

# KIC 011043136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011043136-01	OBS	1644.01	5.243405	131.883732	6768.0	1.925	192.8	190.5	0.88	5749	11.35	258.48
011043136-02	OBS	No	2.621705	131.883398	2457.8	1.837	65.2	69.2	0.88	5749	6.29	651.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011043136-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
011043136-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

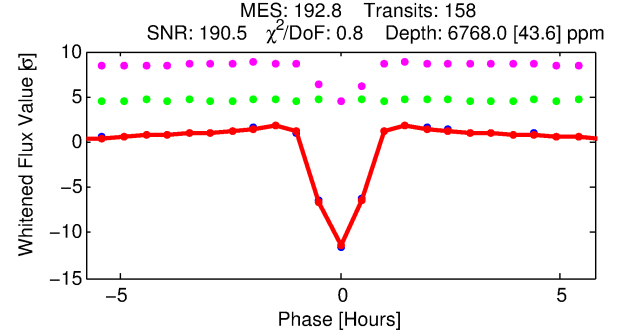
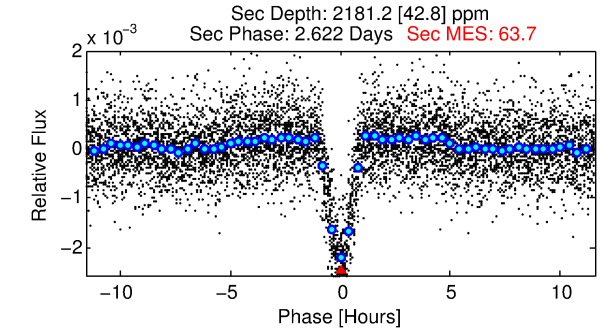
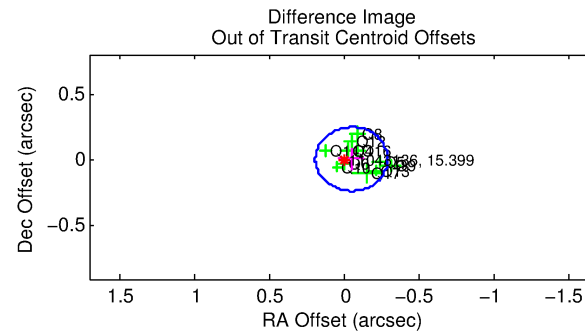
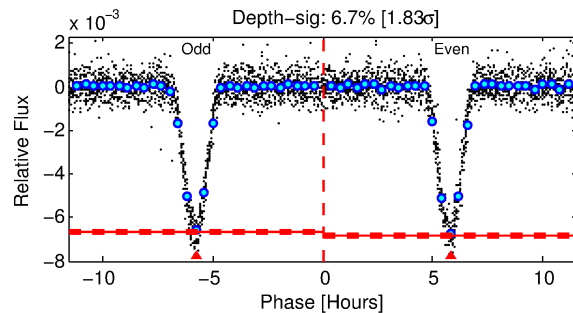
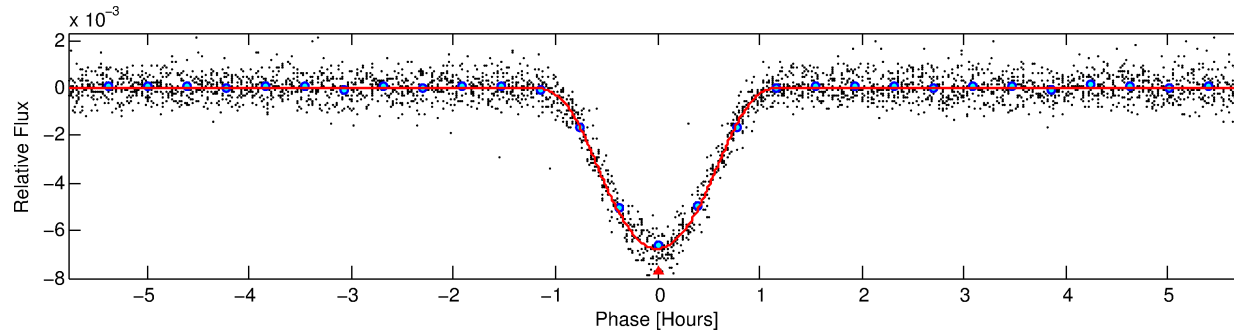
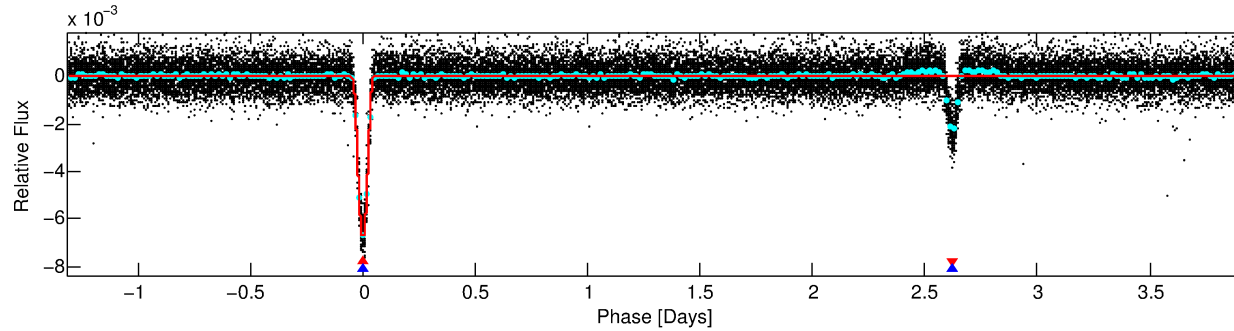
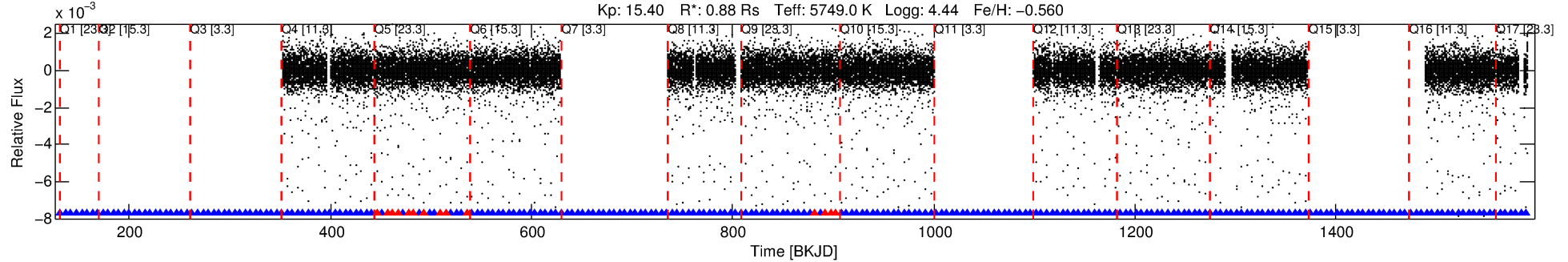
## Ephemeris Match Information For 011043136-01

No Significant Match Found

# DV One-Page Summary

KIC: 11043136 Candidate: 1 of 2 Period: 5.243 d  
KOI: K01644 Corr: No Ephemeris Match

Kp: 15.40 R\*: 0.88 Rs Teff: 5749.0 K Logg: 4.44 Fe/H: -0.560



## DV Fit Results:

Period = 5.24340 [0.00000] d  
Epoch = 131.8837 [0.0002] BKJD  
Rp/R\* = 0.1181 [0.0219]  
a/R\* = 11.67 [0.54]  
b = 0.97 [0.04]  
Seff = 258.48 [86.66]  
Teff = 1022 [86] K  
Rp = 11.35 [3.48] Re  
a = 0.0542 [0.0113] AU  
Ag = 27.37 [13.18] [2.00σ]  
Teffp = 3616 [356] K [7.08σ]

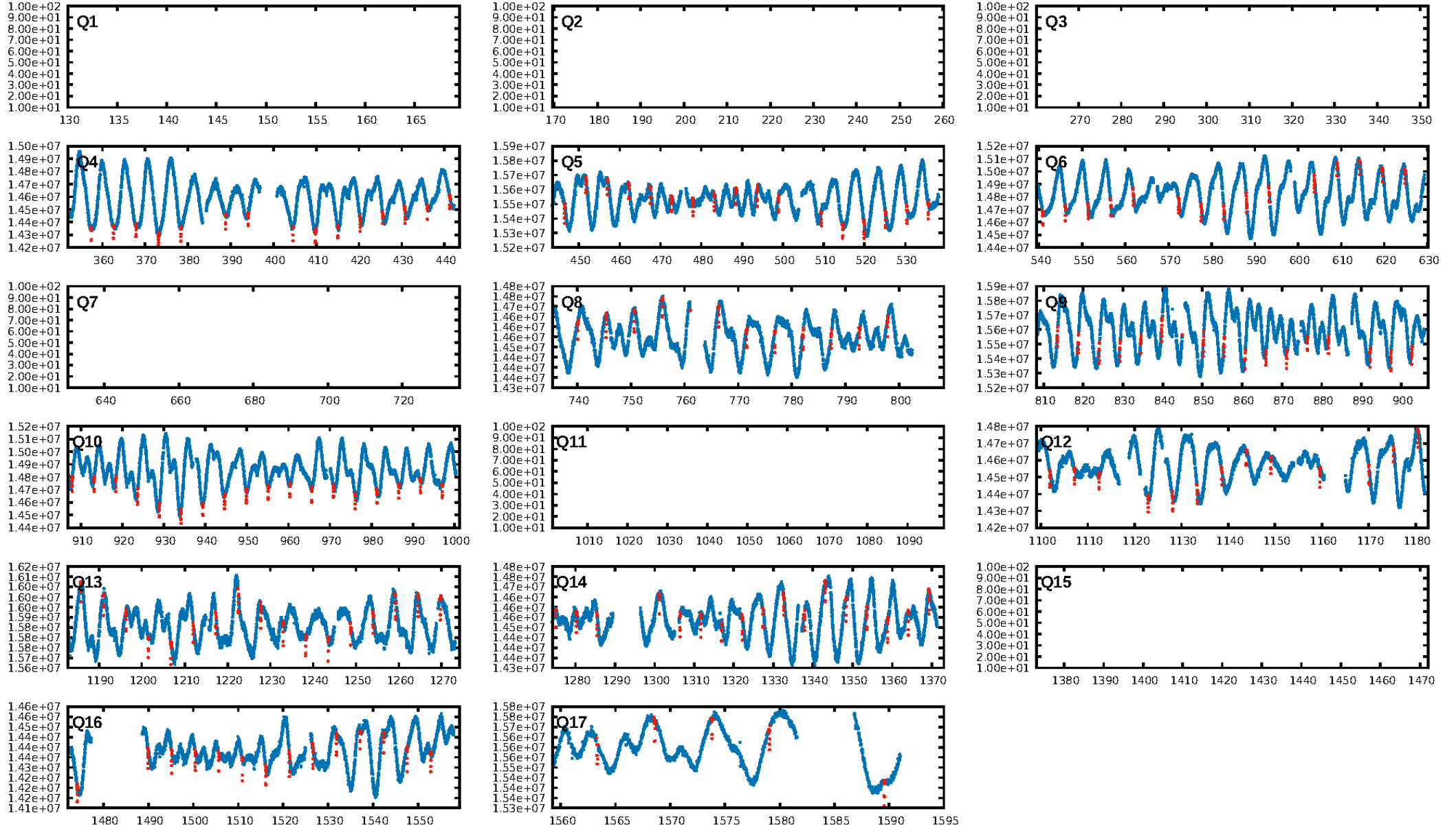
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.65σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 91.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.91 [139/153]  
GhostDiagnostic-chr: 2.53  
Centroid-sig: 0.0%  
Centroid-so: 0.290 arcsec [3.52σ]  
OotOffset-rm: 0.054 arcsec [0.67σ]  
OotOffset-st: 3/0/4/4 [11]  
KicOffset-rm: 0.214 arcsec [3.07σ]  
KicOffset-st: 3/0/4/4 [11]  
DiffImageQuality-fgm: 1.00 [11/11]  
DiffImageOverlap-fno: 0.00 [0/11]

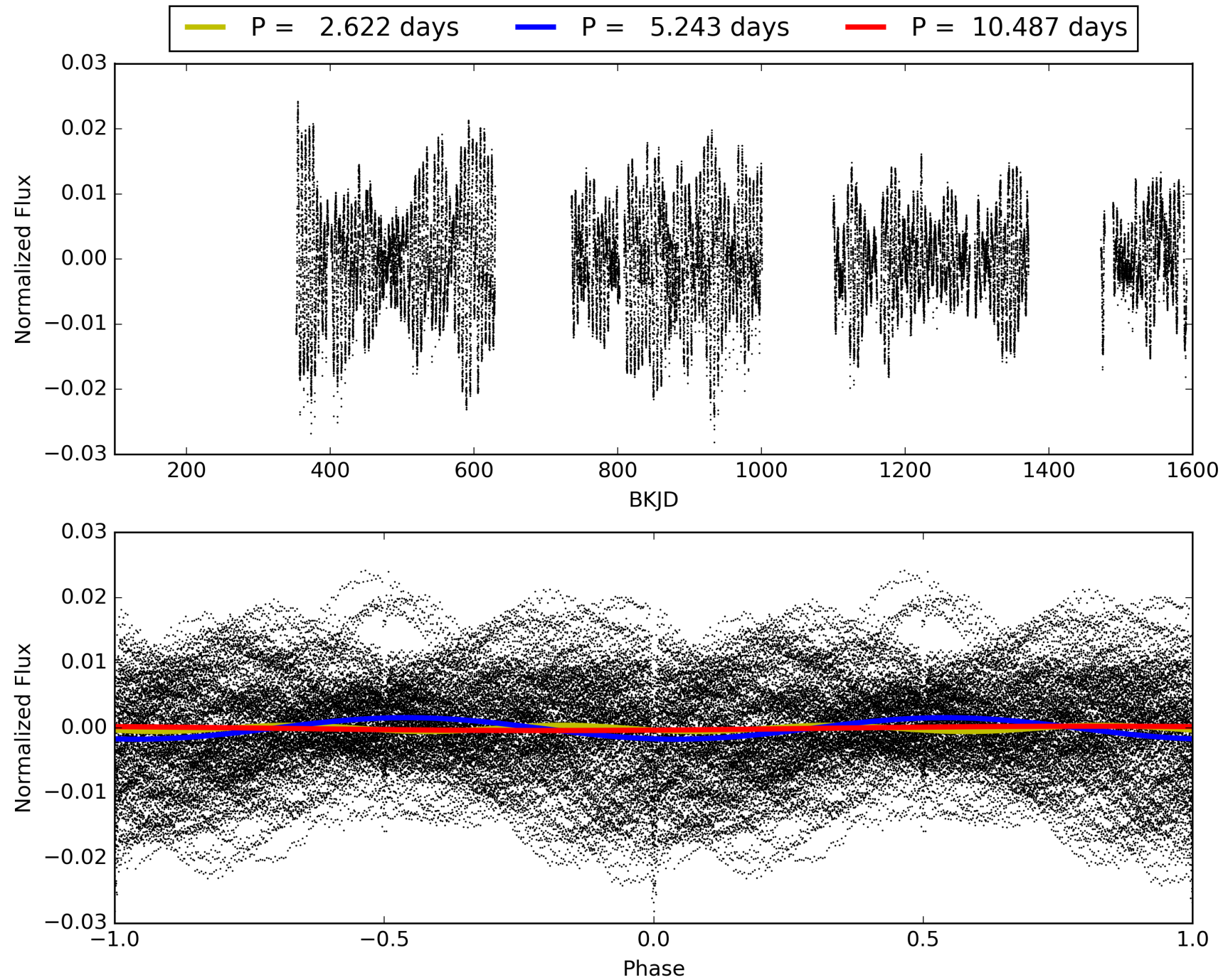
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:01:27 Z

