

# KIC 008036426

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008036426-01	OBS	No	1.532862	132.386927	7.1	9.370	10.0	11.8	1.99	8501	0.62	17467.69
008036426-03	OBS	No	348.064696	451.897171	76.4	7.326	13.0	10.0	1.99	8501	1.96	12.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008036426-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008036426-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

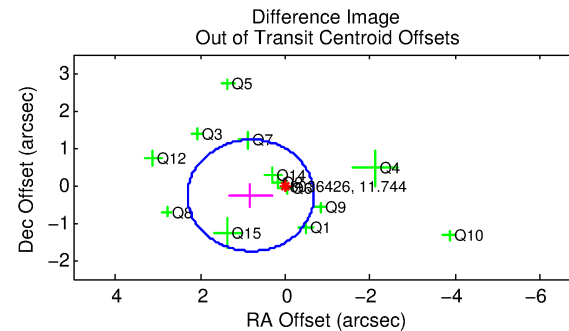
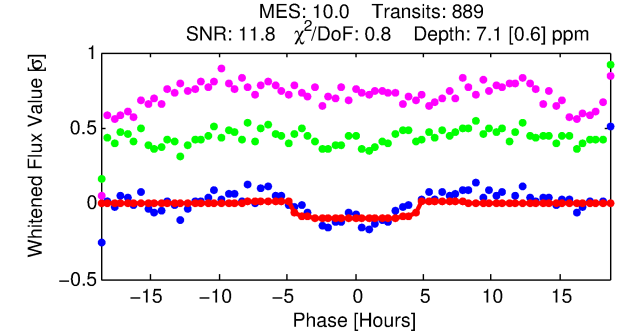
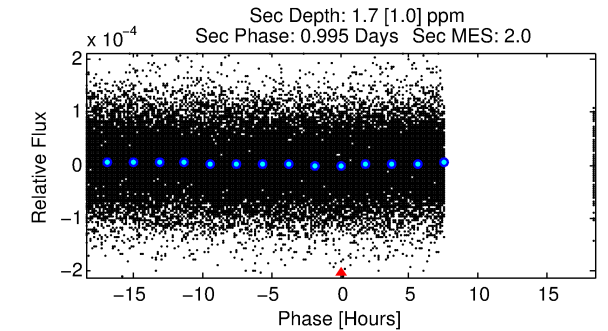
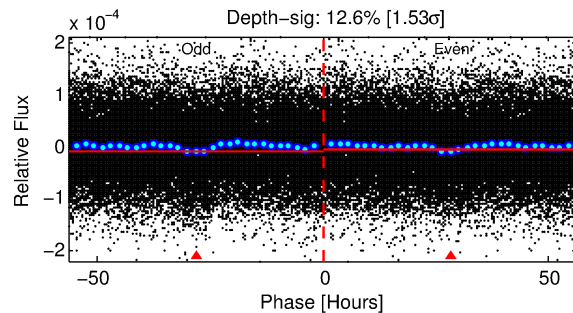
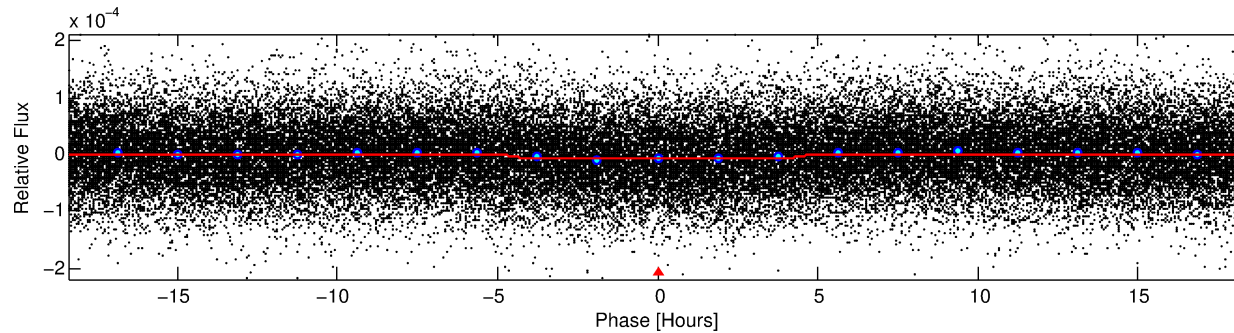
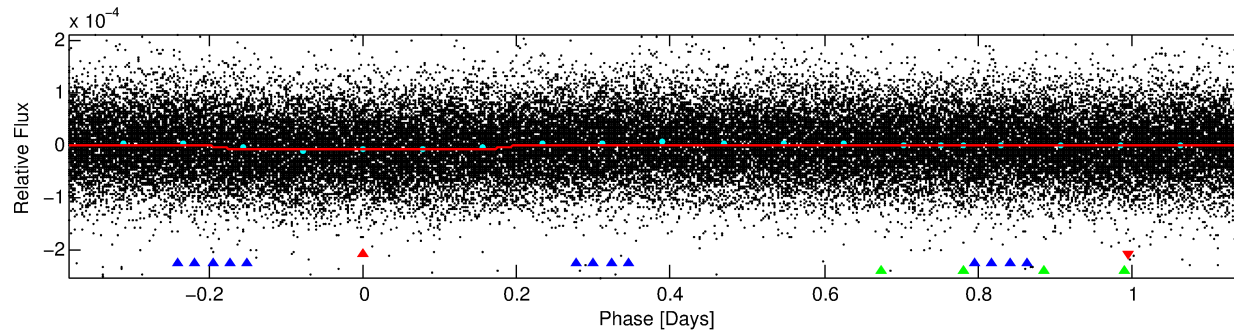
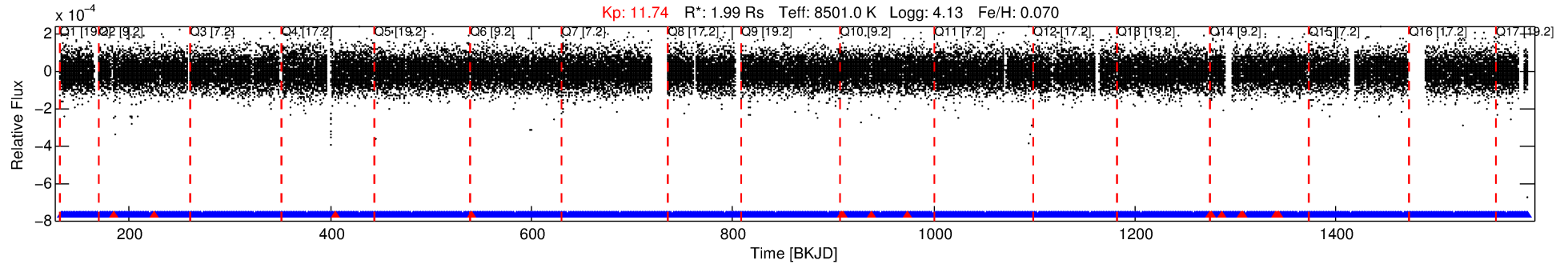
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008036426-01

No Significant Match Found

# DV One-Page Summary

KIC: 8036426 Candidate: 1 of 3 Period: 1.533 d



## DV Fit Results:

Period = 1.53286 [0.00002] d  
Epoch = 132.3869 [0.0060] BKJD  
Rp/R\* = 0.0028 [0.0007]  
a/R\* = 1.09 [0.27]  
b = 0.90 [0.33]  
Seff = 17467.69 [5950.83]  
Teq = 2931 [250] K  
Rp = 0.62 [0.20] Re  
a = 0.0325 [0.0065] AU  
Ag = 2.62 [2.08] [0.78 $\sigma$ ]  
Teffp = 5764 [1091] K [2.53 $\sigma$ ]

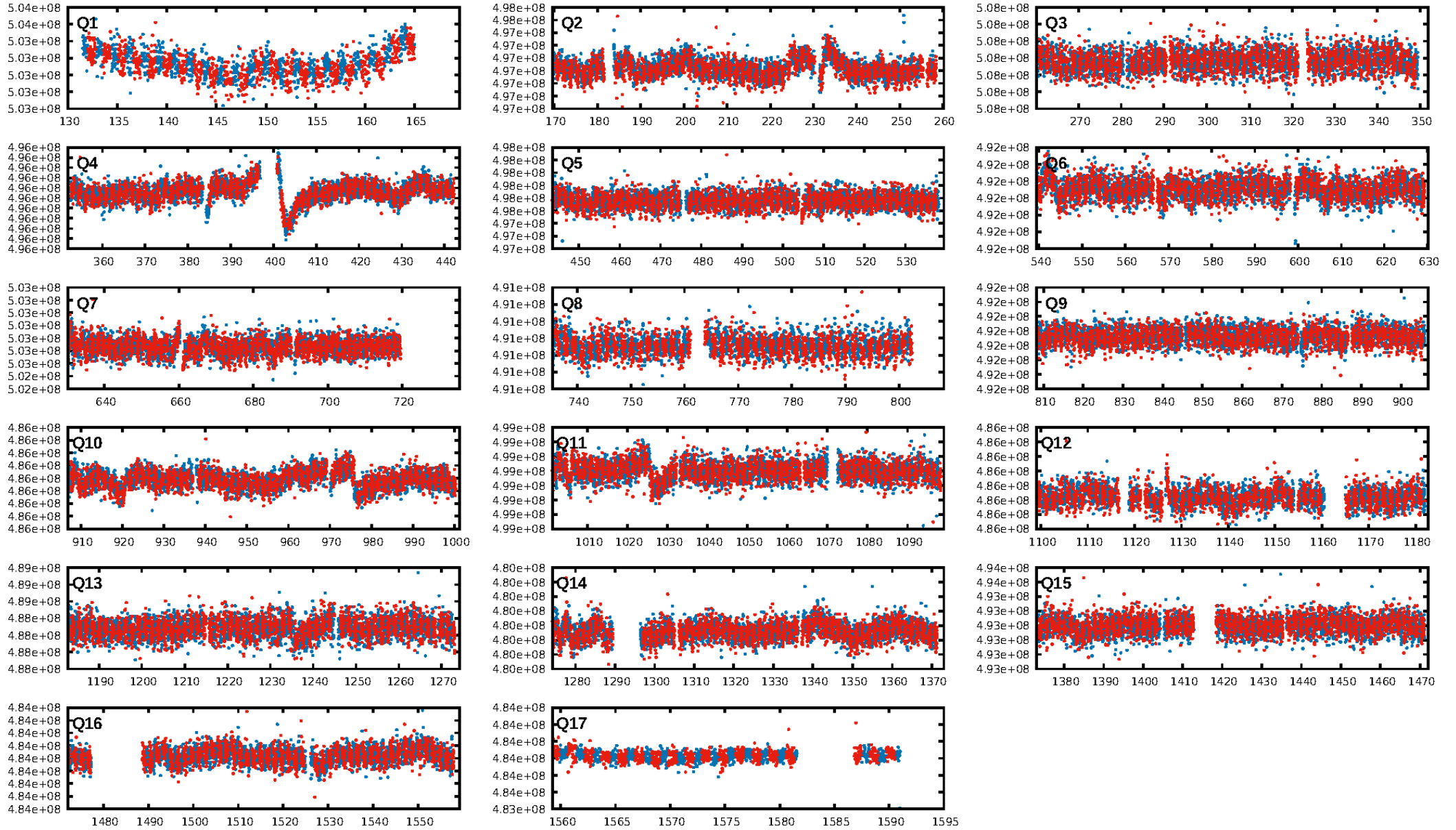
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [244.48 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.83e-17  
RollingBand-fgt: 0.98 [833/849]  
GhostDiagnostic-chr: 2.359  
Centroid-sig: 5.2%  
Centroid-so: 1.627 arcsec [1.66 $\sigma$ ]  
OotOffset-rm: 0.854 arcsec [1.72 $\sigma$ ]  
KicOffset-rm: 0.751 arcsec [1.45 $\sigma$ ]  
OotOffset-st: 4/3/3/3 [13]  
KicOffset-st: 4/3/3/3 [13]  
DiffImageQuality-fgm: 0.77 [10/13]  
DiffImageOverlap-fno: 1.00 [17/17]

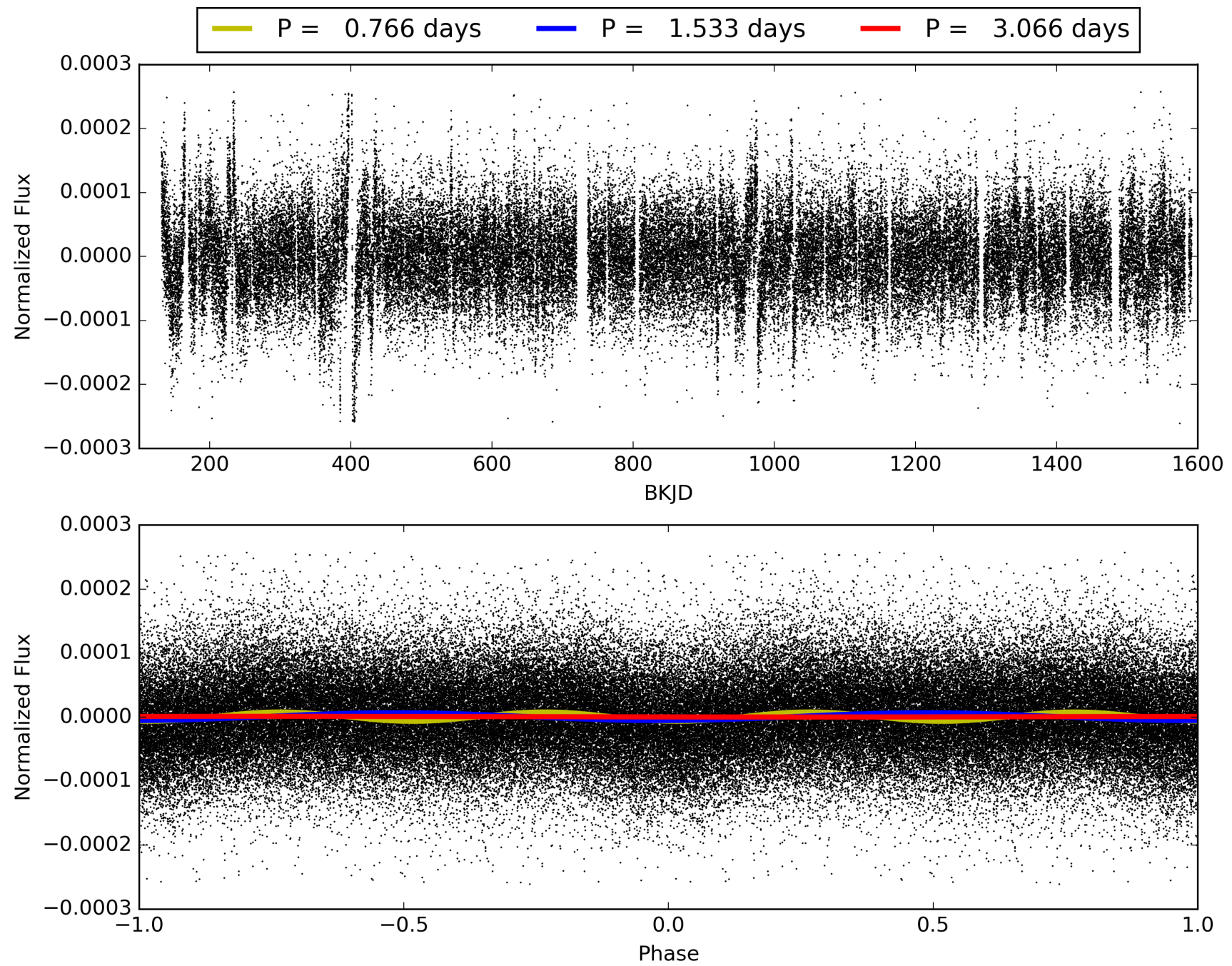
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 08:14:33 Z

