

# KIC 005542211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005542211-01	OBS	No	0.932933	132.089519	60.9	5.001	13.5	7.2	1.41	6836	1.11	9277.26
005542211-02	OBS	No	0.932898	132.415747	101.9	5.833	17.2	8.9	1.41	6836	1.47	9277.72

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005542211-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
005542211-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—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.

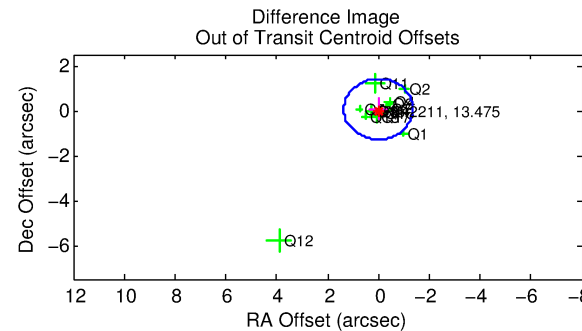
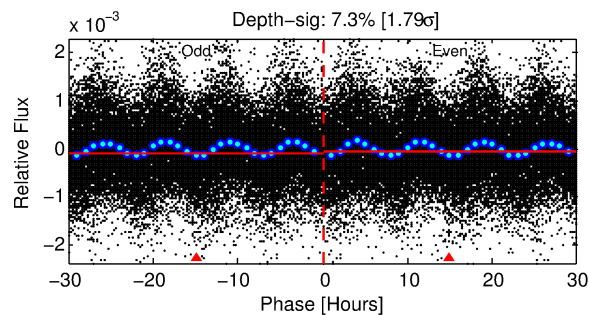
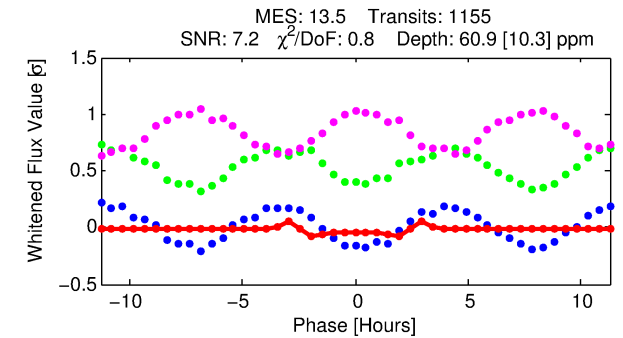
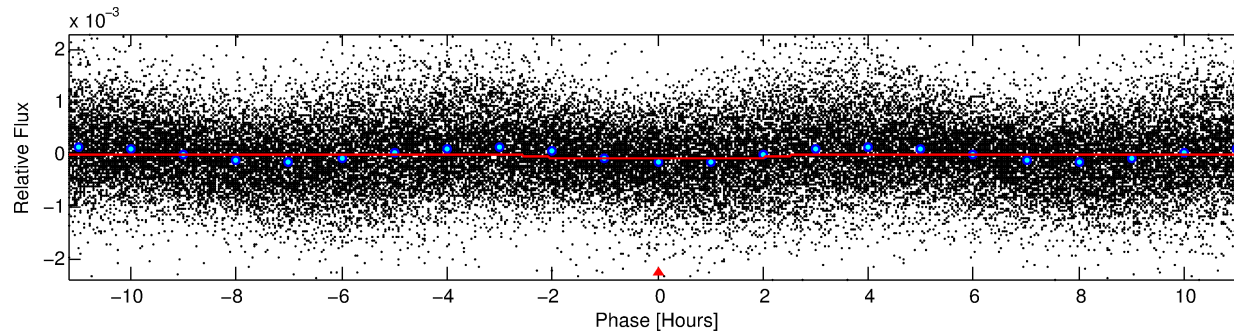
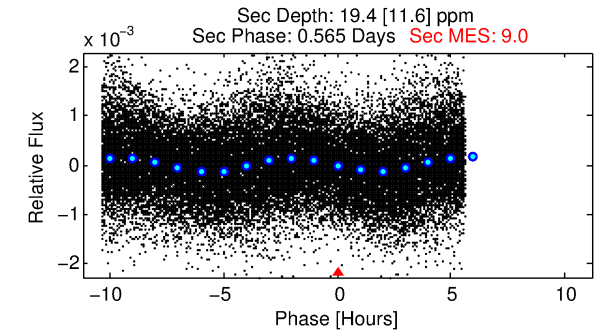
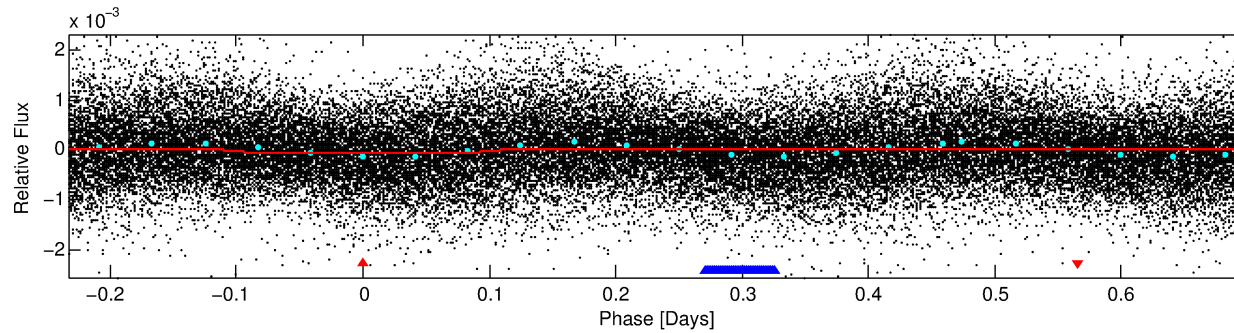
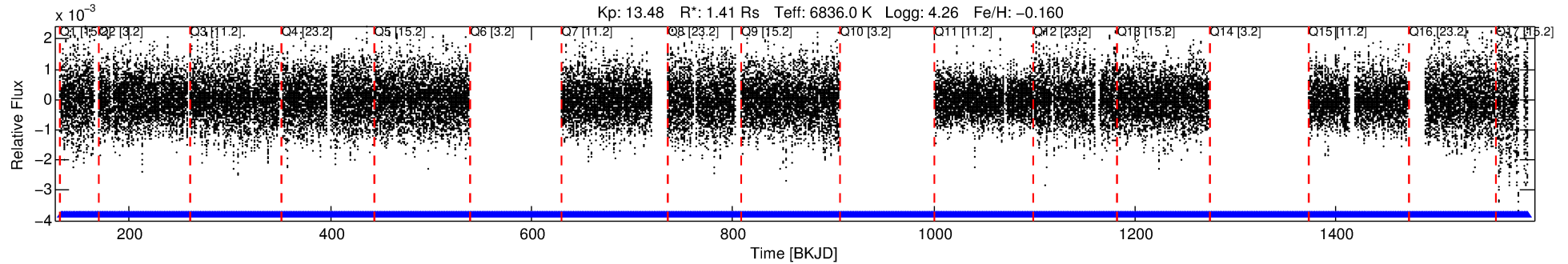
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005542211-01

No Significant Match Found

# DV One-Page Summary

KIC: 5542211 Candidate: 1 of 2 Period: 0.933 d



## DV Fit Results:

Period = 0.93293 [0.00001] d  
Epoch = 132.0895 [0.0024] BKJD  
Rp/R\* = 0.0072 [0.0040]  
a/R\* = 1.55 [2.84]  
b = 0.14 [22.85]  
Seff = 9277.26 [3704.67]  
Teq = 2503 [250] K  
Rp = 1.11 [0.71] Re  
a = 0.0204 [0.0053] AU  
Ag = 3.61 [4.71] [0.55σ]  
Teffp = 5334 [1681] K [1.67σ]

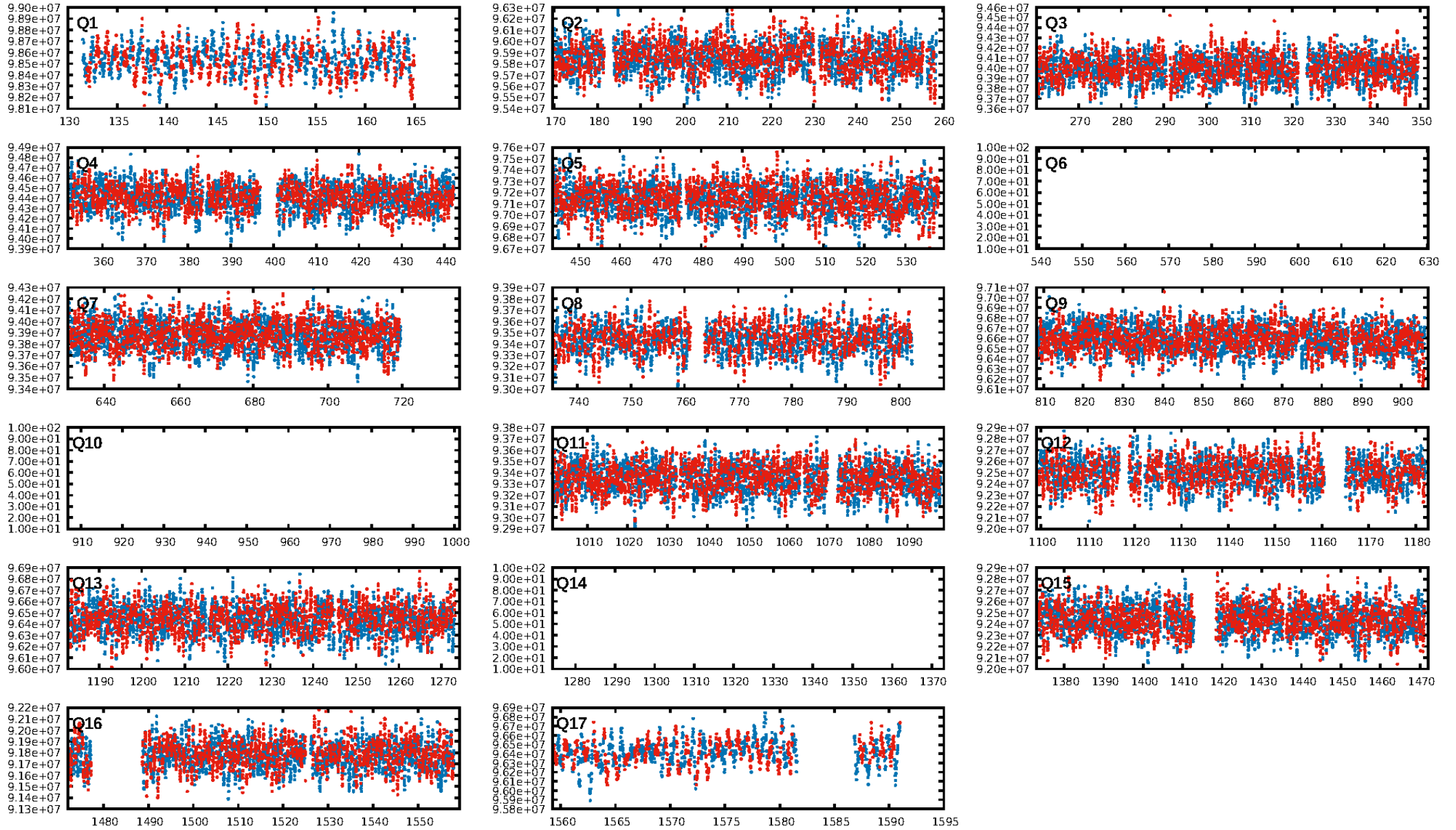
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1091/1091]  
GhostDiagnostic-chr: 0.05393  
Centroid-sig: 3.6%  
Centroid-so: 0.558 arcsec [1.50σ]  
OotOffset-rm: 0.064 arcsec [0.14σ]  
KicOffset-rm: 0.122 arcsec [0.26σ]  
OotOffset-st: 1/3/4/5 [13]  
KicOffset-st: 1/3/4/5 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:53:22 Z

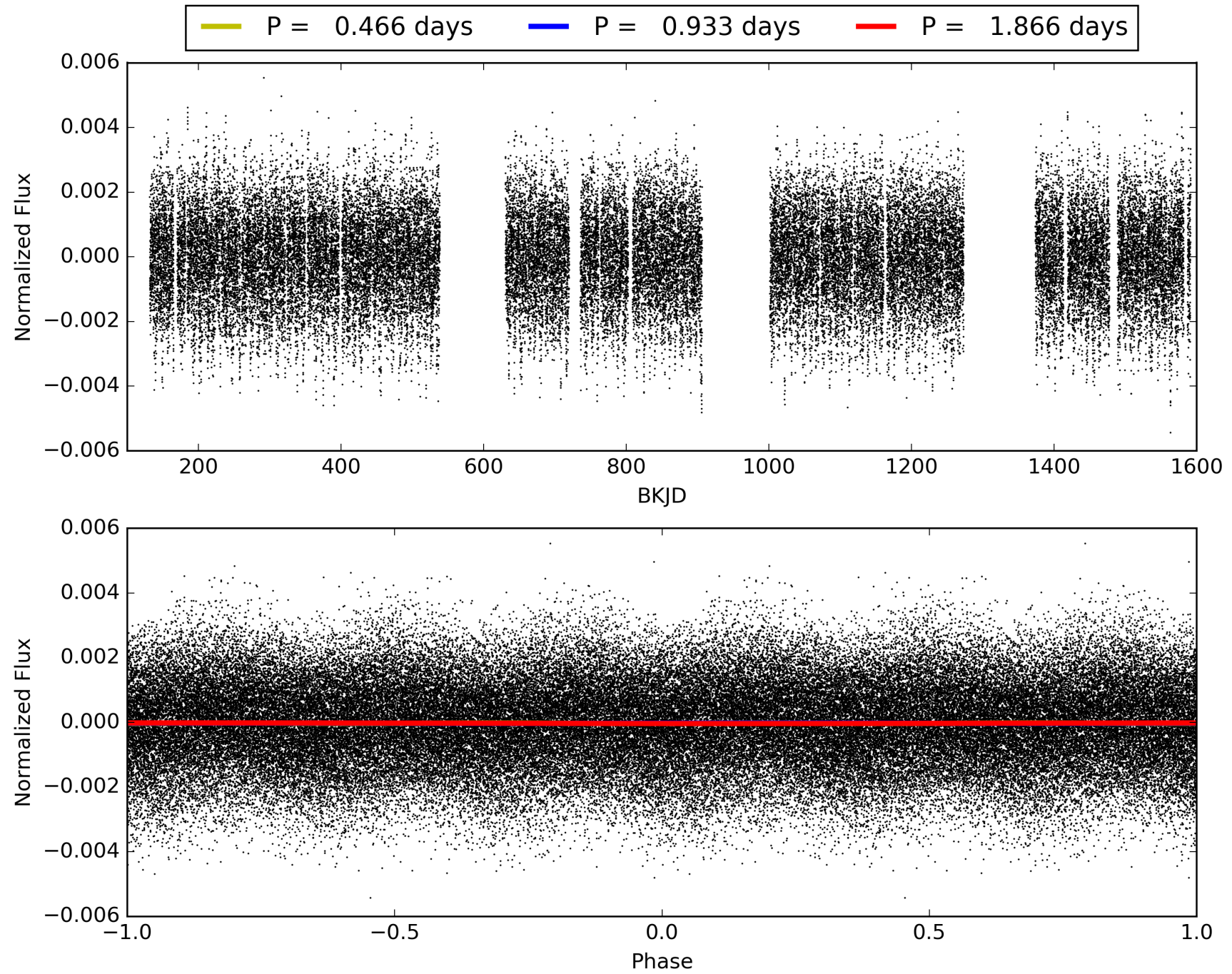
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005542211-01, PDC Light Curves



