

# KIC 002985022

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002985022-01	OBS	No	0.656126	132.149423	97.9	0.763	10.3	4.6	2.37	7202	2.54	44019.47
002985022-02	OBS	No	0.656128	131.697893	115.3	2.334	10.9	6.5	2.37	7202	2.96	44019.30
002985022-03	OBS	No	1.056520	131.783441	135.6	3.500	9.8	-1.0	2.37	7202	2.79	23323.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002985022-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
002985022-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
002985022-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

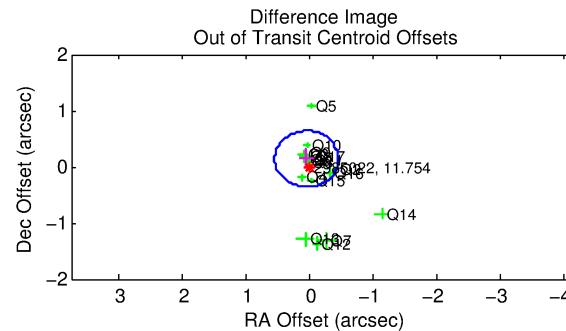
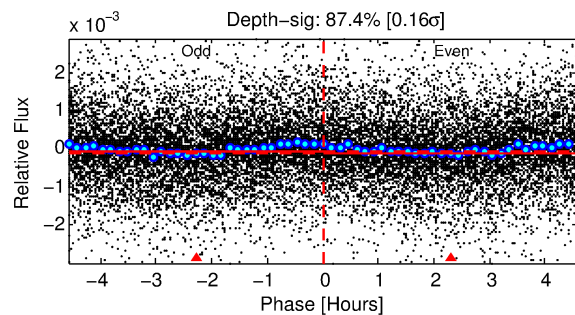
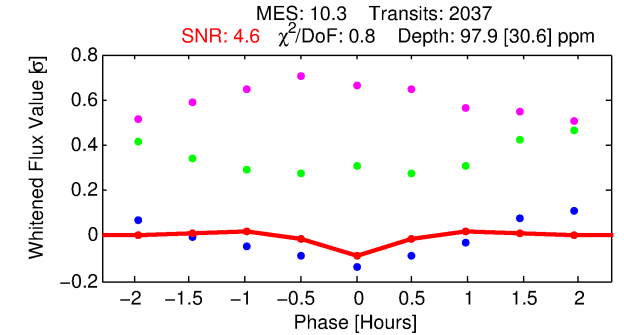
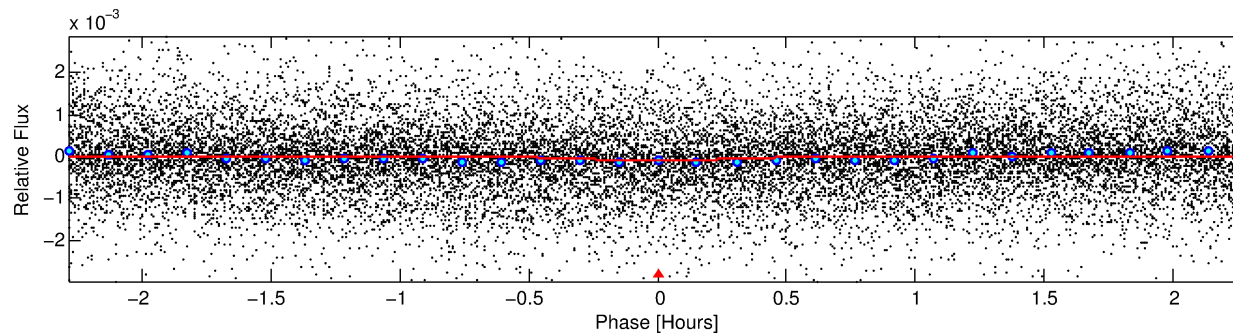
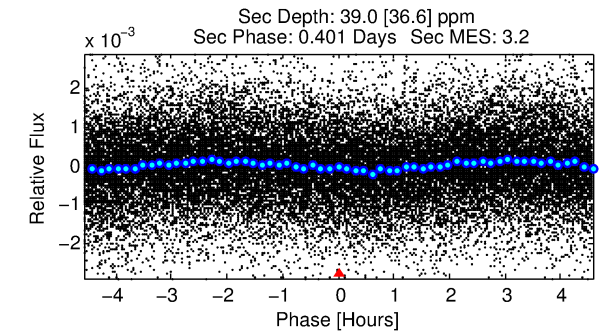
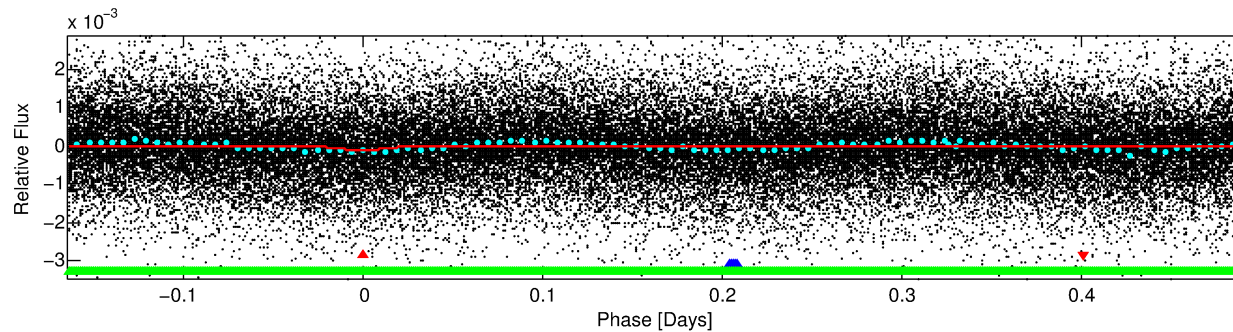
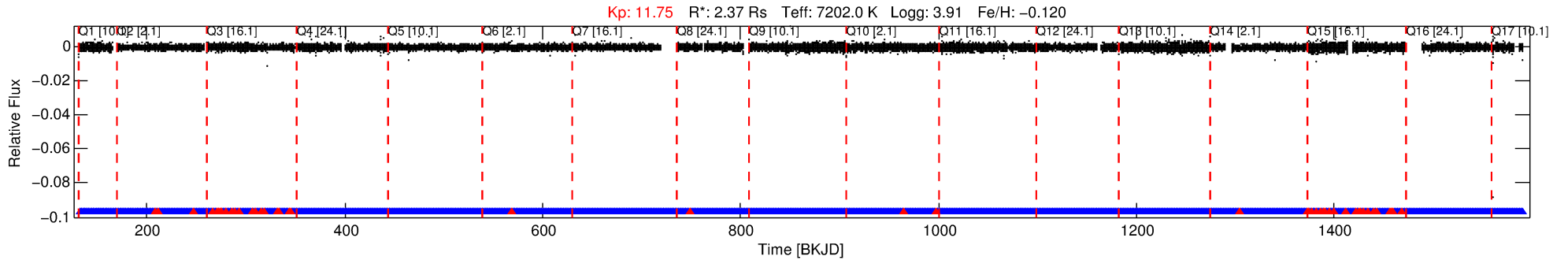
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 002985022-01

No Significant Match Found

# DV One-Page Summary

KIC: 2985022 Candidate: 1 of 3 Period: 0.656 d



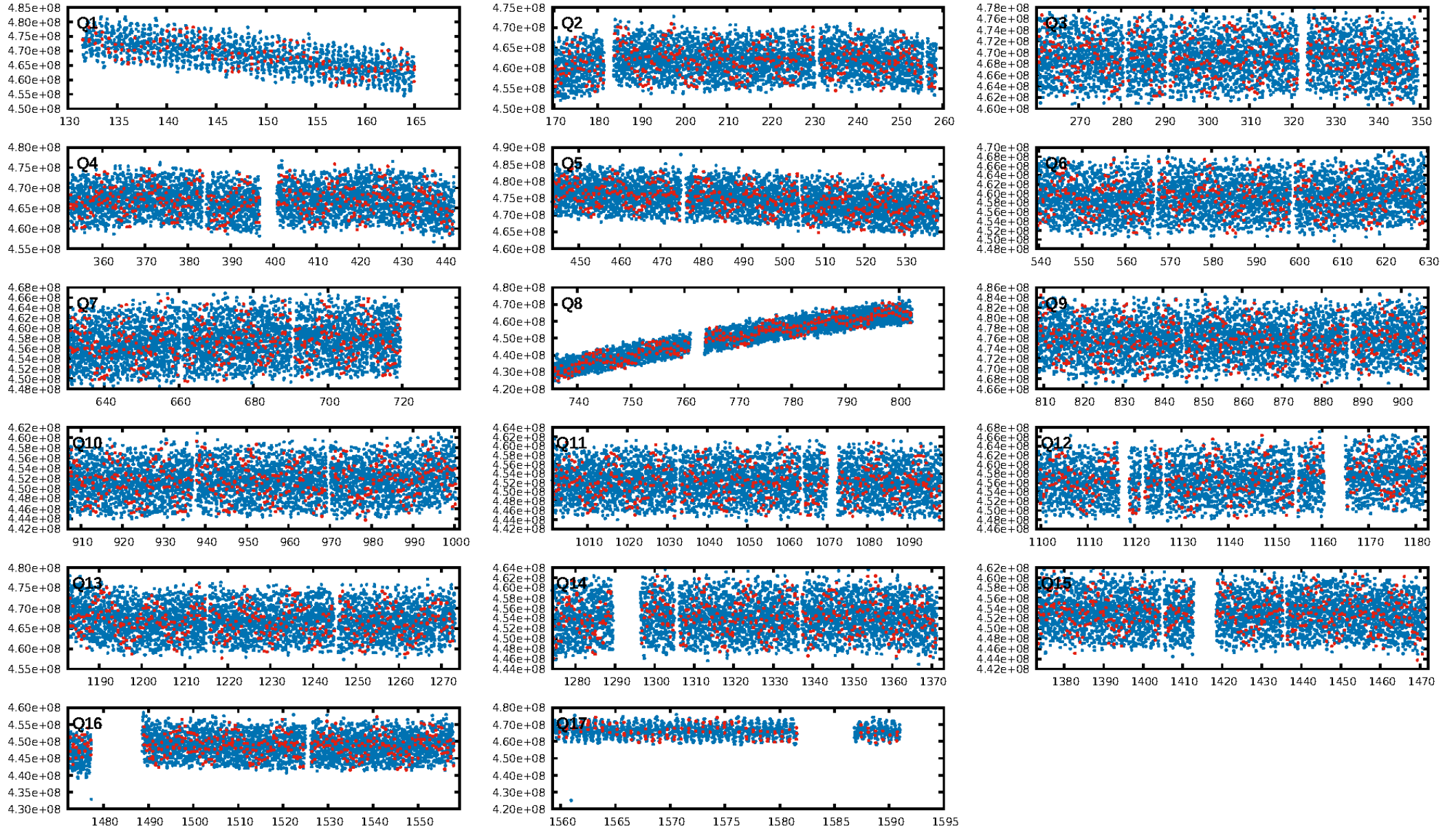
## DV Fit Results:

Period = 0.65613 [0.00002] d  
Epoch = 132.1494 [0.0027] BKJD  
Rp/R\* = 0.0098 [0.0067]  
a/R\* = 4.85 [18.07]  
b = 0.70 [2.84]  
Seff = 44019.47 [24262.66]  
Teff = 3693 [509] K  
Rp = 2.54 [1.95] Re  
a = 0.0175 [0.0059] AU  
Ag = 1.02 [1.76] [0.01σ]  
Teffp = 5735 [2374] K [0.84σ]

## DV Diagnostic Results:

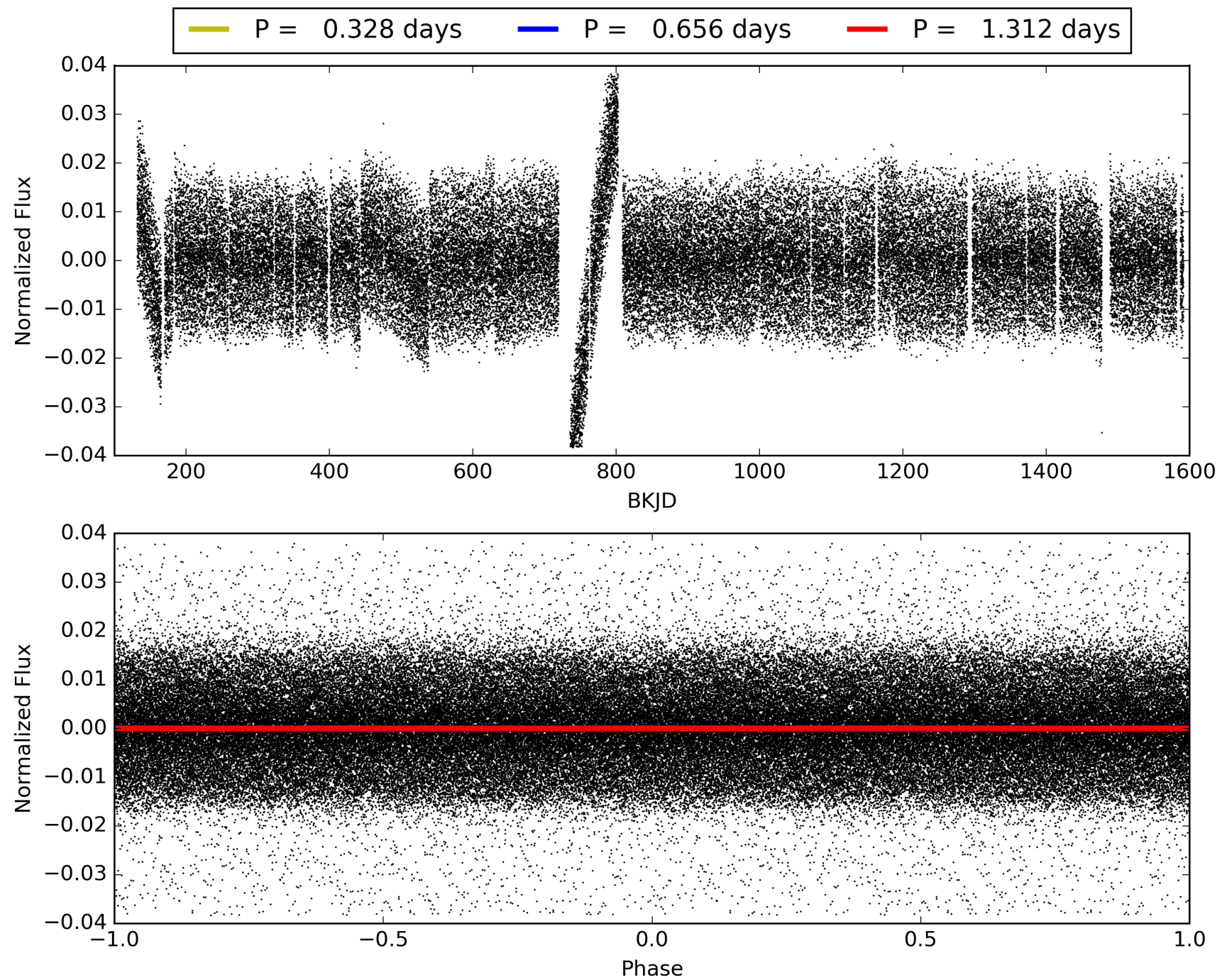
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.97 [1895/1944]  
GhostDiagnostic-chr: 1.143  
Centroid-sig: N/A  
Centroid-so: 0.398 arcsec [1.93σ]  
OotOffset-rm: 0.149 arcsec [0.89σ]  
KicOffset-rm: 0.147 arcsec [0.83σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.65 [11/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 002985022-01, PDC Light Curves





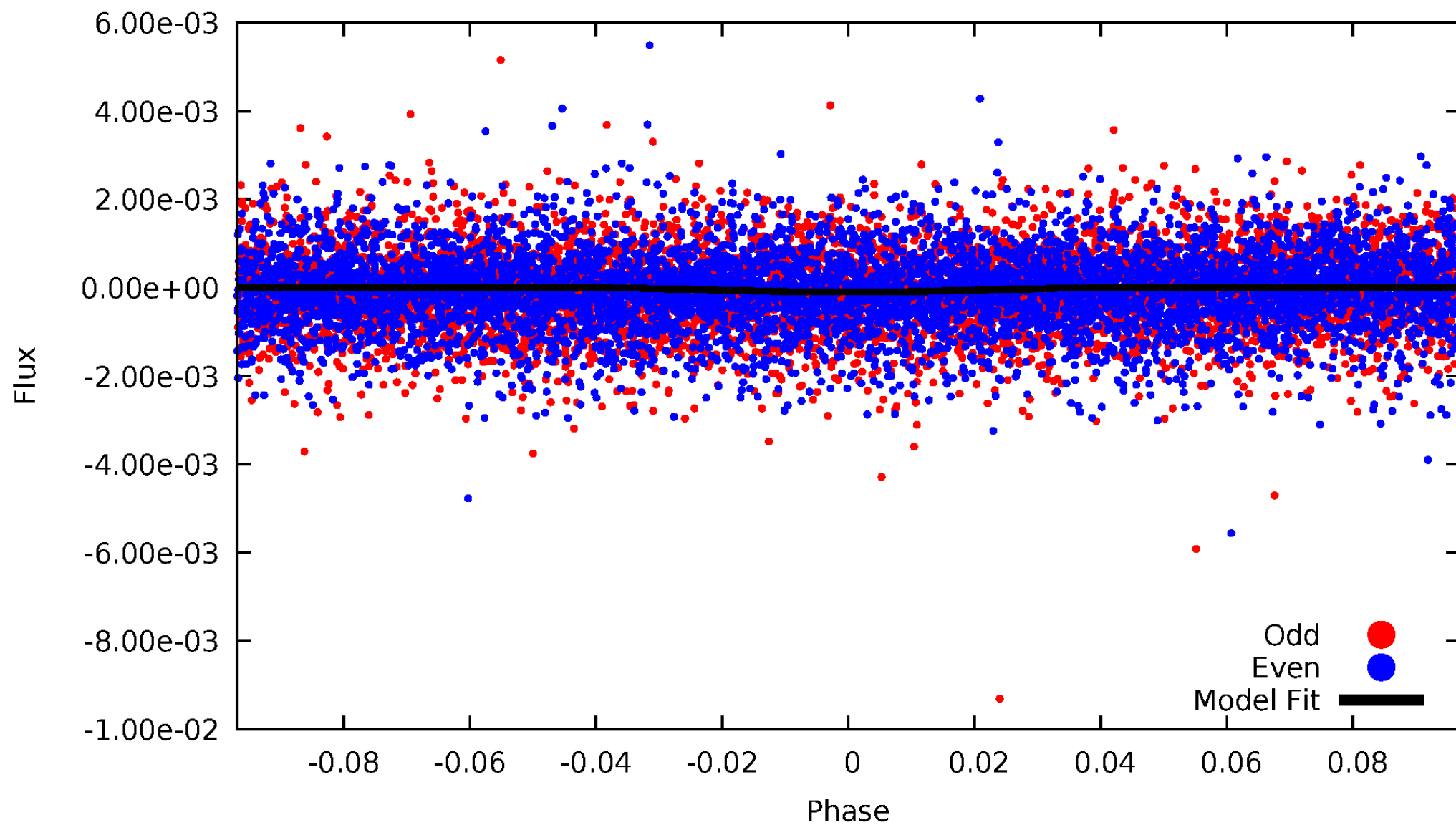
TCE 002985022-01





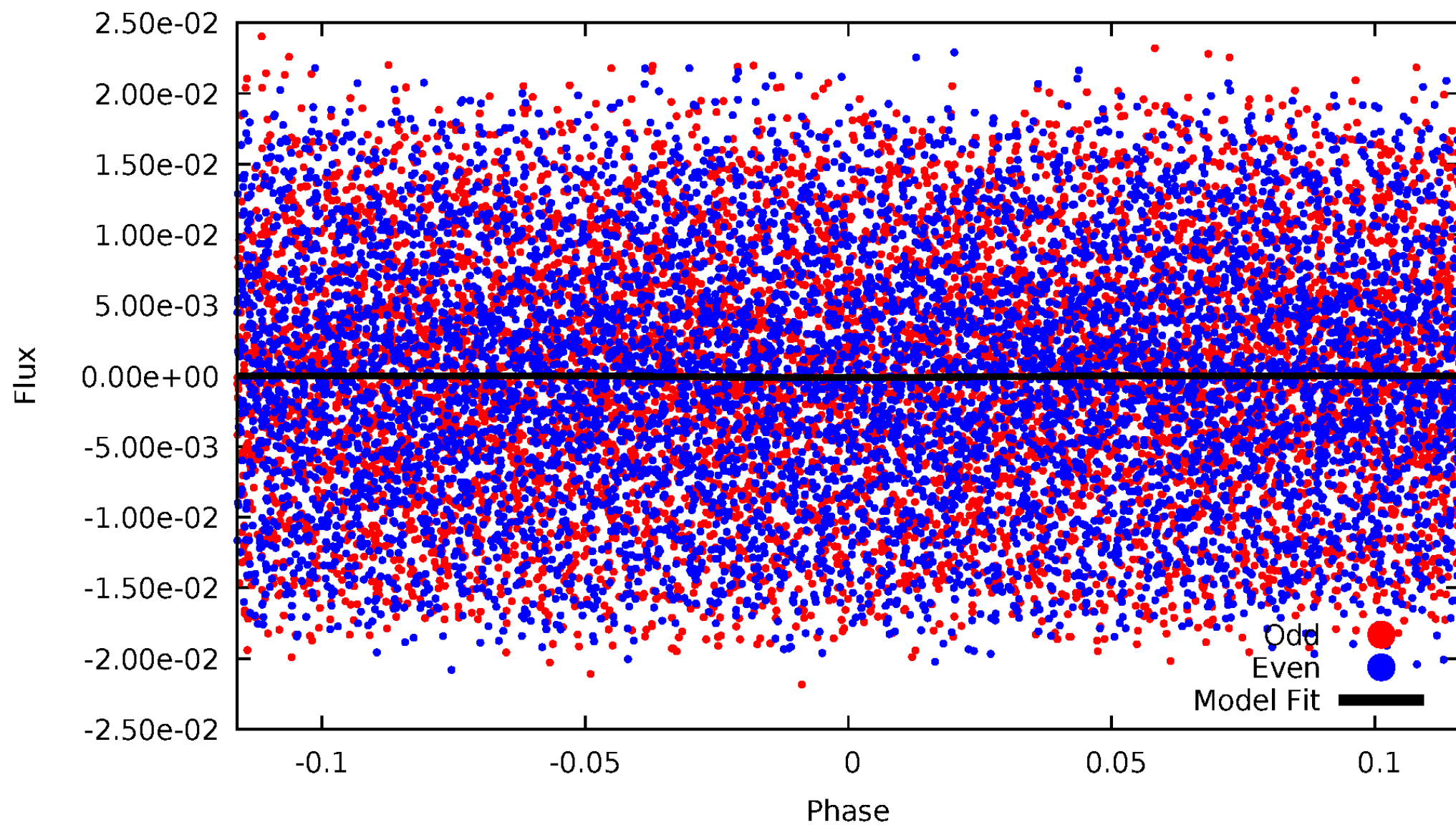
# DV Odd/Even

TCE 002985022-01



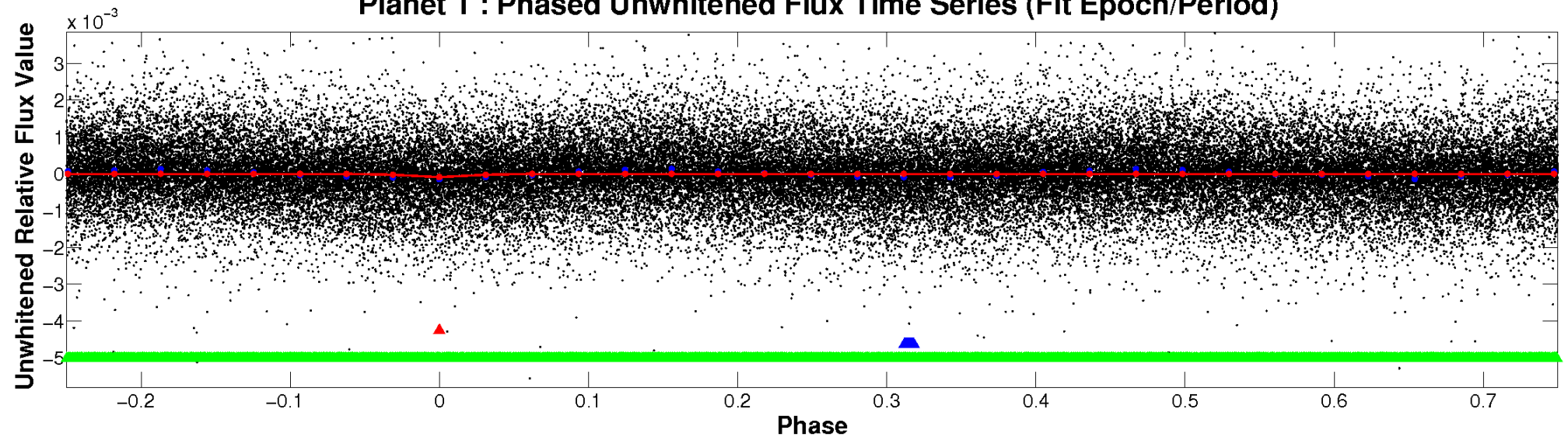
# ALT Odd/Even

TCE 002985022-01

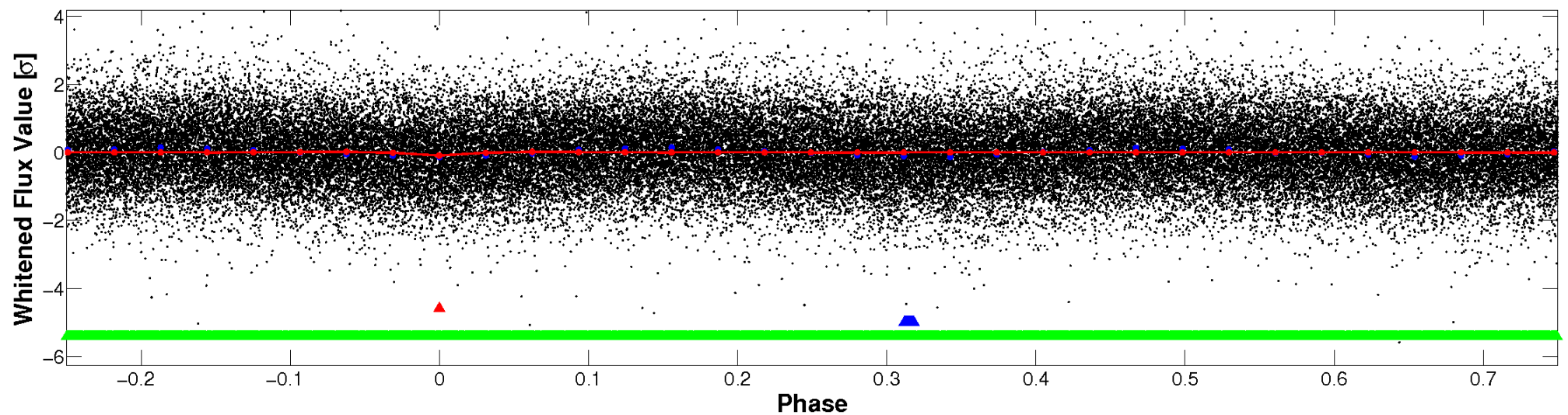


# Non-Whitened Vs. Whitened Light Curve

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



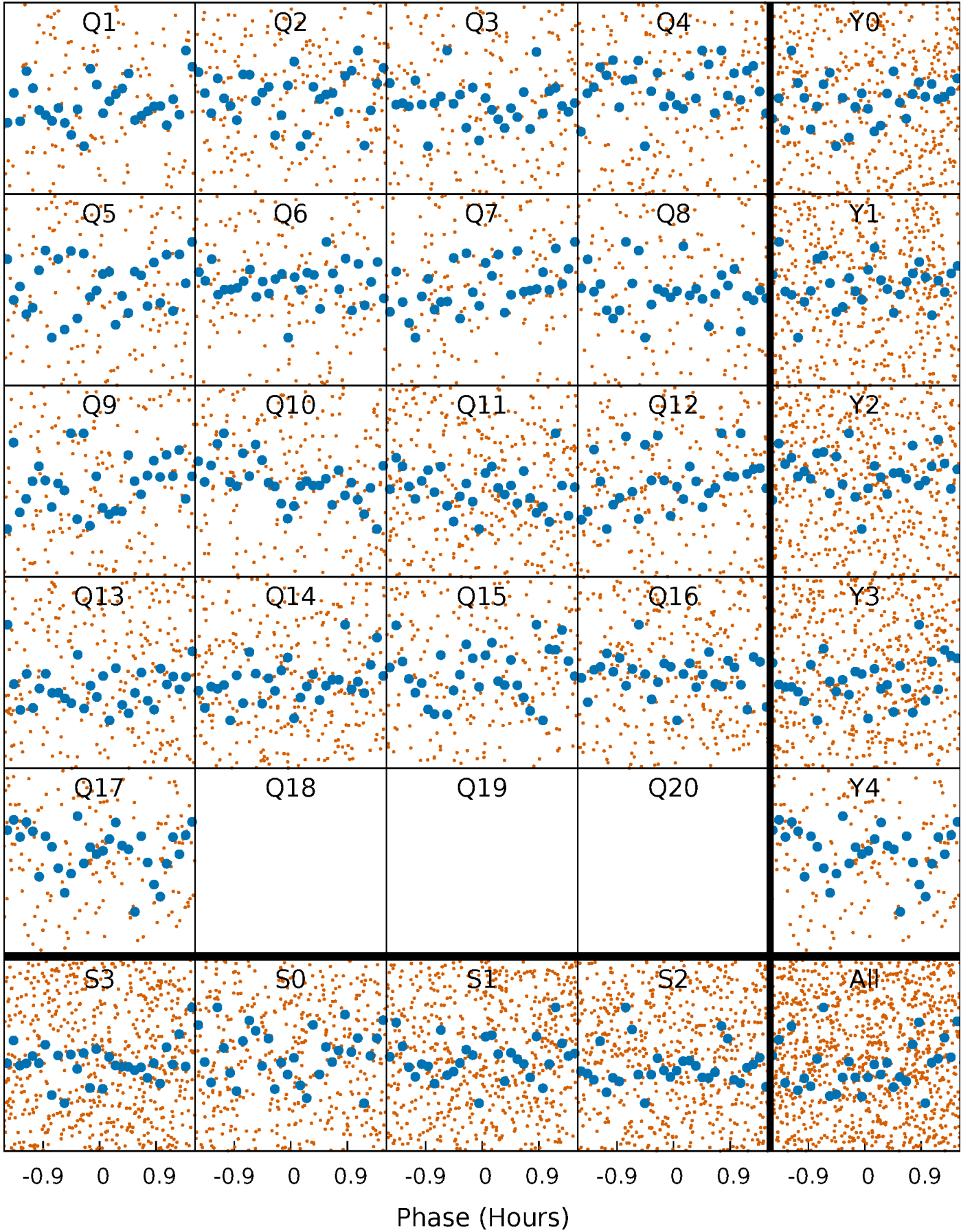
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





