

# KIC 010090722

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010090722-01	OBS	No	2.002707	133.155219	21.0	5.863	10.6	9.0	4.91	11053	2.64	143875.58
010090722-02	OBS	No	6.008032	135.934860	74.6	12.000	9.6	-1.0	4.91	11053	4.37	33253.25
010090722-03	OBS	No	6.008184	134.569217	82.8	10.500	9.3	-1.0	4.91	11053	4.60	33252.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010090722-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_FEW_DIFFS
010090722-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
010090722-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

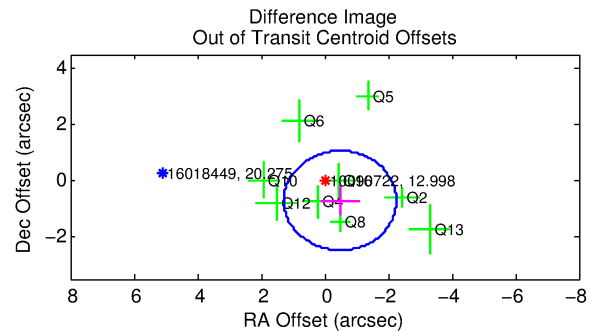
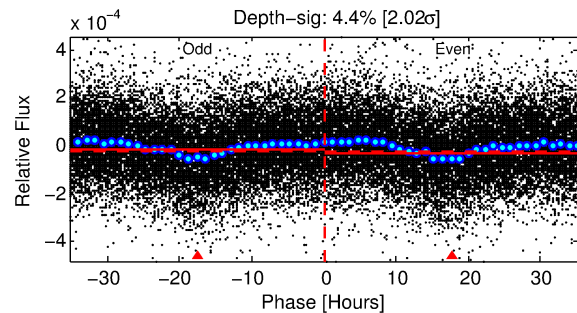
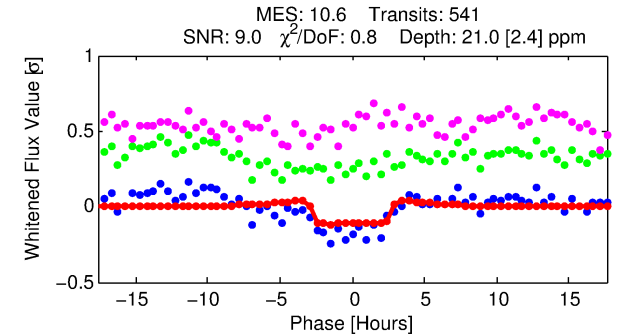
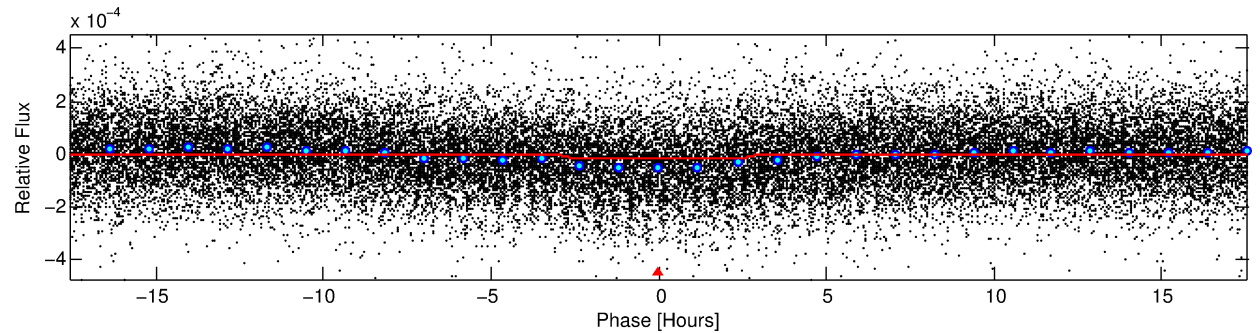
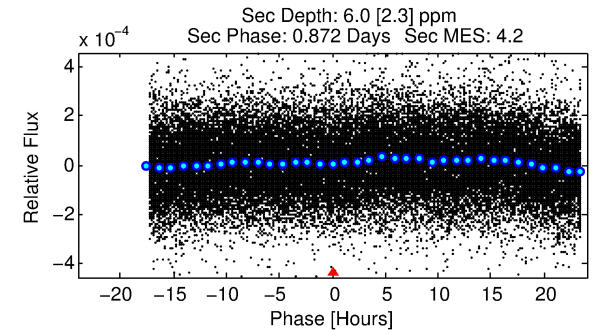
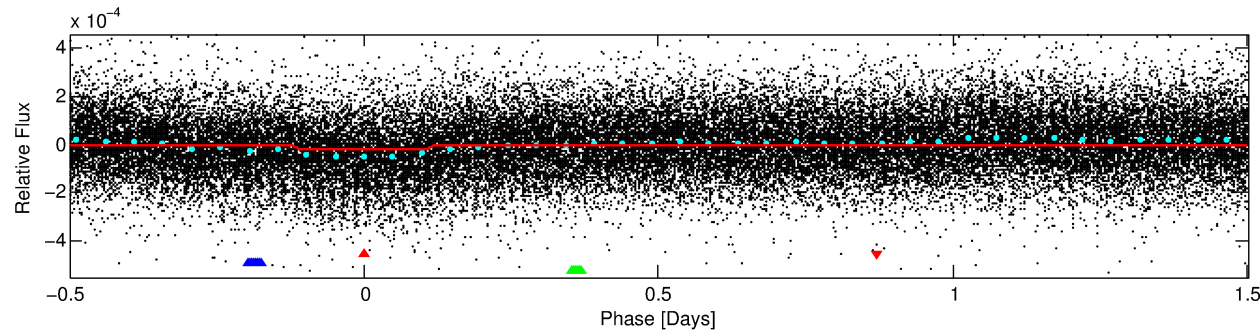
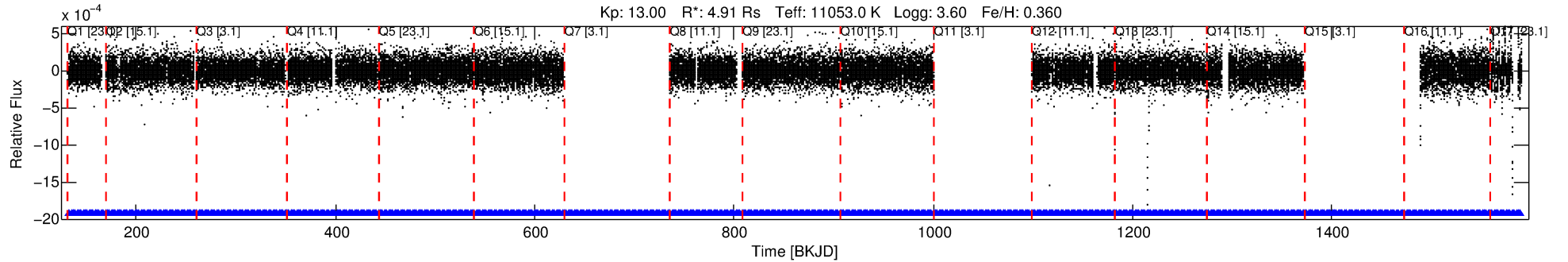
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010090722-01

No Significant Match Found

# DV One-Page Summary

KIC: 10090722 Candidate: 1 of 3 Period: 2.003 d



## DV Fit Results:

Period = 2.00271 [0.00002] d  
Epoch = 133.1552 [0.0049] BKJD  
Rp/R\* = 0.0049 [0.0008]  
a/R\* = 1.36 [0.79]  
b = 0.94 [0.17]  
Seff = 143875.58 [132116.91]  
Teq = 4966 [1140] K  
Rp = 2.64 [1.31] Re  
a = 0.0473 [0.0215] AU  
Ag = 1.06 [0.93] [0.06σ]  
Teffp = 7783 [1468] K [1.52σ]

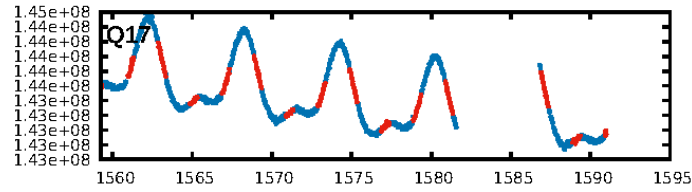
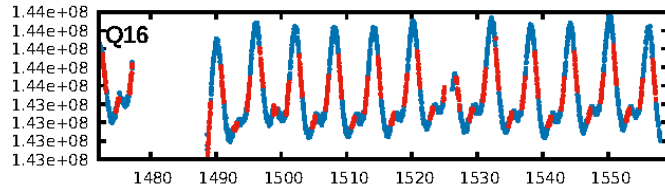
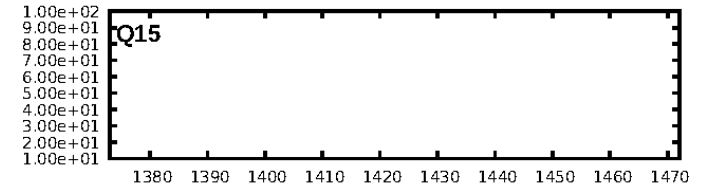
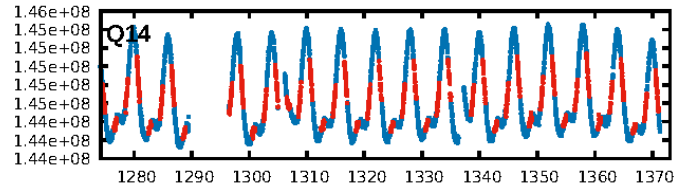
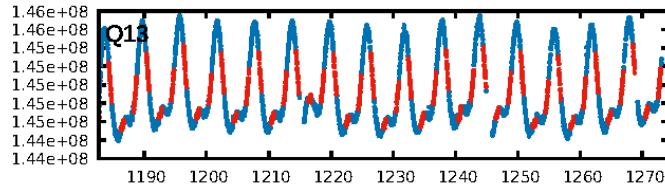
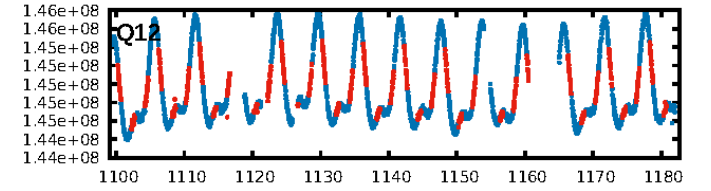
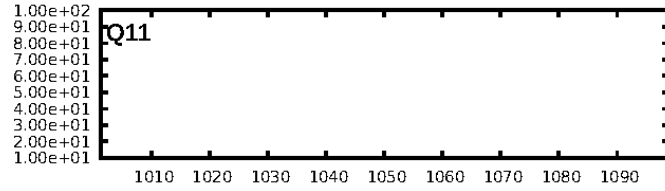
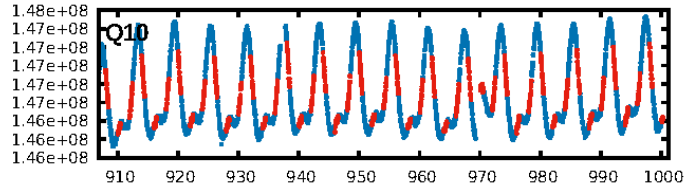
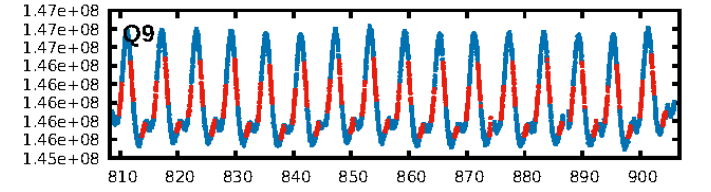
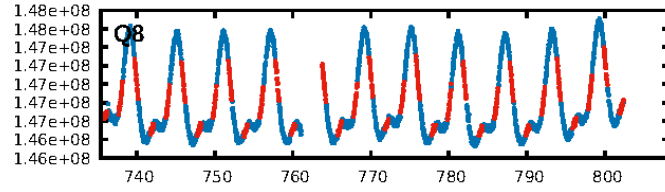
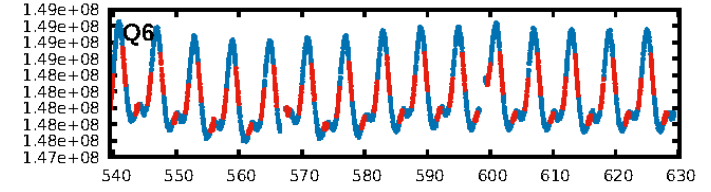
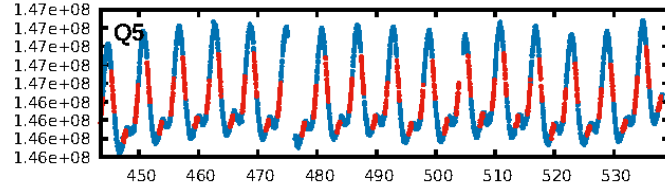
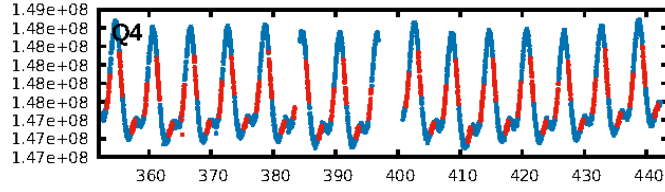
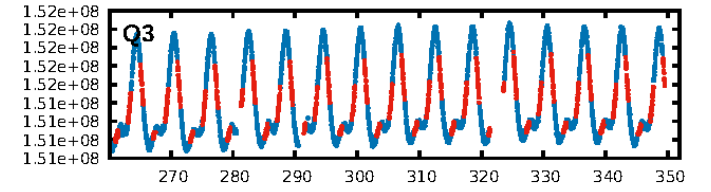
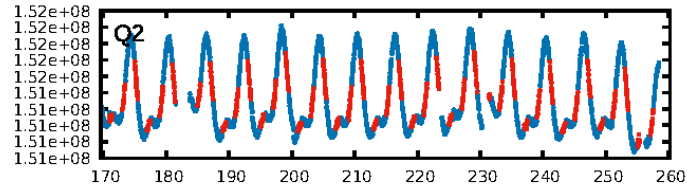
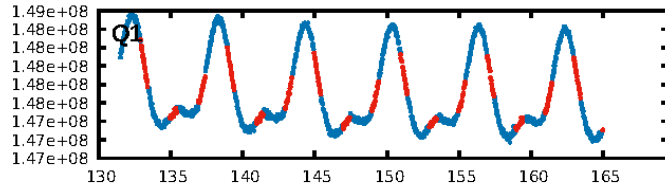
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [7.20σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.29e-19  
RollingBand-fgt: 1.00 [511/511]  
**GhostDiagnostic-chr: 0.6784**  
Centroid-sig: 0.0%  
Centroid-so: 2.471 arcsec [2.38σ]  
OotOffset-rm: 0.857 arcsec [1.45σ]  
KicOffset-rm: 0.998 arcsec [1.94σ]  
OotOffset-st: 3/0/4/2 [9]  
KicOffset-st: 3/0/4/2 [9]  
DiffImageQuality-fgm: 0.00 [0/9]  
DiffImageOverlap-fno: 1.00 [14/14]

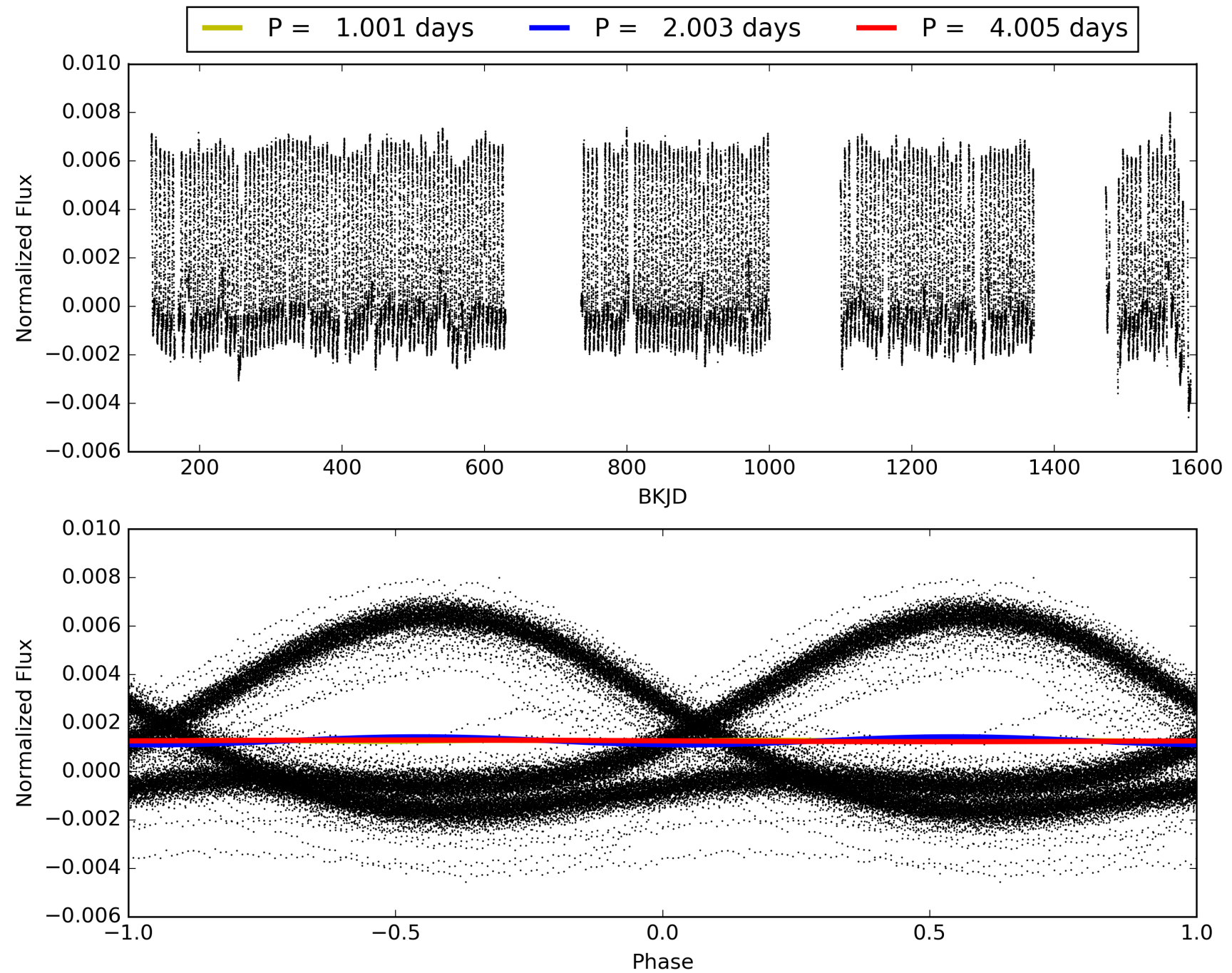
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010090722-01, PDC Light Curves

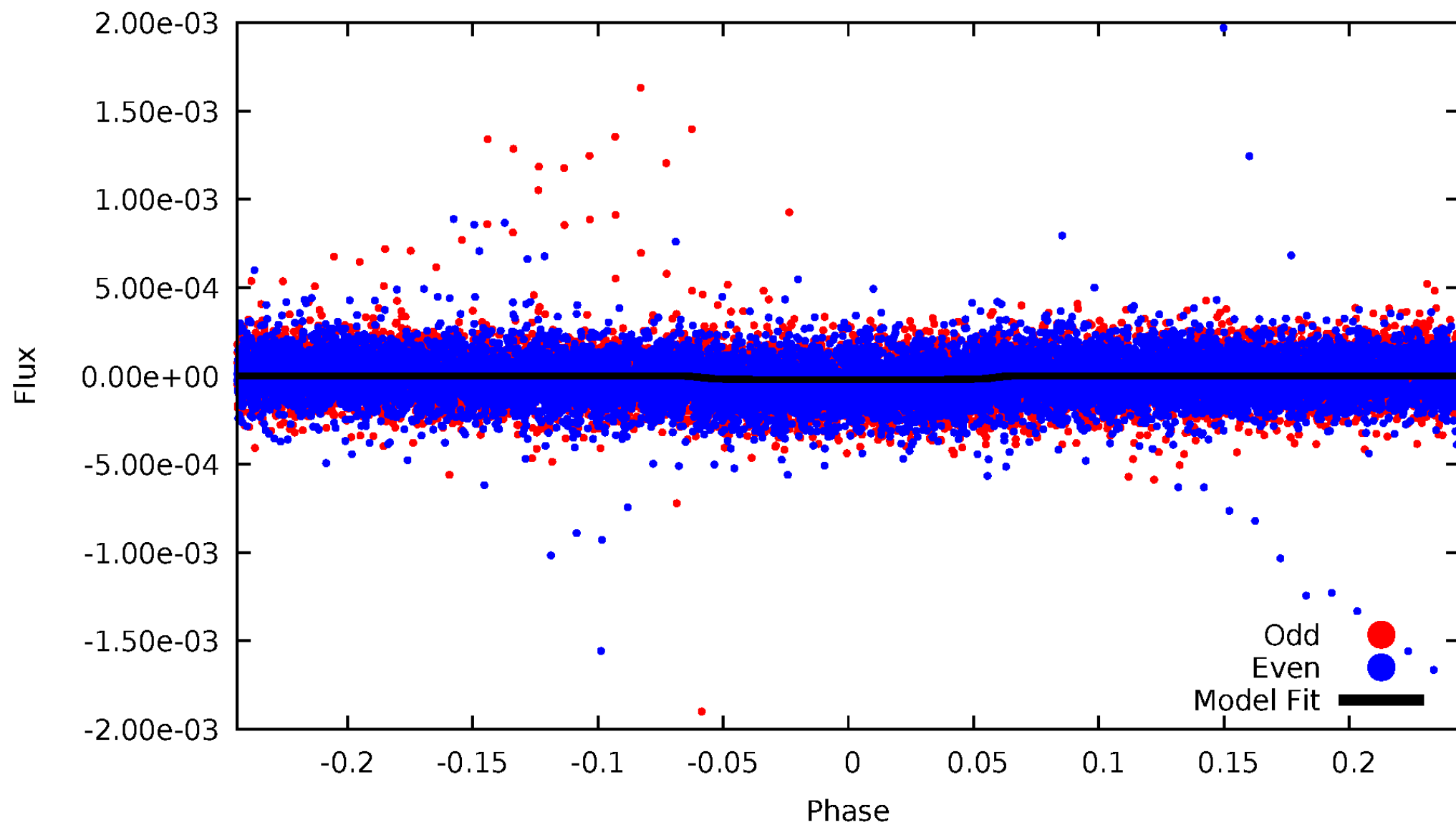


TCE 010090722-01



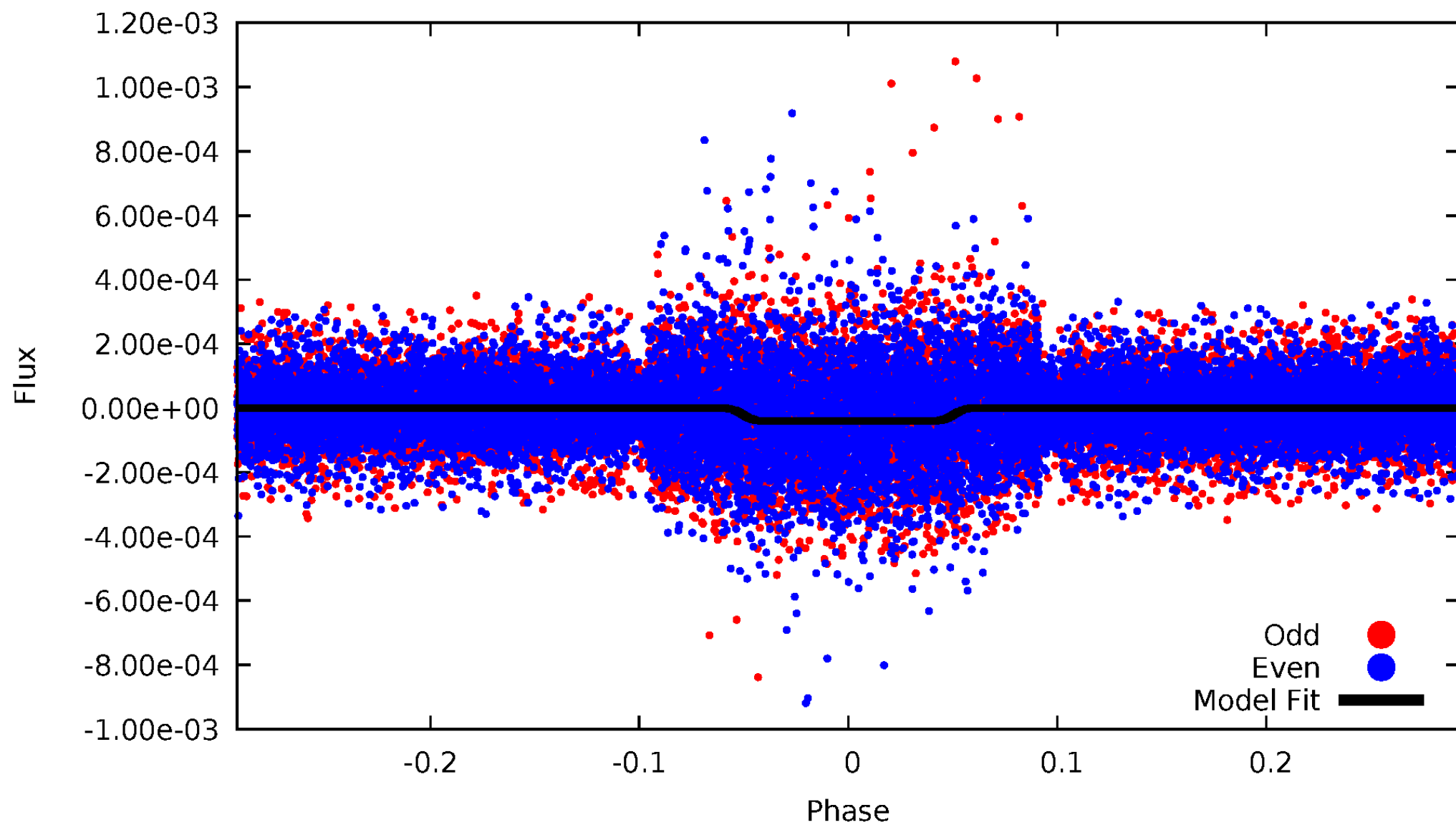
# DV Odd/Even

TCE 010090722-01



# ALT Odd/Even

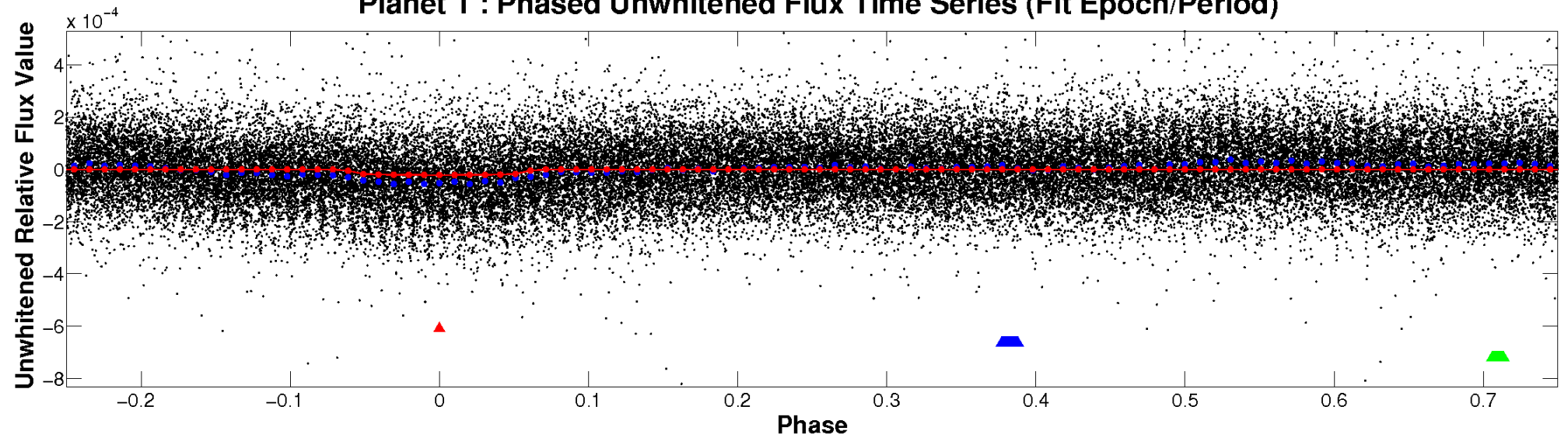
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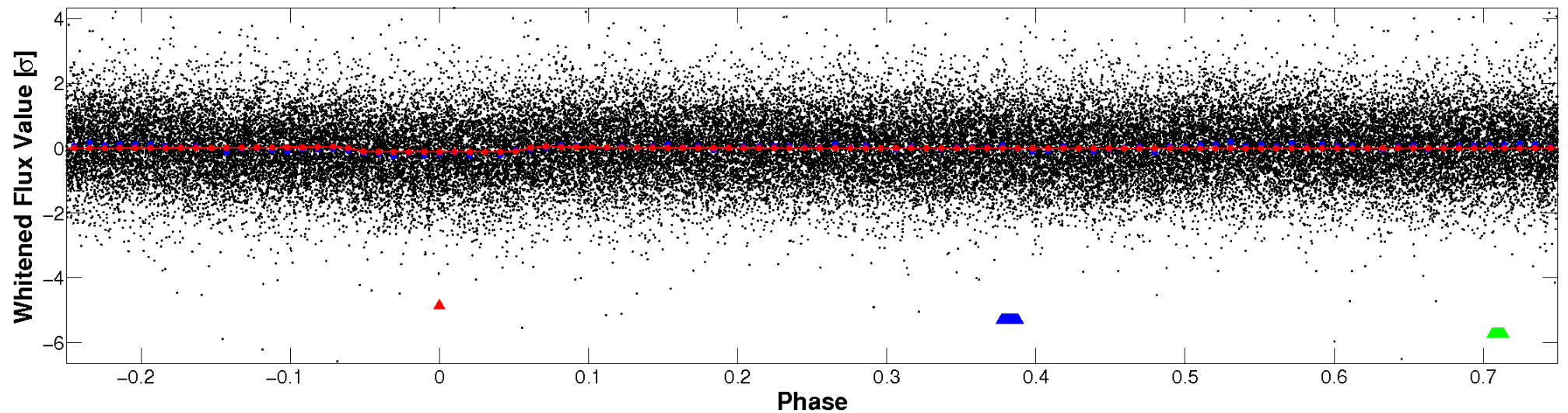


