

# KIC 007819024

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007819024-01	OBS	No	0.545465	131.924570	77.8	1.900	11.7	12.2	1.80	7389	1.84	39269.06
007819024-02	OBS	No	0.545462	131.750210	82.4	0.770	11.5	12.5	1.80	7389	1.93	39269.37
007819024-03	OBS	No	7.959401	138.131527	449.2	5.497	9.2	12.3	1.80	7389	4.83	1101.29
007819024-04	OBS	No	41.406704	158.600020	833.5	5.931	8.8	9.2	1.80	7389	9.74	122.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007819024-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
007819024-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

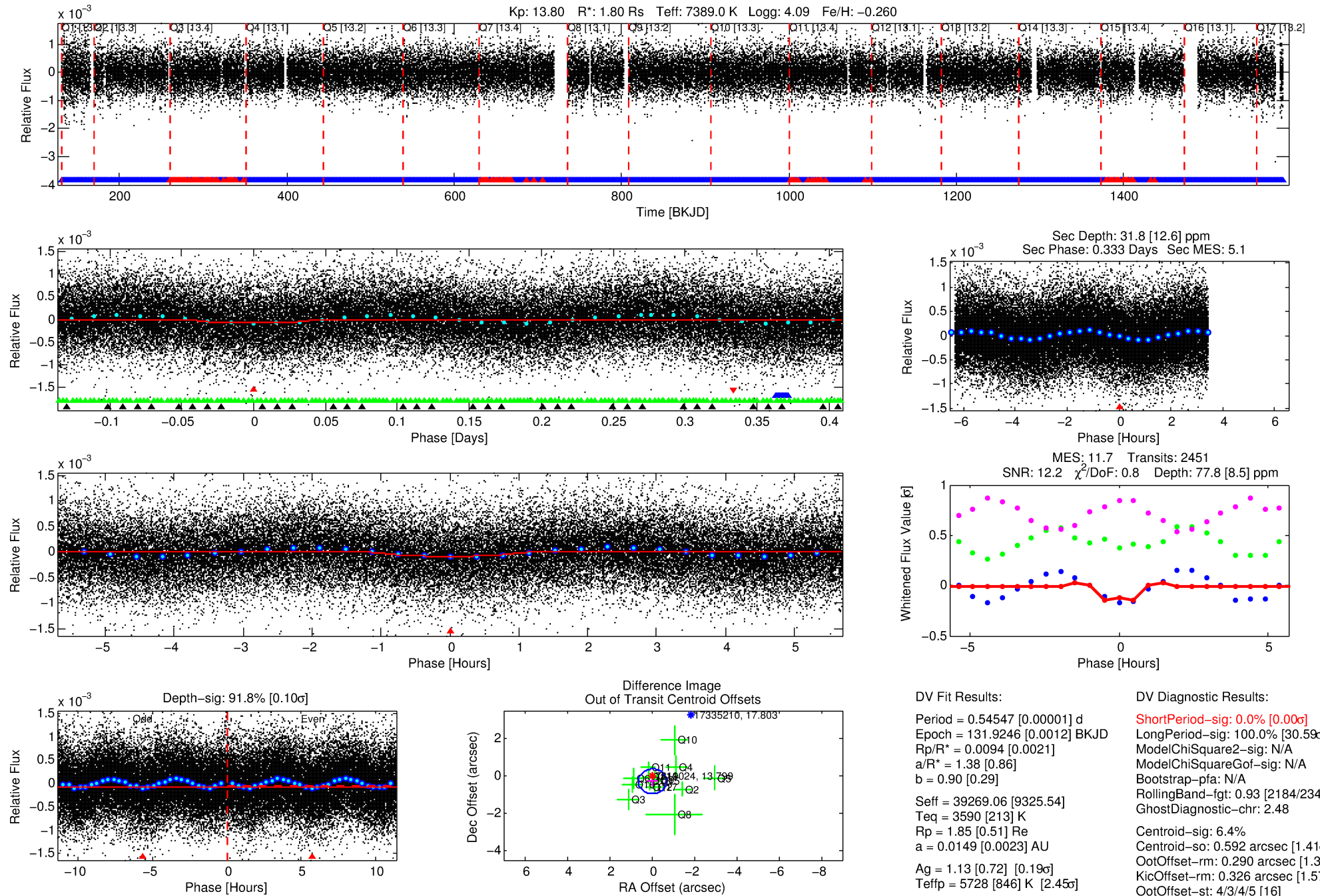
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007819024-01

No Significant Match Found

# DV One-Page Summary

KIC: 7819024 Candidate: 1 of 4 Period: 0.545 d



## DV Fit Results:

Period = 0.54547 [0.00001] d  
Epoch = 131.9246 [0.0012] BKJD  
Rp/R\* = 0.0094 [0.0021]  
a/R\* = 1.38 [0.86]  
b = 0.90 [0.29]  
Seff = 39269.06 [9325.54]  
Teff = 3590 [213] K  
Rp = 1.85 [0.51] Re  
a = 0.0149 [0.0023] AU  
Ag = 1.13 [0.72] [0.19 $\sigma$ ]  
Teffp = 5728 [846] K [2.45 $\sigma$ ]

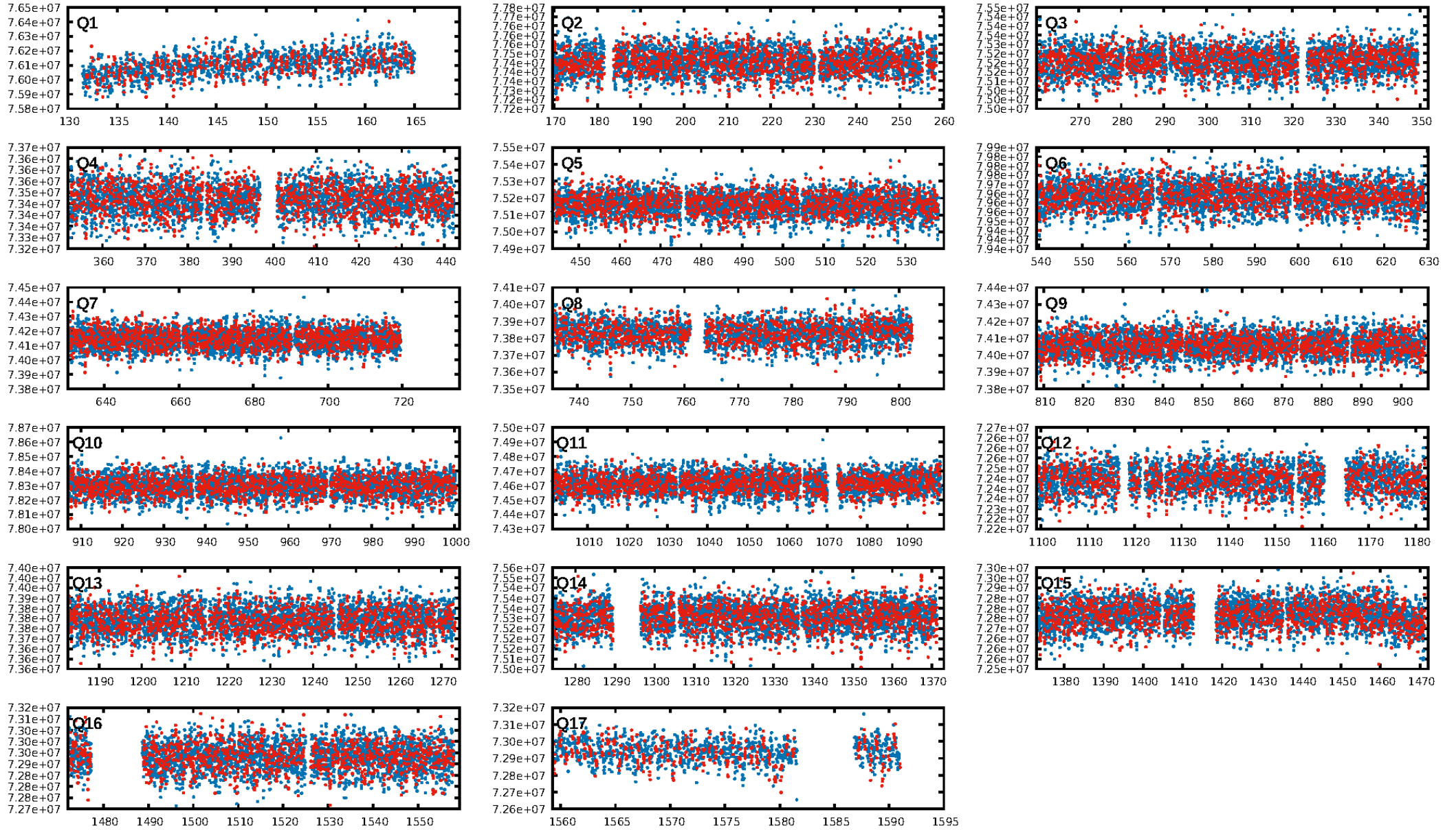
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [30.59 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.93 [2184/2341]  
GhostDiagnostic-chr: 2.48  
Centroid-sig: 6.4%  
Centroid-so: 0.592 arcsec [1.41 $\sigma$ ]  
OotOffset-rm: 0.290 arcsec [1.30 $\sigma$ ]  
KicOffset-rm: 0.326 arcsec [1.57 $\sigma$ ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.75 [12/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:28:55 Z

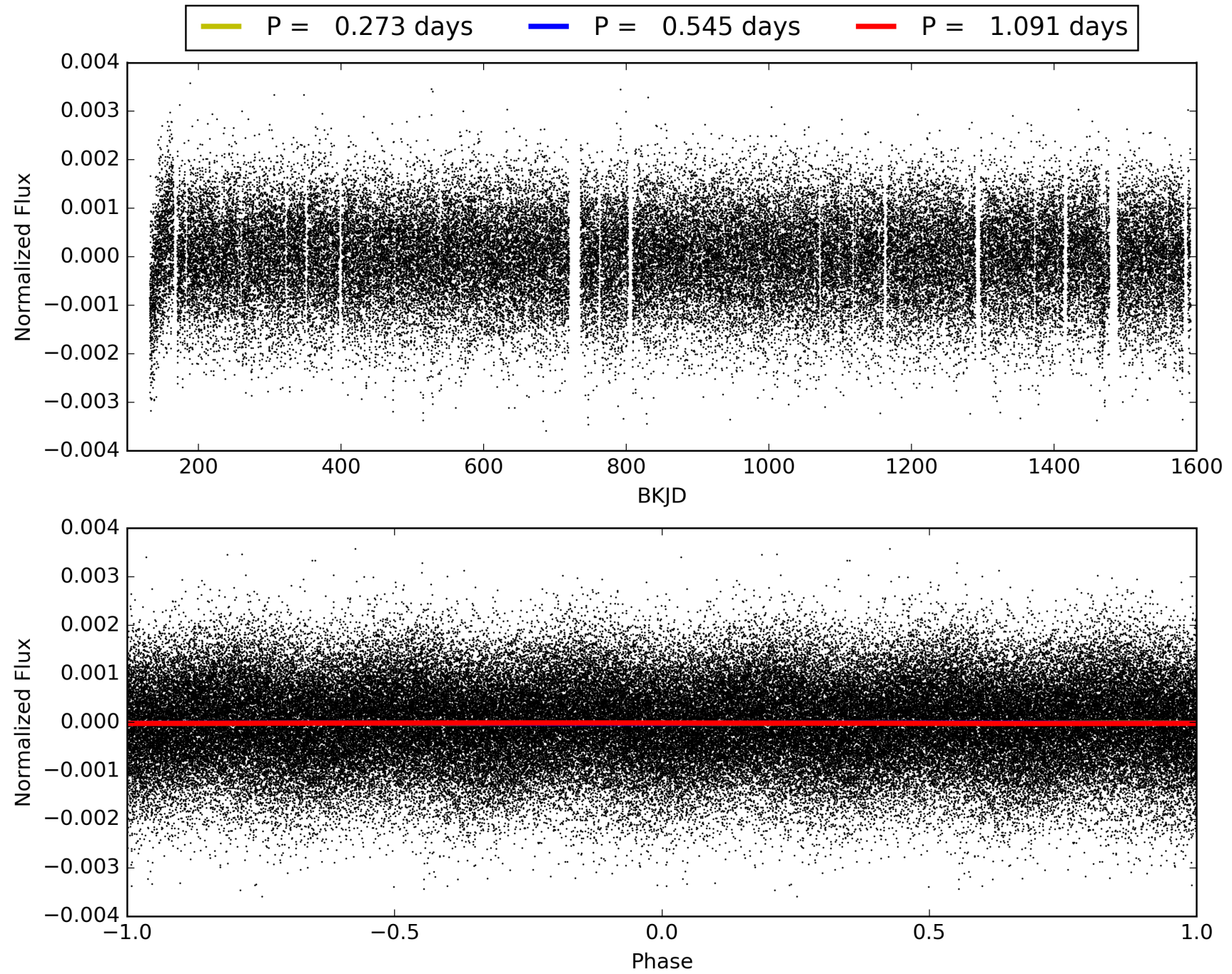
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007819024-01, PDC Light Curves





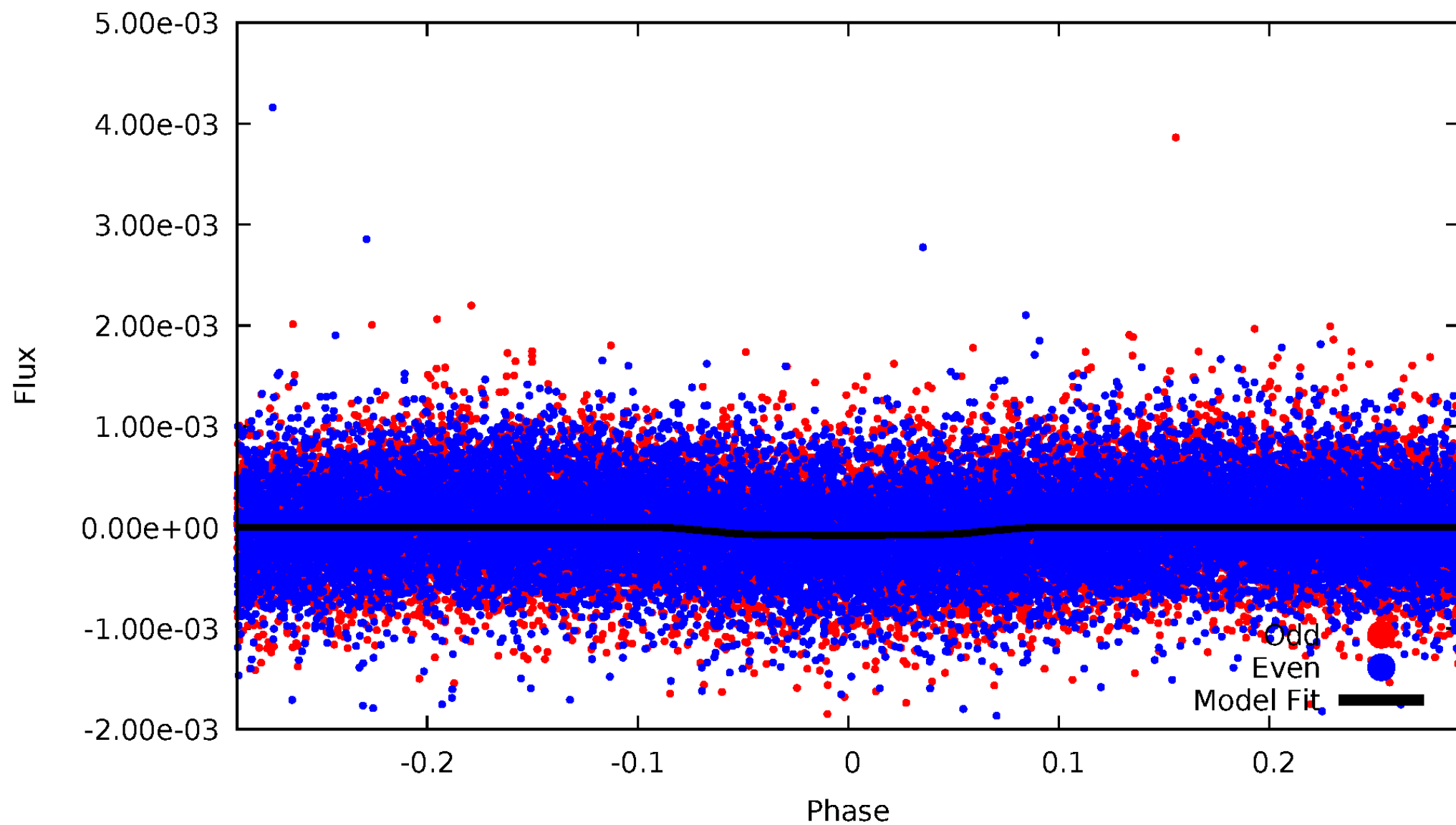
TCE 007819024-01





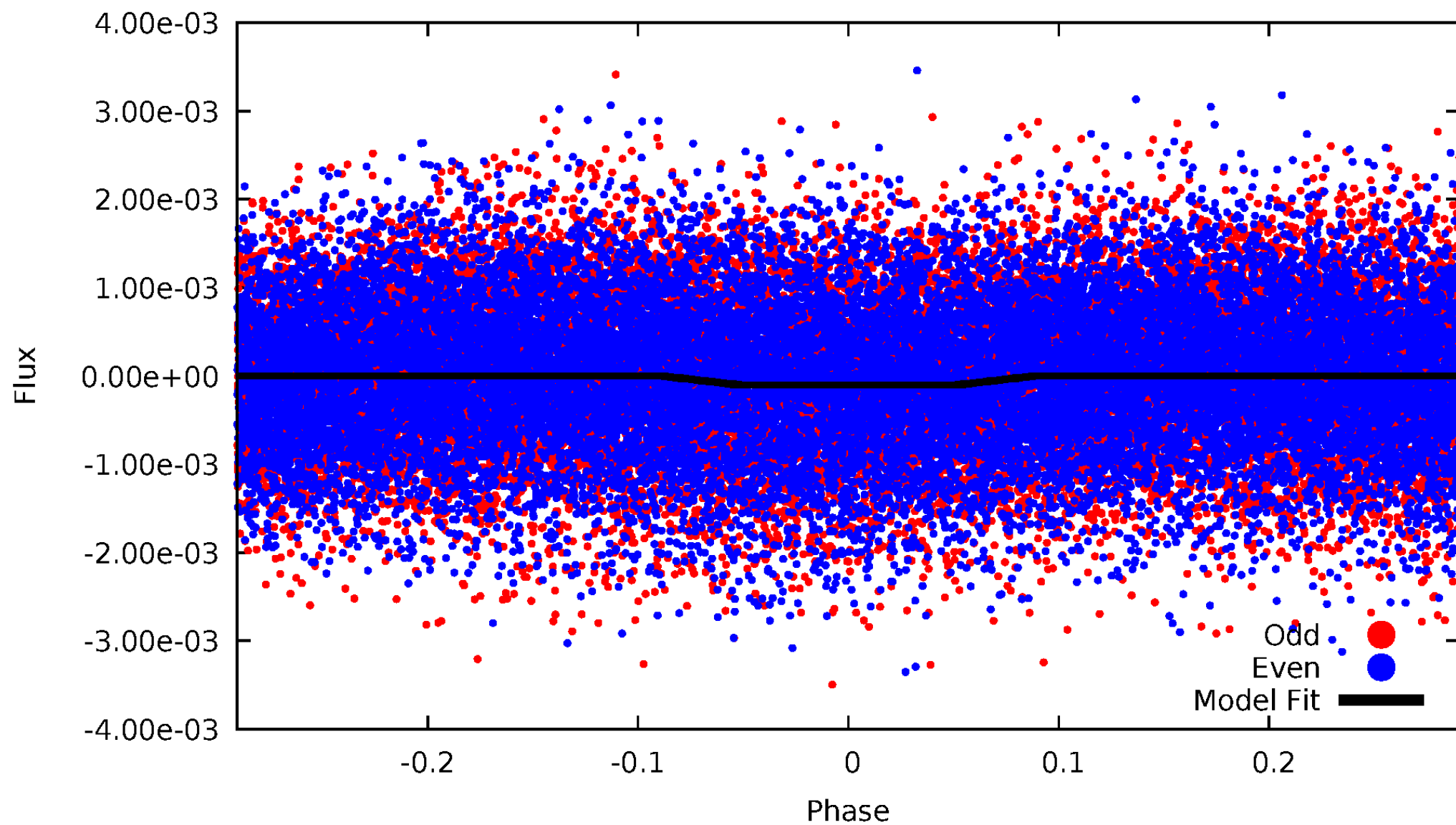
# DV Odd/Even

TCE 007819024-01

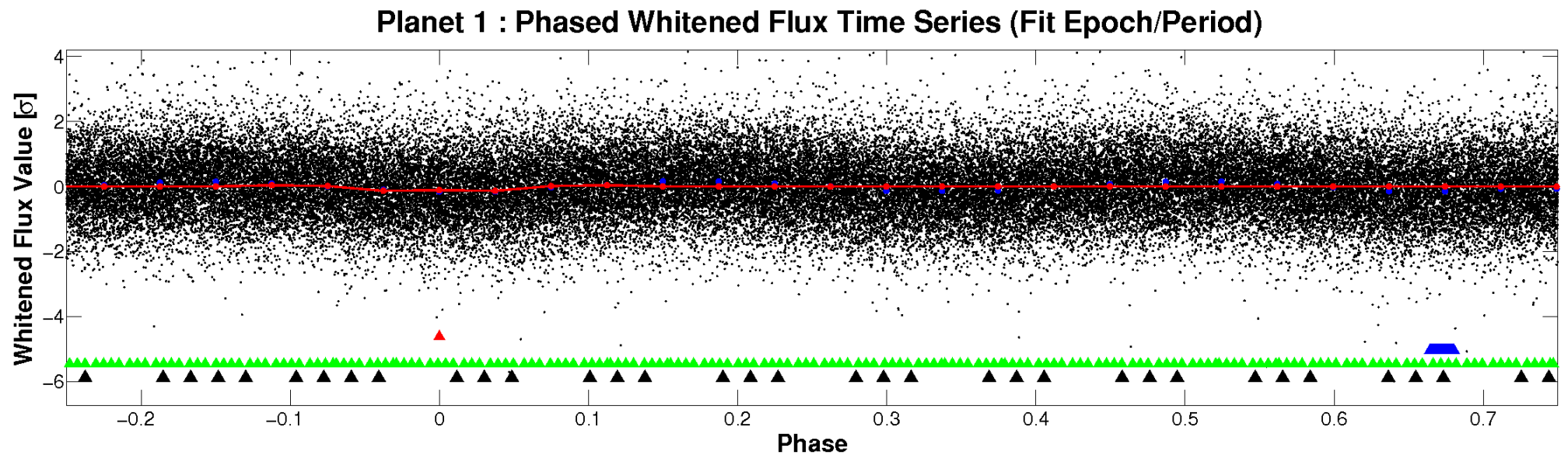
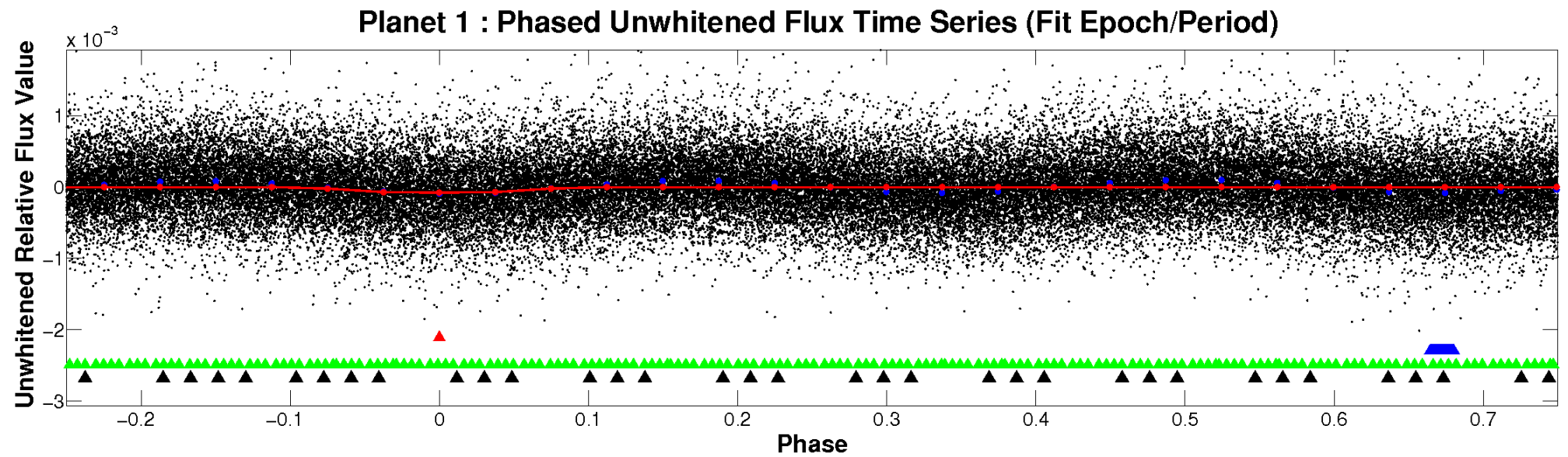


# ALT Odd/Even

TCE 007819024-01



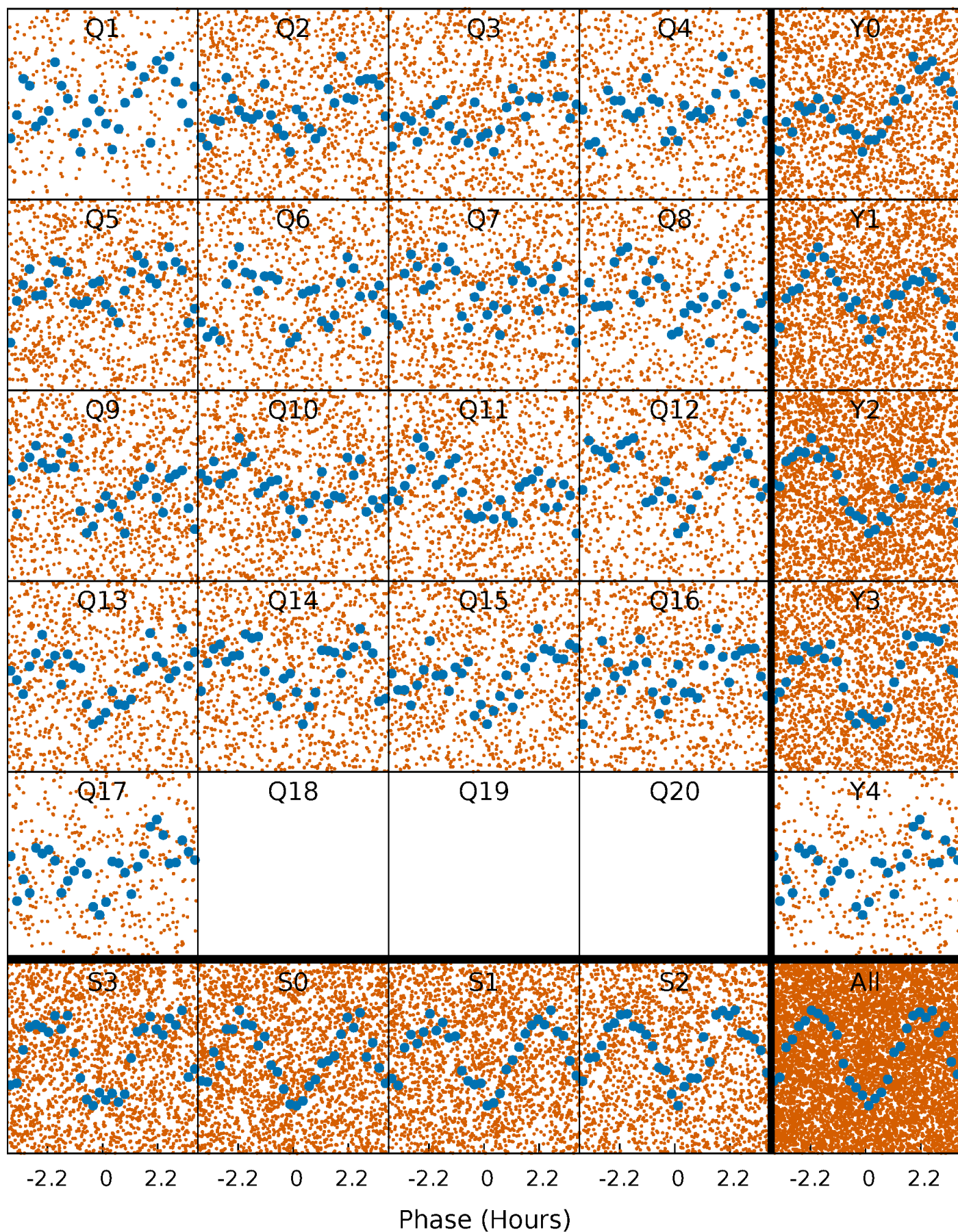
# Non-Whitened Vs. Whitened Light Curve





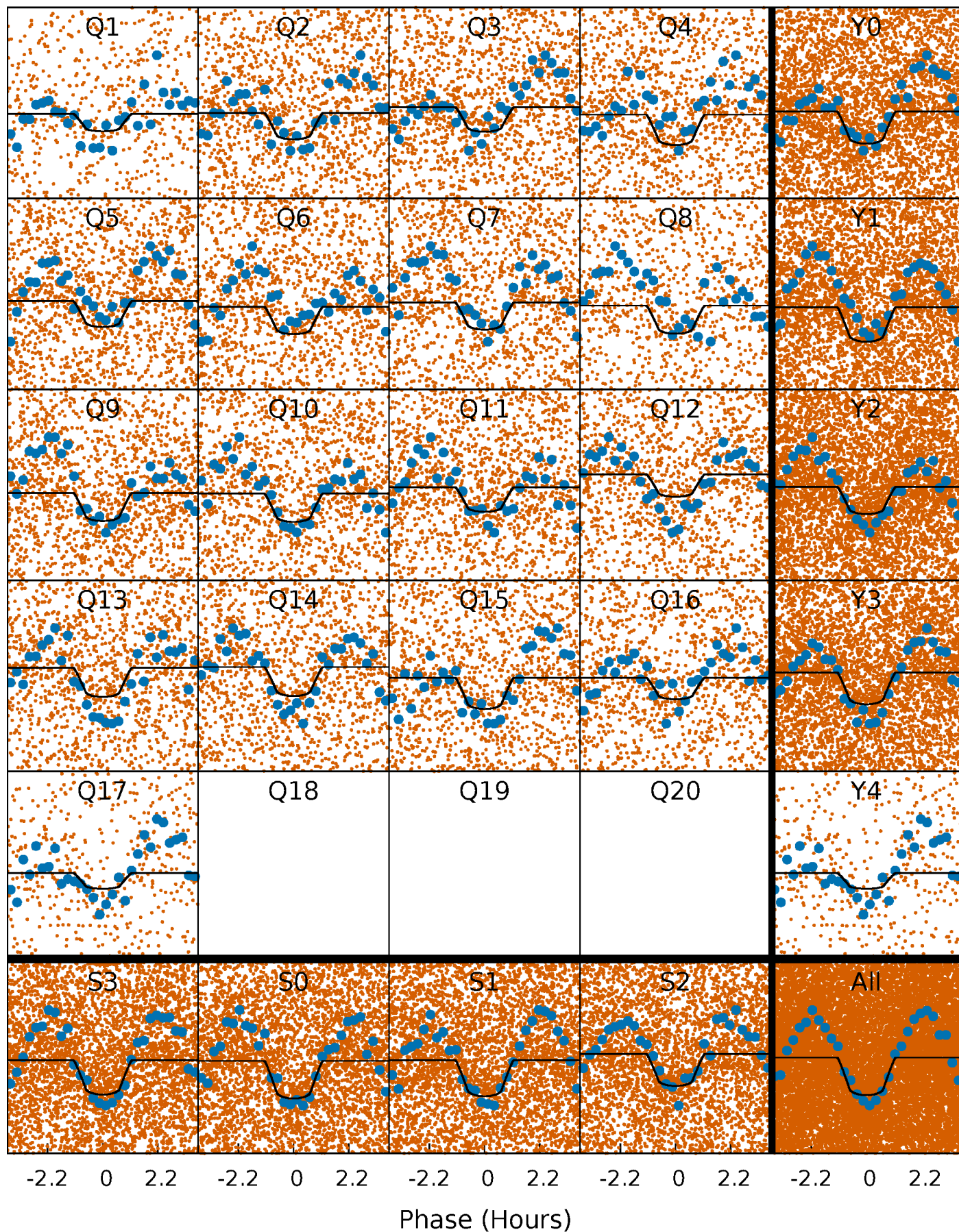
# PDC Quarter-Phased Transit Curves

TCE 007819024-01 P= 0.545465 Days  $T_0=131.924570$  (BKJD)



# DV Quarter-Phased Transit Curves

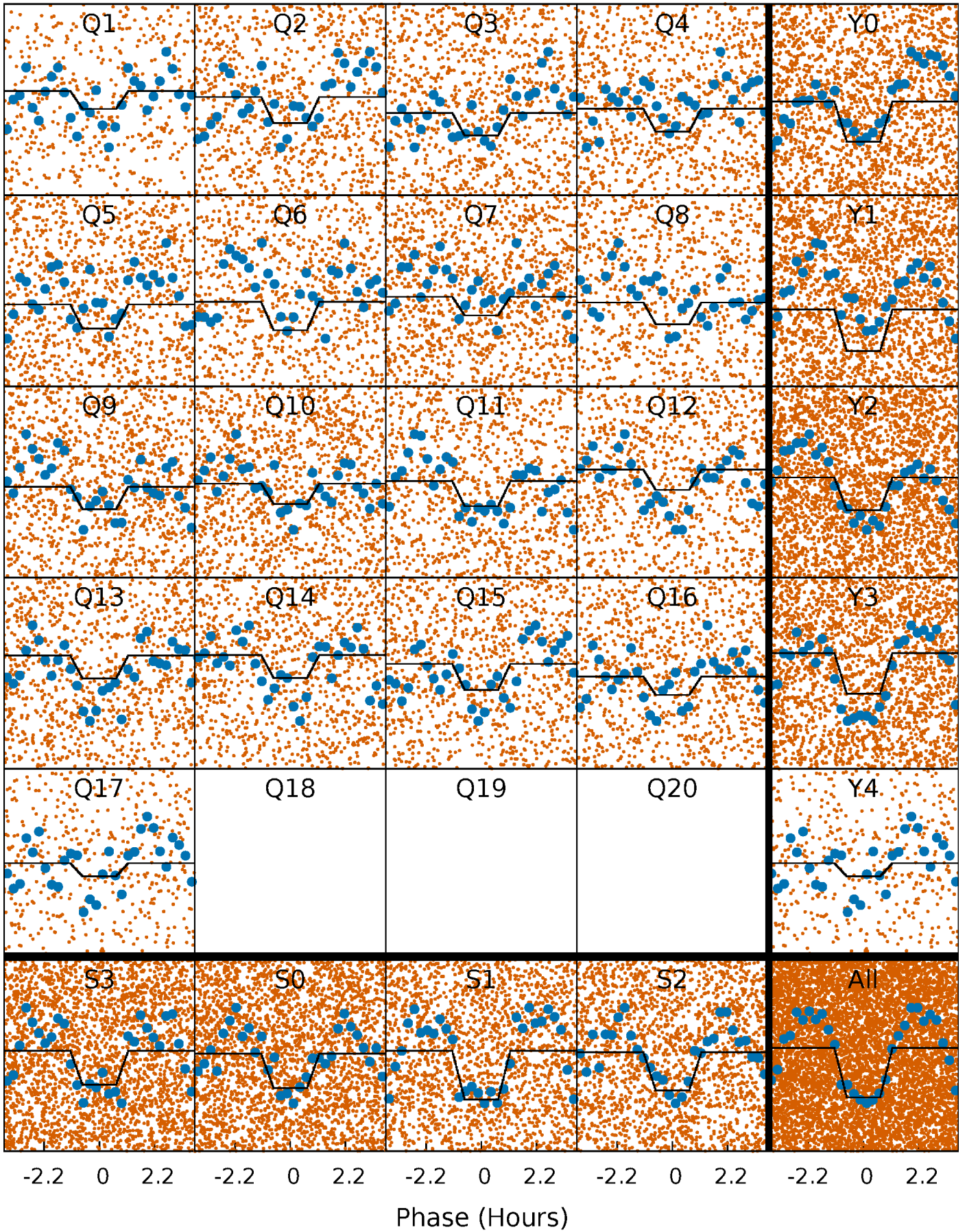
TCE 007819024-01 P= 0.545465 Days  $T_0=131.924570$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007819024-01 P= 0.545470 Days  $T_0=131.923091$  (BKJD)

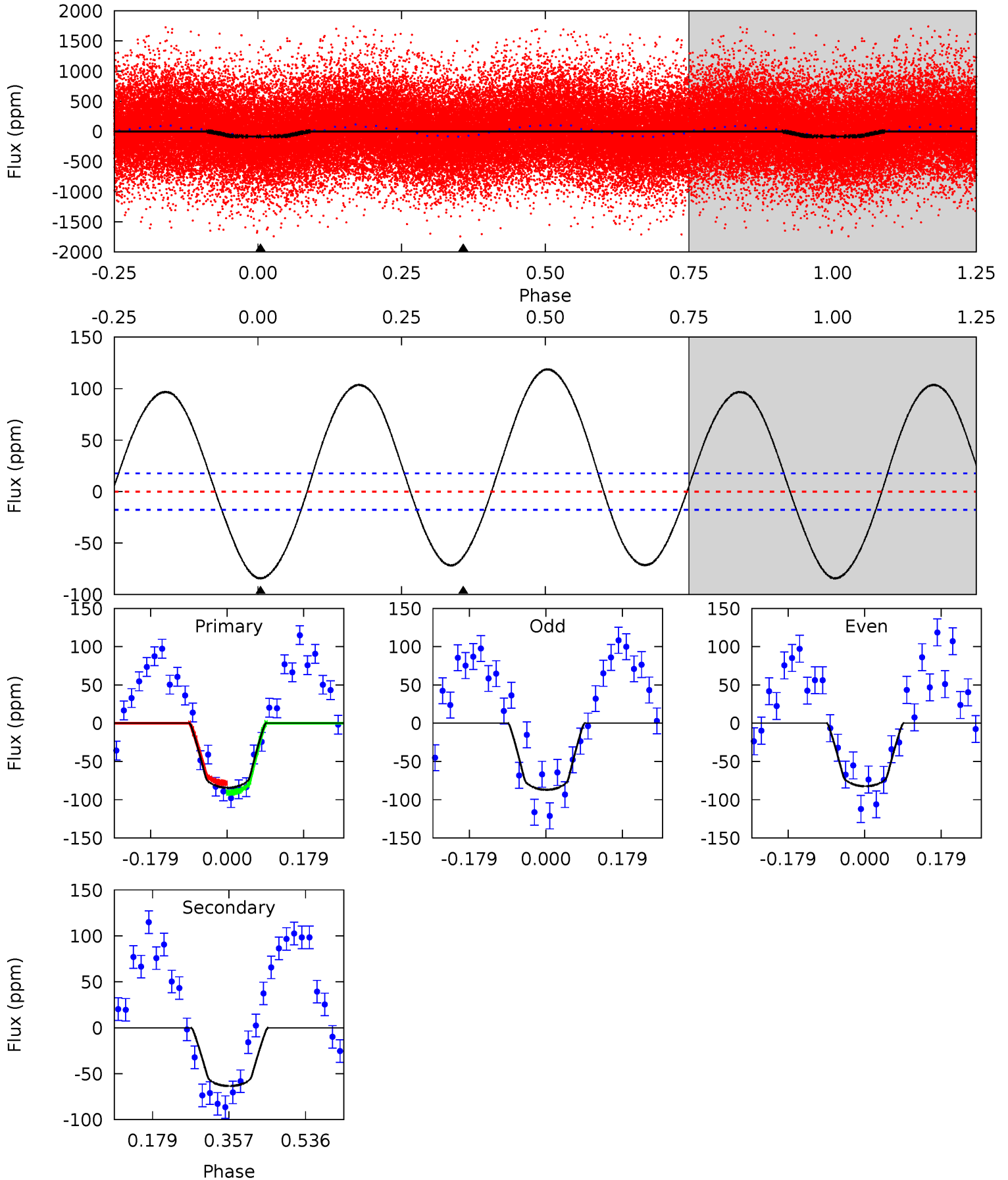




# DV Model-Shift Uniqueness Test

007819024-01, P = 0.545465 Days, E = 131.379105 Days

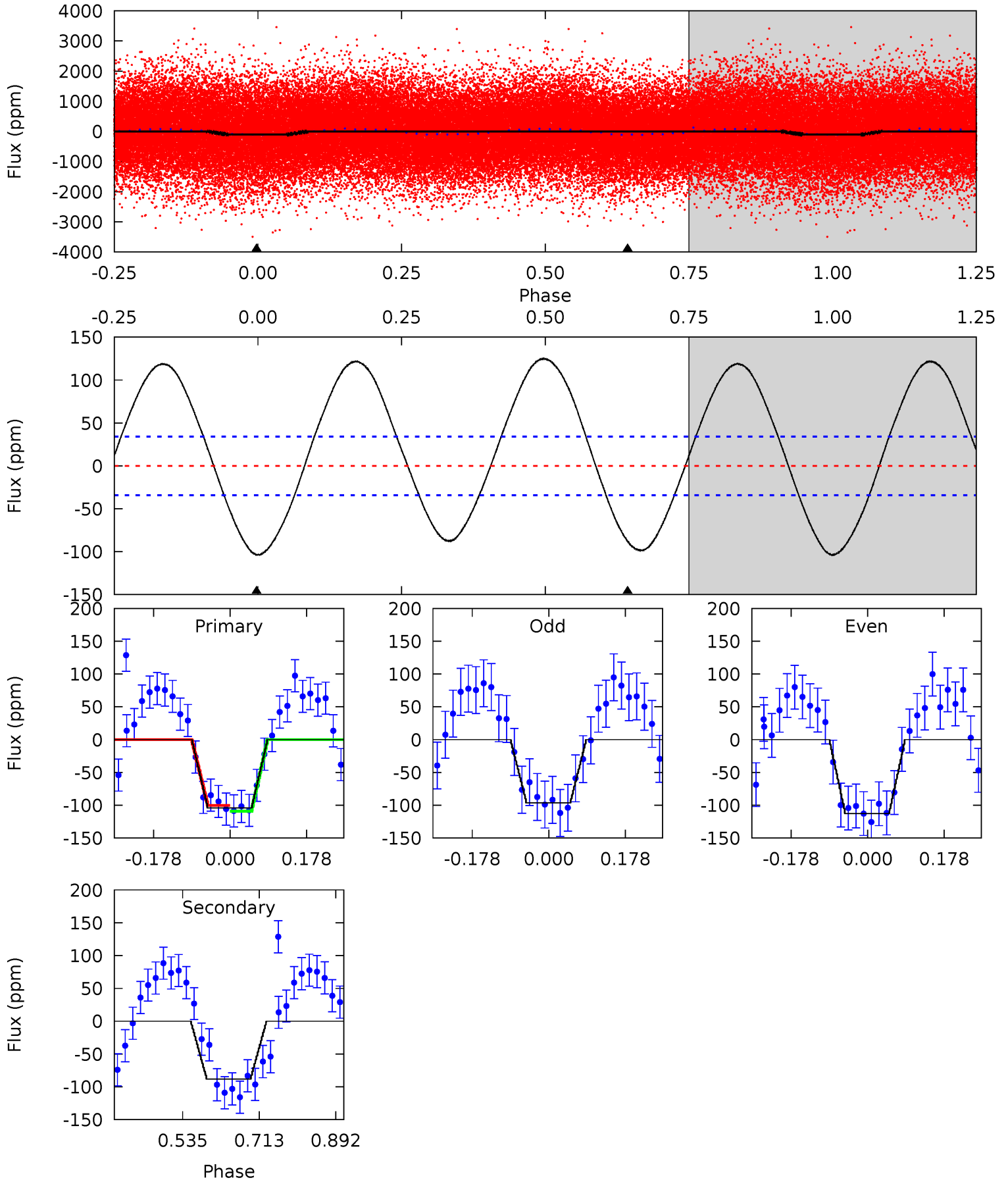
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.2	16.0	0	0	4.44	1.35	14.4	21.2	21.2	16.0	16.0	0.58	0.98	0.58	1.59



