

# KIC 009787239

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009787239-01	OBS	0952.01	5.901287	135.998633	1565.0	2.392	44.2	49.6	0.50	3731	2.23	16.54
009787239-02	OBS	0952.03	22.780805	132.421087	1983.5	3.312	31.4	38.0	0.50	3731	2.26	2.73
009787239-03	OBS	0952.02	8.752109	135.627317	1319.9	3.106	31.8	34.7	0.50	3731	2.36	9.78
009787239-04	OBS	0952.04	2.896009	133.613421	411.3	1.868	15.3	17.4	0.50	3731	1.21	42.72
009787239-05	OBS	0952.05	0.742957	131.791013	205.0	1.299	11.1	13.7	0.50	3731	0.86	262.06

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009787239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009787239-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-04	OBS	PC	0.97	0	0	0	0	CENT_KIC_POS
009787239-05	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

**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.

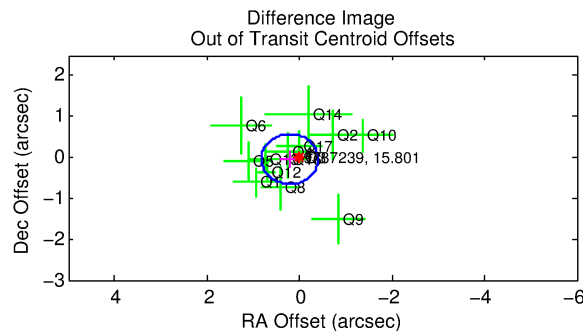
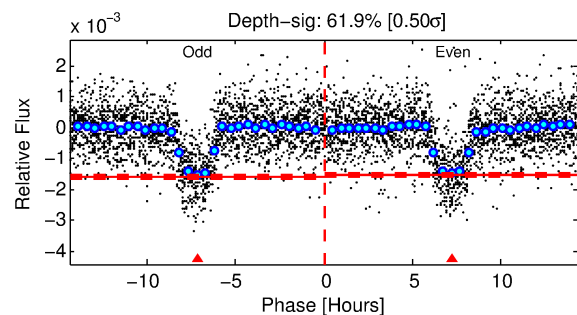
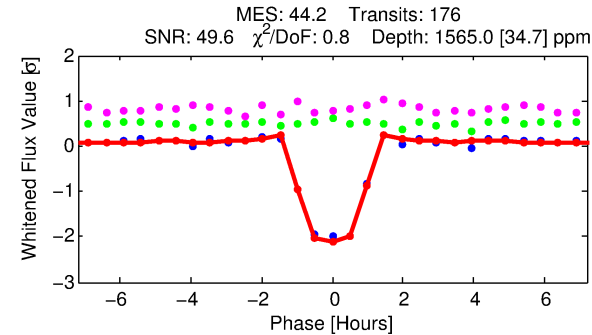
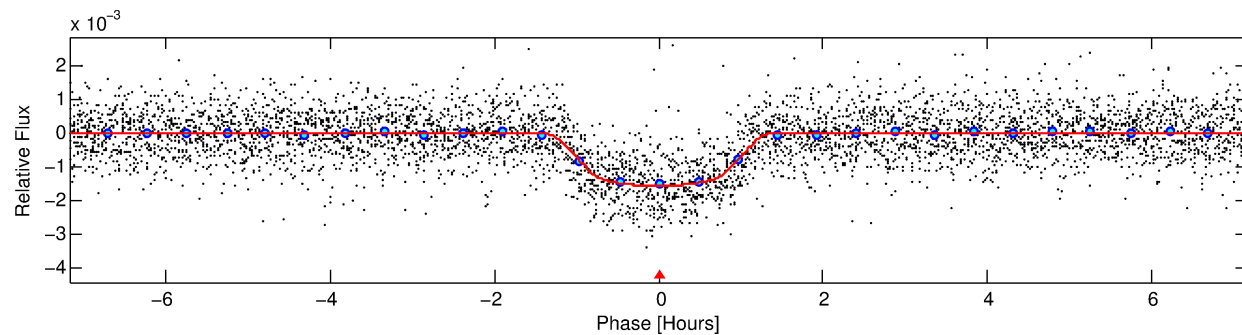
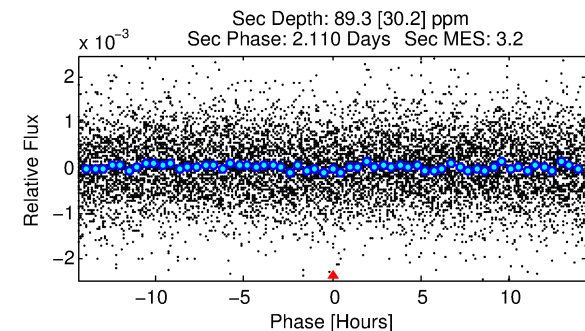
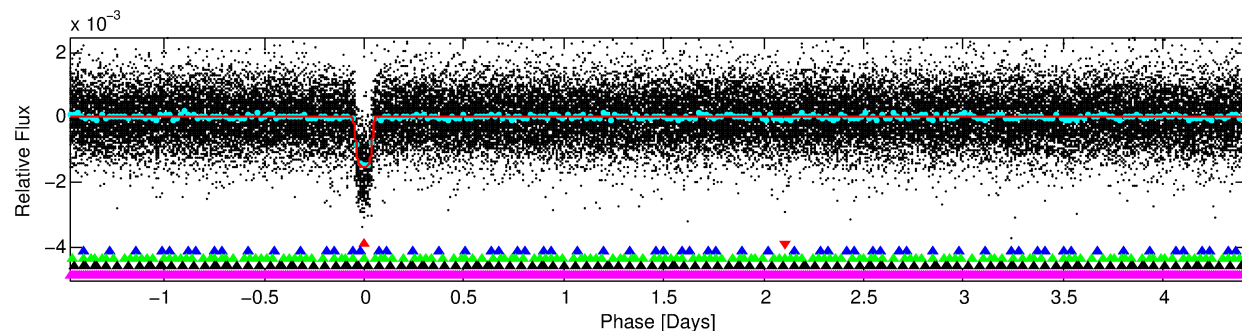
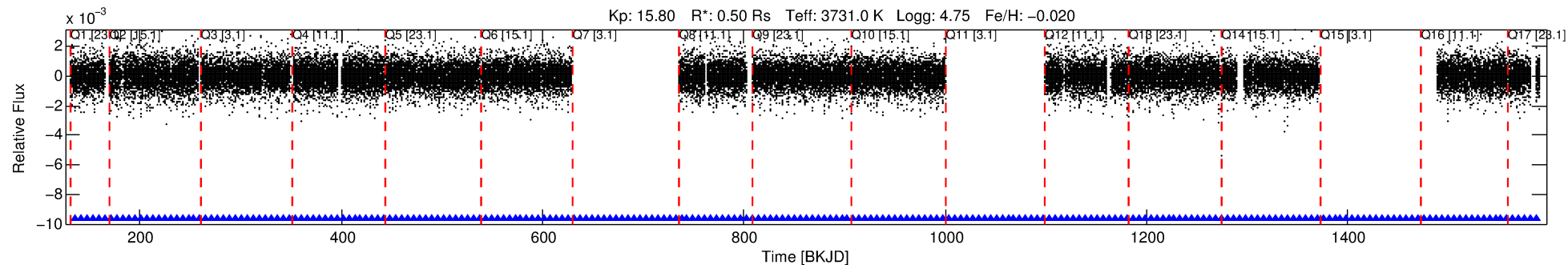
## Ephemeris Match Information For 009787239-01

No Significant Match Found

# DV One-Page Summary

KIC: 9787239 Candidate: 1 of 5 Period: 5.901 d  
KOI: K00952.01 Name: Kepler-32b Corr: 0.972

Kp: 15.80 R\*: 0.50 Rs Teff: 3731.0 K Logg: 4.75 Fe/H: -0.020



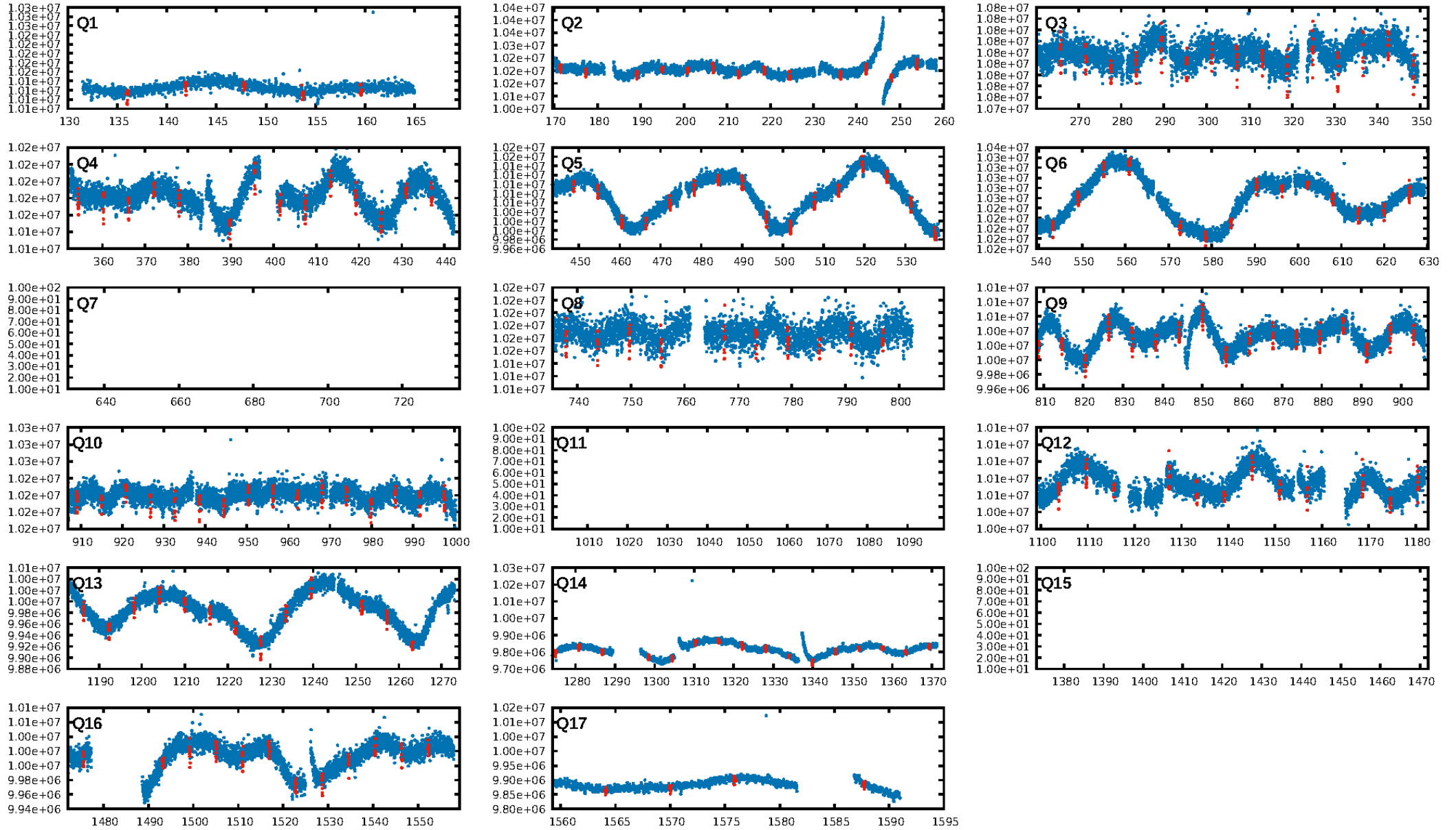
## DV Fit Results:

Period = 5.90129 [0.00001] d  
Epoch = 135.9986 [0.0008] BKJD  
Rp/R\* = 0.0411 [0.0031]  
a/R\* = 11.78 [3.70]  
b = 0.83 [0.12]  
Seff = 16.54 [2.28]  
Teq = 514 [18] K  
Rp = 2.23 [0.28] Re  
a = 0.0510 [0.0040] AU  
Ag = 25.68 [9.90] [2.49σ]  
Teffp = 1790 [171] K [7.44σ]

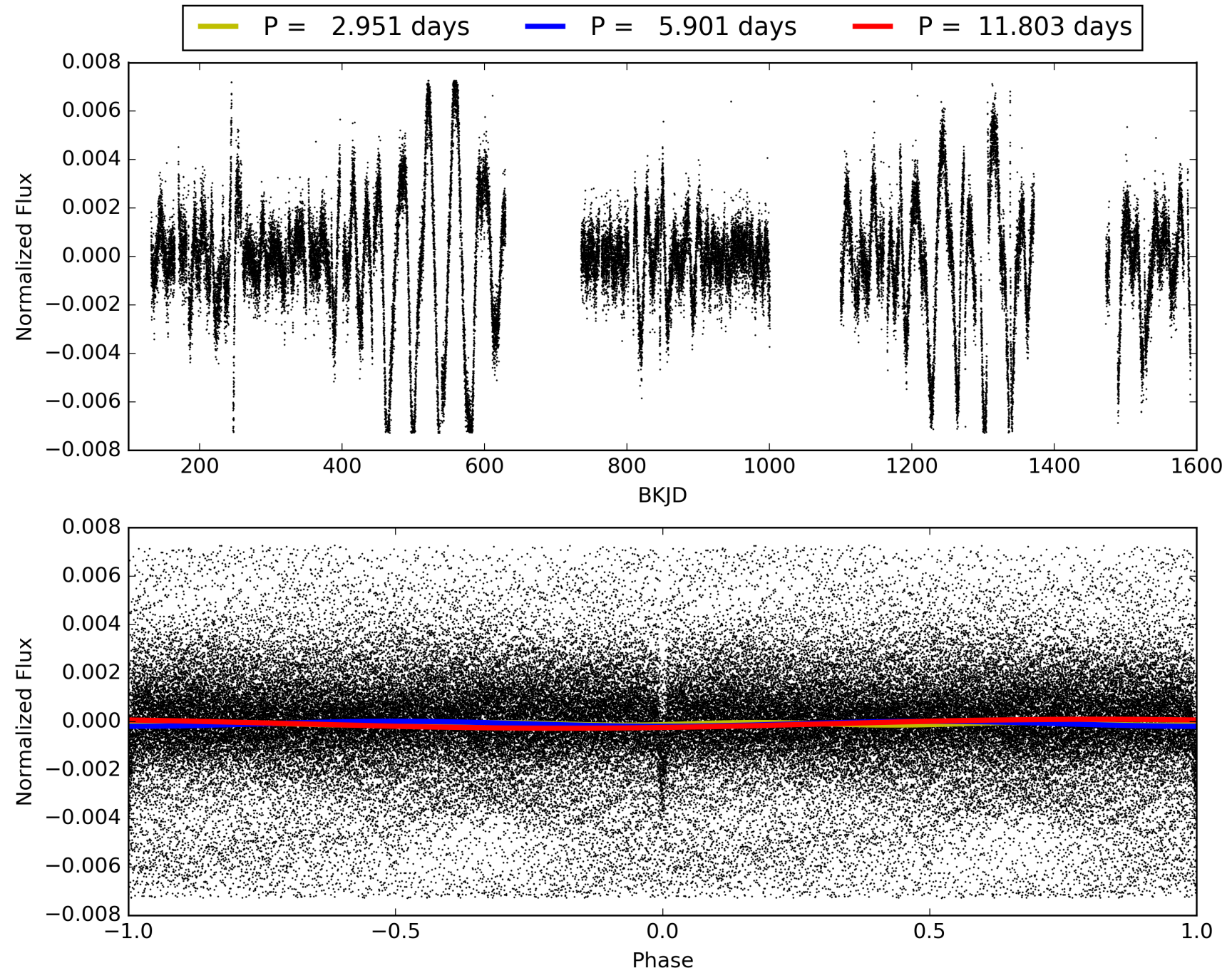
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.77σ]  
LongPeriod-sig: 100.0% [17.45σ]  
ModelChiSquare2-sig: 95.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [167/167]  
GhostDiagnostic-chr: 4.27  
Centroid-sig: 0.0%  
Centroid-so: 0.027 arcsec [0.13σ]  
OotOffset-rm: 0.220 arcsec [1.08σ]  
KicOffset-rm: 0.260 arcsec [1.35σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 0.71 [10/14]

# TCE 009787239-01, PDC Light Curves



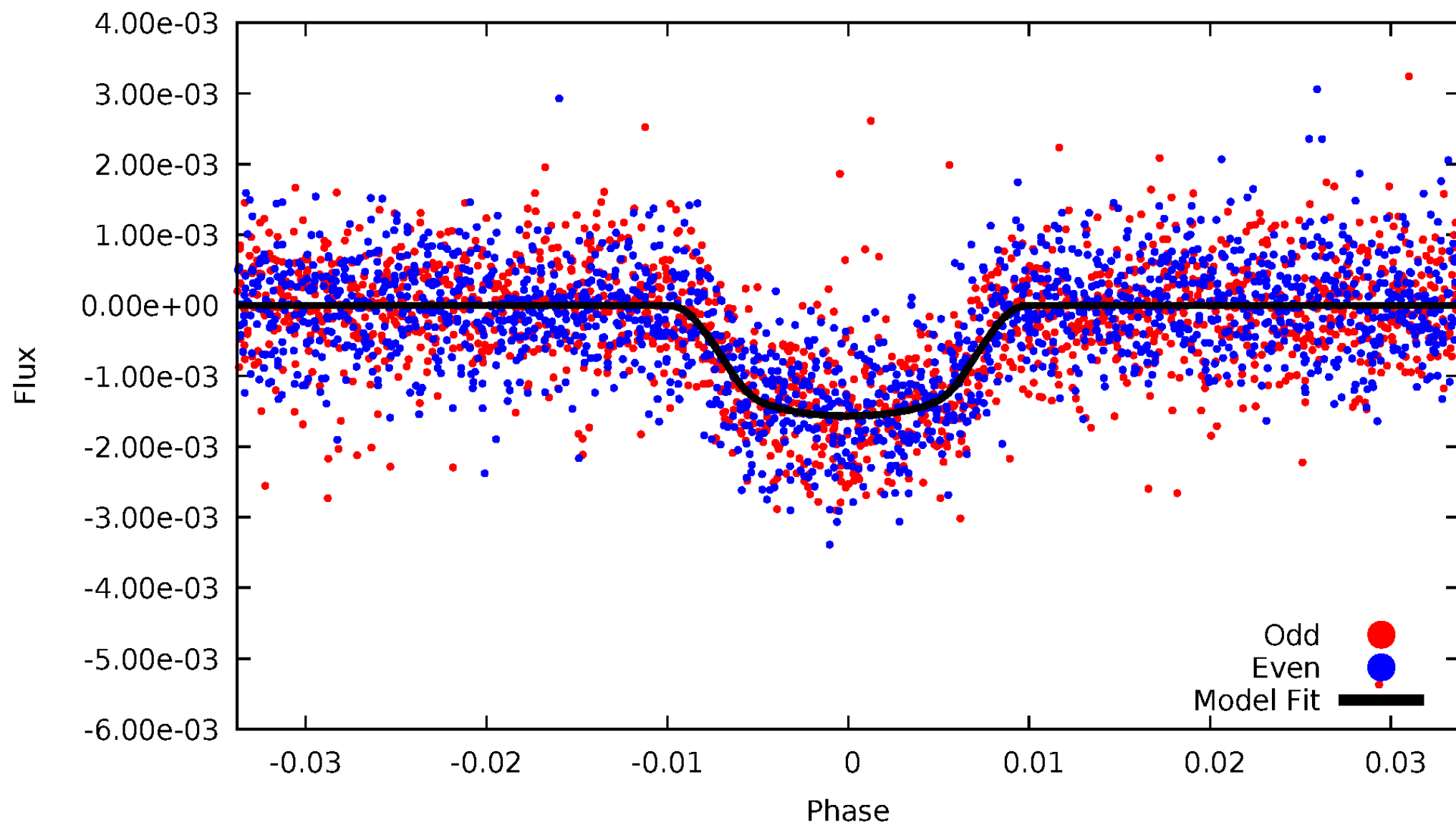
TCE 009787239-01





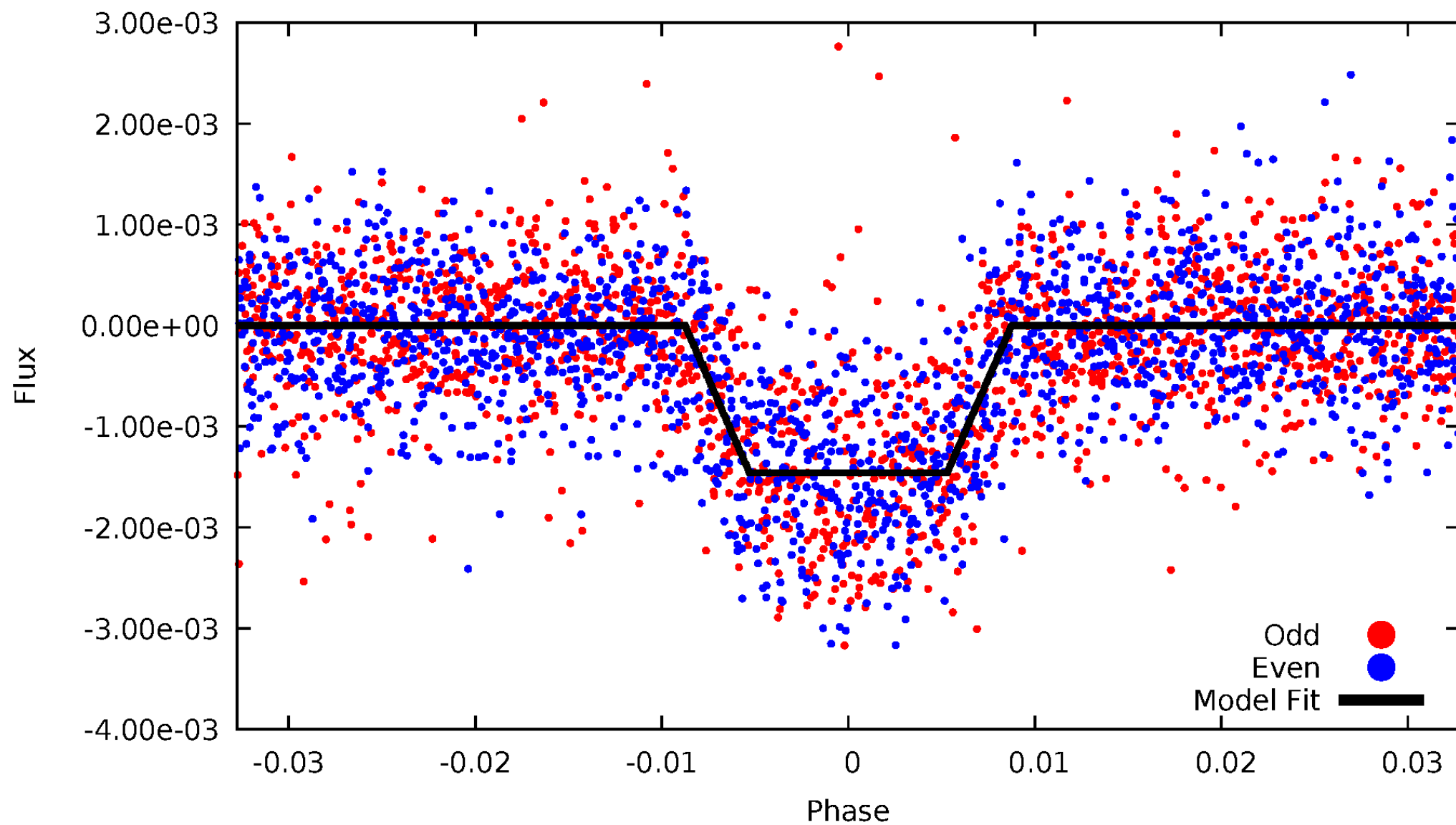
# DV Odd/Even

TCE 009787239-01



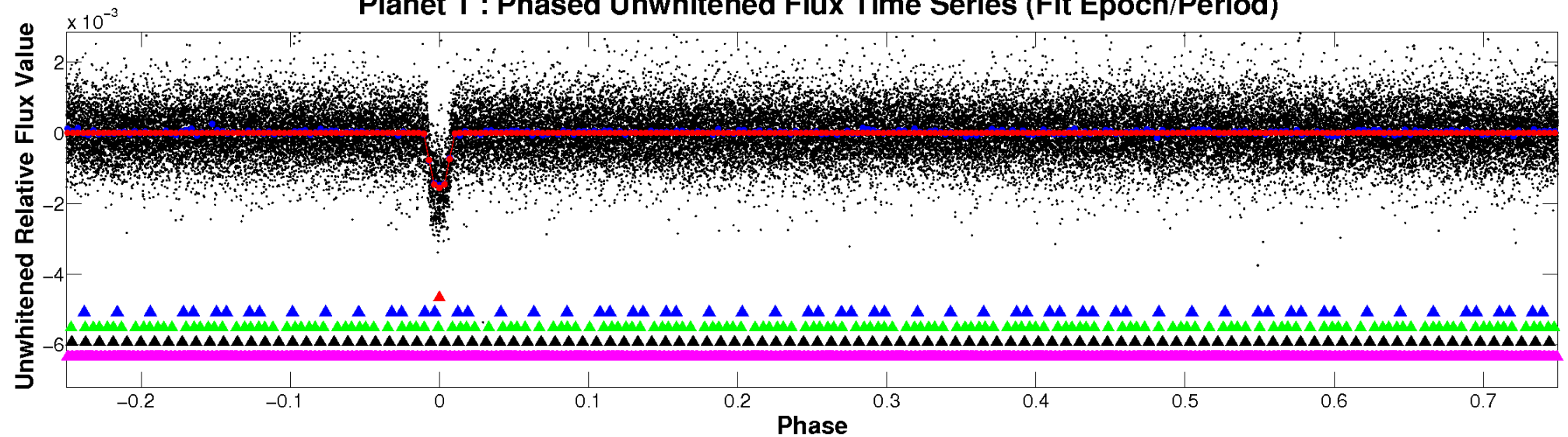
# ALT Odd/Even

TCE 009787239-01

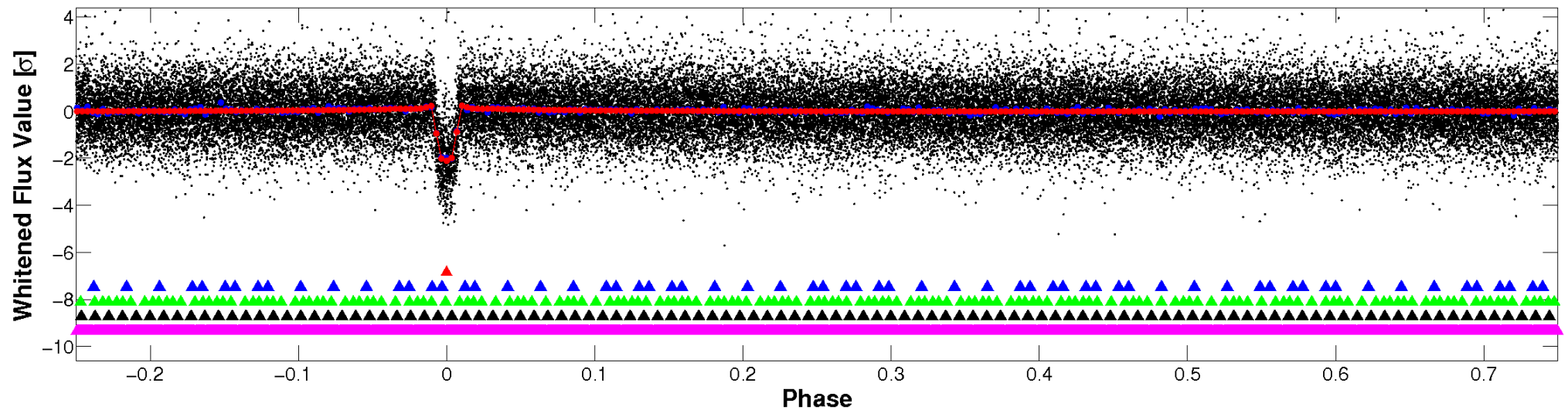


# Non-Whitened Vs. Whitened Light Curve

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

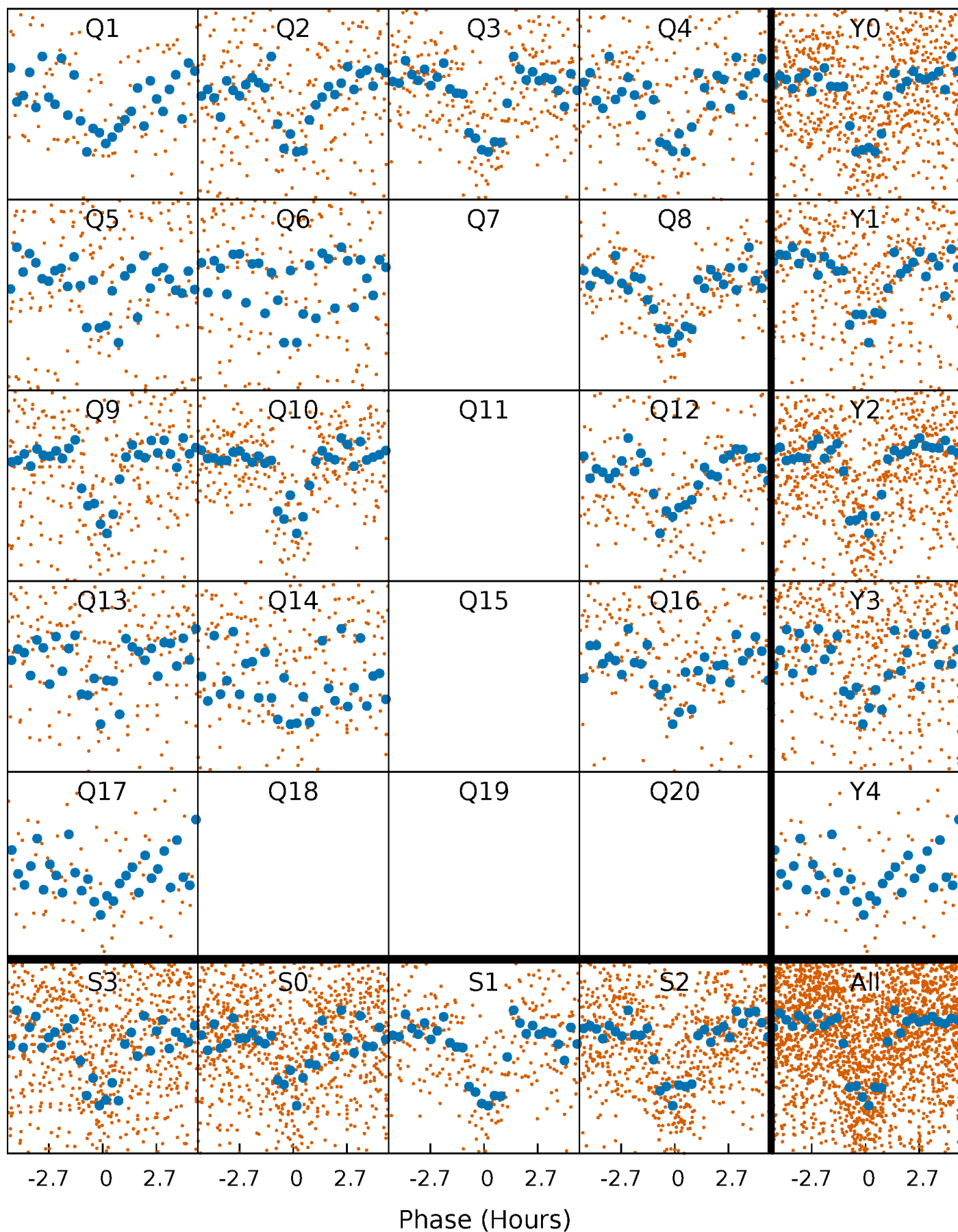


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

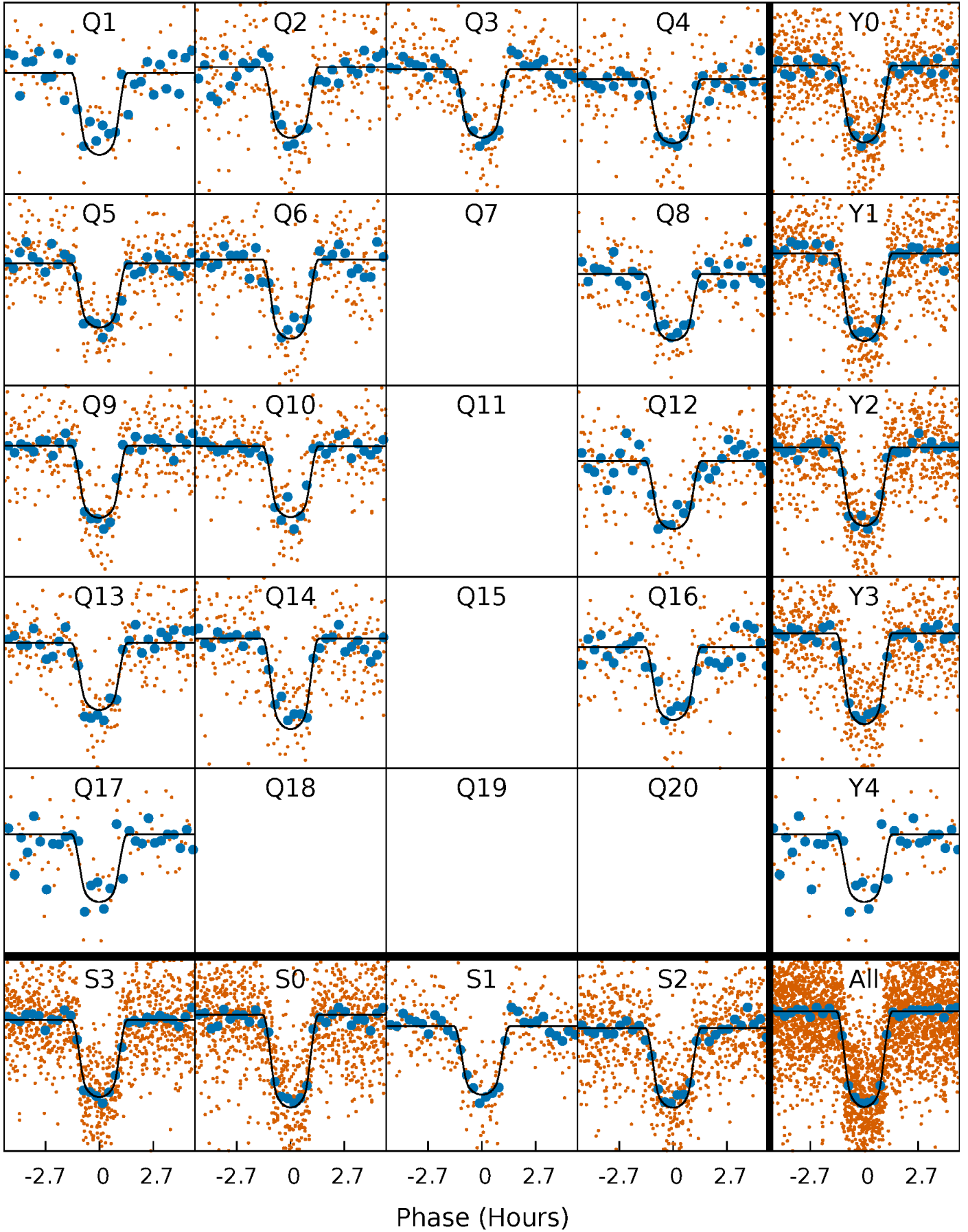
TCE 009787239-01 P= 5.901287 Days  $T_0=135.998633$  (BKJD)





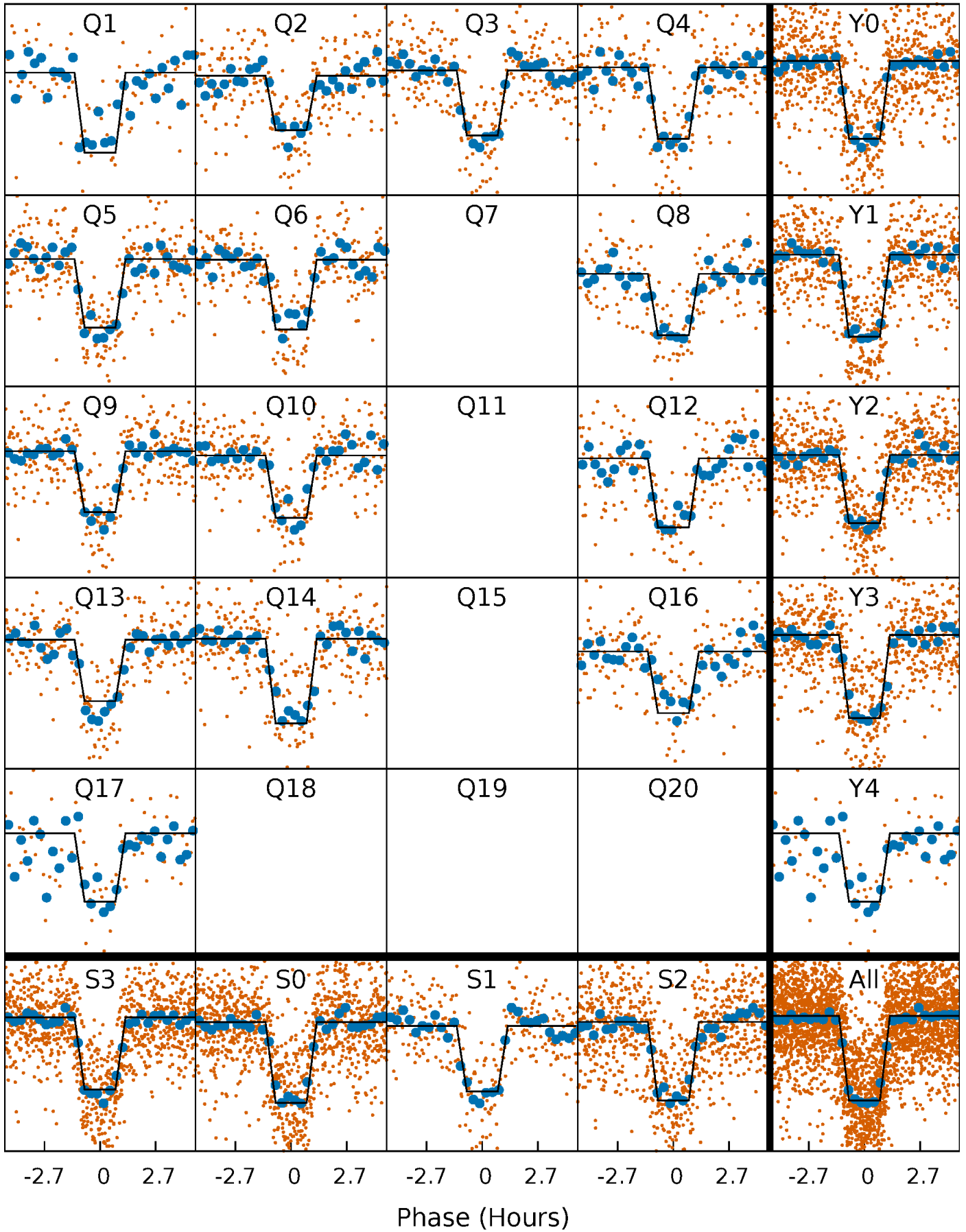
# DV Quarter-Phased Transit Curves

TCE 009787239-01   P= 5.901287 Days    $T_0=135.998633$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

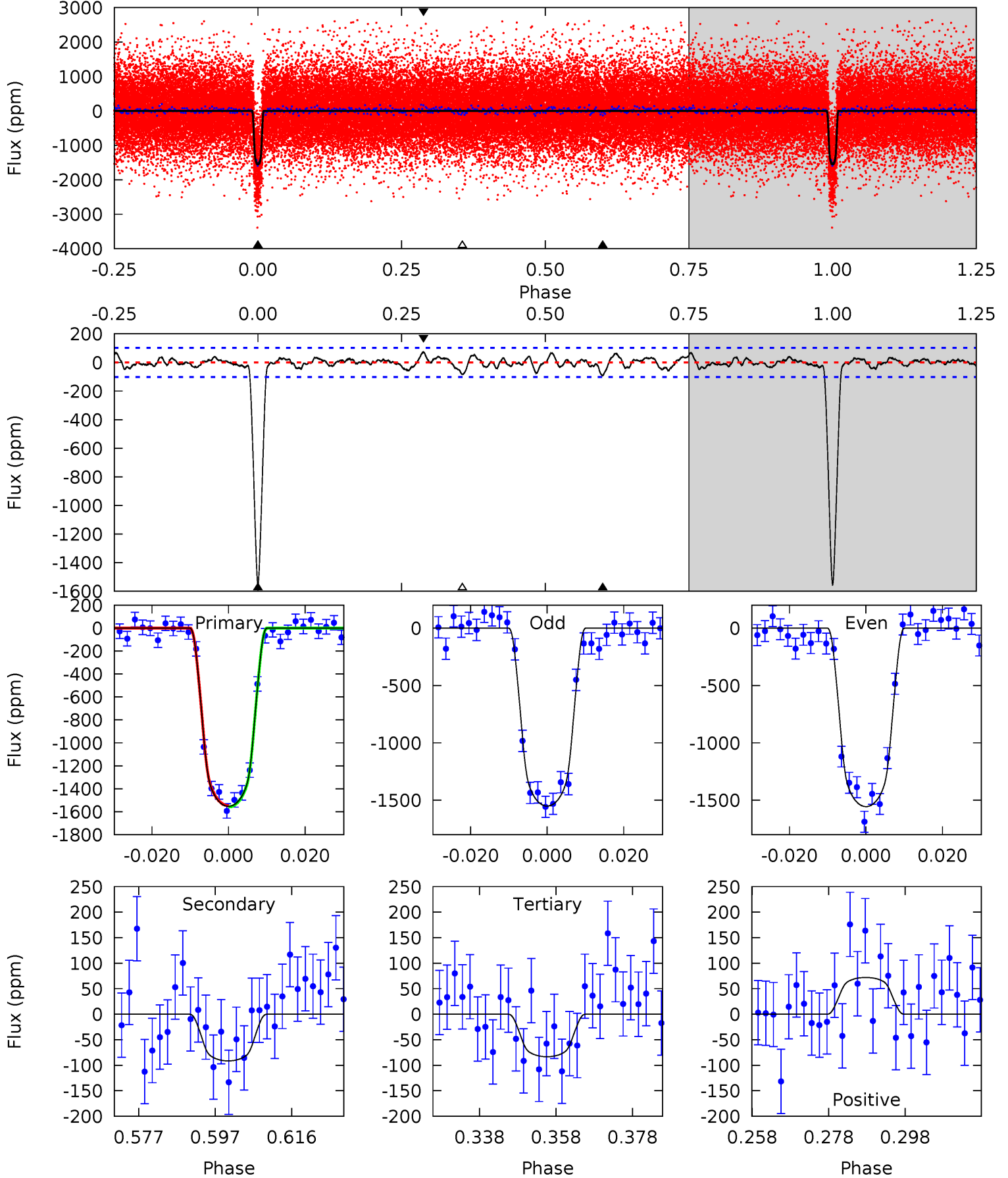
TCE 009787239-01 P= 5.901256 Days  $T_0=136.001561$  (BKJD)



# DV Model-Shift Uniqueness Test

009787239-01, P = 5.901287 Days, E = 130.097346 Days

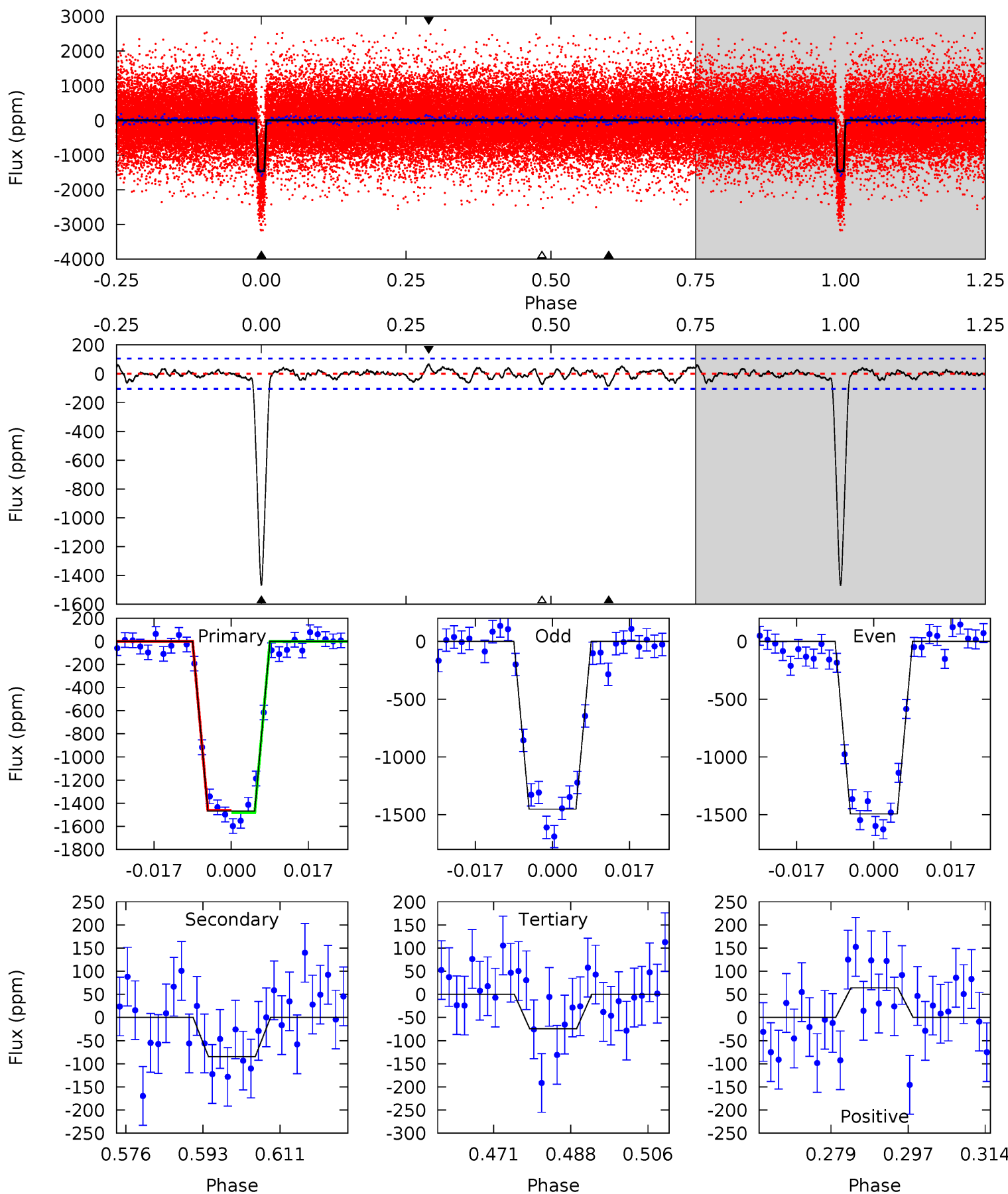
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
74.8	4.41	4.01	3.47	4.89	2.33	1.31	70.8	71.4	0.40	0.94	0.11	1.00	0.04	0.27



# Alt Model-Shift Uniqueness Test

009787239-01, P = 5.901256 Days, E = 130.100305 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
68.9	3.97	3.49	3.01	4.92	2.38	1.17	65.4	65.9	0.47	0.96	0.98	0.98	0.04	0.50





### Stellar Parameters For KIC 009787239

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3731^{+73}_{-83}$	$4.750^{+0.052}_{-0.028}$	$-0.020^{+0.150}_{-0.150}$	$0.498^{+0.034}_{-0.051}$	$0.509^{+0.036}_{-0.045}$	$5.789^{+1.437}_{-0.703}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-10%	+7%/-9%	+25%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 009787239-01 / KOI 0952.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-91 \pm 21$	$2.22^{+0.19}_{-0.20}$	$715^{+18}_{-20}$	$2462^{+91}_{-93}$	$26^{+9}_{-7}$
Alt.	$-85 \pm 21$	$2.06^{+0.21}_{-0.18}$	$717^{+18}_{-21}$	$2486^{+96}_{-114}$	$28^{+10}_{-8}$

$T_{max}$  = 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

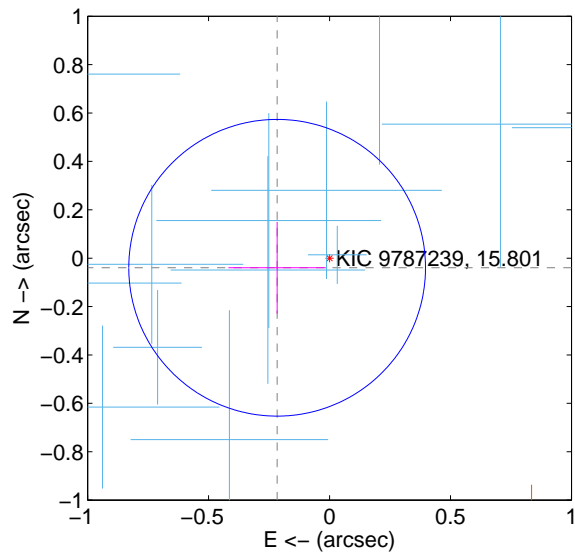
Supplemental centroid analysis for 009787239-01. Kepler magnitude: 15.80. Transit SNR 49.57

There are 13 quarters with good PRF difference image offsets

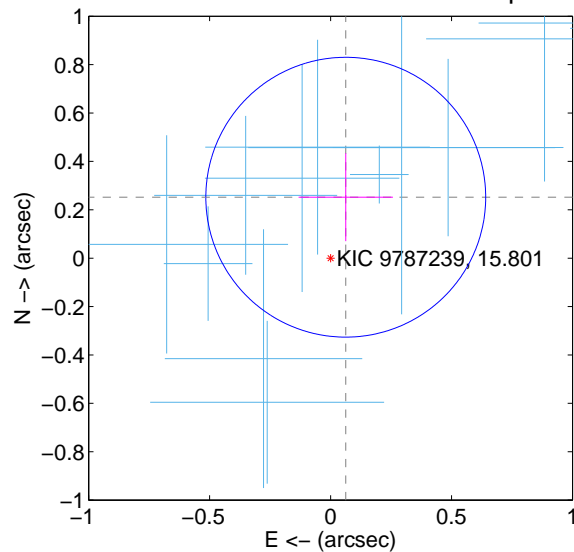
The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.220 \pm 0.204$	1.08	$0.217 \pm 0.201$	$-0.040 \pm 0.190$
PRF-fit source offset from KIC position	$0.260 \pm 0.193$	1.35	$-0.063 \pm 0.195$	$0.252 \pm 0.182$
photometric centroid source offset	$0.03 \pm 0.21$	0.13	$0.01 \pm 0.21$	$-0.02 \pm 0.21$

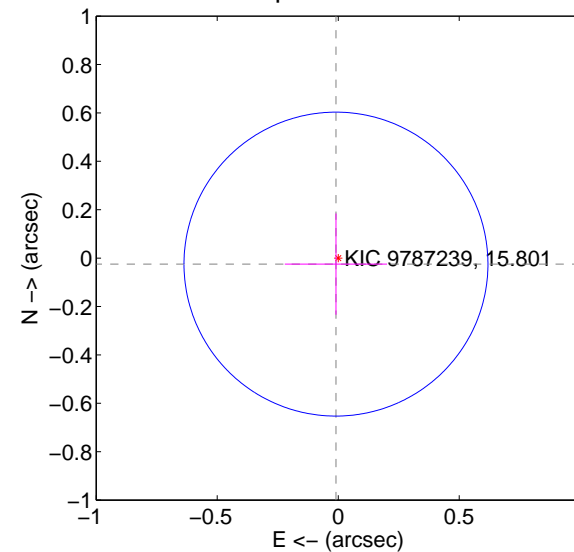
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