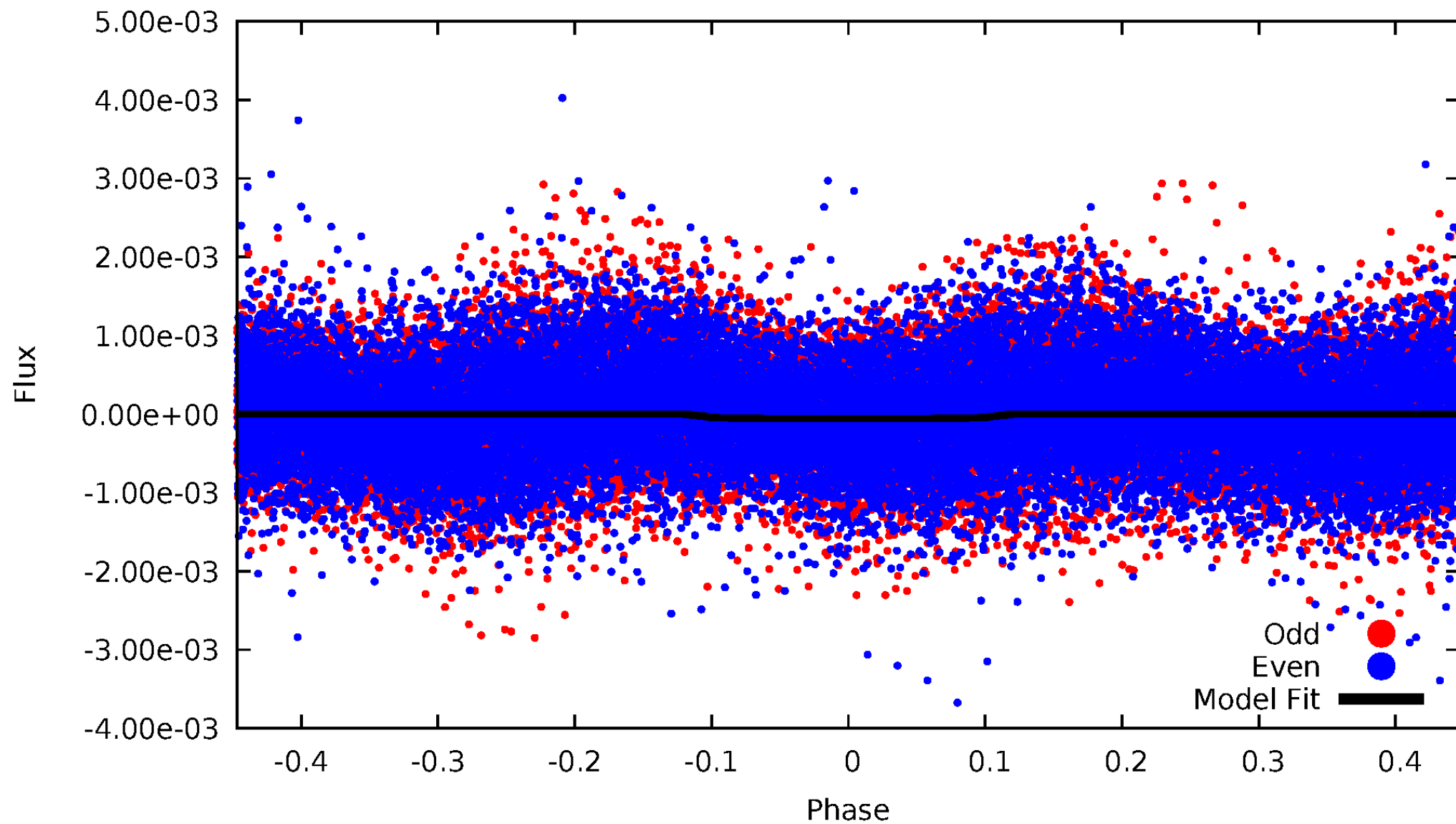


TCE 005542211-01



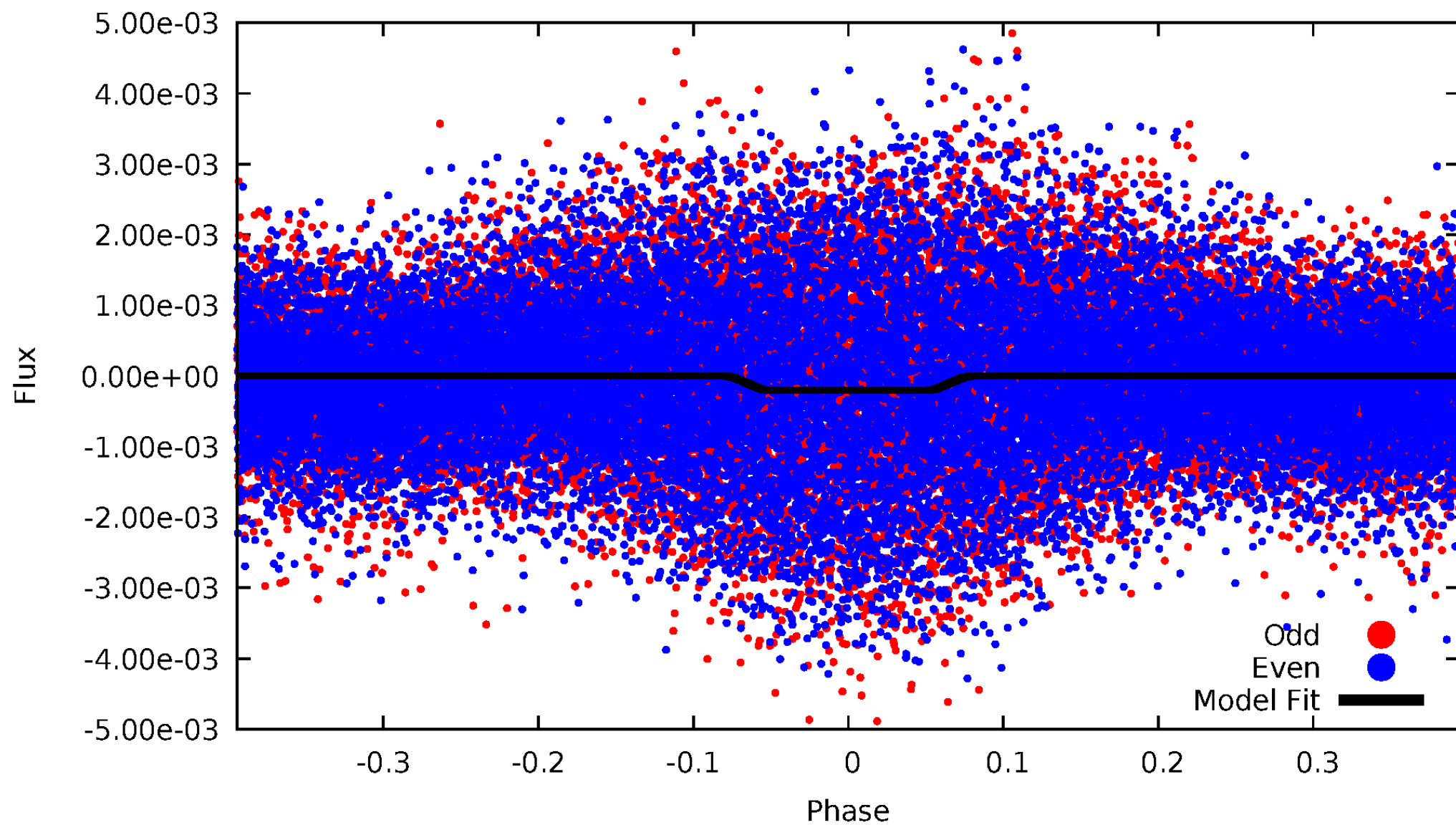
# DV Odd/Even

TCE 005542211-01



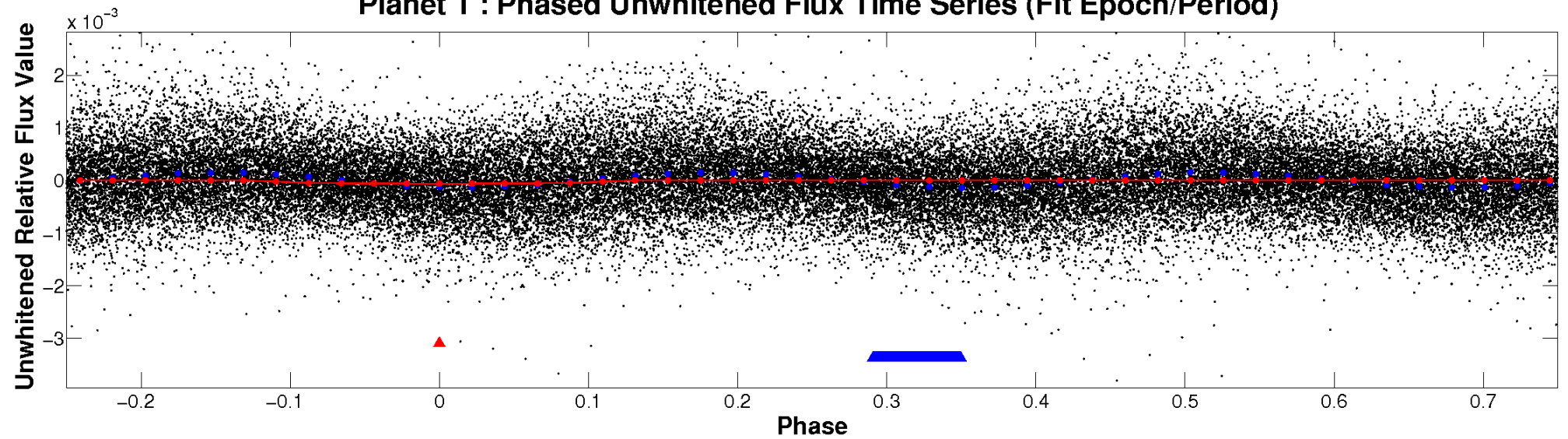
# ALT Odd/Even

TCE 005542211-01

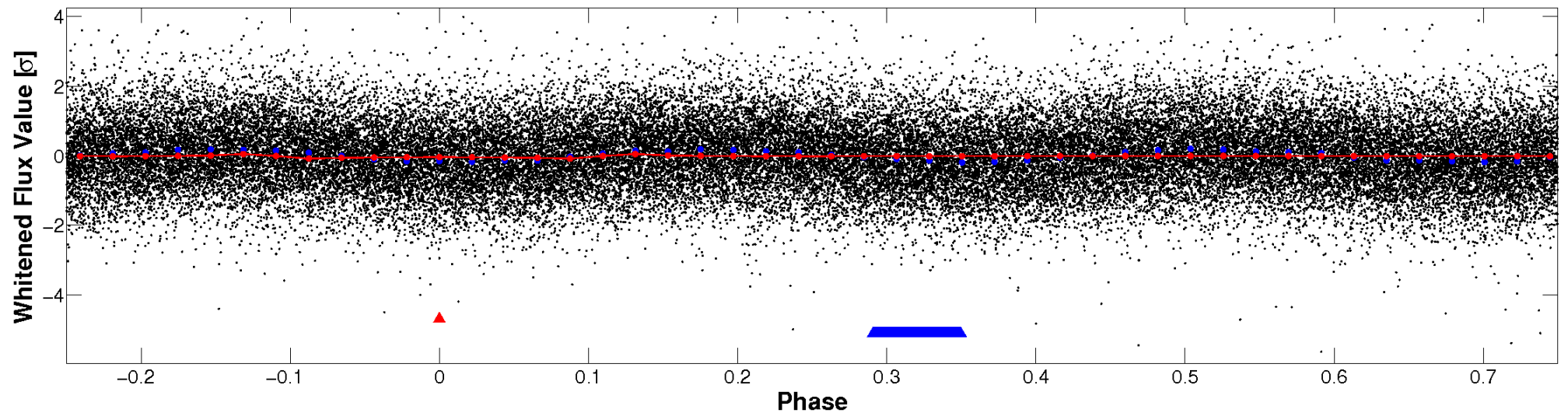


# Non-Whitened Vs. Whitened Light Curve

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



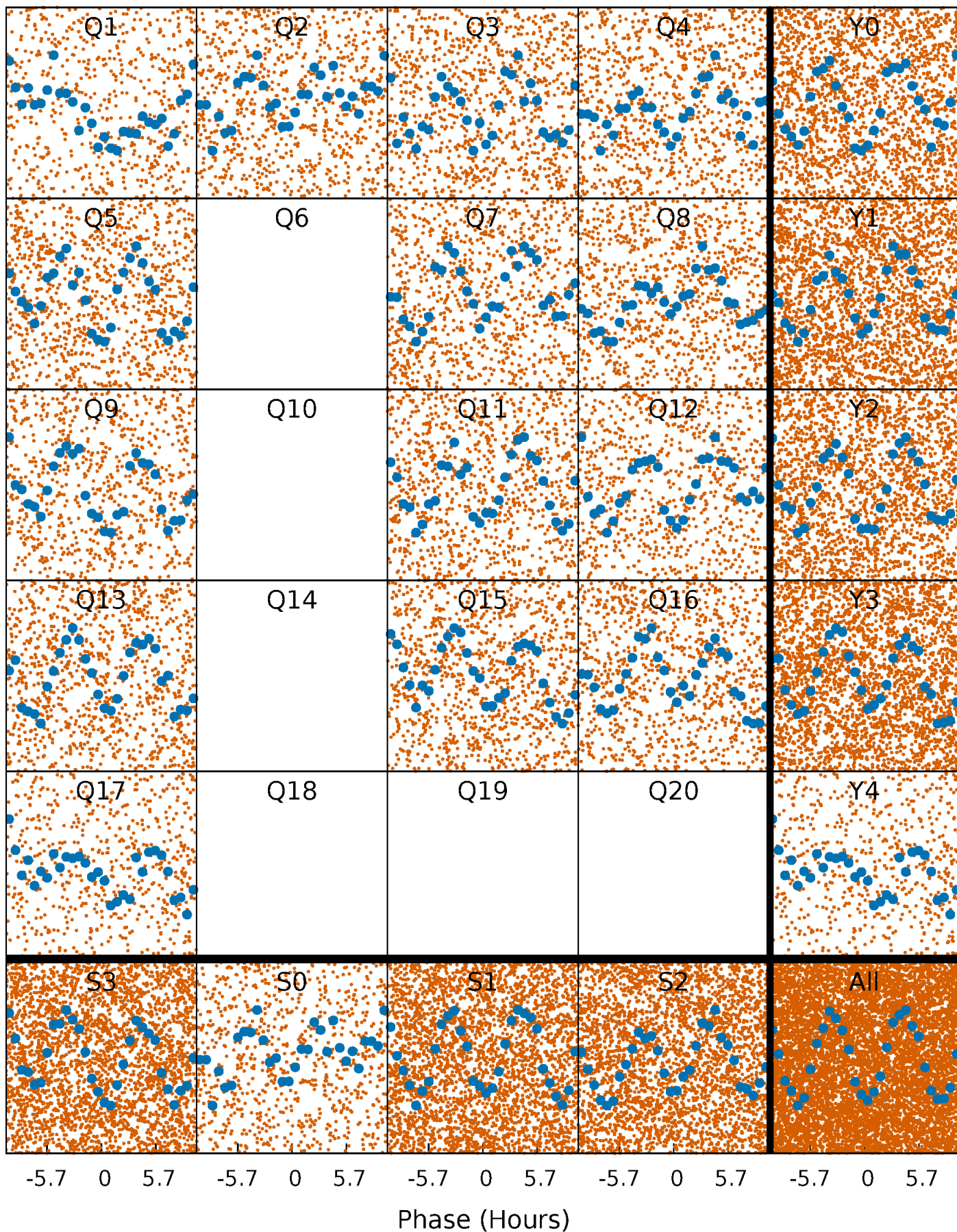
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

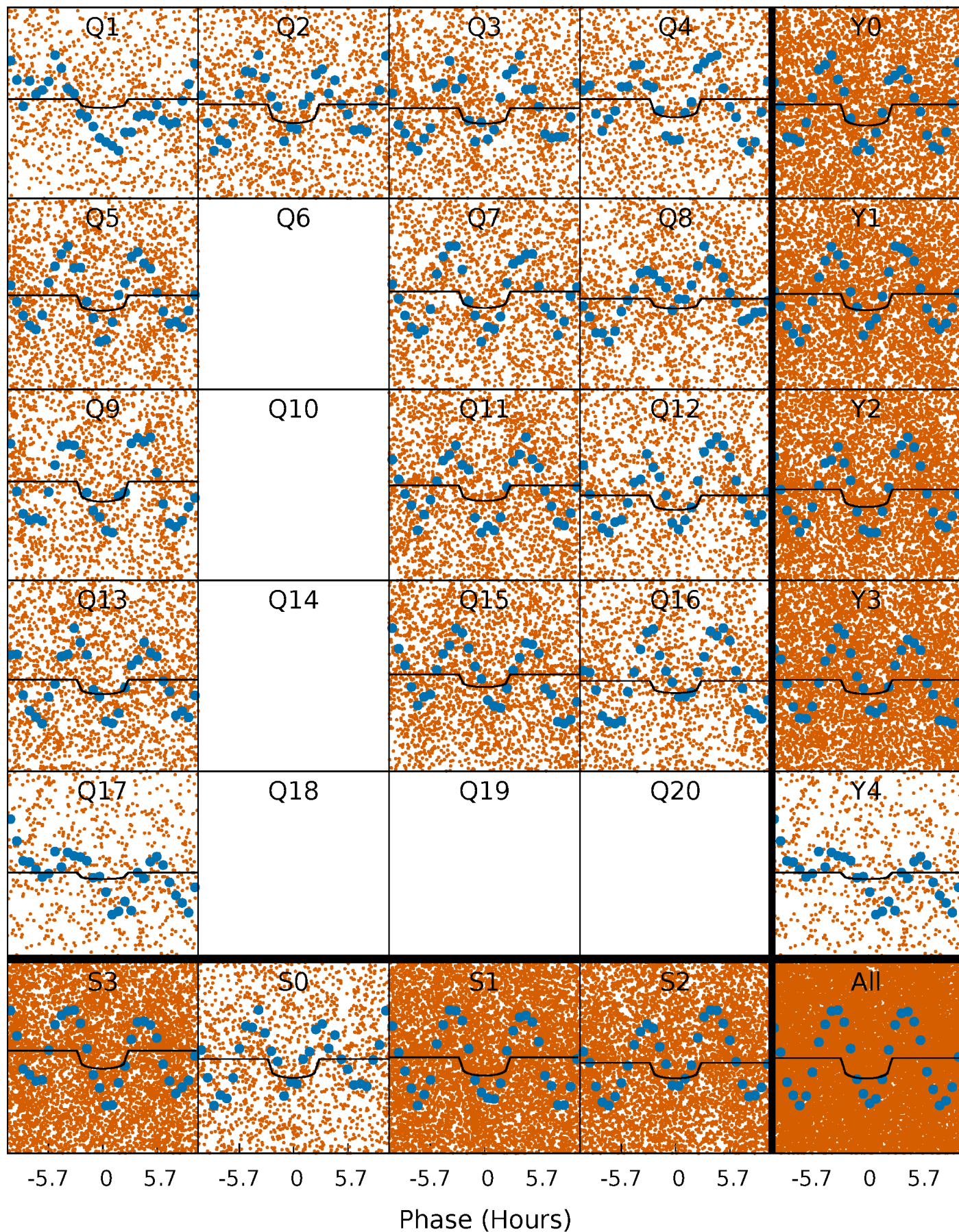
TCE 005542211-01   P= 0.932933 Days    $T_0=132.089519$  (BKJD)





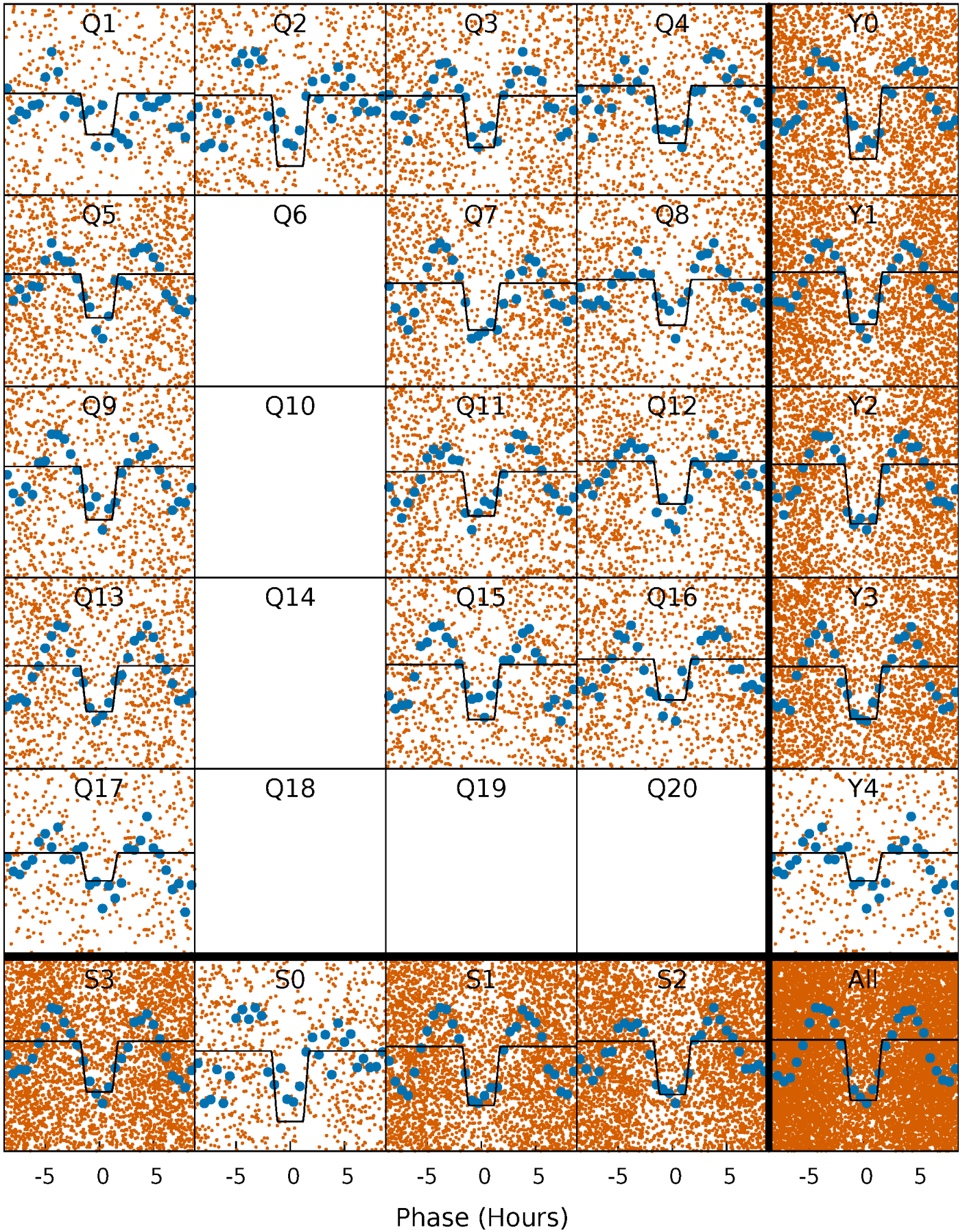
# DV Quarter-Phased Transit Curves

TCE 005542211-01 P= 0.932933 Days  $T_0=132.089519$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005542211-01 P= 0.932976 Days  $T_0=132.066540$  (BKJD)

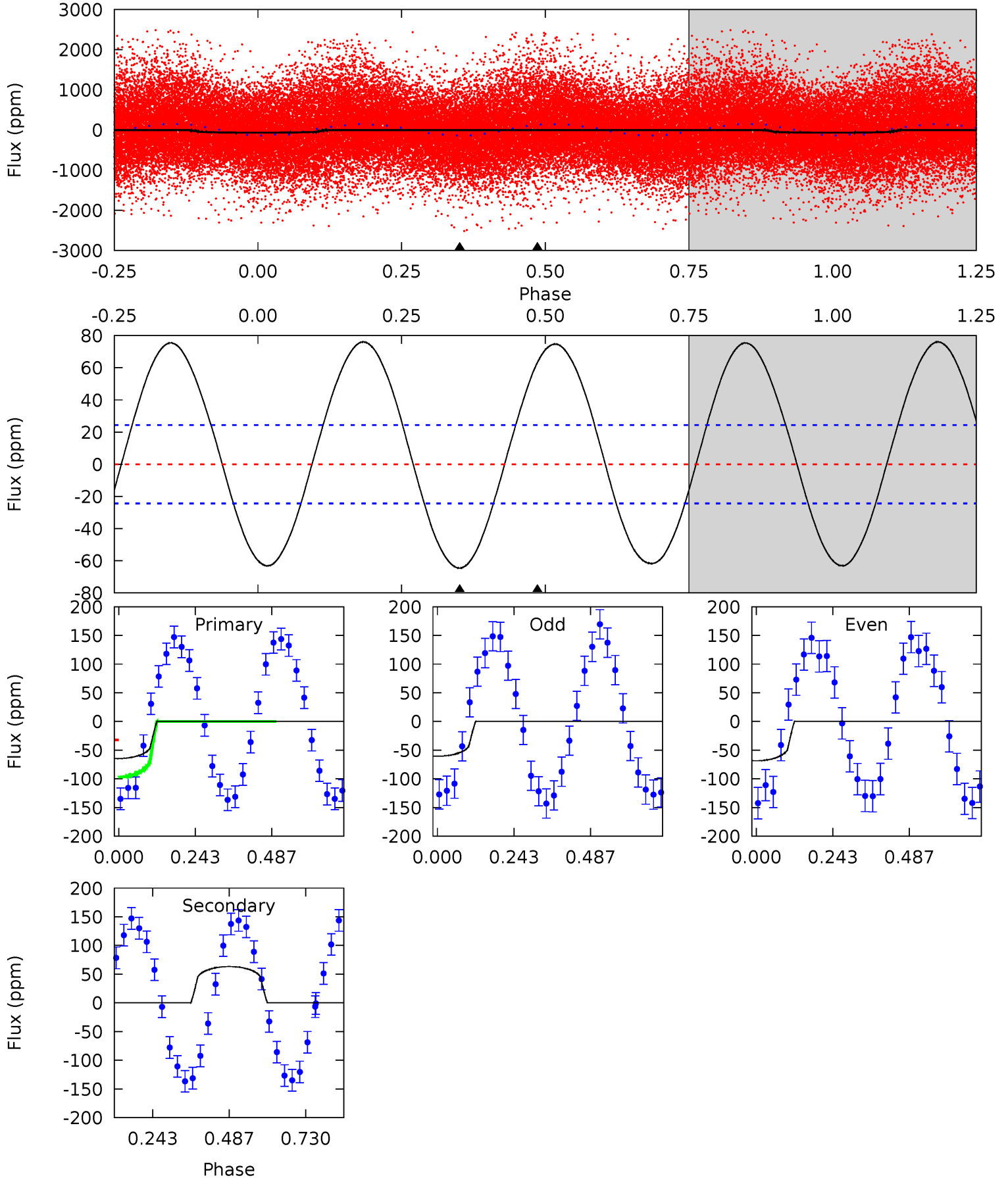




# DV Model-Shift Uniqueness Test

005542211-01, P = 0.932933 Days, E = 131.156586 Days

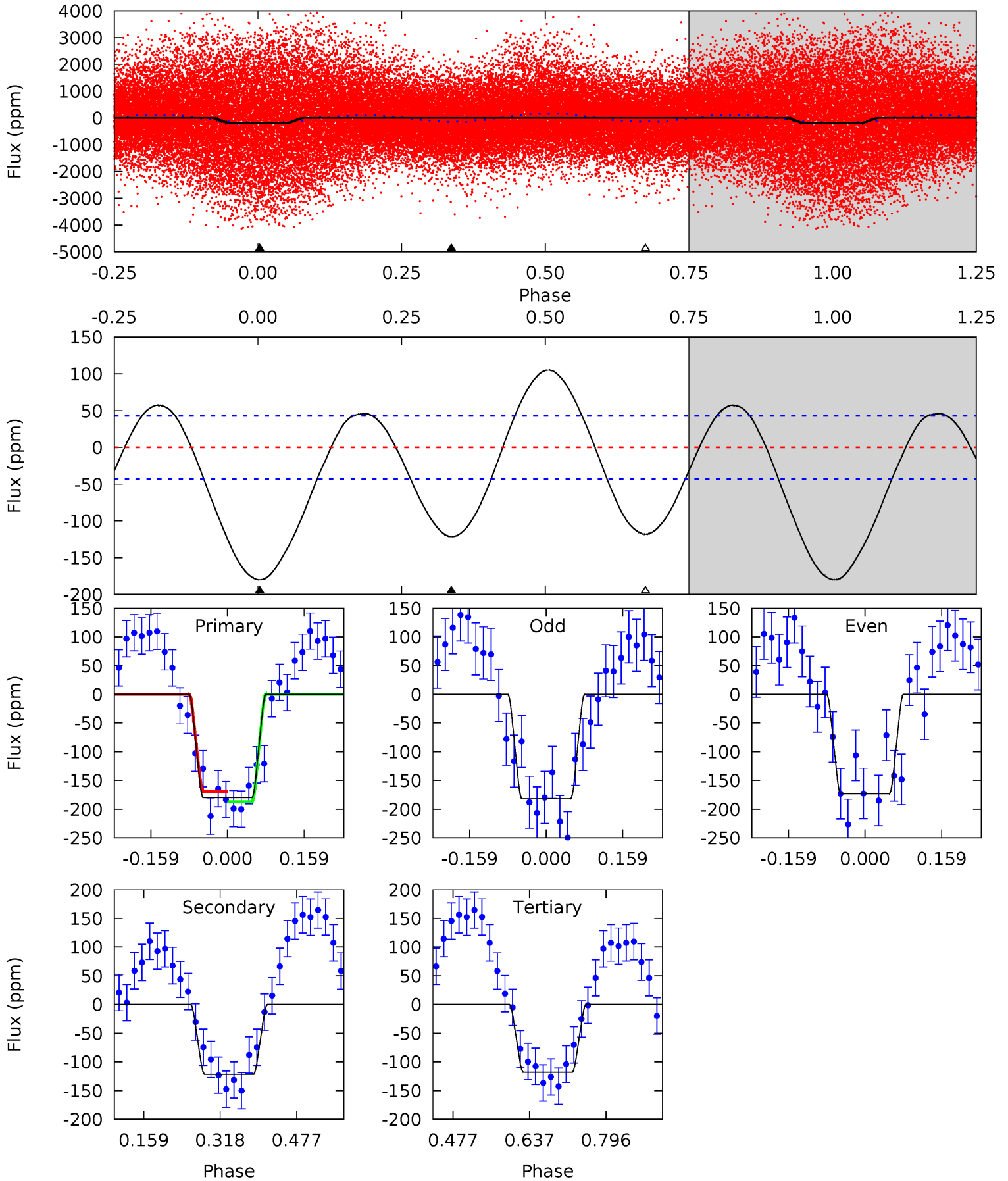
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	-11.4	0	0	4.37	1.17	8.33	11.6	11.6	-11.4	-11.4	0.70	1.64	0.54	6.26



