

# KIC 009655005

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655005-01	OBS	4047.01	1.398932	132.598202	8.9	8.626	13.2	9.4	3.37	7872	1.01	38106.71
009655005-02	OBS	No	103.925614	192.910813	187.5	8.515	15.1	12.5	3.37	7872	5.26	122.02
009655005-03	OBS	No	88.568337	218.115748	155.4	3.708	13.5	9.8	3.37	7872	4.78	151.02
009655005-04	OBS	No	94.048823	156.331762	84.8	13.870	10.0	7.8	3.37	7872	3.40	139.40
009655005-05	OBS	No	604.344606	178.043786	93.8	5.233	8.4	8.0	3.37	7872	3.37	11.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655005-01	OBS	PC	0.20	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV
009655005-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—HALO_GHOST
009655005-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009655005-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009655005-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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 009655005-01

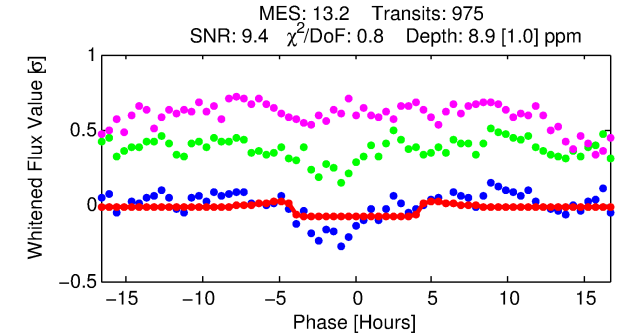
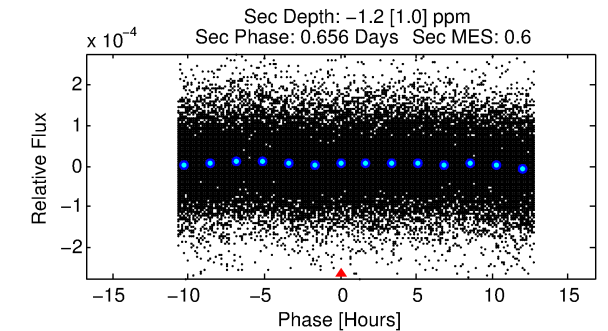
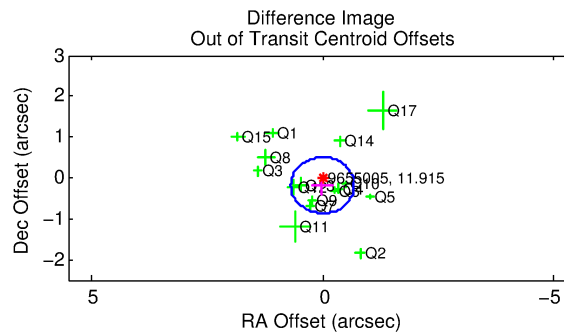
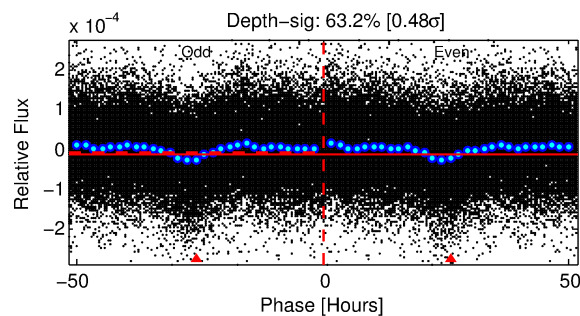
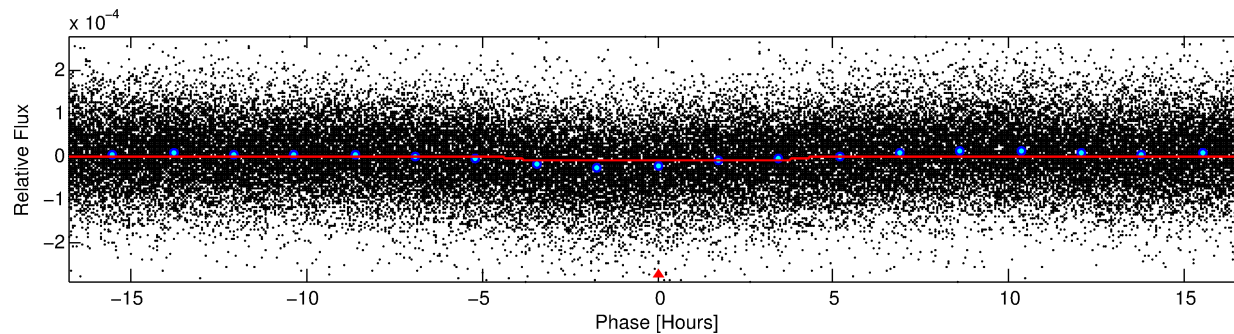
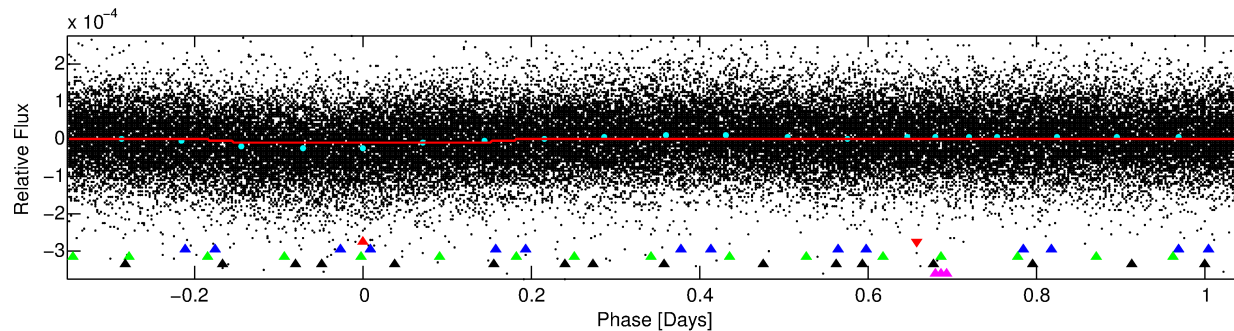
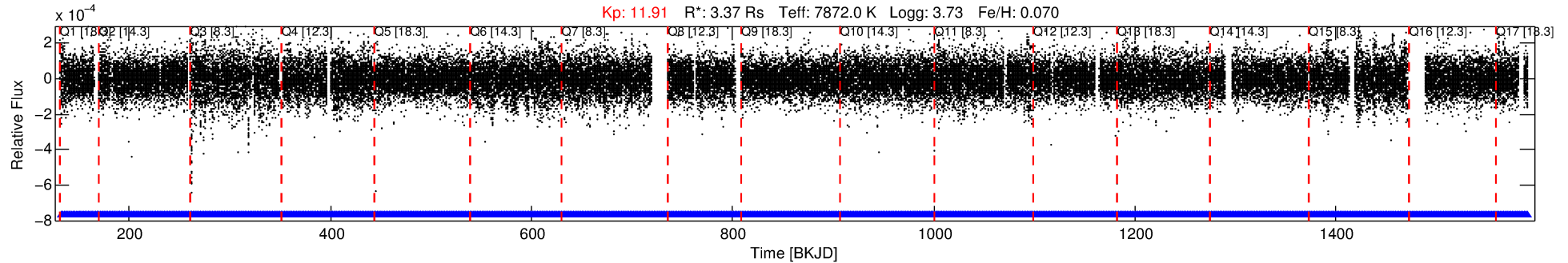
No Significant Match Found

# DV One-Page Summary

KIC: 9655005 Candidate: 1 of 5 Period: 1.399 d

KOI: K04047 Corr: No Ephemeris Match

Kp: 11.91 R\*: 3.37 Rs Teff: 7872.0 K Logg: 3.73 Fe/H: 0.070



## DV Fit Results:

Period = 1.39893 [0.00002] d  
Epoch = 132.5982 [0.0054] BKJD  
Rp/R\* = 0.0028 [0.0024]  
a/R\* = 1.39 [3.33]  
b = 0.02 [305.42]  
Seff = 38106.71 [16093.55]  
Teq = 3563 [376] K  
Rp = 1.01 [0.94] Re  
a = 0.0320 [0.0088] AU  
Ag = N/A  
Teff = N/A

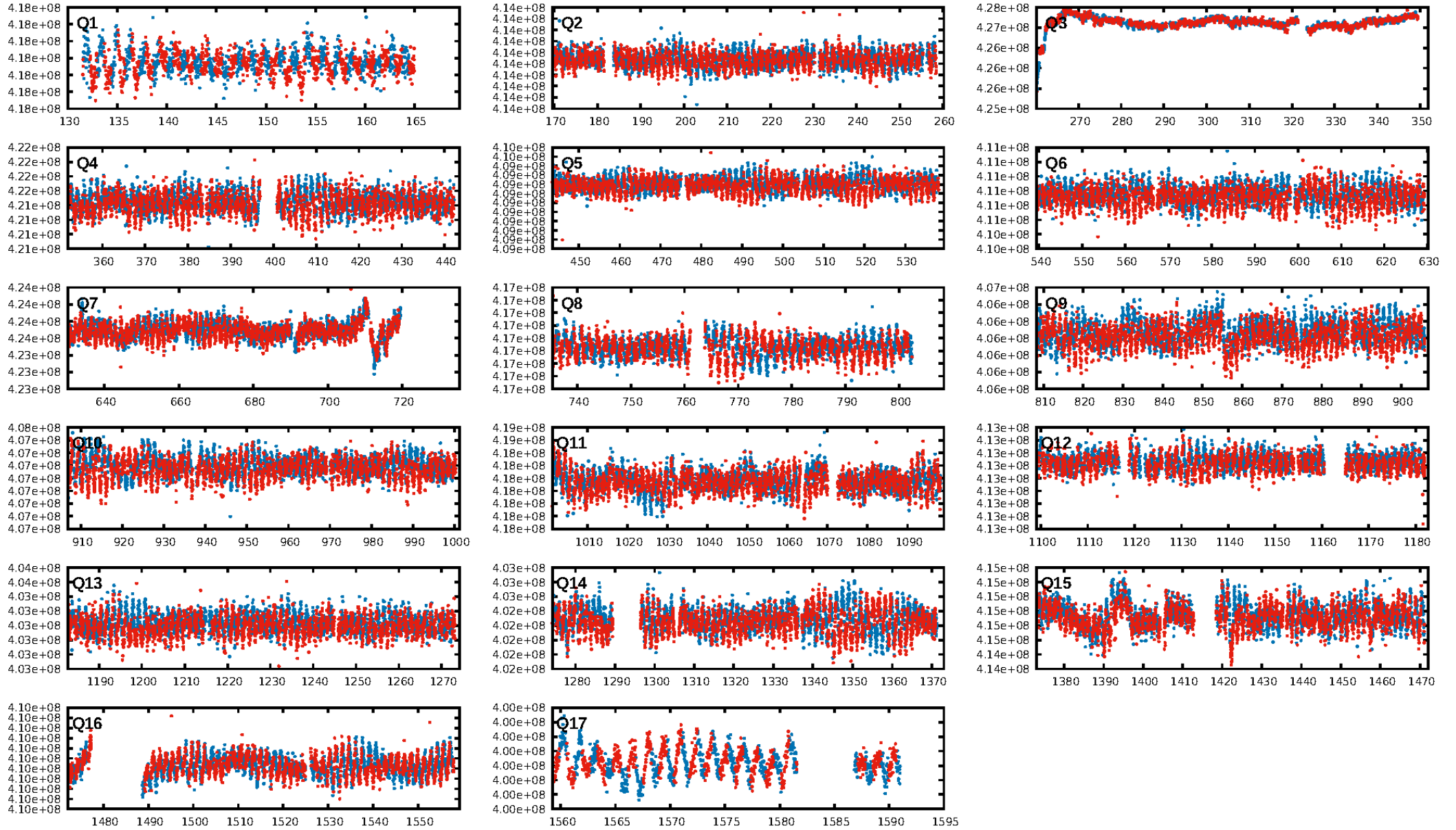
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [222.81σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.49e-22  
RollingBand-fgt: 1.00 [932/932]  
GhostDiagnostic-chr: 2.24  
Centroid-sig: 61.3%  
Centroid-so: 0.654 arcsec [0.78σ]  
OotOffset-rm: 0.181 arcsec [0.79σ]  
KicOffset-rm: 0.237 arcsec [1.05σ]  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.94 [15/16]  
DiffImageOverlap-fno: 1.00 [17/17]

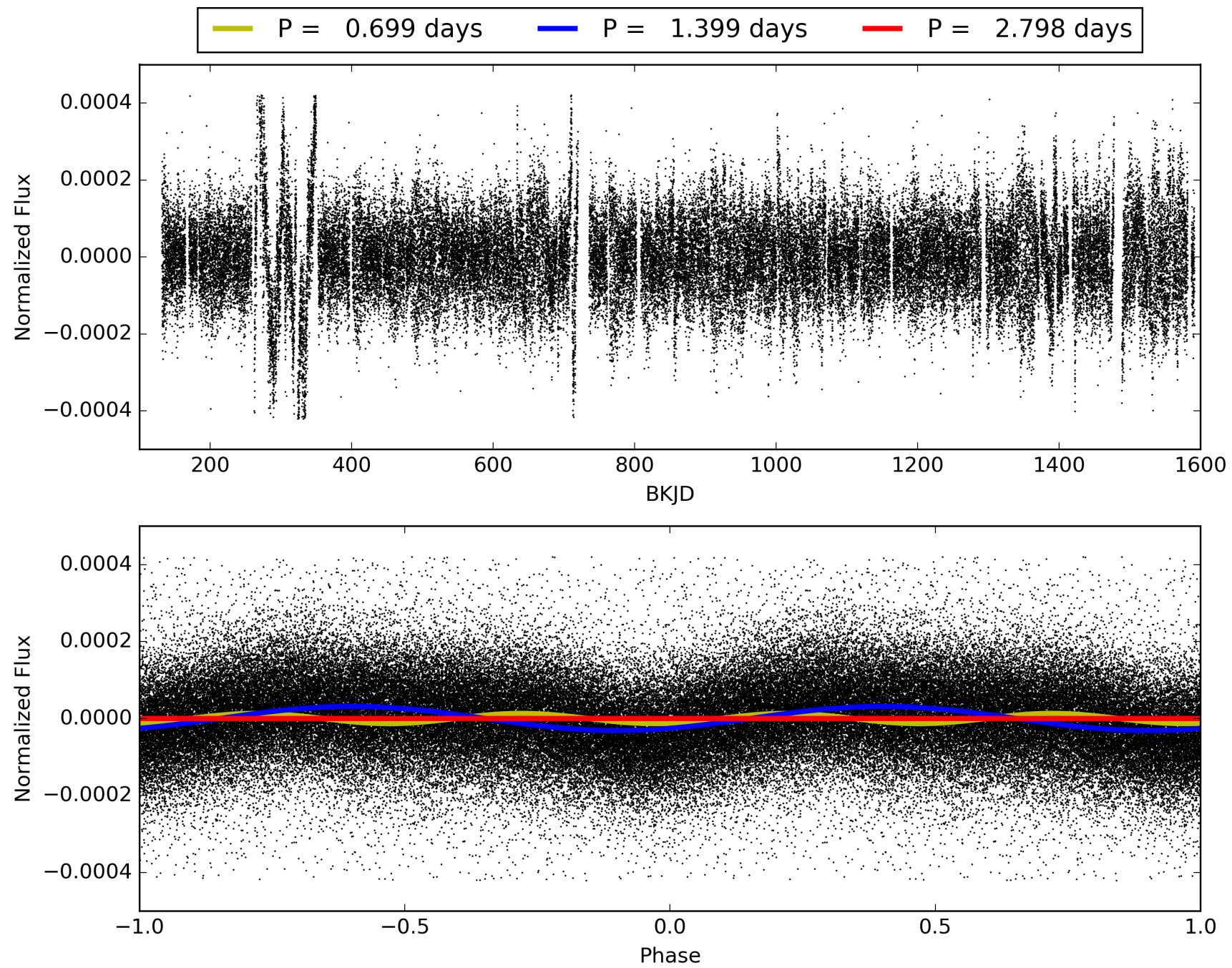
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:13:48 Z

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

# TCE 009655005-01, PDC Light Curves



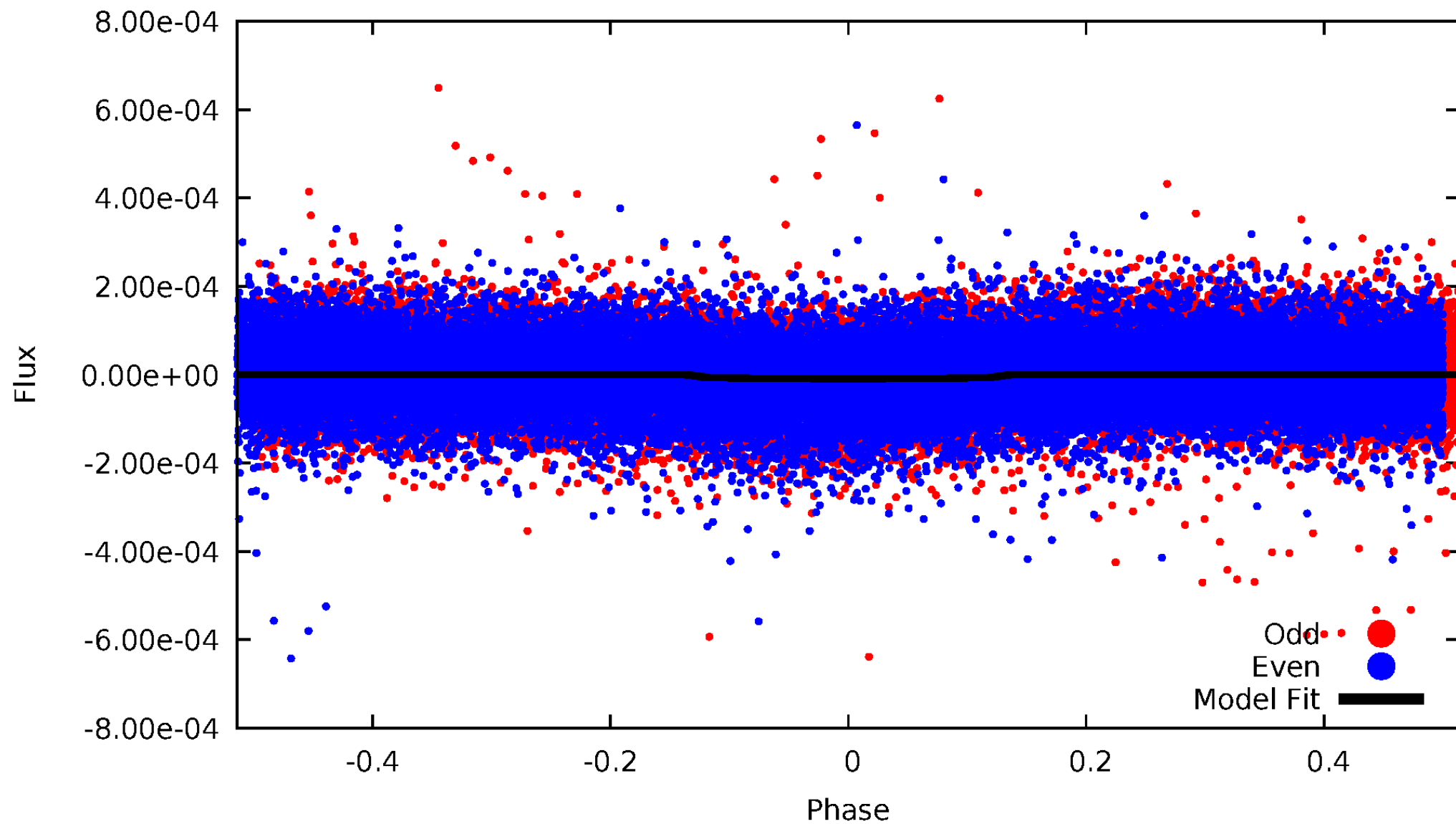
TCE 009655005-01





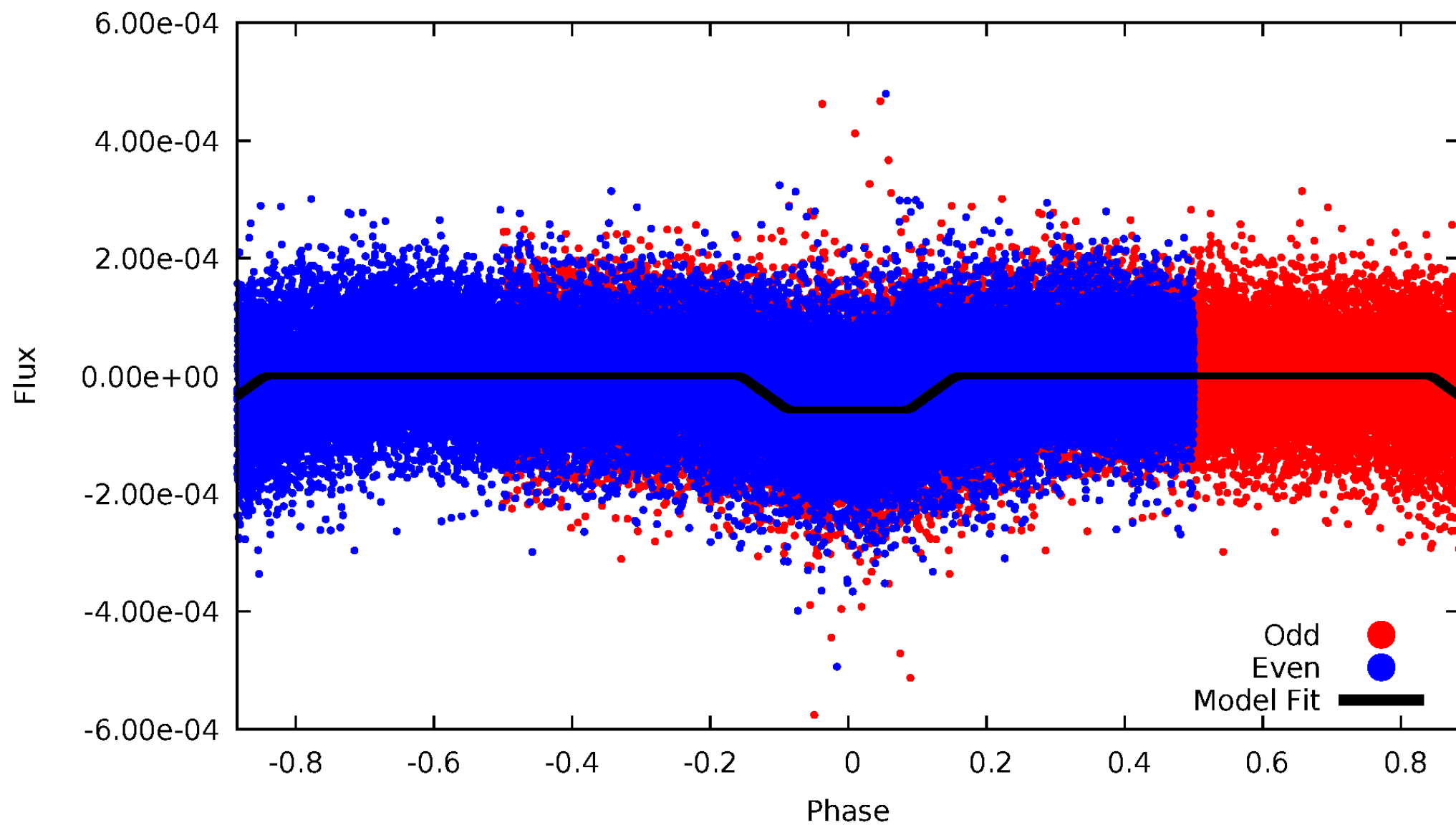
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TCE 009655005-01



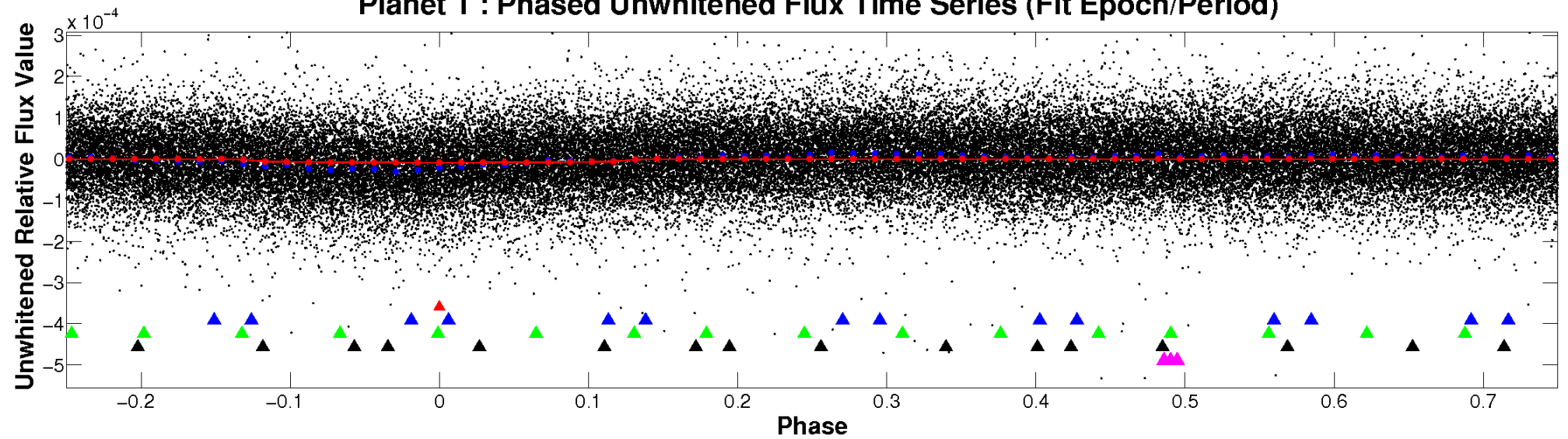
# ALT Odd/Even

TCE 009655005-01

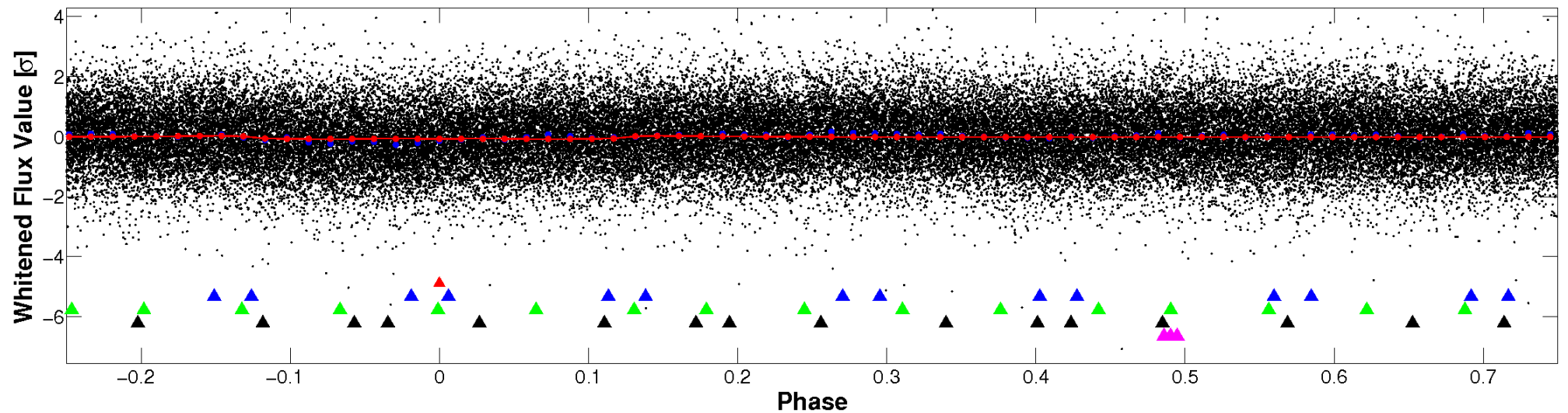


# Non-Whitened Vs. Whitened Light Curve

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

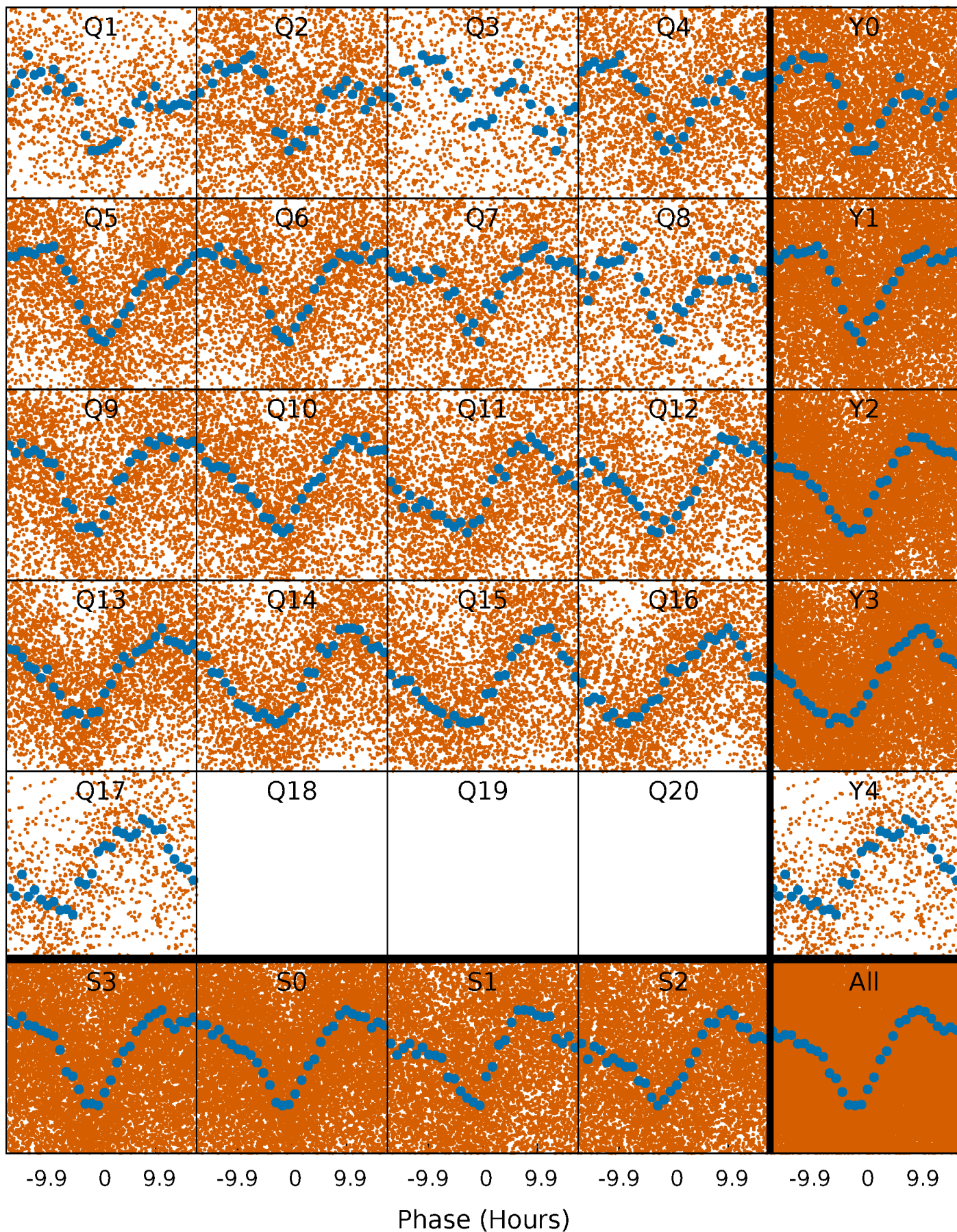


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

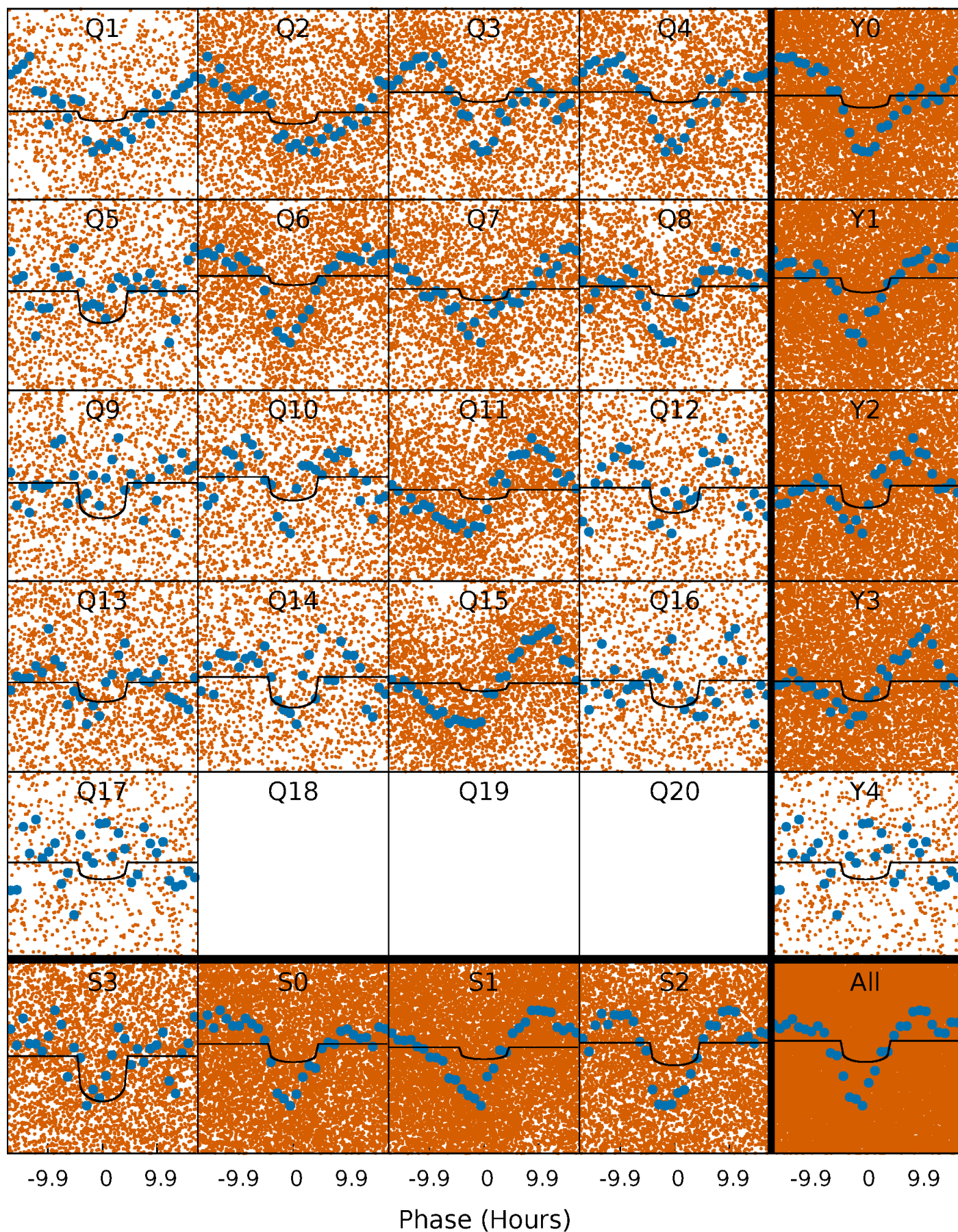
TCE 009655005-01   P= 1.398932 Days    $T_0=132.598202$  (BKJD)





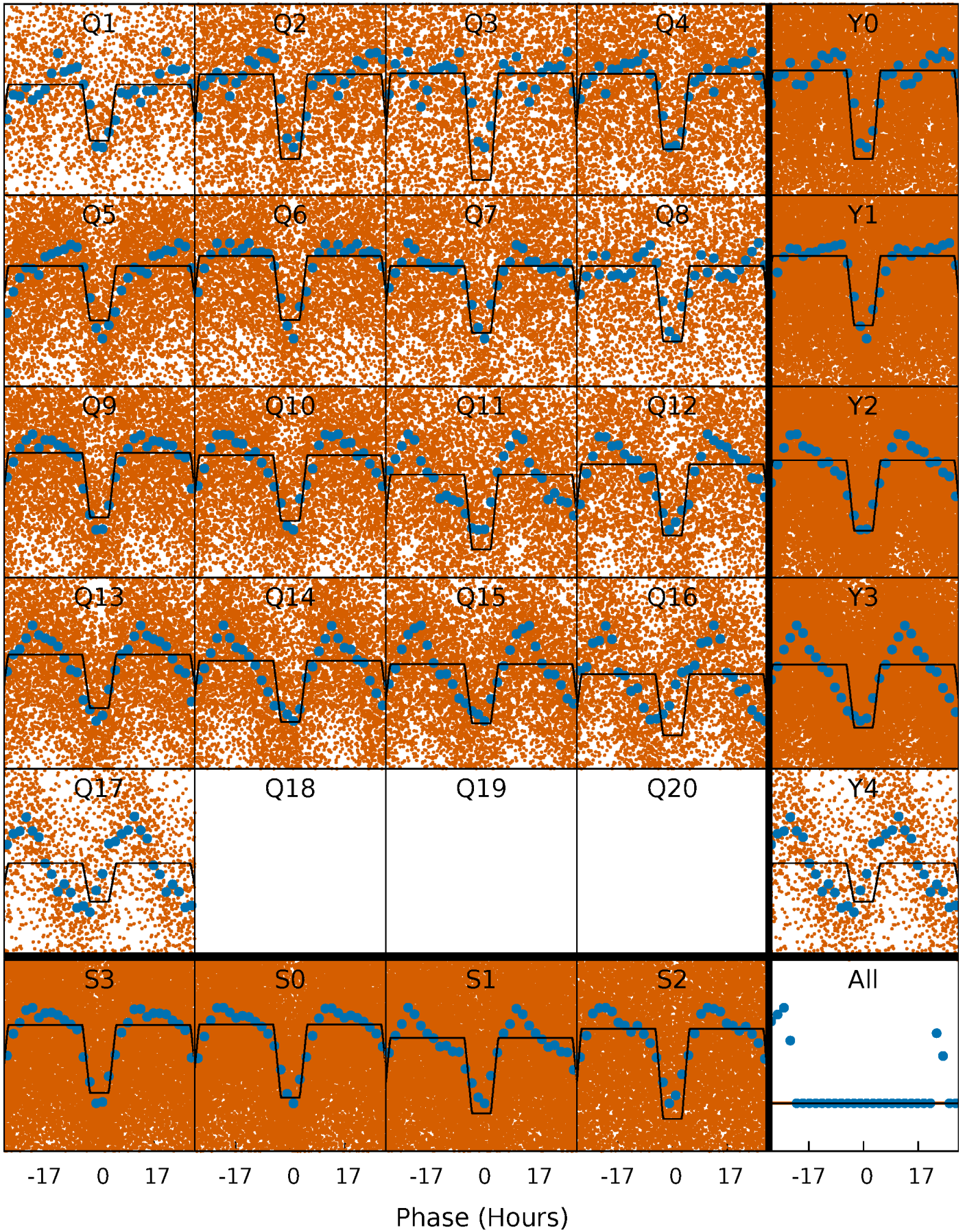
# DV Quarter-Phased Transit Curves

TCE 009655005-01 P= 1.398932 Days  $T_0=132.598202$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009655005-01     $P = 1.398843$  Days     $T_0 = 132.570466$  (BKJD)

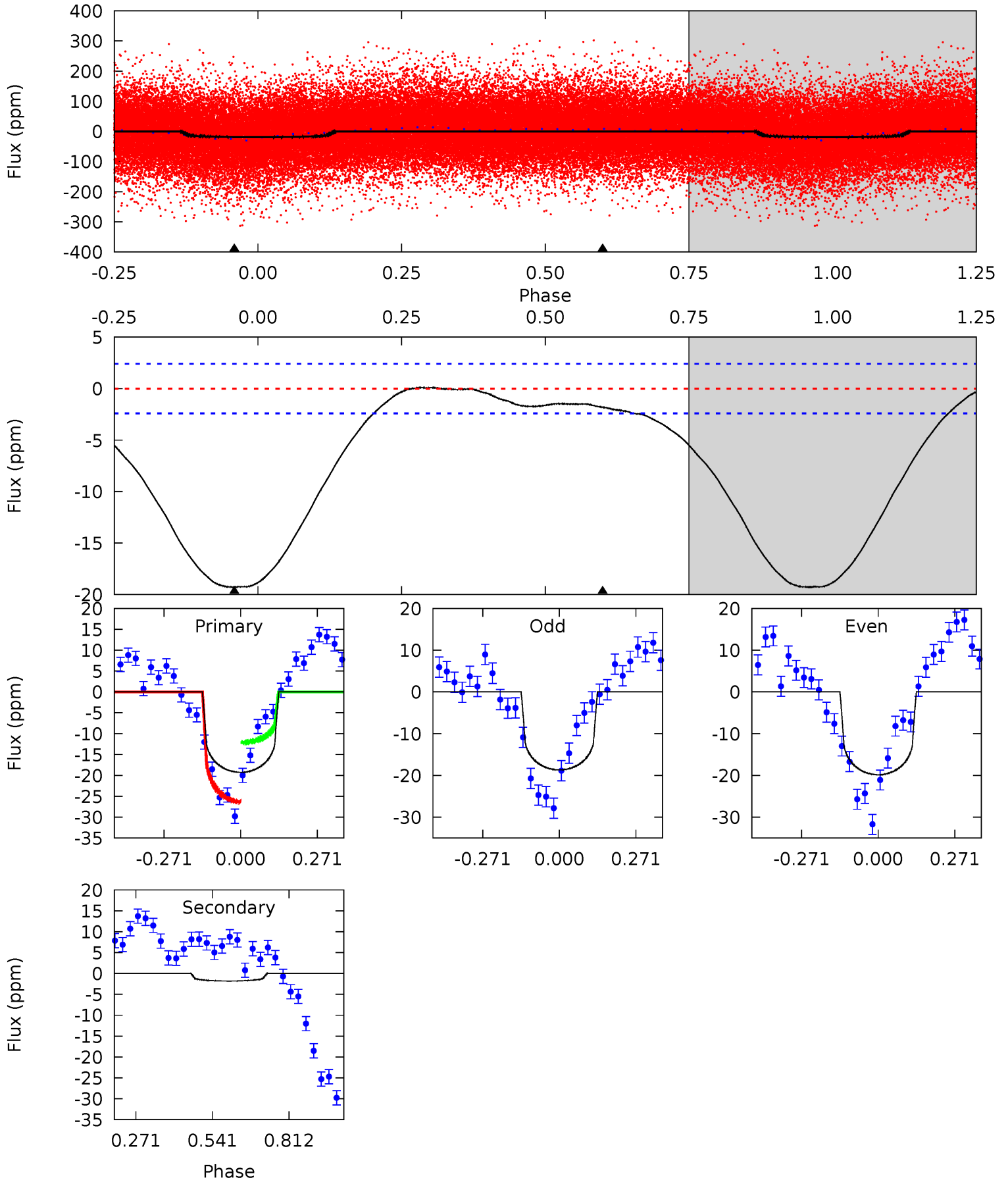




# DV Model-Shift Uniqueness Test

009655005-01, P = 1.398932 Days, E = 131.199270 Days

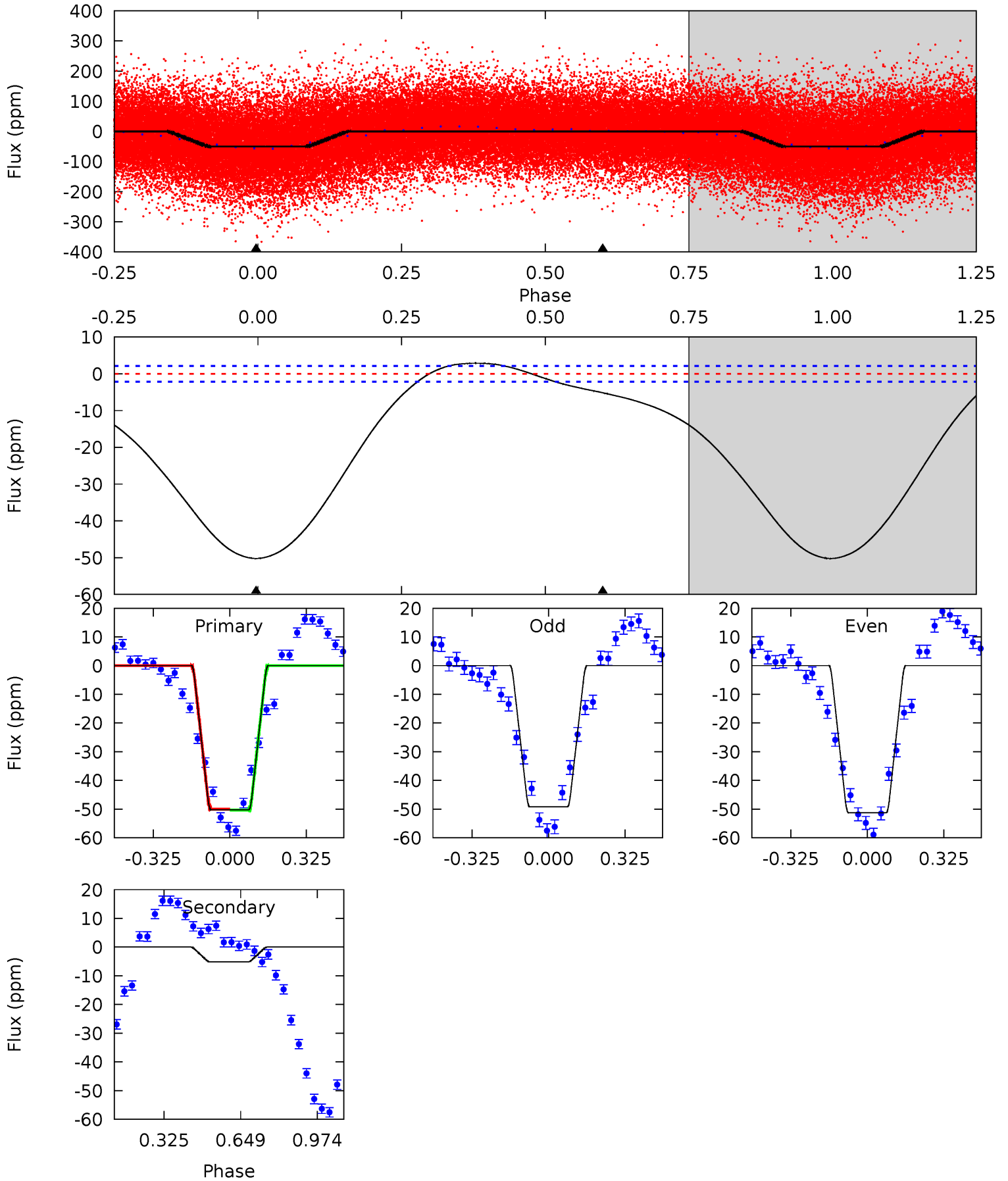
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.8	3.26	0	0	4.35	1.10	0.55	34.8	34.8	3.26	3.26	1.09	1.19	0.00	13.3



