

# KIC 010851035

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010851035-01	OBS	No	0.823494	131.984826	14.9	1.604	8.8	4.7	1.99	7431	0.89	26794.34
010851035-02	OBS	No	0.823475	132.277481	9.1	6.190	9.0	2.2	1.99	7431	0.64	26795.18
010851035-03	OBS	No	16.459948	146.719813	415.0	3.495	8.8	9.5	1.99	7431	4.12	493.95
010851035-04	OBS	No	32.949798	139.211146	1290.0	2.305	9.5	10.3	1.99	7431	7.42	195.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010851035-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010851035-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010851035-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010851035-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV

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

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

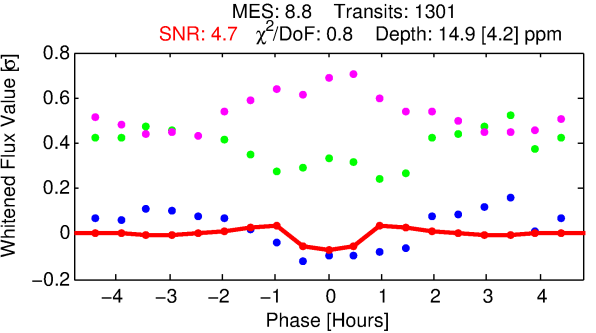
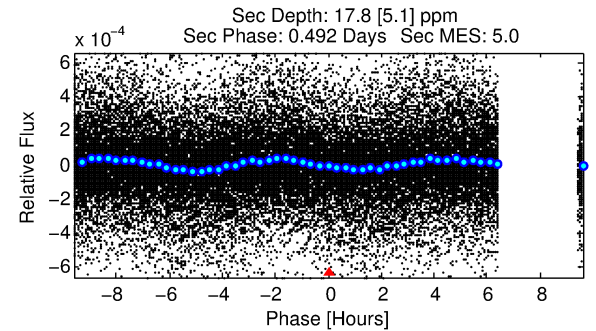
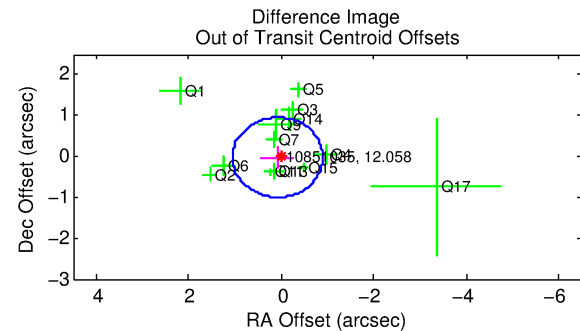
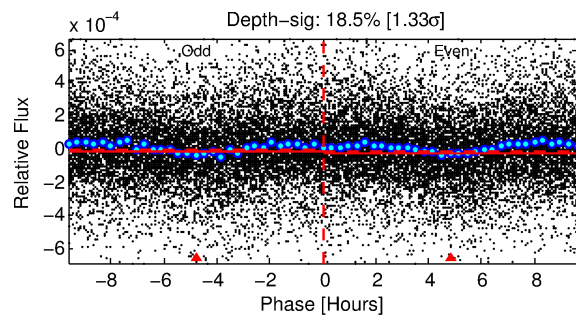
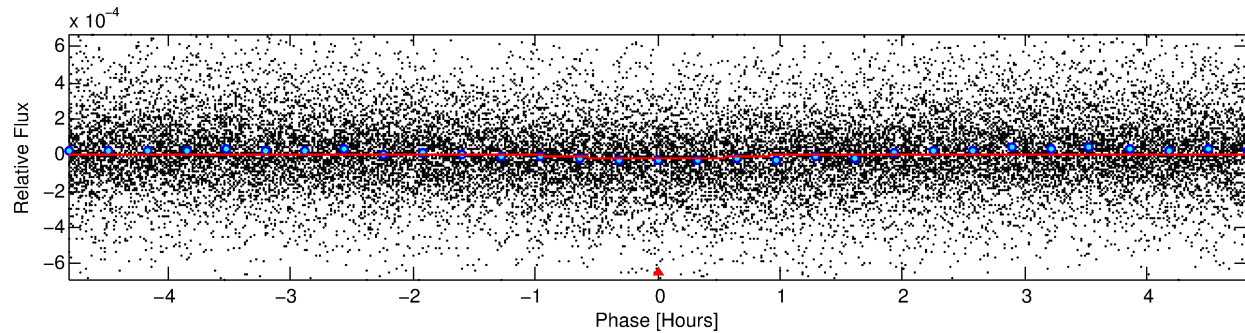
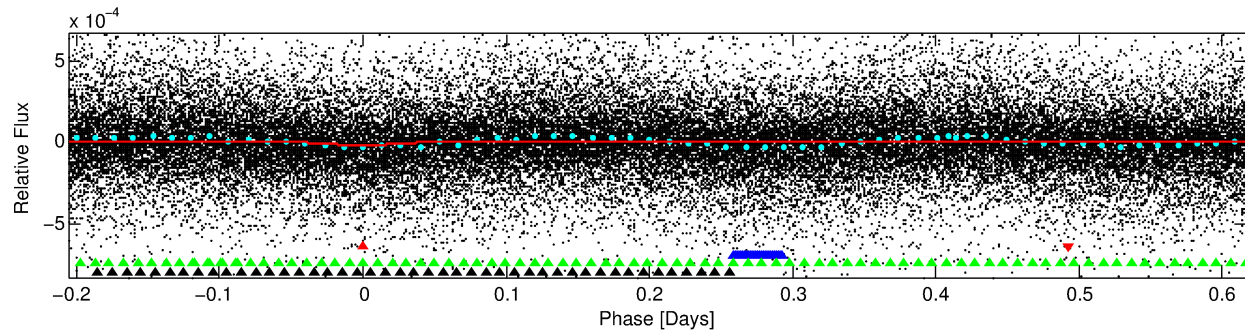
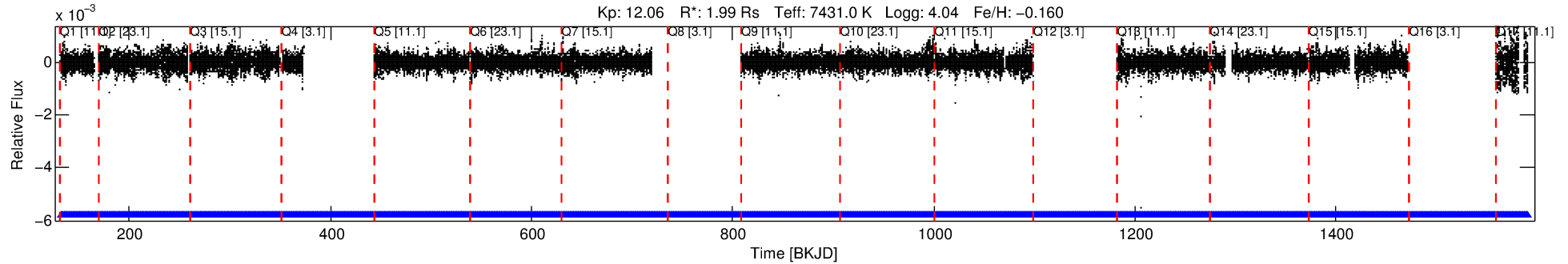
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010851035-01

No Significant Match Found

# DV One-Page Summary

KIC: 10851035 Candidate: 1 of 4 Period: 0.823 d



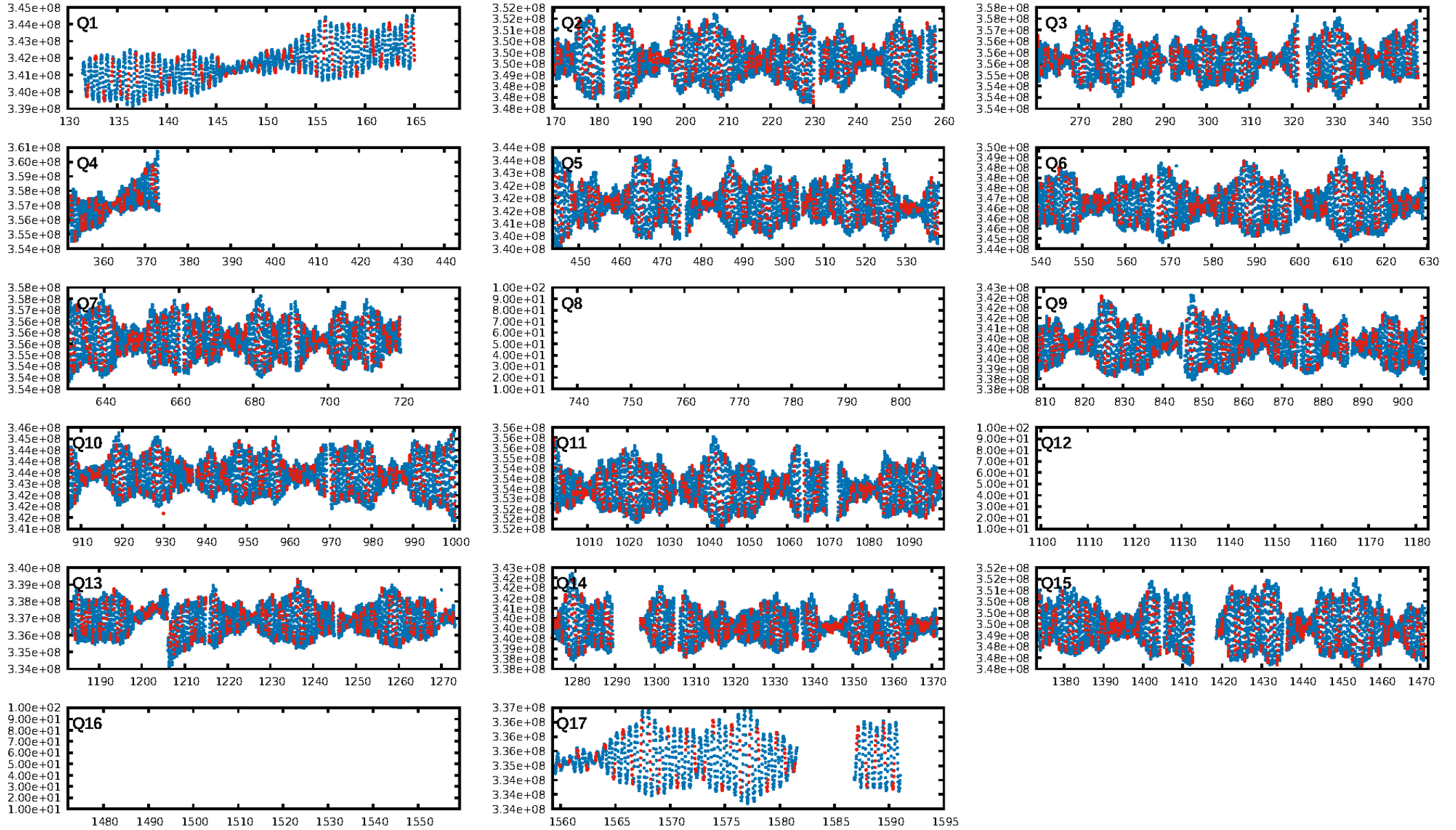
## DV Fit Results:

Period = 0.82349 [0.00002] d  
Epoch = 131.9848 [0.0030] BKJD  
Rp/R\* = 0.0041 [0.0010]  
a/R\* = 2.08 [1.82]  
b = 0.89 [0.28]  
Seff = 26794.34 [10269.20]  
Teq = 3262 [313] K  
Rp = 0.89 [0.32] Re  
a = 0.0200 [0.0046] AU  
Ag = 4.99 [3.27] [1.22 $\sigma$ ]  
Teffp = 7537 [1100] K [3.74 $\sigma$ ]

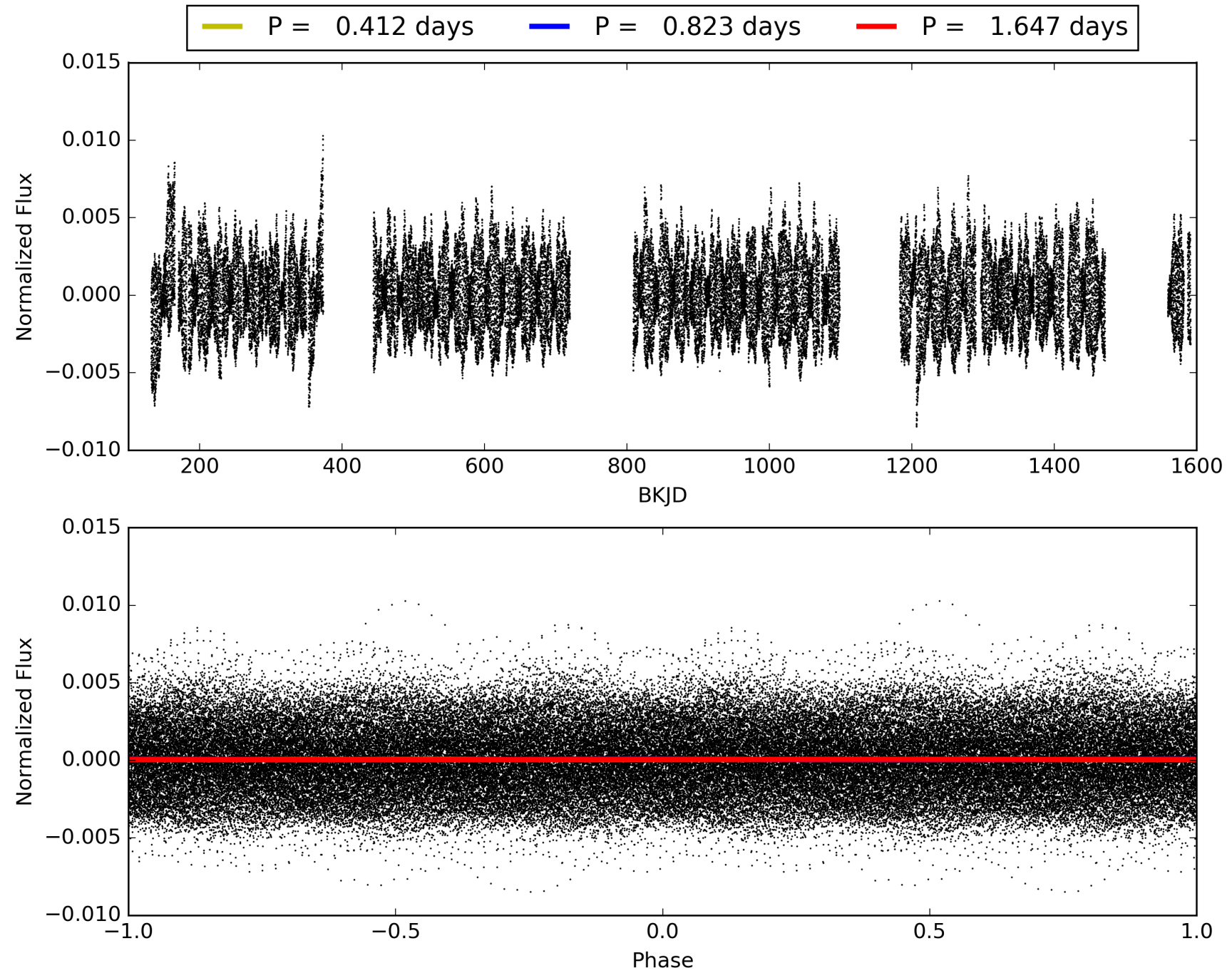
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [97.59 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.42e-25  
RollingBand-fgt: 1.00 [1203/1203]  
GhostDiagnostic-chr: 0.3241  
Centroid-sig: 37.6%  
Centroid-so: 0.960 arcsec [0.89 $\sigma$ ]  
OotOffset-rm: 0.086 arcsec [0.26 $\sigma$ ]  
OotOffset-st: 3/4/1/5 [13]  
KicOffset-rm: 0.279 arcsec [0.84 $\sigma$ ]  
KicOffset-st: 3/4/1/5 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 010851035-01, PDC Light Curves



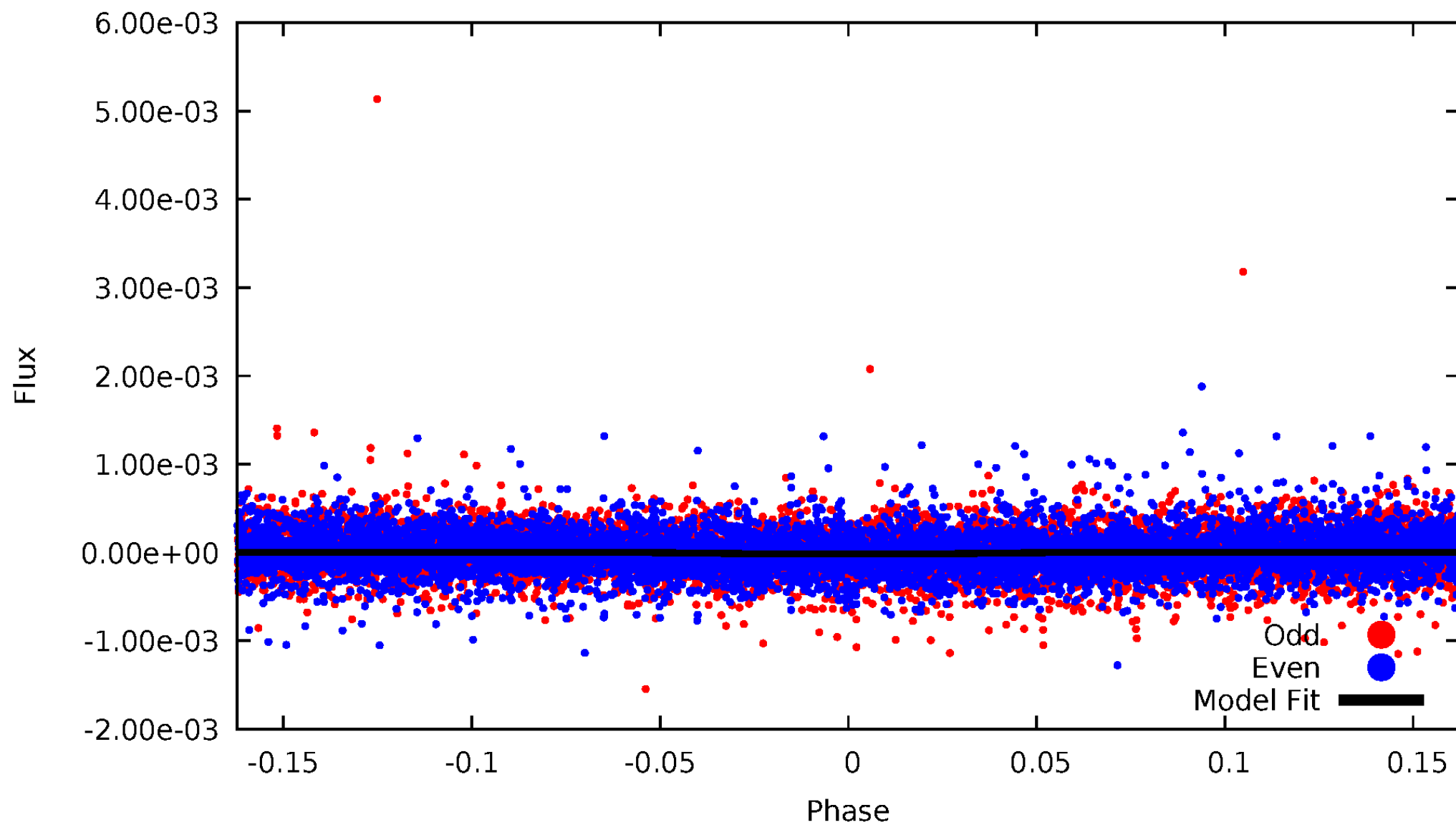
TCE 010851035-01





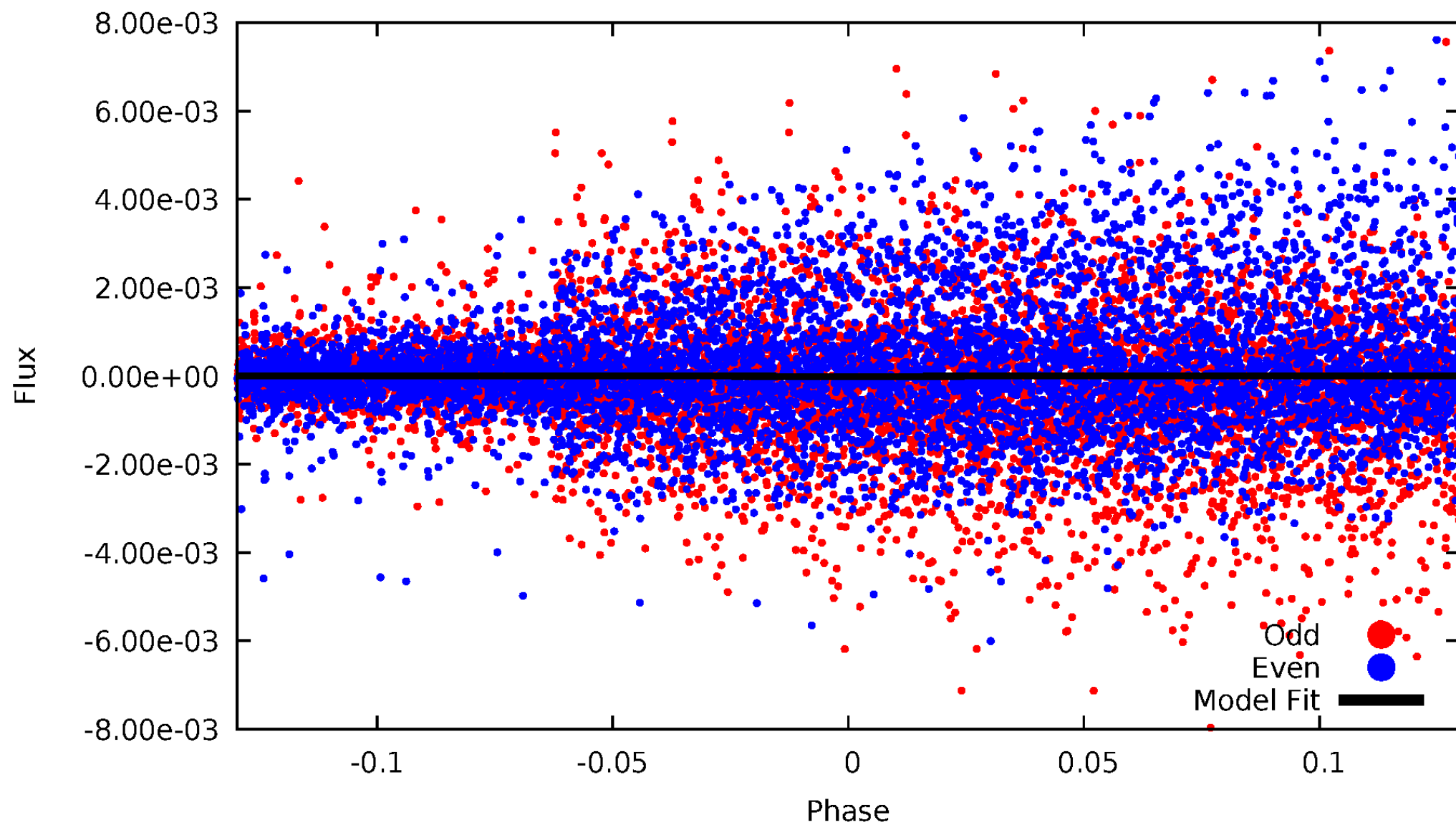
# DV Odd/Even

TCE 010851035-01



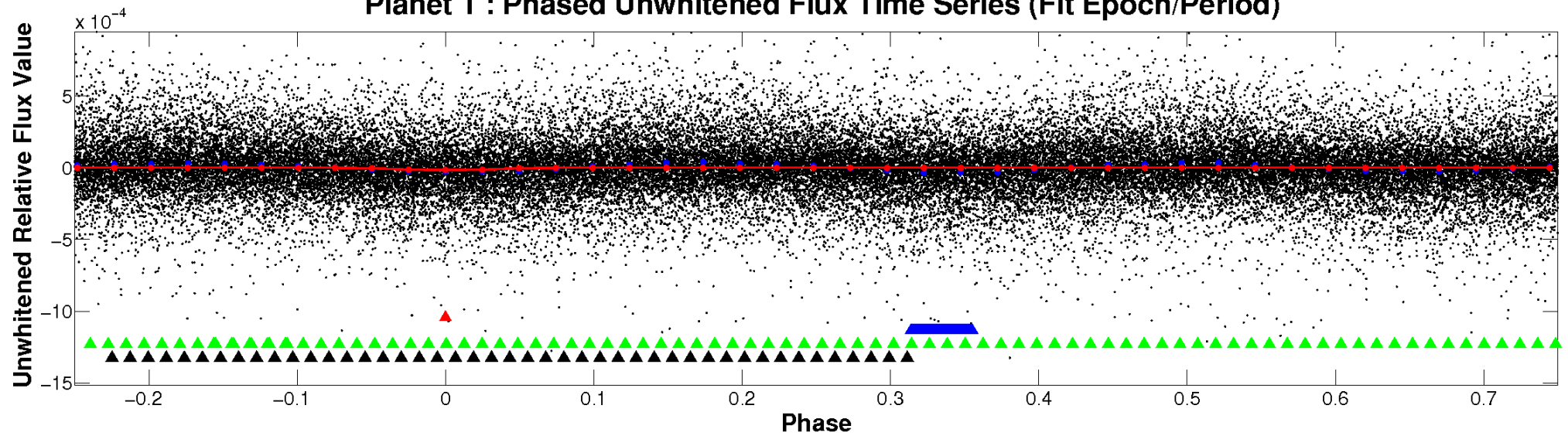
# ALT Odd/Even

TCE 010851035-01

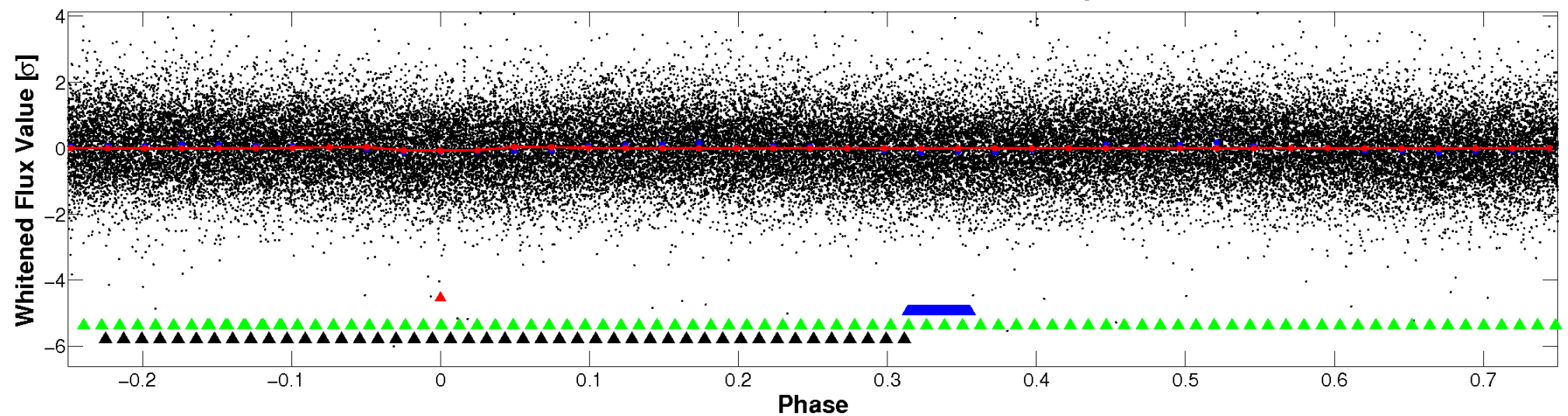


# Non-Whitened Vs. Whitened Light Curve

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

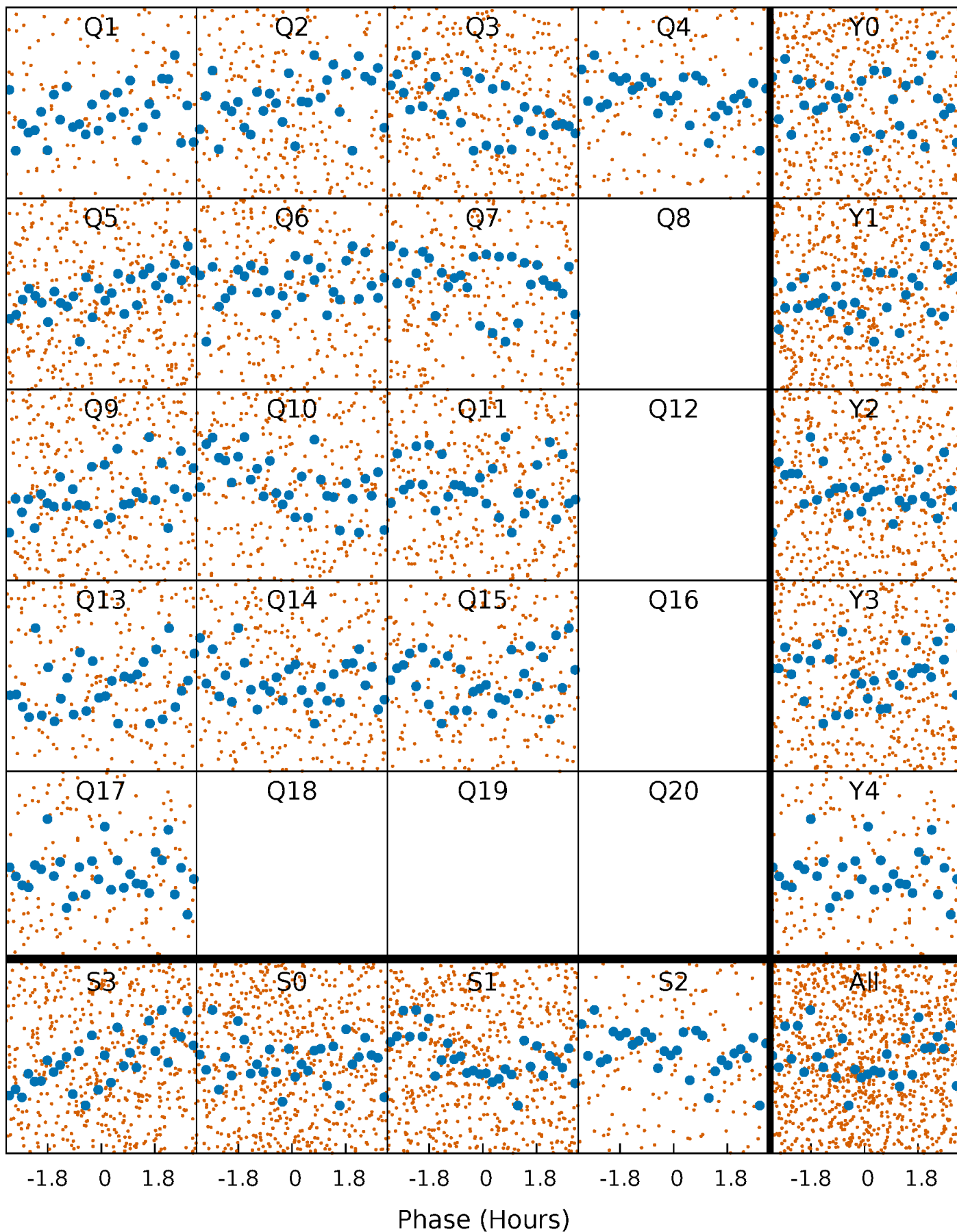


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

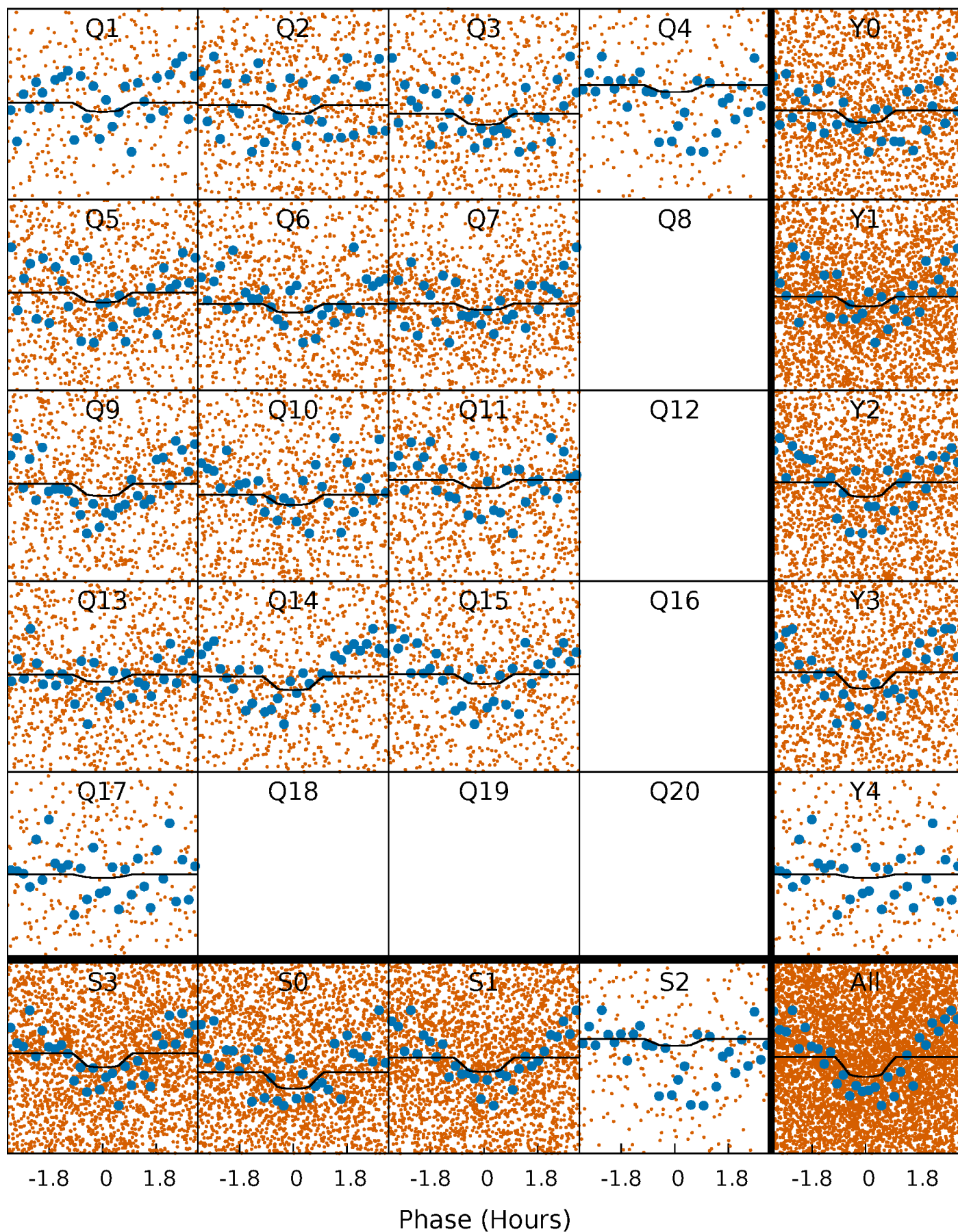
TCE 010851035-01 P= 0.823494 Days  $T_0=131.984826$  (BKJD)