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

# TCE 011043136-01, PDC Light Curves

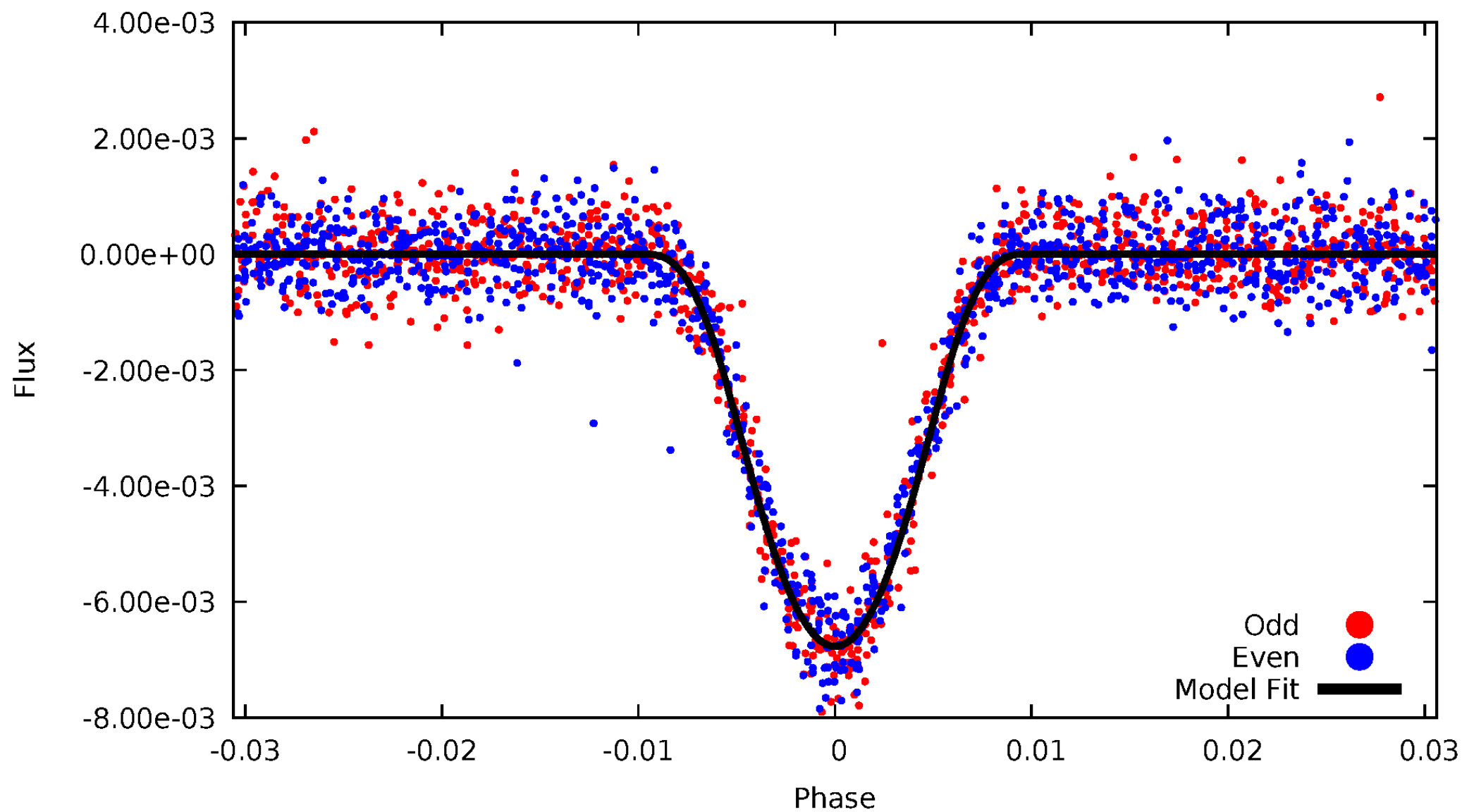


# TCE 011043136-01



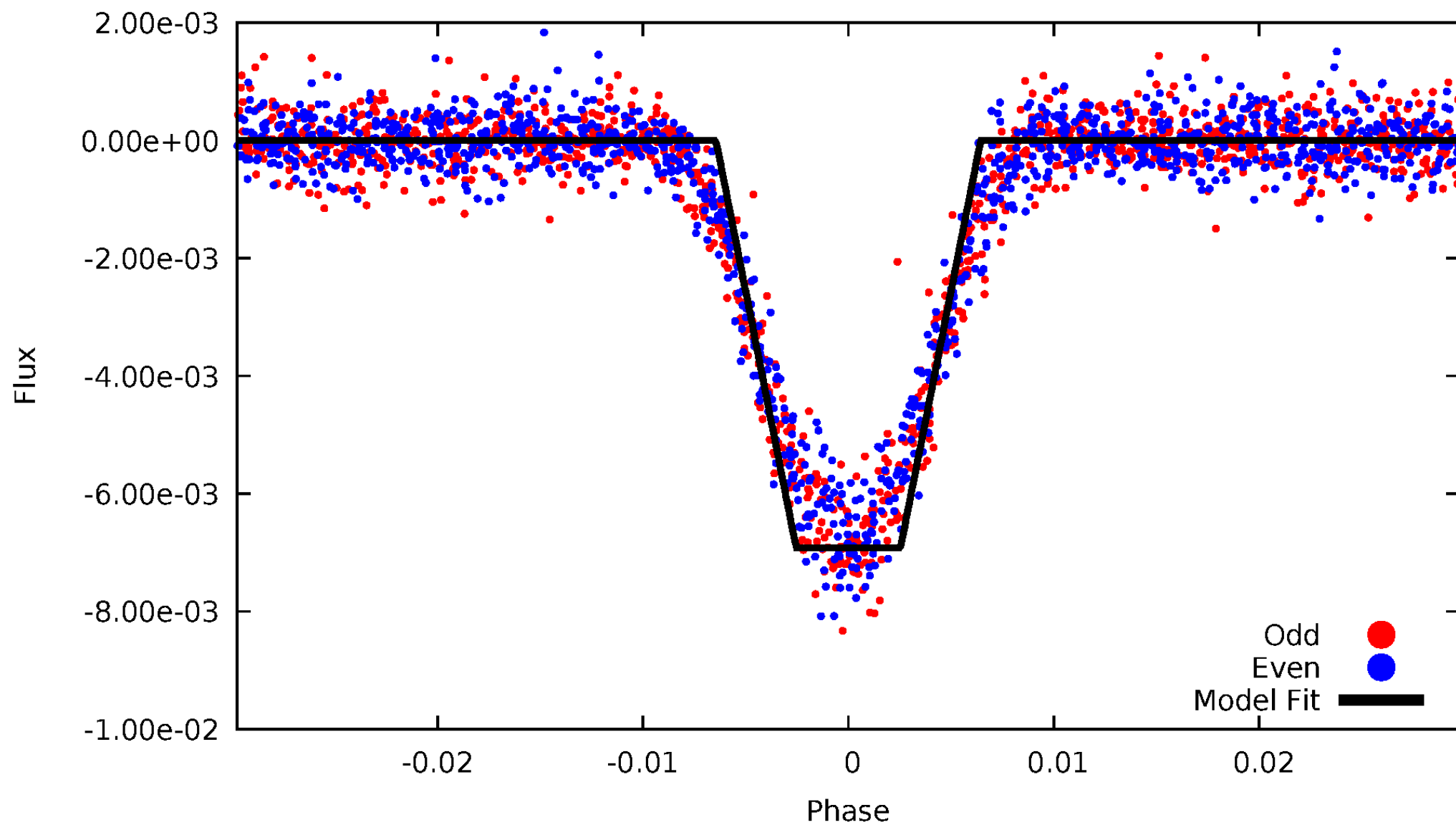
# DV Odd/Even

TCE 011043136-01

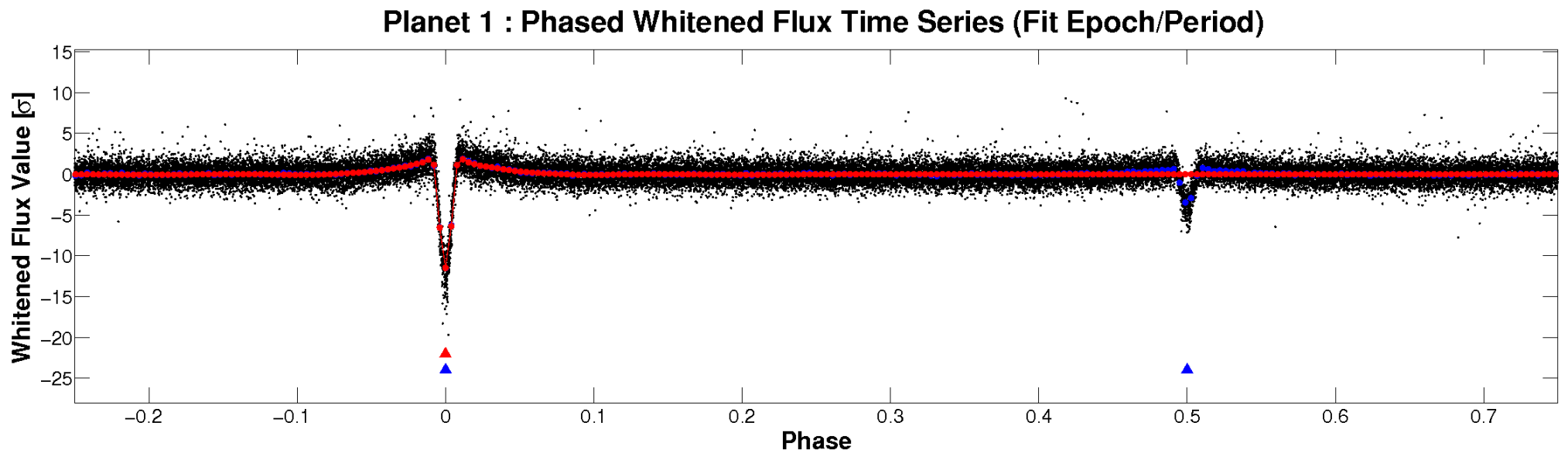
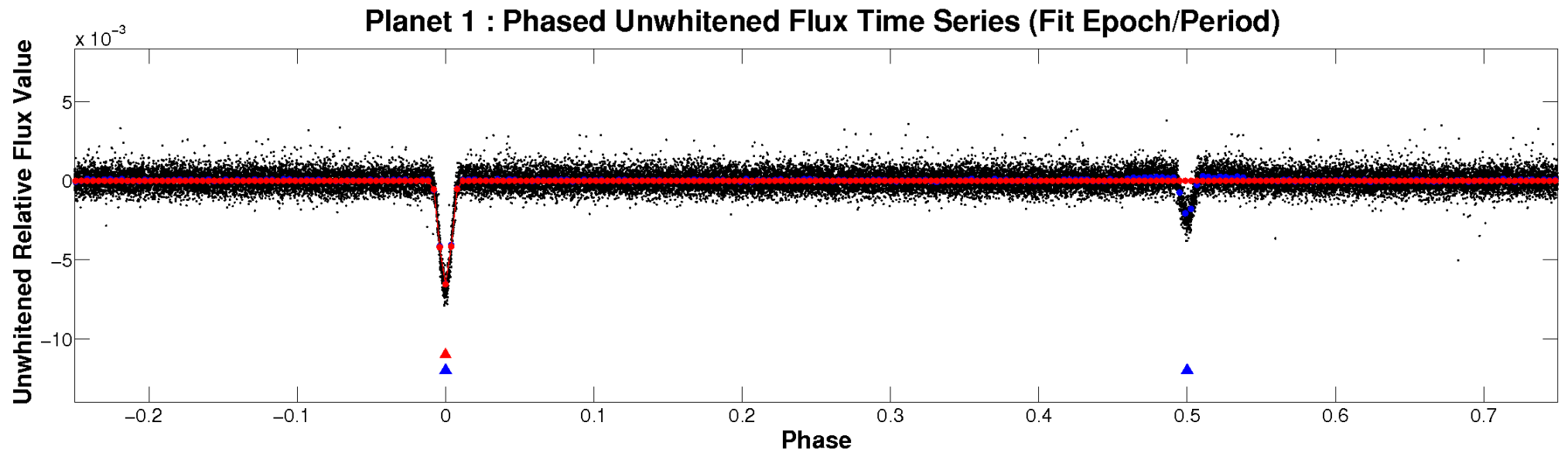


# ALT Odd/Even

TCE 011043136-01



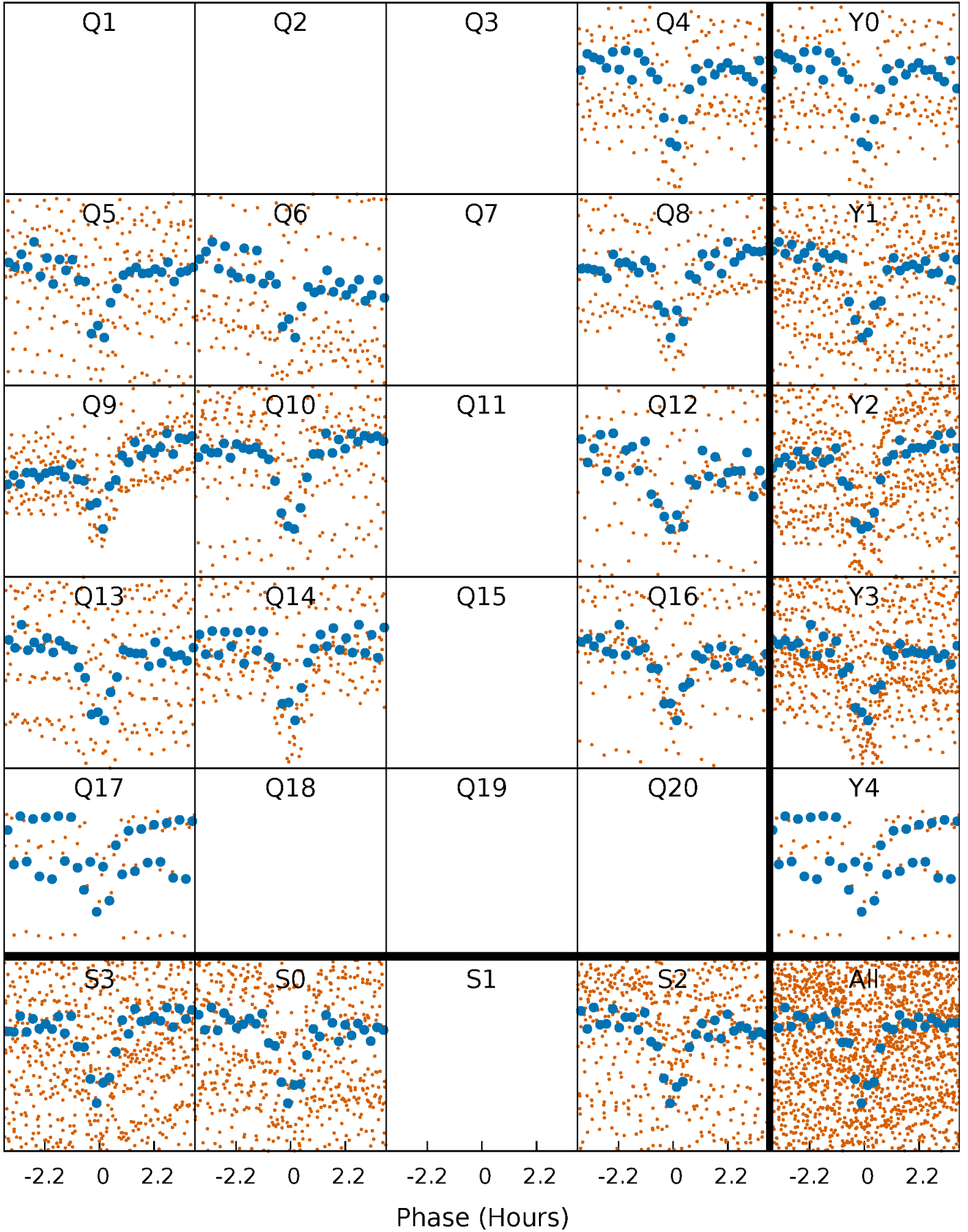
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

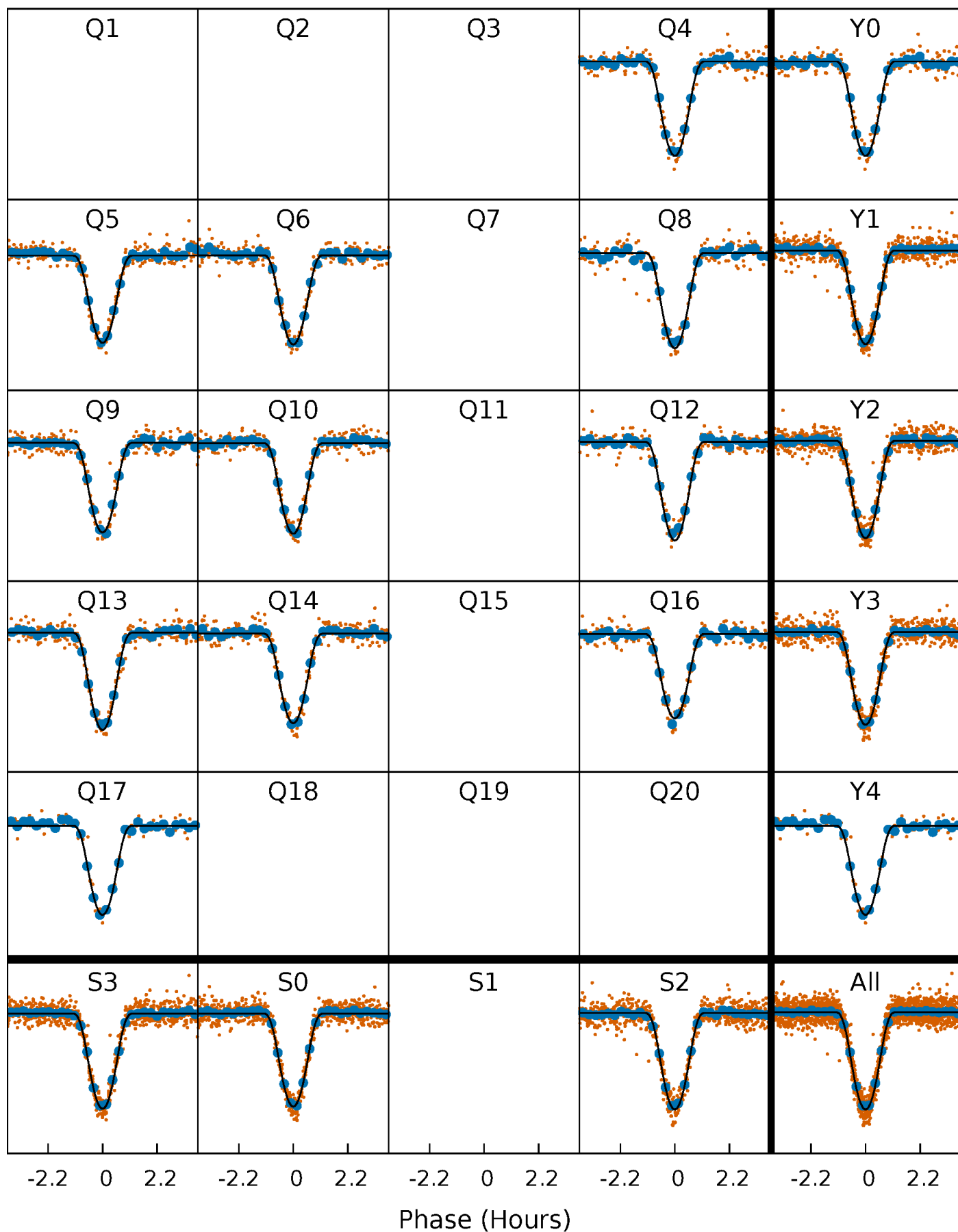
TCE 011043136-01 P= 5.243405 Days  $T_0=131.883732$  (BKJD)





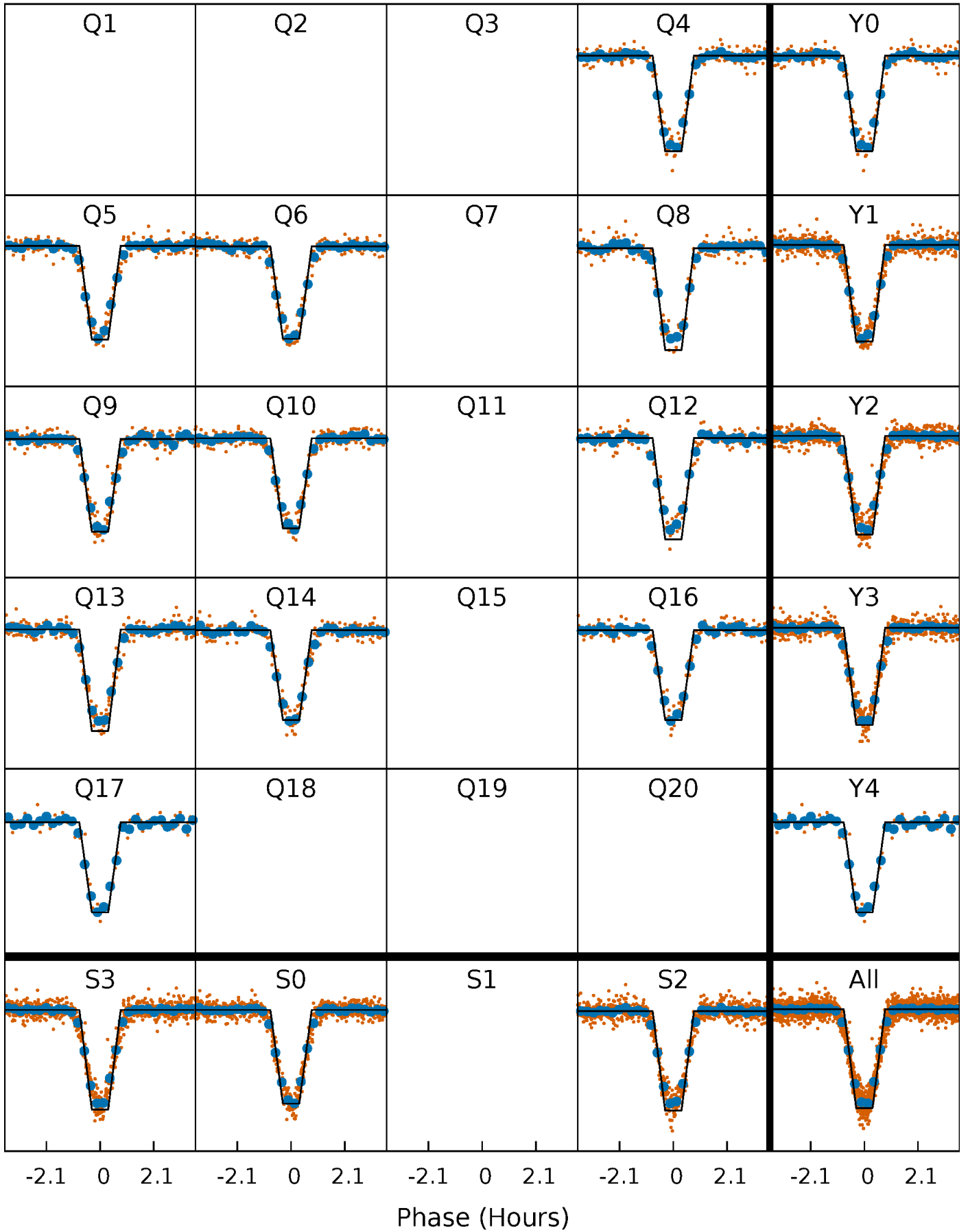
# DV Quarter-Phased Transit Curves

TCE 011043136-01 P= 5.243405 Days  $T_0=131.883732$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

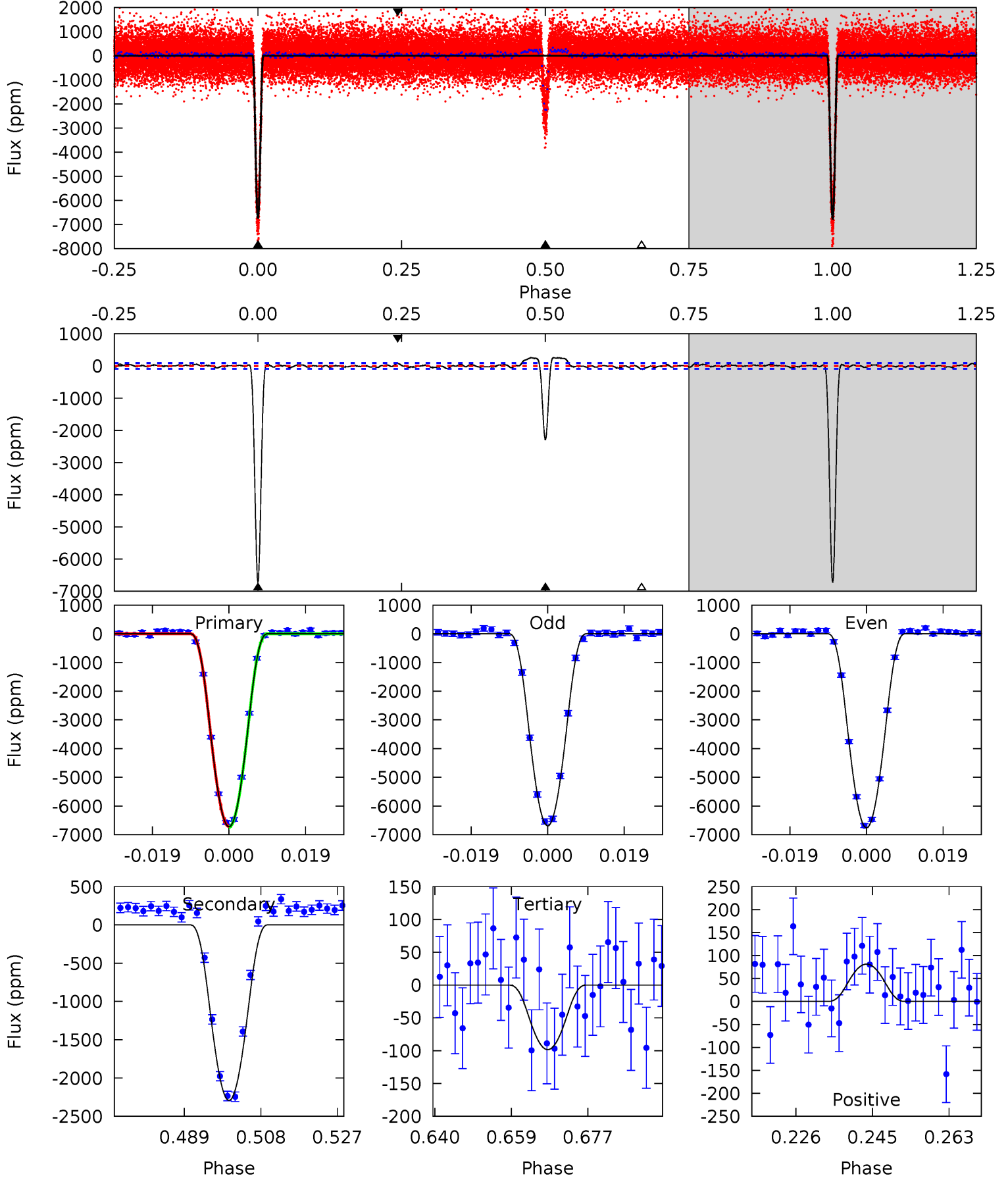
TCE 011043136-01 P= 5.243401 Days  $T_0=131.884312$  (BKJD)



