

# KIC 008972966

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008972966-01	OBS	No	0.990542	132.151721	215.3	1.844	14.2	12.7	3.00	7884	4.72	53991.37
008972966-02	OBS	No	0.990550	131.657633	240.5	1.876	12.3	14.1	3.00	7884	5.41	53990.72
008972966-03	OBS	No	1.382634	132.886892	383.9	16.592	10.0	22.1	3.00	7884	7.50	34610.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008972966-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008972966-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008972966-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

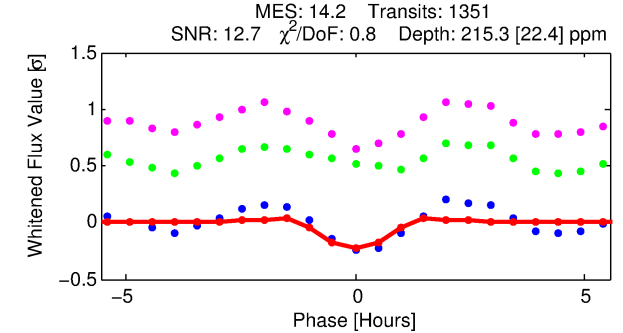
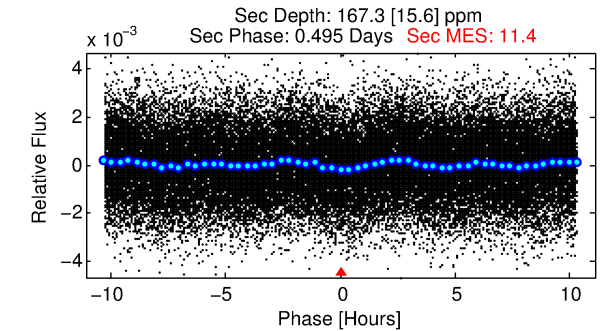
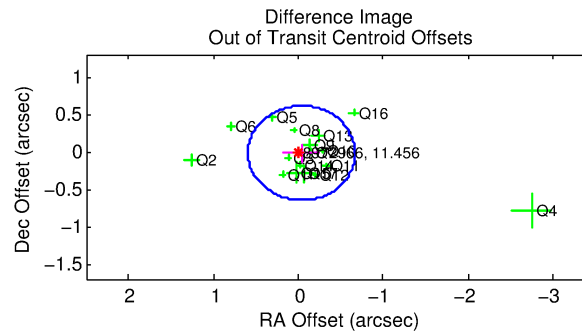
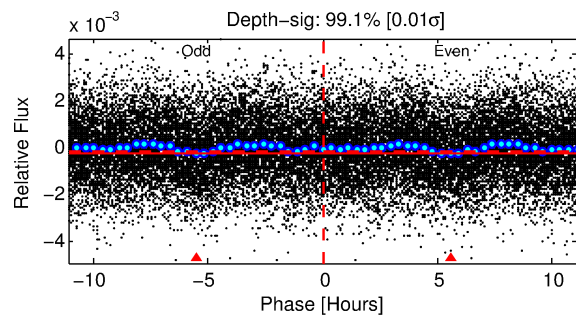
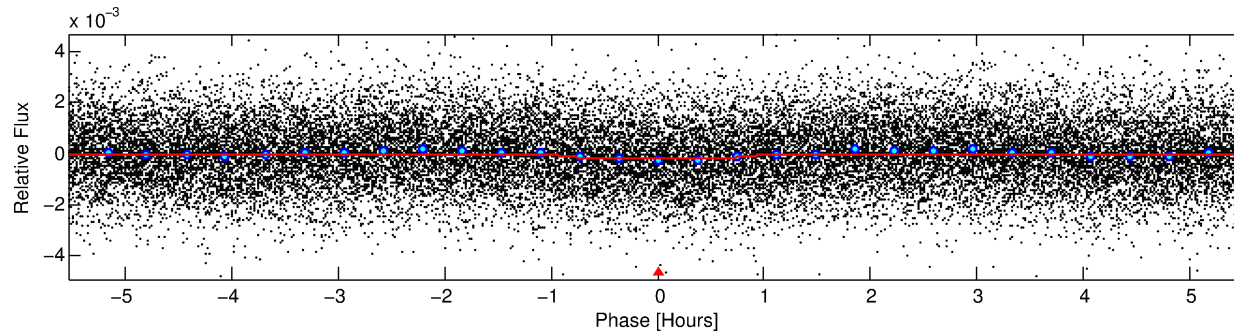
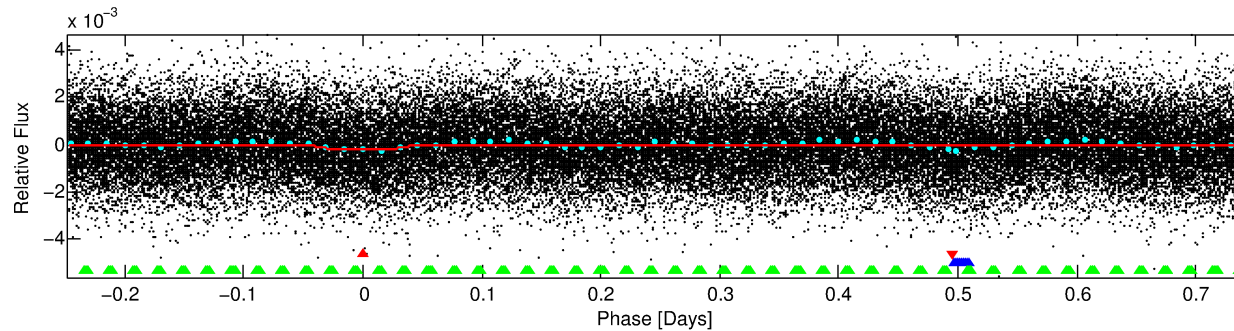
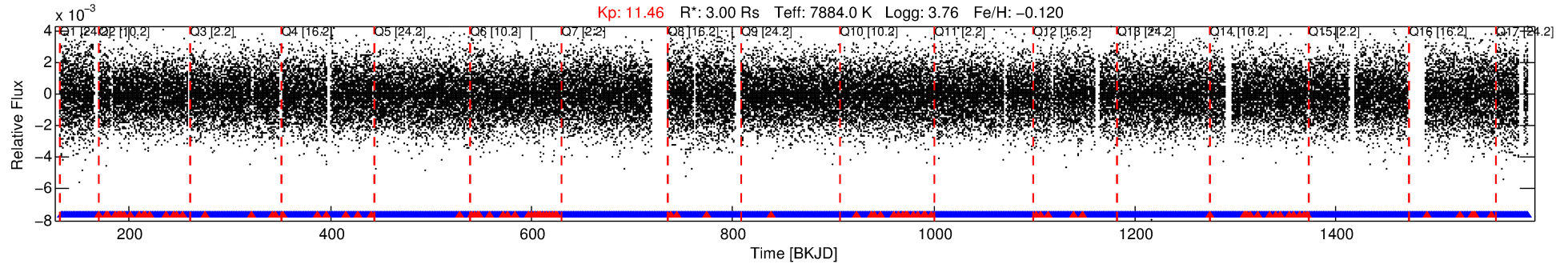
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008972966-01

No Significant Match Found

# DV One-Page Summary

KIC: 8972966 Candidate: 1 of 3 Period: 0.991 d



## DV Fit Results:

Period = 0.99054 [0.00001] d  
Epoch = 132.1517 [0.0021] BKJD  
Rp/R\* = 0.0144 [0.0073]  
a/R\* = 3.16 [8.34]  
b = 0.69 [2.26]  
Seff = 53991.37 [38148.71]  
Teq = 3887 [687] K  
Rp = 4.72 [3.11] Re  
a = 0.0240 [0.0101] AU  
Ag = 2.39 [2.94] [0.47 $\sigma$ ]  
Teffp = 7473 [1927] K [1.75 $\sigma$ ]

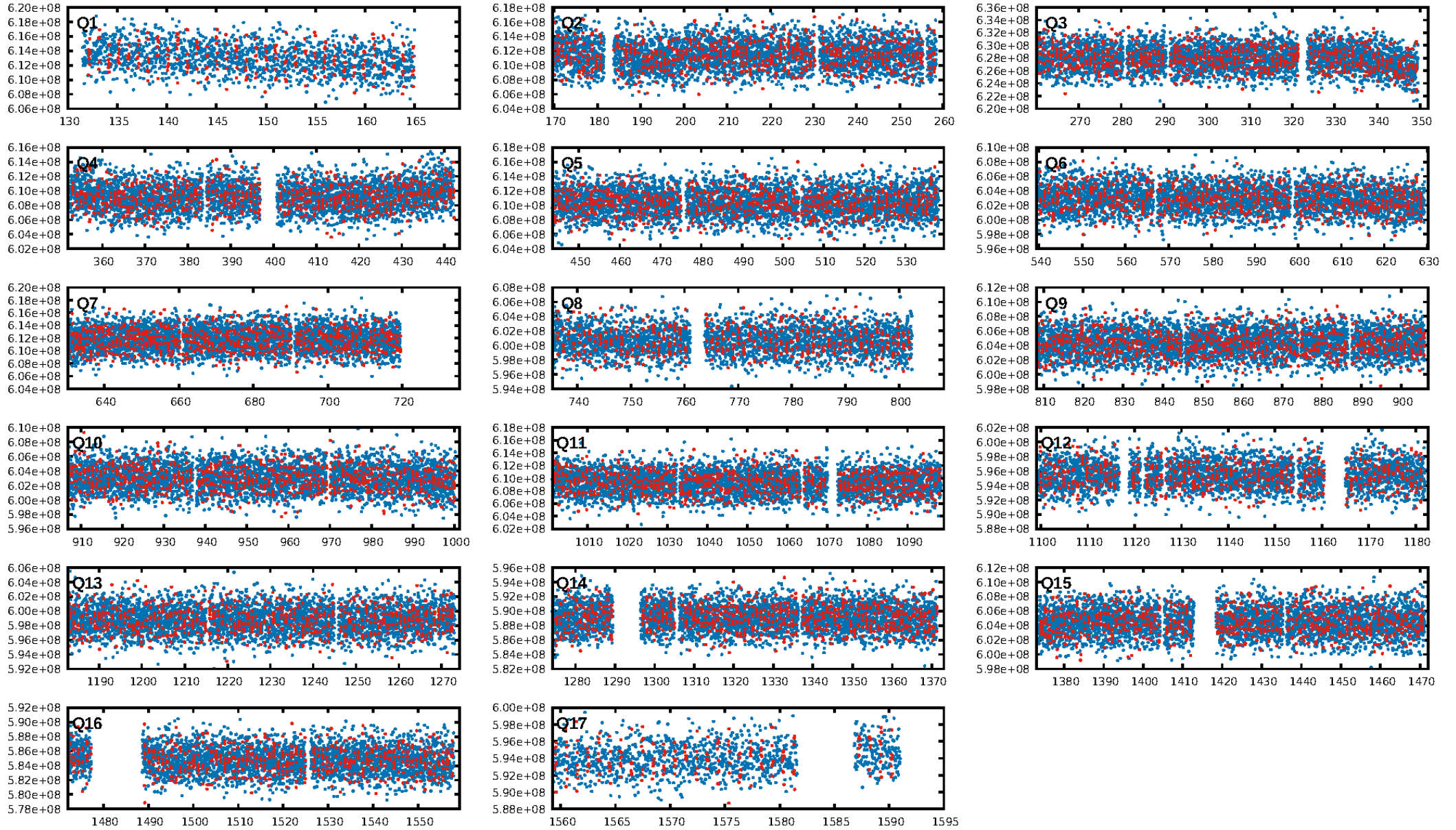
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.92 [1192/1290]  
GhostDiagnostic-chr: 1.153  
Centroid-sig: 0.4%  
Centroid-so: 0.155 arcsec [2.31 $\sigma$ ]  
OotOffset-rm: 0.043 arcsec [0.20 $\sigma$ ]  
KicOffset-rm: 0.067 arcsec [0.39 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.53 [9/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:05:59 Z

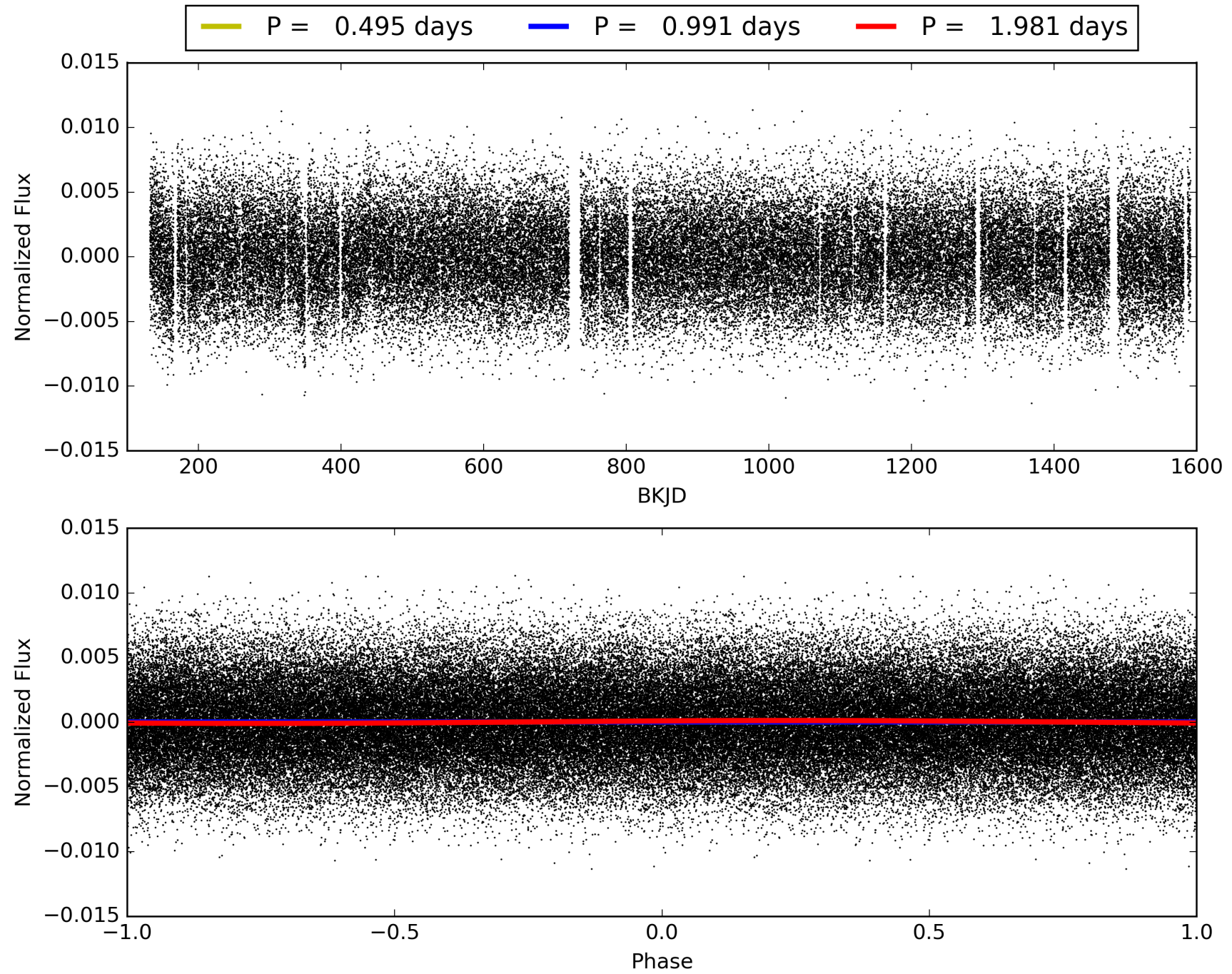
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008972966-01, PDC Light Curves





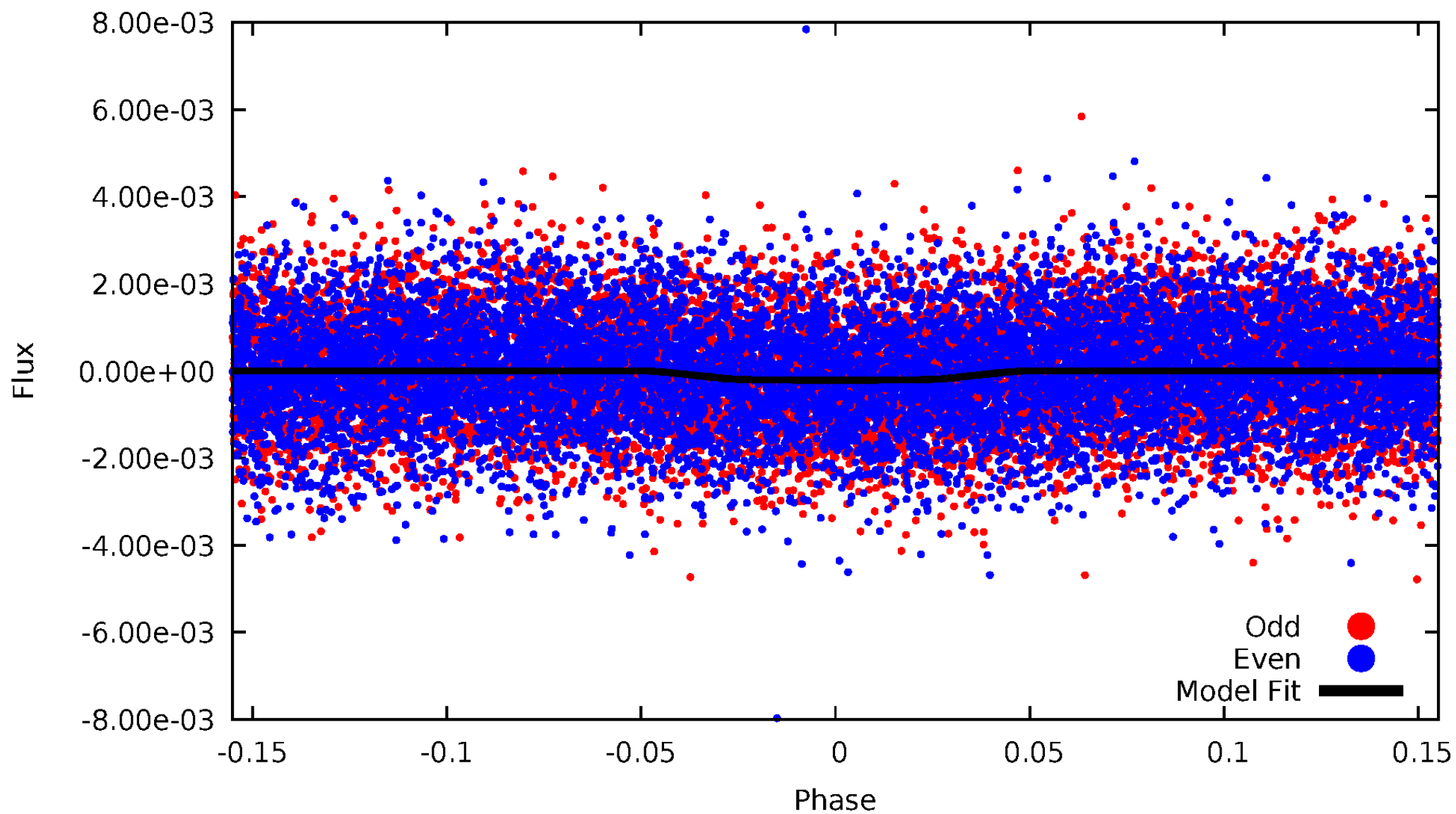
TCE 008972966-01





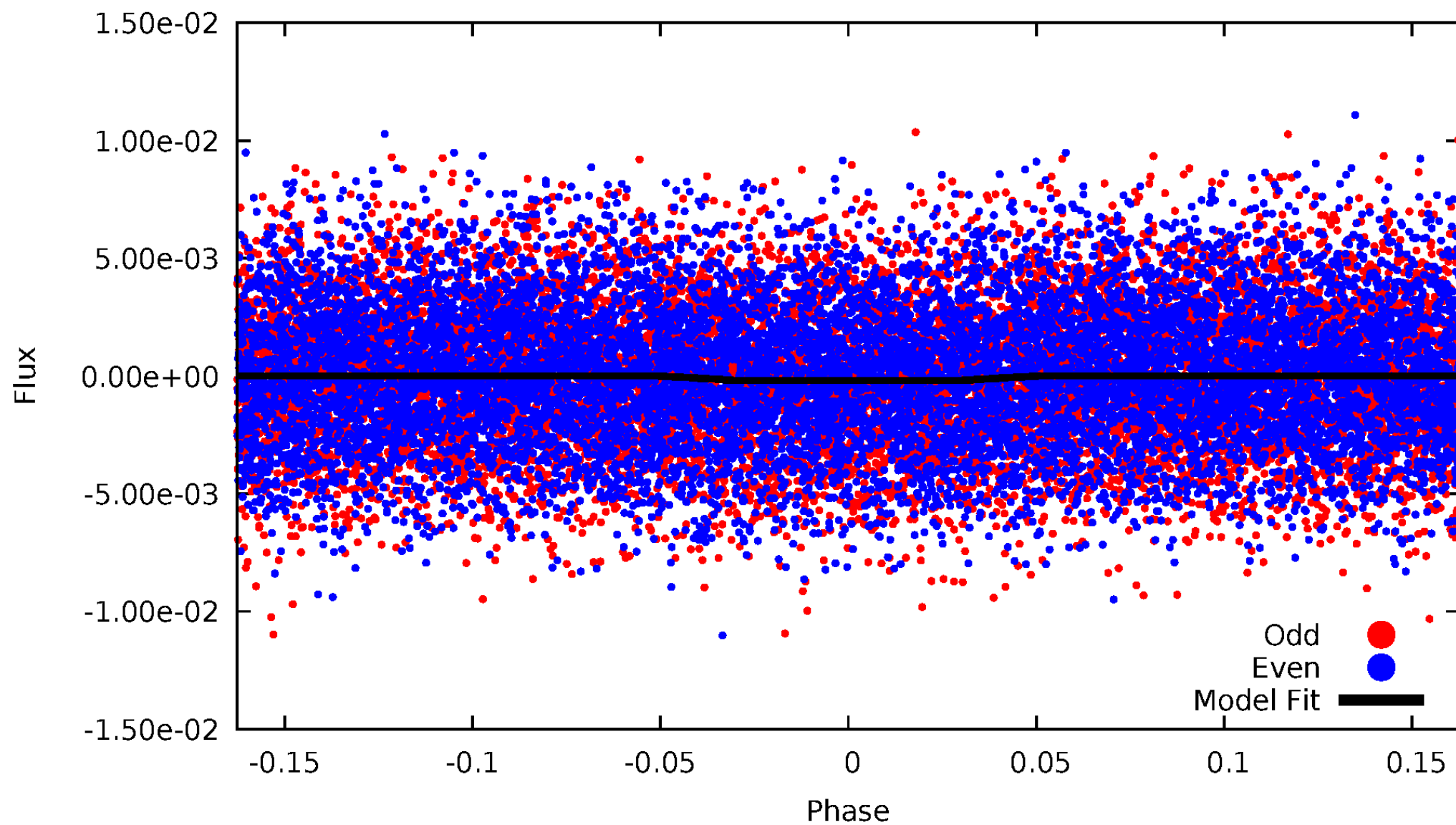
# DV Odd/Even

TCE 008972966-01



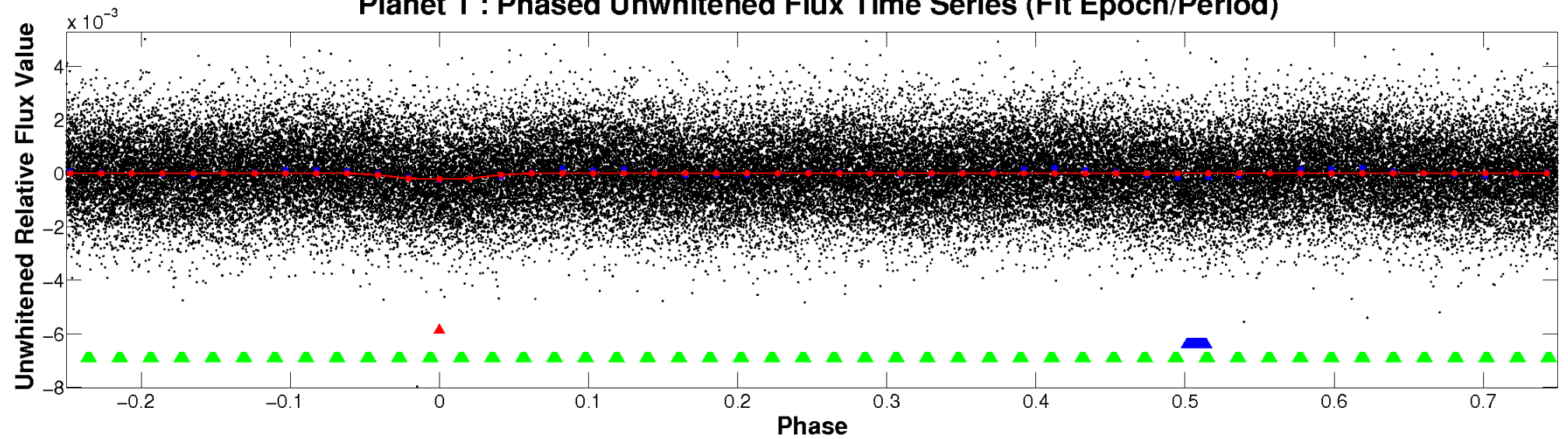
# ALT Odd/Even

TCE 008972966-01

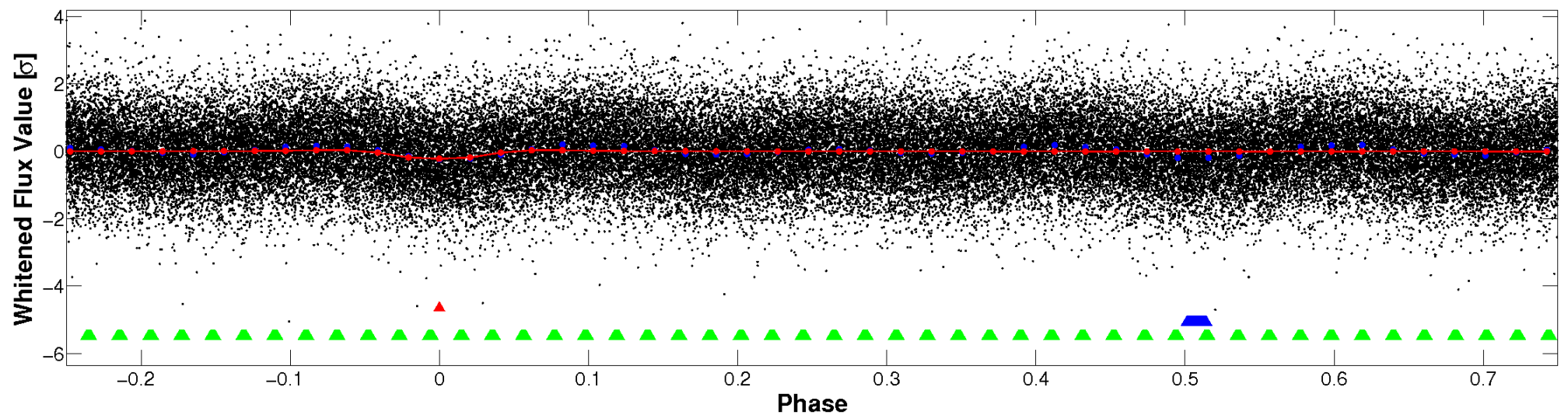


# Non-Whitened Vs. Whitened Light Curve

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



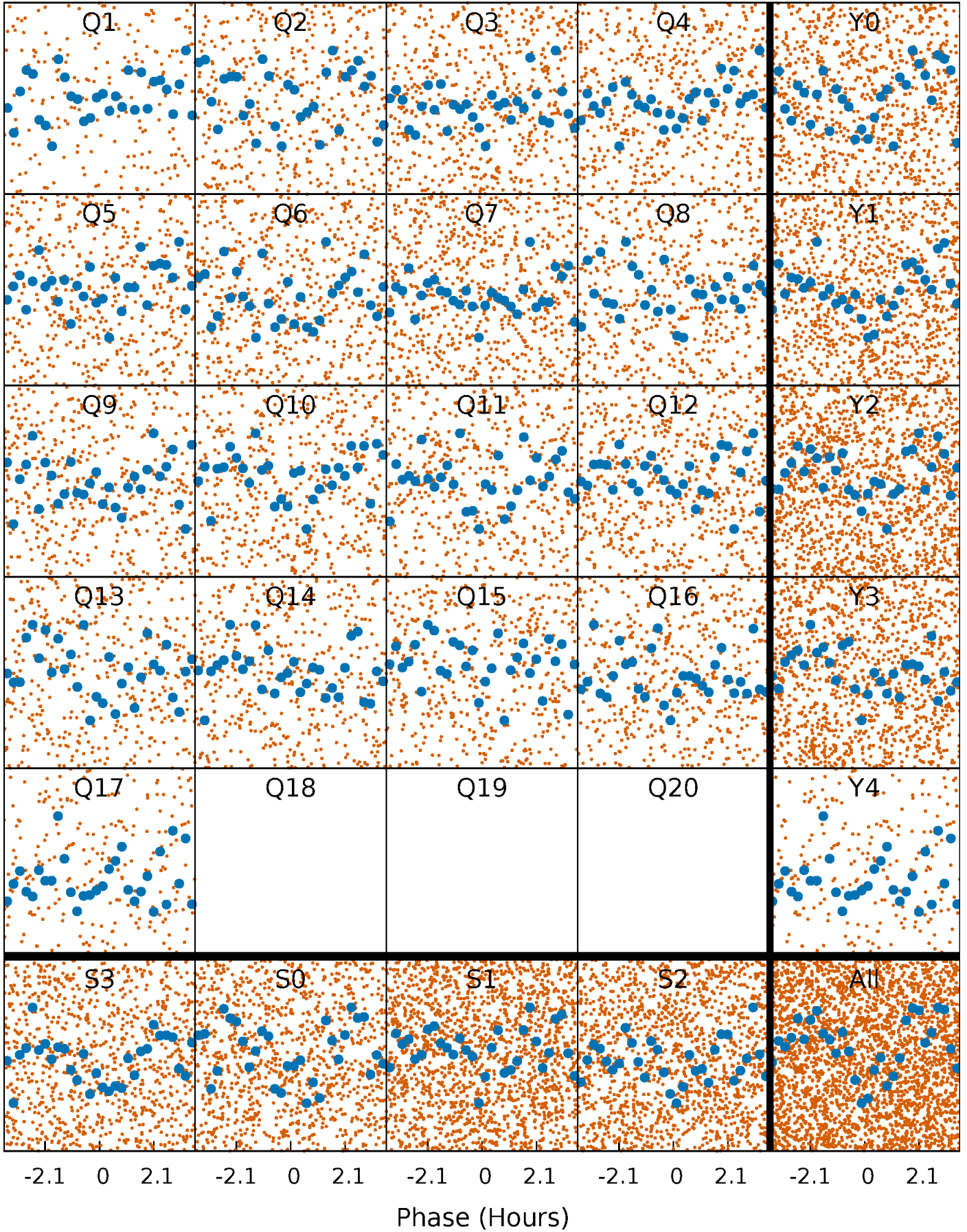
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