# Alt Model-Shift Uniqueness Test

007819024-01, P = 0.545470 Days, E = 131.377621 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
13.5	11.5	0	0	4.44	1.35	8.68	13.5	13.5	11.5	11.5	1.05	1.30	0.55	0.53



### Stellar Parameters For KIC 007819024

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7389^{+73}_{-88}$	$4.094^{+0.132}_{-0.108}$	$-0.260^{+0.150}_{-0.150}$	$1.802^{+0.309}_{-0.309}$	$1.468^{+0.127}_{-0.115}$	$0.353^{+0.204}_{-0.120}$
	+1%/-1%	+3%/-3%	+58%/-58%	+17%/-17%	+9%/-8%	+58%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007819024-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-63 \pm 4$	$1.83^{+0.45}_{-0.41}$	$5004^{+217}_{-228}$	$6462^{+1120}_{-665}$	$2.293^{+1.556}_{-0.802}$
Alt.	$-88 \pm 8$	$1.98^{+0.46}_{-0.43}$	$4988^{+220}_{-217}$	$6798^{+1096}_{-734}$	$2.728^{+1.768}_{-0.965}$

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



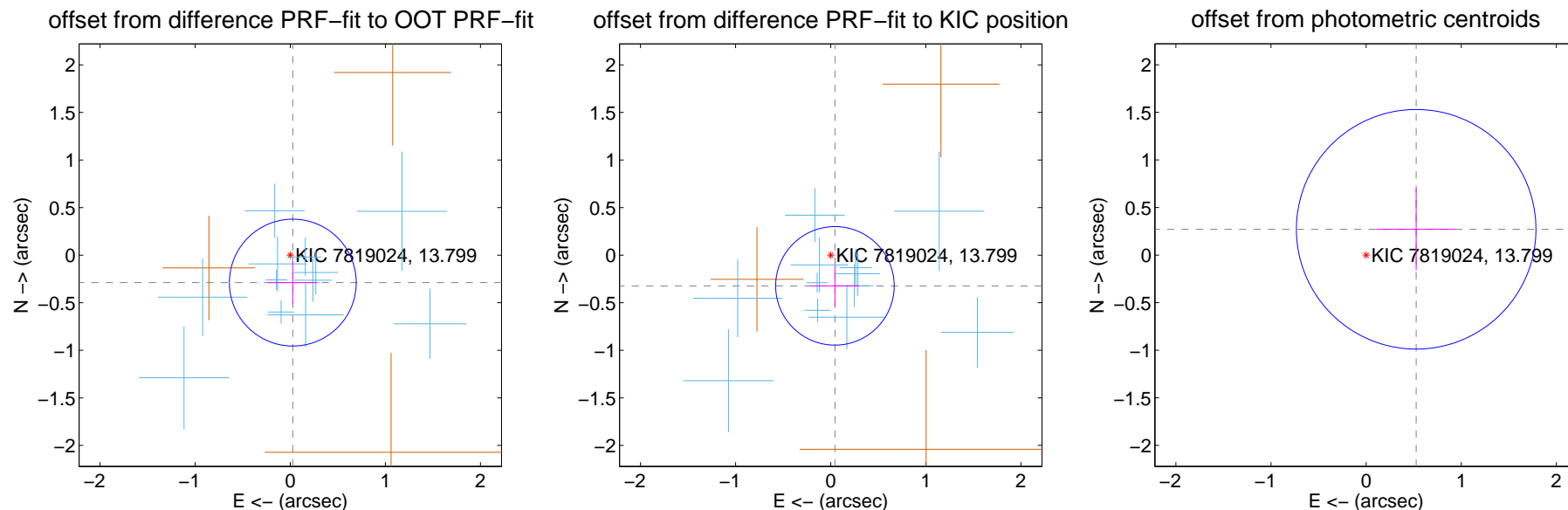
## DV Centroid Data

Supplemental centroid analysis for 007819024-01. Kepler magnitude: 13.80. Transit SNR 12.25

There are 12 quarters with good PRF difference image offsets

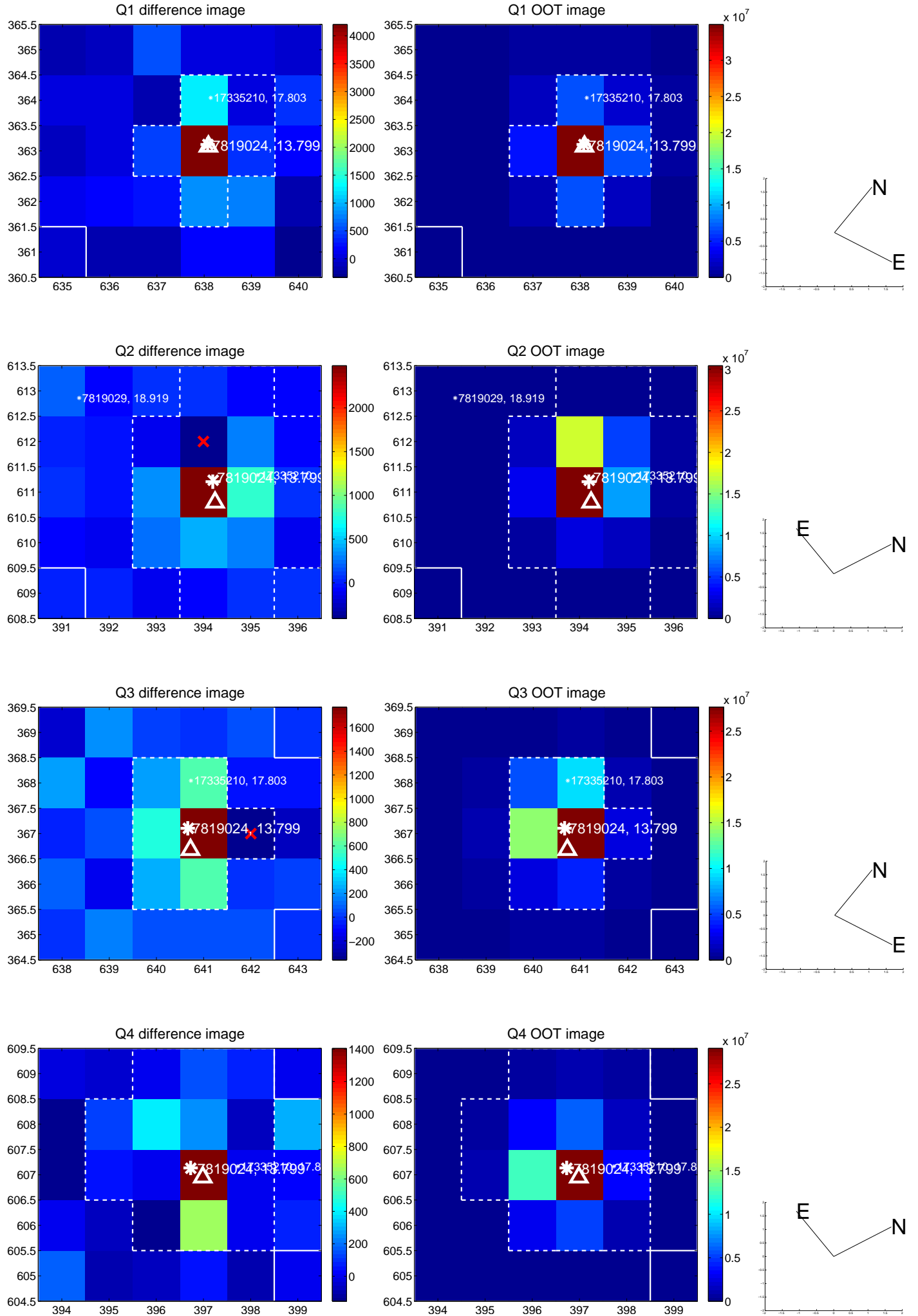
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.290 \pm 0.222$	1.30	$-0.027 \pm 0.260$	$-0.289 \pm 0.226$
PRF-fit source offset from KIC position	$0.326 \pm 0.208$	1.57	$-0.044 \pm 0.263$	$-0.323 \pm 0.213$
photometric centroid source offset	$0.59 \pm 0.42$	1.41	$-0.53 \pm 0.42$	$0.27 \pm 0.43$

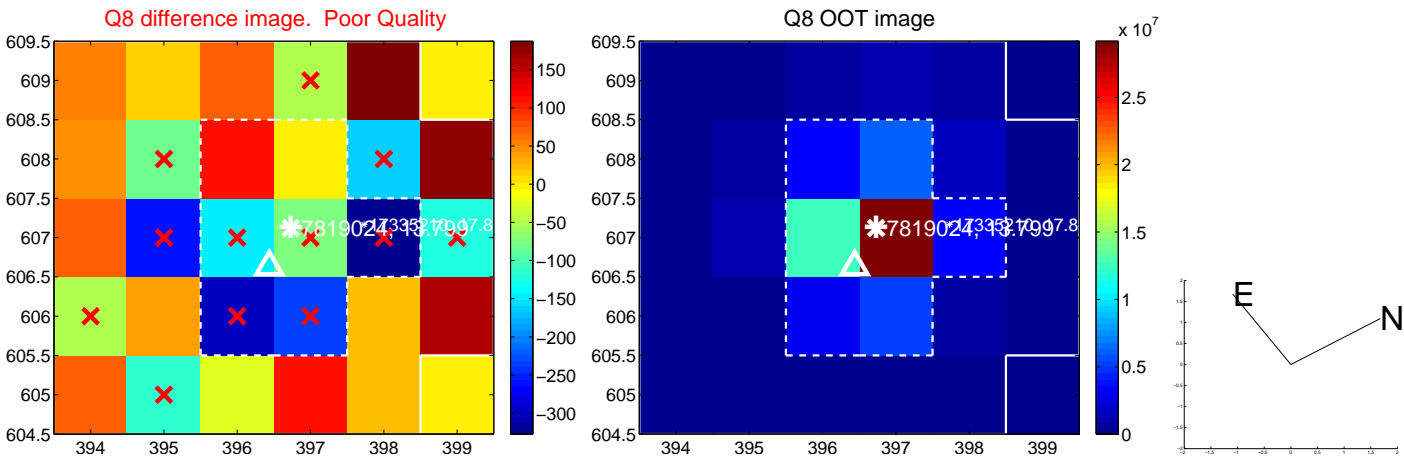
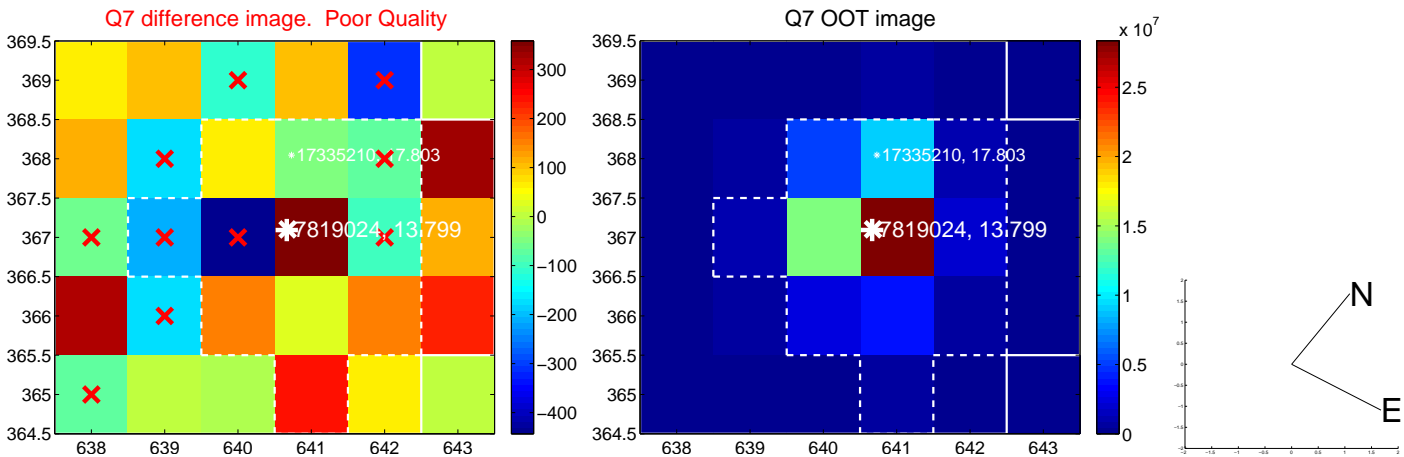
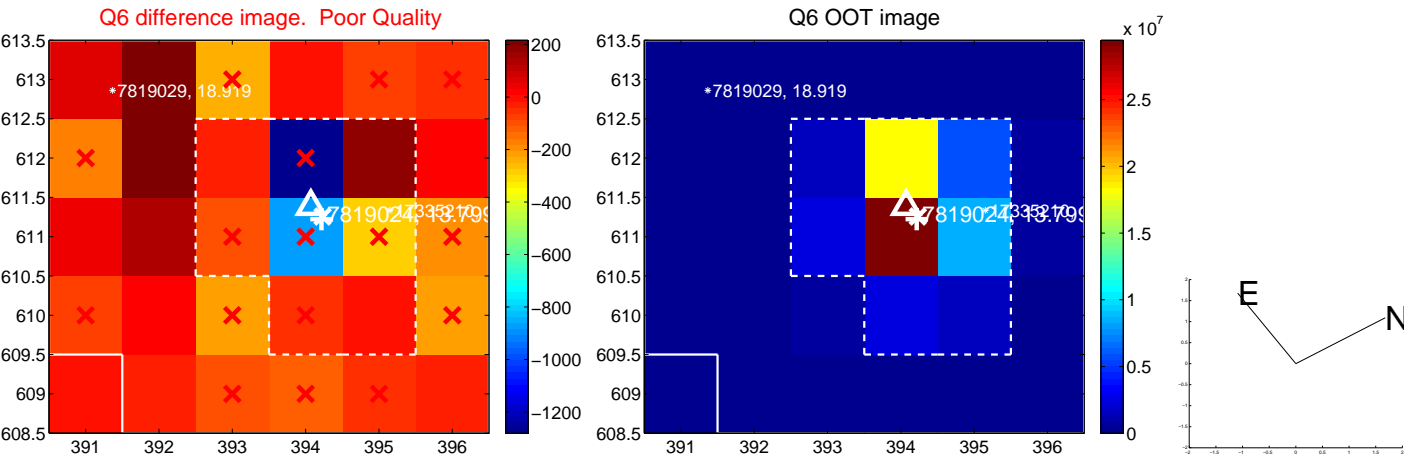
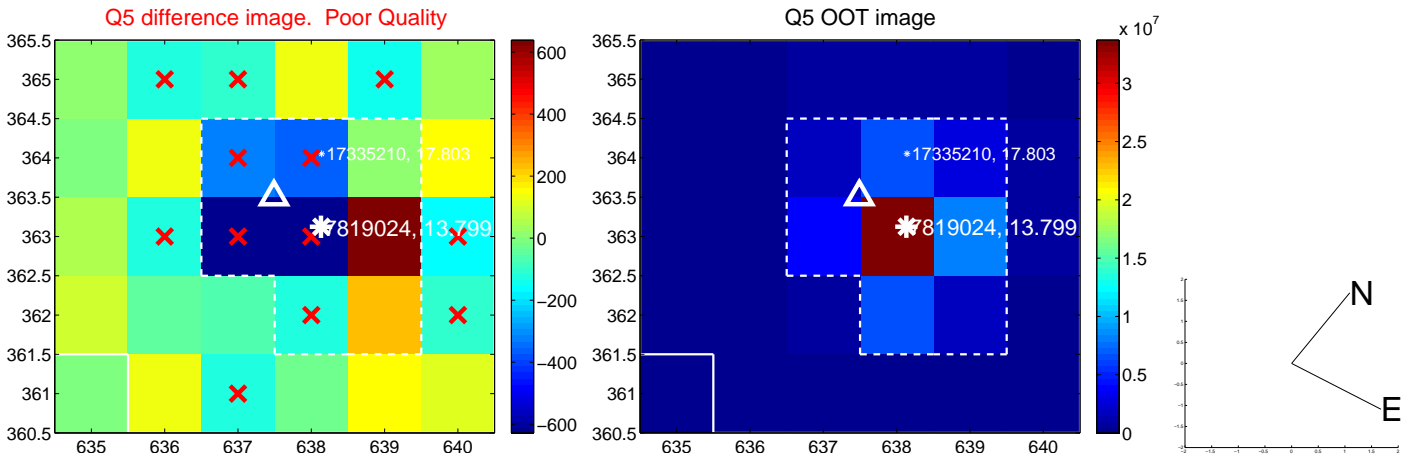


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

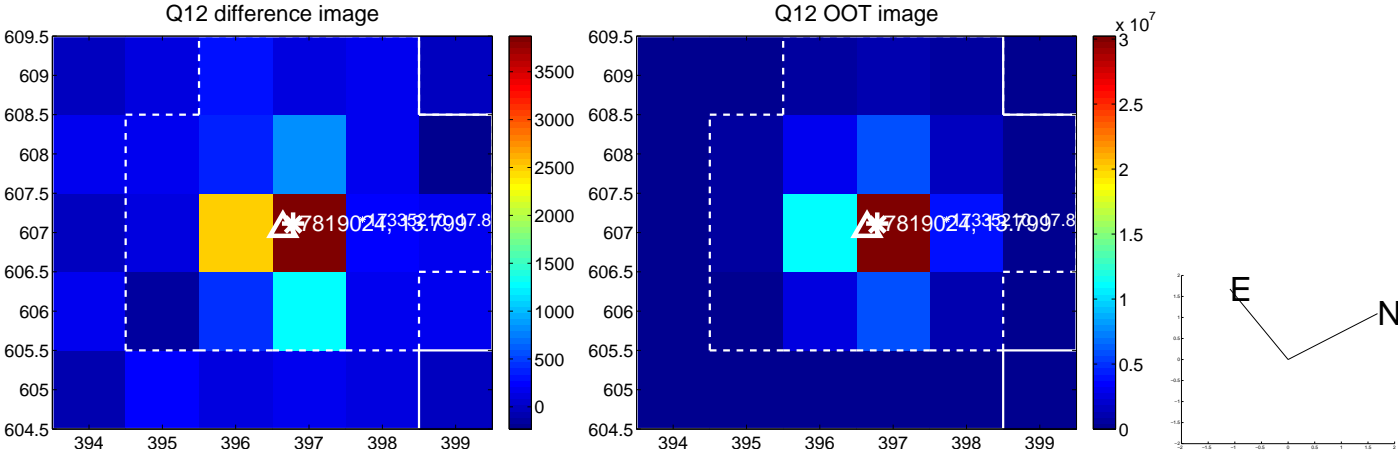
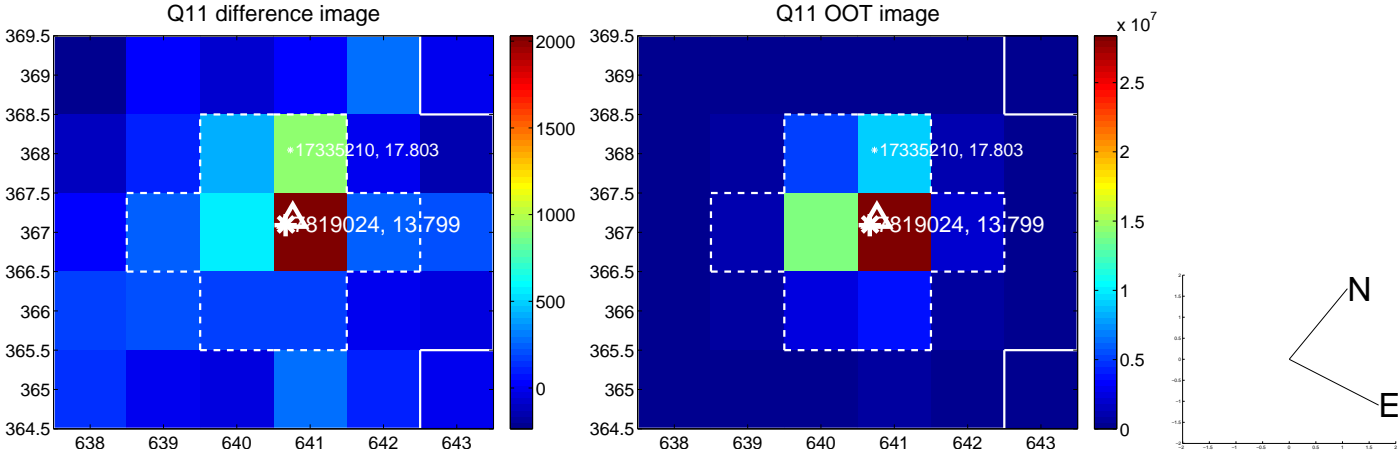
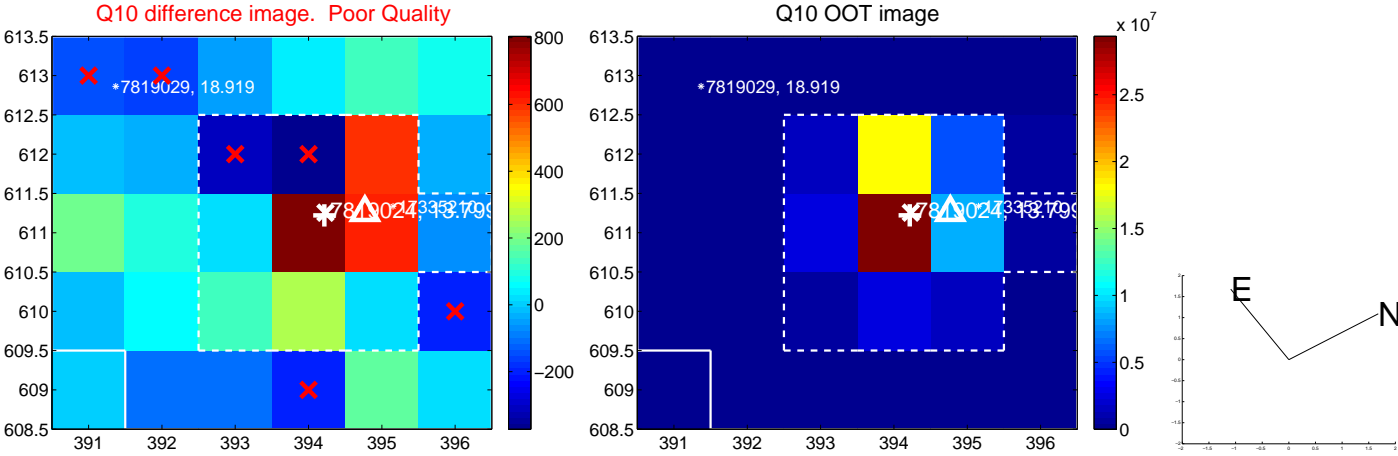
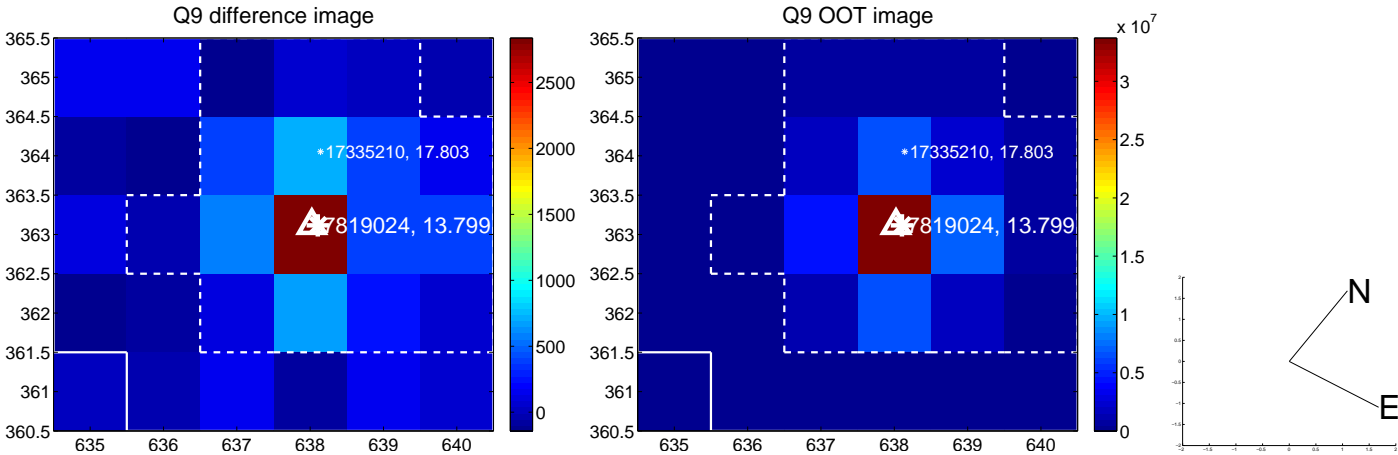
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

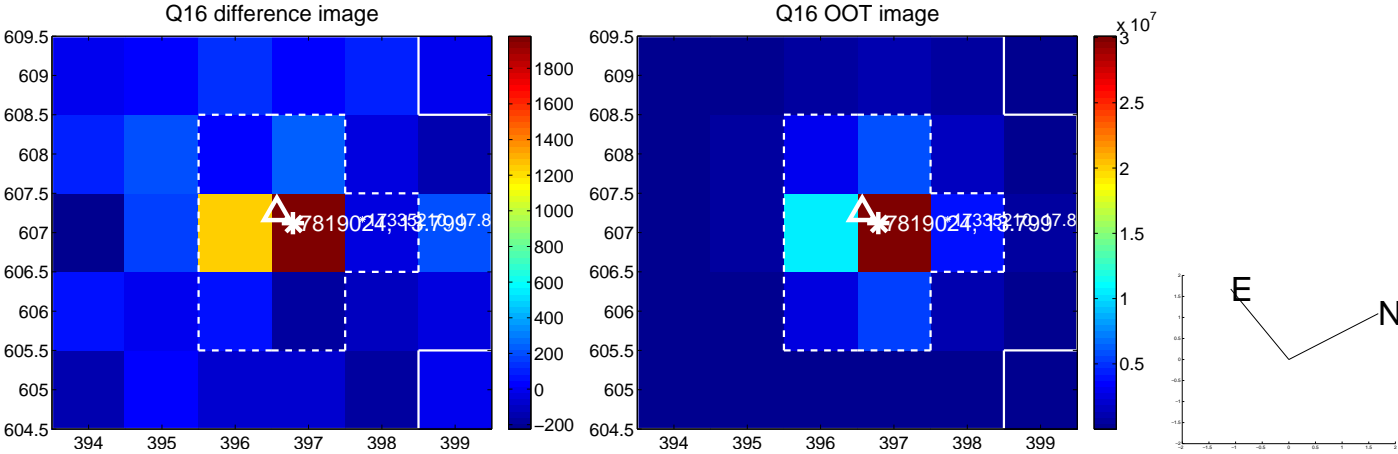
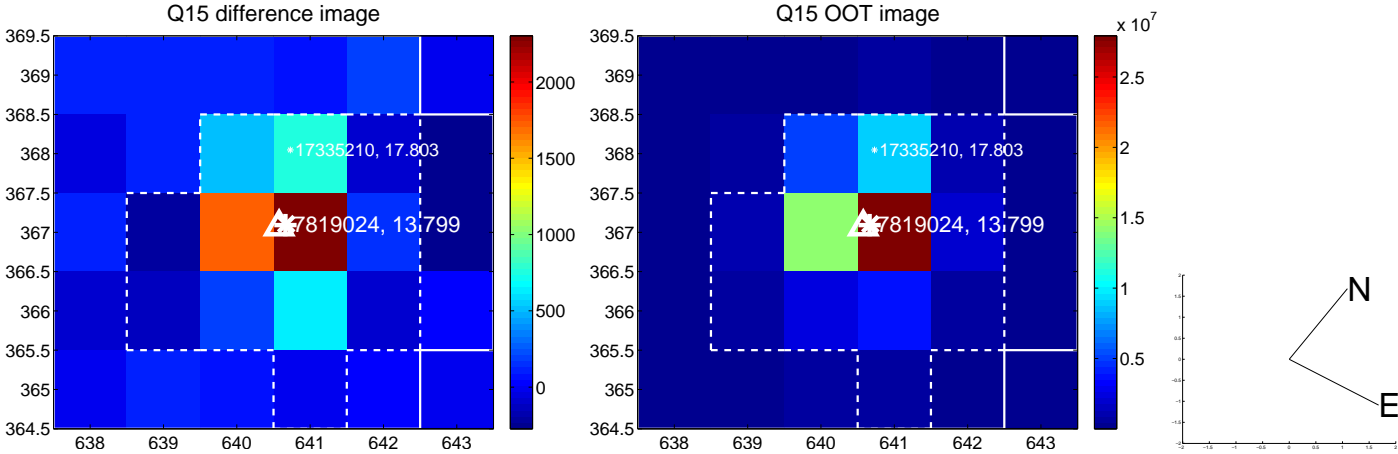
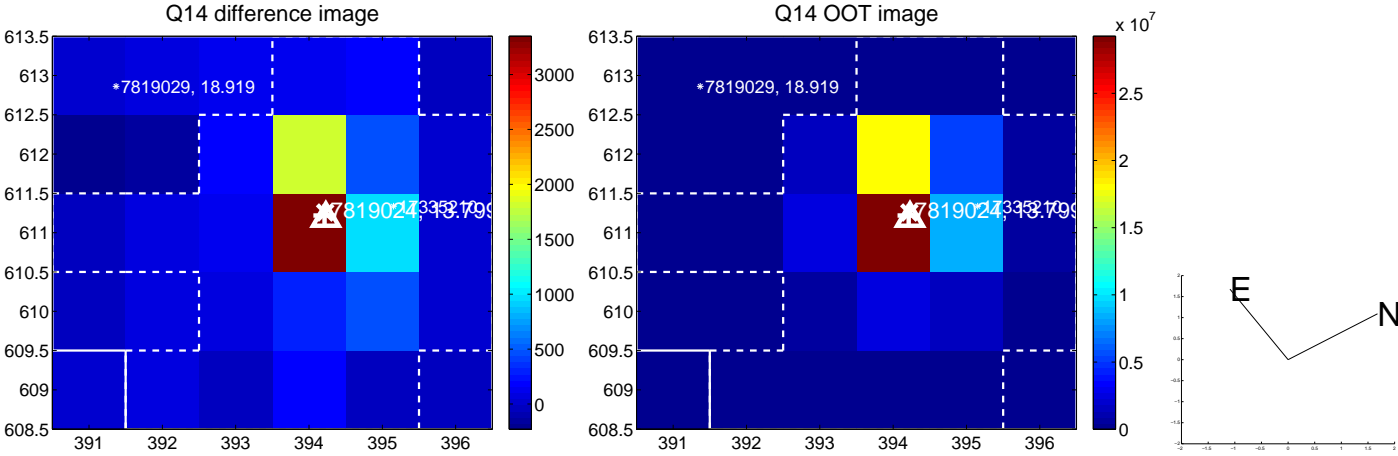
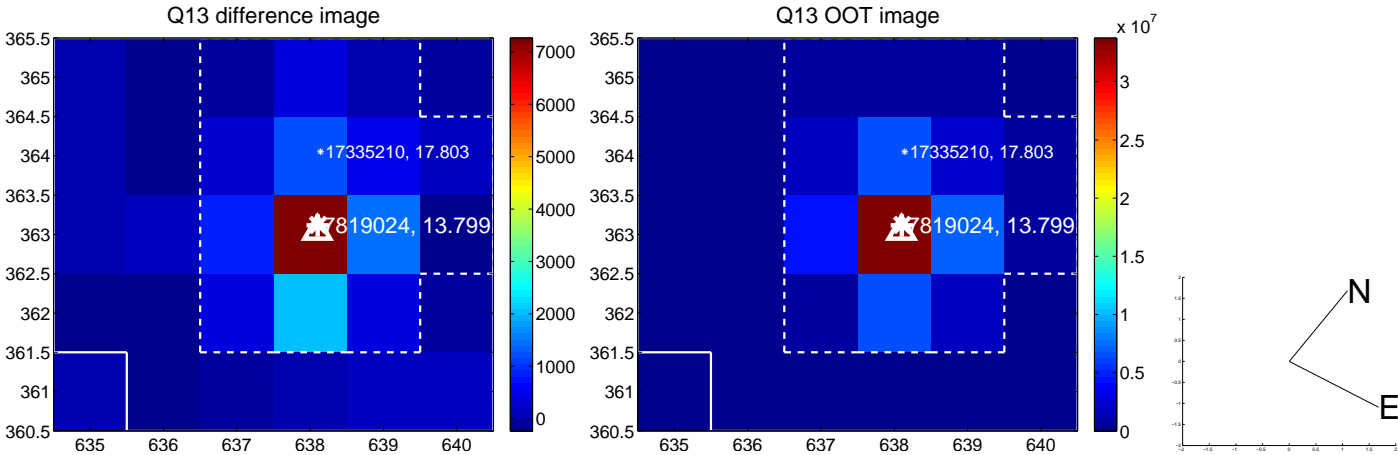


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

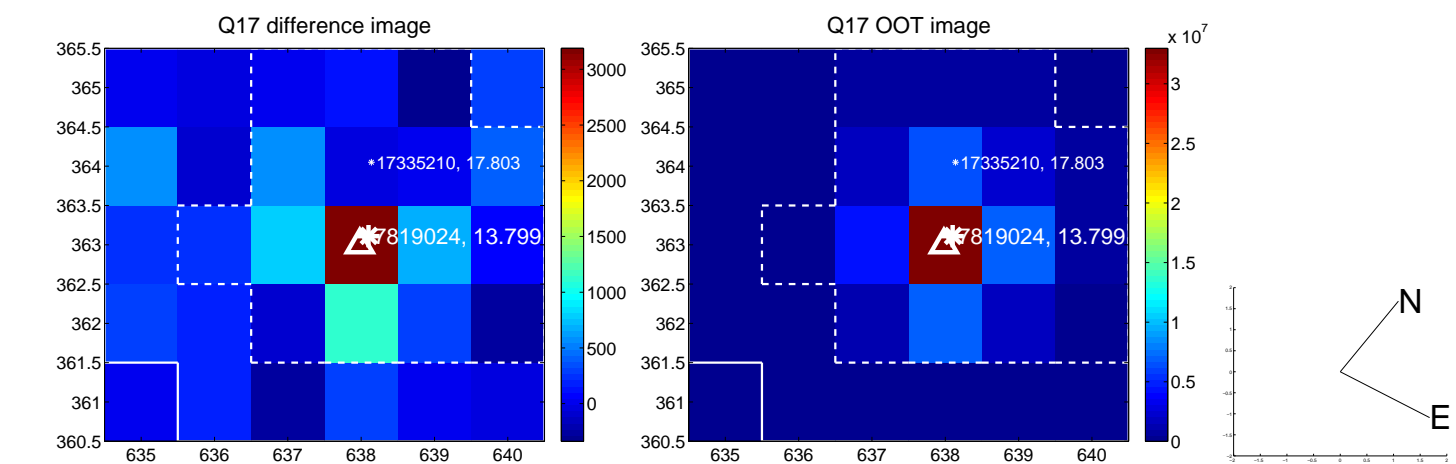




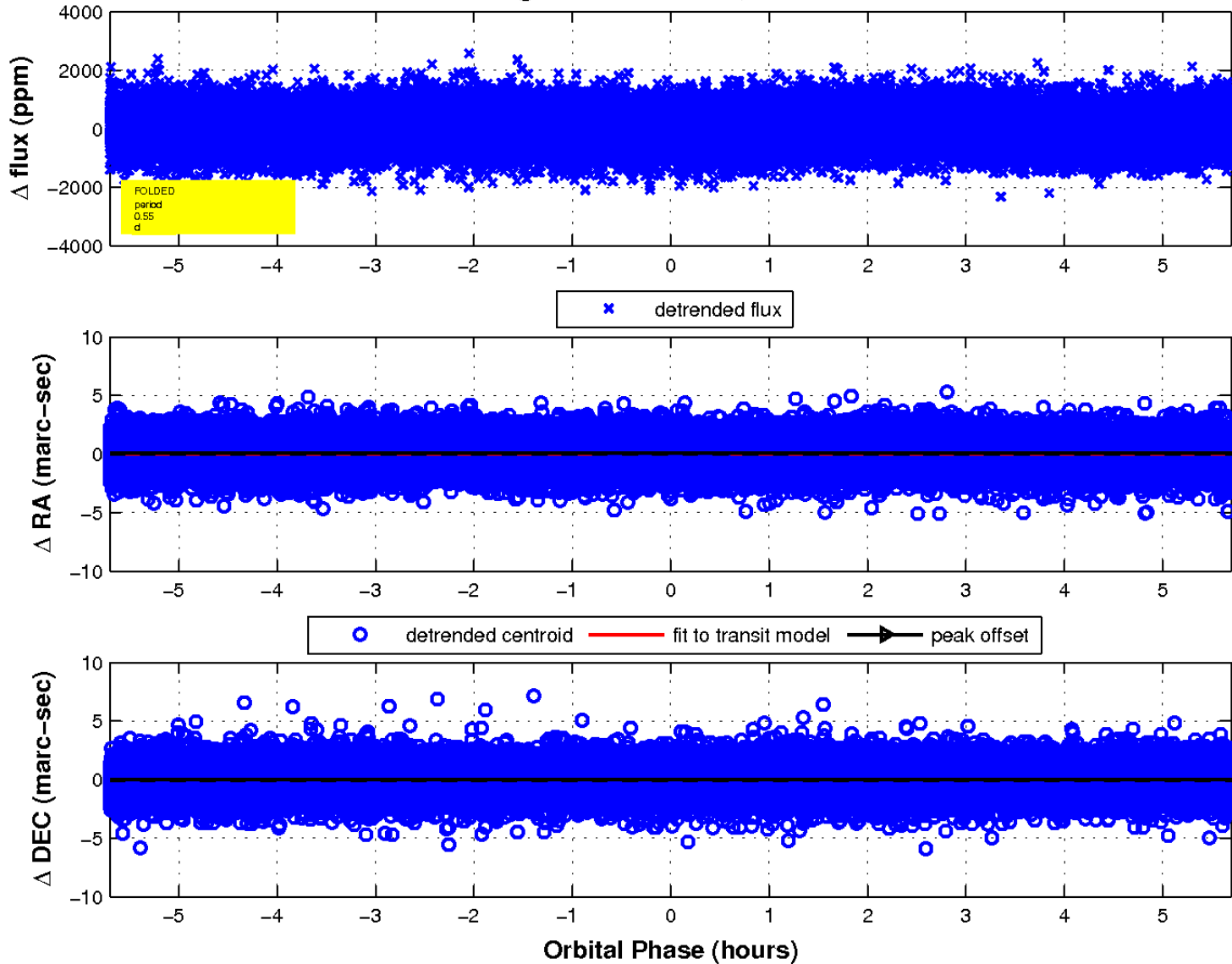
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

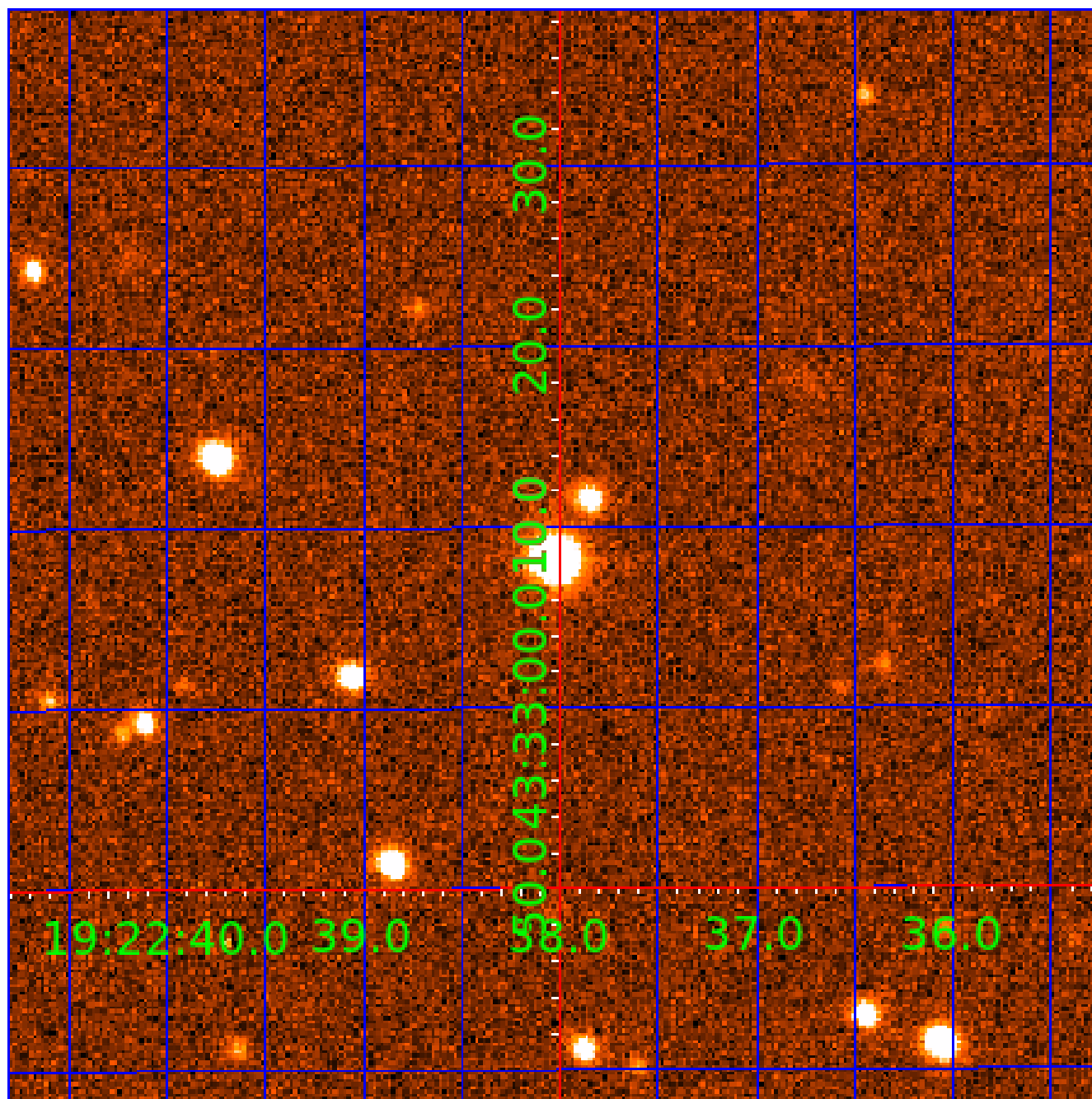


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination





# KIC 007819024

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007819024-01	OBS	No	0.545465	131.924570	77.8	1.900	11.7	12.2	1.80	7389	1.84	39269.06
007819024-02	OBS	No	0.545462	131.750210	82.4	0.770	11.5	12.5	1.80	7389	1.93	39269.37
007819024-03	OBS	No	7.959401	138.131527	449.2	5.497	9.2	12.3	1.80	7389	4.83	1101.29
007819024-04	OBS	No	41.406704	158.600020	833.5	5.931	8.8	9.2	1.80	7389	9.74	122.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007819024-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
007819024-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