# DV Model-Shift Uniqueness Test

011043136-01, P = 5.243405 Days, E = 131.883732 Days

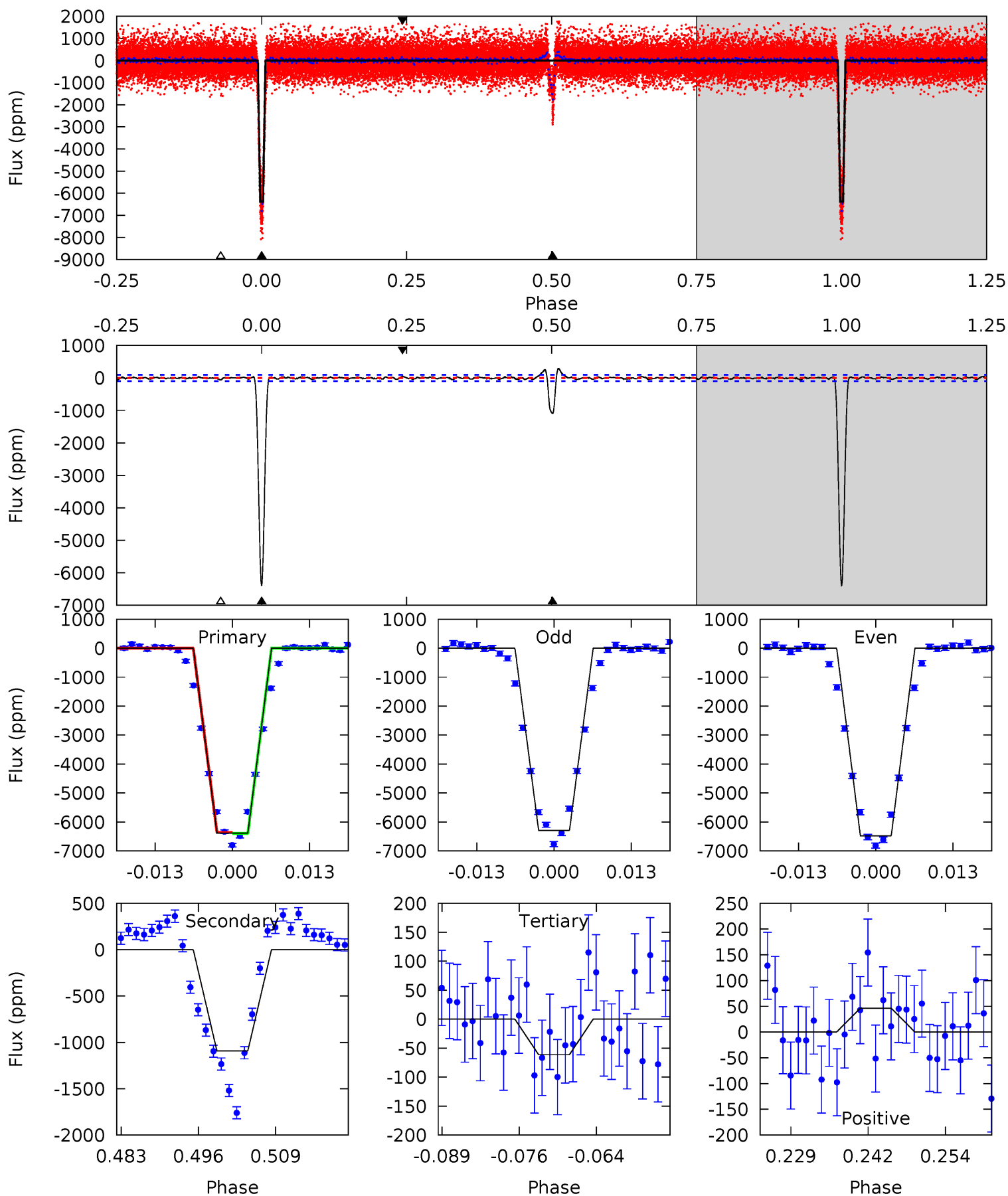
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
368.2	125.6	5.39	4.45	4.90	2.35	3.00	362.8	363.8	120.2	121.1	1.88	1.00	0.04	0.50



# Alt Model-Shift Uniqueness Test

011043136-01, P = 5.243401 Days, E = 131.884312 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
331.4	56.7	3.17	2.40	4.98	2.49	1.57	328.2	329.0	53.5	54.3	4.84	1.01	0.04	0.91



### Stellar Parameters For KIC 011043136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5749^{+192}_{-192}$	$4.436^{+0.155}_{-0.170}$	$-0.560^{+0.300}_{-0.300}$	$0.881^{+0.215}_{-0.132}$	$0.772^{+0.108}_{-0.054}$	$1.590^{+0.976}_{-0.698}$
	+3%/-3%	+3%/-4%	+54%/-54%	+24%/-15%	+14%/-7%	+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 011043136-01 / KOI 1644.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-2293 \pm 18$	$11.34^{+2.51}_{-2.34}$	$1422^{+100}_{-86}$	$3971^{+329}_{-239}$	$29^{+17}_{-10}$
Alt.	$-1093 \pm 19$	$8.14^{+2.63}_{-2.13}$	$1429^{+101}_{-86}$	$3940^{+434}_{-324}$	$27^{+23}_{-12}$

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

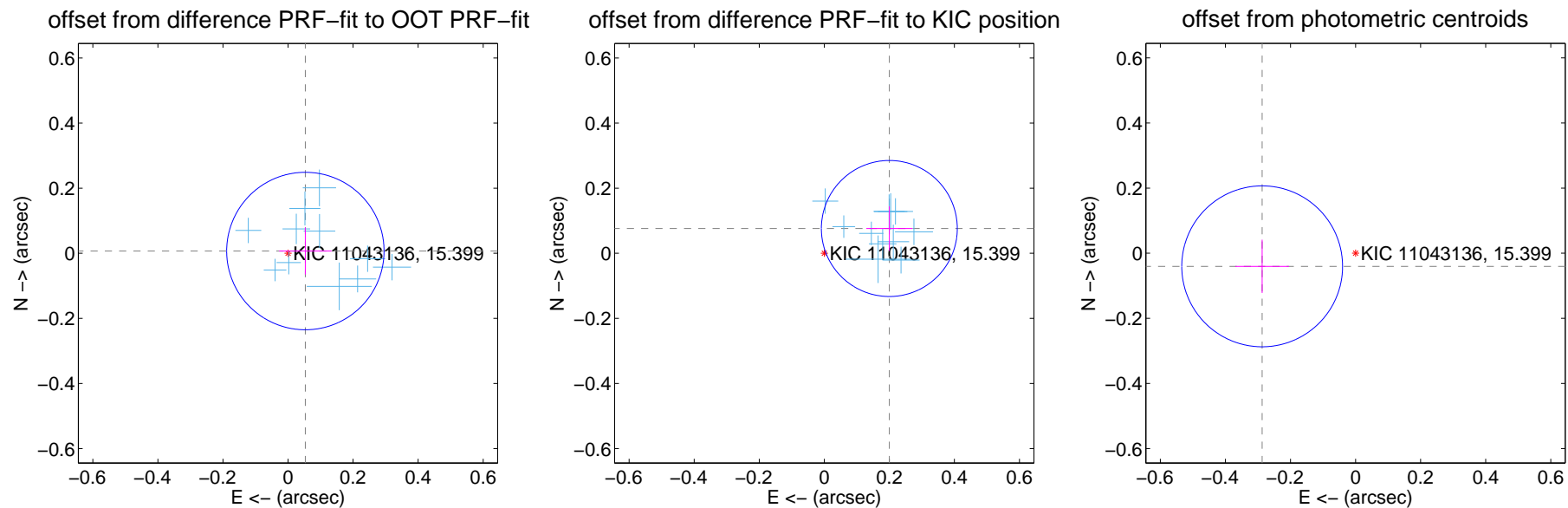
## DV Centroid Data

Supplemental centroid analysis for 011043136-01. Kepler magnitude: 15.40. Transit SNR 190.48

There are 11 quarters with good PRF difference image offsets

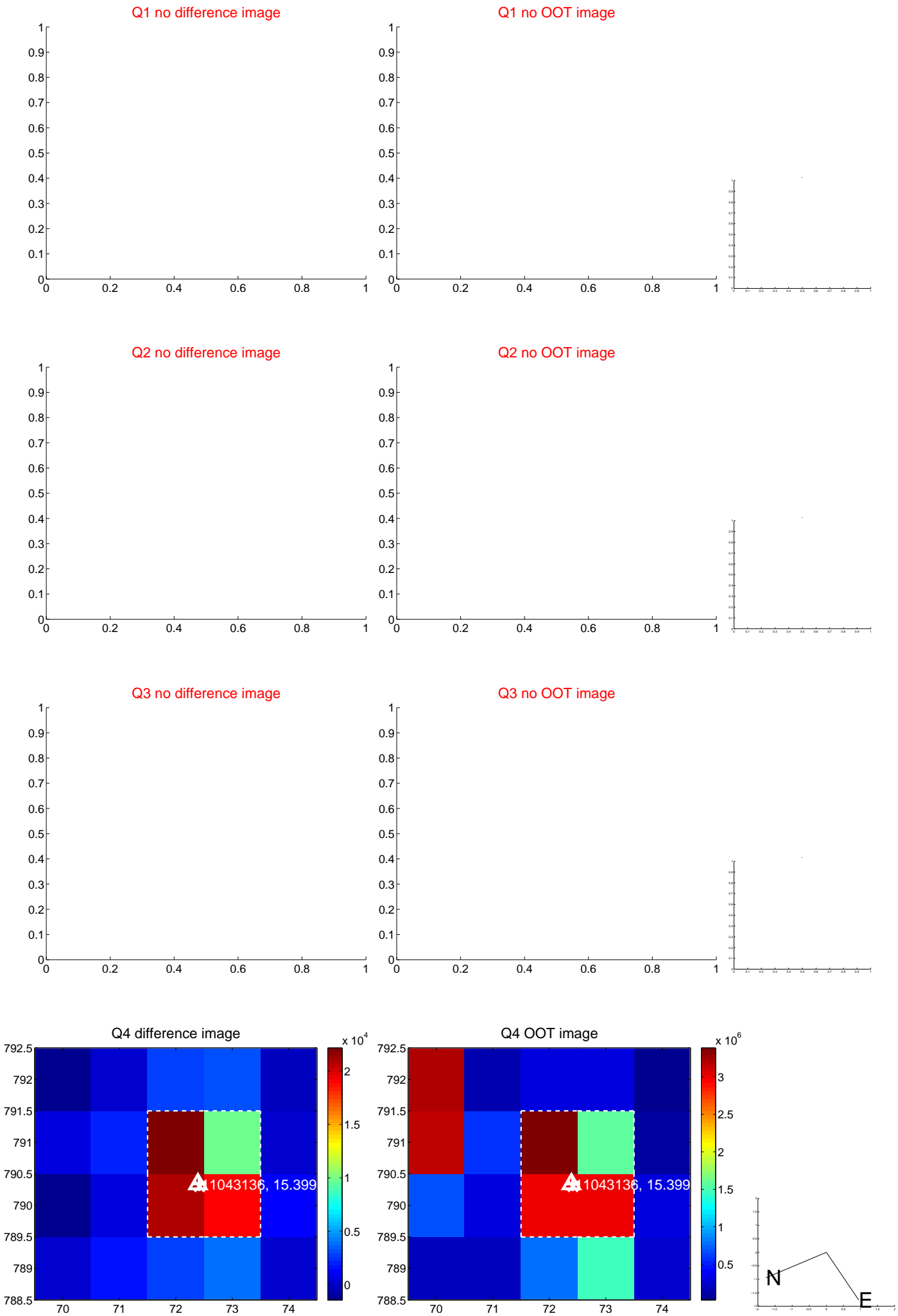
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.054 \pm 0.081$	0.67	$-0.053 \pm 0.081$	$0.007 \pm 0.072$
PRF-fit source offset from KIC position	$0.214 \pm 0.070$	3.07	$-0.200 \pm 0.071$	$0.076 \pm 0.069$
photometric centroid source offset	$0.29 \pm 0.08$	3.52	$0.29 \pm 0.08$	$-0.04 \pm 0.08$



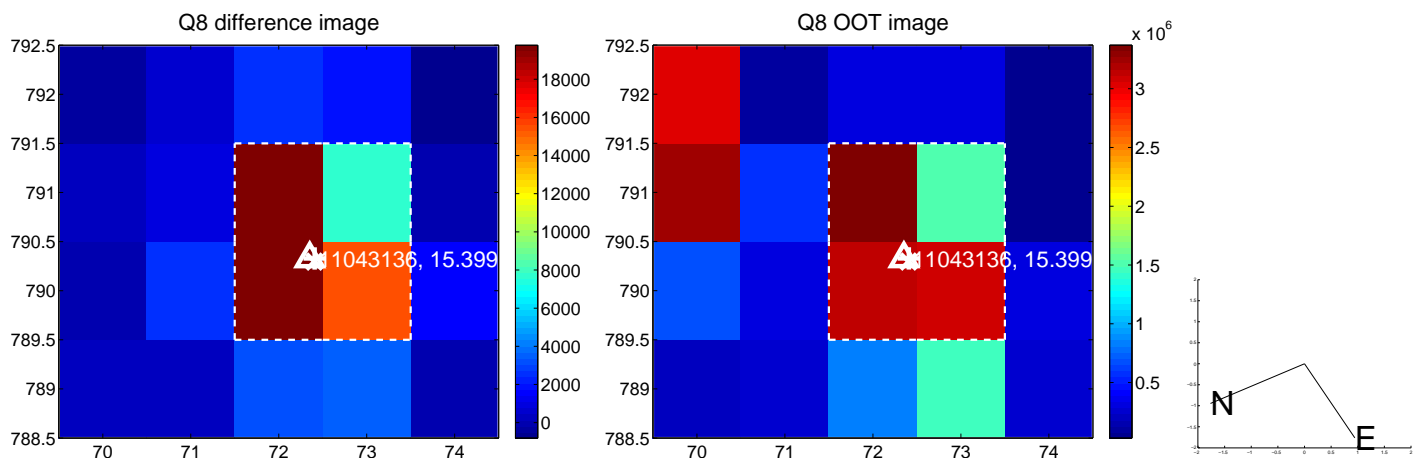
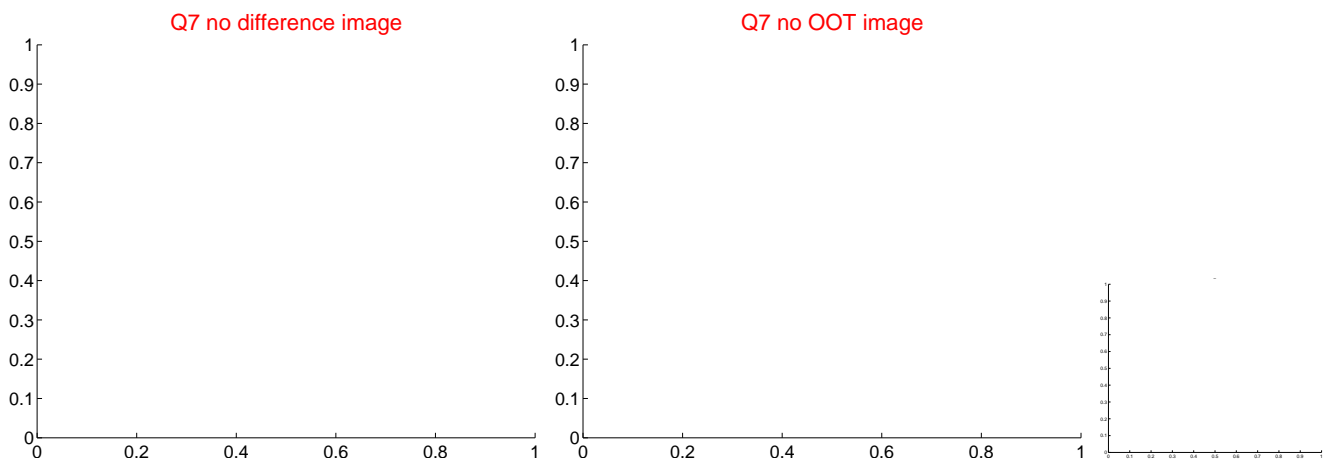
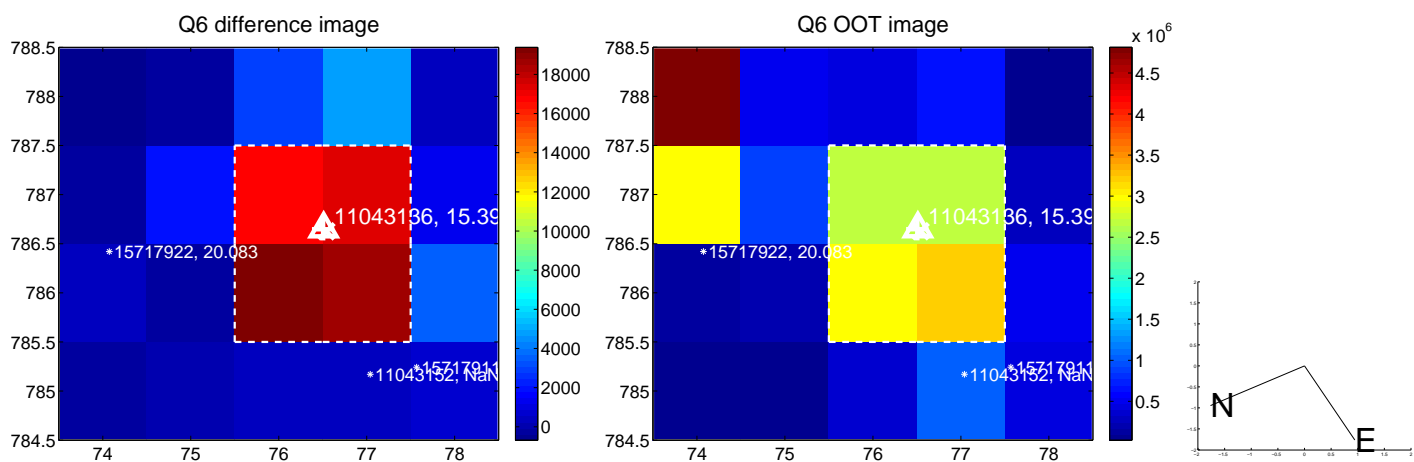
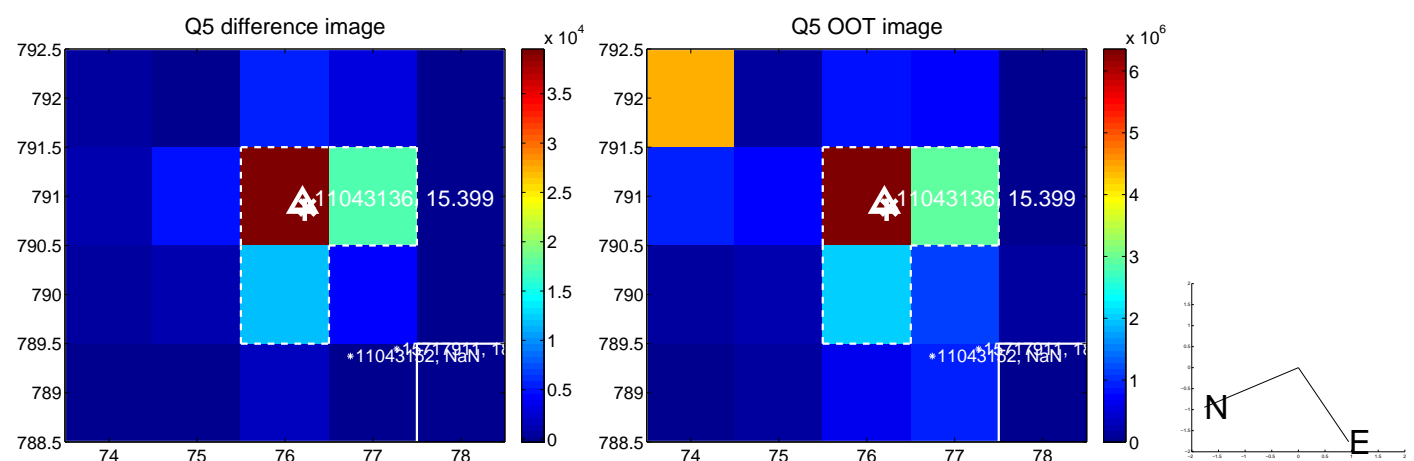
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