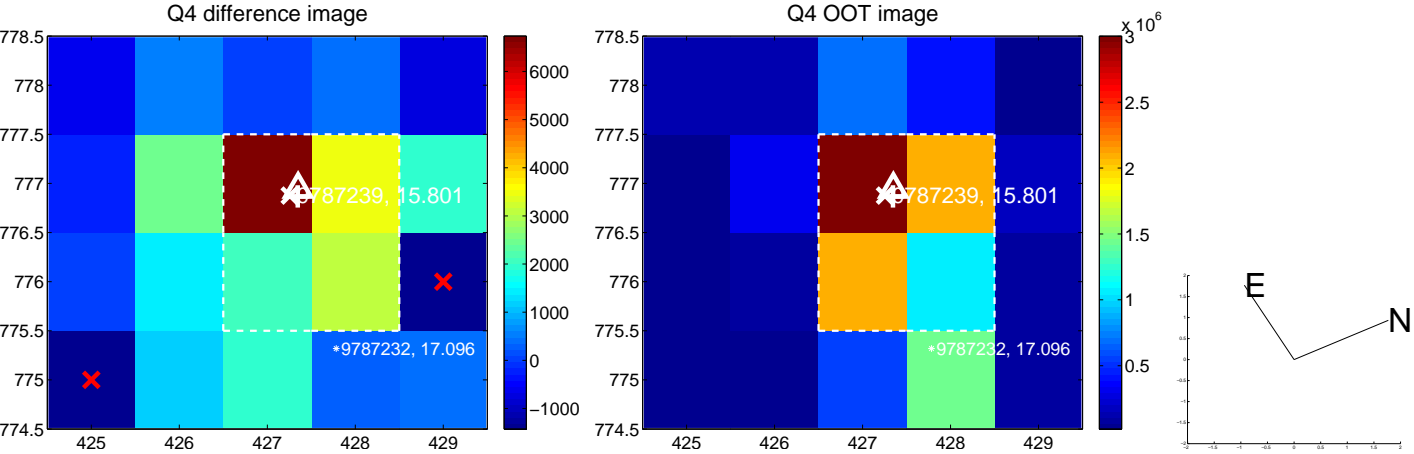
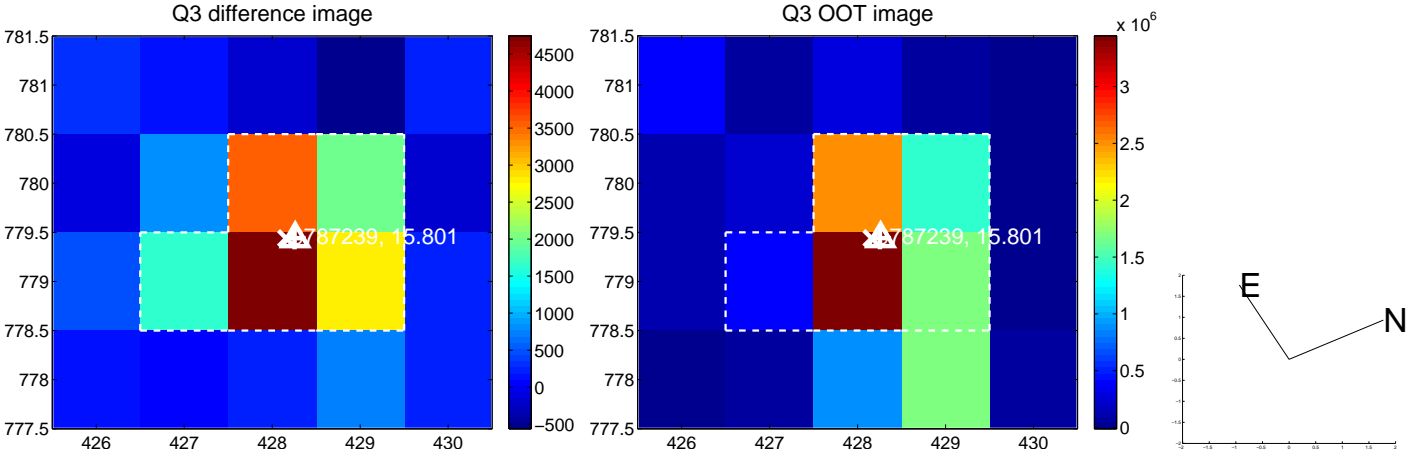
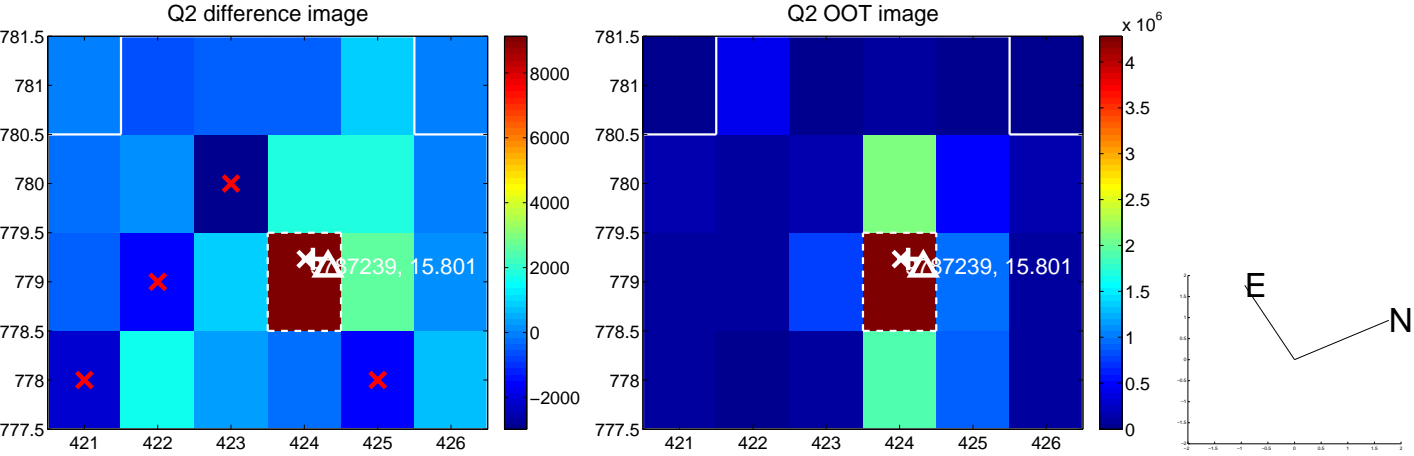
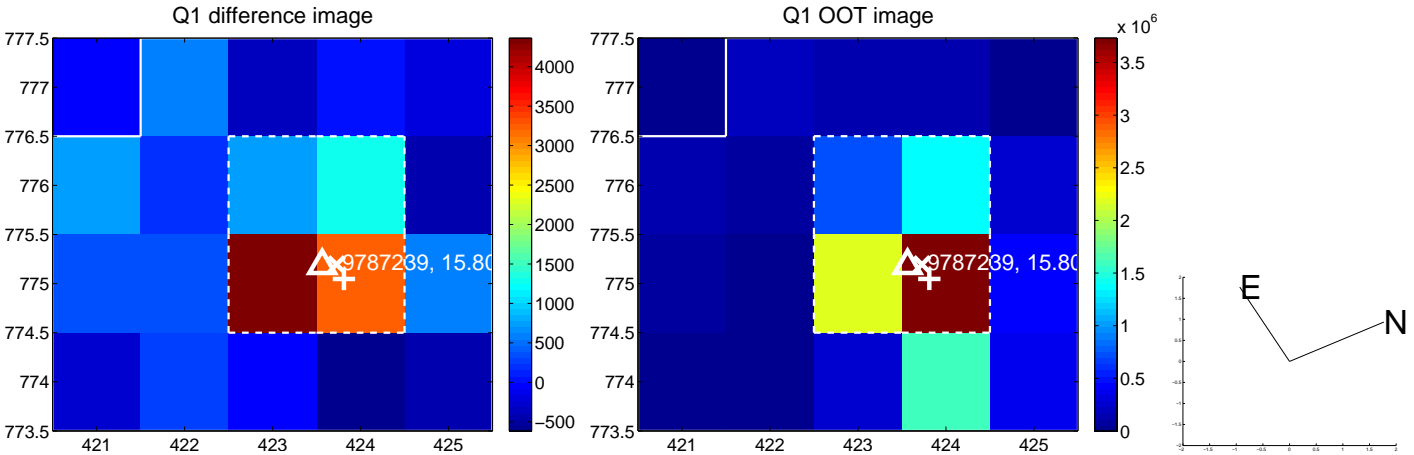


offset from photometric centroids

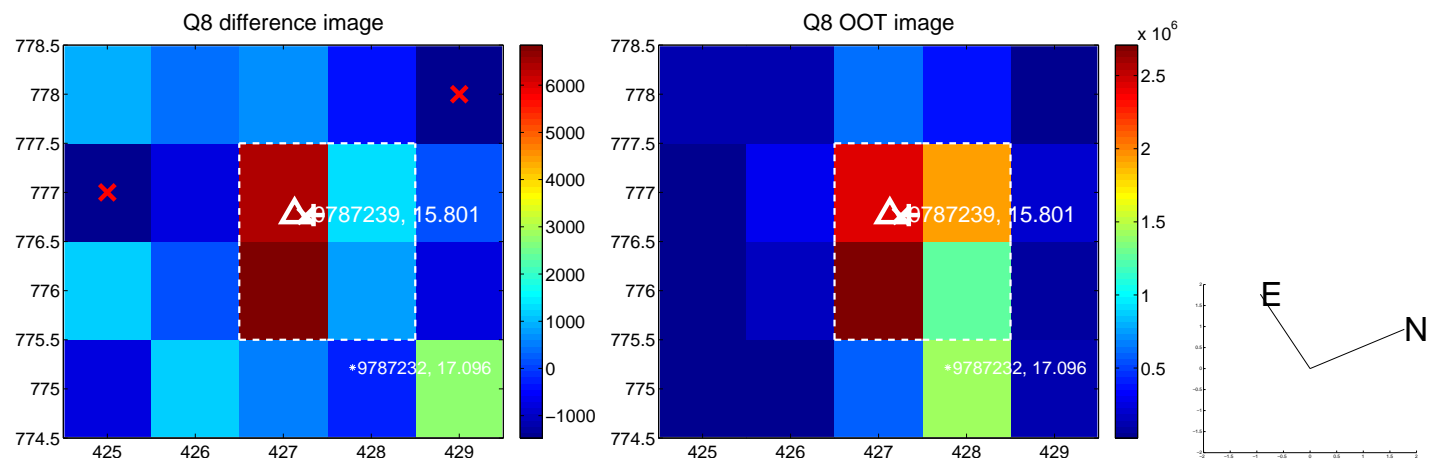
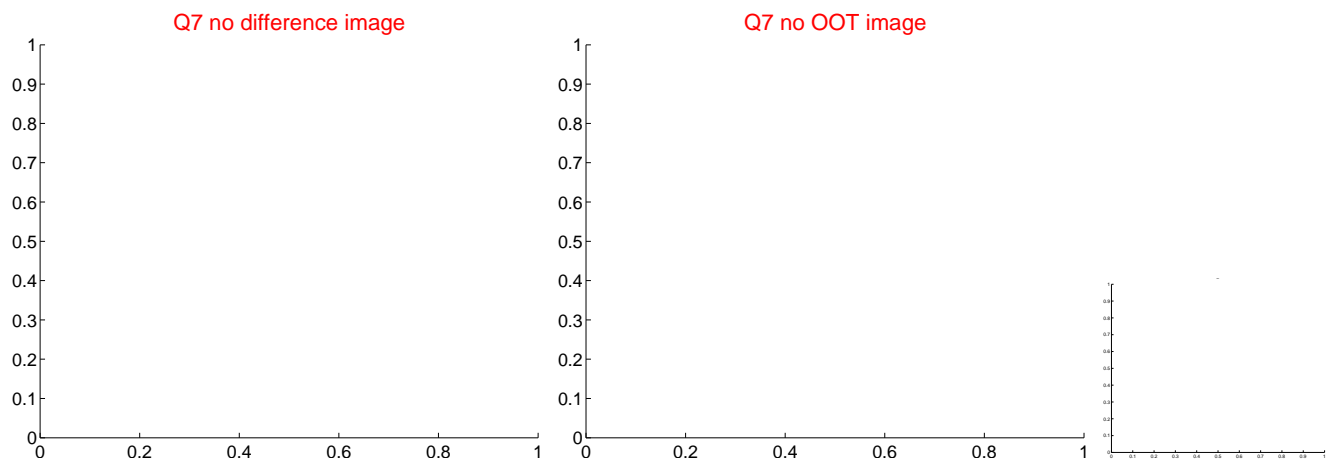
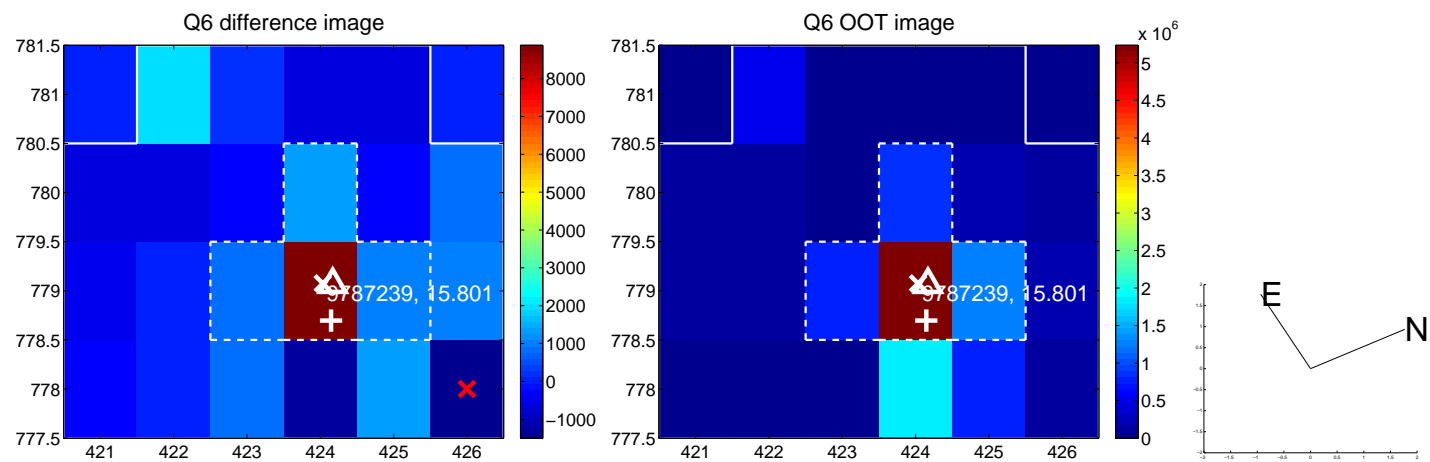
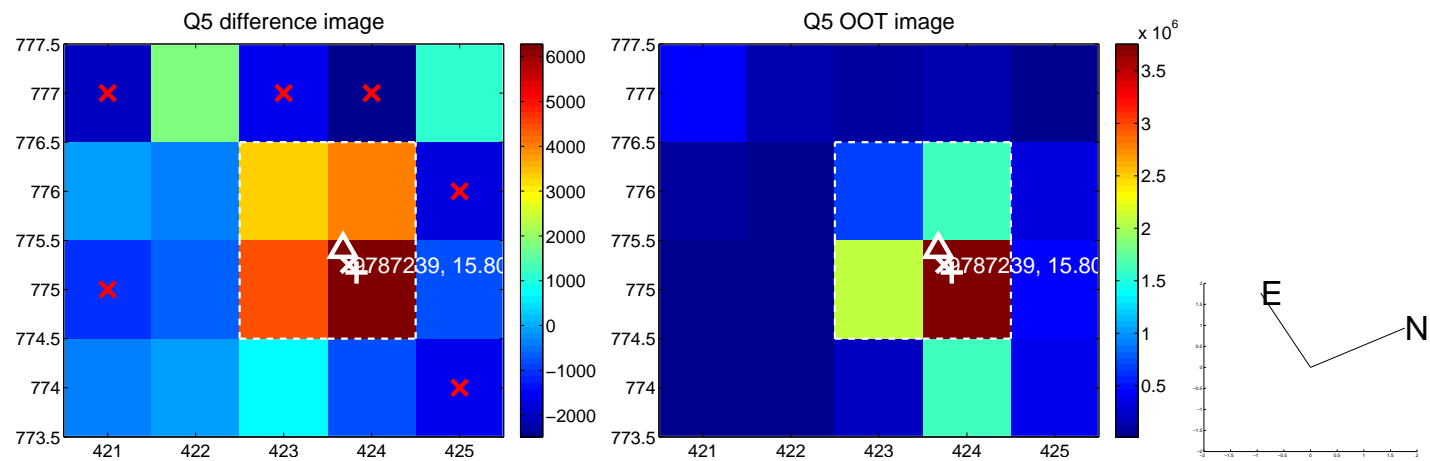


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

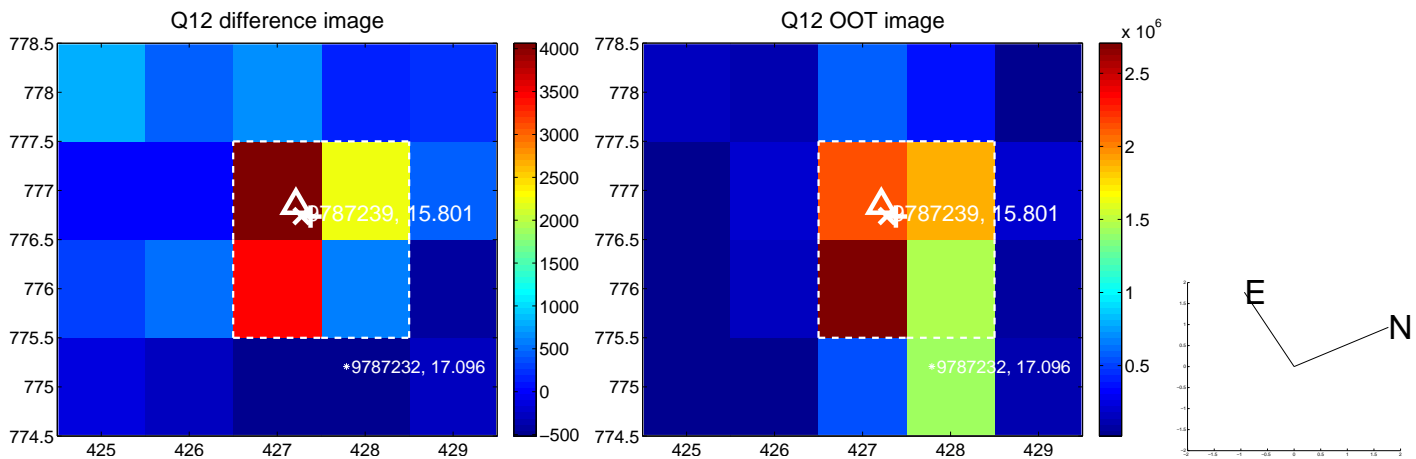
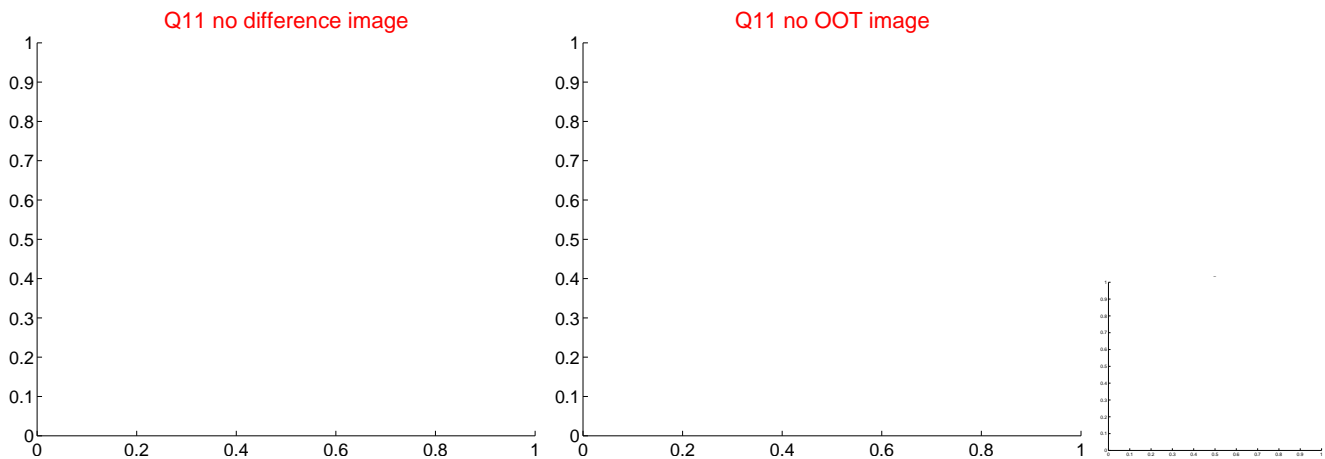
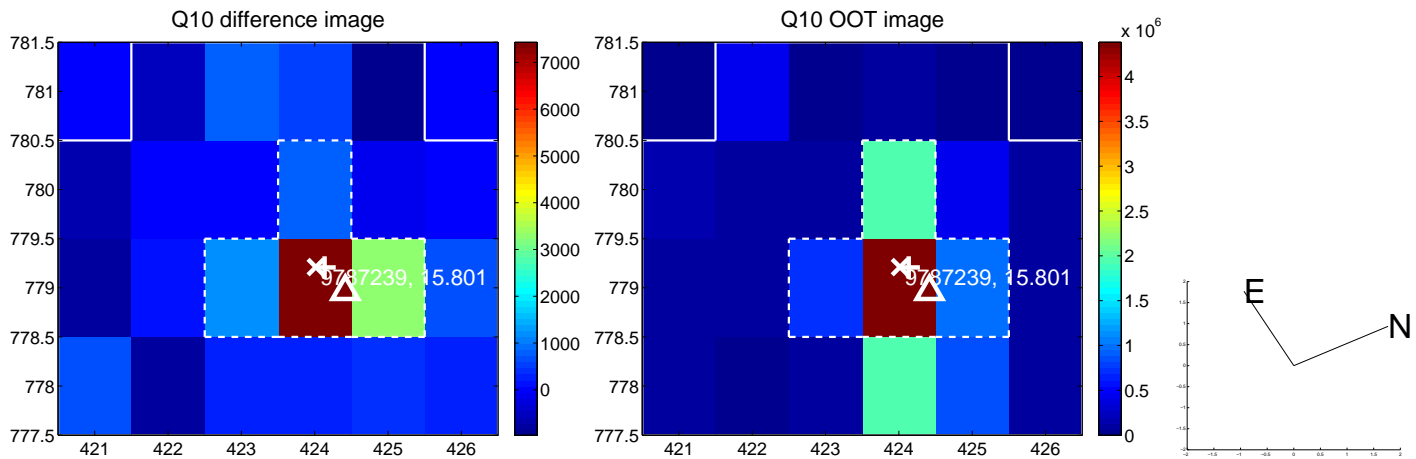
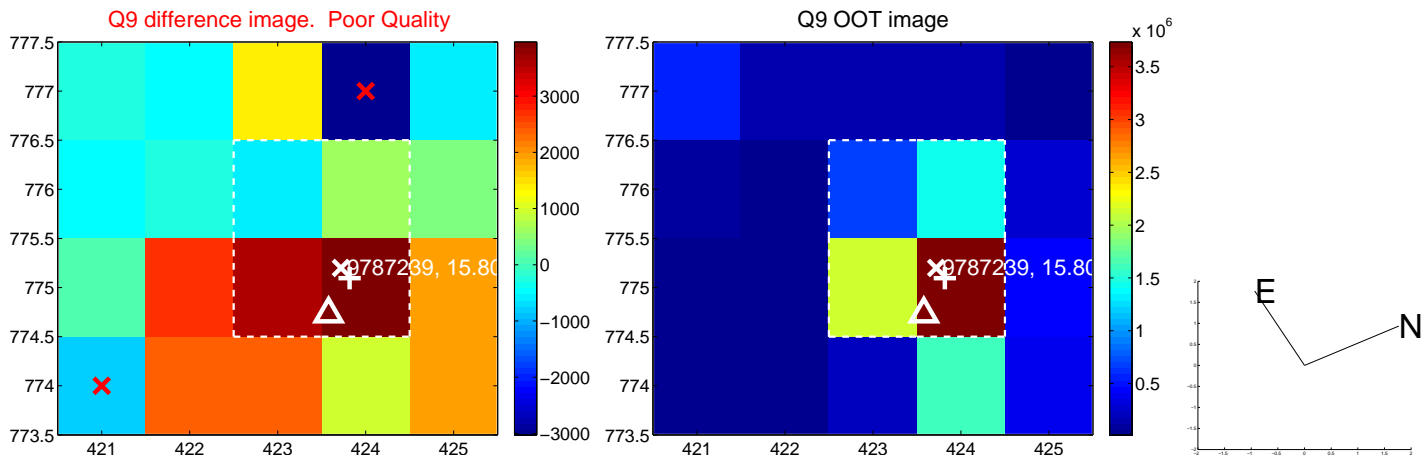


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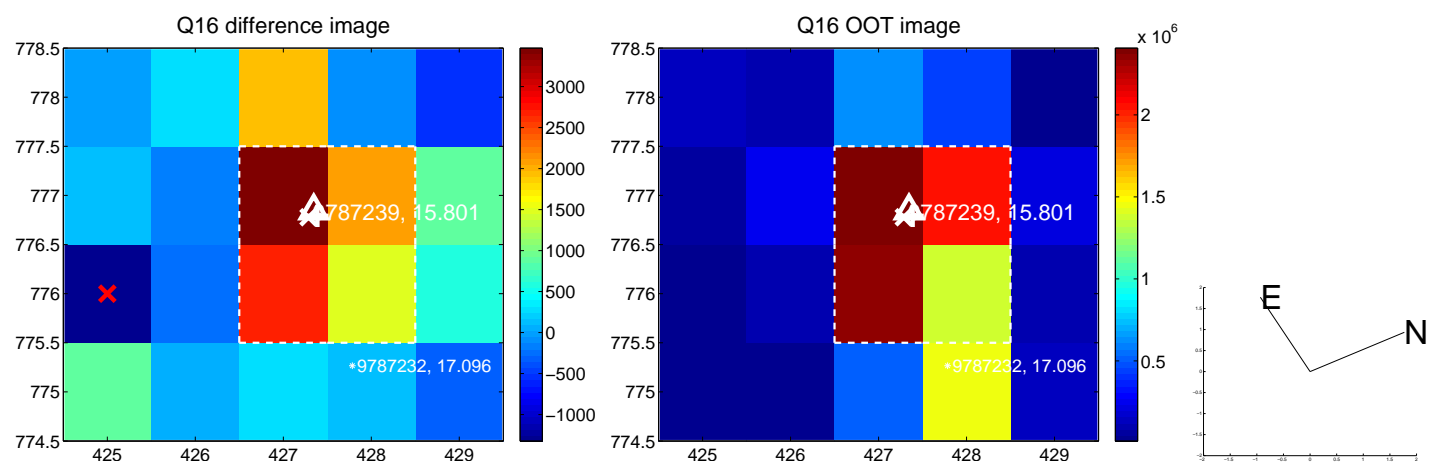
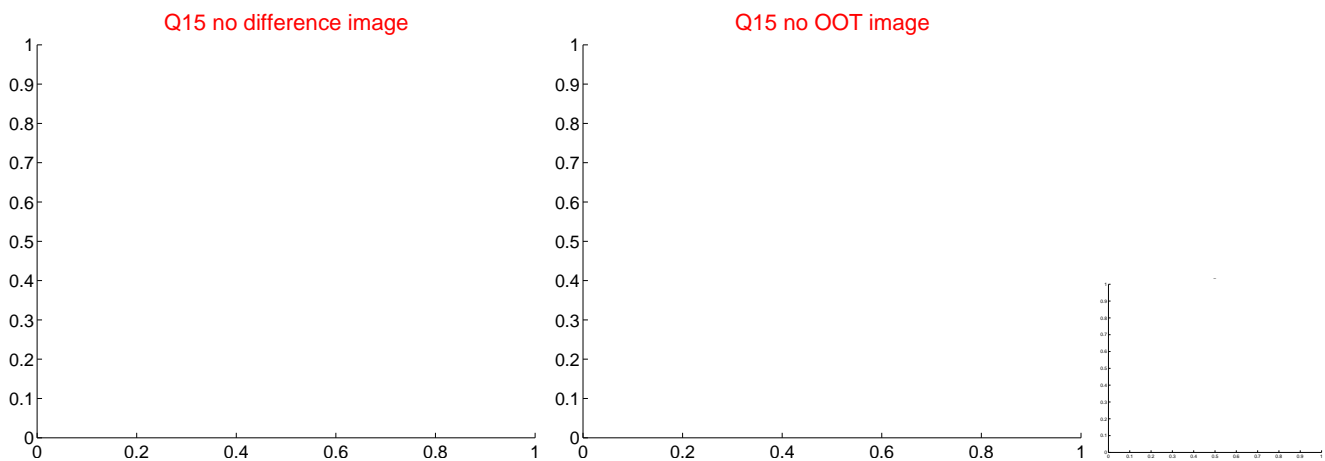
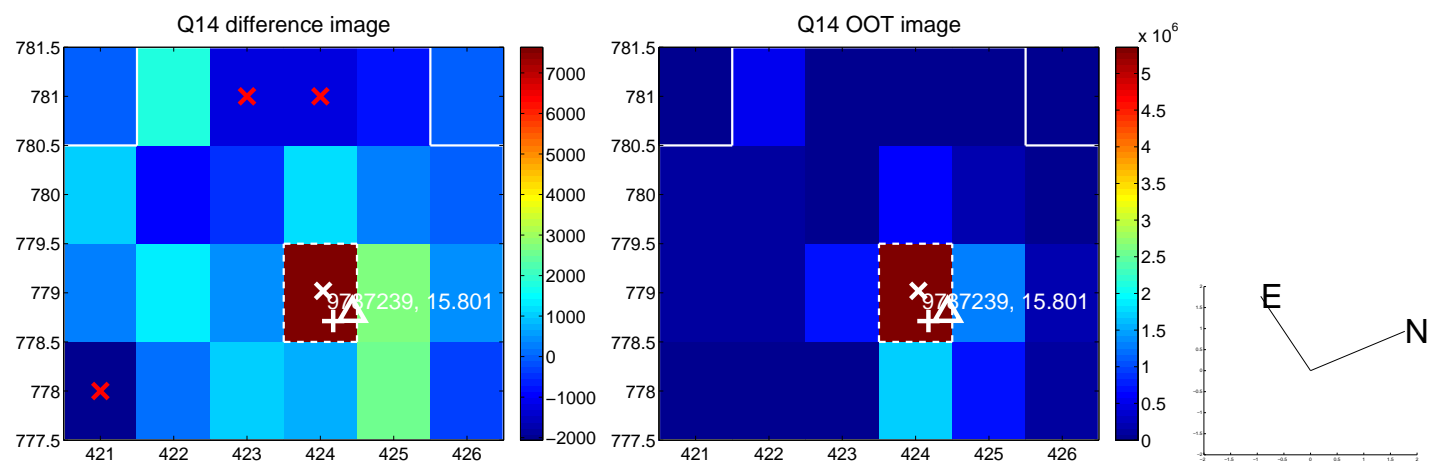
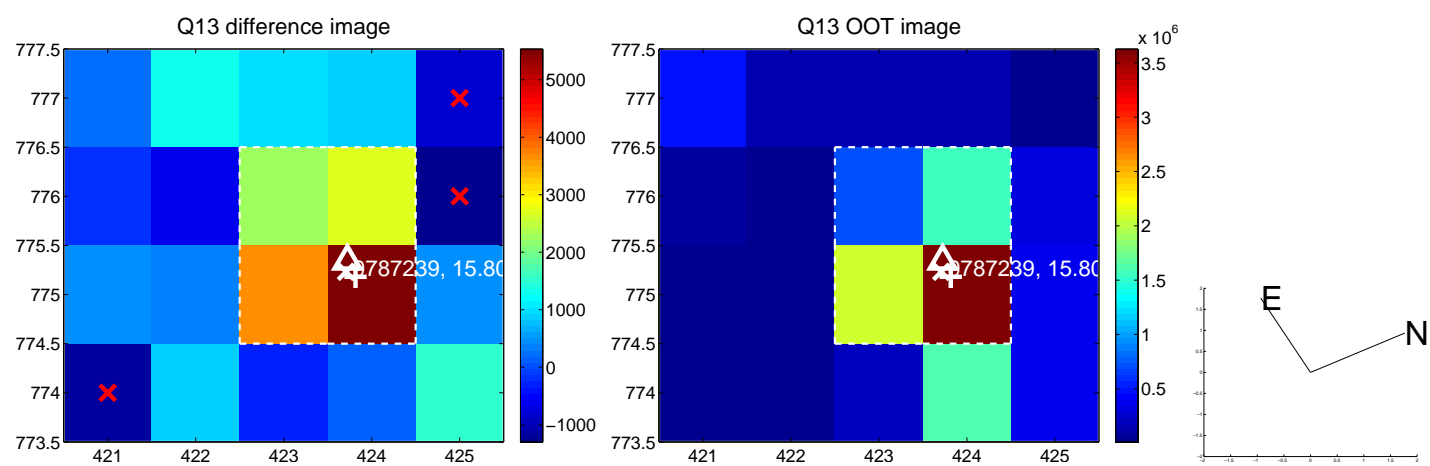




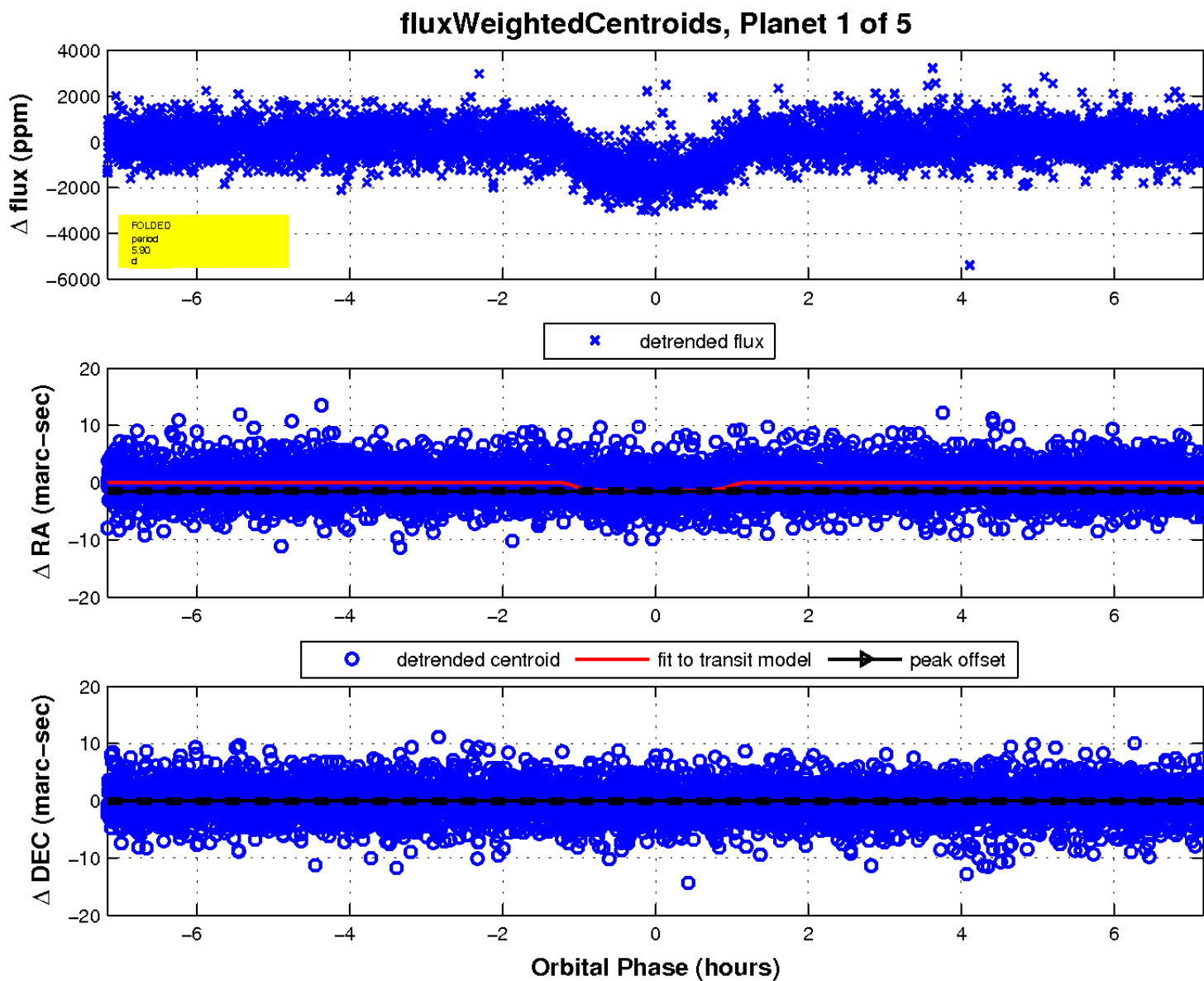
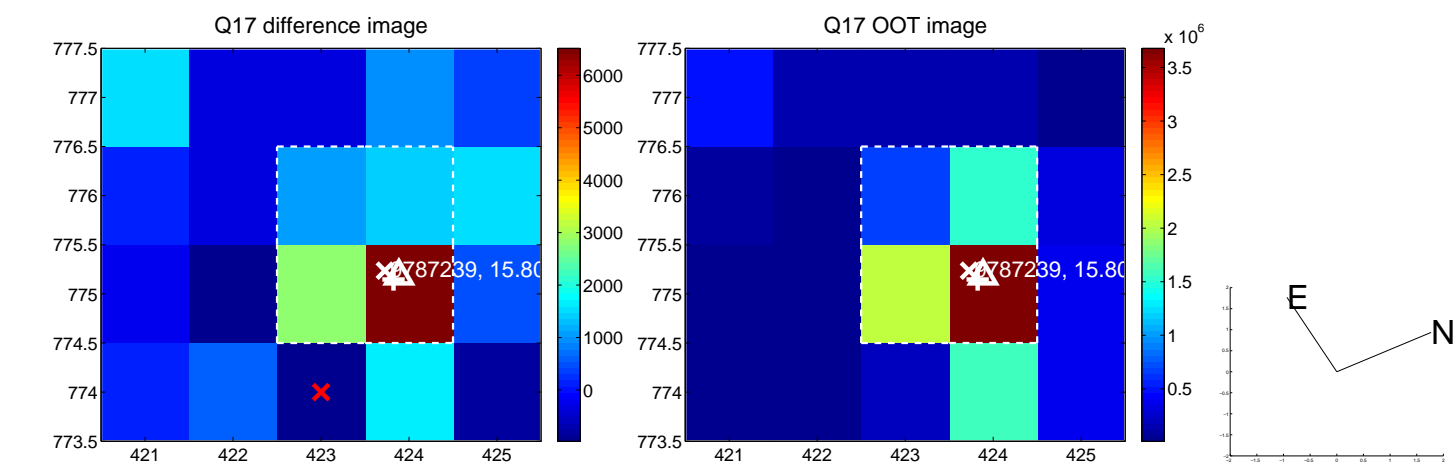
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

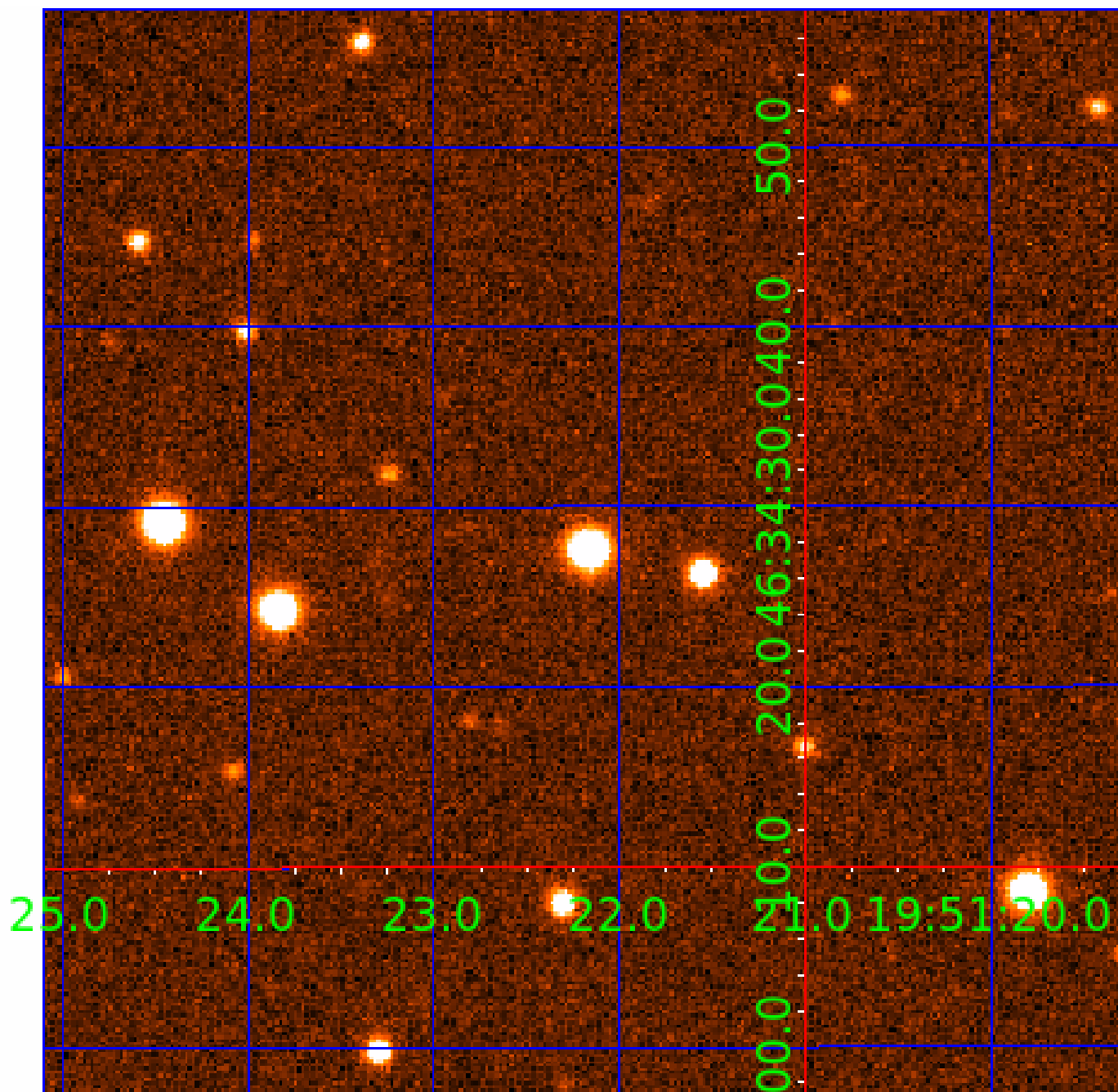


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009787239

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009787239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009787239-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-04	OBS	PC	0.97	0	0	0	0	CENT_KIC_POS
009787239-05	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

**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.

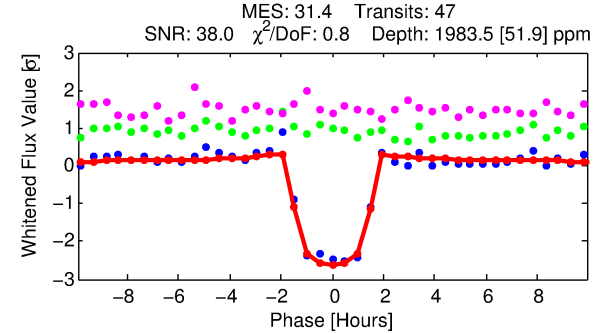
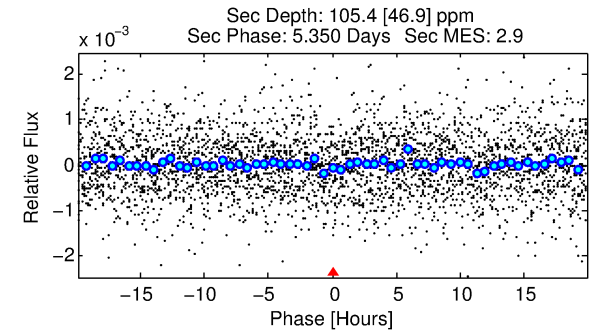
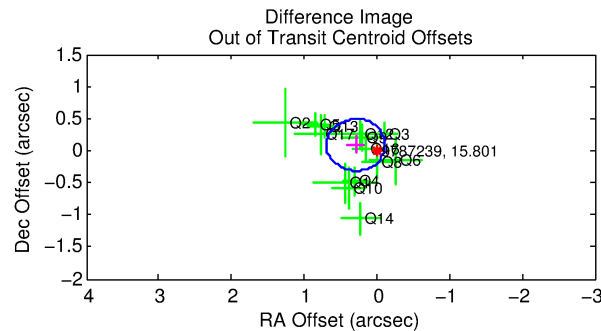
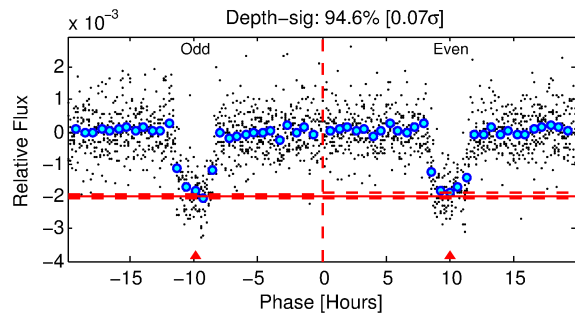
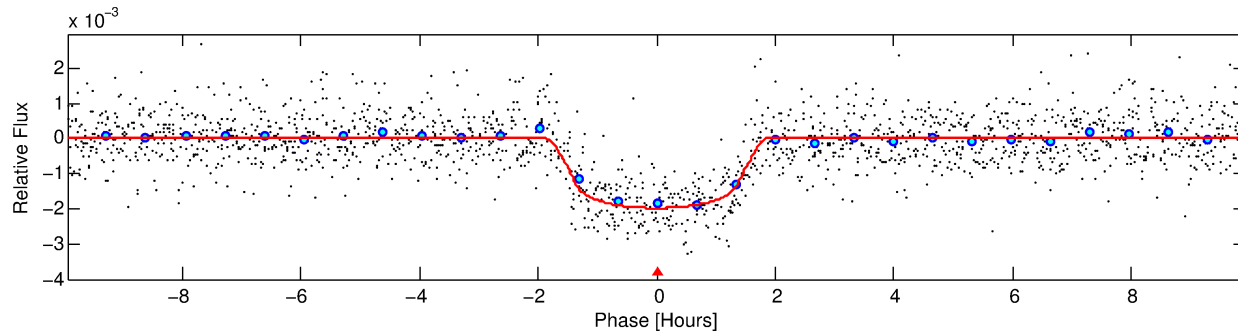
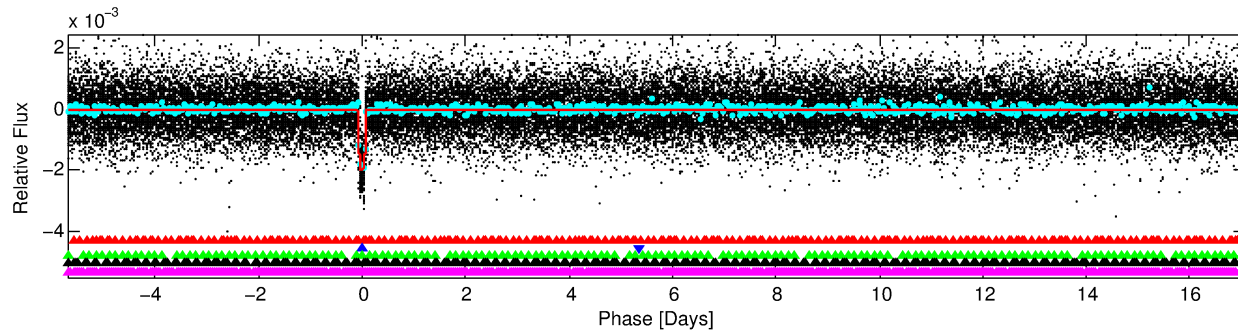
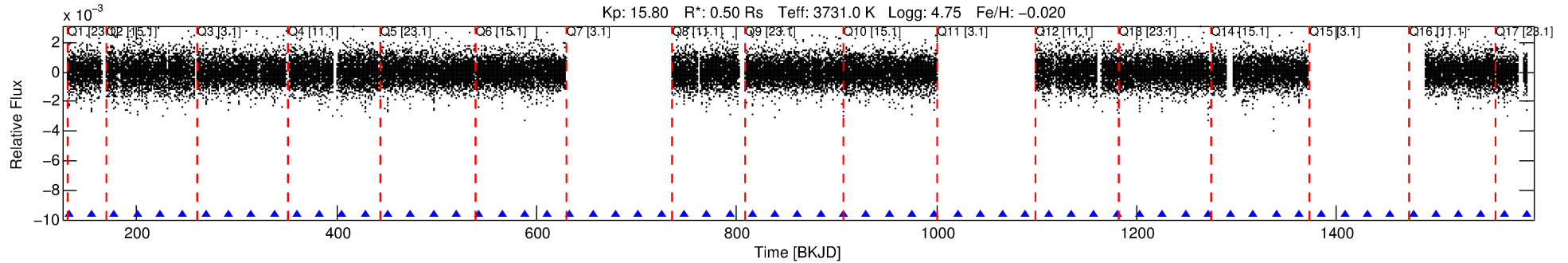
## Ephemeris Match Information For 009787239-02

No Significant Match Found

# DV One-Page Summary

KIC: 9787239 Candidate: 2 of 5 Period: 22.781 d  
KOI: K00952.03 Name: Kepler-32d Corr: 0.990

Kp: 15.80 R\*: 0.50 Rs Teff: 3731.0 K Logg: 4.75 Fe/H: -0.020



## DV Fit Results:

Period = 22.78081 [0.00005] d  
Epoch = 132.4211 [0.0018] BKJD  
Rp/R\* = 0.0416 [0.0110]  
a/R\* = 48.20 [54.33]  
b = 0.49 [1.74]  
Seff = 2.73 [0.38]  
Teq = 328 [11] K  
Rp = 2.26 [0.64] Re  
a = 0.1256 [0.0099] AU  
Ag = 178.88 [125.15] [1.42σ]  
Teffp = 1853 [323] K [4.72σ]

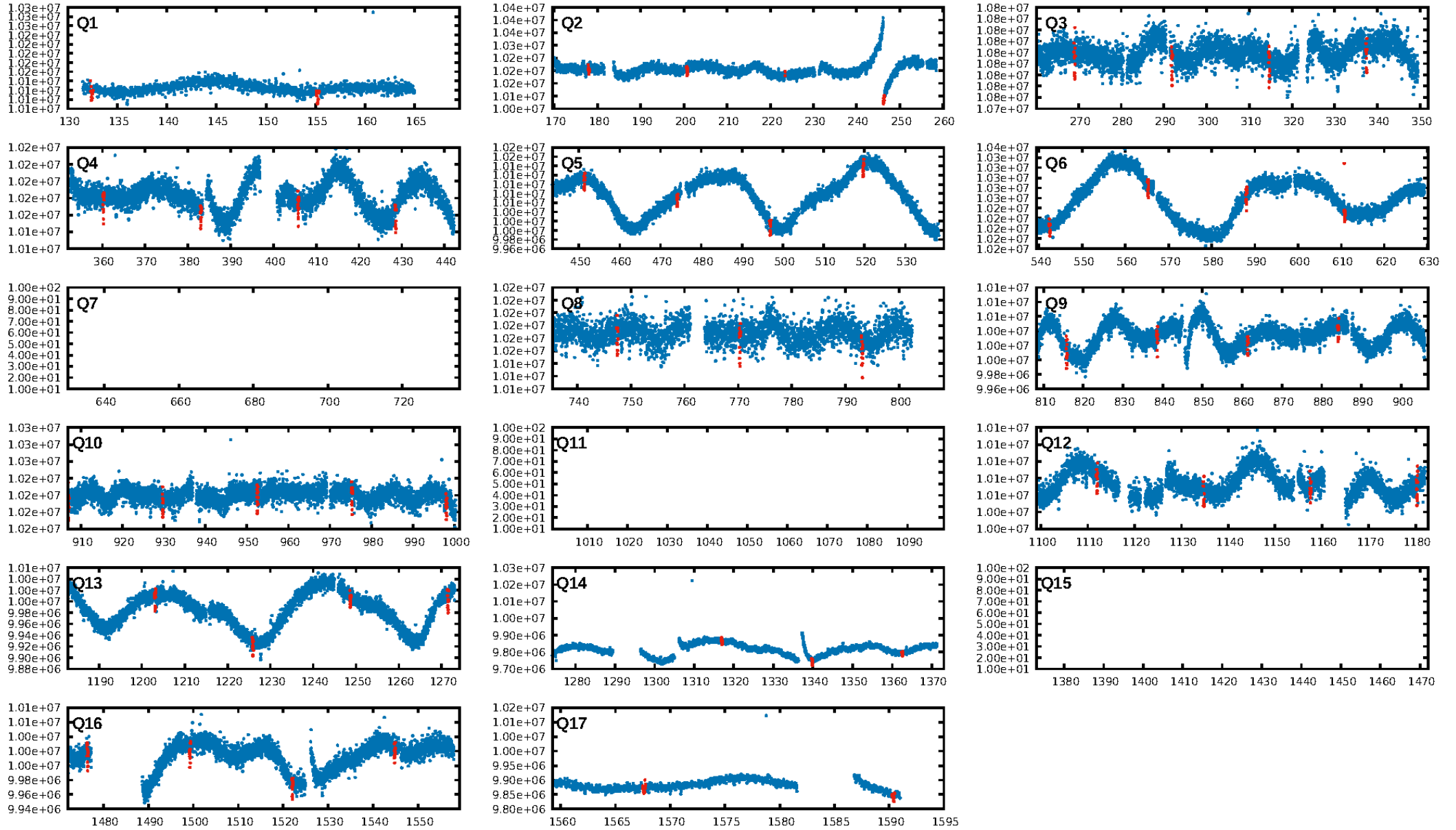
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [74.15σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 82.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.46e-188  
RollingBand-fgt: 1.00 [43/43]  
GhostDiagnostic-chr: 5.062  
Centroid-sig: 0.0%  
Centroid-so: 0.266 arcsec [1.00σ]  
OotOffset-rm: 0.306 arcsec [2.28σ]  
KicOffset-rm: 0.328 arcsec [2.47σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.07 [1/14]

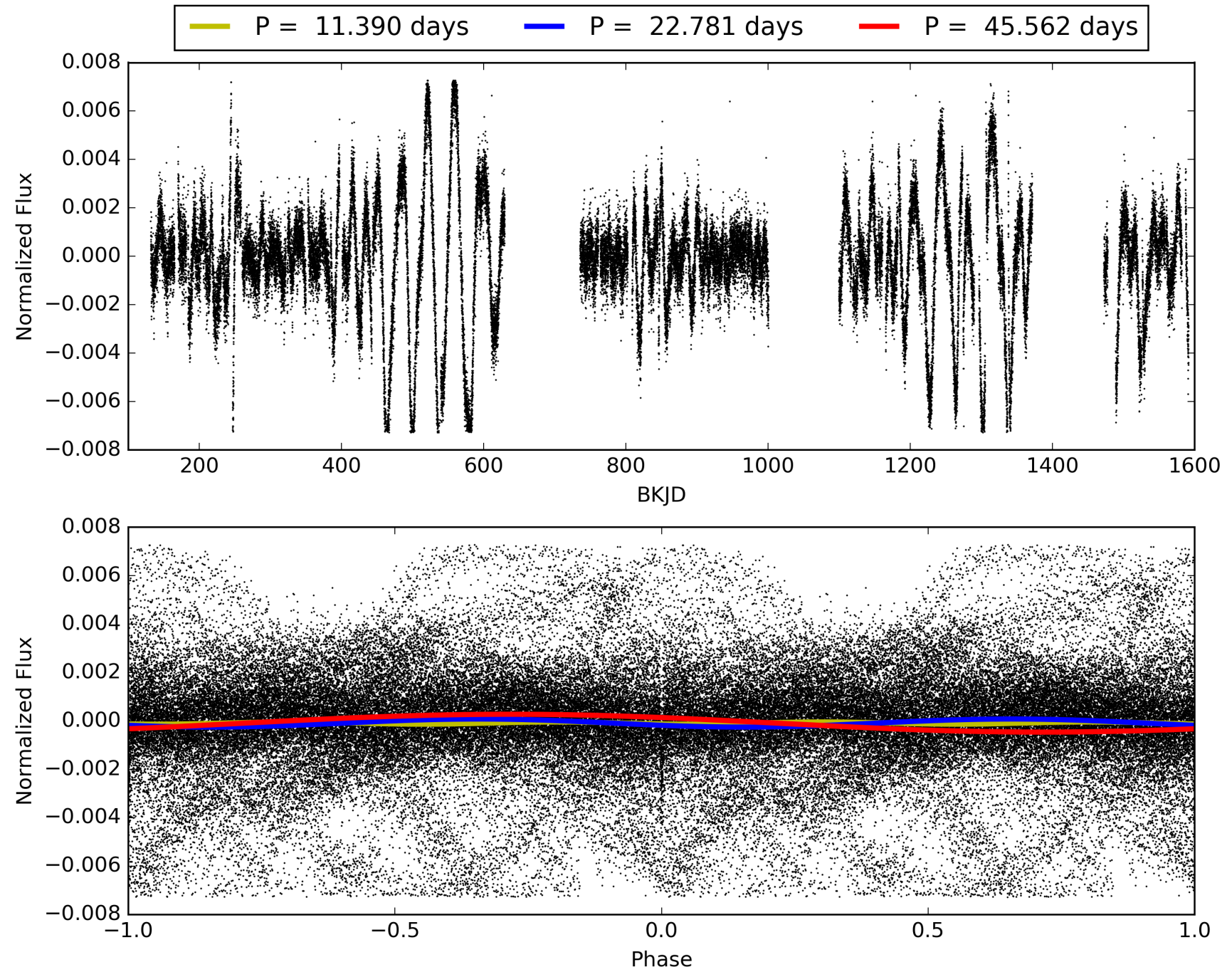
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 11:32:50 Z