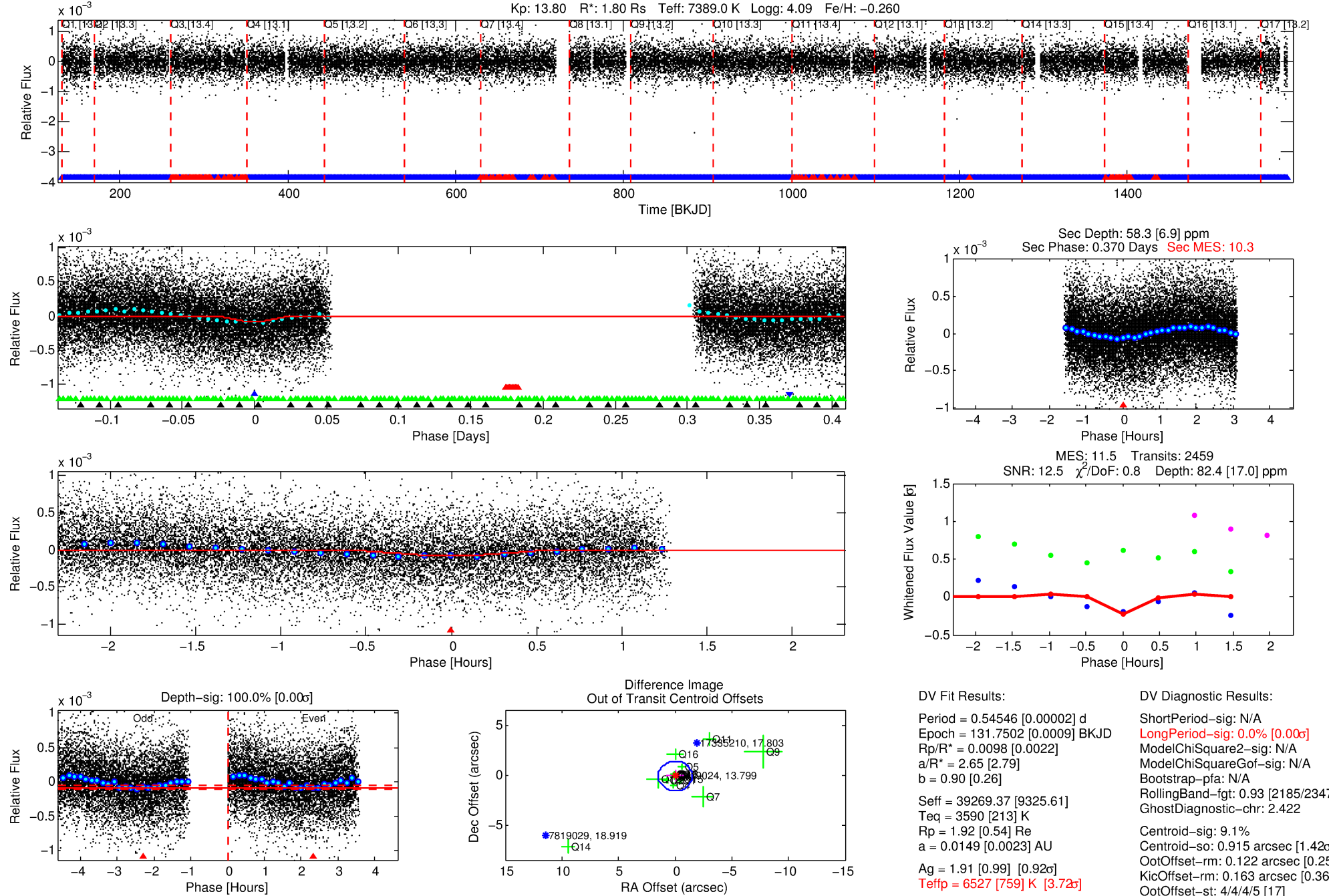
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007819024-02

No Significant Match Found

# DV One-Page Summary

KIC: 7819024 Candidate: 2 of 4 Period: 0.545 d



## DV Fit Results:

Period = 0.54546 [0.00002] d  
Epoch = 131.7502 [0.0009] BKJD  
Rp/R\* = 0.0098 [0.0022]  
a/R\* = 2.65 [2.79]  
b = 0.90 [0.26]  
Seff = 39269.37 [9325.61]  
Teff = 3590 [213] K  
Rp = 1.92 [0.54] Re  
a = 0.0149 [0.0023] AU  
Ag = 1.91 [0.99] [0.92σ]  
Teffp = 6527 [759] K [3.72σ]

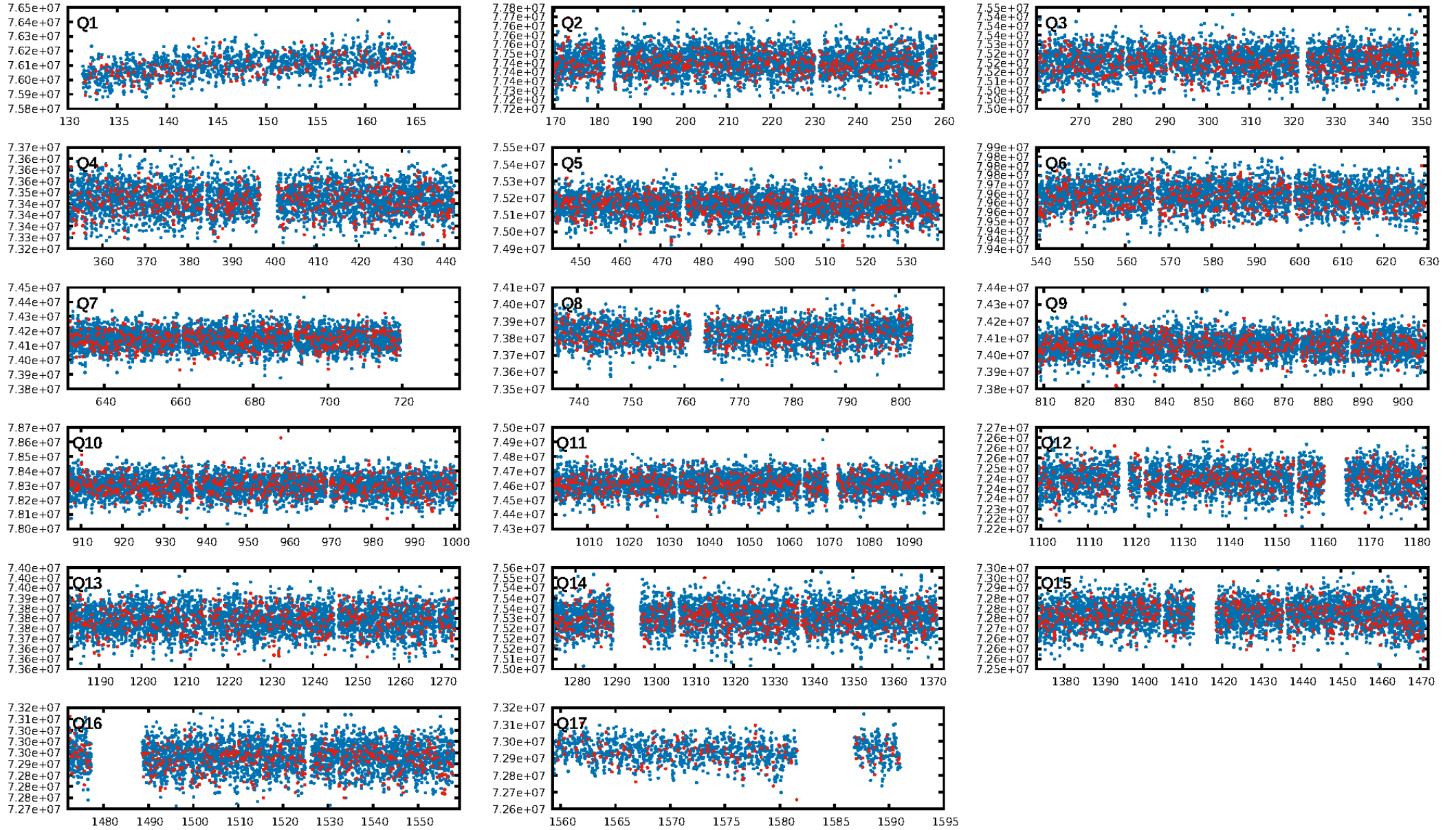
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.93 [2185/2347]  
GhostDiagnostic-chr: 2.422  
Centroid-sig: 9.1%  
Centroid-so: 0.915 arcsec [1.42σ]  
OotOffset-rm: 0.122 arcsec [0.25σ]  
KicOffset-rm: 0.163 arcsec [0.36σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.76 [13/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:29:06 Z

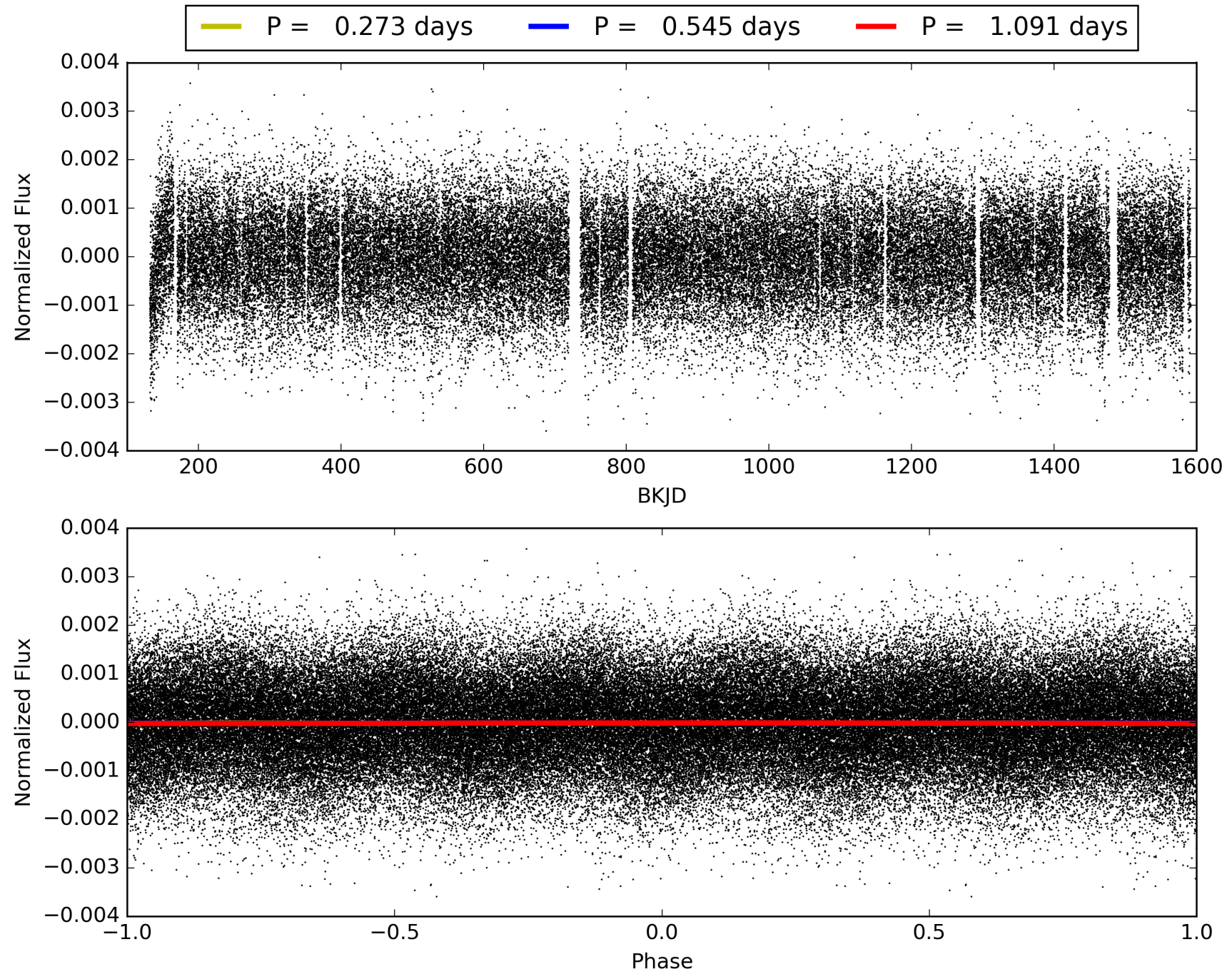
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007819024-02, PDC Light Curves





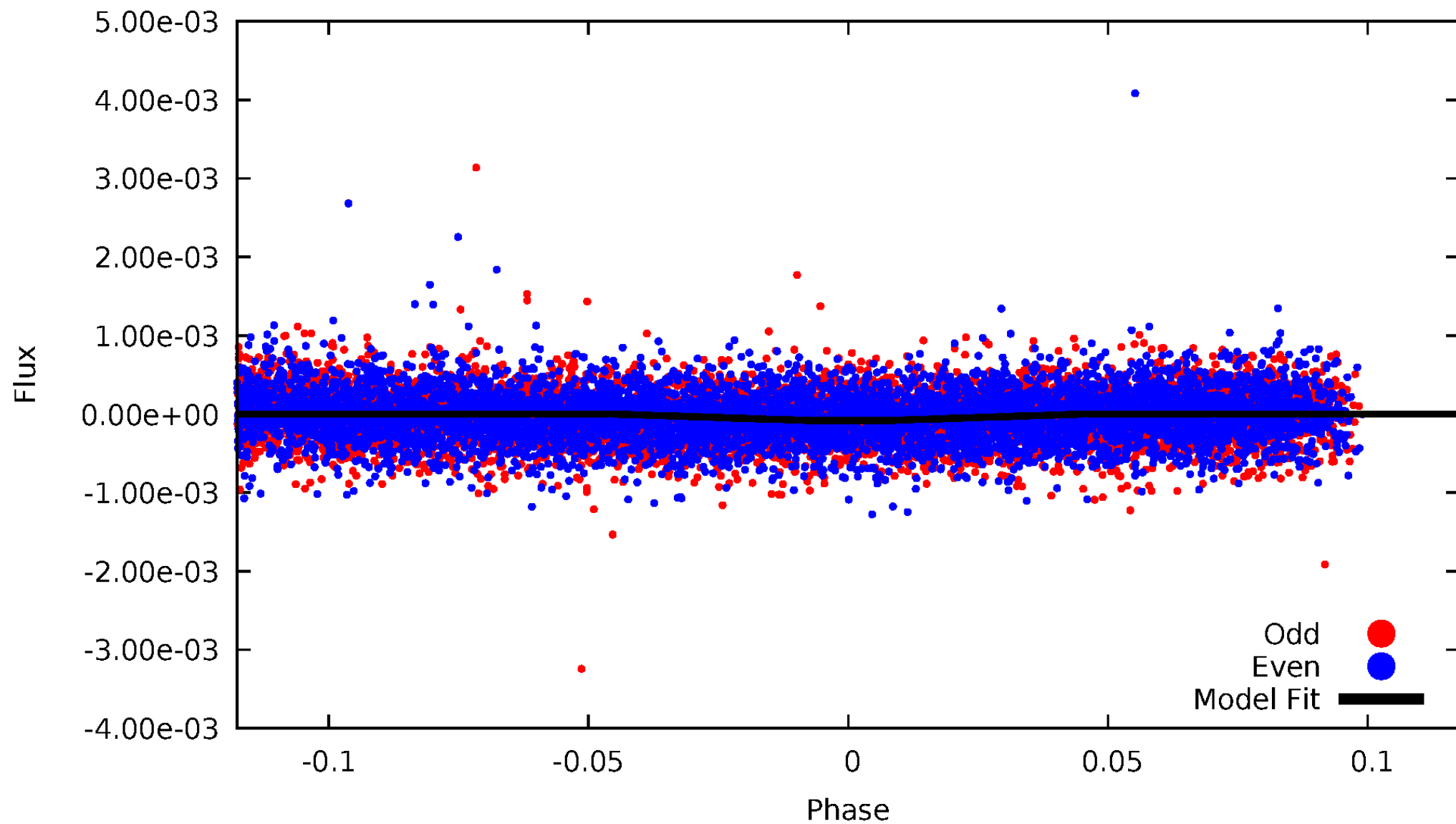
TCE 007819024-02





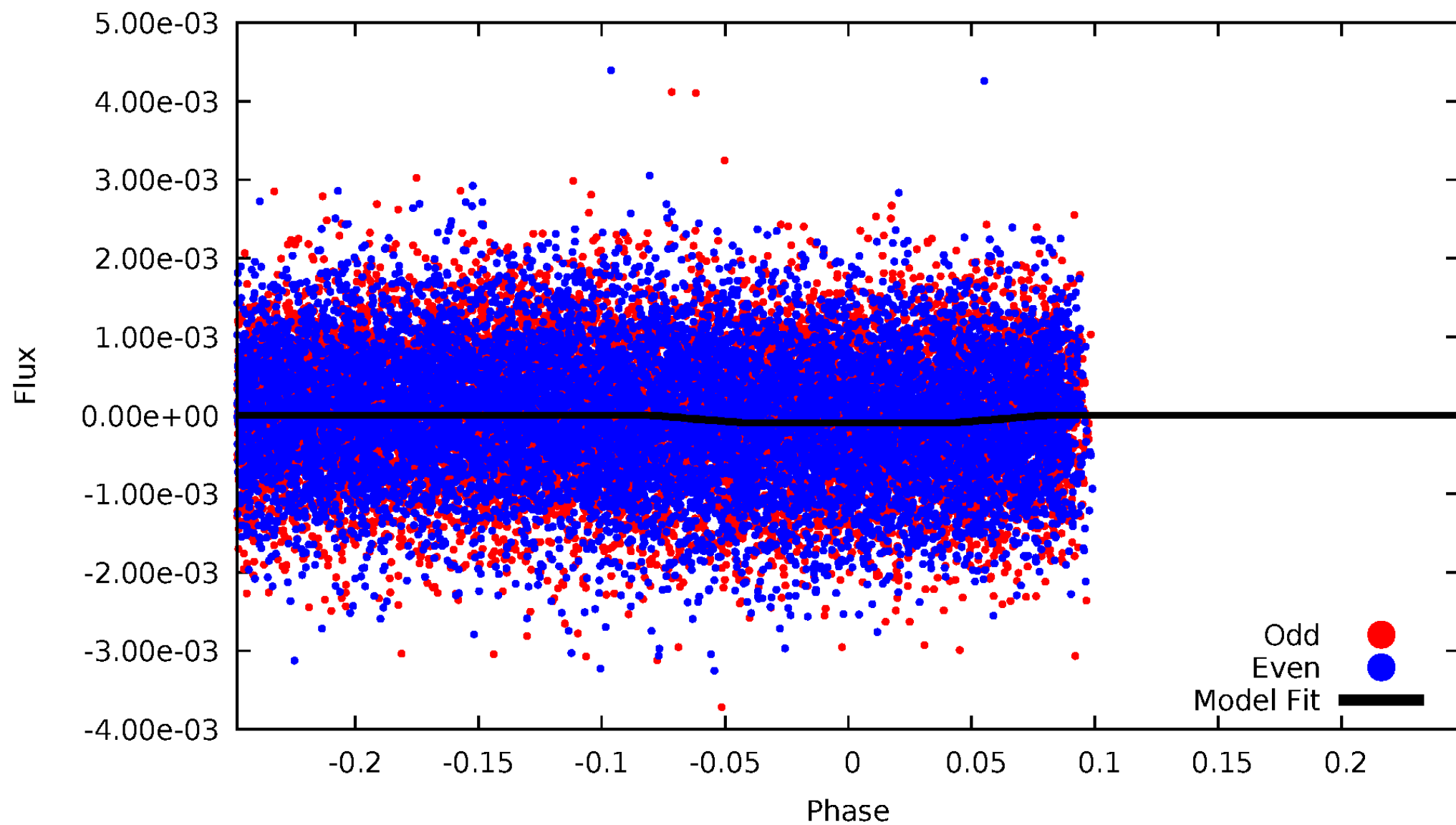
# DV Odd/Even

TCE 007819024-02



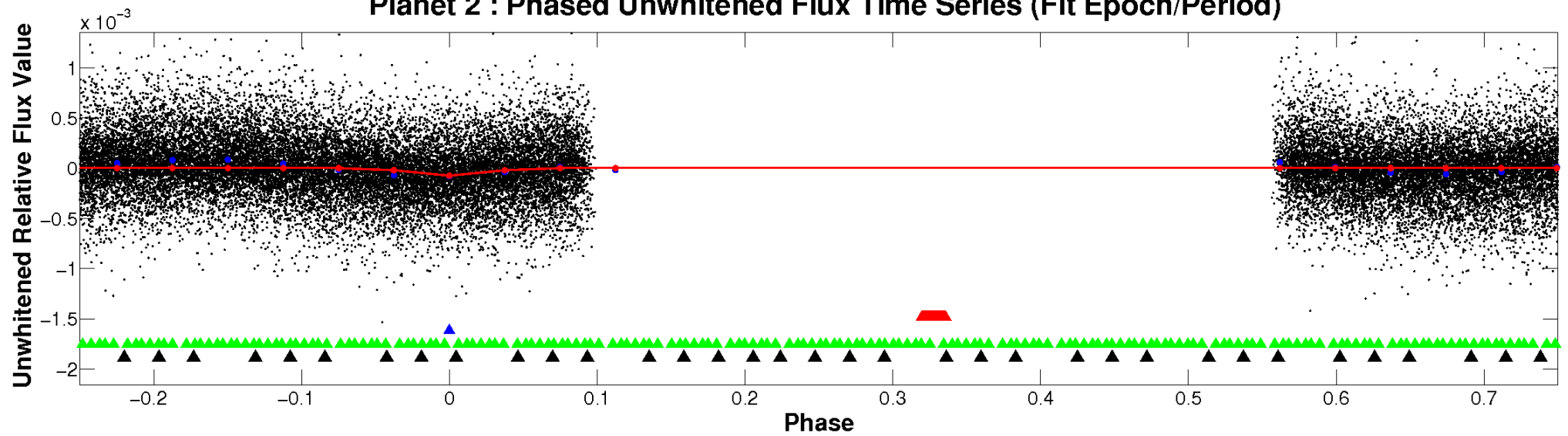
# ALT Odd/Even

TCE 007819024-02

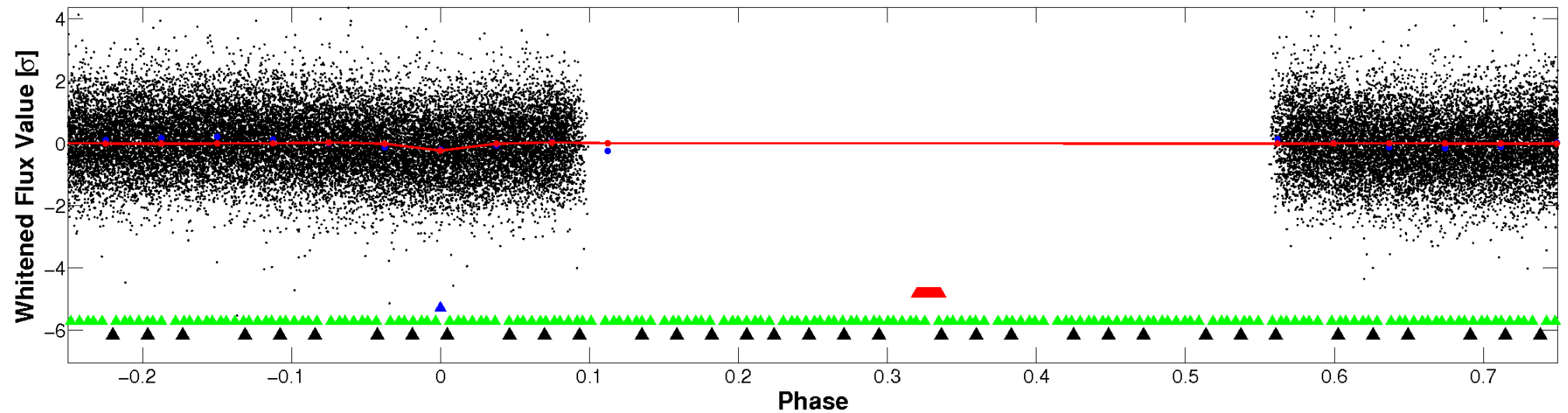


# Non-Whitened Vs. Whitened Light Curve

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

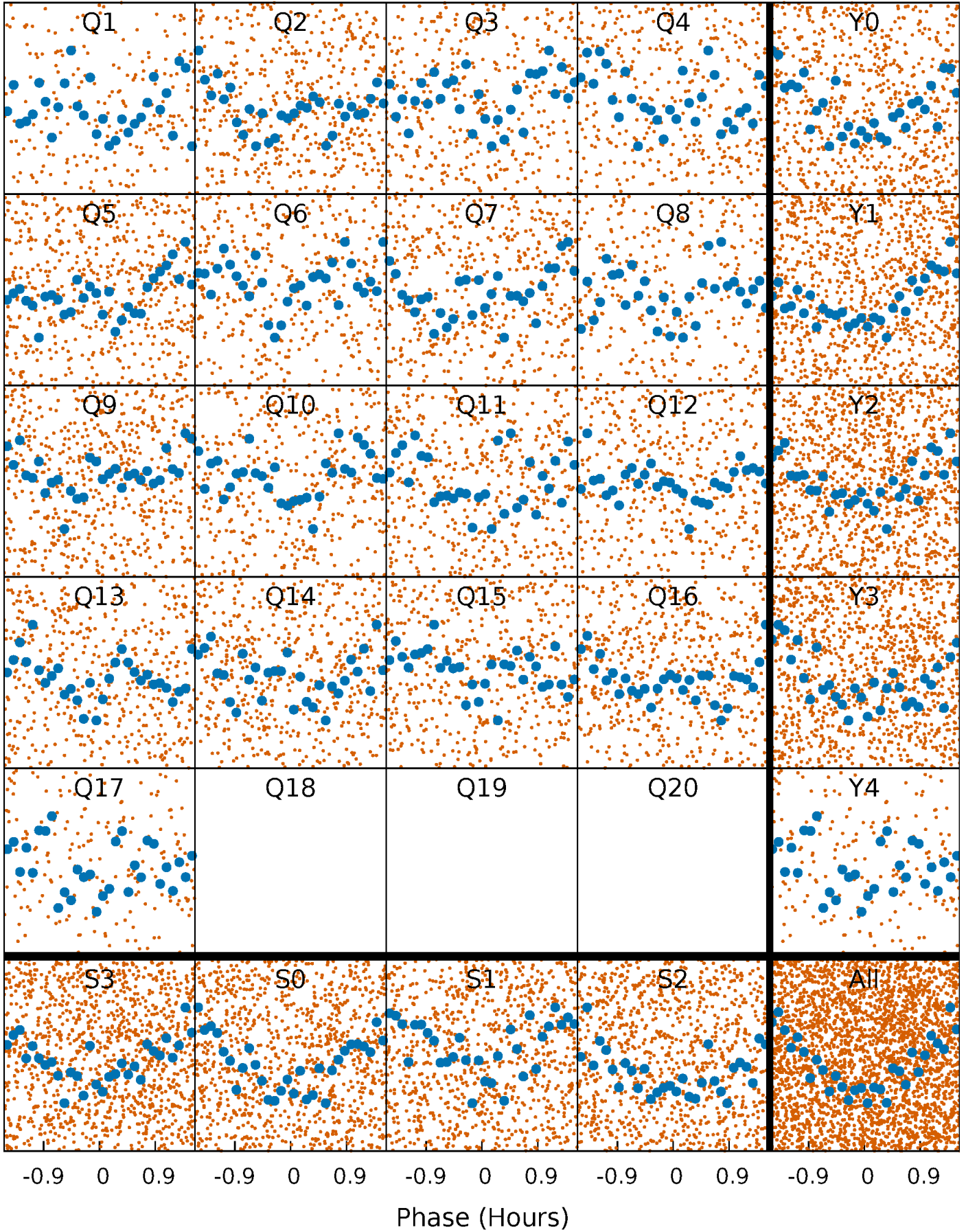


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



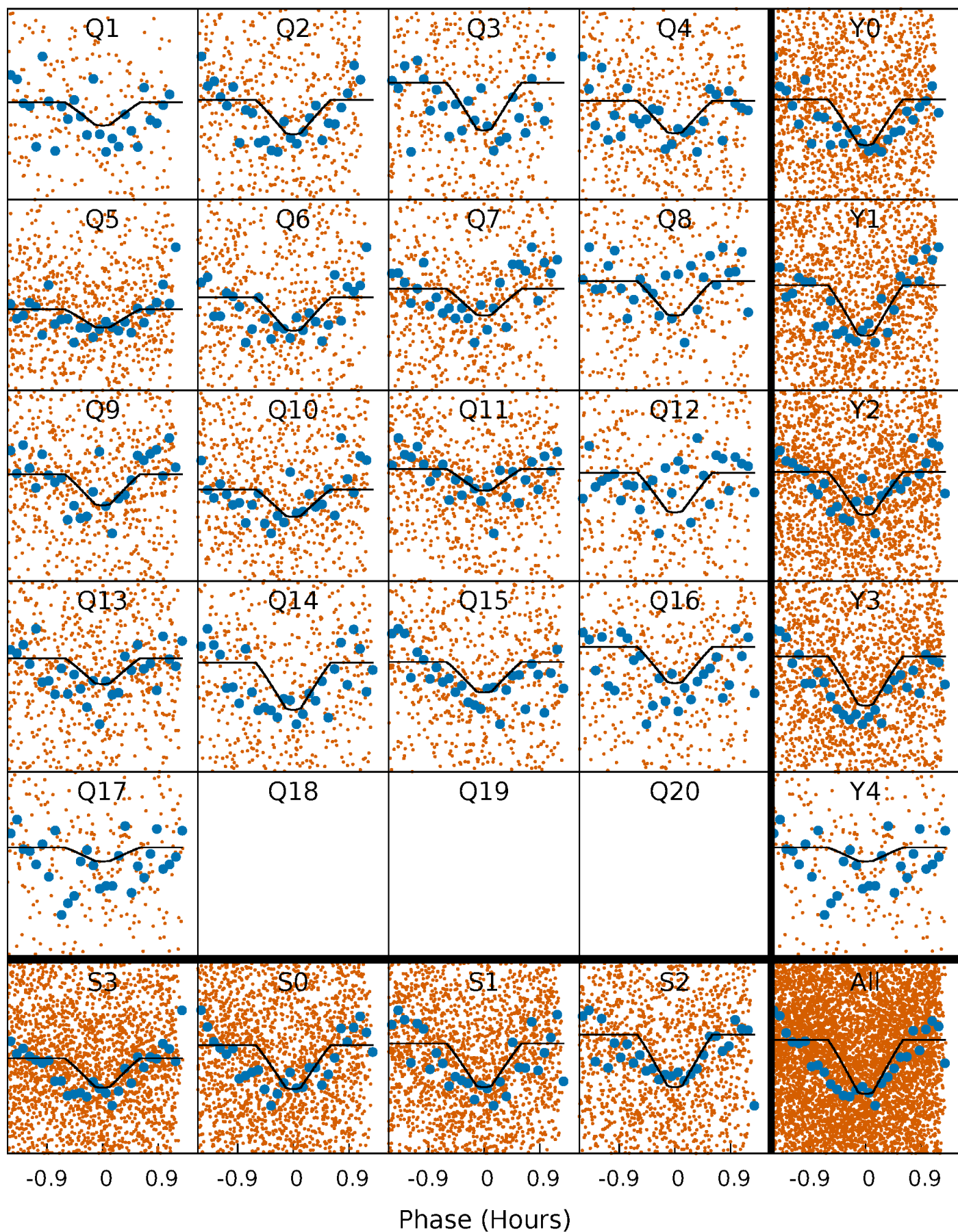
# PDC Quarter-Phased Transit Curves

TCE 007819024-02   P= 0.545462 Days    $T_0=131.750210$  (BKJD)



# DV Quarter-Phased Transit Curves

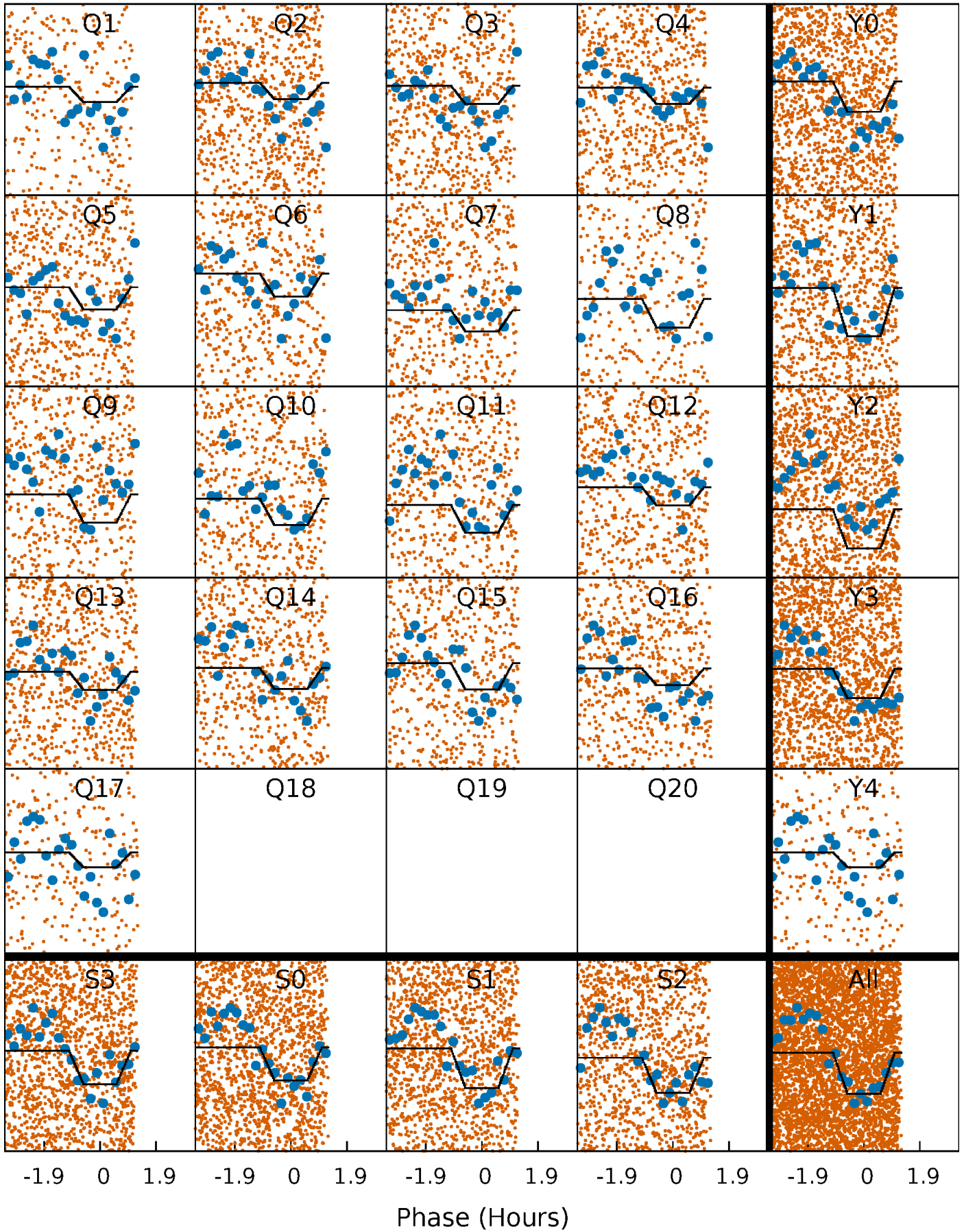
TCE 007819024-02     $P = 0.545462$  Days     $T_0 = 131.750210$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

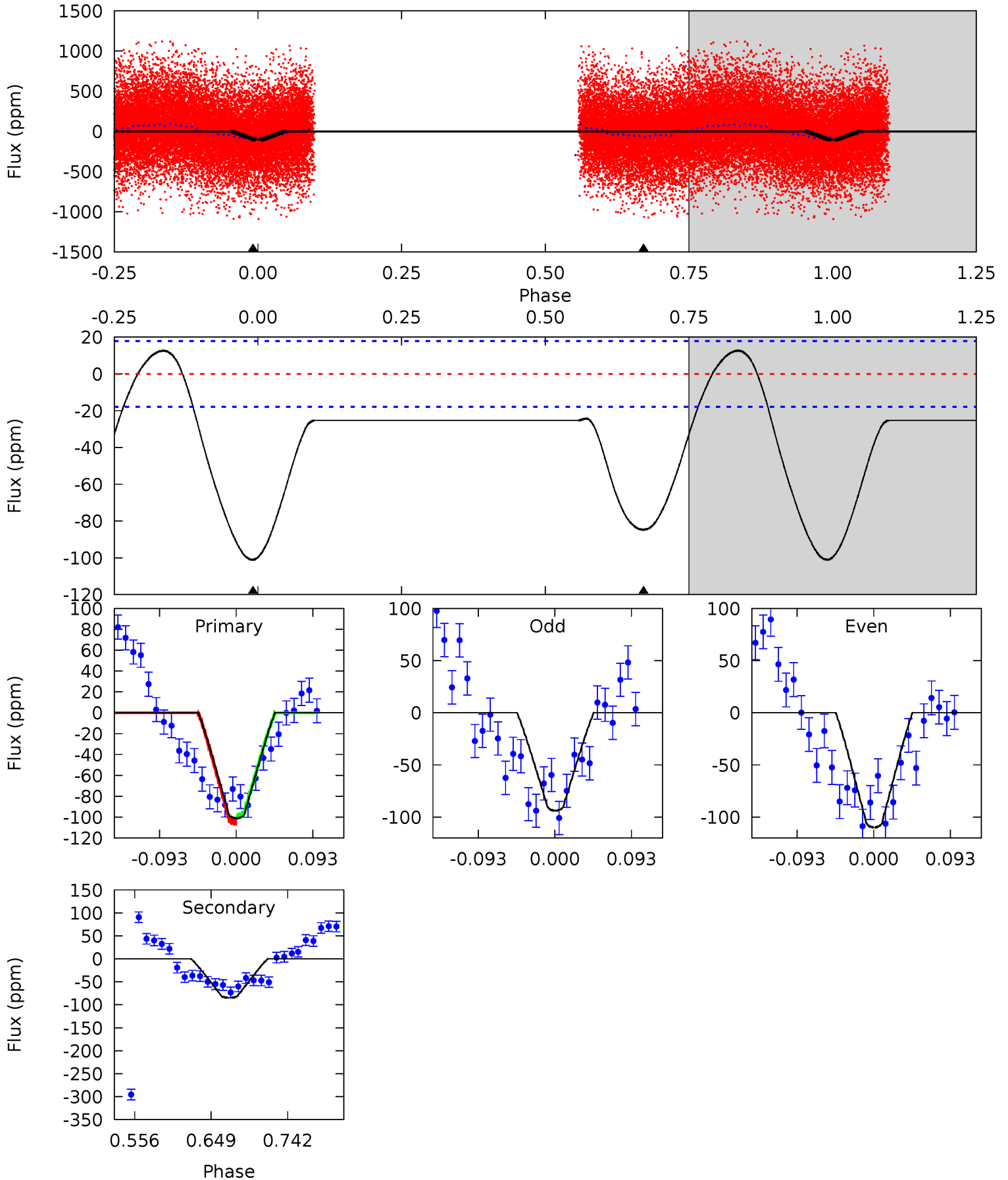
TCE 007819024-02 P= 0.545462 Days  $T_0=131.750210$  (BKJD)



# DV Model-Shift Uniqueness Test

007819024-02, P = 0.545462 Days, E = 131.204748 Days

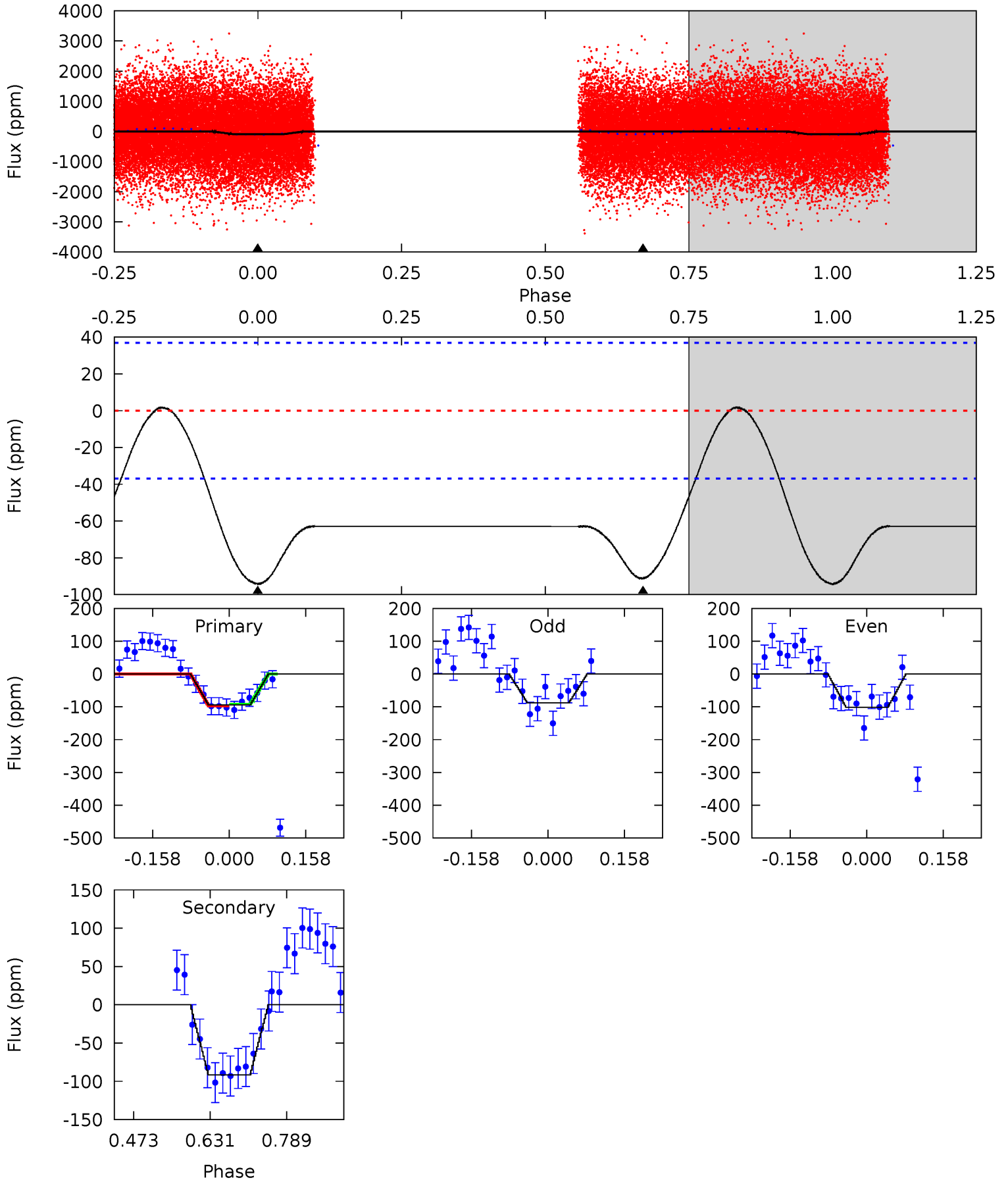
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.9	21.7	0	0	4.58	1.68	3.58	25.9	25.9	21.7	21.7	2.08	0.94	0.11	0.83



# Alt Model-Shift Uniqueness Test

007819024-02, P = 0.545462 Days, E = 131.204748 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
11.4	11.1	0	0	4.47	1.41	0.23	11.4	11.4	11.1	11.1	0.83	1.36	0.02	0.31



### Stellar Parameters For KIC 007819024

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7389^{+73}_{-88}$	$4.094^{+0.132}_{-0.108}$	$-0.260^{+0.150}_{-0.150}$	$1.802^{+0.309}_{-0.309}$	$1.468^{+0.127}_{-0.115}$	$0.353^{+0.204}_{-0.120}$
	+1%/-1%	+3%/-3%	+58%/-58%	+17%/-17%	+9%/-8%	+58%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007819024-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-85 \pm 4$	$1.89^{+0.48}_{-0.45}$	$5009^{+235}_{-229}$	$6968^{+1246}_{-835}$	$2.855^{+2.151}_{-1.013}$
Alt.	$-91 \pm 8$	$1.94^{+0.49}_{-0.46}$	$5017^{+208}_{-229}$	$7044^{+1201}_{-901}$	$2.963^{+2.154}_{-1.068}$