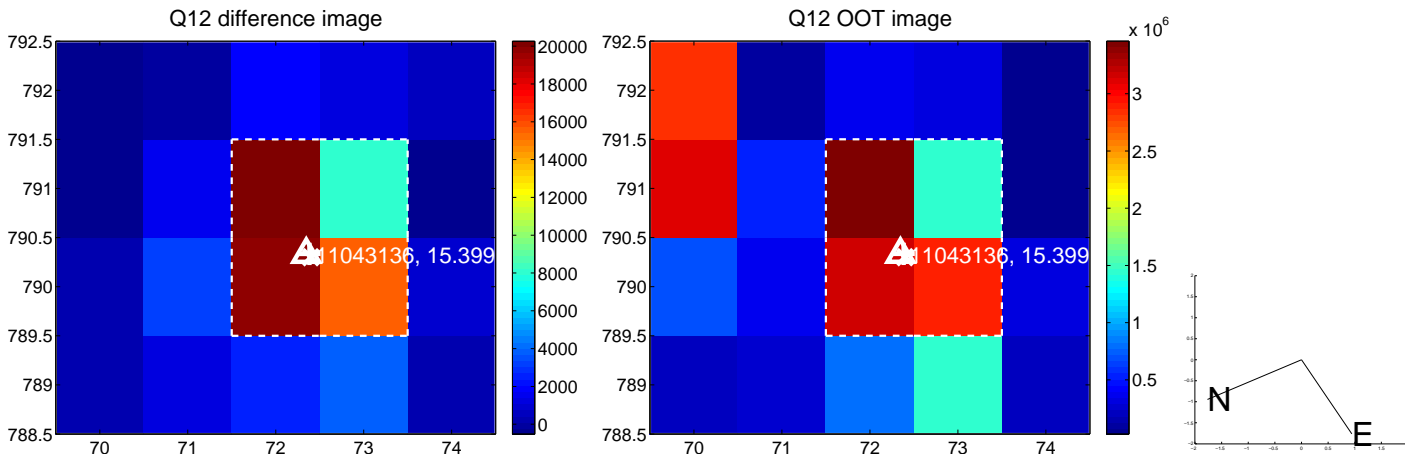
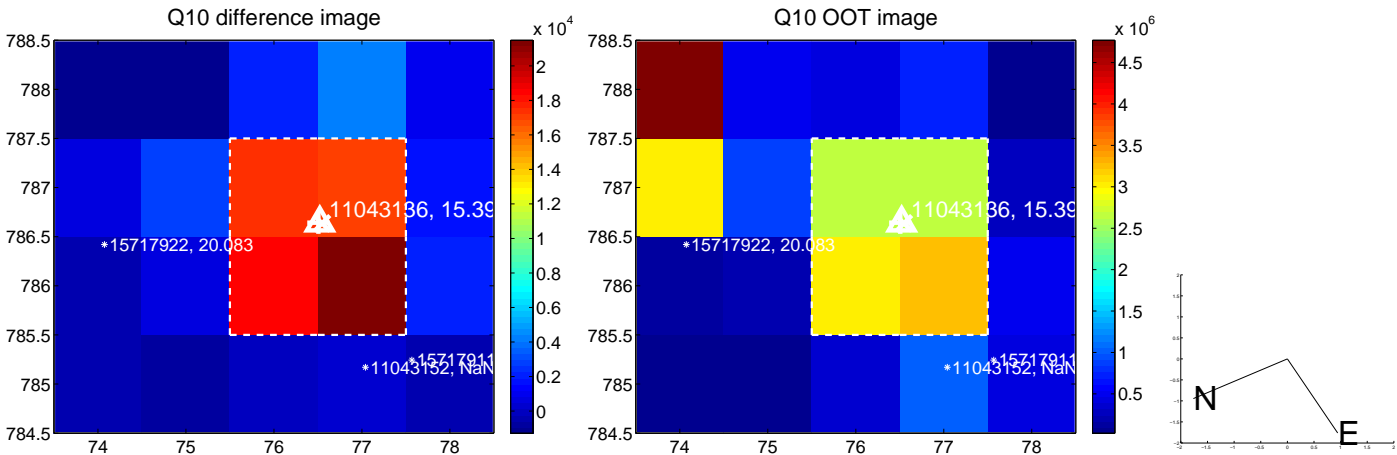
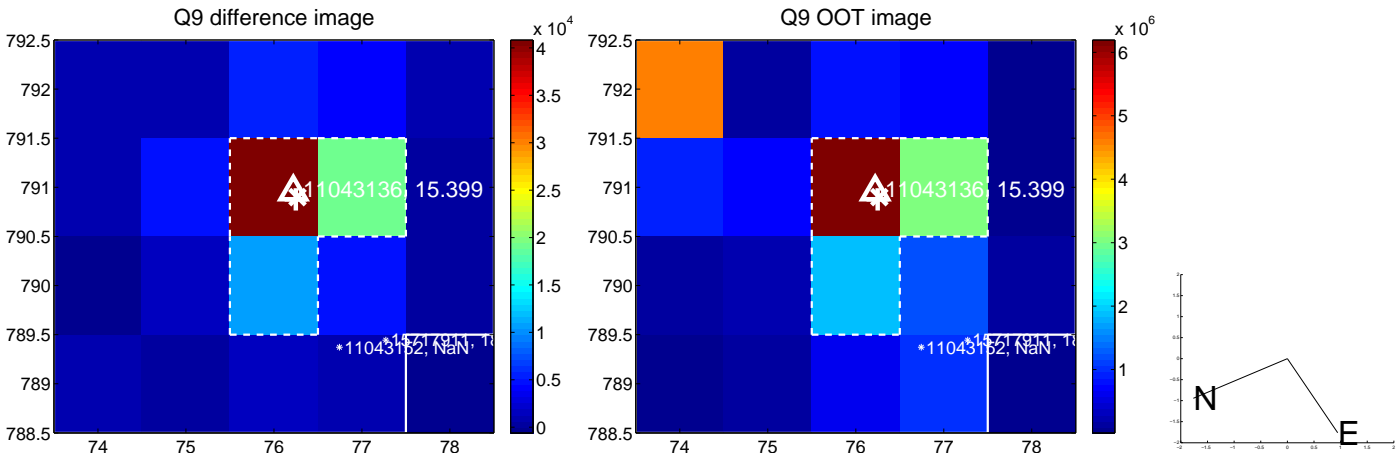




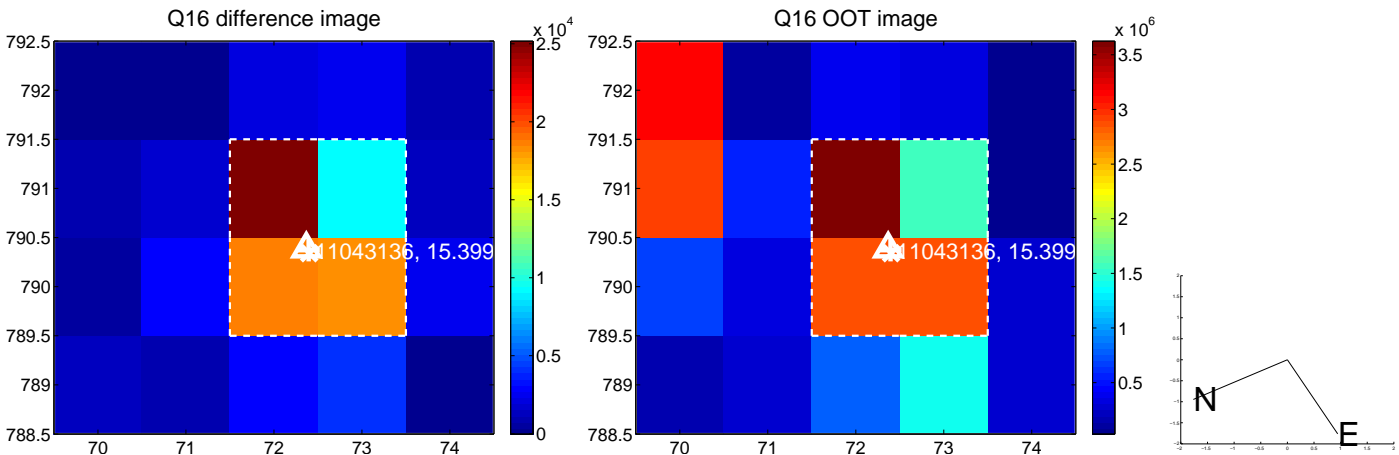
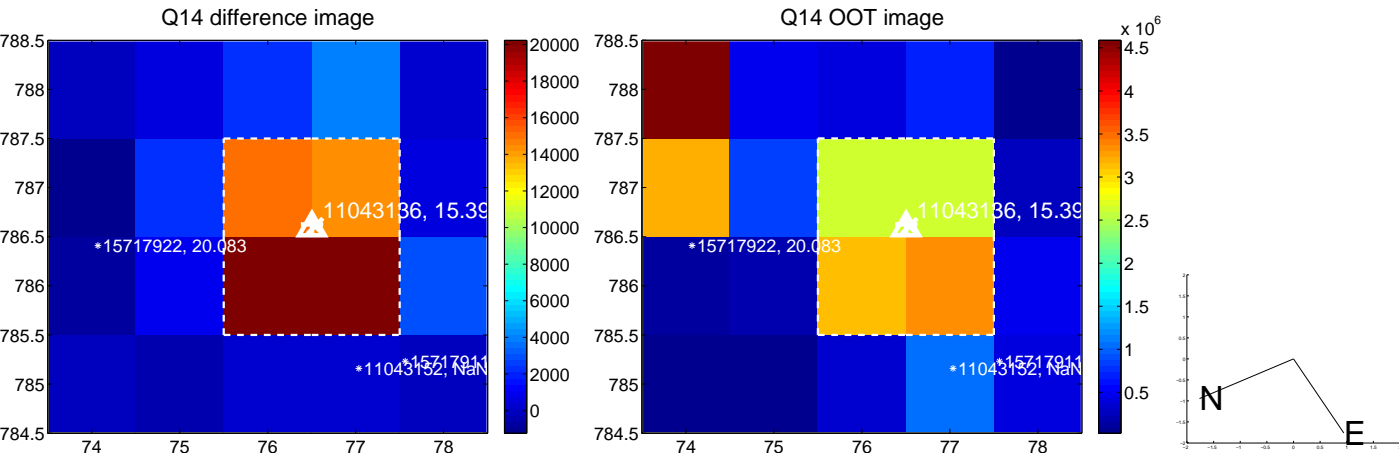
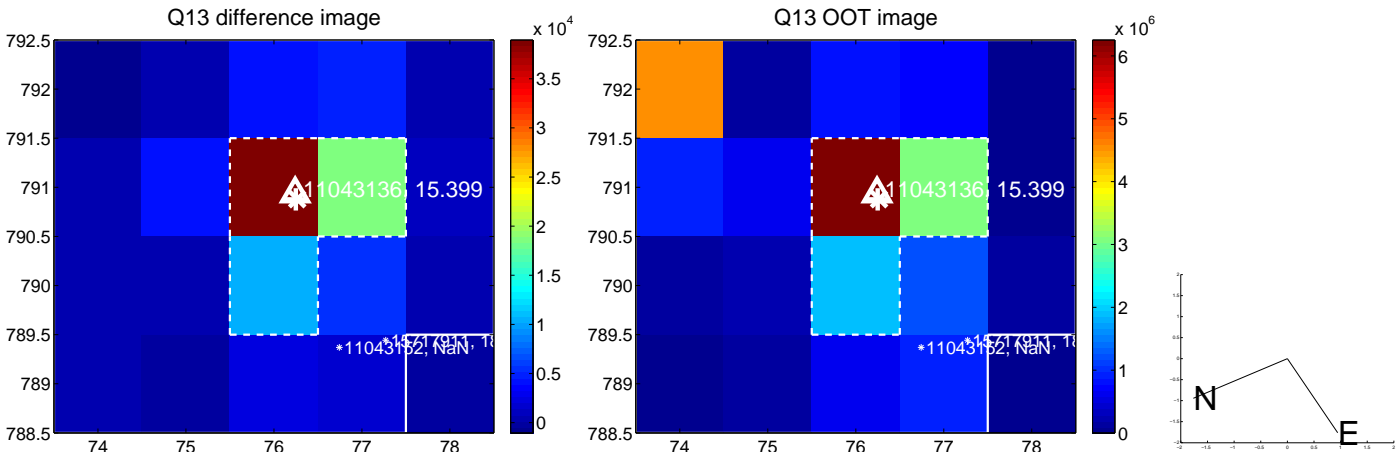
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



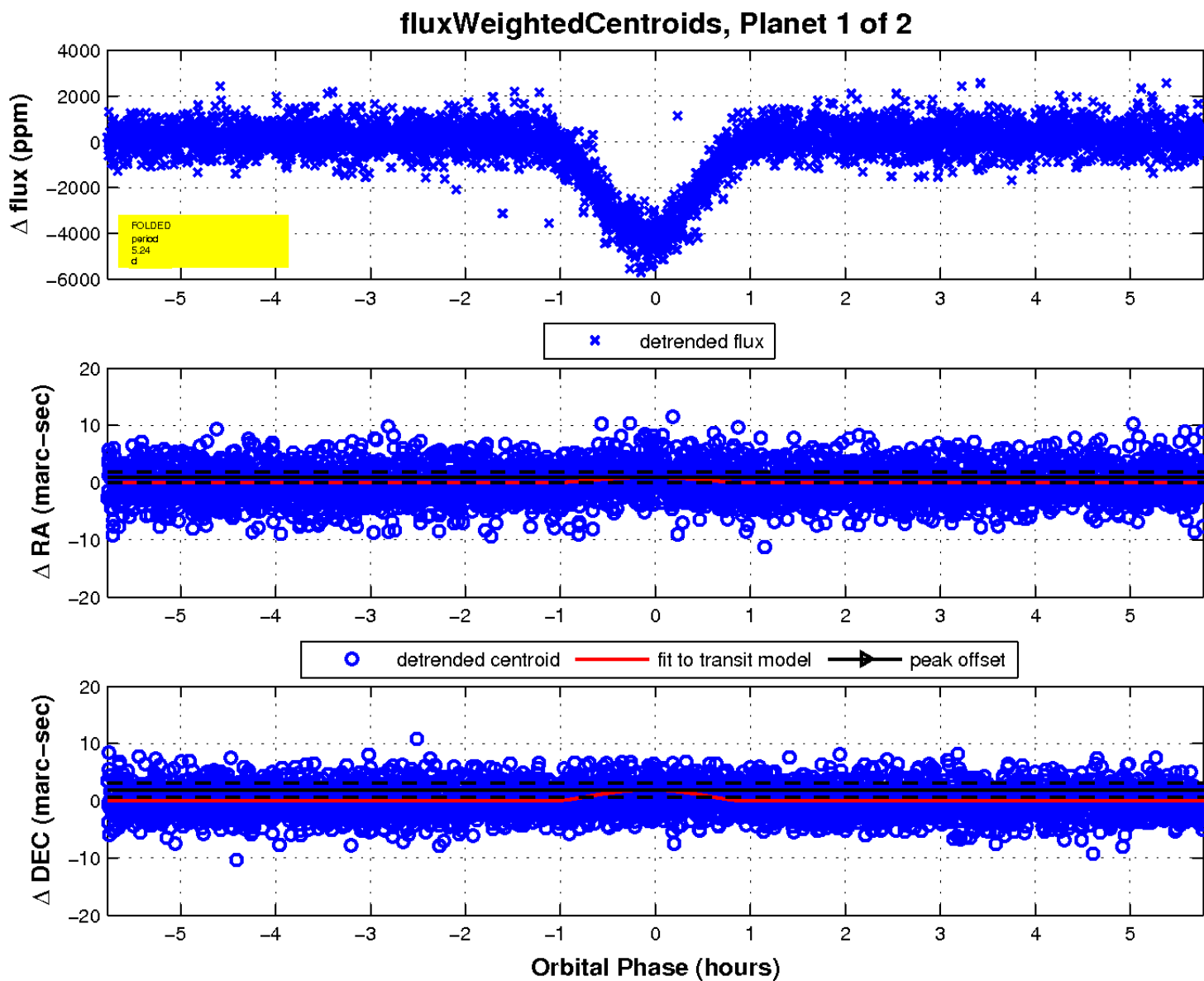
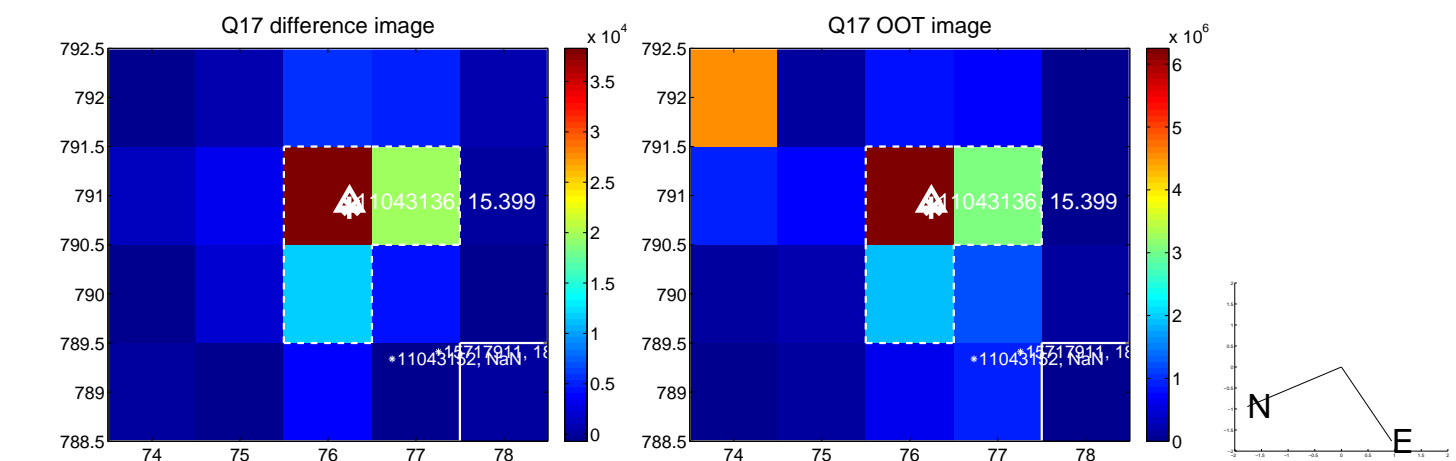
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

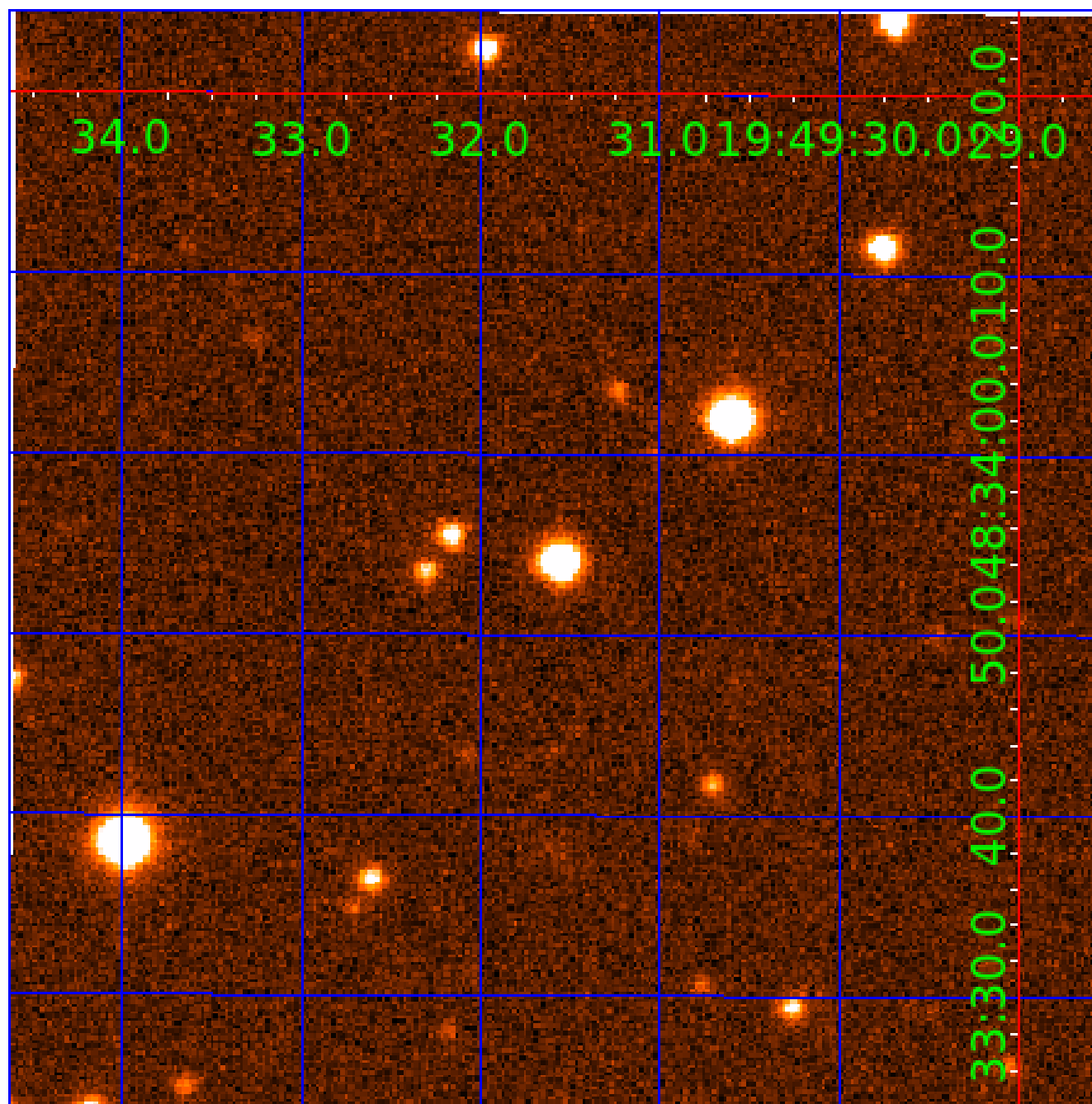


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011043136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011043136-01	OBS	1644.01	5.243405	131.883732	6768.0	1.925	192.8	190.5	0.88	5749	11.35	258.48
011043136-02	OBS	No	2.621705	131.883398	2457.8	1.837	65.2	69.2	0.88	5749	6.29	651.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011043136-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
011043136-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