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

# TCE 009787239-02, PDC Light Curves

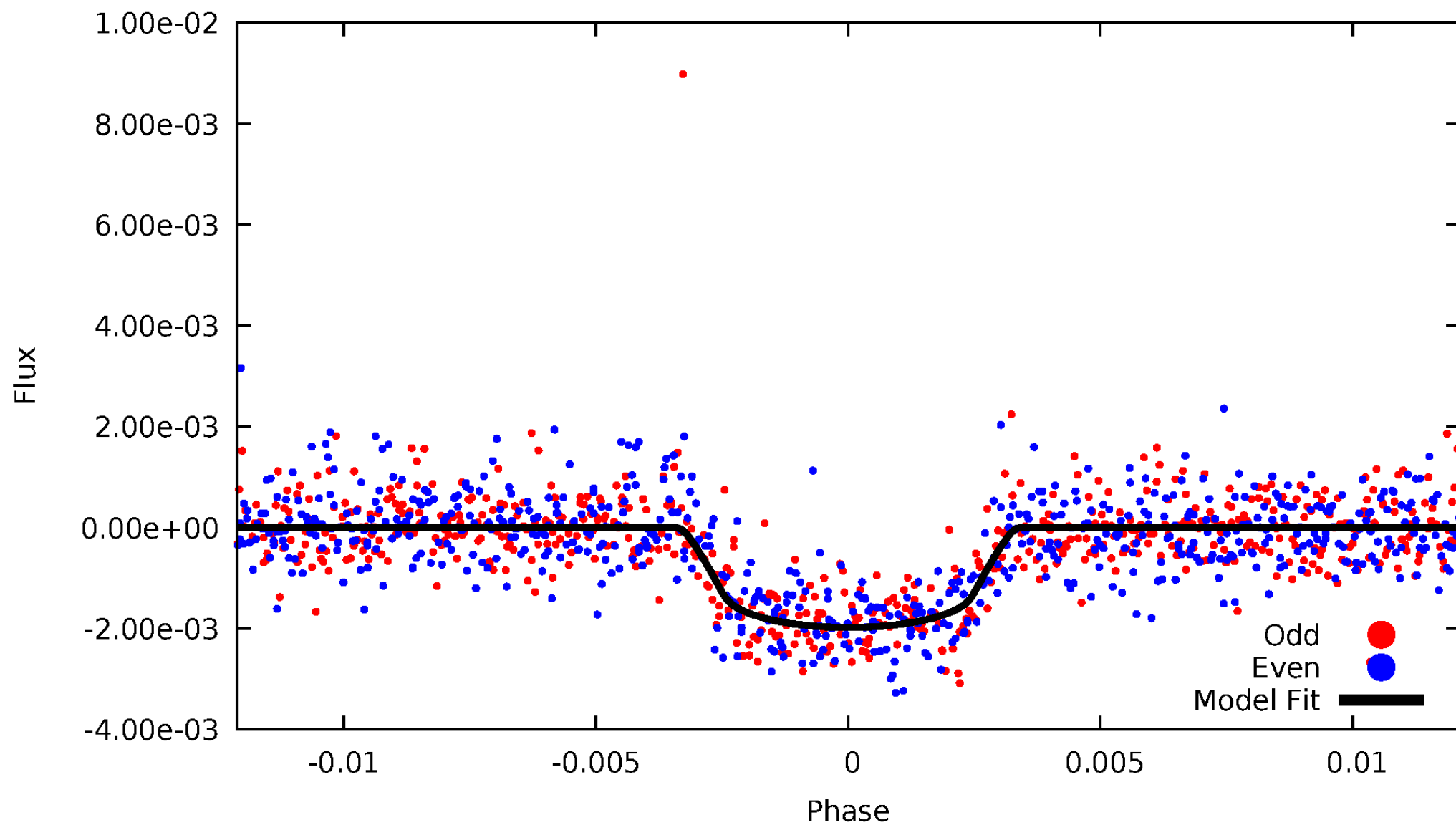


# TCE 009787239-02



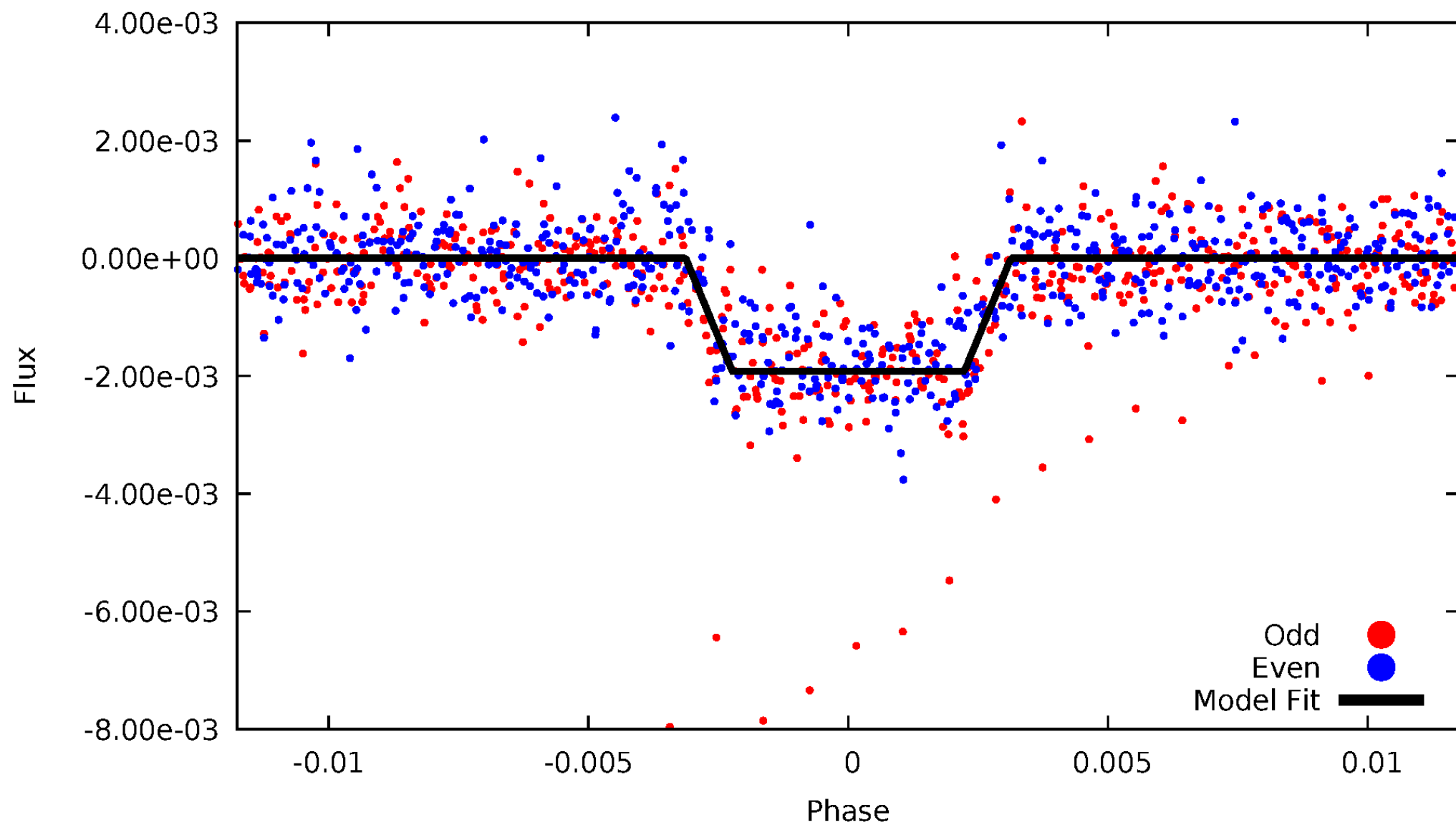
# DV Odd/Even

TCE 009787239-02



# ALT Odd/Even

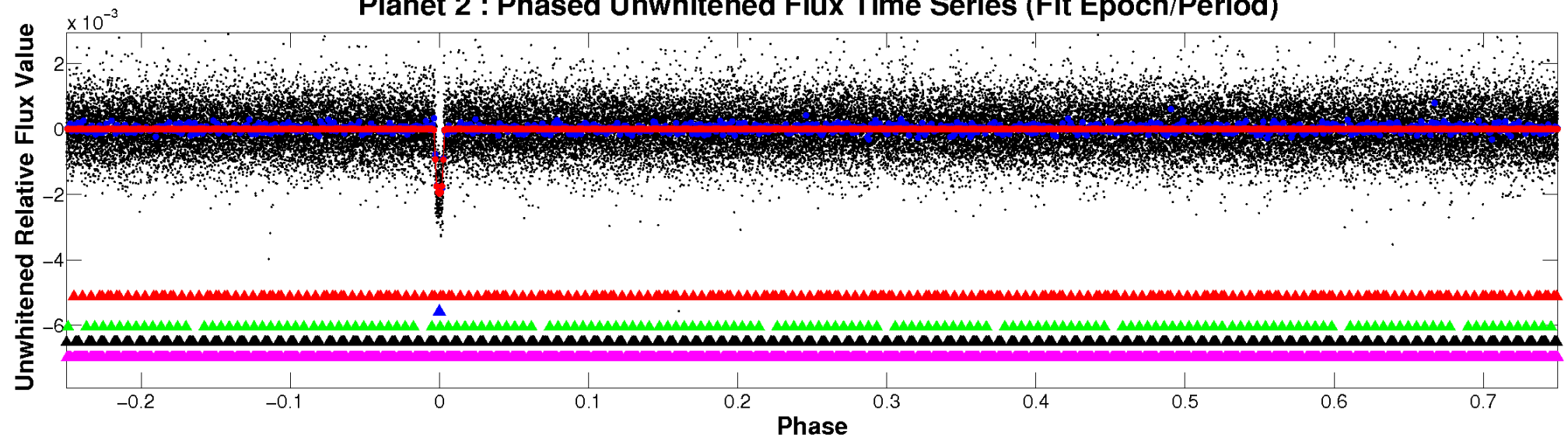
TCE 009787239-02



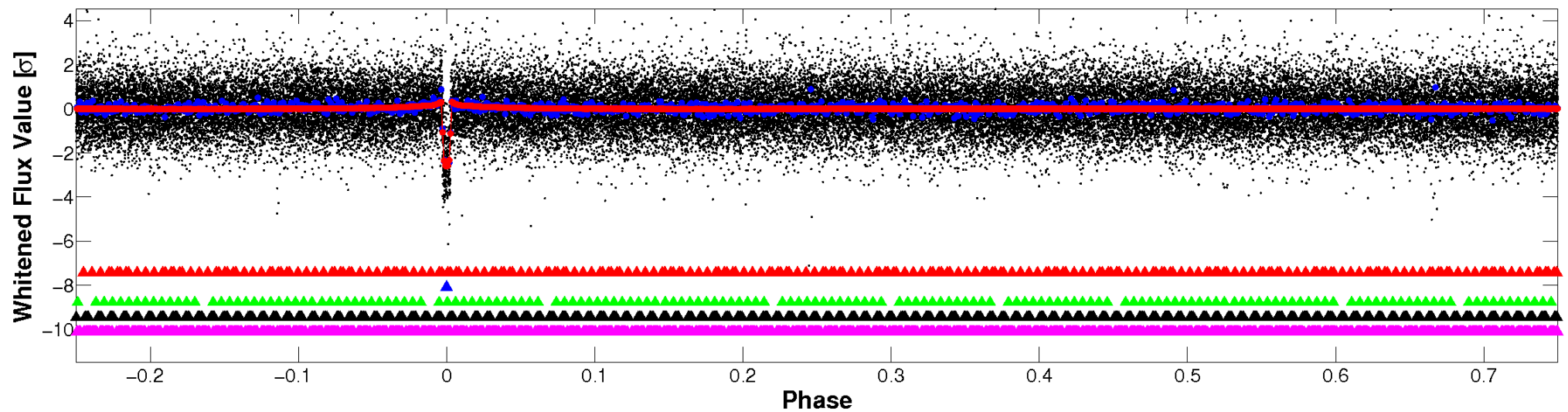


# Non-Whitened Vs. Whitened Light Curve

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



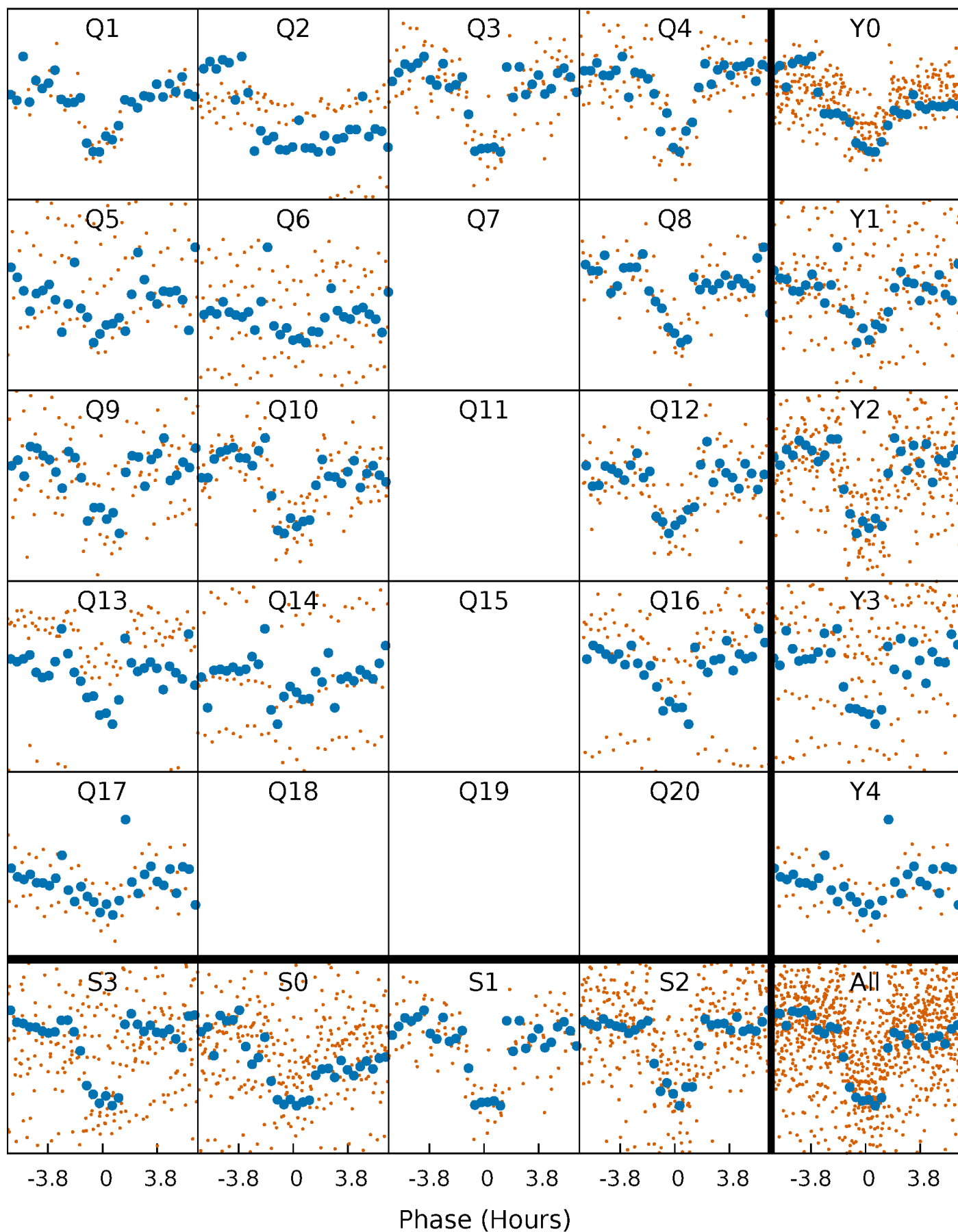
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





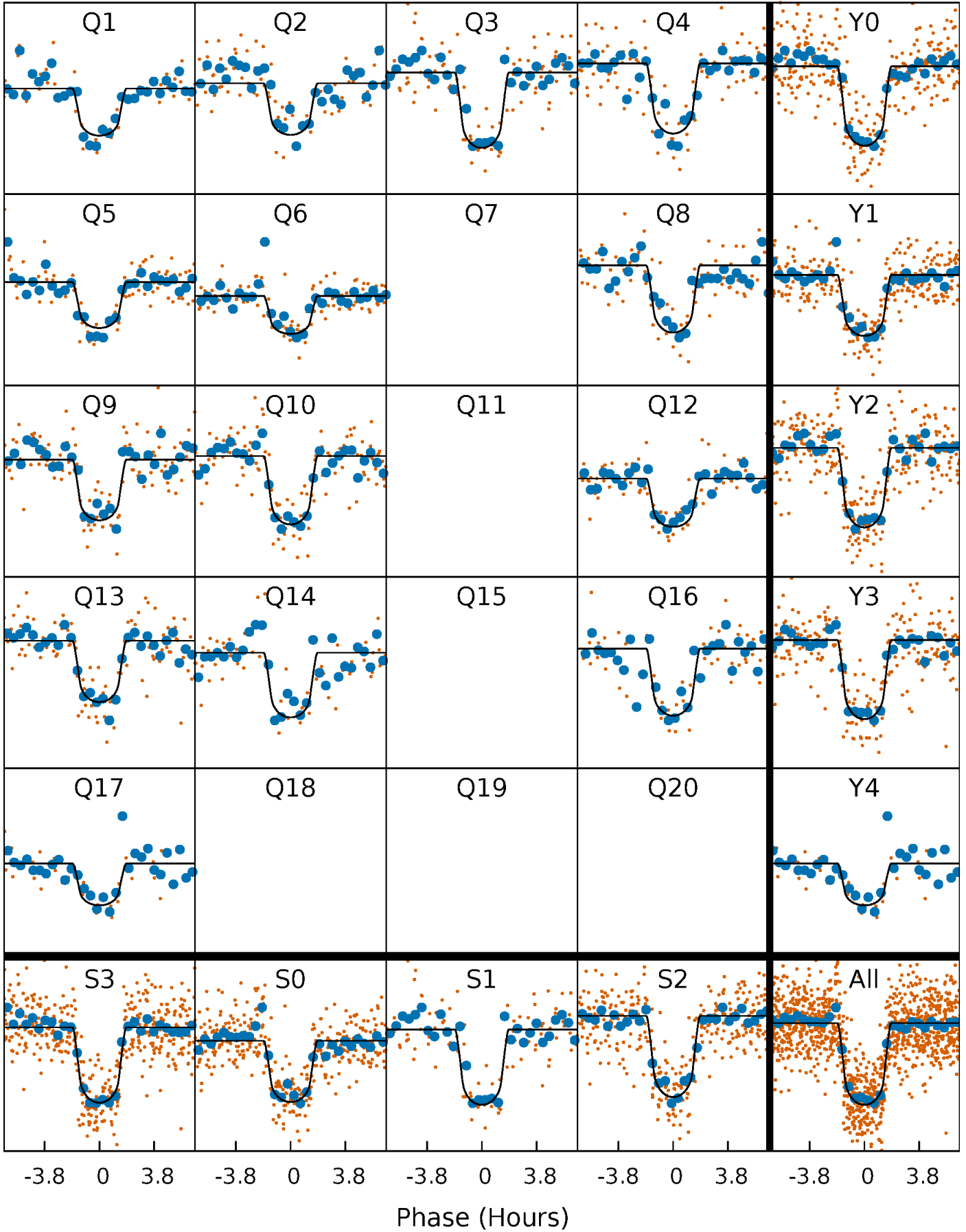
# PDC Quarter-Phased Transit Curves

TCE 009787239-02 P= 22.780805 Days  $T_0=132.421087$  (BKJD)



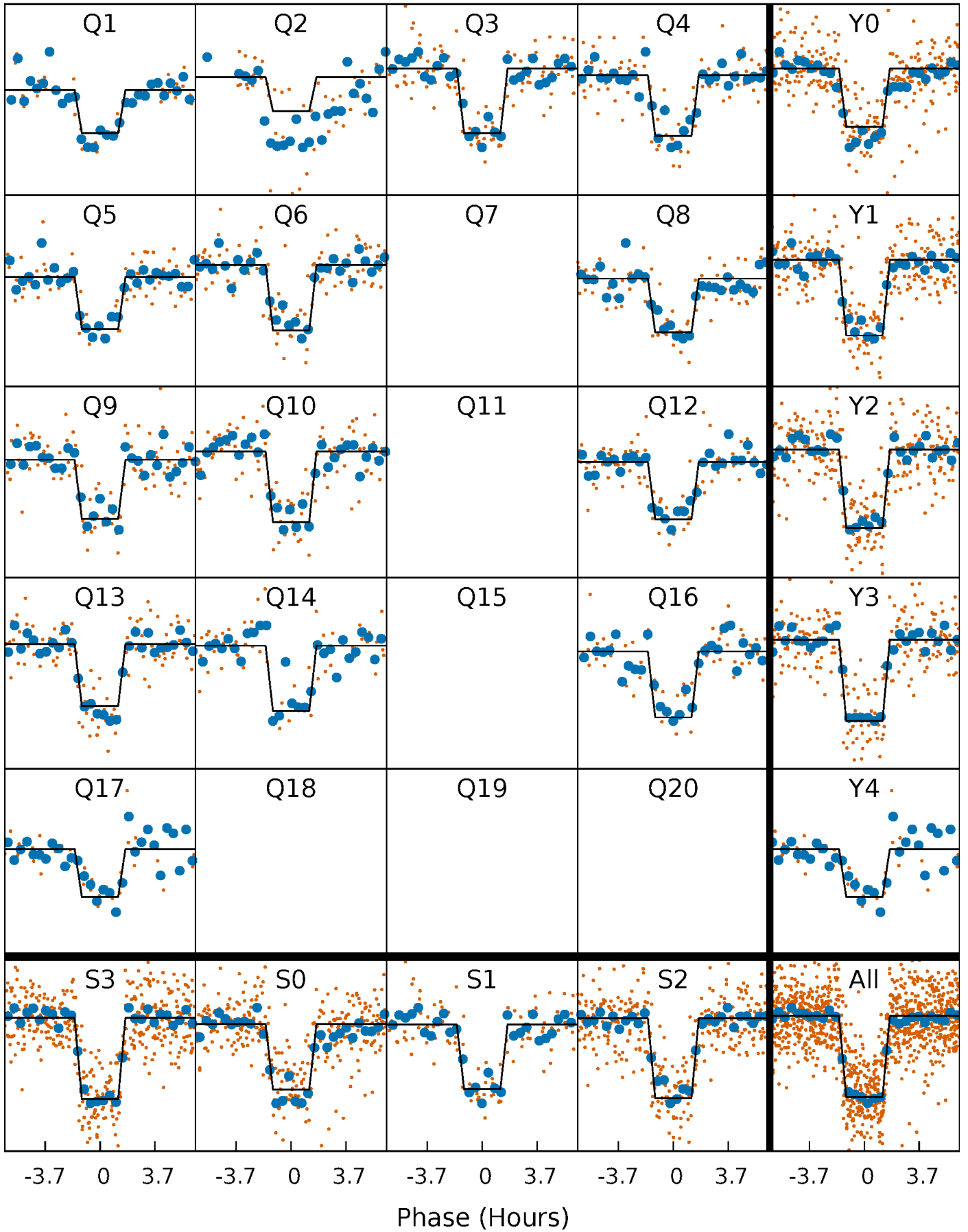
# DV Quarter-Phased Transit Curves

TCE 009787239-02 P= 22.780805 Days  $T_0=132.421087$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

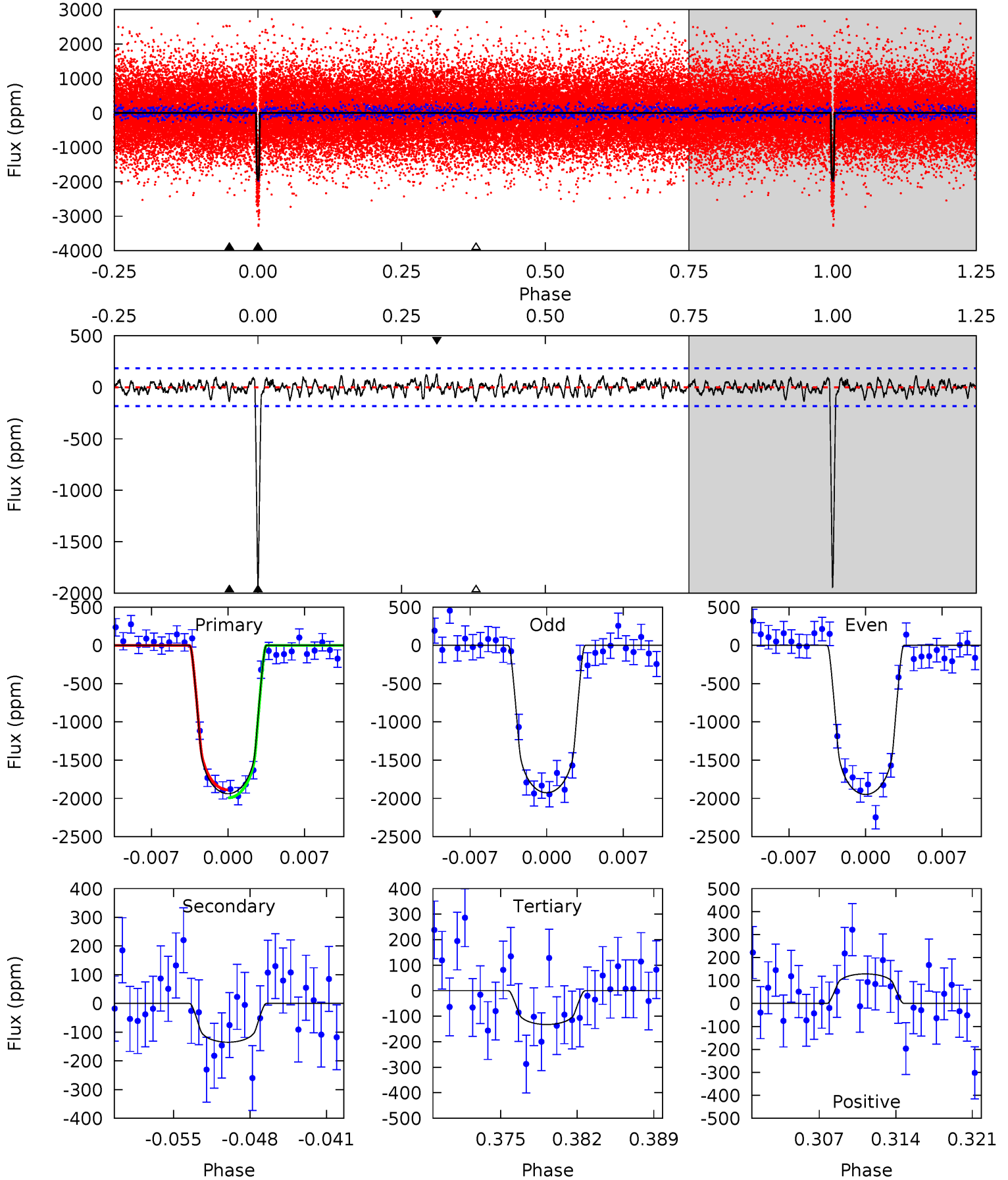
TCE 009787239-02 P= 22.780729 Days  $T_0=132.423352$  (BKJD)



# DV Model-Shift Uniqueness Test

009787239-02, P = 22.780805 Days, E = 109.640282 Days

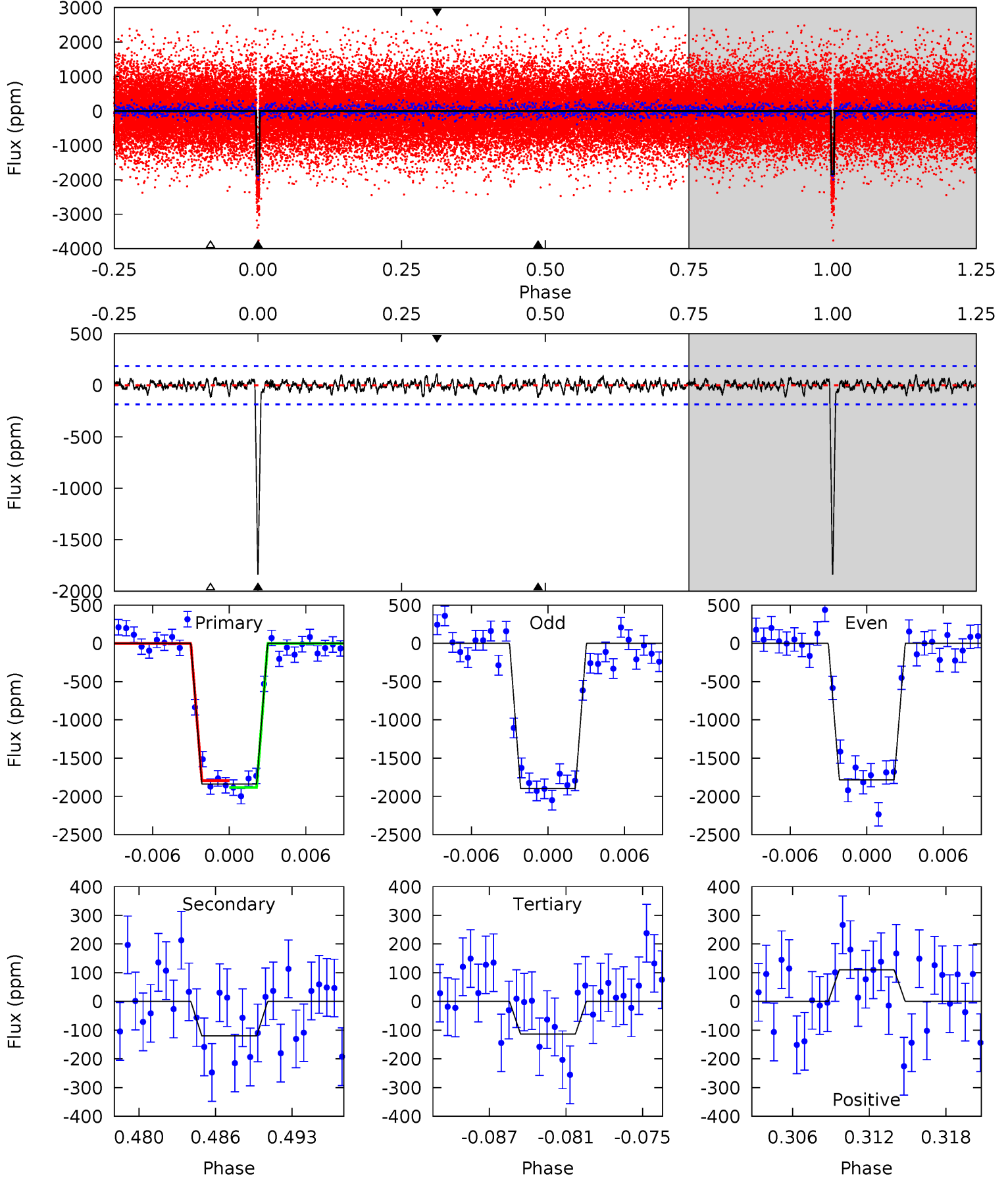
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.9	3.75	3.68	3.58	5.10	2.71	1.27	50.2	50.3	0.07	0.17	0.32	1.00	0.06	1.46



# Alt Model-Shift Uniqueness Test

009787239-02, P = 22.780729 Days, E = 109.642623 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
50.6	3.31	3.13	3.03	5.12	2.74	0.98	47.5	47.6	0.18	0.28	1.53	1.06	0.06	1.25



### Stellar Parameters For KIC 009787239

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$3731^{+73}_{-83}$	$4.750^{+0.052}_{-0.028}$	$-0.020^{+0.150}_{-0.150}$	$0.498^{+0.034}_{-0.051}$	$0.509^{+0.036}_{-0.045}$	$5.789^{+1.437}_{-0.703}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-10%	+7%/-9%	+25%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 009787239-02 / KOI 0952.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-135 \pm 36$	$2.25^{+0.58}_{-0.66}$	$456^{+12}_{-13}$	$2564^{+251}_{-166}$	$227^{+229}_{-99}$
Alt.	$-120 \pm 36$	$2.38^{+0.58}_{-0.62}$	$456^{+12}_{-13}$	$2507^{+220}_{-174}$	$186^{+169}_{-80}$

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

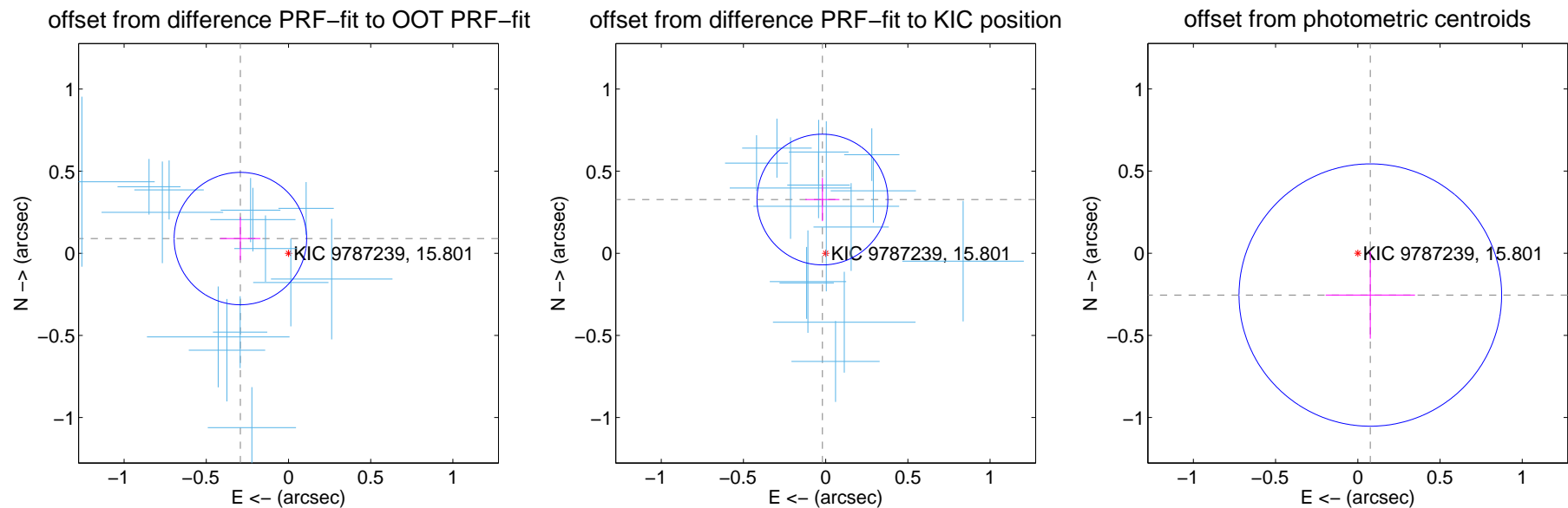
## DV Centroid Data

Supplemental centroid analysis for 009787239-02. Kepler magnitude: 15.80. Transit SNR 38.04

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.57 arcsec

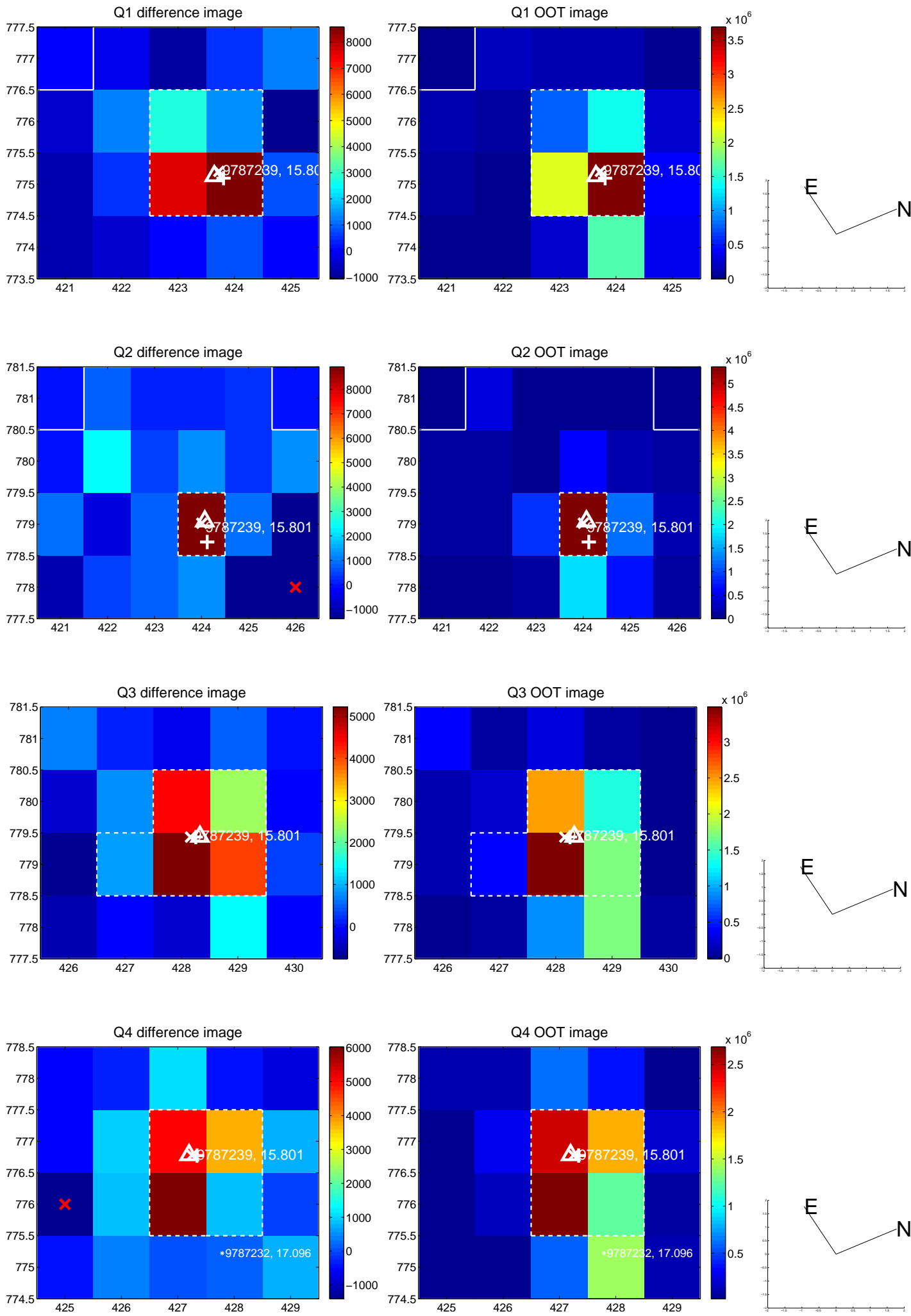
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.306 \pm 0.134$	2.28	$0.293 \pm 0.122$	$0.090 \pm 0.131$
PRF-fit source offset from KIC position	$0.328 \pm 0.133$	2.47	$0.020 \pm 0.103$	$0.327 \pm 0.132$
photometric centroid source offset	$0.27 \pm 0.27$	1.00	$-0.08 \pm 0.27$	$-0.25 \pm 0.27$



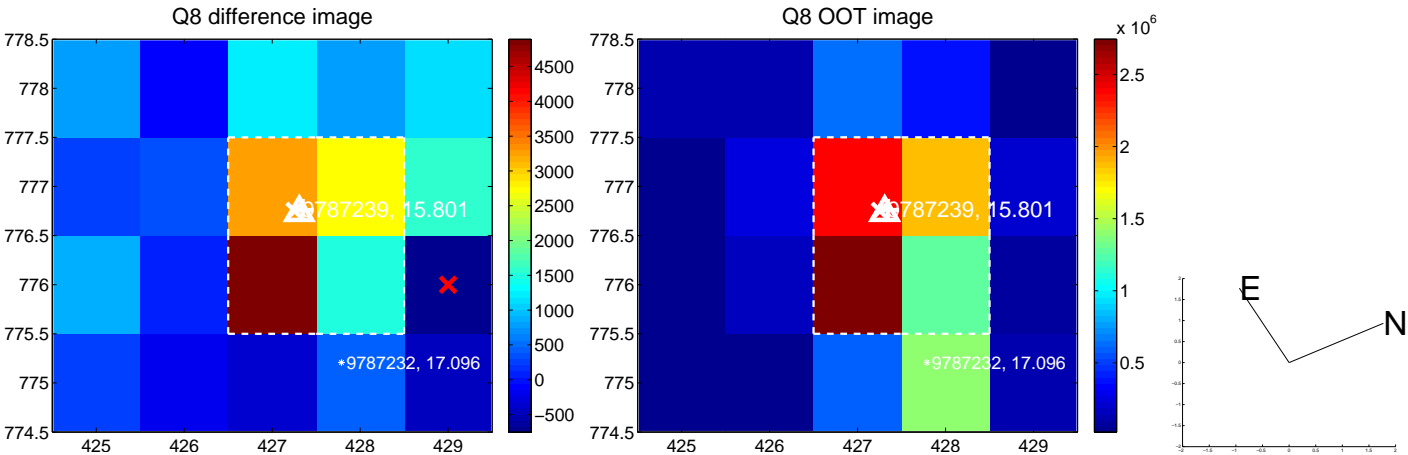
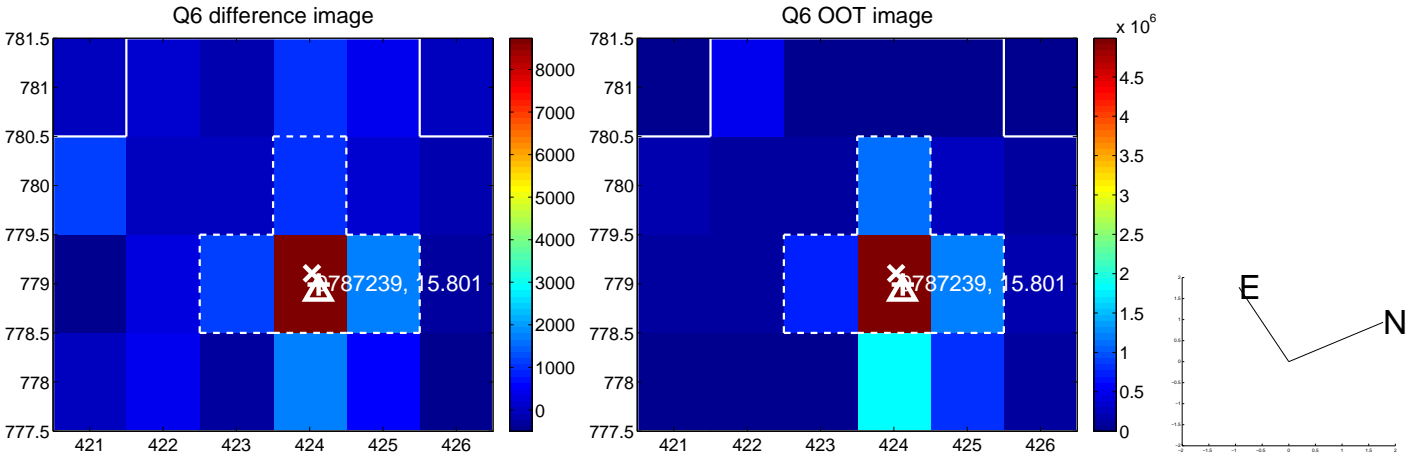
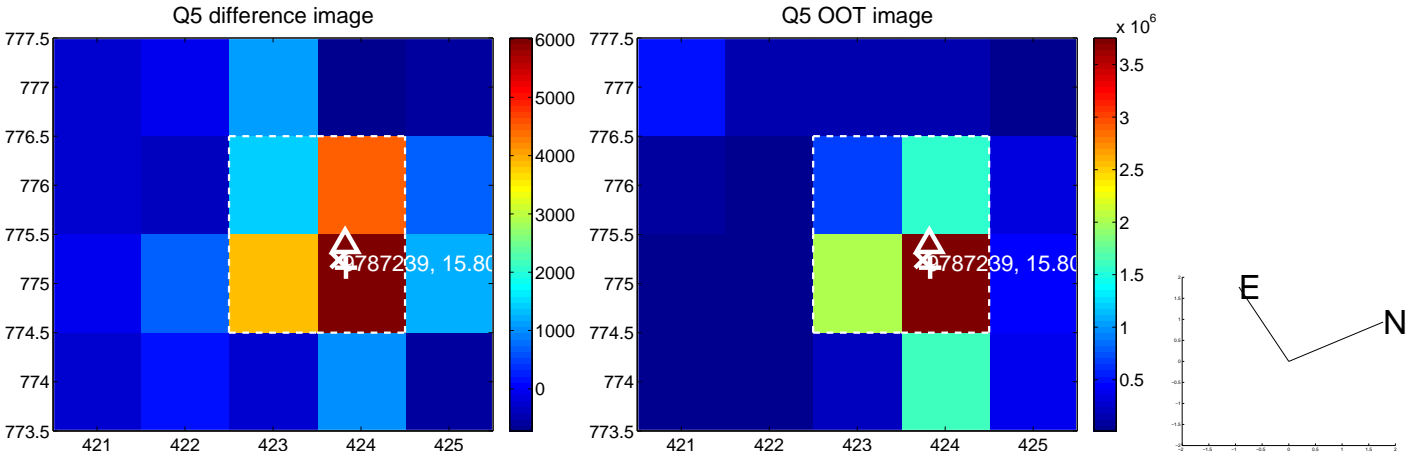
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



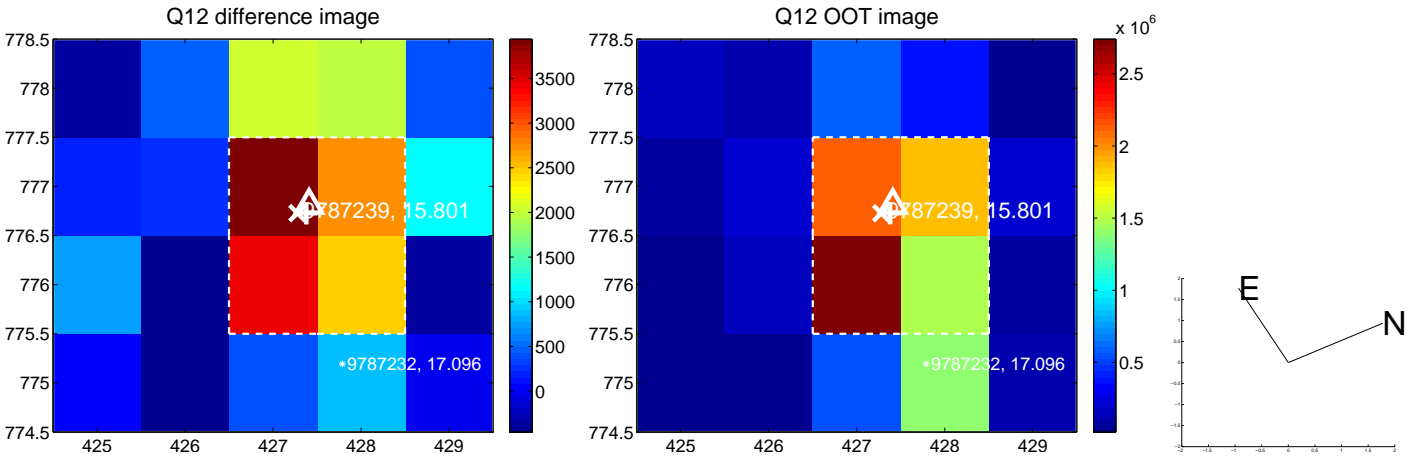
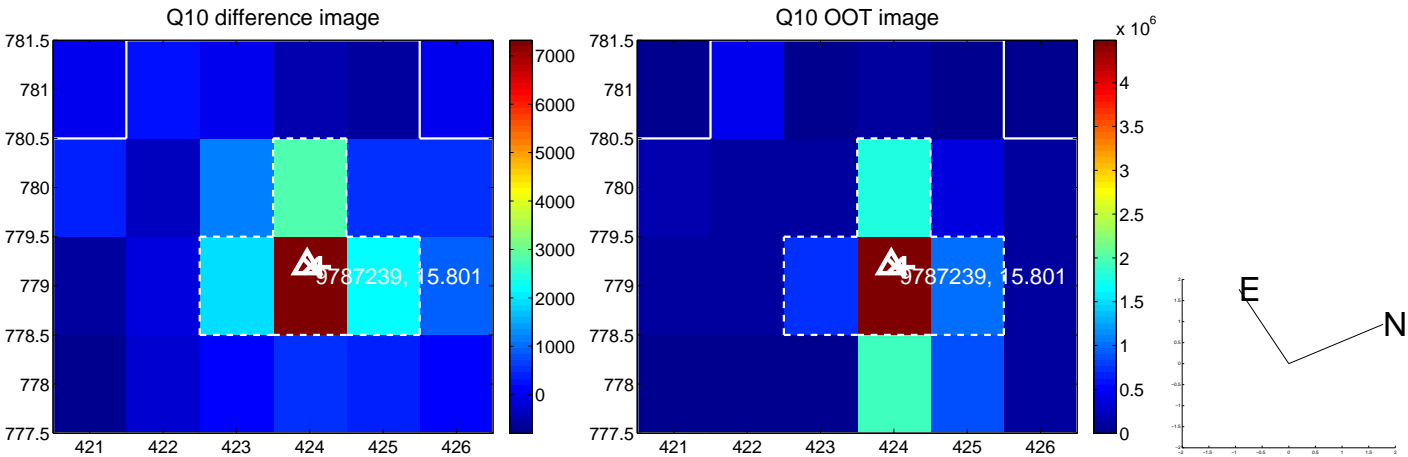
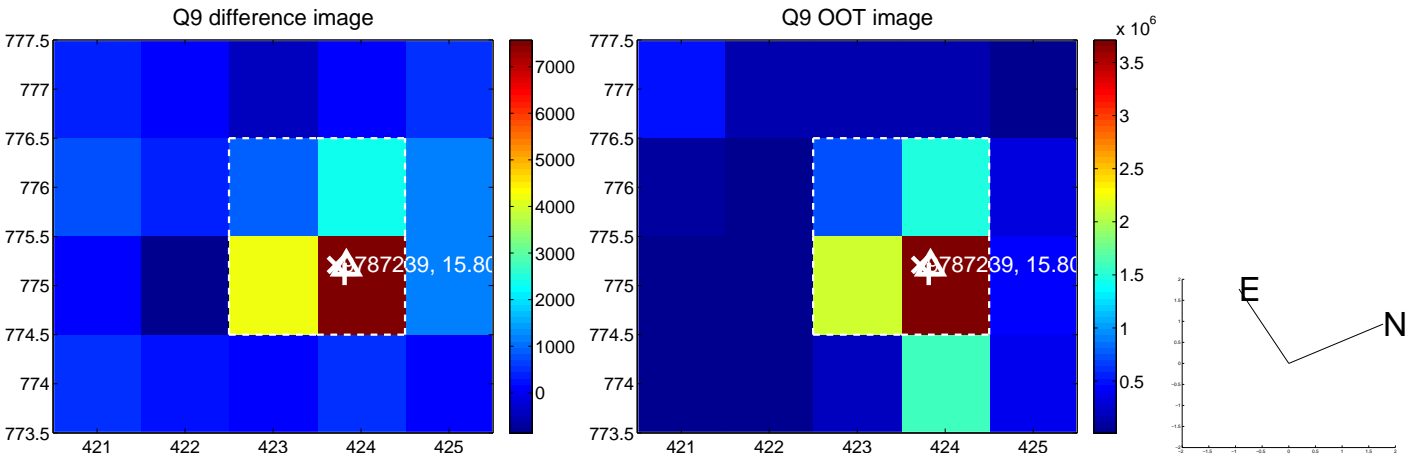
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



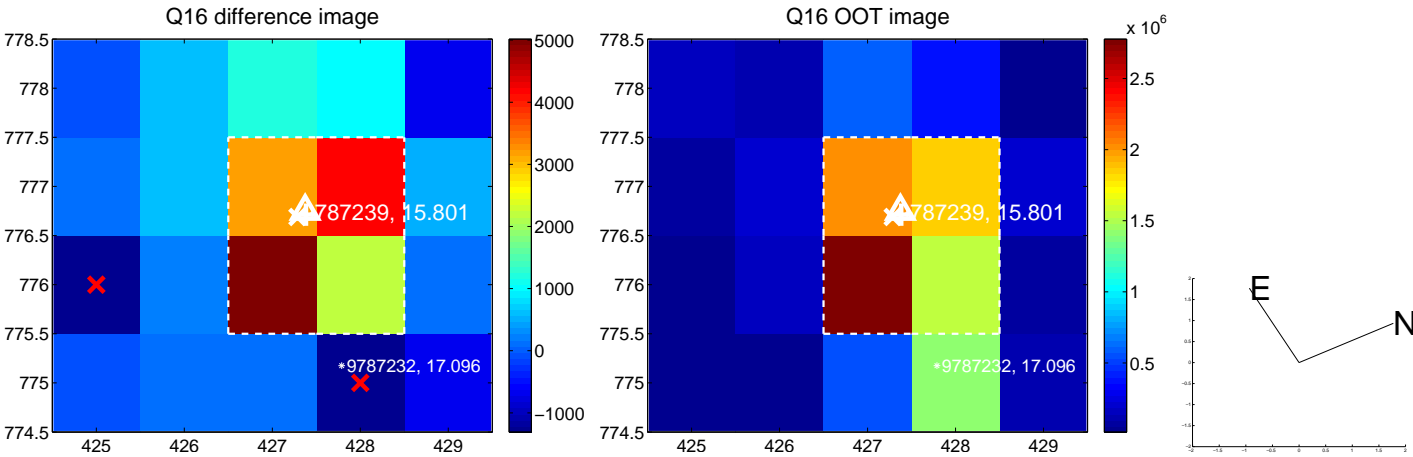
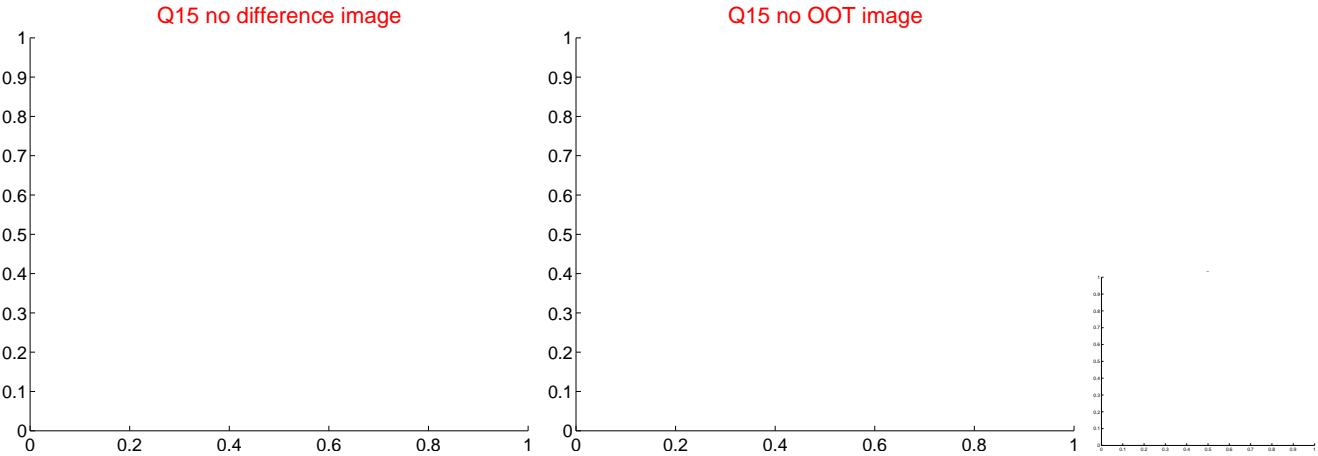
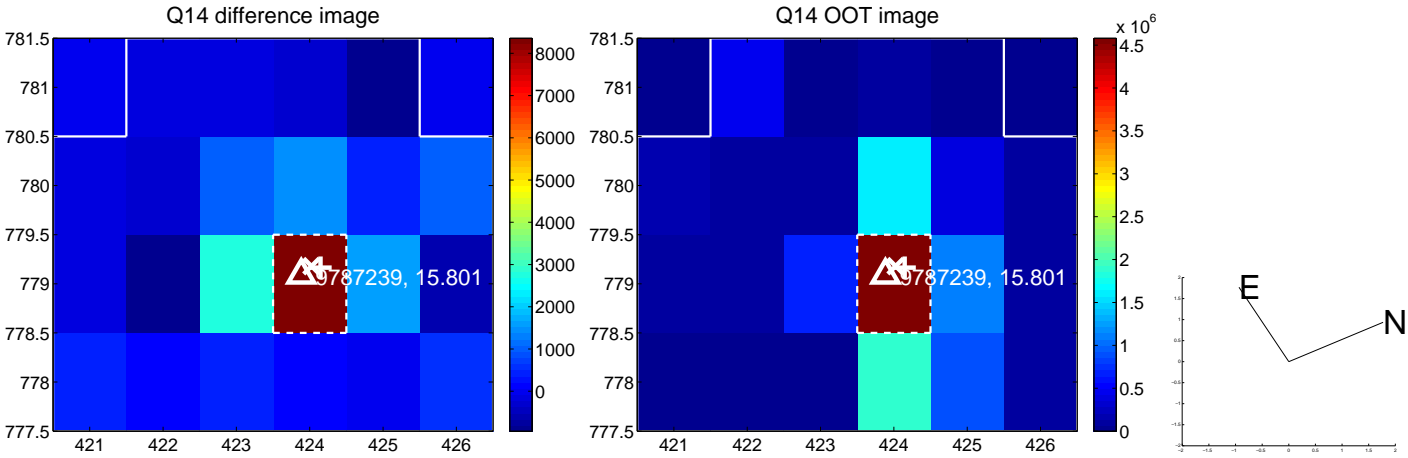
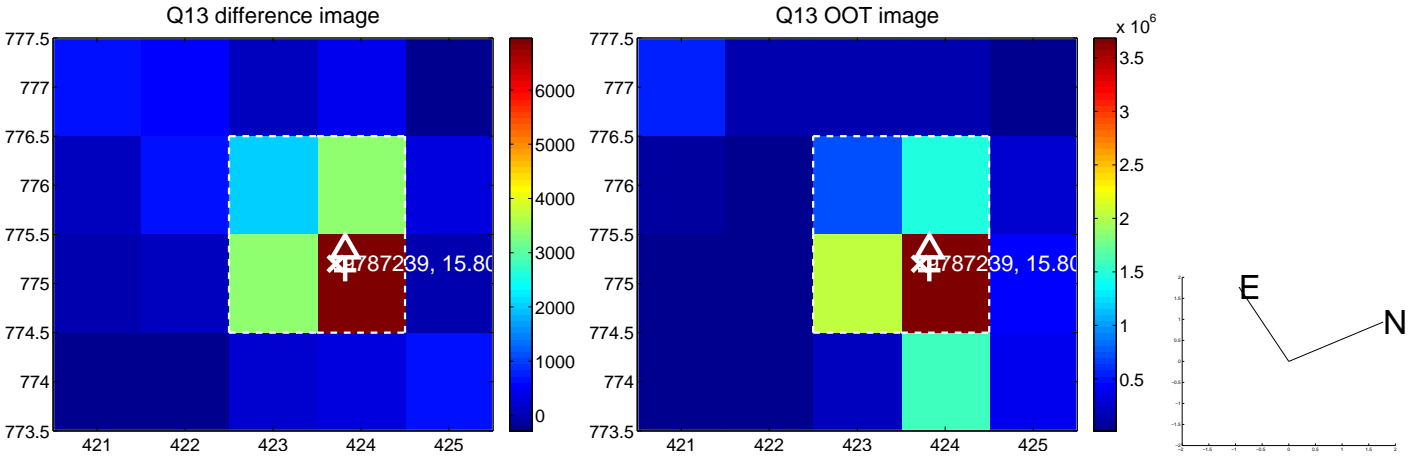
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



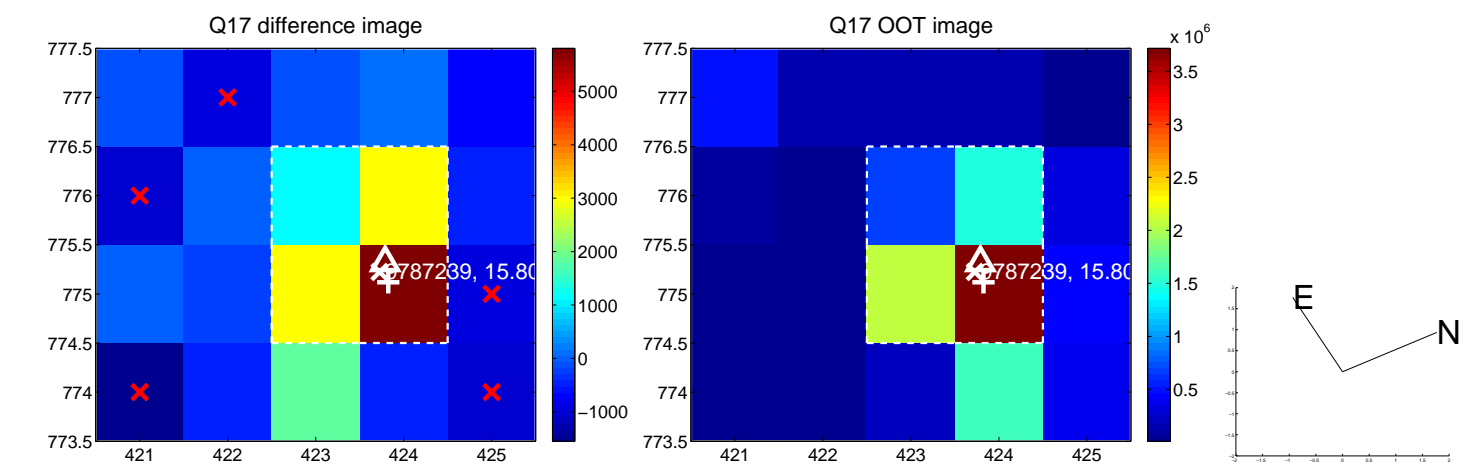
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



