

# KIC 005370646

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005370646-01	OBS	No	0.579208	131.768386	95.7	1.416	12.7	13.8	1.32	7276	1.49	19646.60
005370646-02	OBS	No	0.522539	131.813214	80.8	3.784	11.6	12.1	1.32	7276	1.22	22537.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005370646-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005370646-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV

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

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

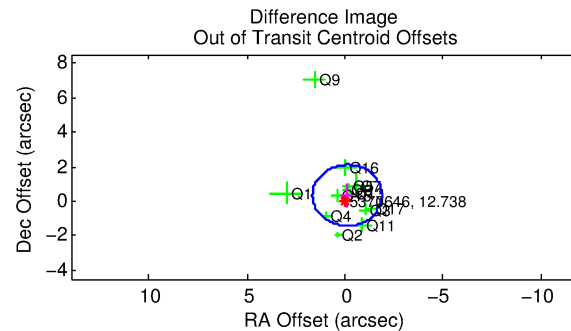
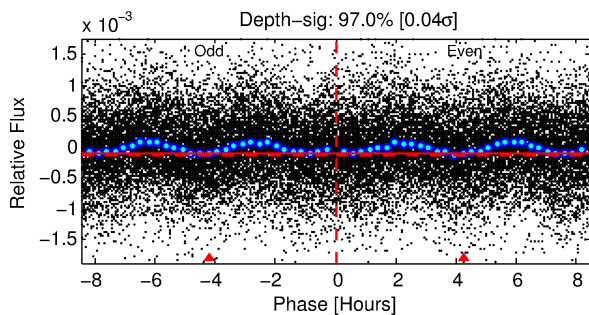
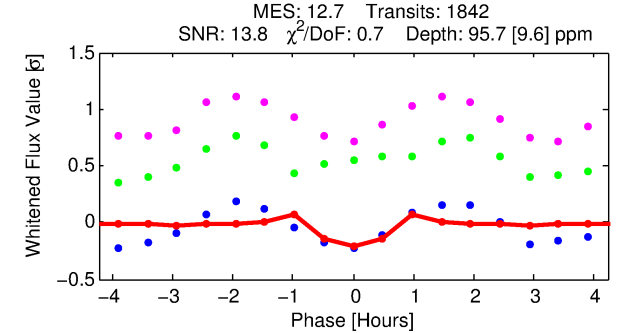
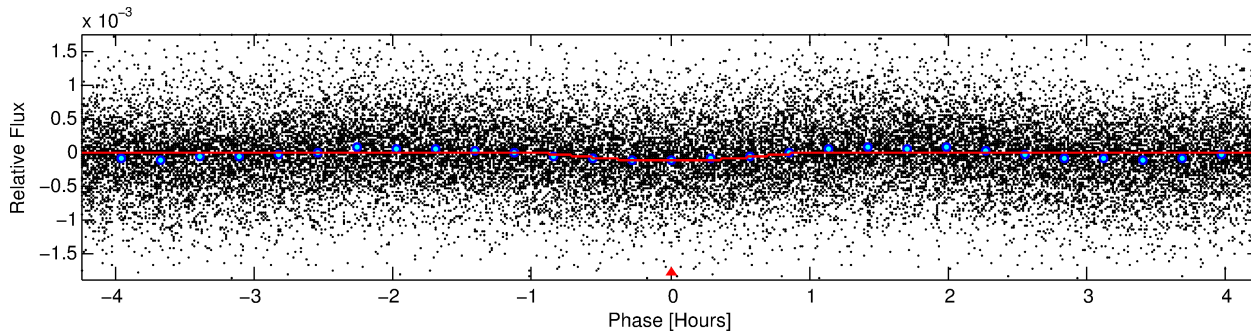
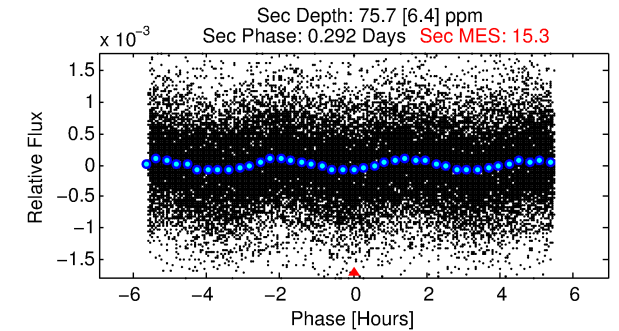
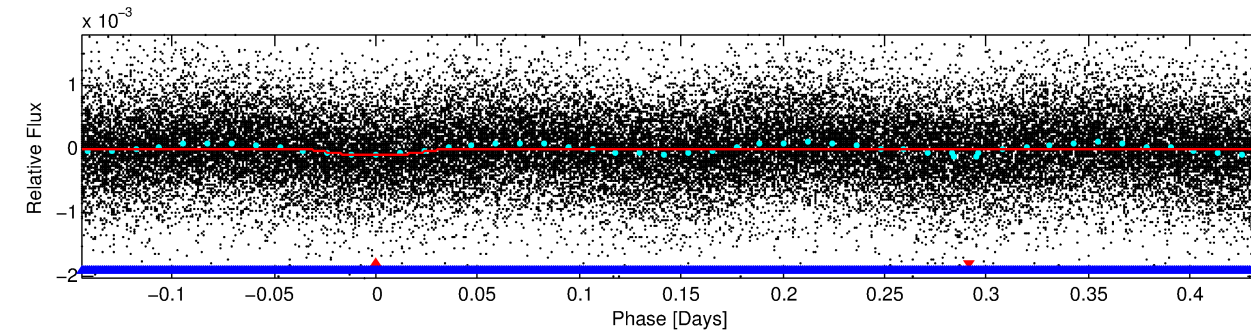
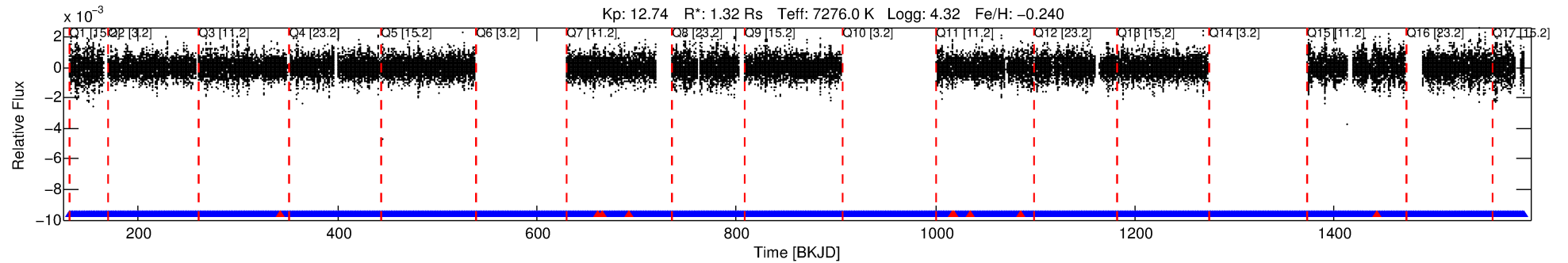
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005370646-01

No Significant Match Found

# DV One-Page Summary

KIC: 5370646 Candidate: 1 of 2 Period: 0.579 d



## DV Fit Results:

Period = 0.57921 [0.00001] d  
Epoch = 131.7684 [0.0009] BKJD  
Rp/R\* = 0.0103 [0.0024]  
a/R\* = 1.76 [1.70]  
b = 0.89 [0.34]  
Seff = 19646.60 [9247.00]  
Teff = 3019 [355] K  
Rp = 1.49 [0.67] Re  
a = 0.0149 [0.0047] AU  
Ag = 4.18 [2.68] [1.18σ]  
**Teffp = 6674 [828] K [4.05σ]**

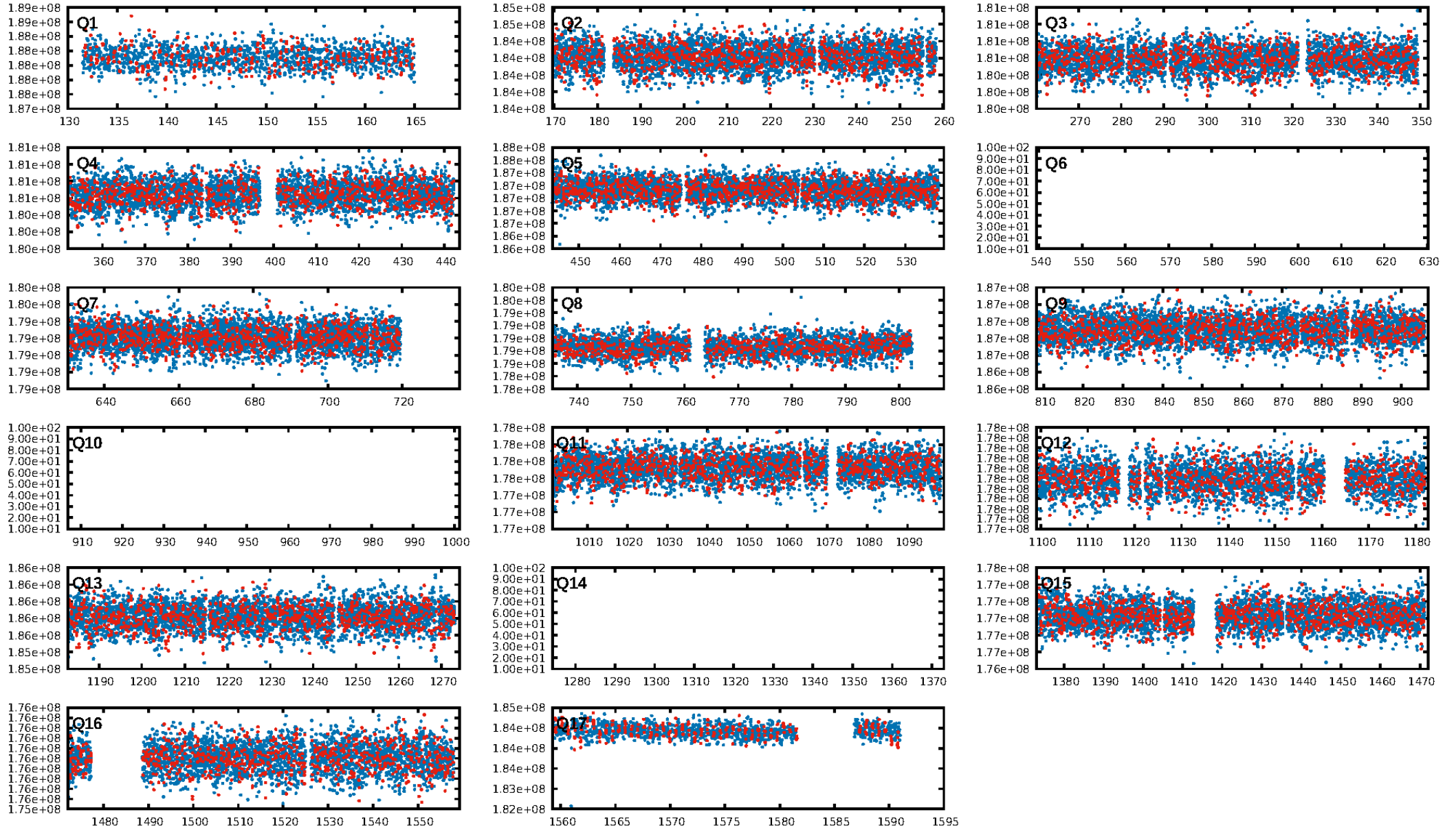
## DV Diagnostic Results:

ShortPeriod-sig: 26.4% [0.34σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.54e-34  
RollingBand-fgt: 0.99 [1729/1738]  
**GhostDiagnostic-chr: 0.8109**  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.352 arcsec [0.60σ]  
KicOffset-rm: 0.348 arcsec [0.69σ]  
OotOffset-st: 1/4/3/5 [13]  
KicOffset-st: 1/4/3/5 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 0.00 [0/14]

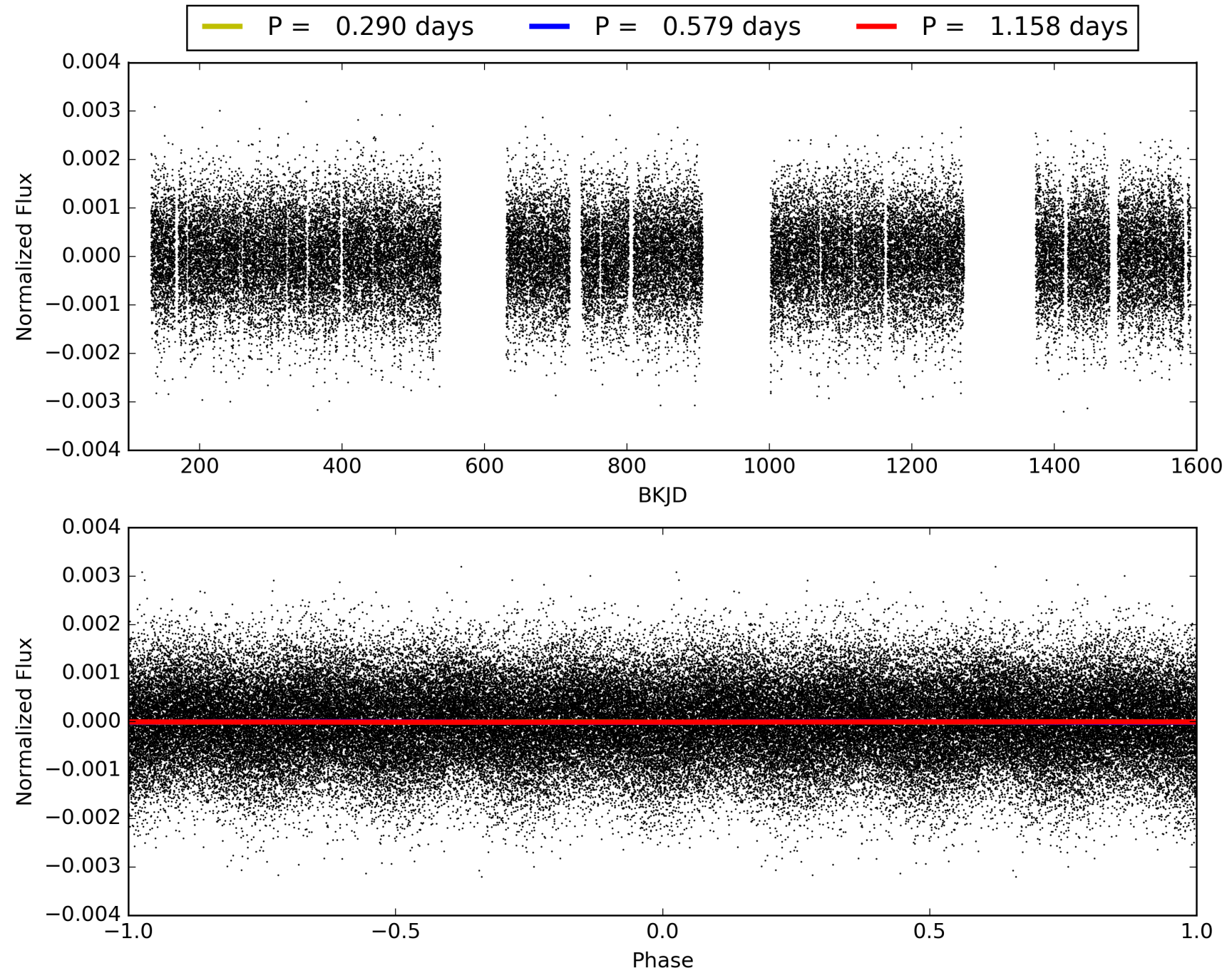
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:33:25 Z