# Alt Model-Shift Uniqueness Test

009655005-01, P = 1.398843 Days, E = 131.171623 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
100.9	10.3	0	0	4.31	0.98	5.39	100.9	100.9	10.3	10.3	2.10	1.08	0.05	0.34





### Stellar Parameters For KIC 009655005

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7872^{+70}_{-86}$	$3.732^{+0.238}_{-0.085}$	$0.070^{+0.150}_{-0.200}$	$3.367^{+0.564}_{-1.047}$	$2.228^{+0.171}_{-0.371}$	$0.082^{+0.135}_{-0.023}$
	+1%/-1%	+6%/-2%	+214%/-286%	+17%/-31%	+8%/-17%	+164%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 009655005-01 / KOI 4047.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2\pm 1$	$1.11^{+0.79}_{-0.66}$	$4911^{+220}_{-338}$	$4502^{+3363}_{-7572}$	$0.799^{+4.143}_{-0.539}$
Alt.	$-5\pm 0$	$2.57^{+0.91}_{-0.81}$	$4912^{+218}_{-372}$	$3585^{+1099}_{-6846}$	$0.432^{+0.466}_{-0.195}$

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

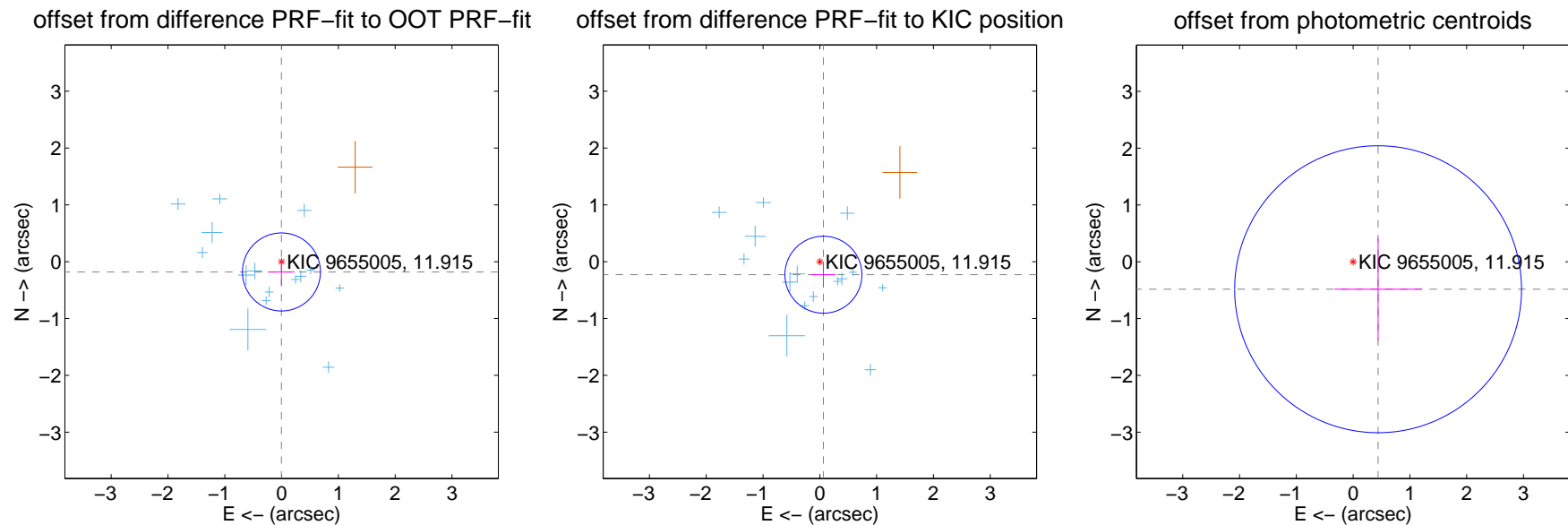
## DV Centroid Data

Supplemental centroid analysis for 009655005-01. **Kepler magnitude: 11.91.** Transit SNR 9.36

There are 15 quarters with good PRF difference image offsets

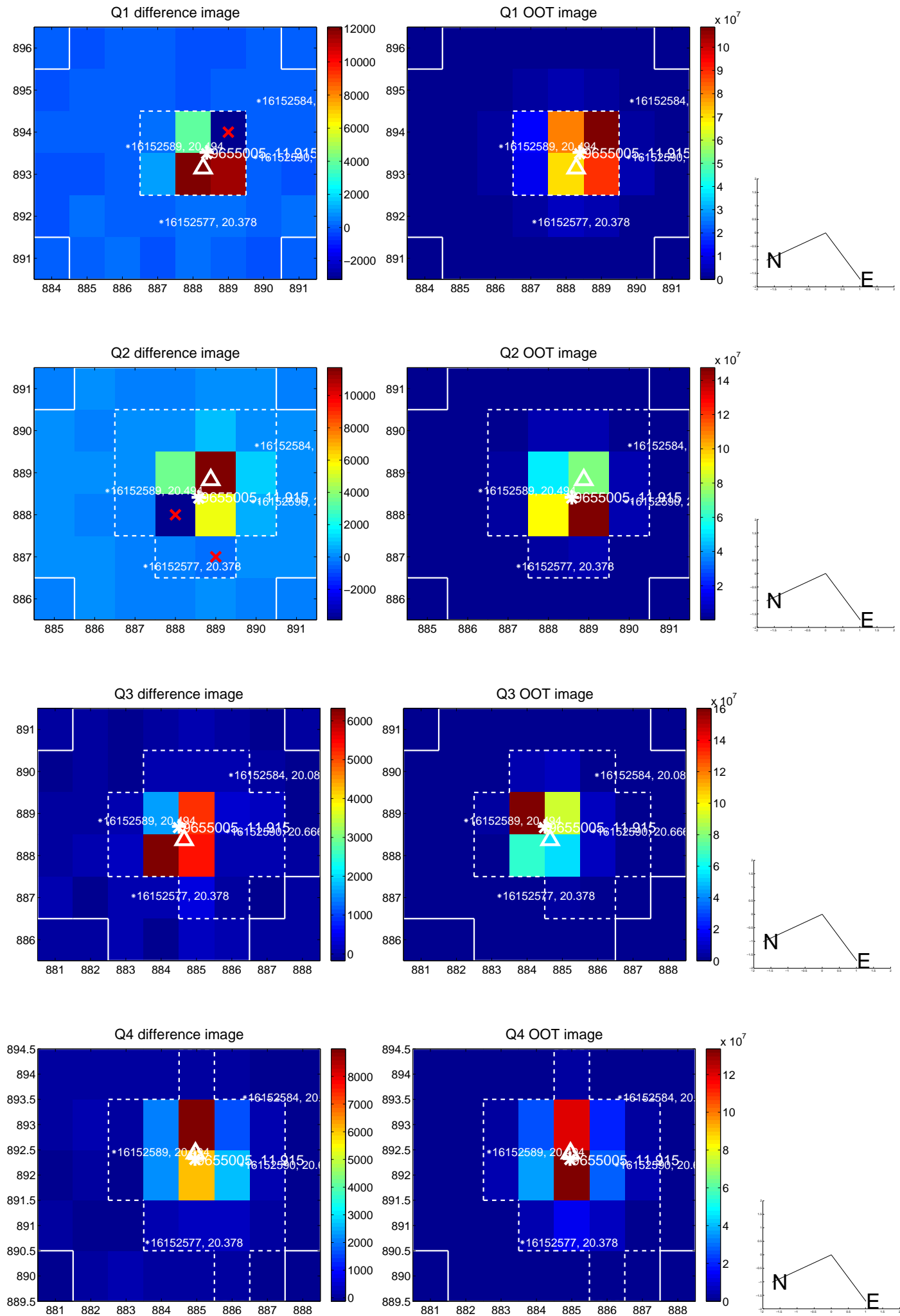
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.181 \pm 0.229$	0.79	$0.003 \pm 0.235$	$-0.181 \pm 0.229$
PRF-fit source offset from KIC position	$0.237 \pm 0.226$	1.05	$-0.063 \pm 0.215$	$-0.229 \pm 0.224$
photometric centroid source offset	$0.65 \pm 0.84$	0.78	$-0.44 \pm 0.77$	$-0.48 \pm 0.90$

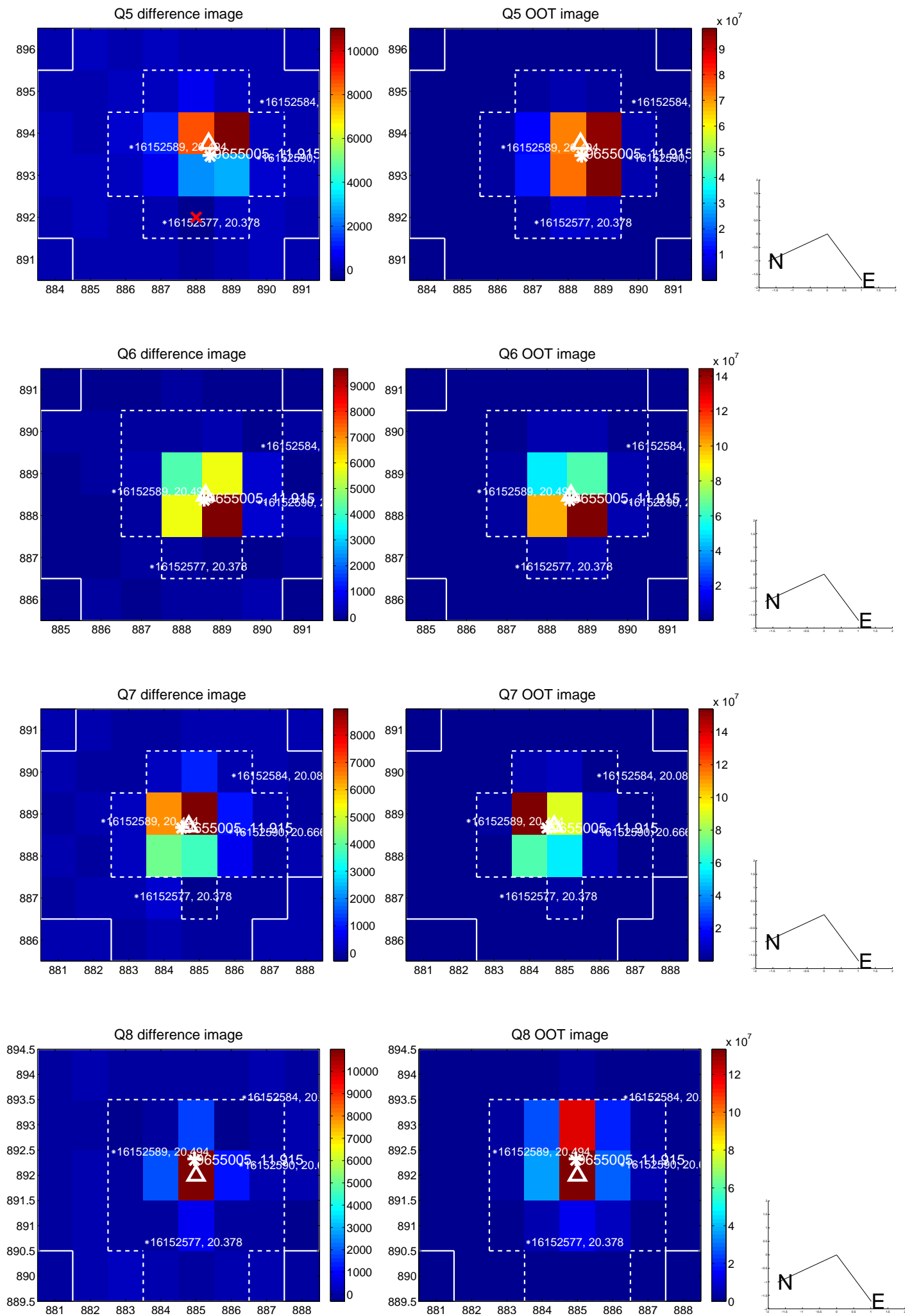


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

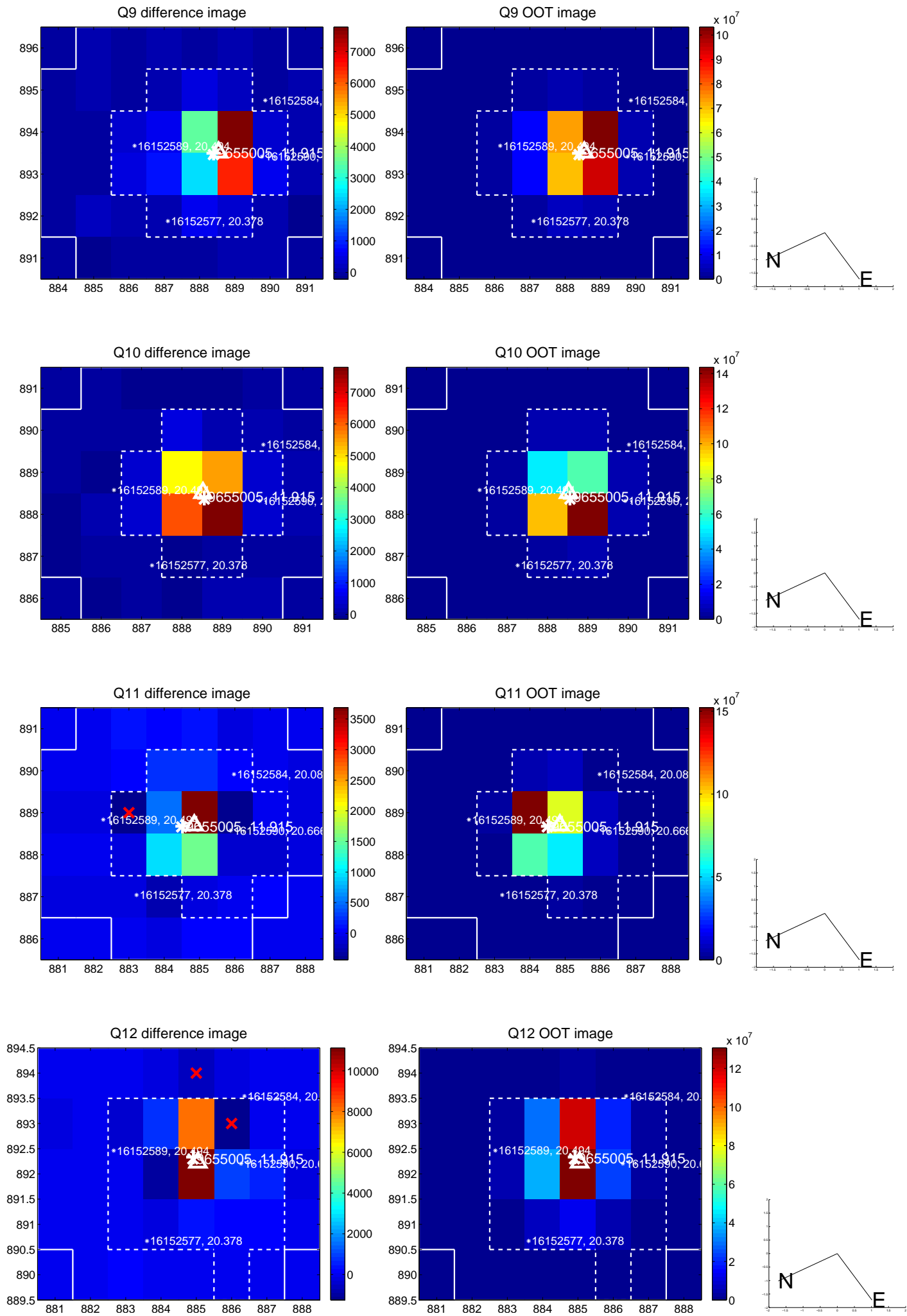


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

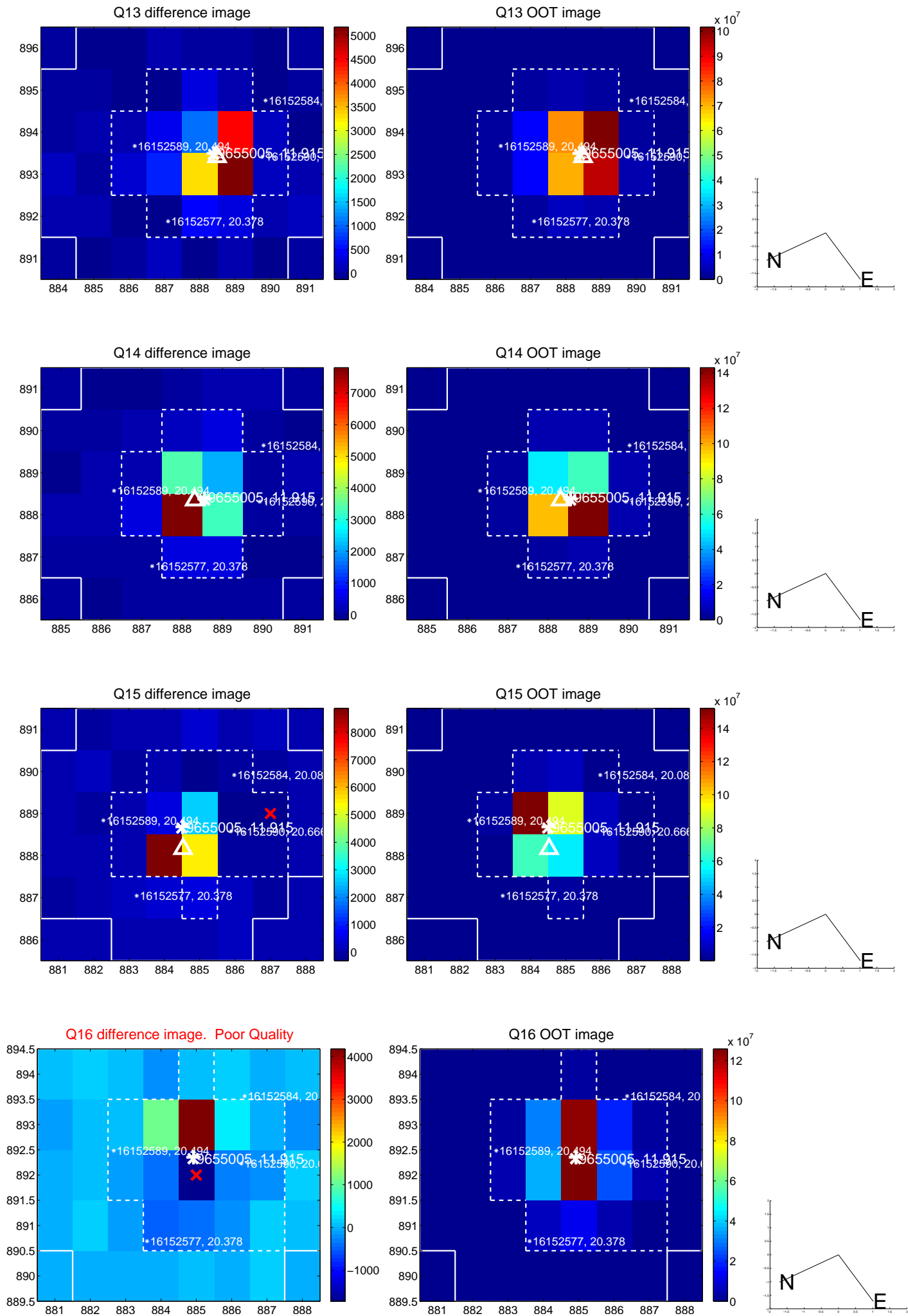




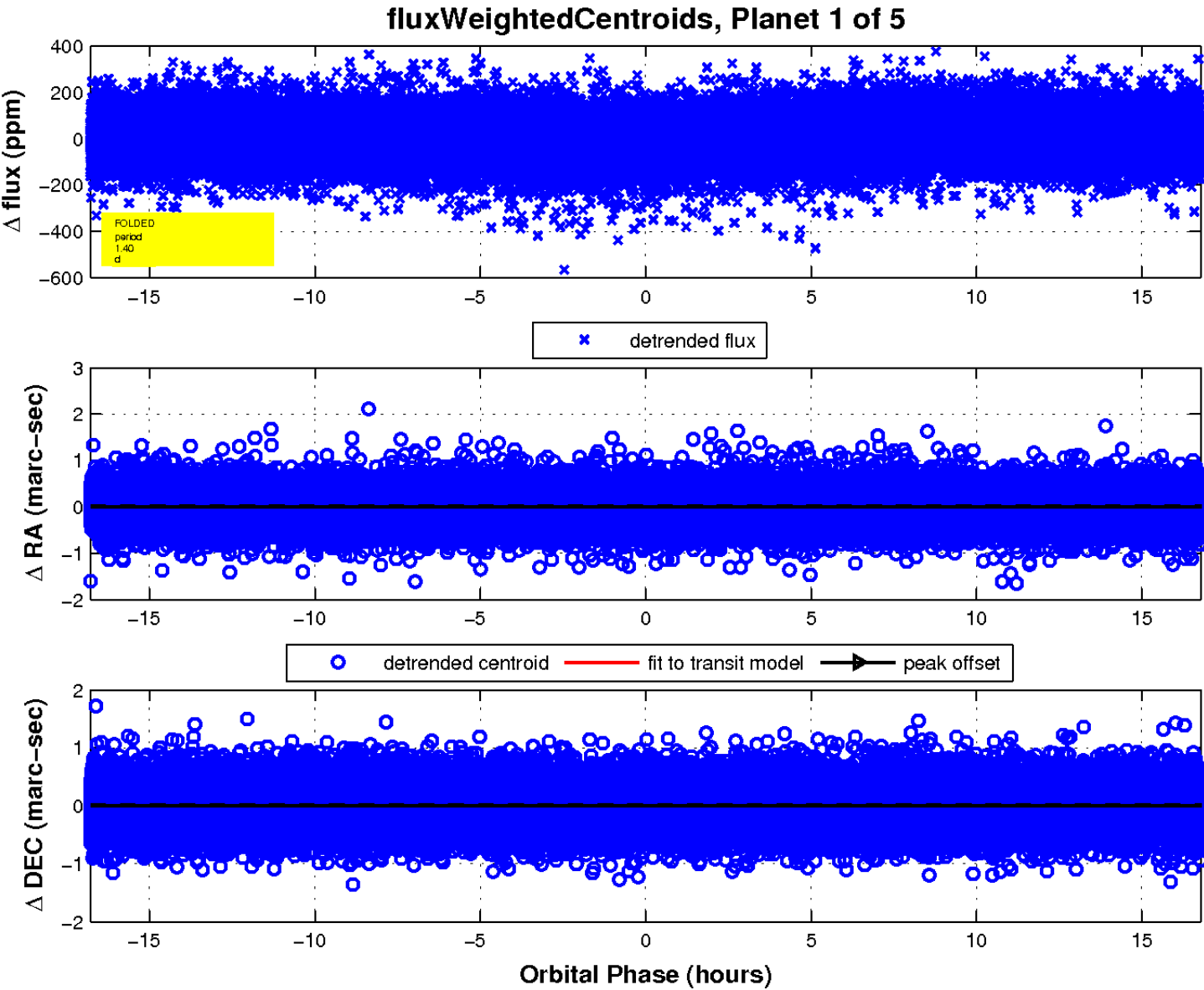
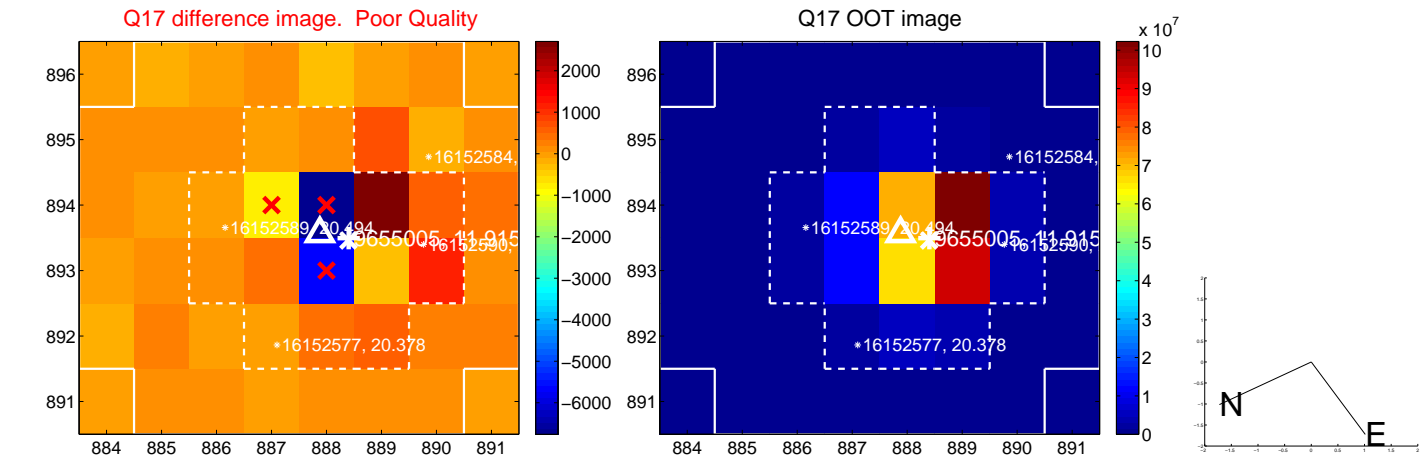
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

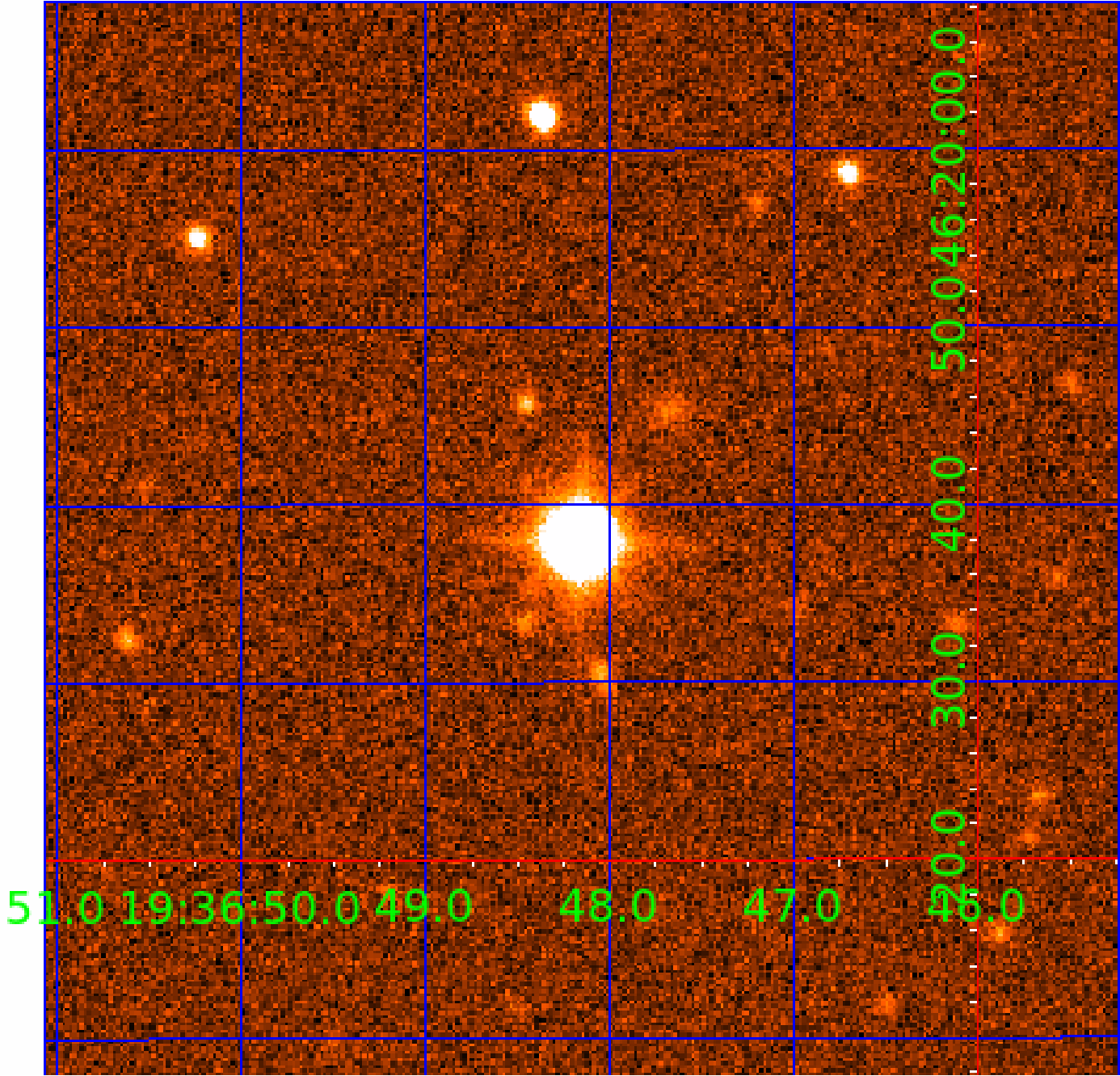


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UKIRT Image

Declination





# KIC 009655005

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655005-01	OBS	4047.01	1.398932	132.598202	8.9	8.626	13.2	9.4	3.37	7872	1.01	38106.71
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009655005-05	OBS	No	604.344606	178.043786	93.8	5.233	8.4	8.0	3.37	7872	3.37	11.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655005-01	OBS	PC	0.20	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV
009655005-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—HALO_GHOST
009655005-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009655005-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009655005-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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 009655005-02

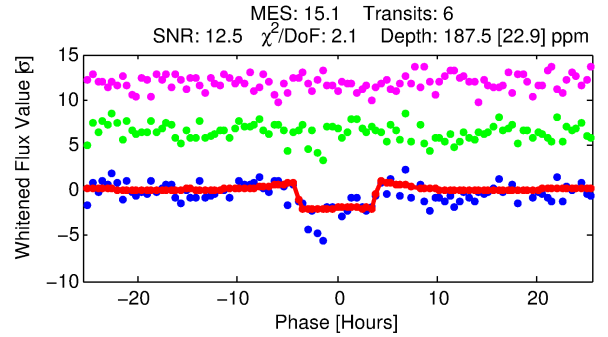
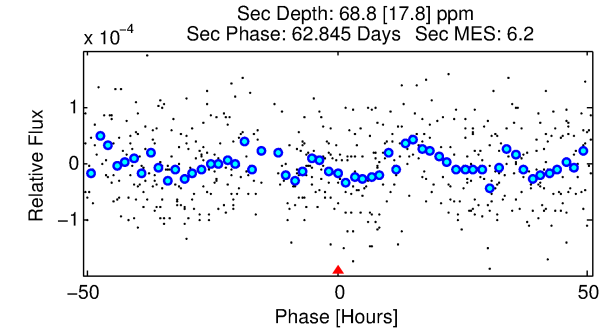
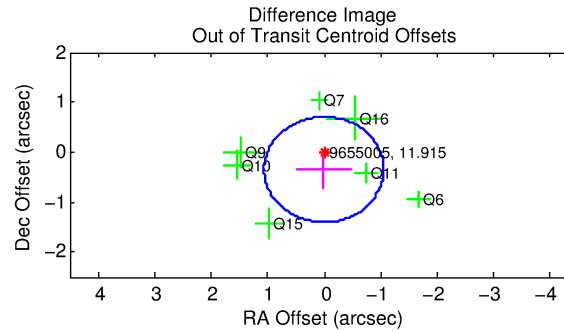
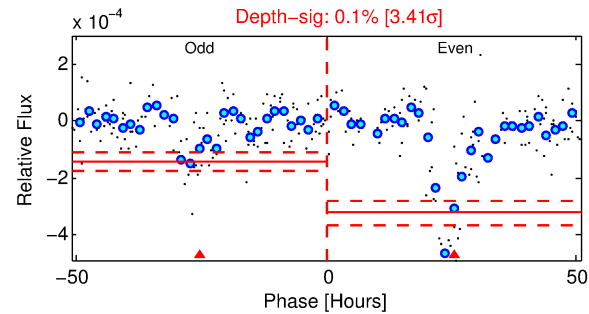
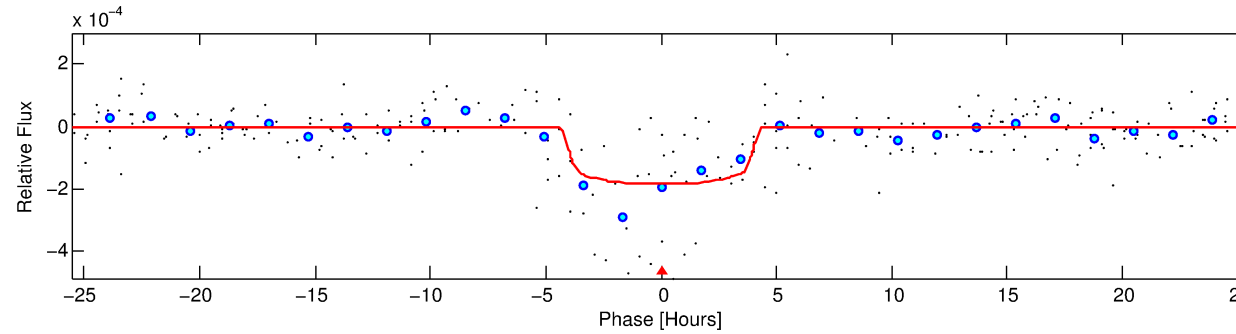
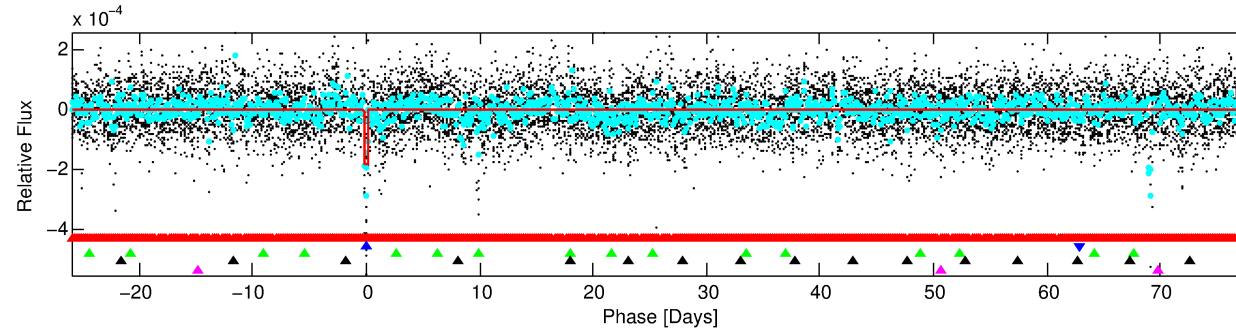
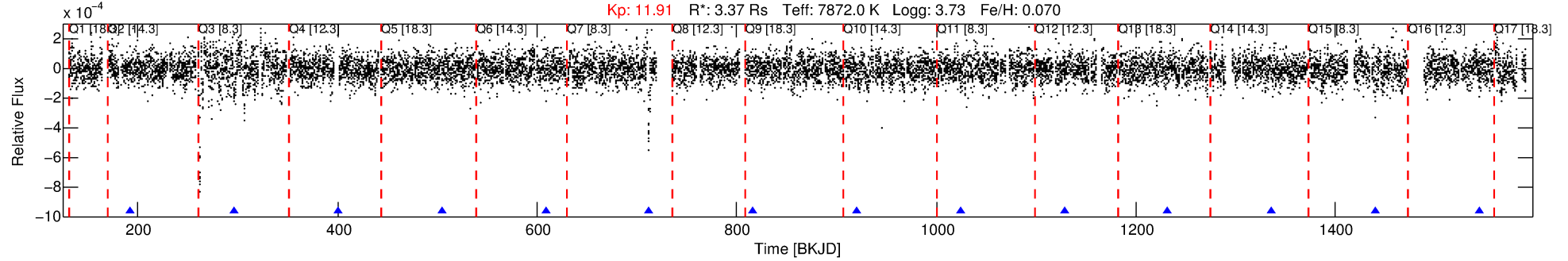
No Significant Match Found

# DV One-Page Summary

KIC: 9655005 Candidate: 2 of 5 Period: 103.926 d

KOI: K04047 Corr: No Ephemeris Match

Kp: 11.91 R\*: 3.37 Rs Teff: 7872.0 K Logg: 3.73 Fe/H: 0.070



## DV Fit Results:

Period = 103.92561 [0.00146] d  
Epoch = 192.9108 [0.0138] BKJD  
Rp/R\* = 0.0143 [0.0046]  
a/R\* = 48.78 [90.57]  
b = 0.87 [0.52]  
Seff = 122.02 [51.53]  
Teq = 847 [89] K  
Rp = 5.26 [2.34] Re  
a = 0.5654 [0.1562] AU  
Ag = 437.50 [352.47] [1.24σ]  
Teffp = 5993 [1032] K [4.97σ]

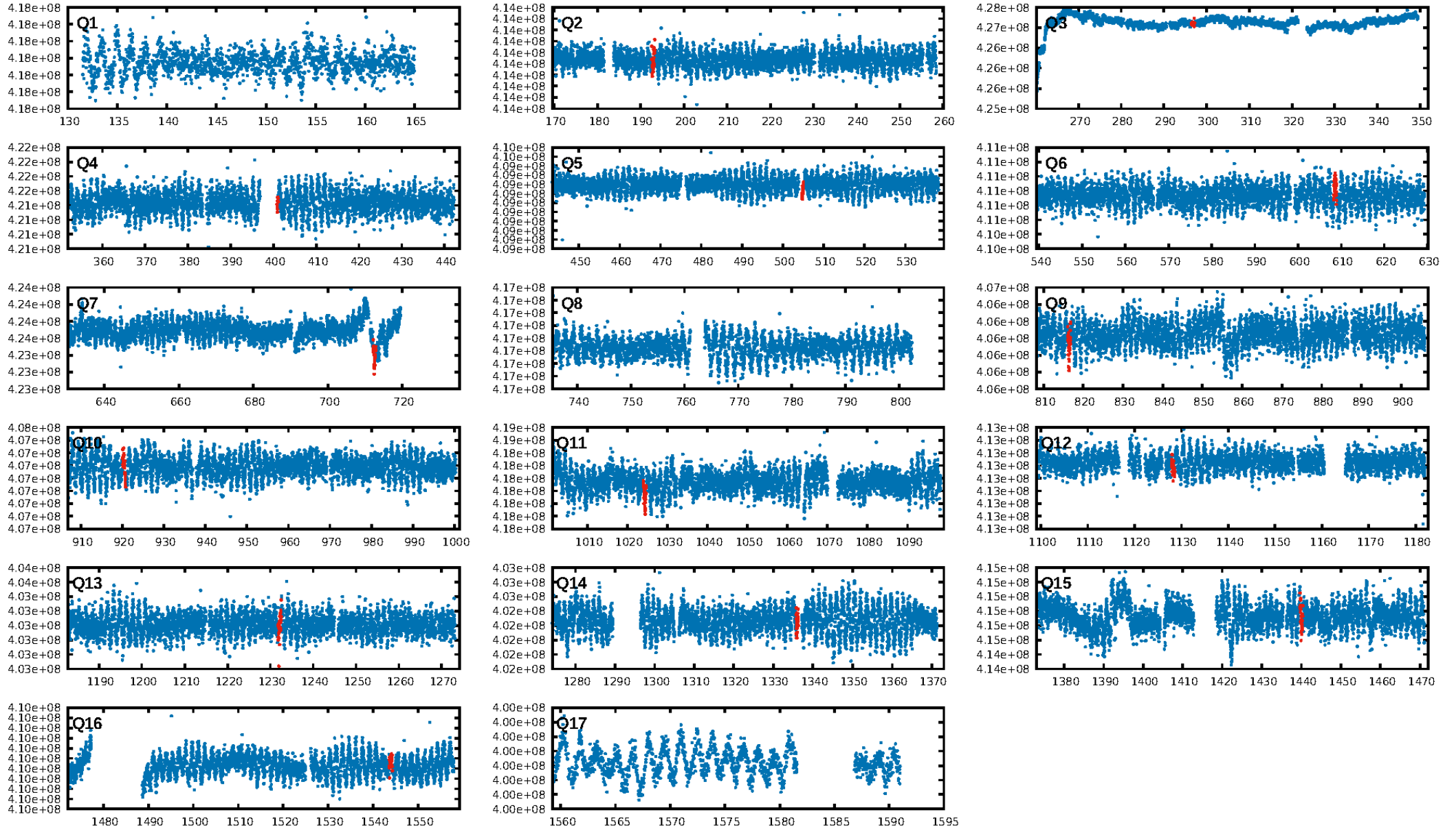
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.56σ]  
LongPeriod-sig: 100.0% [1201.66σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 98.5%  
Bootstrap-pfa: 1.94e-30  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 0.07959  
Centroid-sig: 6.8%  
Centroid-so: 0.416 arcsec [1.11σ]  
OotOffset-rm: 0.349 arcsec [0.99σ]  
OotOffset-st: 2/3/1/1 [7]  
KicOffset-rm: 0.436 arcsec [1.24σ]  
KicOffset-st: 2/3/1/1 [7]  
DiffImageQuality-fgm: 0.57 [4/7]  
DiffImageOverlap-fno: 0.00 [0/10]

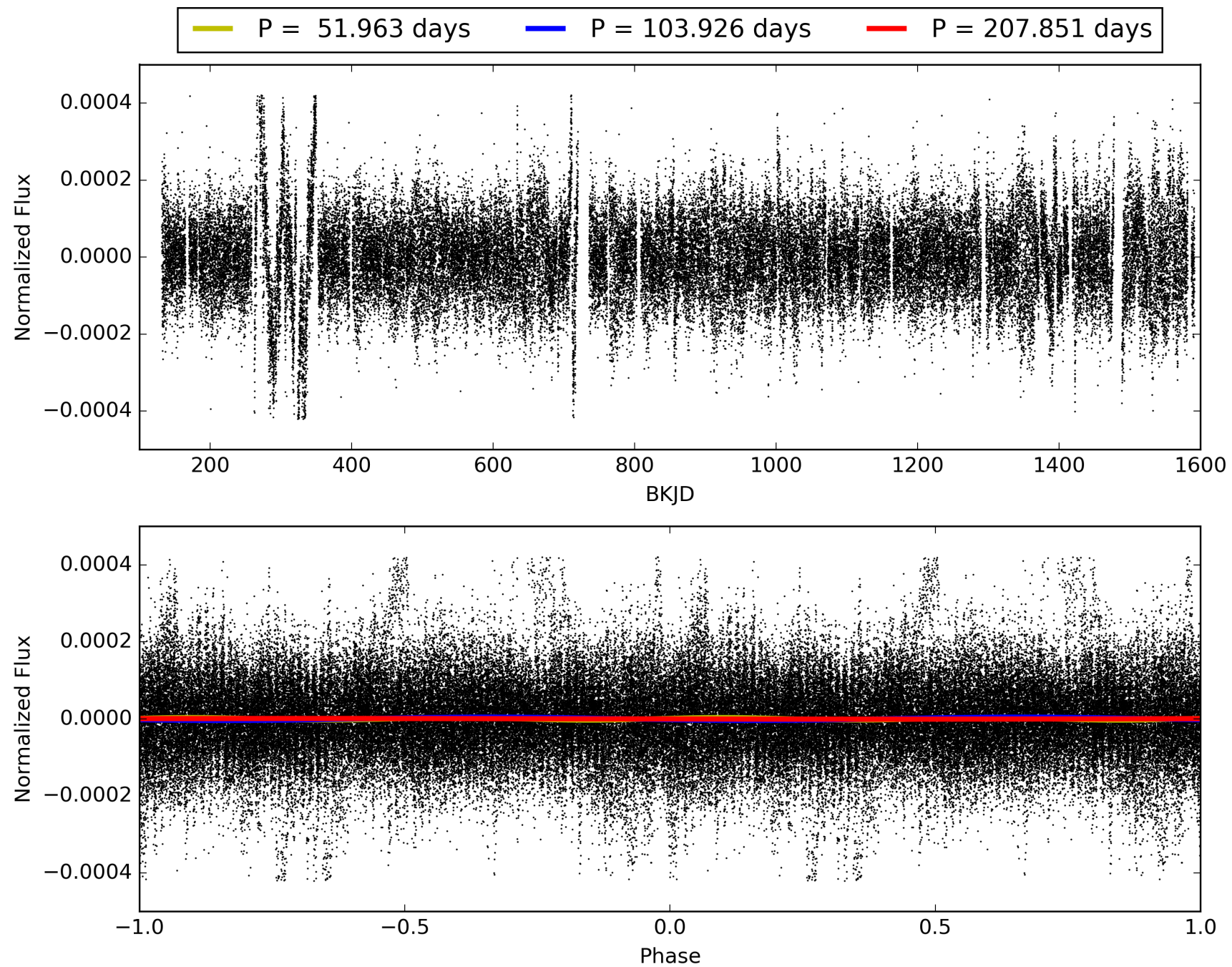
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:13:59 Z