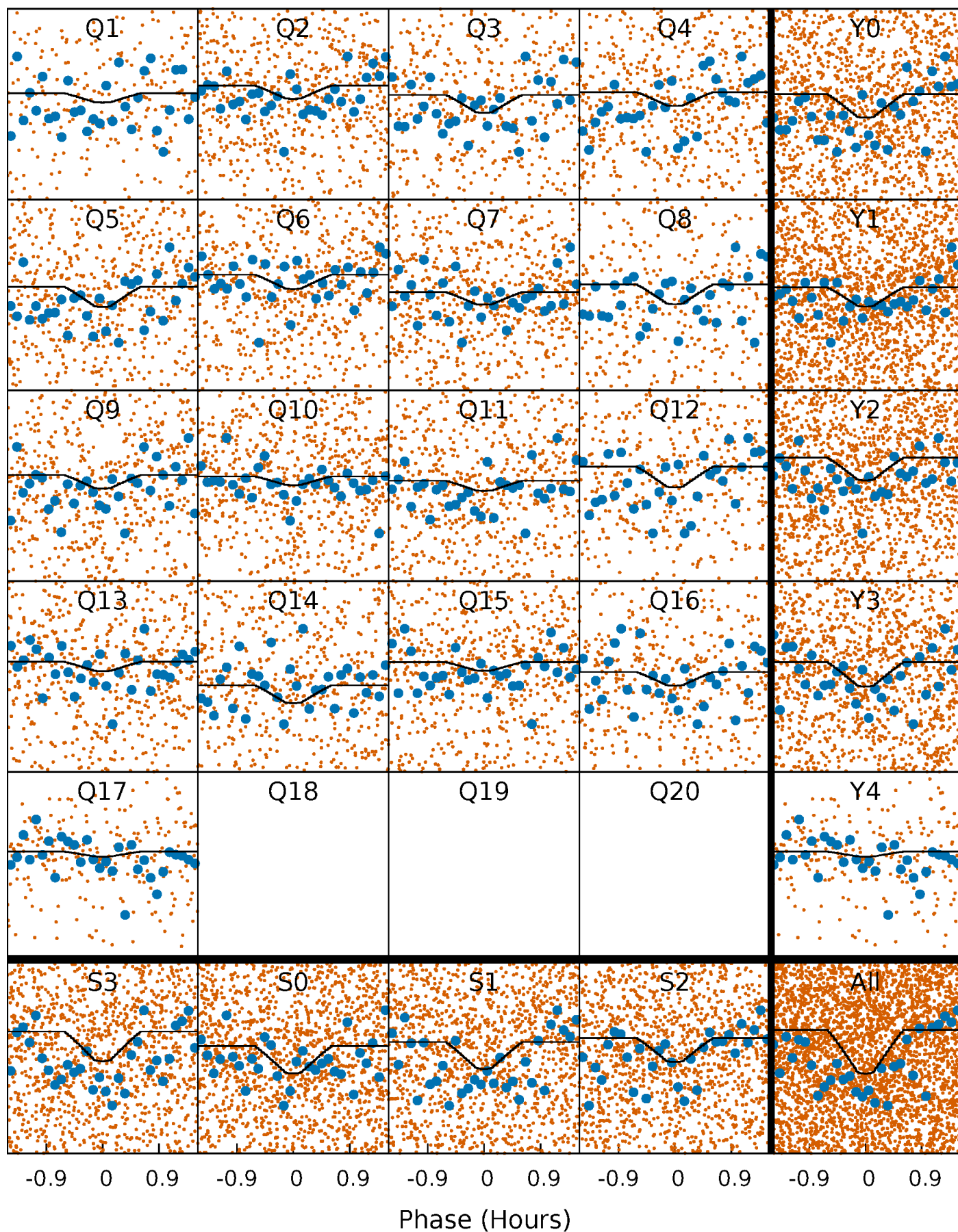
# PDC Quarter-Phased Transit Curves

TCE 002985022-01   P= 0.656126 Days    $T_0=132.149423$  (BKJD)



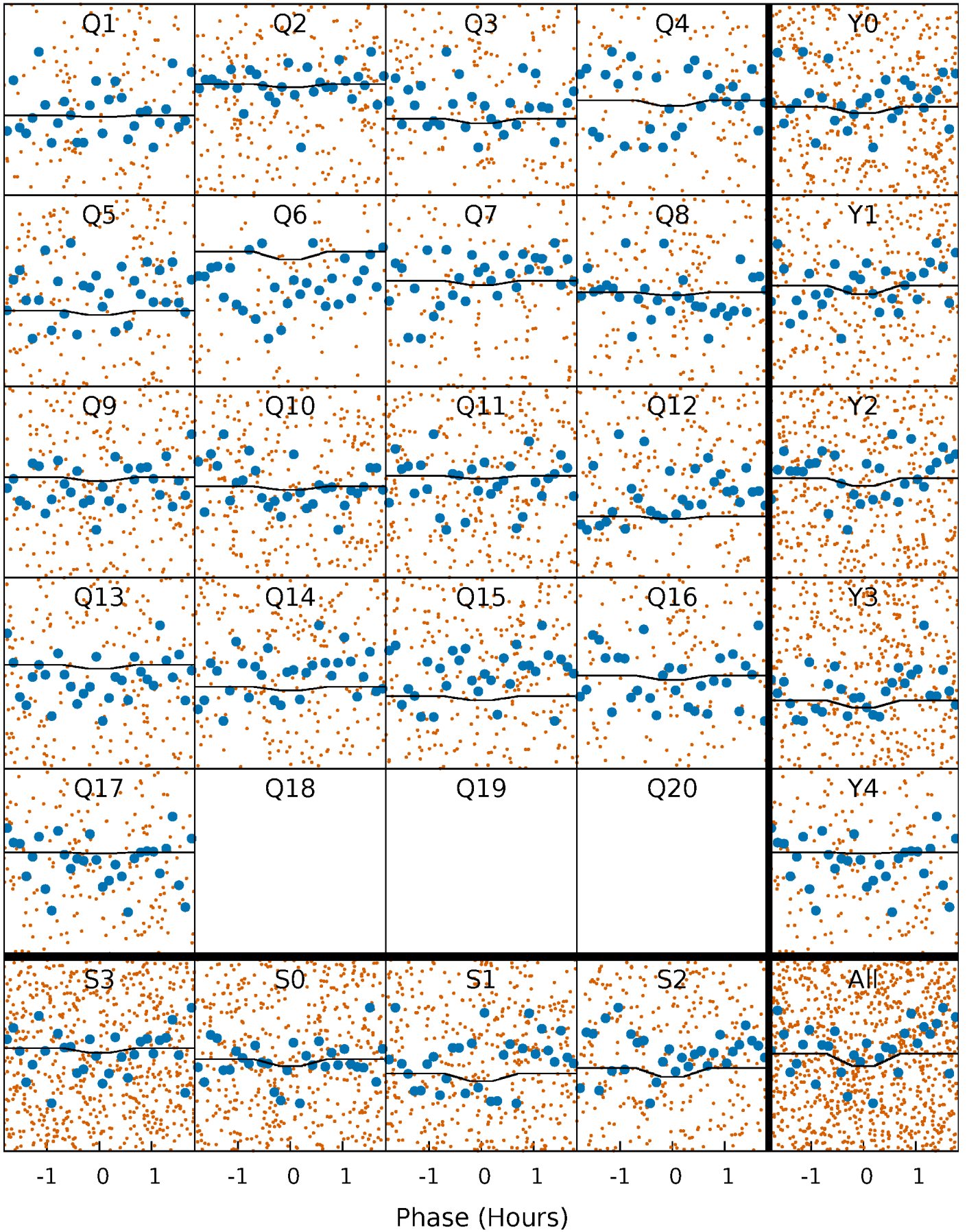
# DV Quarter-Phased Transit Curves

TCE 002985022-01   P= 0.656126 Days    $T_0=132.149423$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 002985022-01 P= 0.656134 Days  $T_0=132.148671$  (BKJD)

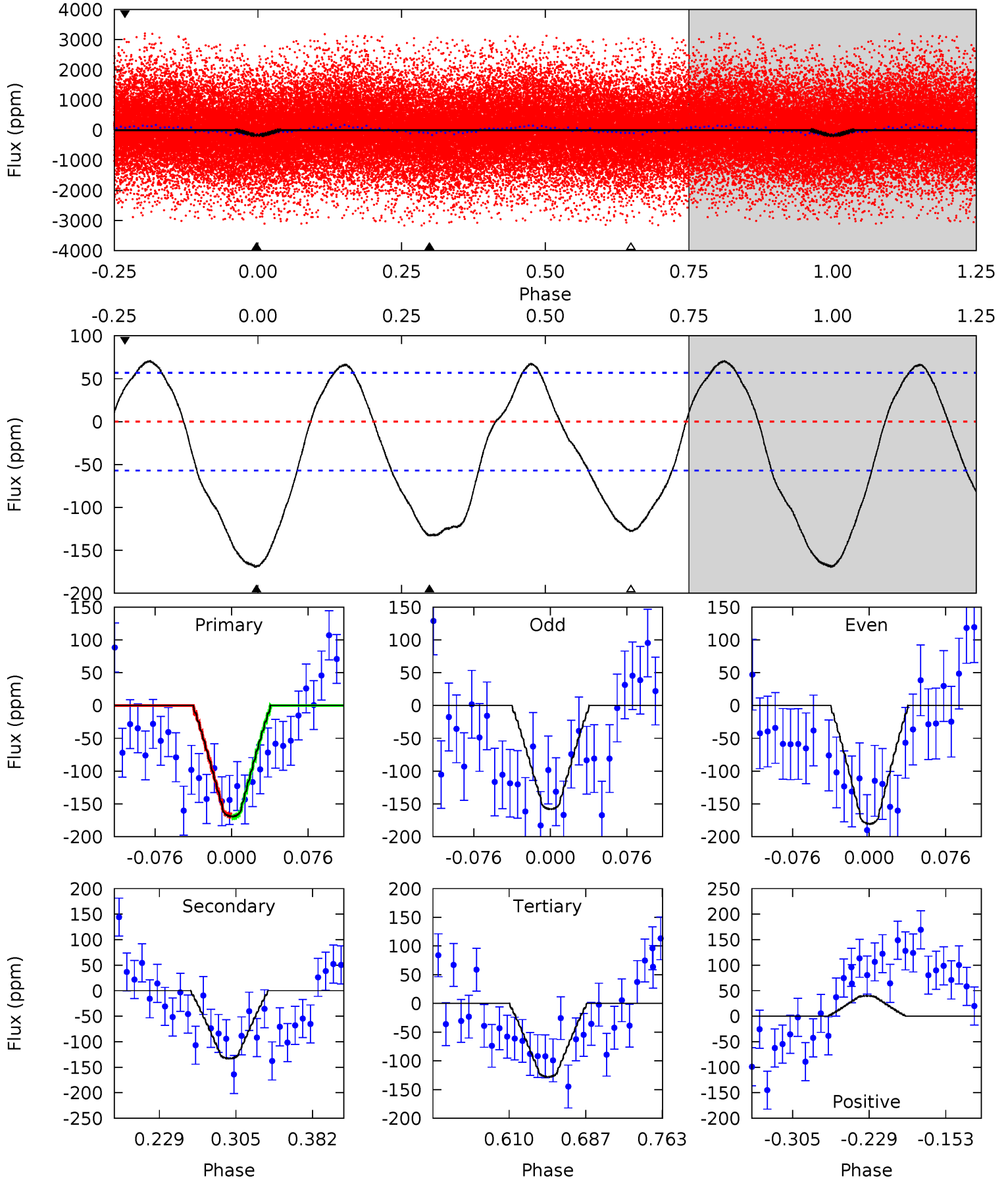




# DV Model-Shift Uniqueness Test

002985022-01, P = 0.656126 Days, E = 131.493297 Days

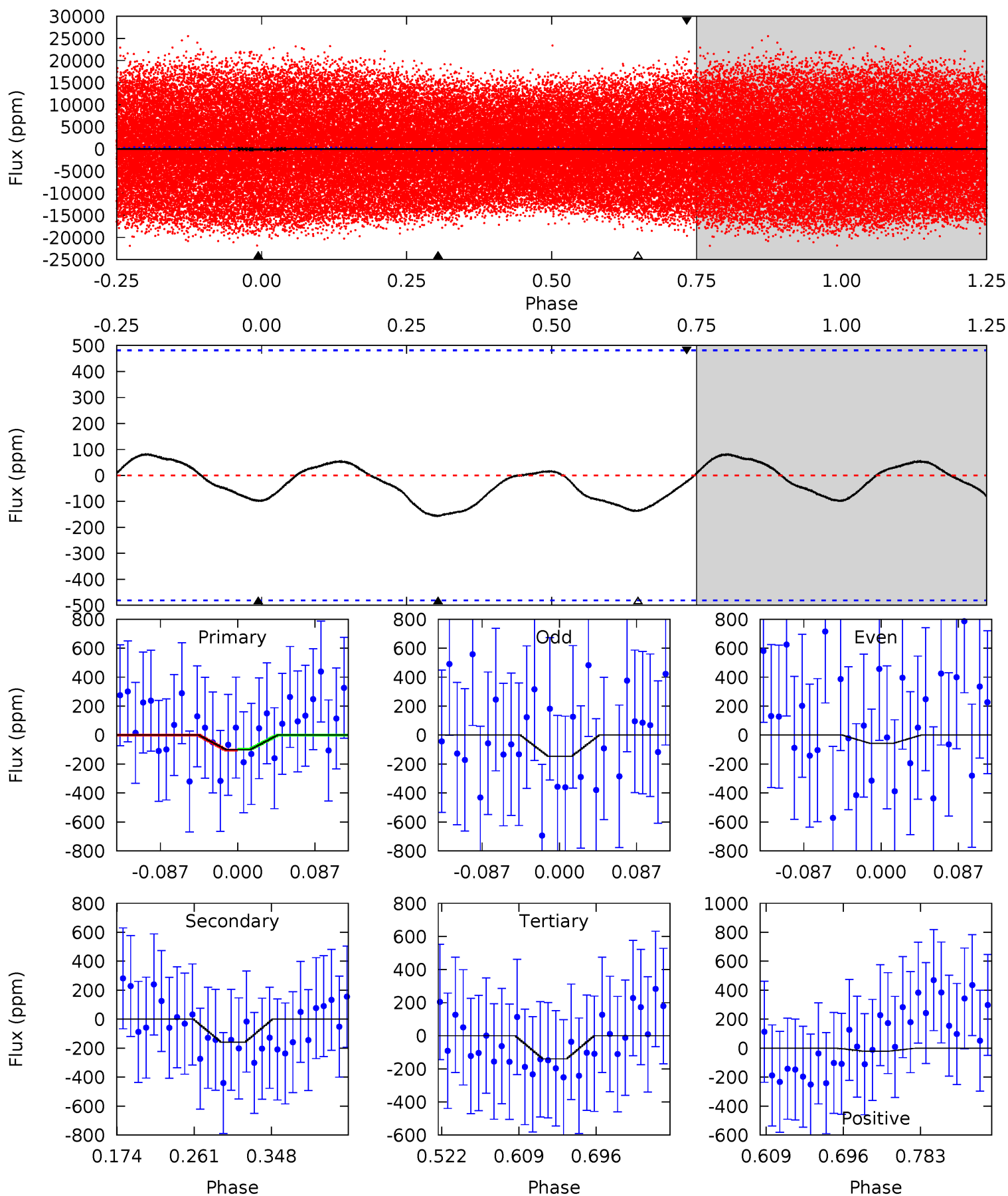
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.7	10.8	10.4	3.22	4.62	1.77	4.89	3.36	10.5	0.41	7.56	0.91	1.10	0.29	0.10



# Alt Model-Shift Uniqueness Test

002985022-01, P = 0.656134 Days, E = 131.492537 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
0.97	1.52	1.33	-0.20	4.59	1.71	0.60	-0.37	1.17	0.18	1.72	0.43	1.39	0.35	0.03



### Stellar Parameters For KIC 002985022

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7202^{+201}_{-277}$	$3.911^{+0.308}_{-0.132}$	$-0.120^{+0.250}_{-0.350}$	$2.368^{+0.563}_{-0.845}$	$1.664^{+0.159}_{-0.371}$	$0.176^{+0.397}_{-0.070}$
	+3%/-4%	+8%/-3%	+208%/-292%	+24%/-36%	+10%/-22%	+225%/-40%
Source	PHO1	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 002985022-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-133 \pm 12$	$2.58^{+1.64}_{-1.31}$	$5063^{+384}_{-471}$	$7305^{+4983}_{-1859}$	$3.291^{+11.045}_{-2.080}$
Alt.	$-159 \pm 105$	$2.47^{+1.62}_{-1.41}$	$5031^{+403}_{-437}$	$7592^{+7275}_{-2727}$	$3.818^{+17.955}_{-2.971}$

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



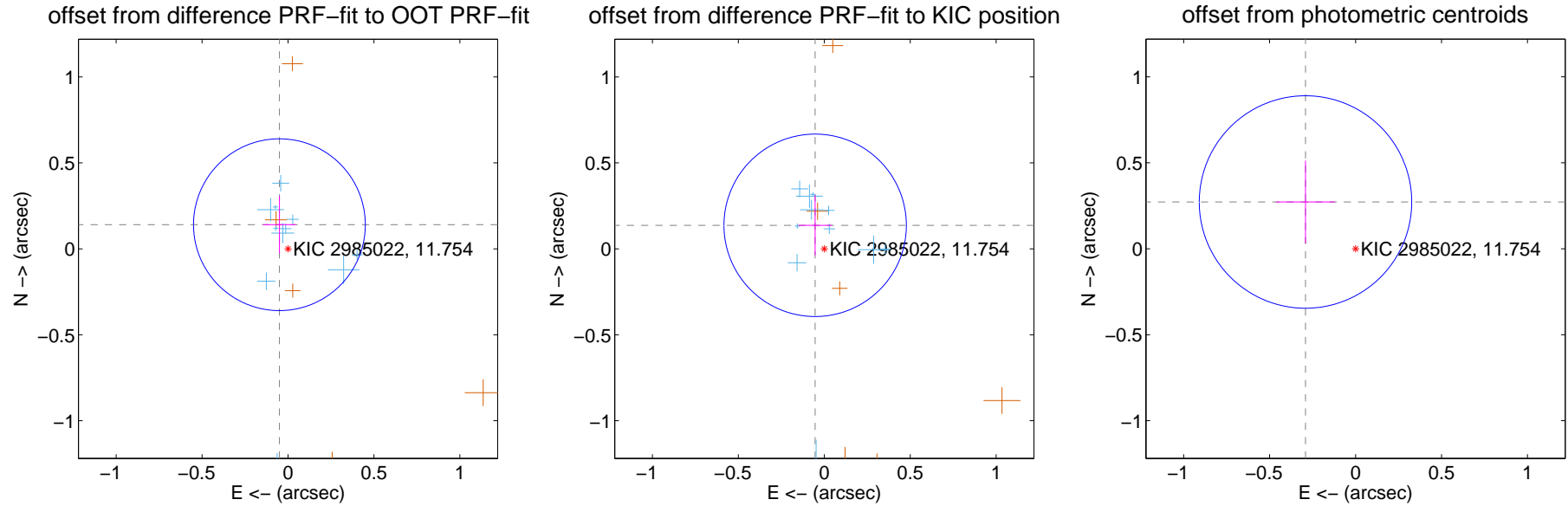
## DV Centroid Data

Supplemental centroid analysis for 002985022-01. **Kepler magnitude: 11.75**. Transit SNR 4.63

There are 11 quarters with good PRF difference image offsets

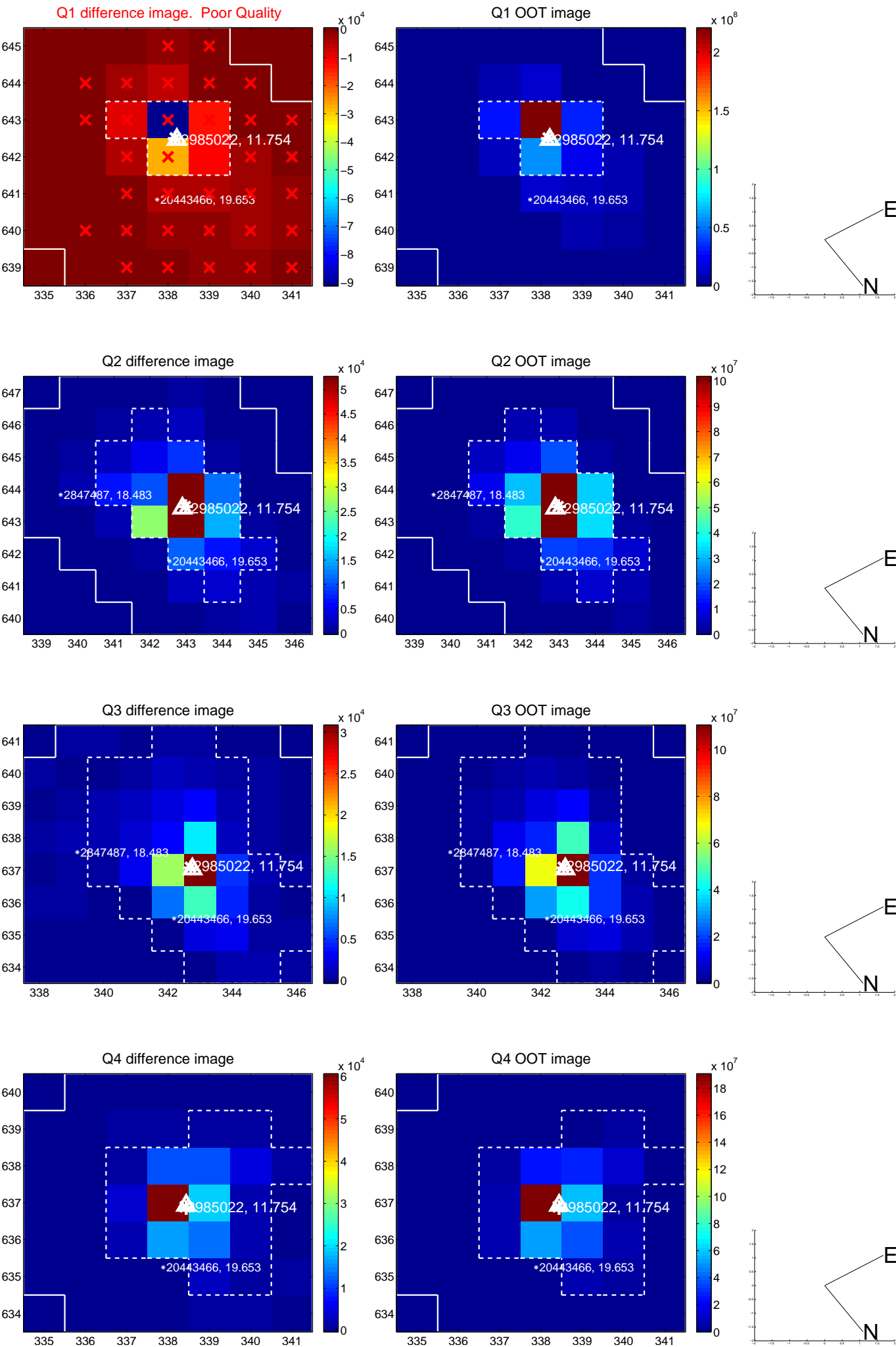
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.149 \pm 0.167$	0.89	$0.050 \pm 0.095$	$0.140 \pm 0.167$
PRF-fit source offset from KIC position	$0.147 \pm 0.177$	0.83	$0.053 \pm 0.097$	$0.137 \pm 0.175$
photometric centroid source offset	$0.40 \pm 0.21$	1.93	$0.29 \pm 0.17$	$0.27 \pm 0.24$