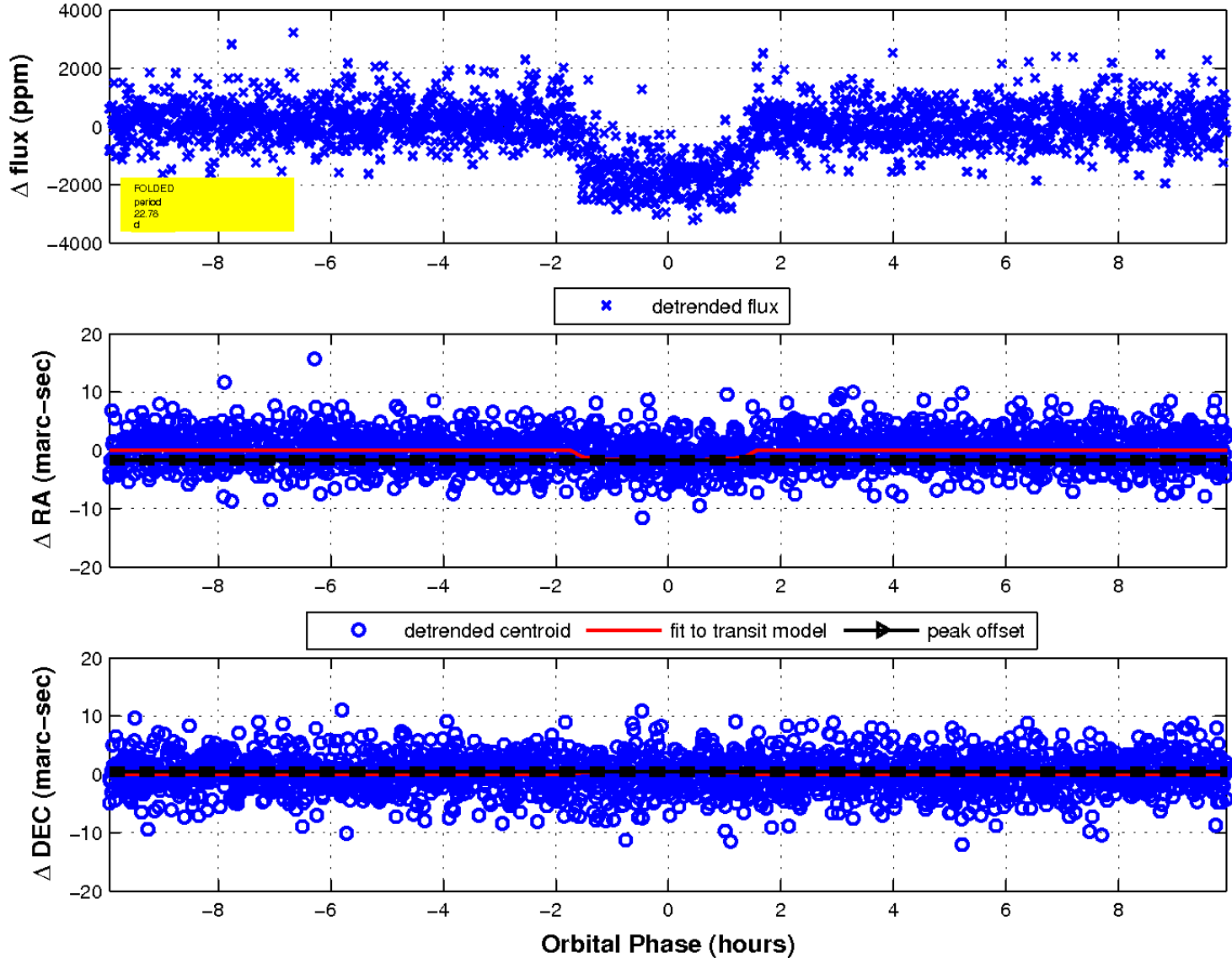
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

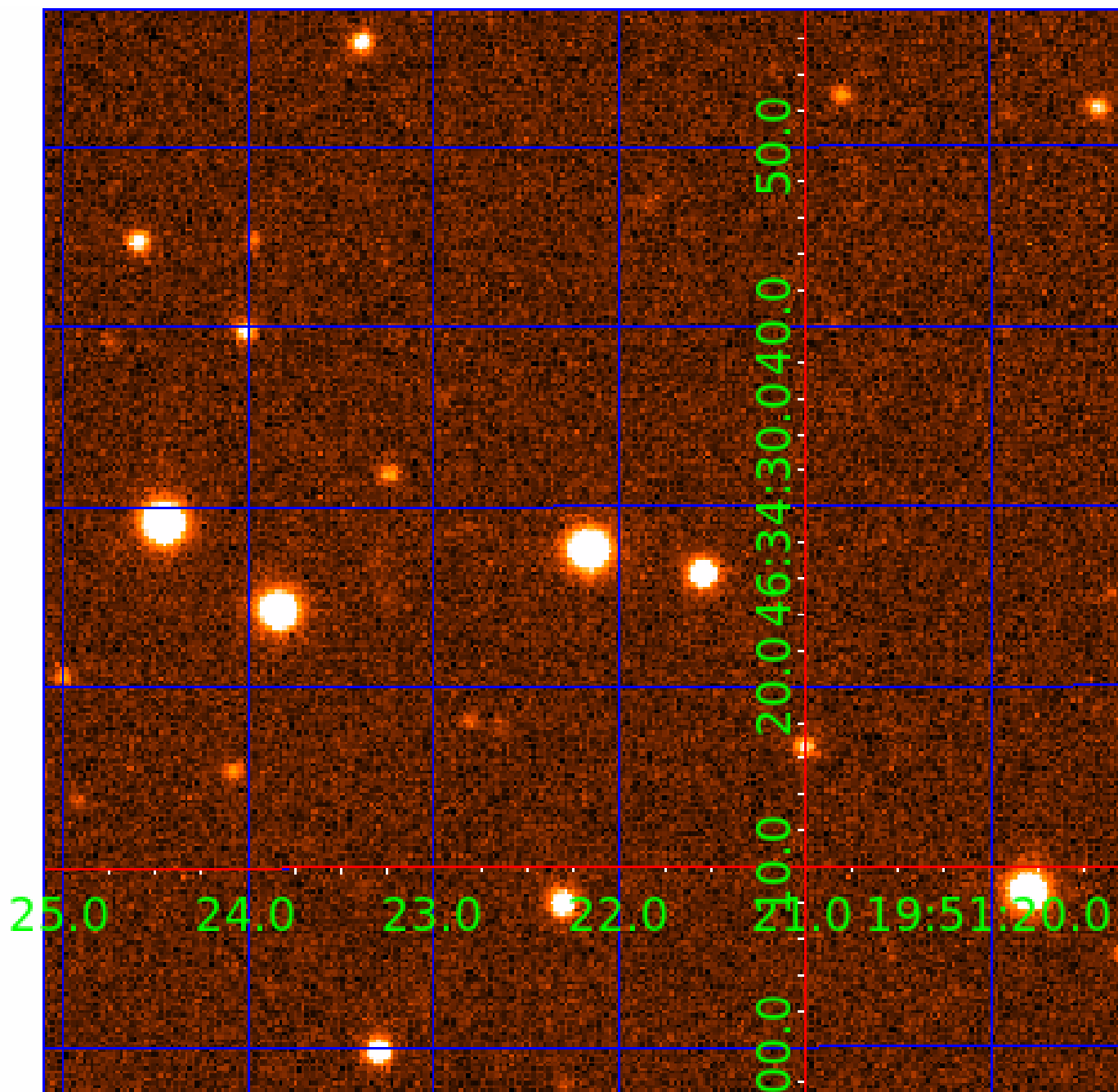


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination



# KIC 009787239

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009787239-01	OBS	0952.01	5.901287	135.998633	1565.0	2.392	44.2	49.6	0.50	3731	2.23	16.54
009787239-02	OBS	0952.03	22.780805	132.421087	1983.5	3.312	31.4	38.0	0.50	3731	2.26	2.73
009787239-03	OBS	0952.02	8.752109	135.627317	1319.9	3.106	31.8	34.7	0.50	3731	2.36	9.78
009787239-04	OBS	0952.04	2.896009	133.613421	411.3	1.868	15.3	17.4	0.50	3731	1.21	42.72
009787239-05	OBS	0952.05	0.742957	131.791013	205.0	1.299	11.1	13.7	0.50	3731	0.86	262.06

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009787239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009787239-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-04	OBS	PC	0.97	0	0	0	0	CENT_KIC_POS
009787239-05	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

**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 009787239-03

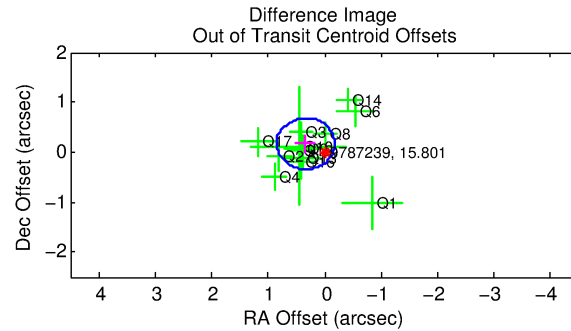
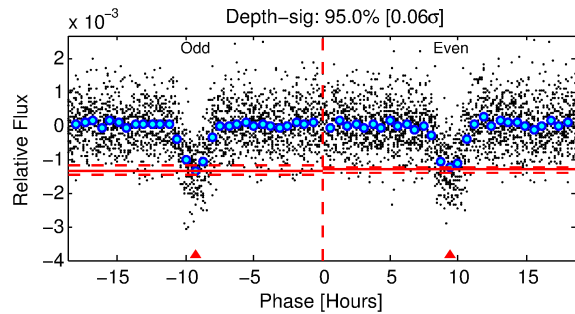
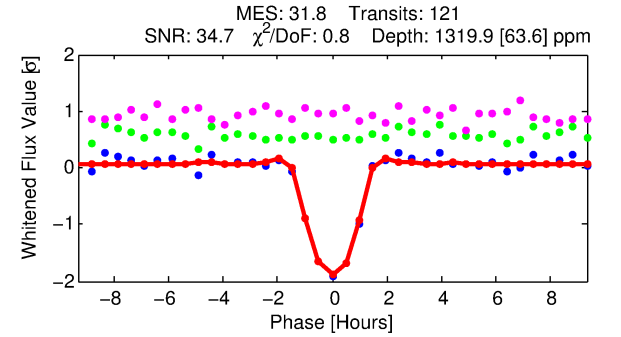
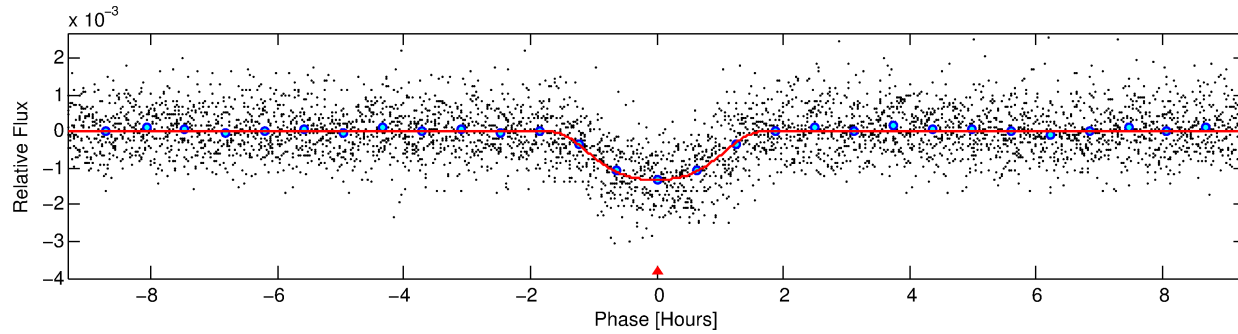
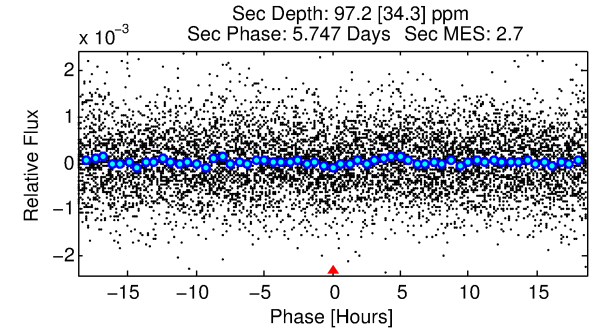
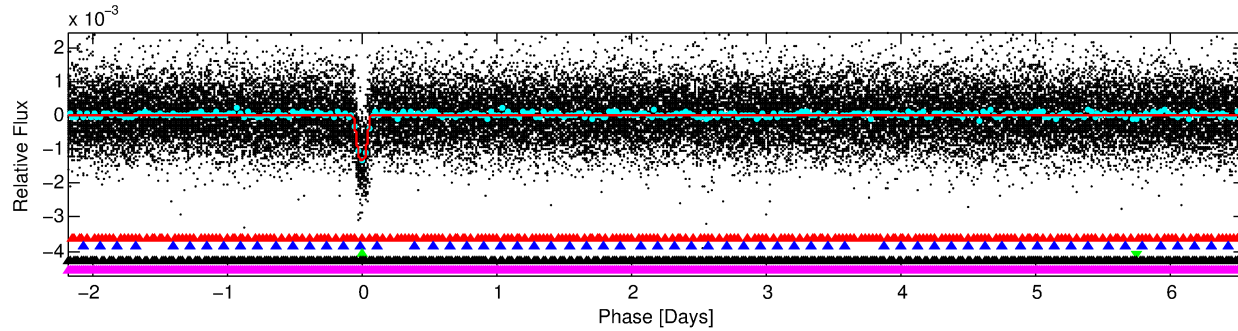
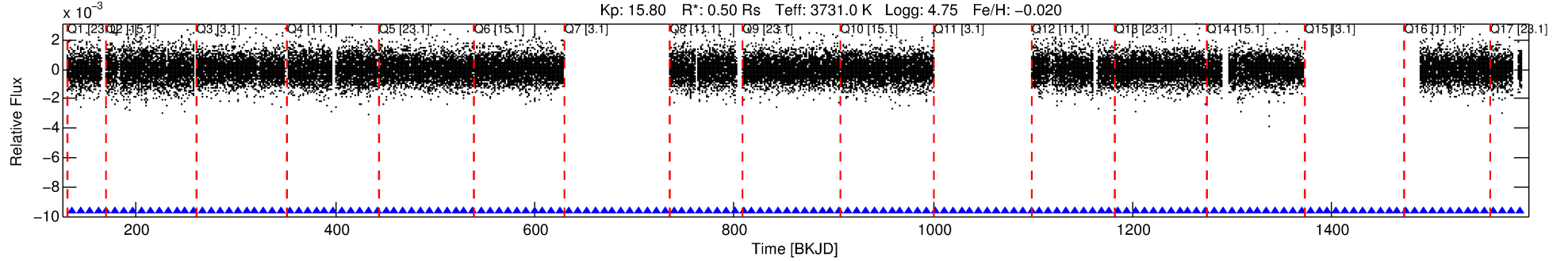
No Significant Match Found



# DV One-Page Summary

KIC: 9787239 Candidate: 3 of 5 Period: 8.752 d  
KOI: K00952.02 Name: Kepler-32c Corr: 0.884

Kp: 15.80 R\*: 0.50 Rs Teff: 3731.0 K Logg: 4.75 Fe/H: -0.020



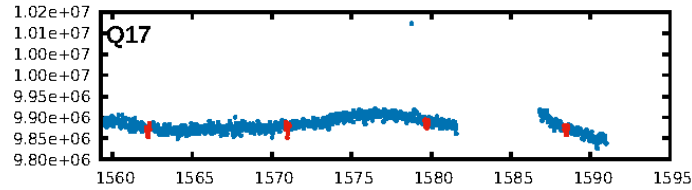
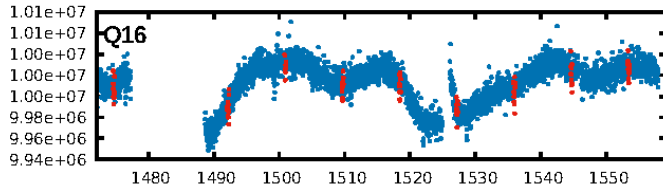
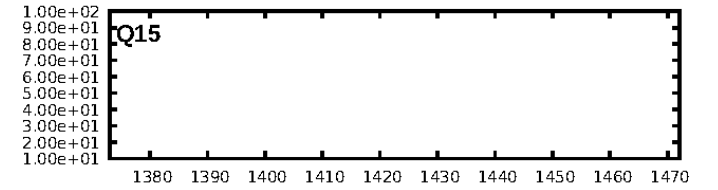
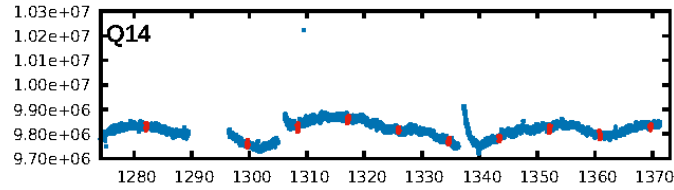
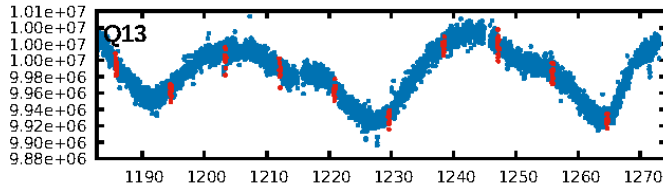
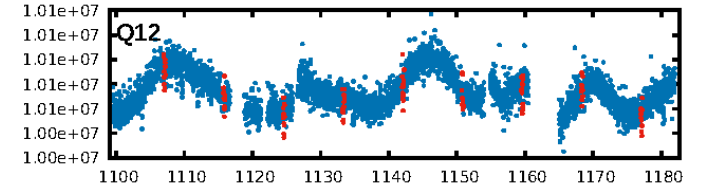
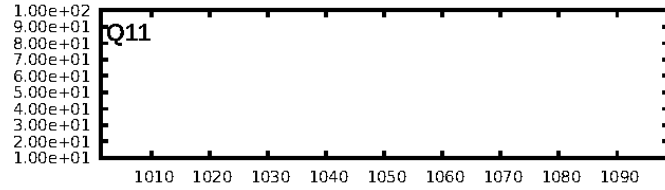
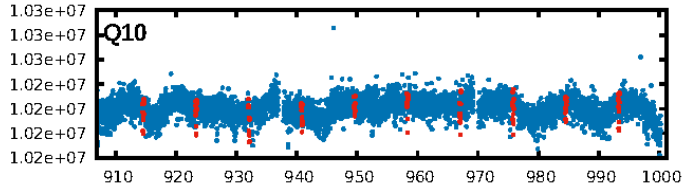
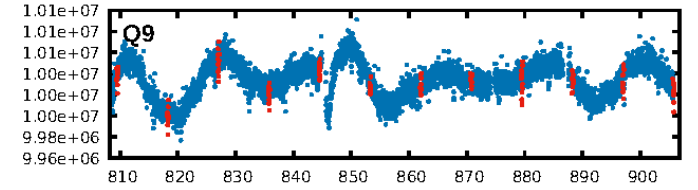
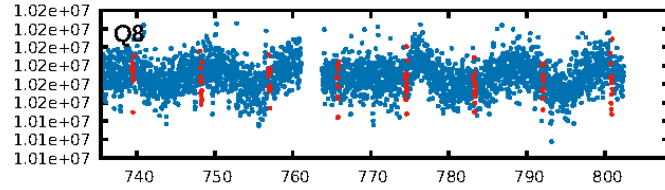
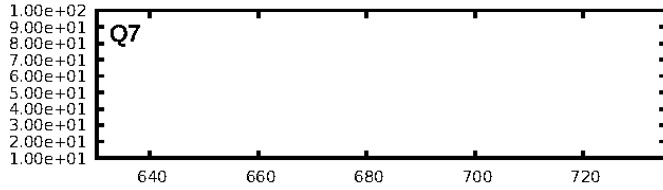
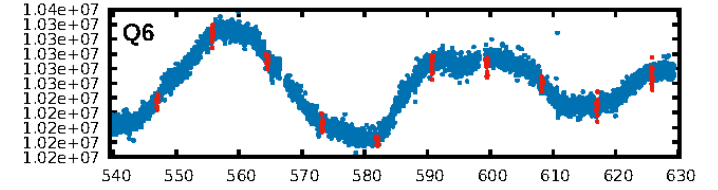
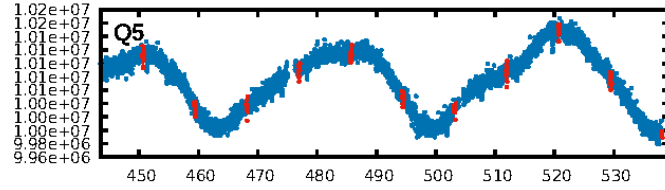
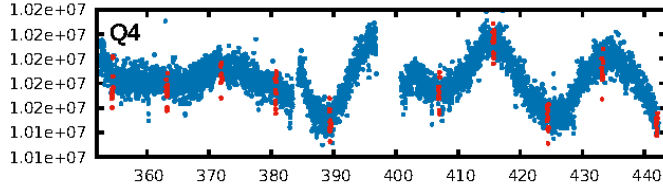
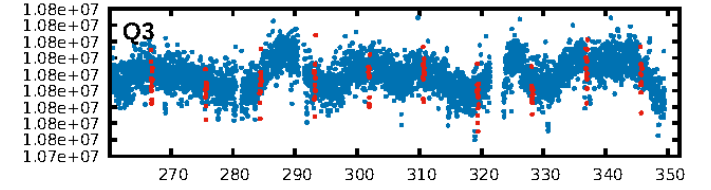
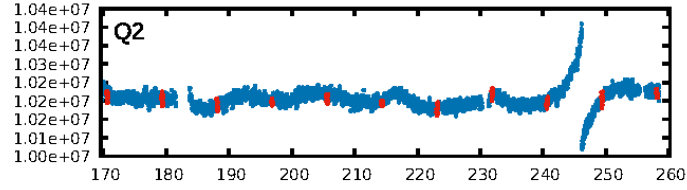
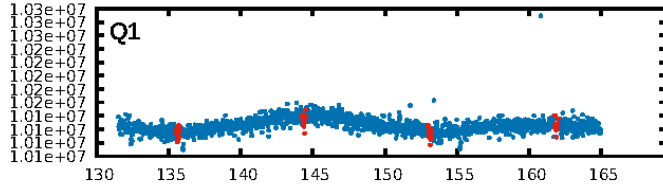
## DV Fit Results:

Period = 8.75211 [0.00002] d  
Epoch = 135.6273 [0.0019] BKJD  
Rp/R\* = 0.0435 [0.0019]  
a/R\* = 9.16 [0.63]  
b = 0.95 [0.01]  
Seff = 9.78 [1.35]  
Teq = 451 [16] K  
Rp = 2.36 [0.26] Re  
a = 0.0664 [0.0052] AU  
Ag = 42.18 [15.98] [2.58σ]  
Teffp = 1777 [166] K [7.93σ]

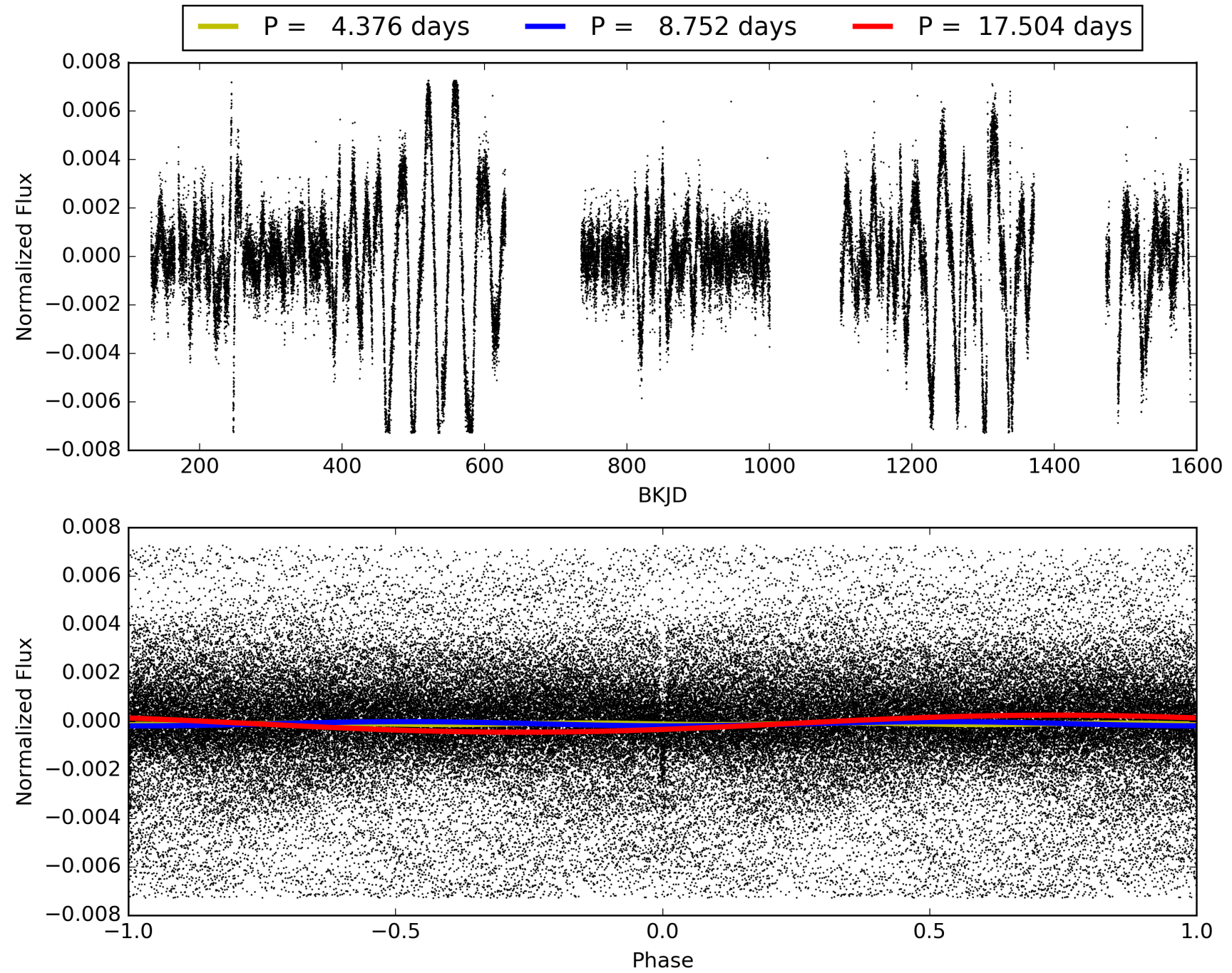
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.45σ]  
LongPeriod-sig: 100.0% [74.15σ]  
ModelChiSquare2-sig: 99.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.30e-202  
RollingBand-fgt: 1.00 [113/113]  
GhostDiagnostic-chr: 4.003  
Centroid-sig: 2.7%  
Centroid-so: 0.710 arcsec [2.34σ]  
OotOffset-rm: 0.378 arcsec [2.21σ]  
KicOffset-rm: 0.487 arcsec [2.97σ]  
OotOffset-st: 4/1/4/4 [13]  
KicOffset-st: 4/1/4/4 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 0.21 [3/14]

# TCE 009787239-03, PDC Light Curves

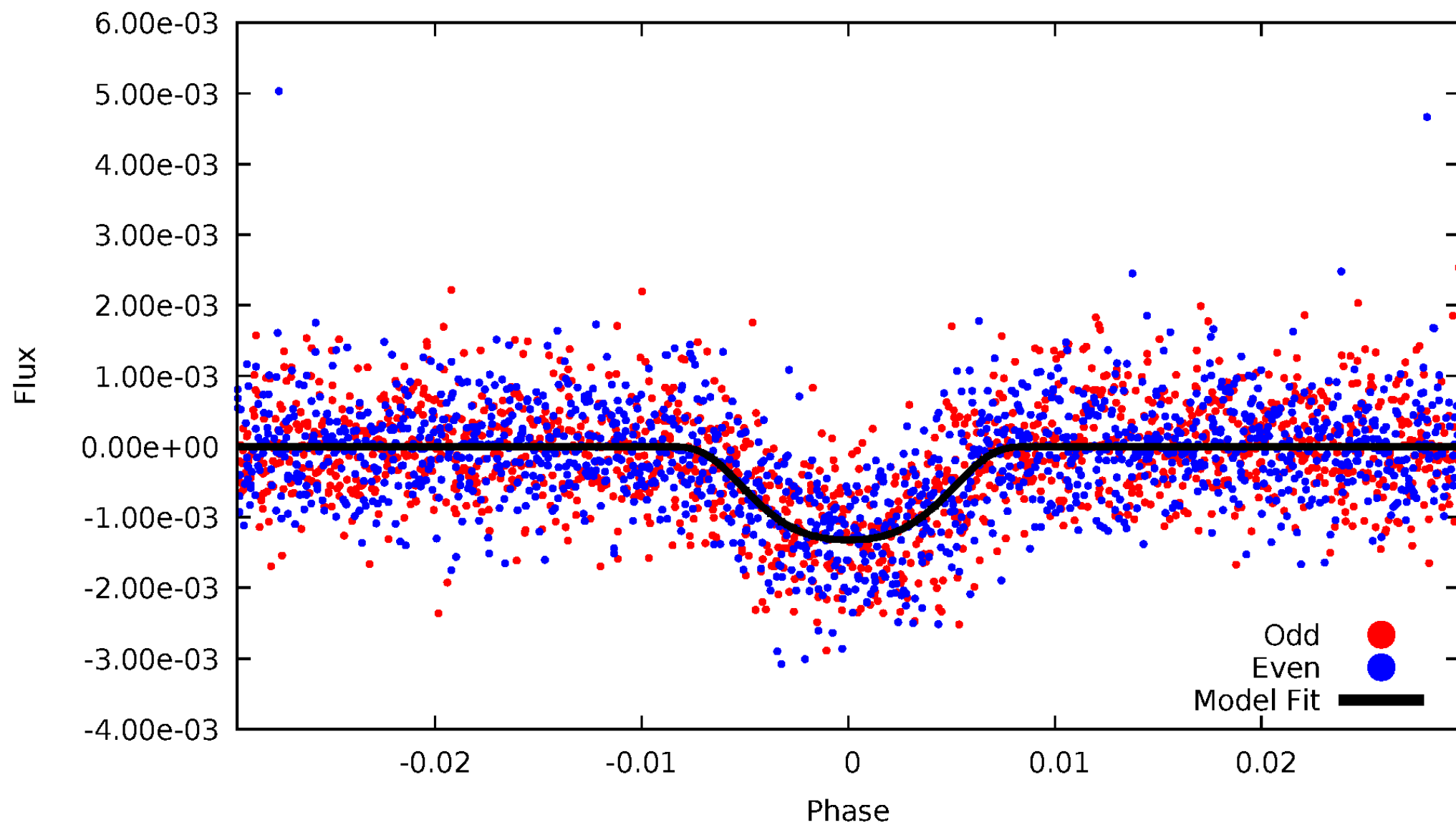


TCE 009787239-03



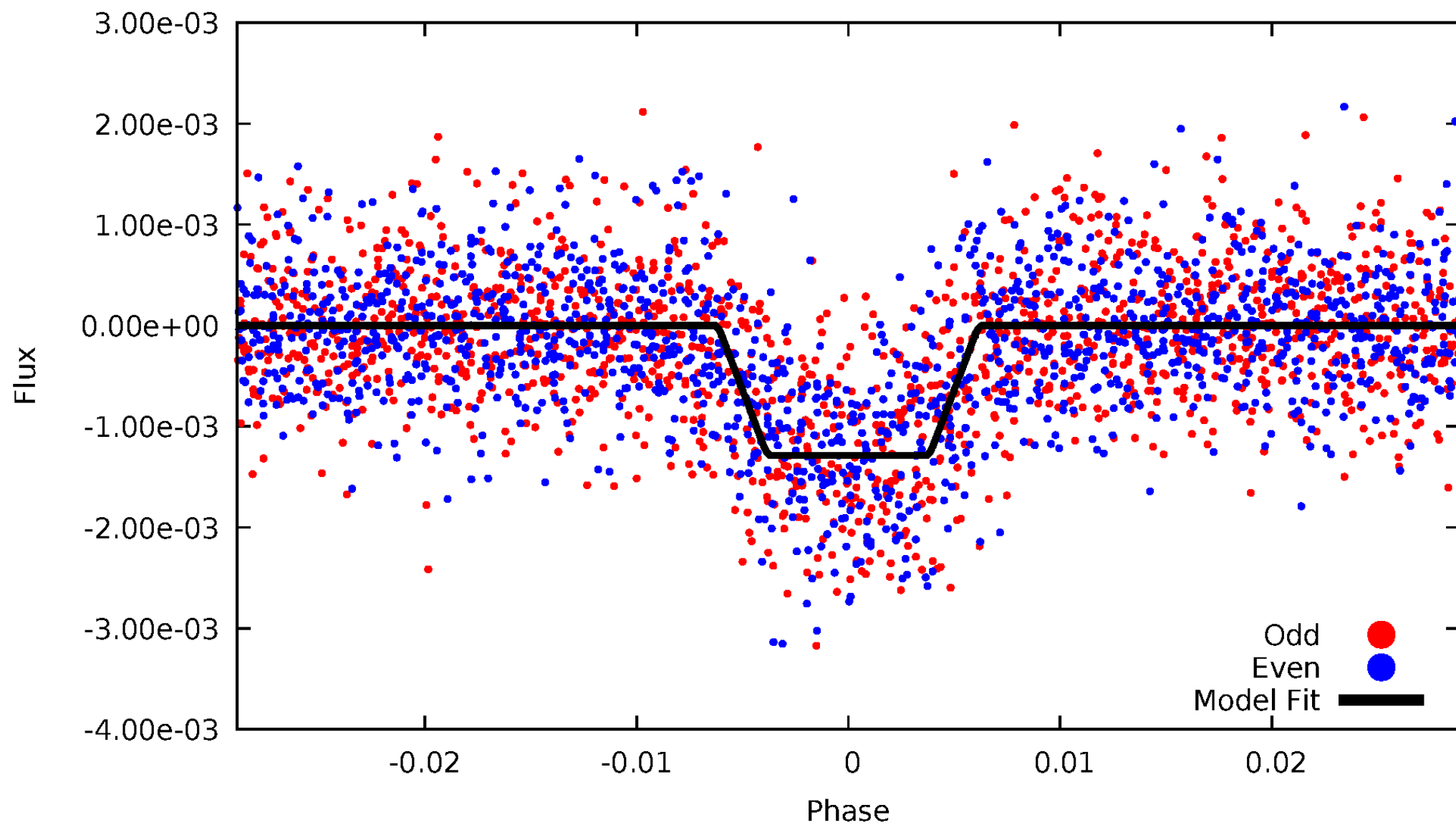
# DV Odd/Even

TCE 009787239-03



# ALT Odd/Even

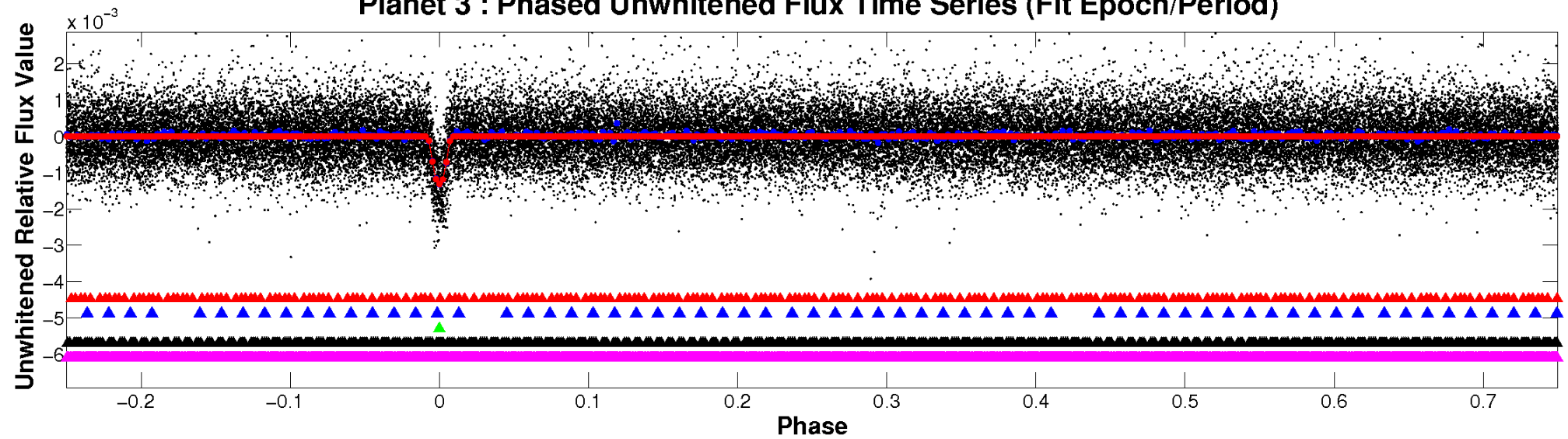
TCE 009787239-03



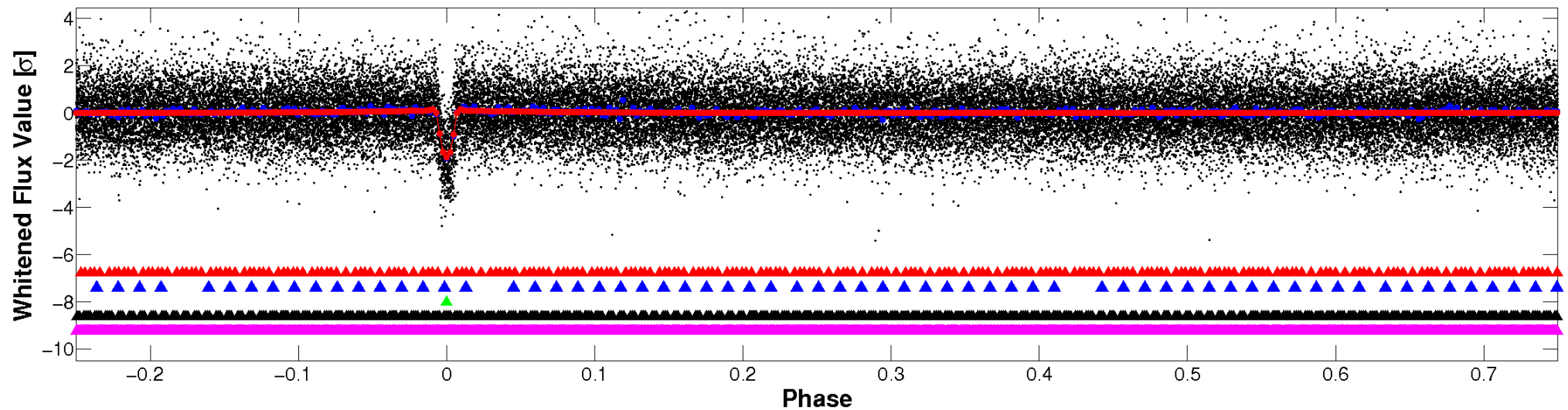


# Non-Whitened Vs. Whitened Light Curve

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

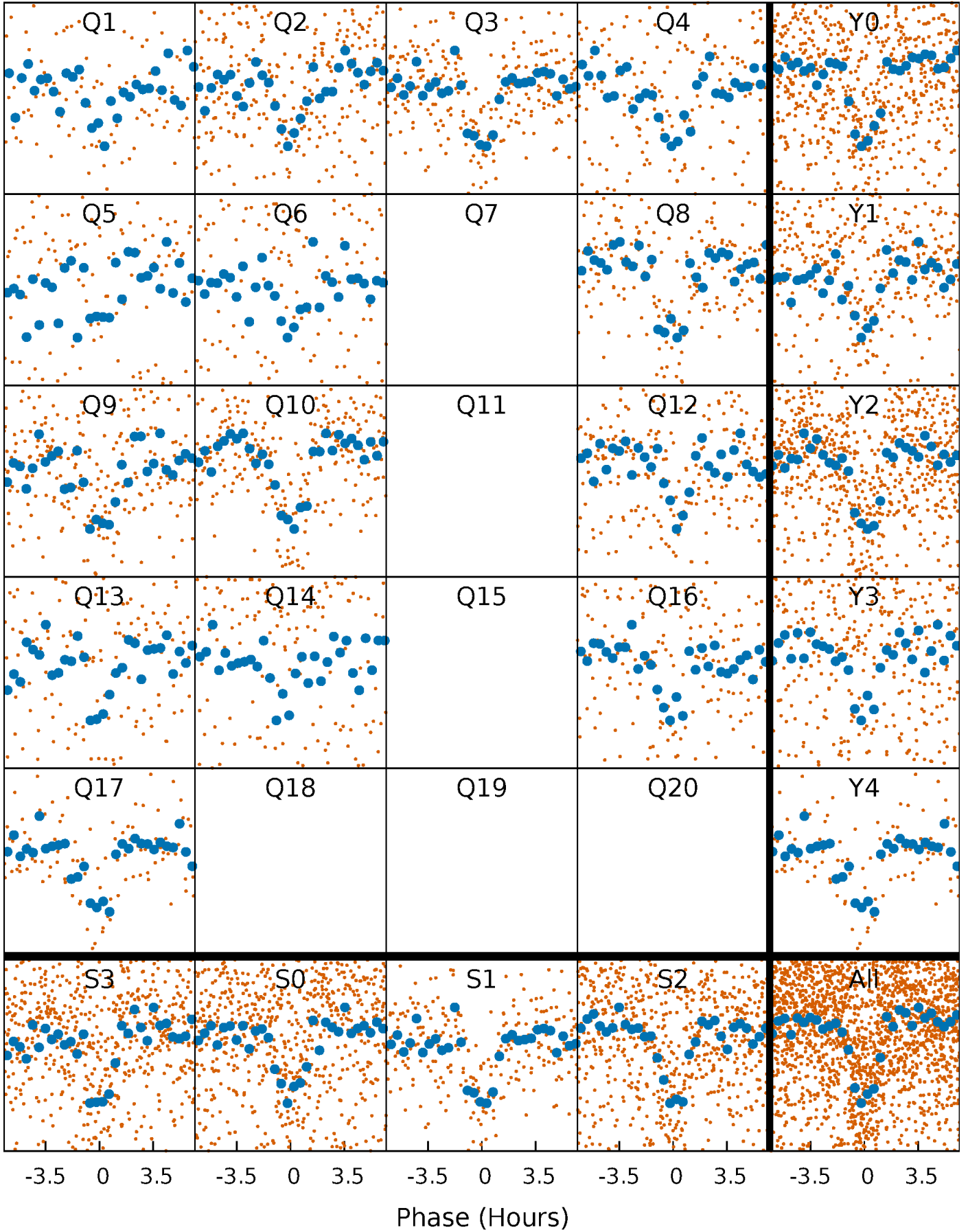


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

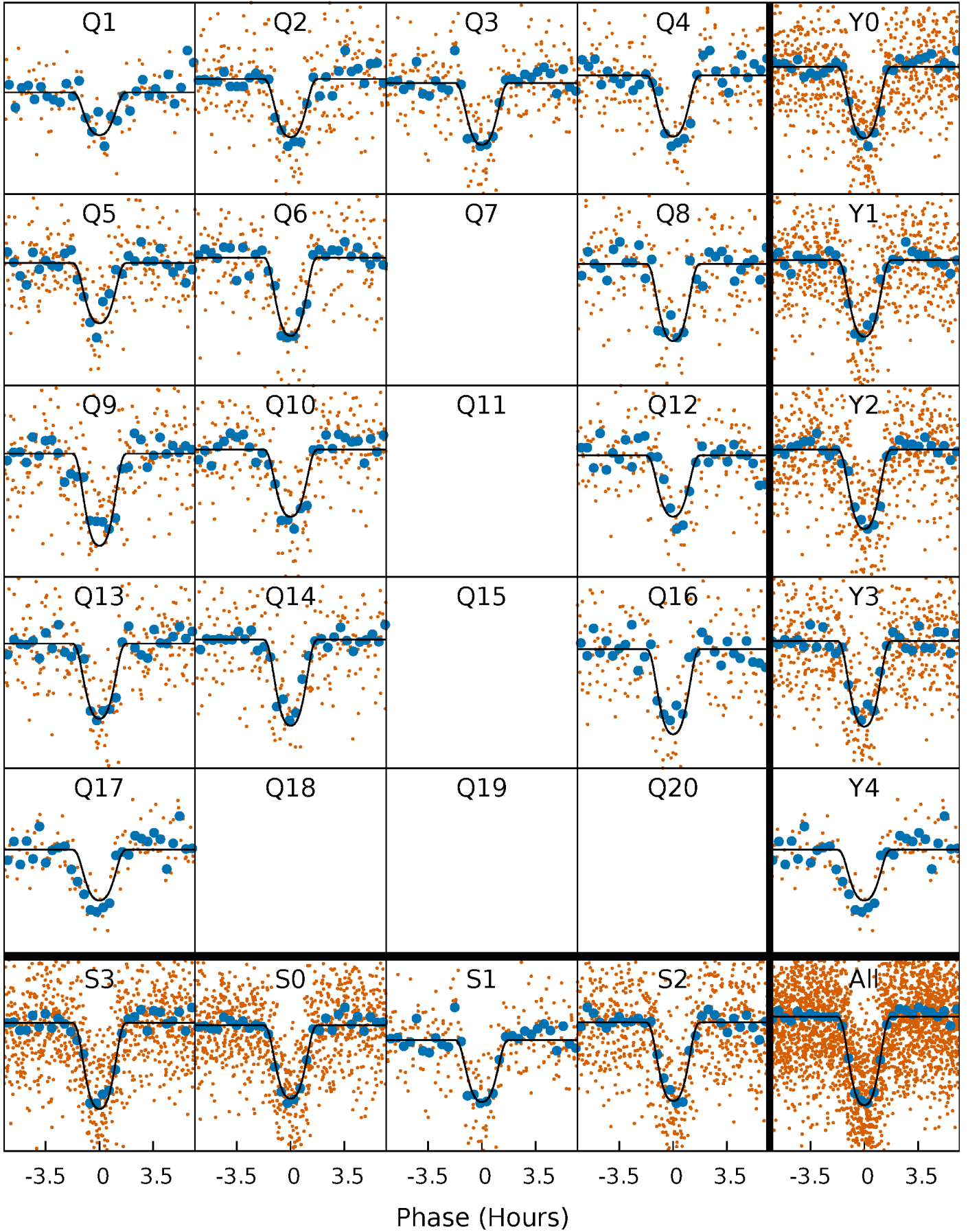
TCE 009787239-03   P= 8.752109 Days    $T_0=135.627317$  (BKJD)





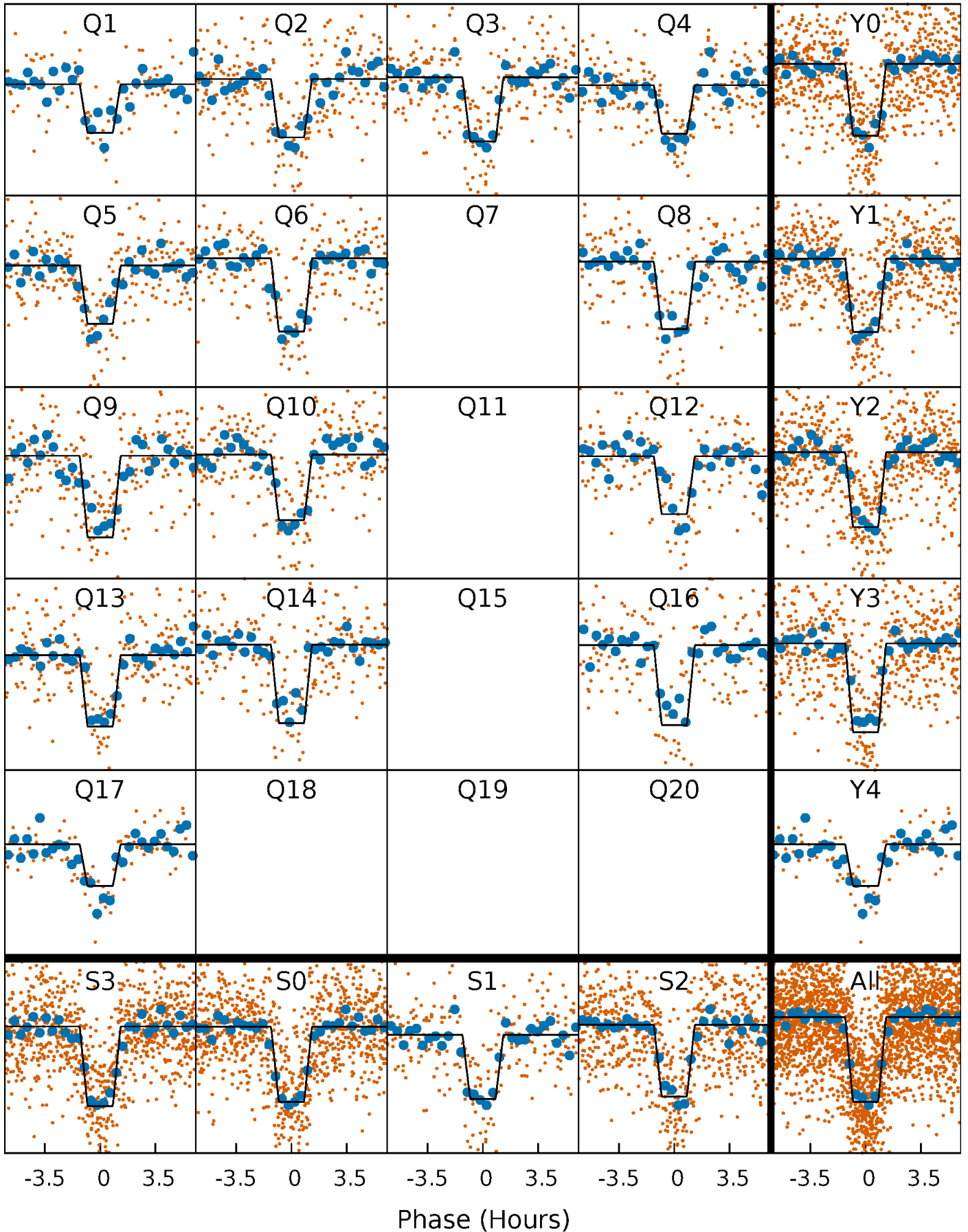
# DV Quarter-Phased Transit Curves

TCE 009787239-03   P= 8.752109 Days    $T_0=135.627317$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

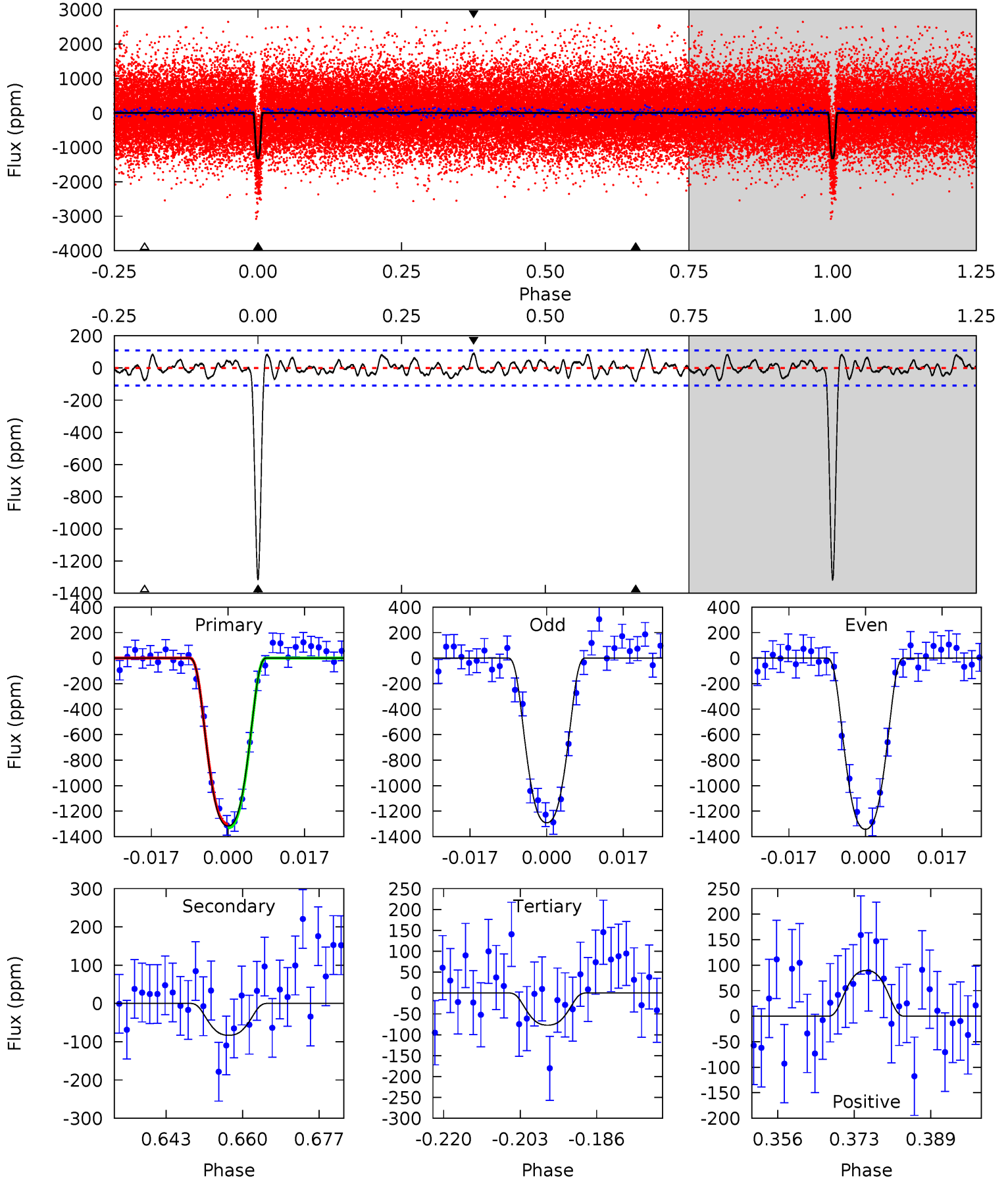
TCE 009787239-03     $P = 8.752047$  Days     $T_0 = 135.632061$  (BKJD)



# DV Model-Shift Uniqueness Test

009787239-03, P = 8.752109 Days, E = 126.875208 Days

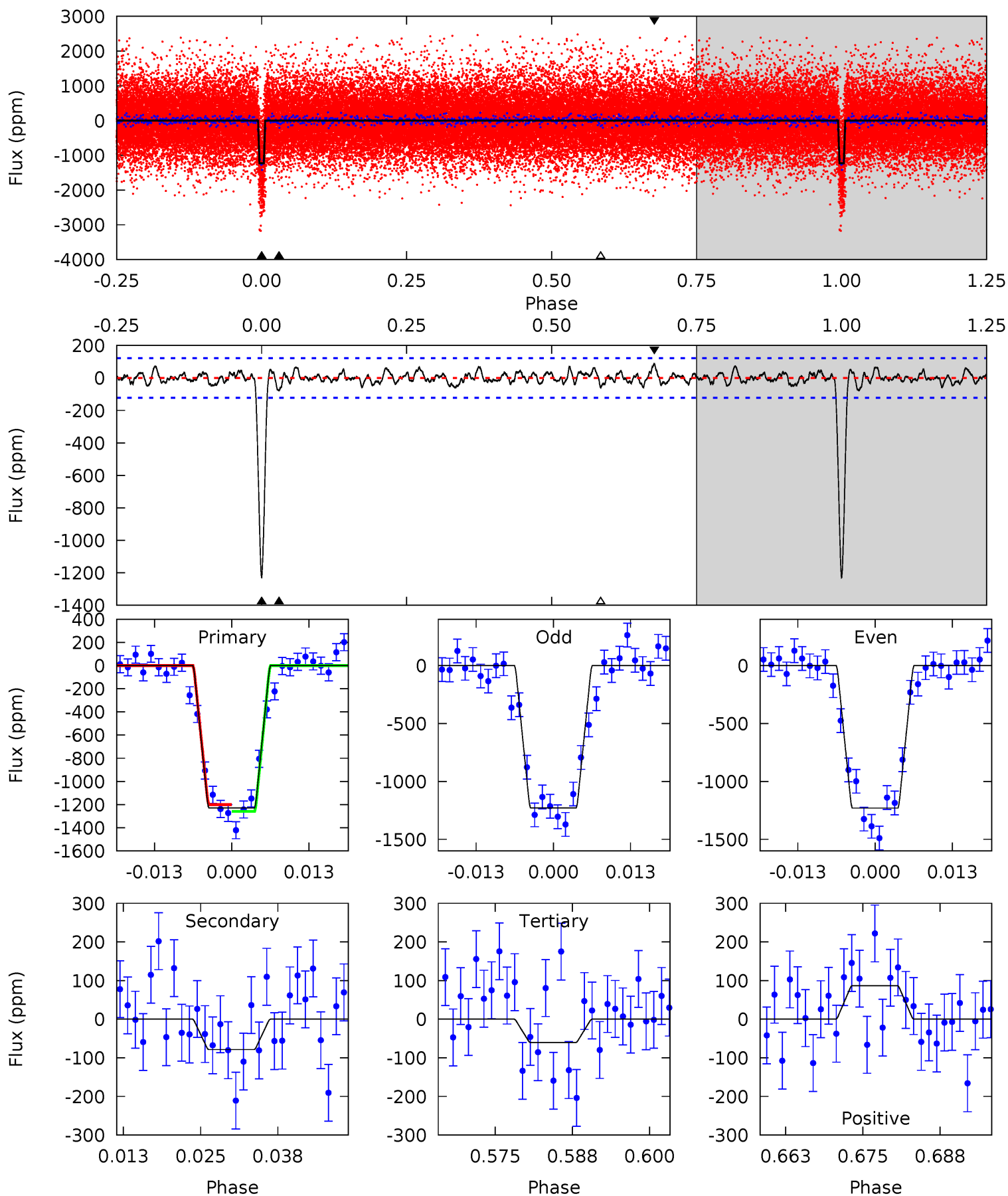
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.5	3.77	3.49	4.05	4.92	2.39	1.51	56.0	55.5	0.28	-0.29	1.17	1.04	0.08	0.67