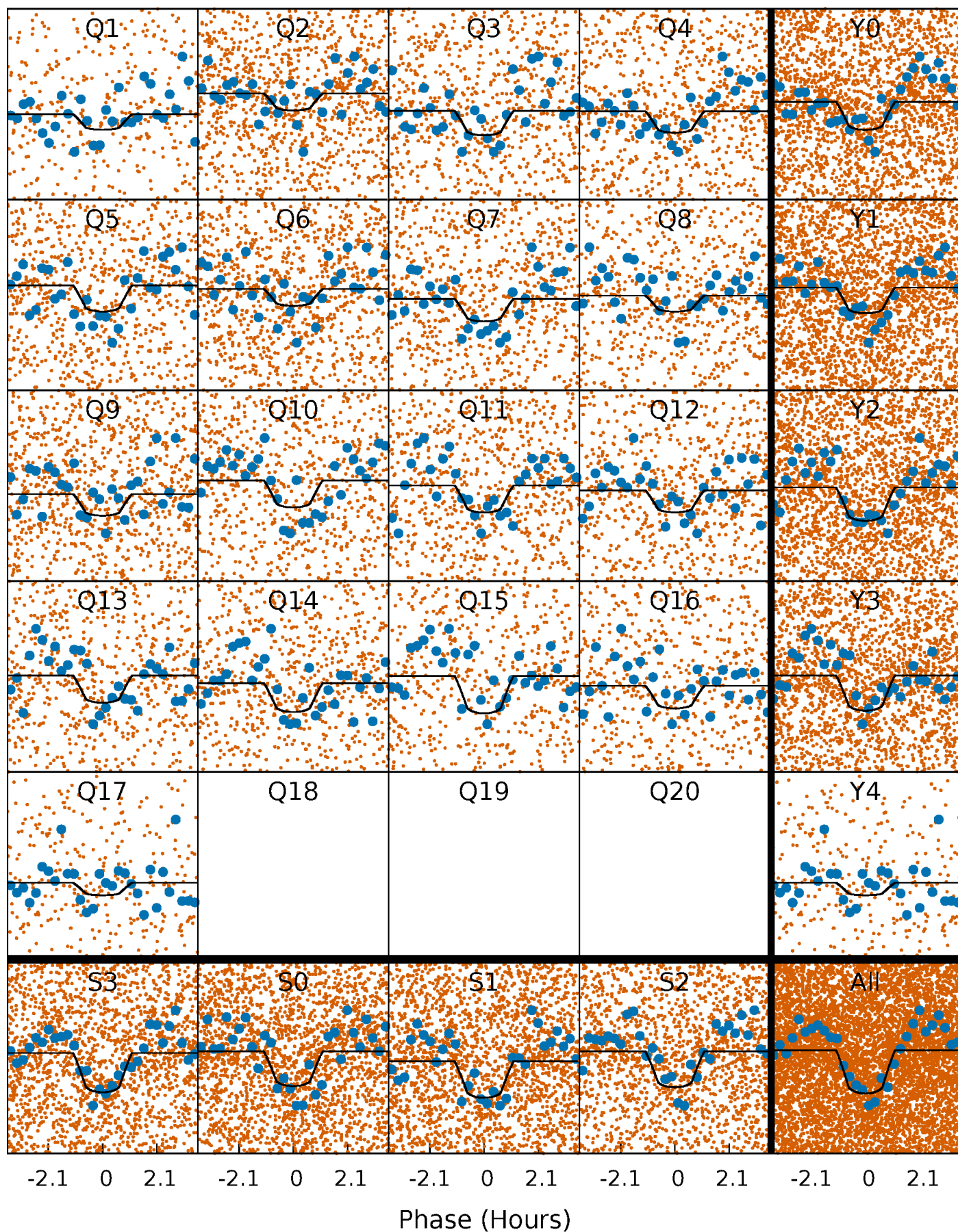
# PDC Quarter-Phased Transit Curves

TCE 008972966-01 P= 0.990542 Days  $T_0=132.151721$  (BKJD)



# DV Quarter-Phased Transit Curves

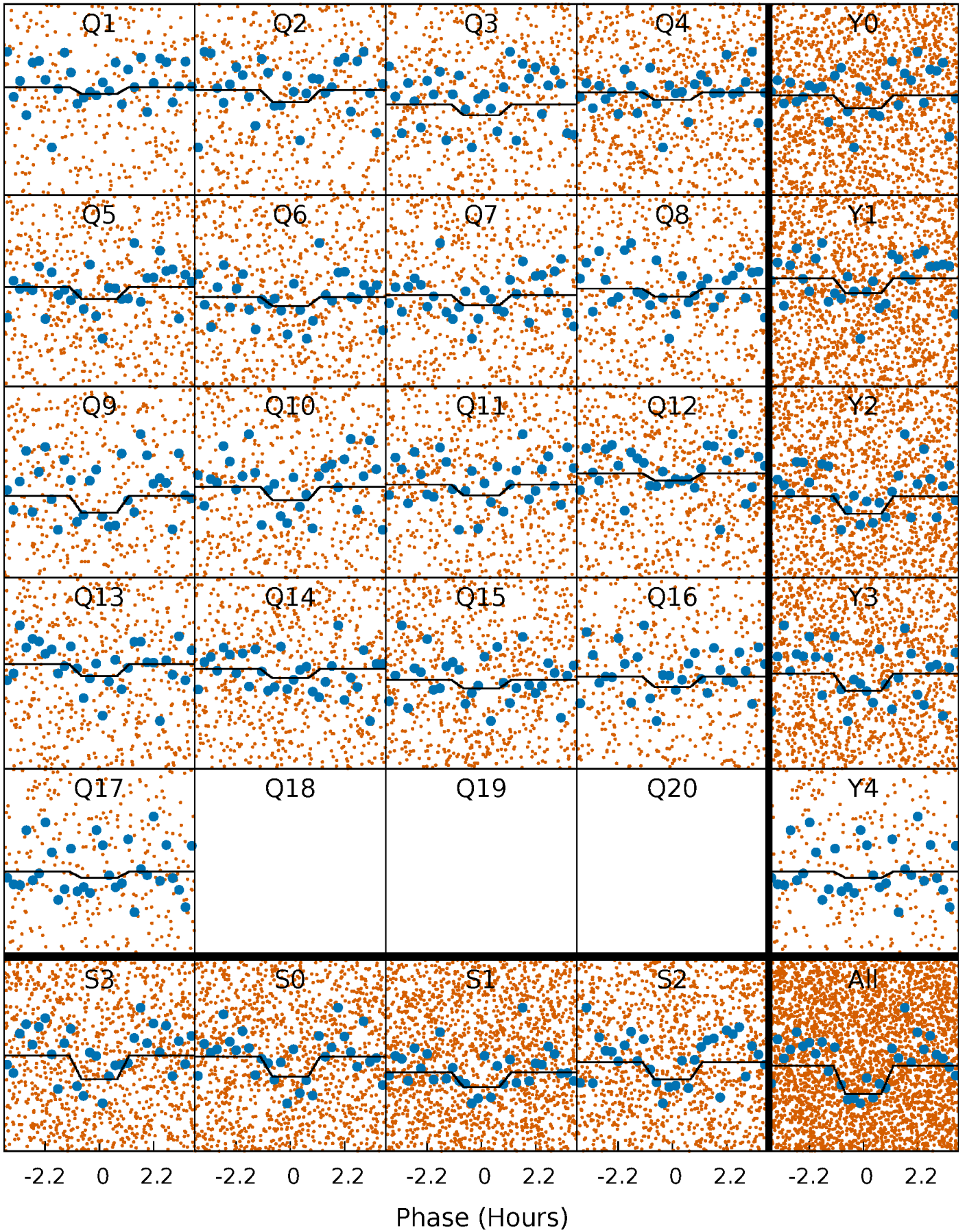
TCE 008972966-01 P= 0.990542 Days  $T_0=132.151721$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 008972966-01   P= 0.990557 Days    $T_0=132.152674$  (BKJD)

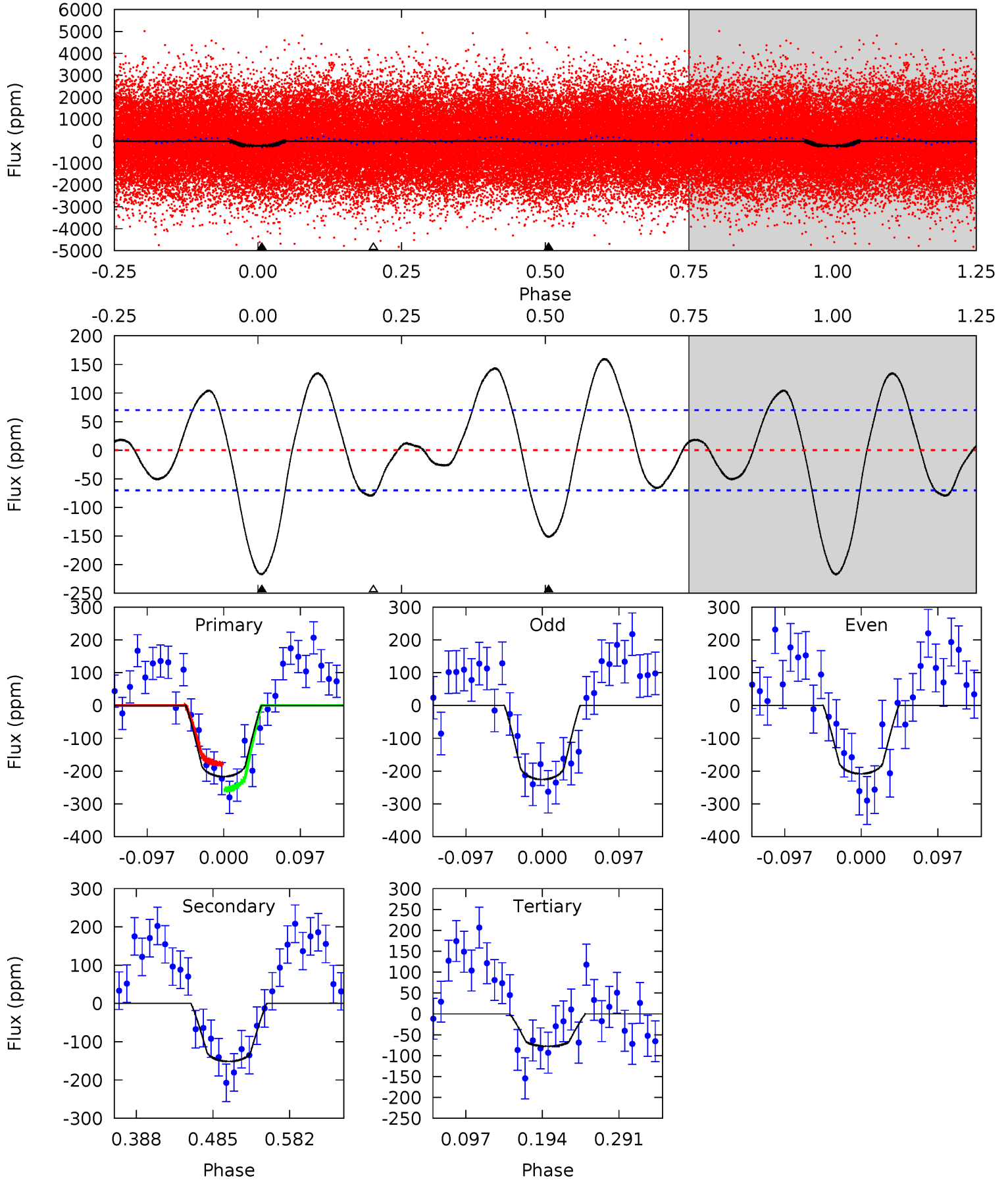




# DV Model-Shift Uniqueness Test

008972966-01, P = 0.990542 Days, E = 131.161179 Days

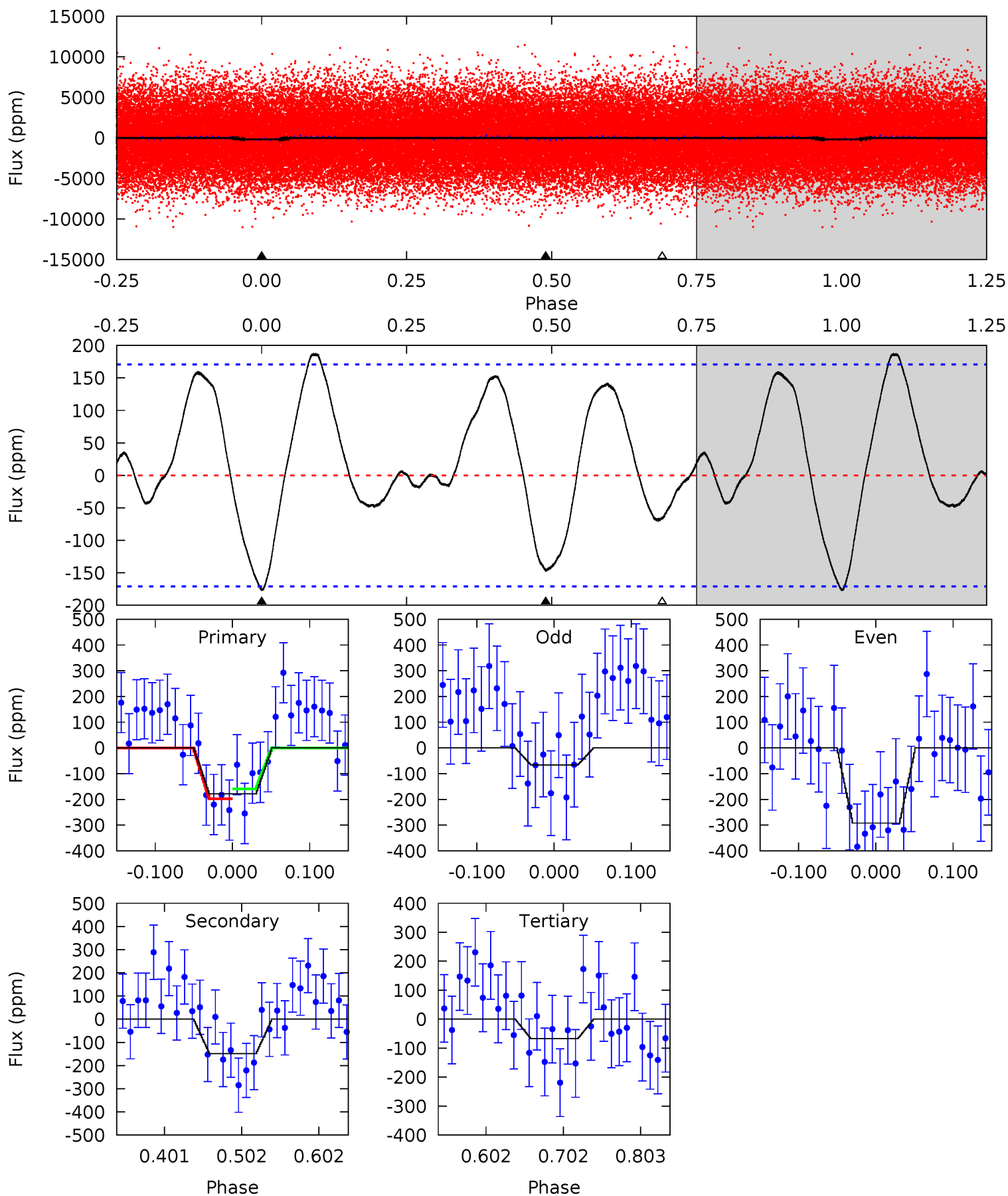
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	9.88	5.06	0	4.57	1.66	4.03	9.09	14.1	4.82	9.88	0.57	1.08	0.42	2.57



# Alt Model-Shift Uniqueness Test

008972966-01, P = 0.990557 Days, E = 131.162117 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
4.76	3.96	1.80	0	4.56	1.64	1.69	2.95	4.76	2.16	3.96	3.02	1.18	0.51	0.52



### Stellar Parameters For KIC 008972966

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7884^{+219}_{-328}$	$3.759^{+0.408}_{-0.072}$	$-0.120^{+0.200}_{-0.350}$	$3.002^{+0.423}_{-1.268}$	$1.884^{+0.102}_{-0.408}$	$0.098^{+0.343}_{-0.022}$
	+3%/-4%	+11%/-2%	+167%/-292%	+14%/-42%	+5%/-22%	+350%/-23%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008972966-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-151 \pm 15$	$4.33^{+2.33}_{-2.01}$	$5243^{+345}_{-606}$	$6668^{+3658}_{-1283}$	$2.486^{+6.150}_{-1.430}$
Alt.	$-148 \pm 37$	$4.02^{+2.29}_{-2.12}$	$5203^{+380}_{-586}$	$7008^{+4604}_{-1684}$	$2.903^{+10.645}_{-1.829}$

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



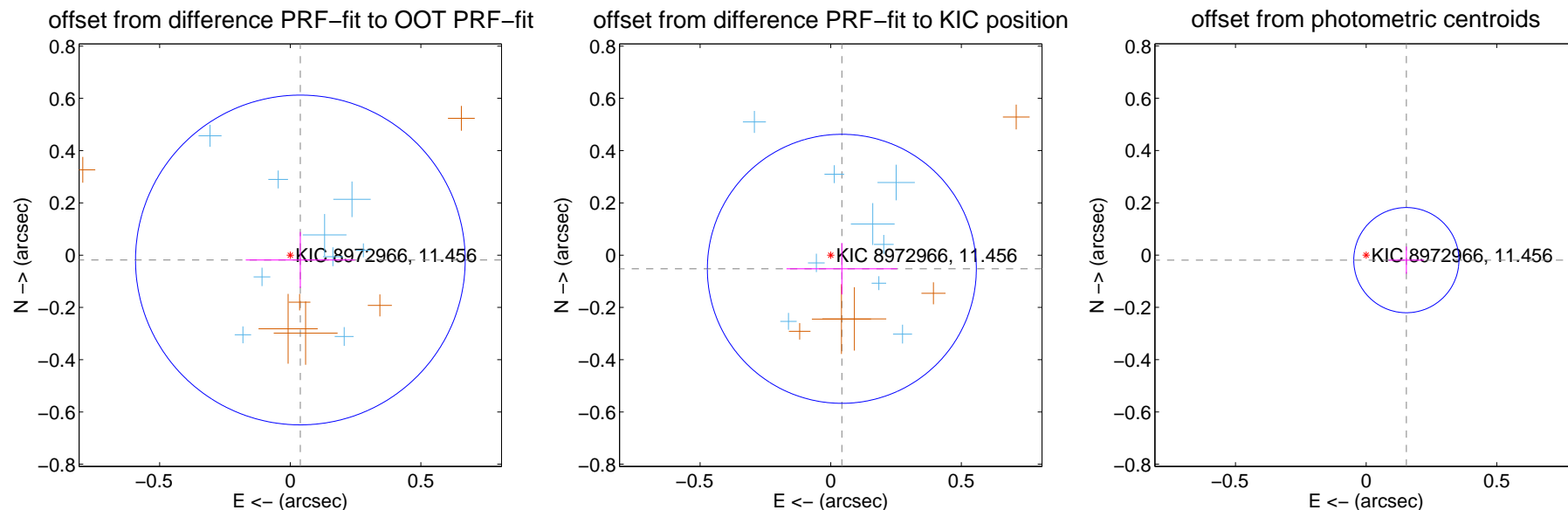
## DV Centroid Data

Supplemental centroid analysis for 008972966-01. **Kepler magnitude: 11.46.** Transit SNR 12.73

There are 9 quarters with good PRF difference image offsets

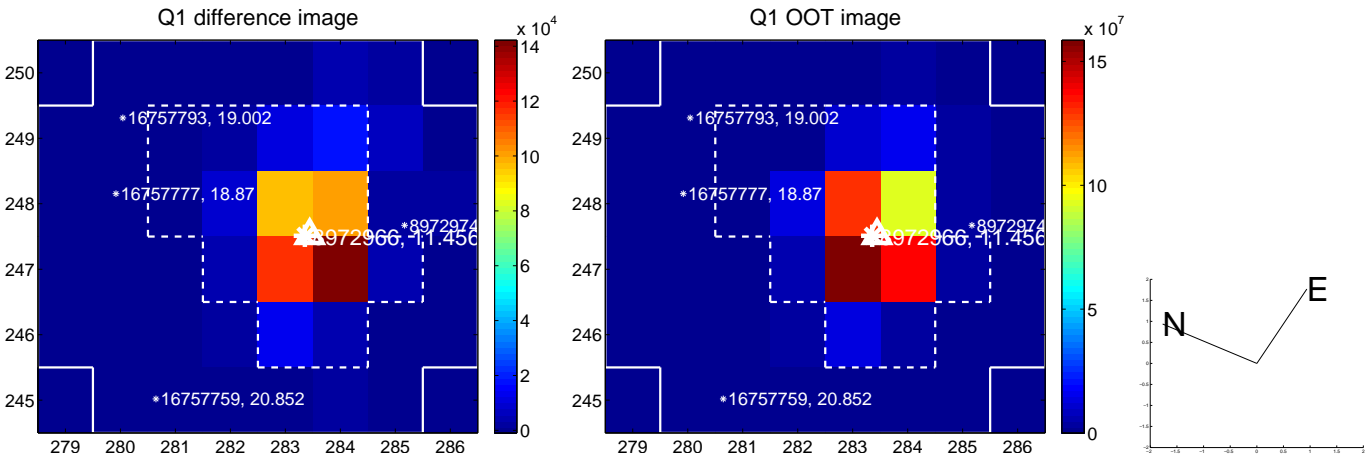
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.043 \pm 0.210$	0.20	$-0.039 \pm 0.209$	$-0.019 \pm 0.107$
PRF-fit source offset from KIC position	$0.067 \pm 0.172$	0.39	$-0.043 \pm 0.212$	$-0.052 \pm 0.098$
photometric centroid source offset	$0.16 \pm 0.07$	2.31	$-0.15 \pm 0.07$	$-0.02 \pm 0.05$

