

# KIC 011403440

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011403440-01	OBS	No	0.933759	132.333325	5.3	3.642	11.0	0.8	0.92	5855	0.21	2564.10
011403440-02	OBS	No	0.934660	131.881290	62.1	11.216	15.2	9.2	0.92	5855	0.80	2560.80

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011403440-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
011403440-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

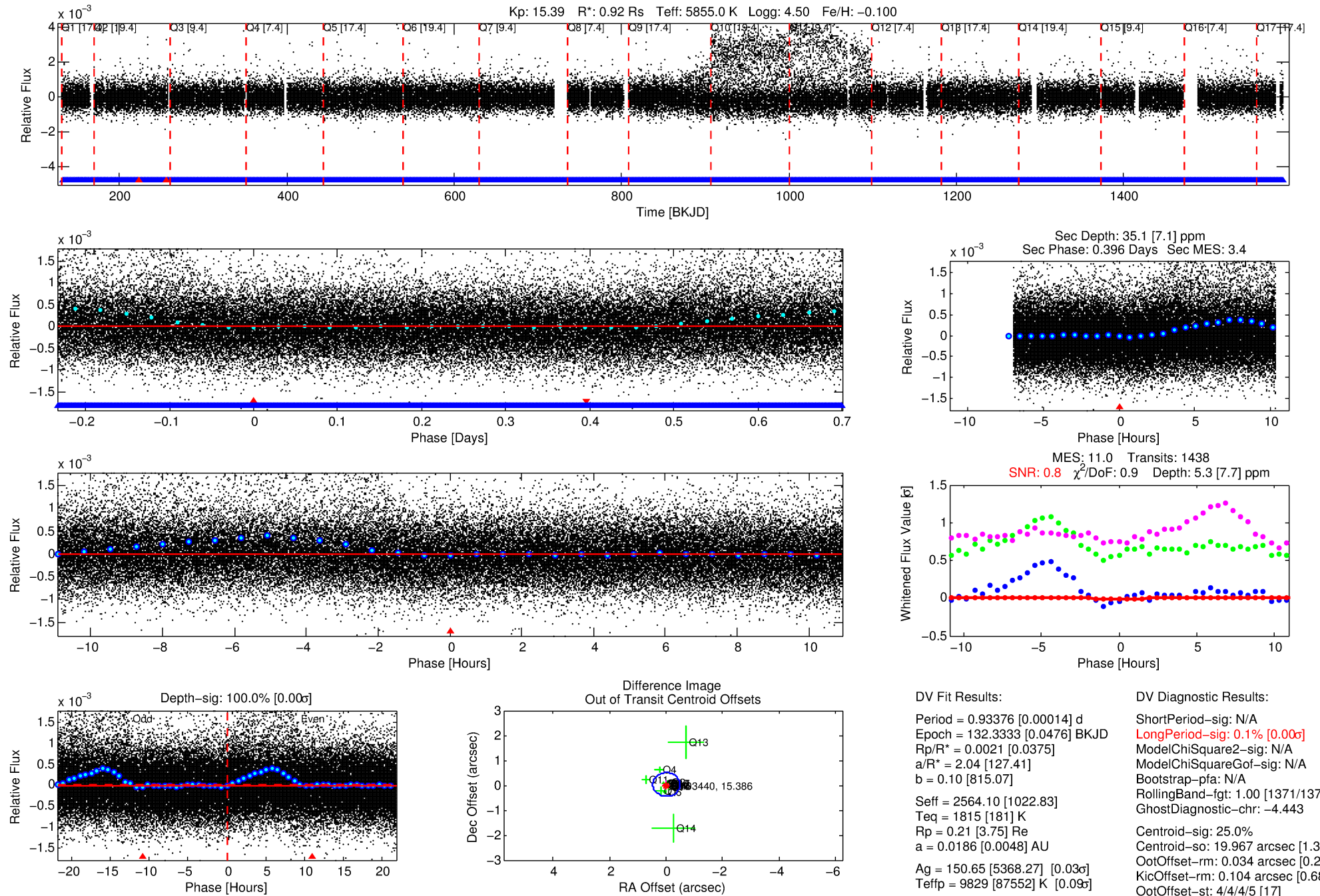
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011403440-01

No Significant Match Found

# DV One-Page Summary

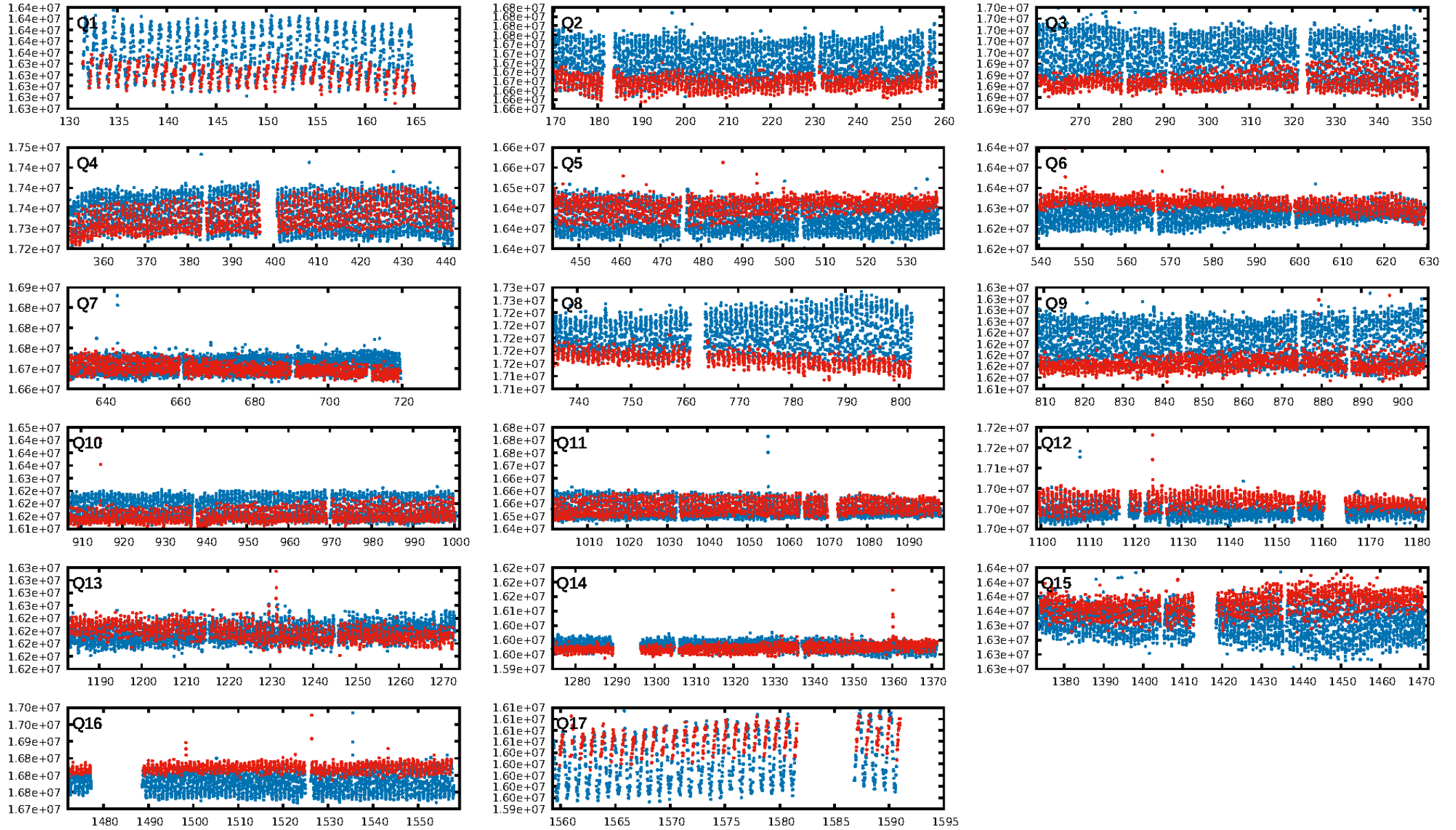
KIC: 11403440 Candidate: 1 of 2 Period: 0.934 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:04:28 Z

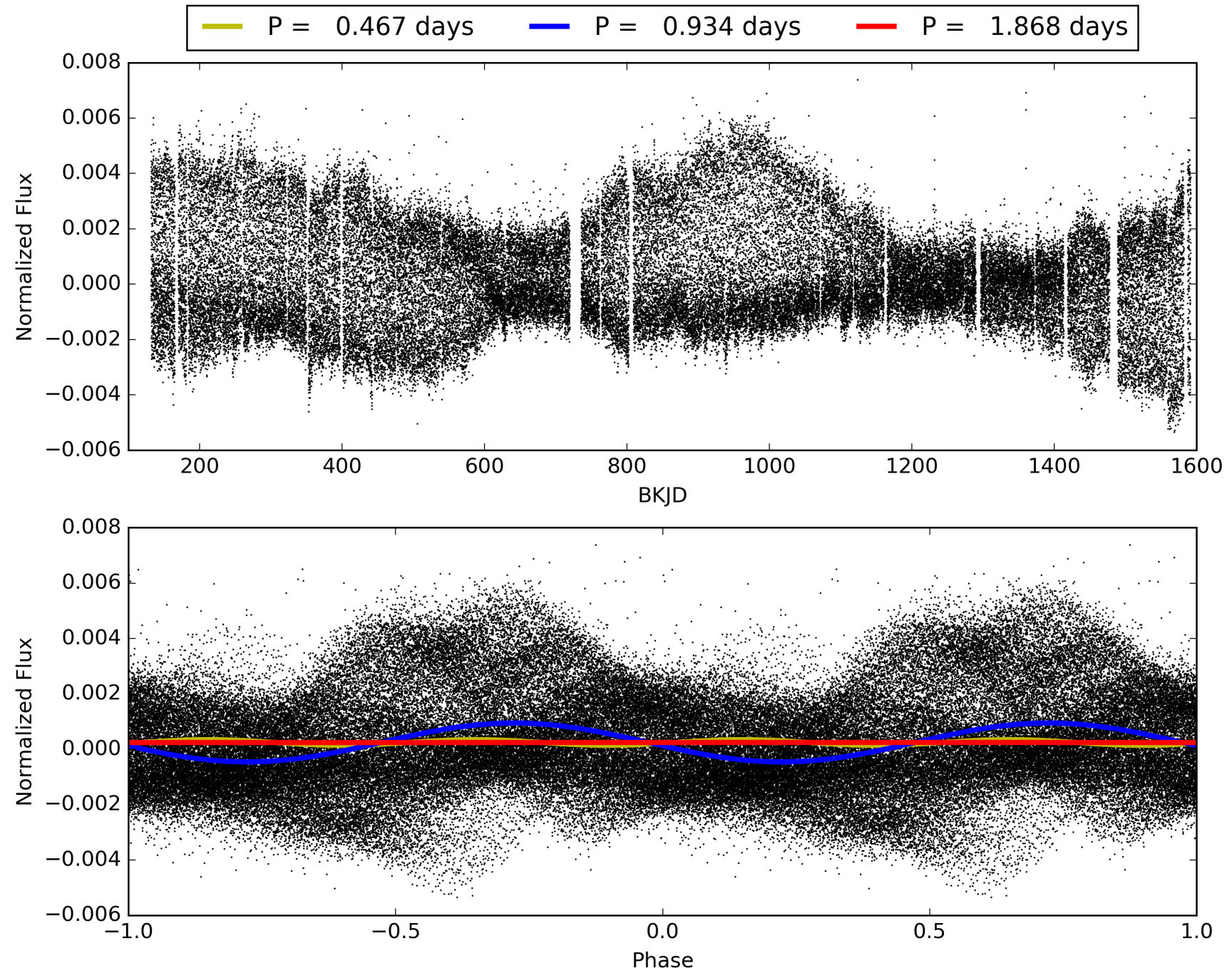
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011403440-01, PDC Light Curves



