

# KIC 008827575

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008827575-01	OBS	3052.01	10.129661	135.990817	87.6	3.453	12.3	12.1	0.84	5383	0.83	69.57
008827575-02	OBS	3052.02	15.611226	144.873378	102.7	3.859	11.3	11.7	0.84	5383	1.03	39.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008827575-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
008827575-02	OBS	PC	0.87	0	0	0	0	NO_COMMENT

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

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

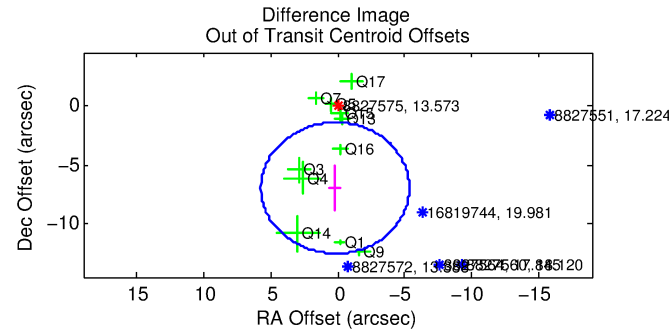
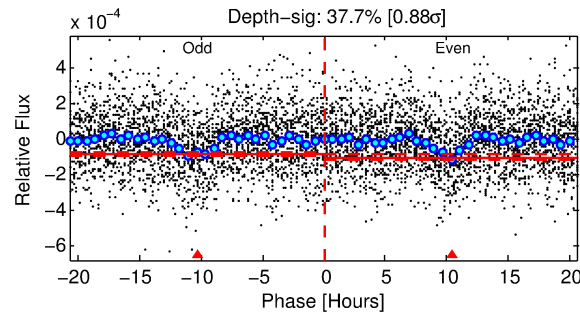
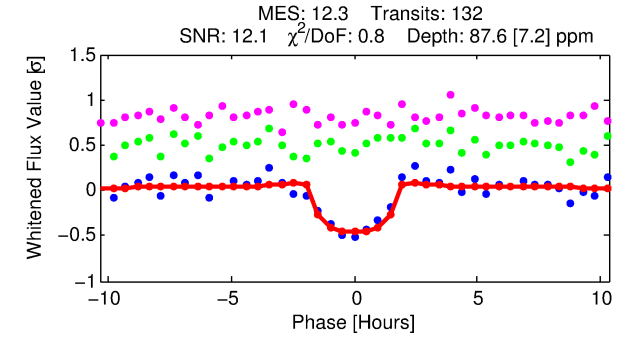
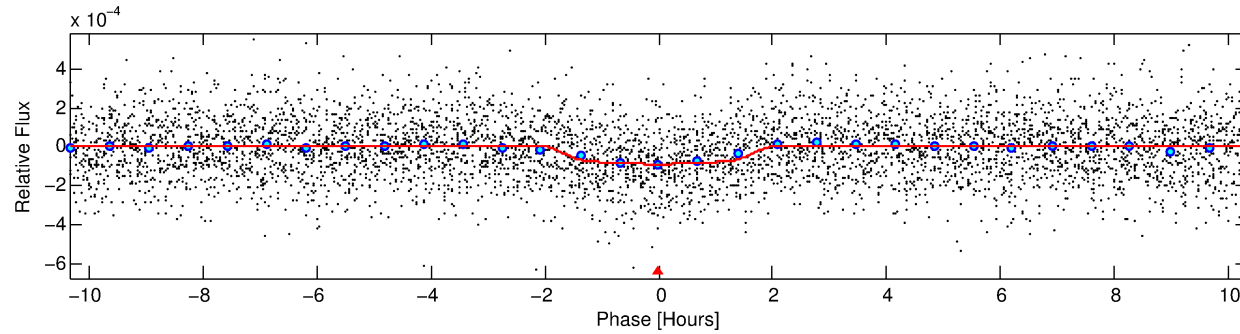
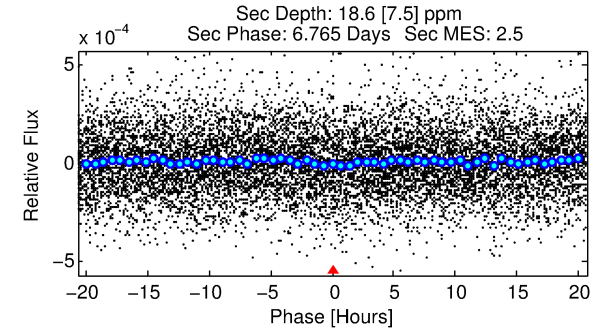
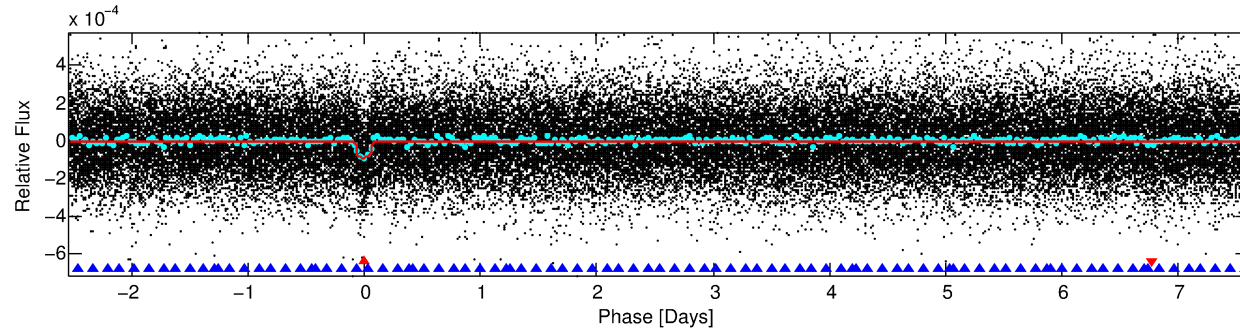
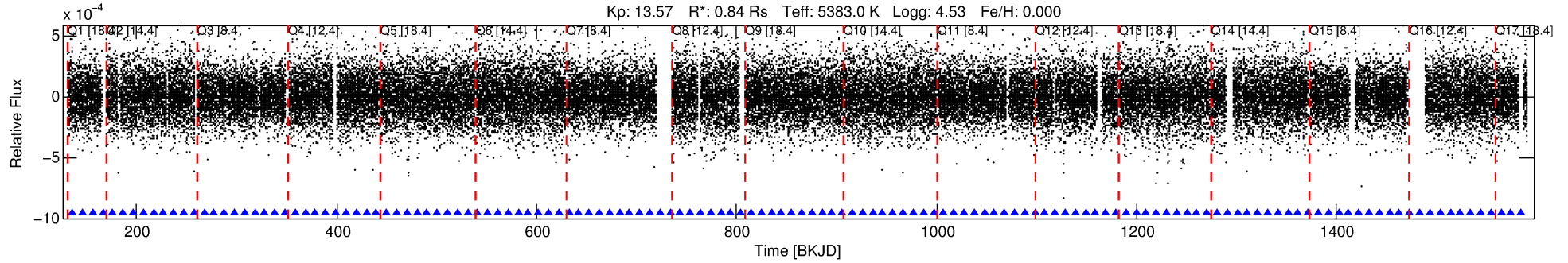
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008827575-01

No Significant Match Found

# DV One-Page Summary

KIC: 8827575 Candidate: 1 of 2 Period: 10.130 d  
KOI: K03052.01 Corr: 0.963



## DV Fit Results:

Period = 10.12966 [0.00007] d  
Epoch = 135.9908 [0.0053] BKJD  
Rp/R\* = 0.0091 [0.0054]  
a/R\* = 16.74 [38.13]  
b = 0.68 [1.85]  
Seff = 69.57 [11.02]  
Teff = 736 [29] K  
Rp = 0.84 [0.50] Re  
a = 0.0876 [0.0078] AU  
Ag = 112.66 [141.08] [0.79σ]  
Teffp = 3709 [1157] K [2.57σ]

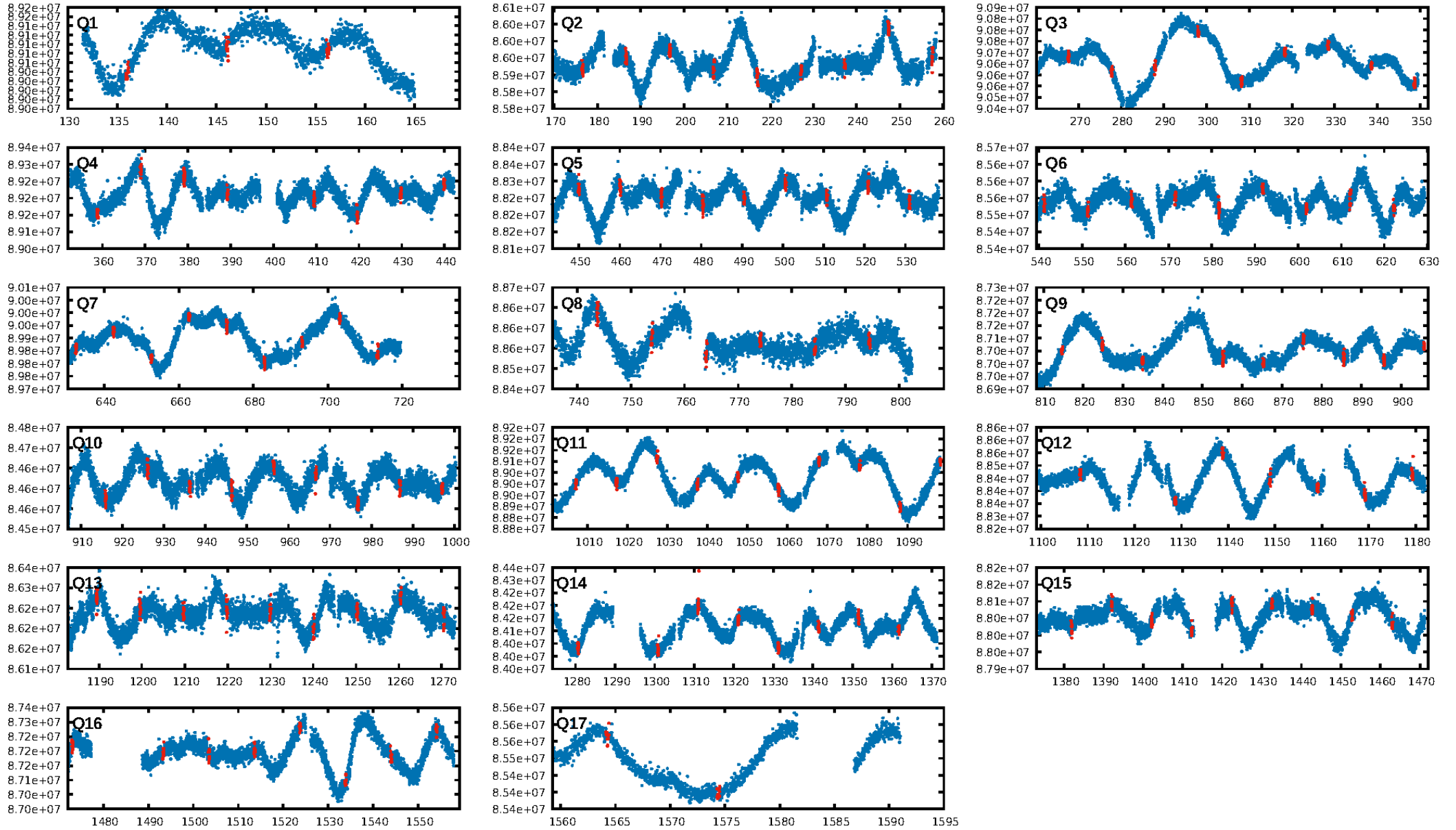
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [25.40σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.45e-33  
RollingBand-fgt: 1.00 [127/127]  
GhostDiagnostic-chr: 3.522  
Centroid-sig: 77.0%  
Centroid-so: 1.134 arcsec [1.12σ]  
OotOffset-rm: 6.978 arcsec [3.78σ]  
KicOffset-rm: 7.265 arcsec [3.95σ]  
OotOffset-st: 1/3/2/5 [11]  
KicOffset-st: 1/3/2/5 [11]  
DiffImageQuality-fgm: 0.55 [6/11]  
DiffImageOverlap-fno: 1.00 [17/17]

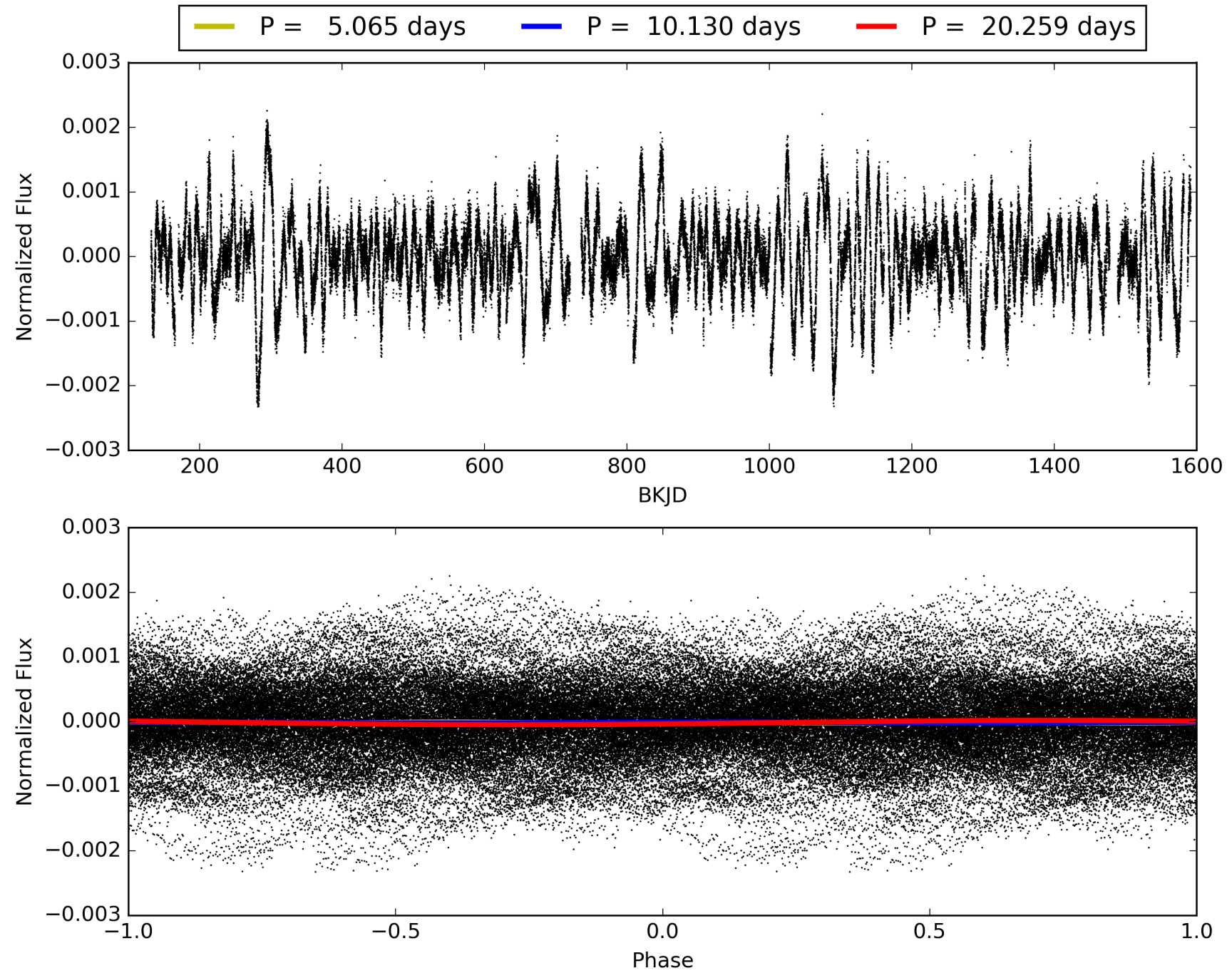
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008827575-01, PDC Light Curves