# Alt Model-Shift Uniqueness Test

005542211-01, P = 0.932976 Days, E = 131.133564 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
18.6	12.6	12.2	0	4.47	1.41	7.55	6.42	18.6	0.37	12.6	0.46	1.51	0.37	0.94





### Stellar Parameters For KIC 005542211

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6836^{+192}_{-264}$	$4.257^{+0.105}_{-0.195}$	$-0.160^{+0.250}_{-0.350}$	$1.405^{+0.452}_{-0.243}$	$1.311^{+0.201}_{-0.201}$	$0.666^{+0.317}_{-0.340}$
	+3%/-4%	+2%/-5%	+156%/-219%	+32%/-17%	+15%/-15%	+48%/-51%
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 005542211-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$63 \pm 6$	$1.16^{+0.71}_{-0.61}$	$3550^{+253}_{-209}$	$-7130^{+1358}_{-4746}$	$-10.627^{+6.344}_{-36.963}$
Alt.	$-122 \pm 10$	$2.26^{+0.71}_{-0.60}$	$3535^{+265}_{-225}$	$5873^{+1100}_{-692}$	$5.407^{+4.969}_{-2.301}$

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

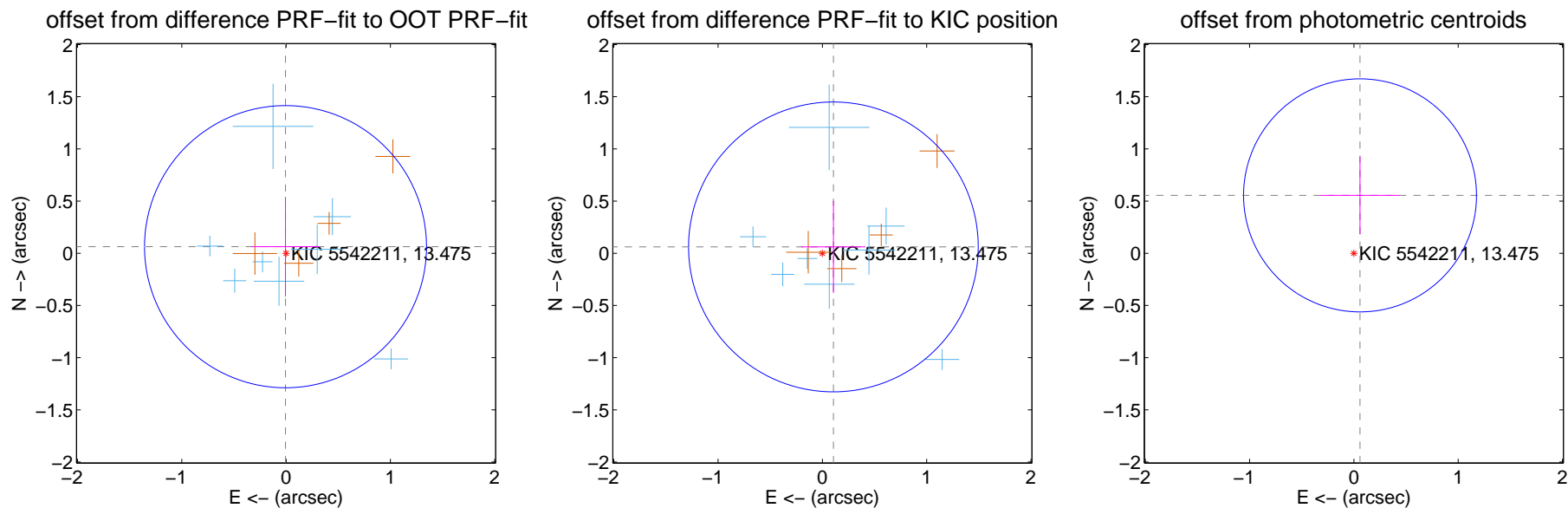
## DV Centroid Data

Supplemental centroid analysis for 005542211-01. Kepler magnitude: 13.47. Transit SNR 7.18

There are 8 quarters with good PRF difference image offsets

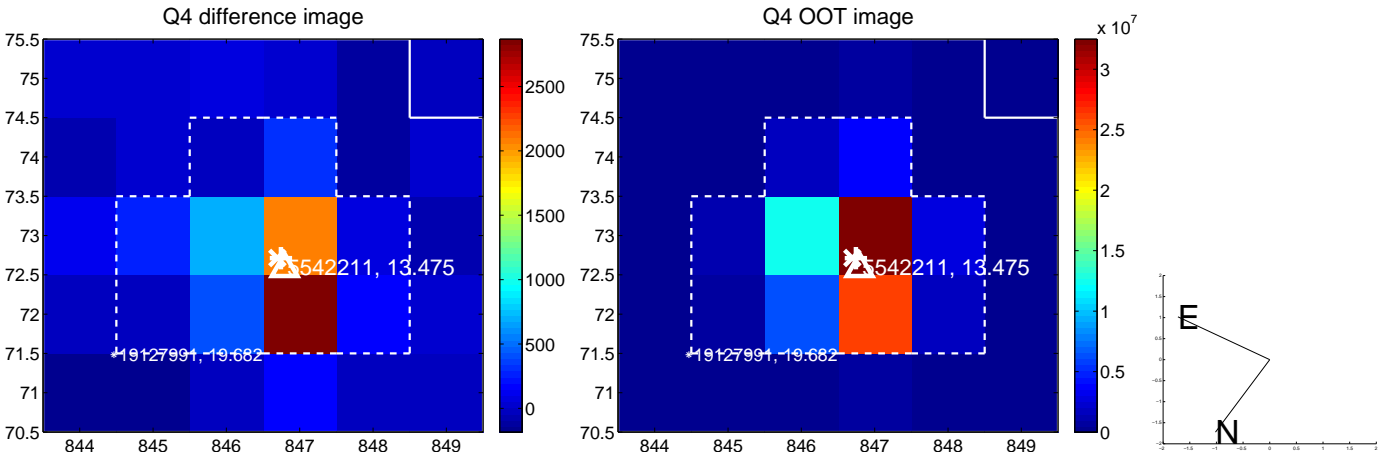
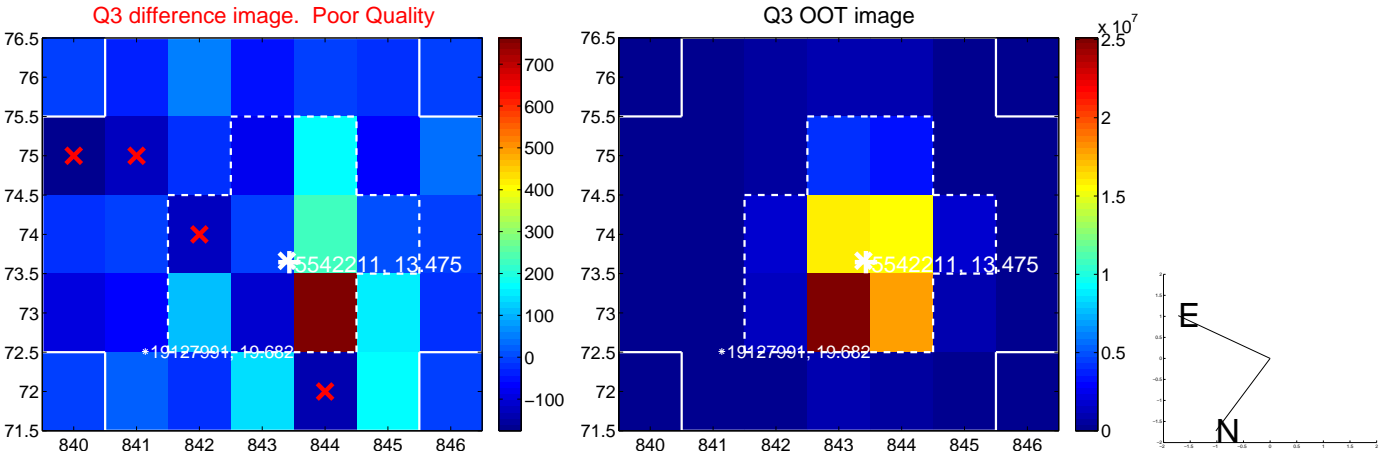
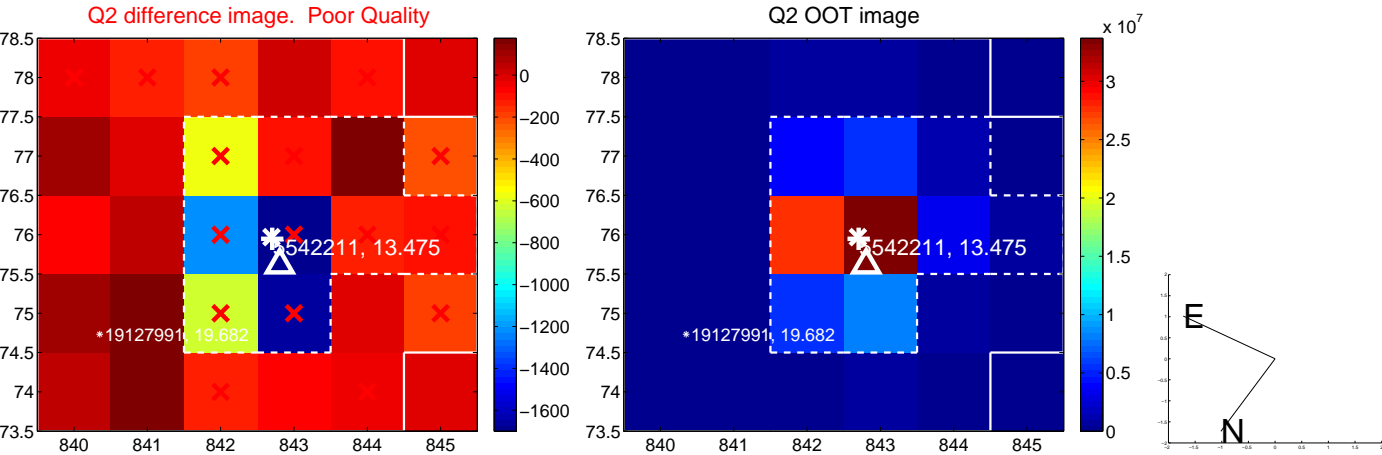
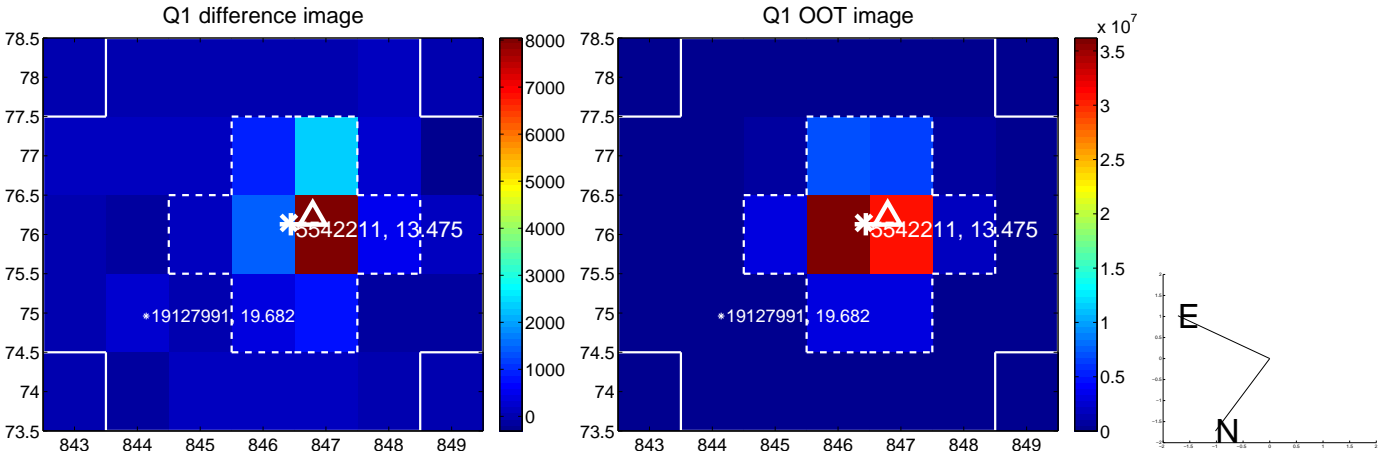
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.064 \pm 0.451$	0.14	$0.006 \pm 0.329$	$0.063 \pm 0.477$
PRF-fit source offset from KIC position	$0.122 \pm 0.463$	0.26	$-0.106 \pm 0.308$	$0.061 \pm 0.441$
photometric centroid source offset	$0.56 \pm 0.37$	1.50	$-0.06 \pm 0.38$	$0.55 \pm 0.37$

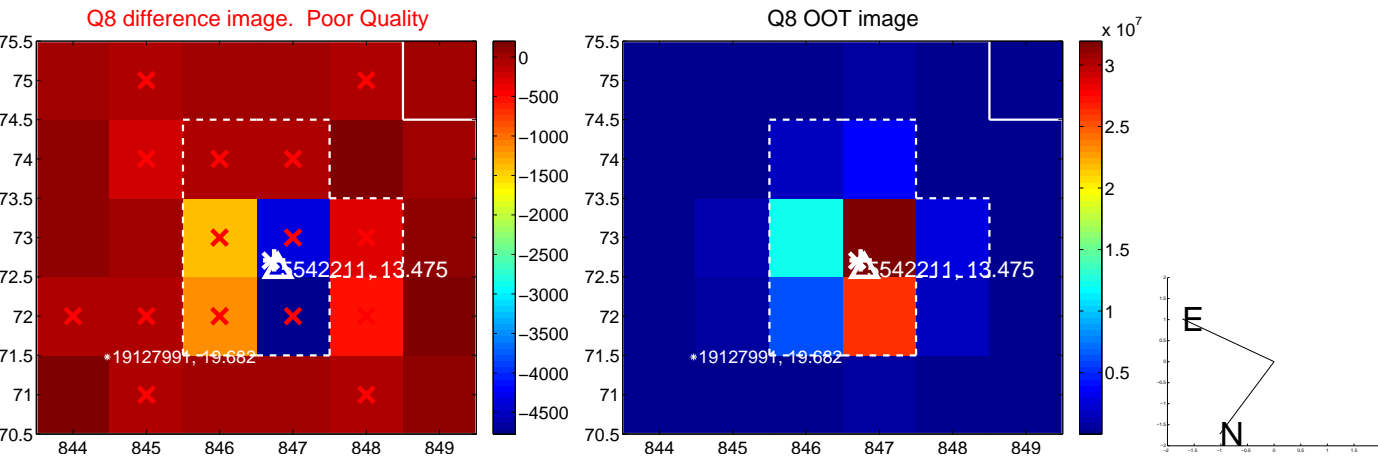
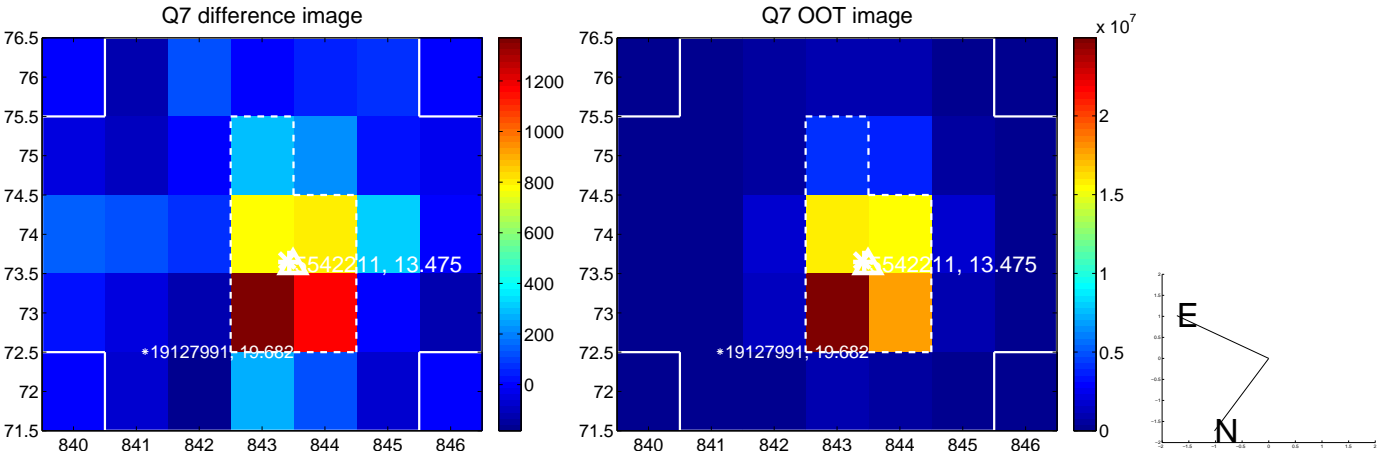
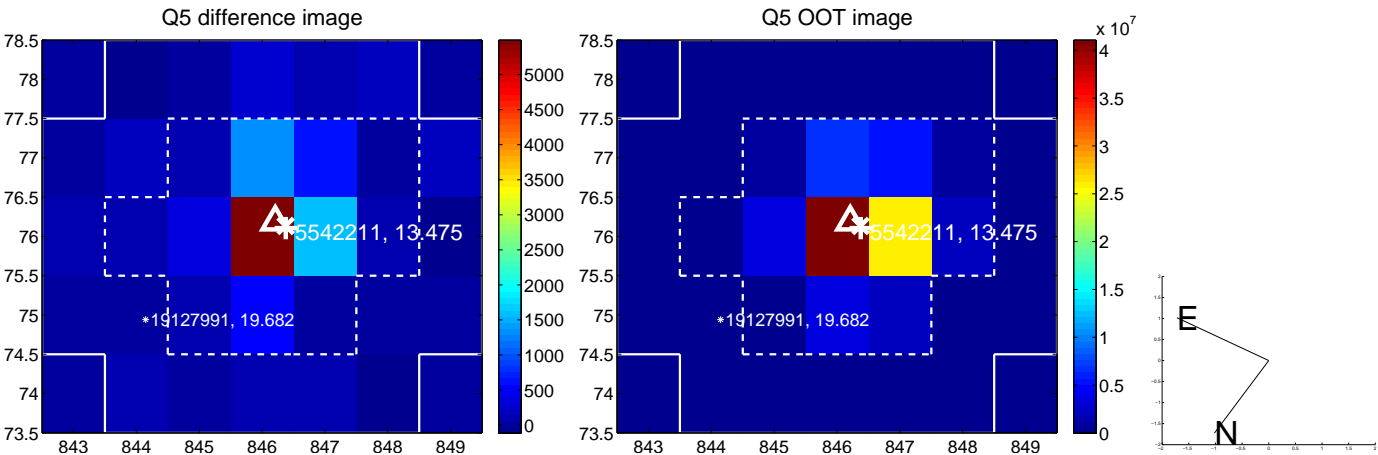