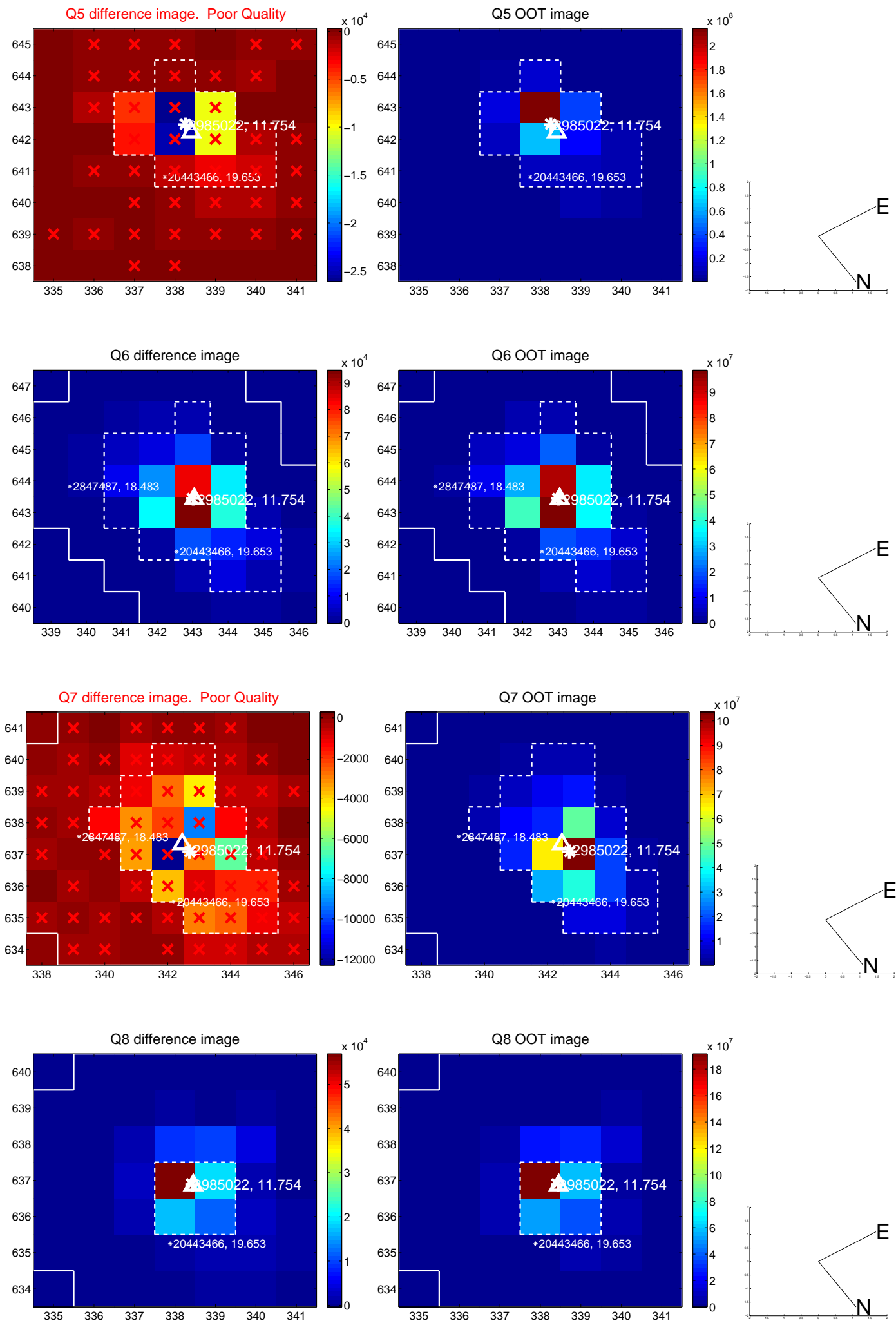


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

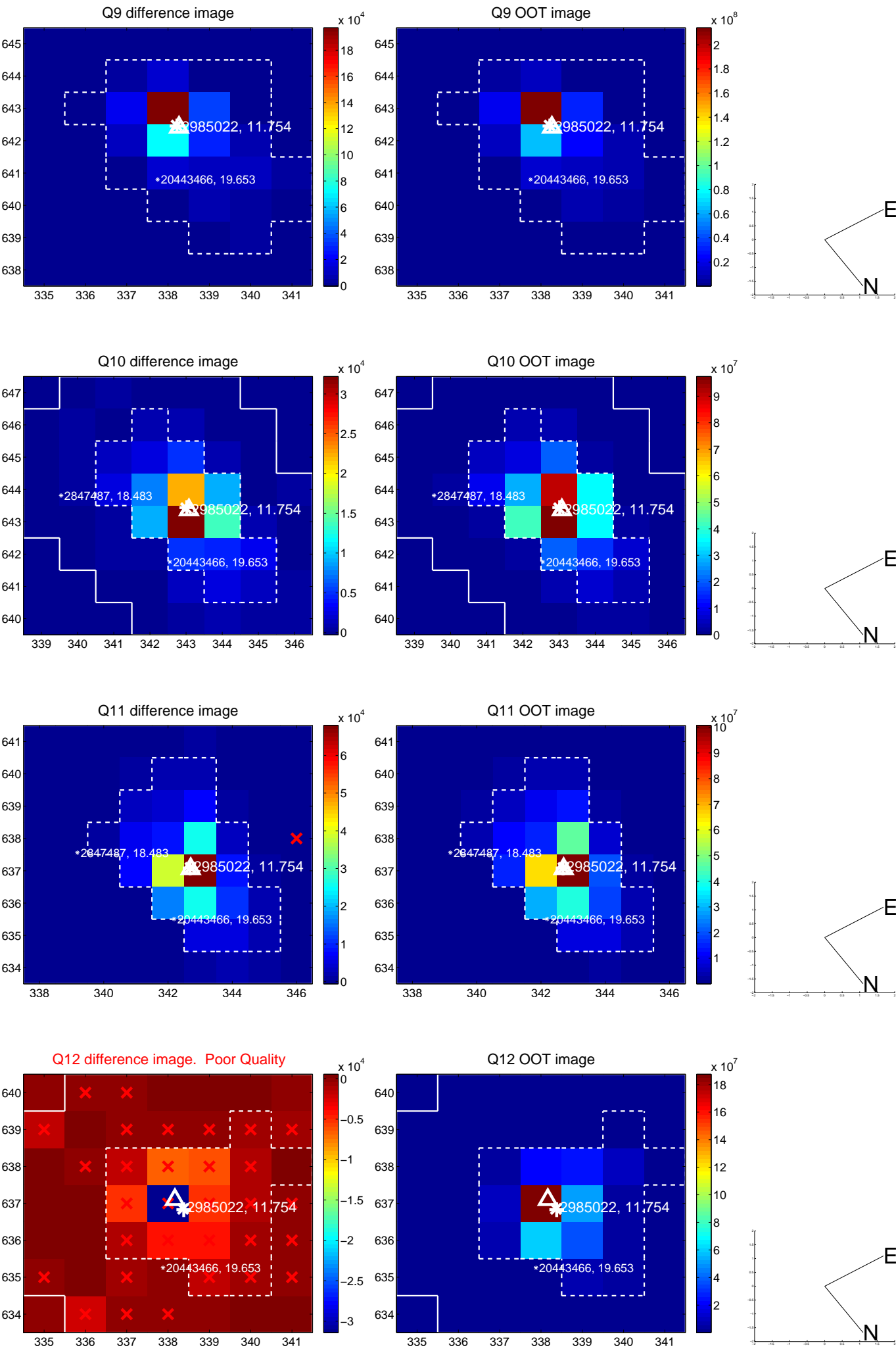


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

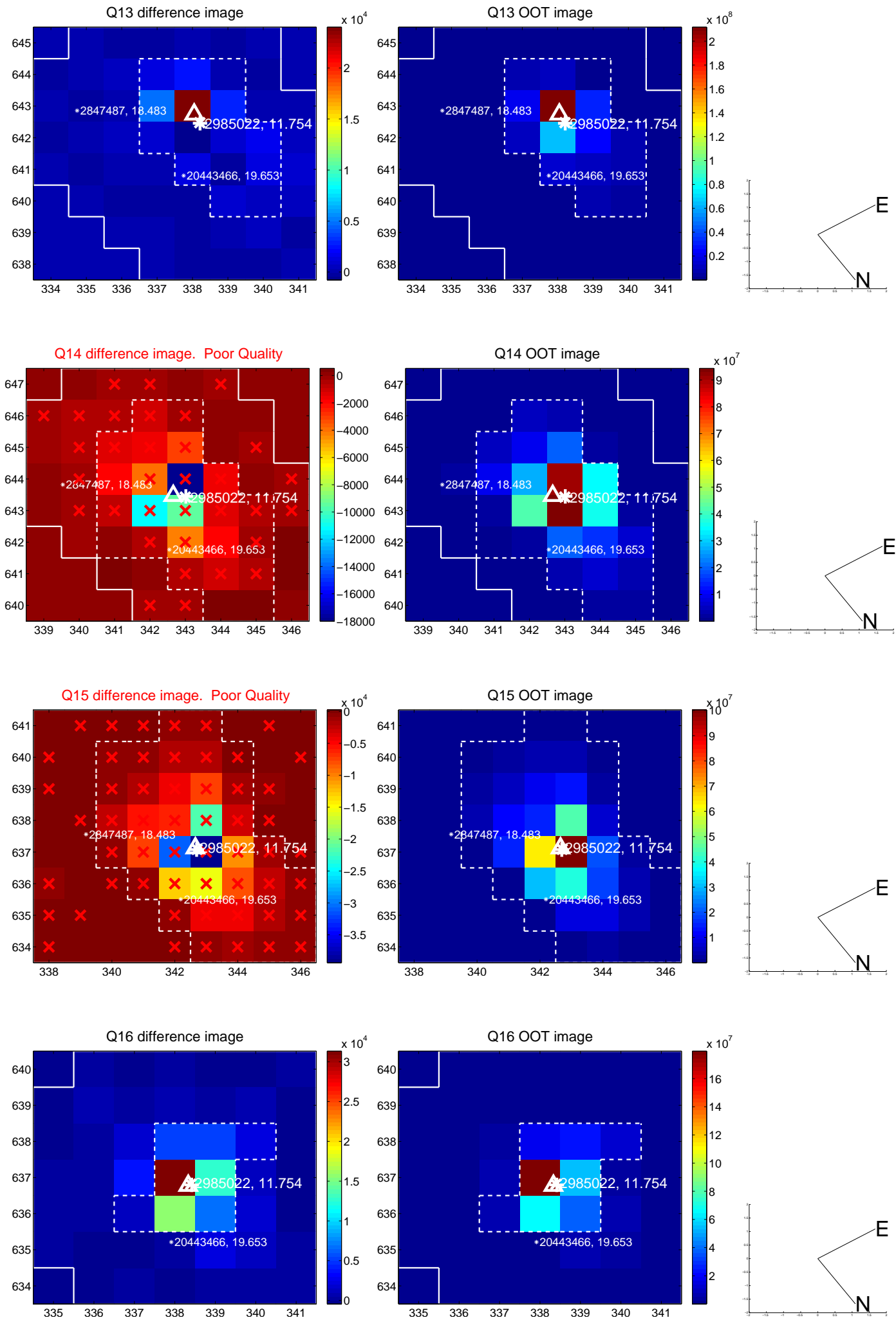




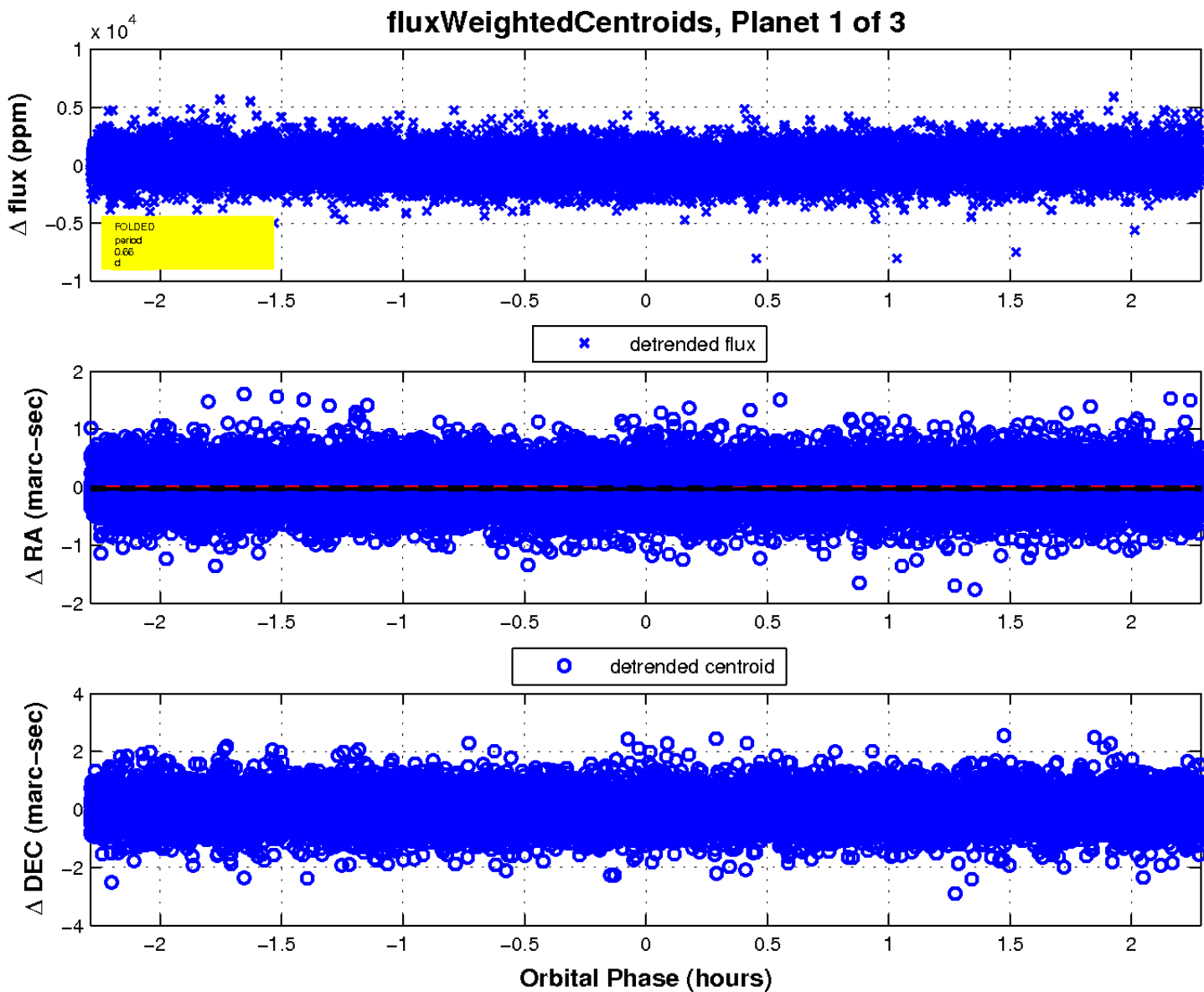
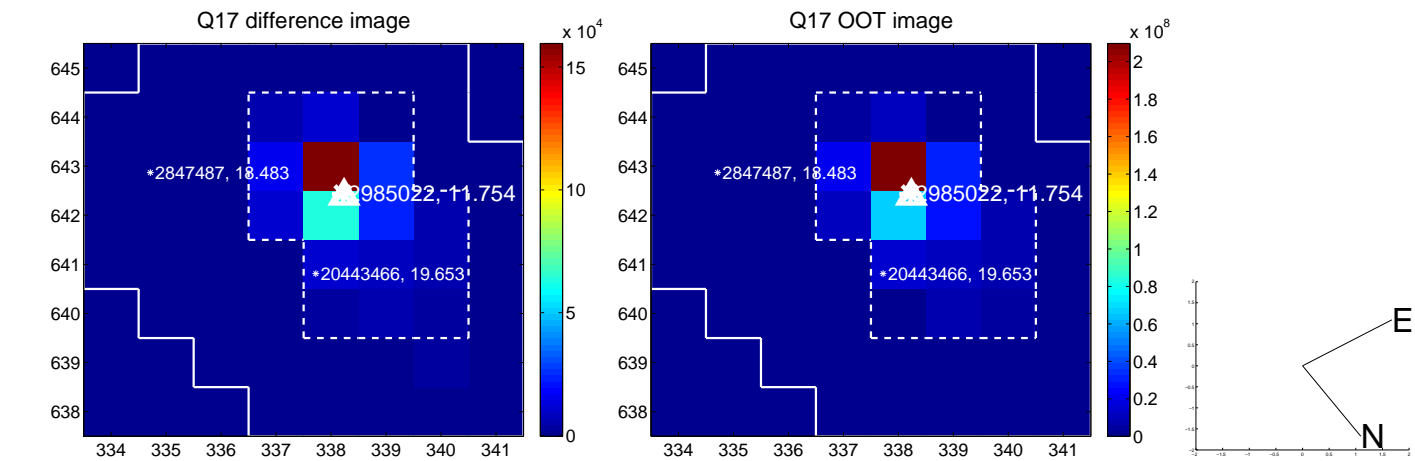
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

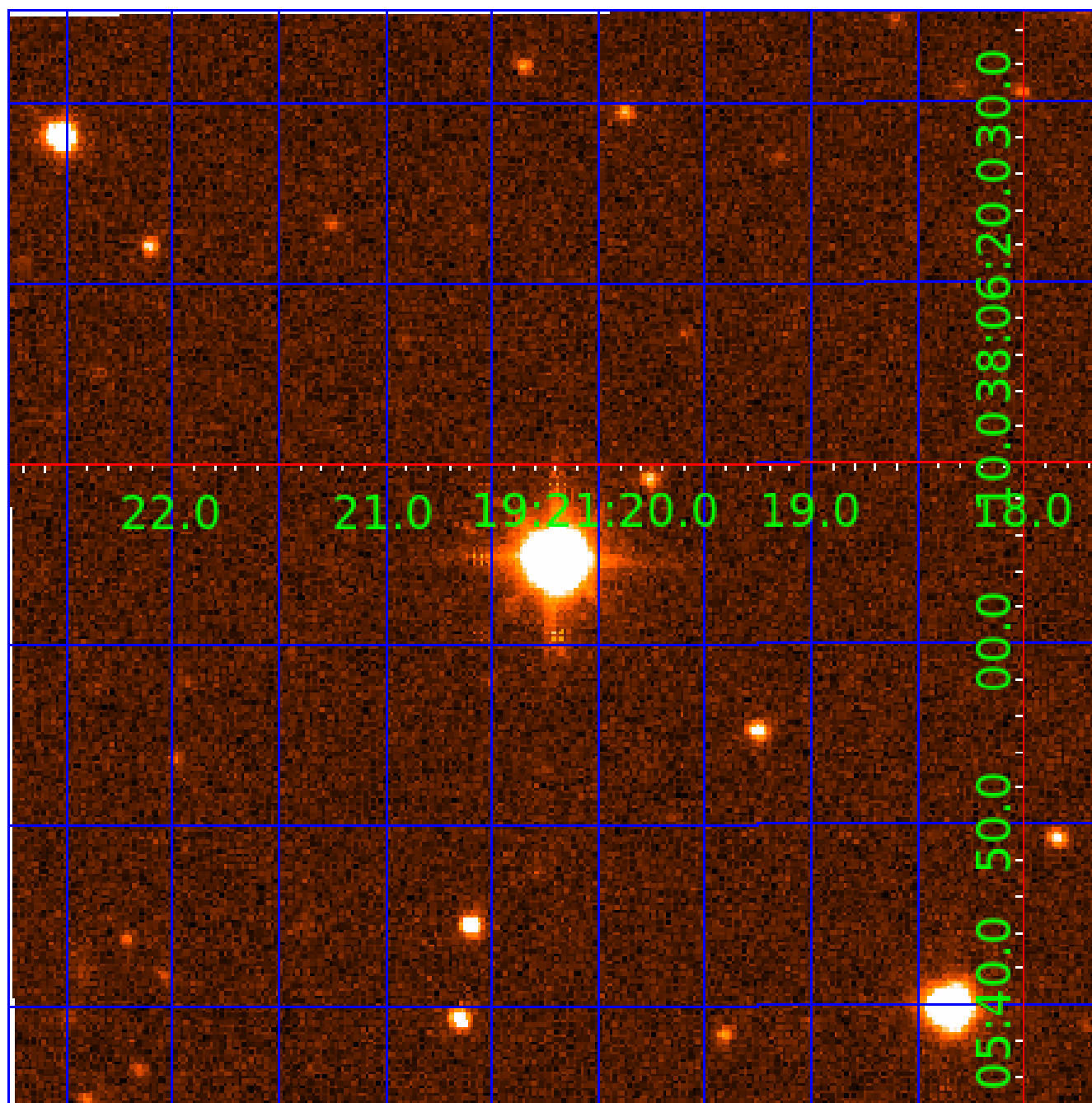


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002985022

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002985022-01	OBS	No	0.656126	132.149423	97.9	0.763	10.3	4.6	2.37	7202	2.54	44019.47
002985022-02	OBS	No	0.656128	131.697893	115.3	2.334	10.9	6.5	2.37	7202	2.96	44019.30
002985022-03	OBS	No	1.056520	131.783441	135.6	3.500	9.8	-1.0	2.37	7202	2.79	23323.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002985022-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
002985022-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
002985022-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—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.

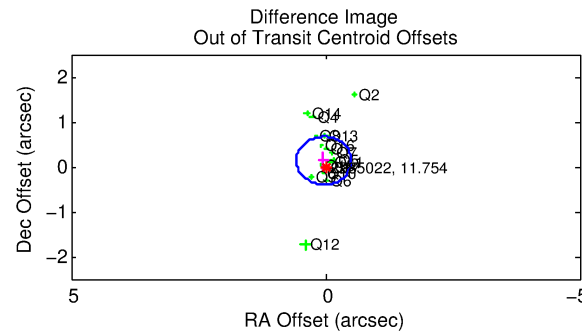
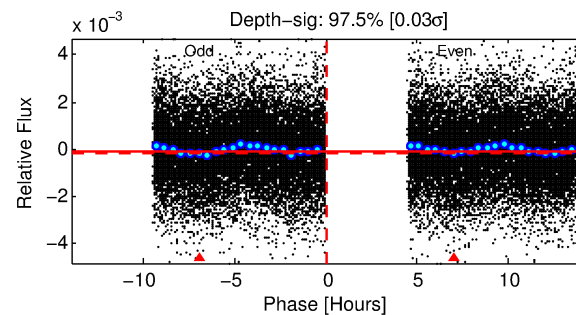
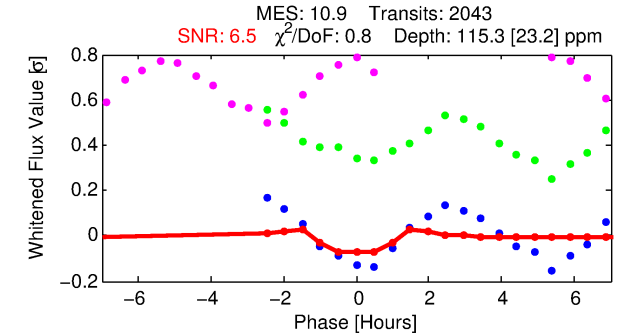
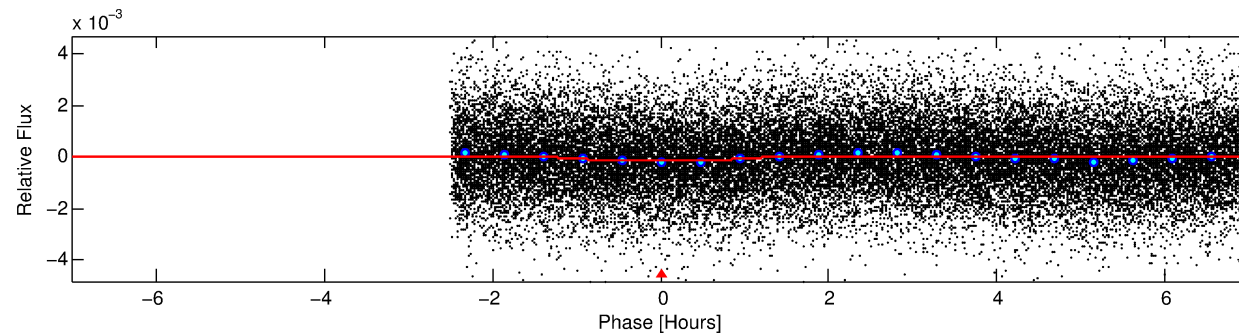
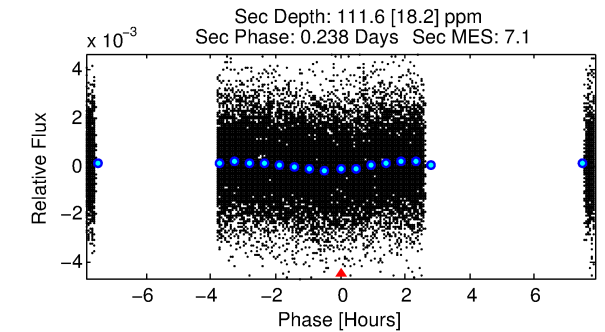
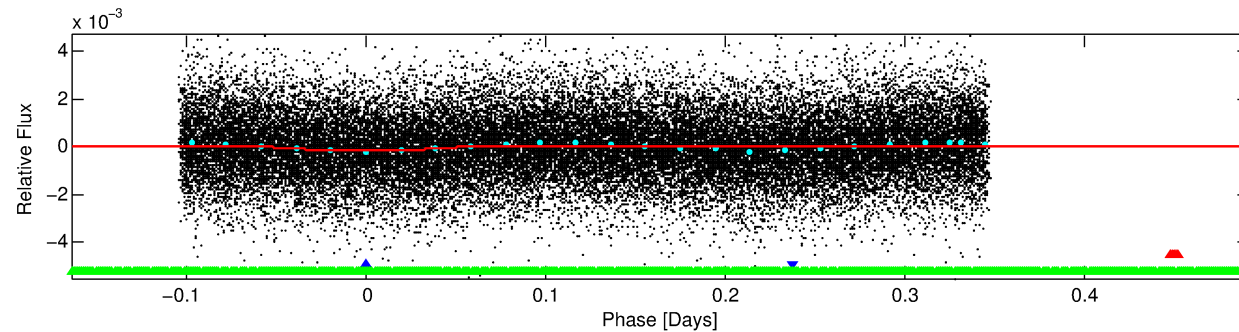
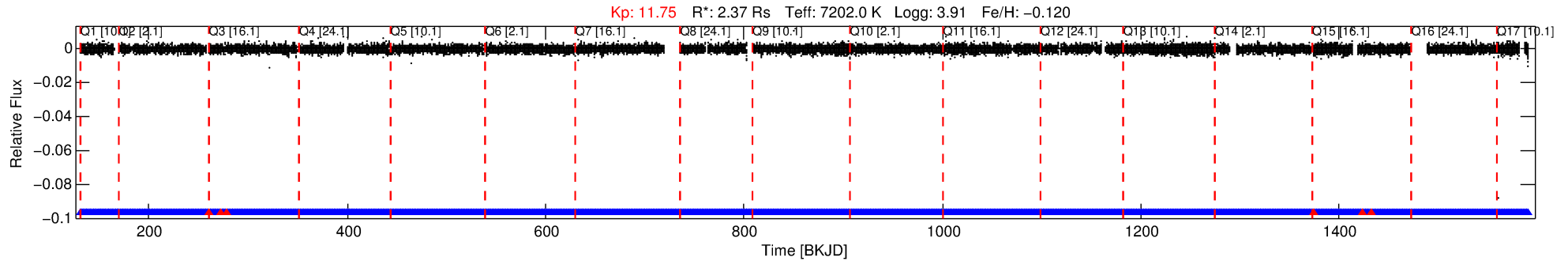
## Ephemeris Match Information For 002985022-02

No Significant Match Found



# DV One-Page Summary

KIC: 2985022 Candidate: 2 of 3 Period: 0.656 d



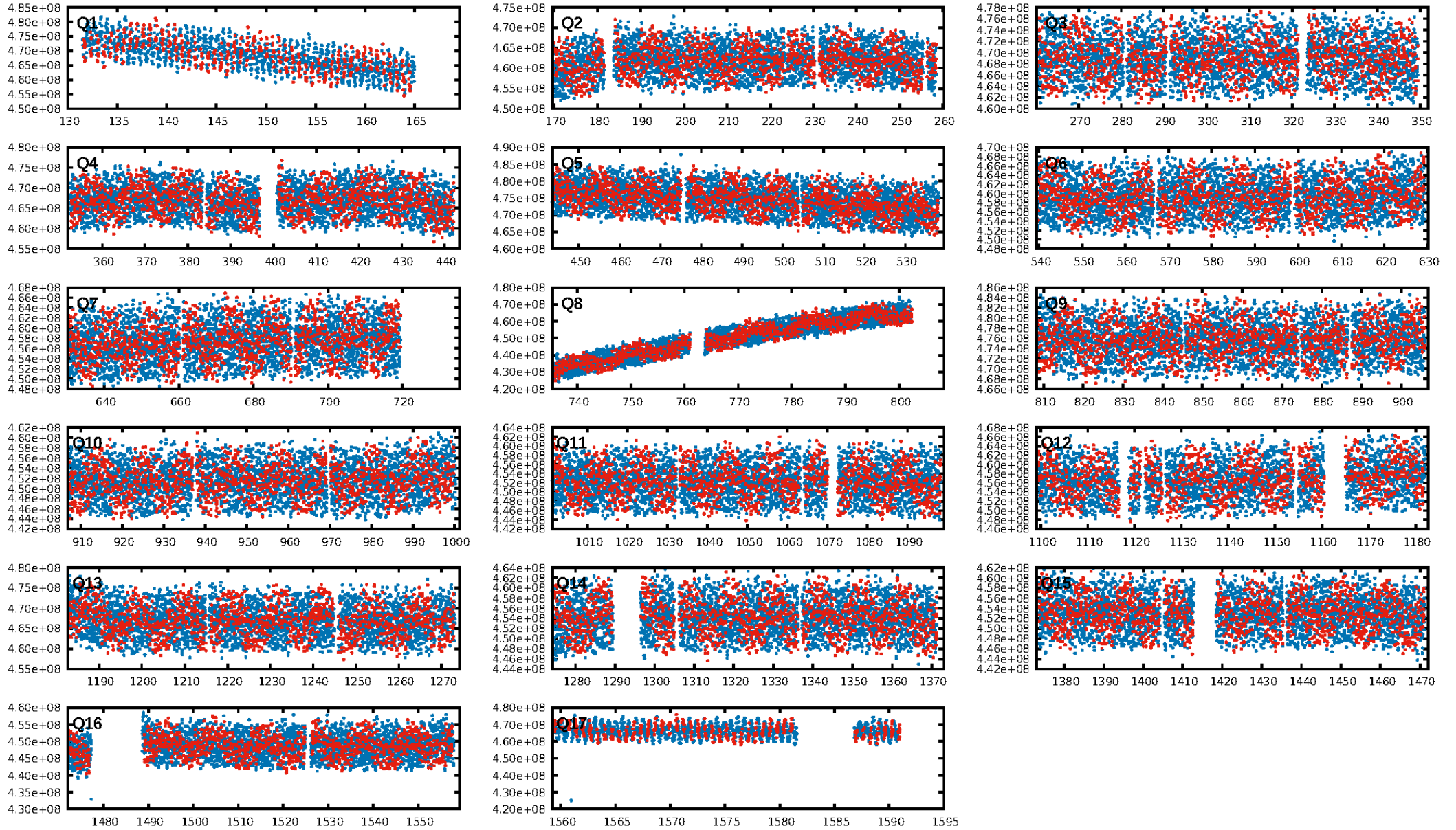
## DV Fit Results:

Period = 0.65613 [0.00001] d  
Epoch = 131.6979 [0.0031] BKJD  
Rp/R\* = 0.0114 [0.0065]  
a/R\* = 1.37 [2.16]  
b = 0.90 [0.73]  
Seff = 44019.30 [24262.57]  
Teff = 3693 [509] K  
Rp = 2.96 [1.98] Re  
a = 0.0175 [0.0059] AU  
Ag = 2.15 [2.72] [0.42σ]  
Teffp = 6919 [2001] K [1.56σ]