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

# TCE 009655005-02, PDC Light Curves



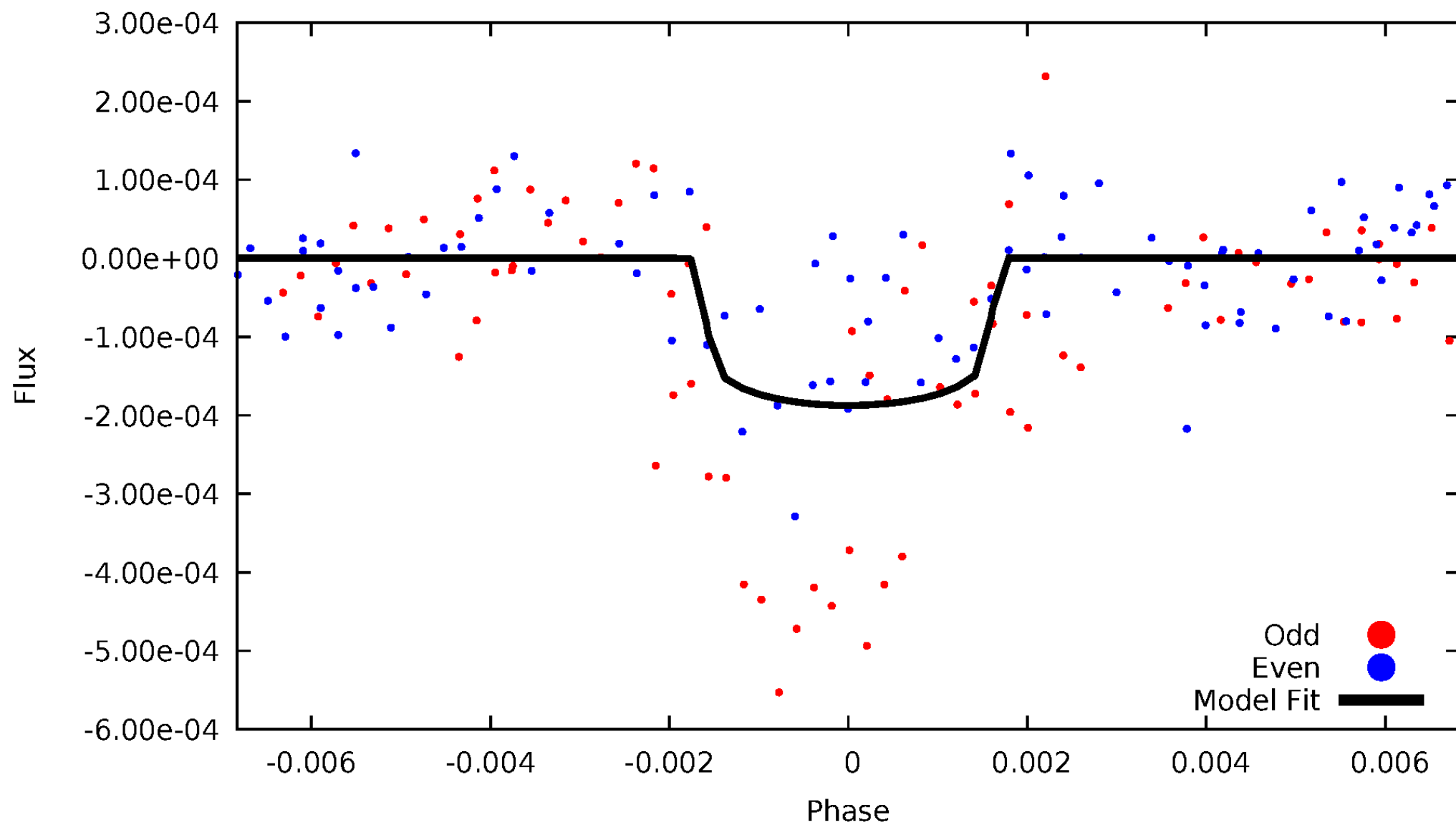
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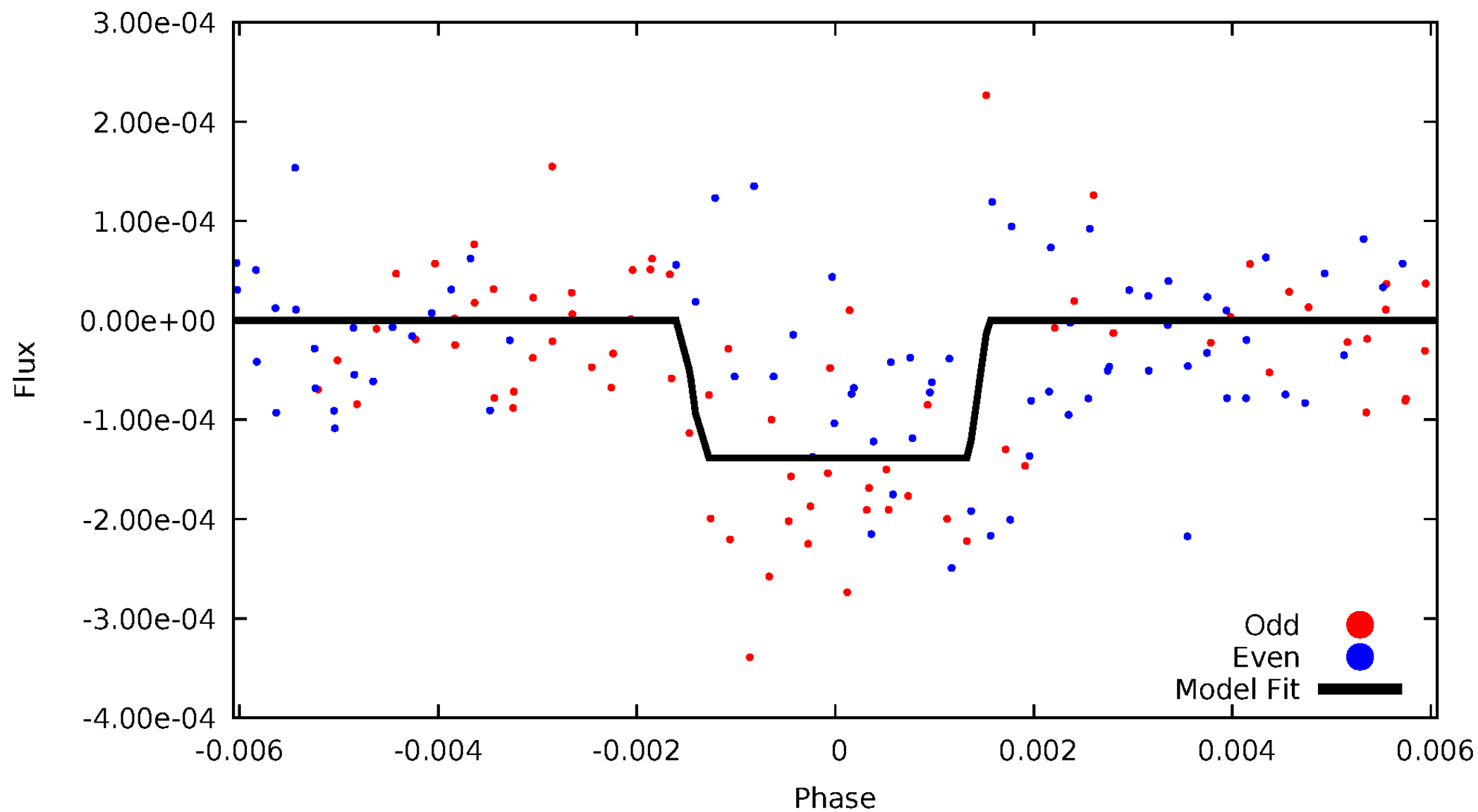
# DV Odd/Even

TCE 009655005-02



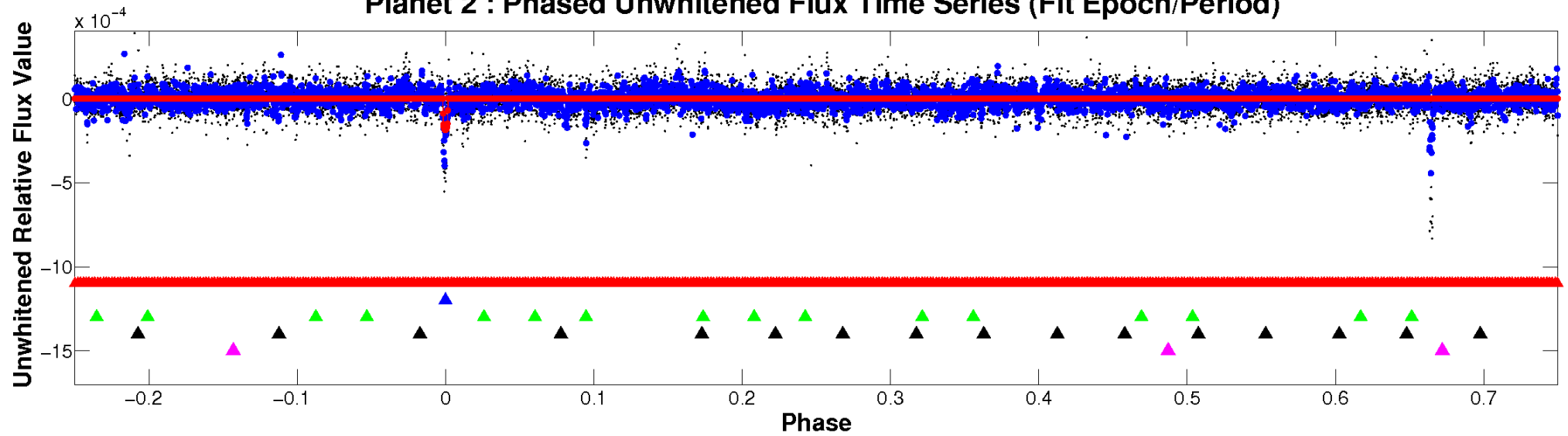
# ALT Odd/Even

TCE 009655005-02

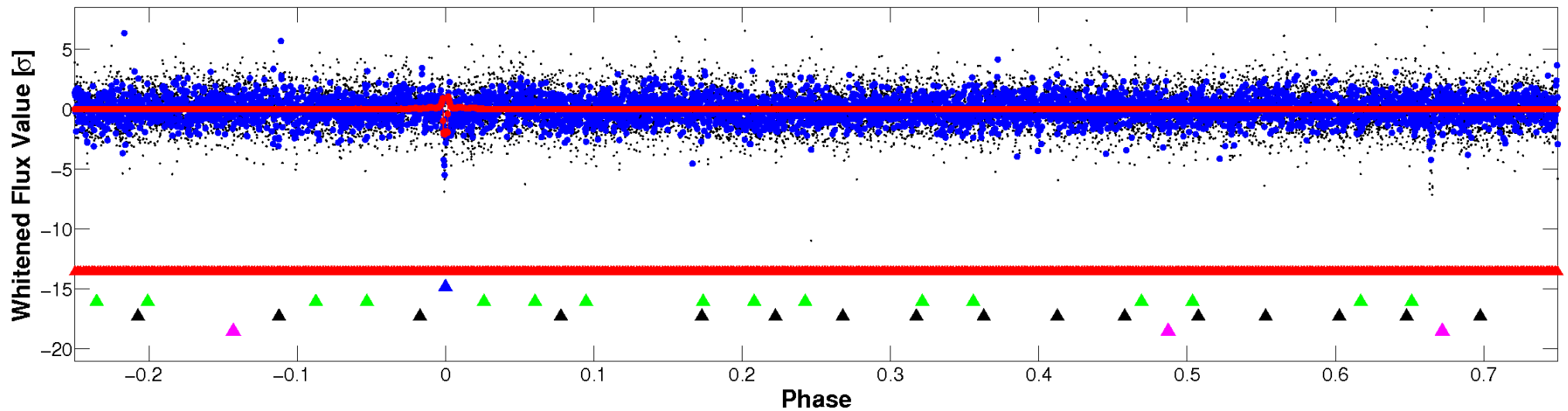


# Non-Whitened Vs. Whitened Light Curve

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

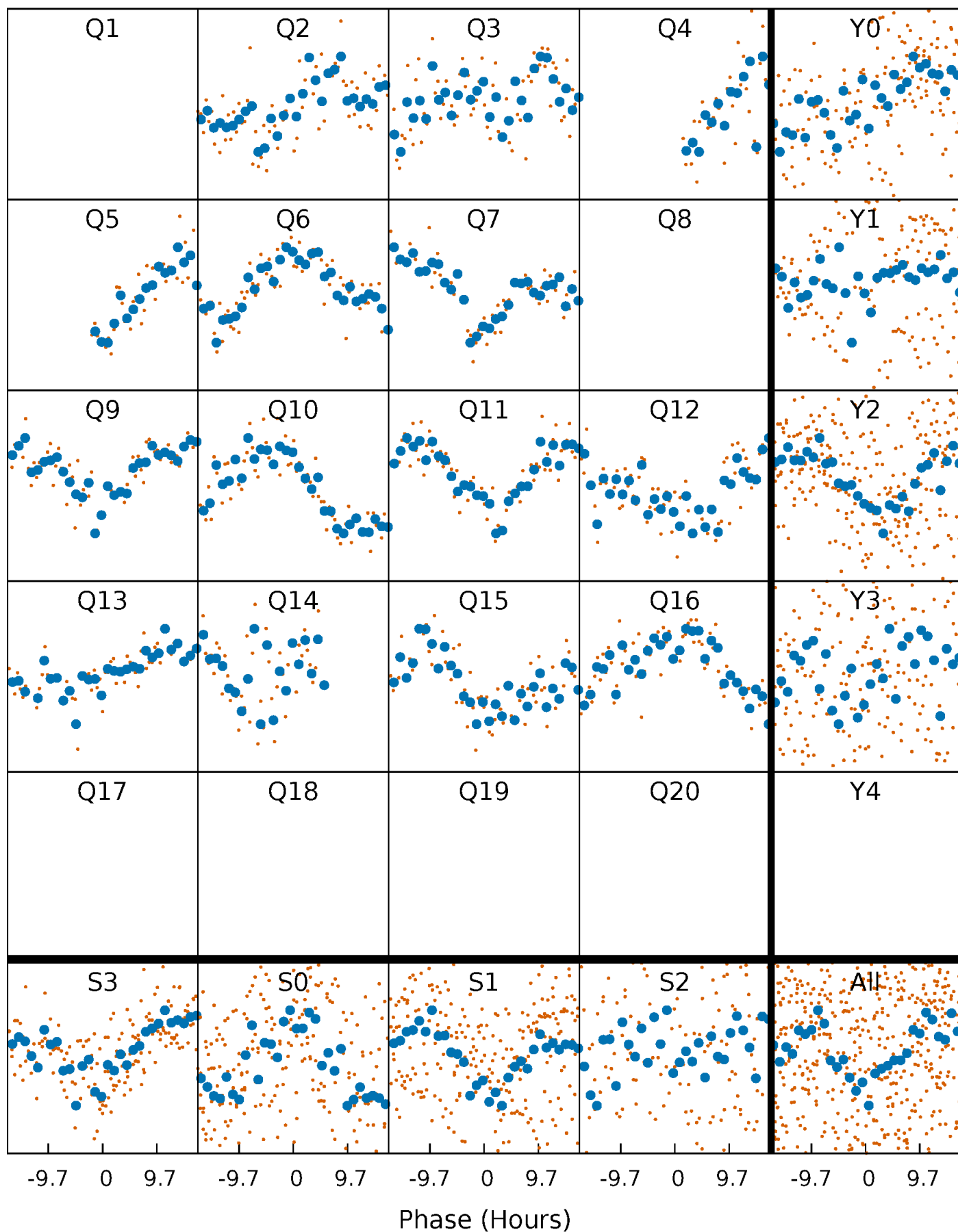


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

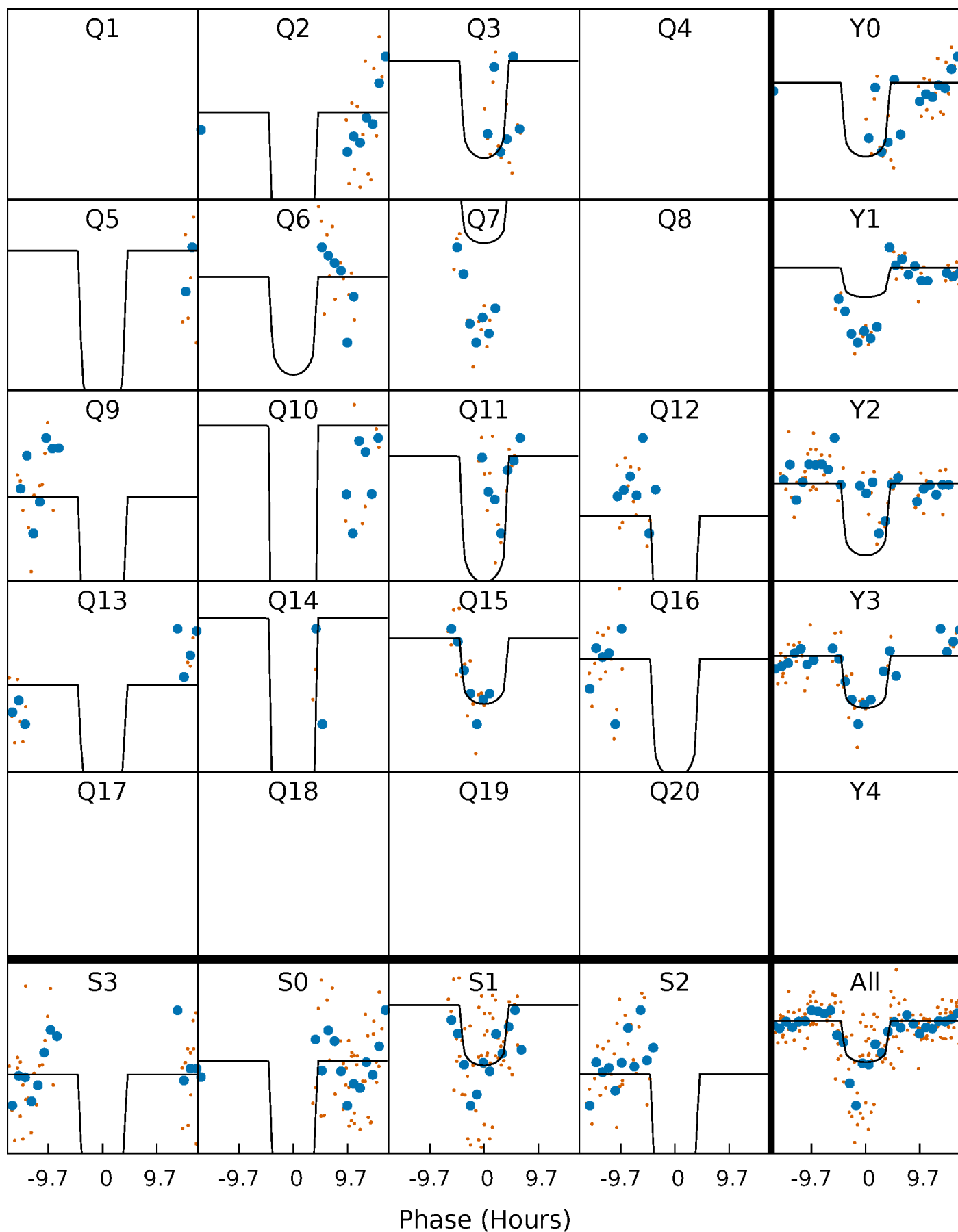
TCE 009655005-02 P=103.925614 Days  $T_0=192.910813$  (BKJD)





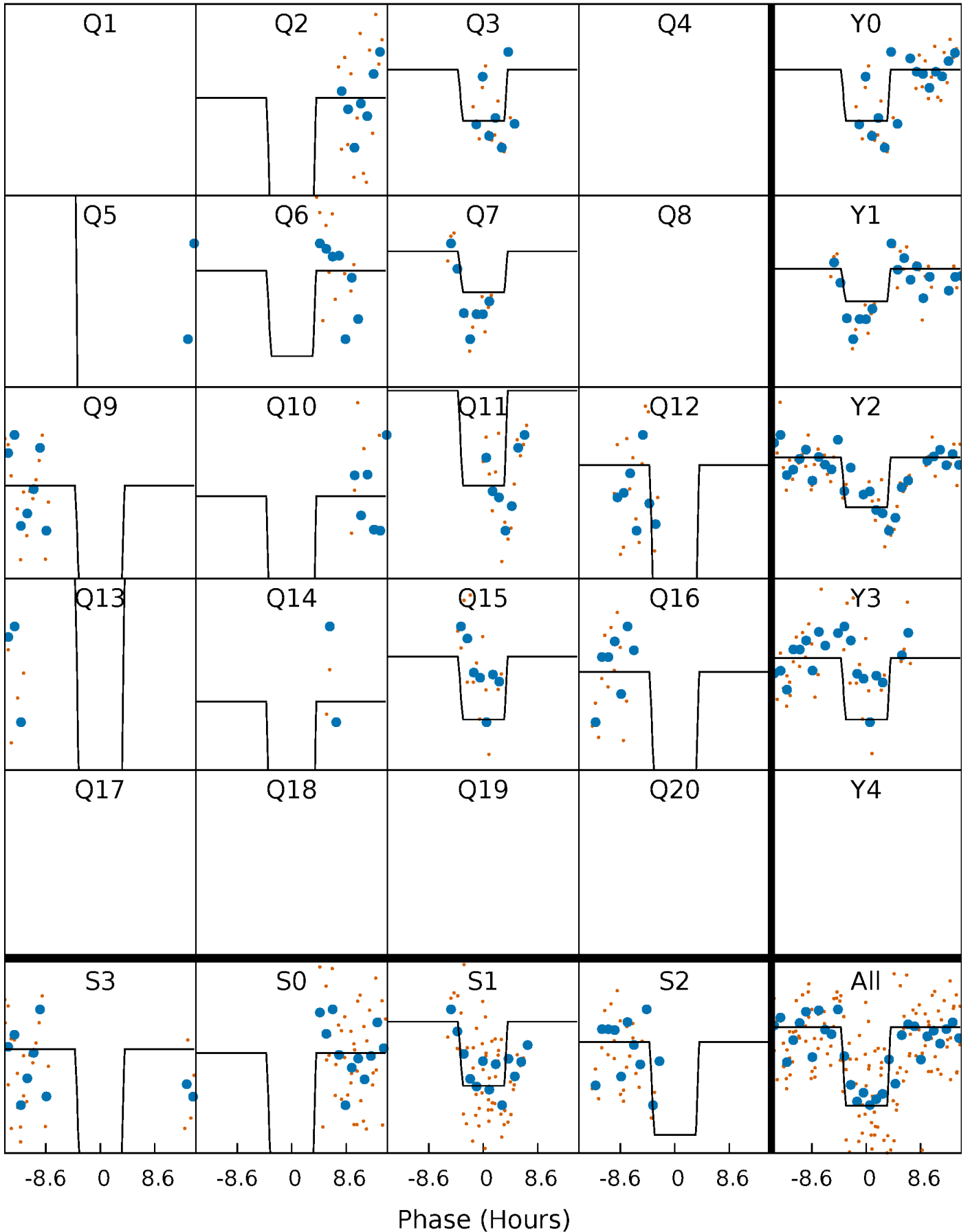
# DV Quarter-Phased Transit Curves

TCE 009655005-02 P=103.925614 Days  $T_0=192.910813$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

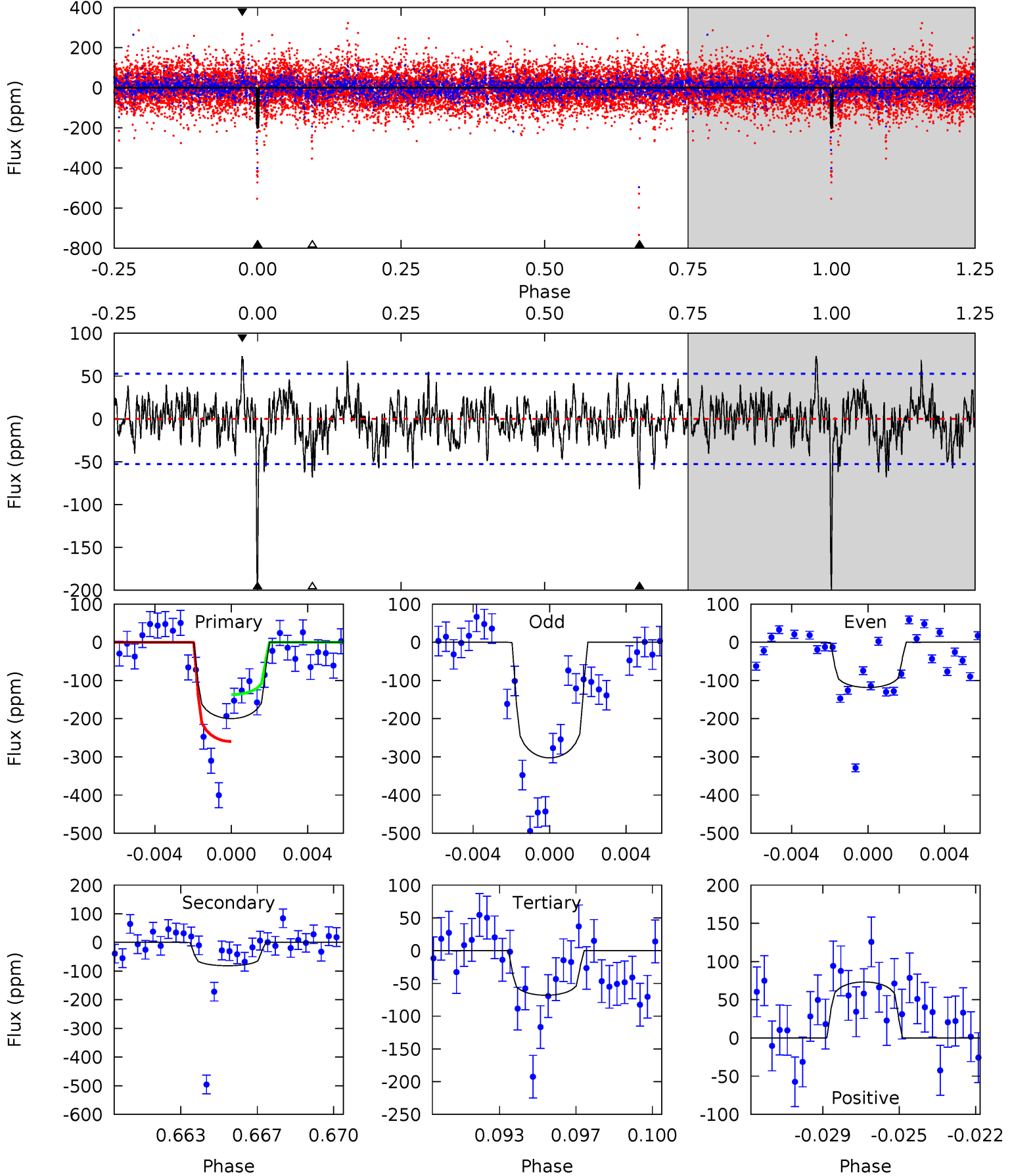
TCE 009655005-02 P=103.910113 Days  $T_0=192.997343$  (BKJD)



# DV Model-Shift Uniqueness Test

009655005-02, P = 103.925614 Days, E = 88.985199 Days

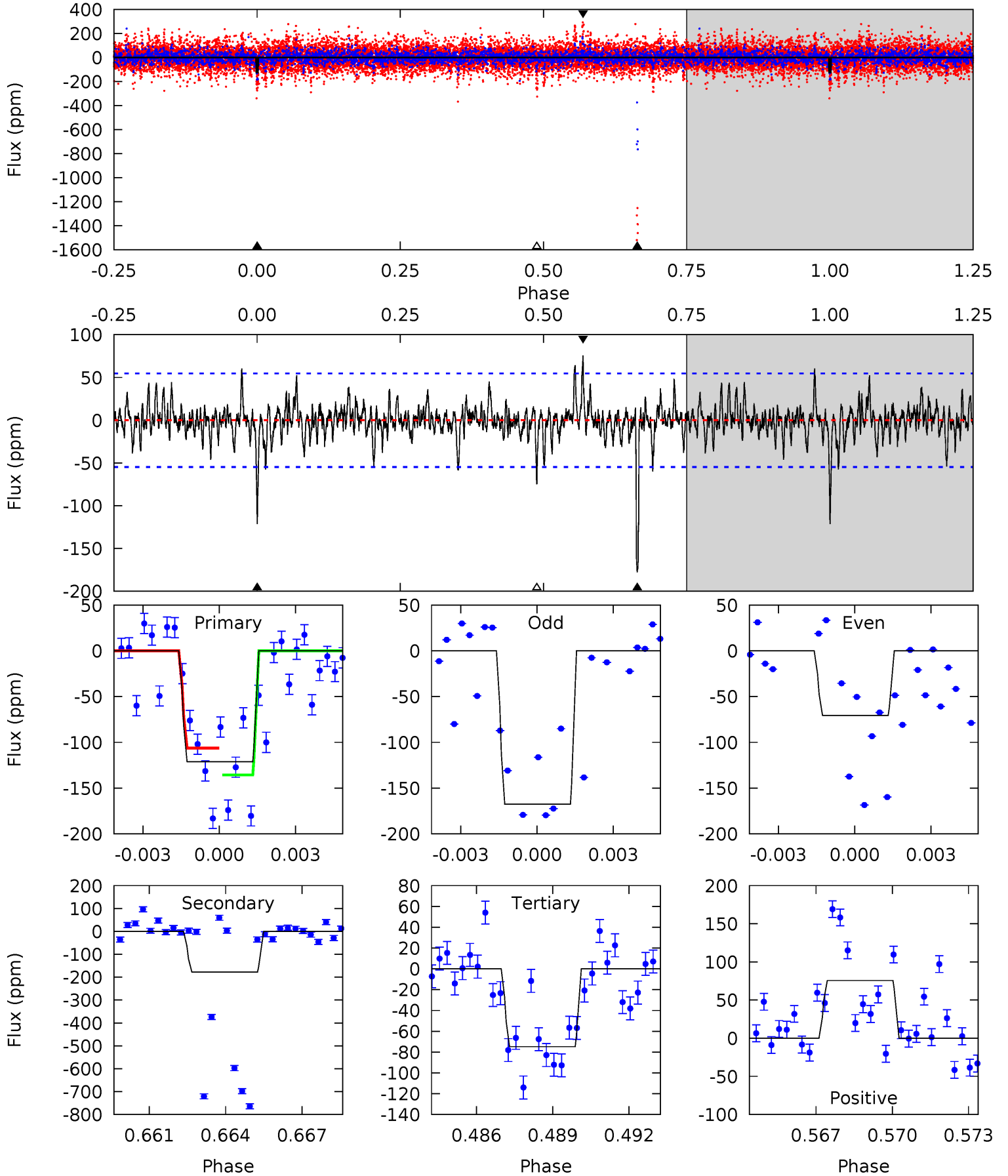
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	8.06	6.75	7.26	5.22	2.91	1.90	13.0	12.5	1.31	0.80	9.31	1.33	0.27	5.93



# Alt Model-Shift Uniqueness Test

009655005-02, P = 103.910113 Days, E = 89.087230 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	17.1	7.18	7.25	5.25	2.97	1.54	4.46	4.39	9.87	9.80	4.03	0.87	0.30	1.42





### Stellar Parameters For KIC 009655005

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7872^{+70}_{-86}$	$3.732^{+0.238}_{-0.085}$	$0.070^{+0.150}_{-0.200}$	$3.367^{+0.564}_{-1.047}$	$2.228^{+0.171}_{-0.371}$	$0.082^{+0.135}_{-0.023}$
	+1%/-1%	+6%/-2%	+214%/-286%	+17%/-31%	+8%/-17%	+164%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 009655005-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-81 \pm 10$	$4.84^{+1.85}_{-1.58}$	$1168^{+56}_{-89}$	$6139^{+1427}_{-758}$	$593^{+724}_{-273}$
Alt.	$-178 \pm 10$	$4.01^{+1.81}_{-1.55}$	$1167^{+57}_{-83}$	$8572^{+3264}_{-1629}$	$1953^{+2988}_{-1054}$

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

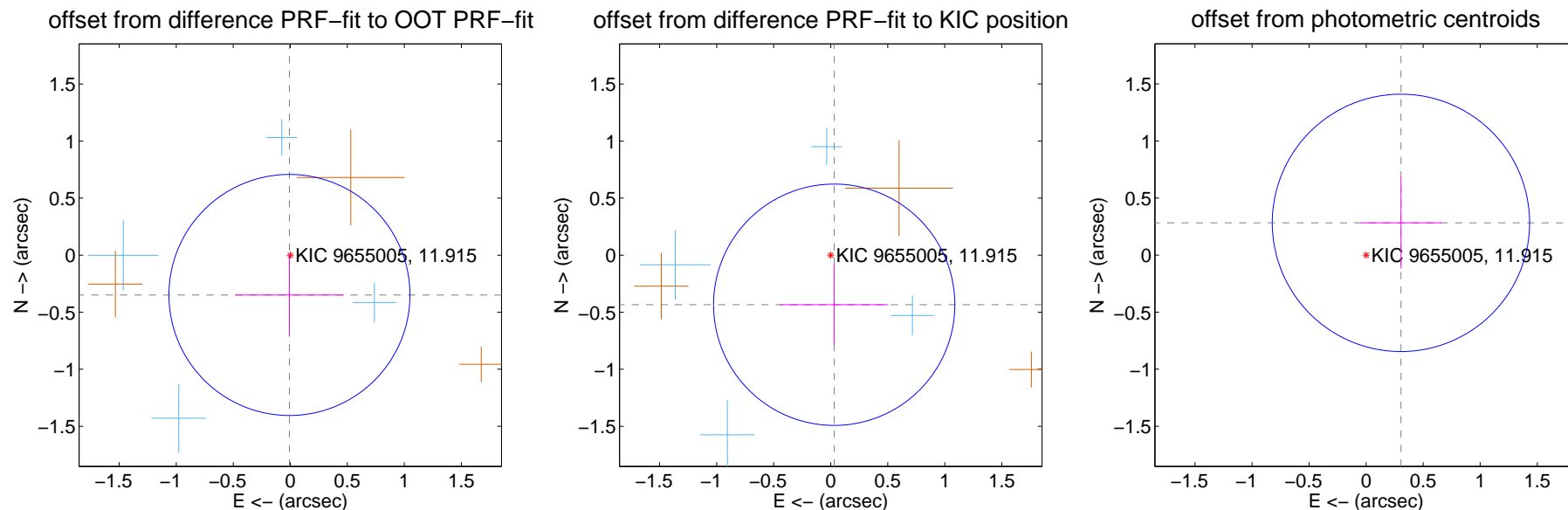
## DV Centroid Data

Supplemental centroid analysis for 009655005-02. **Kepler magnitude: 11.91.** Transit SNR 12.51

There are 4 quarters with good PRF difference image offsets

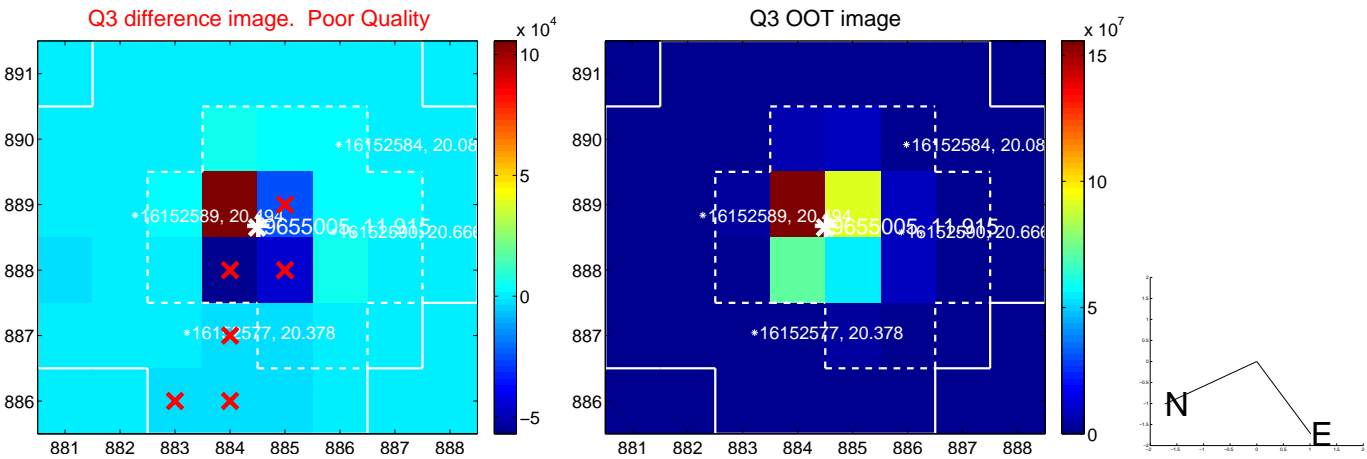
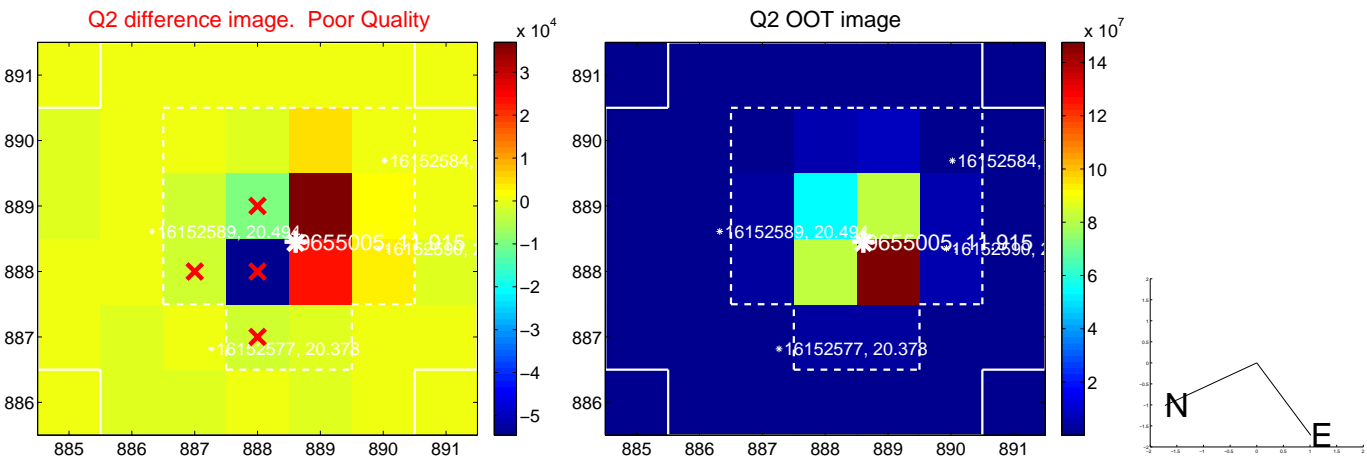
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.349 \pm 0.352$	0.99	$0.007 \pm 0.476$	$-0.349 \pm 0.352$
PRF-fit source offset from KIC position	$0.436 \pm 0.353$	1.24	$-0.031 \pm 0.473$	$-0.435 \pm 0.352$
photometric centroid source offset	$0.42 \pm 0.38$	1.11	$-0.31 \pm 0.35$	$0.28 \pm 0.40$

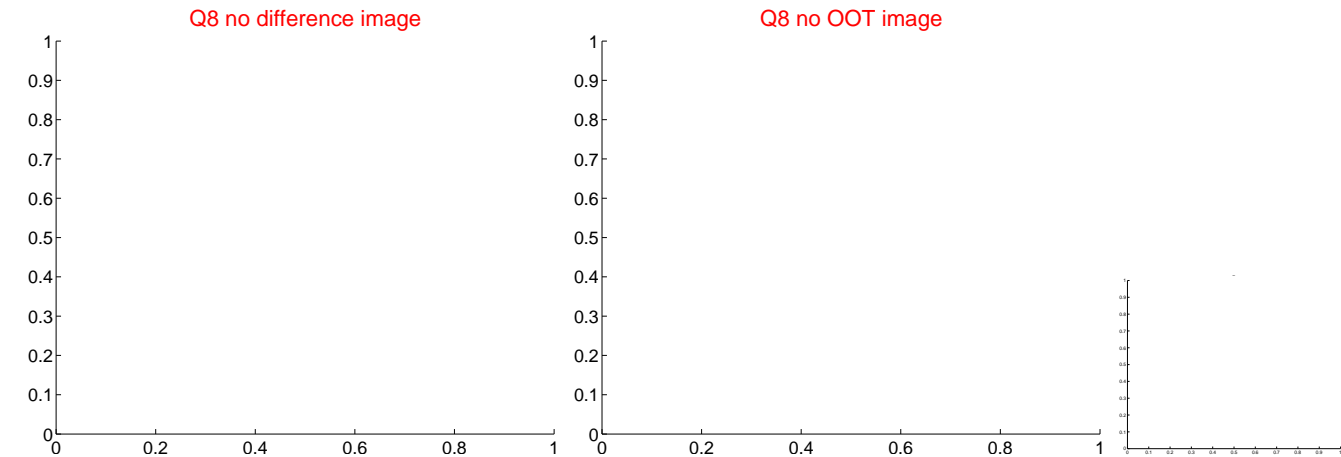
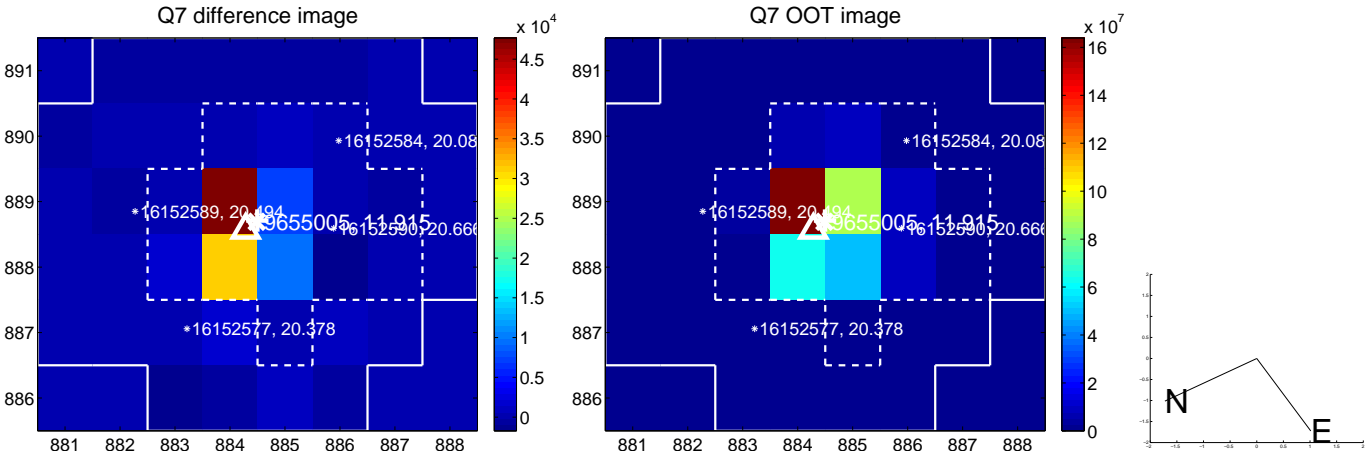
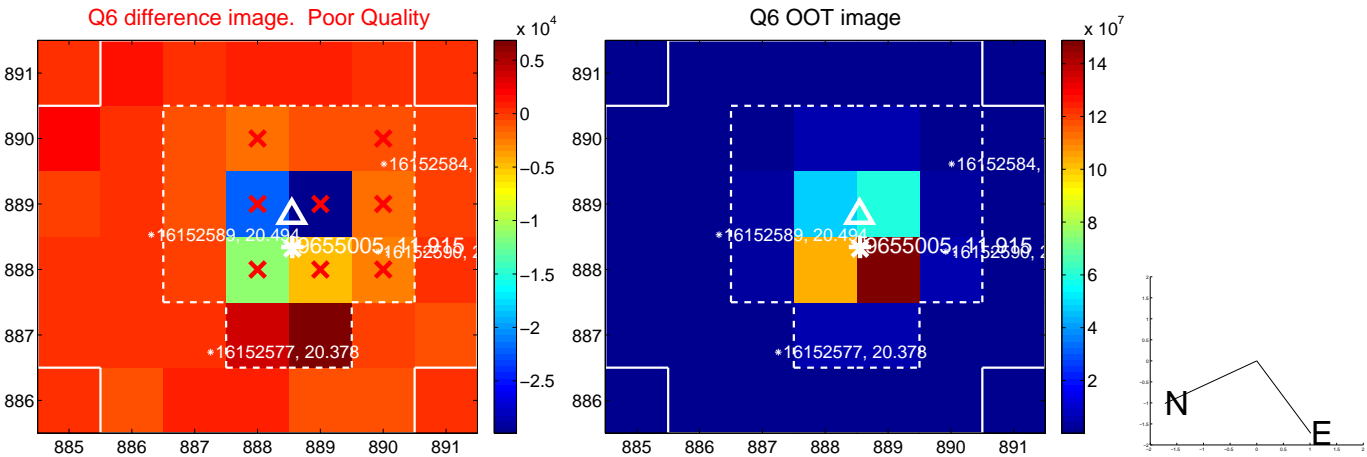
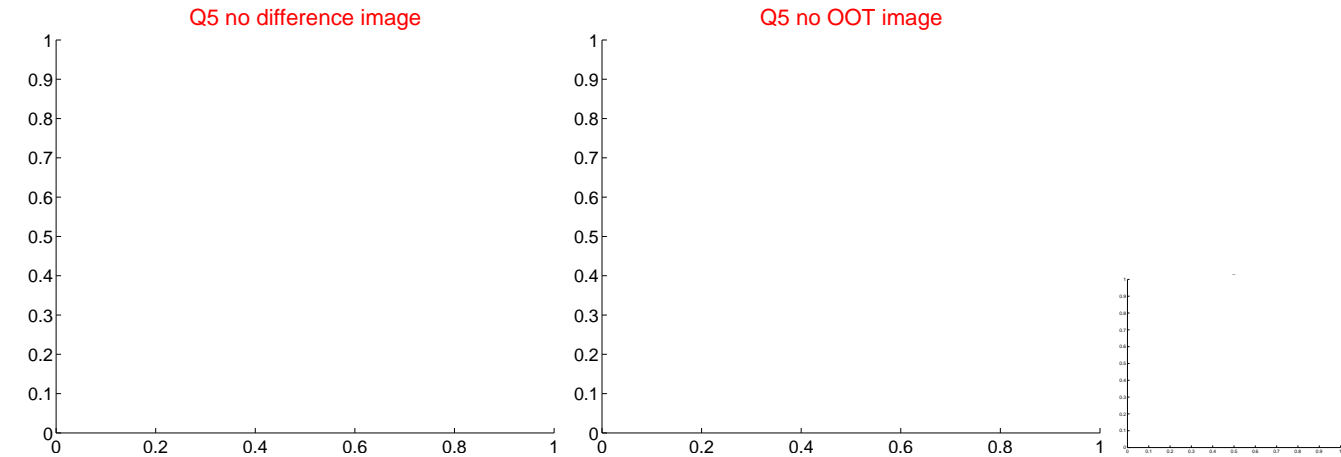


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

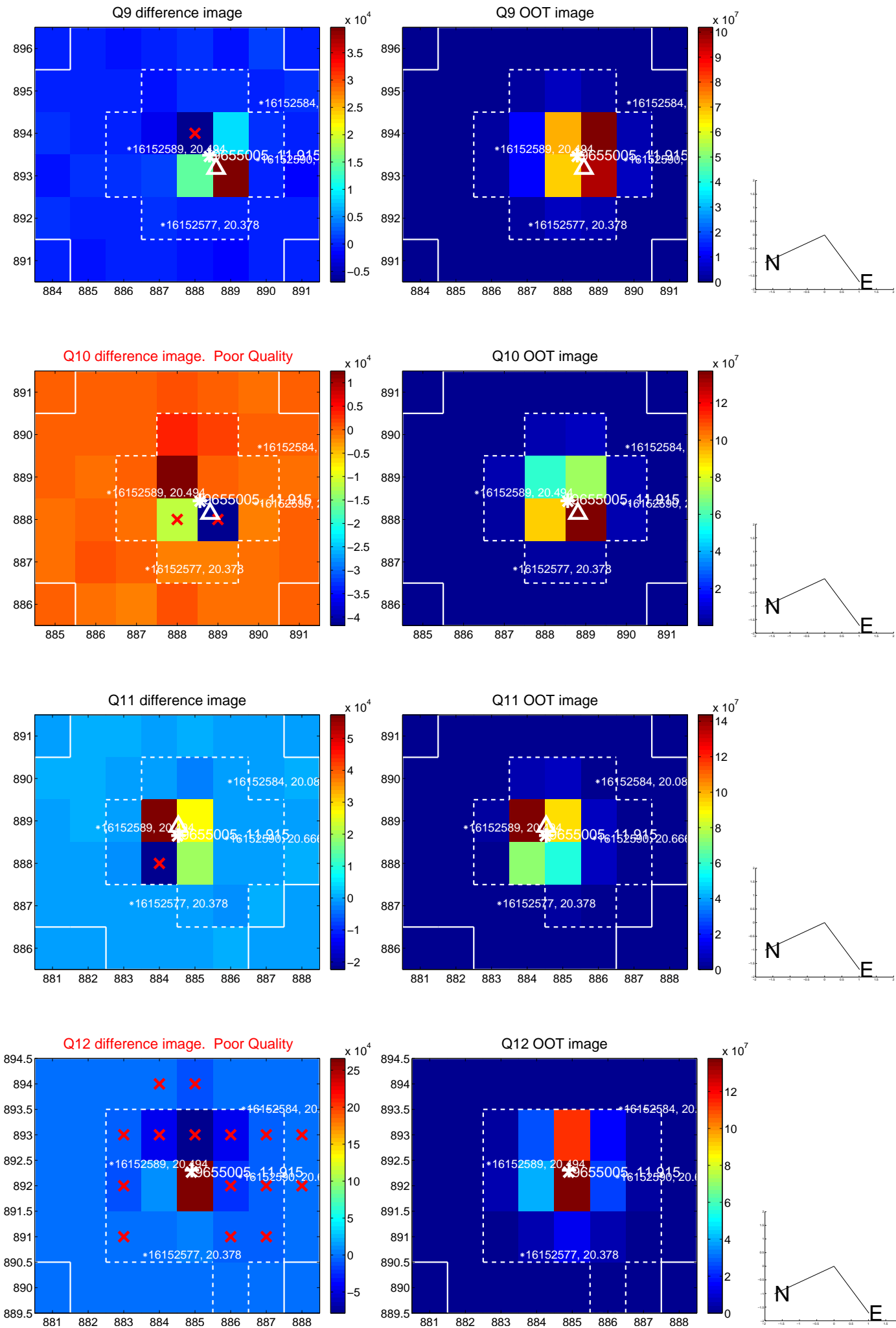
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