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

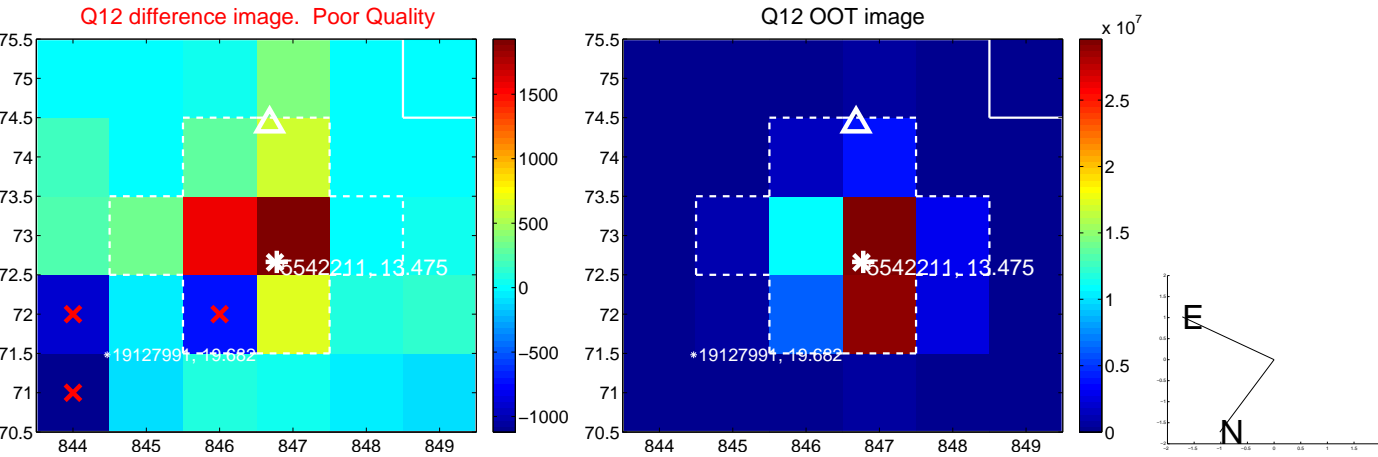
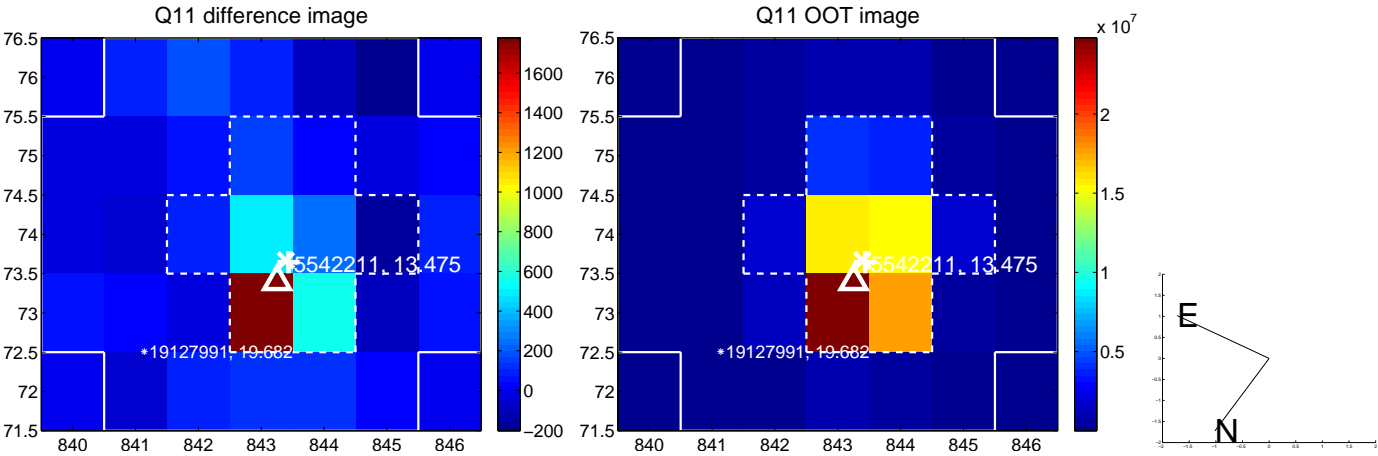
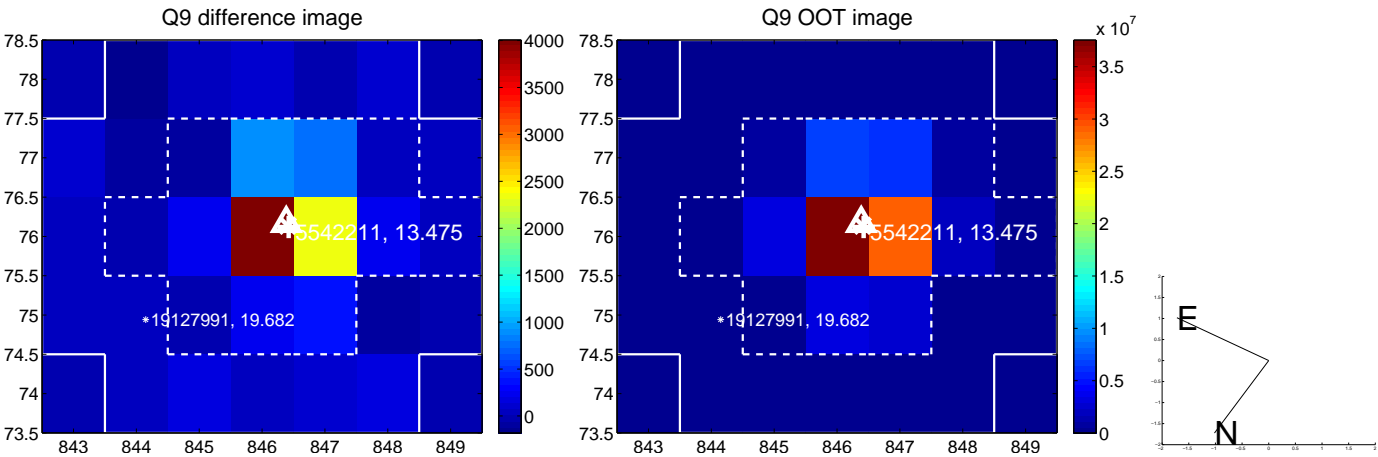


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

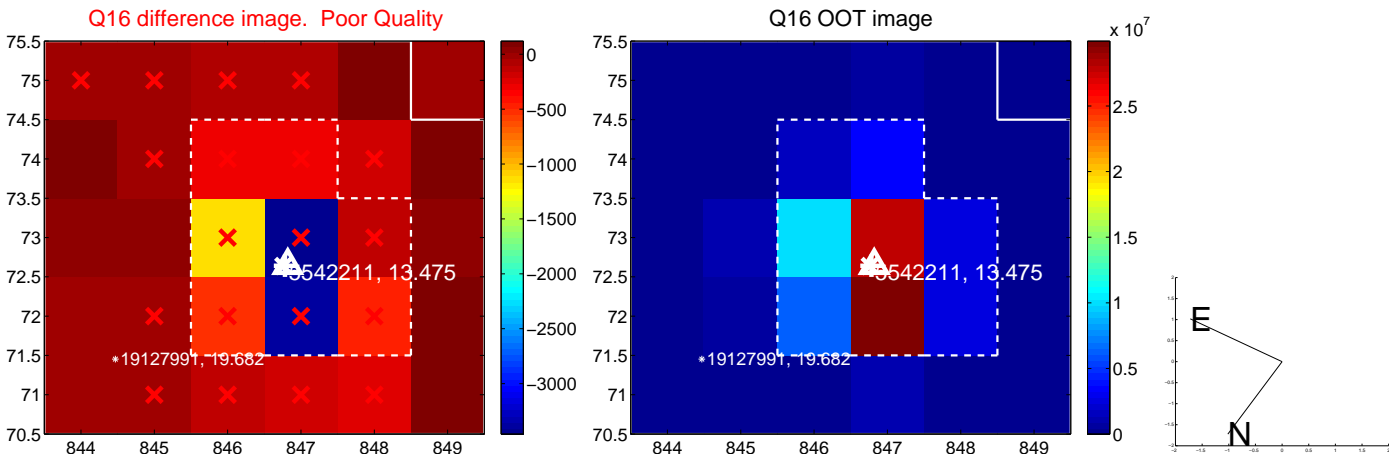
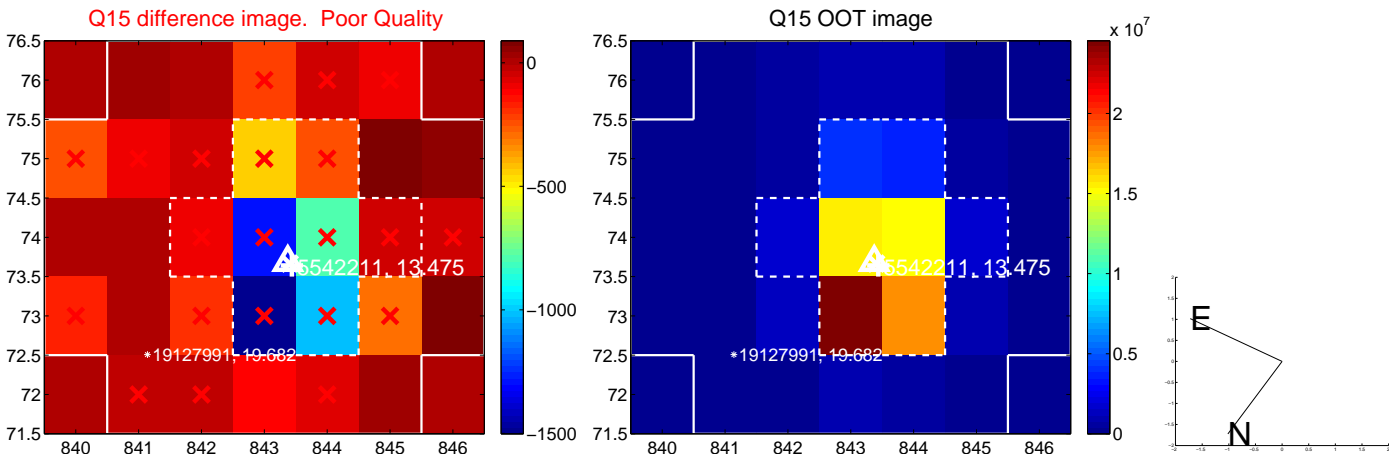
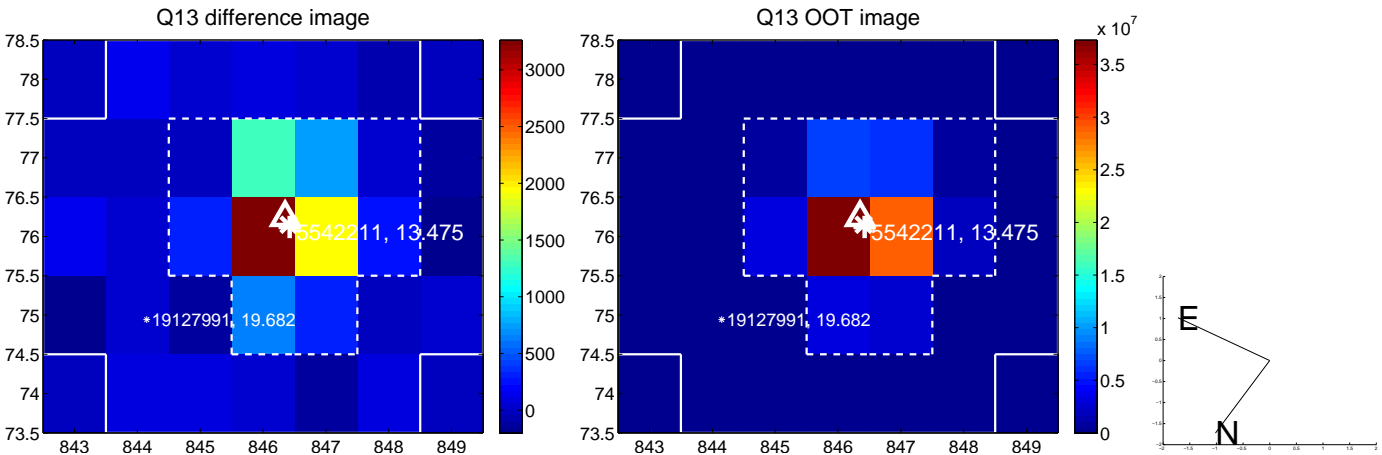




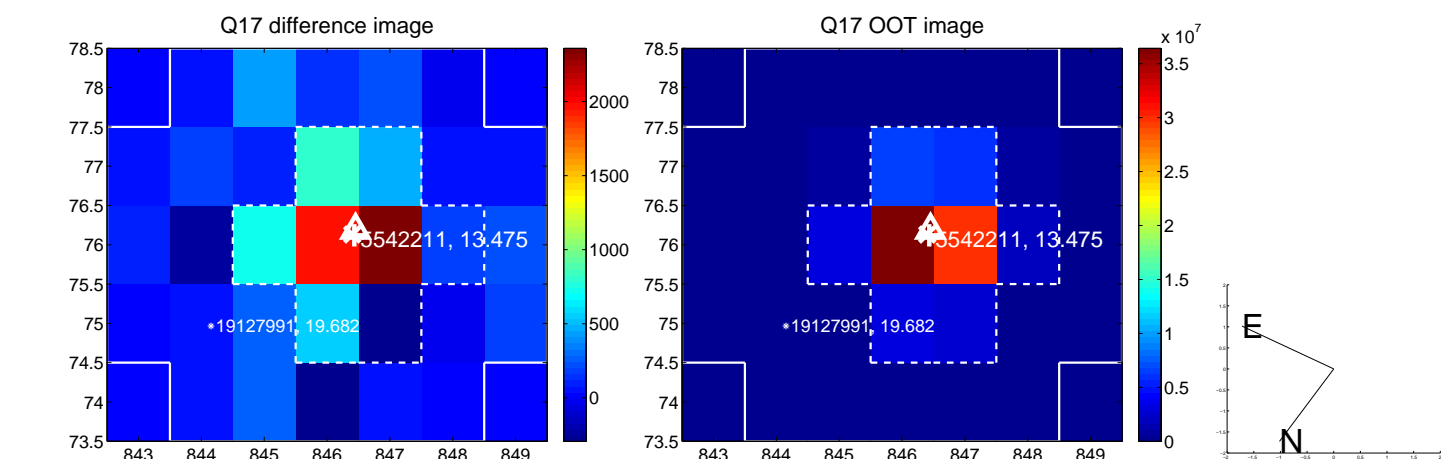
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



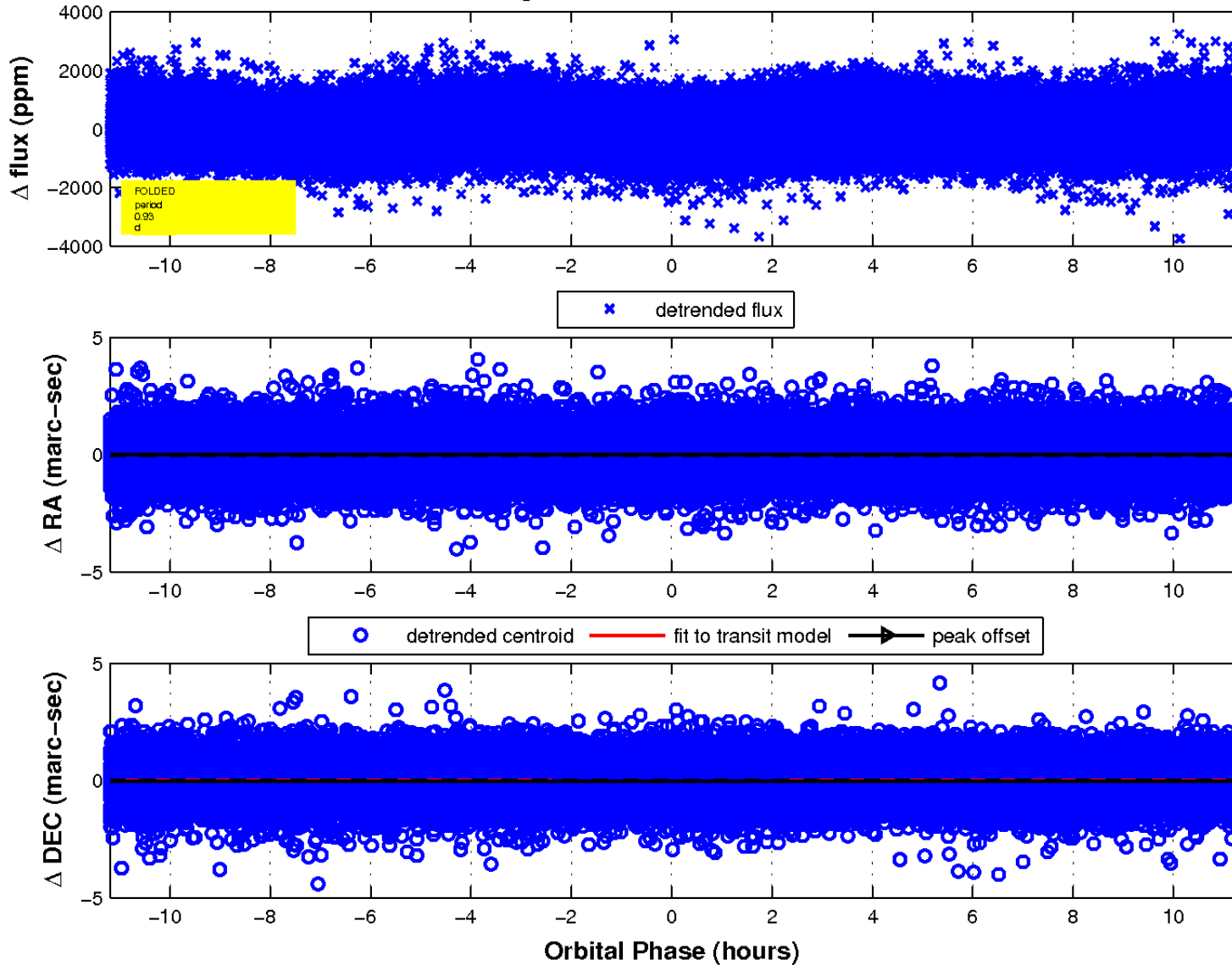
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

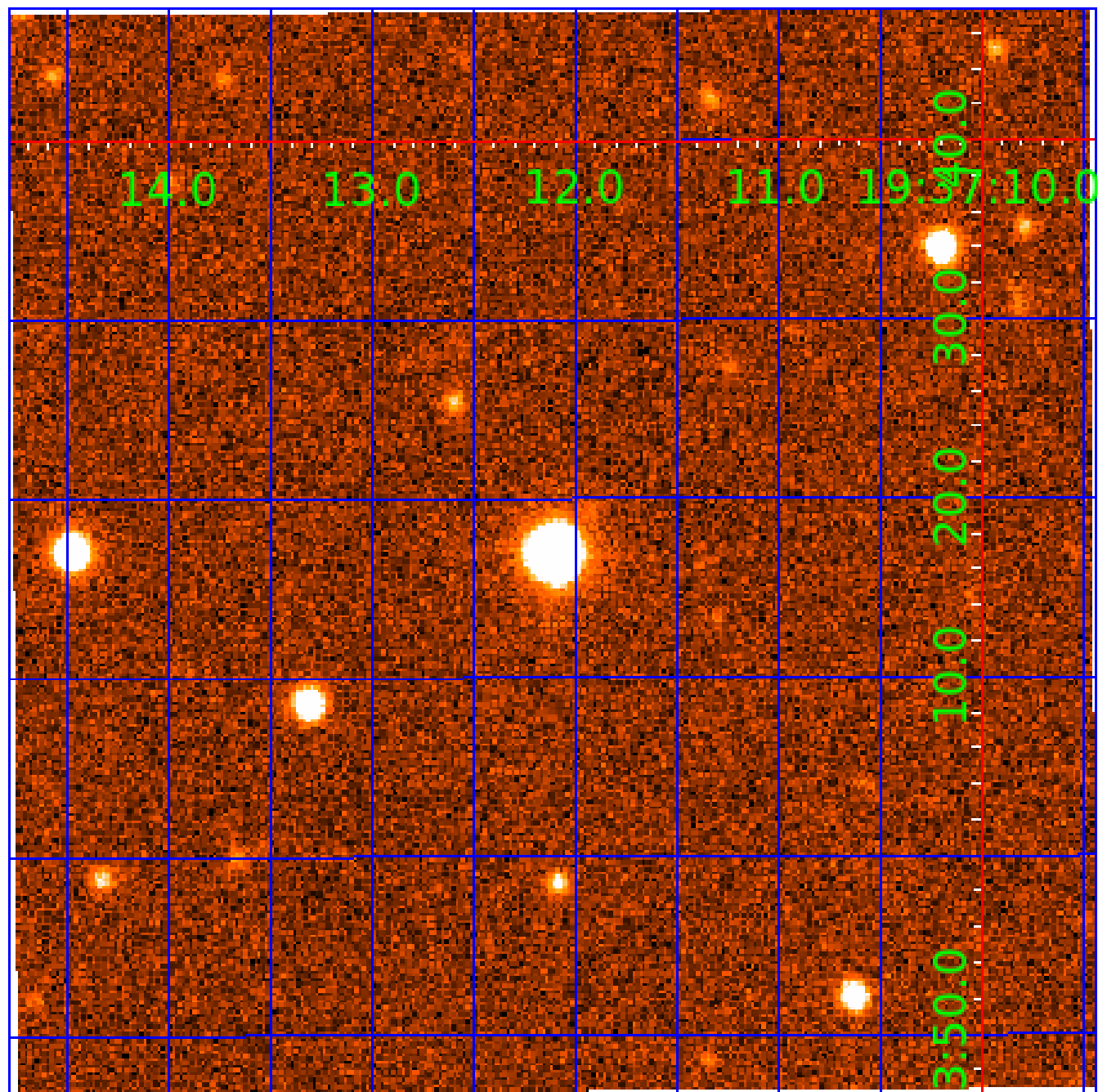


fluxWeightedCentroids, Planet 1 of 2



# UKIRT Image

Declination





# KIC 005542211

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005542211-01	OBS	No	0.932933	132.089519	60.9	5.001	13.5	7.2	1.41	6836	1.11	9277.26
005542211-02	OBS	No	0.932898	132.415747	101.9	5.833	17.2	8.9	1.41	6836	1.47	9277.72

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005542211-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
005542211-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—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.