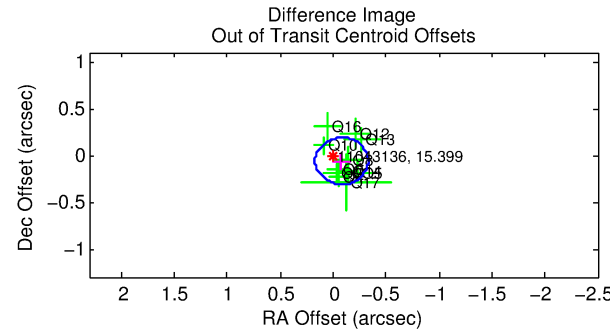
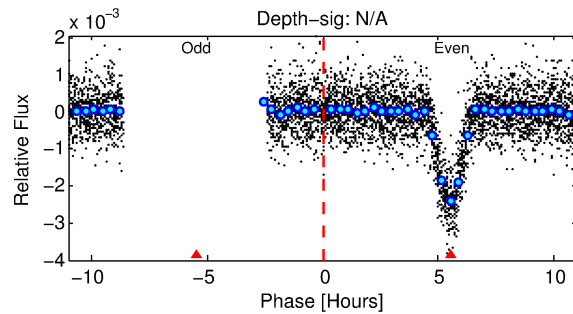
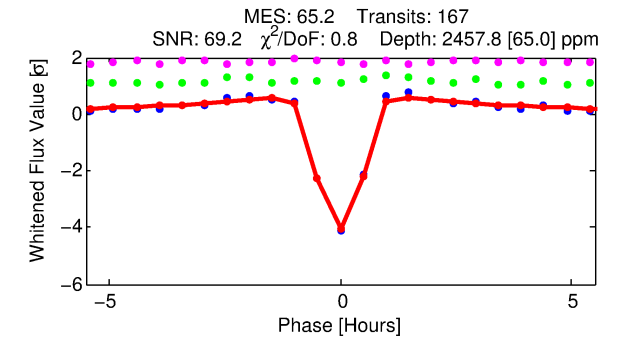
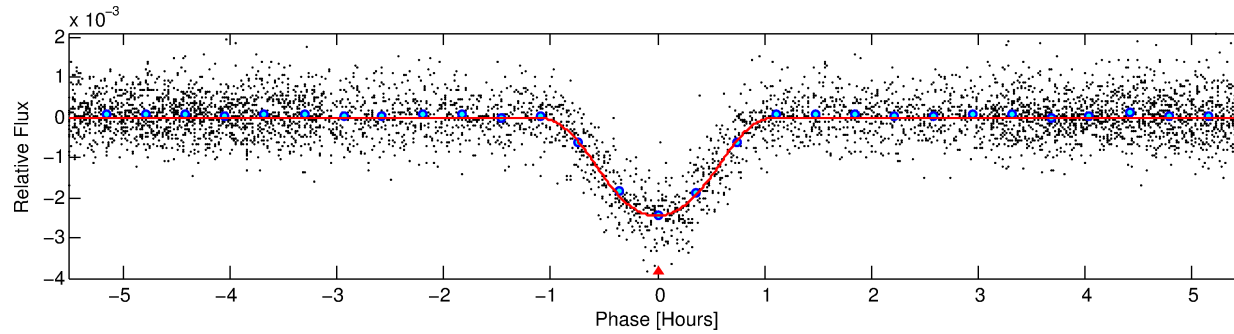
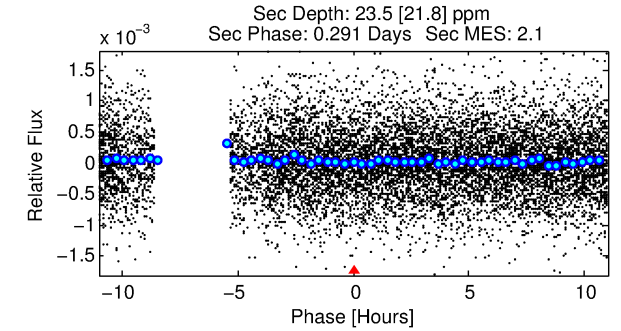
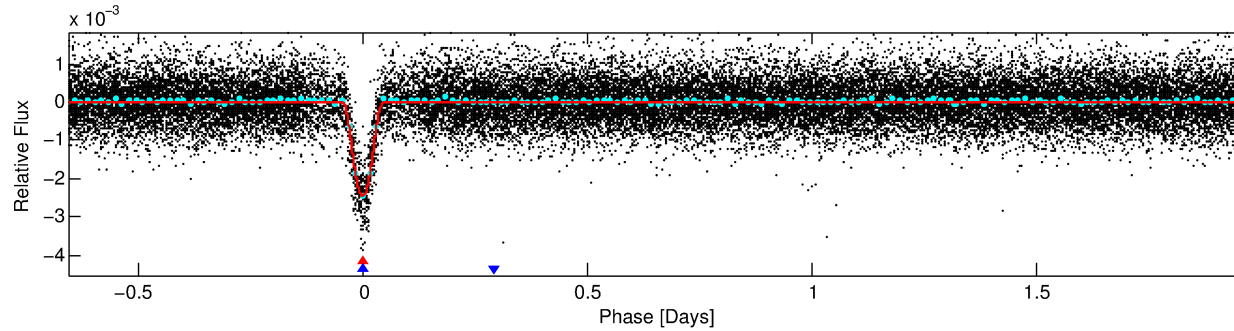
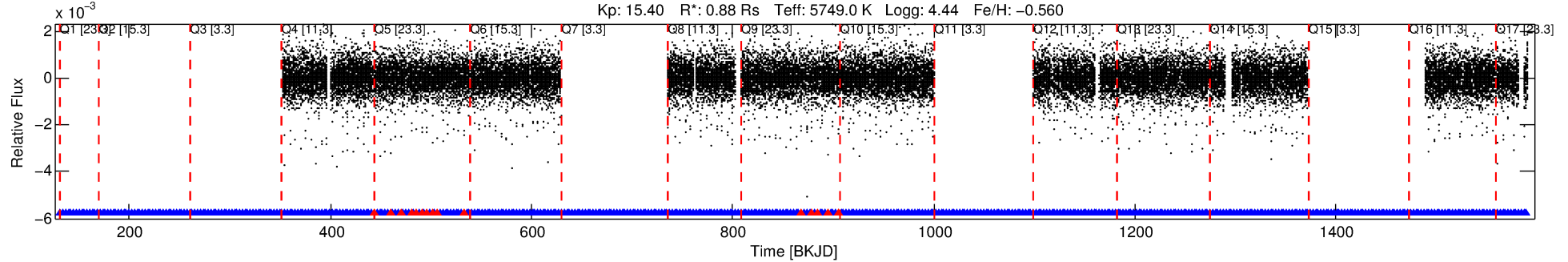
## Ephemeris Match Information For 011043136-02

No Significant Match Found

# DV One-Page Summary

KIC: 11043136 Candidate: 2 of 2 Period: 2.622 d  
KOI: K01644.01 Corr: 0.977

Kp: 15.40 R\*: 0.88 Rs Teff: 5749.0 K Logg: 4.44 Fe/H: -0.560



## DV Fit Results:

Period = 2.62171 [0.00000] d  
Epoch = 131.8834 [0.0004] BKJD  
Rp/R\* = 0.0655 [0.0158]  
a/R\* = 5.03 [0.49]  
b = 0.96 [0.03]  
Seff = 651.33 [218.38]  
Teff = 1288 [108] K  
Rp = 6.29 [2.16] Re  
a = 0.0342 [0.0071] AU  
Ag = 0.38 [0.41] [-1.50σ]  
Teffp = 1564 [412] K [0.65σ]

## DV Diagnostic Results:

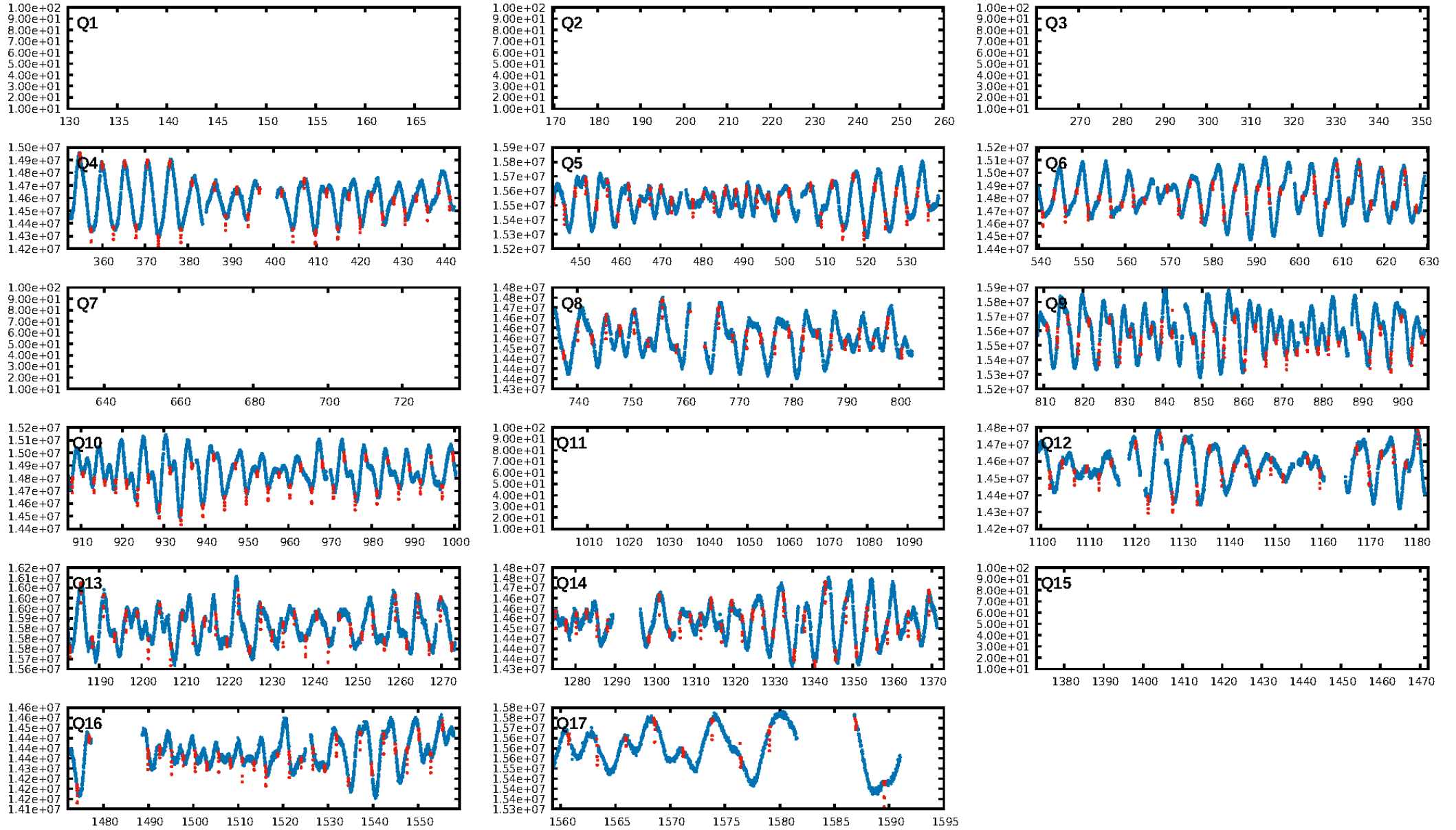
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [23.65σ]  
ModelChiSquare2-sig: 99.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.91 [147/162]  
GhostDiagnostic-chr: 3.595  
Centroid-sig: 0.0%  
Centroid-so: 0.144 arcsec [0.91σ]  
OotOffset-rm: 0.103 arcsec [1.23σ]  
KicOffset-rm: 0.175 arcsec [2.06σ]  
OotOffset-st: 3/0/4/4 [11]  
KicOffset-st: 3/0/4/4 [11]  
DiffImageQuality-fgm: 1.00 [11/11]  
DiffImageOverlap-fno: 1.00 [11/11]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:01:33 Z

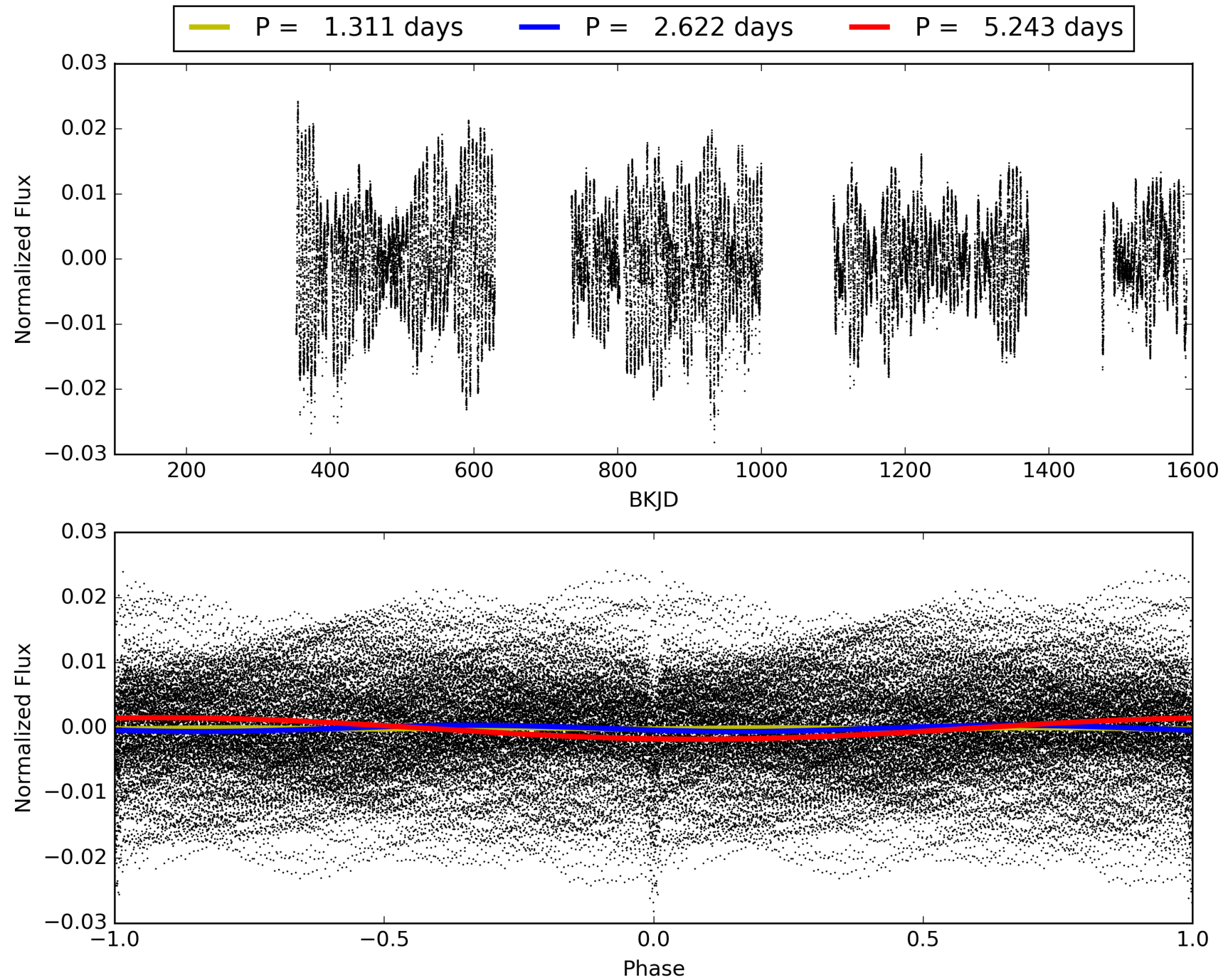
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011043136-02, PDC Light Curves