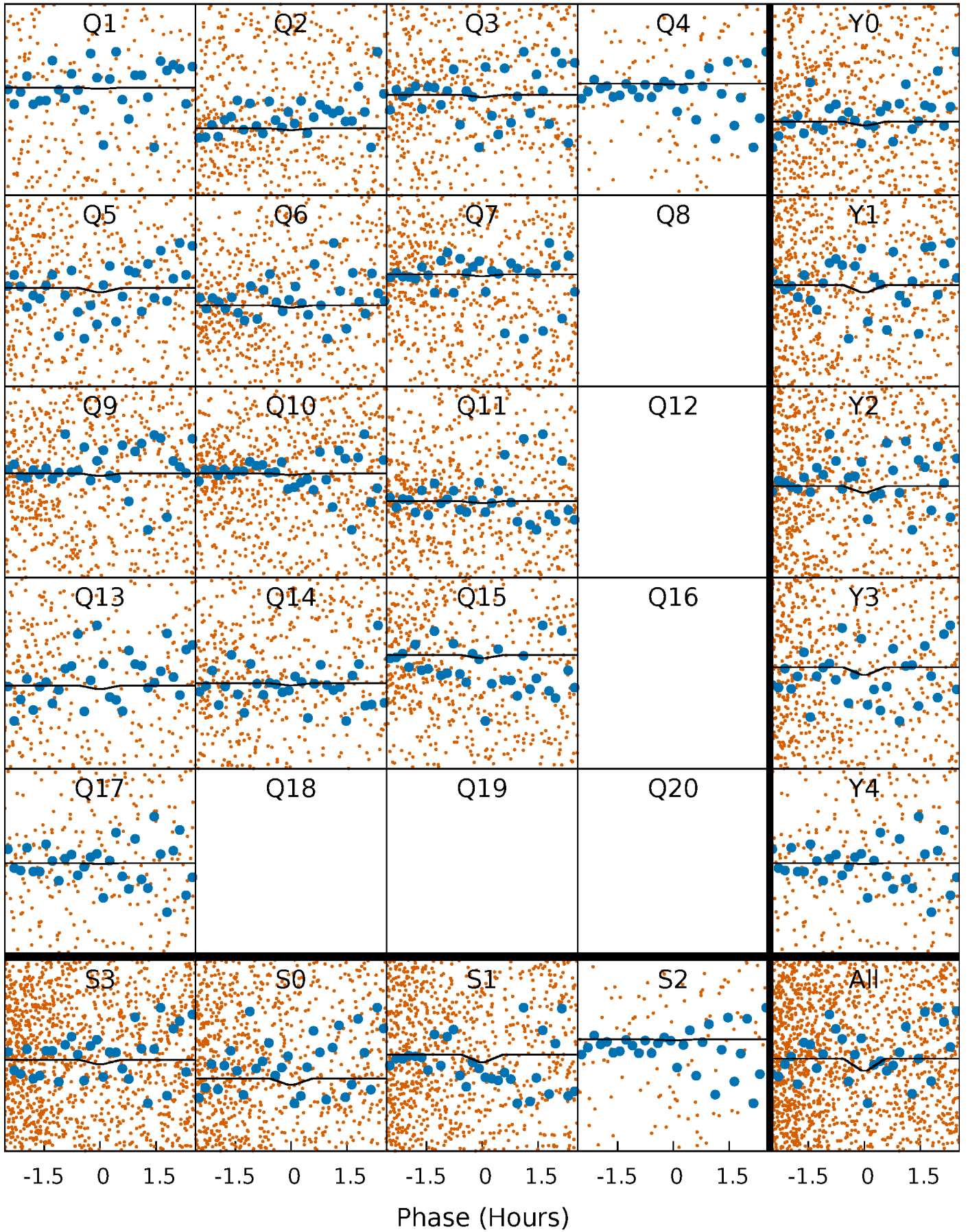
# DV Quarter-Phased Transit Curves

TCE 010851035-01 P= 0.823494 Days  $T_0=131.984826$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

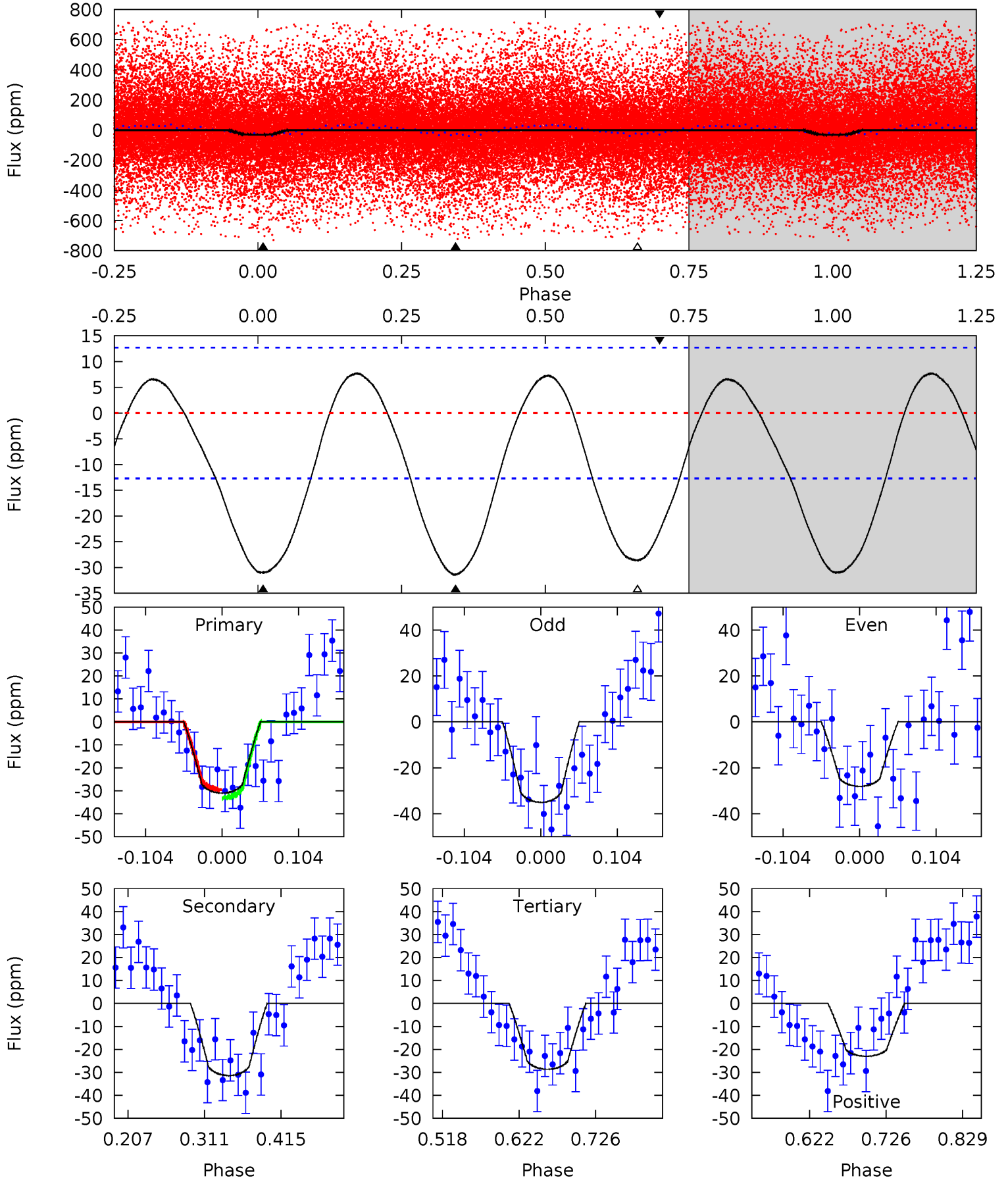
TCE 010851035-01 P= 0.823477 Days  $T_0=131.981140$  (BKJD)



# DV Model-Shift Uniqueness Test

010851035-01, P = 0.823494 Days, E = 131.161332 Days

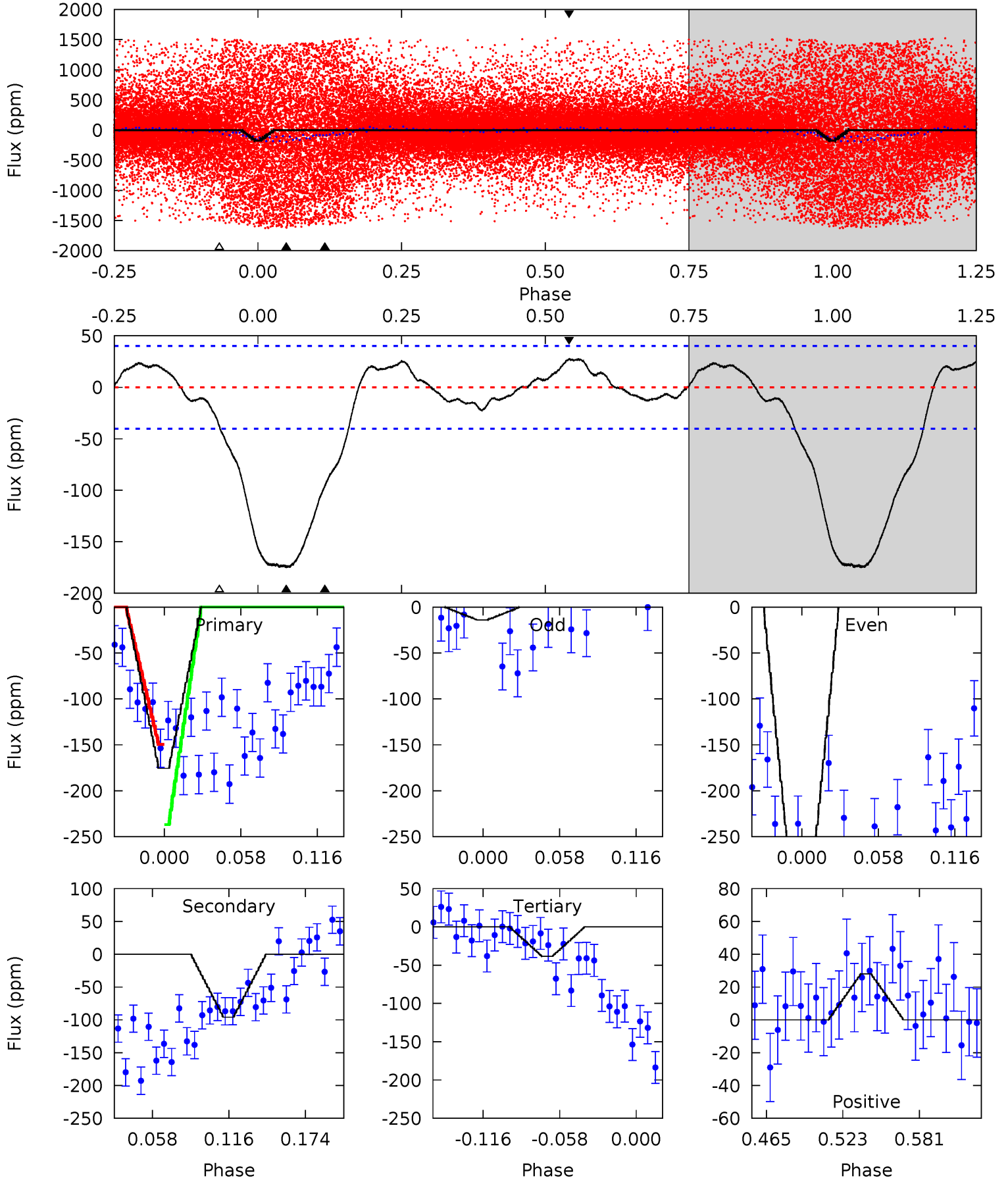
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	11.3	10.3	-8.25	4.56	1.63	4.27	0.84	19.4	0.99	19.5	1.26	1.03	0.20	0.64



# Alt Model-Shift Uniqueness Test

010851035-01, P = 0.823477 Days, E = 131.157663 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
20.4	11.2	4.48	3.26	4.68	1.89	2.81	15.9	17.2	6.67	7.89	18.8	-0.20	0.14	4.47





### Stellar Parameters For KIC 010851035

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7431^{+233}_{-311}$	$4.042^{+0.193}_{-0.158}$	$-0.160^{+0.250}_{-0.350}$	$1.985^{+0.525}_{-0.525}$	$1.580^{+0.213}_{-0.260}$	$0.284^{+0.326}_{-0.134}$
	+3%/-4%	+5%/-4%	+156%/-219%	+26%/-26%	+13%/-16%	+115%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010851035-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-31 \pm 3$	$0.89^{+0.26}_{-0.24}$	$4541^{+340}_{-378}$	$8724^{+2151}_{-1182}$	$8.763^{+7.197}_{-3.452}$
Alt.	$-96 \pm 9$	$0.81^{+0.25}_{-0.24}$	$4531^{+326}_{-333}$	$14958^{+6266}_{-2933}$	$32^{+34}_{-13}$

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

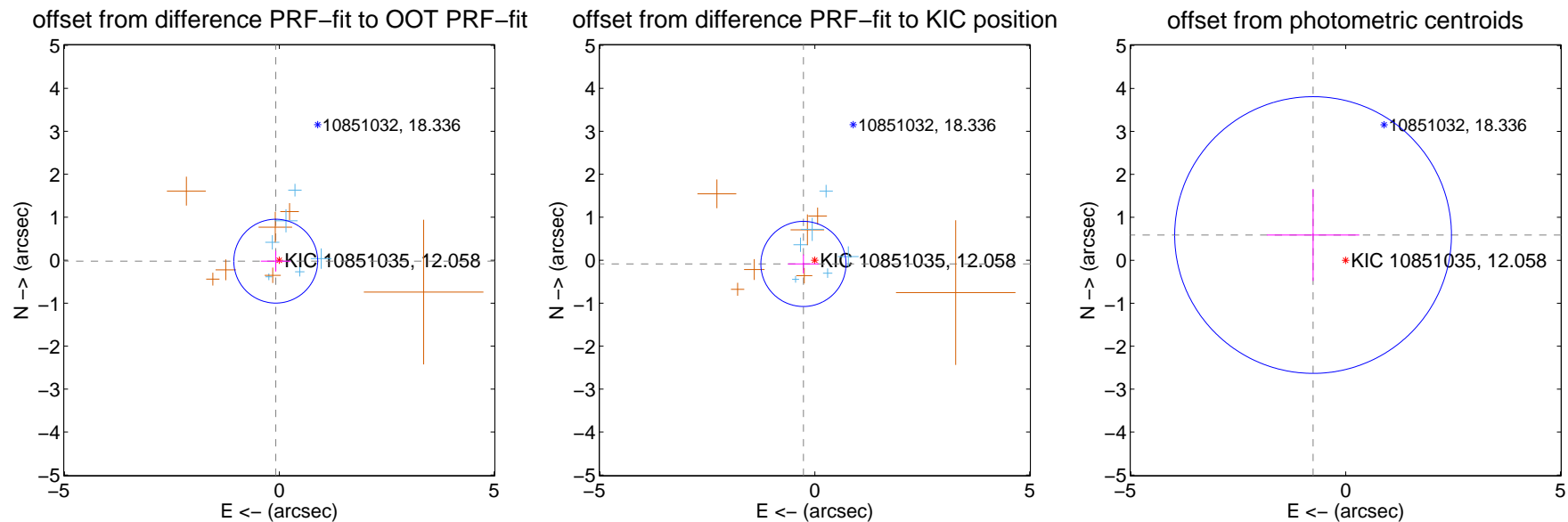
## DV Centroid Data

Supplemental centroid analysis for 010851035-01. Kepler magnitude: 12.06. Transit SNR 4.72

There are 6 quarters with good PRF difference image offsets

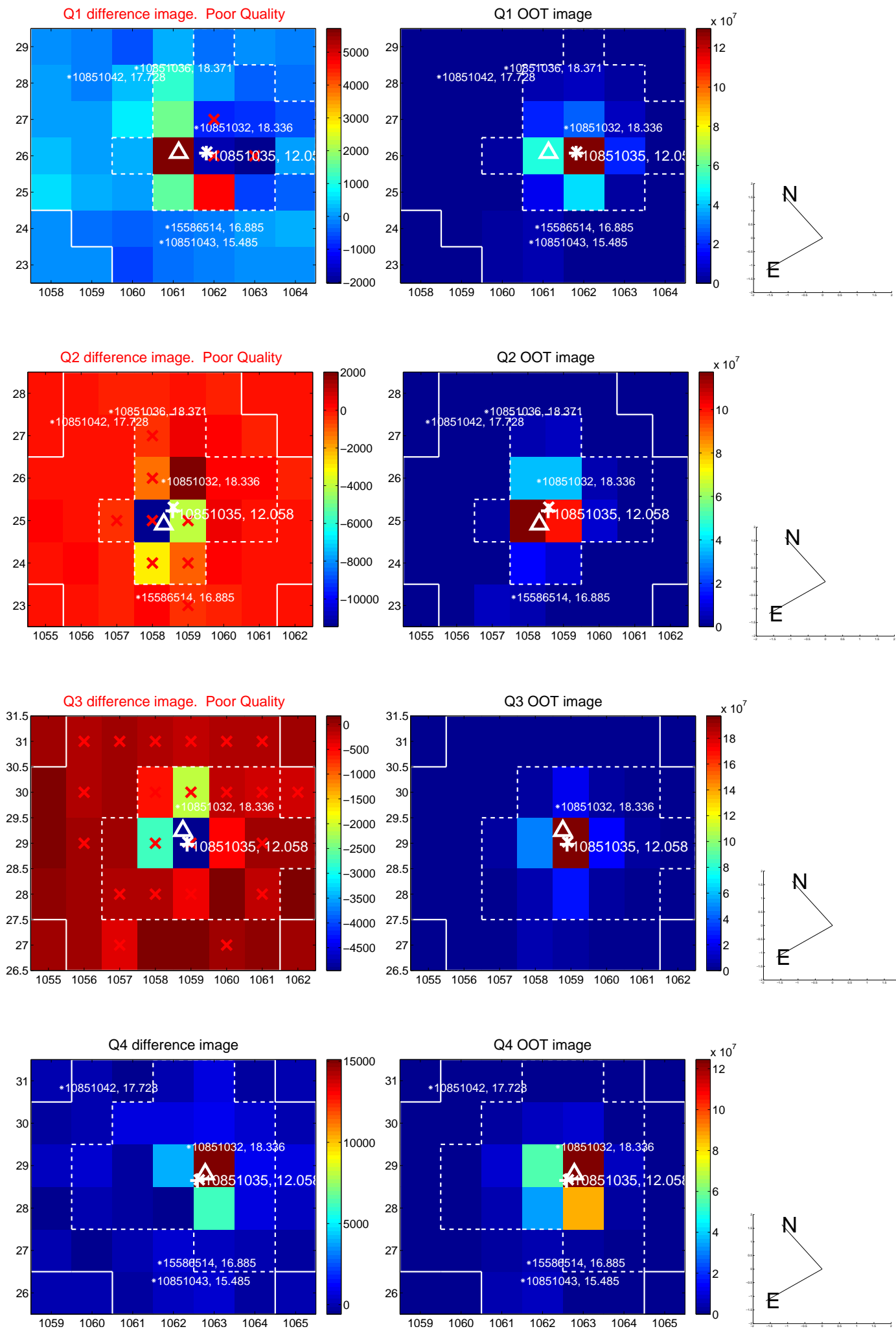
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.086 \pm 0.325$	0.26	$0.083 \pm 0.346$	$-0.022 \pm 0.242$
PRF-fit source offset from KIC position	$0.279 \pm 0.330$	0.84	$0.265 \pm 0.357$	$-0.087 \pm 0.221$
photometric centroid source offset	$0.96 \pm 1.07$	0.89	$0.76 \pm 1.08$	$0.59 \pm 1.07$

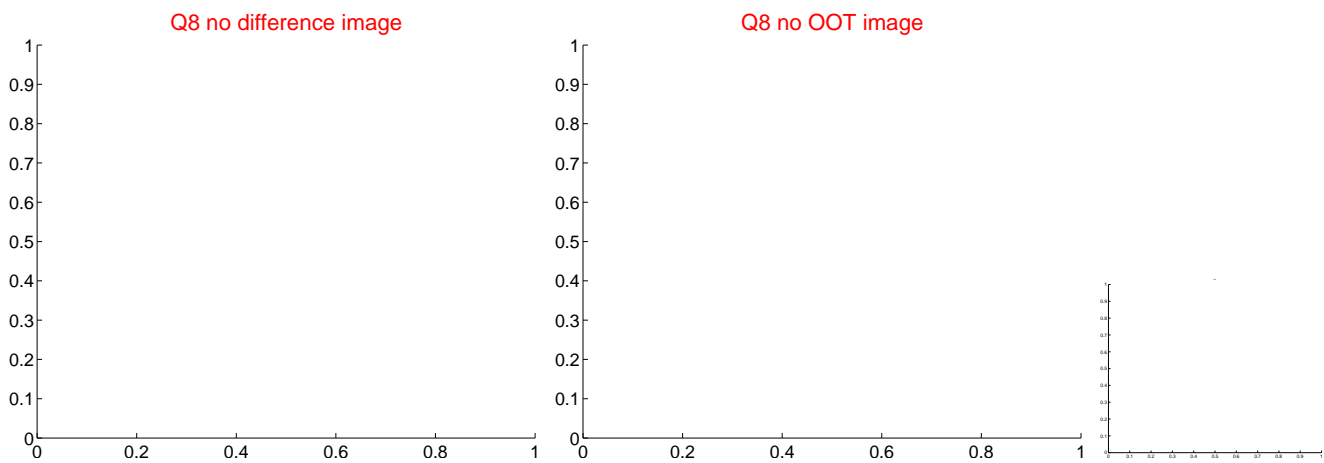
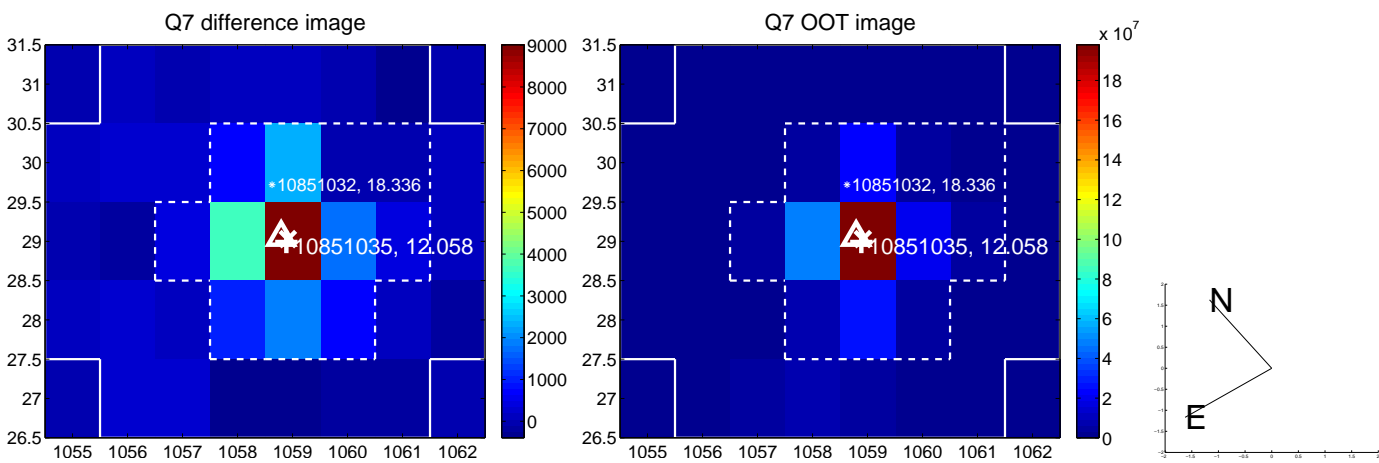
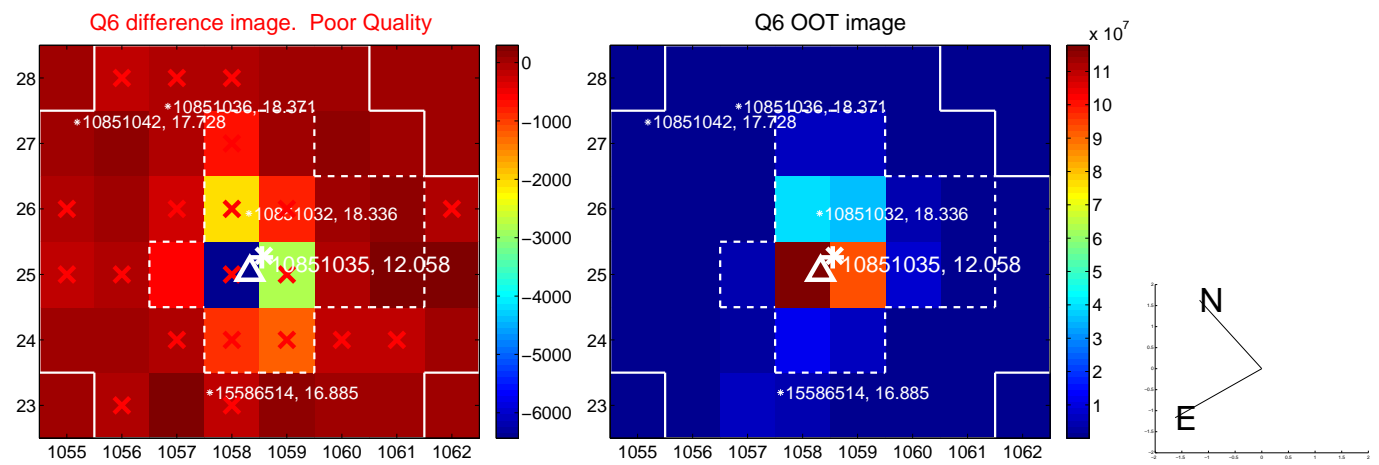
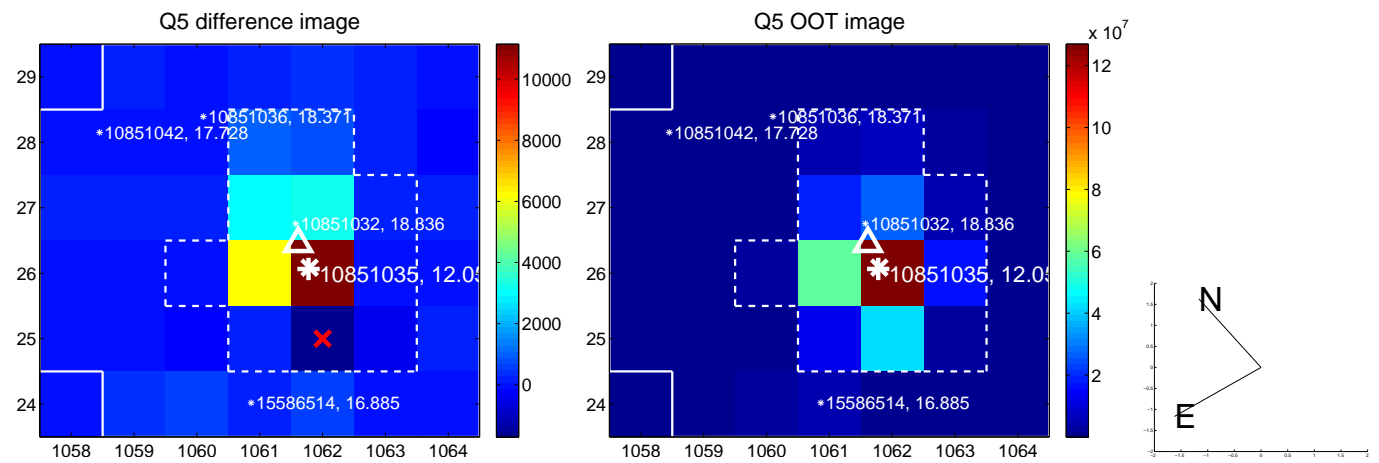


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

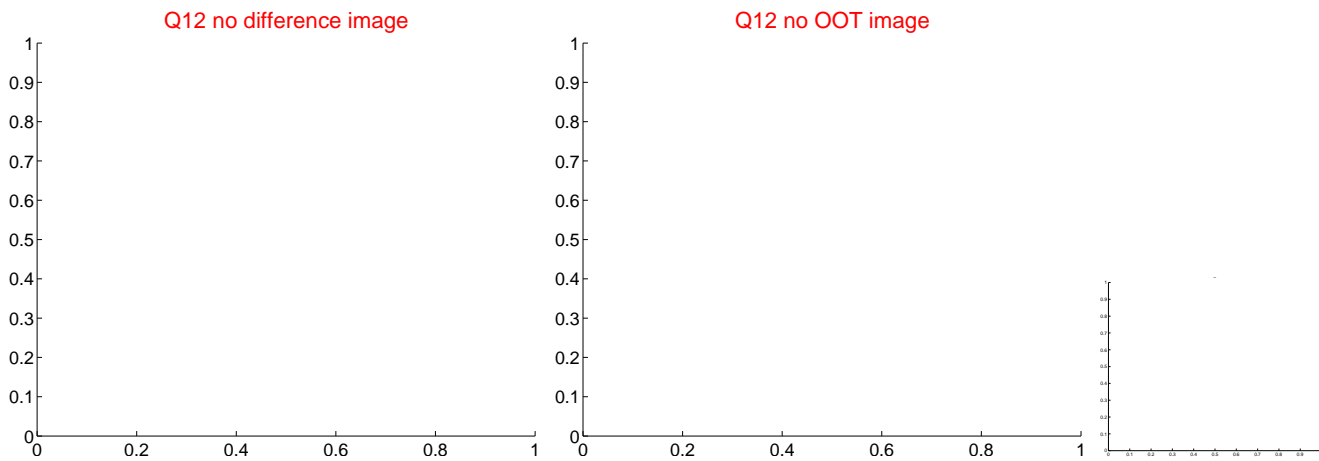
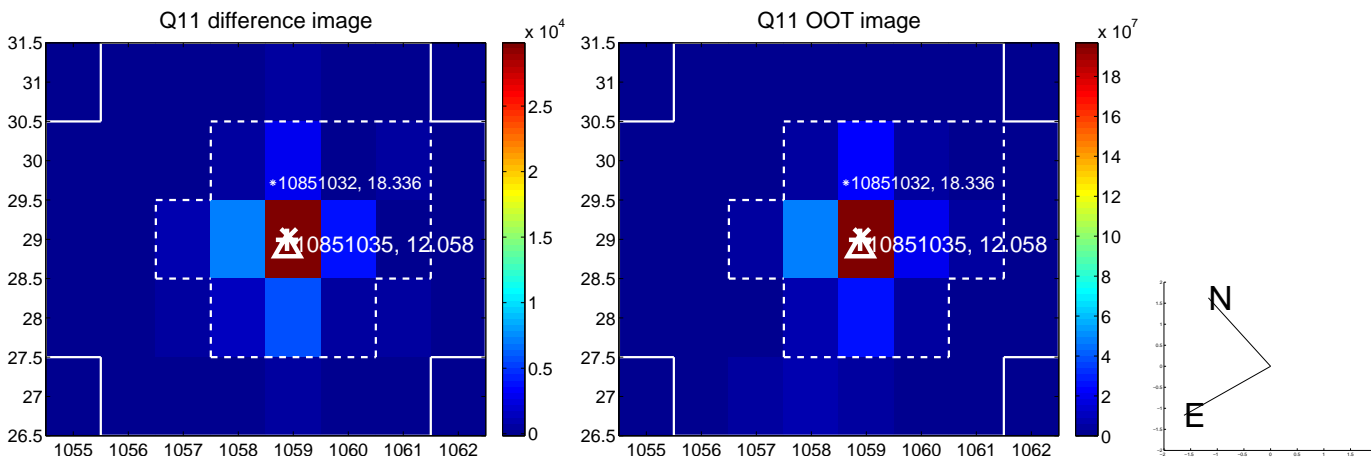
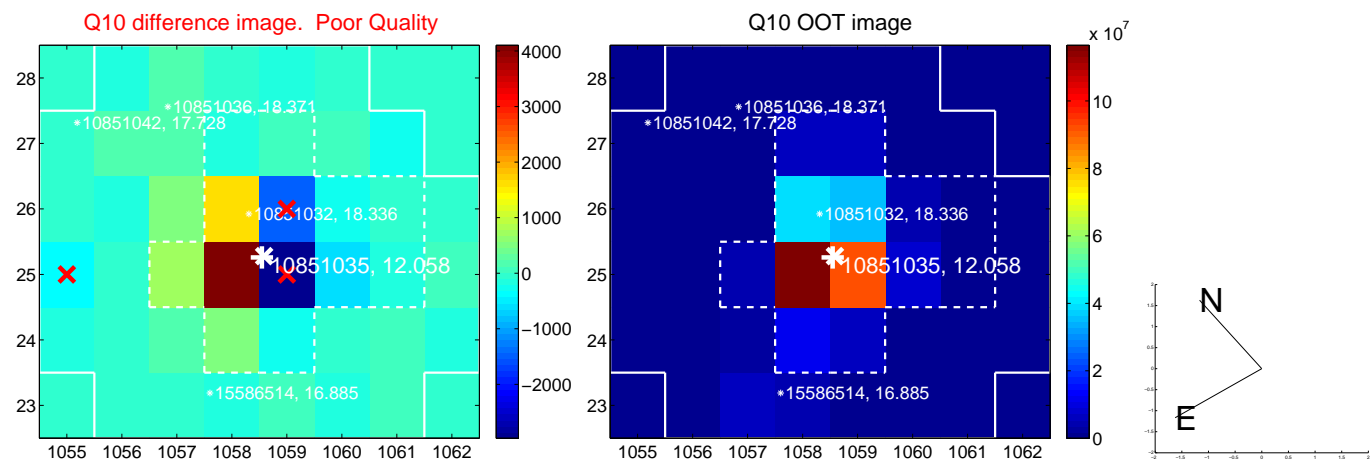
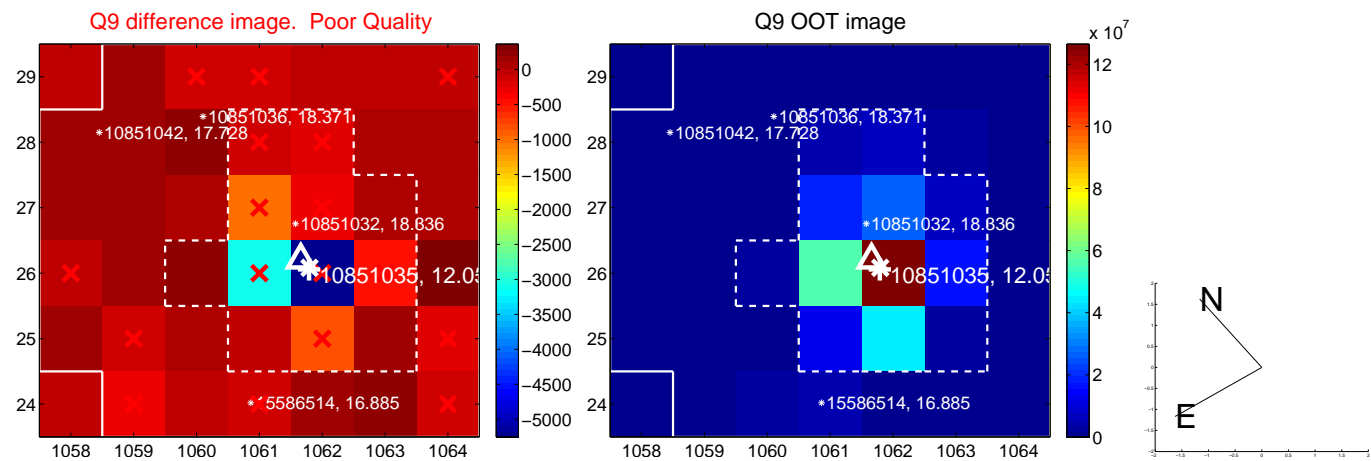


