

# KIC 009020212

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009020212-01	OBS	No	0.535043	132.027182	21.9	0.900	8.4	7.4	1.85	4963	0.94	11699.68

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009020212-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS—HALO_GHOST

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

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

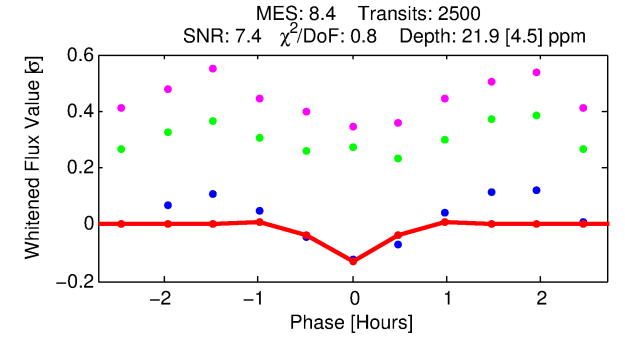
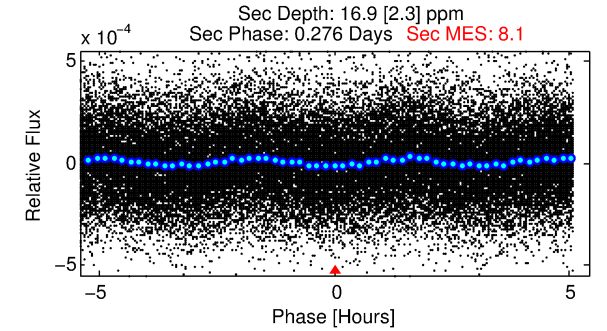
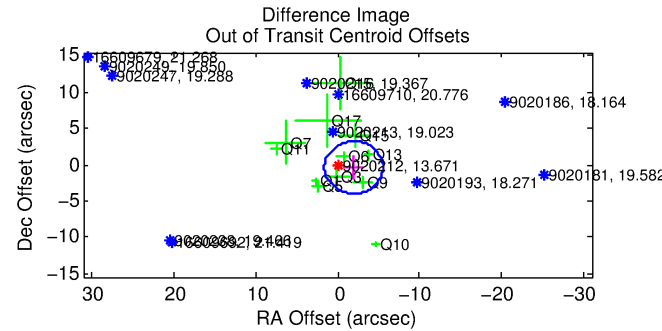
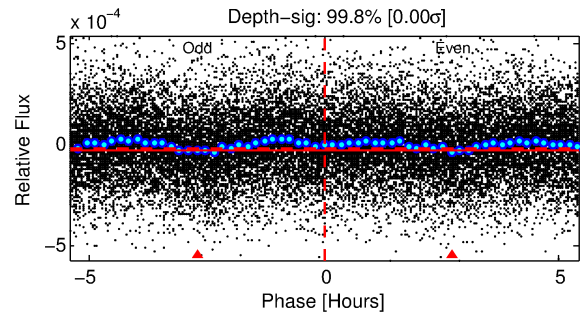
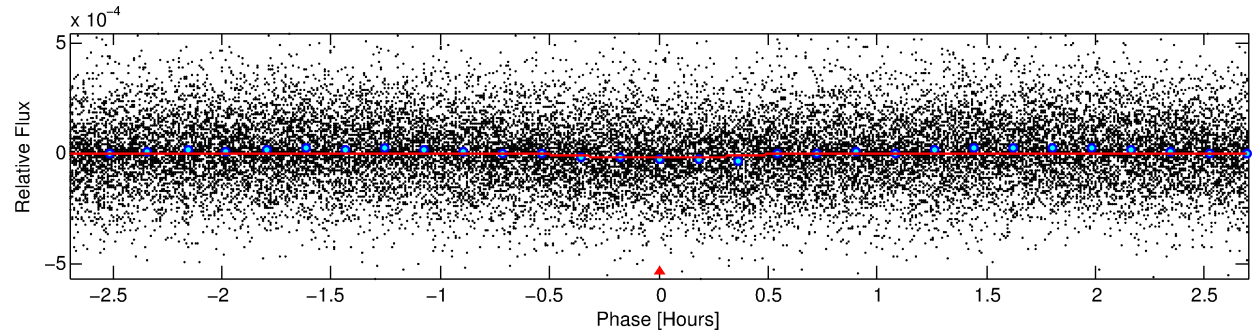
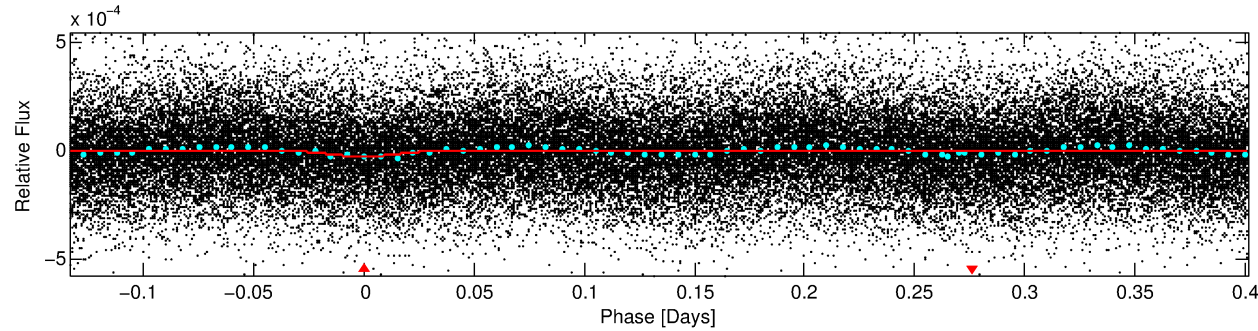
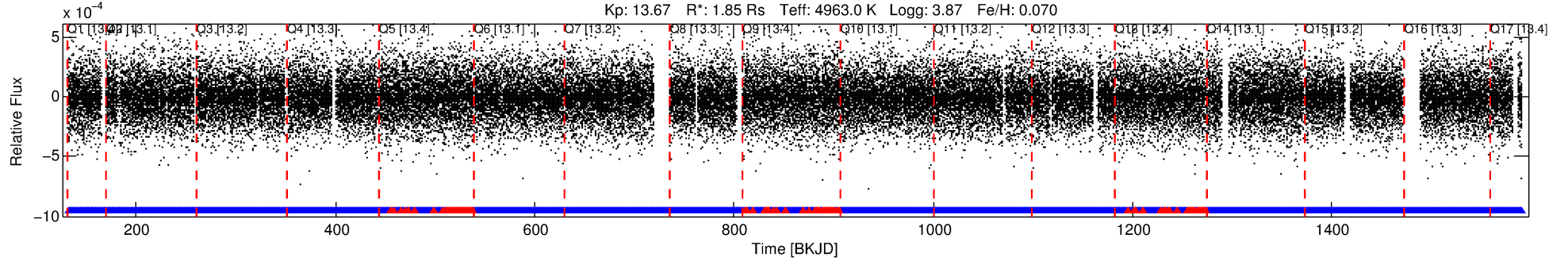
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009020212-01

No Significant Match Found

# DV One-Page Summary

KIC: 9020212 Candidate: 1 of 1 Period: 0.535 d



## DV Fit Results:

Period = 0.53504 [0.00002] d  
Epoch = 132.0272 [0.0021] BKJD  
Rp/R\* = 0.0046 [0.0021]  
a/R\* = 3.38 [4.89]  
b = 0.70 [1.18]  
Seff = 11699.68 [13923.74]  
Teff = 2652 [789] K  
Rp = 0.94 [0.70] Re  
a = 0.0126 [0.0086] AU  
Ag = 1.68 [2.53] [0.27σ]  
Teffp = 4666 [1097] K [1.49σ]

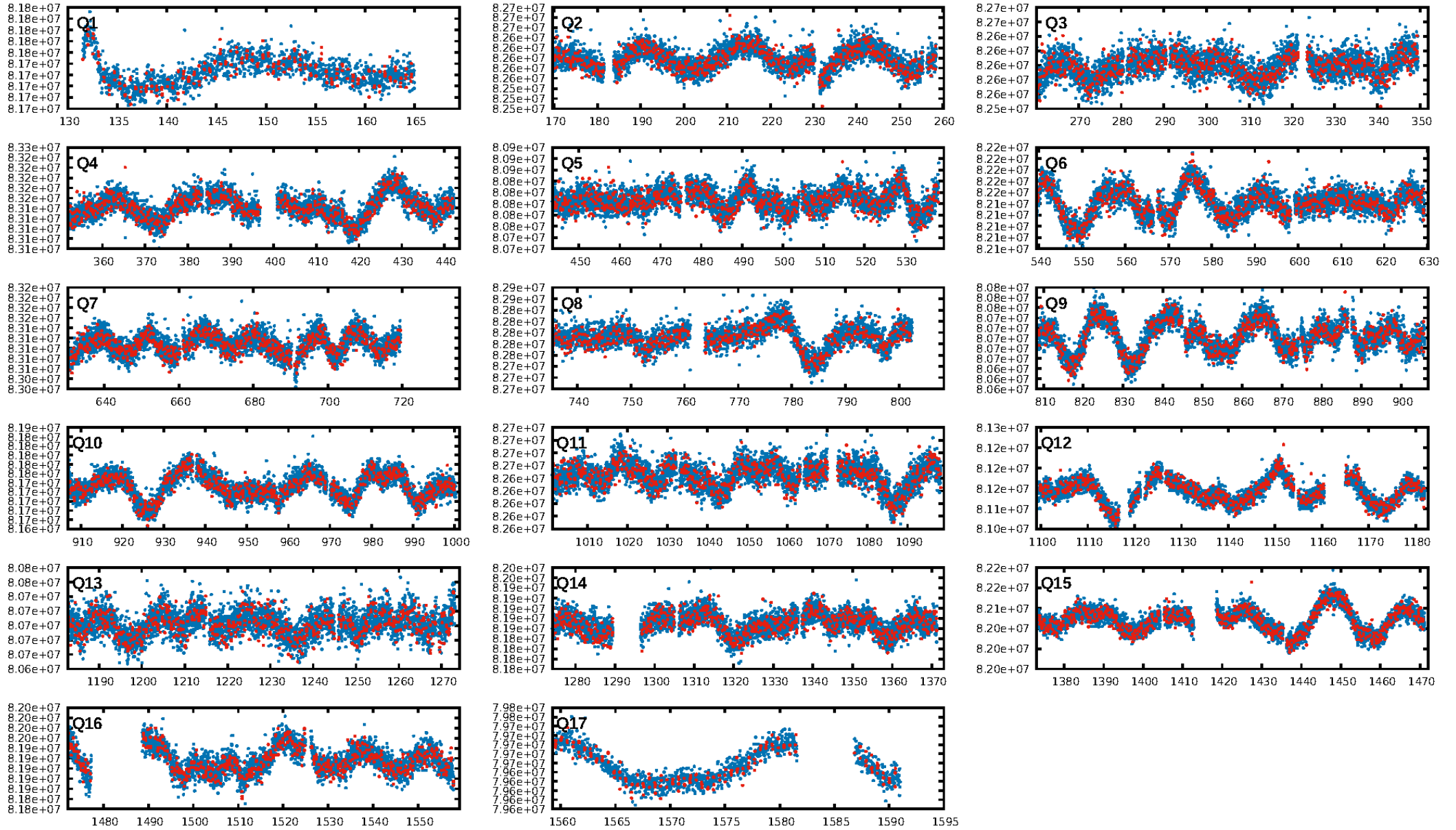
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.37e-17  
RollingBand-fgt: 0.94 [2255/2387]  
GhostDiagnostic-chr: -0.2172  
Centroid-sig: 1.0%  
Centroid-so: 2.626 arcsec [1.46σ]  
OotOffset-rm: 1.981 arcsec [1.66σ]  
OotOffset-st: 2/4/1/5 [12]  
KicOffset-rm: 1.486 arcsec [1.22σ]  
KicOffset-st: 2/4/1/5 [12]  
DiffImageQuality-fgm: 0.17 [2/12]  
DiffImageOverlap-fno: 1.00 [17/17]