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

# TCE 005370646-01, PDC Light Curves



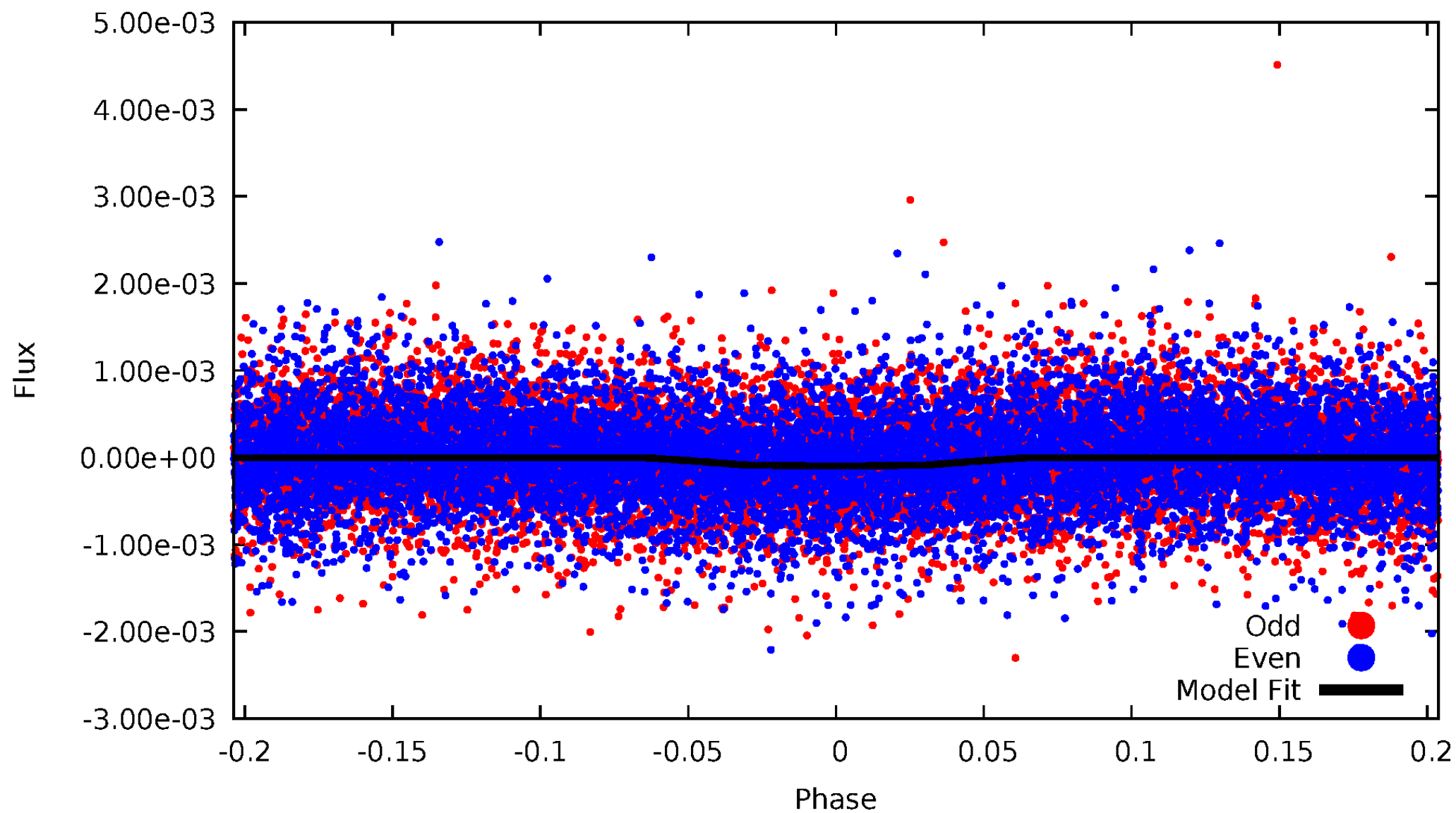
TCE 005370646-01





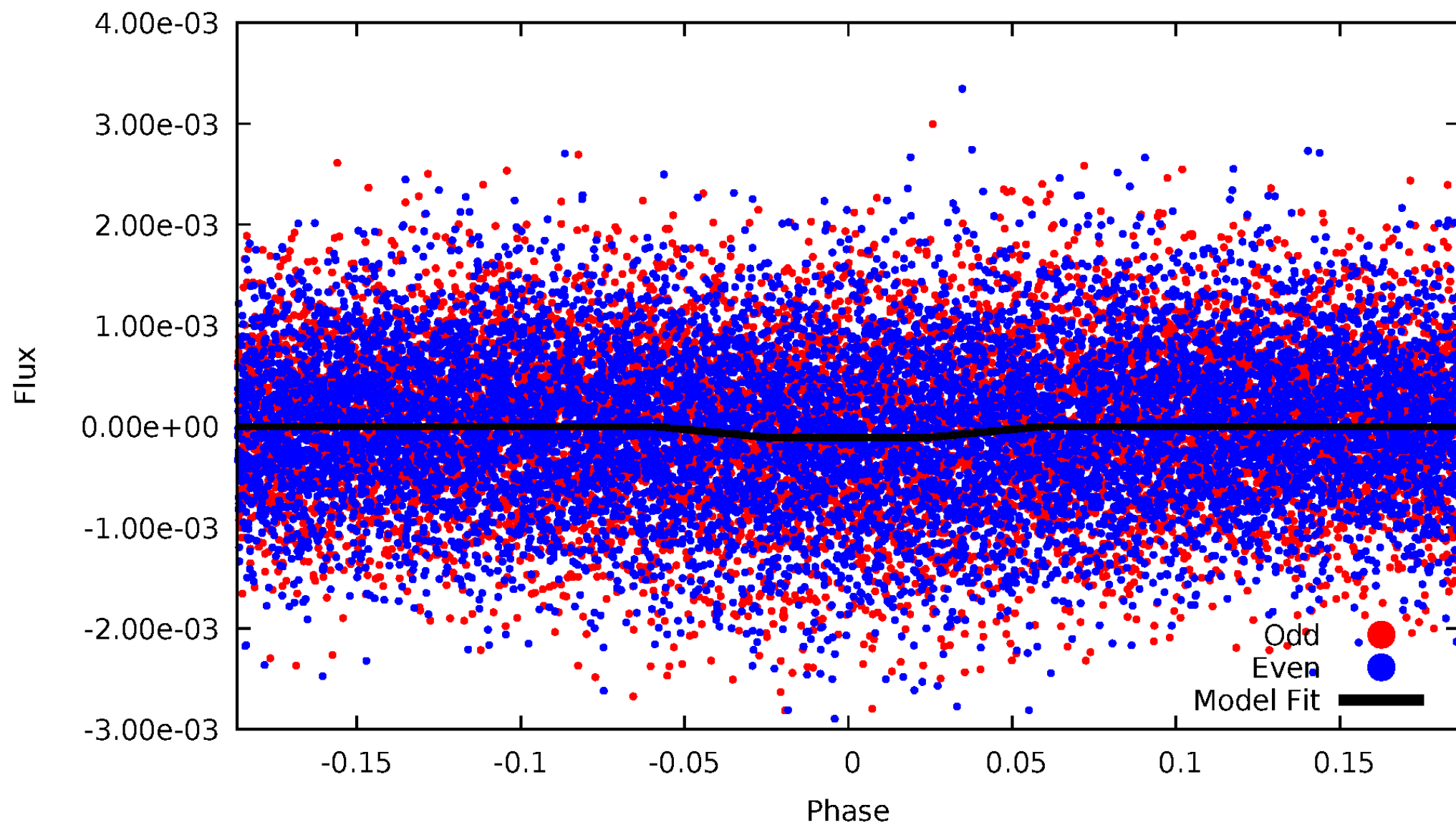
# DV Odd/Even

TCE 005370646-01



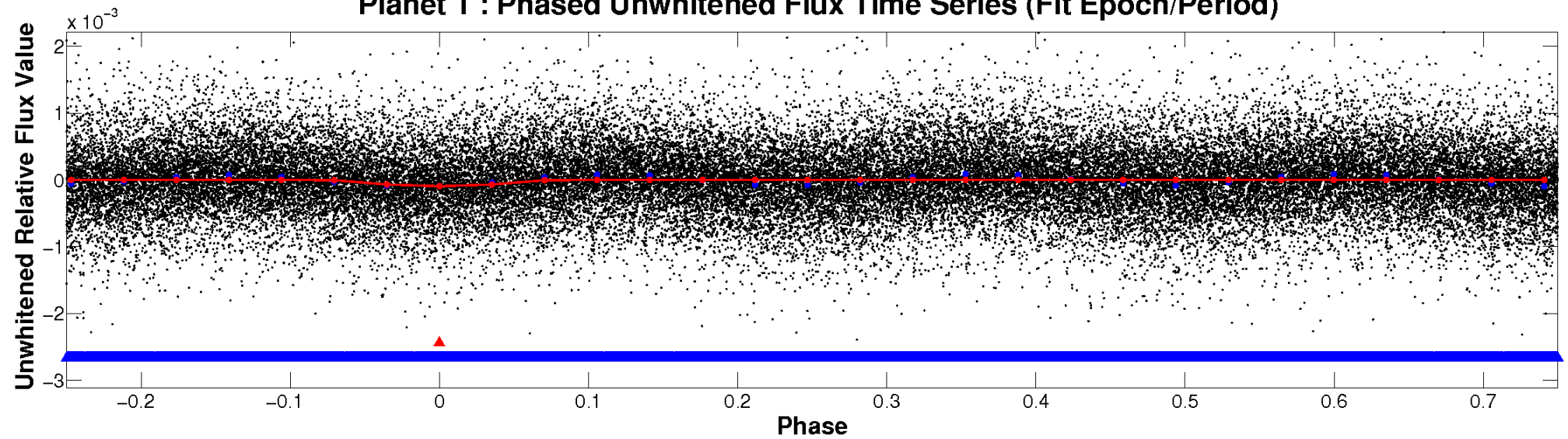
# ALT Odd/Even

TCE 005370646-01

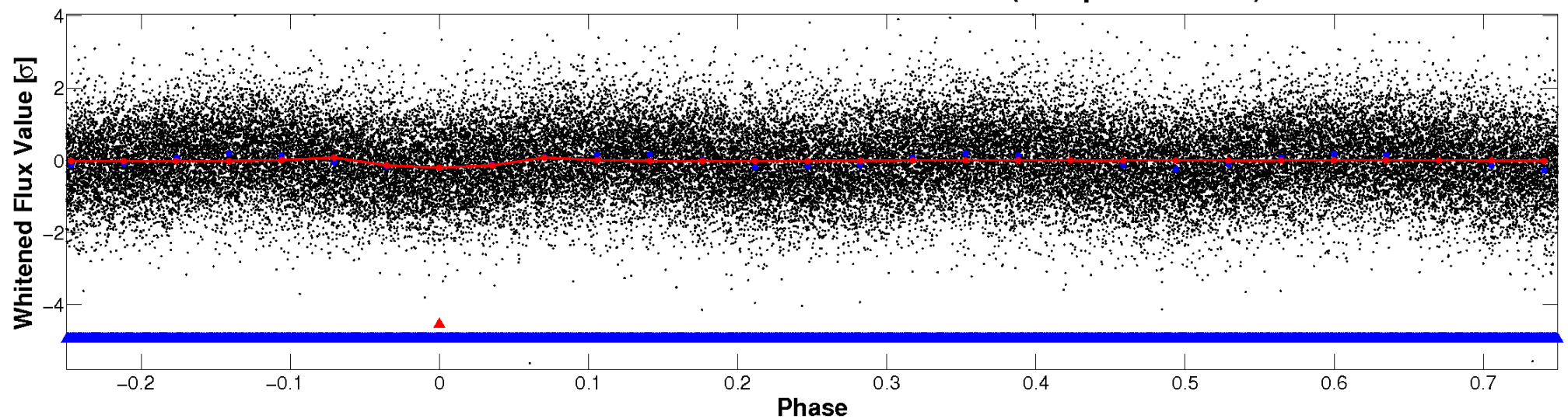


# Non-Whitened Vs. Whitened Light Curve

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

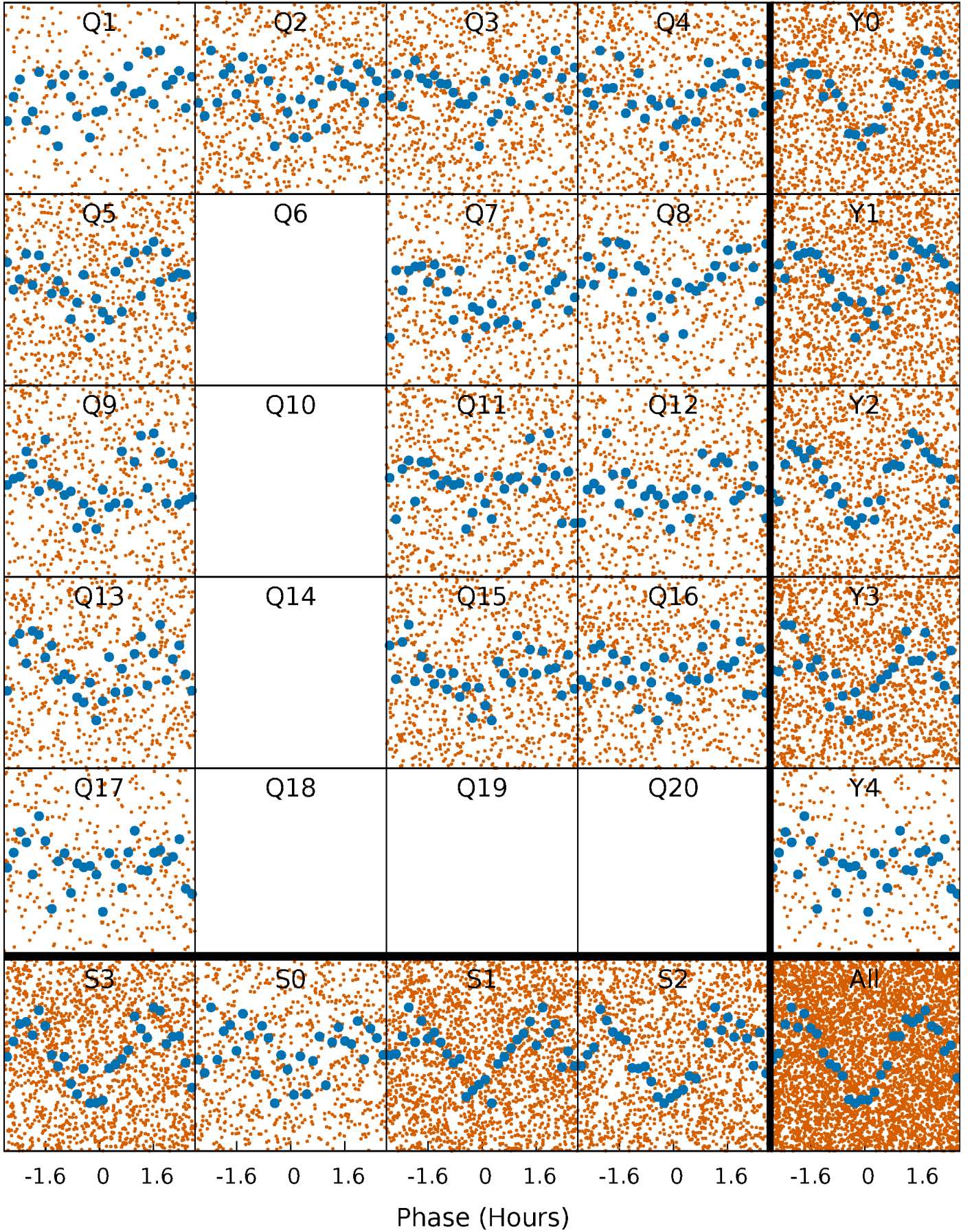


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

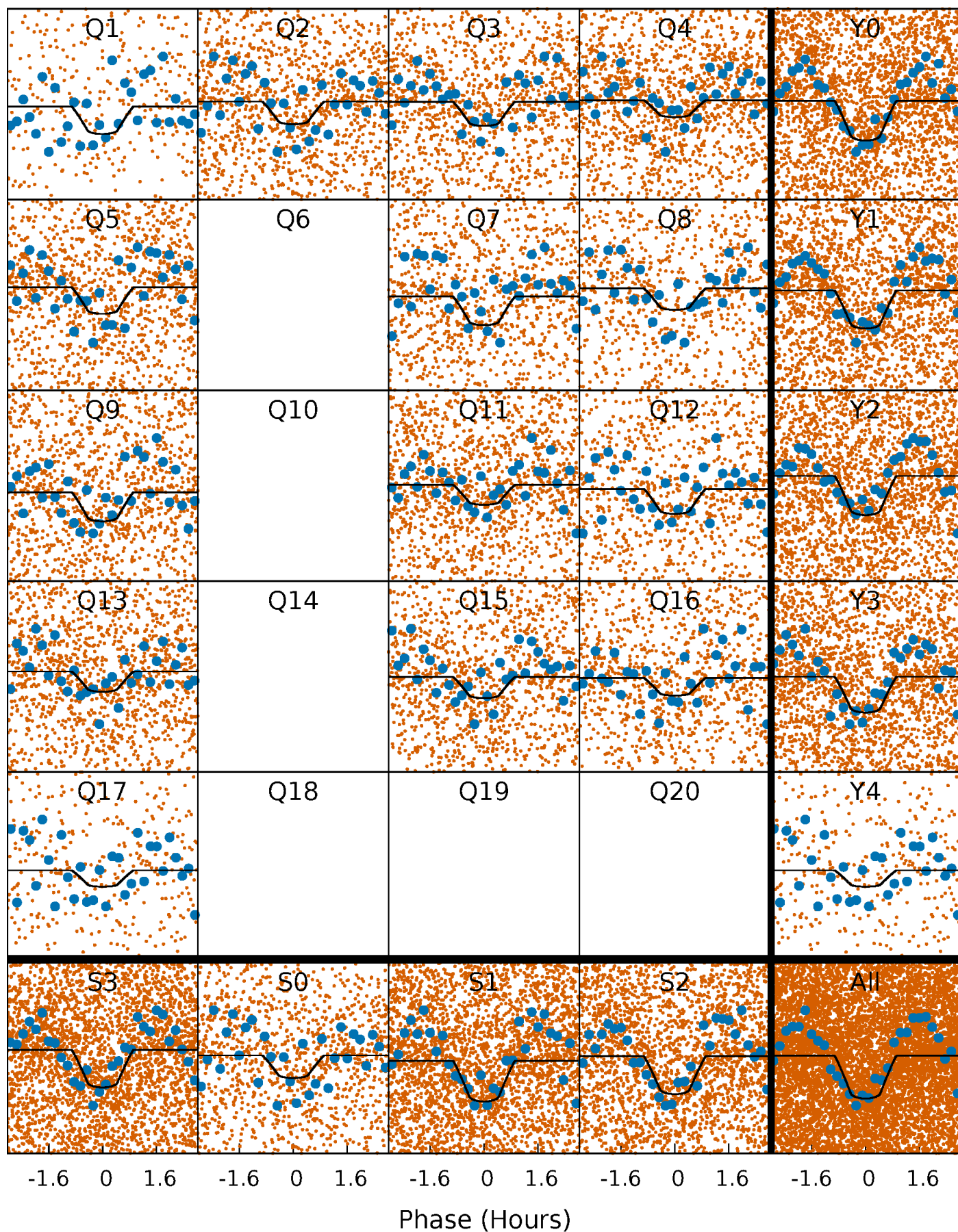
TCE 005370646-01   P= 0.579208 Days    $T_0=131.768386$  (BKJD)





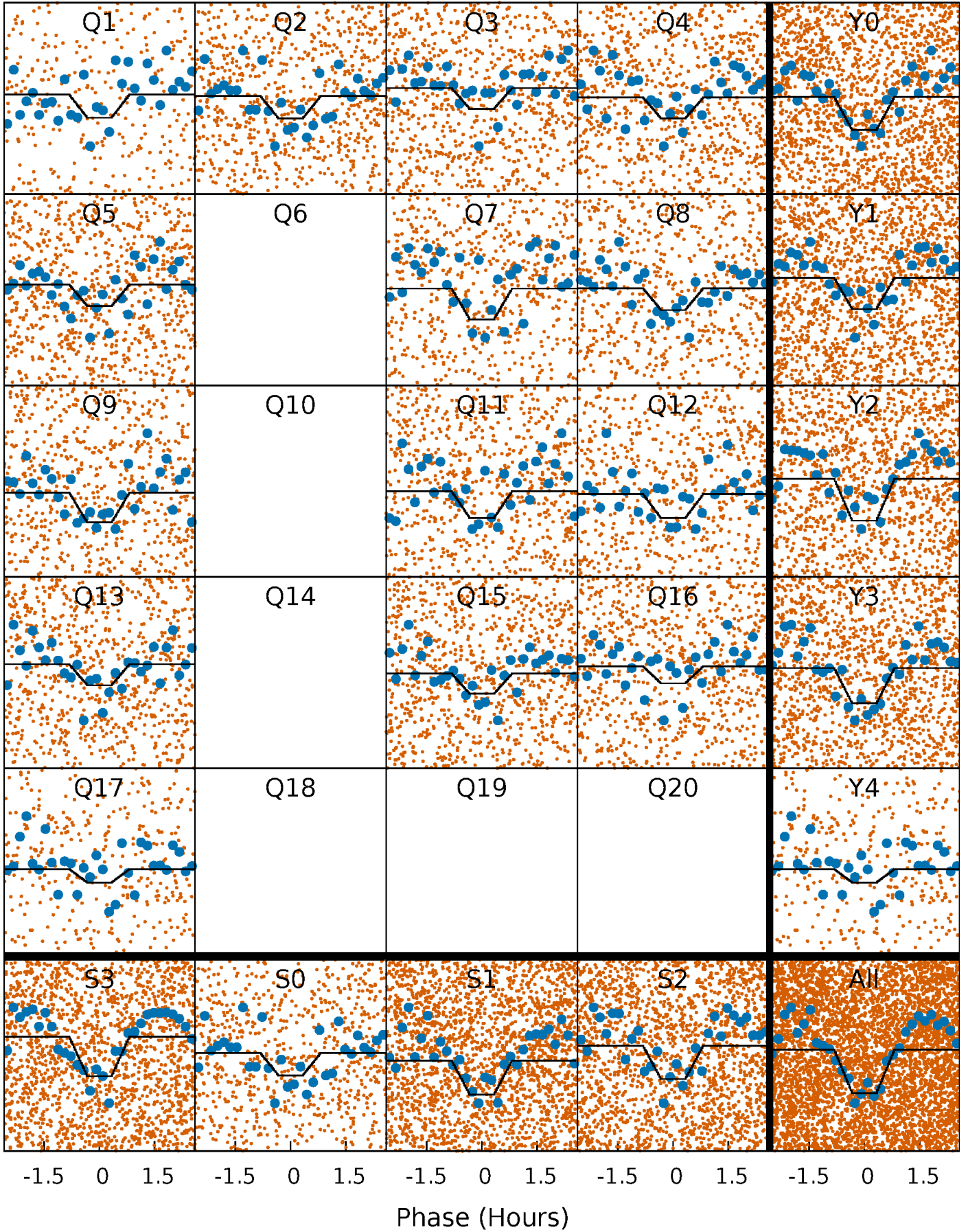
# DV Quarter-Phased Transit Curves

TCE 005370646-01 P= 0.579208 Days  $T_0=131.768386$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