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

# TCE 008036426-01, PDC Light Curves



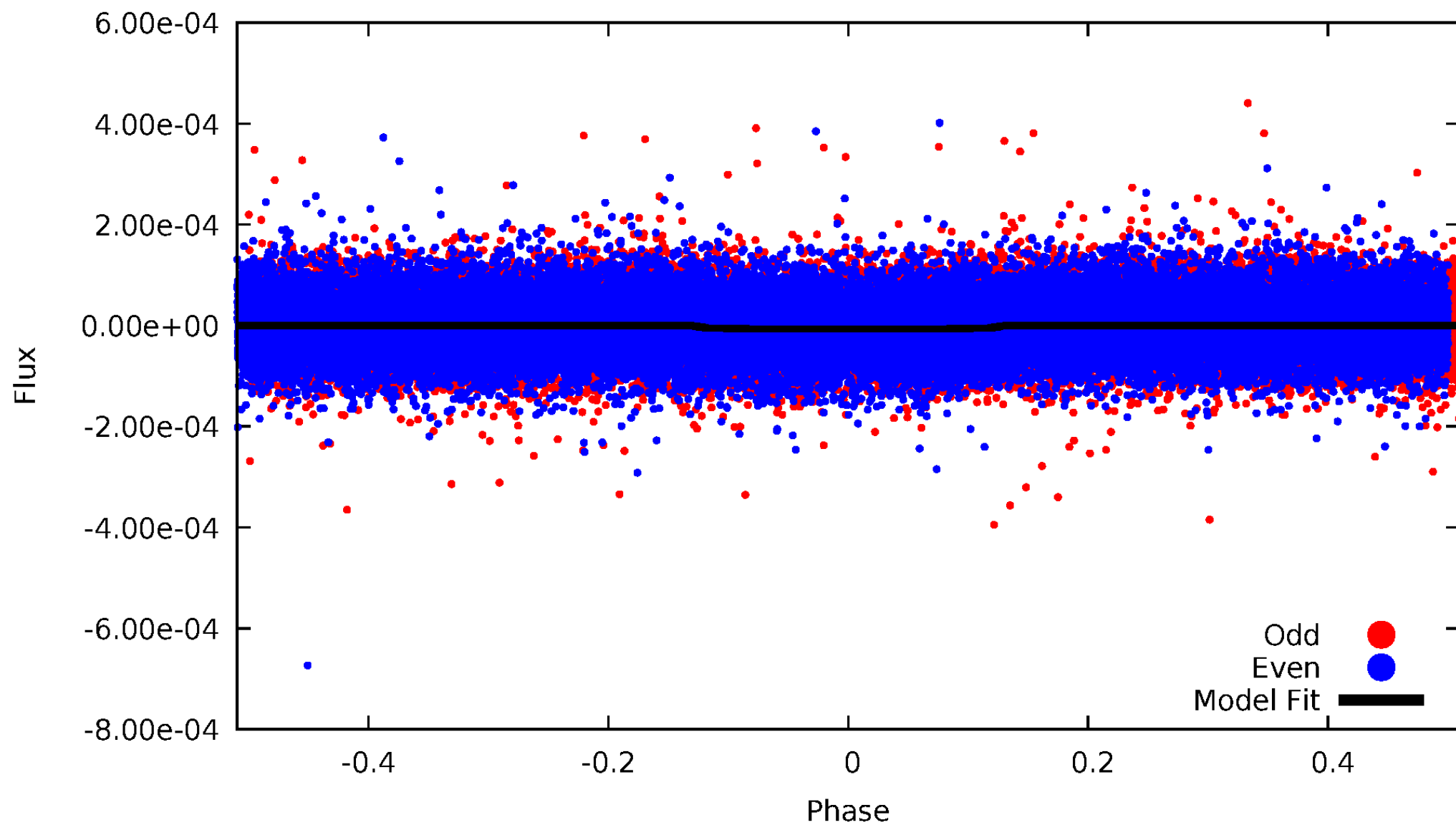
TCE 008036426-01





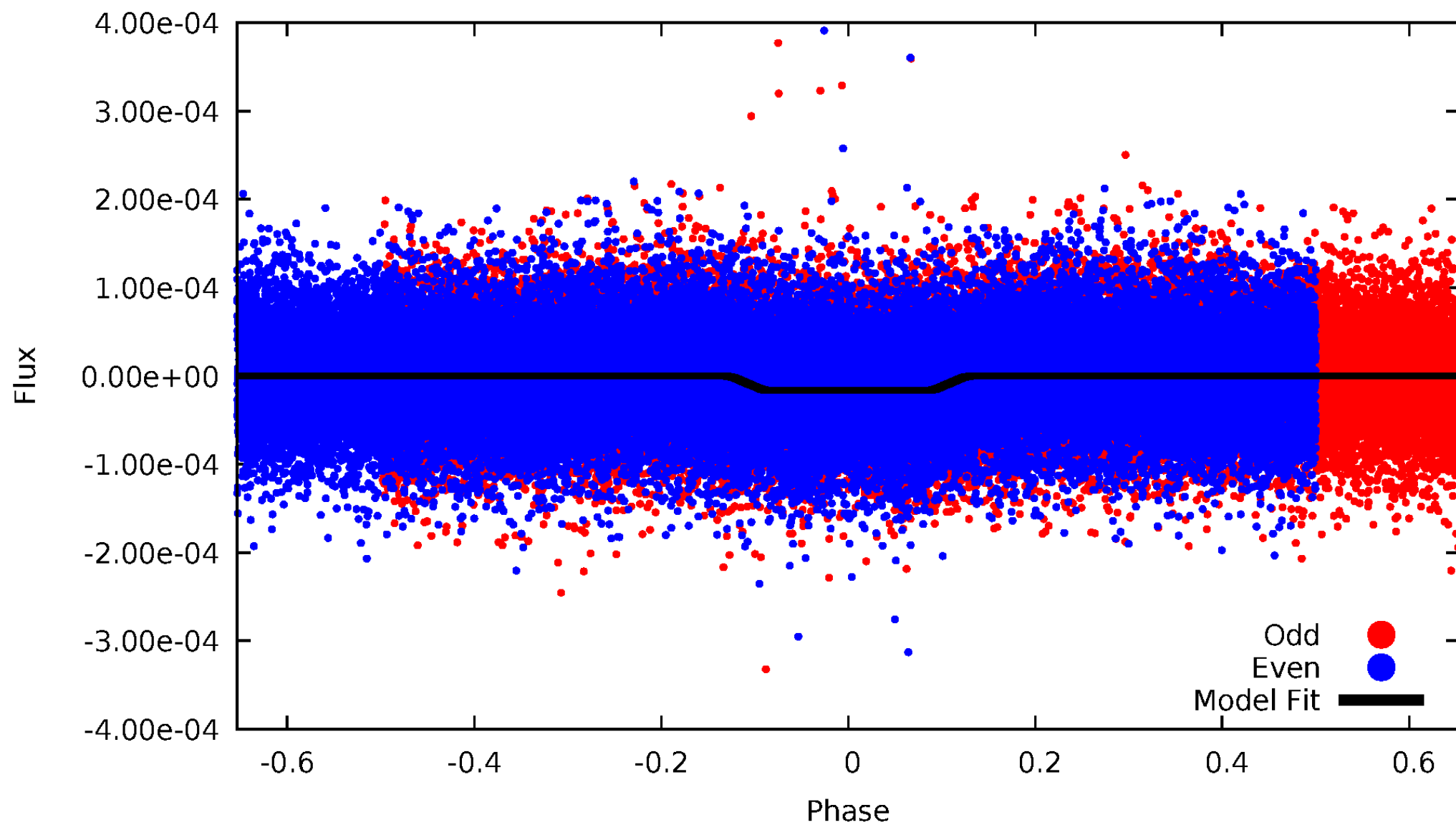
# DV Odd/Even

TCE 008036426-01



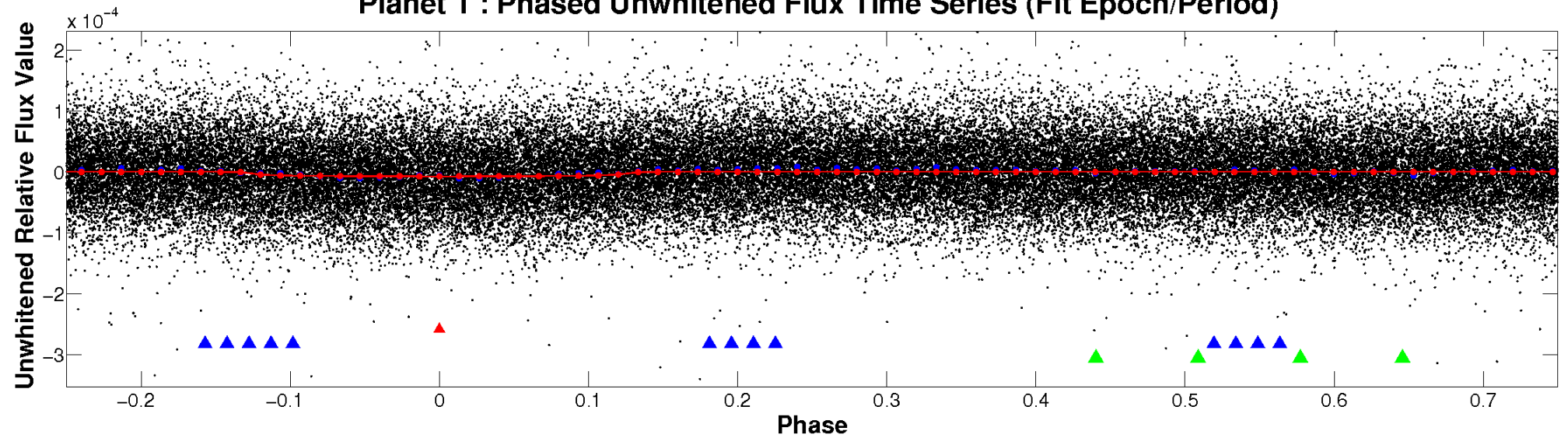
# ALT Odd/Even

TCE 008036426-01

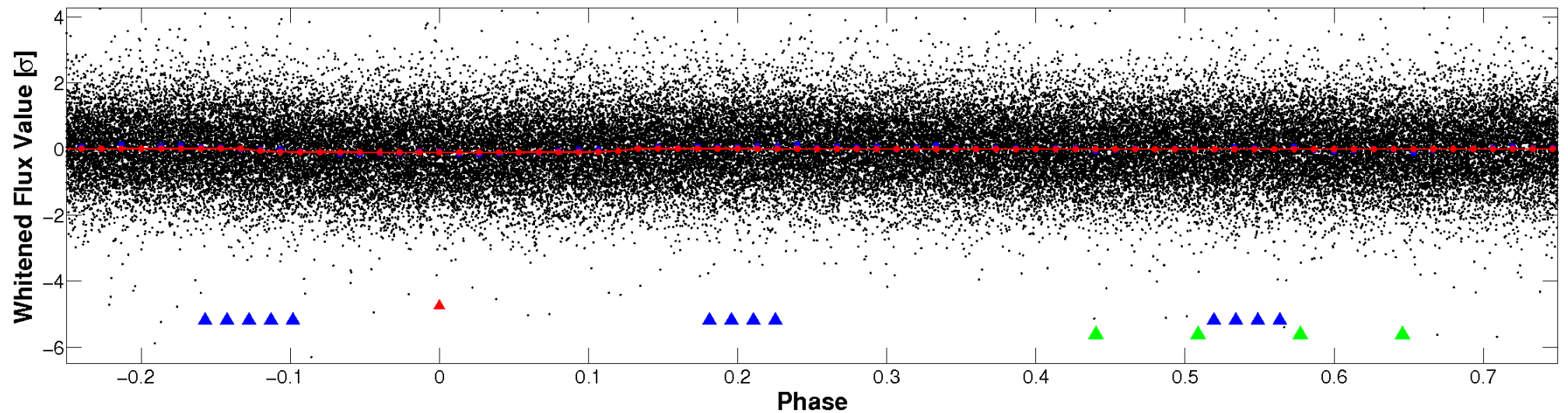


# Non-Whitened Vs. Whitened Light Curve

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

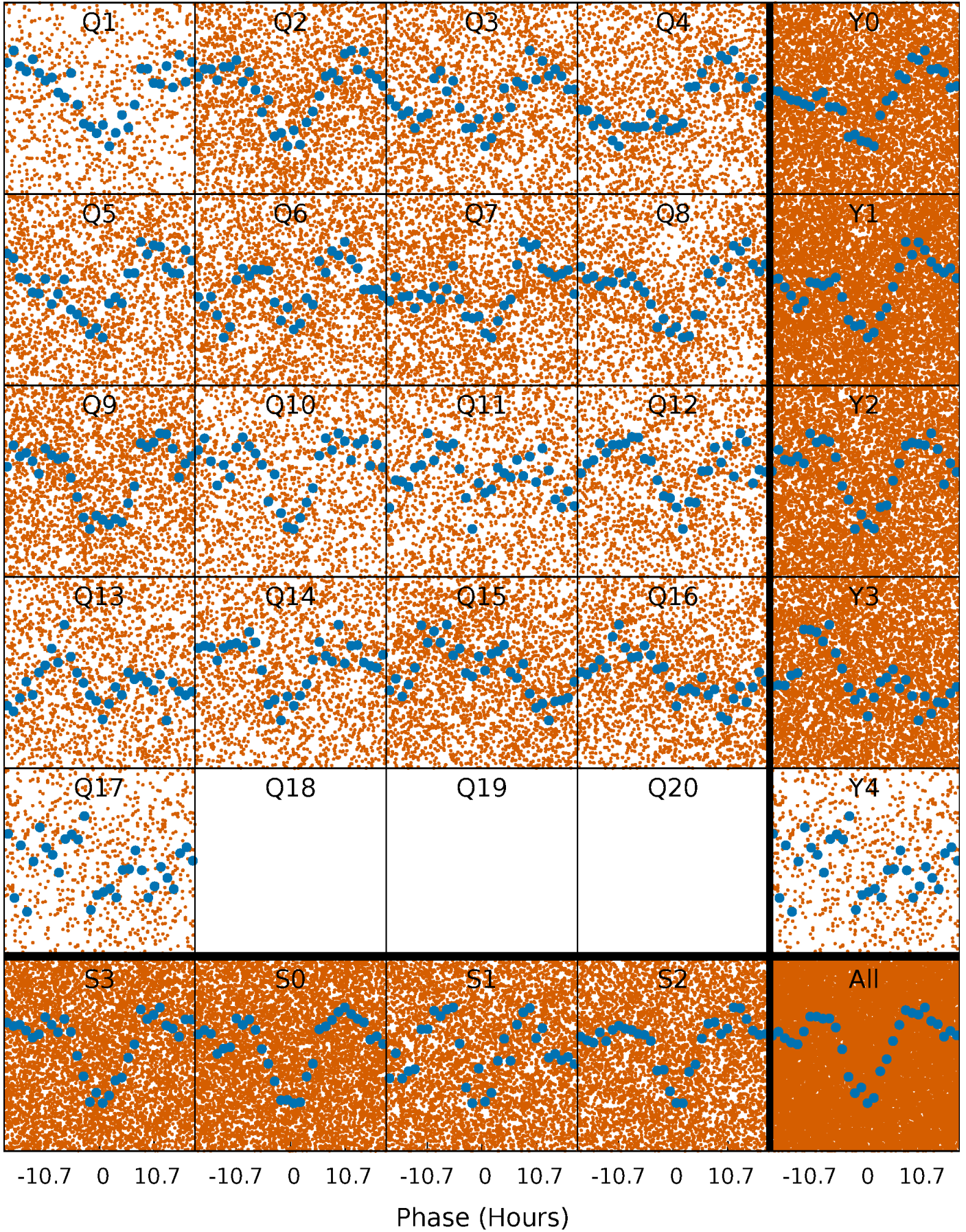


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

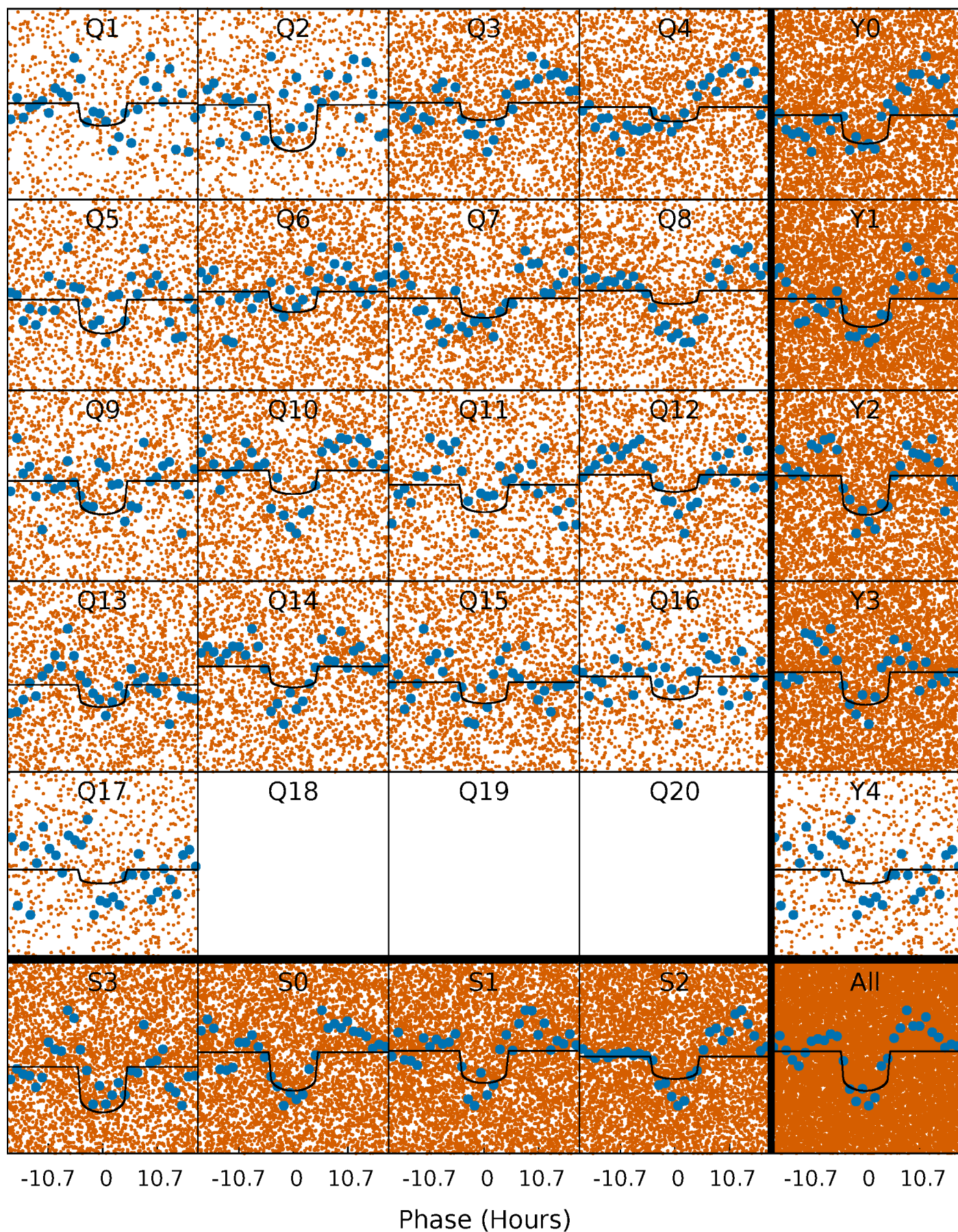
TCE 008036426-01 P= 1.532862 Days  $T_0=132.386927$  (BKJD)