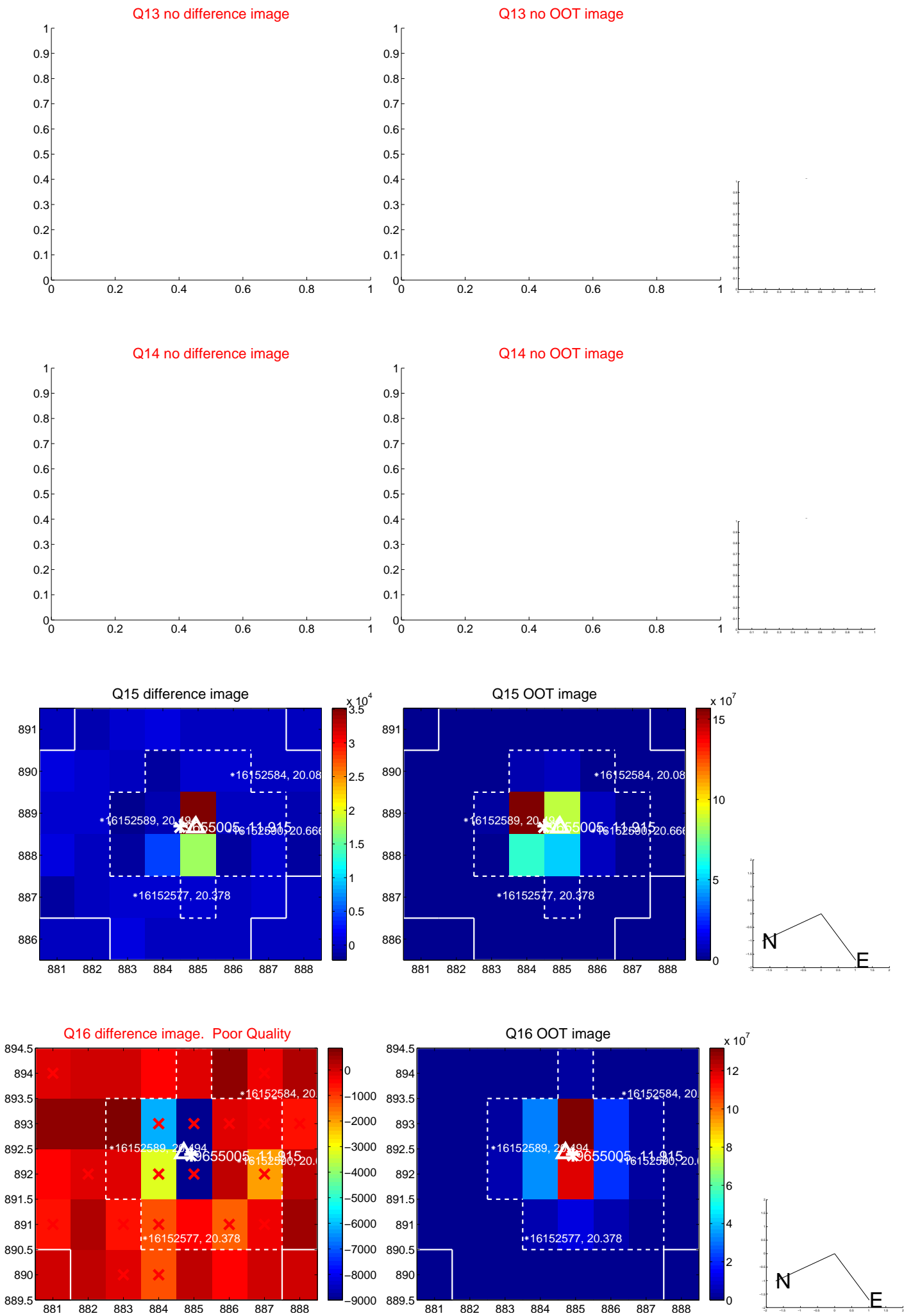


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

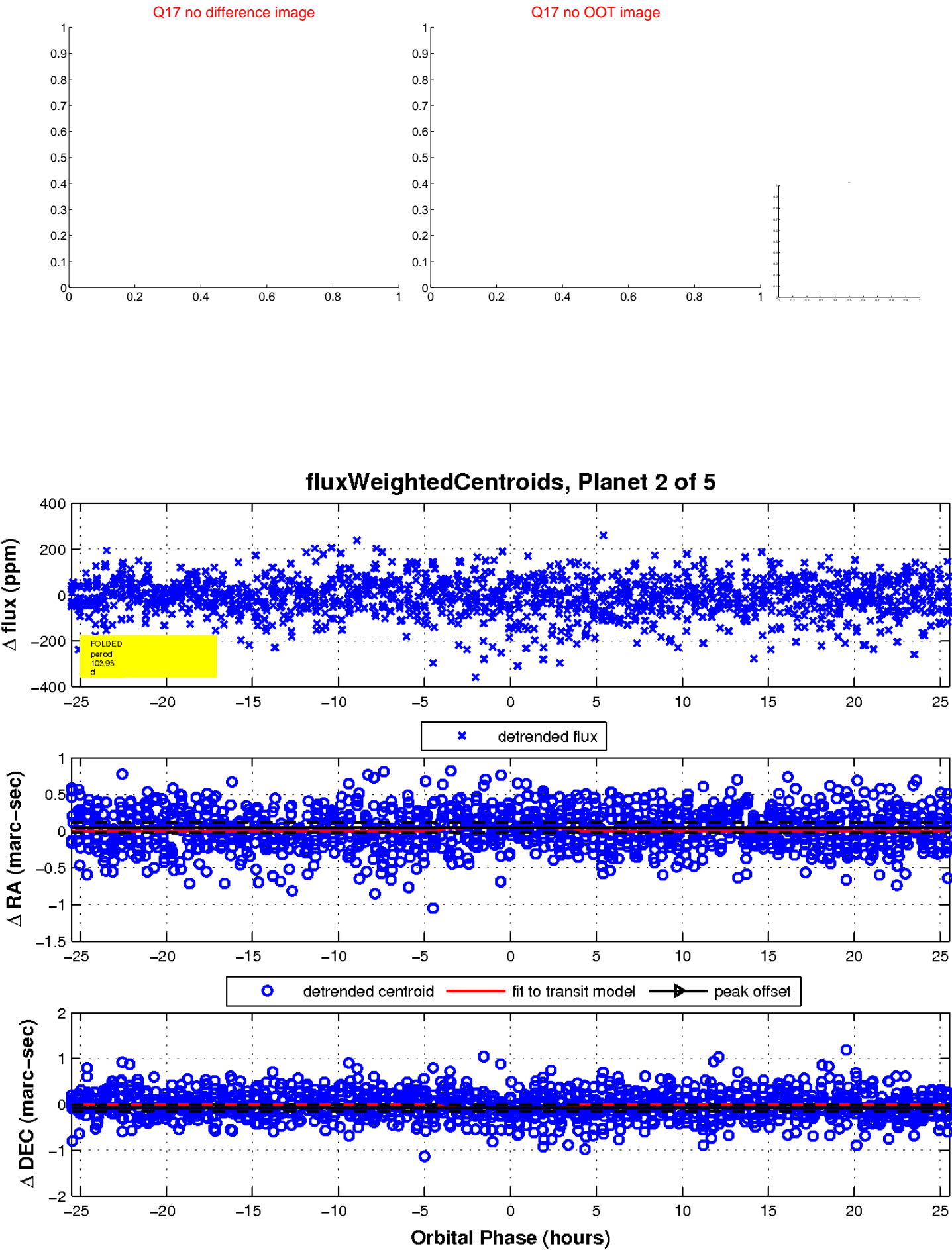




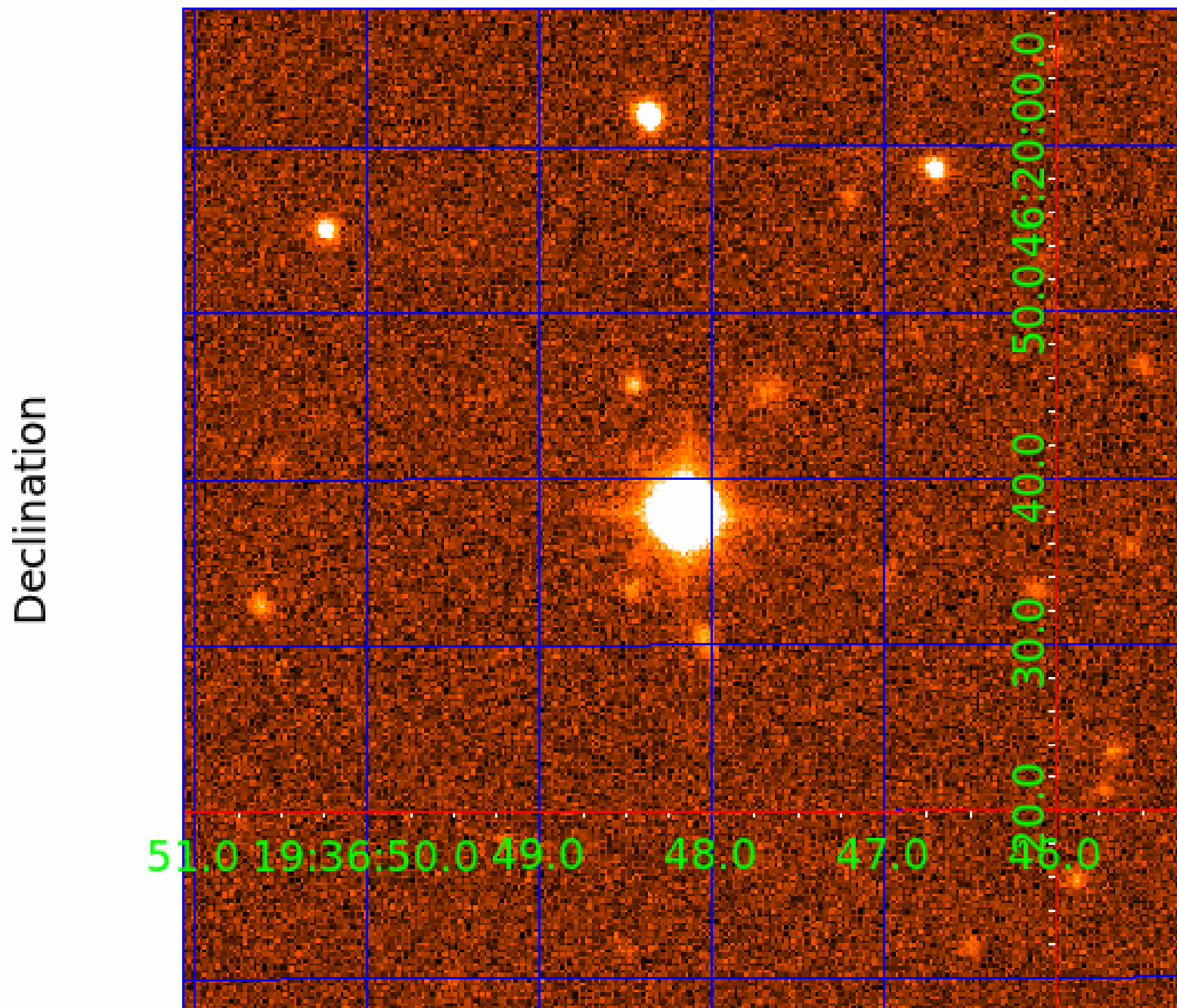
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 009655005

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655005-01	OBS	4047.01	1.398932	132.598202	8.9	8.626	13.2	9.4	3.37	7872	1.01	38106.71
009655005-02	OBS	No	103.925614	192.910813	187.5	8.515	15.1	12.5	3.37	7872	5.26	122.02
009655005-03	OBS	No	88.568337	218.115748	155.4	3.708	13.5	9.8	3.37	7872	4.78	151.02
009655005-04	OBS	No	94.048823	156.331762	84.8	13.870	10.0	7.8	3.37	7872	3.40	139.40
009655005-05	OBS	No	604.344606	178.043786	93.8	5.233	8.4	8.0	3.37	7872	3.37	11.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655005-01	OBS	PC	0.20	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV
009655005-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—HALO_GHOST
009655005-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009655005-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009655005-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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.

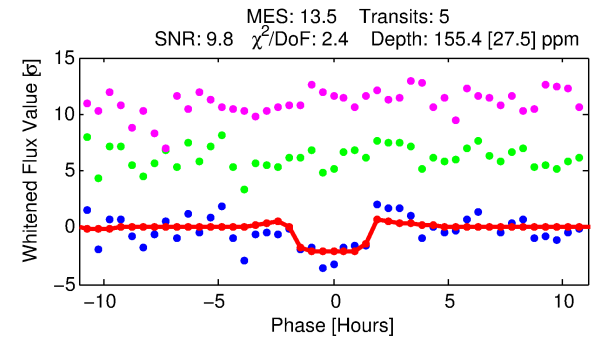
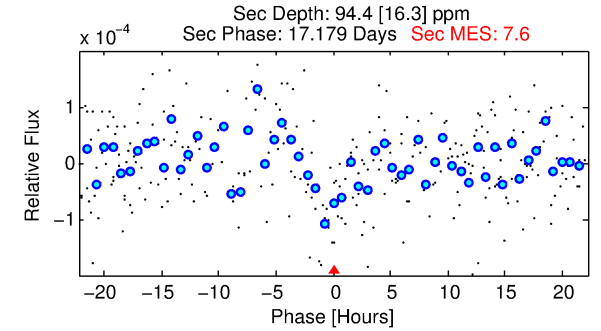
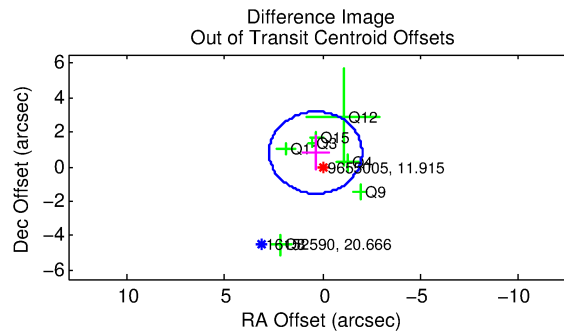
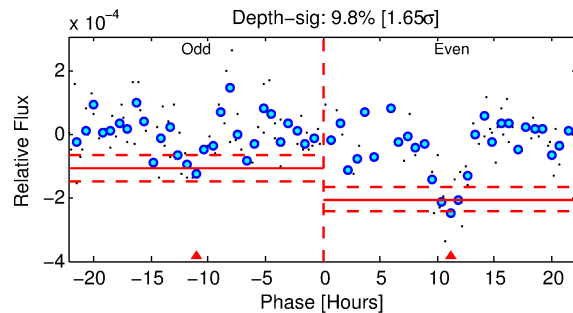
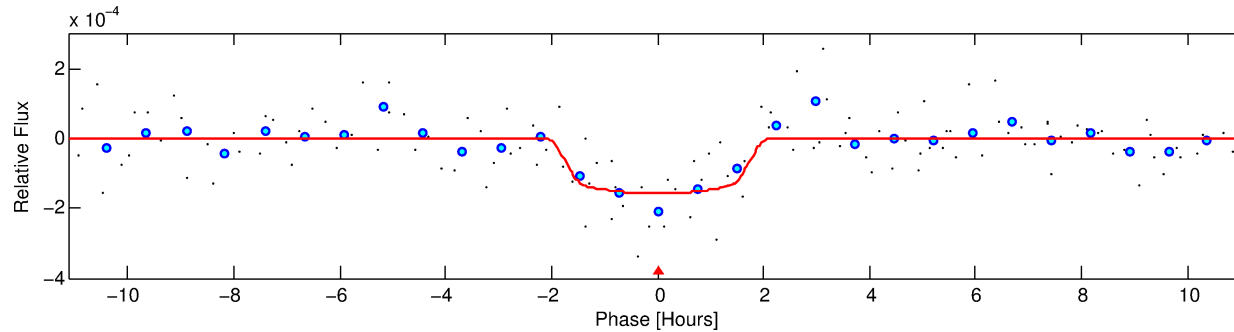
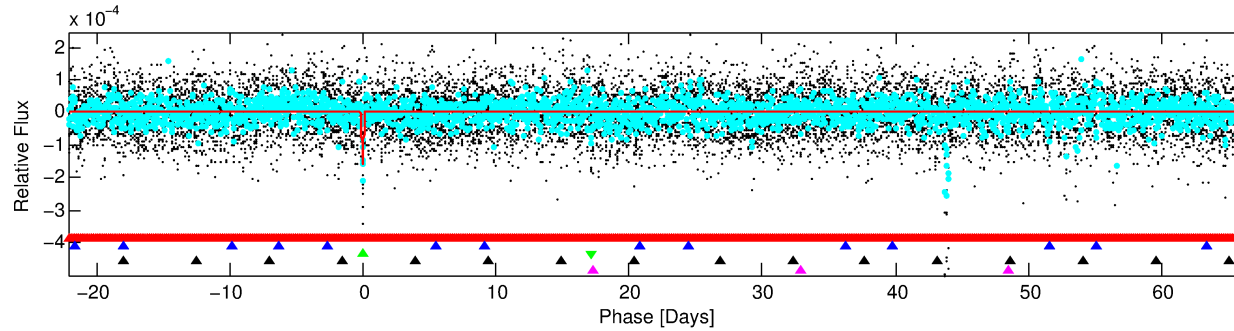
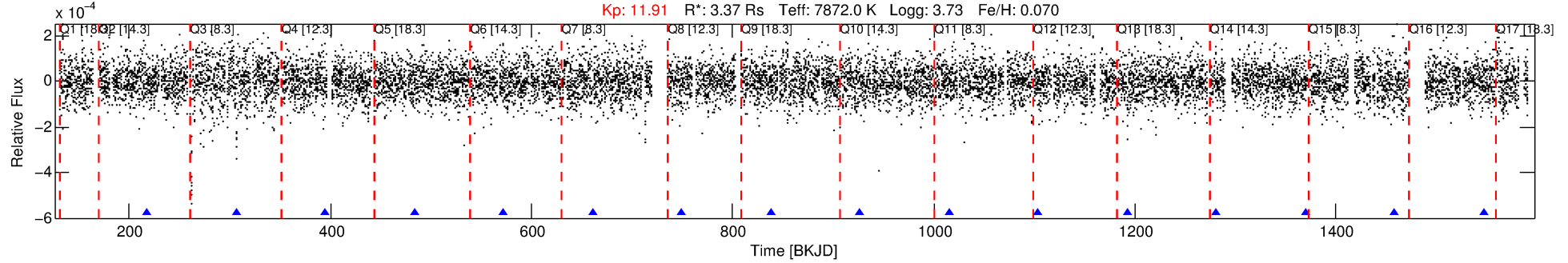
## Ephemeris Match Information For 009655005-03

No Significant Match Found

# DV One-Page Summary

KIC: 9655005 Candidate: 3 of 5 Period: 88.568 d  
KOI: K04047 Corr: No Ephemeris Match

Kp: 11.91 R\*: 3.37 Rs Teff: 7872.0 K Logg: 3.73 Fe/H: 0.070



## DV Fit Results:

Period = 88.56834 [0.00136] d  
Epoch = 218.1157 [0.0141] BKJD  
Rp/R\* = 0.0130 [0.0121]  
a/R\* = 95.78 [537.31]  
b = 0.87 [1.64]  
Seff = 151.02 [63.78]  
Teq = 894 [94] K  
Rp = 4.78 [4.67] Re  
a = 0.5082 [0.1404] AU  
Ag = 586.92 [1120.15] [0.52σ]  
Teffp = 6802 [3167] K [1.86σ]

## DV Diagnostic Results:

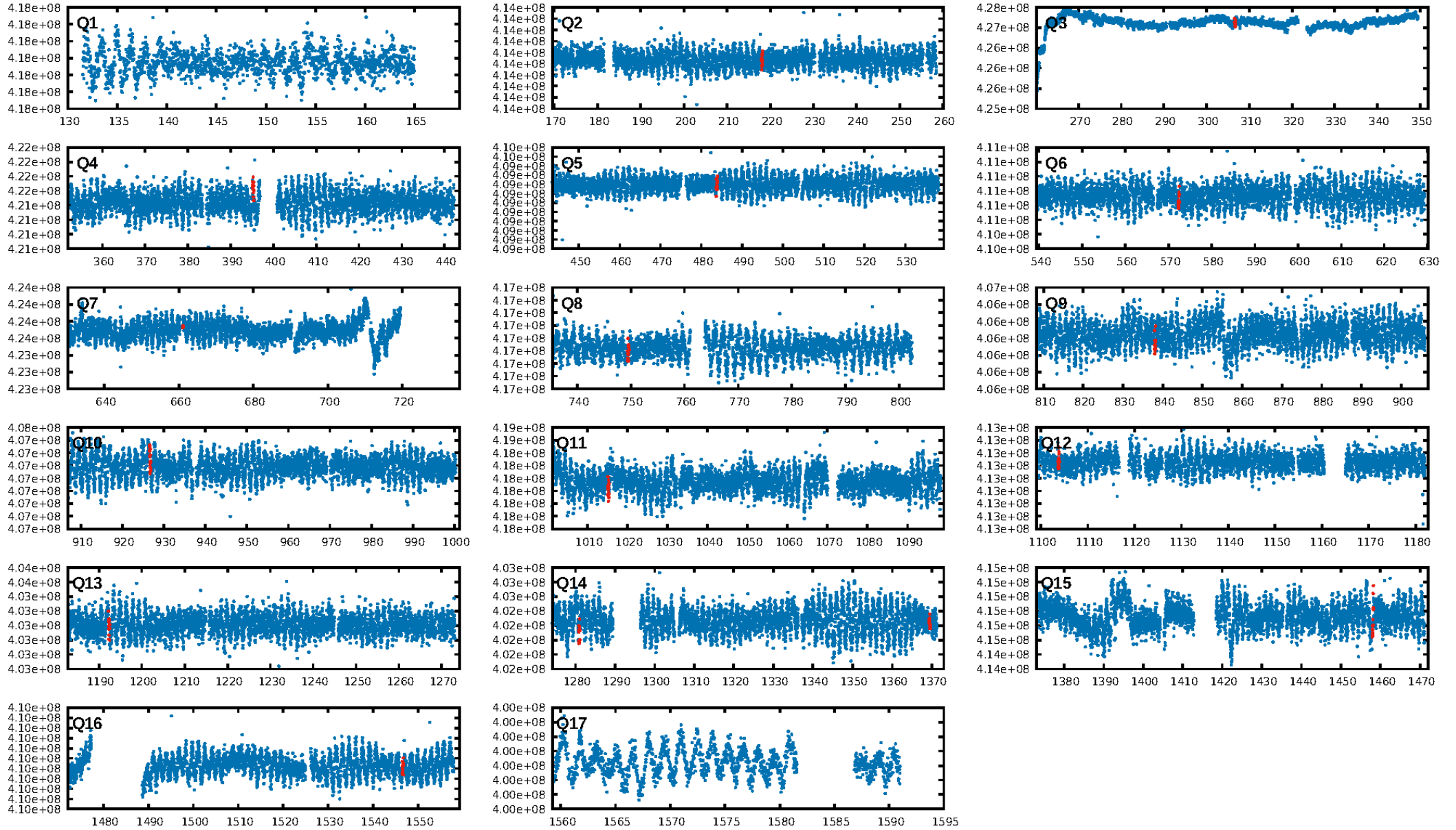
ShortPeriod-sig: 100.0% [222.81σ]  
LongPeriod-sig: 100.0% [9.16σ]  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 71.1%  
Bootstrap-pfa: 4.60e-19  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.2738  
Centroid-sig: 2.0%  
Centroid-so: 0.768 arcsec [1.29σ]  
OotOffset-rm: 0.890 arcsec [1.13σ]  
KicOffset-rm: 0.781 arcsec [1.07σ]  
OotOffset-st: 0/3/3/1 [7]  
KicOffset-st: 0/3/3/1 [7]  
DiffImageQuality-fgm: 0.43 [3/7]  
DiffImageOverlap-fno: 0.17 [2/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:14:03 Z

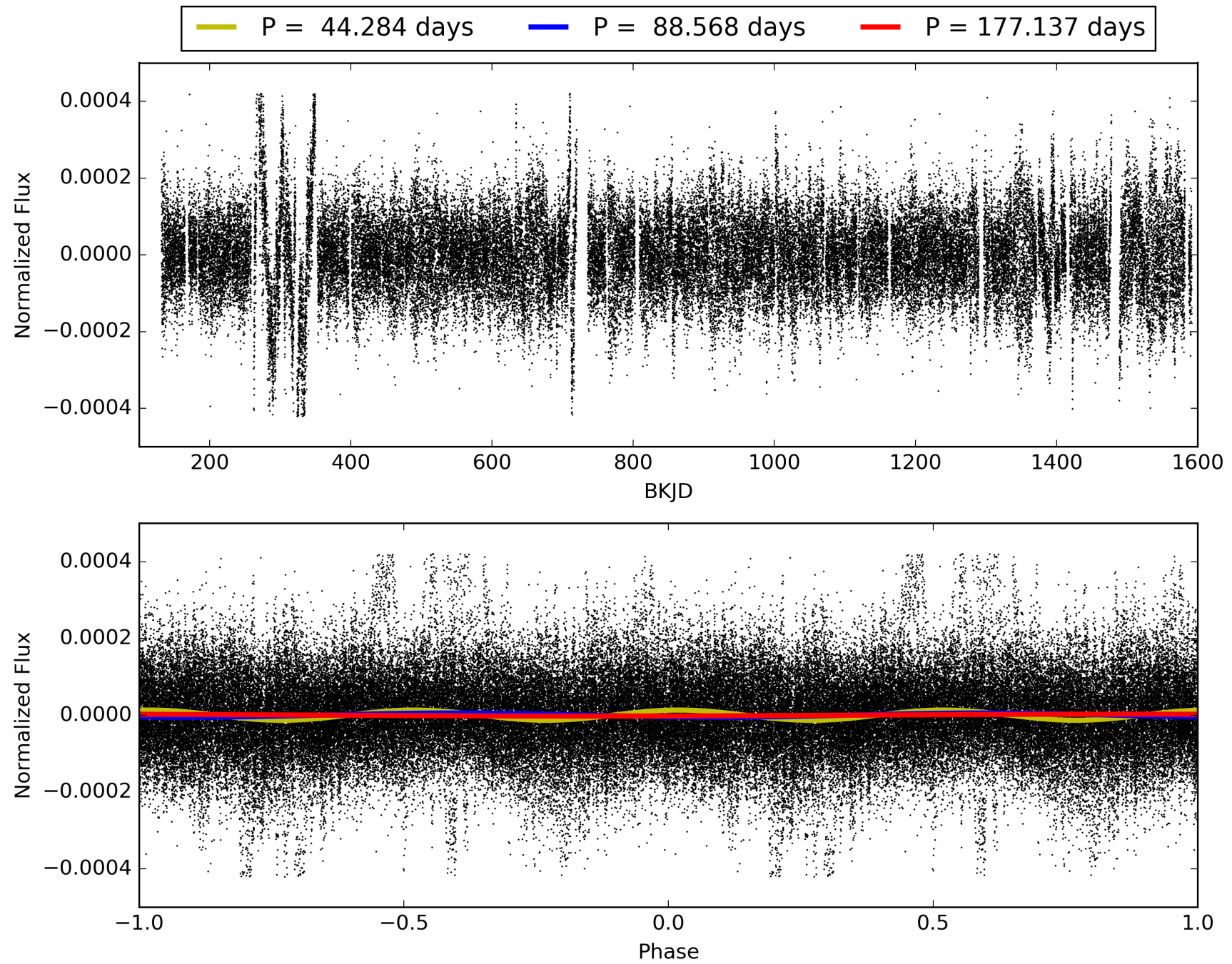
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009655005-03, PDC Light Curves

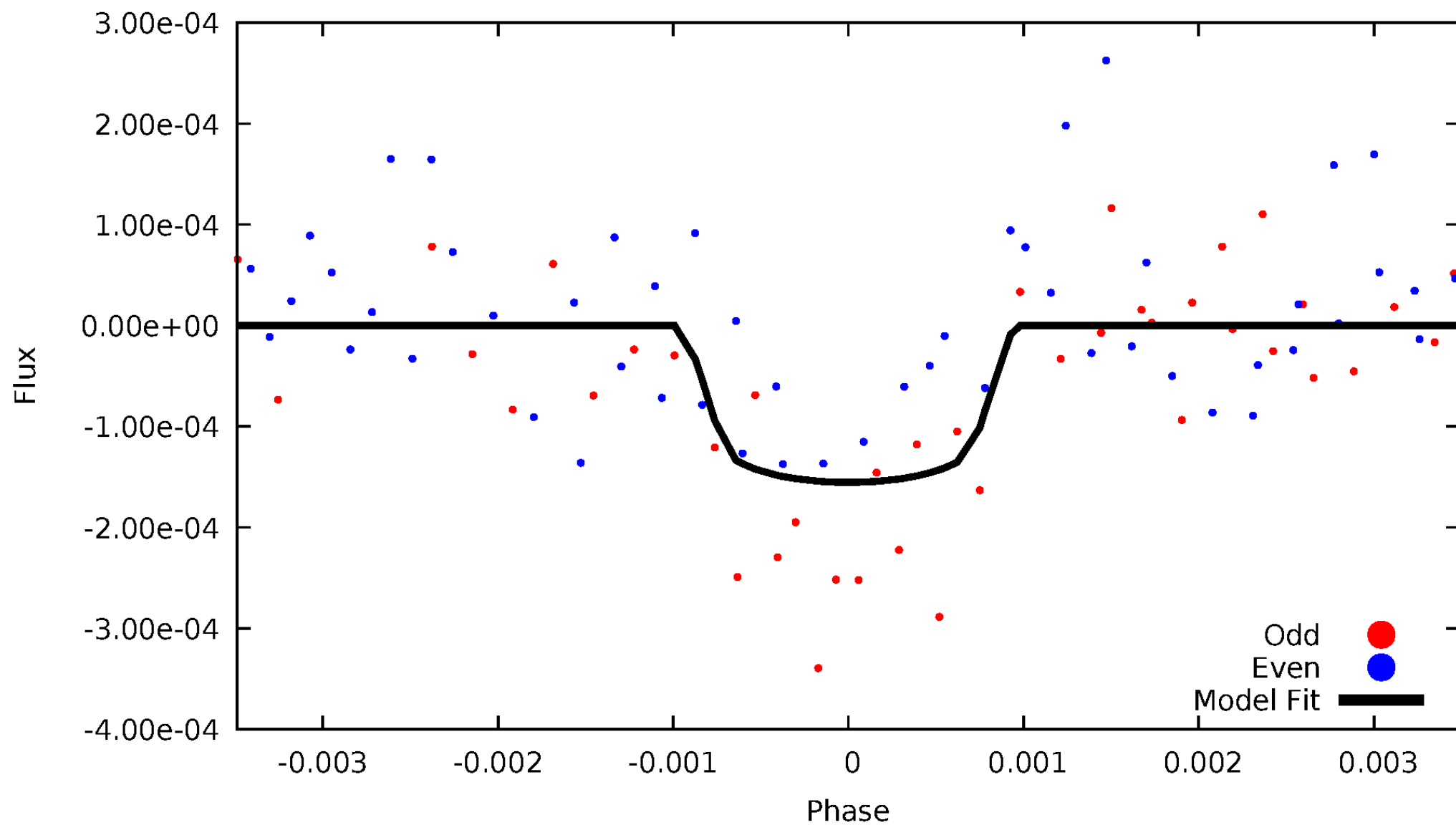


TCE 009655005-03



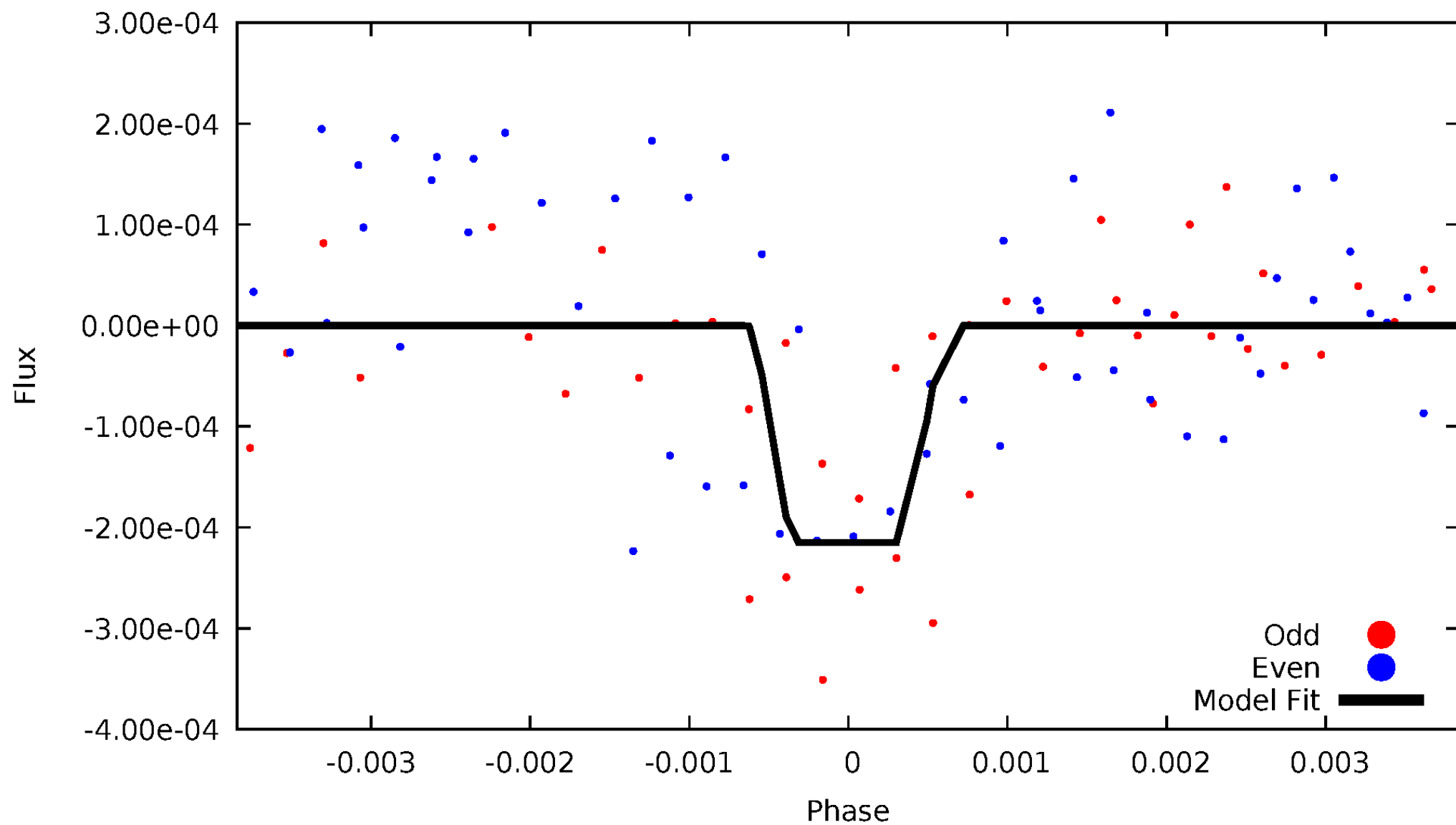
# DV Odd/Even

TCE 009655005-03



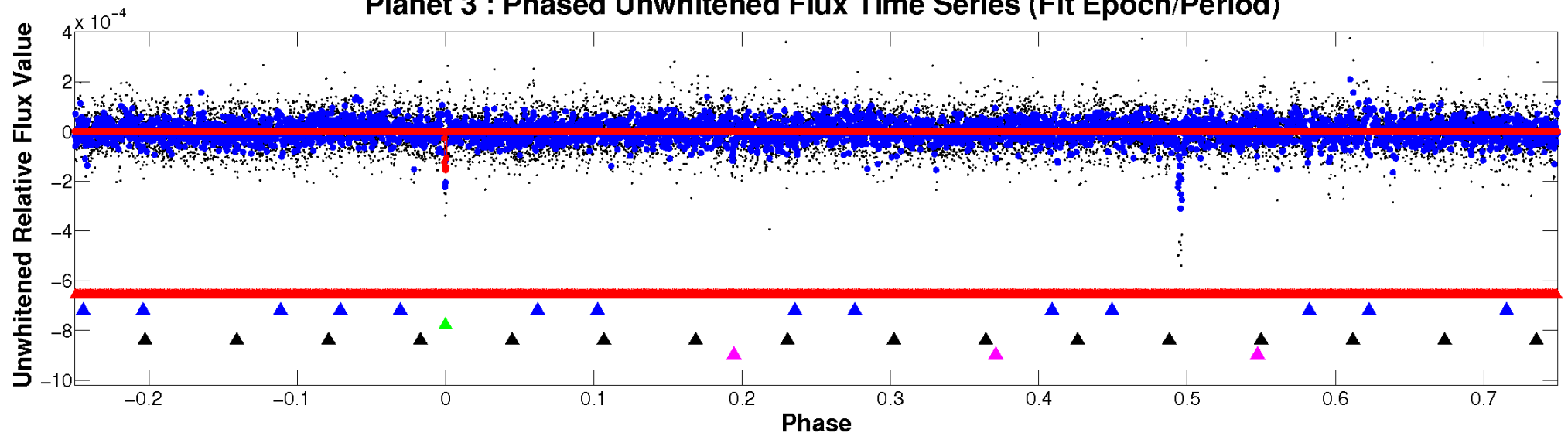
# ALT Odd/Even

TCE 009655005-03

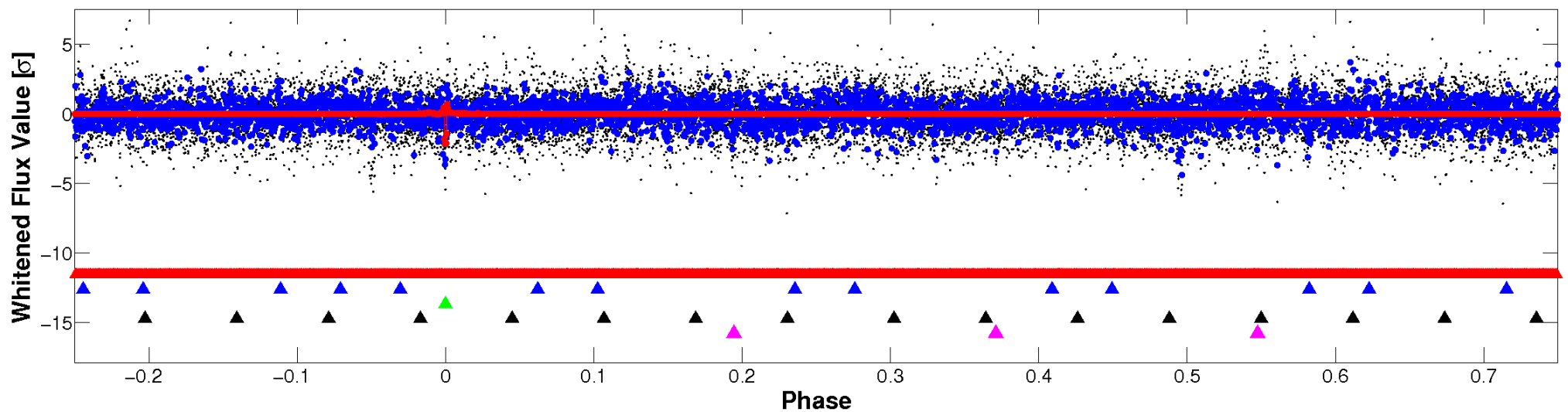


# Non-Whitened Vs. Whitened Light Curve

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

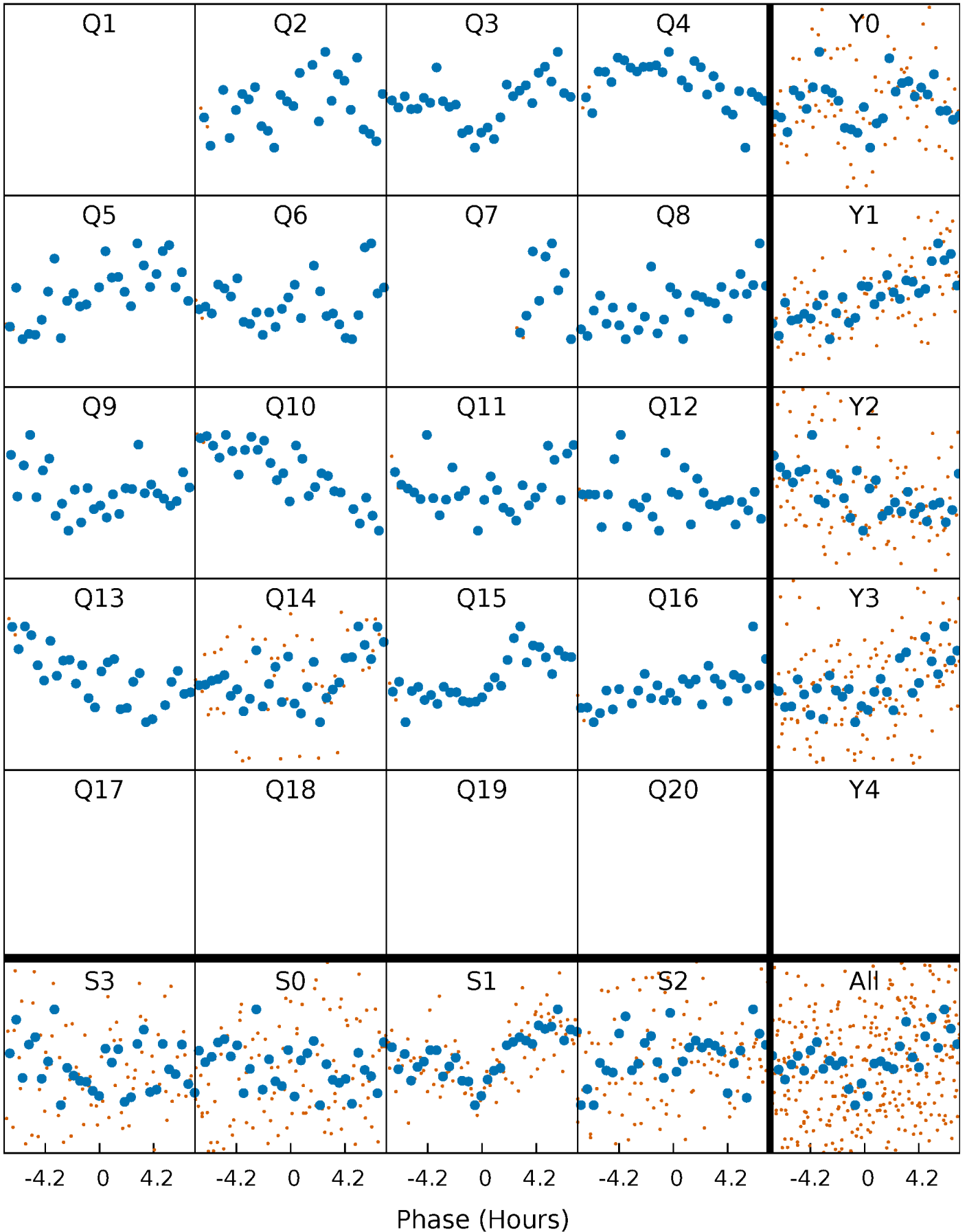


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

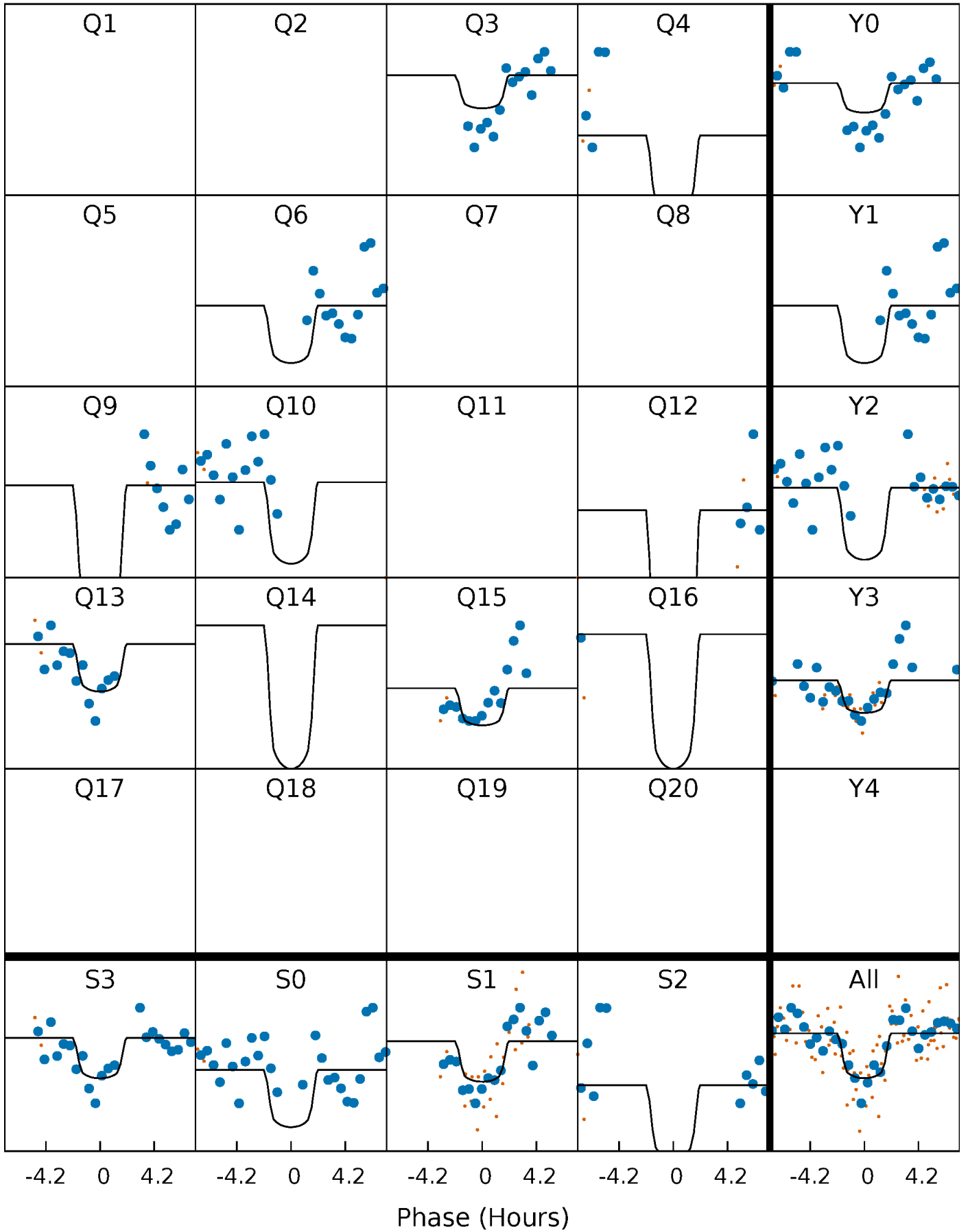
TCE 009655005-03 P= 88.568337 Days  $T_0=218.115748$  (BKJD)