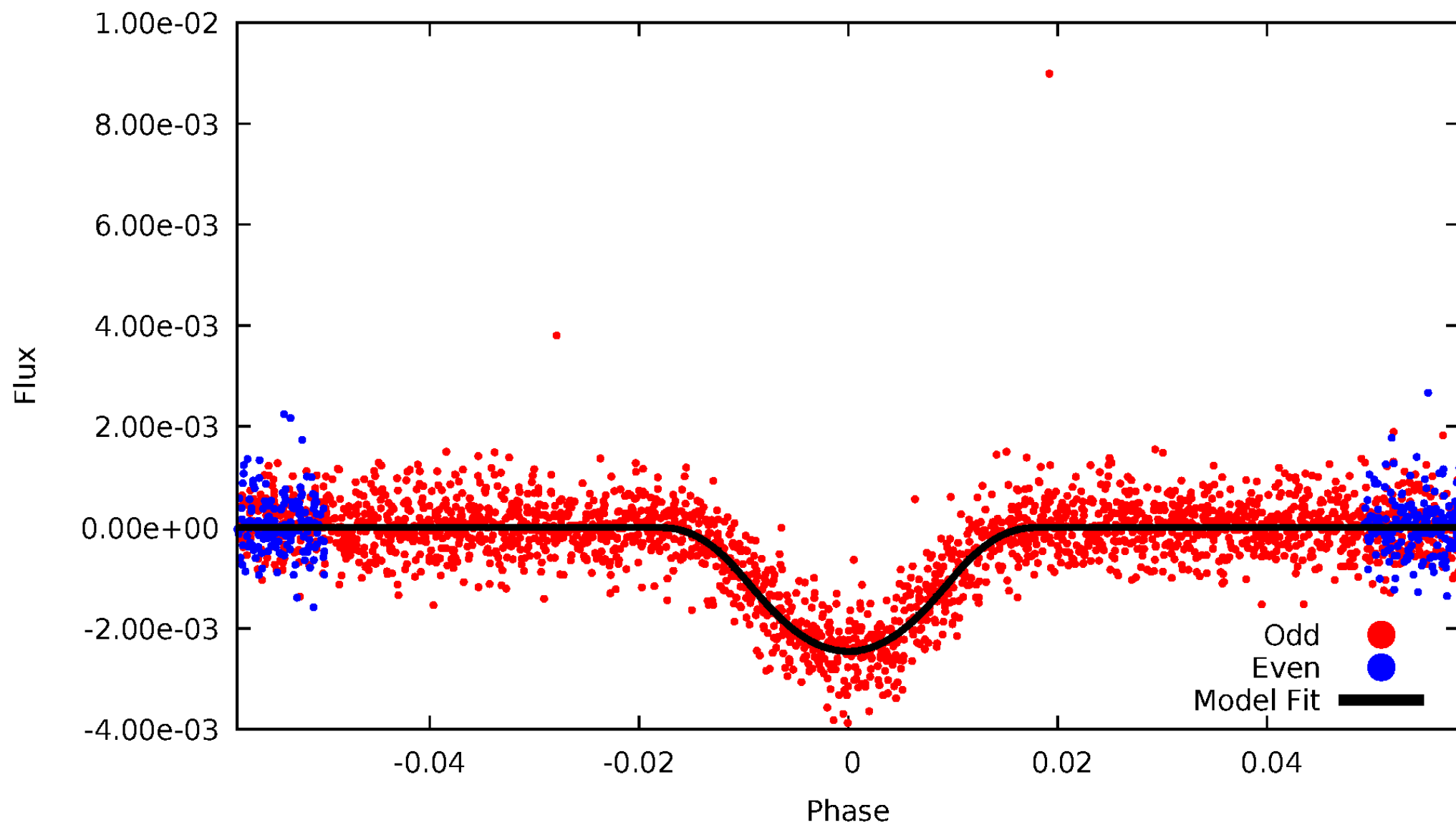


TCE 011043136-02



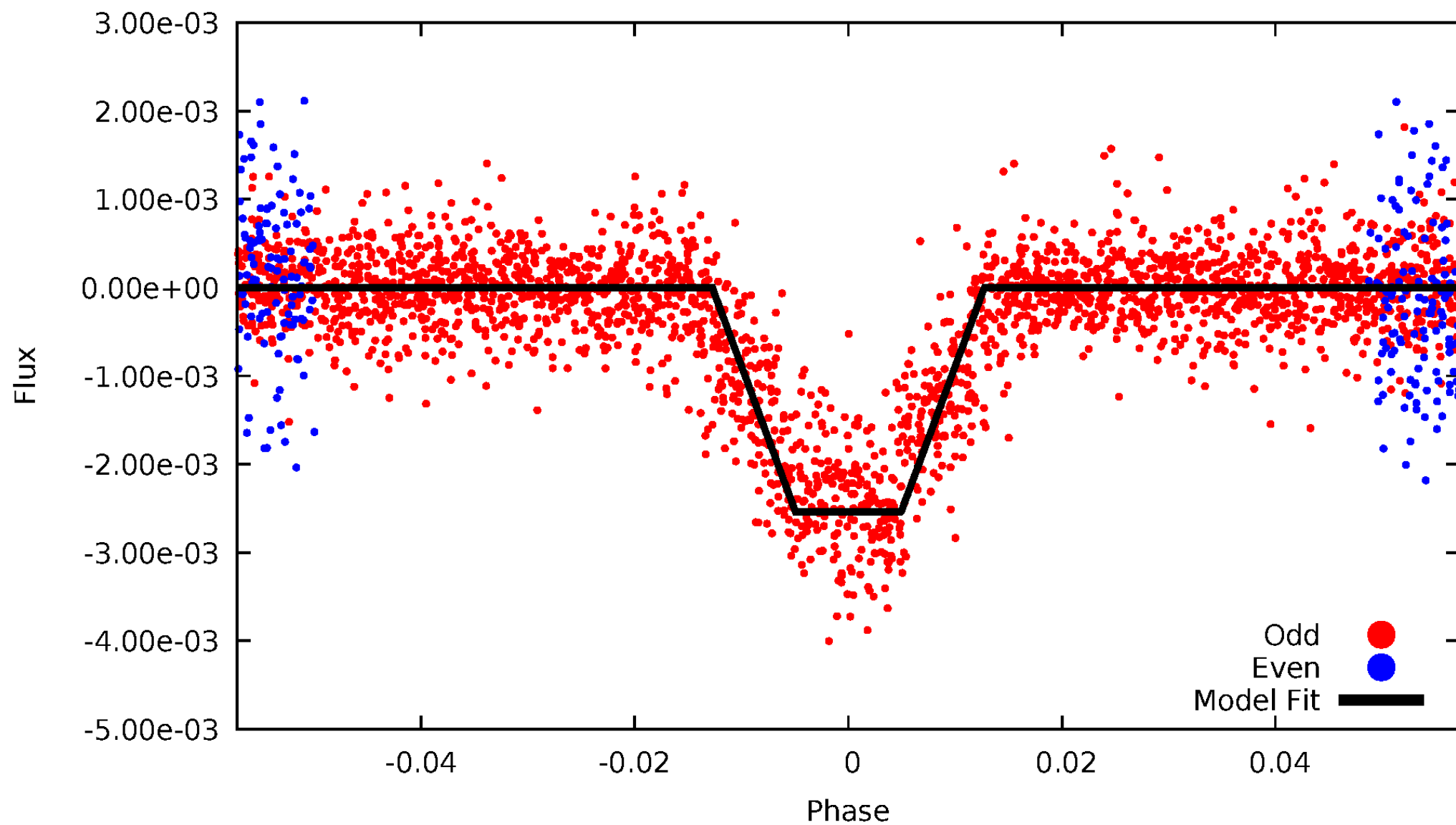
# DV Odd/Even

TCE 011043136-02



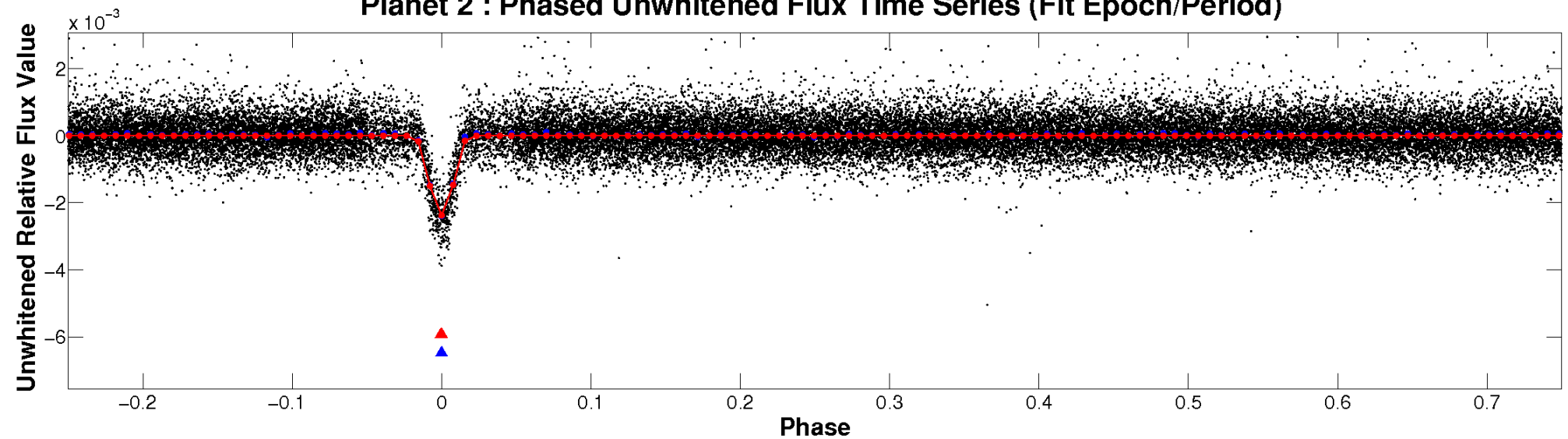
# ALT Odd/Even

TCE 011043136-02

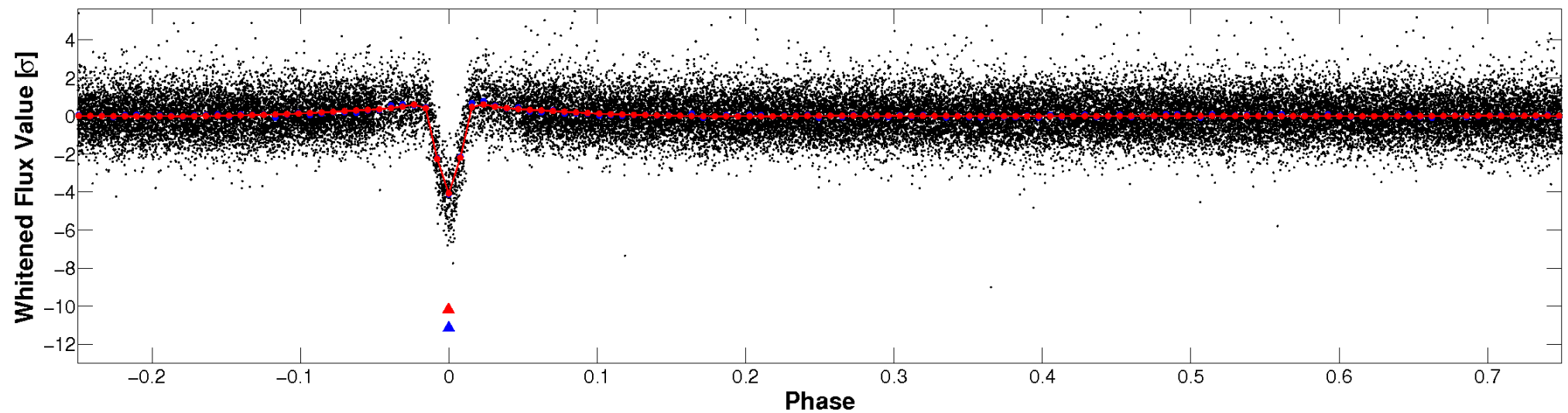


# Non-Whitened Vs. Whitened Light Curve

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

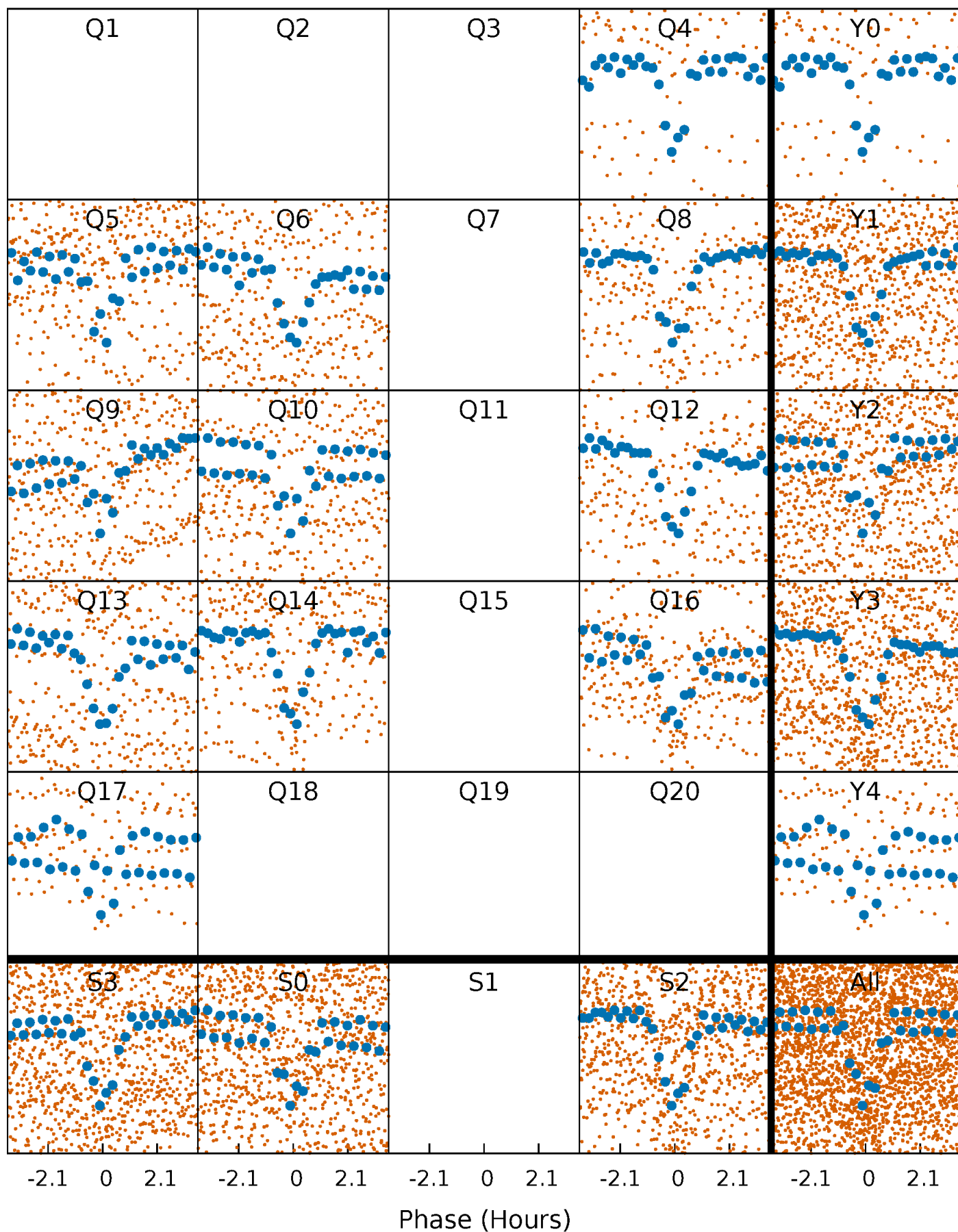


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

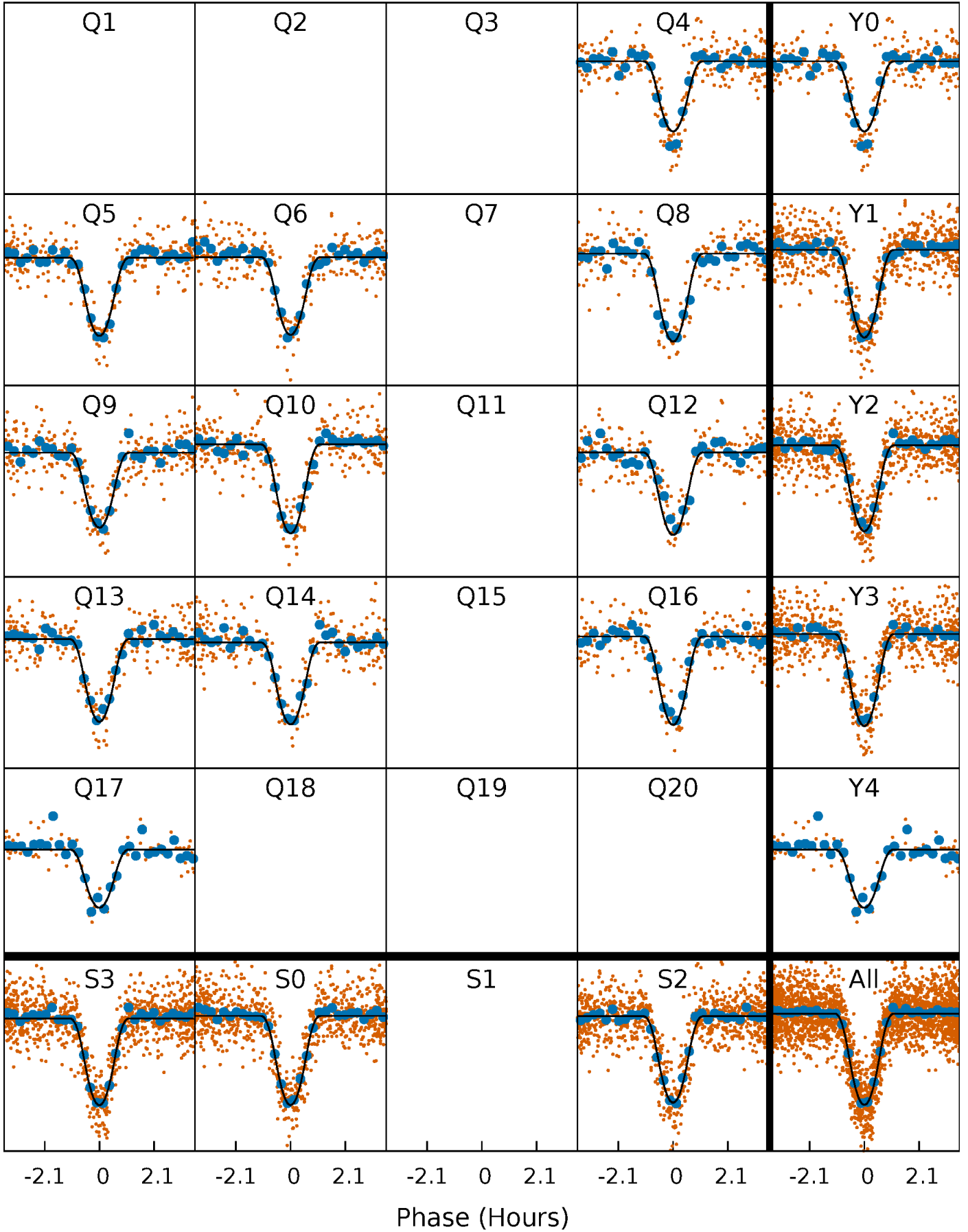
TCE 011043136-02 P= 2.621705 Days  $T_0=131.883398$  (BKJD)





# DV Quarter-Phased Transit Curves

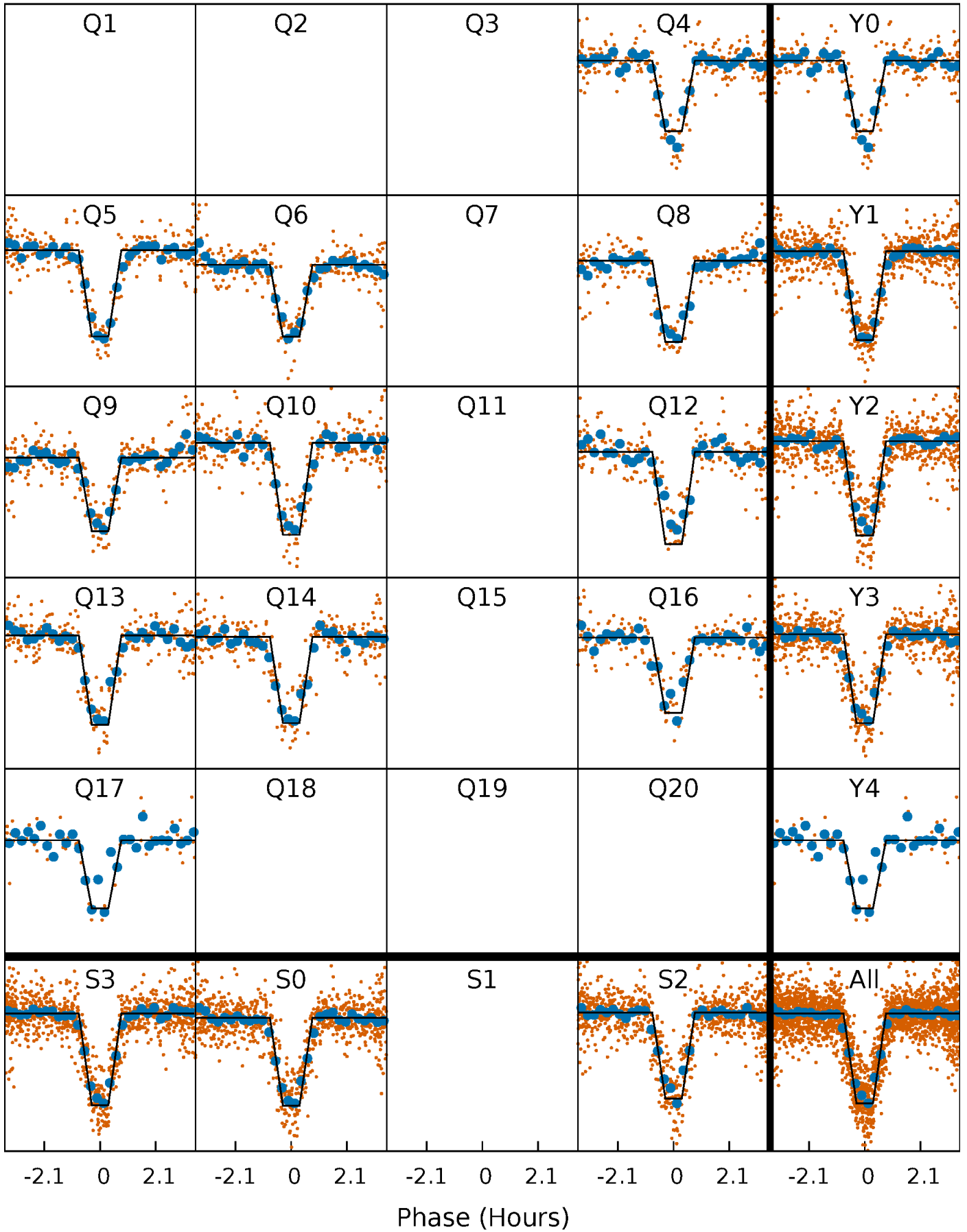
TCE 011043136-02   P= 2.621705 Days    $T_0=131.883398$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

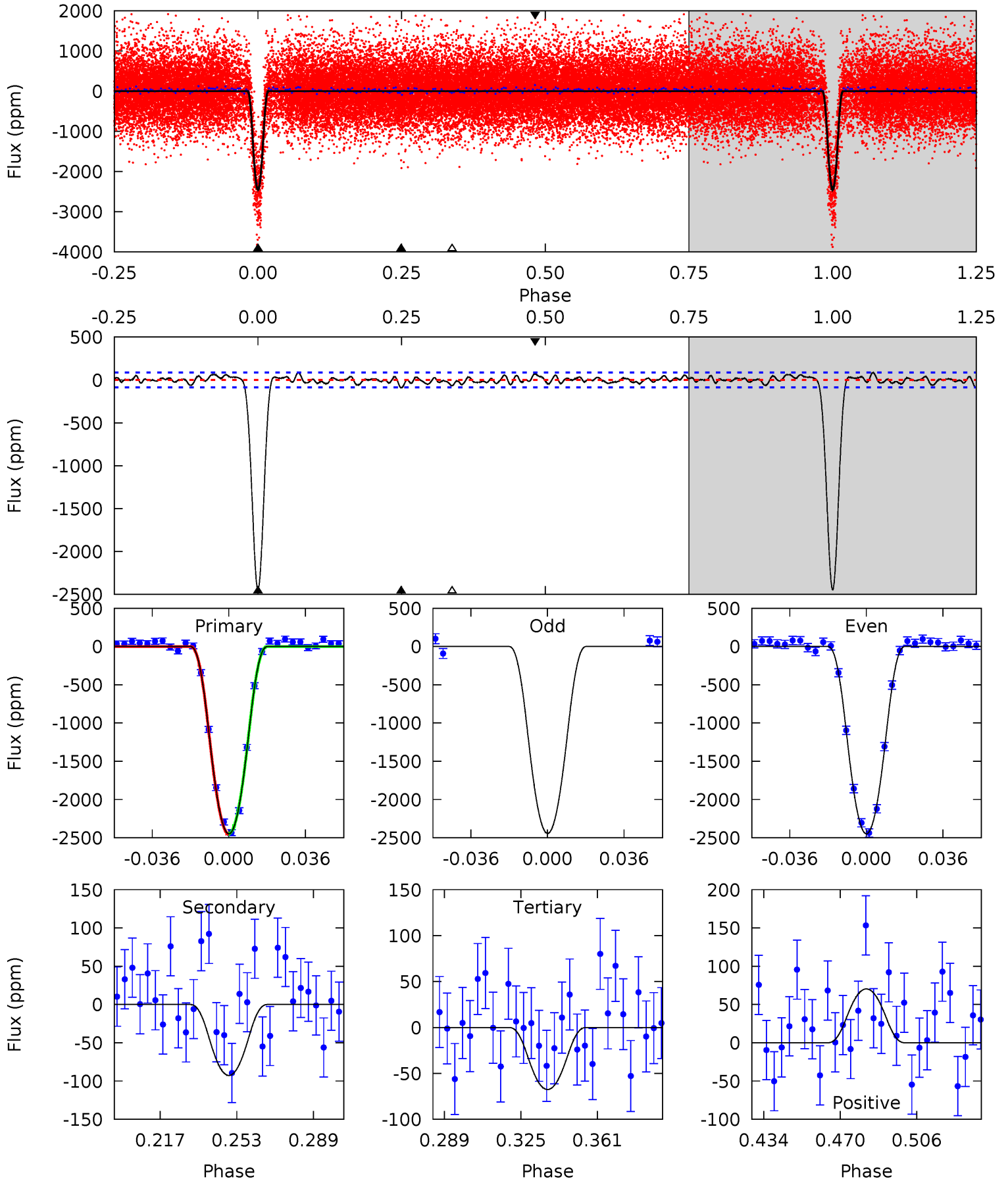
TCE 011043136-02 P= 2.621711 Days  $T_0=131.881905$  (BKJD)



