

# KIC 006276791

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006276791-01	OBS	4477.02	9.328617	135.880123	359.2	1.603	11.3	12.9	0.86	5749	1.63	99.81
006276791-02	OBS	4477.01	5.301779	135.994848	160.8	2.407	8.4	9.2	0.86	5749	1.28	212.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006276791-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
006276791-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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.

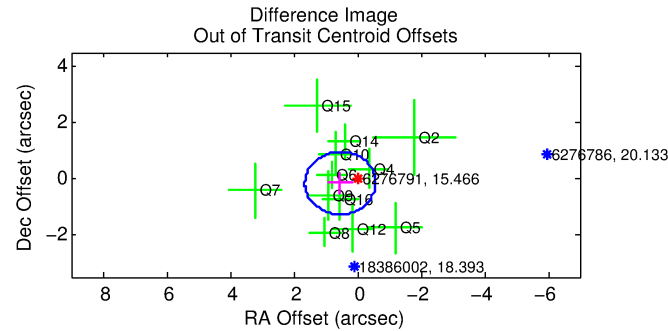
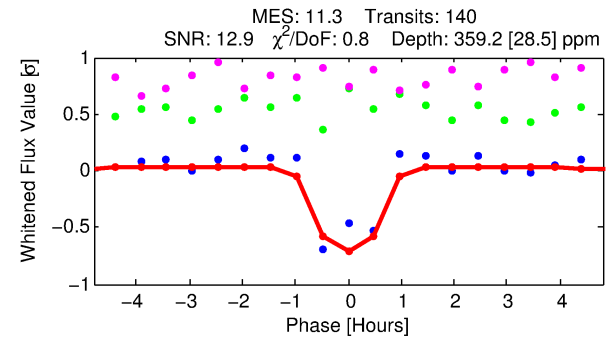
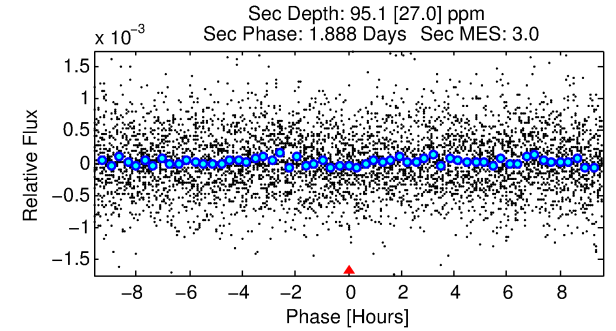
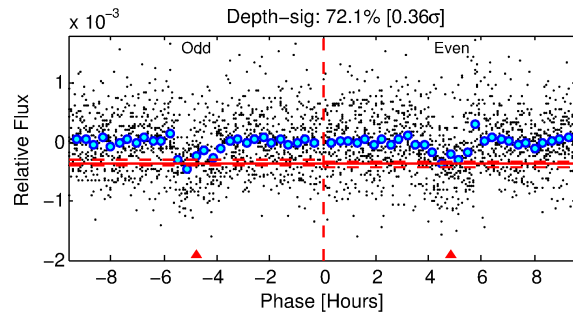
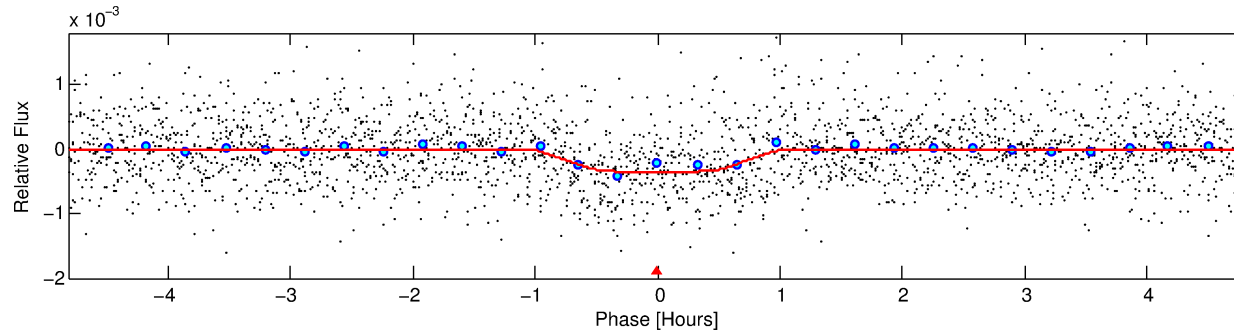
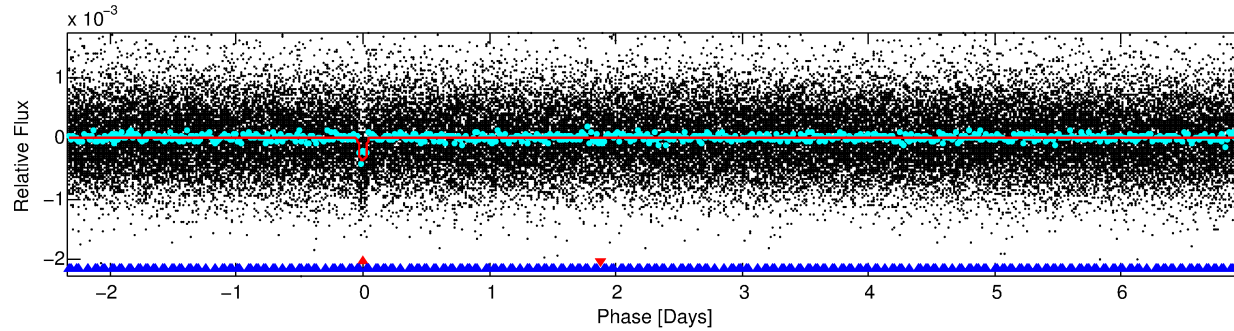
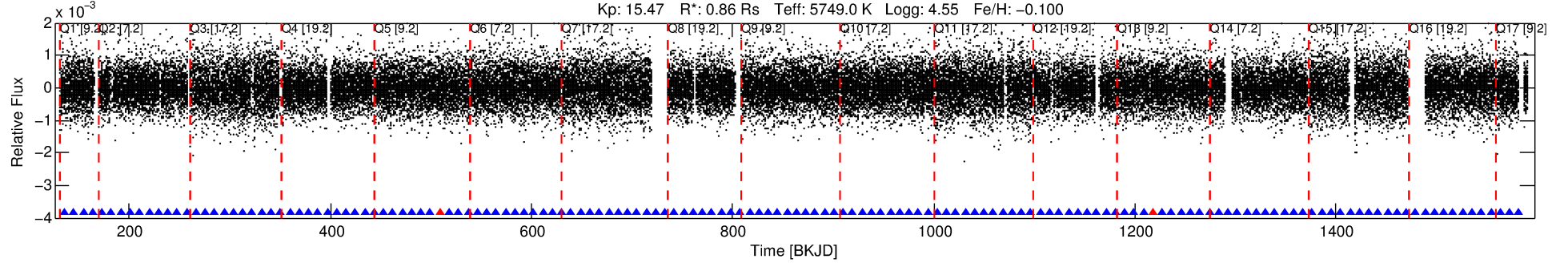
## Ephemeris Match Information For 006276791-01

No Significant Match Found

# DV One-Page Summary

KIC: 6276791 Candidate: 1 of 2 Period: 9.329 d  
KOI: K04477.02 Corr: 0.964

Kp: 15.47 R\*: 0.86 Rs Teff: 5749.0 K Logg: 4.55 Fe/H: -0.100



## DV Fit Results:

Period = 9.32862 [0.00004] d  
Epoch = 135.8801 [0.0032] BKJD  
Rp/R\* = 0.0173 [0.0171]  
a/R\* = 44.45 [193.89]  
b = 0.19 [22.69]  
Seff = 99.81 [35.85]  
Teq = 806 [72] K  
Rp = 1.63 [1.67] Re  
a = 0.0856 [0.0197] AU  
Ag = 143.69 [290.40] [0.49σ]  
Teff = 4314 [2153] K [1.63σ]

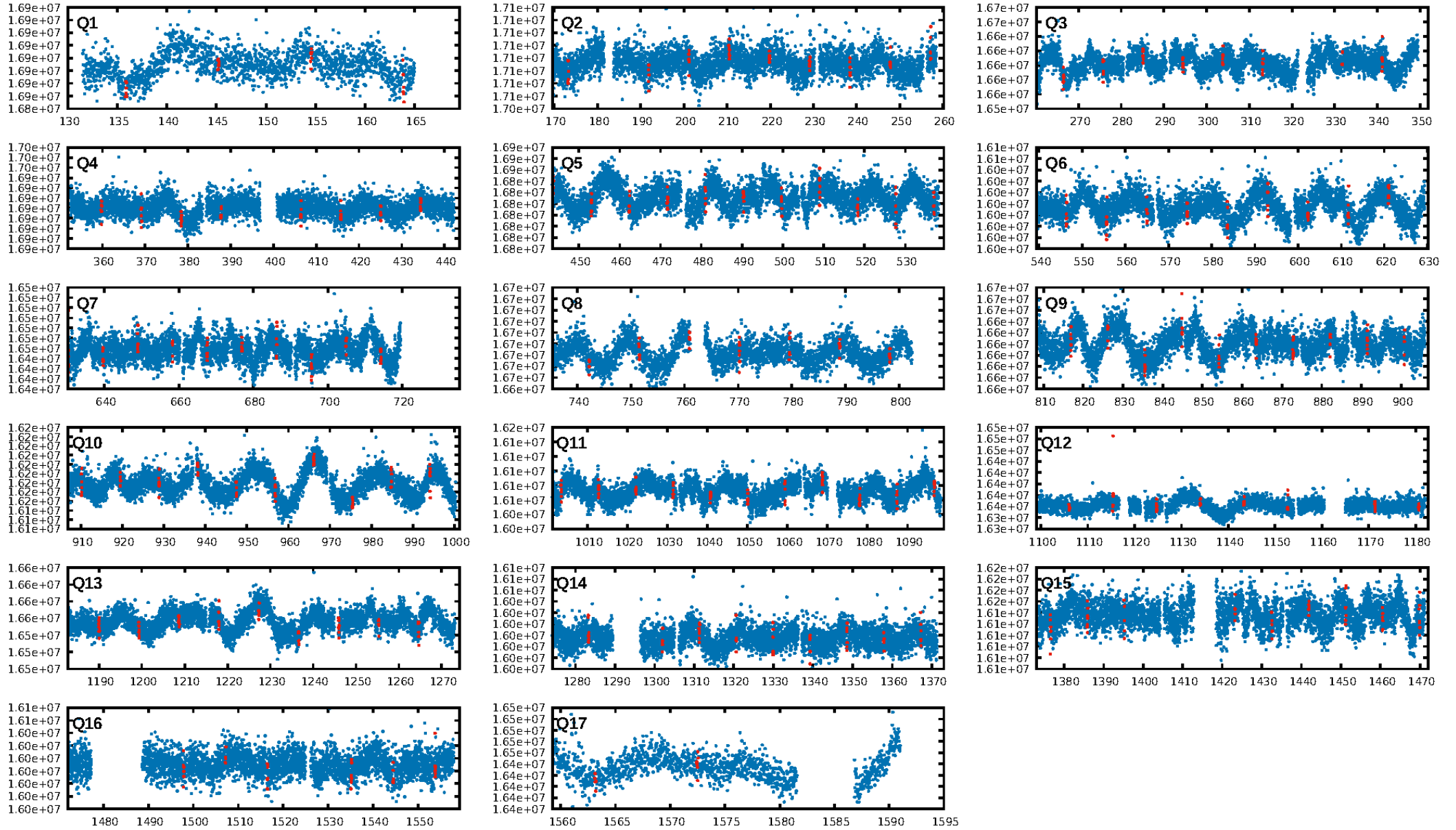
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.41σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 4.91e-29  
RollingBand-fgt: 0.99 [132/134]  
GhostDiagnostic-chr: -11.99  
Centroid-sig: 13.1%  
Centroid-so: 1.350 arcsec [1.19σ]  
OotOffset-rm: 0.561 arcsec [1.51σ]  
OotOffset-st: 4/2/4/2 [12]  
KicOffset-rm: 0.585 arcsec [1.49σ]  
KicOffset-st: 4/2/4/2 [12]  
DiffImageQuality-fgm: 0.67 [8/12]  
DiffImageOverlap-fno: 1.00 [17/17]

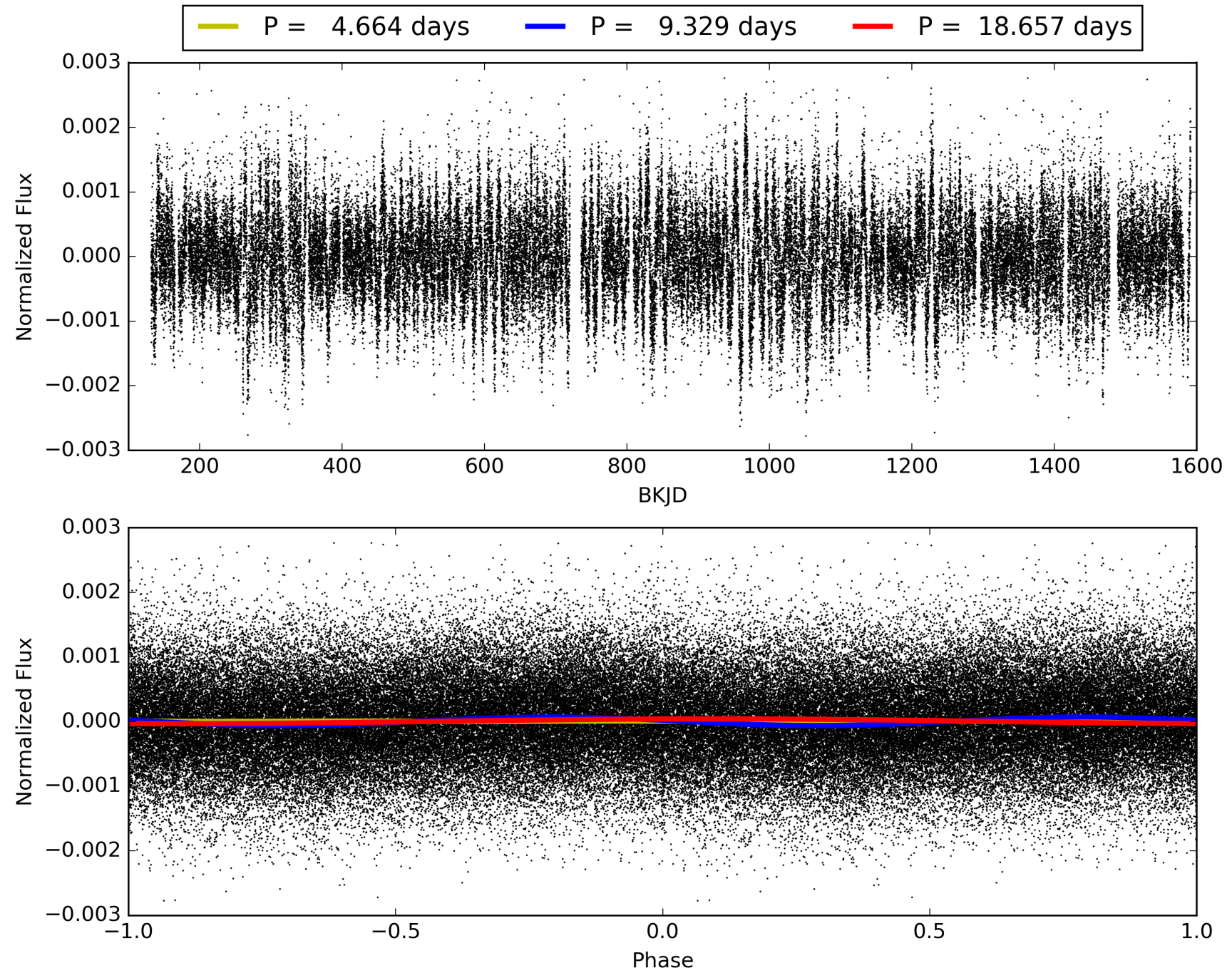
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:12:59 Z