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

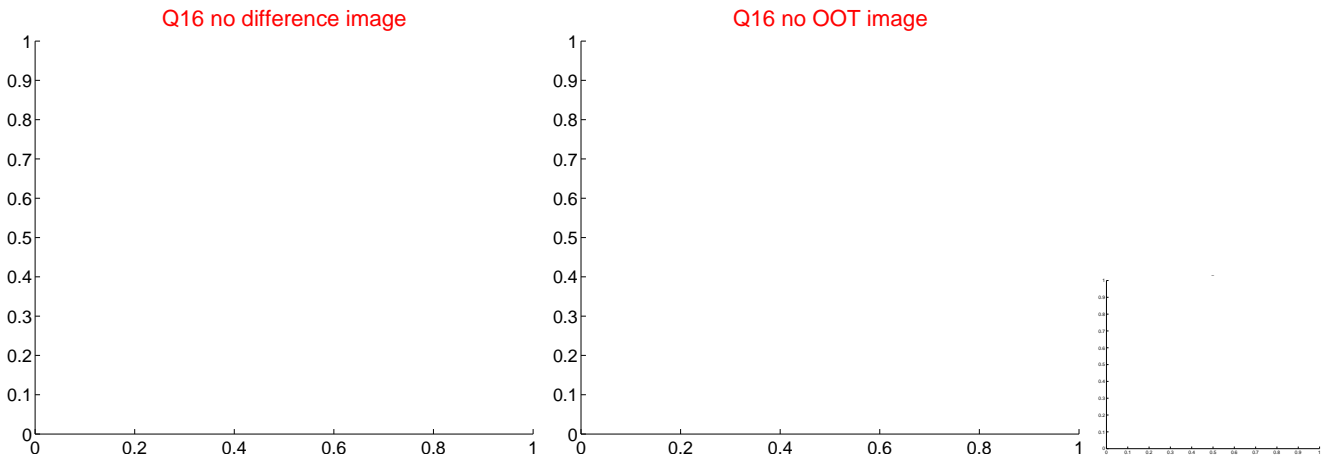
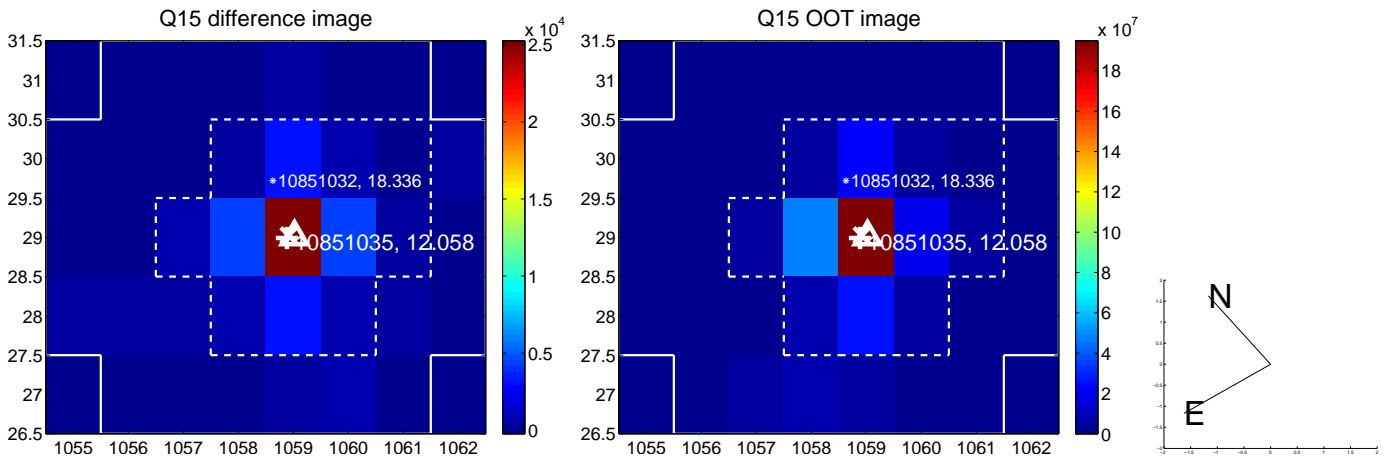
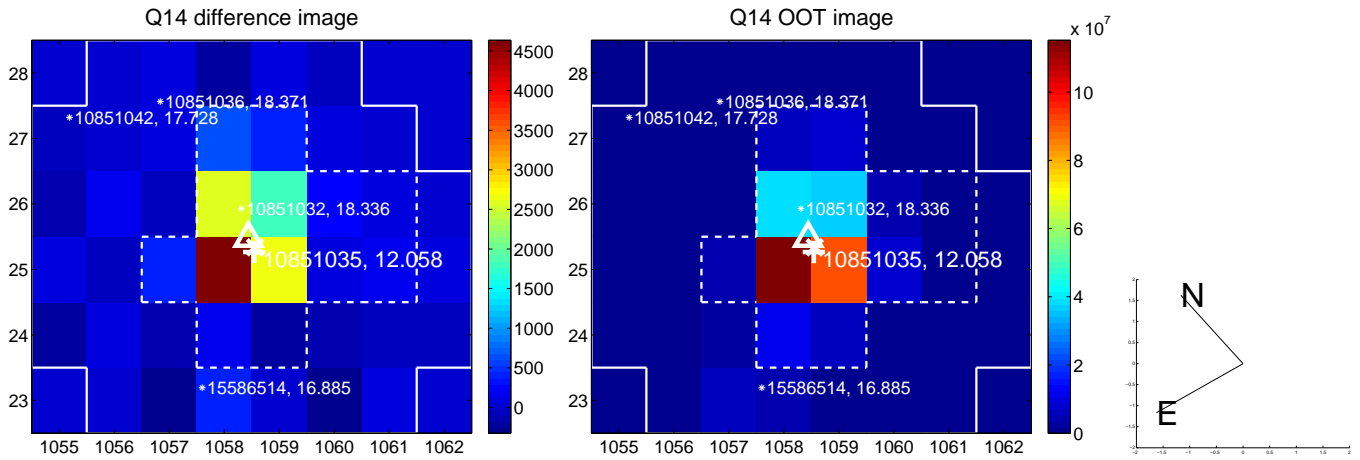
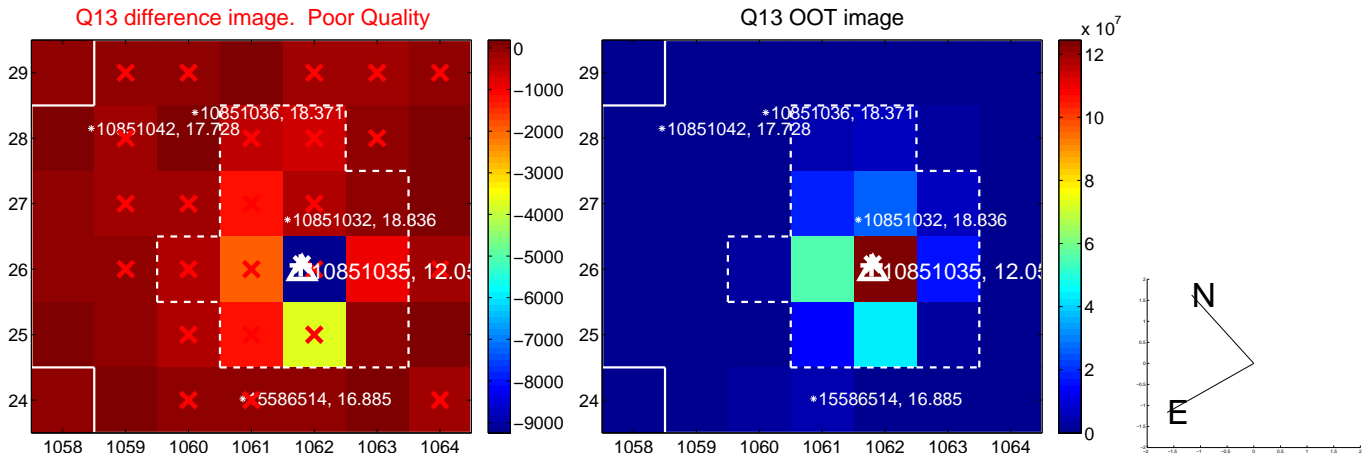




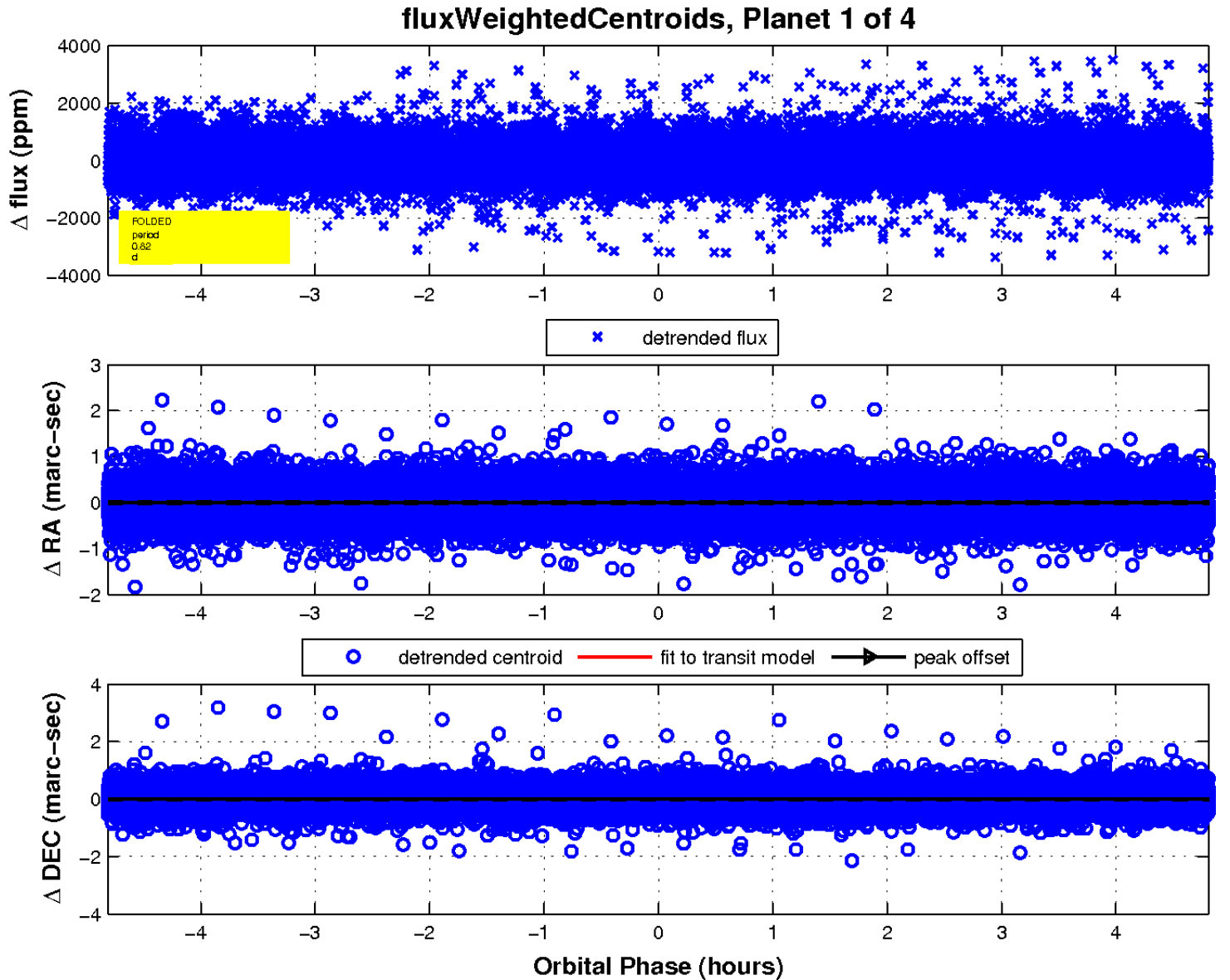
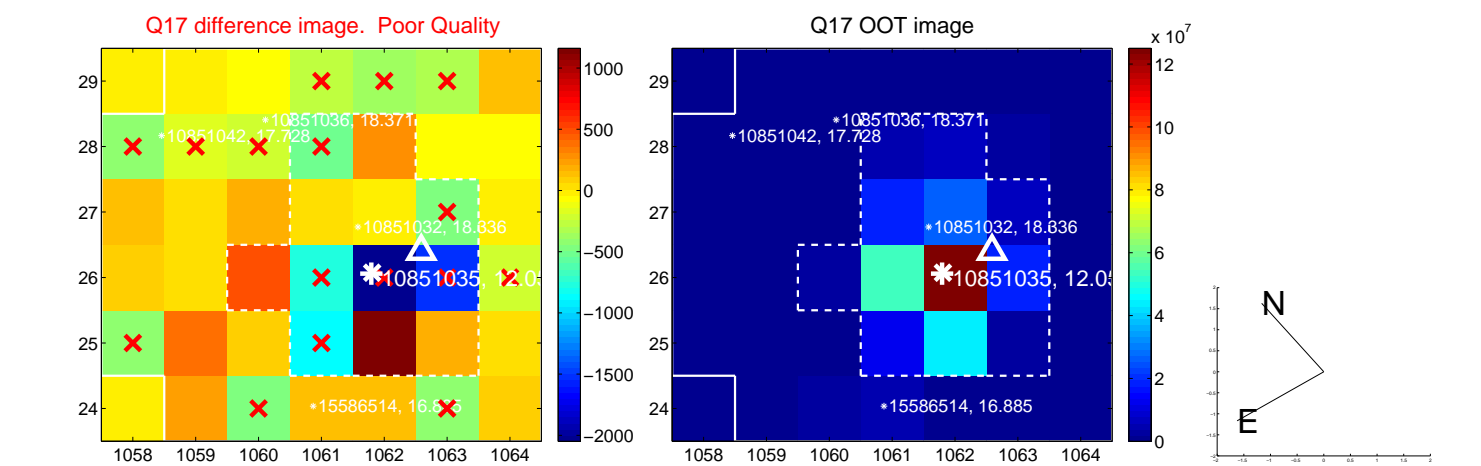
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

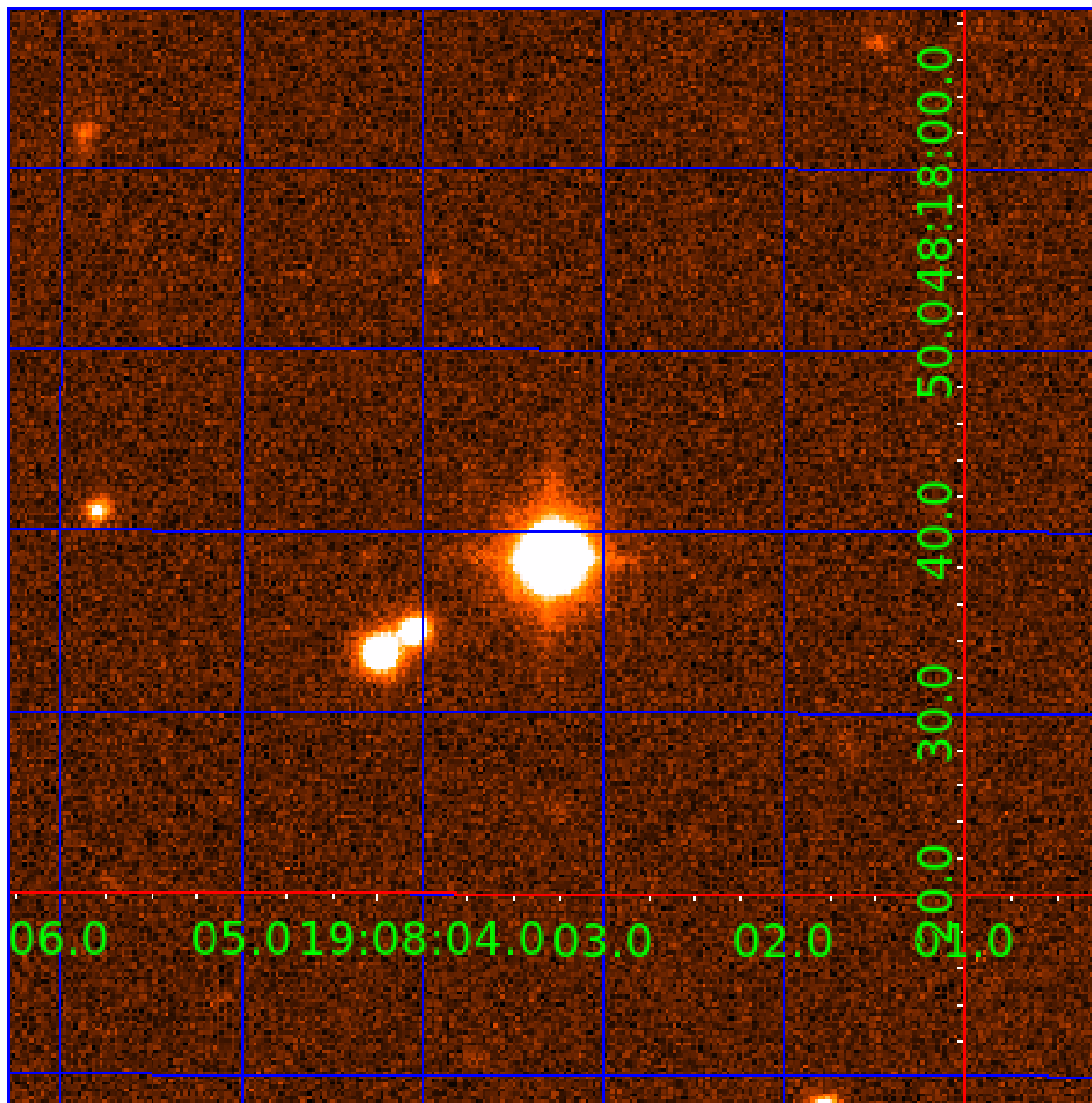


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010851035

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010851035-01	OBS	No	0.823494	131.984826	14.9	1.604	8.8	4.7	1.99	7431	0.89	26794.34
010851035-02	OBS	No	0.823475	132.277481	9.1	6.190	9.0	2.2	1.99	7431	0.64	26795.18
010851035-03	OBS	No	16.459948	146.719813	415.0	3.495	8.8	9.5	1.99	7431	4.12	493.95
010851035-04	OBS	No	32.949798	139.211146	1290.0	2.305	9.5	10.3	1.99	7431	7.42	195.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010851035-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010851035-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010851035-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010851035-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV

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

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

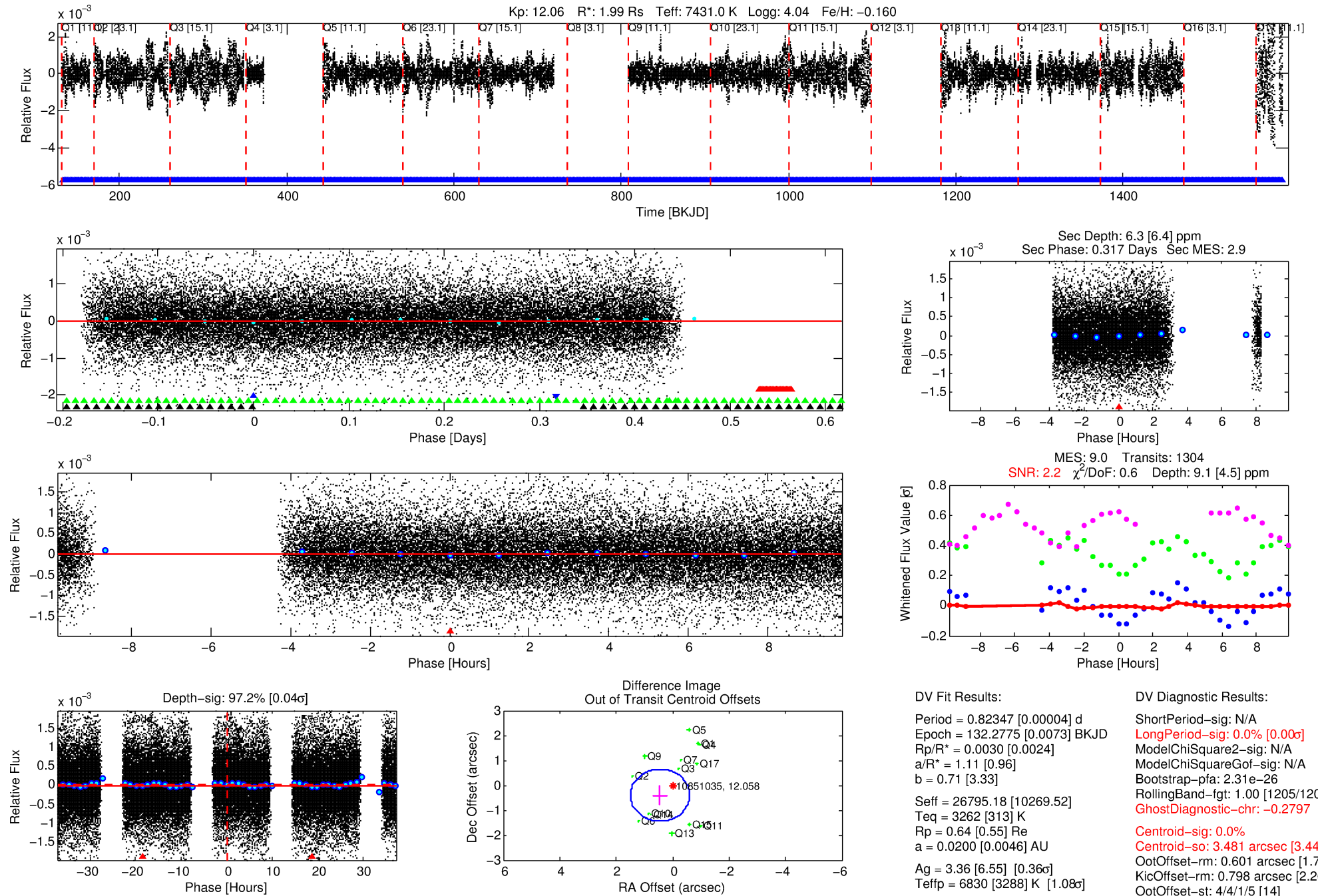
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010851035-02

No Significant Match Found

# DV One-Page Summary

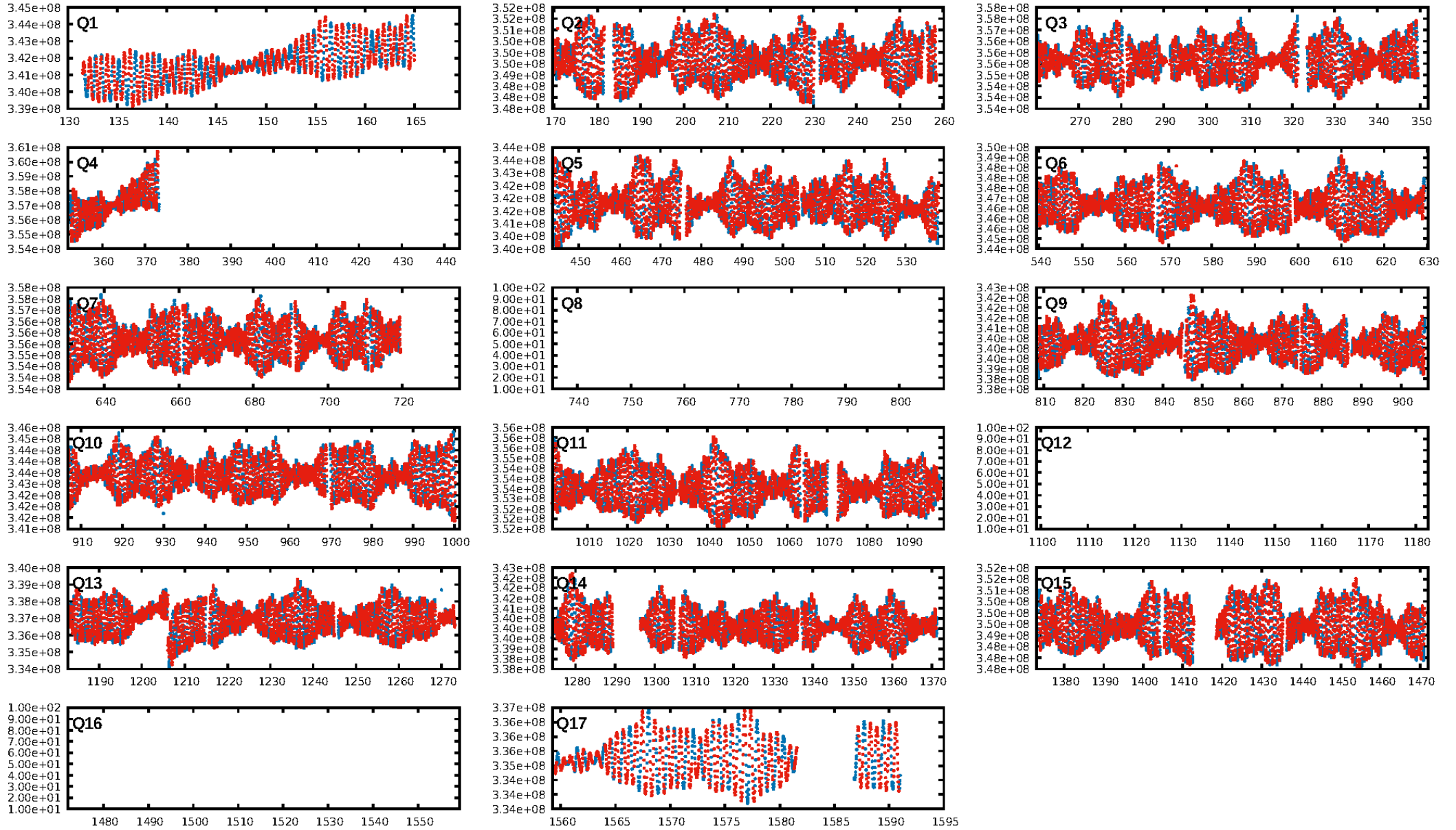
KIC: 10851035 Candidate: 2 of 4 Period: 0.823 d



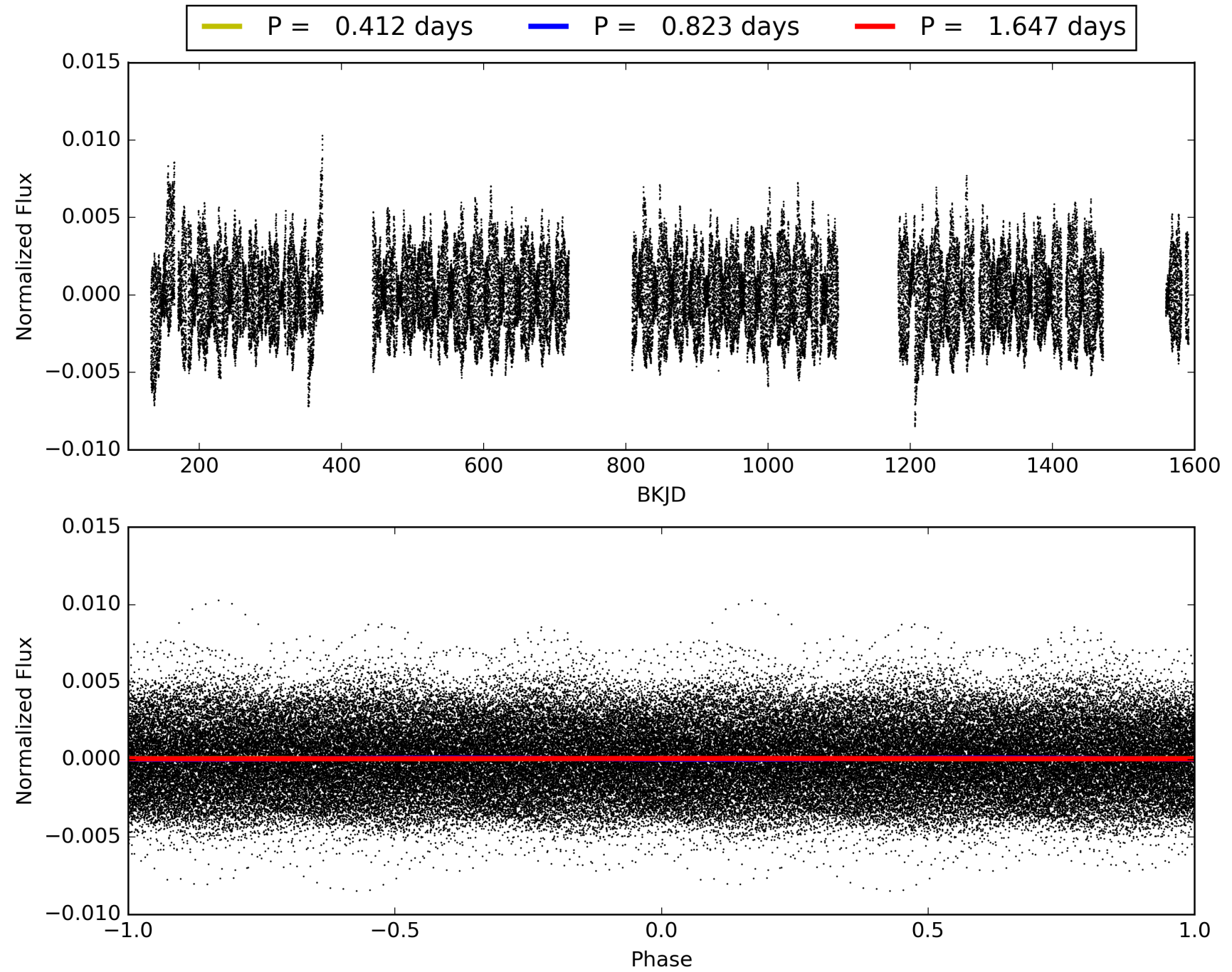
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:23:58 Z