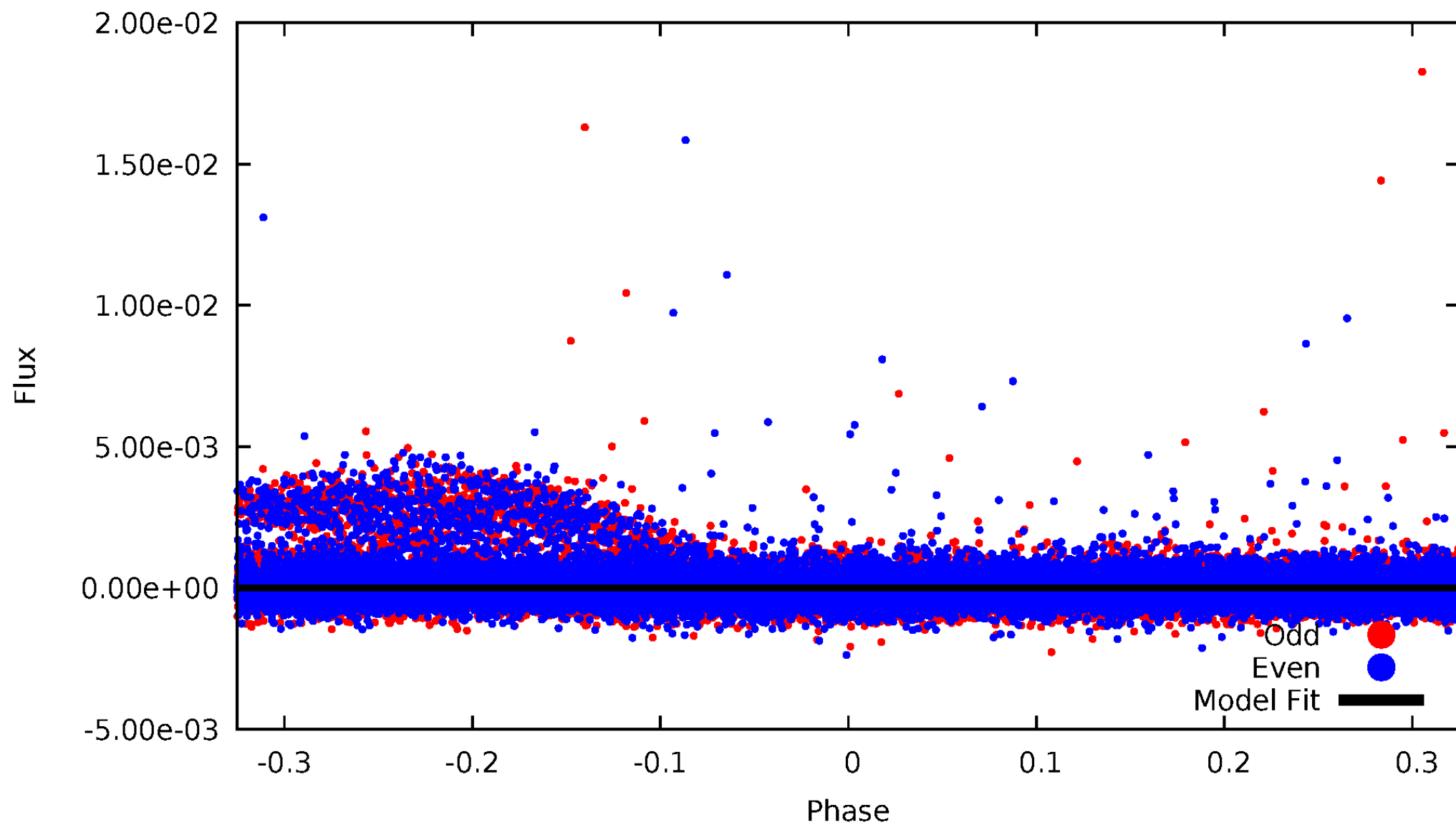


TCE 011403440-01



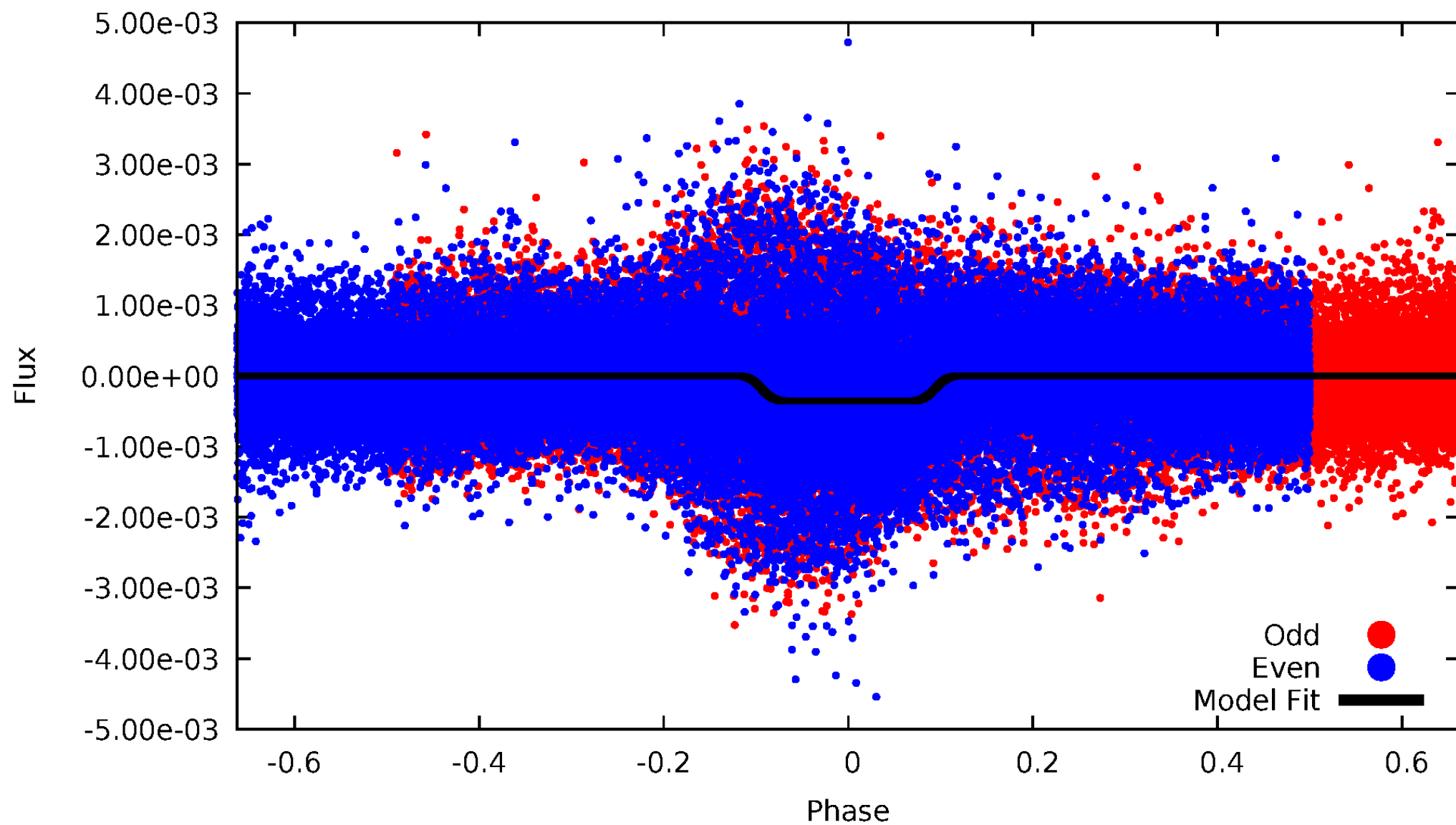
# DV Odd/Even

TCE 011403440-01



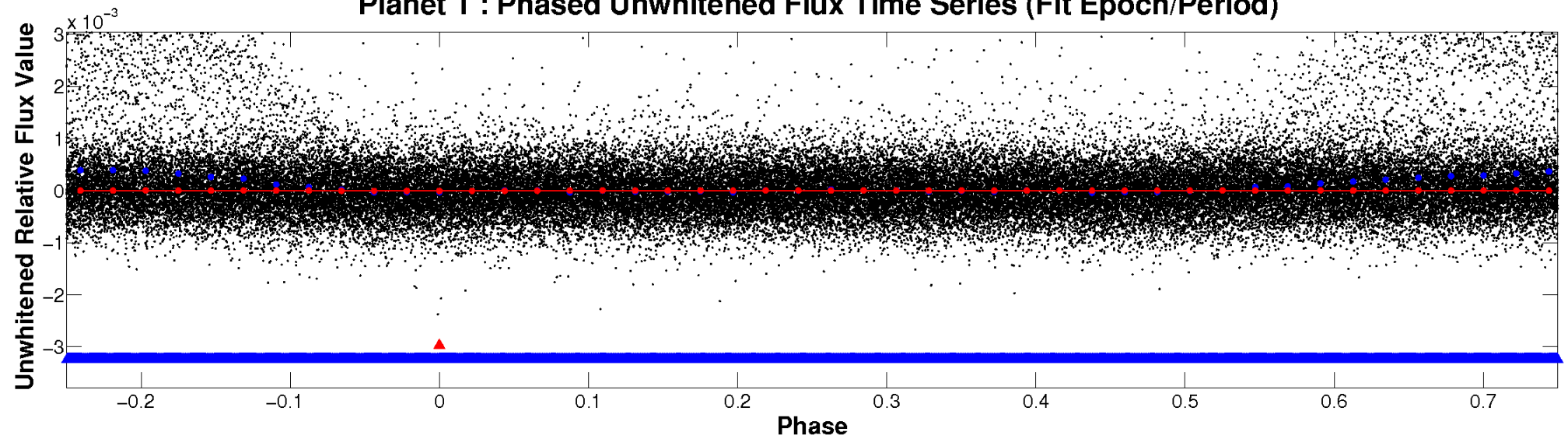
# ALT Odd/Even

TCE 011403440-01

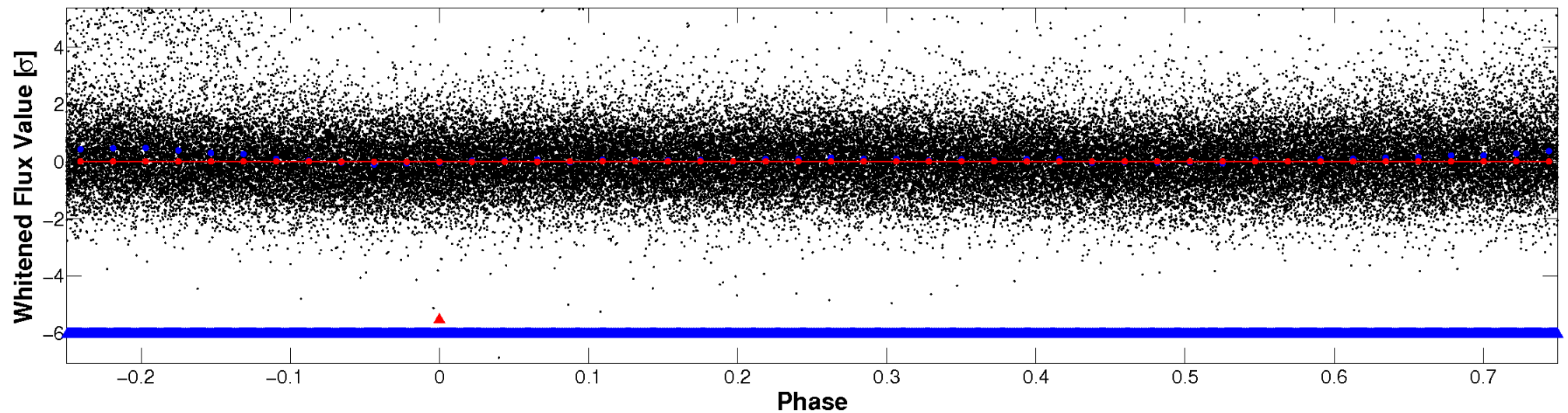


# Non-Whitened Vs. Whitened Light Curve

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



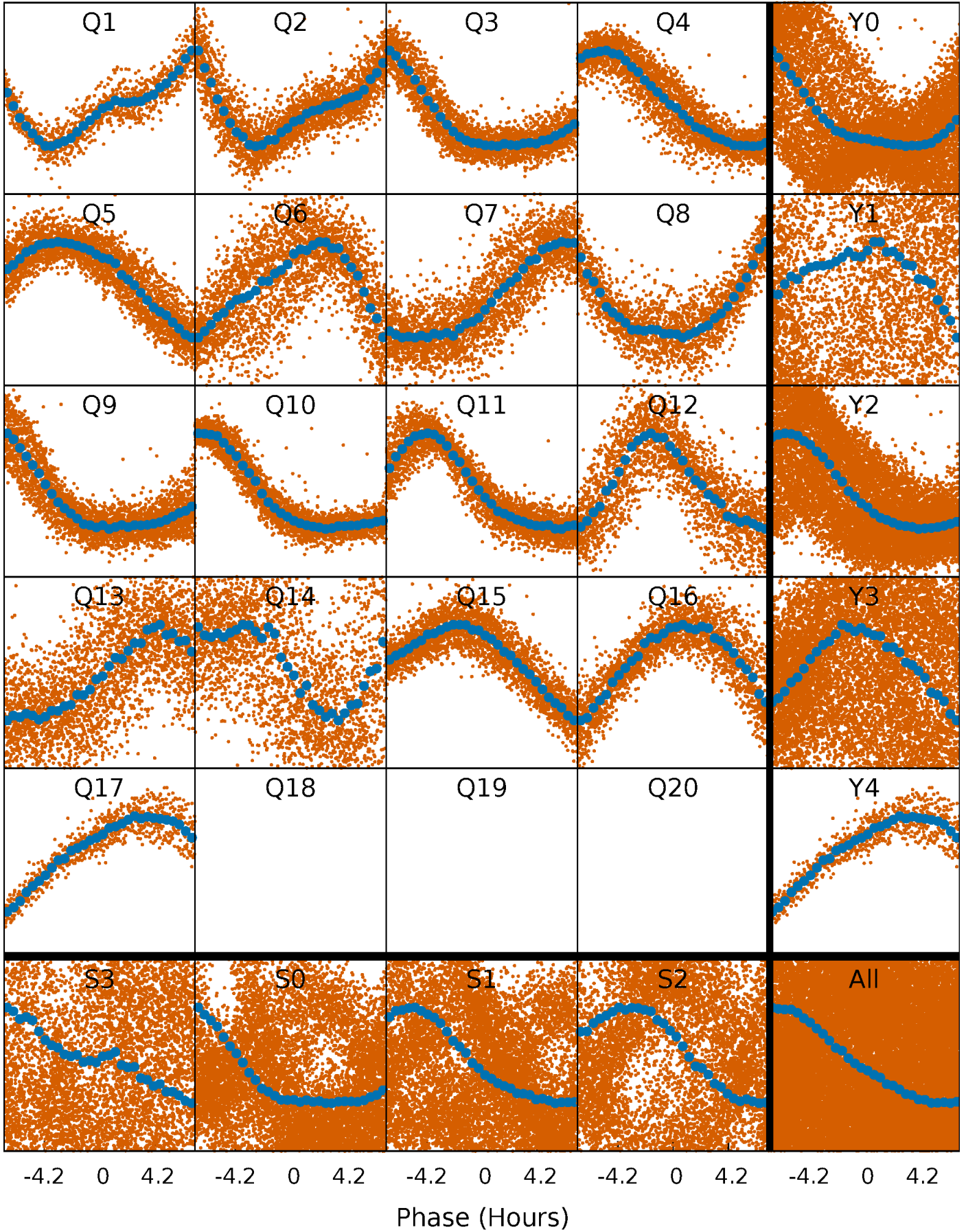
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

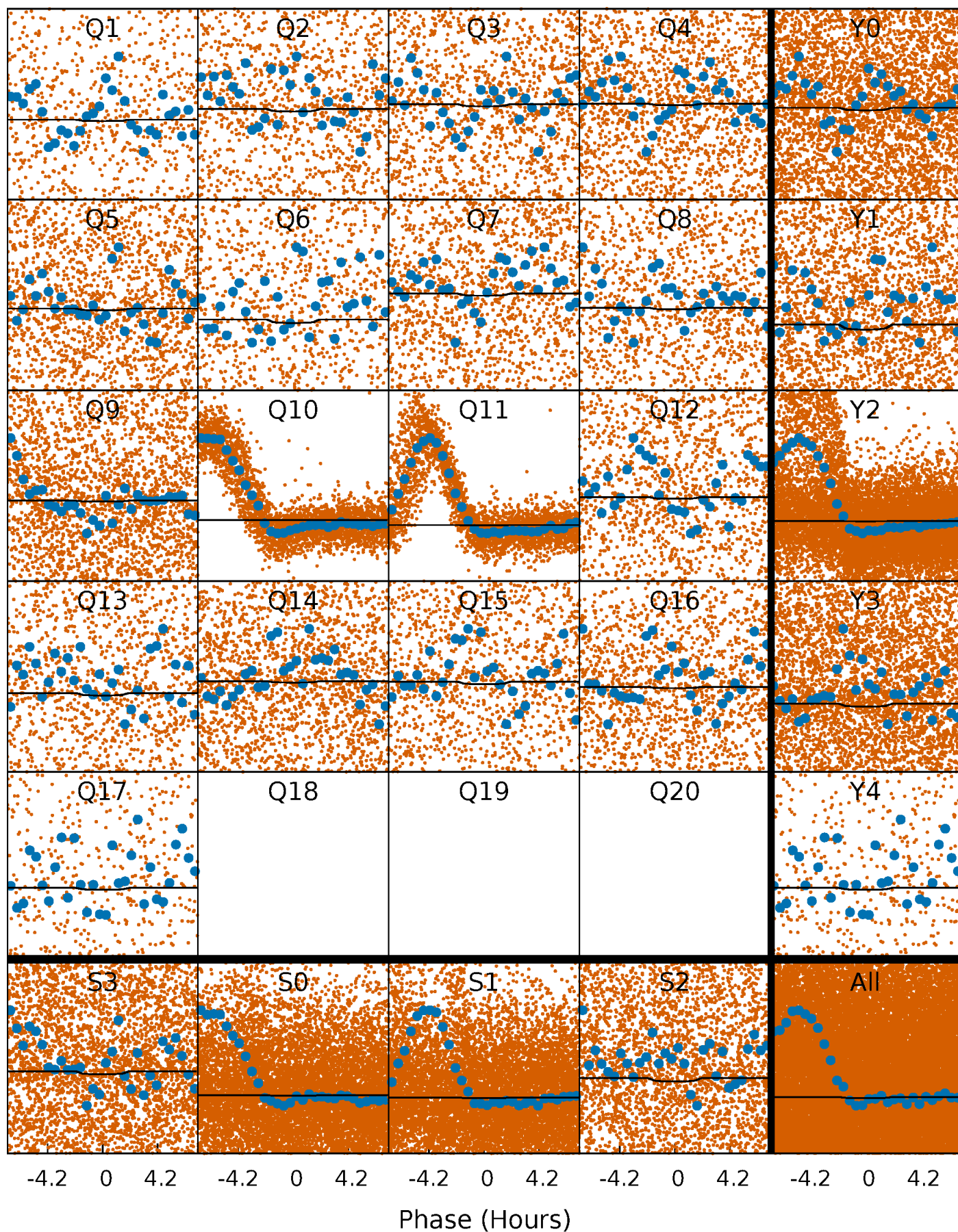
TCE 011403440-01 P= 0.933759 Days  $T_0=132.333325$  (BKJD)





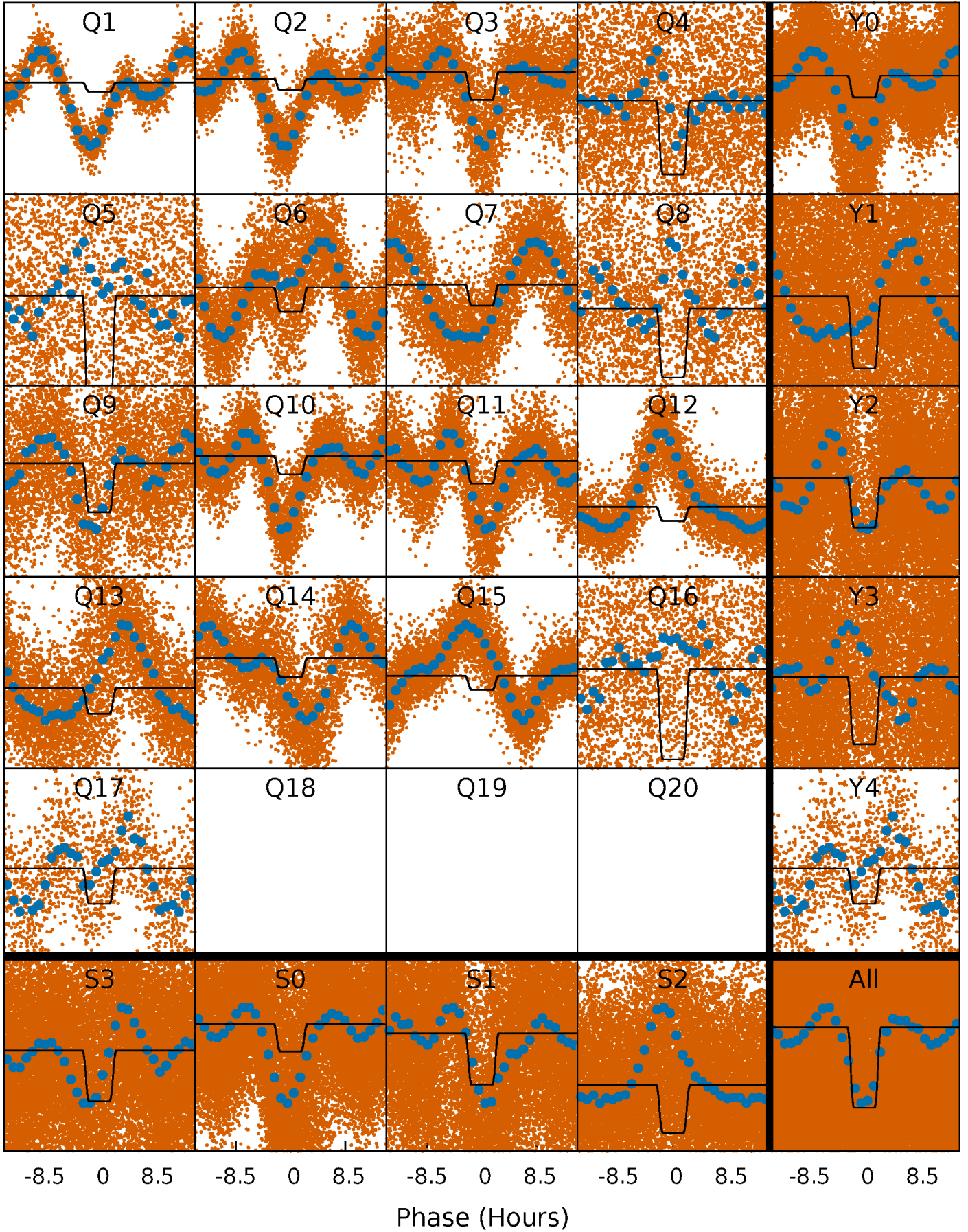
# DV Quarter-Phased Transit Curves

TCE 011403440-01 P= 0.933759 Days  $T_0=132.333325$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

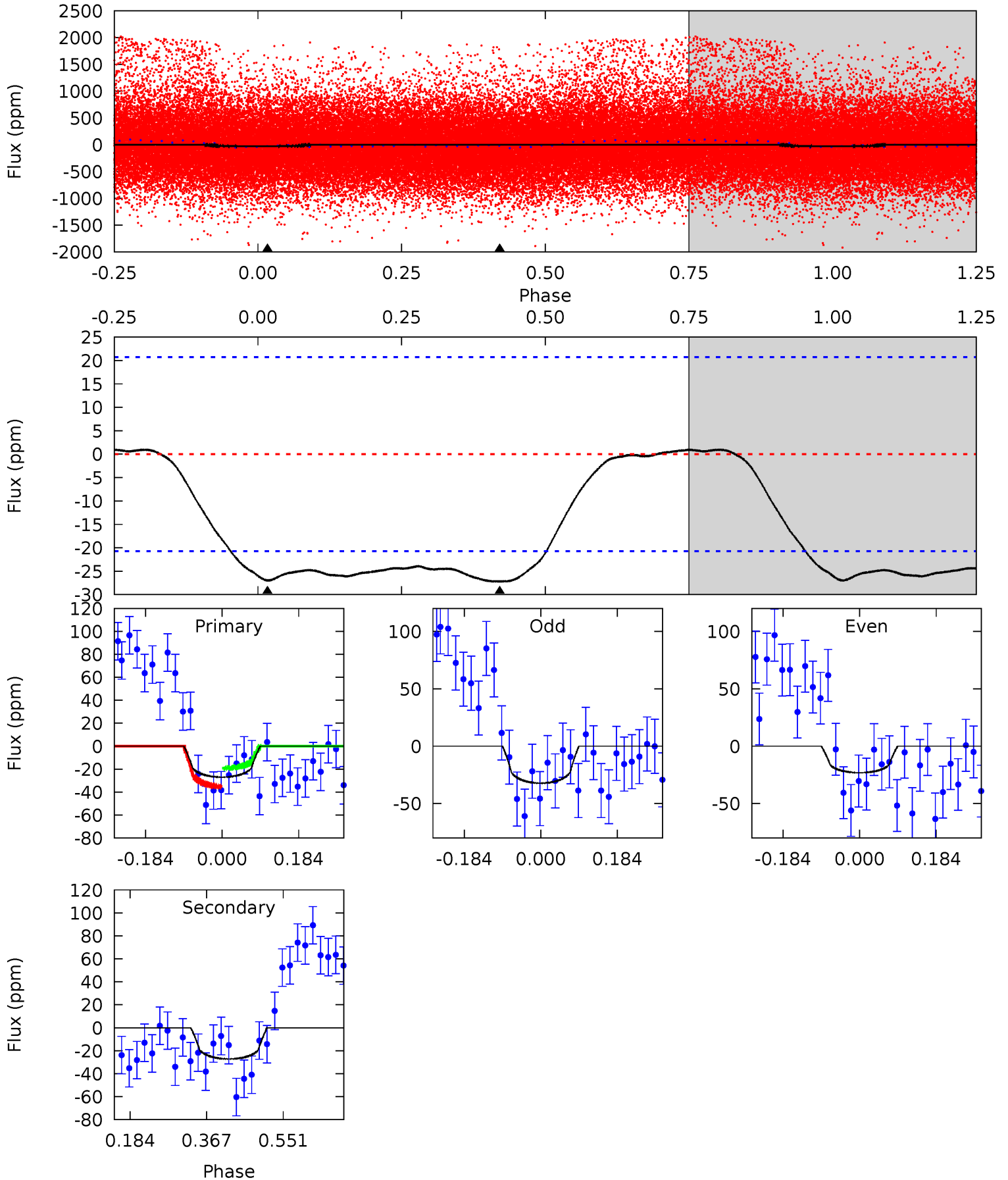
TCE 011403440-01 P= 0.933890 Days  $T_0=132.203063$  (BKJD)



# DV Model-Shift Uniqueness Test

011403440-01, P = 0.933759 Days, E = 131.399566 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
5.78	5.82	0	0	4.44	1.33	1.91	5.78	5.78	5.82	5.82	0.99	2.06	0.03	1.79

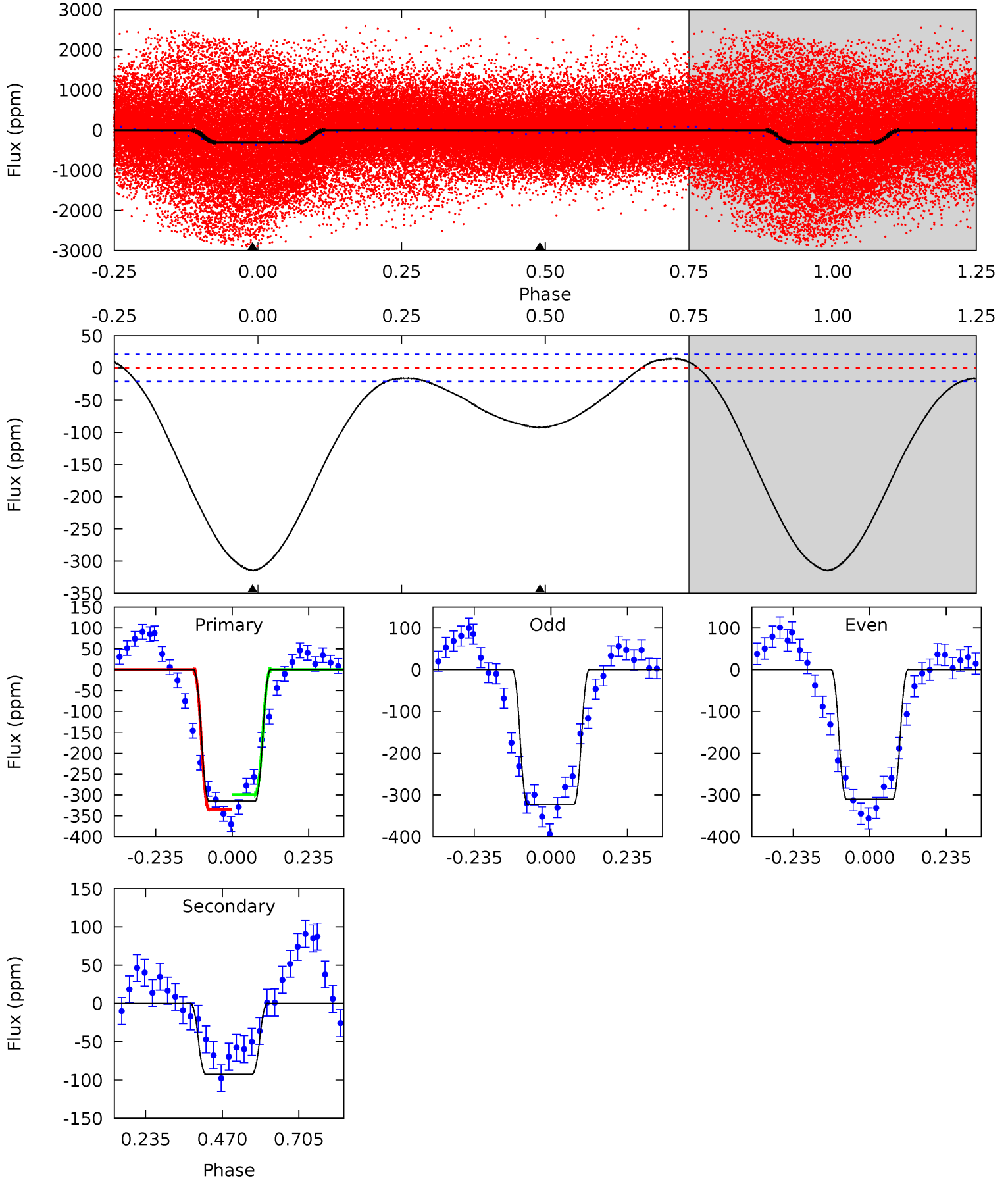




# Alt Model-Shift Uniqueness Test

011403440-01, P = 0.933890 Days, E = 131.269173 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
65.4	19.2	0	0	4.38	1.19	3.06	65.4	65.4	19.2	19.2	1.26	0.97	0.04	3.65