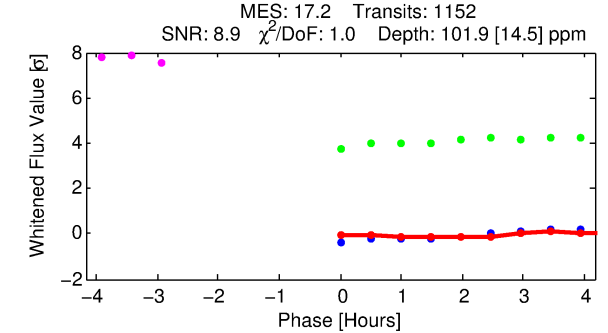
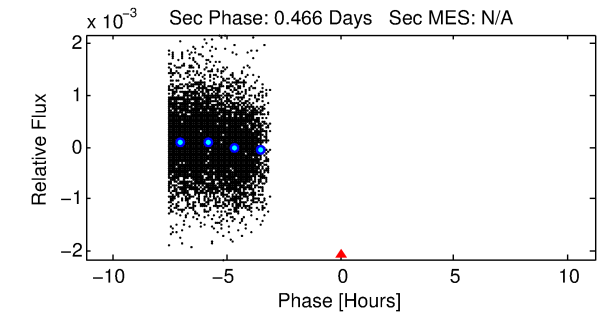
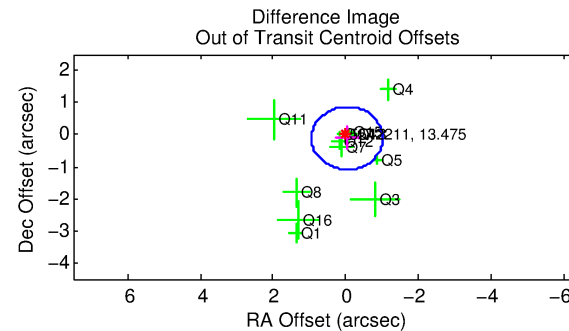
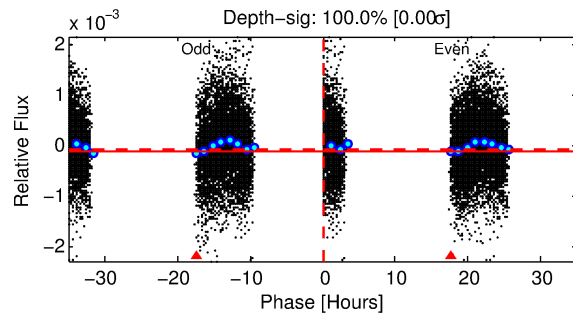
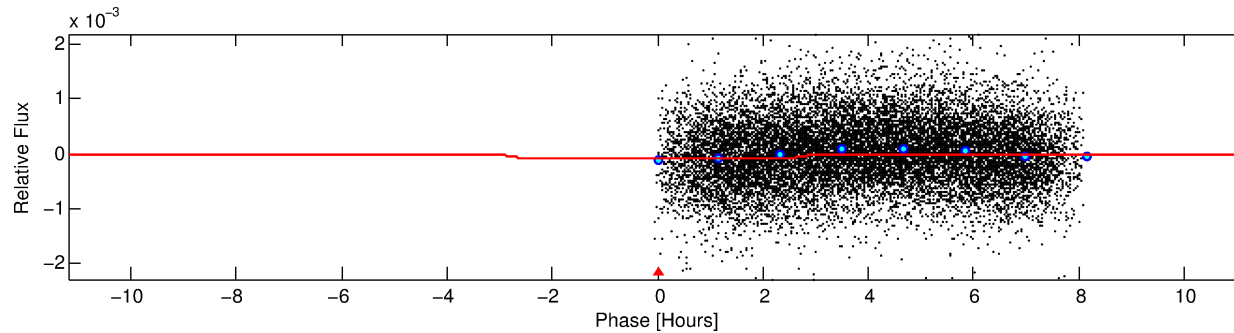
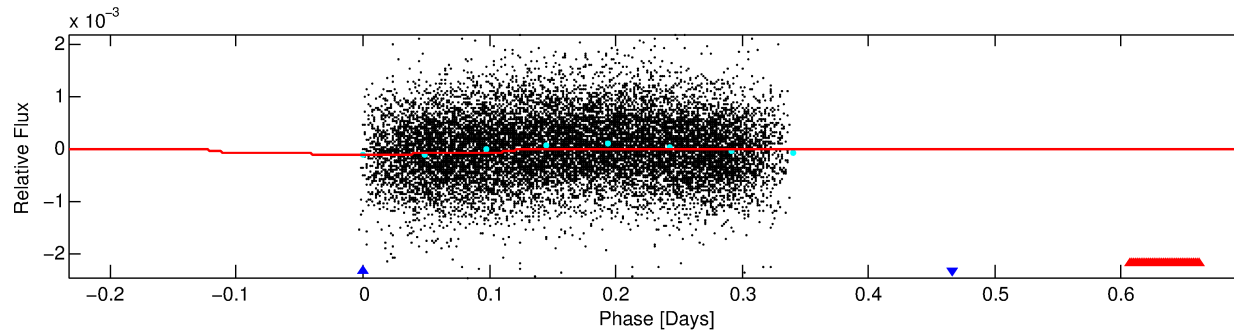
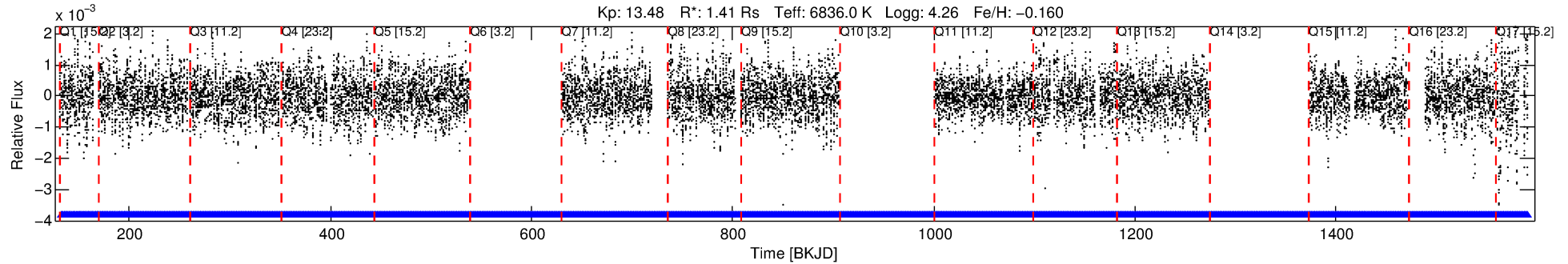
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005542211-02

No Significant Match Found

# DV One-Page Summary

KIC: 5542211 Candidate: 2 of 2 Period: 0.933 d



## DV Fit Results:

Period = 0.93290 [0.00001] d  
Epoch = 132.4157 [0.0095] BKJD  
Rp/R\* = 0.0096 [0.0050]  
a/R\* = 1.30 [1.63]  
b = 0.50 [4.60]  
Seff = 9277.72 [3704.86]  
Teq = 2503 [250] K  
Rp = 1.47 [0.90] Re  
a = 0.0204 [0.0053] AU

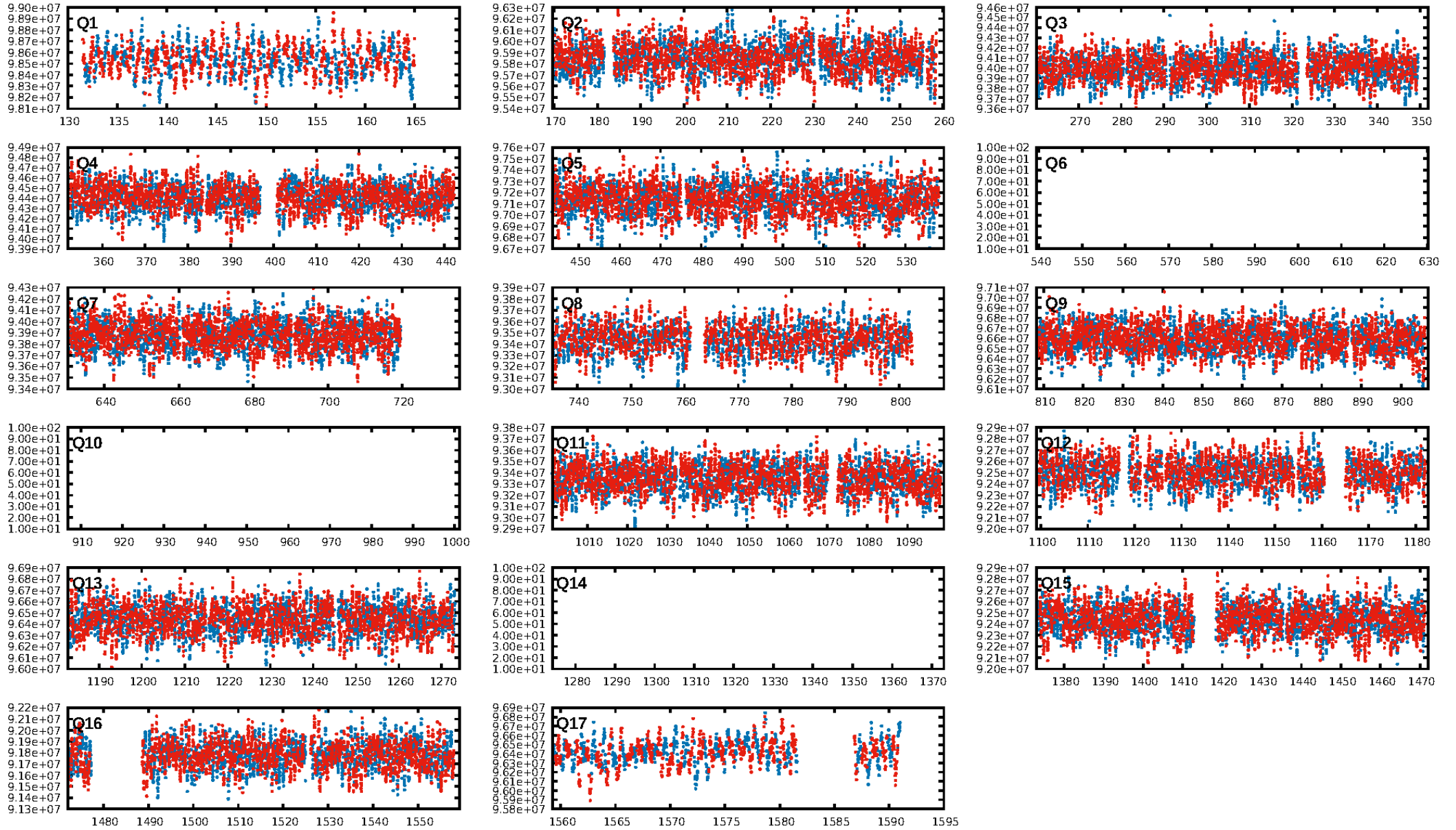
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1087/1087]  
GhostDiagnostic-chr: -1.978  
Centroid-sig: 4.6%  
Centroid-so: 0.169 arcsec [0.81σ]  
OotOffset-rm: 0.120 arcsec [0.37σ]  
KicOffset-rm: 0.201 arcsec [0.80σ]  
OotOffset-st: 0/4/4/4 [12]  
KicOffset-st: 0/4/4/4 [12]  
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DiffImageOverlap-fno: 0.00 [0/14]

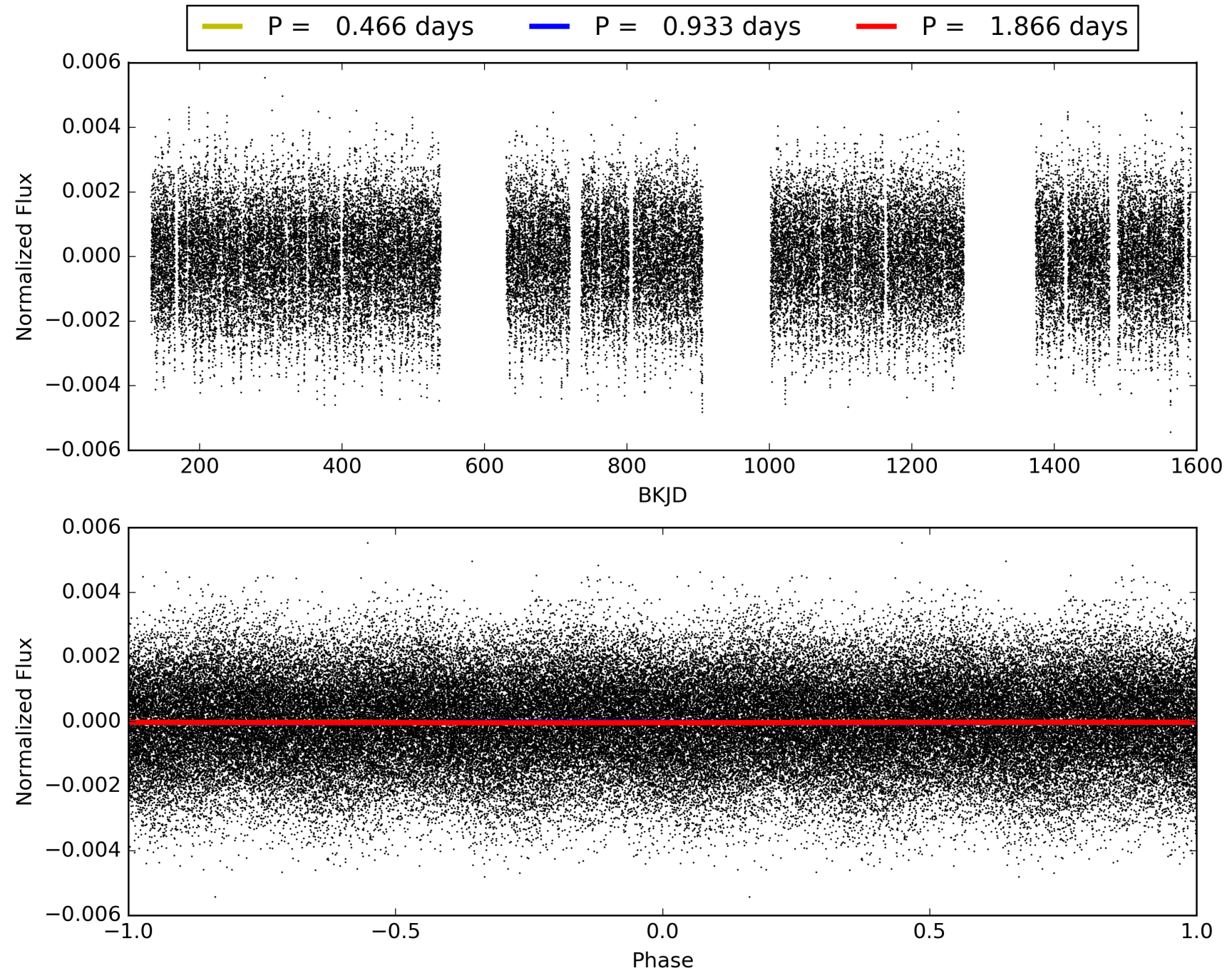
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:53:36 Z