# DV Quarter-Phased Transit Curves

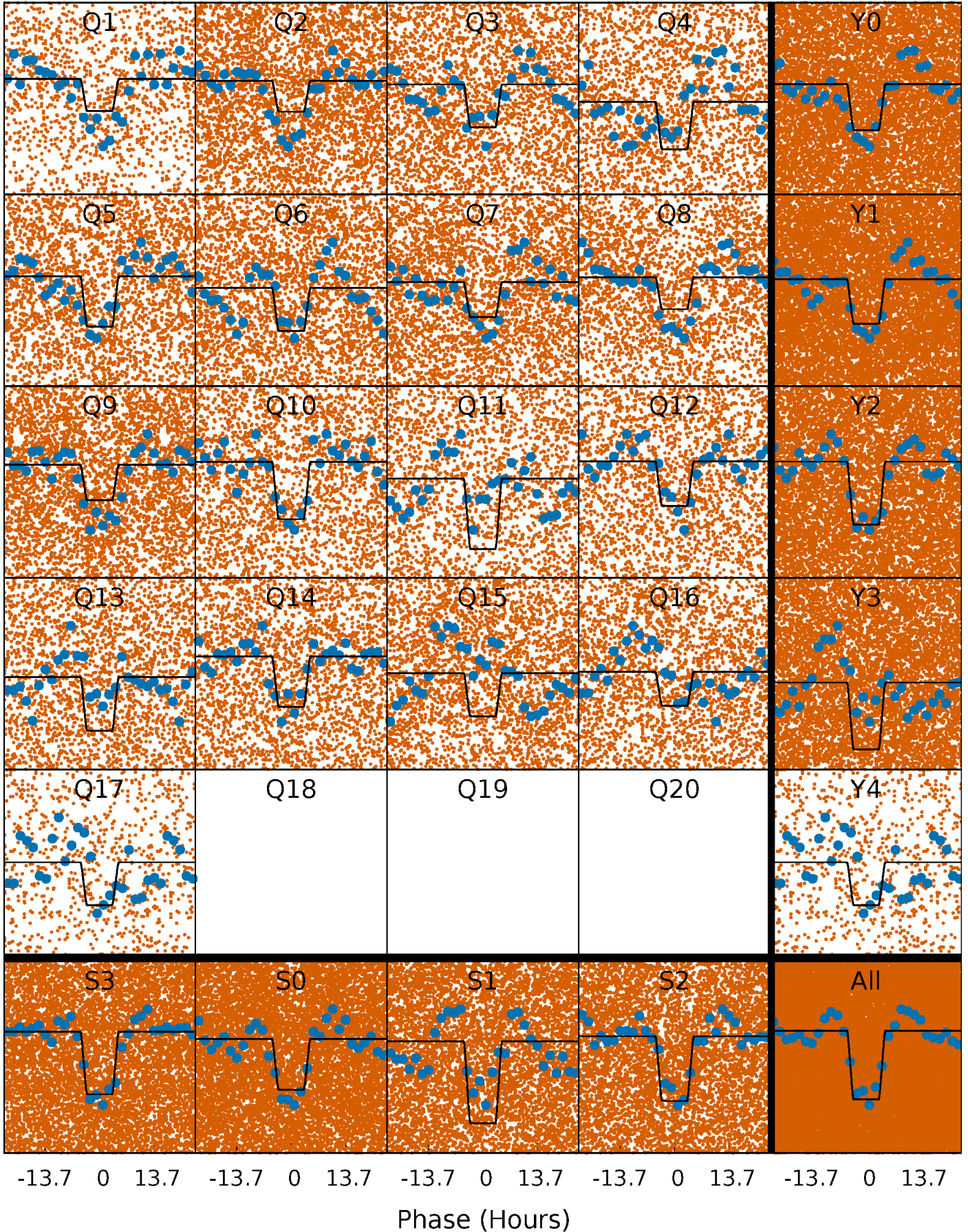
TCE 008036426-01 P= 1.532862 Days  $T_0=132.386927$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

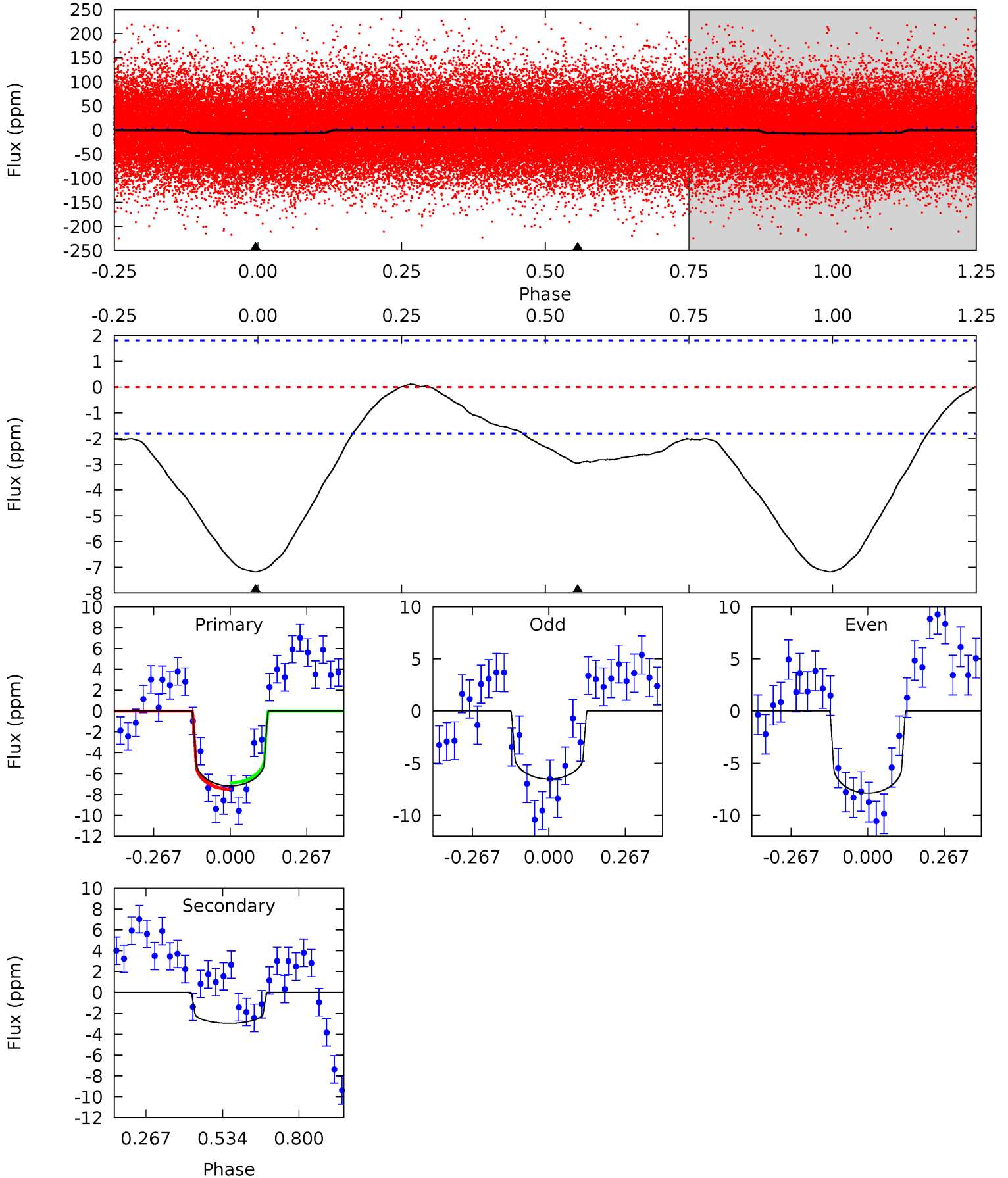
TCE 008036426-01 P= 1.532843 Days  $T_0=132.402498$  (BKJD)



# DV Model-Shift Uniqueness Test

008036426-01, P = 1.532862 Days, E = 130.854065 Days

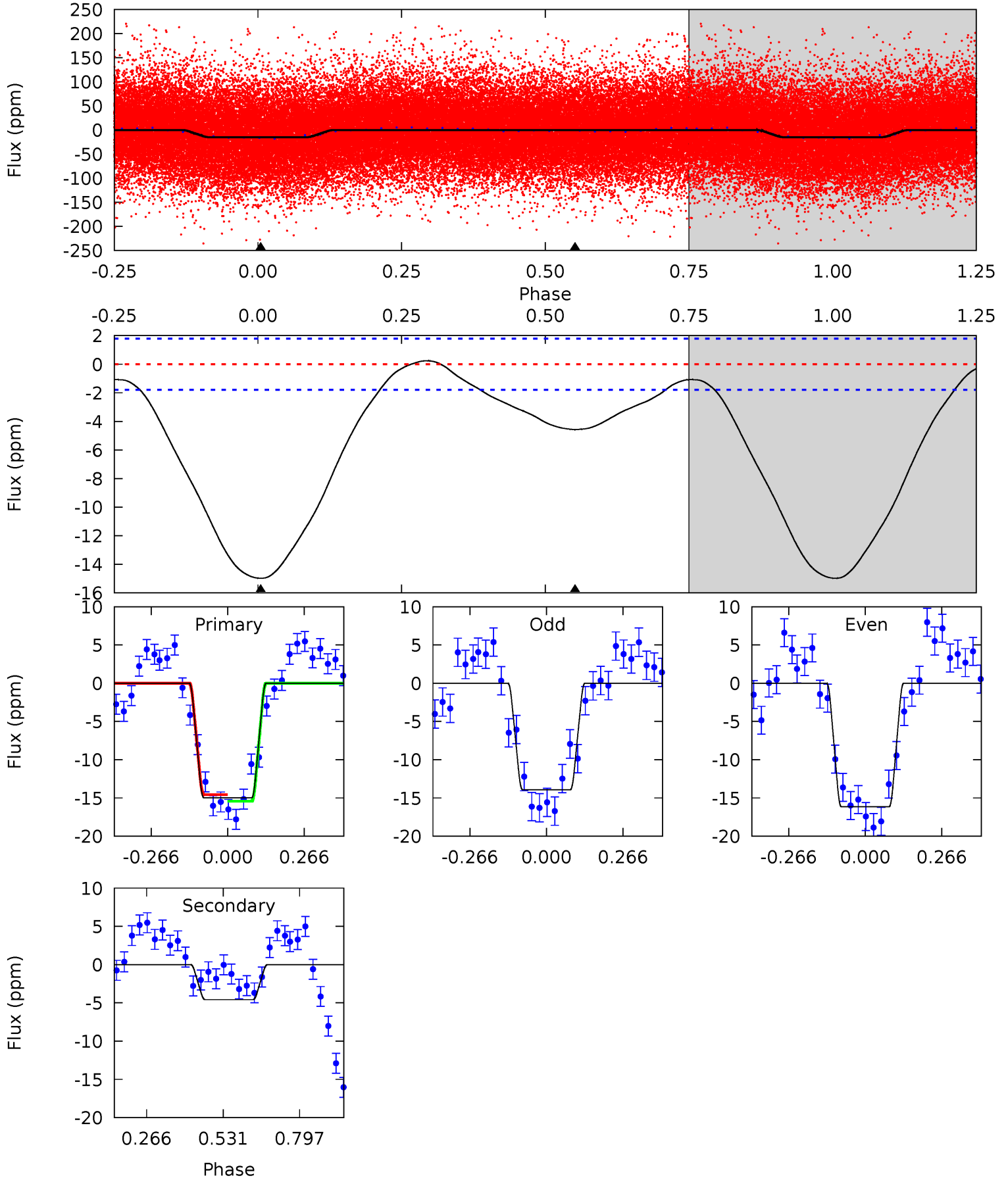
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	7.14	0	0	4.35	1.11	0.31	17.3	17.3	7.14	7.14	1.64	1.00	0.02	0.74



# Alt Model-Shift Uniqueness Test

008036426-01, P = 1.532843 Days, E = 130.869655 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
36.4	11.1	0	0	4.36	1.11	0.94	36.4	36.4	11.1	11.1	2.69	1.01	0.02	1.02





### Stellar Parameters For KIC 008036426

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8501^{+234}_{-368}$	$4.132^{+0.121}_{-0.162}$	$0.070^{+0.250}_{-0.550}$	$1.987^{+0.464}_{-0.422}$	$1.953^{+0.327}_{-0.400}$	$0.351^{+0.213}_{-0.154}$
	+3%/-4%	+3%/-4%	+357%/-786%	+23%/-21%	+17%/-20%	+61%/-44%
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 008036426-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-3 \pm 0$	$0.62^{+0.17}_{-0.16}$	$4111^{+262}_{-253}$	$6191^{+1122}_{-673}$	$4.374^{+3.775}_{-1.722}$
Alt.	$-5 \pm 0$	$0.89^{+0.20}_{-0.19}$	$4129^{+252}_{-286}$	$5762^{+678}_{-507}$	$3.236^{+1.918}_{-1.018}$

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

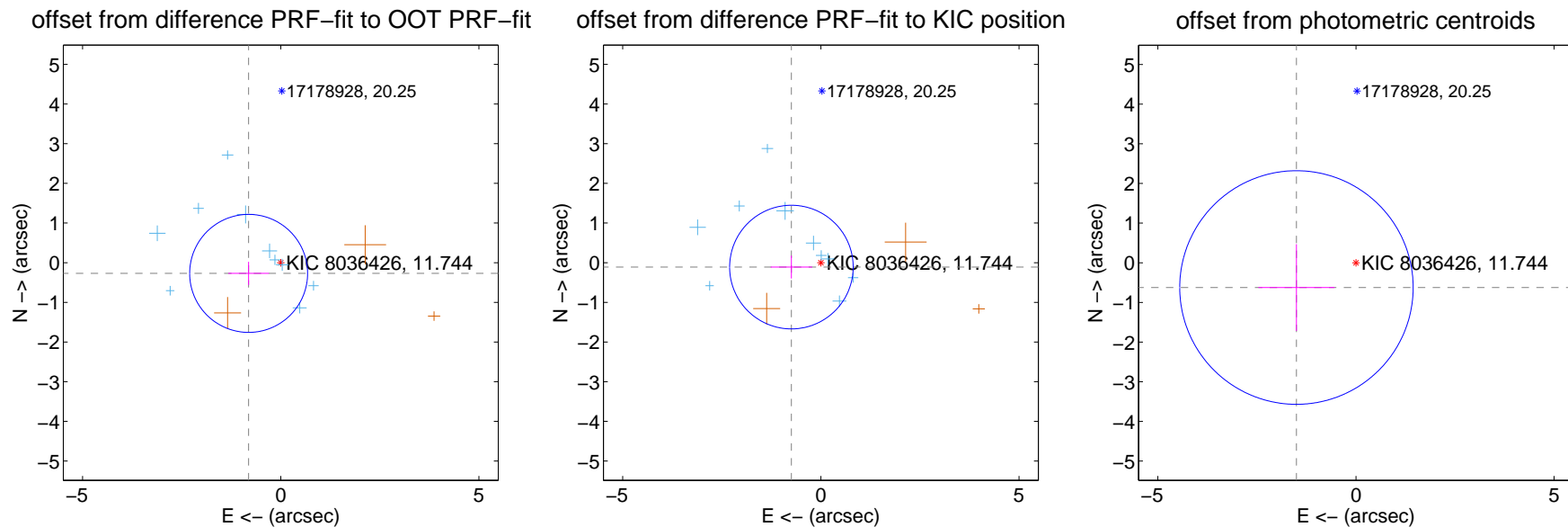
## DV Centroid Data

Supplemental centroid analysis for 008036426-01. **Kepler magnitude: 11.74.** Transit SNR 11.76

There are 10 quarters with good PRF difference image offsets

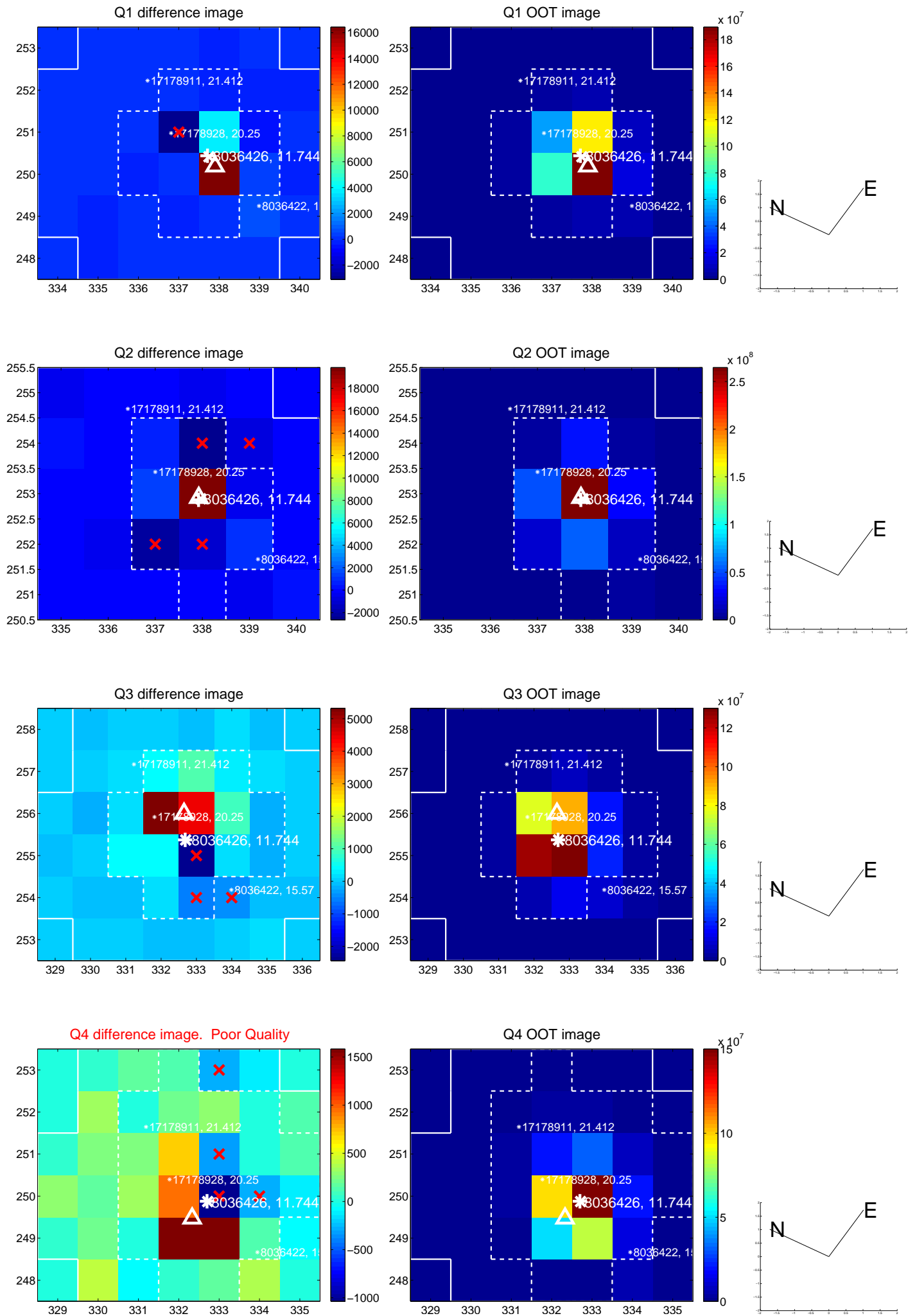
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.854 \pm 0.496$	1.72	$0.811 \pm 0.514$	$-0.270 \pm 0.292$
PRF-fit source offset from KIC position	$0.751 \pm 0.520$	1.45	$0.743 \pm 0.524$	$-0.111 \pm 0.288$
photometric centroid source offset	$1.63 \pm 0.98$	1.66	$1.50 \pm 0.96$	$-0.62 \pm 1.09$