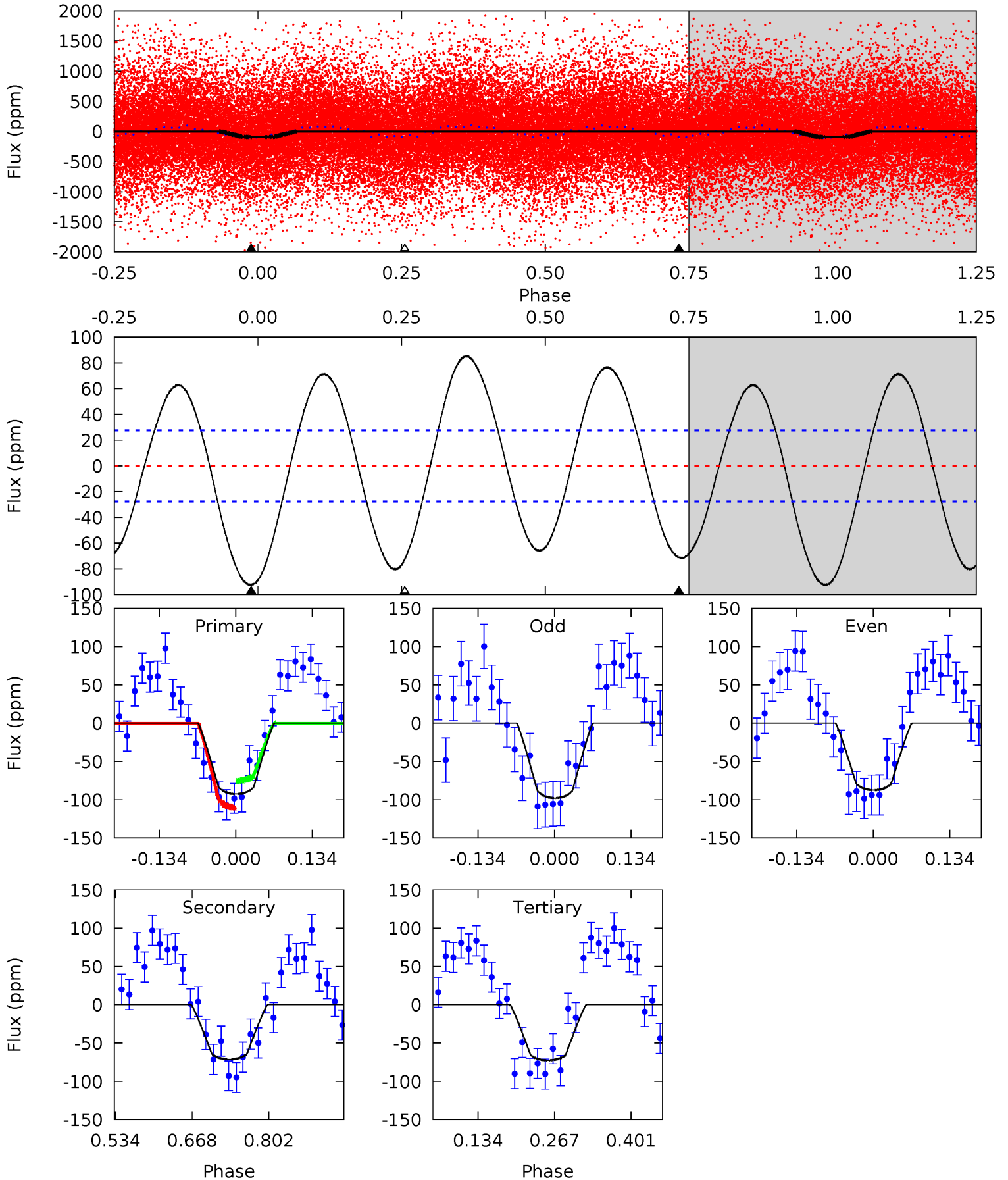
TCE 005370646-01 P= 0.579204 Days  $T_0=131.768045$  (BKJD)



# DV Model-Shift Uniqueness Test

005370646-01, P = 0.579208 Days, E = 131.189178 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
15.1	11.6	11.8	0	4.50	1.50	8.71	3.25	15.1	-0.22	11.6	0.84	0.95	0.48	2.85

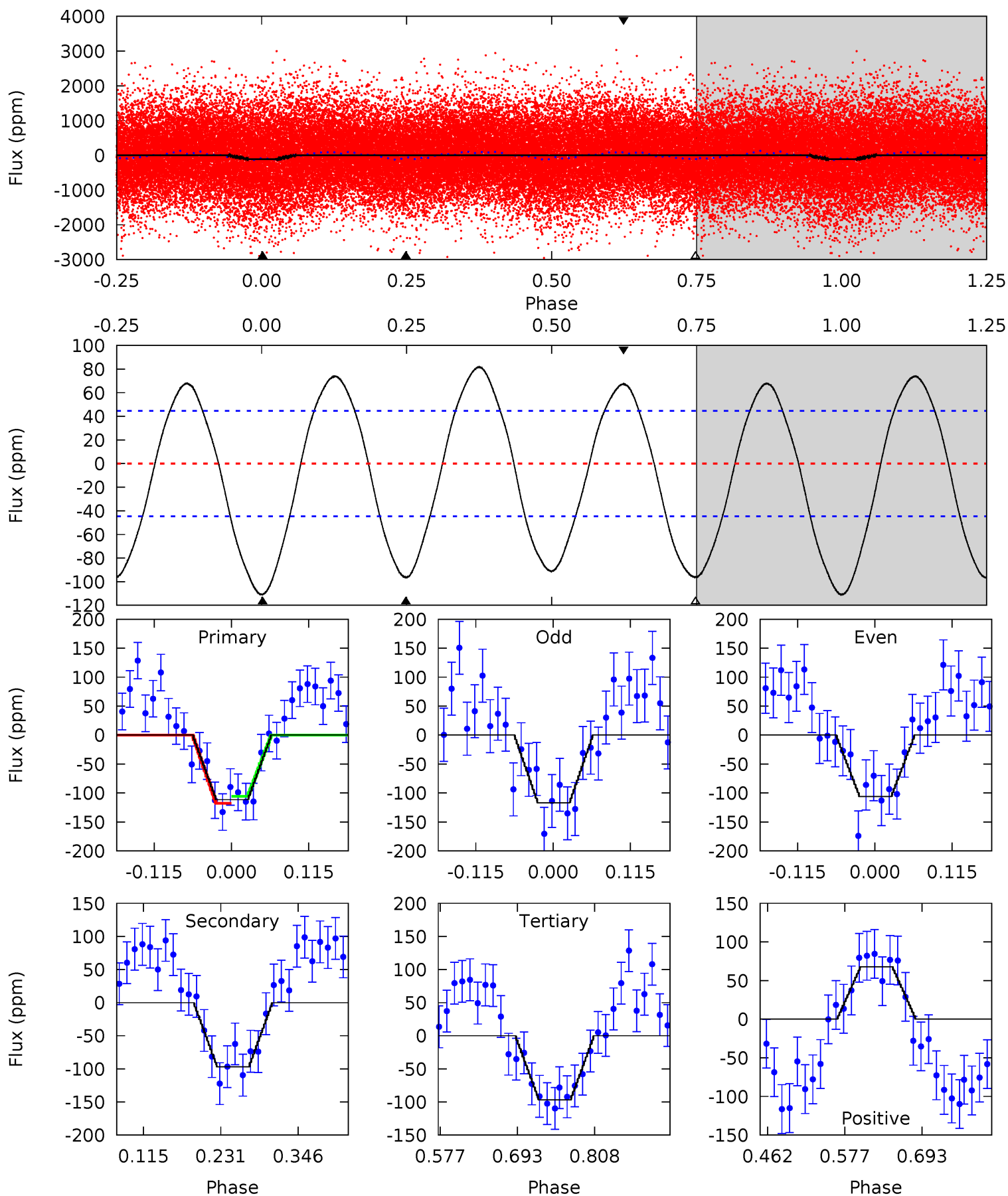




# Alt Model-Shift Uniqueness Test

005370646-01, P = 0.579204 Days, E = 131.188841 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
11.3	9.86	9.83	6.91	4.53	1.57	6.09	1.50	4.43	0.03	2.95	0.55	1.43	0.42	0.59





### Stellar Parameters For KIC 005370646

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7276^{+203}_{-304}$	$4.318^{+0.058}_{-0.232}$	$-0.240^{+0.250}_{-0.350}$	$1.321^{+0.512}_{-0.160}$	$1.342^{+0.225}_{-0.184}$	$0.819^{+0.212}_{-0.499}$
	+3%/-4%	+1%/-5%	+104%/-146%	+39%/-12%	+17%/-14%	+26%/-61%
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 005370646-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-71 \pm 6$	$1.60^{+0.46}_{-0.40}$	$4312^{+376}_{-243}$	$6319^{+1070}_{-730}$	$3.378^{+2.577}_{-1.276}$
Alt.	$-97 \pm 10$	$1.58^{+0.47}_{-0.39}$	$4294^{+365}_{-242}$	$6845^{+1224}_{-765}$	$4.651^{+3.539}_{-1.839}$

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

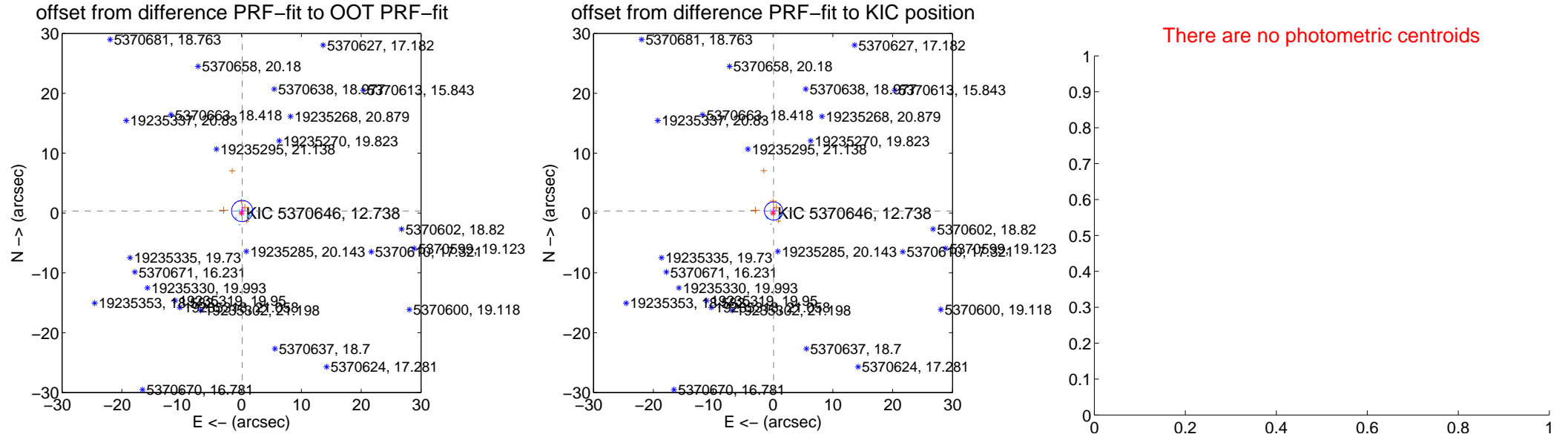
## DV Centroid Data

Supplemental centroid analysis for 005370646-01. Kepler magnitude: 12.74. Transit SNR 13.84

There are 8 quarters with good PRF difference image offsets

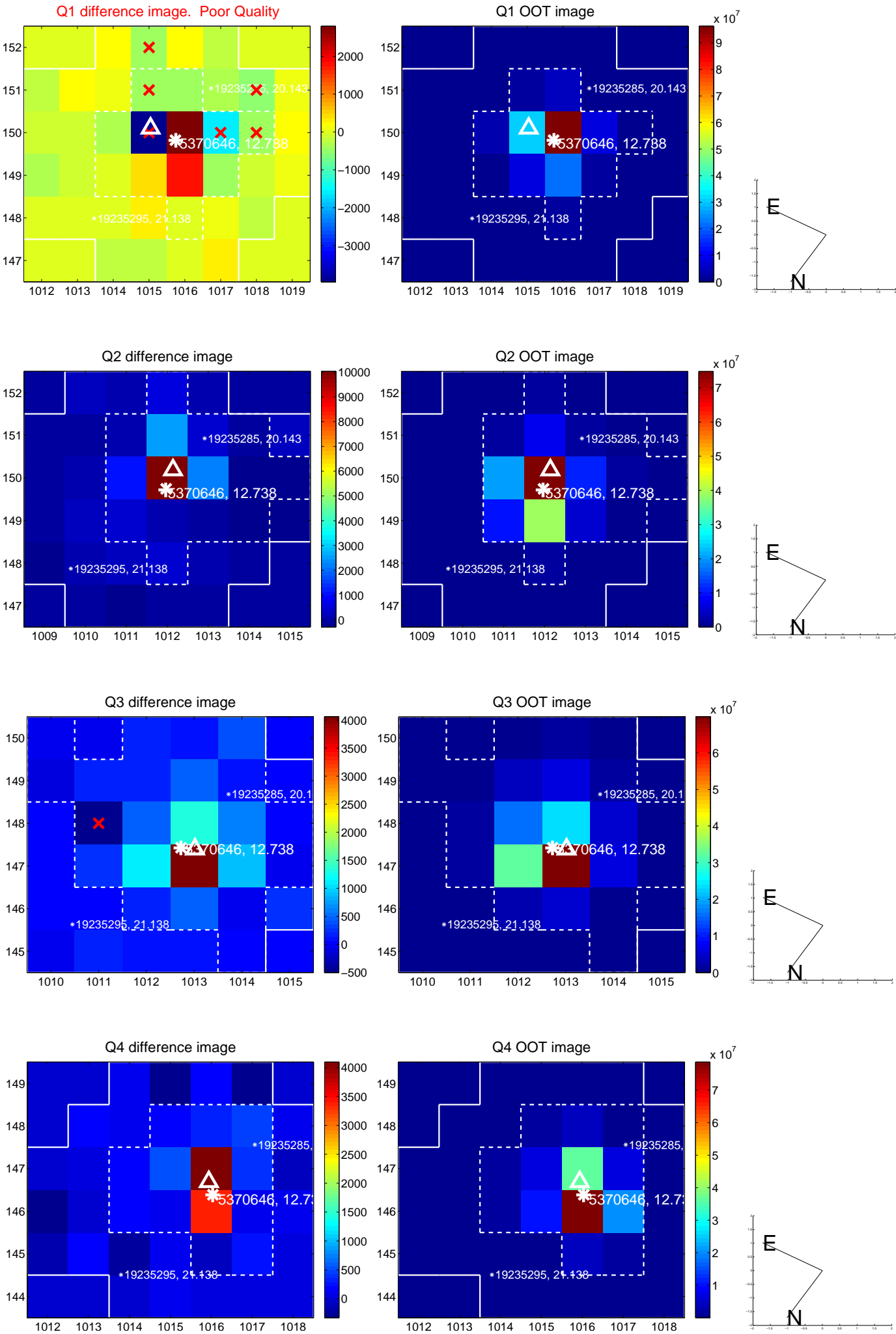
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.352 \pm 0.591$	0.60	$-0.101 \pm 0.300$	$0.337 \pm 0.645$
PRF-fit source offset from KIC position	$0.348 \pm 0.508$	0.69	$-0.094 \pm 0.317$	$0.336 \pm 0.553$
photometric centroid source offset	—	—	—	—

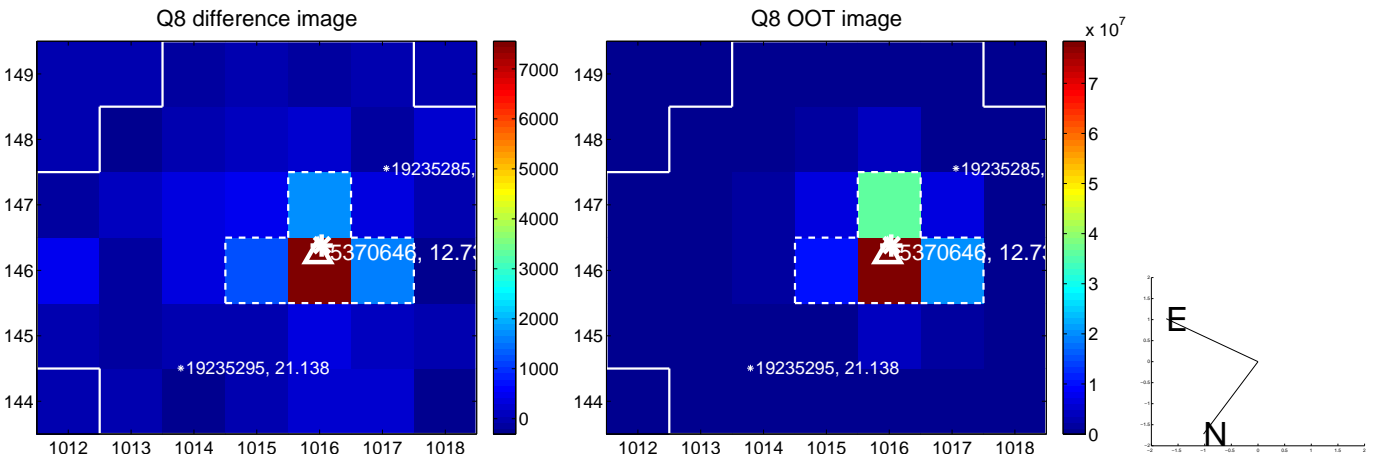
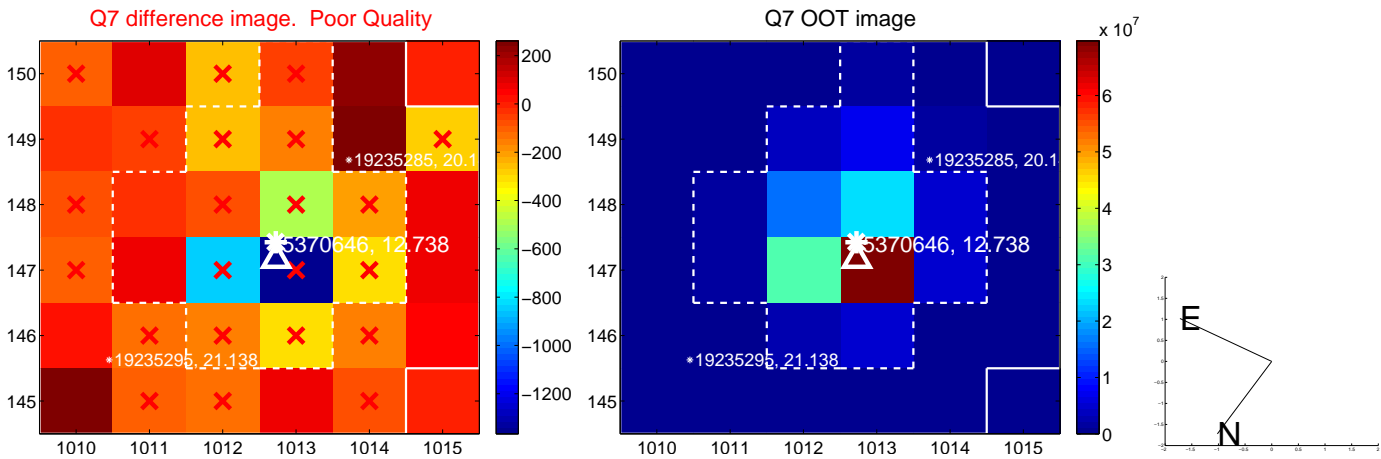
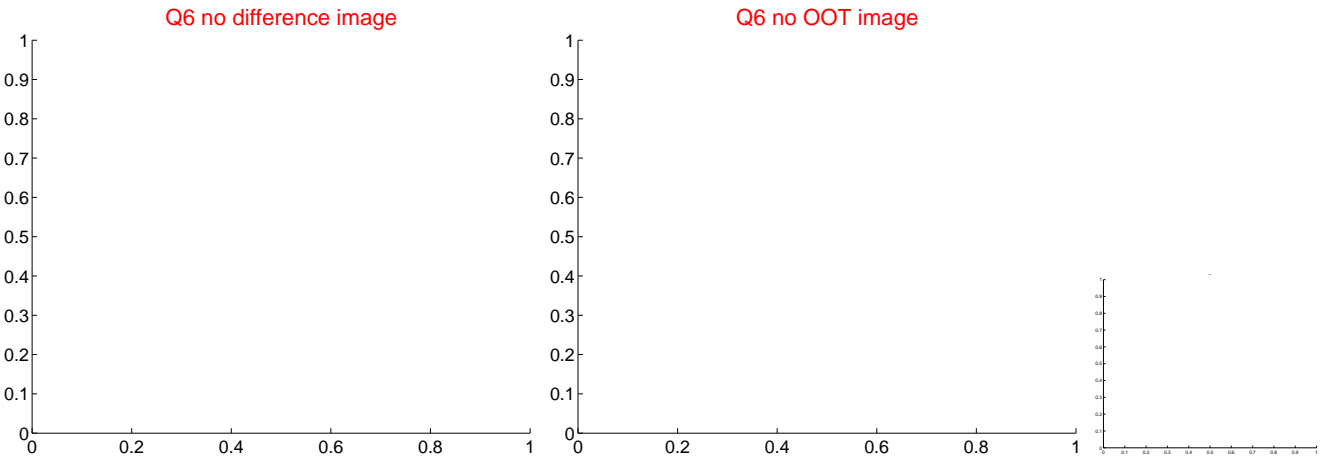
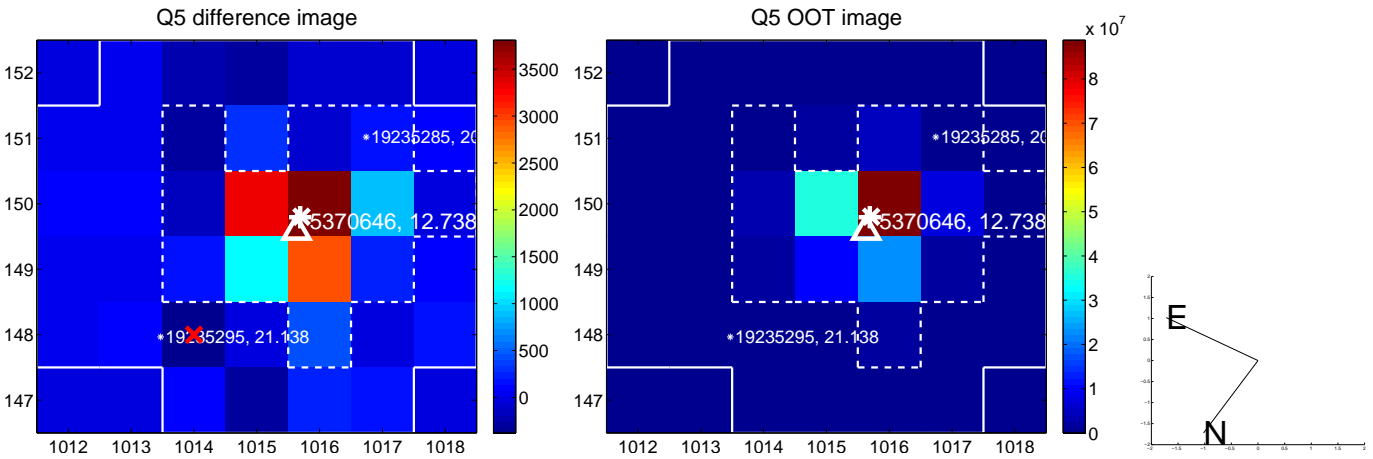