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

# TCE 006276791-01, PDC Light Curves

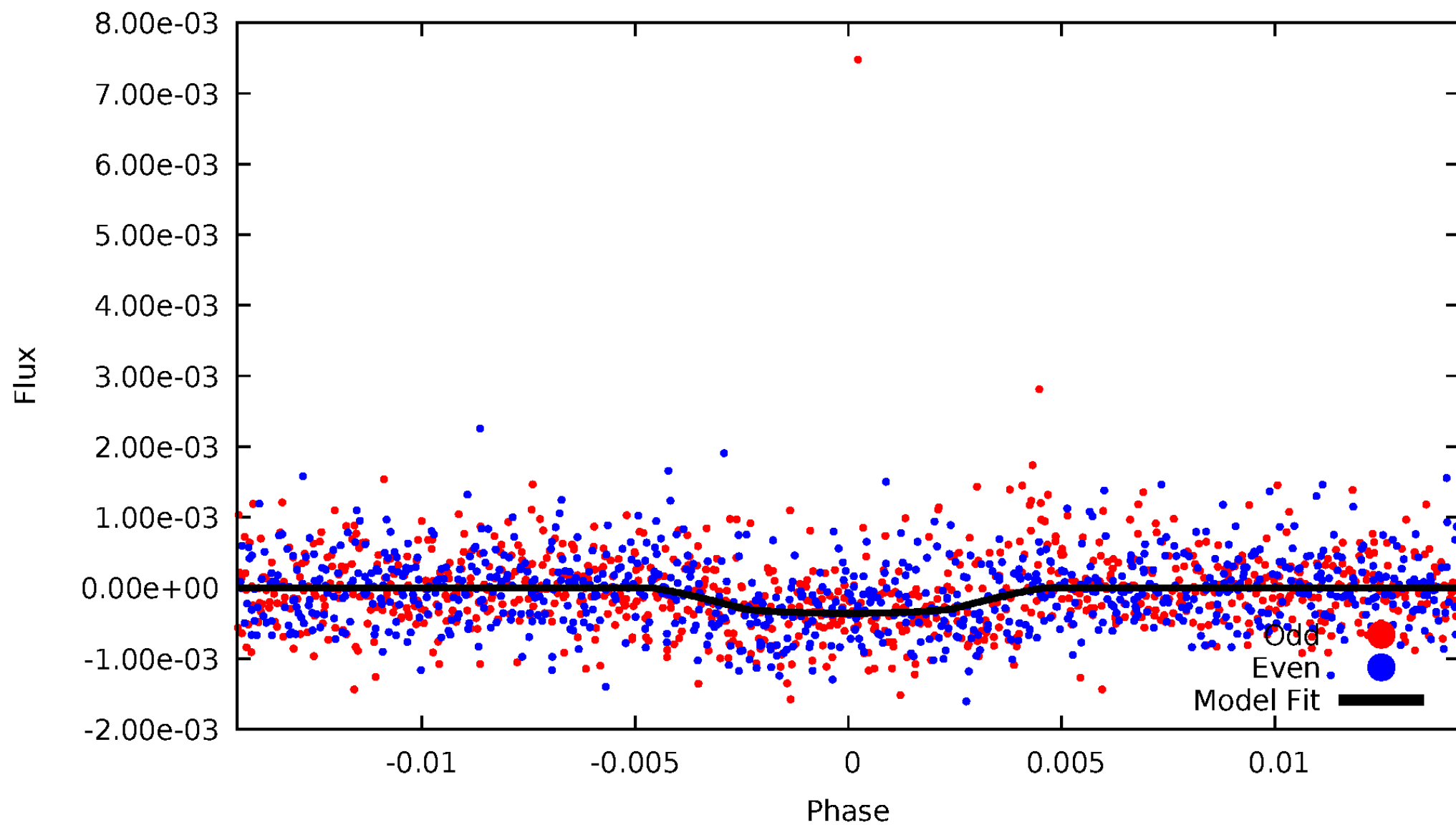


TCE 006276791-01



# DV Odd/Even

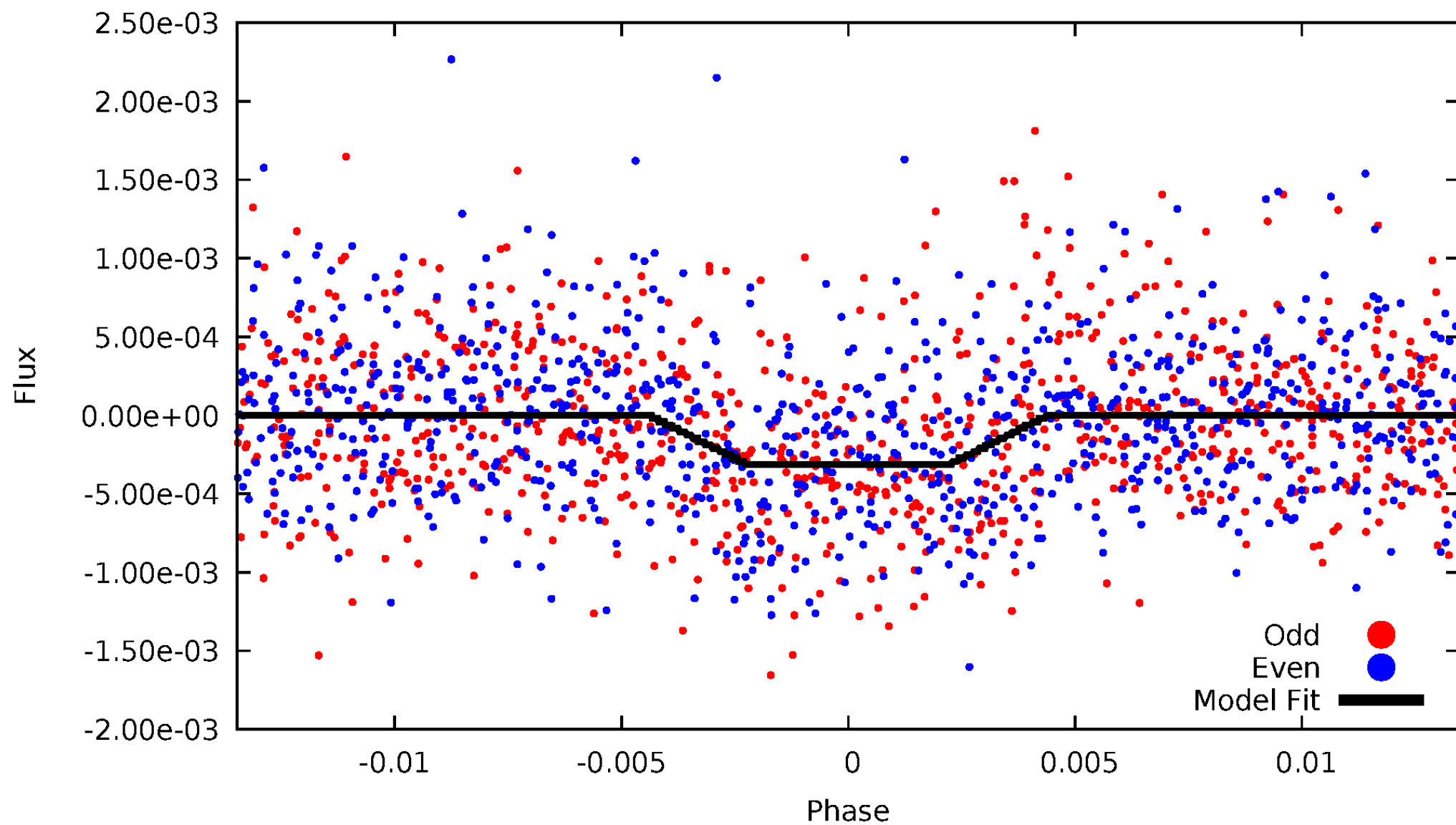
TCE 006276791-01





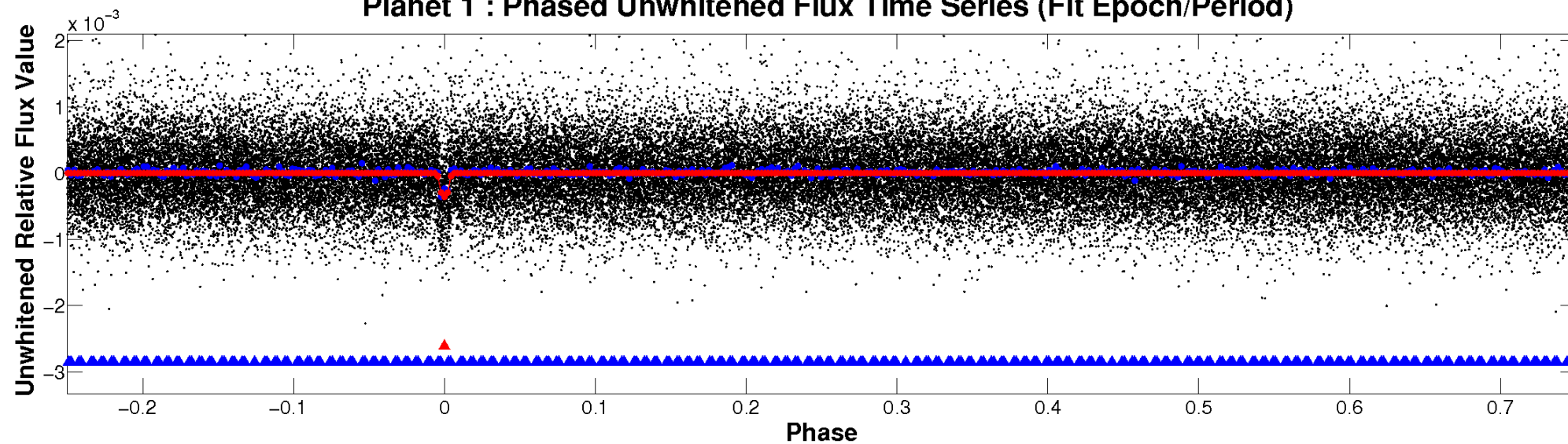
# ALT Odd/Even

TCE 006276791-01

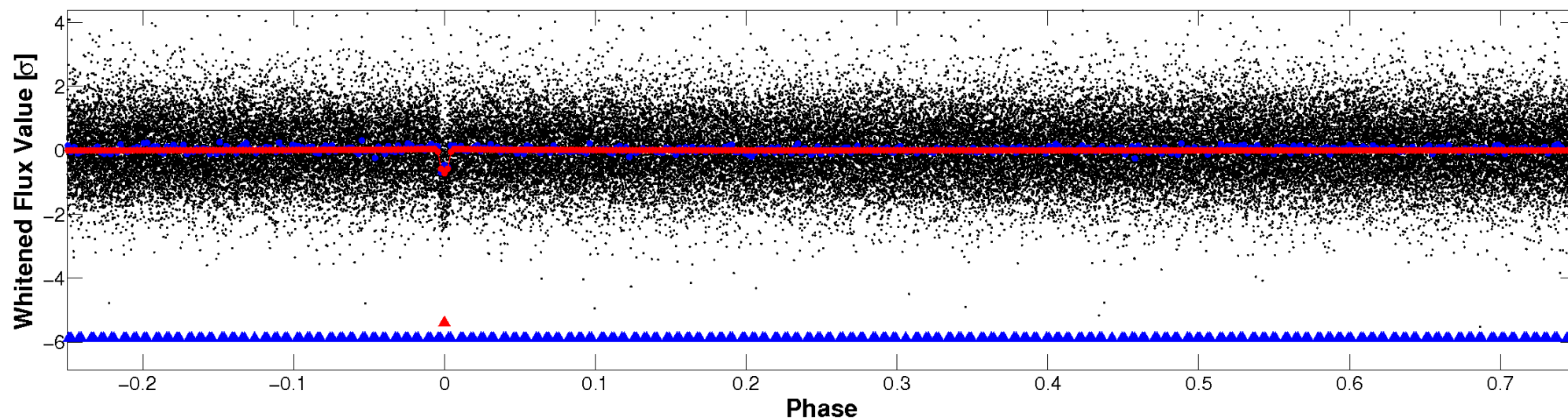


# Non-Whitened Vs. Whitened Light Curve

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

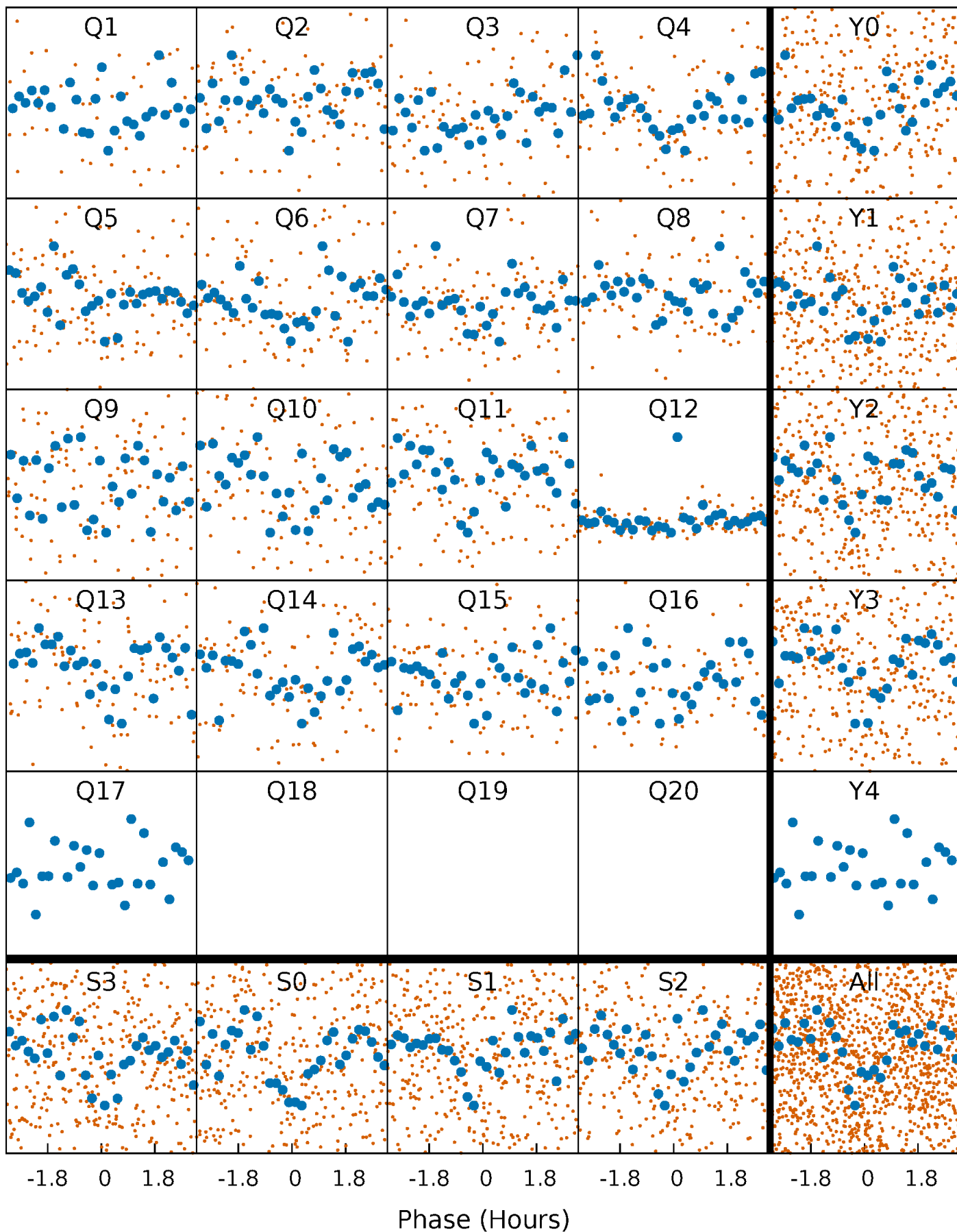


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

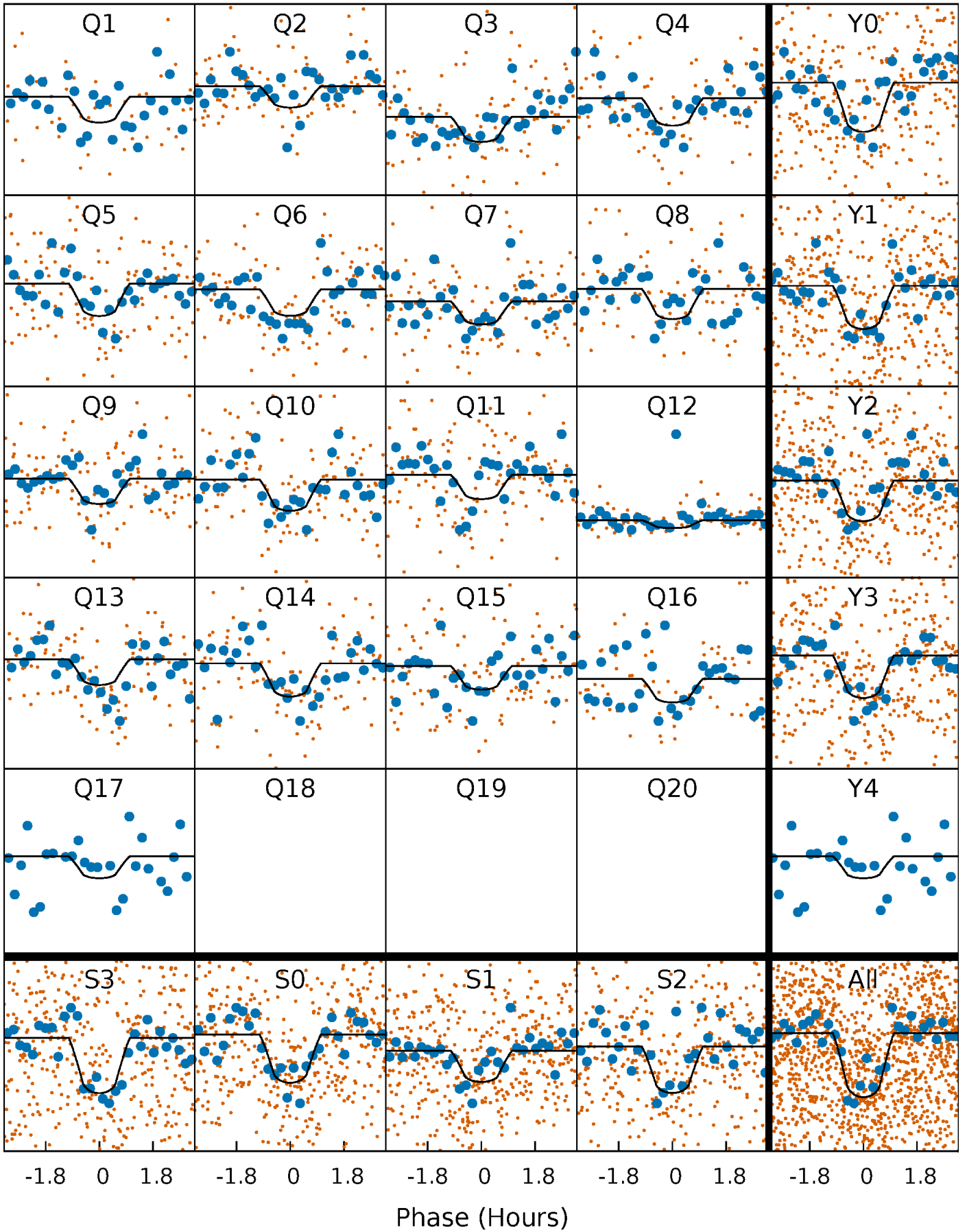
TCE 006276791-01 P= 9.328617 Days  $T_0=135.880123$  (BKJD)





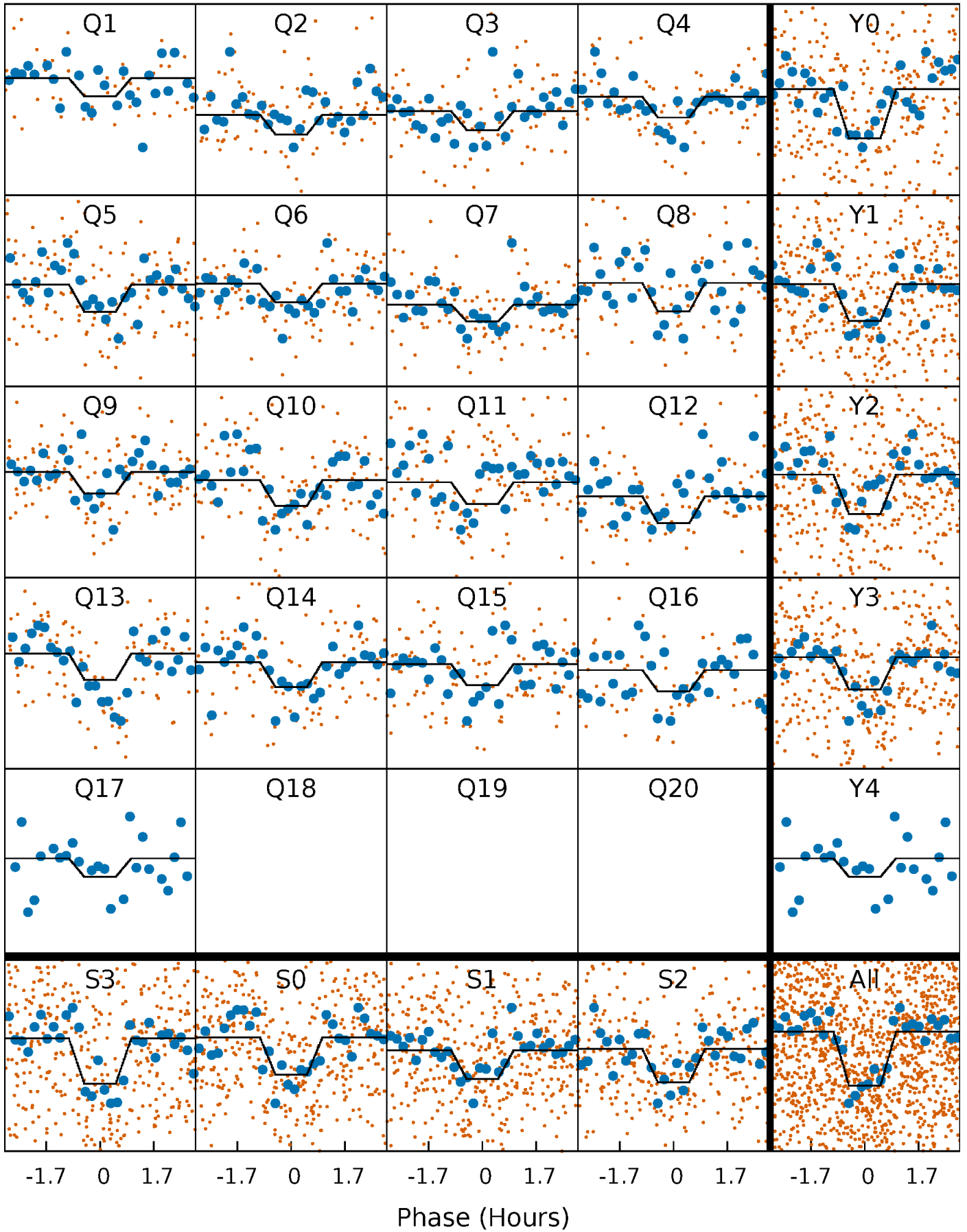
# DV Quarter-Phased Transit Curves

TCE 006276791-01 P= 9.328617 Days  $T_0=135.880123$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

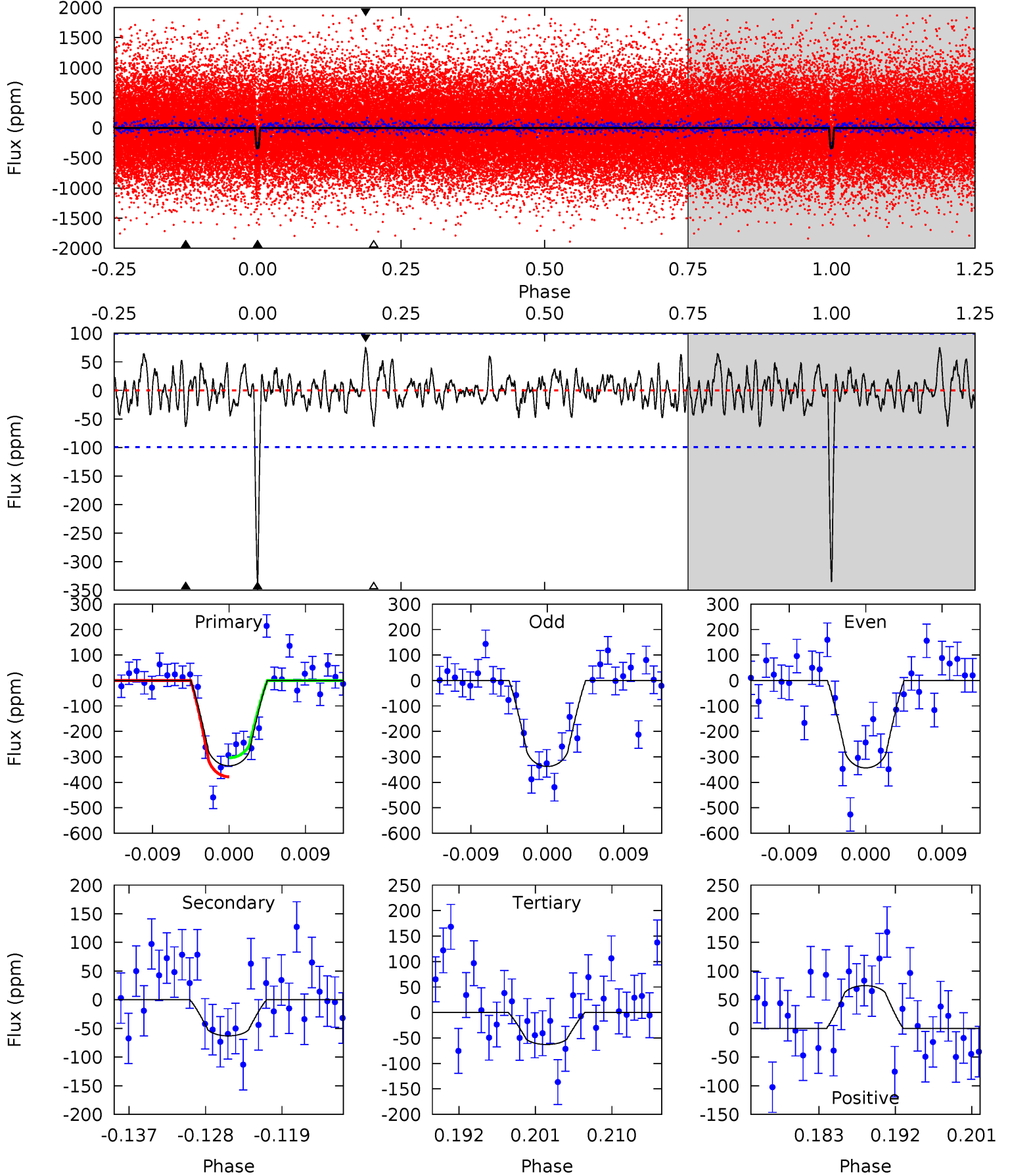
TCE 006276791-01 P= 9.328676 Days  $T_0=135.875526$  (BKJD)



# DV Model-Shift Uniqueness Test

006276791-01, P = 9.328617 Days, E = 126.551506 Days

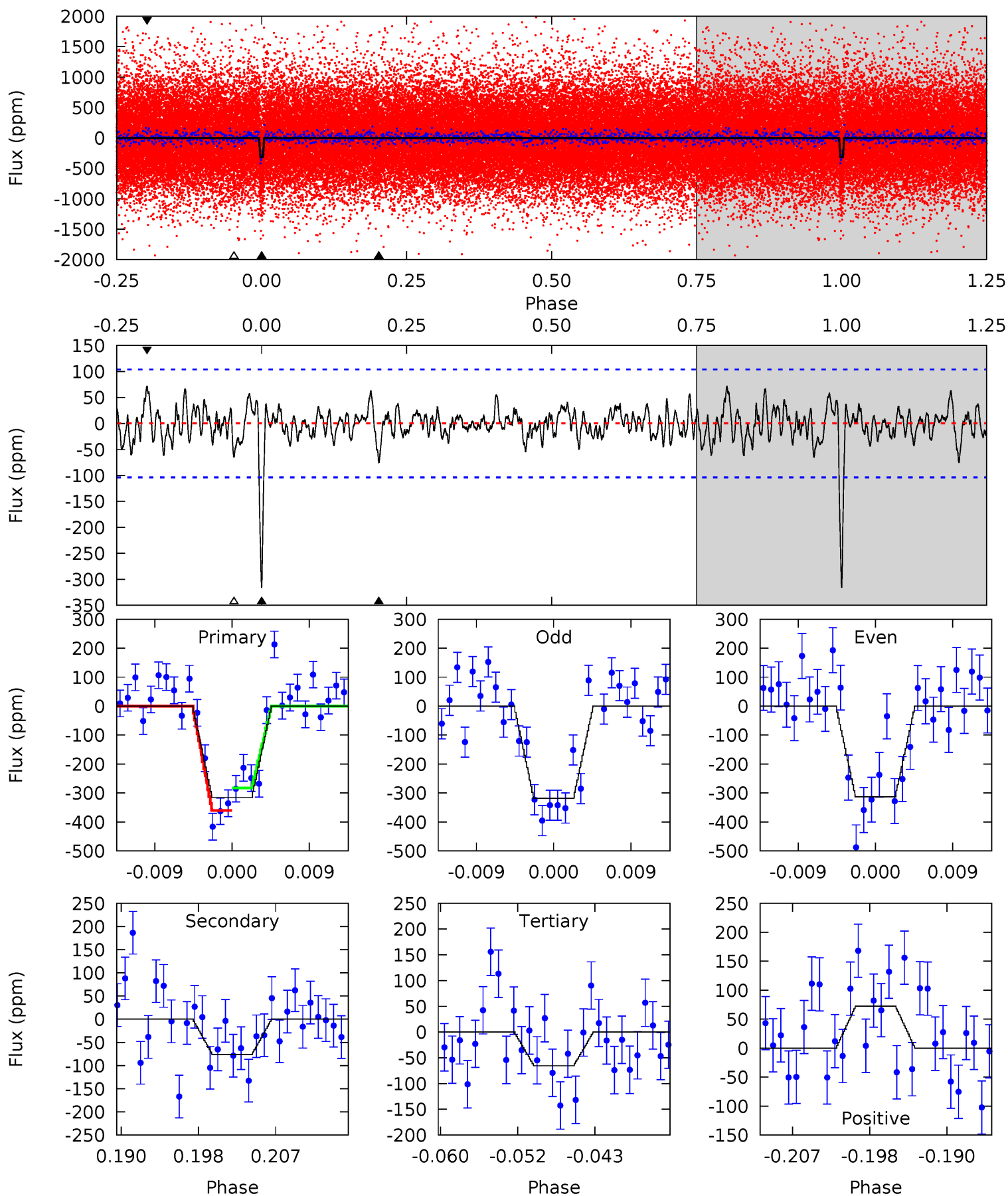
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	3.20	3.18	3.79	5.04	2.61	1.09	13.8	13.2	0.01	-0.59	0.14	0.94	0.18	1.89