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

# TCE 010851035-02, PDC Light Curves

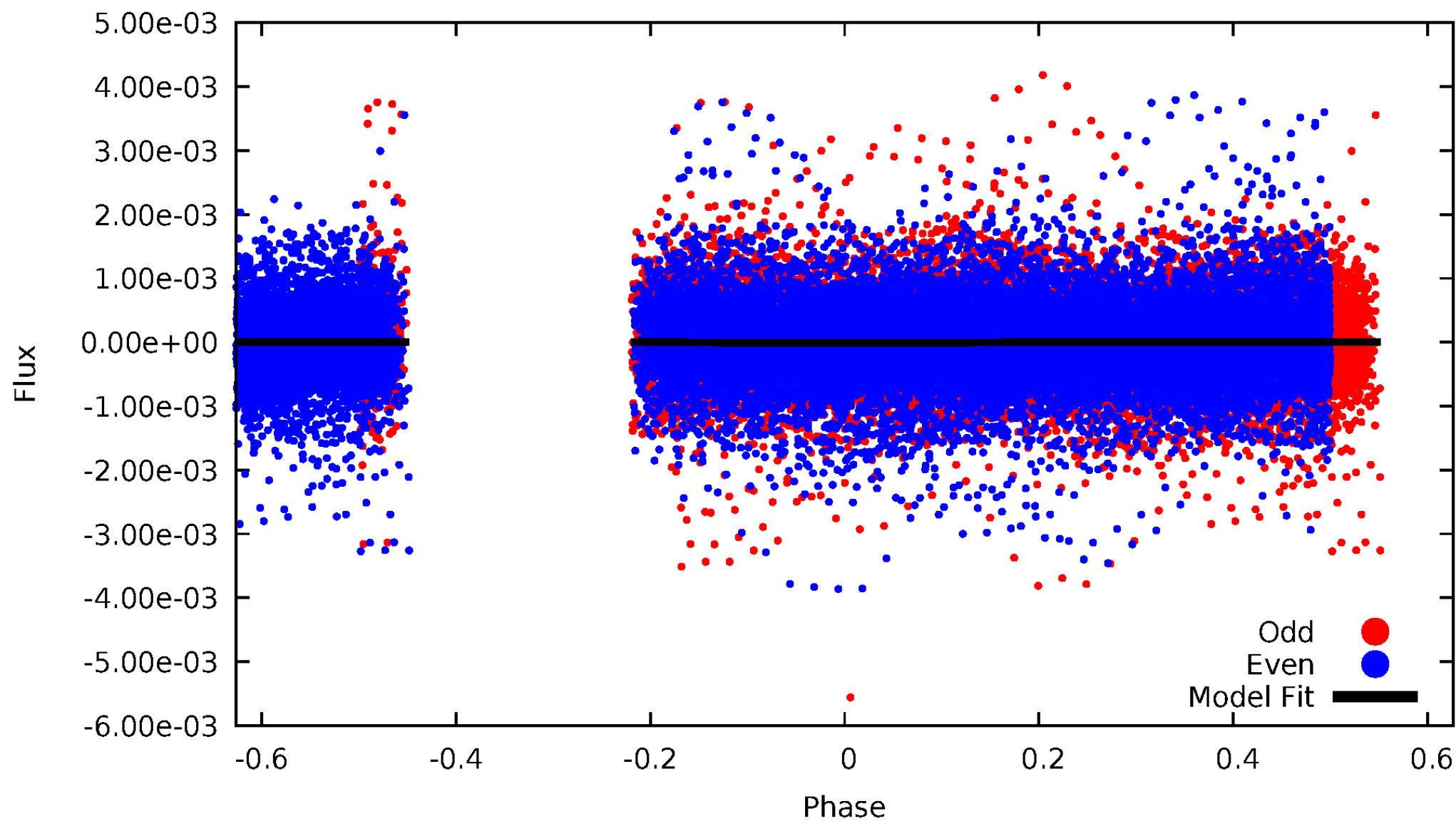


# TCE 010851035-02



# DV Odd/Even

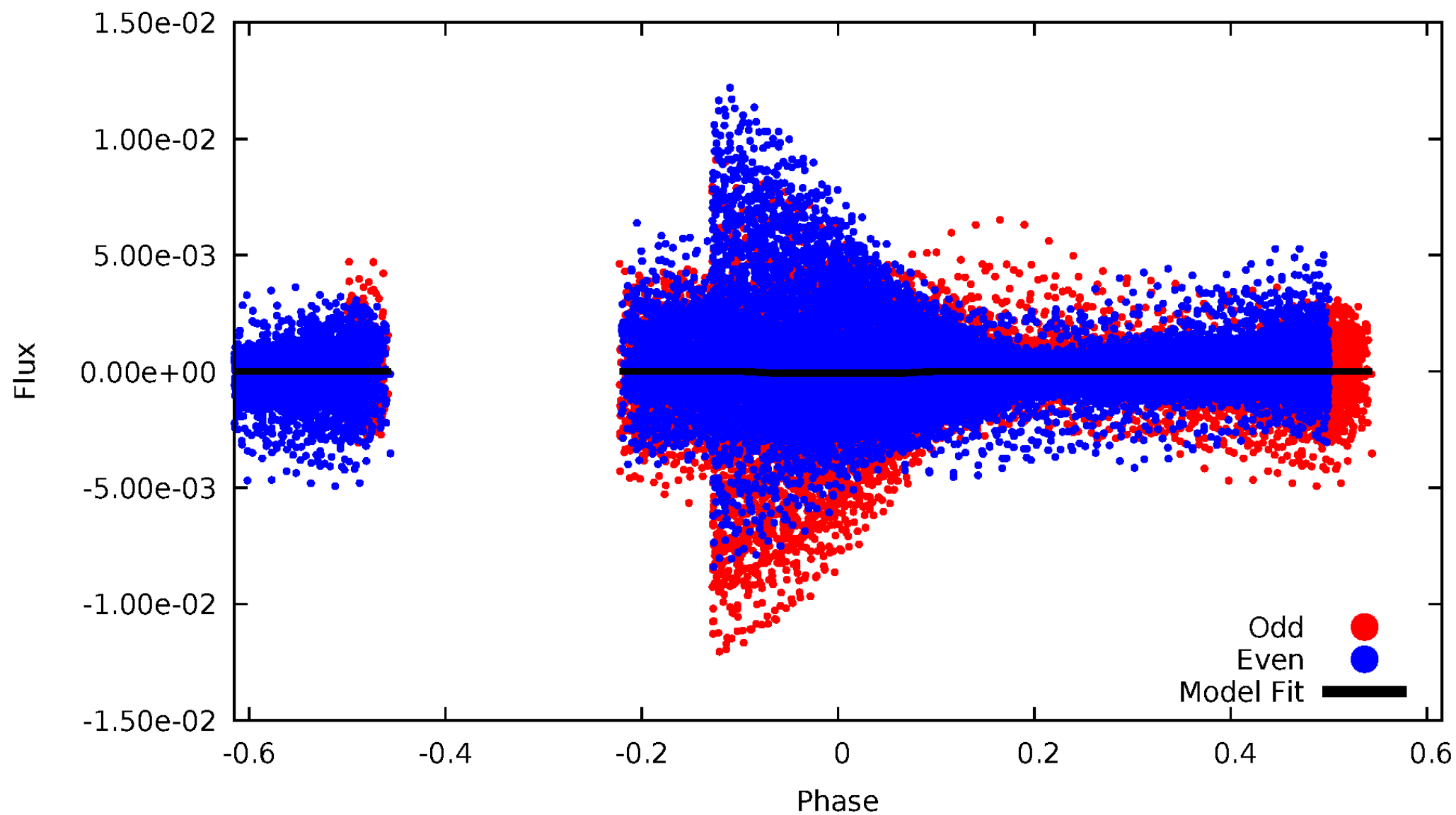
TCE 010851035-02





# ALT Odd/Even

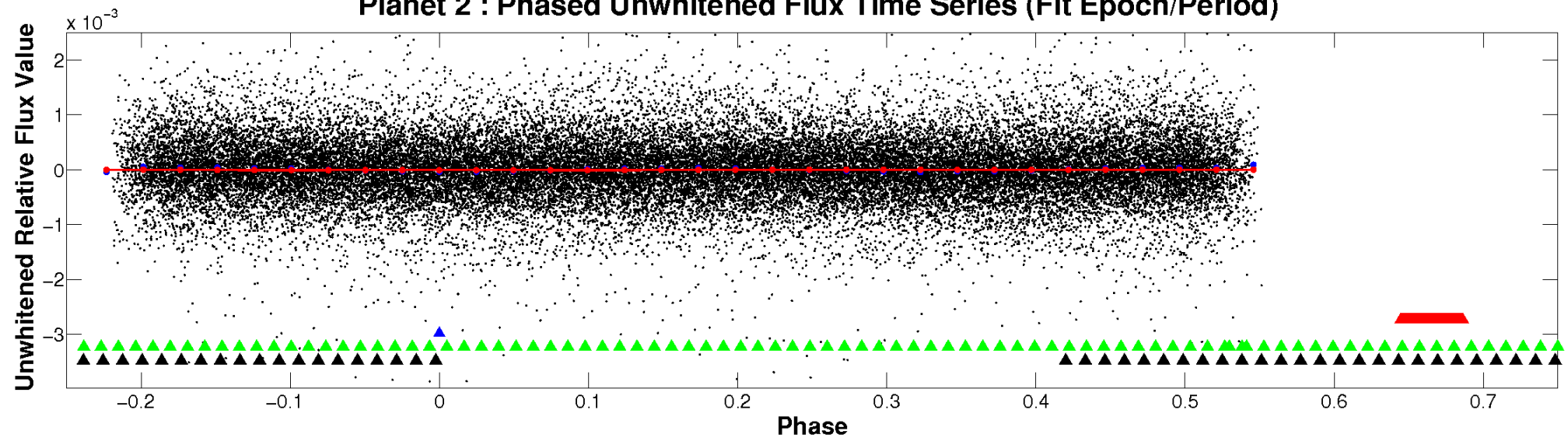
TCE 010851035-02



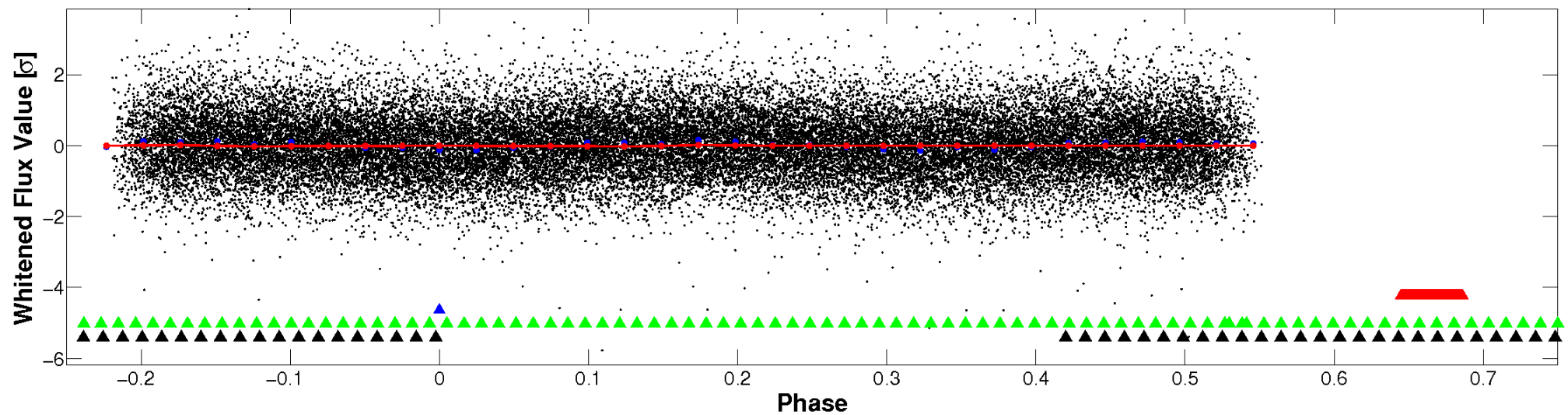


# Non-Whitened Vs. Whitened Light Curve

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

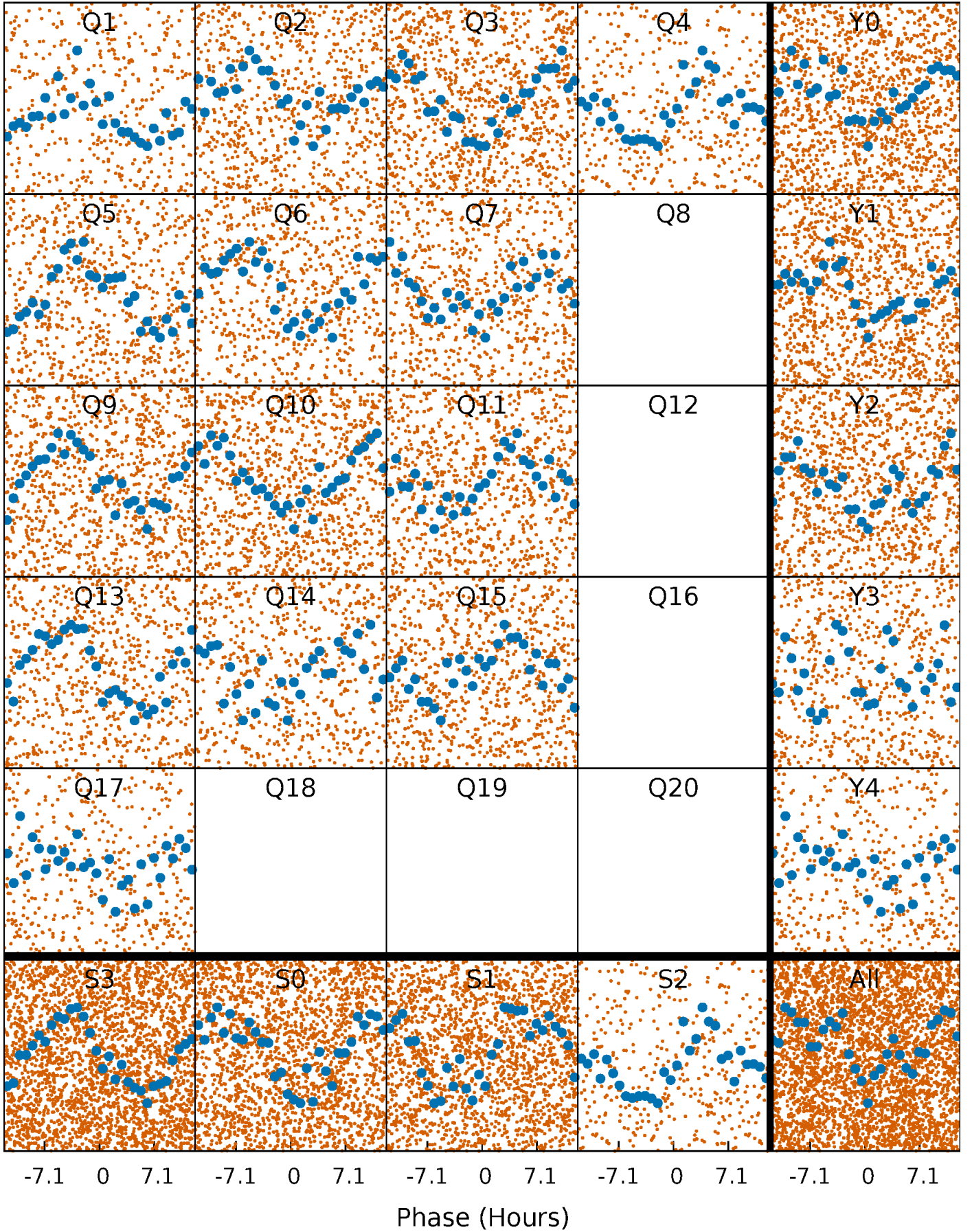


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



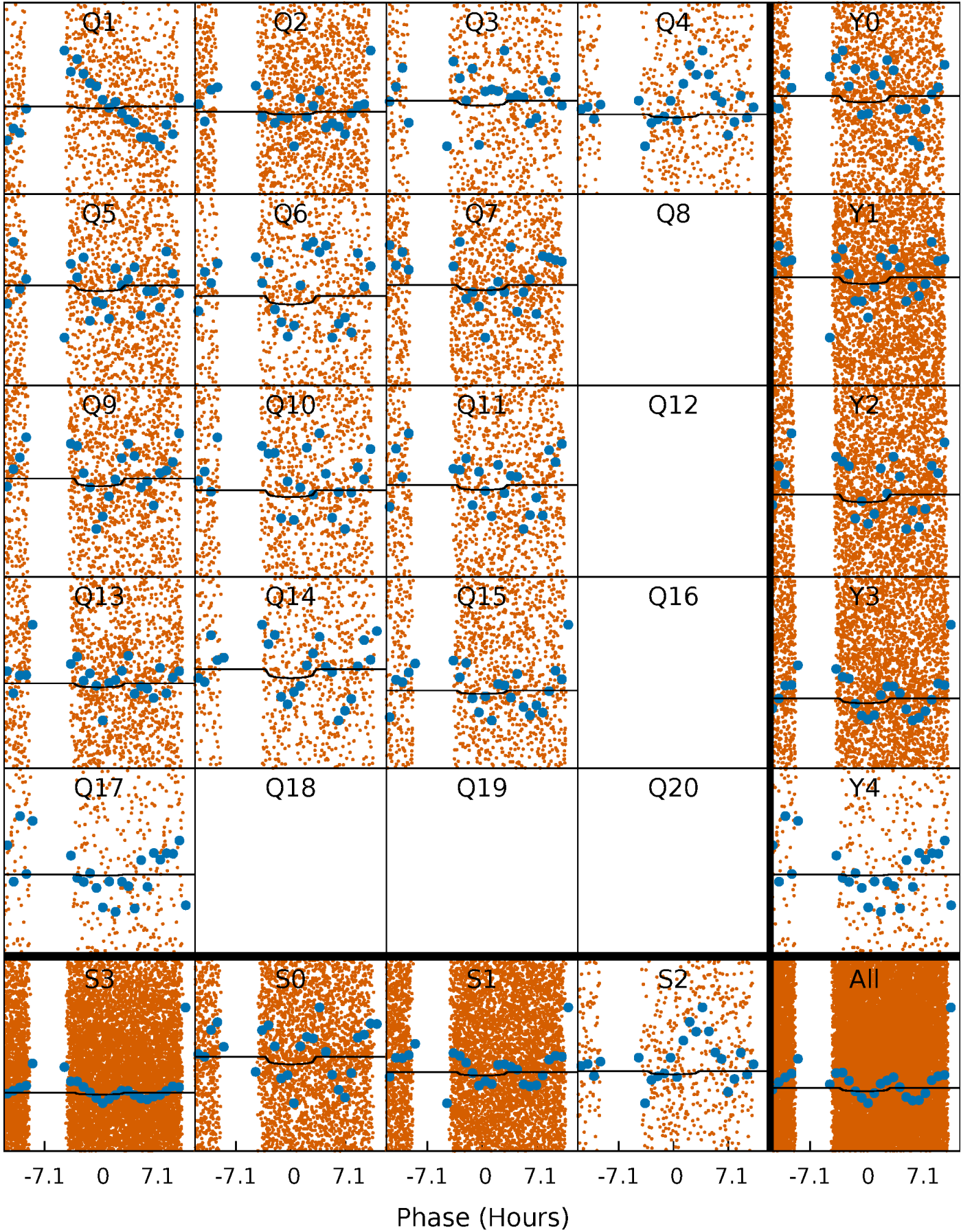
# PDC Quarter-Phased Transit Curves

TCE 010851035-02     $P = 0.823475$  Days     $T_0 = 132.277481$  (BKJD)



# DV Quarter-Phased Transit Curves

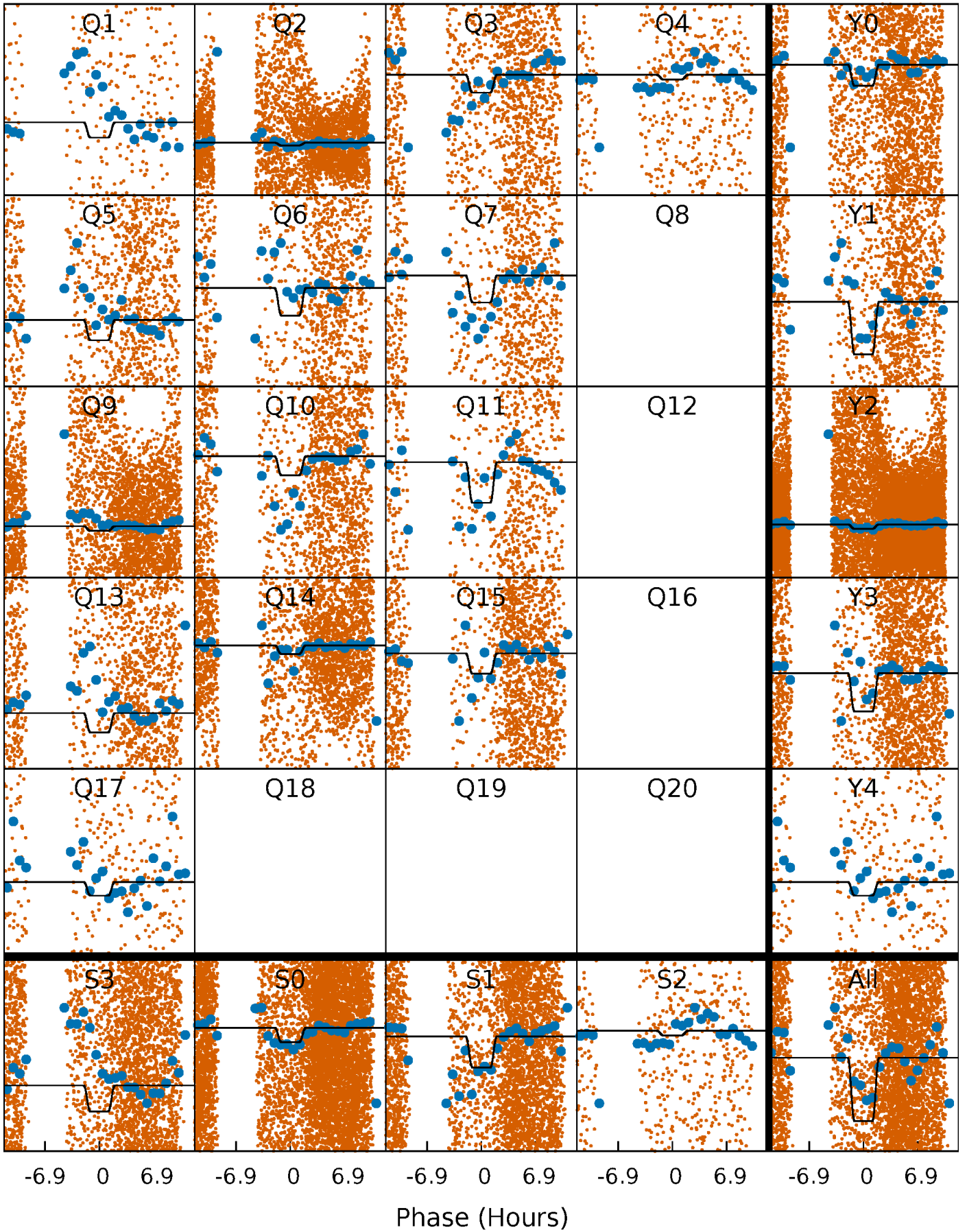
TCE 010851035-02   P= 0.823475 Days    $T_0=132.277481$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

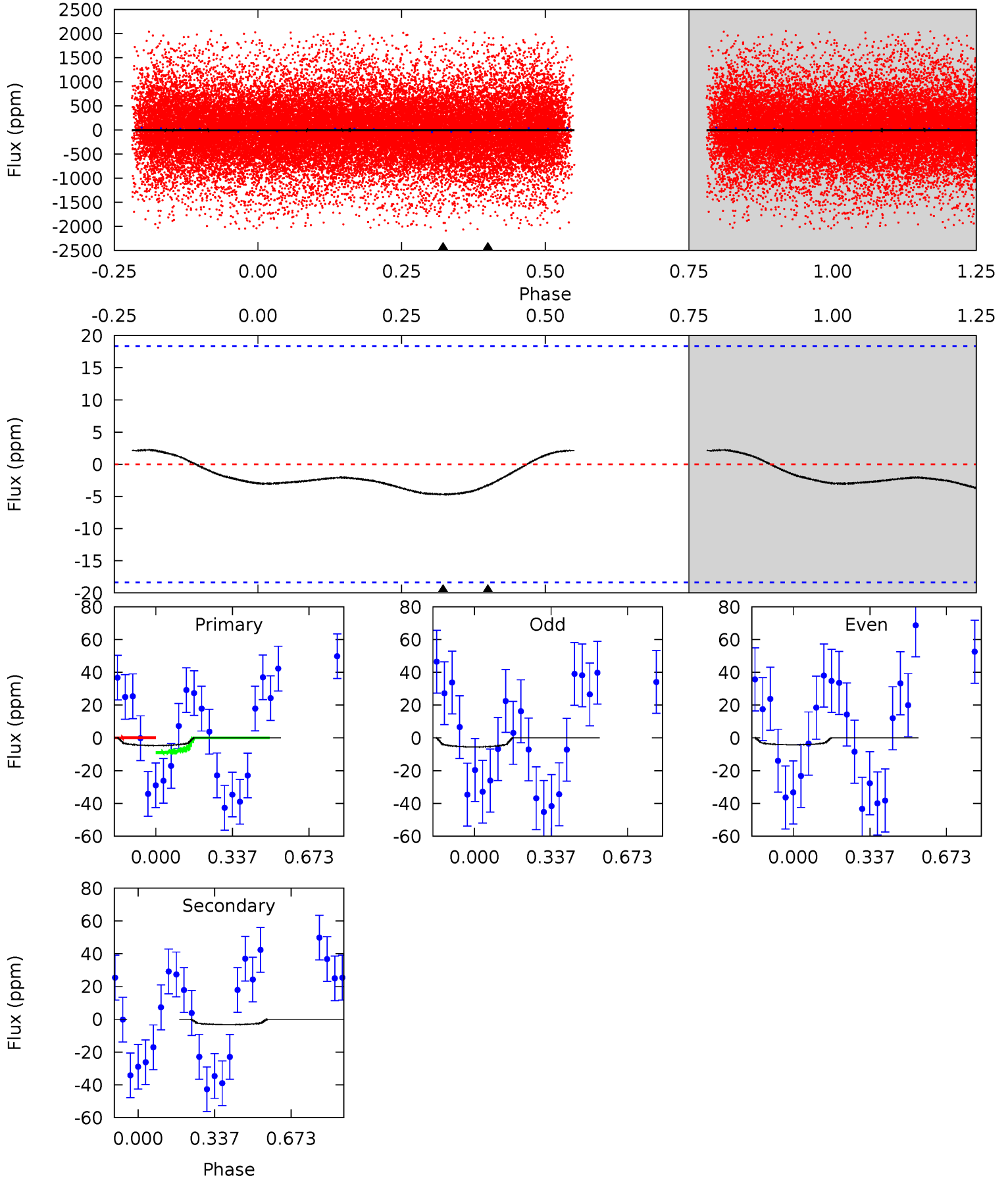
TCE 010851035-02   P= 0.823477 Days    $T_0=132.280378$  (BKJD)



# DV Model-Shift Uniqueness Test

010851035-02, P = 0.823475 Days, E = 131.454006 Days

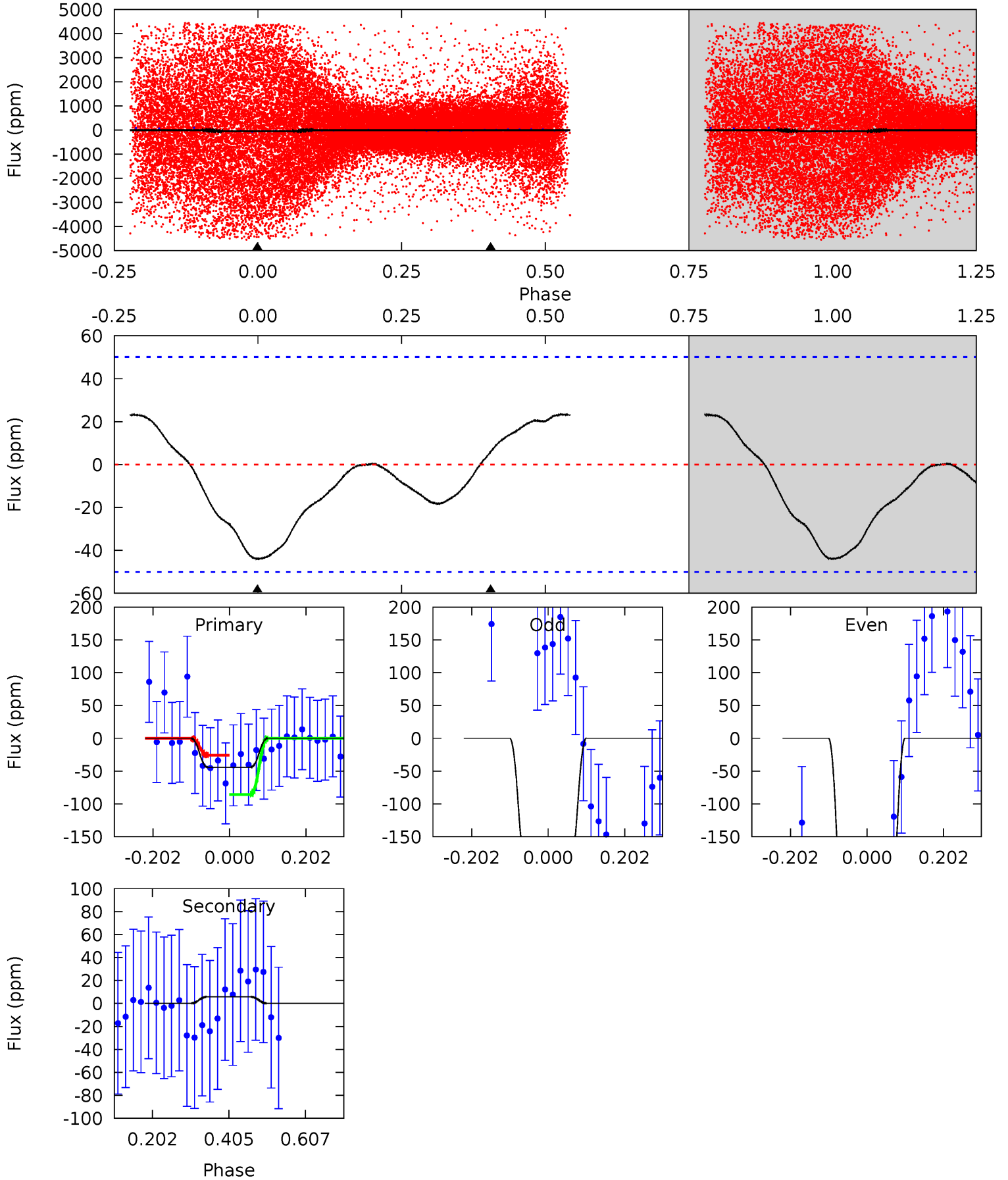
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.10	0.76	0	0	4.30	0.96	0.40	1.10	1.10	0.76	0.76	0.15	-2.56	0.32	1.04



# Alt Model-Shift Uniqueness Test

010851035-02, P = 0.823477 Days, E = 131.456901 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
3.90	-0.51	0	0	4.41	1.28	0.88	3.90	3.90	-0.51	-0.51	6.28	0.70	0.35	2.22





### Stellar Parameters For KIC 010851035

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7431^{+233}_{-311}$	$4.042^{+0.193}_{-0.158}$	$-0.160^{+0.250}_{-0.350}$	$1.985^{+0.525}_{-0.525}$	$1.580^{+0.213}_{-0.260}$	$0.284^{+0.326}_{-0.134}$
	+3%/-4%	+5%/-4%	+156%/-219%	+26%/-26%	+13%/-16%	+115%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010851035-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3 \pm 4$	$0.72^{+0.49}_{-0.43}$	$4510^{+334}_{-346}$	$4668^{+3650}_{-9389}$	$1.049^{+6.427}_{-1.453}$
Alt.	$6 \pm 11$	$1.93^{+0.59}_{-0.58}$	$4532^{+313}_{-316}$	$-4559^{+2713}_{-940}$	$-0.322^{+0.621}_{-0.912}$

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

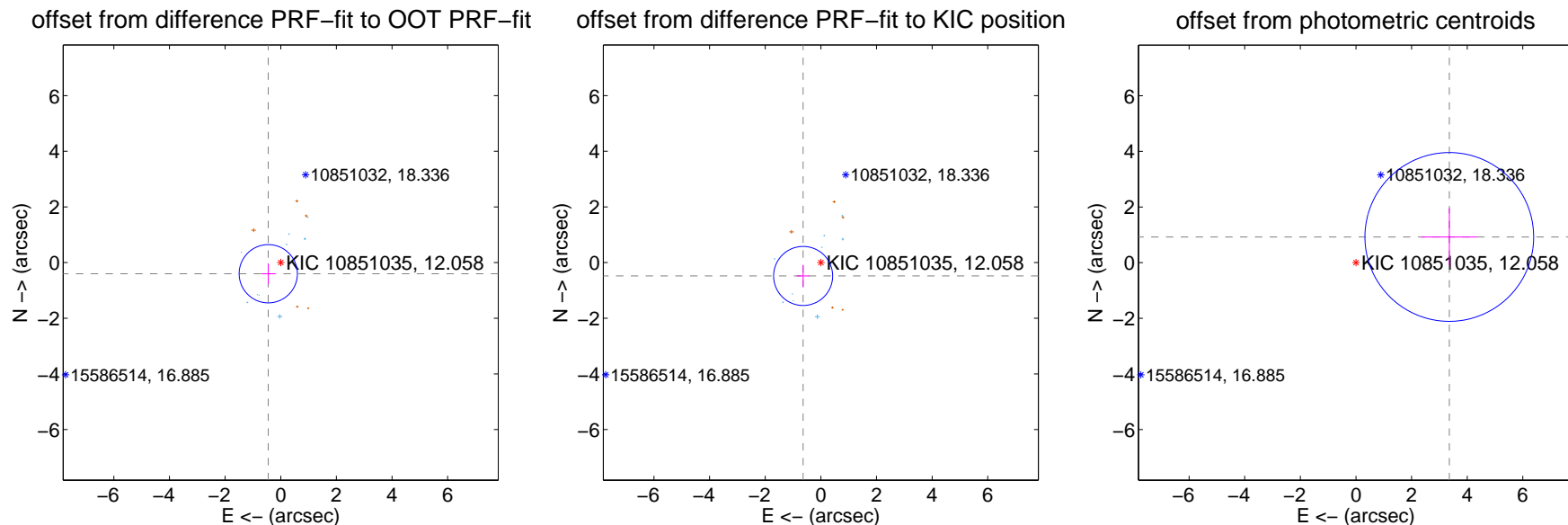
## DV Centroid Data

Supplemental centroid analysis for 010851035-02. Kepler magnitude: 12.06. Transit SNR 2.15

There are 9 quarters with good PRF difference image offsets

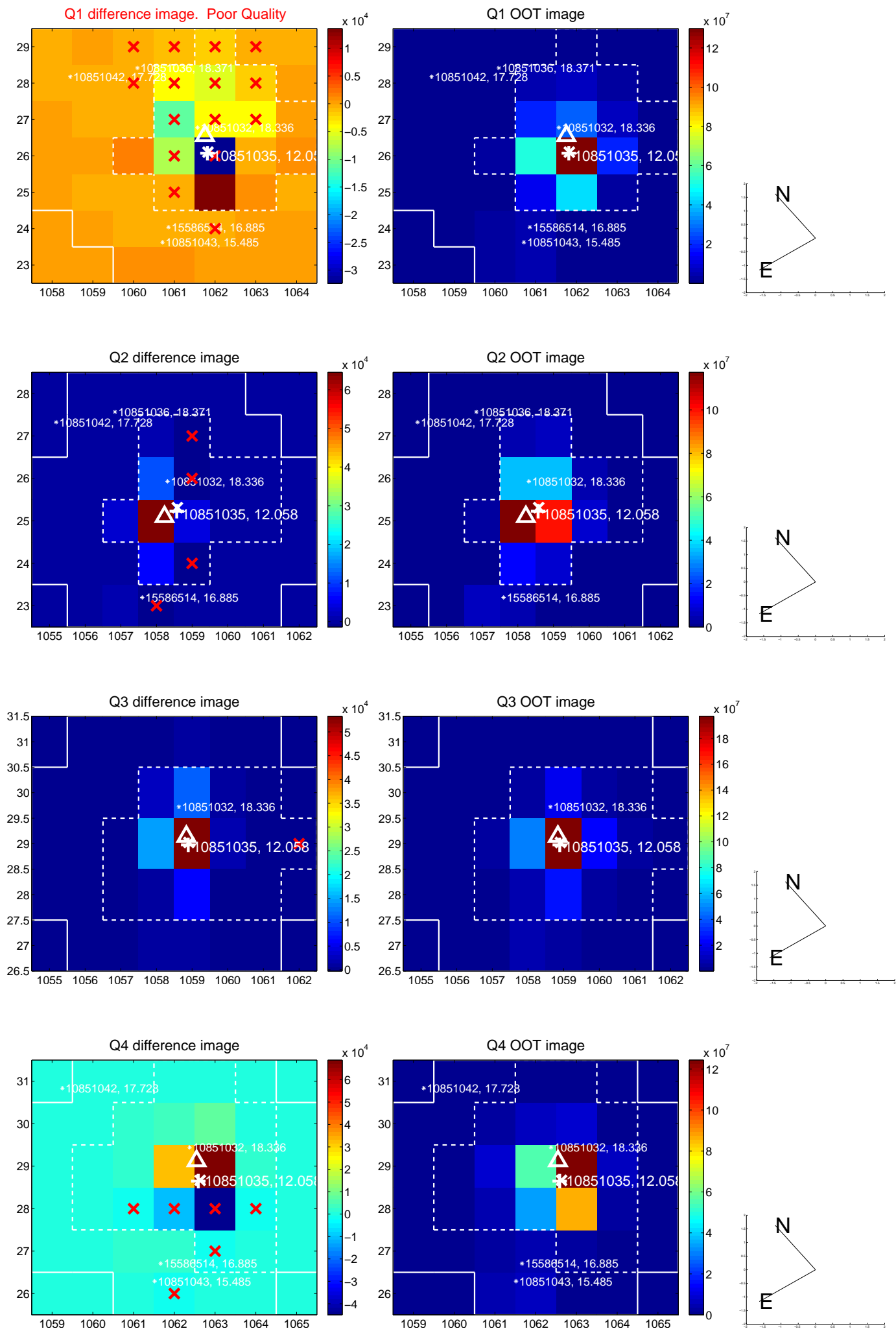
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.601 \pm 0.349$	1.72	$0.449 \pm 0.240$	$-0.401 \pm 0.375$
PRF-fit source offset from KIC position	$0.798 \pm 0.354$	2.26	$0.638 \pm 0.234$	$-0.480 \pm 0.392$
photometric centroid source offset	$3.48 \pm 1.01$	3.44	$-3.36 \pm 1.01$	$0.92 \pm 1.03$