### Stellar Parameters For KIC 011403440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5855^{+157}_{-192}$	$4.505^{+0.052}_{-0.208}$	$-0.100^{+0.300}_{-0.300}$	$0.917^{+0.275}_{-0.092}$	$0.982^{+0.113}_{-0.113}$	$1.790^{+0.490}_{-0.924}$
	+3%/-3%	+1%/-5%	+300%/-300%	+30%/-10%	+12%/-12%	+27%/-52%
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 011403440-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-27 \pm 5$	$2.63^{+2.94}_{-1.90}$	$2578^{+175}_{-122}$	$2991^{+2146}_{-5569}$	$0.731^{+9.384}_{-0.571}$
Alt.	$-92 \pm 5$	$3.36^{+3.62}_{-2.36}$	$2588^{+184}_{-127}$	$3502^{+2280}_{-1168}$	$1.518^{+15.028}_{-1.153}$

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

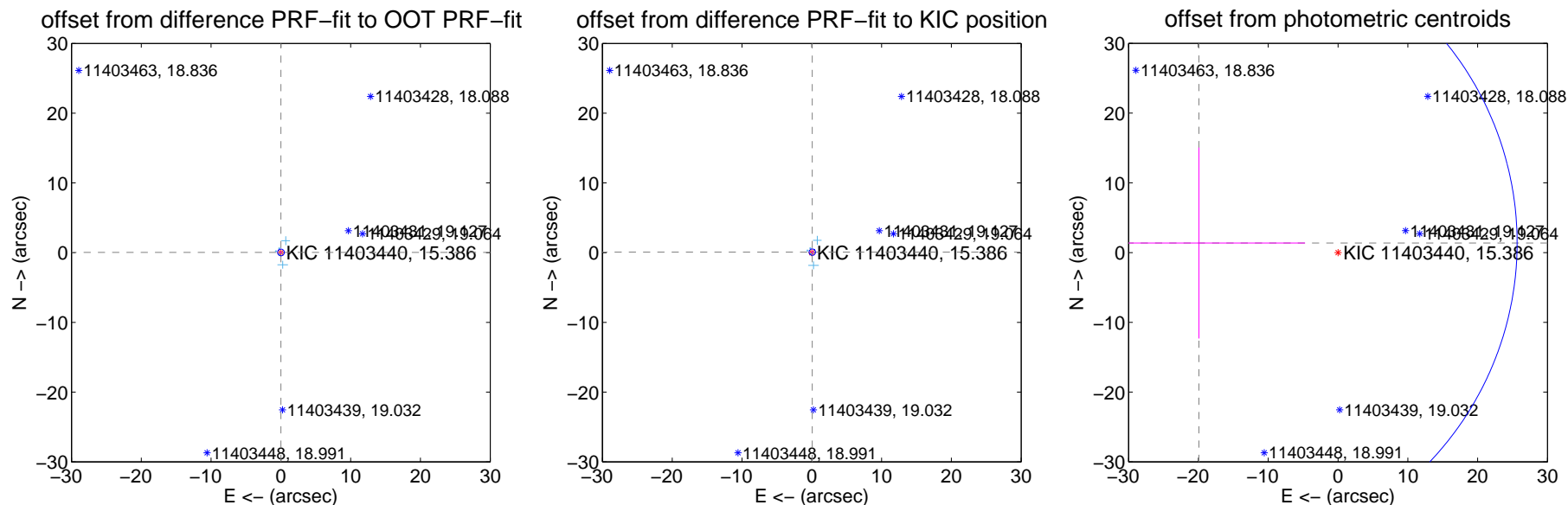
## DV Centroid Data

Supplemental centroid analysis for 011403440-01. Kepler magnitude: 15.39. Transit SNR 0.85

There are 11 quarters with good PRF difference image offsets

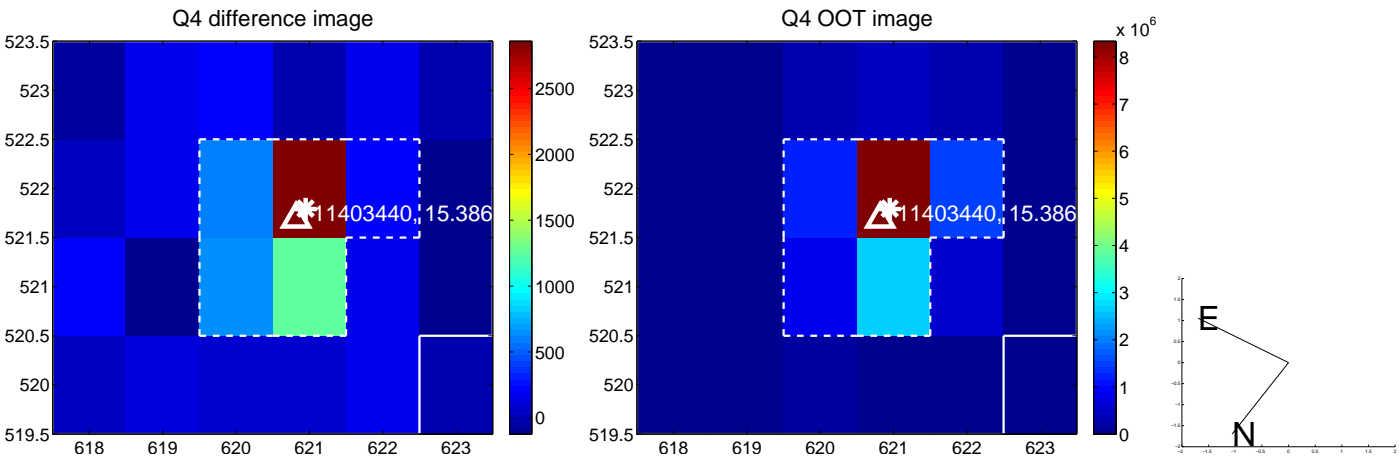
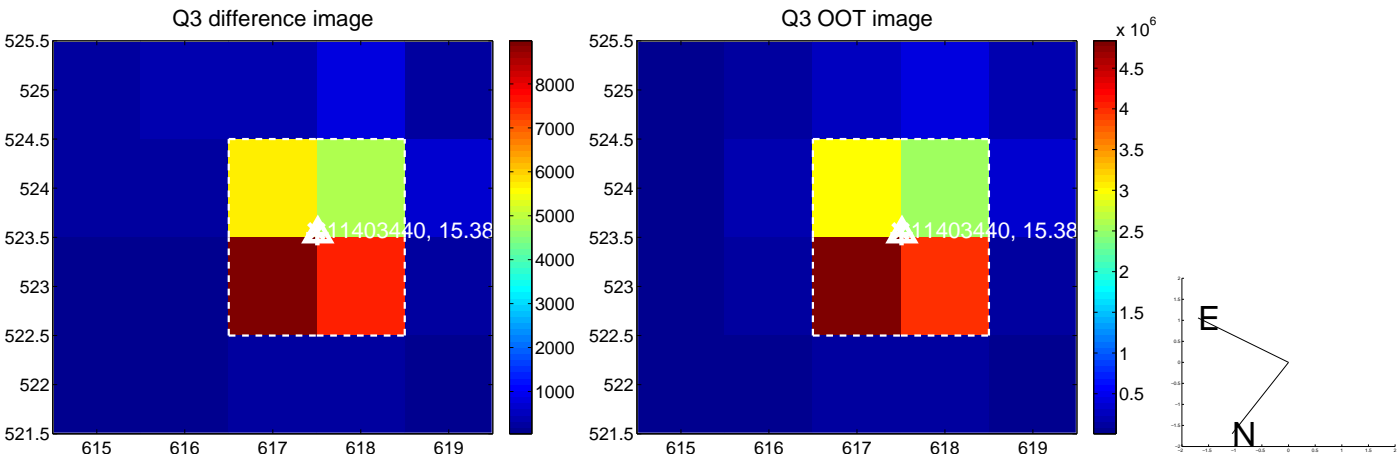
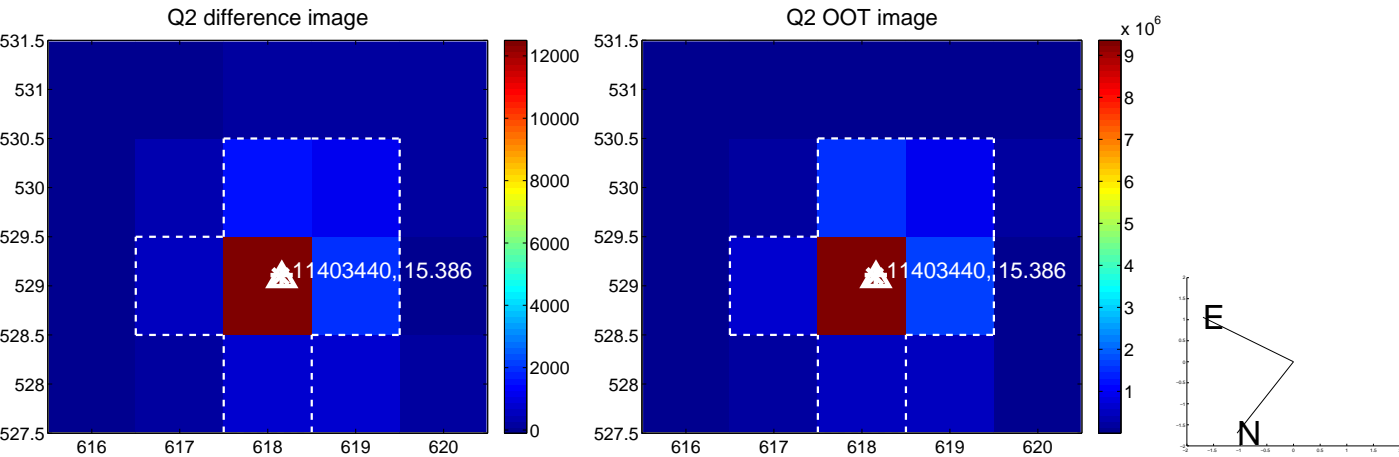
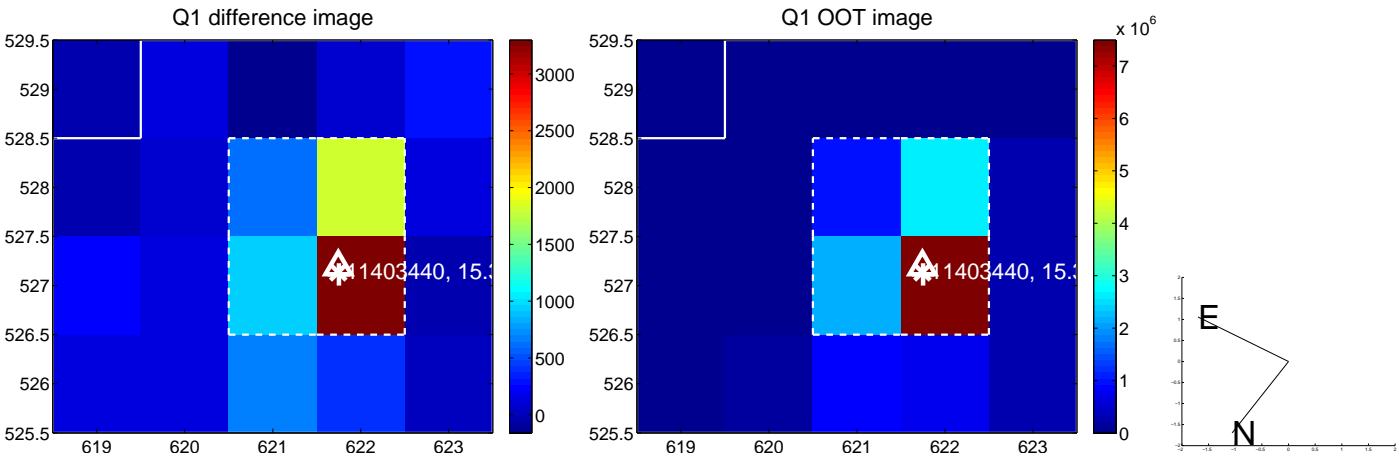
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.034 \pm 0.160$	0.21	$-0.013 \pm 0.095$	$0.032 \pm 0.164$
PRF-fit source offset from KIC position	$0.104 \pm 0.153$	0.68	$-0.069 \pm 0.095$	$0.077 \pm 0.174$
photometric centroid source offset	$19.97 \pm 15.19$	1.31	$19.92 \pm 15.20$	$1.37 \pm 13.68$

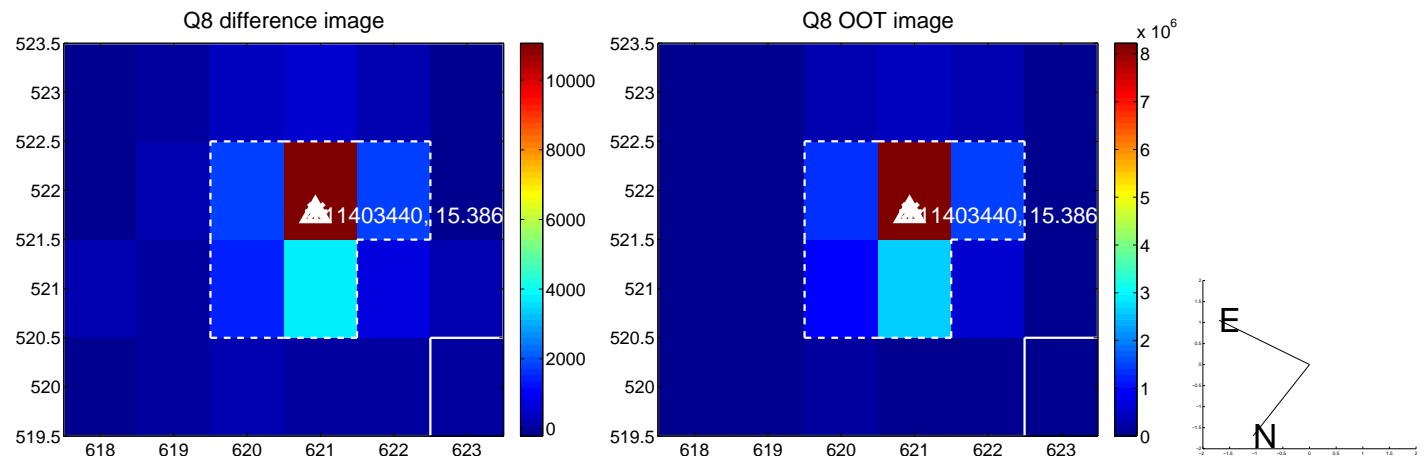
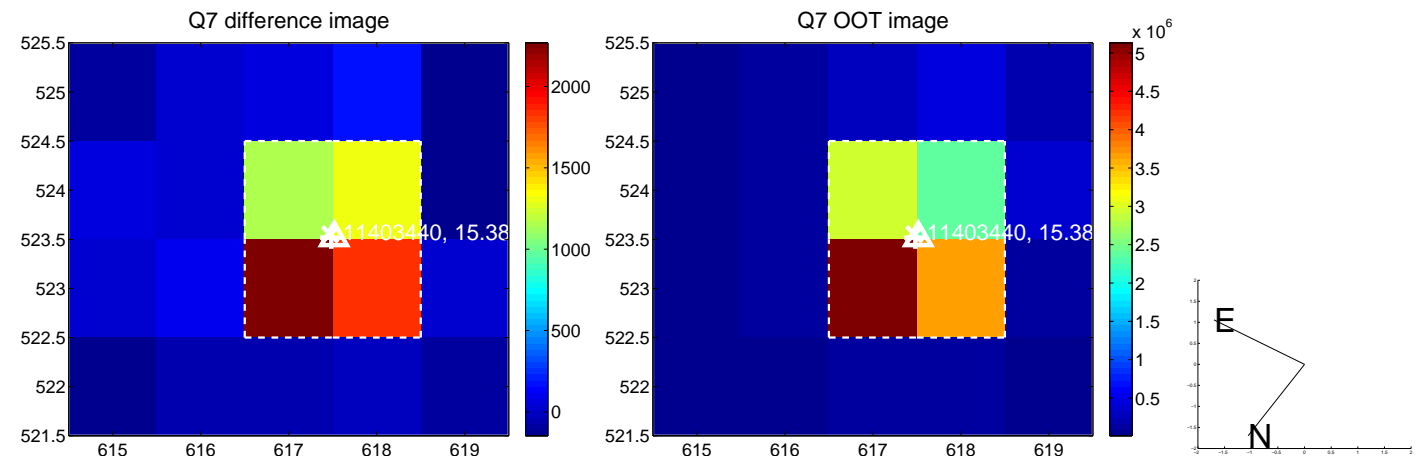
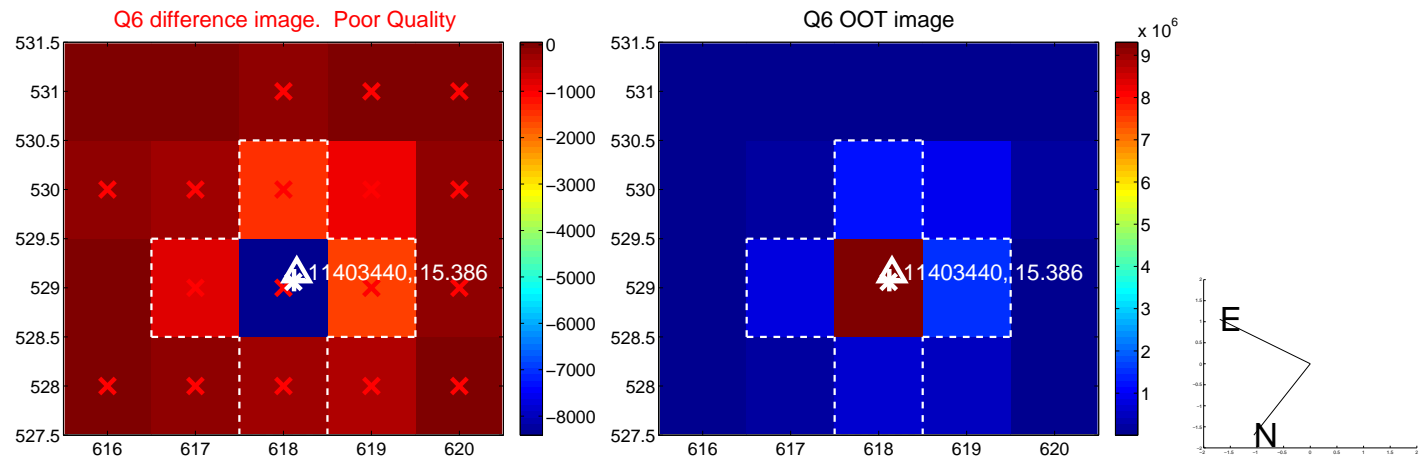
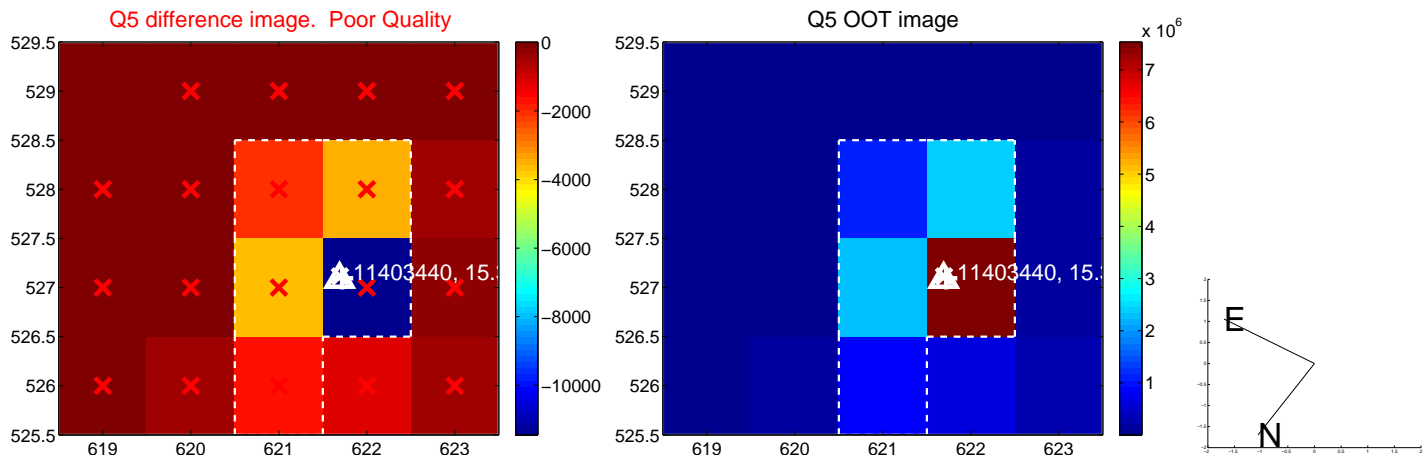