# Alt Model-Shift Uniqueness Test

006276791-01, P = 9.328676 Days, E = 126.546850 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
15.4	3.69	3.18	3.53	5.05	2.63	1.11	12.2	11.8	0.51	0.16	0.14	0.96	0.19	1.89



### Stellar Parameters For KIC 006276791

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5749^{+153}_{-170}$	$4.547^{+0.033}_{-0.187}$	$-0.100^{+0.300}_{-0.300}$	$0.864^{+0.234}_{-0.078}$	$0.961^{+0.095}_{-0.116}$	$2.097^{+0.383}_{-0.974}$
	+3%/-3%	+1%/-4%	+300%/-300%	+27%/-9%	+10%/-12%	+18%/-46%
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 006276791-01 / KOI 4477.02

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-63 \pm 20$	$2.05^{+1.63}_{-1.26}$	$1154^{+81}_{-48}$	$3911^{+1868}_{-735}$	$61^{+356}_{-44}$
Alt.	$-76 \pm 21$	$2.10^{+1.57}_{-1.30}$	$1154^{+71}_{-49}$	$3965^{+1813}_{-665}$	$68^{+362}_{-46}$

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



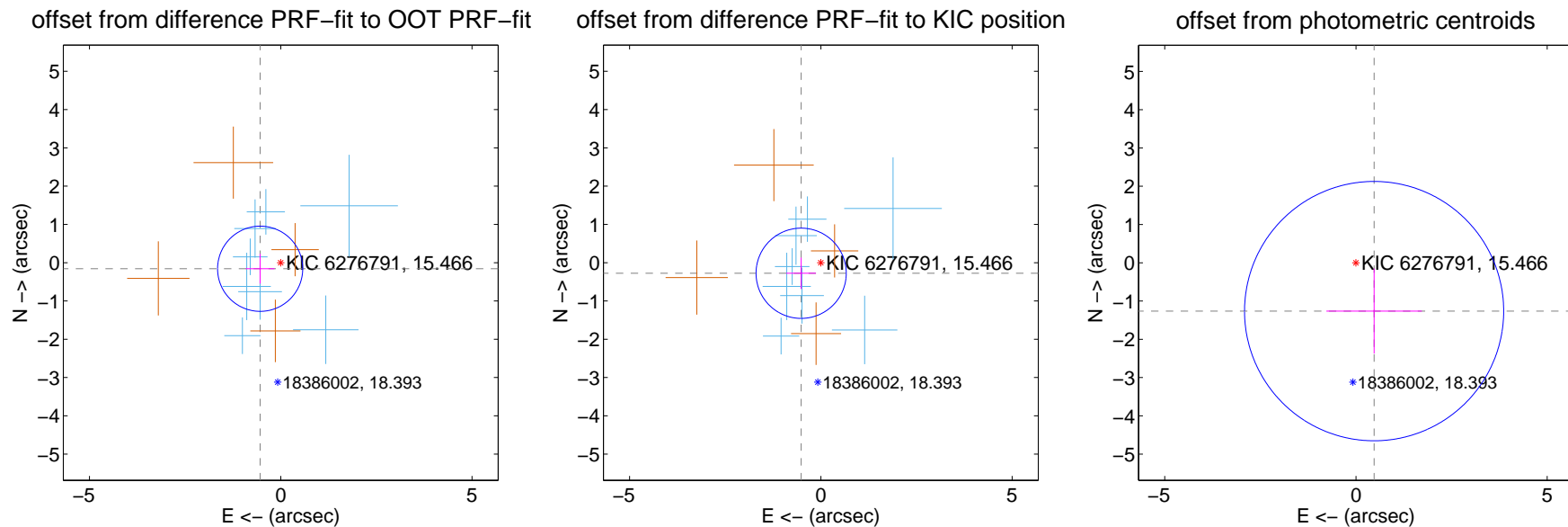
## DV Centroid Data

Supplemental centroid analysis for 006276791-01. Kepler magnitude: 15.47. Transit SNR 12.85

There are 8 quarters with good PRF difference image offsets

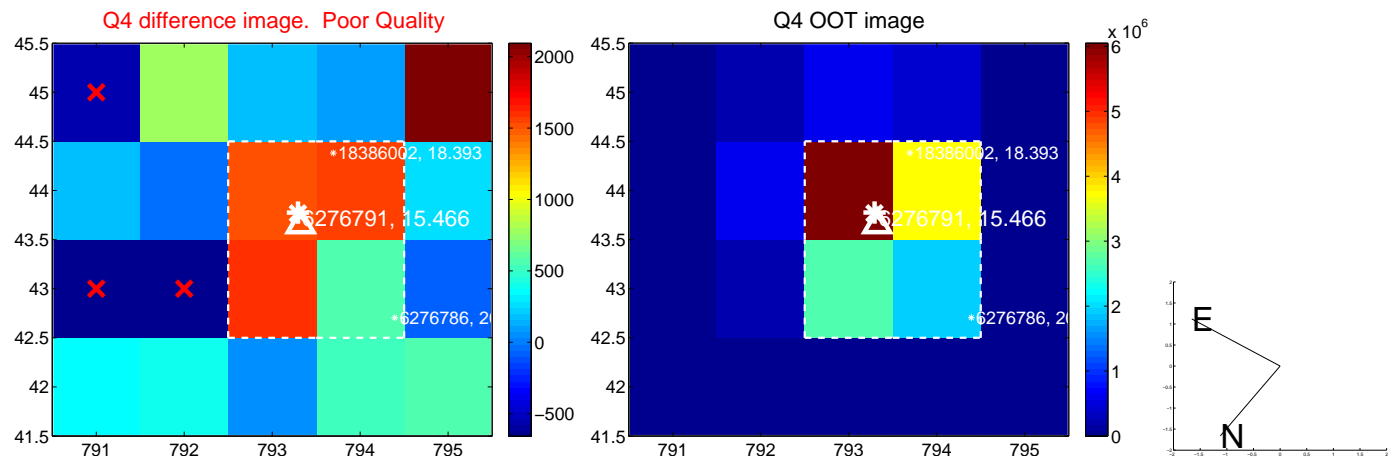
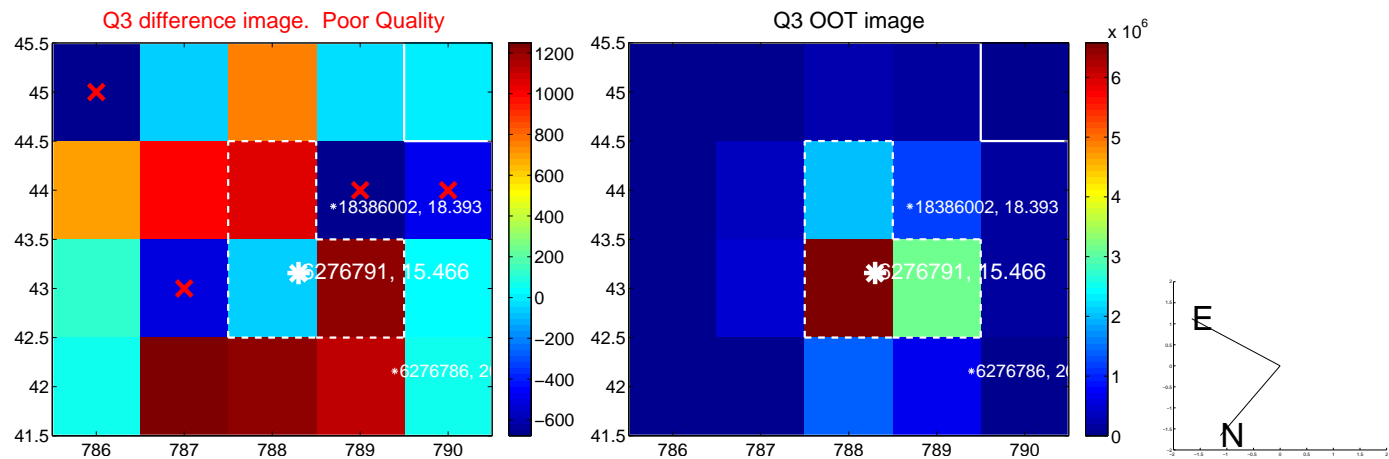
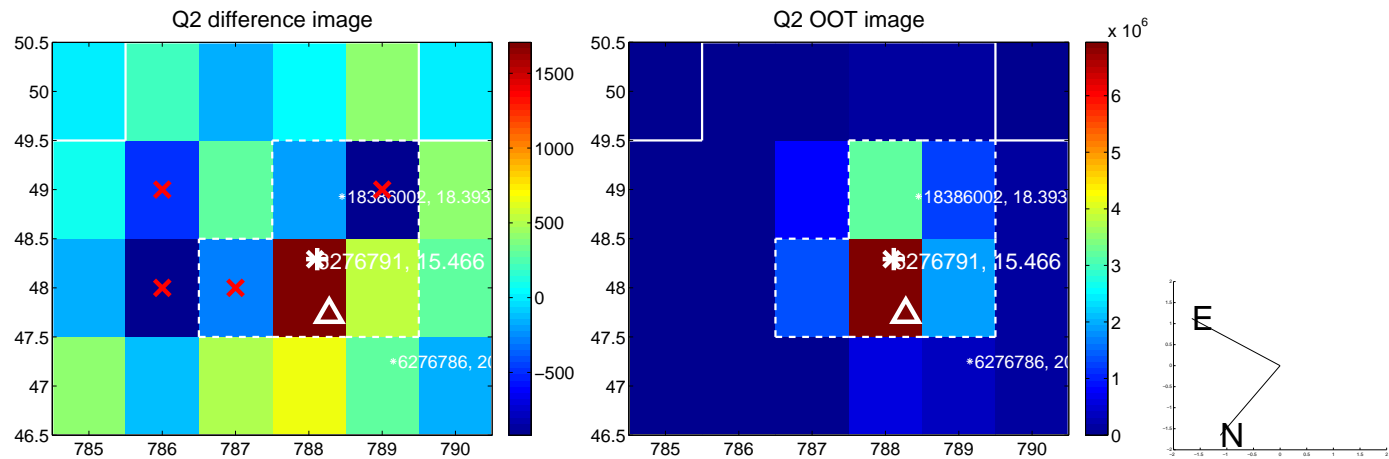
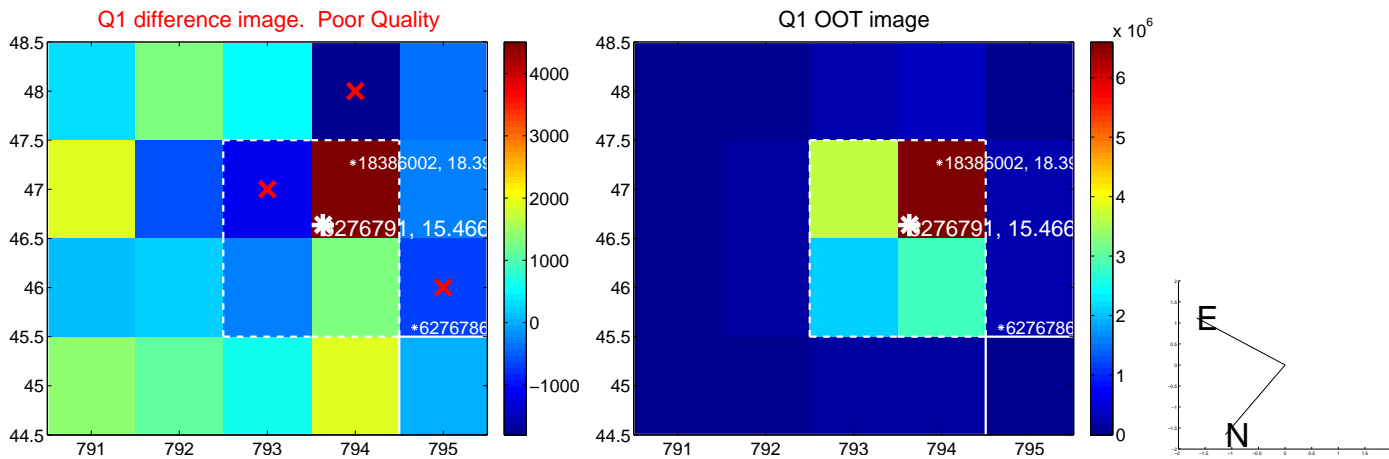
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.561 \pm 0.371$	1.51	$0.539 \pm 0.376$	$-0.158 \pm 0.389$
PRF-fit source offset from KIC position	$0.585 \pm 0.393$	1.49	$0.515 \pm 0.386$	$-0.276 \pm 0.410$
photometric centroid source offset	$1.35 \pm 1.13$	1.19	$-0.47 \pm 1.25$	$-1.26 \pm 1.11$

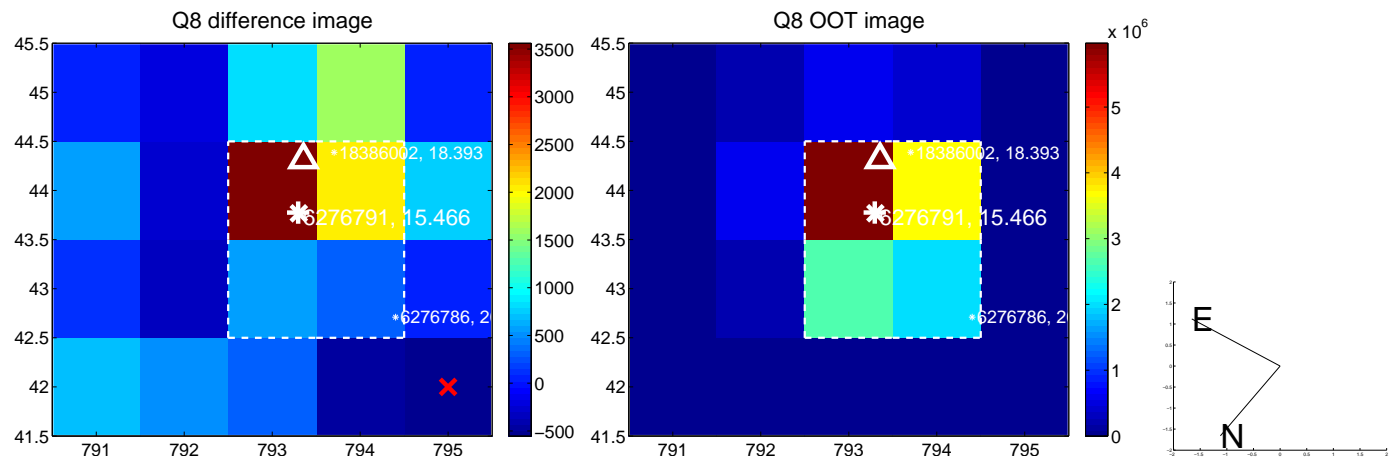
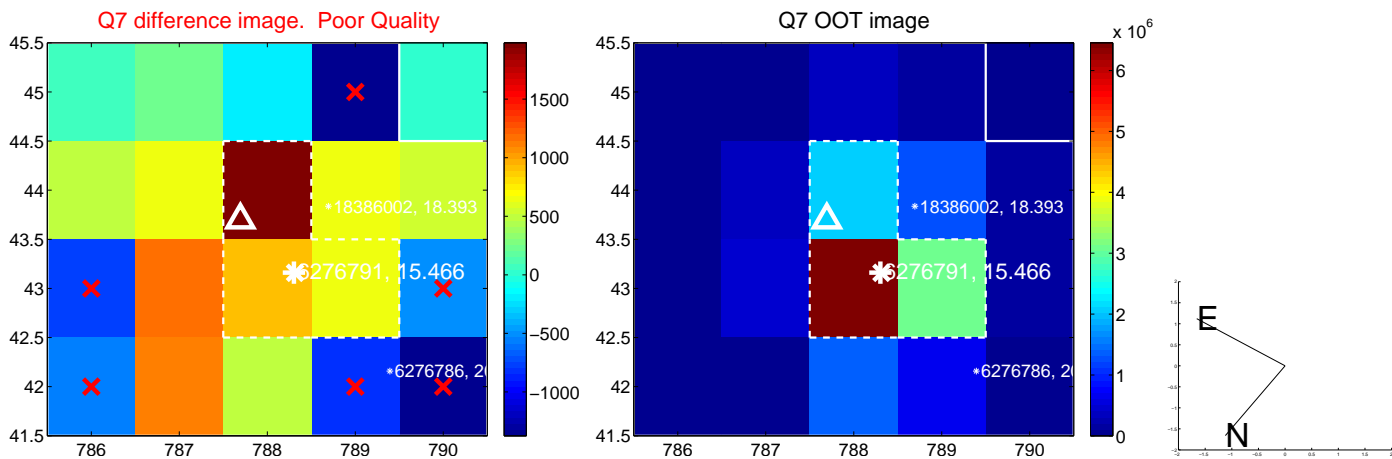
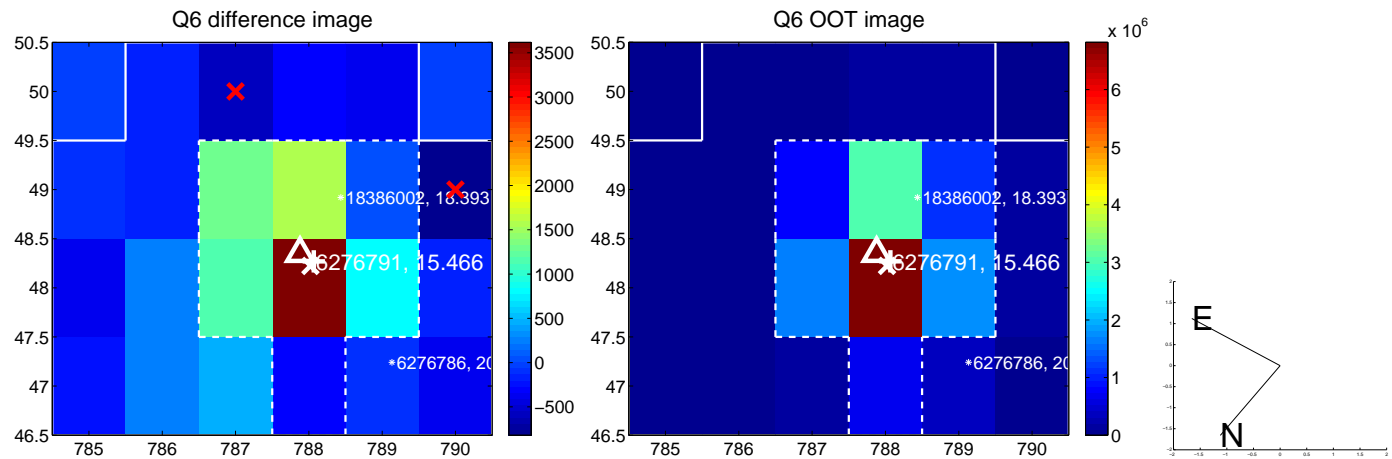
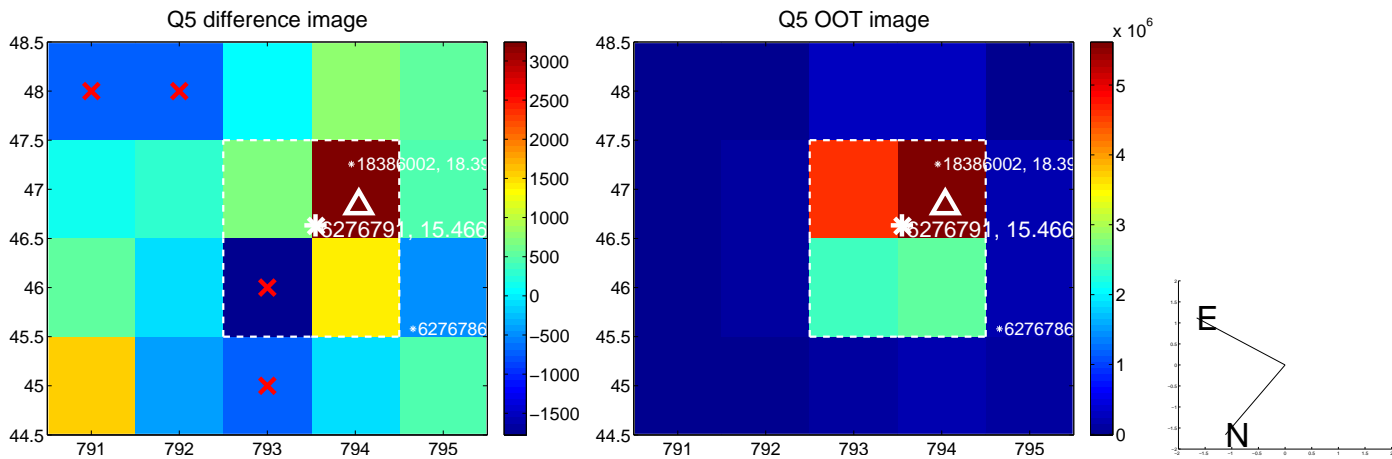