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

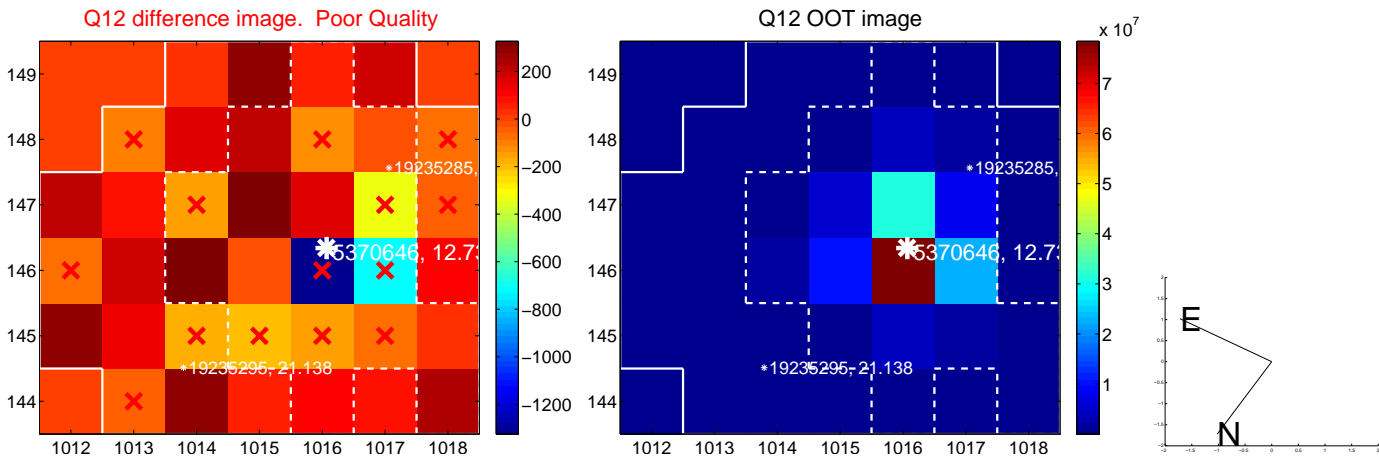
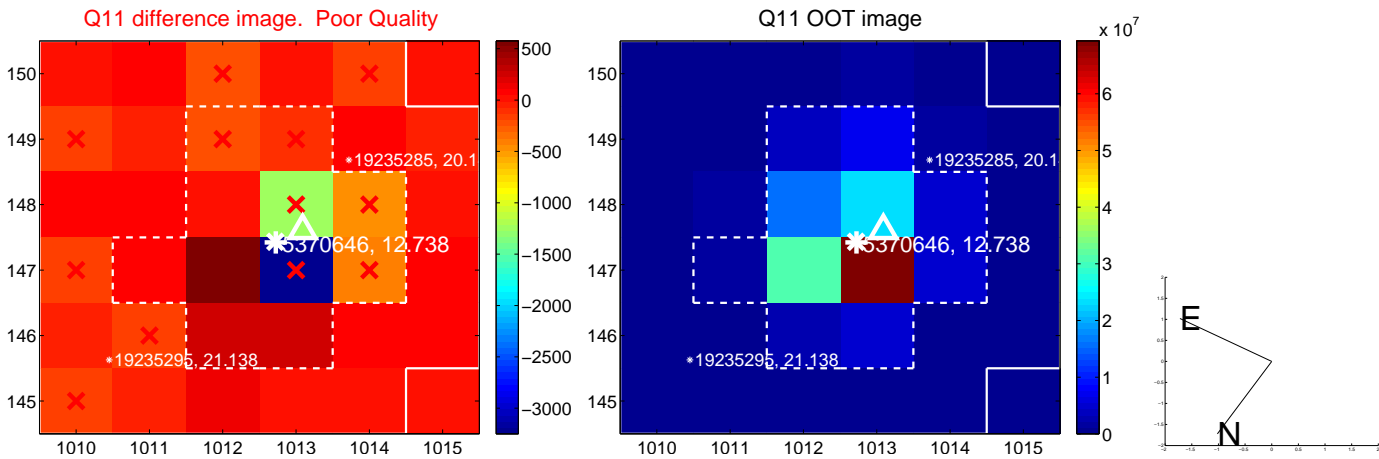
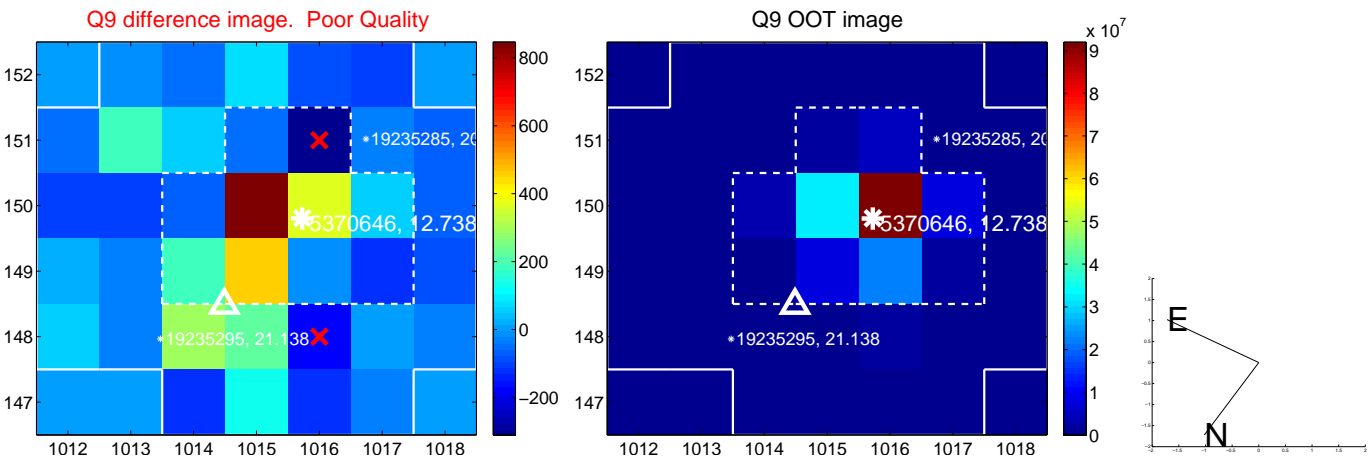


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

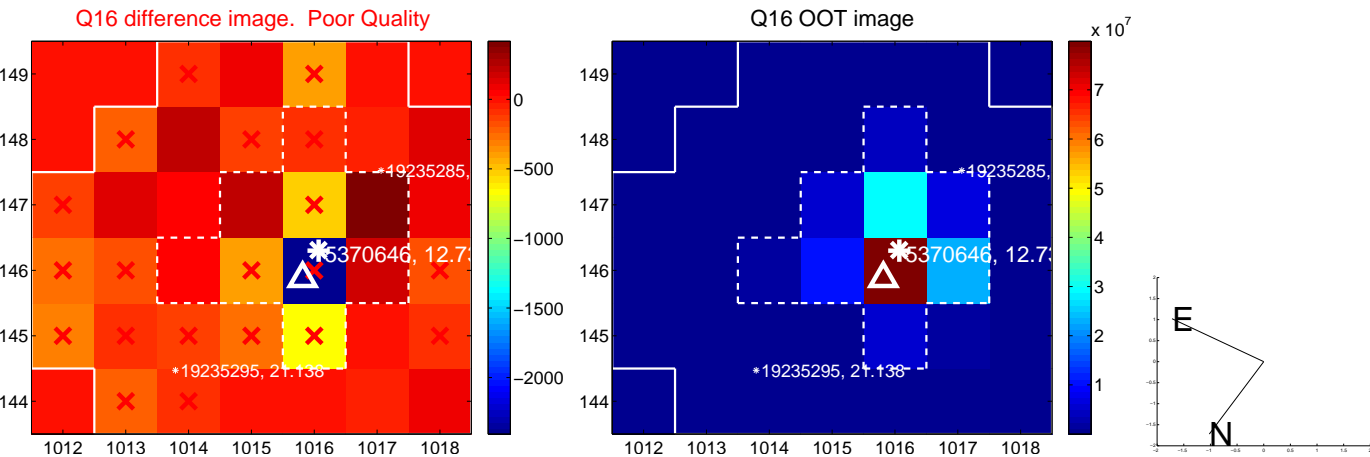
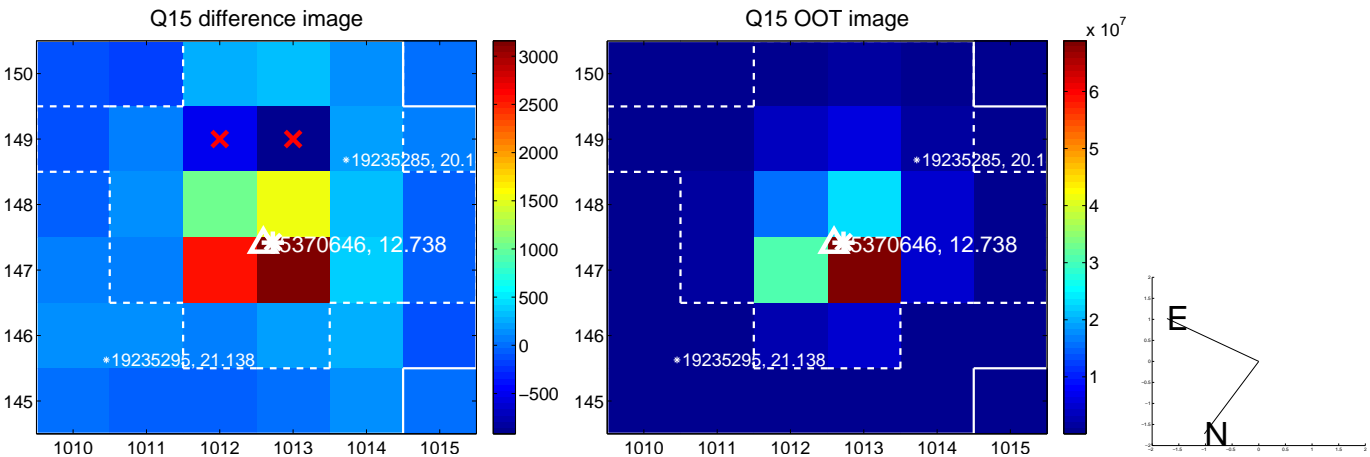
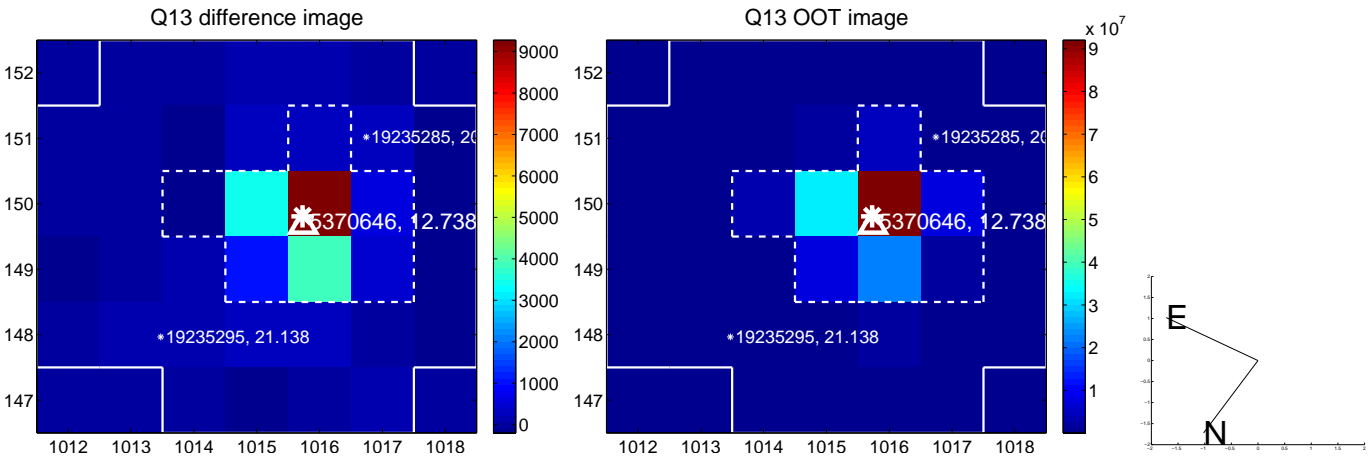




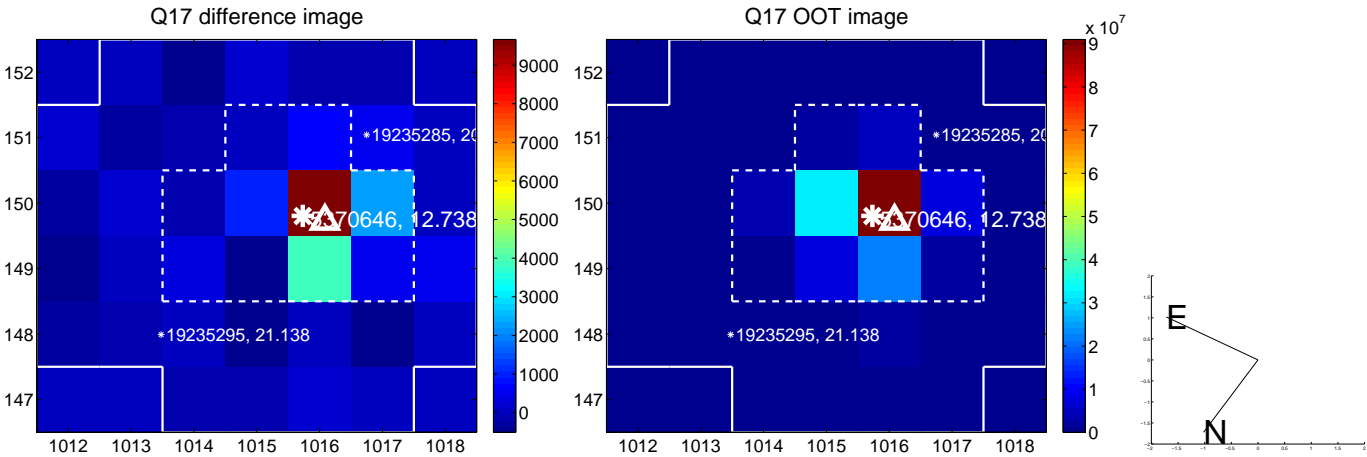
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



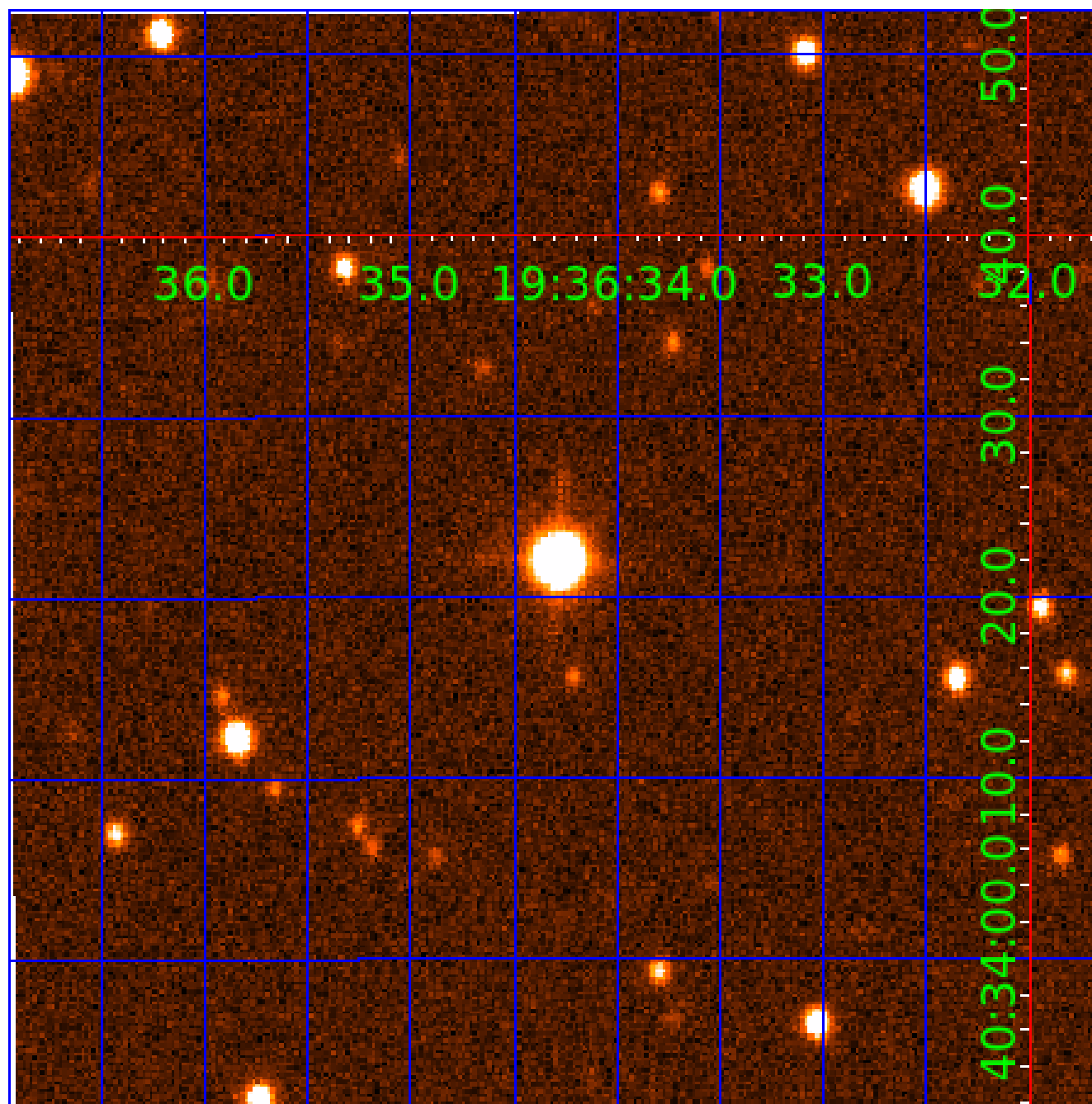
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination