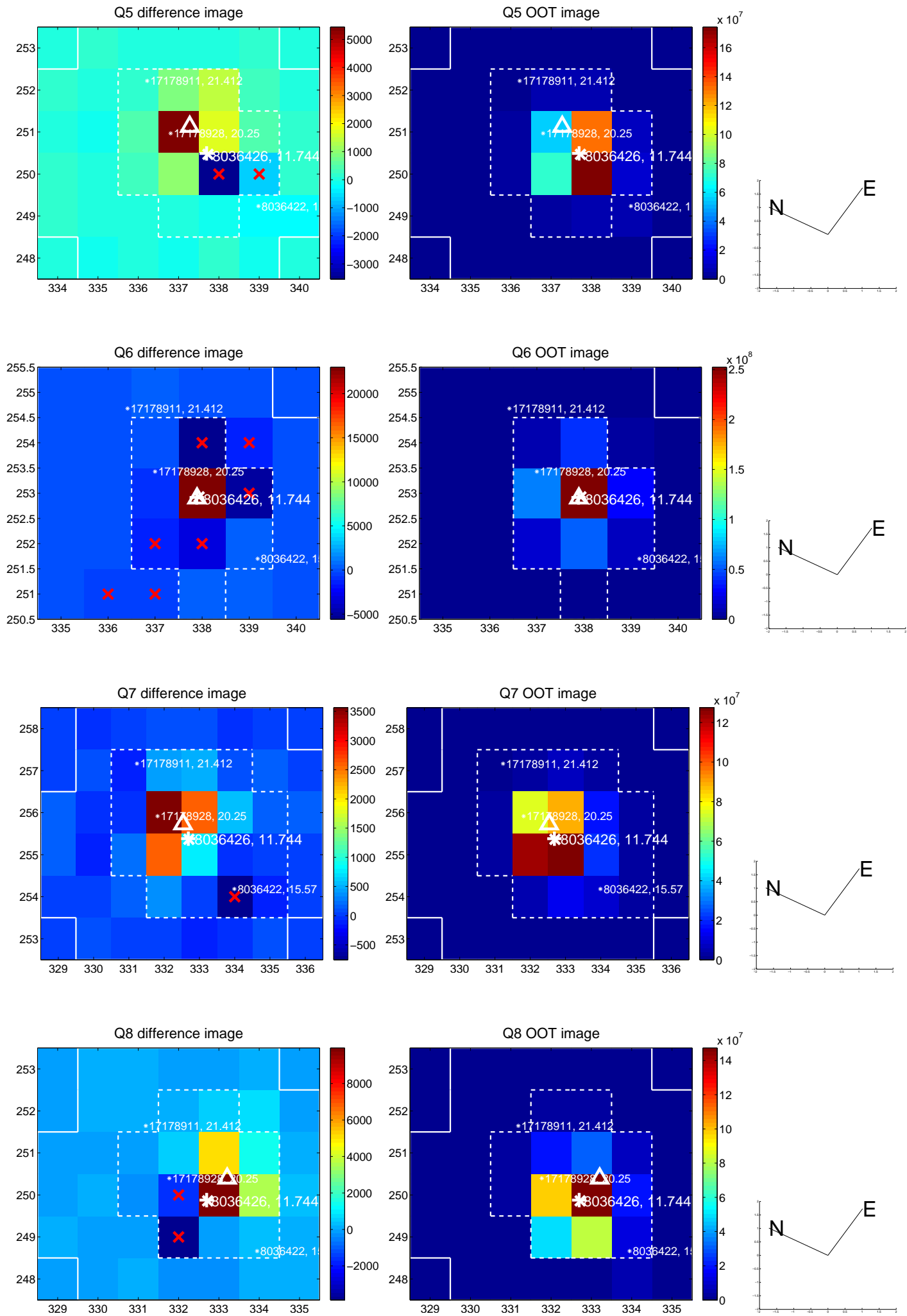


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

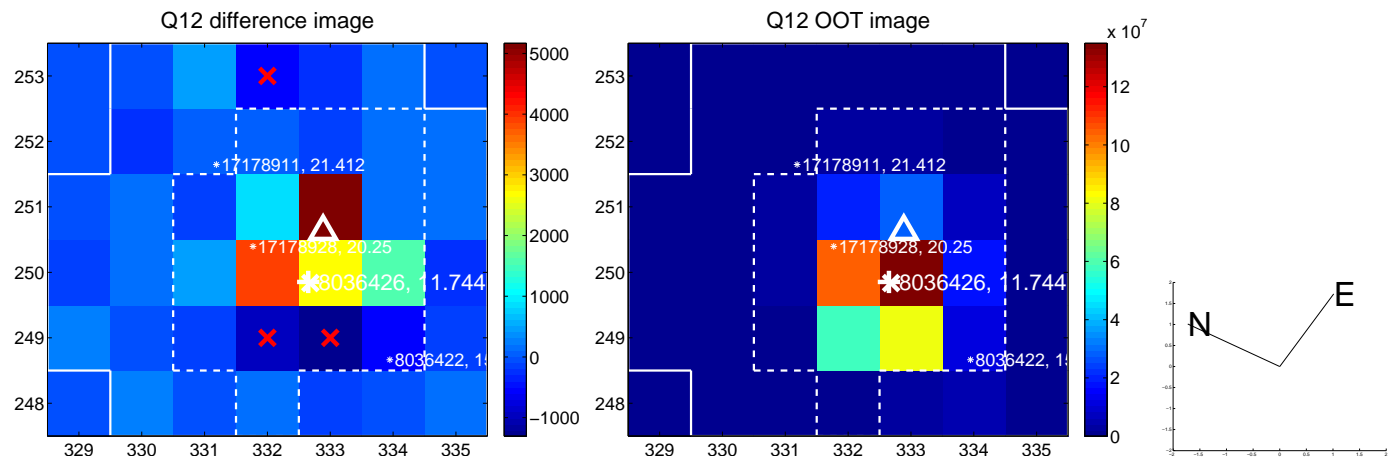
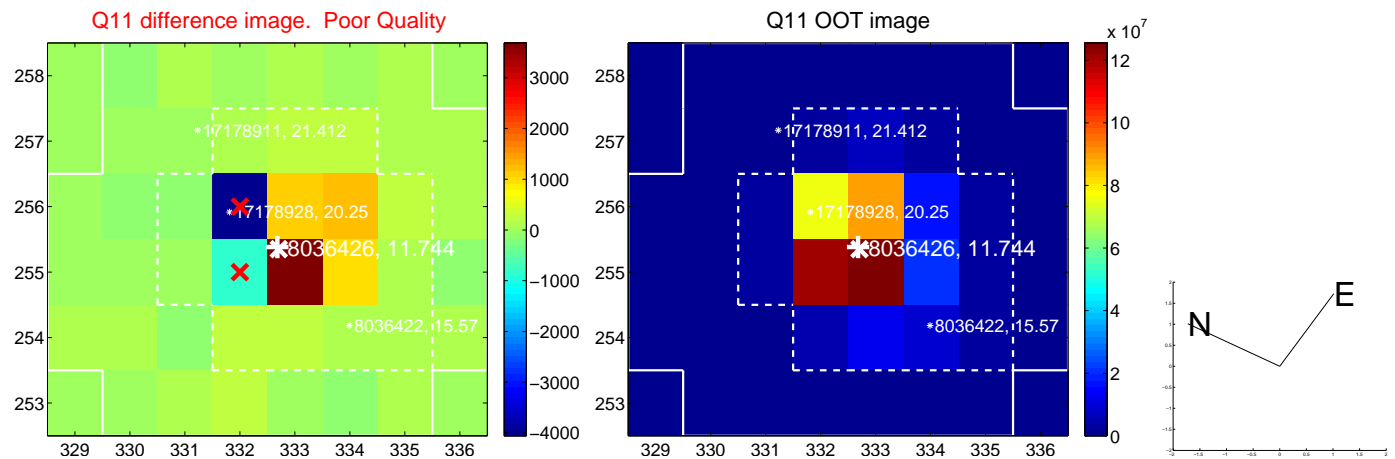
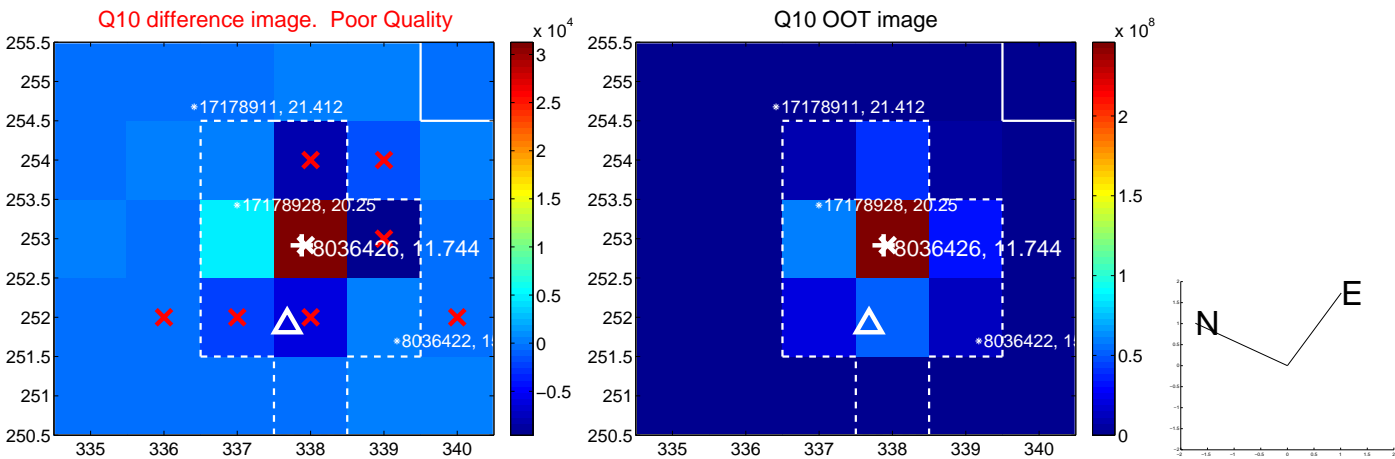
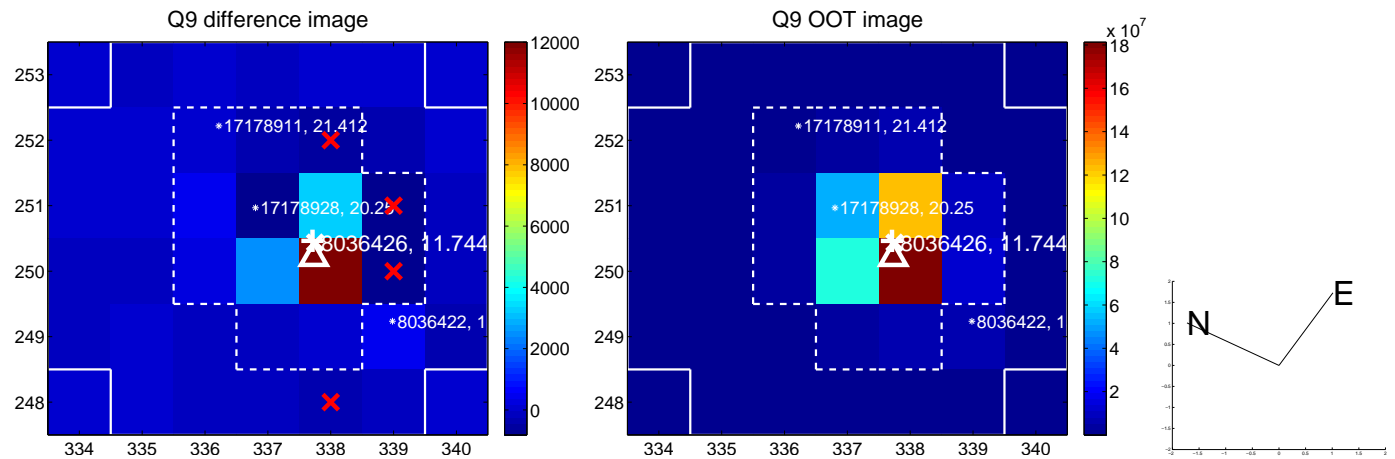