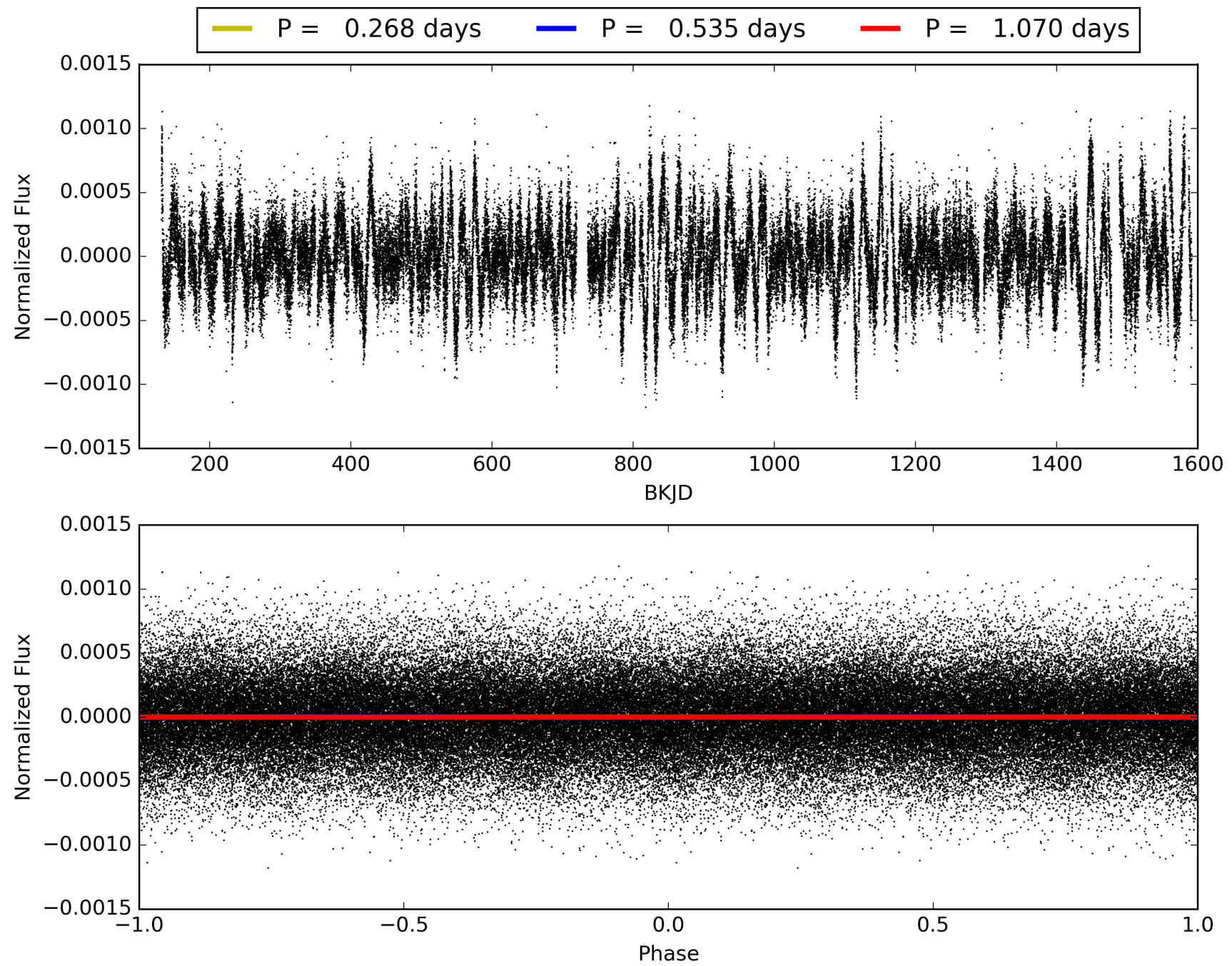
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:47:34 Z