# Non-Whitened Vs. Whitened Light Curve

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

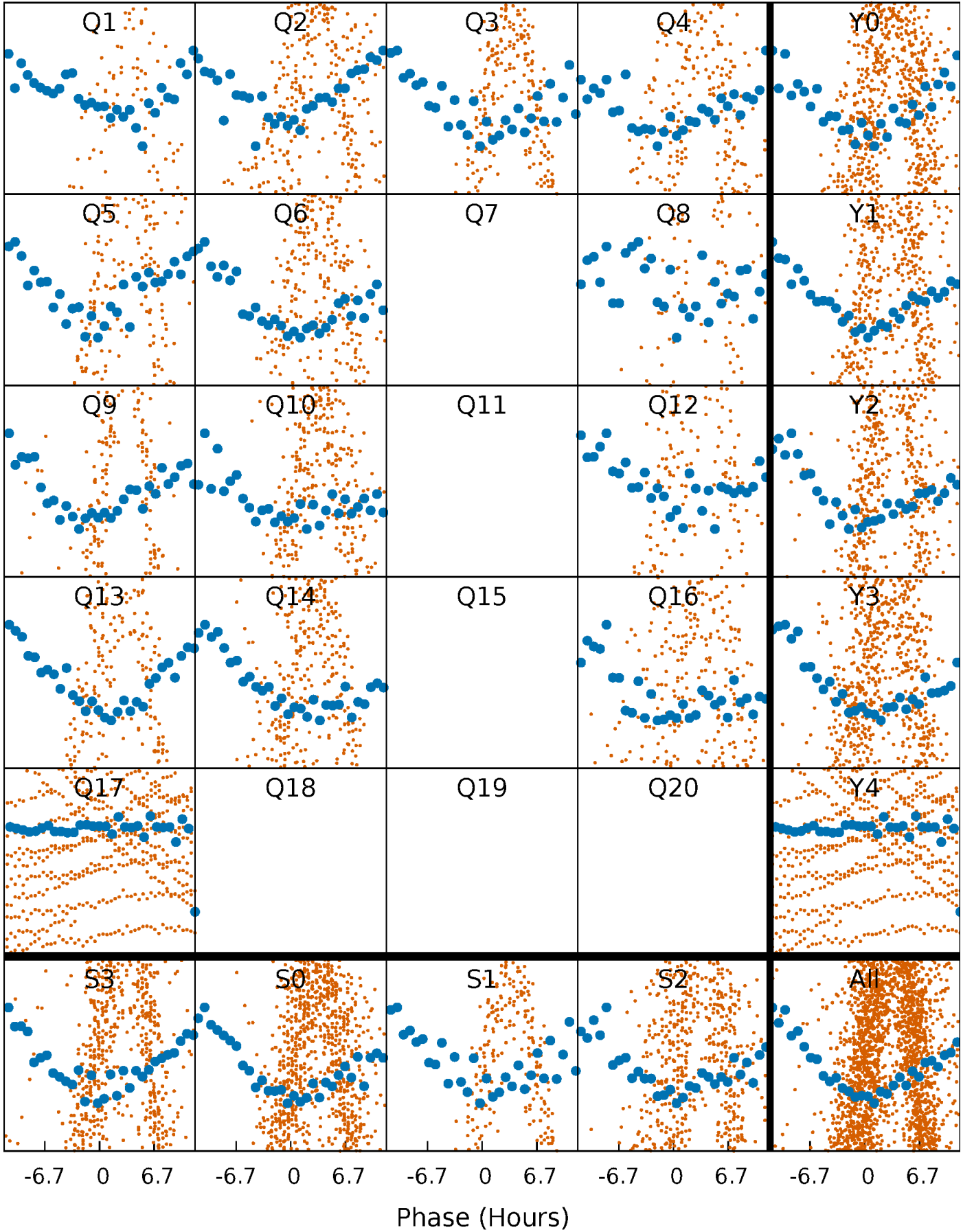


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

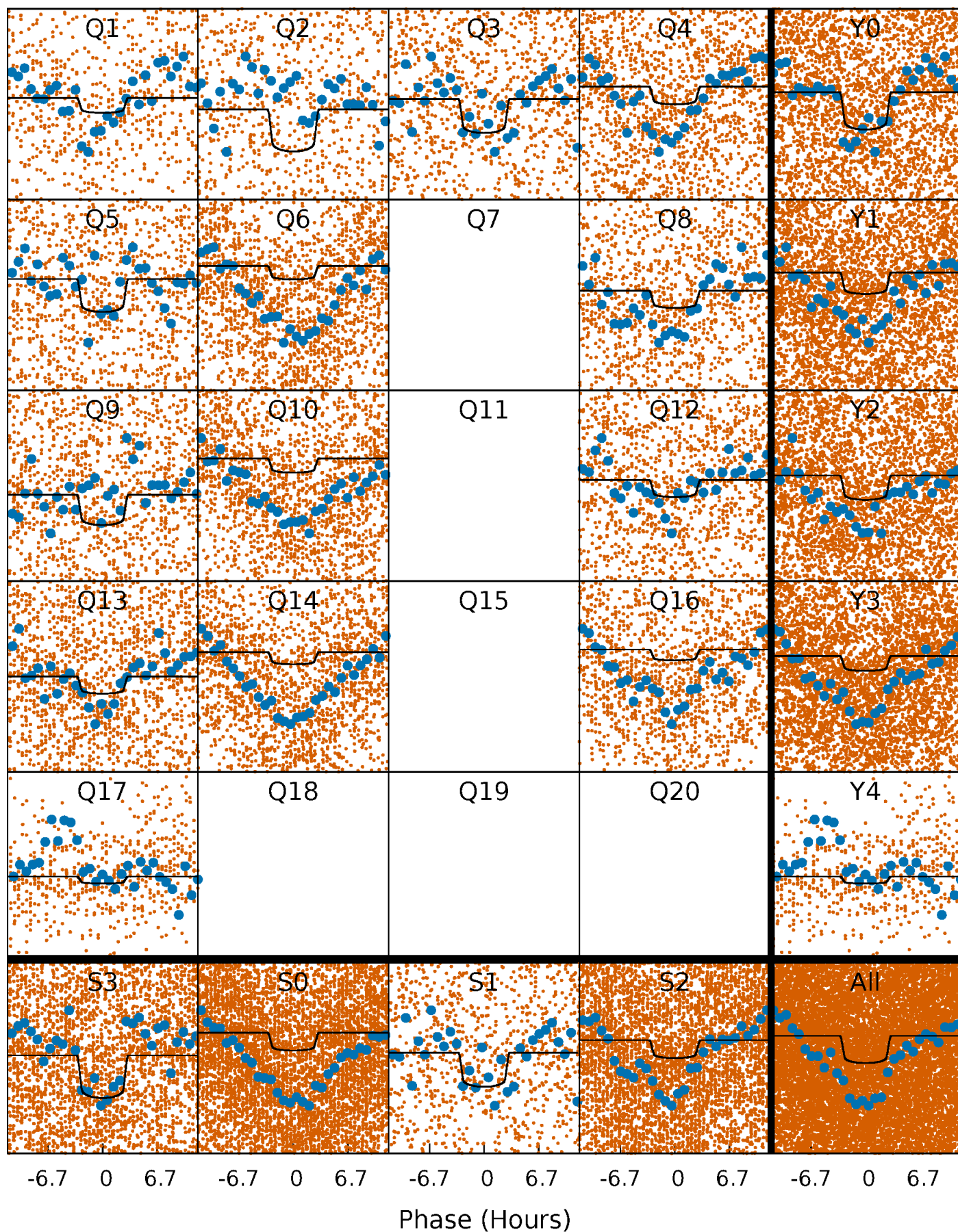
TCE 010090722-01   P= 2.002707 Days    $T_0=133.155219$  (BKJD)





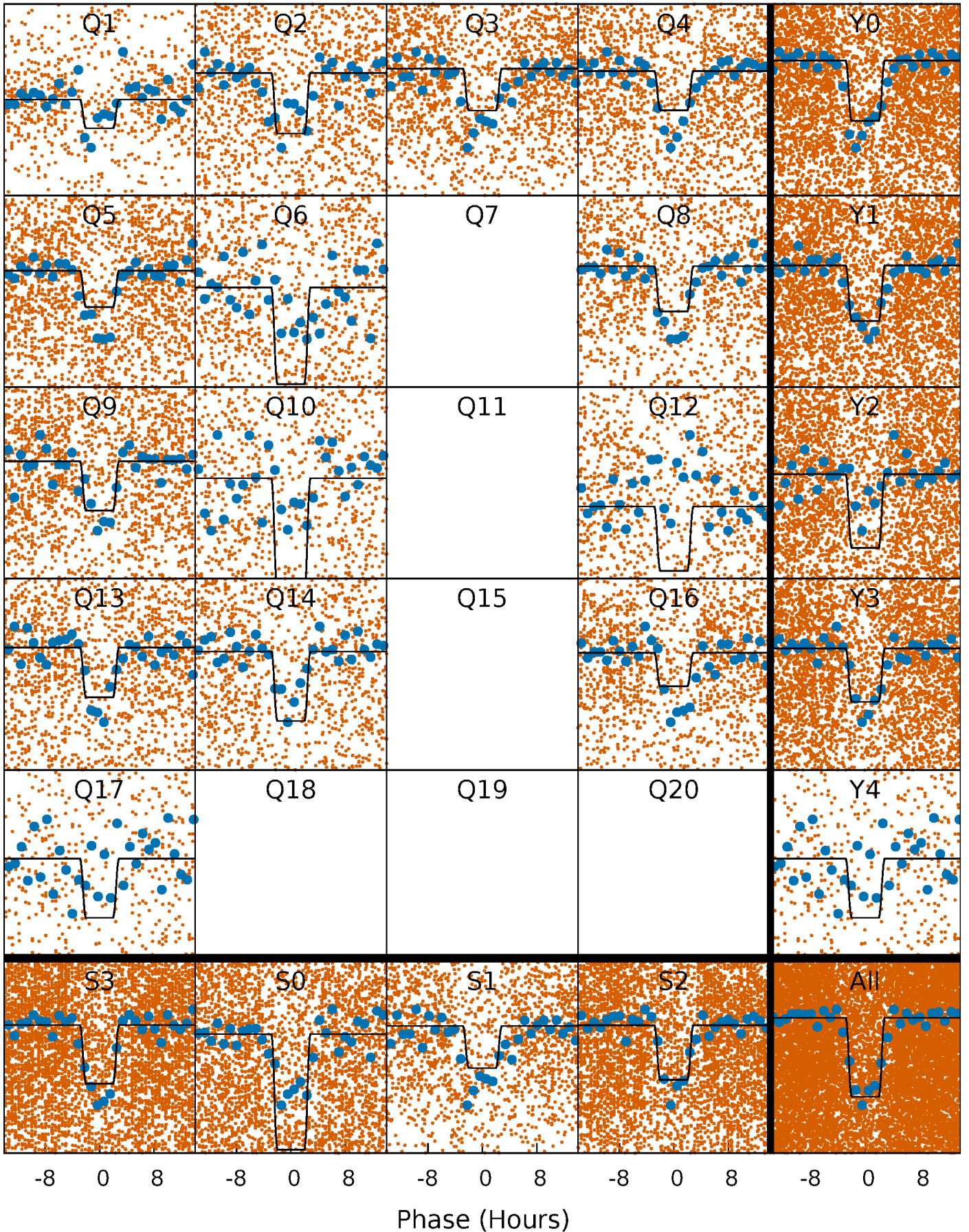
# DV Quarter-Phased Transit Curves

TCE 010090722-01 P= 2.002707 Days  $T_0=133.155219$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010090722-01 P= 2.002714 Days  $T_0=133.150742$  (BKJD)

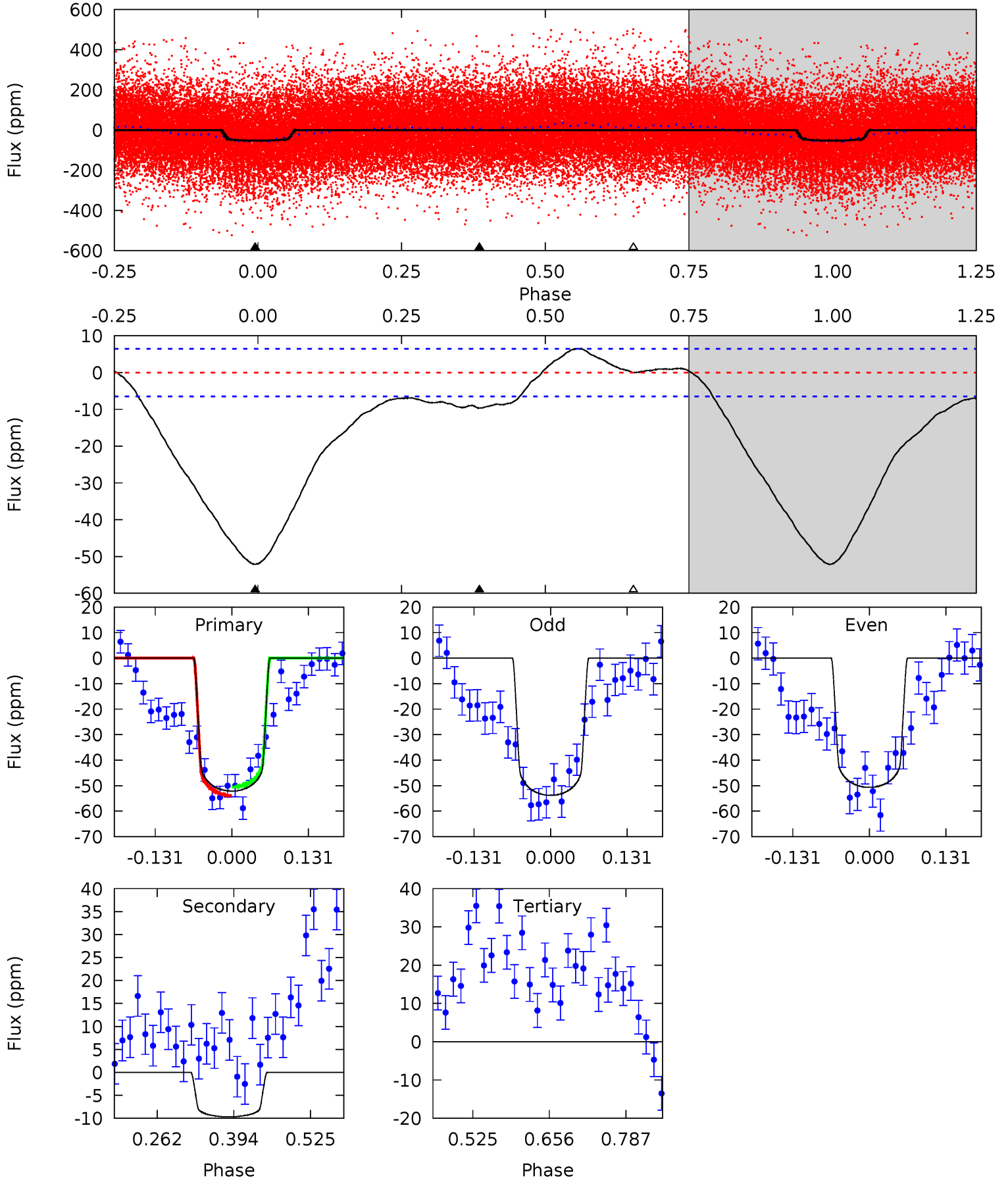




# DV Model-Shift Uniqueness Test

010090722-01, P = 2.002707 Days, E = 131.152512 Days

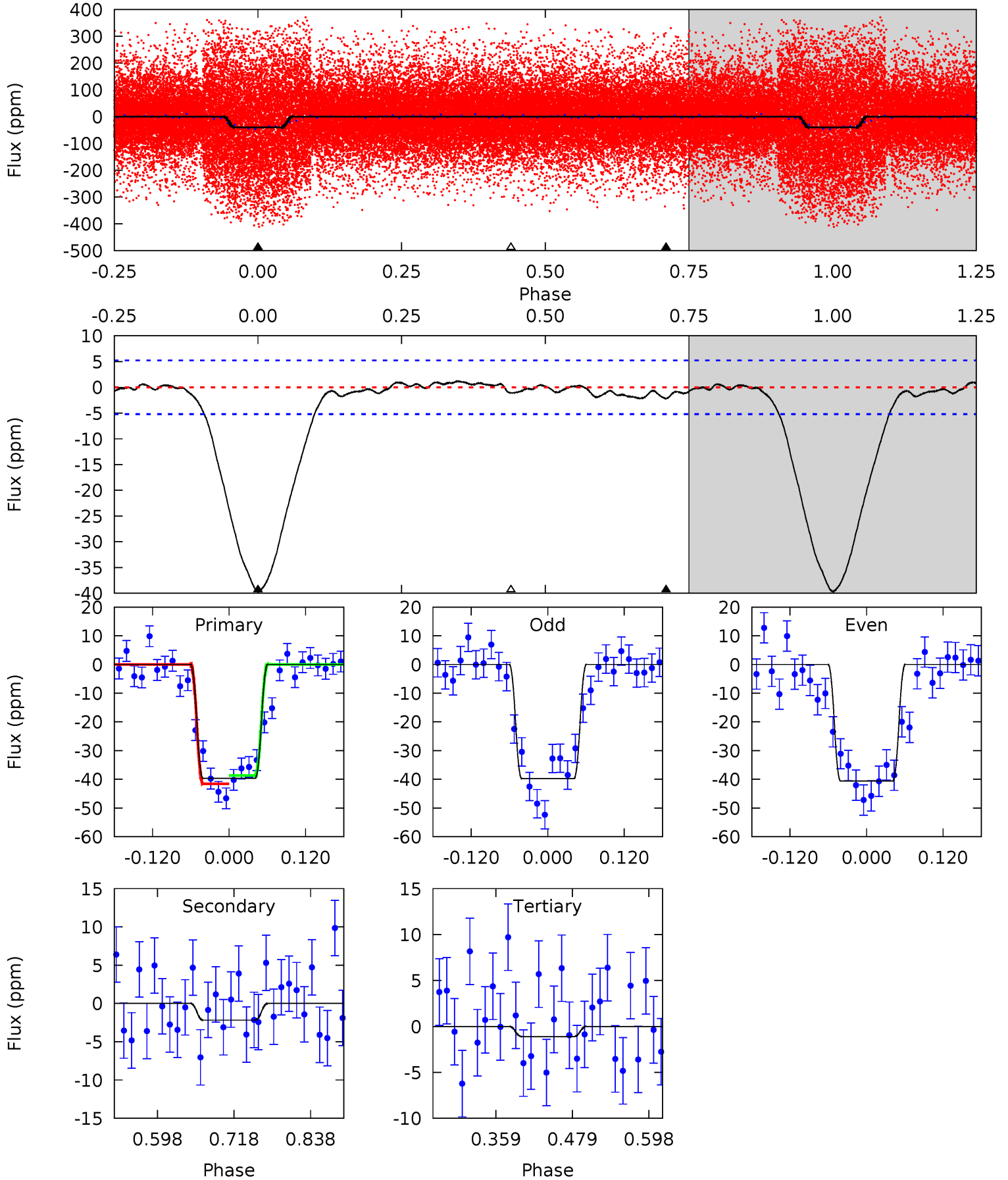
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.3	6.74	-0.01	0	4.51	1.51	5.76	36.3	36.3	6.75	6.74	1.10	1.02	0.11	1.18



# Alt Model-Shift Uniqueness Test

010090722-01, P = 2.002714 Days, E = 131.148028 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
34.3	1.89	0.96	0	4.53	1.56	0.64	33.4	34.3	0.93	1.89	0.36	0.92	0.03	1.27



### Stellar Parameters For KIC 010090722

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$11053^{+519}_{-1558}$	$3.603^{+0.425}_{-0.075}$	$0.360^{+0.050}_{-0.300}$	$4.909^{+0.410}_{-2.325}$	$3.520^{+0.070}_{-0.865}$	$0.042^{+0.160}_{-0.010}$
	+5%/-14%	+12%/-2%	+14%/-83%	+8%/-47%	+2%/-25%	+381%/-24%
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 010090722-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-10 \pm 1$	$2.45^{+0.53}_{-0.62}$	$6560^{+699}_{-1078}$	$7391^{+1189}_{-952}$	$1.950^{+1.389}_{-0.664}$
Alt.	$-2 \pm 1$	$3.14^{+0.63}_{-0.75}$	$6486^{+790}_{-949}$	$-3191^{+7541}_{-1338}$	$0.272^{+0.255}_{-0.144}$

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



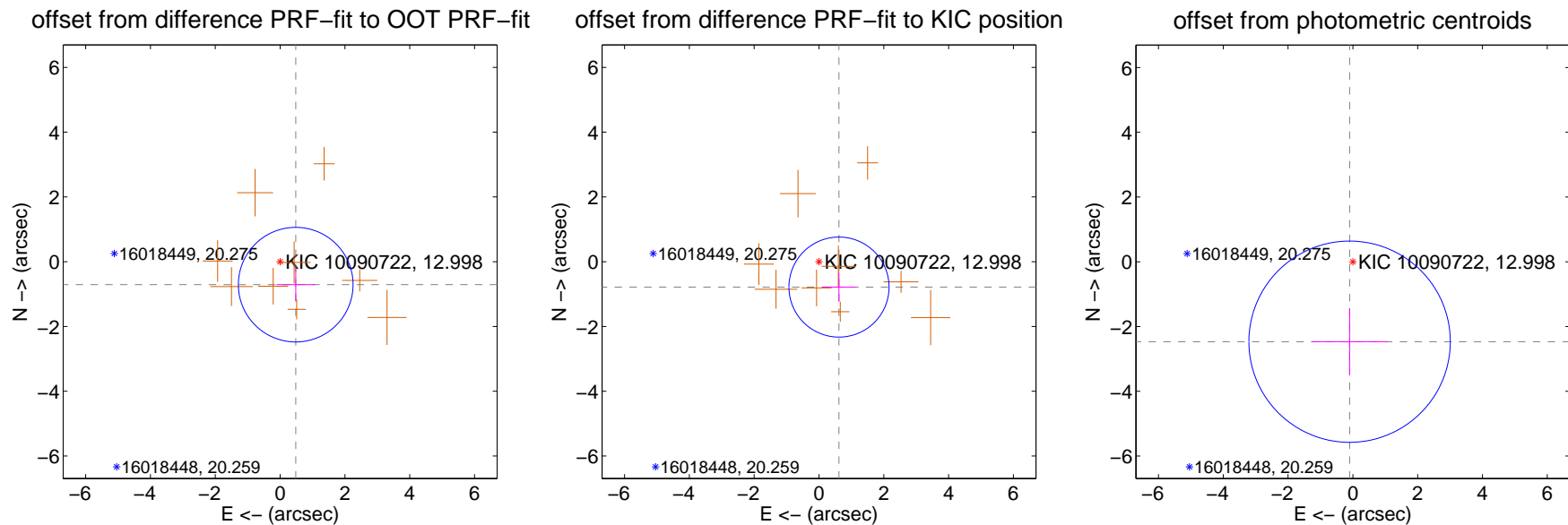
## DV Centroid Data

Supplemental centroid analysis for 010090722-01. Kepler magnitude: 13.00. Transit SNR 8.99

There are 0 quarters with good PRF difference image offsets

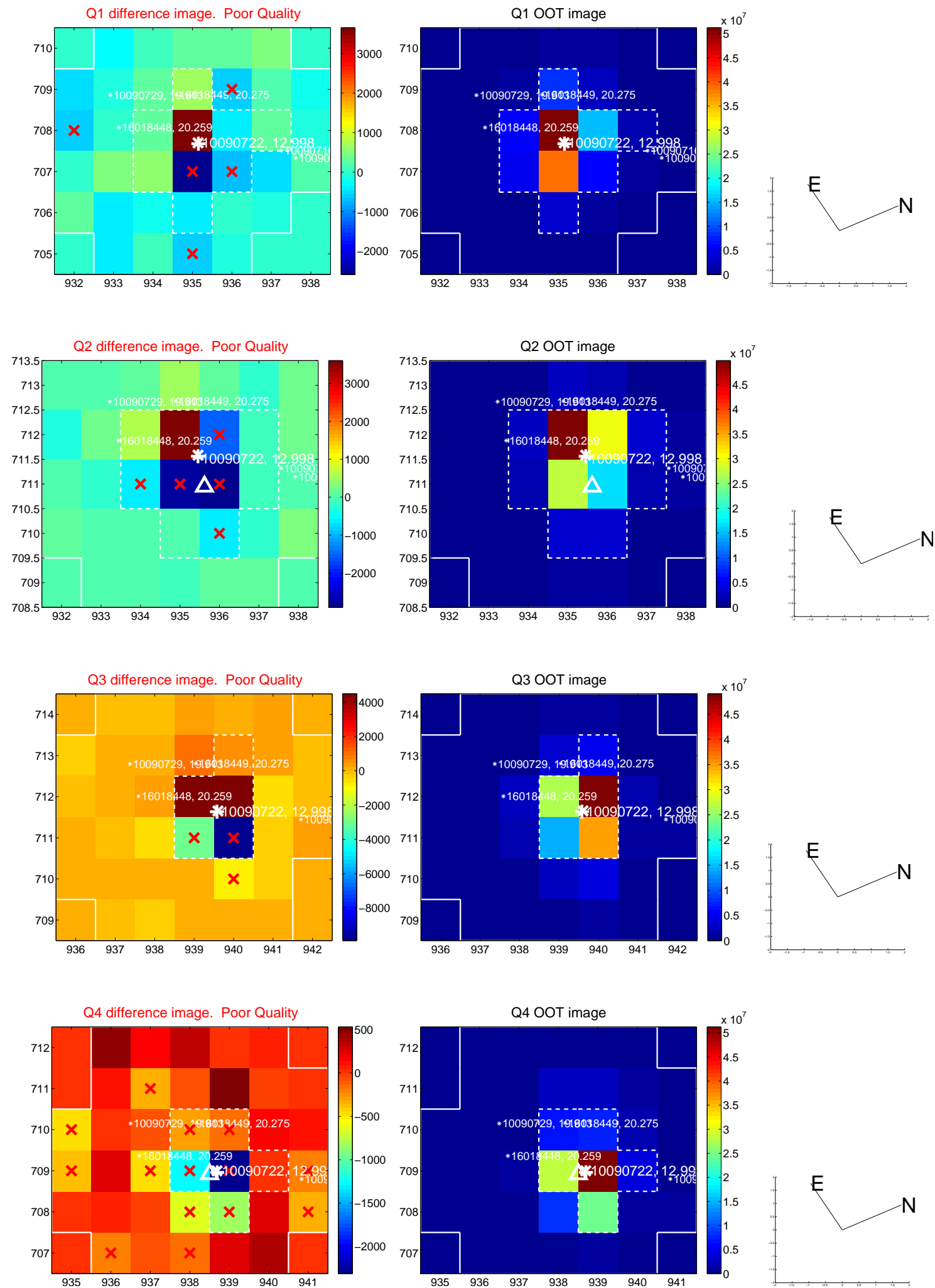
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.857 \pm 0.590$	1.45	$-0.482 \pm 0.594$	$-0.709 \pm 0.513$
PRF-fit source offset from KIC position	$0.998 \pm 0.515$	1.94	$-0.617 \pm 0.511$	$-0.784 \pm 0.452$
photometric centroid source offset	$2.47 \pm 1.04$	2.38	$0.10 \pm 1.17$	$-2.47 \pm 1.04$