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

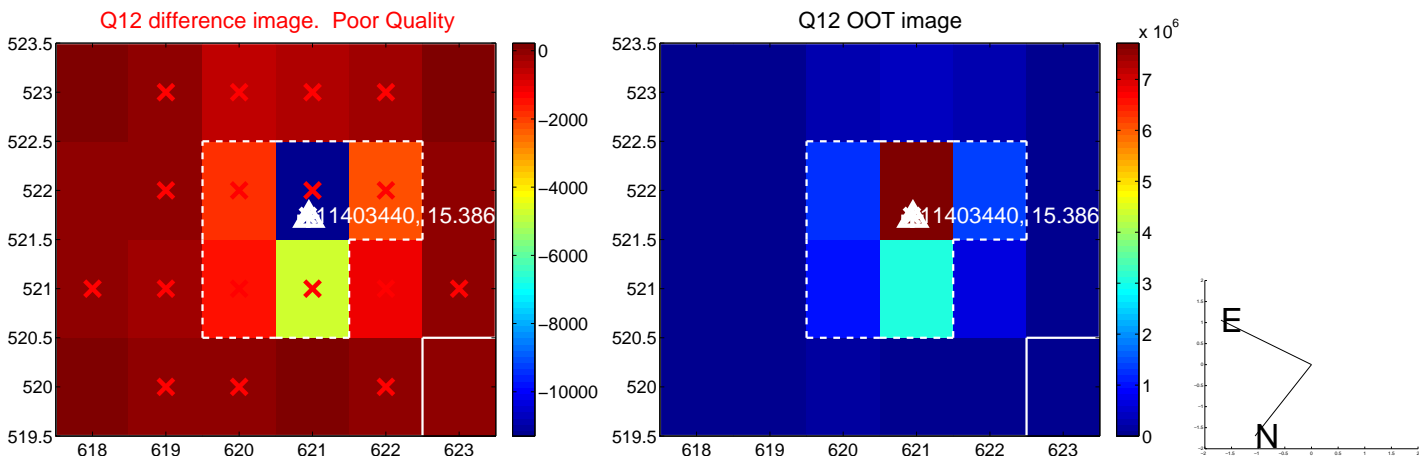
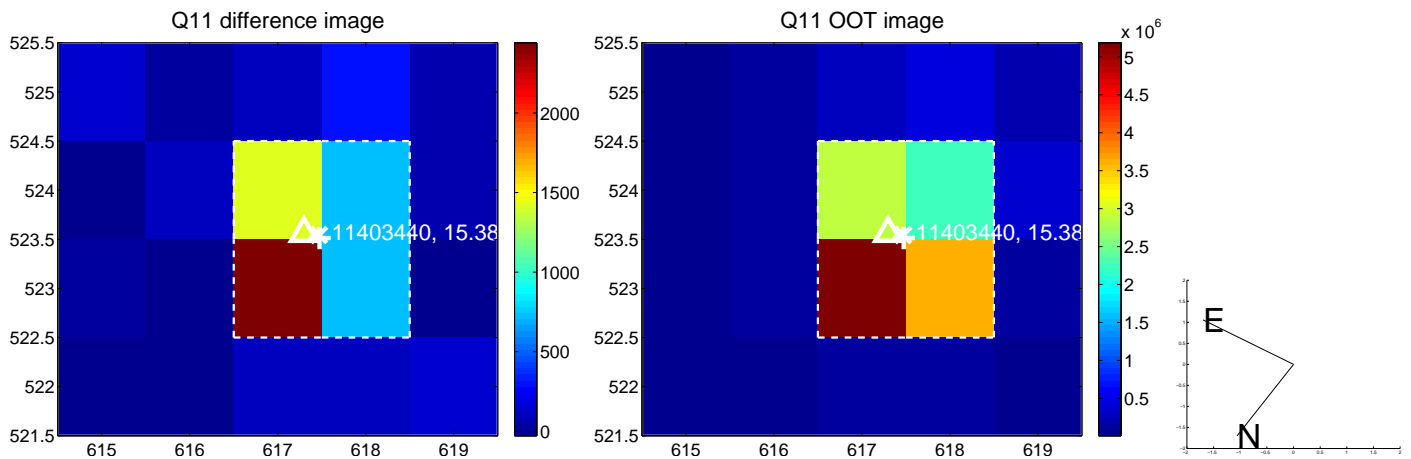
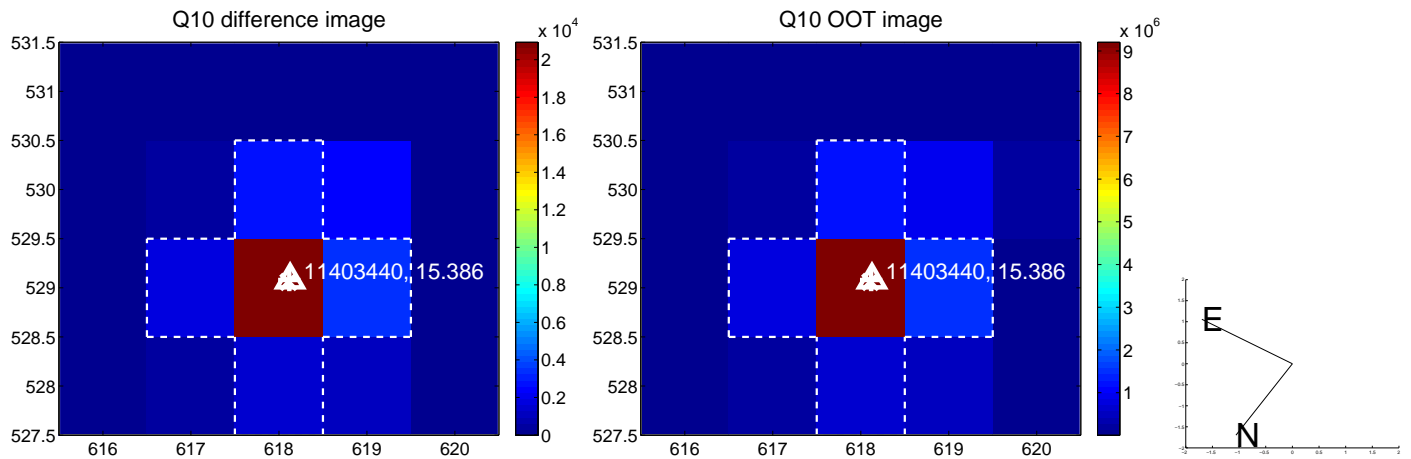
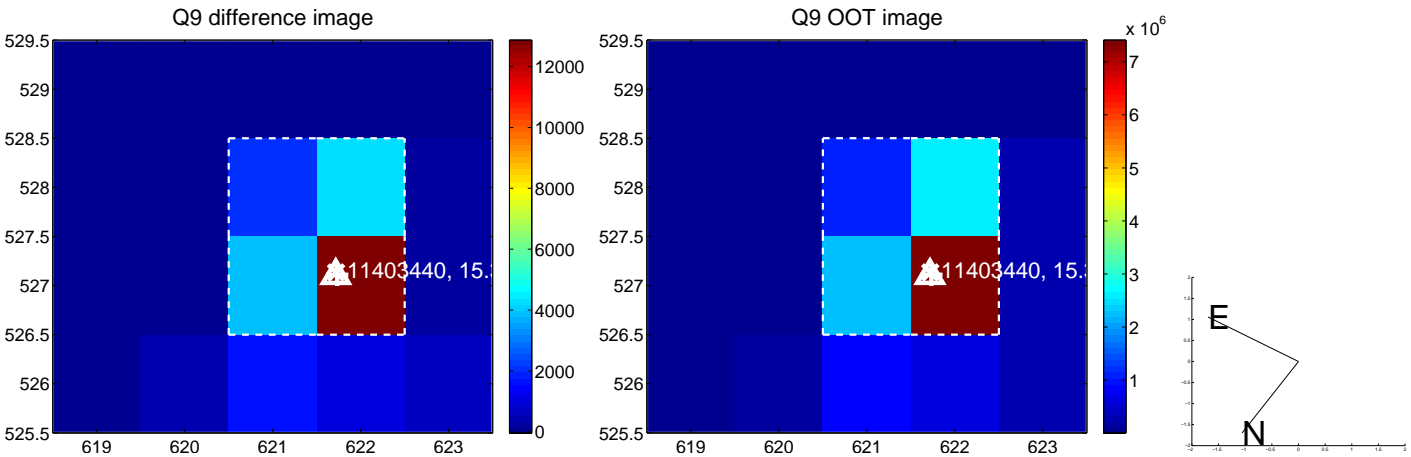


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

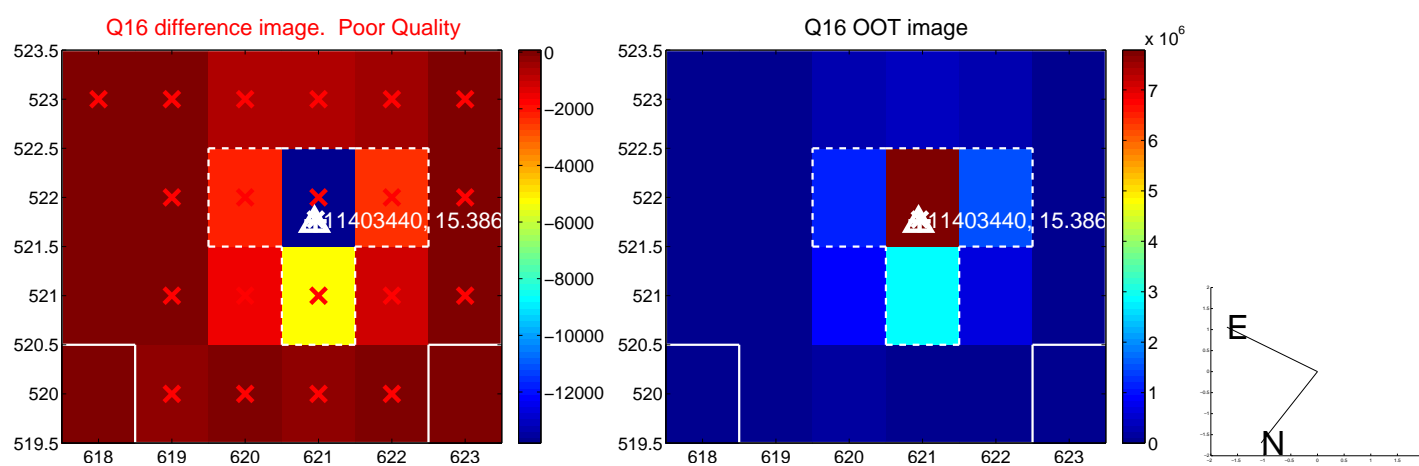
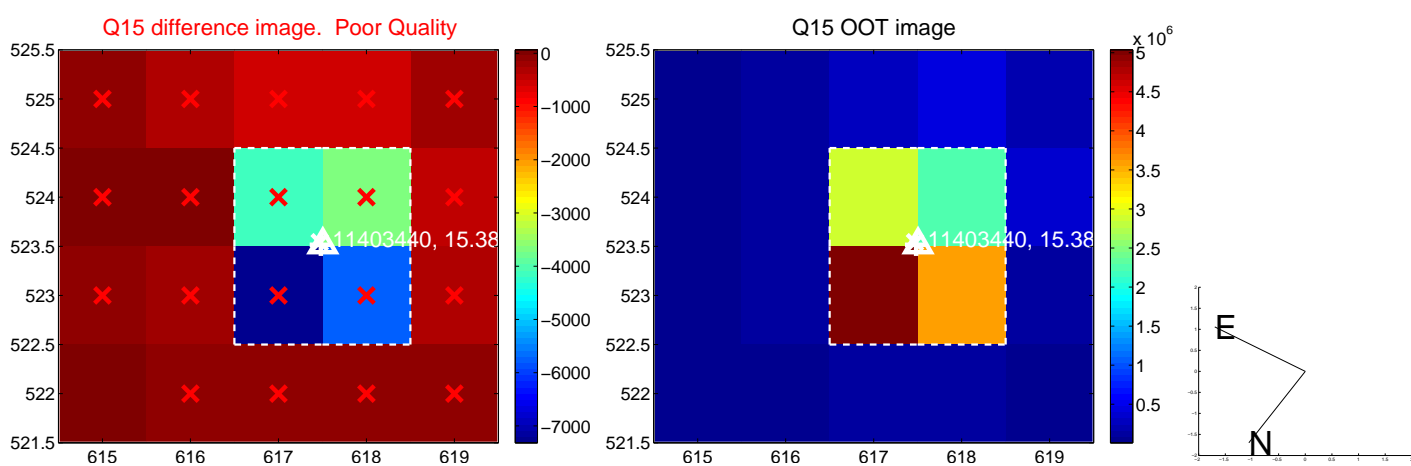
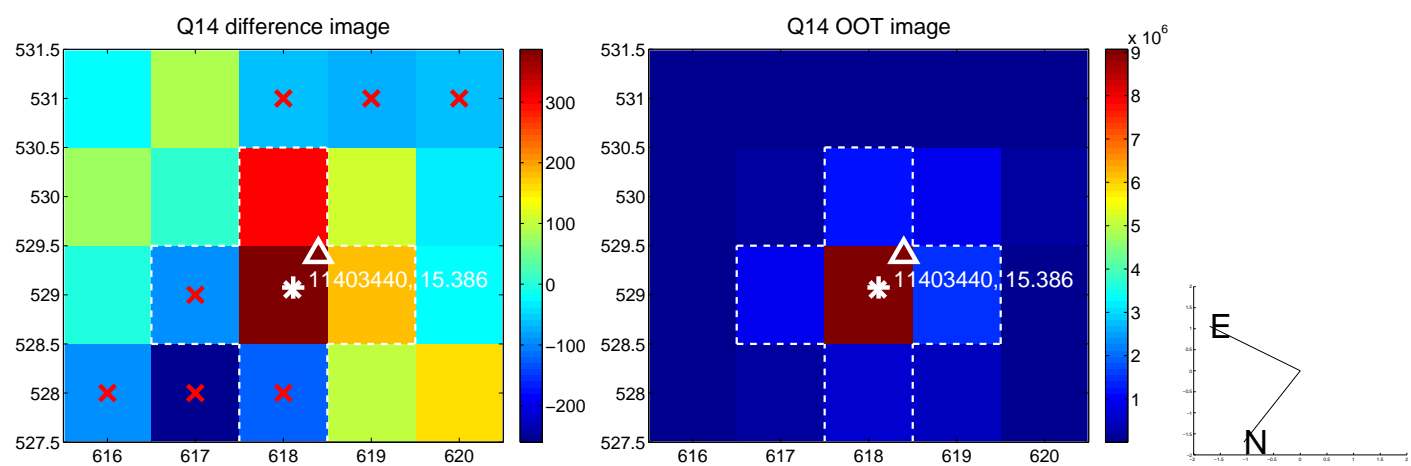
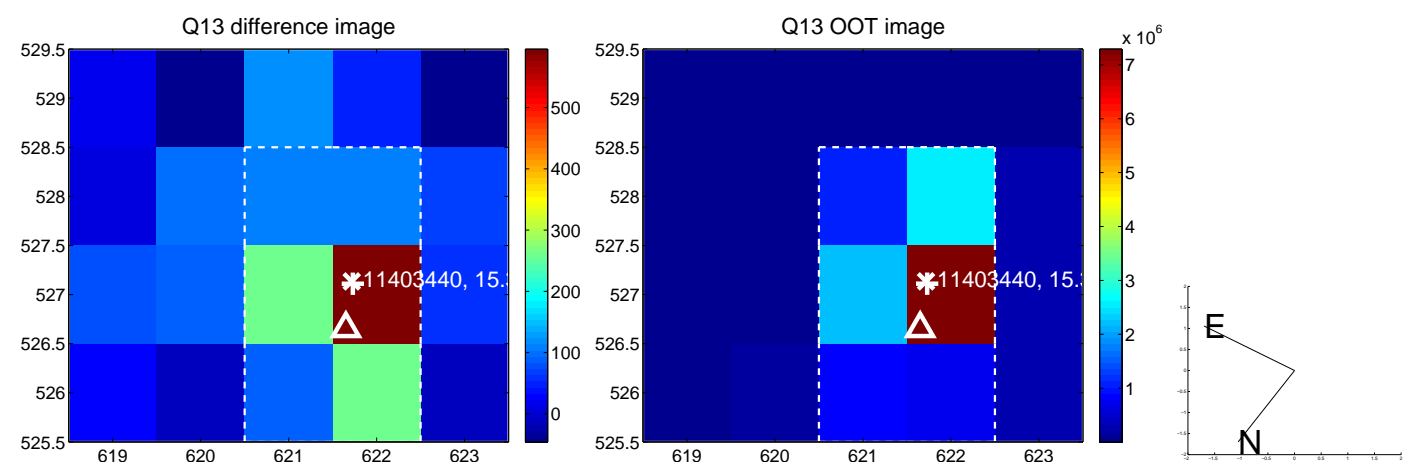




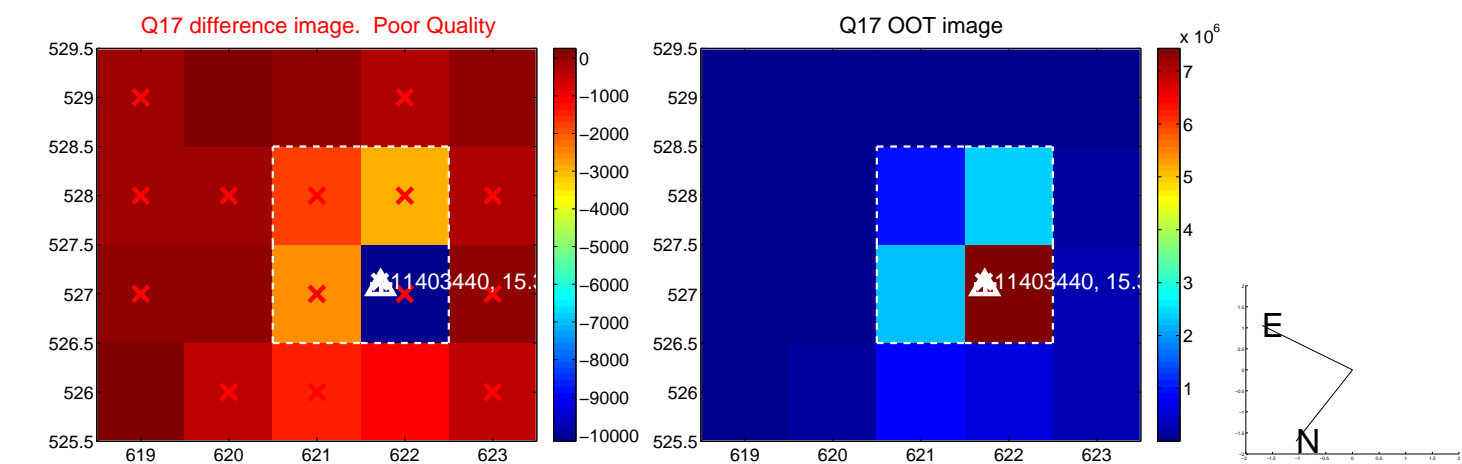
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



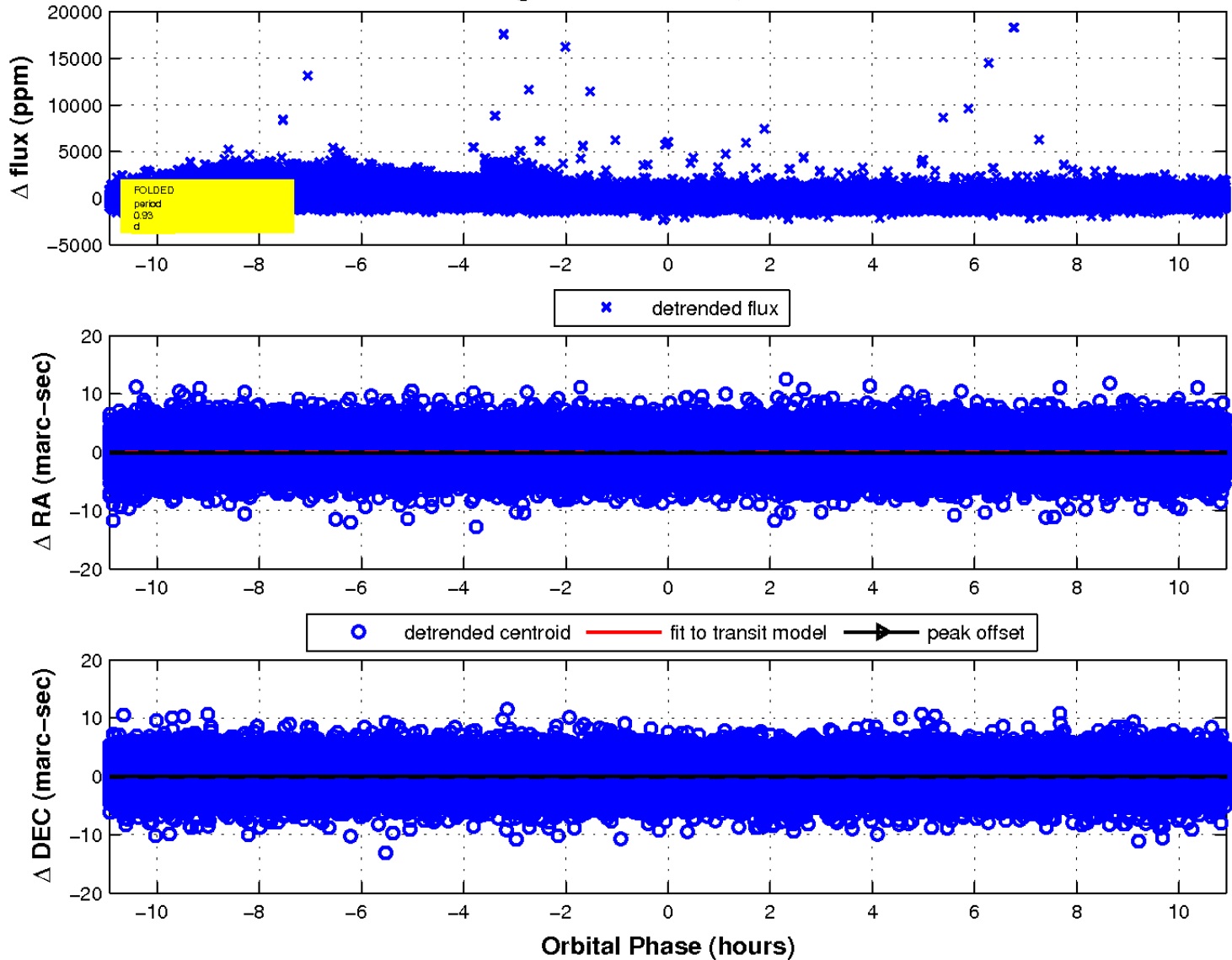
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