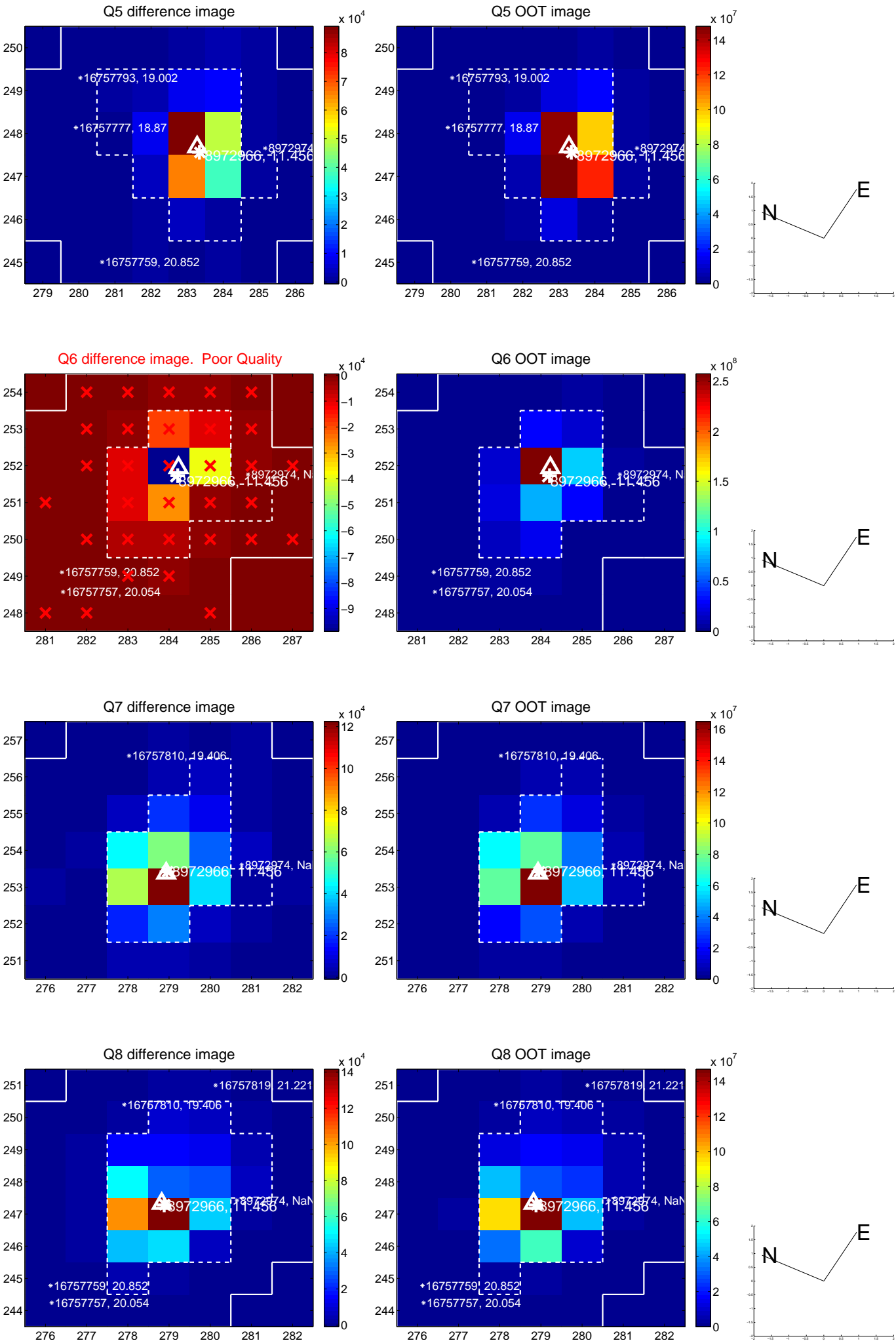


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

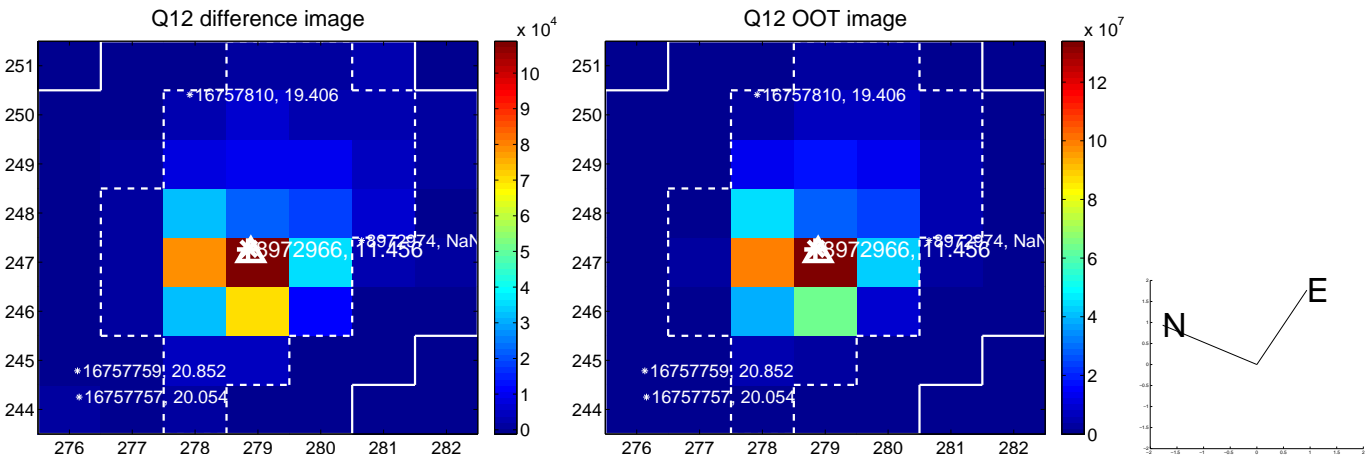
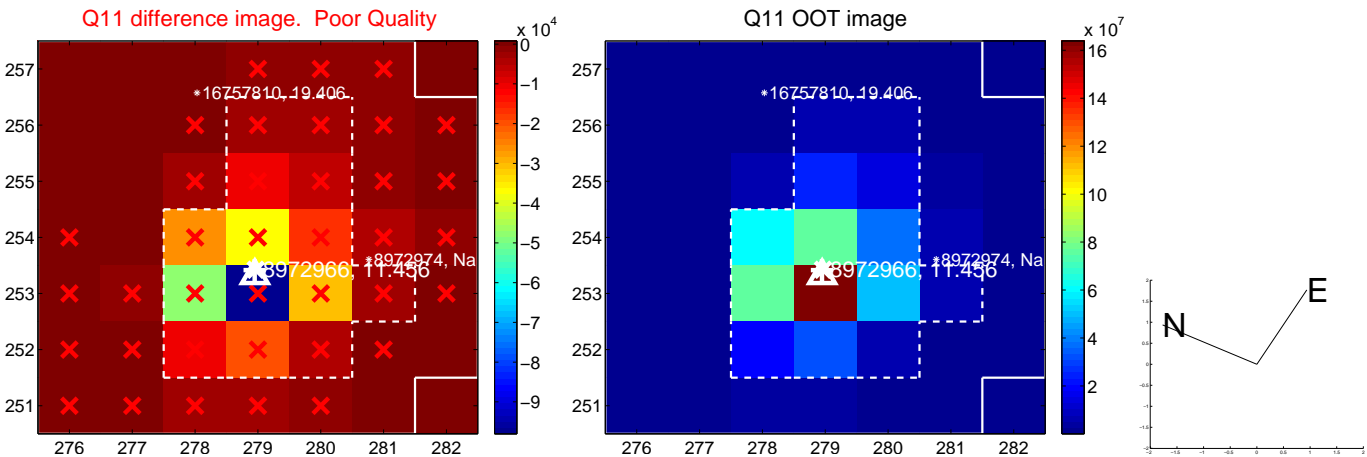
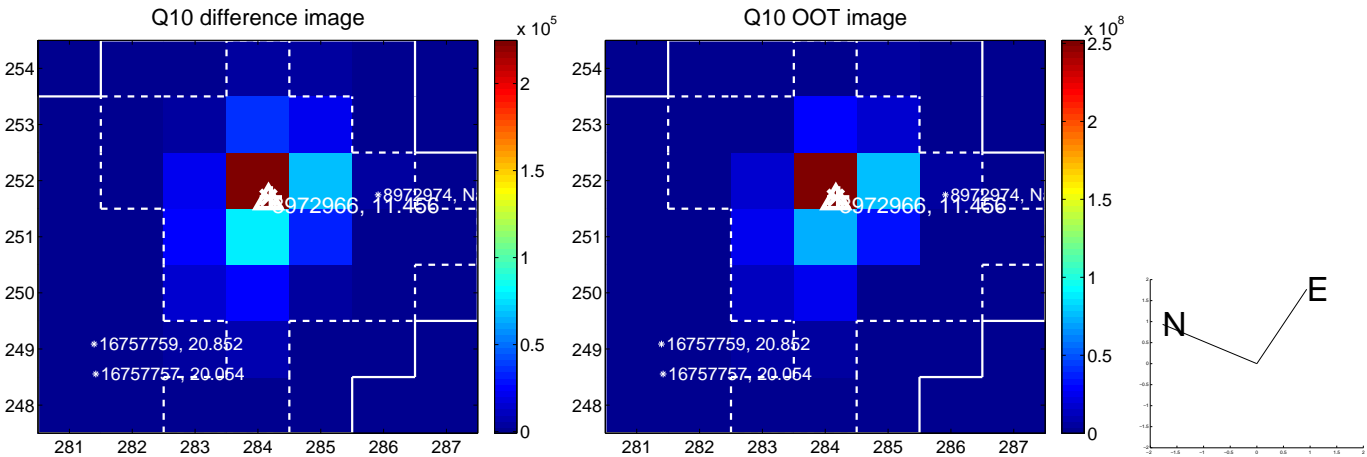
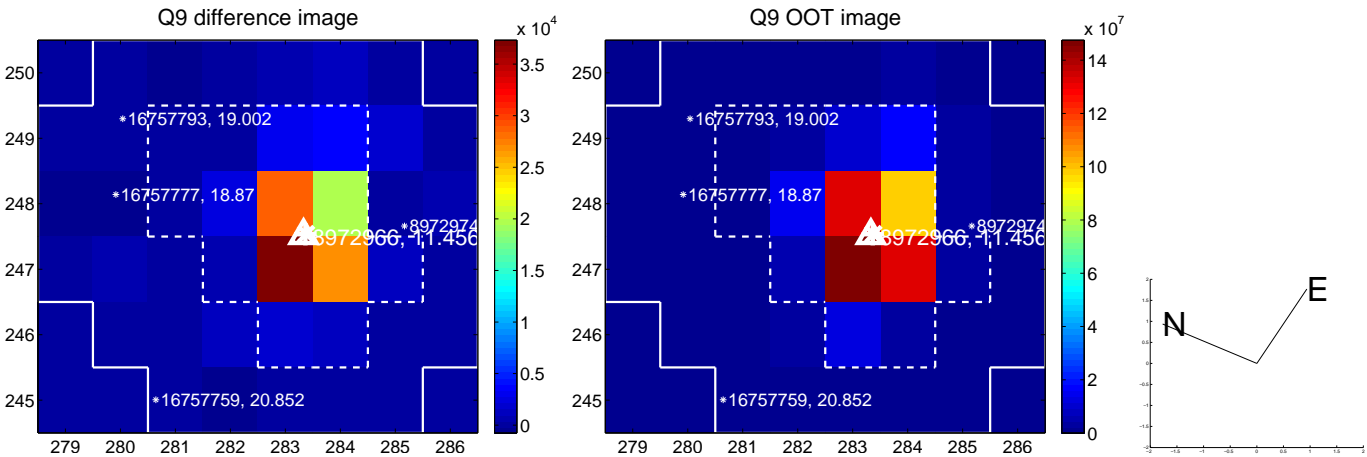


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

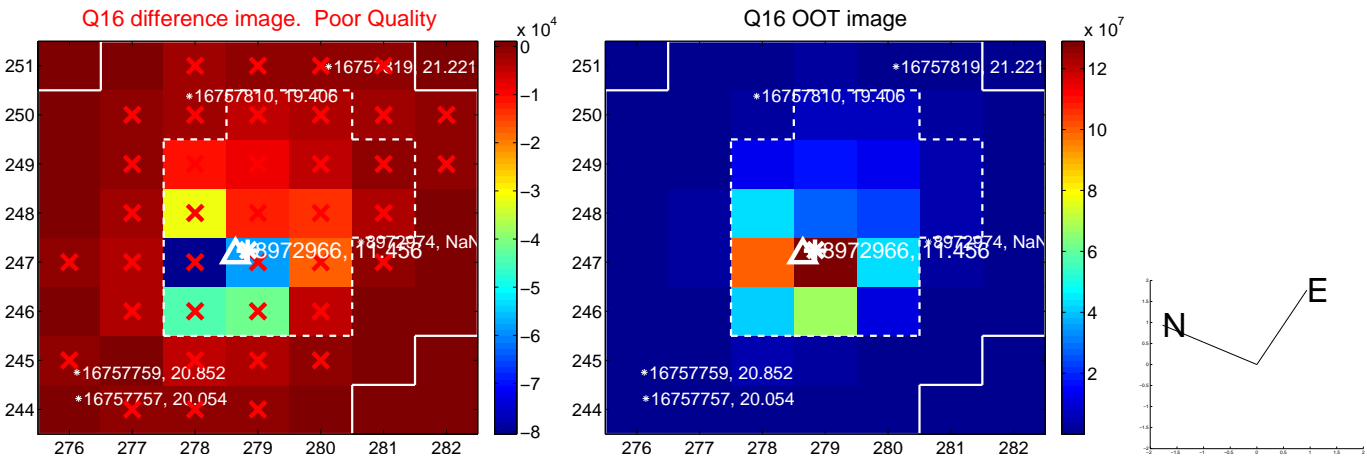
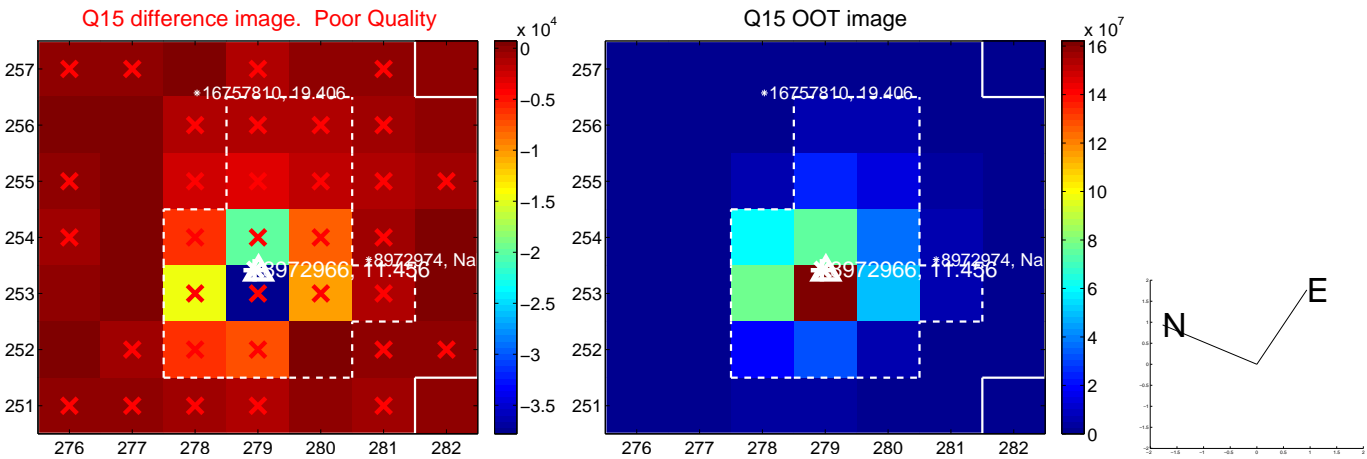
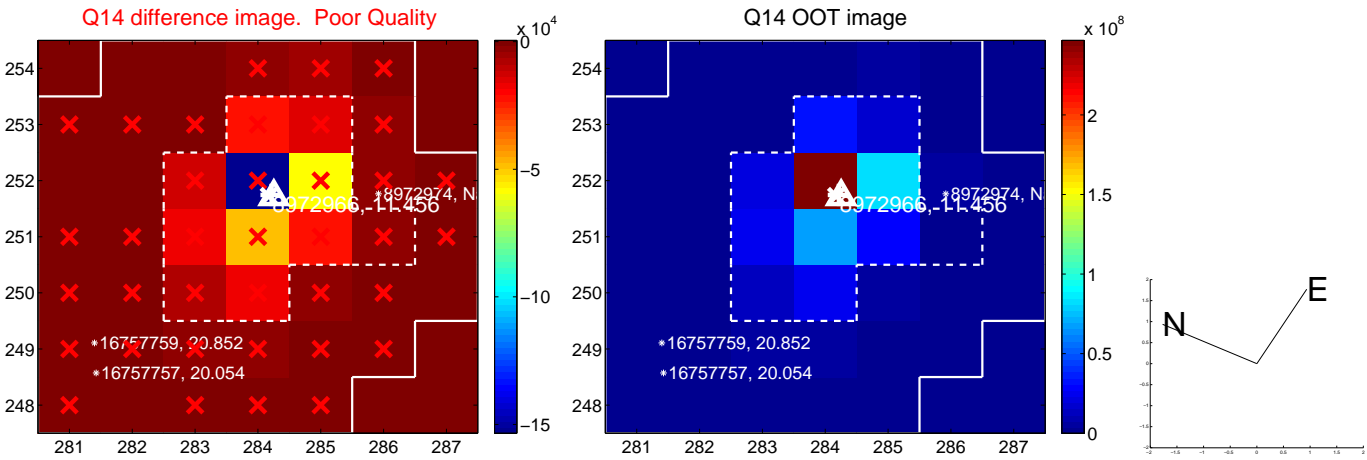
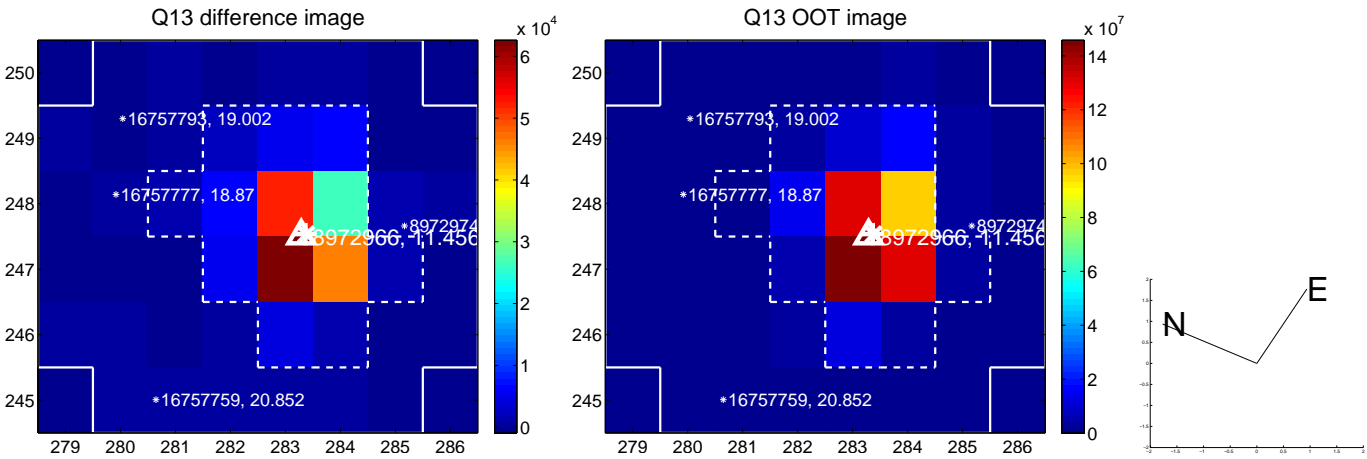




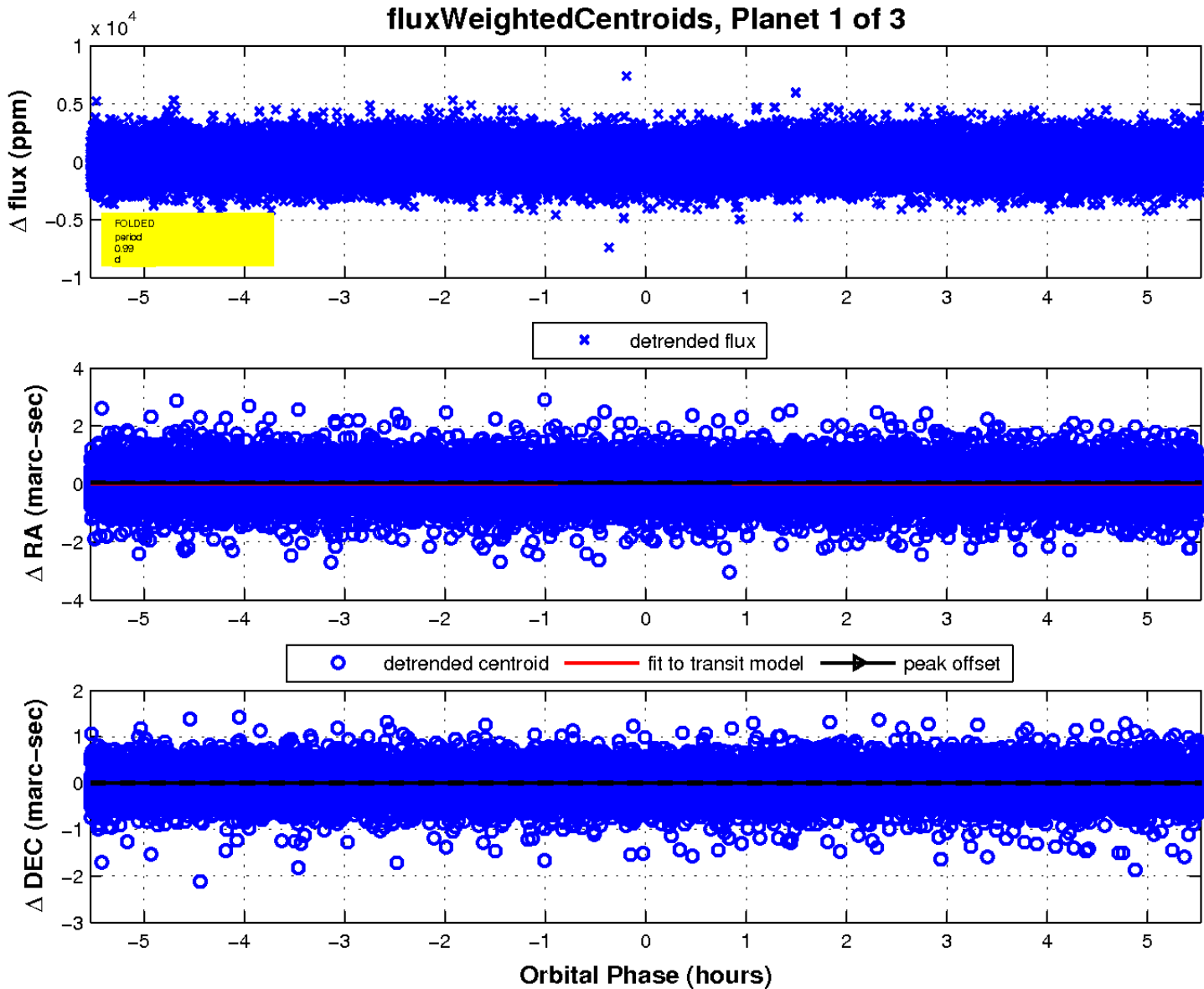
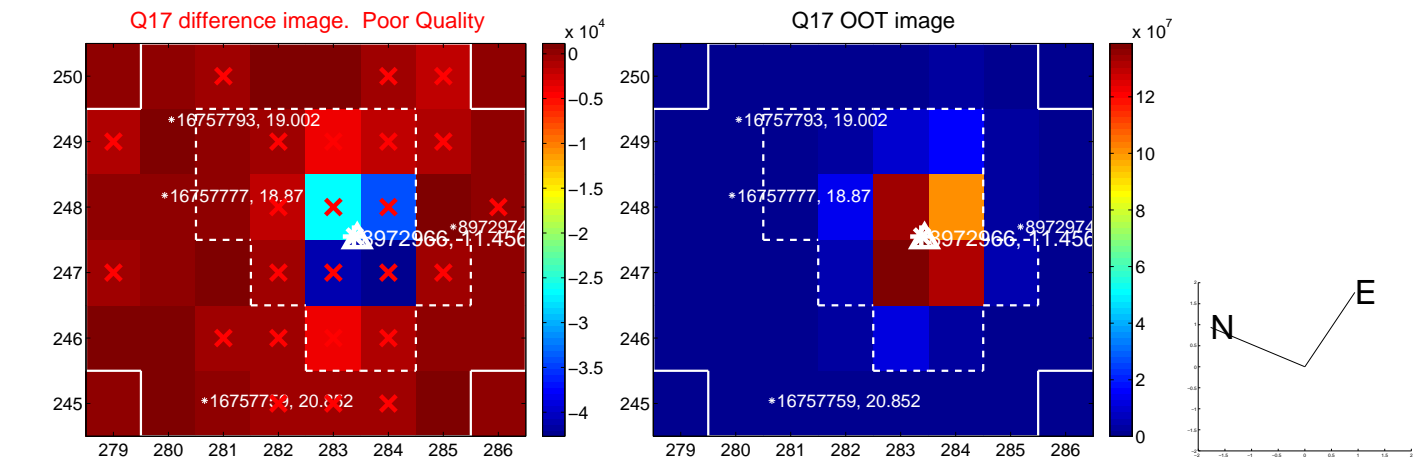
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

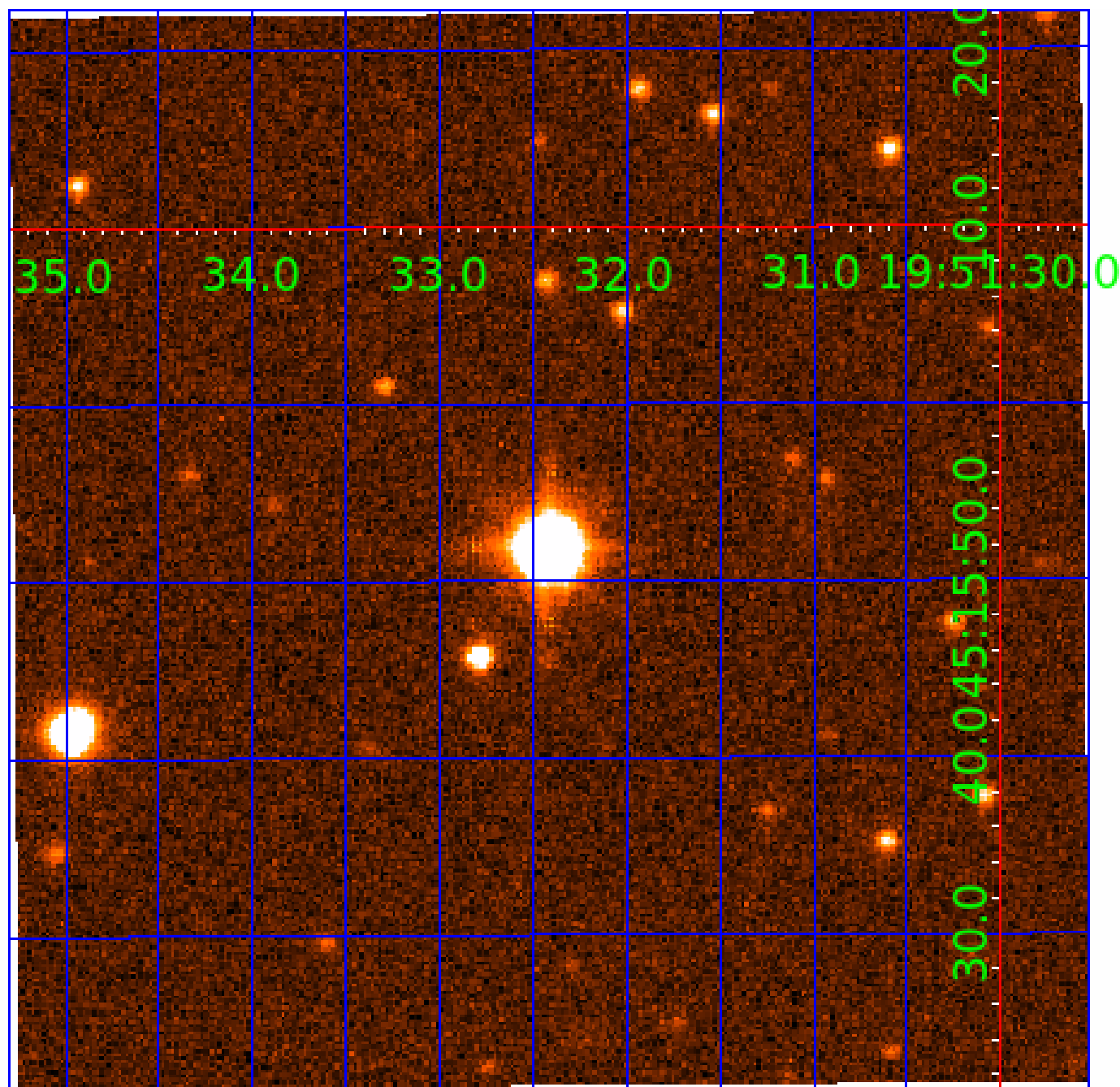


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008972966

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008972966-01	OBS	No	0.990542	132.151721	215.3	1.844	14.2	12.7	3.00	7884	4.72	53991.37
008972966-02	OBS	No	0.990550	131.657633	240.5	1.876	12.3	14.1	3.00	7884	5.41	53990.72
008972966-03	OBS	No	1.382634	132.886892	383.9	16.592	10.0	22.1	3.00	7884	7.50	34610.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008972966-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008972966-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008972966-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

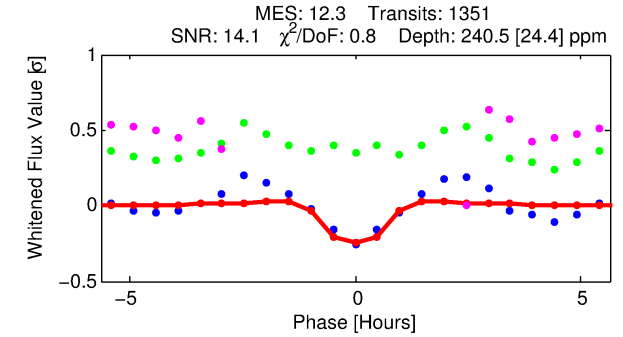
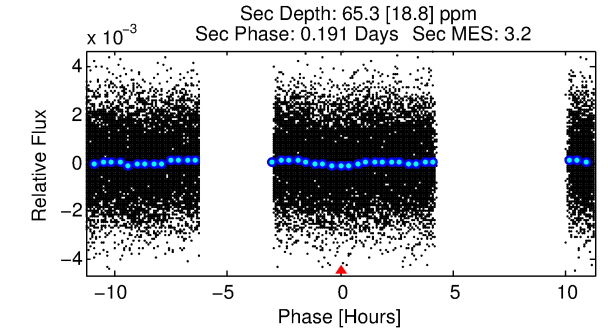
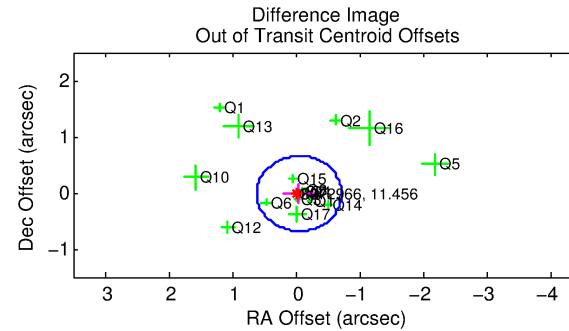
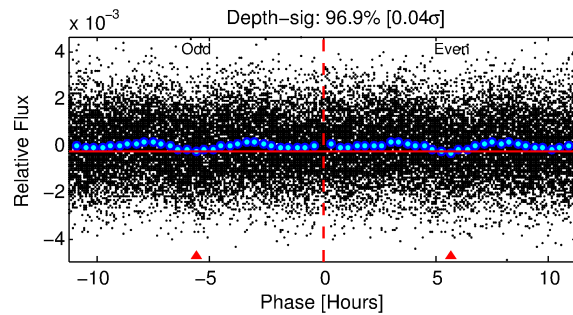
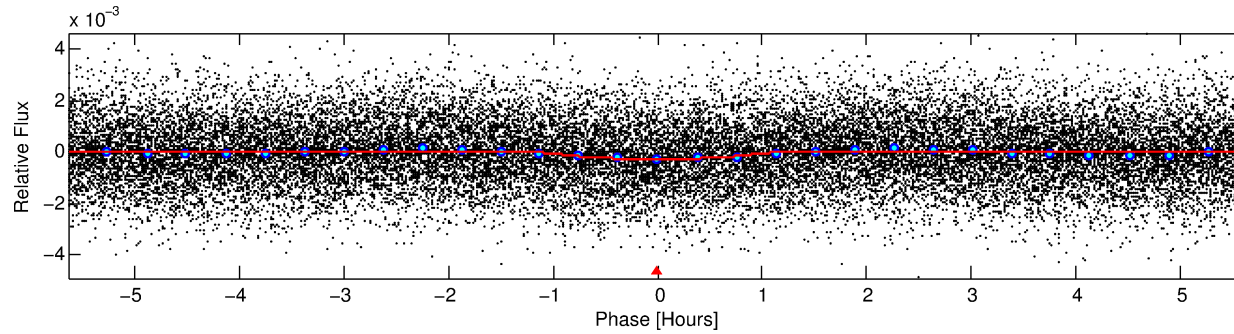
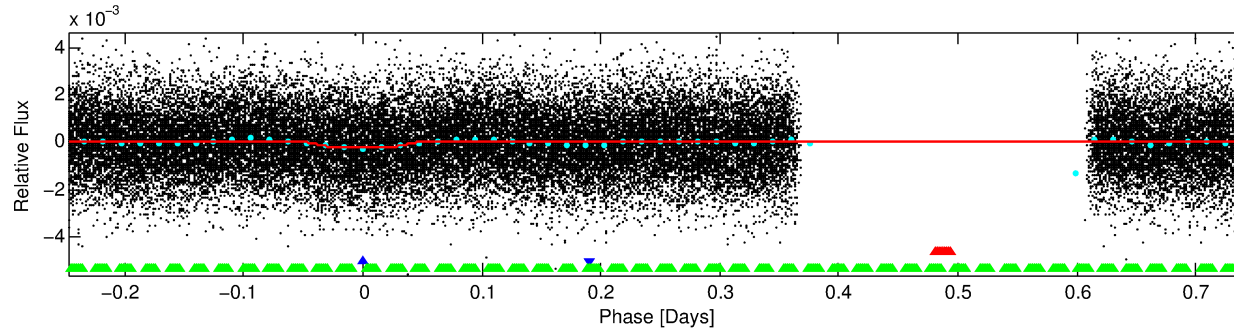
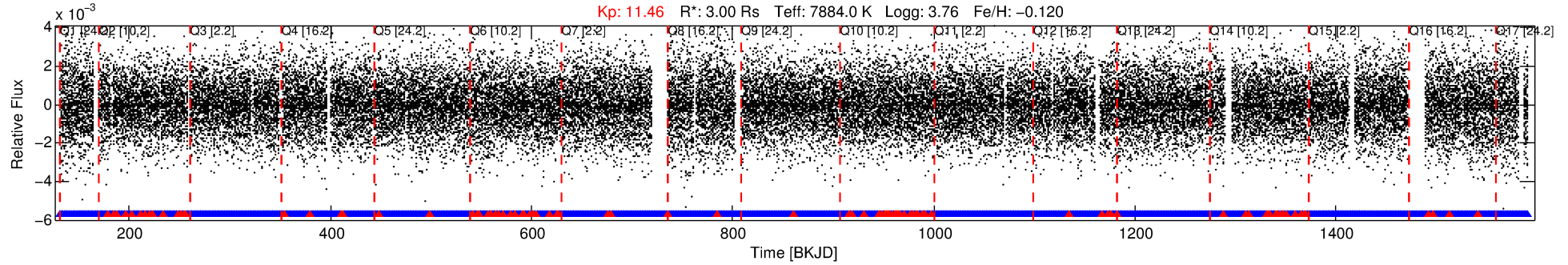
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008972966-02