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

# TCE 005542211-02, PDC Light Curves

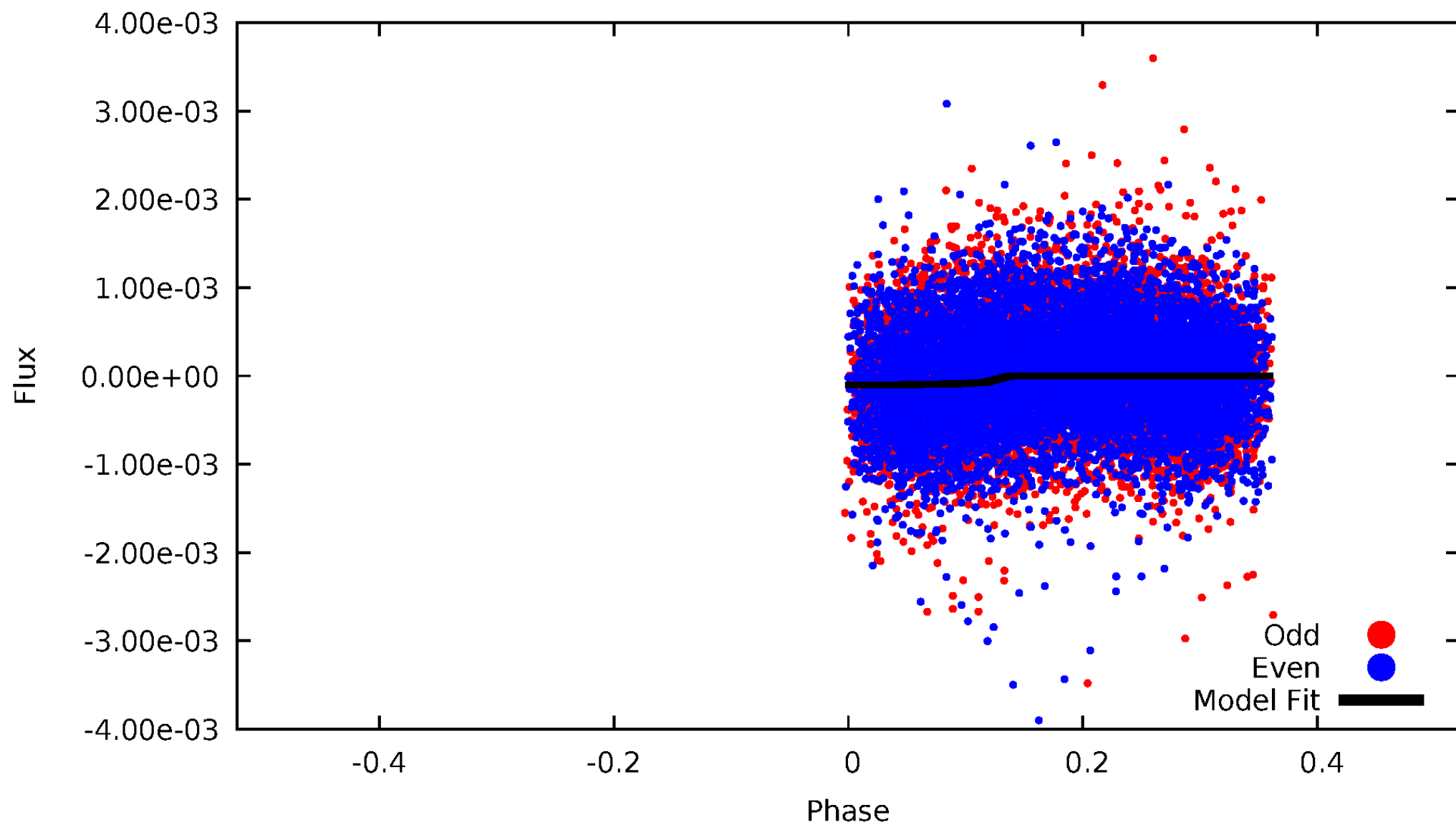


TCE 005542211-02



DV Odd/Even

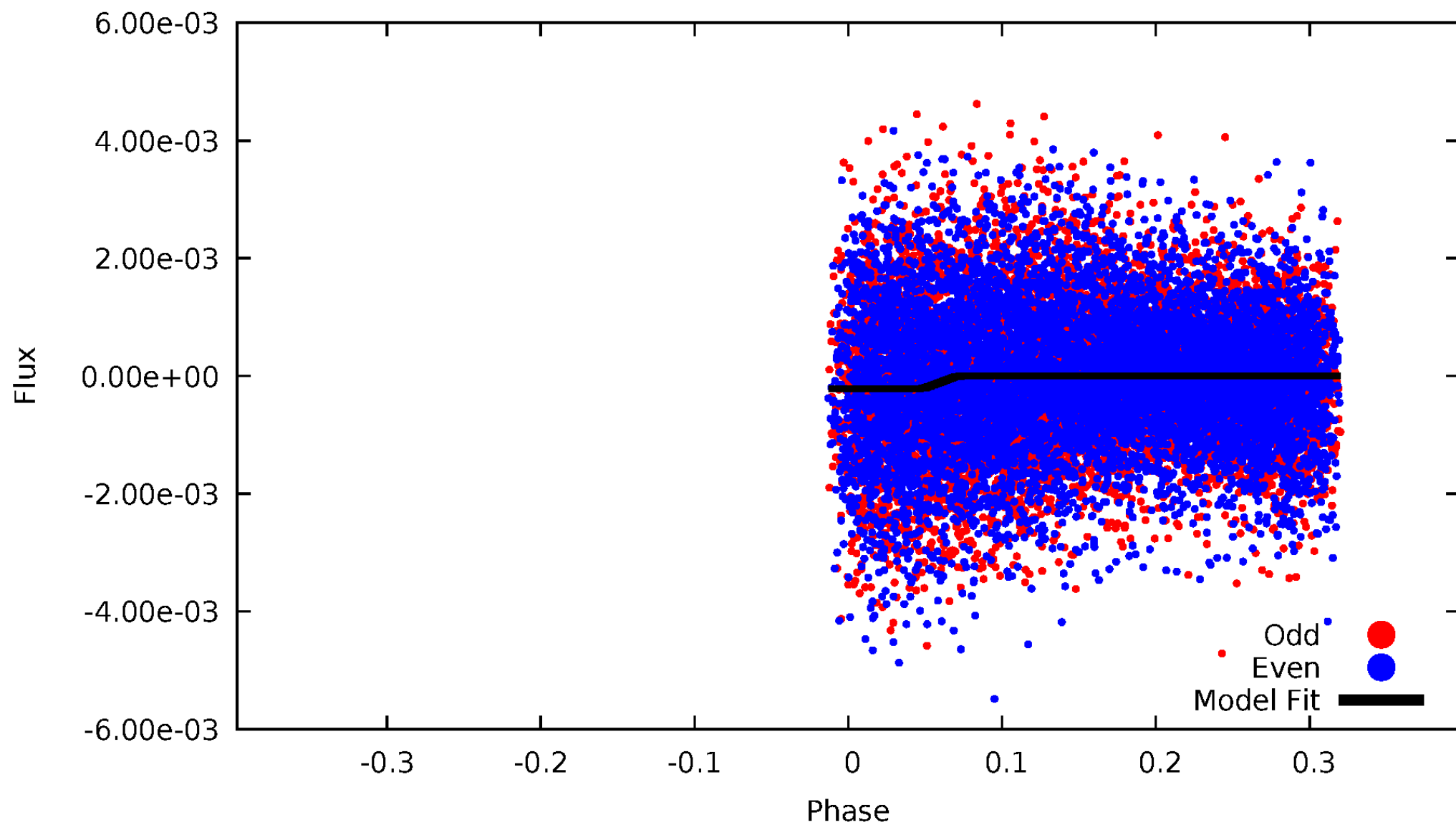
TCE 005542211-02





# ALT Odd/Even

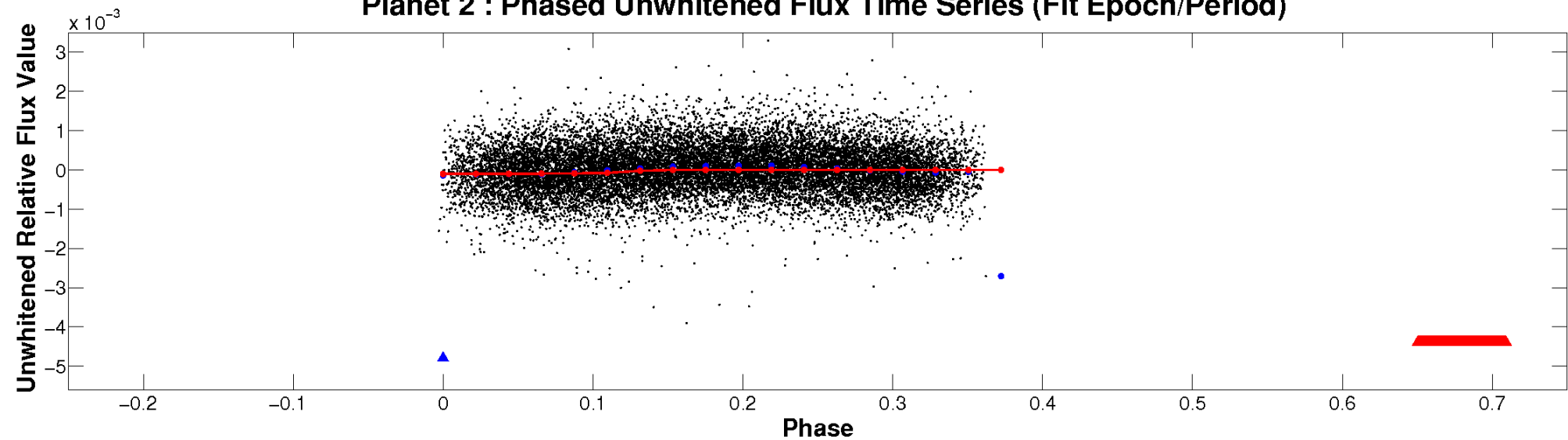
TCE 005542211-02



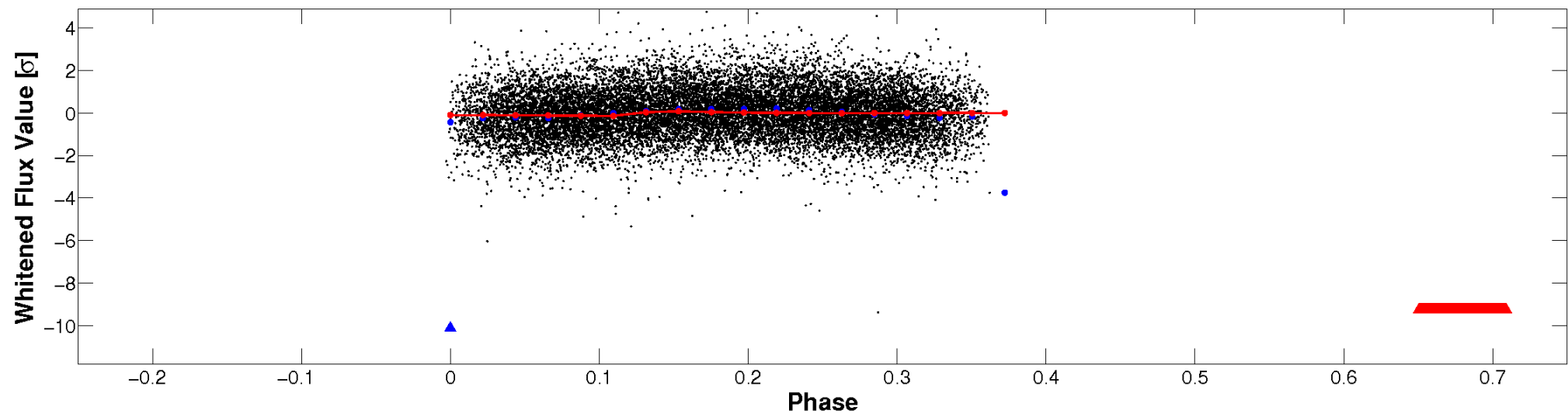


# Non-Whitened Vs. Whitened Light Curve

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

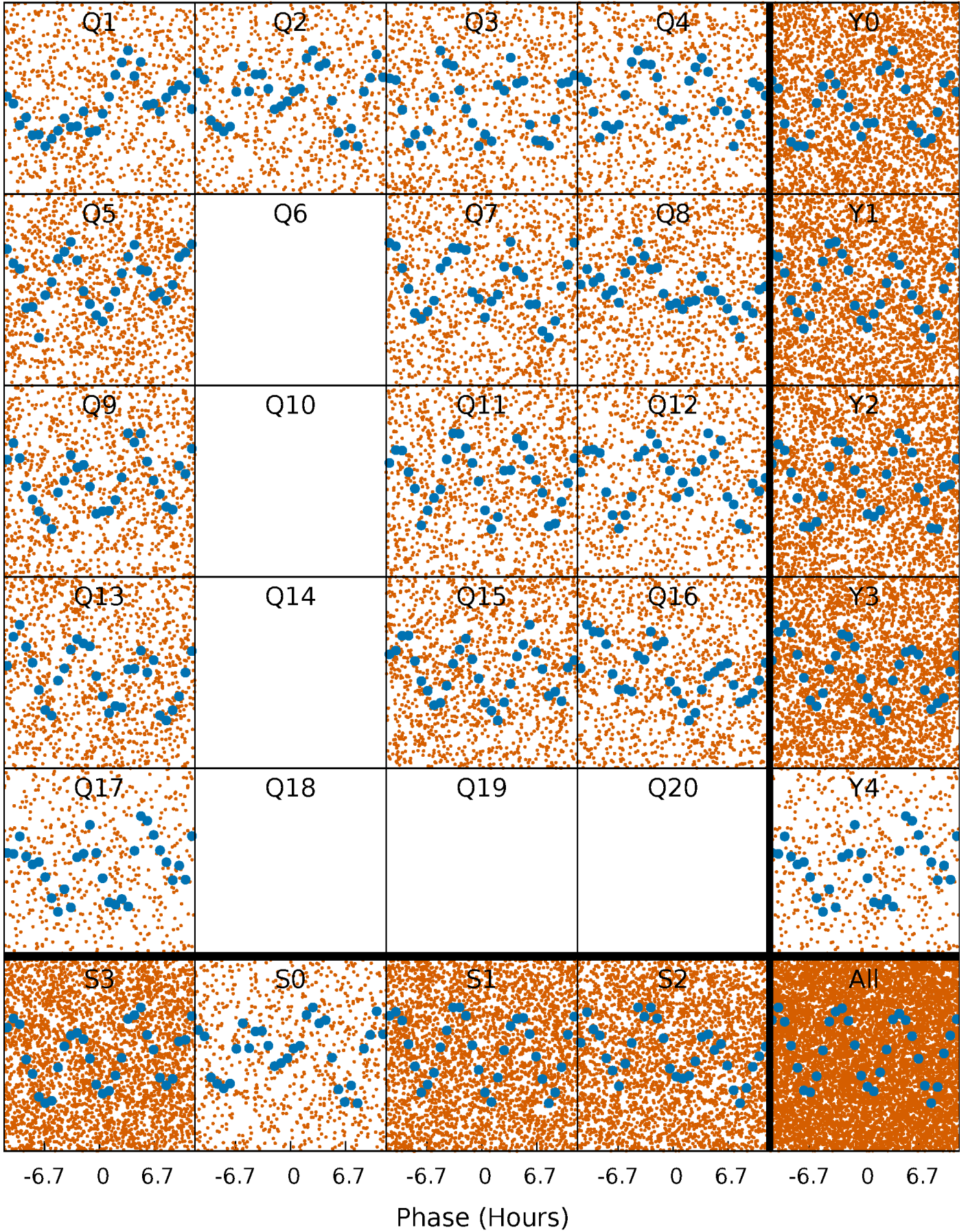


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



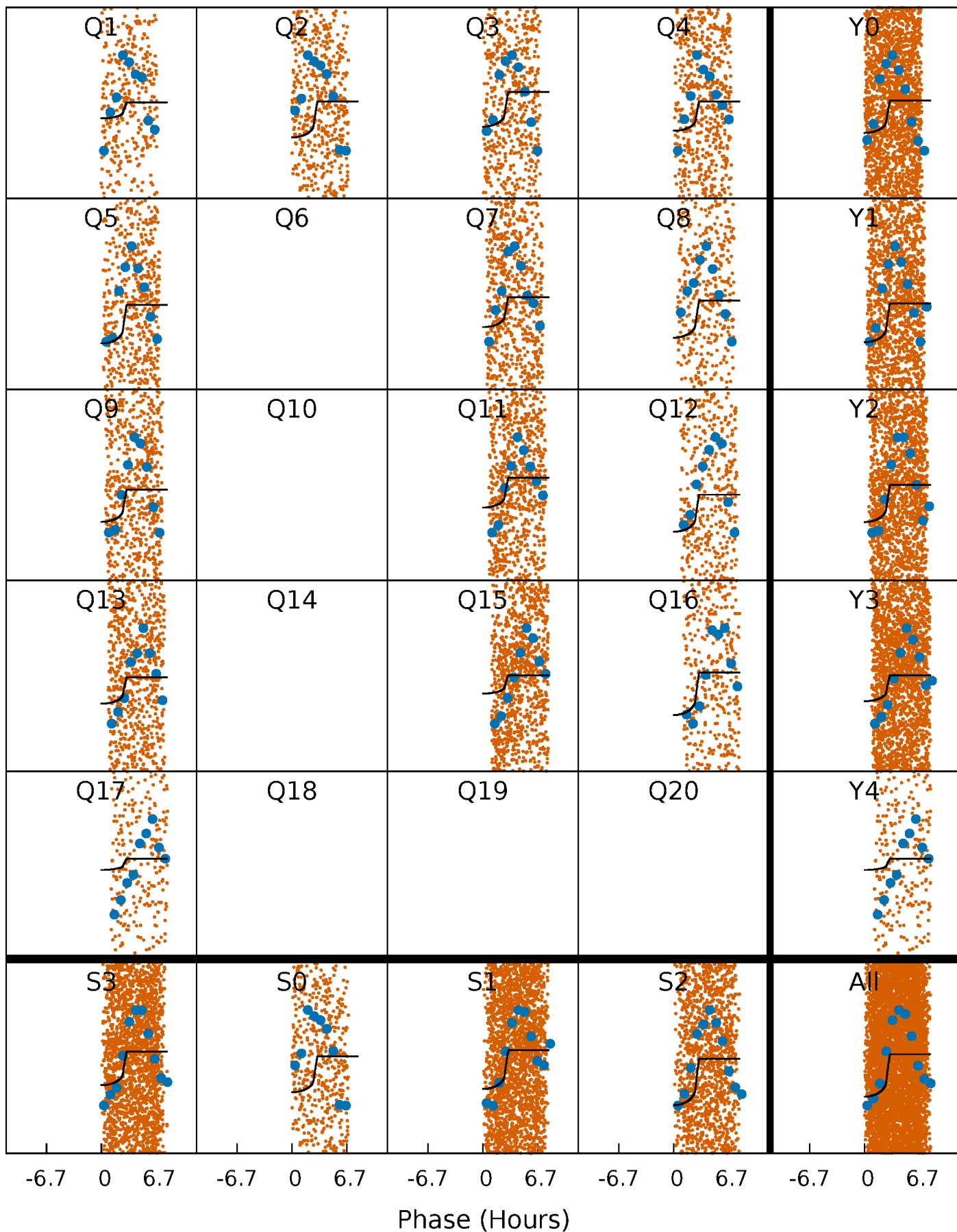
# PDC Quarter-Phased Transit Curves

TCE 005542211-02   P= 0.932898 Days    $T_0=132.415747$  (BKJD)



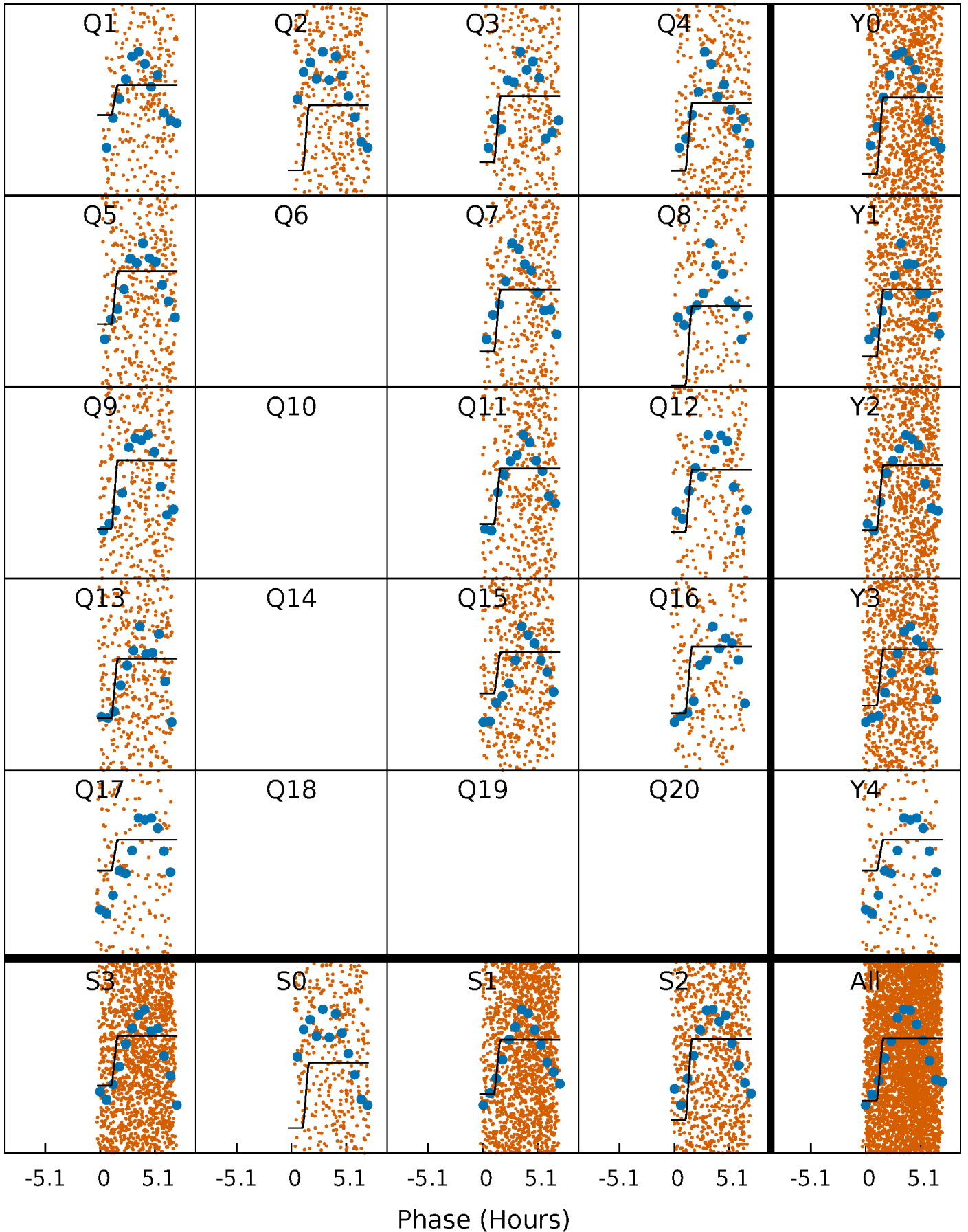
# DV Quarter-Phased Transit Curves

TCE 005542211-02   P= 0.932898 Days    $T_0=132.415747$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005542211-02     $P = 0.932949$  Days     $T_0 = 132.400286$  (BKJD)

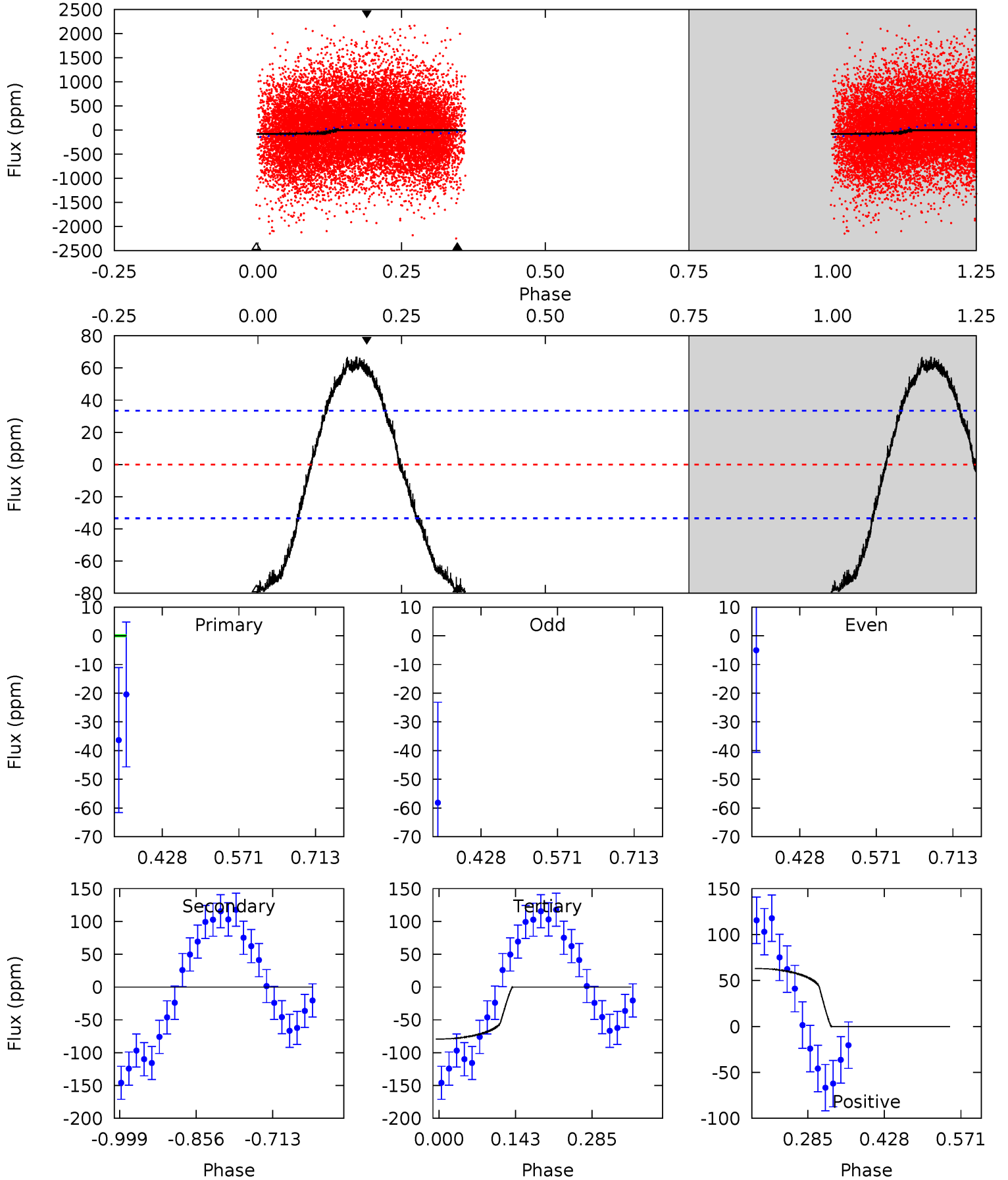




# DV Model-Shift Uniqueness Test

005542211-02, P = 0.932898 Days, E = 131.482849 Days

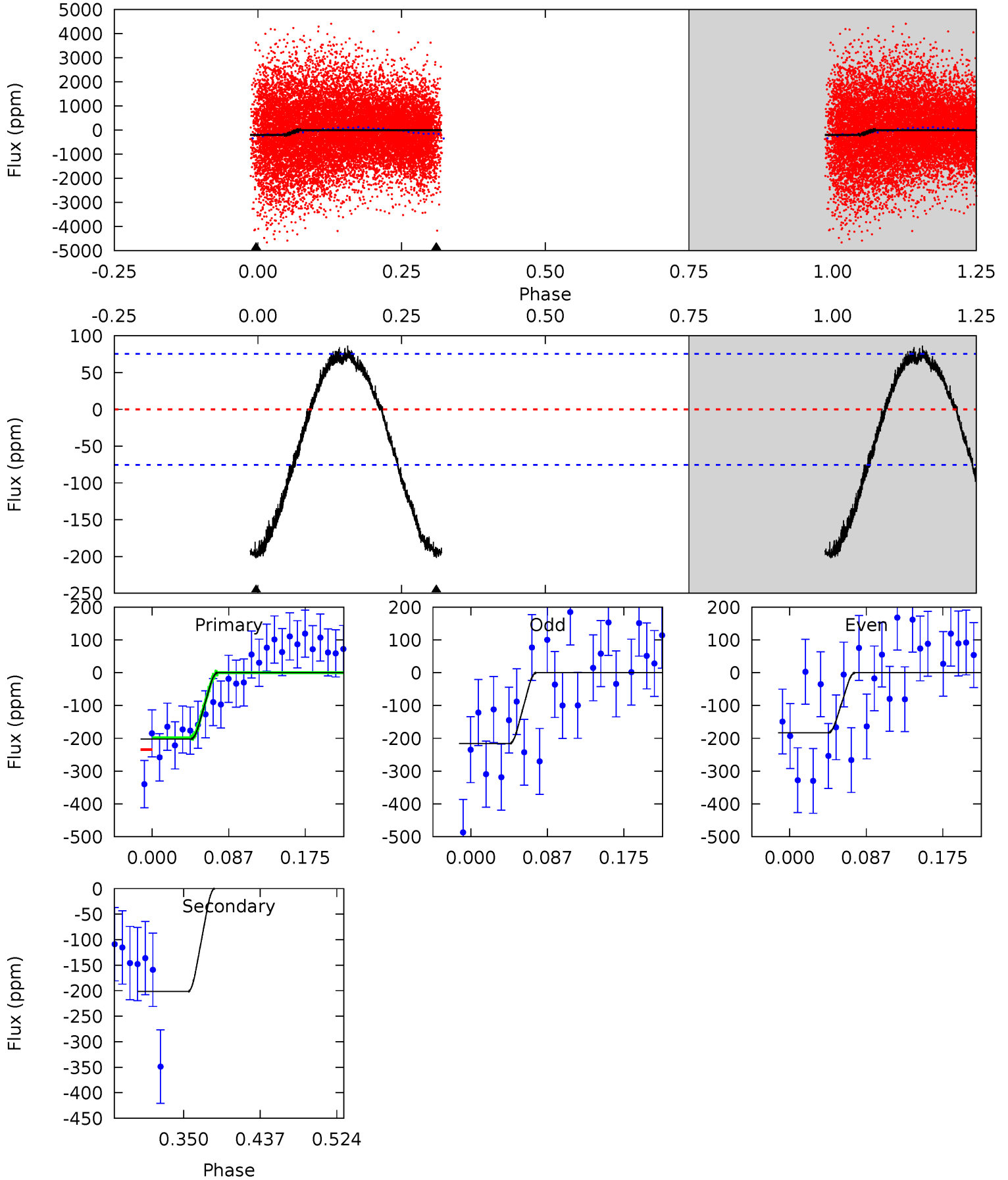
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	0	10.6	8.46	4.49	1.47	6.33	0.06	2.25	-10.6	-8.46	1.17	1.24	0.46	3.12