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

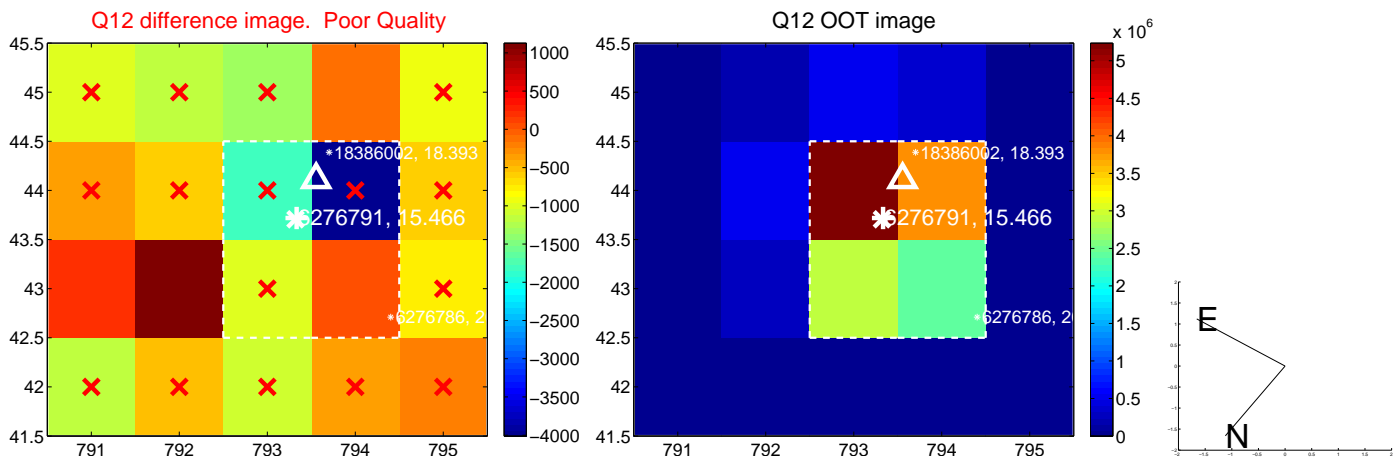
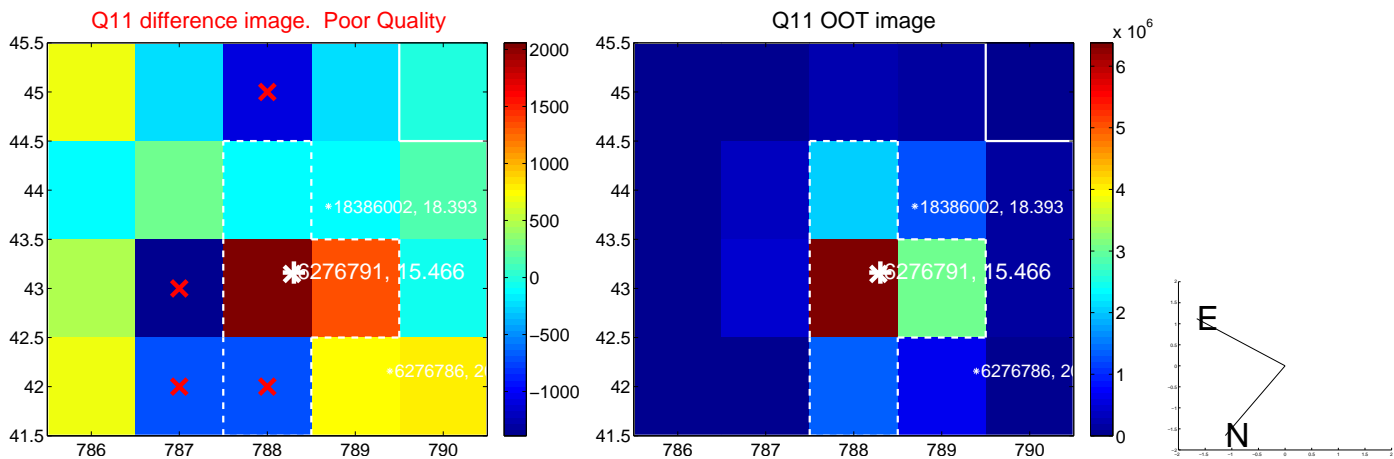
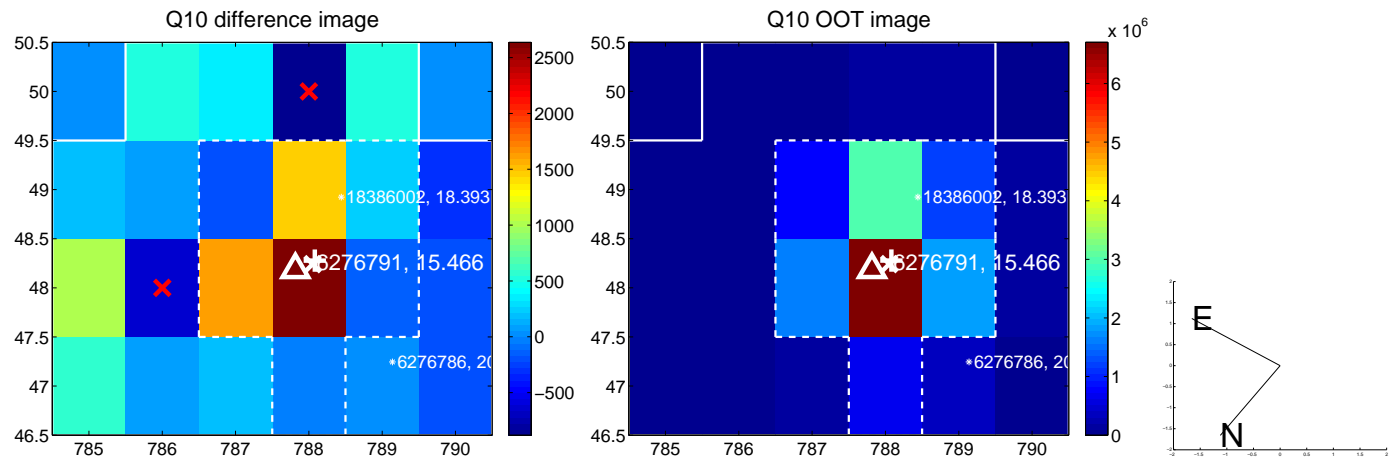
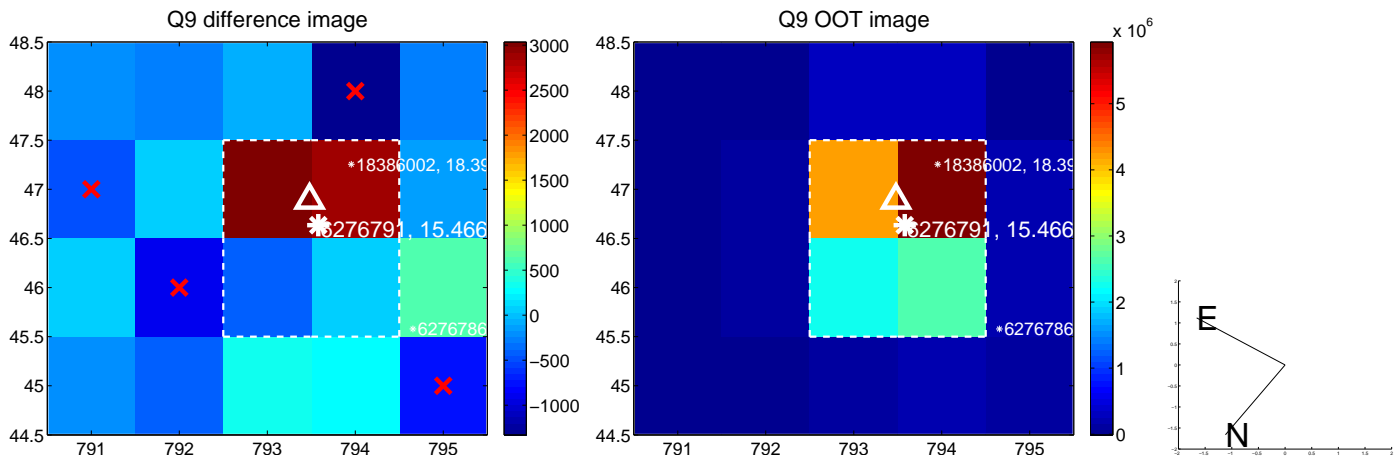
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



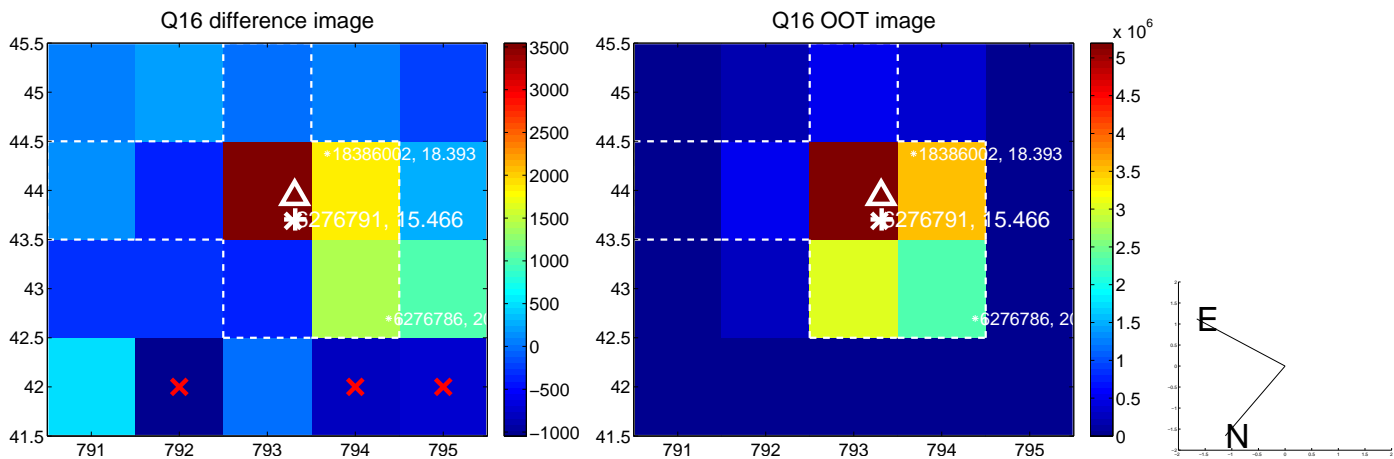
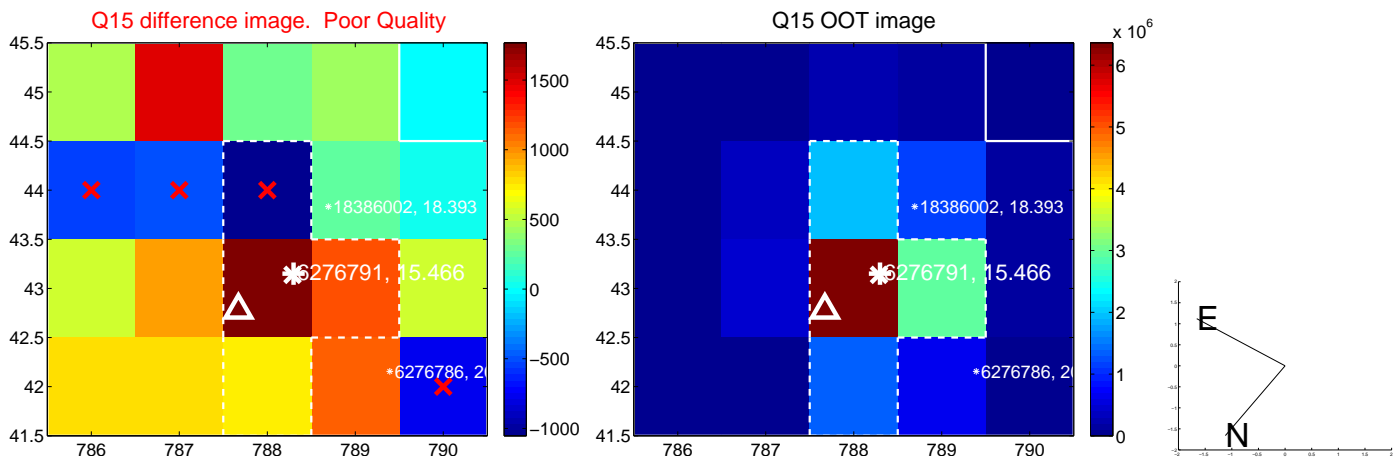
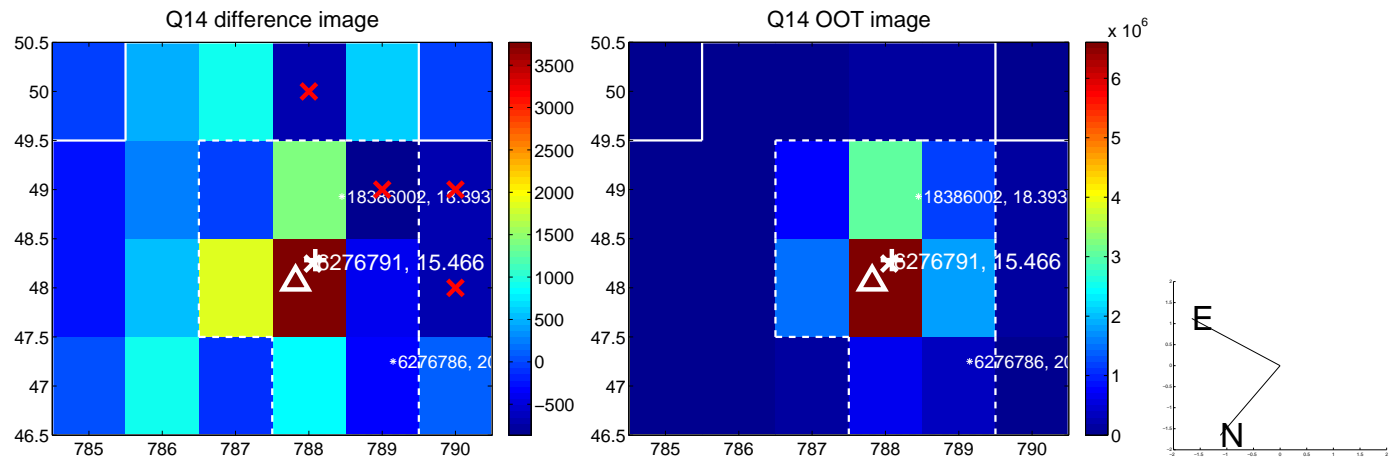
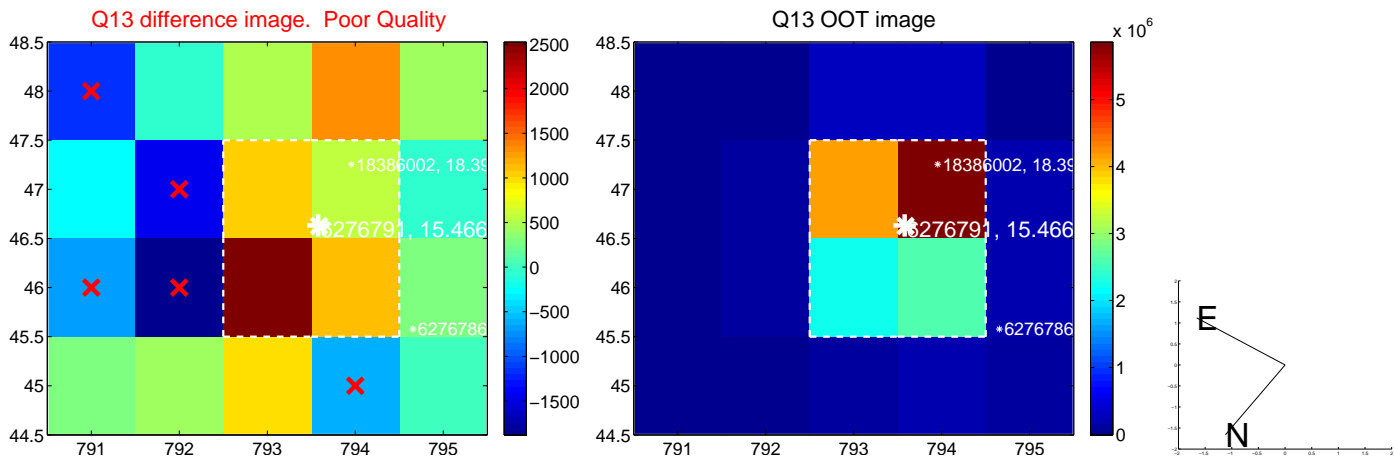
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