No Significant Match Found

# DV One-Page Summary

KIC: 8972966 Candidate: 2 of 3 Period: 0.991 d



## DV Fit Results:

Period = 0.99055 [0.00001] d  
Epoch = 131.6576 [0.0019] BKJD  
Rp/R\* = 0.0165 [0.0079]  
a/R\* = 2.14 [4.92]  
b = 0.90 [0.65]  
Seff = 53990.72 [38148.25]  
Teq = 3887 [687] K  
Rp = 5.41 [3.46] Re  
a = 0.0240 [0.0101] AU  
Ag = 0.71 [0.86] [-0.34 $\sigma$ ]  
Teffp = 5513 [1401] K [1.04 $\sigma$ ]

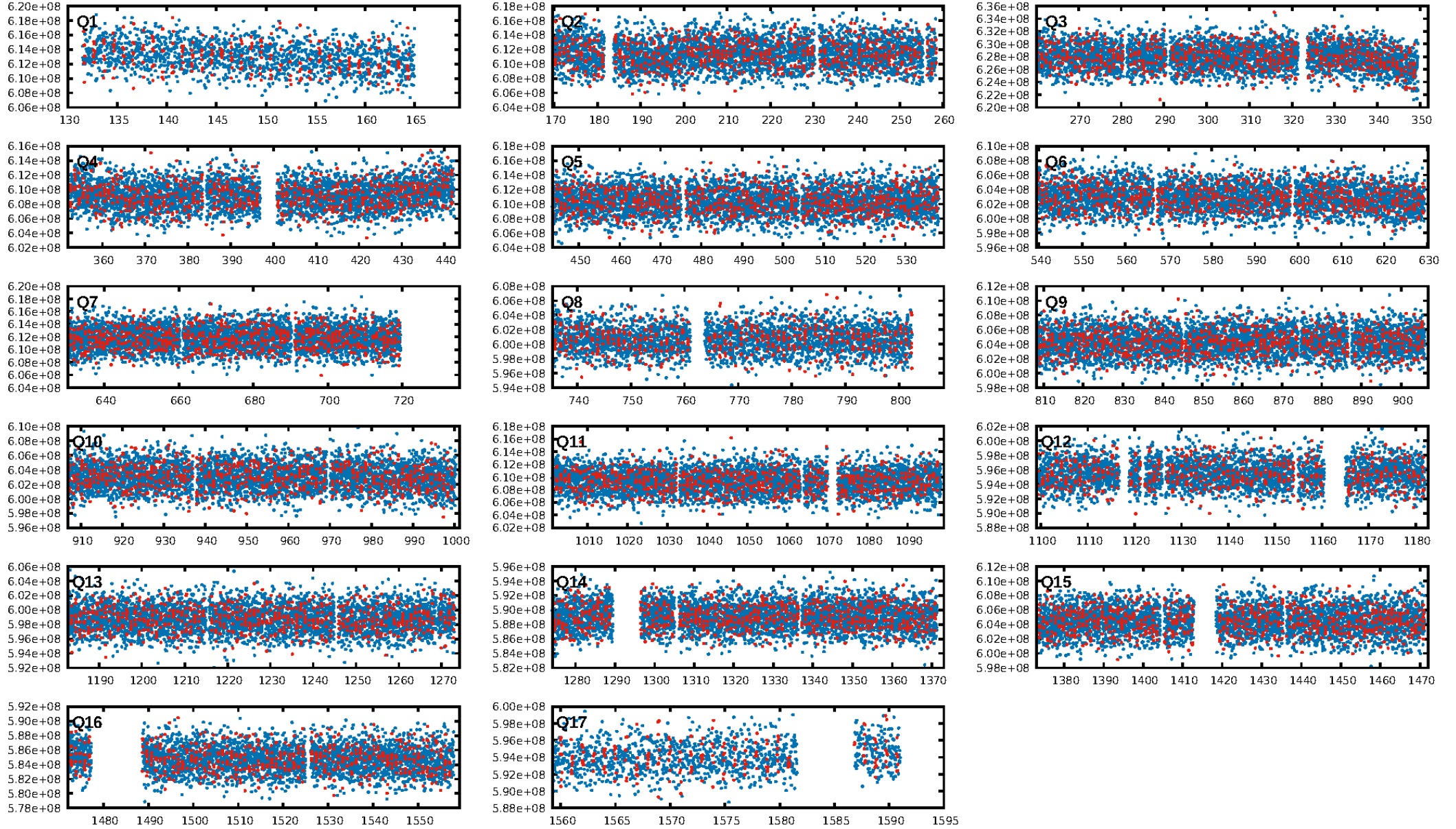
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: 42.7% [0.56 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.92 [1192/1291]  
GhostDiagnostic-chr: 1.029  
Centroid-sig: 22.6%  
Centroid-so: 0.074 arcsec [1.24 $\sigma$ ]  
OotOffset-rm: 0.054 arcsec [0.24 $\sigma$ ]  
KicOffset-rm: 0.099 arcsec [0.42 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.53 [9/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:06:10 Z

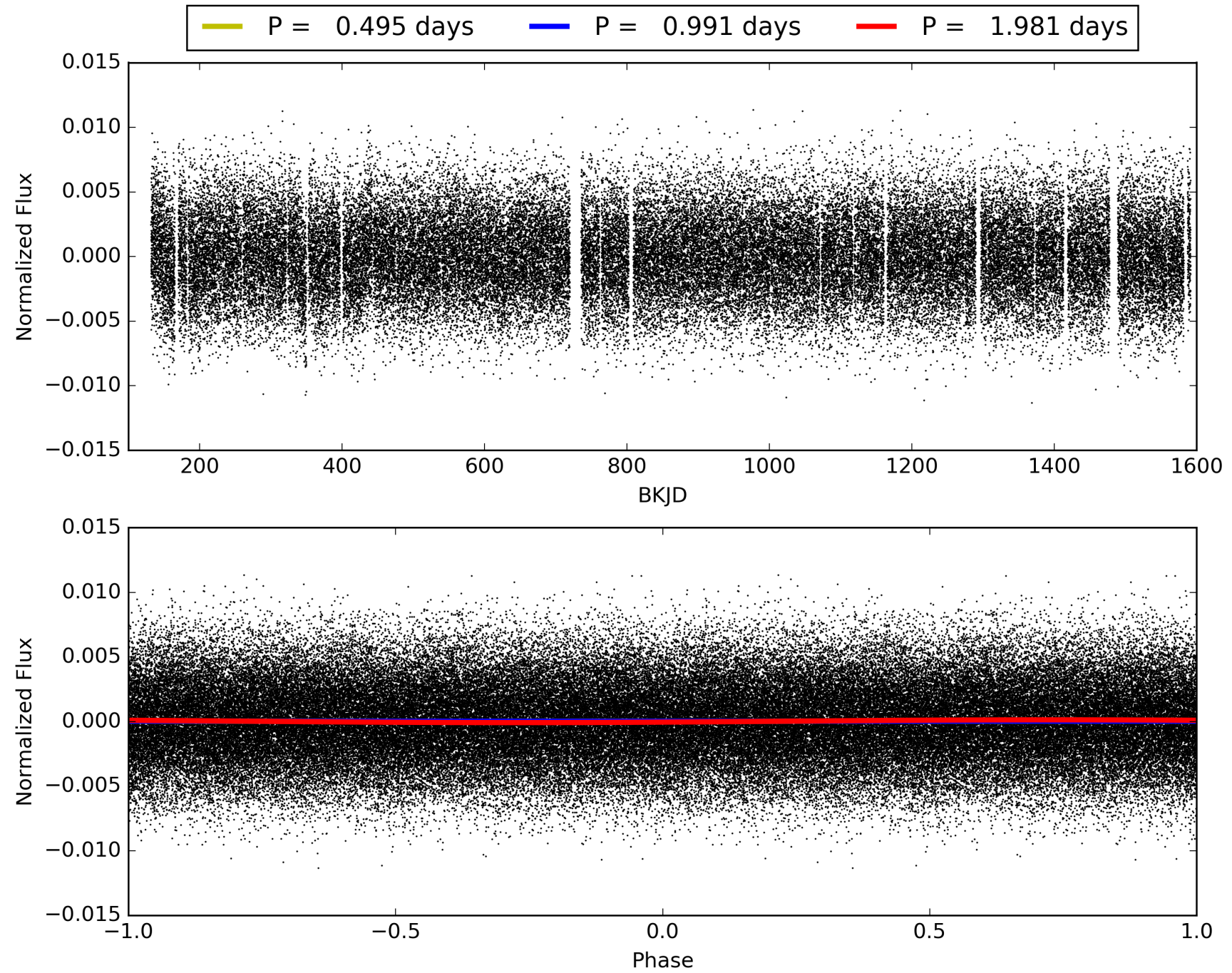
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008972966-02, PDC Light Curves





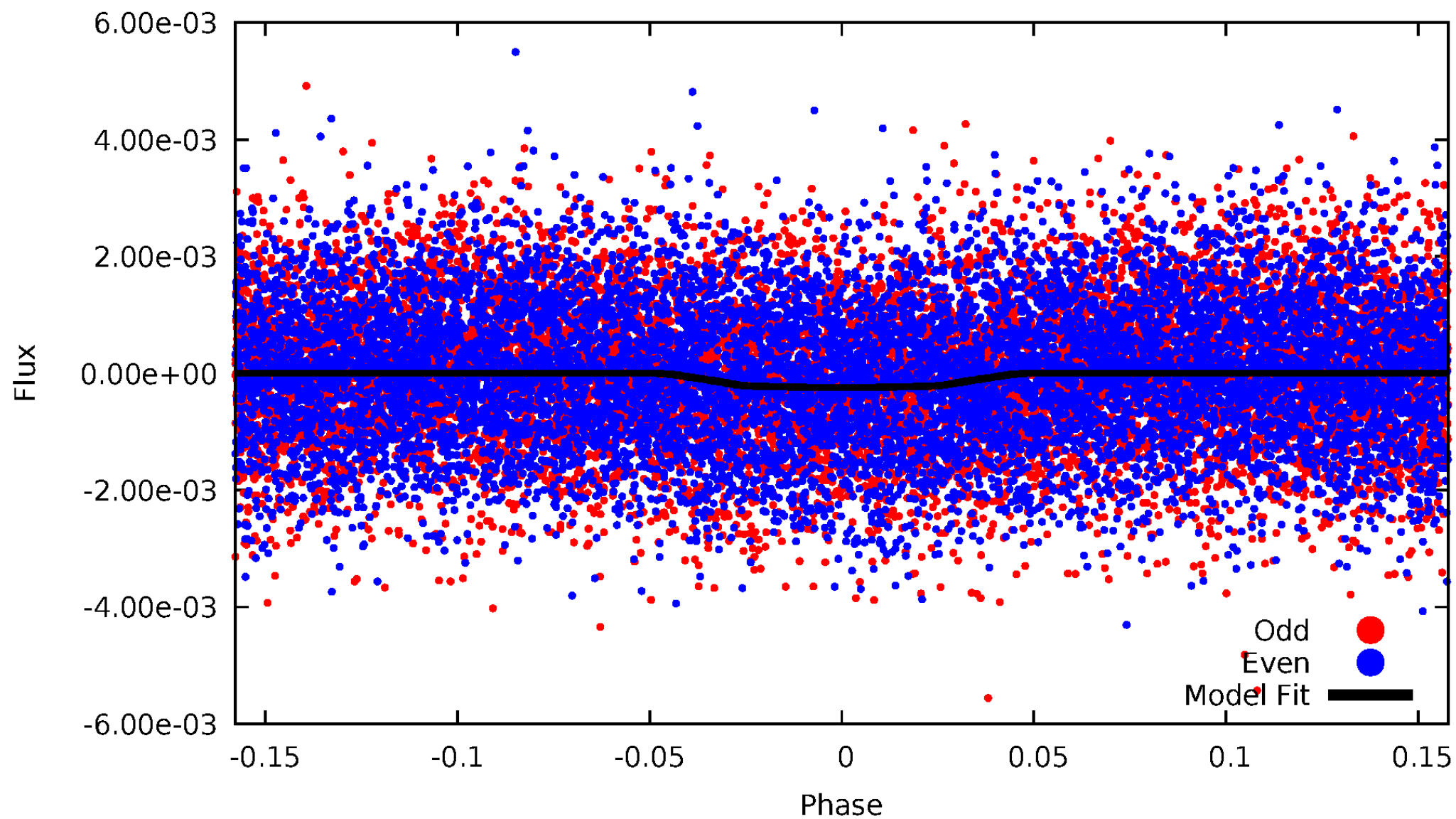
TCE 008972966-02





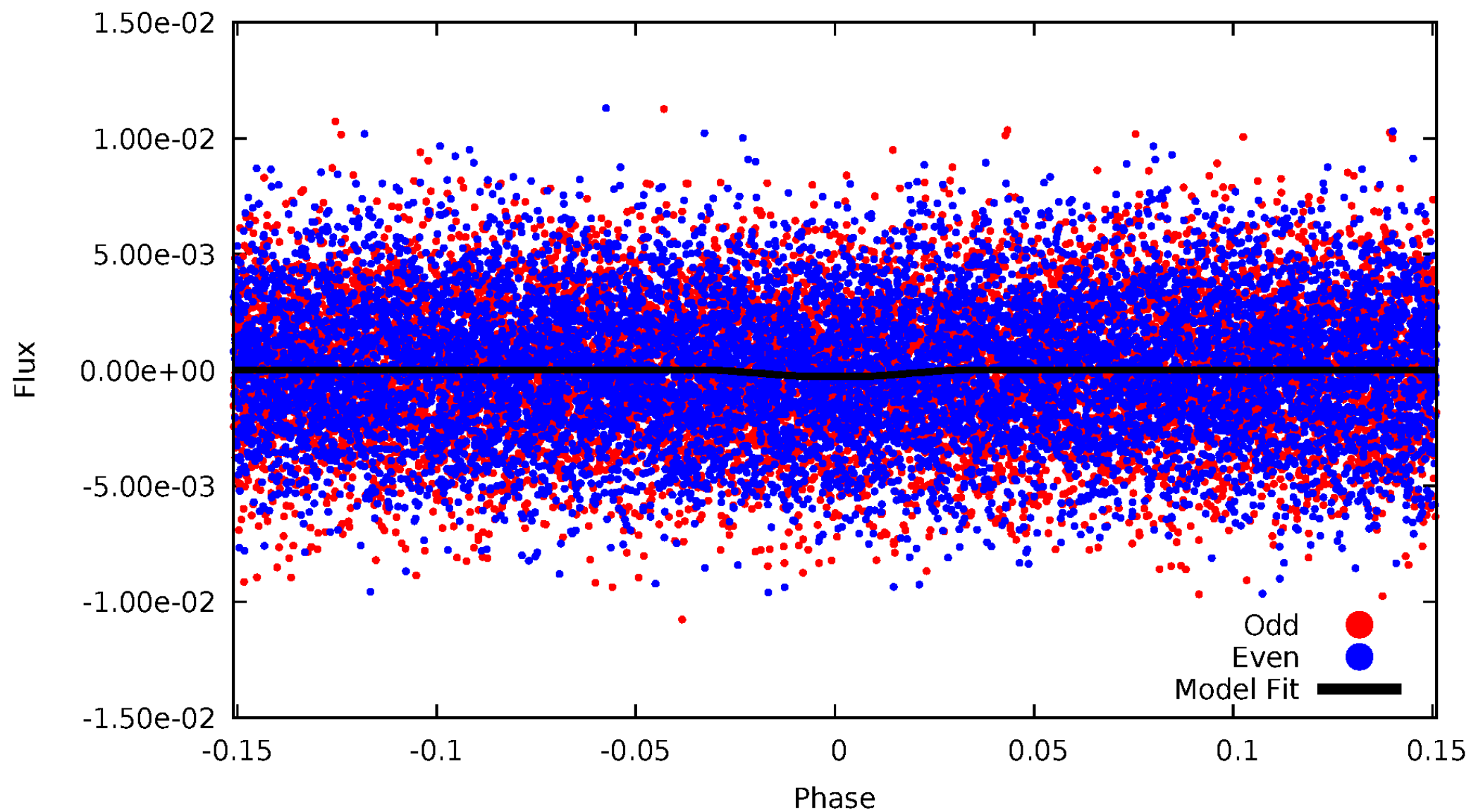
# DV Odd/Even

TCE 008972966-02



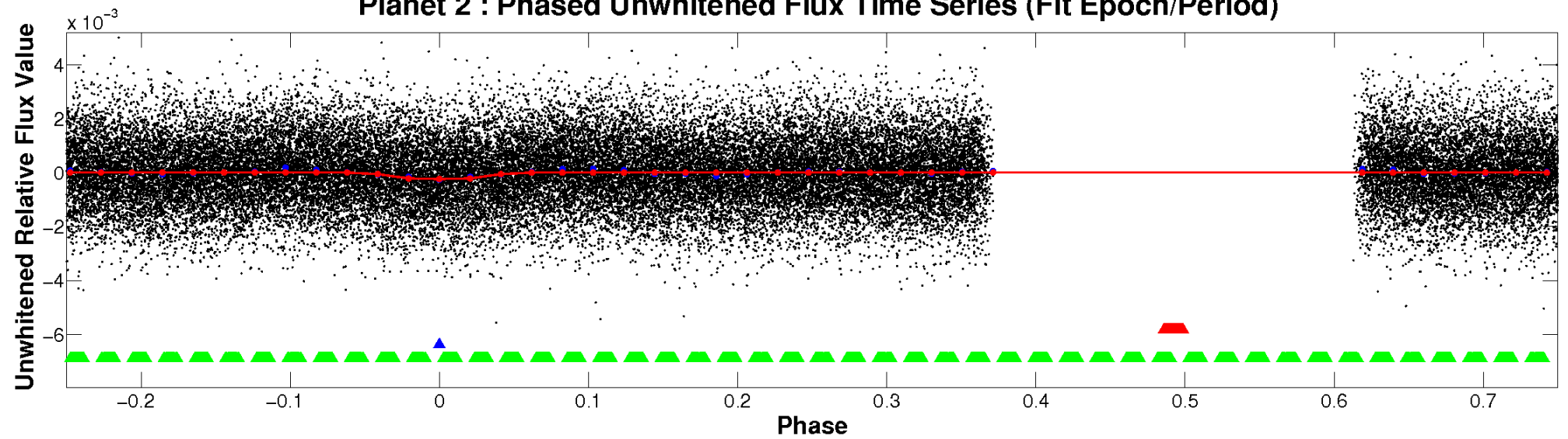
# ALT Odd/Even

TCE 008972966-02

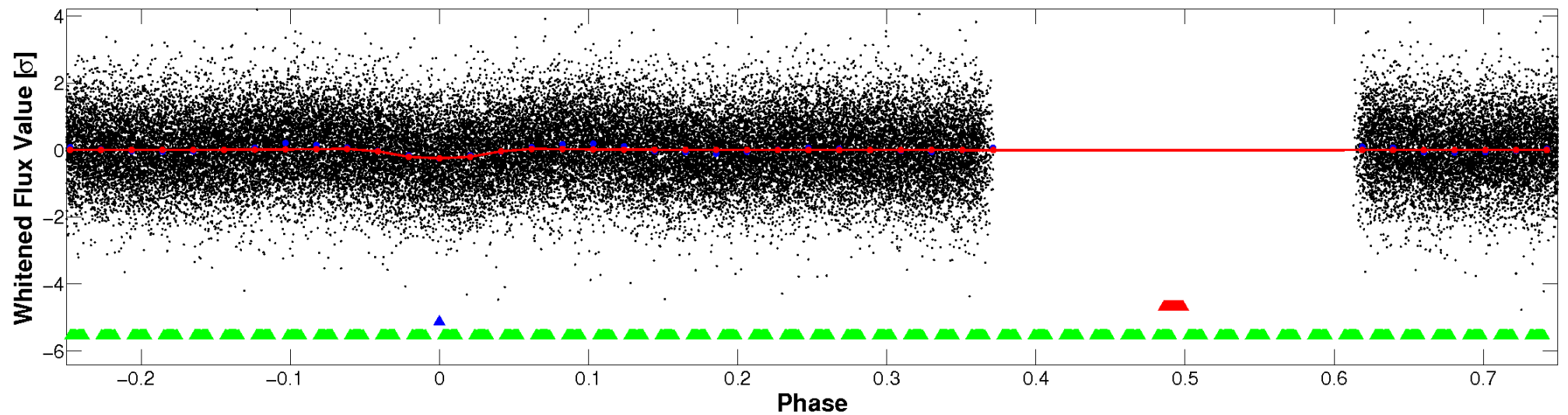


# Non-Whitened Vs. Whitened Light Curve

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

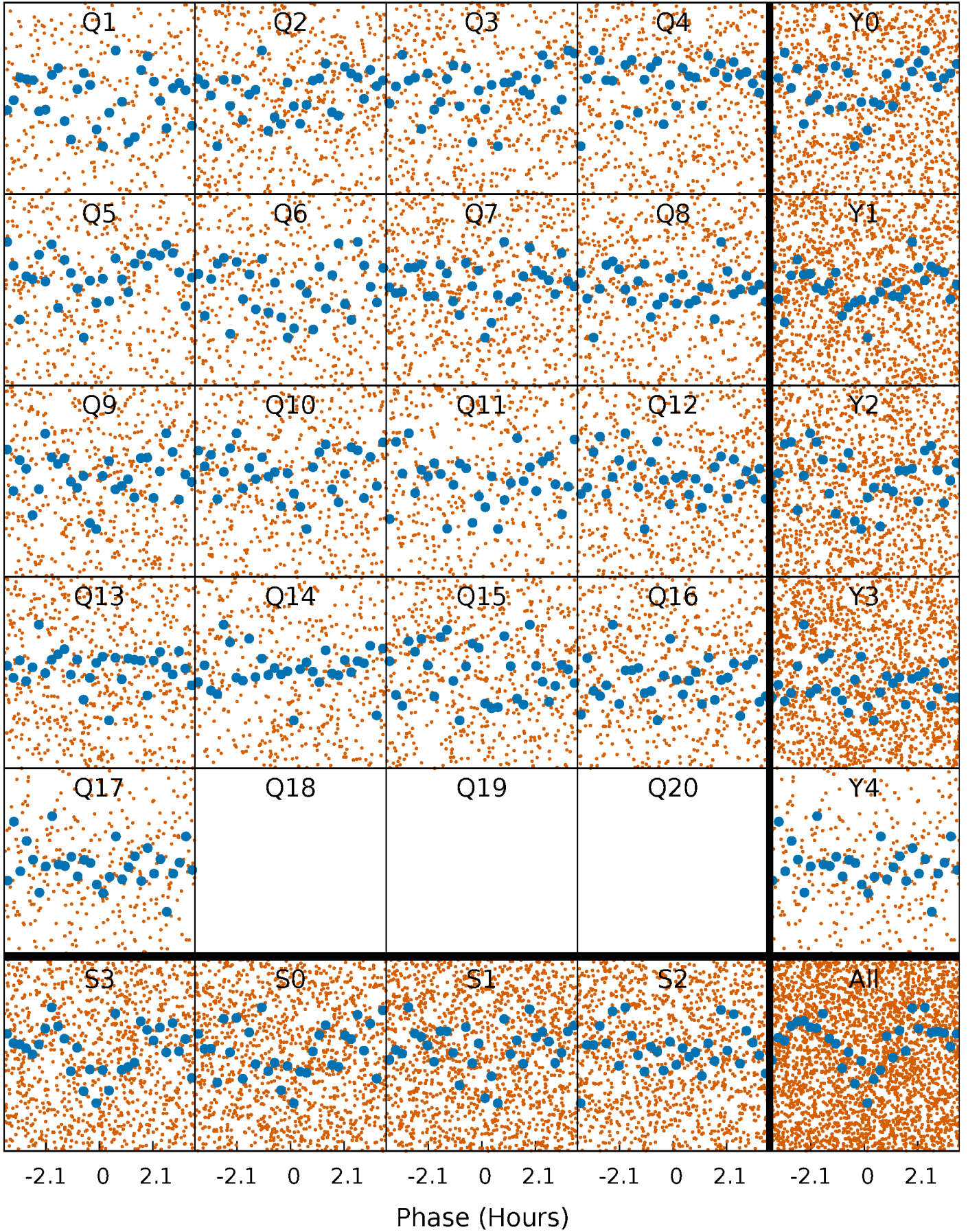


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

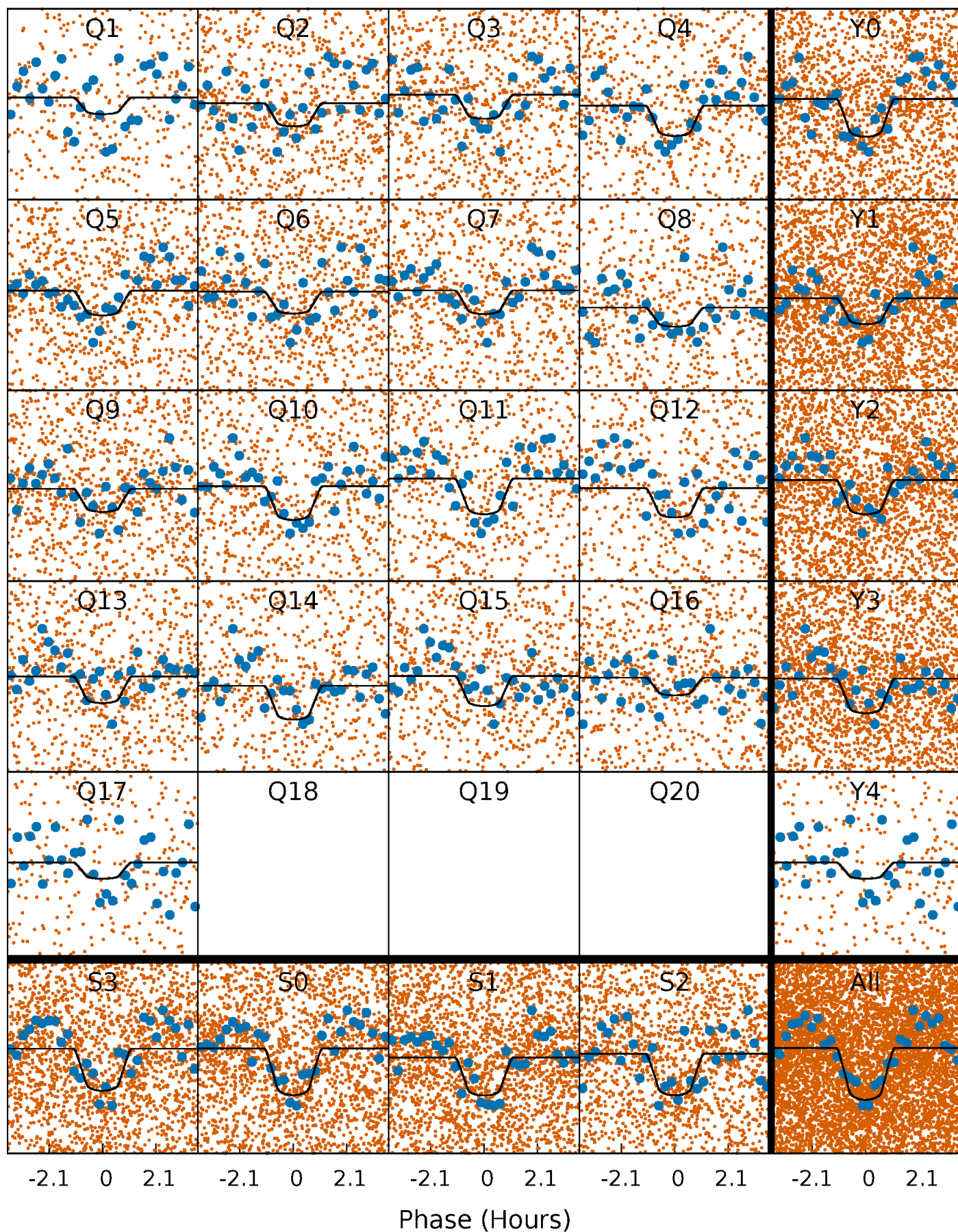
TCE 008972966-02   P= 0.990550 Days    $T_0=131.657633$  (BKJD)