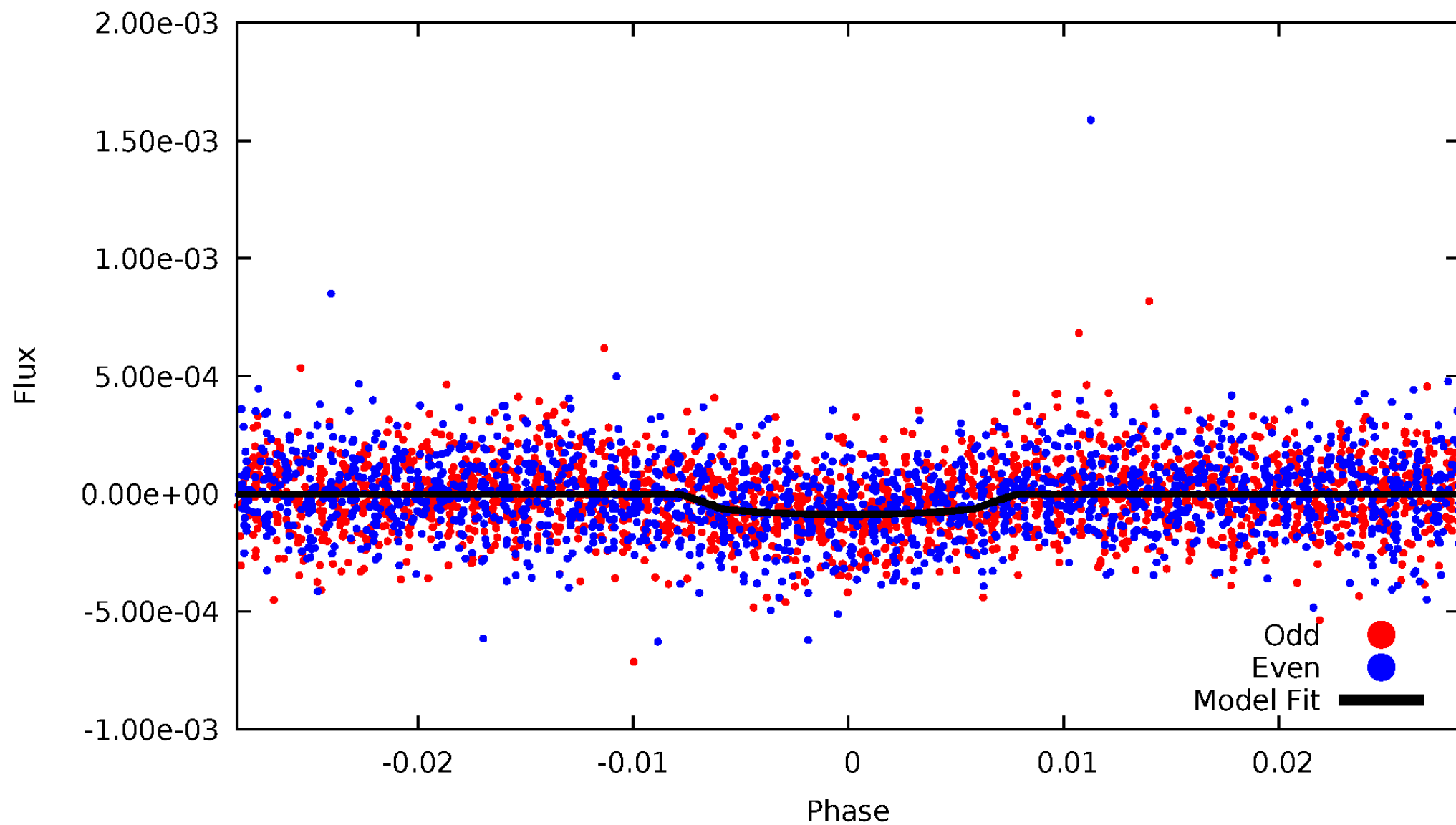


TCE 008827575-01



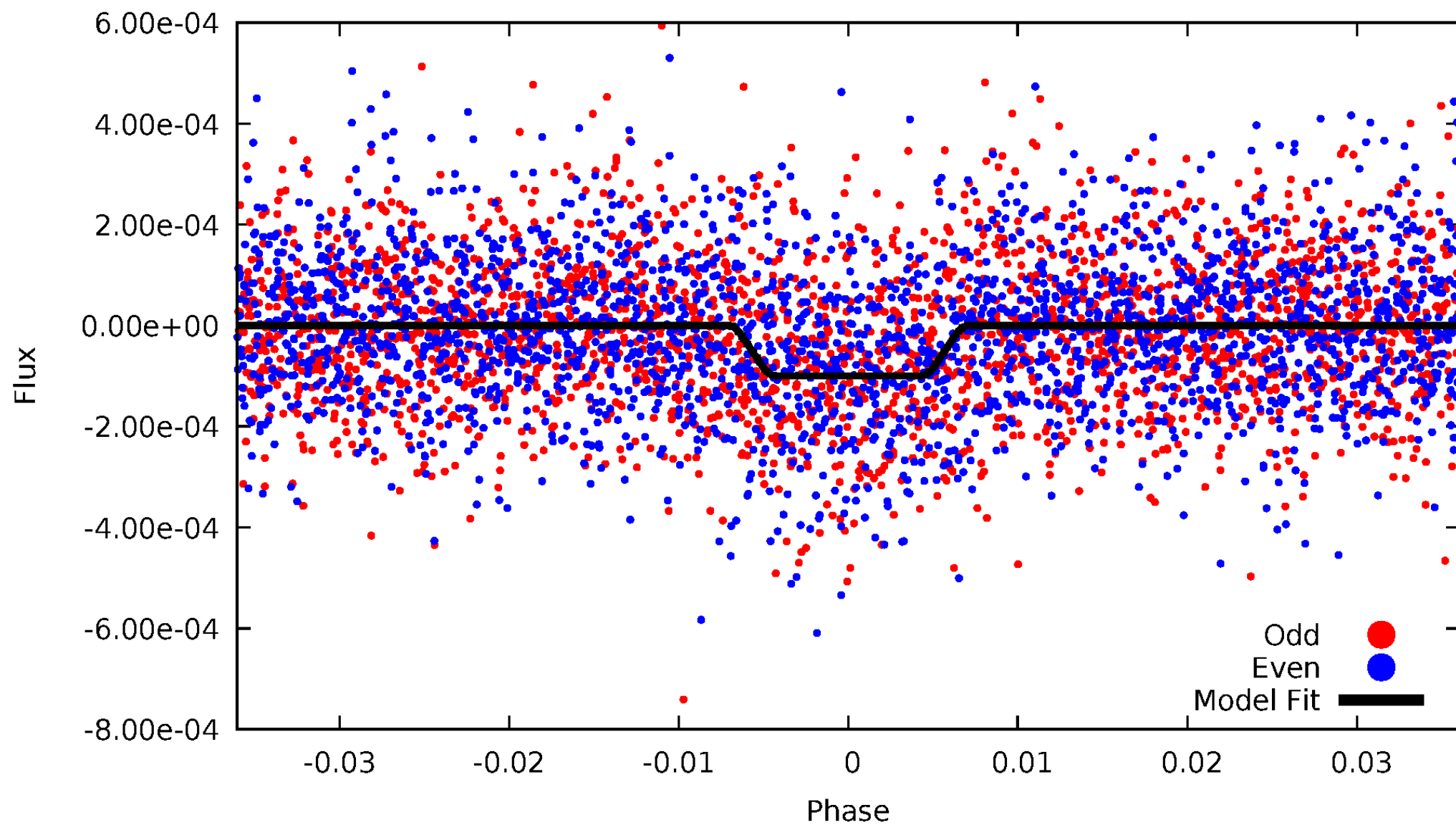
# DV Odd/Even

TCE 008827575-01



# ALT Odd/Even

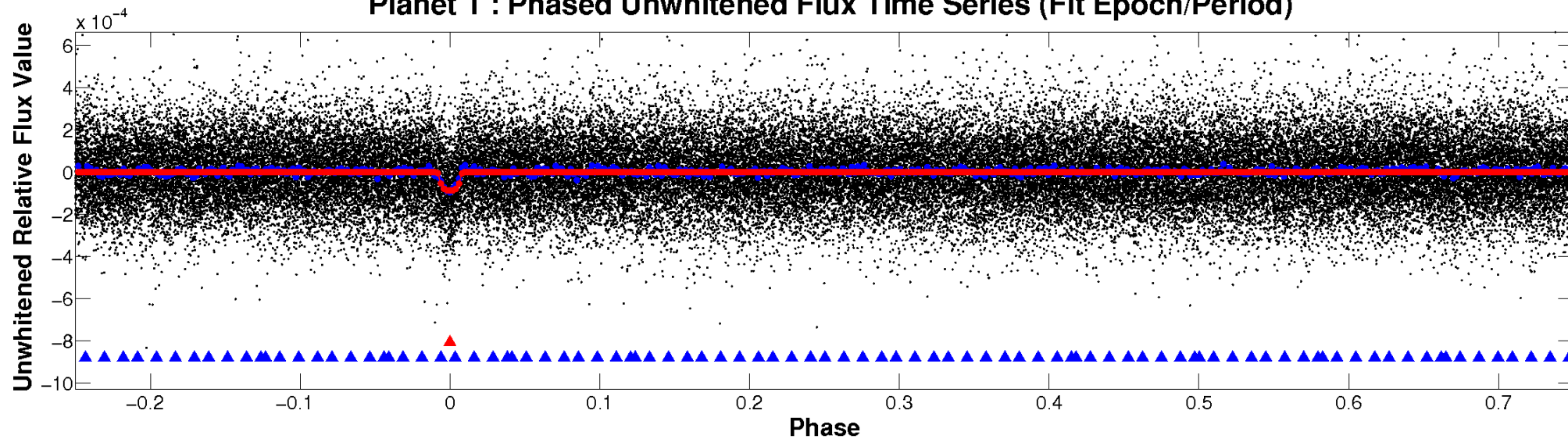
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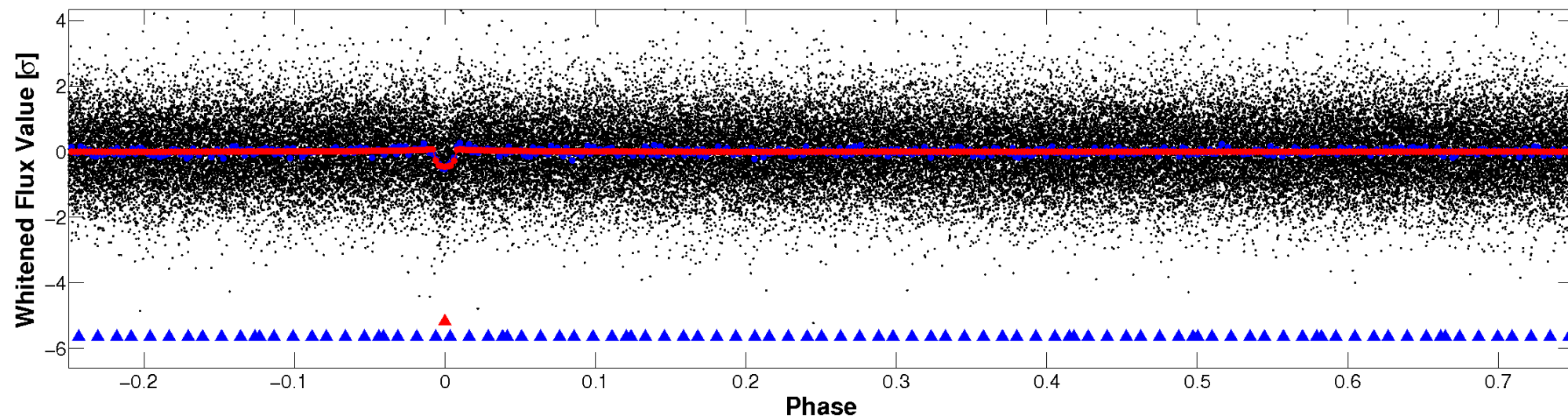


# Non-Whitened Vs. Whitened Light Curve

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

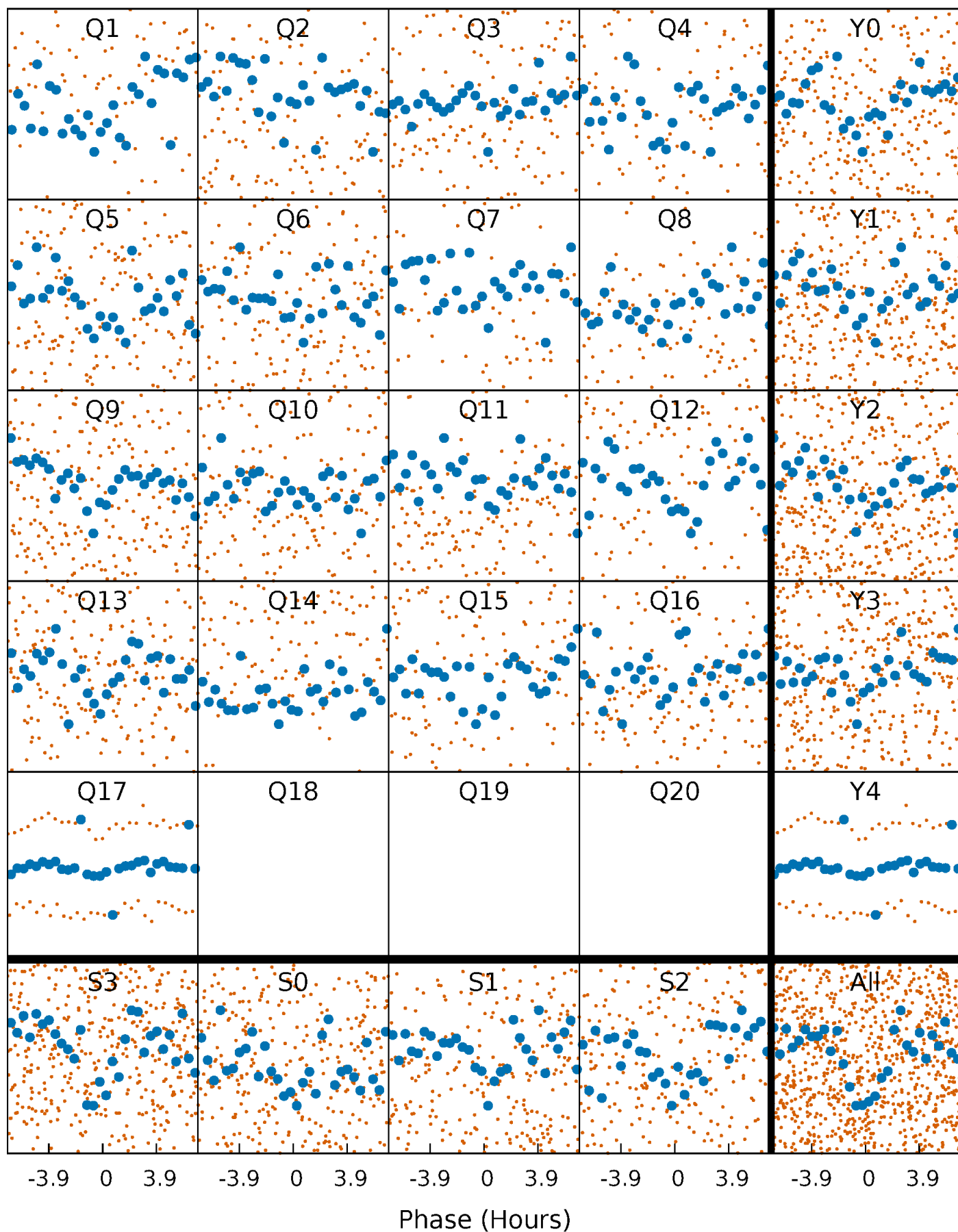


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

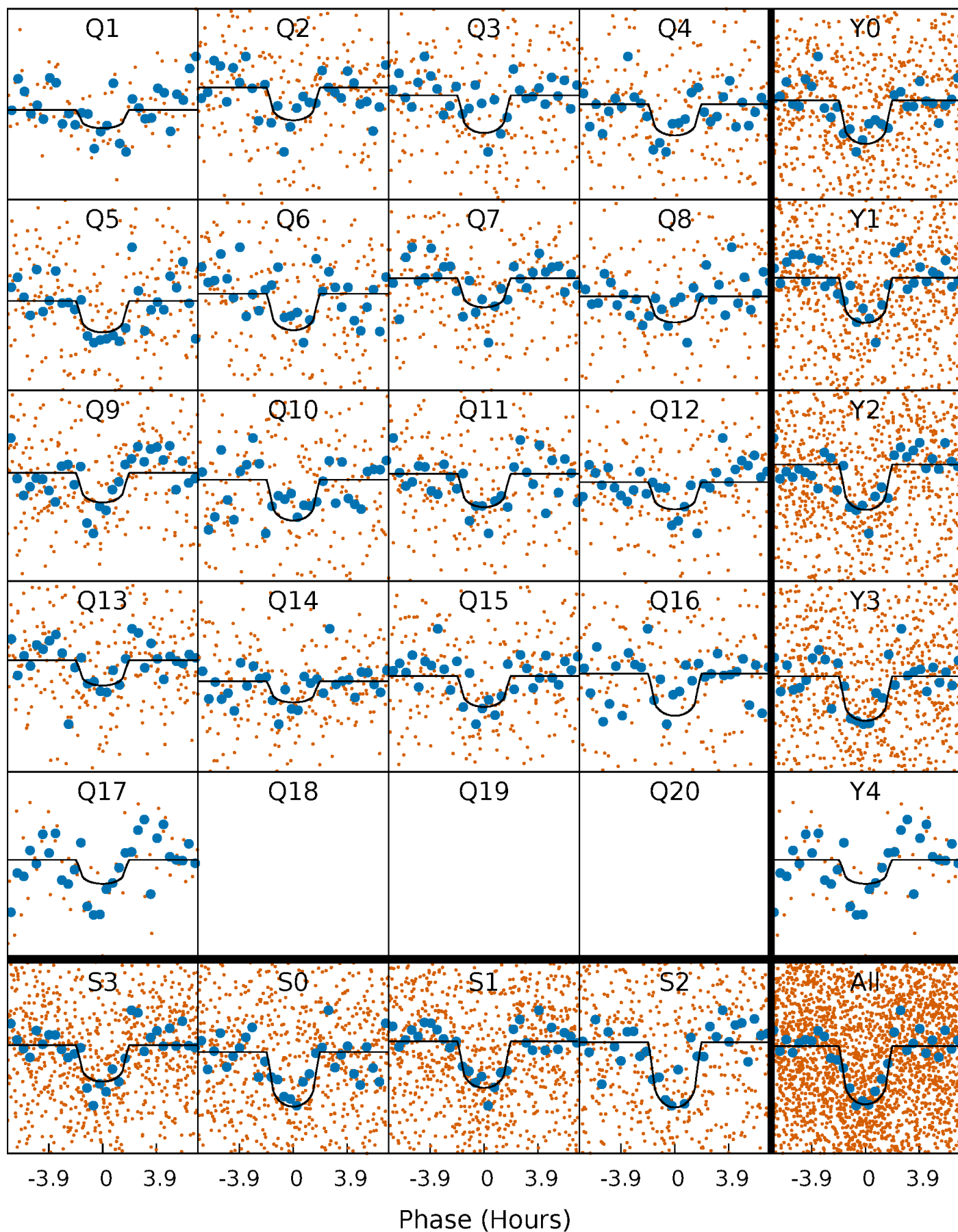
TCE 008827575-01 P= 10.129661 Days  $T_0=135.990817$  (BKJD)





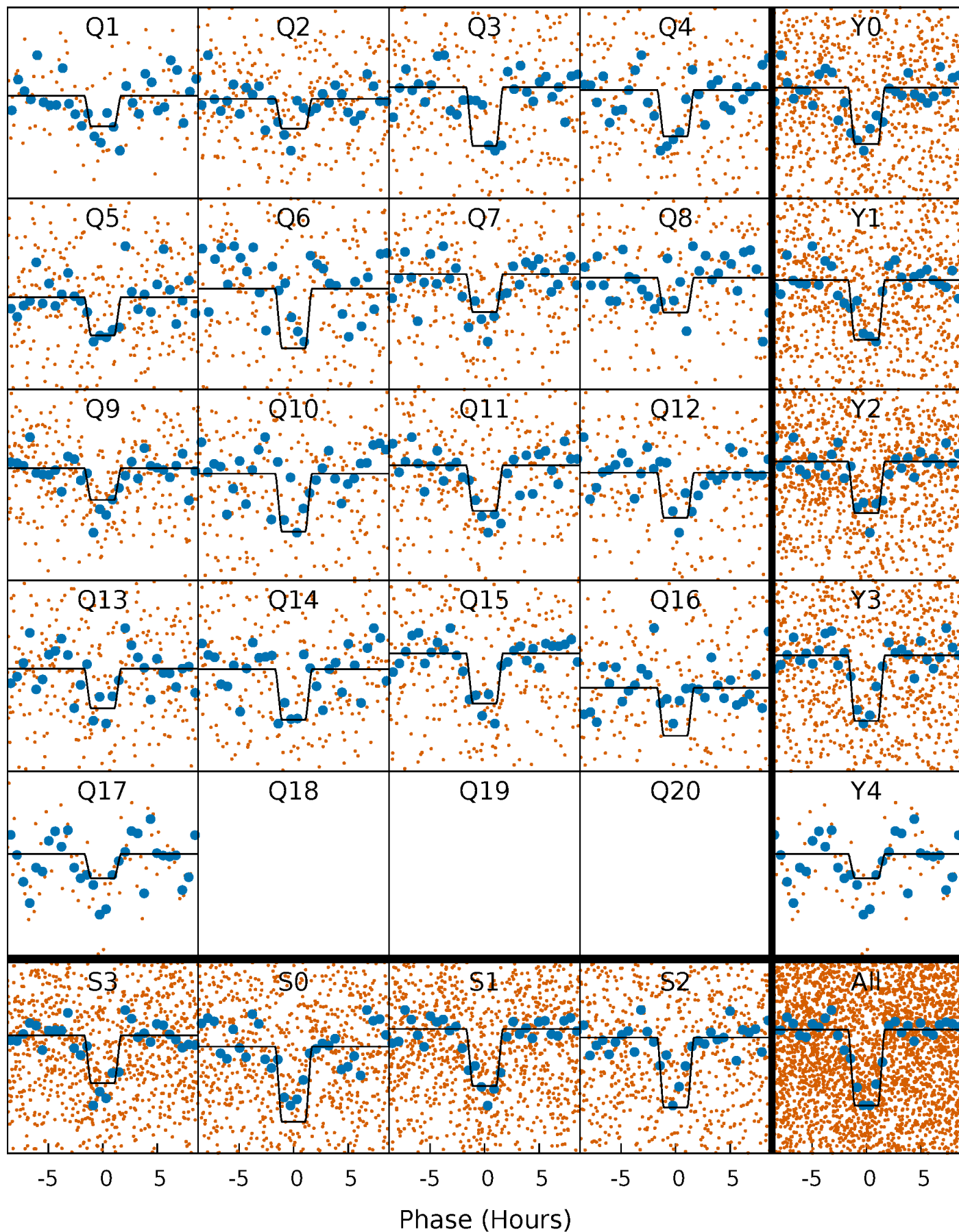
# DV Quarter-Phased Transit Curves

TCE 008827575-01 P= 10.129661 Days  $T_0=135.990817$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

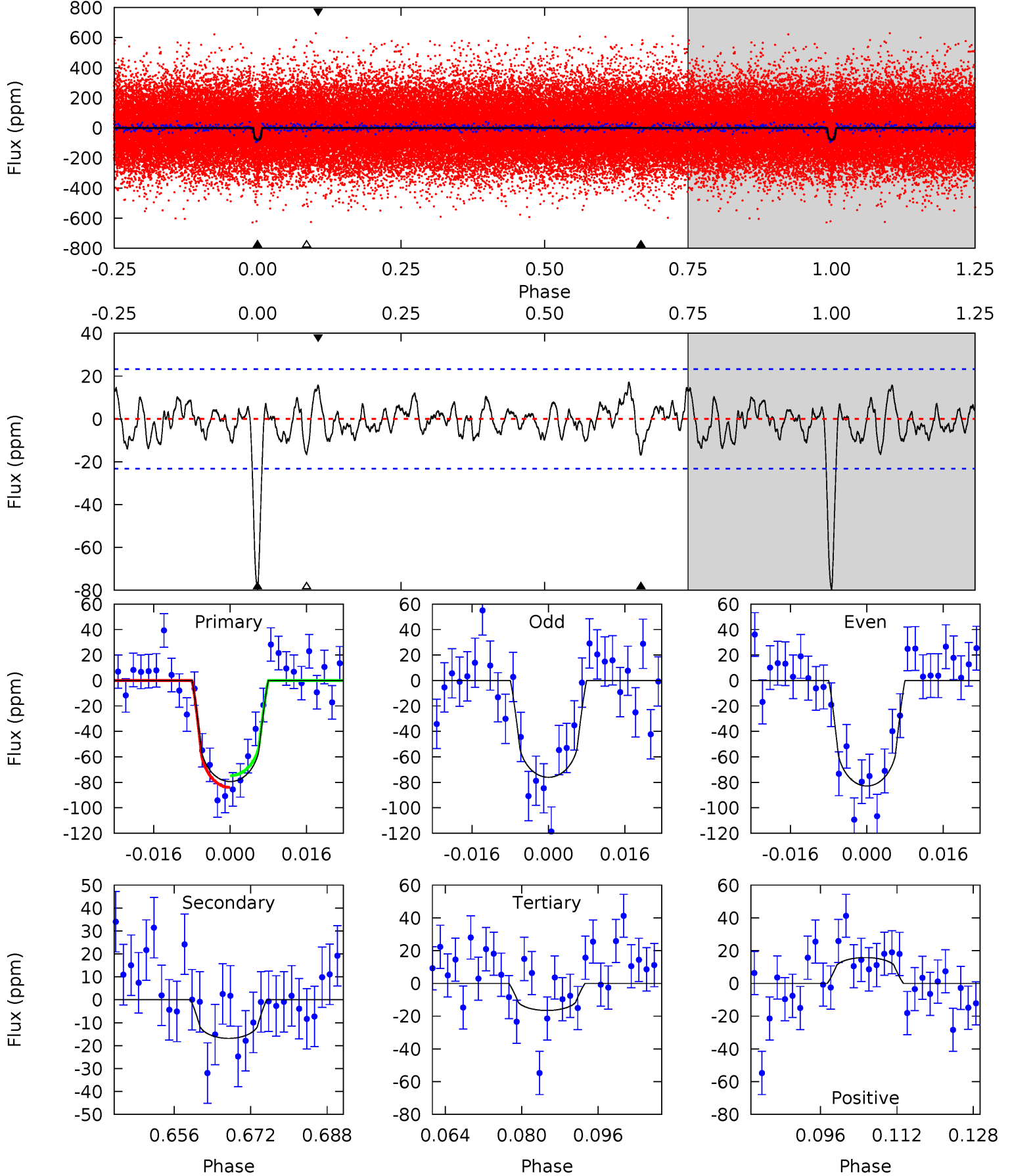
TCE 008827575-01 P= 10.129635 Days  $T_0=135.991096$  (BKJD)



# DV Model-Shift Uniqueness Test

008827575-01, P = 10.129661 Days, E = 125.861156 Days

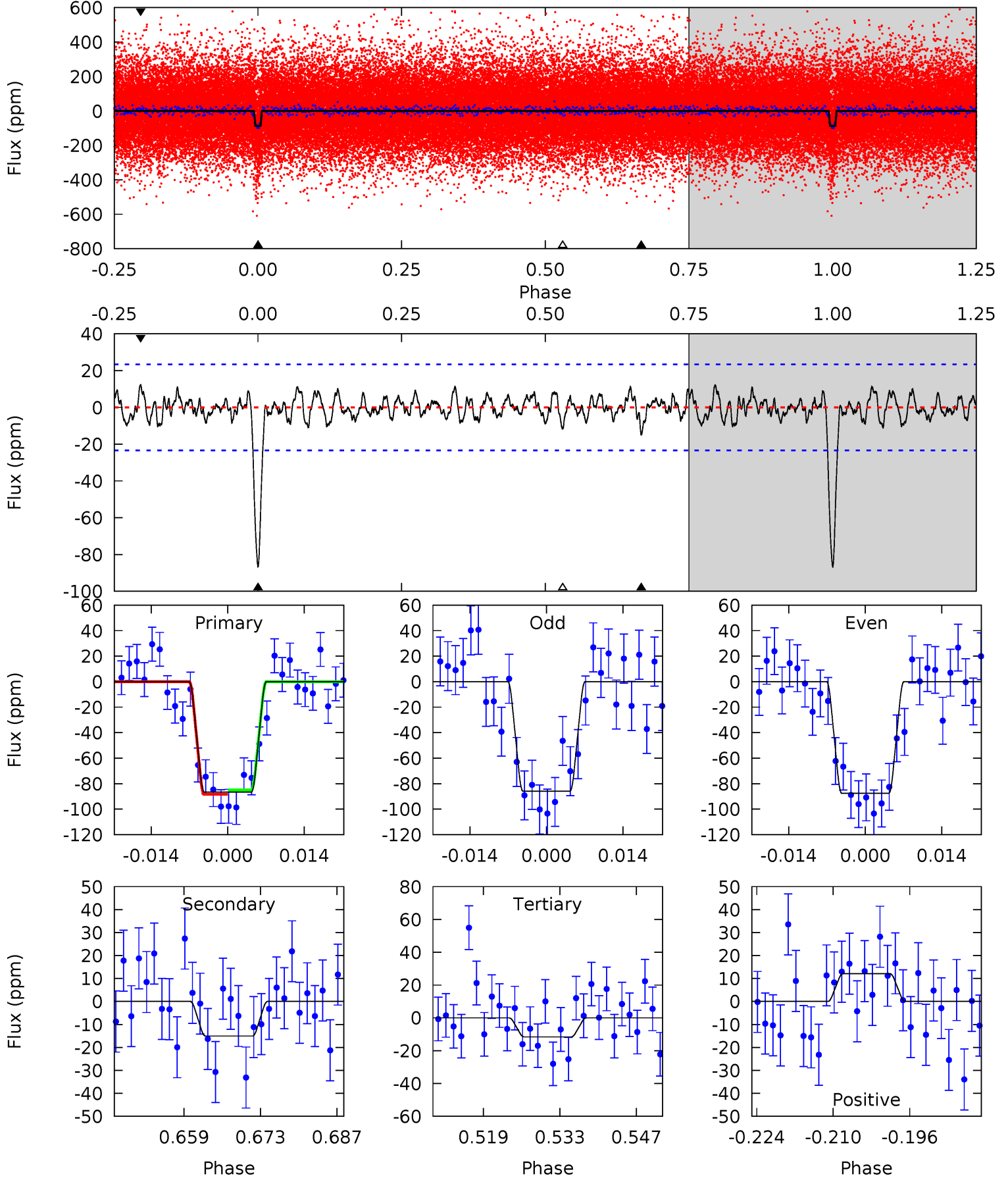
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	3.58	3.51	3.35	4.94	2.41	1.28	13.3	13.5	0.07	0.23	0.73	0.92	0.18	0.98