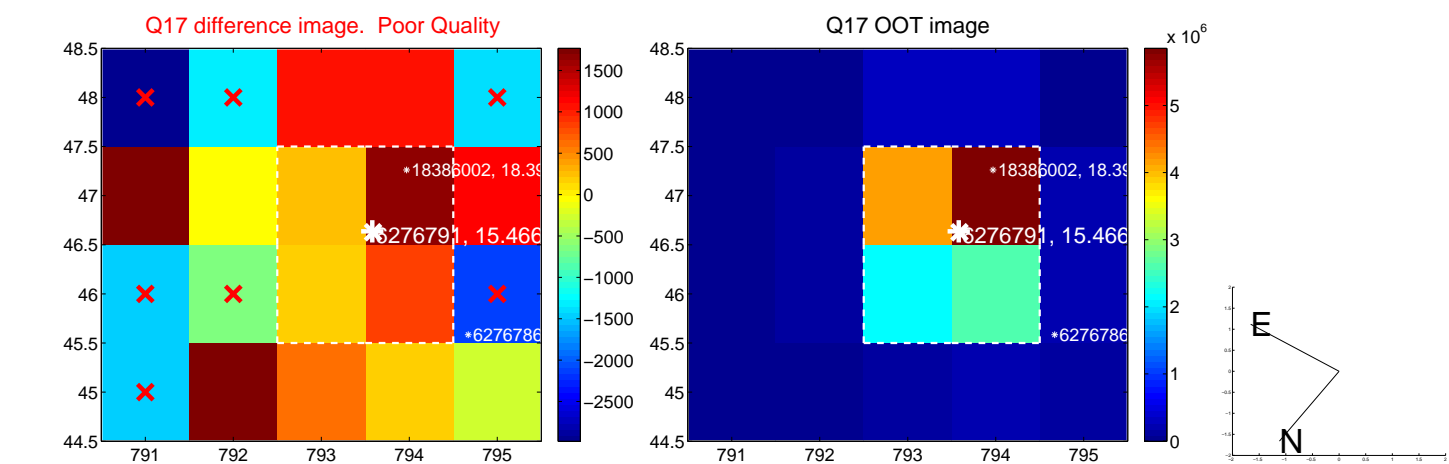


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

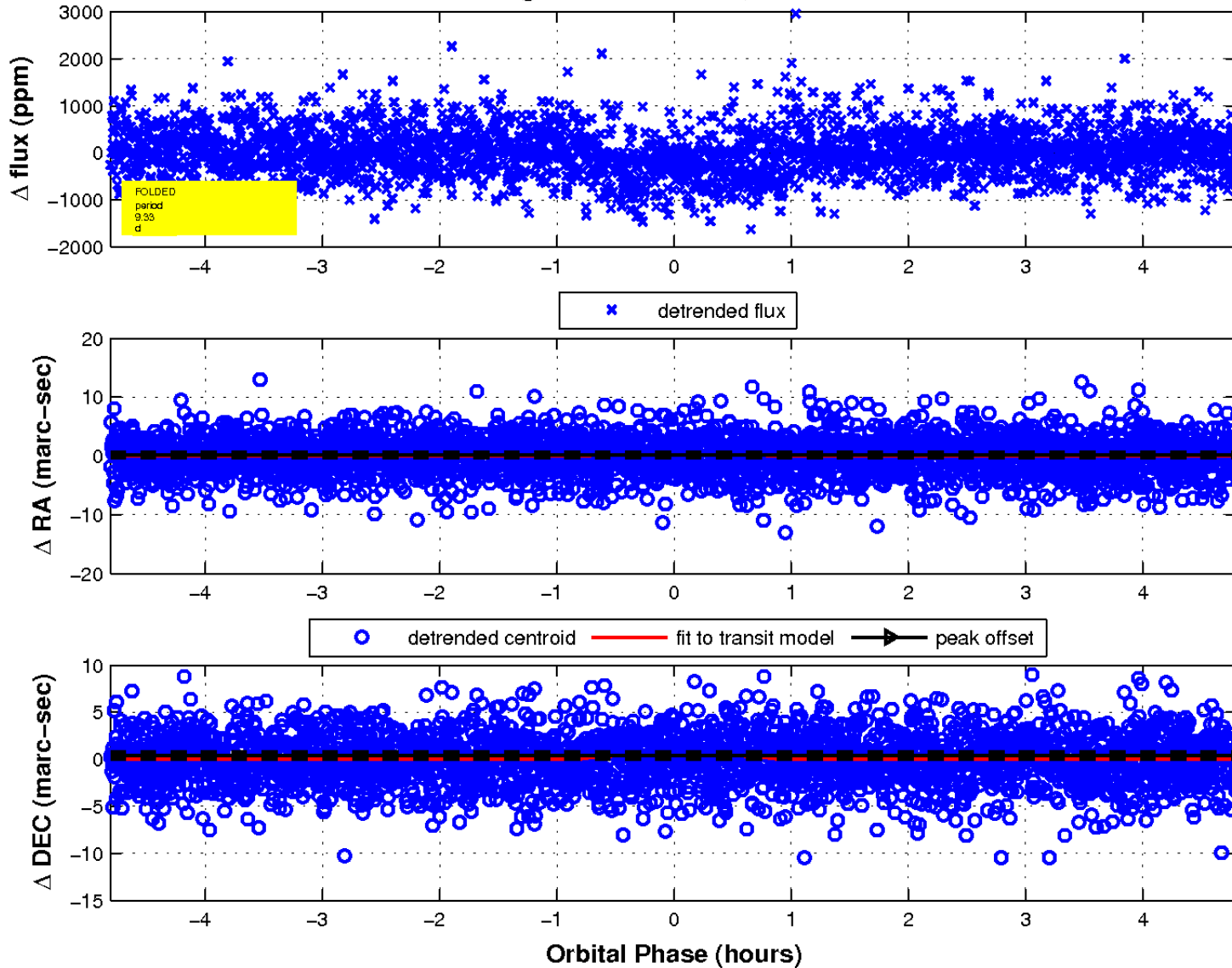




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

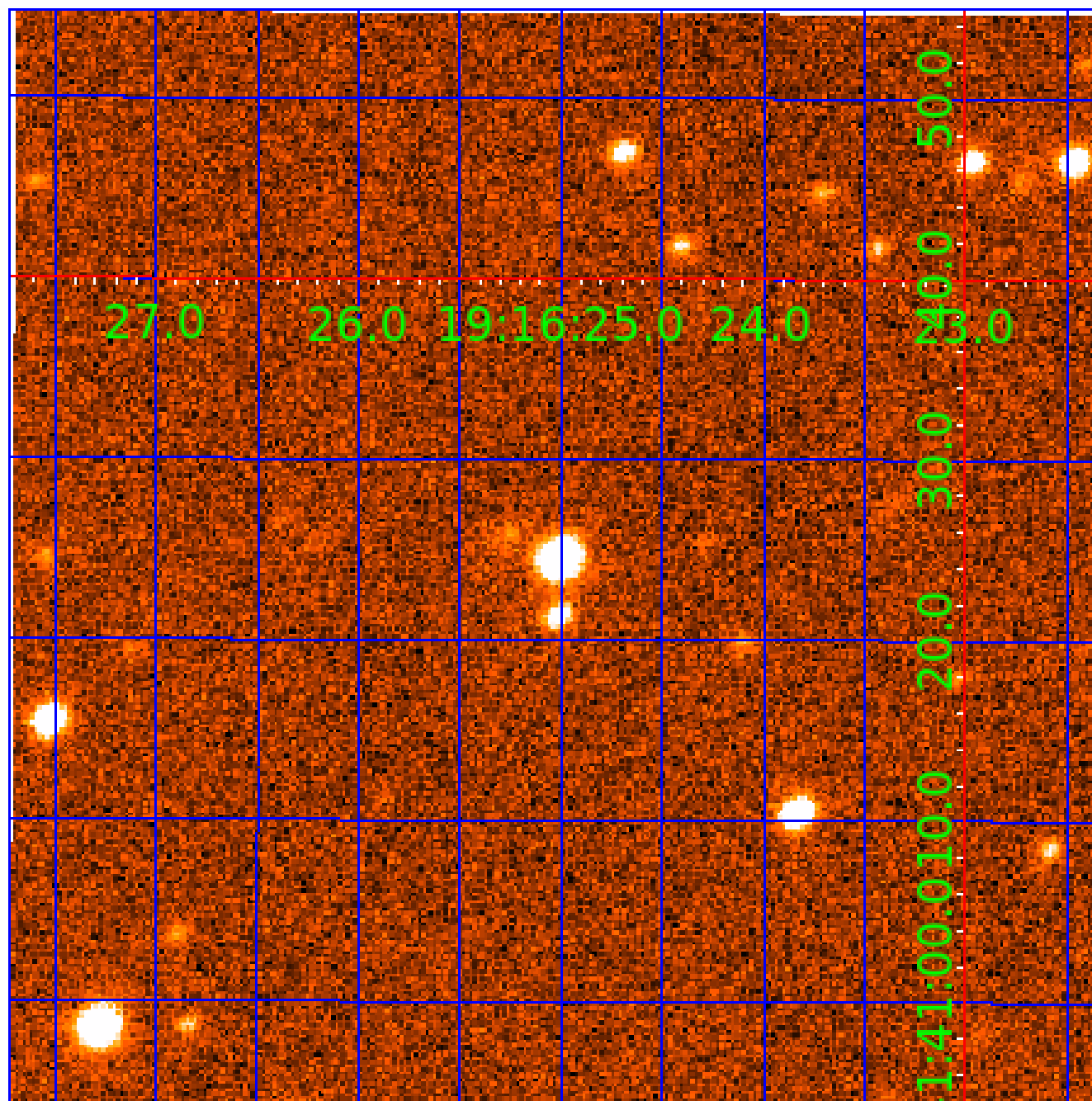


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 006276791

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006276791-01	OBS	4477.02	9.328617	135.880123	359.2	1.603	11.3	12.9	0.86	5749	1.63	99.81
006276791-02	OBS	4477.01	5.301779	135.994848	160.8	2.407	8.4	9.2	0.86	5749	1.28	212.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006276791-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
006276791-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

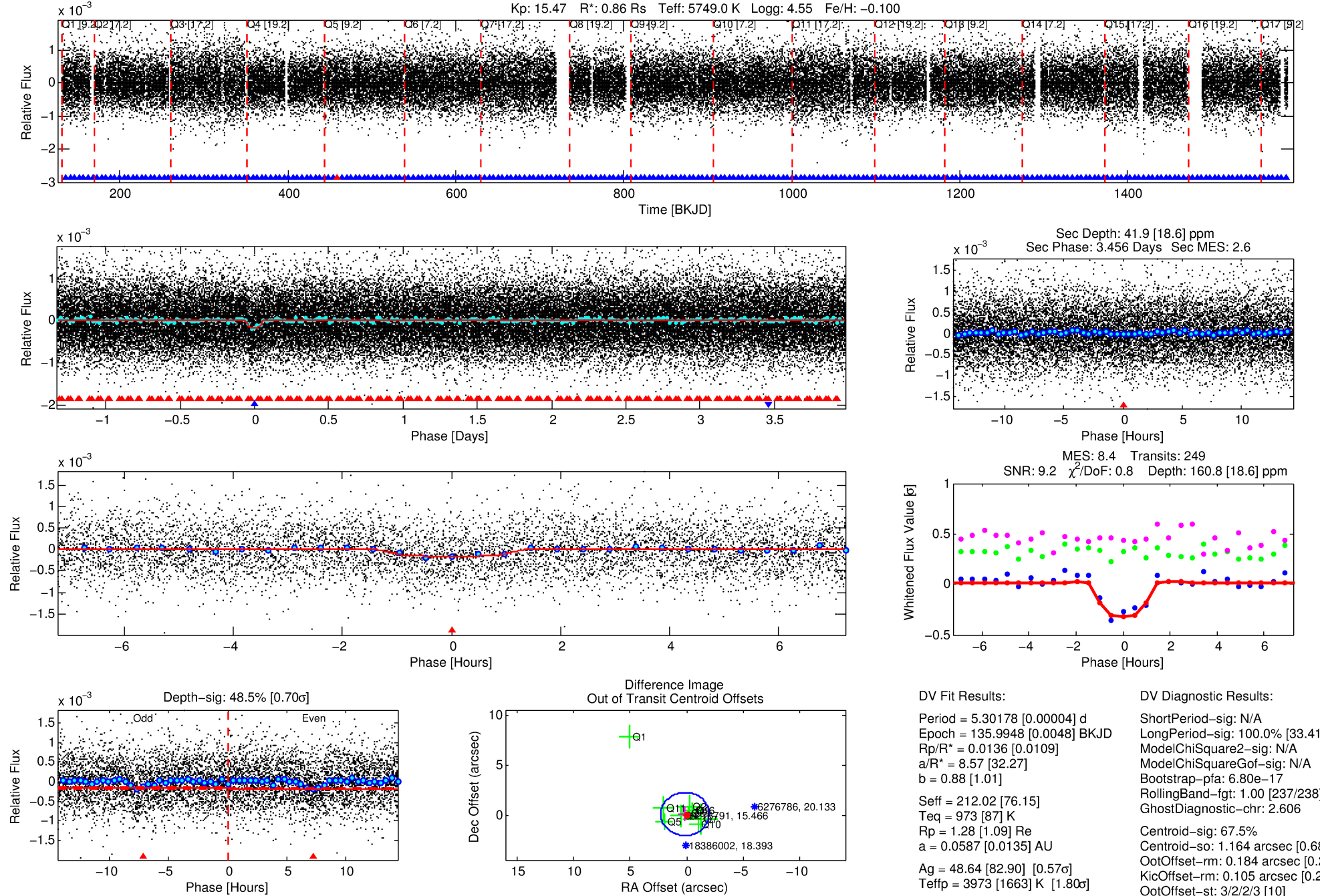
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006276791-02

No Significant Match Found

# DV One-Page Summary

KIC: 6276791 Candidate: 2 of 2 Period: 5.302 d  
KOI: K04477.01 Corr: 0.969



## DV Fit Results:

Period = 5.30178 [0.00004] d  
Epoch = 135.9948 [0.0048] BKJD  
Rp/R\* = 0.0136 [0.0109]  
a/R\* = 8.57 [32.27]  
b = 0.88 [1.01]  
Seff = 212.02 [76.15]  
Teff = 973 [87] K  
Rp = 1.28 [1.09] Re  
a = 0.0587 [0.0135] AU  
Ag = 48.64 [82.90] [0.57 $\sigma$ ]  
Teffp = 3973 [1663] K [1.80 $\sigma$ ]

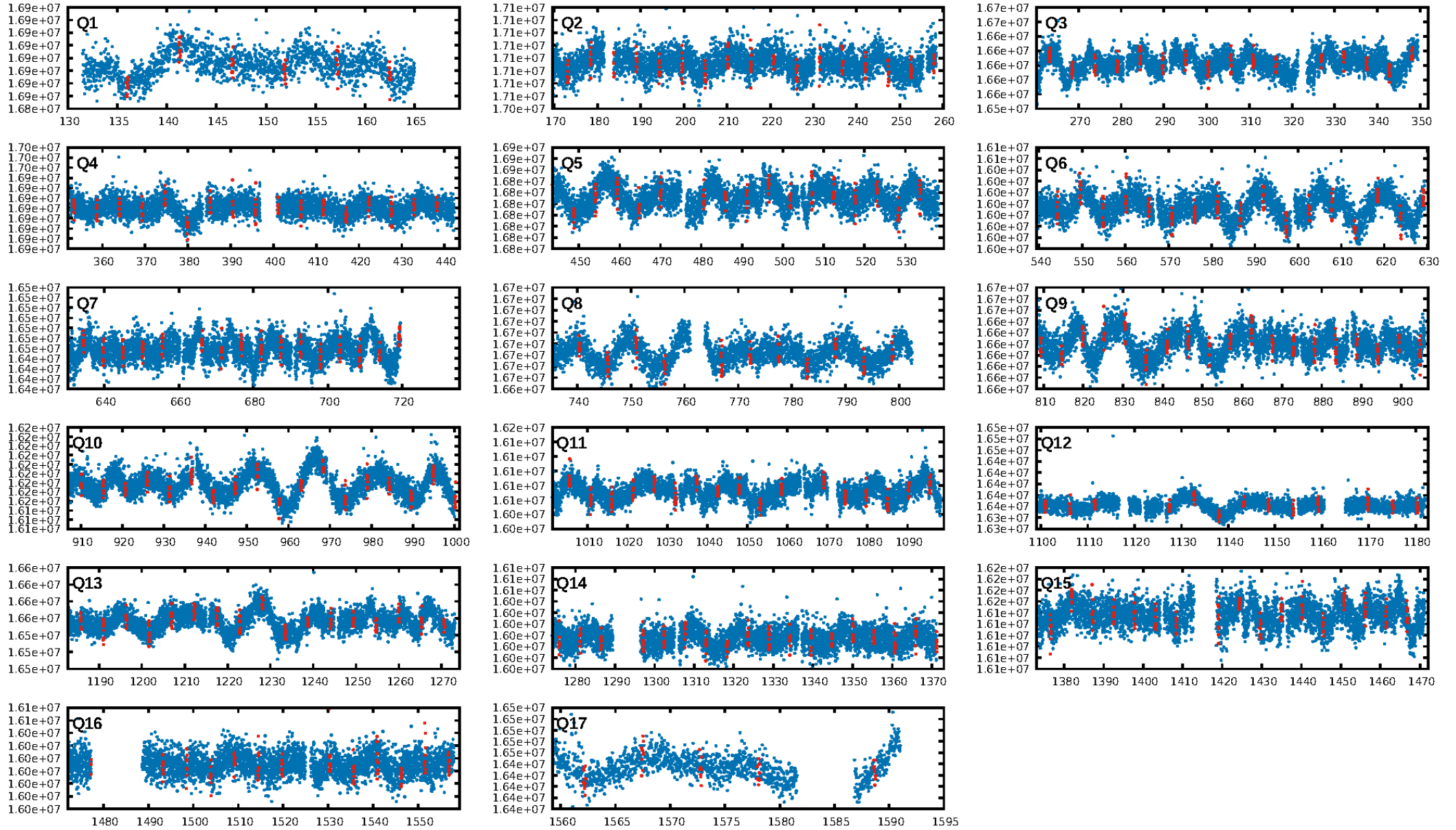
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [33.41 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.80e-17  
RollingBand-fgt: 1.00 [237/238]  
GhostDiagnostic-chr: 2.606  
Centroid-sig: 67.5%  
Centroid-so: 1.164 arcsec [0.68 $\sigma$ ]  
OotOffset-rm: 0.184 arcsec [0.26 $\sigma$ ]  
KicOffset-rm: 0.105 arcsec [0.20 $\sigma$ ]  
OotOffset-st: 3/2/2/3 [10]  
KicOffset-st: 3/2/2/3 [10]  
DiffImageQuality-fgm: 0.60 [6/10]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:13:05 Z

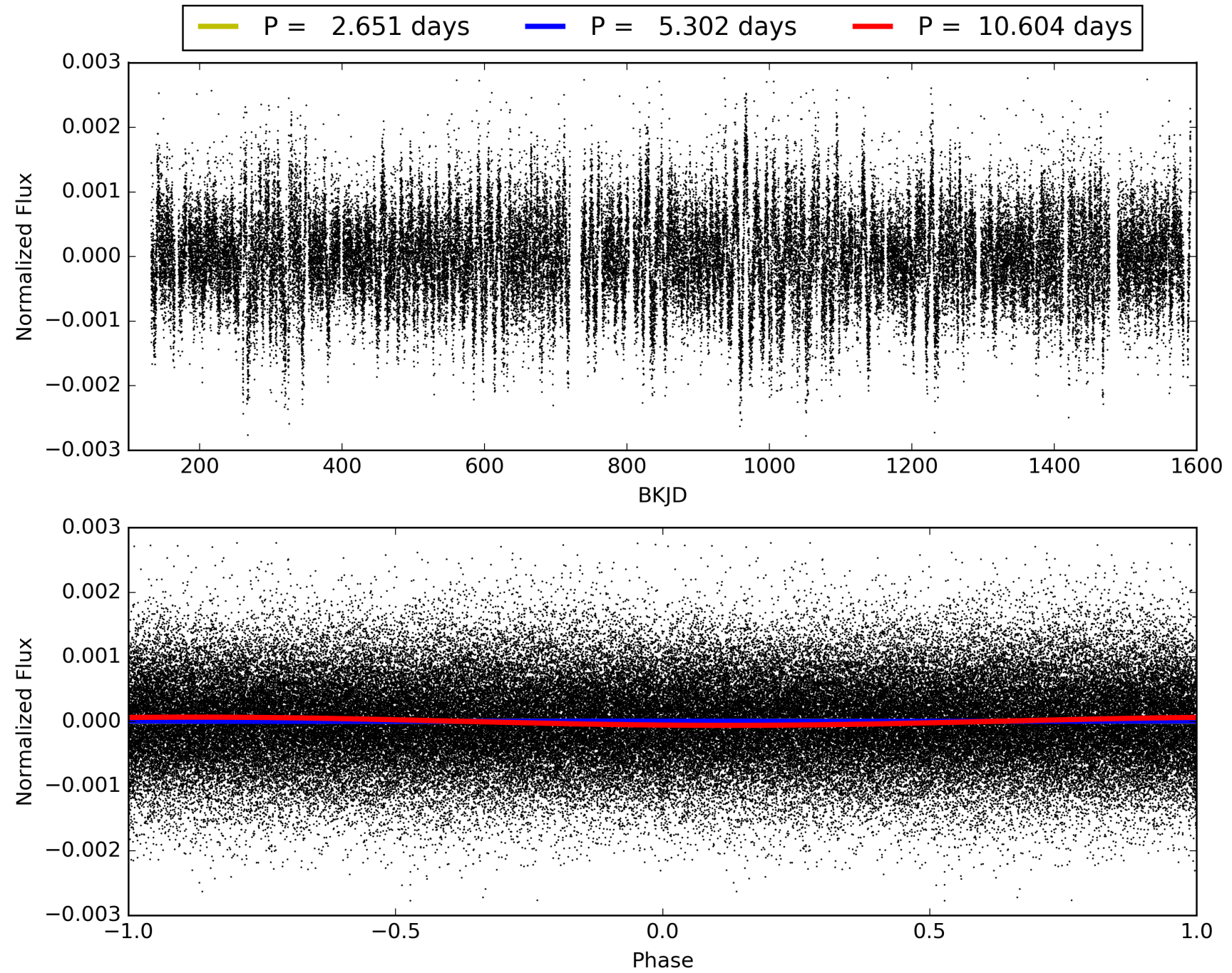
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006276791-02, PDC Light Curves