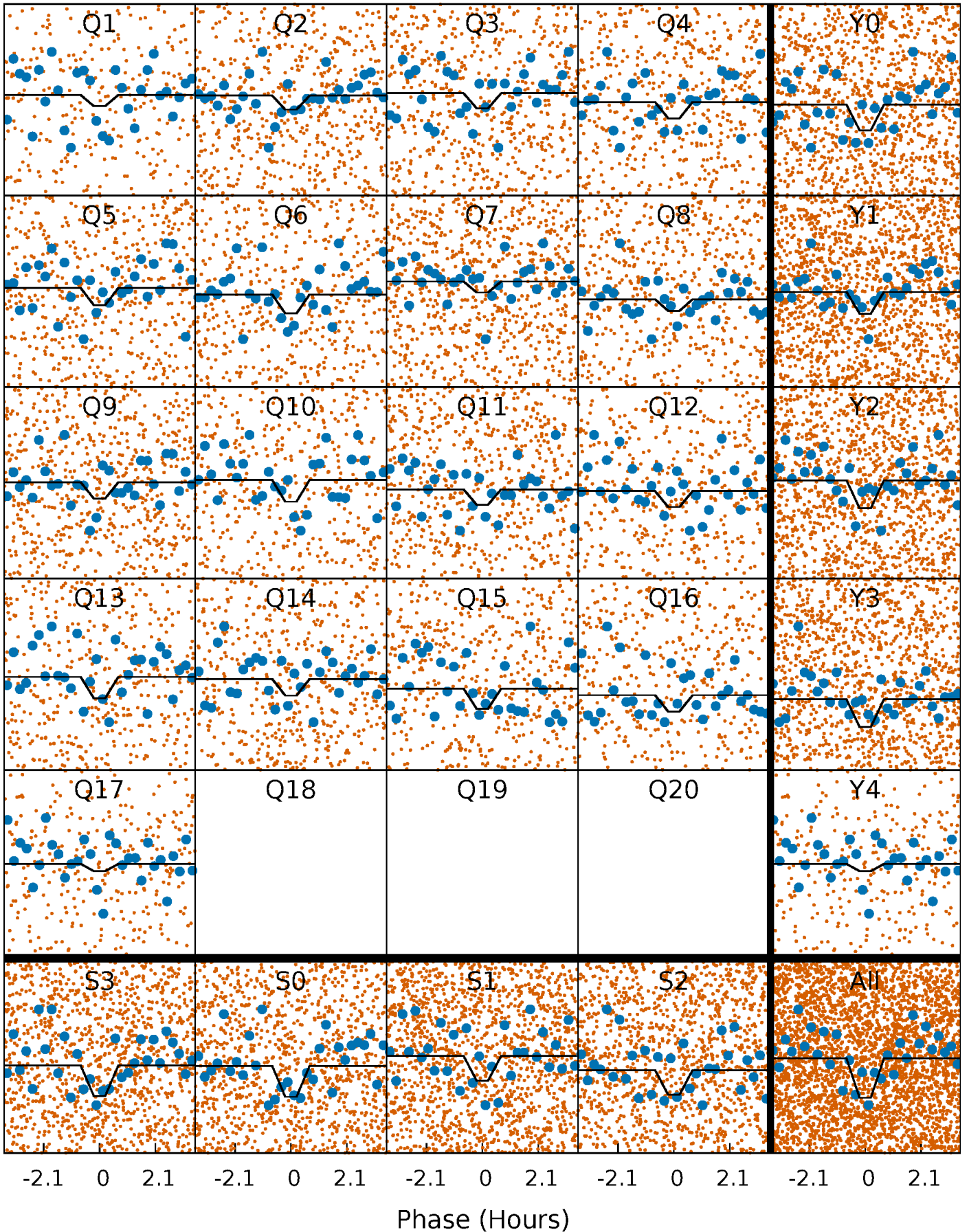
# DV Quarter-Phased Transit Curves

TCE 008972966-02   P= 0.990550 Days    $T_0=131.657633$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

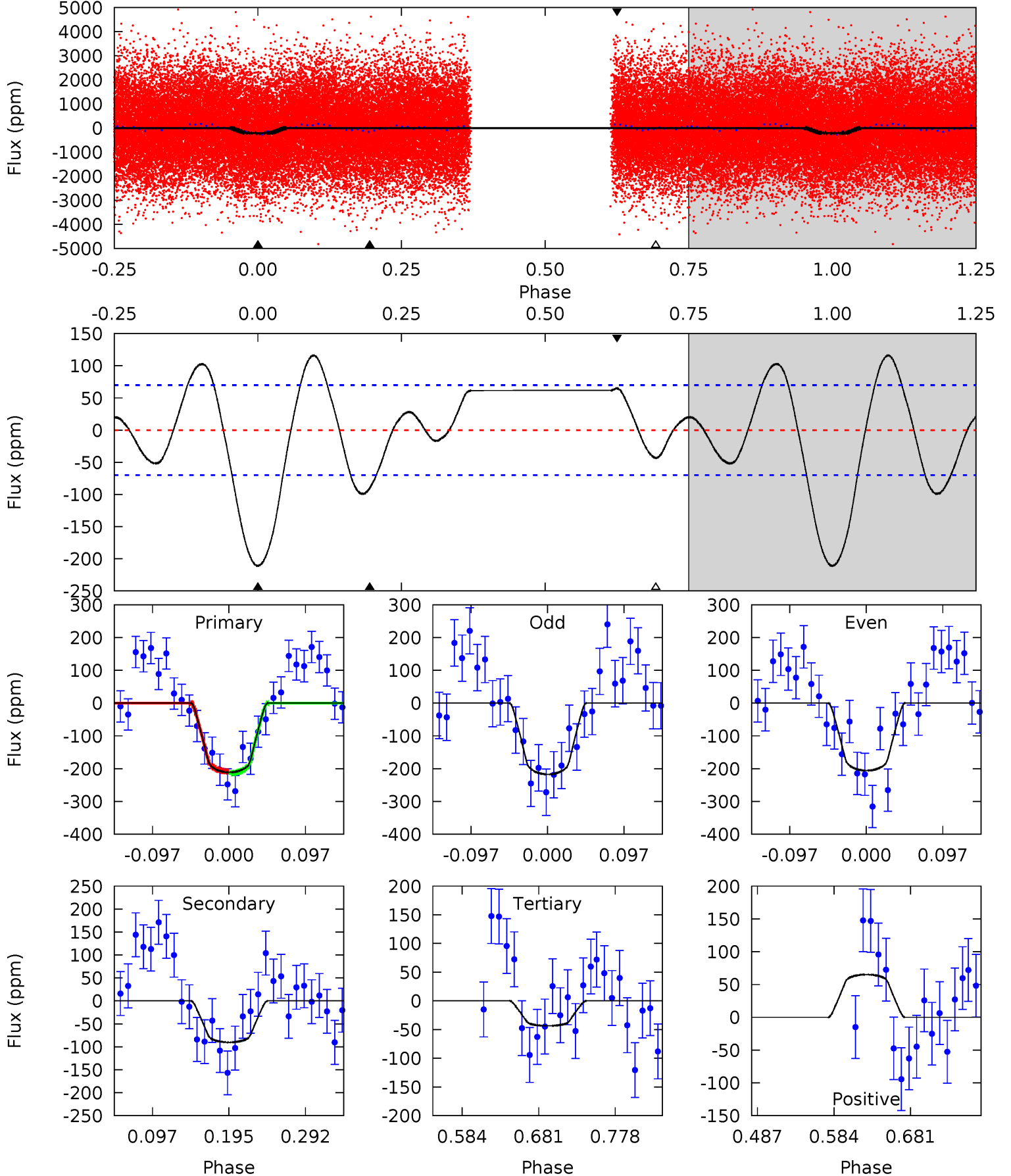
TCE 008972966-02     $P = 0.990553$  Days     $T_0 = 131.657355$  (BKJD)



# DV Model-Shift Uniqueness Test

008972966-02, P = 0.990550 Days, E = 130.667083 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	5.91	2.84	4.26	4.57	1.66	2.56	11.0	9.55	3.06	1.64	0.37	0.94	0.35	0.17

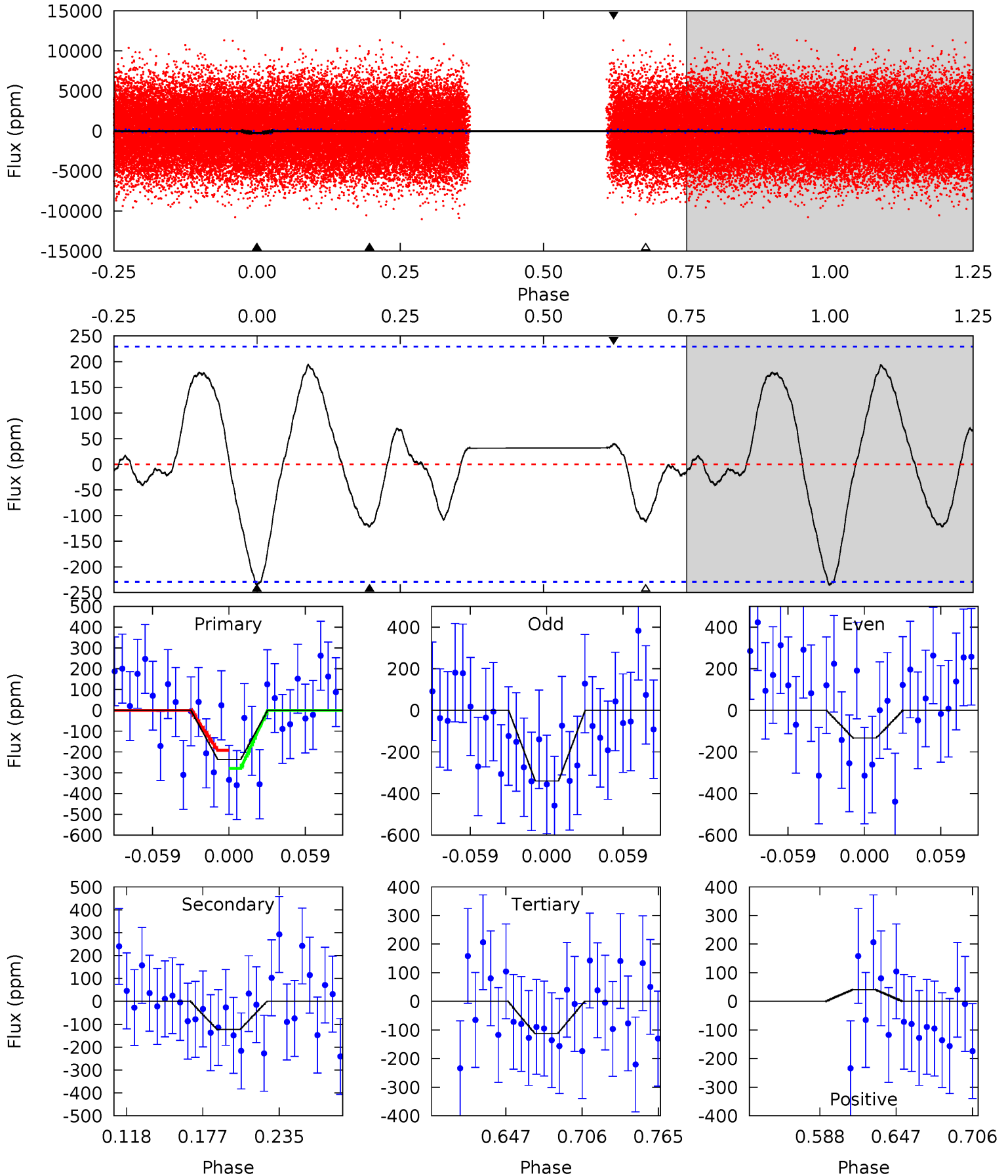




# Alt Model-Shift Uniqueness Test

008972966-02, P = 0.990553 Days, E = 130.666802 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
4.81	2.50	2.28	0.83	4.67	1.89	1.71	2.53	3.98	0.22	1.67	2.12	1.27	0.45	0.89





### Stellar Parameters For KIC 008972966

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7884^{+219}_{-328}$	$3.759^{+0.408}_{-0.072}$	$-0.120^{+0.200}_{-0.350}$	$3.002^{+0.423}_{-1.268}$	$1.884^{+0.102}_{-0.408}$	$0.098^{+0.343}_{-0.022}$
	+3%/-4%	+11%/-2%	+167%/-292%	+14%/-42%	+5%/-22%	+350%/-23%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008972966-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-90 \pm 15$	$4.81^{+2.59}_{-2.31}$	$5209^{+379}_{-584}$	$5345^{+2505}_{-1236}$	$1.194^{+3.190}_{-0.683}$
Alt.	$-123 \pm 49$	$4.78^{+2.56}_{-2.23}$	$5206^{+372}_{-572}$	$5865^{+2788}_{-1685}$	$1.538^{+4.175}_{-0.979}$

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

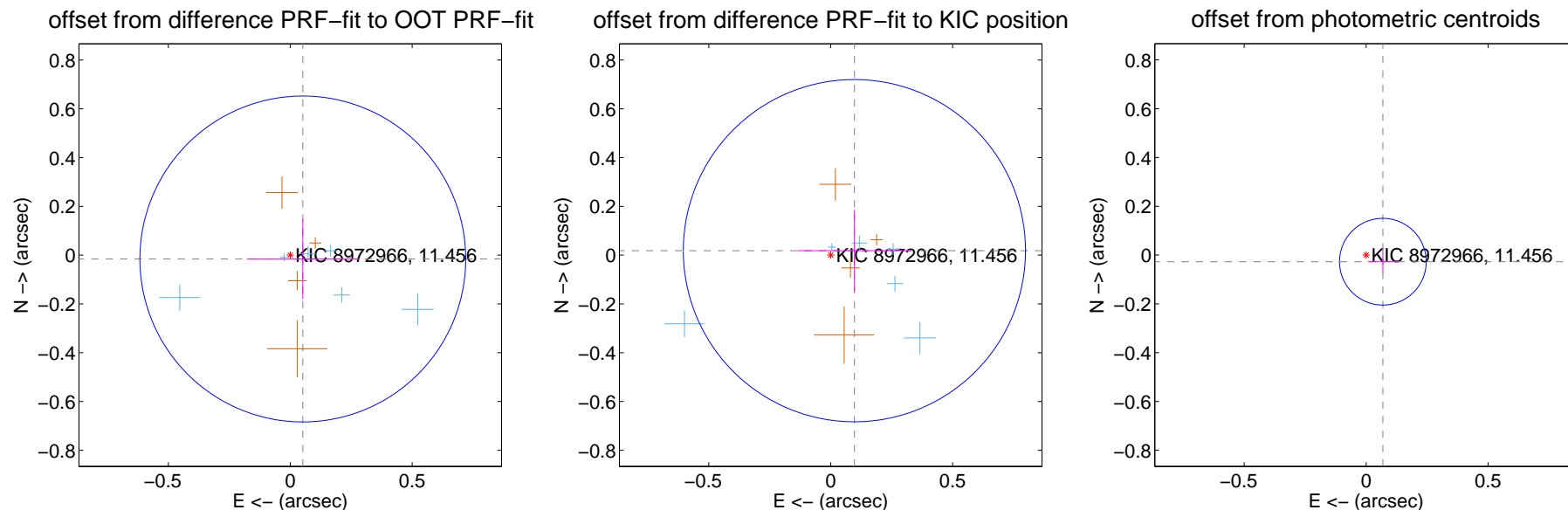
## DV Centroid Data

Supplemental centroid analysis for 008972966-02. **Kepler magnitude: 11.46.** Transit SNR 14.13

There are 9 quarters with good PRF difference image offsets

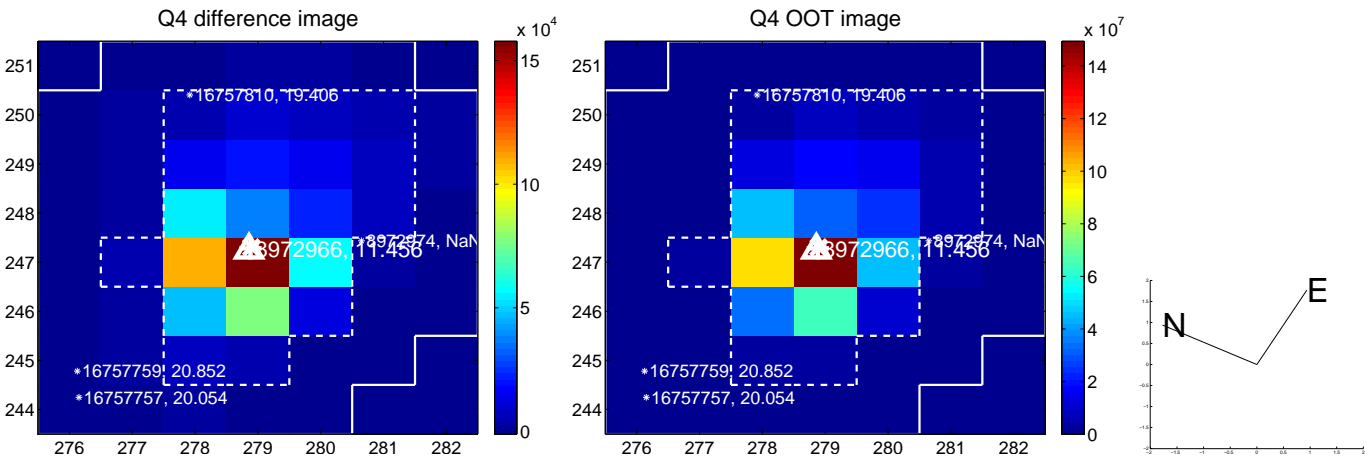
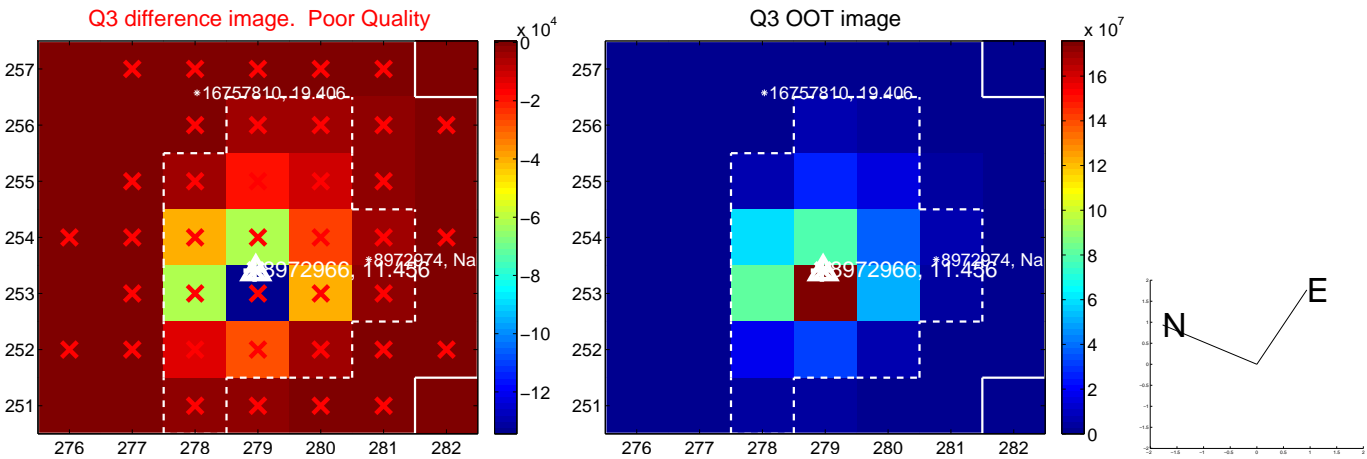
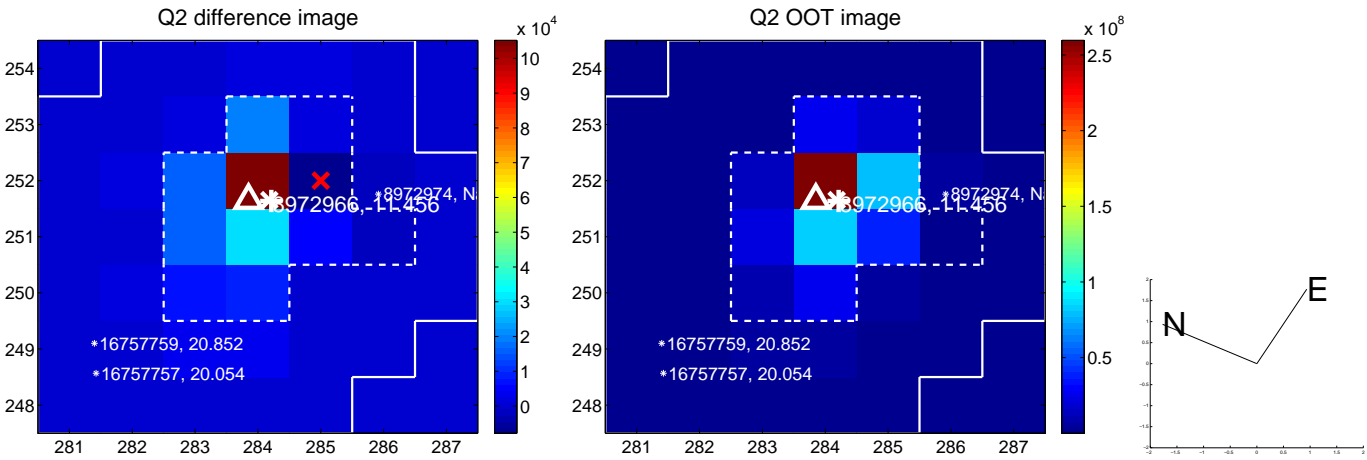
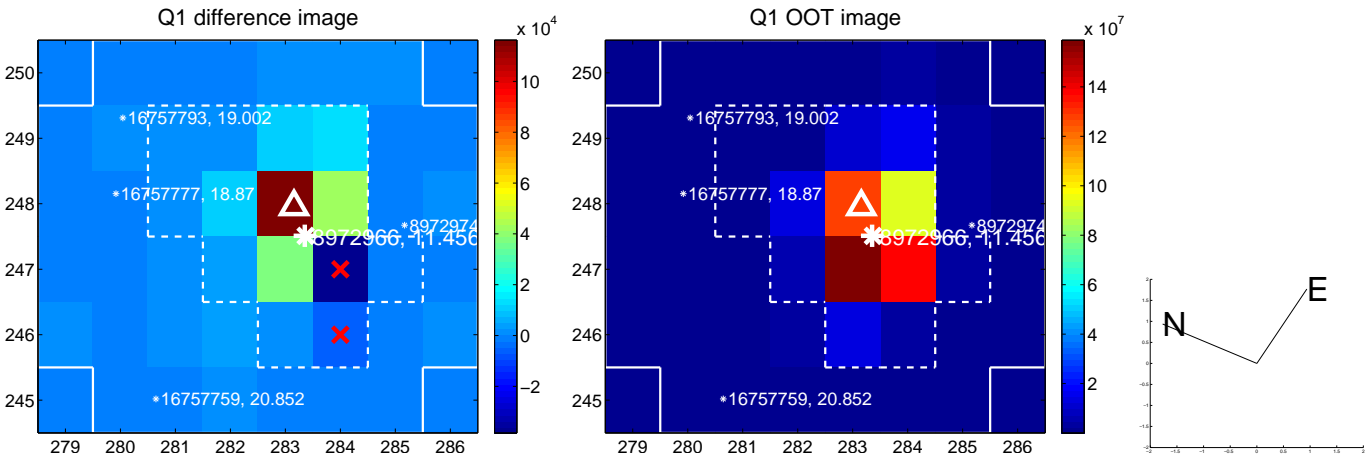
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.054 \pm 0.223$	0.24	$-0.051 \pm 0.229$	$-0.016 \pm 0.164$
PRF-fit source offset from KIC position	$0.099 \pm 0.234$	0.42	$-0.097 \pm 0.232$	$0.018 \pm 0.167$
photometric centroid source offset	$0.07 \pm 0.06$	1.24	$-0.07 \pm 0.06$	$-0.03 \pm 0.05$