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



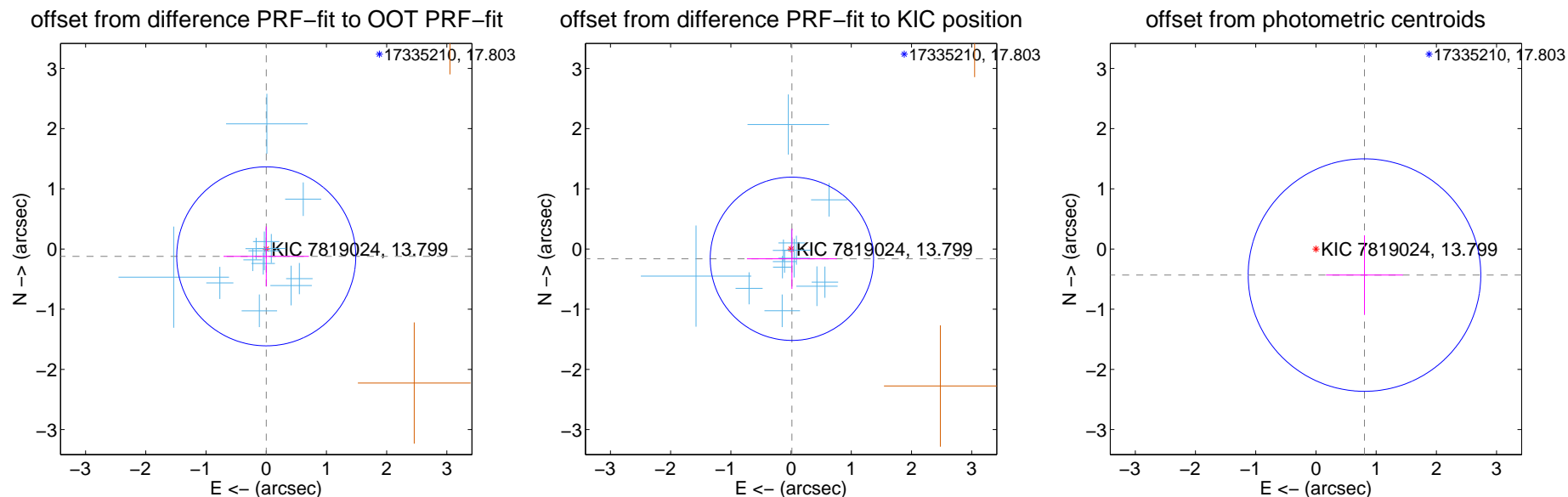
## DV Centroid Data

Supplemental centroid analysis for 007819024-02. Kepler magnitude: 13.80. Transit SNR 12.48

There are 13 quarters with good PRF difference image offsets

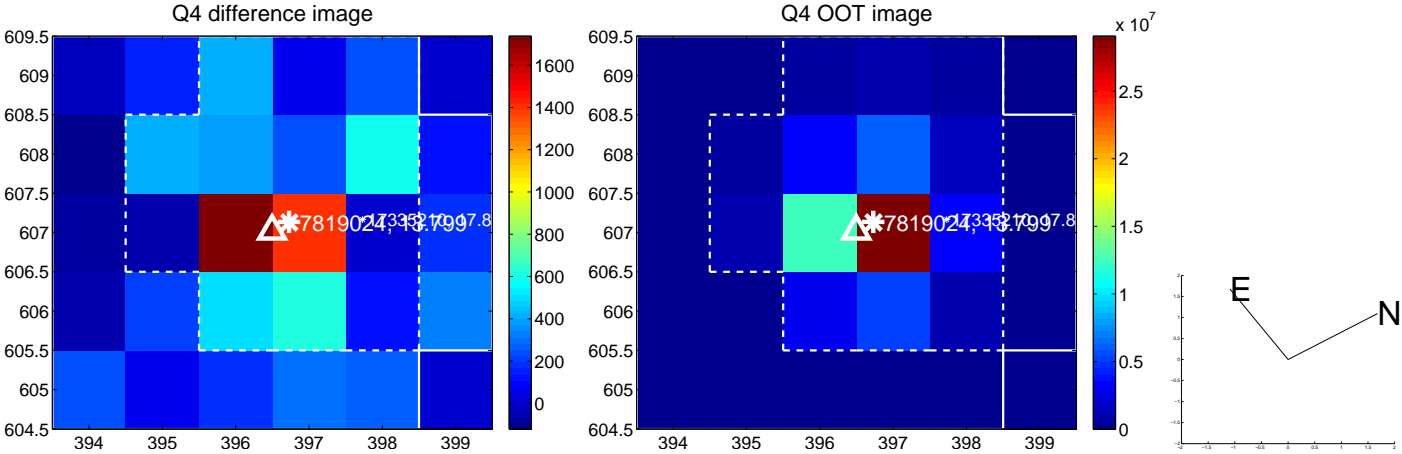
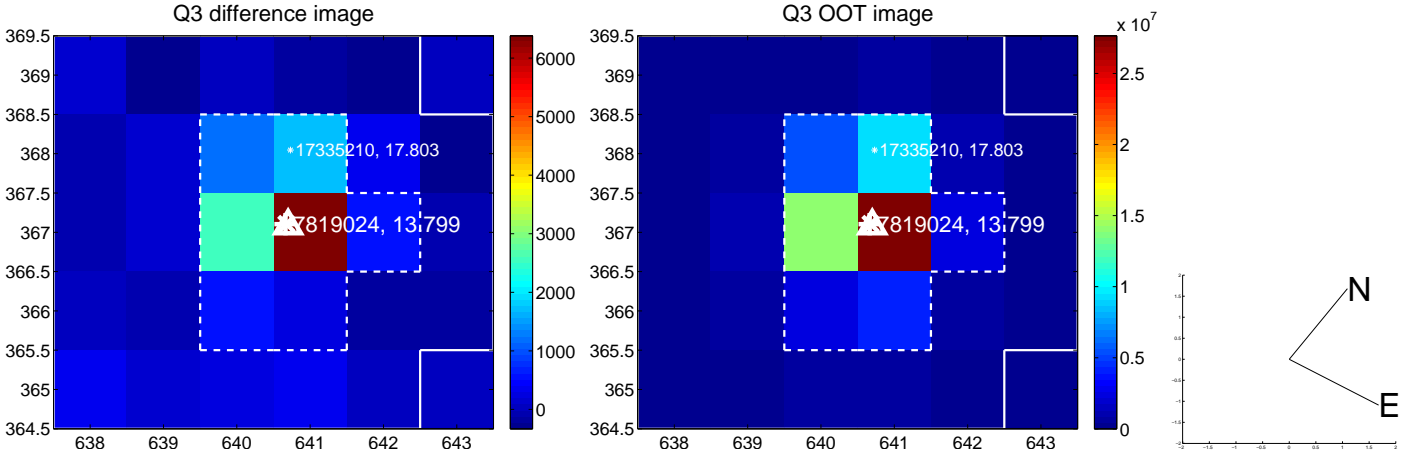
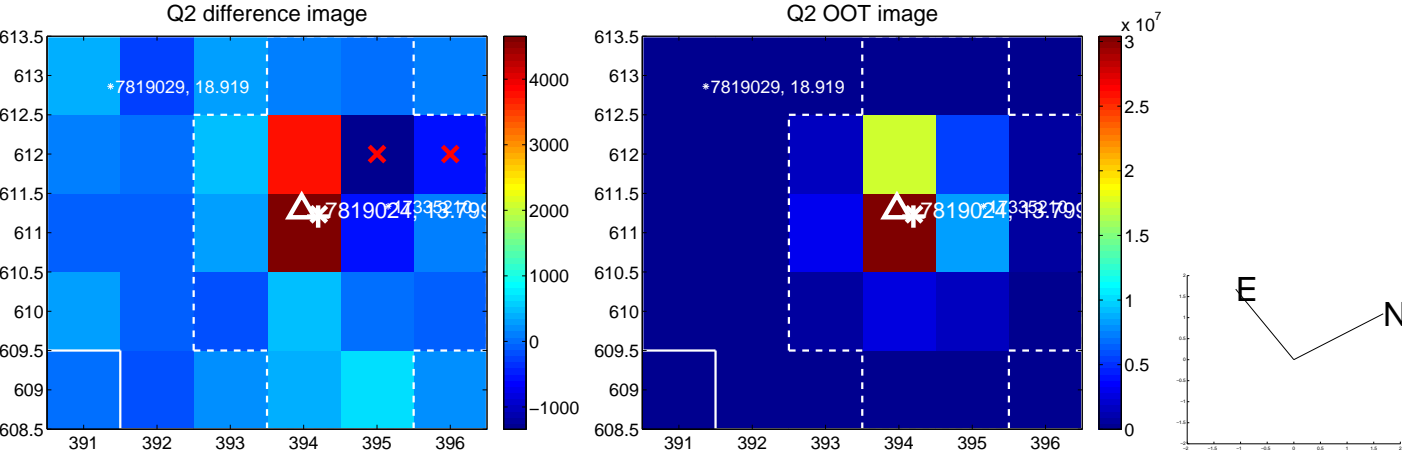
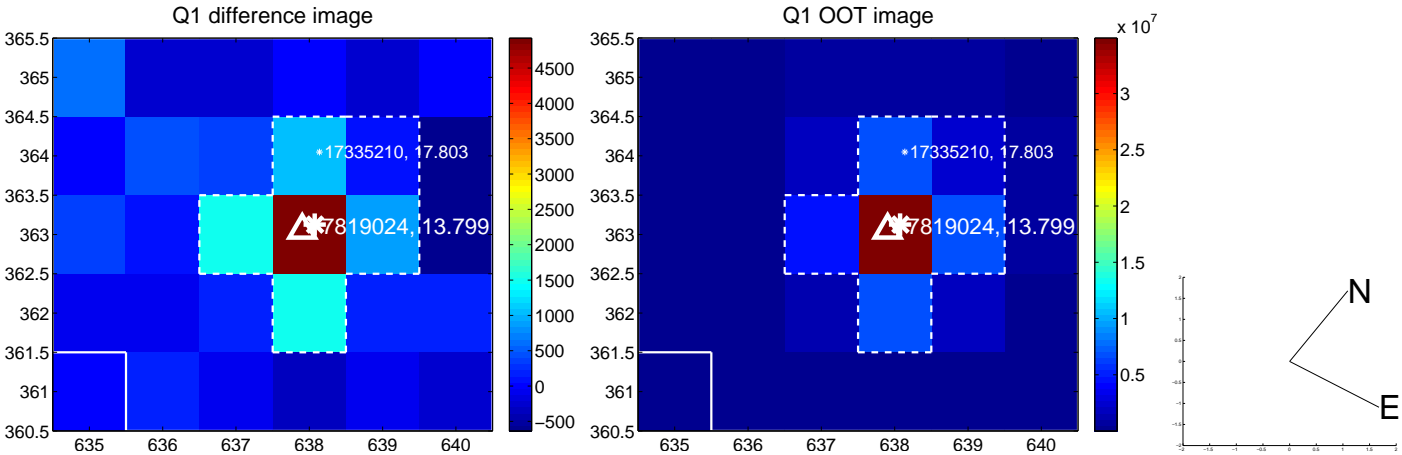
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.122 \pm 0.496$	0.25	$-0.001 \pm 0.709$	$-0.122 \pm 0.498$
PRF-fit source offset from KIC position	$0.163 \pm 0.452$	0.36	$-0.013 \pm 0.746$	$-0.162 \pm 0.500$
photometric centroid source offset	$0.92 \pm 0.64$	1.42	$-0.81 \pm 0.64$	$-0.43 \pm 0.66$

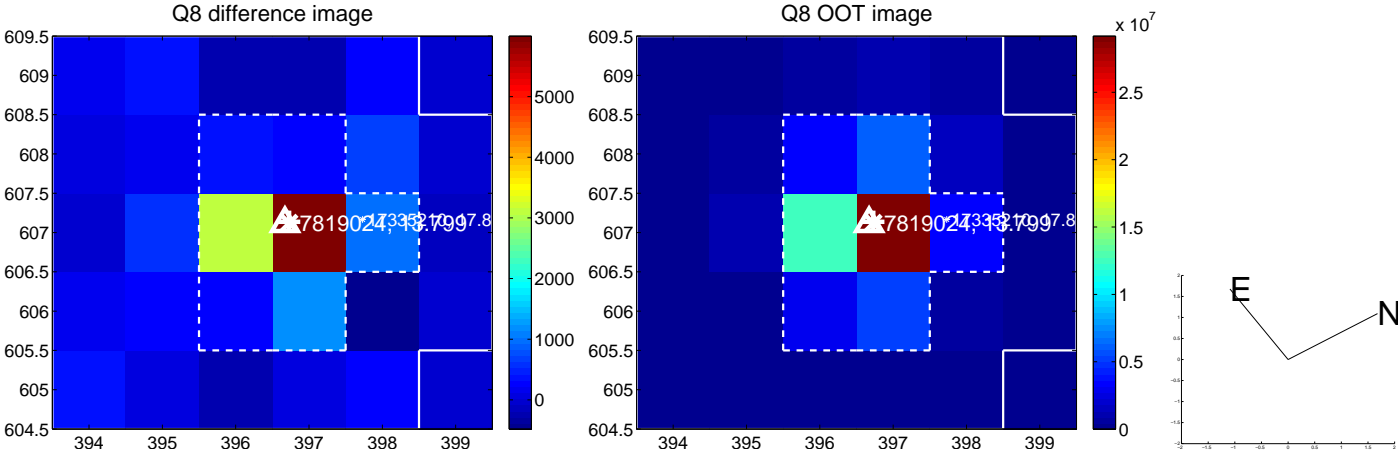
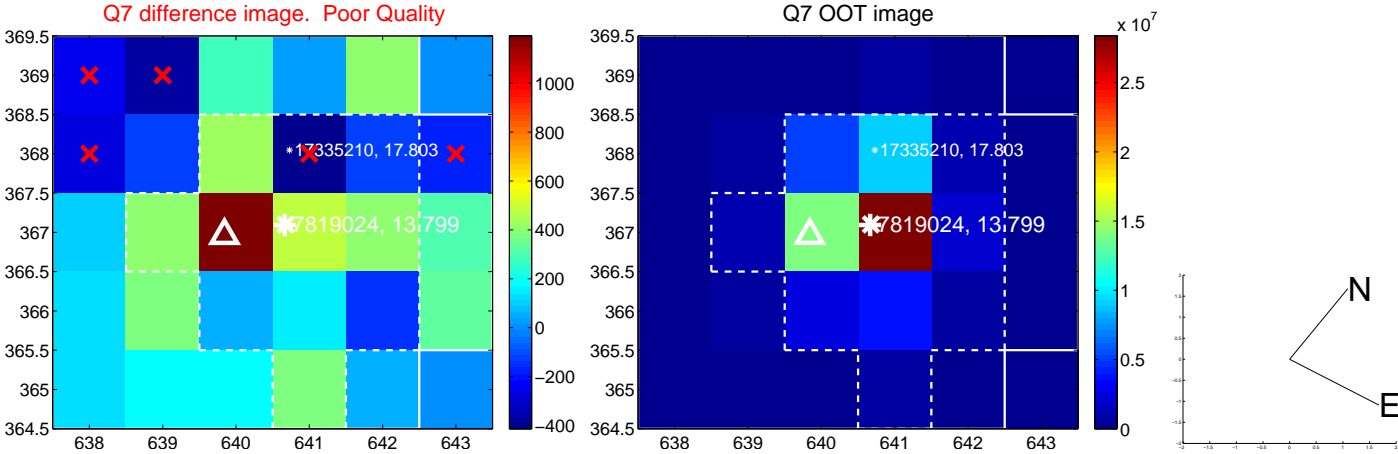
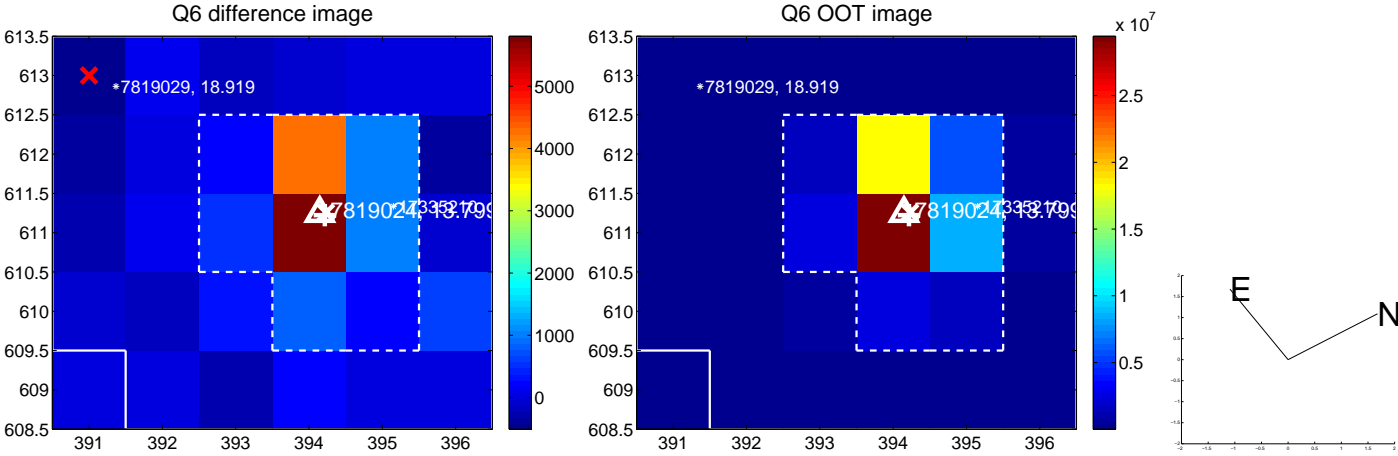
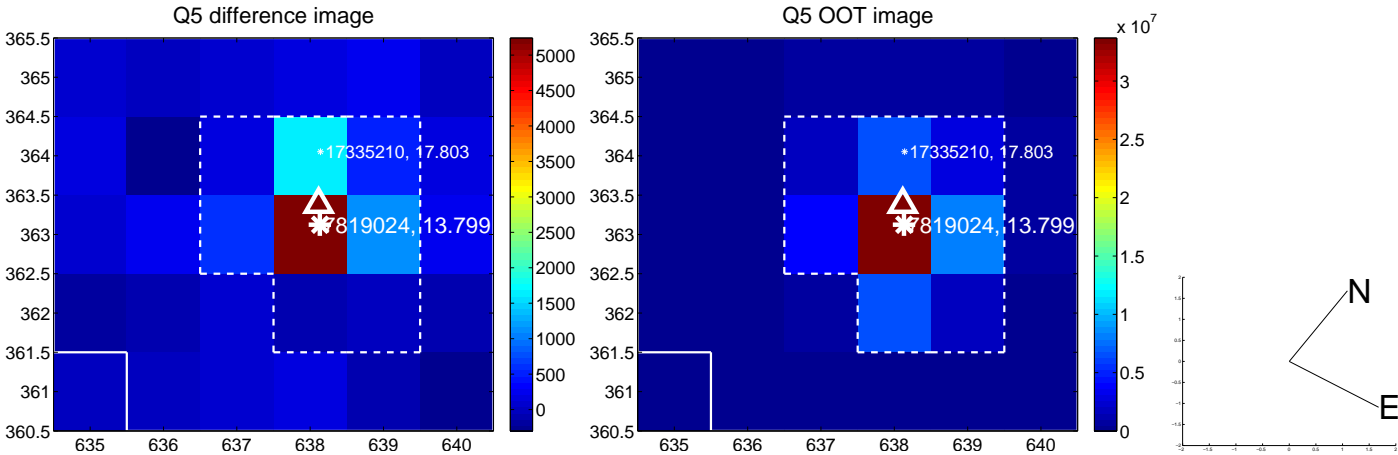


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

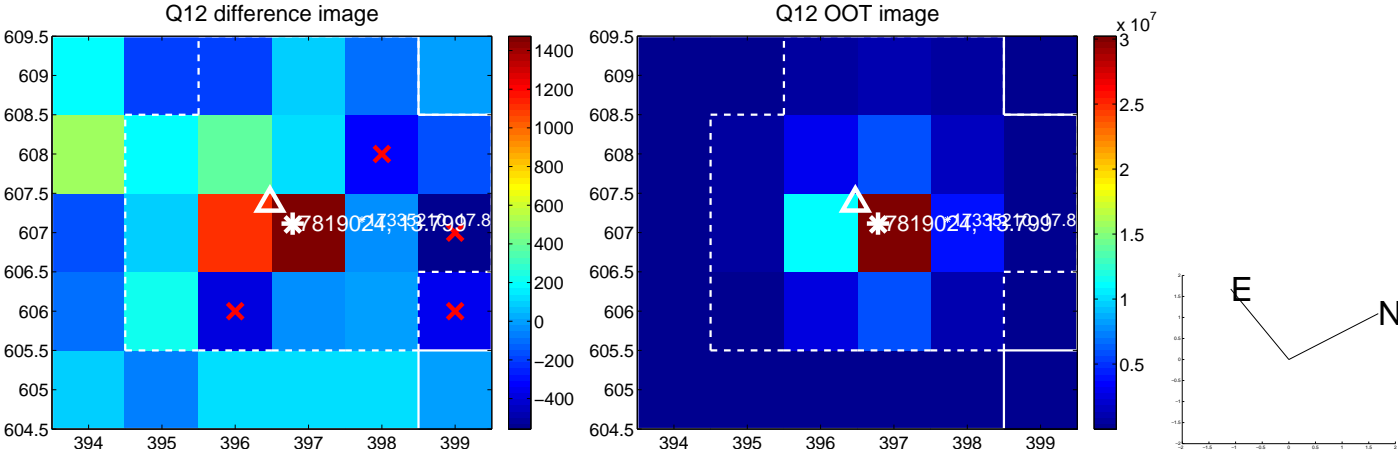
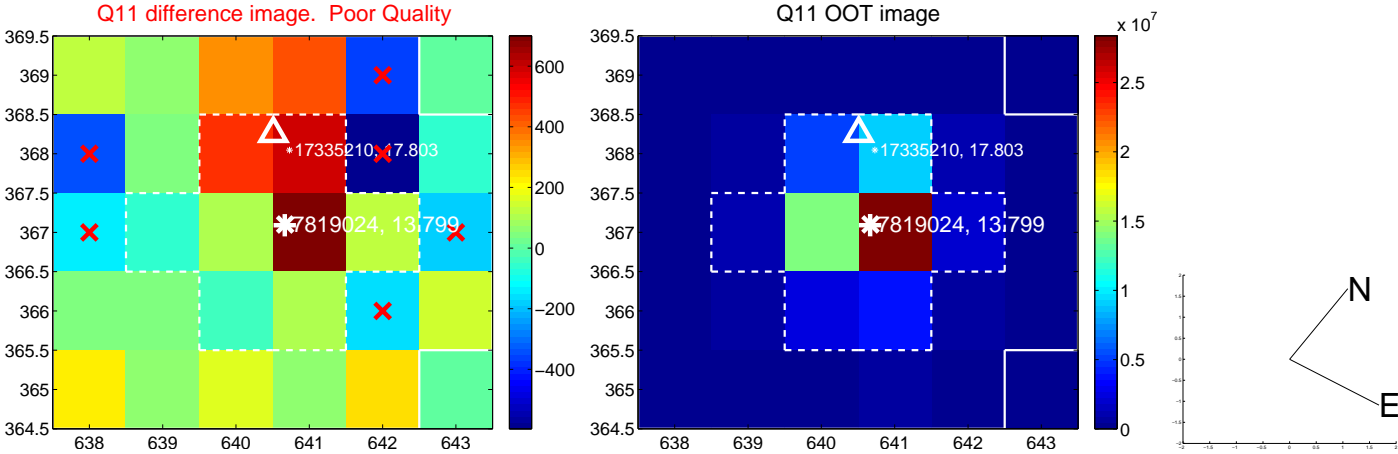
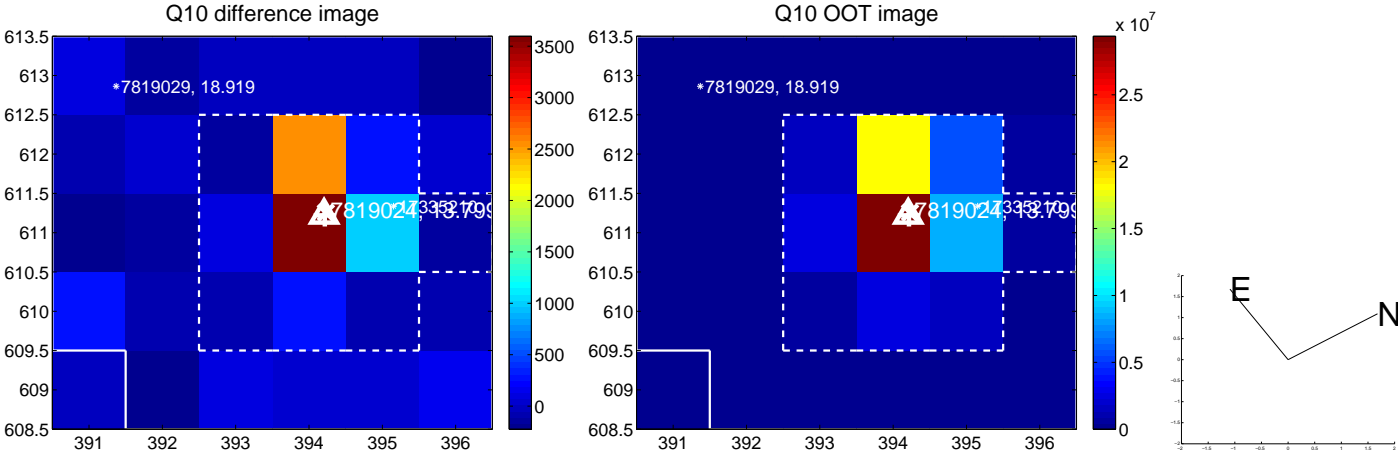
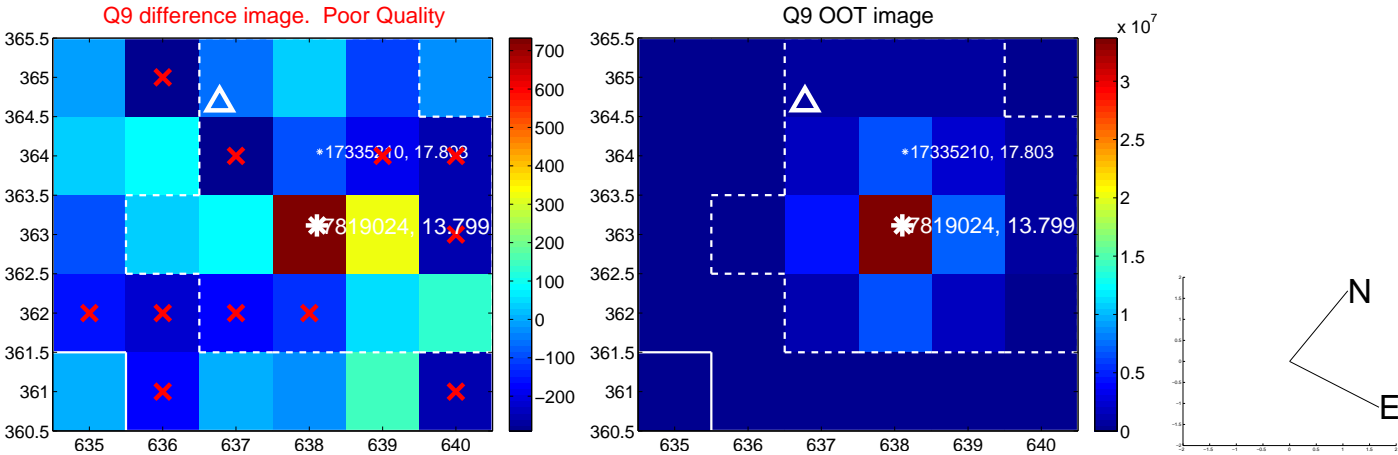
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

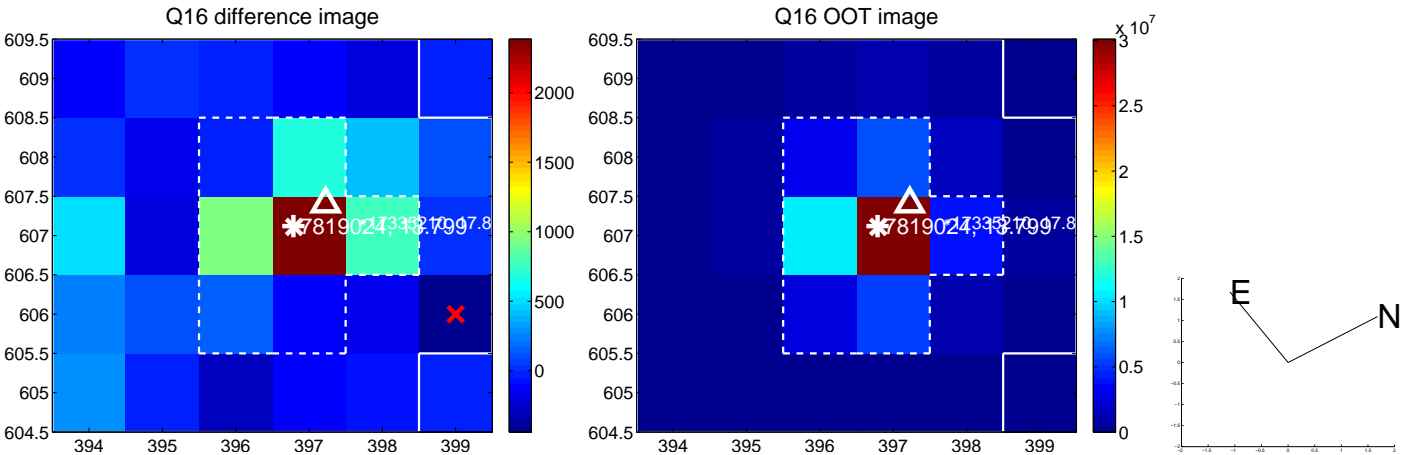
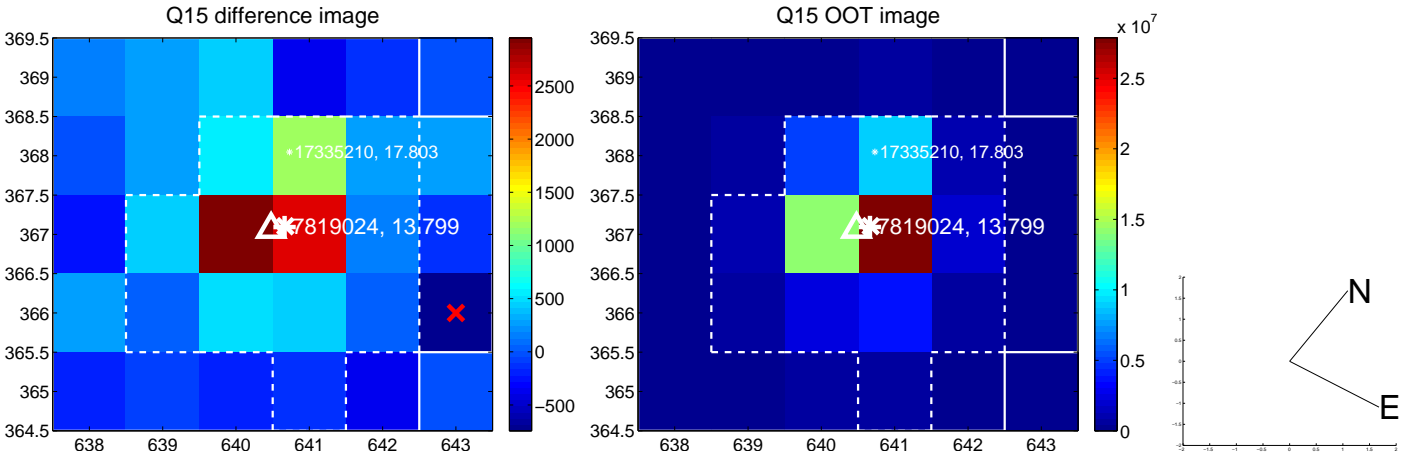
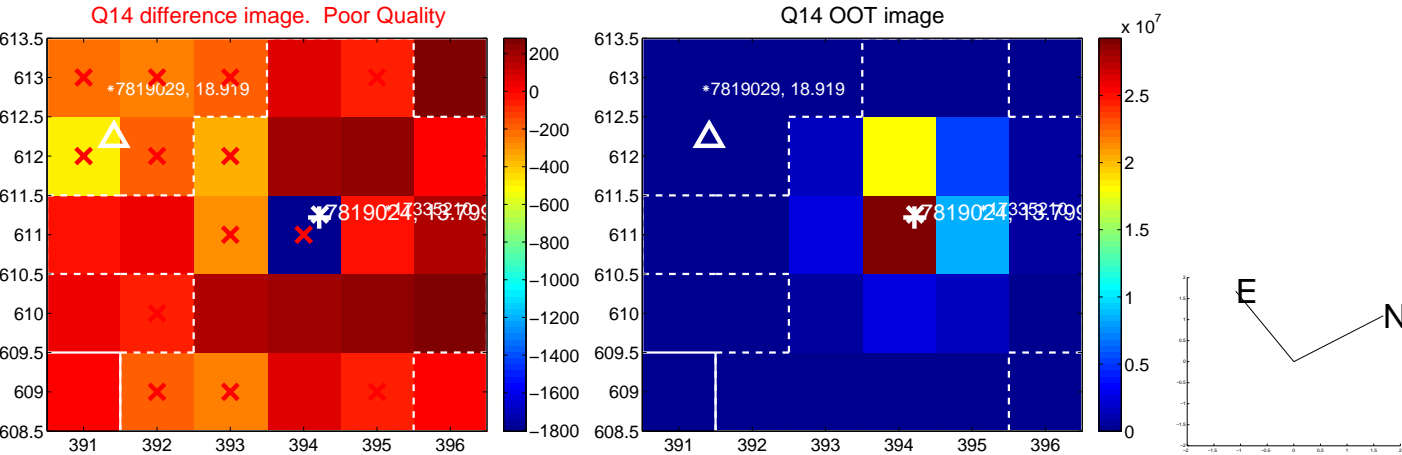
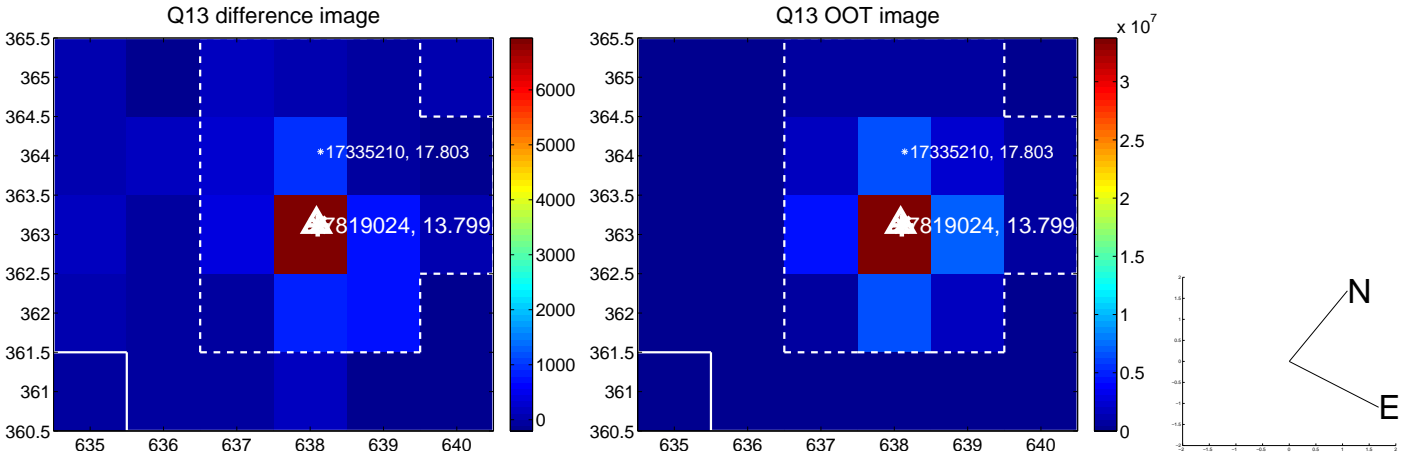


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

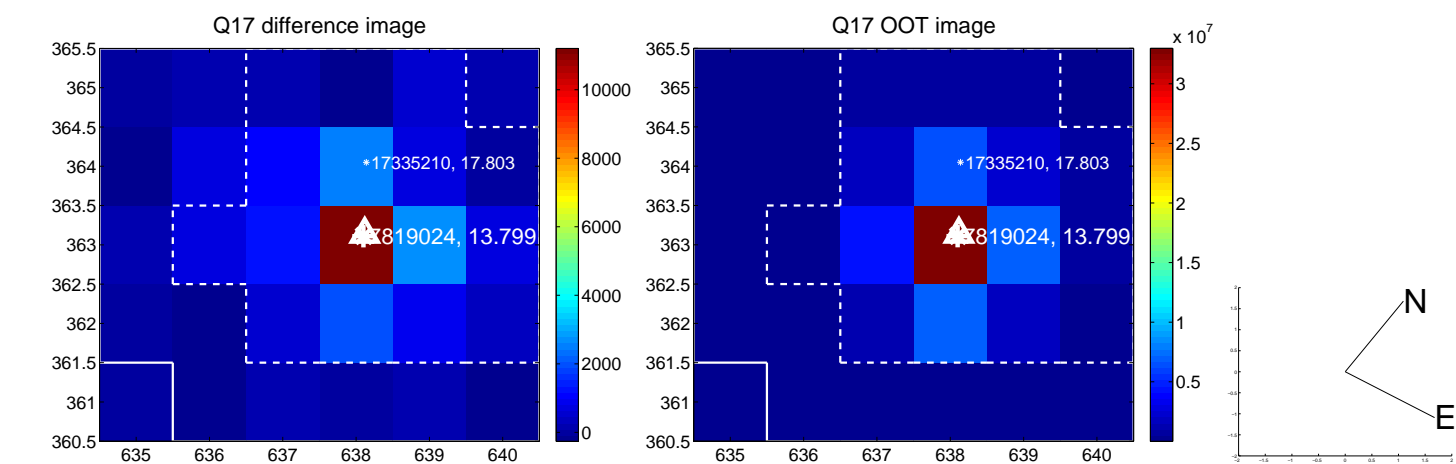




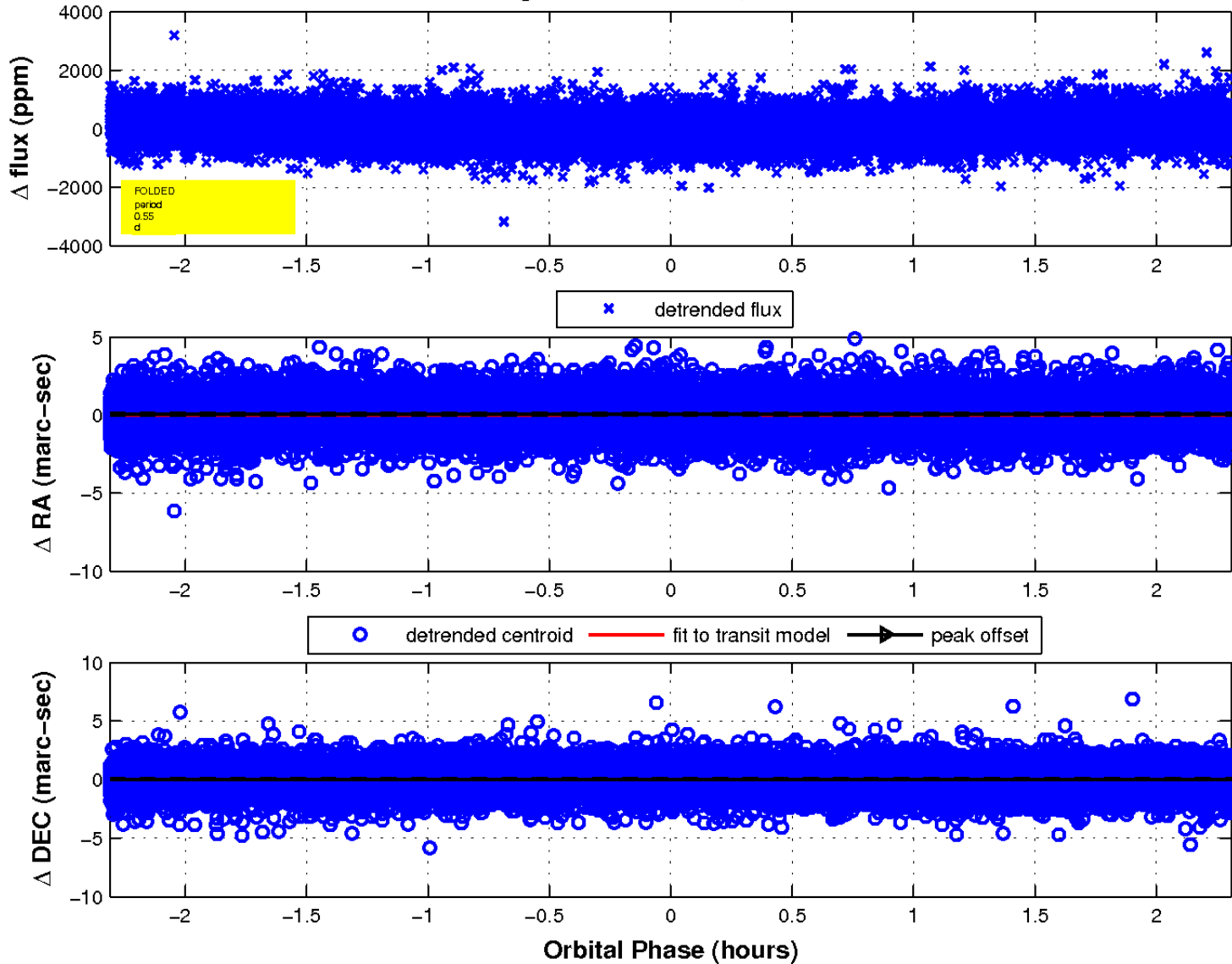
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

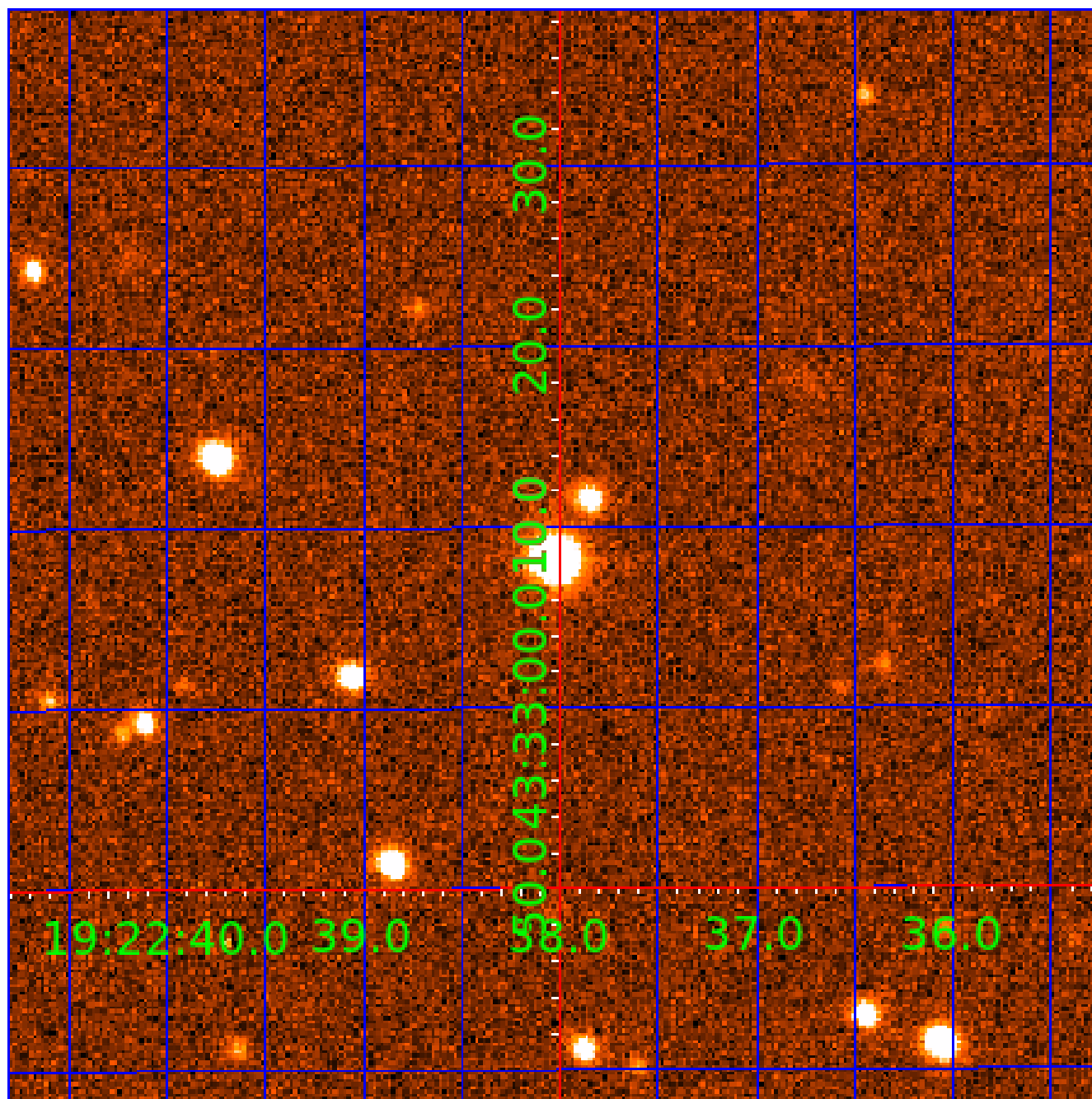


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



# KIC 007819024

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007819024-01	OBS	No	0.545465	131.924570	77.8	1.900	11.7	12.2	1.80	7389	1.84	39269.06
007819024-02	OBS	No	0.545462	131.750210	82.4	0.770	11.5	12.5	1.80	7389	1.93	39269.37
007819024-03	OBS	No	7.959401	138.131527	449.2	5.497	9.2	12.3	1.80	7389	4.83	1101.29
007819024-04	OBS	No	41.406704	158.600020	833.5	5.931	8.8	9.2	1.80	7389	9.74	122.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007819024-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
007819024-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