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

# TCE 009020212-01, PDC Light Curves



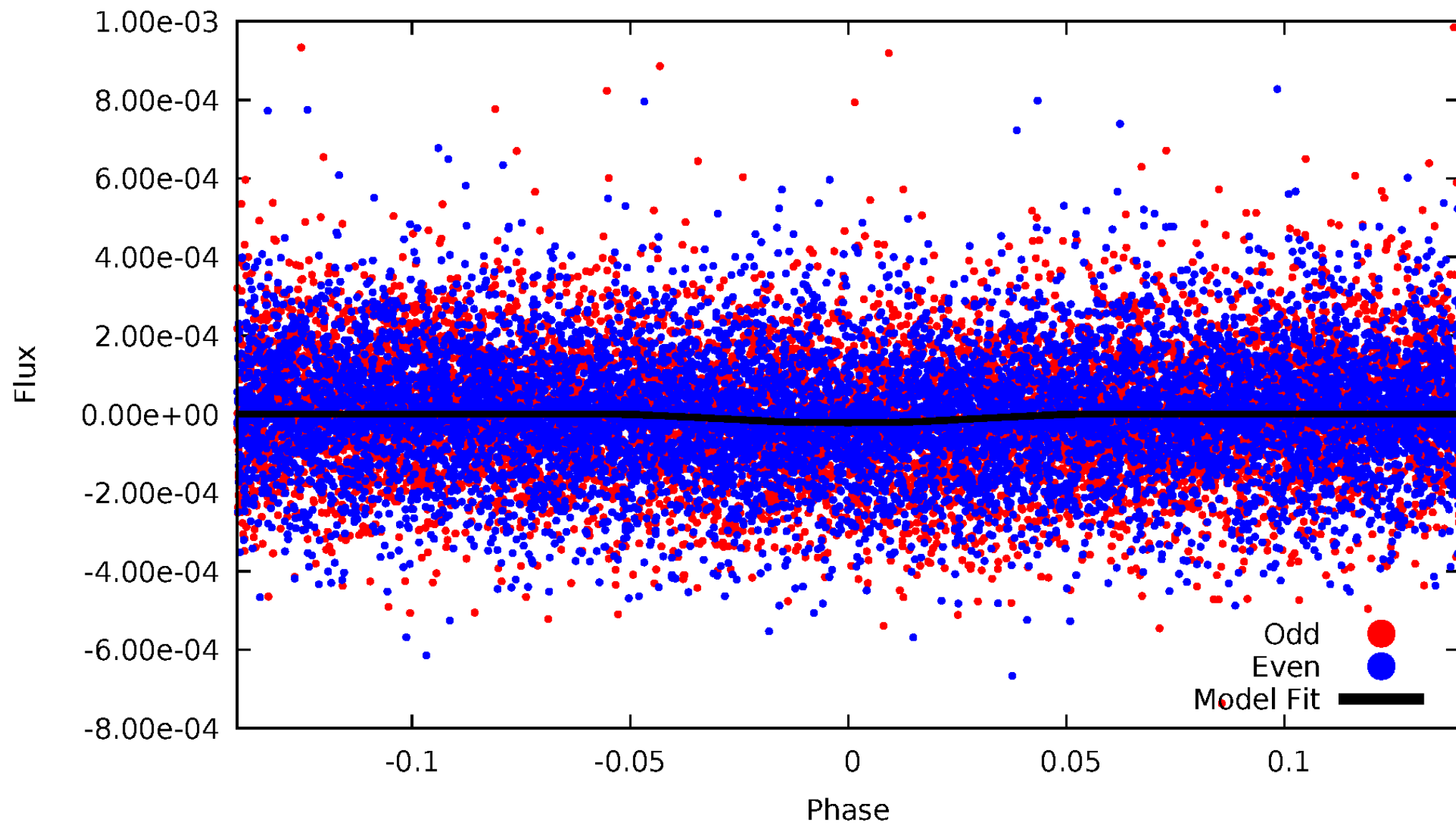
TCE 009020212-01





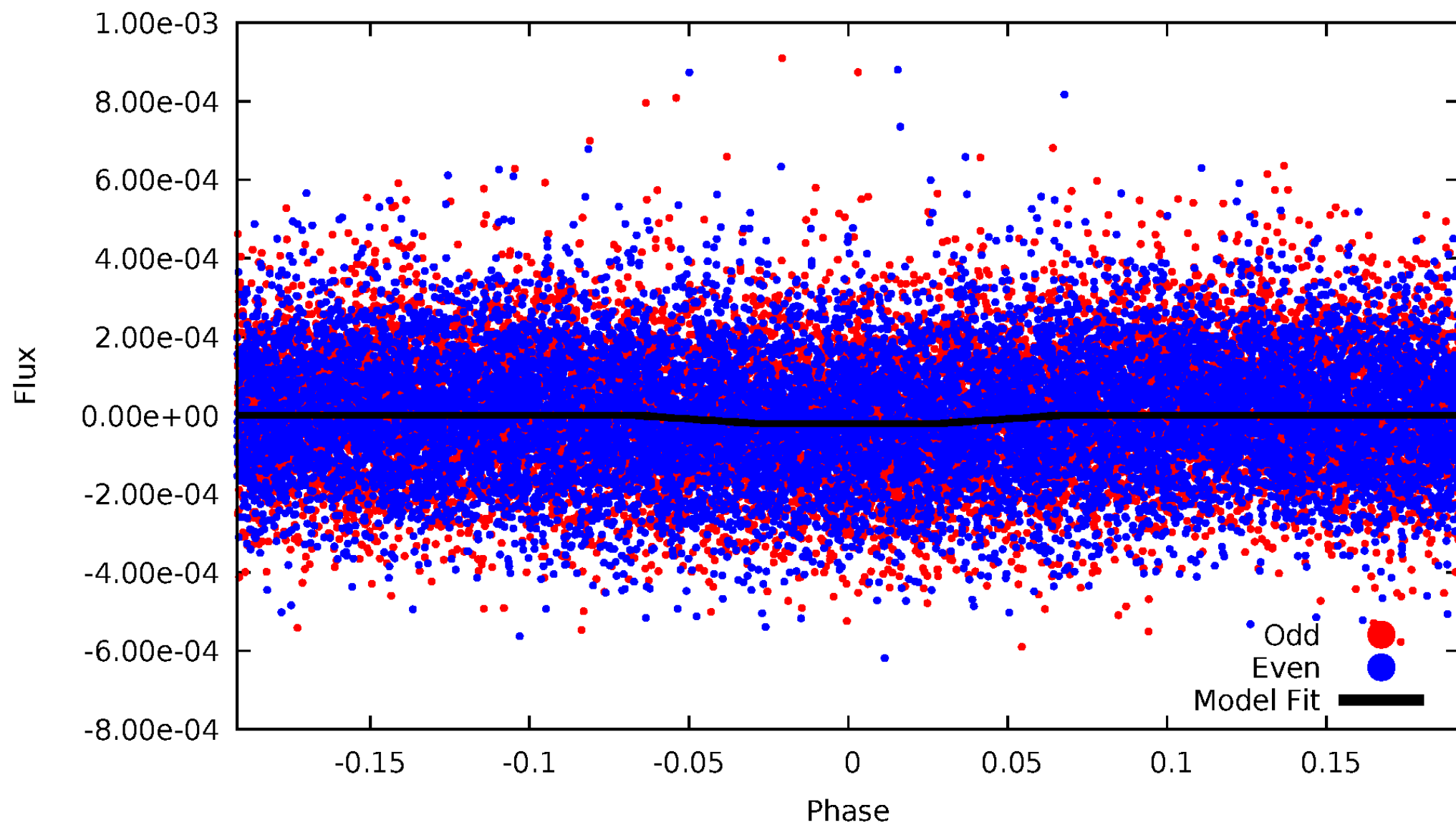
# DV Odd/Even

TCE 009020212-01



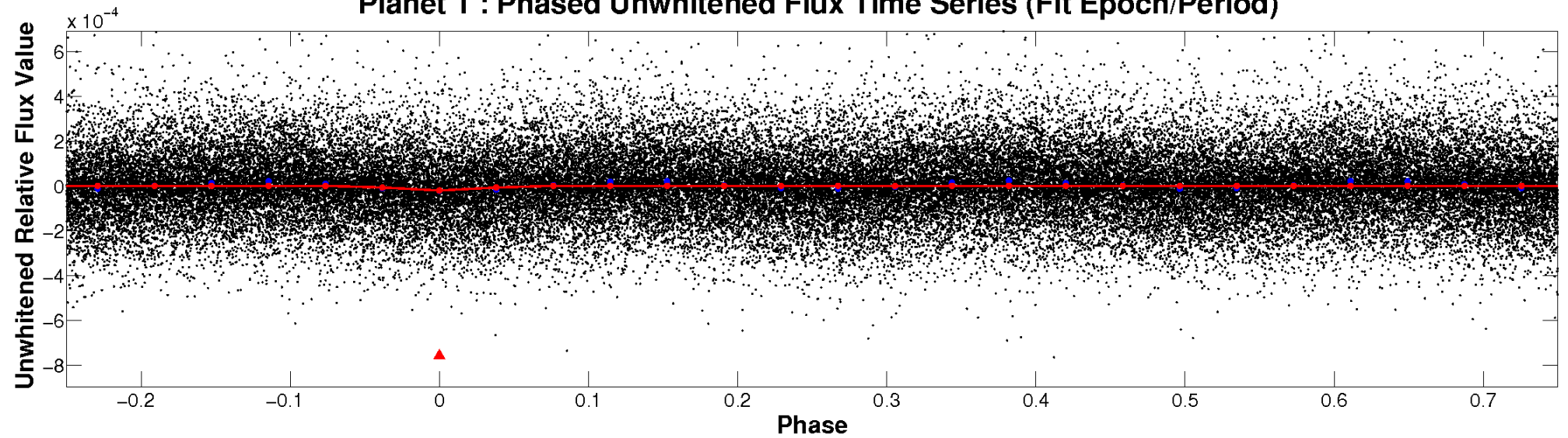
# ALT Odd/Even

TCE 009020212-01

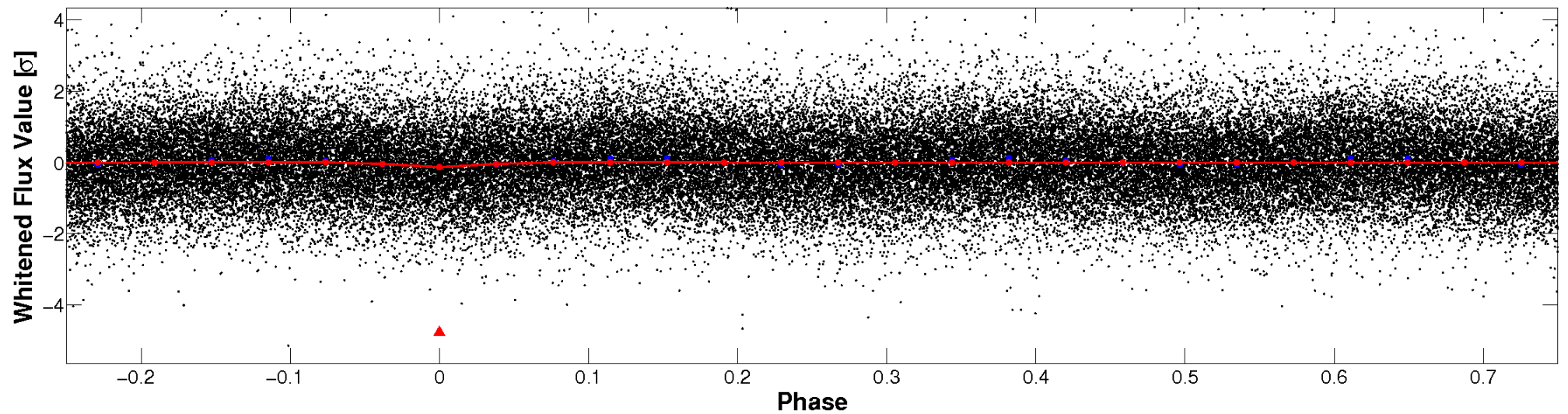


# Non-Whitened Vs. Whitened Light Curve

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