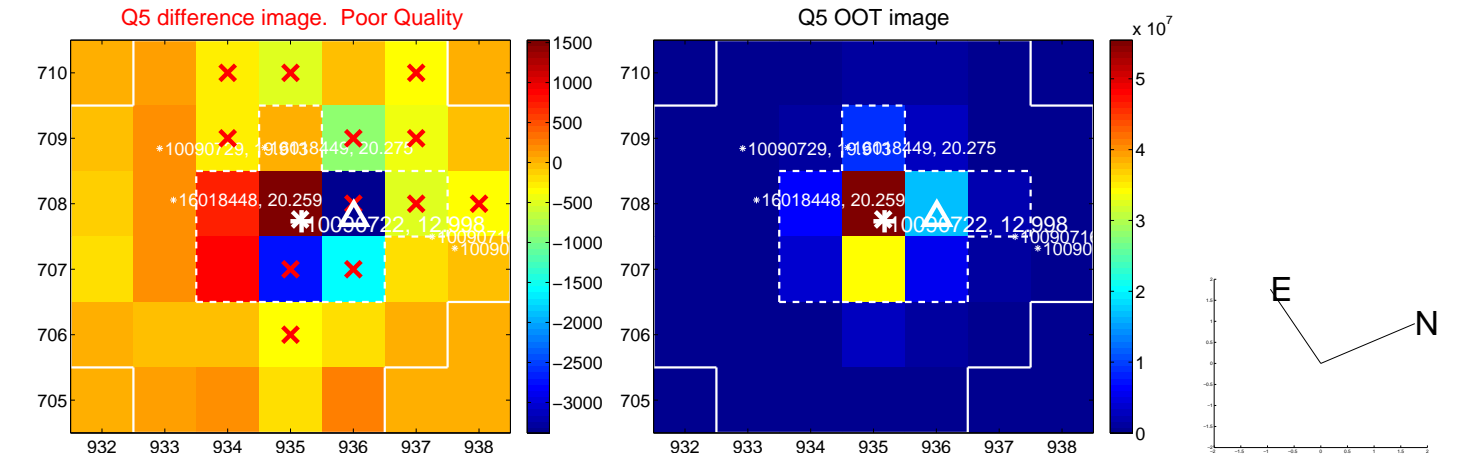


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

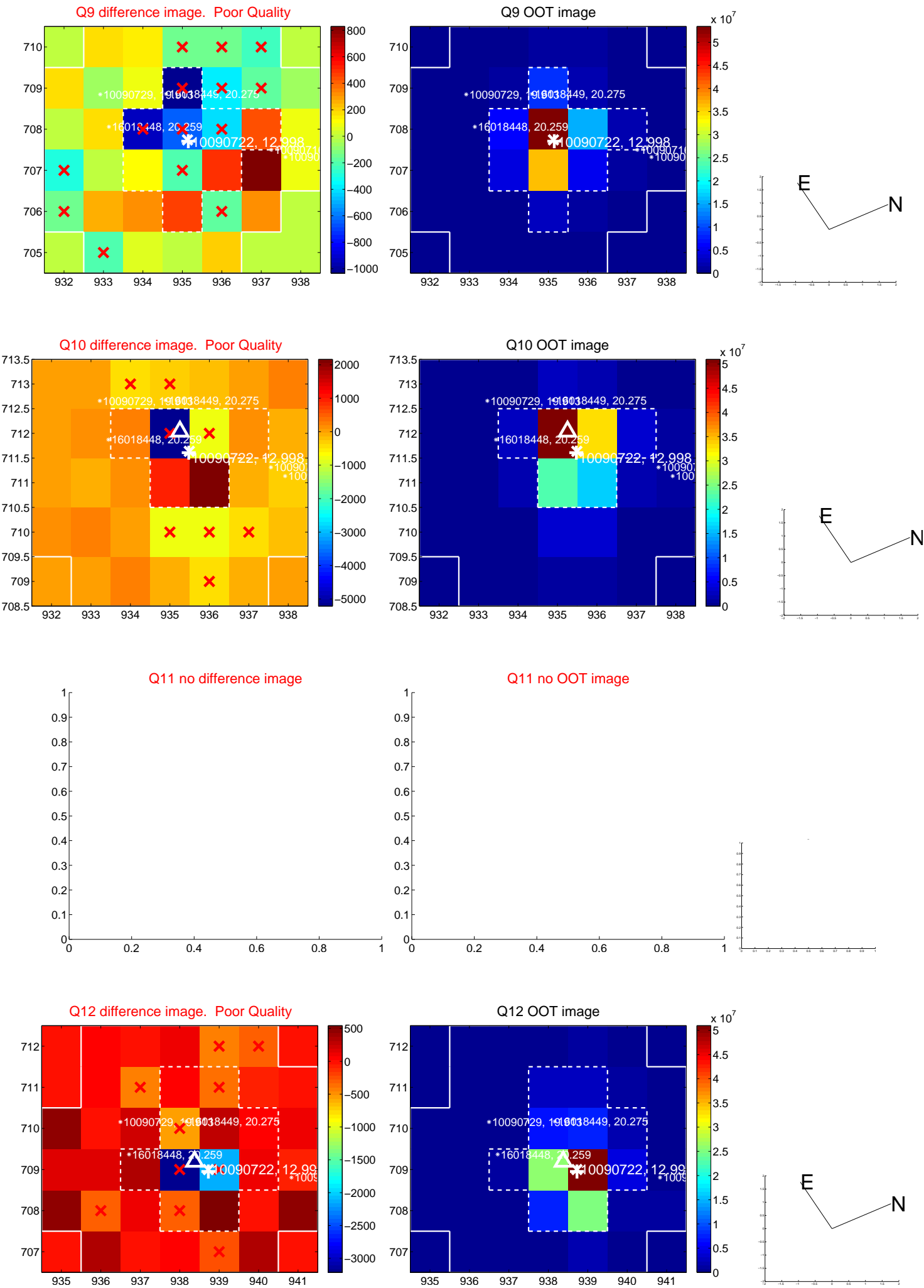
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



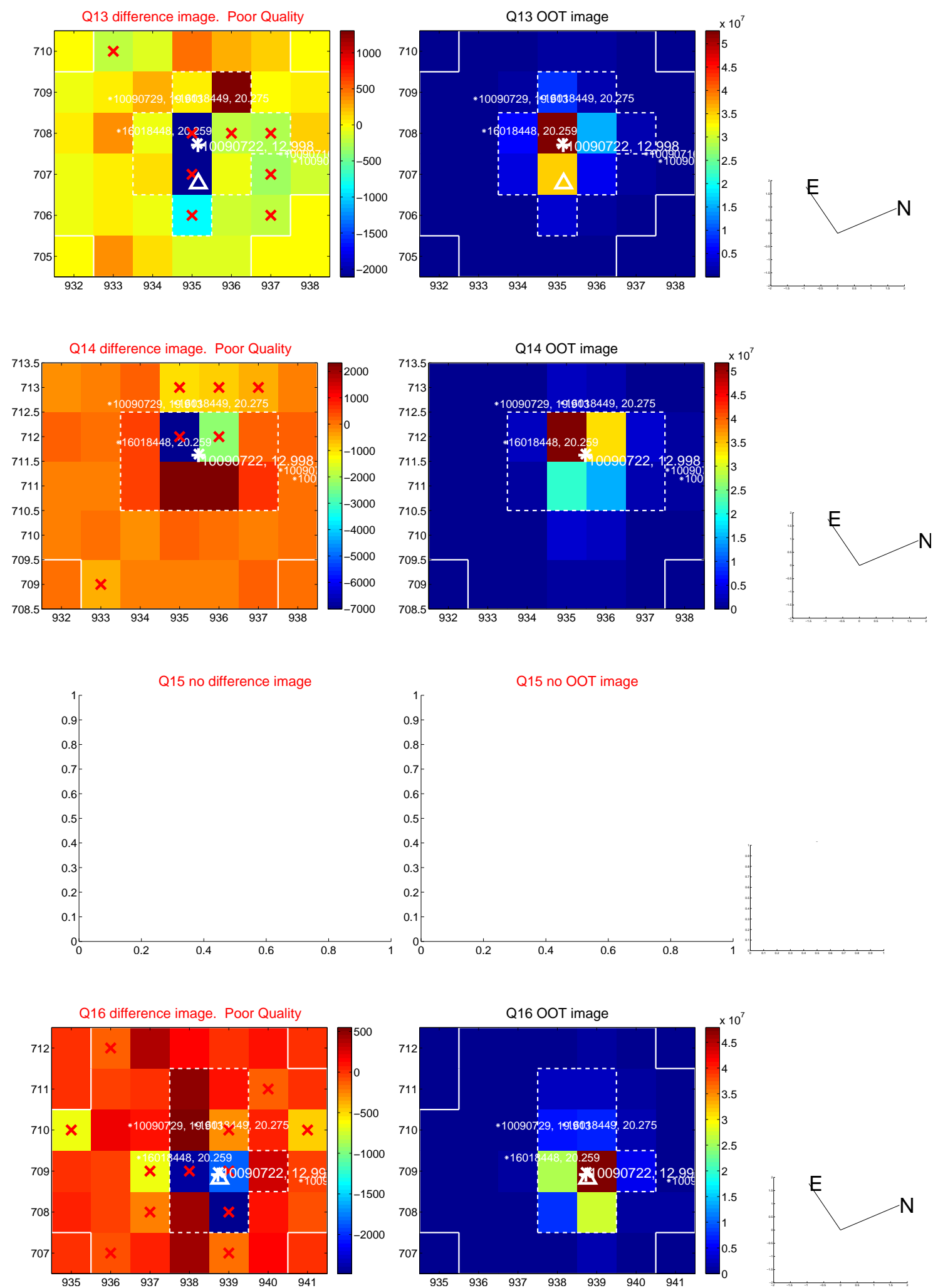
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

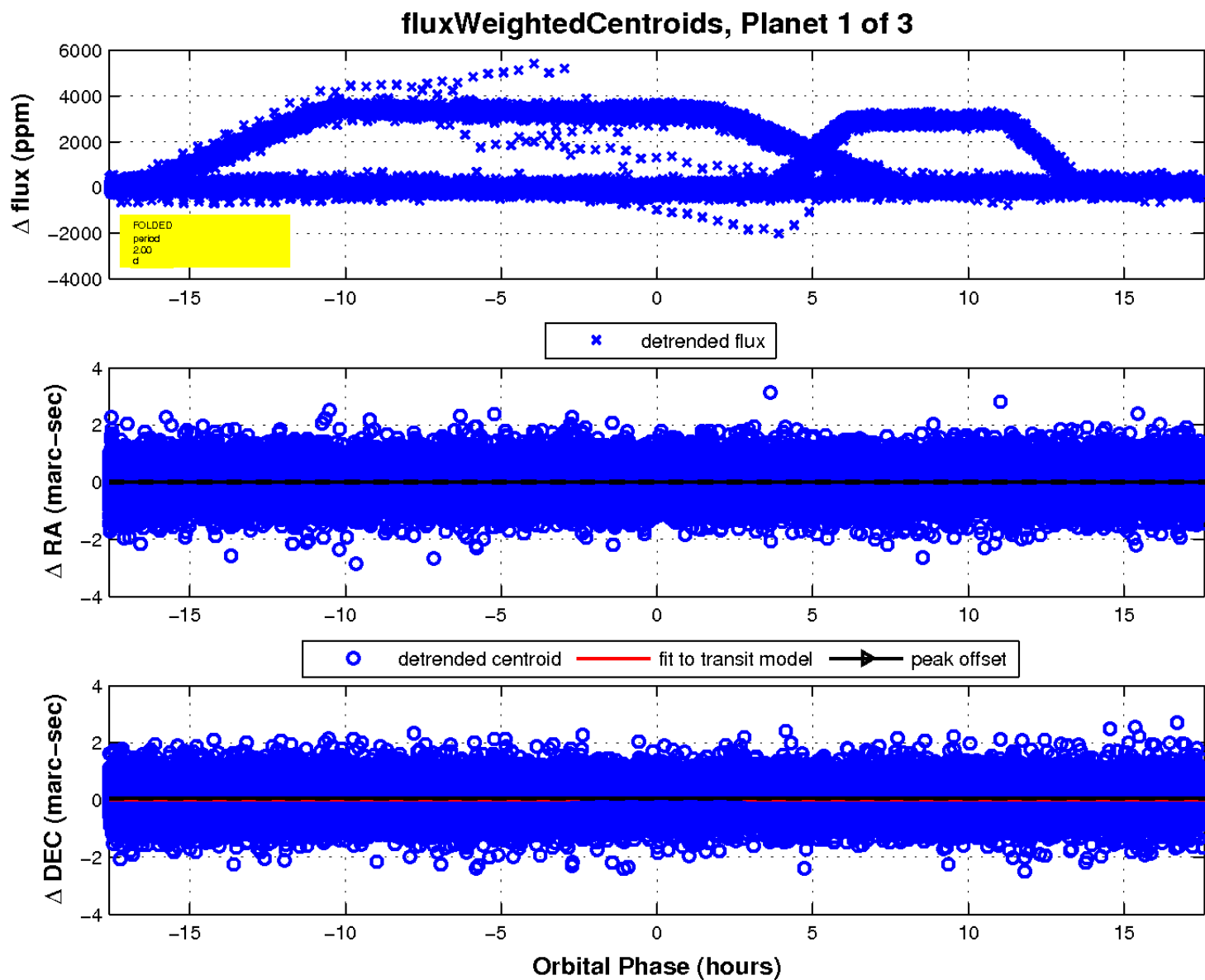
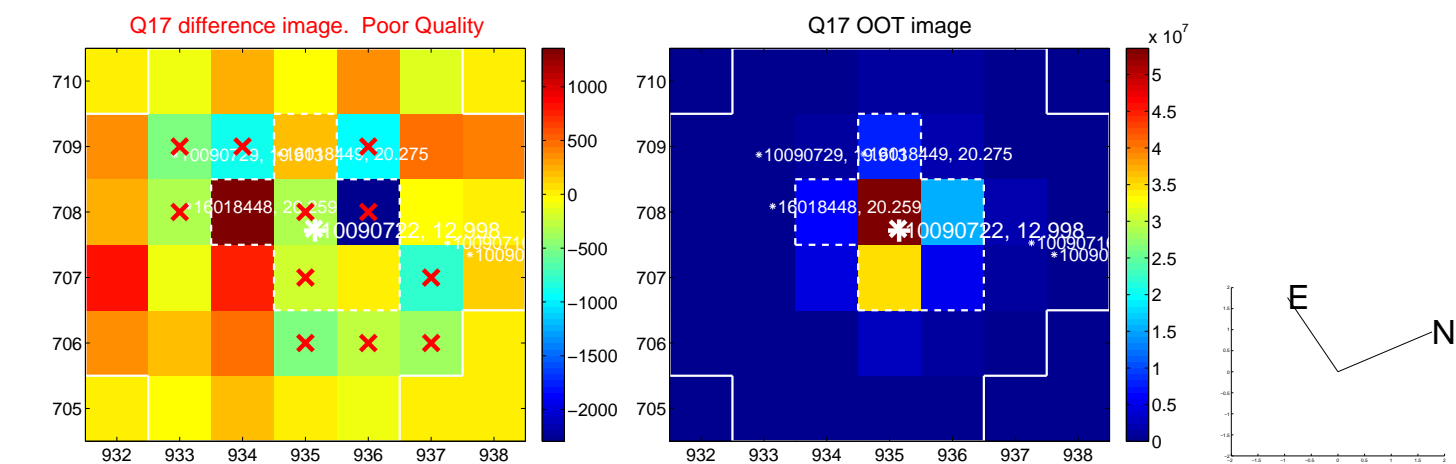


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



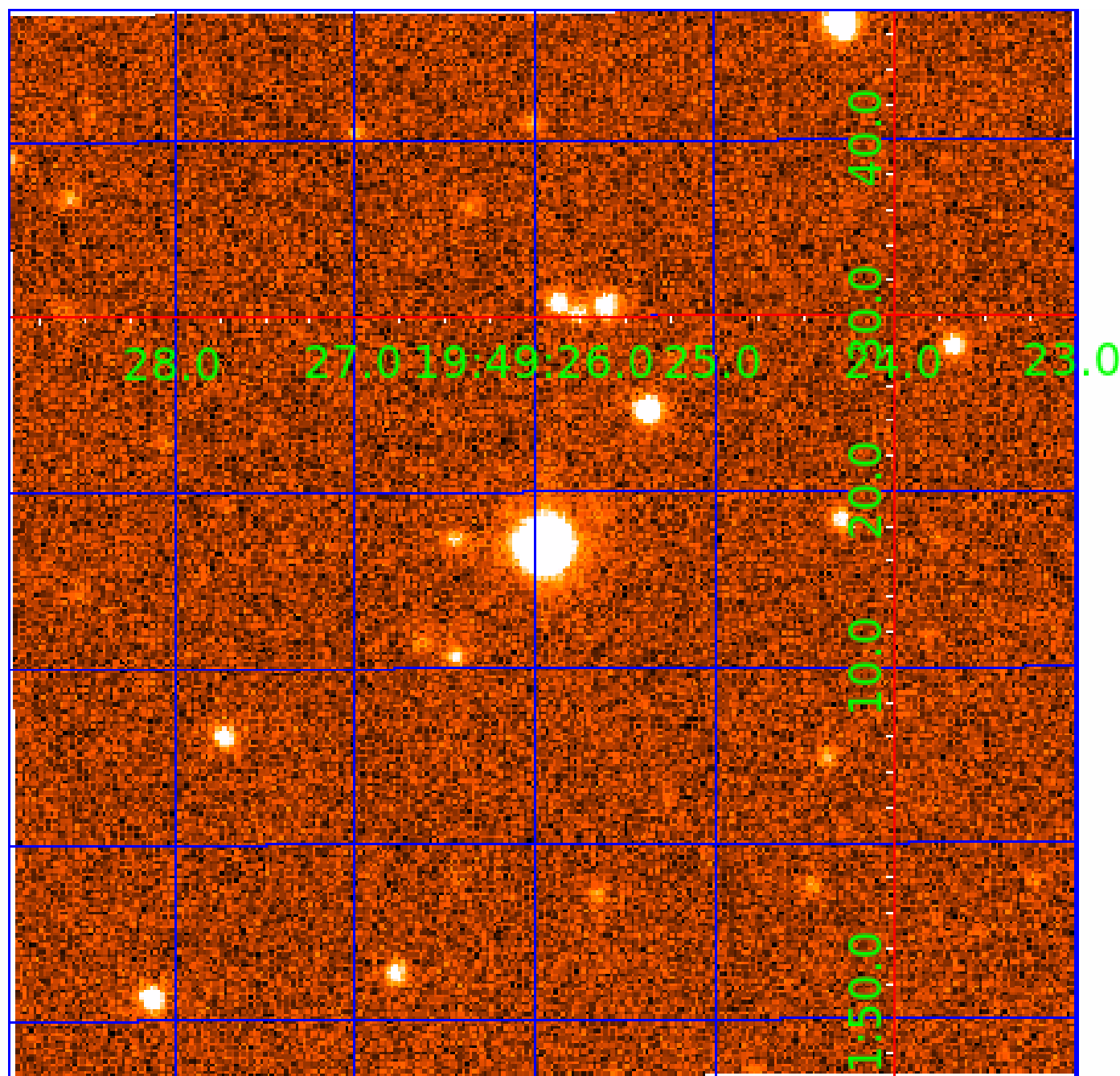


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010090722

## 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

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010090722-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
010090722-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

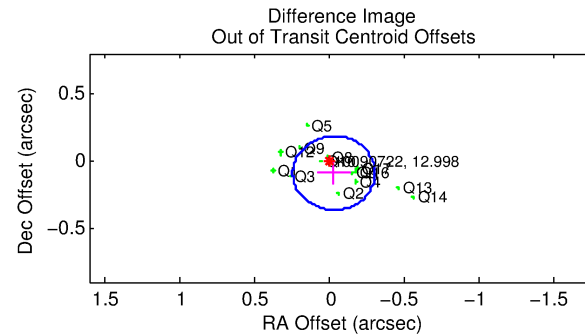
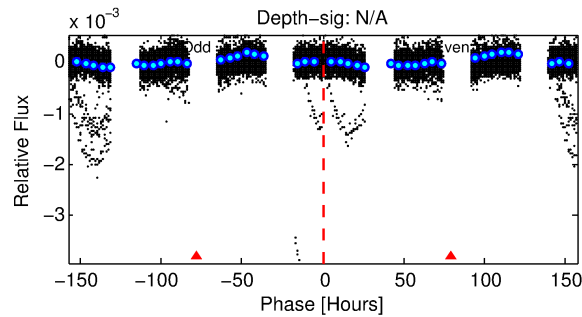
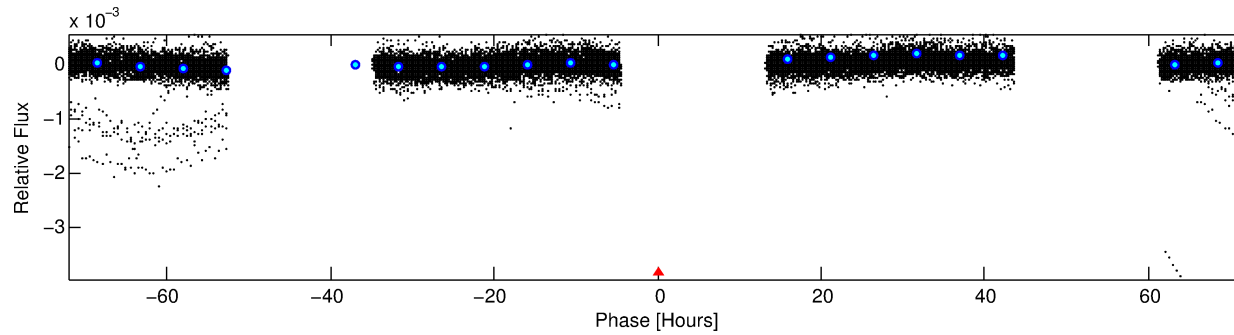
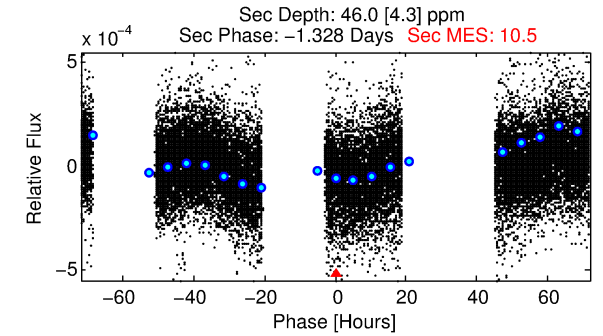
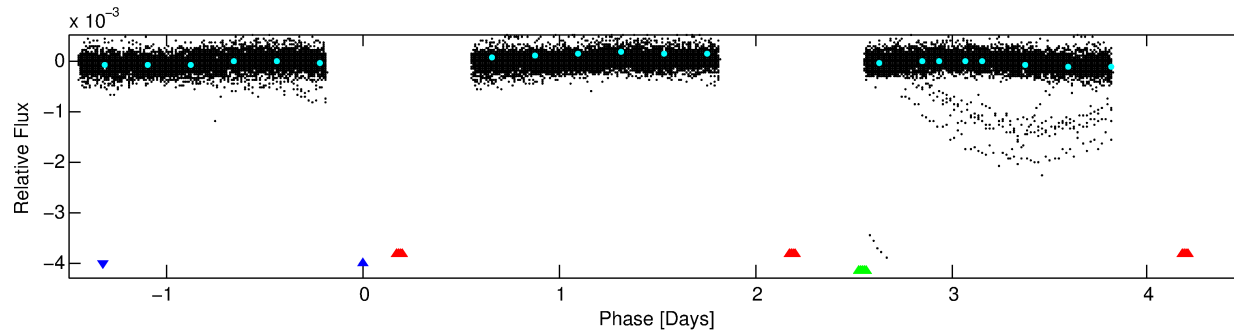
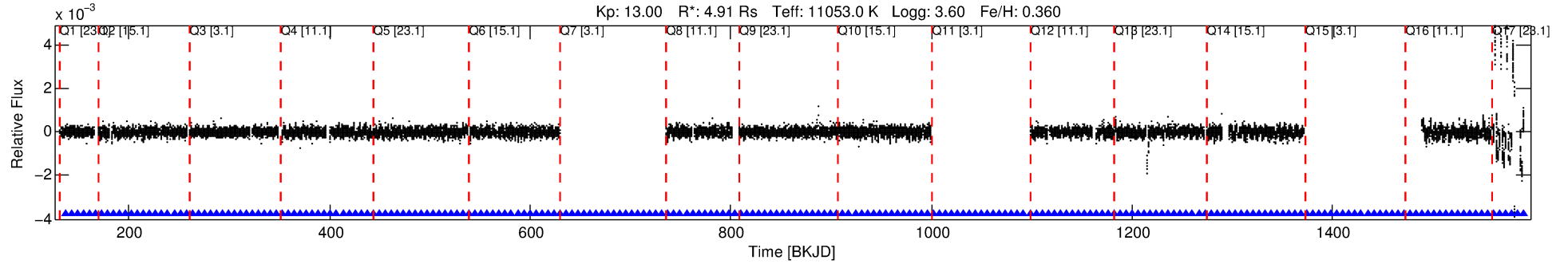
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010090722-02