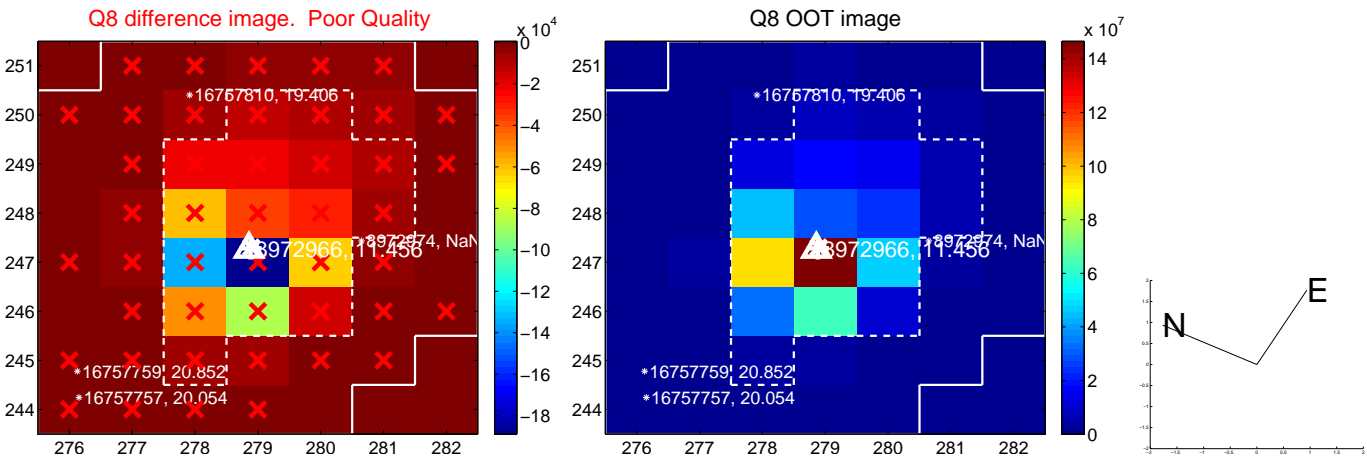
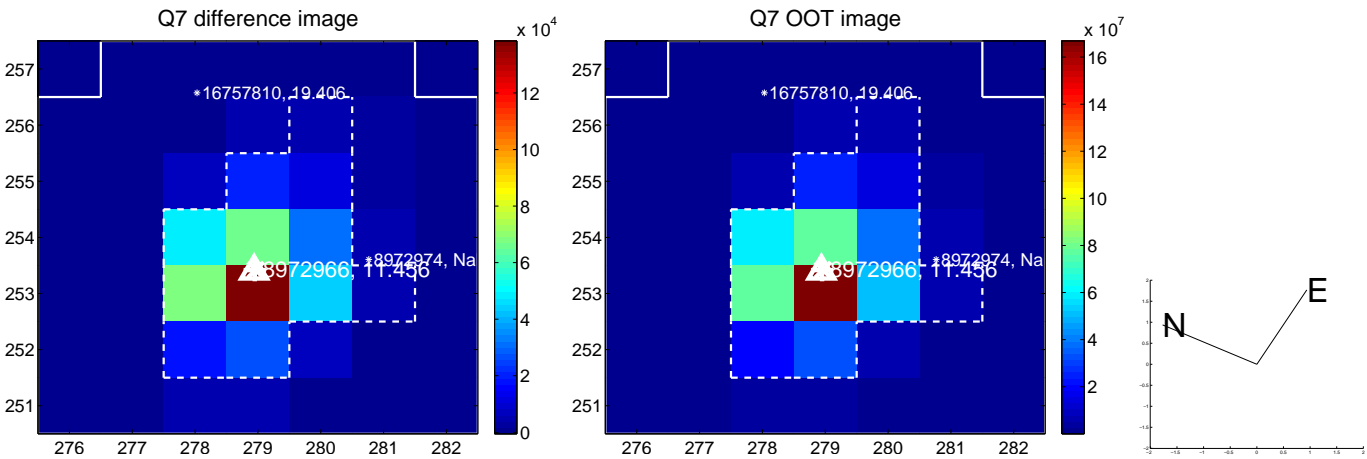
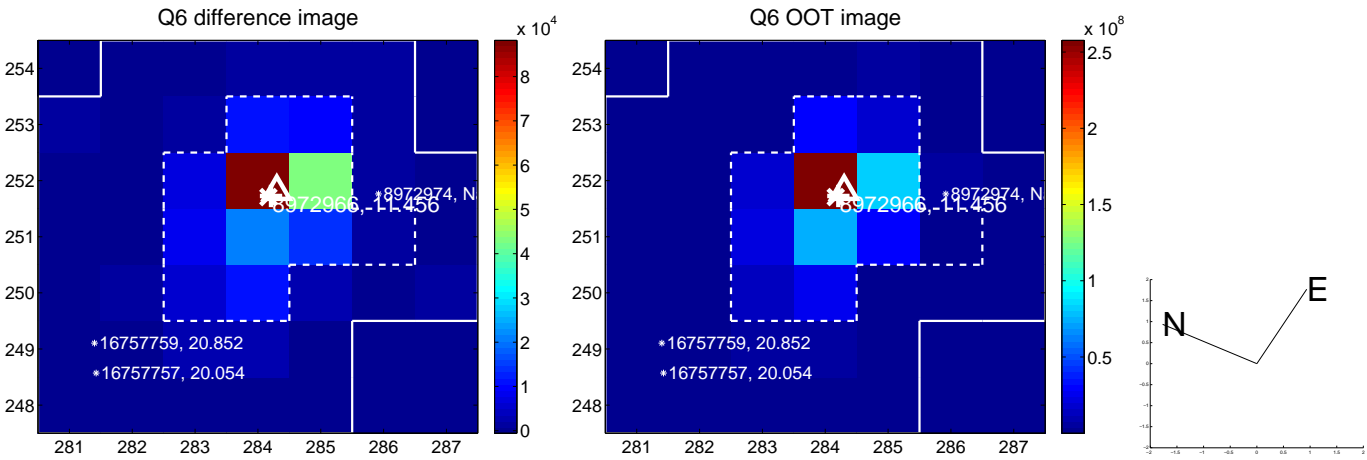
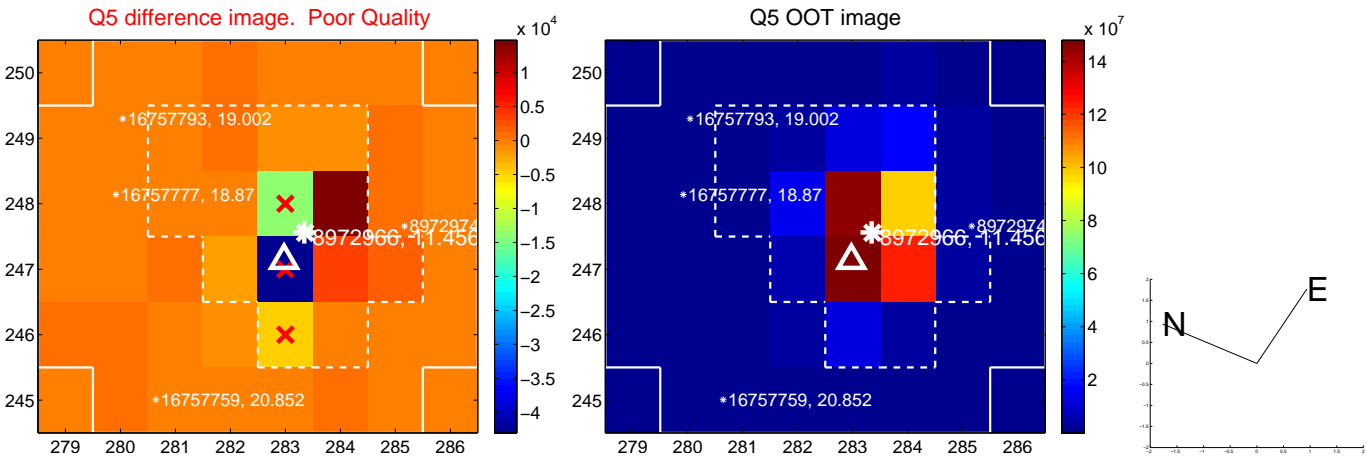


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

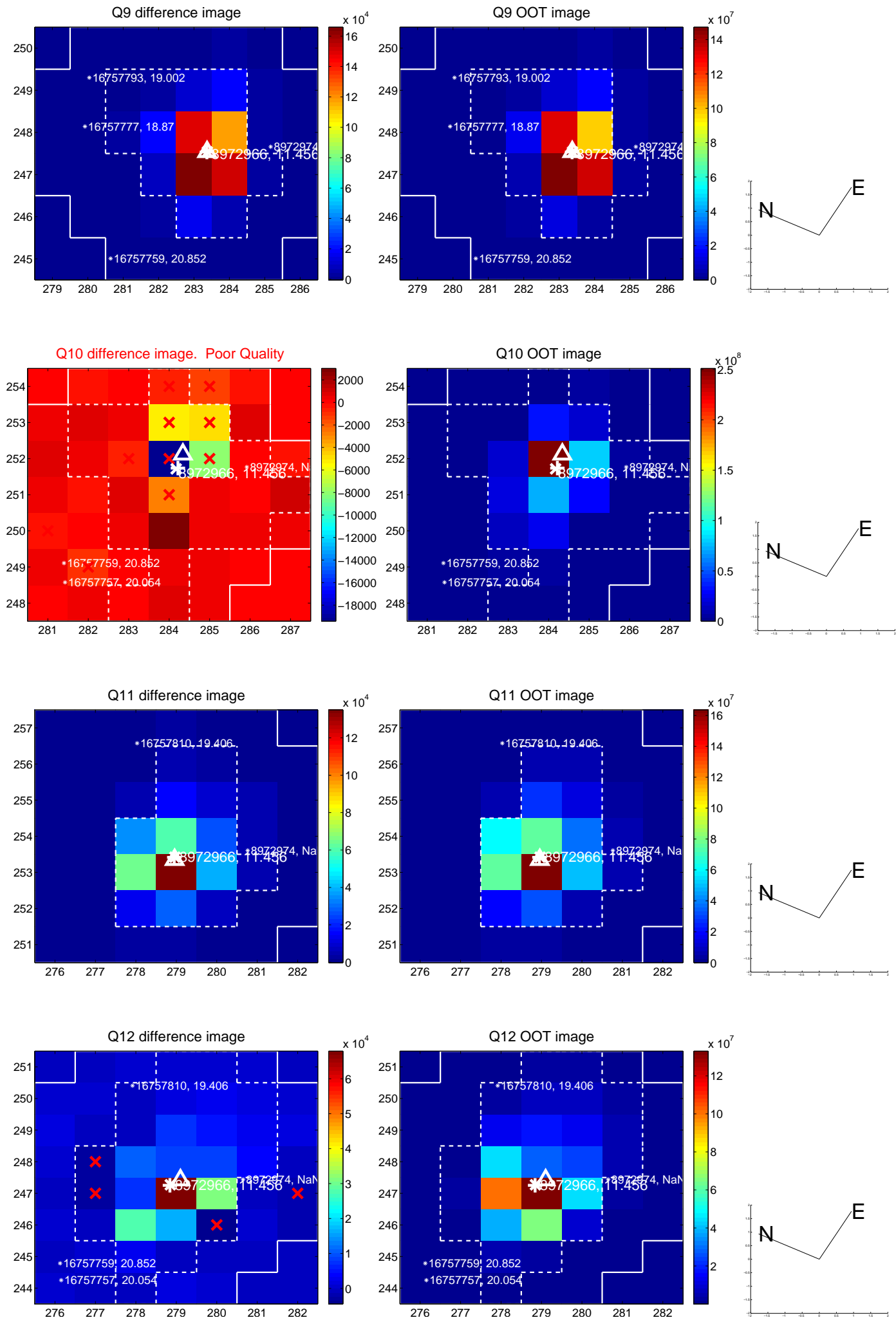
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



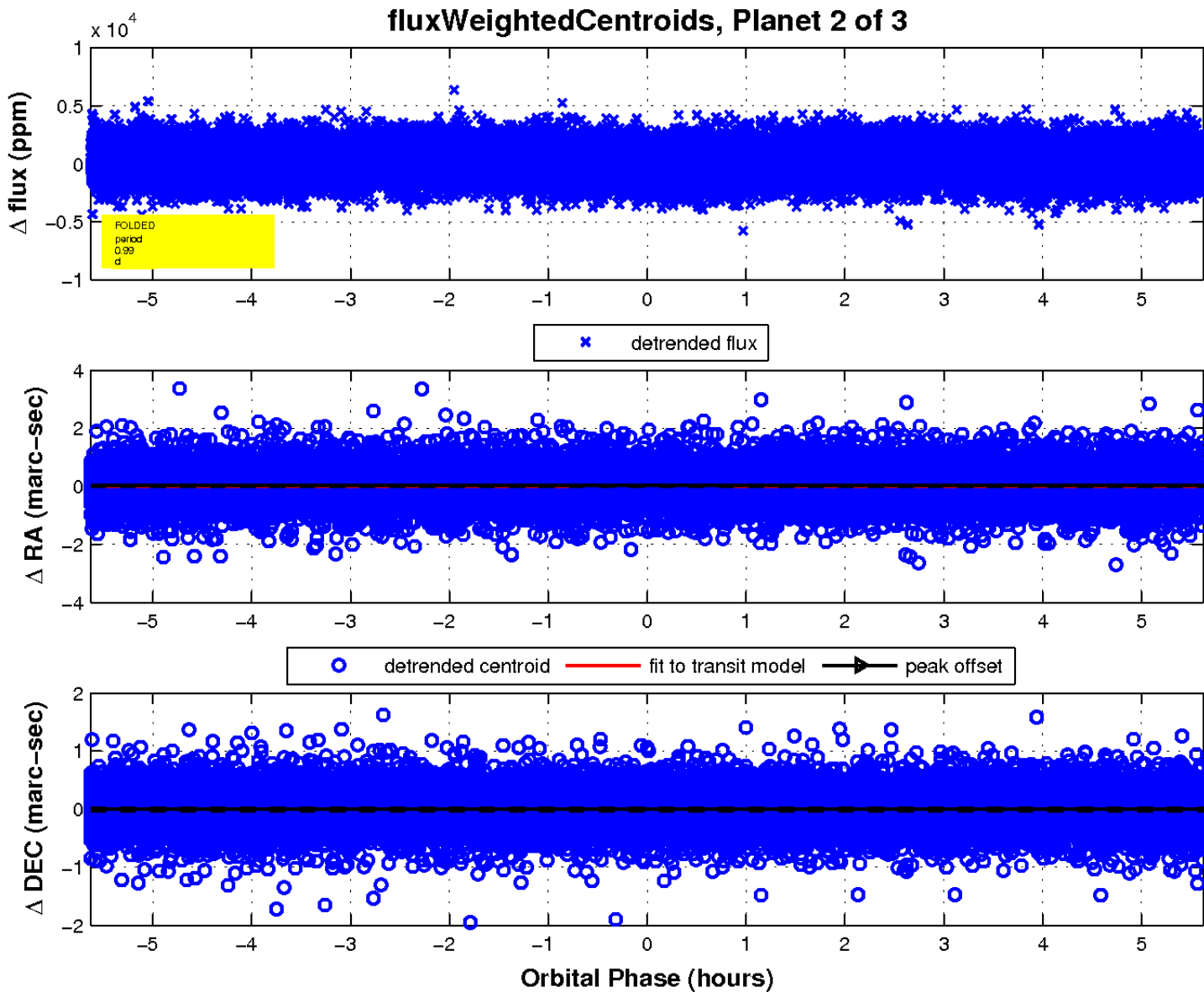
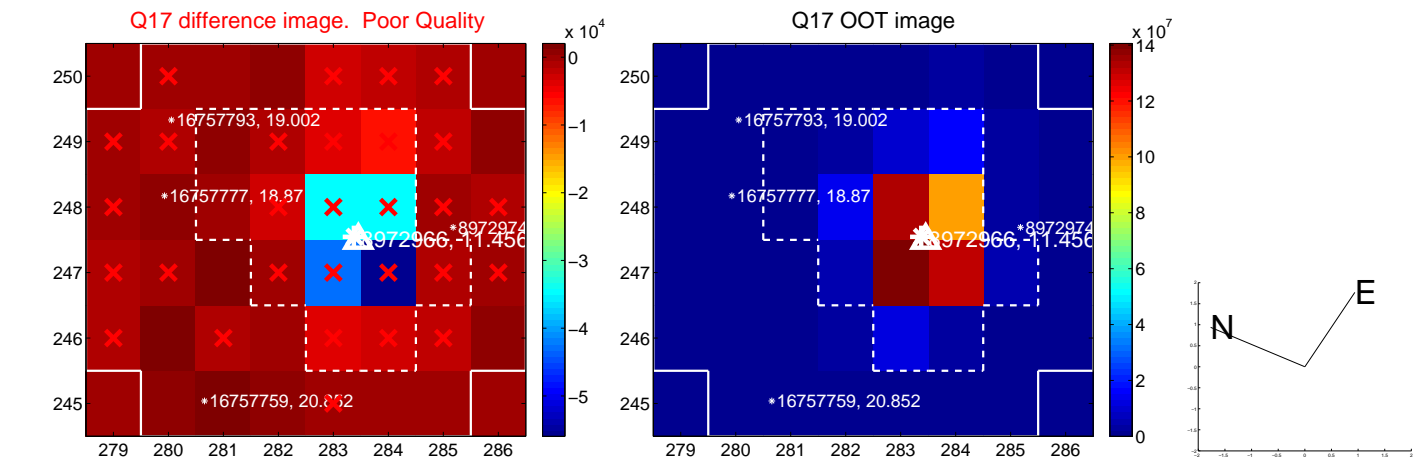
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





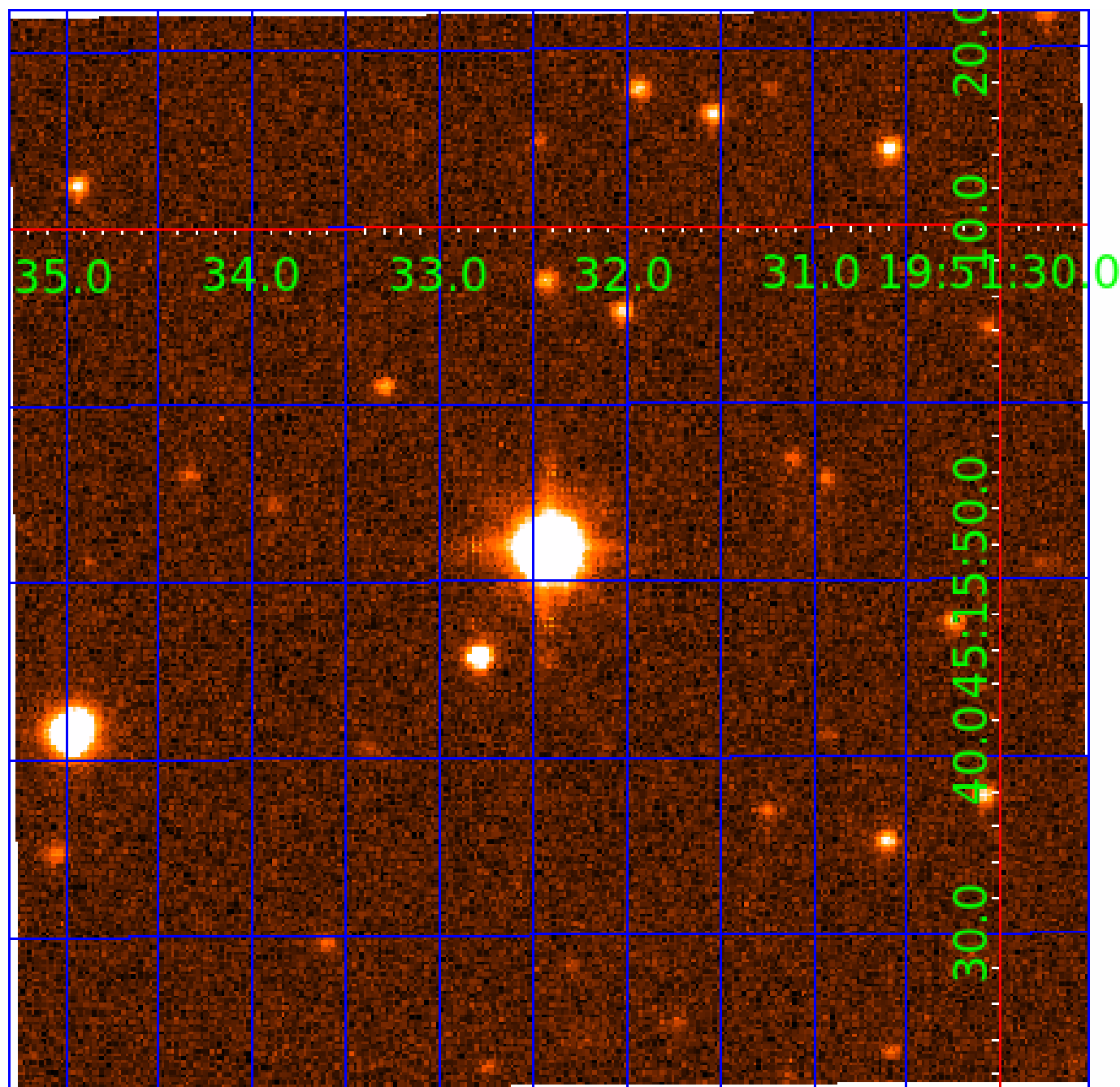


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008972966

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008972966-01	OBS	No	0.990542	132.151721	215.3	1.844	14.2	12.7	3.00	7884	4.72	53991.37
008972966-02	OBS	No	0.990550	131.657633	240.5	1.876	12.3	14.1	3.00	7884	5.41	53990.72
008972966-03	OBS	No	1.382634	132.886892	383.9	16.592	10.0	22.1	3.00	7884	7.50	34610.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008972966-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008972966-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
008972966-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_SATURATED

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

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

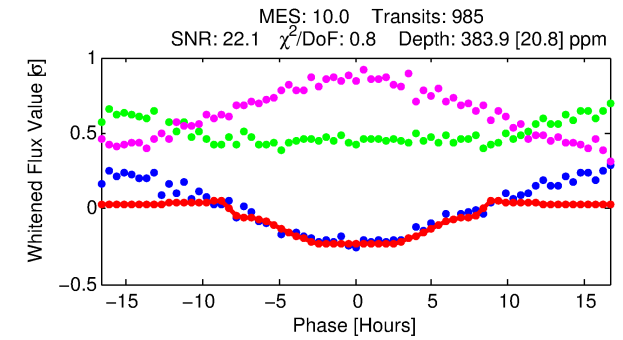
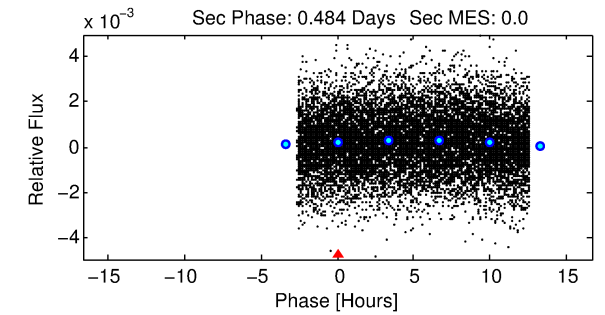
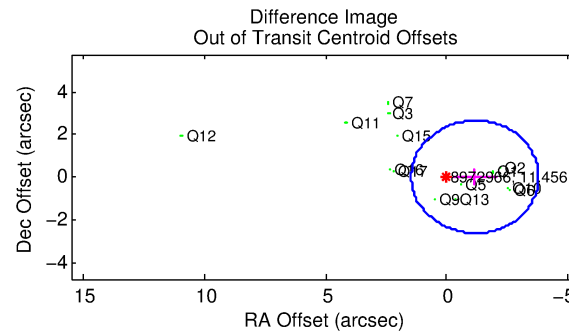
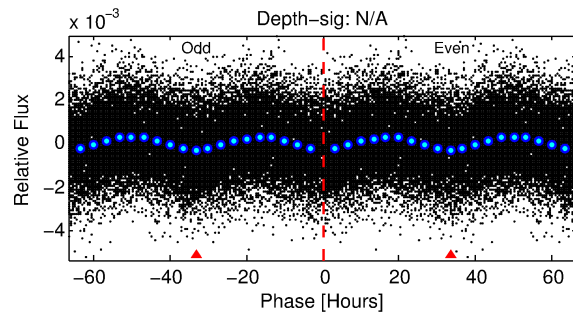
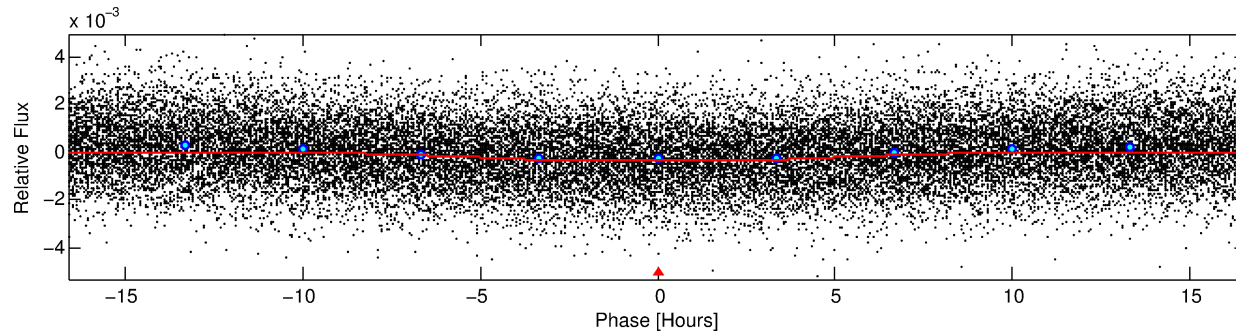
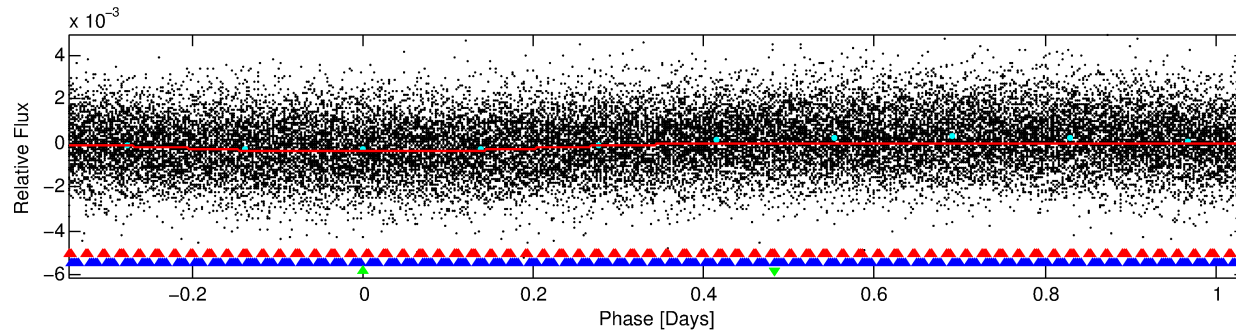
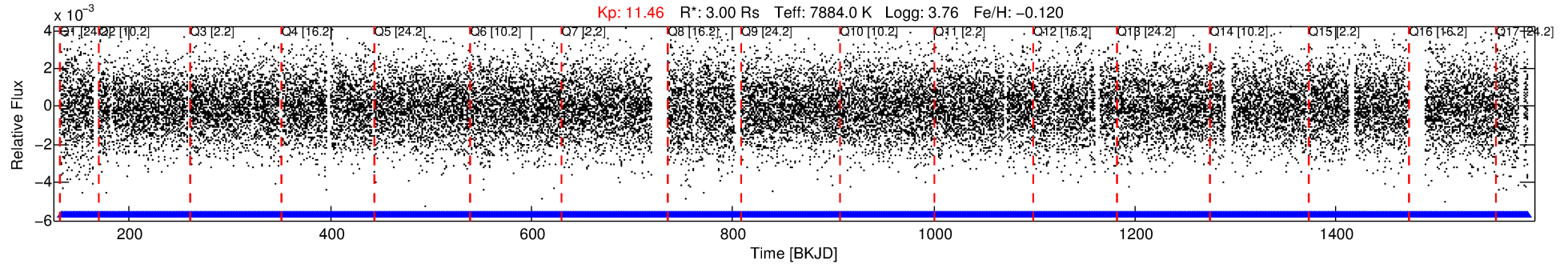
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008972966-03

No Significant Match Found

# DV One-Page Summary

KIC: 8972966 Candidate: 3 of 3 Period: 1.383 d



## DV Fit Results:

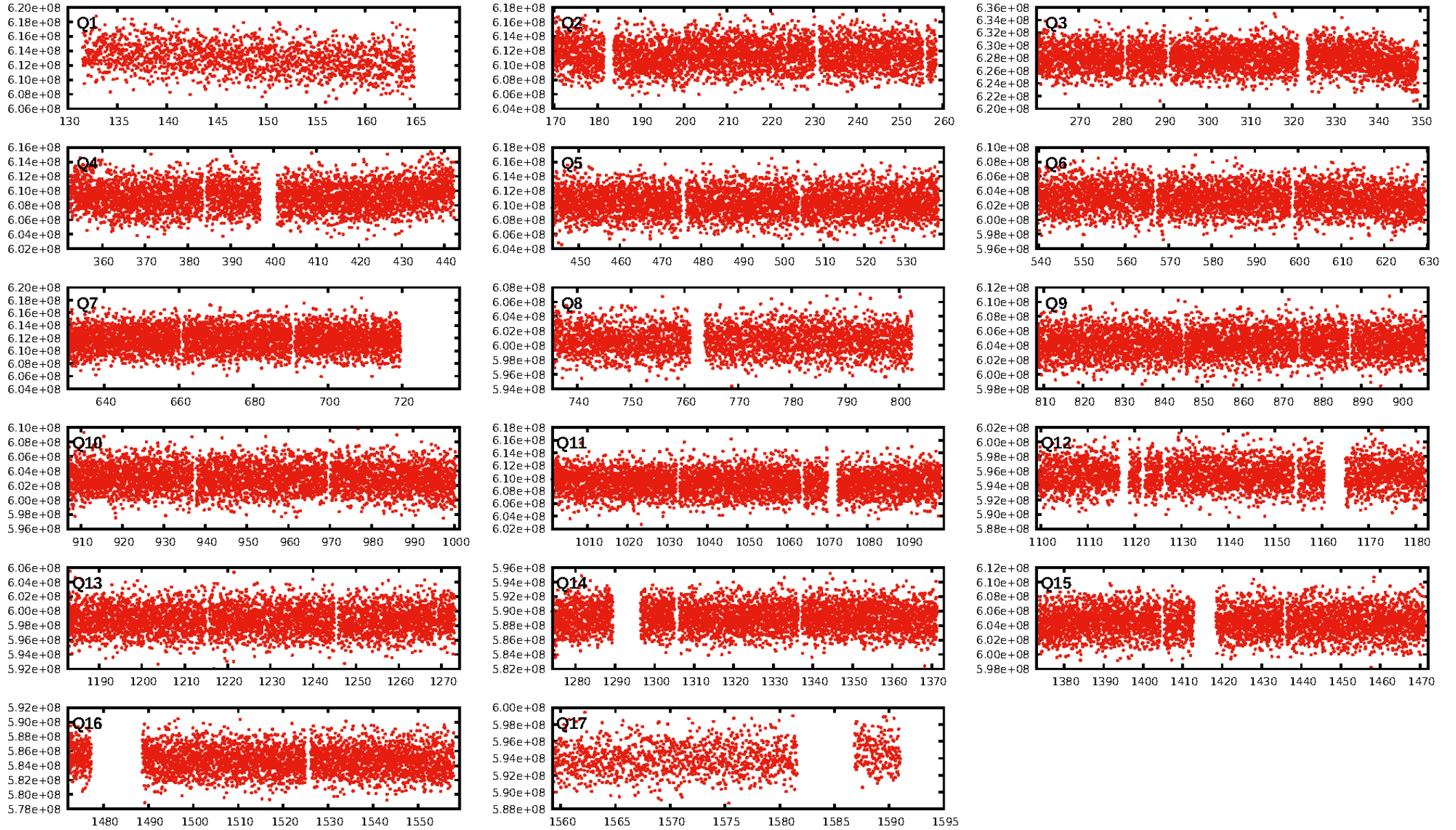
Period = 1.38263 [0.00002] d  
Epoch = 132.8869 [0.0070] BKJD  
Rp/R\* = 0.0229 [0.0008]  
a/R\* = 1.01 [0.00]  
b = 0.97 [0.01]  
Seff = 34610.79 [24454.96]  
Teq = 3478 [614] K  
Rp = 7.50 [3.18] Re  
a = 0.0300 [0.0126] AU  
Ag = N/A  
Teffp = N/A