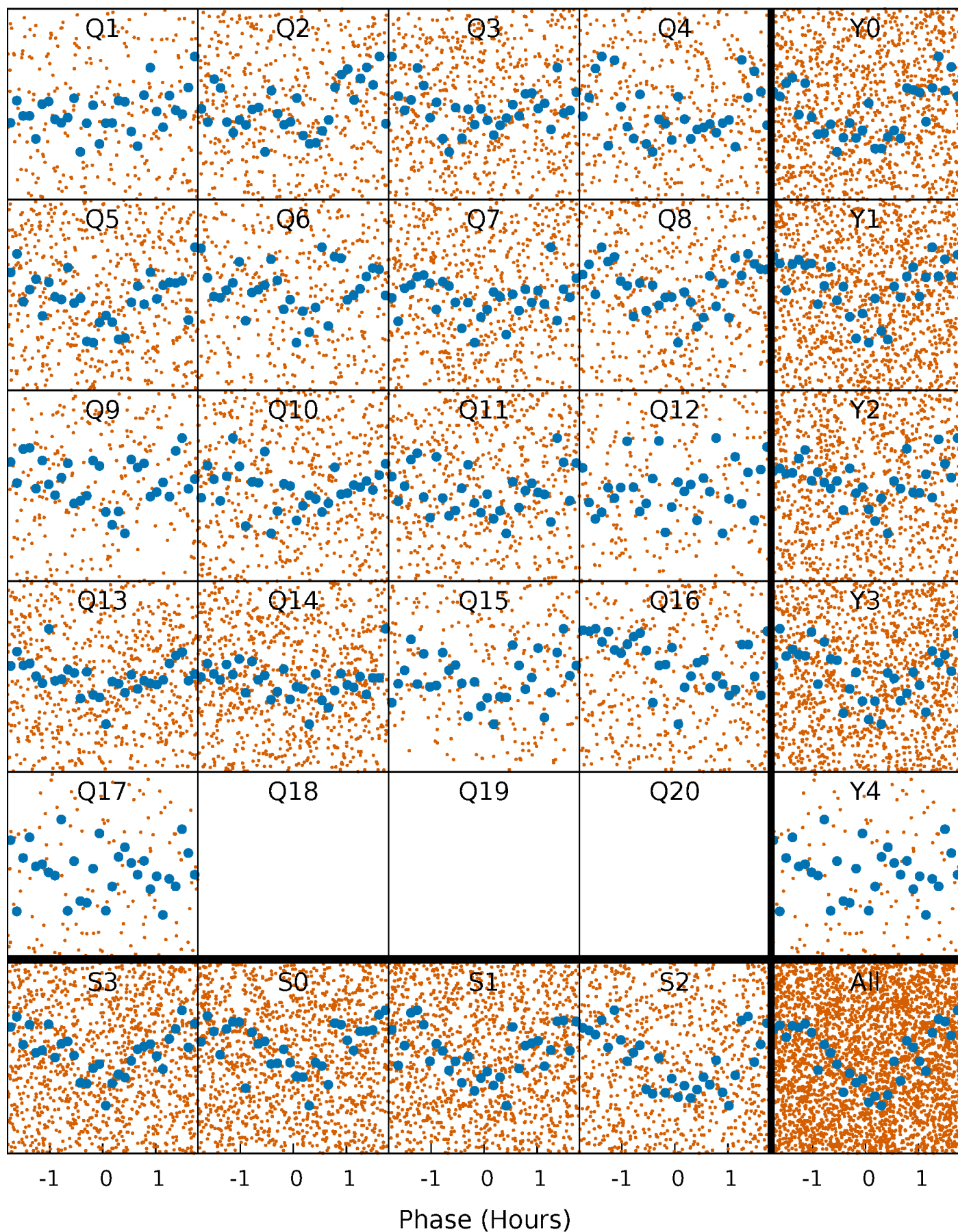


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

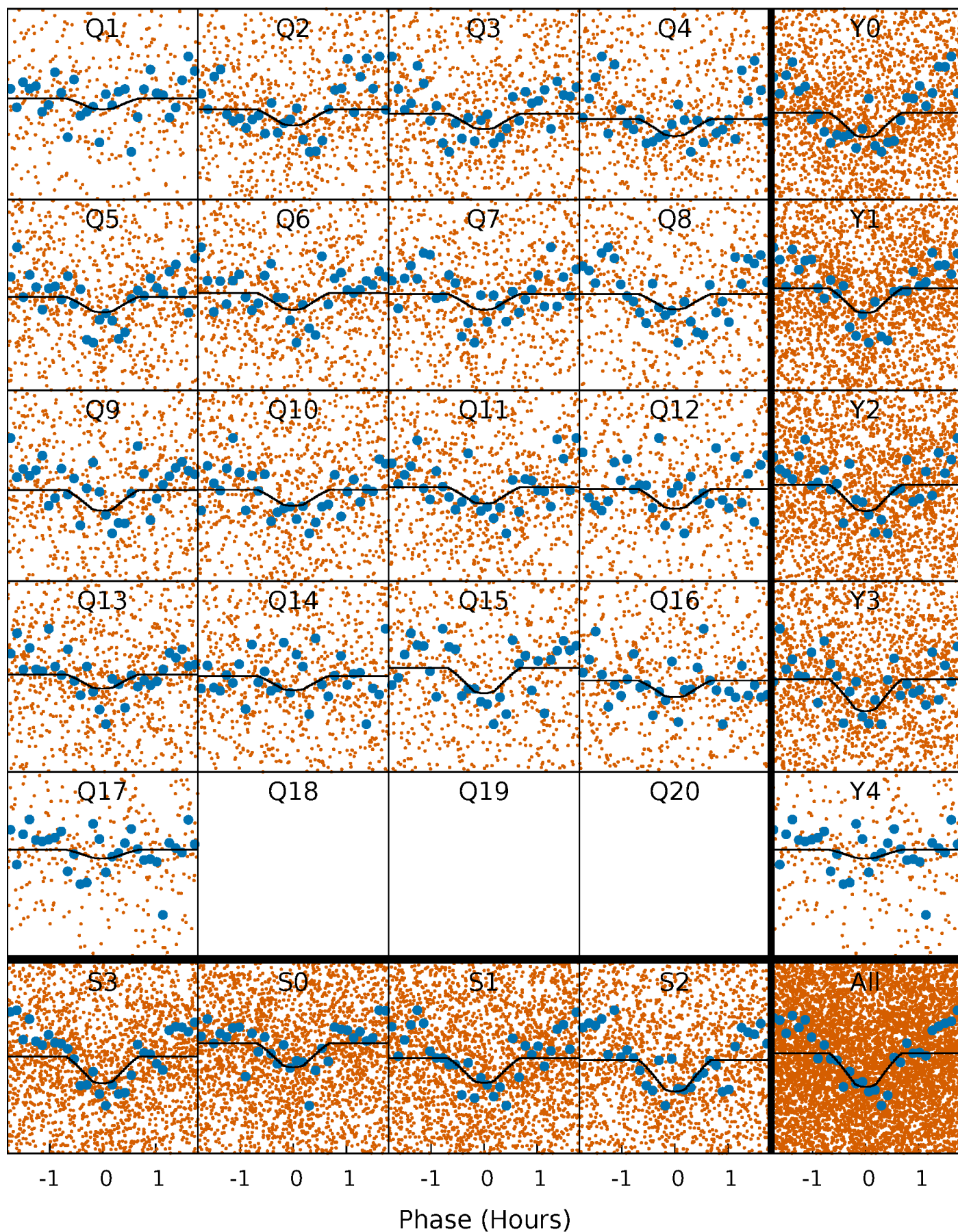
TCE 009020212-01 P= 0.535043 Days  $T_0=132.027182$  (BKJD)





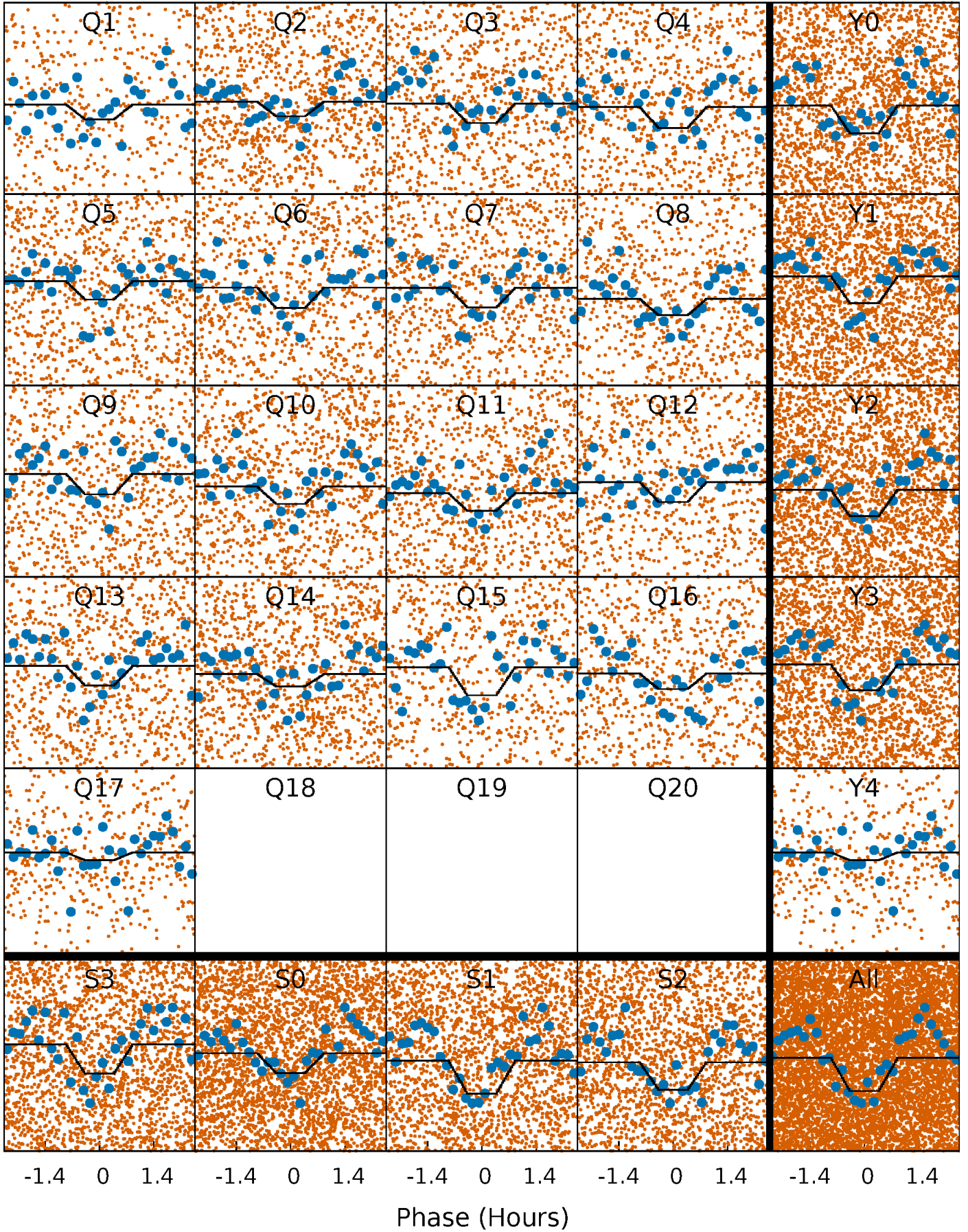
# DV Quarter-Phased Transit Curves

TCE 009020212-01 P= 0.535043 Days  $T_0=132.027182$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009020212-01 P= 0.535049 Days  $T_0=132.027959$  (BKJD)