# Alt Model-Shift Uniqueness Test

009787239-03, P = 8.752047 Days, E = 126.880014 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
50.1	3.20	2.46	3.53	4.98	2.50	1.10	47.6	46.6	0.74	-0.32	0.03	1.02	0.07	1.20



### Stellar Parameters For KIC 009787239

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3731^{+73}_{-83}$	$4.750^{+0.052}_{-0.028}$	$-0.020^{+0.150}_{-0.150}$	$0.498^{+0.034}_{-0.051}$	$0.509^{+0.036}_{-0.045}$	$5.789^{+1.437}_{-0.703}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-10%	+7%/-9%	+25%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 009787239-03 / KOI 0952.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-83 \pm 22$	$2.35^{+0.15}_{-0.16}$	$626^{+17}_{-17}$	$2402^{+89}_{-91}$	$37^{+11}_{-10}$
Alt.	$-79 \pm 25$	$1.94^{+0.14}_{-0.14}$	$627^{+17}_{-17}$	$2506^{+102}_{-119}$	$52^{+18}_{-16}$

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

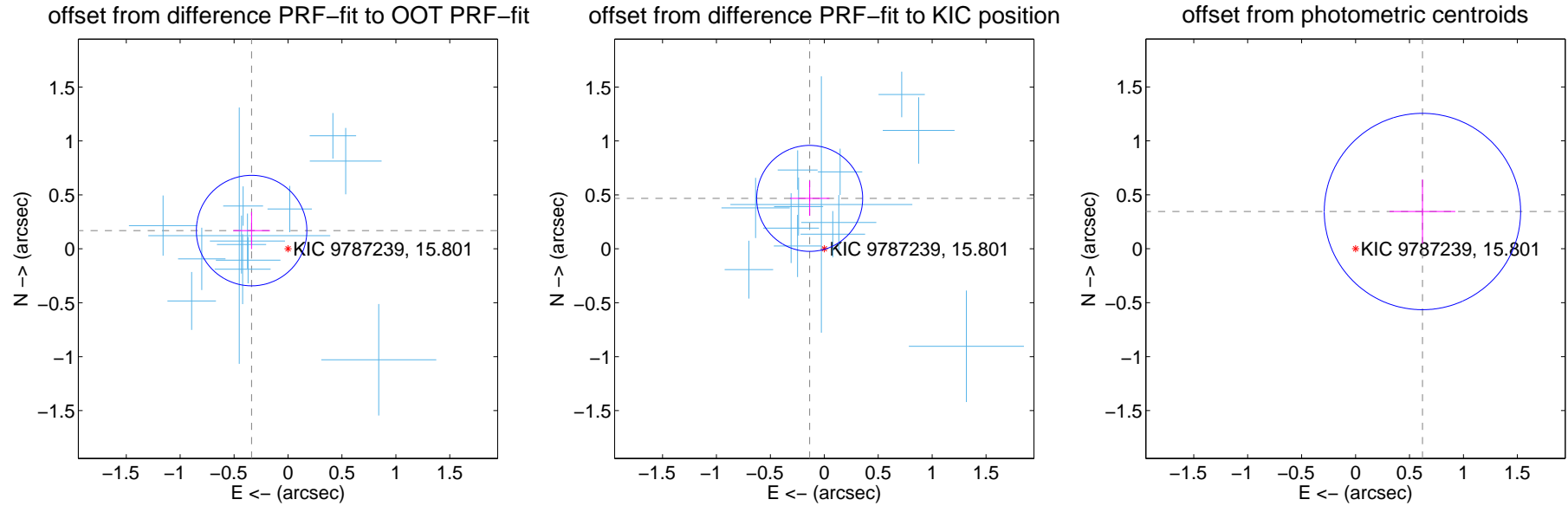
## DV Centroid Data

Supplemental centroid analysis for 009787239-03. Kepler magnitude: 15.80. Transit SNR 34.72

There are 13 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.378 \pm 0.171$	2.21	$0.338 \pm 0.171$	$0.169 \pm 0.172$
PRF-fit source offset from KIC position	$0.487 \pm 0.164$	2.97	$0.136 \pm 0.182$	$0.468 \pm 0.162$
photometric centroid source offset	$0.71 \pm 0.30$	2.34	$-0.62 \pm 0.31$	$0.35 \pm 0.30$

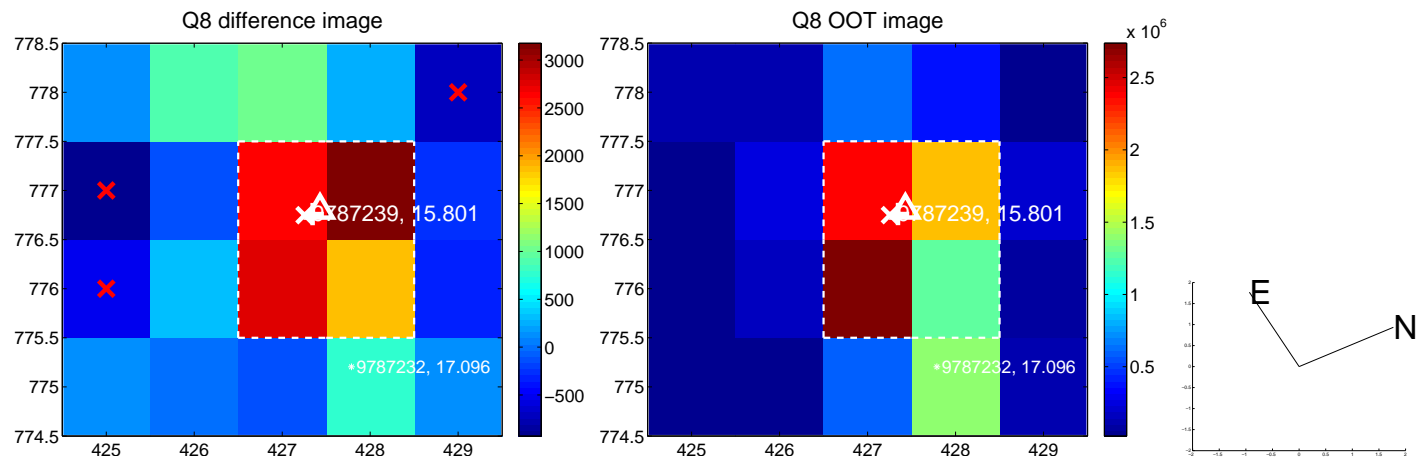
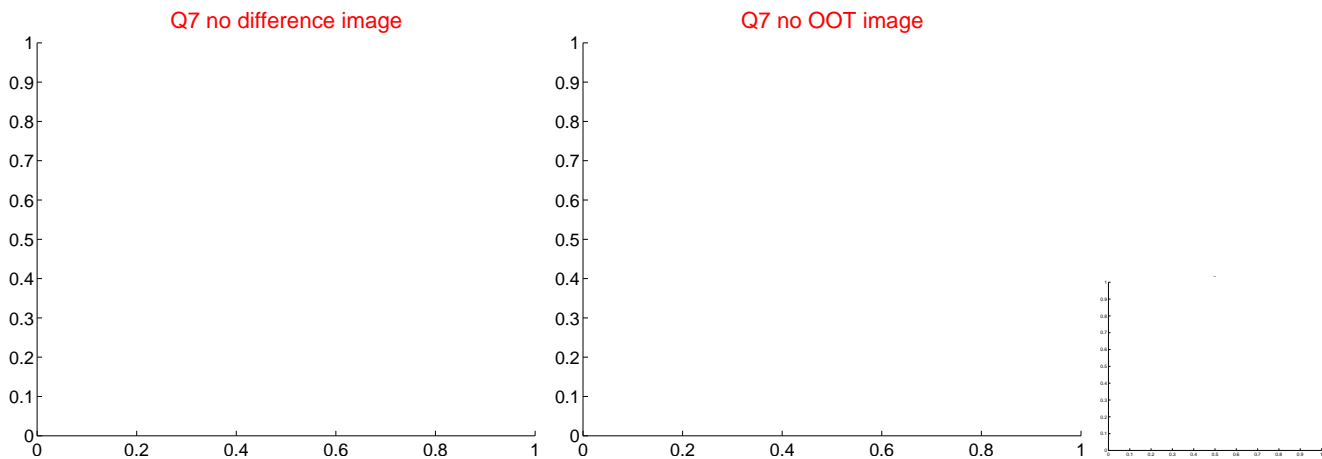
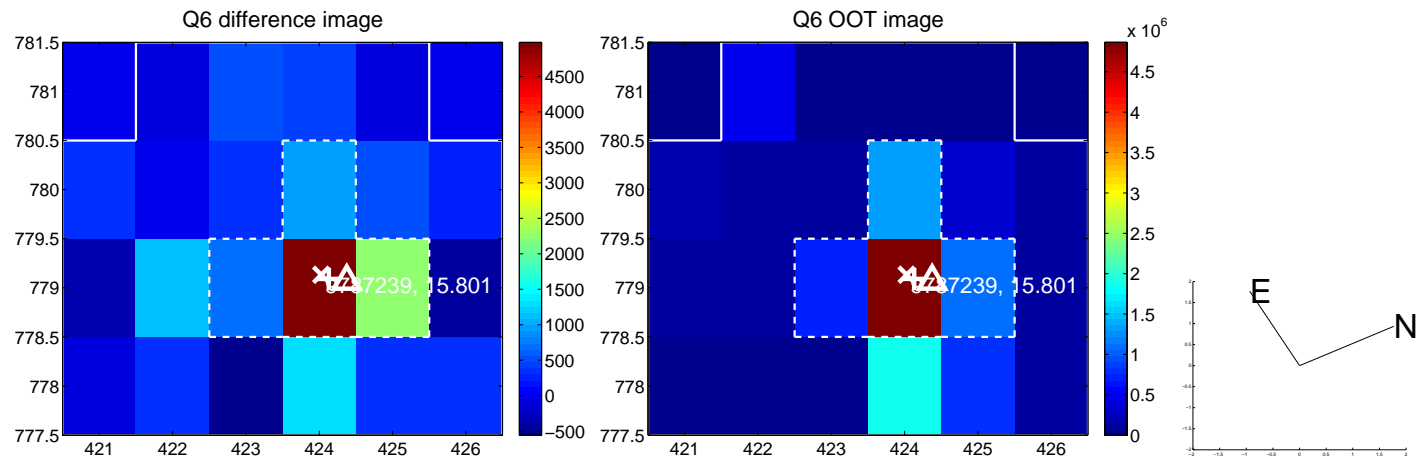
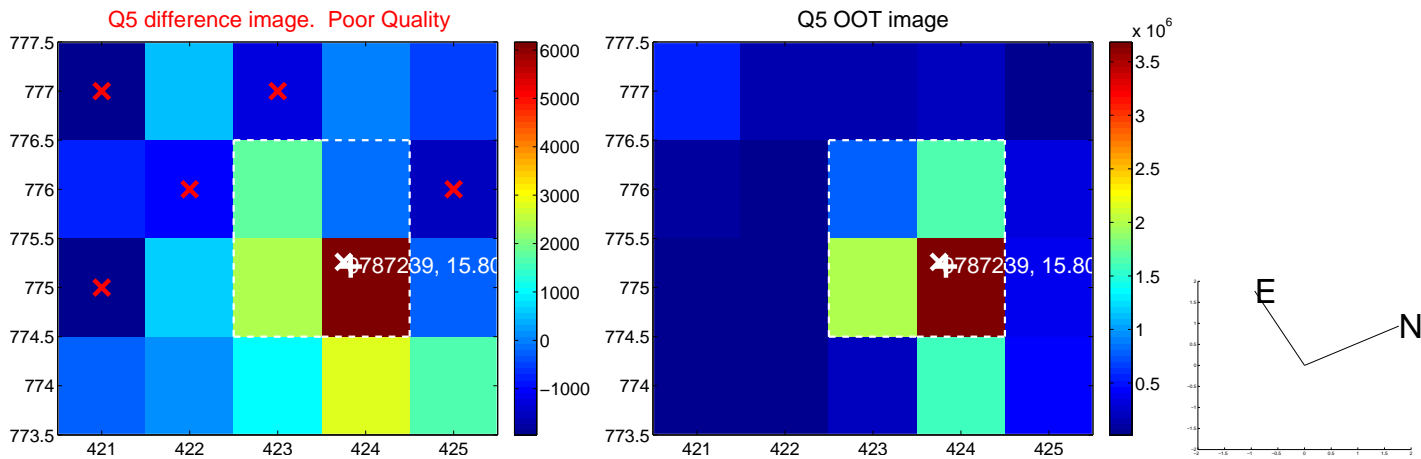


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

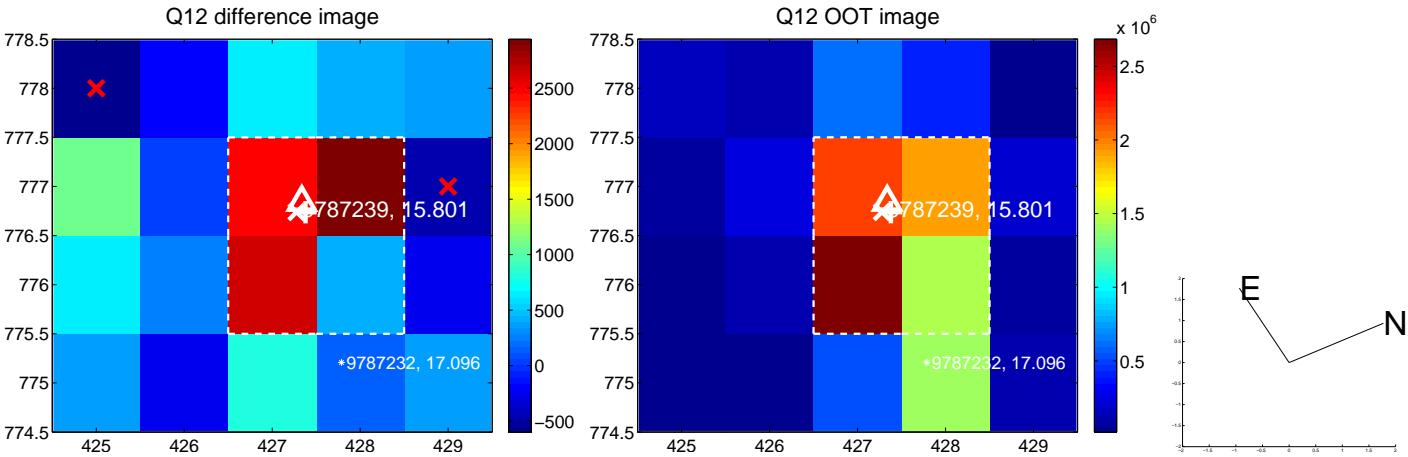
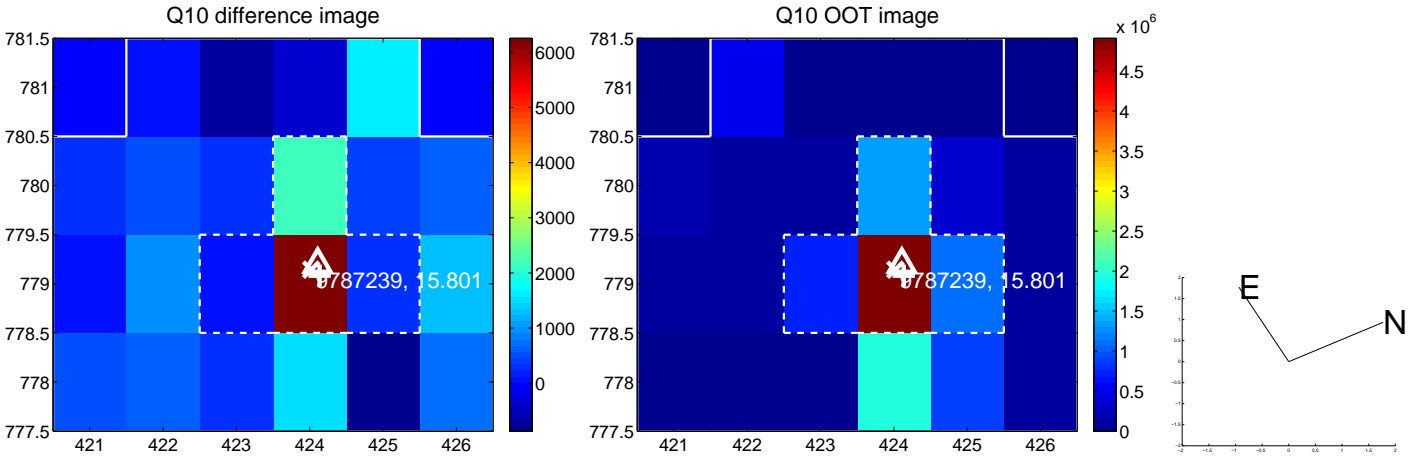
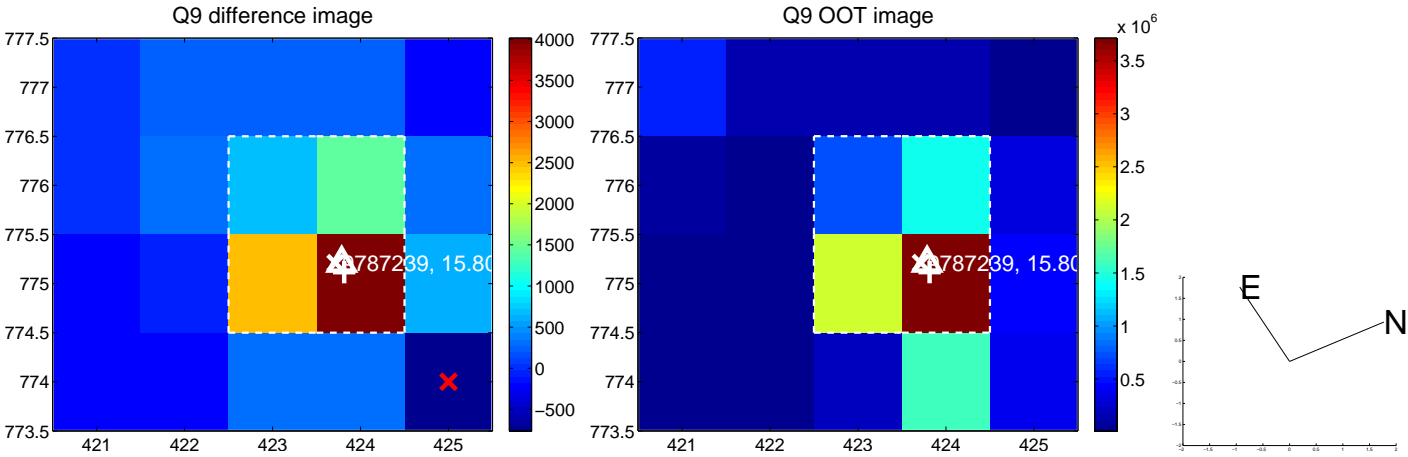




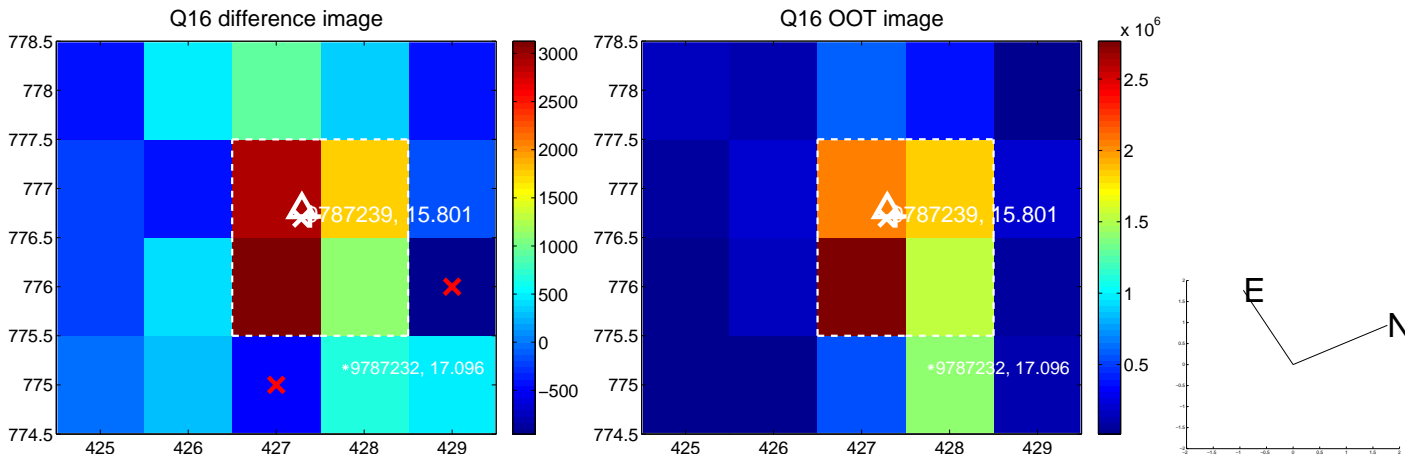
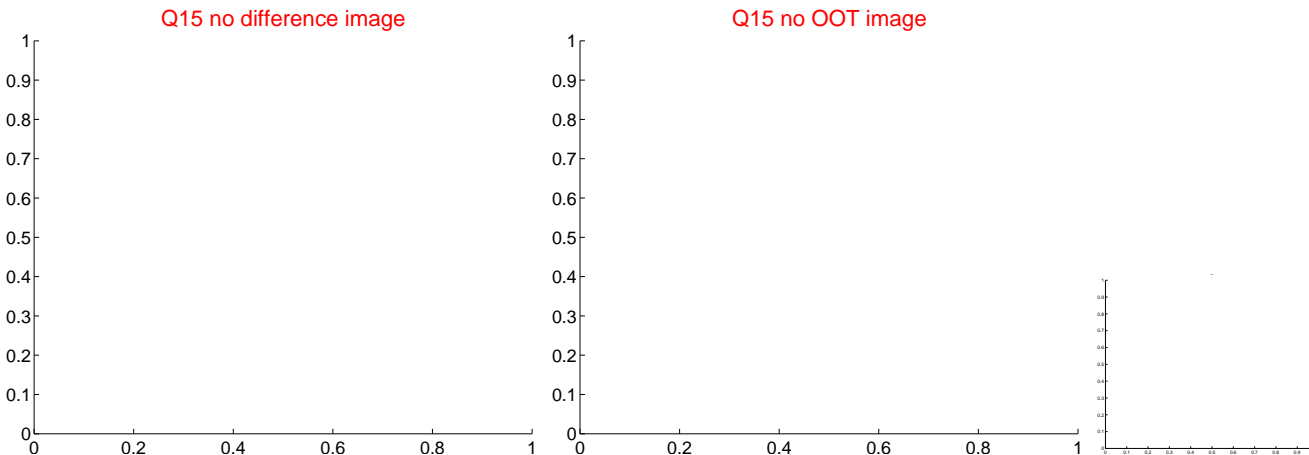
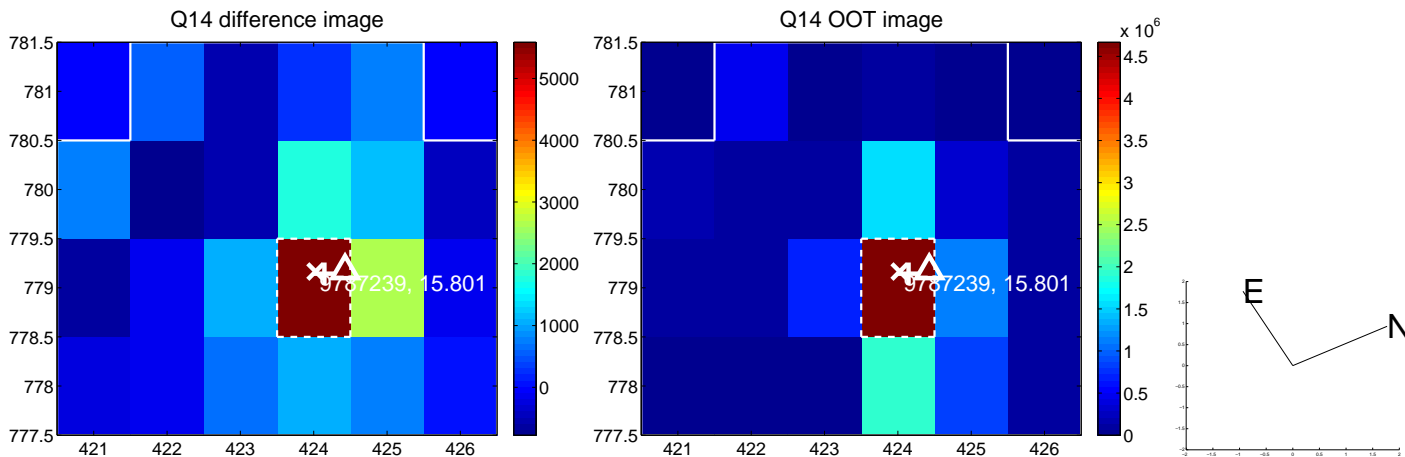
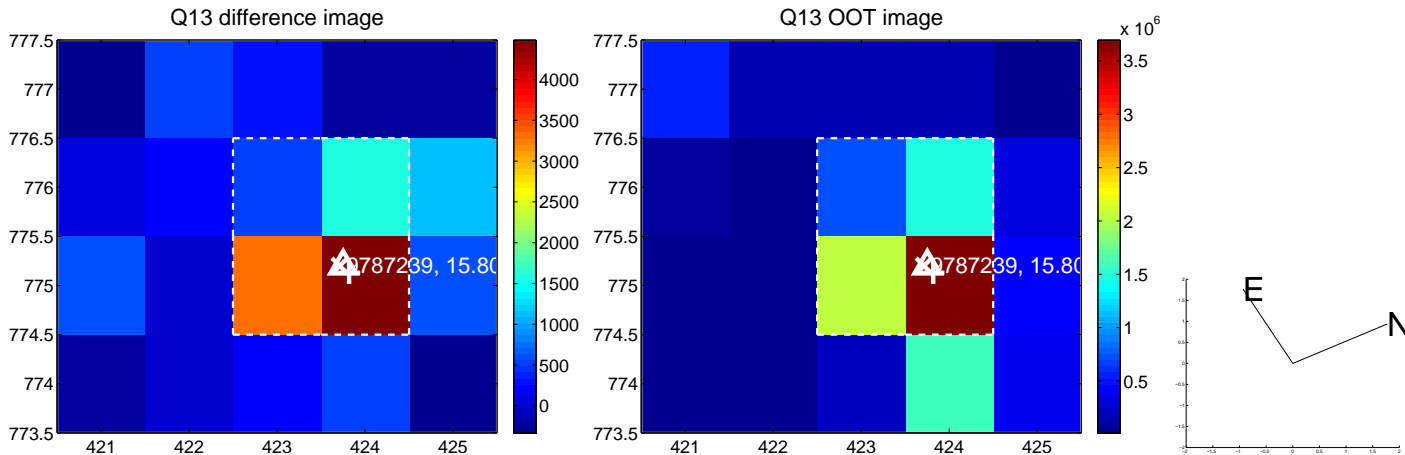
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



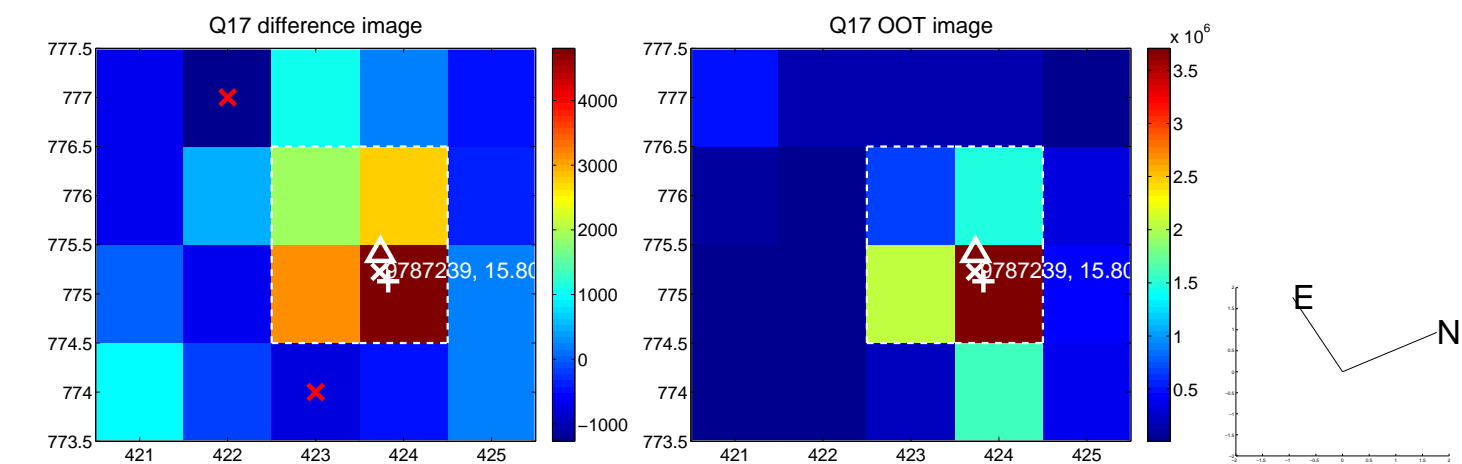
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



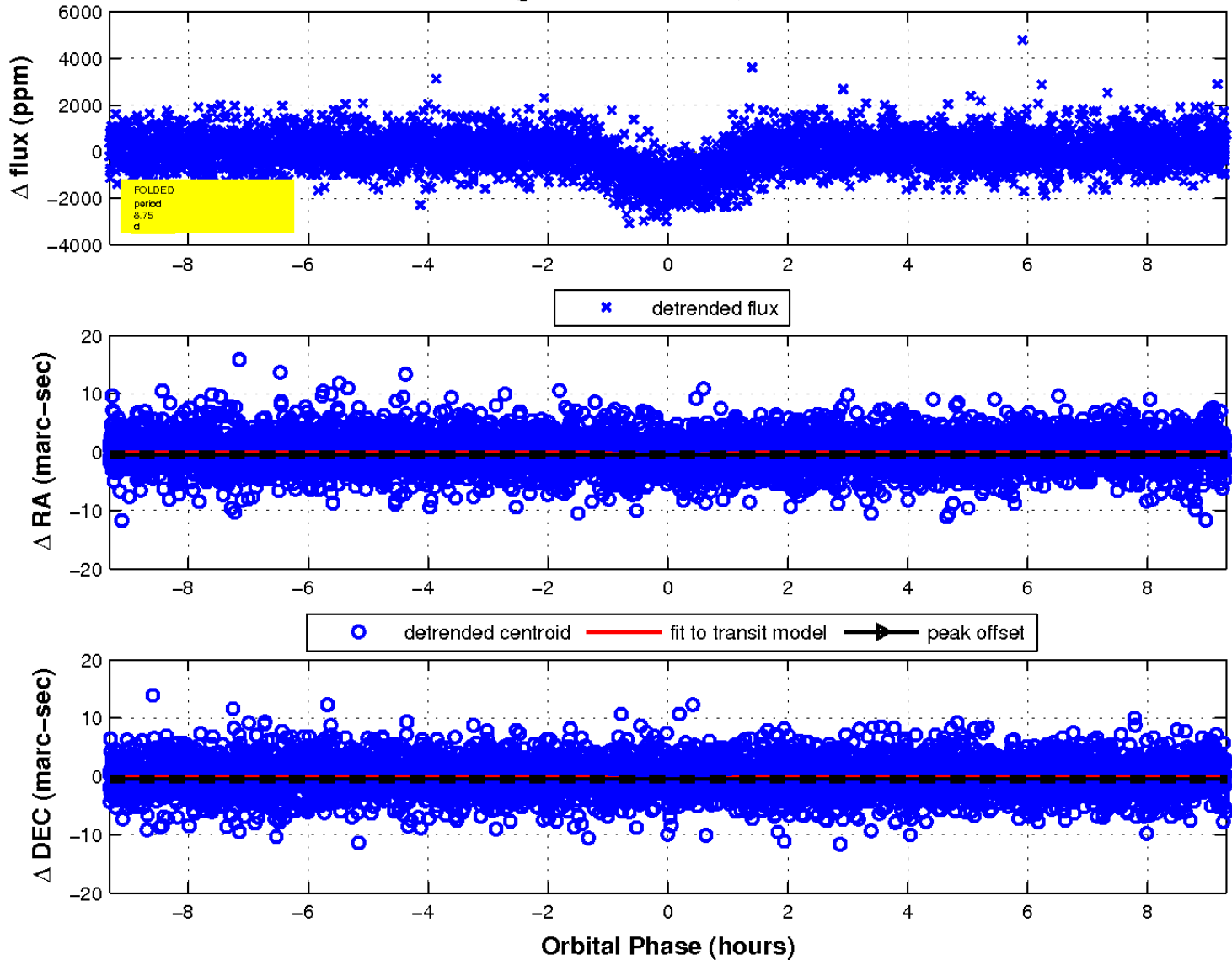
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

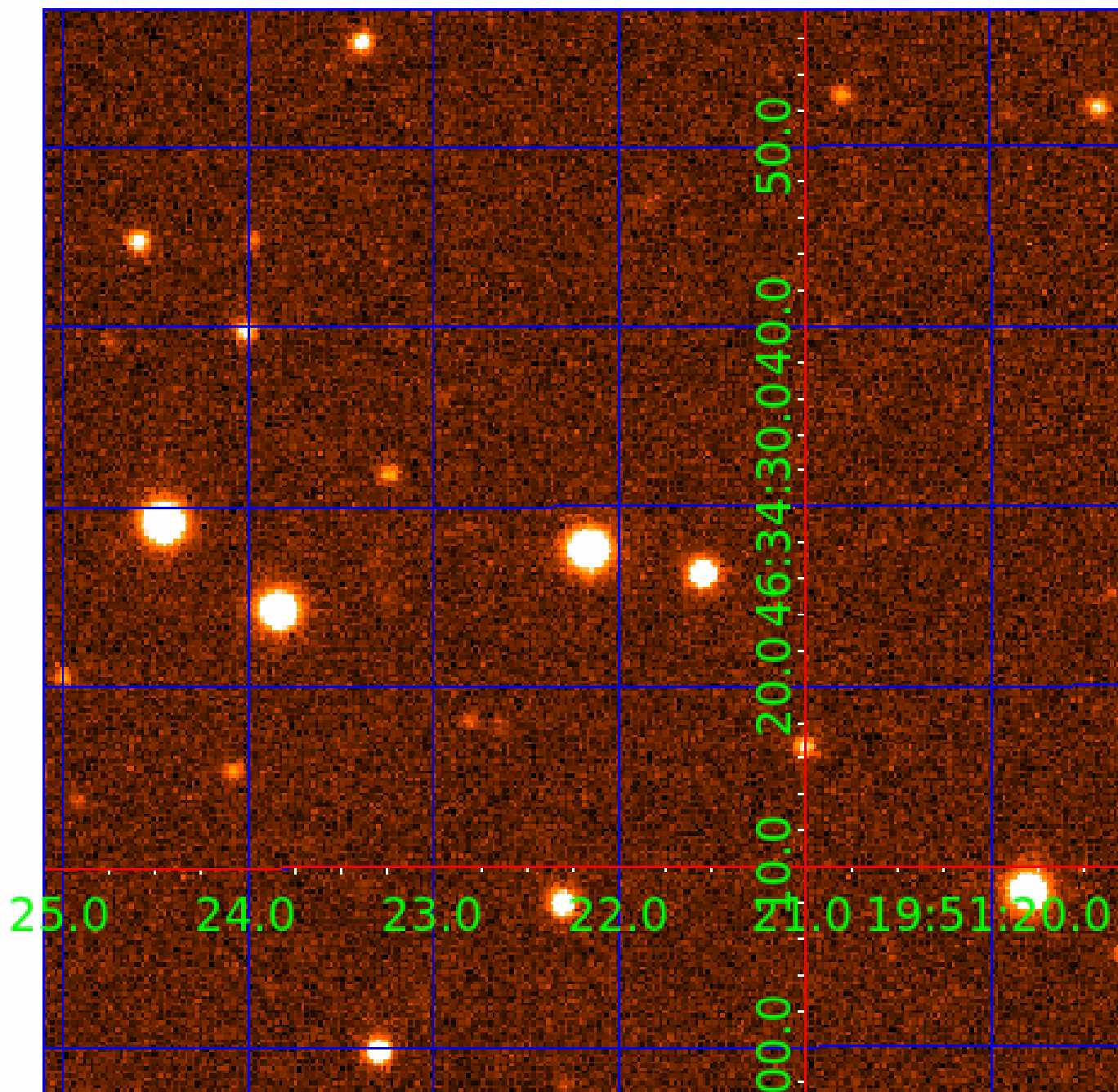


fluxWeightedCentroids, Planet 3 of 5



UKIRT Image

Declination



# KIC 009787239

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009787239-01	OBS	0952.01	5.901287	135.998633	1565.0	2.392	44.2	49.6	0.50	3731	2.23	16.54
009787239-02	OBS	0952.03	22.780805	132.421087	1983.5	3.312	31.4	38.0	0.50	3731	2.26	2.73
009787239-03	OBS	0952.02	8.752109	135.627317	1319.9	3.106	31.8	34.7	0.50	3731	2.36	9.78
009787239-04	OBS	0952.04	2.896009	133.613421	411.3	1.868	15.3	17.4	0.50	3731	1.21	42.72
009787239-05	OBS	0952.05	0.742957	131.791013	205.0	1.299	11.1	13.7	0.50	3731	0.86	262.06

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009787239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009787239-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-04	OBS	PC	0.97	0	0	0	0	CENT_KIC_POS
009787239-05	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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

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

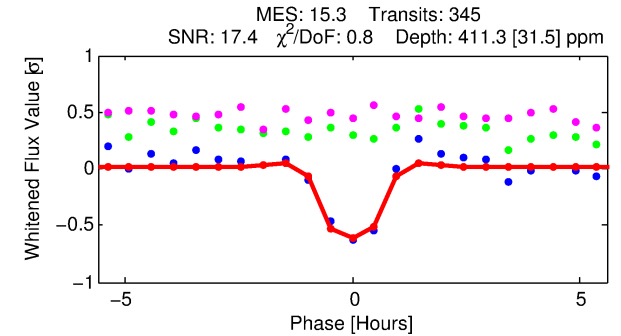
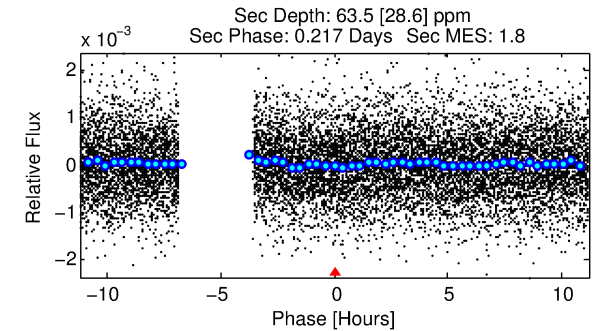
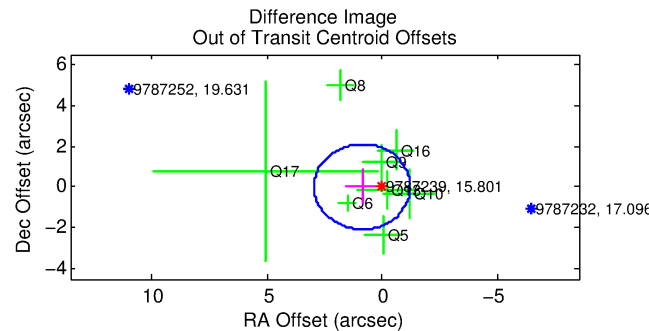
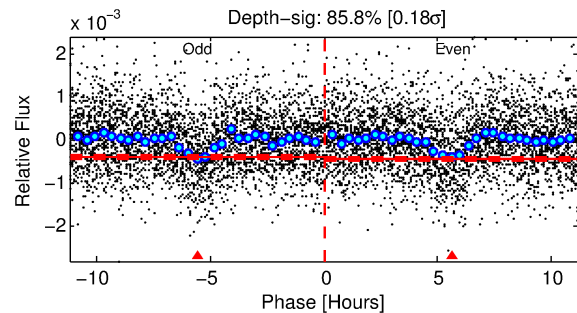
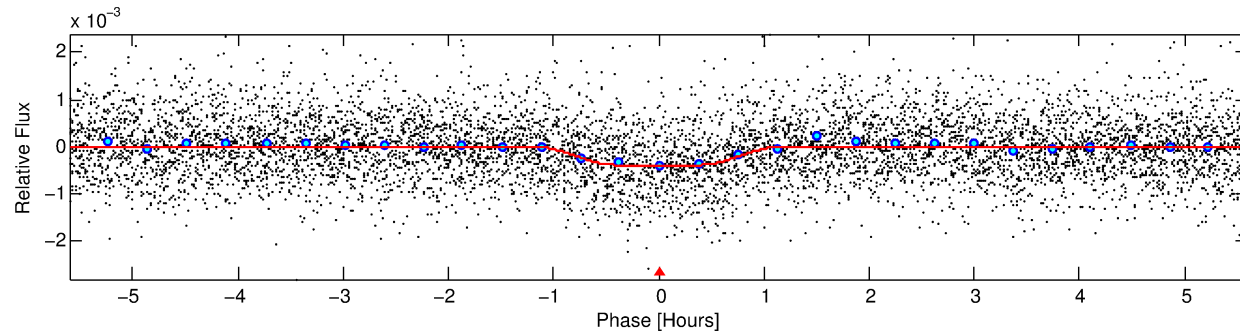
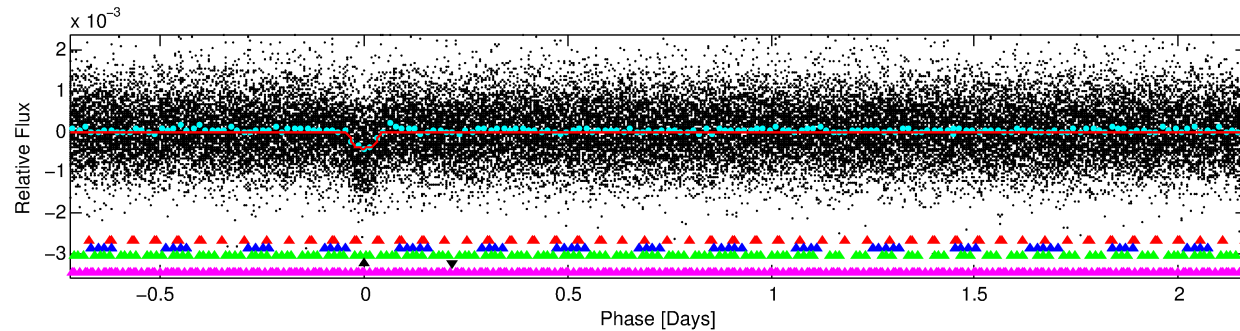
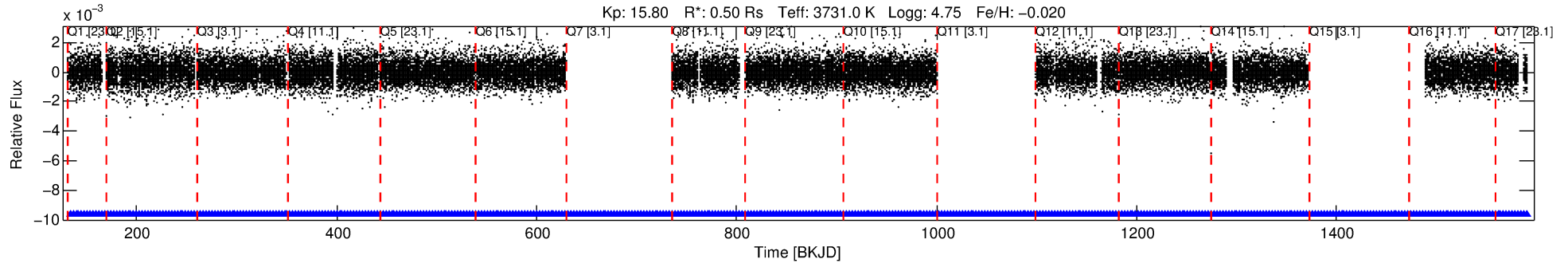
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009787239-04

No Significant Match Found

# DV One-Page Summary

KIC: 9787239 Candidate: 4 of 5 Period: 2.896 d  
KOI: K00952.04 Name: Kepler-32e Corr: 0.961



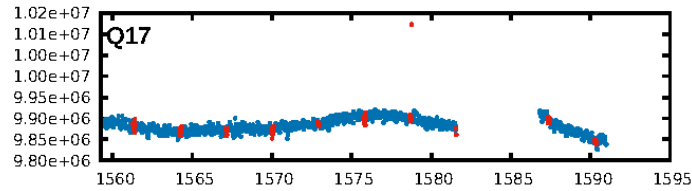
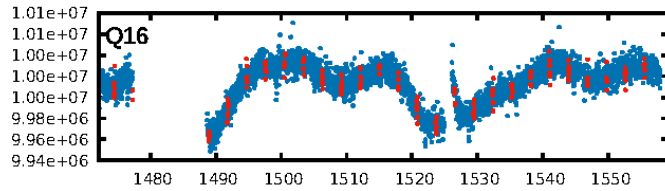
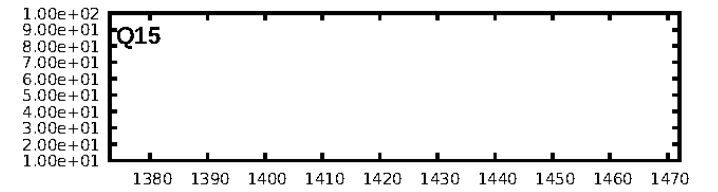
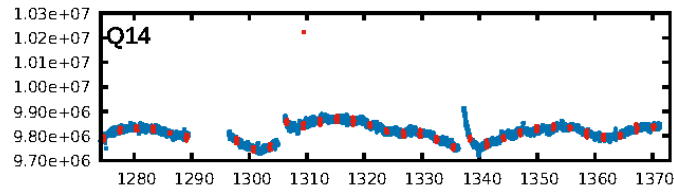
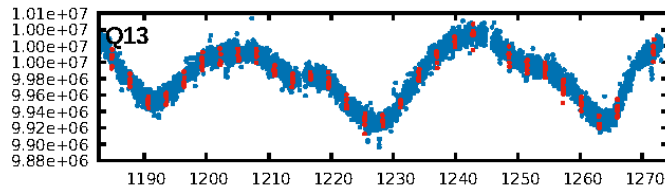
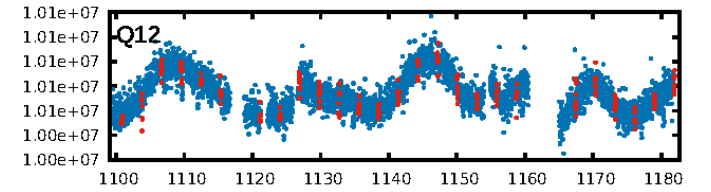
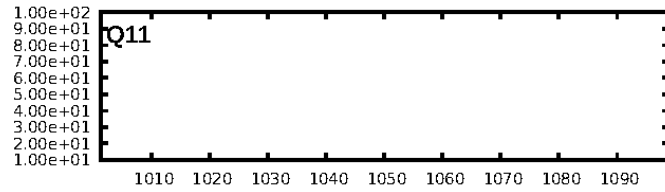
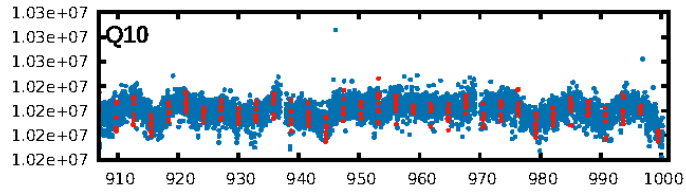
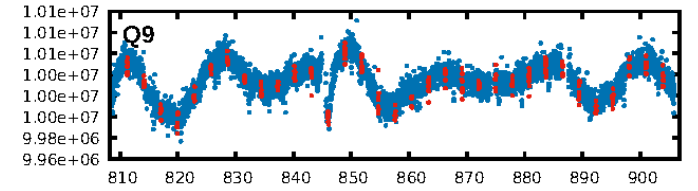
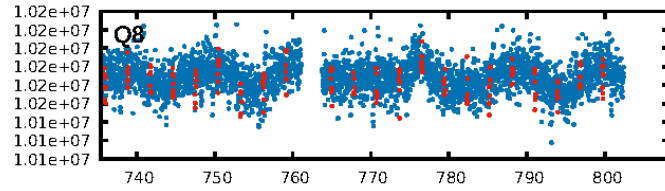
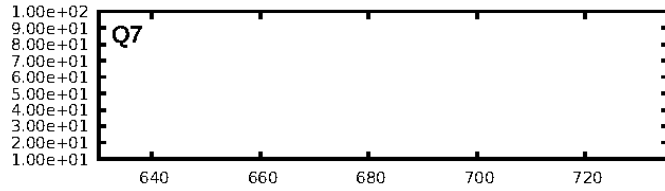
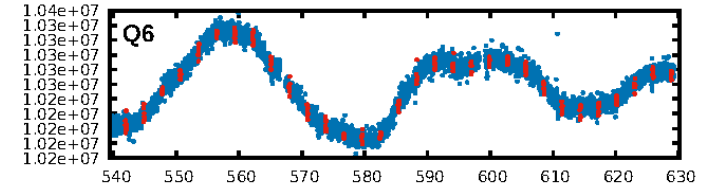
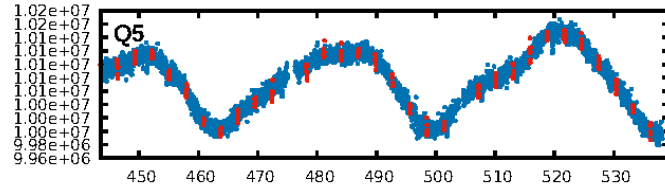
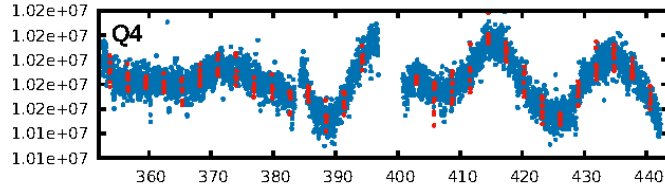
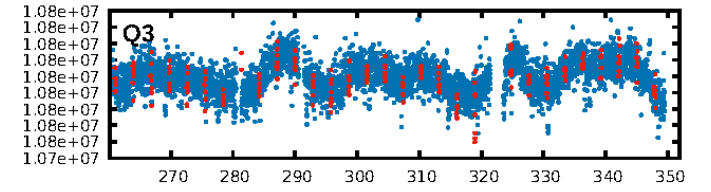
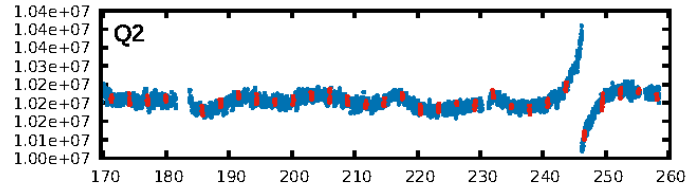
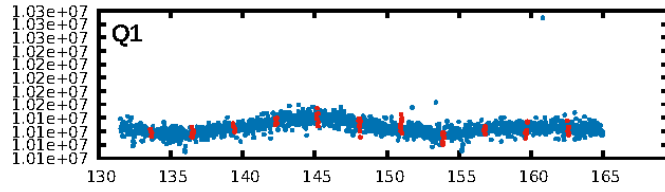
## DV Fit Results:

Period = 2.89601 [0.00001] d  
Epoch = 133.6134 [0.0018] BKJD  
Rp/R\* = 0.0222 [0.0071]  
a/R\* = 5.77 [7.80]  
b = 0.90 [0.29]  
Seff = 42.72 [5.88]  
Teff = 652 [22] K  
Rp = 1.21 [0.41] Re  
a = 0.0317 [0.0025] AU  
Ag = 24.10 [19.07] [1.21 $\sigma$ ]  
Teffp = 2233 [441] K [3.58 $\sigma$ ]

## DV Diagnostic Results:

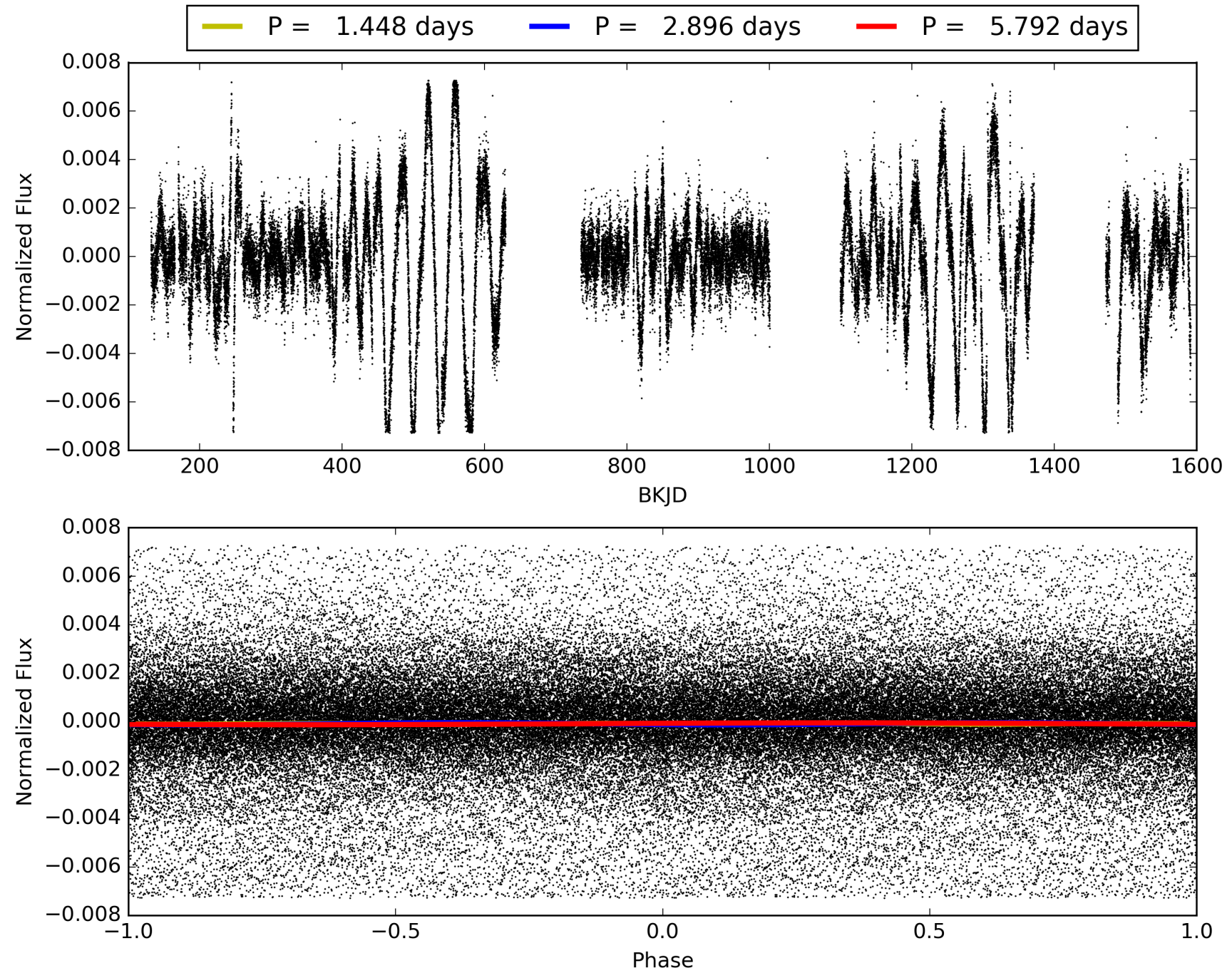
ShortPeriod-sig: 100.0% [22.71 $\sigma$ ]  
LongPeriod-sig: 100.0% [23.77 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.70e-51  
RollingBand-fgt: 1.00 [328/328]  
GhostDiagnostic-chr: 7.413  
Centroid-sig: 93.9%  
Centroid-so: 1.113 arcsec [1.78 $\sigma$ ]  
OotOffset-rm: 0.882 arcsec [1.27 $\sigma$ ]  
OotOffset-st: 2/0/2/4 [8]  
KicOffset-rm: 0.536 arcsec [0.79 $\sigma$ ]  
KicOffset-st: 2/0/2/4 [8]  
DiffImageQuality-fgm: 0.88 [7/8]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 009787239-04, PDC Light Curves