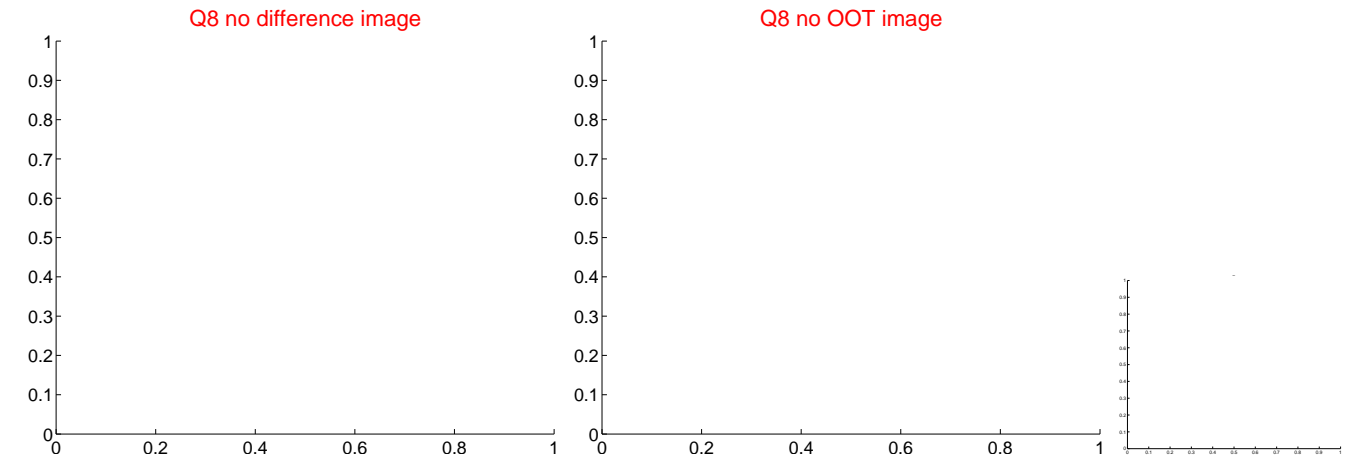
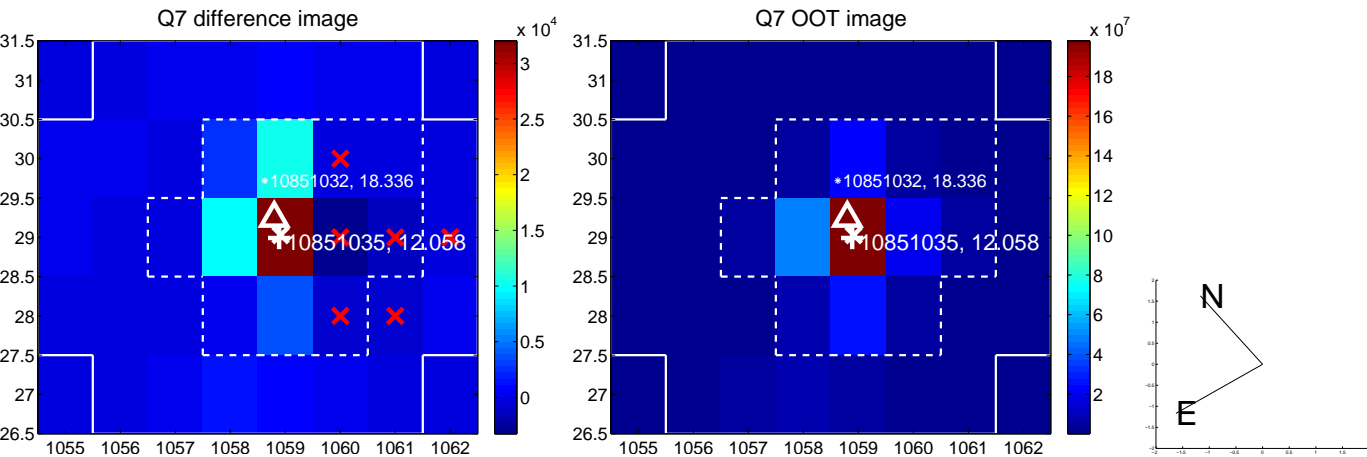
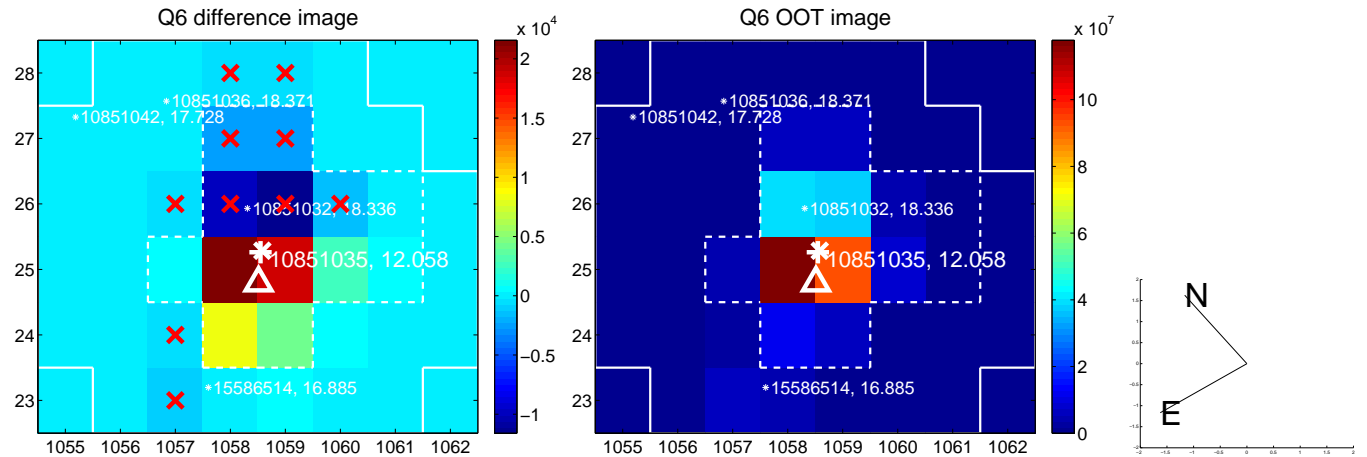
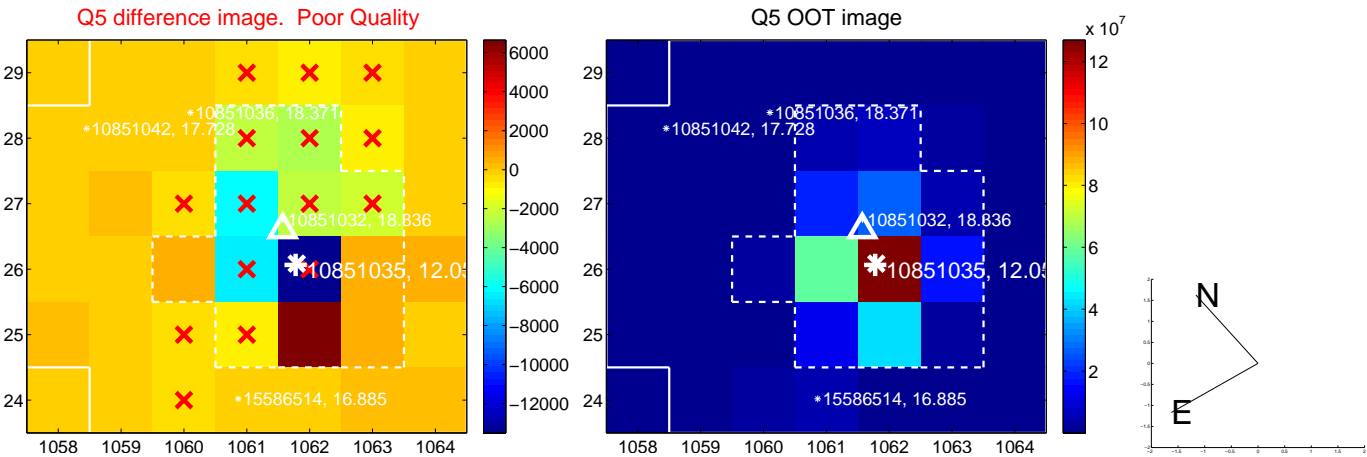


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

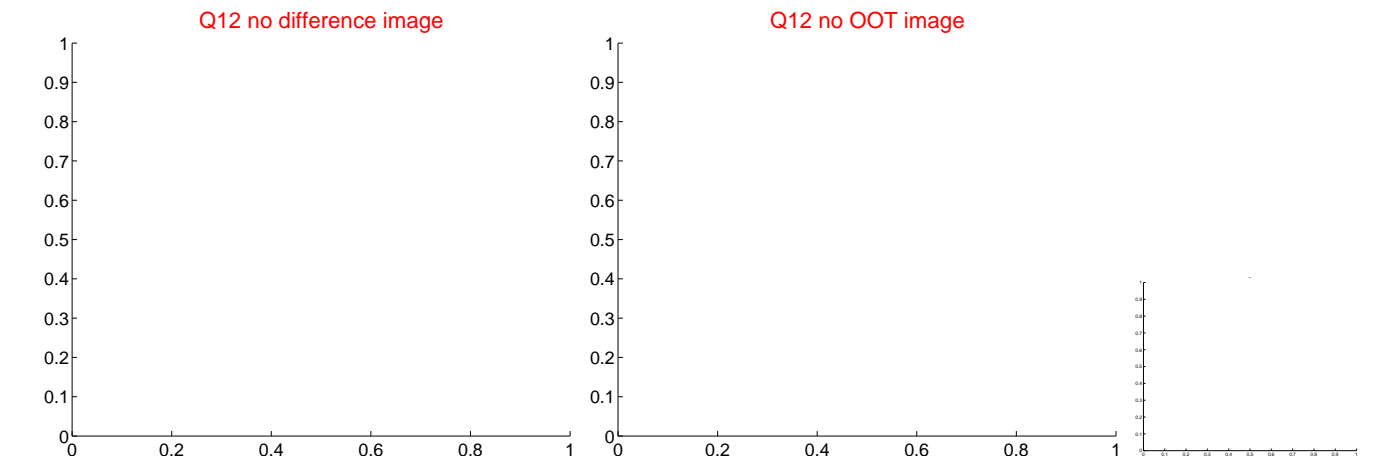
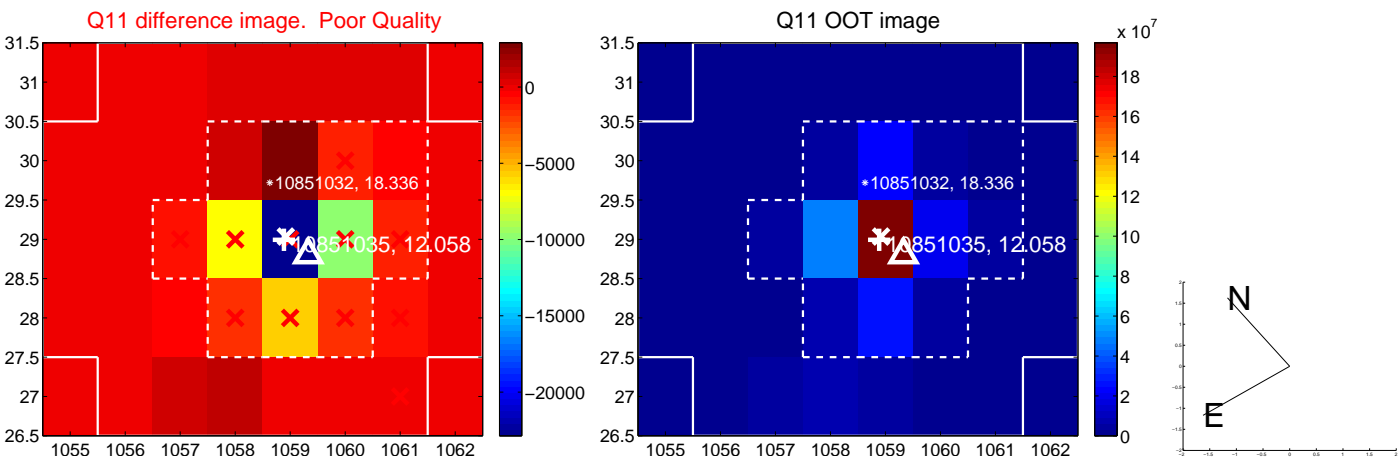
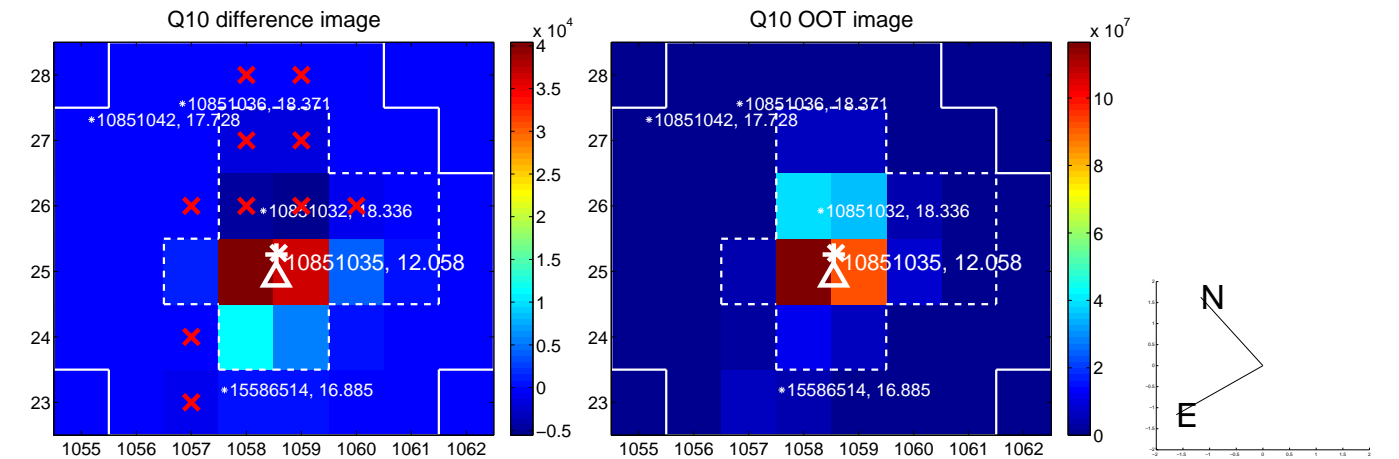
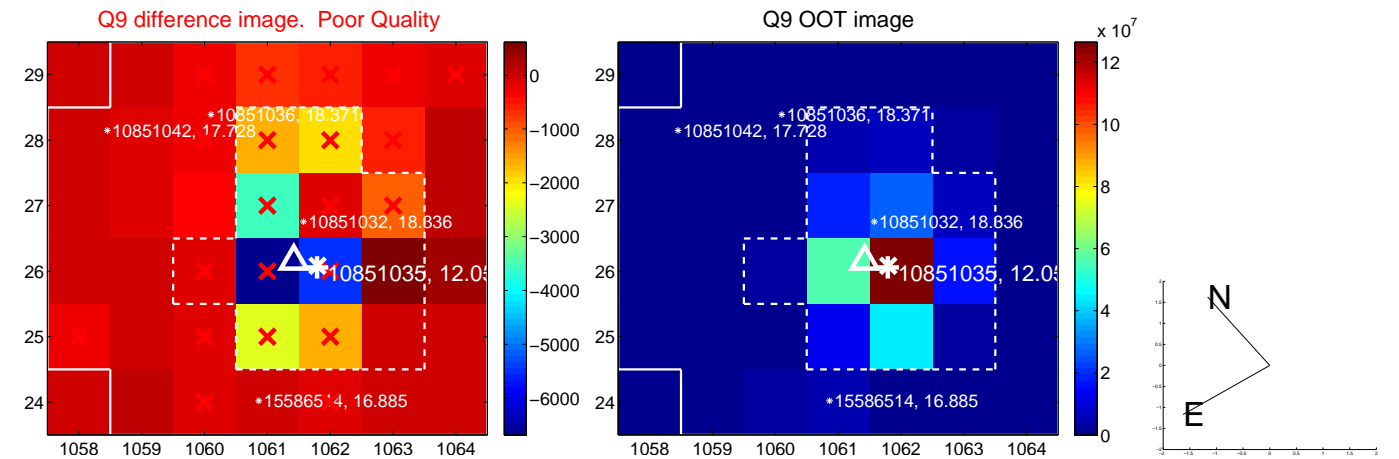
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



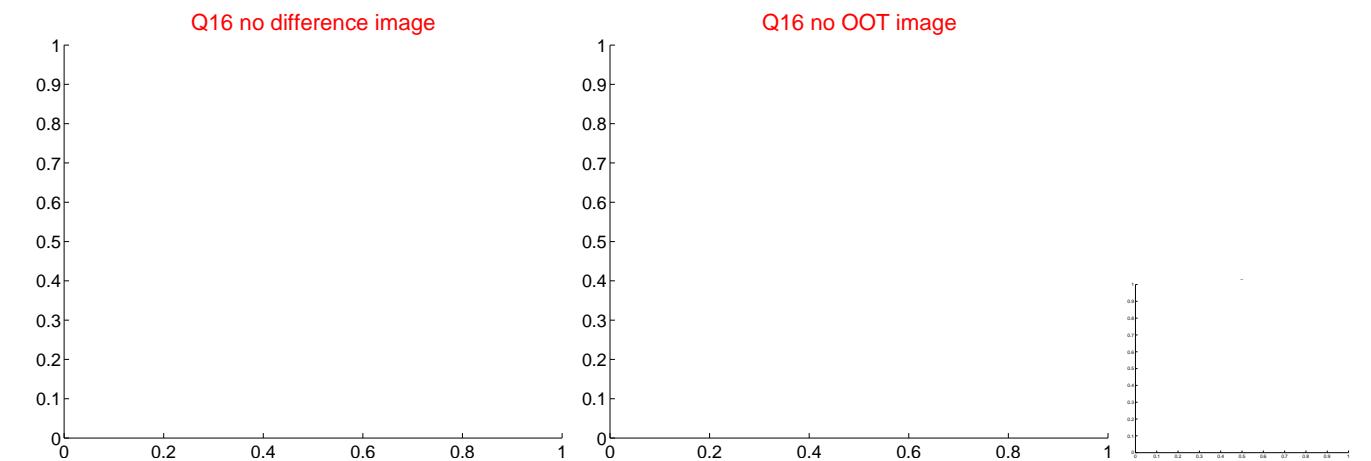
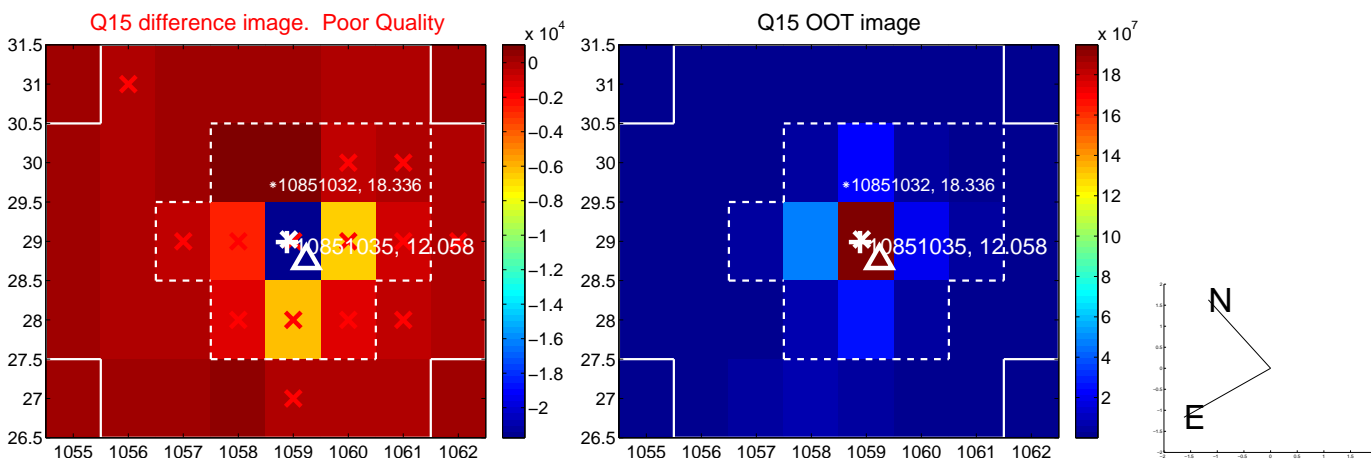
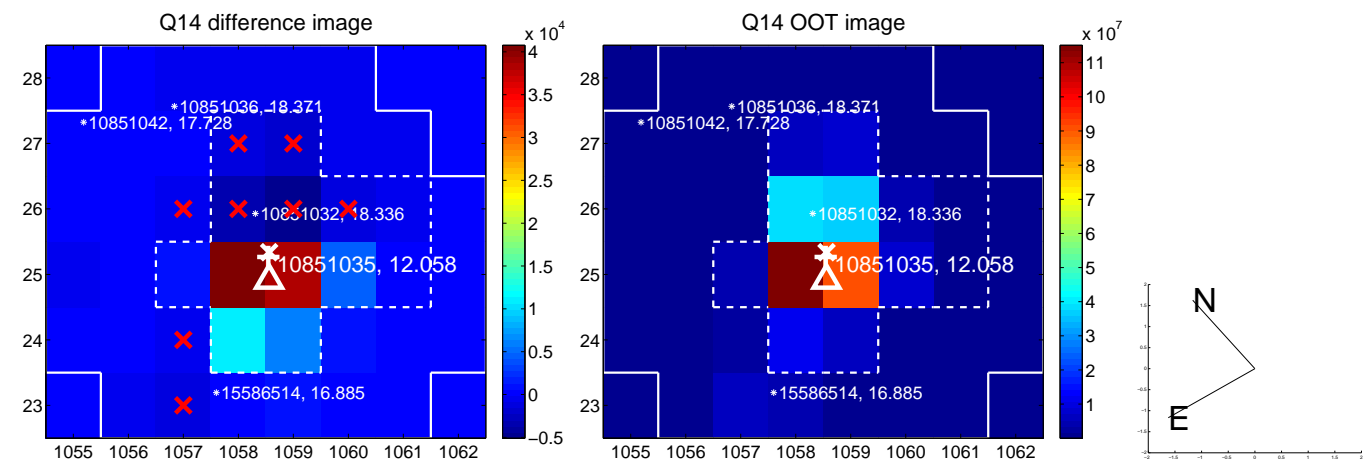
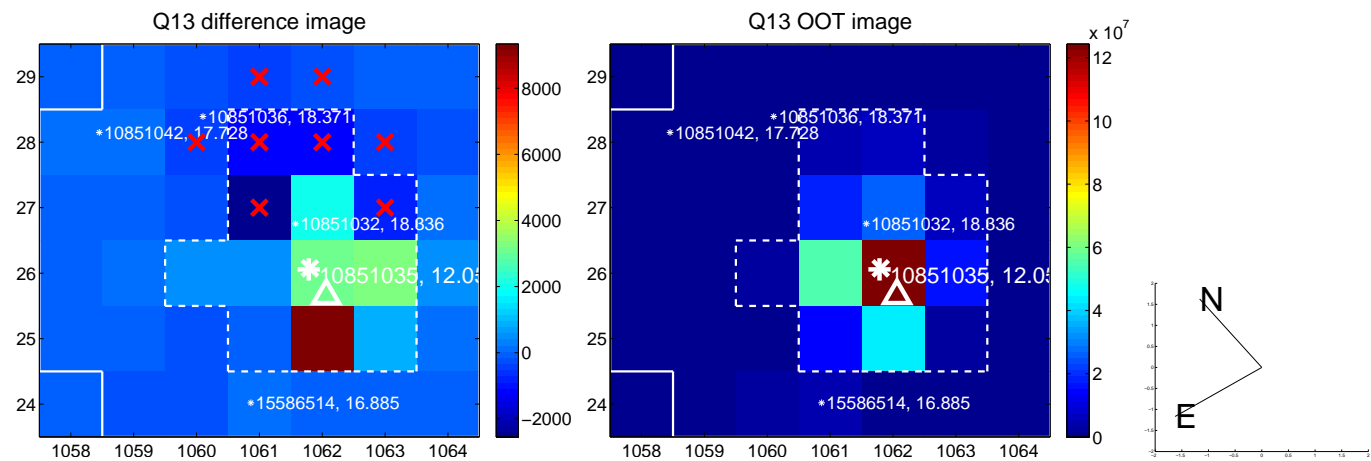
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

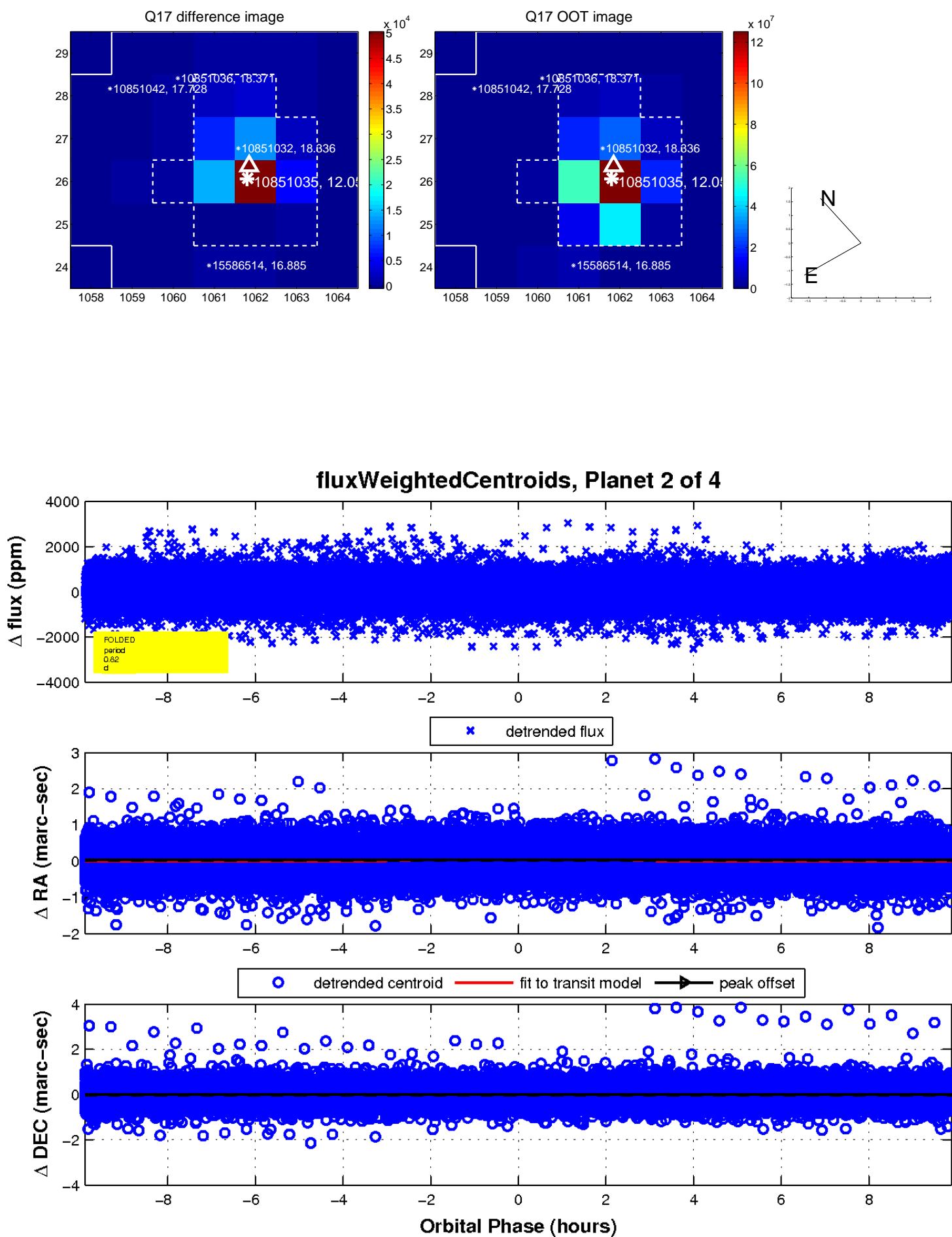


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



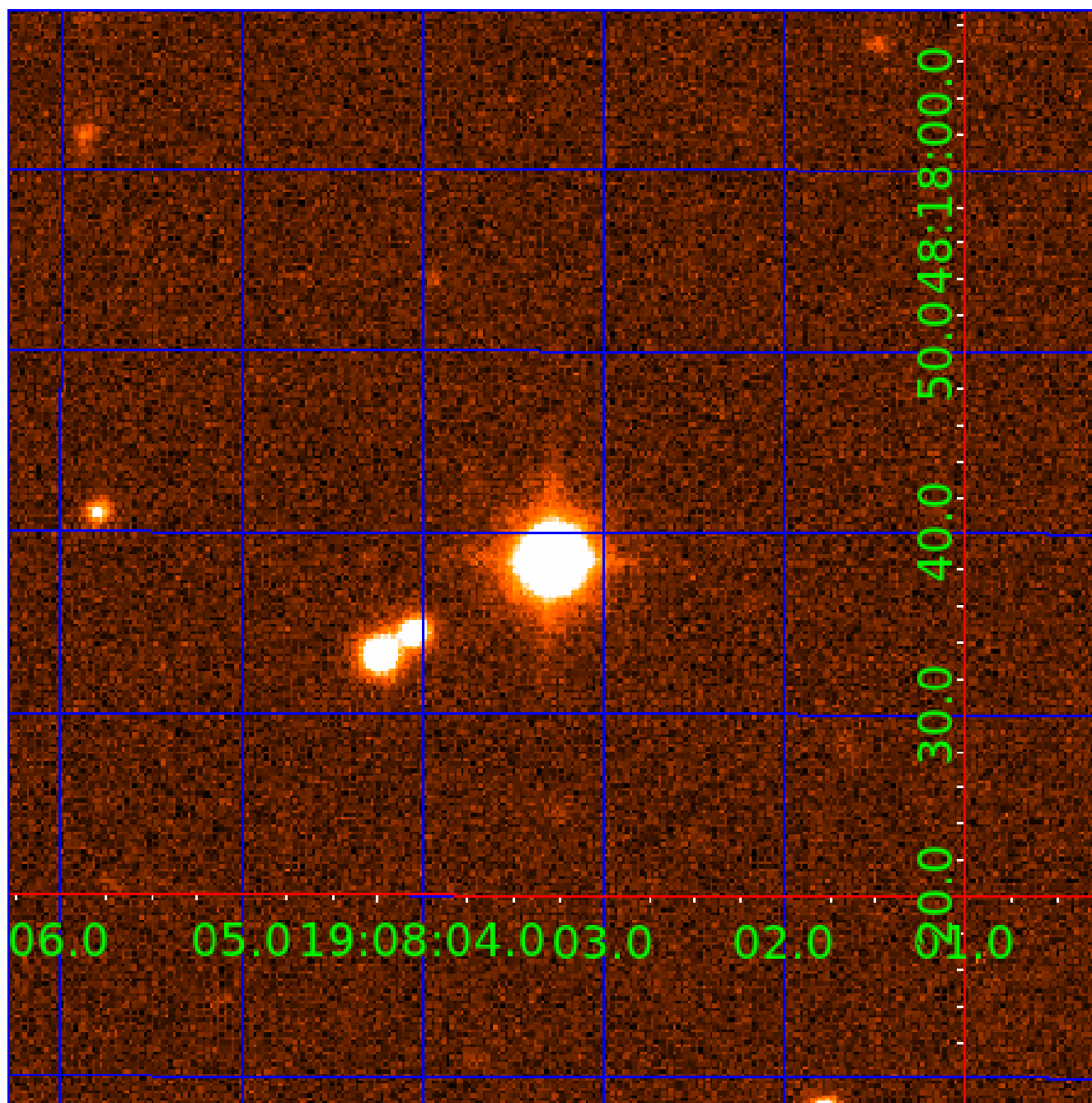


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010851035

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010851035-01	OBS	No	0.823494	131.984826	14.9	1.604	8.8	4.7	1.99	7431	0.89	26794.34
010851035-02	OBS	No	0.823475	132.277481	9.1	6.190	9.0	2.2	1.99	7431	0.64	26795.18
010851035-03	OBS	No	16.459948	146.719813	415.0	3.495	8.8	9.5	1.99	7431	4.12	493.95
010851035-04	OBS	No	32.949798	139.211146	1290.0	2.305	9.5	10.3	1.99	7431	7.42	195.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010851035-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010851035-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010851035-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010851035-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV

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

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

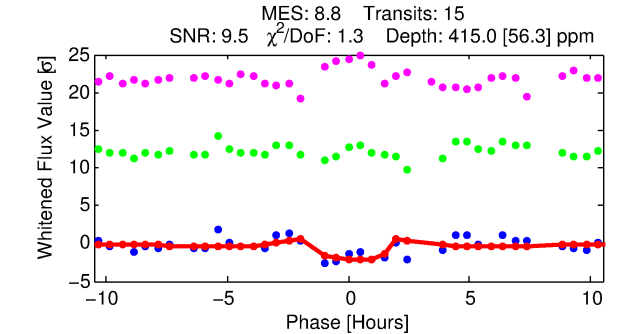
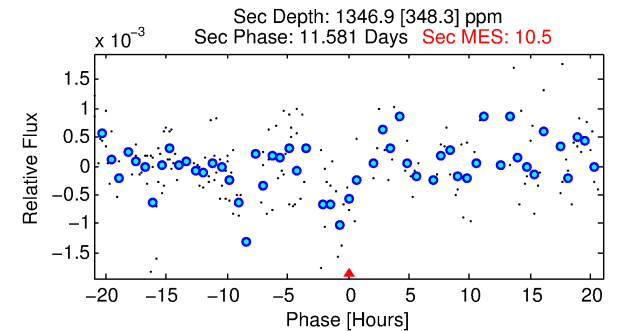
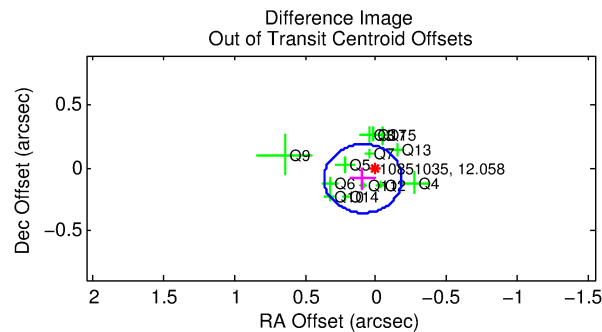
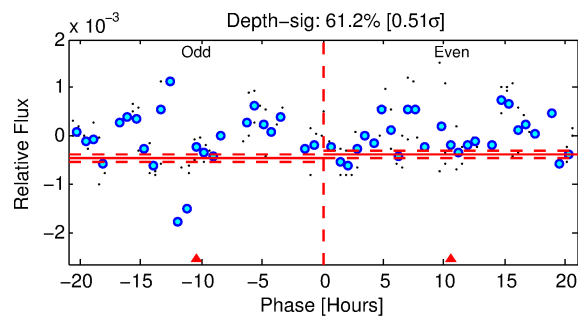
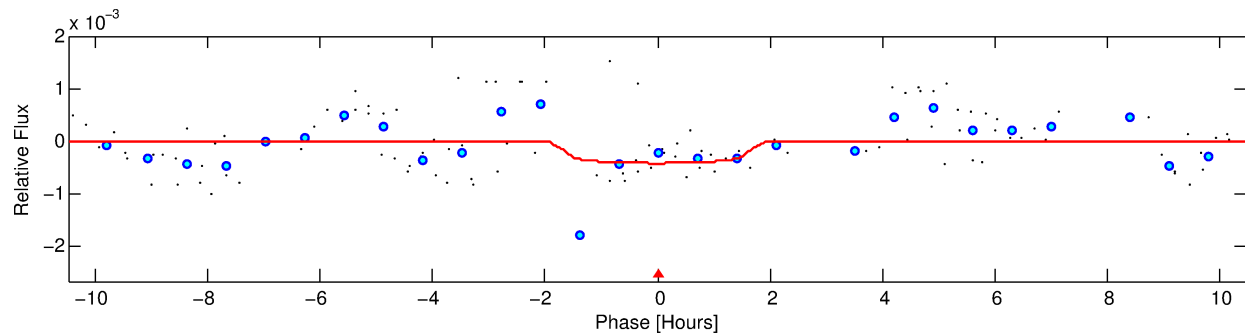
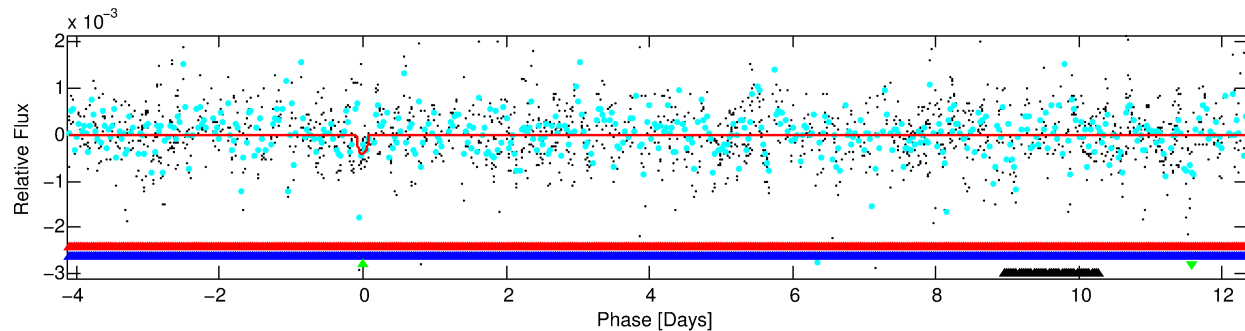
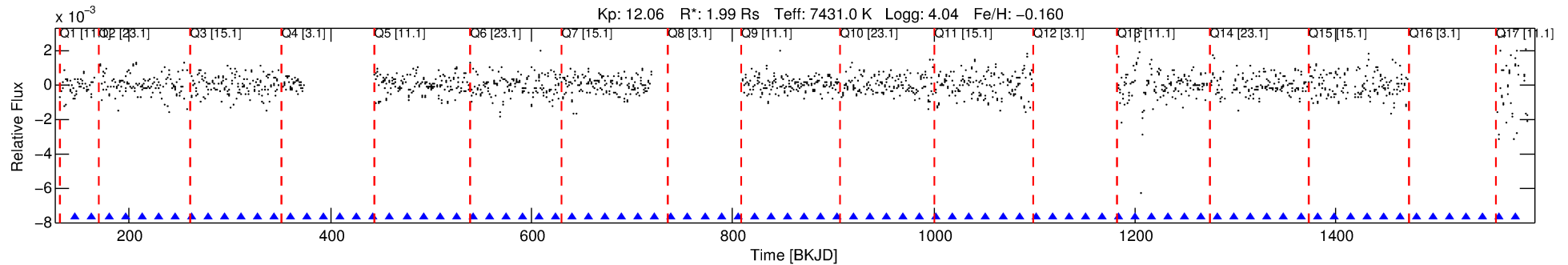
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010851035-03