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

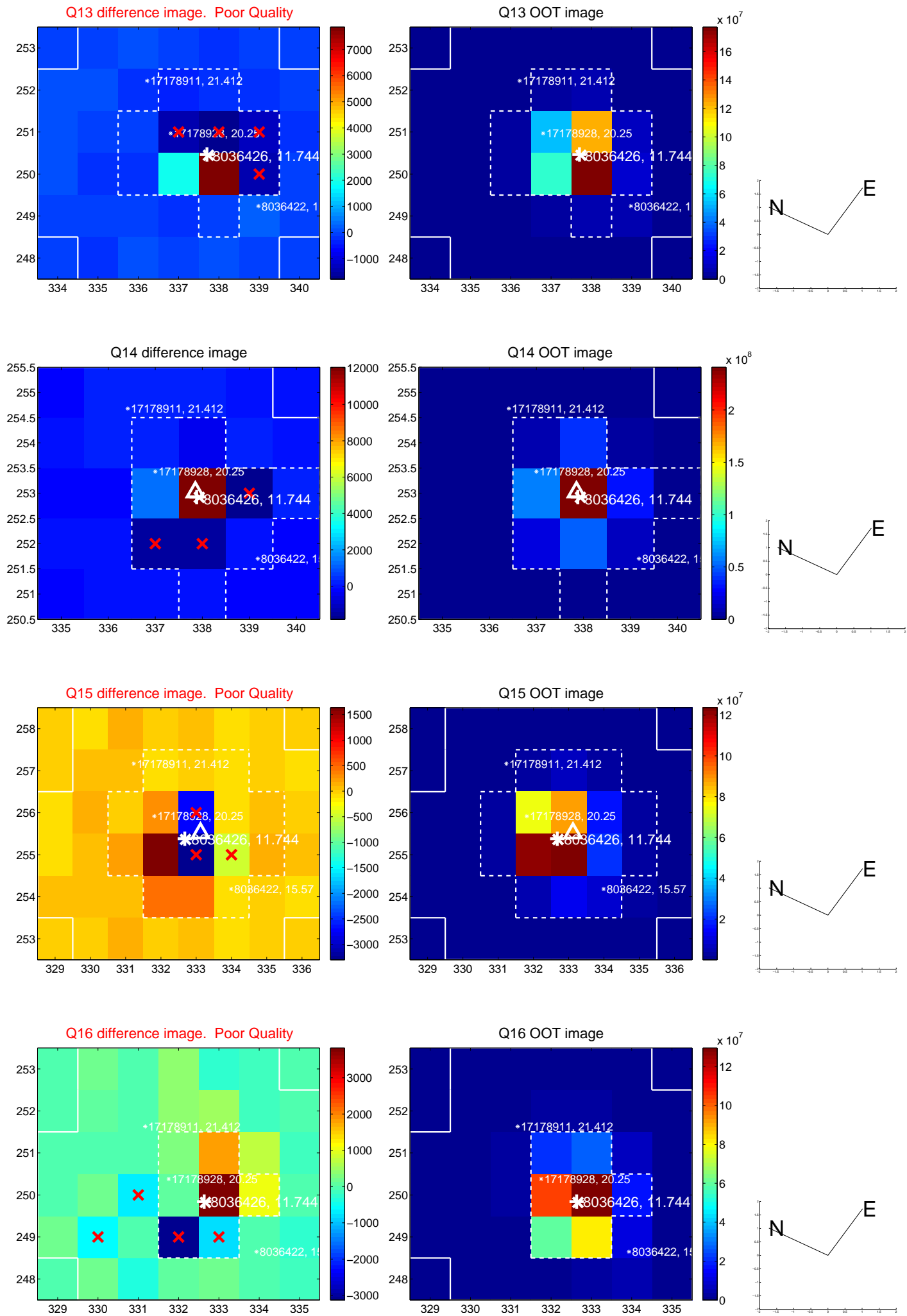




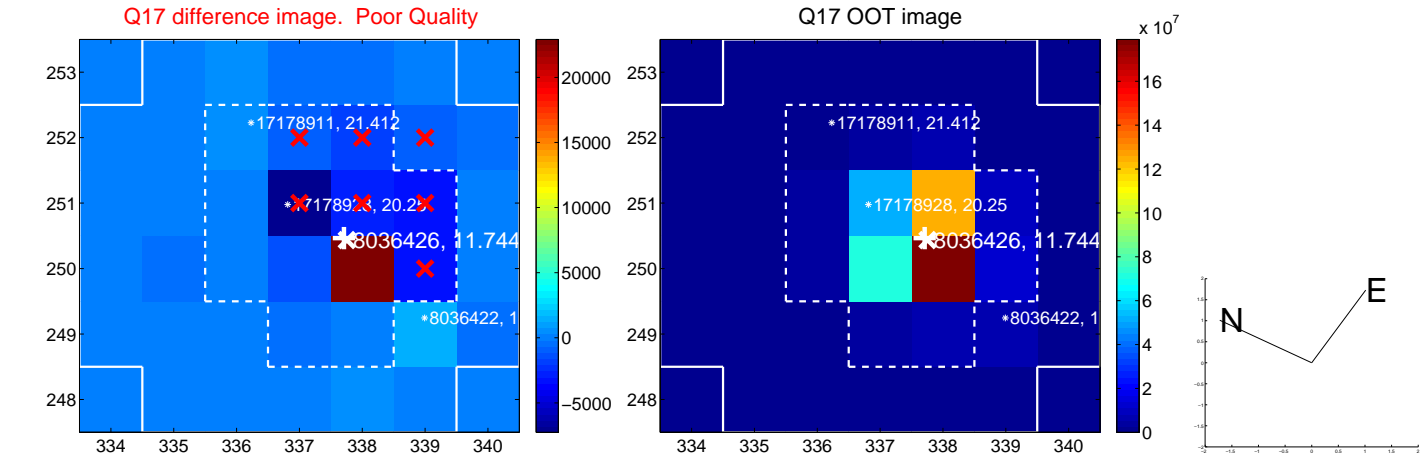
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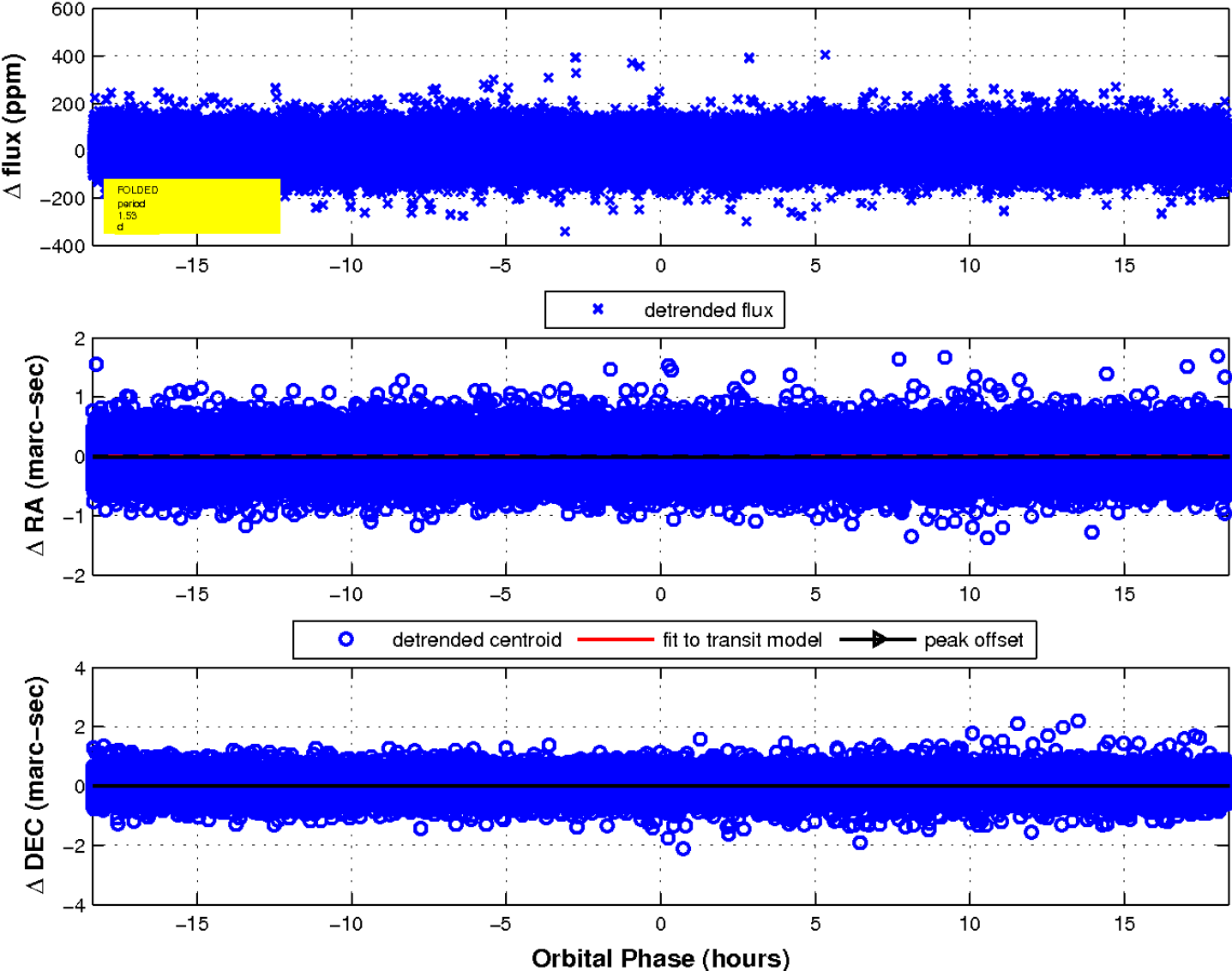
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

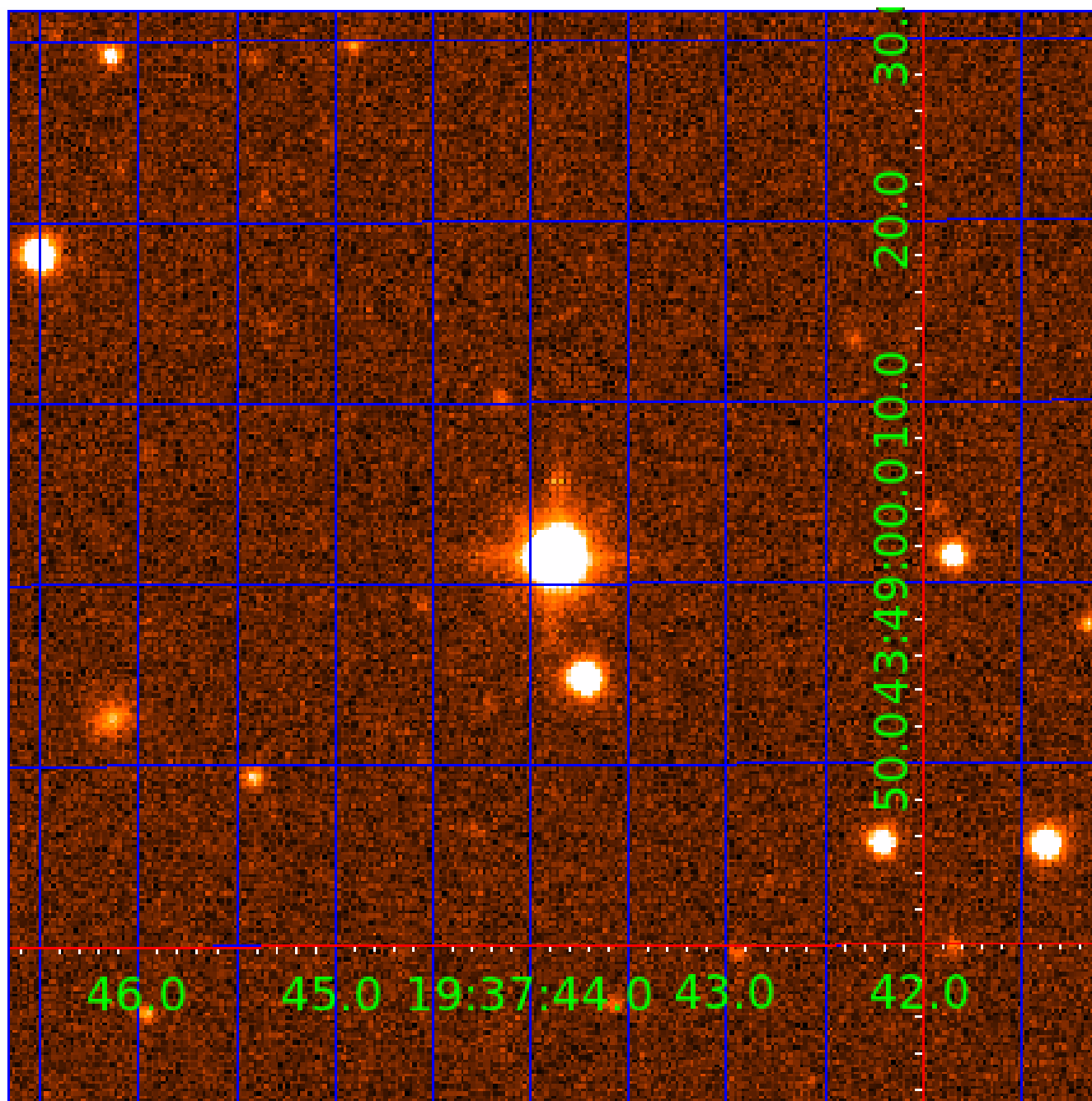


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 008036426

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008036426-01	OBS	No	1.532862	132.386927	7.1	9.370	10.0	11.8	1.99	8501	0.62	17467.69
008036426-03	OBS	No	348.064696	451.897171	76.4	7.326	13.0	10.0	1.99	8501	1.96	12.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008036426-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008036426-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

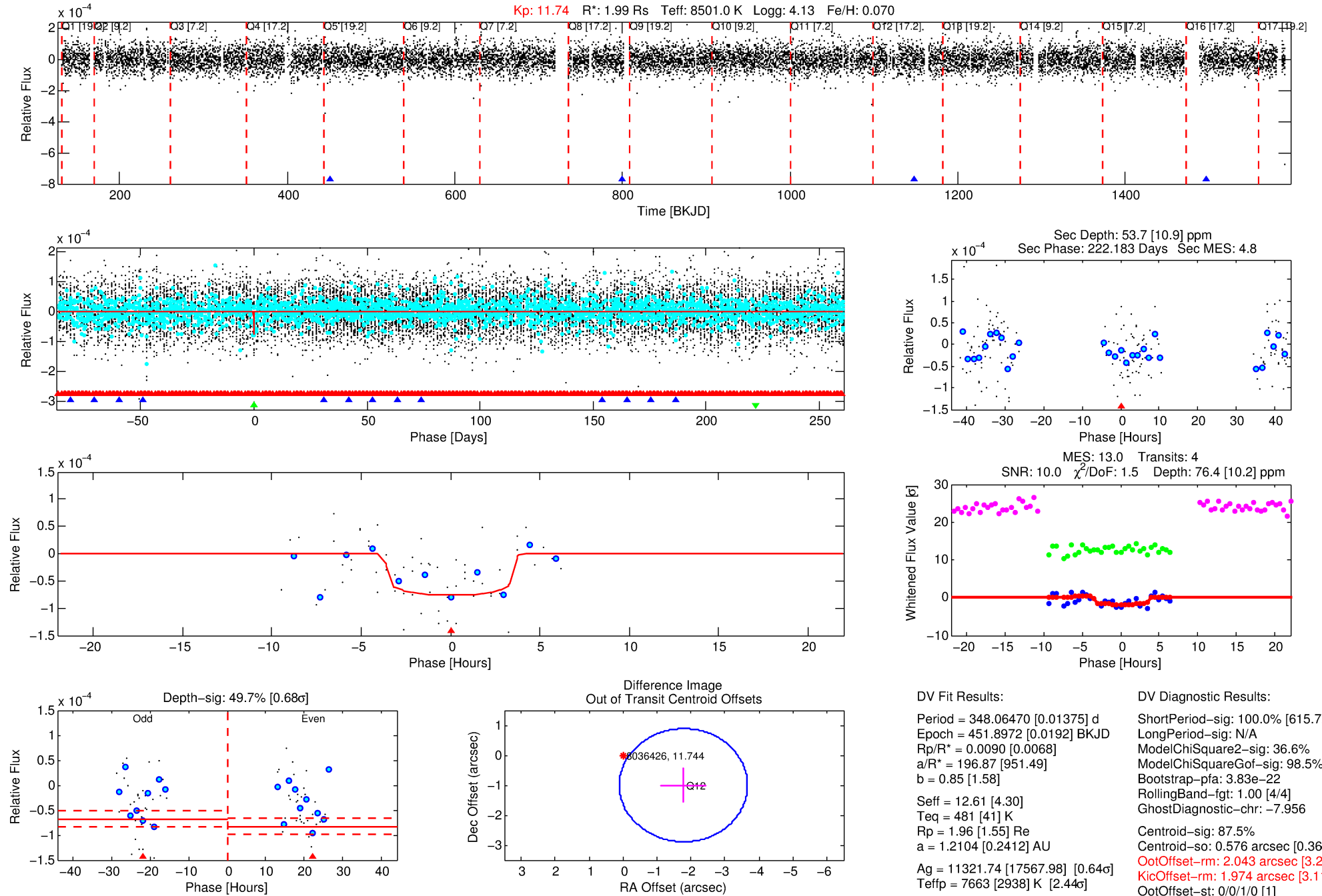
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008036426-03

No Significant Match Found

# DV One-Page Summary

KIC: 8036426 Candidate: 3 of 3 Period: 348.065 d



## DV Fit Results:

Period = 348.06470 [0.01375] d  
Epoch = 451.8972 [0.0192] BKJD  
Rp/R\* = 0.0090 [0.0068]  
a/R\* = 196.87 [951.49]  
b = 0.85 [1.58]  
Seff = 12.61 [4.30]  
Teff = 481 [41] K  
Rp = 1.96 [1.55] Re  
a = 1.2104 [0.2412] AU  
Ag = 11321.74 [17567.98] [0.64 $\sigma$ ]  
Teffp = 7663 [2938] K [2.44 $\sigma$ ]

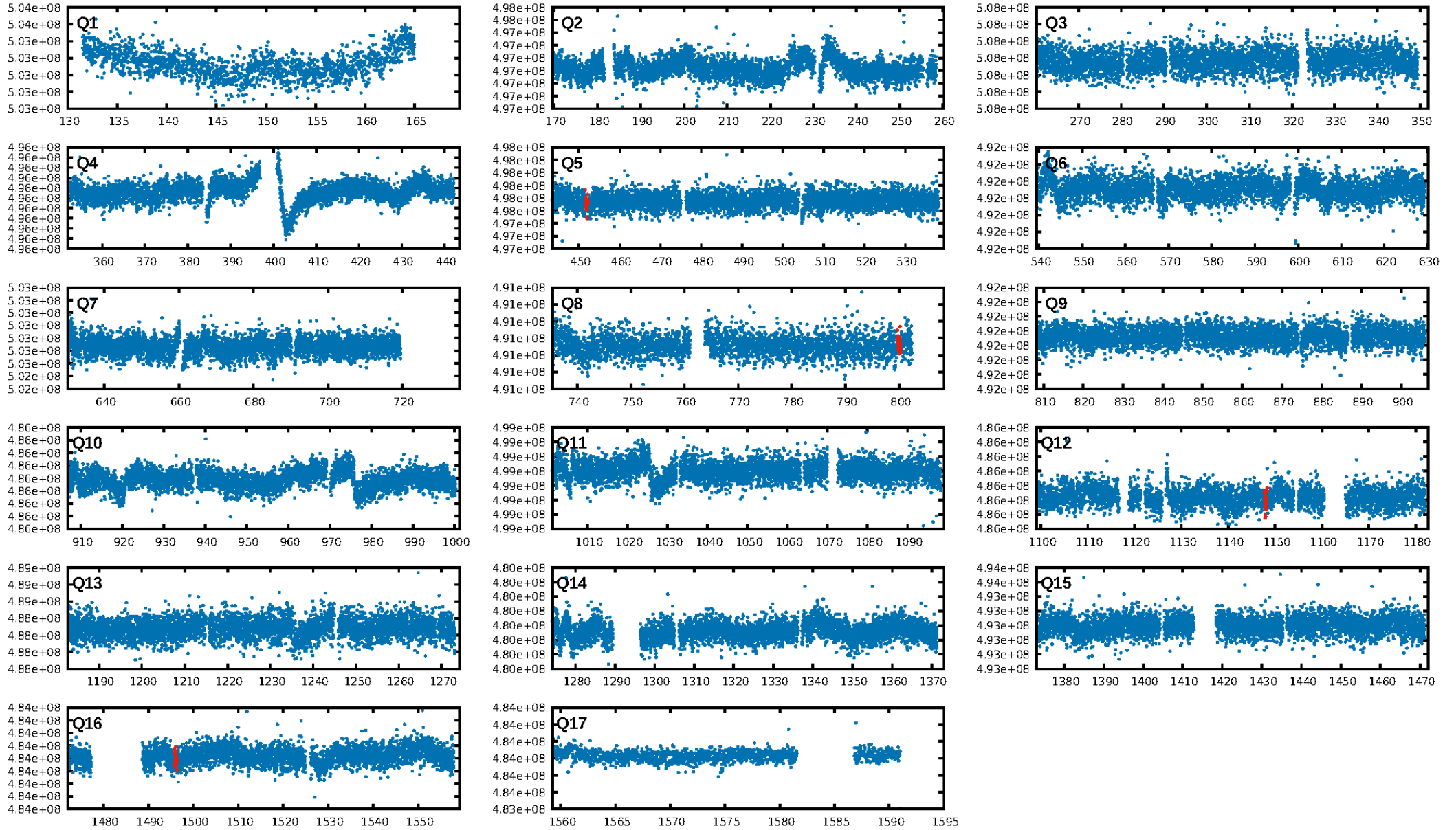
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [615.72 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 36.6%  
ModelChiSquareGof-sig: 98.5%  
Bootstrap-pfa: 3.83e-22  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -7.956  
Centroid-sig: 87.5%  
Centroid-so: 0.576 arcsec [0.36 $\sigma$ ]  
OotOffset-rm: 2.043 arcsec [3.25 $\sigma$ ]  
KicOffset-rm: 1.974 arcsec [3.11 $\sigma$ ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 0.00 [0/4]

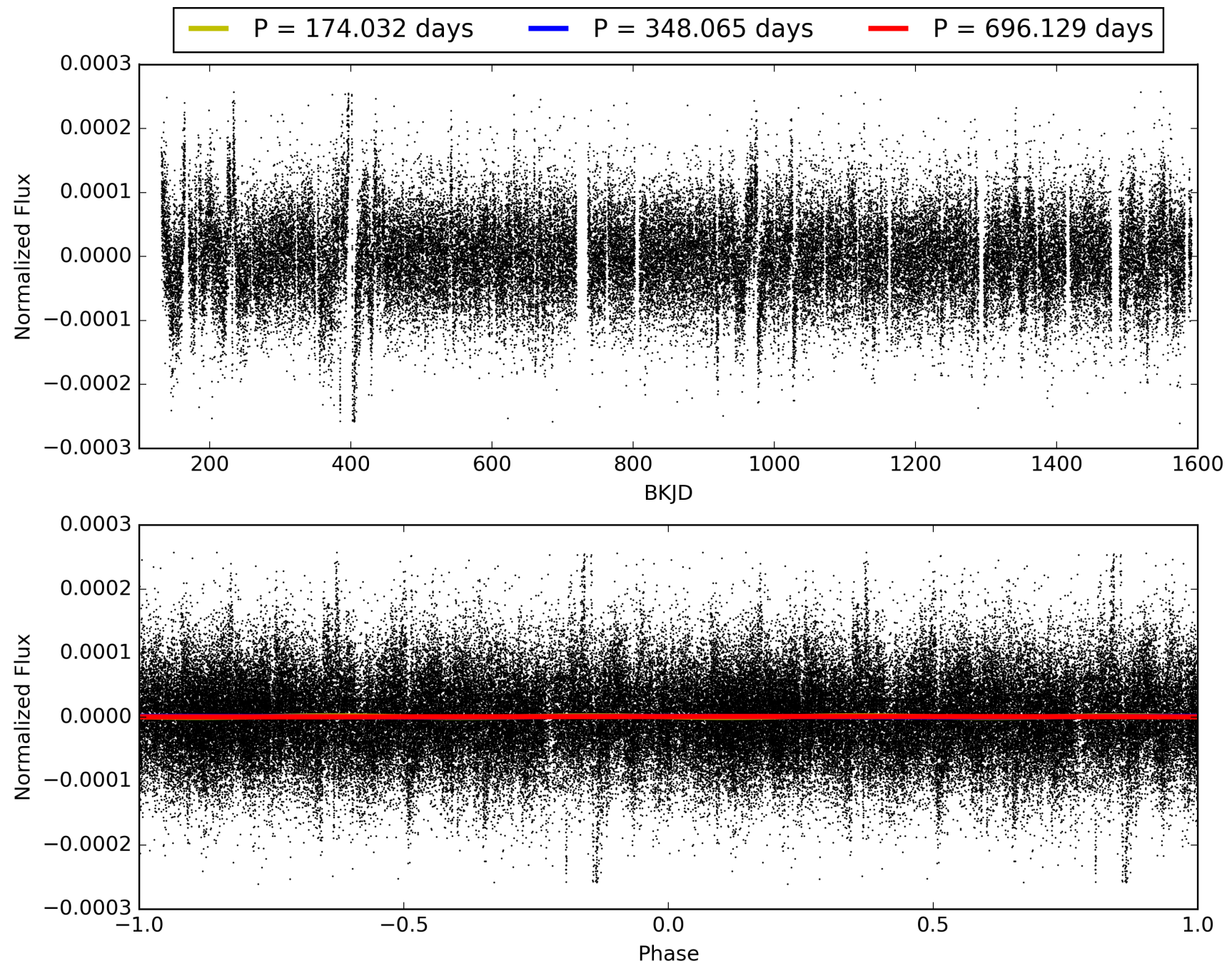
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 08:14:49 Z

