]  
DiffImageOverlap-fno: 0.00 [0/6]

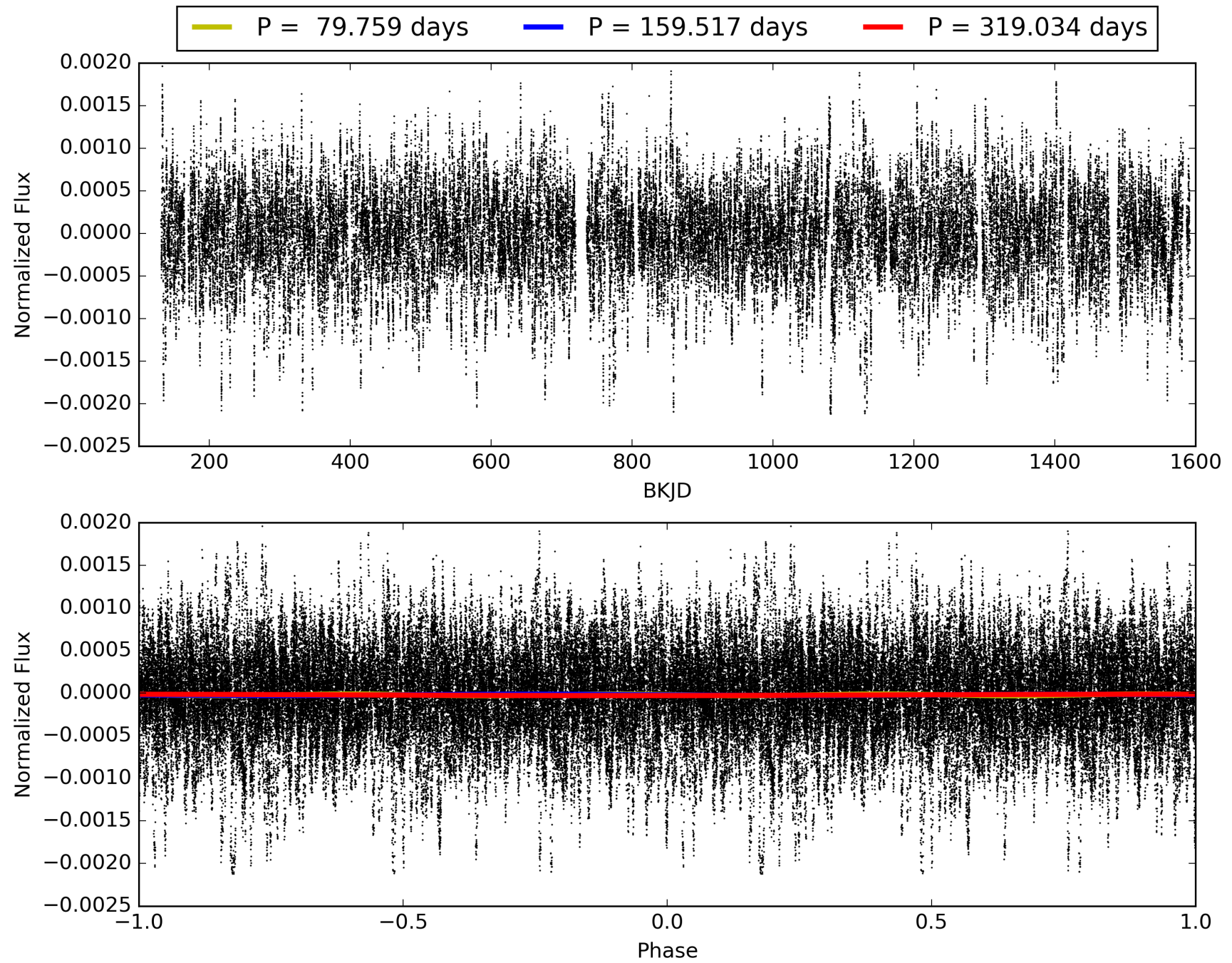
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:46:31 Z

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

# TCE 010722668-02, PDC Light Curves

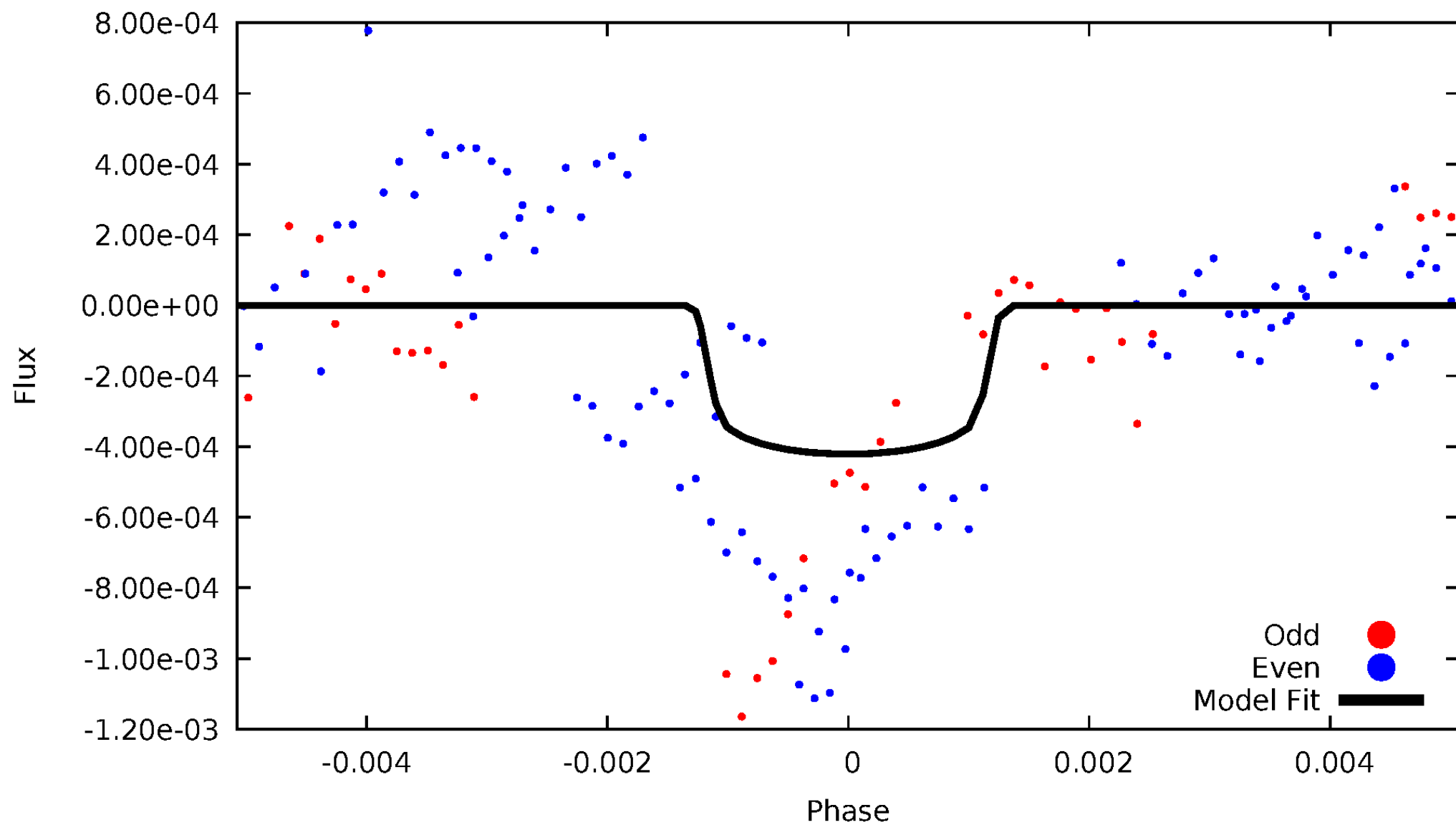


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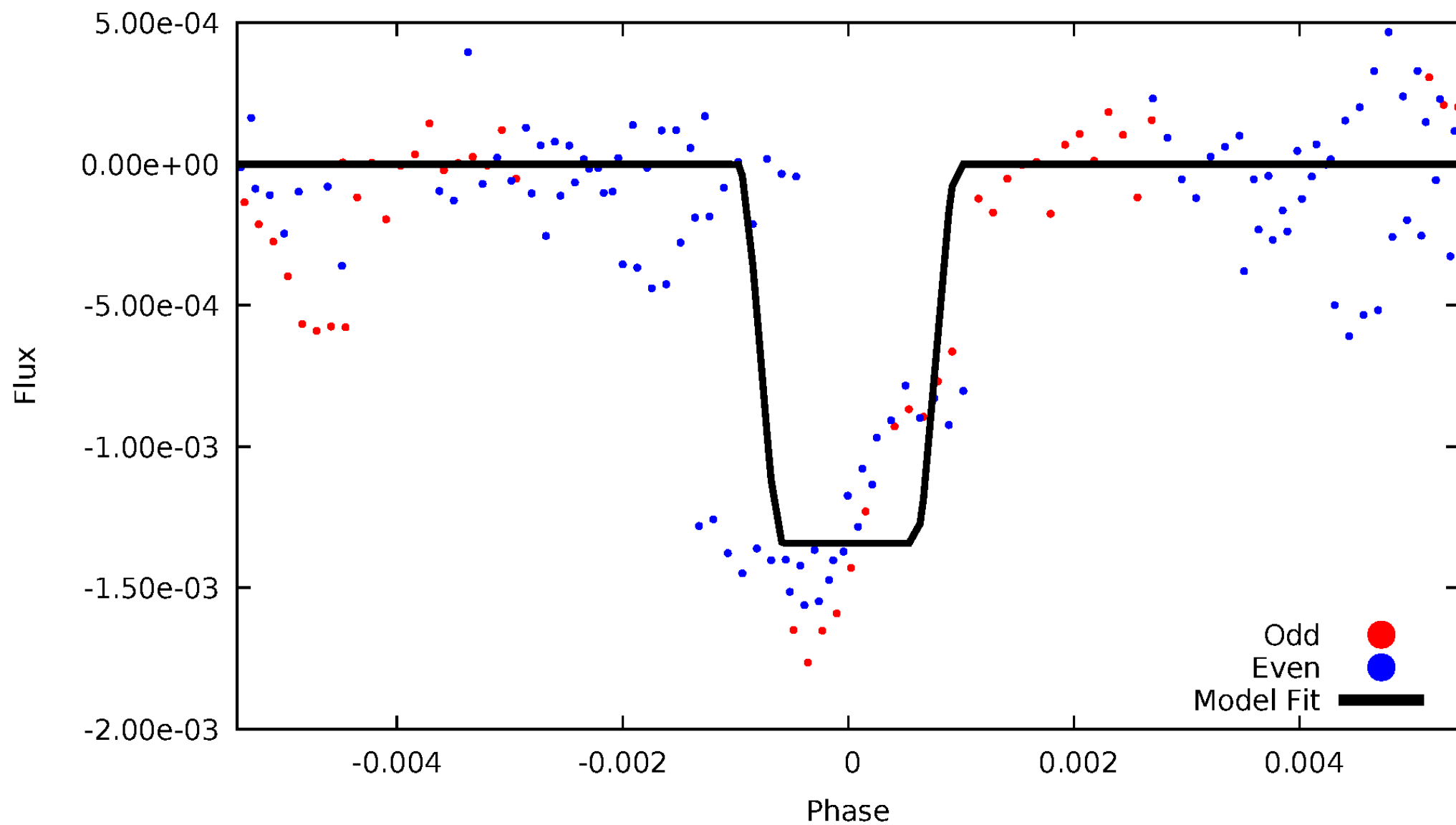
# DV Odd/Even