No Significant Match Found

# DV One-Page Summary

KIC: 10090722 Candidate: 2 of 3 Period: 6.008 d



## TPS TCE Results:

Period = 6.00803 d  
Epoch = 135.9349 BKJD

**DV fit results are unavailable**

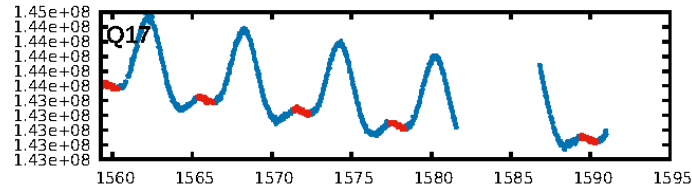
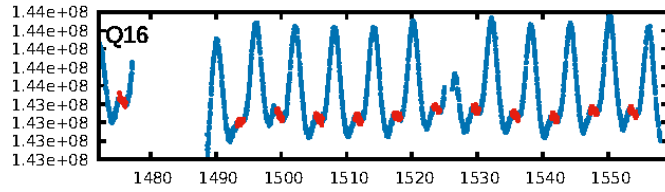
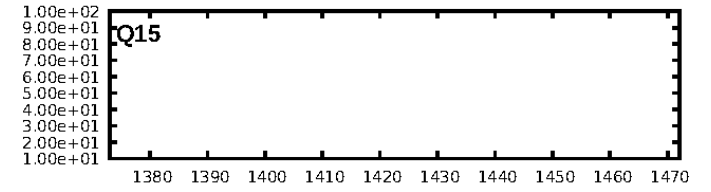
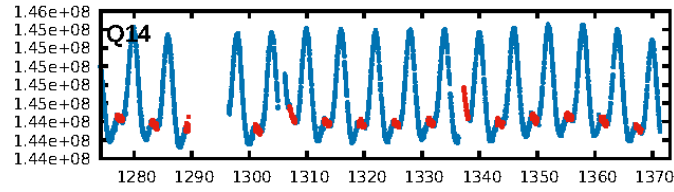
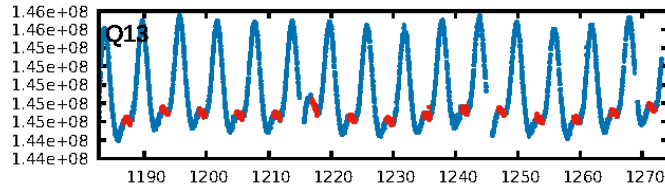
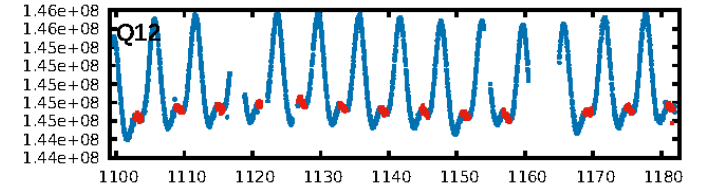
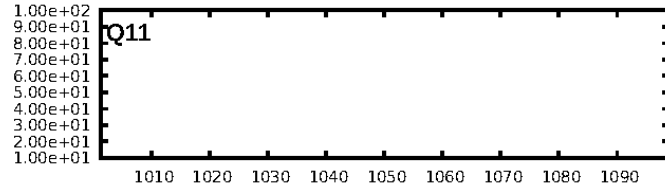
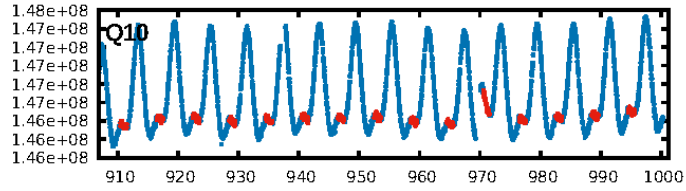
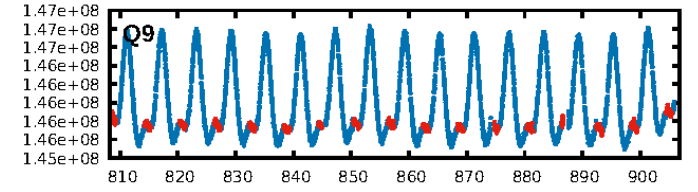
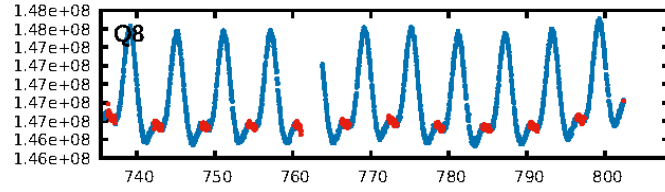
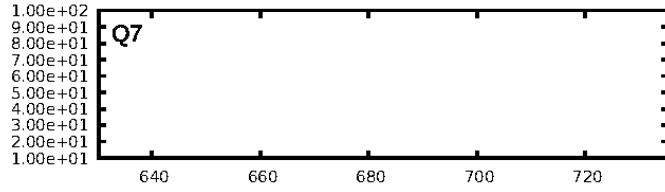
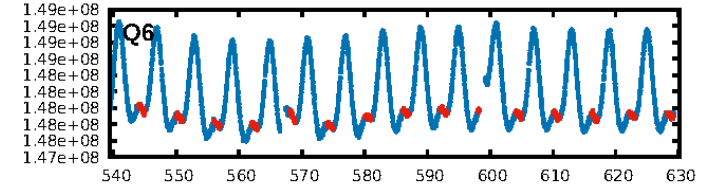
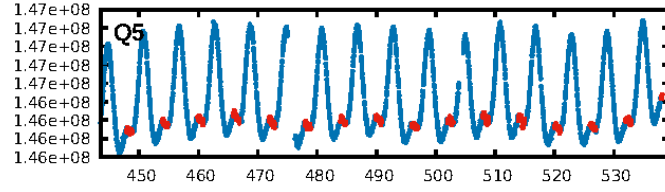
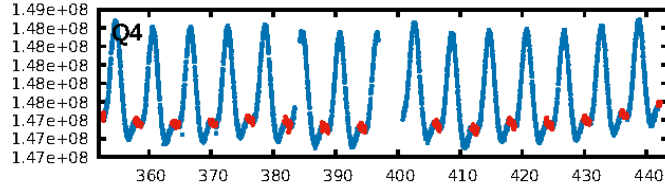
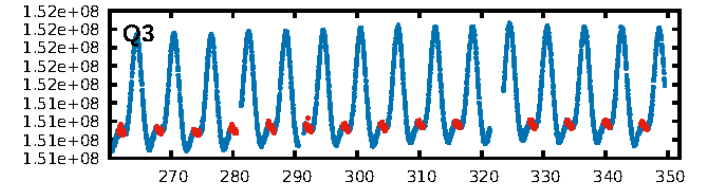
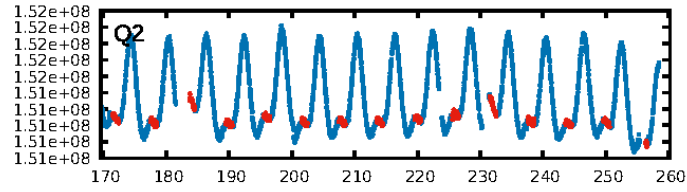
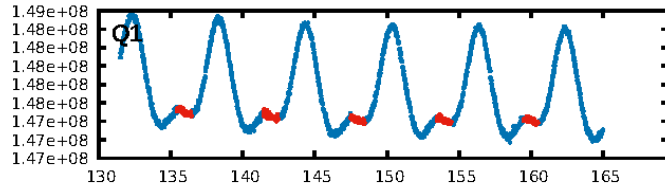
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.20 $\sigma$ ]  
**LongPeriod-sig: 0.0% [0.00 $\sigma$ ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.83e-17  
RollingBand-fgt: 1.00 [169/169]  
**GhostDiagnostic-chr: 0.5737**  
**Centroid-sig: 0.0%**  
Centroid-so: 0.029 arcsec [2.94 $\sigma$ ]  
OotOffset-rm: 0.096 arcsec [1.05 $\sigma$ ]  
KicOffset-rm: 0.226 arcsec [2.35 $\sigma$ ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:02:55 Z

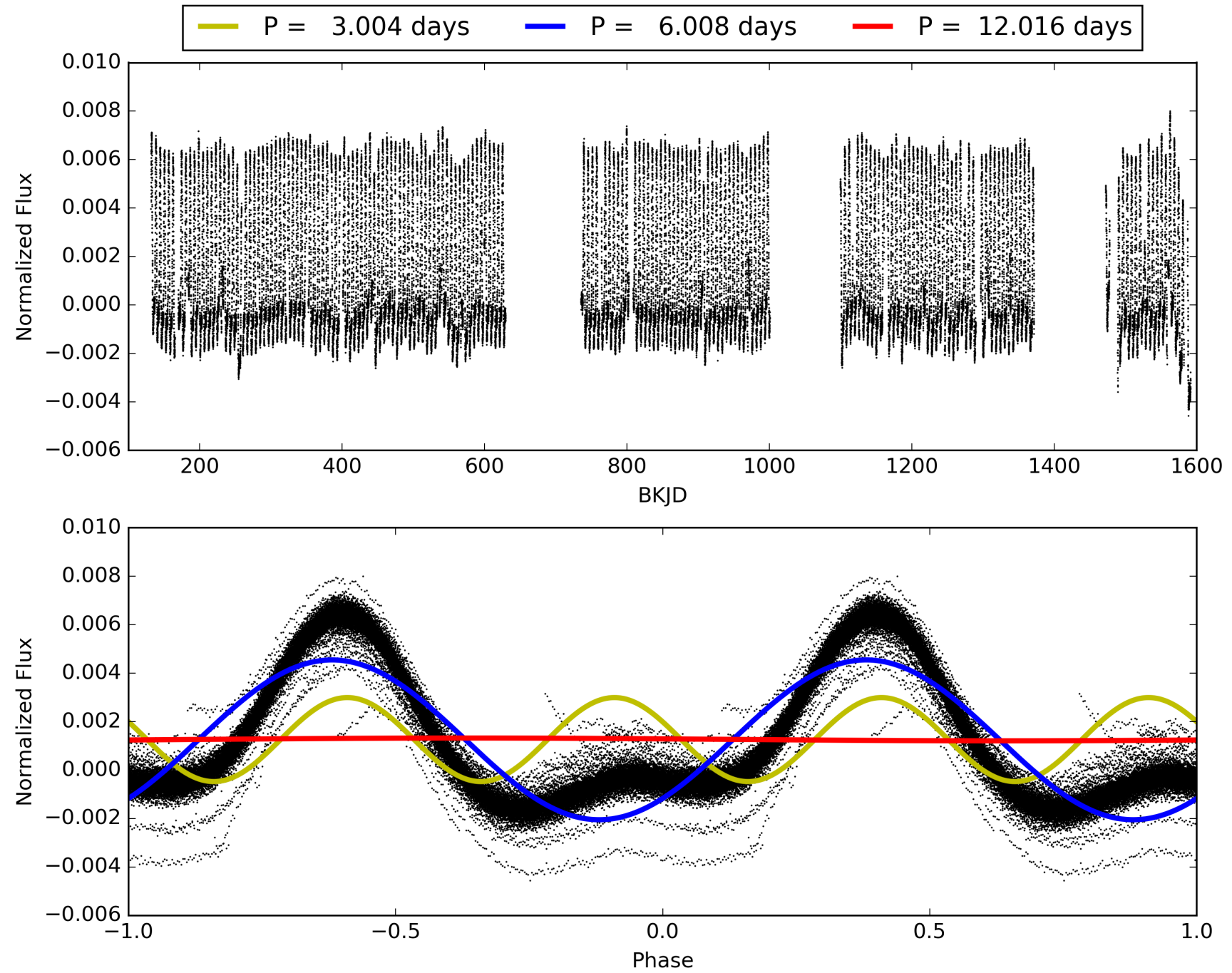
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010090722-02, PDC Light Curves



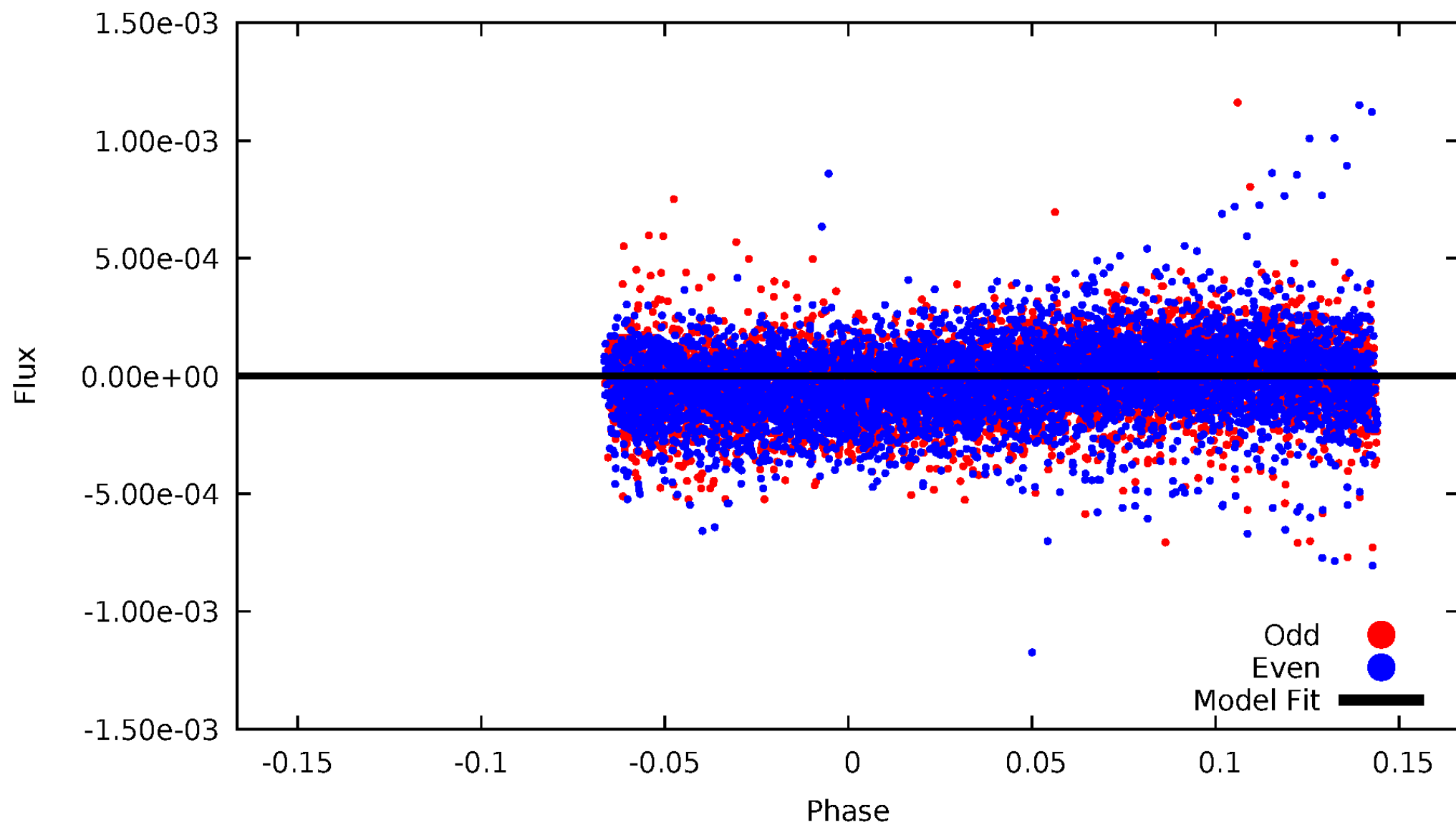


TCE 010090722-02



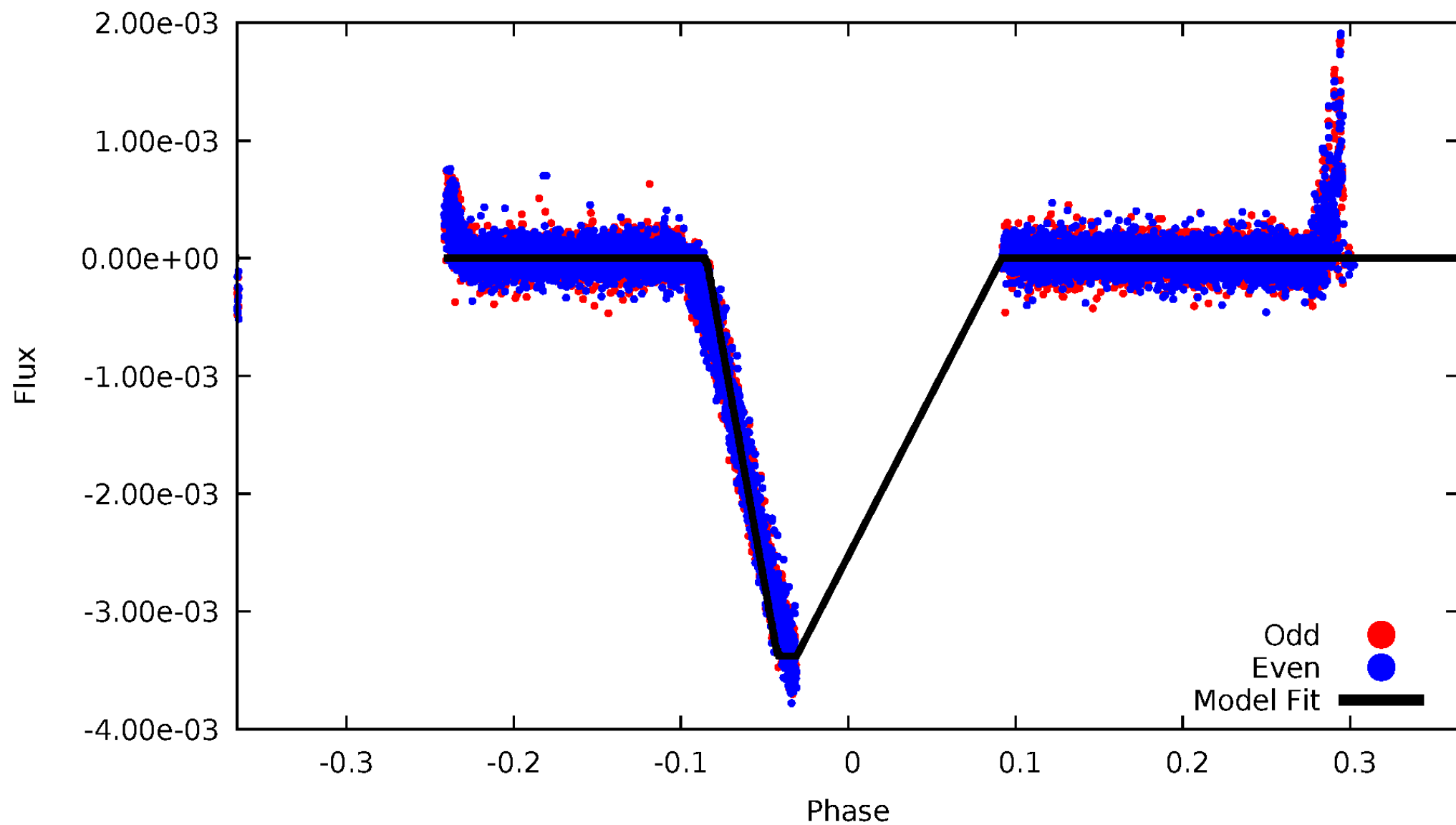
# DV Odd/Even

TCE 010090722-02



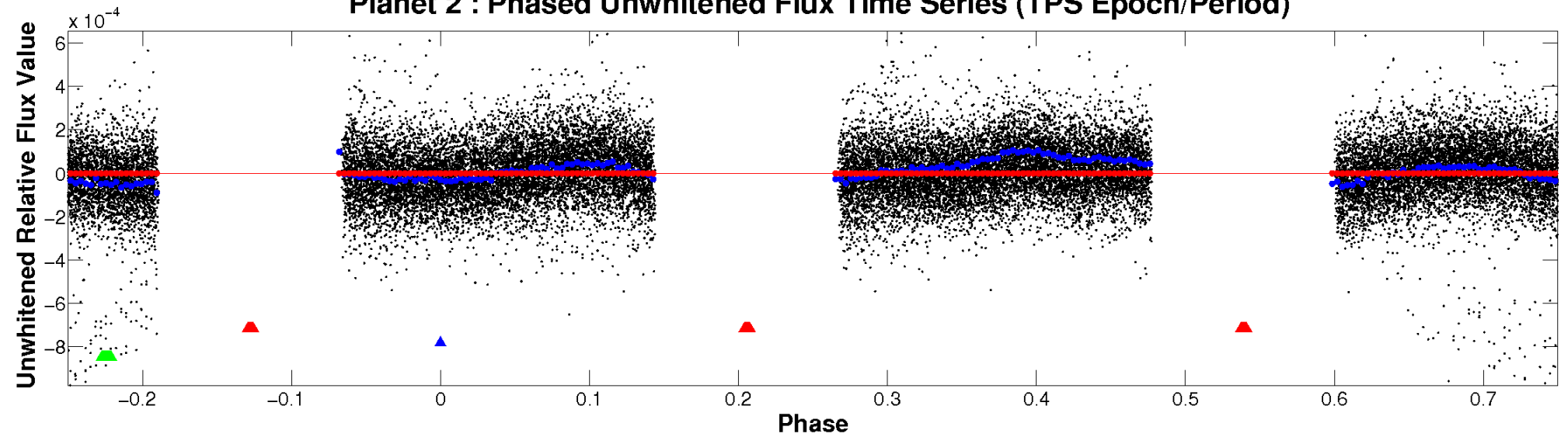
# ALT Odd/Even

TCE 010090722-02

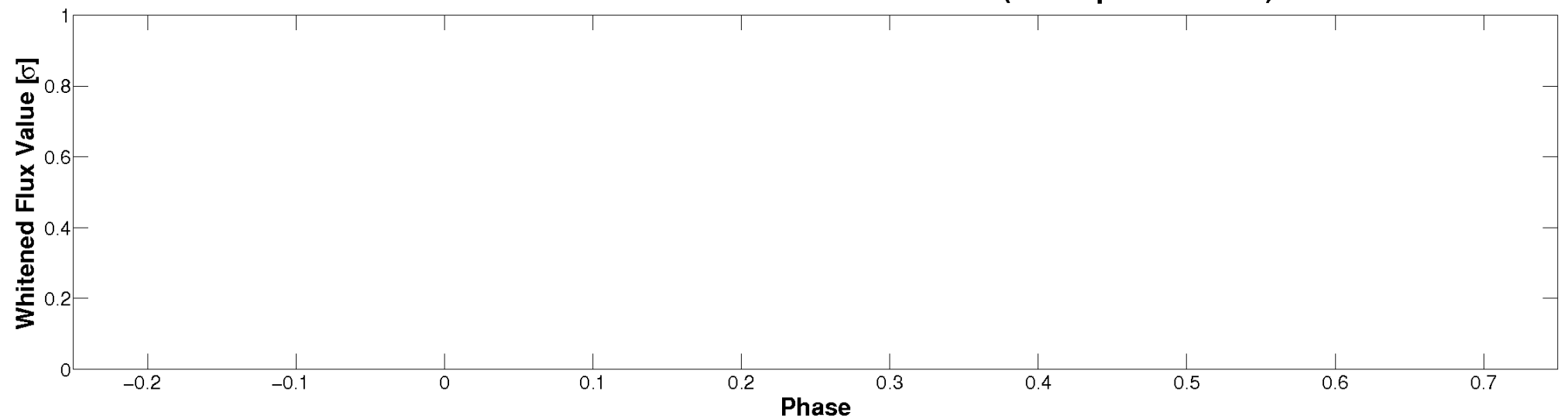


# Non-Whitened Vs. Whitened Light Curve

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

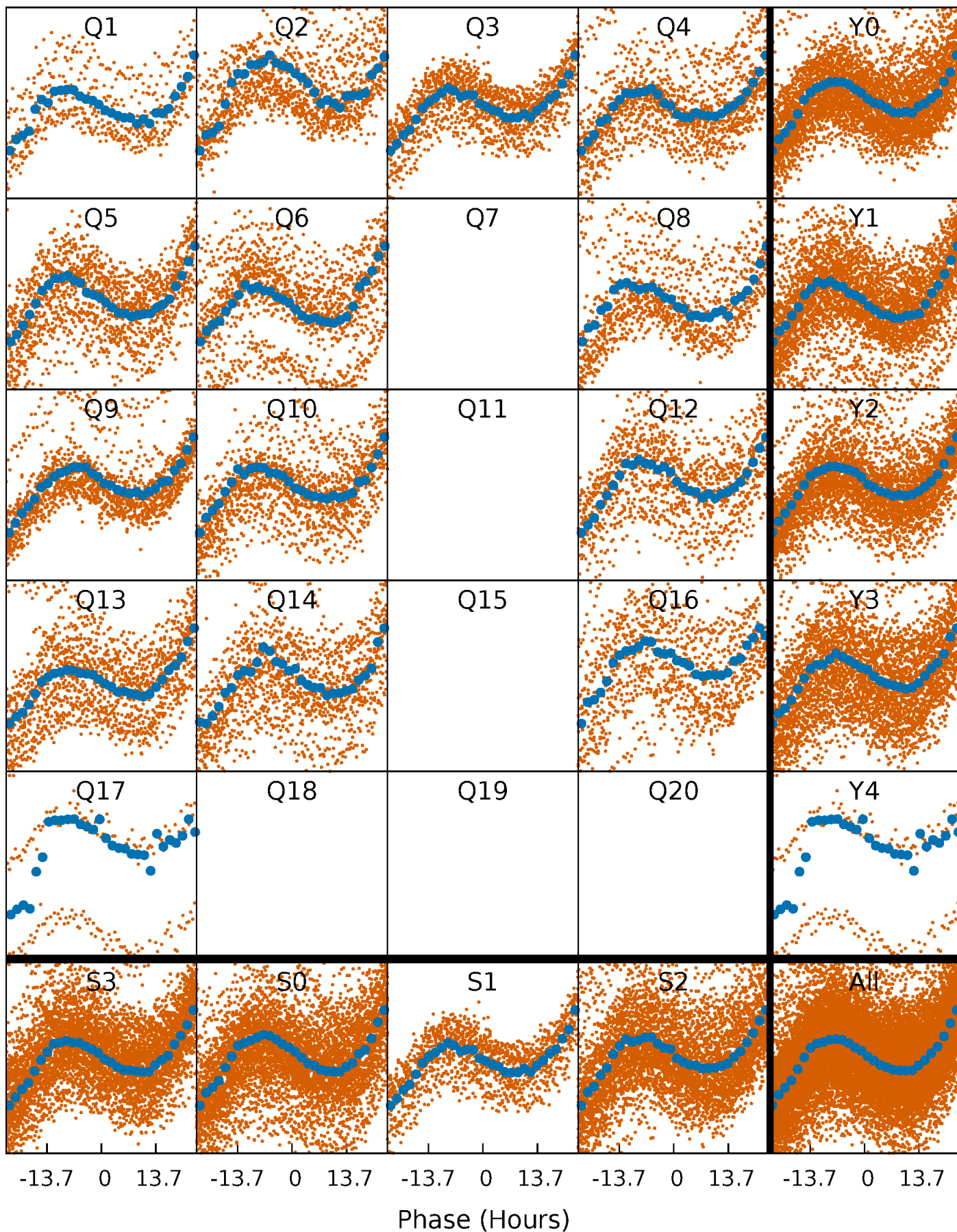


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

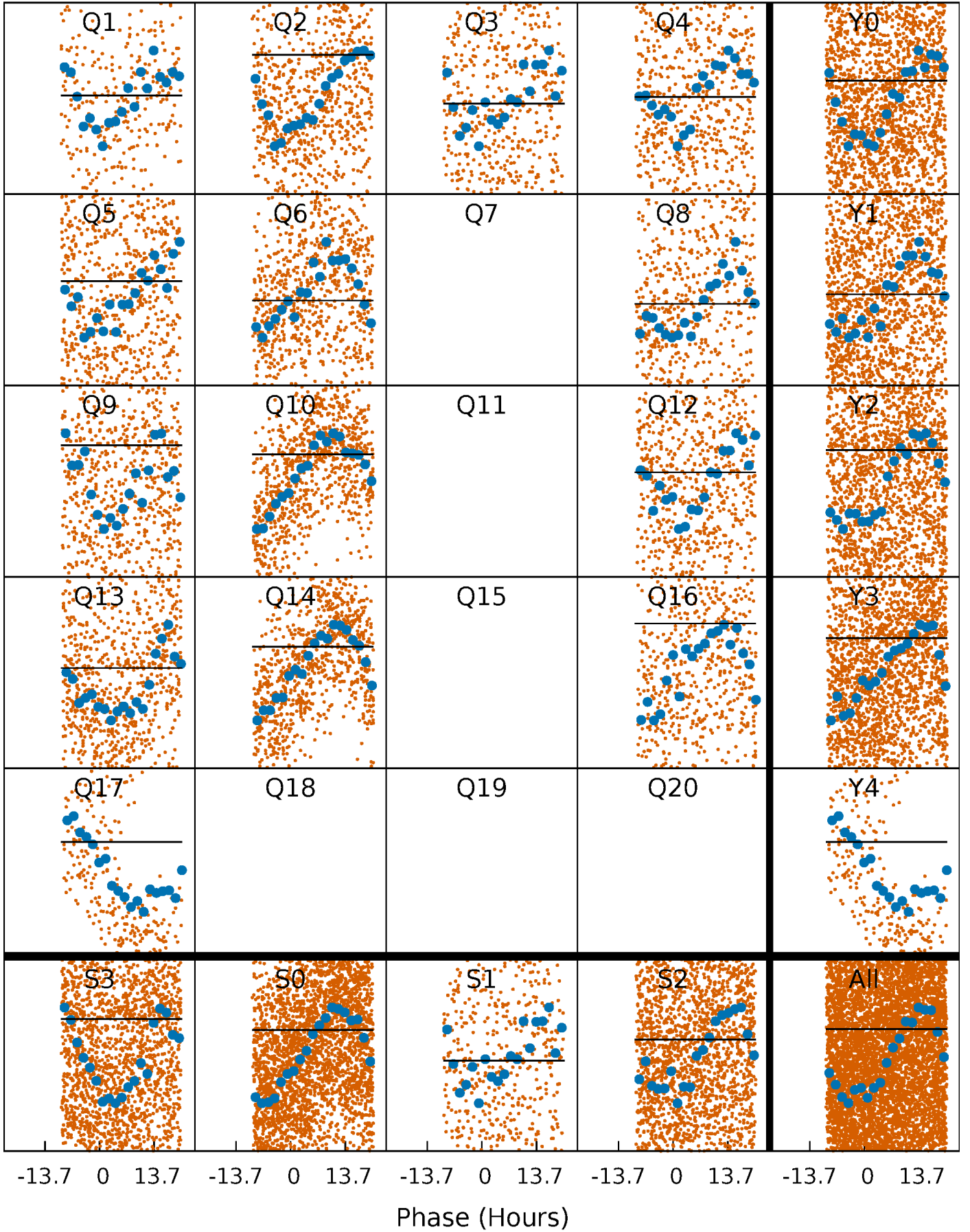
TCE 010090722-02   P= 6.008032 Days    $T_0=135.934860$  (BKJD)