# DV Model-Shift Uniqueness Test

011043136-02, P = 2.621705 Days, E = 131.883398 Days

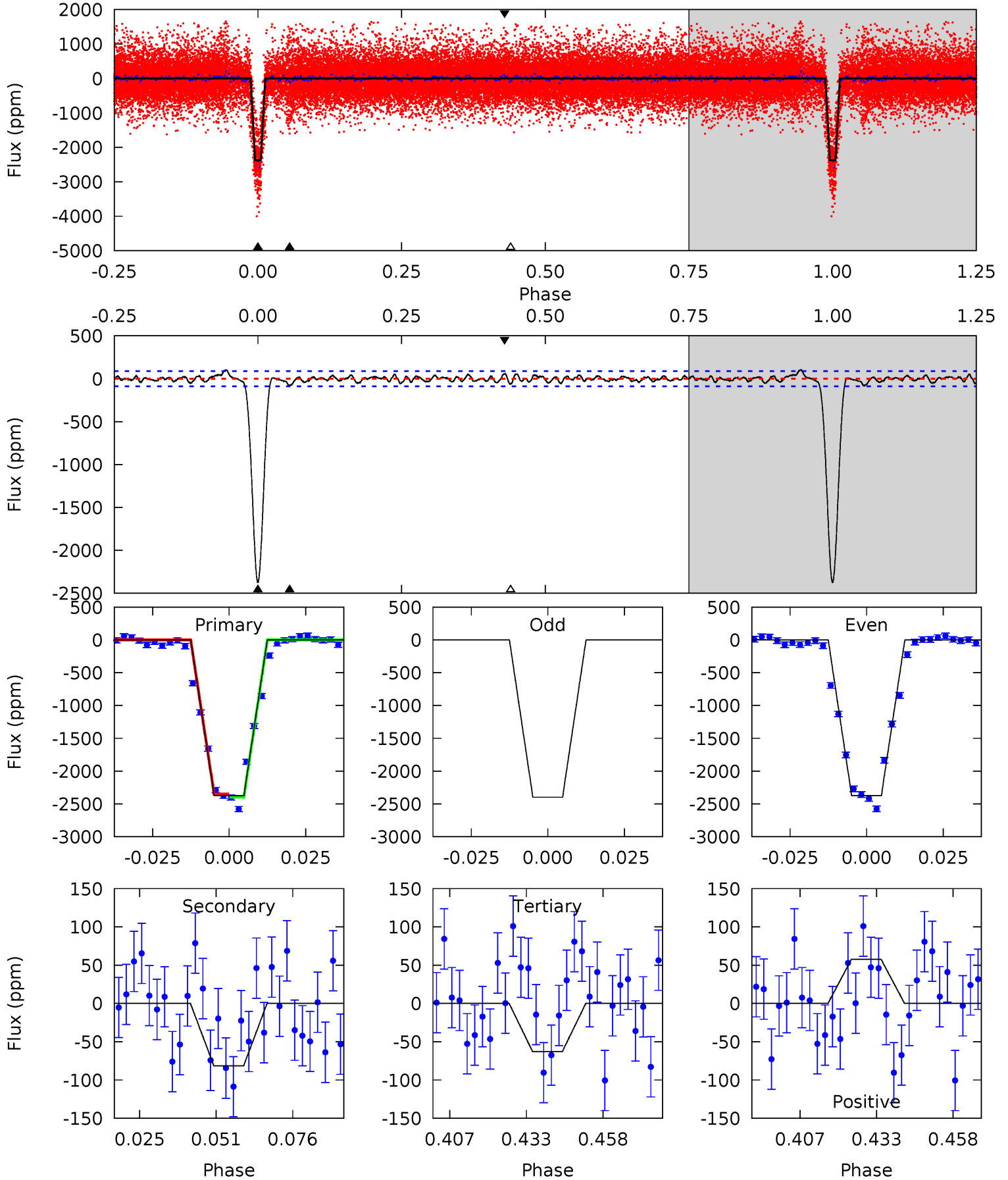
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
135.8	5.15	3.75	3.90	4.77	2.10	1.58	132.1	131.9	1.40	1.24	0.16	0.99	0.03	0.27



# Alt Model-Shift Uniqueness Test

011043136-02, P = 2.621711 Days, E = 131.881905 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
130.1	4.46	3.45	3.15	4.84	2.23	1.38	126.7	127.0	1.02	1.31	0.79	1.00	0.04	1.37



### Stellar Parameters For KIC 011043136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5749^{+192}_{-192}$	$4.436^{+0.155}_{-0.170}$	$-0.560^{+0.300}_{-0.300}$	$0.881^{+0.215}_{-0.132}$	$0.772^{+0.108}_{-0.054}$	$1.590^{+0.976}_{-0.698}$
	+3%/-3%	+3%/-4%	+54%/-54%	+24%/-15%	+14%/-7%	+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 011043136-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-93±18	$6.34^{+1.77}_{-1.63}$	$1804^{+117}_{-108}$	$2811^{+309}_{-248}$	$1.510^{+1.332}_{-0.668}$
Alt.	-81±18	$4.89^{+1.89}_{-1.61}$	$1804^{+127}_{-106}$	$3007^{+405}_{-316}$	$2.176^{+2.766}_{-1.038}$

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

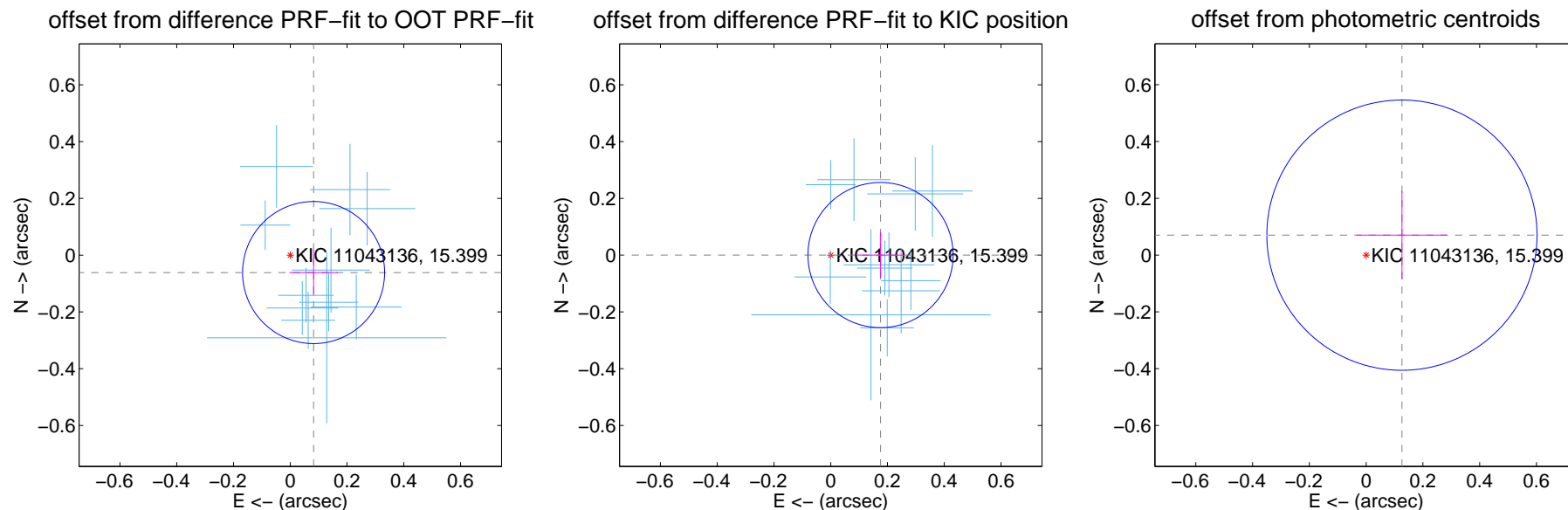
## DV Centroid Data

Supplemental centroid analysis for 011043136-02. Kepler magnitude: 15.40. Transit SNR 69.18

There are 11 quarters with good PRF difference image offsets

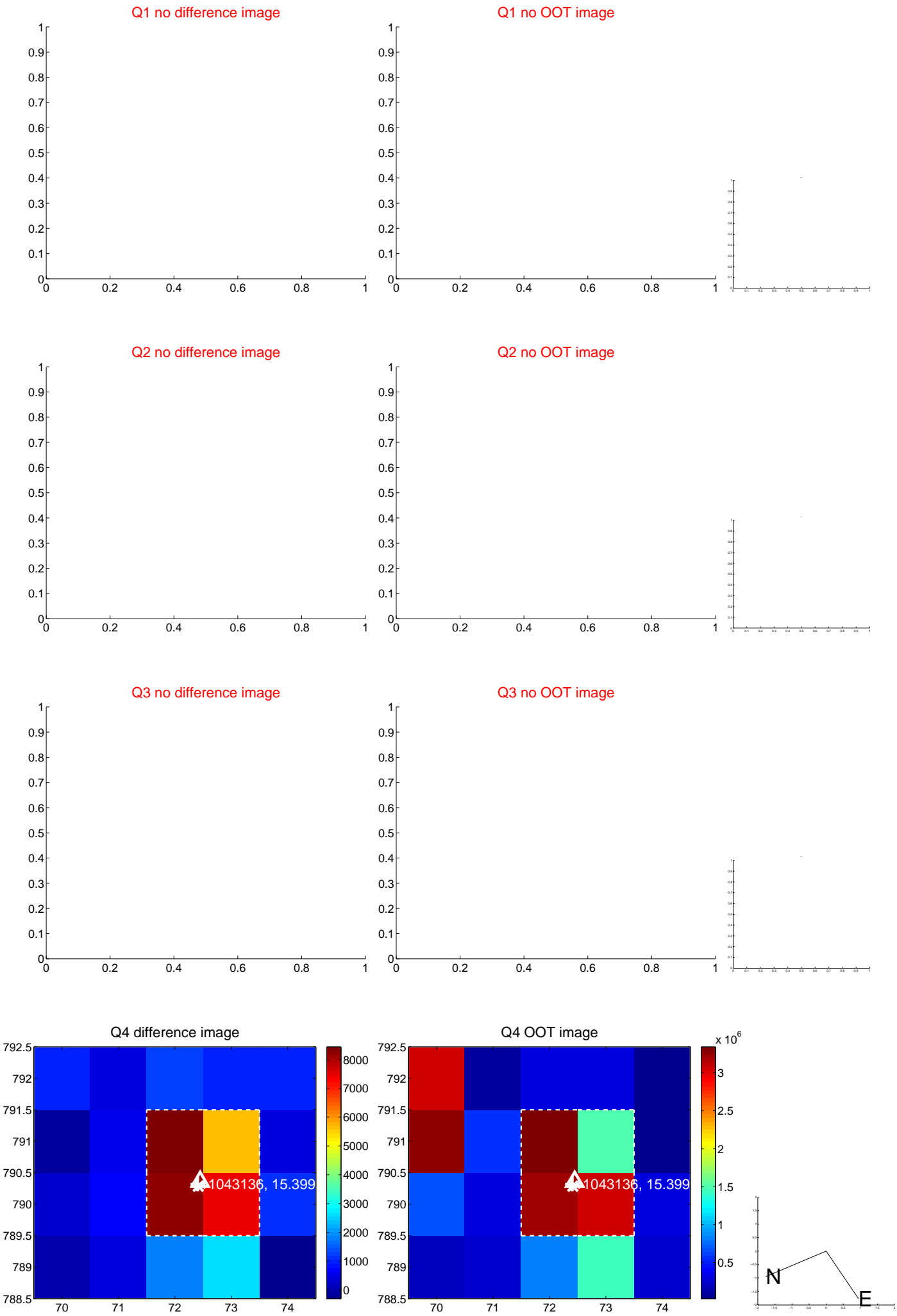
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.103 \pm 0.083$	1.23	$-0.082 \pm 0.085$	$-0.061 \pm 0.080$
PRF-fit source offset from KIC position	$0.175 \pm 0.085$	2.06	$-0.175 \pm 0.085$	$0.000 \pm 0.080$
photometric centroid source offset	$0.14 \pm 0.16$	0.91	$-0.13 \pm 0.16$	$0.07 \pm 0.16$

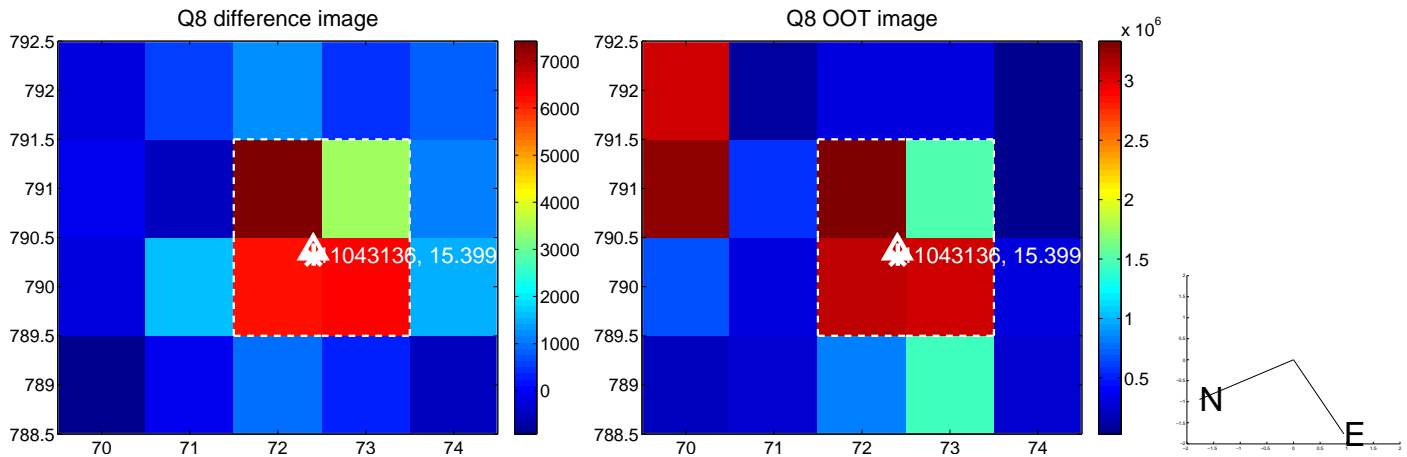
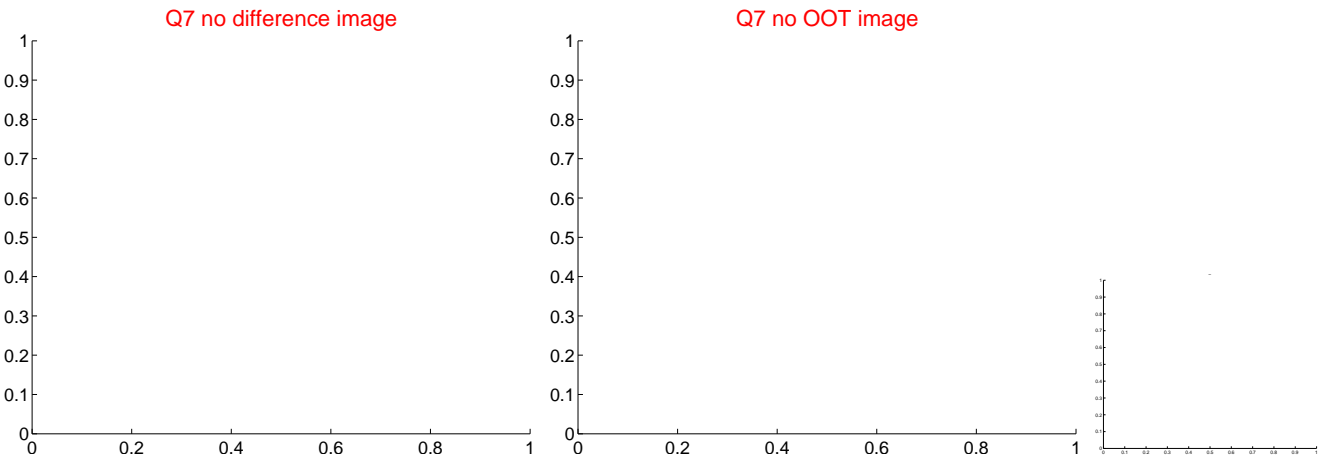
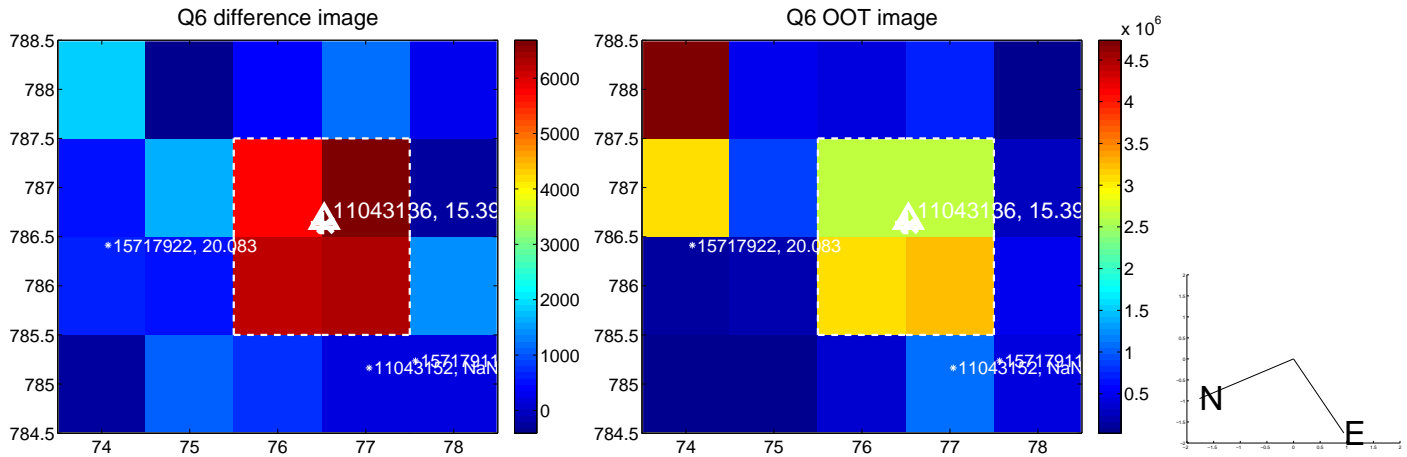
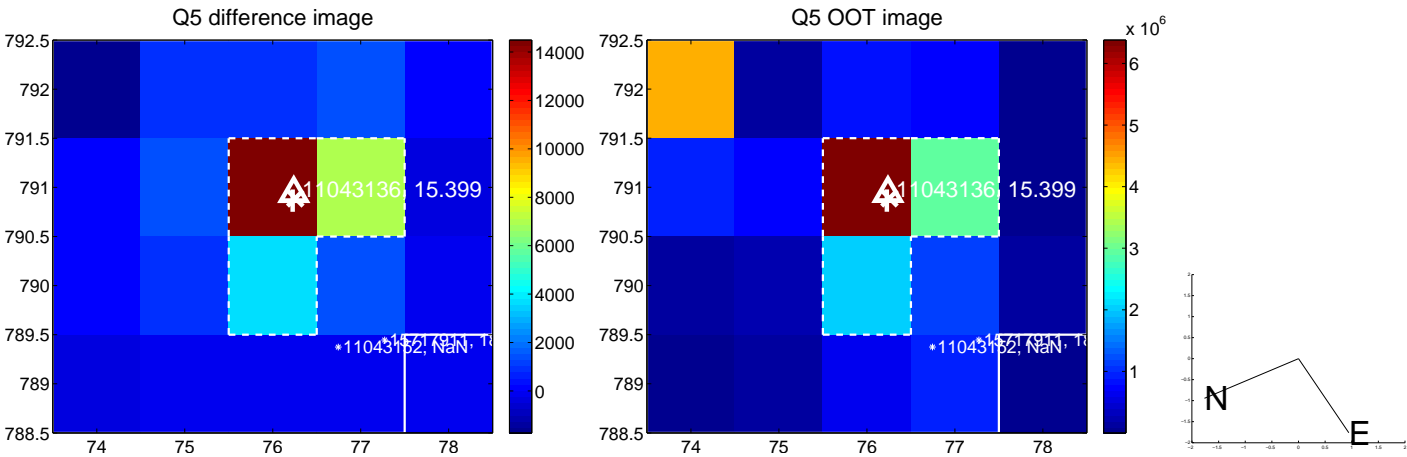