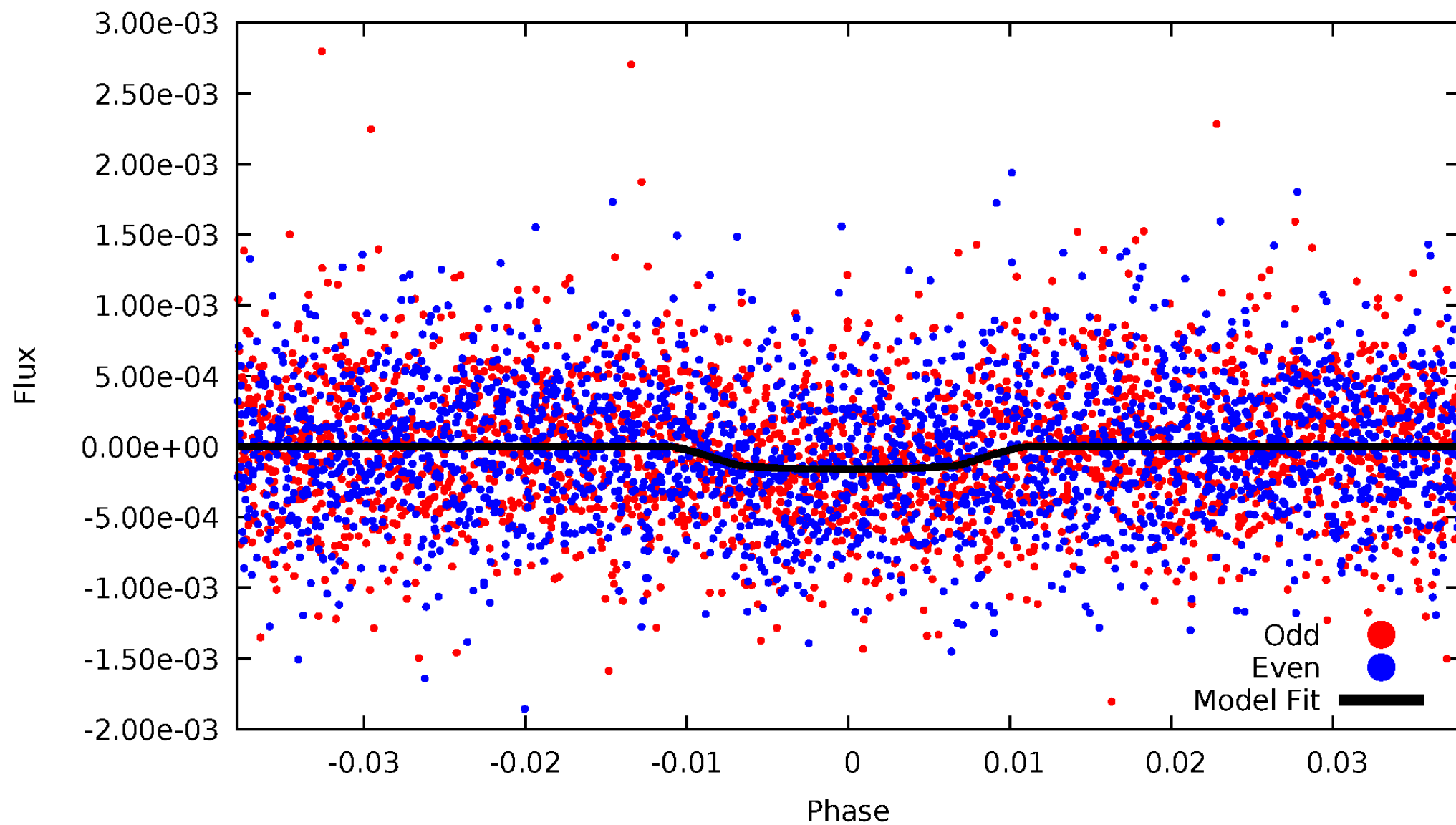


TCE 006276791-02



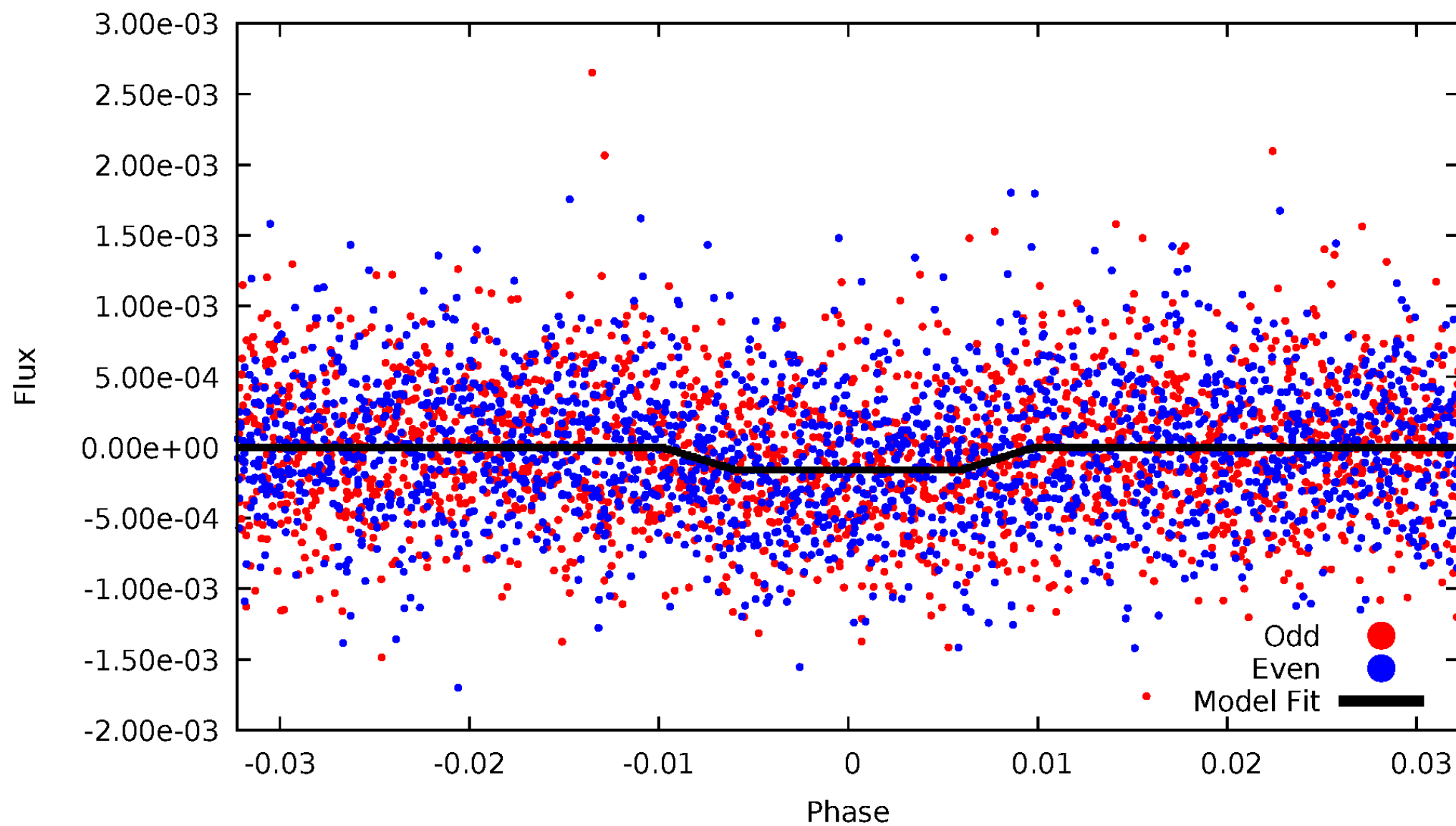
# DV Odd/Even

TCE 006276791-02



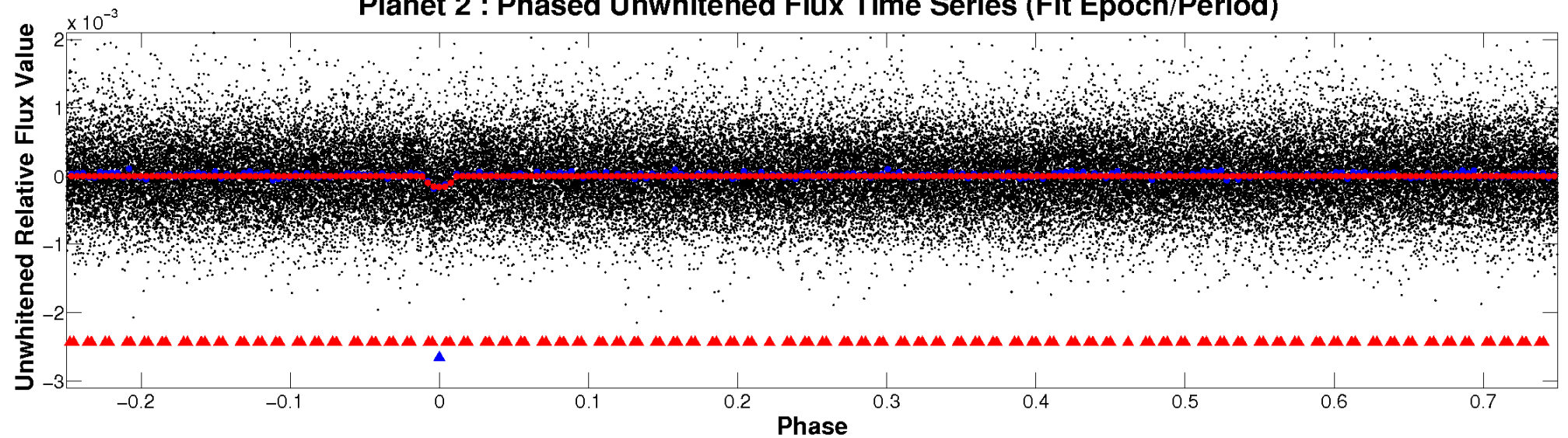
# ALT Odd/Even

TCE 006276791-02

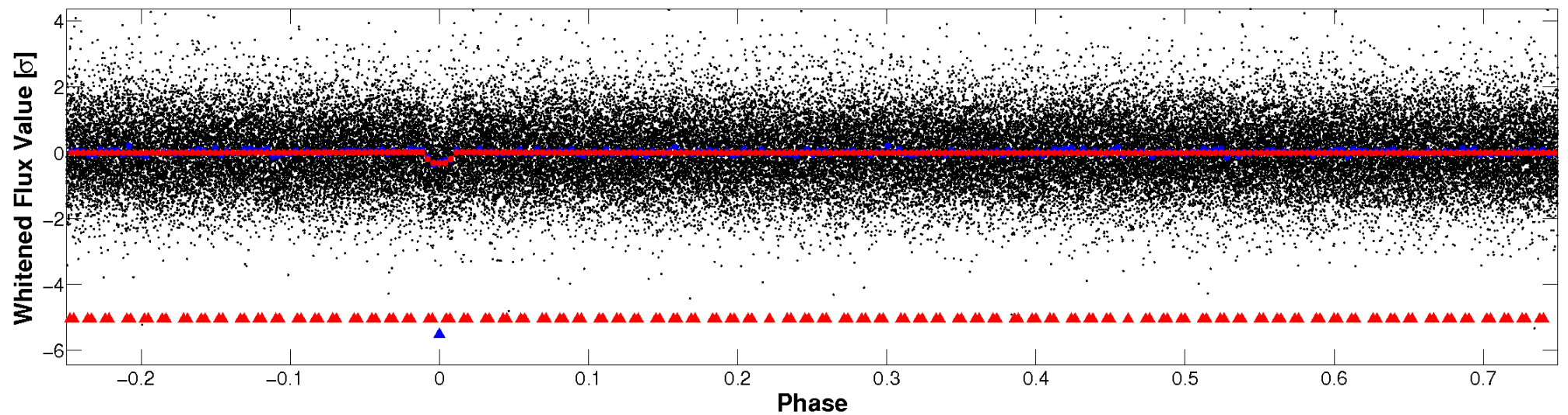


# Non-Whitened Vs. Whitened Light Curve

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



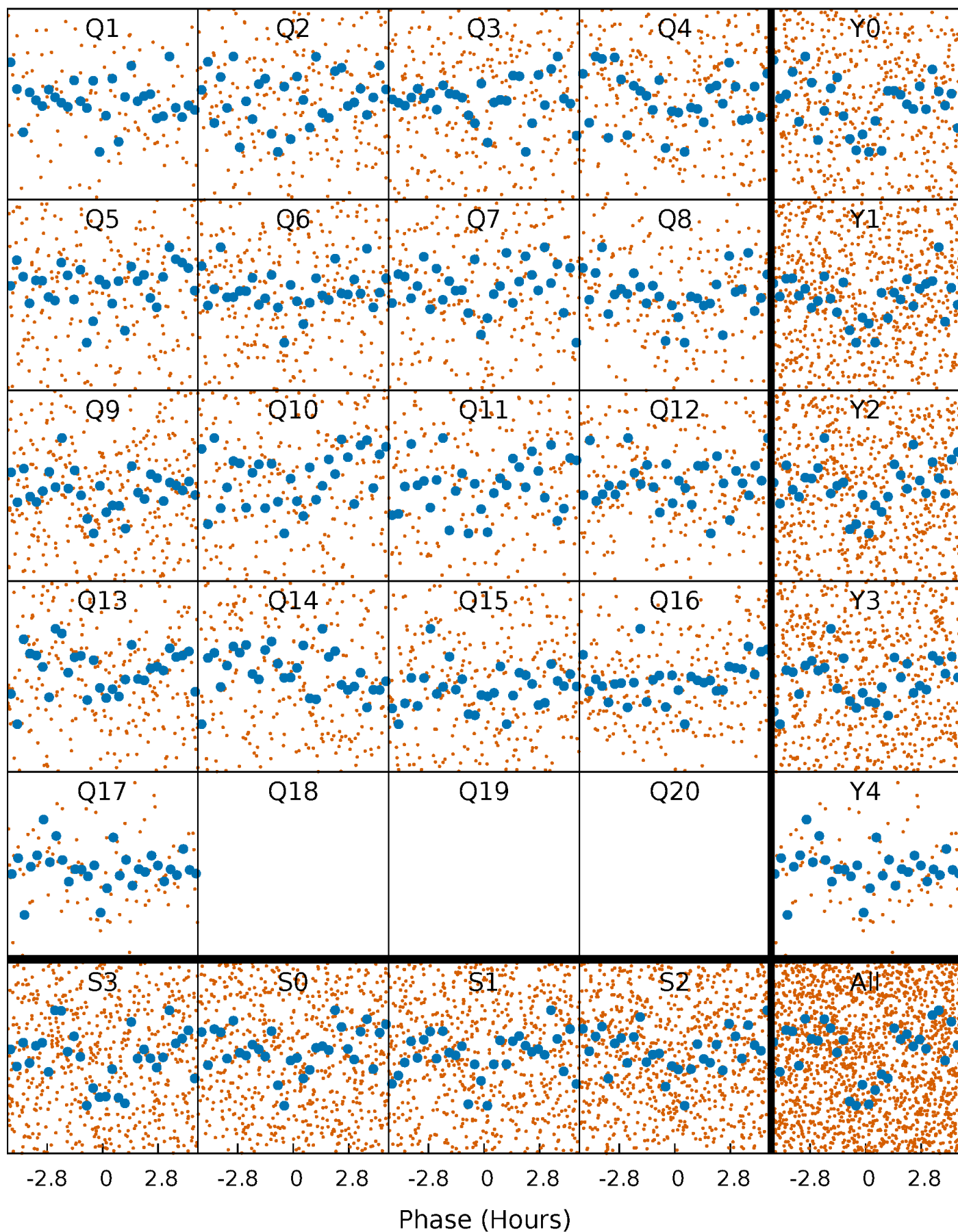
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

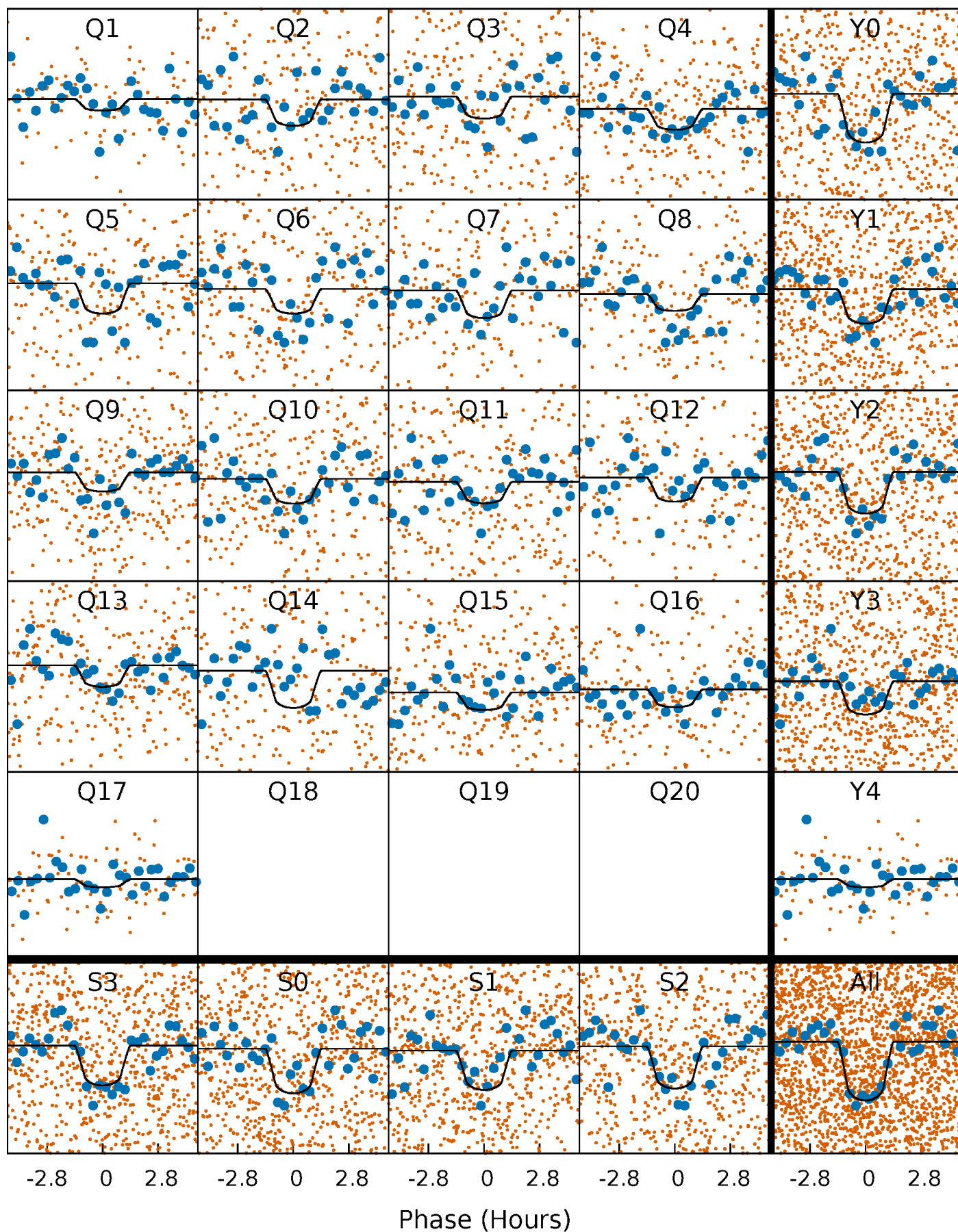
TCE 006276791-02   P= 5.301779 Days    $T_0=135.994848$  (BKJD)





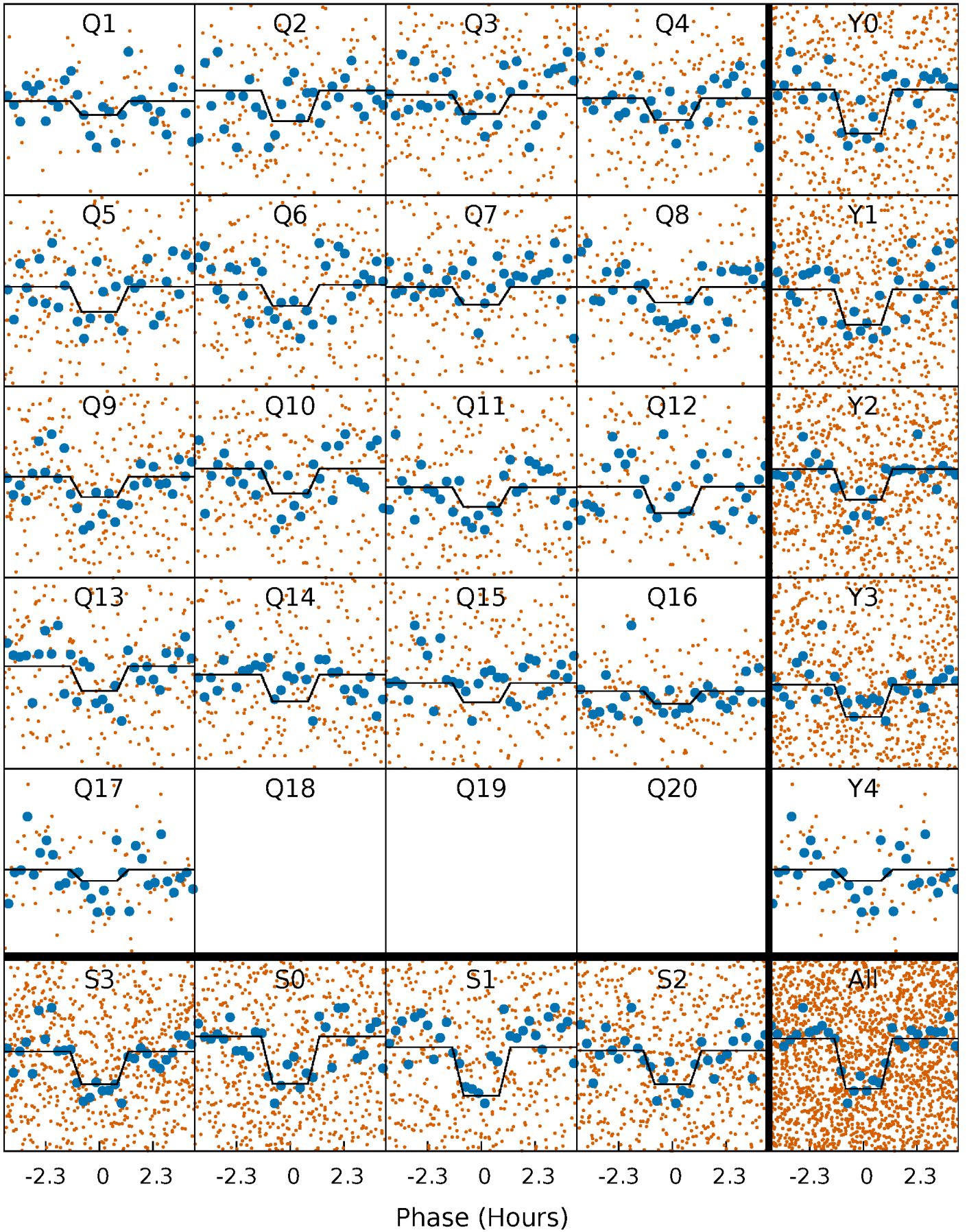
# DV Quarter-Phased Transit Curves

TCE 006276791-02 P= 5.301779 Days  $T_0=135.994848$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

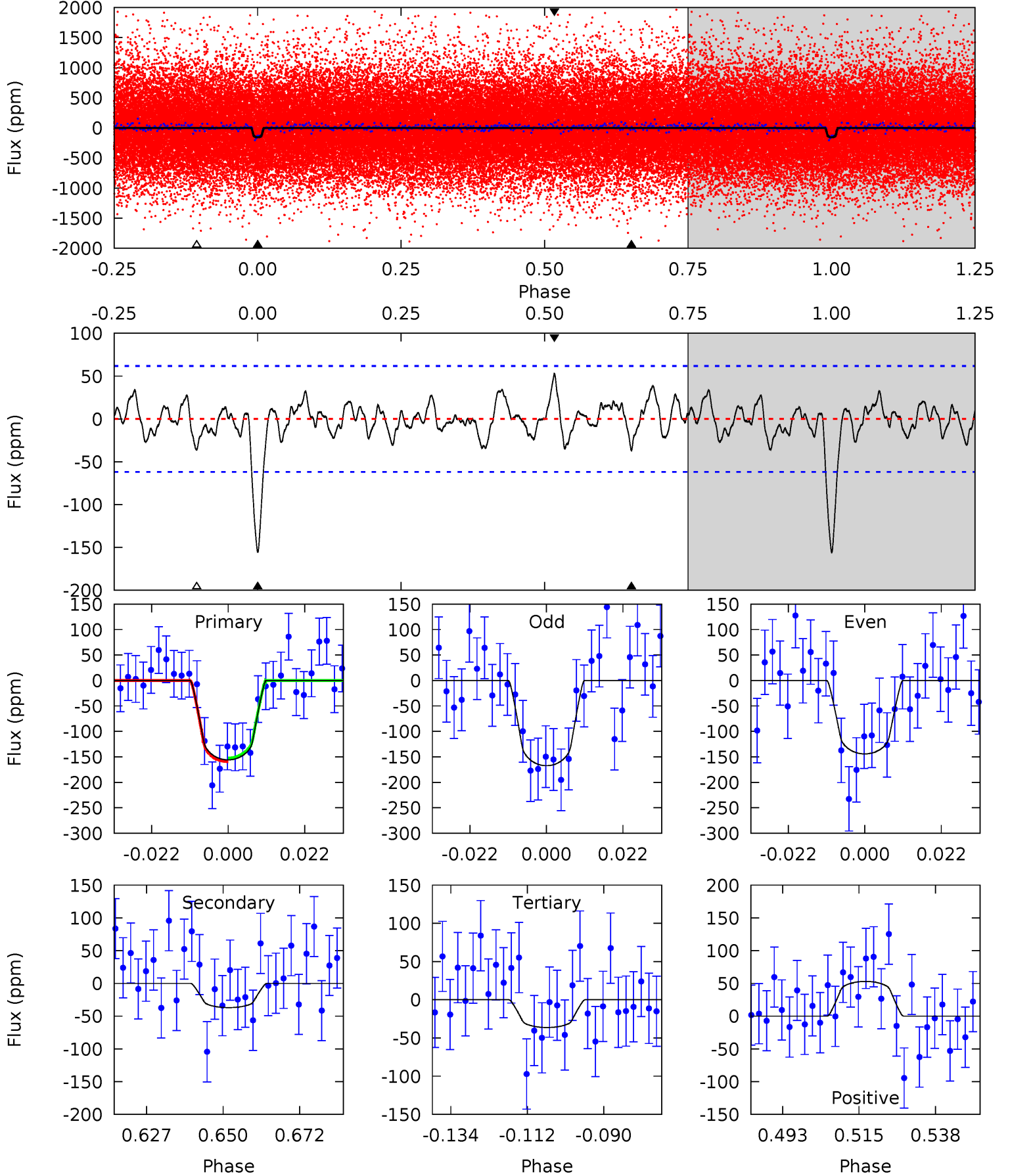
TCE 006276791-02 P= 5.301767 Days  $T_0=135.998162$  (BKJD)