No Significant Match Found

# DV One-Page Summary

KIC: 10851035 Candidate: 3 of 4 Period: 16.460 d



## DV Fit Results:

Period = 16.45995 [0.00056] d  
Epoch = 146.7198 [0.0237] BKJD  
Rp/R\* = 0.0190 [0.0738]  
a/R\* = 34.16 [710.35]  
b = 0.37 [48.99]  
Seff = 493.95 [189.31]  
Teq = 1202 [115] K  
Rp = 4.13 [16.03] Re  
a = 0.1476 [0.0340] AU  
Ag = 948.91 [7369.90] [0.13 $\sigma$ ]  
Teffp = 10316 [20014] K [0.46 $\sigma$ ]

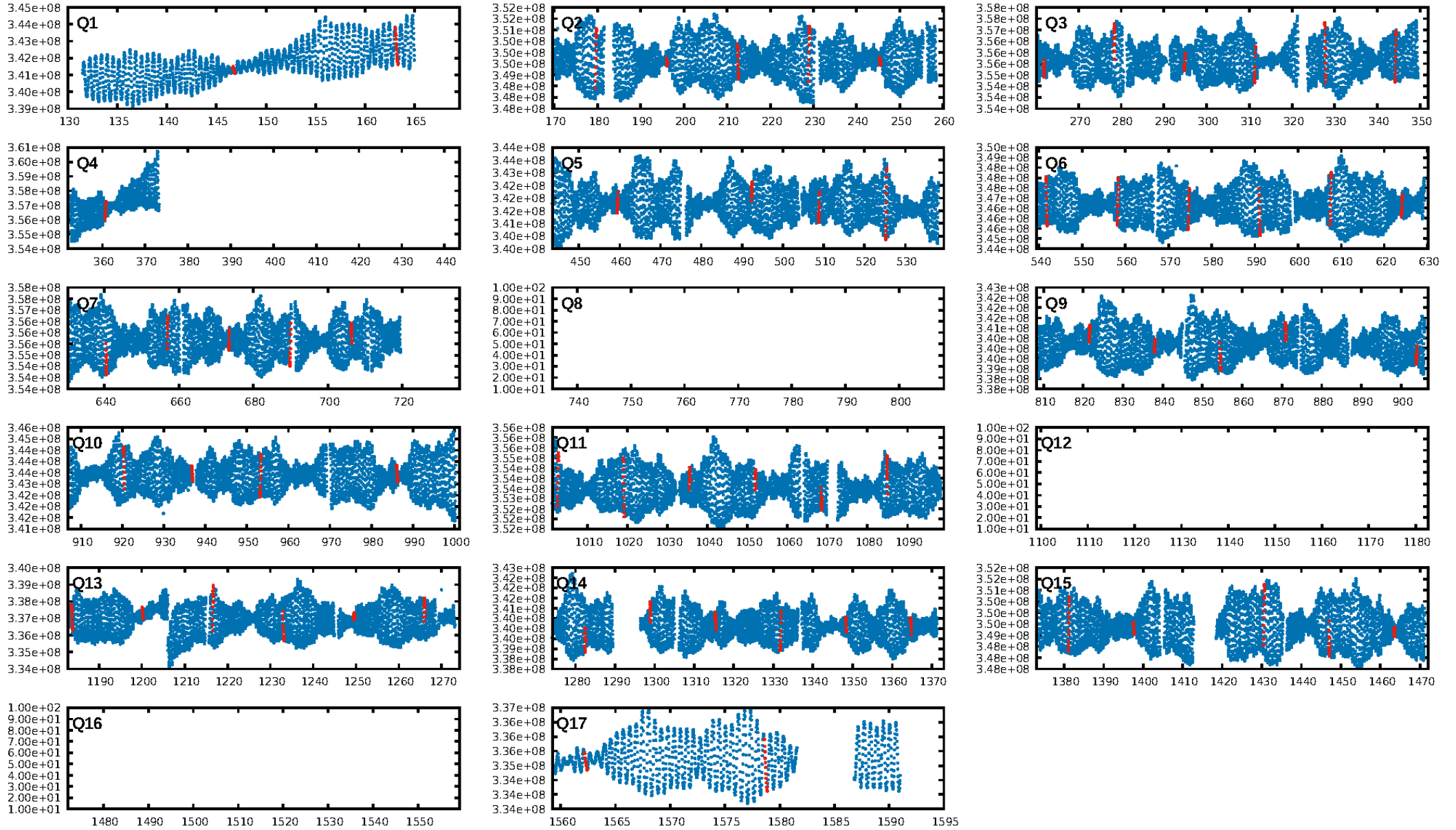
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [97.59 $\sigma$ ]  
LongPeriod-sig: 100.0% [94.53 $\sigma$ ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.16e-15  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 0.3251  
Centroid-sig: 4.6%  
Centroid-so: 0.641 arcsec [4.54 $\sigma$ ]  
OotOffset-rm: 0.127 arcsec [1.38 $\sigma$ ]  
KicOffset-rm: 0.333 arcsec [3.46 $\sigma$ ]  
OotOffset-st: 4/4/1/4 [13]  
KicOffset-st: 4/4/1/4 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 0.00 [0/14]

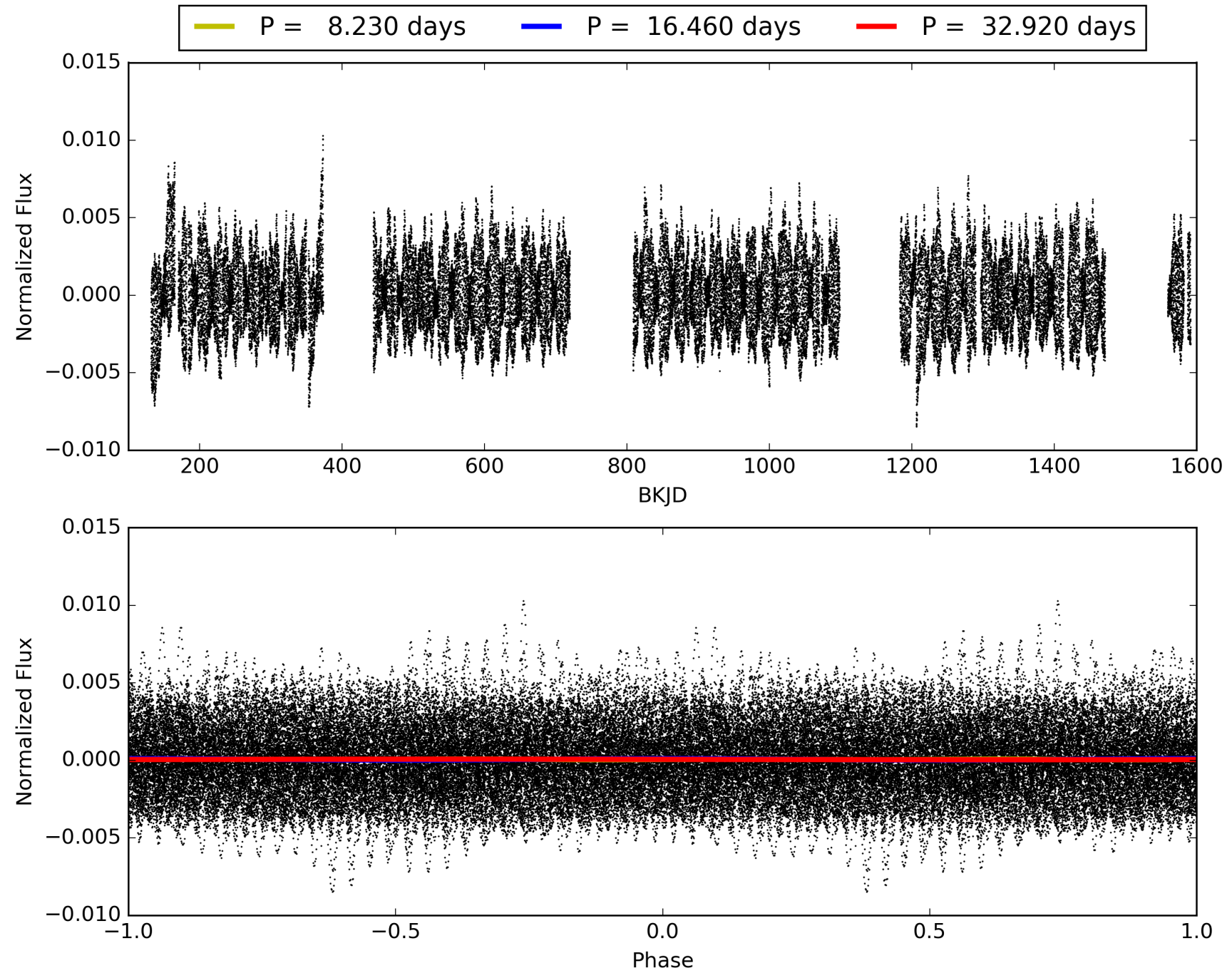
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:24:06 Z

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

# TCE 010851035-03, PDC Light Curves



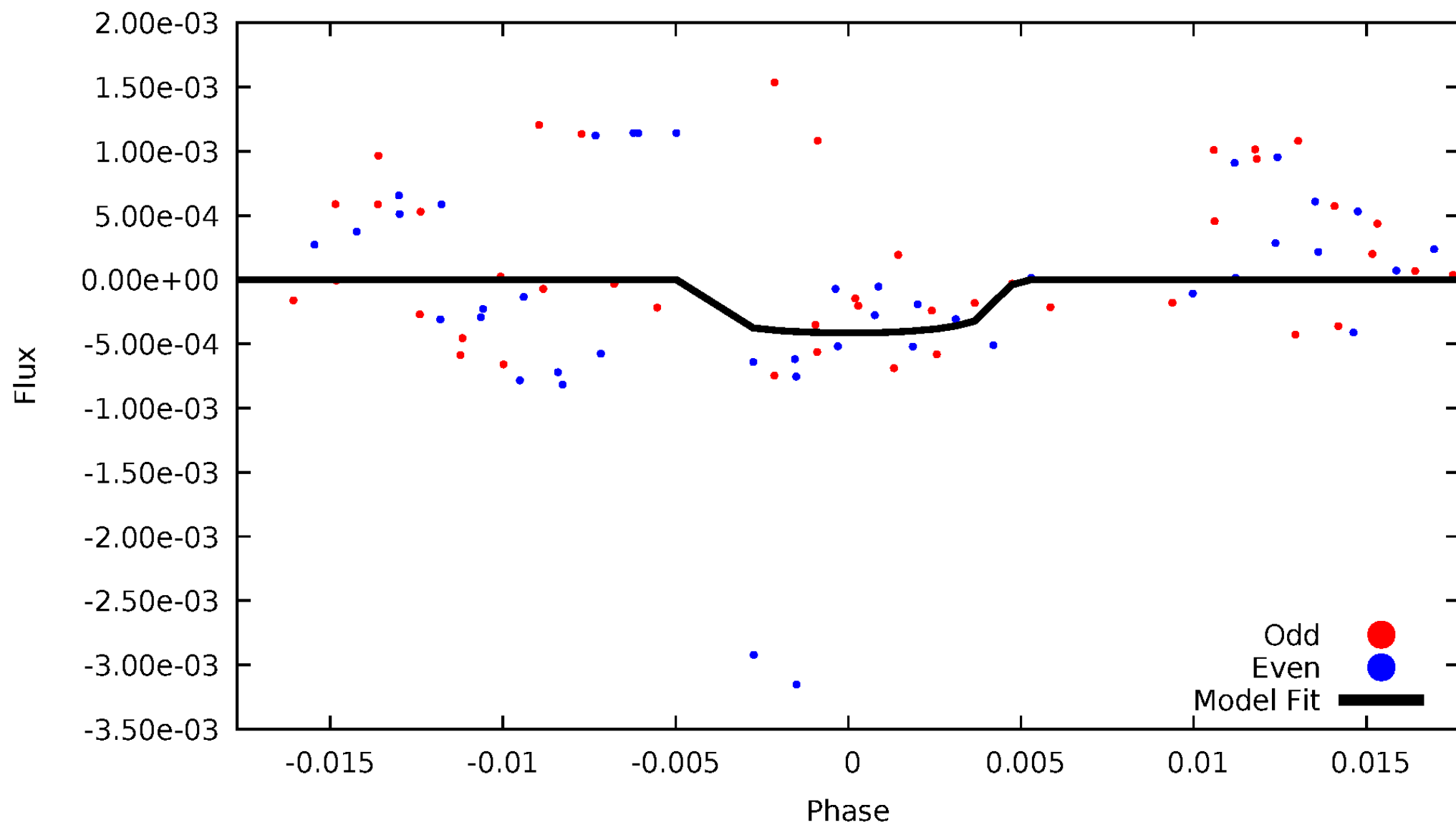
TCE 010851035-03





# DV Odd/Even

TCE 010851035-03



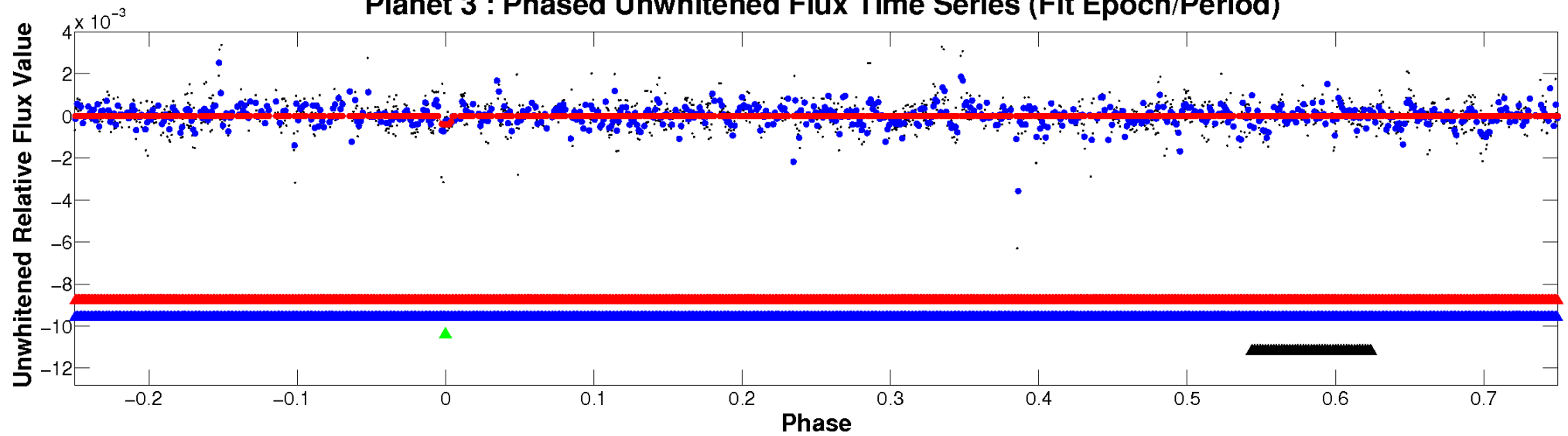


ALT Odd/Even

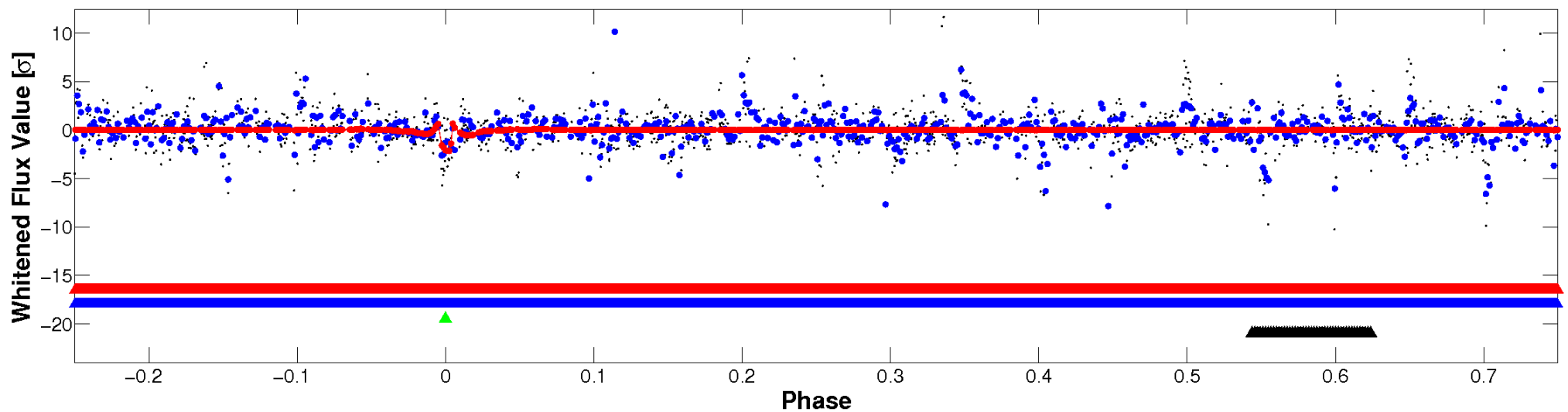
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

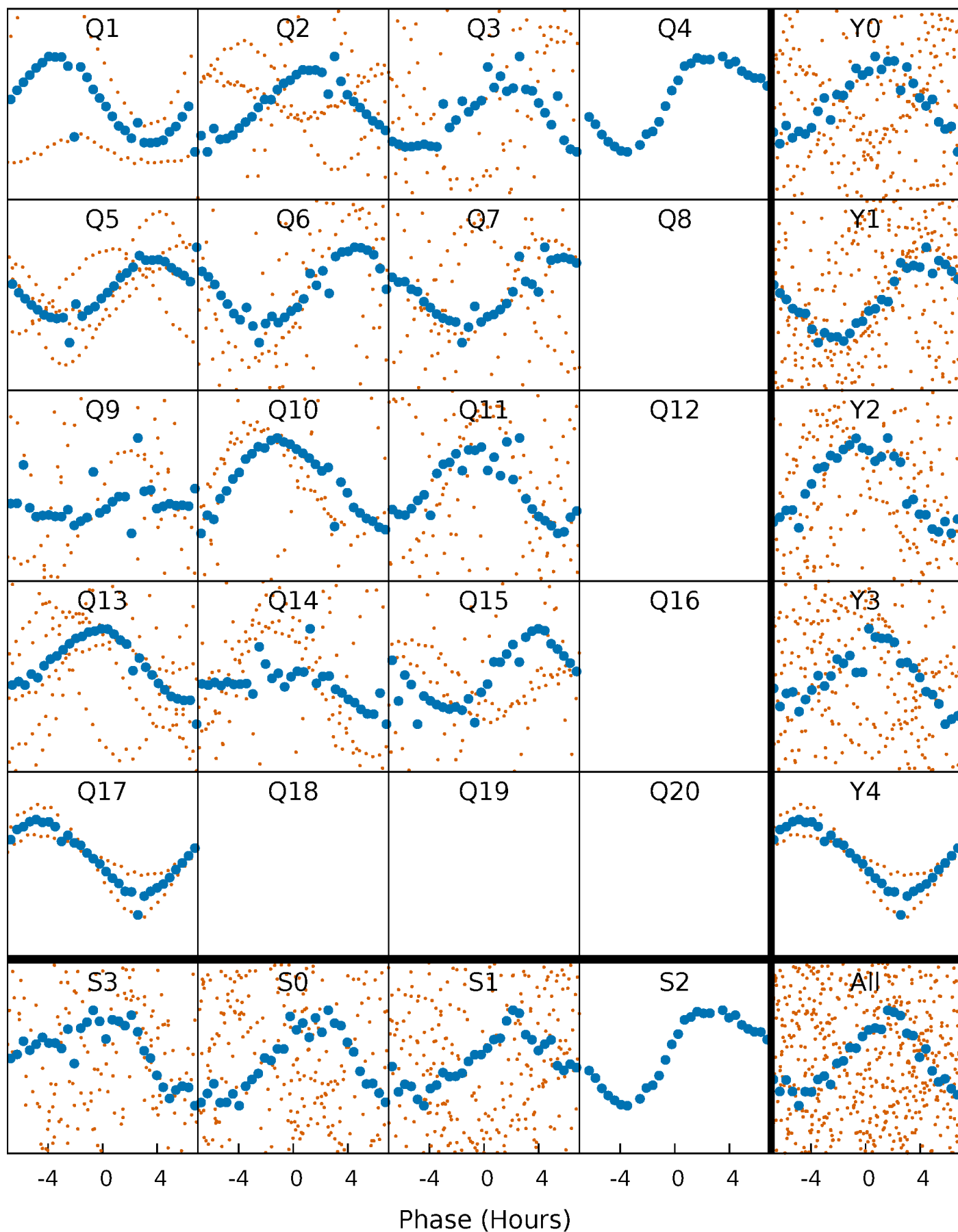


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



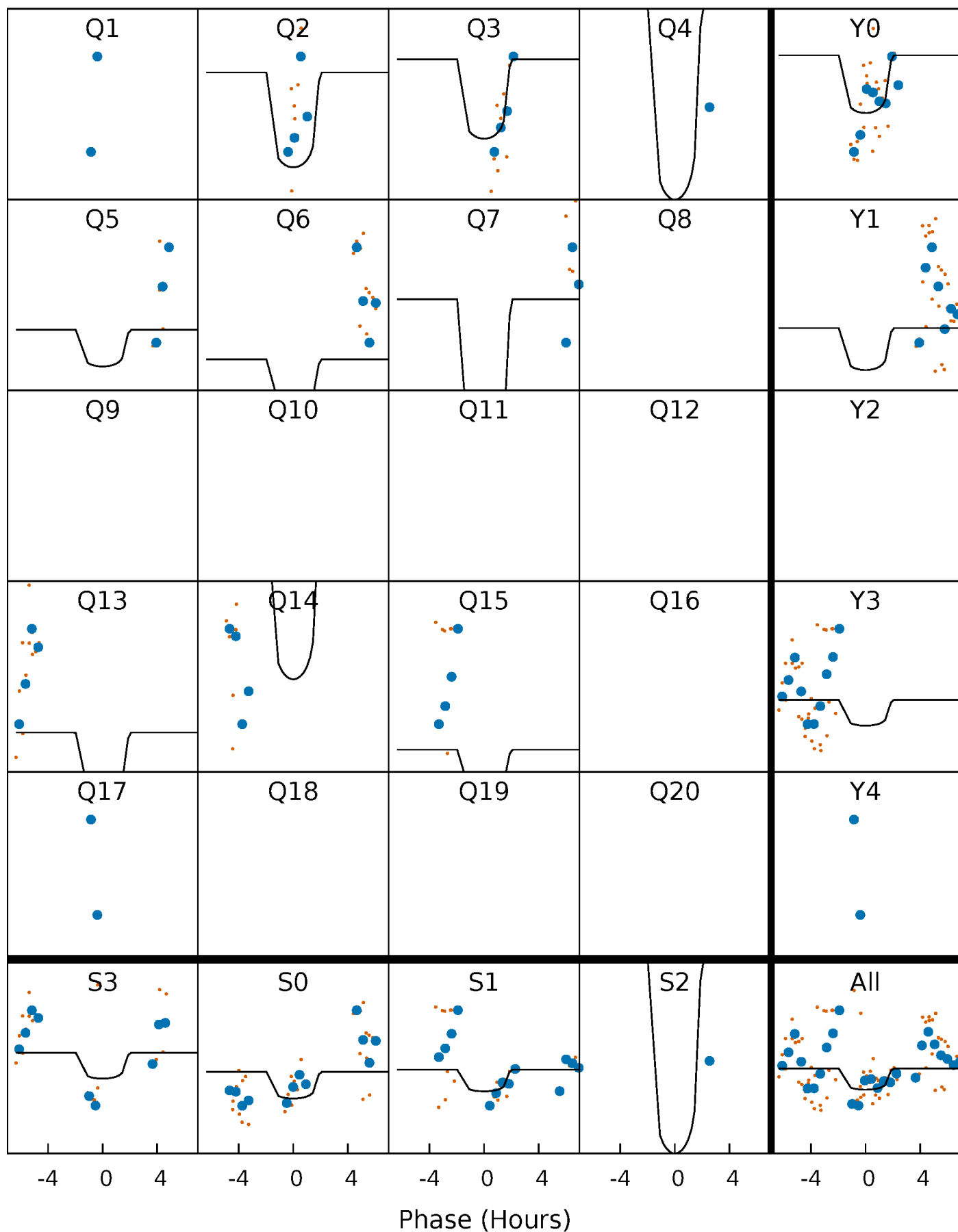
# PDC Quarter-Phased Transit Curves

TCE 010851035-03 P= 16.459948 Days  $T_0=146.719813$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 010851035-03 P= 16.459948 Days  $T_0=146.719813$  (BKJD)



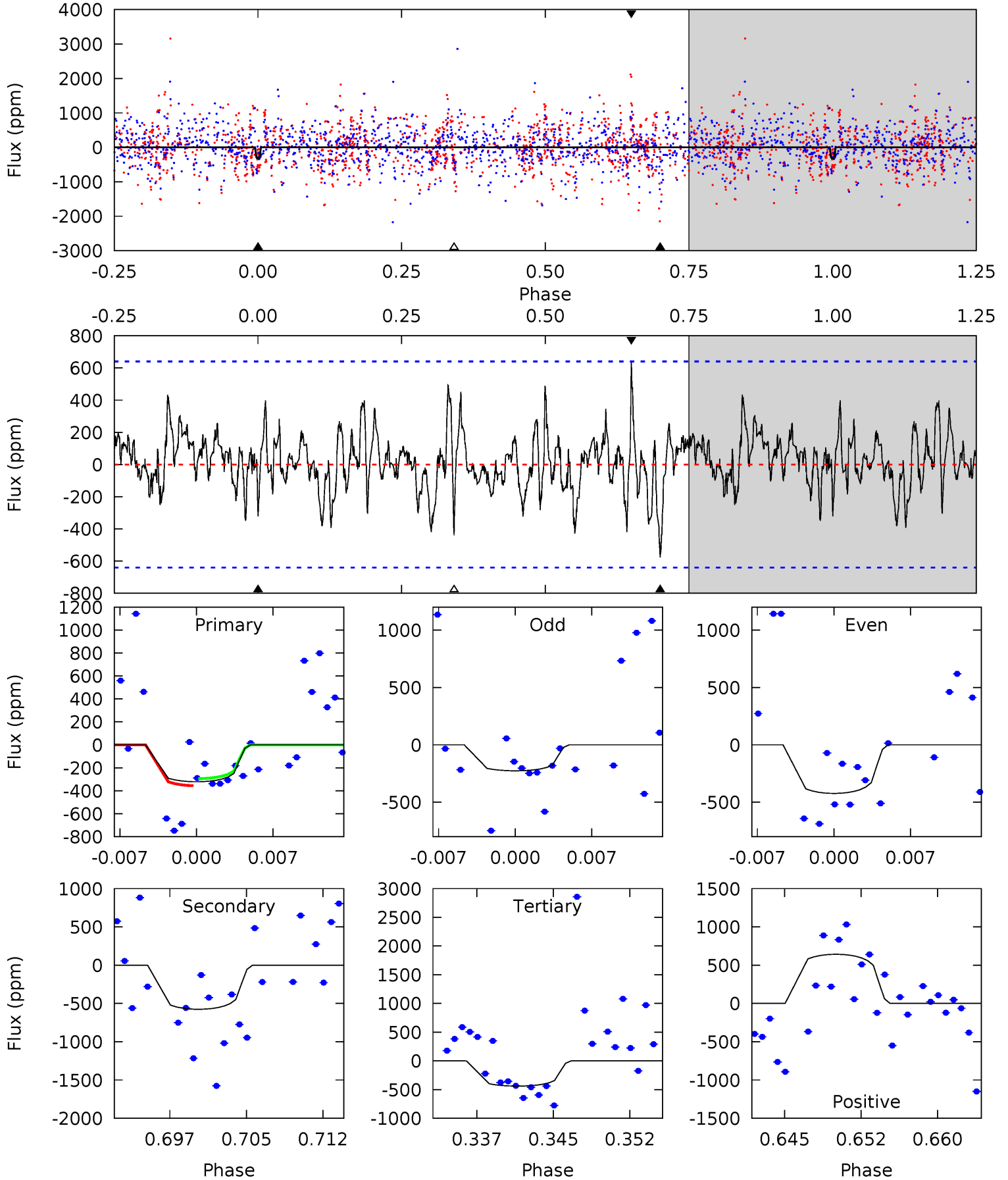


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

010851035-03, P = 16.459948 Days, E = 130.259865 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
2.55	4.57	3.48	5.10	5.08	2.67	1.36	-0.93	-2.55	1.09	-0.53	0.75	1.32	0.53	0.24



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 010851035

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7431^{+233}_{-311}$	$4.042^{+0.193}_{-0.158}$	$-0.160^{+0.250}_{-0.350}$	$1.985^{+0.525}_{-0.525}$	$1.580^{+0.213}_{-0.260}$	$0.284^{+0.326}_{-0.134}$
	+3%/-4%	+5%/-4%	+156%/-219%	+26%/-26%	+13%/-16%	+115%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010851035-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-576 \pm 126$	$12.68^{+12.36}_{-9.15}$	$1674^{+118}_{-121}$	$4742^{+4440}_{-1041}$	$43^{+466}_{-32}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

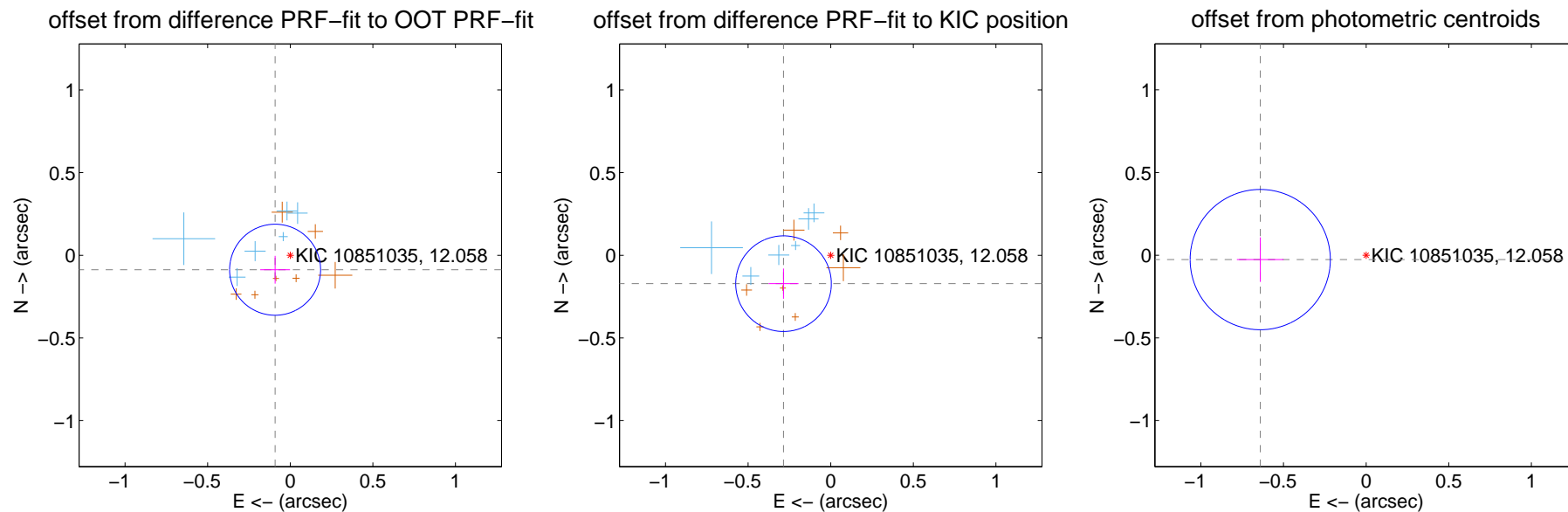
## DV Centroid Data

Supplemental centroid analysis for 010851035-03. Kepler magnitude: 12.06. Transit SNR 9.47