# Alt Model-Shift Uniqueness Test

008827575-01, P = 10.129635 Days, E = 125.861461 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
18.4	3.19	2.46	2.56	4.96	2.46	1.01	15.9	15.8	0.73	0.63	0.18	0.97	0.12	0.37



### Stellar Parameters For KIC 008827575

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5383^{+107}_{-107}$	$4.528^{+0.042}_{-0.078}$	$0.000^{+0.150}_{-0.150}$	$0.842^{+0.084}_{-0.045}$	$0.874^{+0.048}_{-0.054}$	$2.060^{+0.322}_{-0.487}$
	+2%/-2%	+1%/-2%	+inf%/-inf%	+10%/-5%	+5%/-6%	+16%/-24%
Source	SPE57	SPE57	SPE57	DSEP		

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

### Secondary Eclipse Parameters for KIC 008827575-01 / KOI 3052.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-17 \pm 5$	$0.90^{+0.52}_{-0.44}$	$1033^{+33}_{-28}$	$3815^{+1133}_{-518}$	$84^{+267}_{-51}$
Alt.	$-15 \pm 5$	$0.95^{+0.46}_{-0.46}$	$1035^{+29}_{-30}$	$3705^{+1015}_{-508}$	$70^{+189}_{-43}$

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



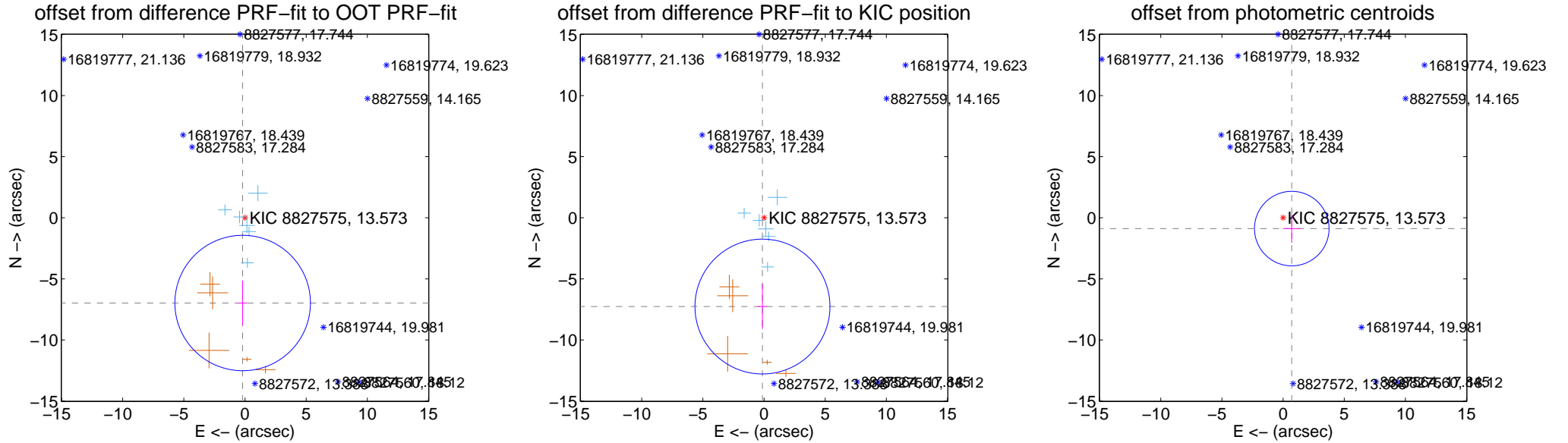
## DV Centroid Data

Supplemental centroid analysis for 008827575-01. Kepler magnitude: 13.57. Transit SNR 12.09

There are 6 quarters with good PRF difference image offsets

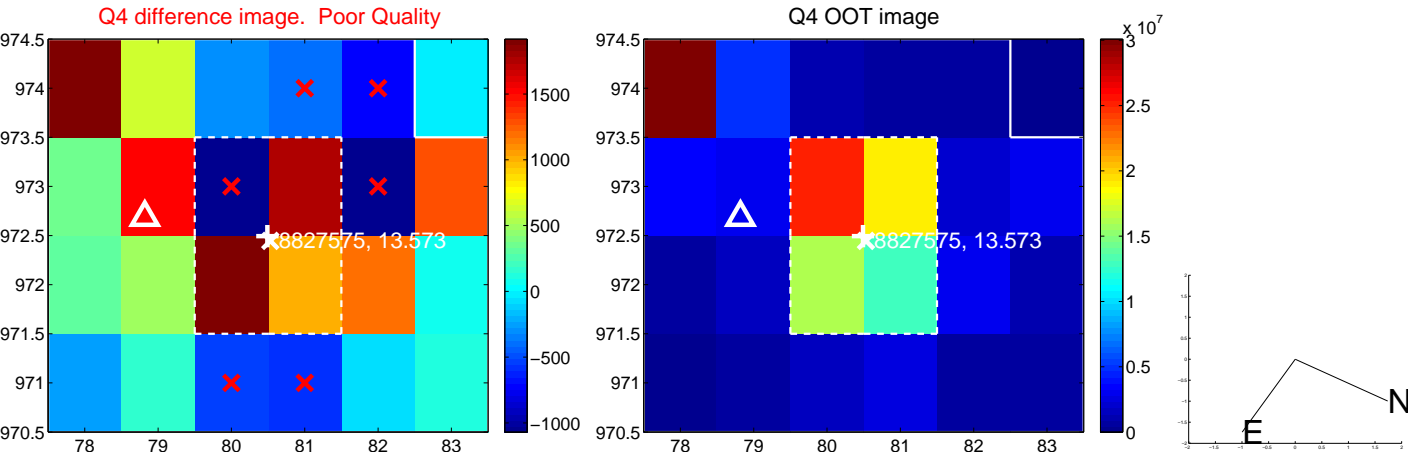
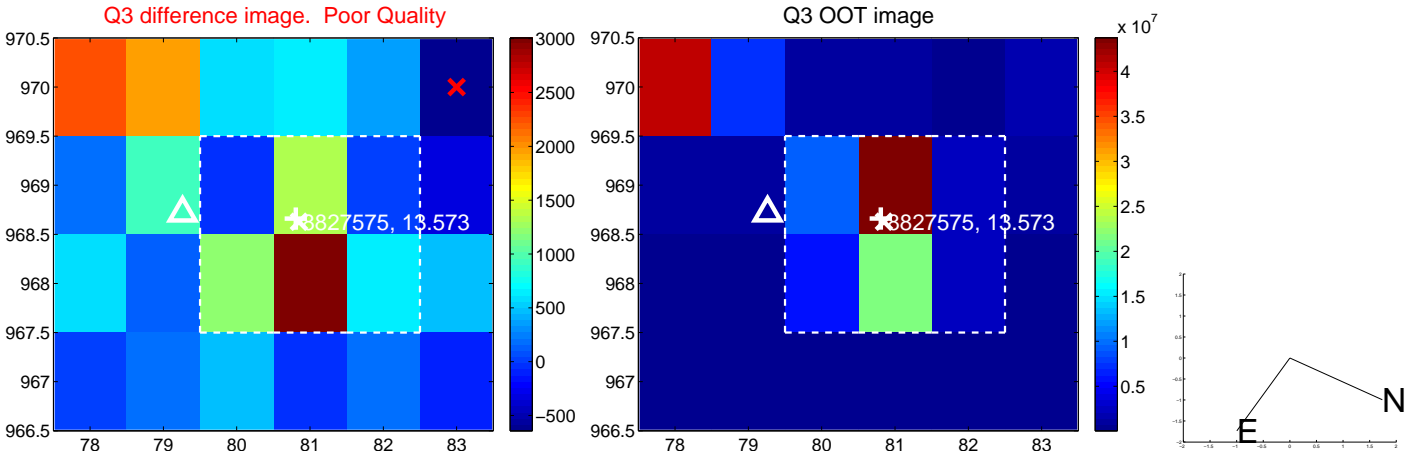
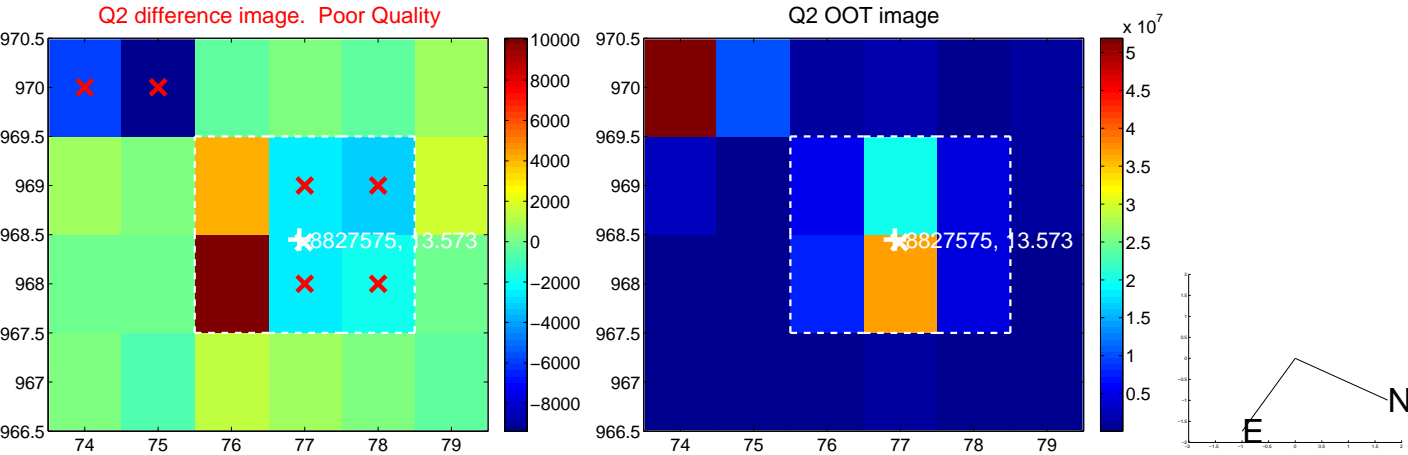
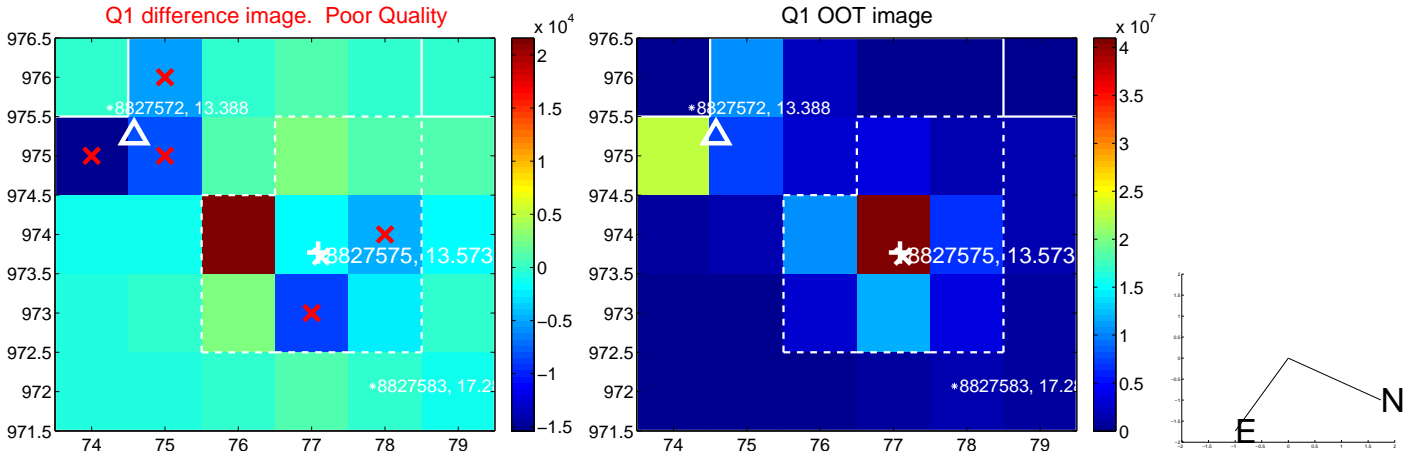
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.978 \pm 1.847$	<b>3.78</b>	$0.192 \pm 0.375$	$-6.975 \pm 1.848$
PRF-fit source offset from KIC position	$7.265 \pm 1.839$	<b>3.95</b>	$0.129 \pm 0.385$	$-7.264 \pm 1.840$
photometric centroid source offset	$1.13 \pm 1.02$	1.12	$-0.71 \pm 0.71$	$-0.88 \pm 1.17$

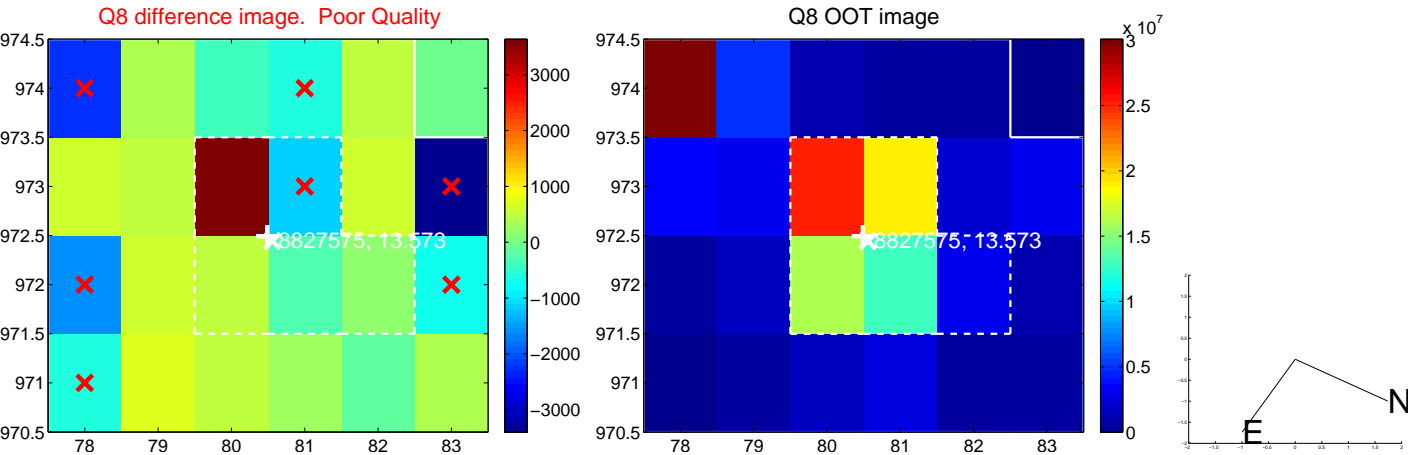
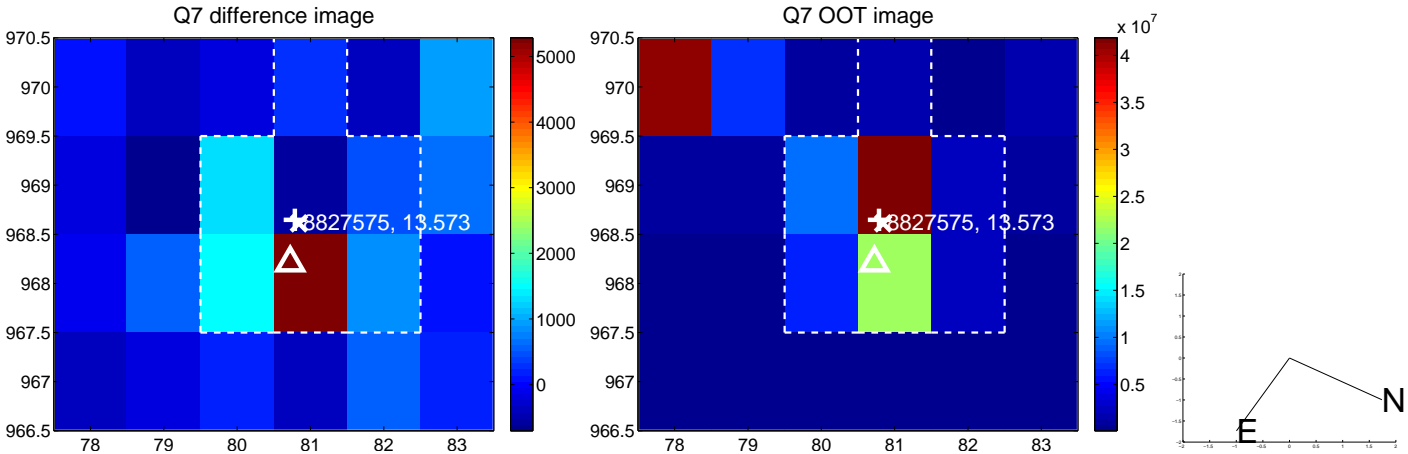
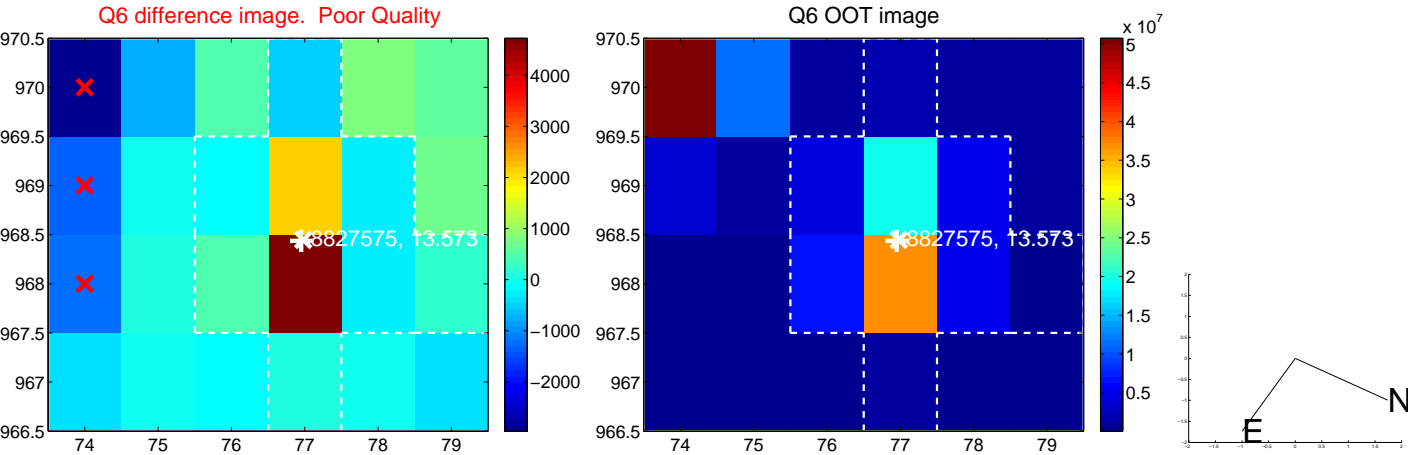
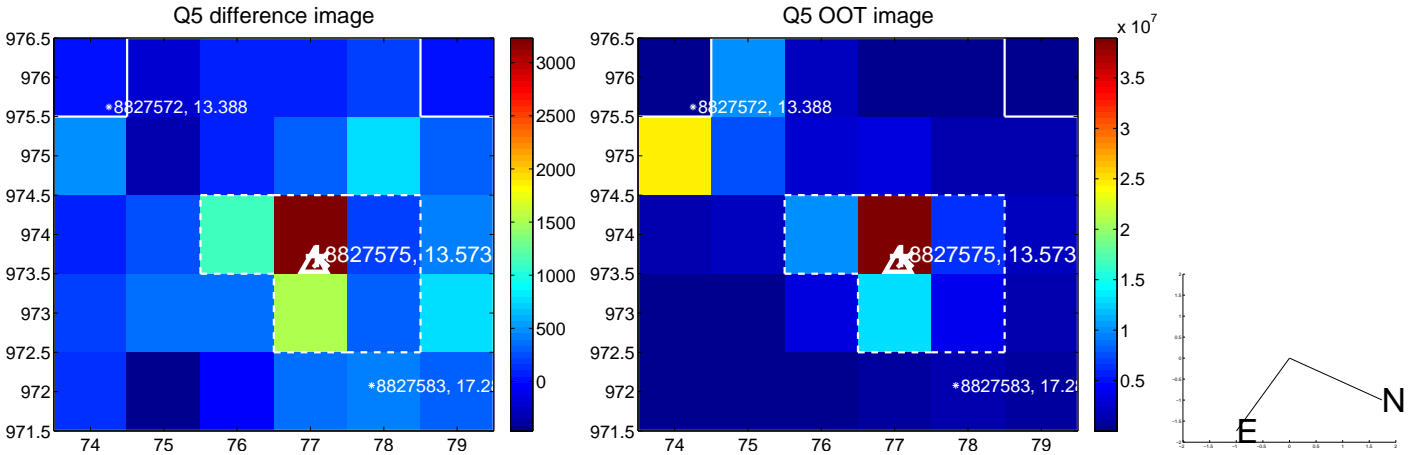