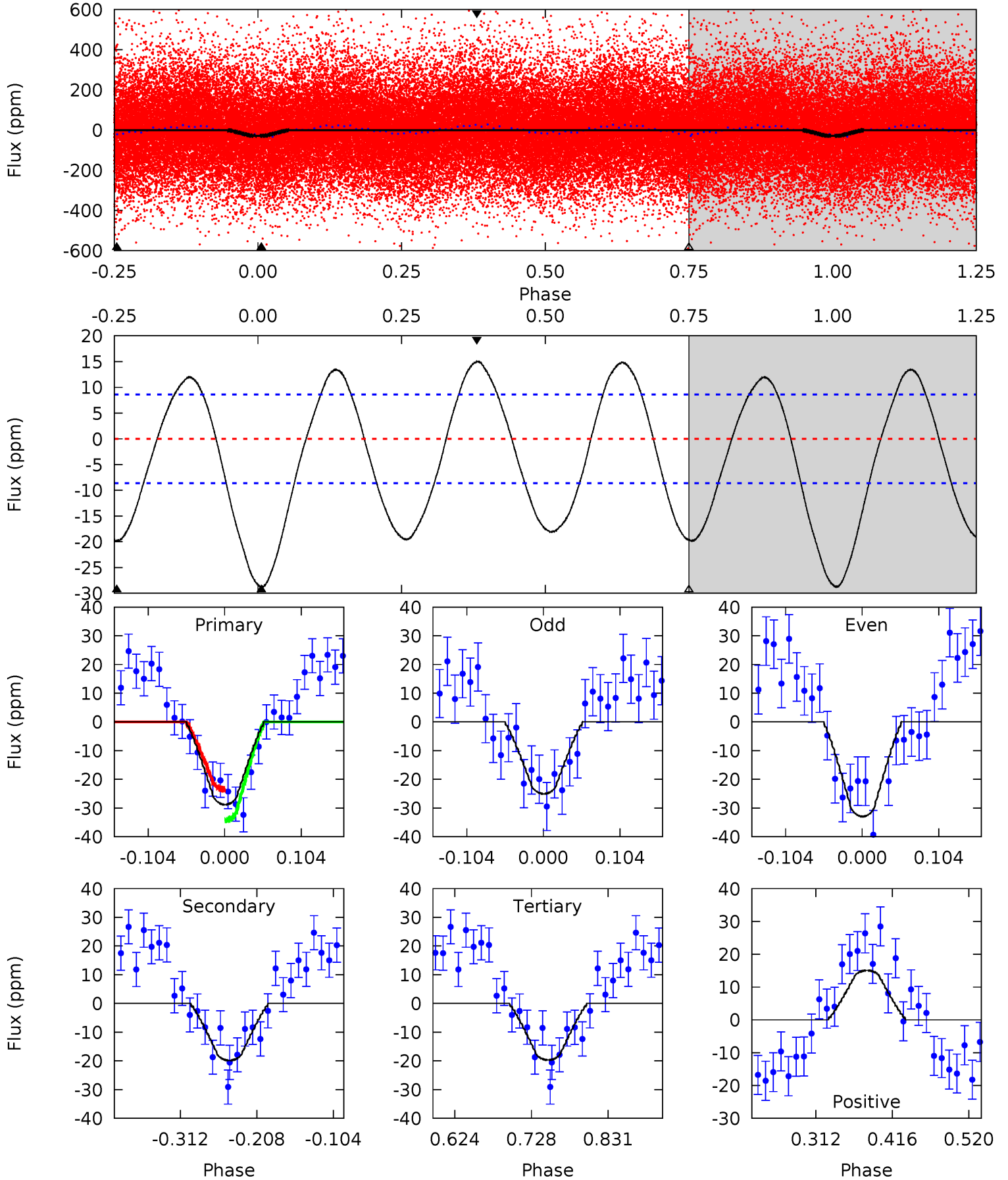




# DV Model-Shift Uniqueness Test

009020212-01, P = 0.535043 Days, E = 131.492139 Days

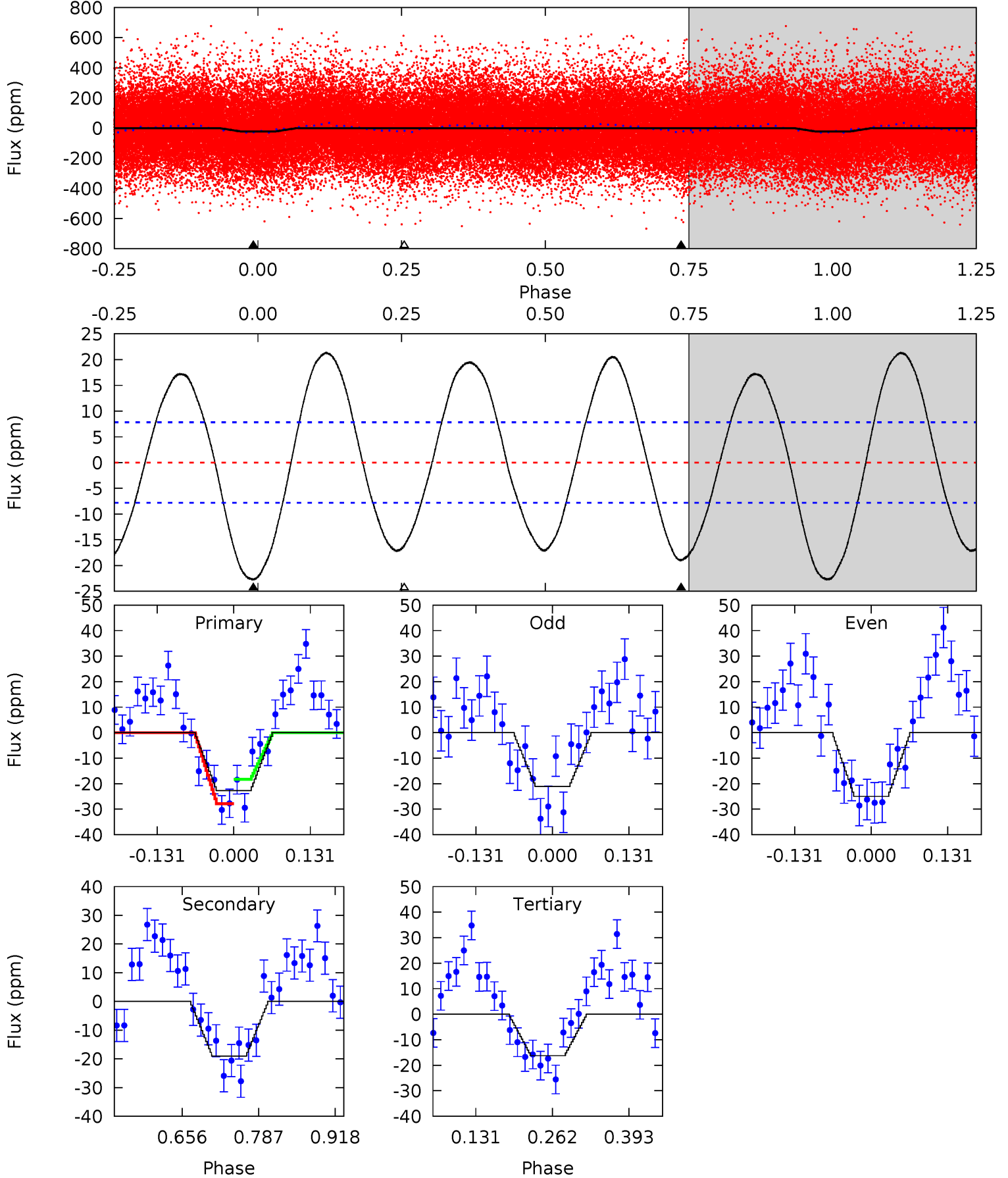
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	10.5	10.4	7.97	4.56	1.63	6.31	4.83	7.29	0.08	2.53	2.11	0.93	0.34	2.85



# Alt Model-Shift Uniqueness Test

009020212-01, P = 0.535049 Days, E = 131.492910 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
13.1	11.0	9.37	0	4.51	1.51	7.43	3.74	13.1	1.59	11.0	1.13	0.92	0.48	2.73





### Stellar Parameters For KIC 009020212

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4963^{+134}_{-134}$	$3.873^{+0.728}_{-0.312}$	$0.070^{+0.250}_{-0.300}$	$1.846^{+1.093}_{-1.093}$	$0.927^{+0.220}_{-0.160}$	$0.207^{+2.810}_{-0.144}$
	+3%/-3%	+19%/-8%	+357%/-429%	+59%/-59%	+24%/-17%	+1354%/-69%
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 009020212-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-20 \pm 2$	$0.90^{+0.57}_{-0.47}$	$3657^{+545}_{-685}$	$4644^{+1690}_{-765}$	$2.125^{+7.599}_{-1.297}$
Alt.	$-19 \pm 2$	$0.87^{+0.60}_{-0.46}$	$3682^{+527}_{-621}$	$4720^{+1738}_{-910}$	$2.238^{+7.675}_{-1.482}$

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

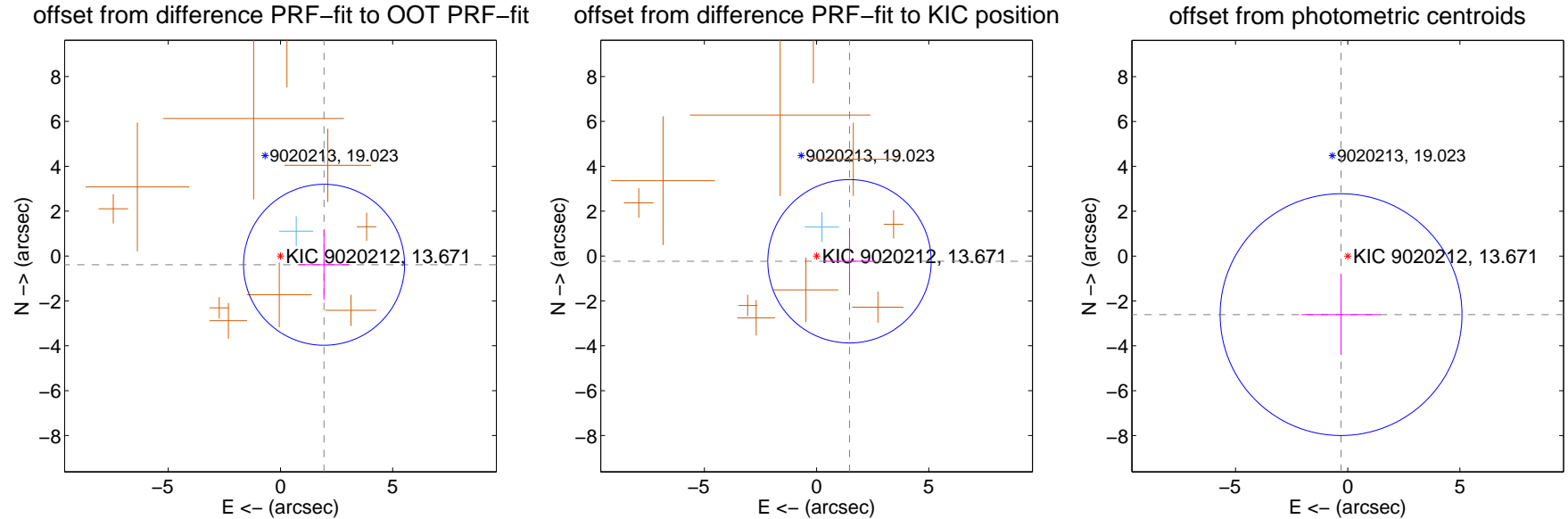
## DV Centroid Data

Supplemental centroid analysis for 009020212-01. Kepler magnitude: 13.67. Transit SNR 7.38