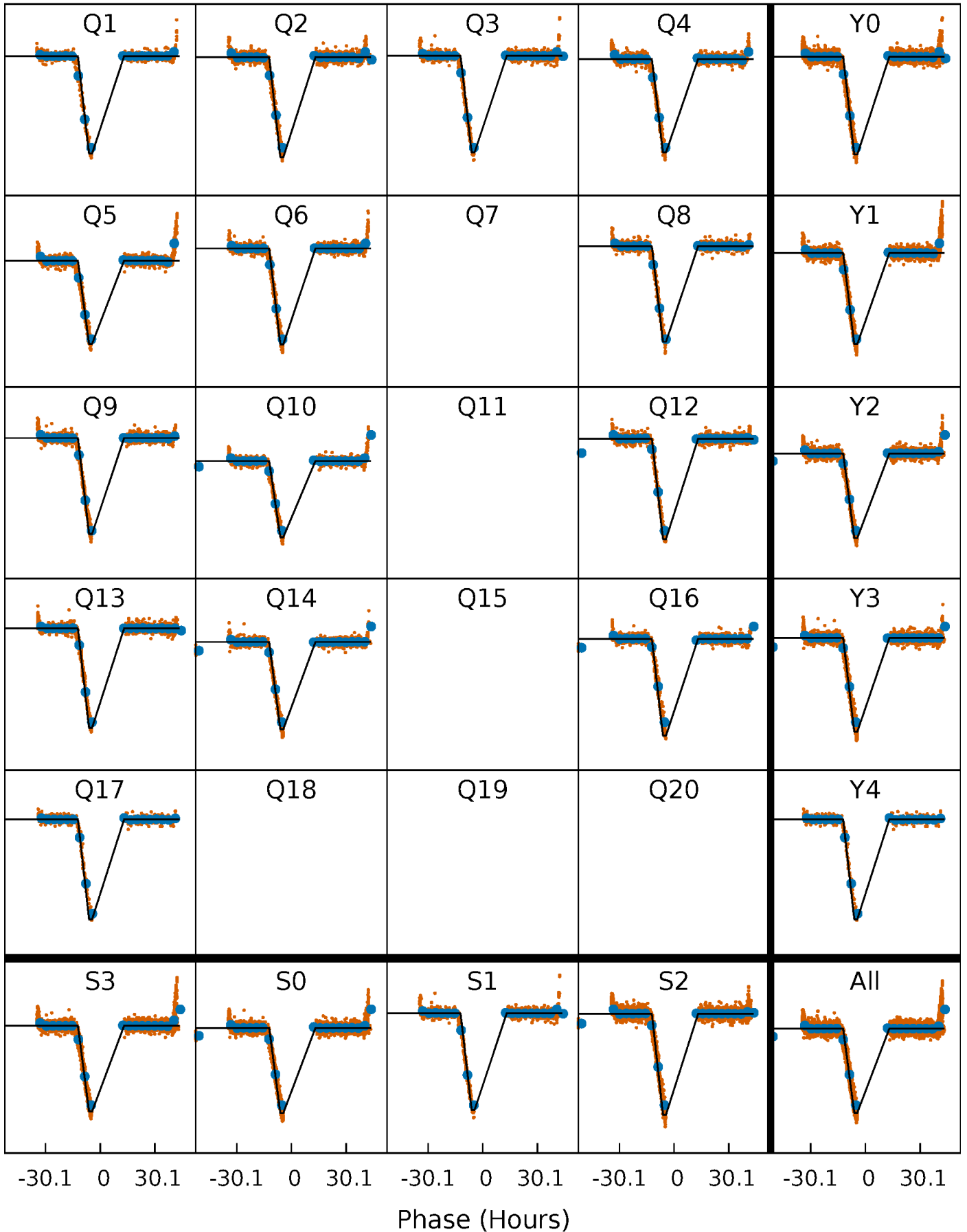
# DV Quarter-Phased Transit Curves

TCE 010090722-02    P= 6.008032 Days     $T_0=135.934860$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

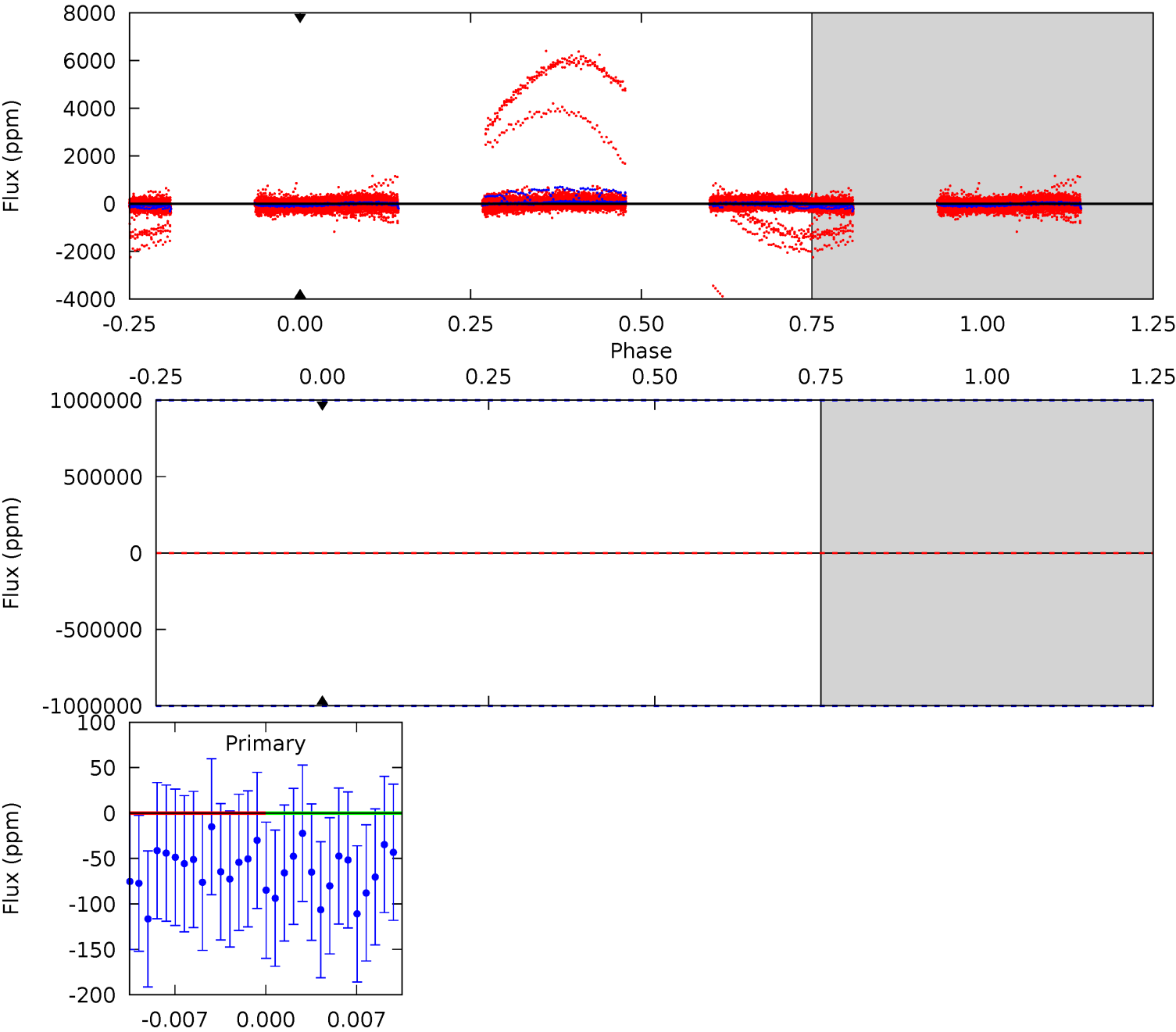
TCE 010090722-02   P= 6.008032 Days    $T_0=136.986679$  (BKJD)



DV Model-Shift Uniqueness Test

010090722-02, P = 6.008032 Days, E = 129.926828 Days

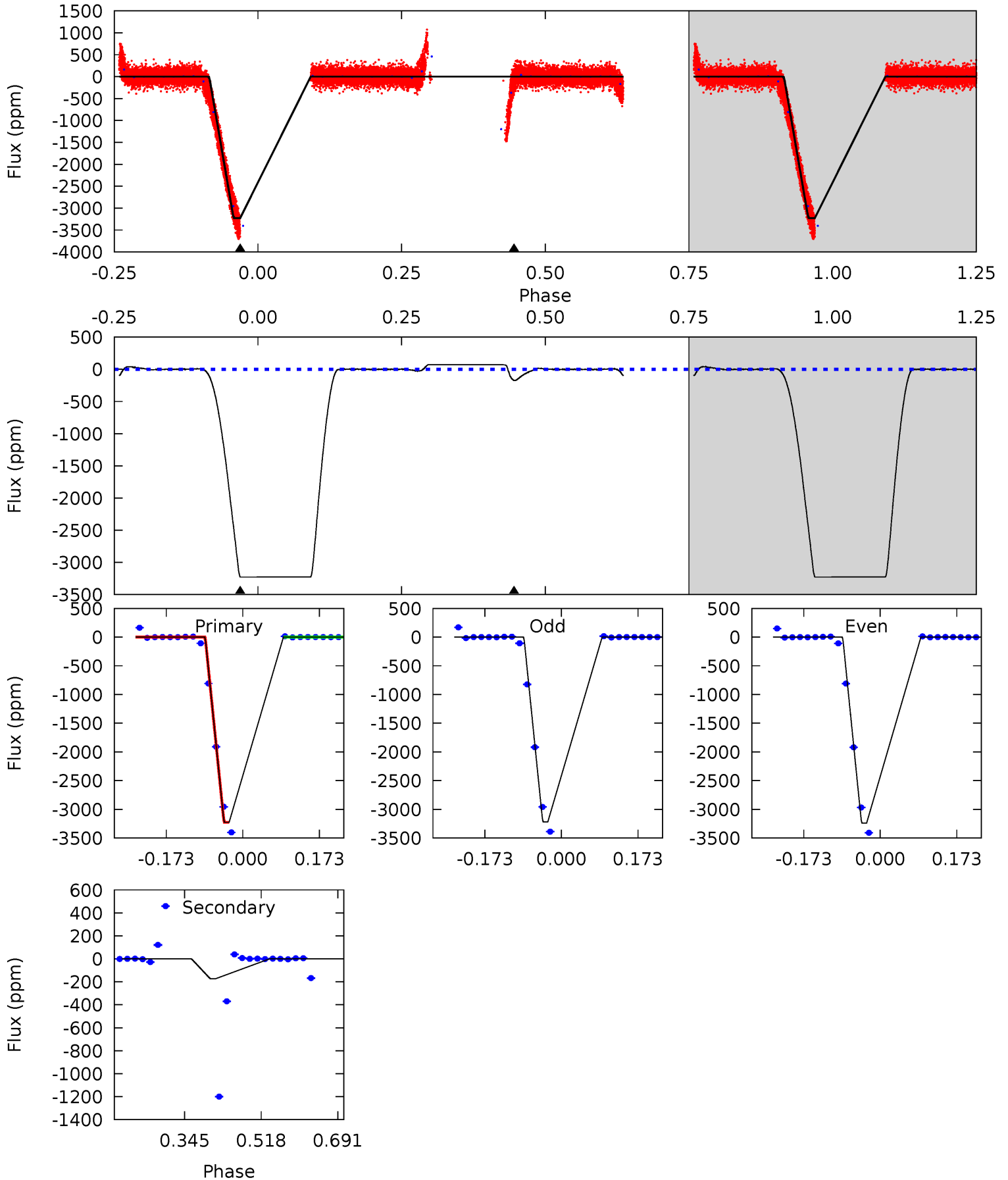
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010090722-02, P = 6.008032 Days, E = 130.978647 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
1277	68.7	0	0	4.45	1.36	7.49	1277	1277	68.7	68.7	4.31	0	0.02	0



### Stellar Parameters For KIC 010090722

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$11053^{+519}_{-1558}$	$3.603^{+0.425}_{-0.075}$	$0.360^{+0.050}_{-0.300}$	$4.909^{+0.410}_{-2.325}$	$3.520^{+0.070}_{-0.865}$	$0.042^{+0.160}_{-0.010}$
	+5%/-14%	+12%/-2%	+14%/-83%	+8%/-47%	+2%/-25%	+381%/-24%
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 010090722-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$34.91^{+37.42}_{-24.12}$	$4499^{+519}_{-670}$	$7739^{+94089}_{-92187}$	$8.216^{+792.351}_{-661.108}$
Alt.	$-174 \pm 3$	$42.52^{+42.52}_{-28.84}$	$4487^{+514}_{-699}$	$3357^{+2980}_{-6775}$	$0.496^{+4.310}_{-0.375}$

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

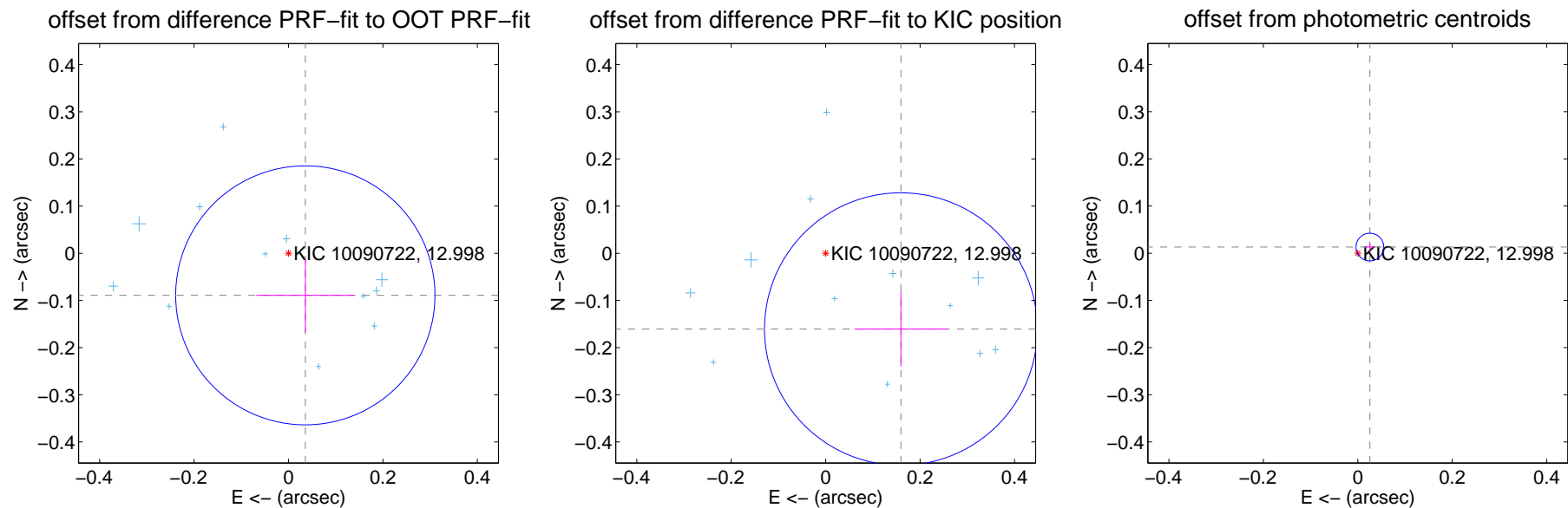
## DV Centroid Data

Supplemental centroid analysis for 010090722-02. Kepler magnitude: 13.00. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

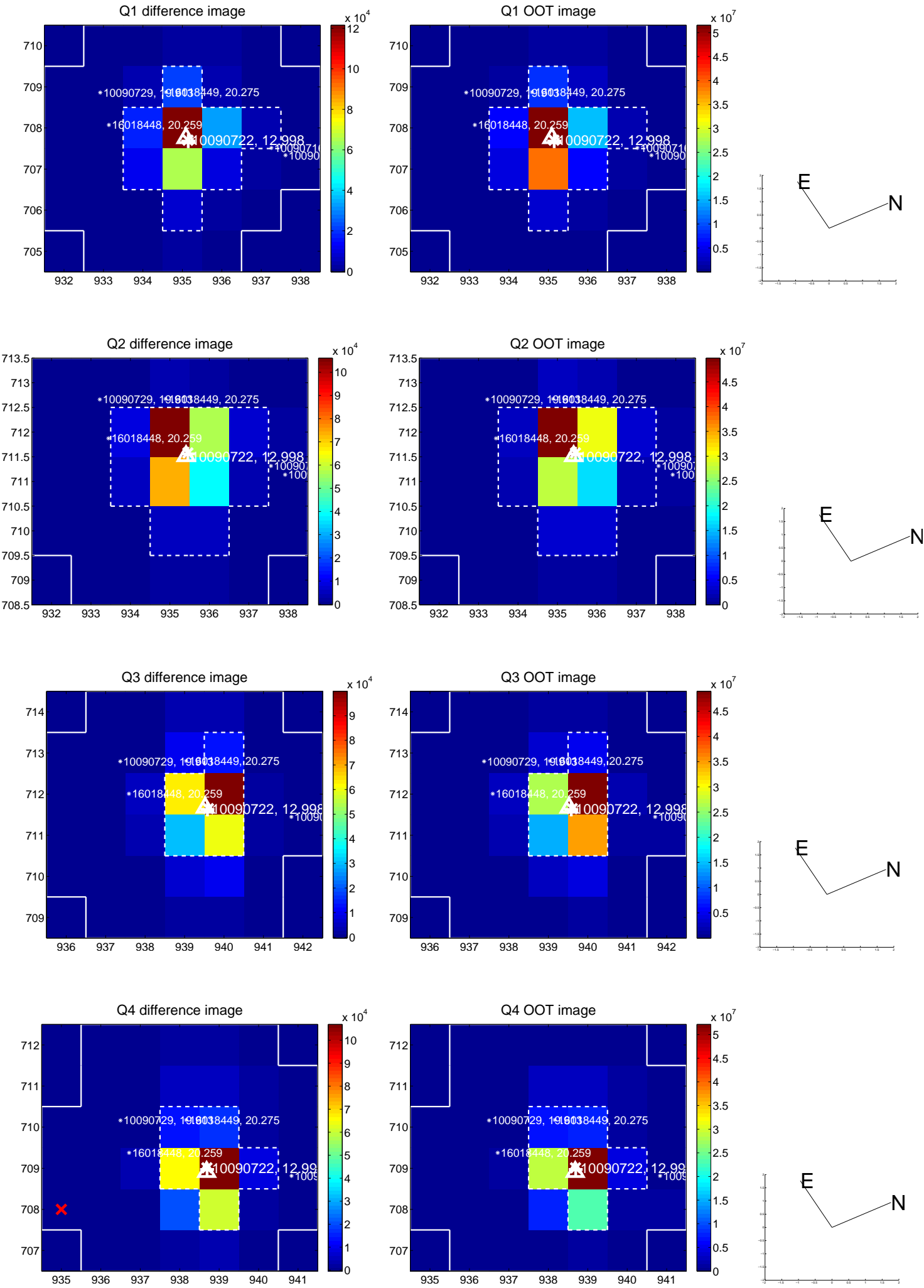
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.096 \pm 0.092$	1.05	$-0.036 \pm 0.104$	$-0.089 \pm 0.078$
PRF-fit source offset from KIC position	$0.226 \pm 0.096$	2.35	$-0.159 \pm 0.098$	$-0.161 \pm 0.079$
photometric centroid source offset	$0.03 \pm 0.01$	2.94	$-0.03 \pm 0.01$	$0.01 \pm 0.01$



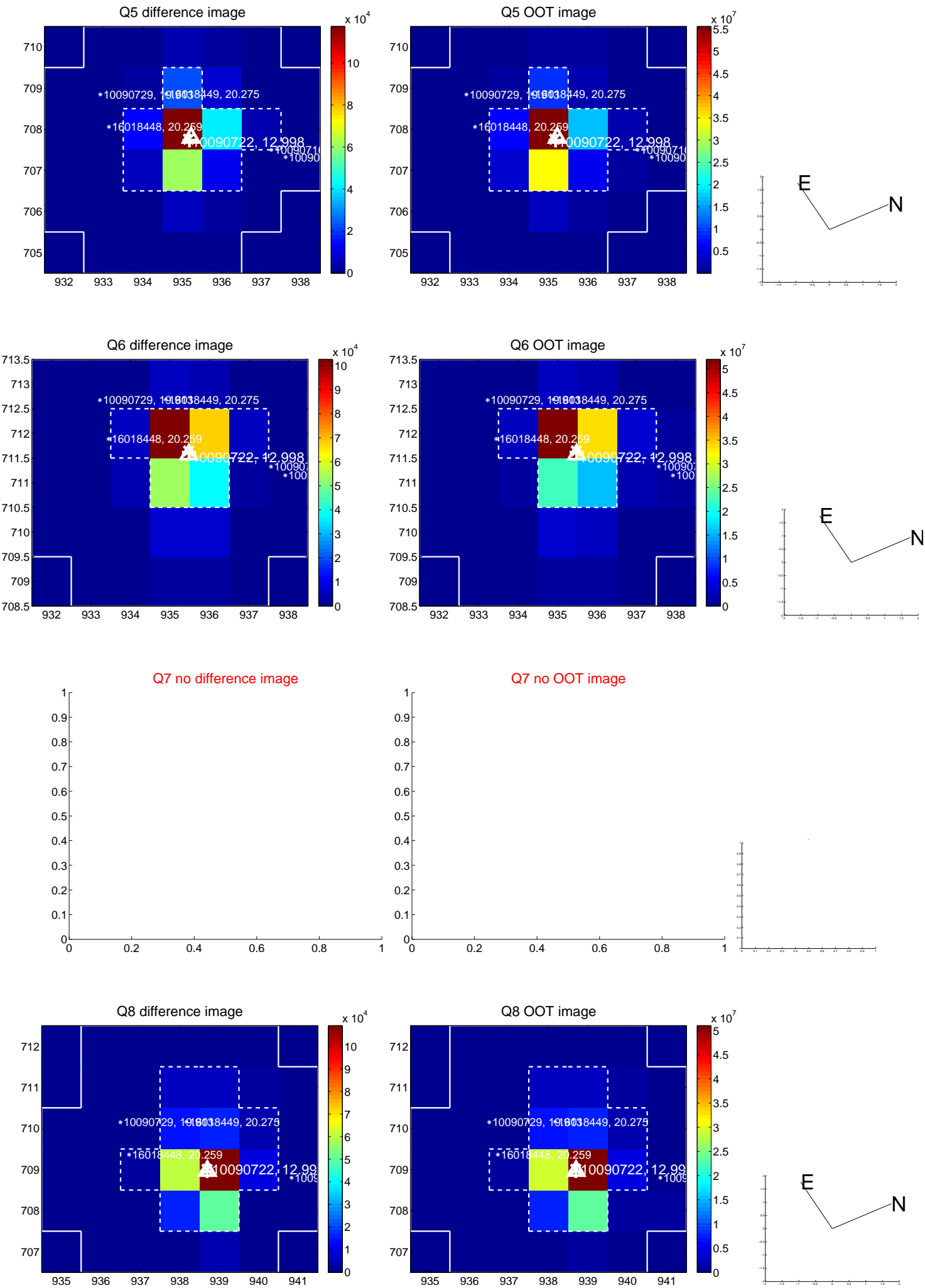
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