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

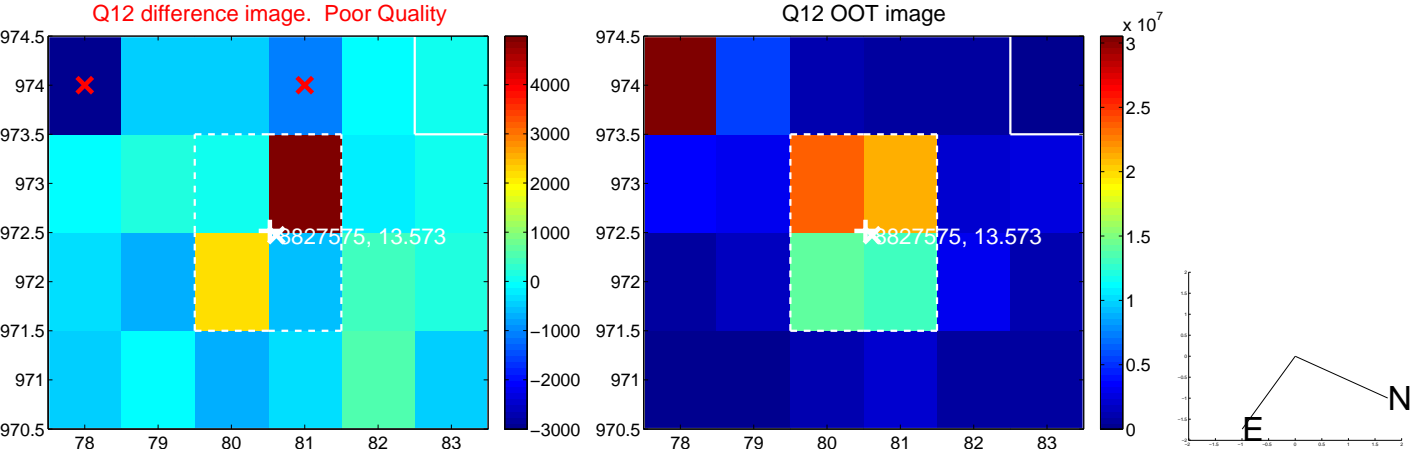
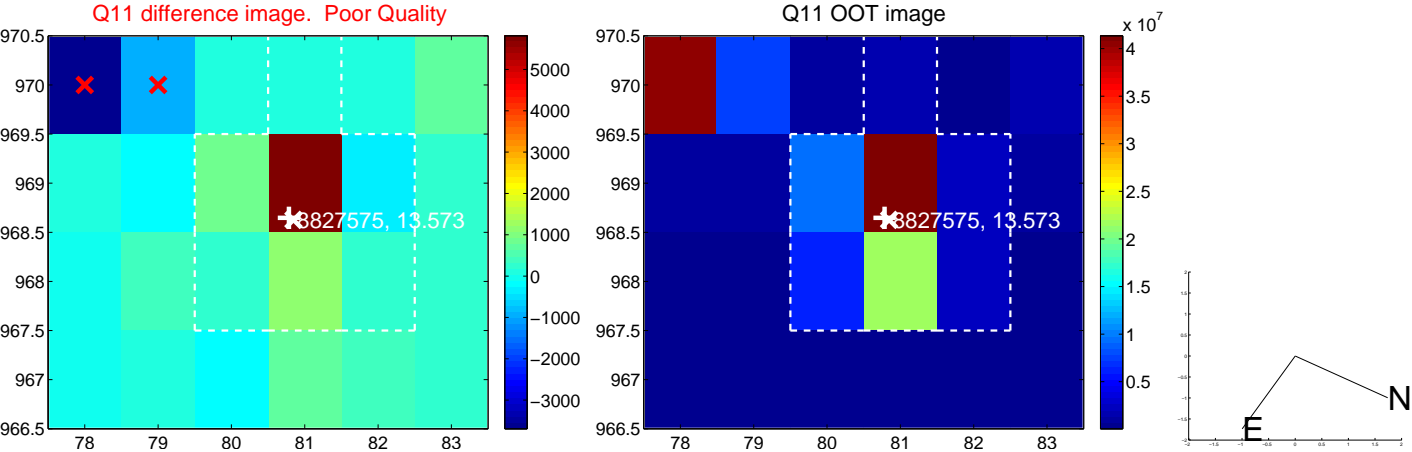
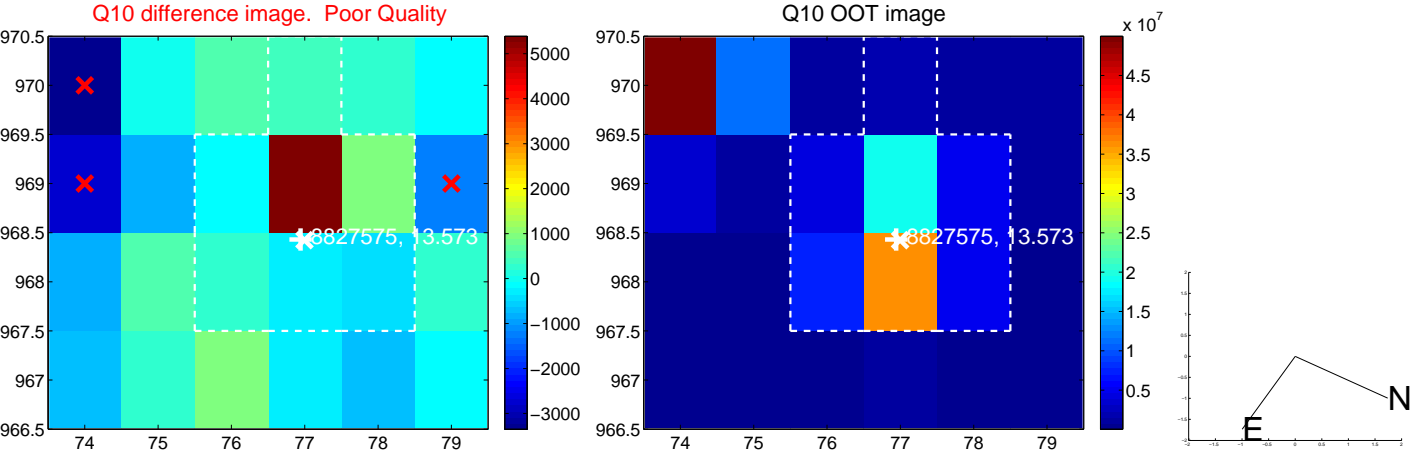
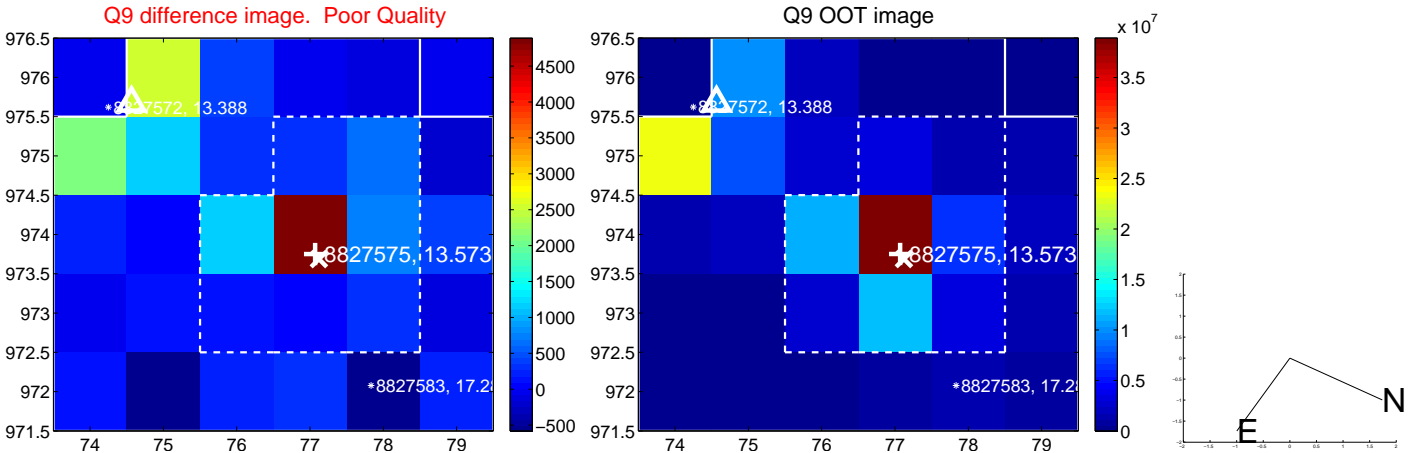
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



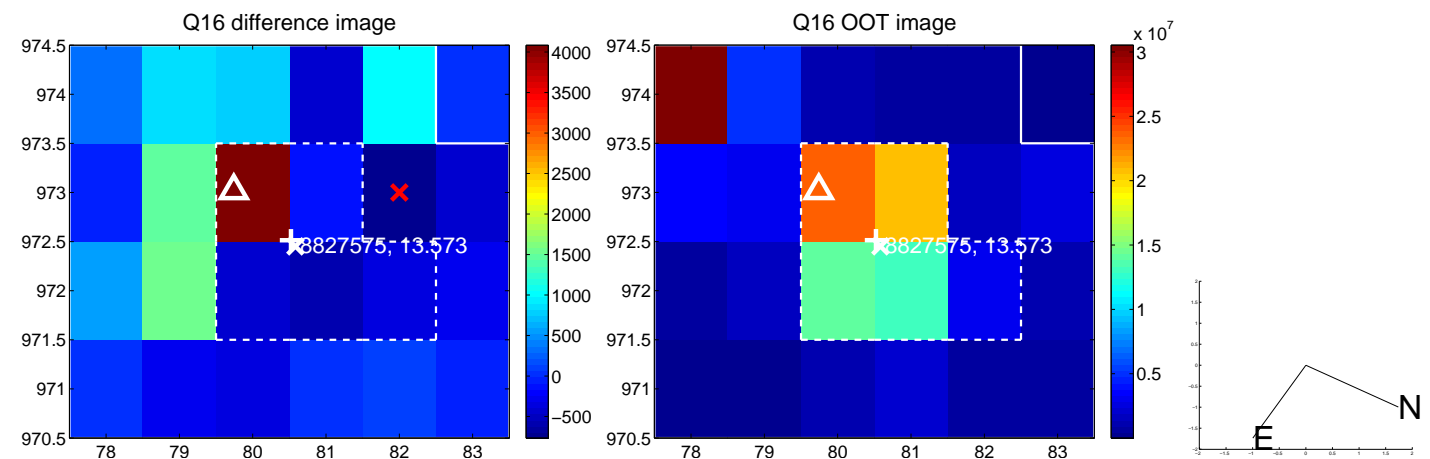
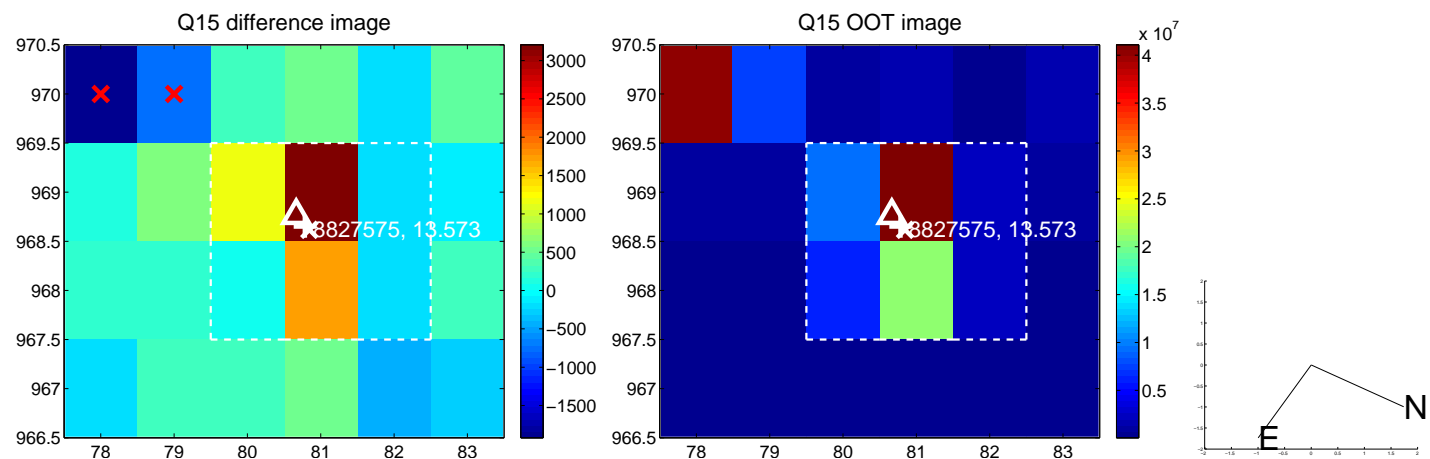
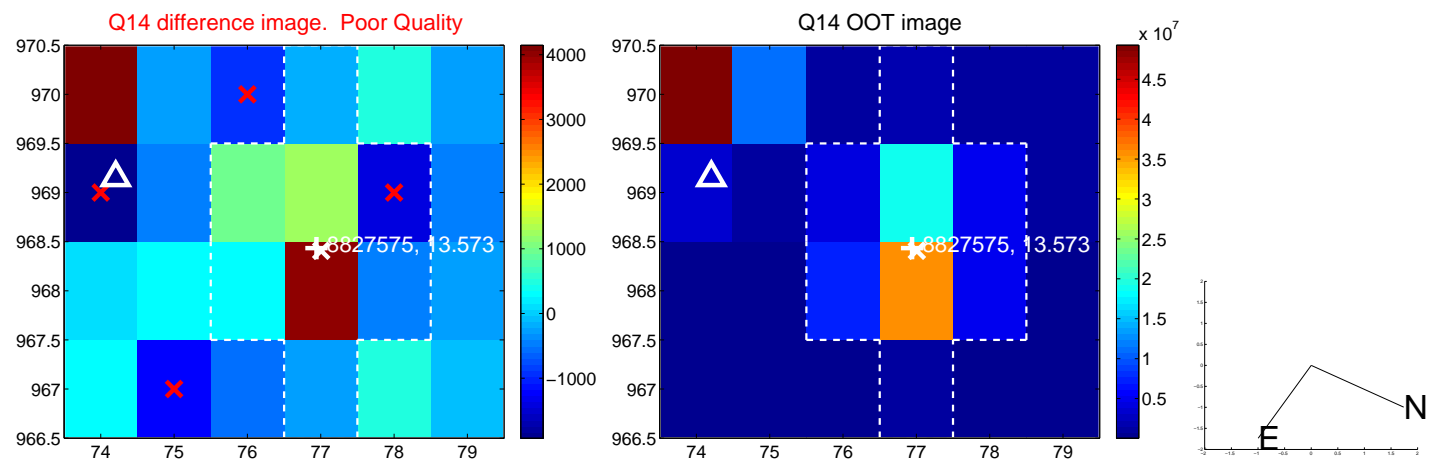
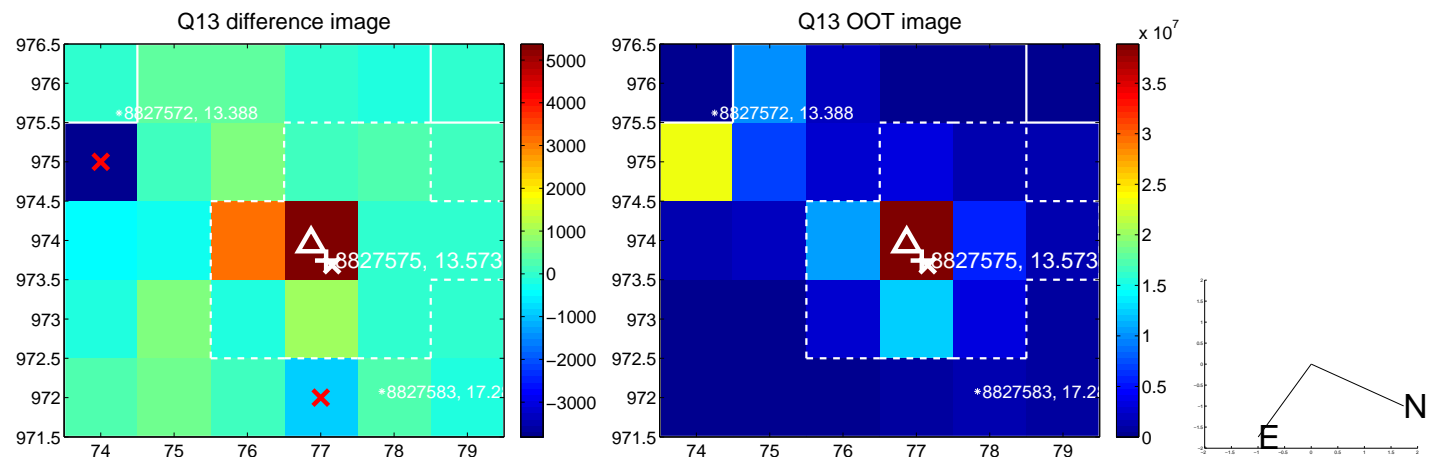
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