# KIC 005370646

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005370646-01	OBS	No	0.579208	131.768386	95.7	1.416	12.7	13.8	1.32	7276	1.49	19646.60
005370646-02	OBS	No	0.522539	131.813214	80.8	3.784	11.6	12.1	1.32	7276	1.22	22537.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005370646-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005370646-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV

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

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

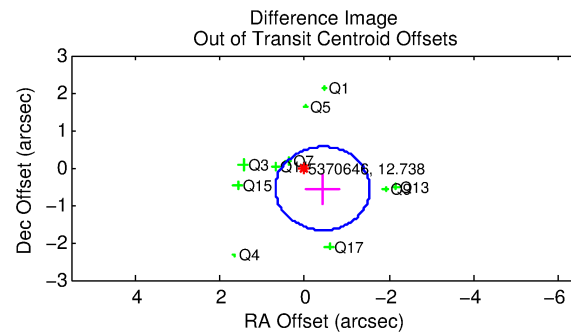
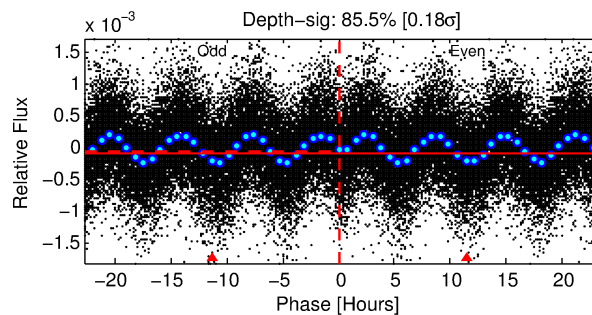
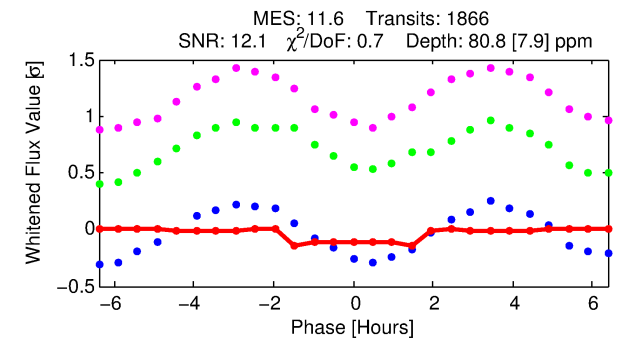
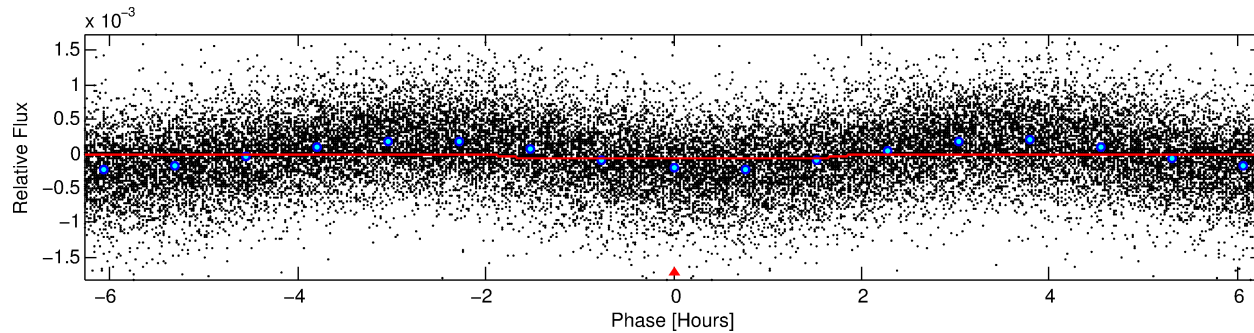
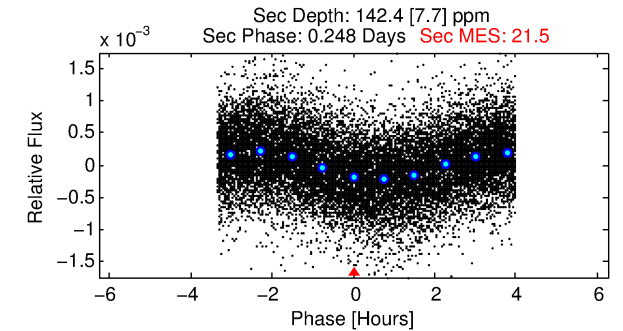
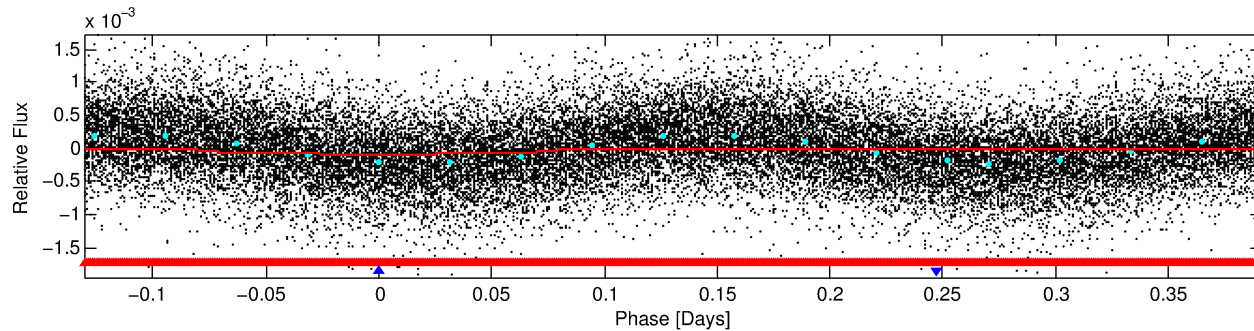
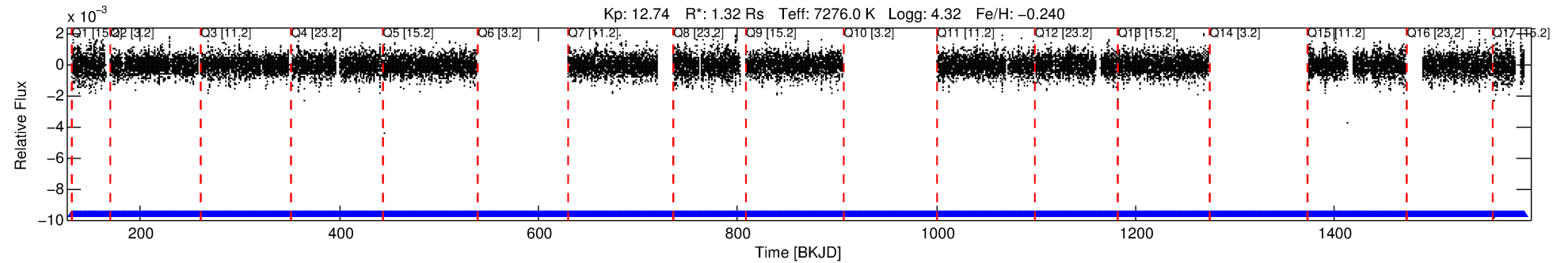
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005370646-02

No Significant Match Found

# DV One-Page Summary

KIC: 5370646 Candidate: 2 of 2 Period: 0.523 d



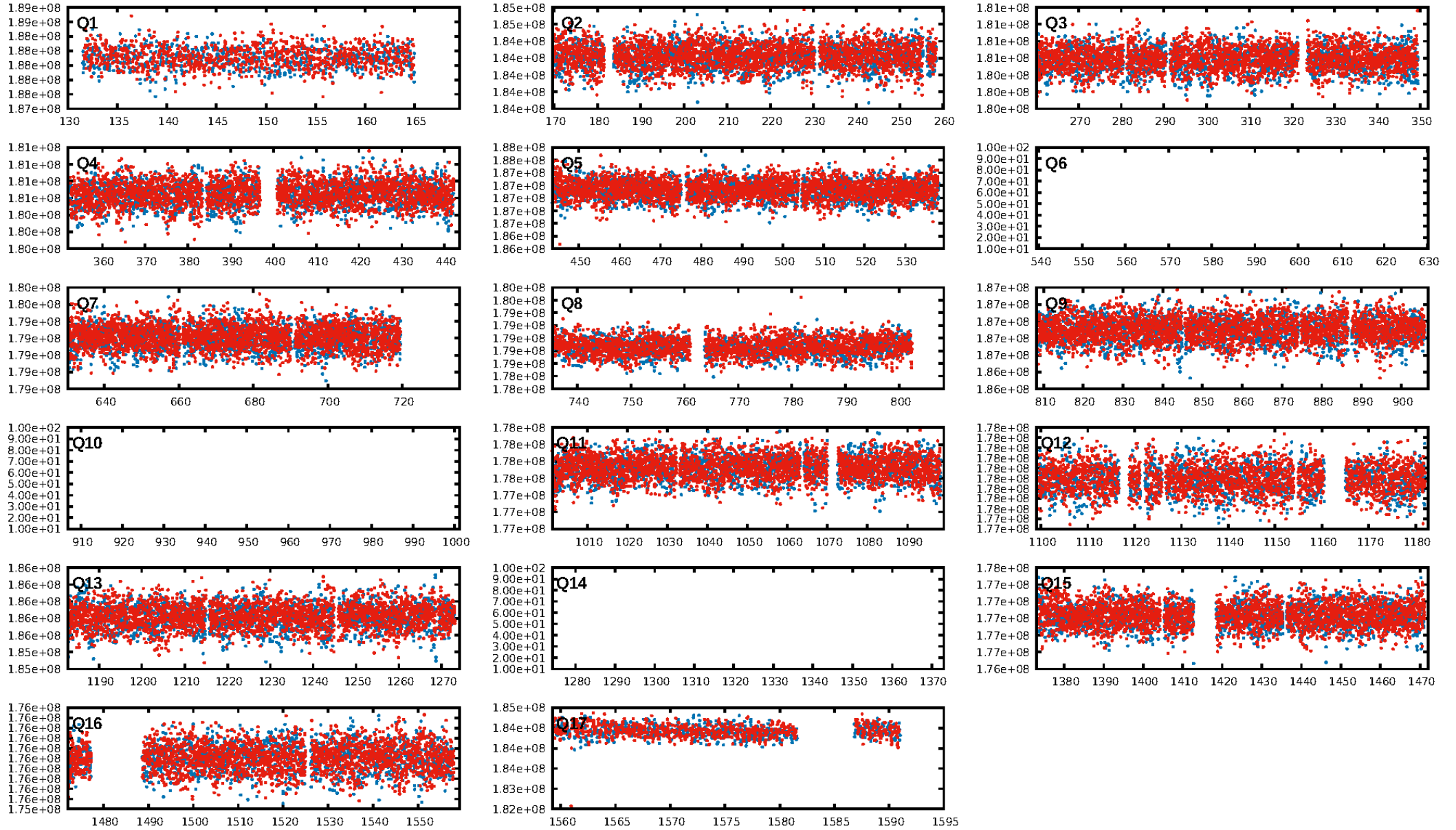
## DV Fit Results:

Period = 0.52254 [0.00001] d  
Epoch = 131.8132 [0.0018] BKJD  
Rp/R\* = 0.0085 [0.0038]  
a/R\* = 1.20 [1.01]  
b = 0.42 [5.30]  
Seff = 22537.67 [10607.72]  
Teff = 3124 [368] K  
Rp = 1.22 [0.72] Re  
a = 0.0139 [0.0044] AU  
Ag = 10.17 [10.07] [0.91σ]  
Teffp = 8626 [1947] K [2.78σ]

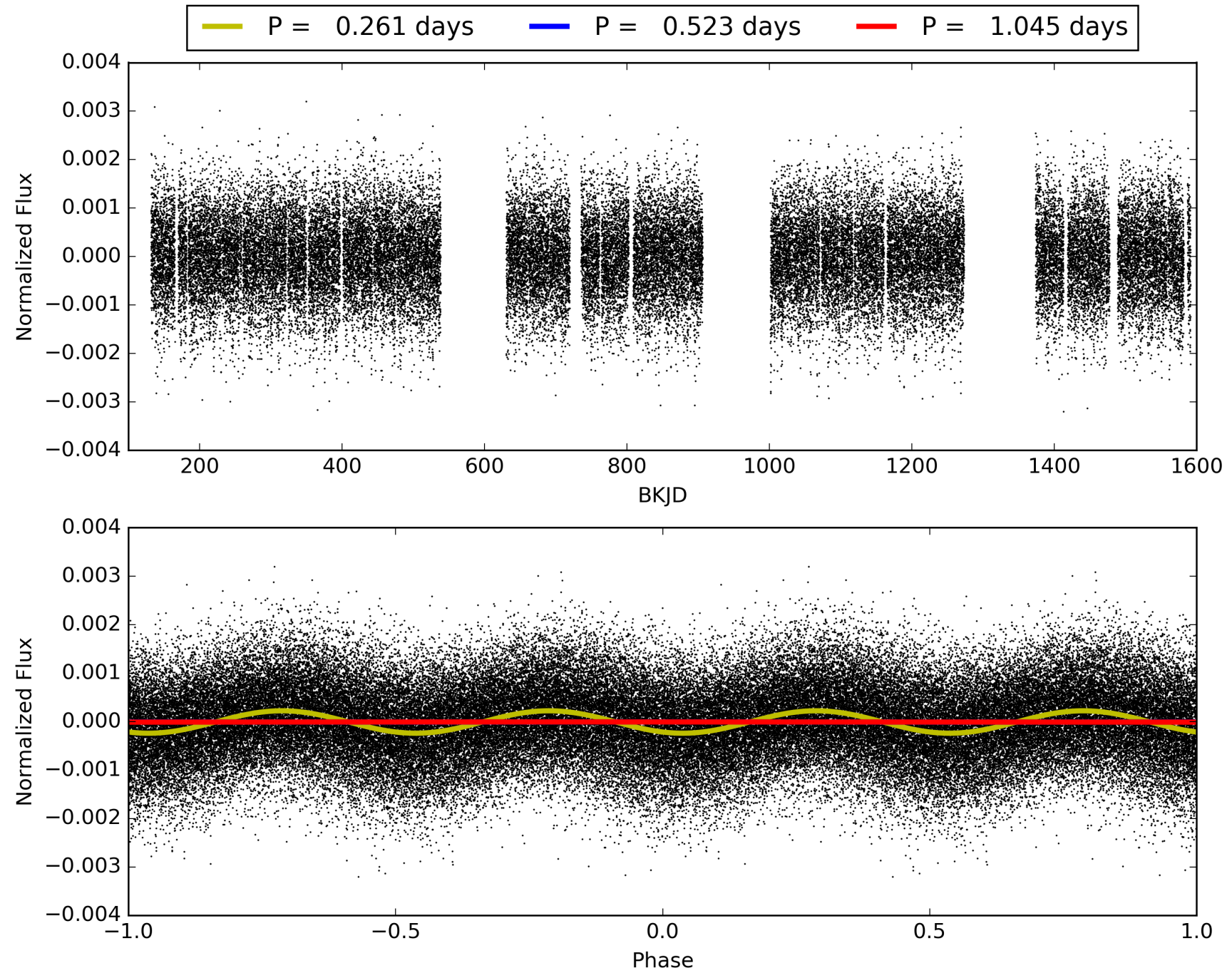
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 26.4% [0.34σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.14e-28  
RollingBand-fgt: 1.00 [1761/1761]  
**GhostDiagnostic-chr: -1.76**  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.704 arcsec [1.90σ]  
KicOffset-rm: 0.691 arcsec [1.90σ]  
OotOffset-st: 0/4/1/5 [10]  
KicOffset-st: 0/4/1/5 [10]  
DiffImageQuality-fgm: 0.90 [9/10]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 005370646-02, PDC Light Curves