# DV Model-Shift Uniqueness Test

006276791-02, P = 5.301779 Days, E = 130.693069 Days

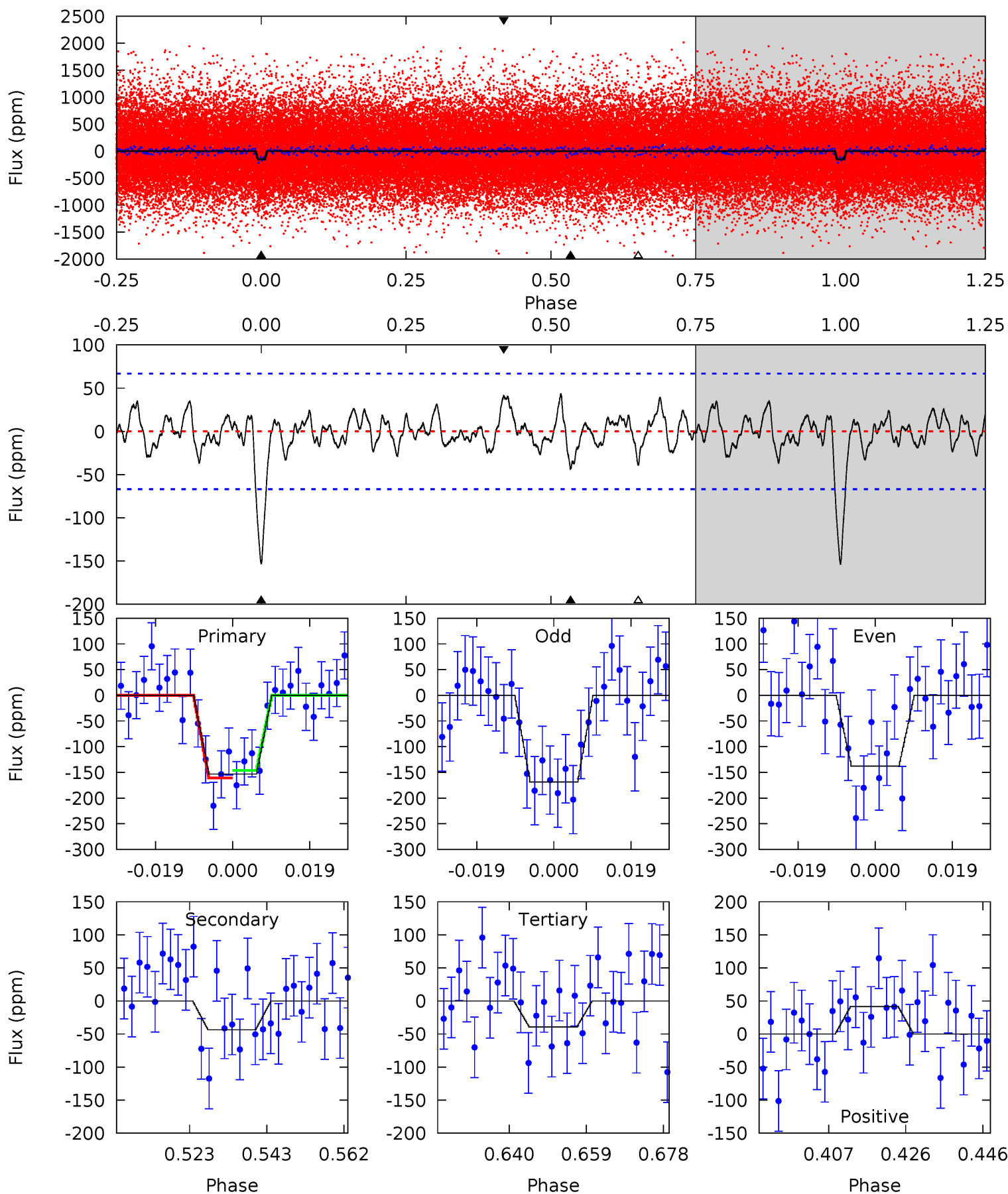
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	2.91	2.86	4.18	4.87	2.28	1.25	9.42	8.10	0.05	-1.26	0.91	1.09	0.25	0.28



# Alt Model-Shift Uniqueness Test

006276791-02, P = 5.301767 Days, E = 130.696395 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
11.2	3.20	2.88	3.04	4.90	2.34	1.11	8.34	8.18	0.32	0.16	1.14	1.03	0.22	0.53



### Stellar Parameters For KIC 006276791

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5749^{+153}_{-170}$	$4.547^{+0.033}_{-0.187}$	$-0.100^{+0.300}_{-0.300}$	$0.864^{+0.234}_{-0.078}$	$0.961^{+0.095}_{-0.116}$	$2.097^{+0.383}_{-0.974}$
	+3%/-3%	+1%/-4%	+300%/-300%	+27%/-9%	+10%/-12%	+18%/-46%
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 006276791-02 / KOI 4477.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-37 \pm 13$	$1.53^{+1.03}_{-0.89}$	$1388^{+94}_{-62}$	$3949^{+1480}_{-725}$	$29^{+123}_{-20}$
Alt.	$-44 \pm 14$	$1.41^{+1.03}_{-0.89}$	$1393^{+89}_{-56}$	$4124^{+2232}_{-707}$	$38^{+244}_{-25}$

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

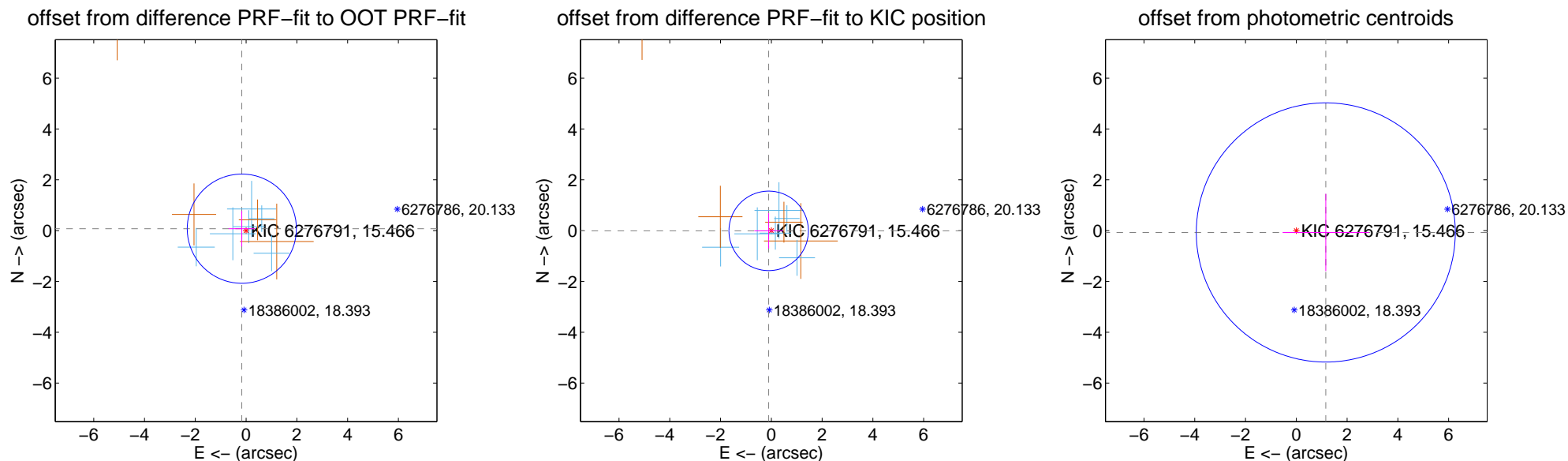
## DV Centroid Data

Supplemental centroid analysis for 006276791-02. Kepler magnitude: 15.47. Transit SNR 9.23

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

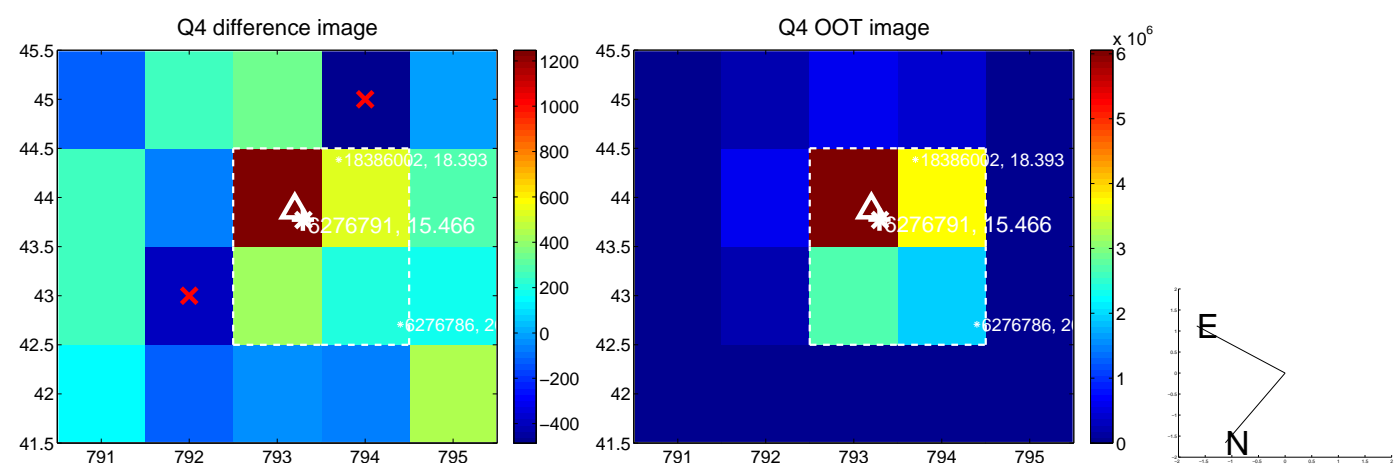
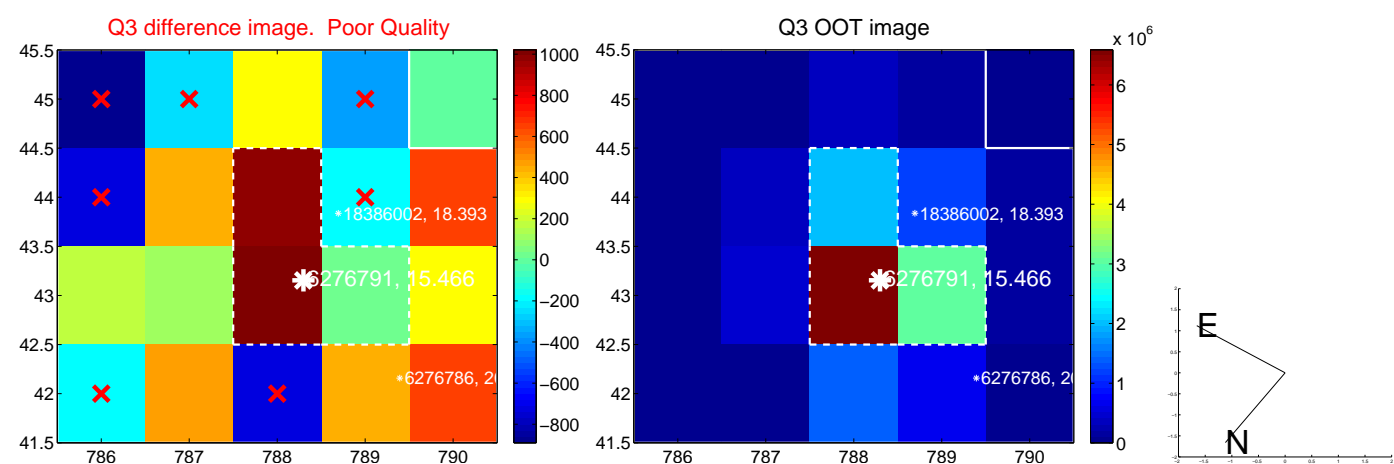
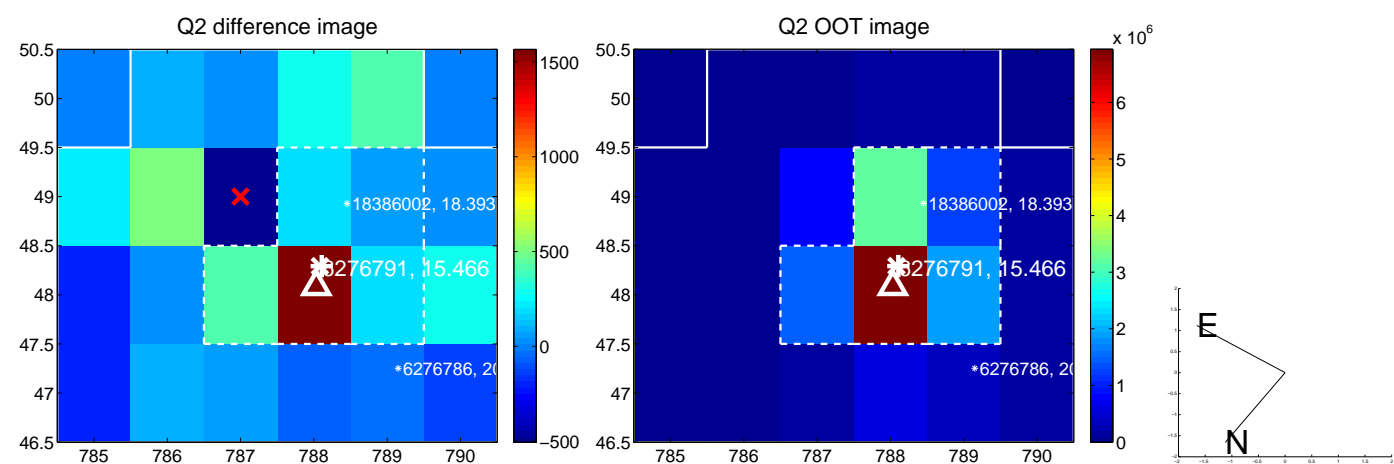
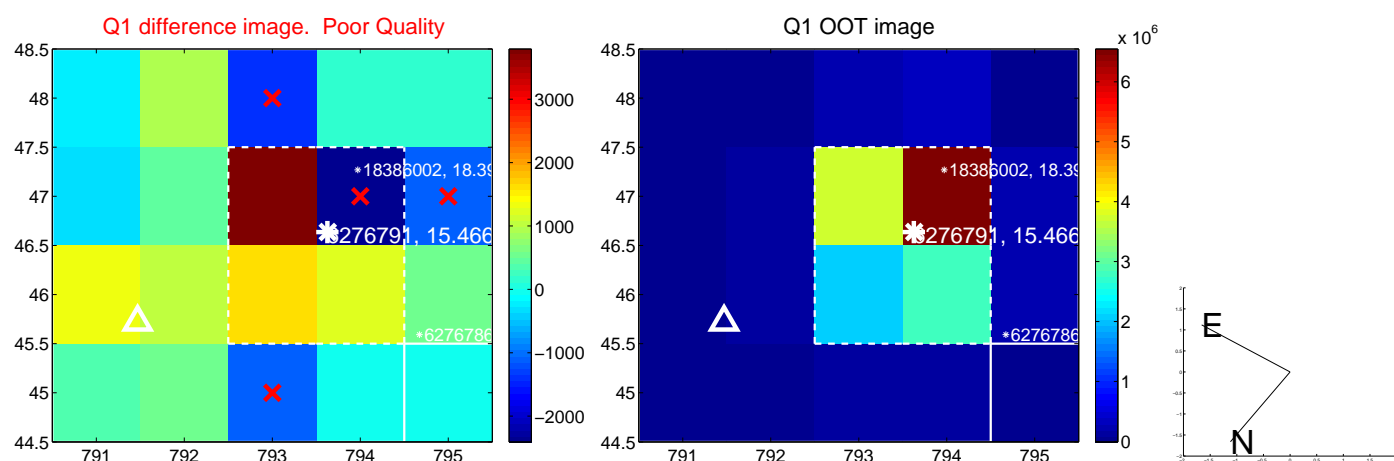
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.184 \pm 0.716$	0.26	$0.168 \pm 0.522$	$0.077 \pm 0.698$
PRF-fit source offset from KIC position	$0.105 \pm 0.522$	0.20	$0.104 \pm 0.568$	$-0.009 \pm 0.693$
photometric centroid source offset	$1.16 \pm 1.70$	0.68	$-1.16 \pm 1.70$	$-0.07 \pm 1.52$



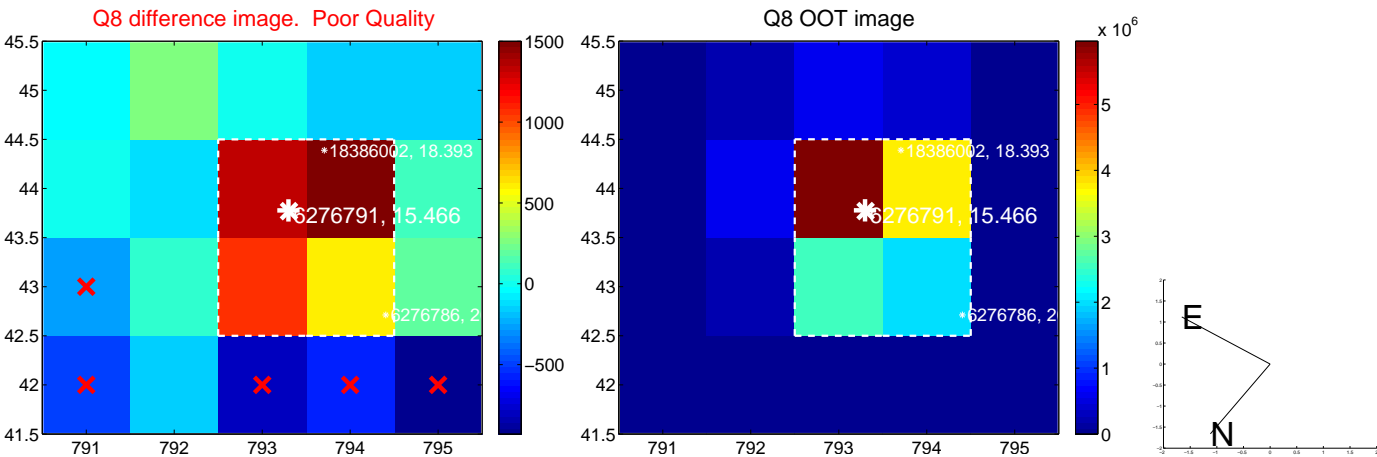
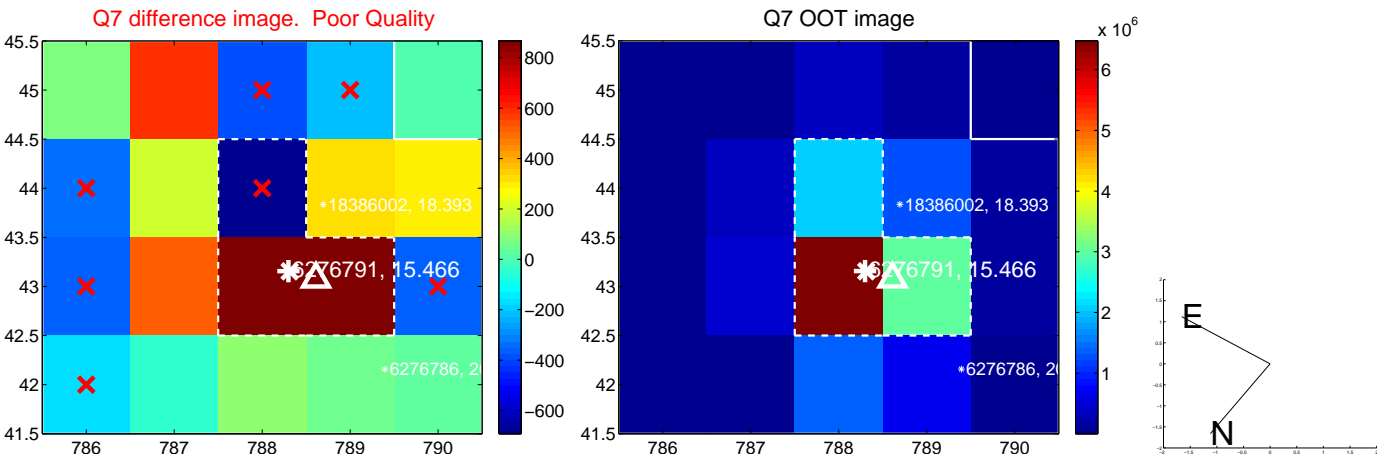
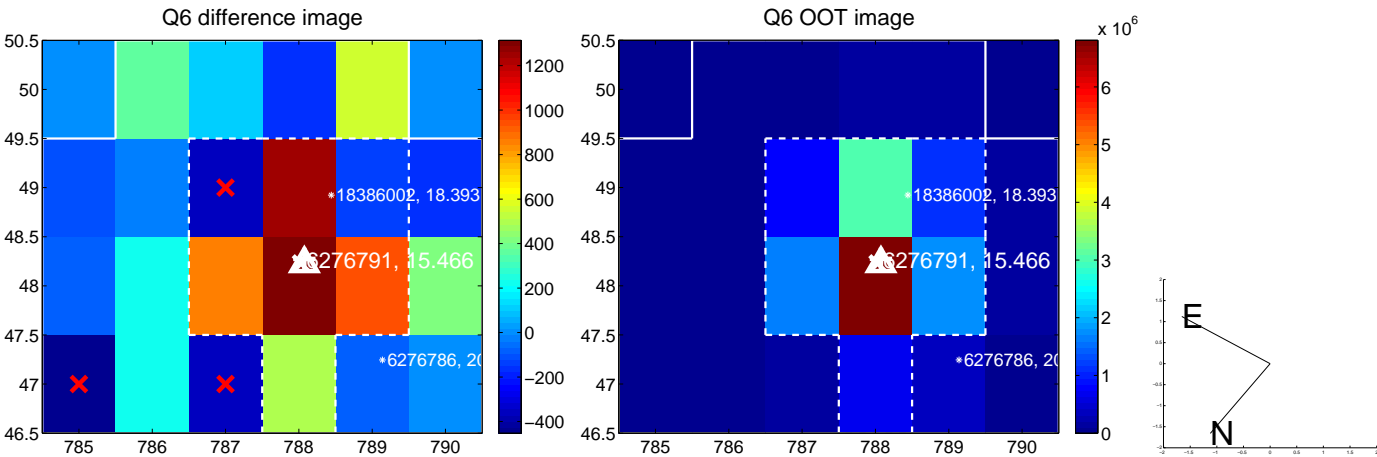
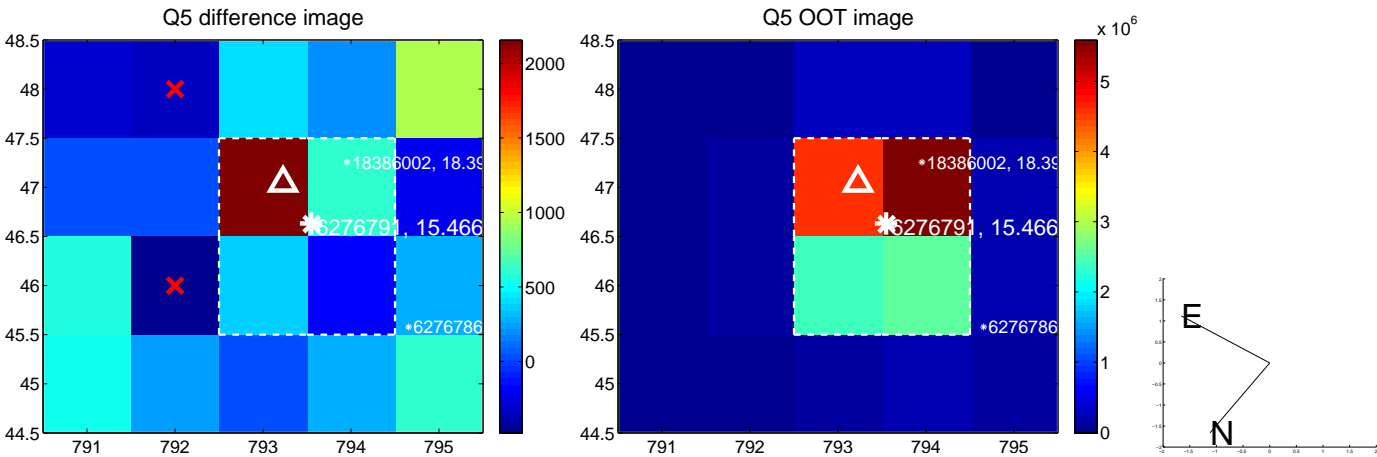
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