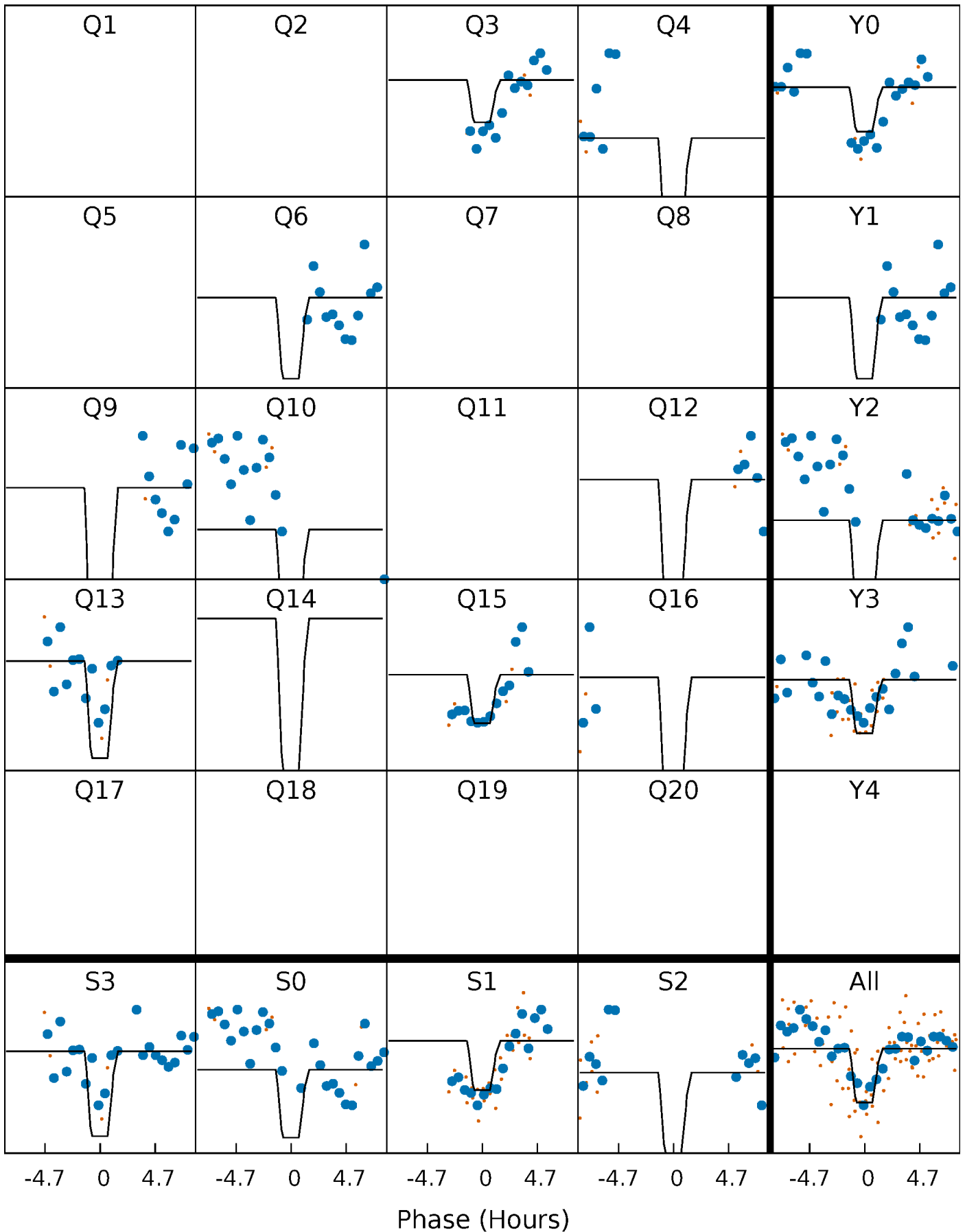
# DV Quarter-Phased Transit Curves

TCE 009655005-03 P= 88.568337 Days  $T_0=218.115748$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

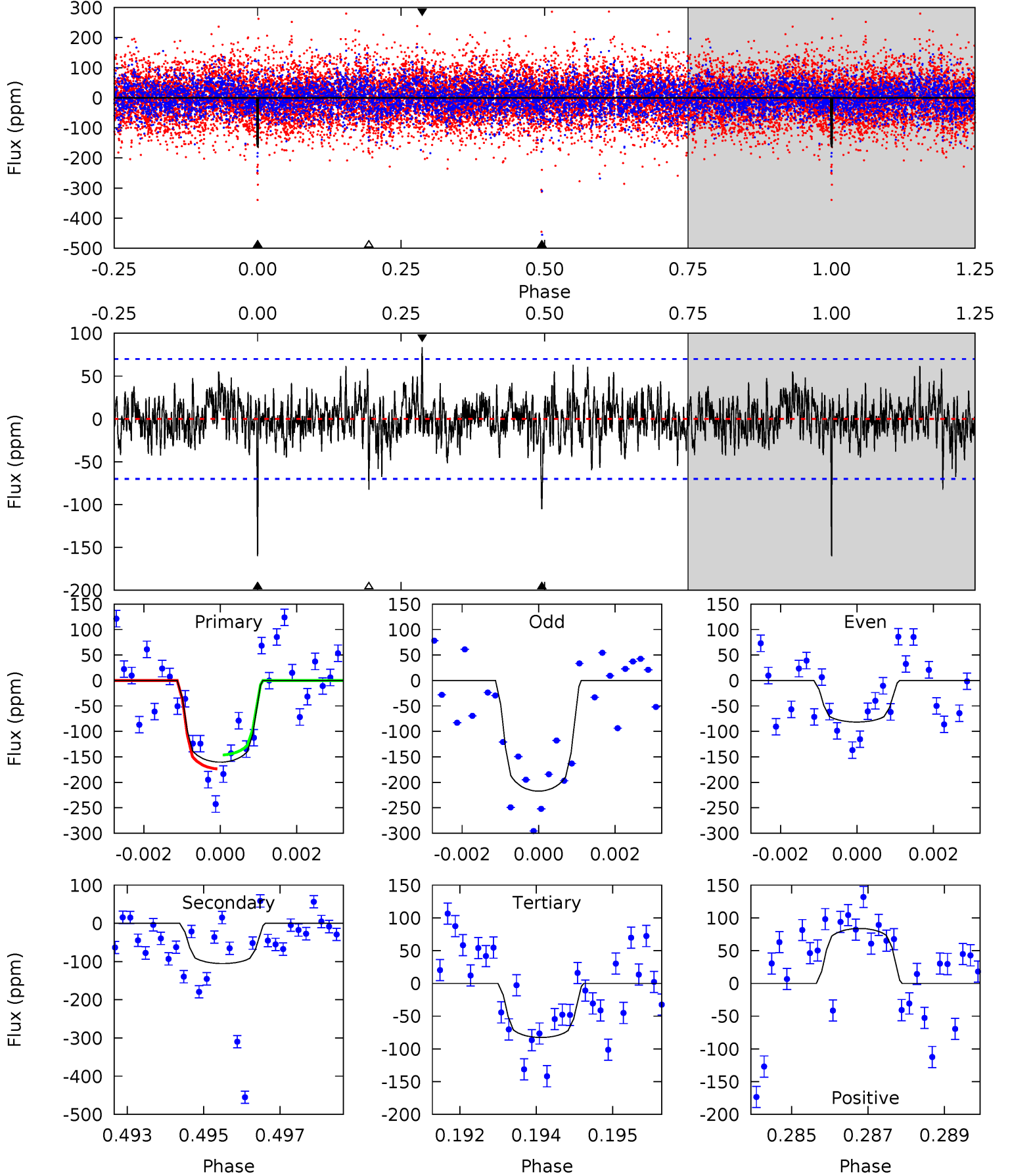
TCE 009655005-03 P= 88.567230 Days  $T_0=218.115758$  (BKJD)



# DV Model-Shift Uniqueness Test

009655005-03, P = 88.568337 Days, E = 129.547411 Days

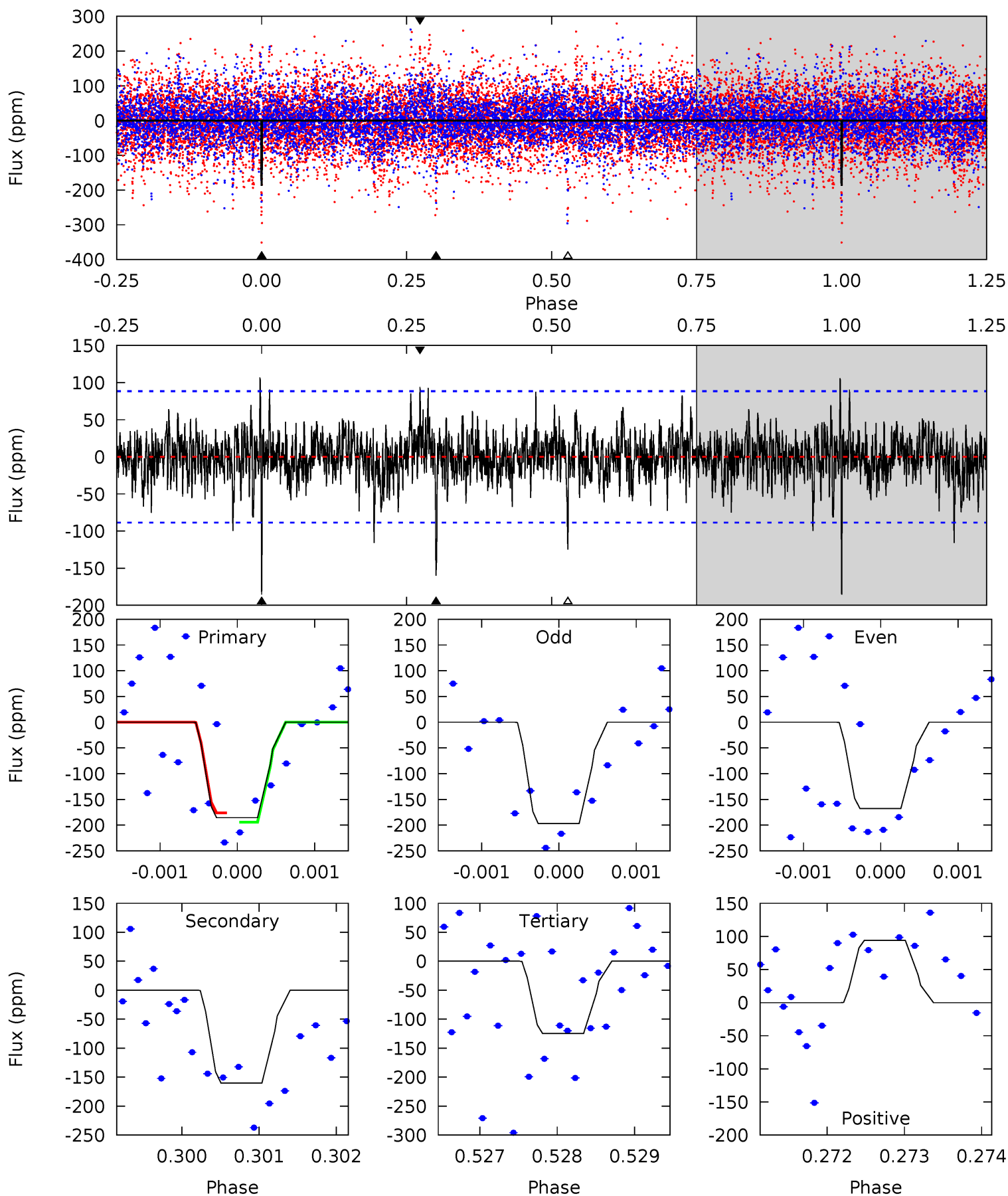
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	8.04	6.31	6.41	5.35	3.13	1.46	5.94	5.85	1.73	1.63	5.13	1.12	0.34	1.04



# Alt Model-Shift Uniqueness Test

009655005-03, P = 88.567230 Days, E = 129.548528 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	9.81	7.64	5.76	5.43	3.25	1.52	3.72	5.60	2.17	4.05	0.79	0.95	0.36	0.57



### Stellar Parameters For KIC 009655005

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7872^{+70}_{-86}$	$3.732^{+0.238}_{-0.085}$	$0.070^{+0.150}_{-0.200}$	$3.367^{+0.564}_{-1.047}$	$2.228^{+0.171}_{-0.371}$	$0.082^{+0.135}_{-0.023}$
	+1%/-1%	+6%/-2%	+214%/-286%	+17%/-31%	+8%/-17%	+164%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 009655005-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-105 \pm 13$	$5.35^{+3.92}_{-3.35}$	$1233^{+54}_{-90}$	$6288^{+5357}_{-1402}$	$525^{+2949}_{-361}$
Alt.	$-160 \pm 16$	$5.80^{+3.85}_{-3.61}$	$1229^{+58}_{-85}$	$6680^{+5806}_{-1411}$	$663^{+3908}_{-419}$

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

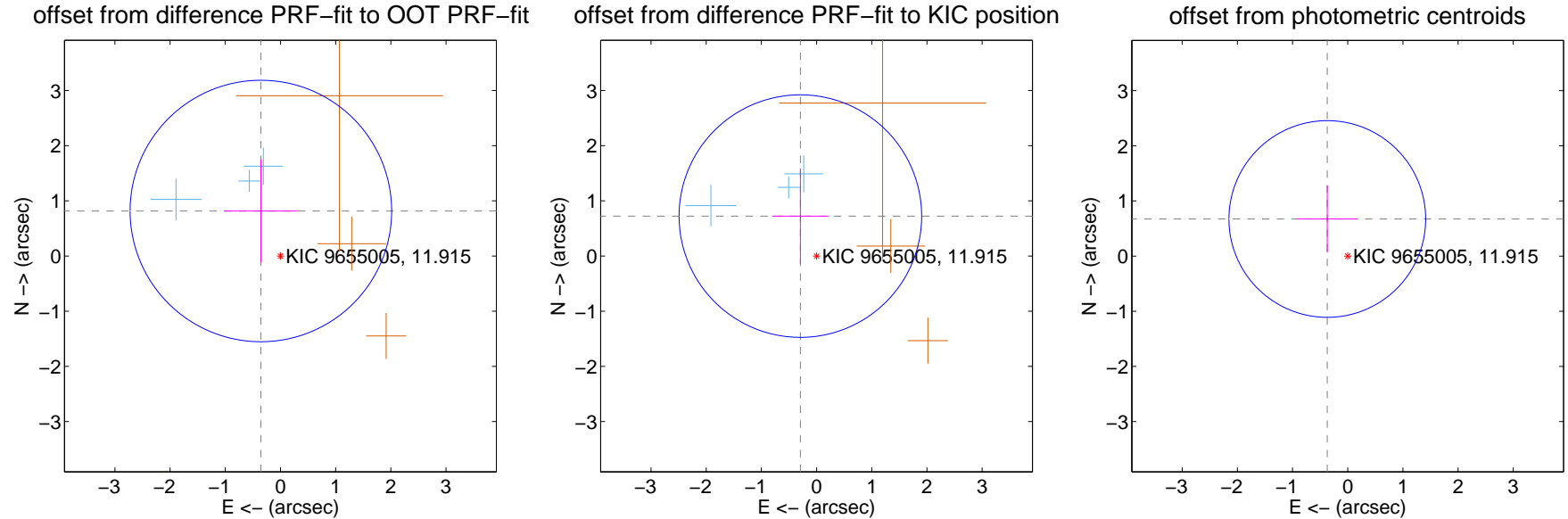
## DV Centroid Data

Supplemental centroid analysis for 009655005-03. **Kepler magnitude: 11.91.** Transit SNR 9.82

**There are 3 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

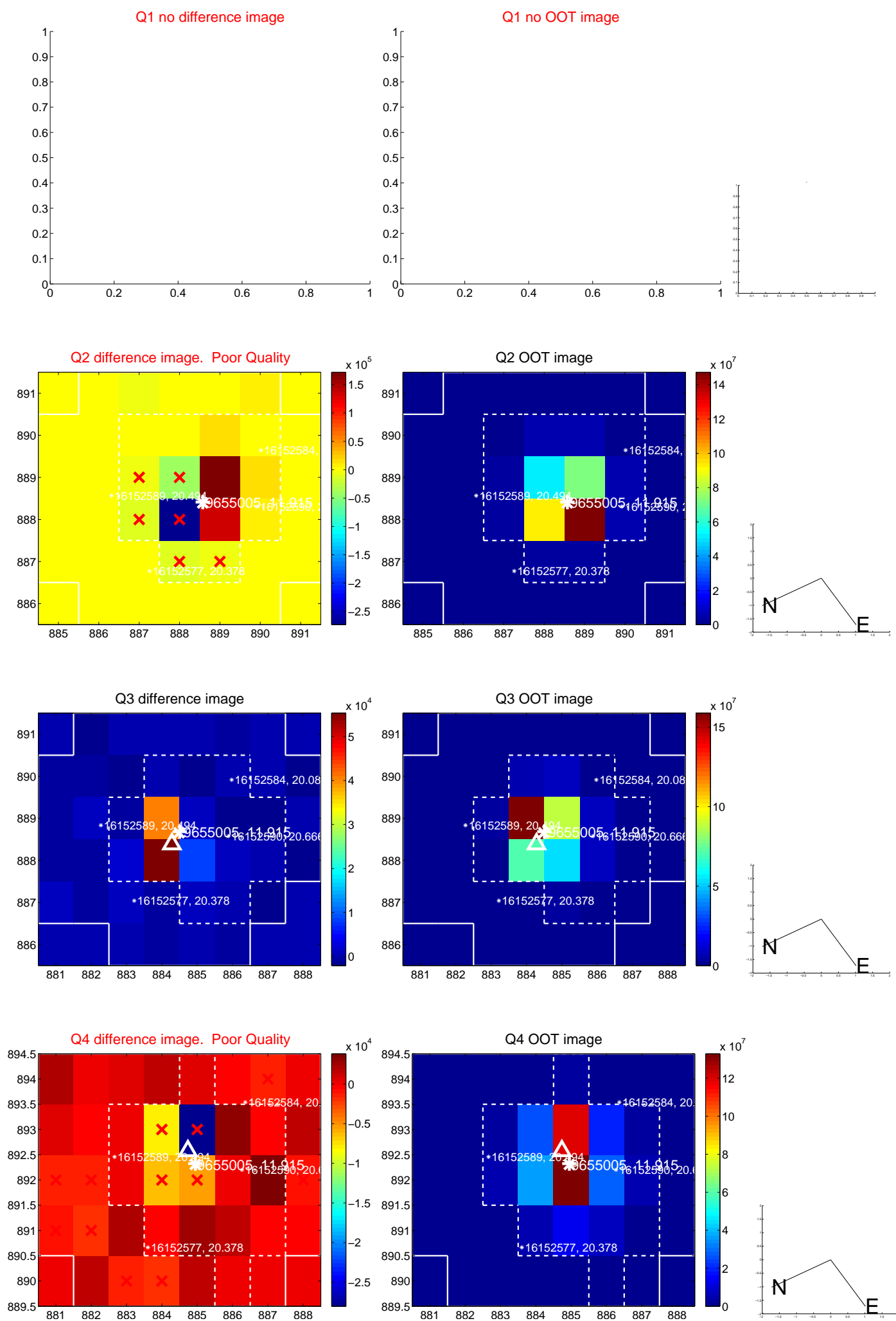
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.890 \pm 0.790$	1.13	$0.355 \pm 0.667$	$0.816 \pm 0.929$
PRF-fit source offset from KIC position	$0.781 \pm 0.732$	1.07	$0.294 \pm 0.509$	$0.723 \pm 0.864$
photometric centroid source offset	$0.77 \pm 0.59$	1.29	$0.37 \pm 0.55$	$0.67 \pm 0.61$



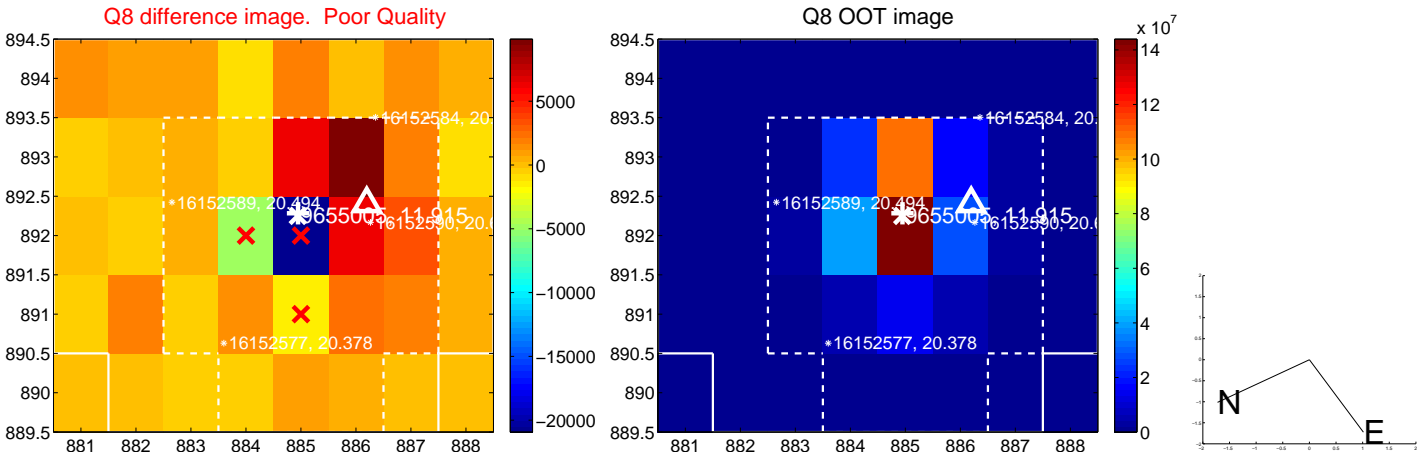
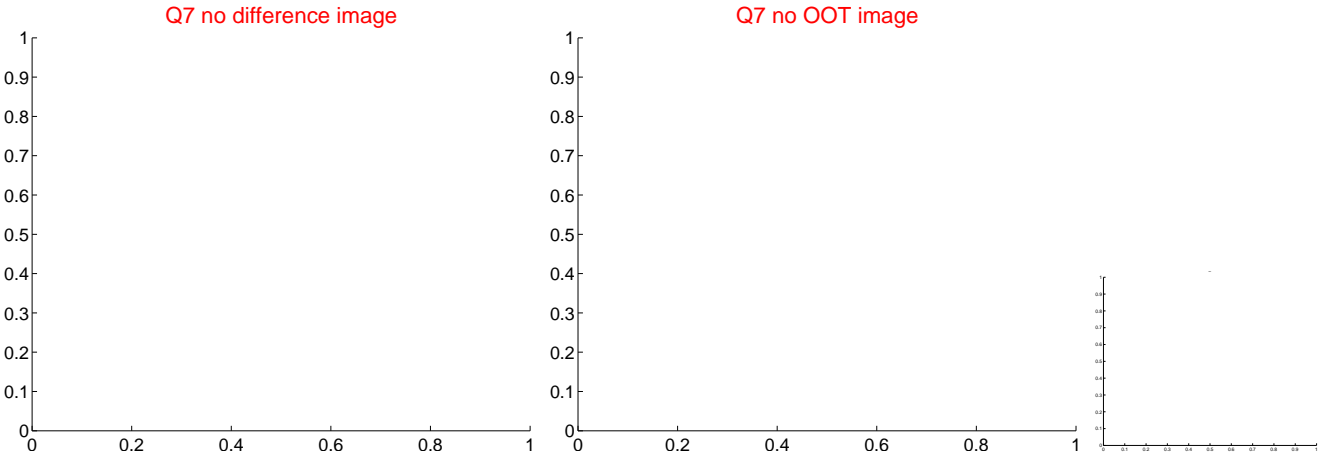
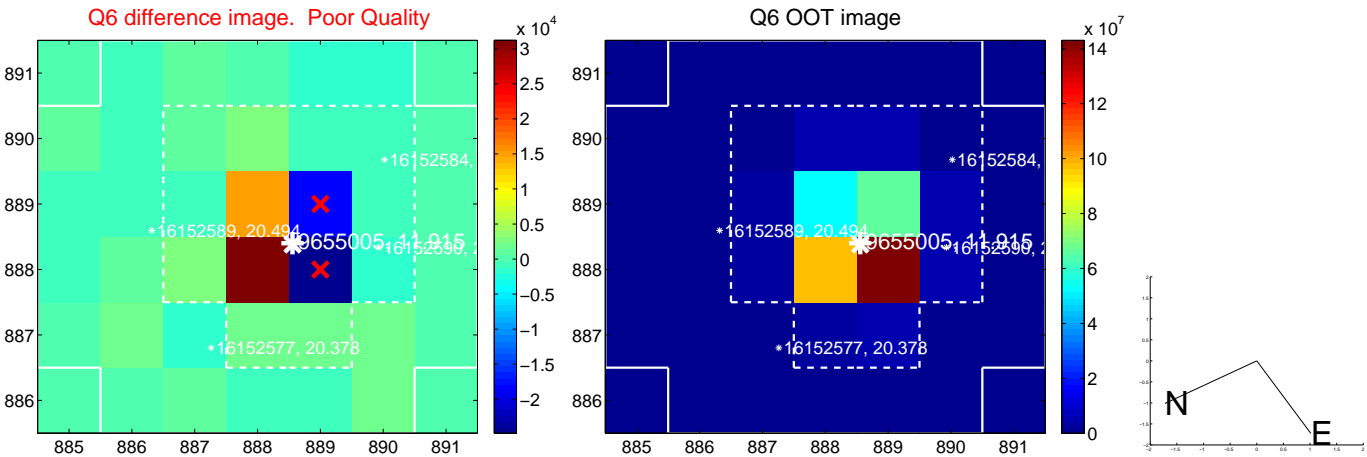
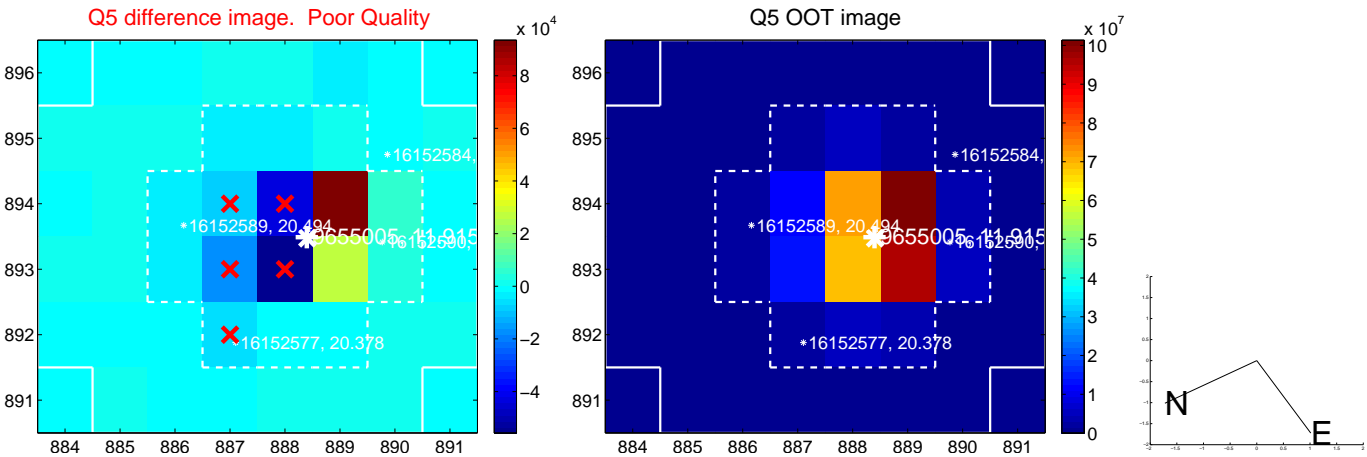
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



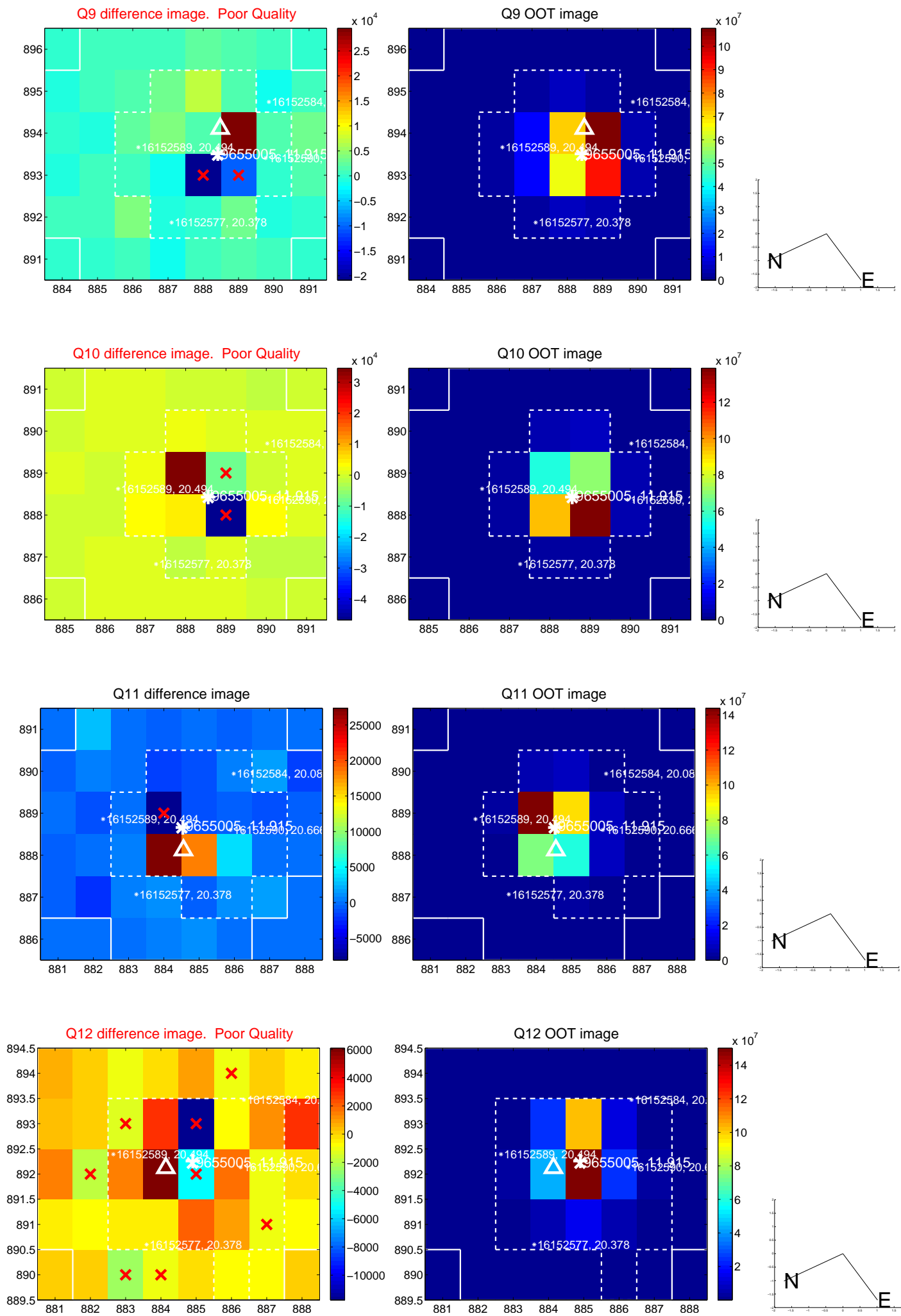
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



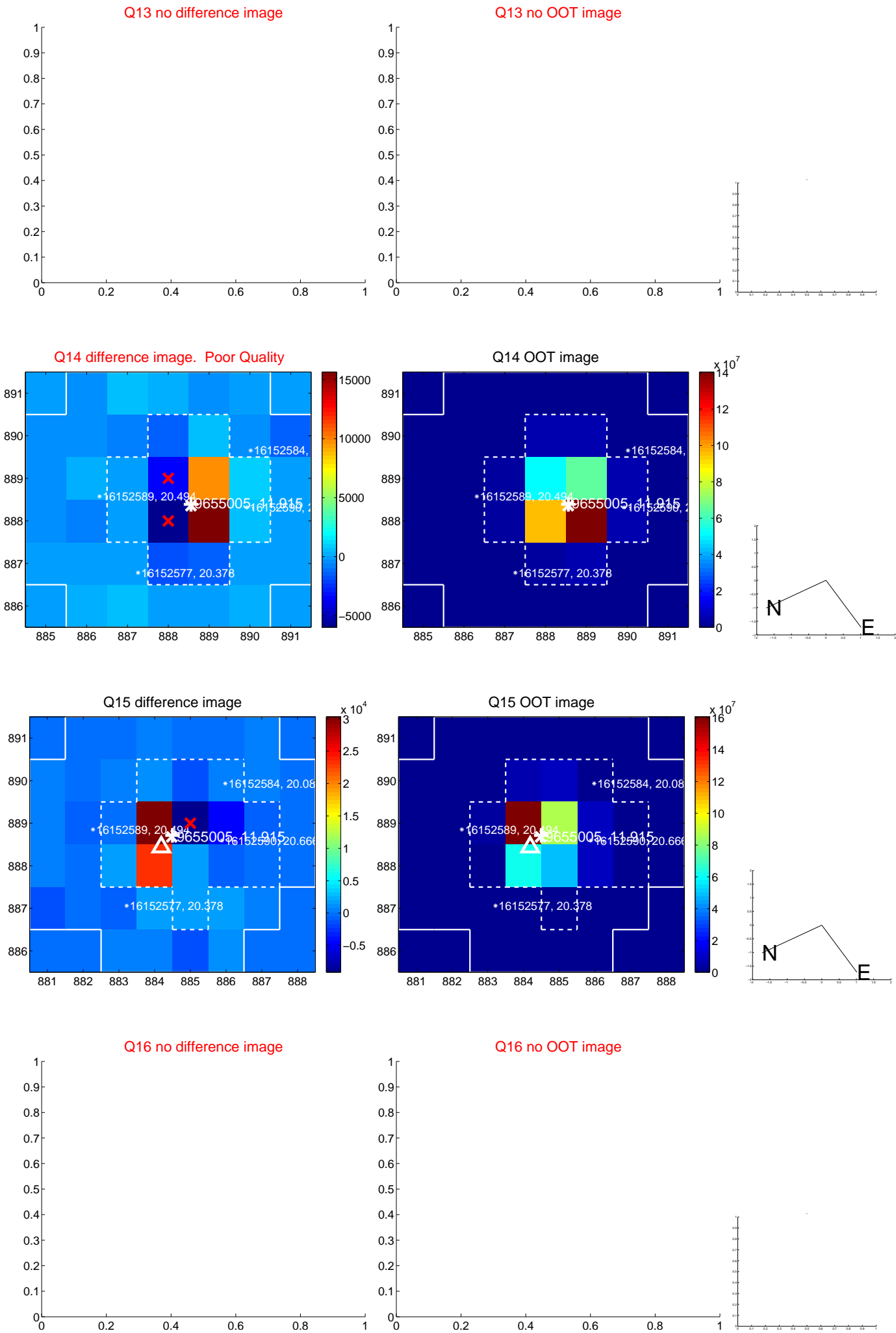
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



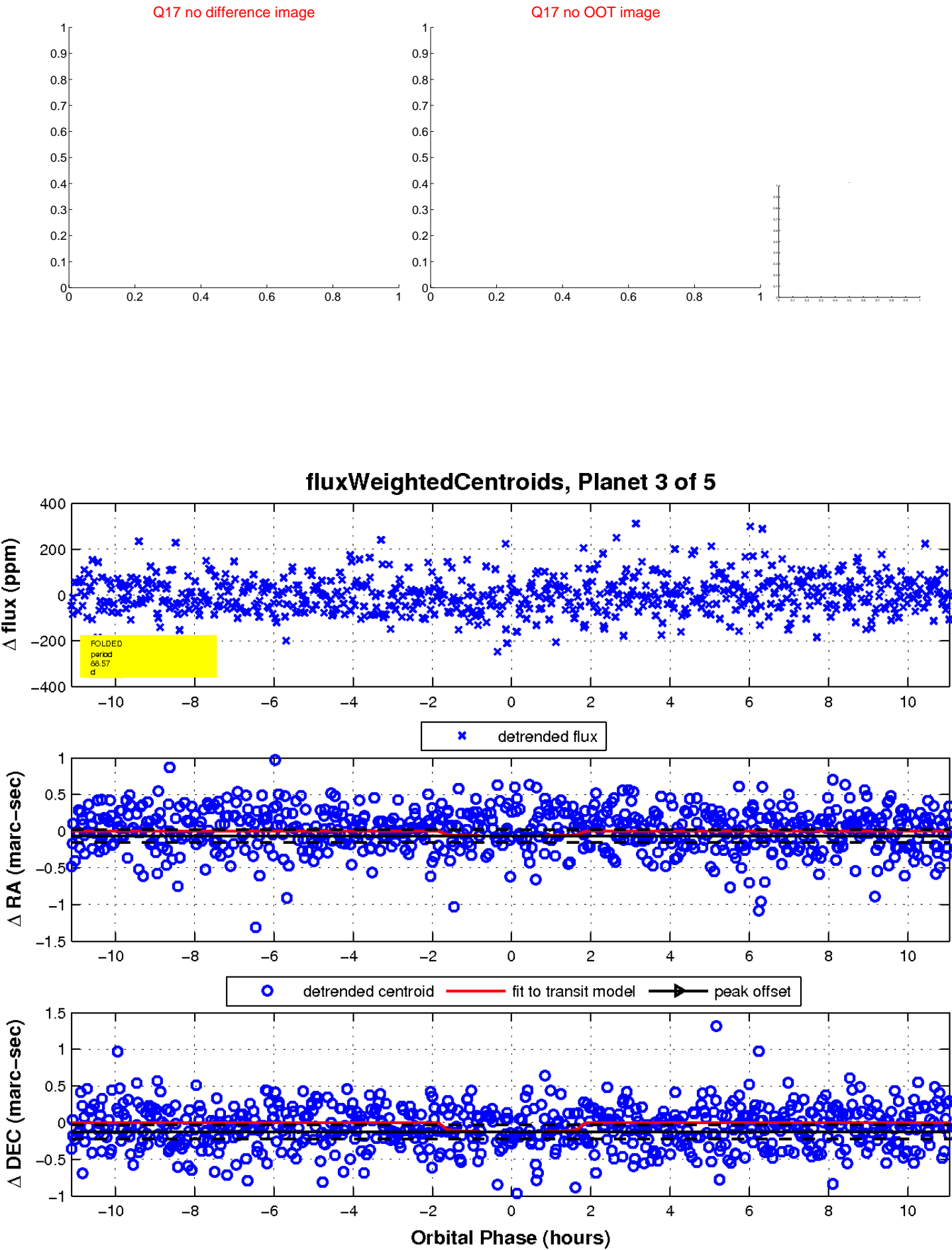
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



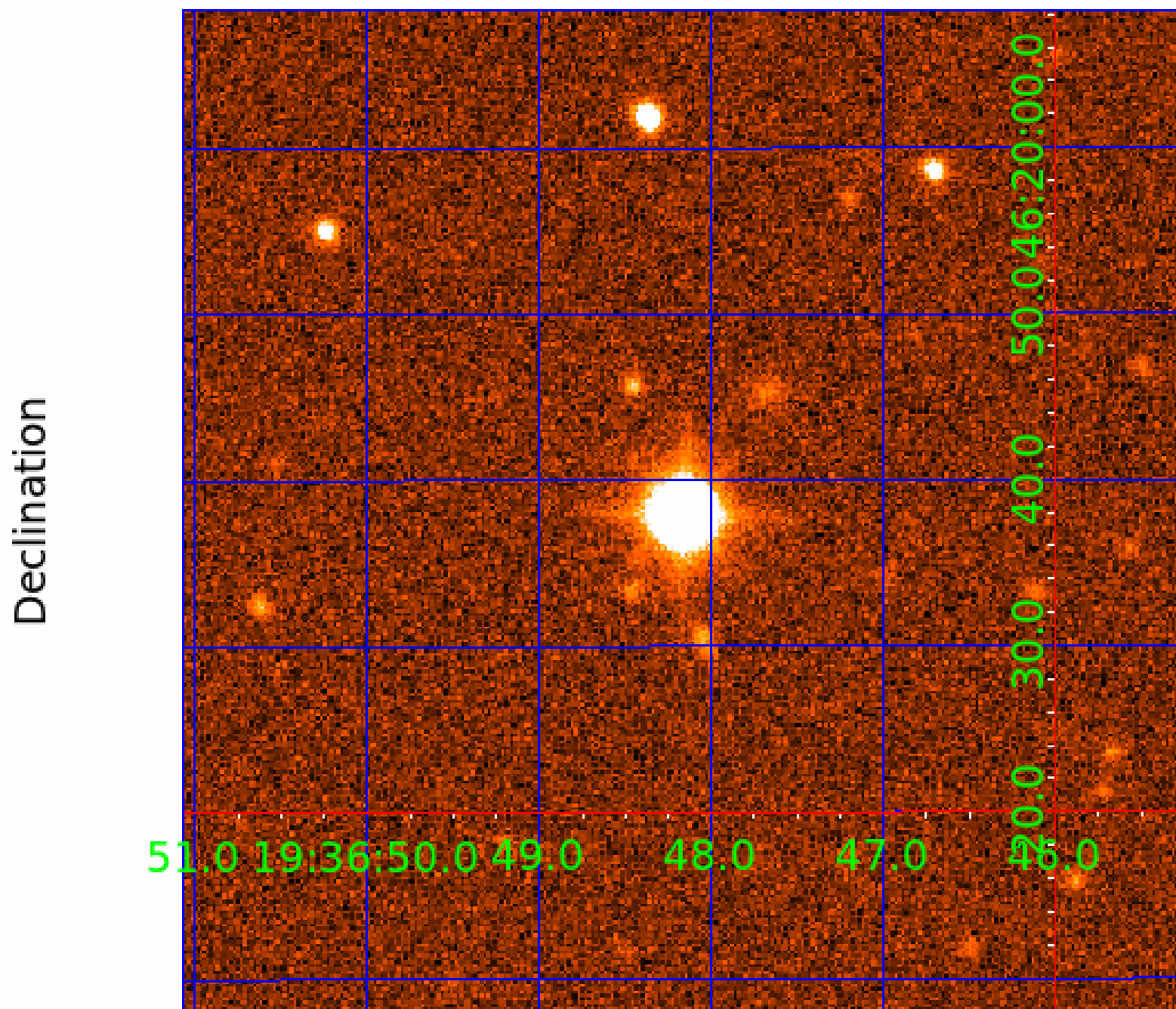
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 009655005

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655005-01	OBS	4047.01	1.398932	132.598202	8.9	8.626	13.2	9.4	3.37	7872	1.01	38106.71
009655005-02	OBS	No	103.925614	192.910813	187.5	8.515	15.1	12.5	3.37	7872	5.26	122.02
009655005-03	OBS	No	88.568337	218.115748	155.4	3.708	13.5	9.8	3.37	7872	4.78	151.02
009655005-04	OBS	No	94.048823	156.331762	84.8	13.870	10.0	7.8	3.37	7872	3.40	139.40
009655005-05	OBS	No	604.344606	178.043786	93.8	5.233	8.4	8.0	3.37	7872	3.37	11.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655005-01	OBS	PC	0.20	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV
009655005-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—HALO_GHOST
009655005-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009655005-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009655005-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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.