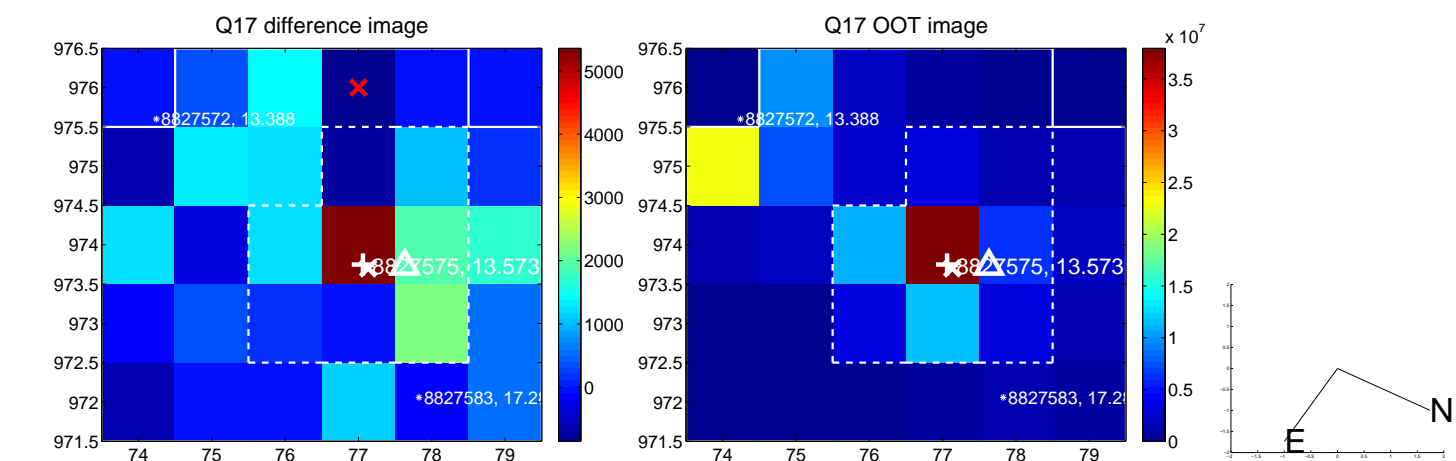


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

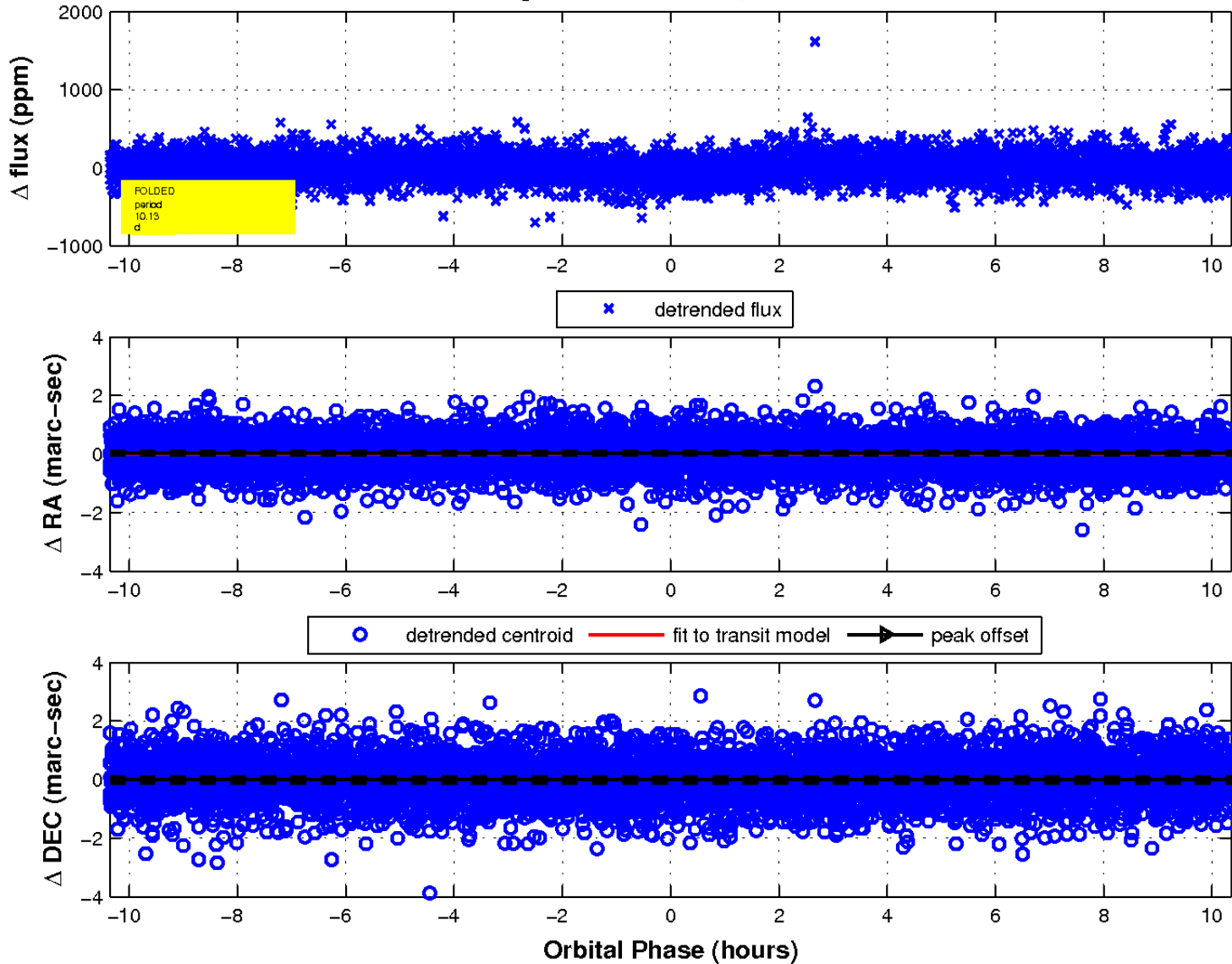




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

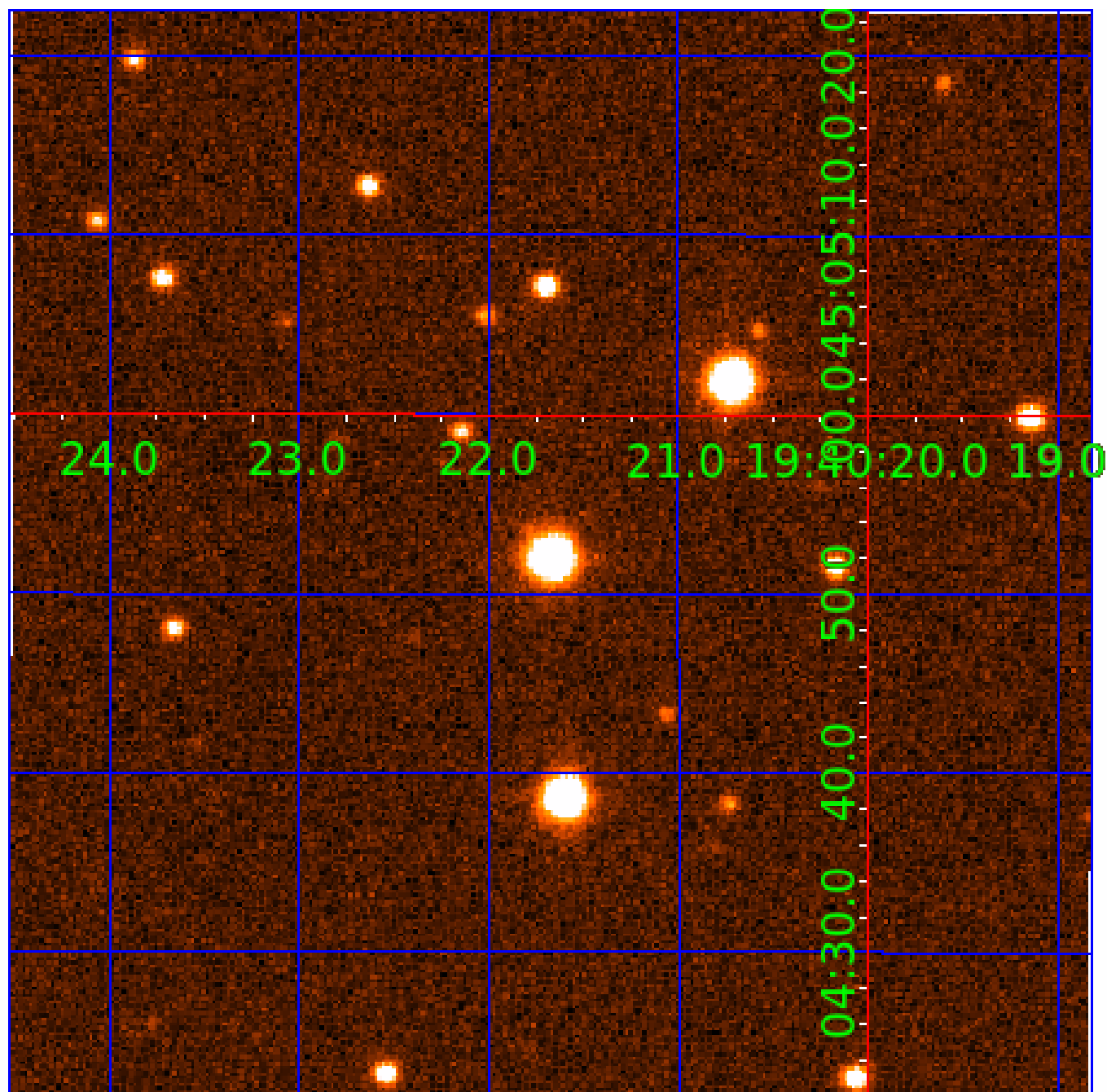


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 008827575

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008827575-01	OBS	3052.01	10.129661	135.990817	87.6	3.453	12.3	12.1	0.84	5383	0.83	69.57
008827575-02	OBS	3052.02	15.611226	144.873378	102.7	3.859	11.3	11.7	0.84	5383	1.03	39.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008827575-01	OBS	PC	0.98	0	0	0	0	NO_COMMENT
008827575-02	OBS	PC	0.87	0	0	0	0	NO_COMMENT

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

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

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

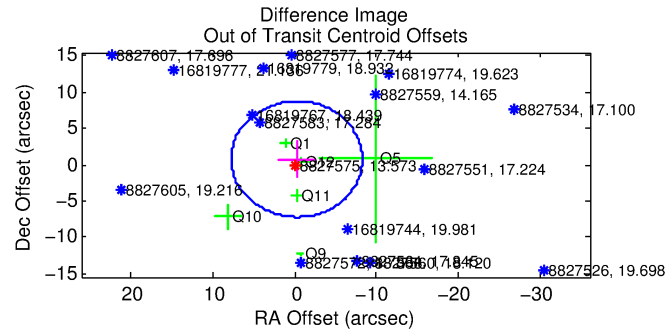
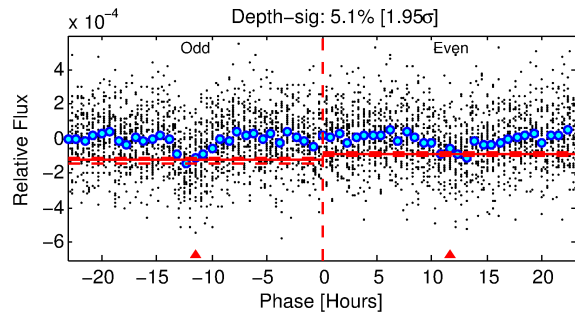
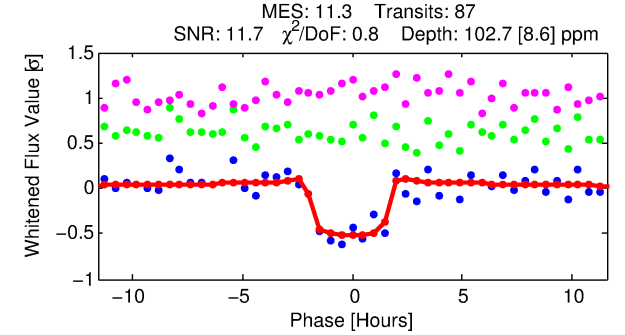
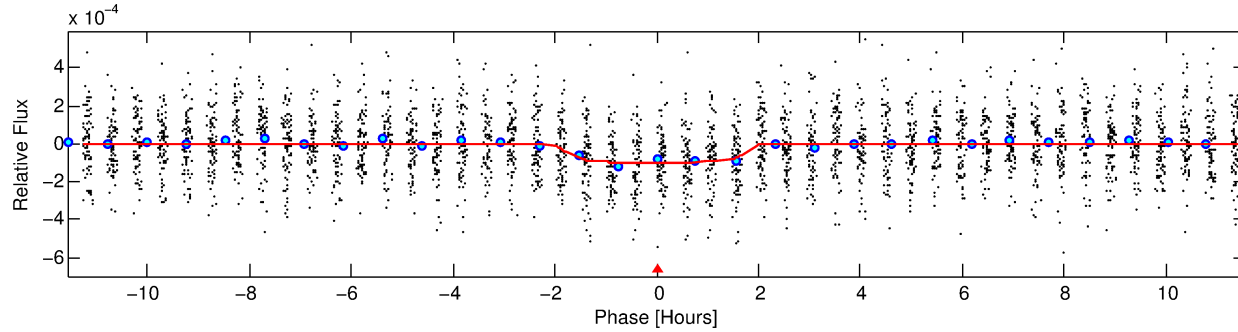
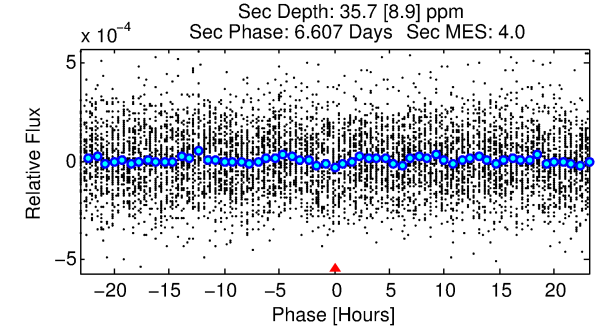
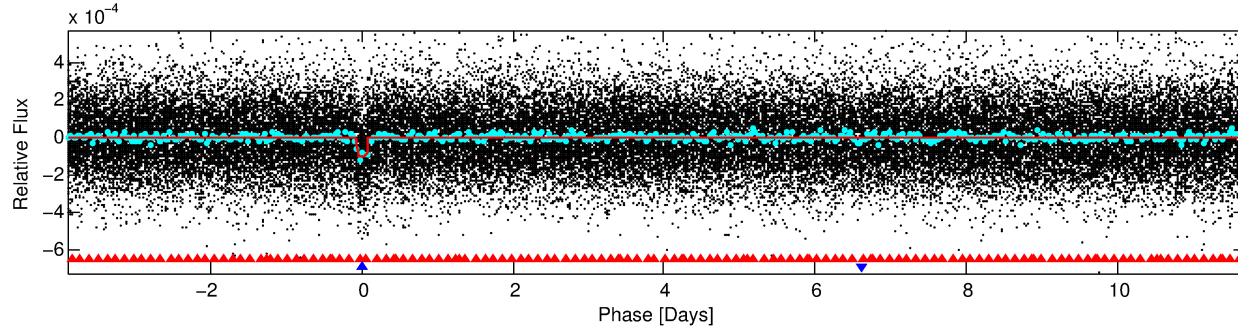
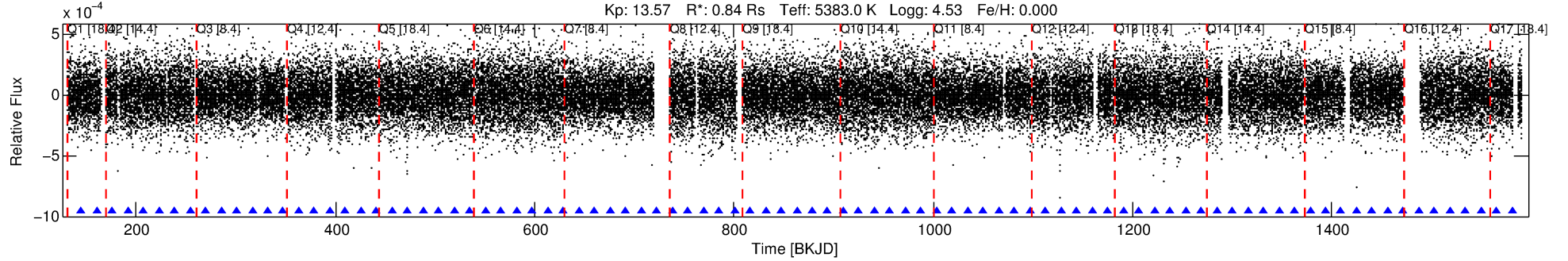
## Ephemeris Match Information For 008827575-02

No Significant Match Found

# DV One-Page Summary

KIC: 8827575 Candidate: 2 of 2 Period: 15.611 d

KOI: K03052.02 Corr: 0.990



## DV Fit Results:

Period = 15.61123 [0.00013] d  
Epoch = 144.8734 [0.0065] BKJD  
Rp/R\* = 0.0112 [0.0043]  
a/R\* = 14.27 [23.72]  
b = 0.90 [0.36]  
Seff = 39.08 [6.19]  
Teq = 638 [25] K  
Rp = 1.03 [0.41] Re  
a = 0.1168 [0.0105] AU  
Ag = 254.18 [207.76] [1.22σ]  
Teffp = 3936 [797] K [4.14σ]

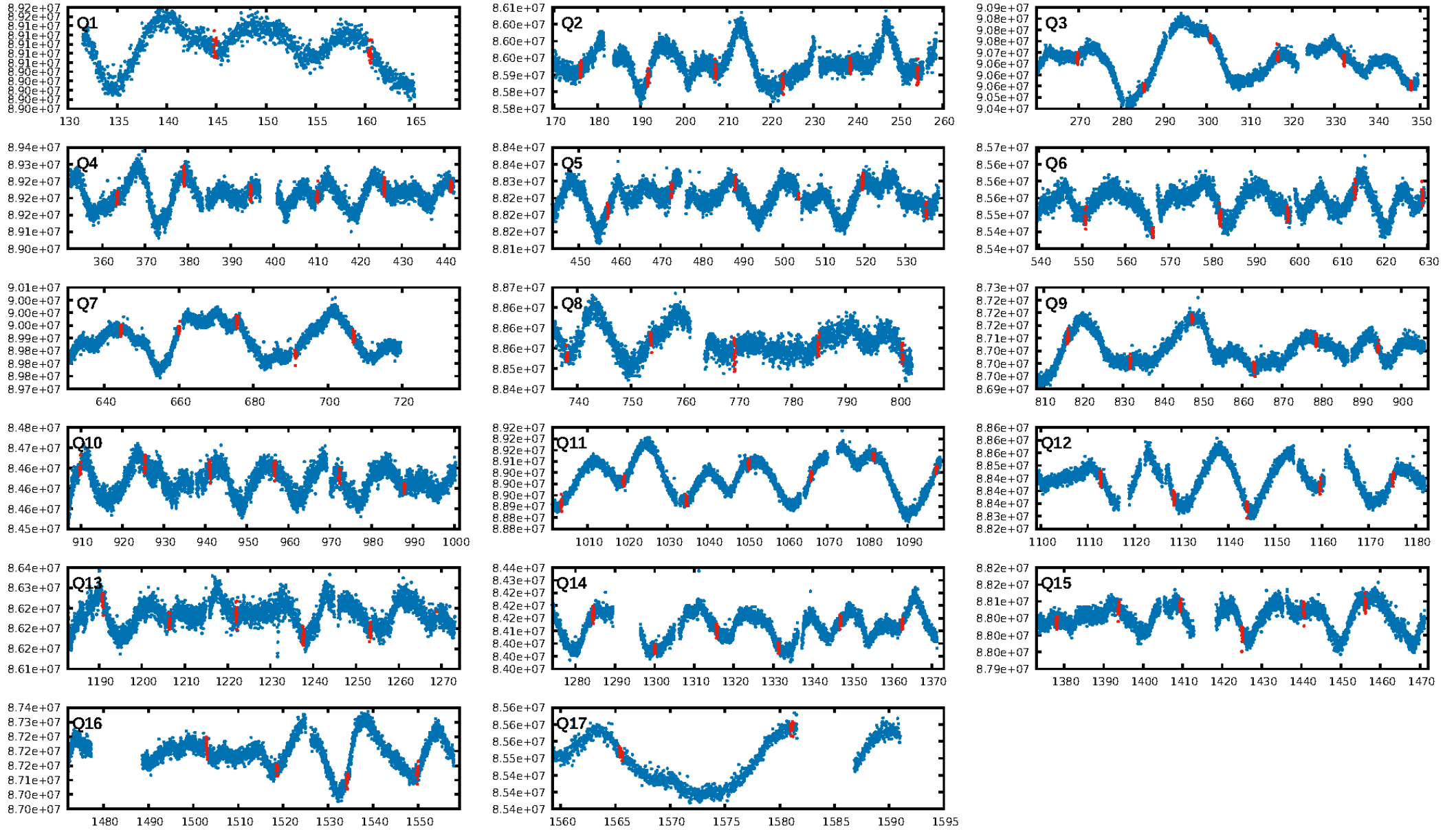
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.40σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.22e-28  
RollingBand-fgt: 1.00 [83/83]  
GhostDiagnostic-chr: 31.52  
Centroid-sig: 0.8%  
Centroid-so: 1.569 arcsec [1.93σ]  
OotOffset-rm: 0.797 arcsec [0.30σ]  
KicOffset-rm: 0.575 arcsec [0.21σ]  
OotOffset-st: 1/1/1/3 [6]  
KicOffset-st: 1/1/1/3 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:37:46 Z

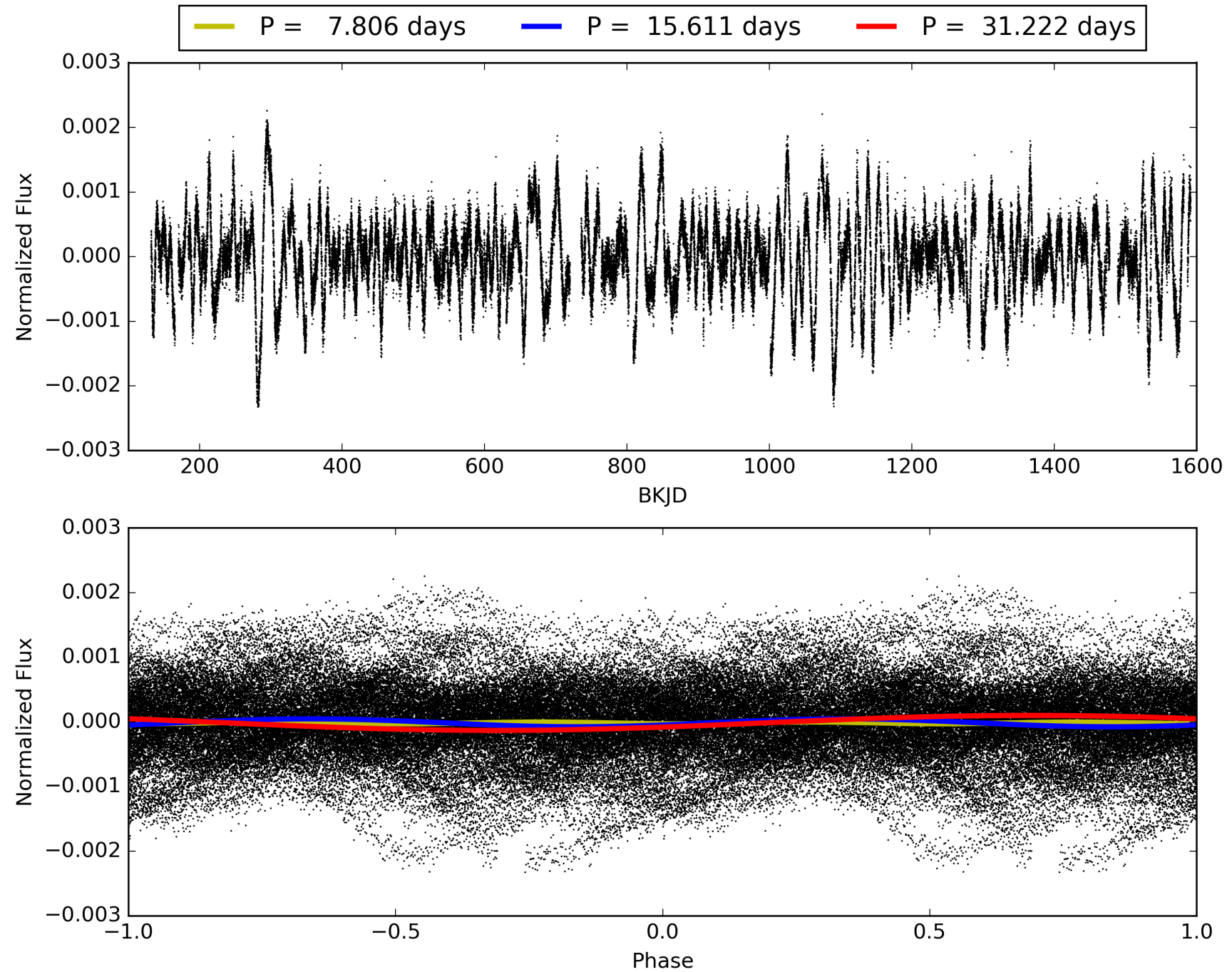
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008827575-02, PDC Light Curves