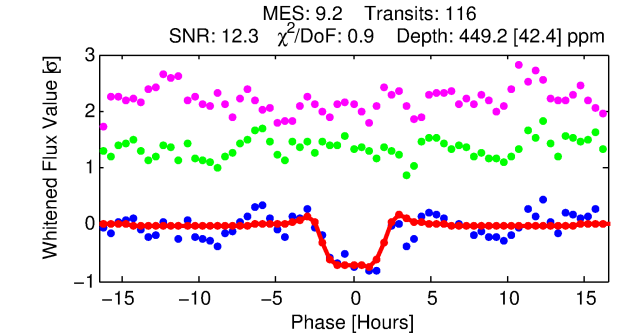
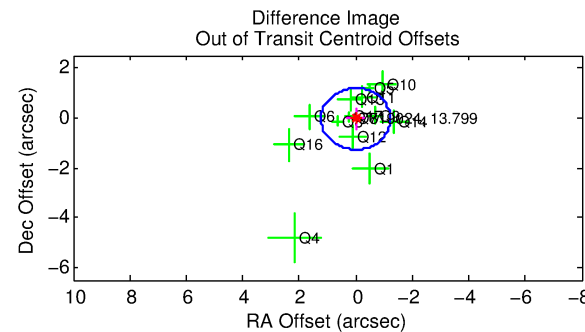
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007819024-03

No Significant Match Found



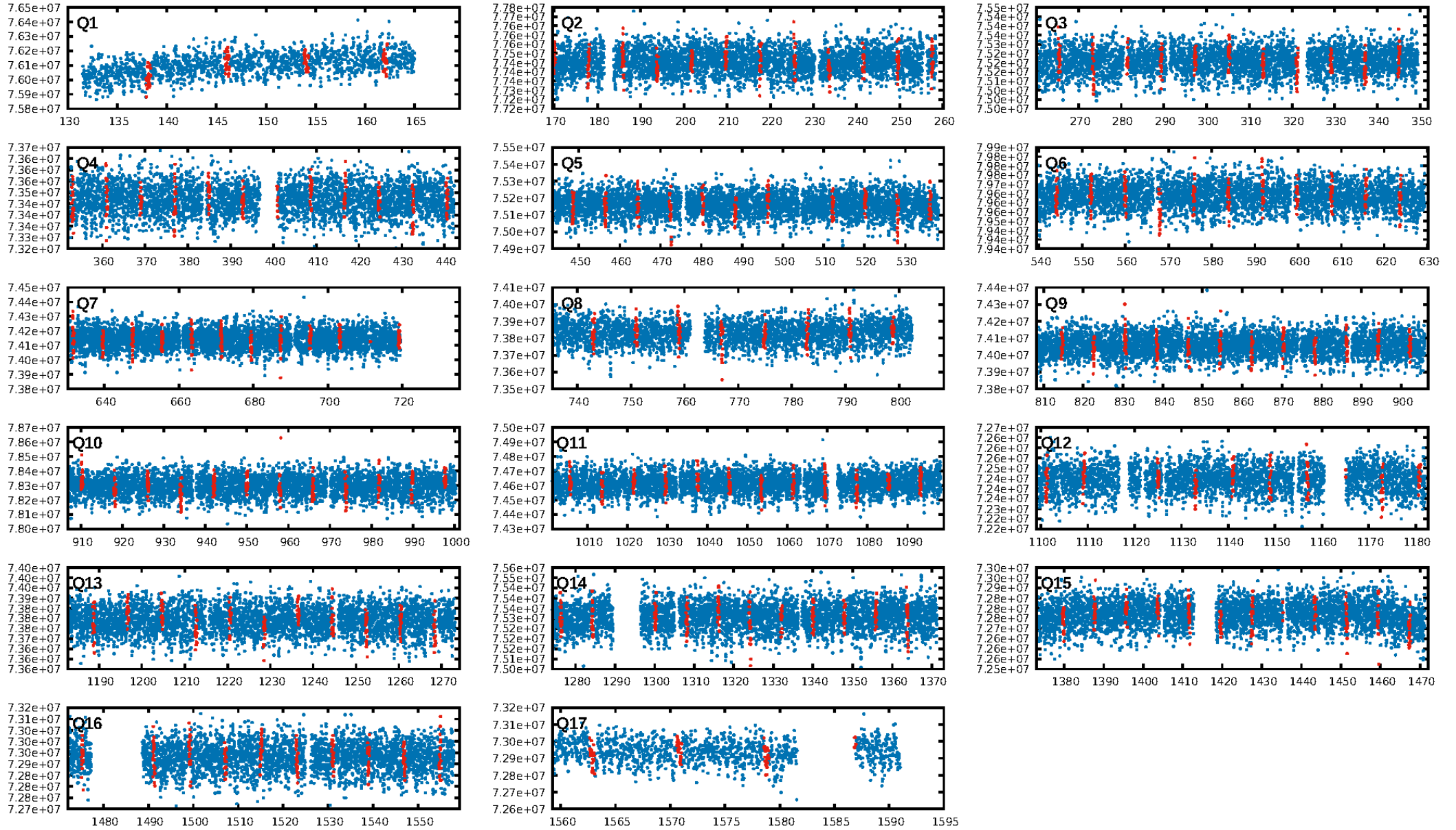
KIC: 7819024    Candidate: 3 of 4    Period: 7.959 d



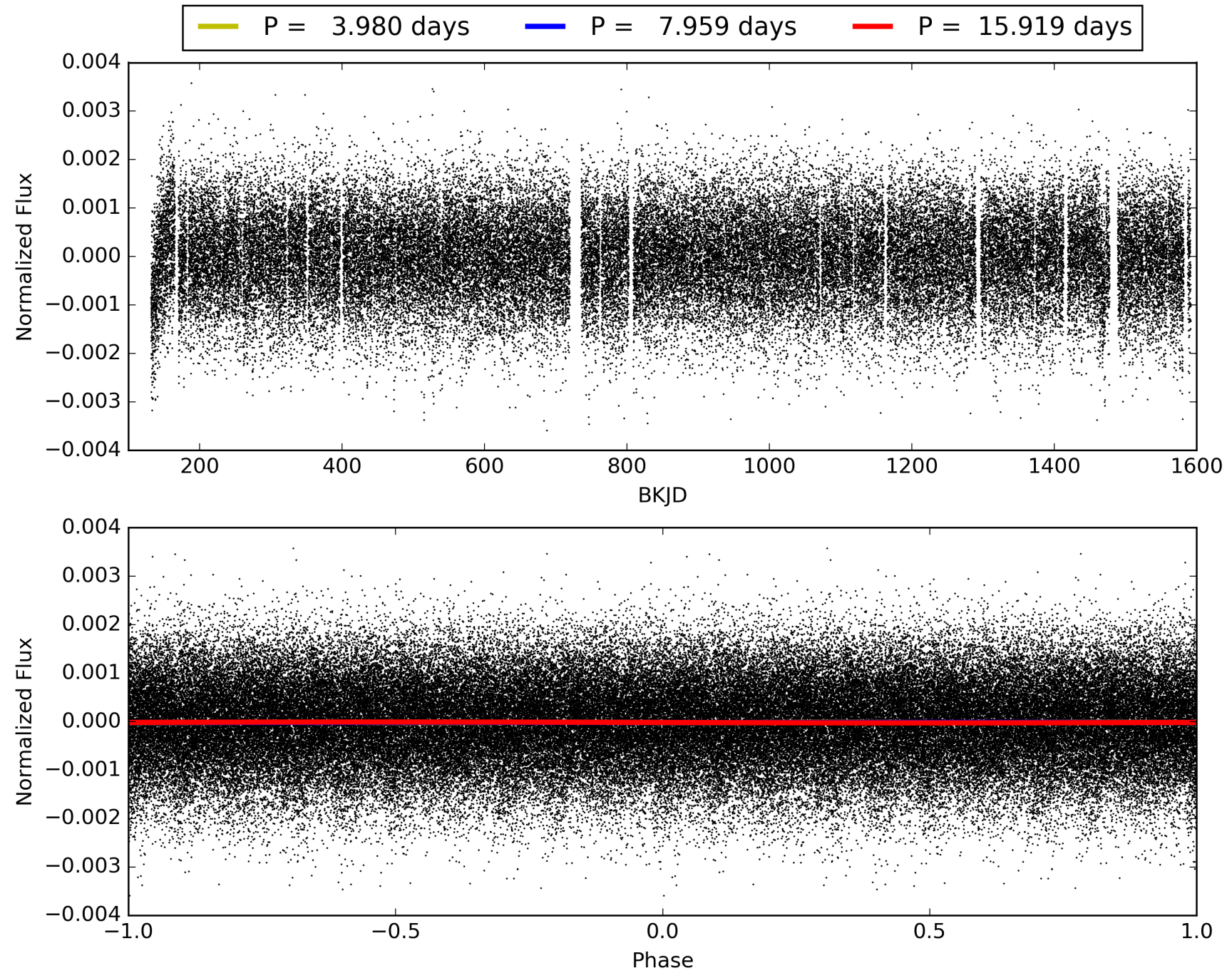
ShortPeriod-sig: 100.0% [30.59s]  
LongPeriod-sig: 100.0% [99.27s]  
ModelChiSquare2-sig: 46.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [109/110]  
GhostDiagnostic-chr: 13.85

Centroid-sig: 0.5%  
Centroid-so: 0.475 arcsec [2.44s]  
OotOffset-rm: 0.039 arcsec [0.09s]  
KicOffset-rm: 0.069 arcsec [0.19s]  
OotOffset-st: 3/2/4/5 [14]  
KicOffset-st: 3/2/4/5 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 007819024-03, PDC Light Curves

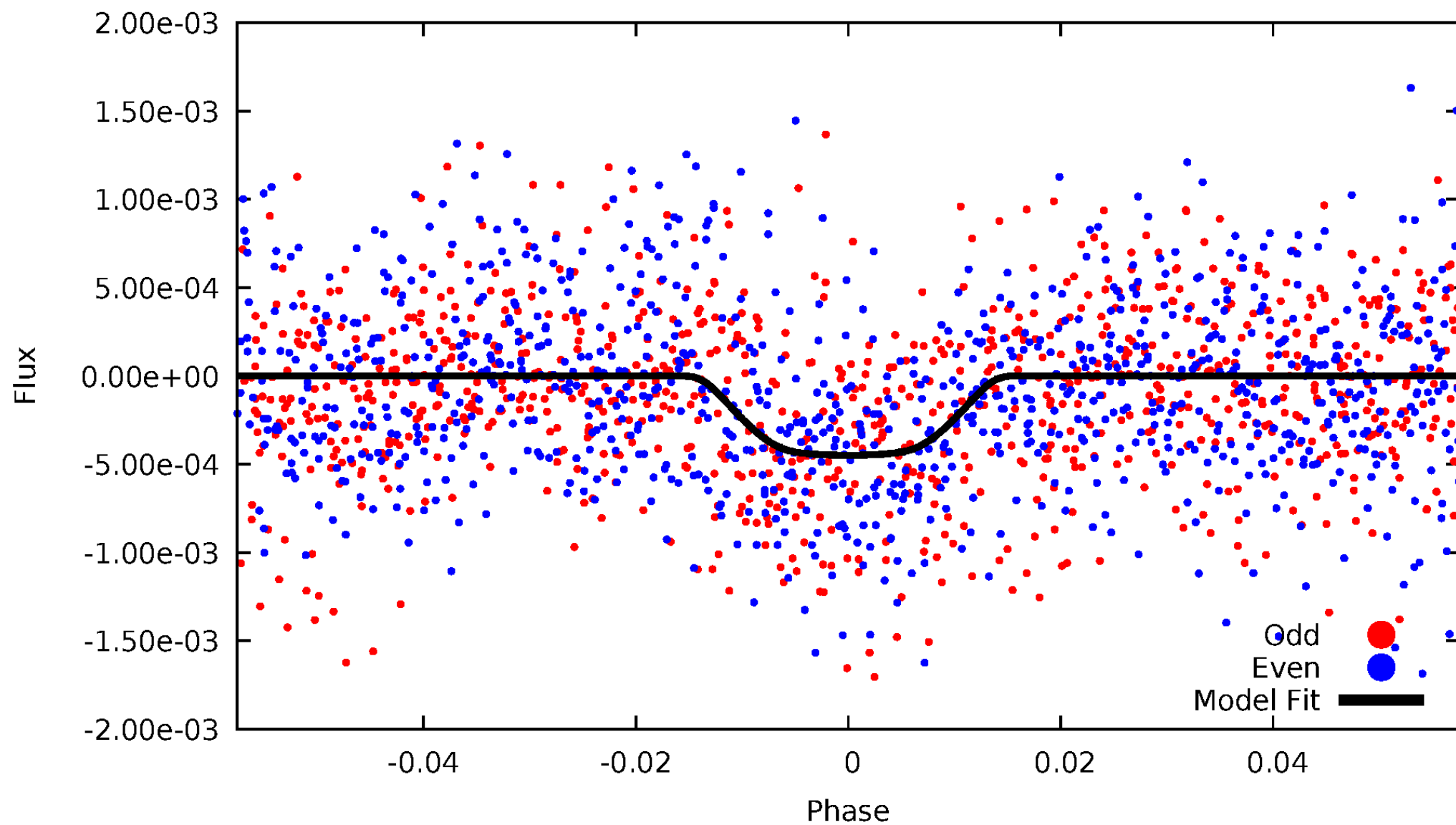


# TCE 007819024-03



# DV Odd/Even

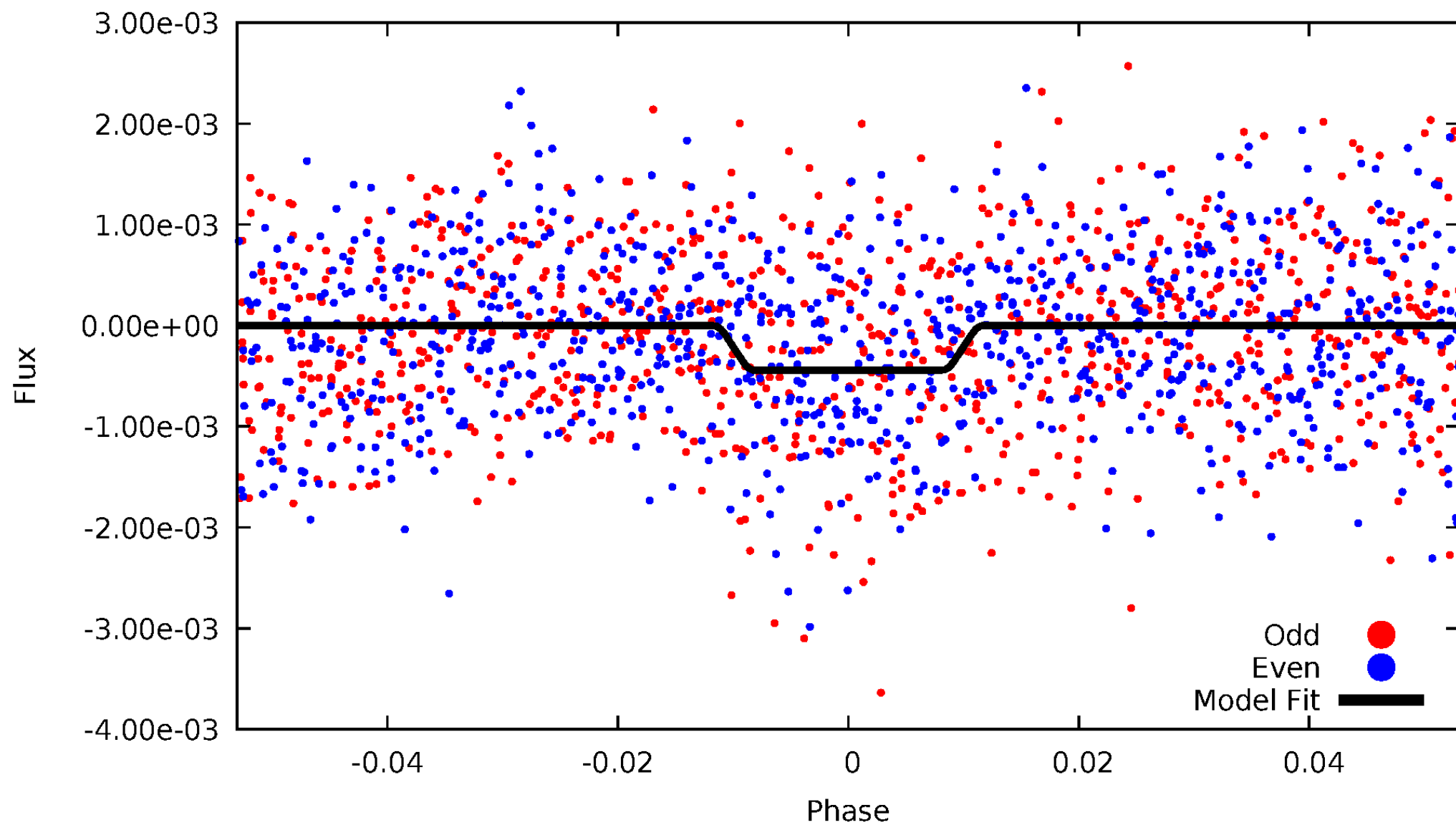
TCE 007819024-03





# ALT Odd/Even

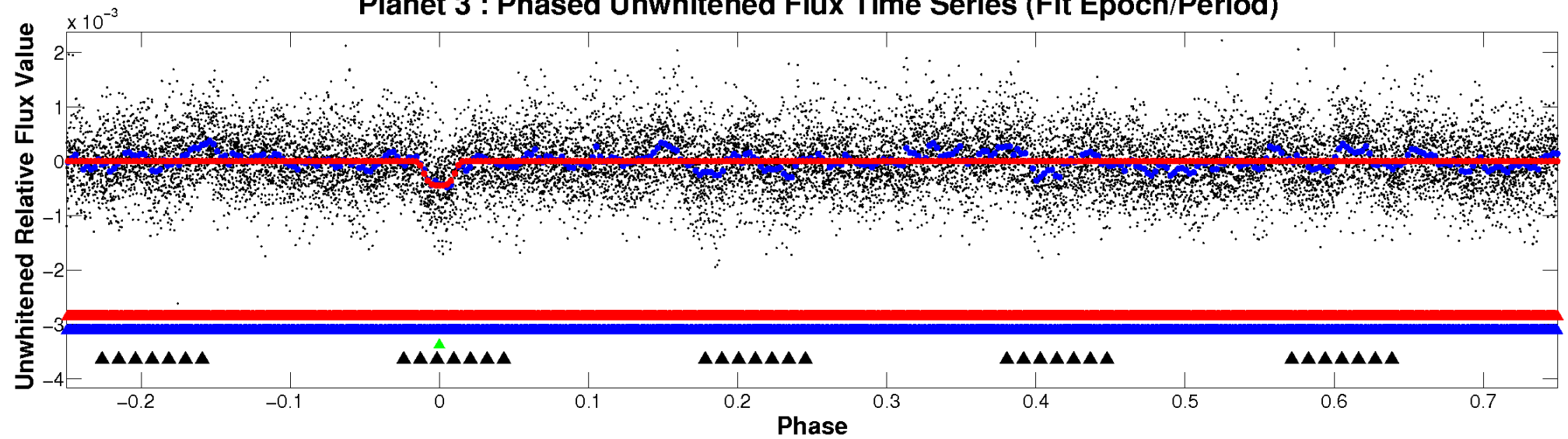
TCE 007819024-03



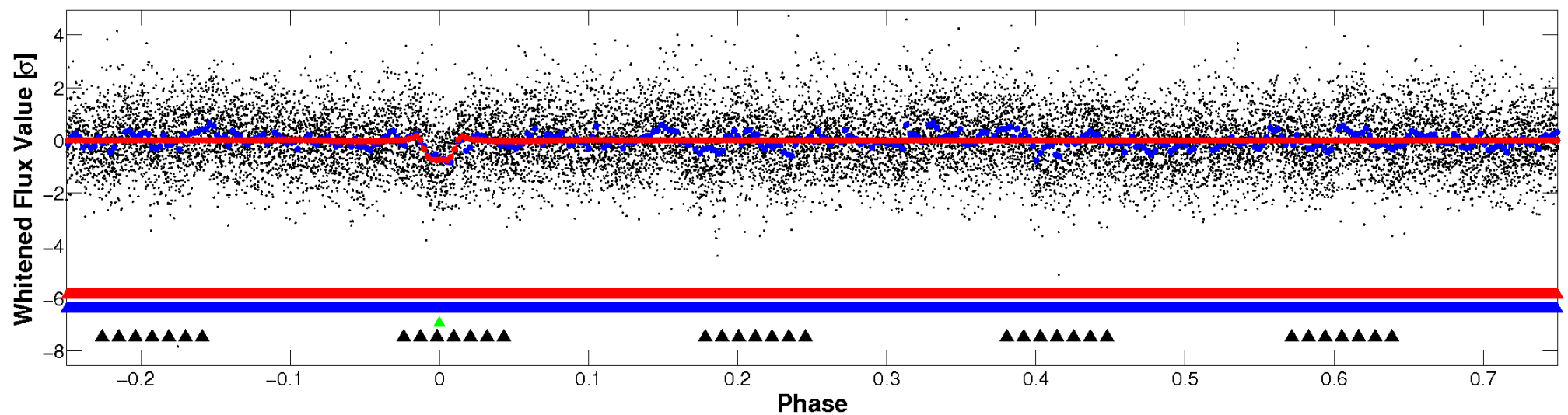


# Non-Whitened Vs. Whitened Light Curve

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

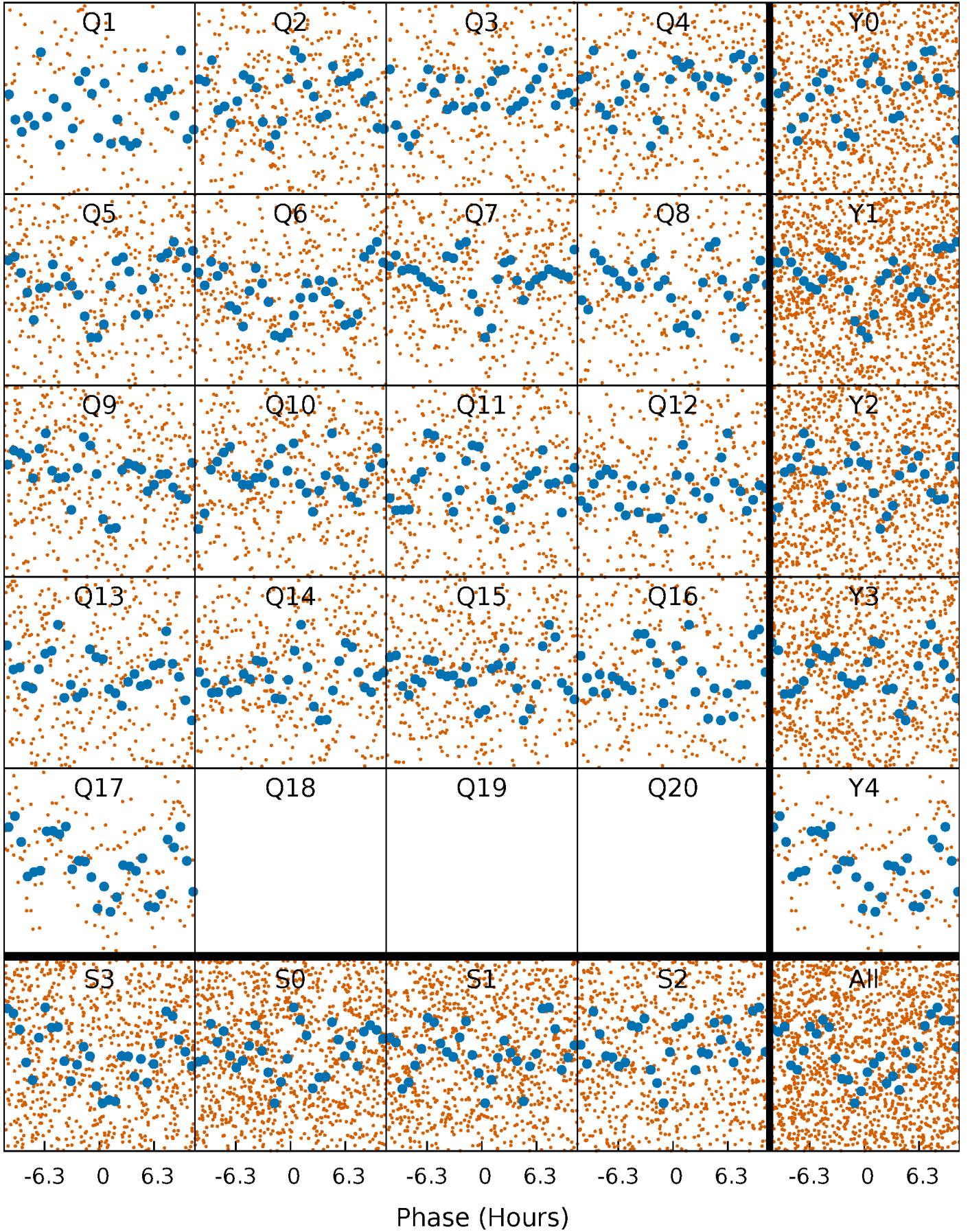


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



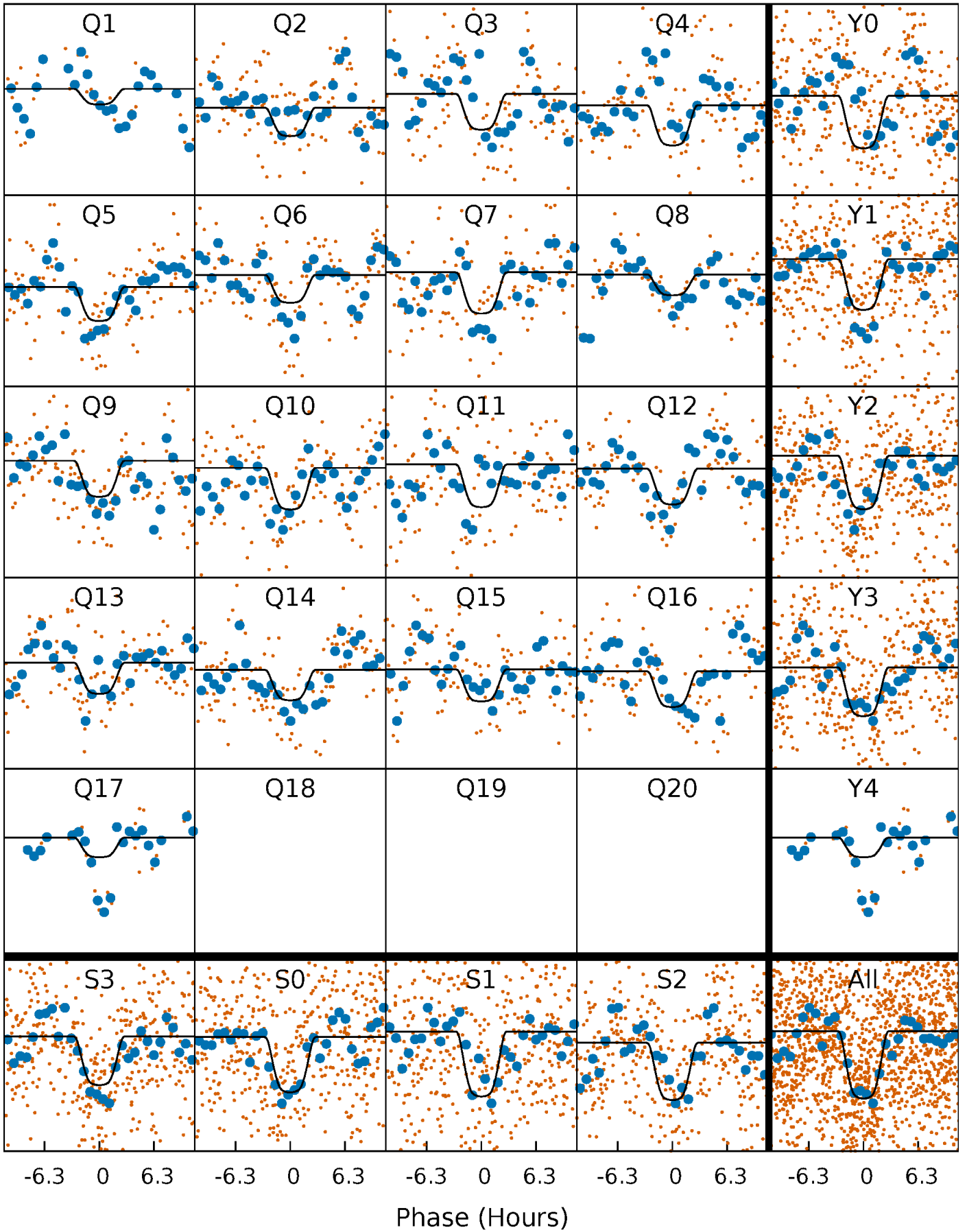
# PDC Quarter-Phased Transit Curves

TCE 007819024-03 P= 7.959401 Days  $T_0=138.131527$  (BKJD)



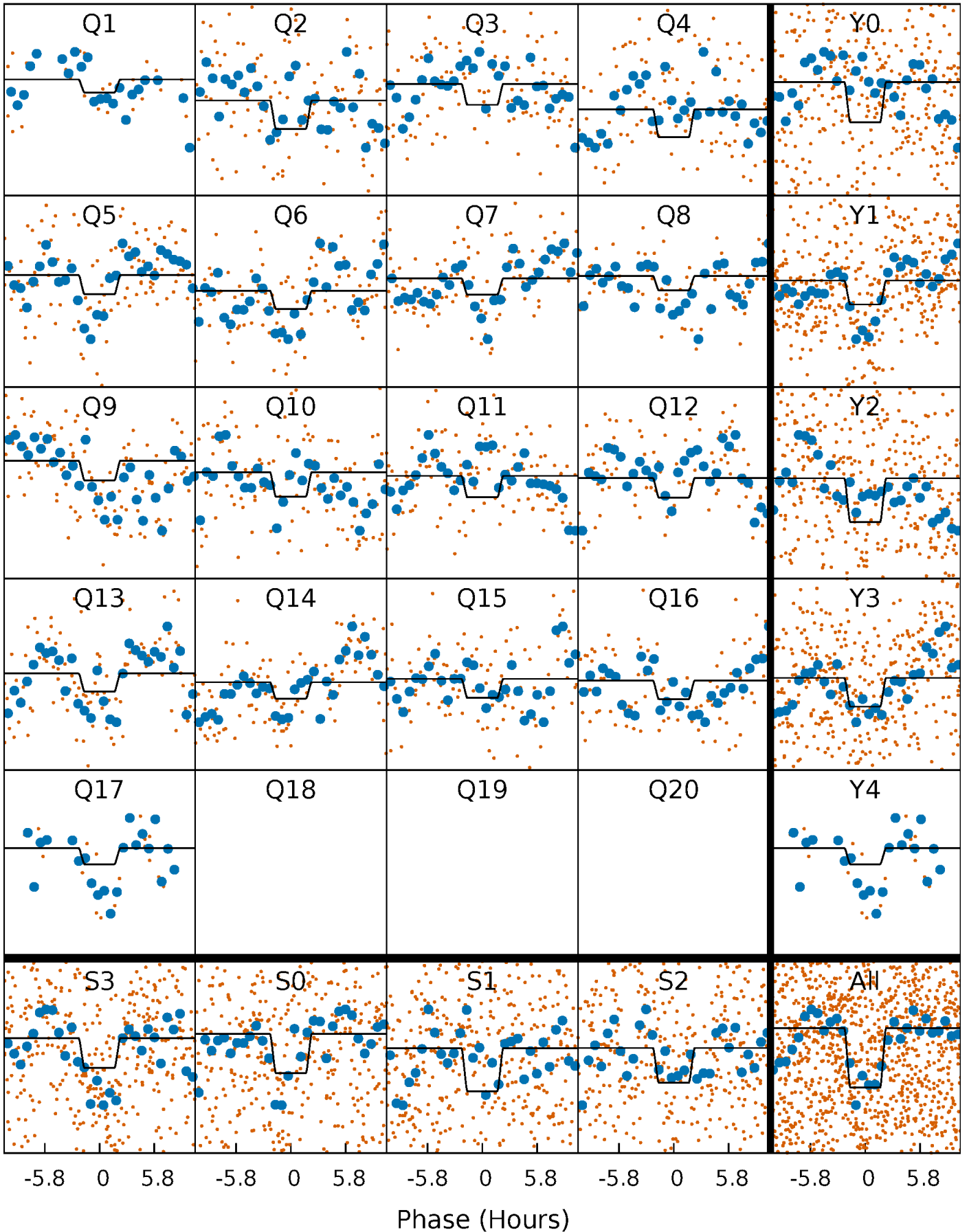
# DV Quarter-Phased Transit Curves

TCE 007819024-03 P= 7.959401 Days  $T_0=138.131527$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

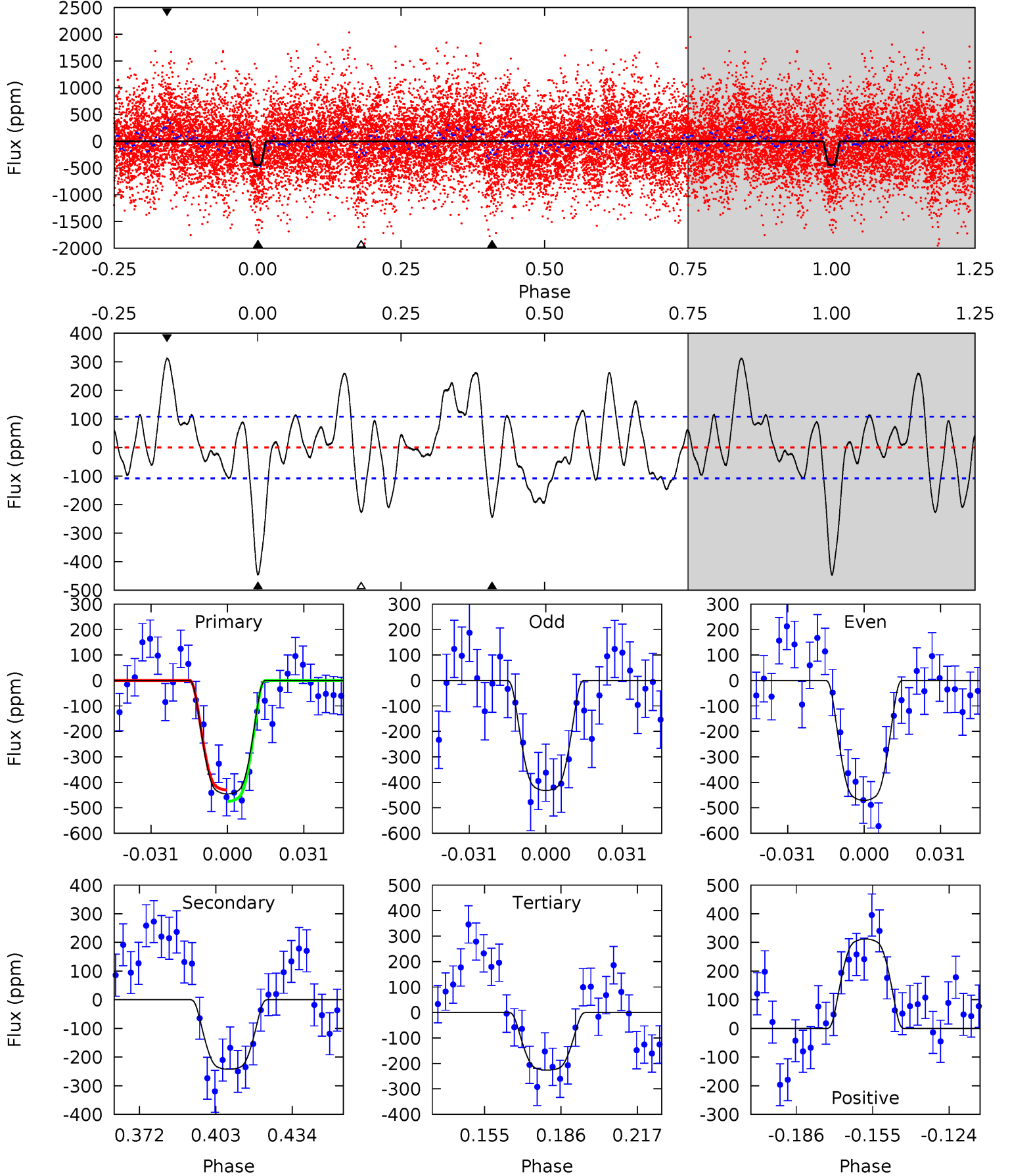
TCE 007819024-03 P= 7.959206 Days  $T_0=138.138422$  (BKJD)



# DV Model-Shift Uniqueness Test

007819024-03, P = 7.959401 Days, E = 130.172126 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.9	10.8	10.1	13.9	4.80	2.16	5.00	9.77	5.96	0.74	-3.08	0.86	0.62	0.41	0.98

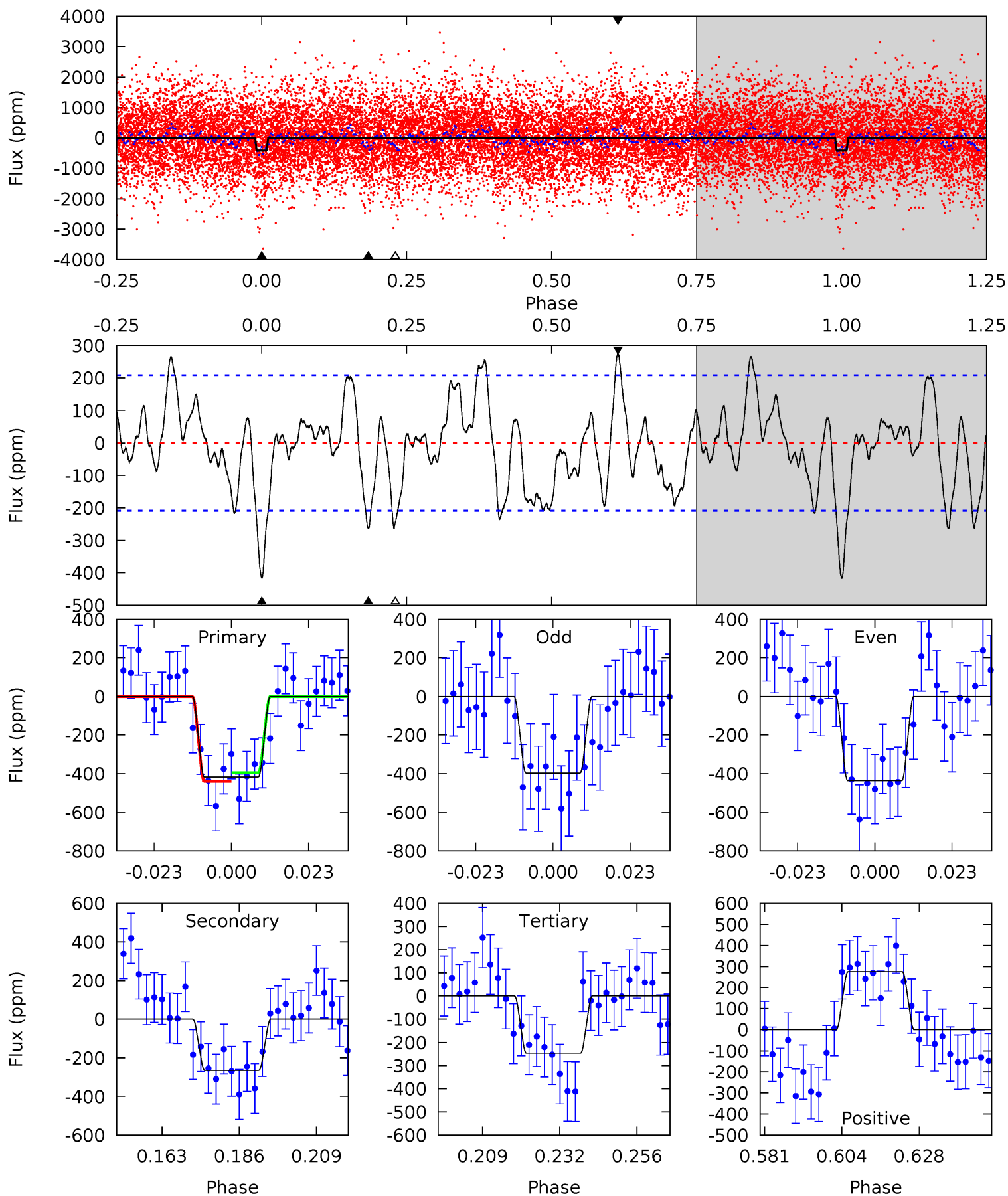




# Alt Model-Shift Uniqueness Test

007819024-03, P = 7.959206 Days, E = 130.179216 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
9.70	6.16	5.74	6.42	4.86	2.27	2.61	3.96	3.27	0.42	-0.26	0.46	1.04	0.40	0.52



### Stellar Parameters For KIC 007819024

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7389^{+73}_{-88}$	$4.094^{+0.132}_{-0.108}$	$-0.260^{+0.150}_{-0.150}$	$1.802^{+0.309}_{-0.309}$	$1.468^{+0.127}_{-0.115}$	$0.353^{+0.204}_{-0.120}$
	+1%/-1%	+3%/-3%	+58%/-58%	+17%/-17%	+9%/-8%	+58%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007819024-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-243 \pm 22$	$4.76^{+0.57}_{-0.48}$	$2042^{+92}_{-89}$	$5809^{+229}_{-200}$	$46^{+13}_{-9}$
Alt.	$-265 \pm 43$	$4.14^{+0.43}_{-0.47}$	$2045^{+91}_{-82}$	$6383^{+434}_{-358}$	$67^{+21}_{-15}$