TCE 010722668-02



# ALT Odd/Even

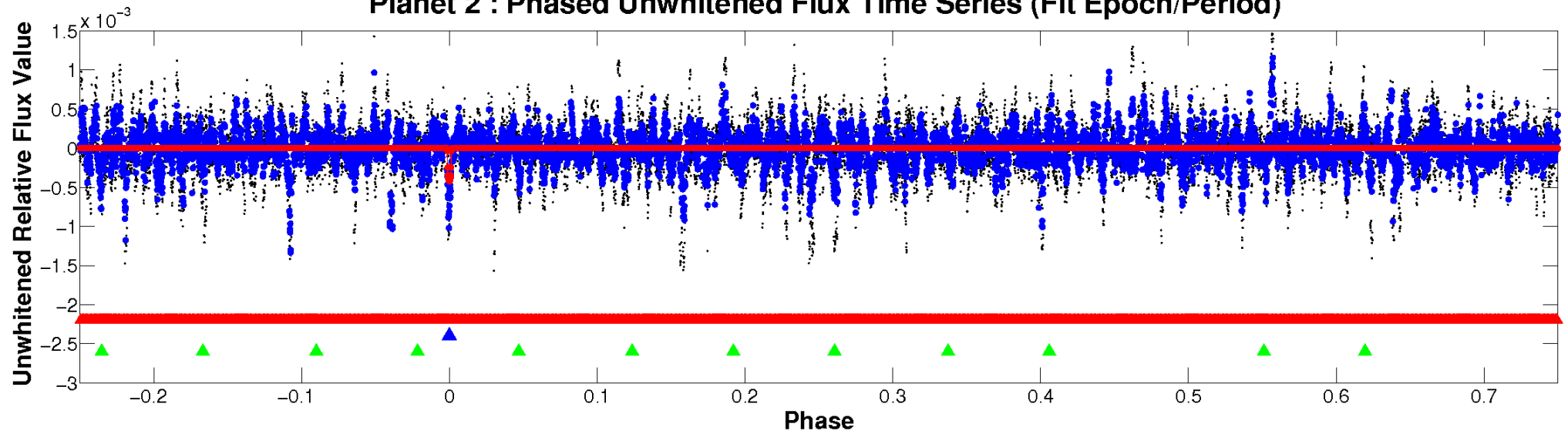
TCE 010722668-02



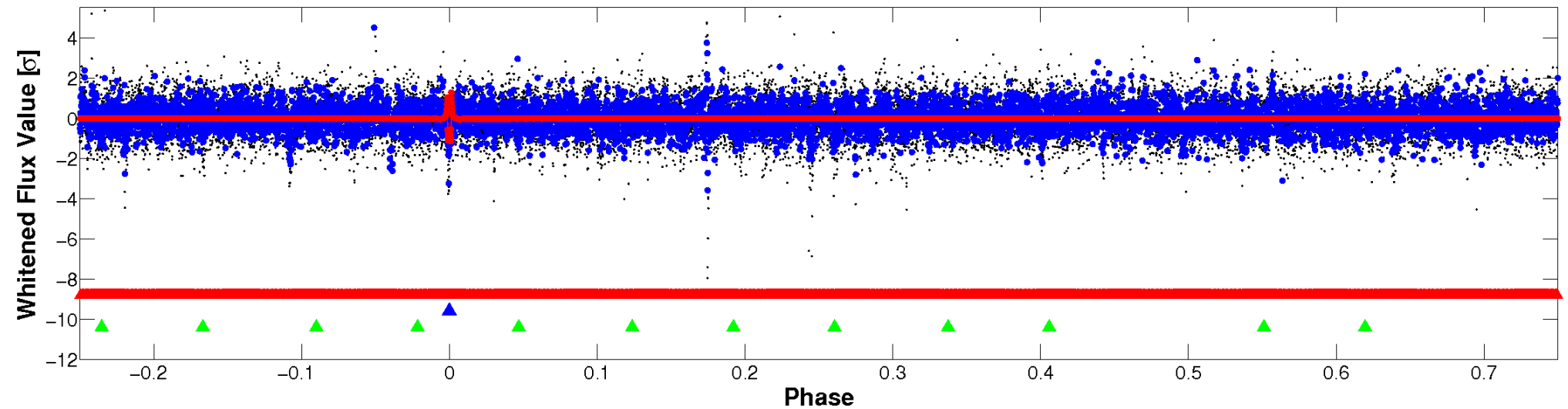


# Non-Whitened Vs. Whitened Light Curve

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

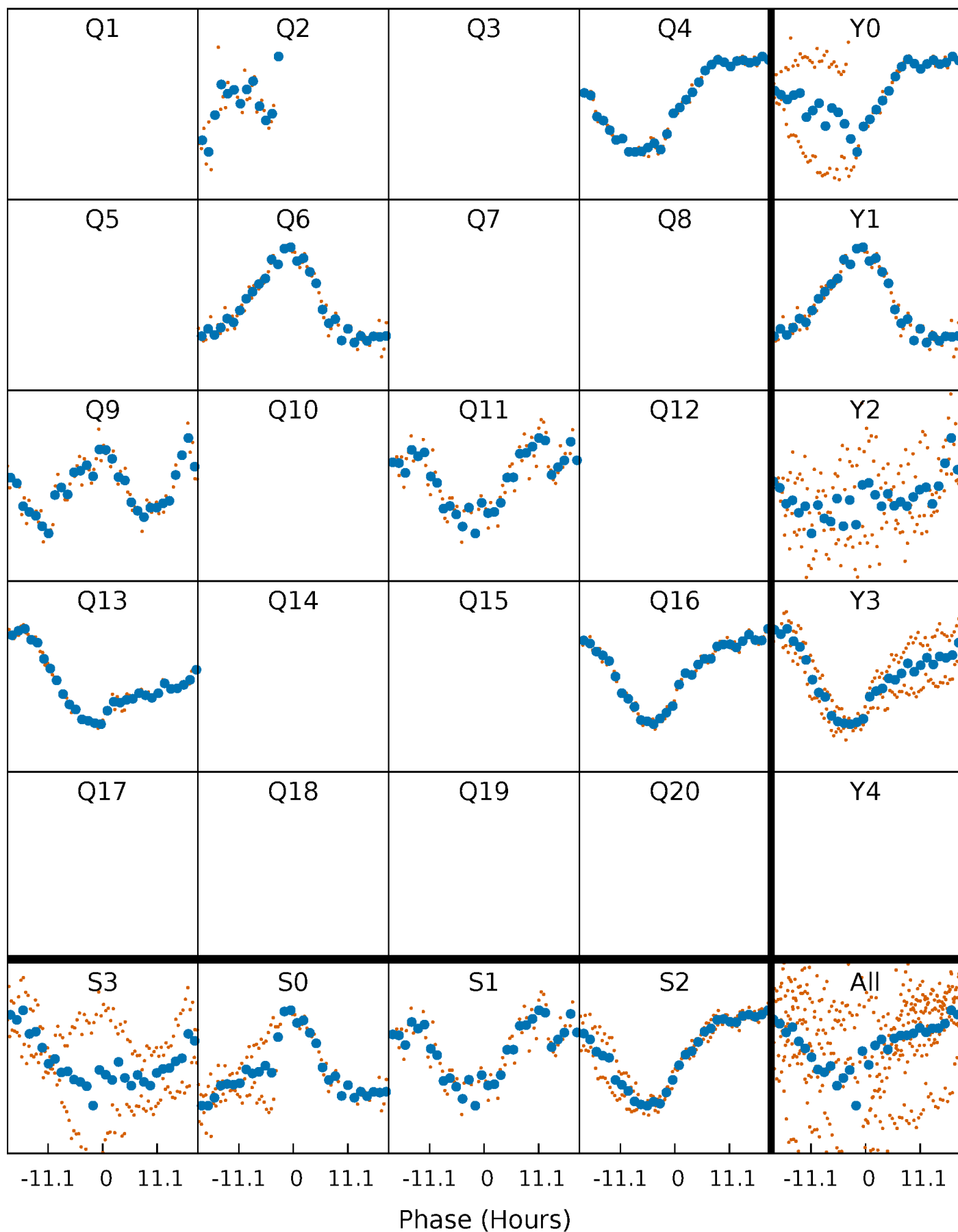


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



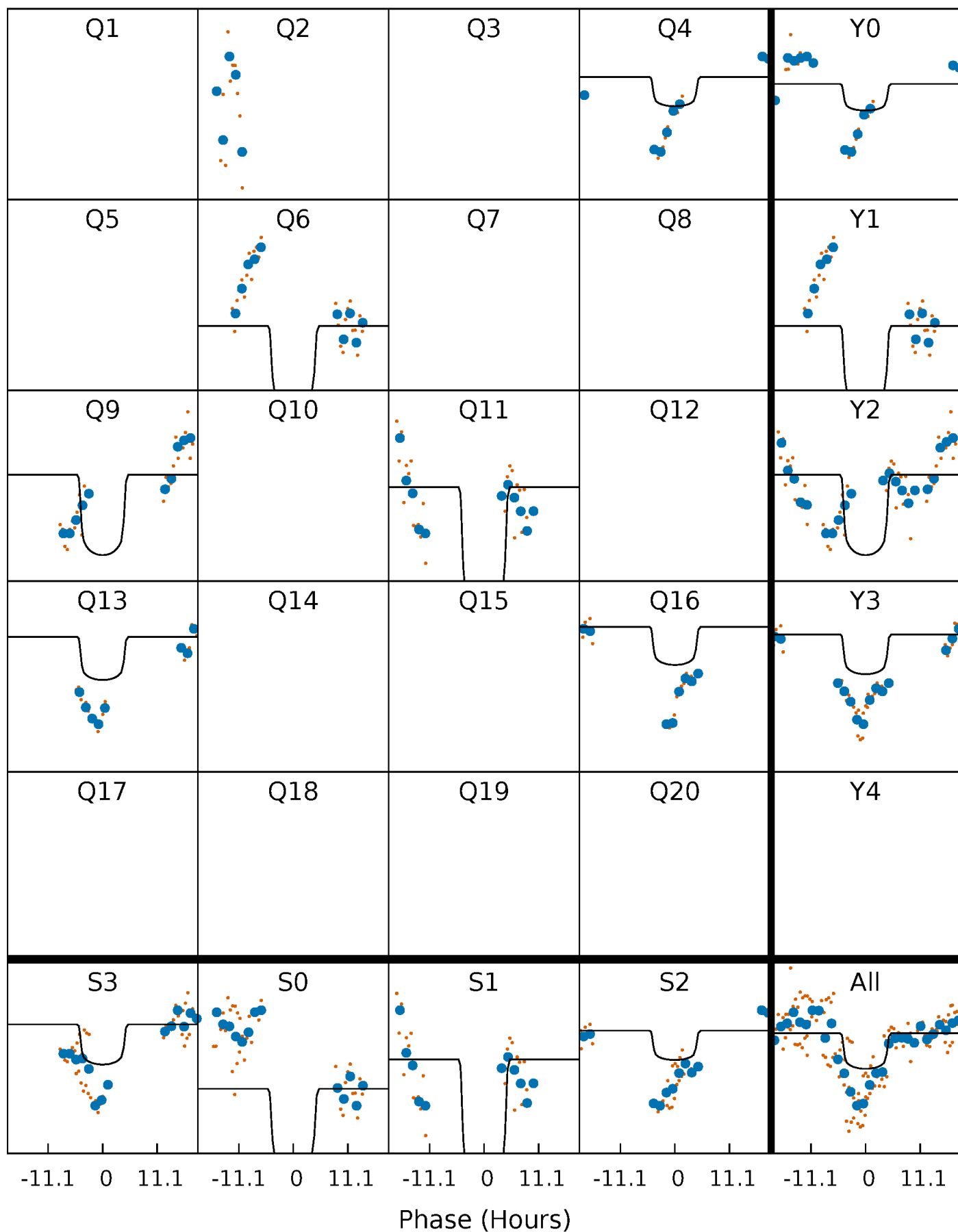
# PDC Quarter-Phased Transit Curves

TCE 010722668-02 P=159.517169 Days  $T_0=255.527364$  (BKJD)



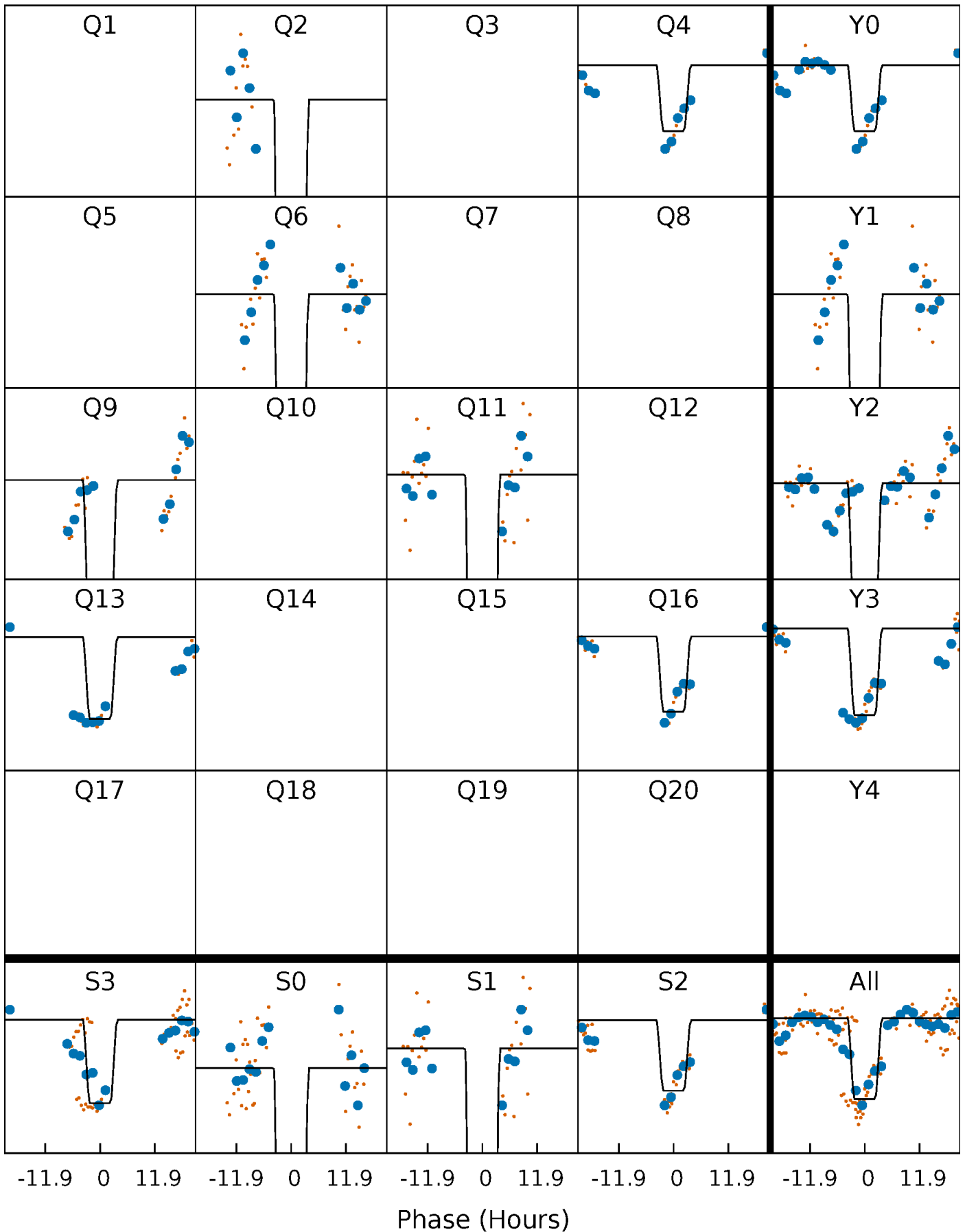
# DV Quarter-Phased Transit Curves

TCE 010722668-02 P=159.517169 Days  $T_0=255.527364$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010722668-02 P=159.531635 Days  $T_0=255.429034$  (BKJD)

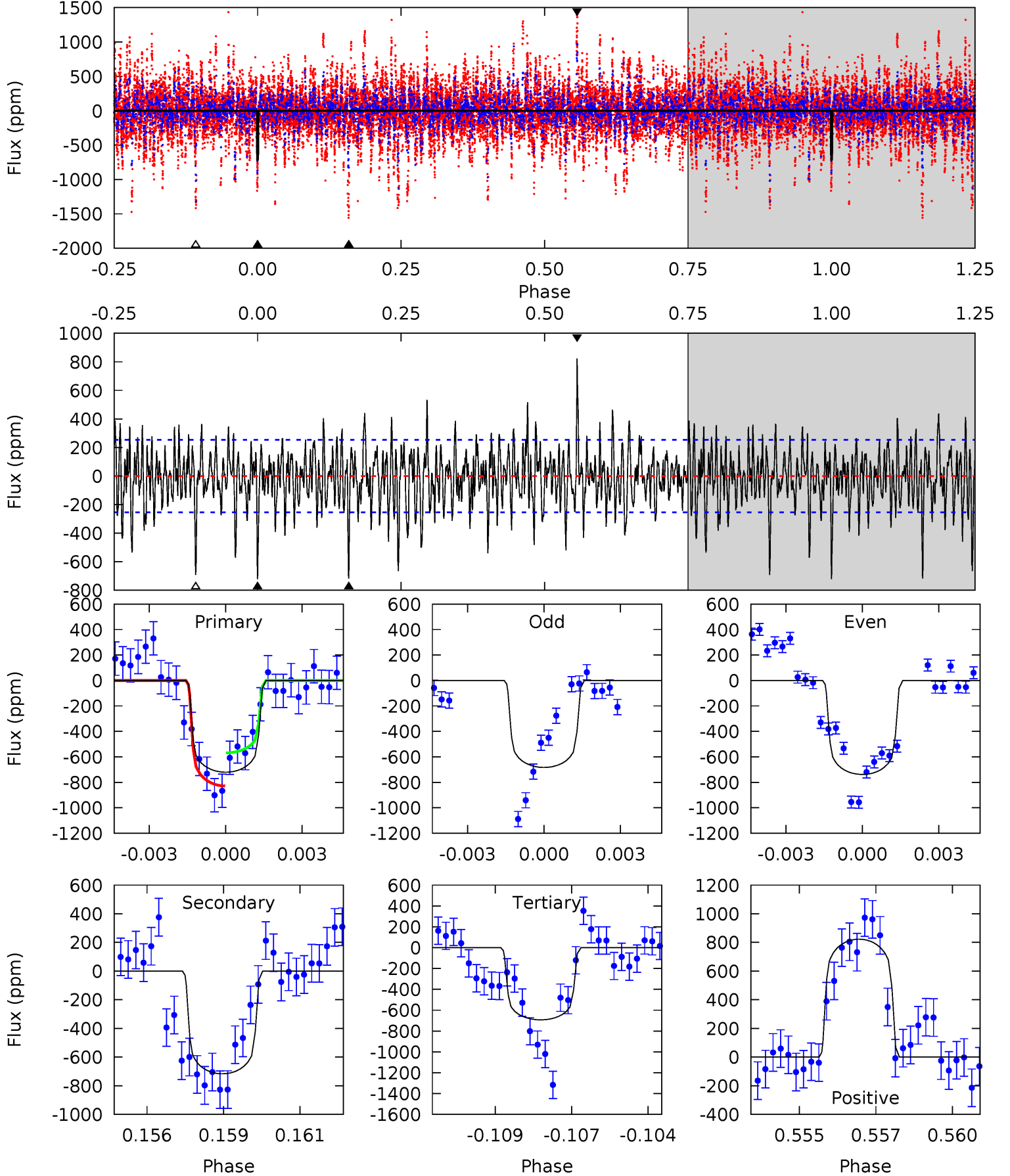




# DV Model-Shift Uniqueness Test

010722668-02,  $P = 159.517169$  Days,  $E = 96.010195$  Days

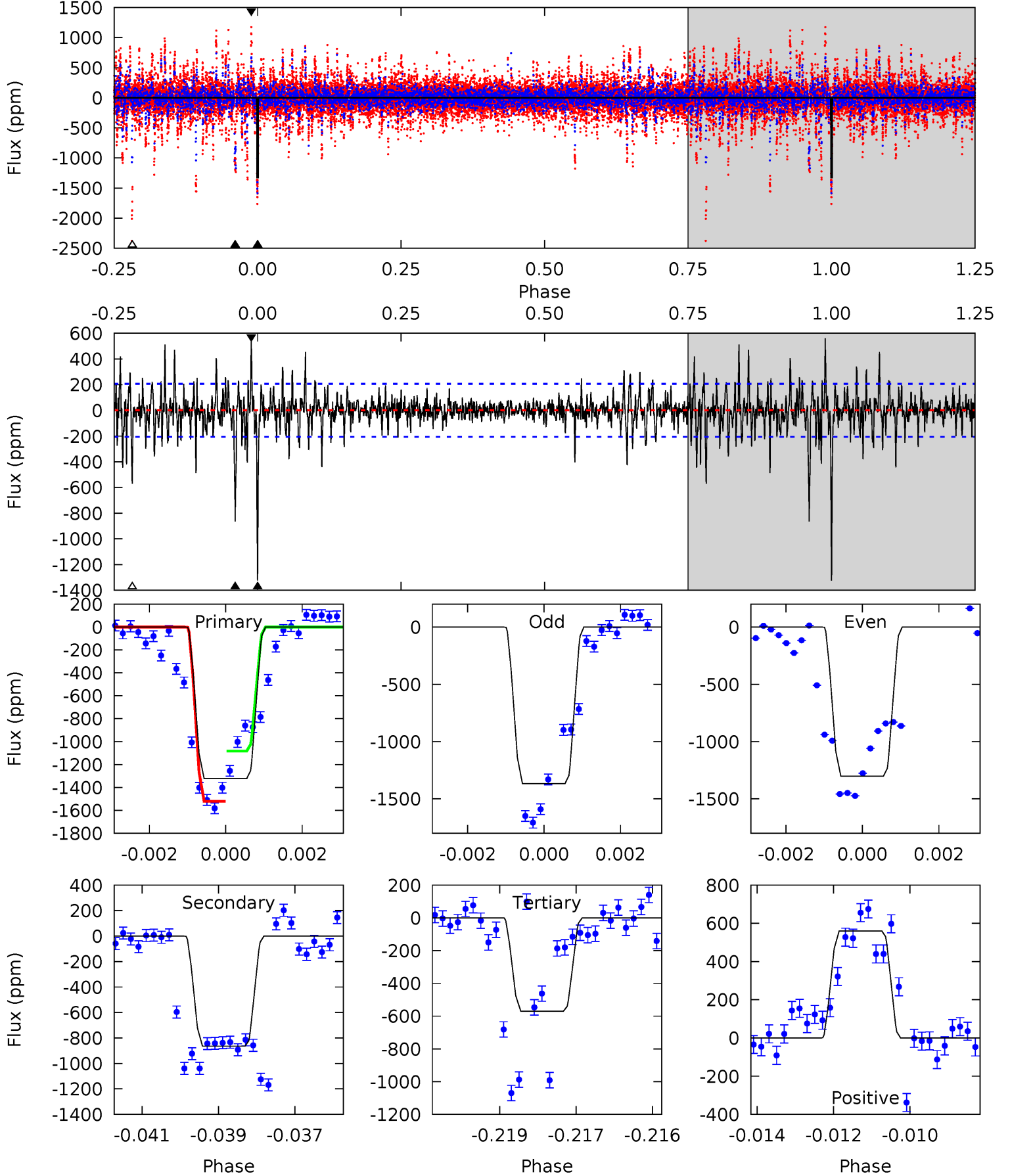
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	14.9	14.4	17.1	5.28	3.01	3.57	0.58	-2.13	0.50	-2.21	0.52	0.70	0.53	2.70



# Alt Model-Shift Uniqueness Test

010722668-02, P = 159.531635 Days, E = 95.897399 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
34.1	22.3	14.7	14.4	5.33	3.10	2.56	19.4	19.6	7.58	7.84	0.82	0.79	0.30	5.60



### Stellar Parameters For KIC 010722668

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7358^{+228}_{-304}$	$3.748^{+0.417}_{-0.074}$	$-0.020^{+0.200}_{-0.350}$	$2.970^{+0.427}_{-1.280}$	$1.799^{+0.194}_{-0.389}$	$0.097^{+0.351}_{-0.029}$
	+3%/-4%	+11%/-2%	+1000%/-1750%	+14%/-43%	+11%/-22%	+363%/-30%
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 010722668-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-717 \pm 48$	$6.28^{+1.37}_{-1.46}$	$897^{+66}_{-99}$	$8430^{+965}_{-732}$	$4935^{+3409}_{-1537}$
Alt.	$-864 \pm 39$	$11.10^{+1.77}_{-2.46}$	$904^{+62}_{-97}$	$6511^{+359}_{-331}$	$1895^{+1102}_{-460}$

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

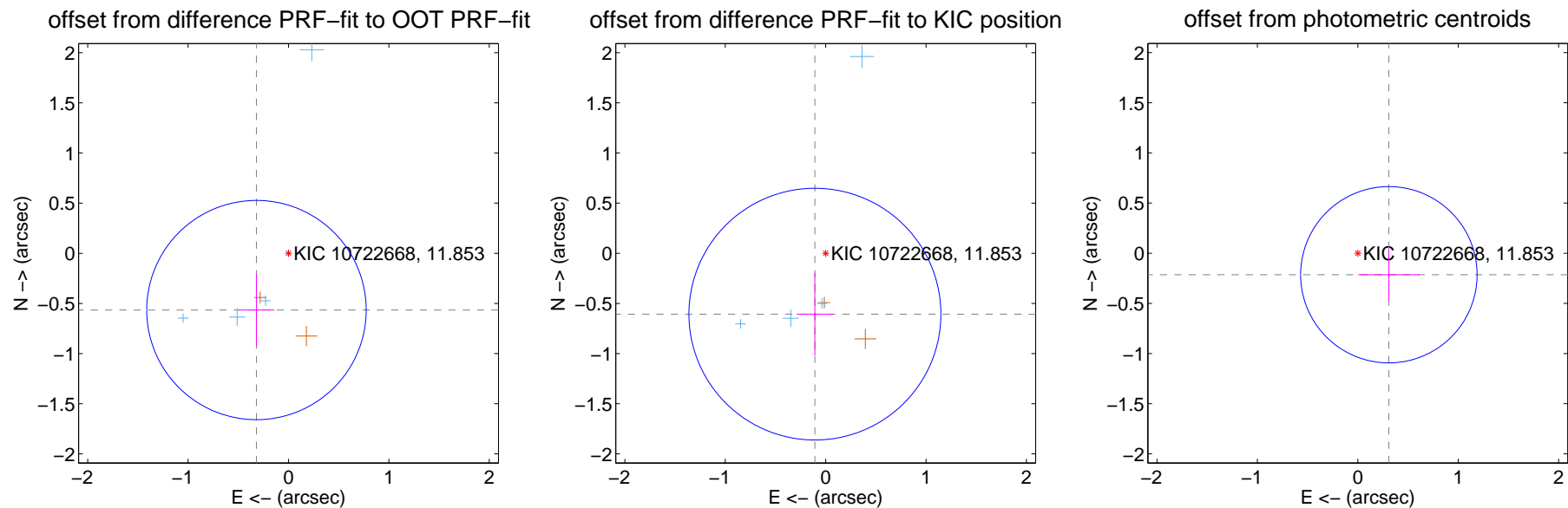
## DV Centroid Data

Supplemental centroid analysis for 010722668-02. **Kepler magnitude: 11.85.** Transit SNR 5.66

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

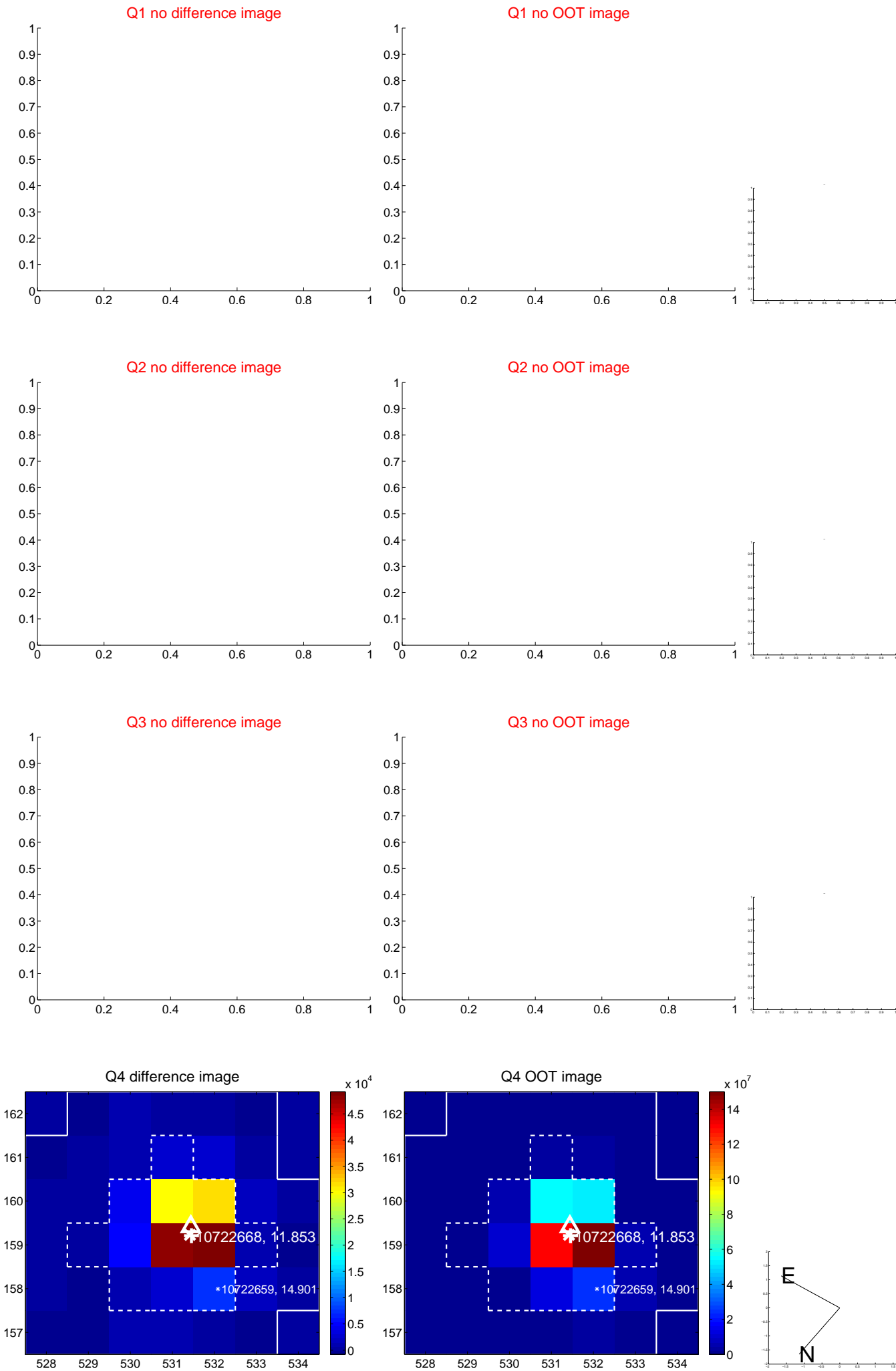
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.650 \pm 0.364$	1.78	$0.319 \pm 0.178$	$-0.566 \pm 0.358$
PRF-fit source offset from KIC position	$0.616 \pm 0.418$	1.47	$0.107 \pm 0.181$	$-0.607 \pm 0.411$
photometric centroid source offset	$0.38 \pm 0.29$	1.28	$-0.31 \pm 0.31$	$-0.21 \pm 0.26$



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.