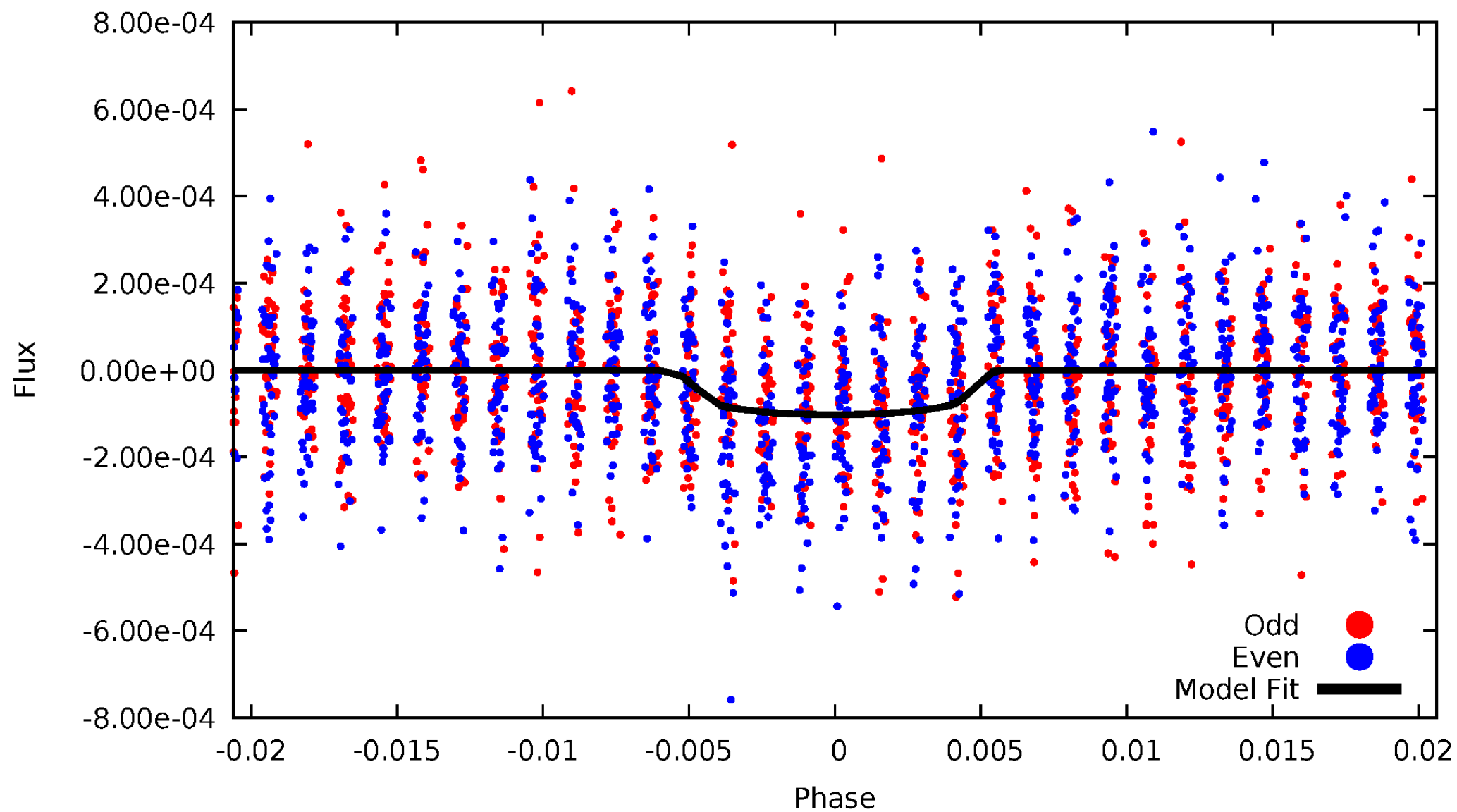


TCE 008827575-02



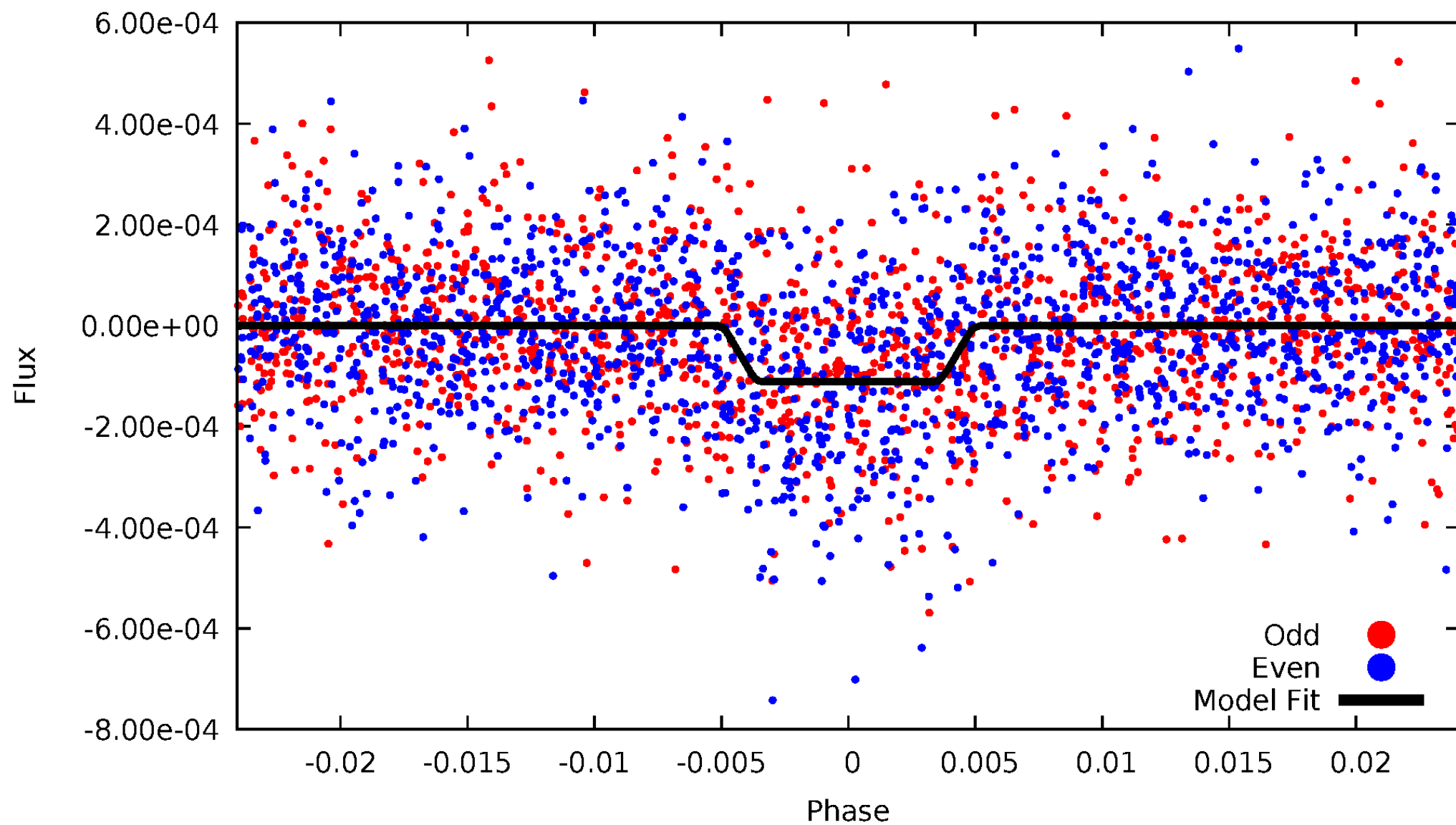
DV Odd/Even

TCE 008827575-02



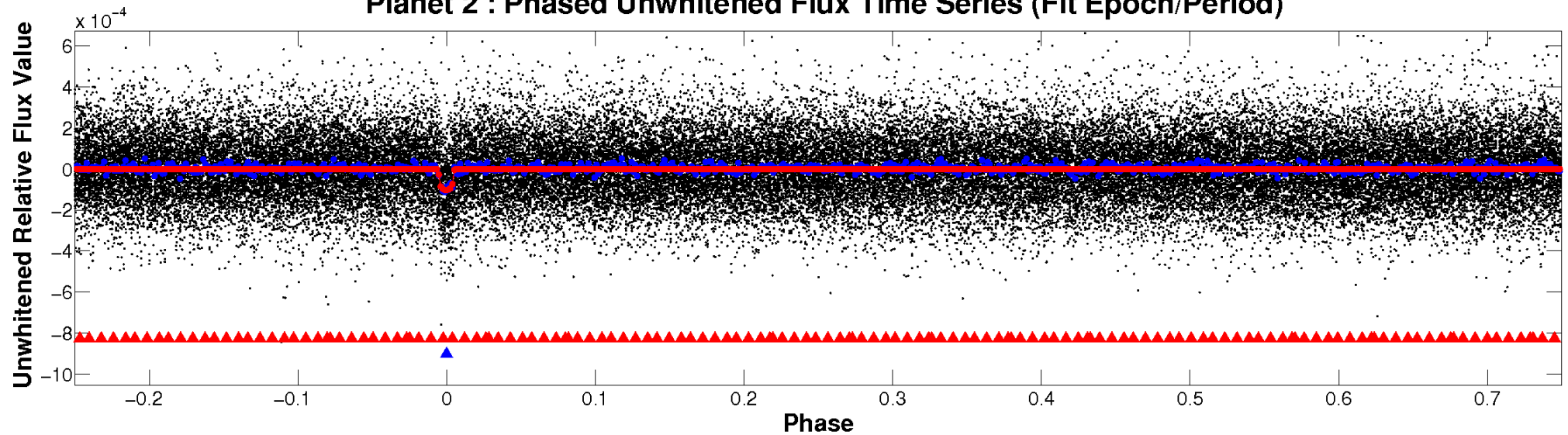
# ALT Odd/Even

TCE 008827575-02

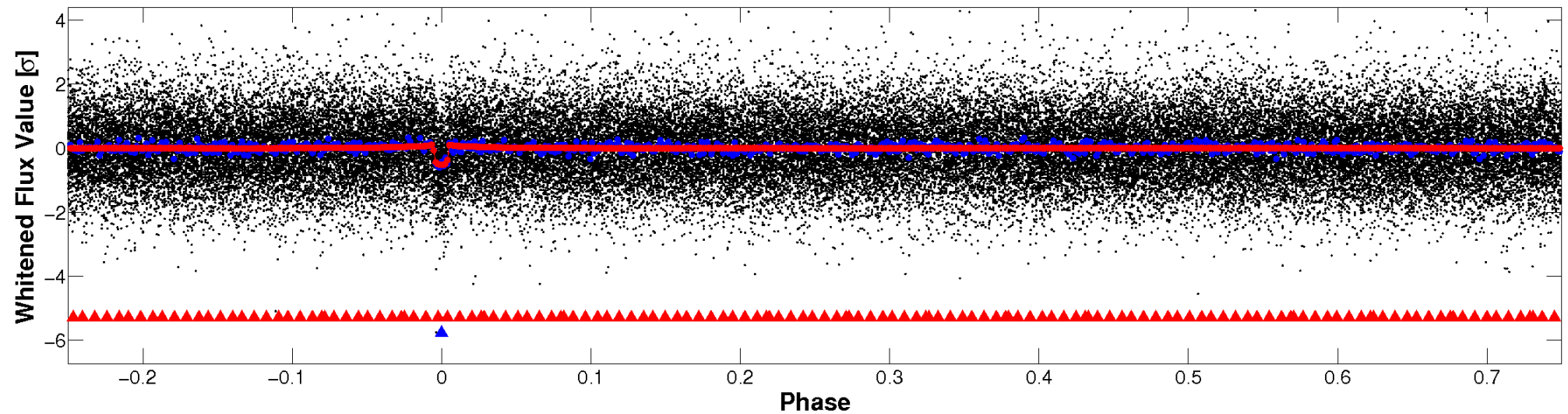


# Non-Whitened Vs. Whitened Light Curve

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

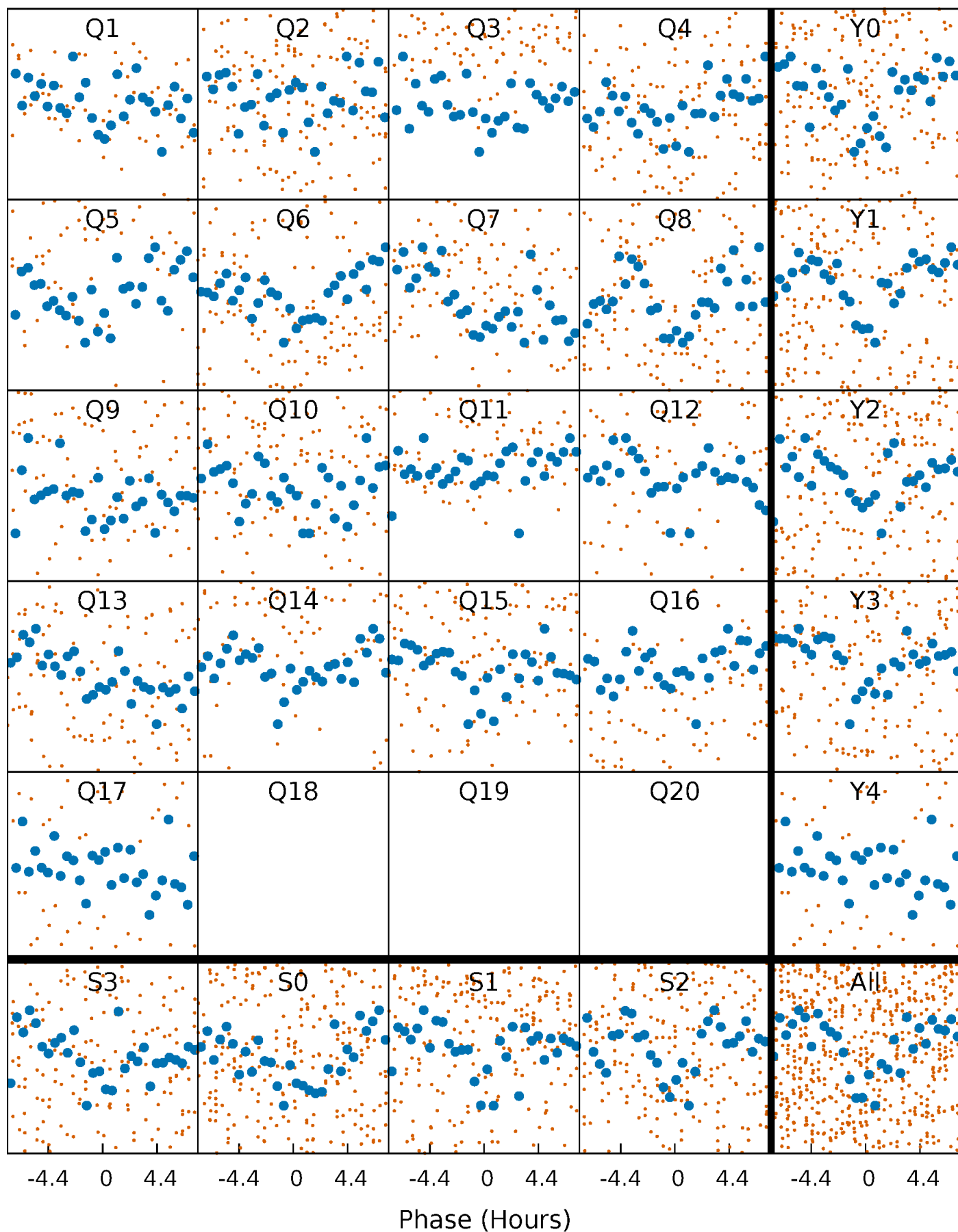


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

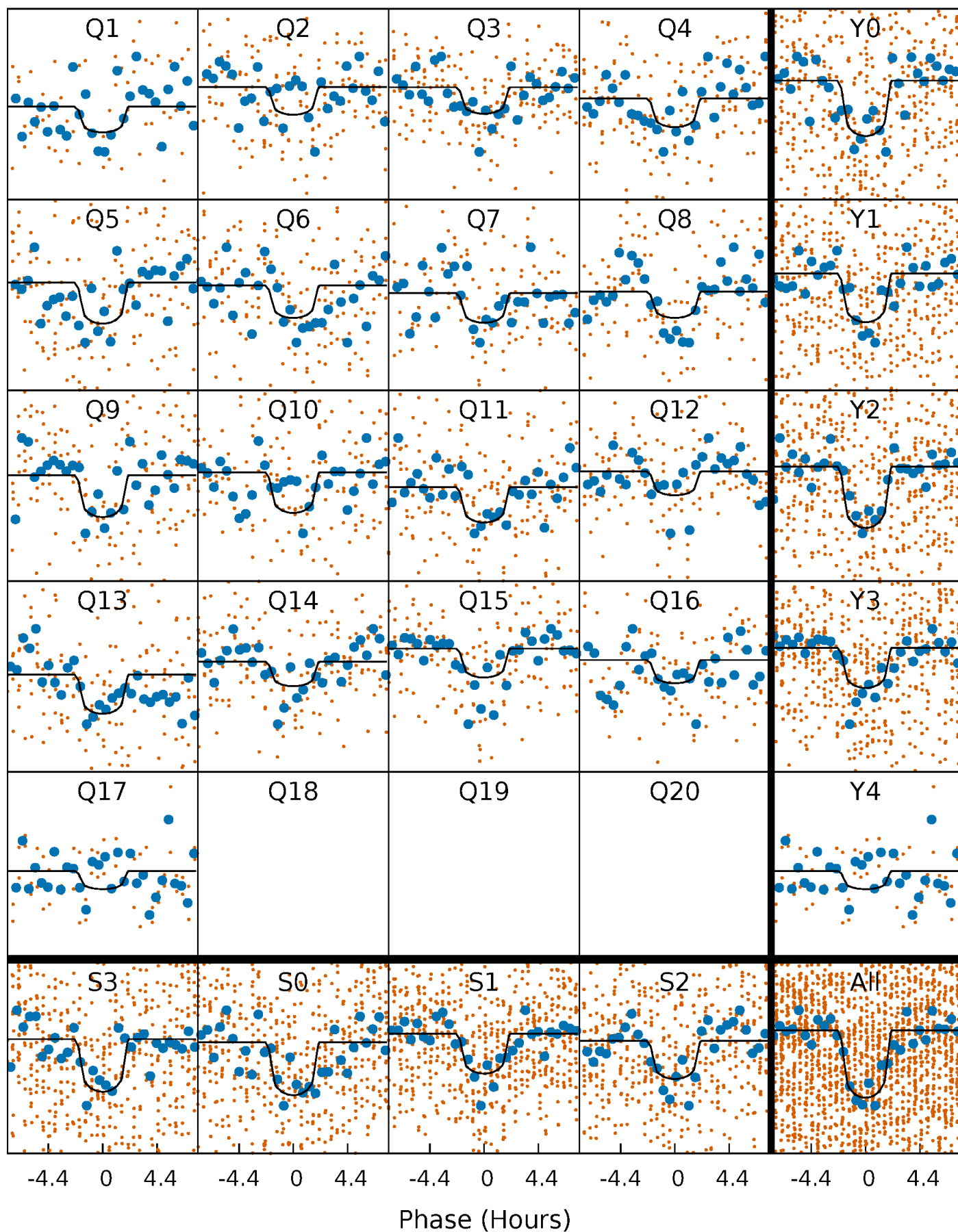
TCE 008827575-02 P= 15.611226 Days  $T_0=144.873378$  (BKJD)





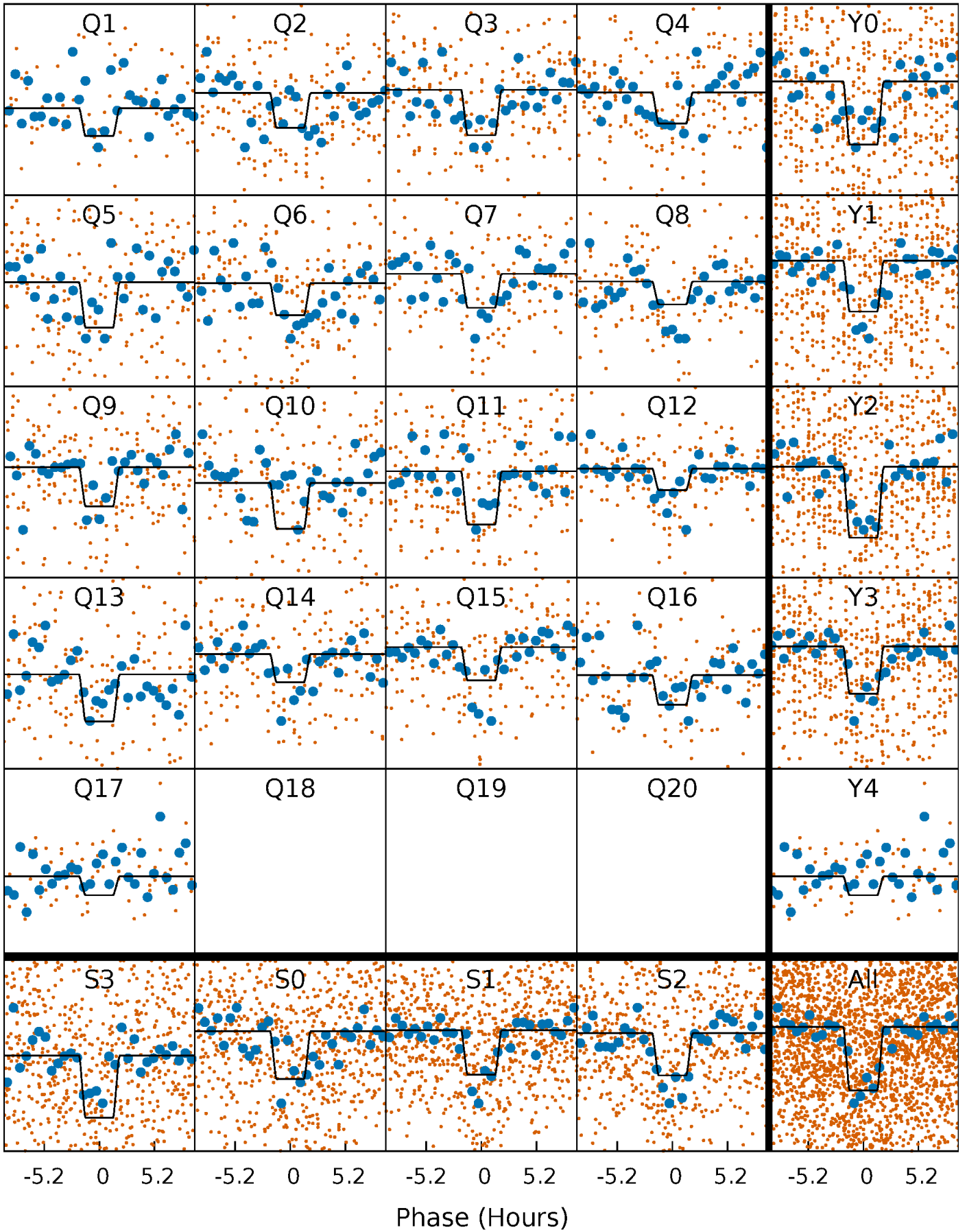
# DV Quarter-Phased Transit Curves

TCE 008827575-02 P= 15.611226 Days  $T_0=144.873378$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