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

# TCE 008036426-03, PDC Light Curves



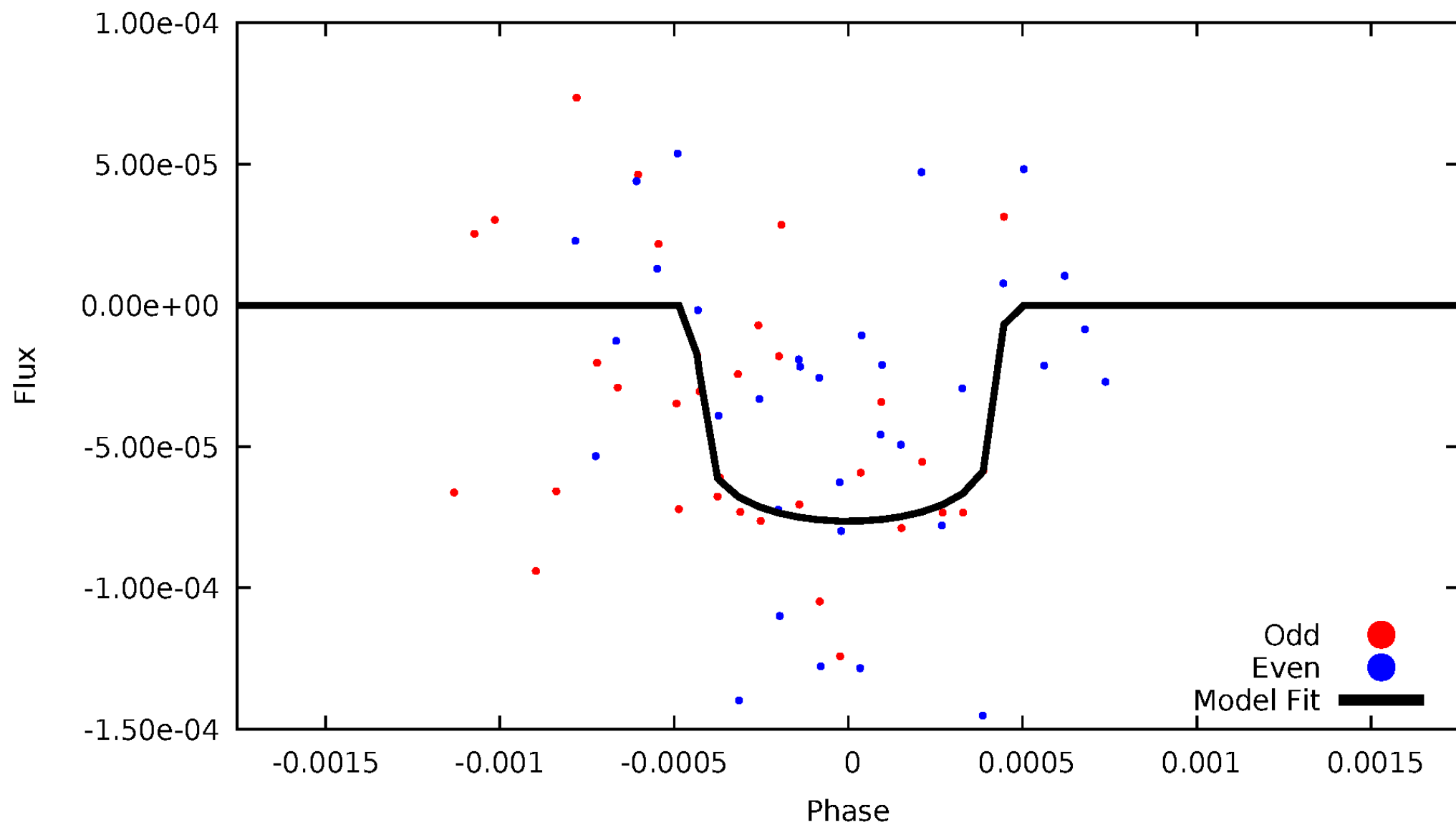
TCE 008036426-03





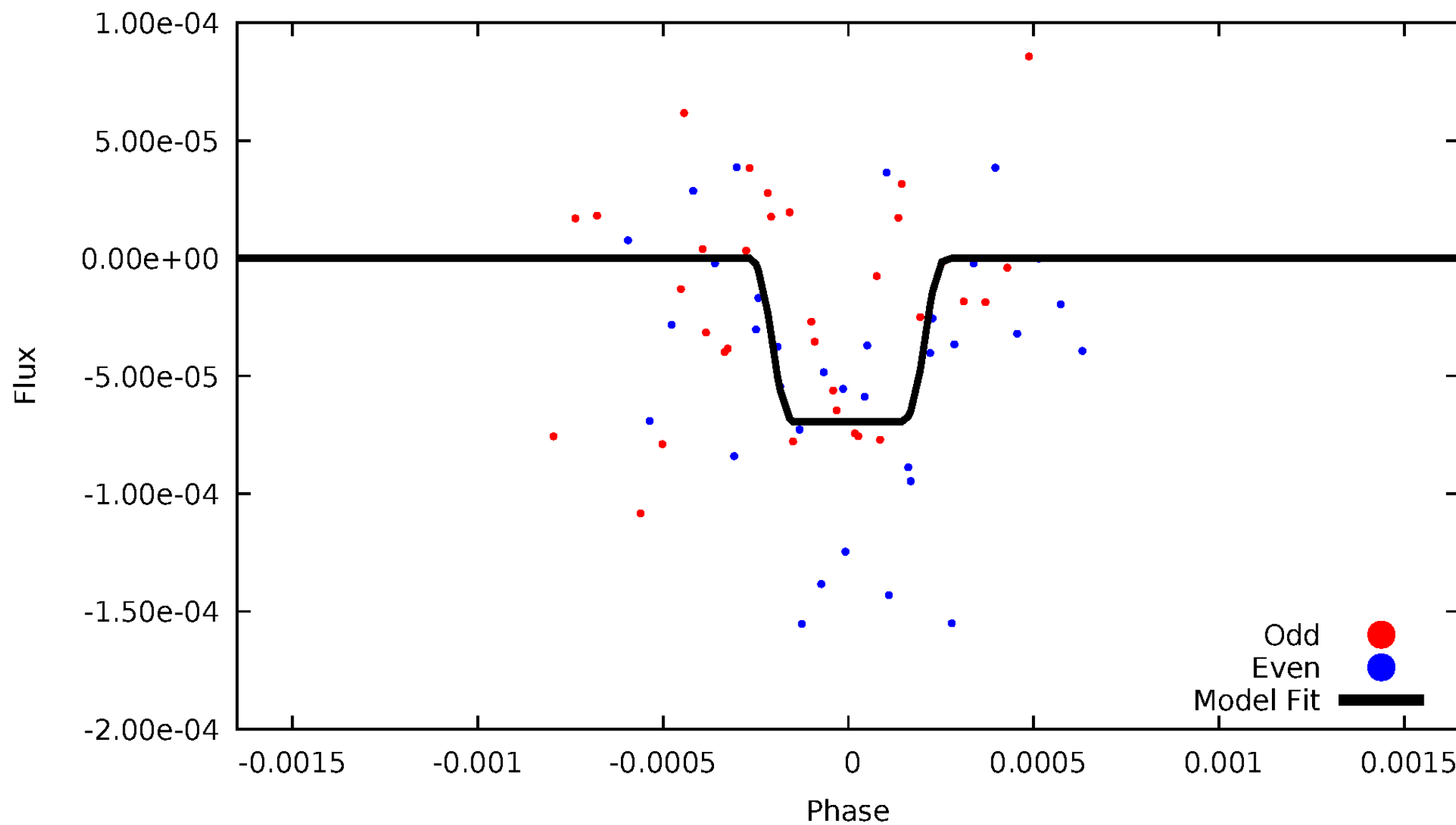
# DV Odd/Even

TCE 008036426-03



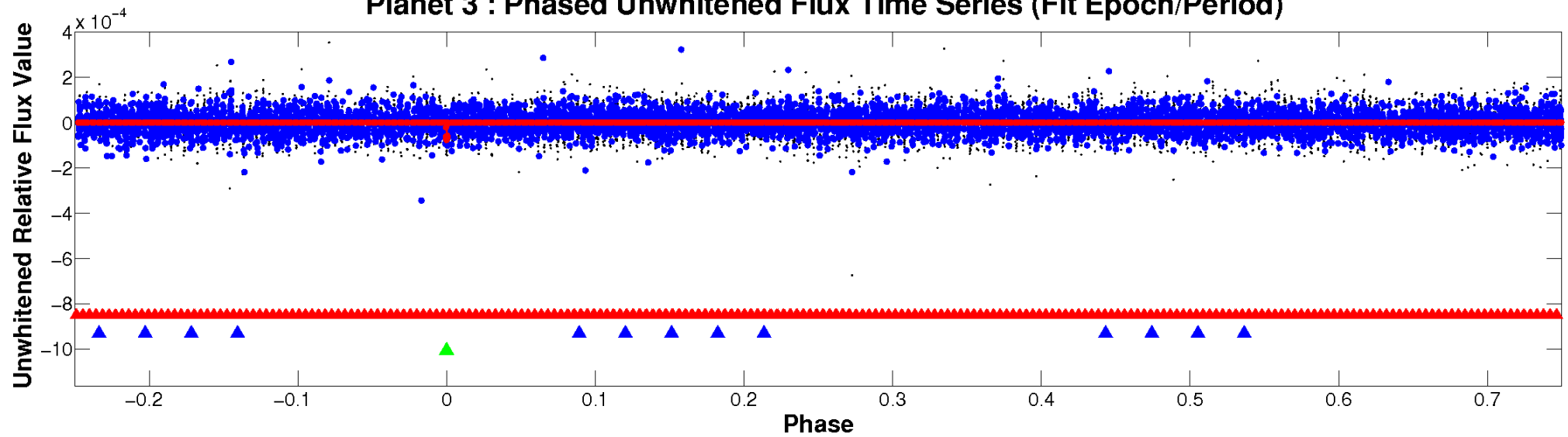
# ALT Odd/Even

TCE 008036426-03

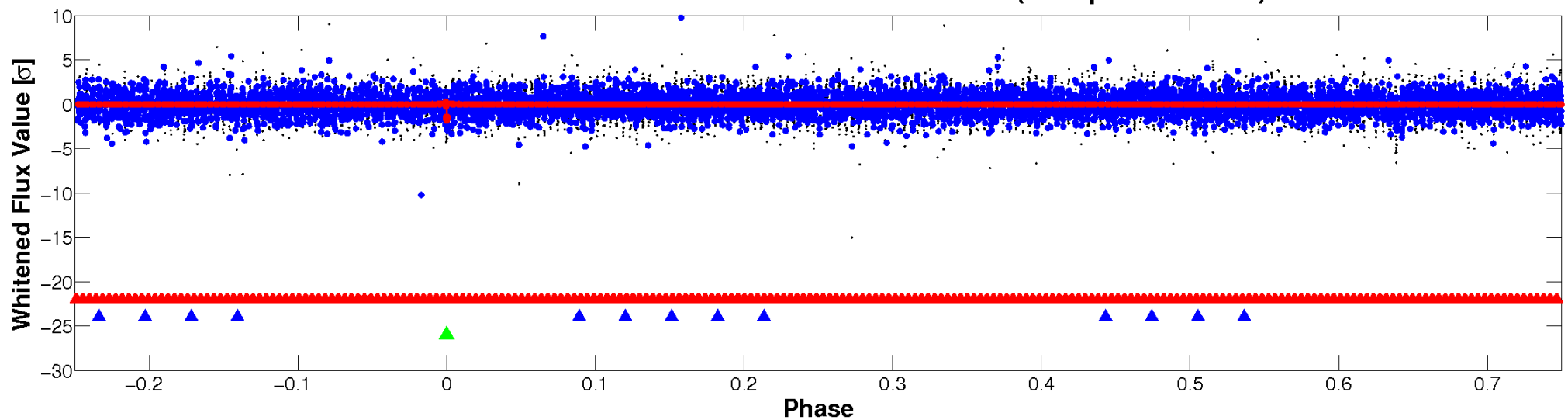


# Non-Whitened Vs. Whitened Light Curve

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



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



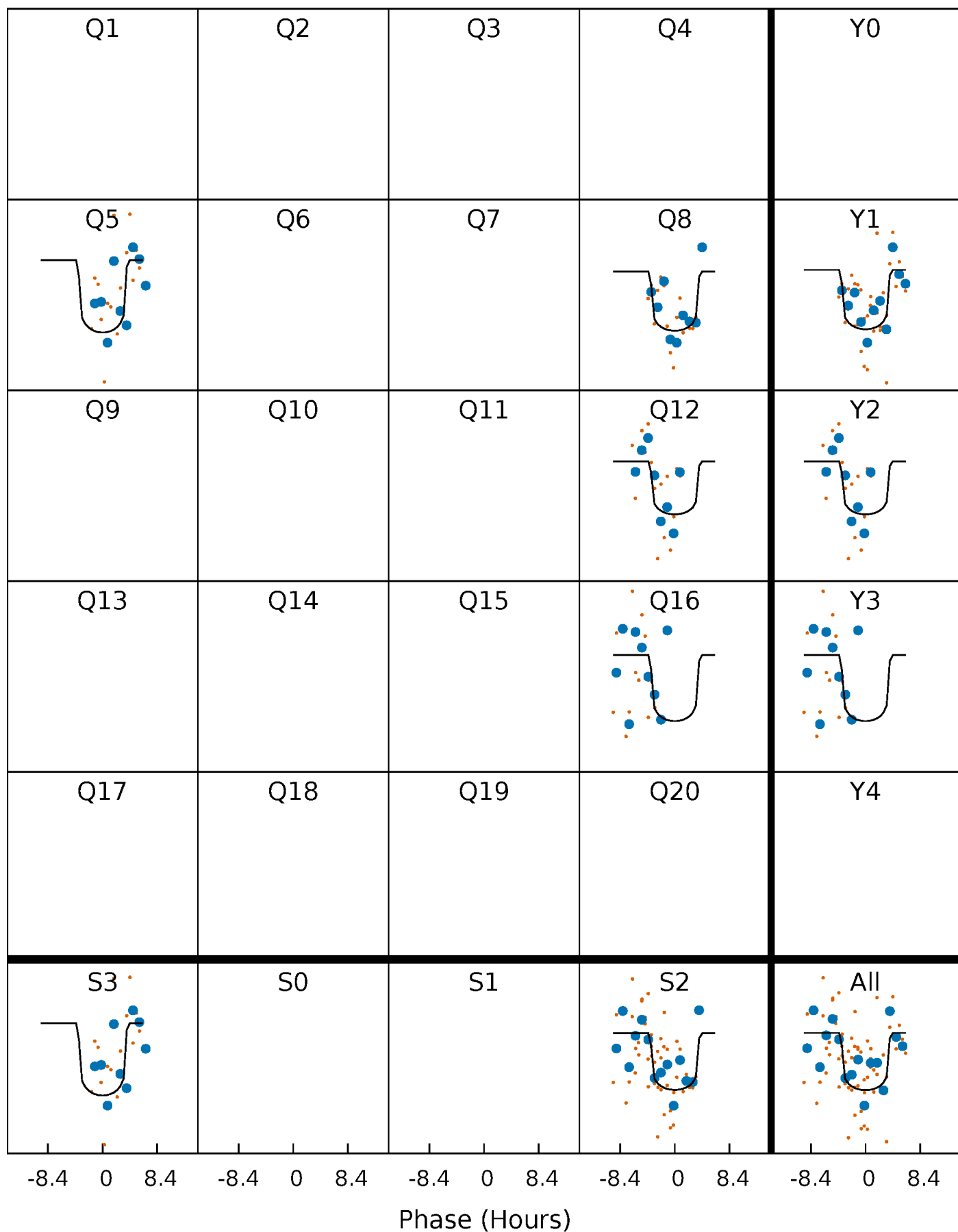
# PDC Quarter-Phased Transit Curves

TCE 008036426-03     $P=348.064696$  Days     $T_0=451.897171$  (BKJD)