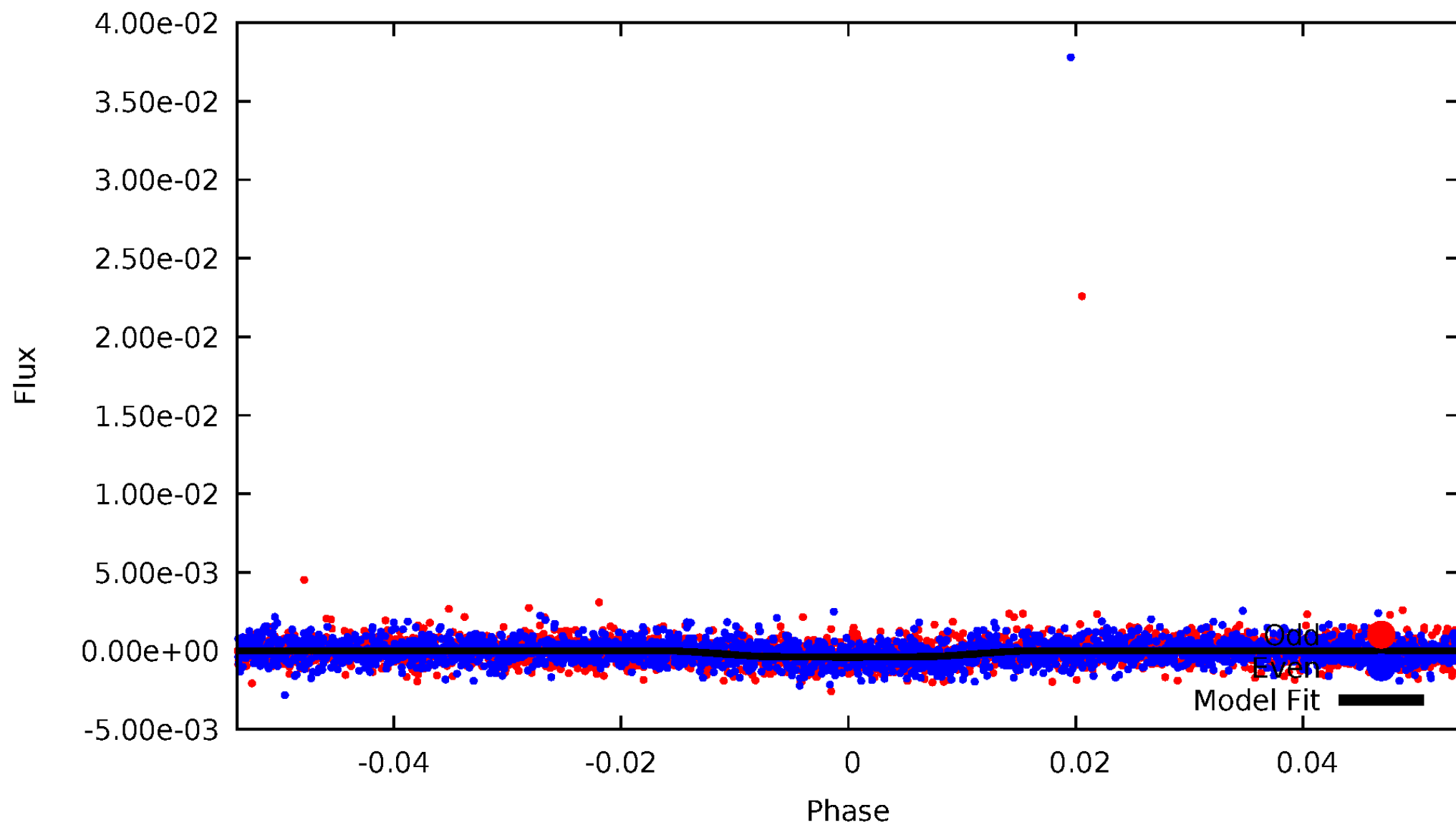


TCE 009787239-04



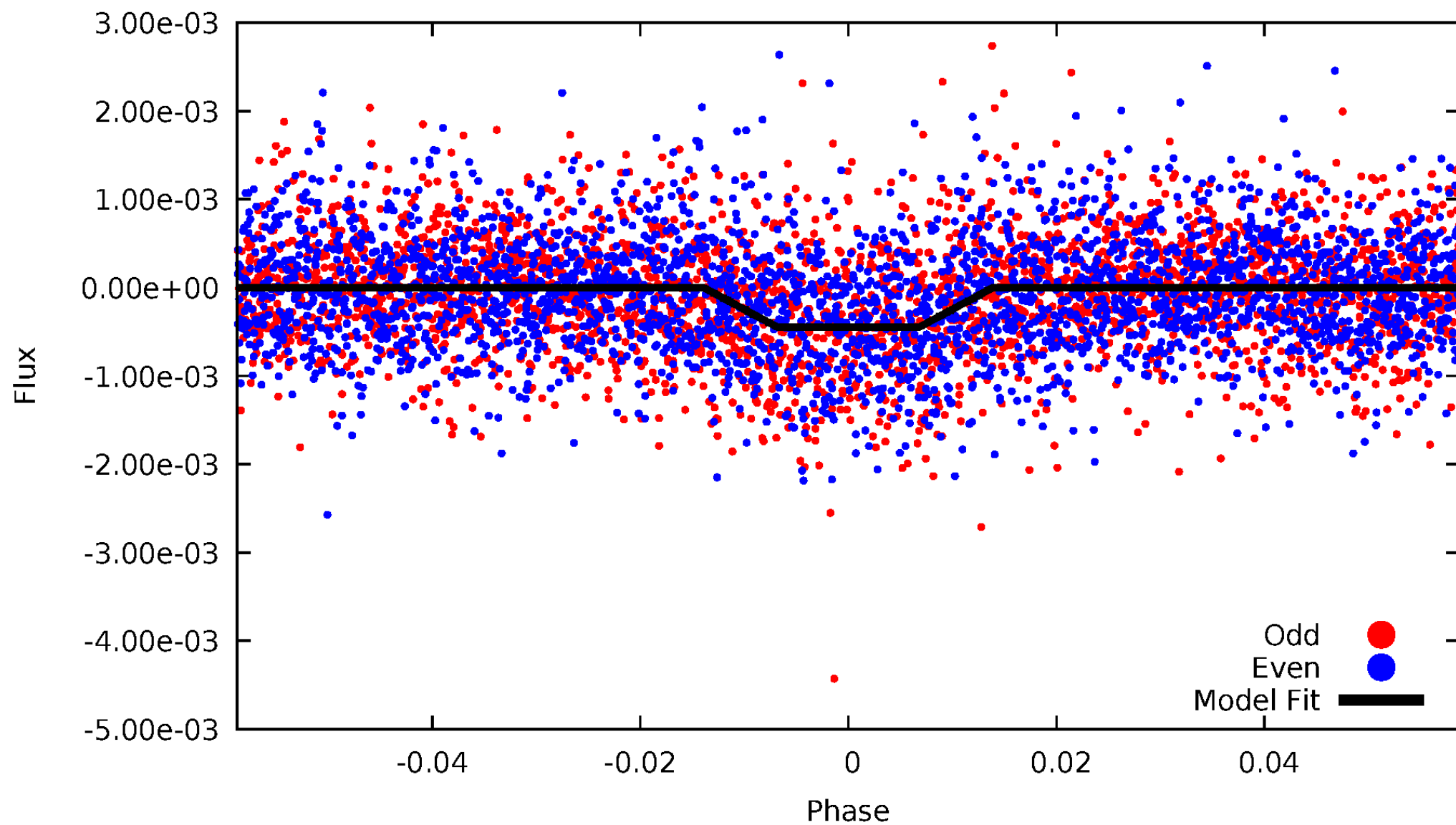
# DV Odd/Even

TCE 009787239-04



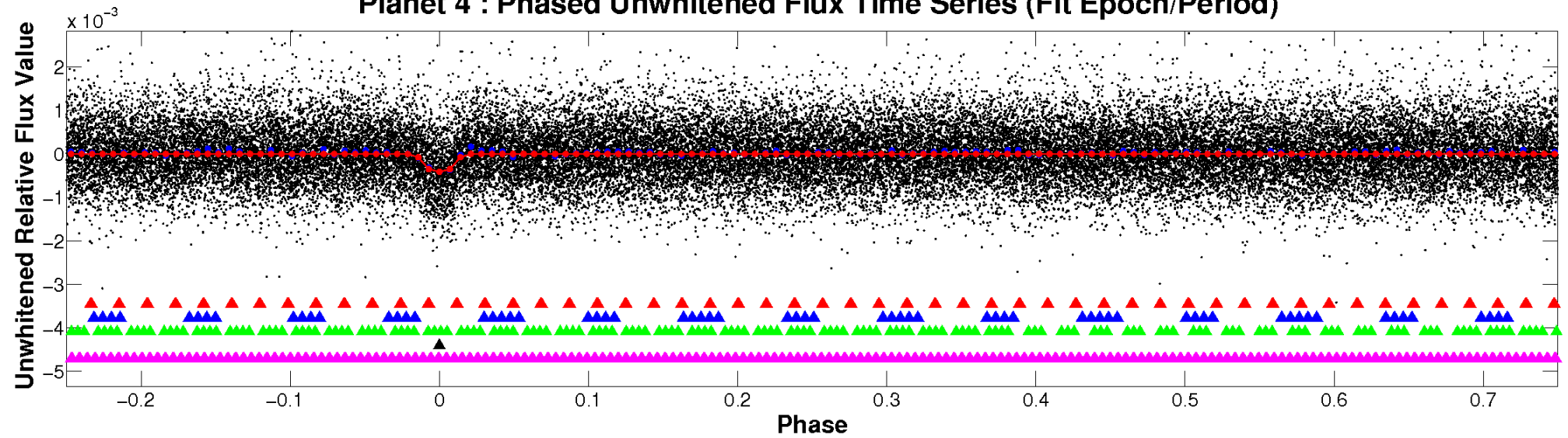
# ALT Odd/Even

TCE 009787239-04

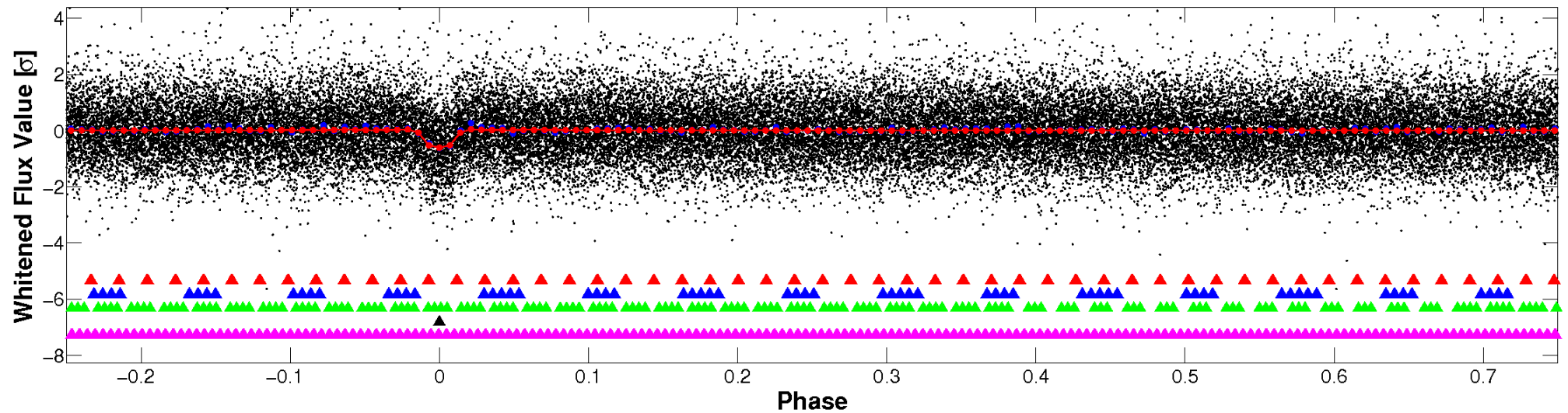


# Non-Whitened Vs. Whitened Light Curve

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

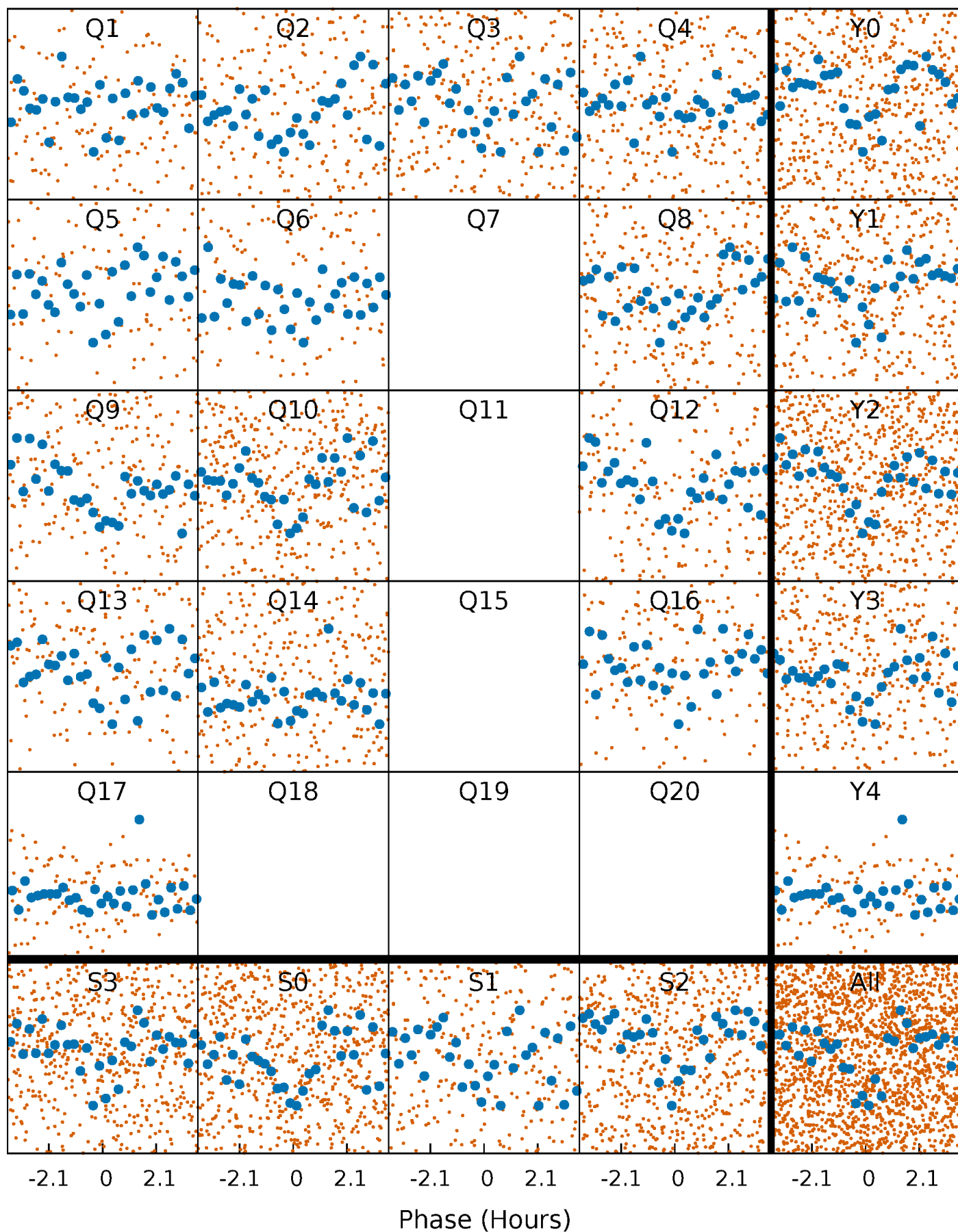


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

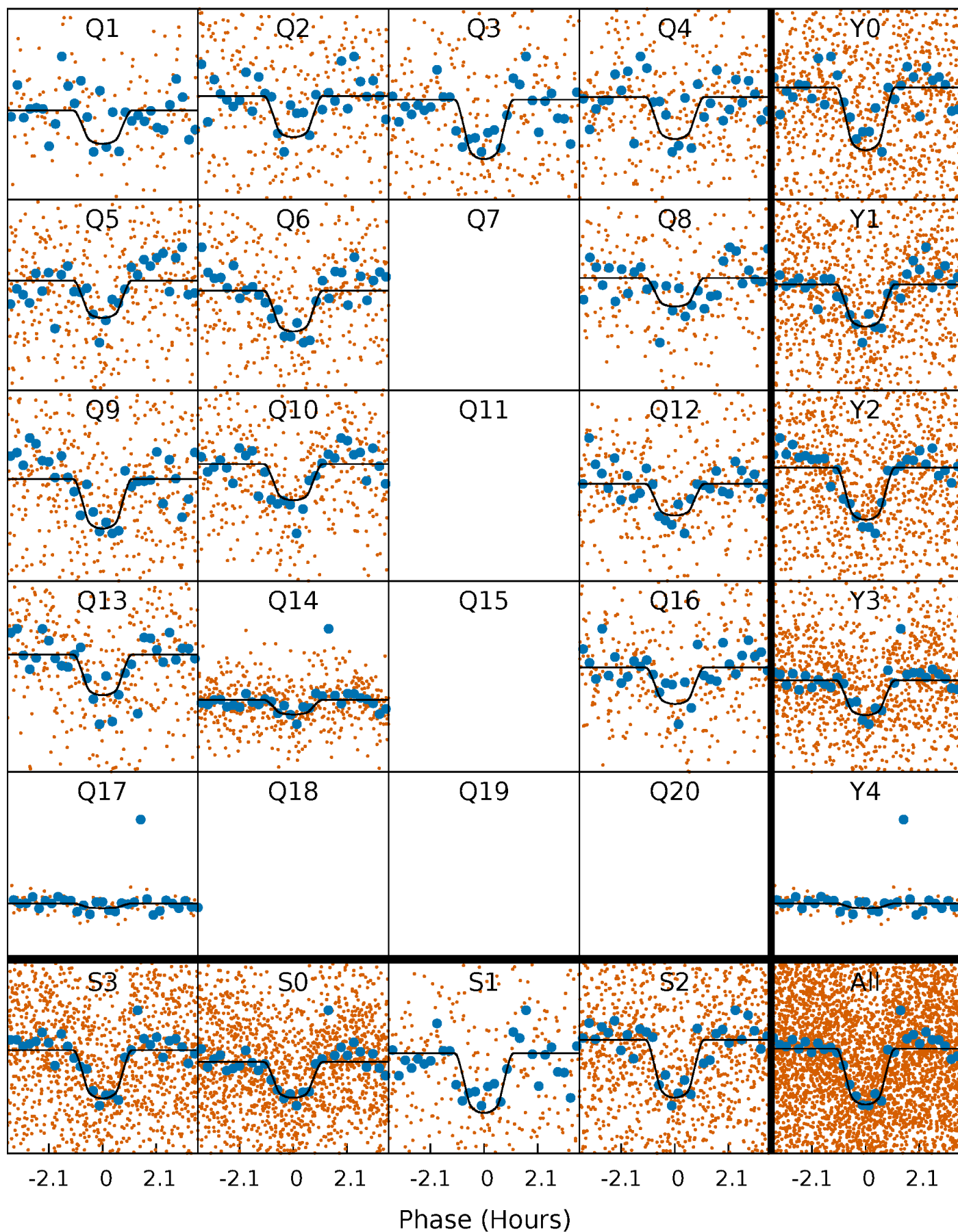
TCE 009787239-04 P= 2.896009 Days  $T_0=133.613421$  (BKJD)





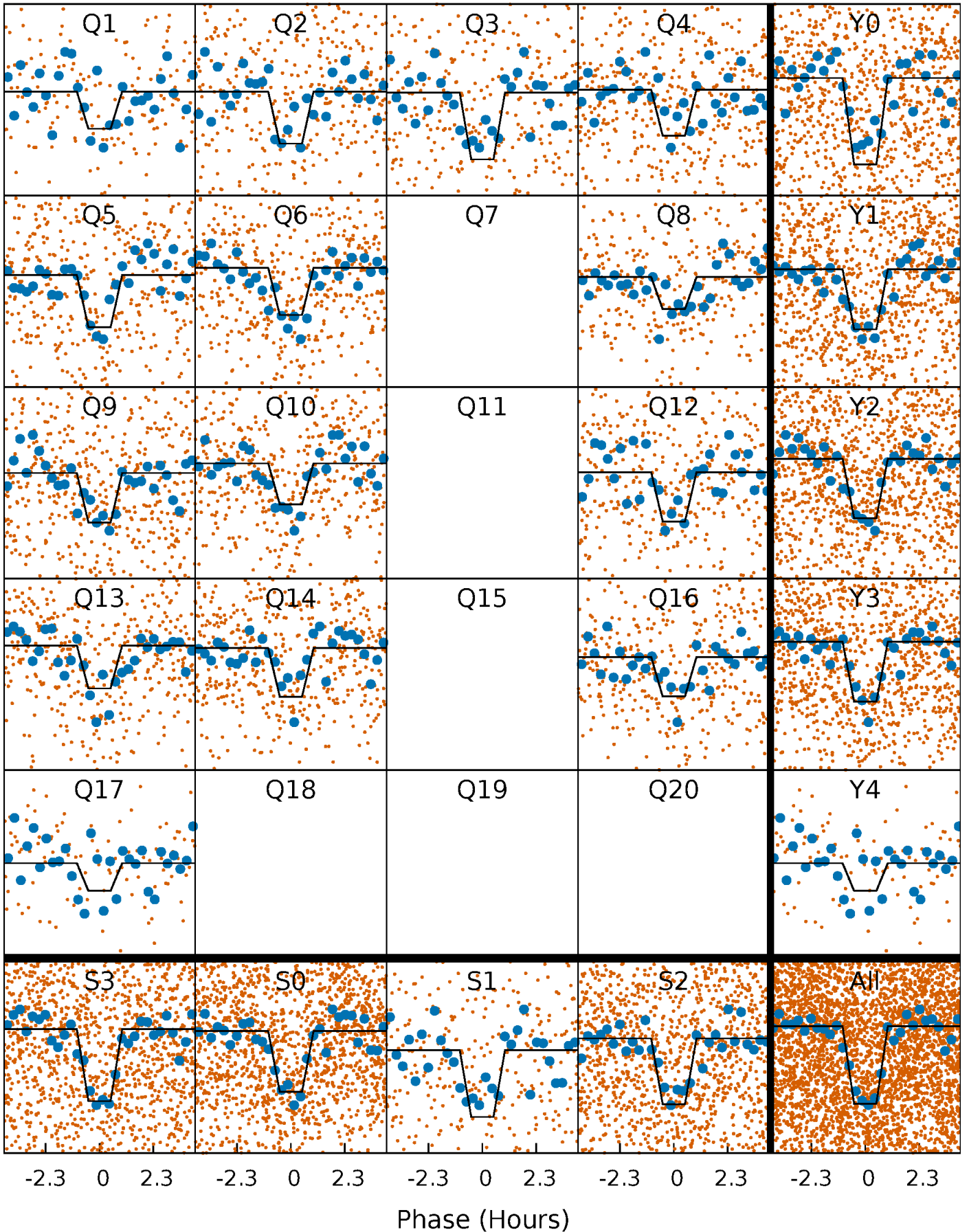
# DV Quarter-Phased Transit Curves

TCE 009787239-04 P= 2.896009 Days  $T_0=133.613421$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

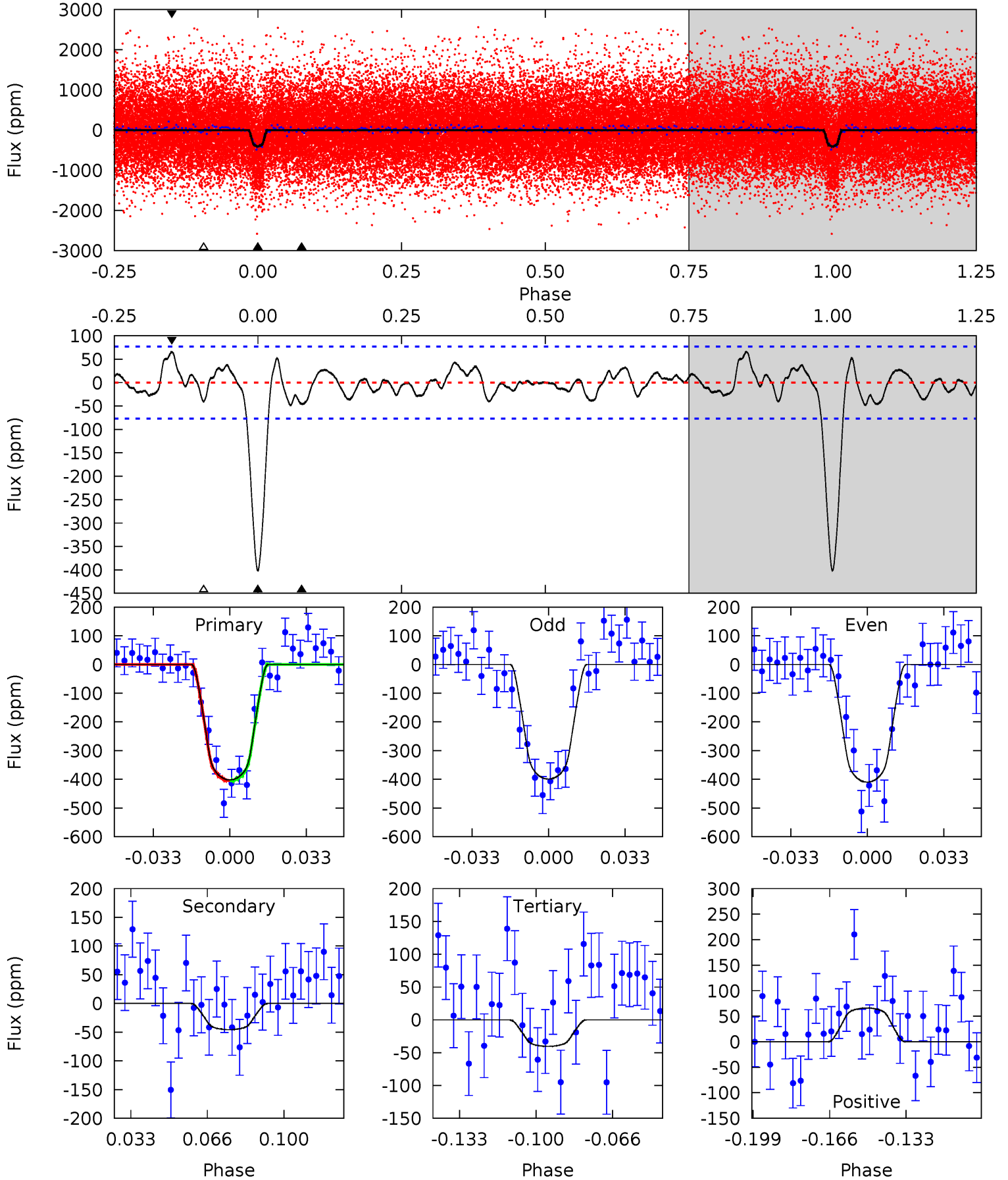
TCE 009787239-04     $P = 2.896004$  Days     $T_0 = 133.615012$  (BKJD)



# DV Model-Shift Uniqueness Test

009787239-04, P = 2.896009 Days, E = 130.717412 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
25.0	2.85	2.52	4.11	4.79	2.13	1.29	22.5	20.9	0.33	-1.26	0.33	0.95	0.14	0.04

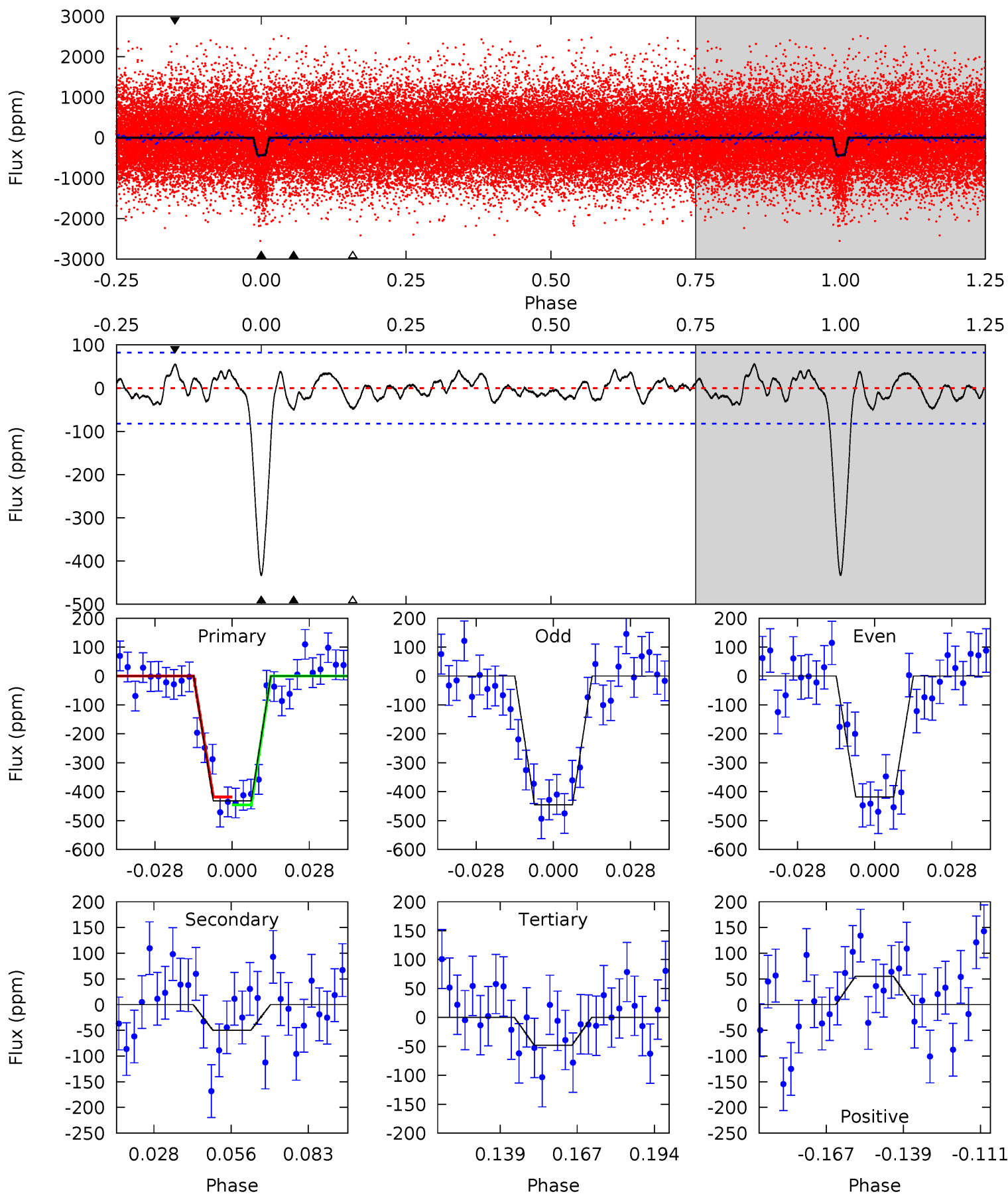




# Alt Model-Shift Uniqueness Test

009787239-04, P = 2.896004 Days, E = 130.719008 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
25.4	2.94	2.81	3.25	4.83	2.20	1.21	22.6	22.2	0.13	-0.31	0.78	0.96	0.11	0.81



### Stellar Parameters For KIC 009787239

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3731^{+73}_{-83}$	$4.750^{+0.052}_{-0.028}$	$-0.020^{+0.150}_{-0.150}$	$0.498^{+0.034}_{-0.051}$	$0.509^{+0.036}_{-0.045}$	$5.789^{+1.437}_{-0.703}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-10%	+7%/-9%	+25%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 009787239-04 / KOI 0952.04

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-46 \pm 16$	$1.19^{+0.39}_{-0.42}$	$906^{+23}_{-26}$	$2620^{+361}_{-213}$	$17^{+27}_{-8}$
Alt.	$-50 \pm 17$	$1.14^{+0.38}_{-0.40}$	$906^{+23}_{-25}$	$2703^{+352}_{-242}$	$22^{+31}_{-11}$

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

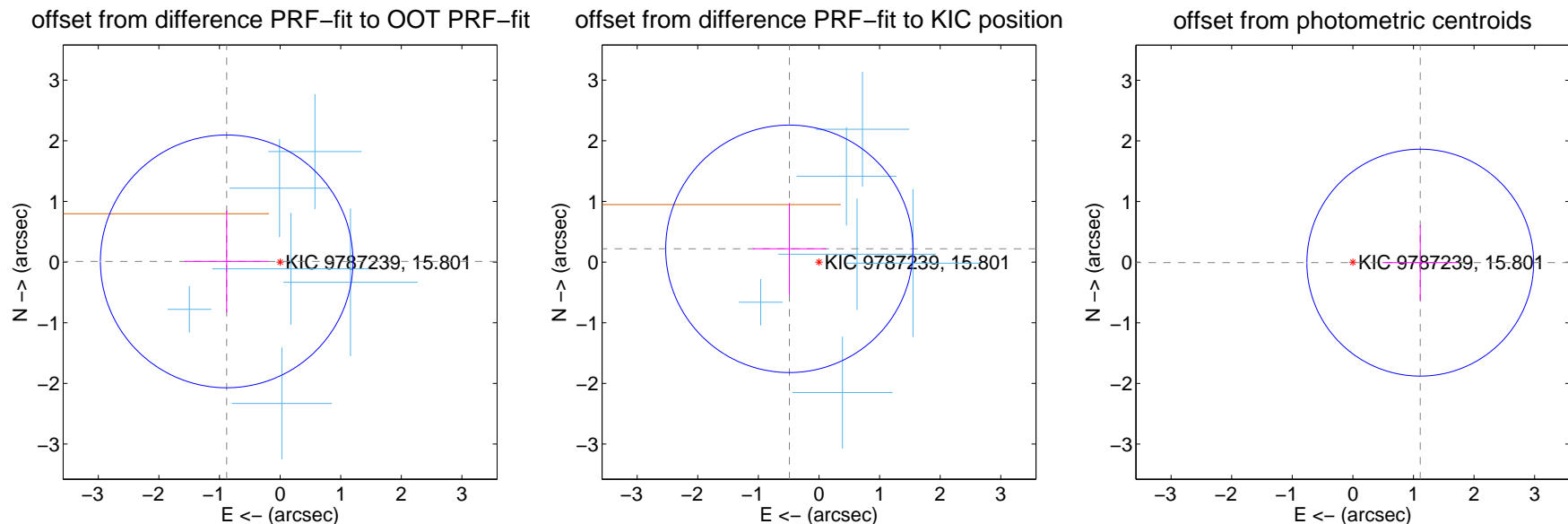
## DV Centroid Data

Supplemental centroid analysis for 009787239-04. Kepler magnitude: 15.80. Transit SNR 17.40

There are 7 quarters with good PRF difference image offsets

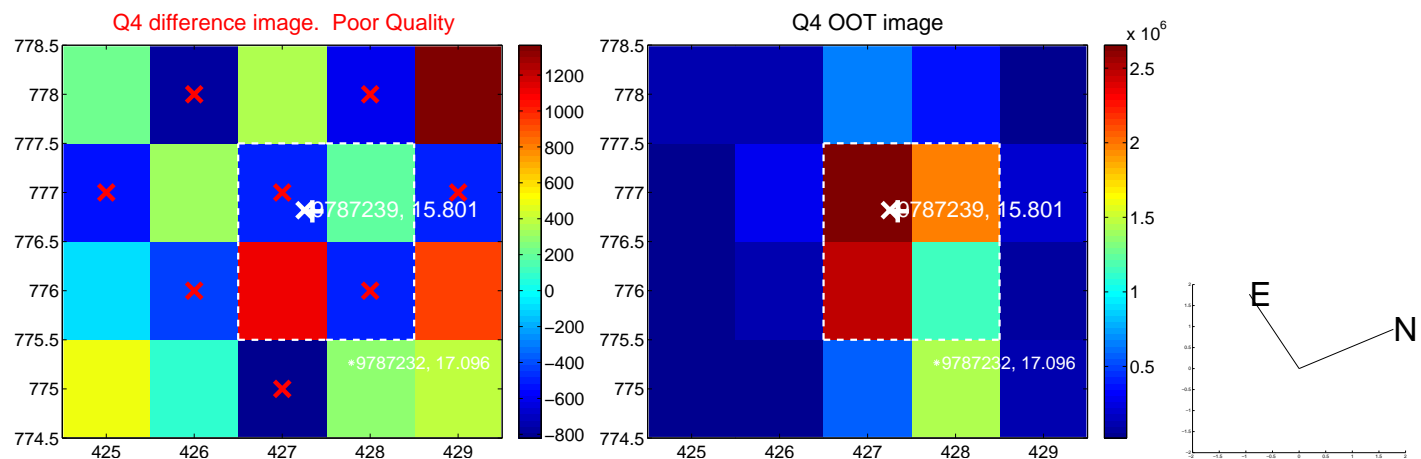
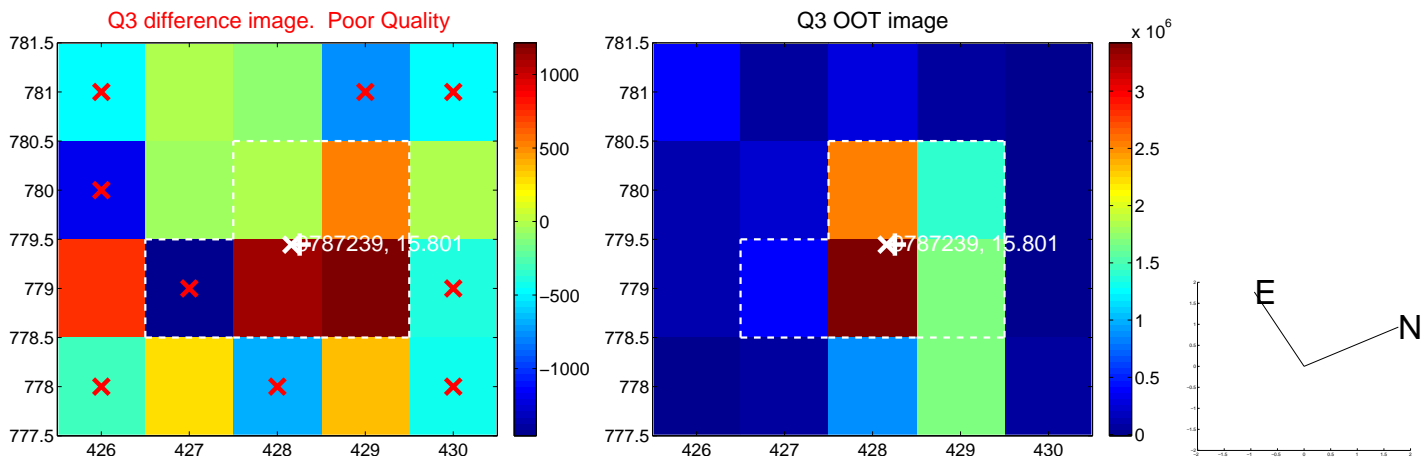
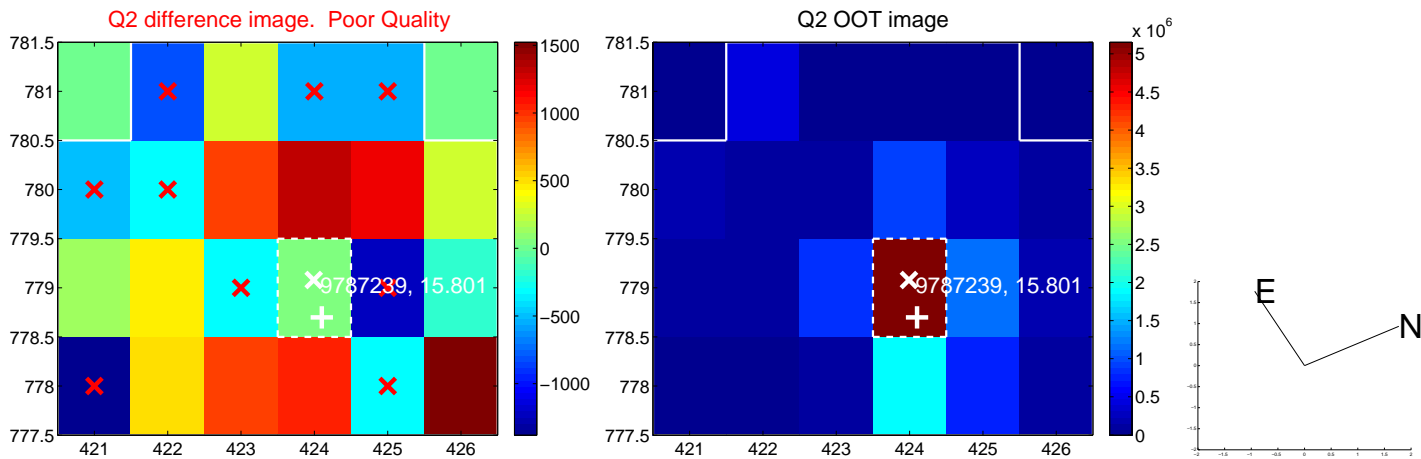
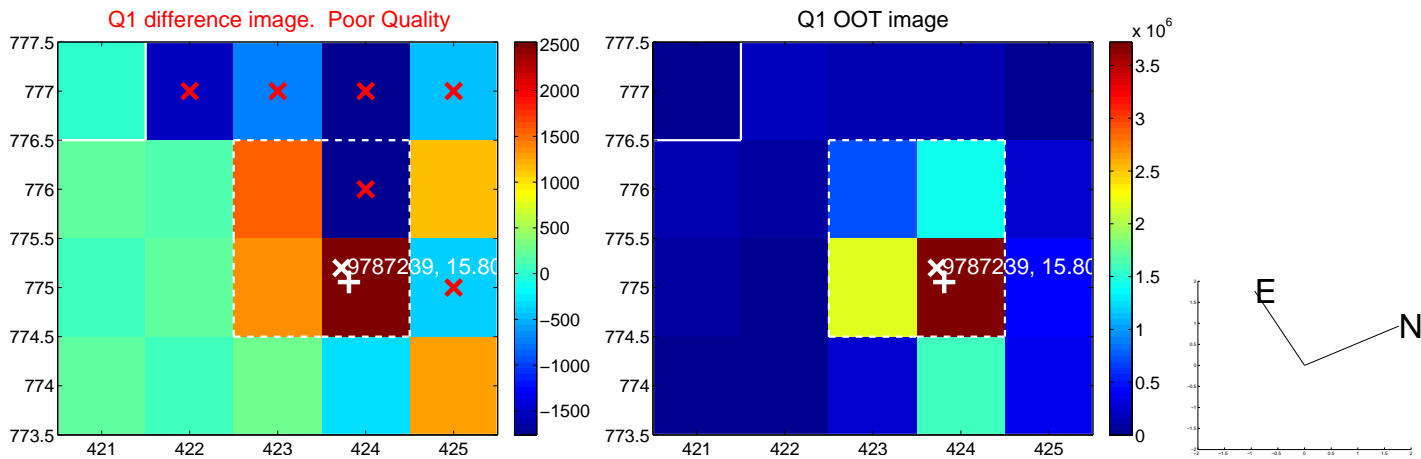
The direct PRF centroid is offset from the target star catalog position by about 0.56 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.882 \pm 0.695$	1.27	$0.882 \pm 0.692$	$0.011 \pm 0.839$
PRF-fit source offset from KIC position	$0.536 \pm 0.680$	0.79	$0.489 \pm 0.606$	$0.219 \pm 0.756$
photometric centroid source offset	$1.11 \pm 0.62$	1.78	$-1.11 \pm 0.62$	$-0.01 \pm 0.62$

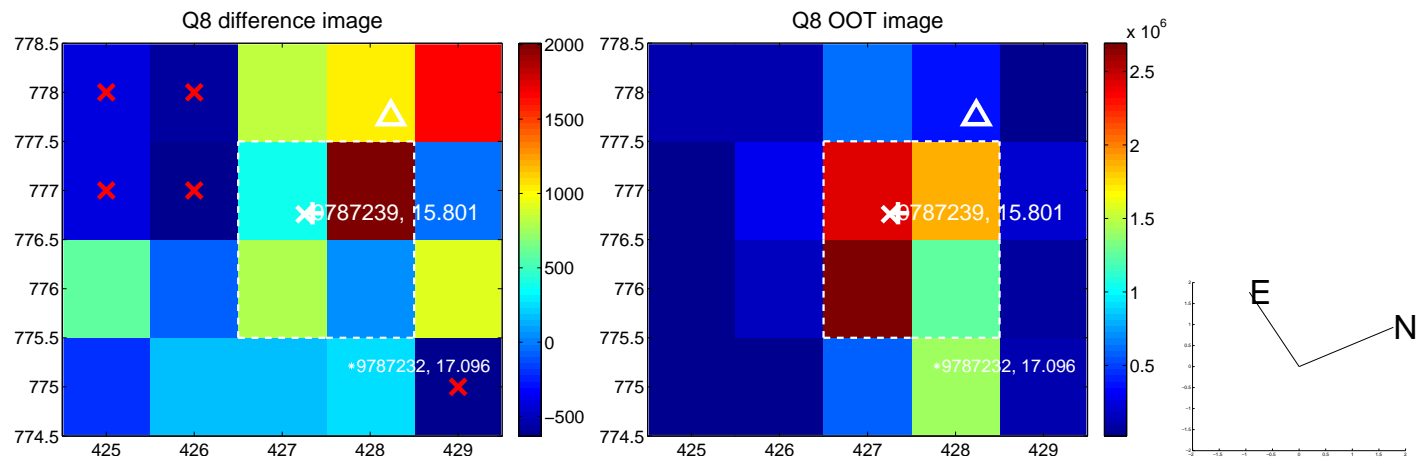
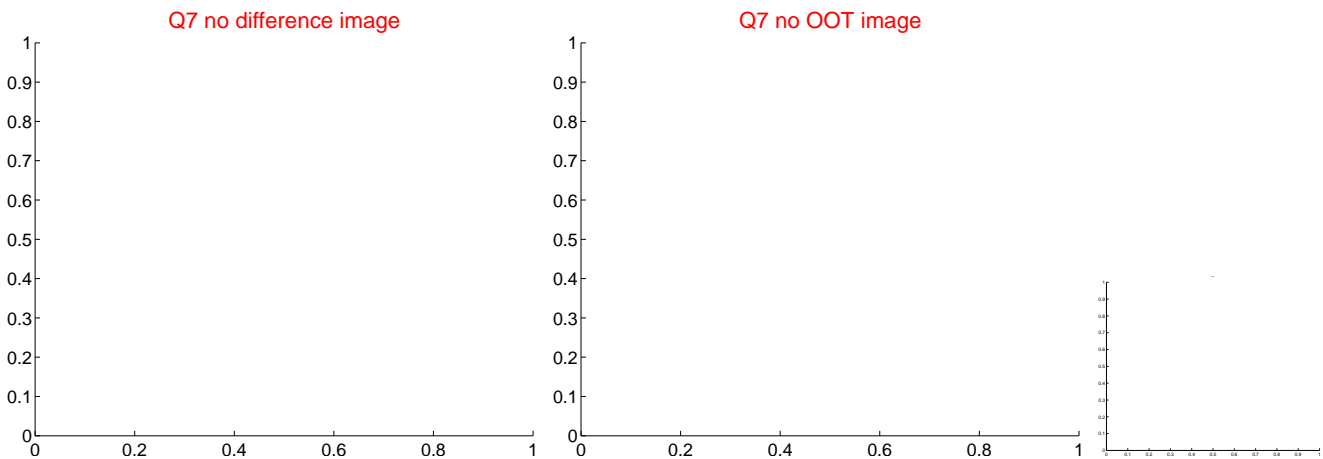
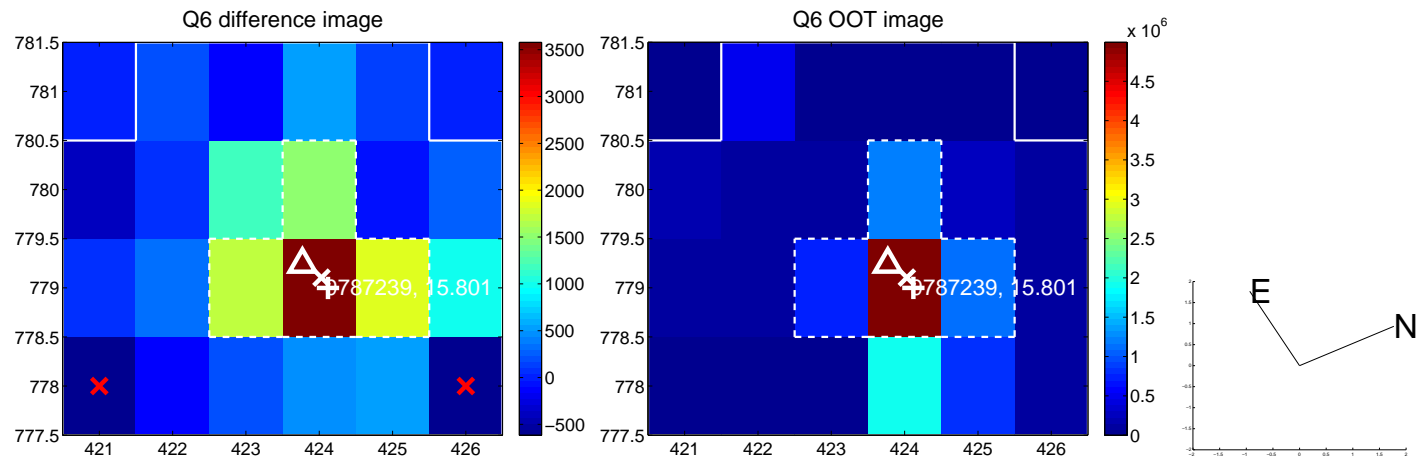
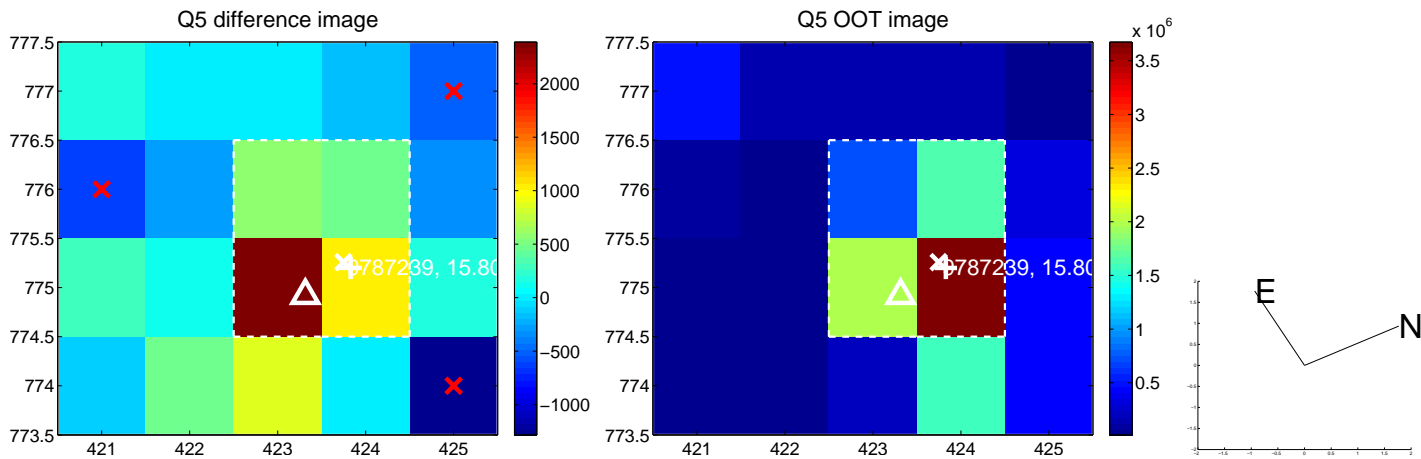


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

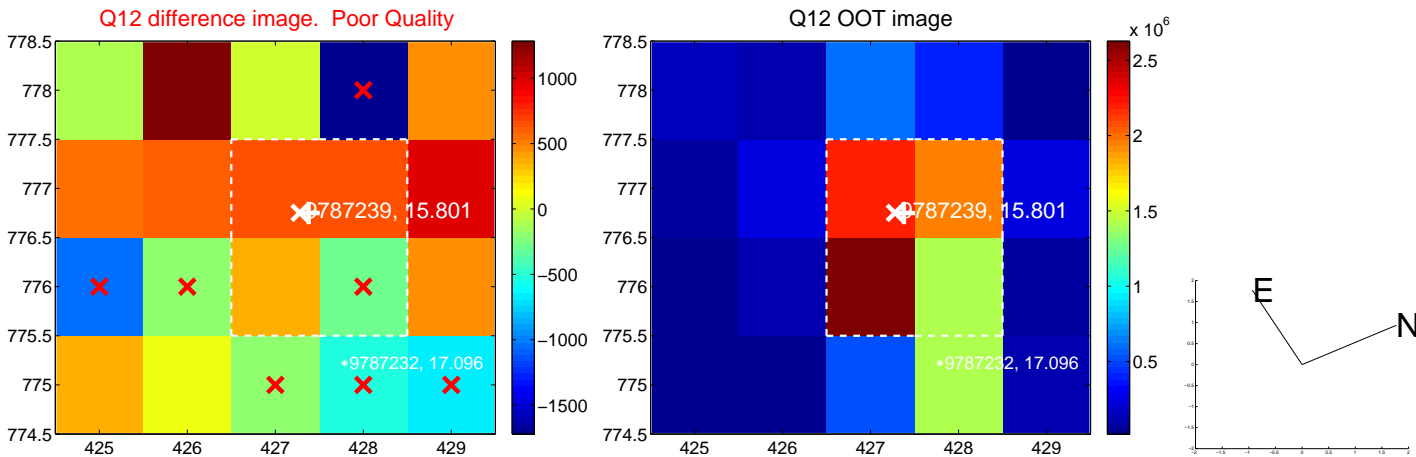
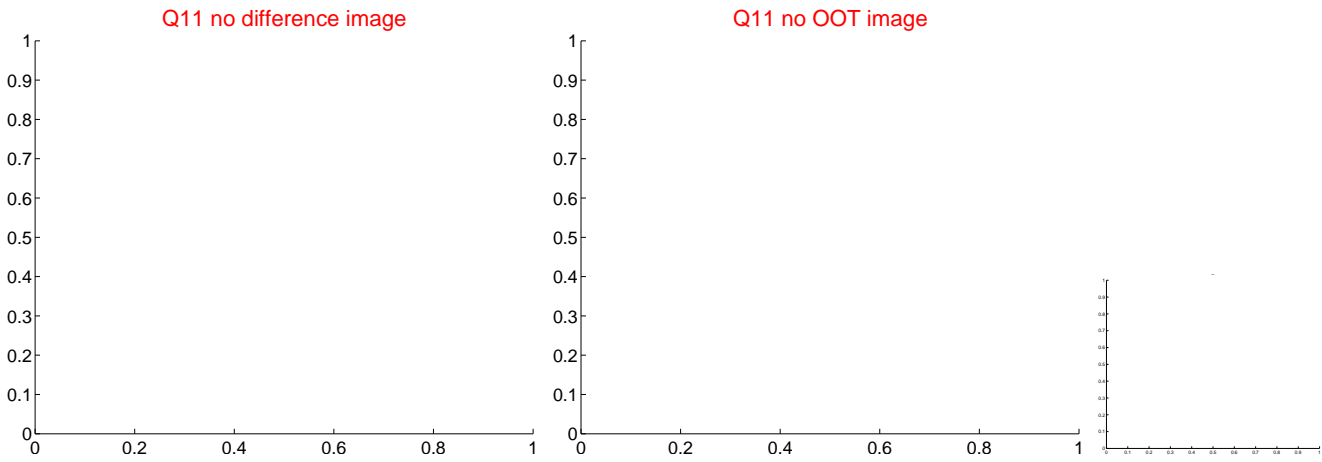
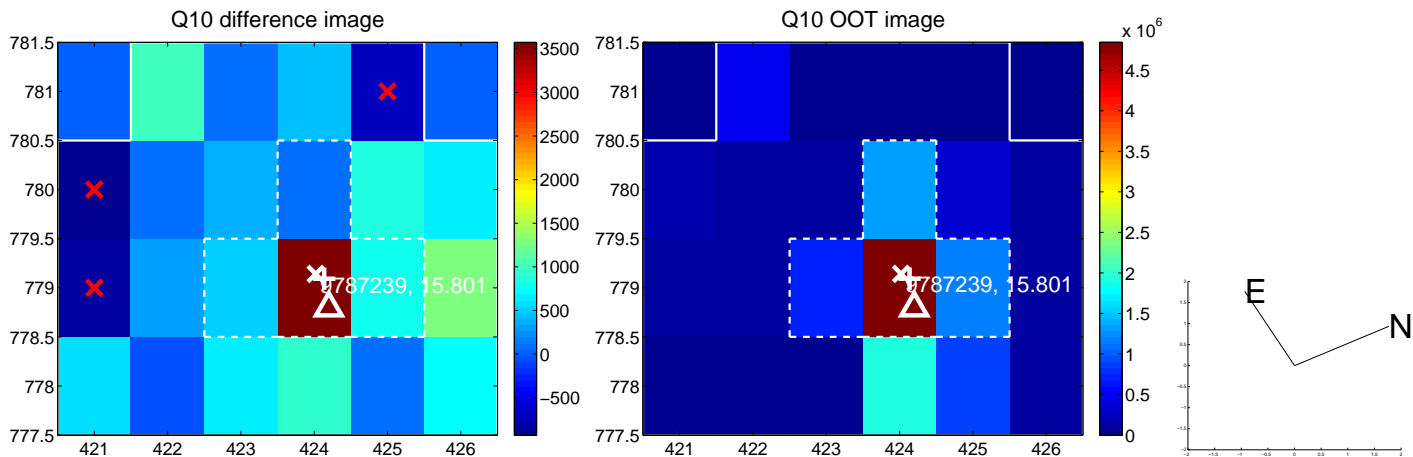
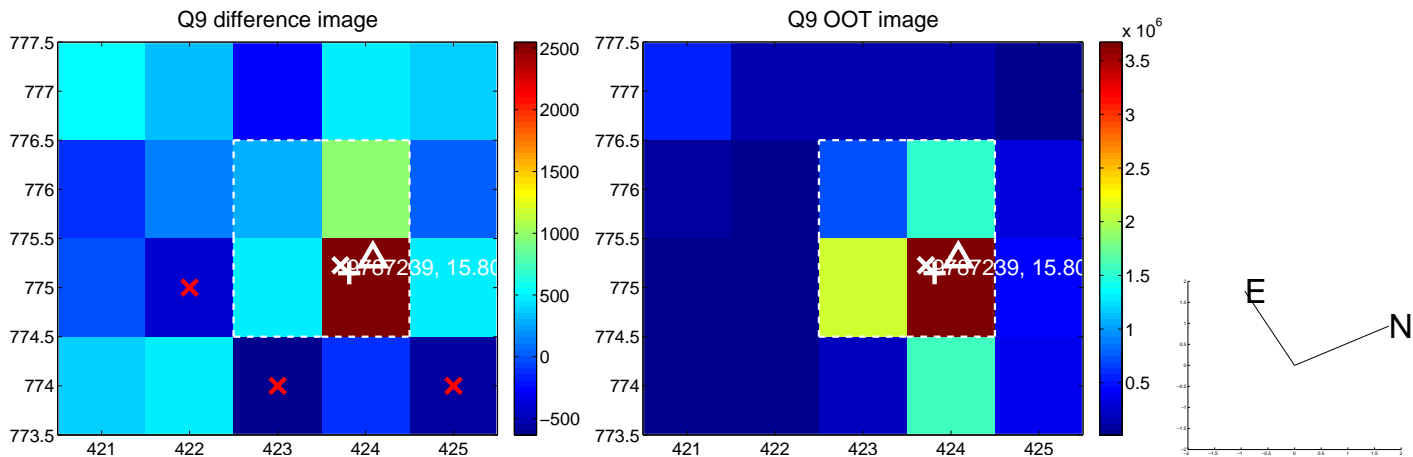
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