# Alt Model-Shift Uniqueness Test

005542211-02, P = 0.932949 Days, E = 131.467337 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
12.3	12.3	0	0	4.59	1.71	4.79	12.3	12.3	12.3	12.3	0.91	1.16	0.30	0.45





### Stellar Parameters For KIC 005542211

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6836^{+192}_{-264}$	$4.257^{+0.105}_{-0.195}$	$-0.160^{+0.250}_{-0.350}$	$1.405^{+0.452}_{-0.243}$	$1.311^{+0.201}_{-0.201}$	$0.666^{+0.317}_{-0.340}$
	+3%/-4%	+2%/-5%	+156%/-219%	+32%/-17%	+15%/-15%	+48%/-51%
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 005542211-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 7$	$1.64^{+0.77}_{-0.77}$	$3534^{+265}_{-206}$	$-3420^{+7200}_{-875}$	$-0.002^{+0.876}_{-0.812}$
Alt.	$-202 \pm 16$	$2.30^{+0.93}_{-0.74}$	$3529^{+256}_{-211}$	$6625^{+1698}_{-988}$	$8.694^{+10.200}_{-4.168}$

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

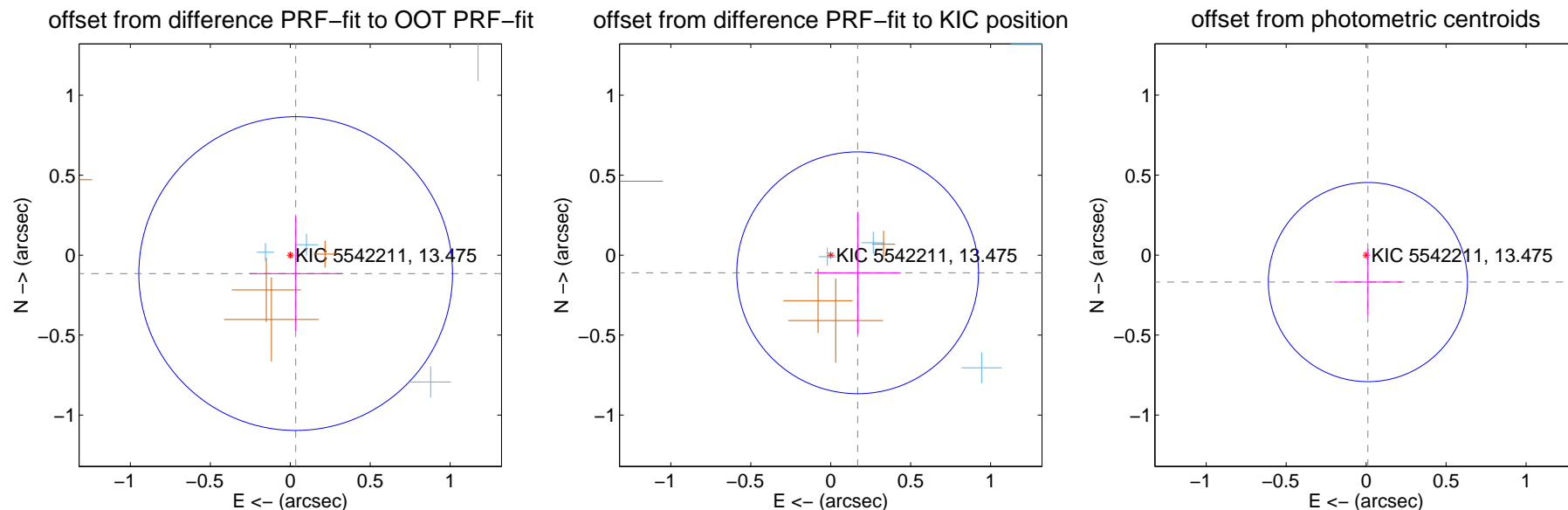
## DV Centroid Data

Supplemental centroid analysis for 005542211-02. Kepler magnitude: 13.47. Transit SNR 8.94

There are 4 quarters with good PRF difference image offsets

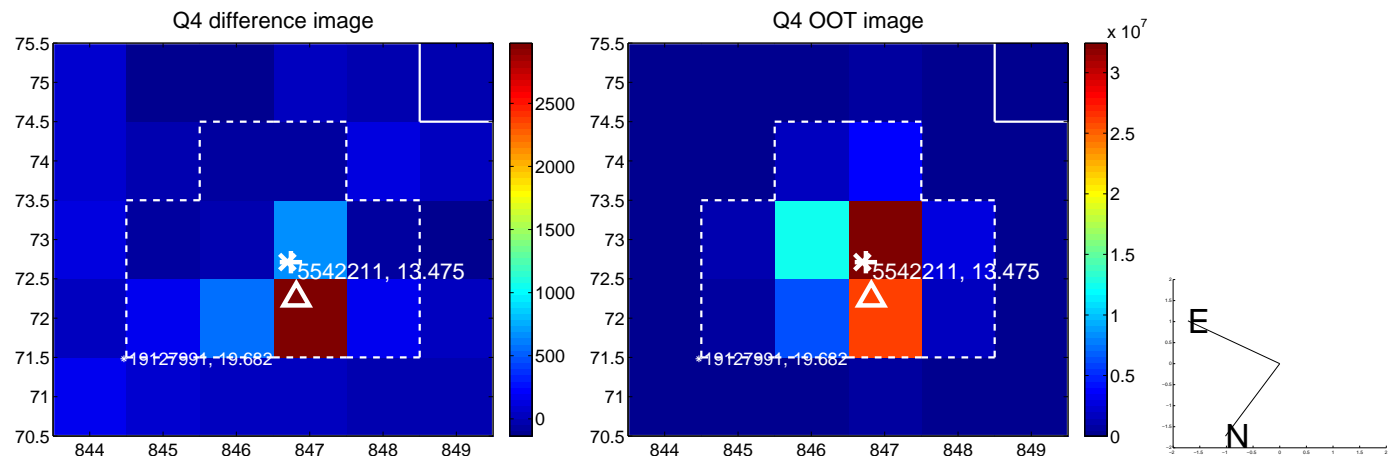
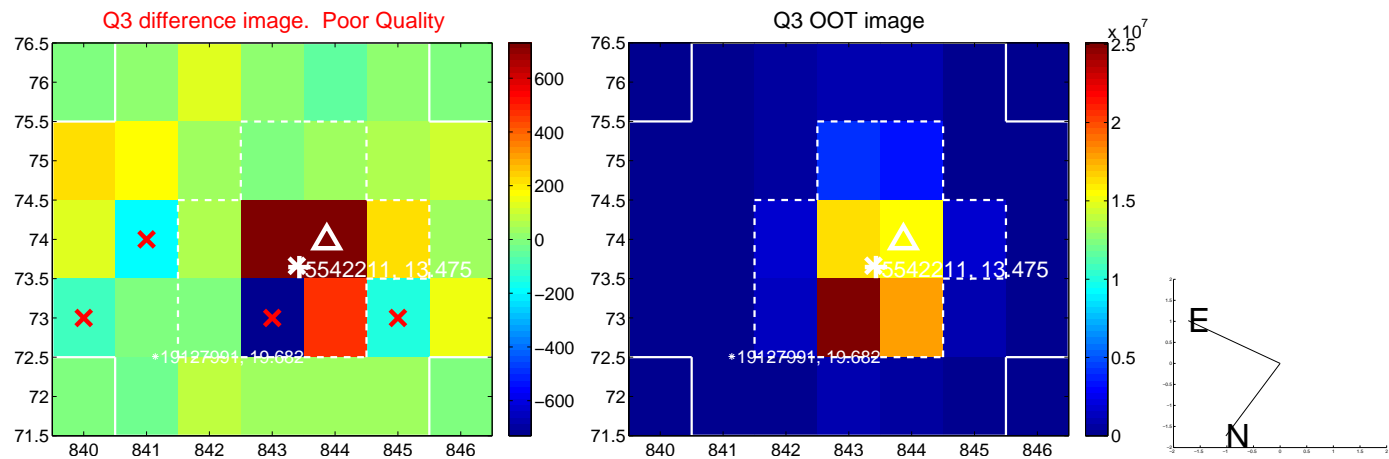
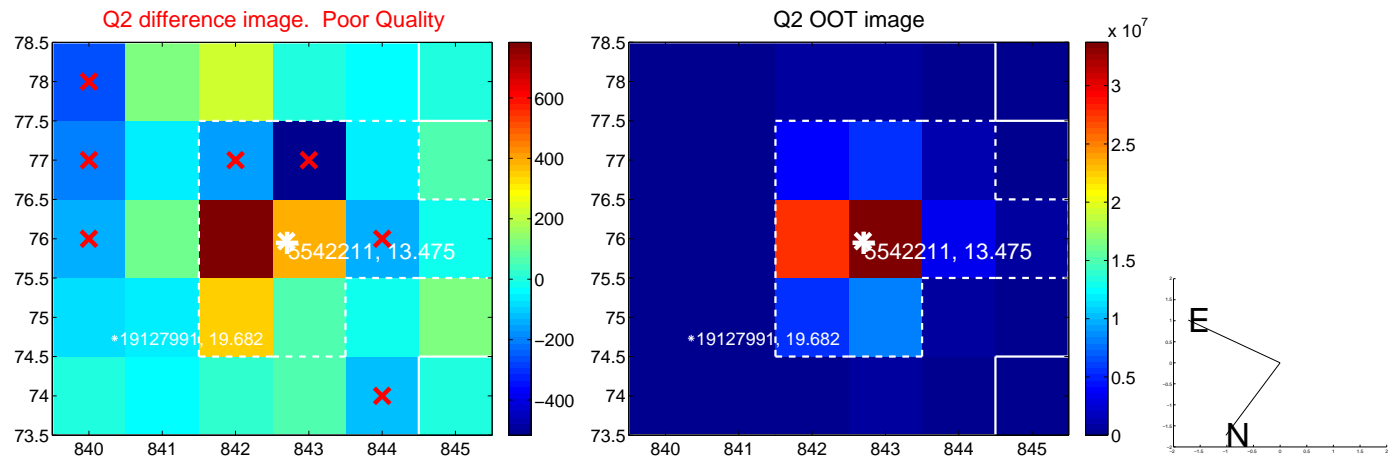
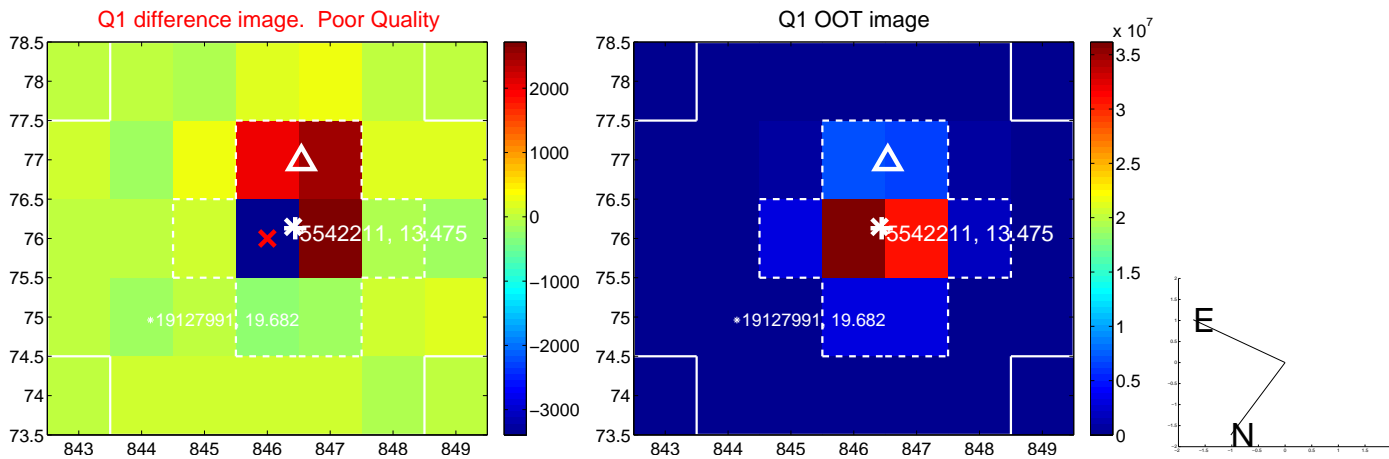
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.120 \pm 0.327$	0.37	$-0.034 \pm 0.292$	$-0.115 \pm 0.358$
PRF-fit source offset from KIC position	$0.201 \pm 0.252$	0.80	$-0.168 \pm 0.269$	$-0.110 \pm 0.381$
photometric centroid source offset	$0.17 \pm 0.21$	0.81	$-0.01 \pm 0.21$	$-0.17 \pm 0.21$

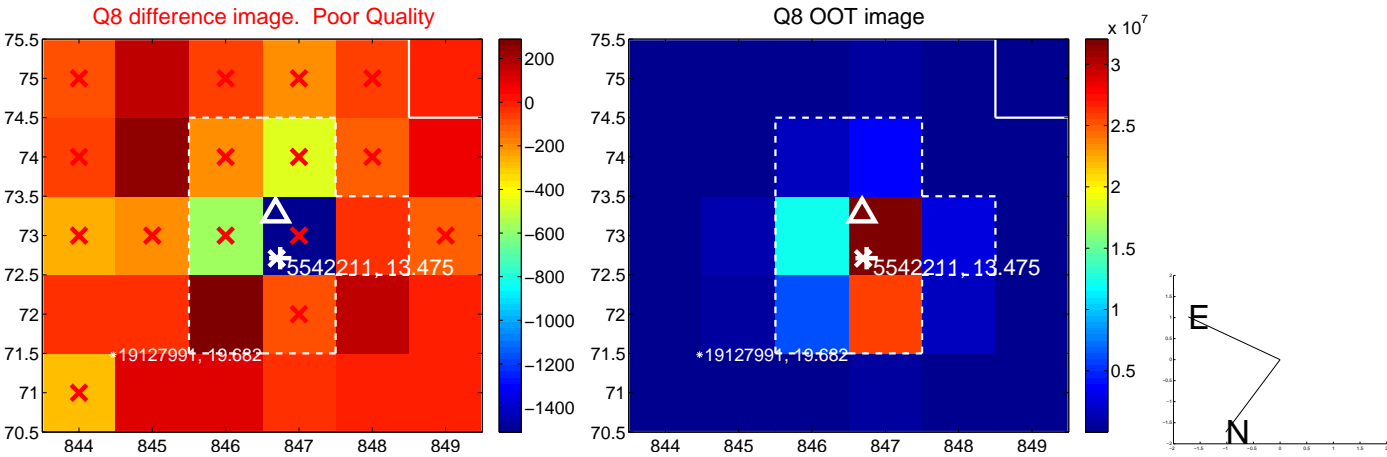
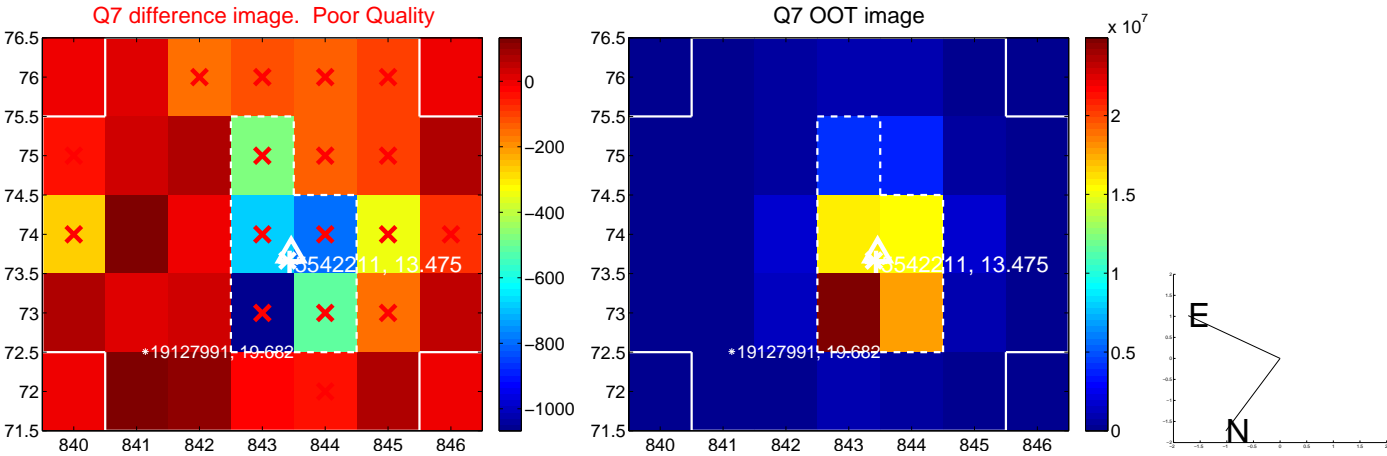
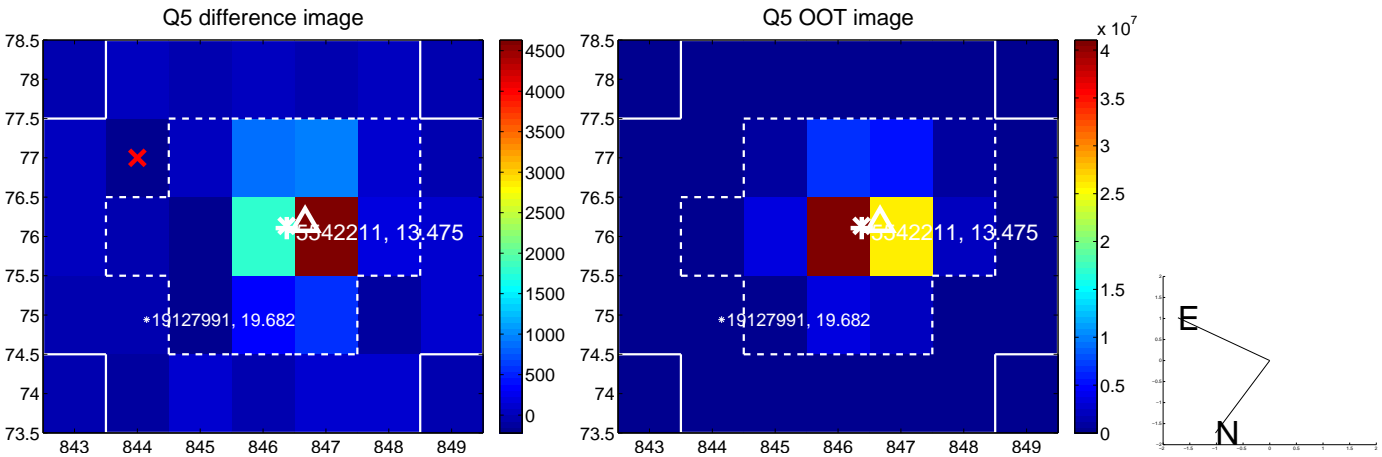