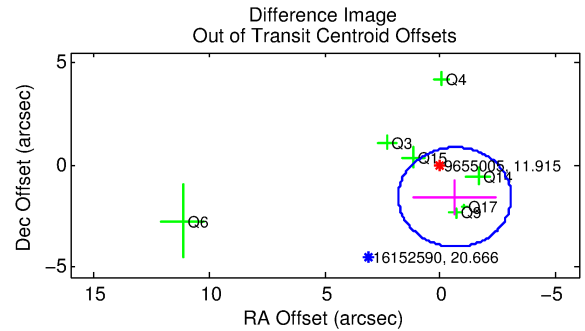
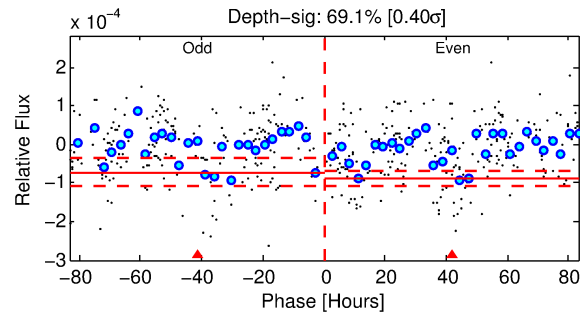
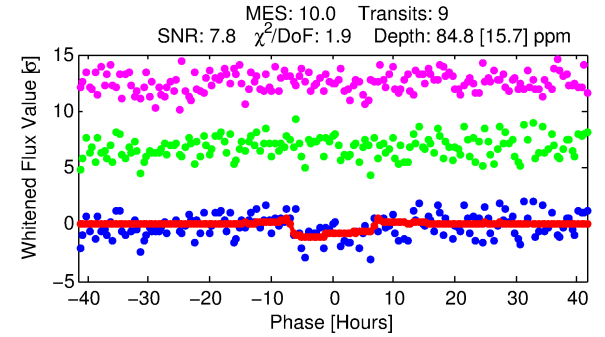
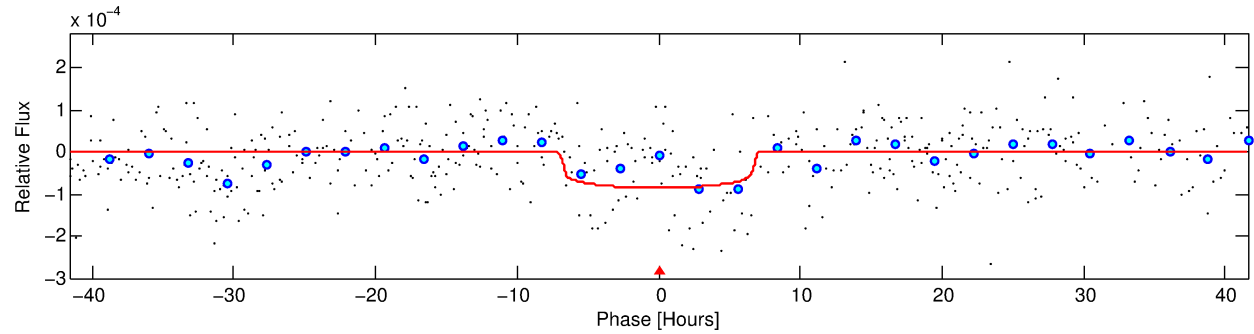
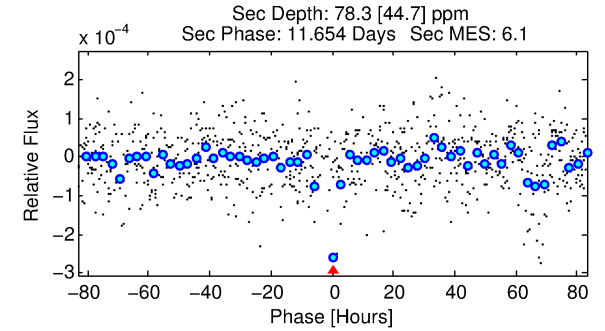
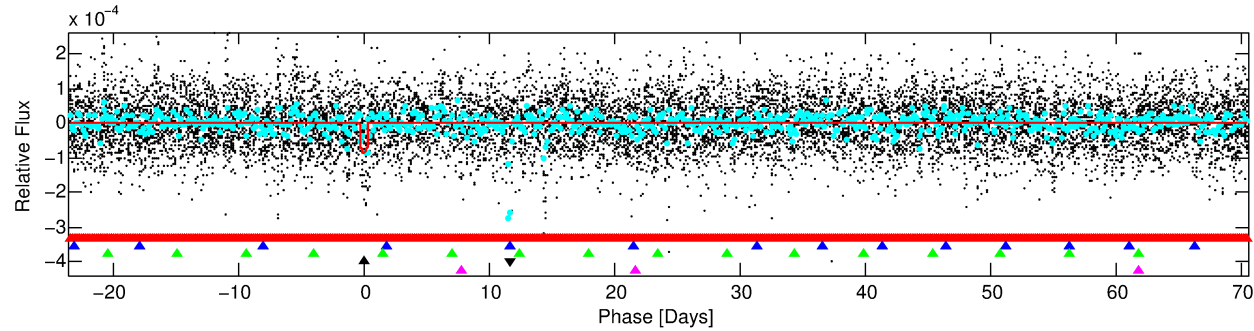
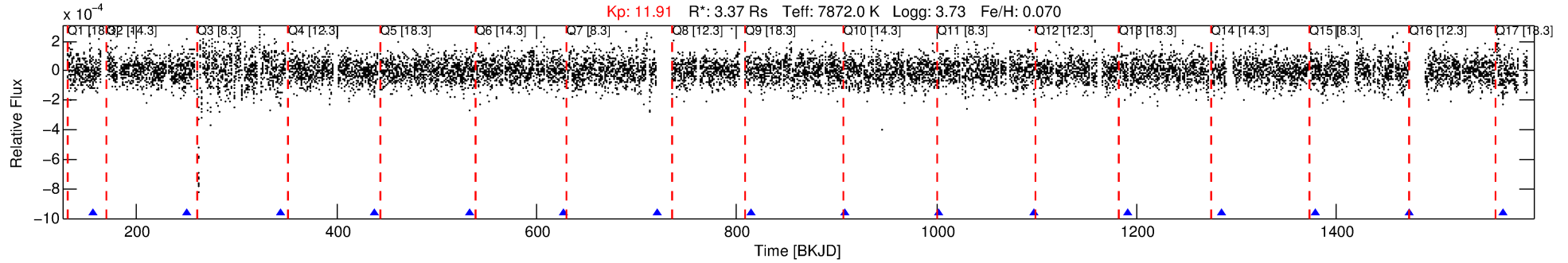
## Ephemeris Match Information For 009655005-04

No Significant Match Found

# DV One-Page Summary

KIC: 9655005 Candidate: 4 of 5 Period: 94.049 d

KOI: K04047 Corr: No Ephemeris Match



## DV Fit Results:

Period = 94.04882 [0.00224] d  
Epoch = 156.3318 [0.0197] BKJD  
Rp/R\* = 0.0093 [0.0044]  
a/R\* = 33.13 [90.89]  
b = 0.78 [1.37]  
Seff = 139.40 [58.87]  
Teq = 876 [93] K  
Rp = 3.40 [1.94] Re  
a = 0.5290 [0.1462] AU  
Ag = 1043.55 [1241.11] [0.84σ]  
Teffp = 7699 [2143] K [3.18σ]

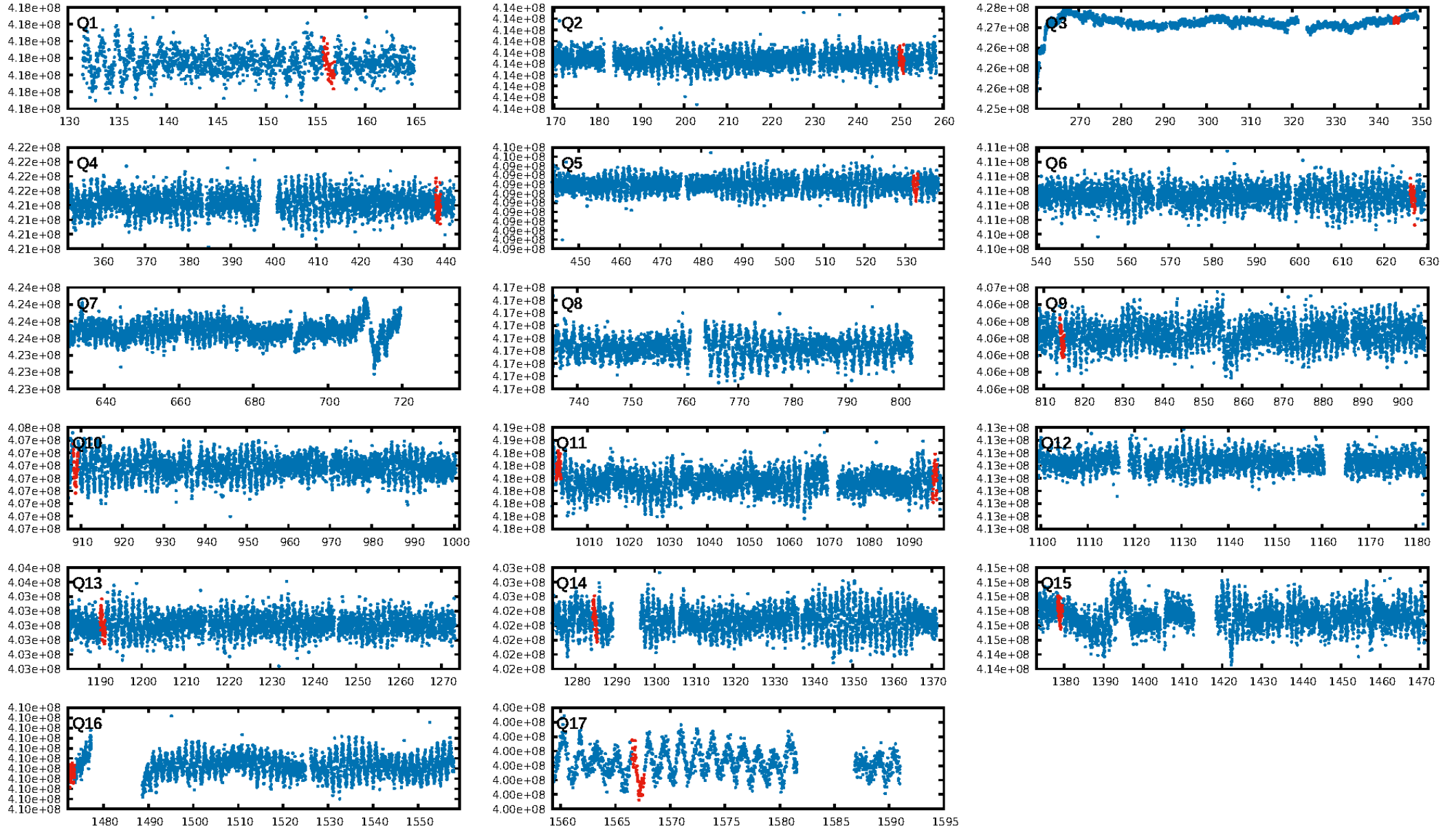
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.16σ]  
LongPeriod-sig: 100.0% [14.56σ]  
ModelChiSquare2-sig: 0.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.34e-18  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -1.859  
Centroid-sig: 2.6%  
Centroid-so: 1.128 arcsec [1.60σ]  
OotOffset-rm: 1.709 arcsec [2.10σ]  
KicOffset-rm: 1.852 arcsec [1.99σ]  
OotOffset-st: 2/2/1/2 [7]  
KicOffset-st: 2/2/1/2 [7]  
DiffImageQuality-fgm: 0.43 [3/7]  
DiffImageOverlap-fno: 0.00 [0/11]

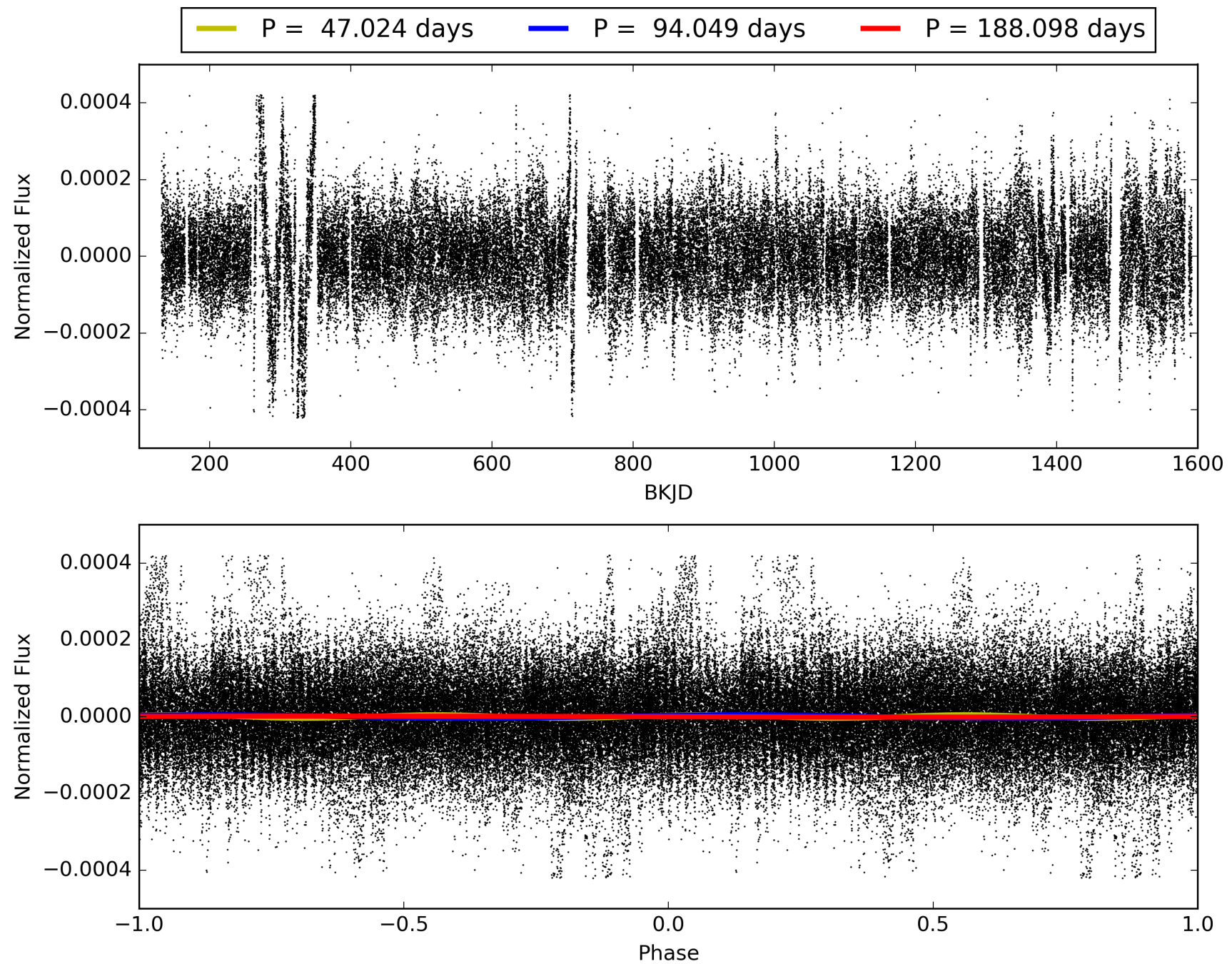
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 09:14:07 Z

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

# TCE 009655005-04, PDC Light Curves

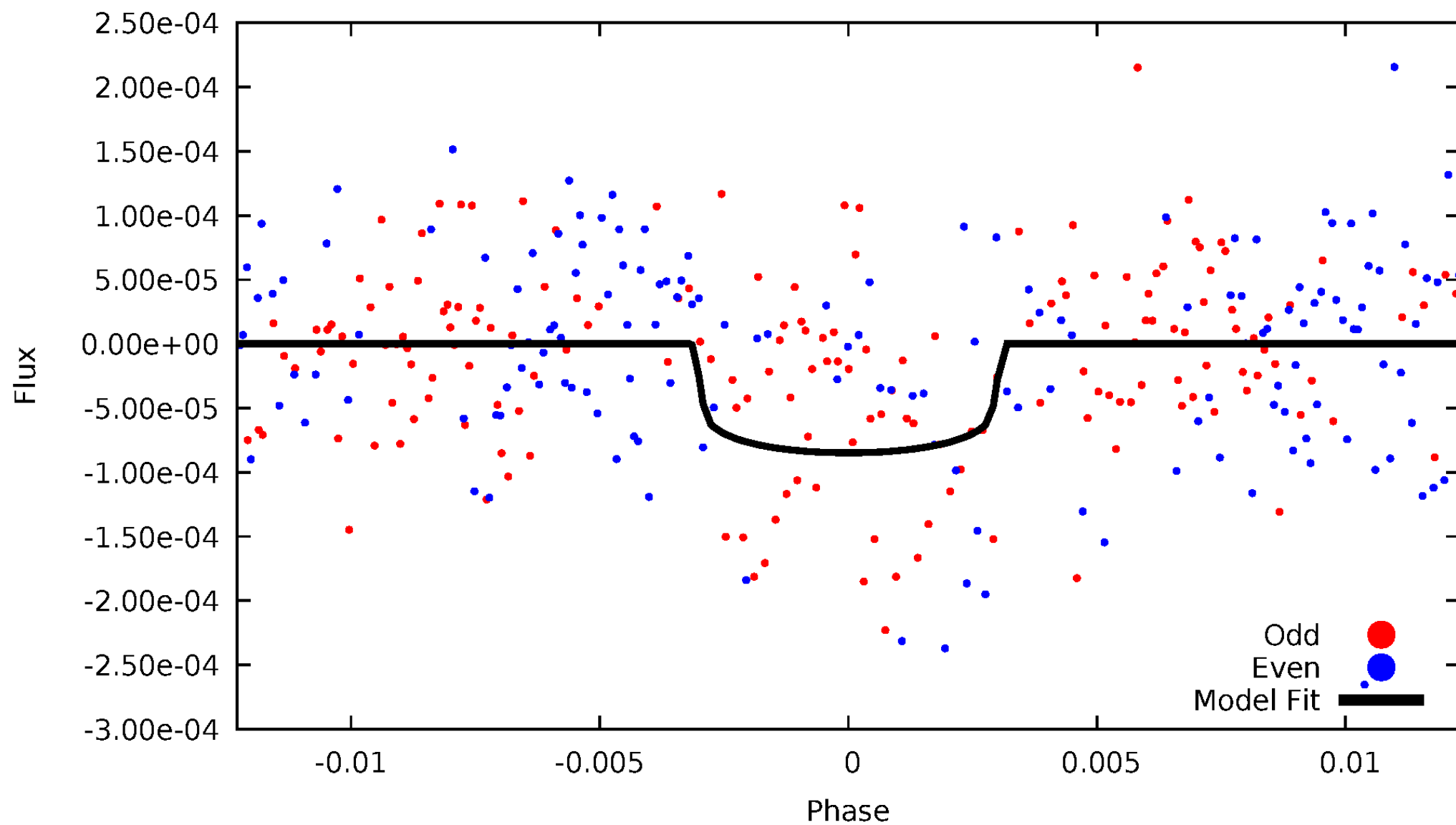


TCE 009655005-04



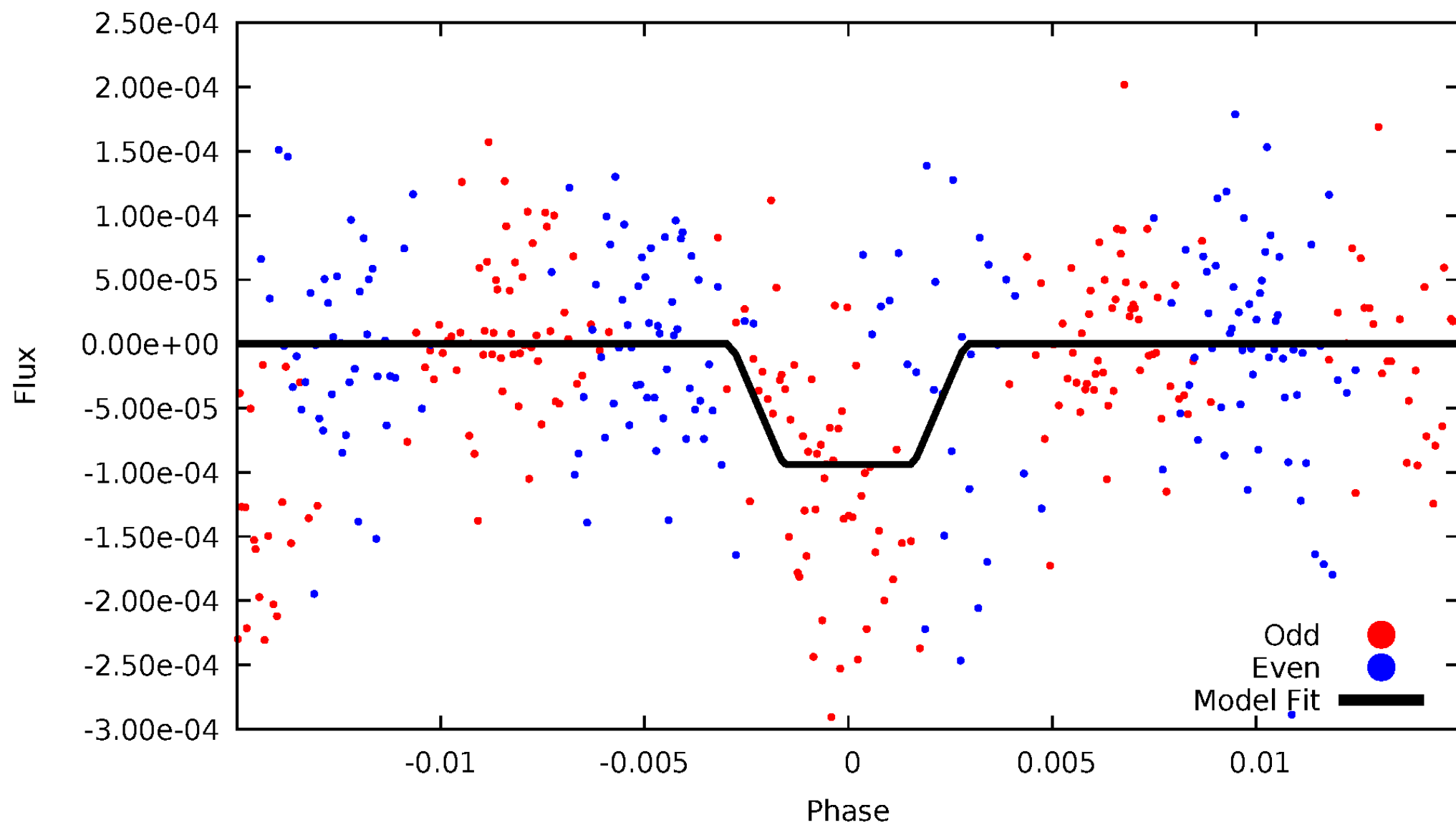
# DV Odd/Even

TCE 009655005-04



# ALT Odd/Even

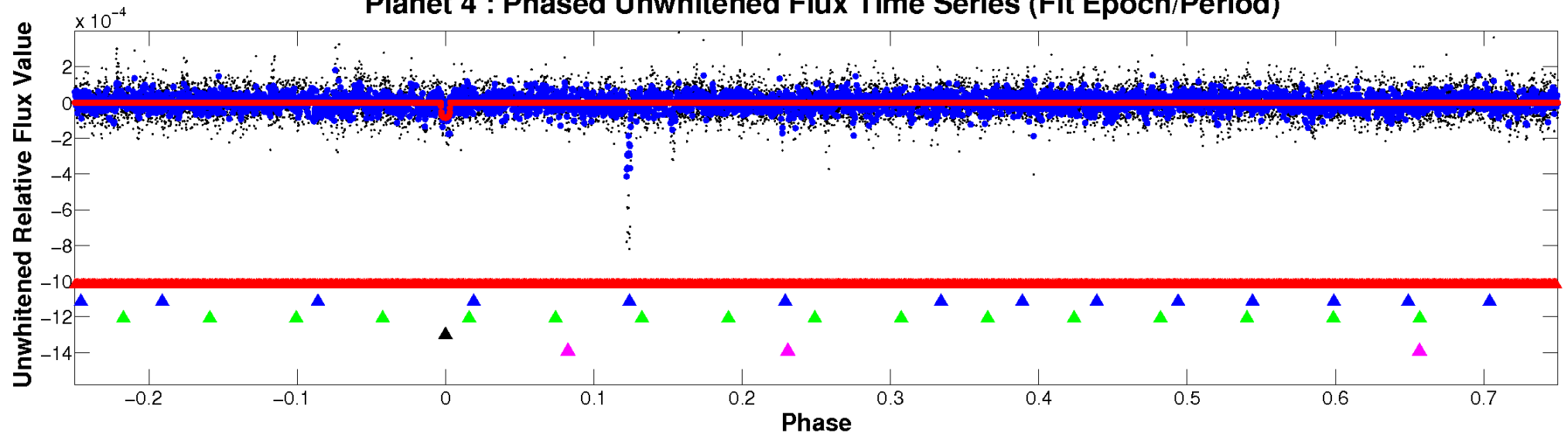
TCE 009655005-04



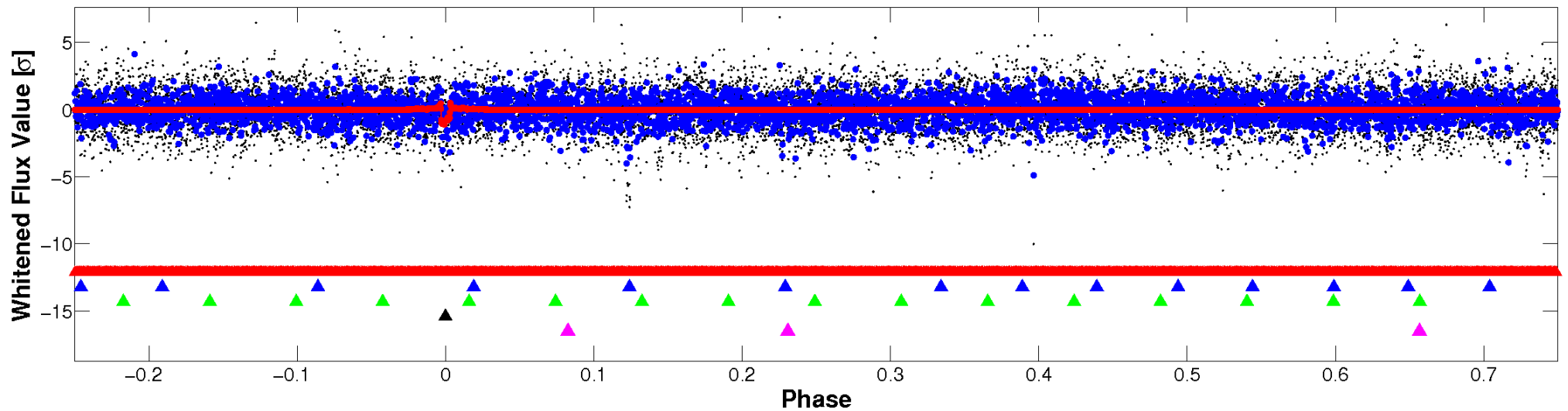


# Non-Whitened Vs. Whitened Light Curve

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



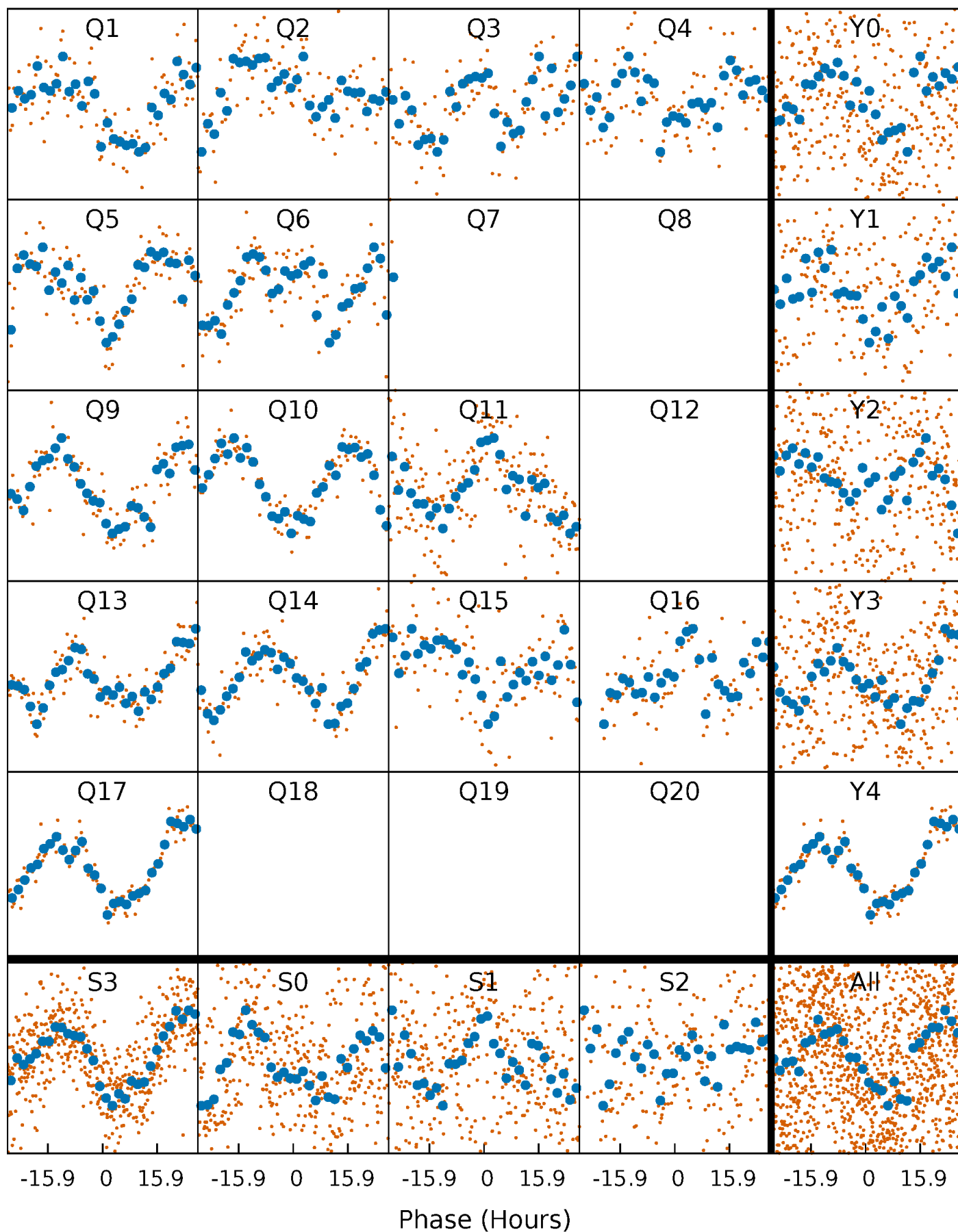
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





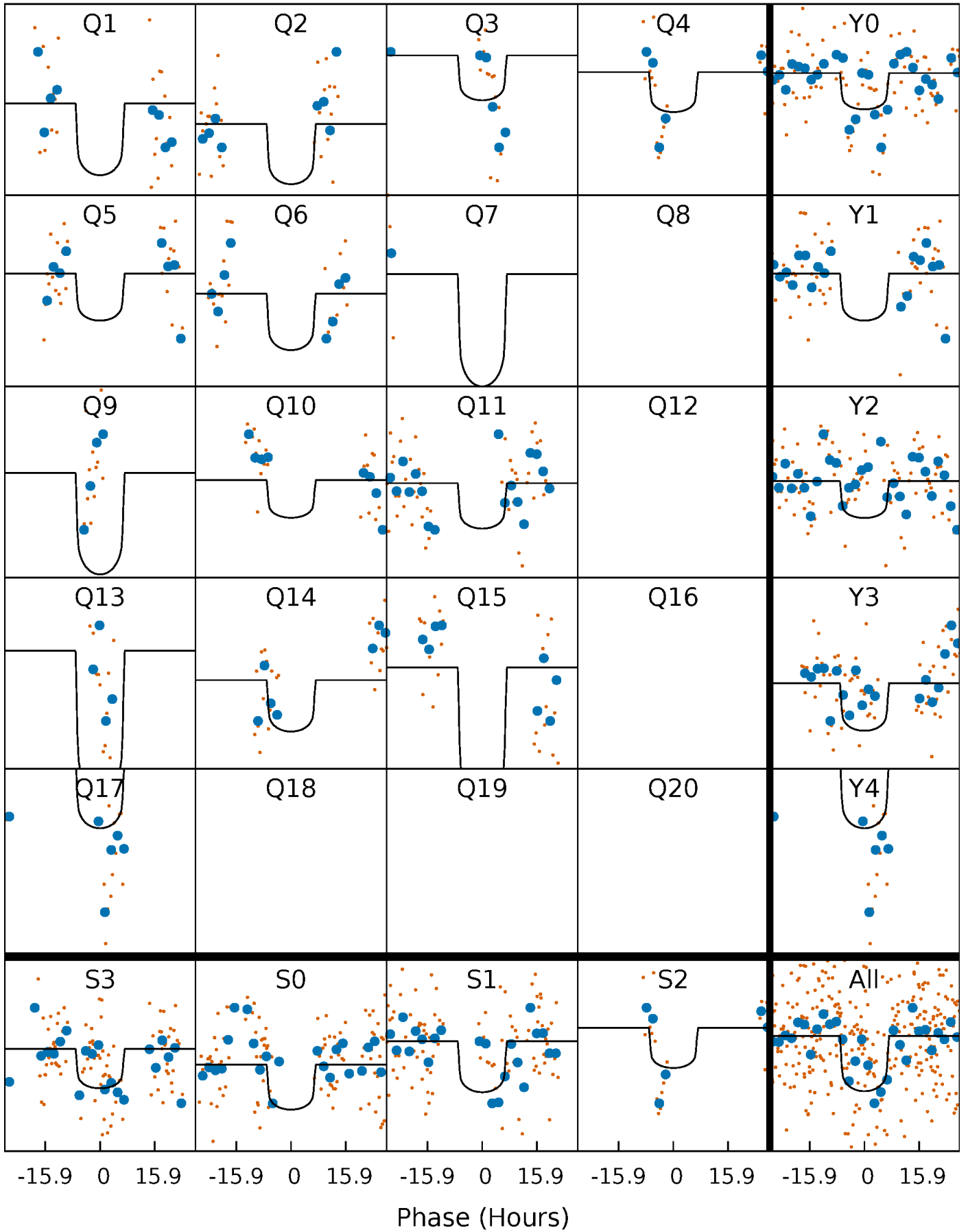
# PDC Quarter-Phased Transit Curves

TCE 009655005-04 P= 94.048823 Days  $T_0=156.331762$  (BKJD)



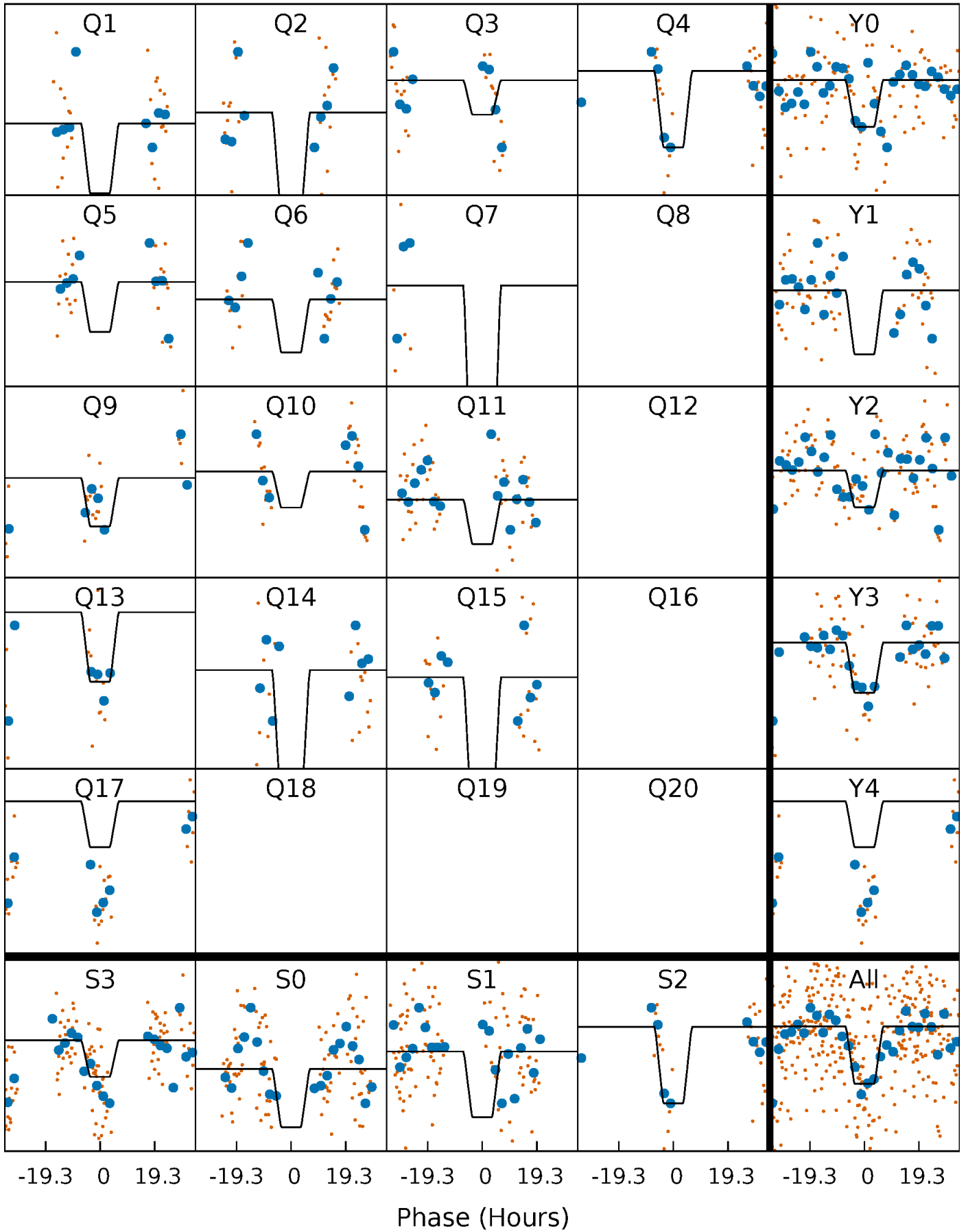
# DV Quarter-Phased Transit Curves

TCE 009655005-04     $P = 94.048823$  Days     $T_0 = 156.331762$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

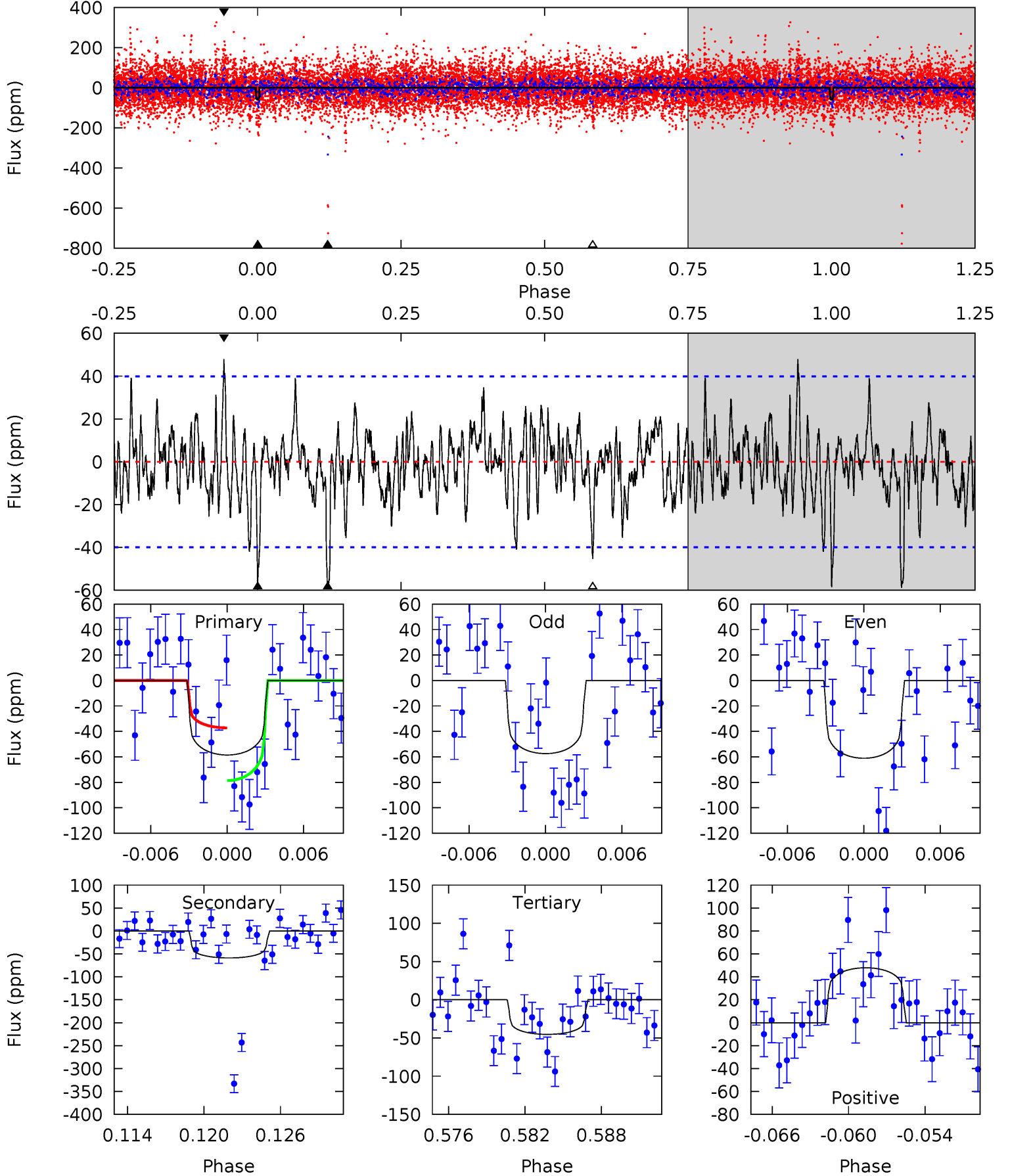
TCE 009655005-04 P= 94.063064 Days  $T_0=156.227458$  (BKJD)



# DV Model-Shift Uniqueness Test

009655005-04, P = 94.048823 Days, E = 62.282939 Days

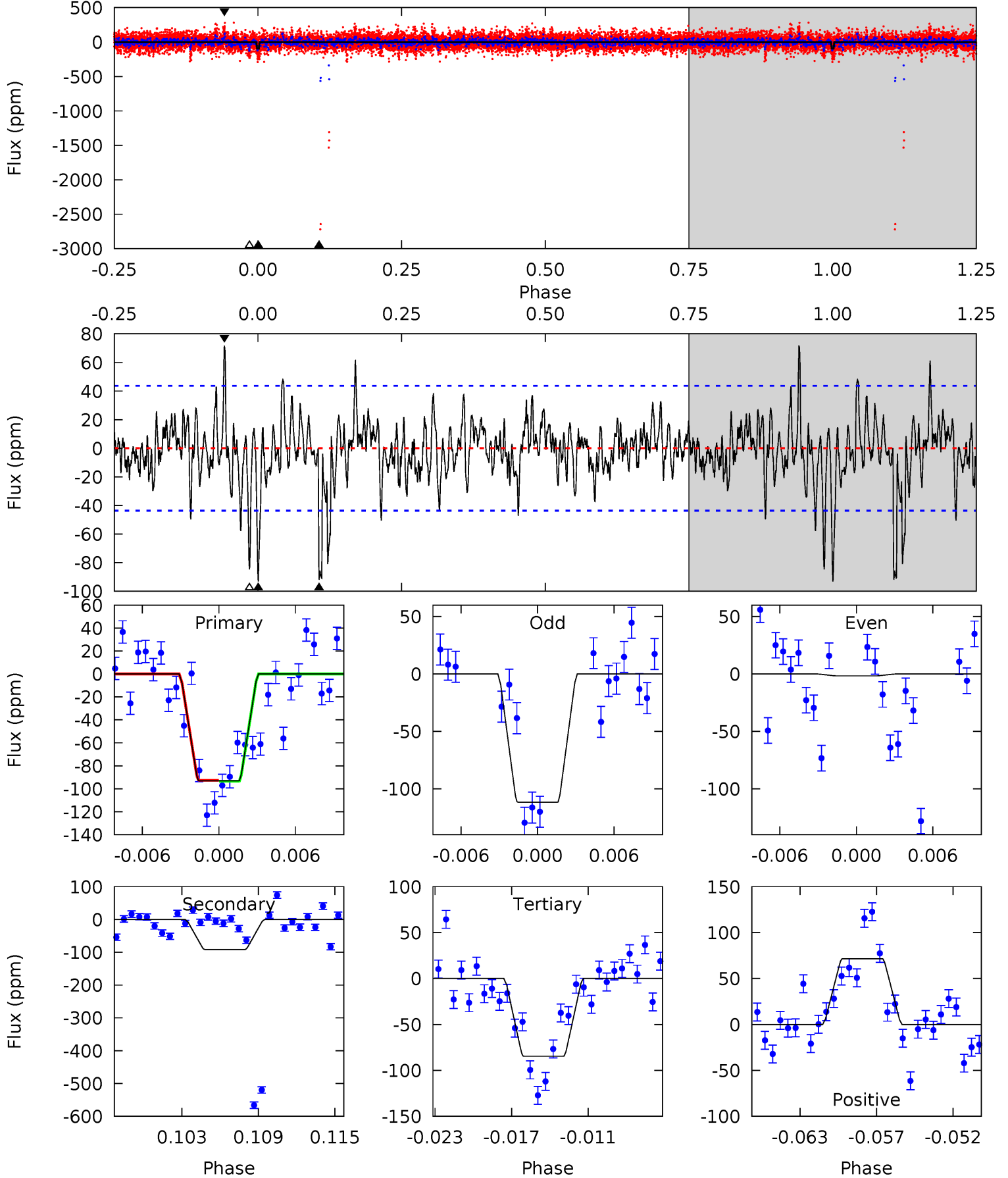
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.52	7.56	5.82	6.15	5.12	2.75	1.69	1.70	1.37	1.74	1.40	0.22	1.03	0.45	2.67



# Alt Model-Shift Uniqueness Test

009655005-04, P = 94.063064 Days, E = 62.164394 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
10.9	10.8	9.95	8.40	5.13	2.76	2.03	0.98	2.53	0.84	2.38	5.86	1.19	0.43	0.05



### Stellar Parameters For KIC 009655005

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7872^{+70}_{-86}$	$3.732^{+0.238}_{-0.085}$	$0.070^{+0.150}_{-0.200}$	$3.367^{+0.564}_{-1.047}$	$2.228^{+0.171}_{-0.371}$	$0.082^{+0.135}_{-0.023}$
	+1%/-1%	+6%/-2%	+214%/-286%	+17%/-31%	+8%/-17%	+164%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 009655005-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-59 \pm 8$	$3.14^{+1.62}_{-1.54}$	$1204^{+62}_{-88}$	$7097^{+3726}_{-1348}$	$918^{+2516}_{-535}$
Alt.	$-92 \pm 9$	$3.35^{+1.61}_{-1.37}$	$1210^{+52}_{-93}$	$7790^{+3316}_{-1428}$	$1220^{+2323}_{-652}$

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

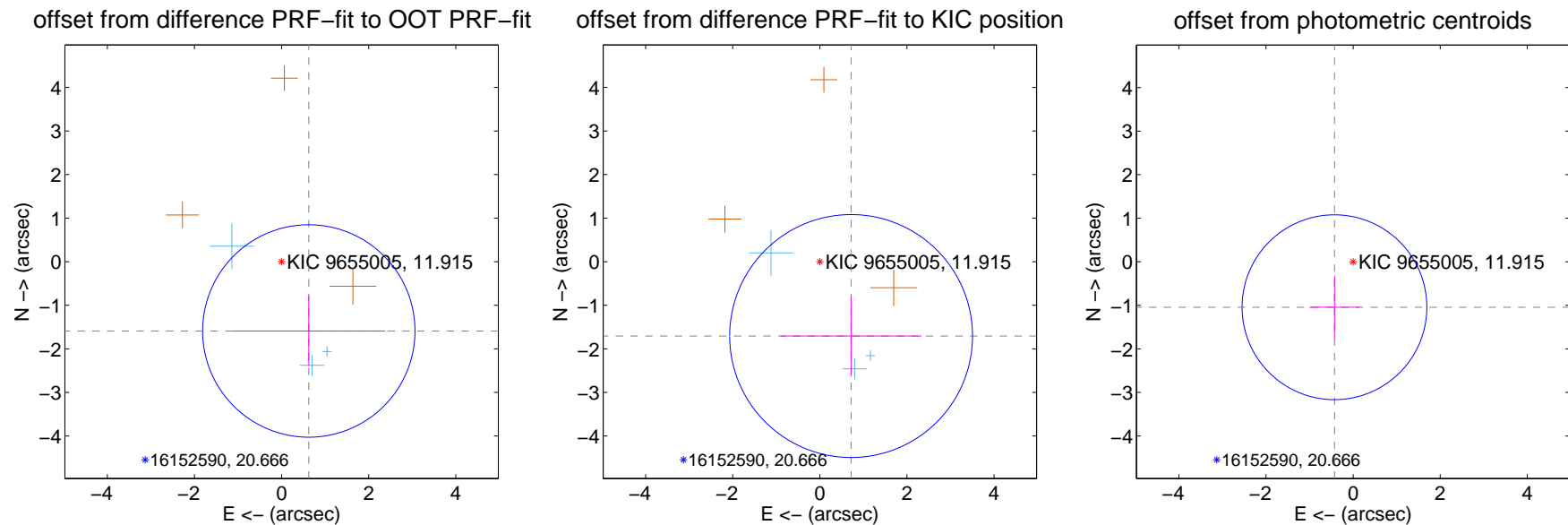
## DV Centroid Data

Supplemental centroid analysis for 009655005-04. **Kepler magnitude: 11.91.** Transit SNR 7.77