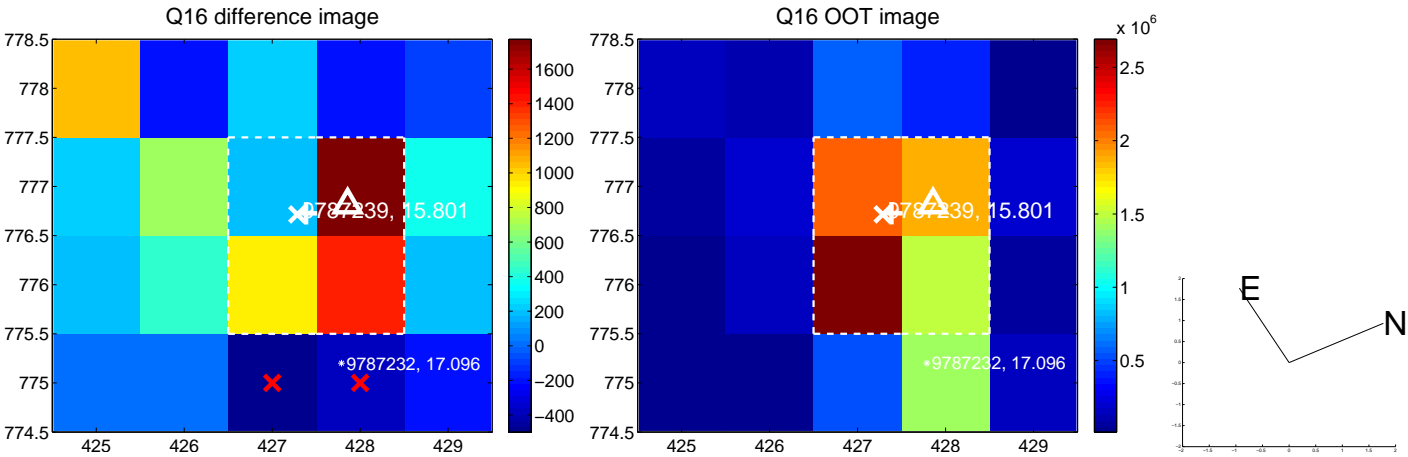
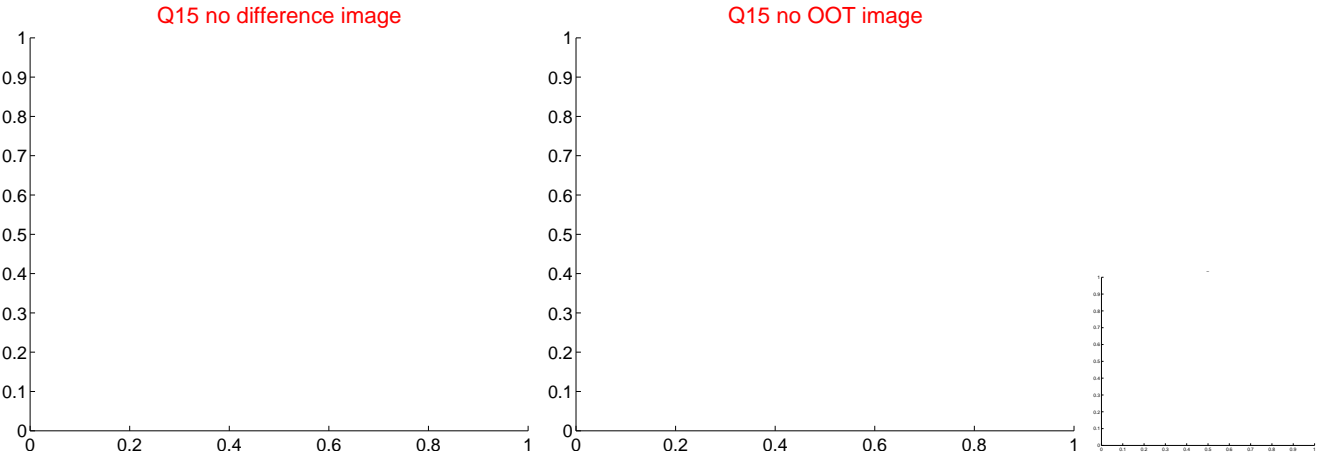
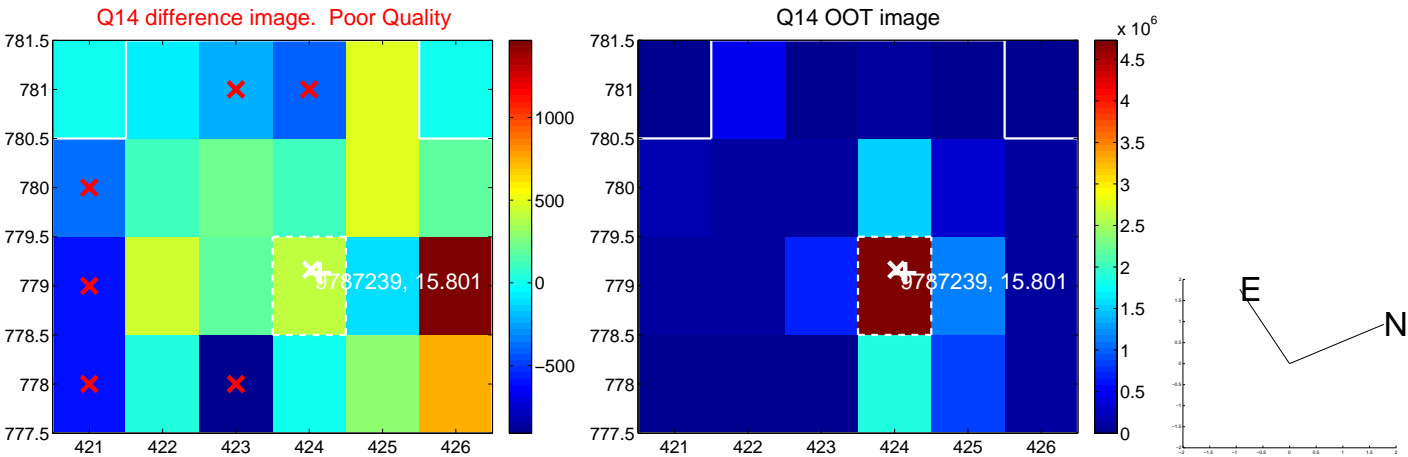
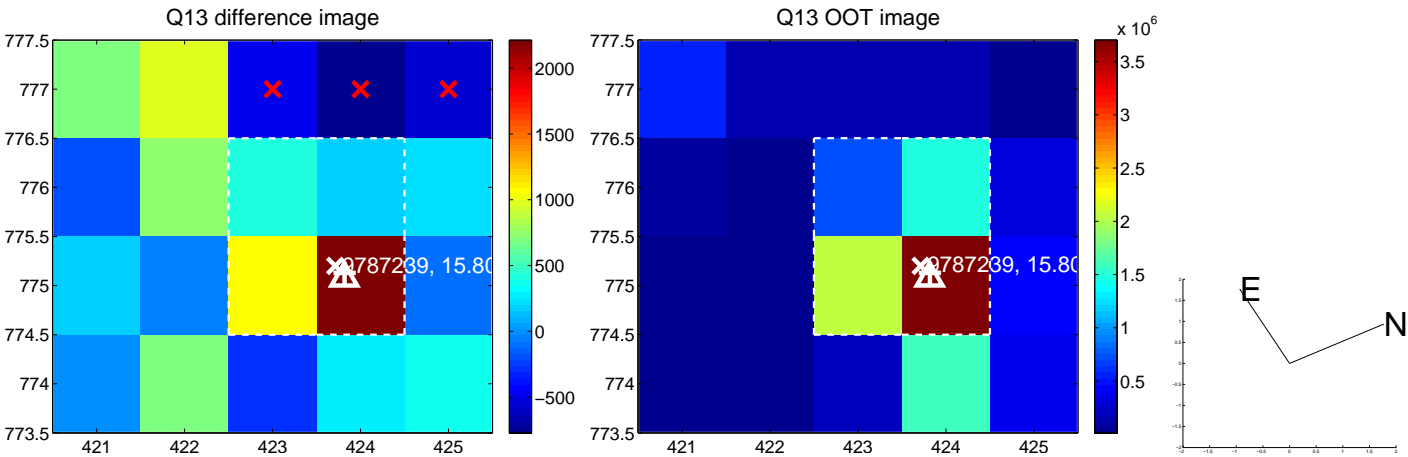
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

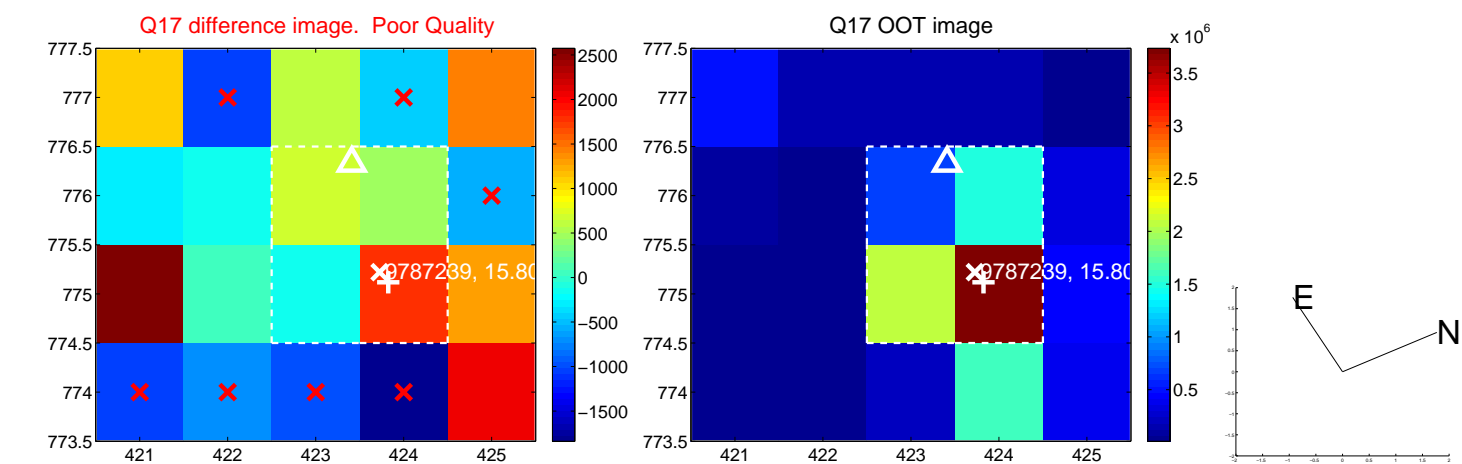


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

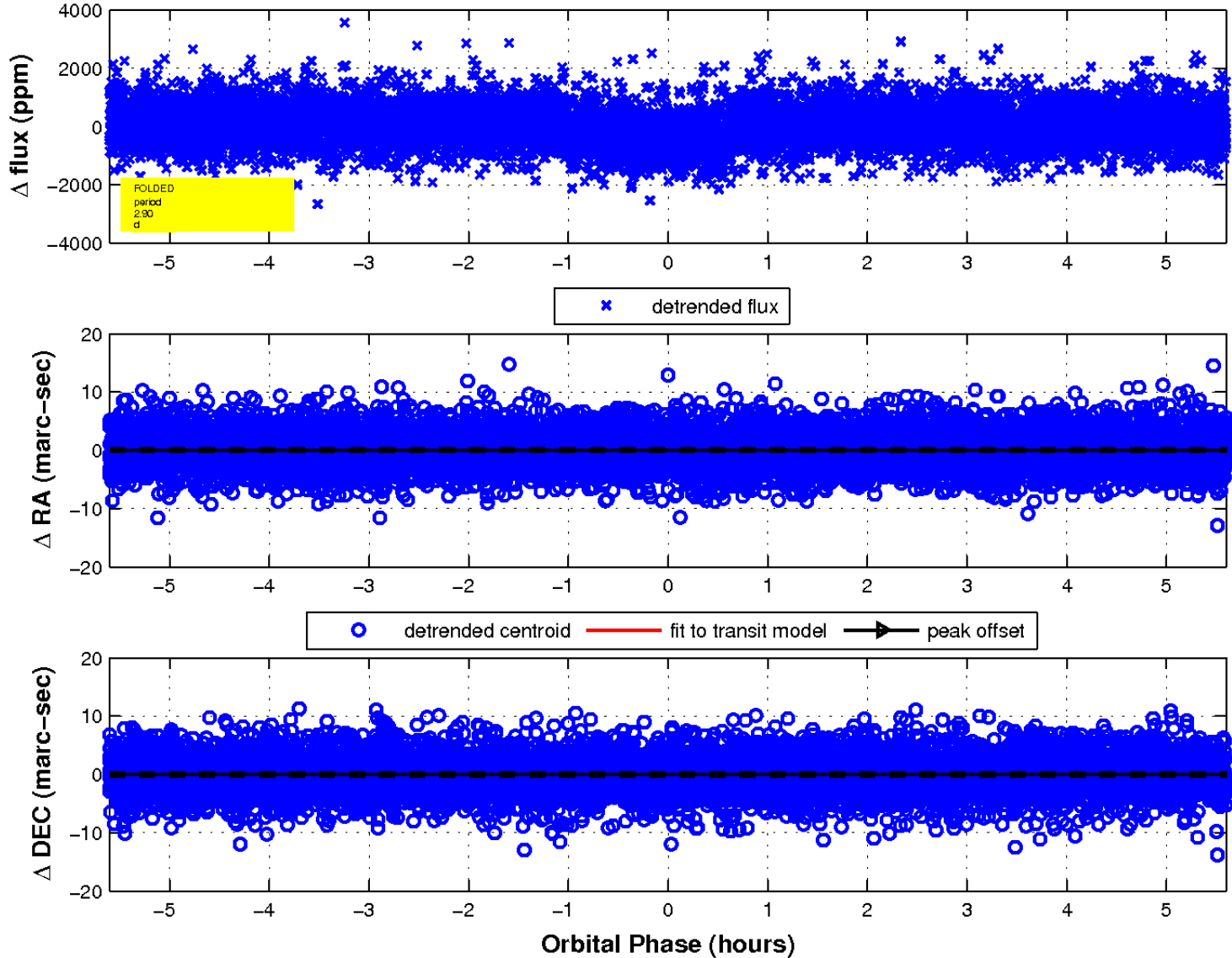




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

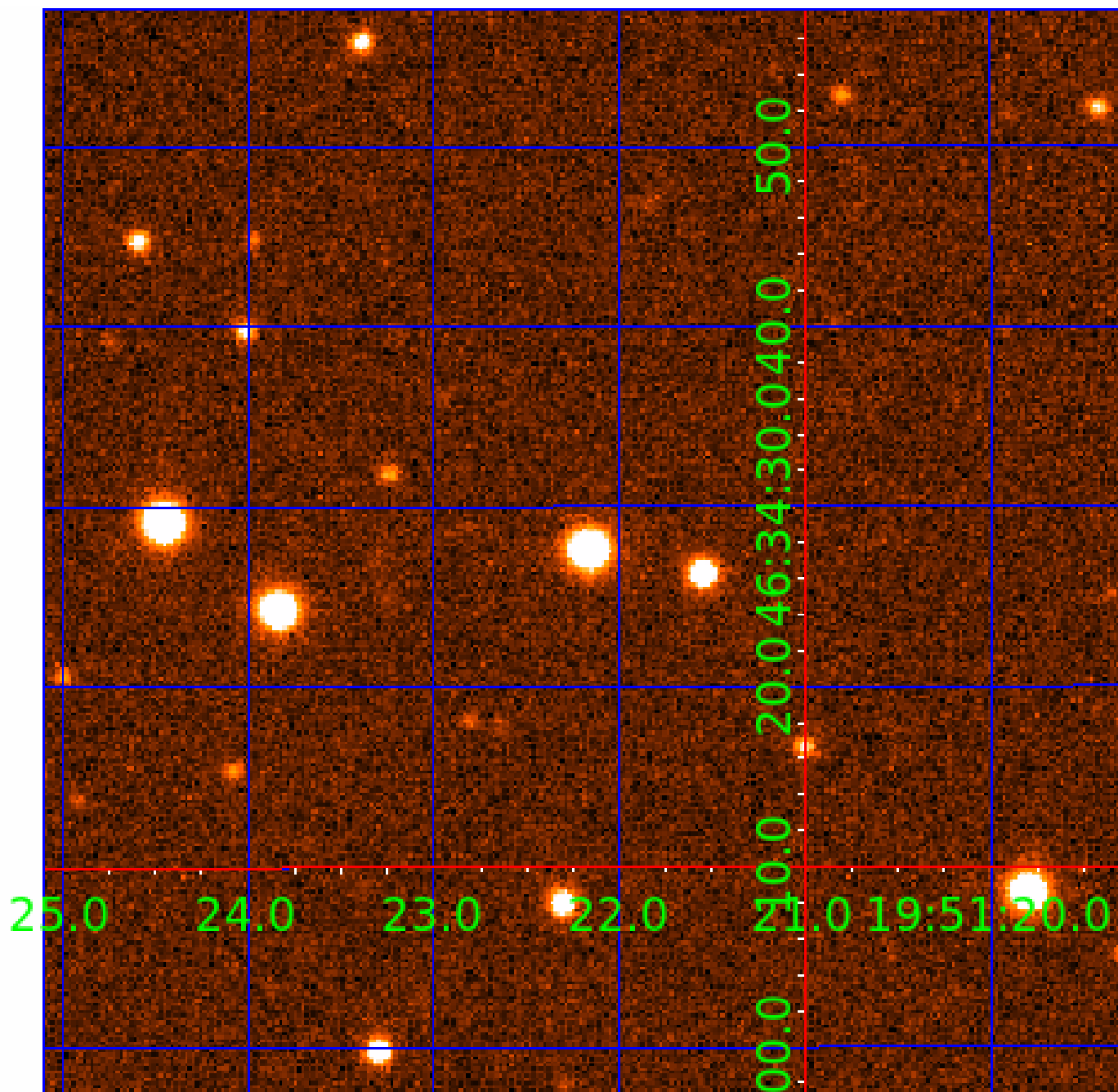


fluxWeightedCentroids, Planet 4 of 5



UKIRT Image

Declination



# KIC 009787239

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009787239-01	OBS	0952.01	5.901287	135.998633	1565.0	2.392	44.2	49.6	0.50	3731	2.23	16.54
009787239-02	OBS	0952.03	22.780805	132.421087	1983.5	3.312	31.4	38.0	0.50	3731	2.26	2.73
009787239-03	OBS	0952.02	8.752109	135.627317	1319.9	3.106	31.8	34.7	0.50	3731	2.36	9.78
009787239-04	OBS	0952.04	2.896009	133.613421	411.3	1.868	15.3	17.4	0.50	3731	1.21	42.72
009787239-05	OBS	0952.05	0.742957	131.791013	205.0	1.299	11.1	13.7	0.50	3731	0.86	262.06

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009787239-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009787239-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009787239-04	OBS	PC	0.97	0	0	0	0	CENT_KIC_POS
009787239-05	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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

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

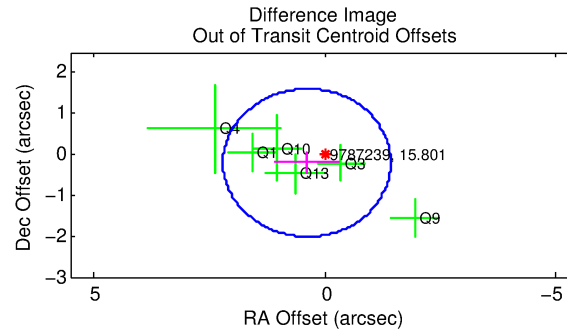
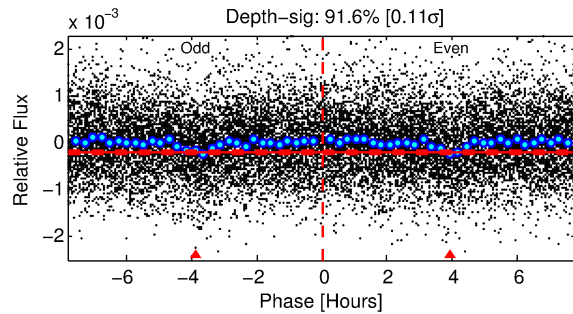
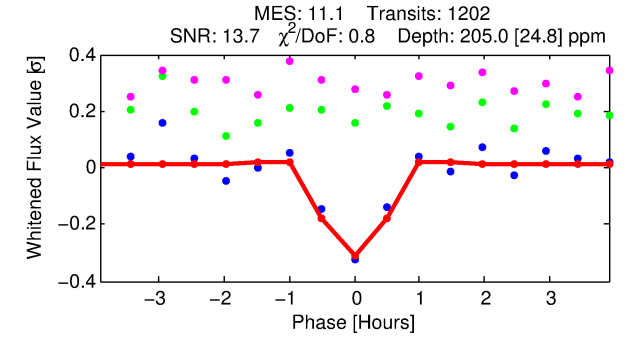
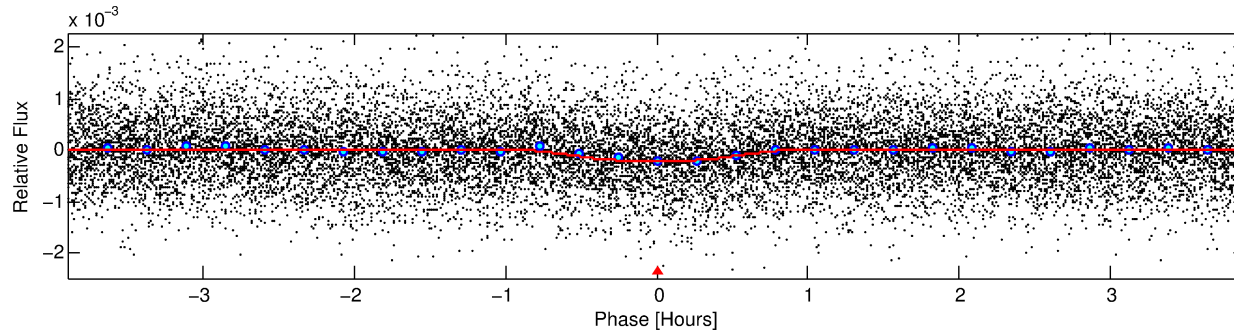
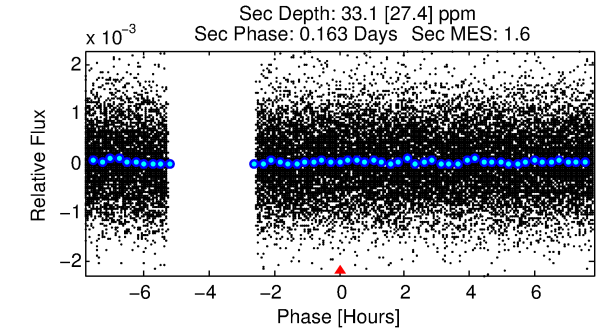
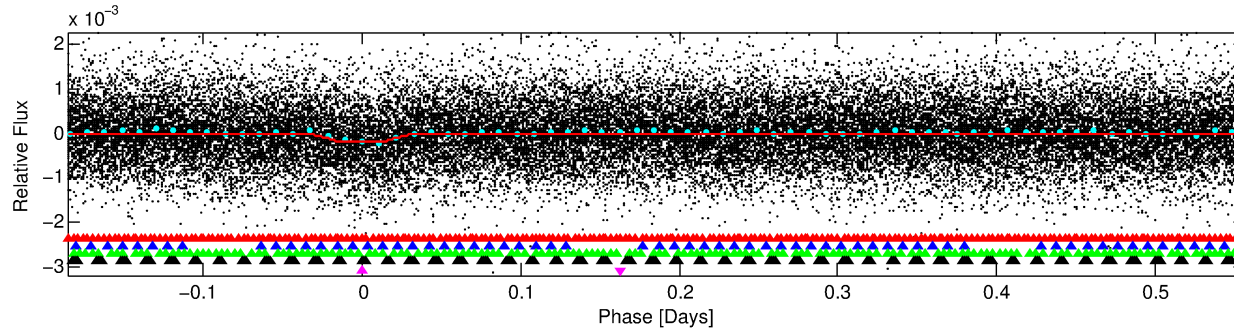
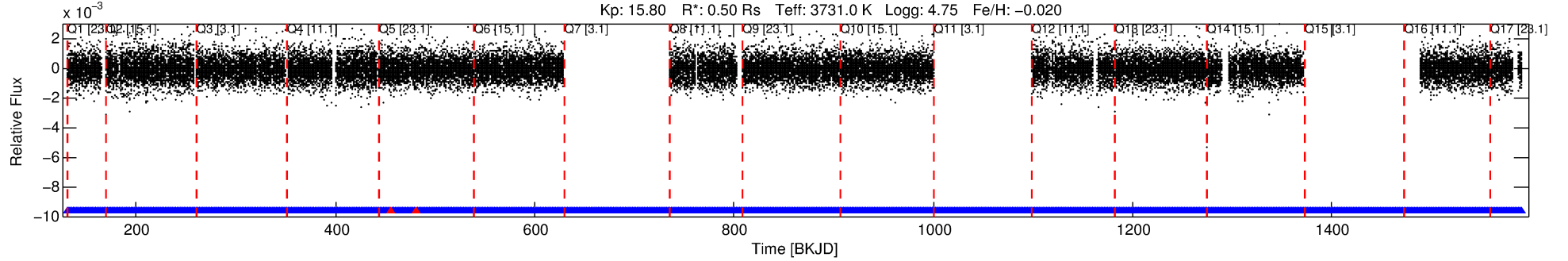
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009787239-05

No Significant Match Found

# DV One-Page Summary

KIC: 9787239 Candidate: 5 of 5 Period: 0.743 d  
KOI: K00952.05 Name: Kepler-32f Corr: 0.915



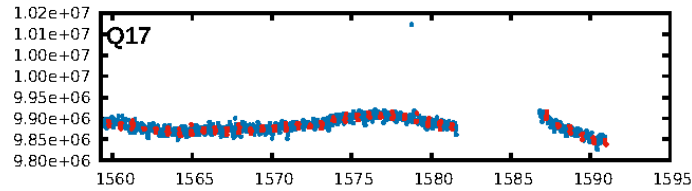
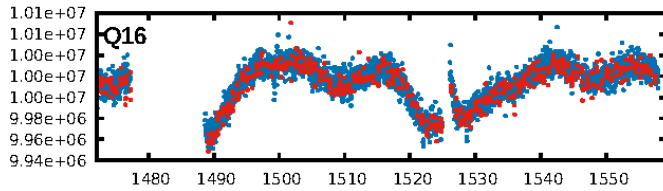
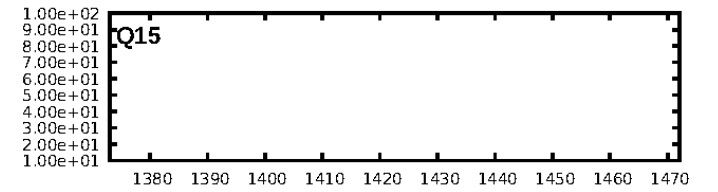
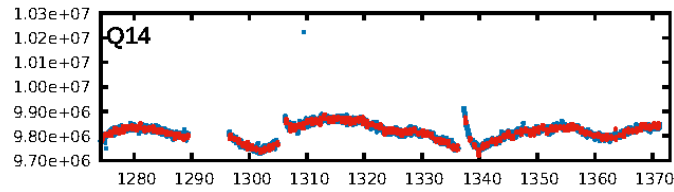
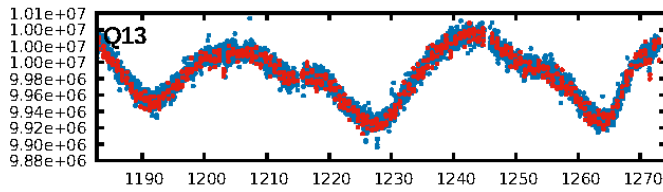
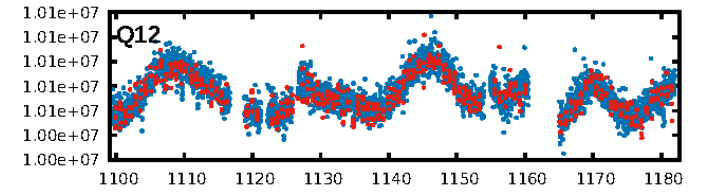
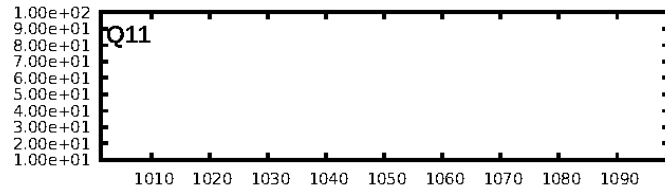
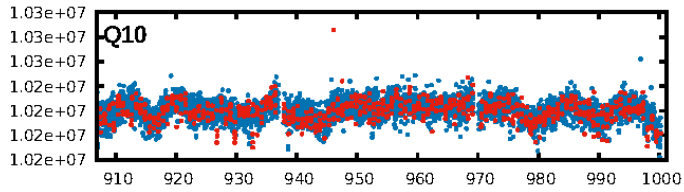
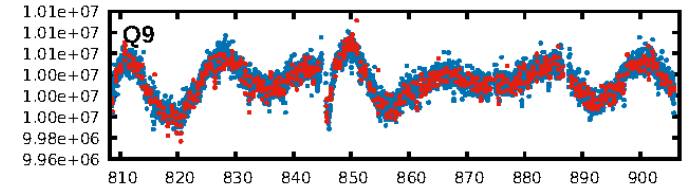
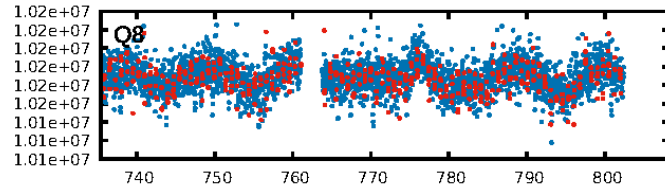
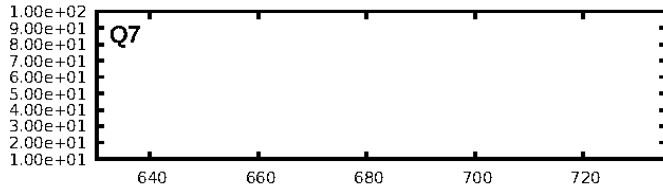
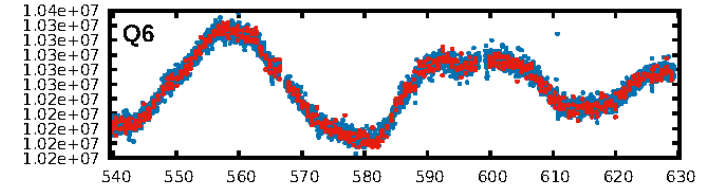
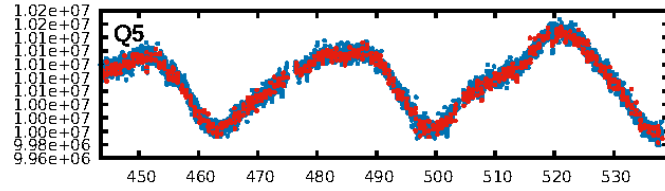
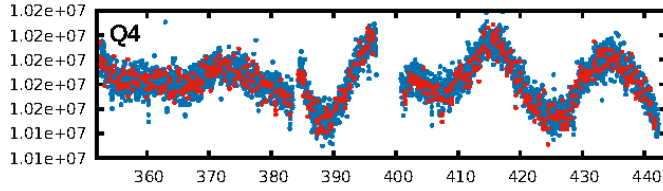
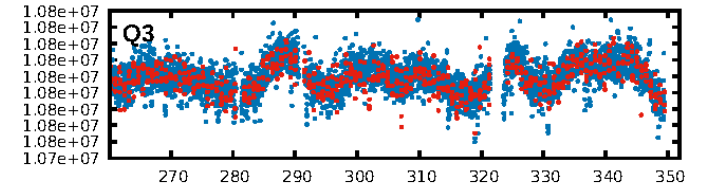
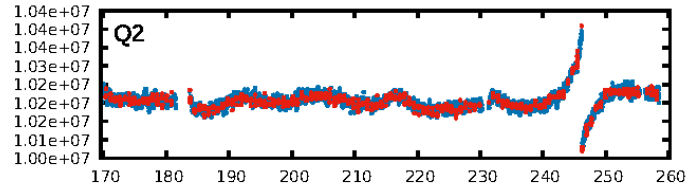
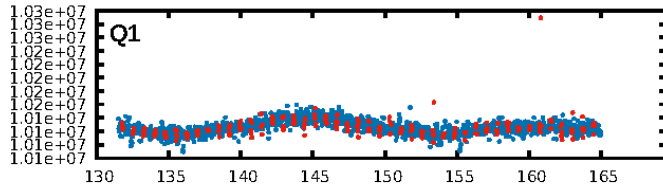
## DV Fit Results:

Period = 0.74296 [0.00001] d  
Epoch = 131.7910 [0.0014] BKJD  
Rp/R\* = 0.0158 [0.0107]  
a/R\* = 2.25 [5.43]  
b = 0.90 [0.63]  
Seff = 262.06 [36.08]  
Teq = 1026 [35] K  
Rp = 0.86 [0.59] Re  
a = 0.0128 [0.0010] AU  
Ag = 4.08 [6.51] [0.47σ]  
Teffp = 2254 [899] K [1.37σ]

## DV Diagnostic Results:

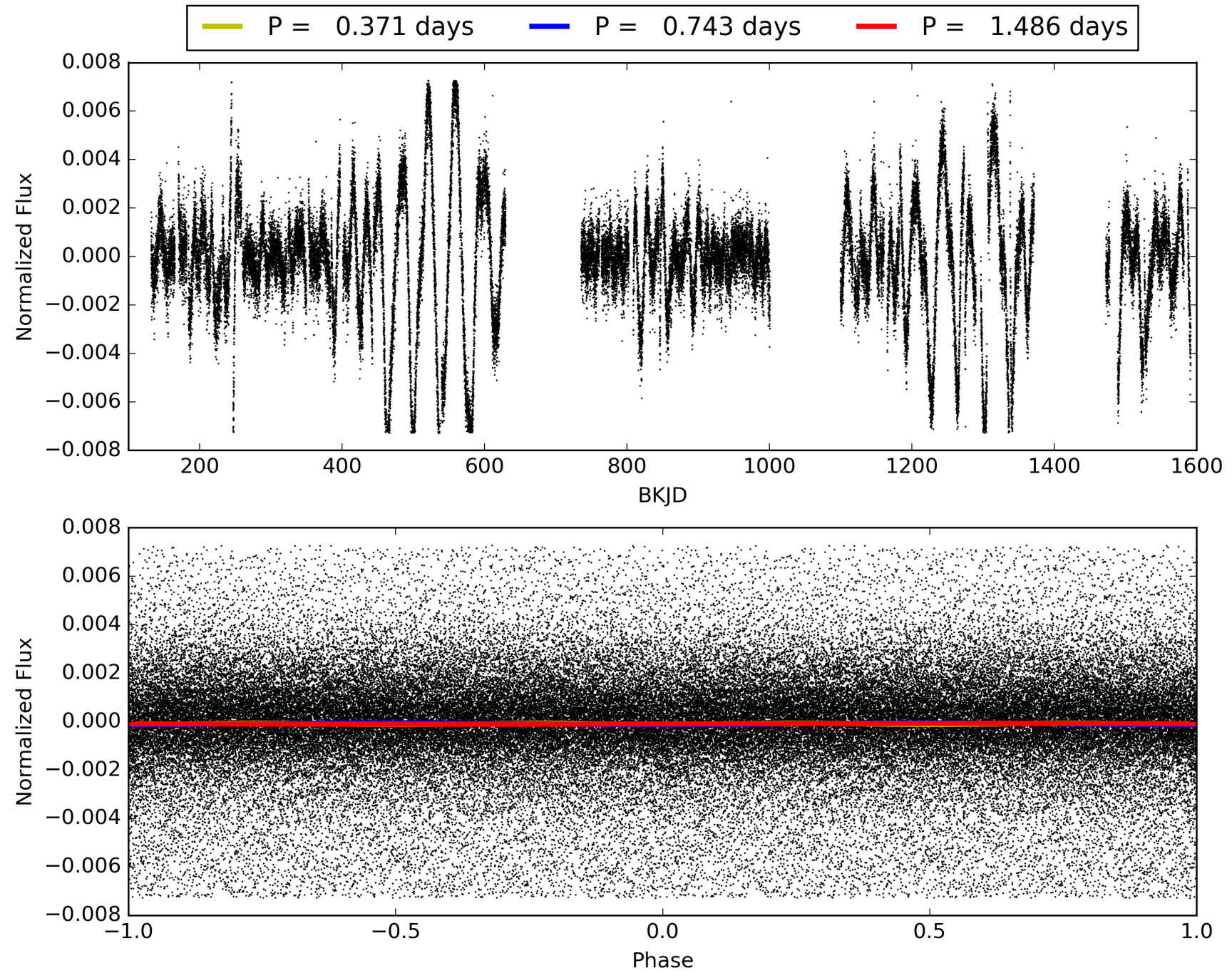
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [22.71σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.45e-31  
RollingBand-fgt: 1.00 [1129/1131]  
GhostDiagnostic-chr: 5.494  
Centroid-sig: 10.4%  
Centroid-so: 0.833 arcsec [1.09σ]  
OotOffset-rm: 0.435 arcsec [0.72σ]  
KicOffset-rm: 0.063 arcsec [0.09σ]  
OotOffset-st: 1/1/1/3 [6]  
KicOffset-st: 1/1/1/3 [6]  
DiffImageQuality-fgm: 1.00 [6/6]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 009787239-05, PDC Light Curves



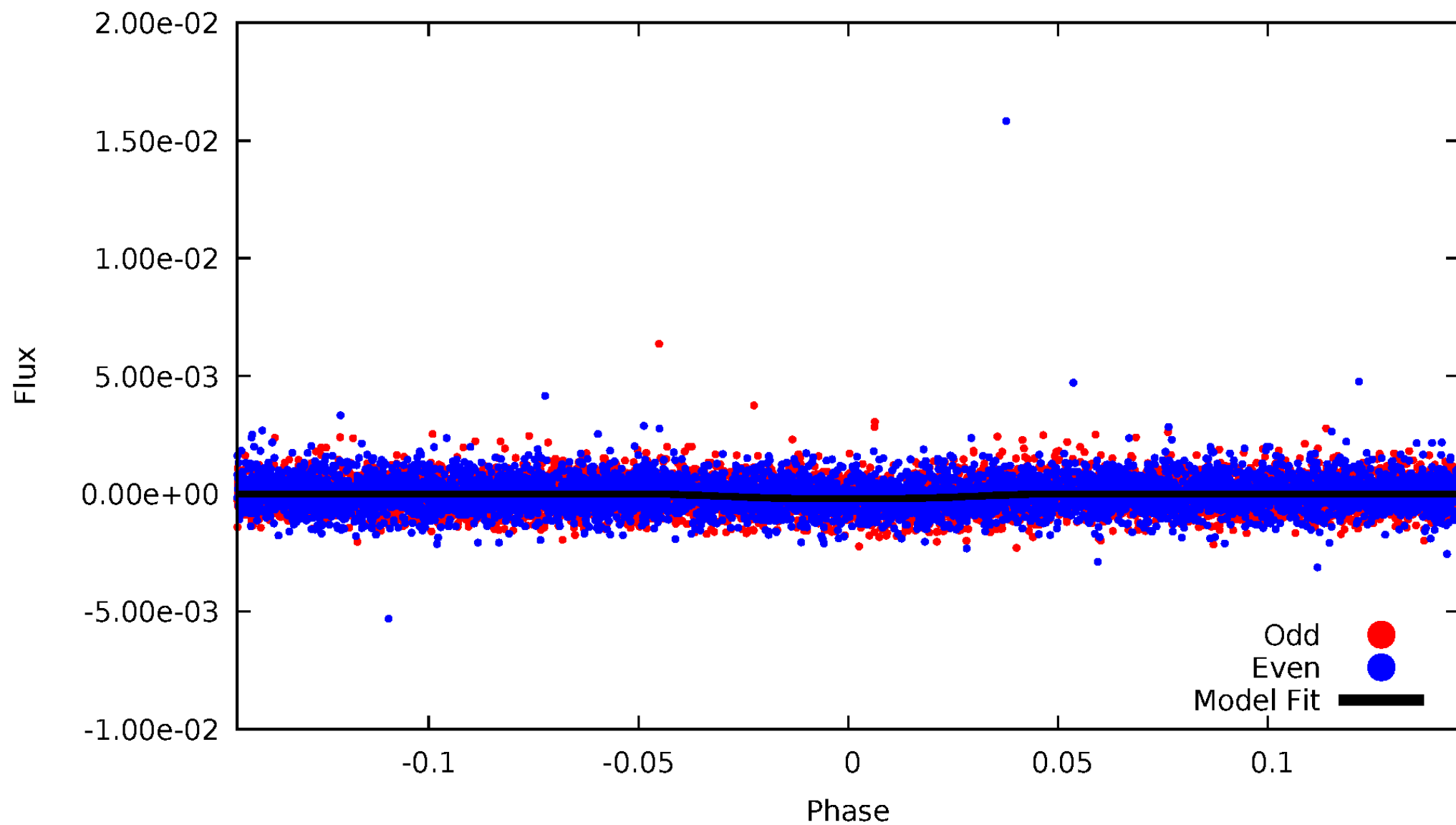


TCE 009787239-05



# DV Odd/Even

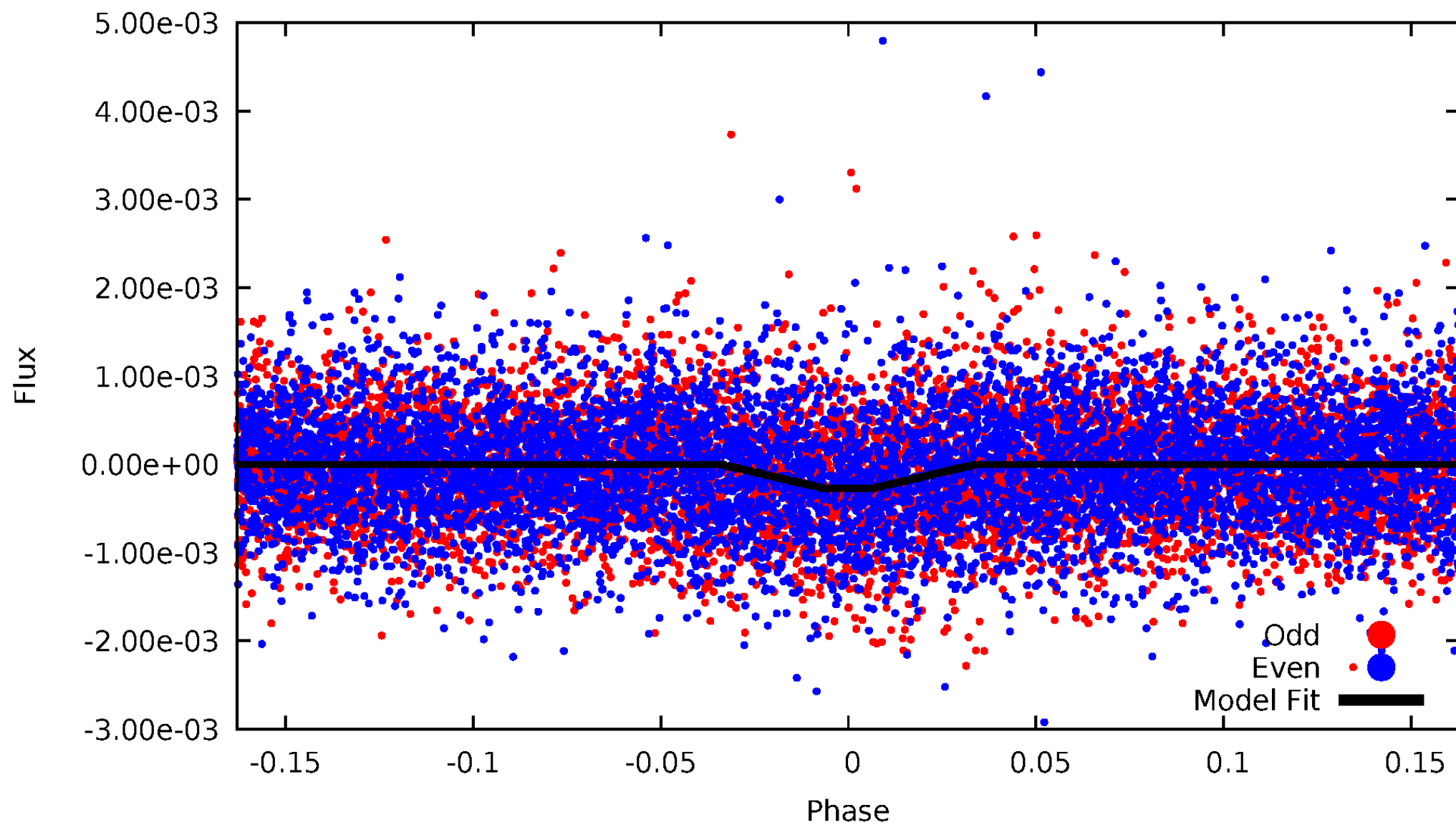
TCE 009787239-05



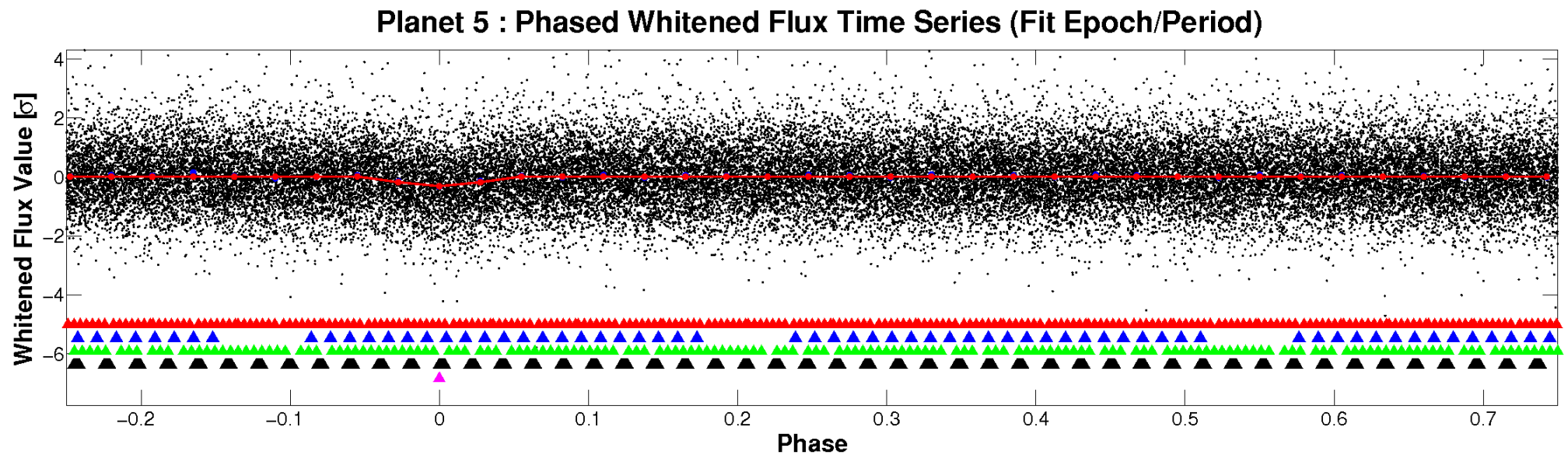
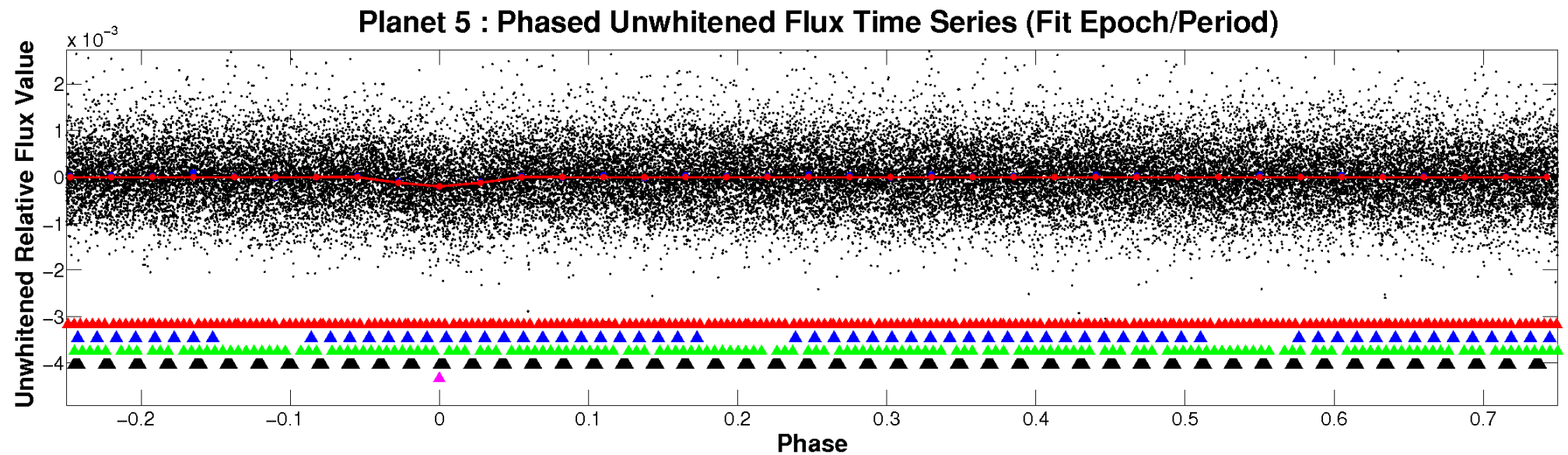


# ALT Odd/Even

TCE 009787239-05

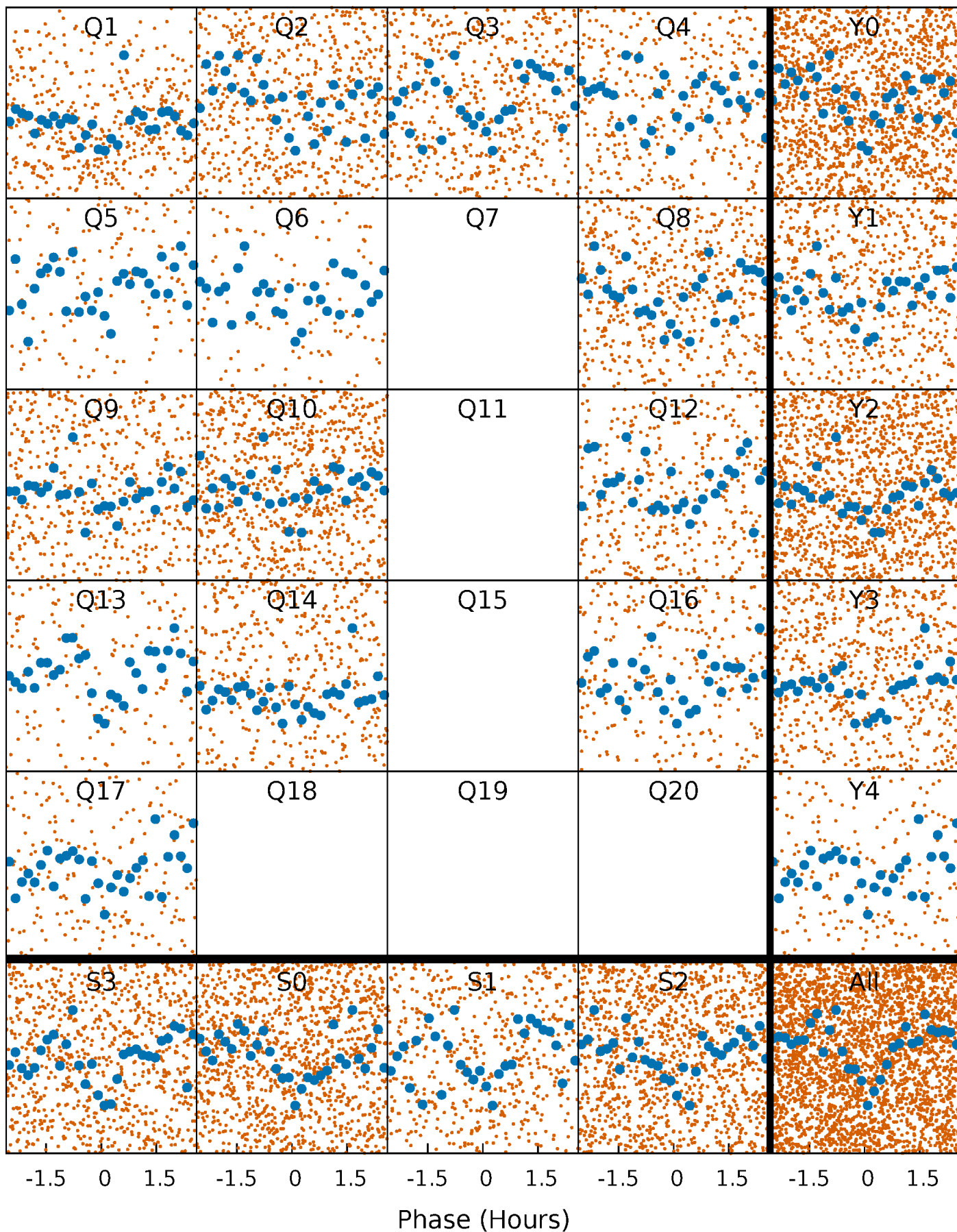


# Non-Whitened Vs. Whitened Light Curve



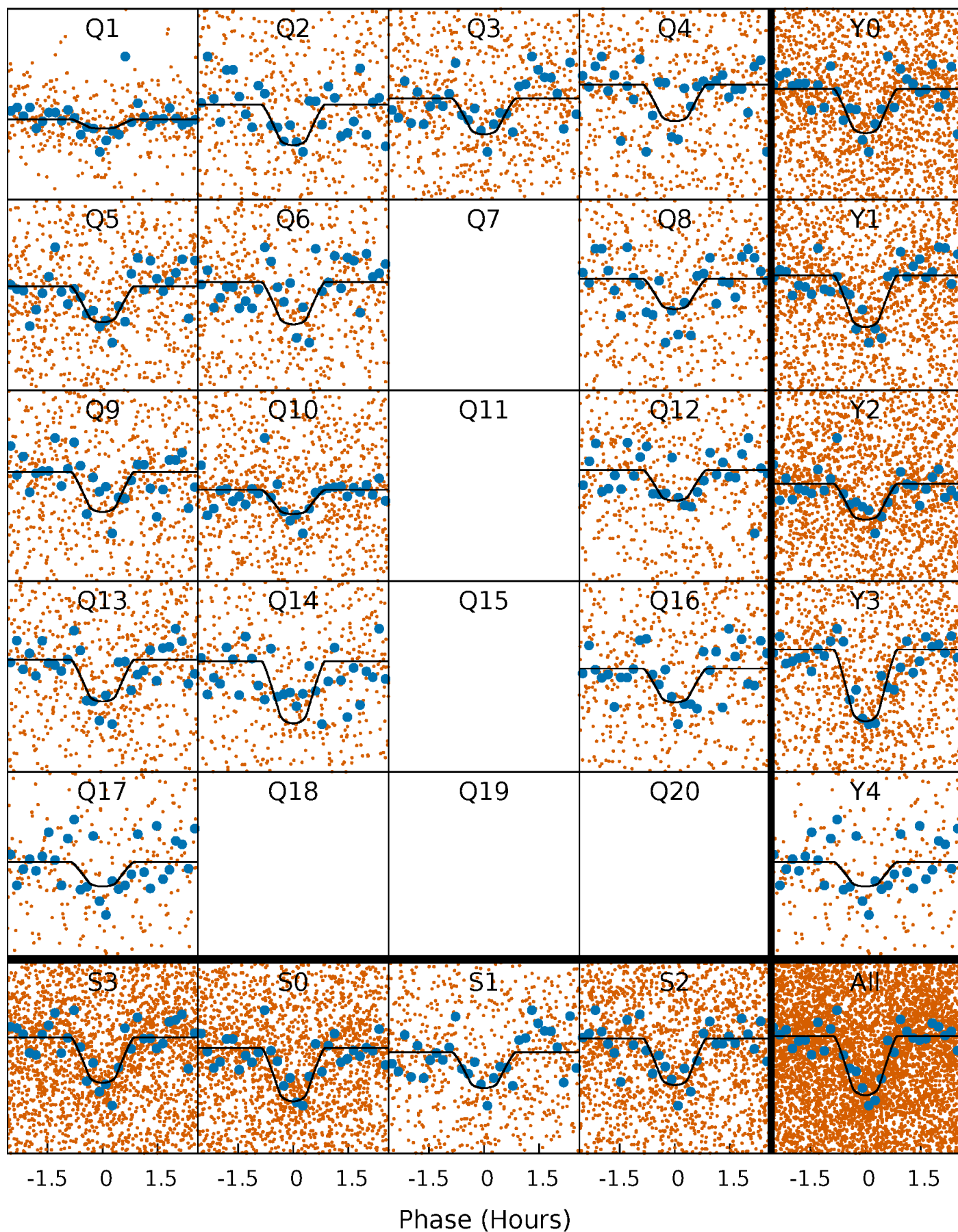
# PDC Quarter-Phased Transit Curves

TCE 009787239-05     $P = 0.742957$  Days     $T_0 = 131.791013$  (BKJD)