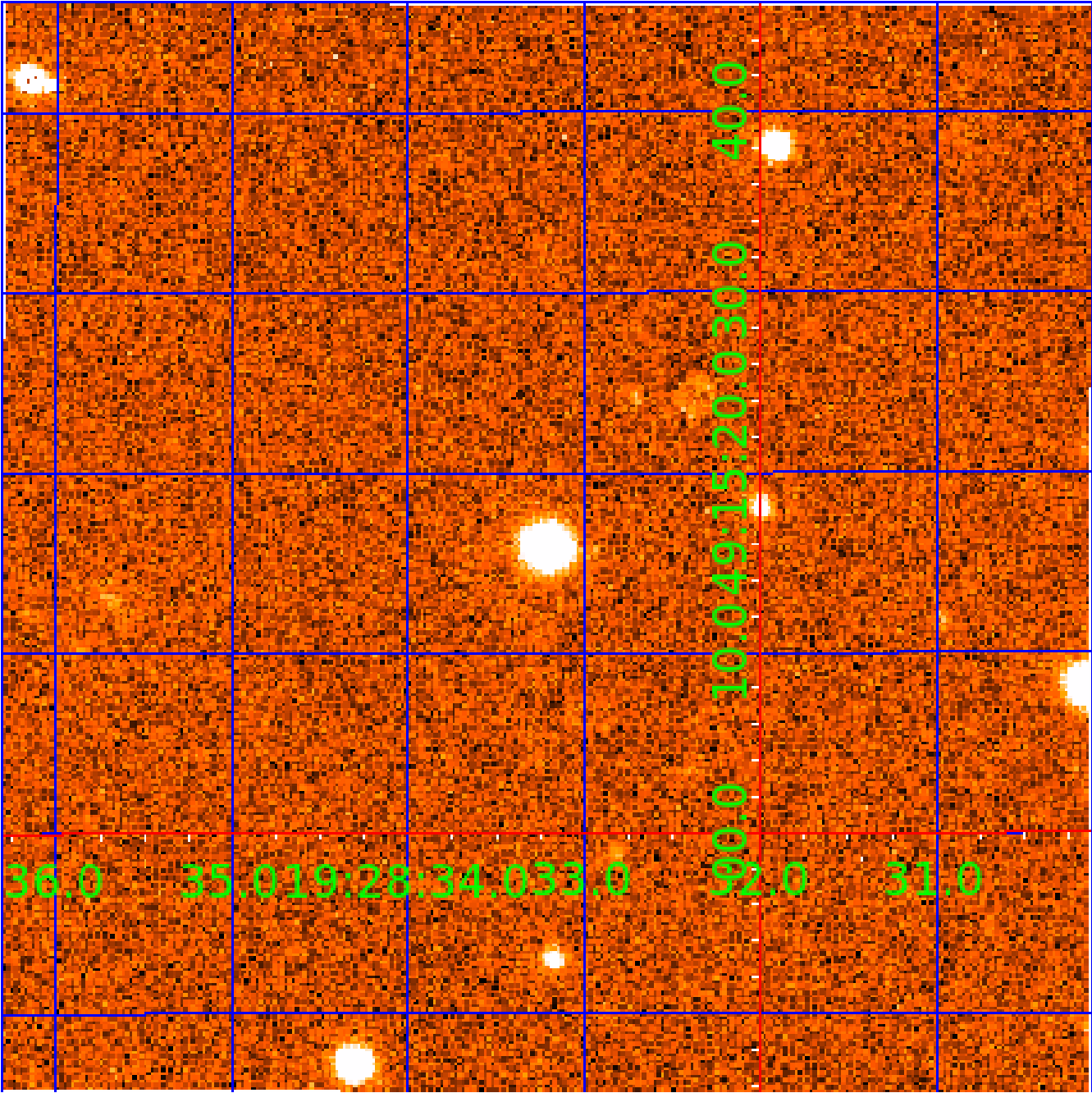


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 011403440

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011403440-01	OBS	No	0.933759	132.333325	5.3	3.642	11.0	0.8	0.92	5855	0.21	2564.10
011403440-02	OBS	No	0.934660	131.881290	62.1	11.216	15.2	9.2	0.92	5855	0.80	2560.80

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011403440-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
011403440-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

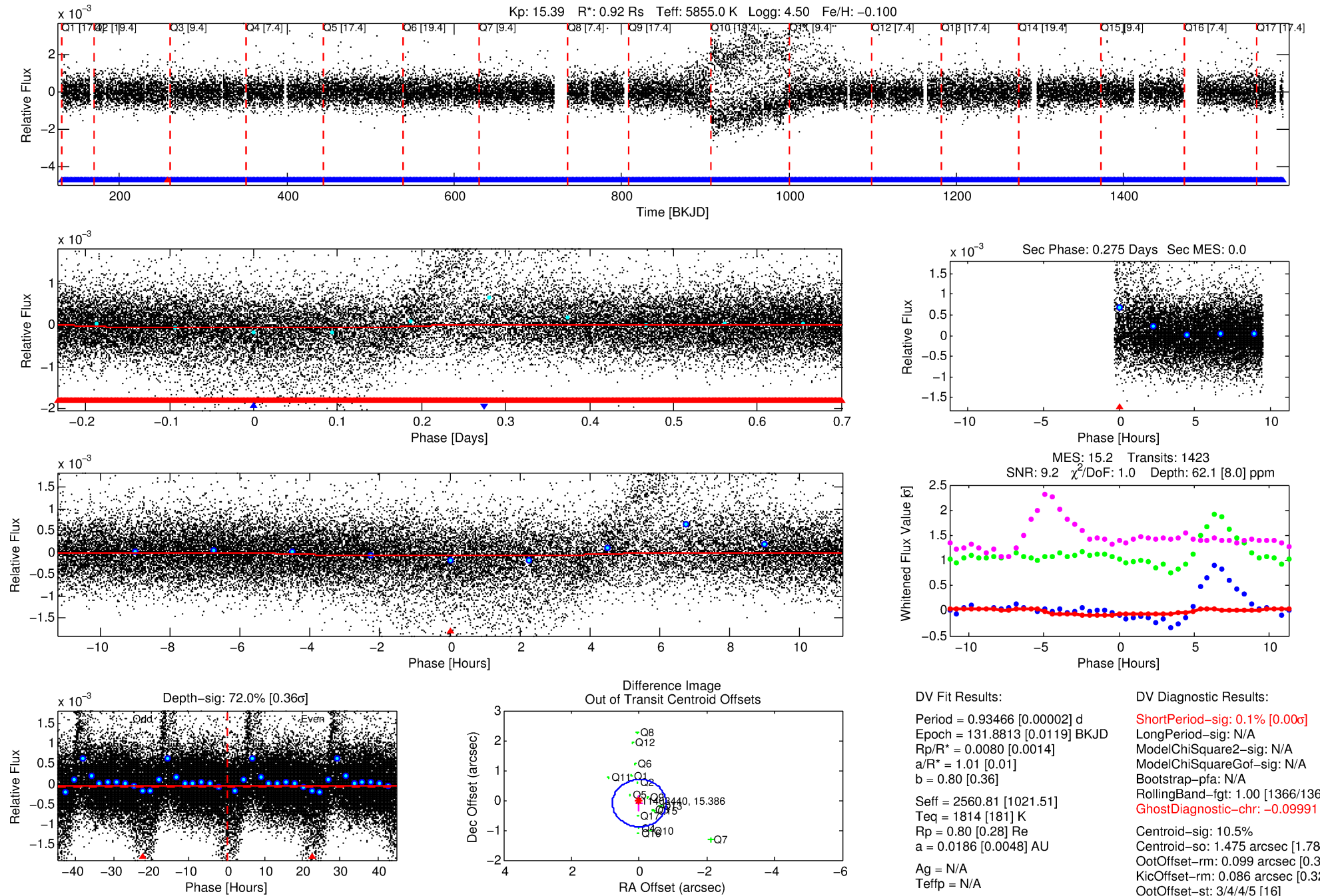
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011403440-02

No Significant Match Found

# DV One-Page Summary

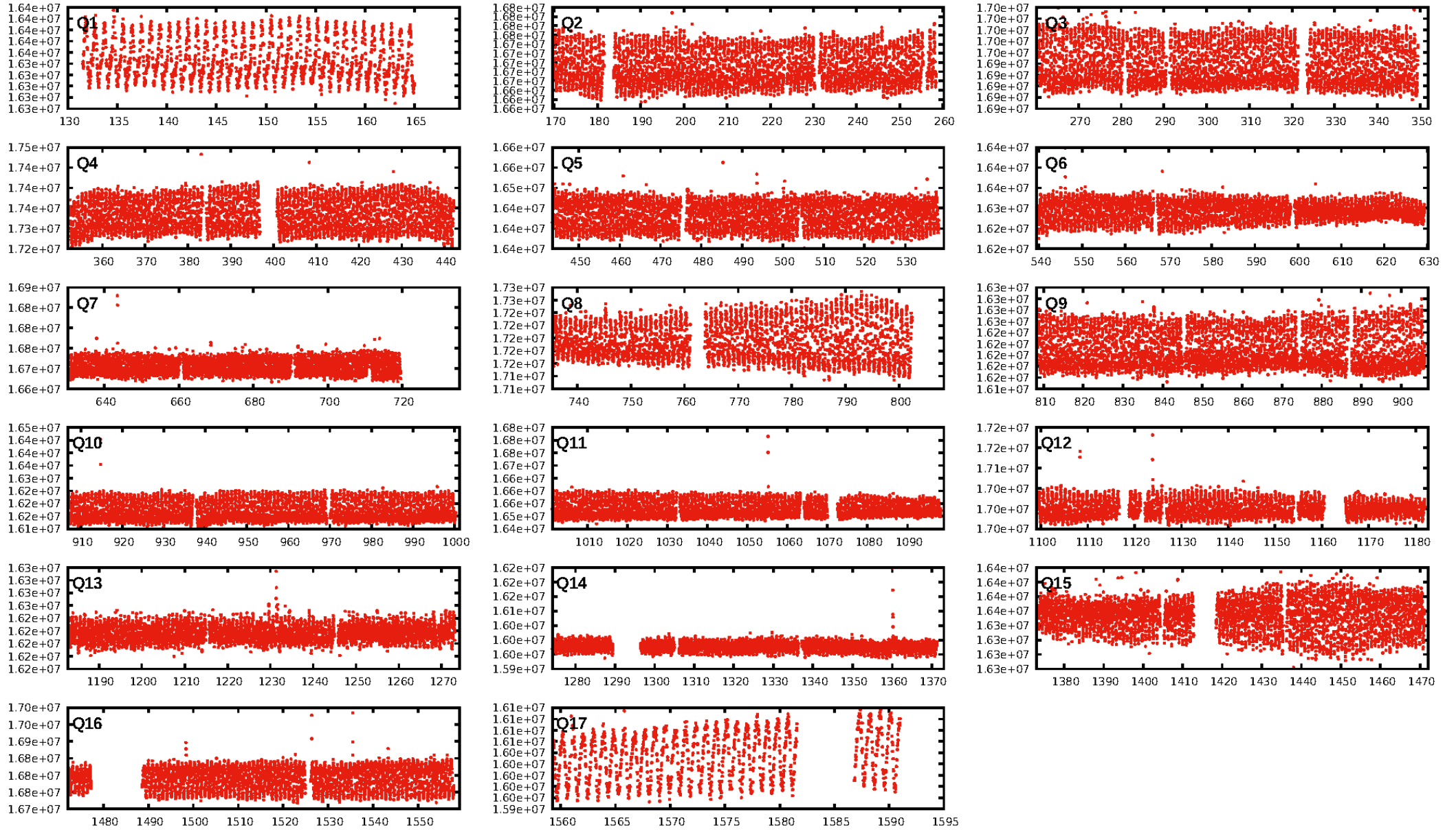
KIC: 11403440 Candidate: 2 of 2 Period: 0.935 d



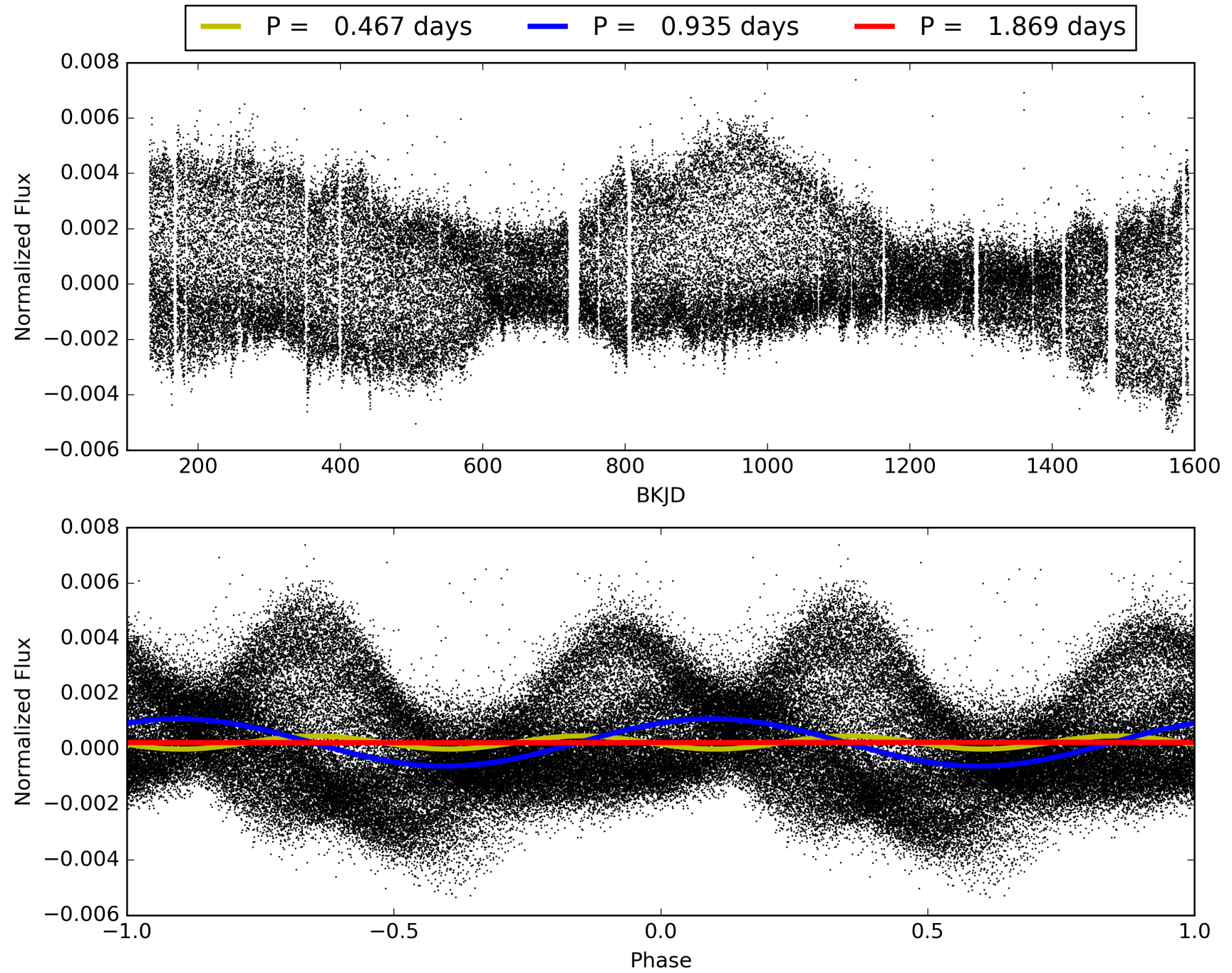
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:04:44 Z

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

# TCE 011403440-02, PDC Light Curves



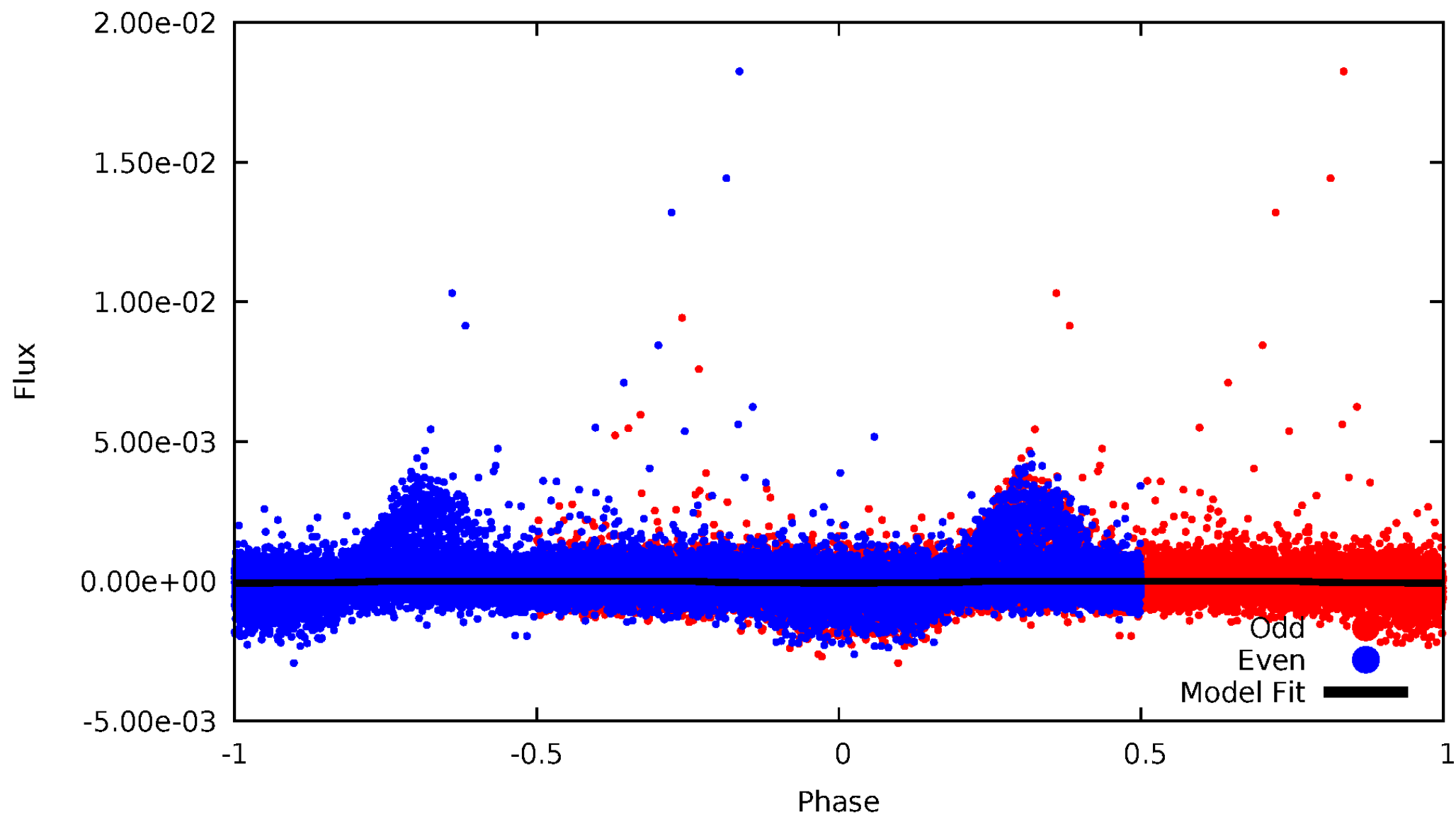
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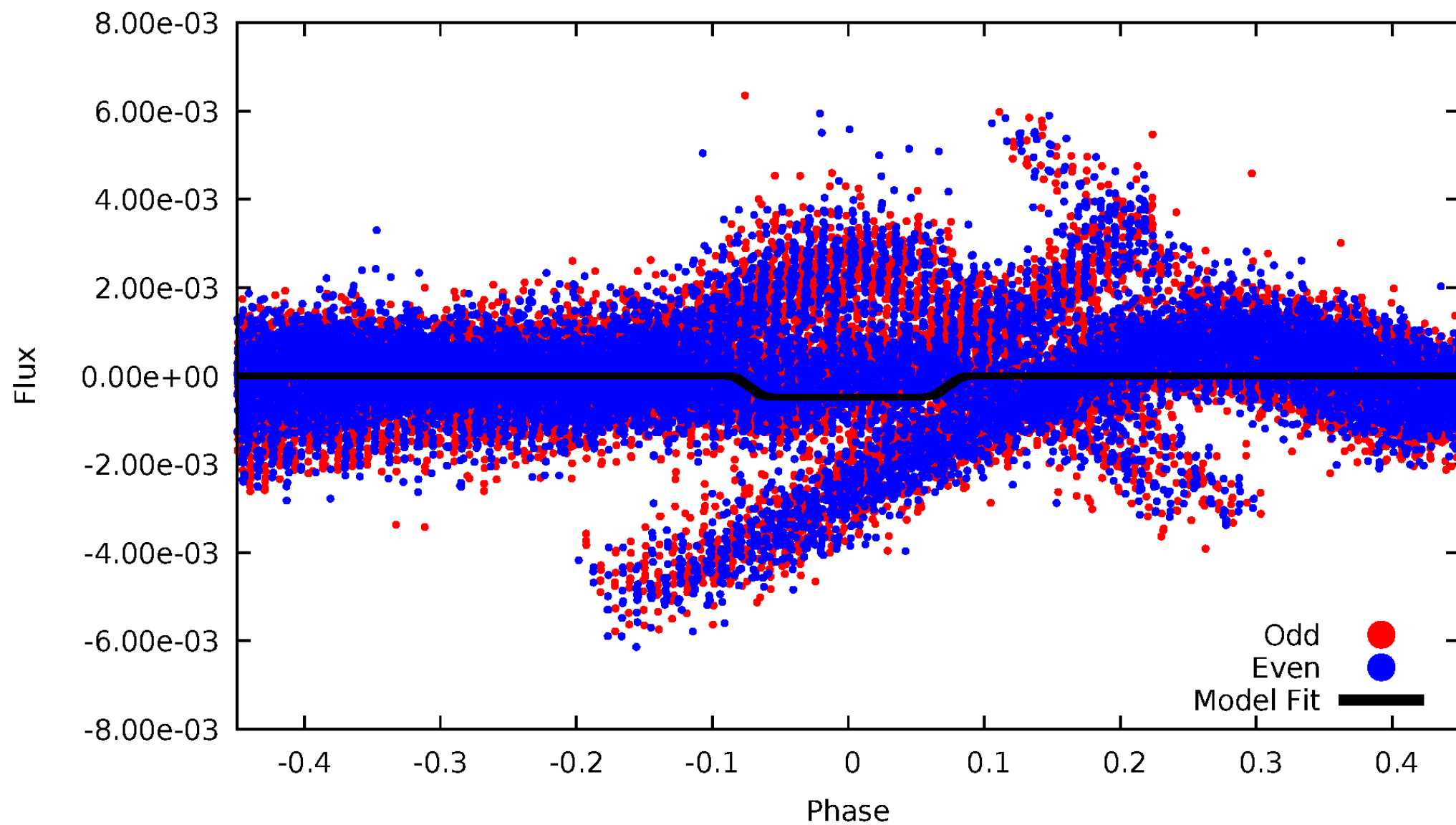
# DV Odd/Even