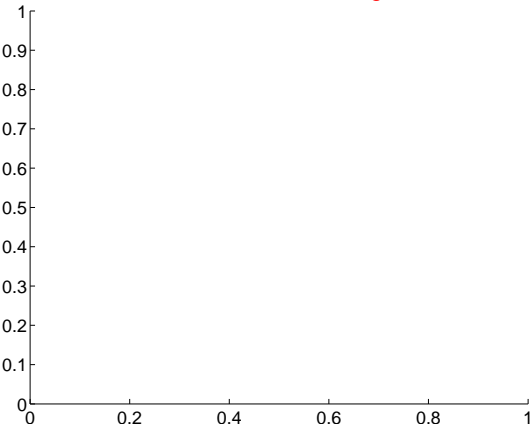


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

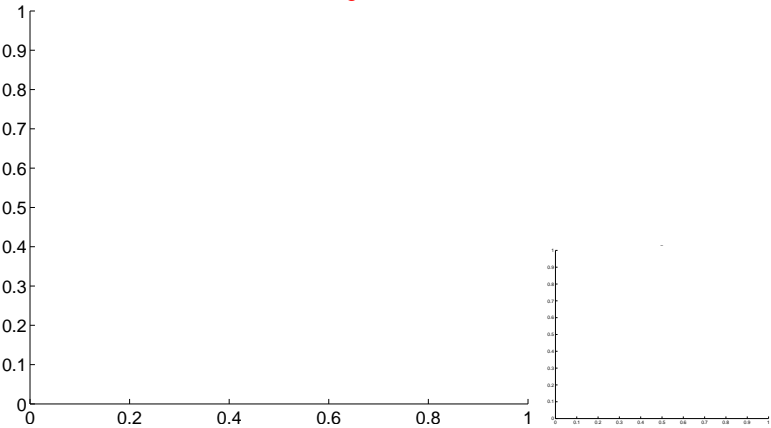


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

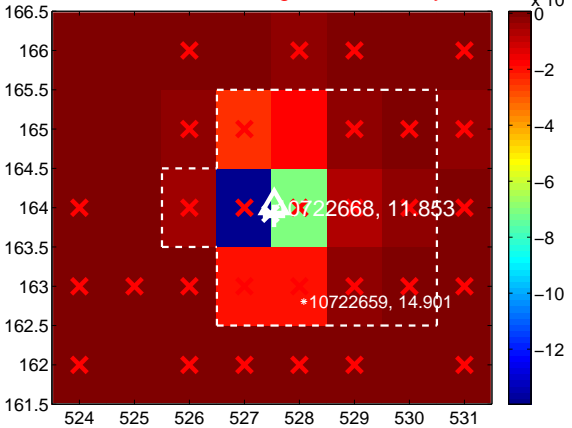
Q5 no difference image



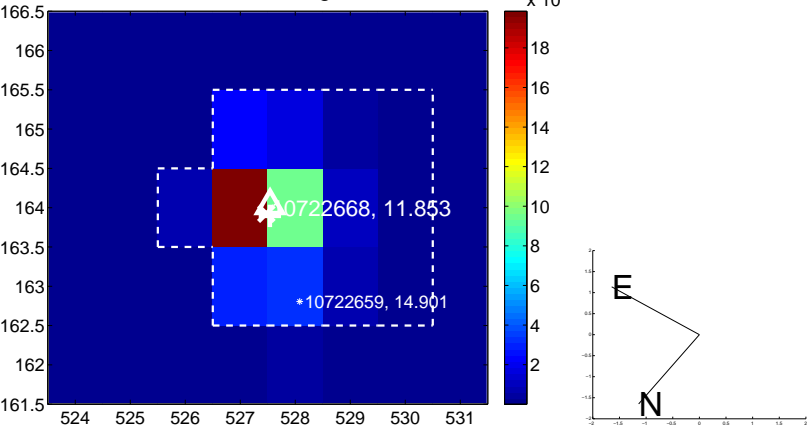
Q5 no OOT image



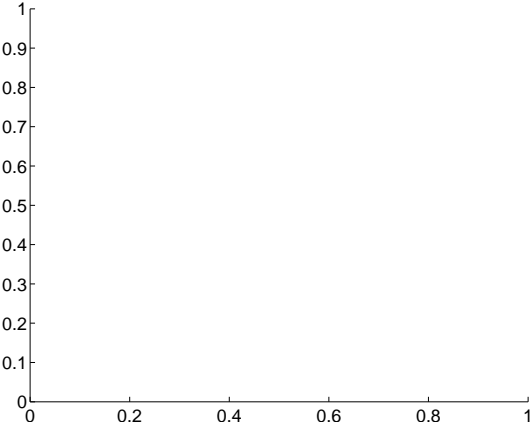
Q6 difference image. Poor Quality



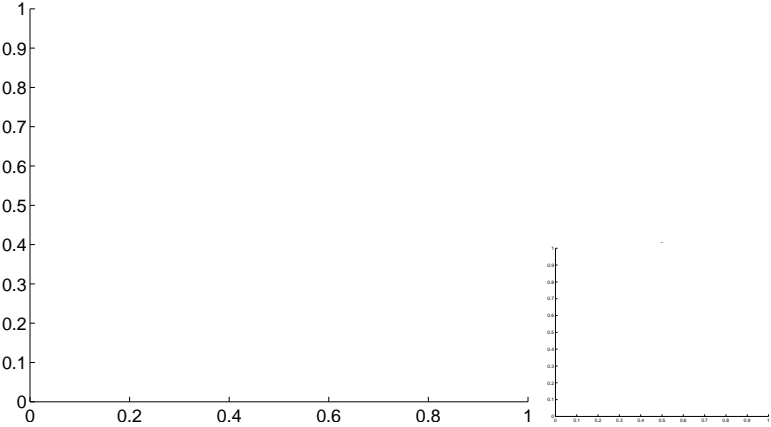
Q6 OOT image



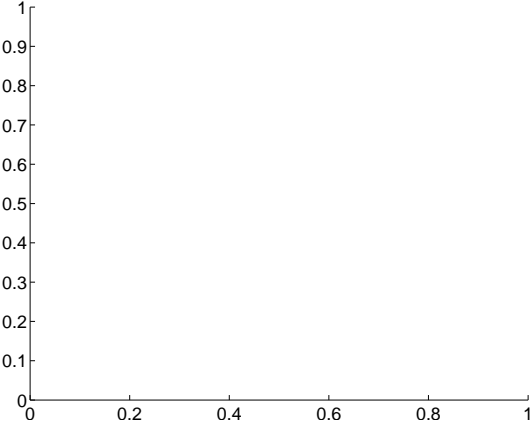
Q7 no difference image



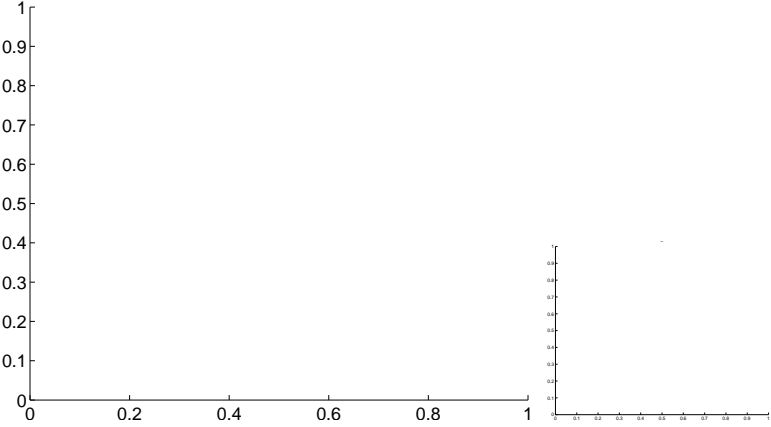
Q7 no OOT image



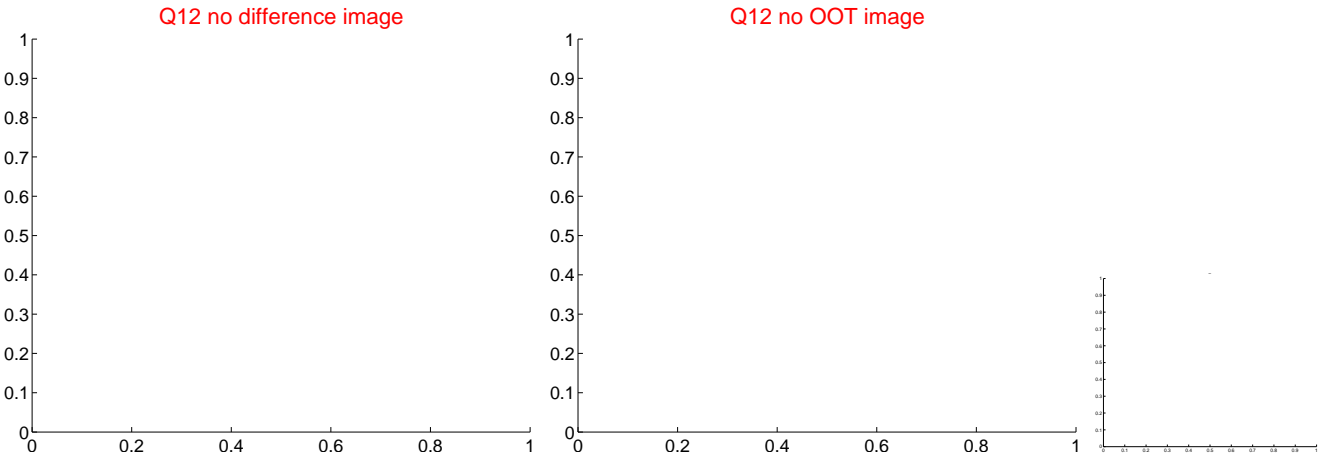
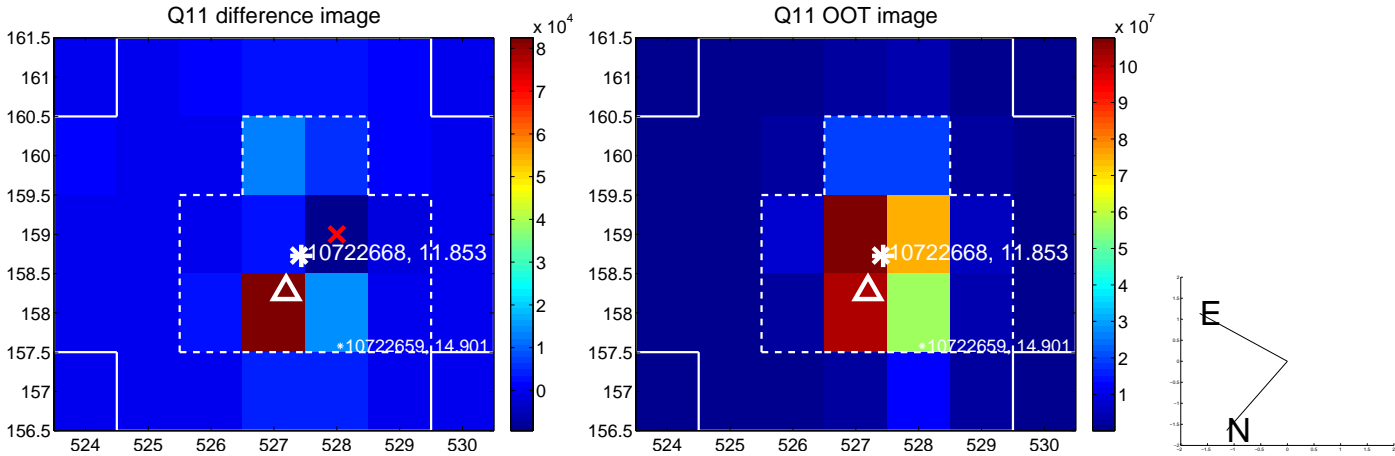
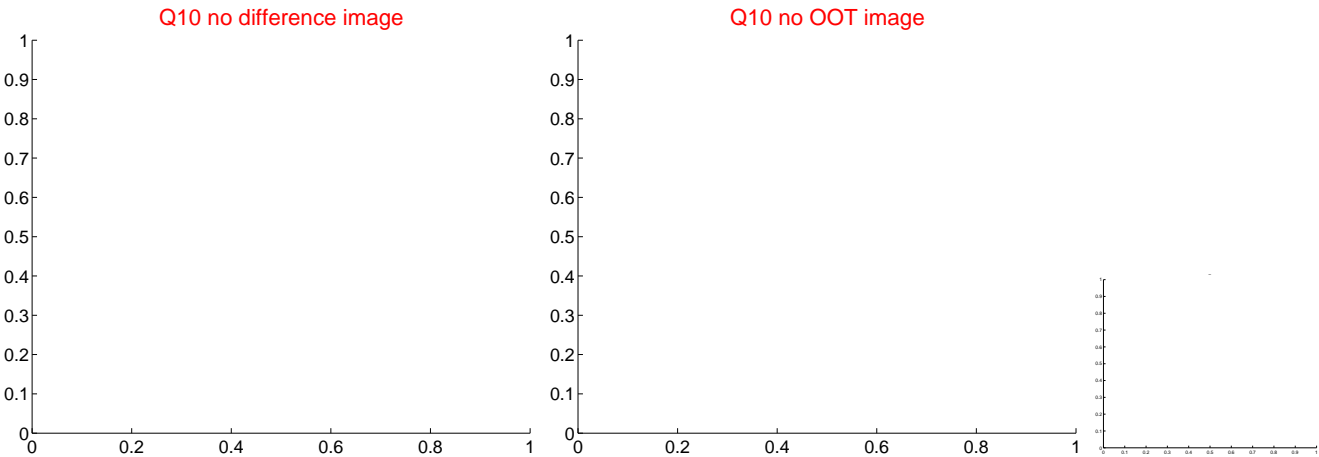
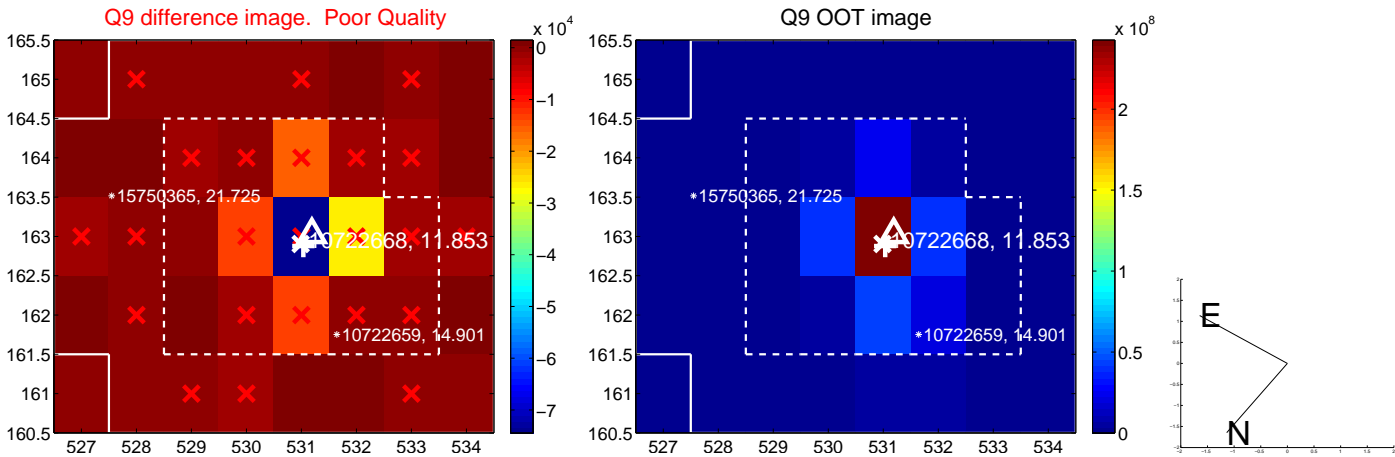
Q8 no difference image