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

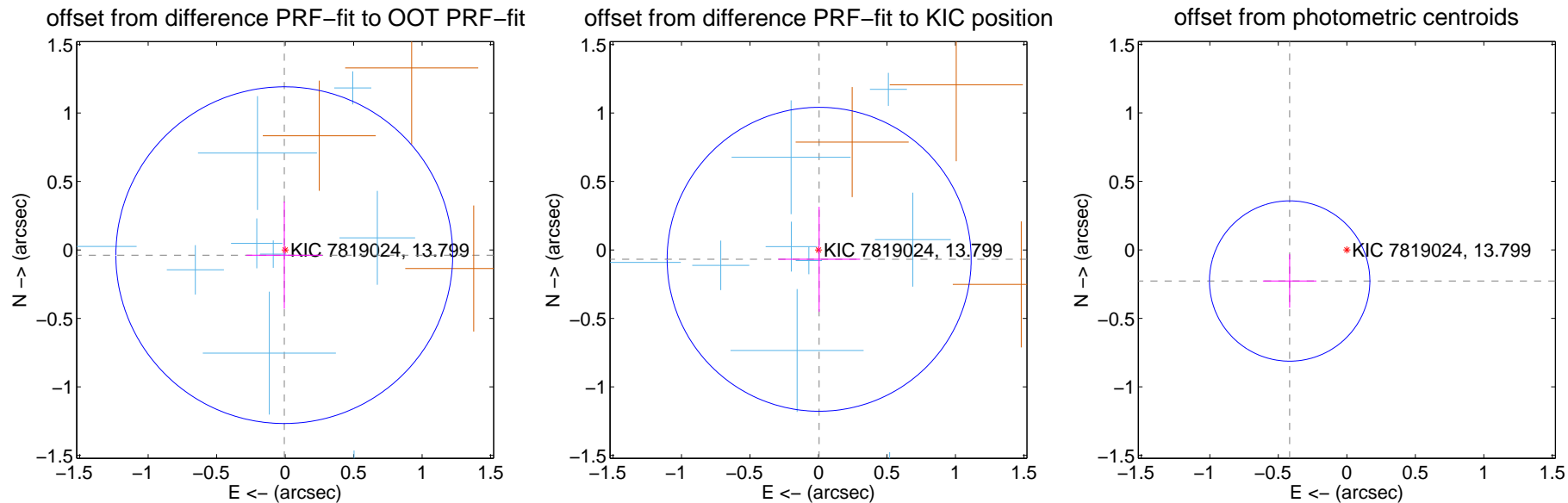
## DV Centroid Data

Supplemental centroid analysis for 007819024-03. Kepler magnitude: 13.80. Transit SNR 12.33

There are 9 quarters with good PRF difference image offsets

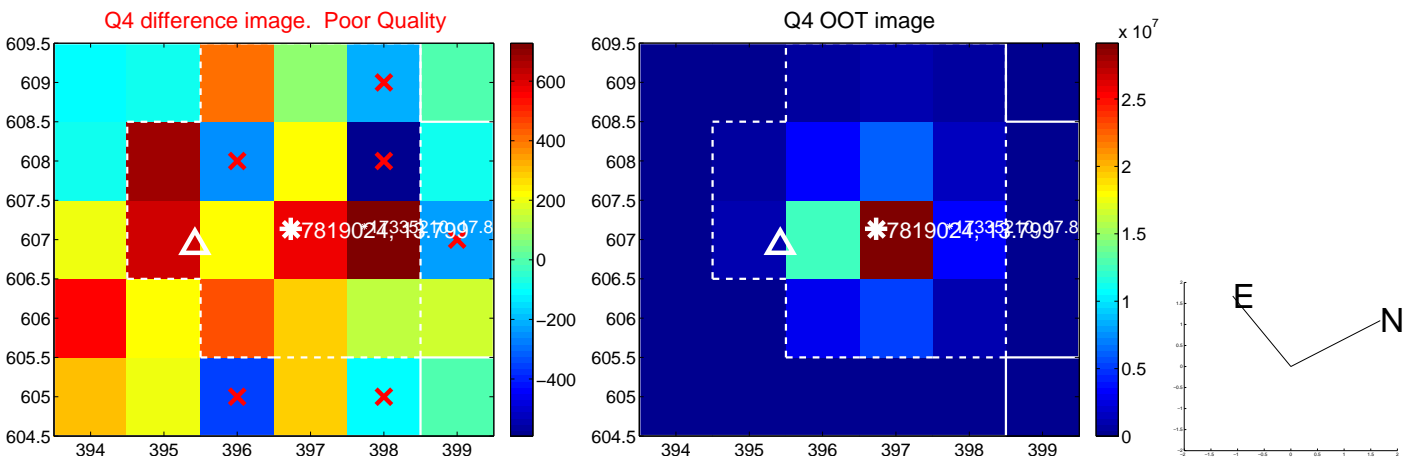
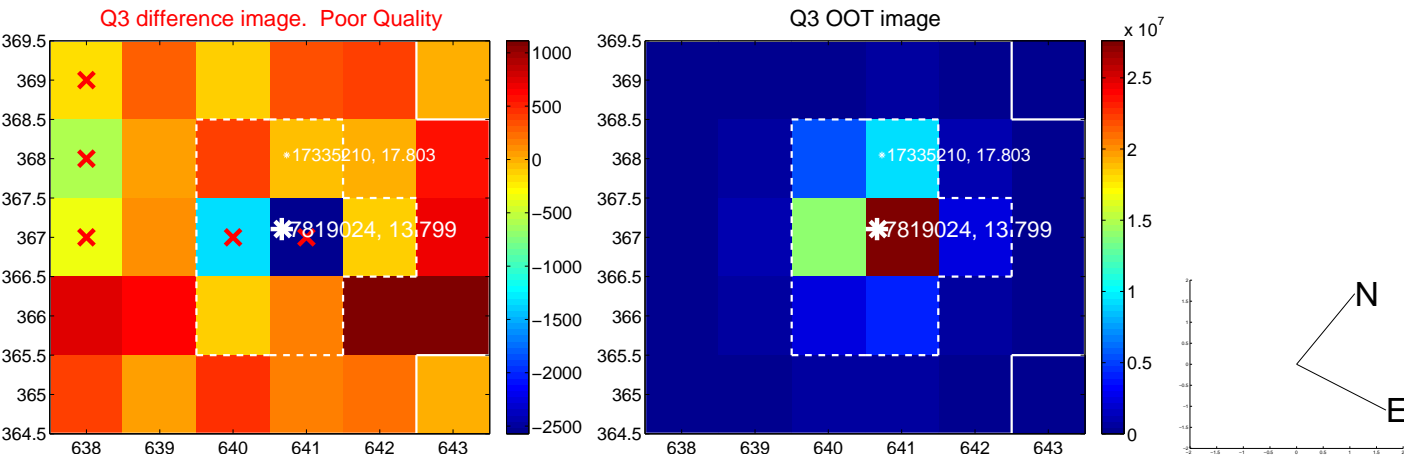
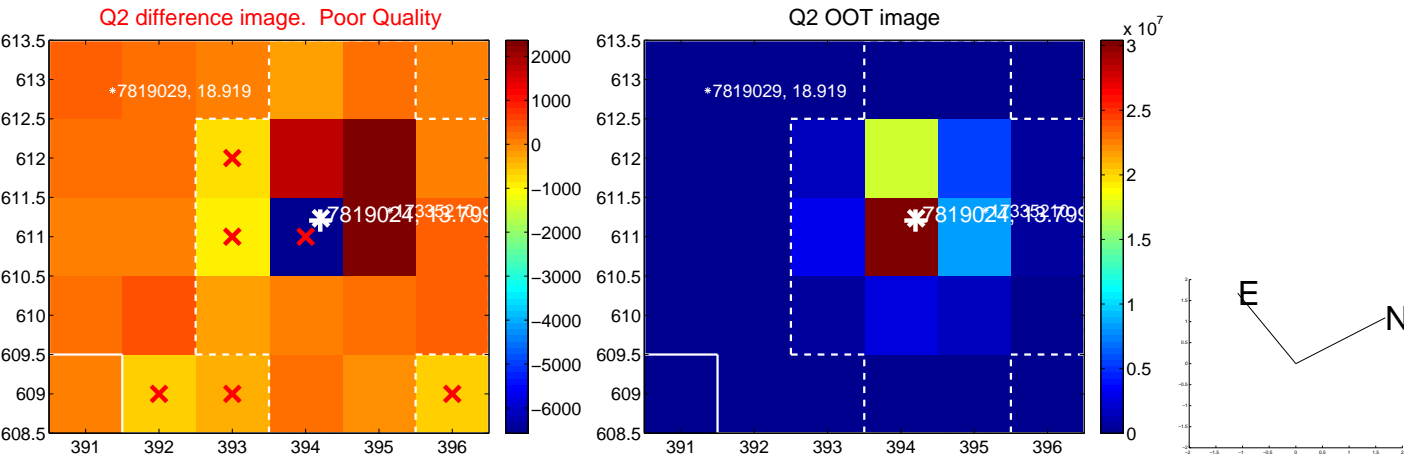
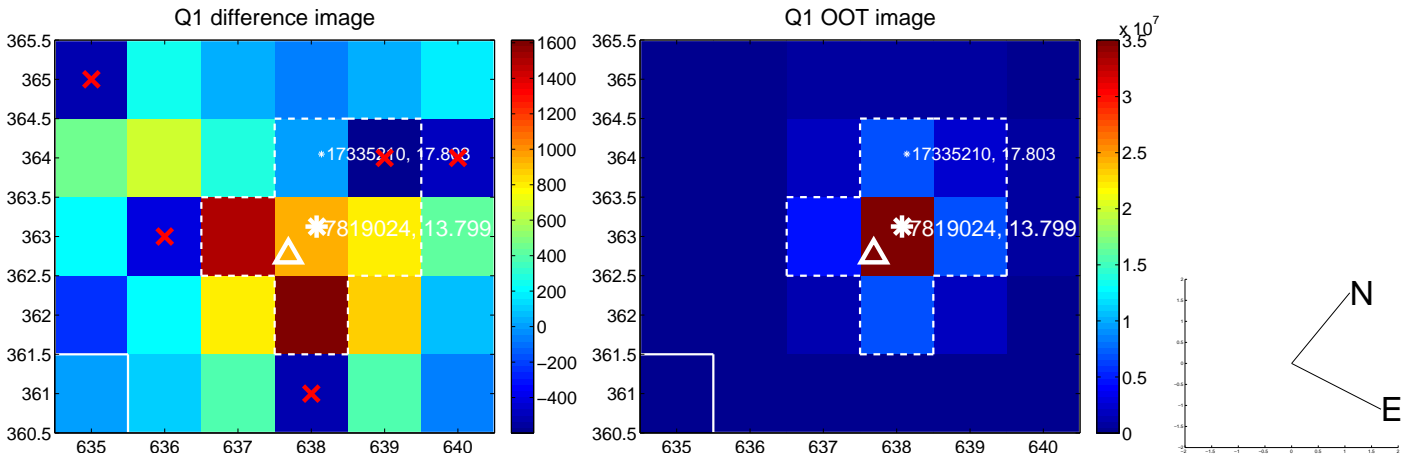
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.039 \pm 0.410$	0.09	$0.006 \pm 0.277$	$-0.038 \pm 0.391$
PRF-fit source offset from KIC position	$0.069 \pm 0.370$	0.19	$-0.005 \pm 0.299$	$-0.068 \pm 0.383$
photometric centroid source offset	$0.48 \pm 0.20$	2.44	$0.42 \pm 0.20$	$-0.23 \pm 0.20$

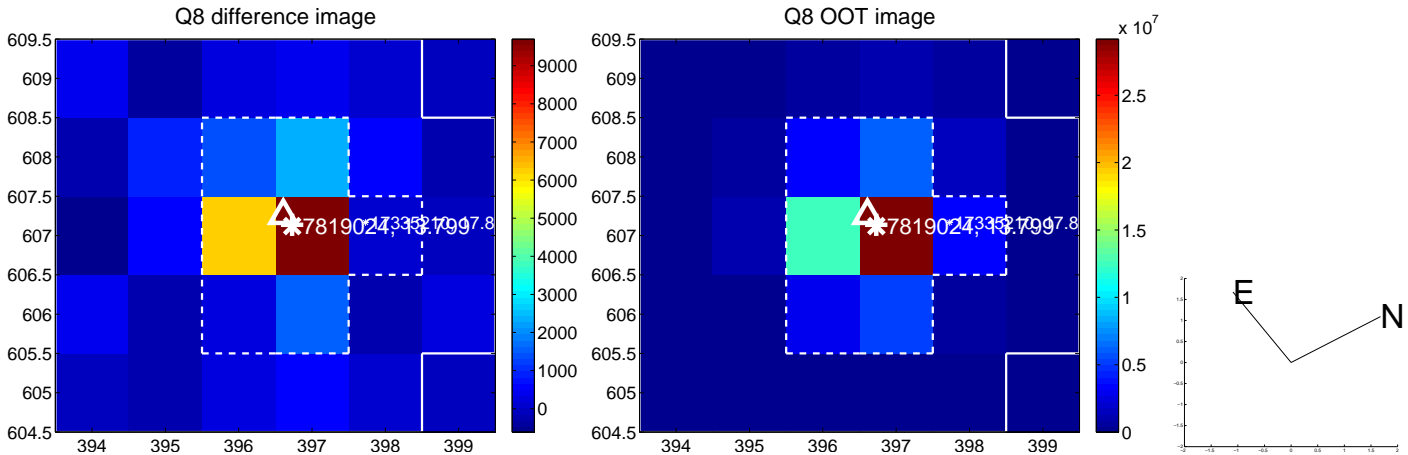
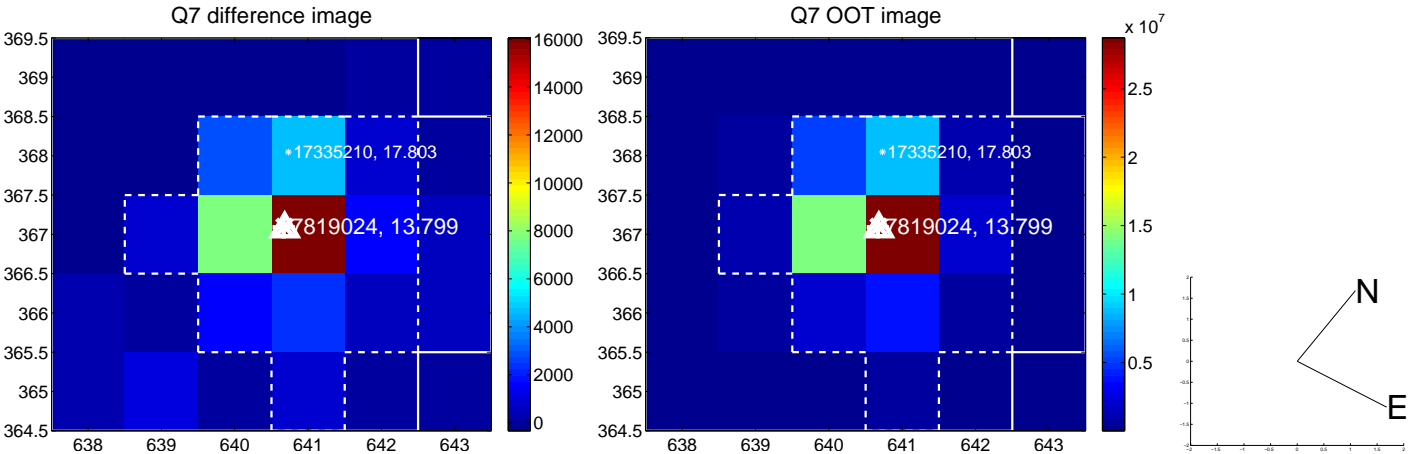
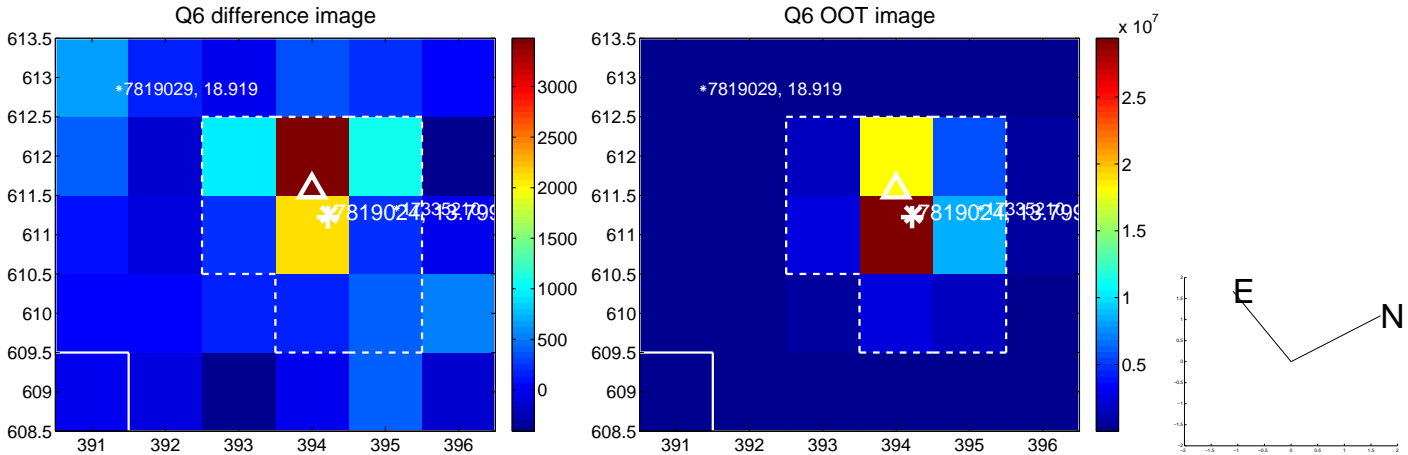
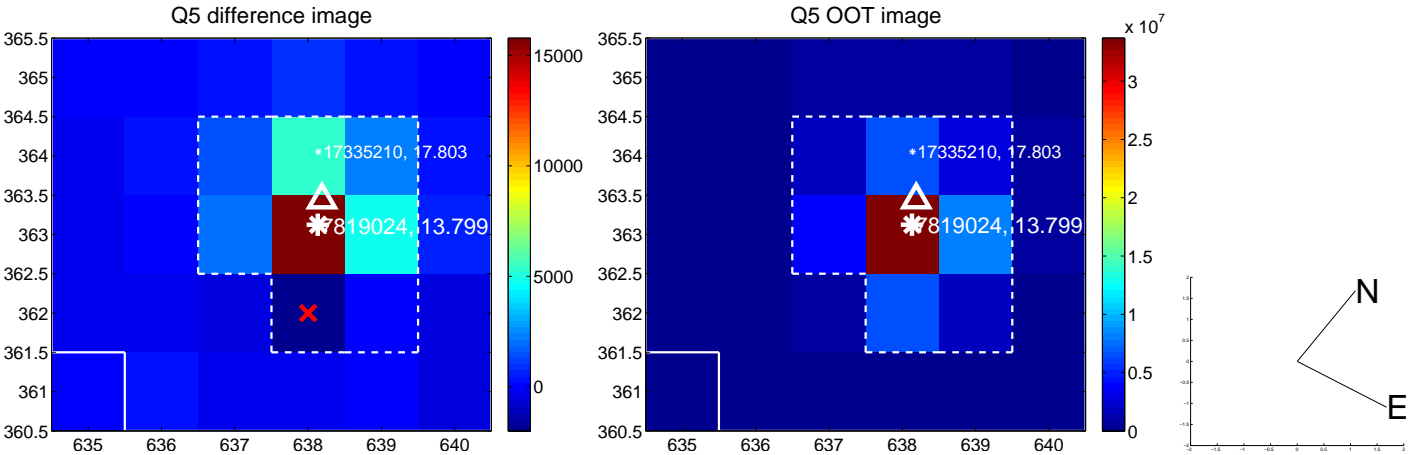


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

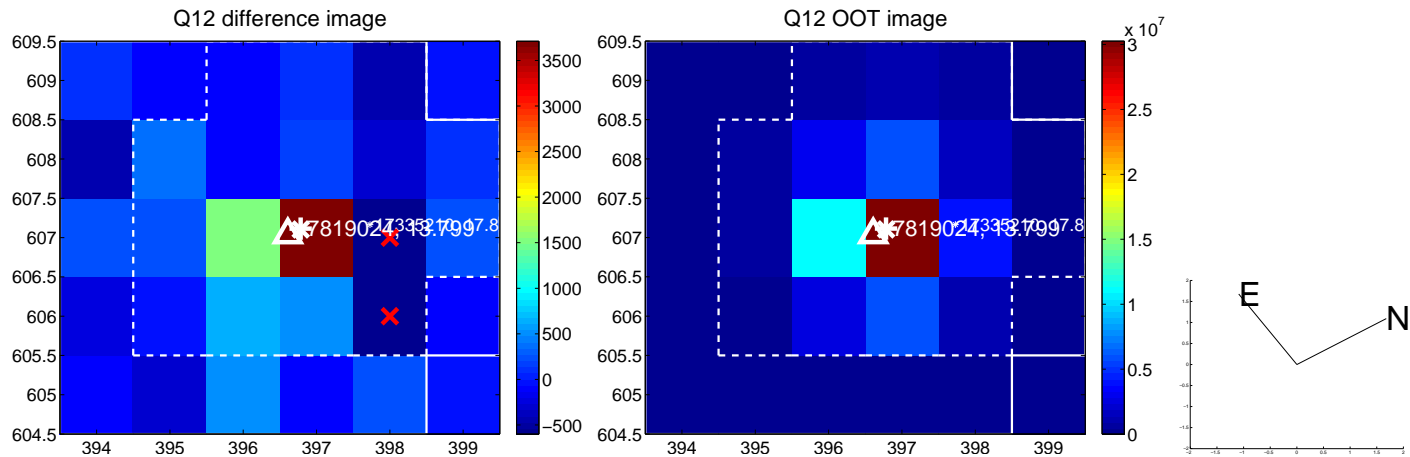
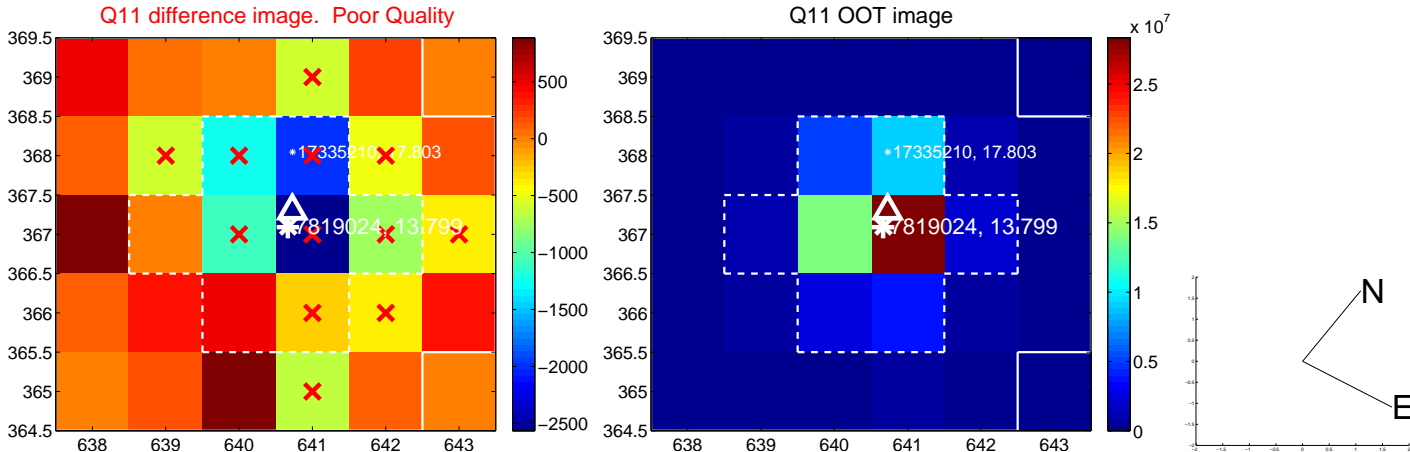
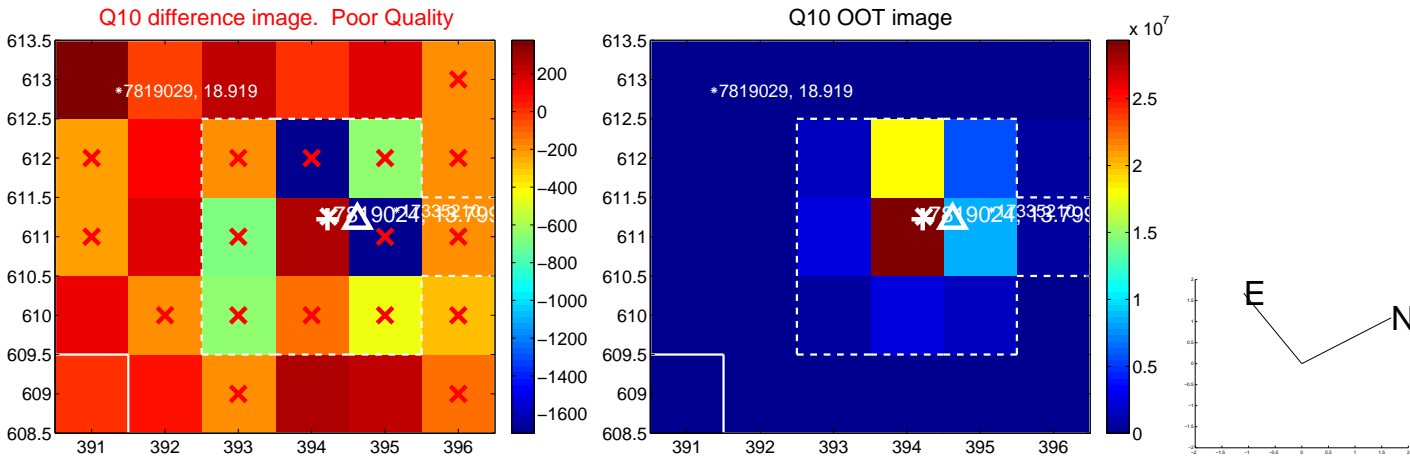
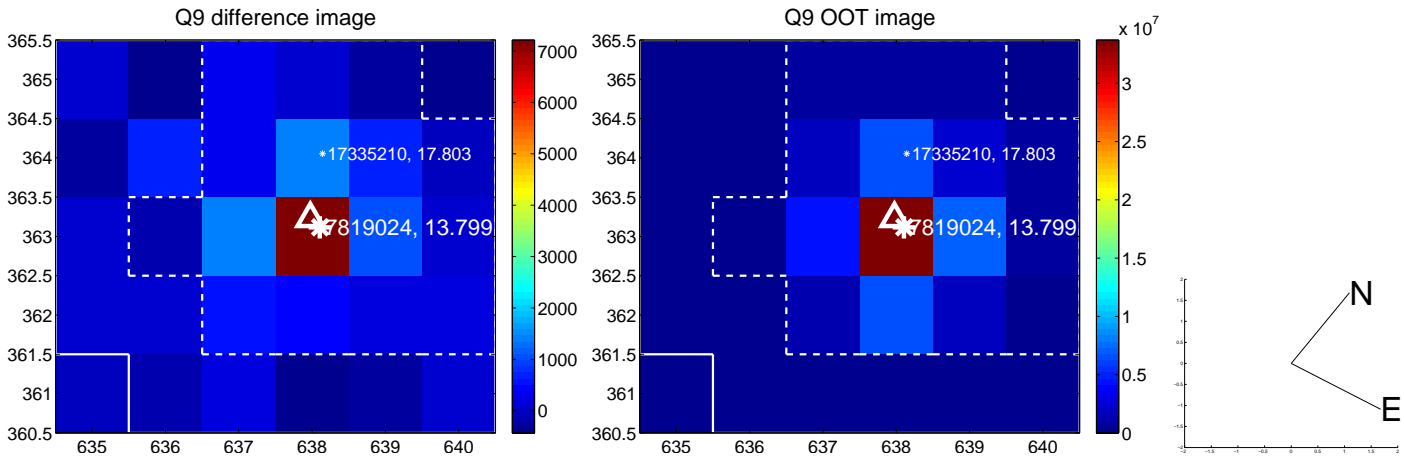


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

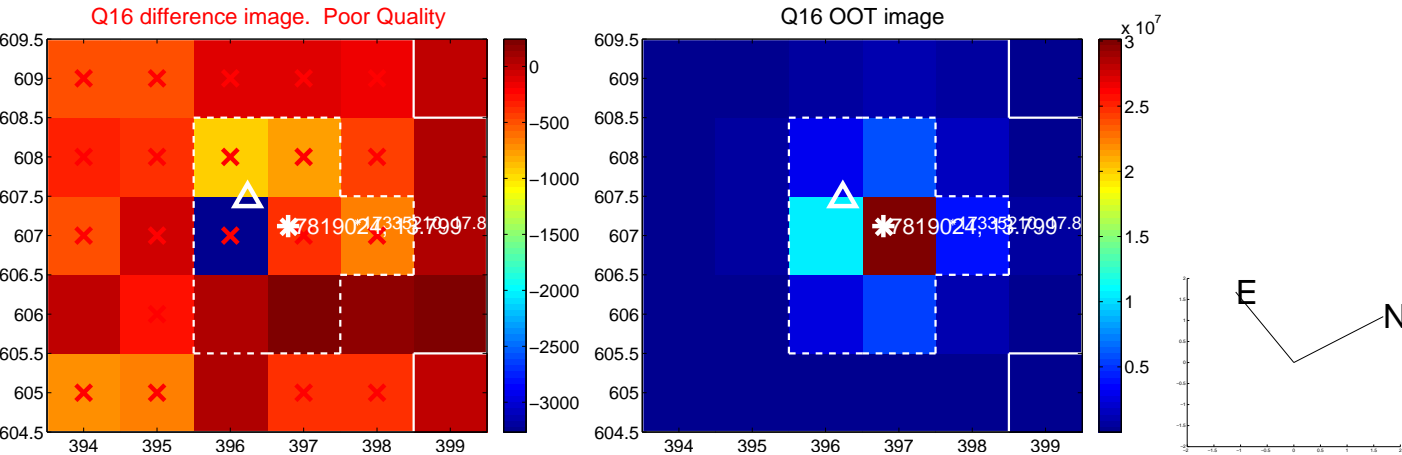
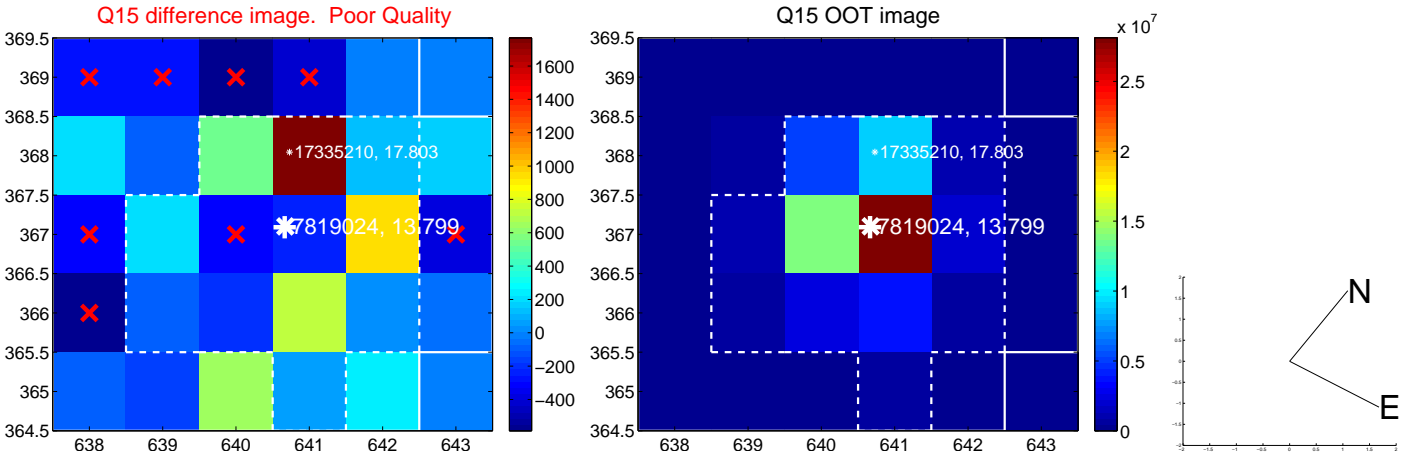
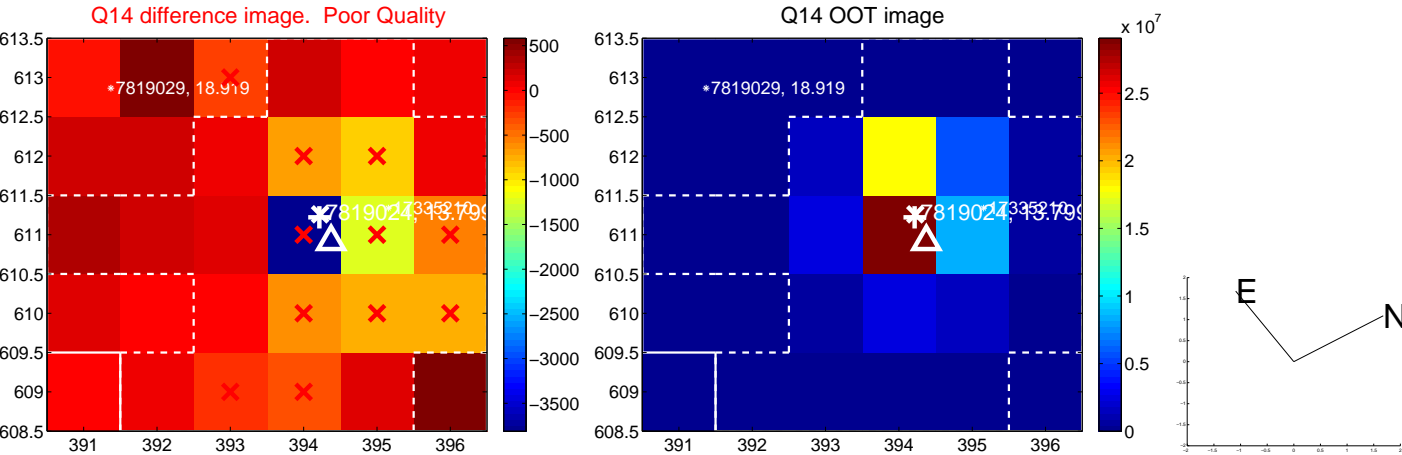
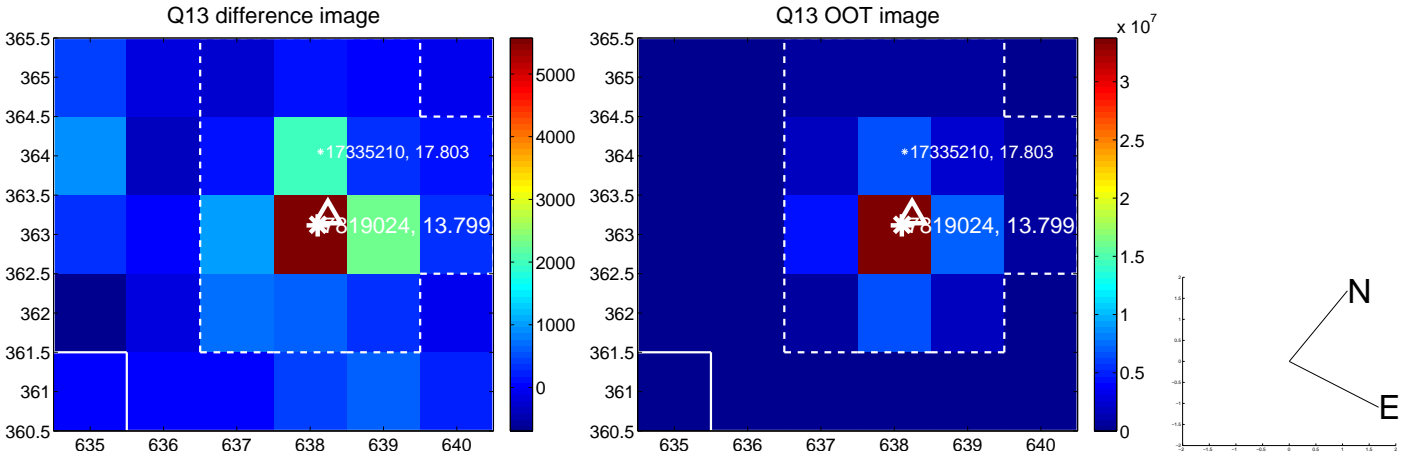




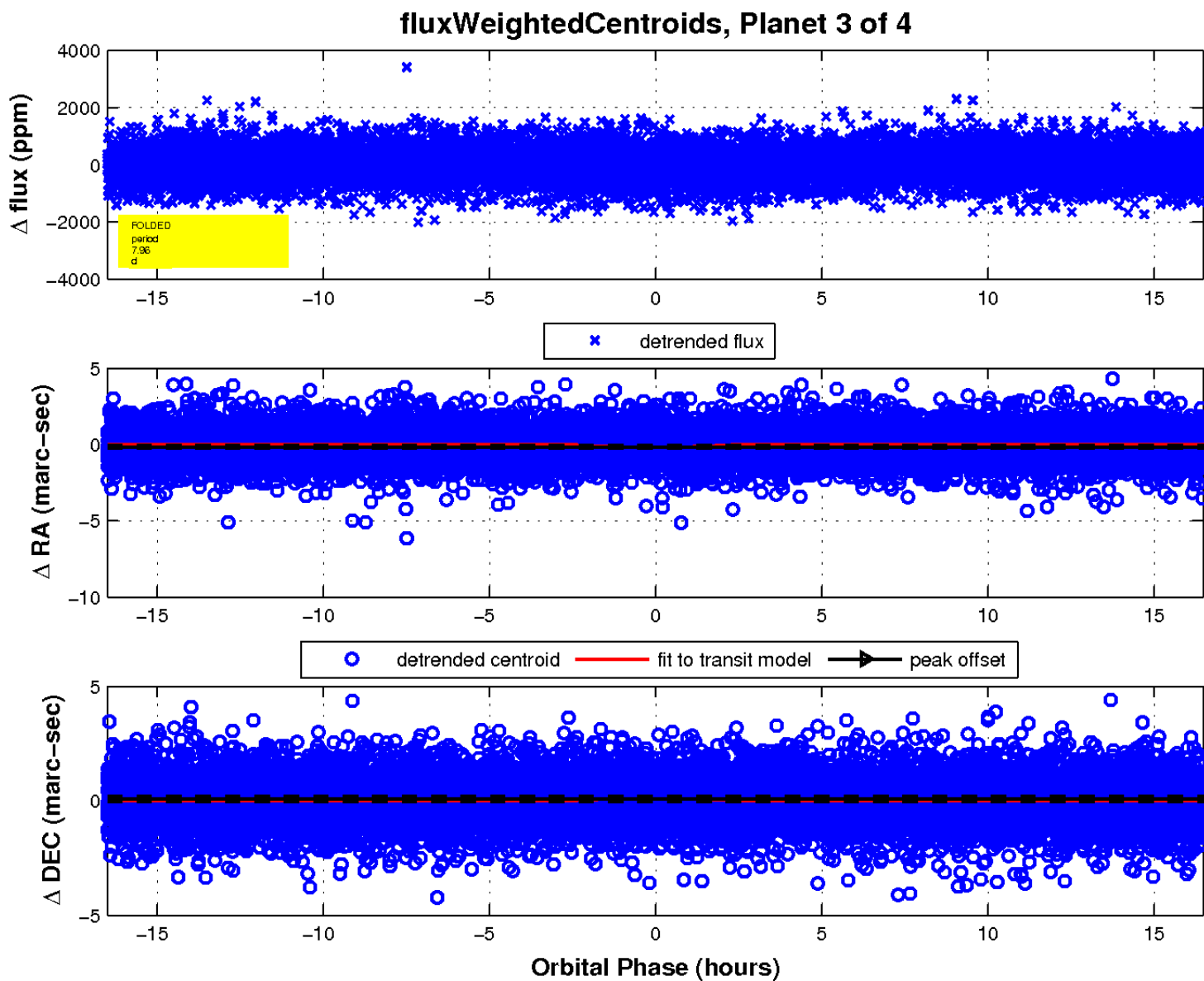
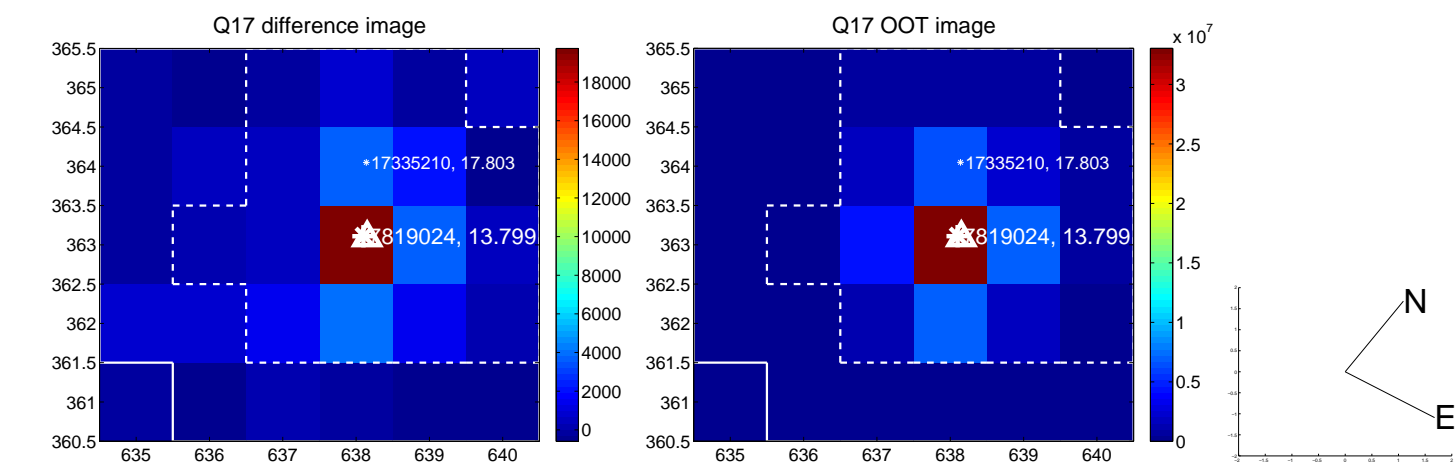
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



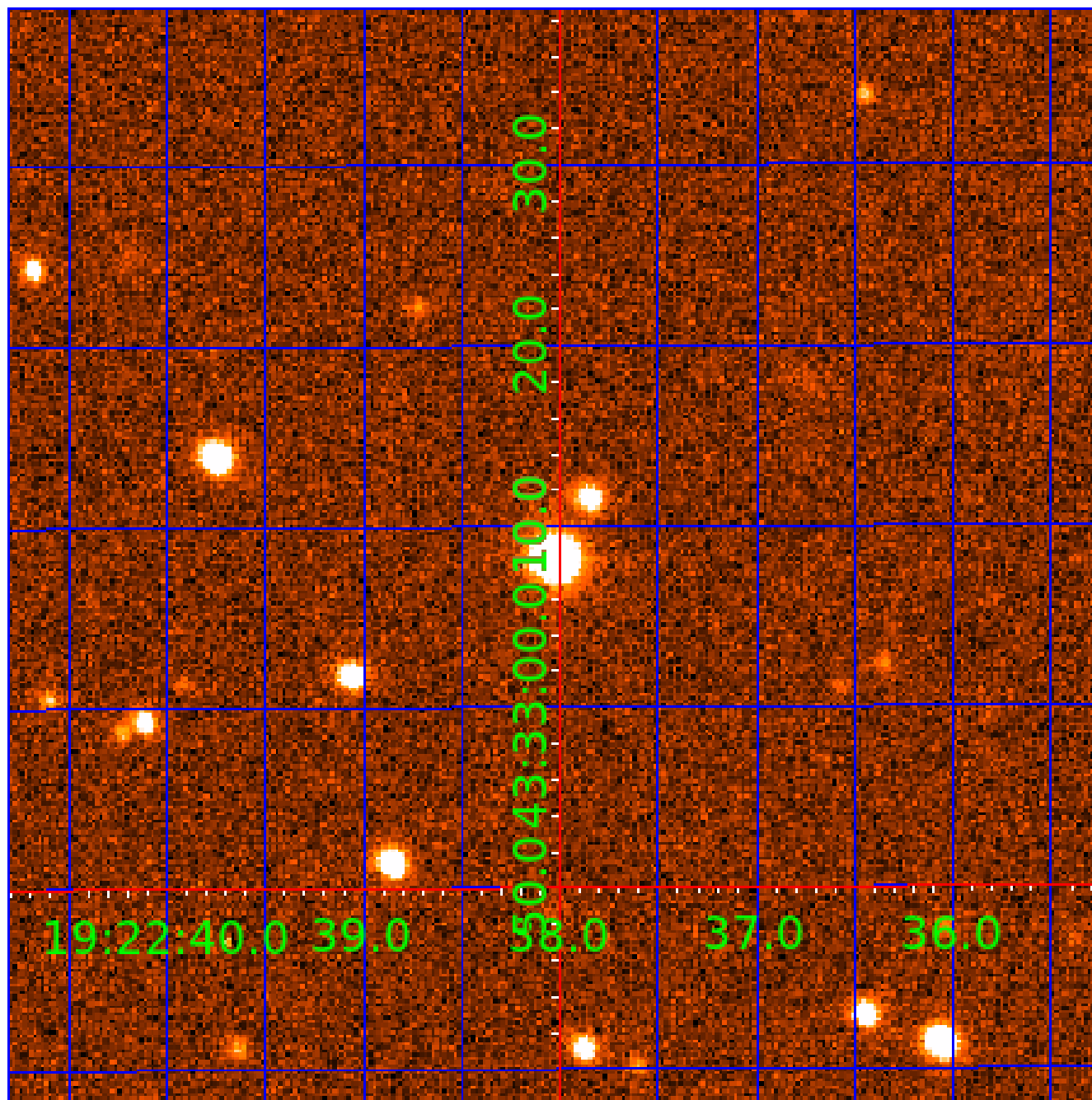
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 007819024

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007819024-01	OBS	No	0.545465	131.924570	77.8	1.900	11.7	12.2	1.80	7389	1.84	39269.06
007819024-02	OBS	No	0.545462	131.750210	82.4	0.770	11.5	12.5	1.80	7389	1.93	39269.37
007819024-03	OBS	No	7.959401	138.131527	449.2	5.497	9.2	12.3	1.80	7389	4.83	1101.29
007819024-04	OBS	No	41.406704	158.600020	833.5	5.931	8.8	9.2	1.80	7389	9.74	122.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007819024-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
007819024-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
007819024-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**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.