There are 2 quarters with good PRF difference image offsets

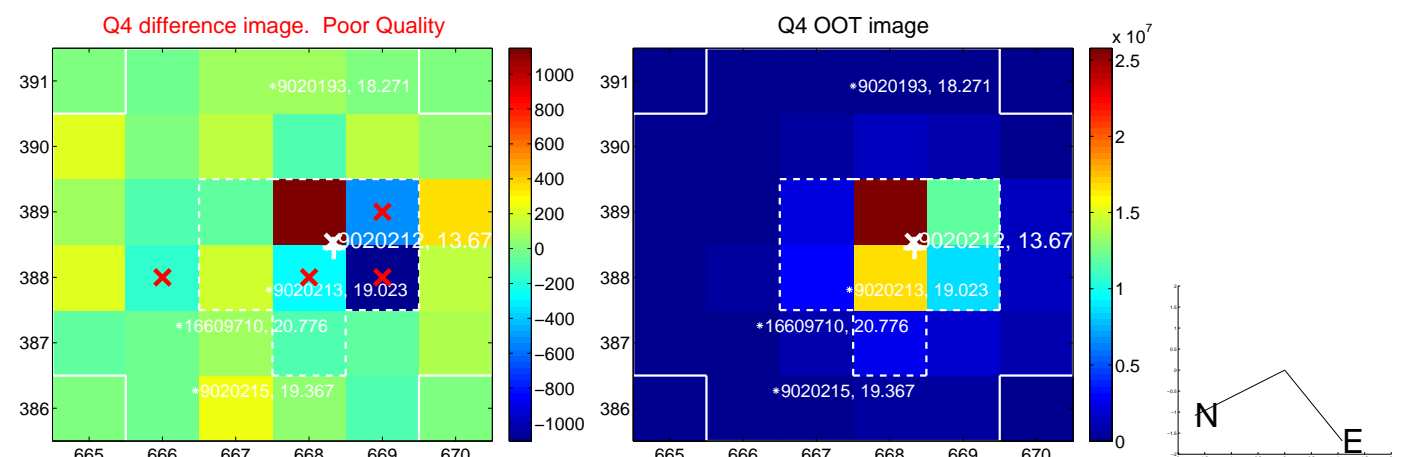
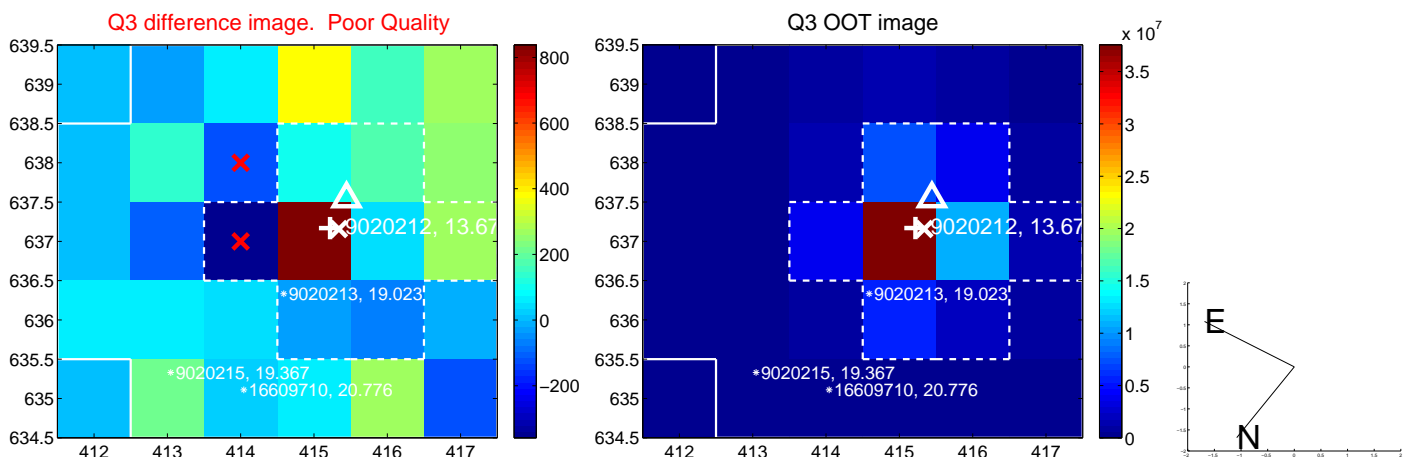
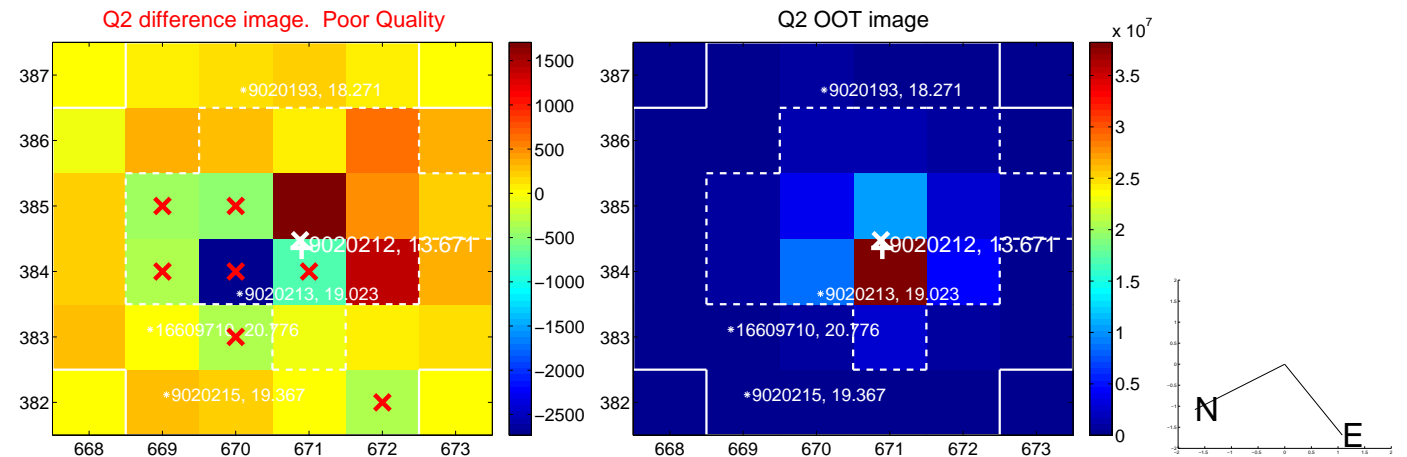
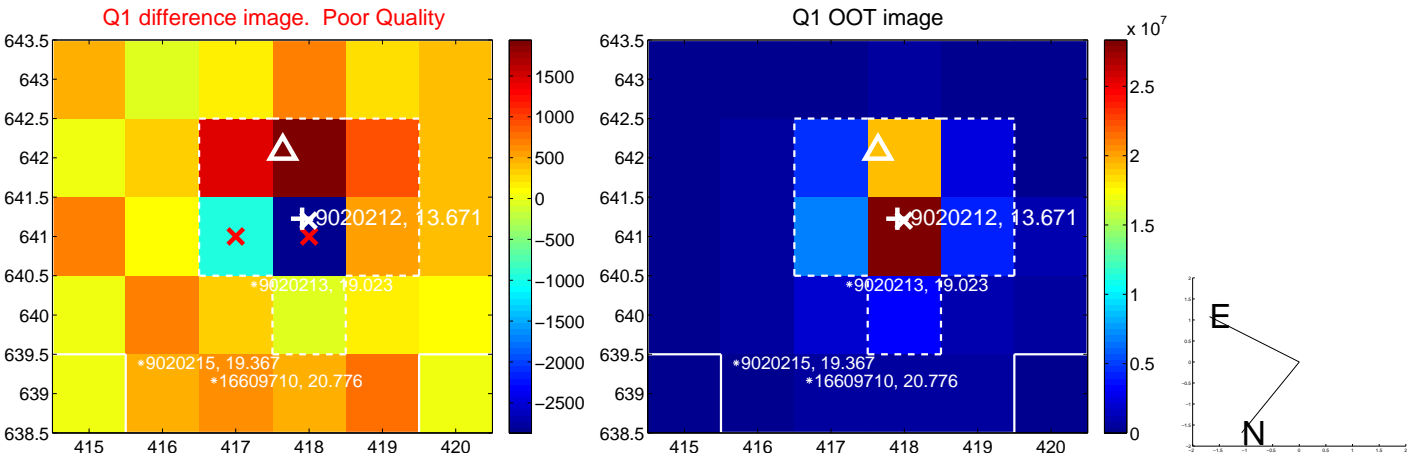
The direct PRF centroid is offset from the target star catalog position by about 0.45 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.981 \pm 1.196$	1.66	$-1.943 \pm 1.121$	$-0.390 \pm 1.562$
PRF-fit source offset from KIC position	$1.486 \pm 1.213$	1.22	$-1.467 \pm 1.162$	$-0.235 \pm 1.470$
photometric centroid source offset	$2.63 \pm 1.80$	1.46	$0.30 \pm 1.76$	$-2.61 \pm 1.80$