There are 6 quarters with good PRF difference image offsets

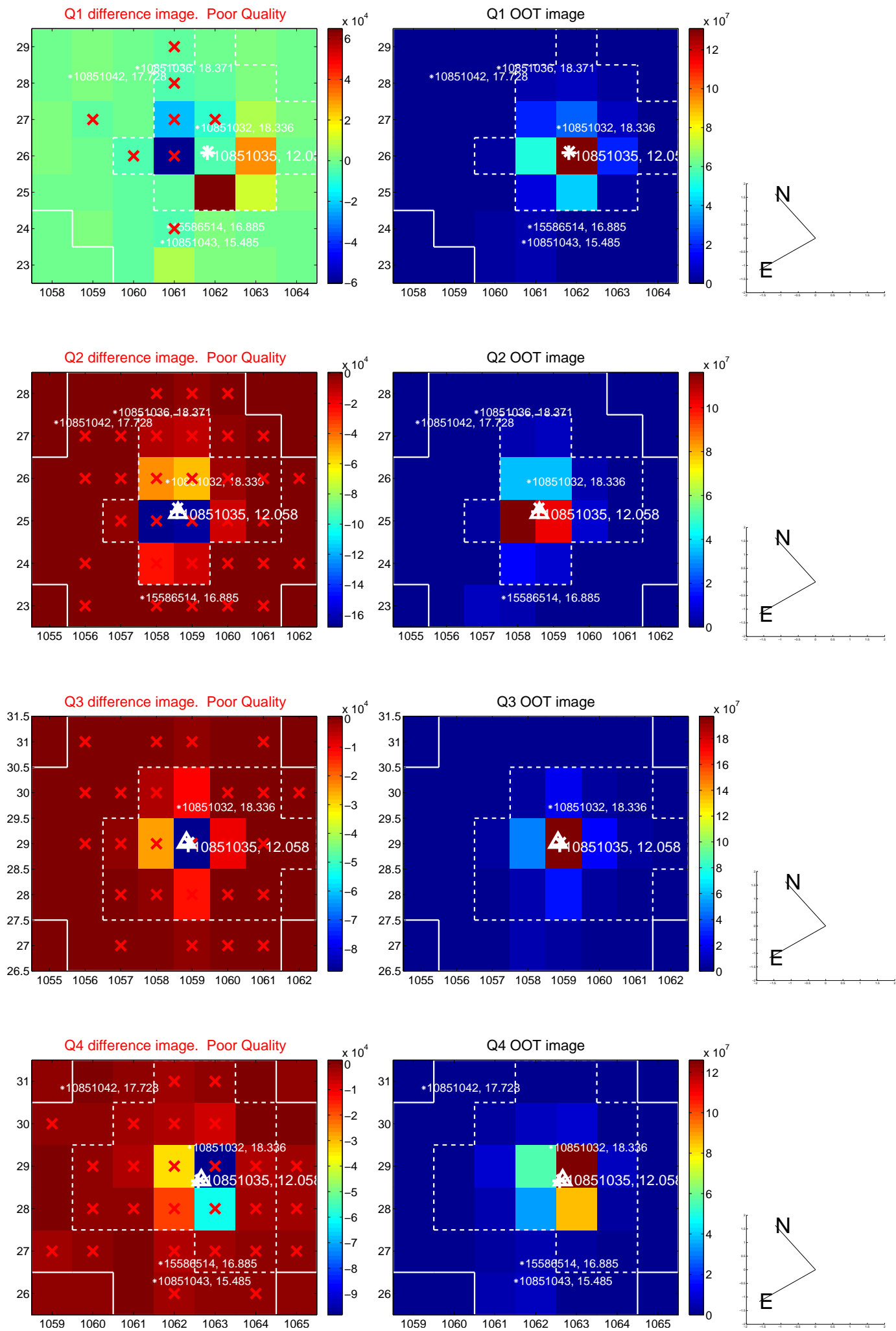
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.127 \pm 0.092$	1.38	$0.092 \pm 0.090$	$-0.087 \pm 0.084$
PRF-fit source offset from KIC position	$0.333 \pm 0.096$	3.46	$0.286 \pm 0.090$	$-0.172 \pm 0.091$
photometric centroid source offset	$0.64 \pm 0.14$	4.54	$0.64 \pm 0.14$	$-0.03 \pm 0.13$



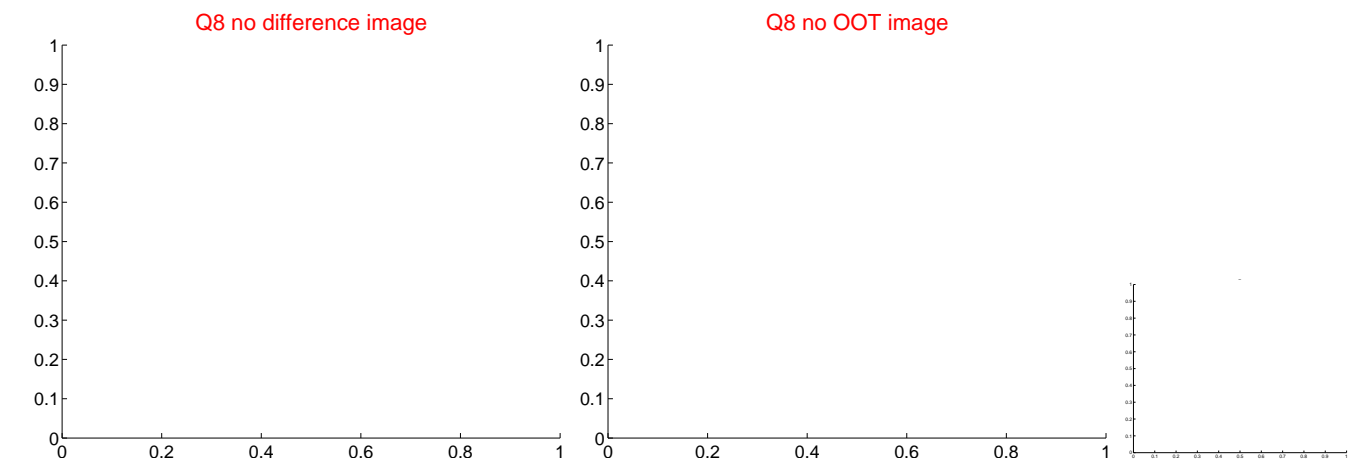
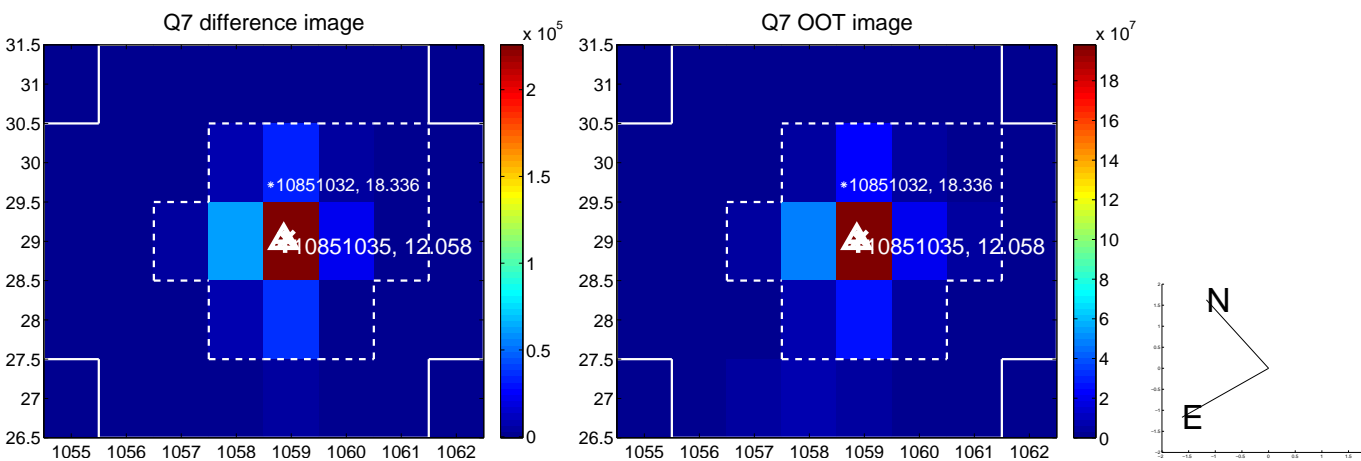
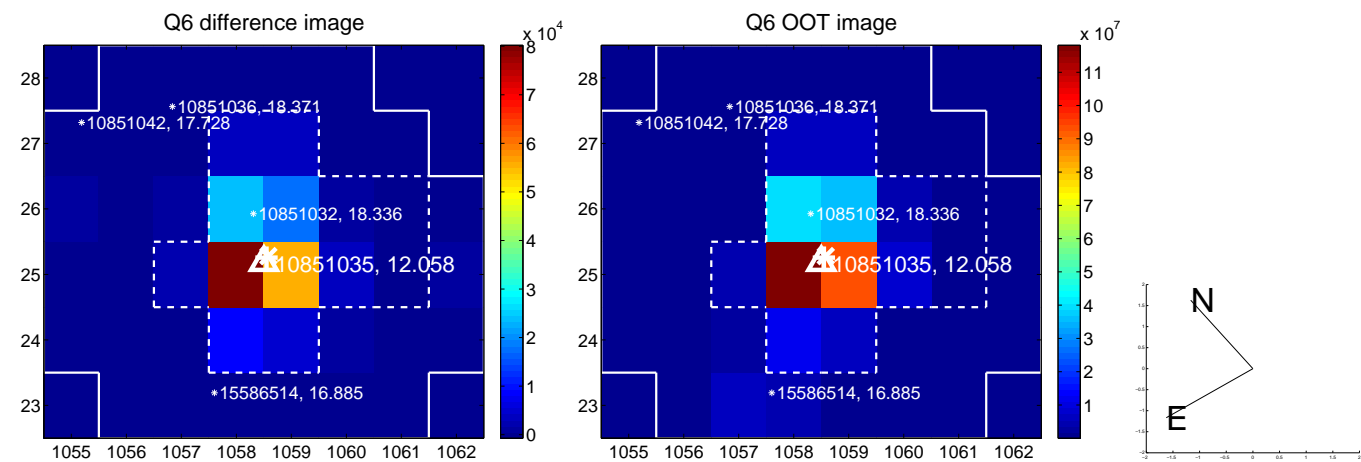
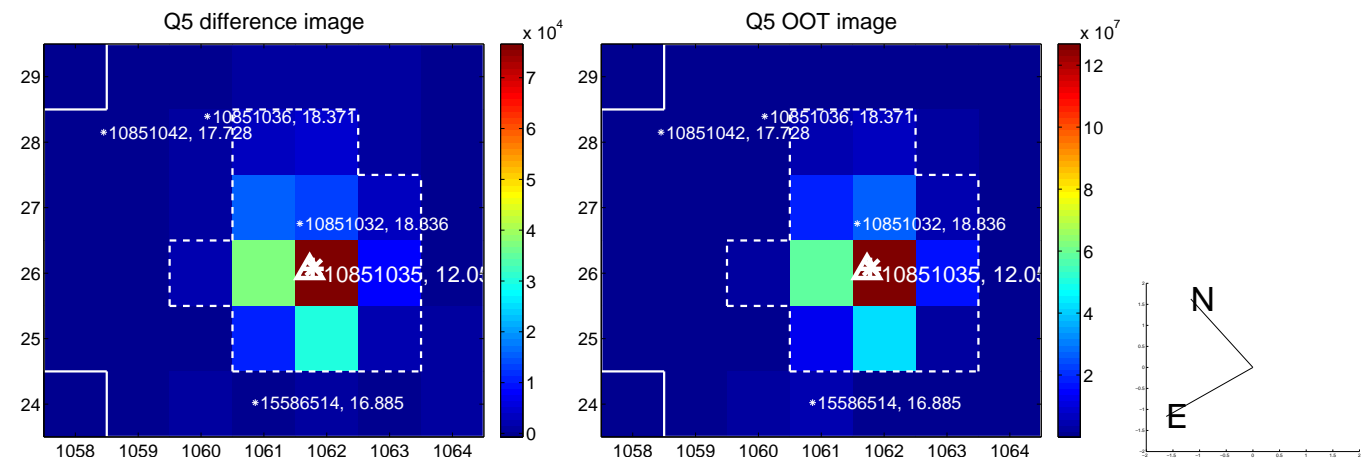
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

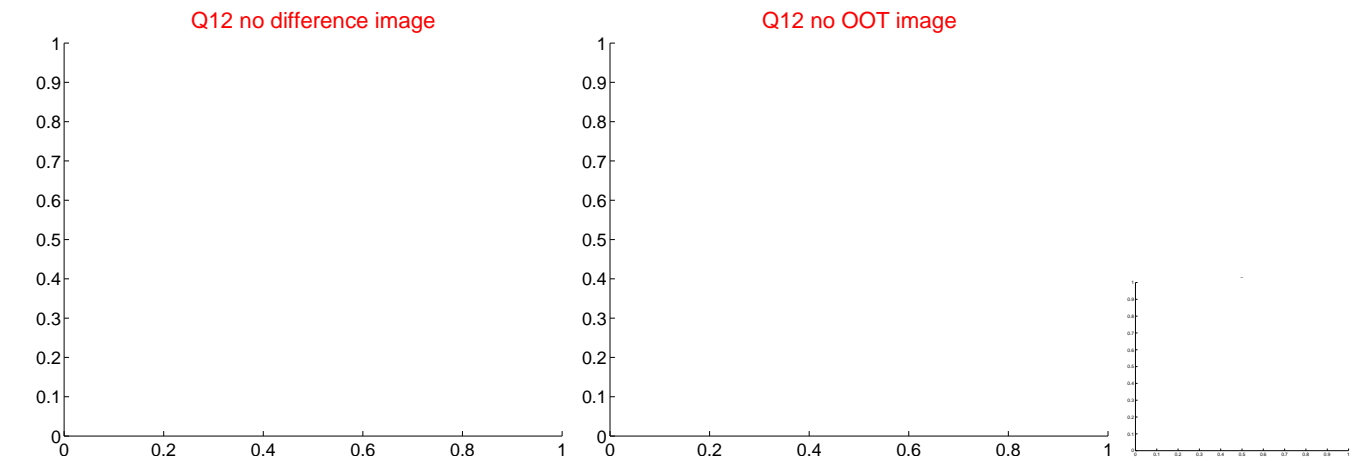
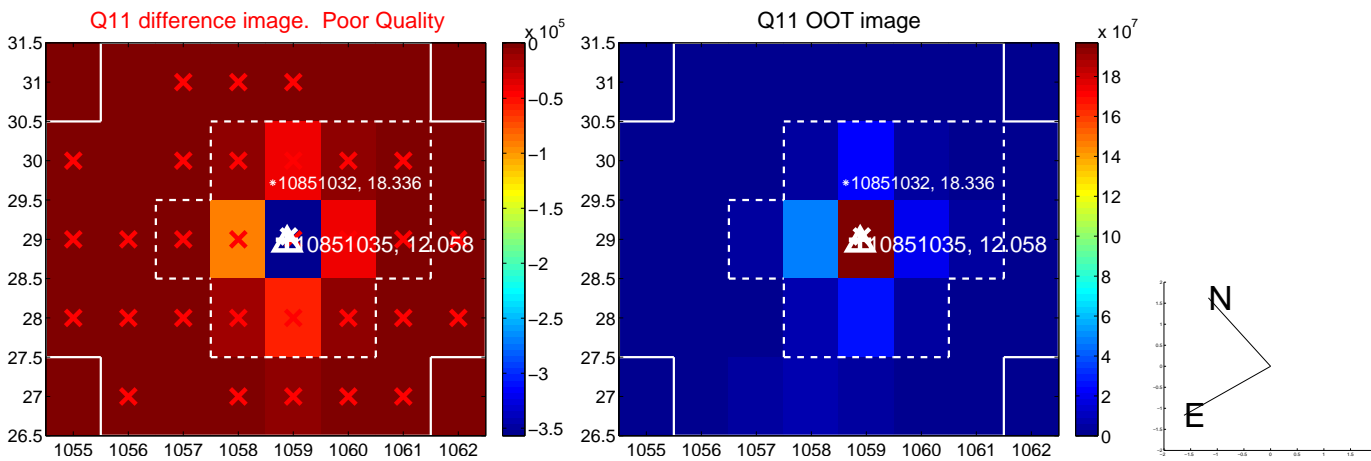
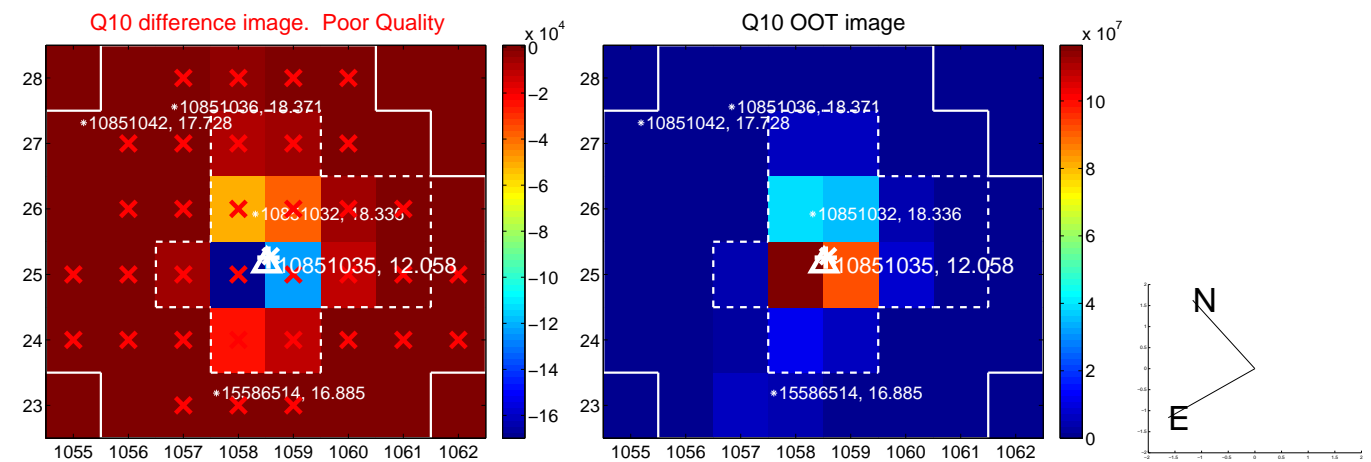
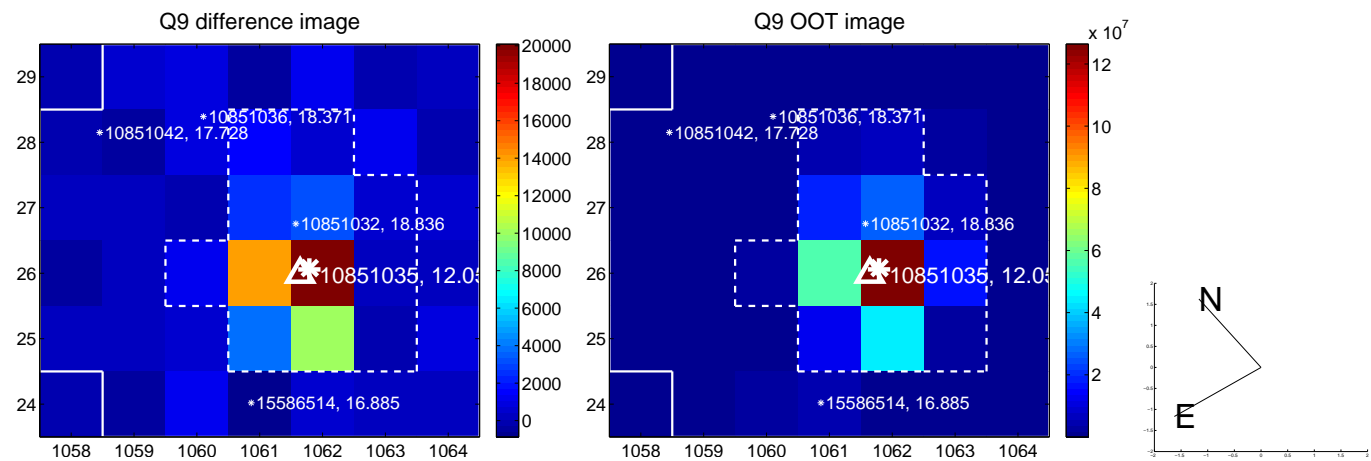




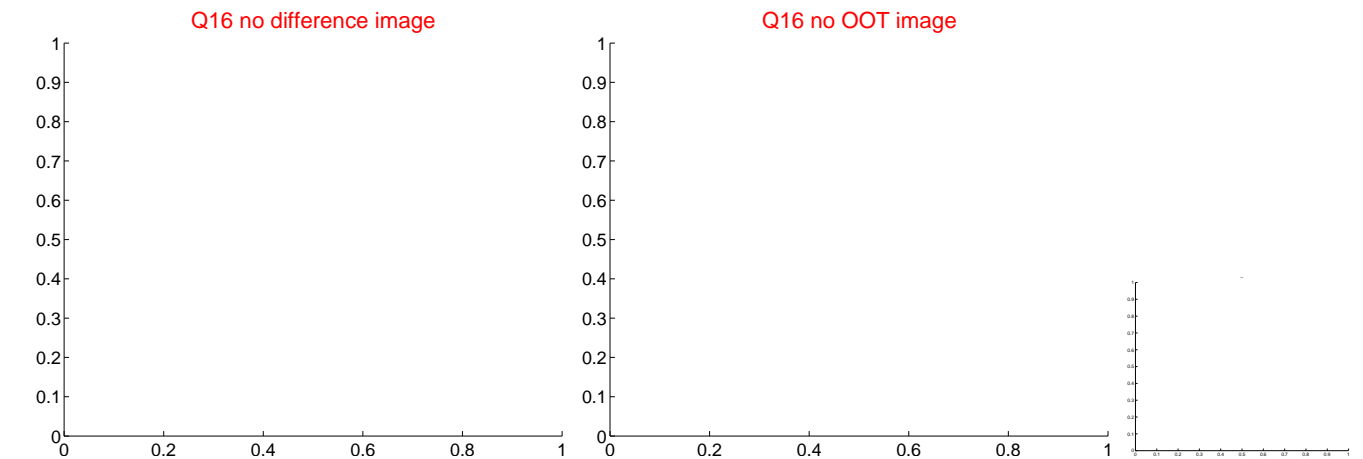
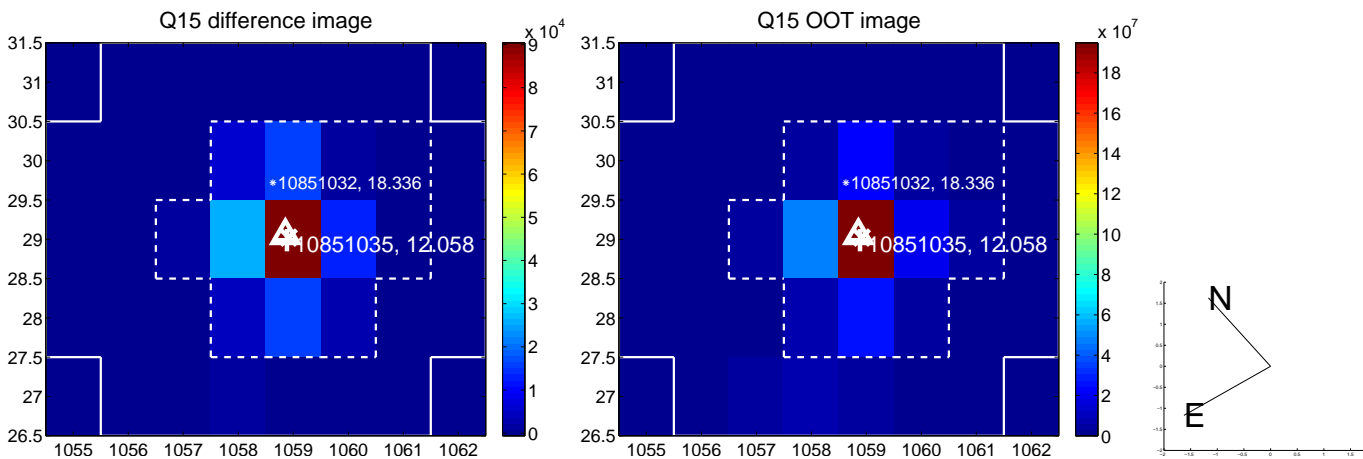
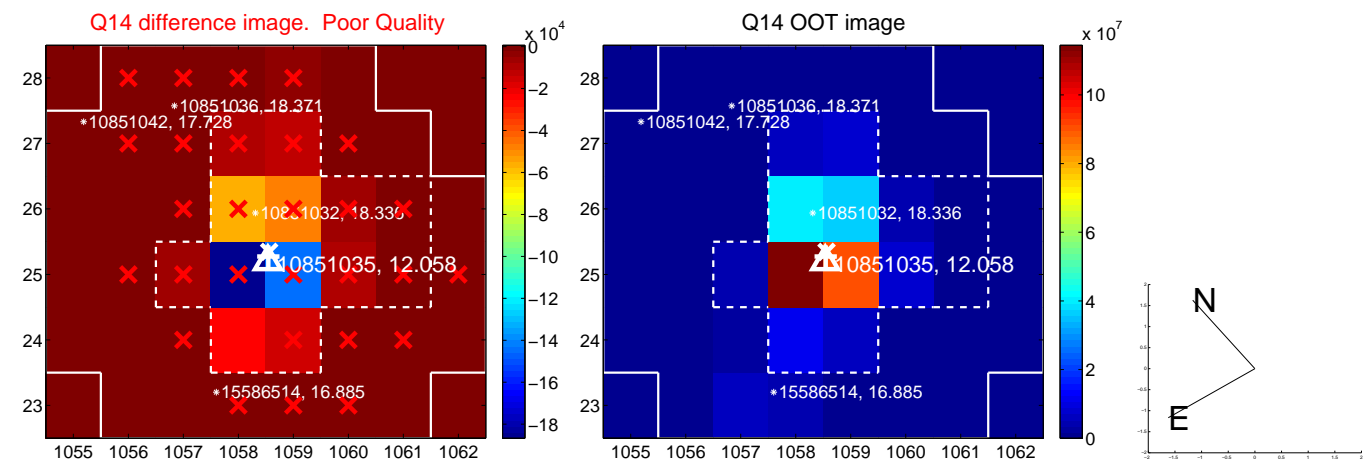
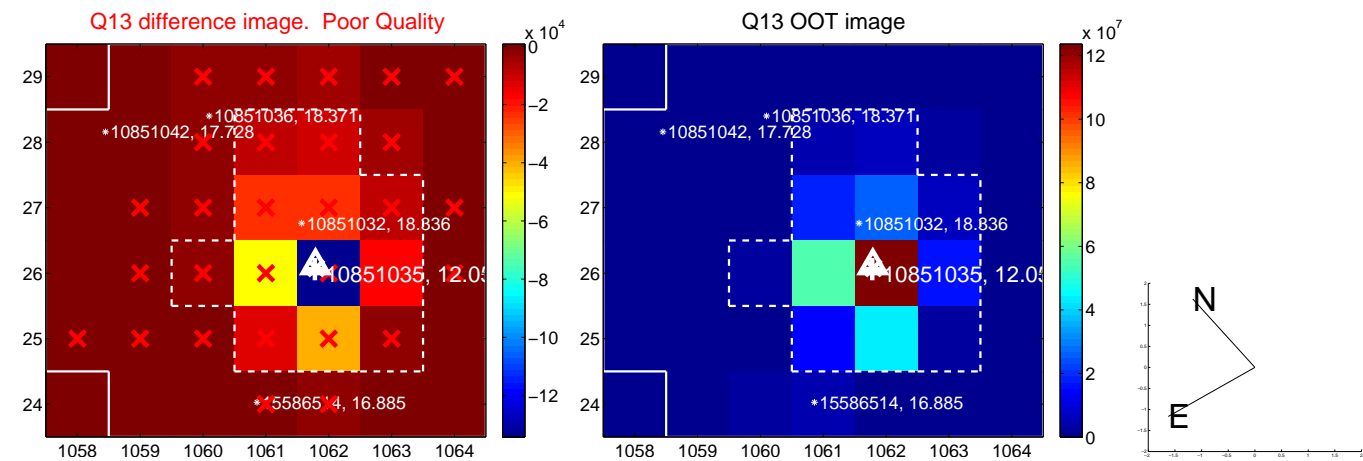
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



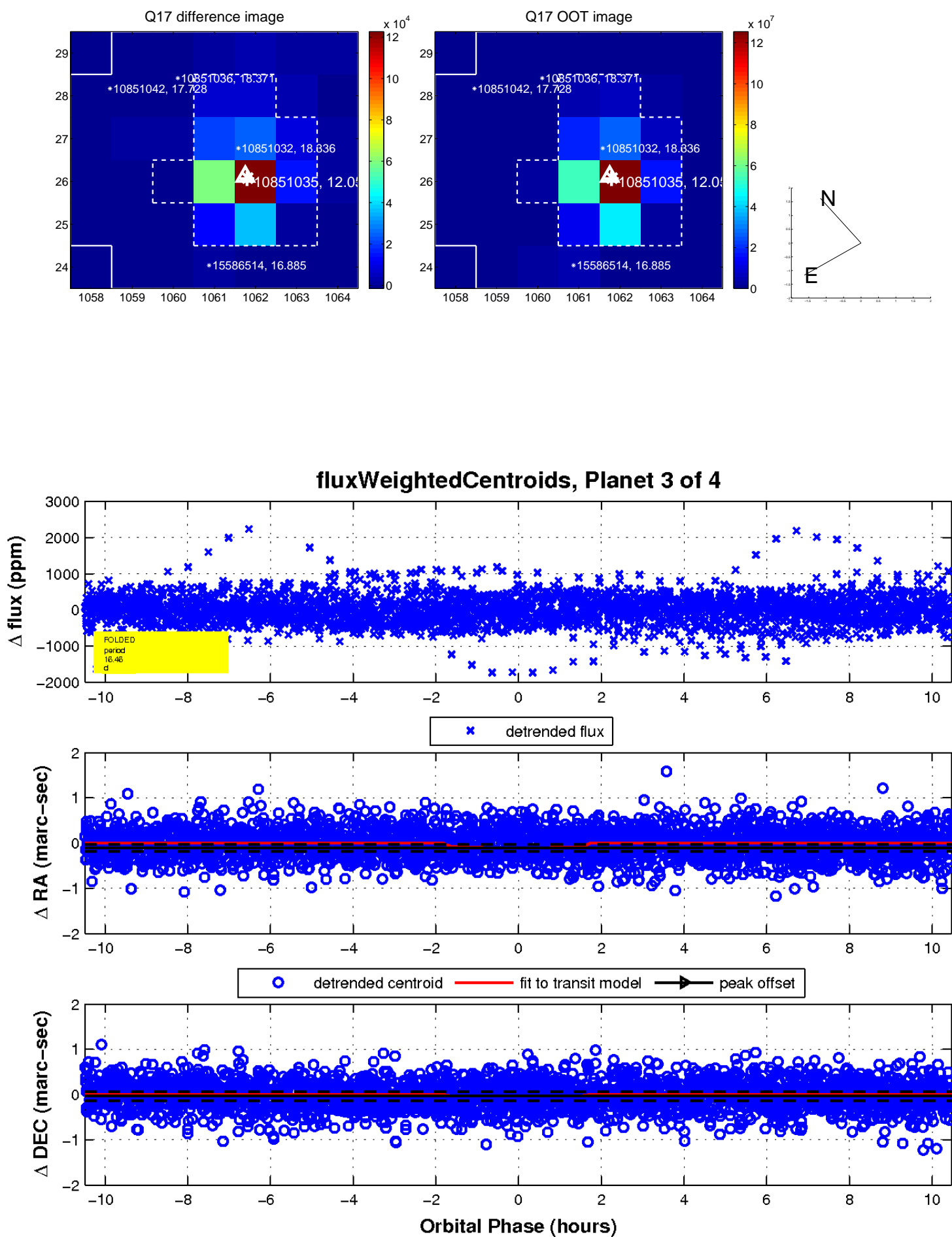
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

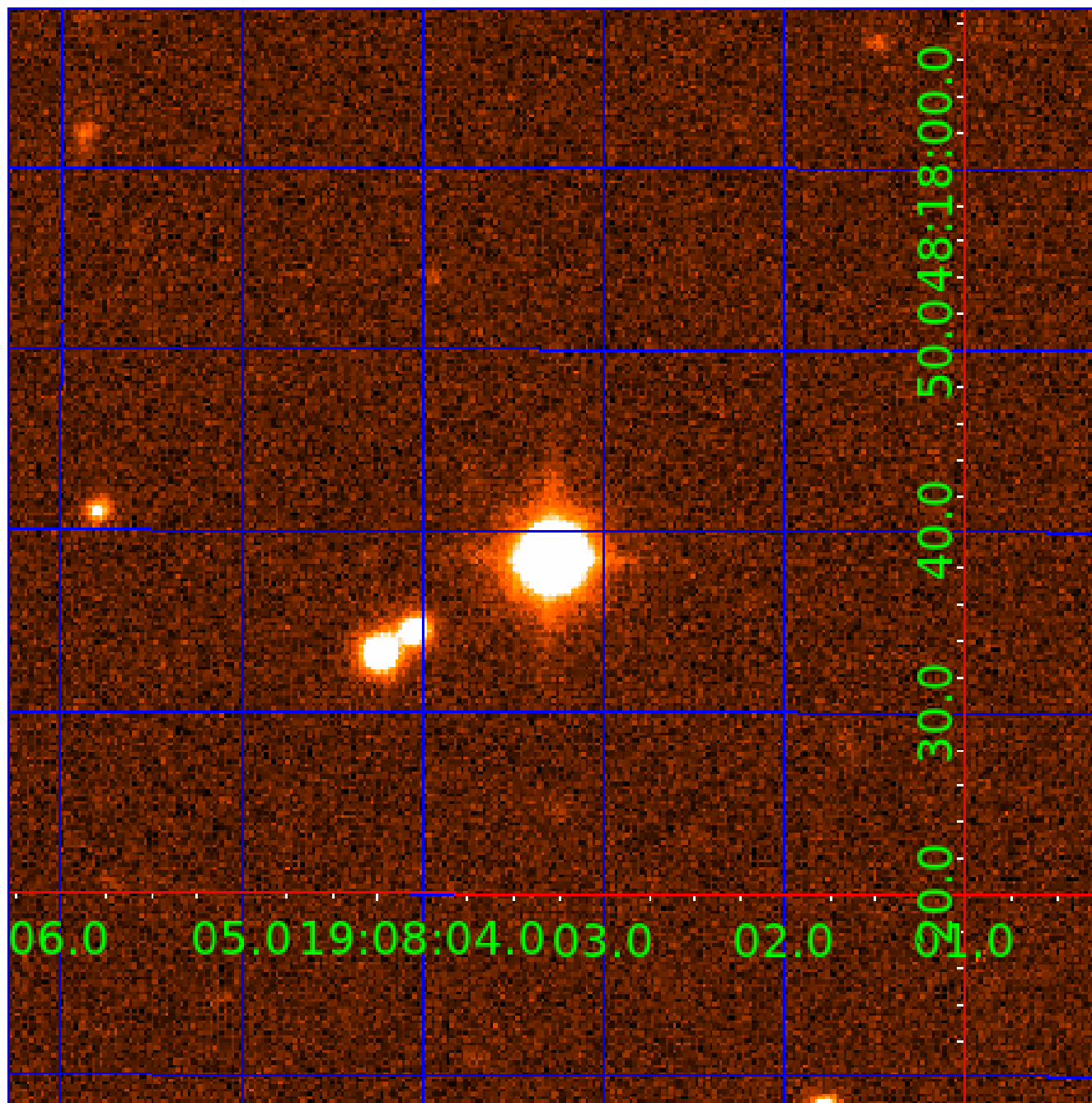


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010851035

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010851035-01	OBS	No	0.823494	131.984826	14.9	1.604	8.8	4.7	1.99	7431	0.89	26794.34
010851035-02	OBS	No	0.823475	132.277481	9.1	6.190	9.0	2.2	1.99	7431	0.64	26795.18
010851035-03	OBS	No	16.459948	146.719813	415.0	3.495	8.8	9.5	1.99	7431	4.12	493.95
010851035-04	OBS	No	32.949798	139.211146	1290.0	2.305	9.5	10.3	1.99	7431	7.42	195.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010851035-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010851035-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
010851035-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010851035-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV