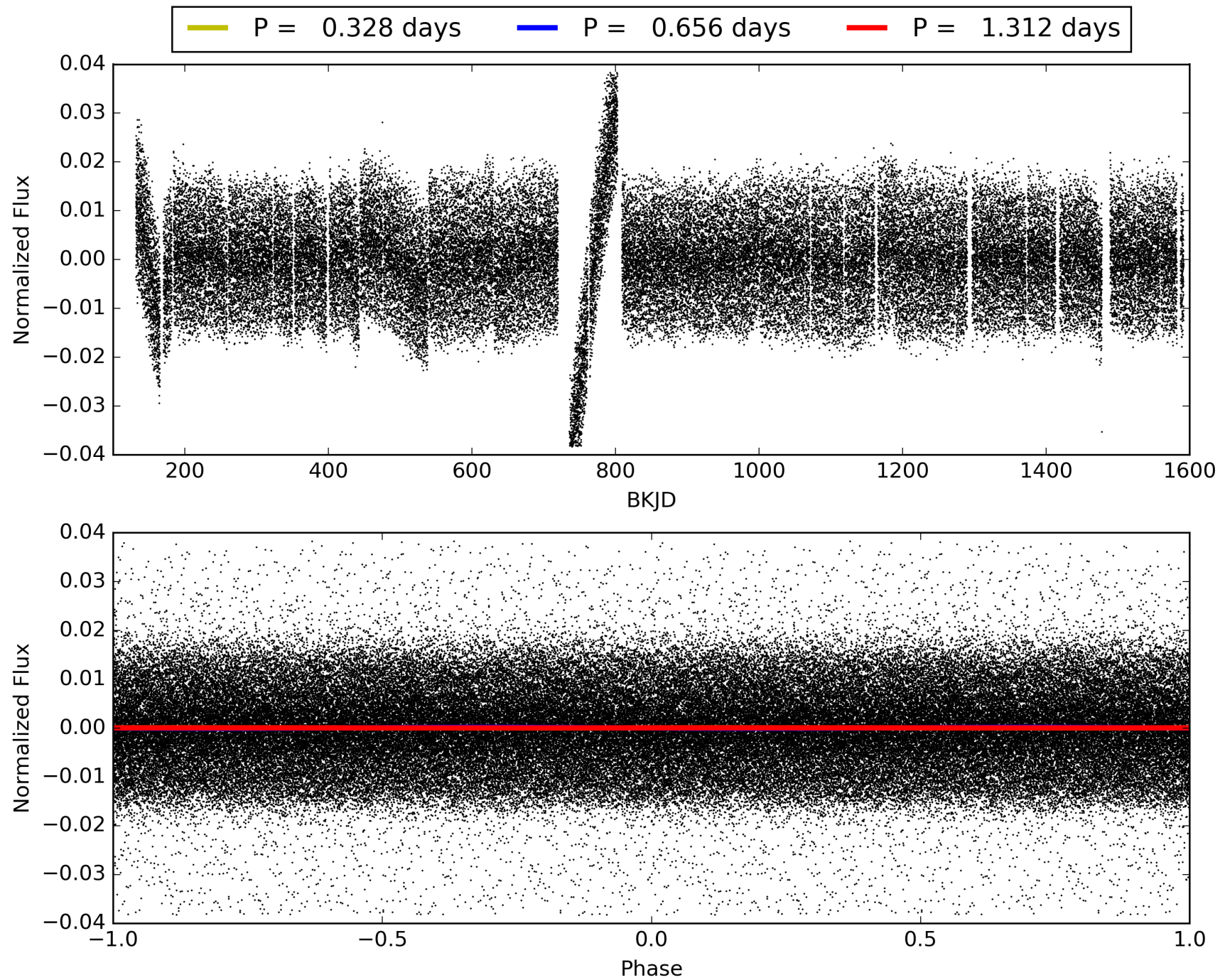
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 97.8% [2.28σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1945/1951]  
GhostDiagnostic-chr: 0.5755  
Centroid-sig: N/A  
Centroid-so: 0.287 arcsec [2.77σ]  
OotOffset-rm: 0.140 arcsec [0.78σ]  
KicOffset-rm: 0.193 arcsec [1.20σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.65 [11/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 002985022-02, PDC Light Curves



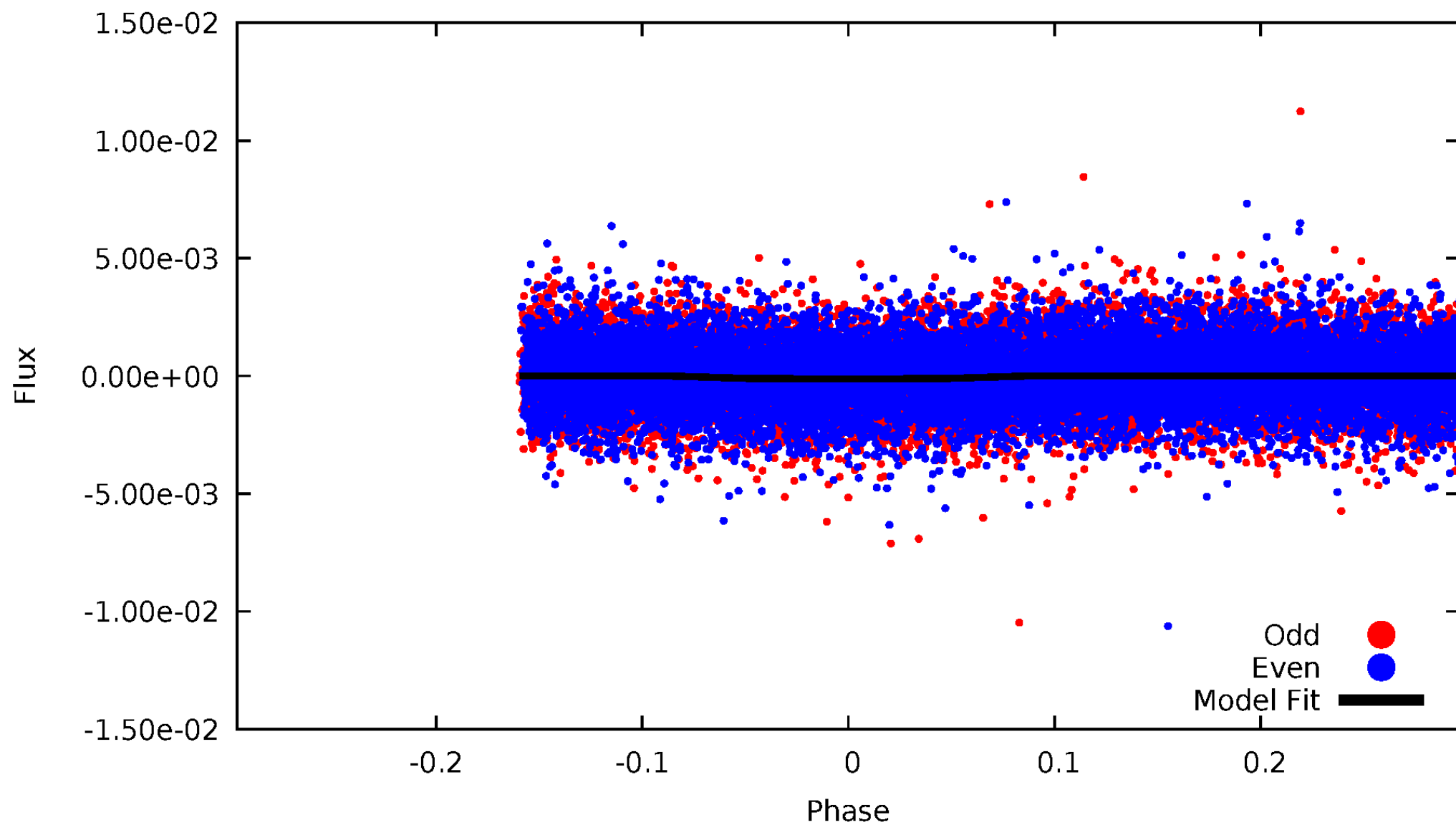
TCE 002985022-02





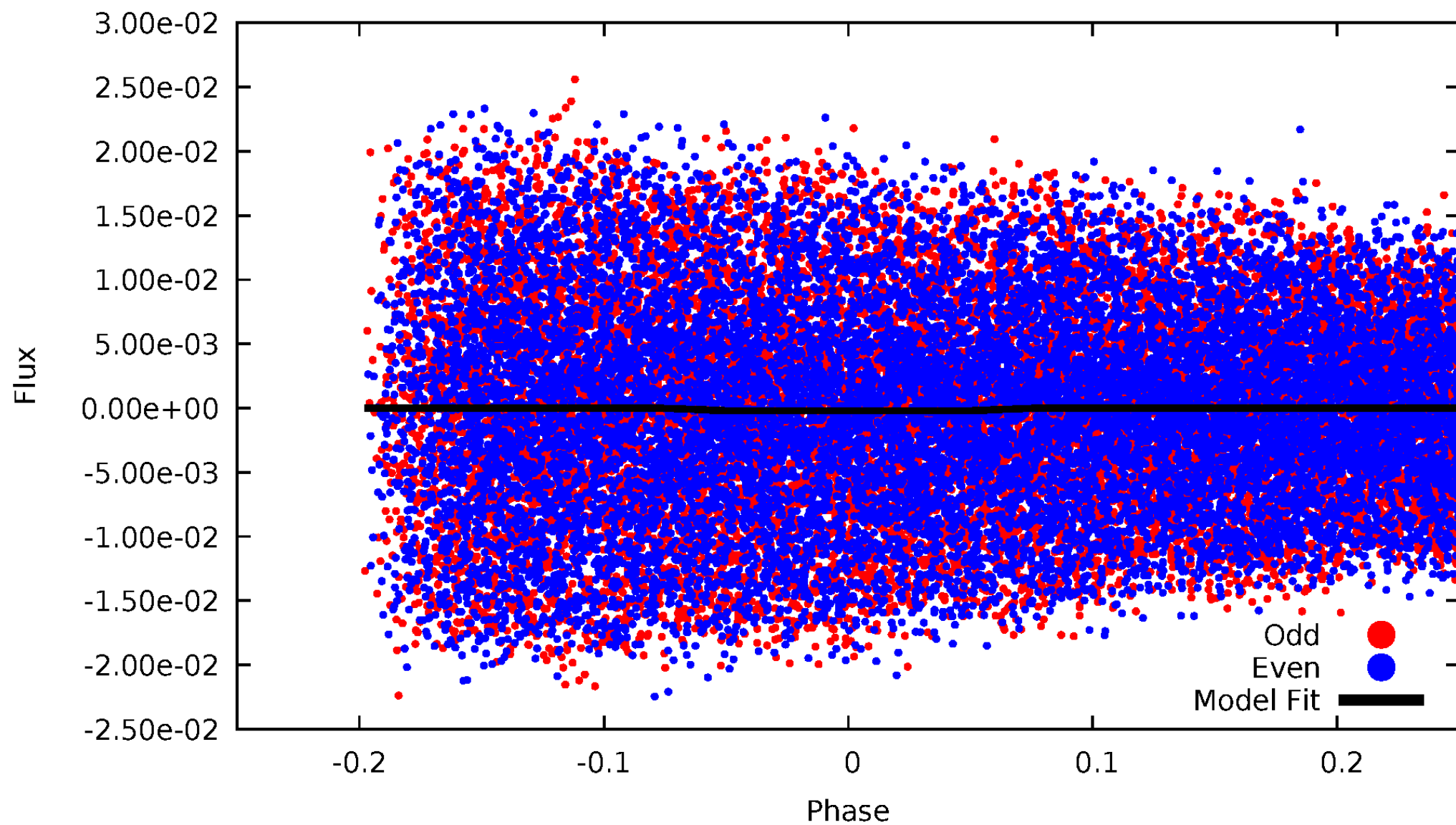
# DV Odd/Even

TCE 002985022-02



# ALT Odd/Even

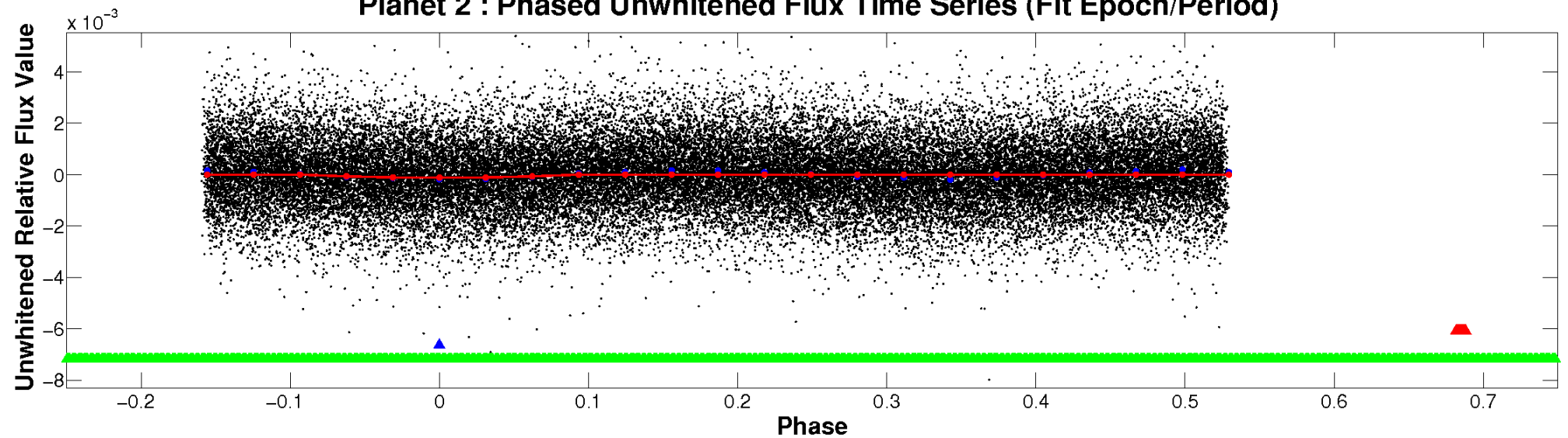
TCE 002985022-02



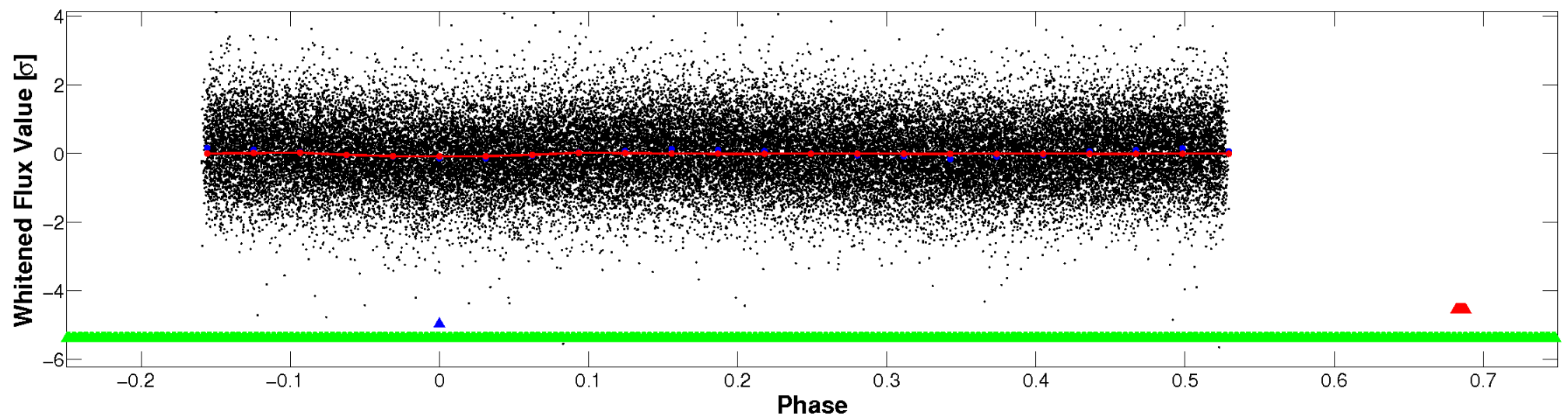


# Non-Whitened Vs. Whitened Light Curve

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

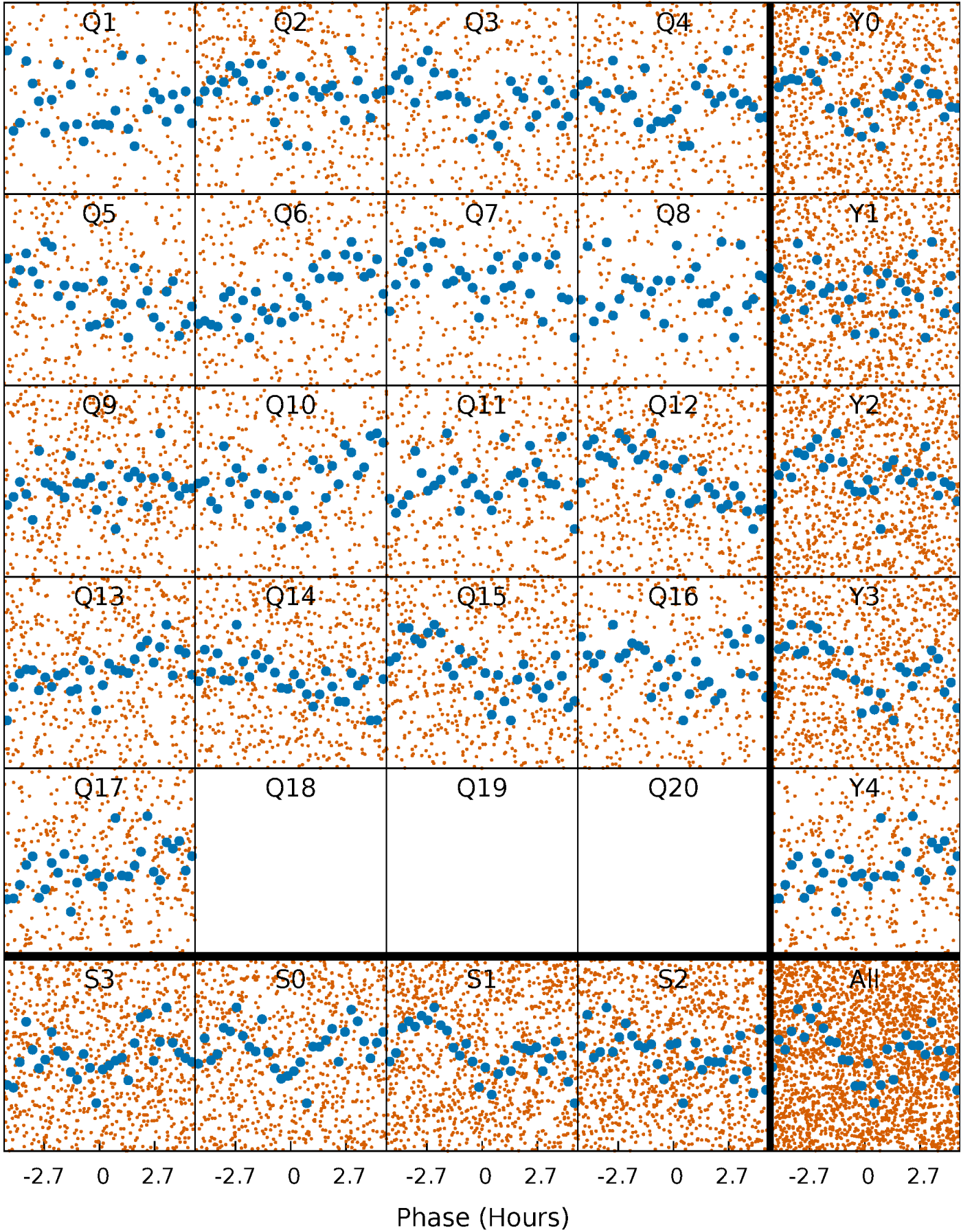


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



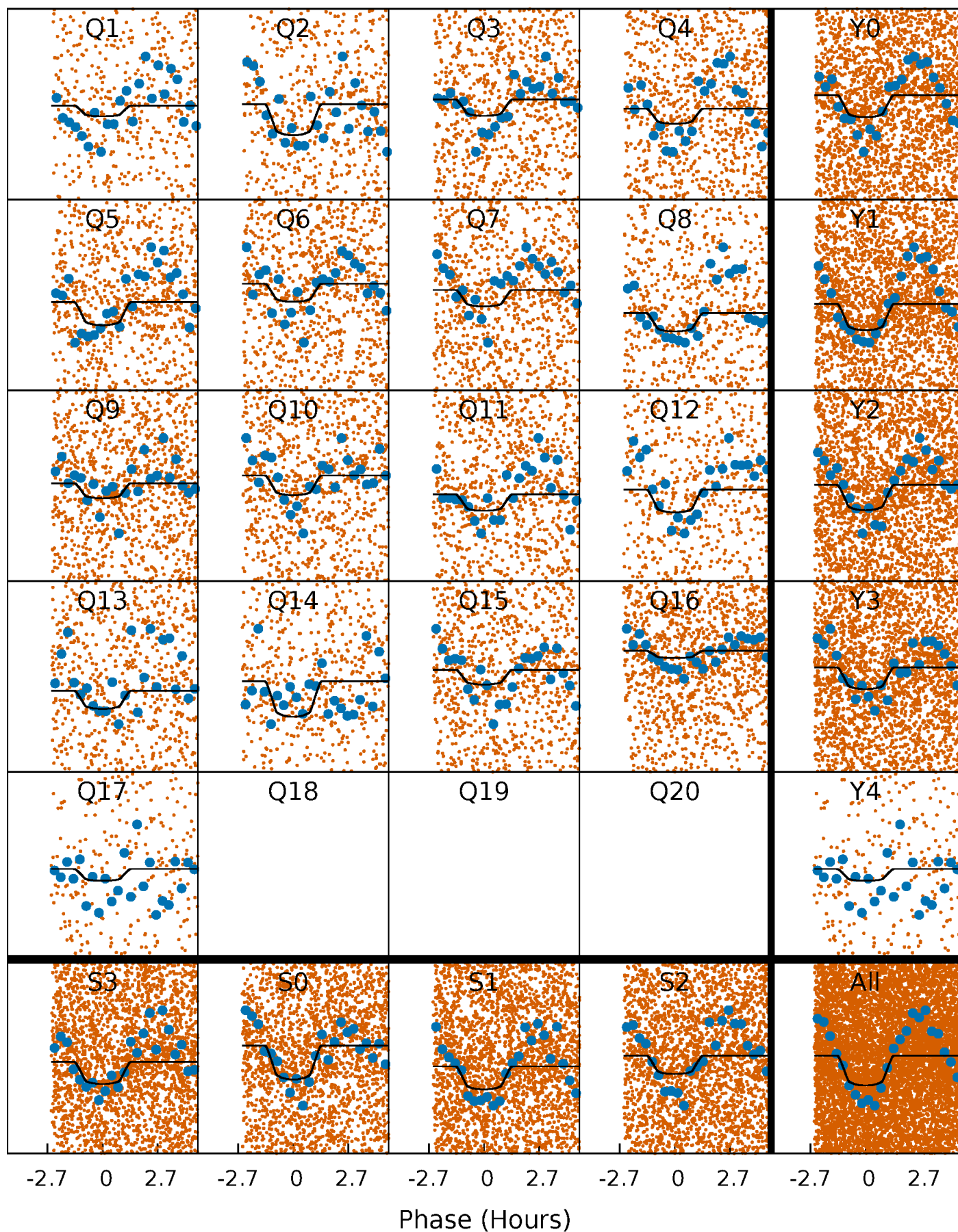
# PDC Quarter-Phased Transit Curves

TCE 002985022-02   P= 0.656128 Days    $T_0=131.697893$  (BKJD)



# DV Quarter-Phased Transit Curves

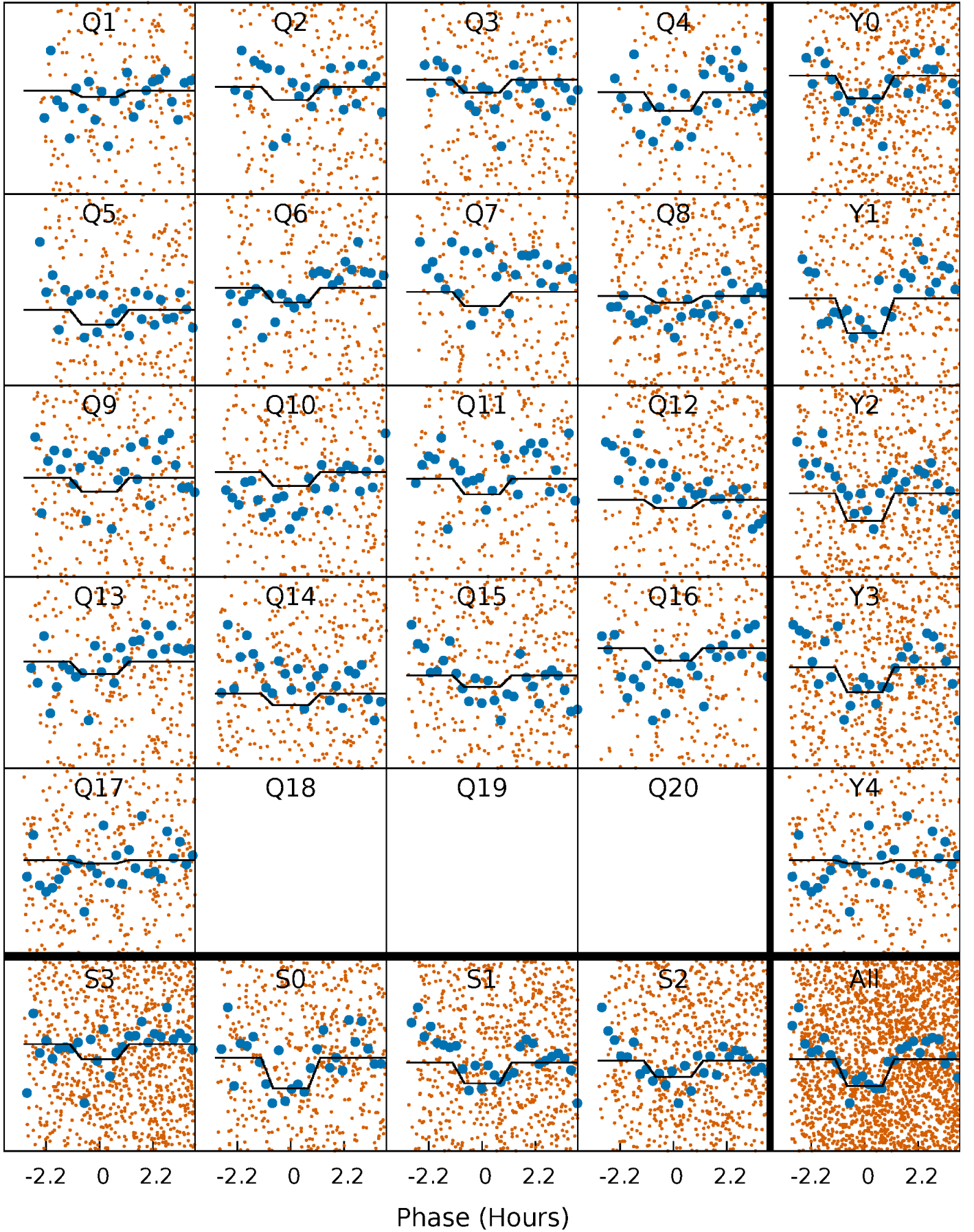
TCE 002985022-02   P= 0.656128 Days    $T_0=131.697893$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

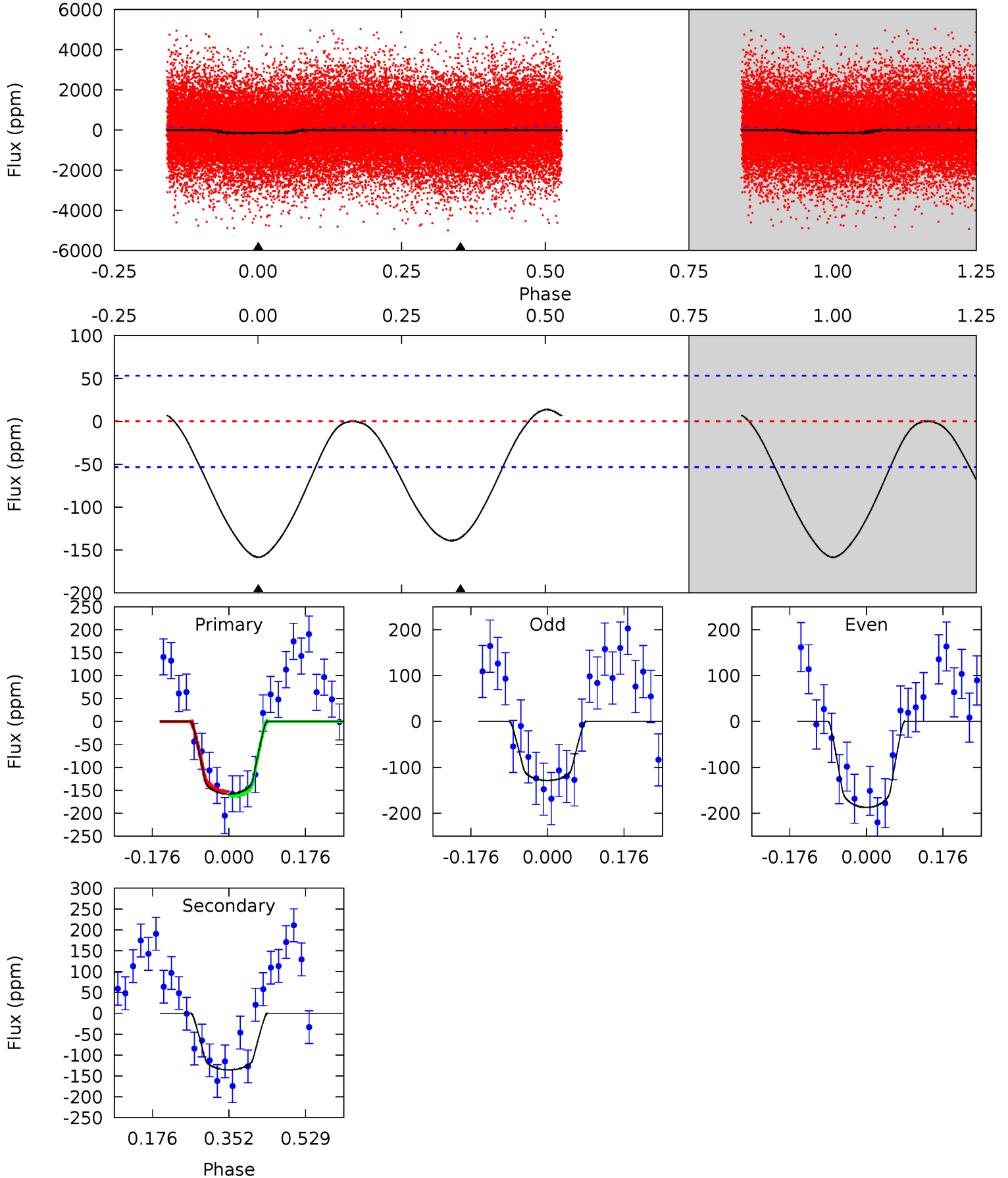
TCE 002985022-02   P= 0.656140 Days    $T_0=131.697372$  (BKJD)