TCE 011403440-02



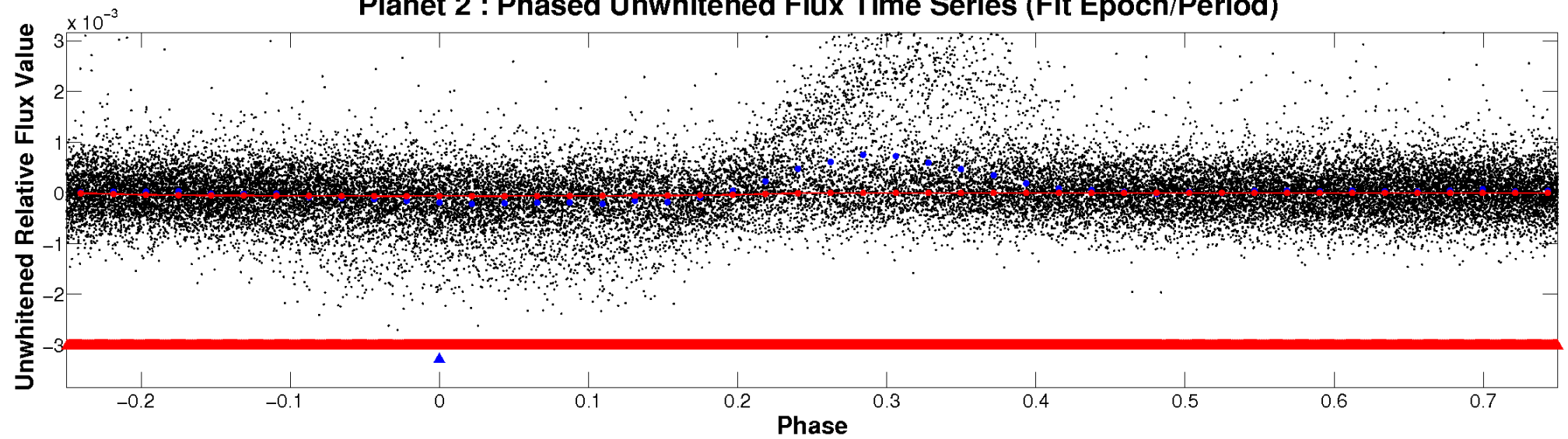
# ALT Odd/Even

TCE 011403440-02

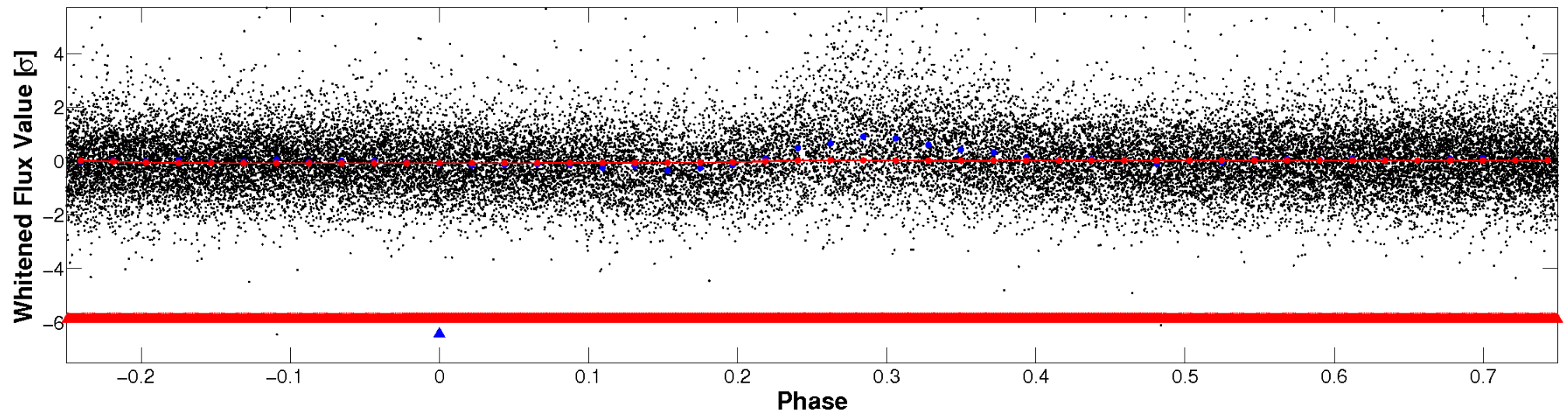


# Non-Whitened Vs. Whitened Light Curve

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

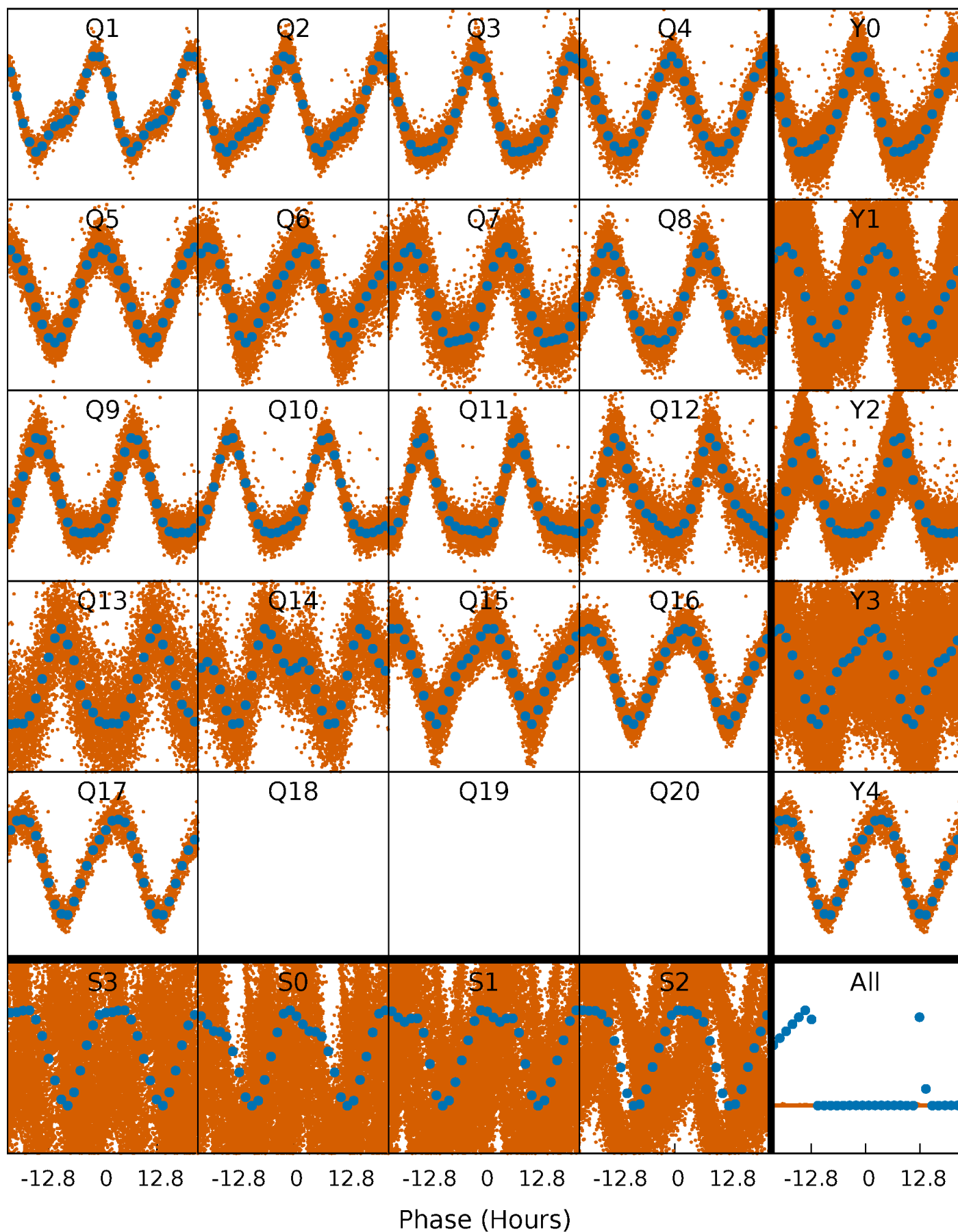


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



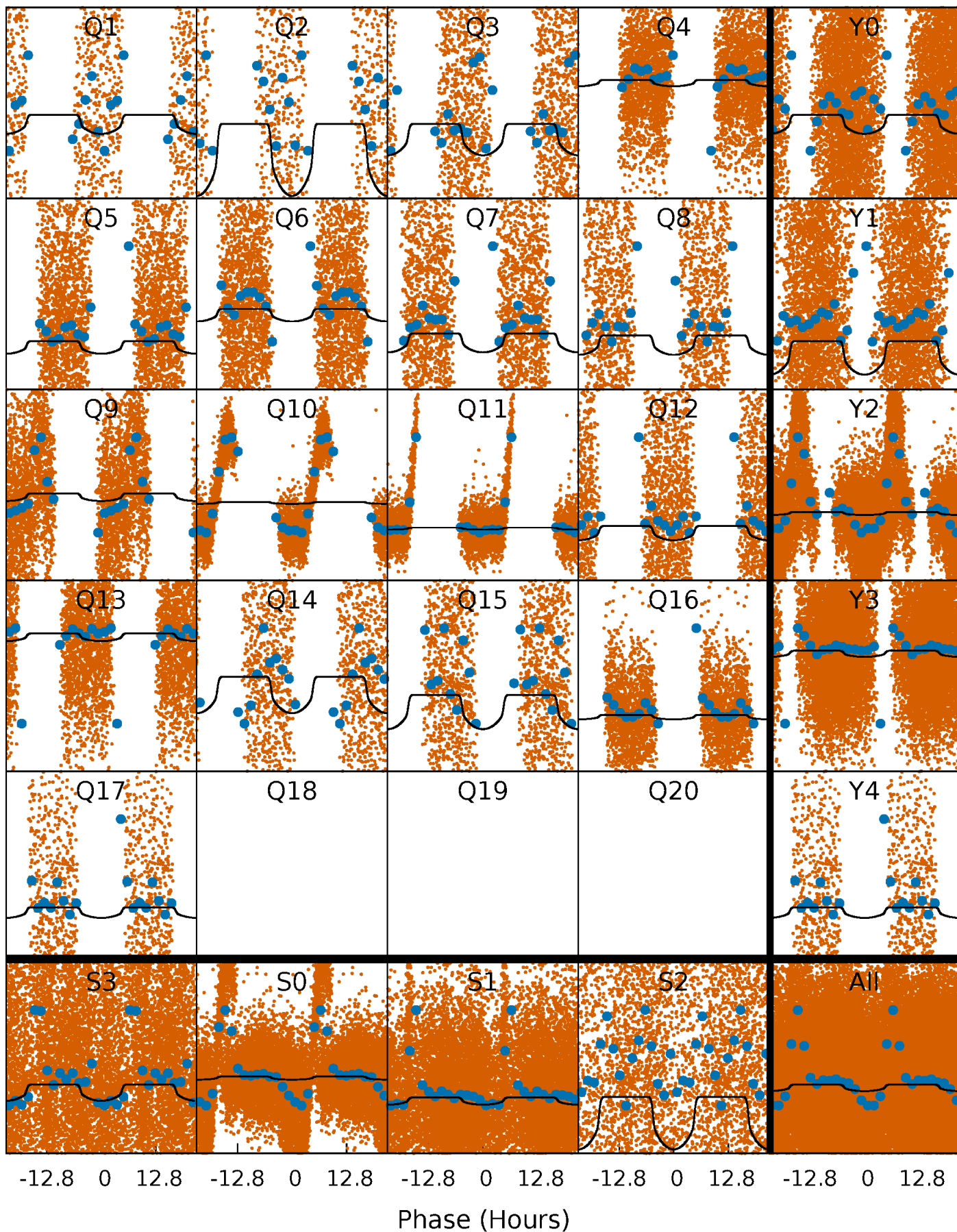
# PDC Quarter-Phased Transit Curves

TCE 011403440-02   P= 0.934660 Days    $T_0=131.881290$  (BKJD)



# DV Quarter-Phased Transit Curves

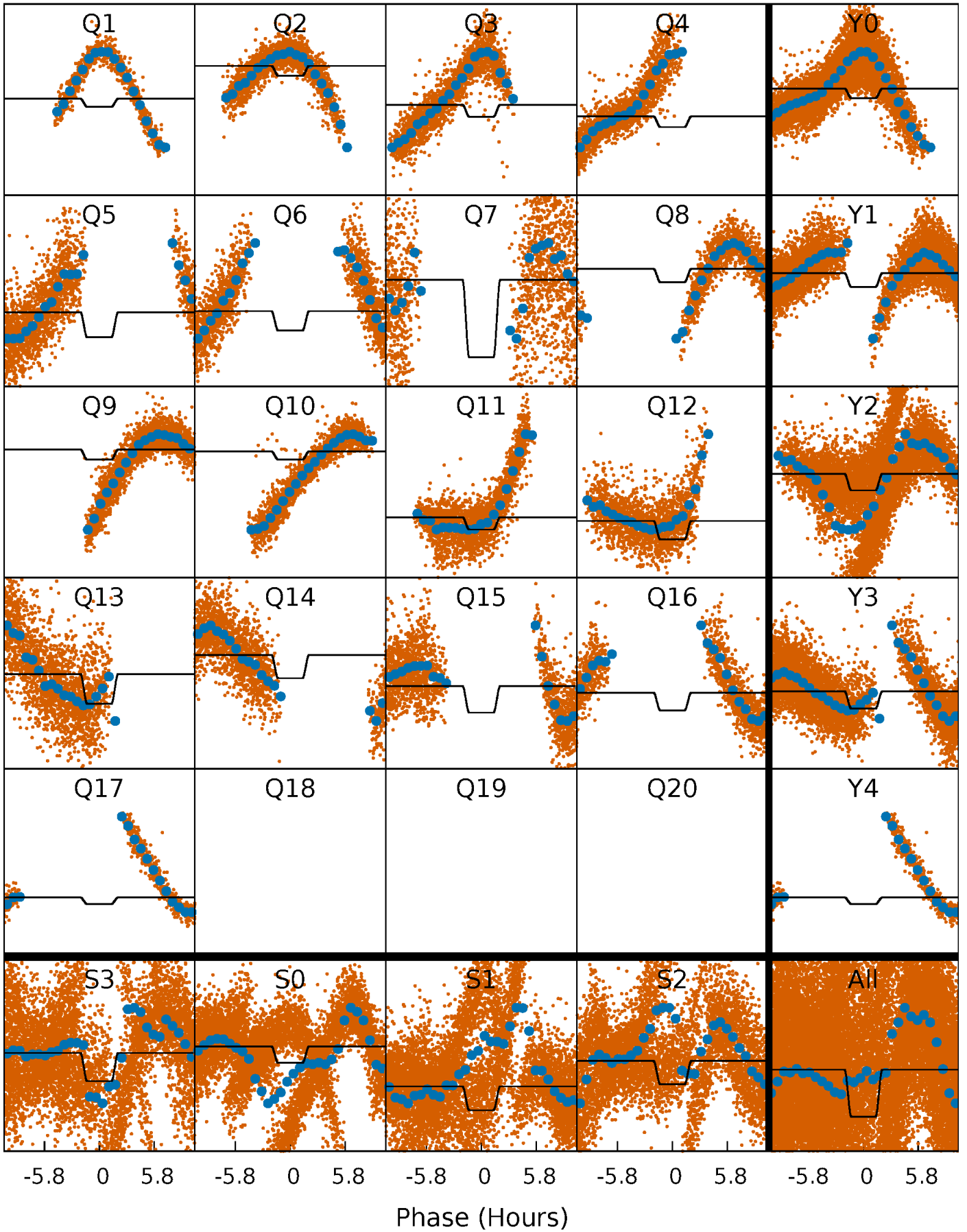
TCE 011403440-02   P= 0.934660 Days    $T_0=131.881290$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

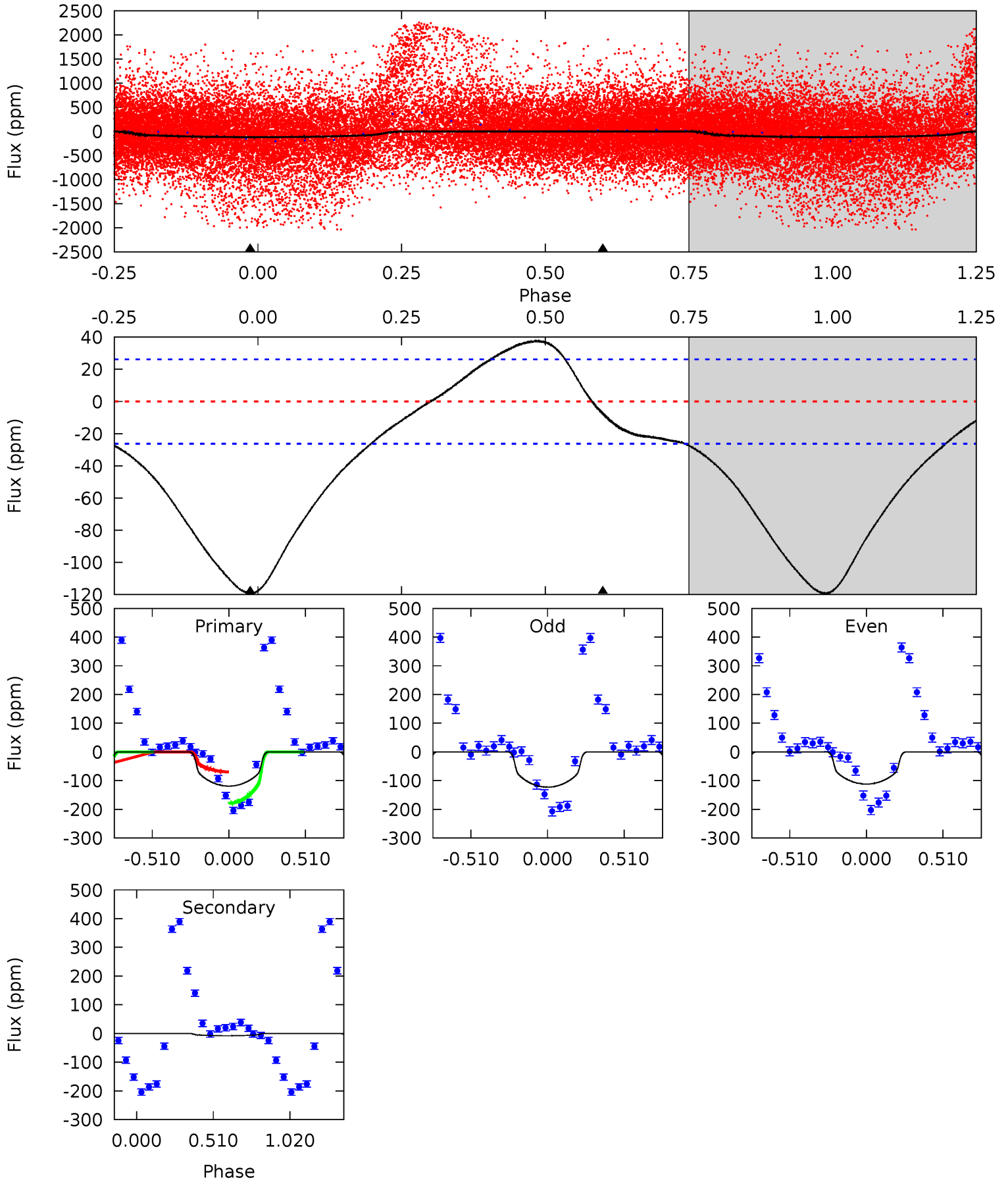
TCE 011403440-02   P= 0.934788 Days    $T_0=131.805931$  (BKJD)