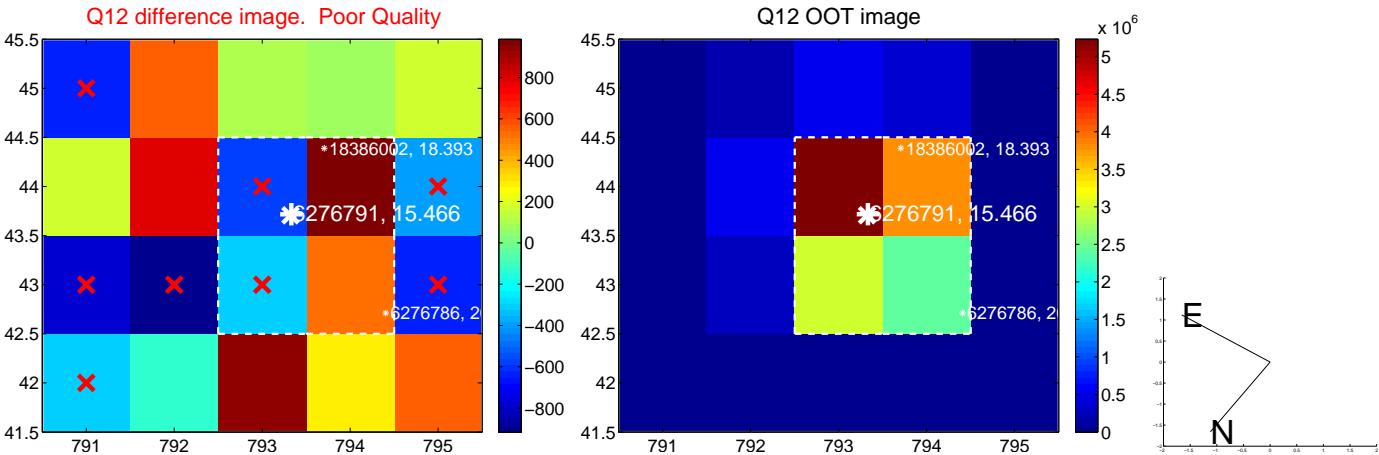
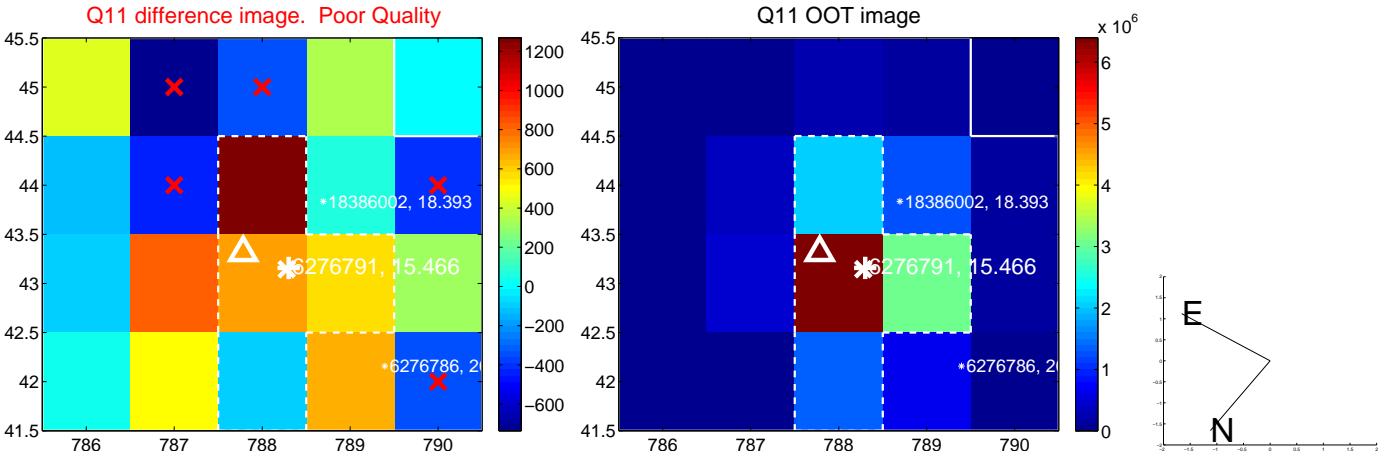
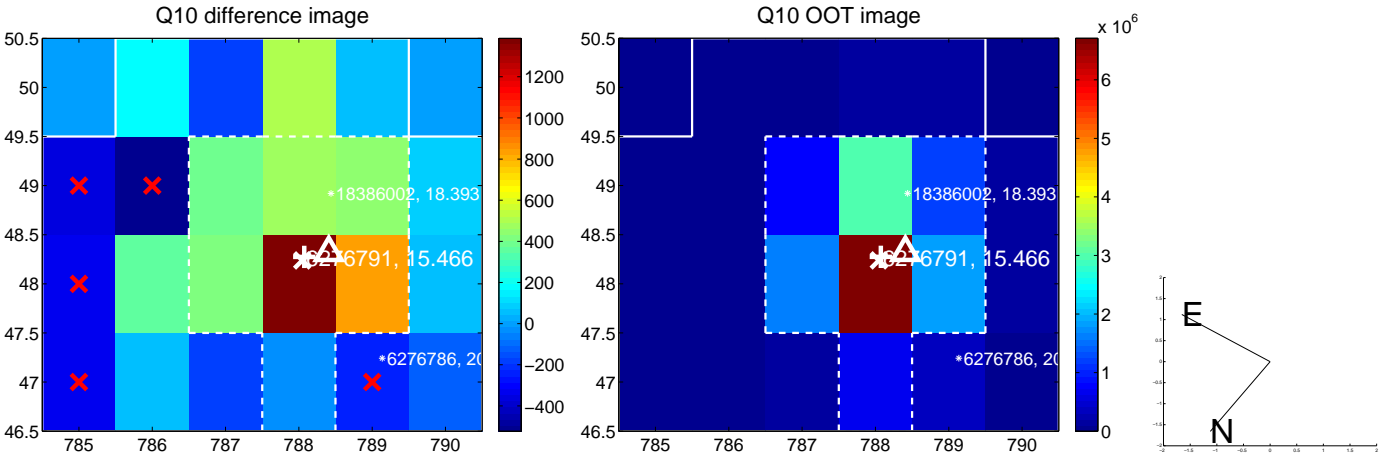
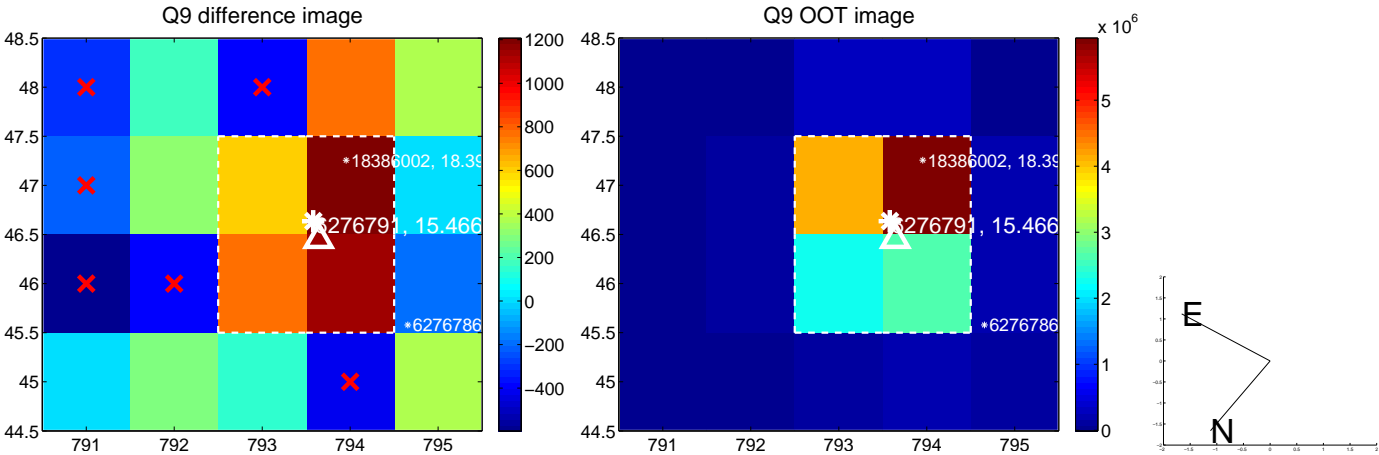
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



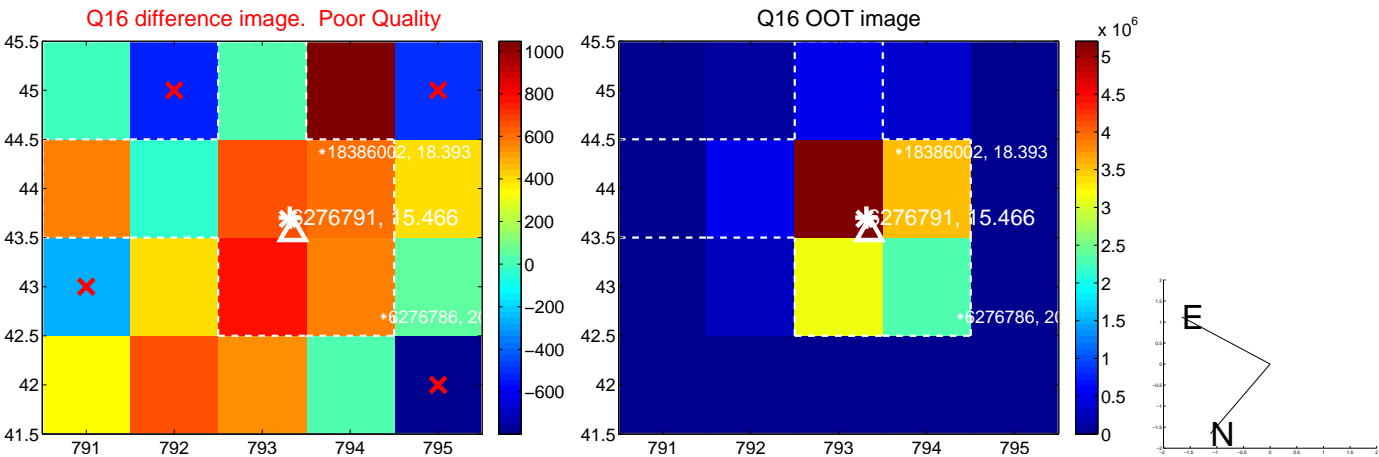
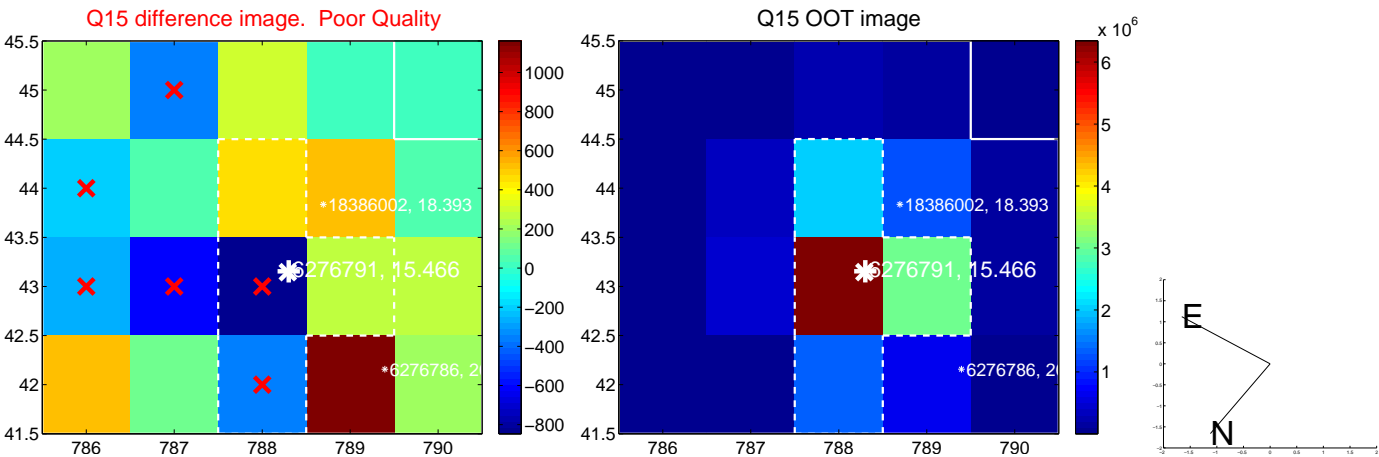
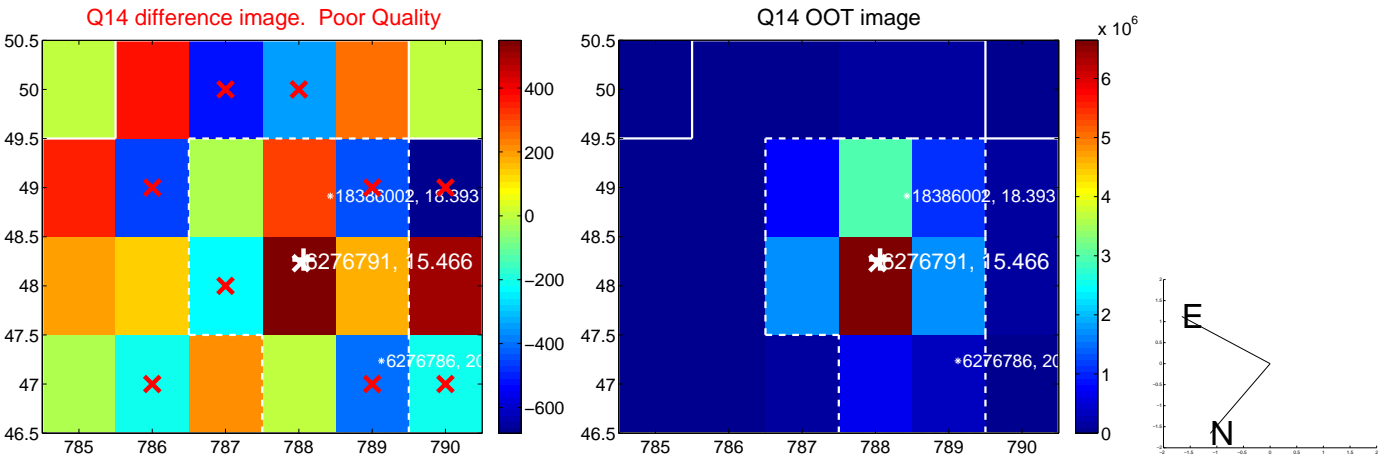
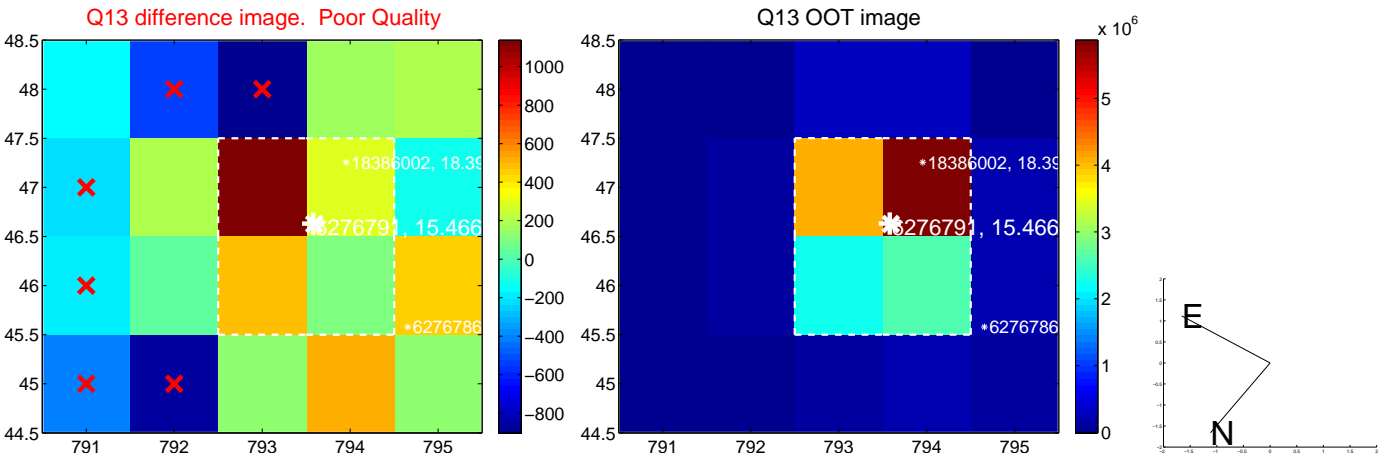
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



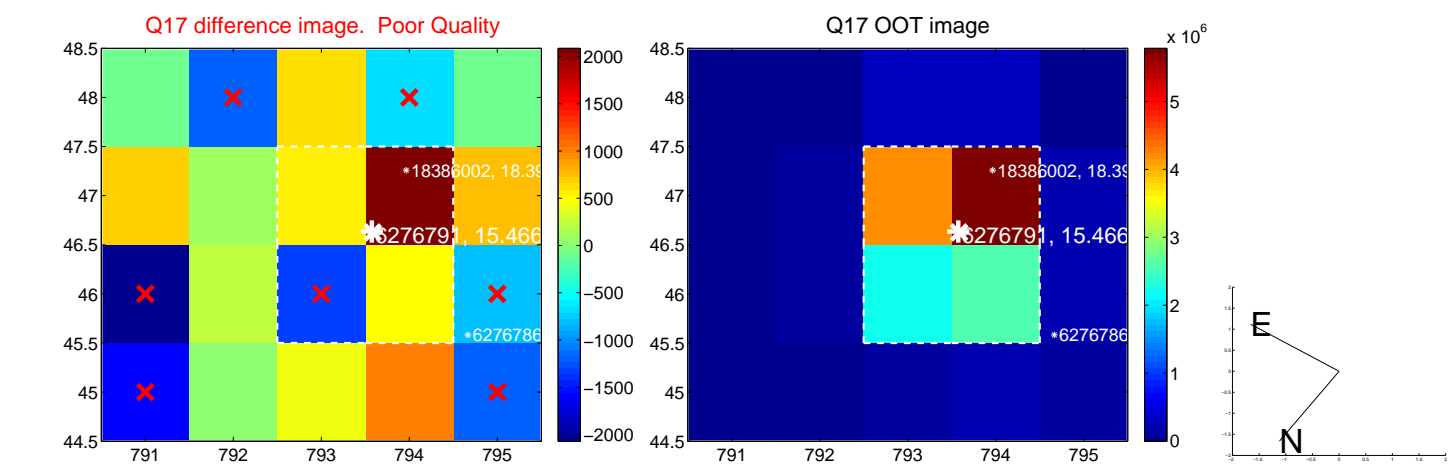
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



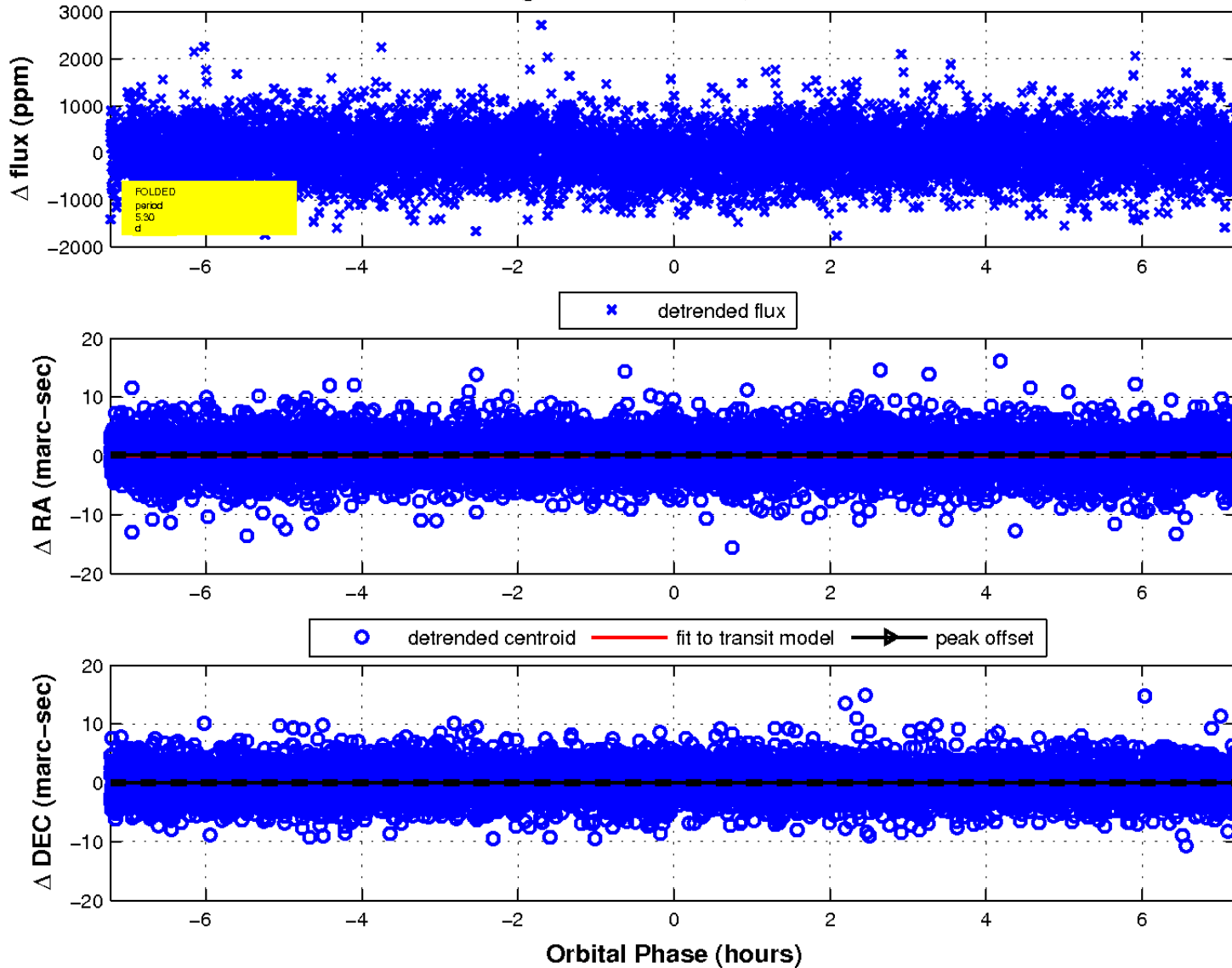
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



# UKIRT Image

Declination