# DV Model-Shift Uniqueness Test

002985022-02, P = 0.656128 Days, E = 131.041765 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	11.3	0	0	4.44	1.35	0.56	13.2	13.2	11.3	11.3	2.47	1.25	0.08	0.40

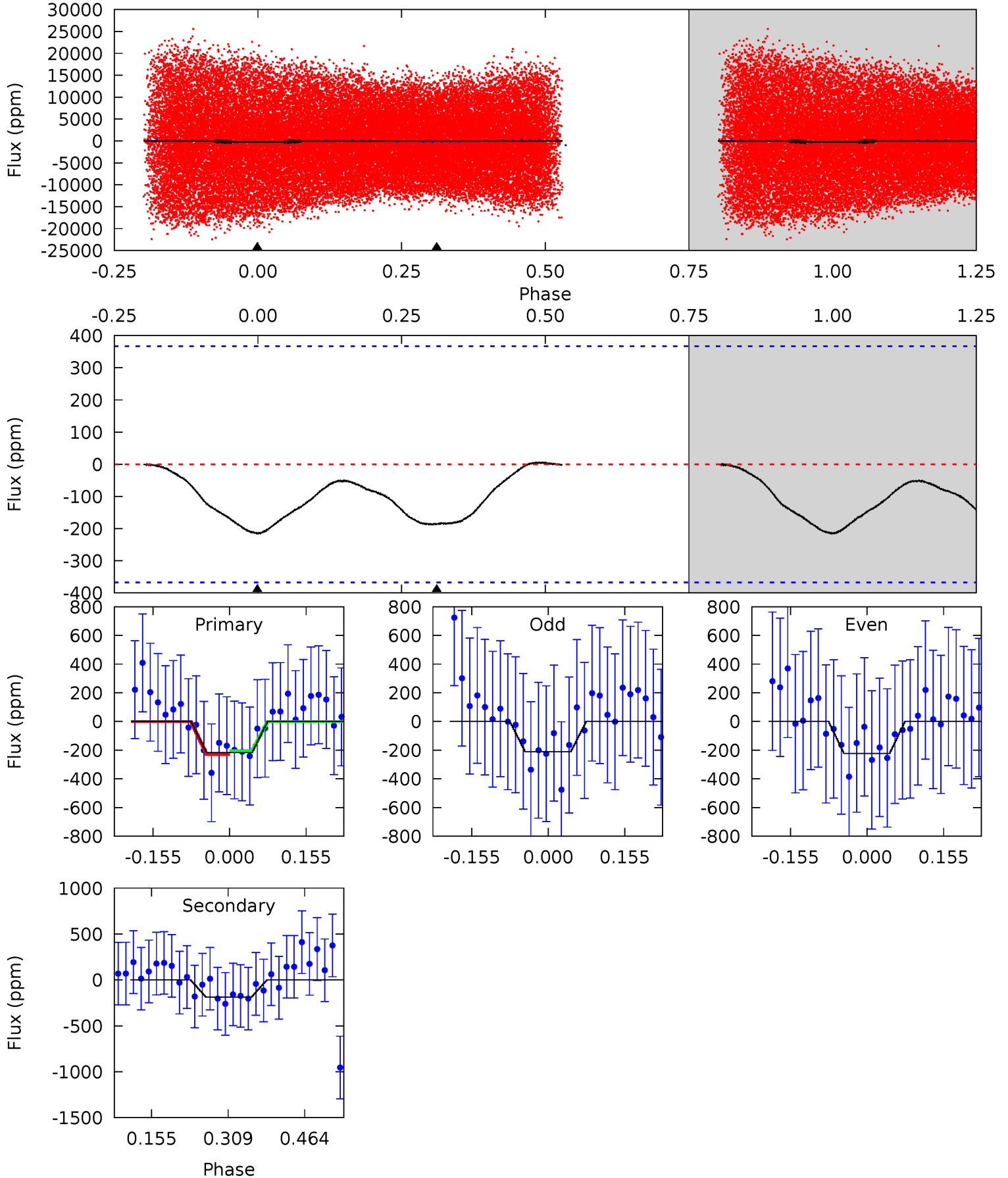




# Alt Model-Shift Uniqueness Test

002985022-02, P = 0.656140 Days, E = 131.041232 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
2.64	2.27	0	0	4.47	1.42	0.19	2.64	2.64	2.27	2.27	0.08	0.68	0.04	0.15



### Stellar Parameters For KIC 002985022

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7202^{+201}_{-277}$	$3.911^{+0.308}_{-0.132}$	$-0.120^{+0.250}_{-0.350}$	$2.368^{+0.563}_{-0.845}$	$1.664^{+0.159}_{-0.371}$	$0.176^{+0.397}_{-0.070}$
	+3%/-4%	+8%/-3%	+208%/-292%	+24%/-36%	+10%/-22%	+225%/-40%
Source	PHO1	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 002985022-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-136 \pm 12$	$2.75^{+1.55}_{-1.39}$	$5063^{+358}_{-498}$	$6990^{+4947}_{-1588}$	$2.975^{+9.553}_{-1.774}$
Alt.	$-187 \pm 82$	$3.62^{+1.83}_{-1.55}$	$5051^{+384}_{-449}$	$6388^{+2918}_{-1653}$	$2.258^{+4.576}_{-1.479}$

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

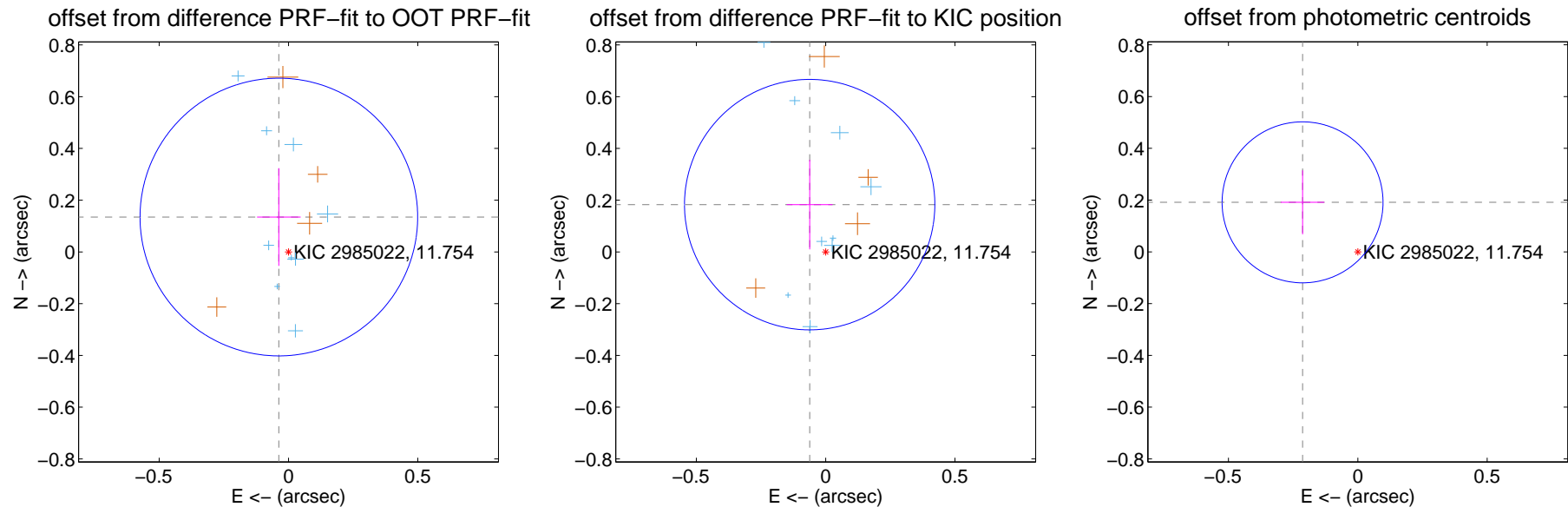
## DV Centroid Data

Supplemental centroid analysis for 002985022-02. **Kepler magnitude: 11.75.** Transit SNR 6.52

There are 11 quarters with good PRF difference image offsets

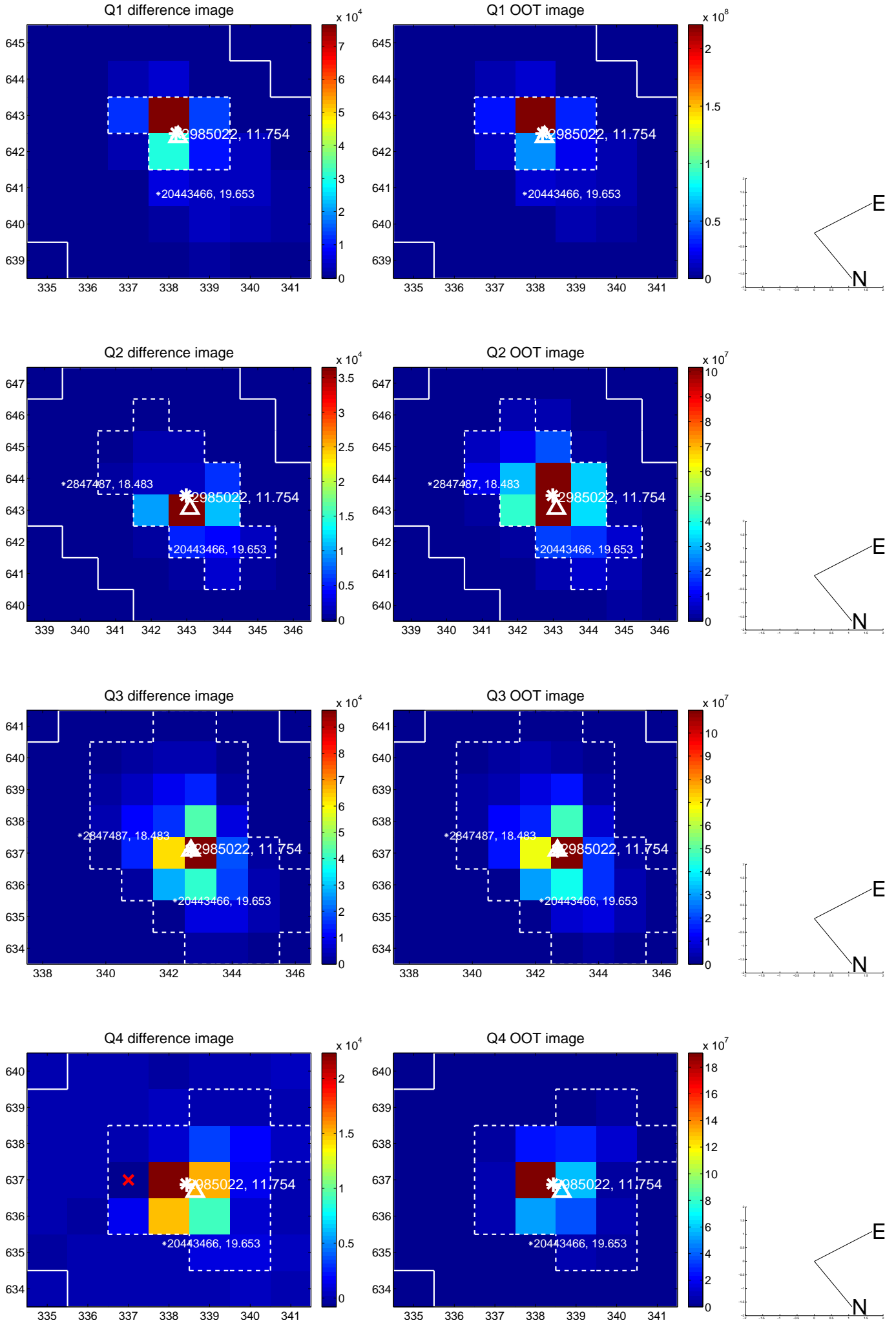
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.140 \pm 0.179$	0.78	$0.037 \pm 0.084$	$0.135 \pm 0.189$
PRF-fit source offset from KIC position	$0.193 \pm 0.161$	1.20	$0.062 \pm 0.089$	$0.183 \pm 0.173$
photometric centroid source offset	$0.29 \pm 0.10$	2.77	$0.21 \pm 0.08$	$0.19 \pm 0.12$

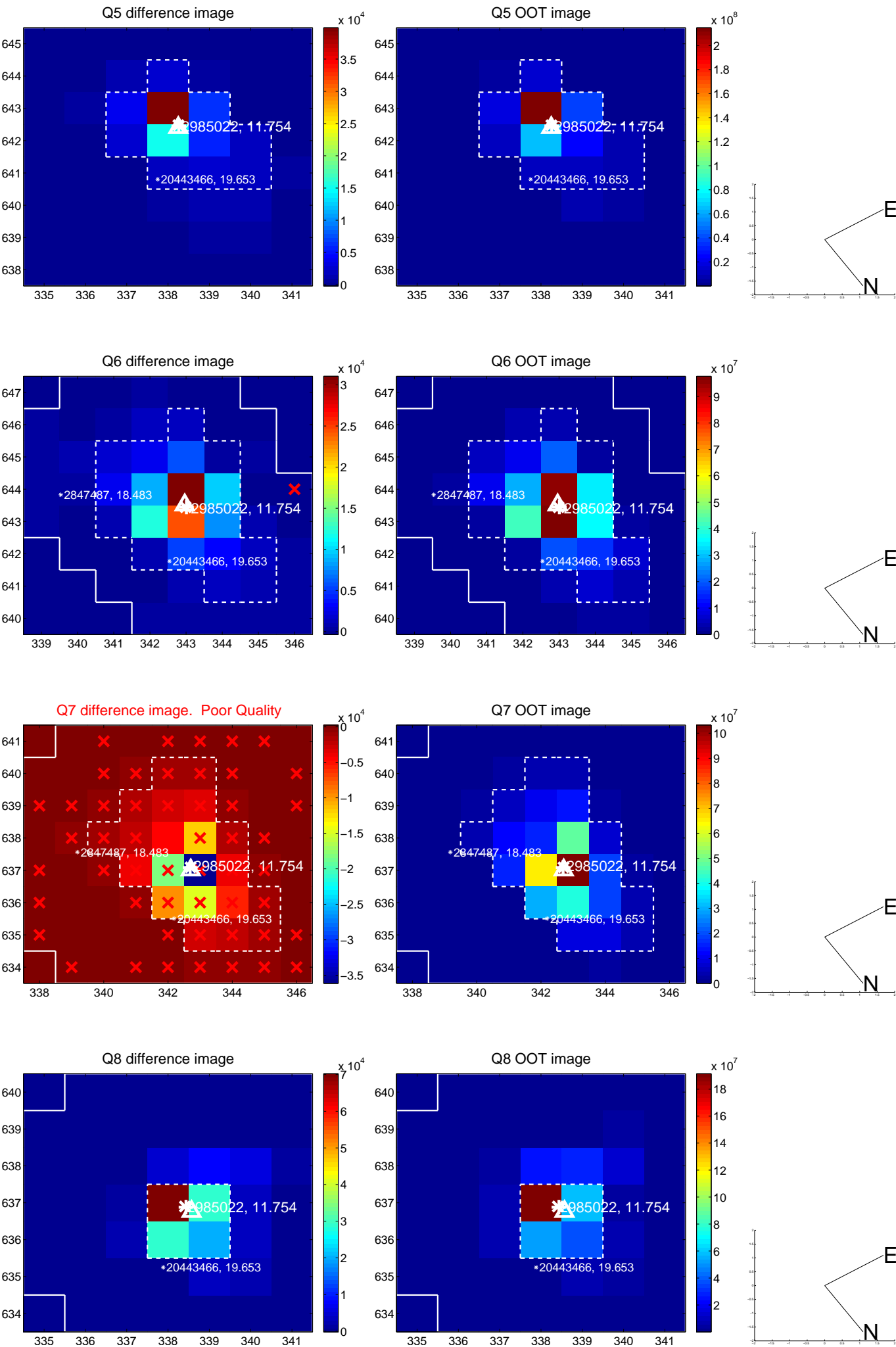


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

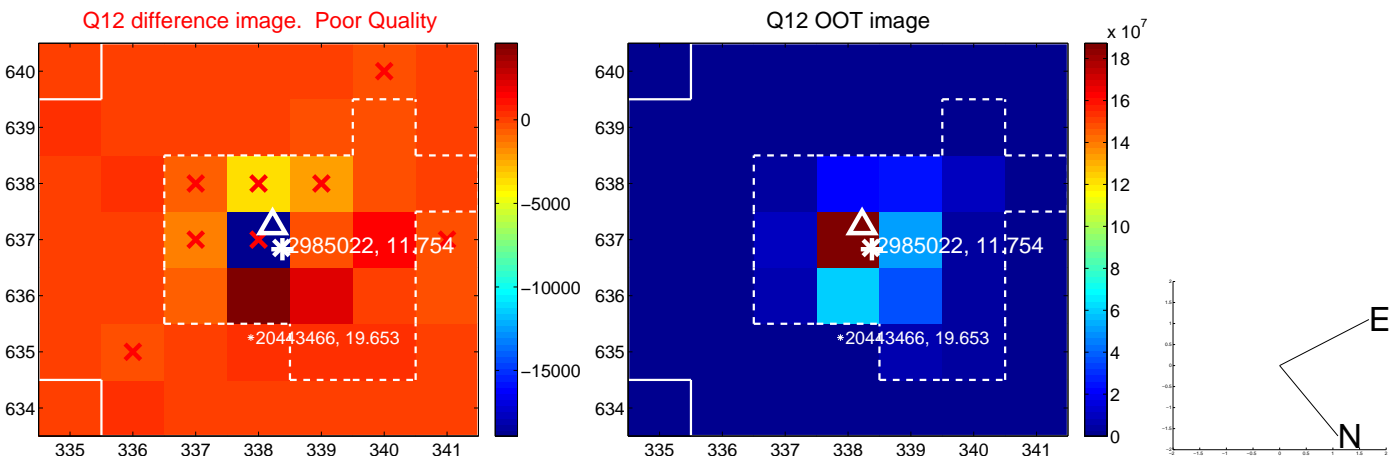
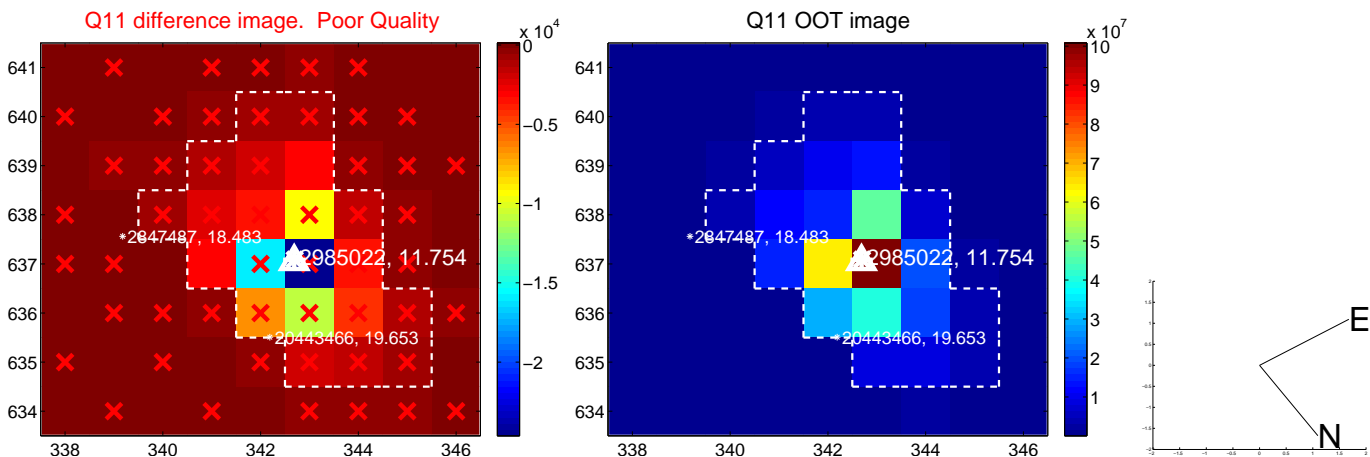
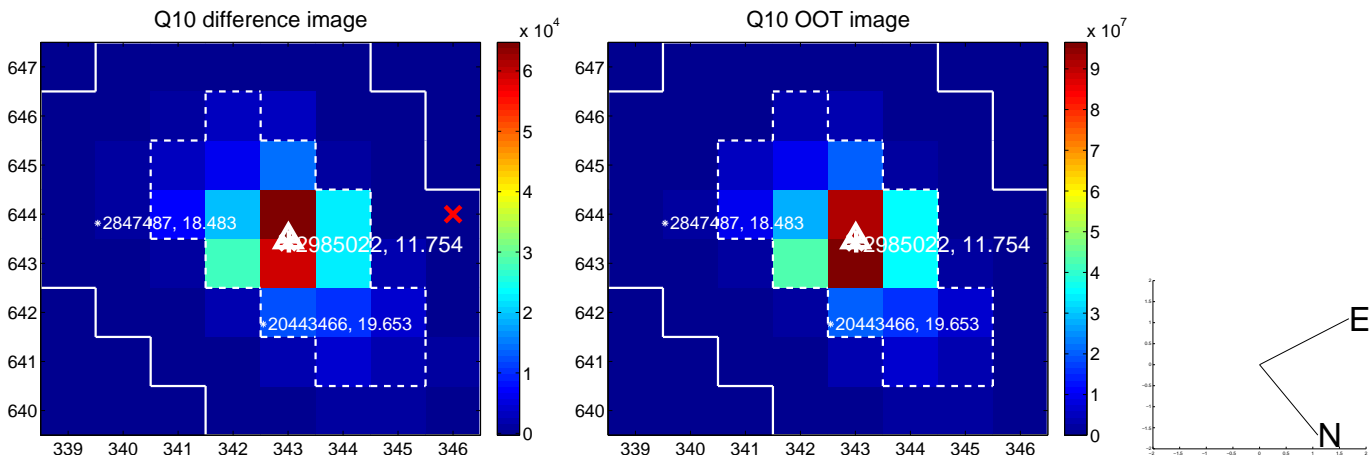
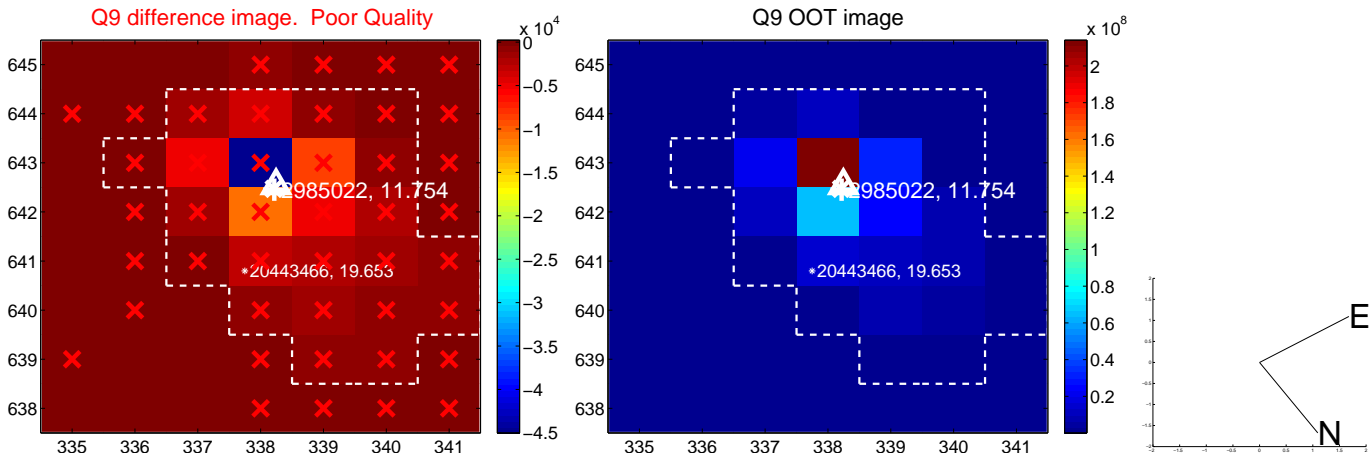


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

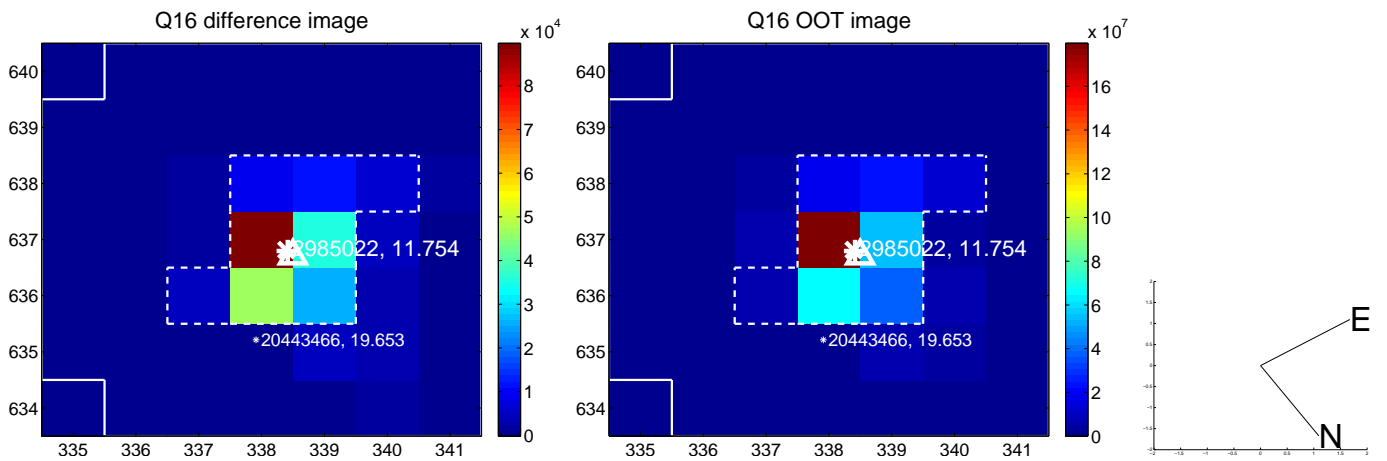
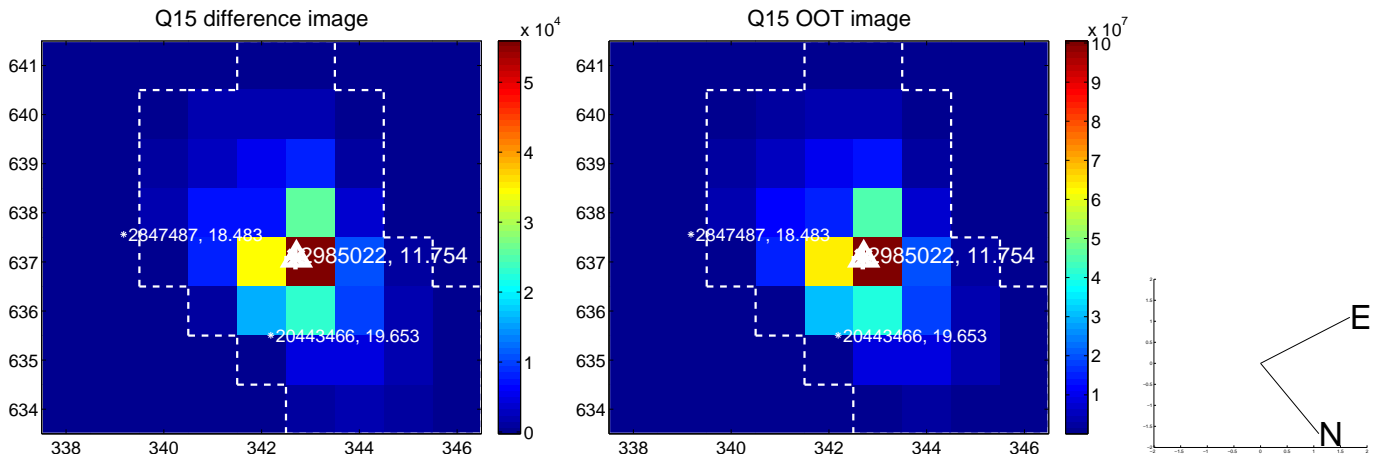
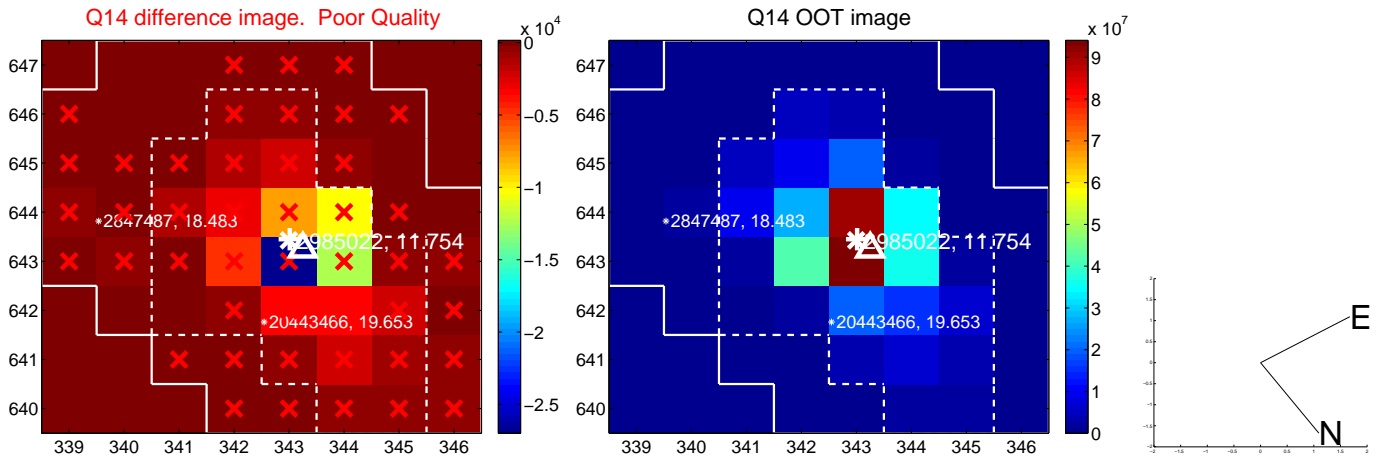
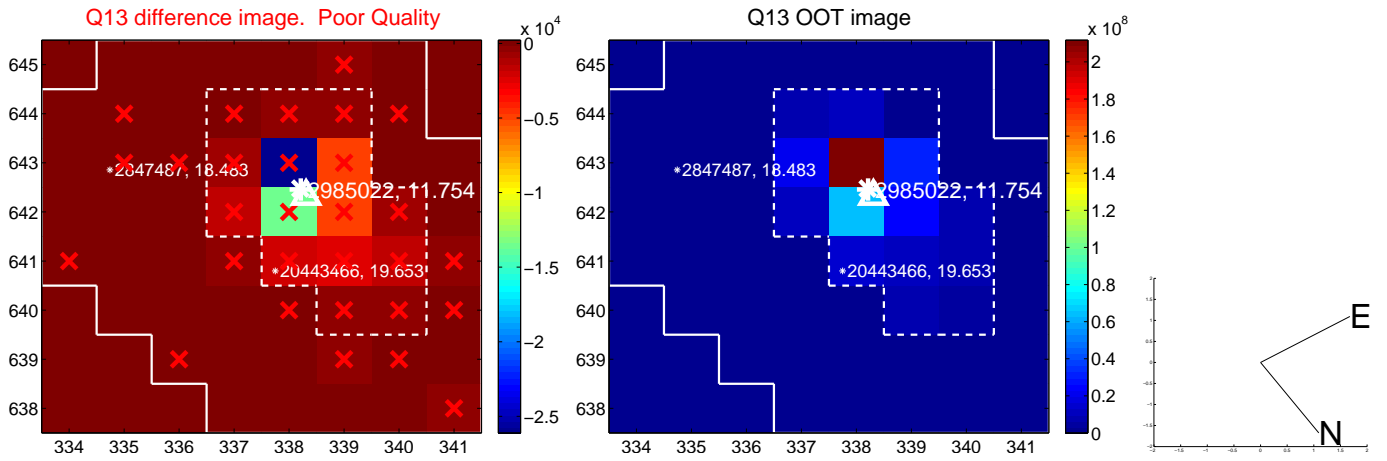