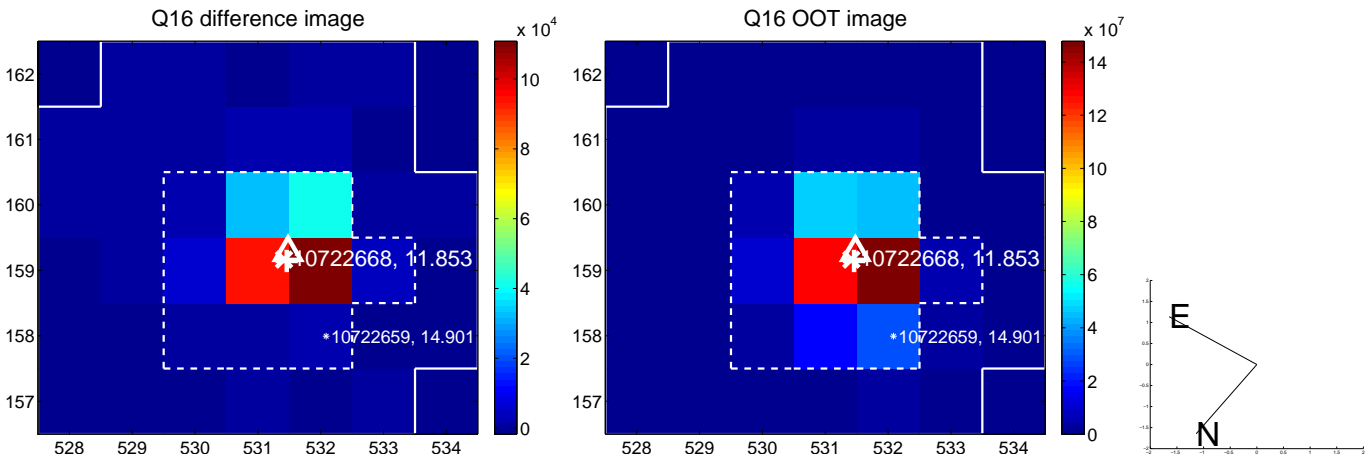
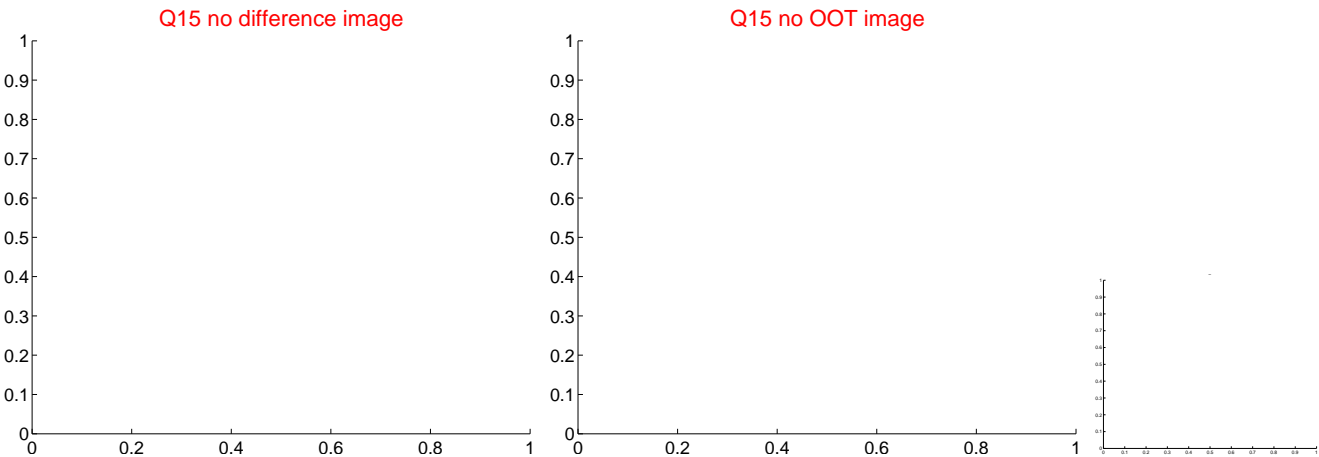
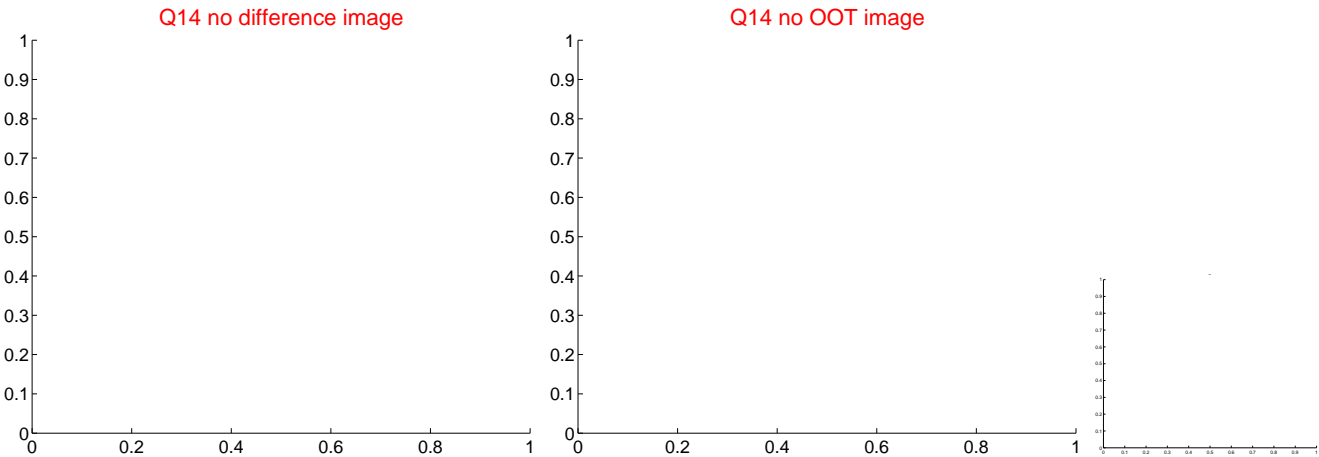
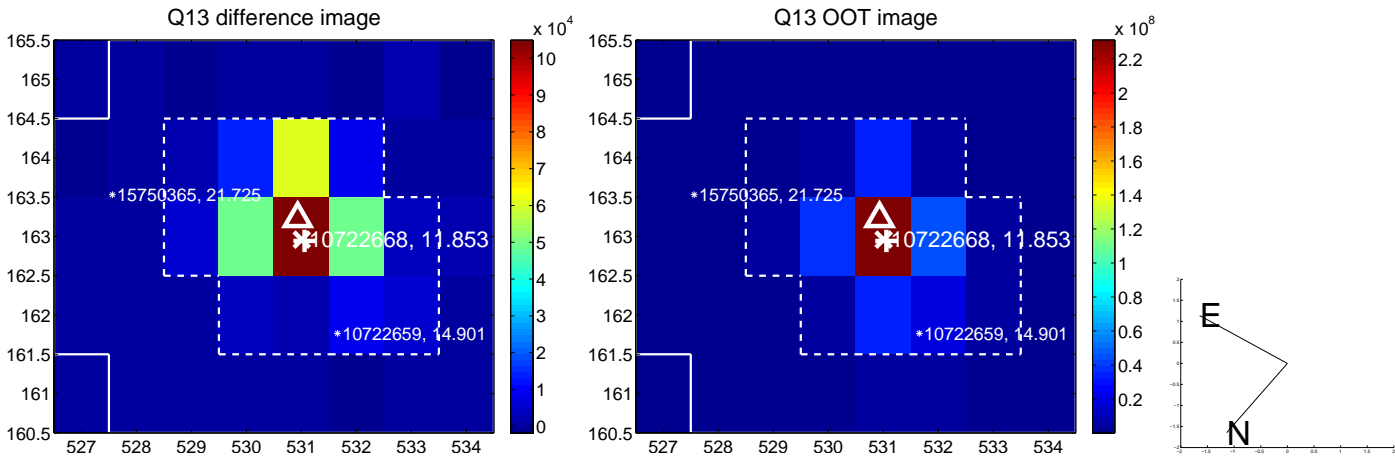
Q8 no OOT image



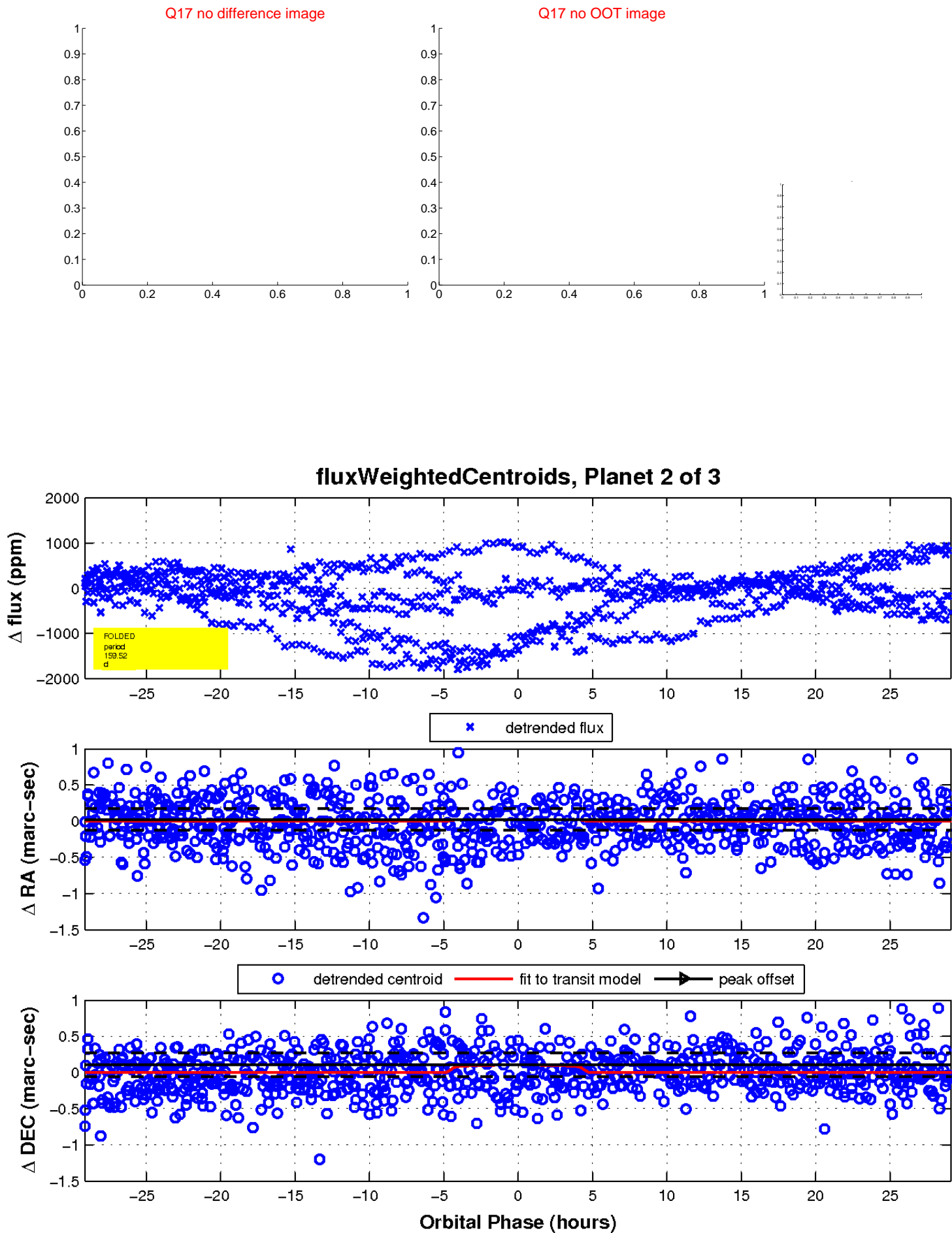
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



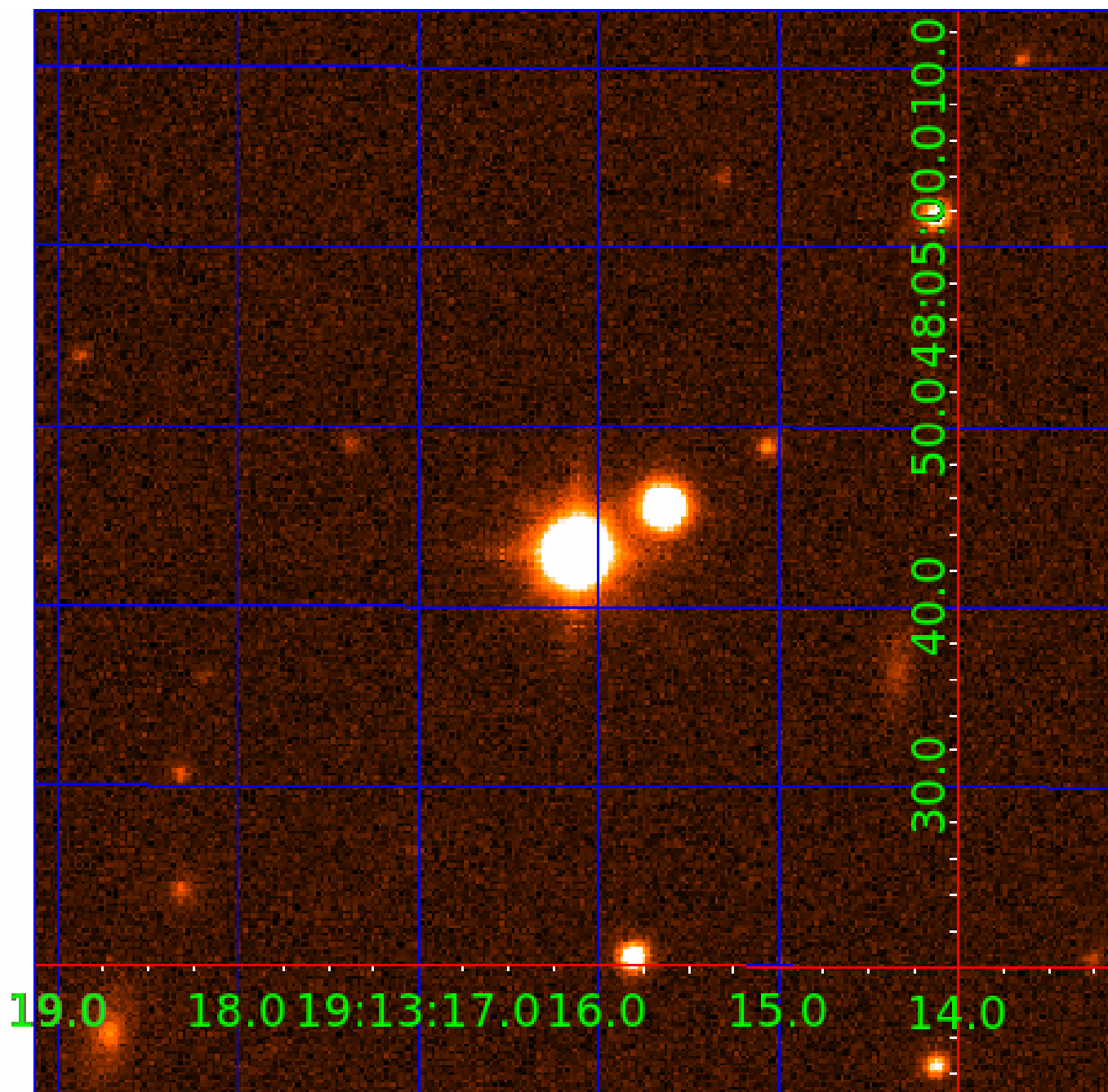
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 010722668

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010722668-01	OBS	No	0.889102	131.834217	32.8	4.832	9.8	13.0	2.97	7358	1.78	47771.54
010722668-02	OBS	No	159.517169	255.527364	421.0	9.713	8.8	5.7	2.97	7358	6.87	47.21
010722668-03	OBS	No	125.429929	137.583772	326.3	5.045	7.7	5.1	2.97	7358	5.89	65.05

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010722668-01	OBS	FP	0.00	1	0	0	0	LPP_DV
010722668-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—HALO_GHOST
010722668-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES

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

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

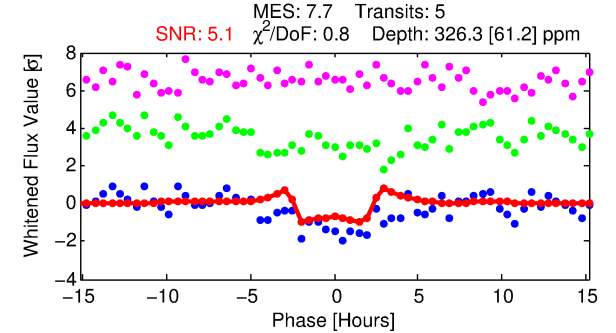
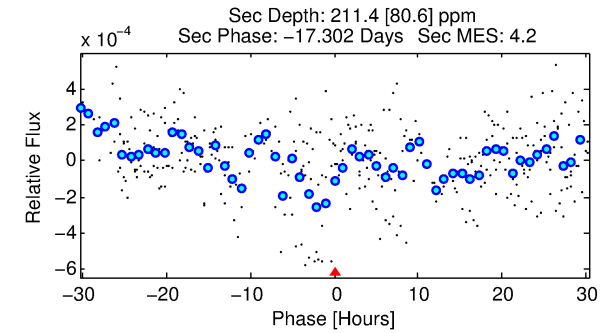
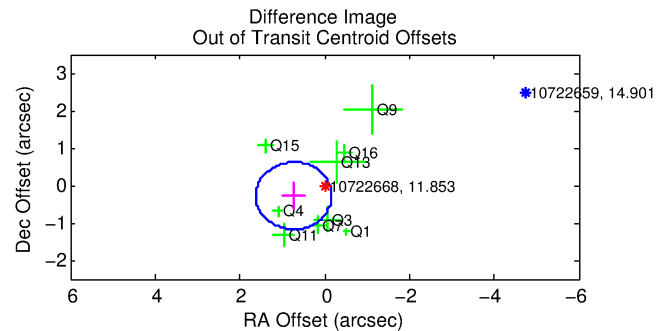
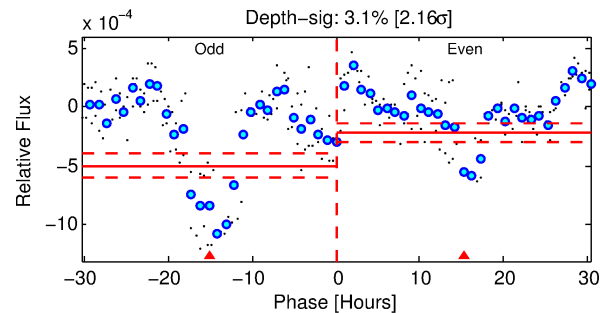
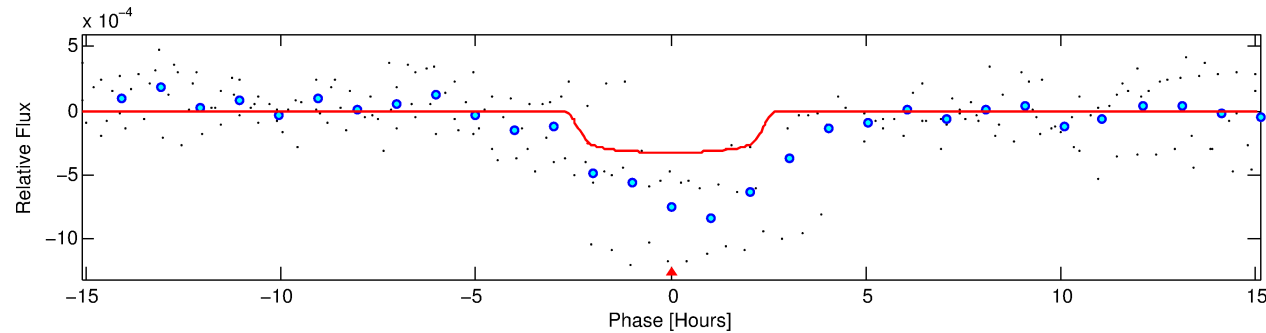
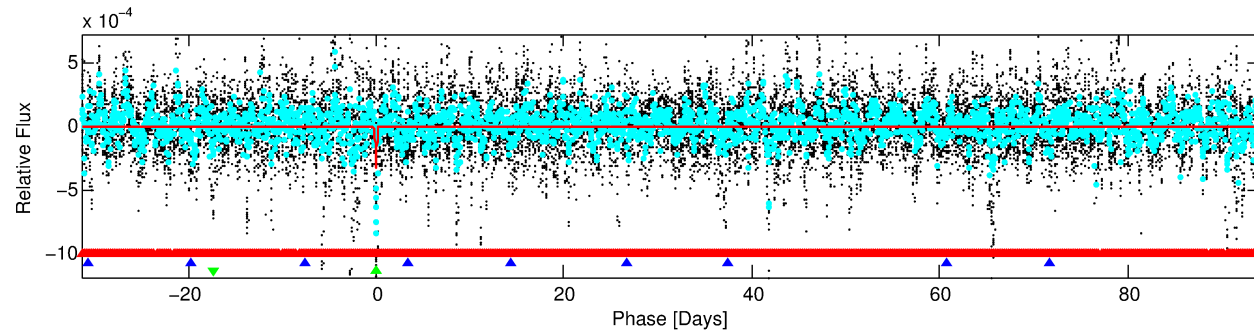
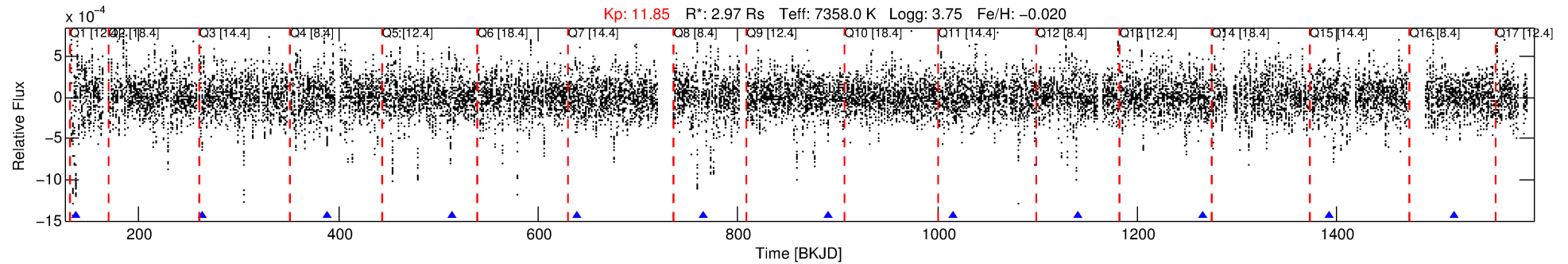
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010722668-03