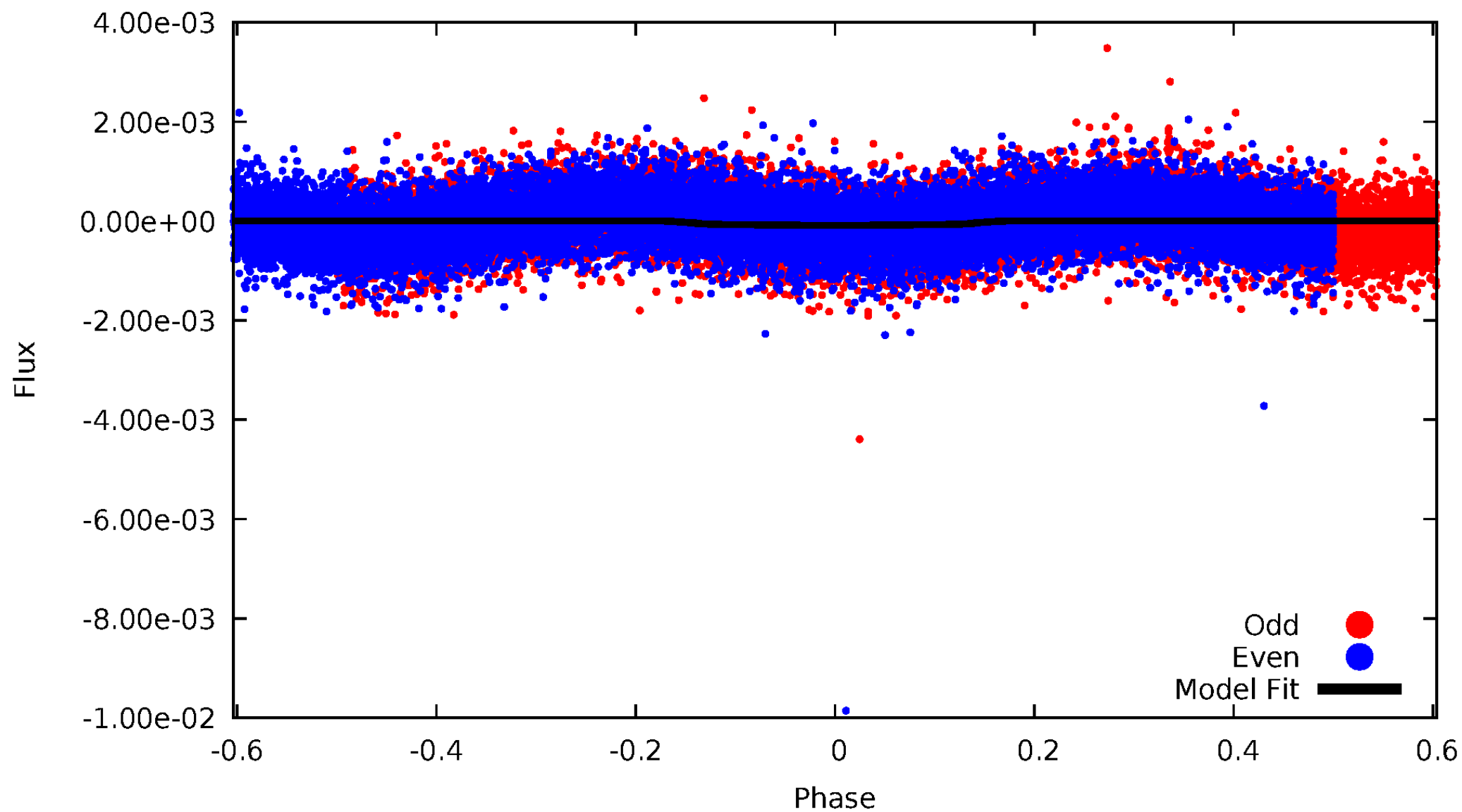
# TCE 005370646-02





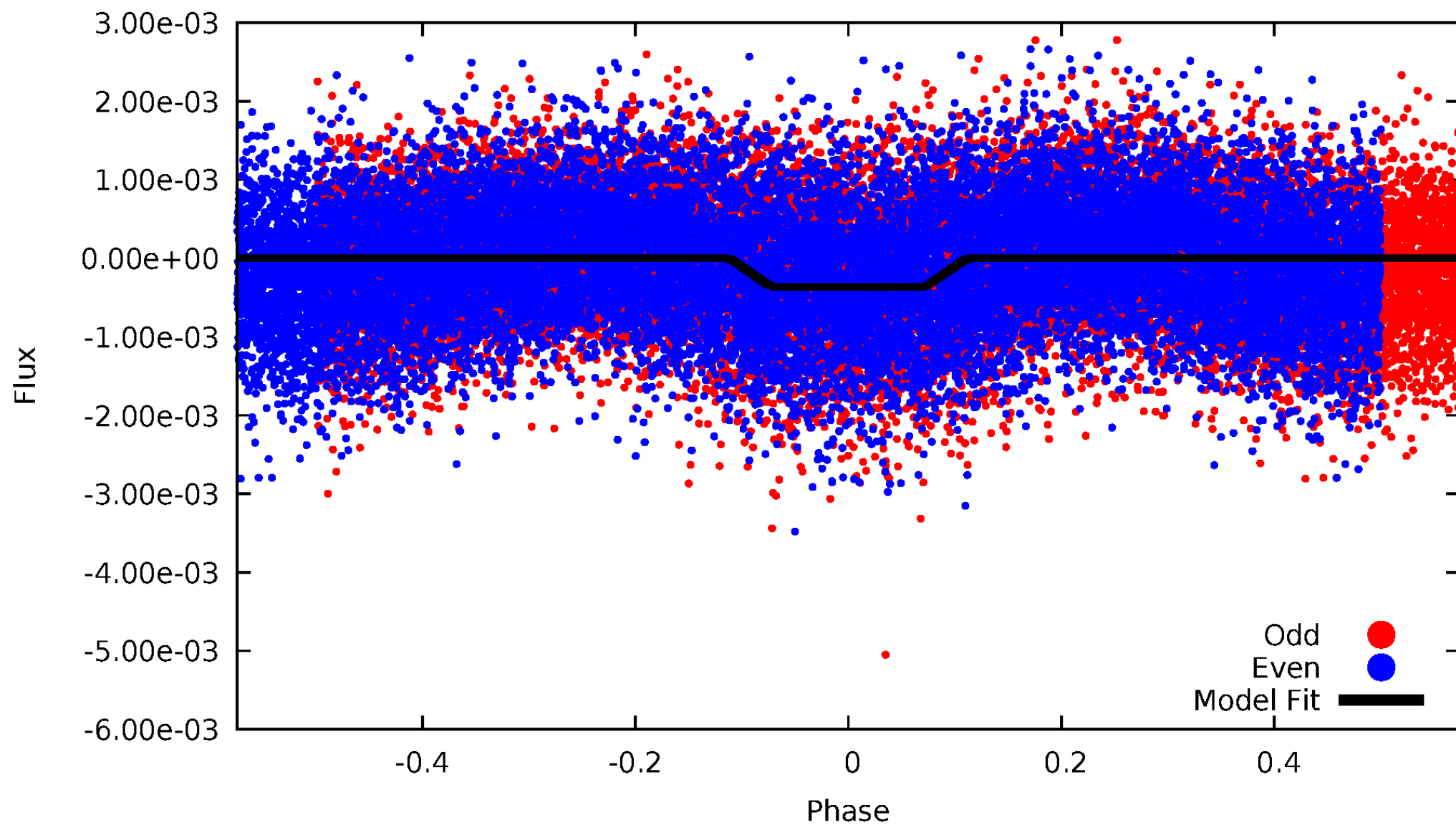
# DV Odd/Even

TCE 005370646-02



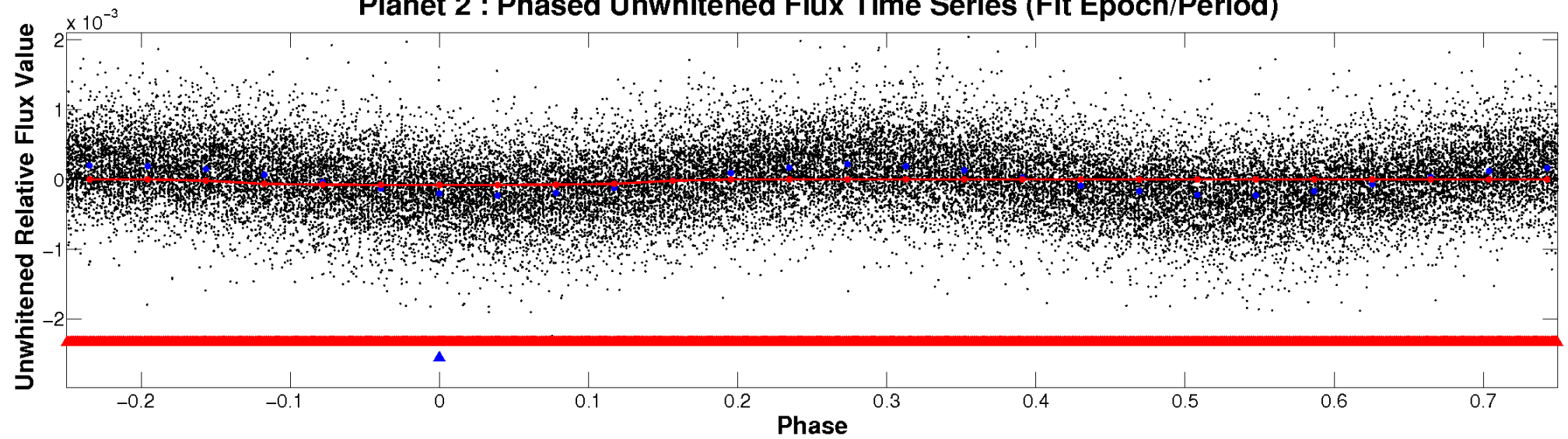
# ALT Odd/Even

TCE 005370646-02

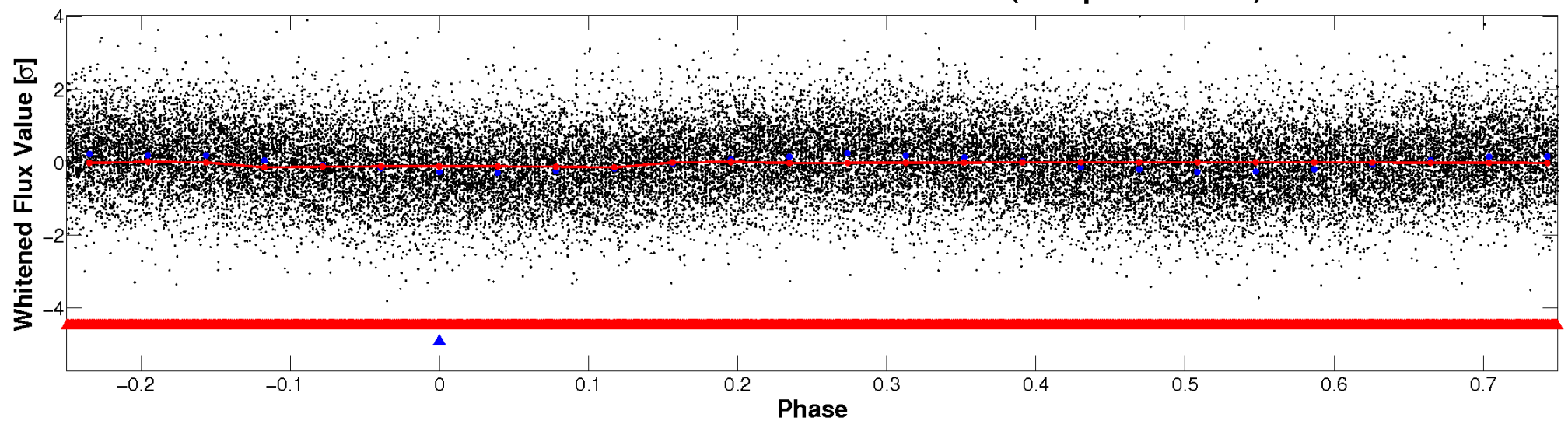


# Non-Whitened Vs. Whitened Light Curve

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

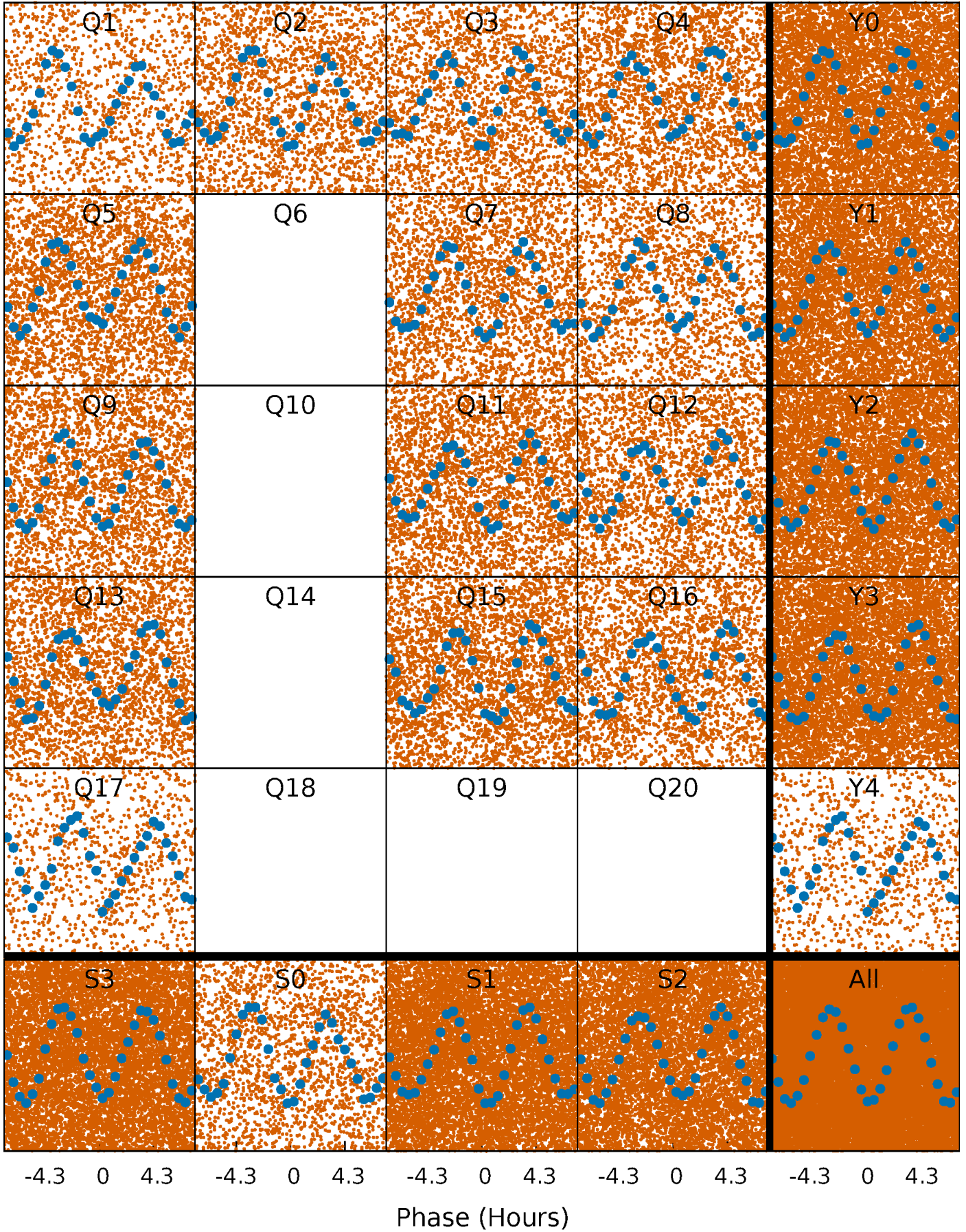


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

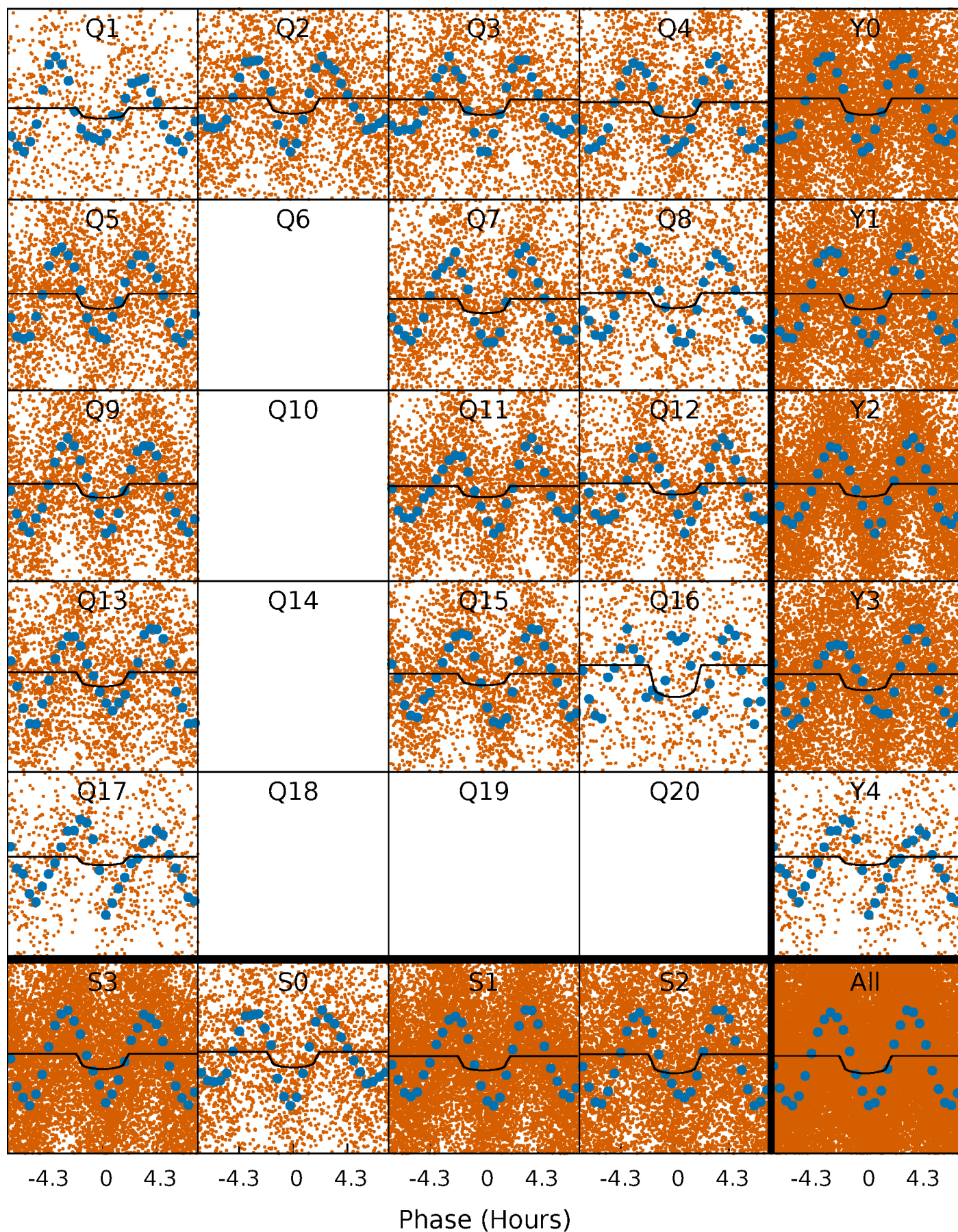
TCE 005370646-02   P= 0.522539 Days    $T_0=131.813214$  (BKJD)





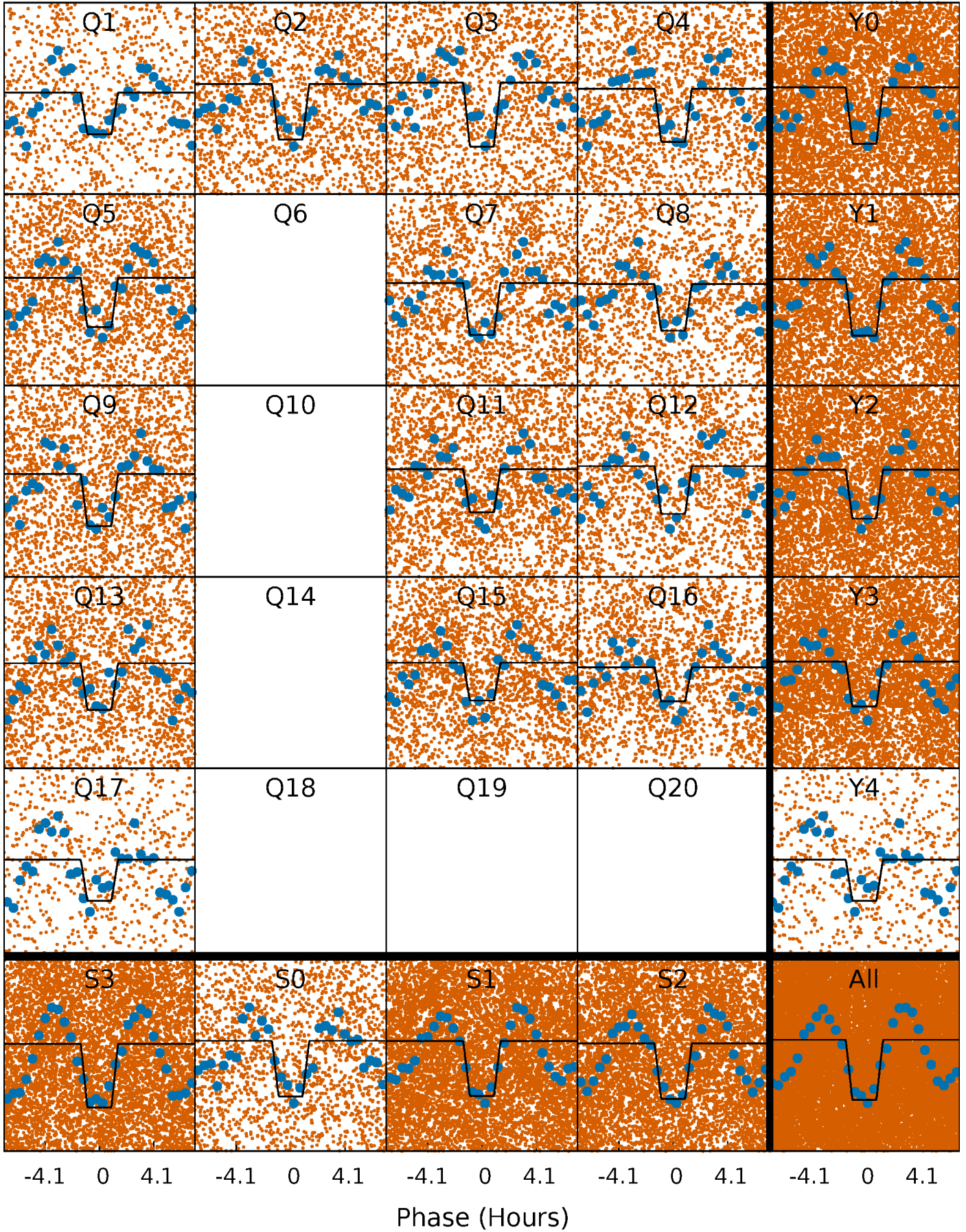
# DV Quarter-Phased Transit Curves

TCE 005370646-02   P= 0.522539 Days    $T_0=131.813214$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005370646-02   P= 0.522573 Days    $T_0=131.787623$  (BKJD)