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

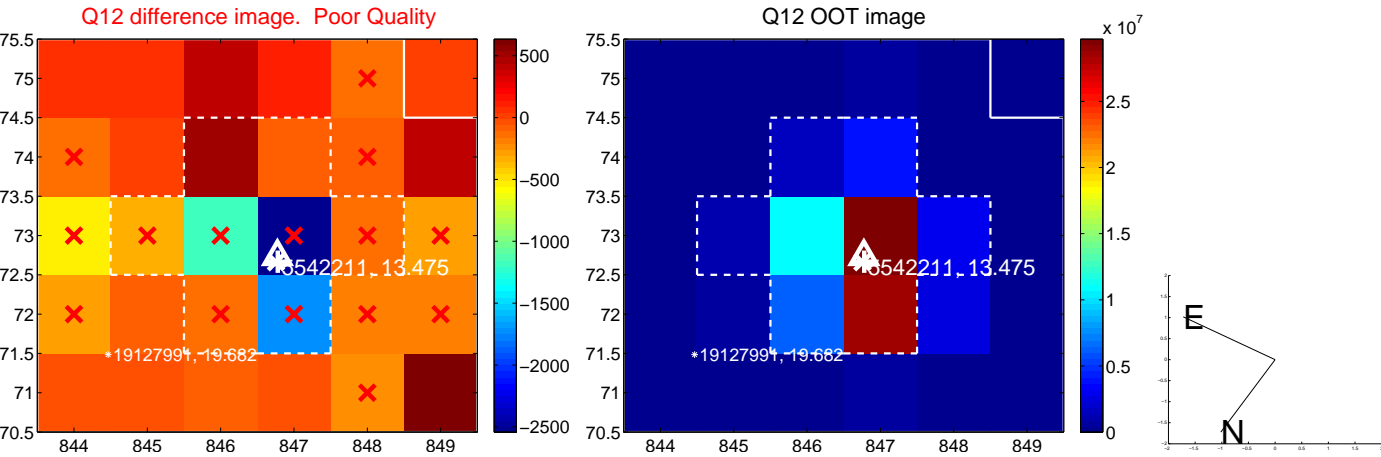
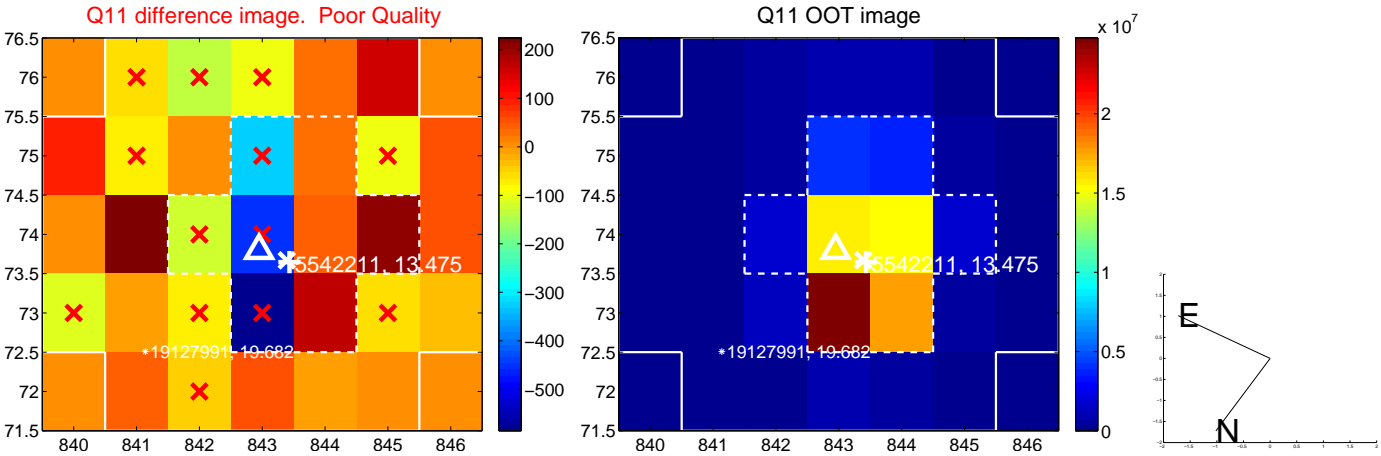
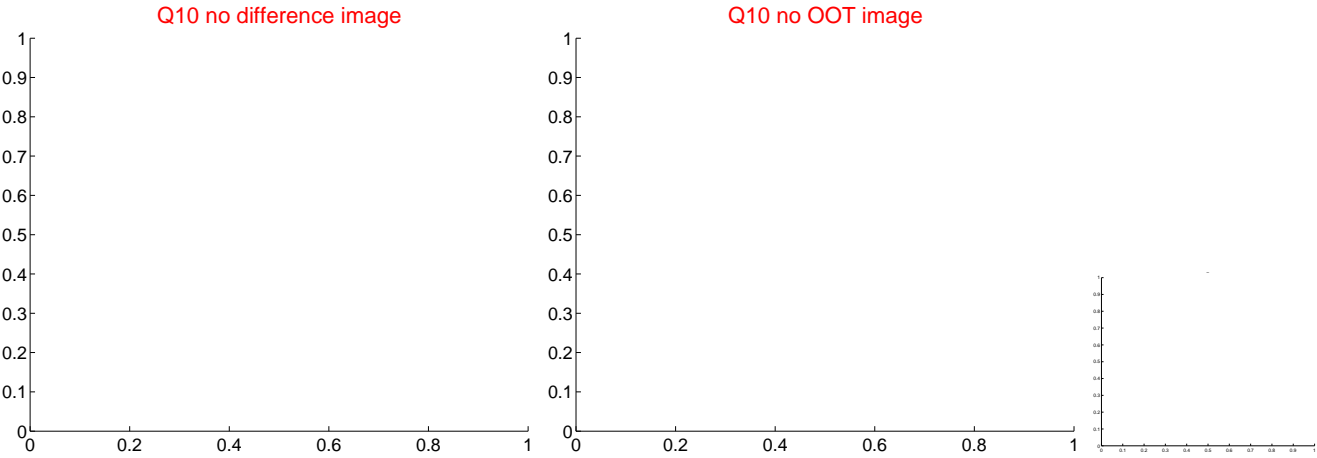
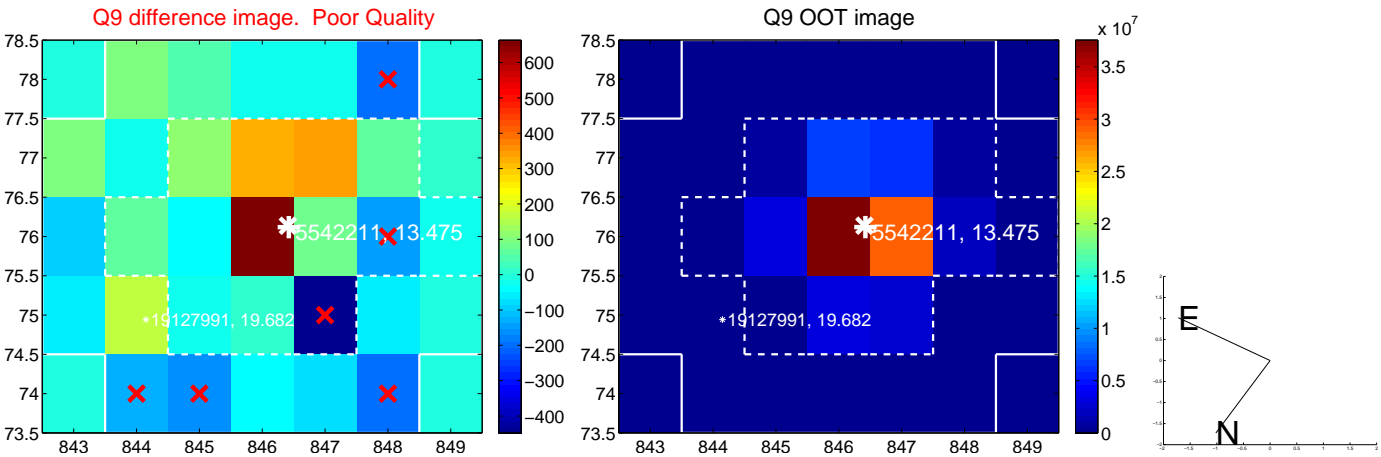
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

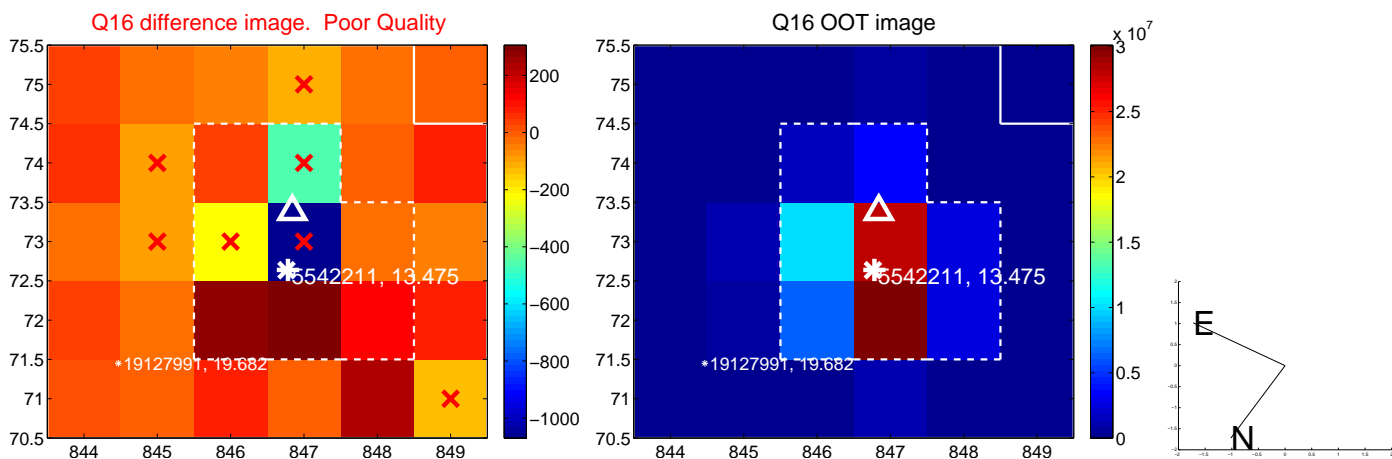
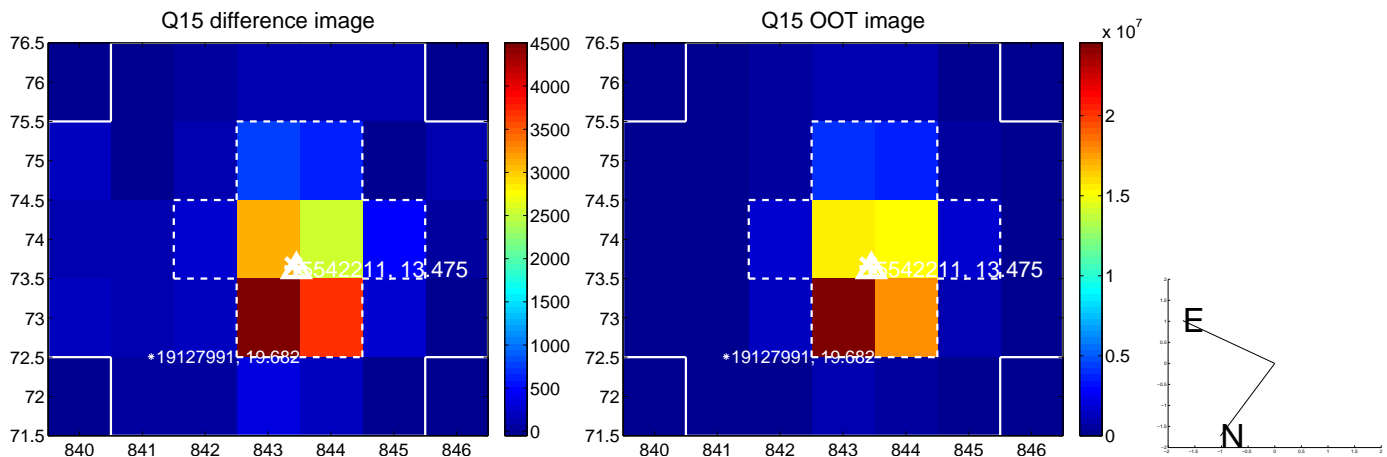
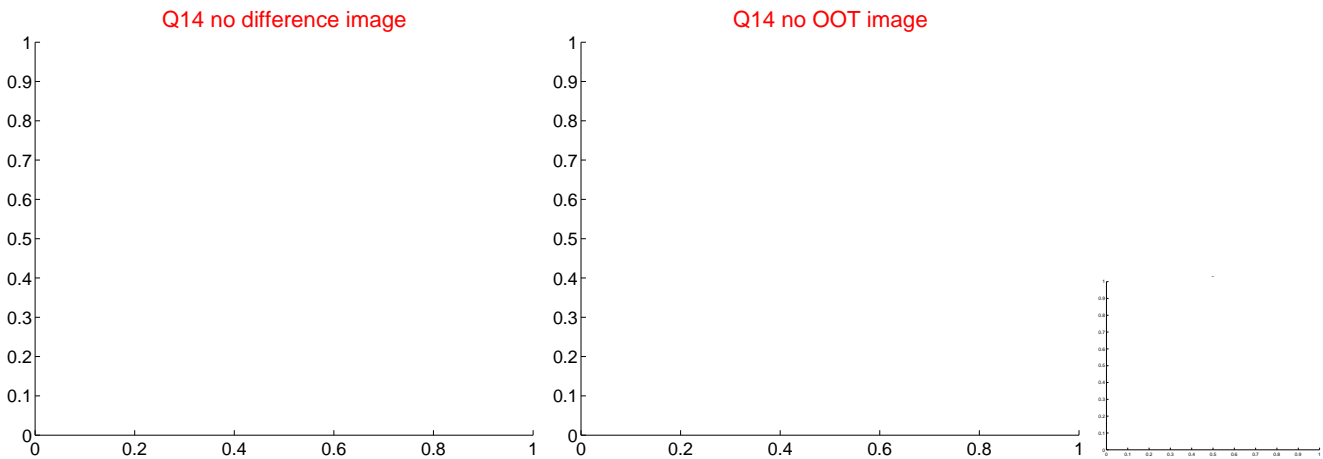
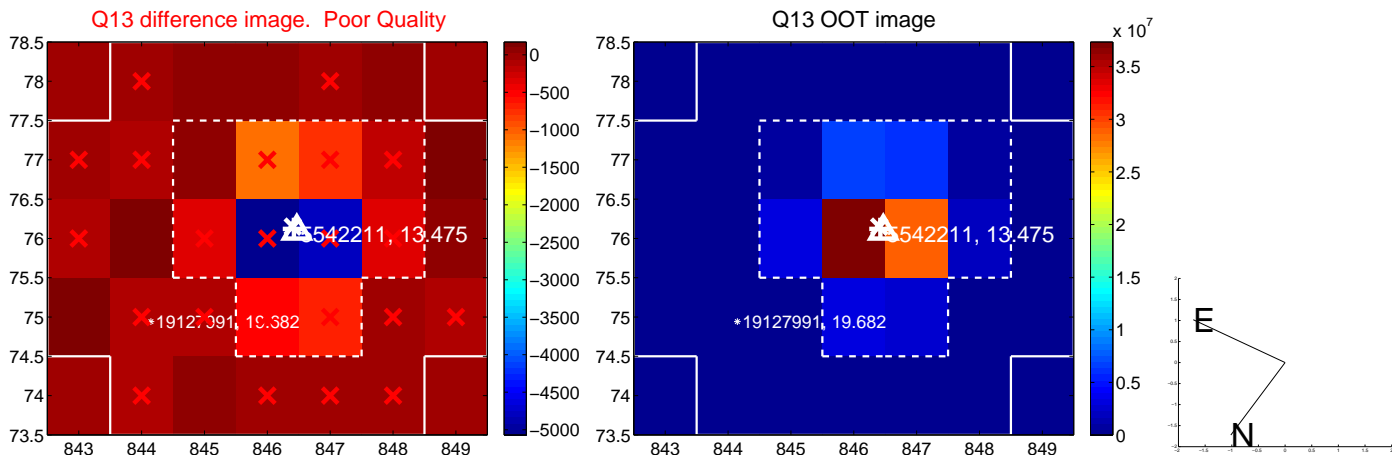


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

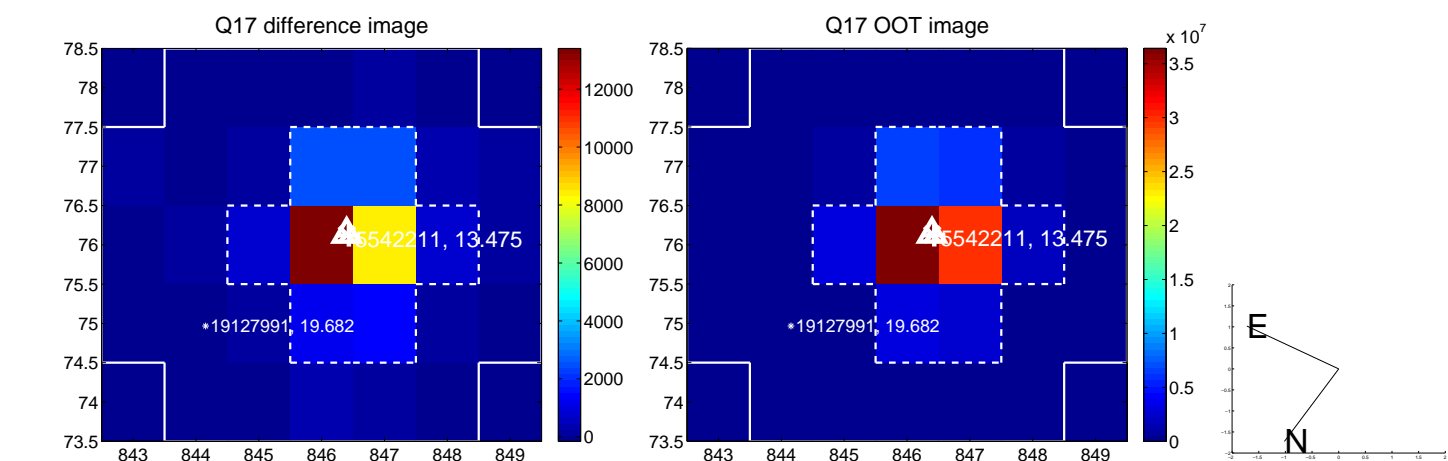




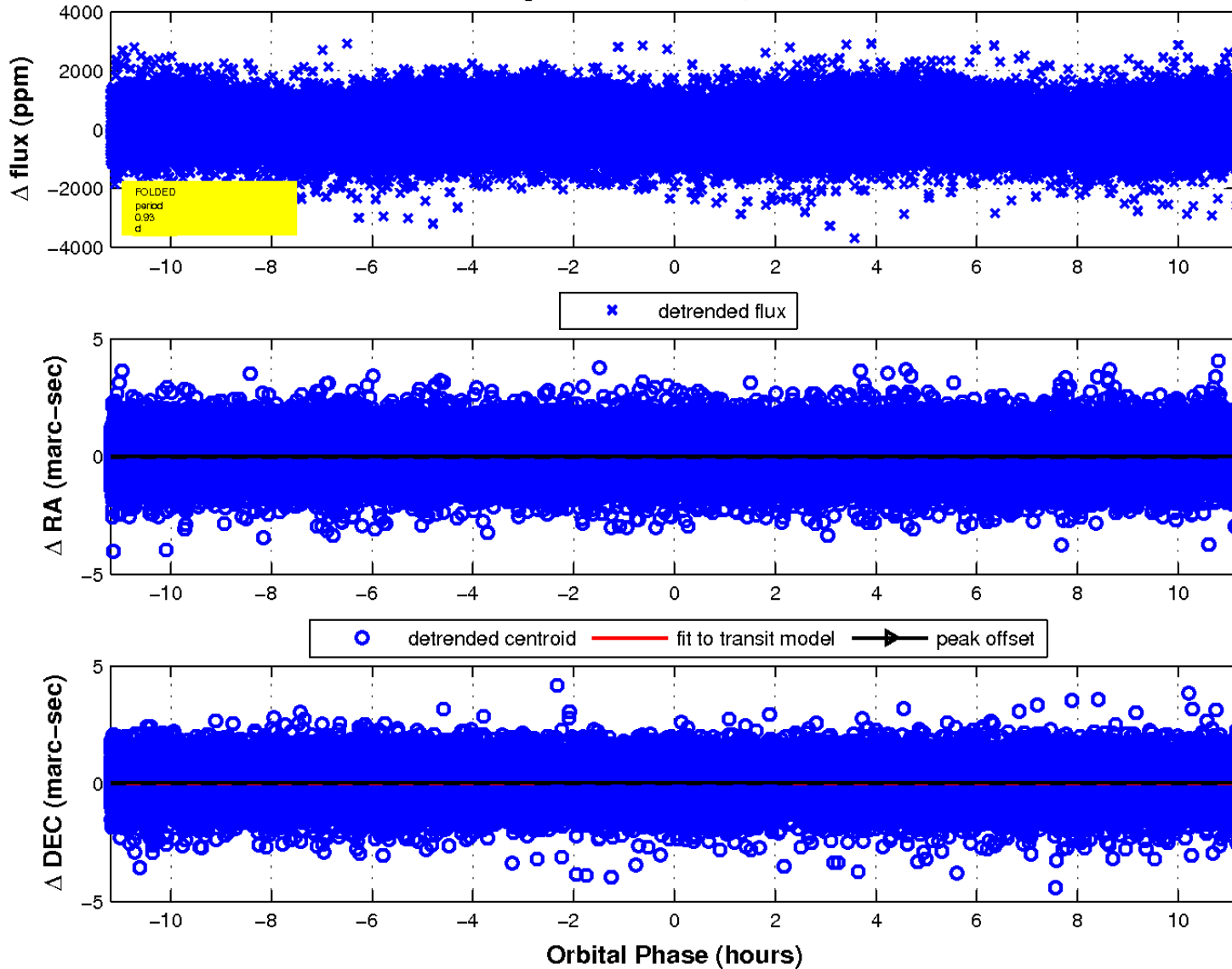
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



### fluxWeightedCentroids, Planet 2 of 2



# UKIRT Image

Declination