No Significant Match Found

# DV One-Page Summary

KIC: 10722668 Candidate: 3 of 3 Period: 125.430 d



## DV Fit Results:

Period = 125.42993 [0.00139] d  
Epoch = 137.5838 [0.0061] BKJD  
Rp/R\* = 0.0182 [0.0073]  
a/R\* = 121.96 [286.29]  
b = 0.79 [1.12]  
Seff = 65.05 [46.89]  
Teq = 724 [131] K  
Rp = 5.89 [3.47] Re  
a = 0.5968 [0.2567] AU  
Ag = 1192.29 [1350.37] [0.88 $\sigma$ ]  
Teffp = 6579 [1487] K [3.92 $\sigma$ ]

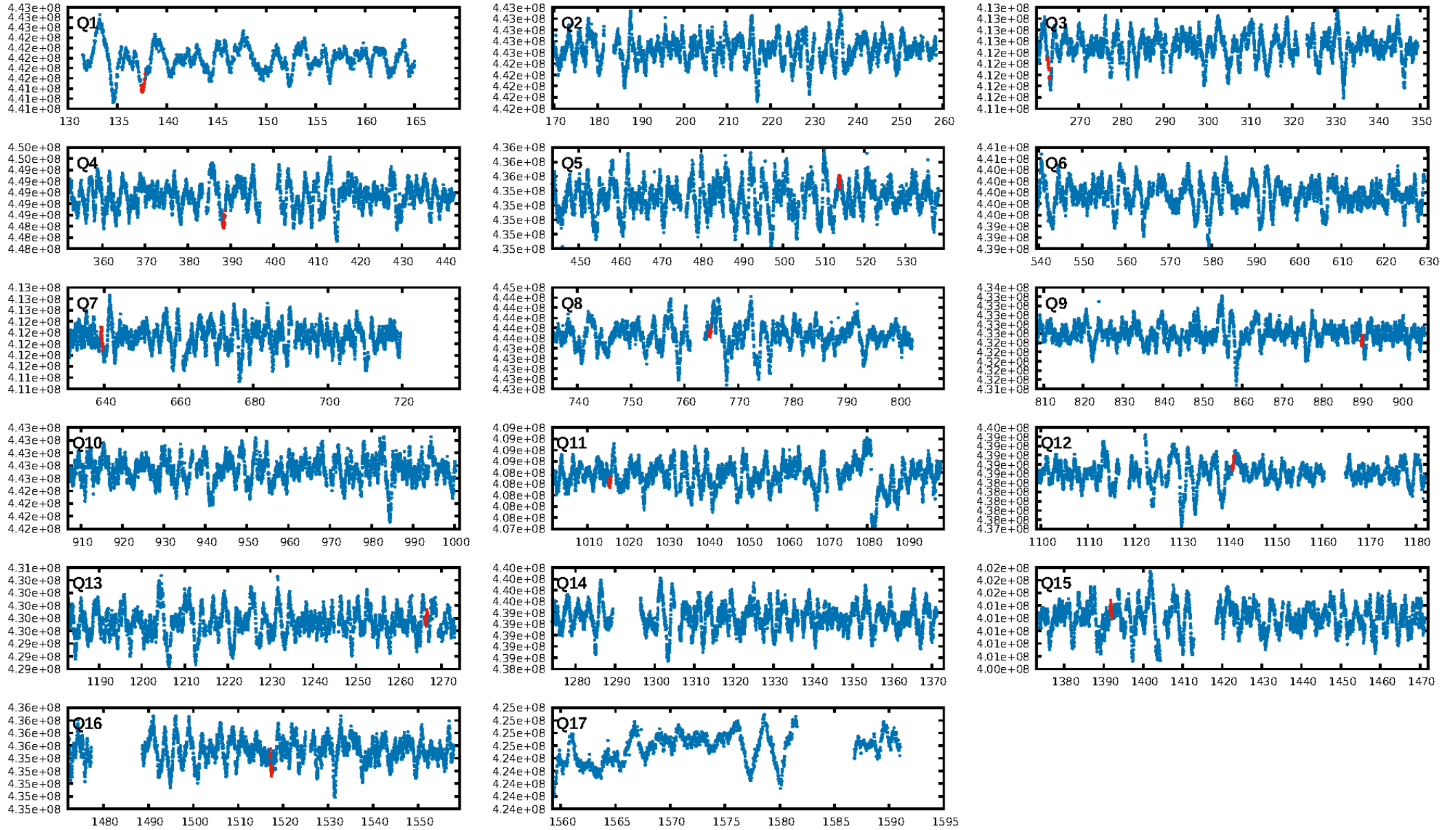
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [427.84 $\sigma$ ]  
LongPeriod-sig: 100.0% [74.75 $\sigma$ ]  
ModelChiSquare2-sig: 17.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.21e-09**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 40.56  
Centroid-sig: 22.0%  
Centroid-so: 0.203 arcsec [0.65 $\sigma$ ]  
OotOffset-rm: 0.784 arcsec [2.62 $\sigma$ ]  
KicOffset-rm: 0.671 arcsec [1.96 $\sigma$ ]  
OotOffset-st: 0/4/2/3 [9]  
KicOffset-st: 0/4/2/3 [9]  
DiffImageQuality-fgm: 0.56 [5/9]  
DiffImageOverlap-fno: 0.00 [0/11]

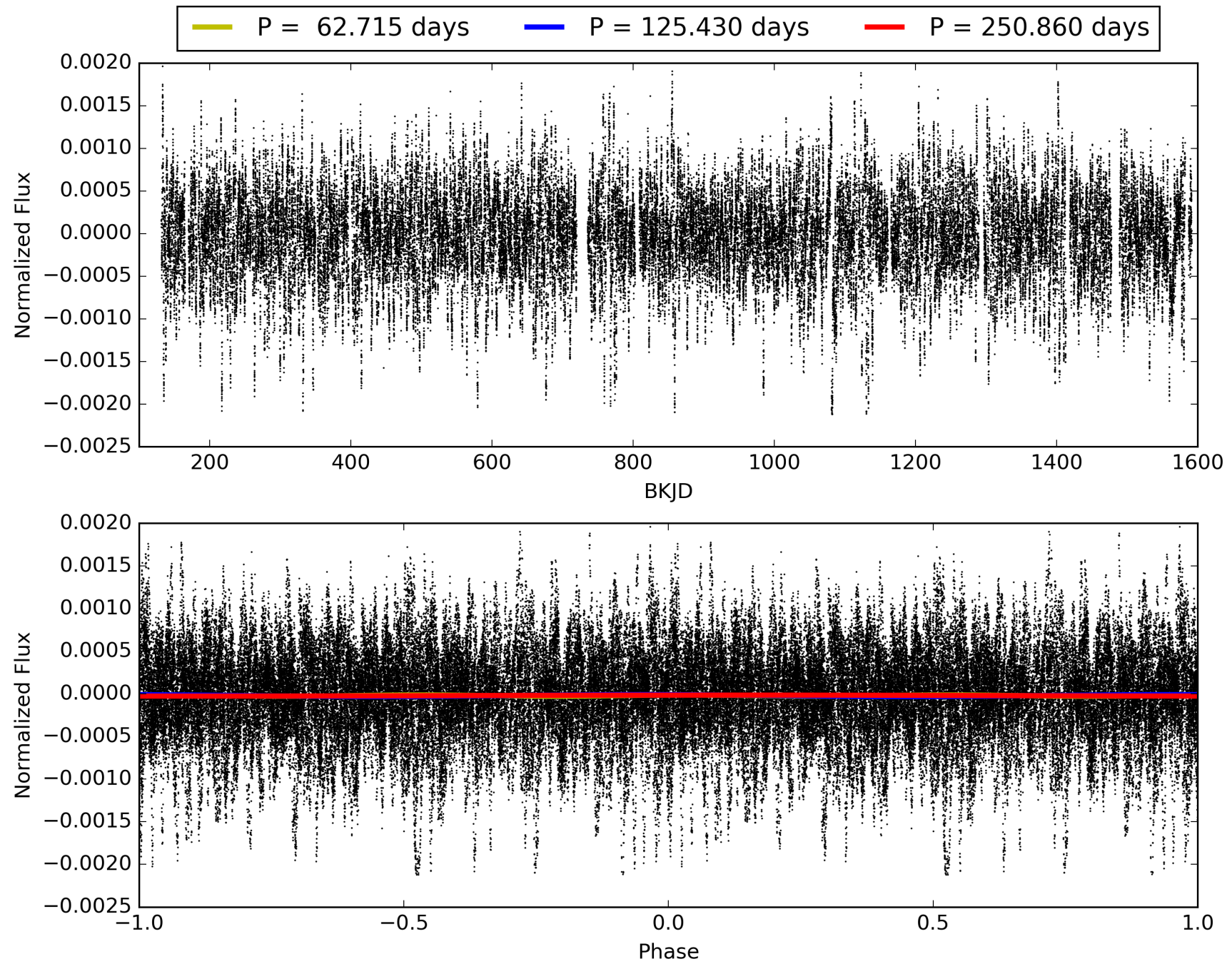
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:46:35 Z