## DV Diagnostic Results:

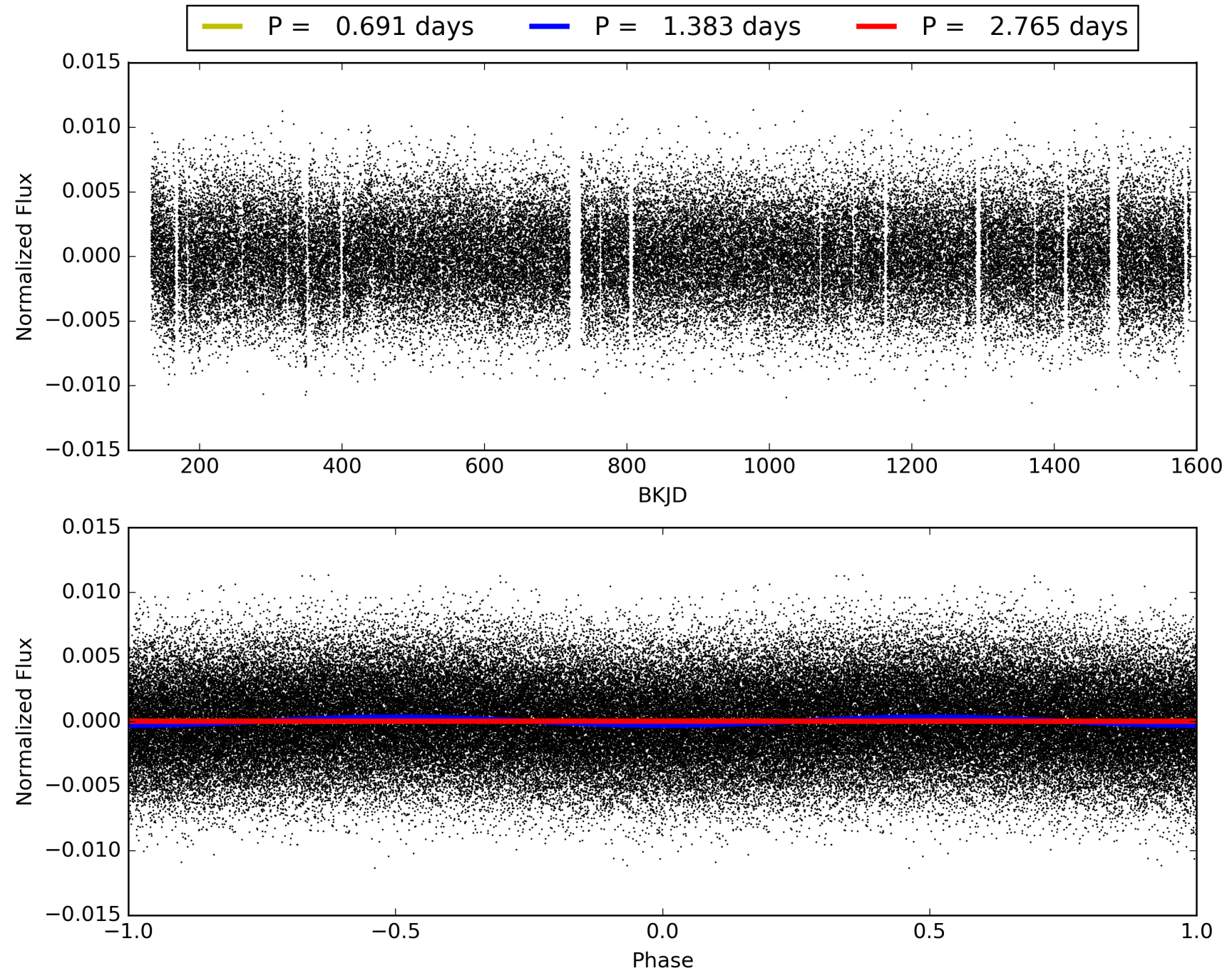
ShortPeriod-sig: 42.7% [0.56σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [940/940]  
GhostDiagnostic-chr: 1.124  
Centroid-sig: 11.6%  
Centroid-so: 0.053 arcsec [3.05σ]  
OotOffset-rm: 1.170 arcsec [1.33σ]  
KicOffset-rm: 1.130 arcsec [1.22σ]  
OotOffset-st: 3/4/2/5 [14]  
KicOffset-st: 3/4/2/5 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 0.00 [0/17]



# TCE 008972966-03, PDC Light Curves

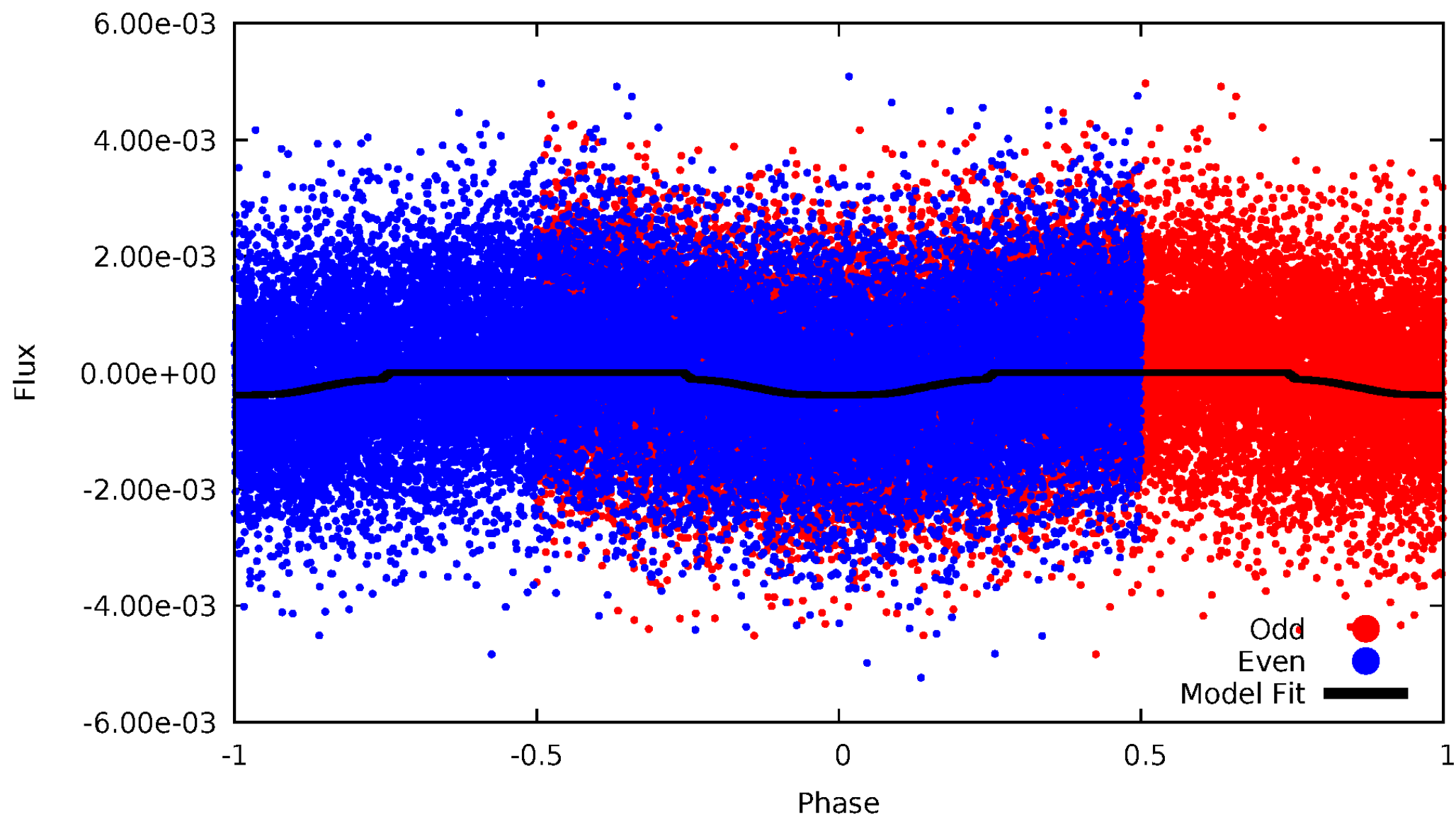


TCE 008972966-03



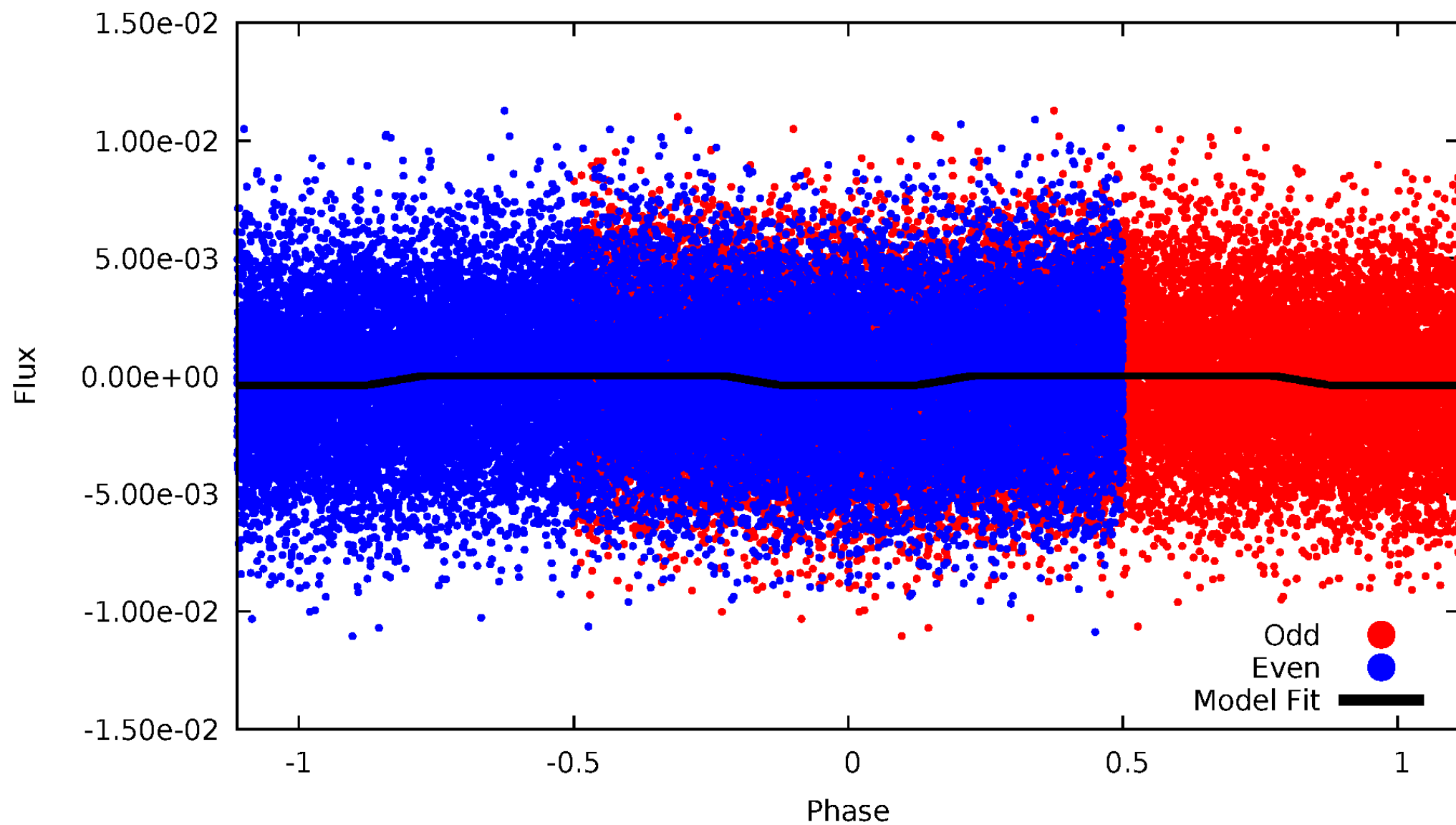
# DV Odd/Even

TCE 008972966-03



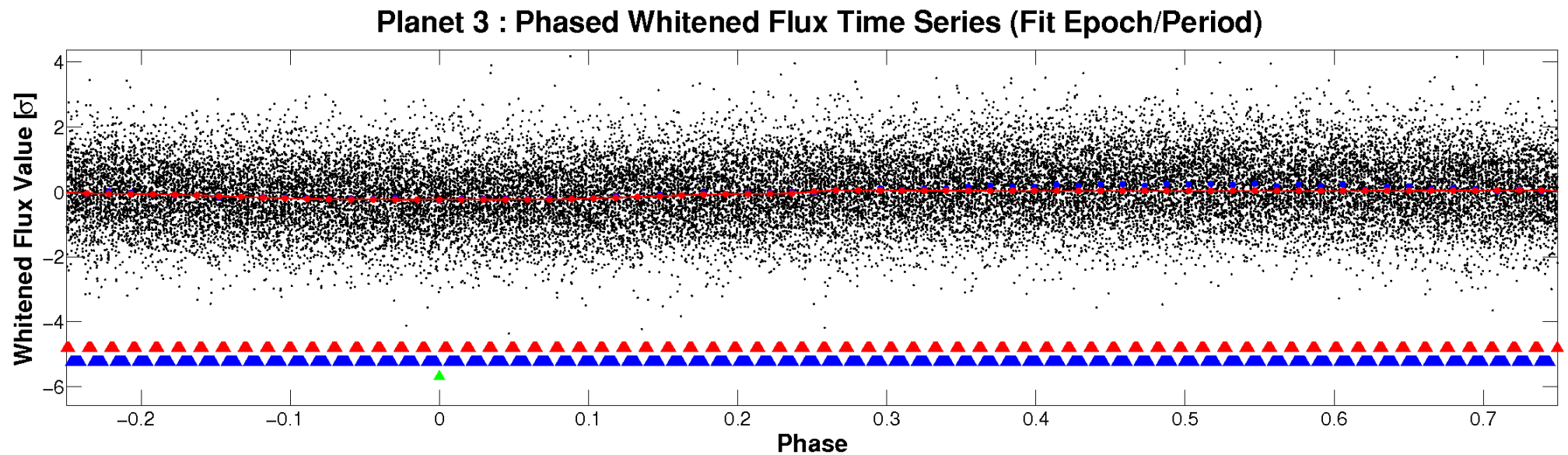
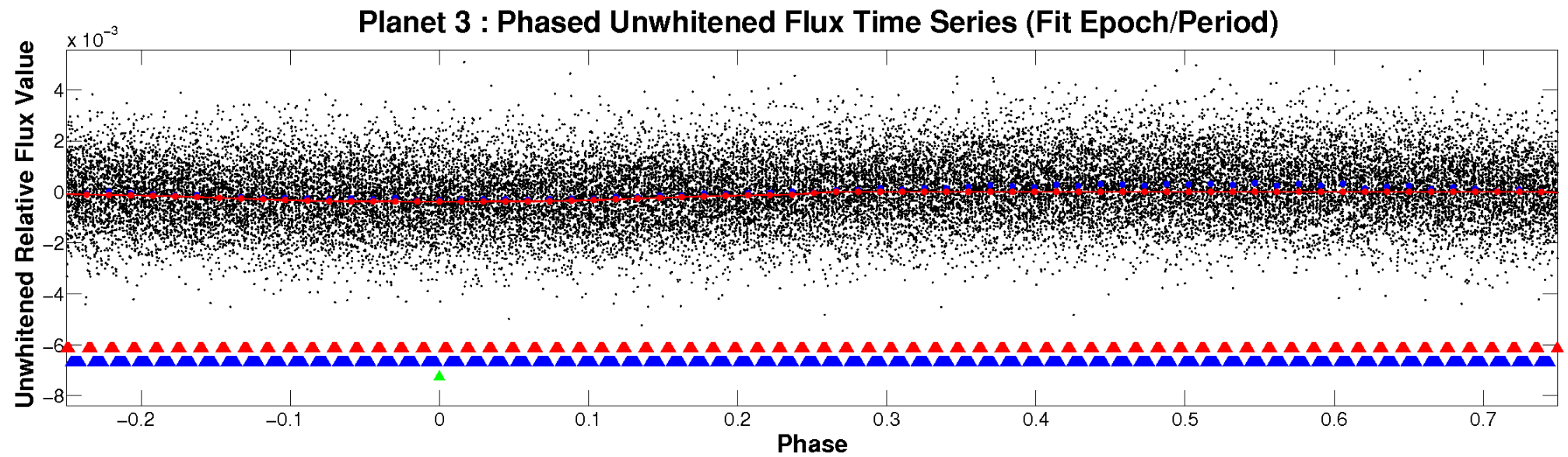
# ALT Odd/Even

TCE 008972966-03



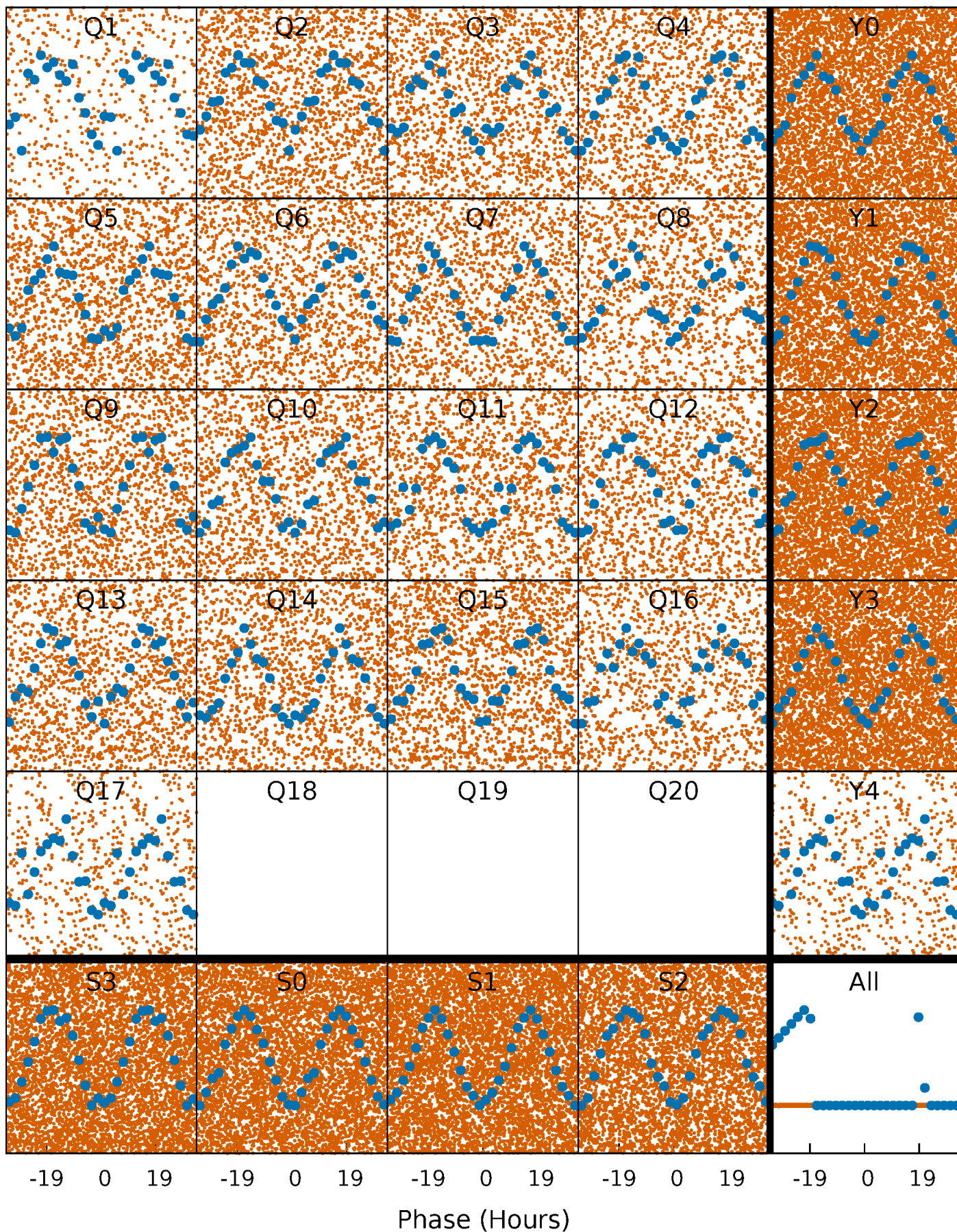


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

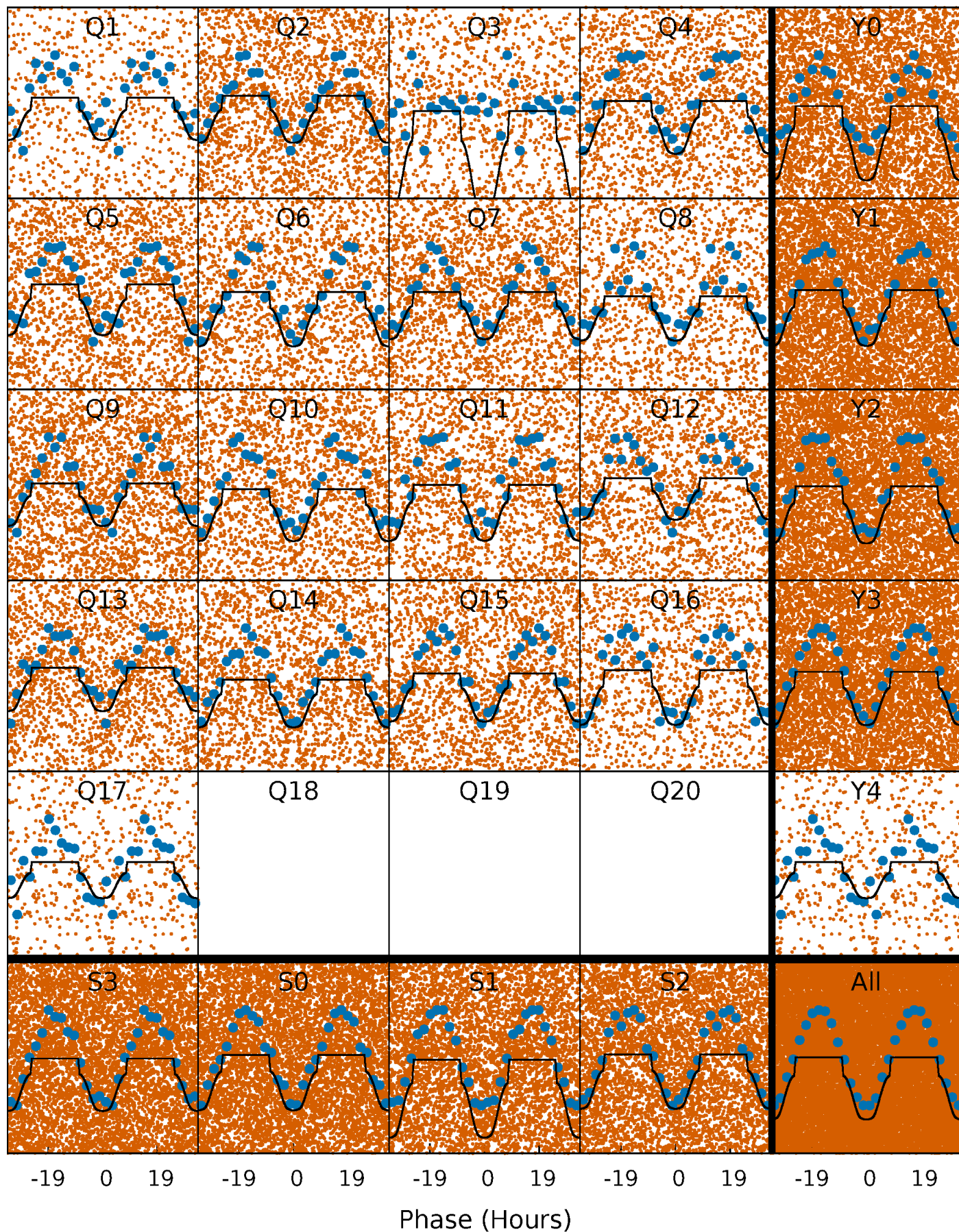
TCE 008972966-03   P= 1.382634 Days    $T_0=132.886892$  (BKJD)





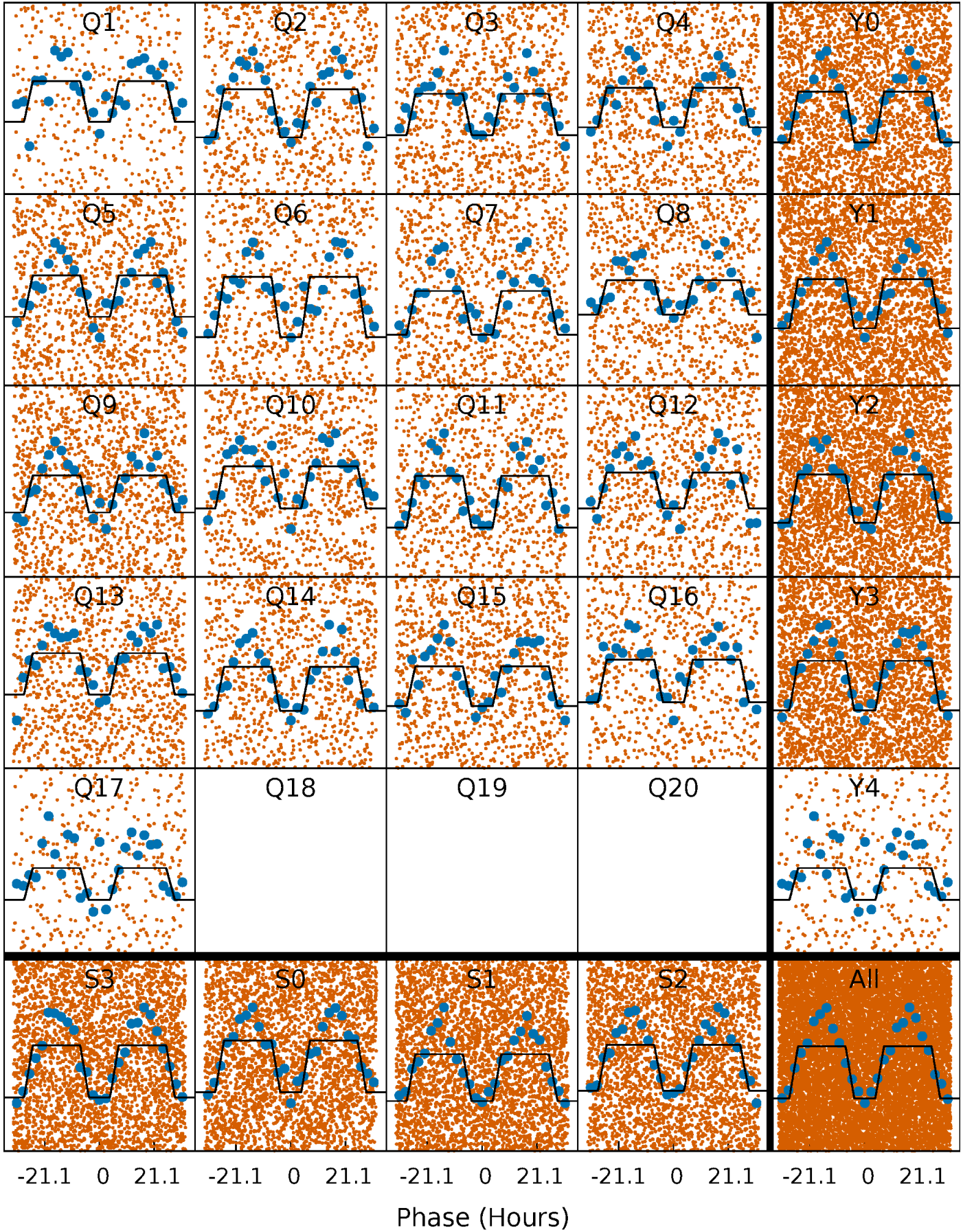
# DV Quarter-Phased Transit Curves

TCE 008972966-03   P= 1.382634 Days    $T_0=132.886892$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008972966-03     $P = 1.382691$  Days     $T_0 = 132.852235$  (BKJD)