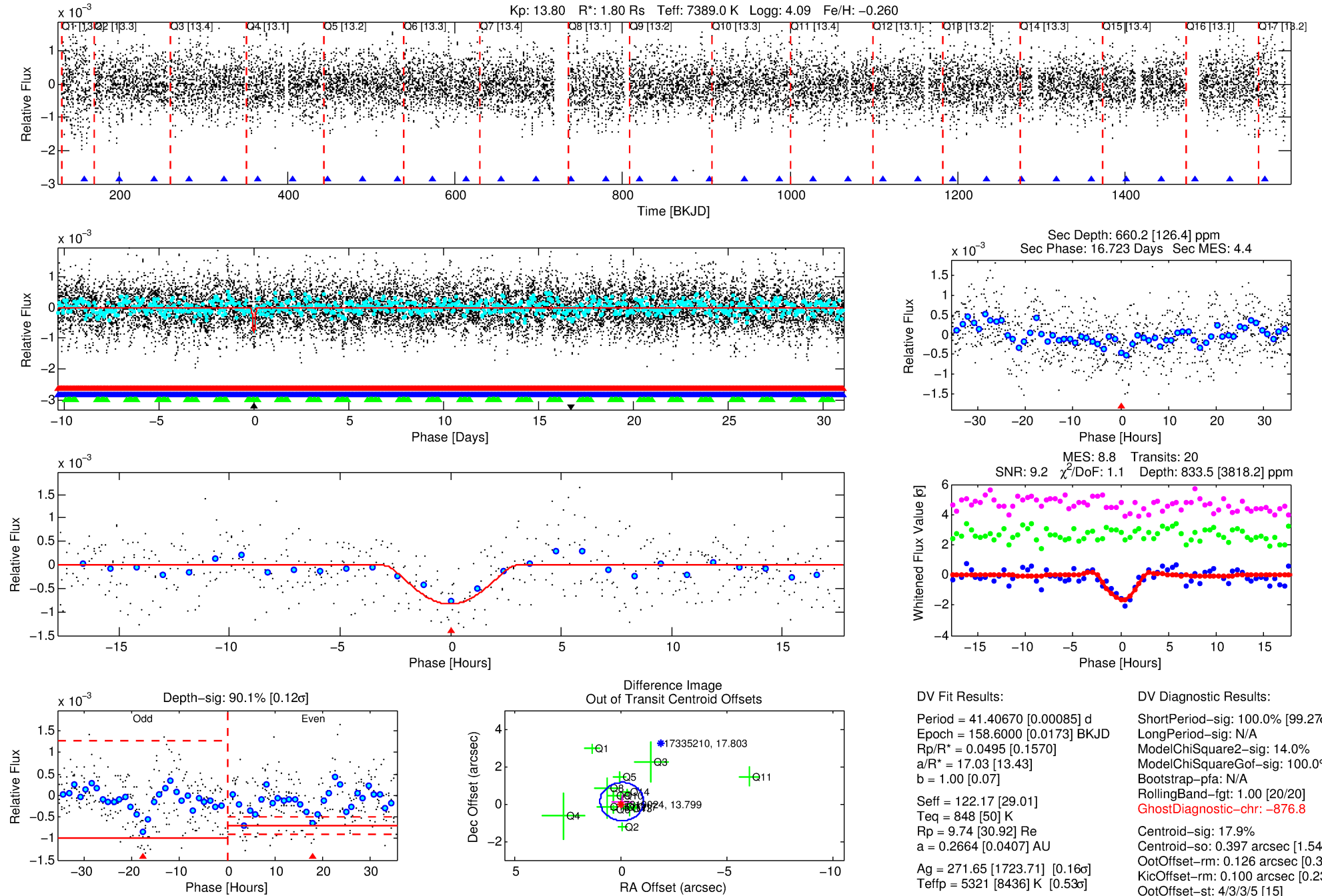
Ephemeris Match Information For 007819024-04

No Significant Match Found



# DV One-Page Summary

KIC: 7819024 Candidate: 4 of 4 Period: 41.407 d



## DV Fit Results:

Period = 41.40670 [0.00085] d  
Epoch = 158.6000 [0.0173] BKJD  
Rp/R\* = 0.0495 [0.1570]  
a/R\* = 17.03 [13.43]  
b = 1.00 [0.07]  
Seff = 122.17 [29.01]  
Teff = 848 [50] K  
Rp = 9.74 [30.92] Re  
a = 0.2664 [0.0407] AU  
Ag = 271.65 [1723.71] [0.16 $\sigma$ ]  
Teffp = 5321 [8436] K [0.53 $\sigma$ ]

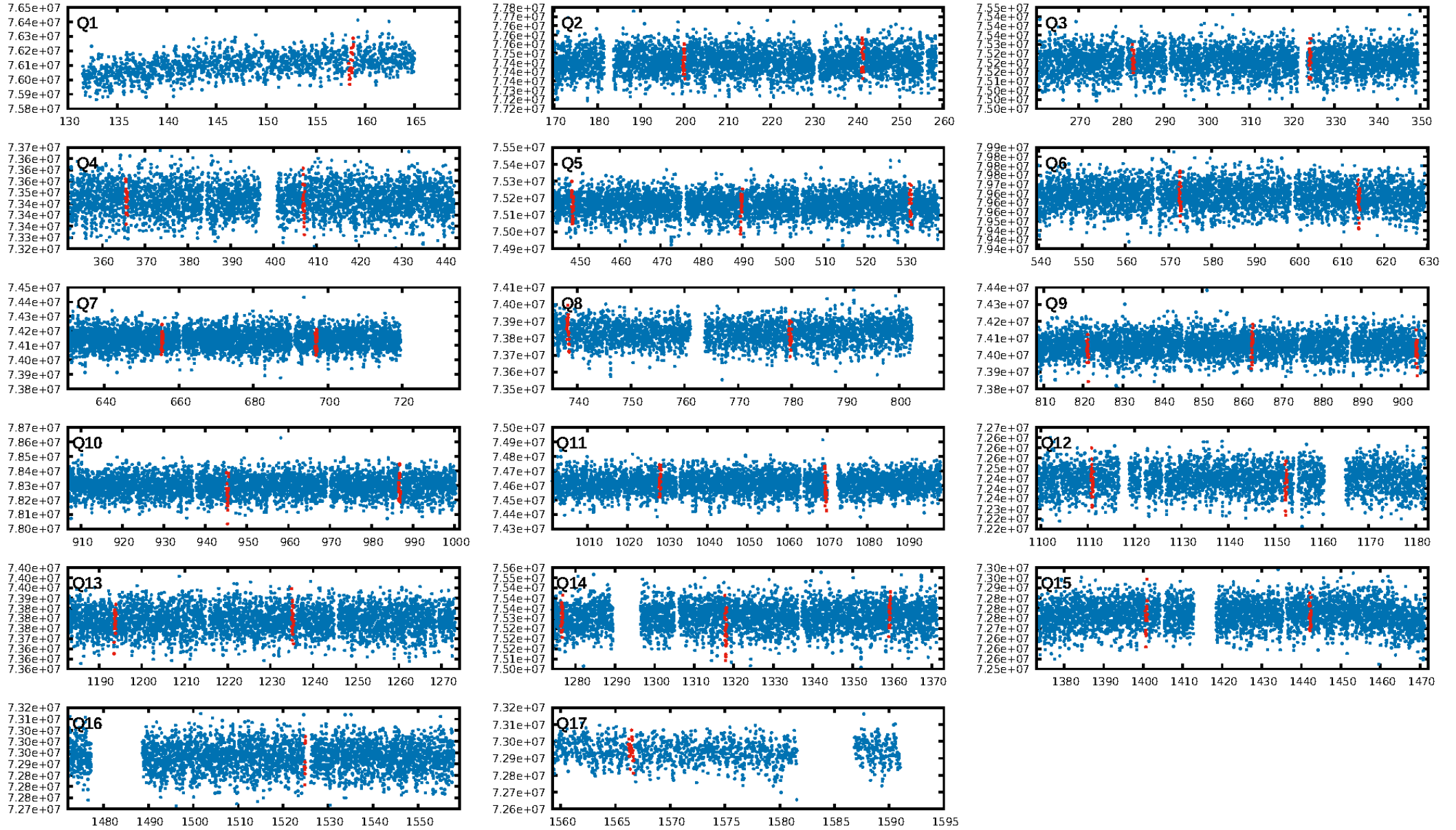
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [99.27 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 14.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [20/20]  
GhostDiagnostic-chr: -876.8  
Centroid-sig: 17.9%  
Centroid-so: 0.397 arcsec [1.54 $\sigma$ ]  
OotOffset-rm: 0.126 arcsec [0.37 $\sigma$ ]  
KicOffset-rm: 0.100 arcsec [0.23 $\sigma$ ]  
OotOffset-st: 4/3/3/5 [15]  
KicOffset-st: 4/3/3/5 [15]  
DiffImageQuality-fgm: 0.53 [8/15]  
DiffImageOverlap-fno: 0.00 [0/16]

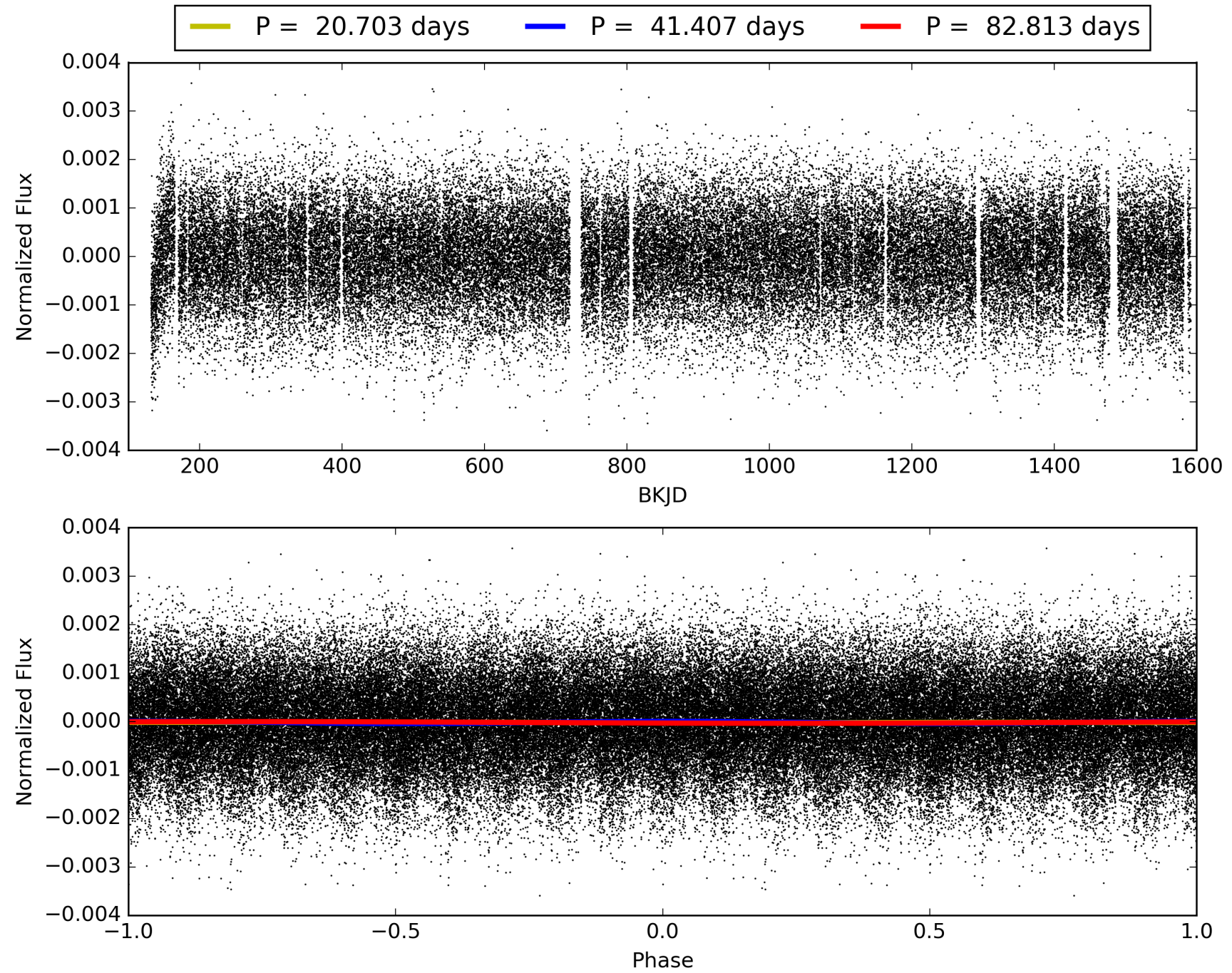
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:29:17 Z

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

# TCE 007819024-04, PDC Light Curves

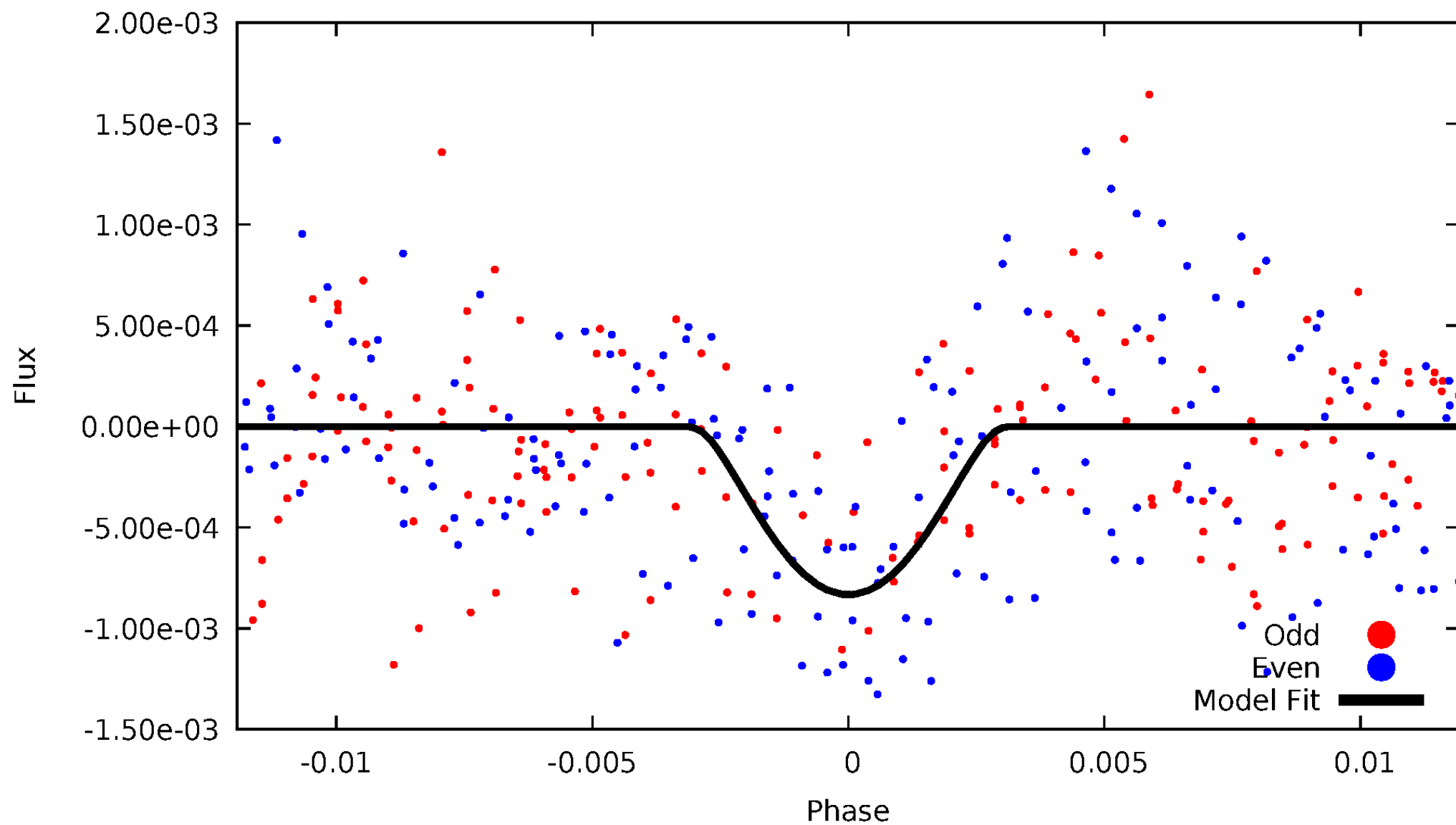


TCE 007819024-04



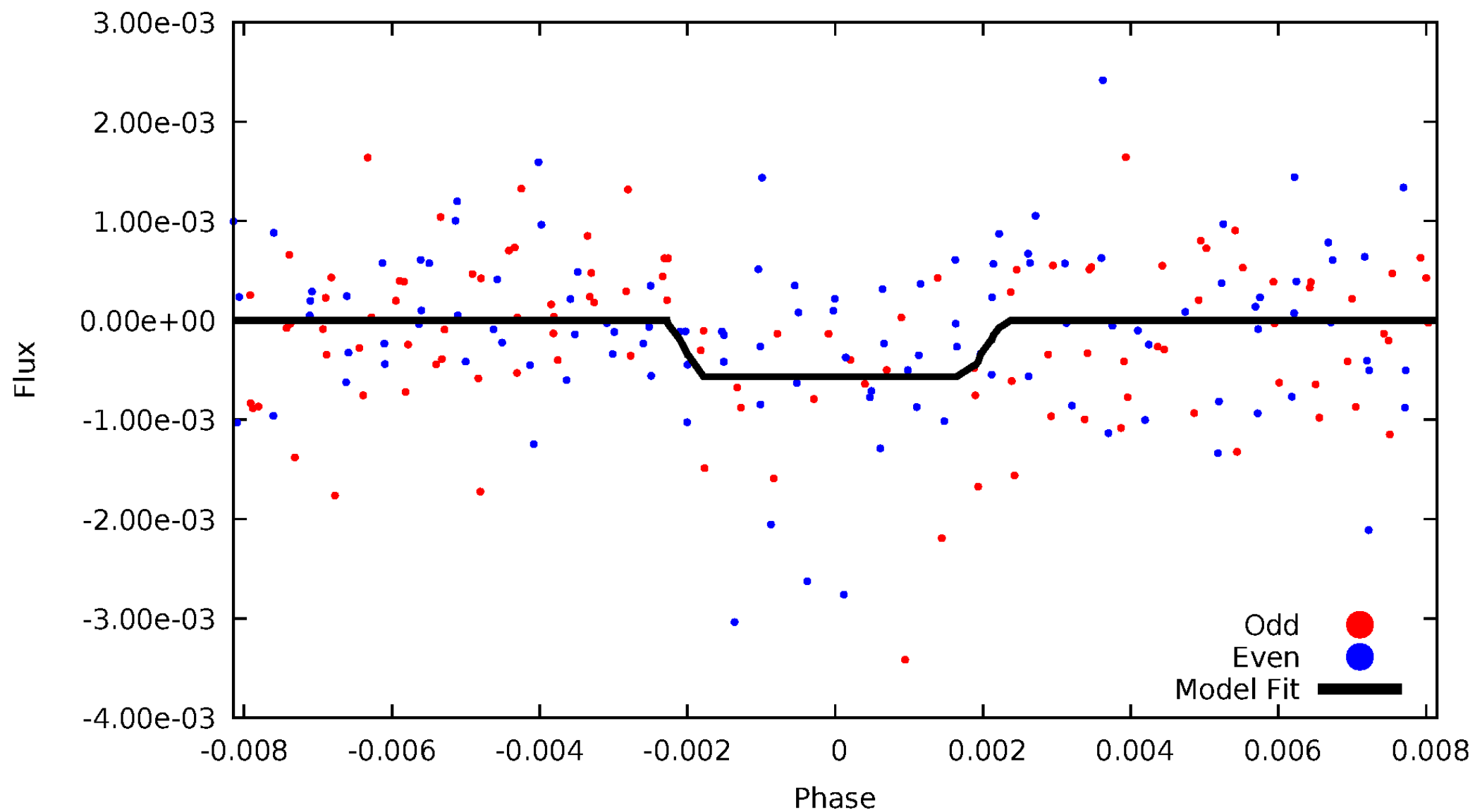
# DV Odd/Even

TCE 007819024-04



# ALT Odd/Even

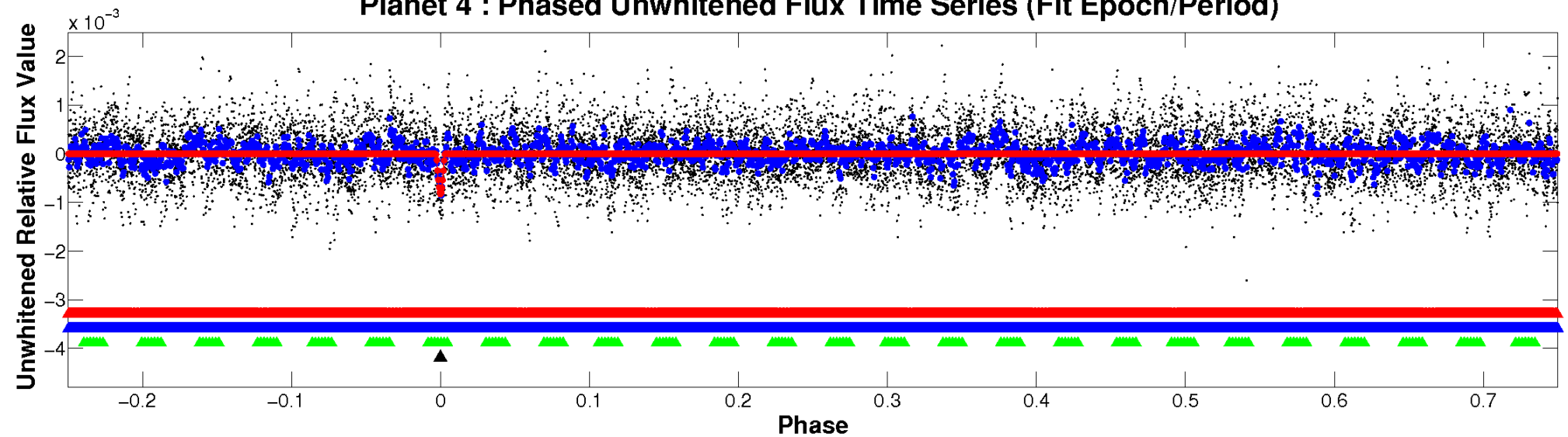
TCE 007819024-04



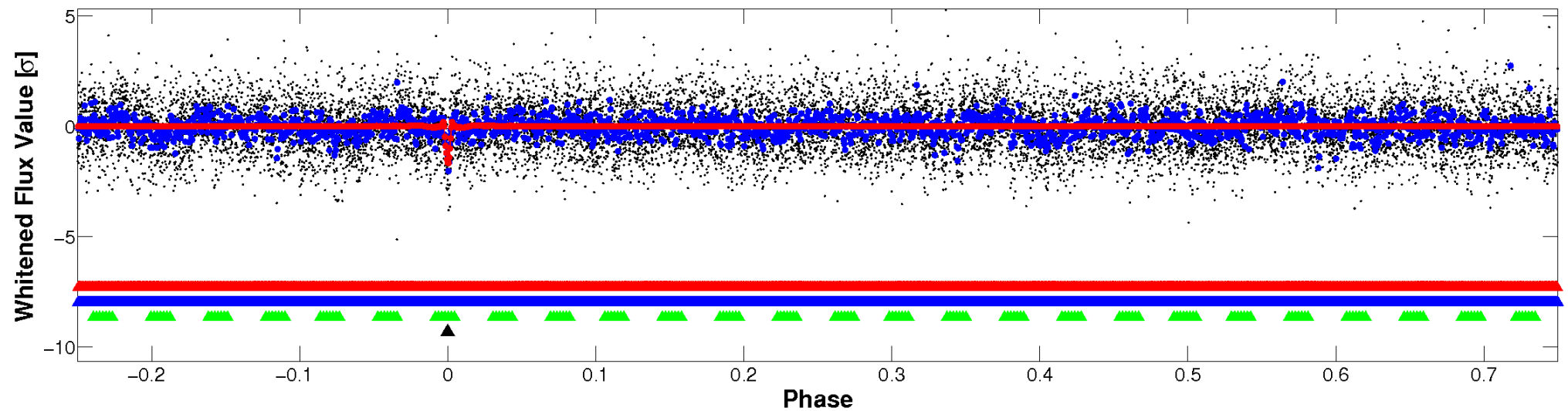


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

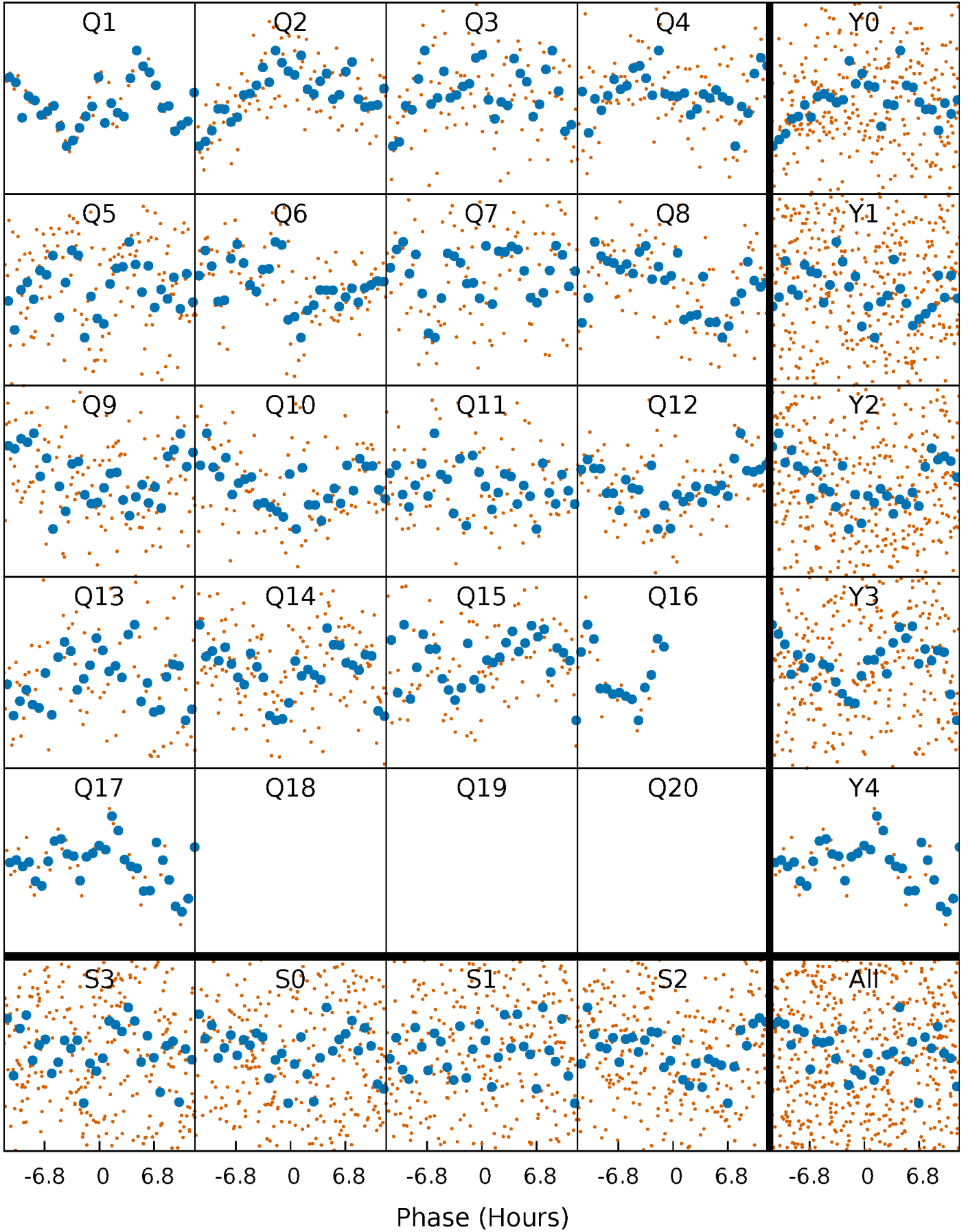


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



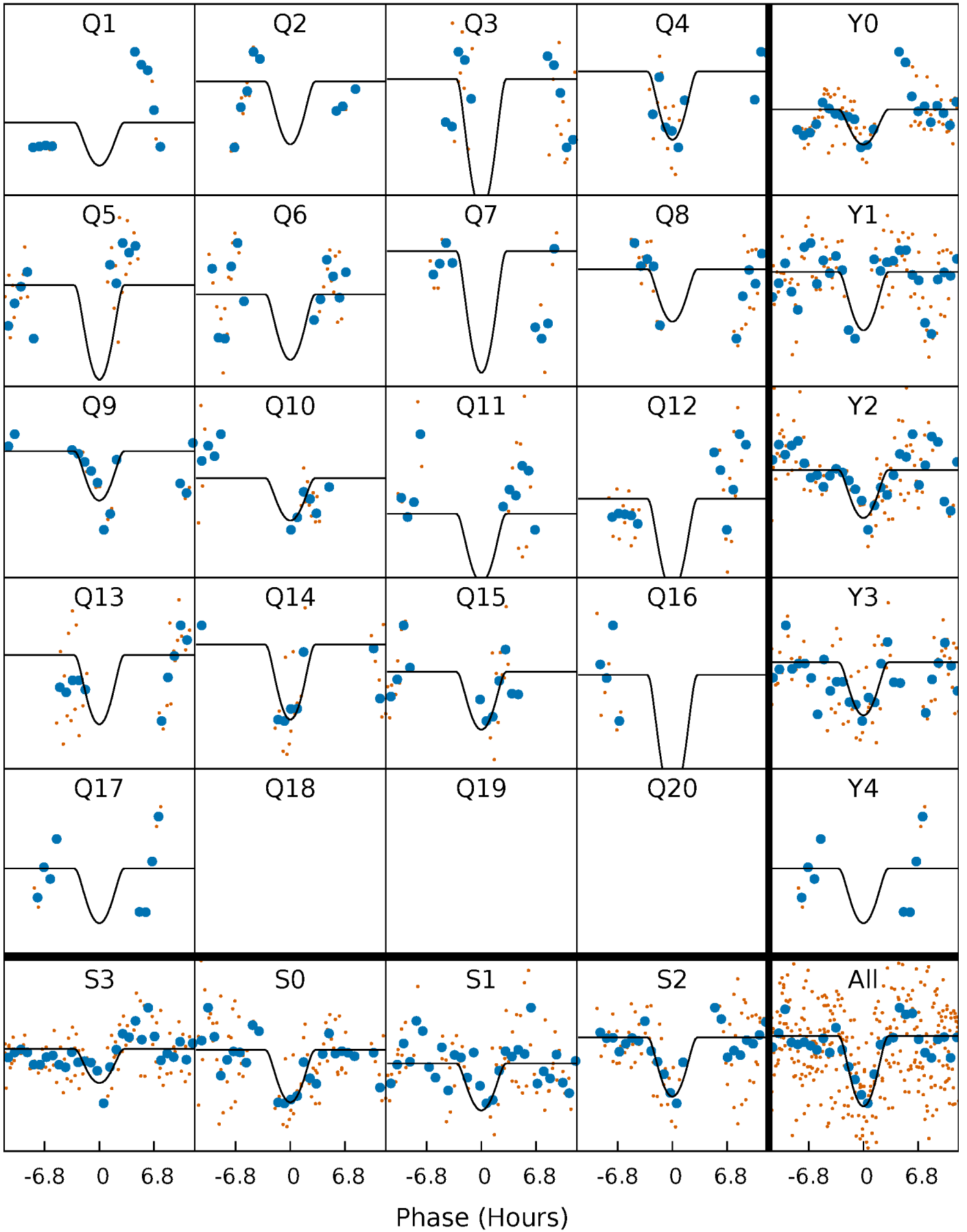
# PDC Quarter-Phased Transit Curves

TCE 007819024-04   P= 41.406704 Days    $T_0=158.600020$  (BKJD)



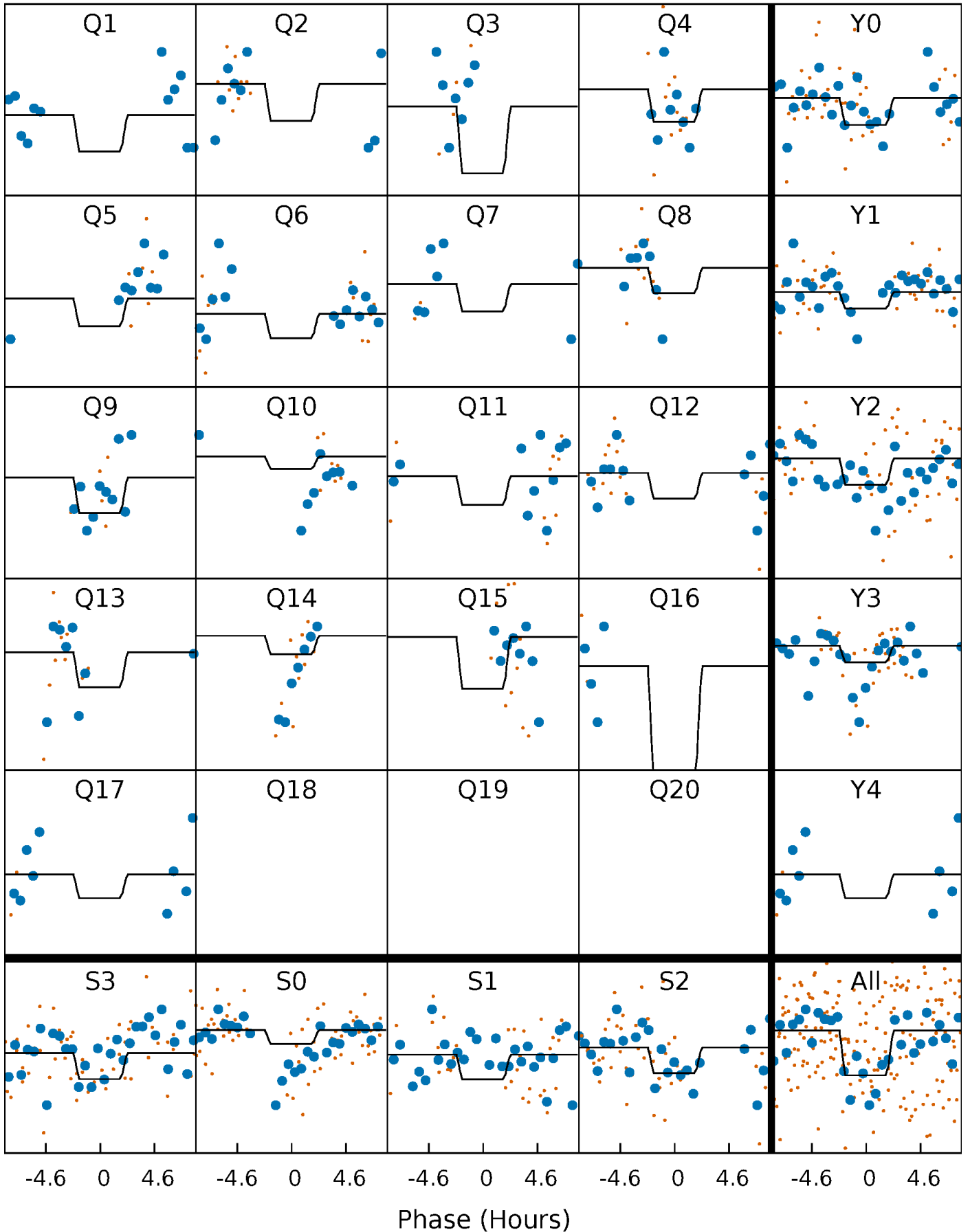
# DV Quarter-Phased Transit Curves

TCE 007819024-04   P= 41.406704 Days    $T_0=158.600020$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

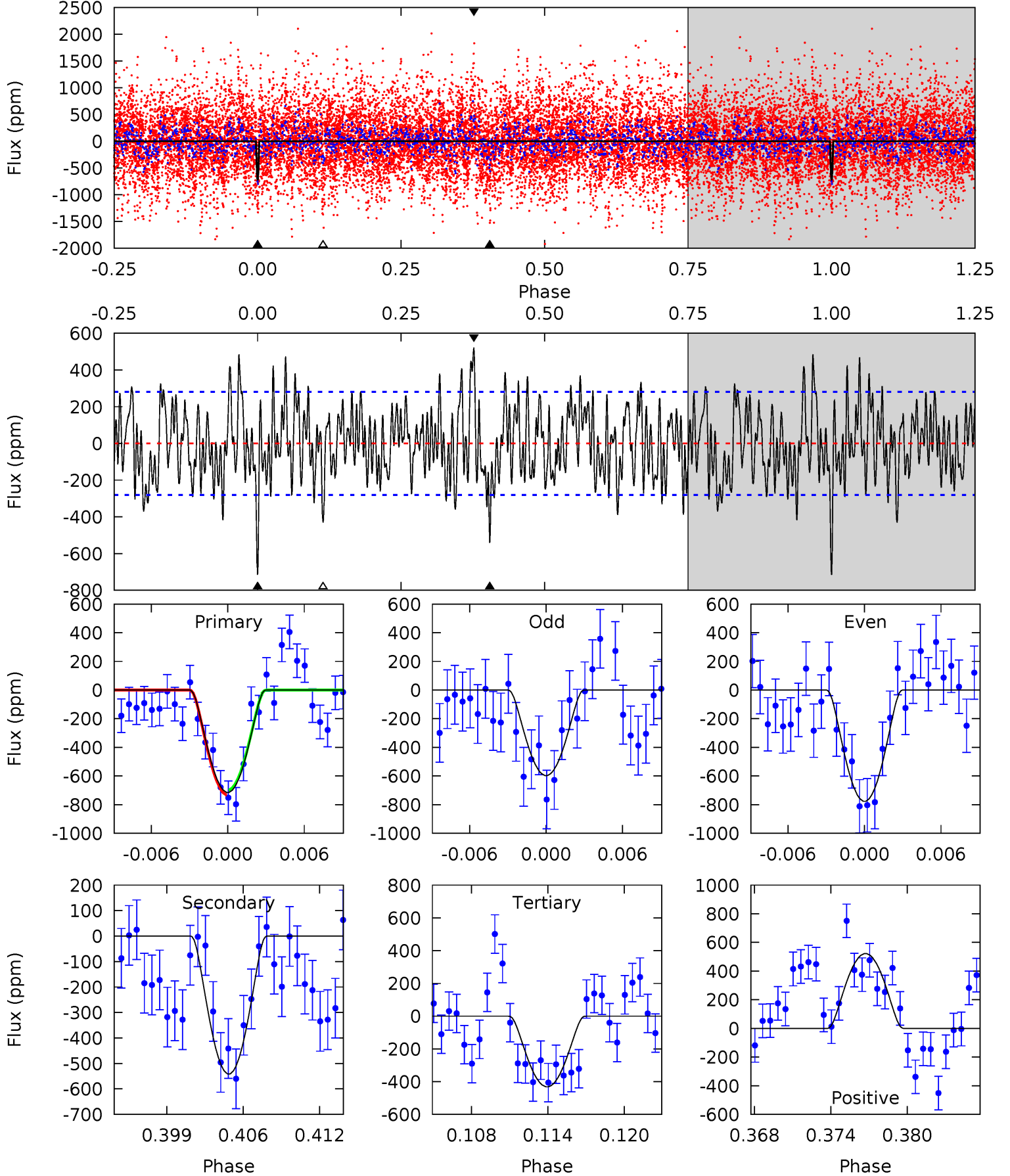
TCE 007819024-04     $P = 41.406830$  Days     $T_0 = 158.574643$  (BKJD)



# DV Model-Shift Uniqueness Test

007819024-04, P = 41.406704 Days, E = 117.193316 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
13.0	9.85	7.85	9.50	5.11	2.73	3.08	5.15	3.51	2.00	0.35	1.60	0.29	0.42	0.32

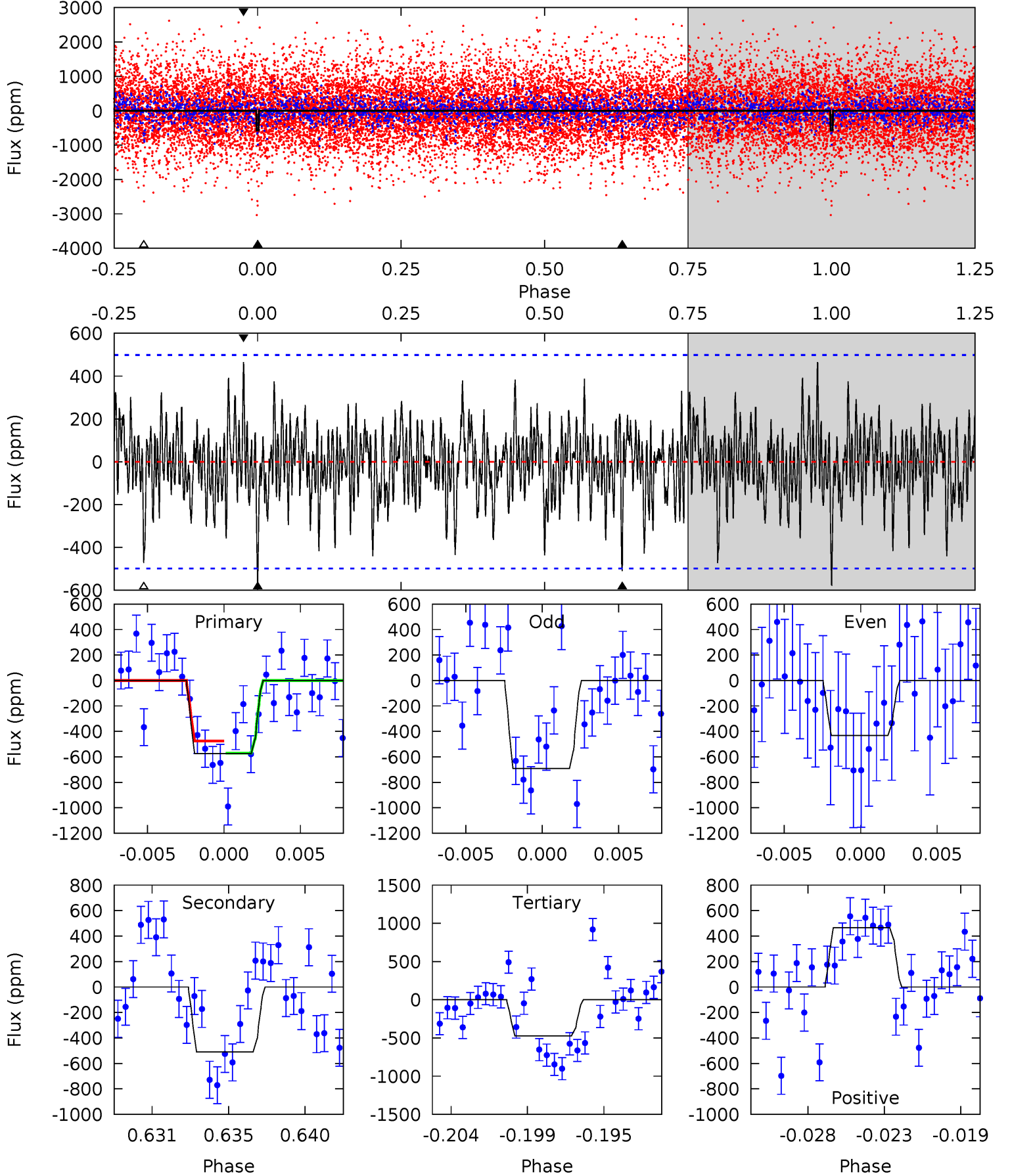




# Alt Model-Shift Uniqueness Test

007819024-04, P = 41.406830 Days, E = 117.167813 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.96	5.29	4.90	4.83	5.17	2.83	1.45	1.06	1.14	0.39	0.47	1.25	1.96	0.45	0.49