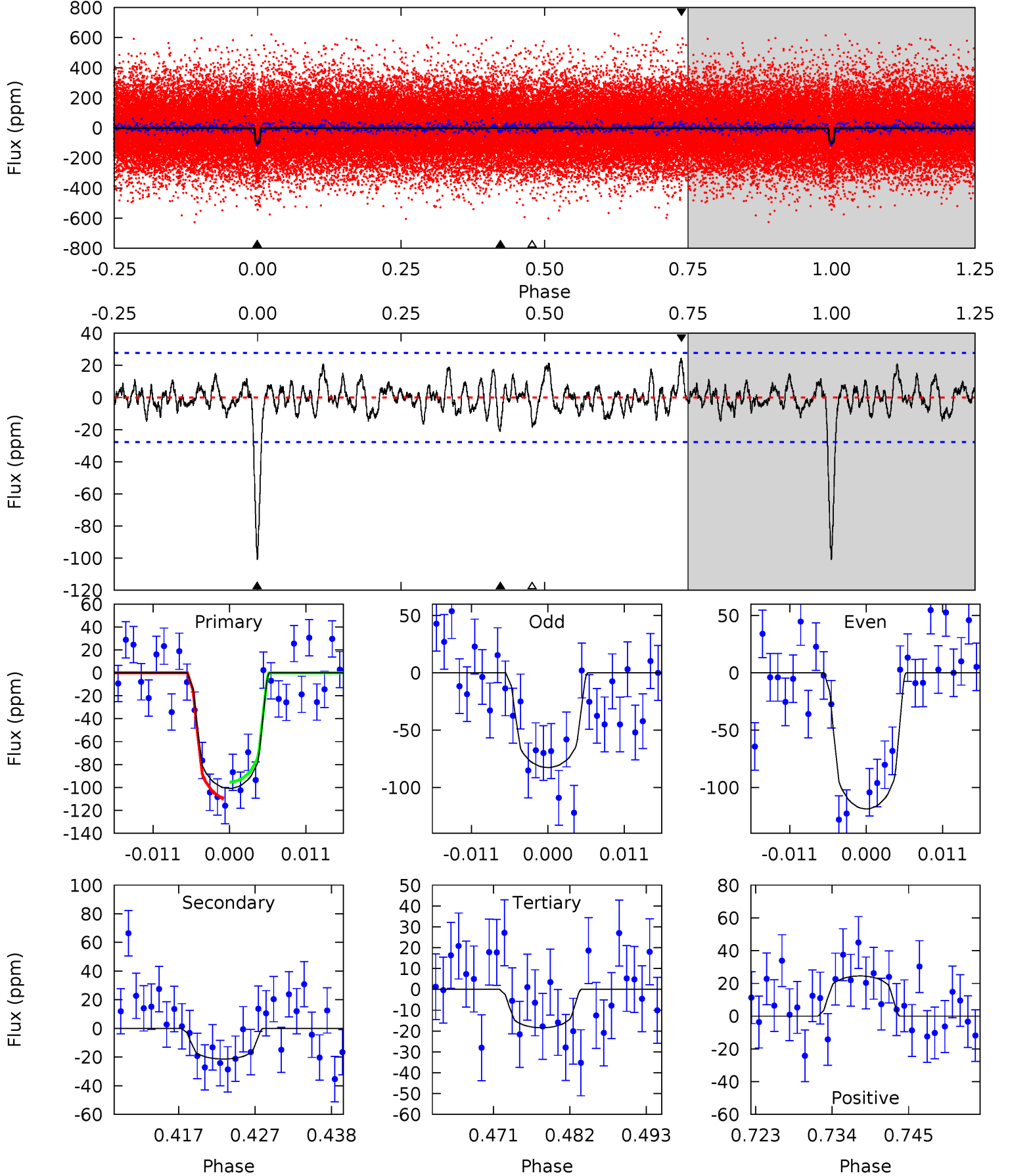
TCE 008827575-02 P= 15.611082 Days  $T_0=144.876114$  (BKJD)



# DV Model-Shift Uniqueness Test

008827575-02,  $P = 15.611226$  Days,  $E = 129.262152$  Days

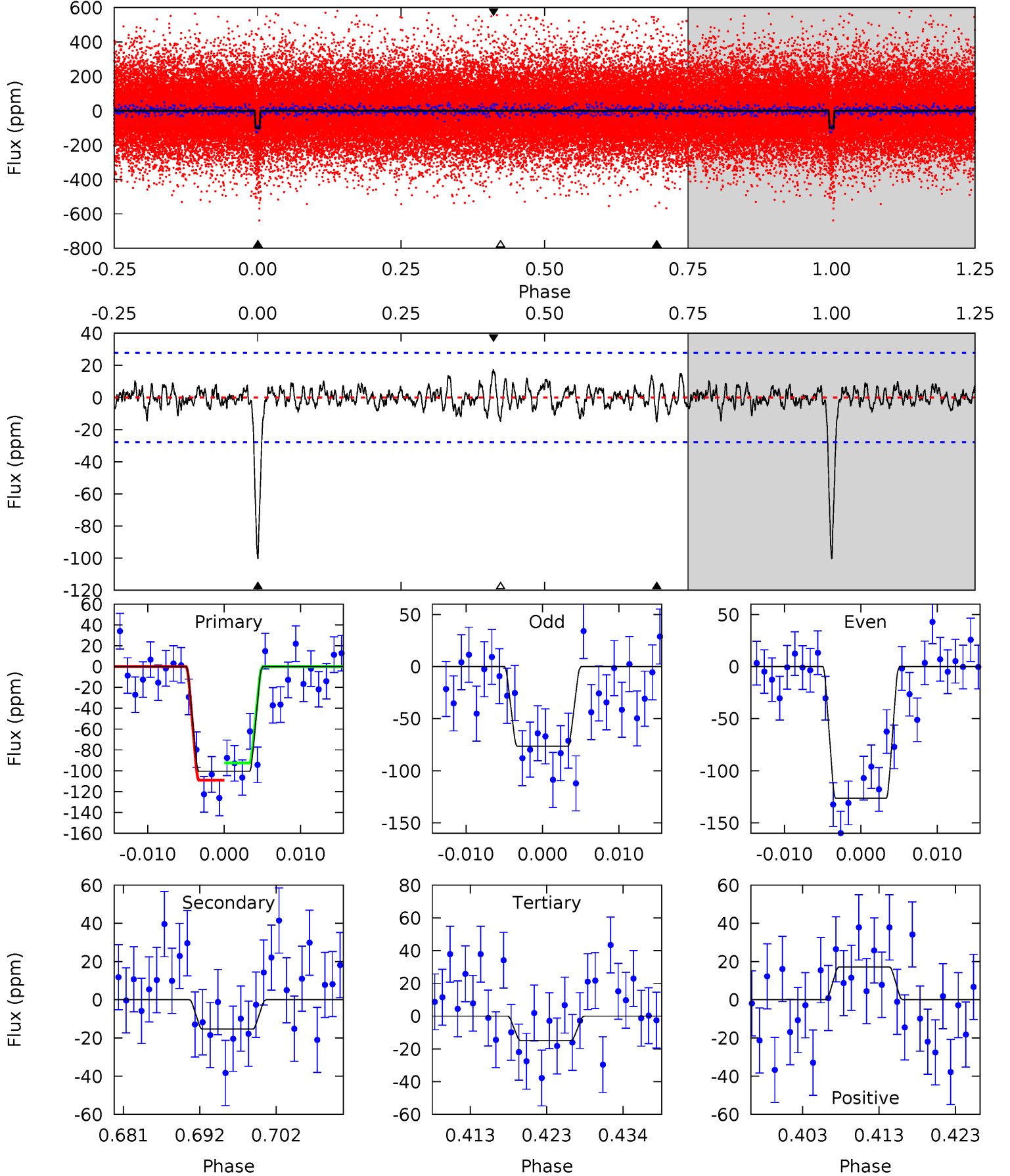
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	3.85	3.33	4.43	5.01	2.54	1.28	14.9	13.8	0.53	-0.57	3.26	1.10	0.20	1.28



# Alt Model-Shift Uniqueness Test

008827575-02,  $P = 15.611082$  Days,  $E = 129.265032$  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
18.2	2.78	2.70	3.09	5.02	2.56	0.91	15.5	15.1	0.08	-0.32	4.51	1.10	0.15	1.48



### Stellar Parameters For KIC 008827575

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5383^{+107}_{-107}$	$4.528^{+0.042}_{-0.078}$	$0.000^{+0.150}_{-0.150}$	$0.842^{+0.084}_{-0.045}$	$0.874^{+0.048}_{-0.054}$	$2.060^{+0.322}_{-0.487}$
	+2%/-2%	+1%/-2%	+inf%/-inf%	+10%/-5%	+5%/-6%	+16%/-24%
Source	SPE57	SPE57	SPE57	DSEP		

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

### Secondary Eclipse Parameters for KIC 008827575-02 / KOI 3052.02

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-21 \pm 6$	$1.02^{+0.38}_{-0.40}$	$895^{+26}_{-26}$	$3833^{+774}_{-431}$	$151^{+282}_{-75}$
Alt.	$-15 \pm 6$	$0.99^{+0.40}_{-0.41}$	$895^{+29}_{-25}$	$3657^{+784}_{-451}$	$113^{+233}_{-63}$

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

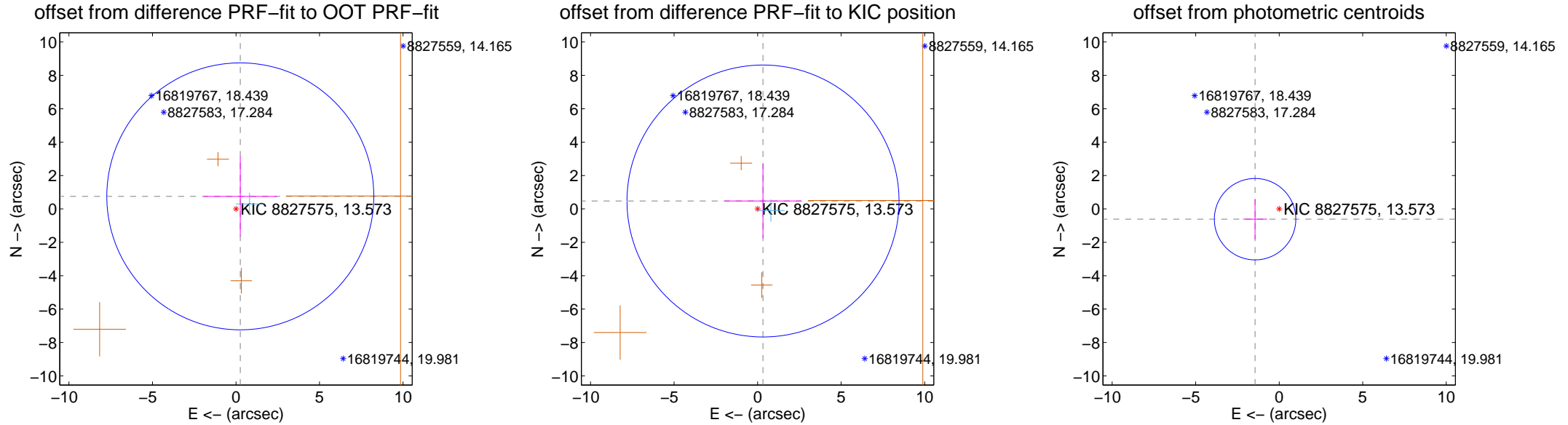
## DV Centroid Data

Supplemental centroid analysis for 008827575-02. Kepler magnitude: 13.57. Transit SNR 11.71

There are 2 quarters with good PRF difference image offsets

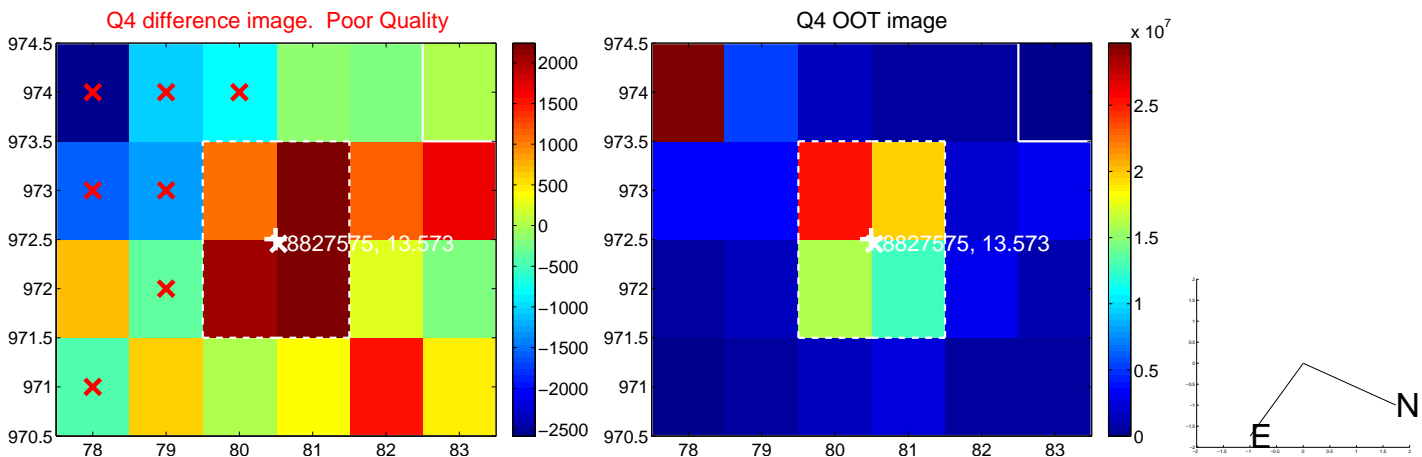
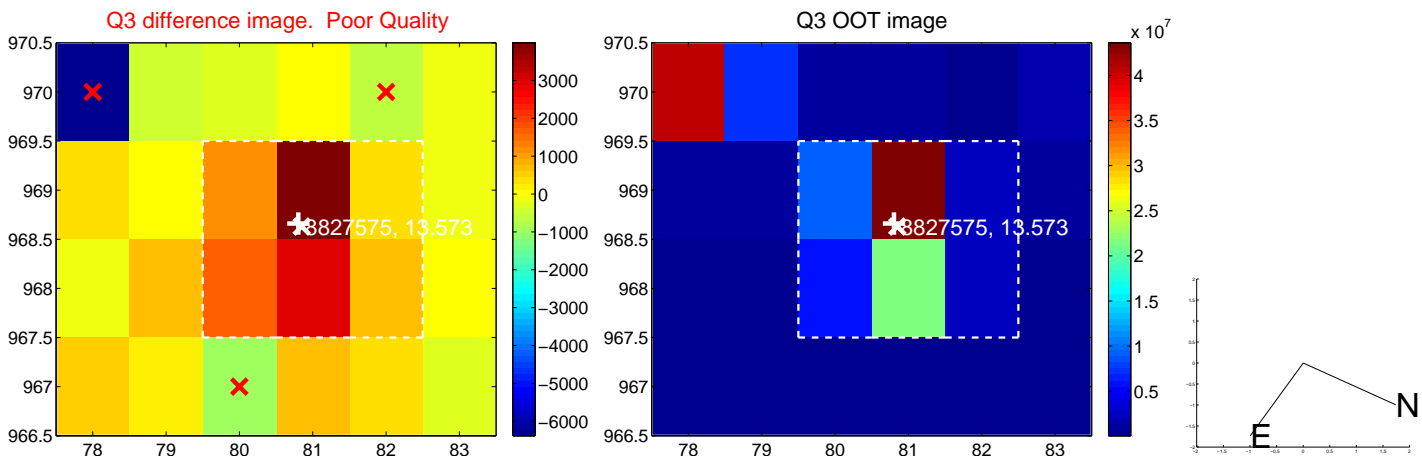
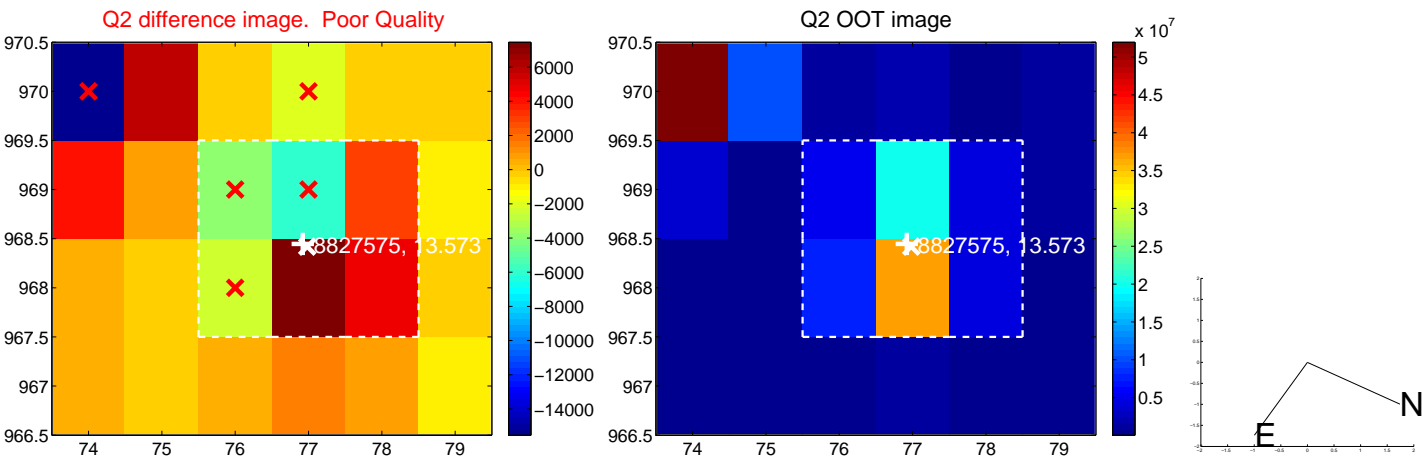
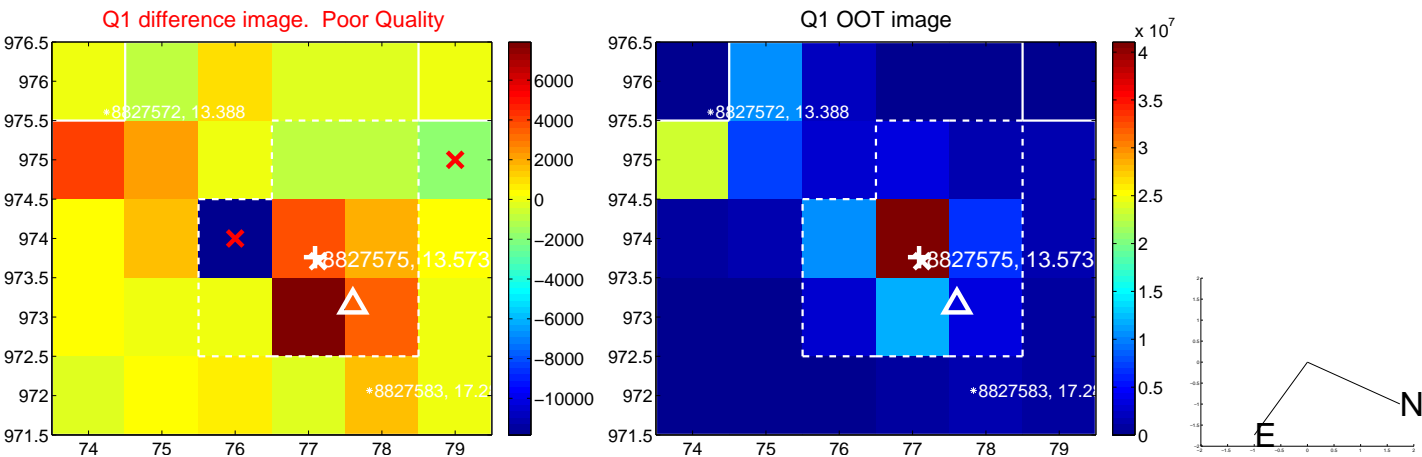
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.797 \pm 2.664$	0.30	$-0.258 \pm 2.196$	$0.754 \pm 2.389$
PRF-fit source offset from KIC position	$0.575 \pm 2.715$	0.21	$-0.324 \pm 2.305$	$0.475 \pm 2.223$
photometric centroid source offset	$1.57 \pm 0.81$	1.93	$1.44 \pm 0.72$	$-0.61 \pm 1.20$