# DV Model-Shift Uniqueness Test

011403440-02, P = 0.934660 Days, E = 130.946630 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
19.1	1.27	0	0	4.21	0.66	1.70	19.1	19.1	1.27	1.27	0.88	-2.91	0.24	12.0

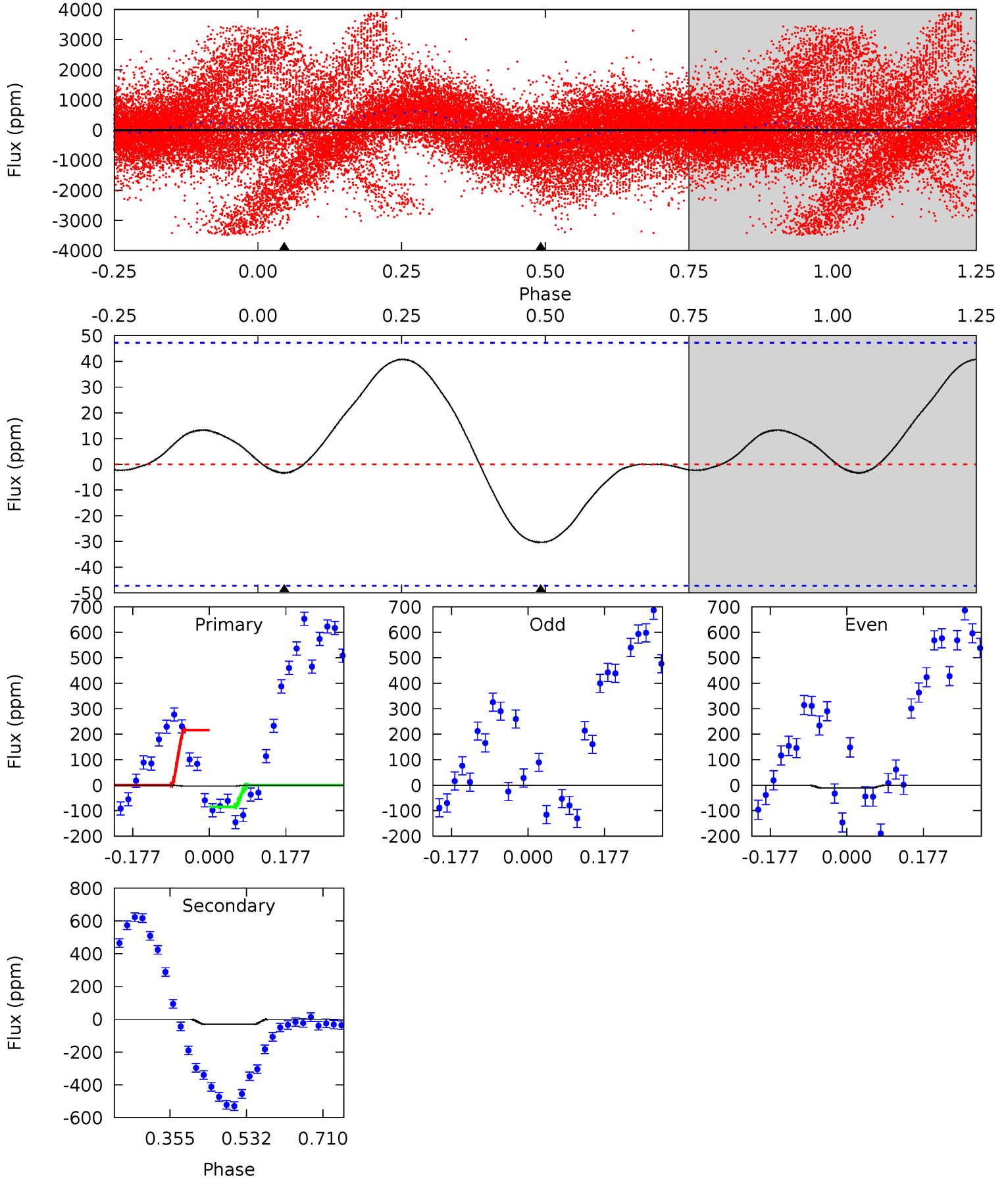




# Alt Model-Shift Uniqueness Test

011403440-02, P = 0.934788 Days, E = 130.871143 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
0.32	2.86	0	0	4.44	1.35	1.52	0.32	0.32	2.86	2.86	0.36	0.35	0.57	4.33



### Stellar Parameters For KIC 011403440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5855^{+157}_{-192}$	$4.505^{+0.052}_{-0.208}$	$-0.100^{+0.300}_{-0.300}$	$0.917^{+0.275}_{-0.092}$	$0.982^{+0.113}_{-0.113}$	$1.790^{+0.490}_{-0.924}$
	+3%/-3%	+1%/-5%	+300%/-300%	+30%/-10%	+12%/-12%	+27%/-52%
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 011403440-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-8 \pm 6$	$0.83^{+0.20}_{-0.15}$	$2580^{+188}_{-123}$	$3701^{+589}_{-1413}$	$1.987^{+2.287}_{-1.635}$
Alt.	$-30 \pm 11$	$2.26^{+0.36}_{-0.23}$	$2583^{+186}_{-117}$	$3266^{+234}_{-302}$	$1.076^{+0.502}_{-0.417}$

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

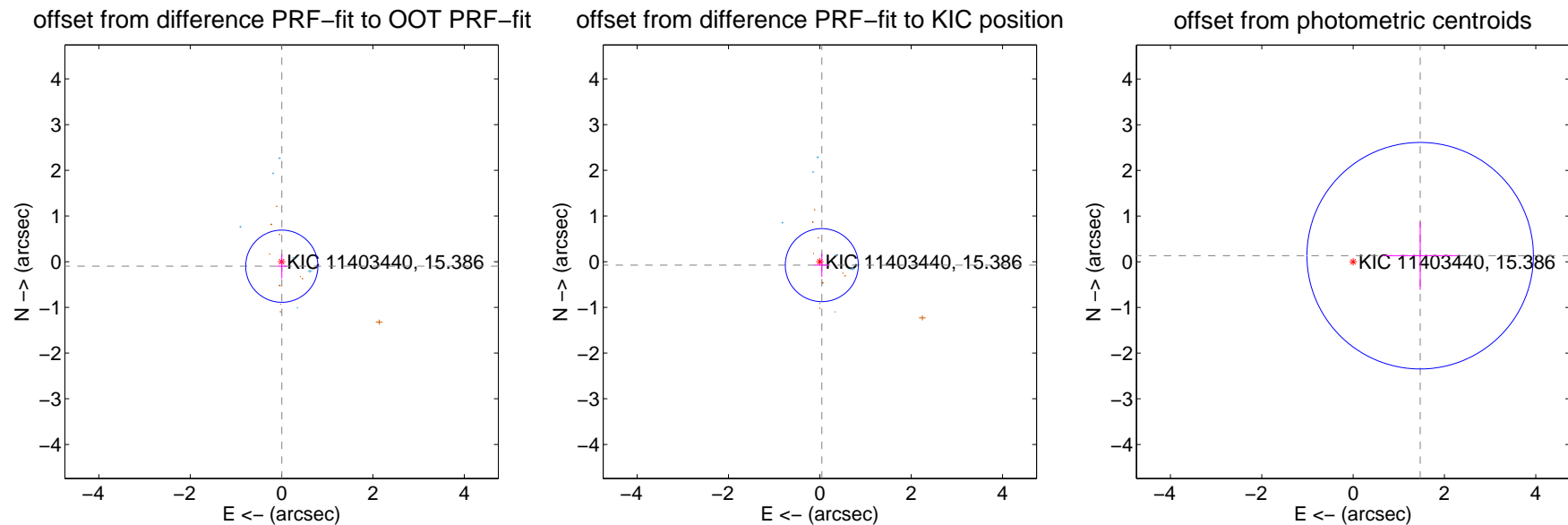
## DV Centroid Data

Supplemental centroid analysis for 011403440-02. Kepler magnitude: 15.39. Transit SNR 9.19

There are 6 quarters with good PRF difference image offsets

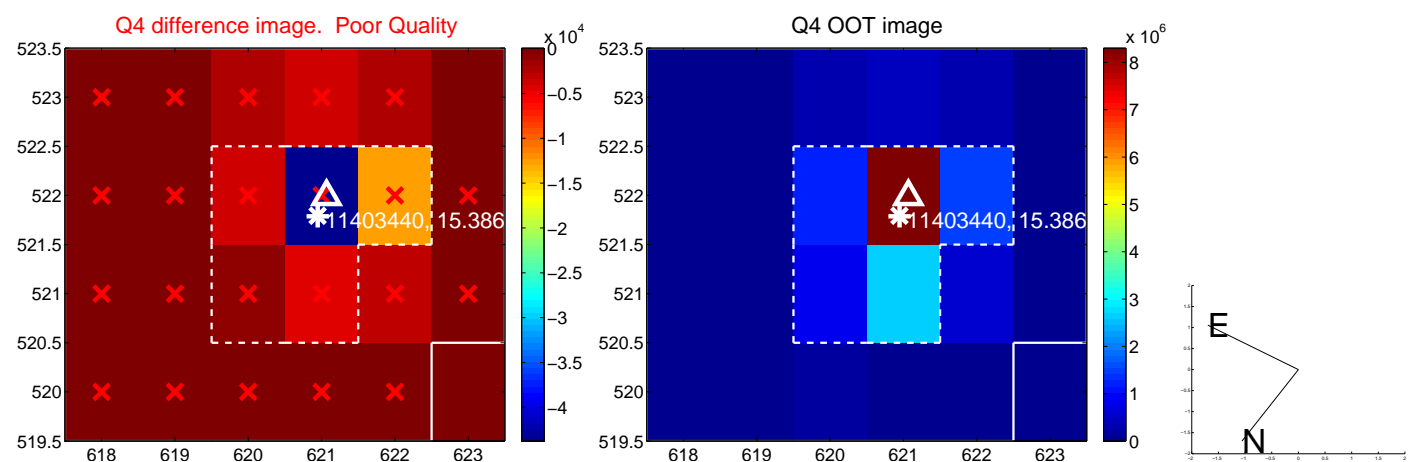
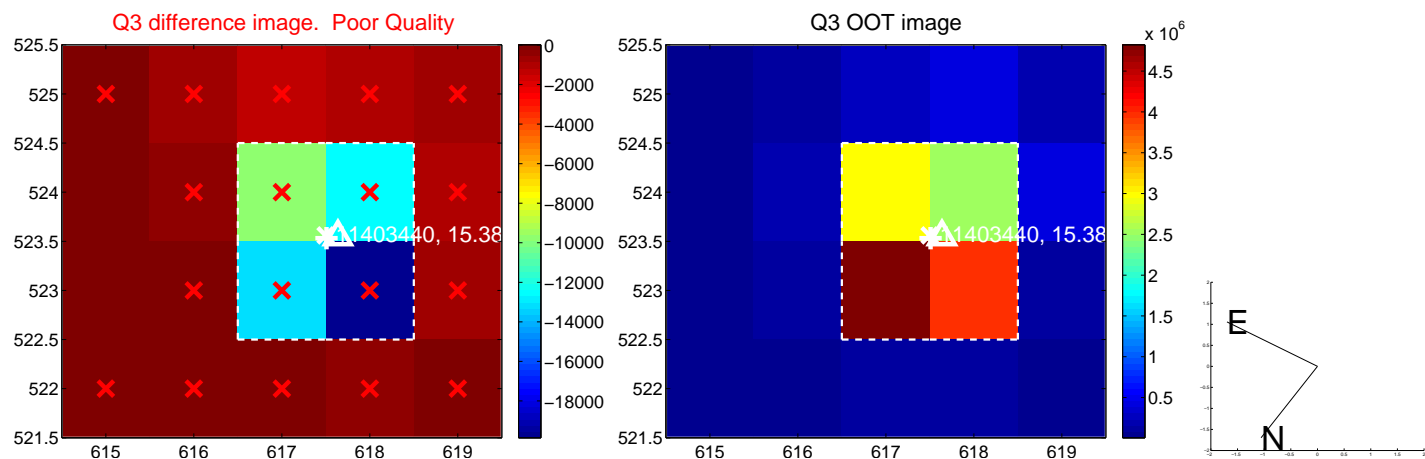
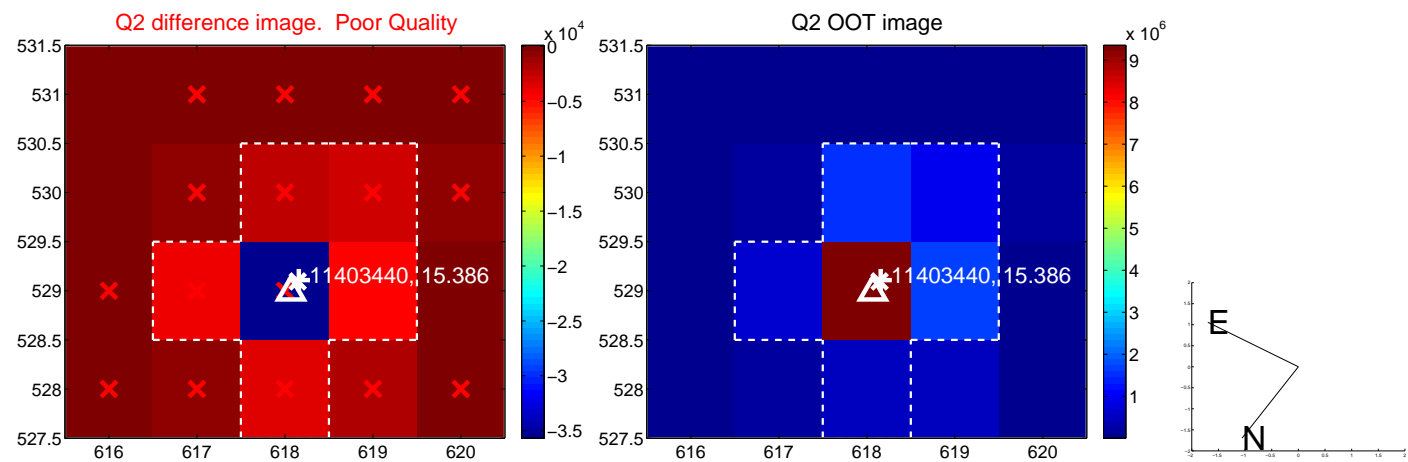
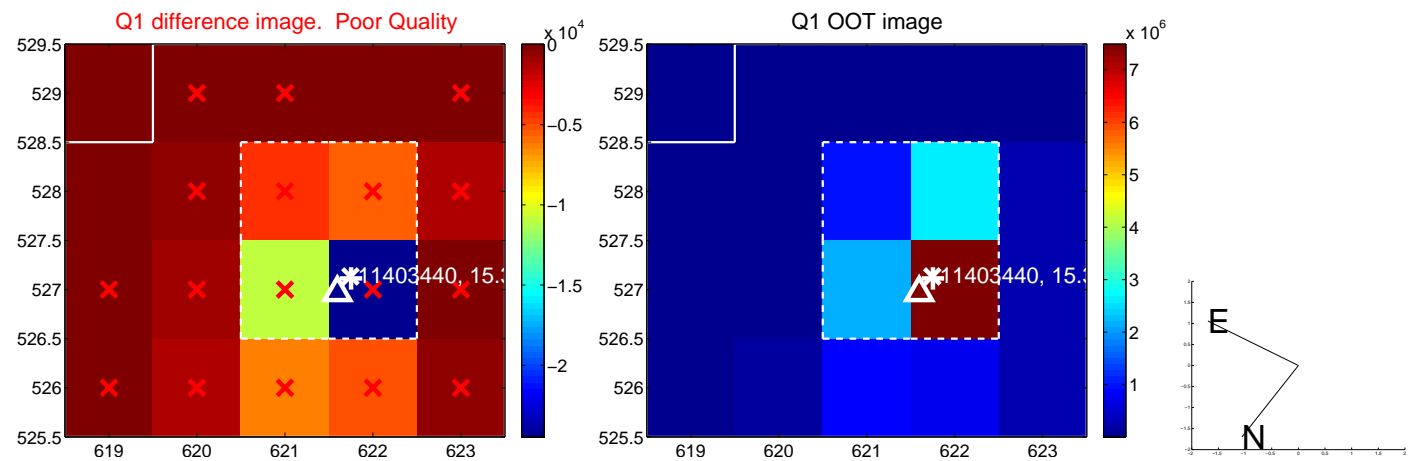
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.099 \pm 0.263$	0.38	$-0.005 \pm 0.107$	$-0.099 \pm 0.264$
PRF-fit source offset from KIC position	$0.086 \pm 0.266$	0.32	$-0.043 \pm 0.159$	$-0.075 \pm 0.253$
photometric centroid source offset	$1.47 \pm 0.83$	1.78	$-1.47 \pm 0.83$	$0.13 \pm 0.75$

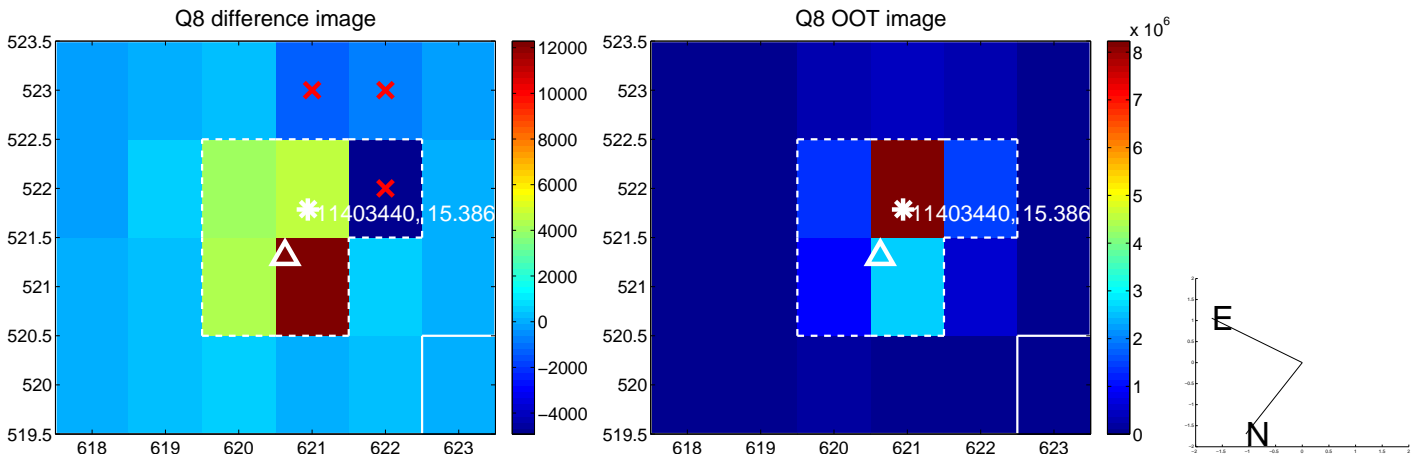
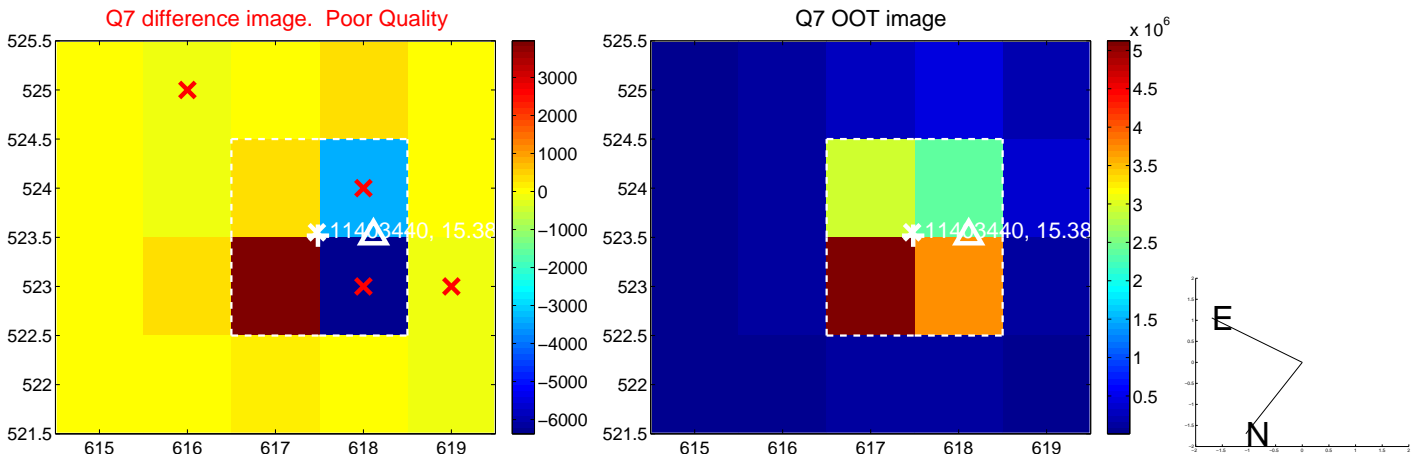
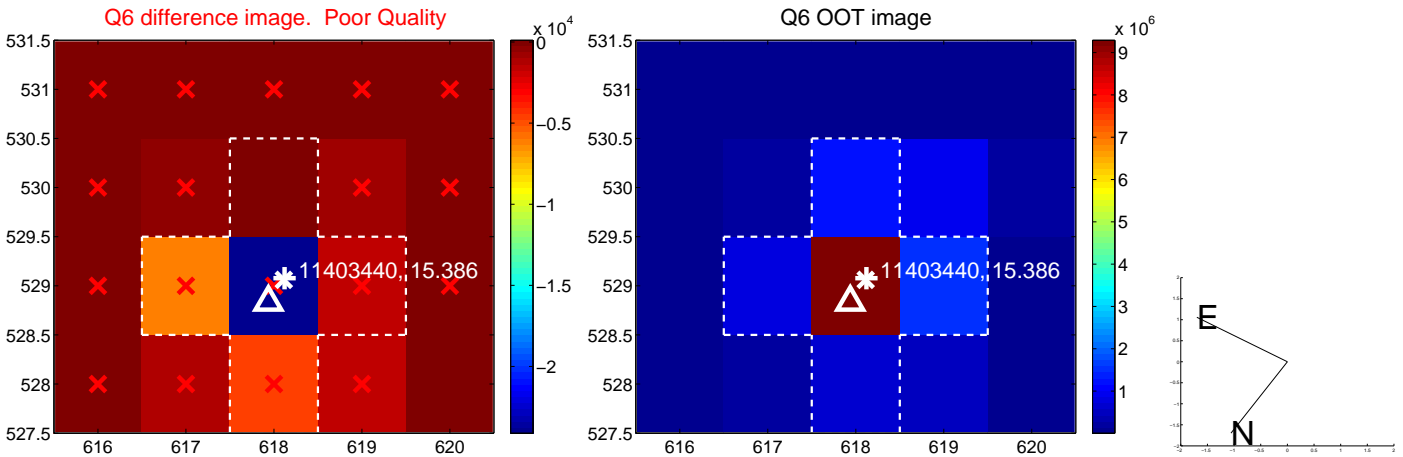
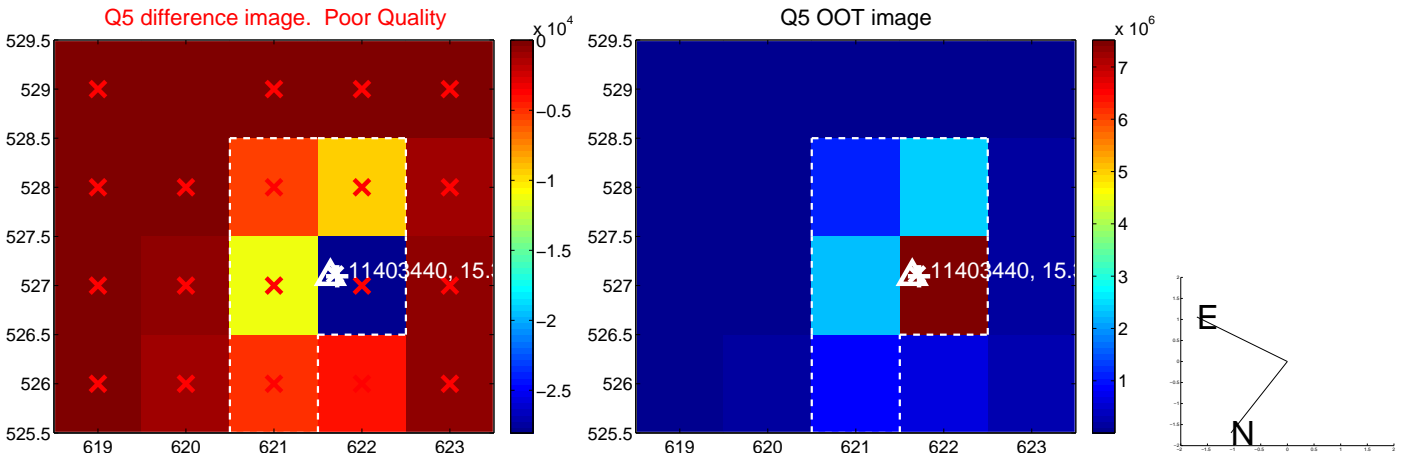