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

# TCE 010722668-03, PDC Light Curves



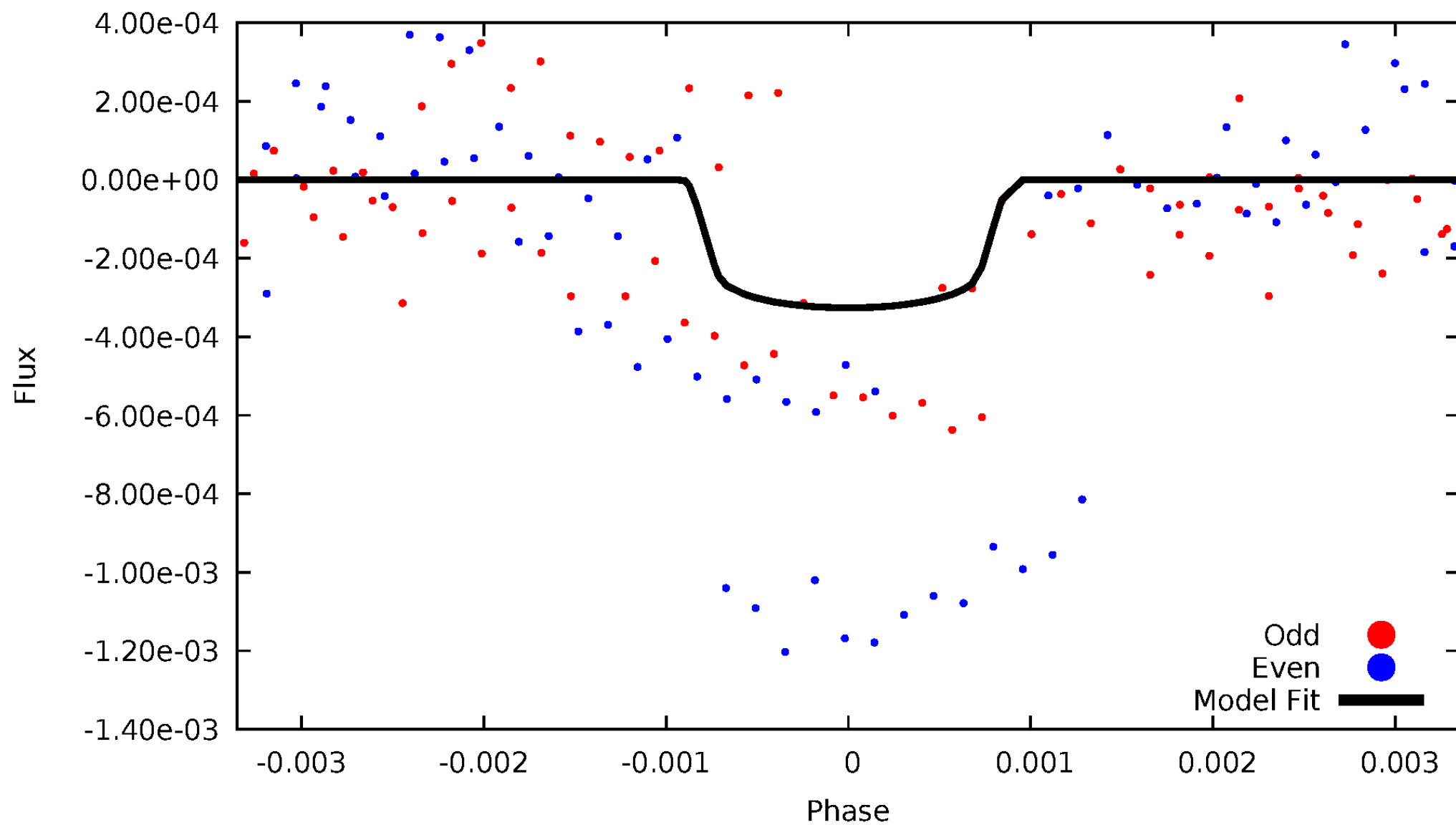
# TCE 010722668-03





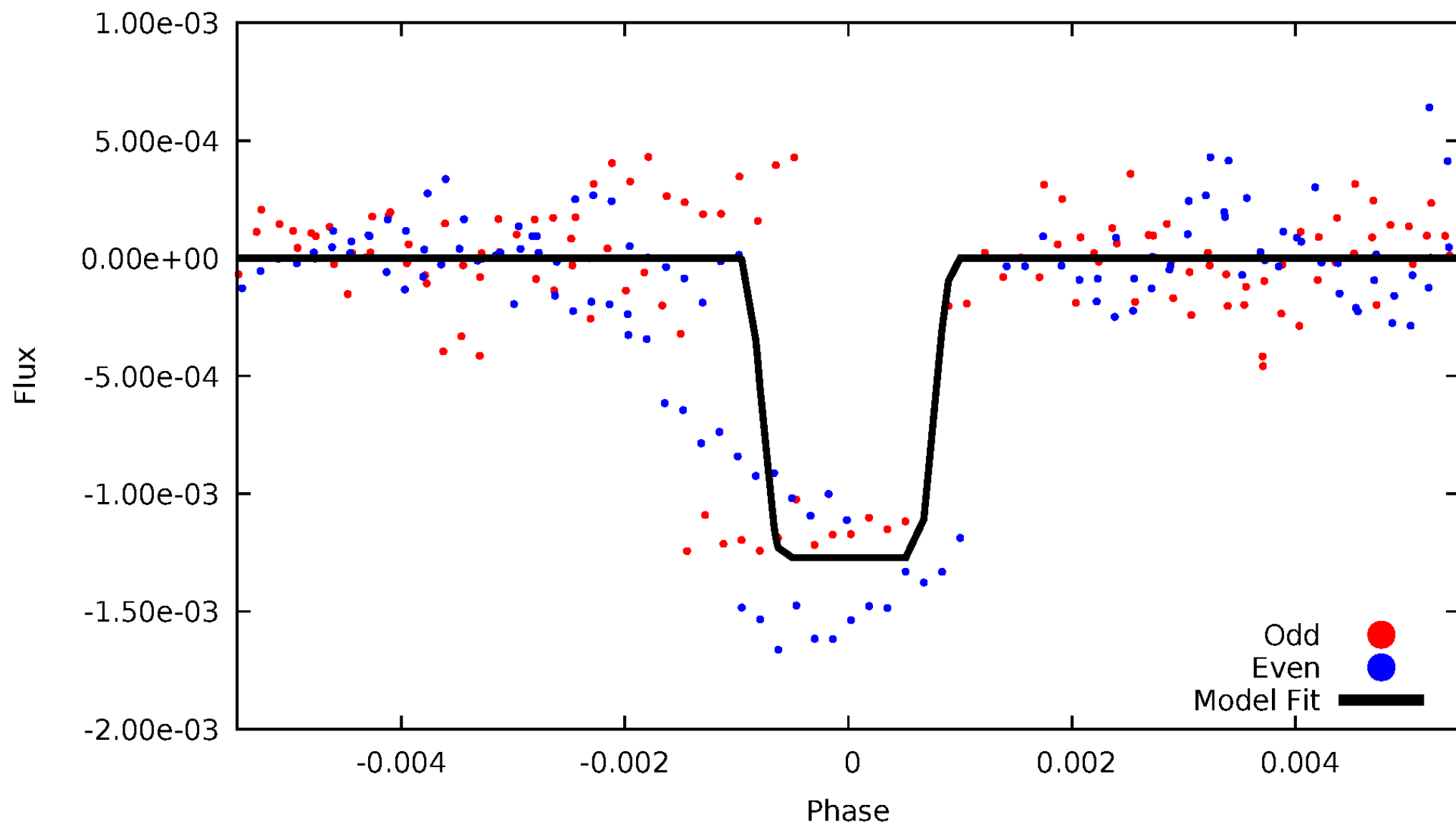
# DV Odd/Even

TCE 010722668-03



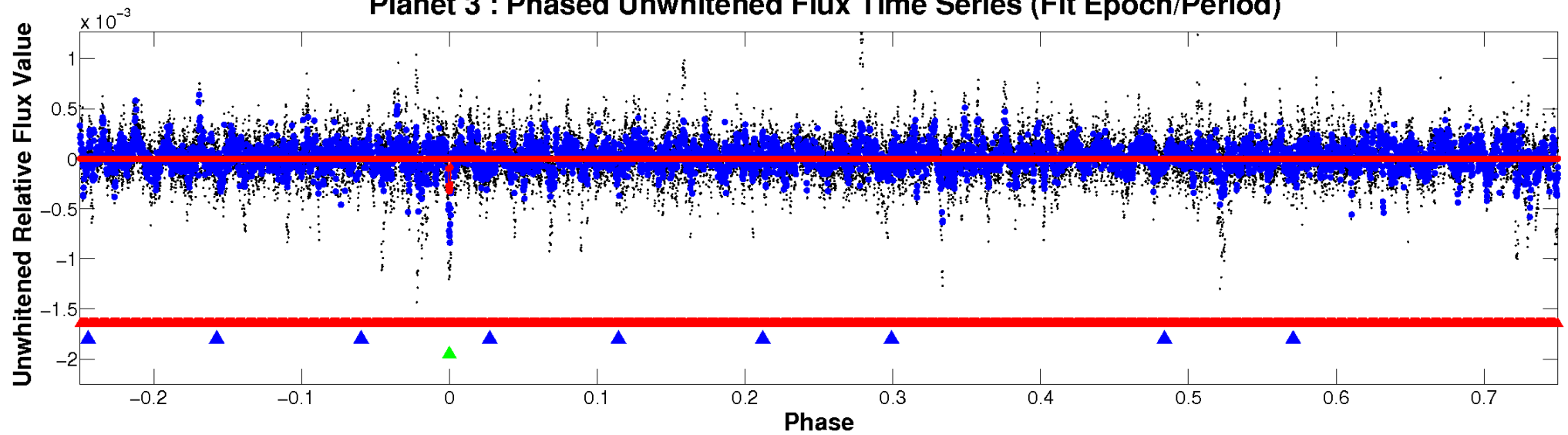
# ALT Odd/Even

TCE 010722668-03

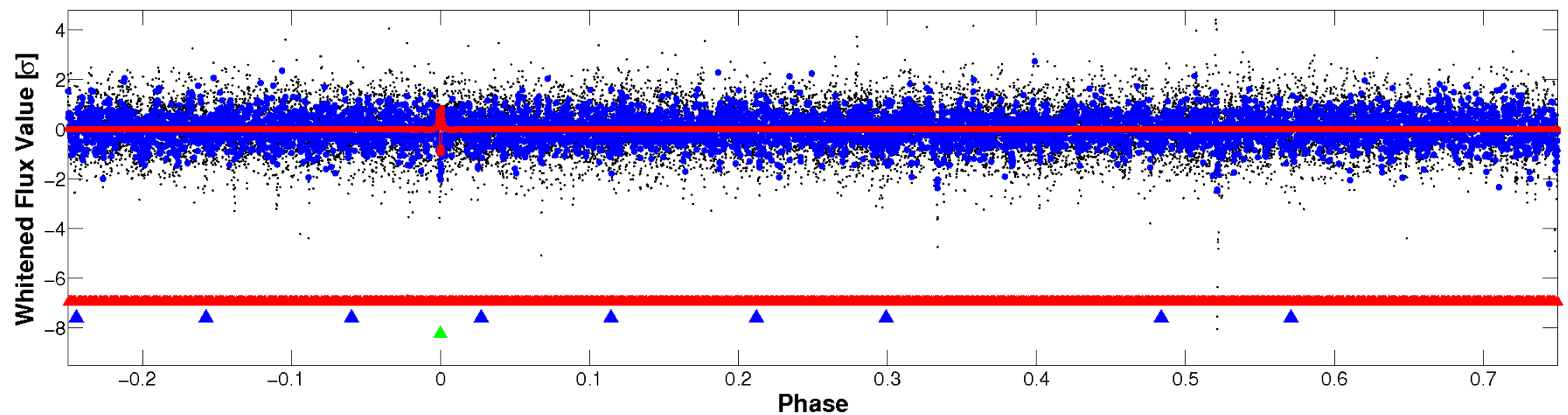


# Non-Whitened Vs. Whitened Light Curve

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

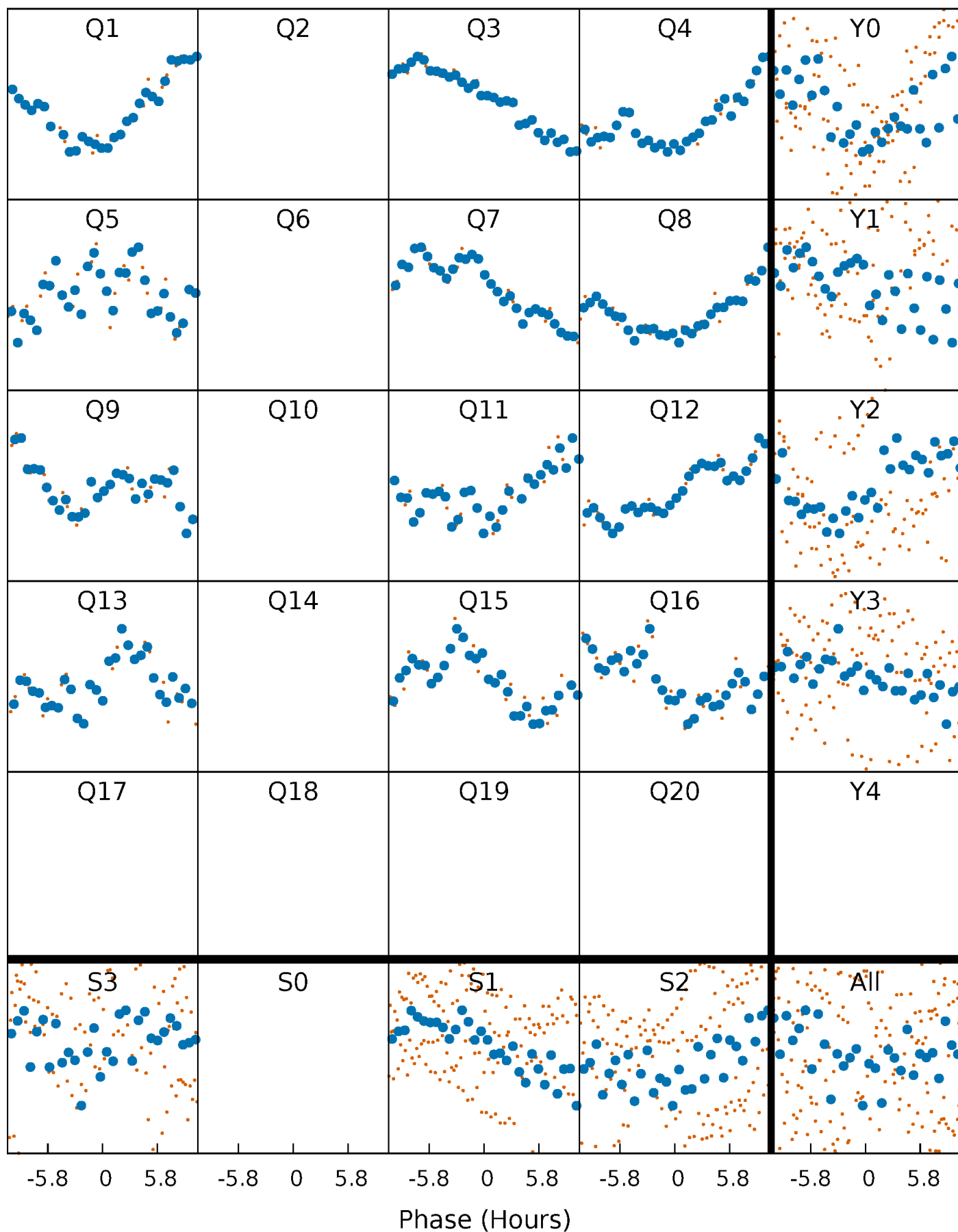


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



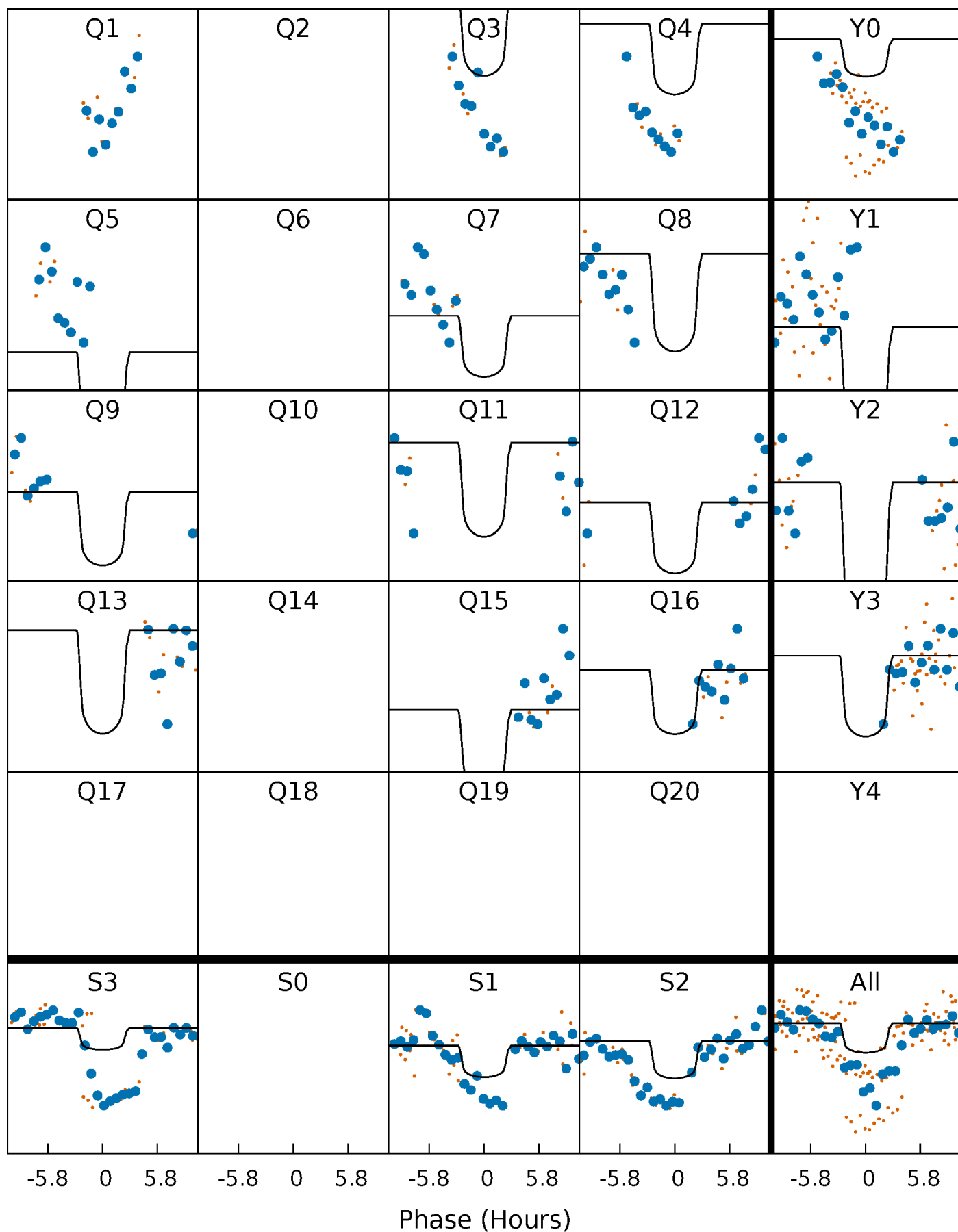
# PDC Quarter-Phased Transit Curves

TCE 010722668-03   P=125.429929 Days    $T_0=137.583772$  (BKJD)



# DV Quarter-Phased Transit Curves

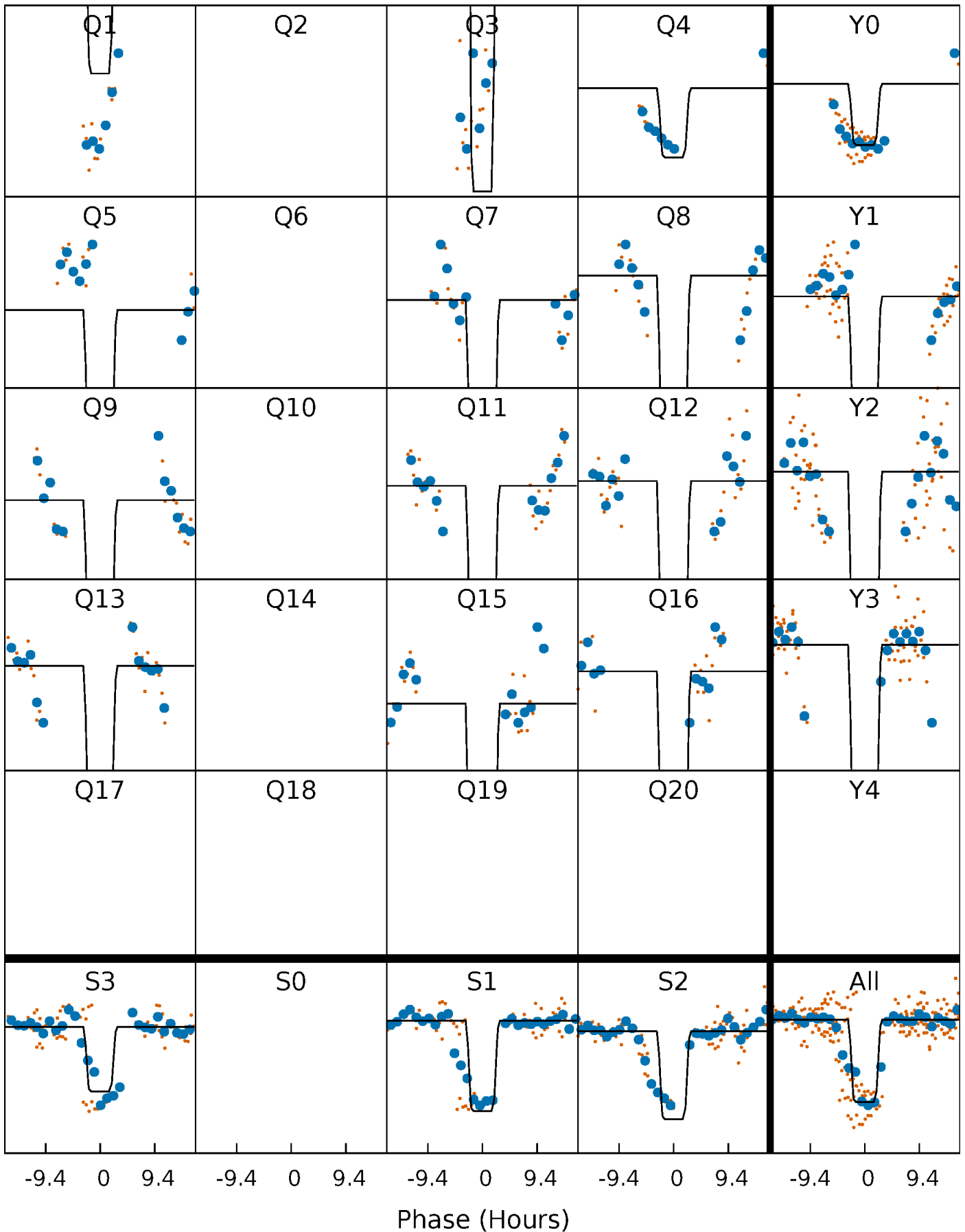
TCE 010722668-03   P=125.429929 Days    $T_0=137.583772$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

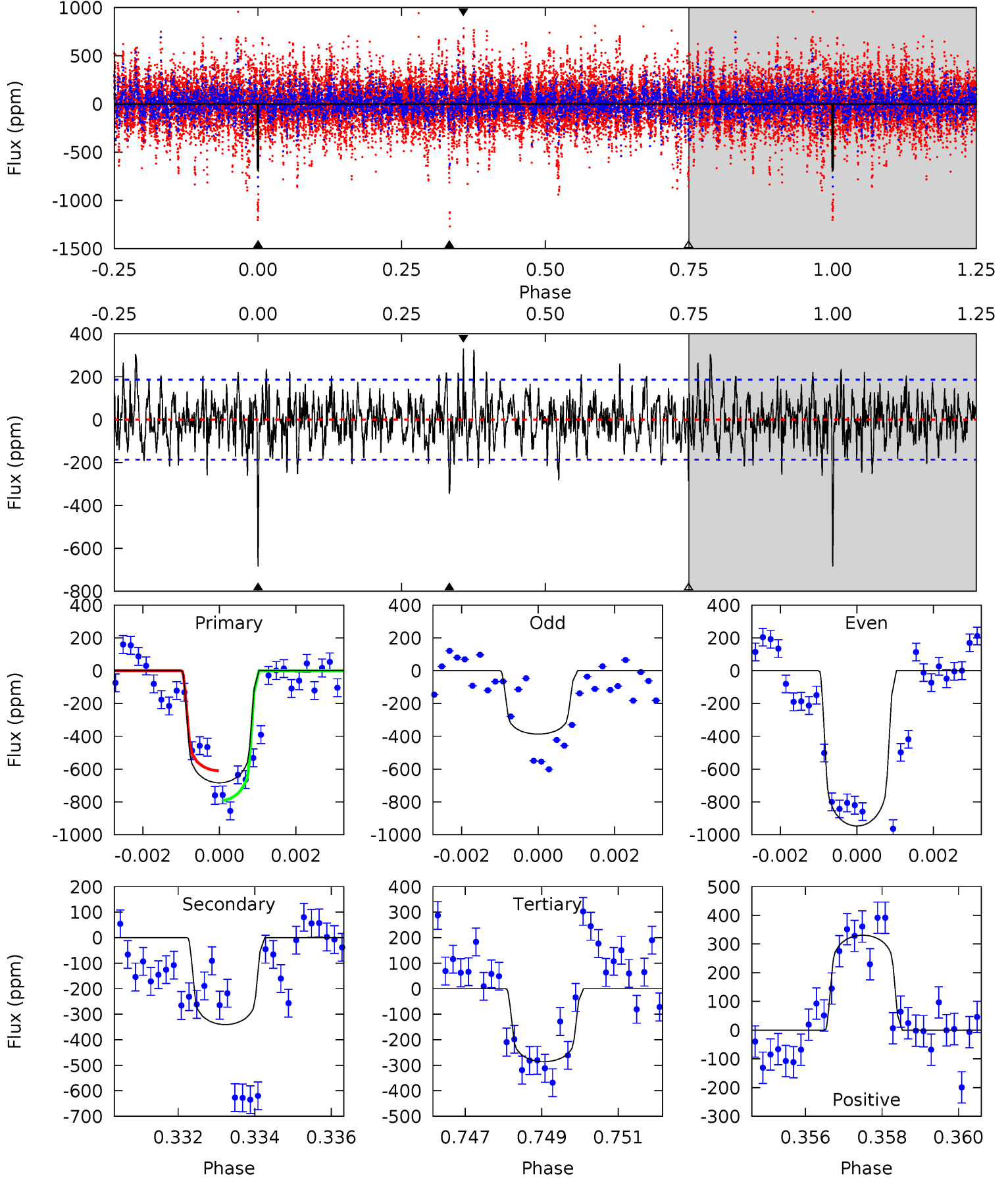
TCE 010722668-03 P=125.422381 Days  $T_0=137.619081$  (BKJD)



# DV Model-Shift Uniqueness Test

010722668-03, P = 125.429929 Days, E = 12.153843 Days

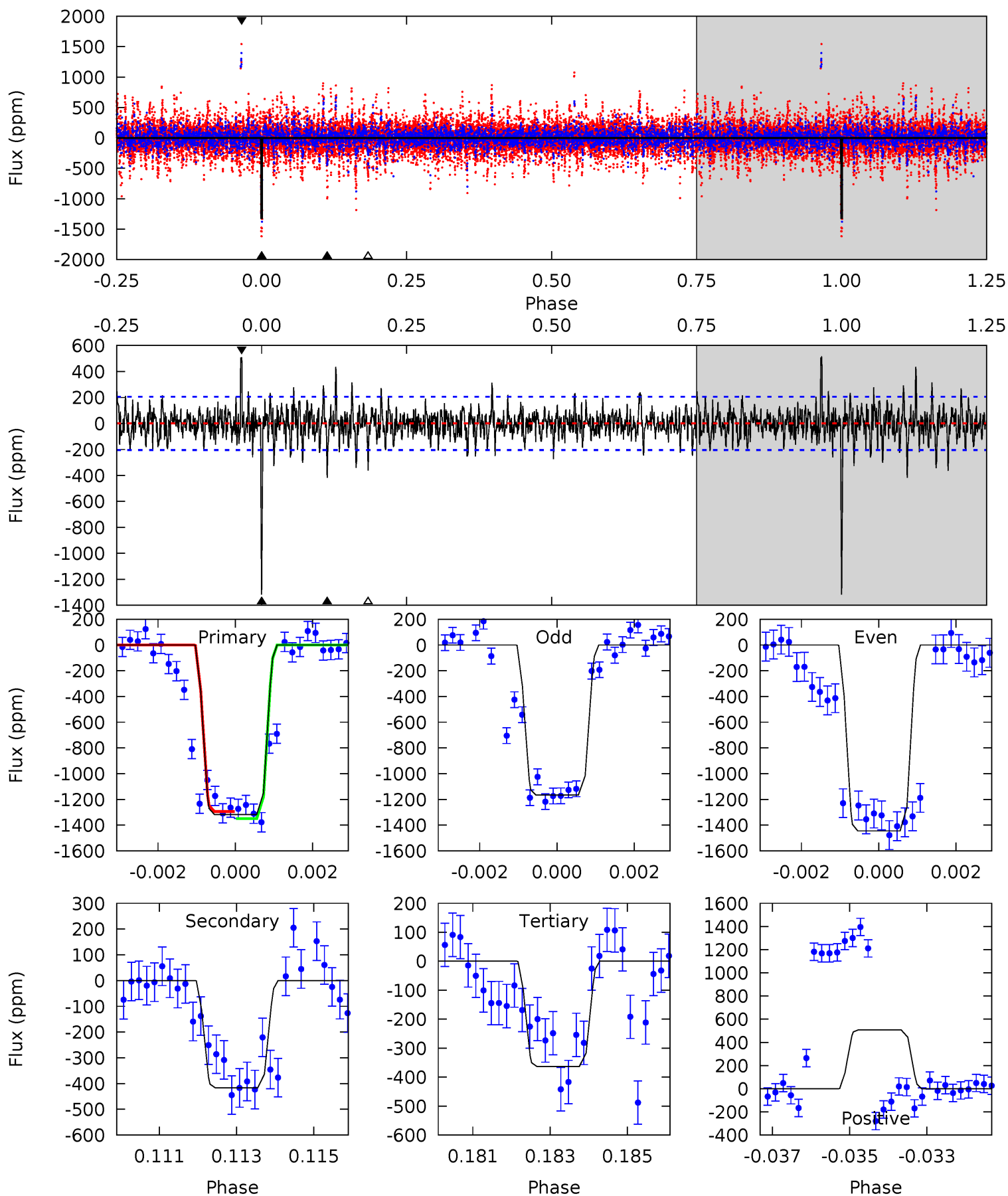
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.6	9.76	8.20	9.48	5.34	3.11	2.43	11.4	10.1	1.57	0.28	7.72	0.88	0.33	2.58