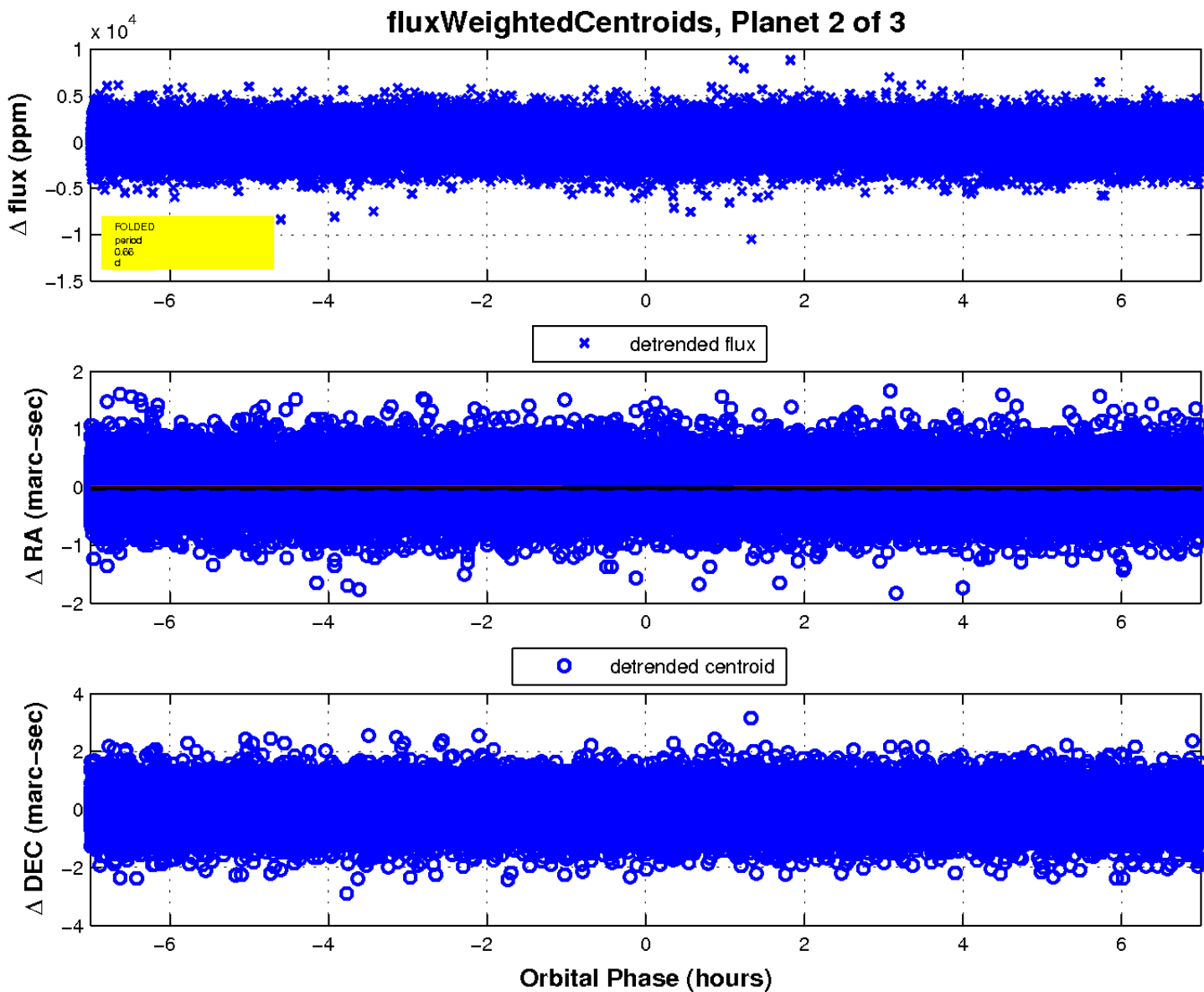
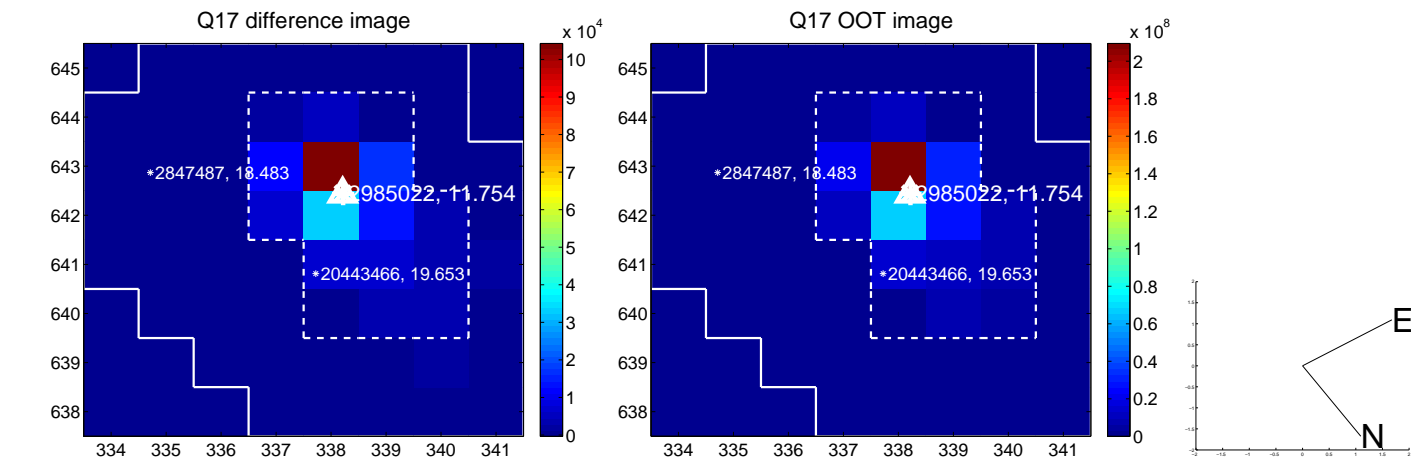
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

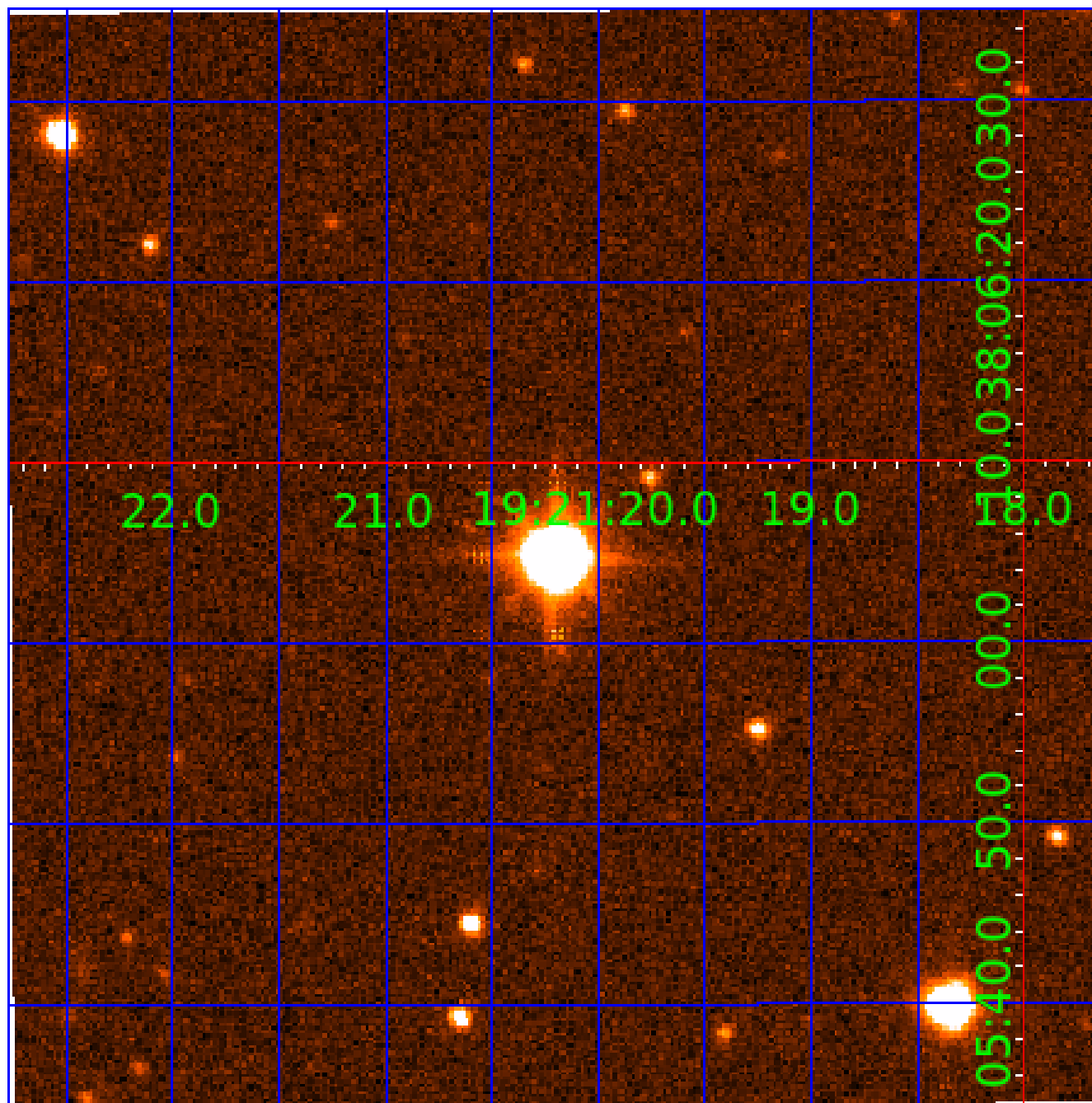


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002985022

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002985022-01	OBS	No	0.656126	132.149423	97.9	0.763	10.3	4.6	2.37	7202	2.54	44019.47
002985022-02	OBS	No	0.656128	131.697893	115.3	2.334	10.9	6.5	2.37	7202	2.96	44019.30
002985022-03	OBS	No	1.056520	131.783441	135.6	3.500	9.8	-1.0	2.37	7202	2.79	23323.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002985022-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
002985022-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
002985022-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—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.

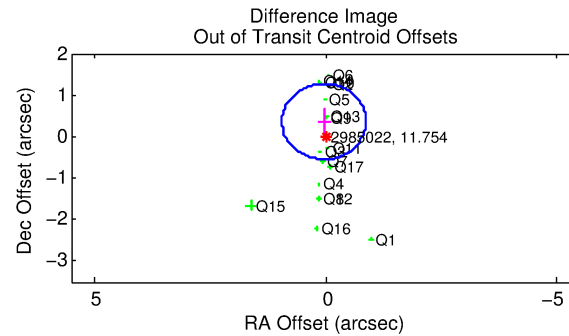
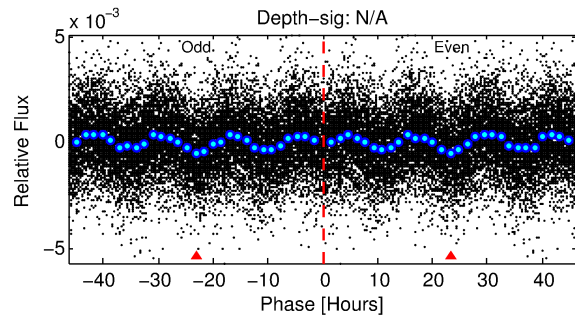
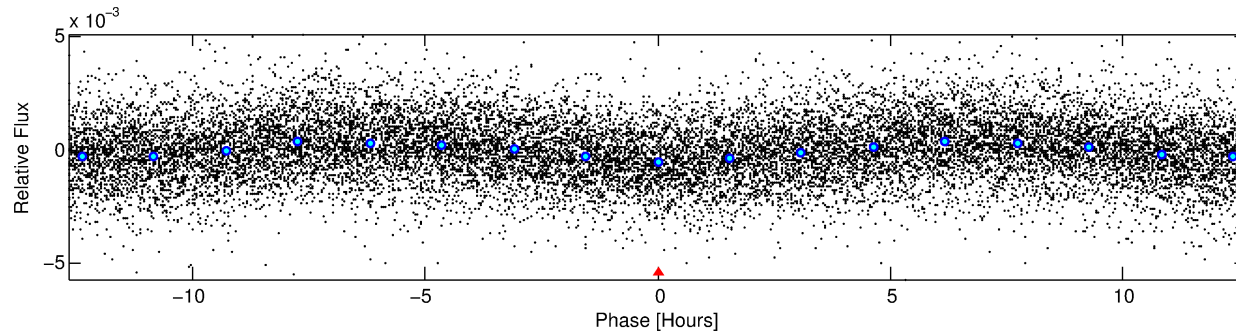
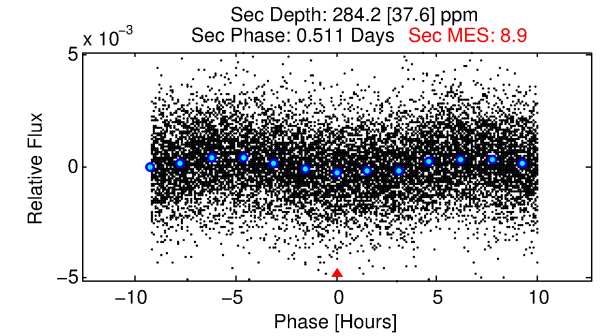
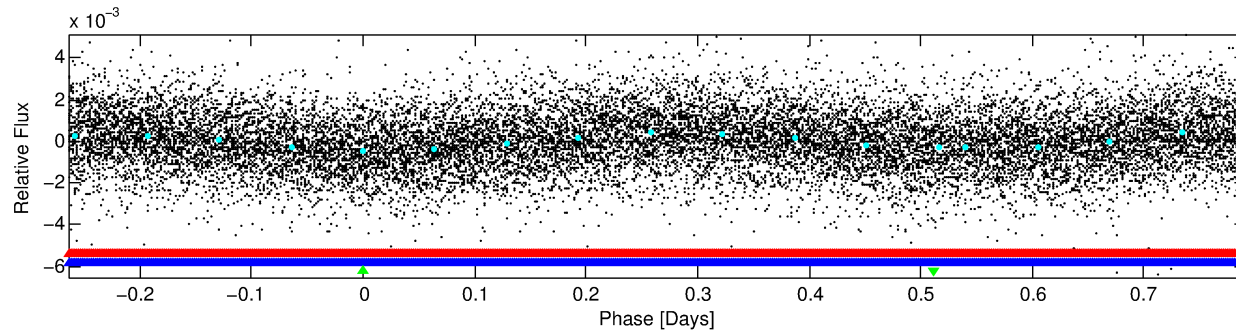
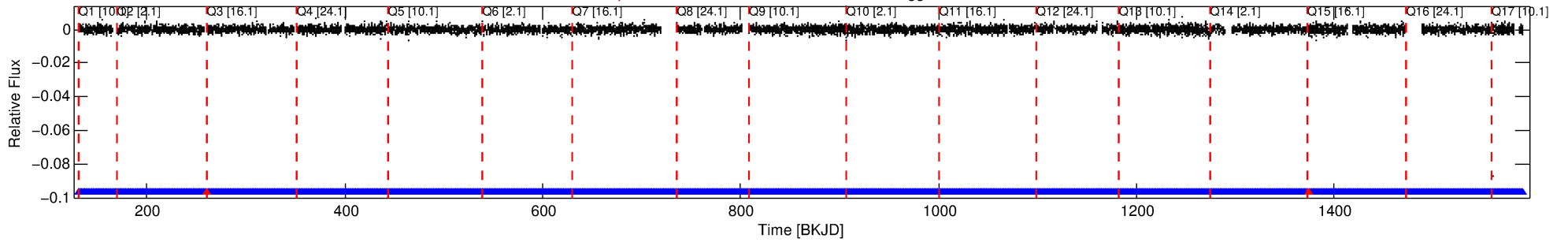
## Ephemeris Match Information For 002985022-03

No Significant Match Found

# DV One-Page Summary

KIC: 2985022 Candidate: 3 of 3 Period: 1.057 d

Kp: 11.75 R\*: 2.37 Rs Teff: 7202.0 K Logg: 3.91 Fe/H: -0.120



## TPS TCE Results:

Period = 1.05652 d  
Epoch = 131.7834 BKJD

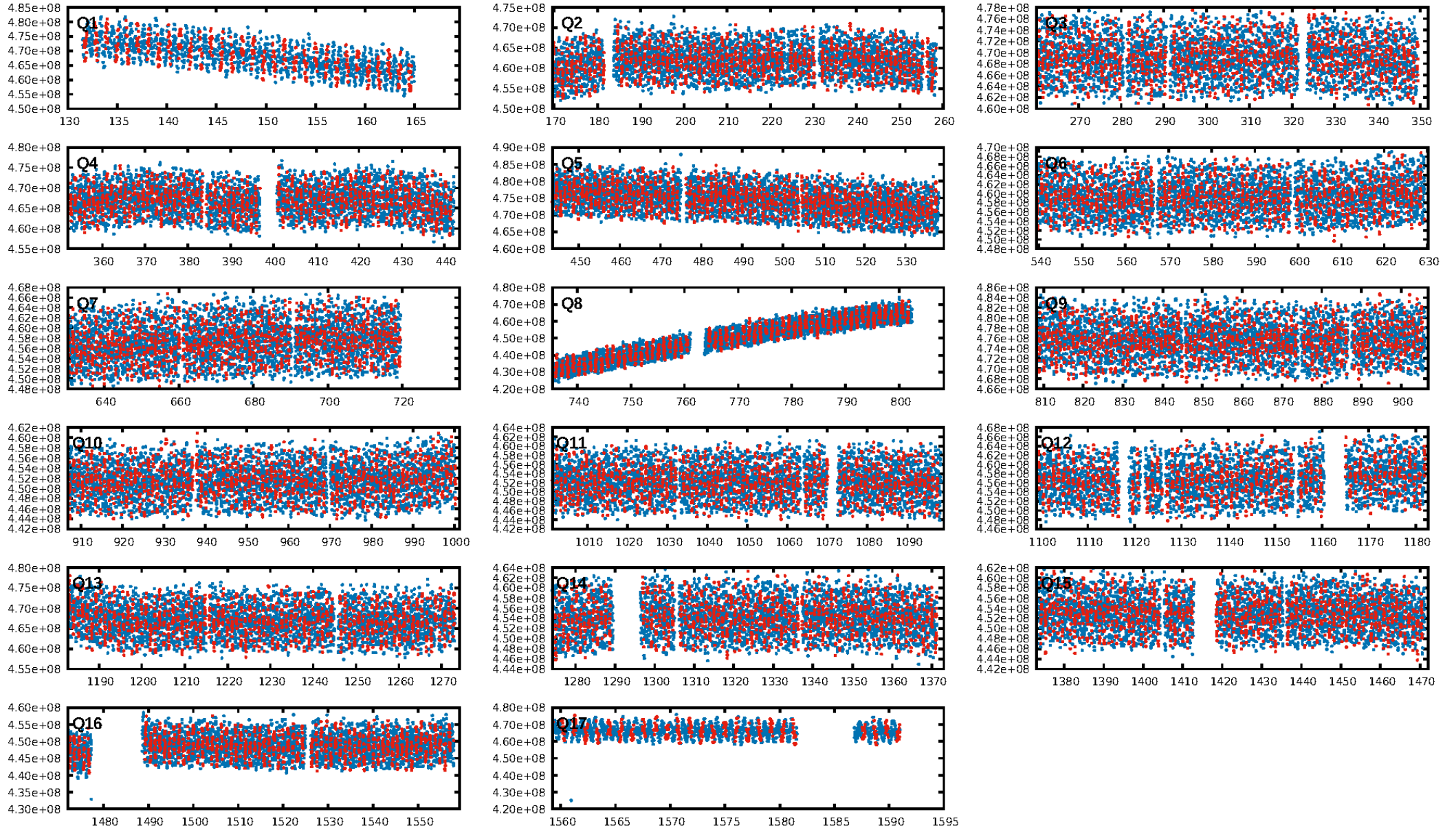
DV fit results are unavailable

## DV Diagnostic Results:

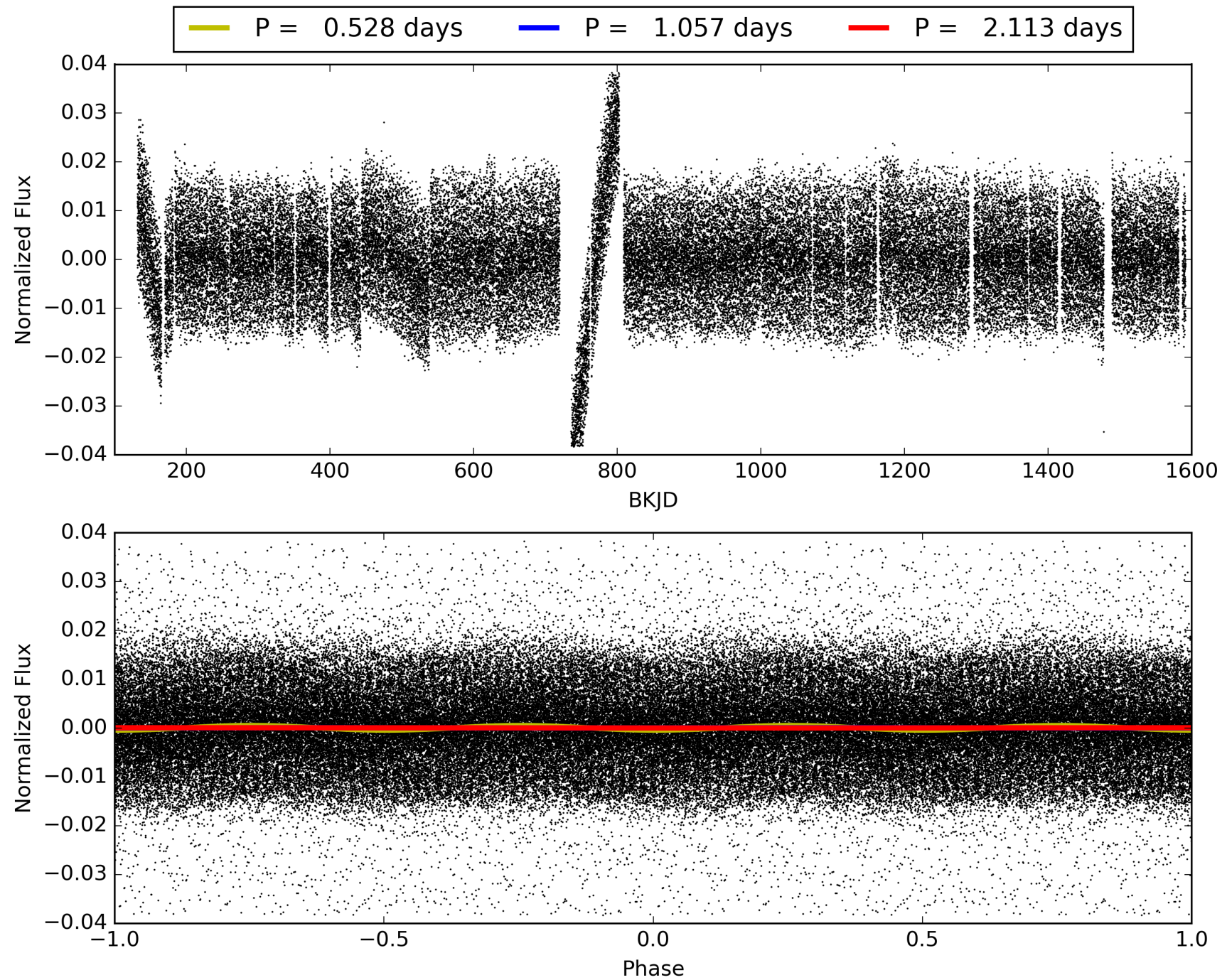
ShortPeriod-sig: 97.8% [2.28 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [941/943]  
GhostDiagnostic-chr: 1.019  
Centroid-sig: N/A  
Centroid-so: 0.067 arcsec [3.25 $\sigma$ ]  
OotOffset-rm: 0.365 arcsec [1.20 $\sigma$ ]  
KicOffset-rm: 0.419 arcsec [1.42 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.88 [15/17]  
DiffImageOverlap-fno: 0.00 [0/17]