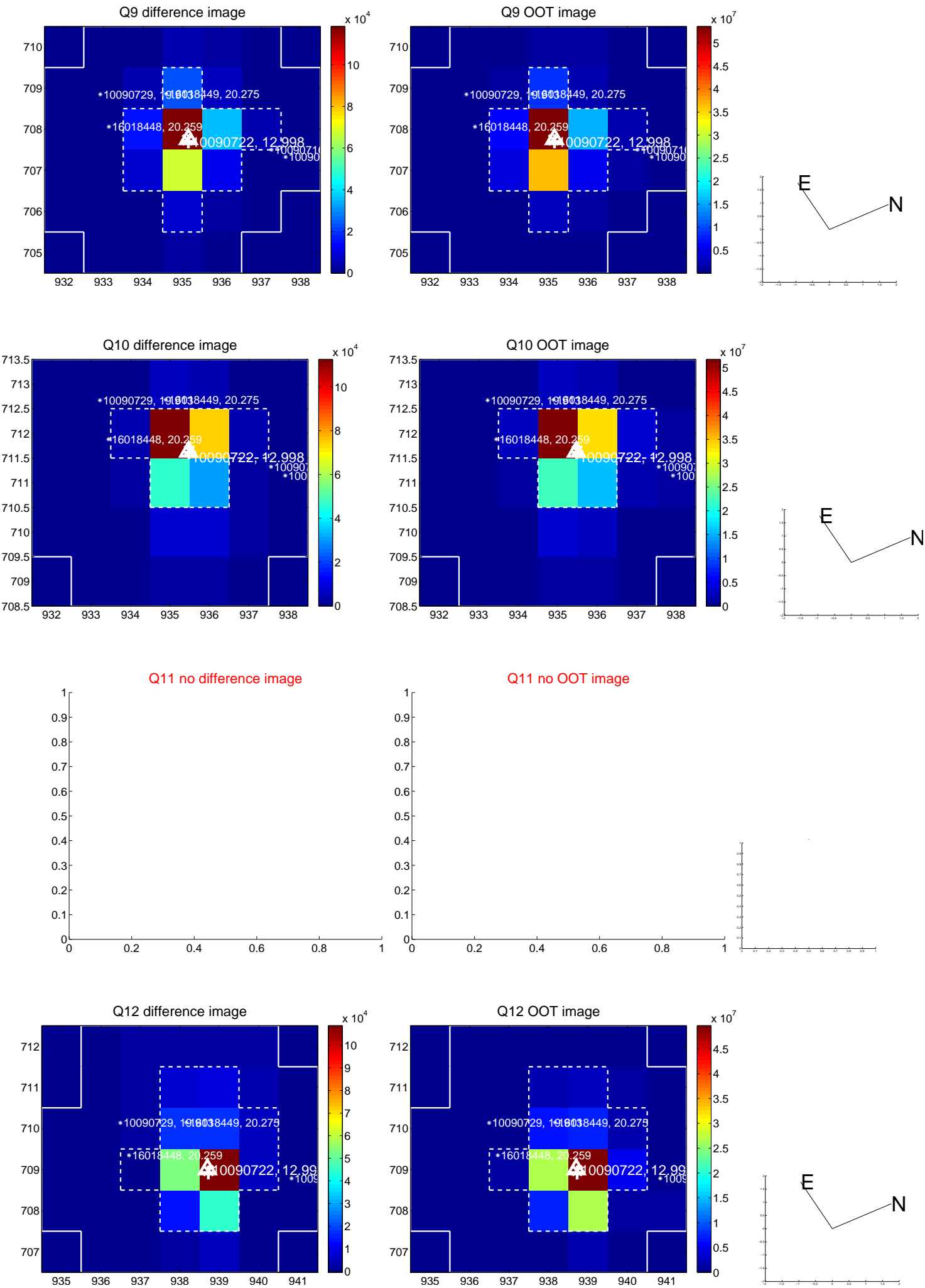




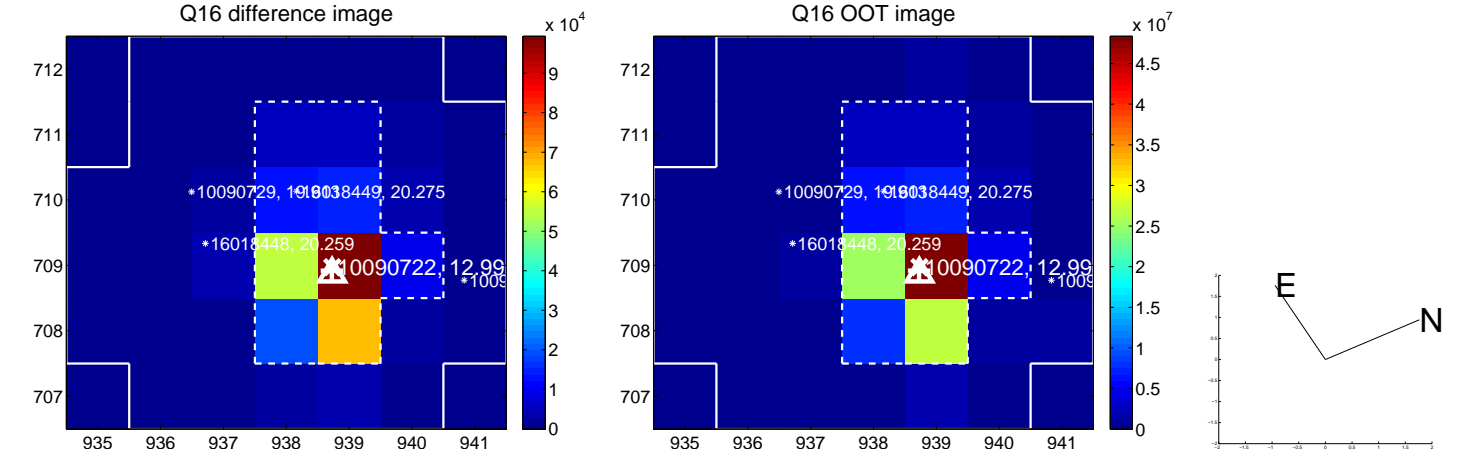
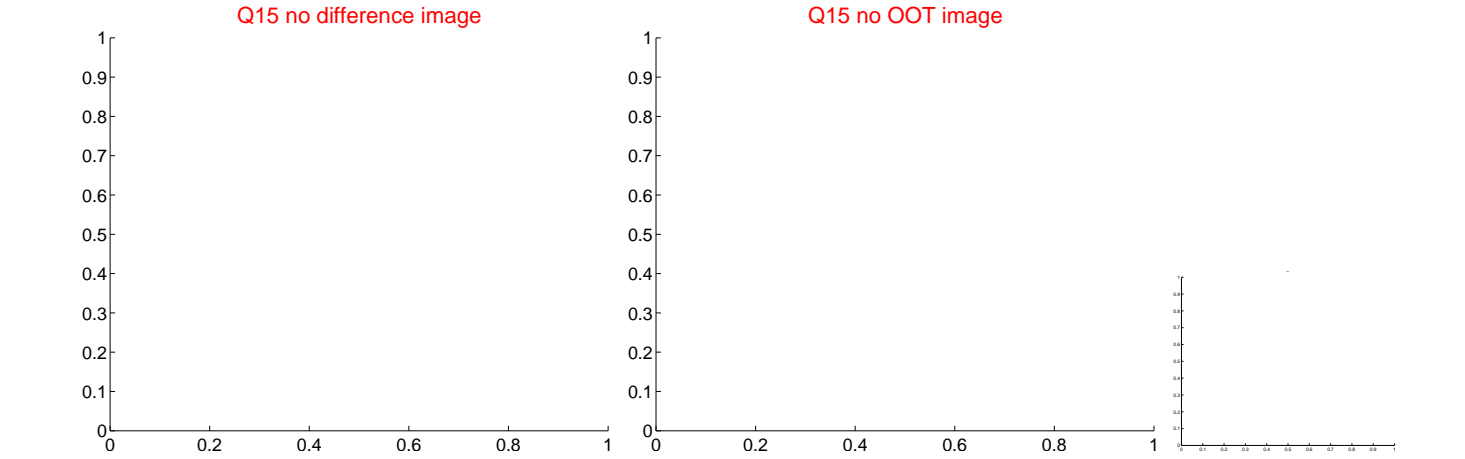
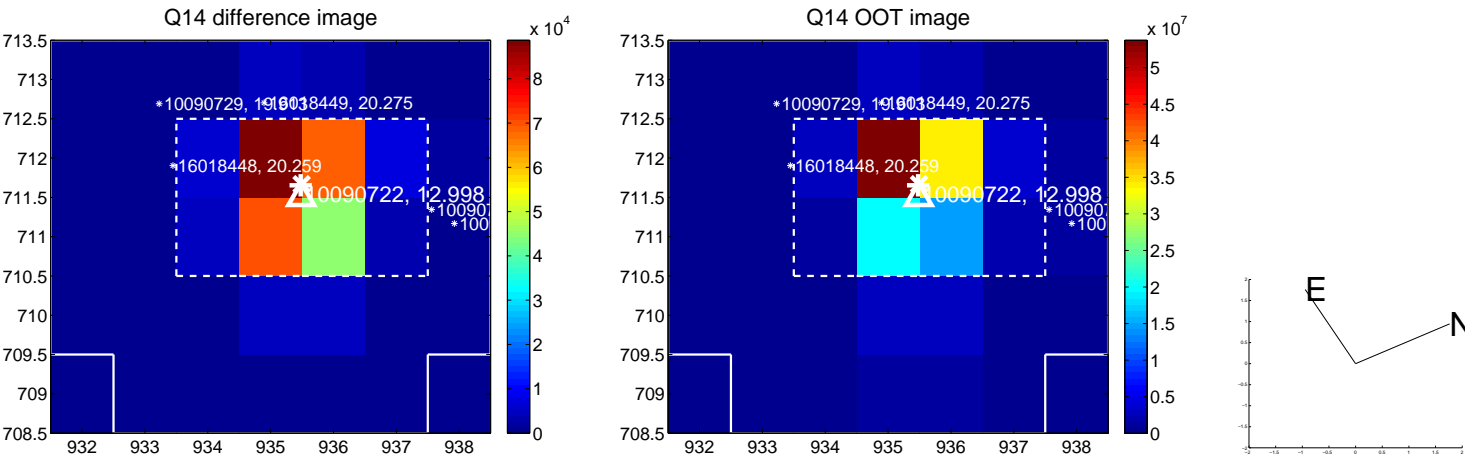
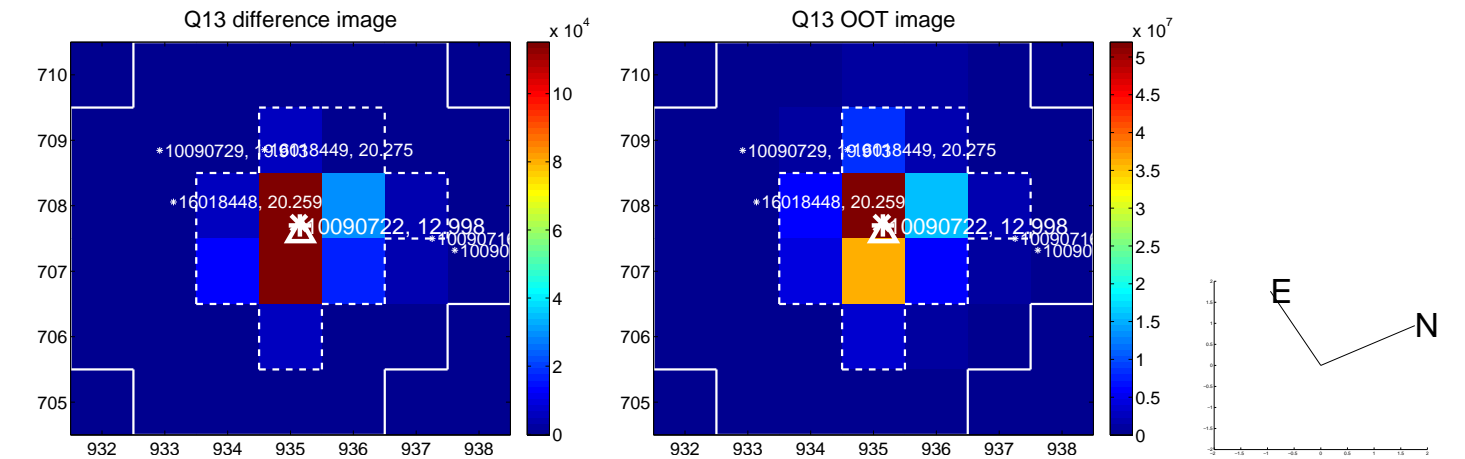
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



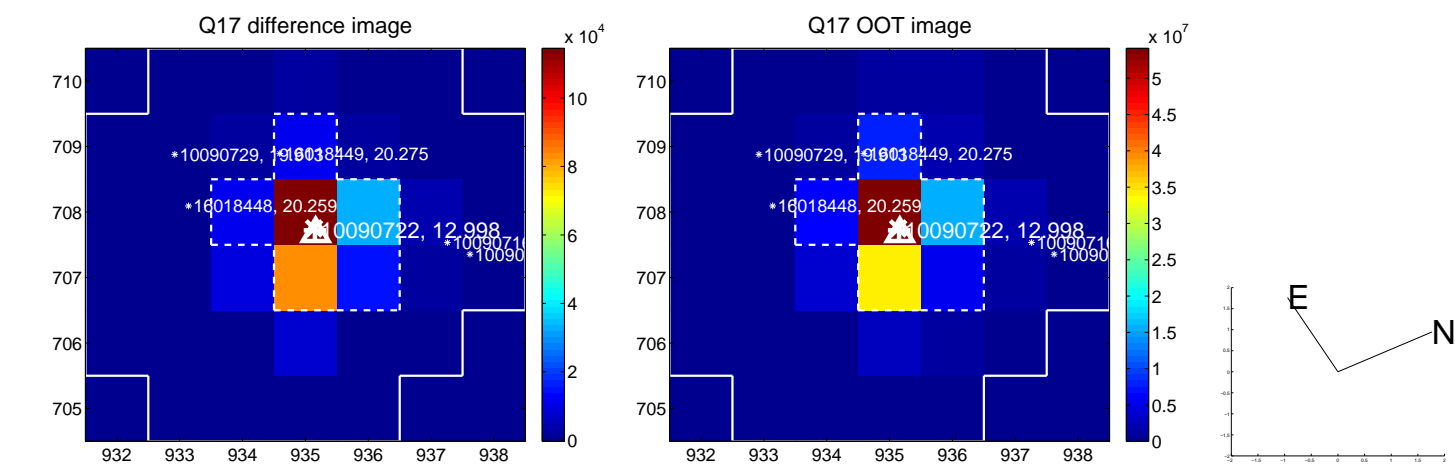
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



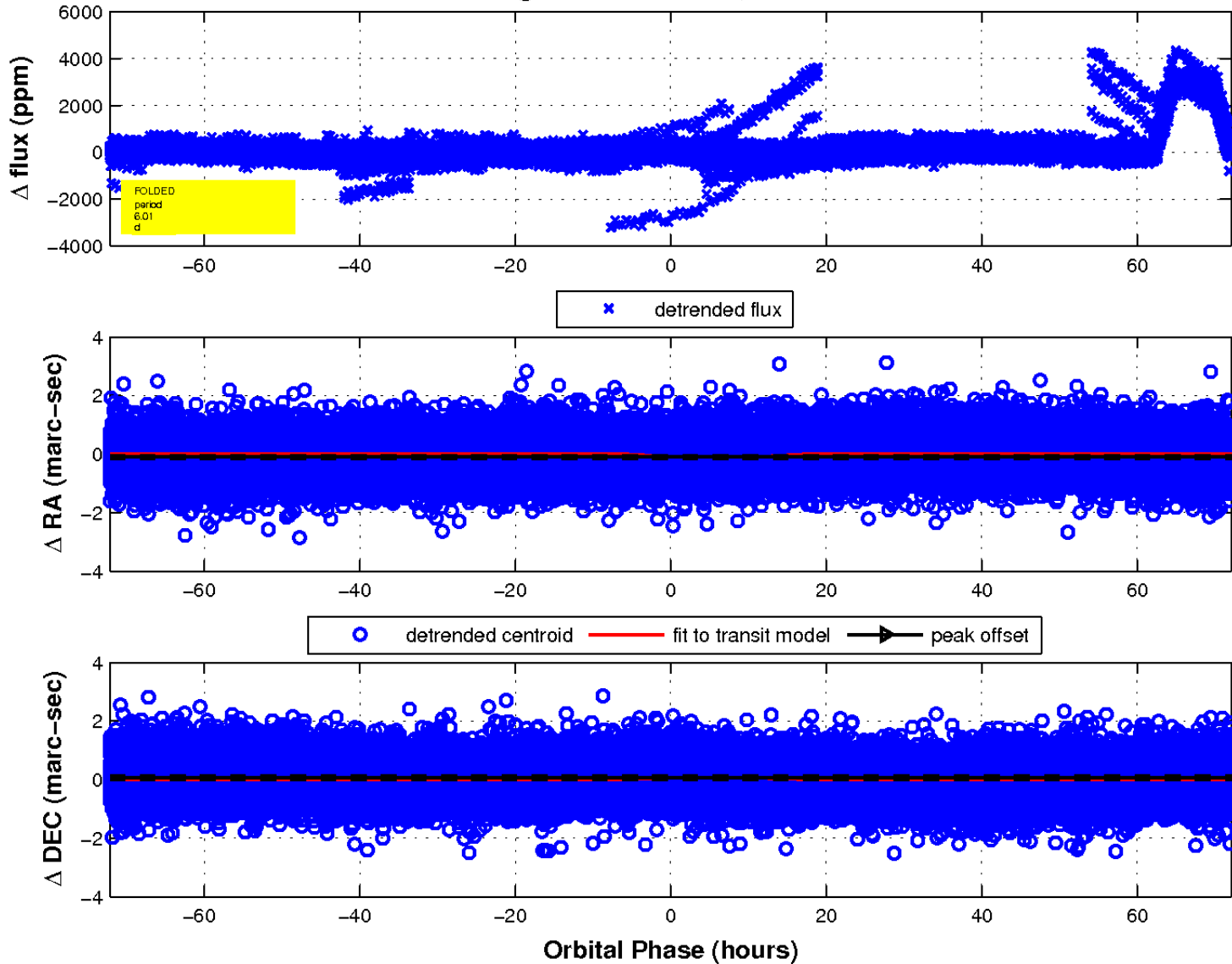
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

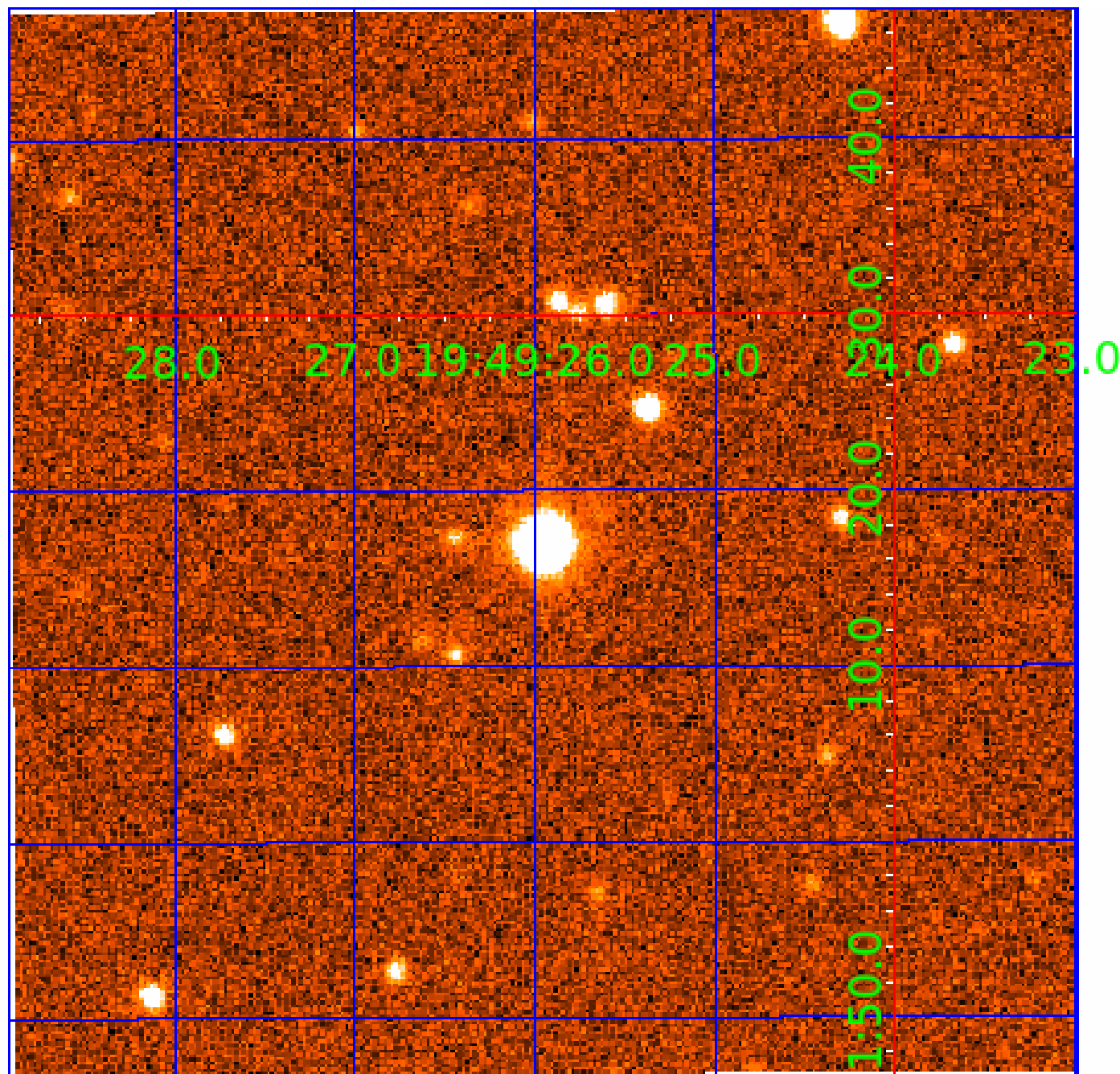


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



# KIC 010090722

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010090722-01	OBS	No	2.002707	133.155219	21.0	5.863	10.6	9.0	4.91	11053	2.64	143875.58
010090722-02	OBS	No	6.008032	135.934860	74.6	12.000	9.6	-1.0	4.91	11053	4.37	33253.25
010090722-03	OBS	No	6.008184	134.569217	82.8	10.500	9.3	-1.0	4.91	11053	4.60	33252.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010090722-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_FEW_DIFFS
010090722-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
010090722-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

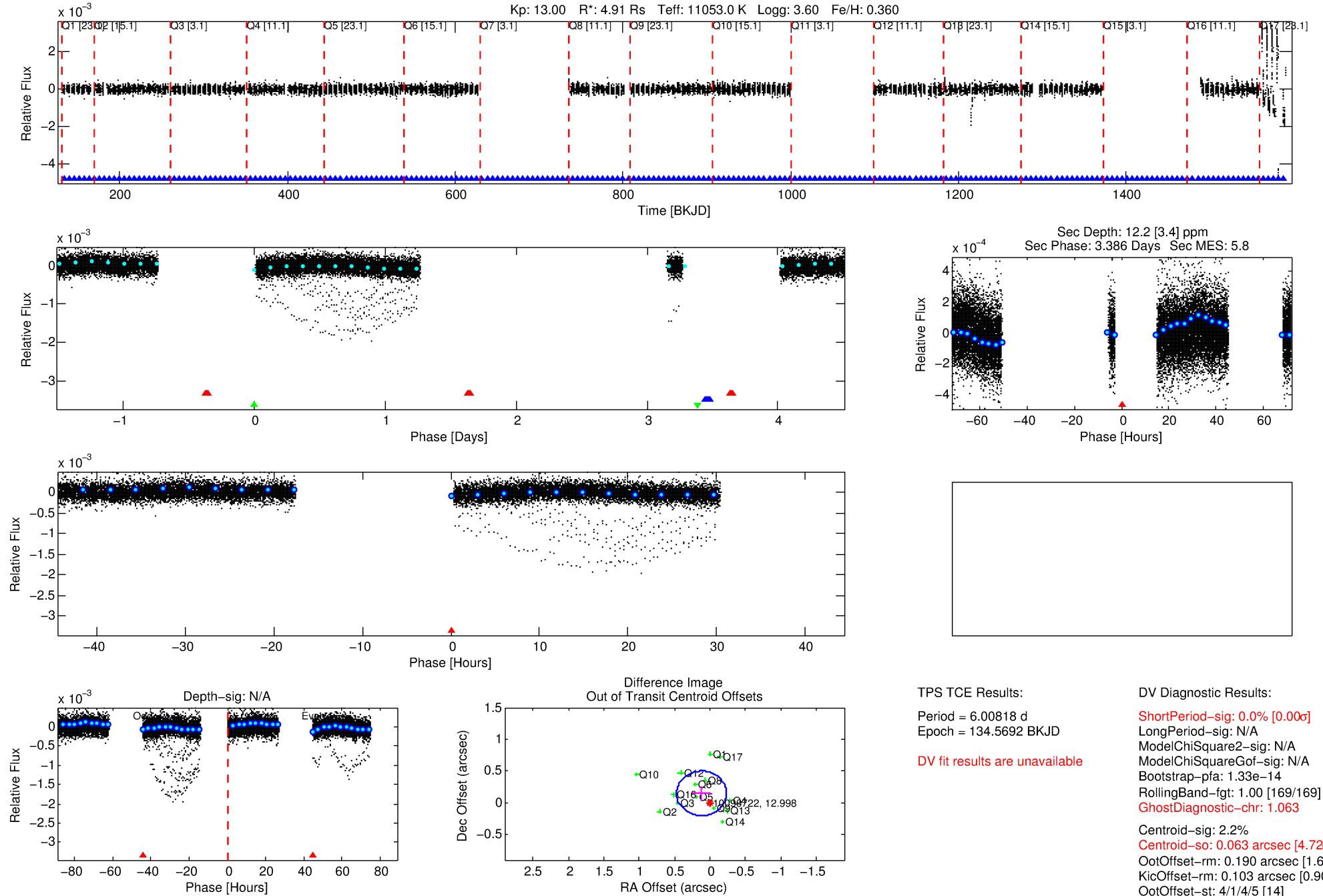
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010090722-03

No Significant Match Found

# DV One-Page Summary

KIC: 10090722 Candidate: 3 of 3 Period: 6.008 d



## TPS TCE Results:

Period = 6.00818 d  
Epoch = 134.5692 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

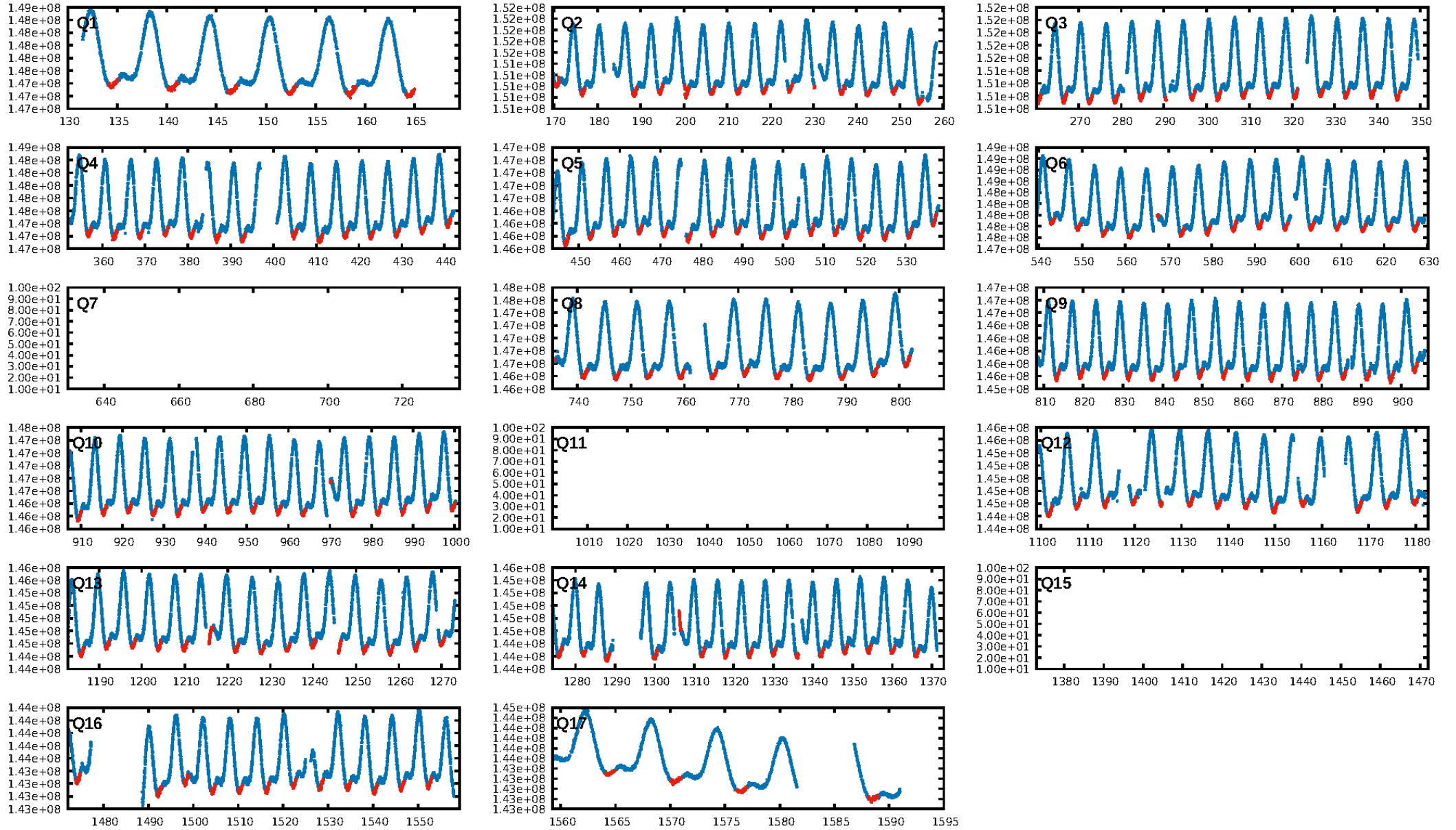
ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.33e-14  
RollingBand-fgt: 1.00 [169/169]  
GhostDiagnostic-chr: 1.063  
Centroid-sig: 2.2%  
Centroid-so: 0.063 arcsec [4.72 $\sigma$ ]  
OotOffset-rm: 0.190 arcsec [1.62 $\sigma$ ]  
KicOffset-rm: 0.103 arcsec [0.90 $\sigma$ ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:03:03 Z

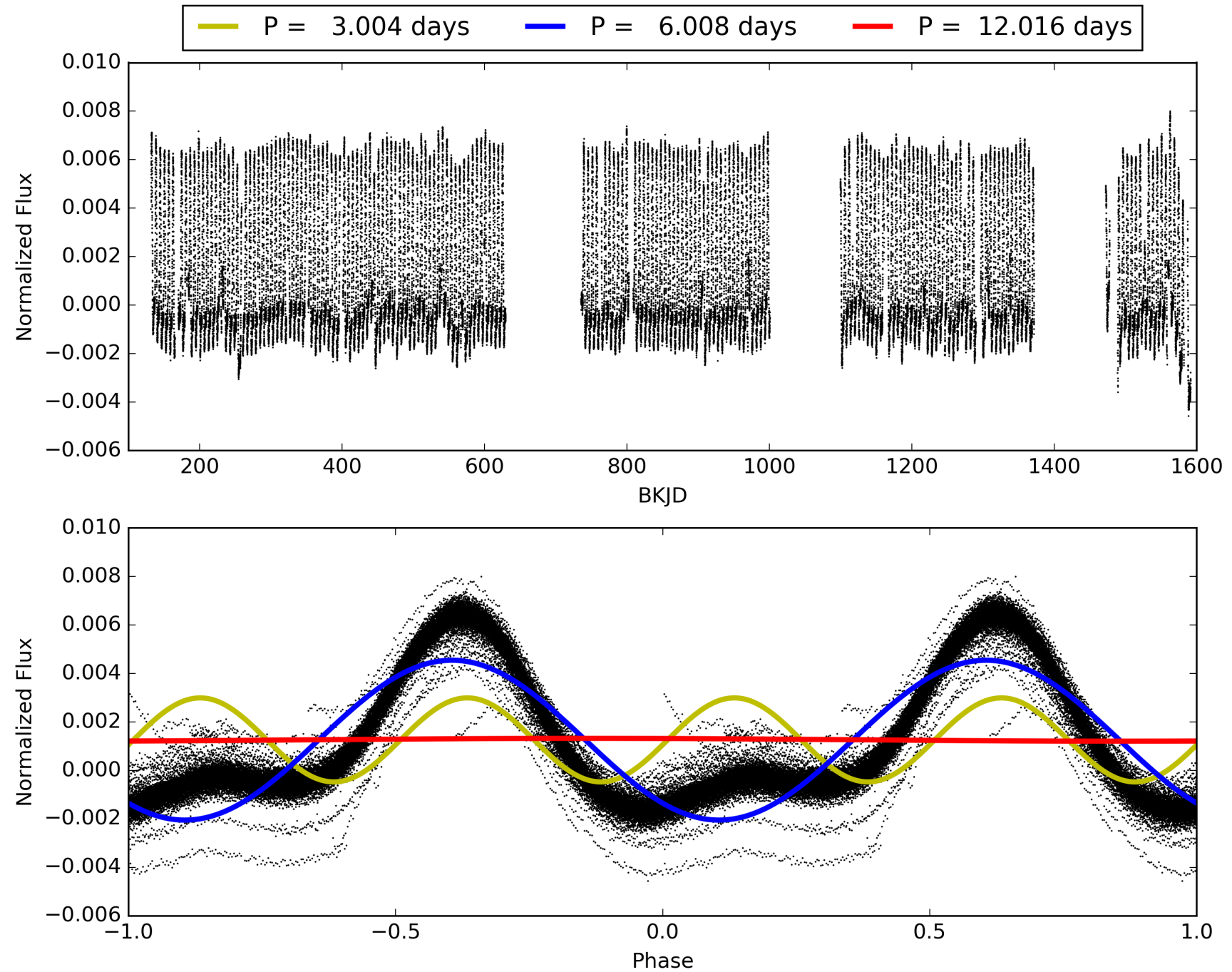
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010090722-03, PDC Light Curves