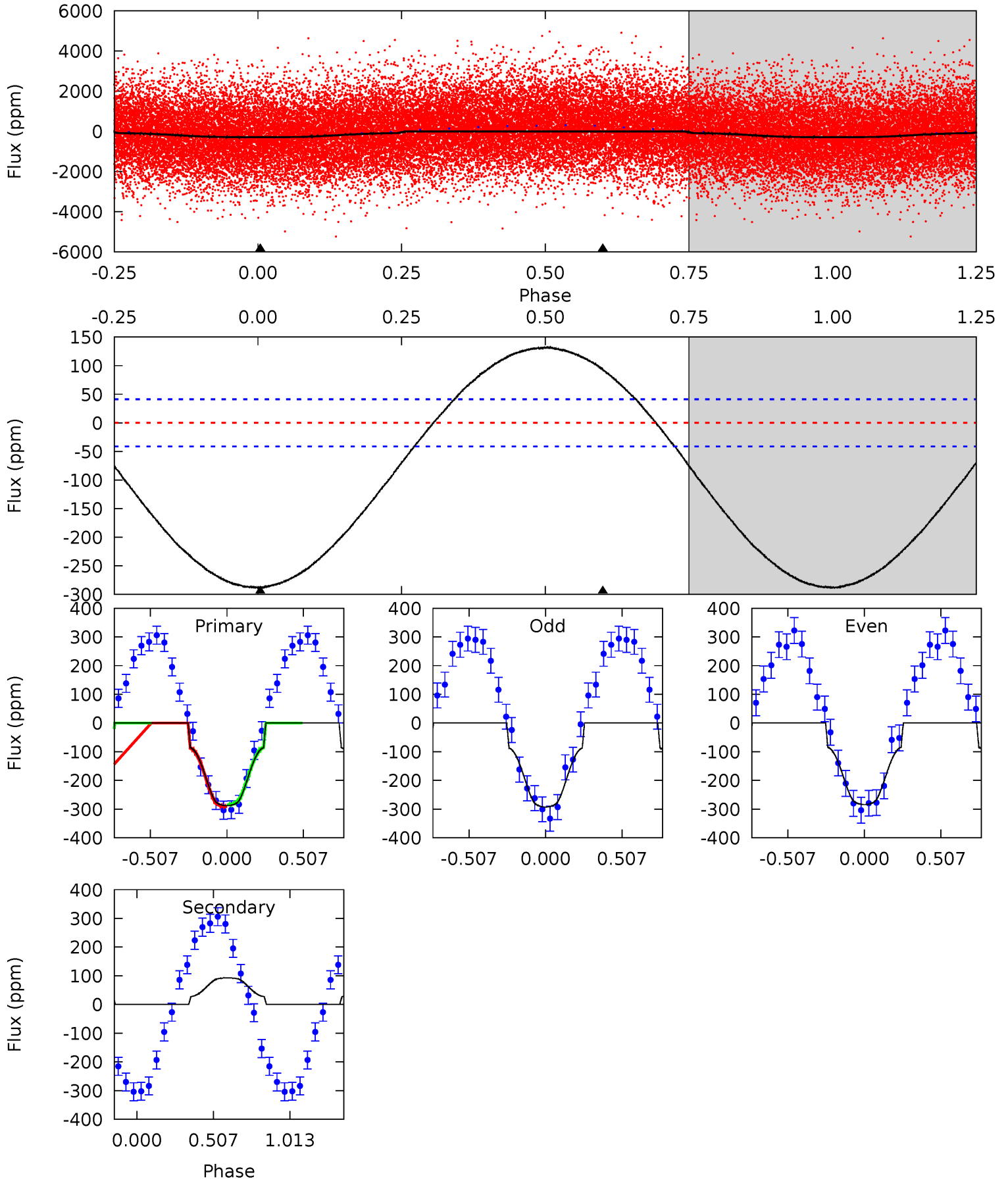




# DV Model-Shift Uniqueness Test

008972966-03, P = 1.382634 Days, E = 131.504258 Days

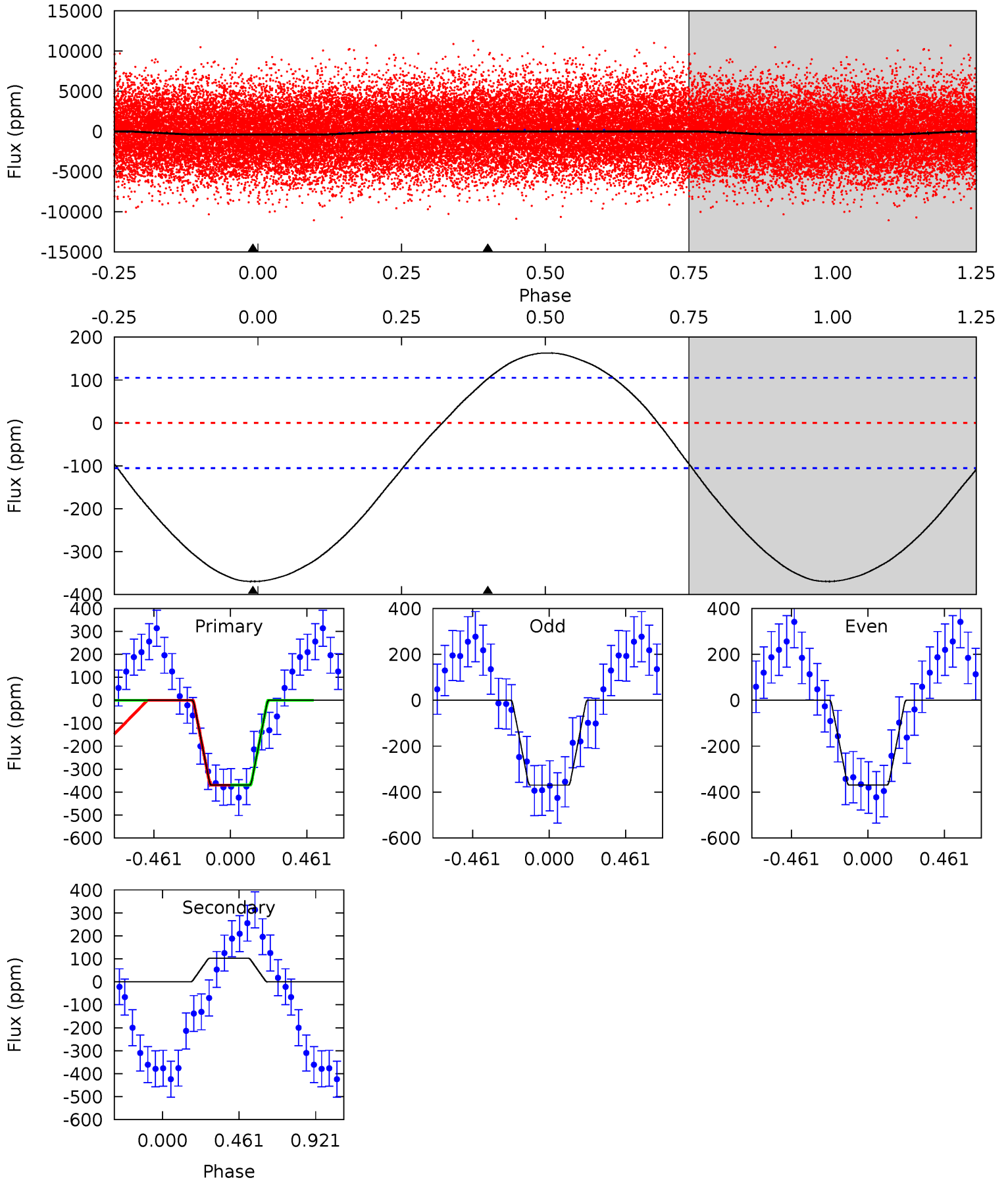
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.4	-9.46	0	0	4.21	0.66	3.67	29.4	29.4	-9.46	-9.46	0.44	1.02	0.32	0.34



# Alt Model-Shift Uniqueness Test

008972966-03, P = 1.382691 Days, E = 131.469544 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
14.9	-4.13	0	0	4.23	0.74	1.97	14.9	14.9	-4.13	-4.13	0.02	0.90	0.31	0.01



### Stellar Parameters For KIC 008972966

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7884^{+219}_{-328}$	$3.759^{+0.408}_{-0.072}$	$-0.120^{+0.200}_{-0.350}$	$3.002^{+0.423}_{-1.268}$	$1.884^{+0.102}_{-0.408}$	$0.098^{+0.343}_{-0.022}$
	+3%/-4%	+11%/-2%	+167%/-292%	+14%/-42%	+5%/-22%	+350%/-23%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008972966-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$93 \pm 10$	$7.05^{+0.93}_{-1.58}$	$4695^{+327}_{-540}$	$-5372^{+210}_{-188}$	$-0.910^{+0.197}_{-0.539}$
Alt.	$103 \pm 25$	$6.10^{+0.86}_{-1.39}$	$4669^{+344}_{-526}$	$-5717^{+358}_{-347}$	$-1.326^{+0.436}_{-0.940}$

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

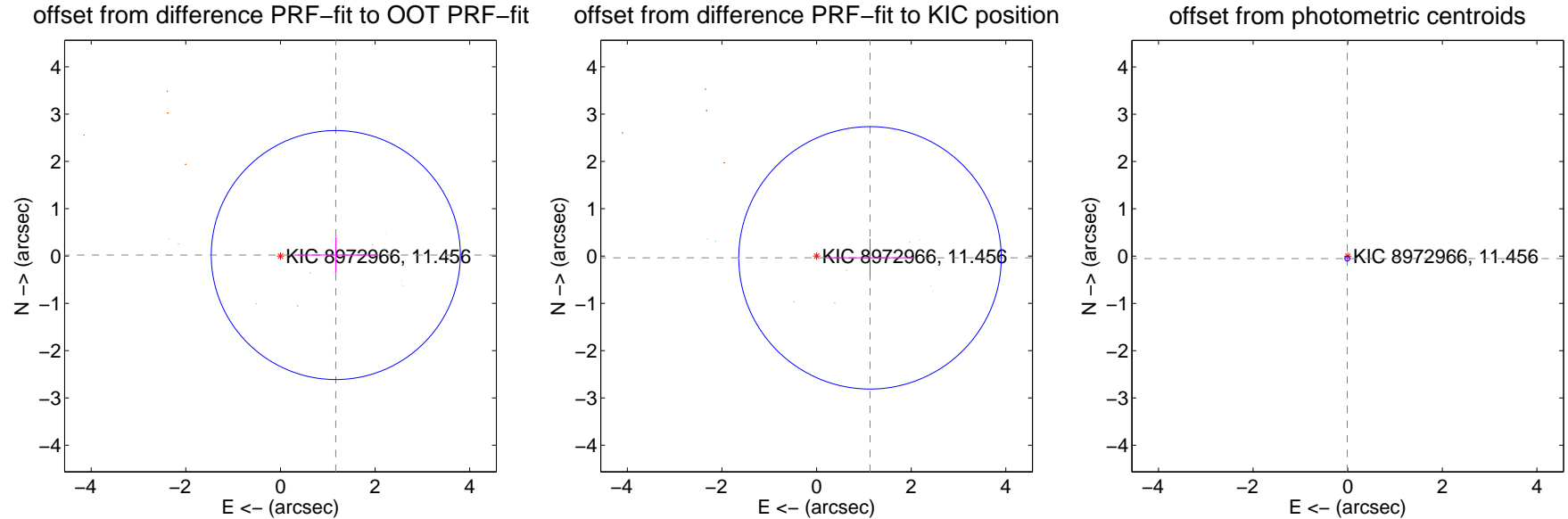
## DV Centroid Data

Supplemental centroid analysis for 008972966-03. **Kepler magnitude: 11.46.** Transit SNR 22.14

There are 9 quarters with good PRF difference image offsets

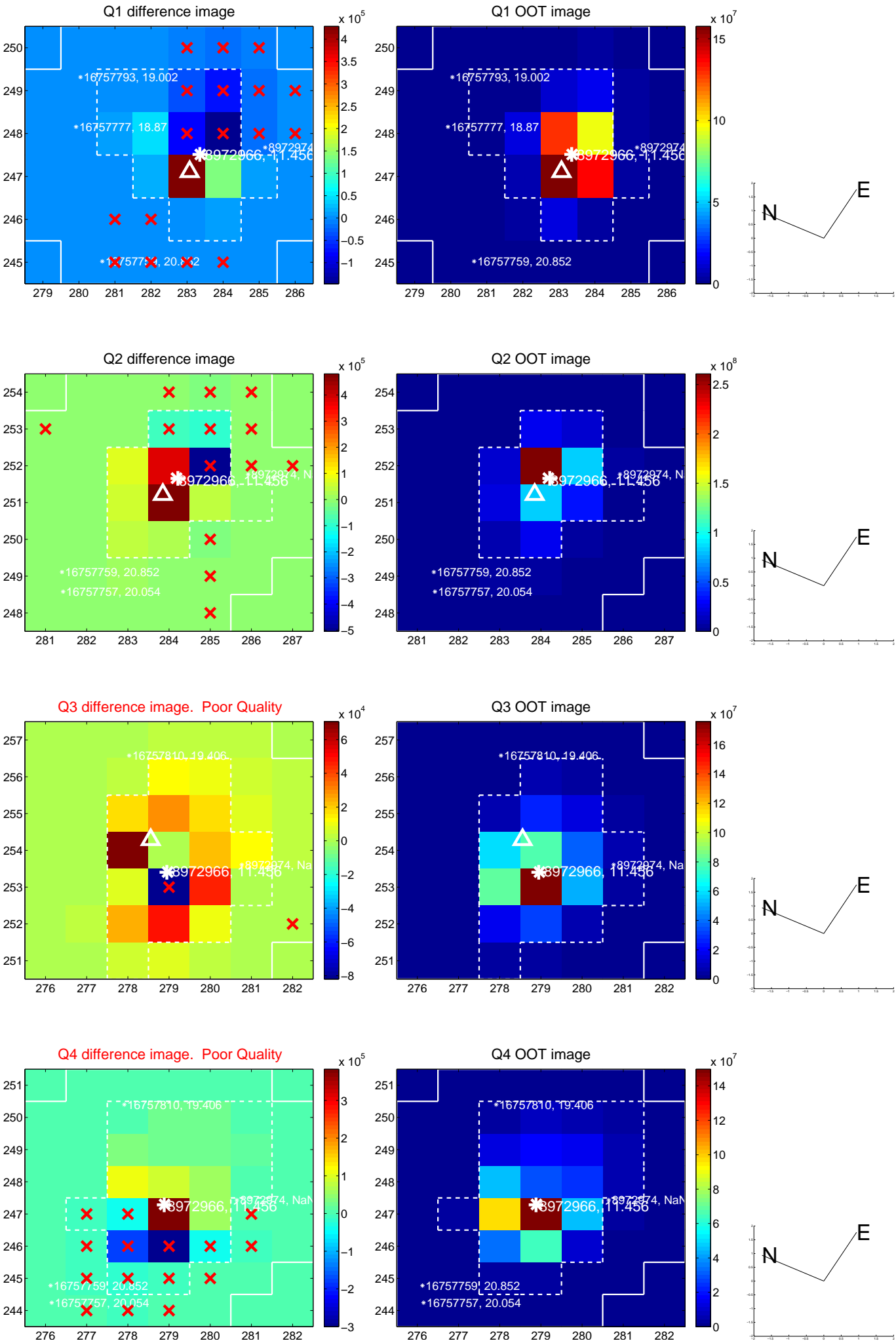
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.170 \pm 0.877$	1.33	$-1.169 \pm 0.881$	$0.020 \pm 0.383$
PRF-fit source offset from KIC position	$1.130 \pm 0.924$	1.22	$-1.129 \pm 0.918$	$-0.039 \pm 0.405$
photometric centroid source offset	<b><math>0.05 \pm 0.02</math></b>	<b>3.05</b>	$0.01 \pm 0.02$	$-0.05 \pm 0.02$



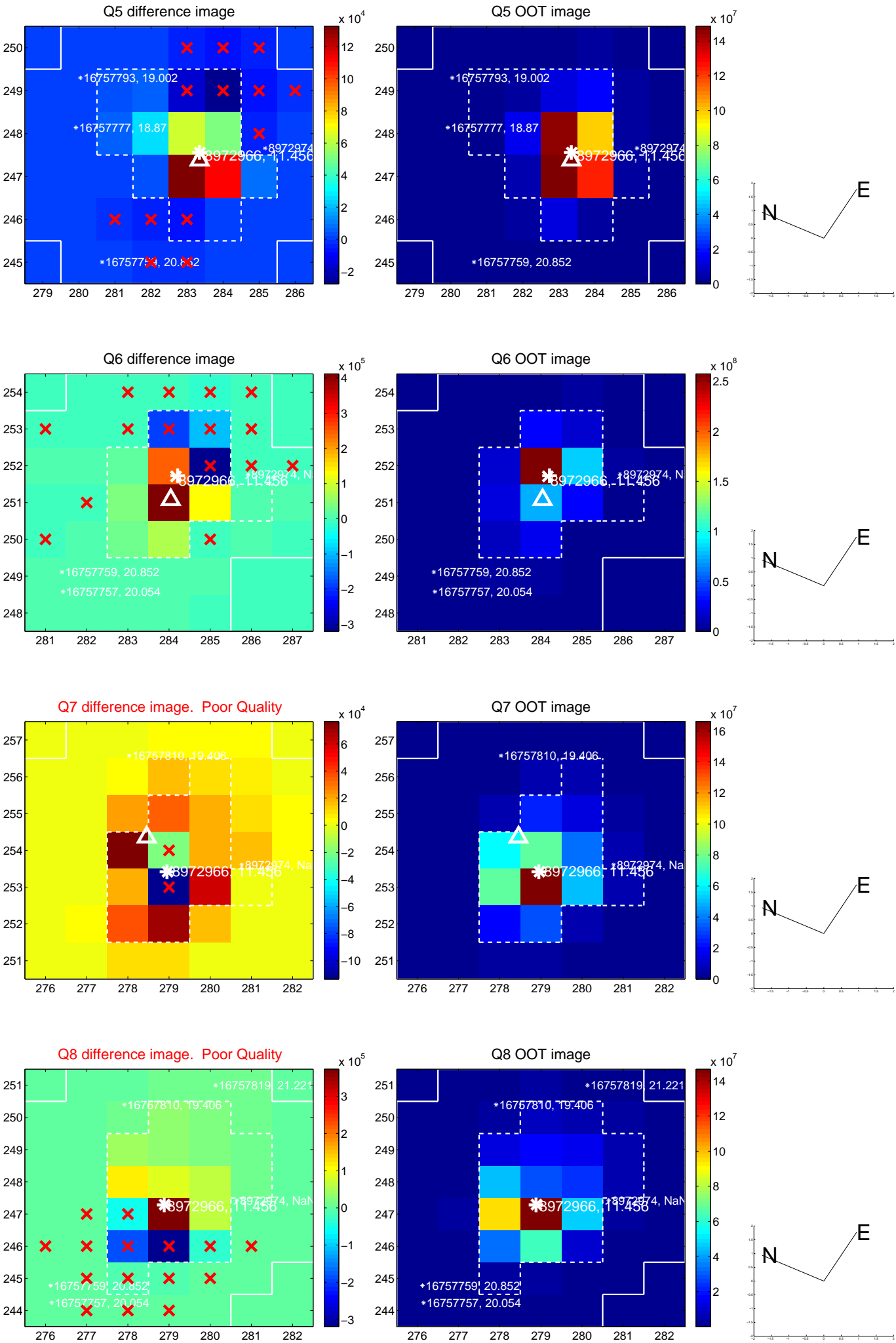
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

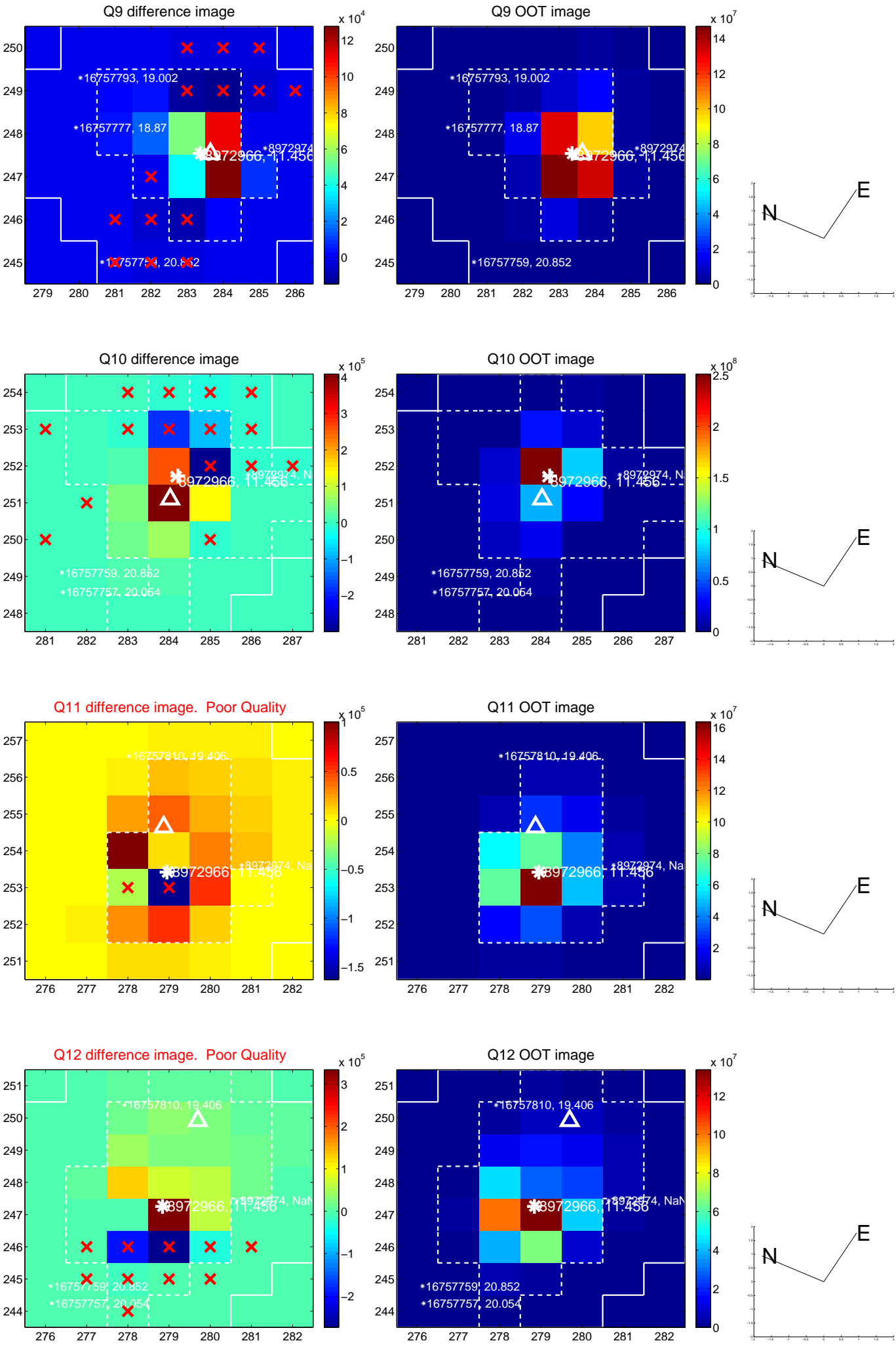




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

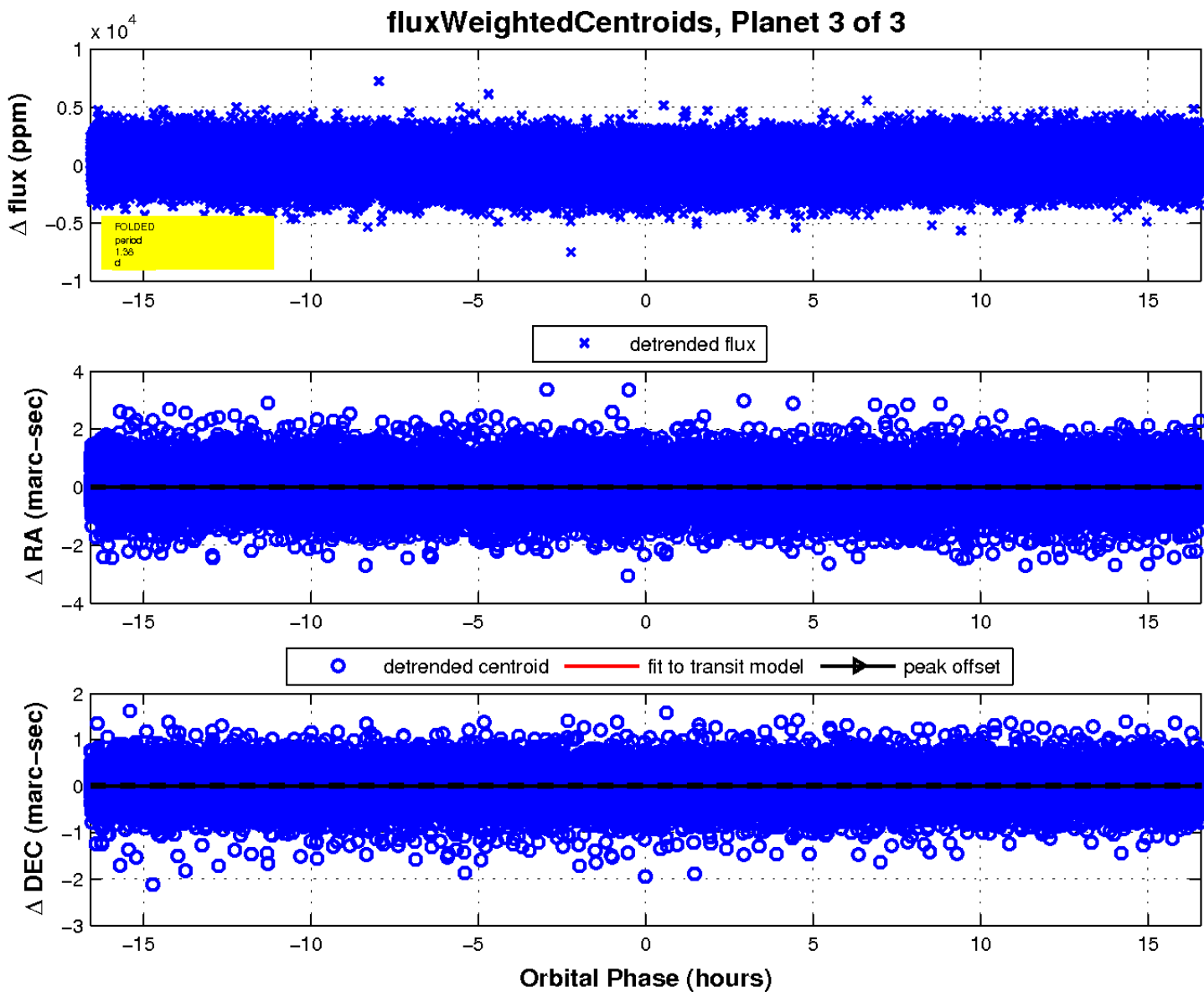
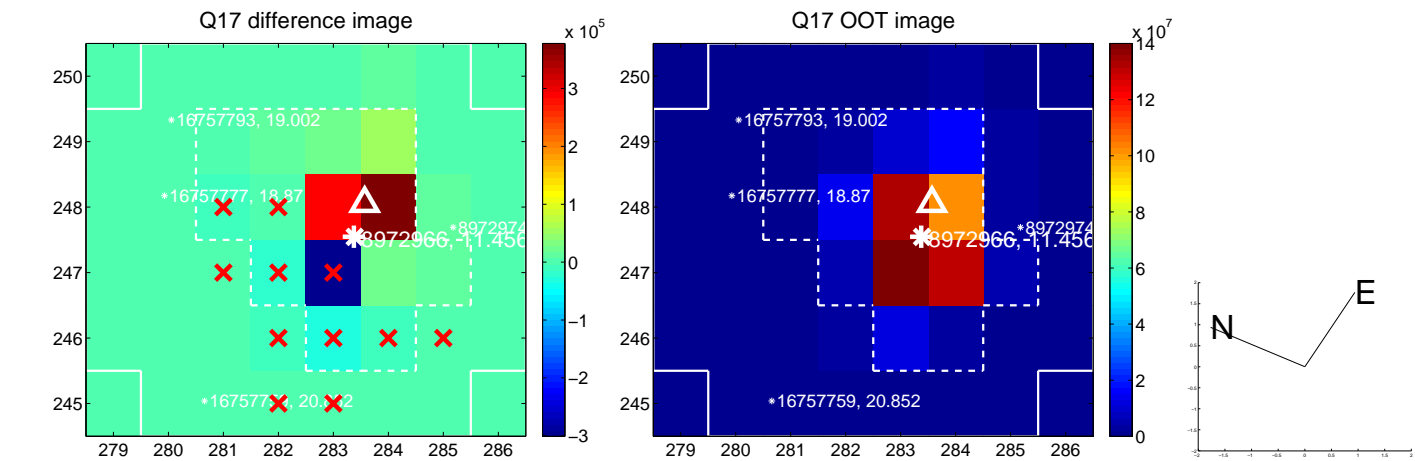


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