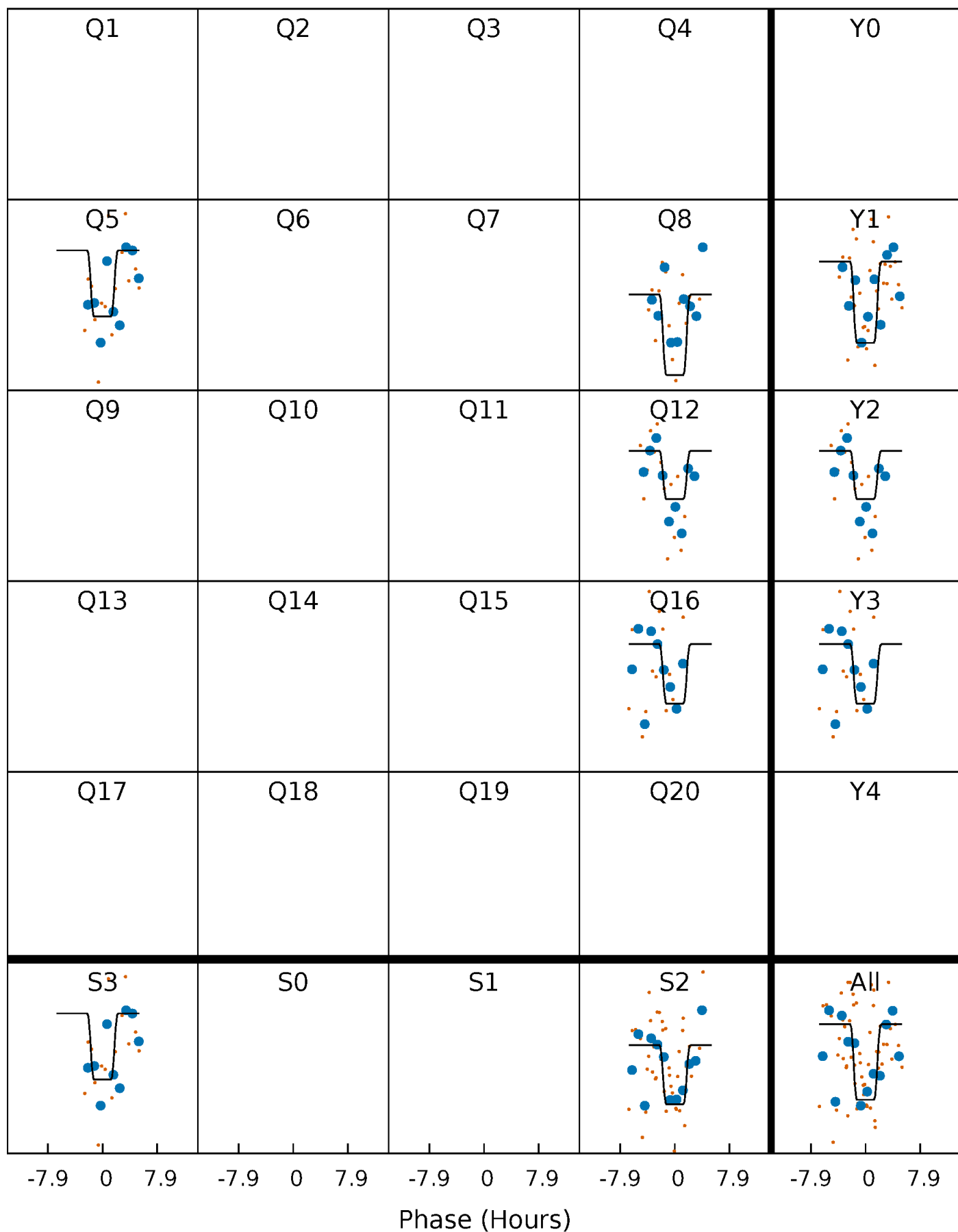
# DV Quarter-Phased Transit Curves

TCE 008036426-03 P=348.064696 Days  $T_0=451.897171$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008036426-03 P=348.013230 Days  $T_0=451.934333$  (BKJD)

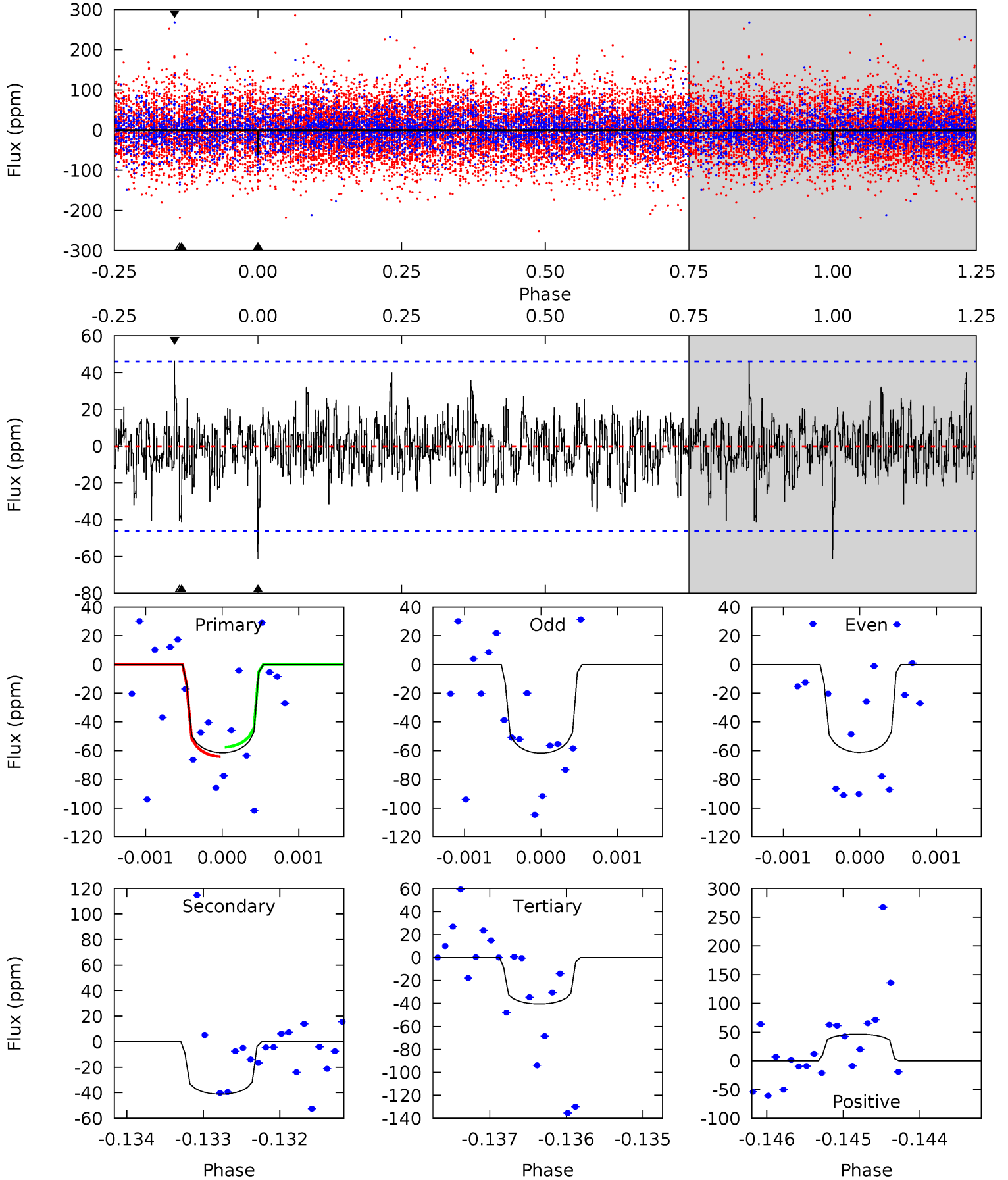




# DV Model-Shift Uniqueness Test

008036426-03, P = 348.064696 Days, E = 103.832475 Days

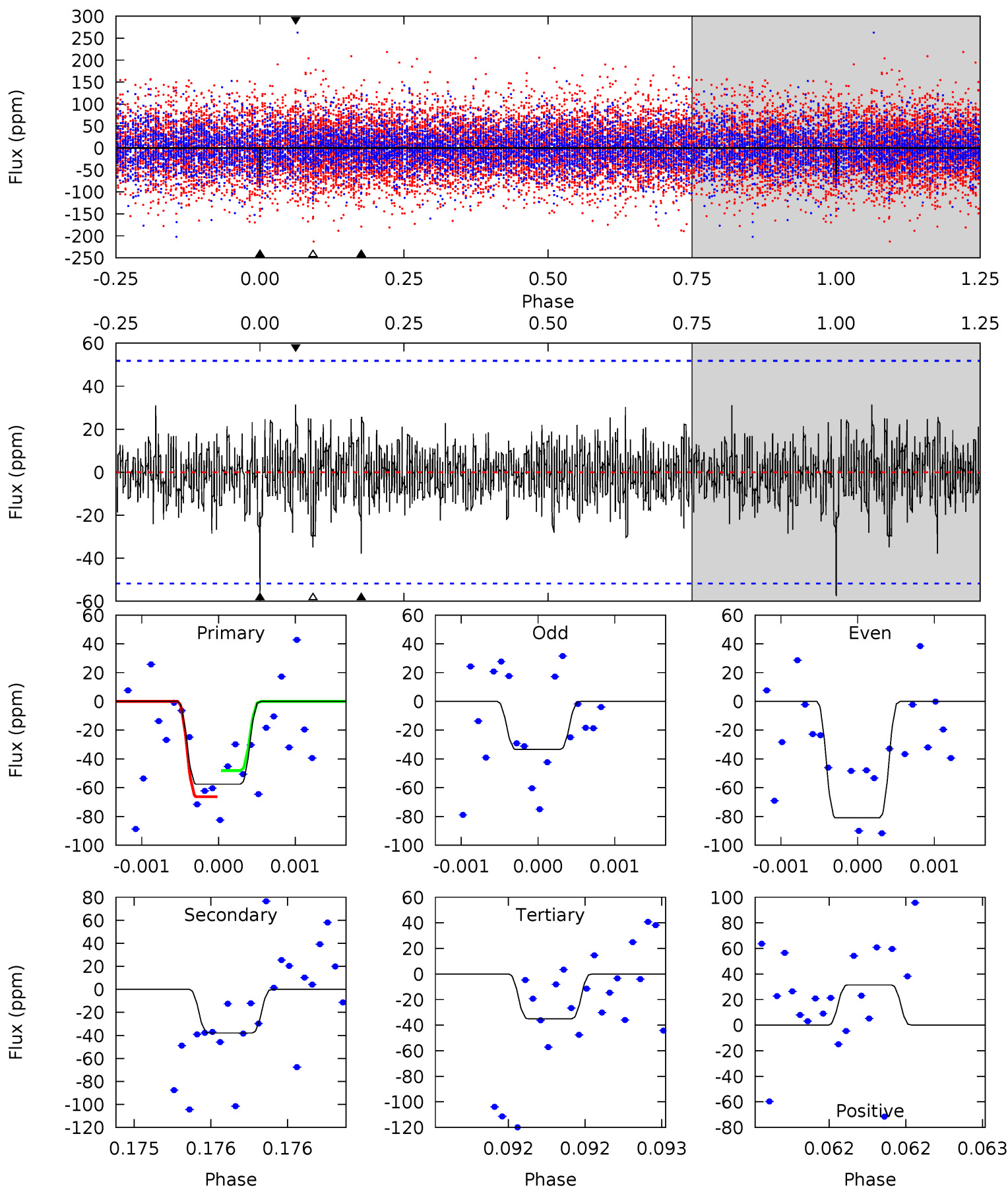
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.28	4.86	4.80	5.51	5.46	3.31	1.32	2.48	1.77	0.07	-0.64	0.03	0.98	0.43	0.39



# Alt Model-Shift Uniqueness Test

008036426-03, P = 348.013230 Days, E = 103.921103 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
6.19	4.08	3.76	3.38	5.57	3.48	0.96	2.43	2.81	0.32	0.70	2.55	1.04	0.35	0.97



### Stellar Parameters For KIC 008036426

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8501^{+234}_{-368}$	$4.132^{+0.121}_{-0.162}$	$0.070^{+0.250}_{-0.550}$	$1.987^{+0.464}_{-0.422}$	$1.953^{+0.327}_{-0.400}$	$0.351^{+0.213}_{-0.154}$
	+3%/-4%	+3%/-4%	+357%/-786%	+23%/-21%	+17%/-20%	+61%/-44%
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 008036426-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-41 \pm 8$	$2.09^{+1.52}_{-1.22}$	$673^{+45}_{-44}$	$6645^{+5531}_{-1543}$	$7617^{+37003}_{-5208}$
Alt.	$-38 \pm 9$	$2.04^{+1.50}_{-1.21}$	$673^{+49}_{-44}$	$6514^{+5247}_{-1451}$	$6927^{+35115}_{-4639}$

$T_{max}$  = 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

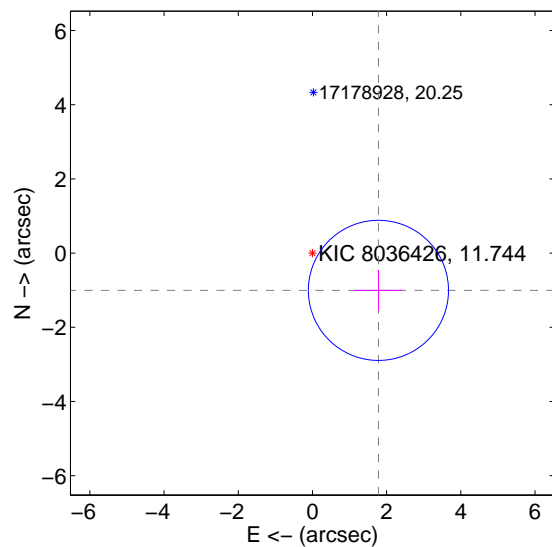
Supplemental centroid analysis for 008036426-03. **Kepler magnitude: 11.74.** Transit SNR 10.00

**There are 1 quarters with good PRF difference image offsets**

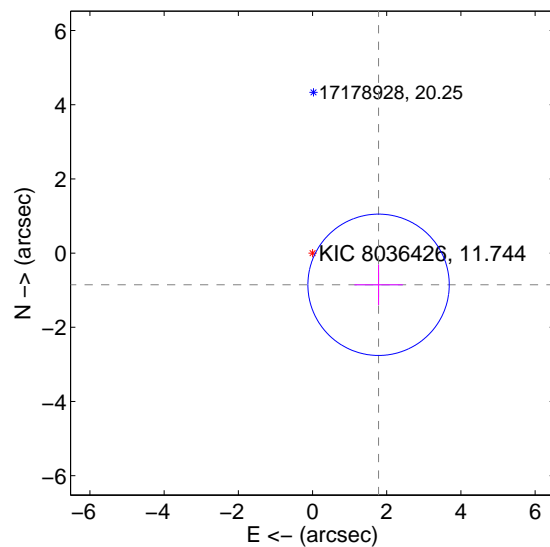
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>2.043 \pm 0.629</math></b>	<b>3.25</b>	$-1.779 \pm 0.653$	$-1.004 \pm 0.548$
PRF-fit source offset from KIC position	<b><math>1.974 \pm 0.635</math></b>	<b>3.11</b>	$-1.780 \pm 0.653$	$-0.854 \pm 0.548$
photometric centroid source offset	$0.58 \pm 1.62$	0.36	$0.46 \pm 1.58$	$-0.35 \pm 1.68$

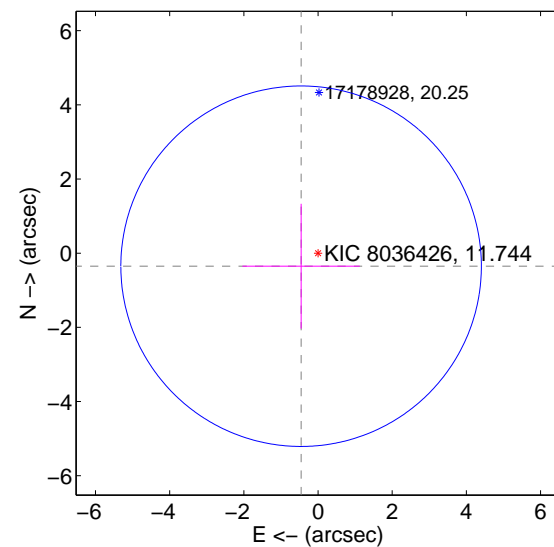
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

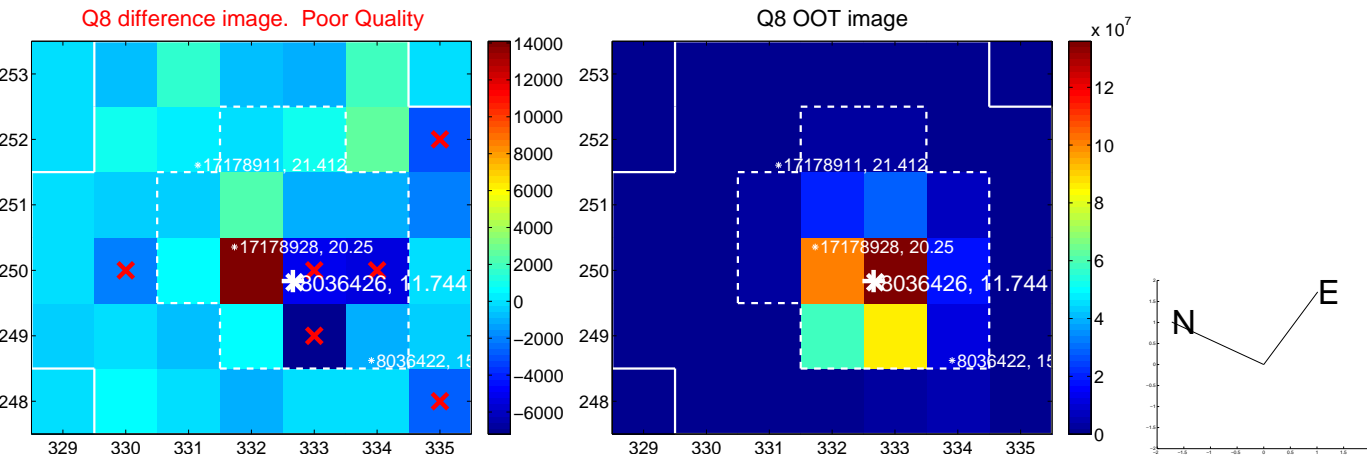
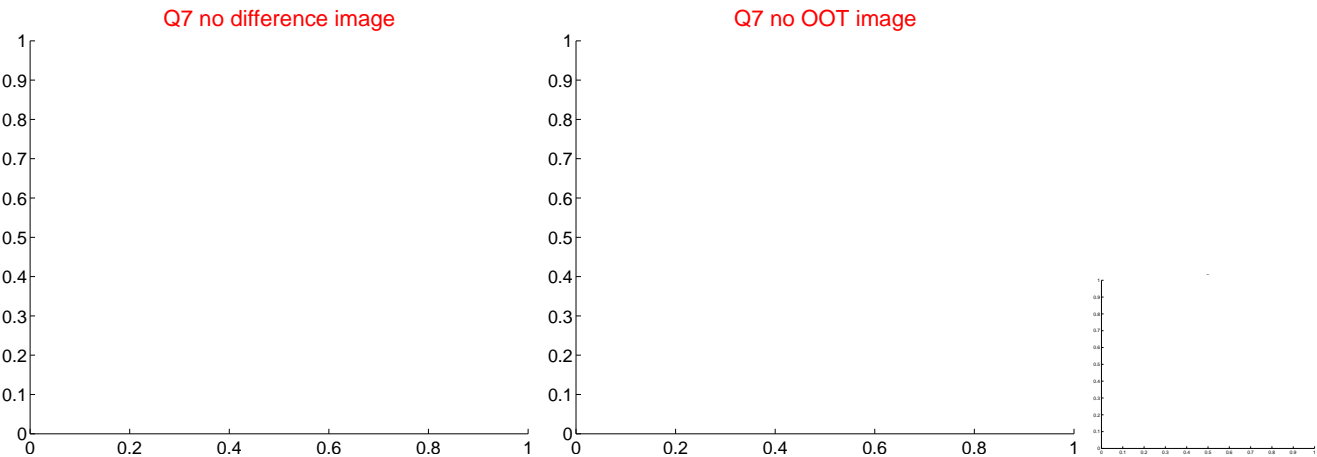
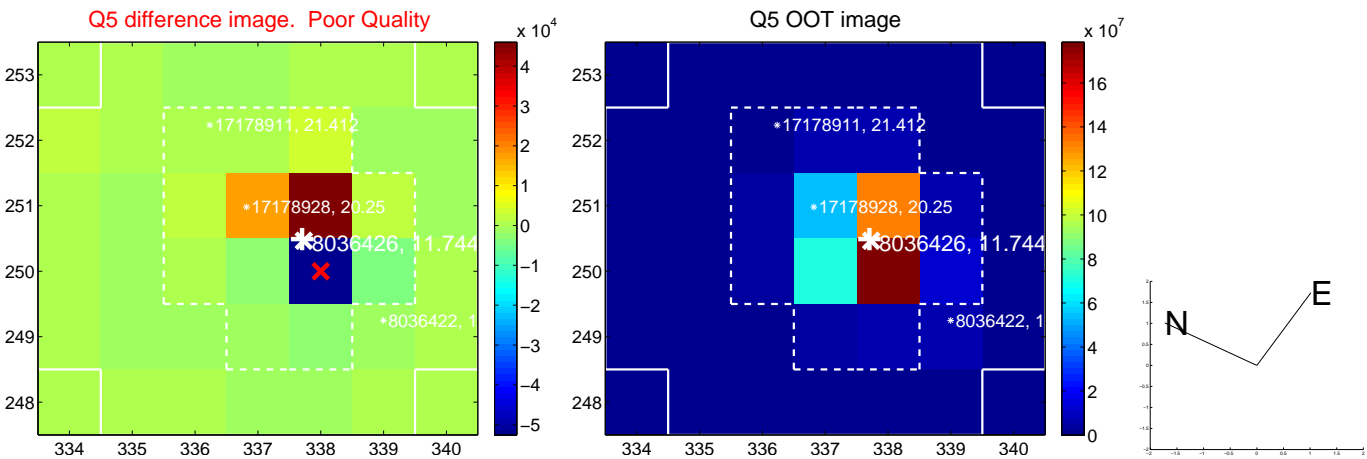