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

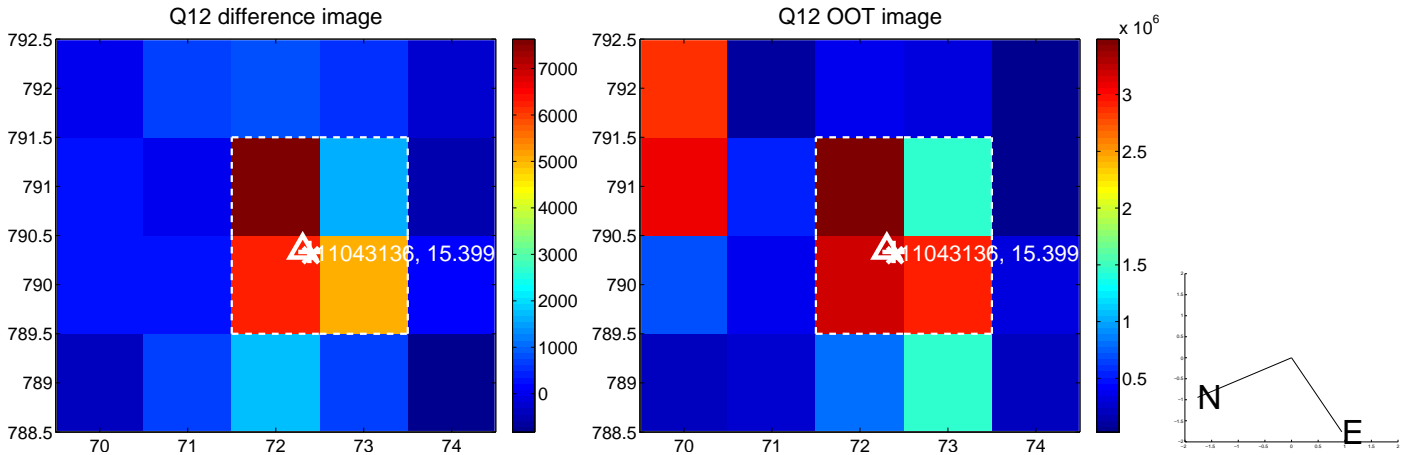
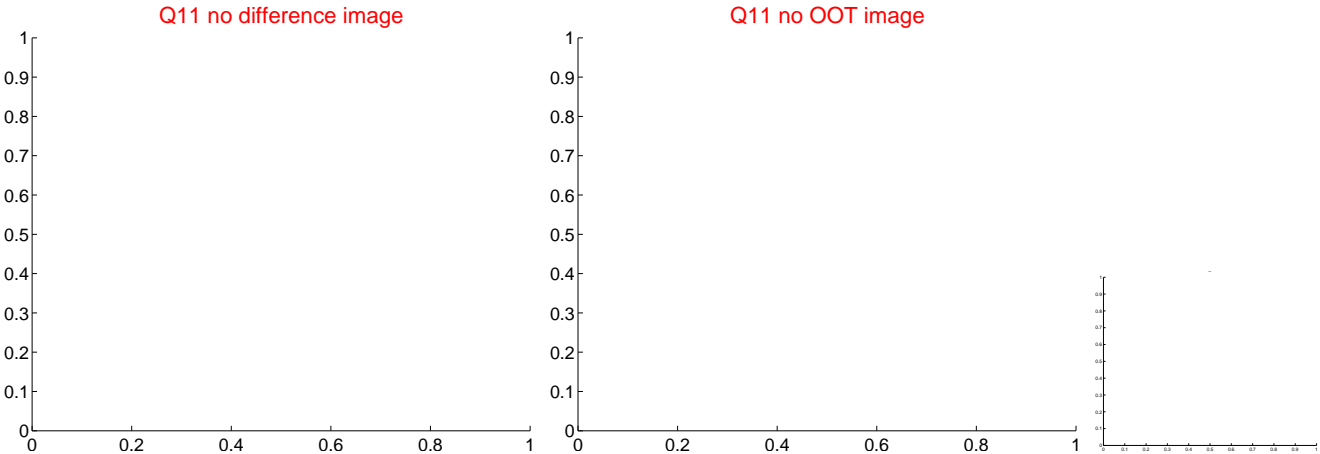
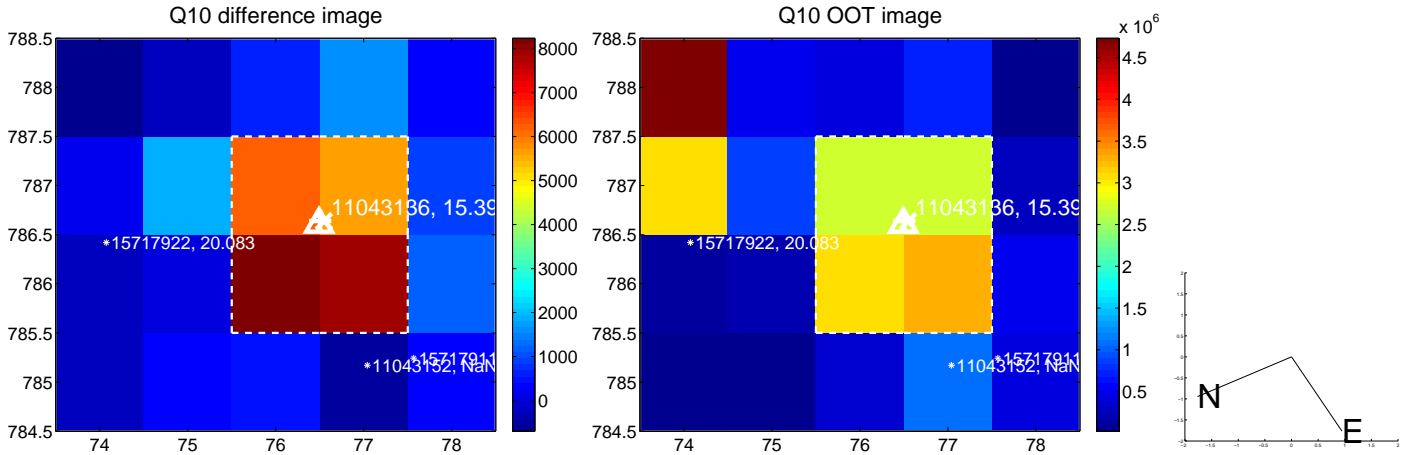
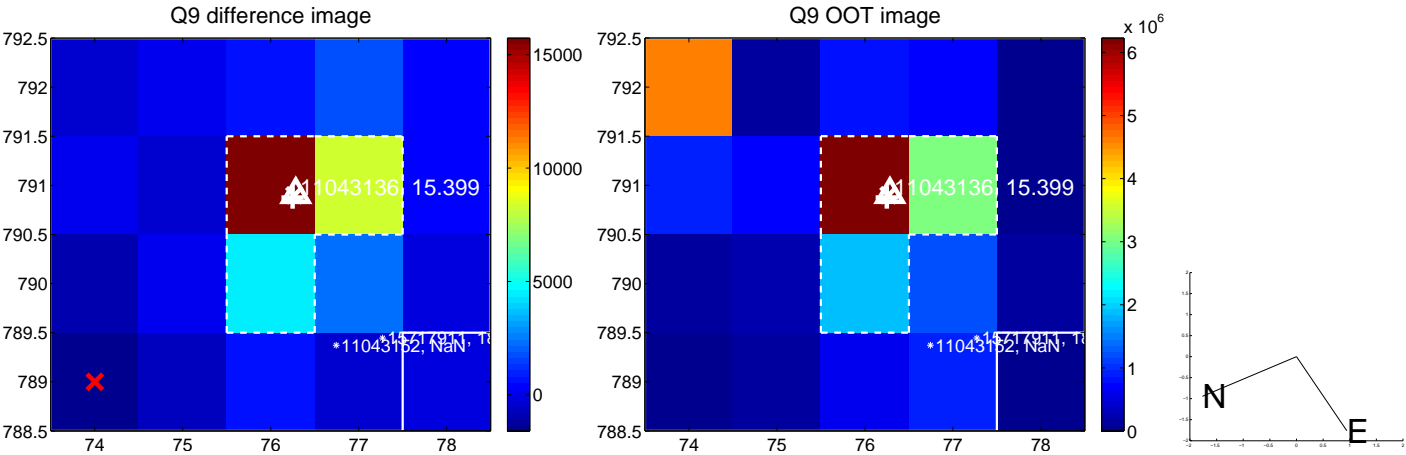


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

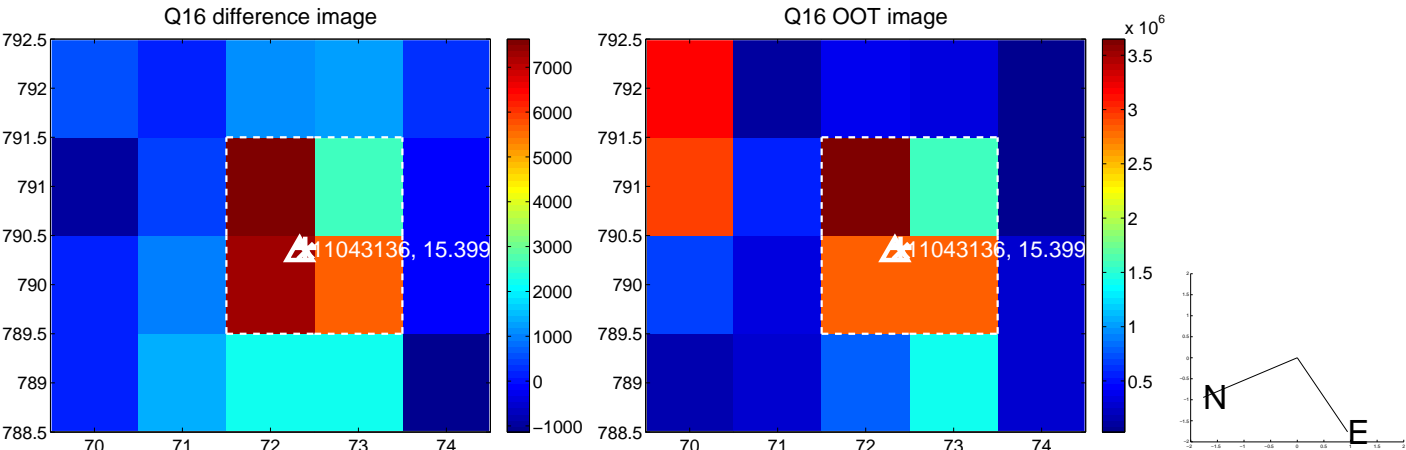
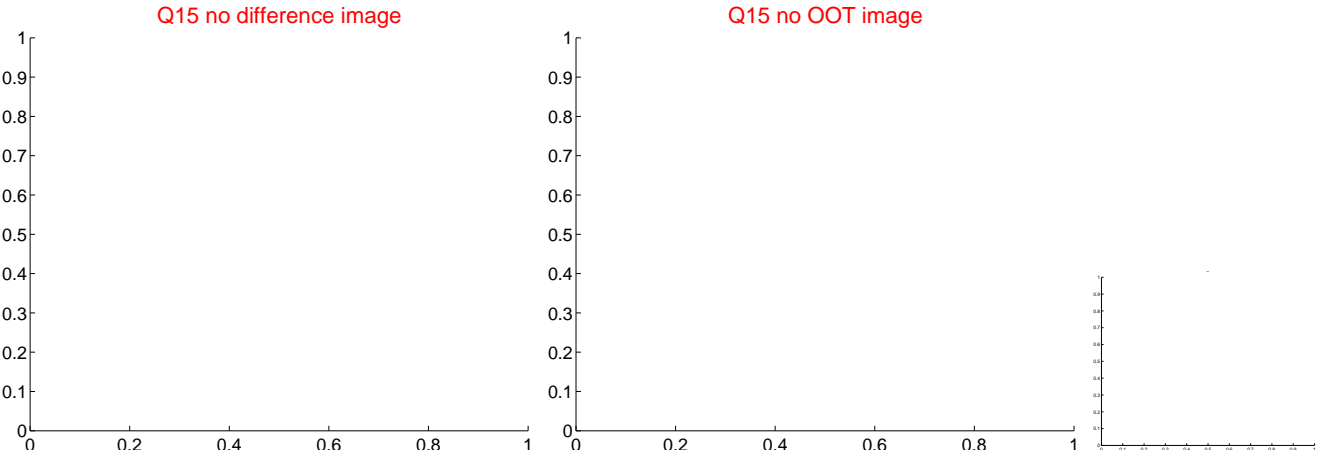
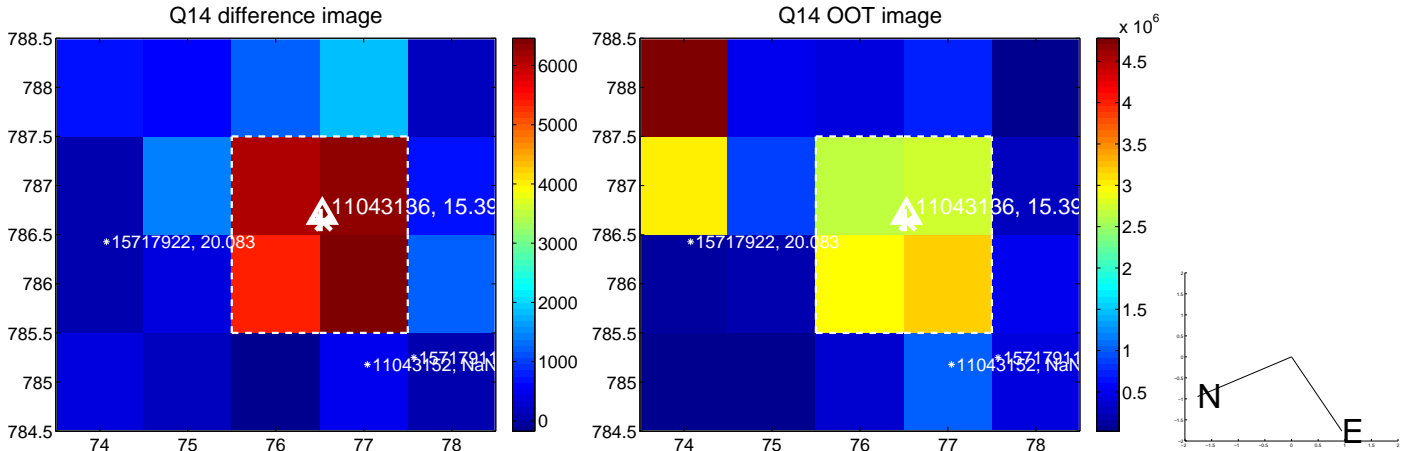
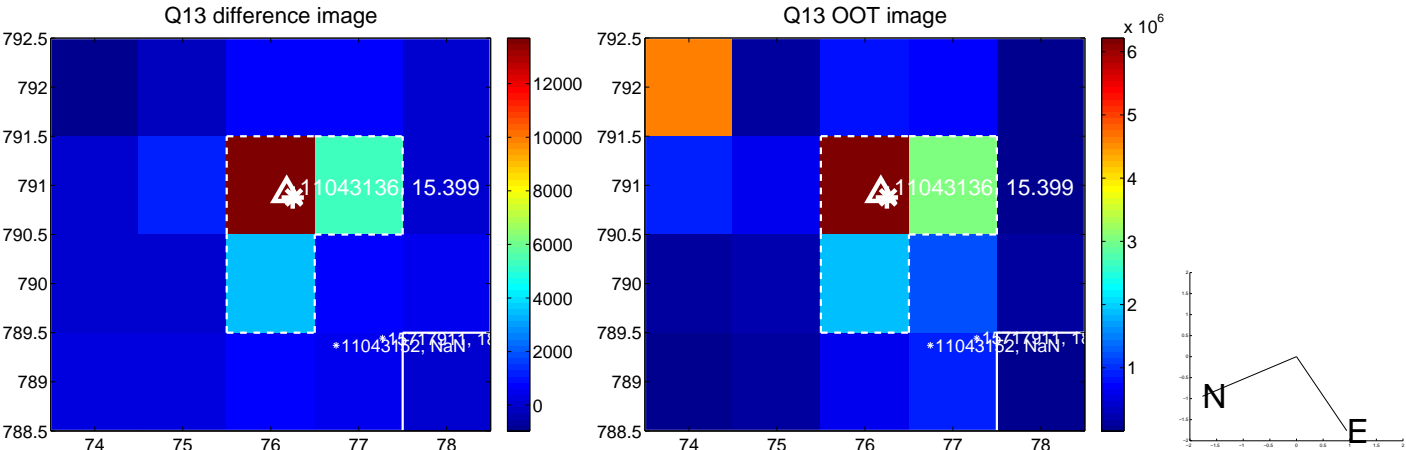




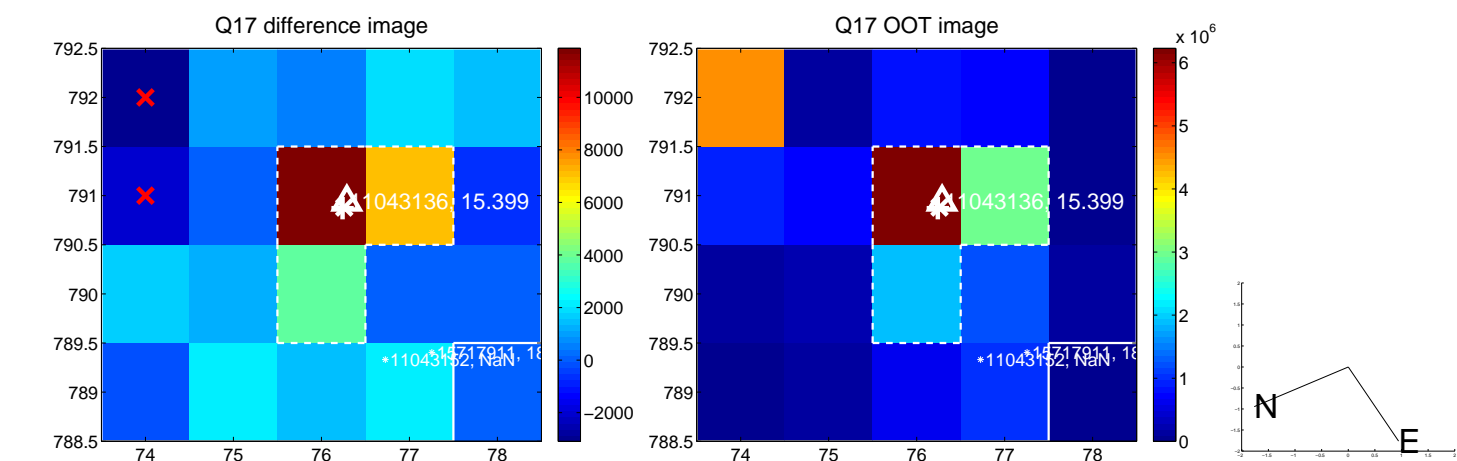
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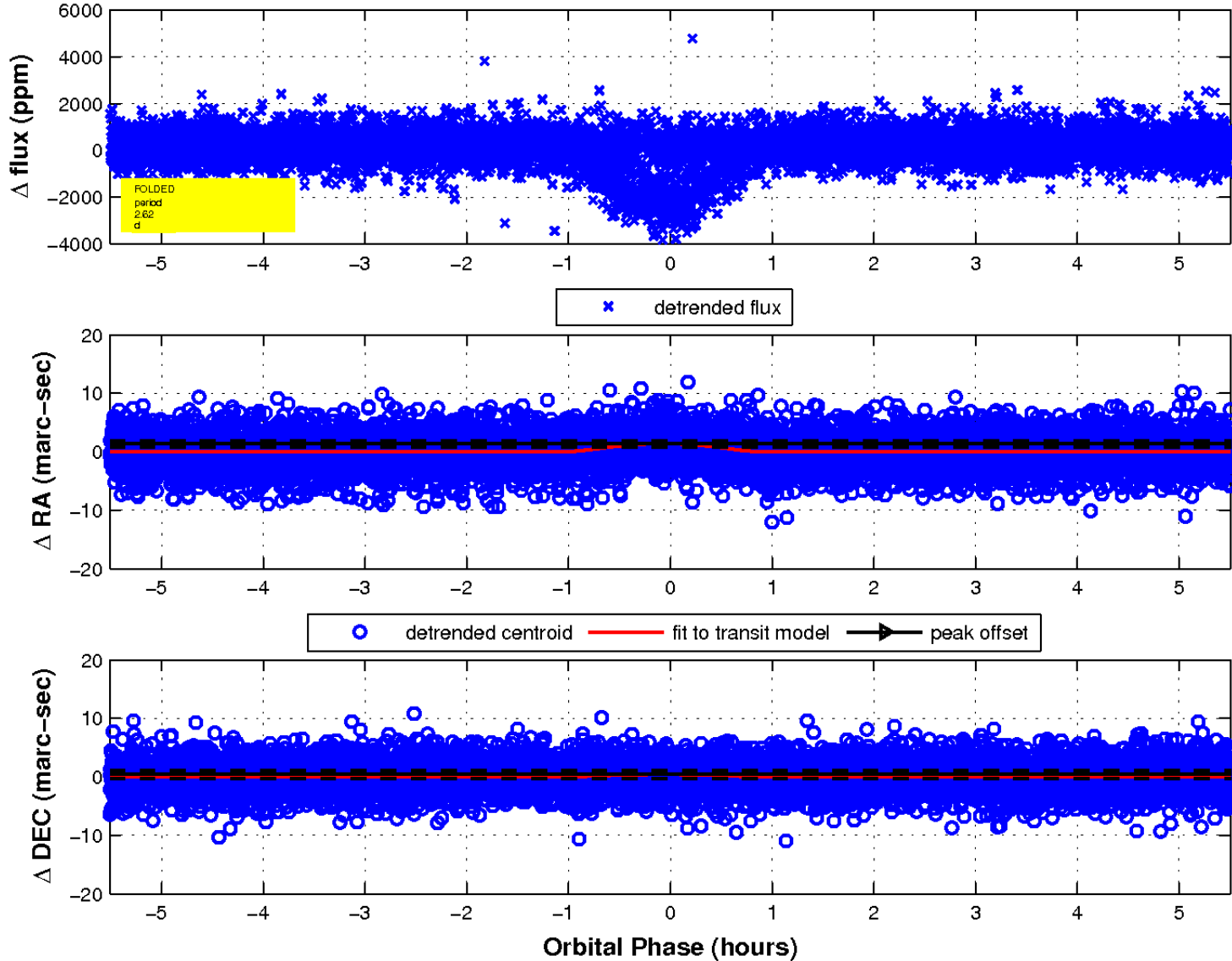
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