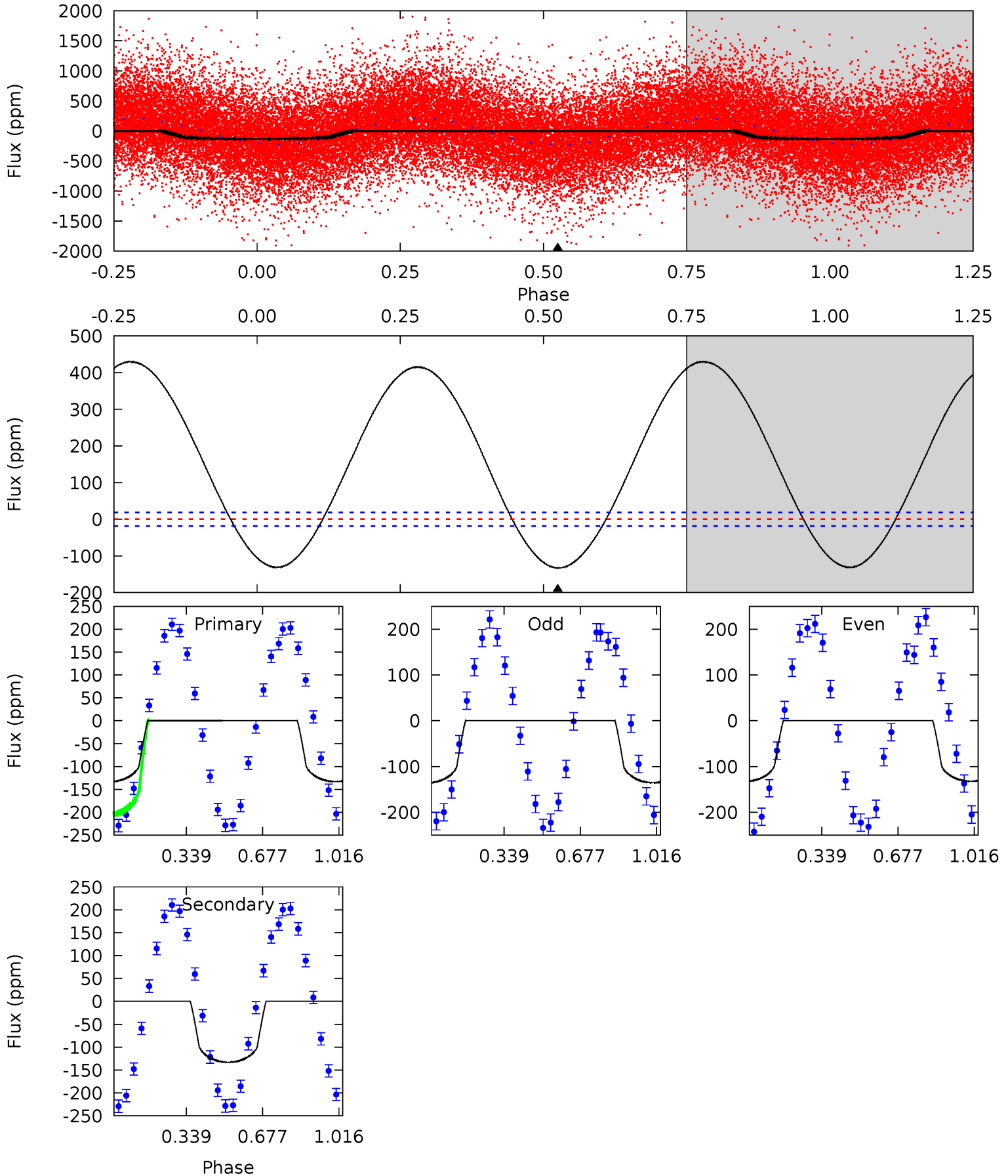




# DV Model-Shift Uniqueness Test

005370646-02, P = 0.522539 Days, E = 131.290675 Days

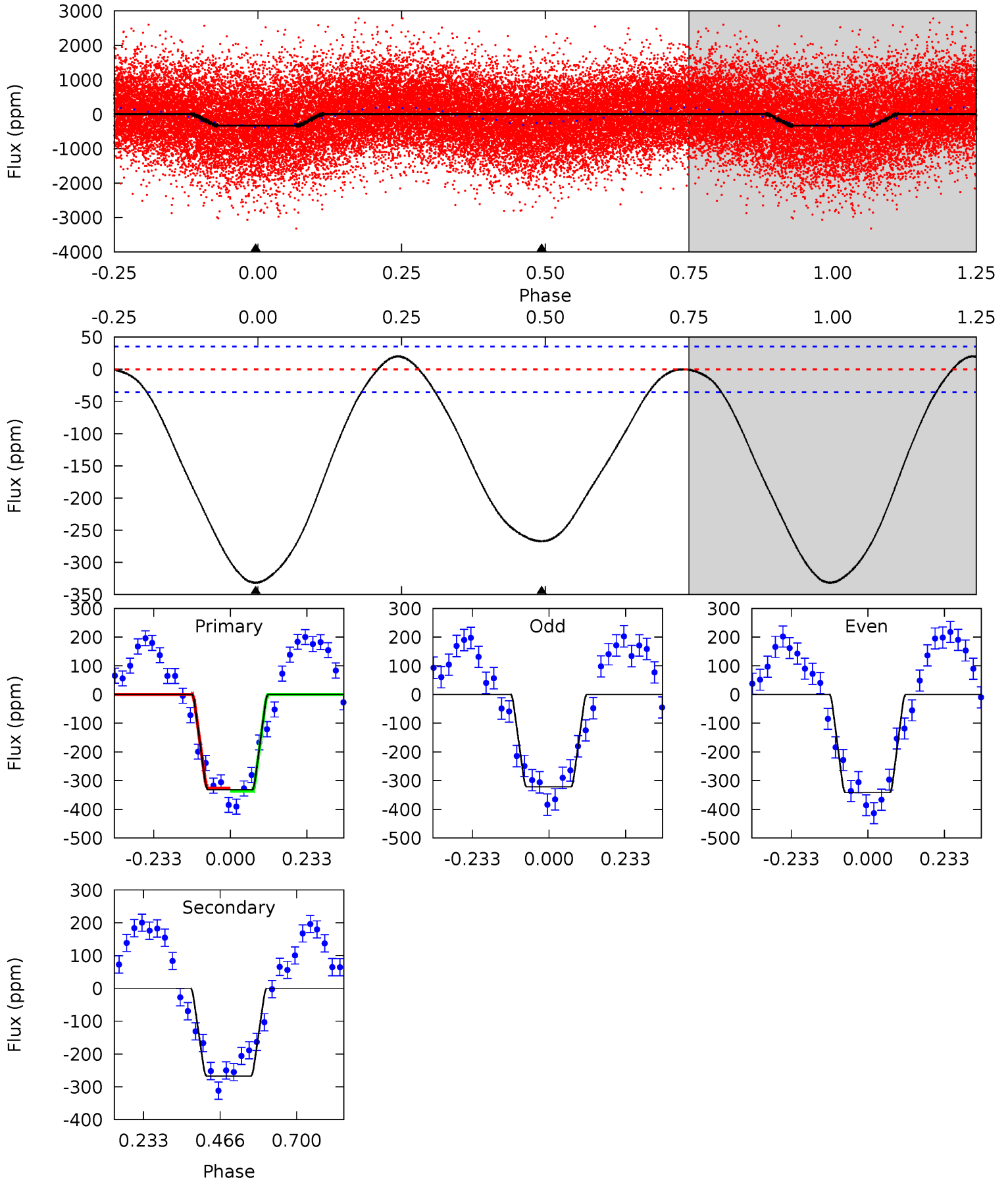
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.7	30.7	0	0	4.30	0.96	29.2	30.7	30.7	30.7	30.7	0.36	1.13	0.76	16.3



# Alt Model-Shift Uniqueness Test

005370646-02, P = 0.522573 Days, E = 131.265050 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
41.1	33.1	0	0	4.38	1.19	1.18	41.1	41.1	33.1	33.1	1.28	1.09	0.06	0.65



### Stellar Parameters For KIC 005370646

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7276^{+203}_{-304}$	$4.318^{+0.058}_{-0.232}$	$-0.240^{+0.250}_{-0.350}$	$1.321^{+0.512}_{-0.160}$	$1.342^{+0.225}_{-0.184}$	$0.819^{+0.212}_{-0.499}$
	+3%/-4%	+1%/-5%	+104%/-146%	+39%/-12%	+17%/-14%	+26%/-61%
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 005370646-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-133 \pm 4$	$1.33^{+0.65}_{-0.62}$	$4468^{+386}_{-250}$	$8581^{+5462}_{-1800}$	$8.100^{+20.442}_{-4.372}$
Alt.	$-267 \pm 8$	$2.92^{+0.74}_{-0.66}$	$4452^{+369}_{-245}$	$6474^{+880}_{-656}$	$3.327^{+2.084}_{-1.204}$

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

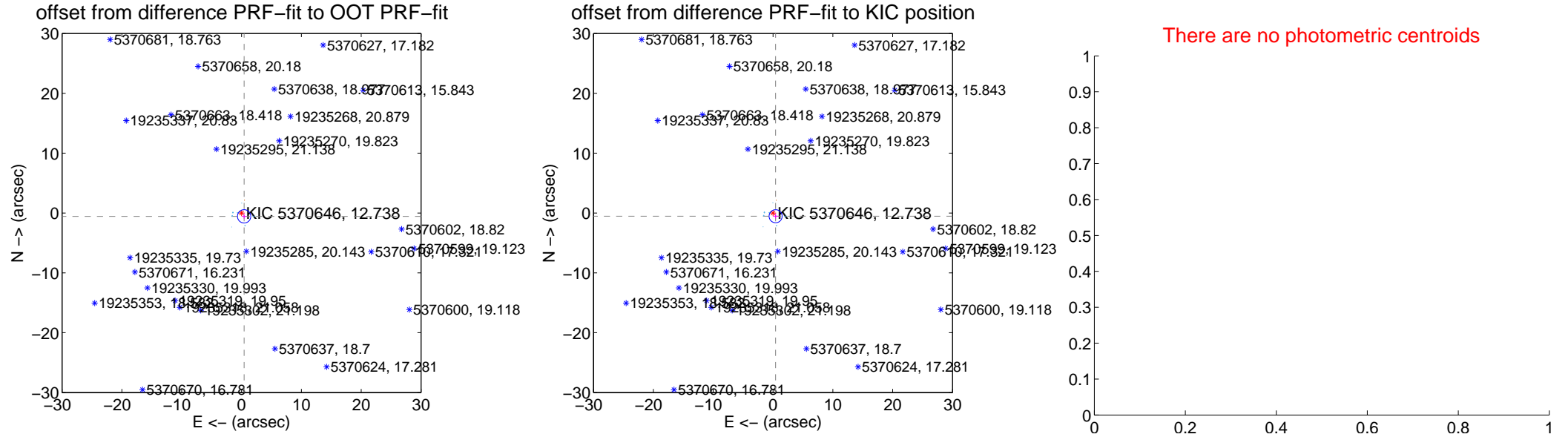
## DV Centroid Data

Supplemental centroid analysis for 005370646-02. Kepler magnitude: 12.74. Transit SNR 12.07

There are 9 quarters with good PRF difference image offsets

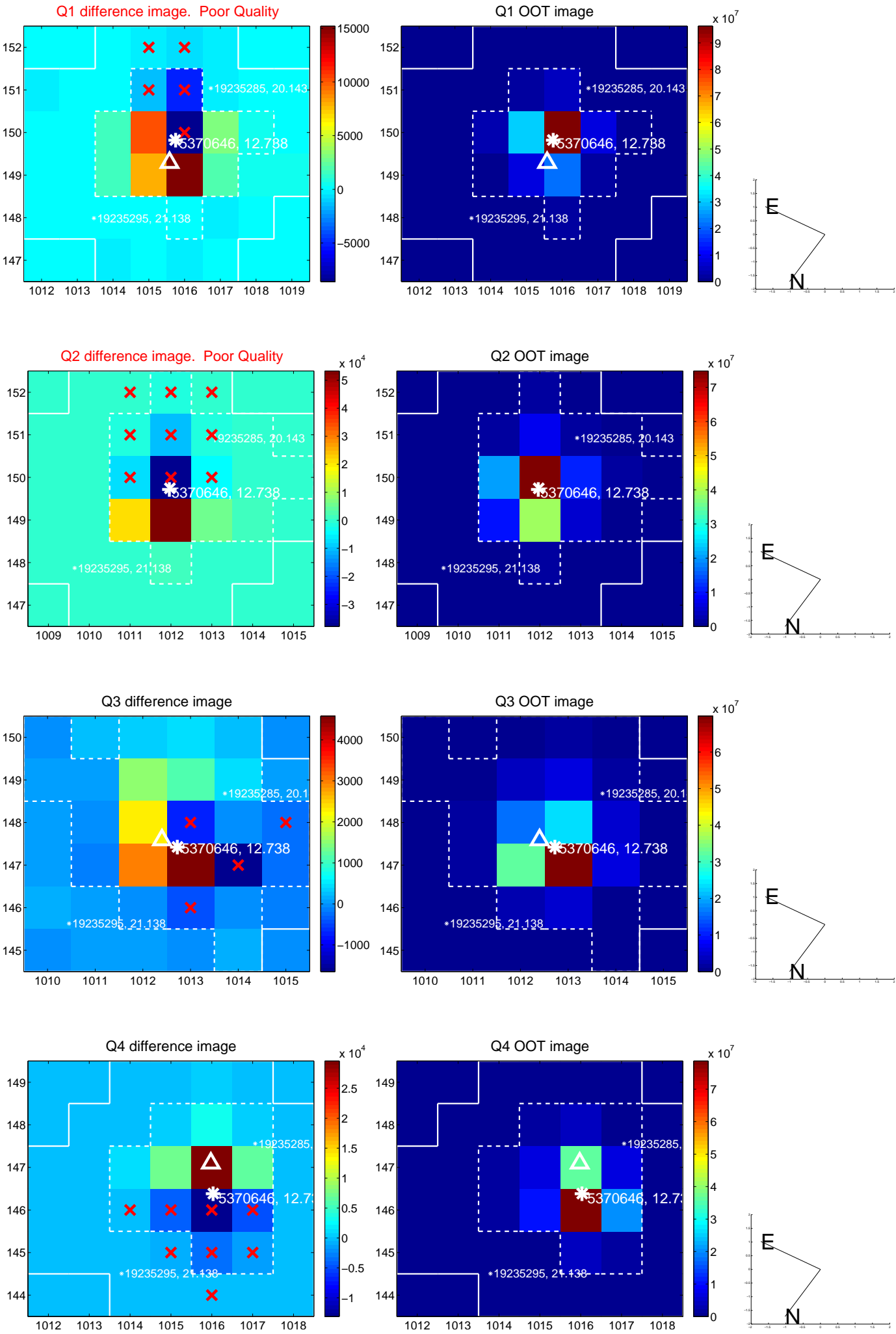
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.704 \pm 0.371$	1.90	$-0.432 \pm 0.392$	$-0.556 \pm 0.396$
PRF-fit source offset from KIC position	$0.691 \pm 0.363$	1.90	$-0.436 \pm 0.445$	$-0.536 \pm 0.413$
photometric centroid source offset	—	—	—	—

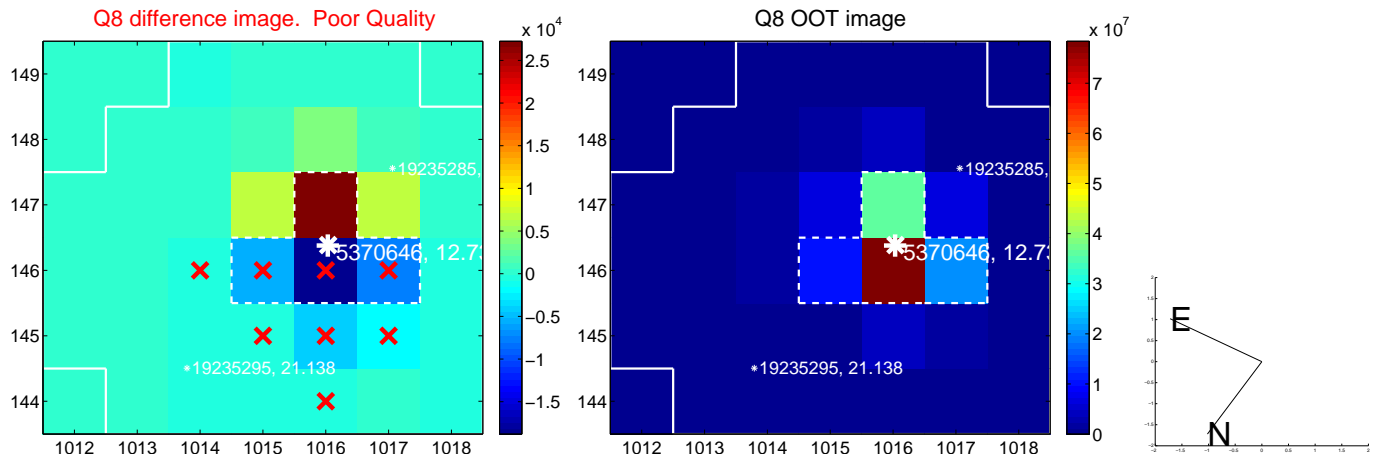
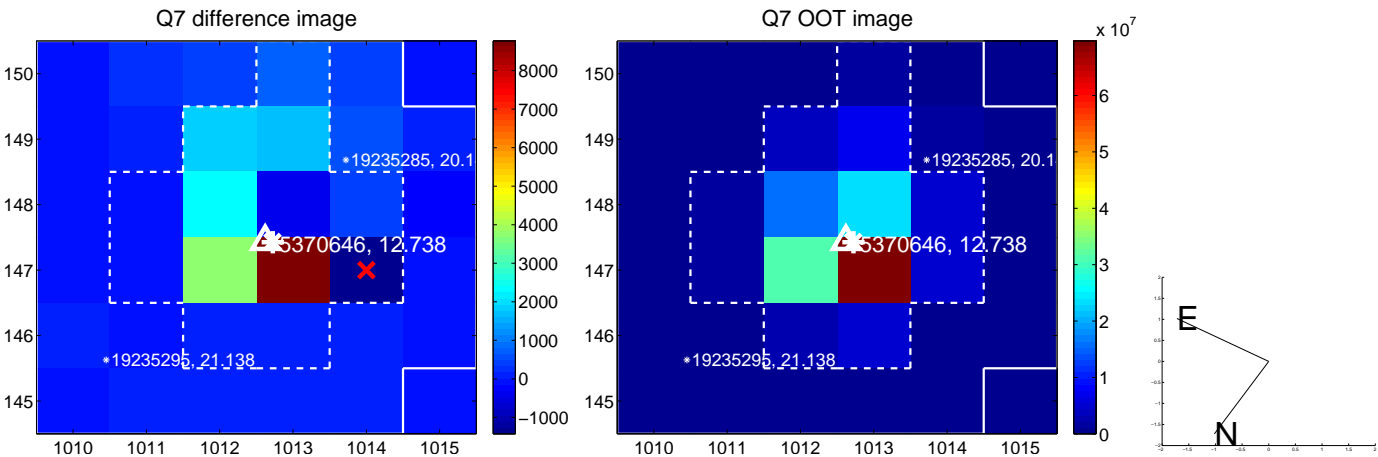
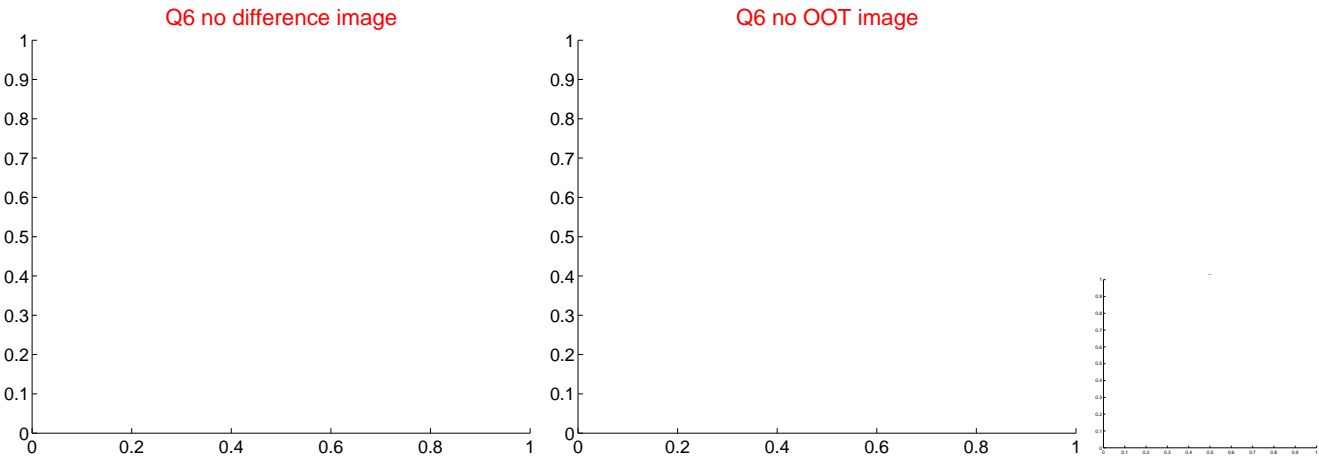
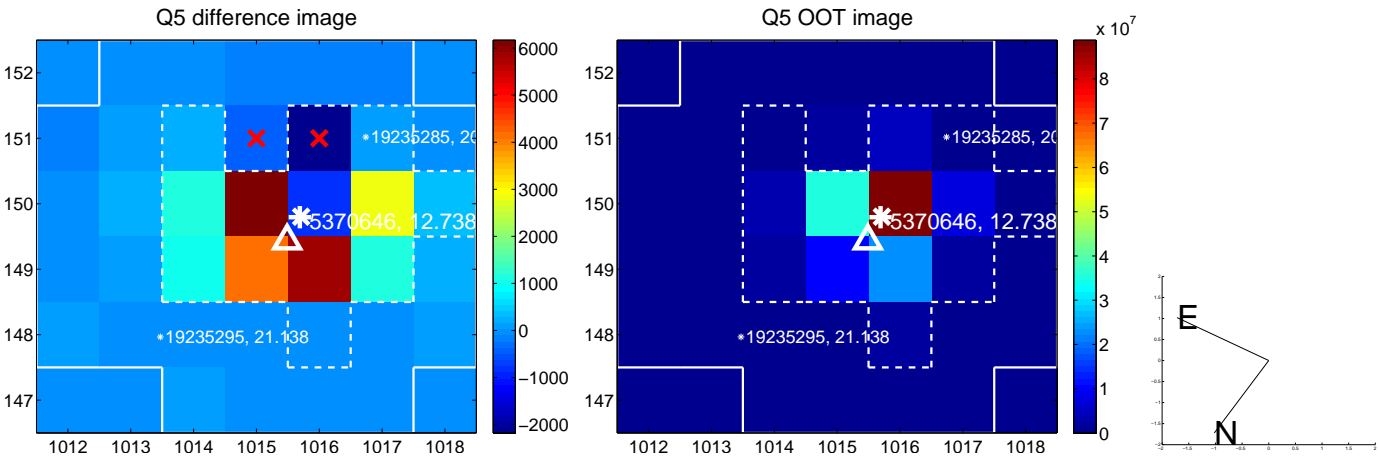