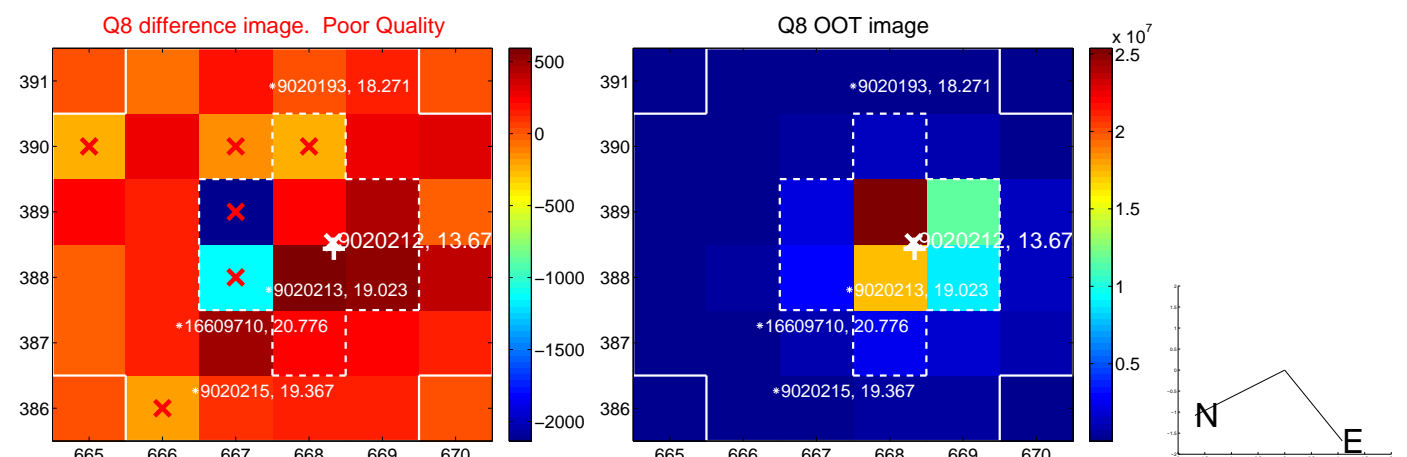
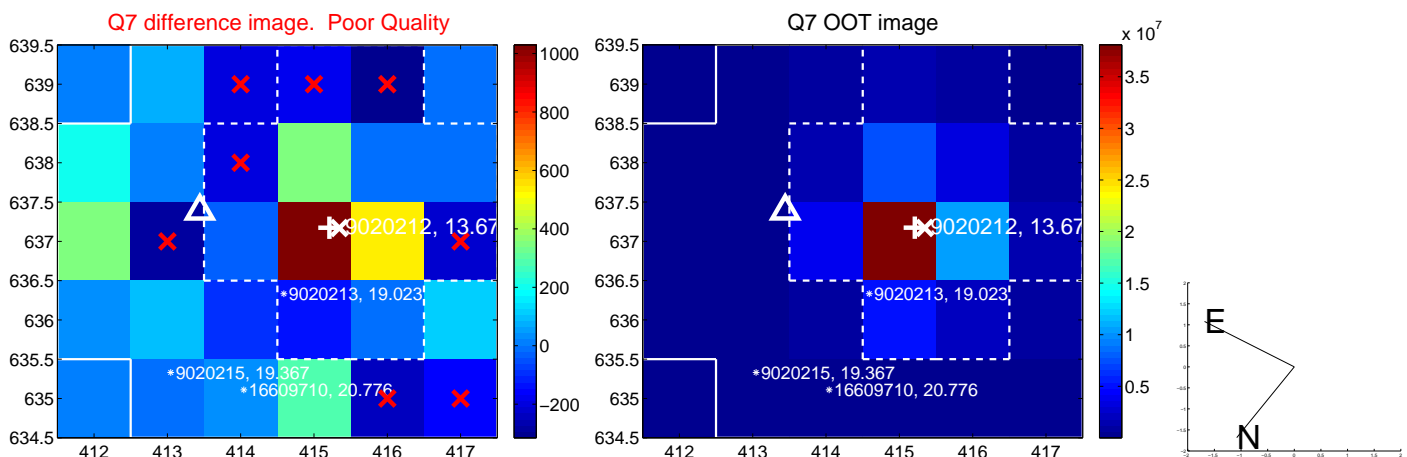
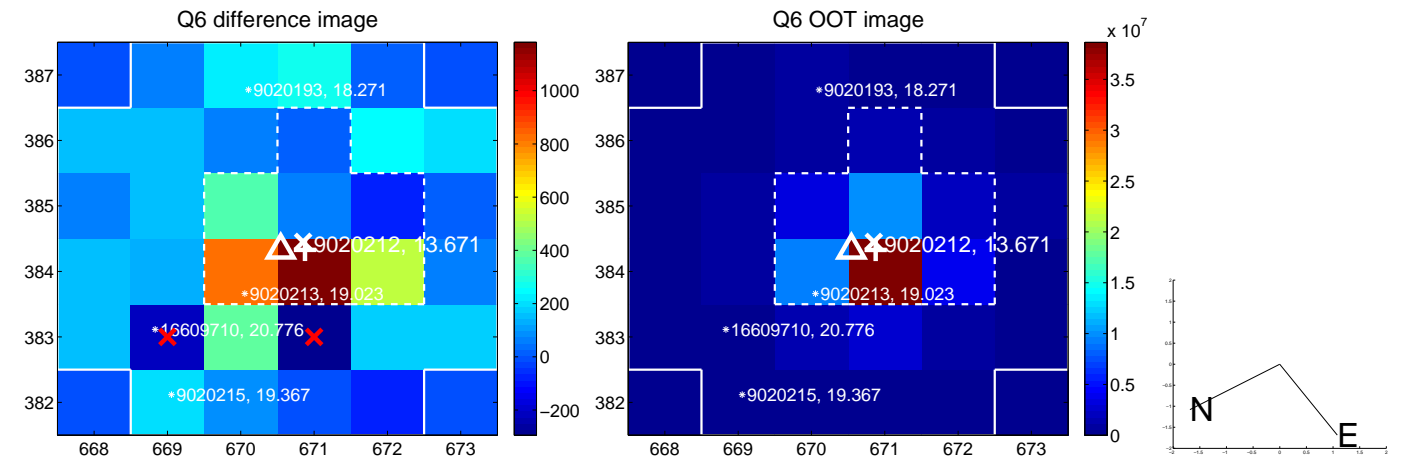
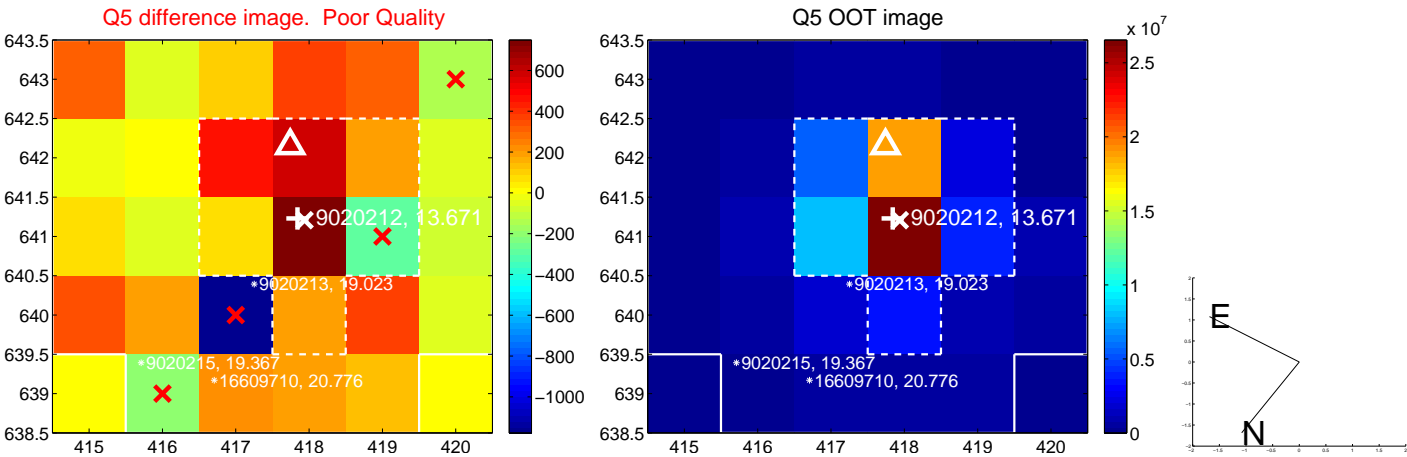


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

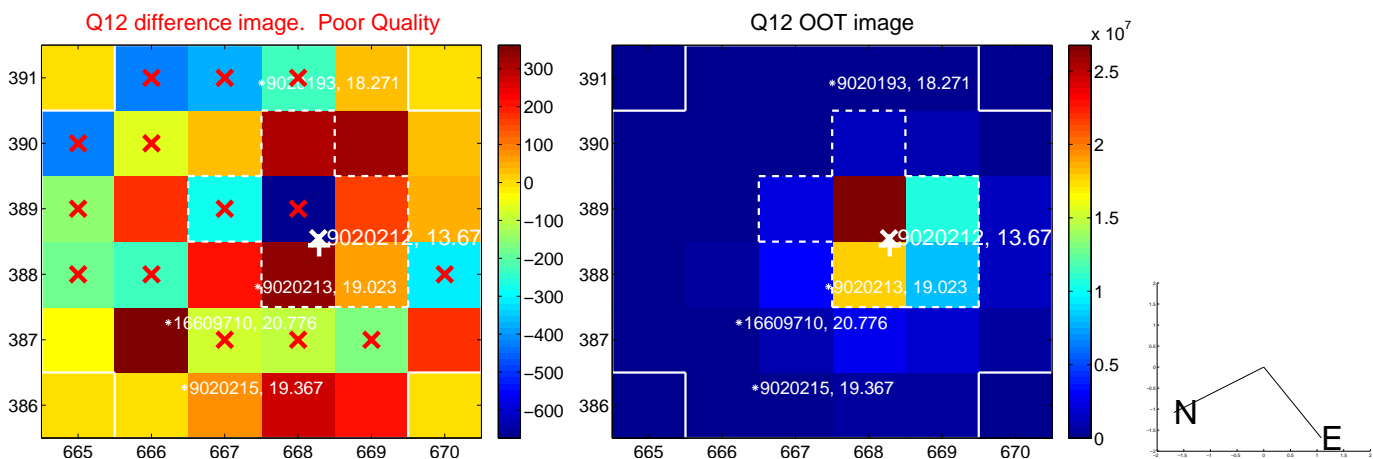
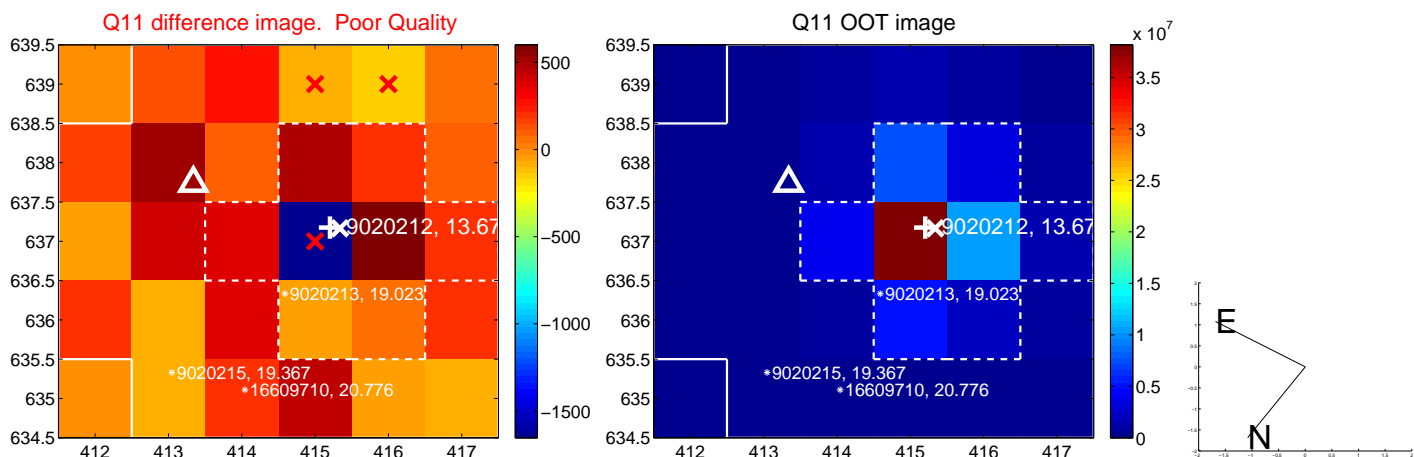
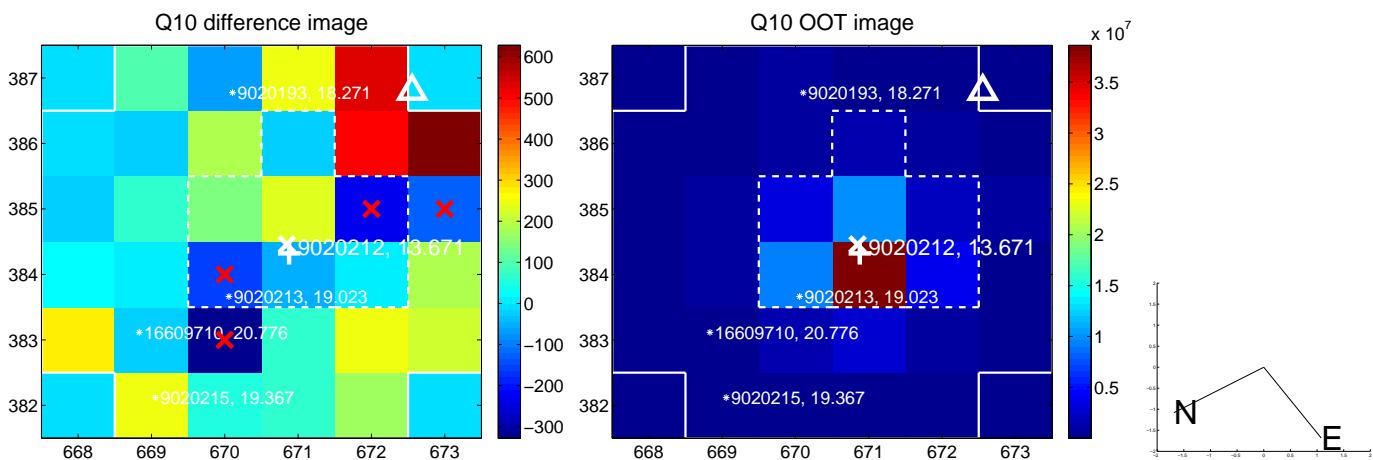
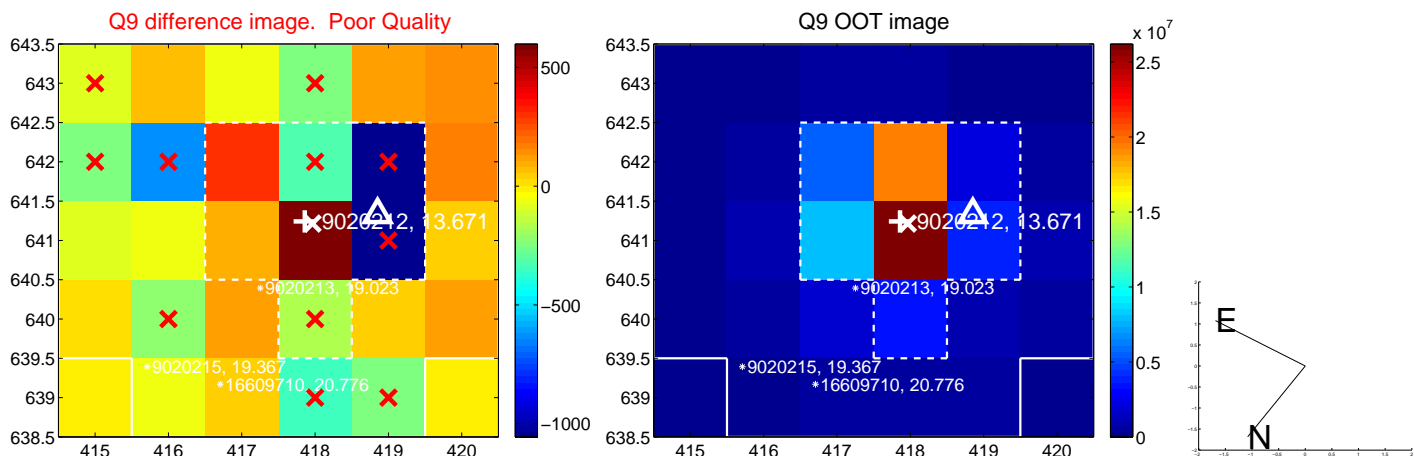