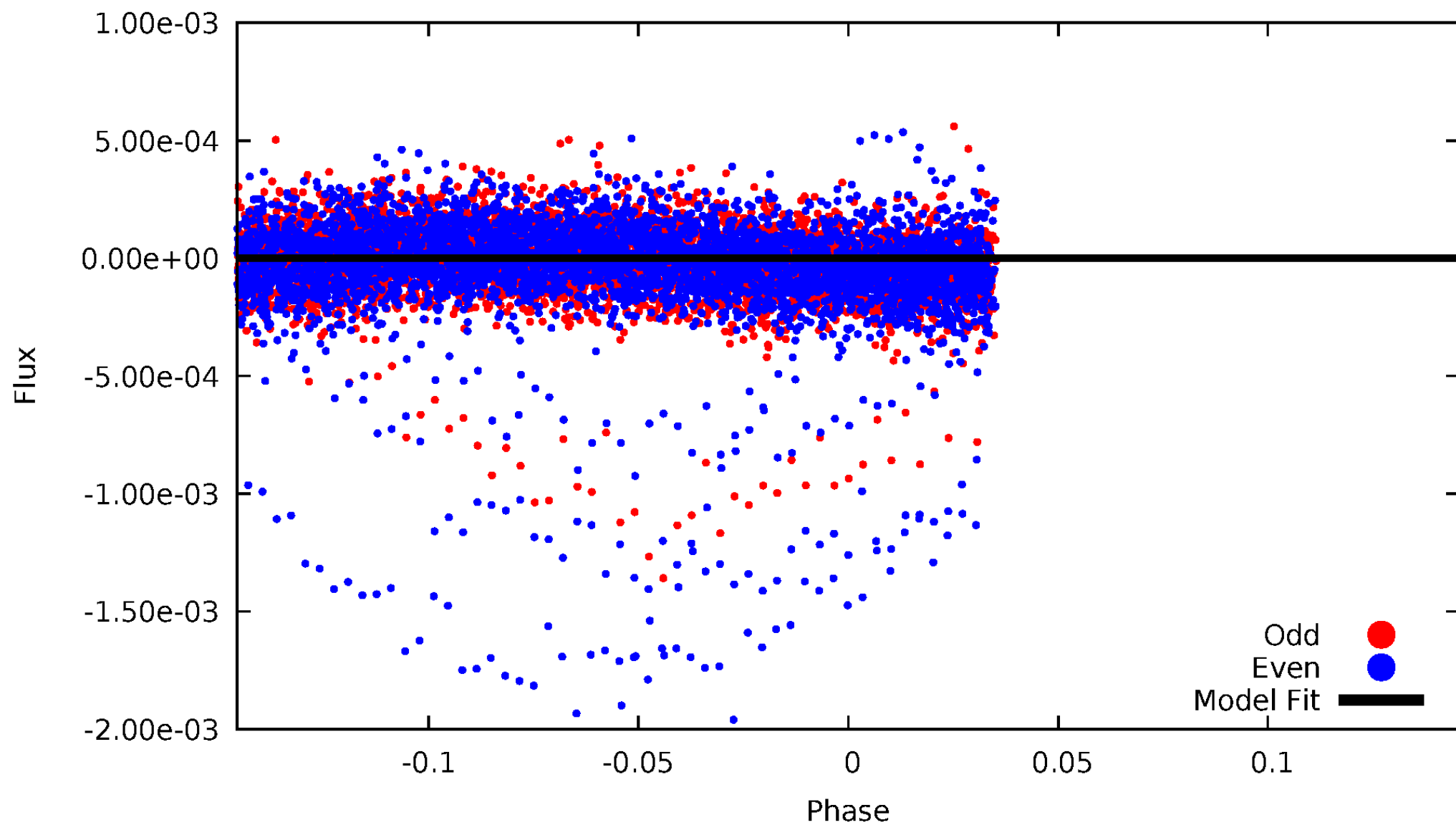


TCE 010090722-03



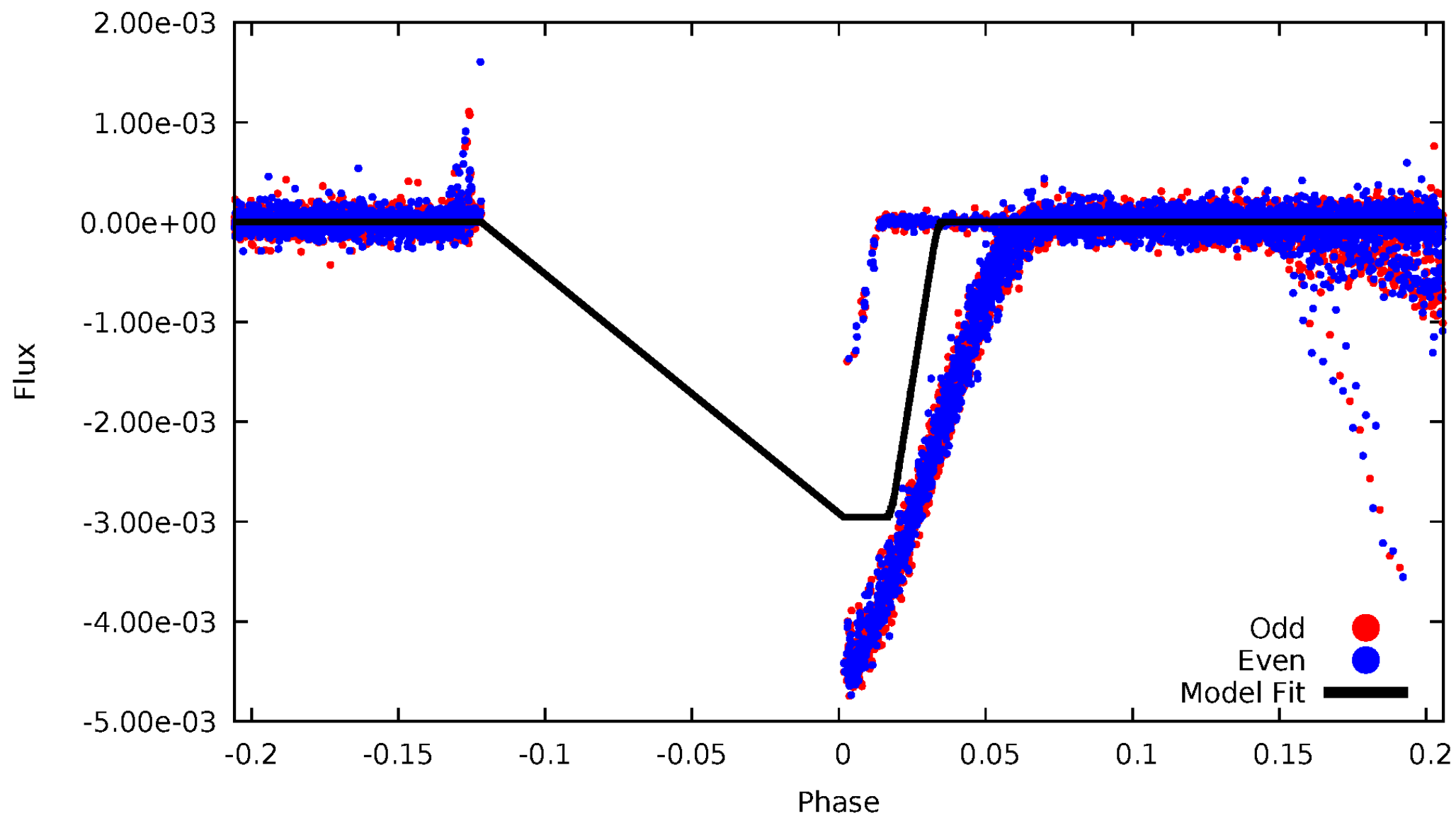
# DV Odd/Even

TCE 010090722-03



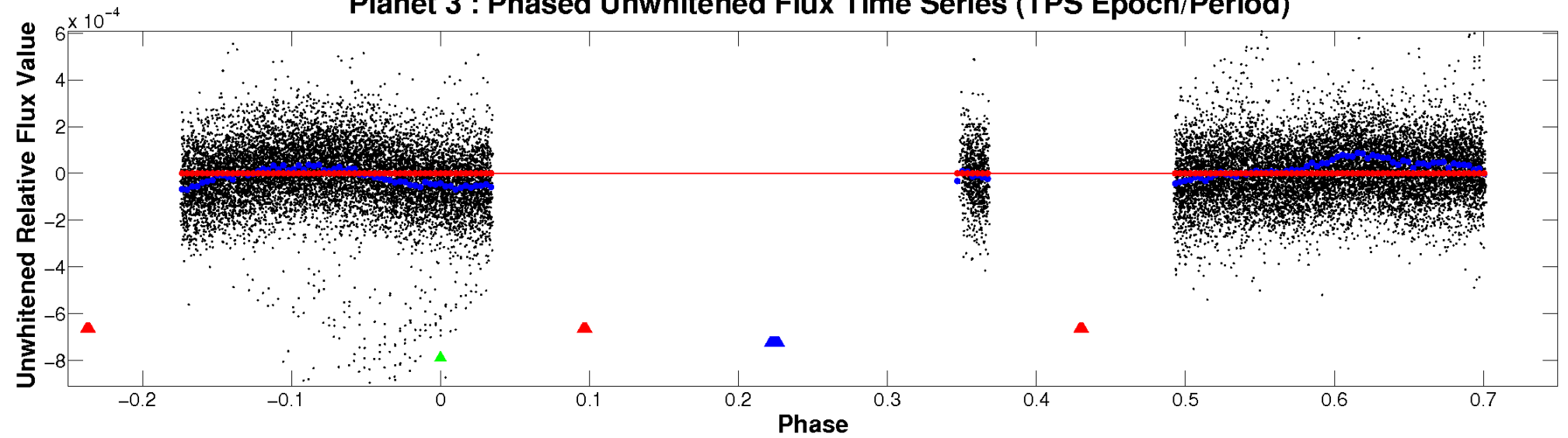
# ALT Odd/Even

TCE 010090722-03

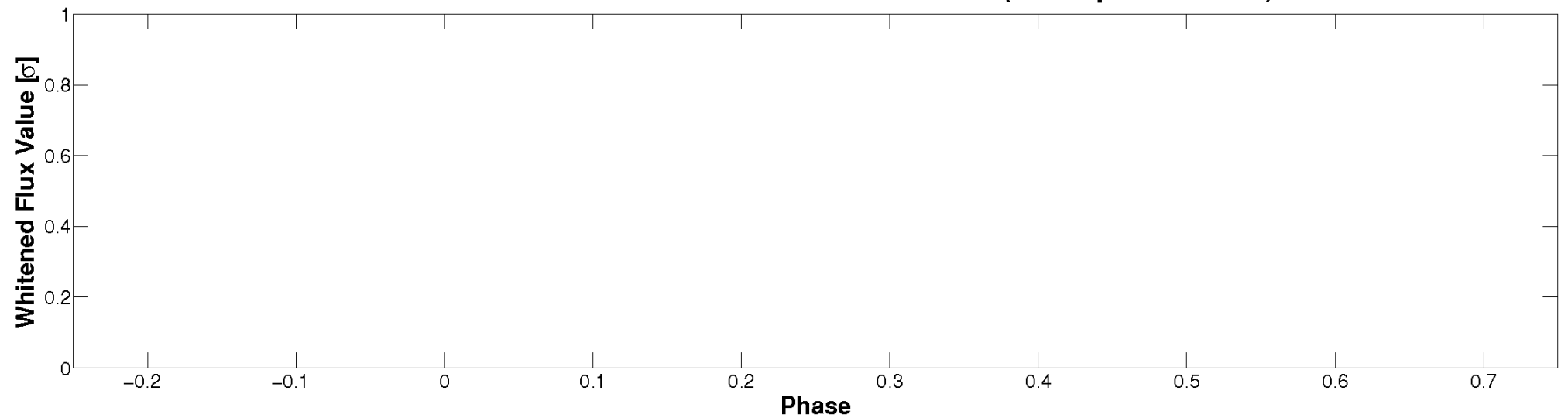


# Non-Whitened Vs. Whitened Light Curve

**Planet 3 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

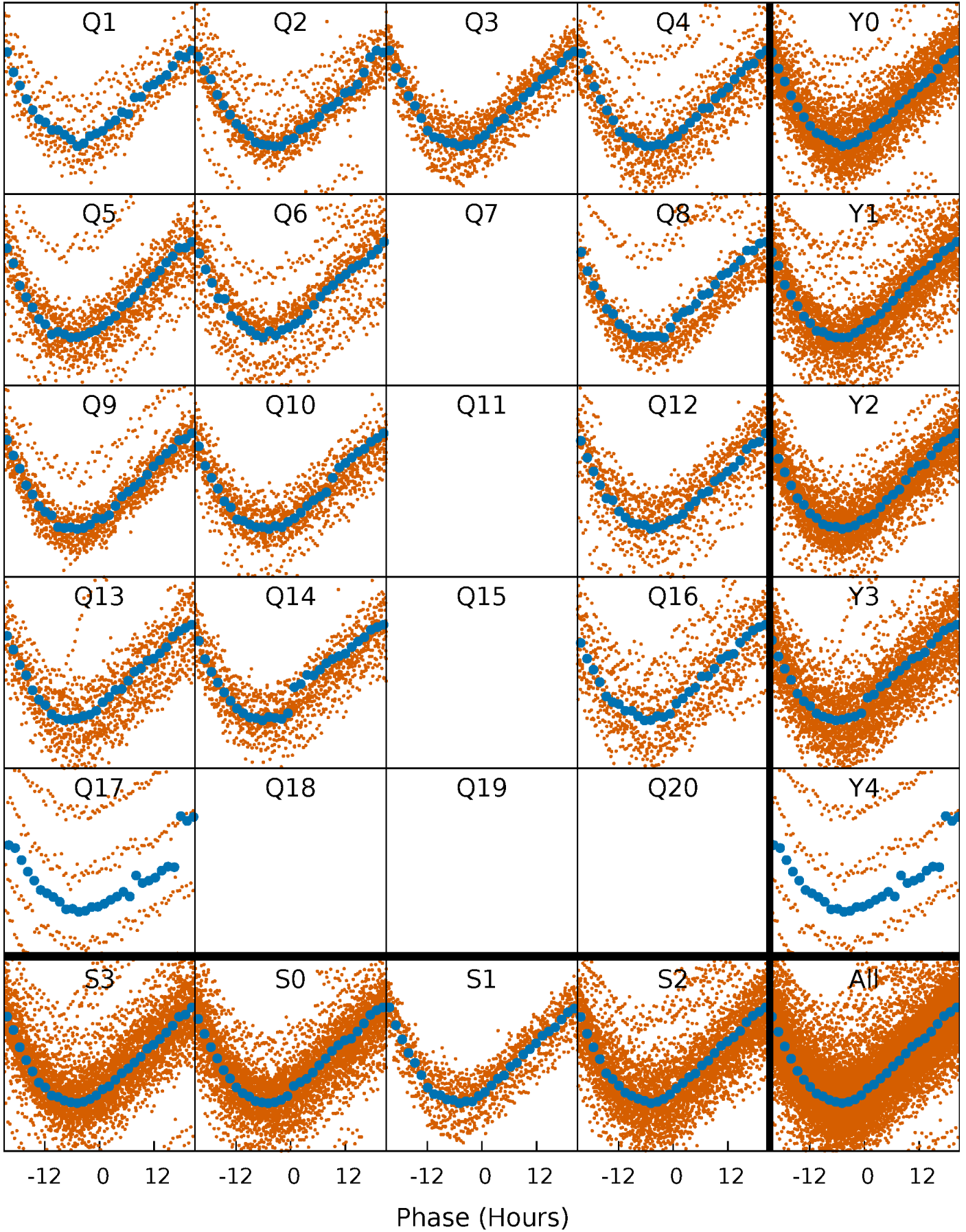


**Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

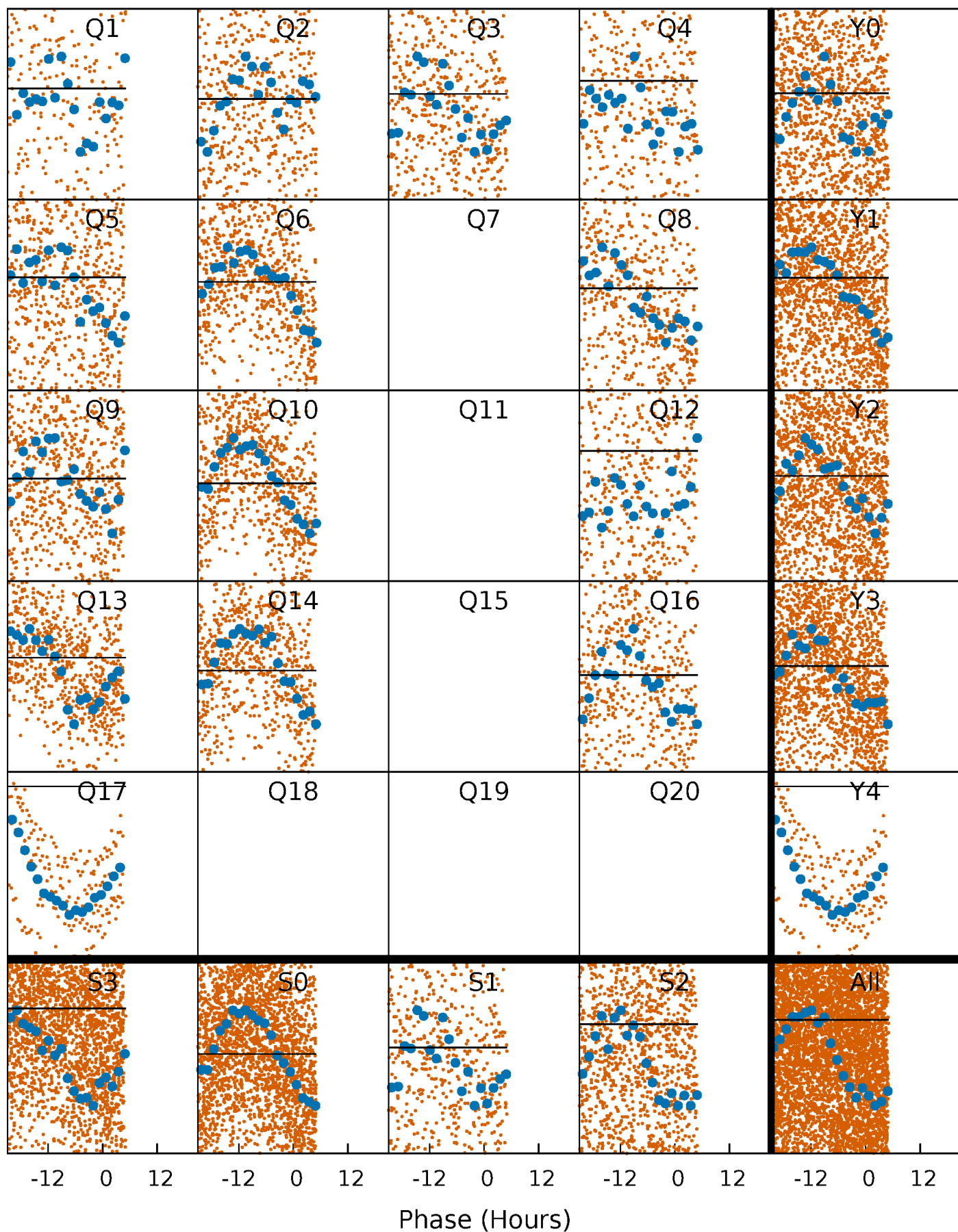
TCE 010090722-03 P= 6.008184 Days  $T_0=134.569217$  (BKJD)





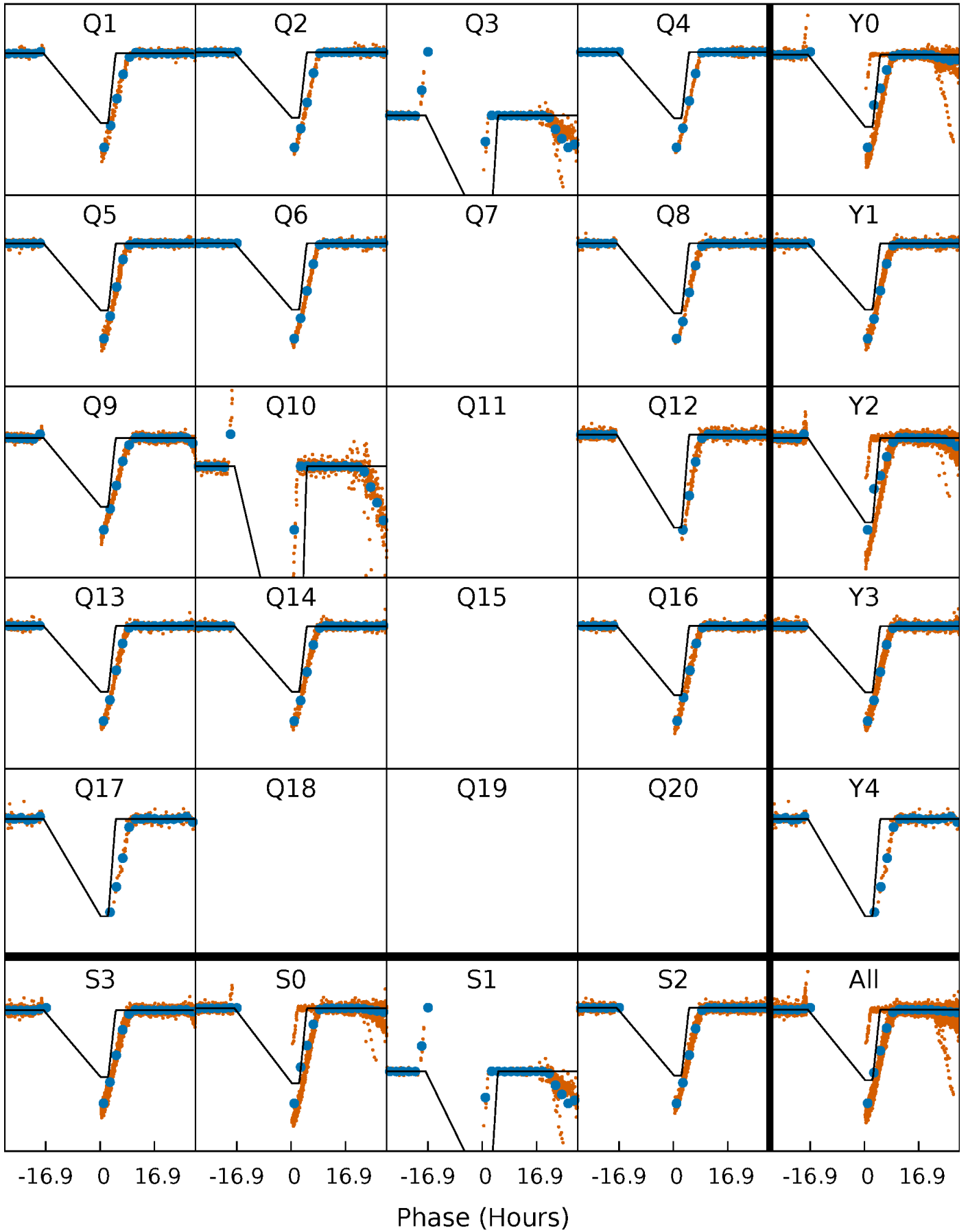
# DV Quarter-Phased Transit Curves

TCE 010090722-03 P= 6.008184 Days  $T_0=134.569217$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

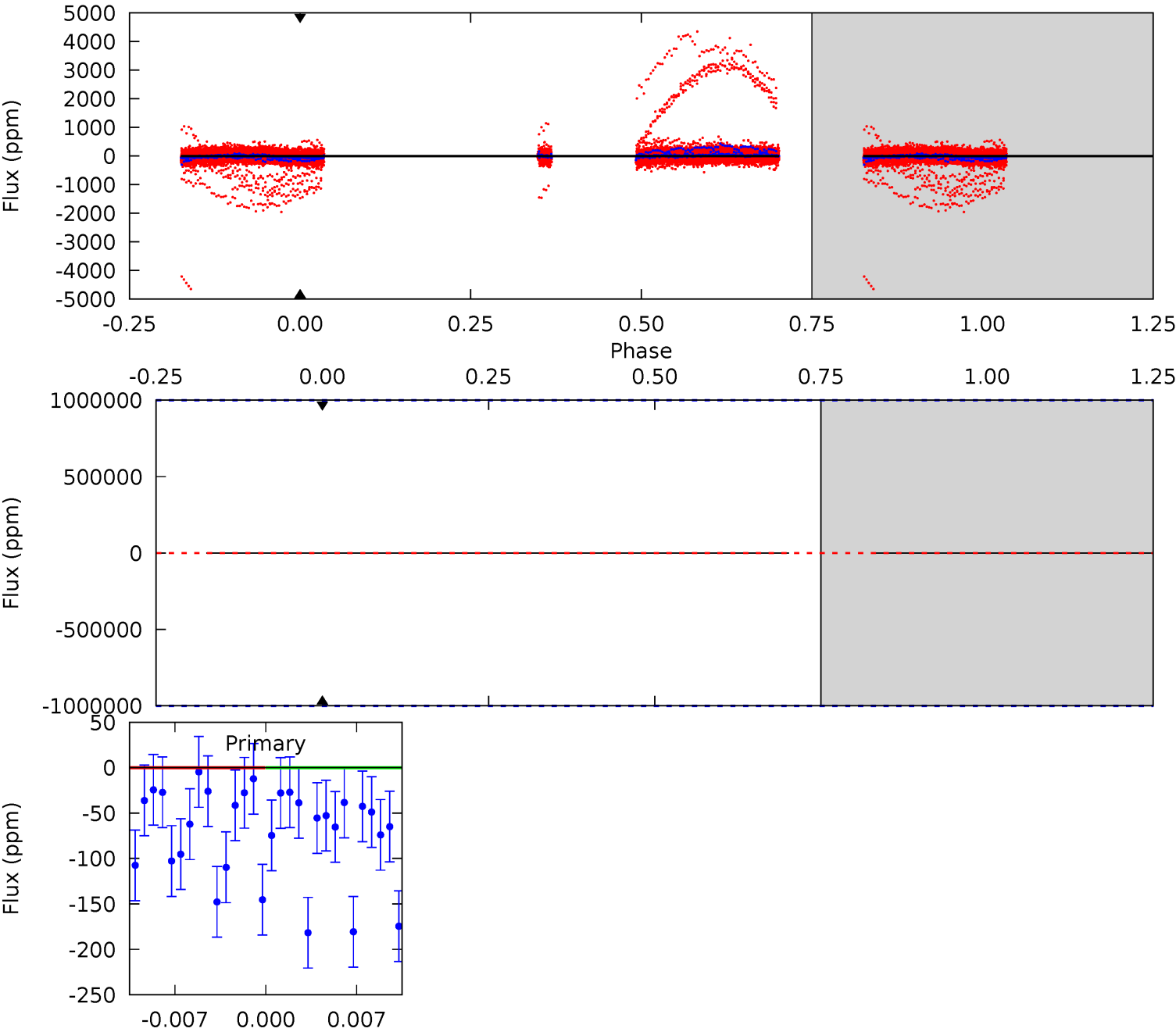
TCE 010090722-03 P= 6.008184 Days  $T_0=133.509592$  (BKJD)