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

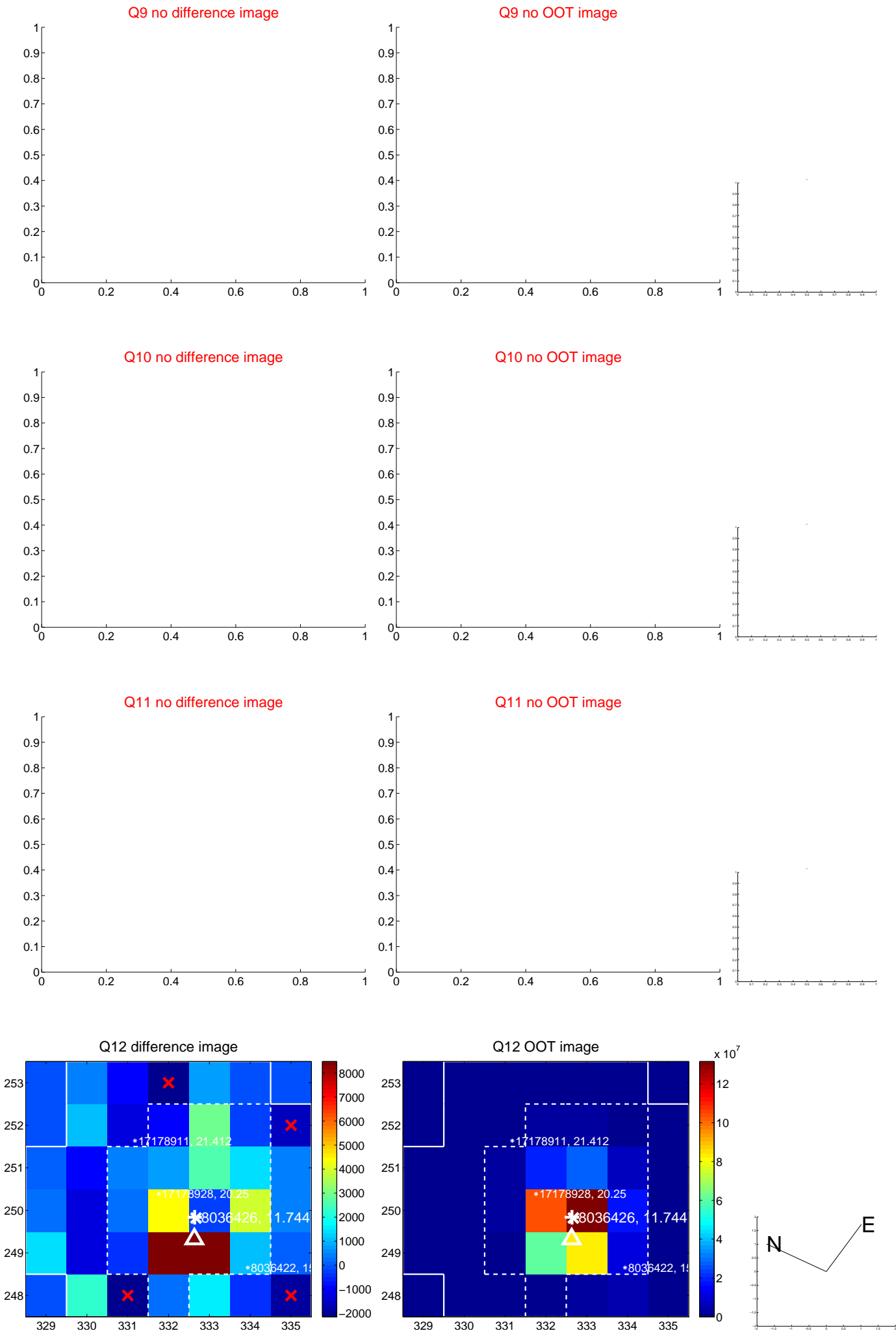


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

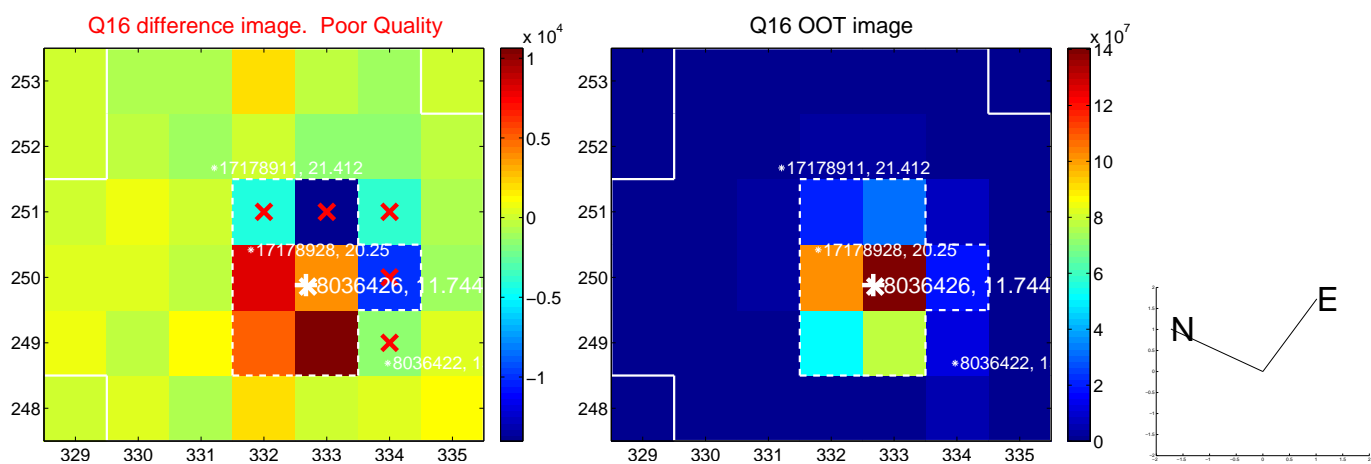
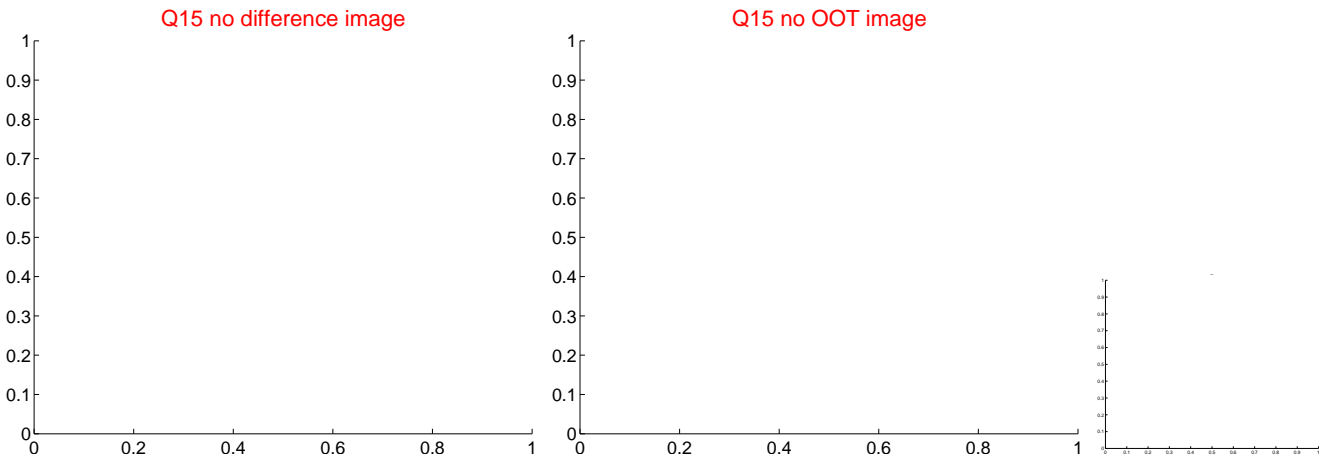
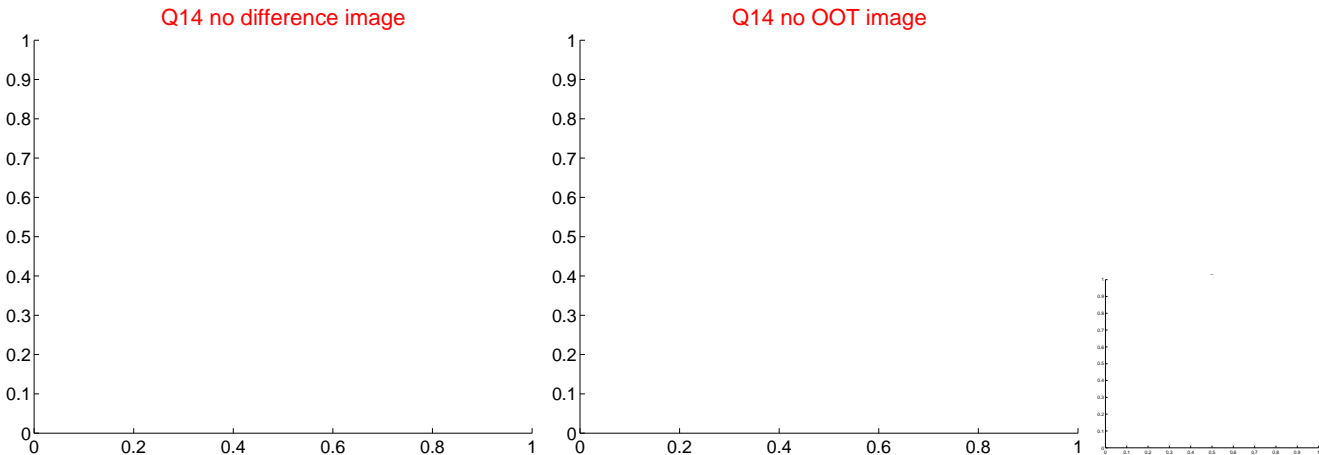
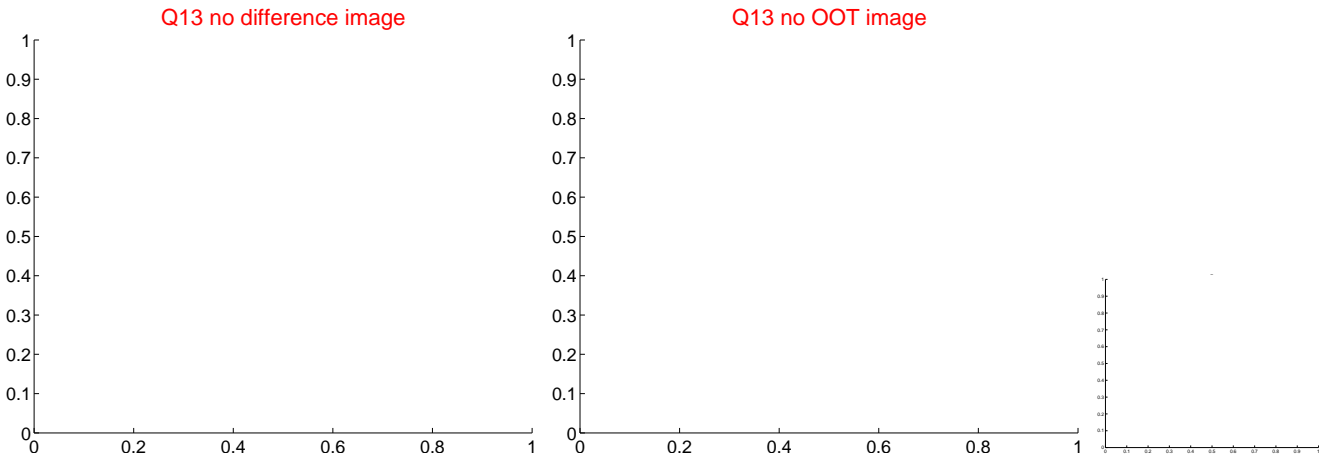




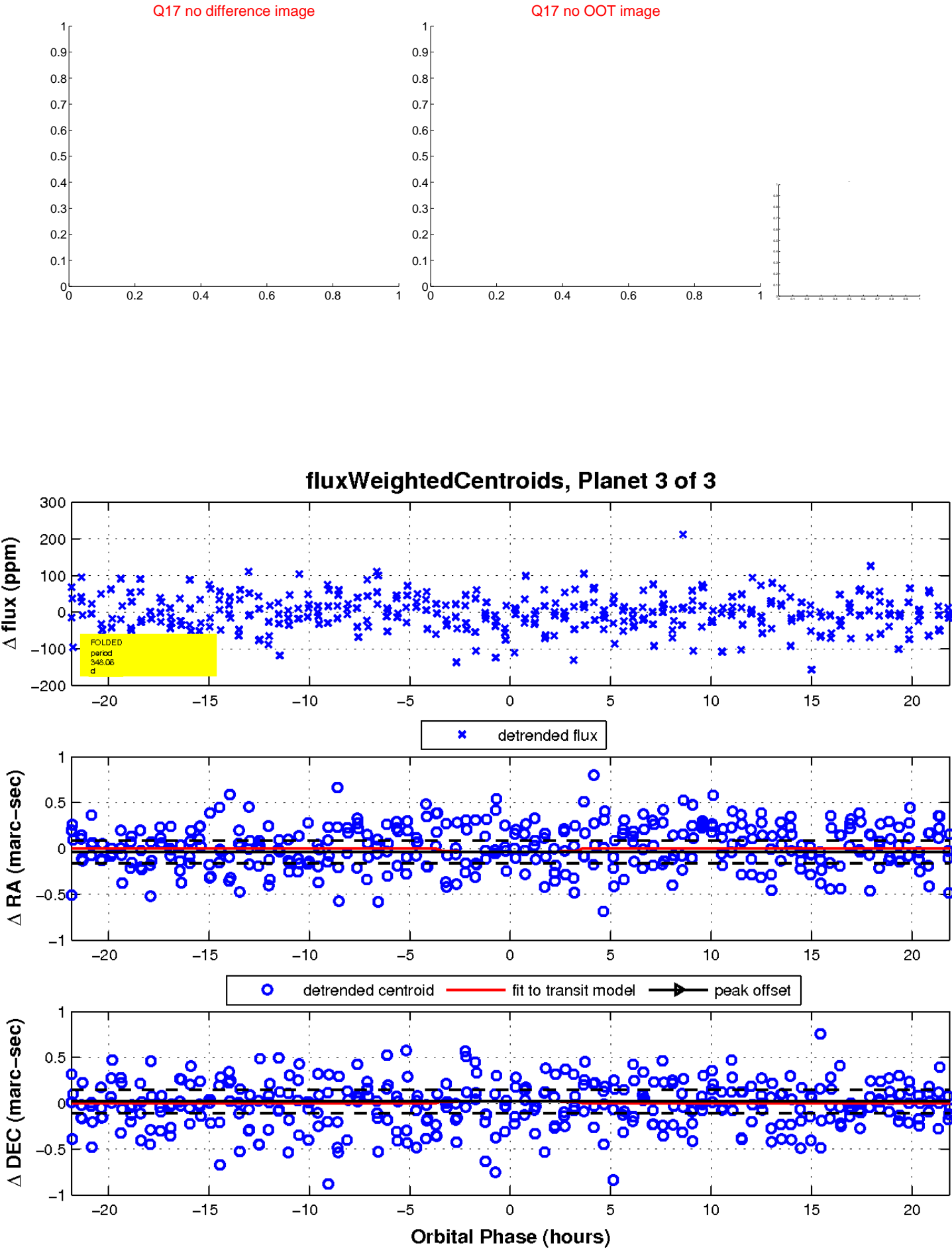
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