# TCE 002985022-03, PDC Light Curves

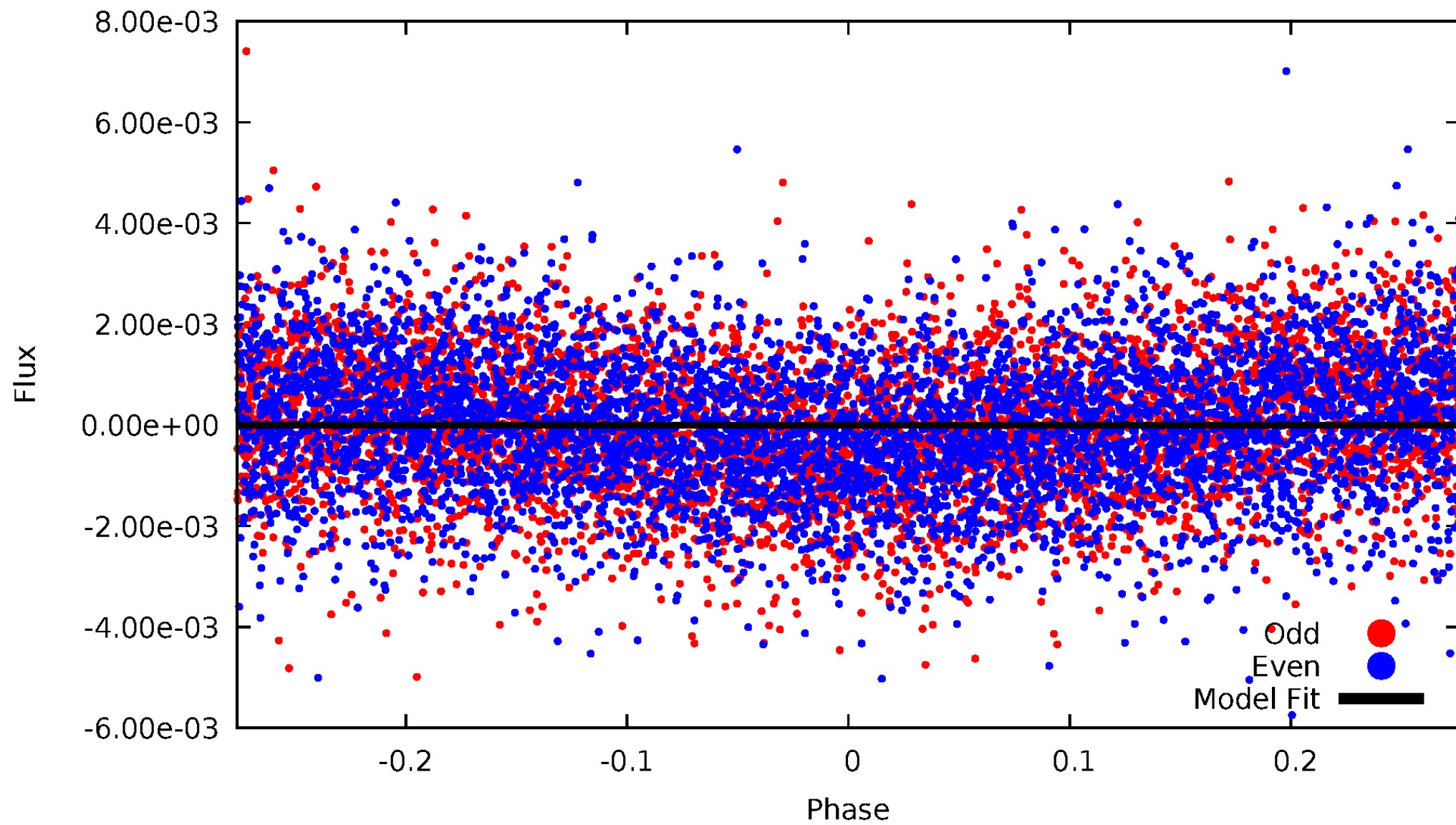


TCE 002985022-03



# DV Odd/Even

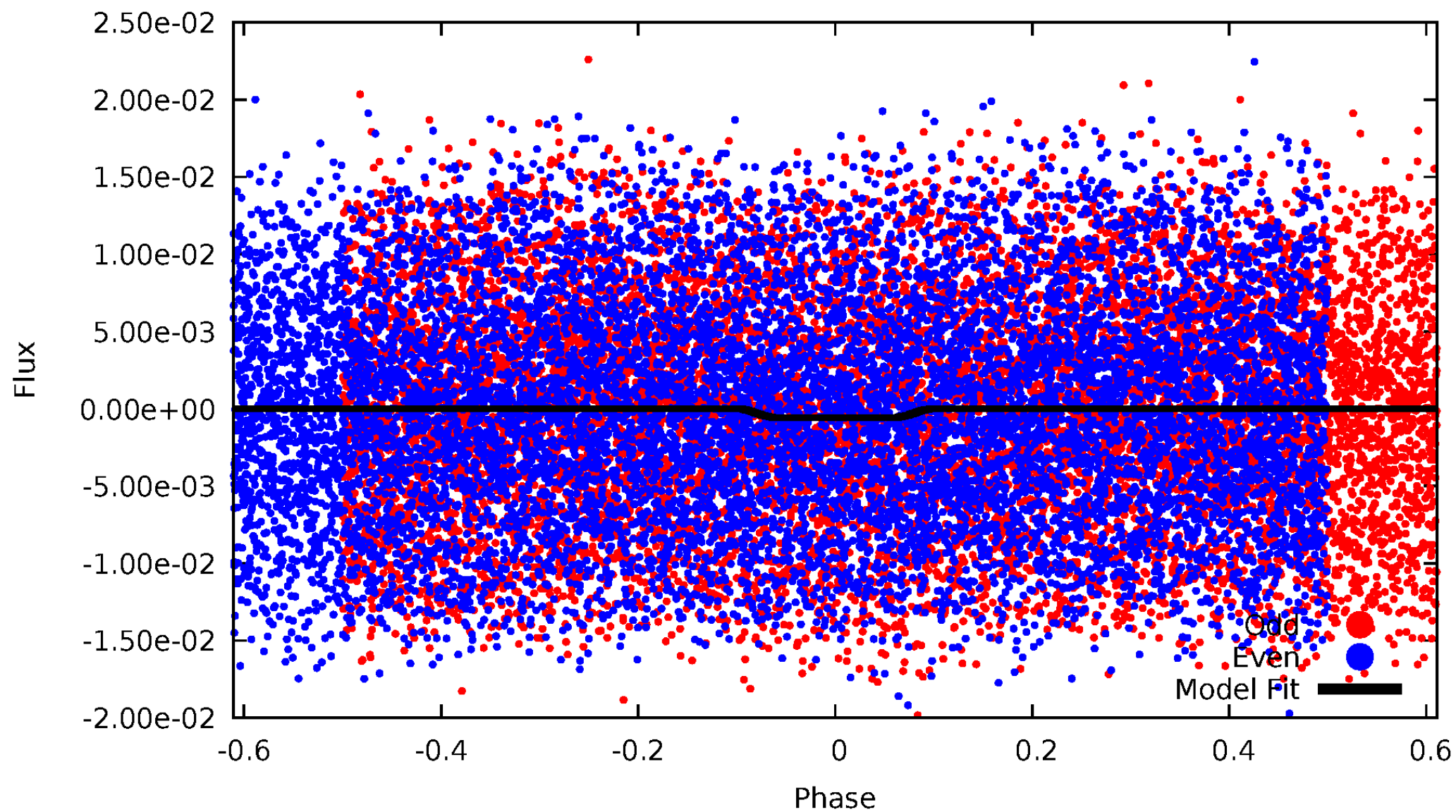
TCE 002985022-03





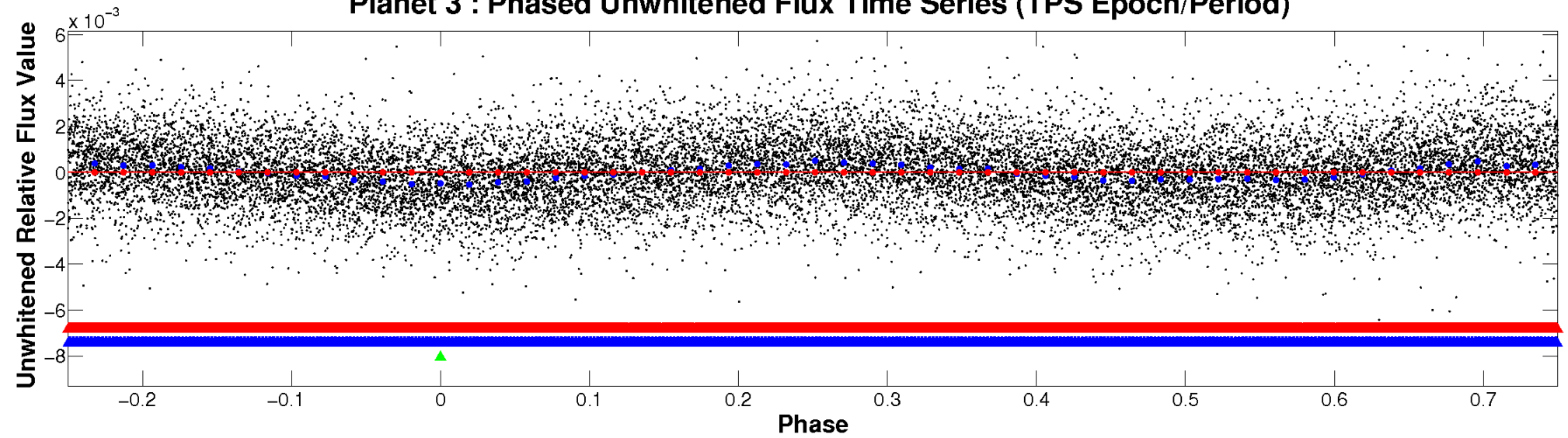
# ALT Odd/Even

TCE 002985022-03

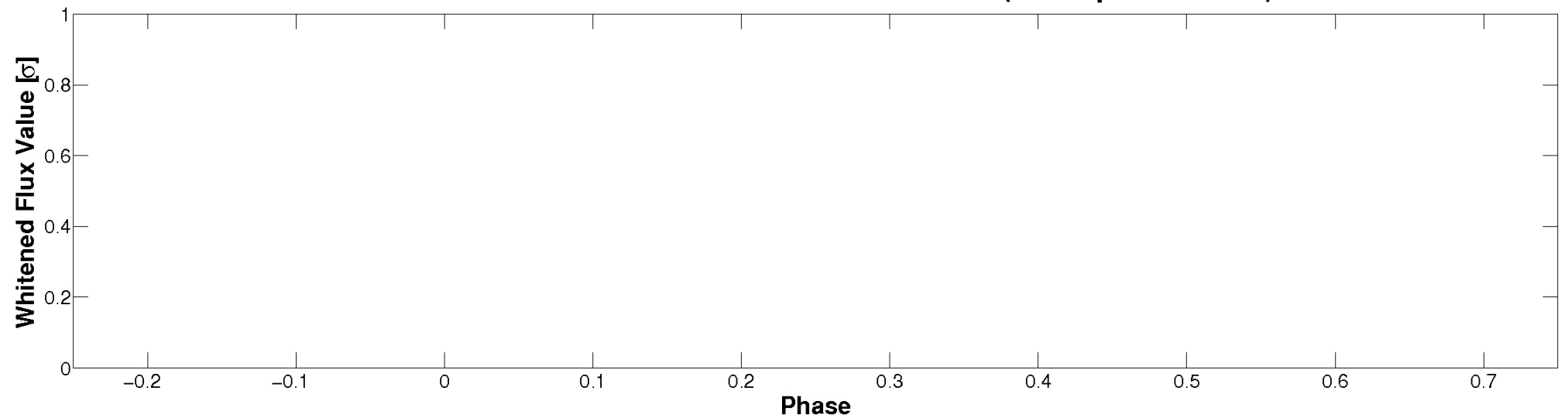


# Non-Whitened Vs. Whitened Light Curve

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

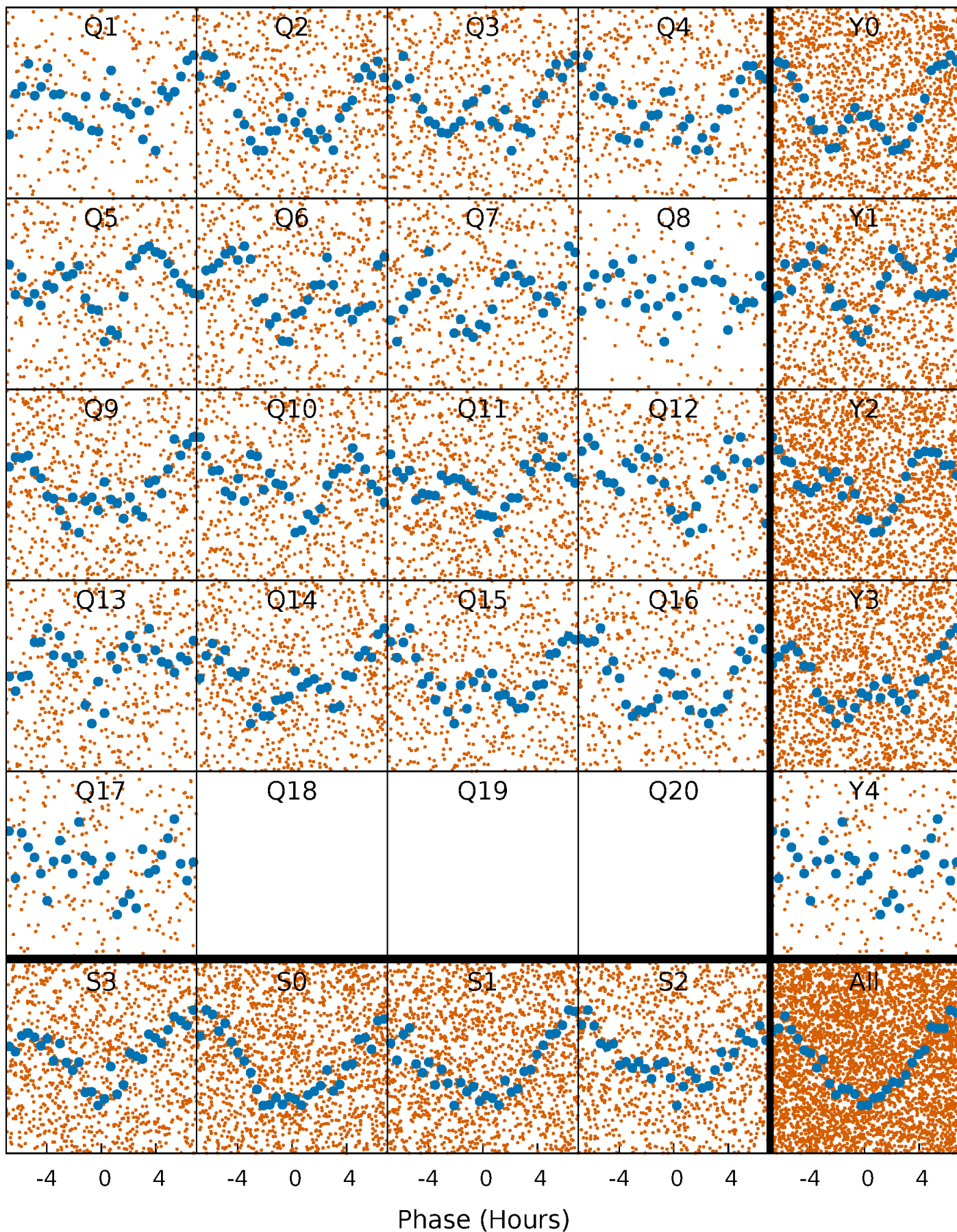


**Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

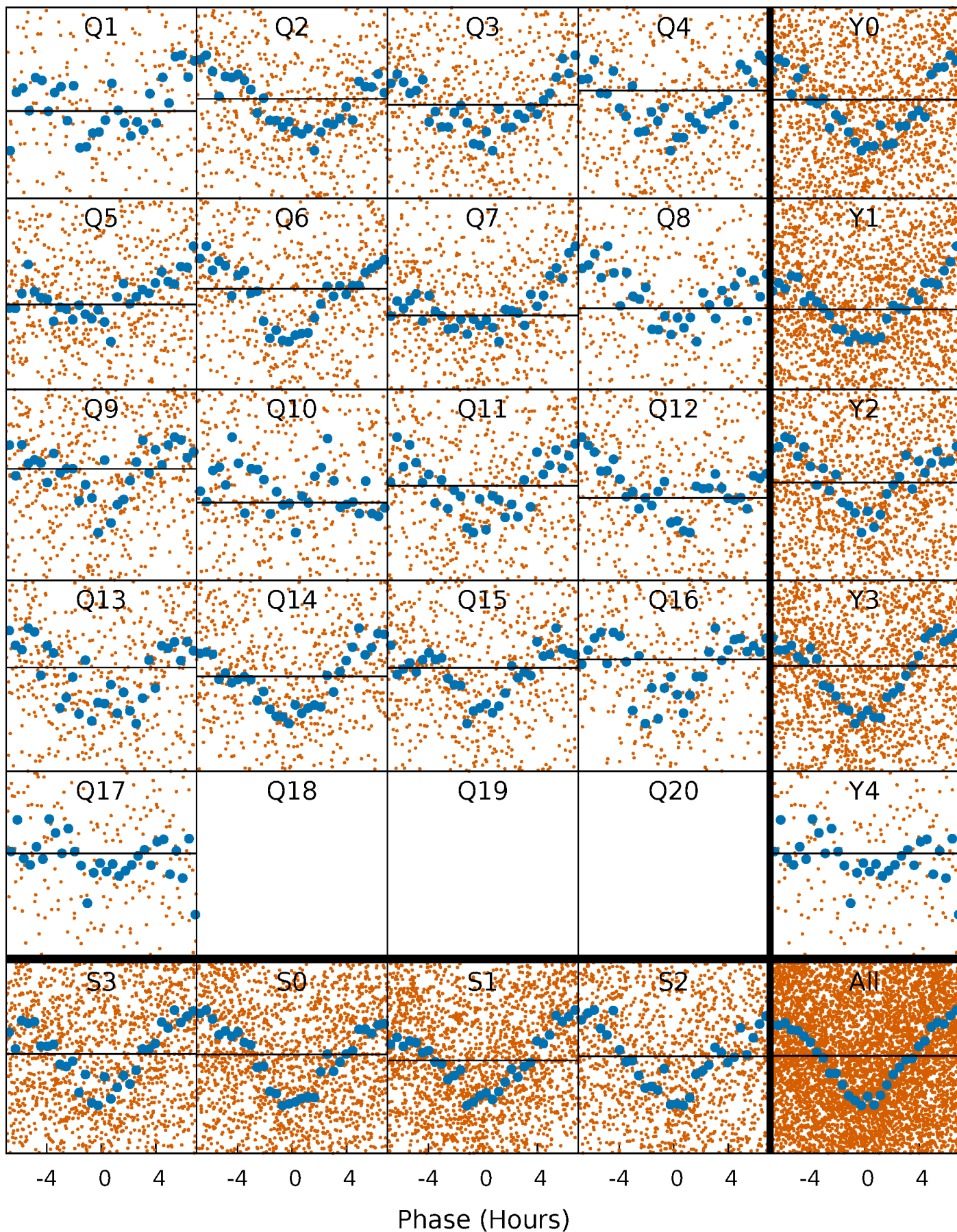
TCE 002985022-03 P= 1.056520 Days  $T_0=131.783441$  (BKJD)





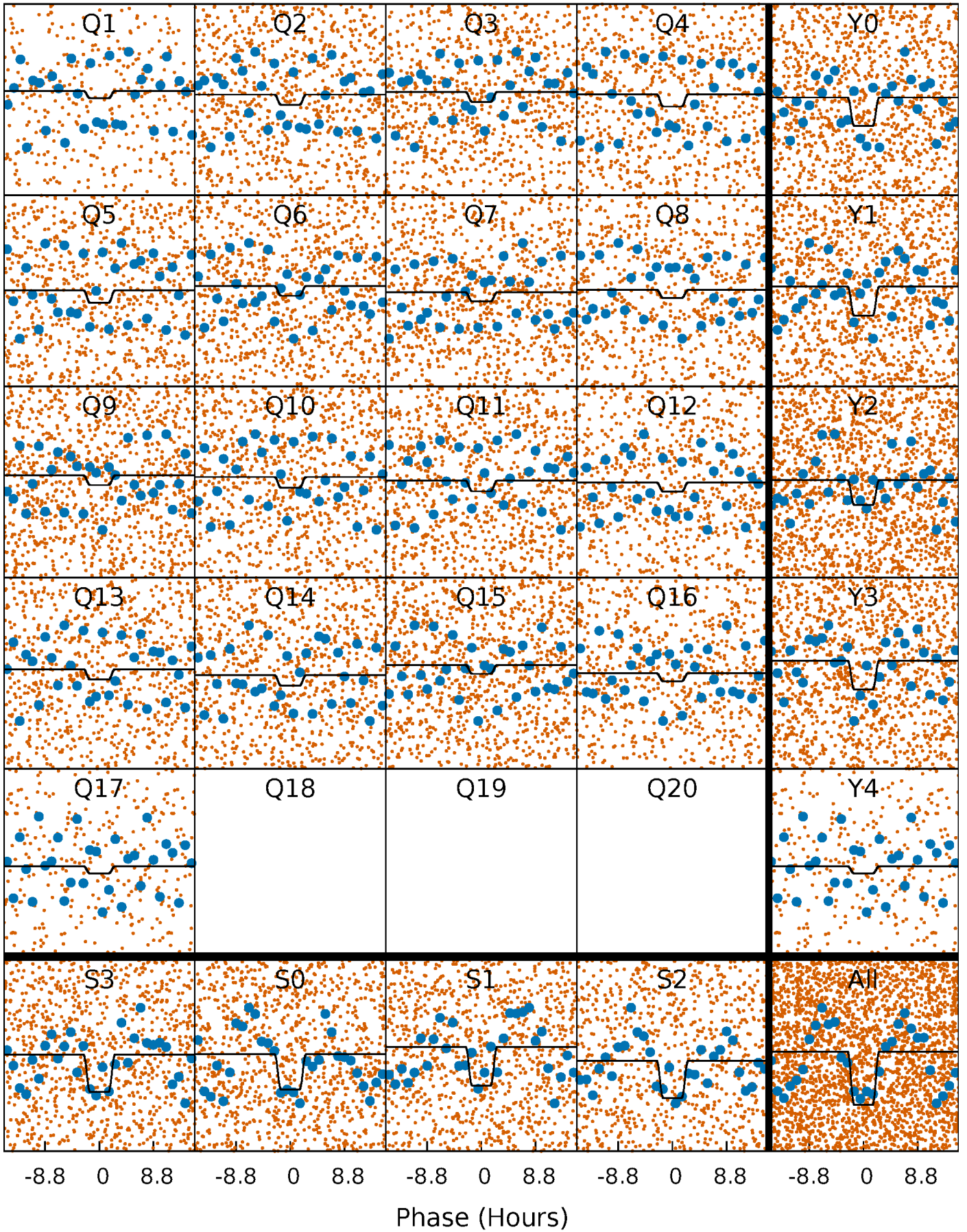
# DV Quarter-Phased Transit Curves

TCE 002985022-03 P= 1.056520 Days  $T_0=131.783441$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

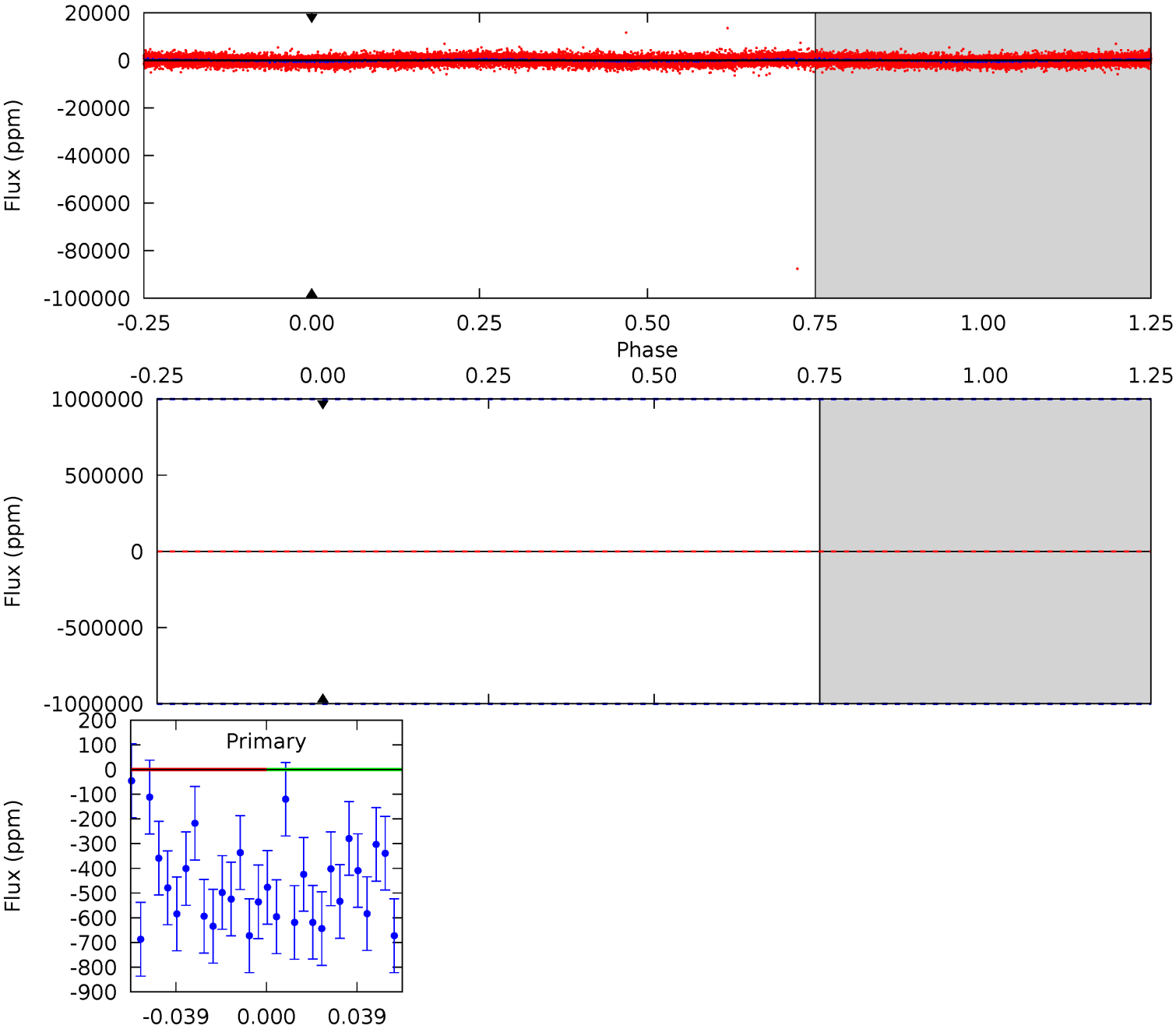
TCE 002985022-03 P= 1.056520 Days  $T_0=131.773803$  (BKJD)



# DV Model-Shift Uniqueness Test

002985022-03, P = 1.056520 Days, E = 131.783441 Days

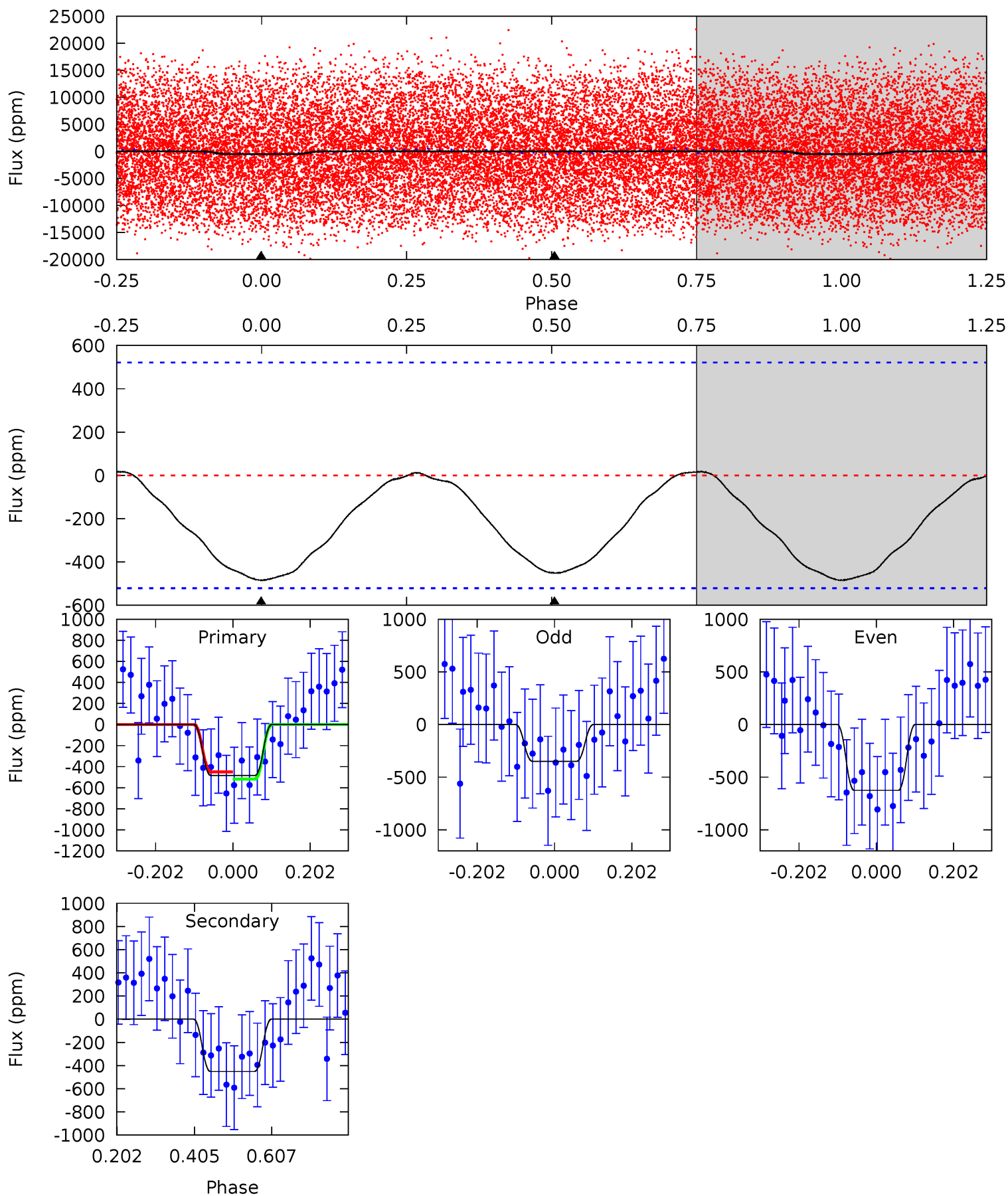
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