DV Model-Shift Uniqueness Test

010090722-03, P = 6.008184 Days, E = 128.561033 Days

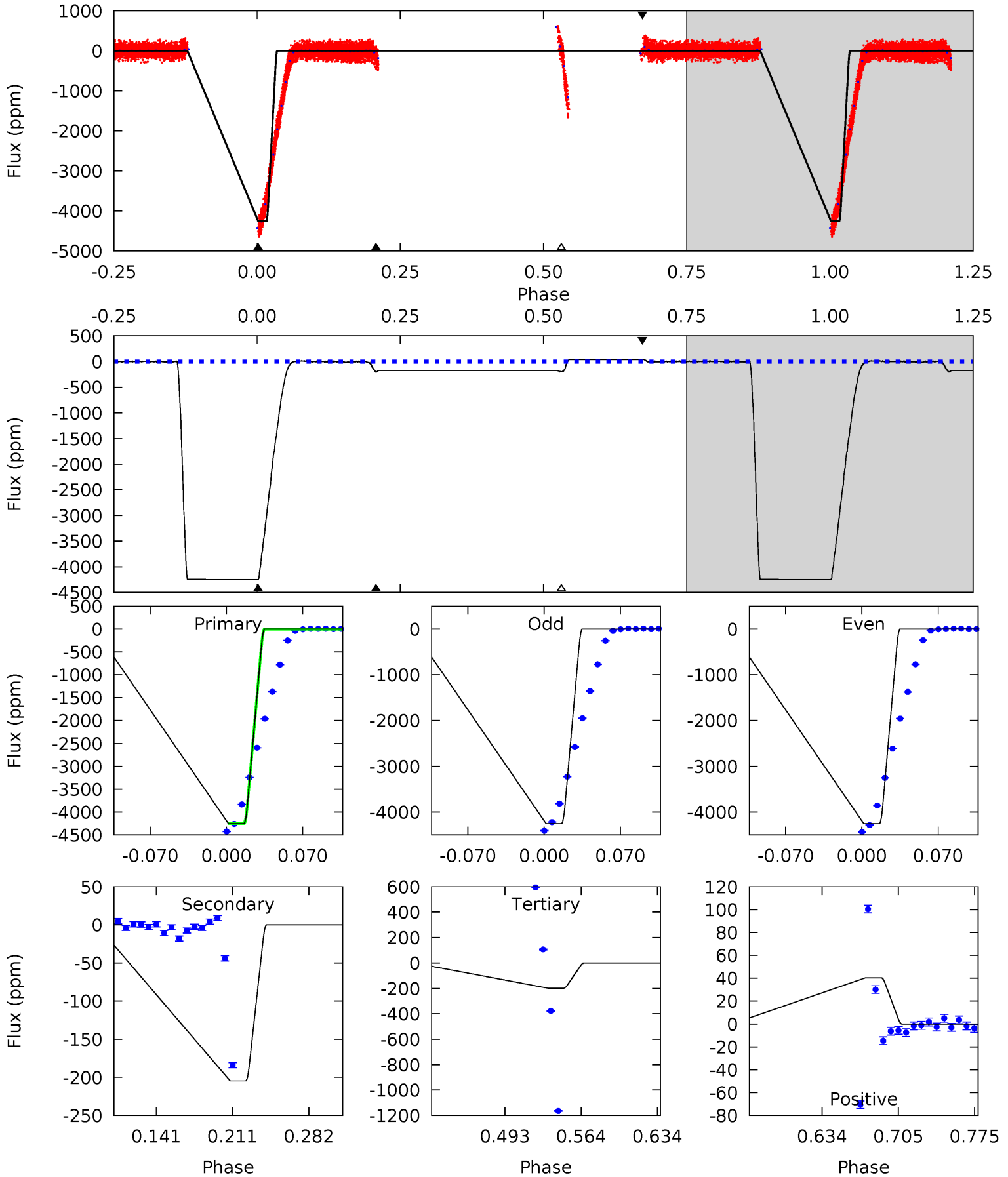
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010090722-03, P = 6.008184 Days, E = 127.501408 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
1007	48.5	47.0	9.56	4.64	1.81	124.0	959.8	997.2	1.47	38.9	0.48	0.88	0.01	0



### Stellar Parameters For KIC 010090722

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$11053^{+519}_{-1558}$	$3.603^{+0.425}_{-0.075}$	$0.360^{+0.050}_{-0.300}$	$4.909^{+0.410}_{-2.325}$	$3.520^{+0.070}_{-0.865}$	$0.042^{+0.160}_{-0.010}$
	+5%/-14%	+12%/-2%	+14%/-83%	+8%/-47%	+2%/-25%	+381%/-24%
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 010090722-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$33.16^{+37.25}_{-22.75}$	$4544^{+465}_{-707}$	$4197^{+81922}_{-102876}$	$0.634^{+670.591}_{-781.430}$
Alt.	$-205 \pm 4$	$43.49^{+43.02}_{-29.90}$	$4560^{+475}_{-738}$	$3609^{+2960}_{-7005}$	$0.564^{+5.380}_{-0.424}$

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

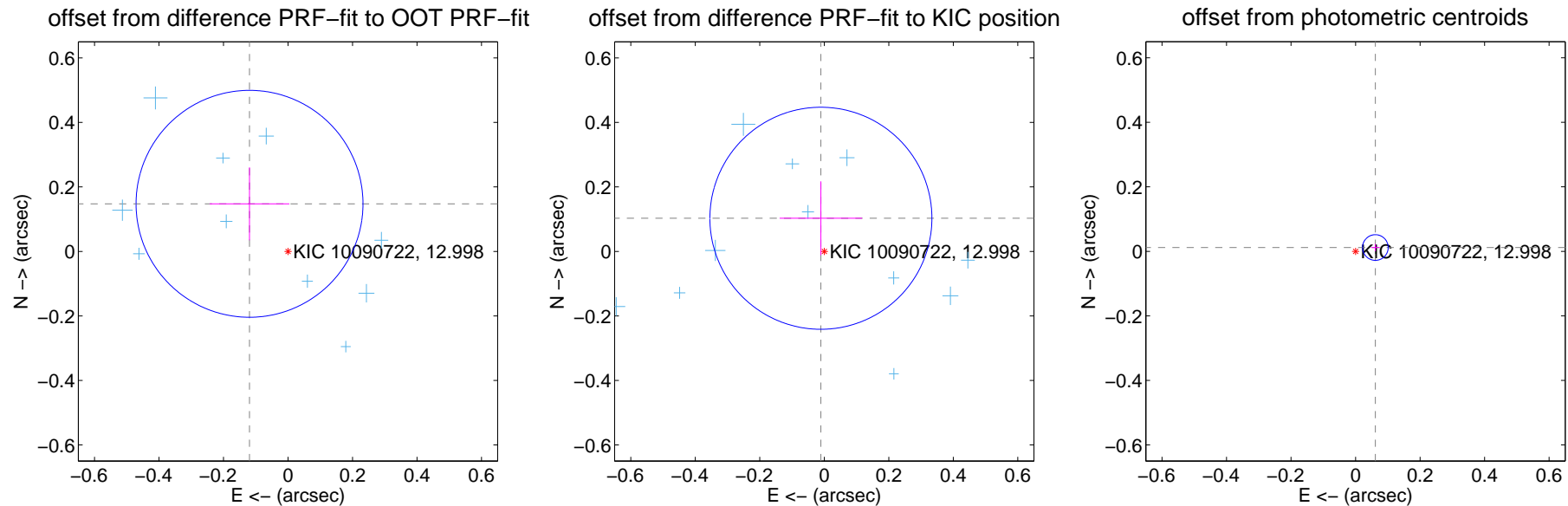
## DV Centroid Data

Supplemental centroid analysis for 010090722-03. Kepler magnitude: 13.00. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

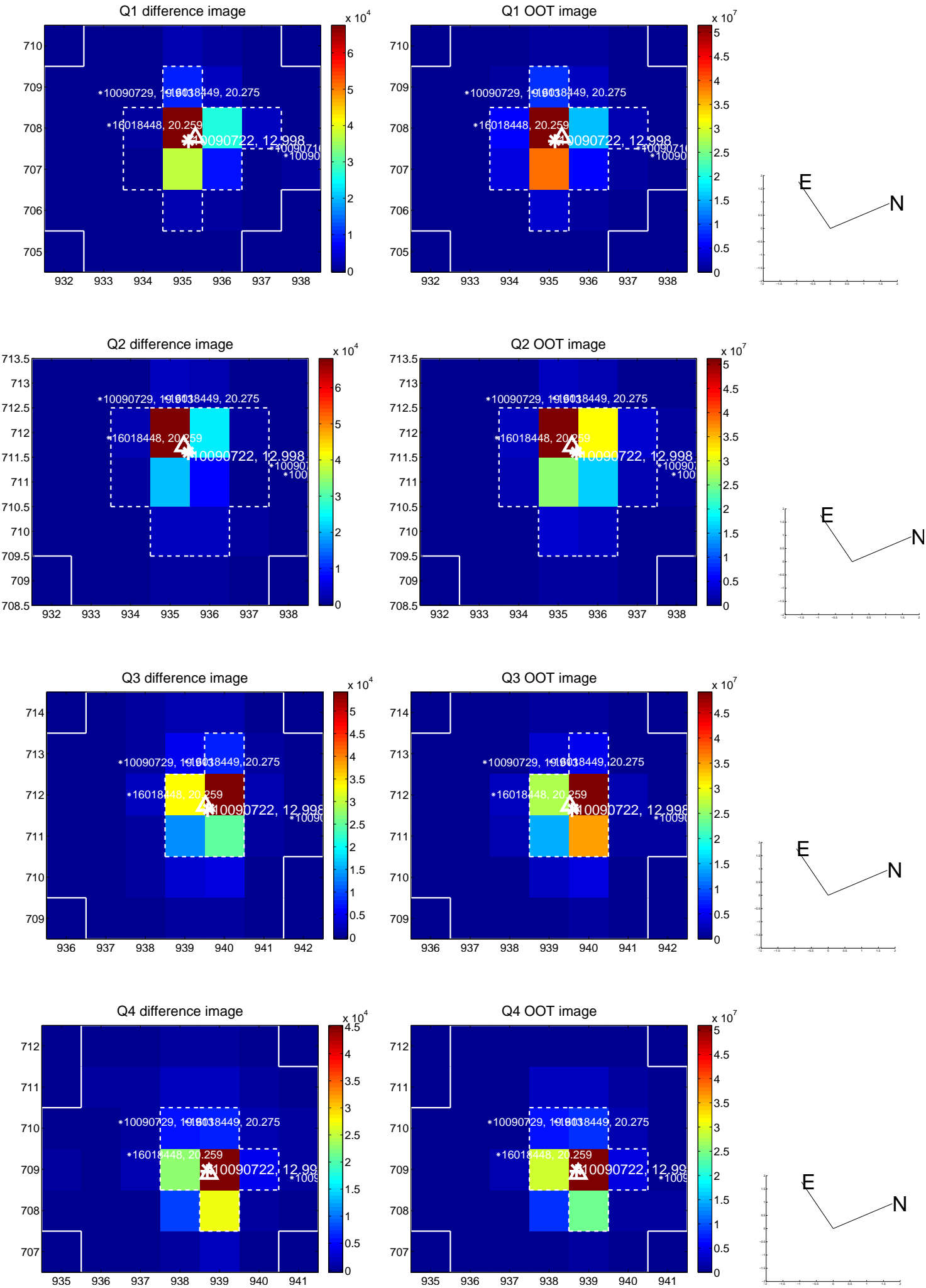
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.190 \pm 0.117$	1.62	$0.119 \pm 0.123$	$0.148 \pm 0.113$
PRF-fit source offset from KIC position	$0.103 \pm 0.115$	0.90	$0.011 \pm 0.128$	$0.103 \pm 0.115$
photometric centroid source offset	$0.06 \pm 0.01$	4.72	$-0.06 \pm 0.01$	$0.01 \pm 0.01$



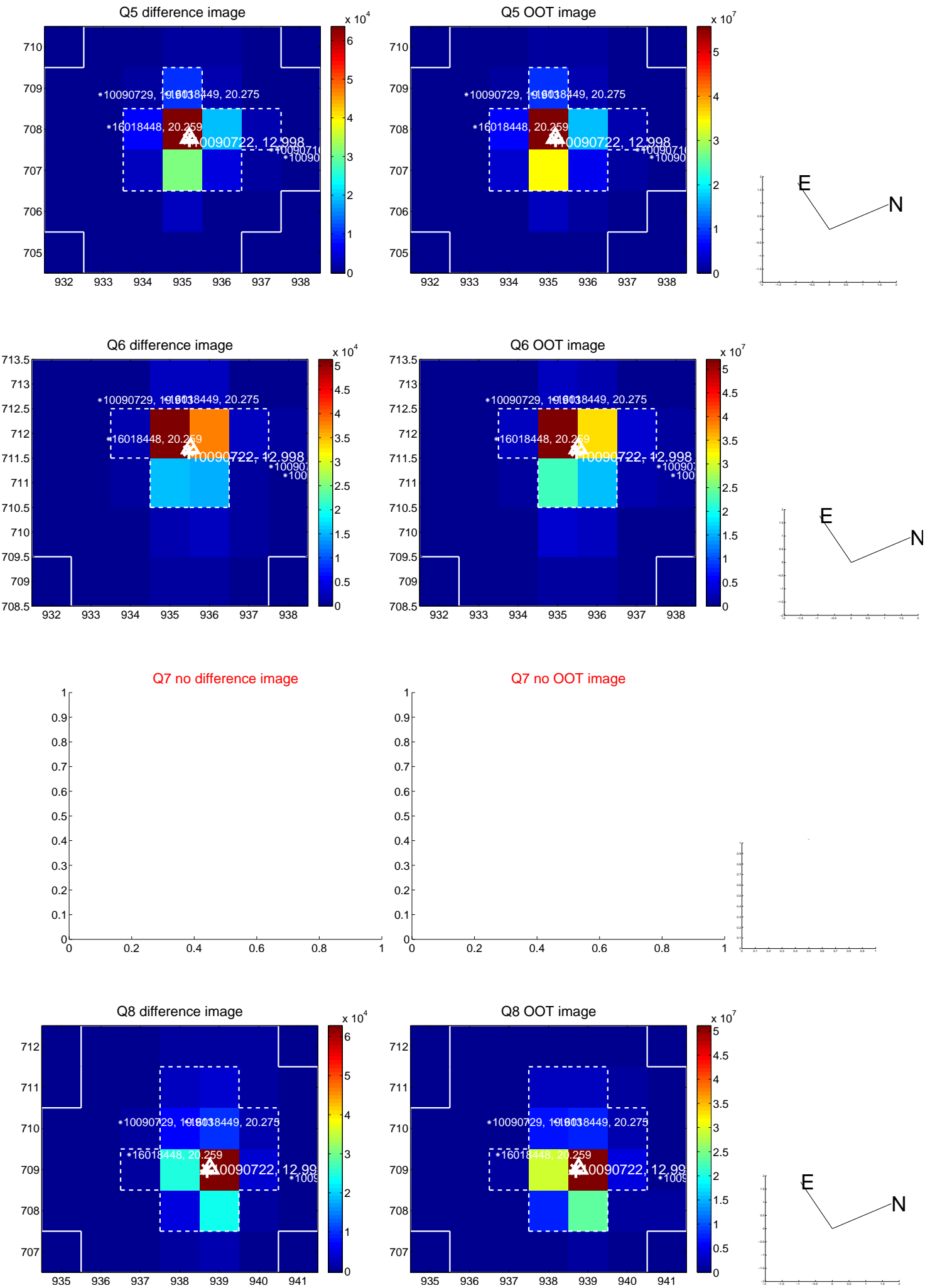
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



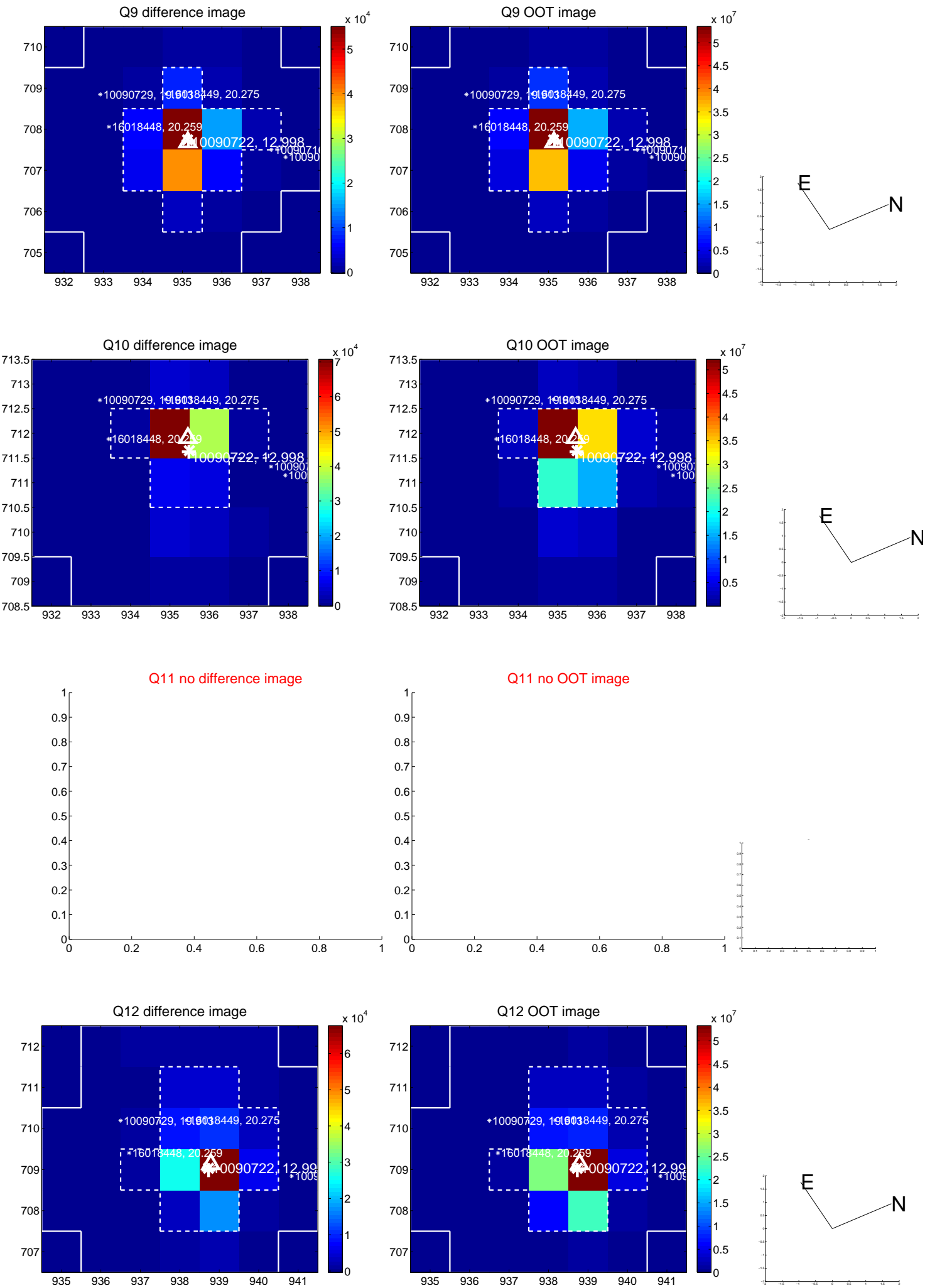
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



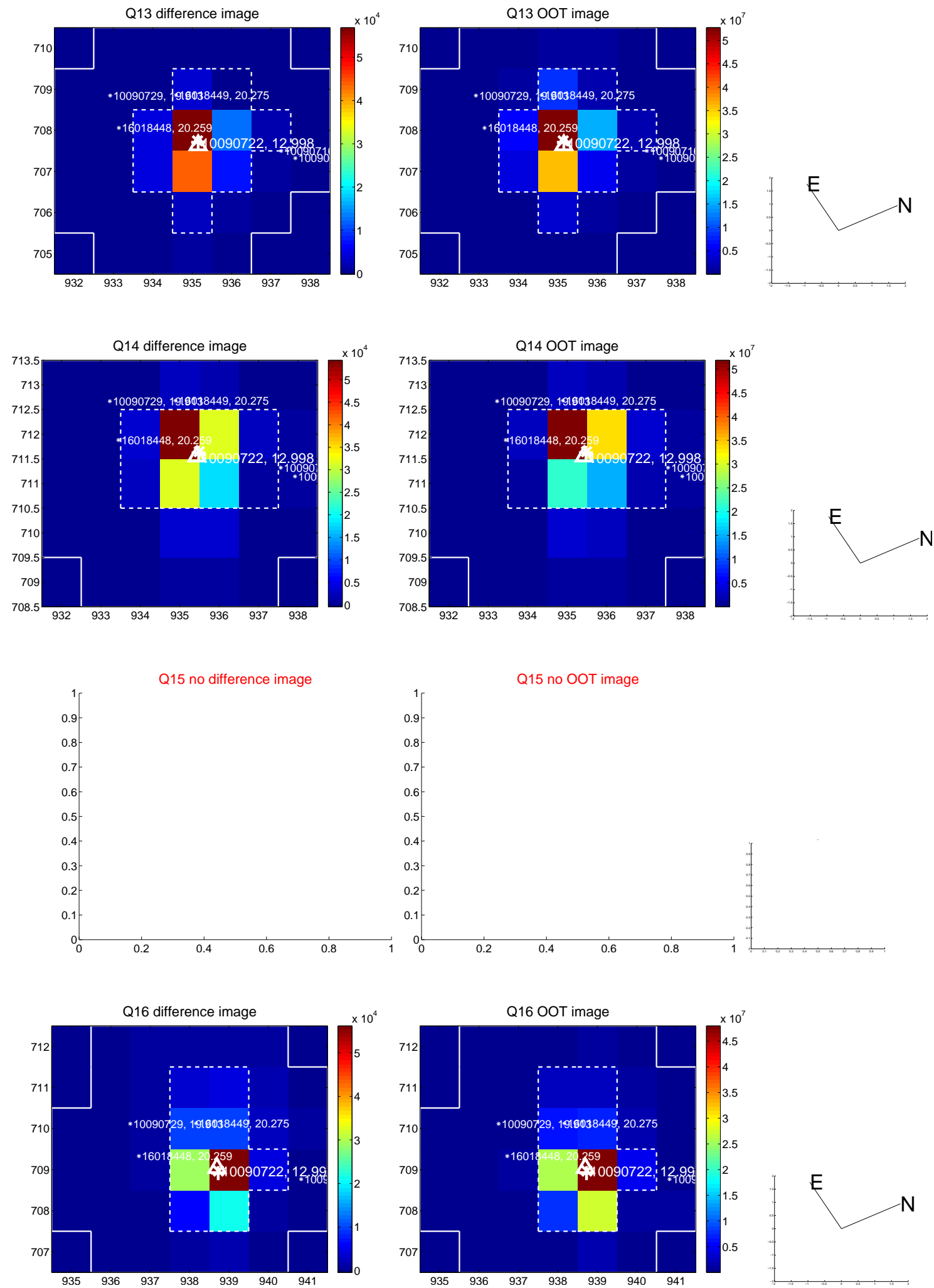
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



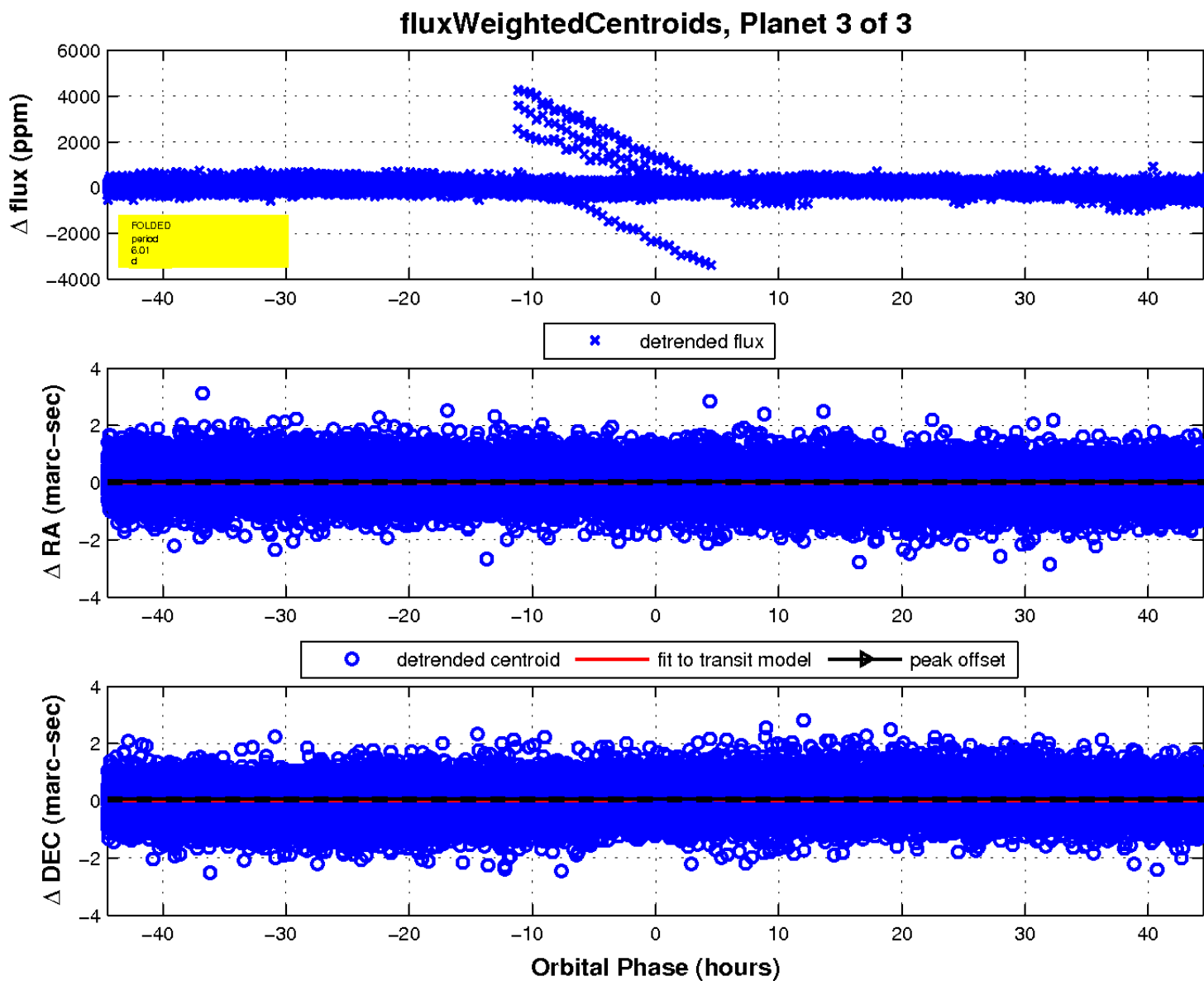
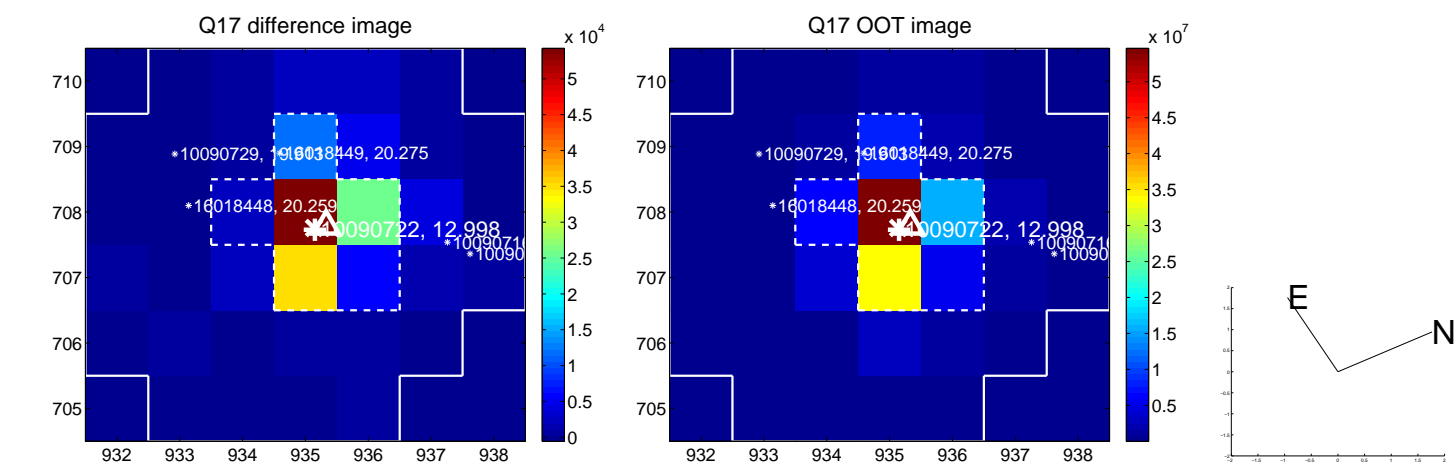
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