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

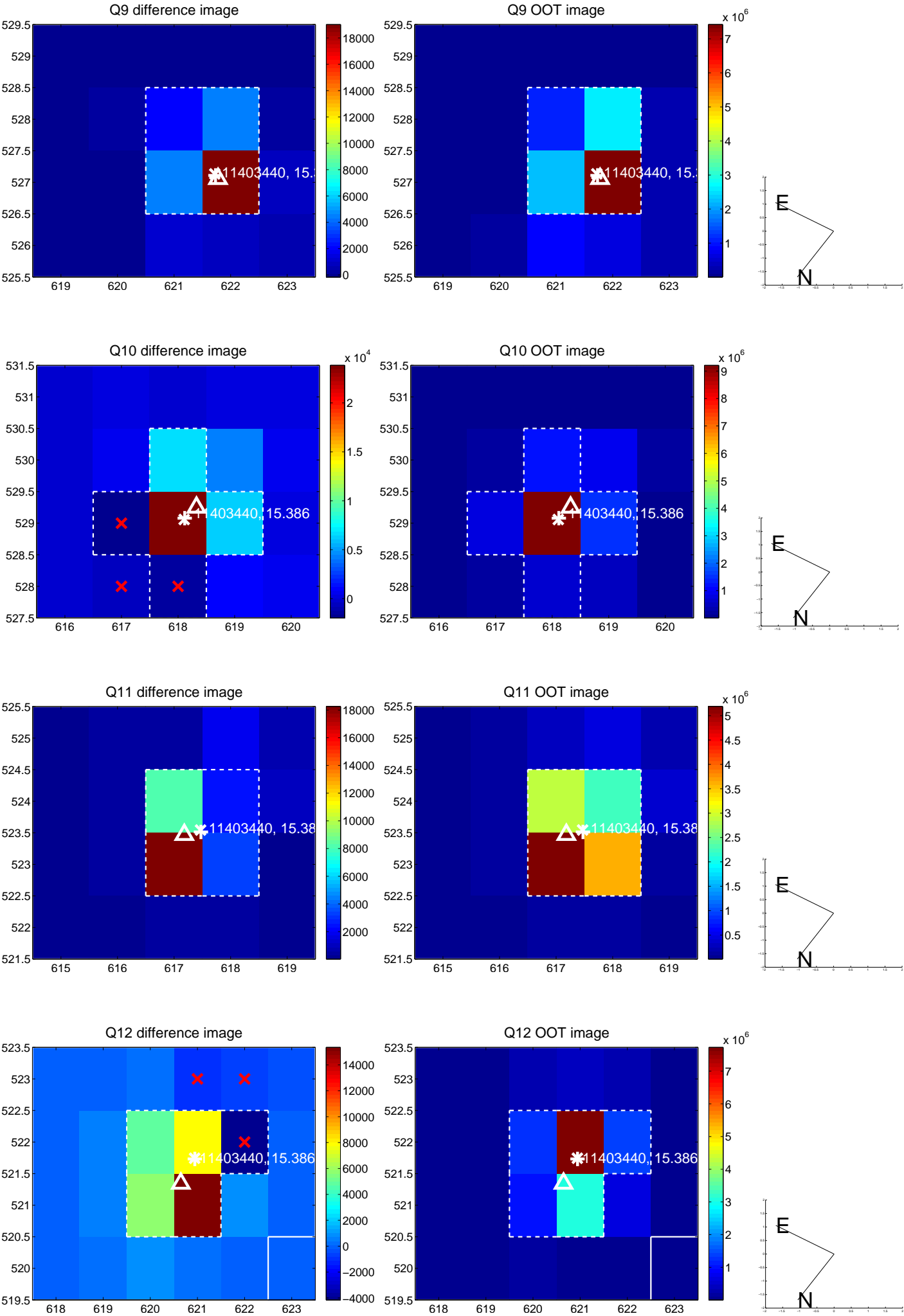
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



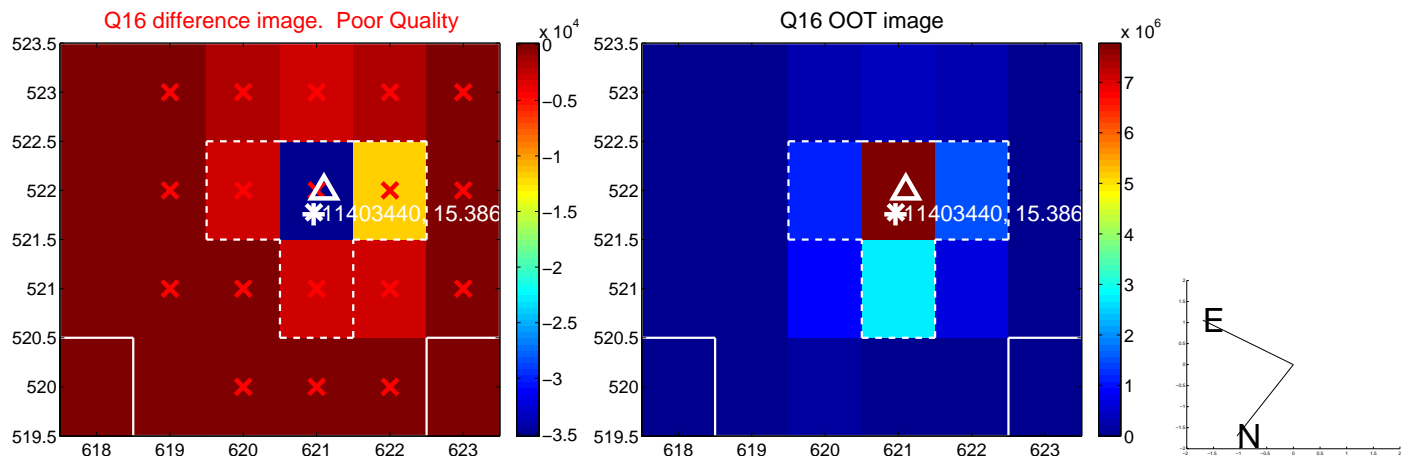
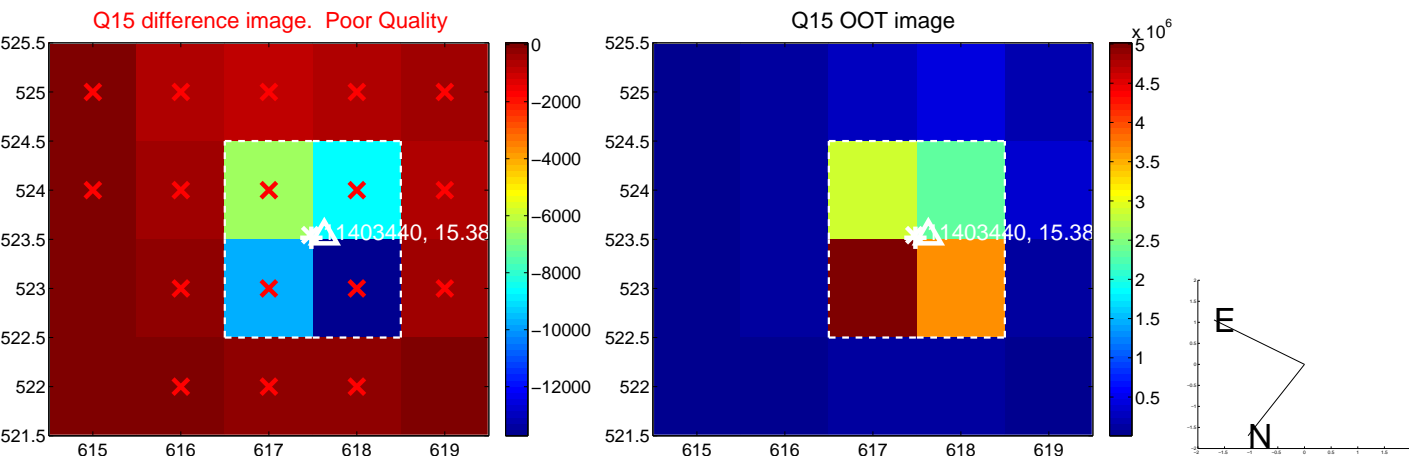
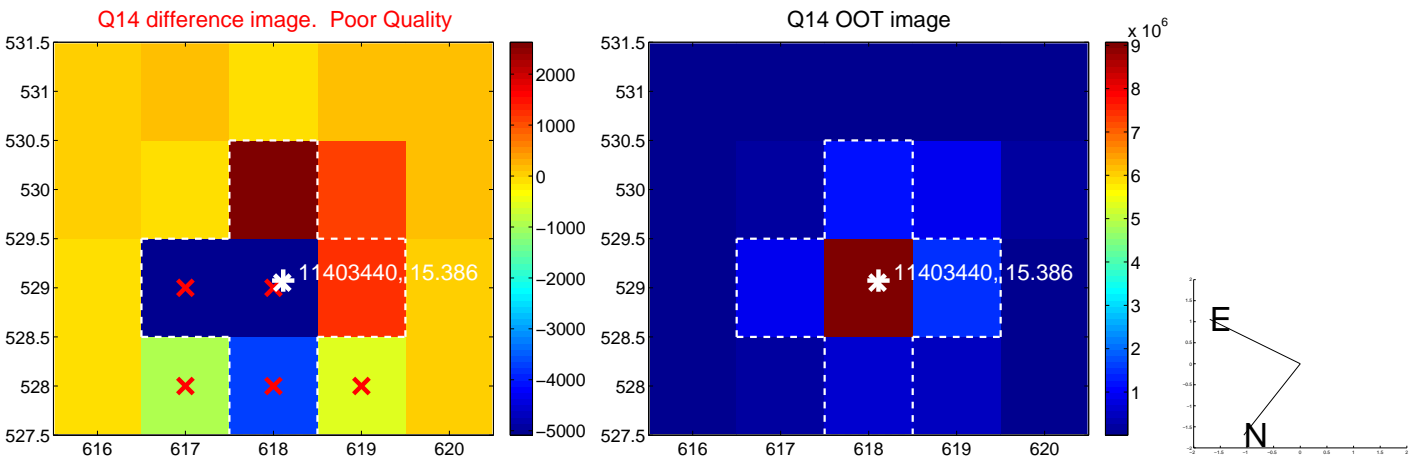
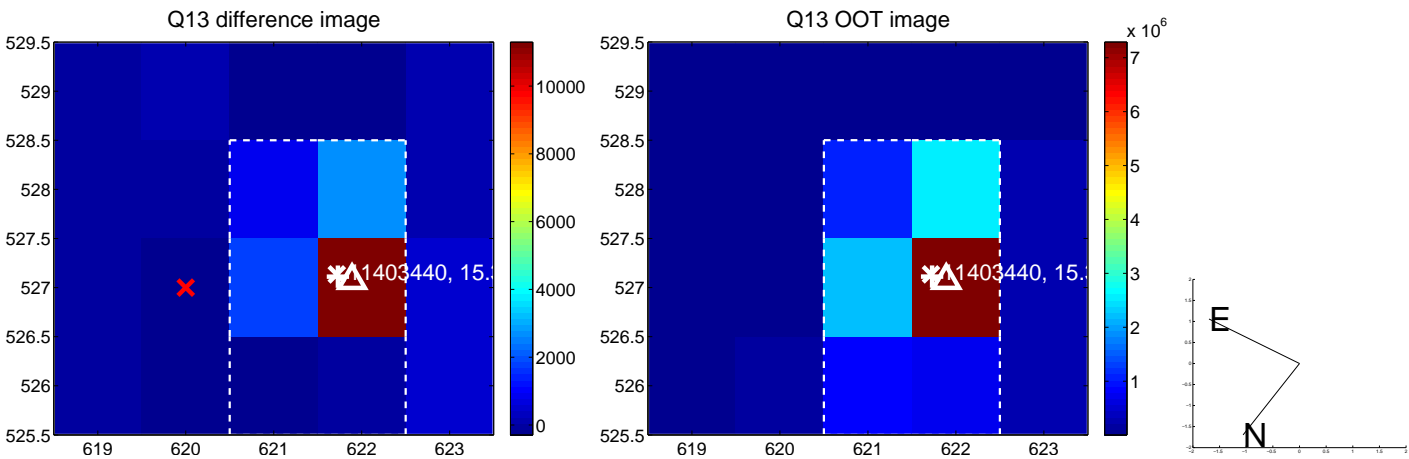
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

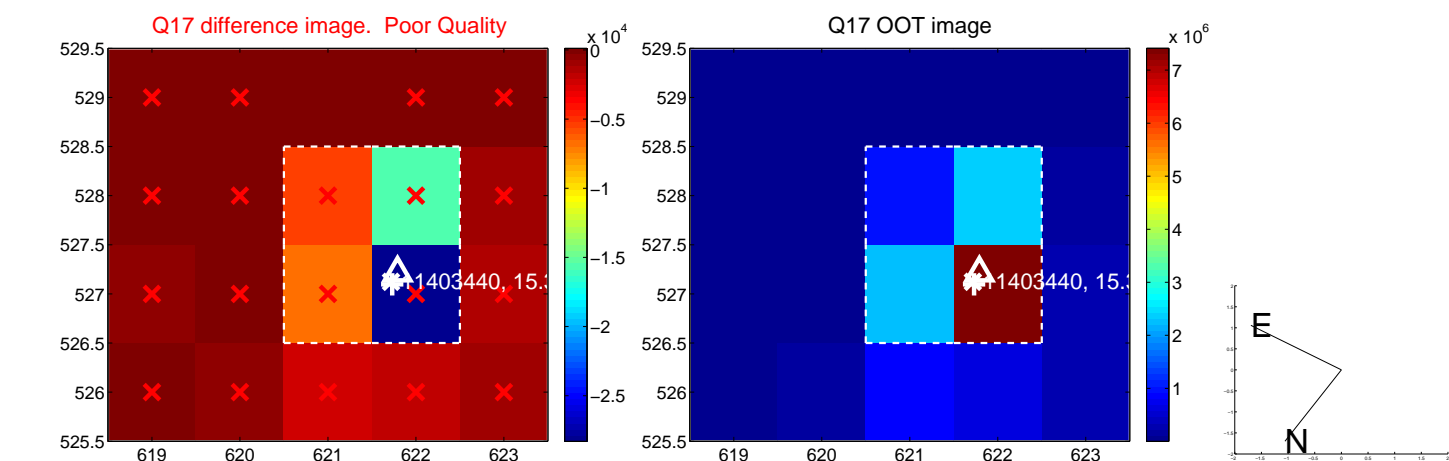


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

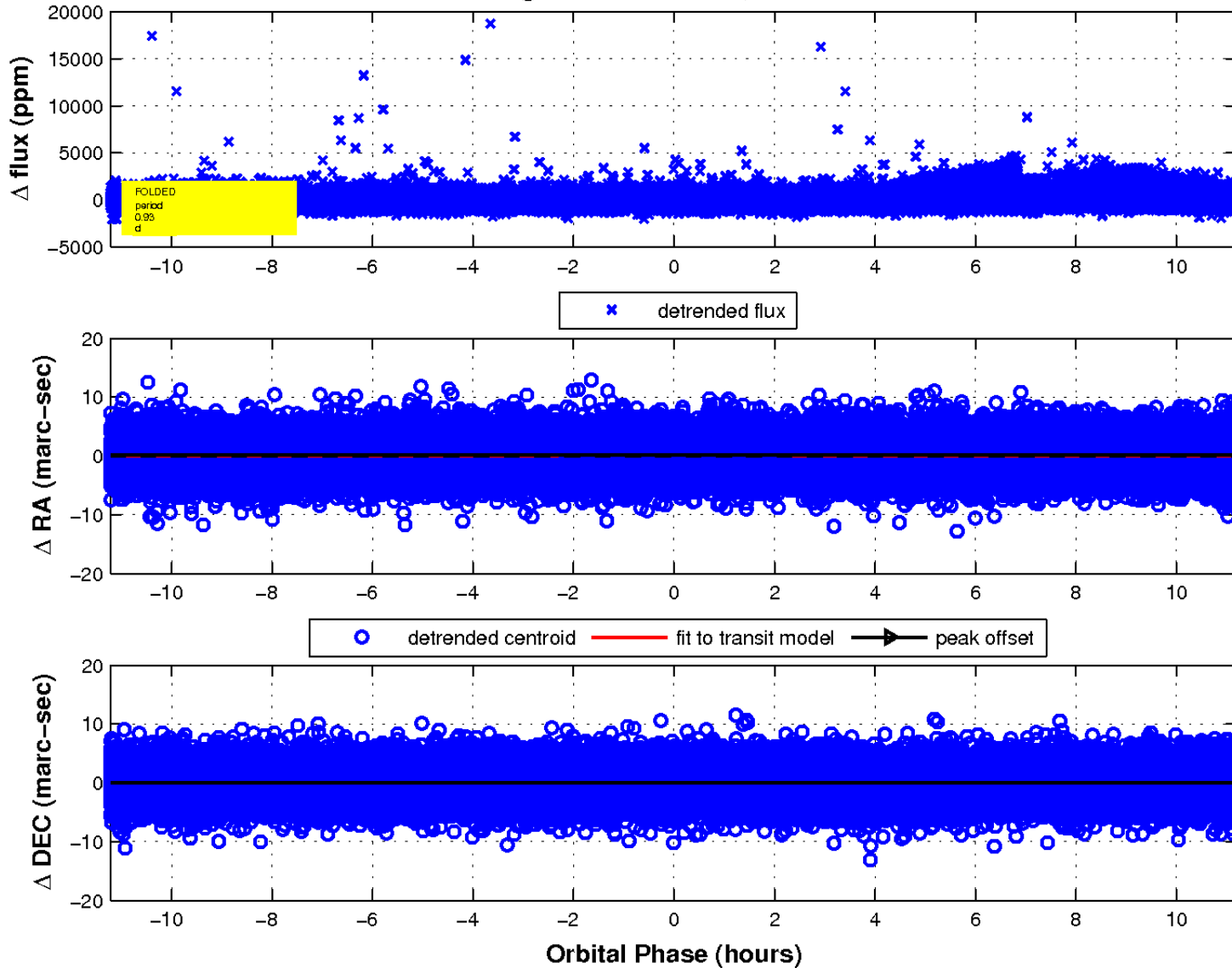




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