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

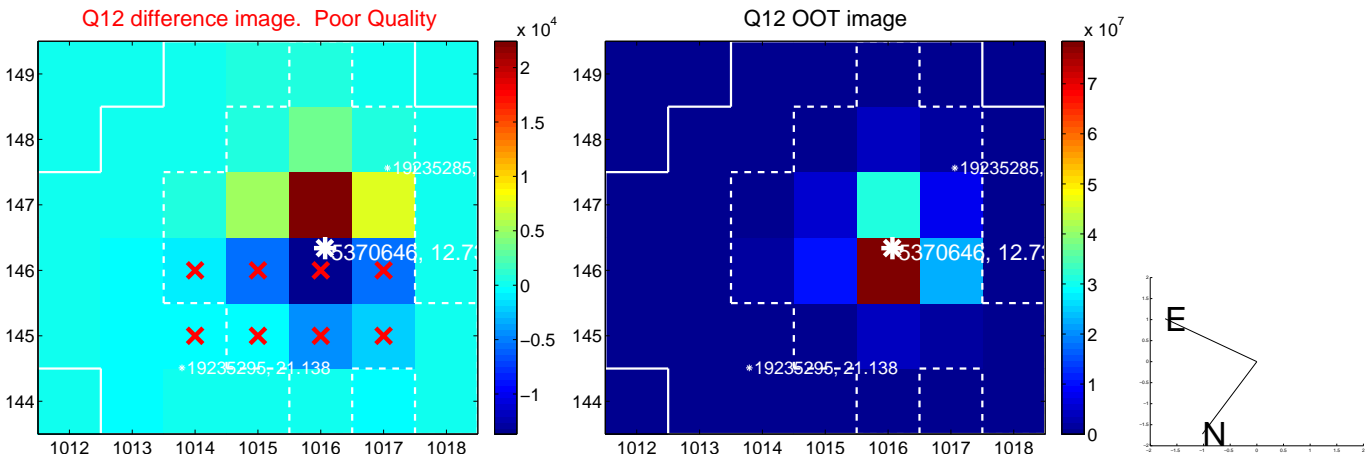
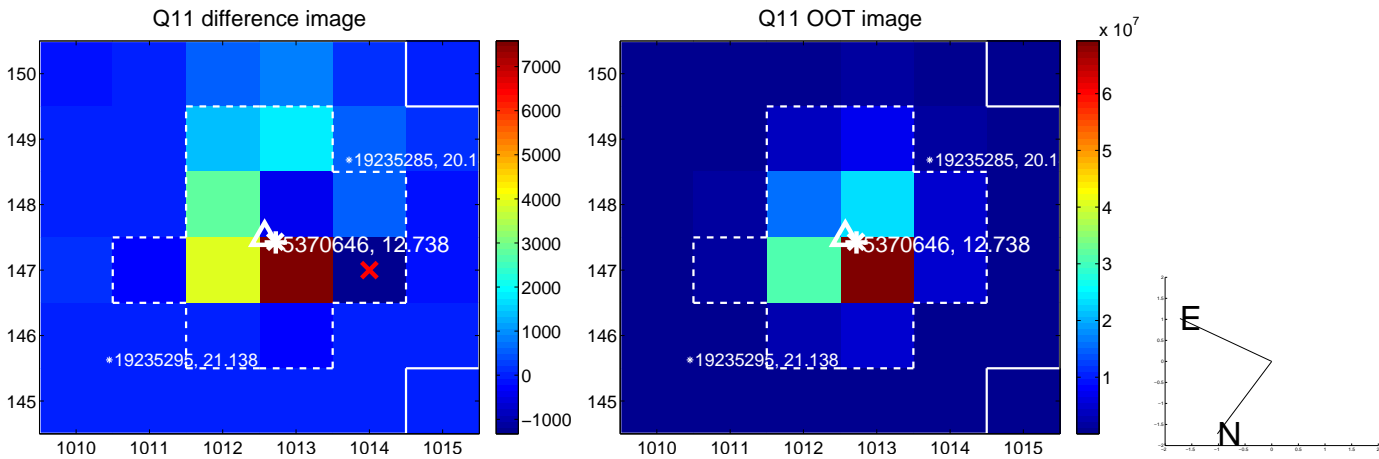
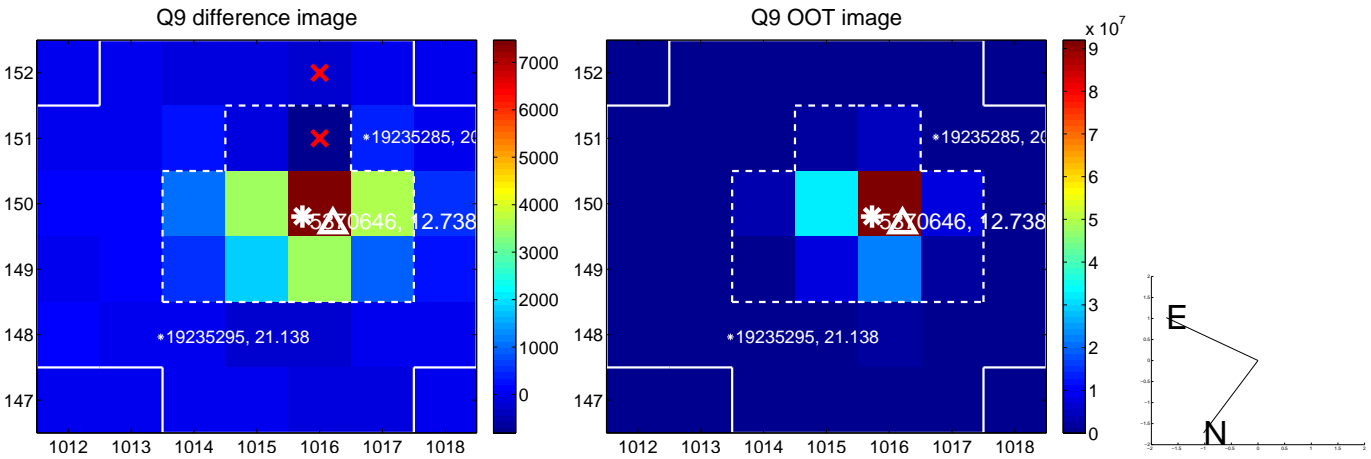


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

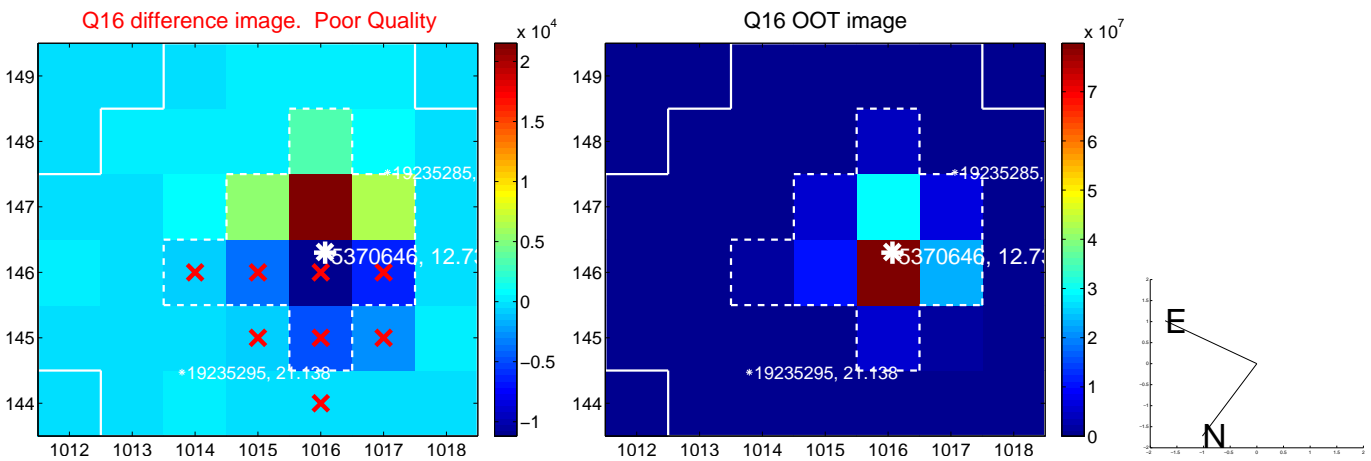
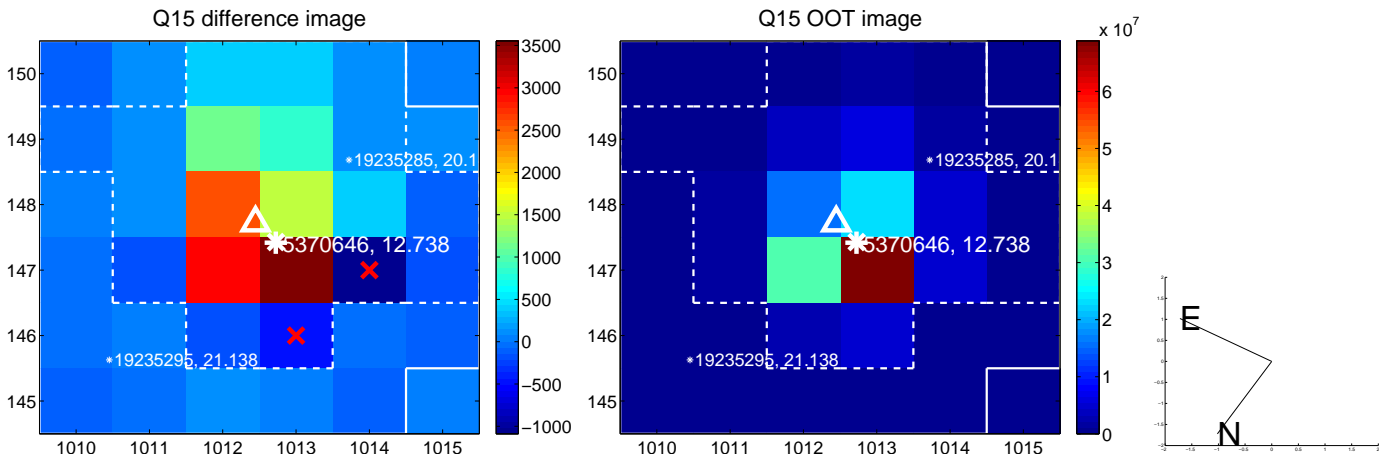
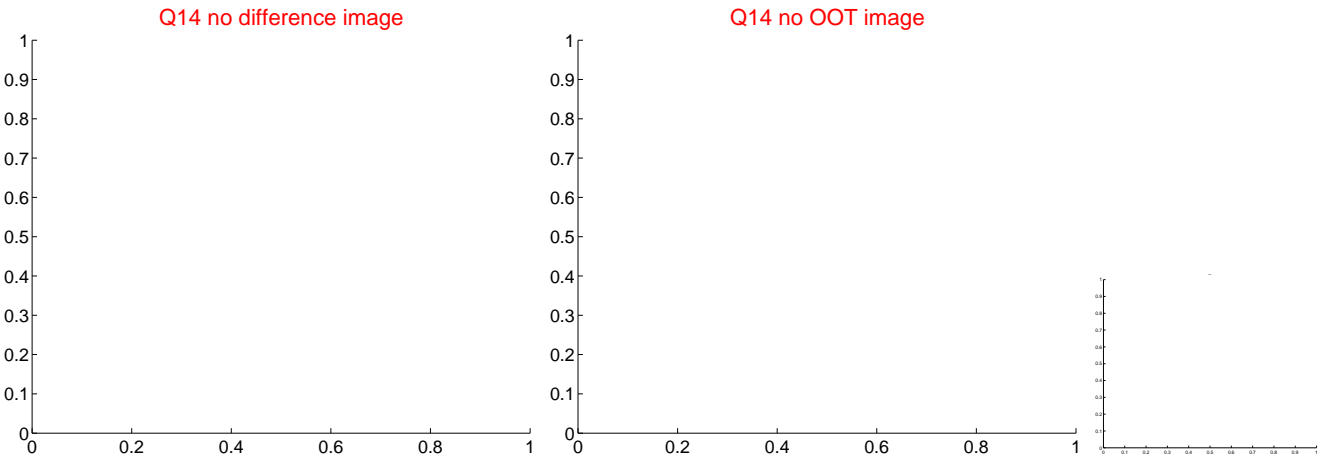
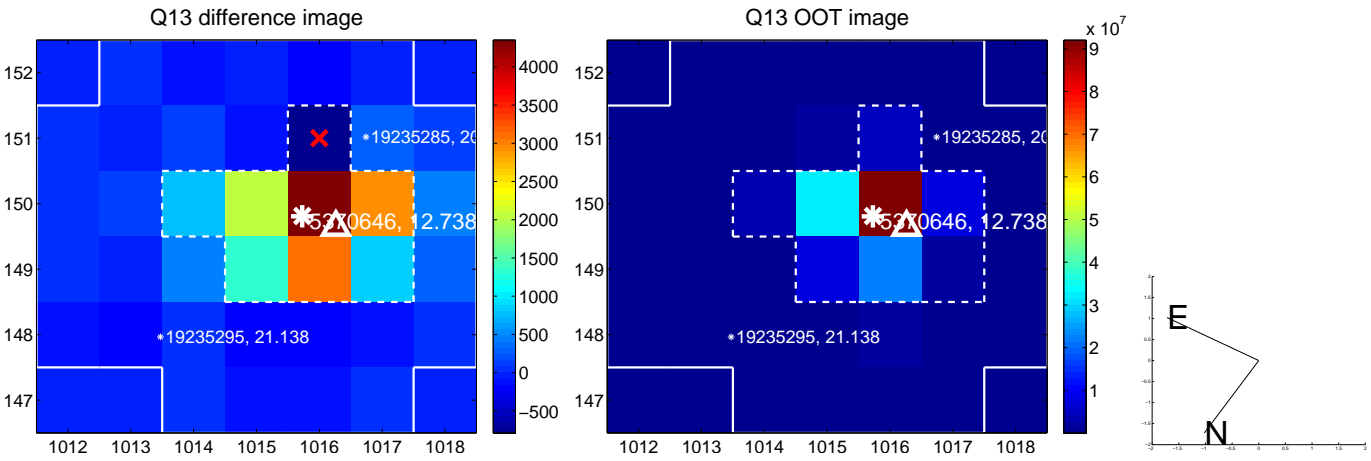




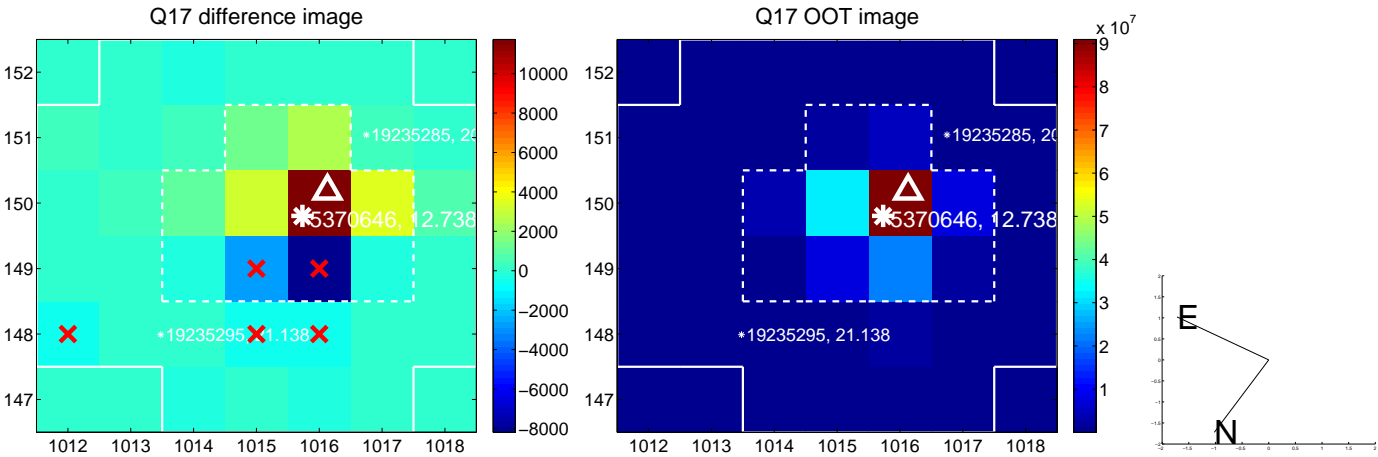
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



folded centroid time series figure for this object.

UKIRT Image

Declination