# DV Quarter-Phased Transit Curves

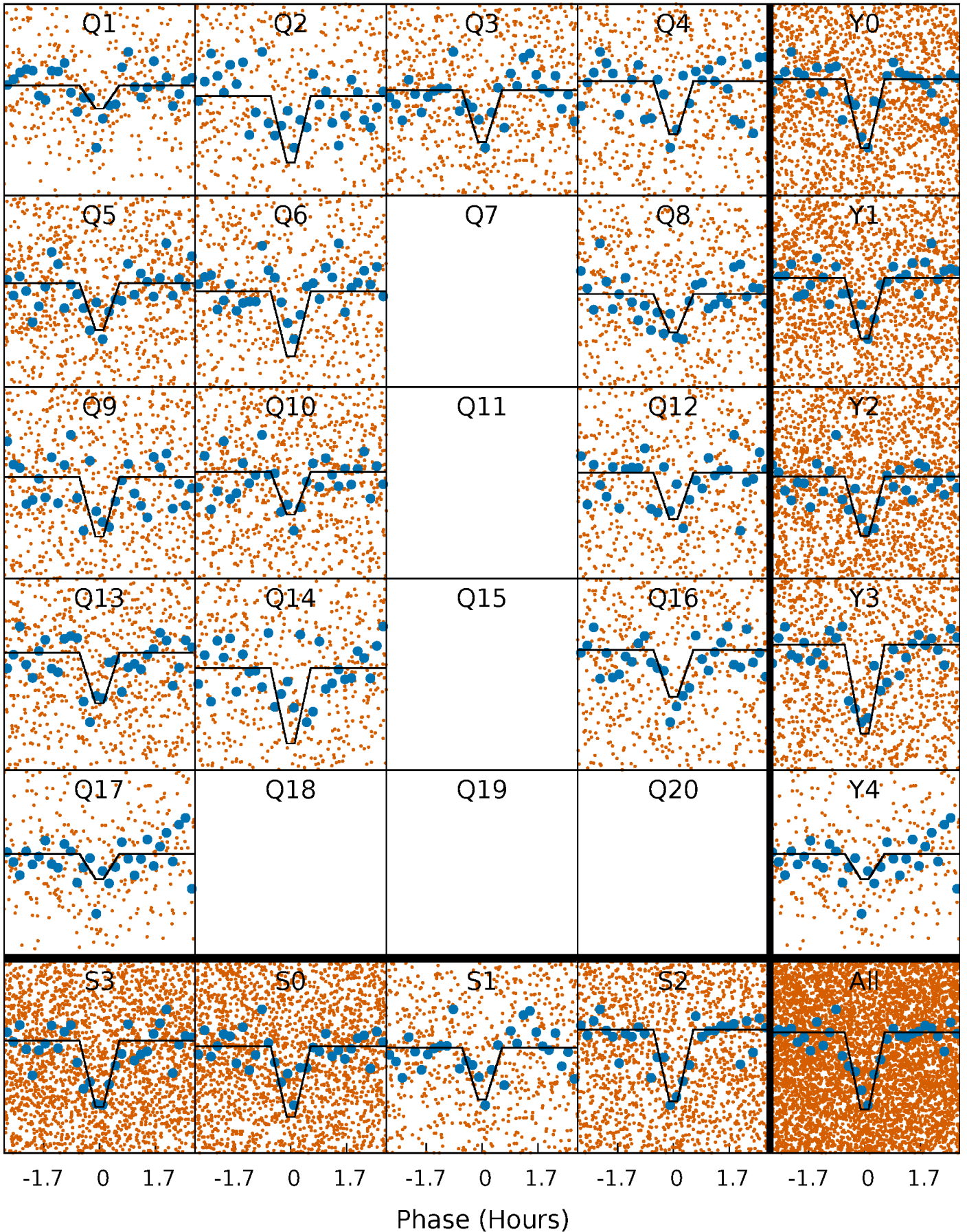
TCE 009787239-05   P= 0.742957 Days    $T_0=131.791013$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

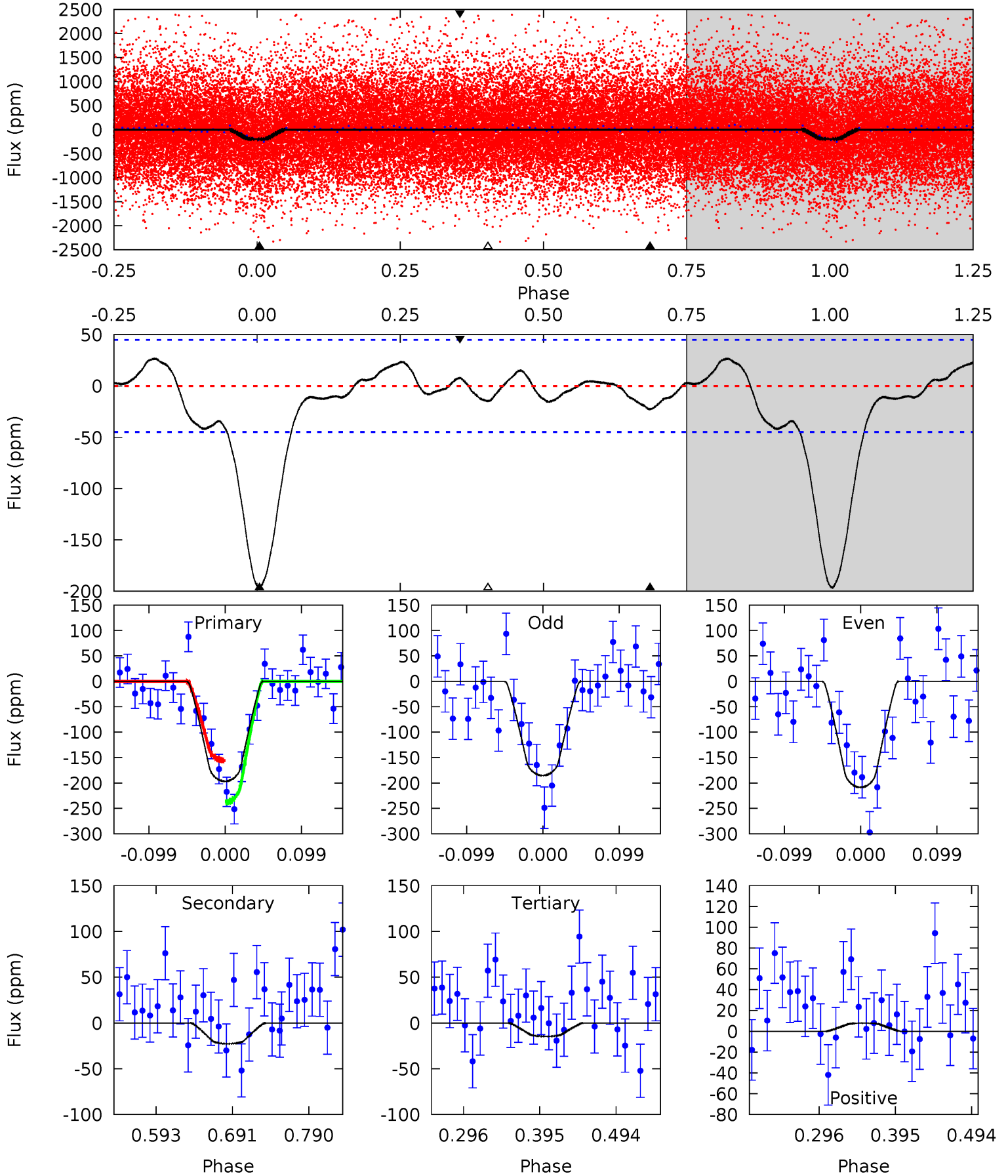
TCE 009787239-05   P= 0.742959 Days    $T_0=131.792647$  (BKJD)



# DV Model-Shift Uniqueness Test

009787239-05, P = 0.742957 Days, E = 131.048056 Days

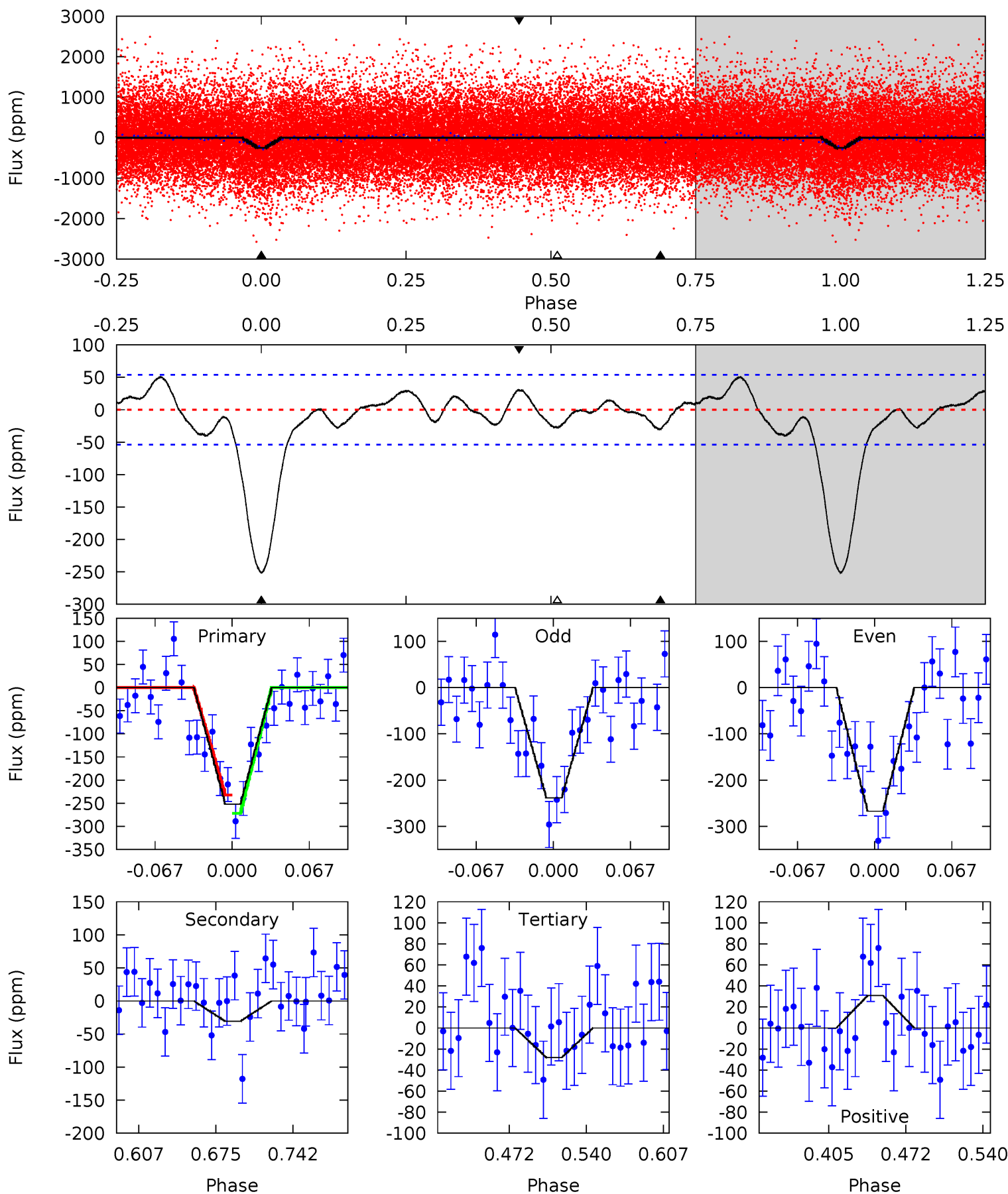
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.0	2.32	1.50	0.80	4.57	1.65	1.44	18.5	19.2	0.81	1.51	1.19	0.99	0.12	4.23



# Alt Model-Shift Uniqueness Test

009787239-05, P = 0.742959 Days, E = 131.049688 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
21.7	2.65	2.43	2.67	4.65	1.83	1.70	19.3	19.1	0.22	-0.02	1.24	0.96	0.17	1.73



### Stellar Parameters For KIC 009787239

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3731^{+73}_{-83}$	$4.750^{+0.052}_{-0.028}$	$-0.020^{+0.150}_{-0.150}$	$0.498^{+0.034}_{-0.051}$	$0.509^{+0.036}_{-0.045}$	$5.789^{+1.437}_{-0.703}$
	+2%/-2%	+1%/-1%	+750%/-750%	+7%/-10%	+7%/-9%	+25%/-12%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 009787239-05 / KOI 0952.05

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-23 \pm 10$	$0.89^{+0.55}_{-0.48}$	$1424^{+40}_{-38}$	$2561^{+654}_{-406}$	$2.579^{+9.830}_{-1.745}$
Alt.	$-31 \pm 12$	$0.91^{+0.57}_{-0.48}$	$1423^{+39}_{-35}$	$2640^{+681}_{-390}$	$3.208^{+12.375}_{-2.169}$

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



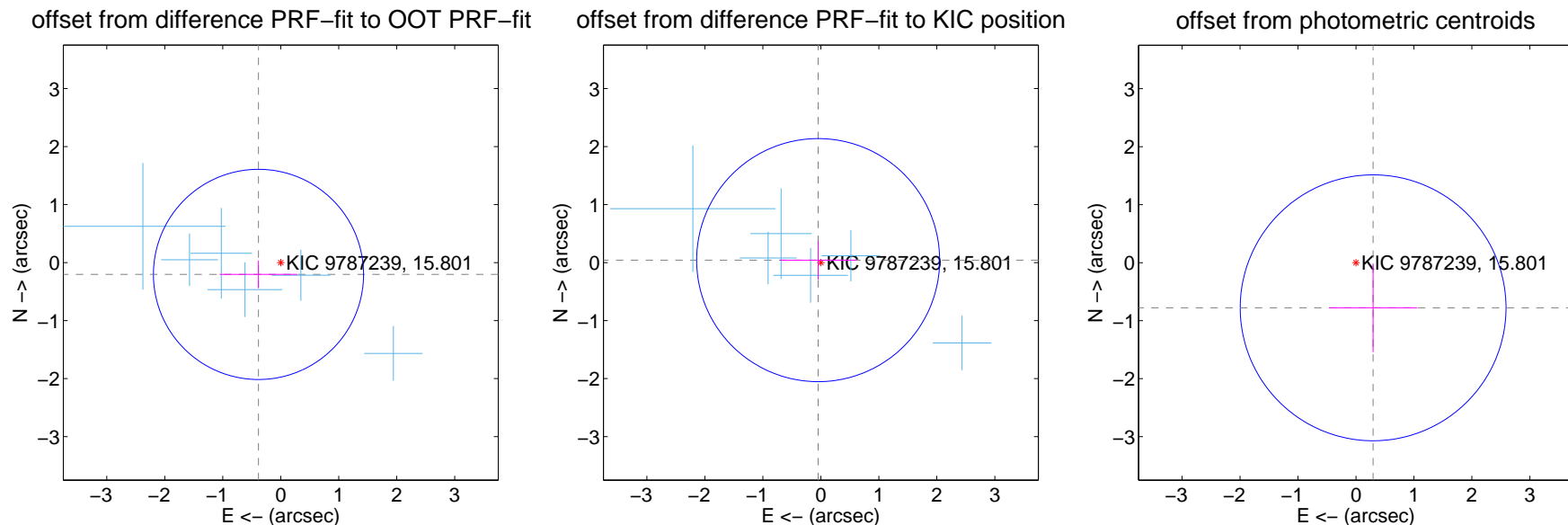
## DV Centroid Data

Supplemental centroid analysis for 009787239-05. Kepler magnitude: 15.80. Transit SNR 13.71

There are 6 quarters with good PRF difference image offsets

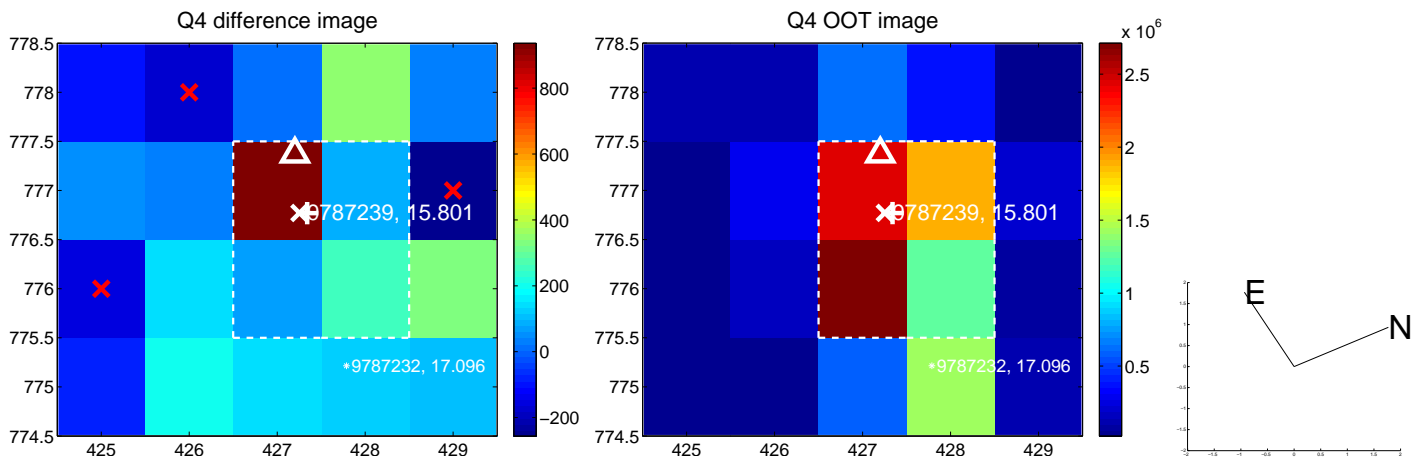
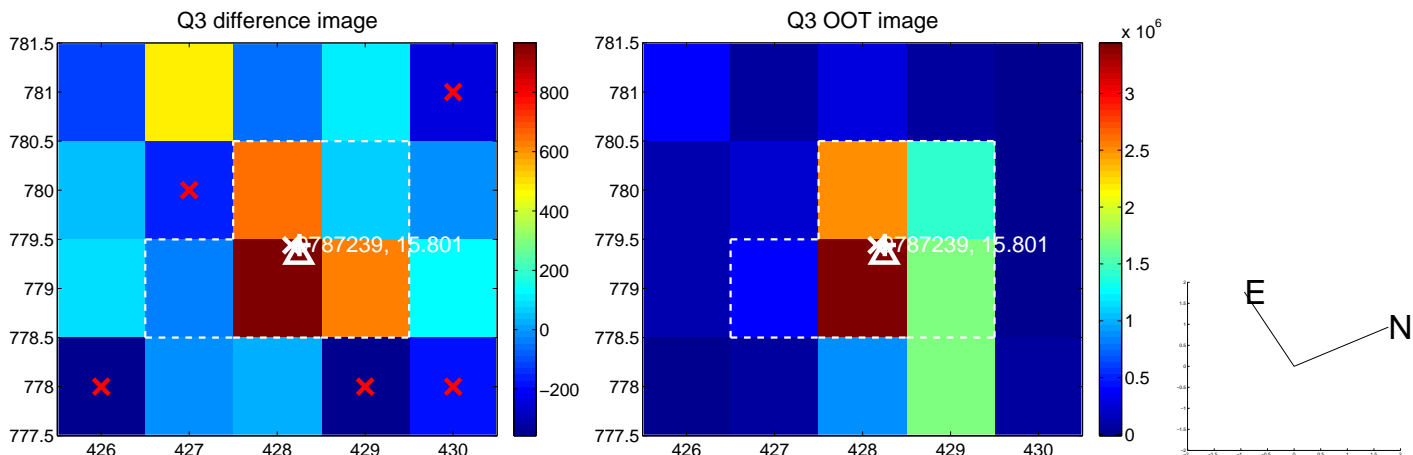
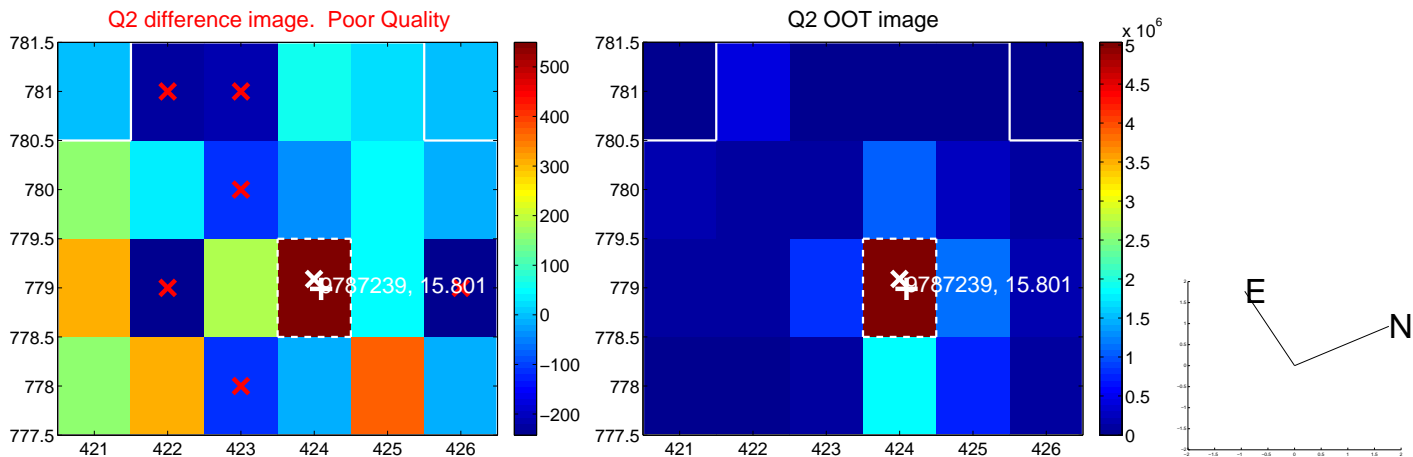
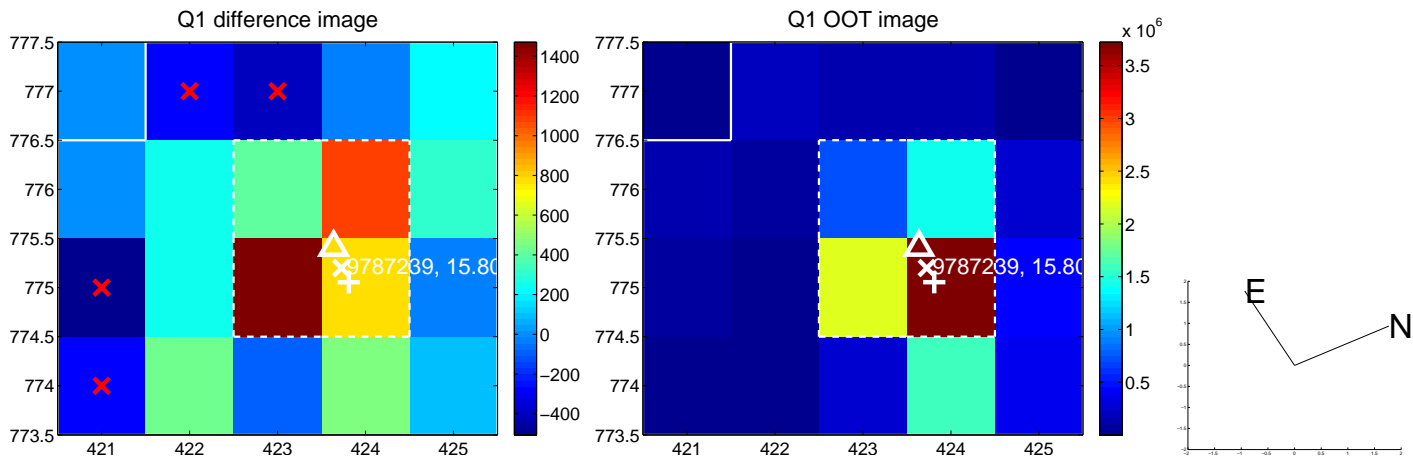
The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.435 \pm 0.604$	0.72	$0.384 \pm 0.672$	$-0.204 \pm 0.239$
PRF-fit source offset from KIC position	$0.063 \pm 0.698$	0.09	$0.047 \pm 0.657$	$0.042 \pm 0.335$
photometric centroid source offset	$0.83 \pm 0.76$	1.09	$-0.30 \pm 0.76$	$-0.78 \pm 0.76$

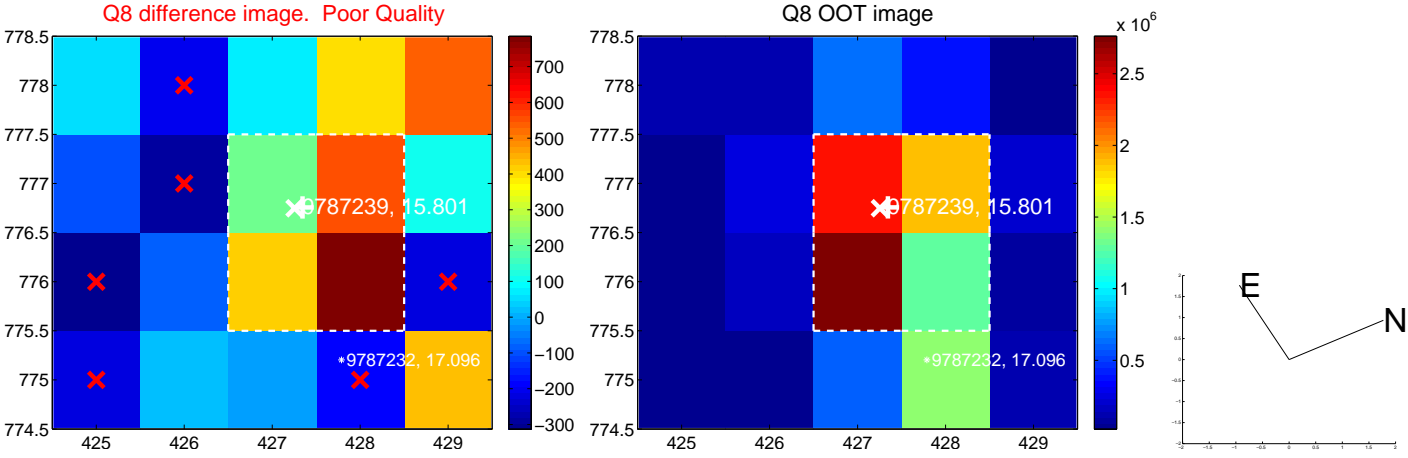
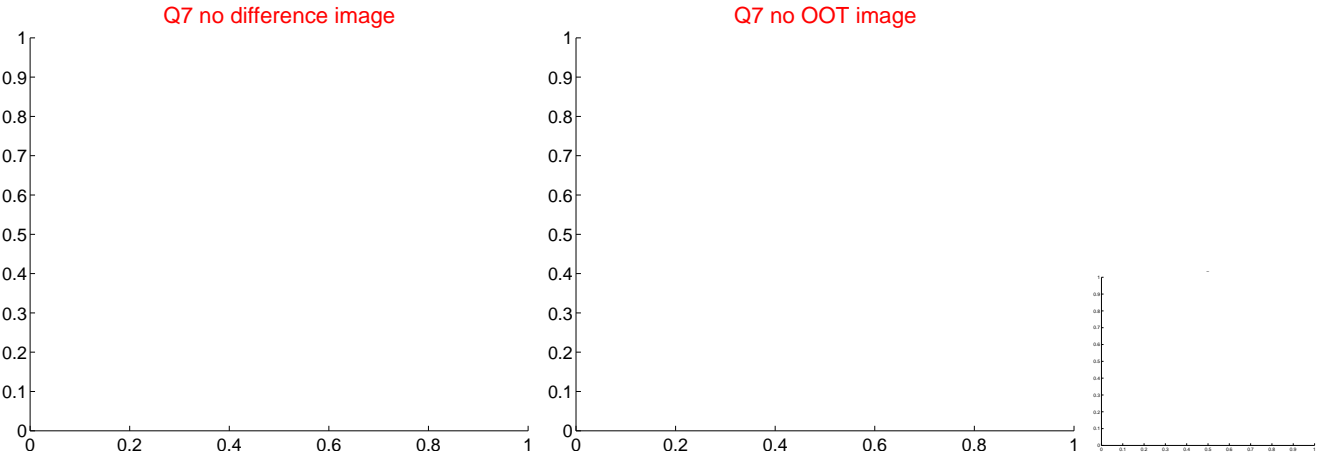
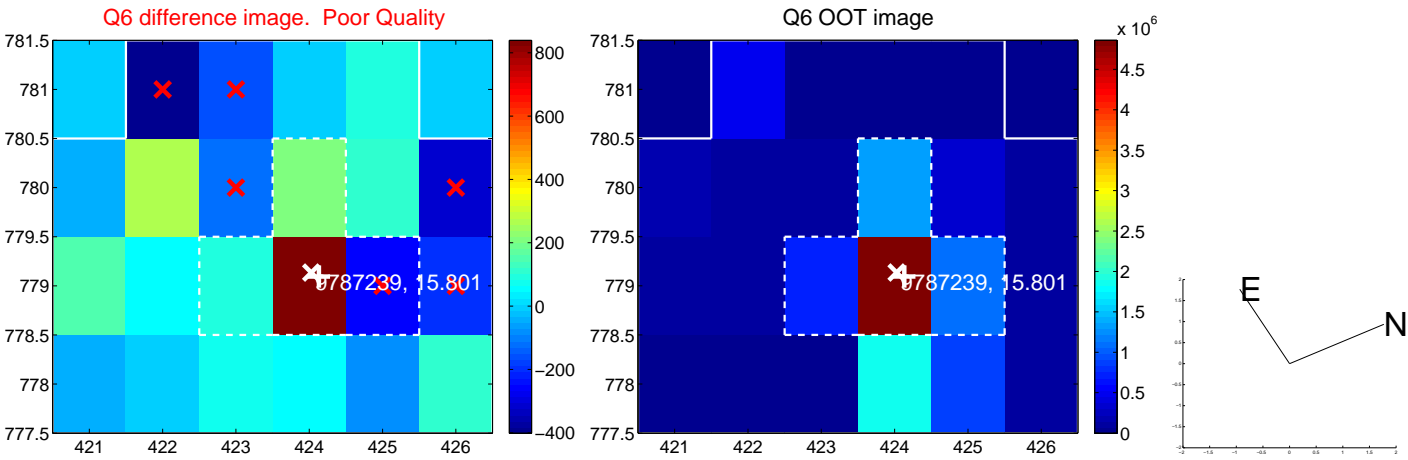
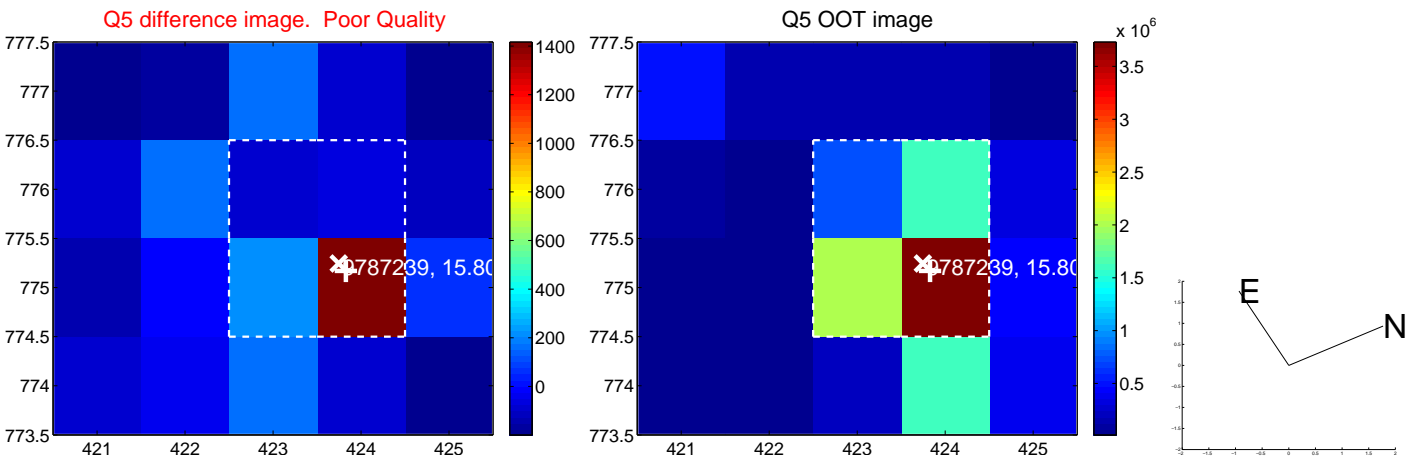


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

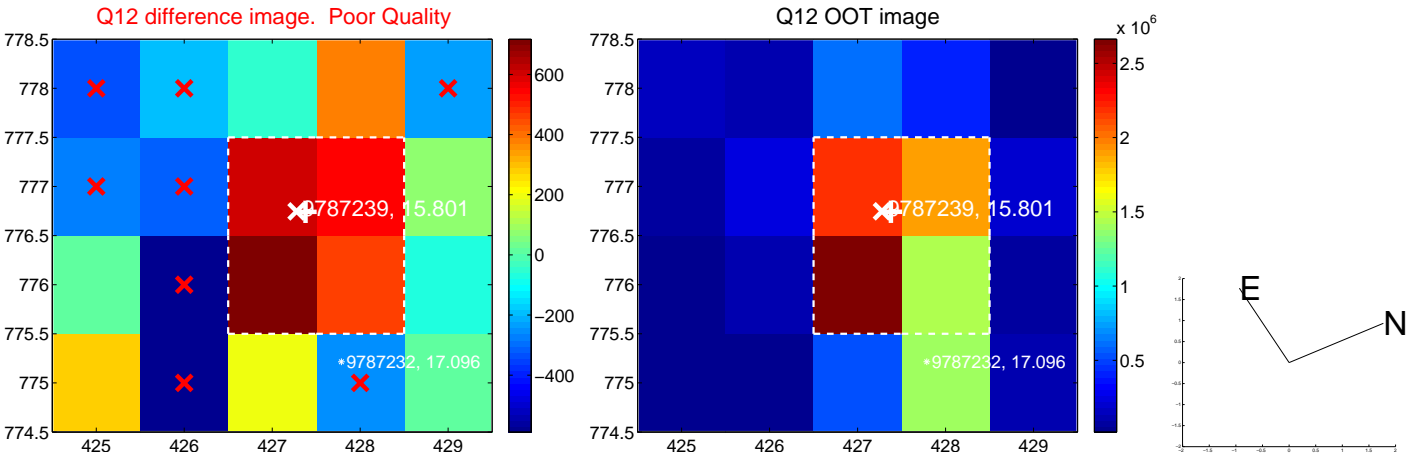
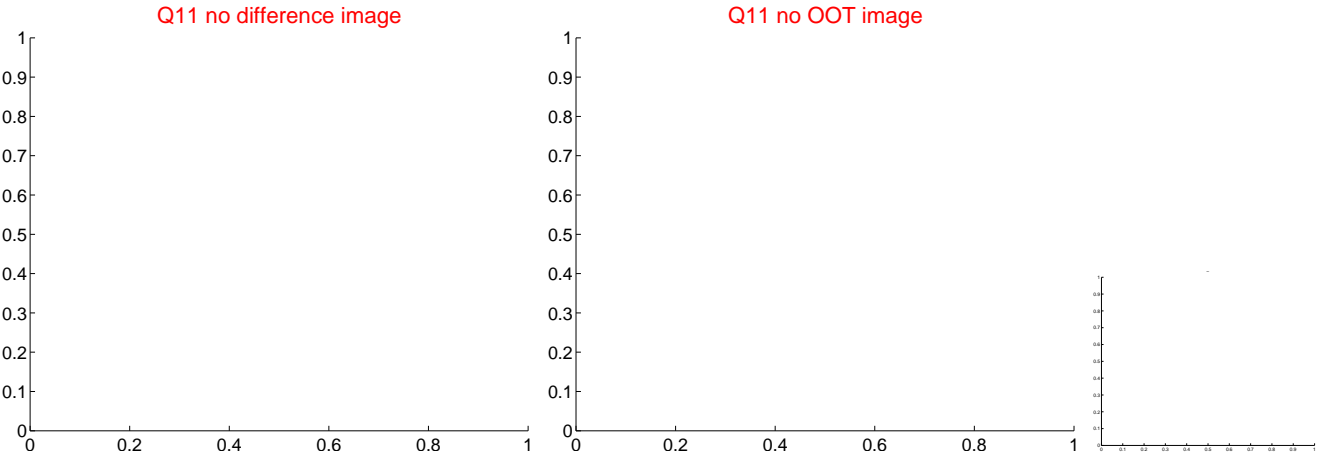
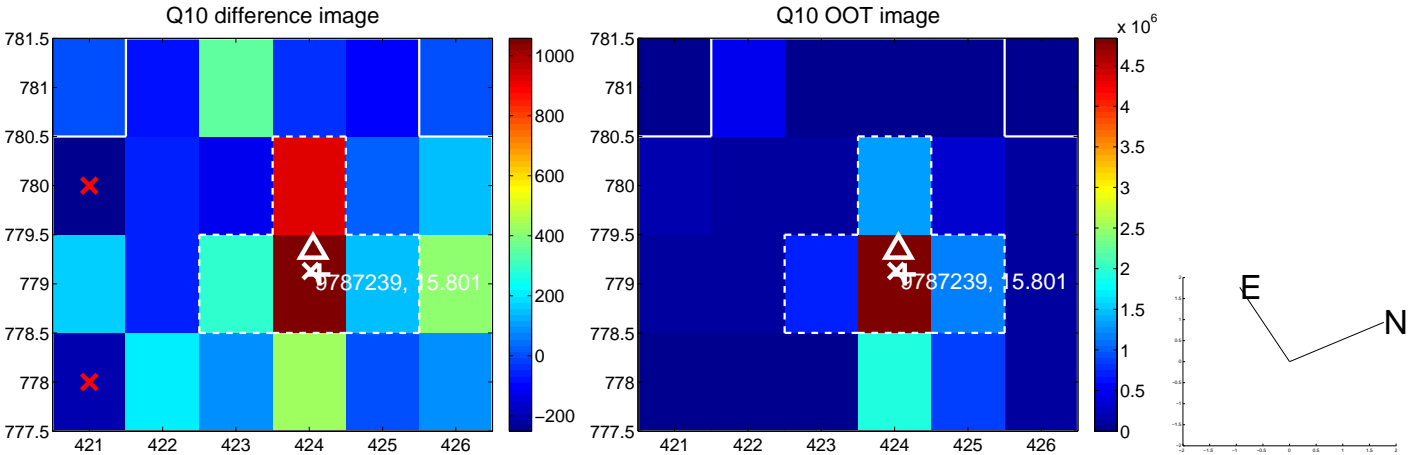
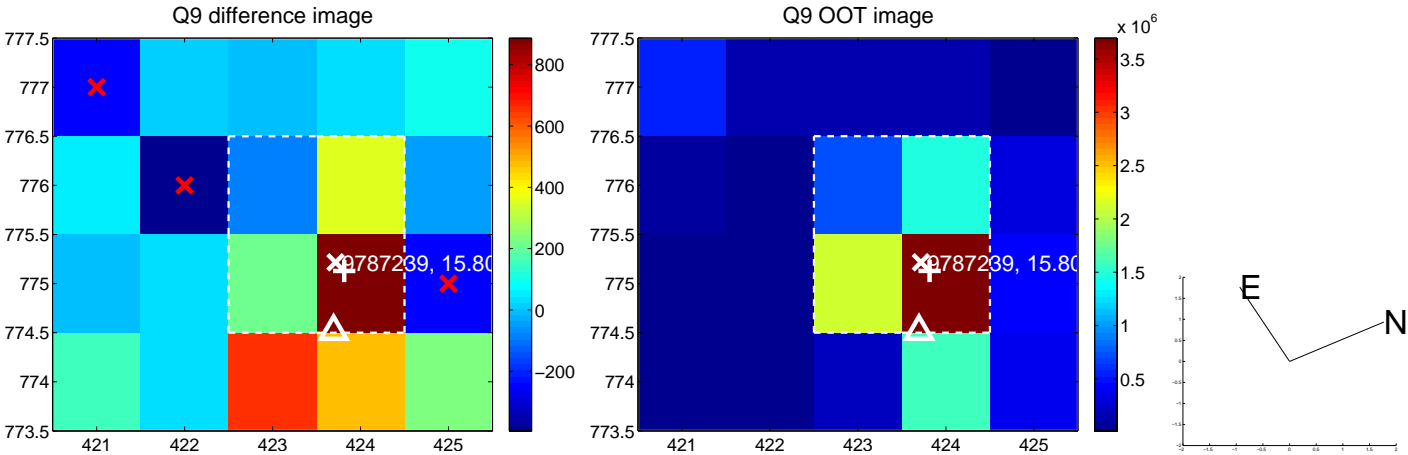
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



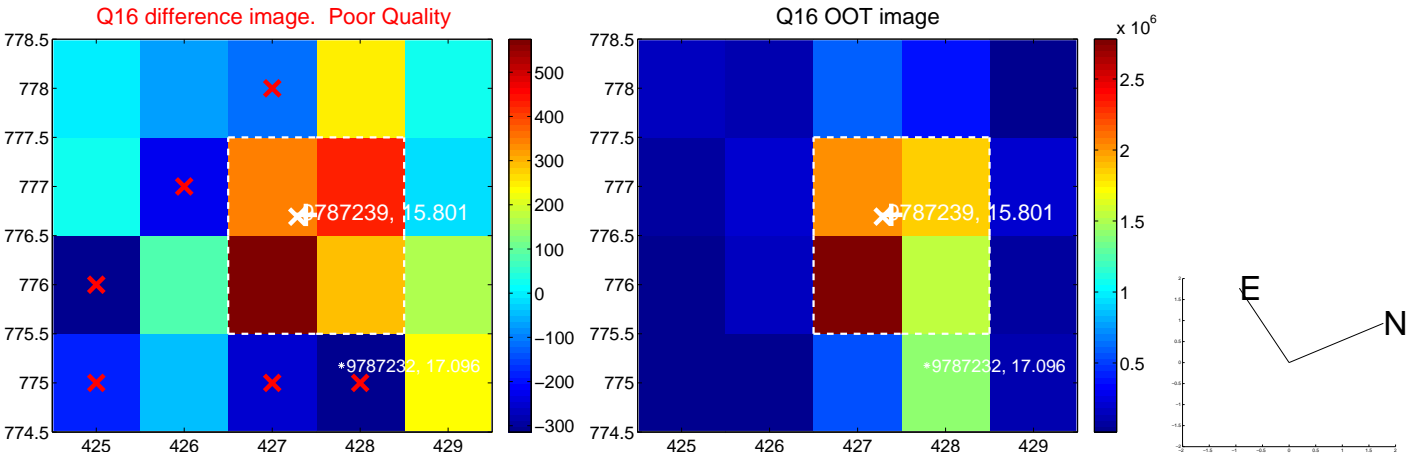
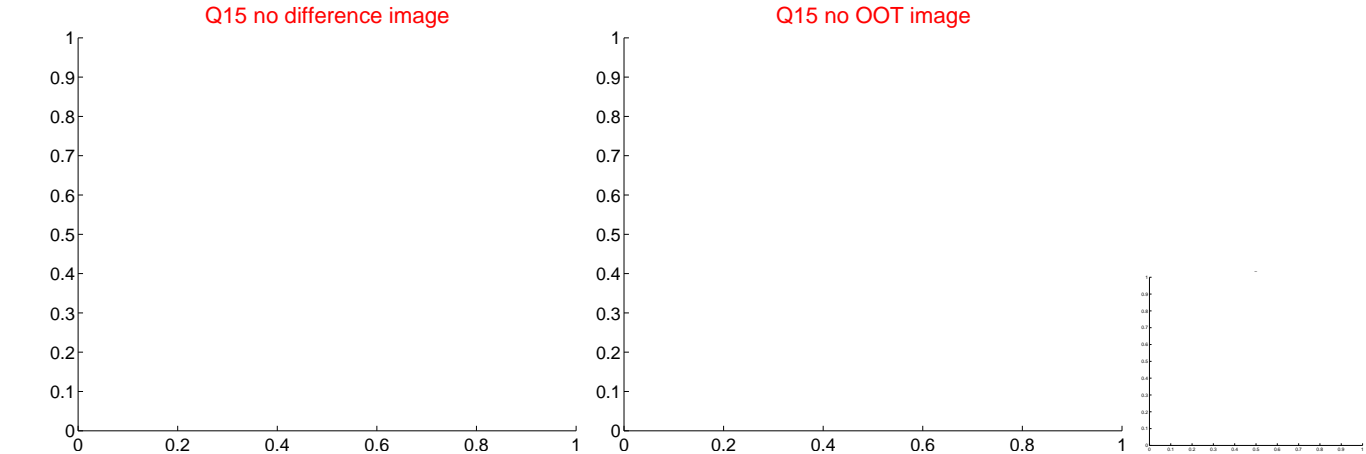
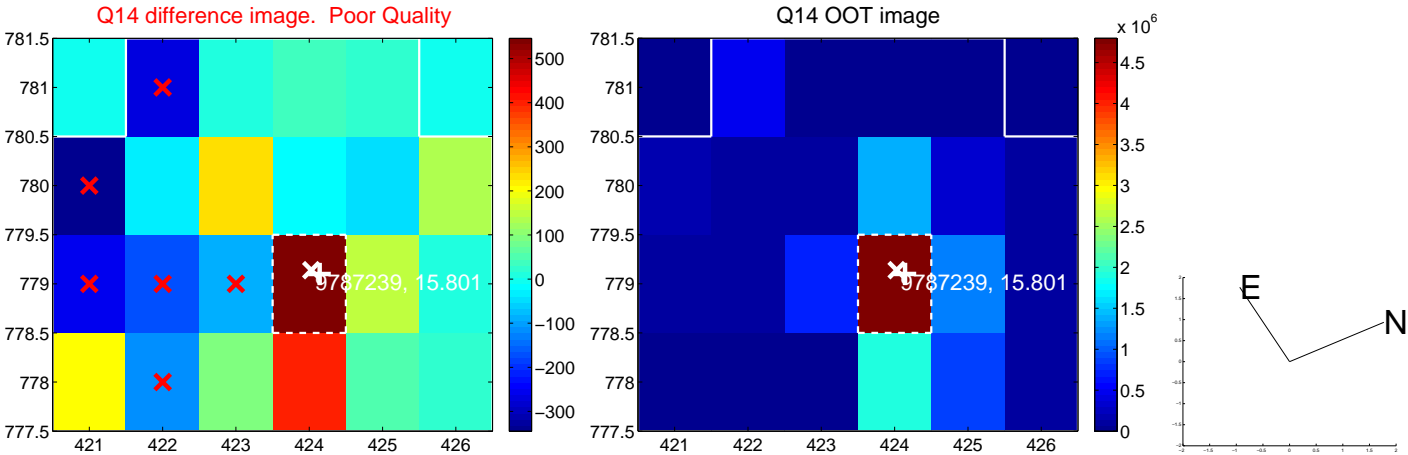
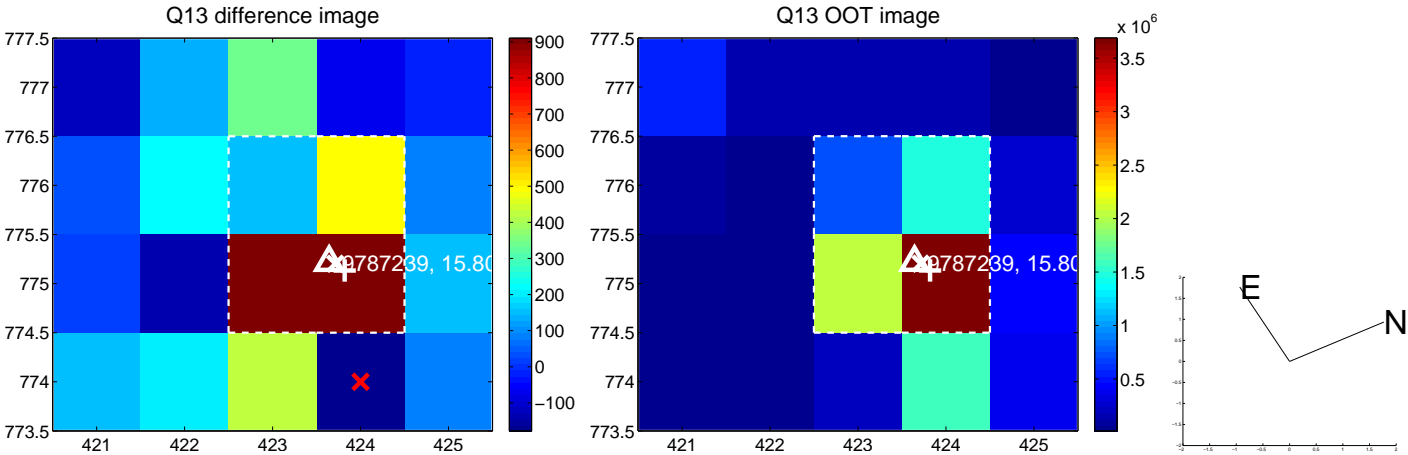
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



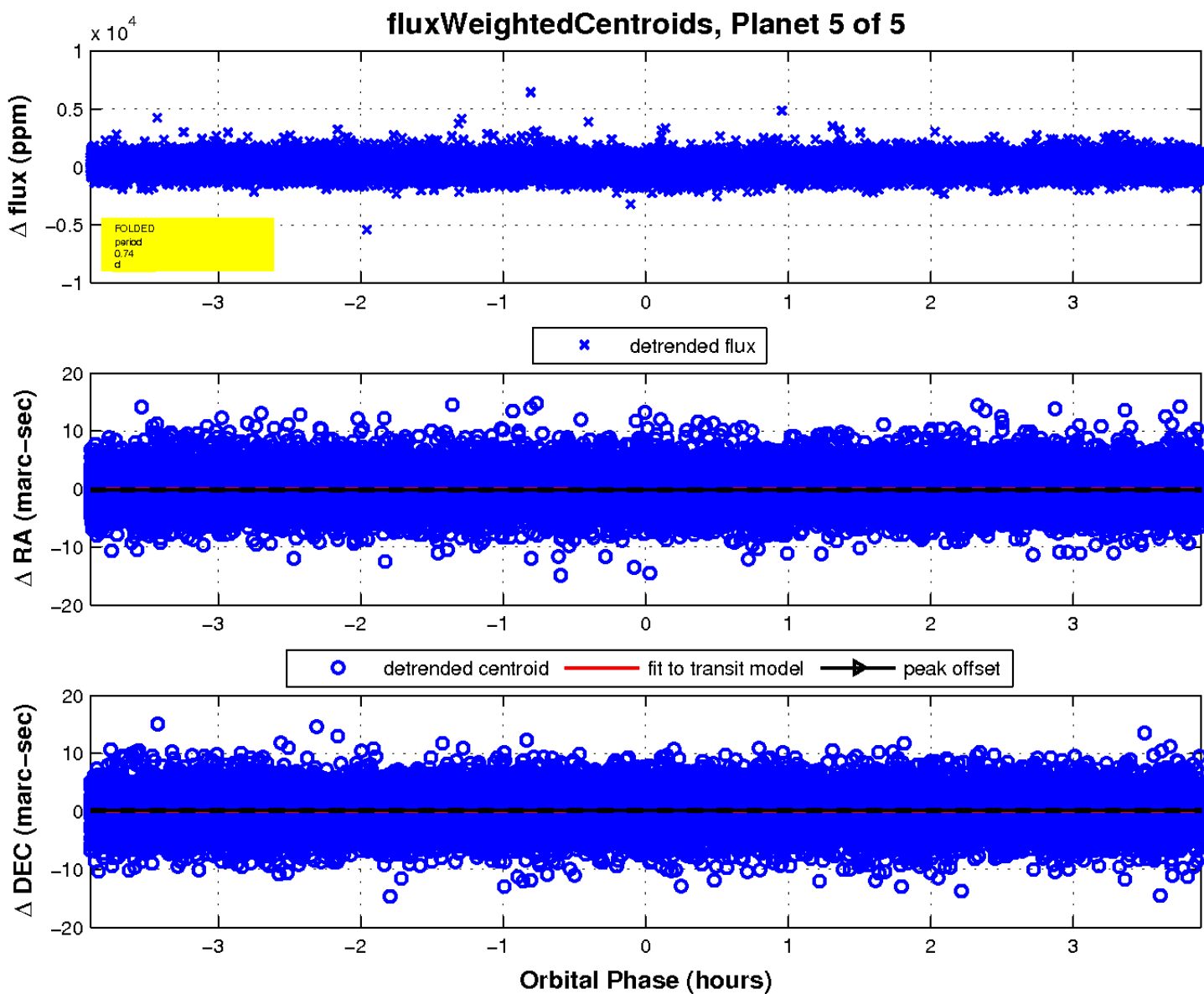
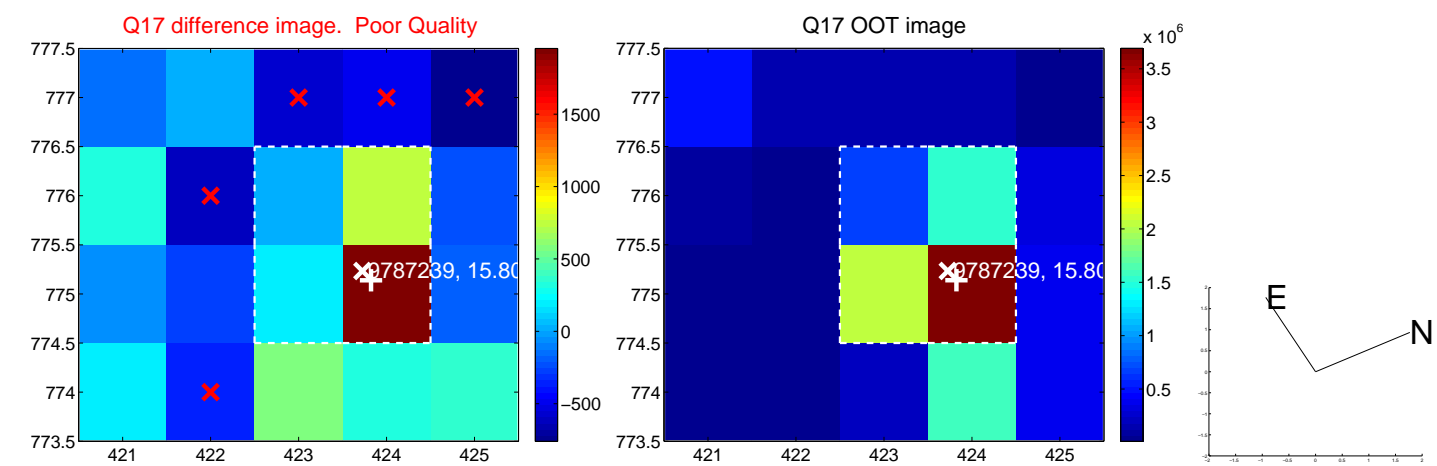
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