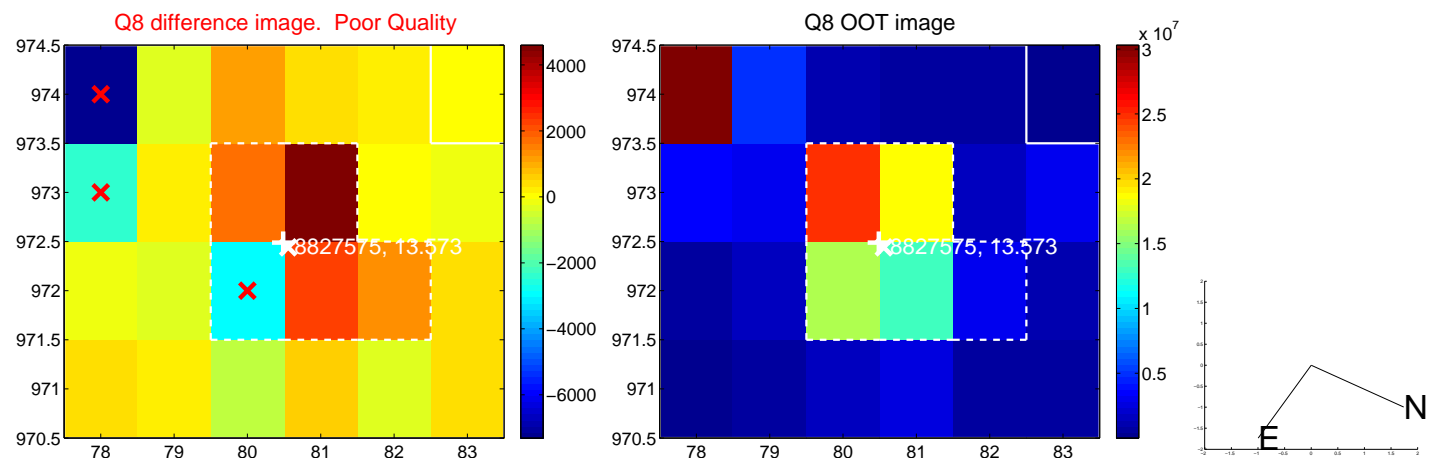
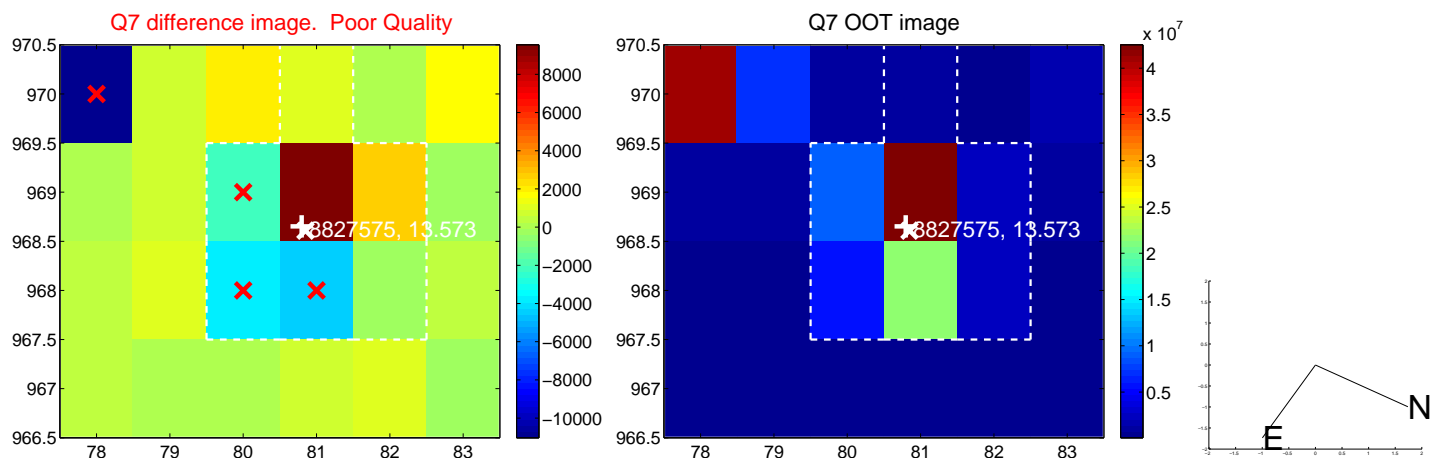
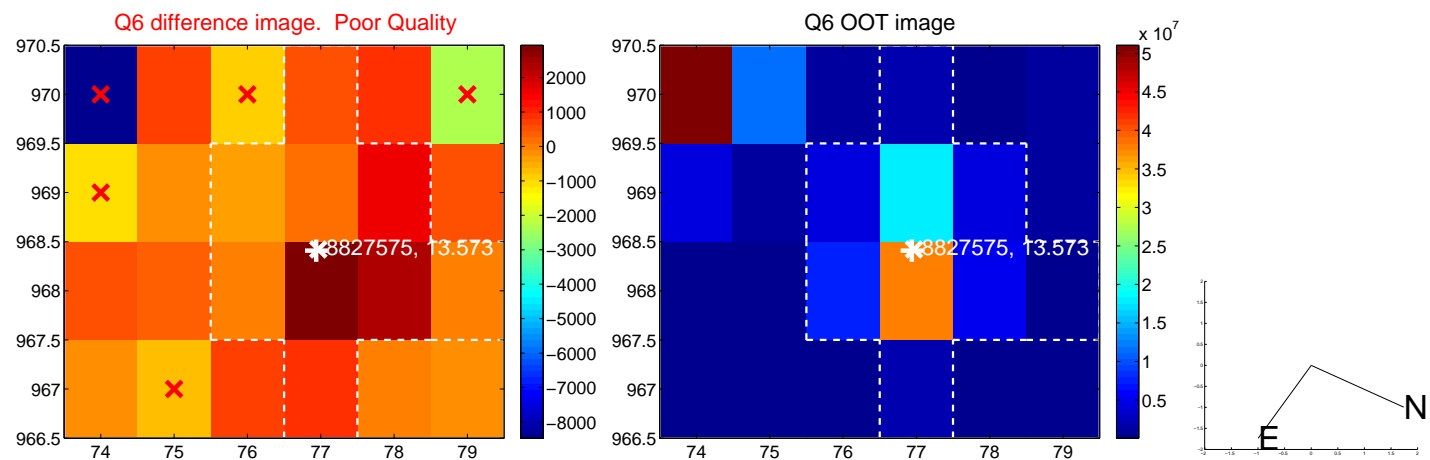
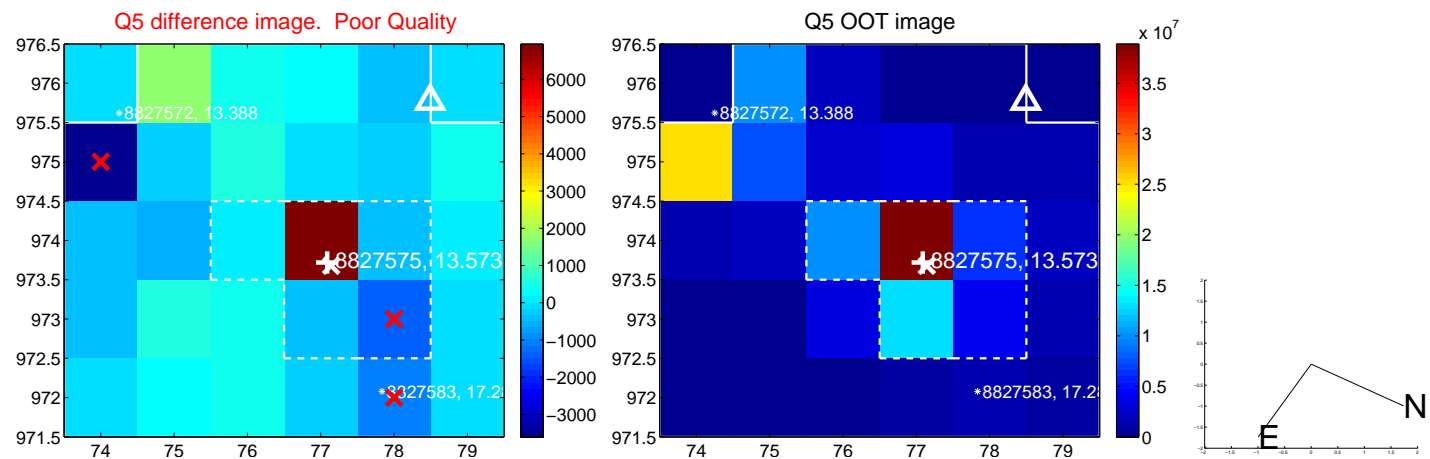
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

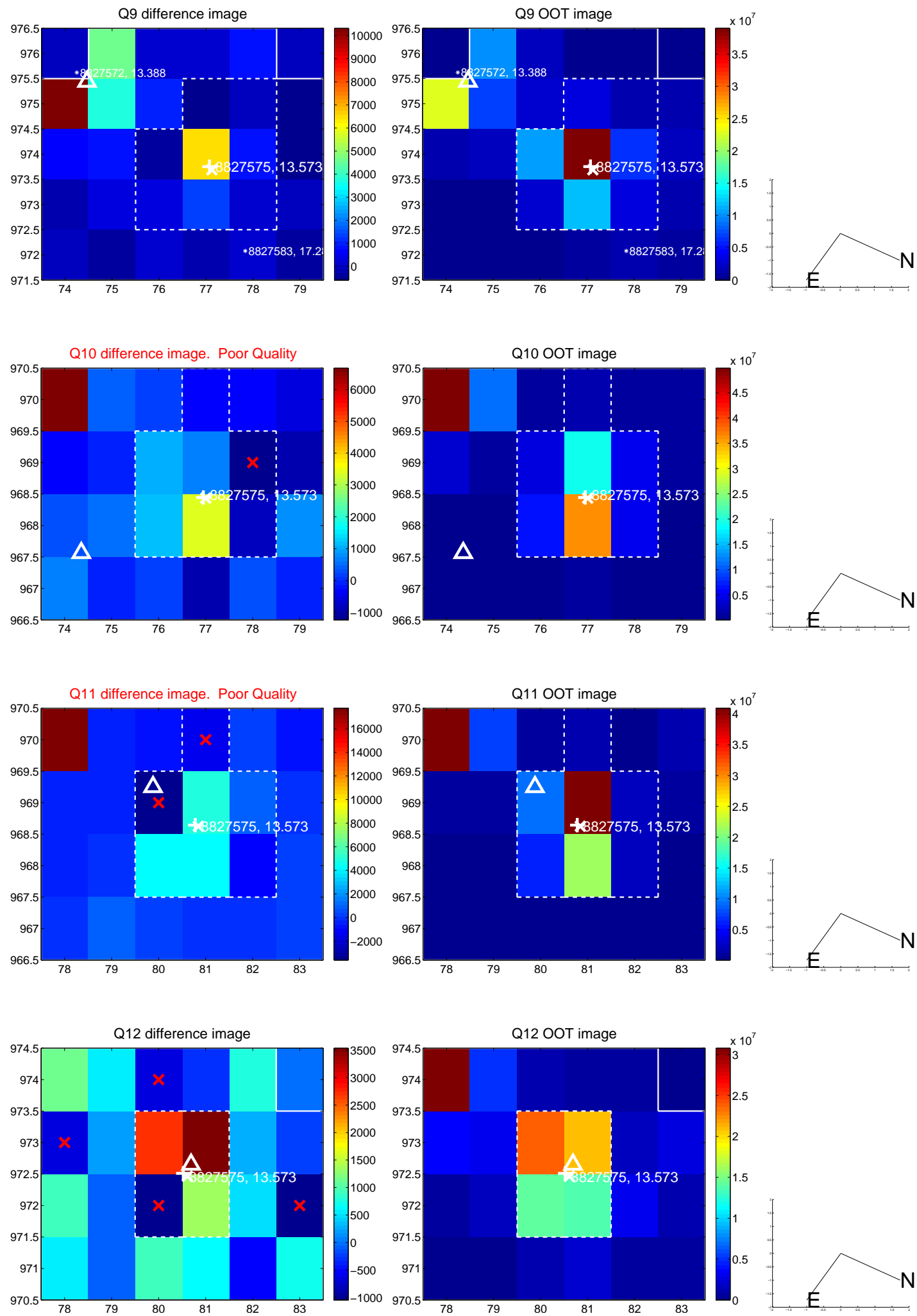




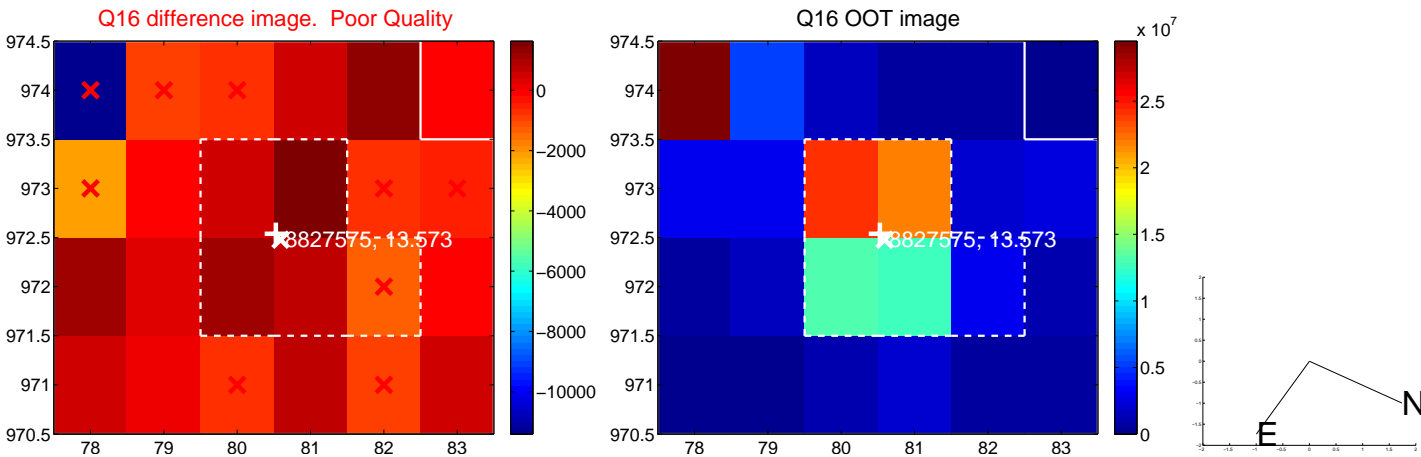
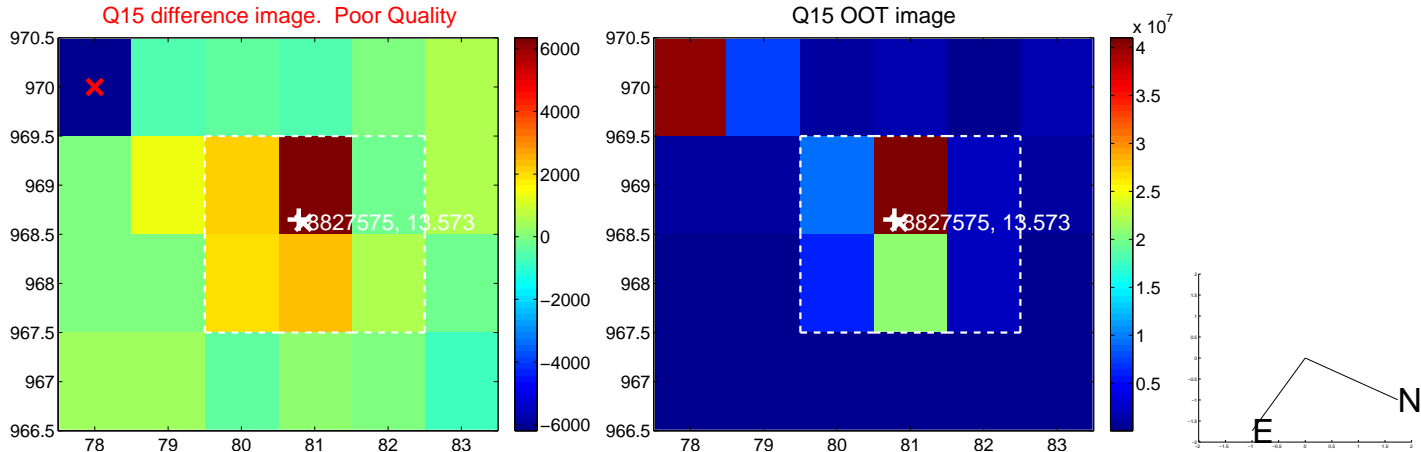
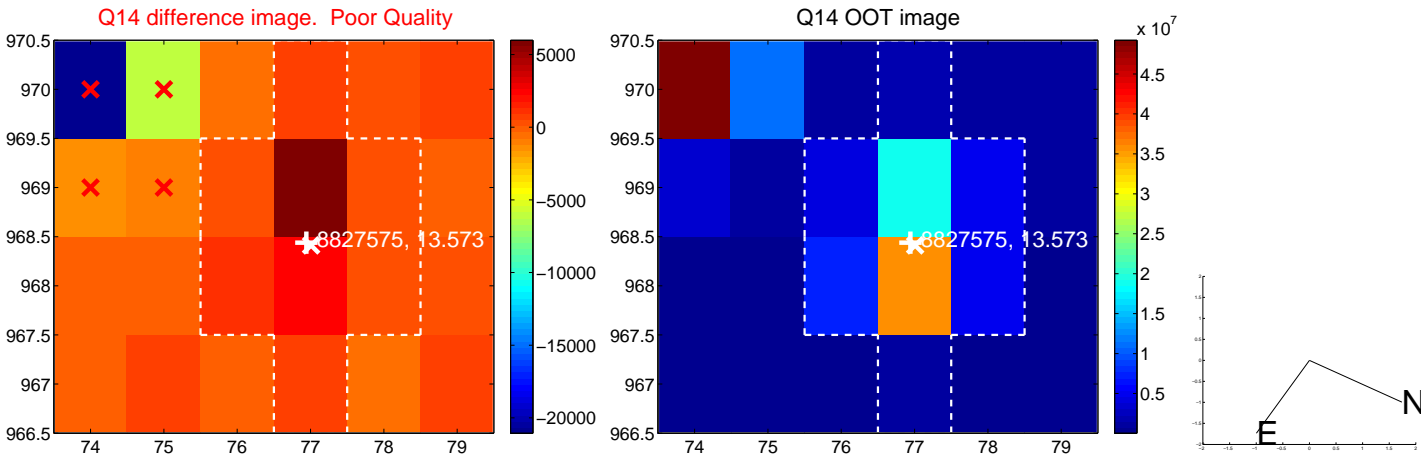
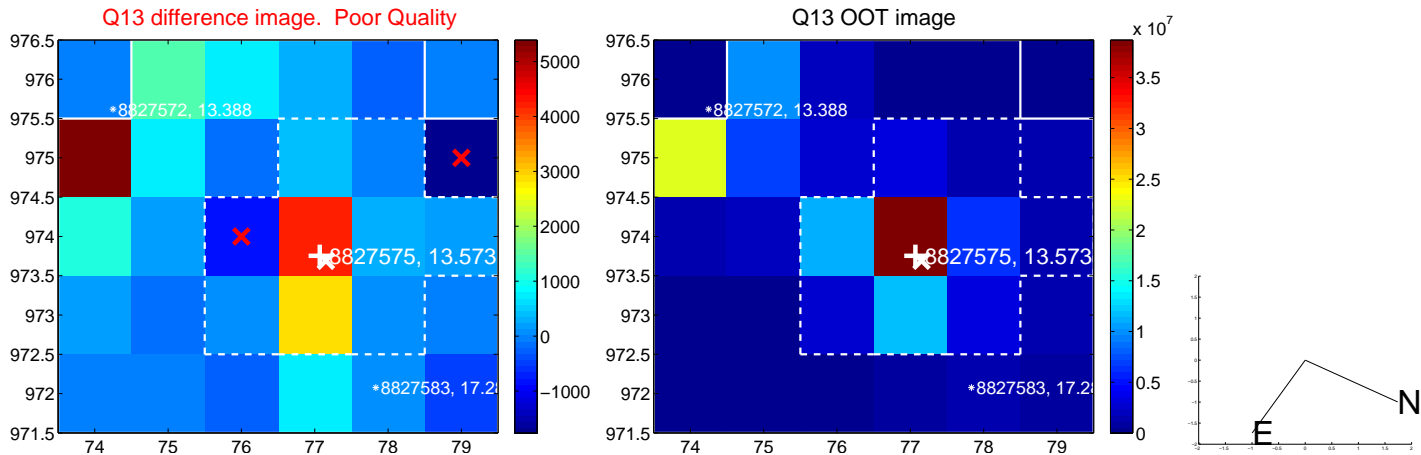
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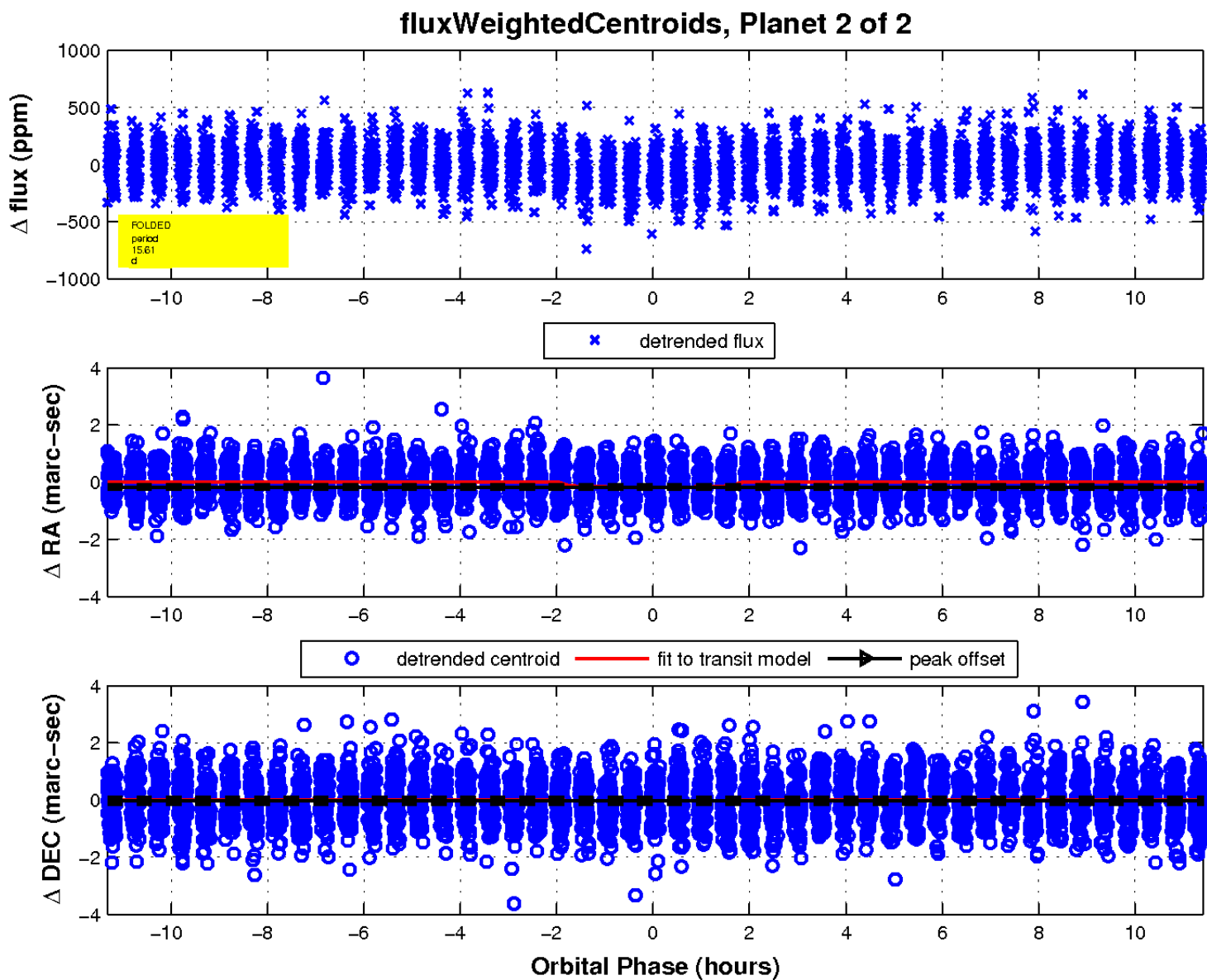
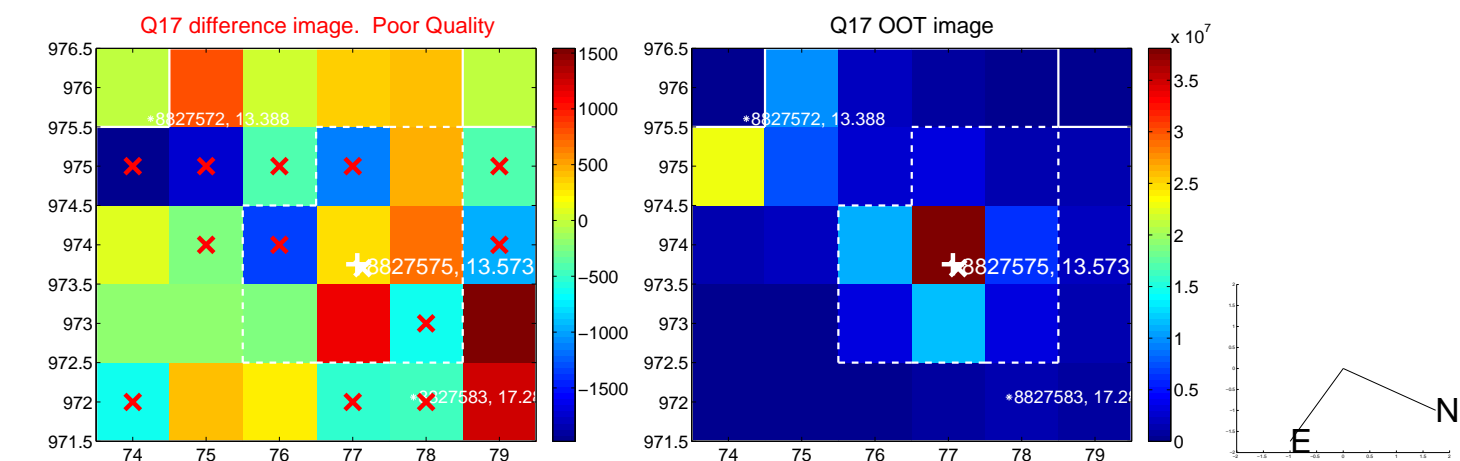
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