002985022-03, P = 1.056520 Days, E = 131.773803 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.10	3.82	0	0	4.41	1.27	0.16	4.10	4.10	3.82	3.82	1.17	0.95	0.03	0.29





### Stellar Parameters For KIC 002985022

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7202^{+201}_{-277}$	$3.911^{+0.308}_{-0.132}$	$-0.120^{+0.250}_{-0.350}$	$2.368^{+0.563}_{-0.845}$	$1.664^{+0.159}_{-0.371}$	$0.176^{+0.397}_{-0.070}$
	+3%/-4%	+8%/-3%	+208%/-292%	+24%/-36%	+10%/-22%	+225%/-40%
Source	PHO1	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 002985022-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$16.77^{+19.12}_{-11.23}$	$4299^{+331}_{-367}$	$-5711^{+40016}_{-32117}$	$-1.887^{+181.554}_{-181.801}$
Alt.	$-451 \pm 118$	$17.93^{+20.65}_{-12.11}$	$4320^{+294}_{-403}$	$3357^{+3212}_{-6998}$	$0.439^{+3.802}_{-0.343}$

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



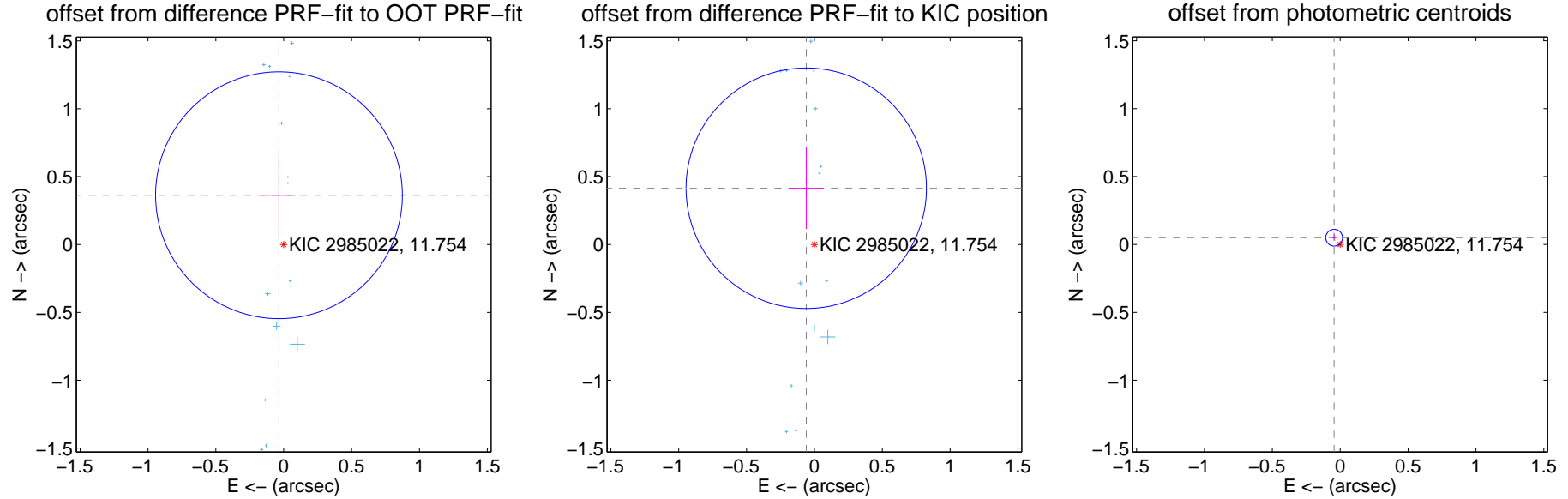
## DV Centroid Data

Supplemental centroid analysis for 002985022-03. **Kepler magnitude: 11.75**. Transit SNR -1.00

There are 15 quarters with good PRF difference image offsets

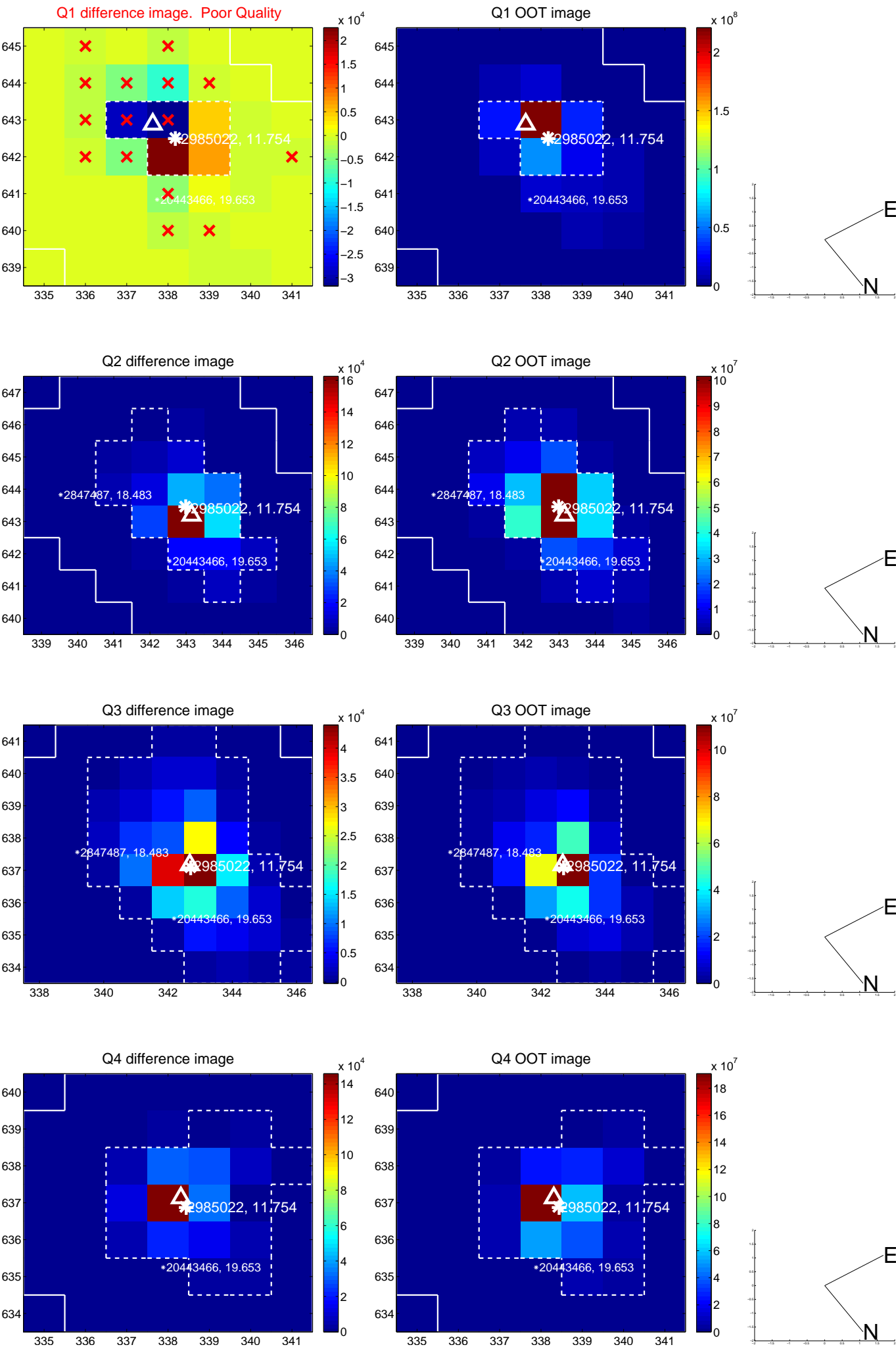
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.365 \pm 0.303$	1.20	$0.035 \pm 0.122$	$0.363 \pm 0.304$
PRF-fit source offset from KIC position	$0.419 \pm 0.295$	1.42	$0.060 \pm 0.130$	$0.415 \pm 0.300$
photometric centroid source offset	<b><math>0.07 \pm 0.02</math></b>	<b>3.25</b>	$0.04 \pm 0.02$	$0.05 \pm 0.02$

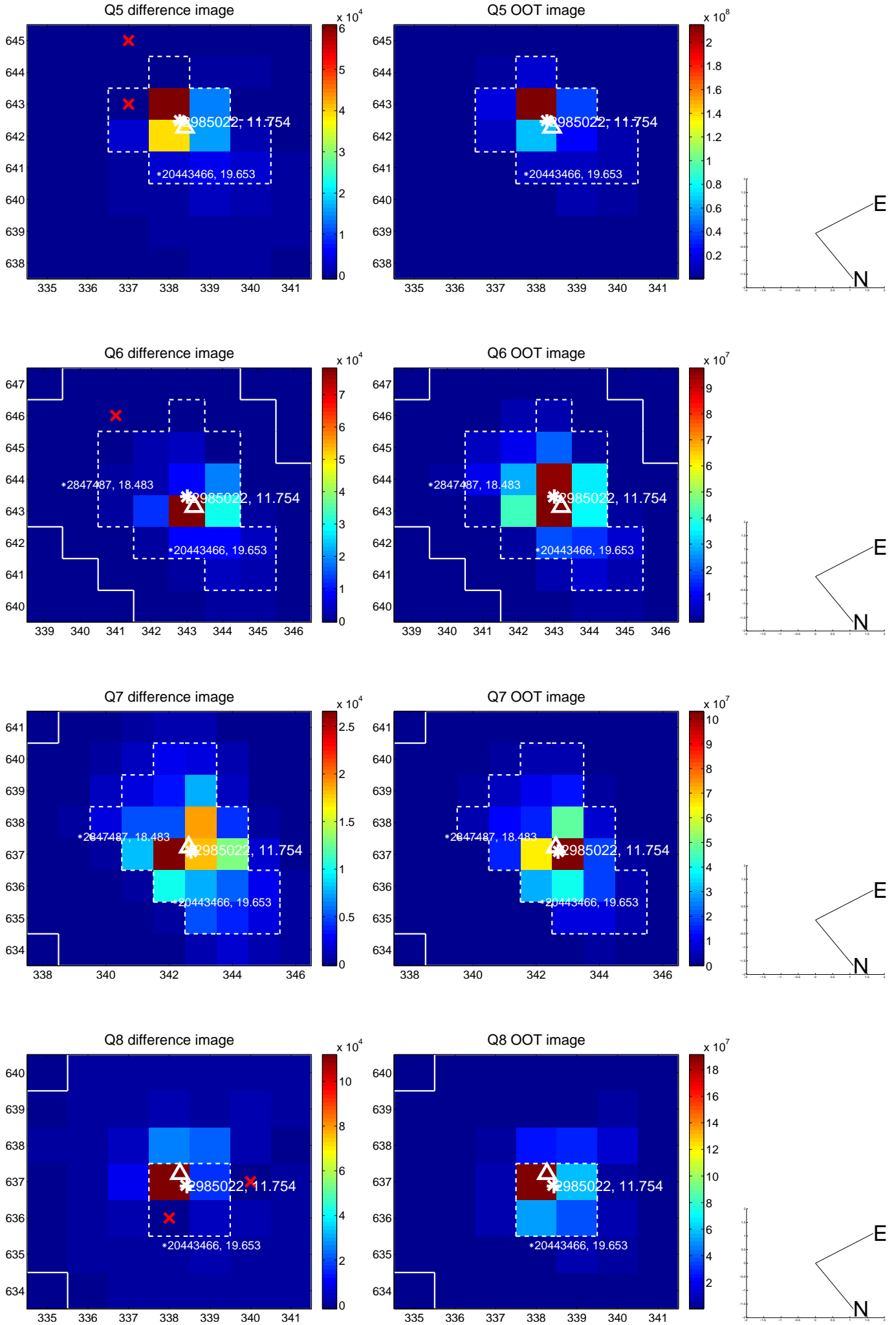


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

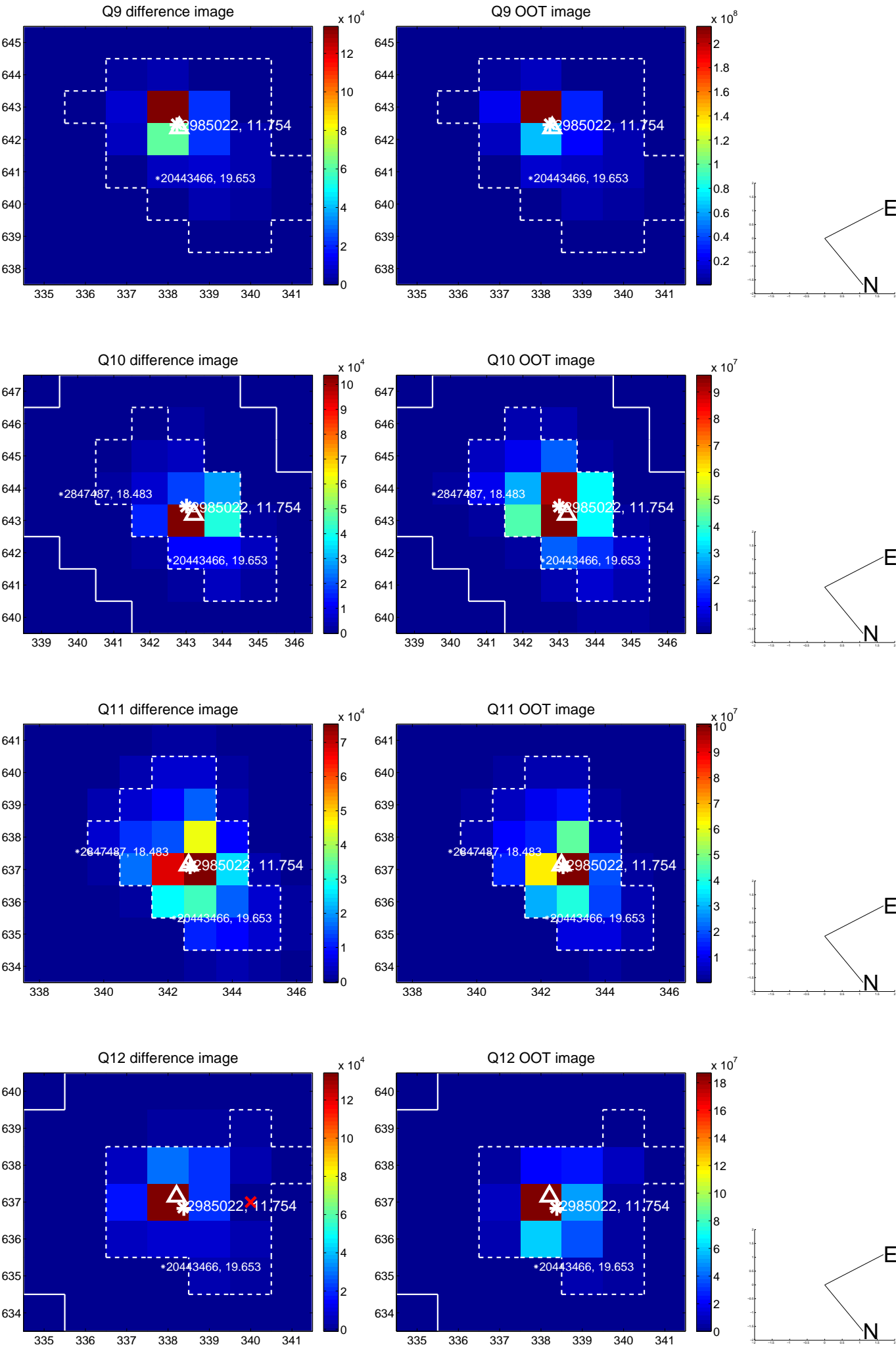
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



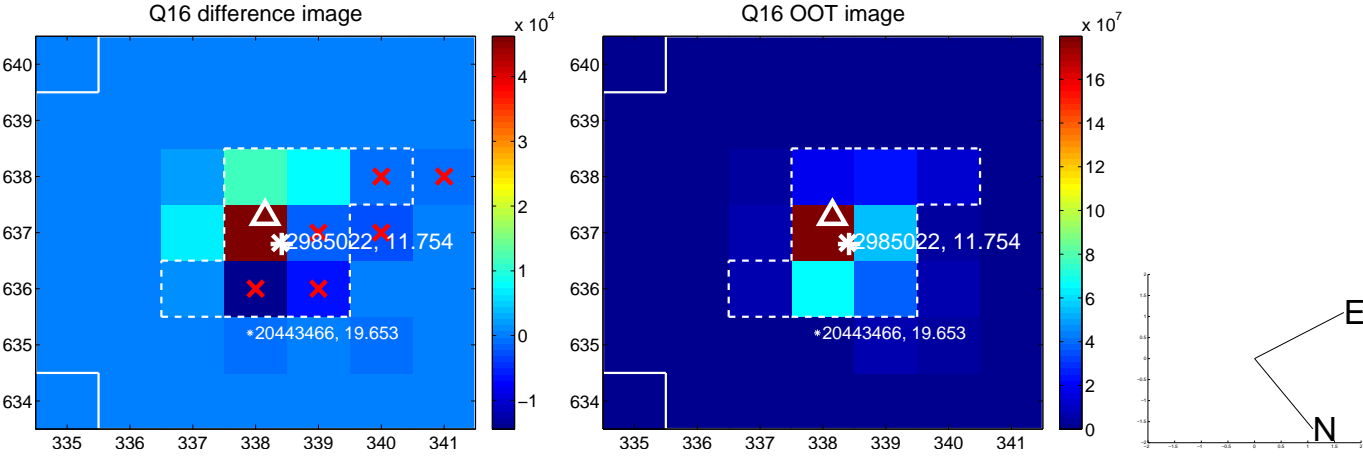
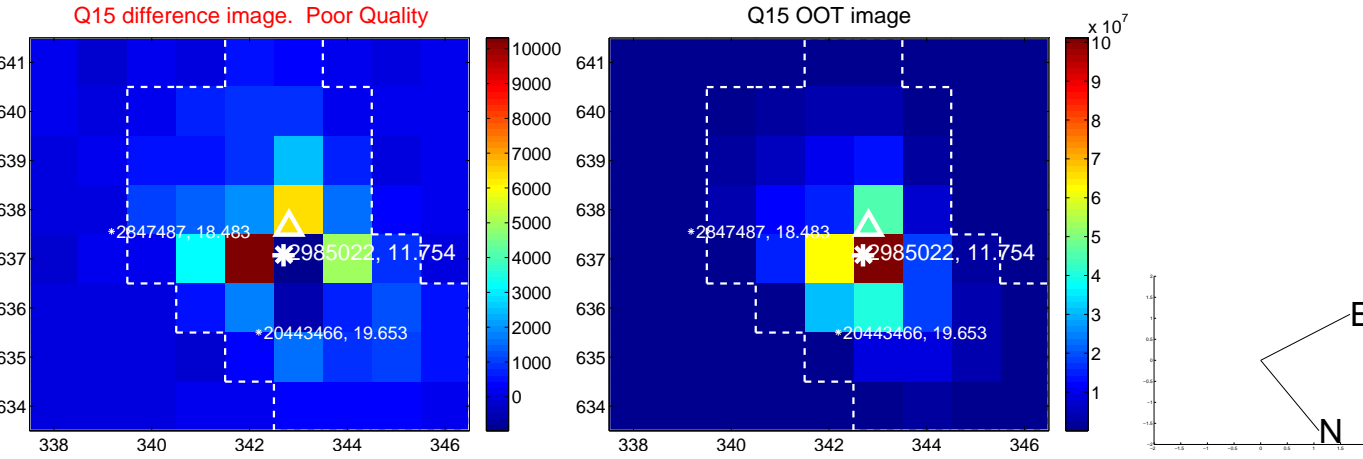
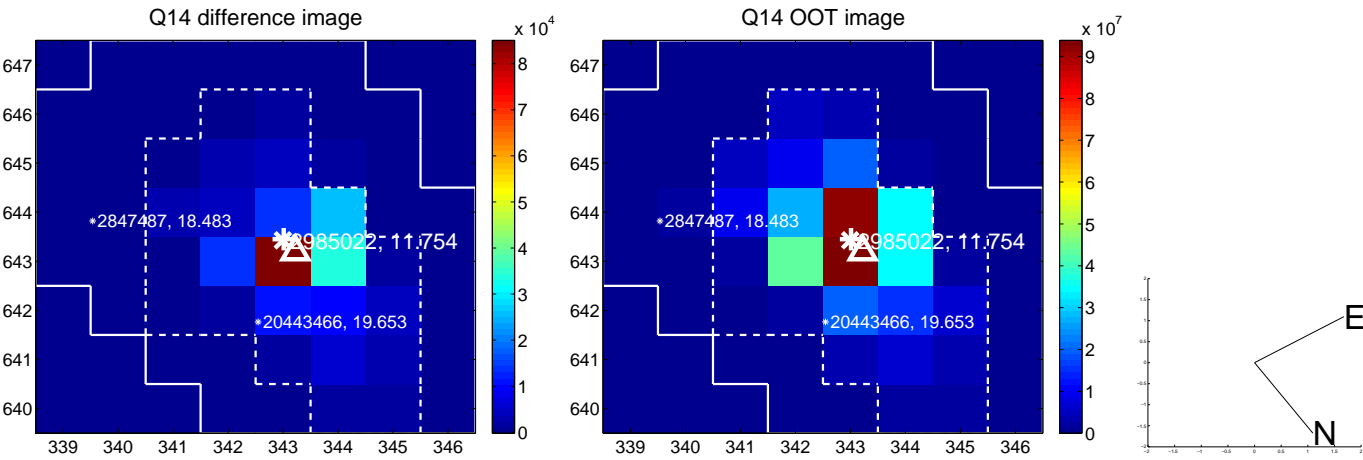
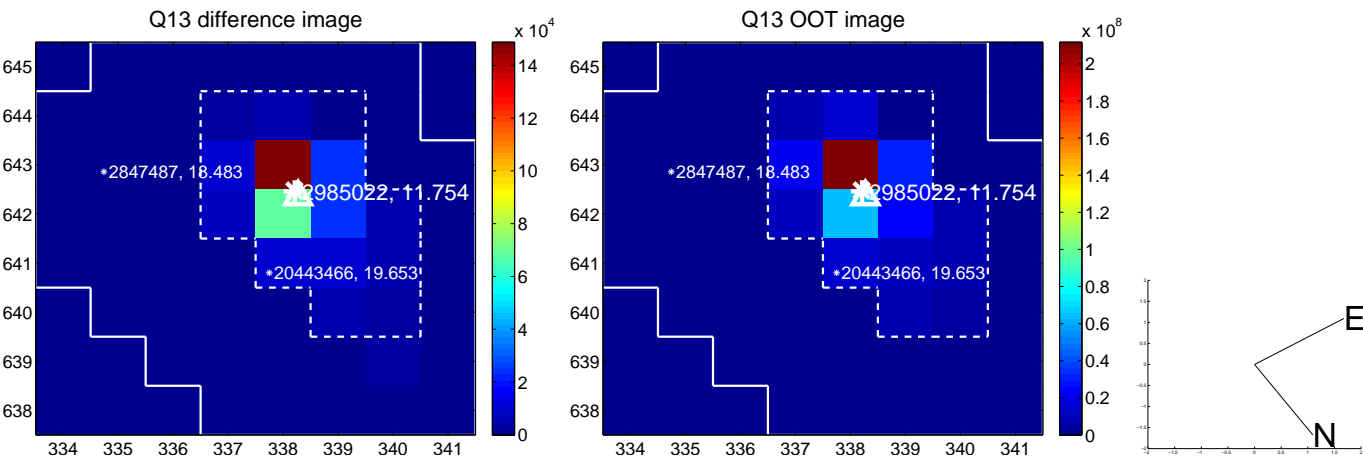
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

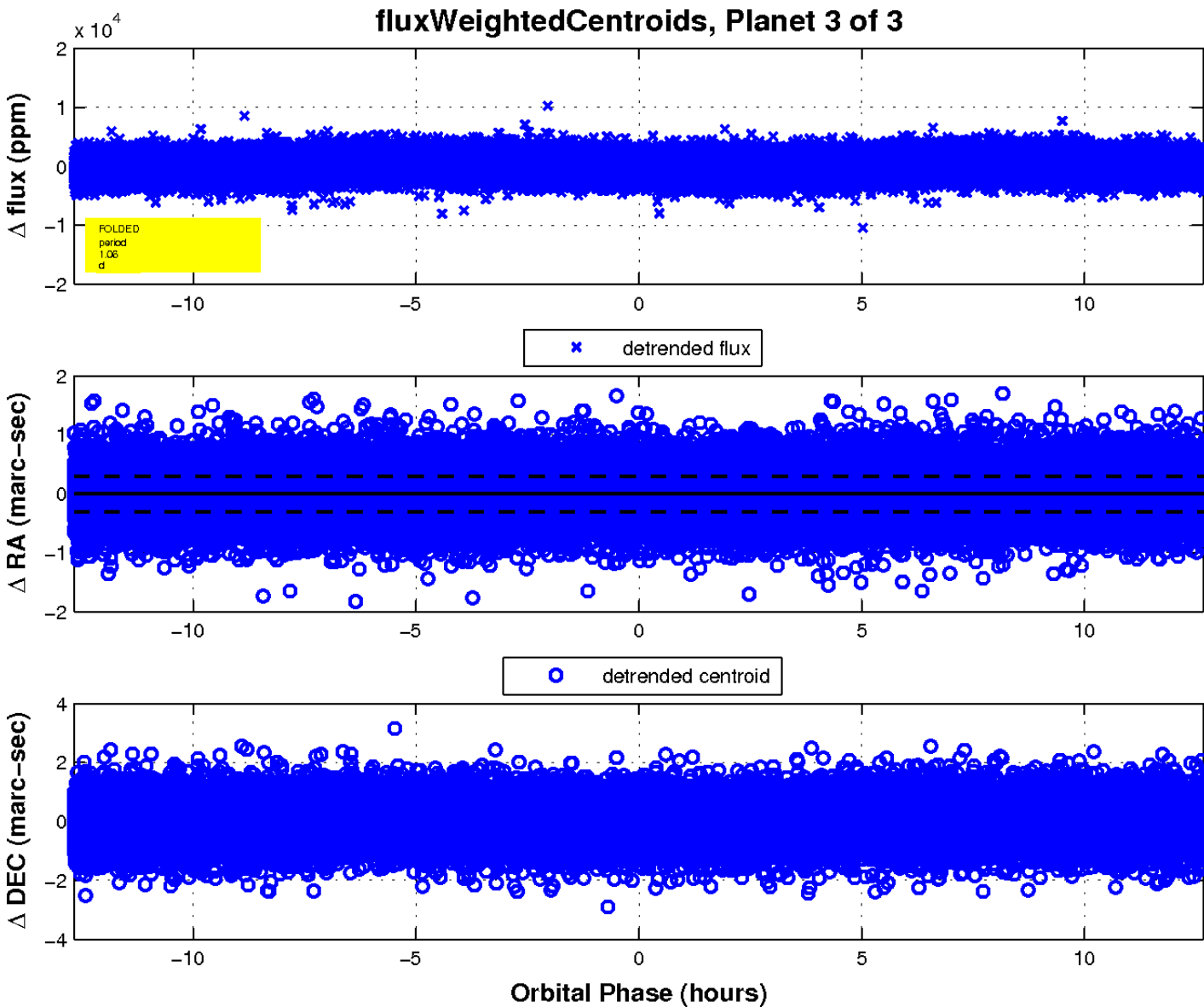
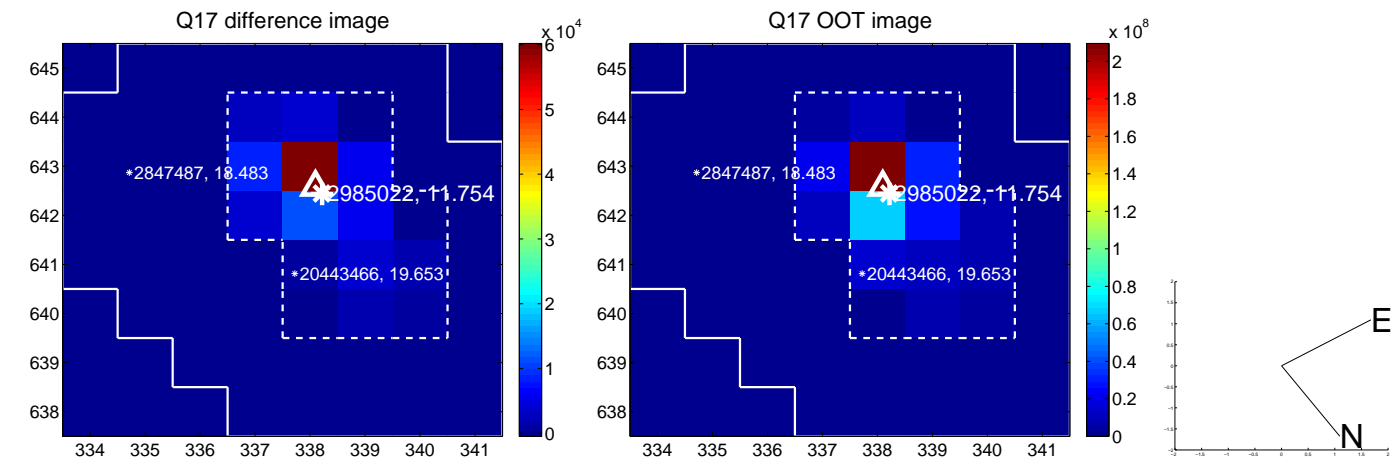


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