# Alt Model-Shift Uniqueness Test

010722668-03, P = 125.422381 Days, E = 12.196700 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
34.3	10.9	9.46	13.2	5.34	3.11	2.16	24.8	21.1	1.40	-2.39	3.39	0.76	0.28	0.70



### Stellar Parameters For KIC 010722668

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7358^{+228}_{-304}$	$3.748^{+0.417}_{-0.074}$	$-0.020^{+0.200}_{-0.350}$	$2.970^{+0.427}_{-1.280}$	$1.799^{+0.194}_{-0.389}$	$0.097^{+0.351}_{-0.029}$
	+3%/-4%	+11%/-2%	+1000%/-1750%	+14%/-43%	+11%/-22%	+363%/-30%
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 010722668-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-340 \pm 35$	$5.25^{+2.58}_{-2.24}$	$974^{+71}_{-115}$	$7364^{+2811}_{-1259}$	$2434^{+4866}_{-1331}$
Alt.	$-417 \pm 38$	$10.50^{+3.39}_{-3.07}$	$978^{+69}_{-114}$	$5523^{+682}_{-488}$	$741^{+699}_{-302}$

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

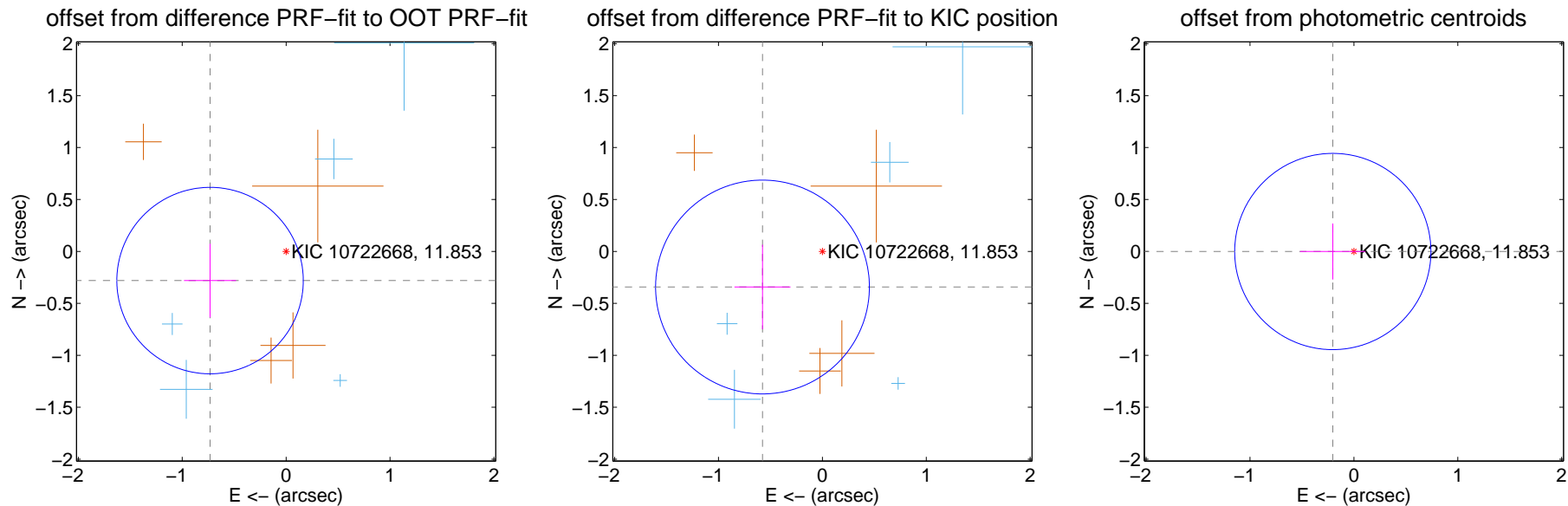
## DV Centroid Data

Supplemental centroid analysis for 010722668-03. **Kepler magnitude: 11.85**. Transit SNR 5.10

There are 5 quarters with good PRF difference image offsets

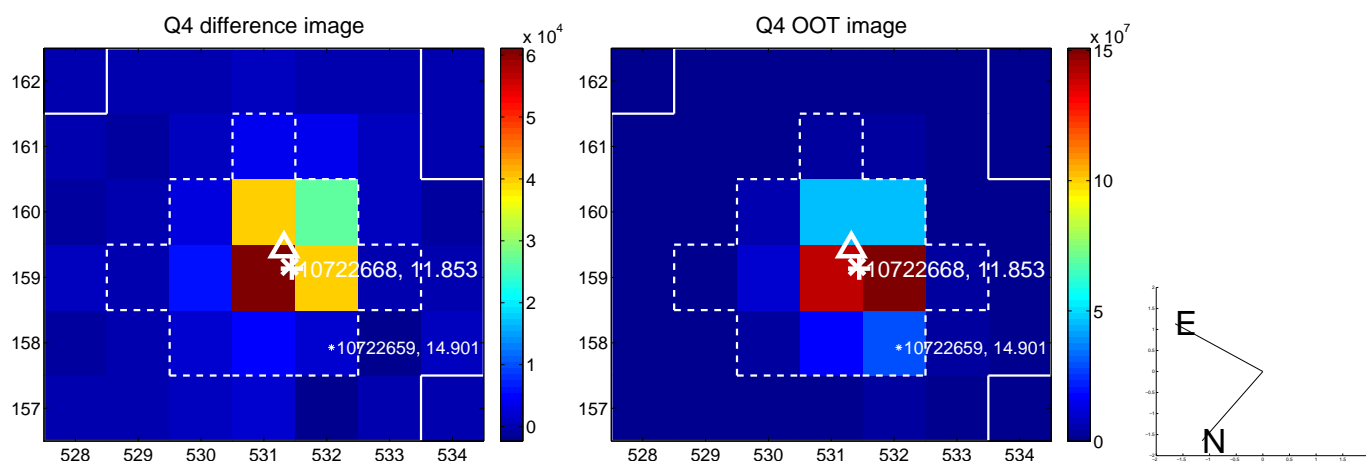
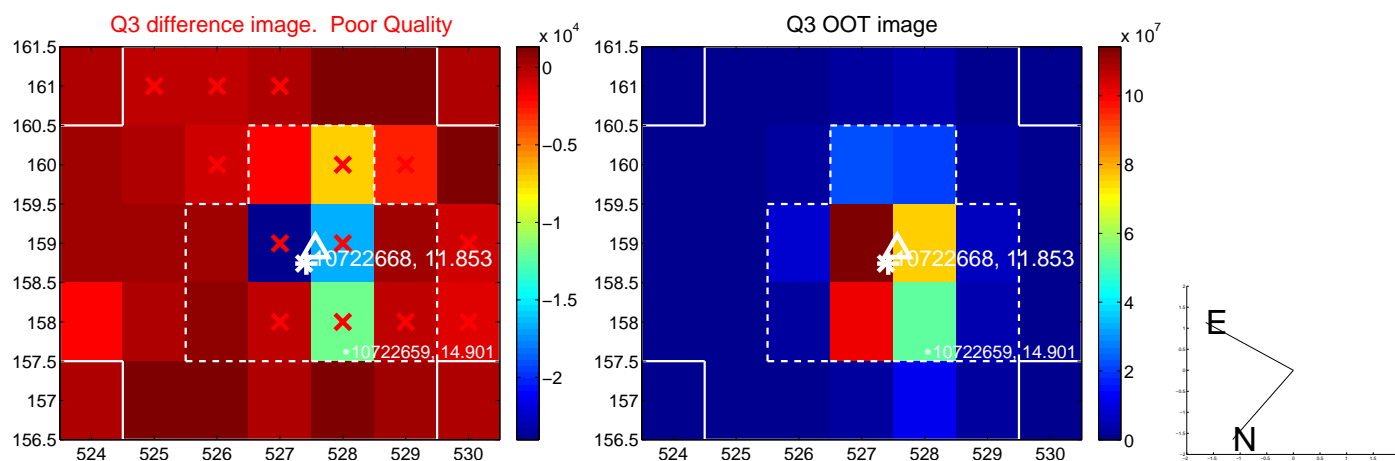
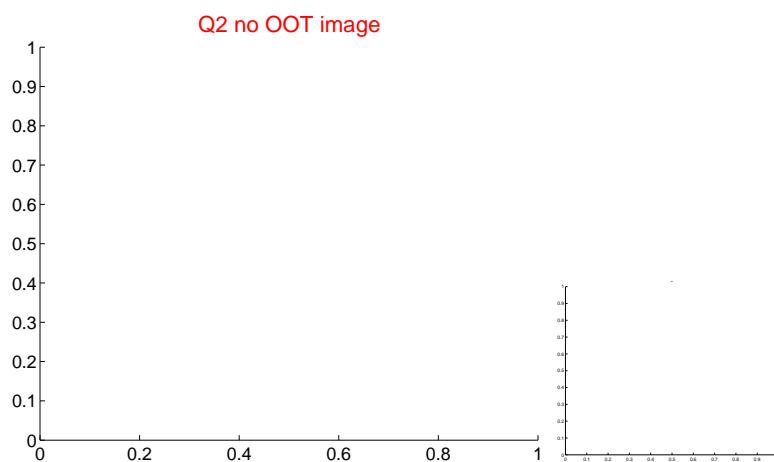
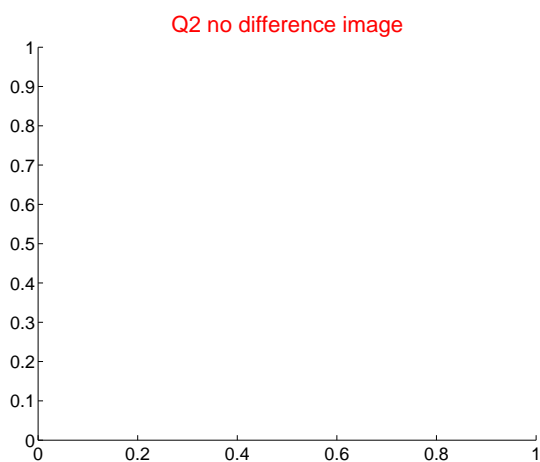
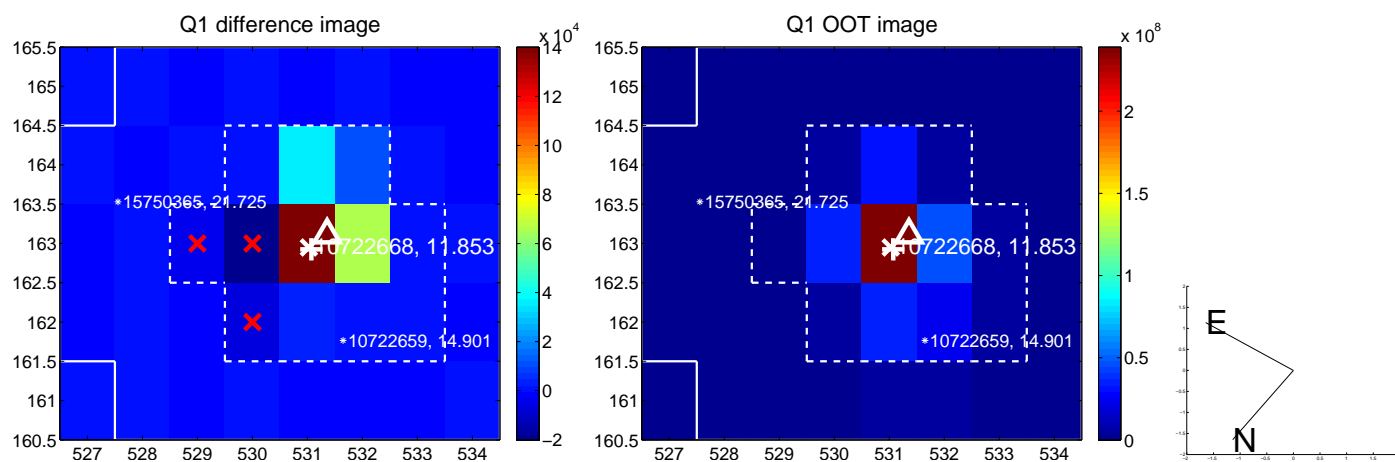
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.784 \pm 0.299$	2.62	$0.732 \pm 0.251$	$-0.281 \pm 0.354$
PRF-fit source offset from KIC position	$0.671 \pm 0.343$	1.96	$0.577 \pm 0.270$	$-0.343 \pm 0.407$
photometric centroid source offset	$0.20 \pm 0.31$	0.65	$0.20 \pm 0.31$	$-0.00 \pm 0.27$



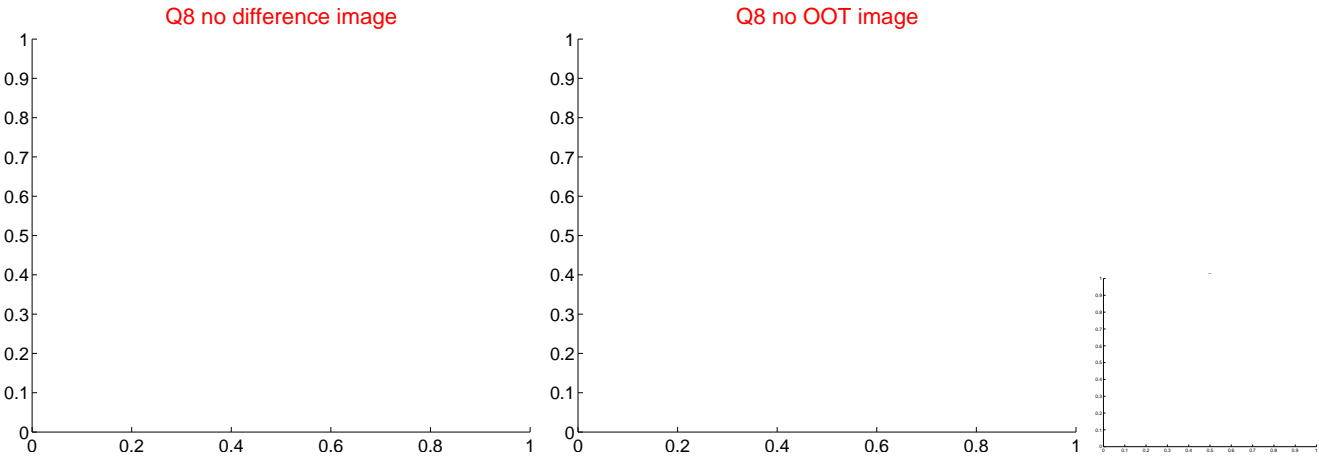
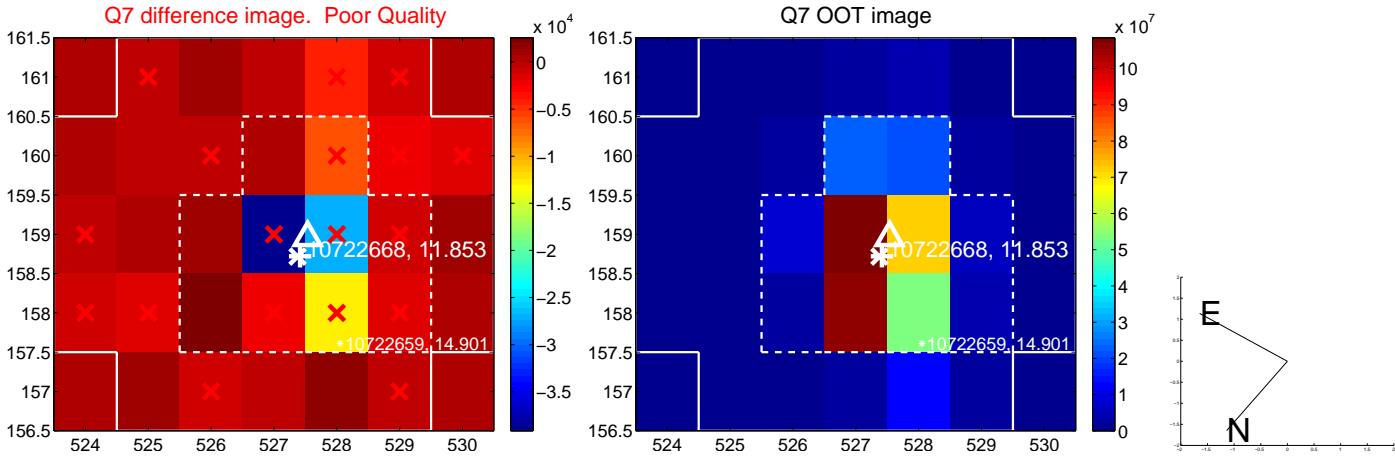
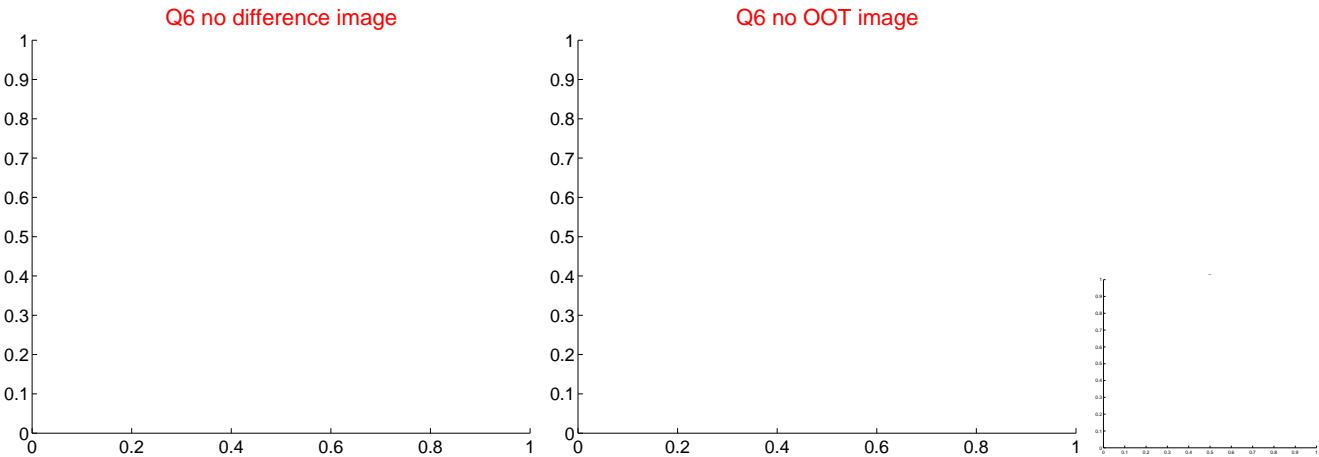
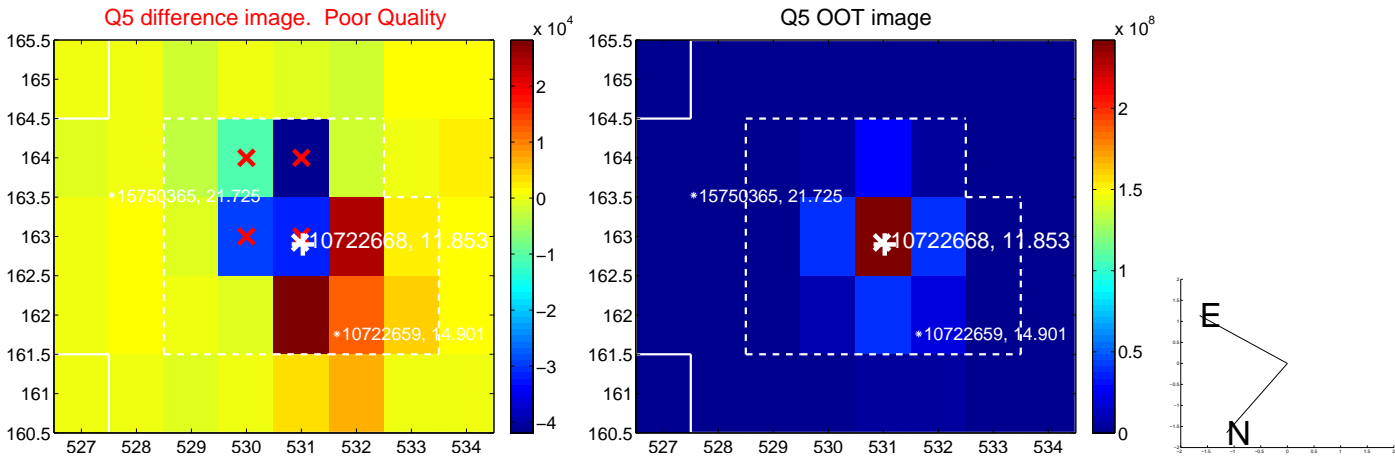
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