### Stellar Parameters For KIC 007819024

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7389^{+73}_{-88}$	$4.094^{+0.132}_{-0.108}$	$-0.260^{+0.150}_{-0.150}$	$1.802^{+0.309}_{-0.309}$	$1.468^{+0.127}_{-0.115}$	$0.353^{+0.204}_{-0.120}$
	+1%/-1%	+3%/-3%	+58%/-58%	+17%/-17%	+9%/-8%	+58%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007819024-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-541 \pm 55$	$25.46^{+26.14}_{-18.84}$	$1183^{+50}_{-55}$	$3541^{+2410}_{-687}$	$34^{+435}_{-26}$
Alt.	$-510 \pm 96$	$23.02^{+24.07}_{-15.71}$	$1182^{+51}_{-52}$	$3626^{+2011}_{-711}$	$38^{+322}_{-29}$

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

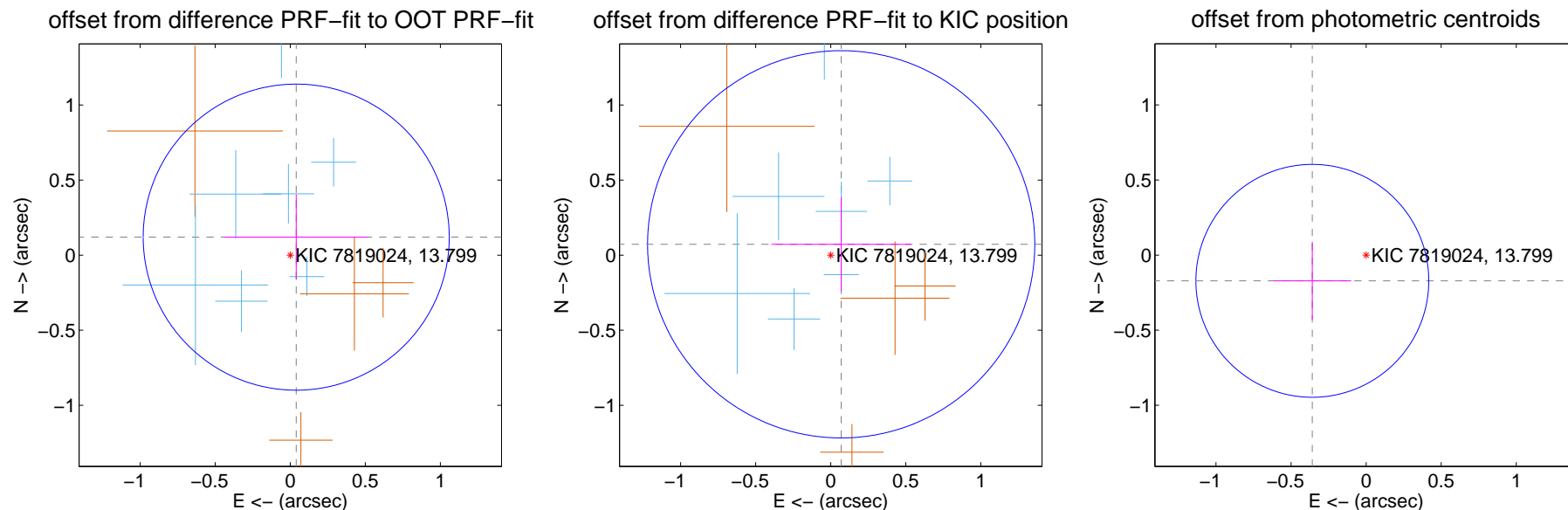
## DV Centroid Data

Supplemental centroid analysis for 007819024-04. Kepler magnitude: 13.80. Transit SNR 9.15

There are 8 quarters with good PRF difference image offsets

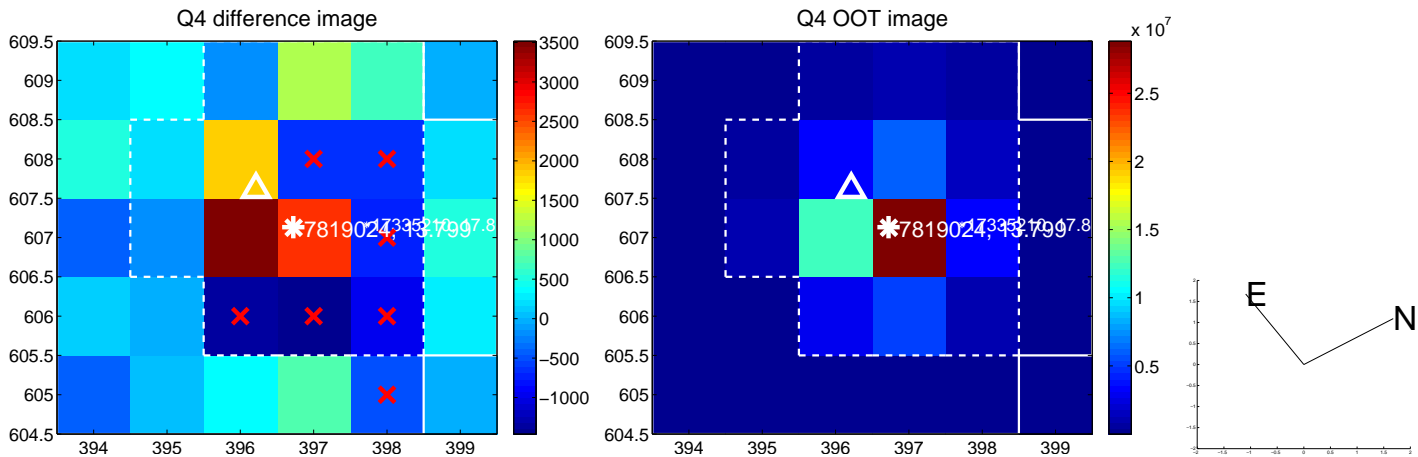
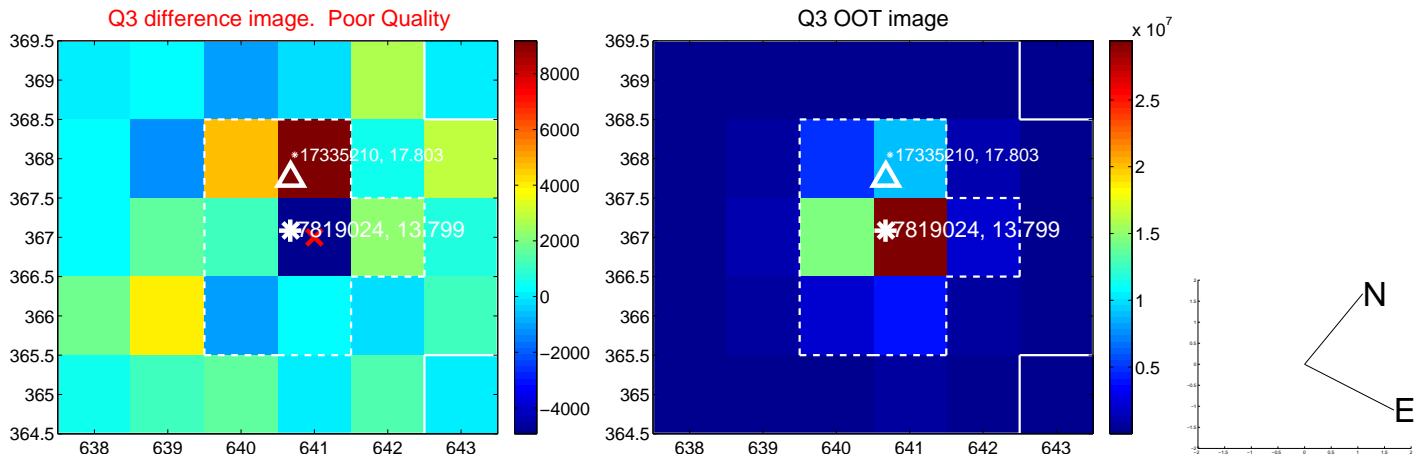
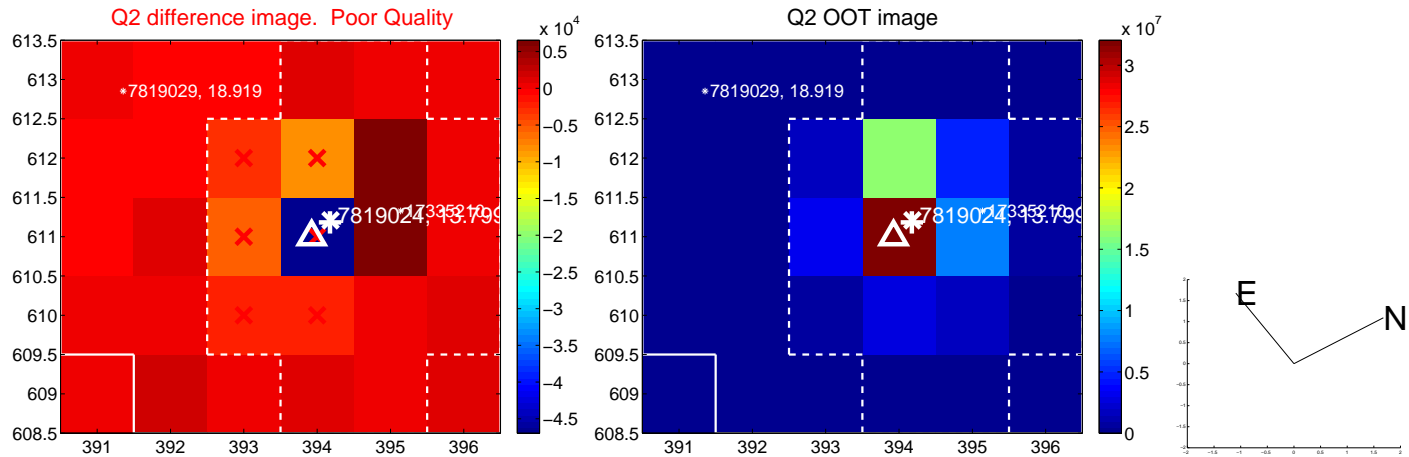
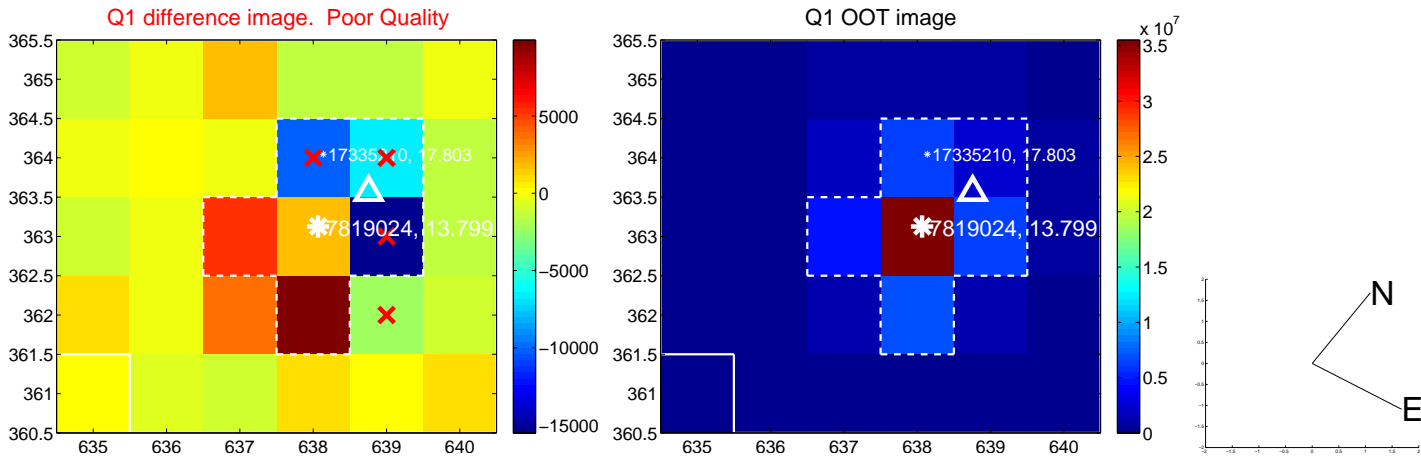
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.126 \pm 0.340$	0.37	$-0.040 \pm 0.479$	$0.120 \pm 0.284$
PRF-fit source offset from KIC position	$0.100 \pm 0.430$	0.23	$-0.070 \pm 0.465$	$0.072 \pm 0.314$
photometric centroid source offset	$0.40 \pm 0.26$	1.54	$0.36 \pm 0.26$	$-0.17 \pm 0.26$

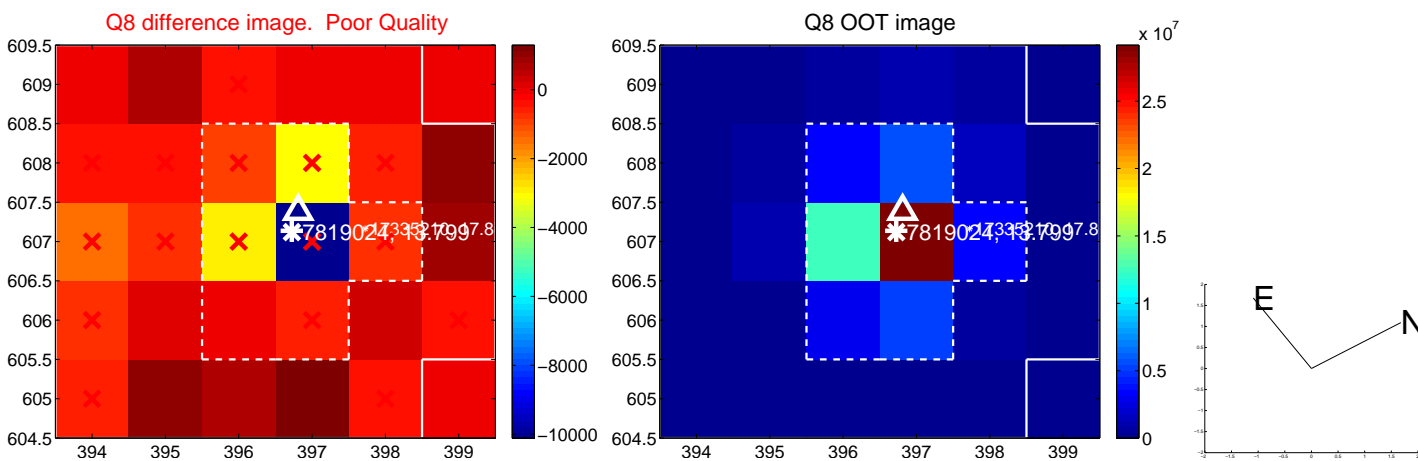
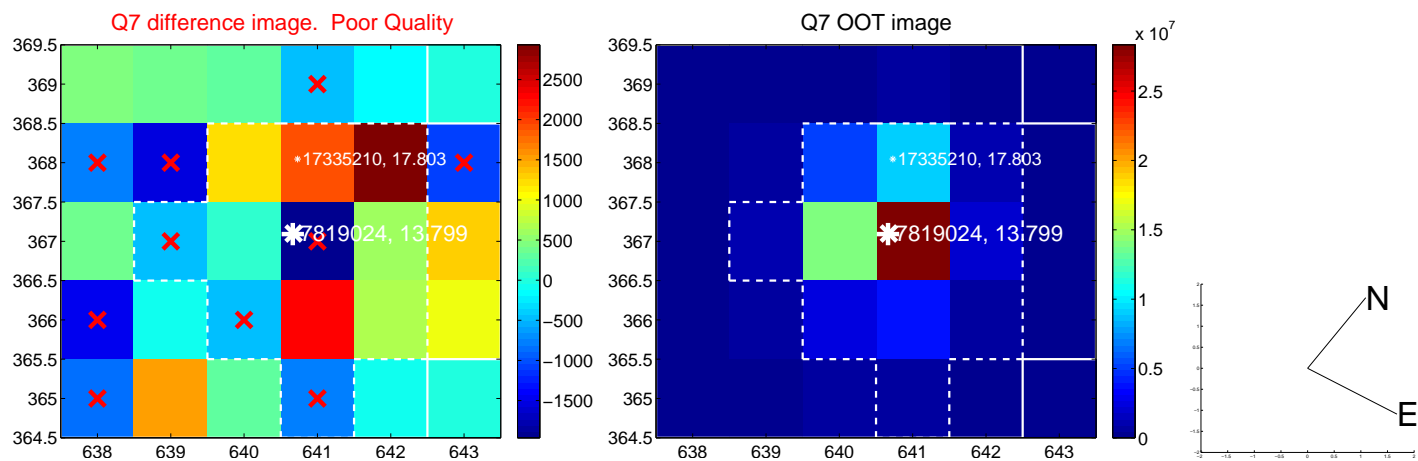
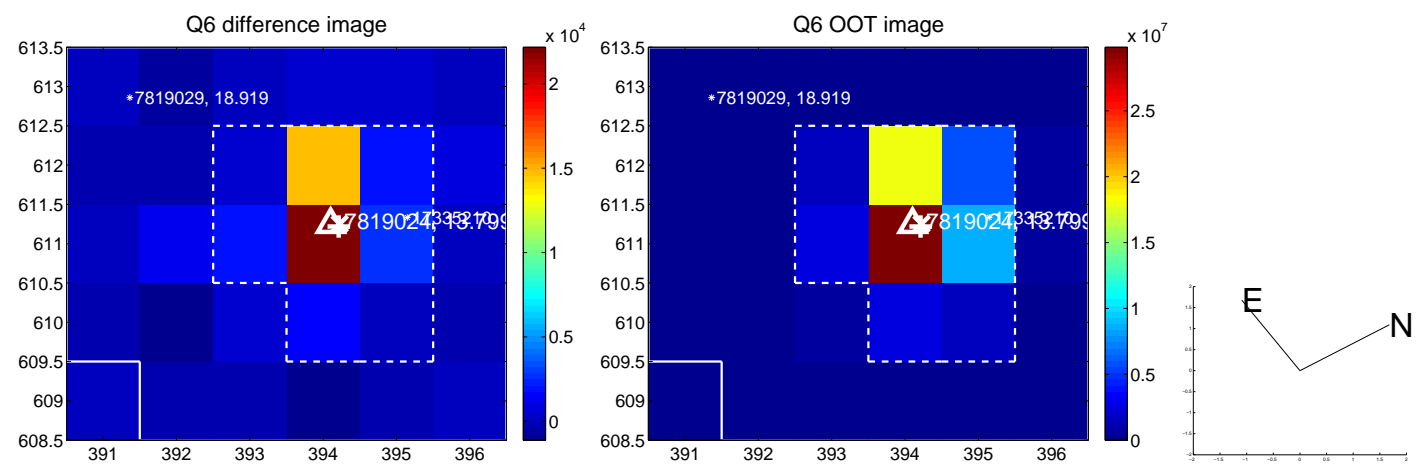
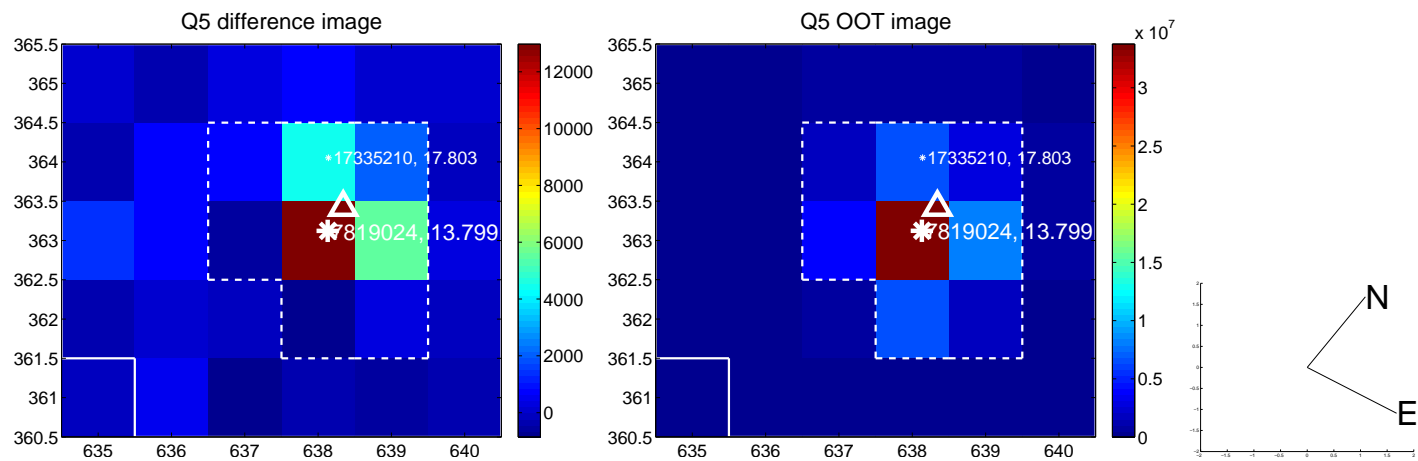


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

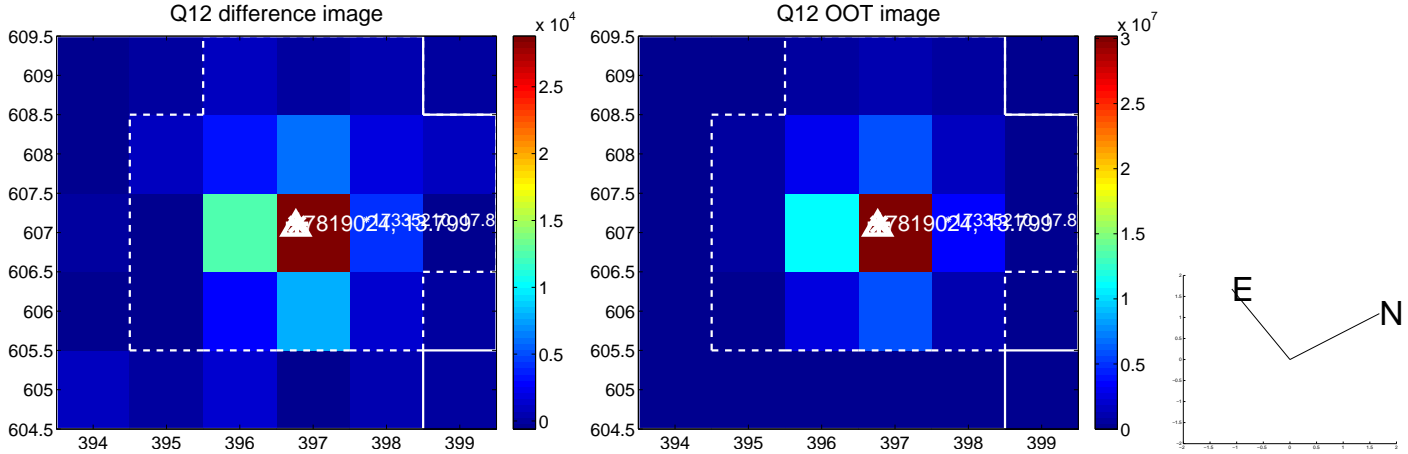
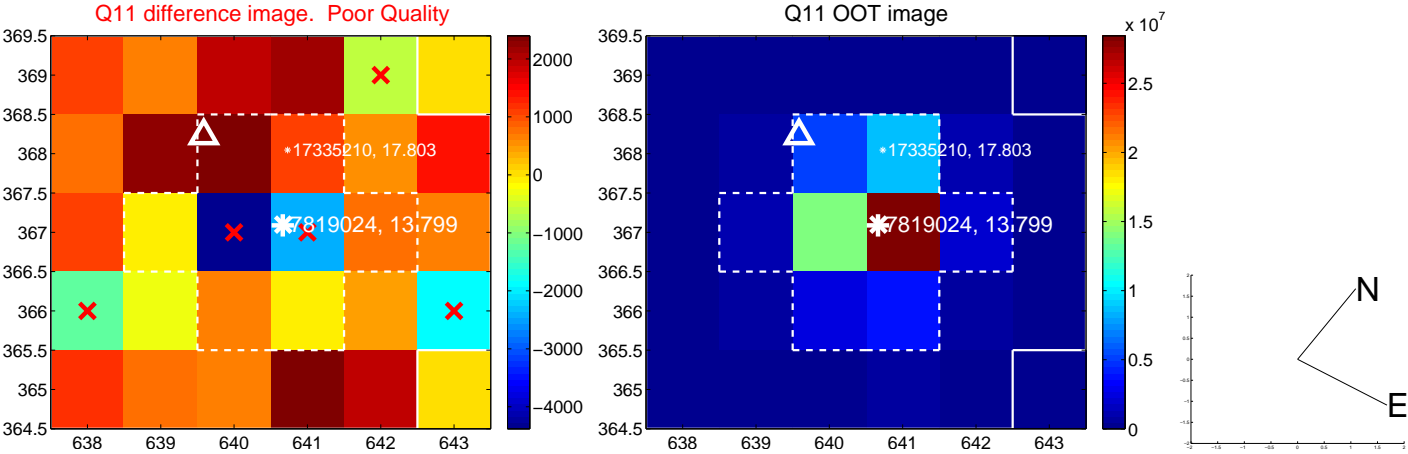
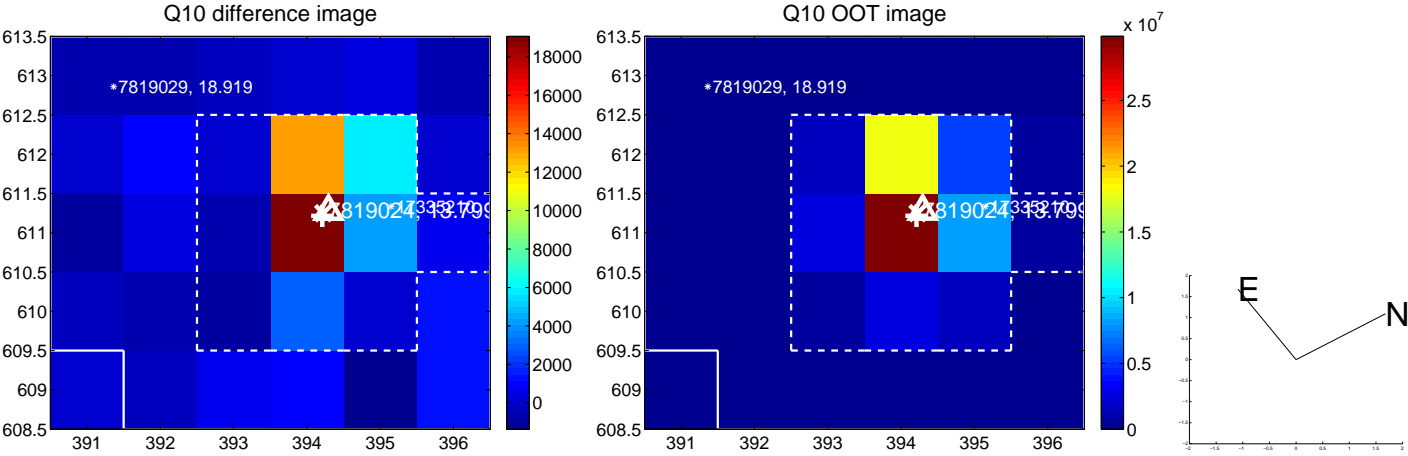
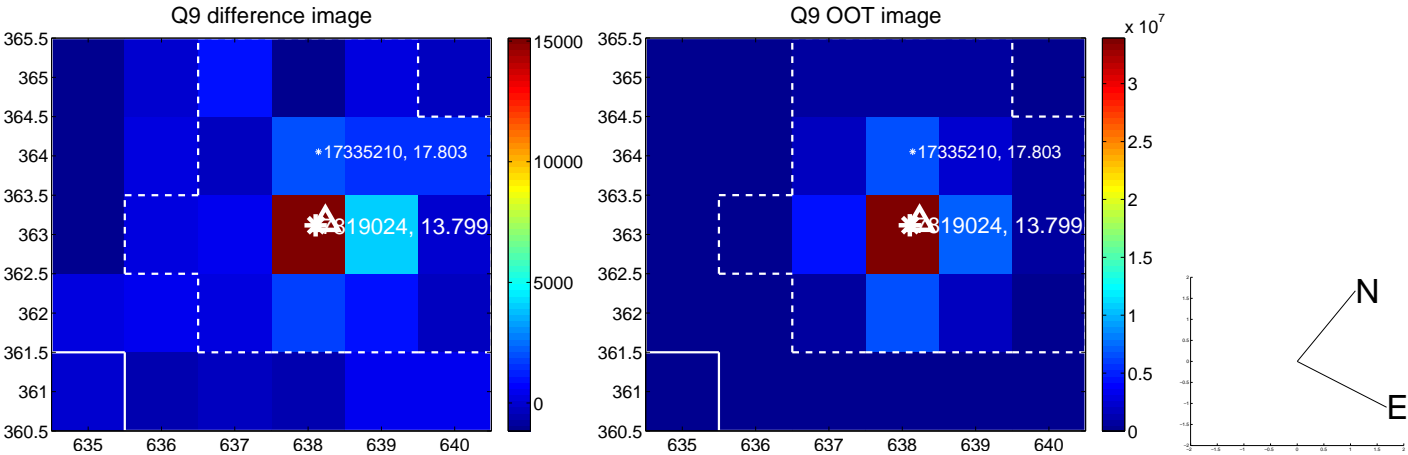
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

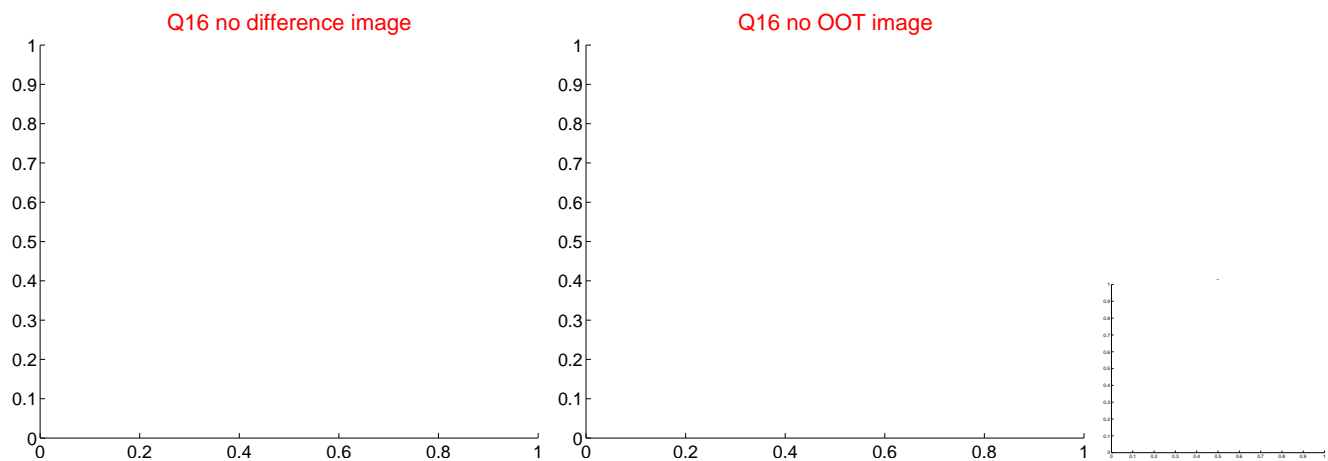
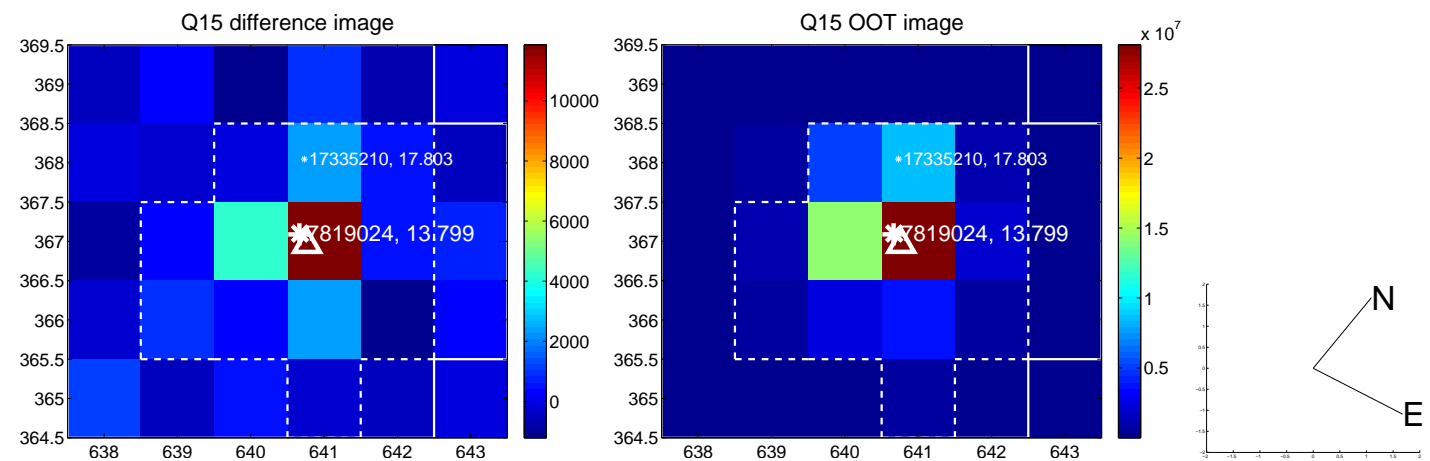
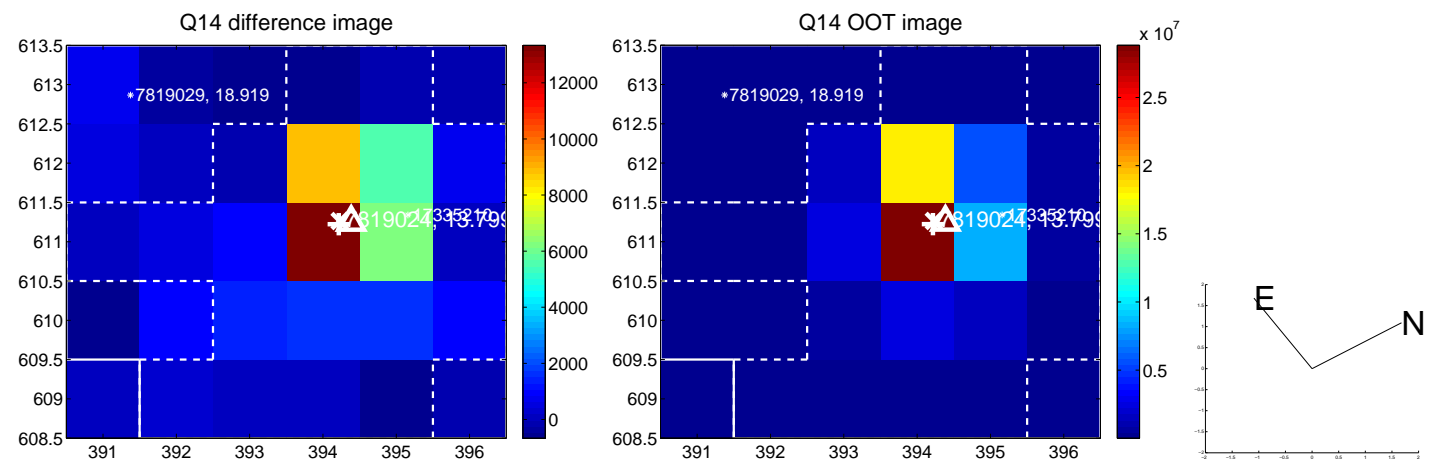
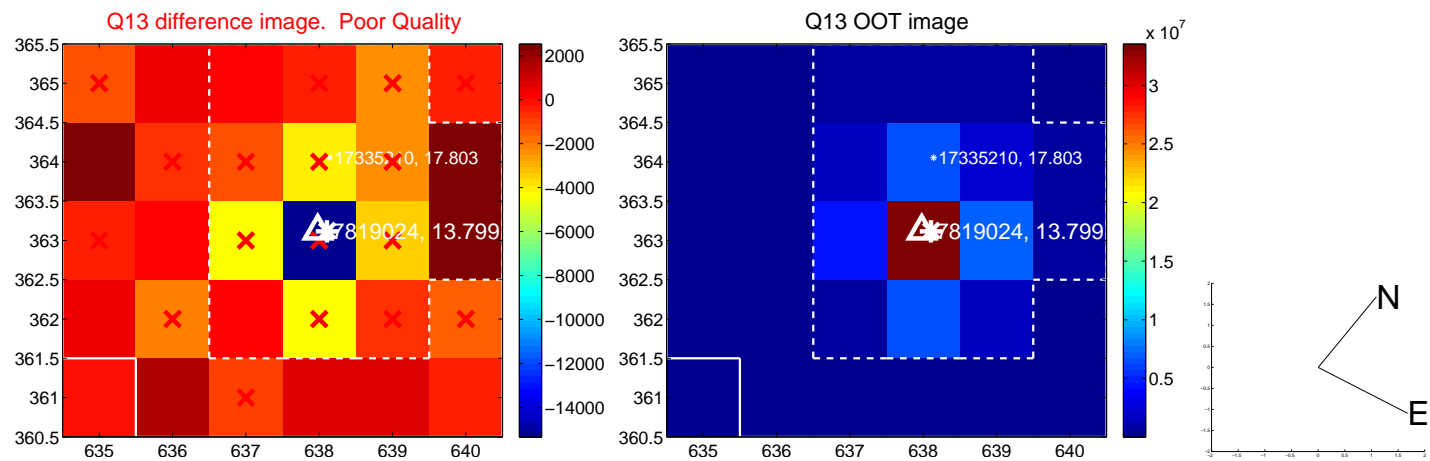


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

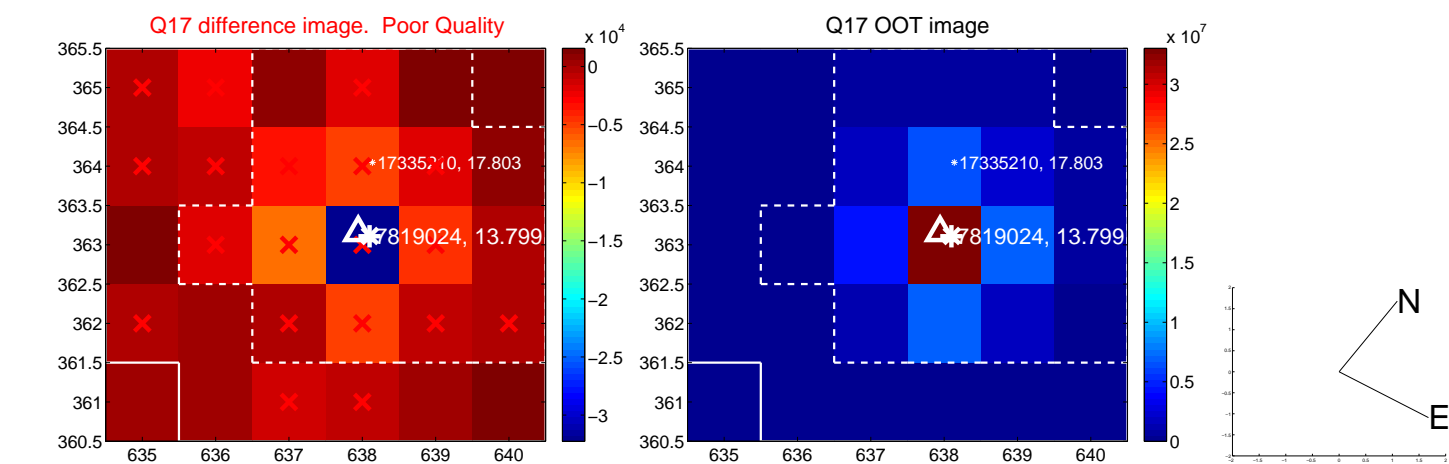




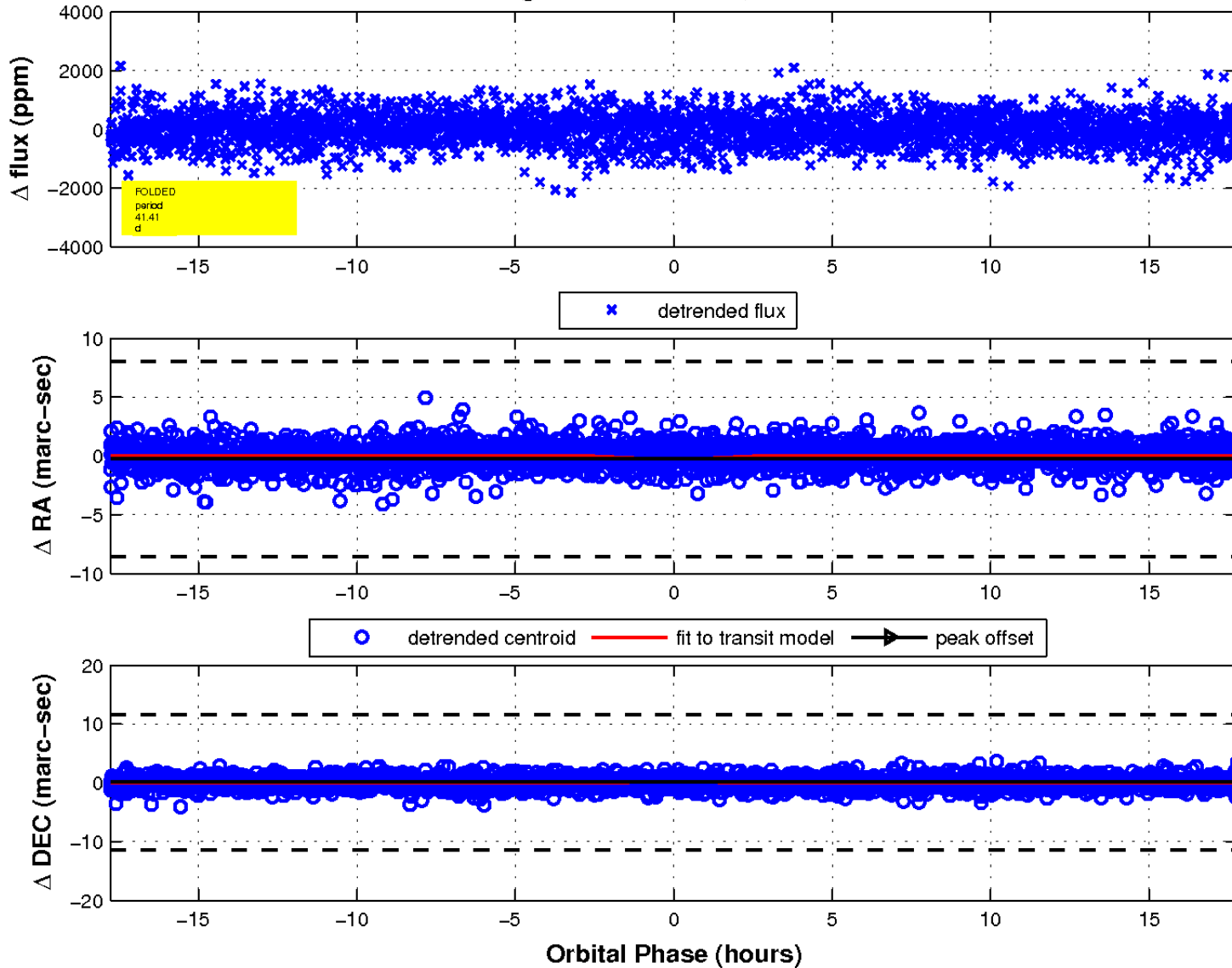
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