**There are 3 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

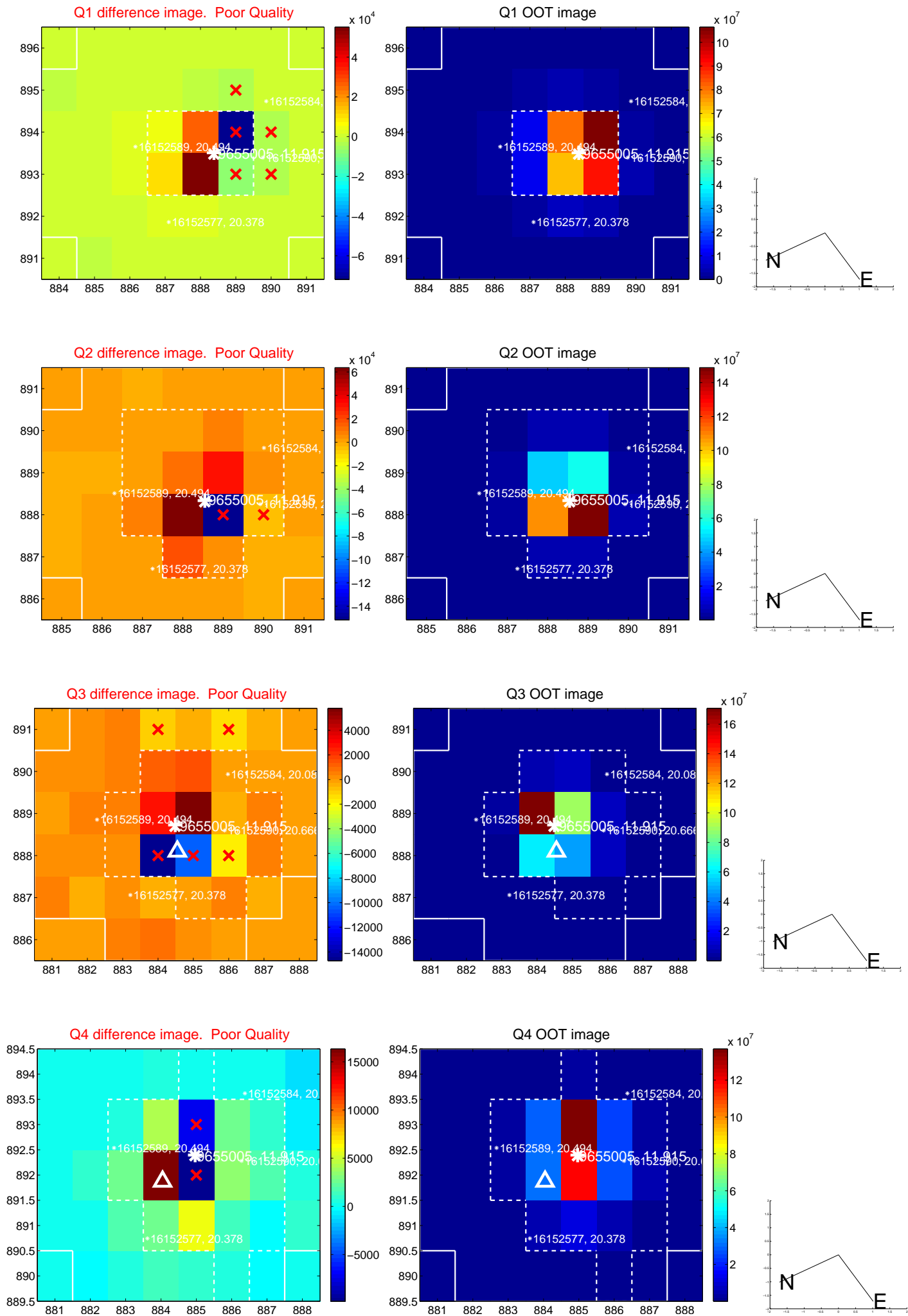
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.709 \pm 0.813$	2.10	$-0.626 \pm 1.757$	$-1.591 \pm 0.805$
PRF-fit source offset from KIC position	$1.852 \pm 0.930$	1.99	$-0.718 \pm 1.617$	$-1.707 \pm 0.916$
photometric centroid source offset	$1.13 \pm 0.71$	1.60	$0.43 \pm 0.58$	$-1.04 \pm 0.73$



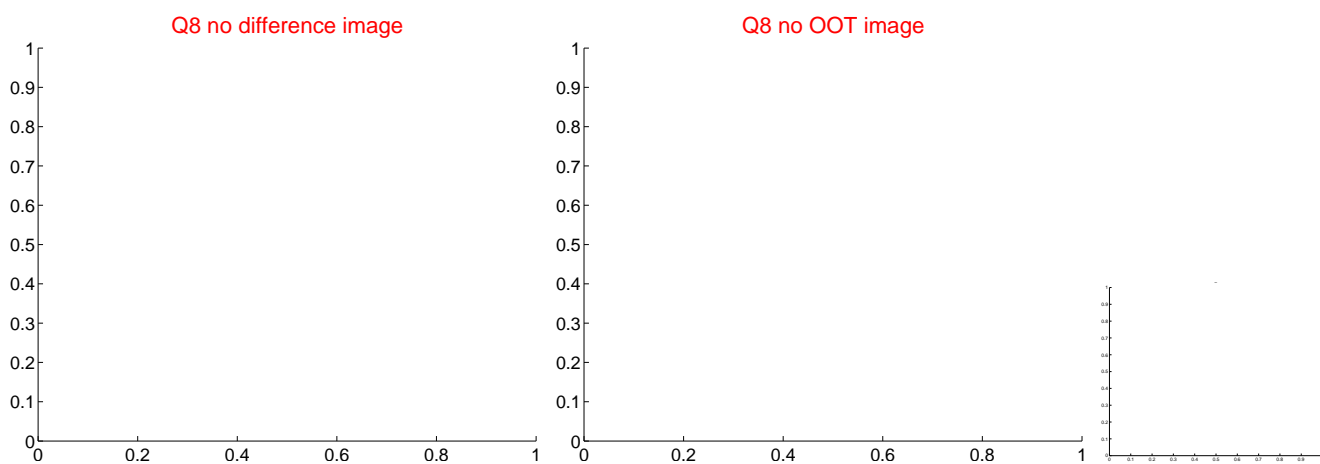
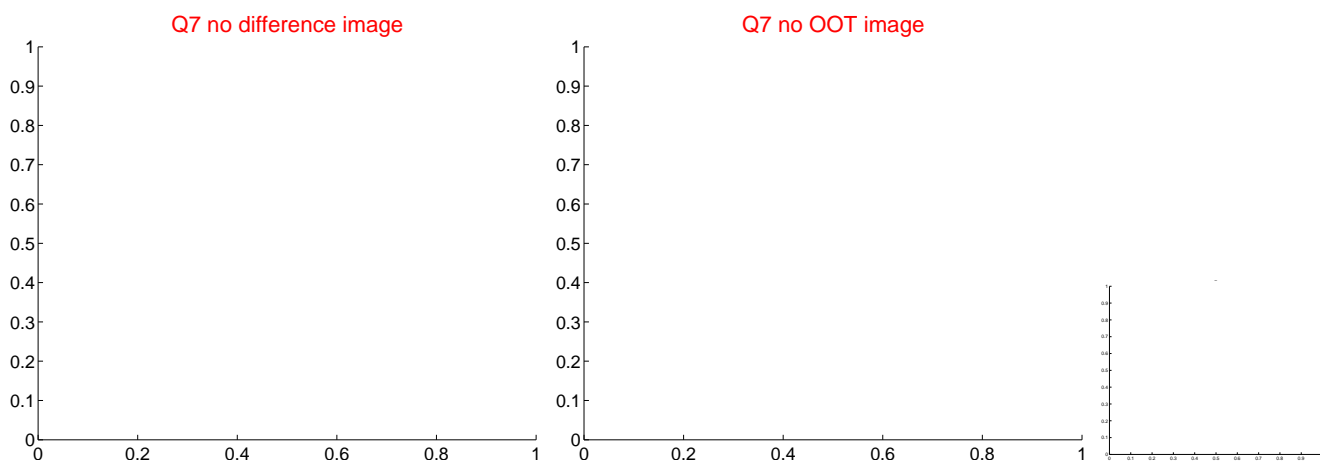
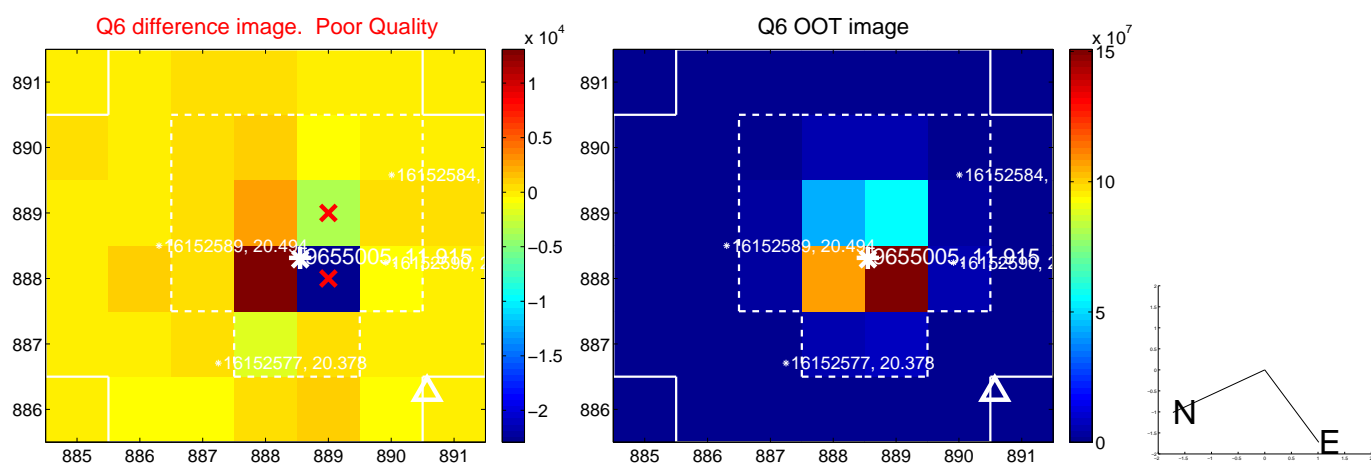
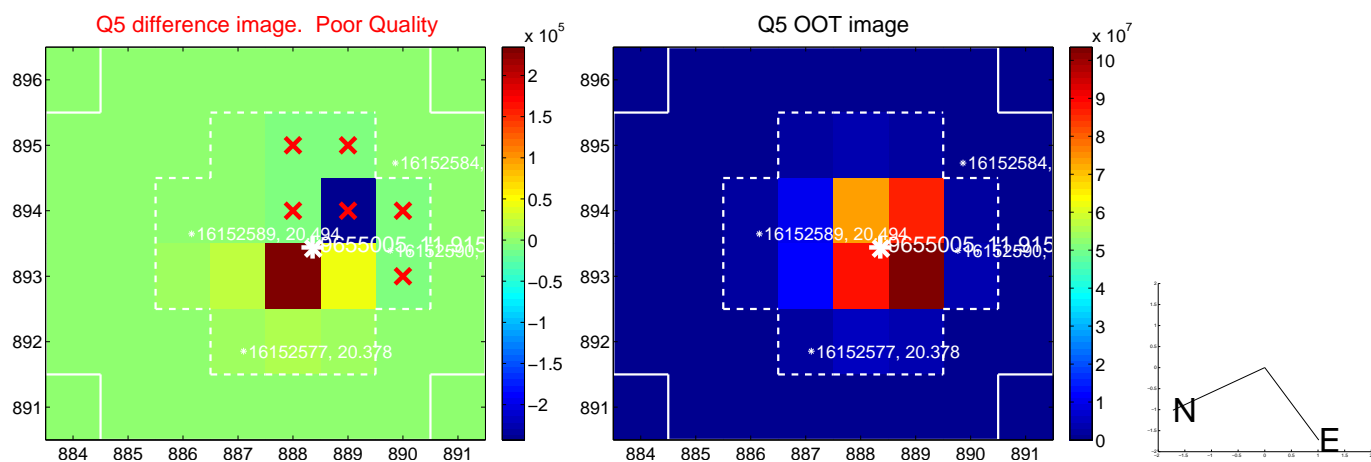
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



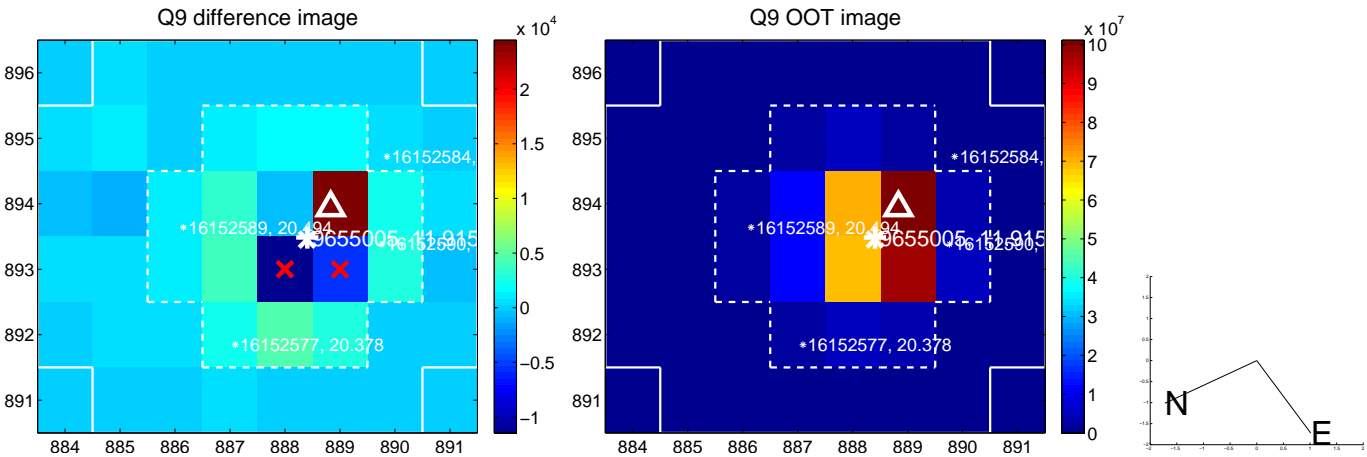
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



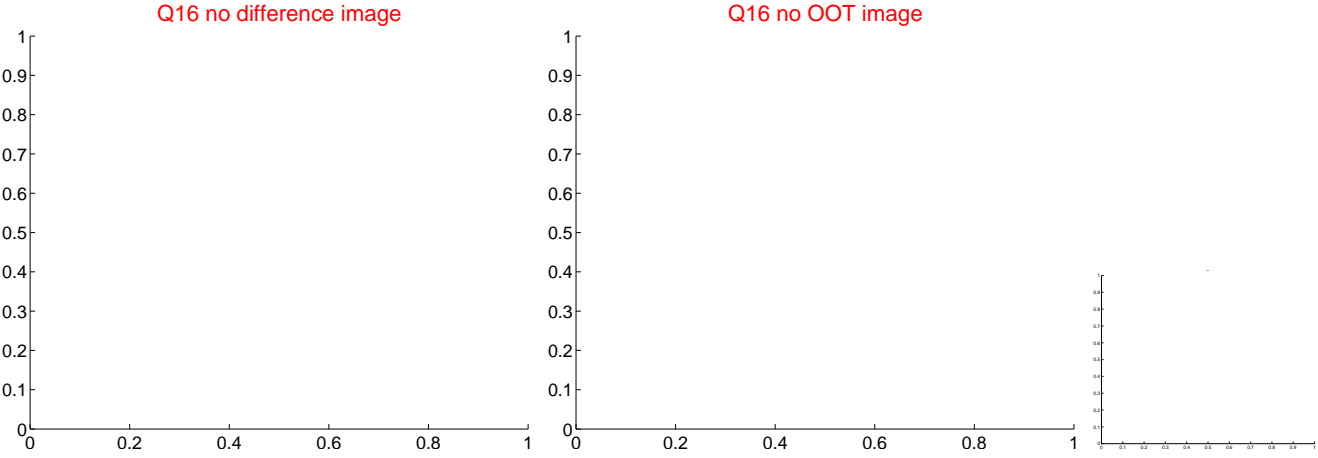
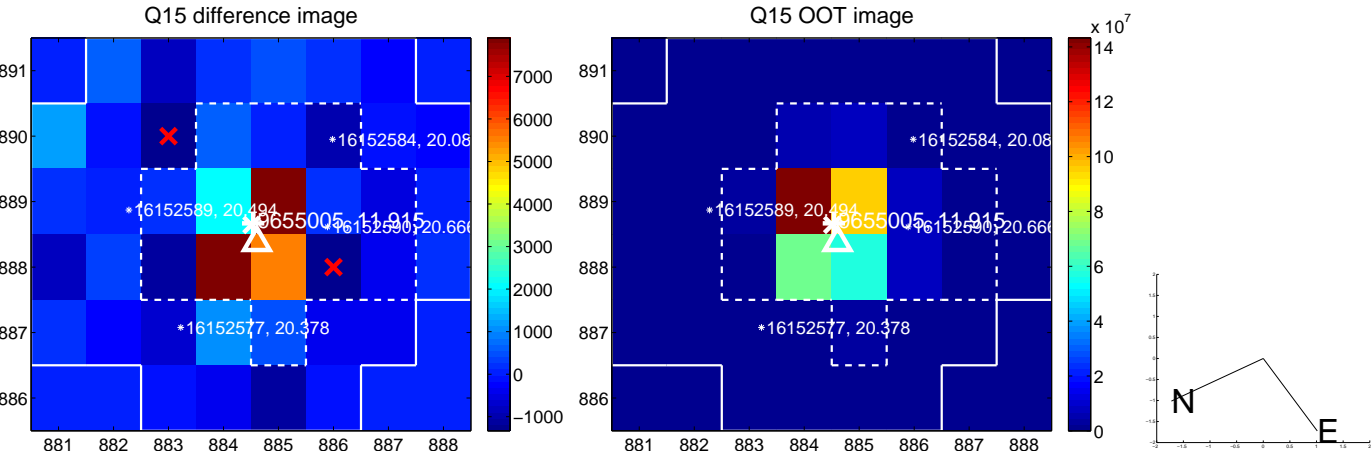
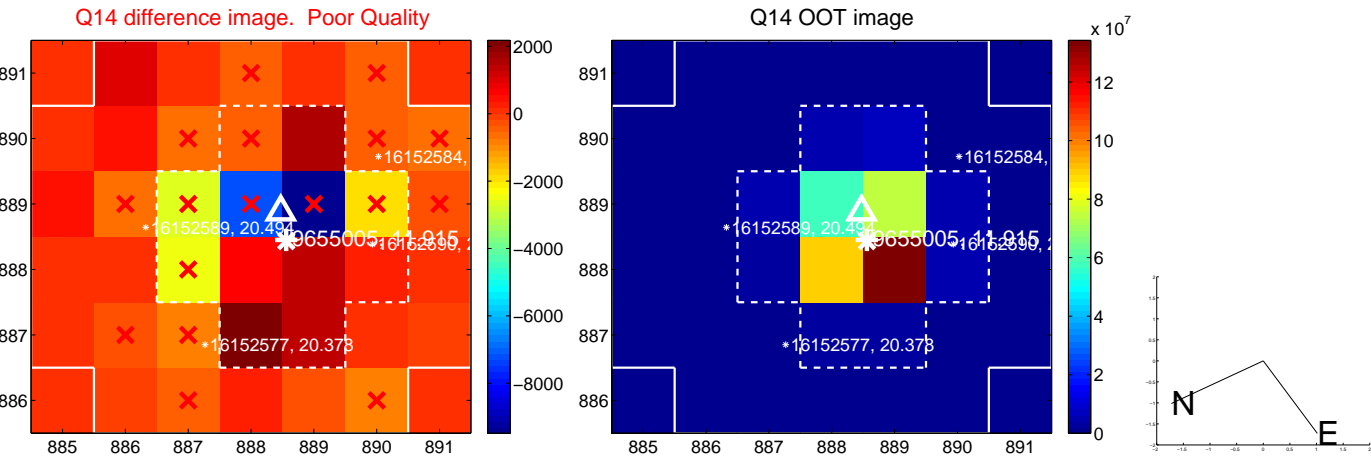
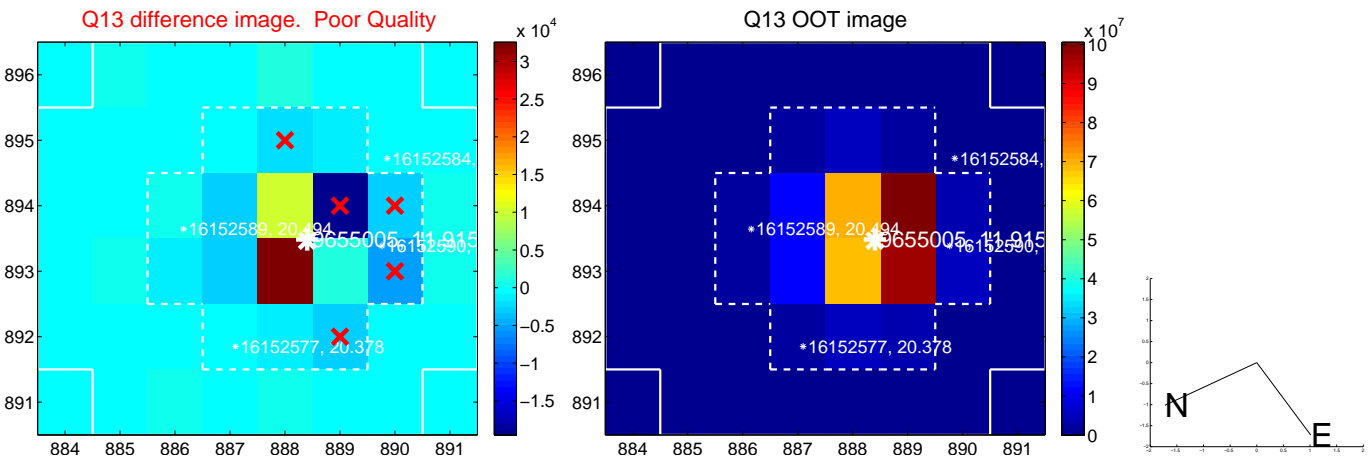
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



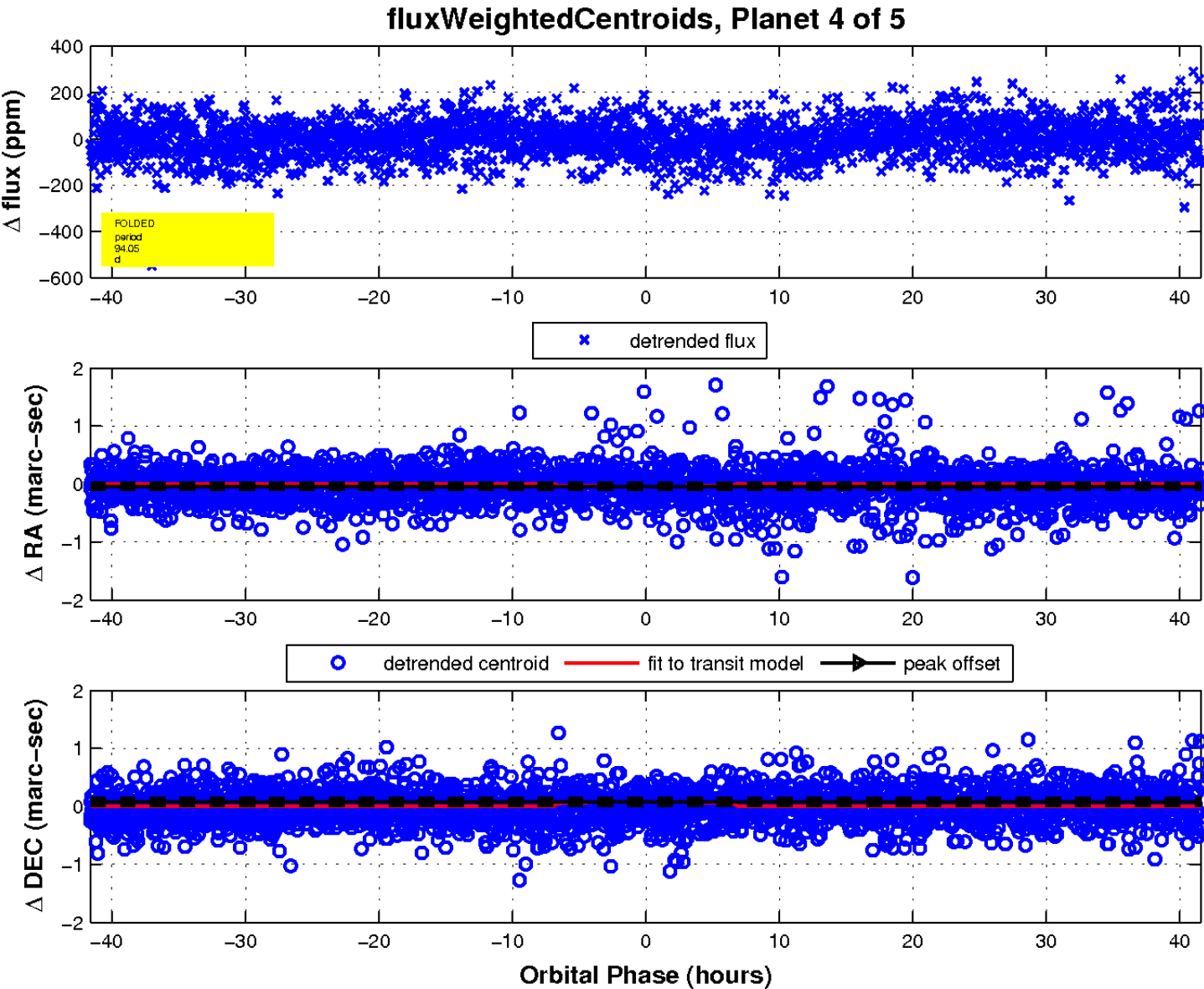
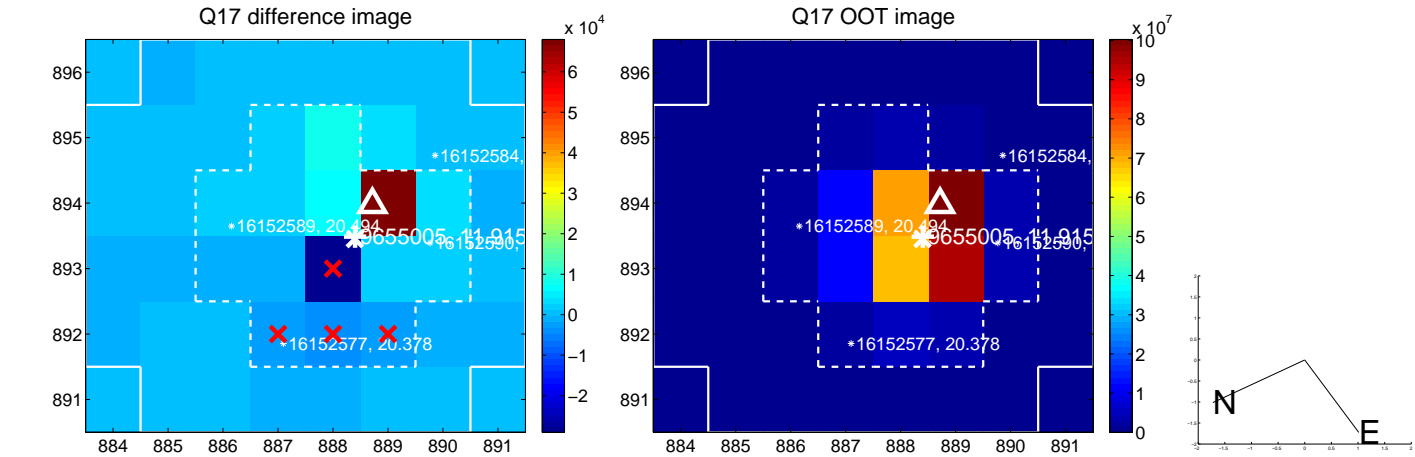
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



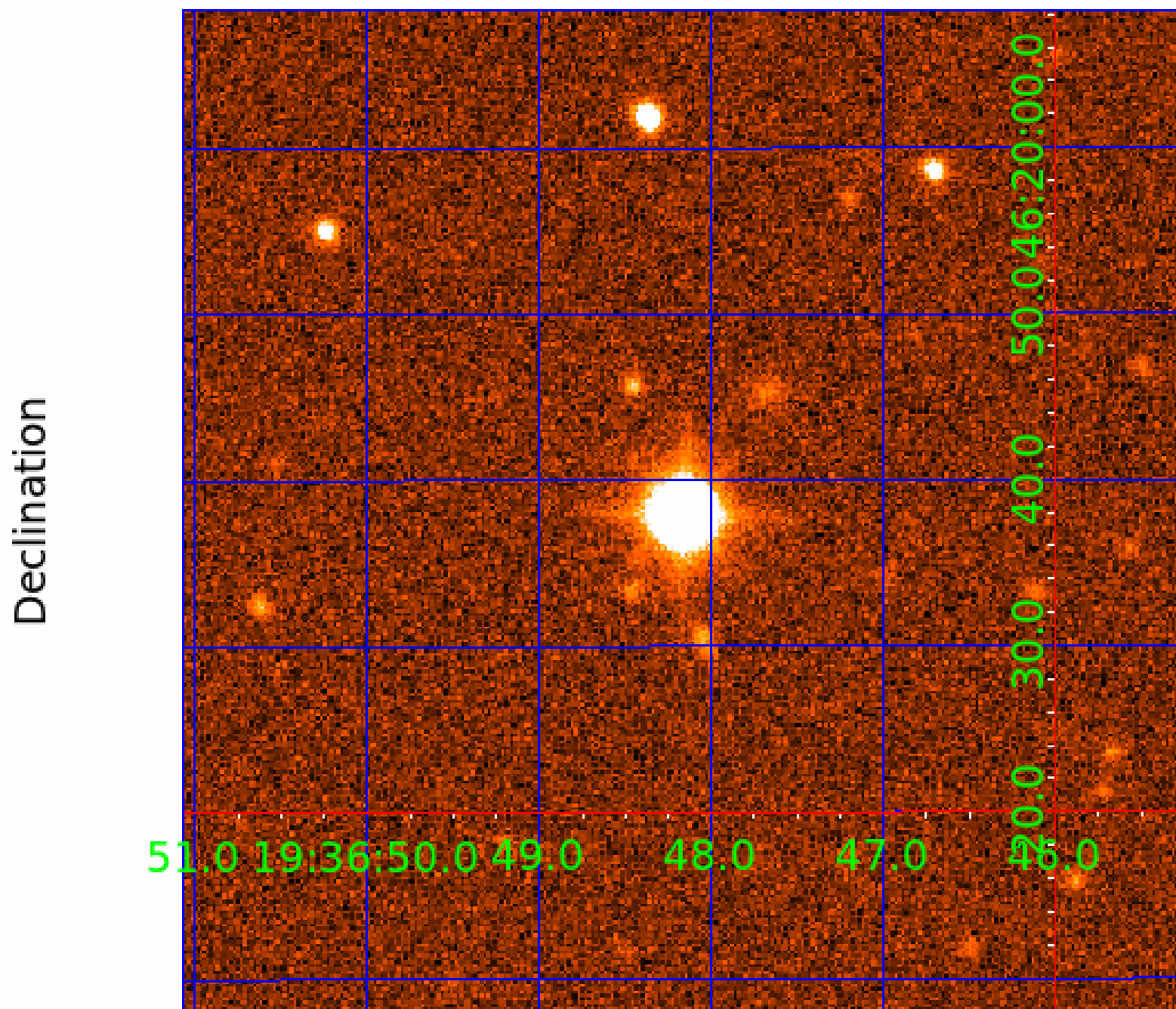
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 009655005

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009655005-01	OBS	4047.01	1.398932	132.598202	8.9	8.626	13.2	9.4	3.37	7872	1.01	38106.71
009655005-02	OBS	No	103.925614	192.910813	187.5	8.515	15.1	12.5	3.37	7872	5.26	122.02
009655005-03	OBS	No	88.568337	218.115748	155.4	3.708	13.5	9.8	3.37	7872	4.78	151.02
009655005-04	OBS	No	94.048823	156.331762	84.8	13.870	10.0	7.8	3.37	7872	3.40	139.40
009655005-05	OBS	No	604.344606	178.043786	93.8	5.233	8.4	8.0	3.37	7872	3.37	11.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655005-01	OBS	PC	0.20	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV
009655005-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—HALO_GHOST
009655005-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009655005-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009655005-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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 009655005-05

No Significant Match Found

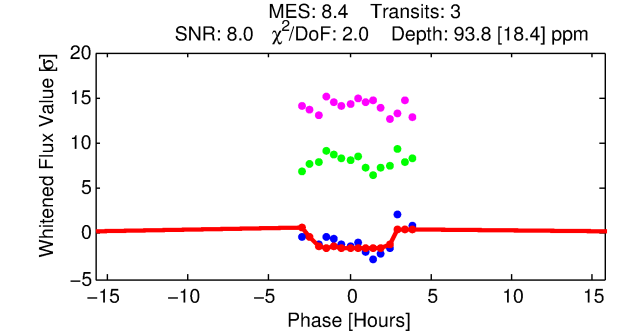
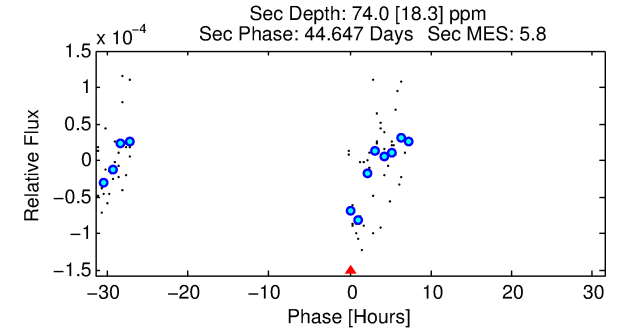
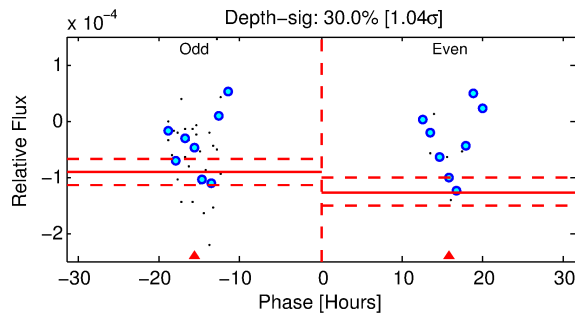
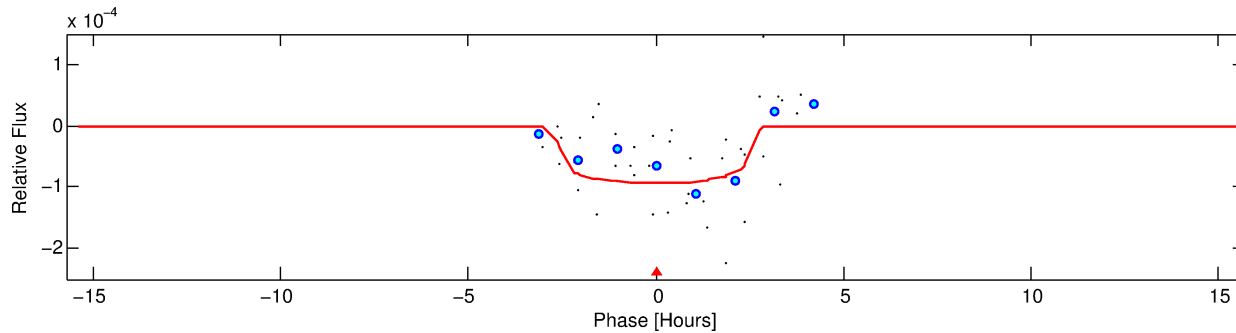
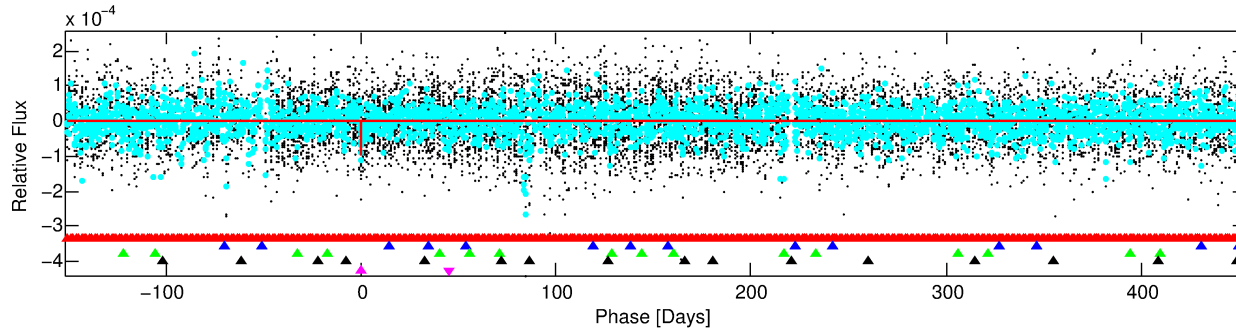
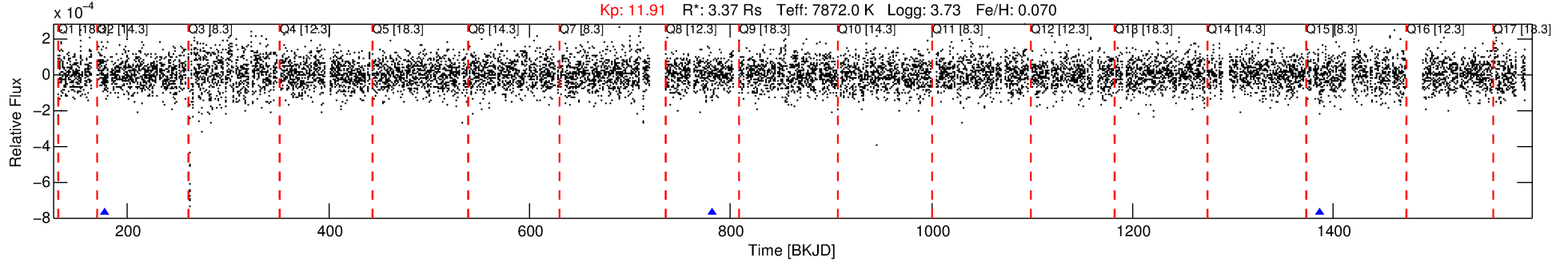


# DV One-Page Summary

KIC: 9655005 Candidate: 5 of 5 Period: 604.345 d

KOI: K04047 Corr: No Ephemeris Match

Kp: 11.91 R\*: 3.37 Rs Teff: 7872.0 K Logg: 3.73 Fe/H: 0.070



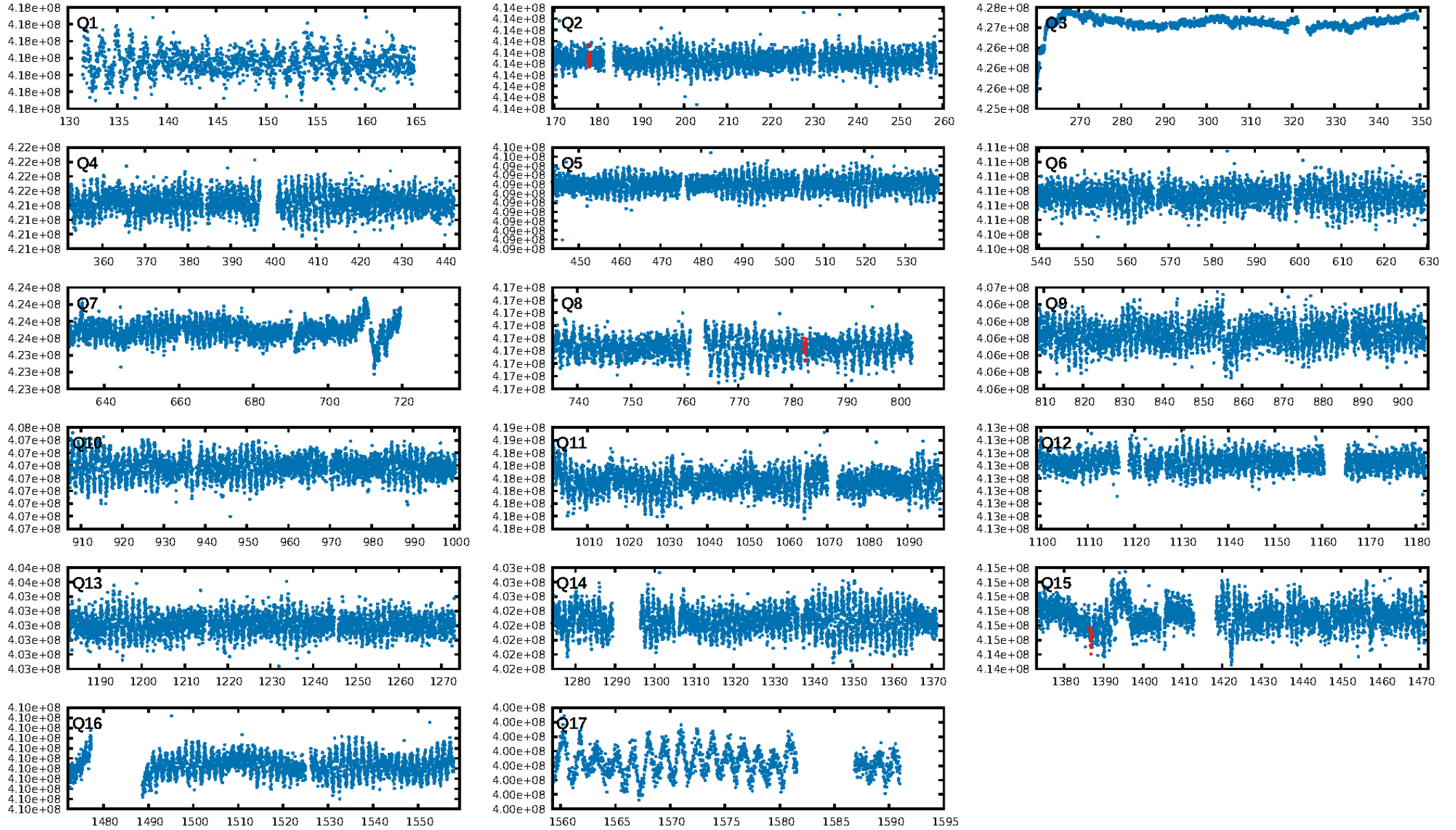
## DV Fit Results:

Period = 604.34461 [0.00794] d  
Epoch = 178.0438 [0.0109] BKJD  
Rp/R\* = 0.0092 [0.0321]  
a/R\* = 777.56 [15430.61]  
b = 0.49 [30.82]  
Seff = 11.67 [4.93]  
Teq = 471 [50] K  
Rp = 3.37 [11.85] Re  
a = 1.8283 [0.5052] AU  
Ag = 11966.94 [83967.87] [0.14σ]  
Teff = 7621 [13345] K [0.54σ]

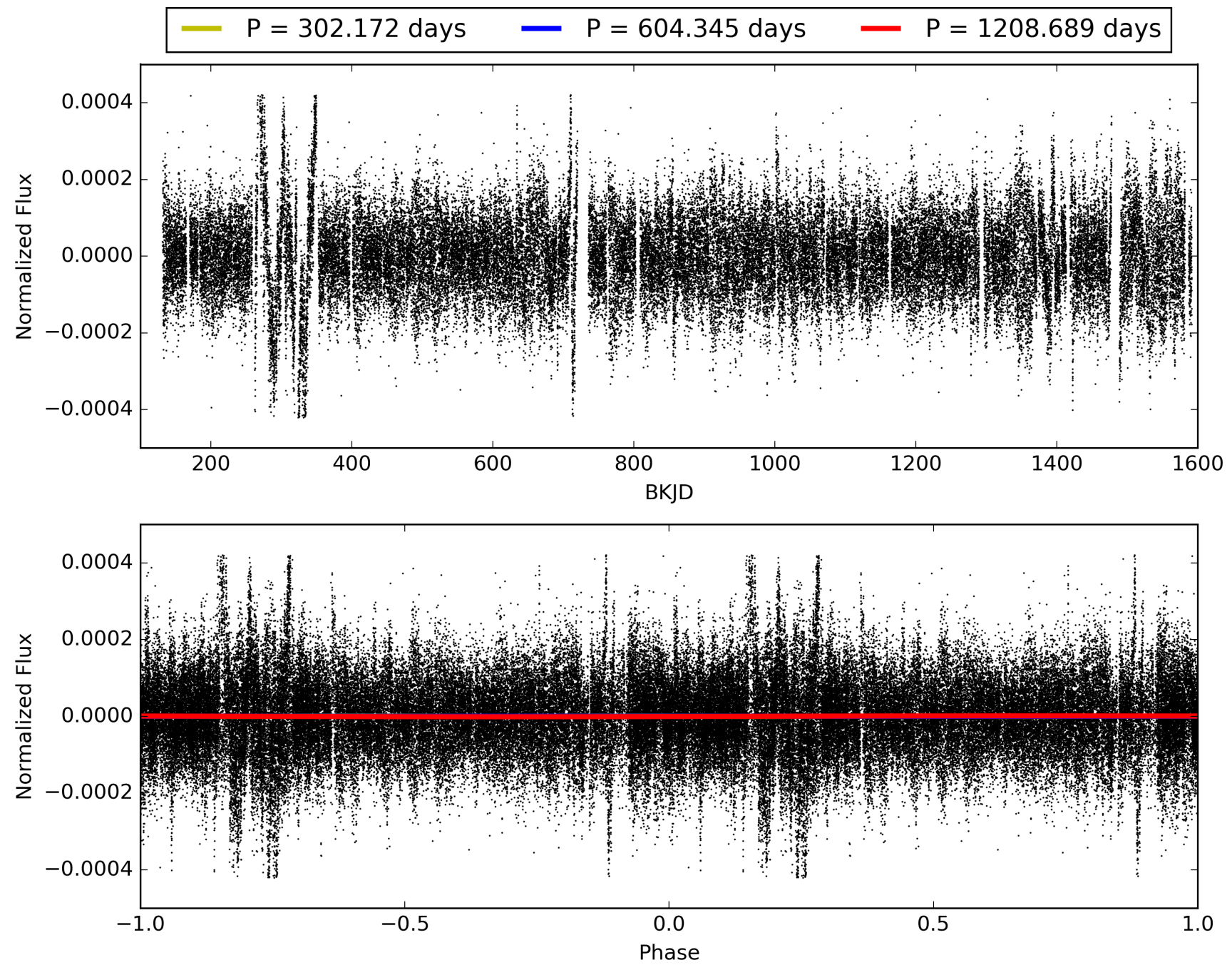
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1201.66σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.3%  
ModelChiSquareGof-sig: 3.8%  
**Bootstrap-pfa: 3.86e-08**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -3.91  
Centroid-sig: 57.2%  
Centroid-so: 0.847 arcsec [0.47σ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 009655005-05, PDC Light Curves