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

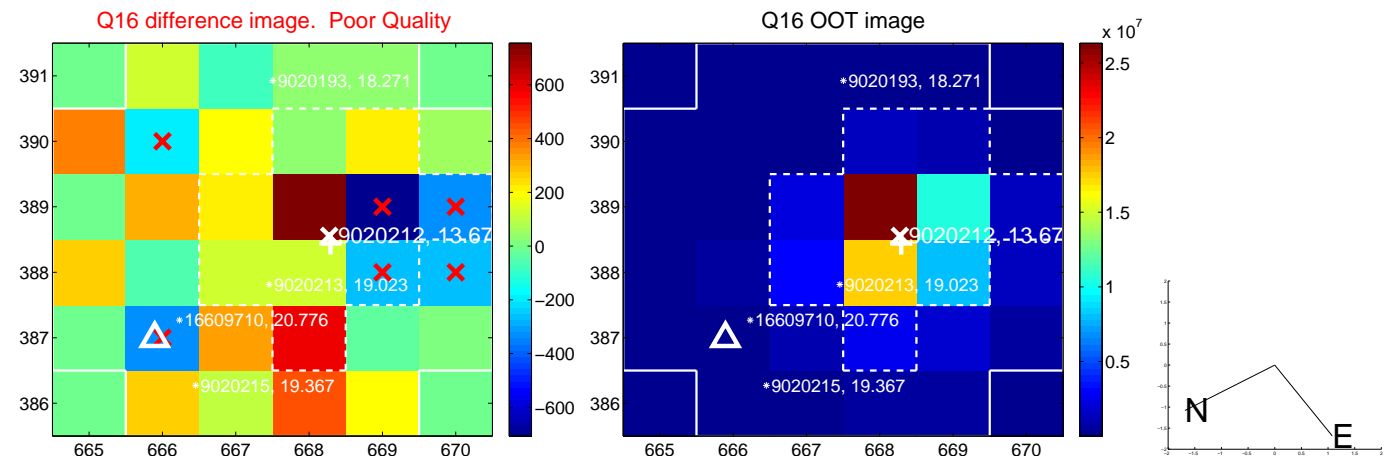
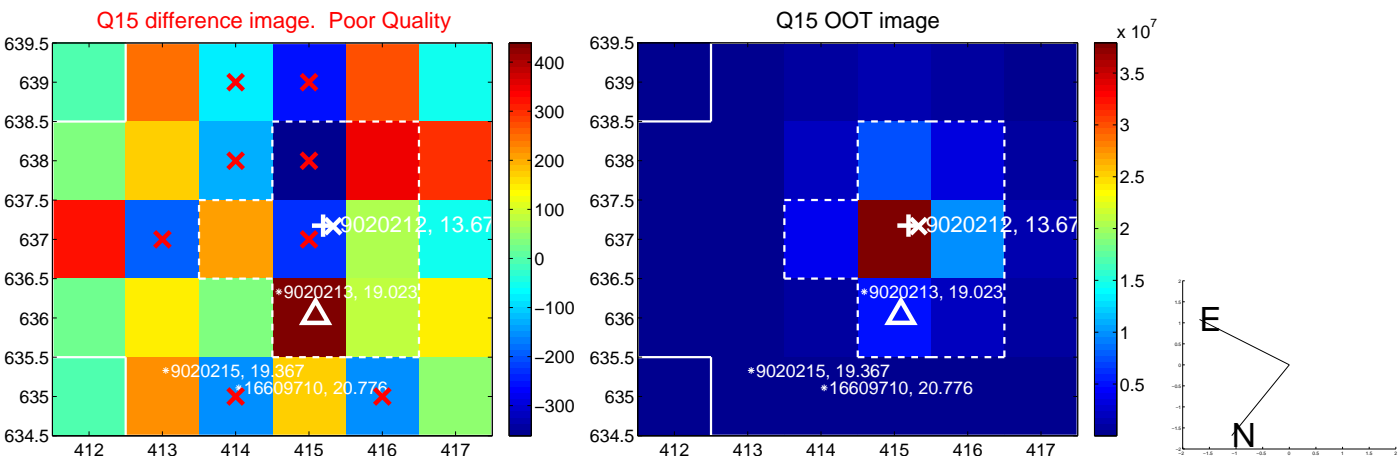
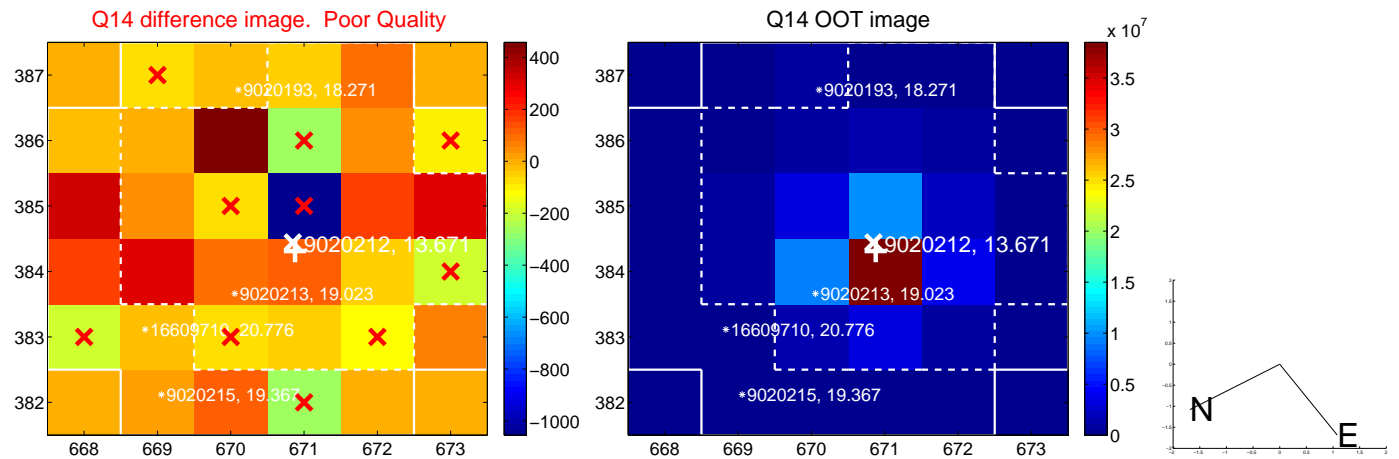
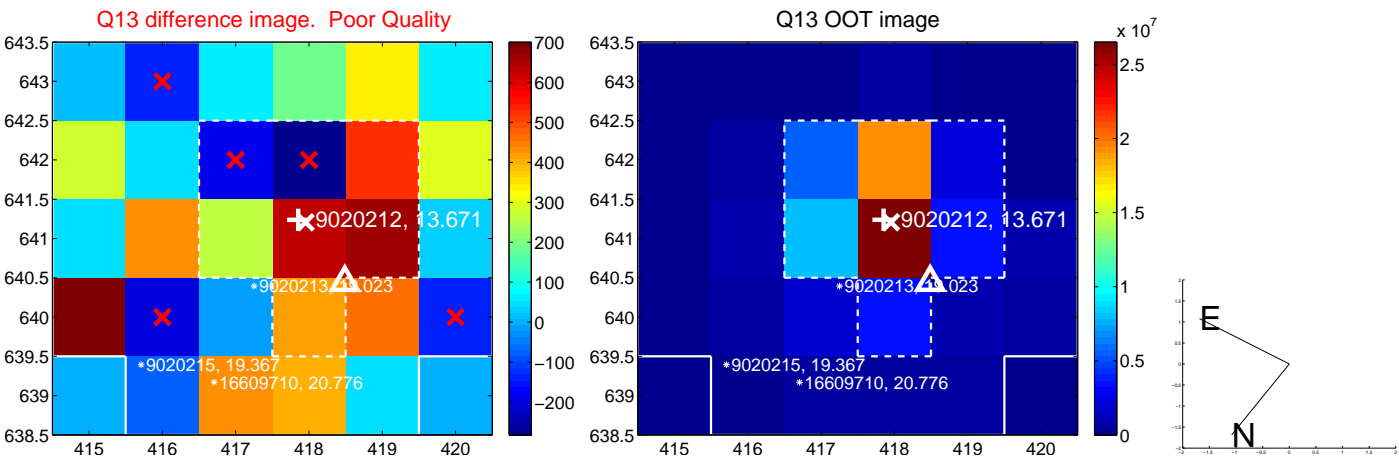




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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





UKIRT Image

Declination