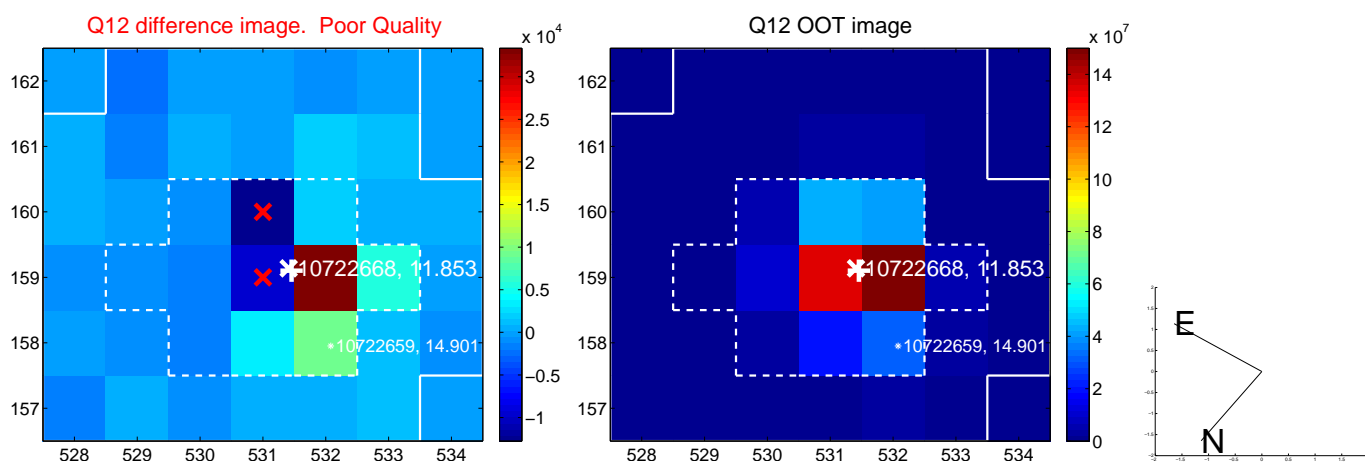
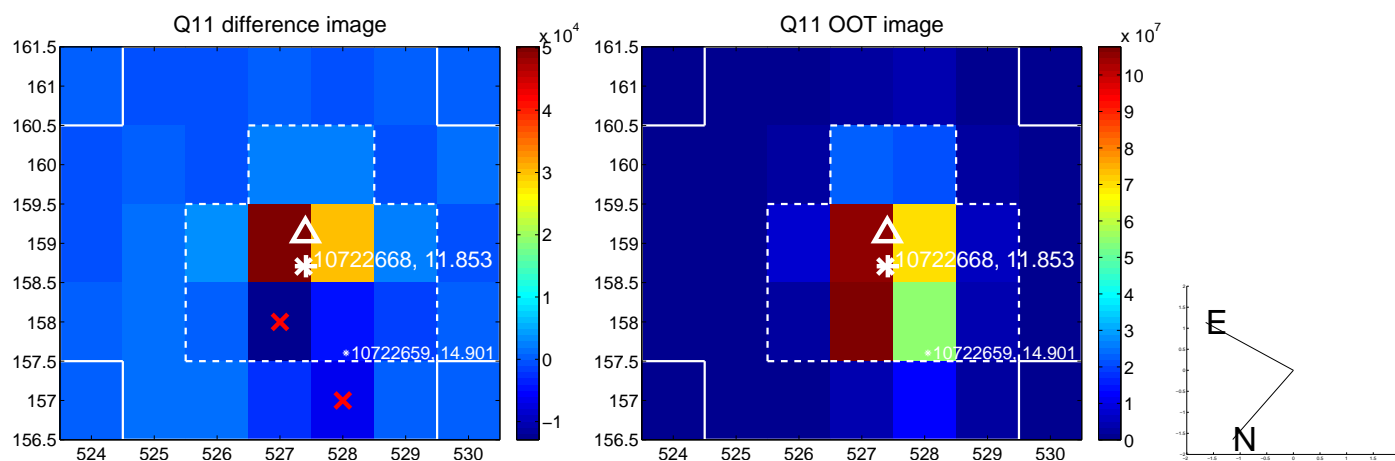
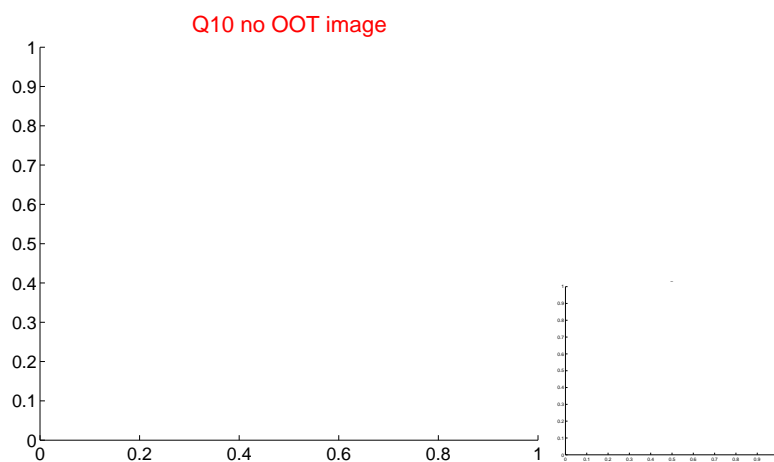
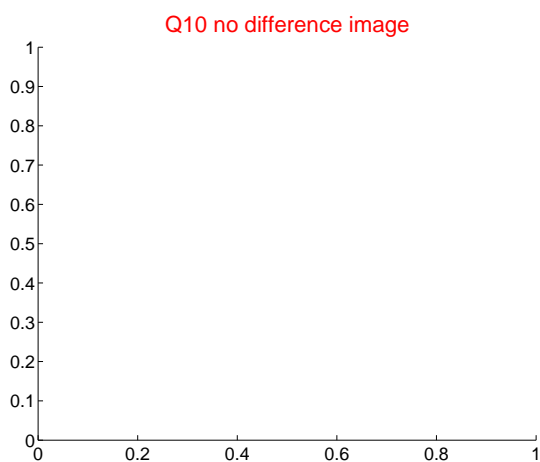
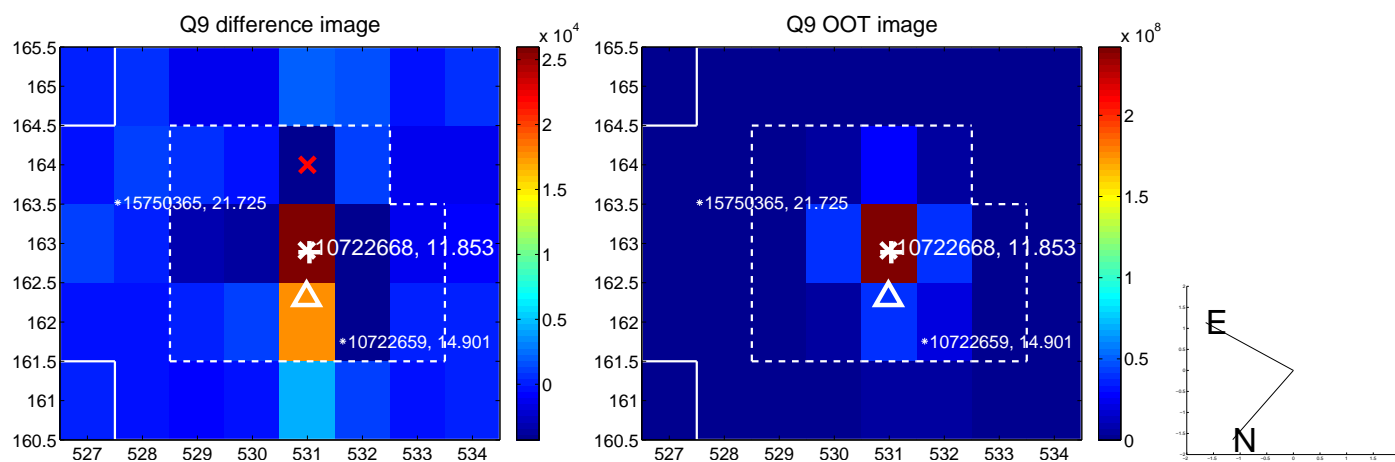




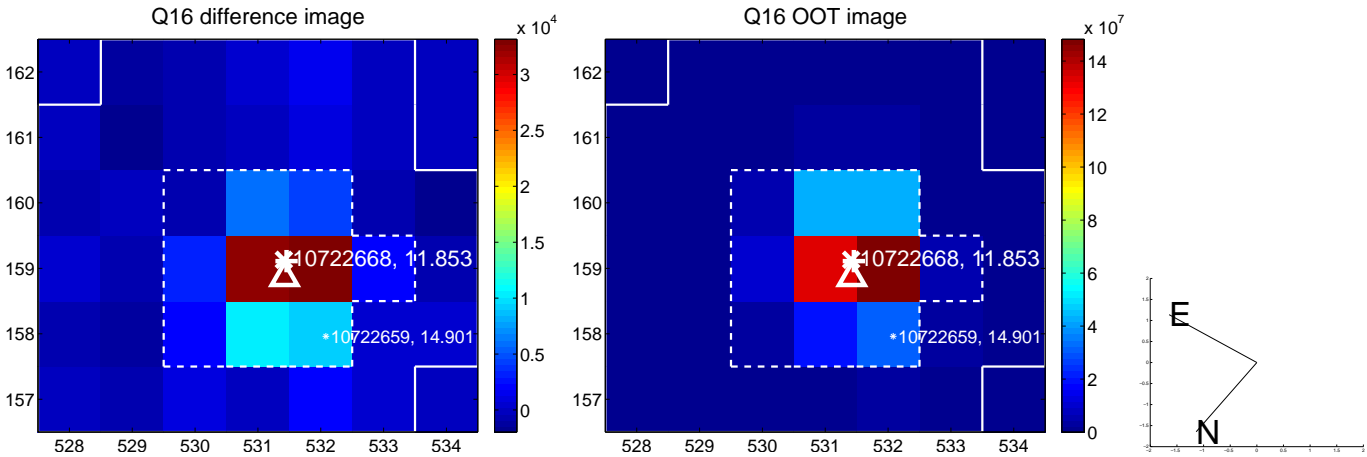
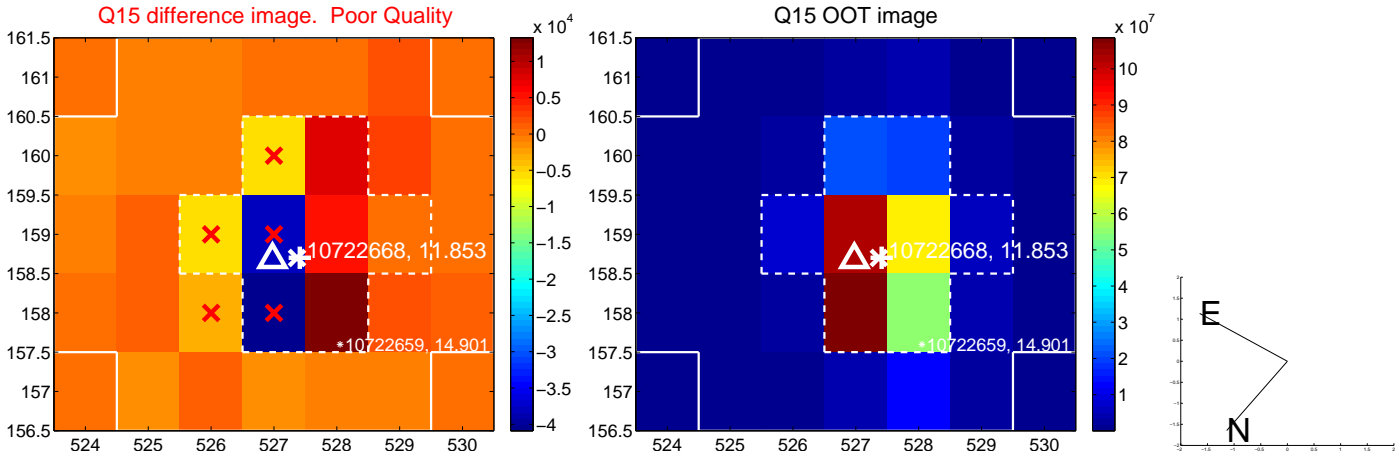
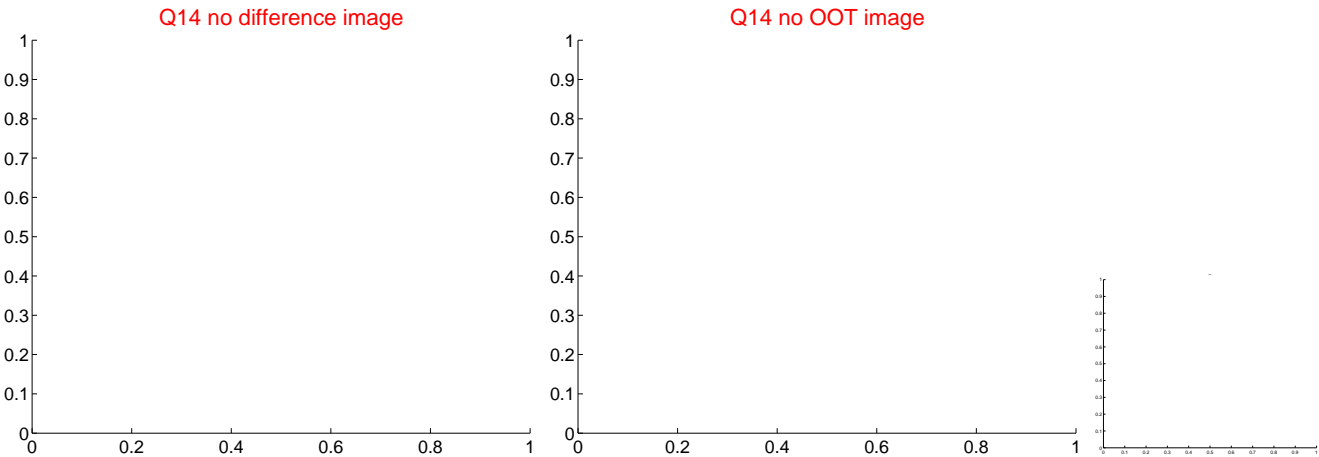
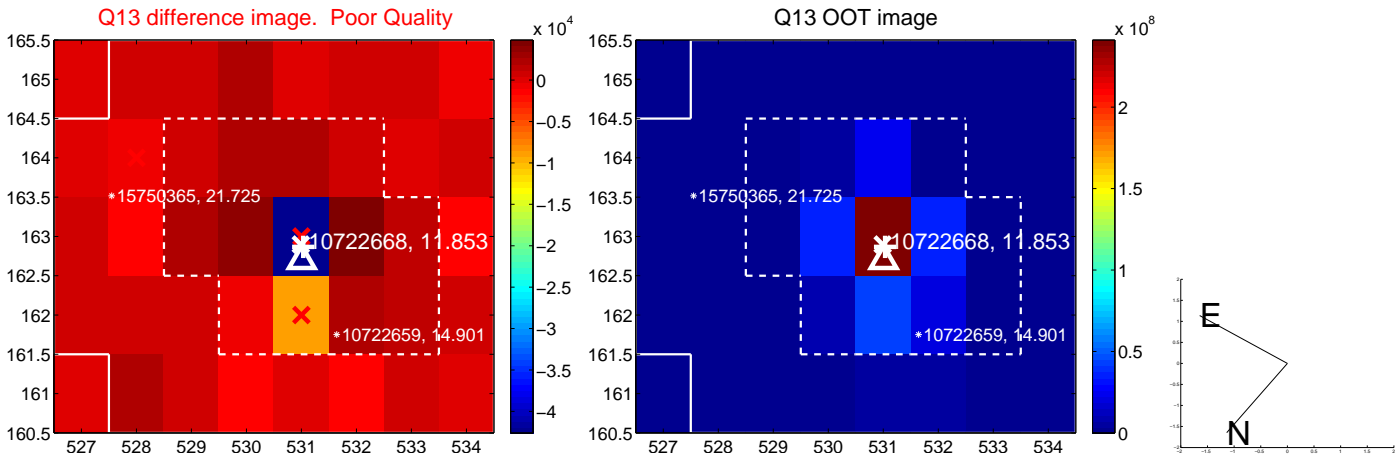
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



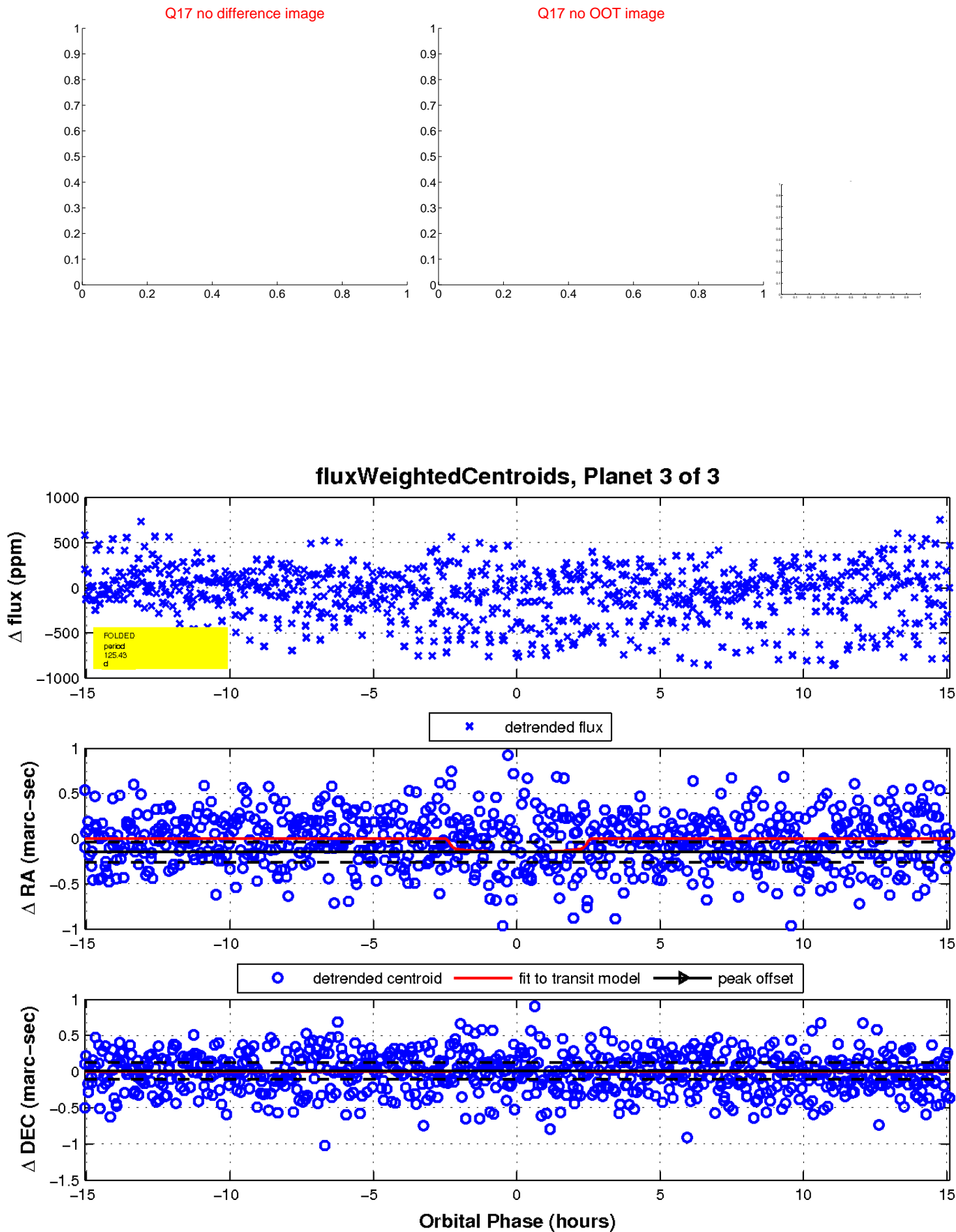
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