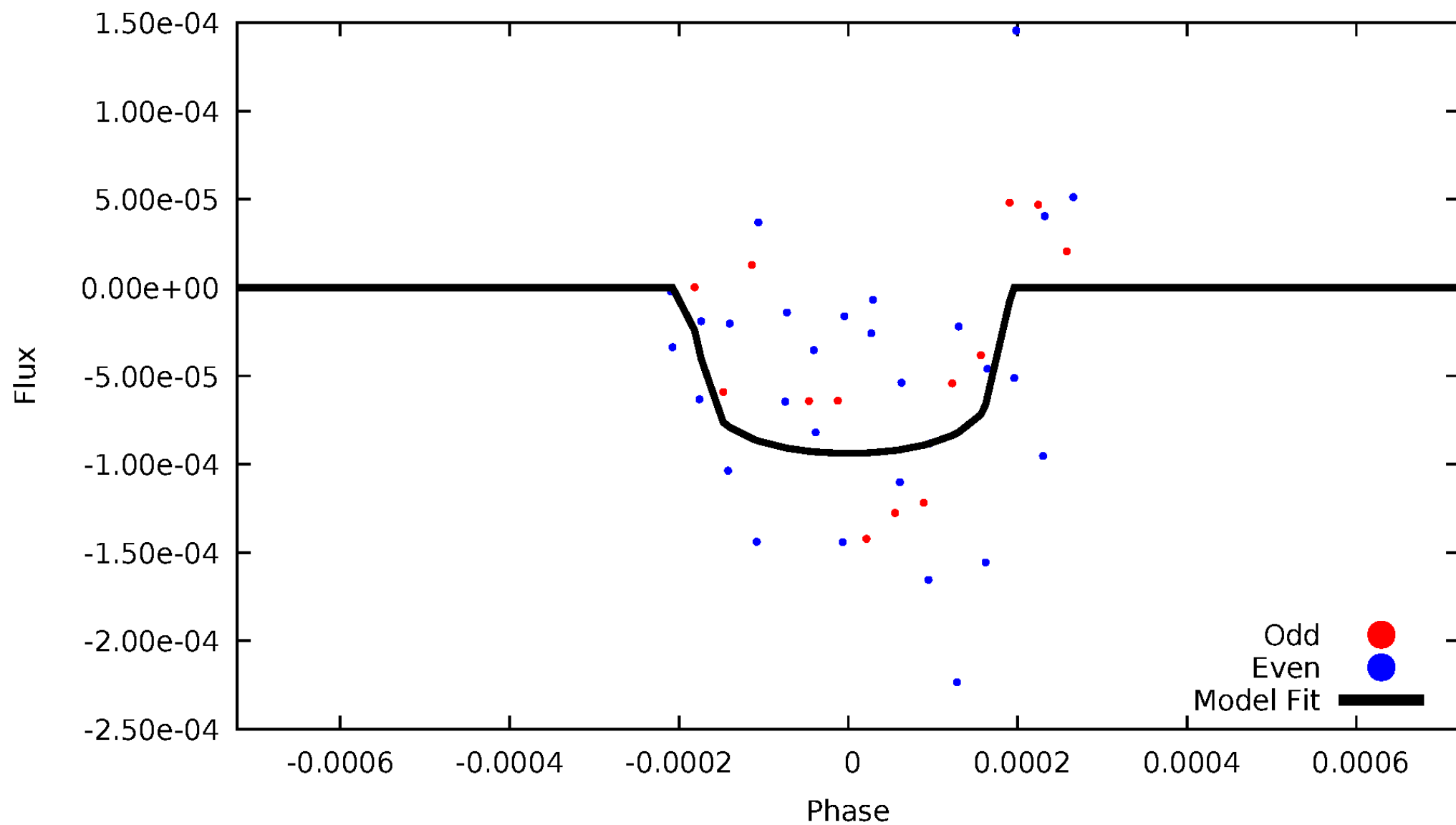


TCE 009655005-05



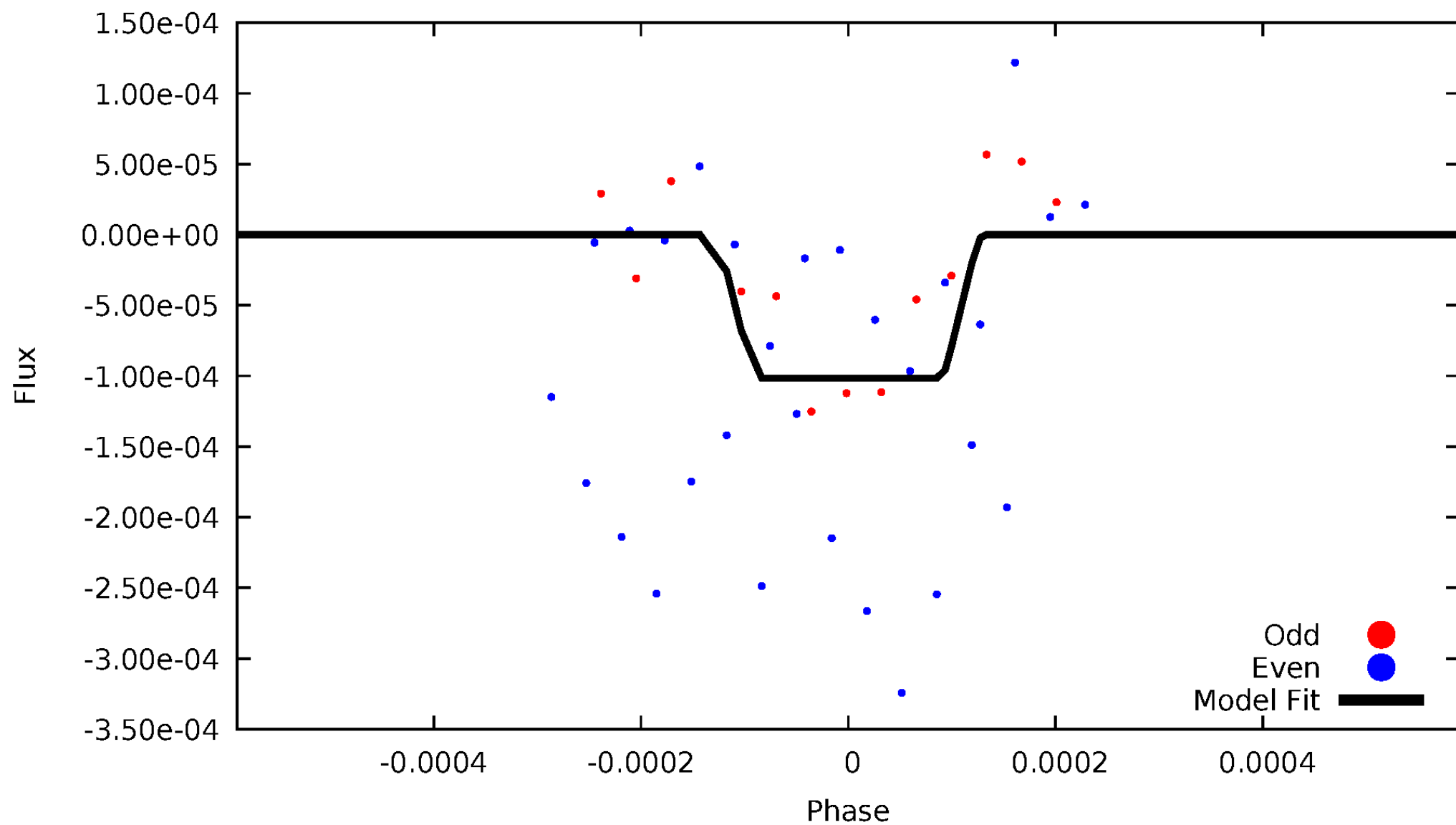
# DV Odd/Even

TCE 009655005-05



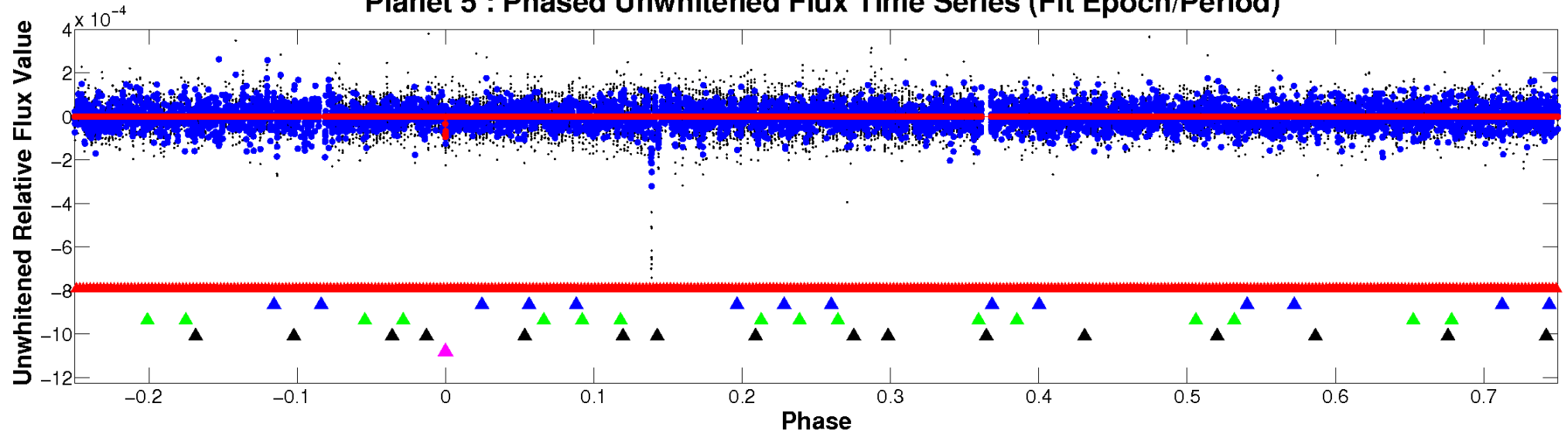
# ALT Odd/Even

TCE 009655005-05

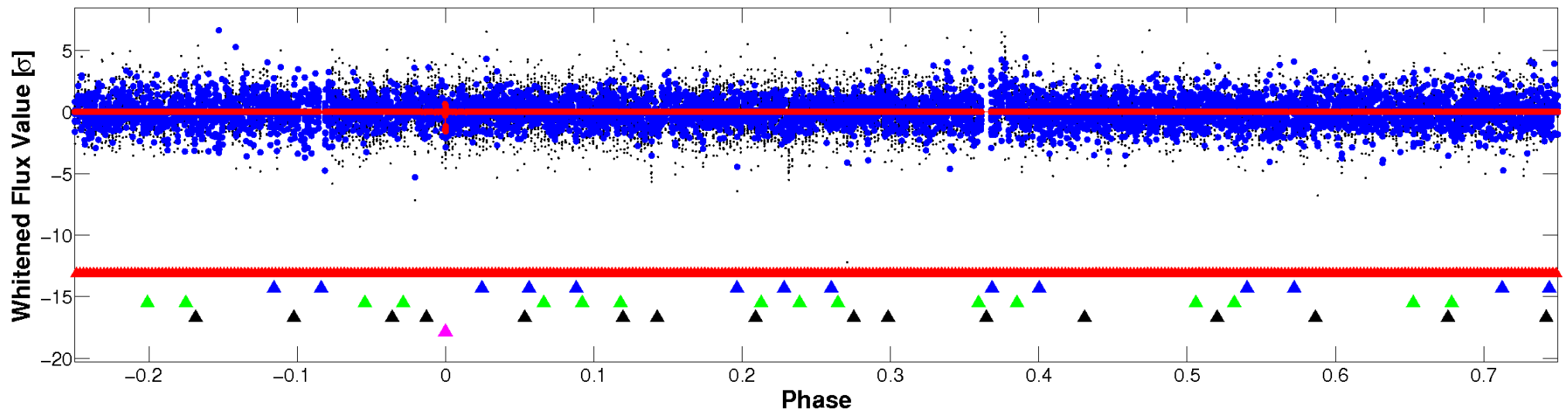


### Non-Whitened Vs. Whitened Light Curve

### Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

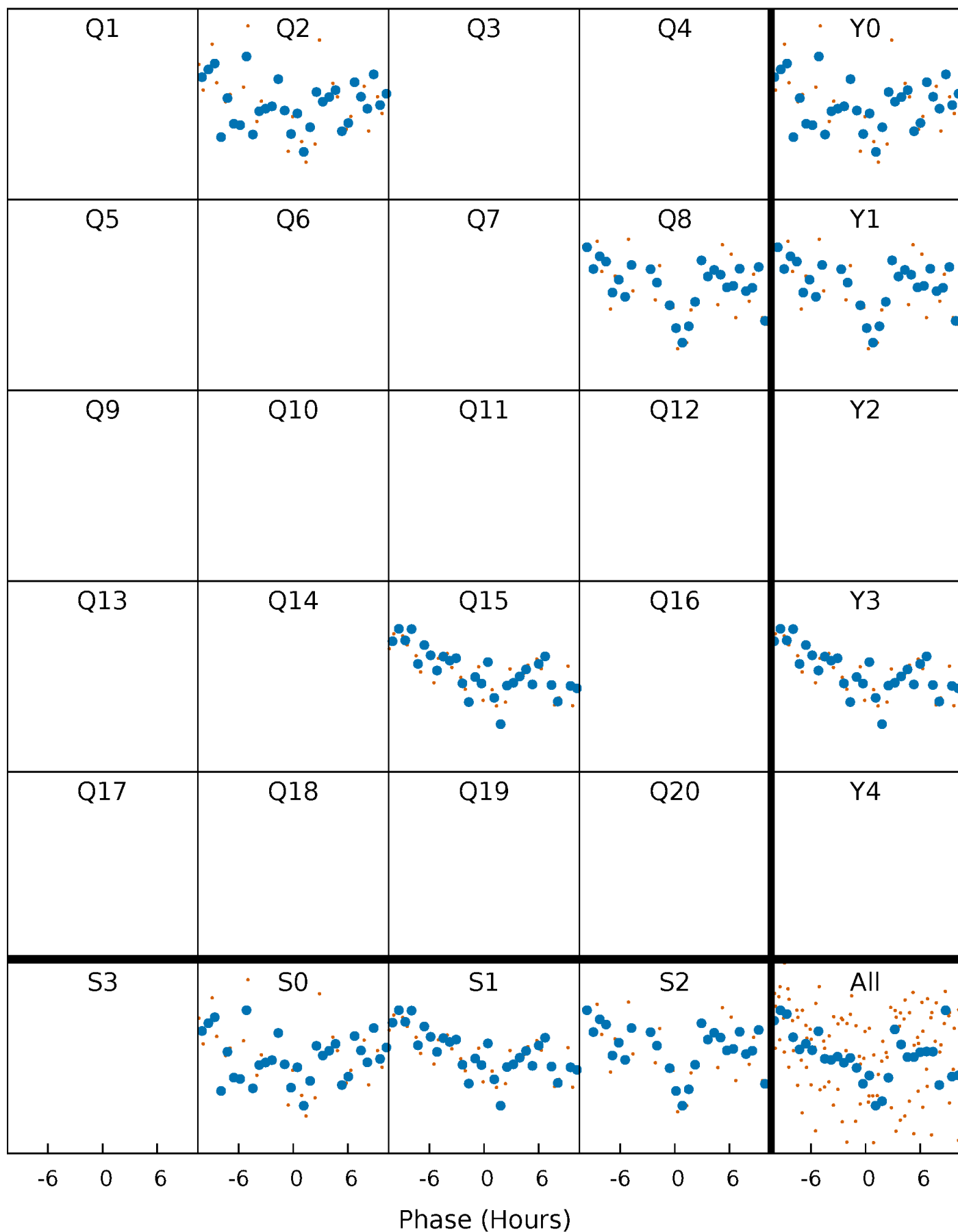


### Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

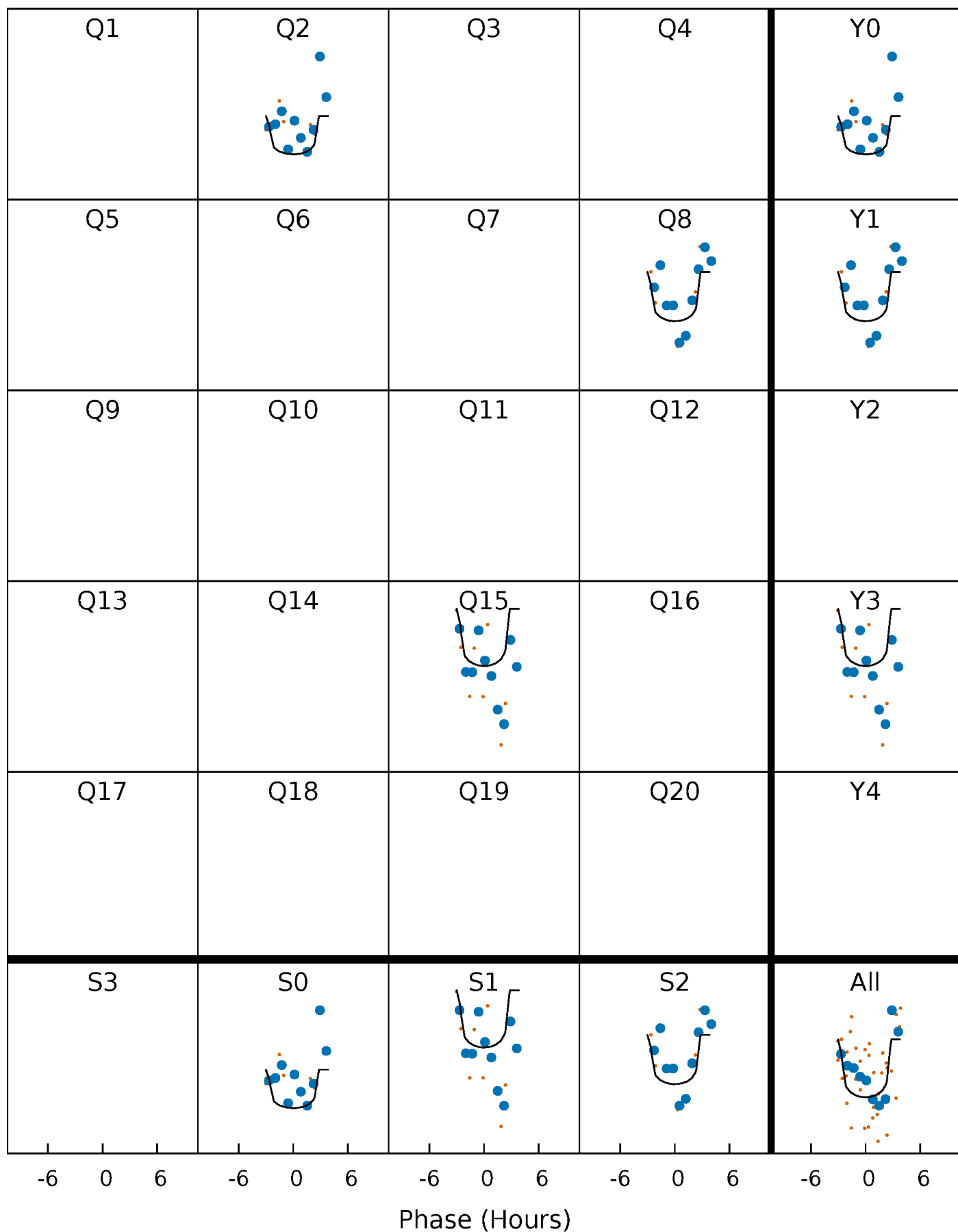
TCE 009655005-05     $P=604.344606$  Days     $T_0=178.043786$  (BKJD)





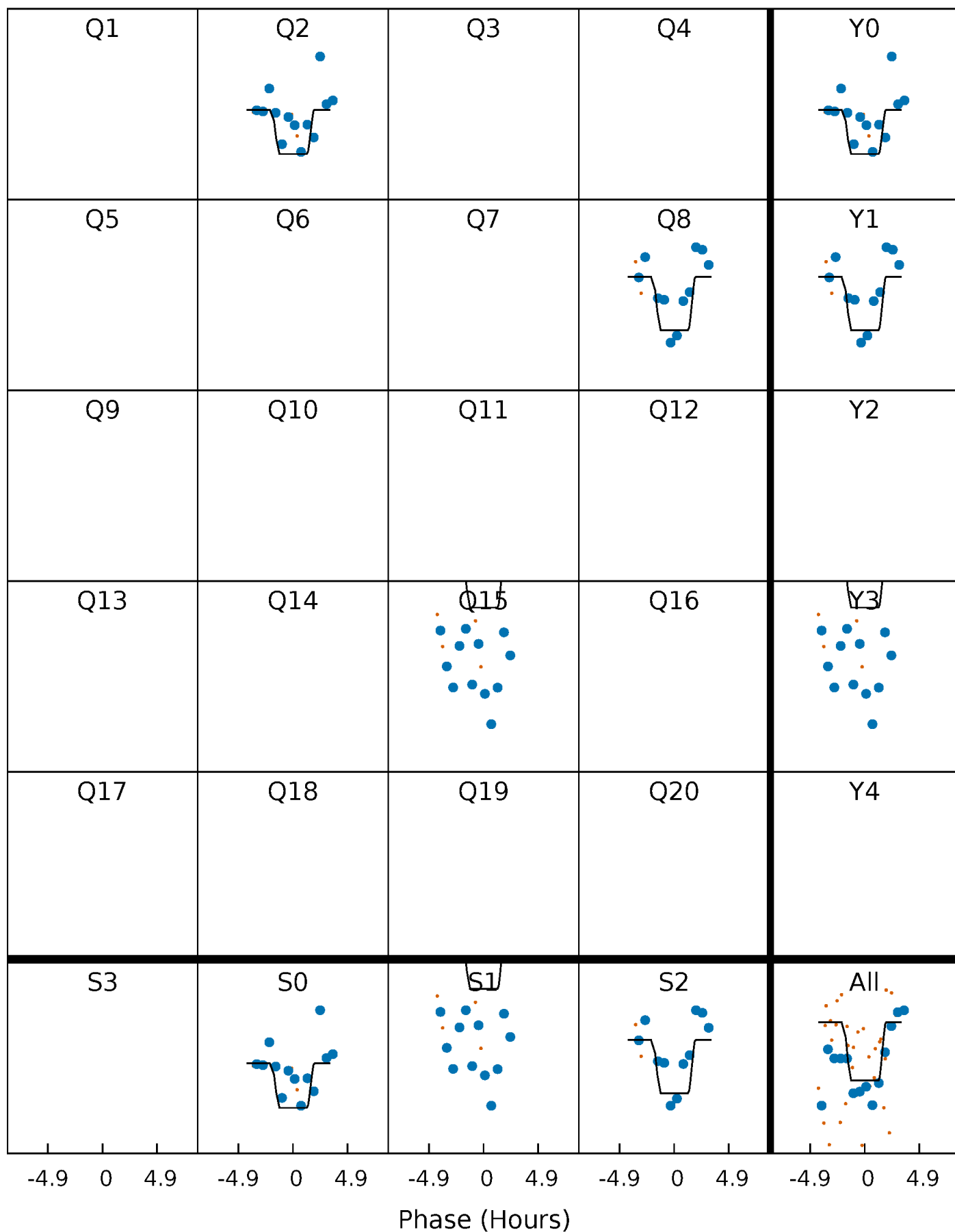
# DV Quarter-Phased Transit Curves

TCE 009655005-05     $P=604.344606$  Days     $T_0=178.043786$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

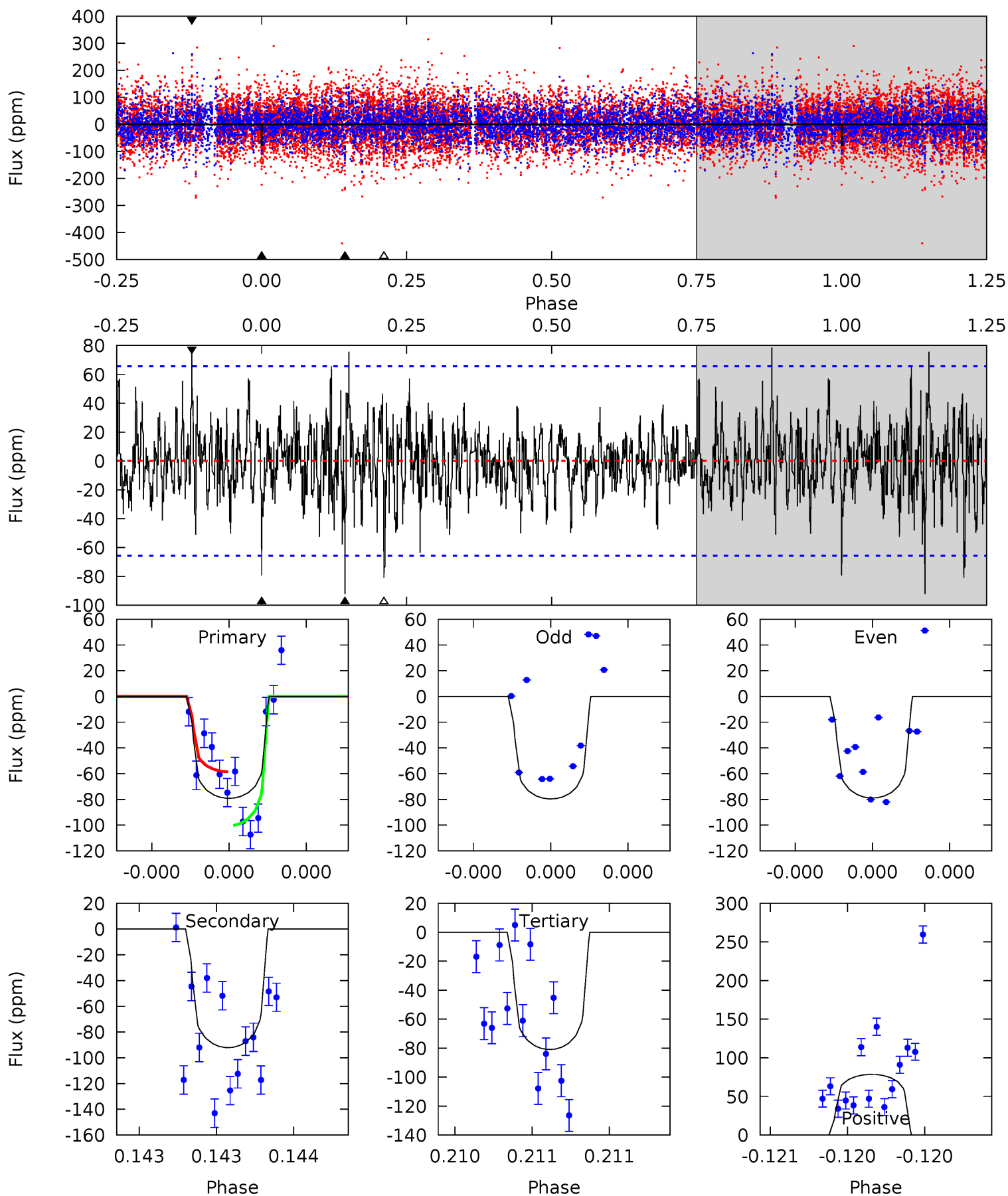
TCE 009655005-05 P=604.356593 Days  $T_0=178.066252$  (BKJD)



# DV Model-Shift Uniqueness Test

009655005-05, P = 604.344606 Days, E = 178.043786 Days

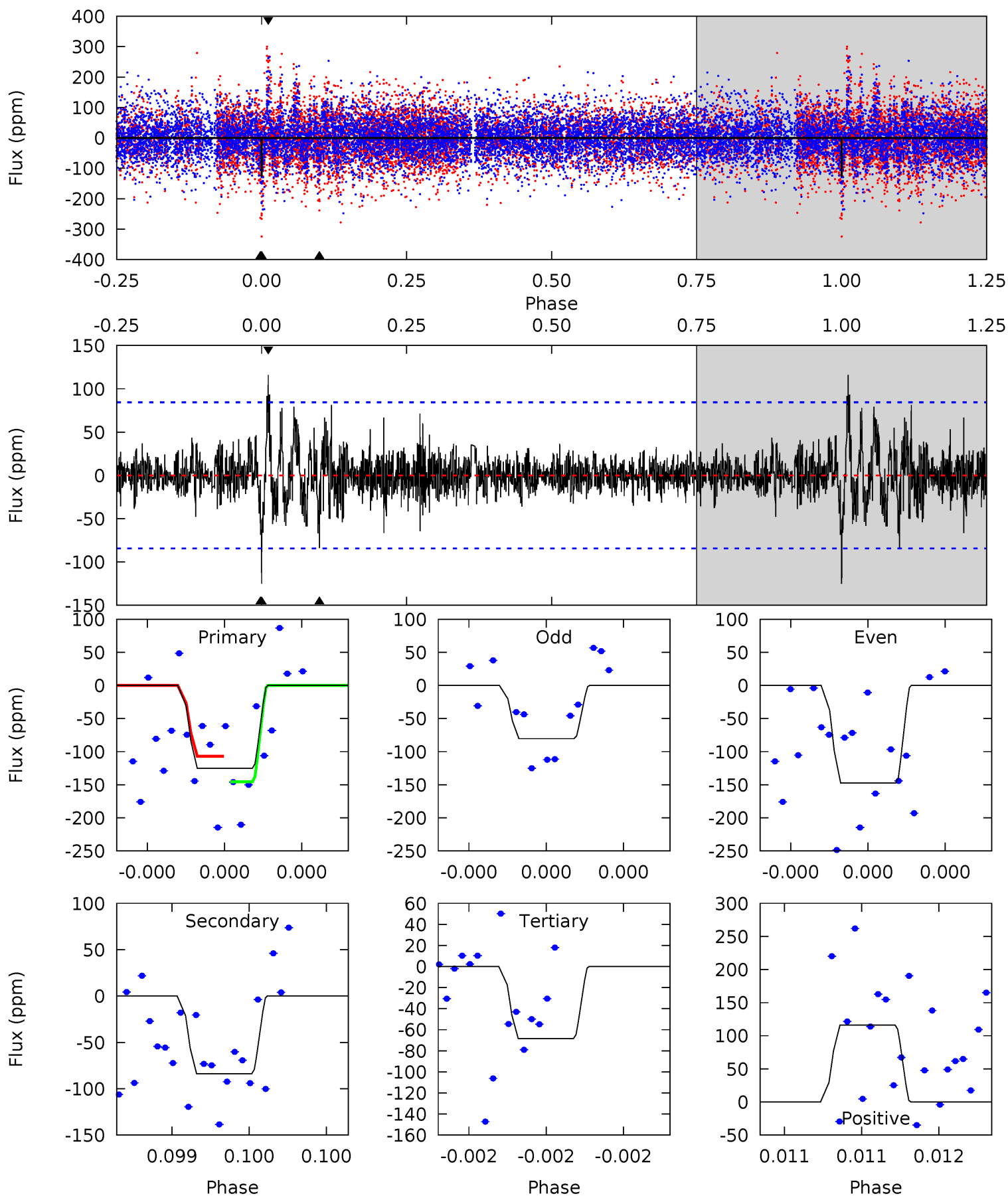
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.78	7.89	6.93	6.73	5.62	3.56	1.65	-0.15	0.05	0.96	1.16	0.03	0.99	0.46	1.79



# Alt Model-Shift Uniqueness Test

009655005-05, P = 604.356593 Days, E = 178.066252 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
8.46	5.67	4.63	7.84	5.70	3.68	1.33	3.82	0.62	1.03	-2.18	2.21	1.56	0.48	1.31



### Stellar Parameters For KIC 009655005

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7872^{+70}_{-86}$	$3.732^{+0.238}_{-0.085}$	$0.070^{+0.150}_{-0.200}$	$3.367^{+0.564}_{-1.047}$	$2.228^{+0.171}_{-0.371}$	$0.082^{+0.135}_{-0.023}$
	+1%/-1%	+6%/-2%	+214%/-286%	+17%/-31%	+8%/-17%	+164%/-28%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 009655005-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-92 \pm 12$	$8.78^{+9.39}_{-5.77}$	$650^{+29}_{-47}$	$4840^{+3571}_{-1118}$	$2175^{+17236}_{-1663}$
Alt.	$-84 \pm 15$	$8.80^{+9.15}_{-5.80}$	$650^{+31}_{-52}$	$4717^{+3456}_{-1061}$	$2004^{+14902}_{-1540}$

$T_{max}$  = 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

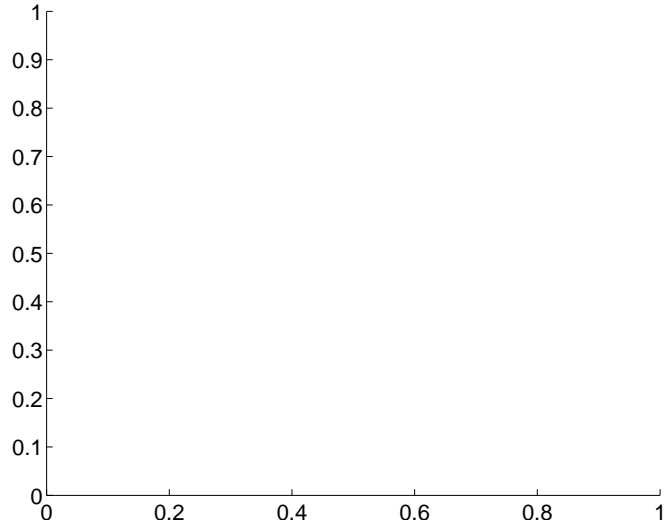
Supplemental centroid analysis for 009655005-05. **Kepler magnitude: 11.91.** Transit SNR 8.02

**There are 0 quarters with good PRF difference image offsets**

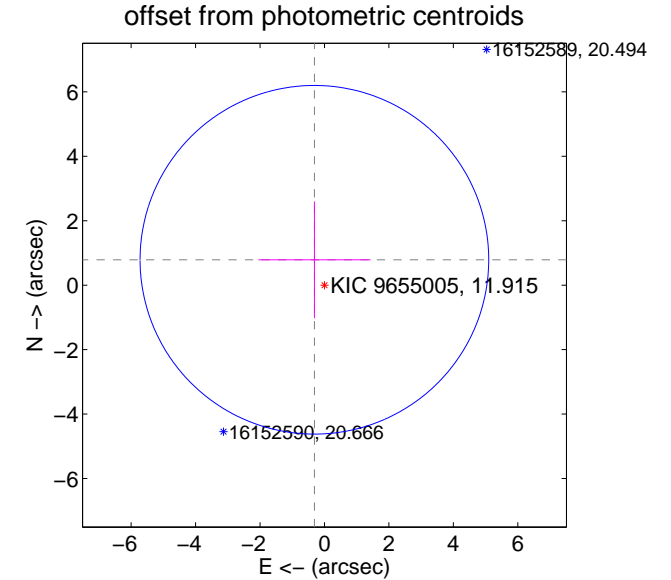
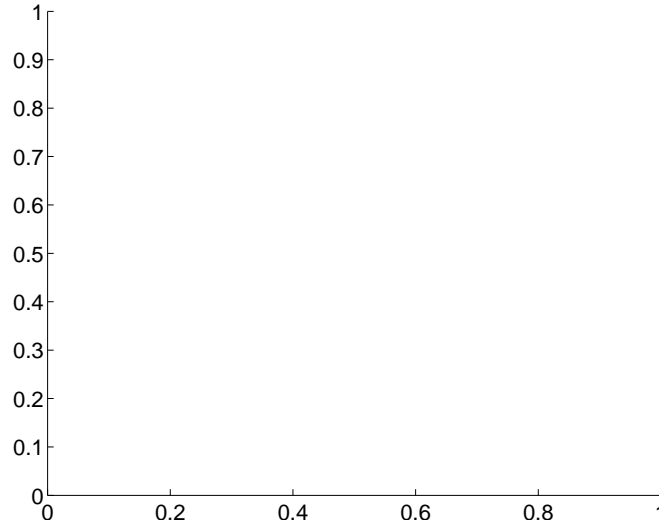
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$0.85 \pm 1.80$	0.47	$0.31 \pm 1.74$	$0.79 \pm 1.81$

There is no PRF-fit offset from OOT-fit

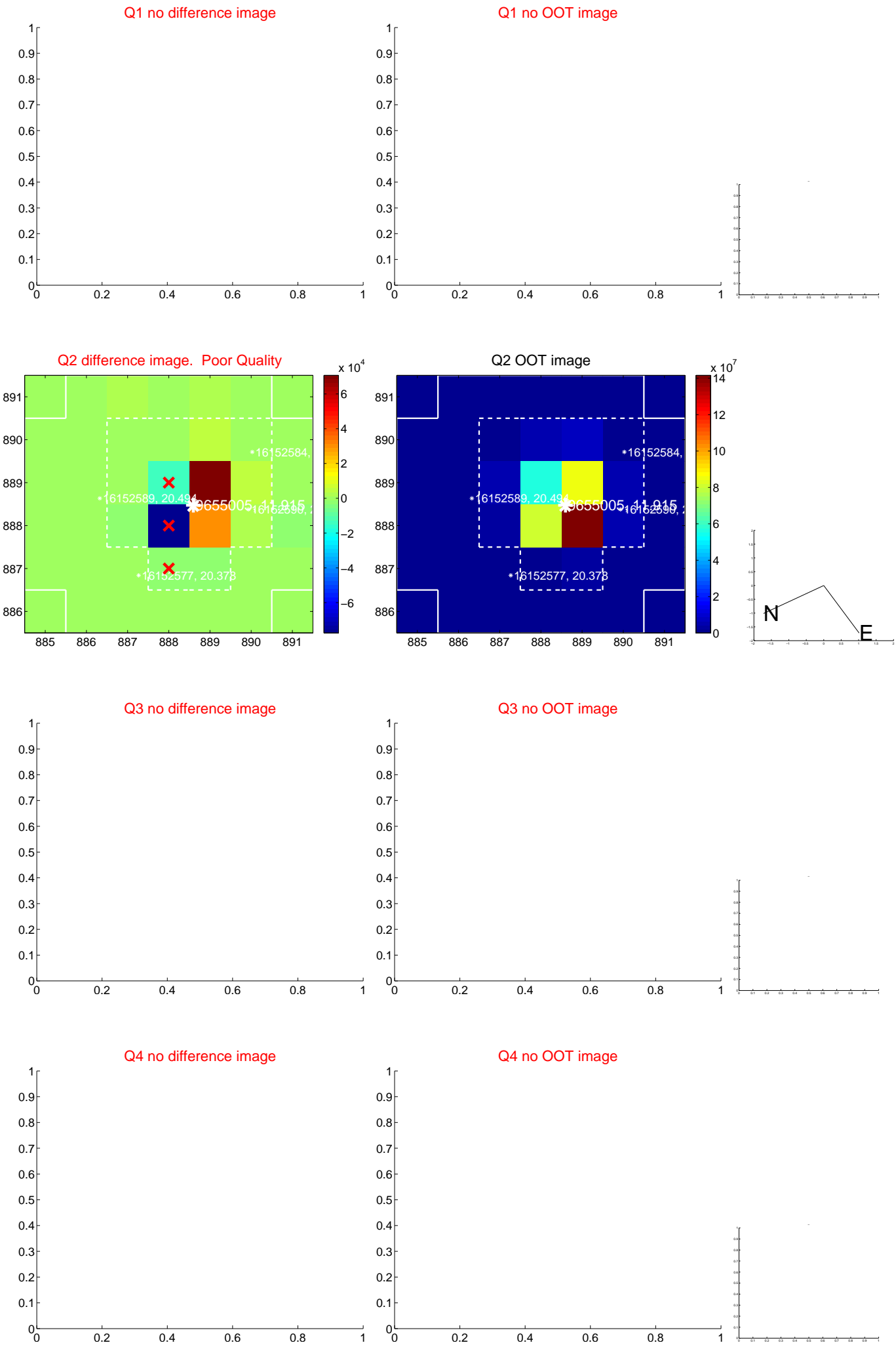


There is no PRF-fit offset from KIC



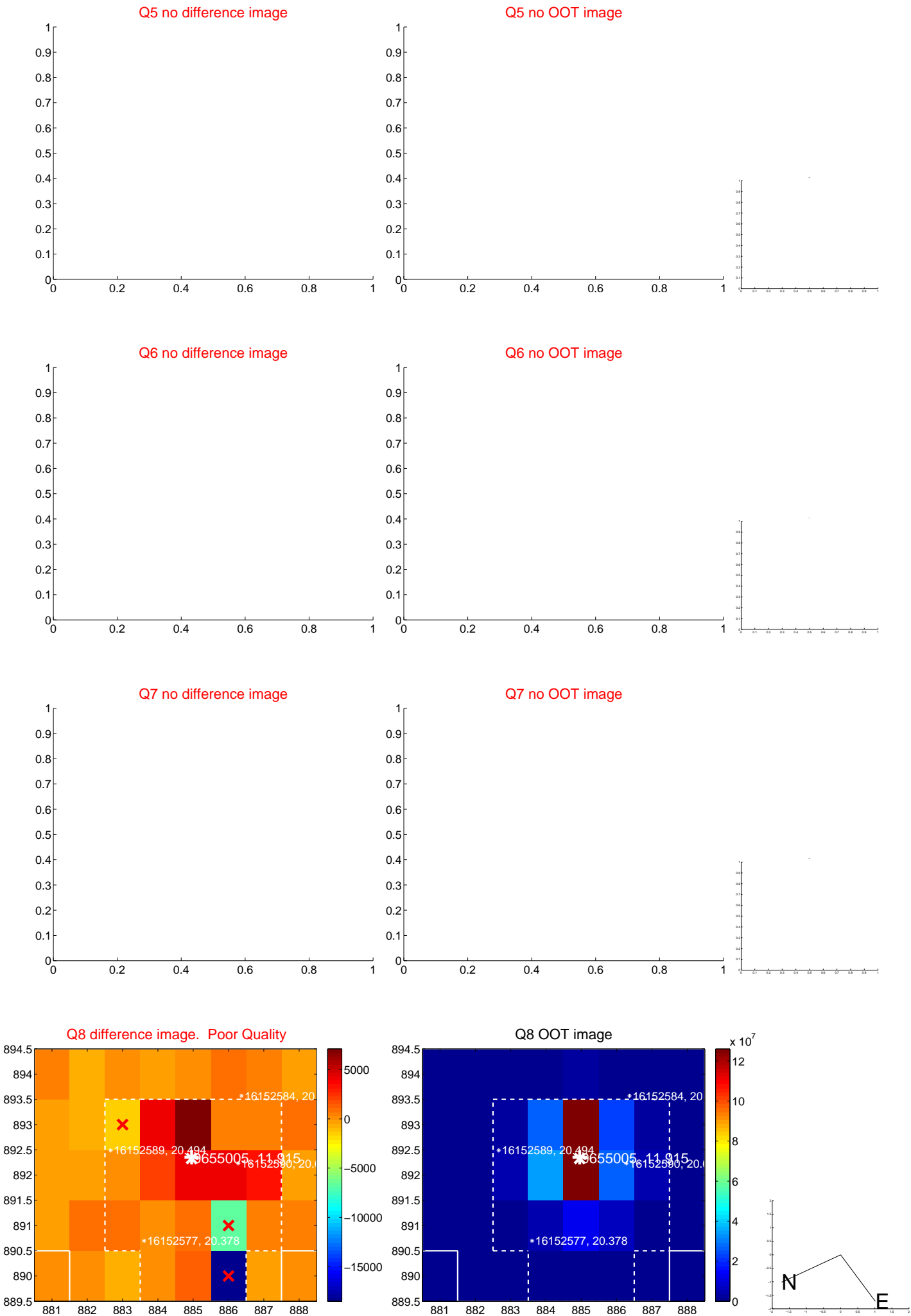
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



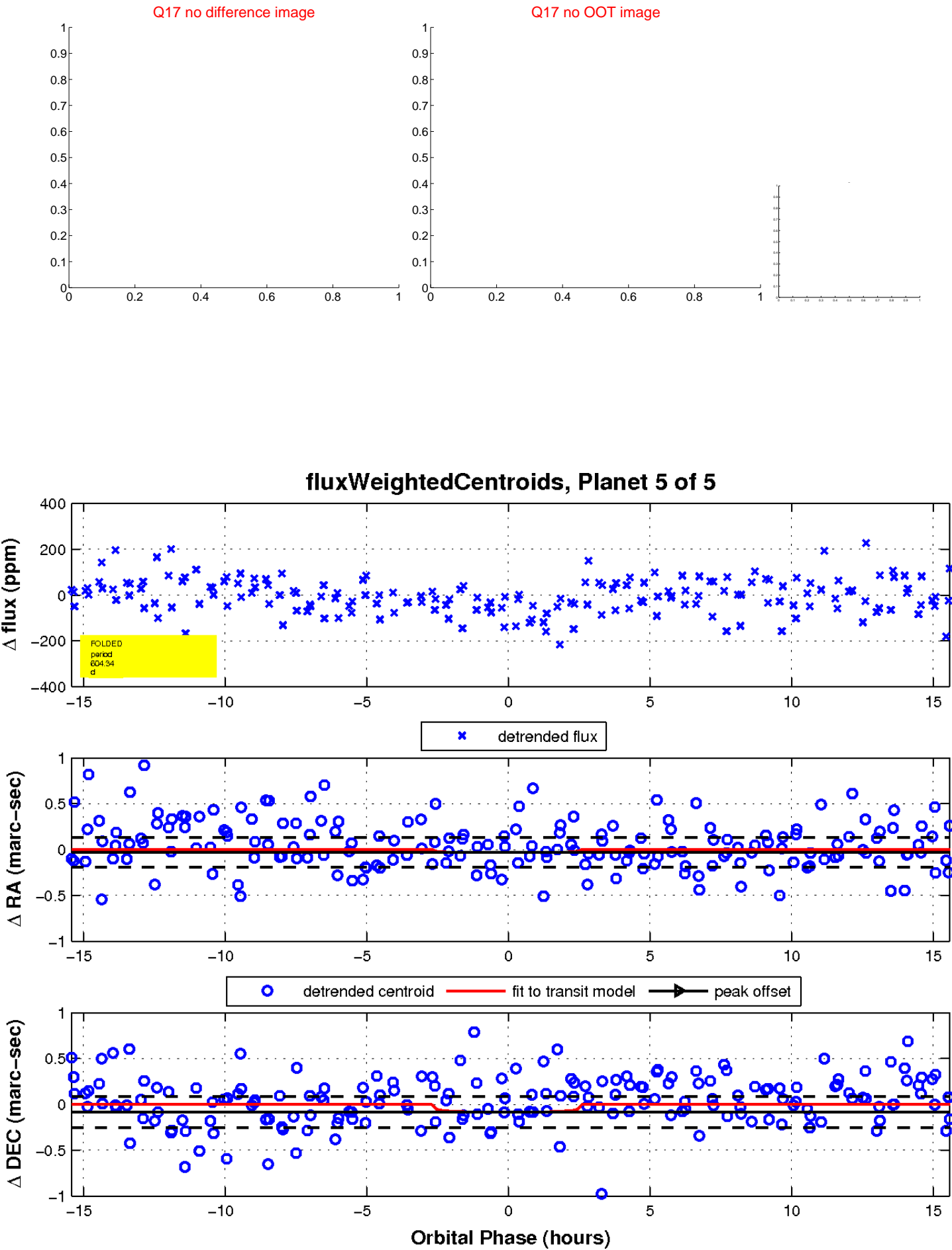
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