**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.

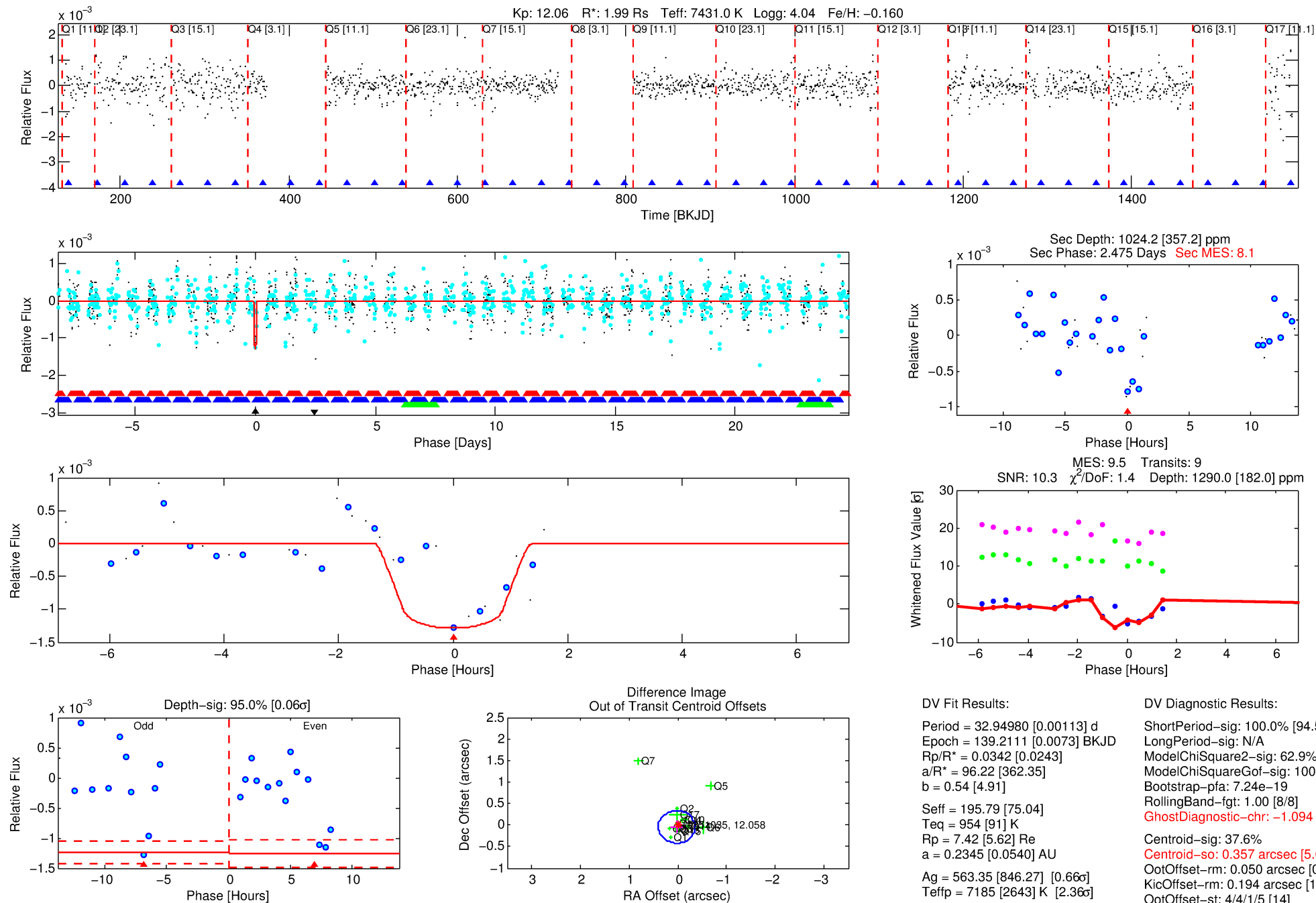
Ephemeris Match Information For 010851035-04

No Significant Match Found



# DV One-Page Summary

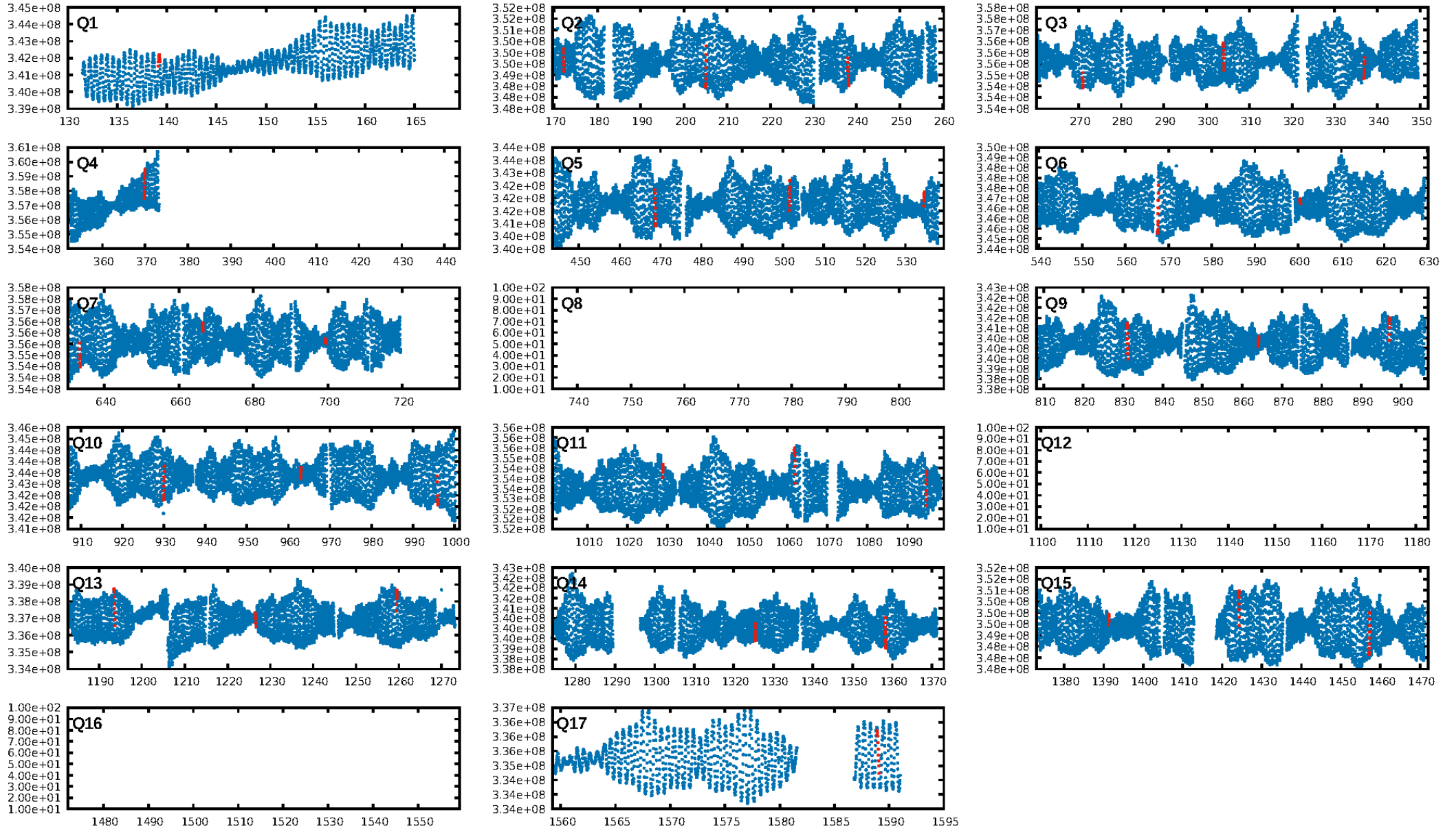
KIC: 10851035 Candidate: 4 of 4 Period: 32.950 d



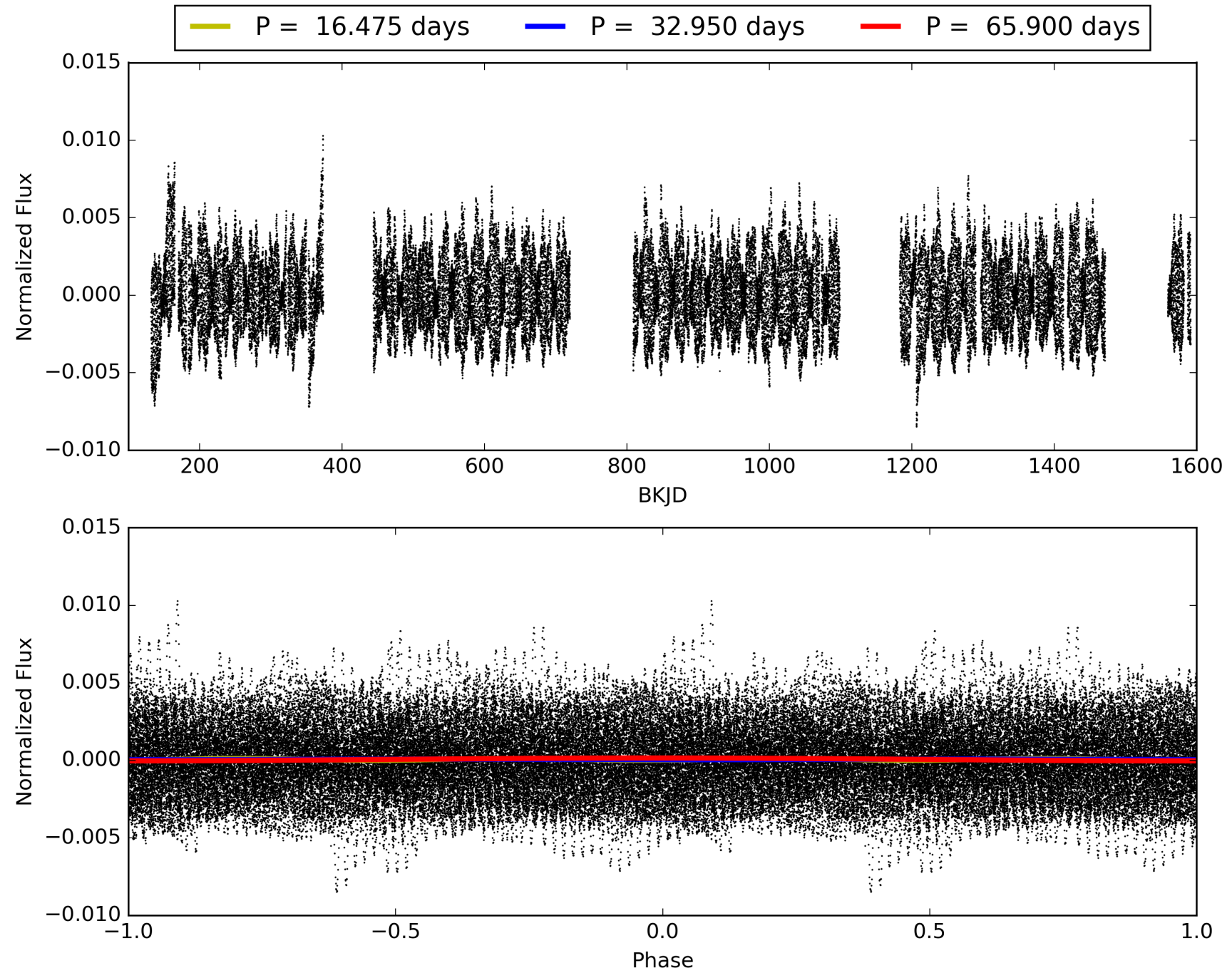
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:24:09 Z

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

# TCE 010851035-04, PDC Light Curves

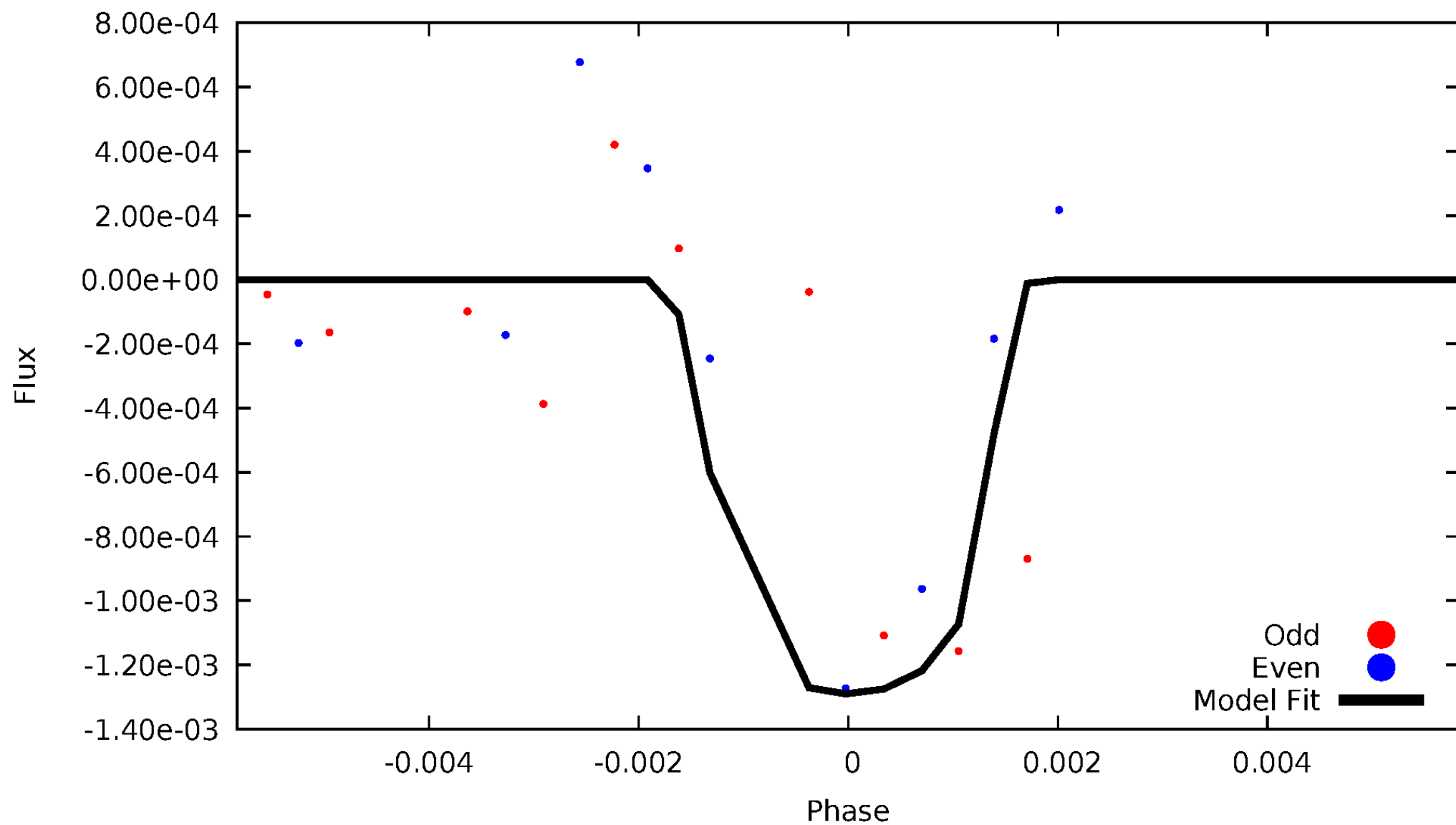


TCE 010851035-04



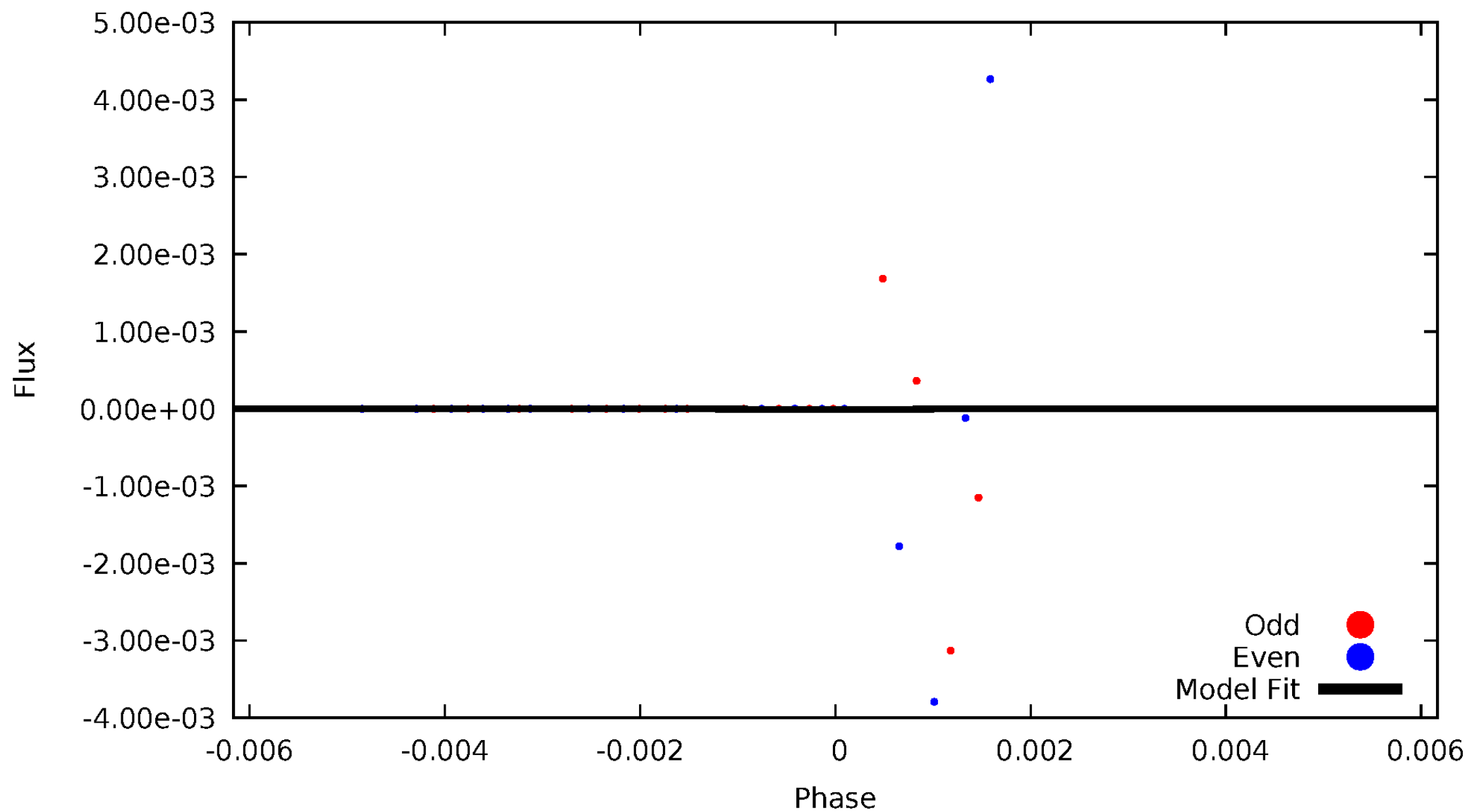
# DV Odd/Even

TCE 010851035-04



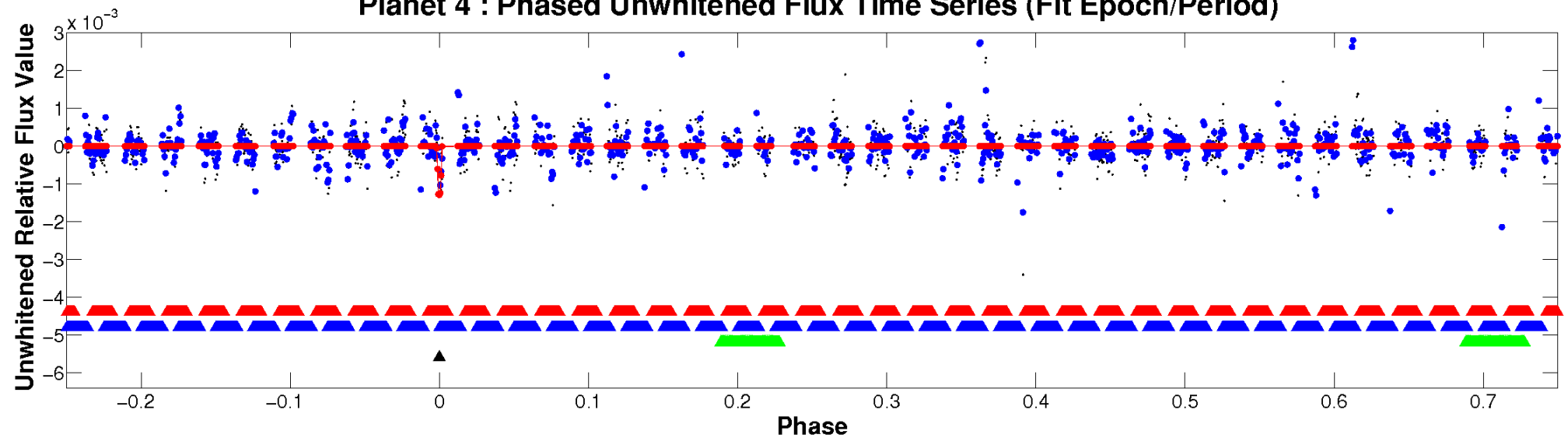
# ALT Odd/Even

TCE 010851035-04

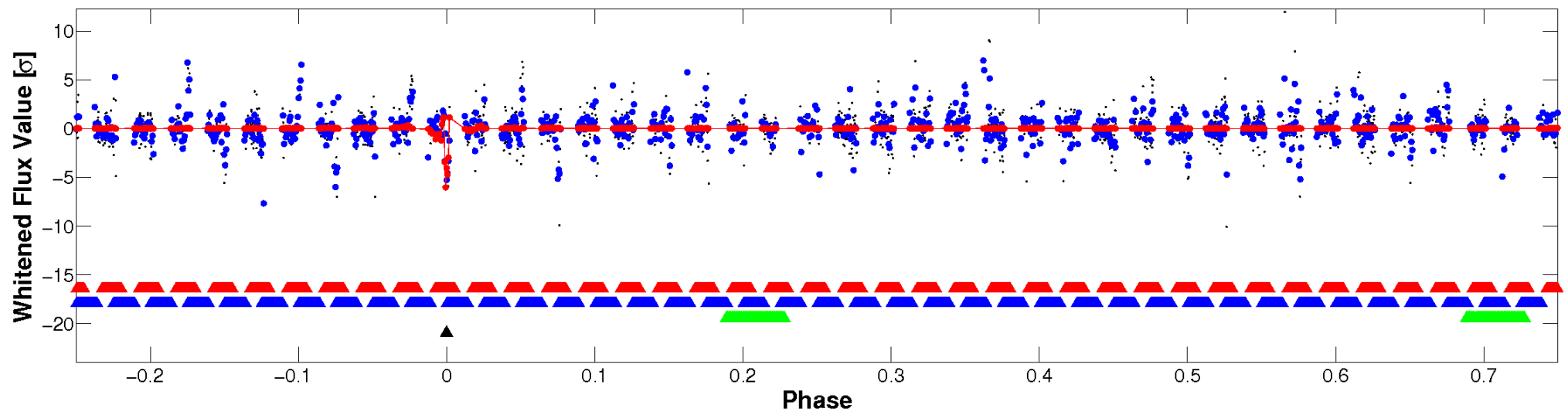


# Non-Whitened Vs. Whitened Light Curve

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



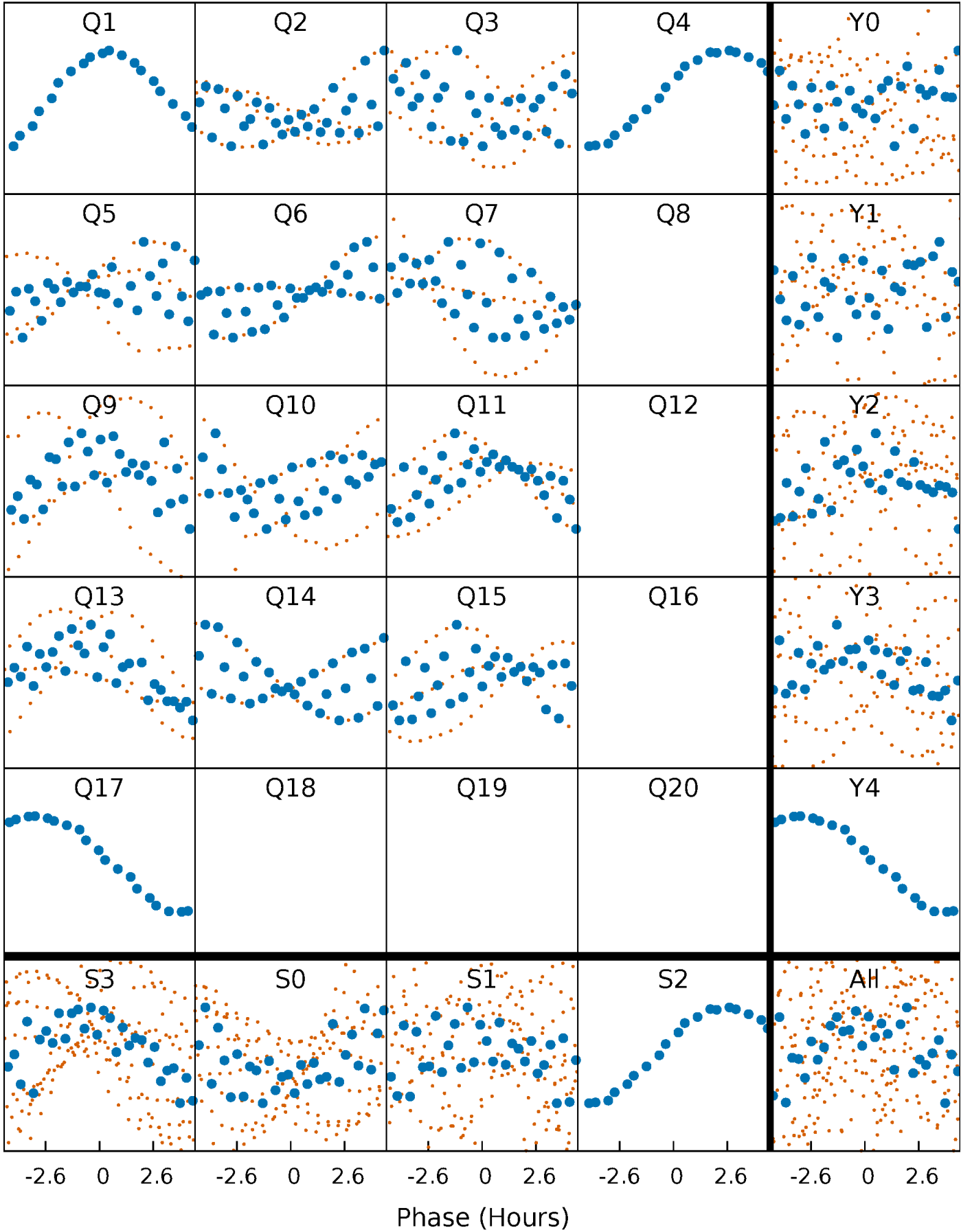
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





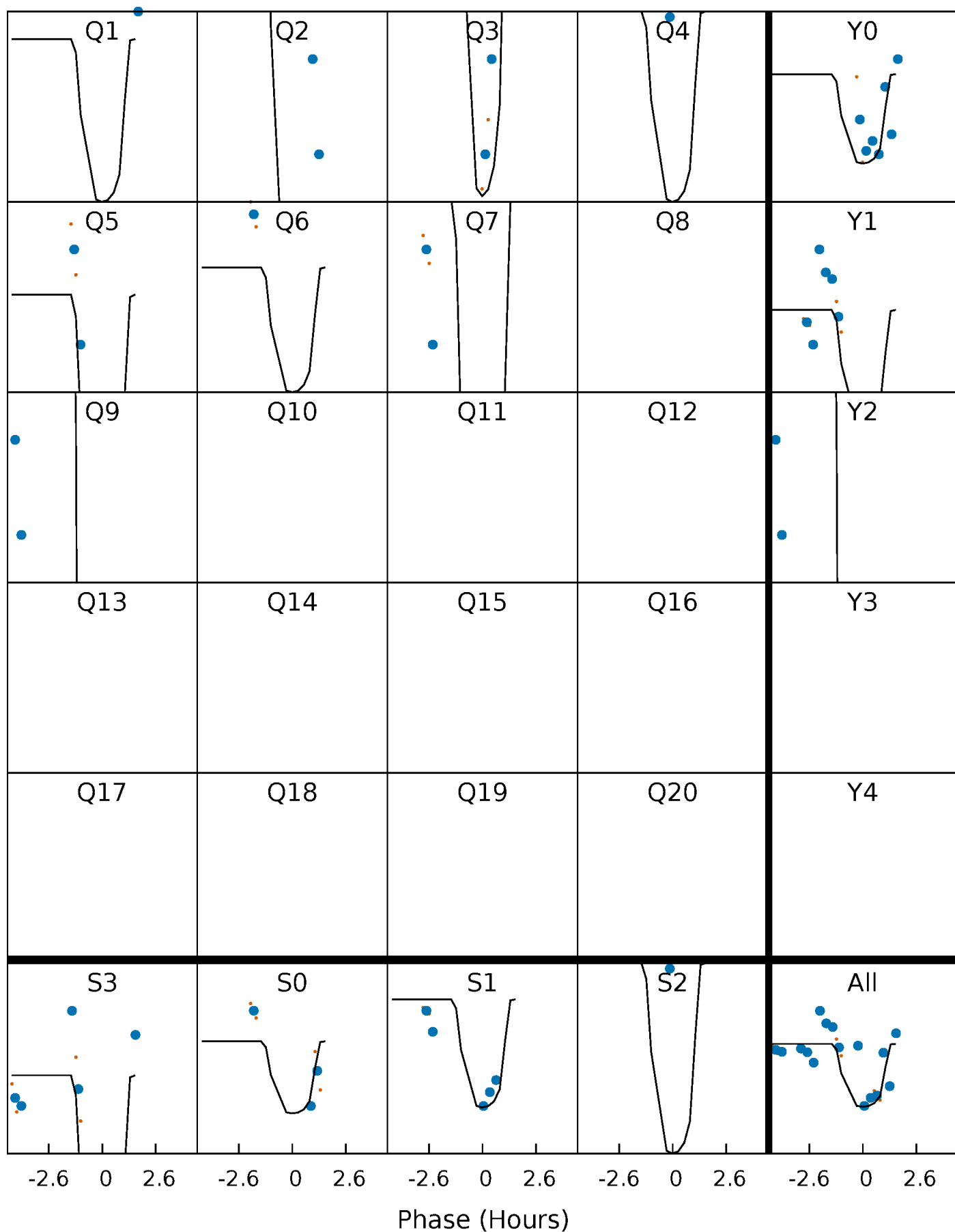
# PDC Quarter-Phased Transit Curves

TCE 010851035-04   P= 32.949798 Days    $T_0=139.211146$  (BKJD)



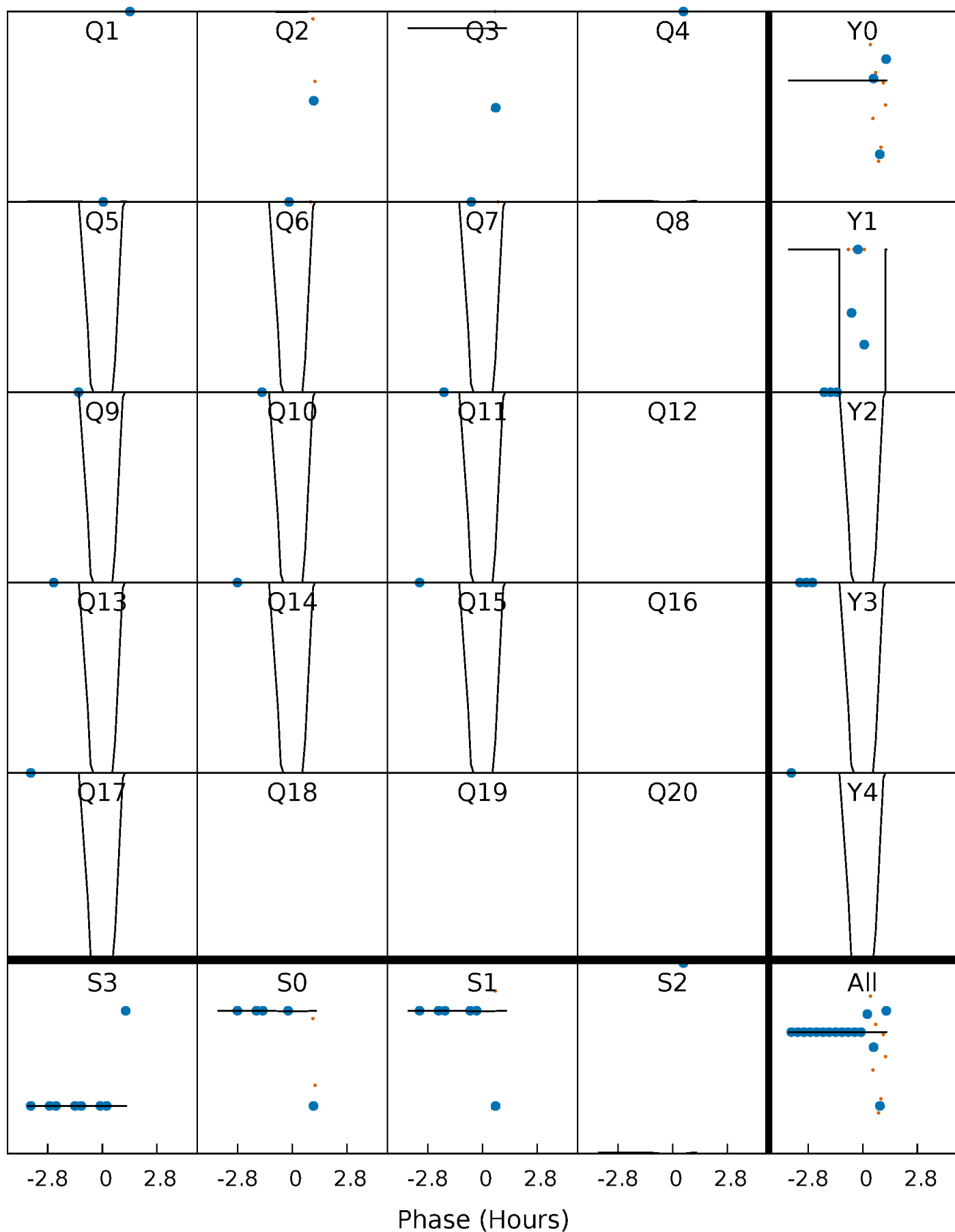
# DV Quarter-Phased Transit Curves

TCE 010851035-04 P= 32.949798 Days  $T_0=139.211146$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

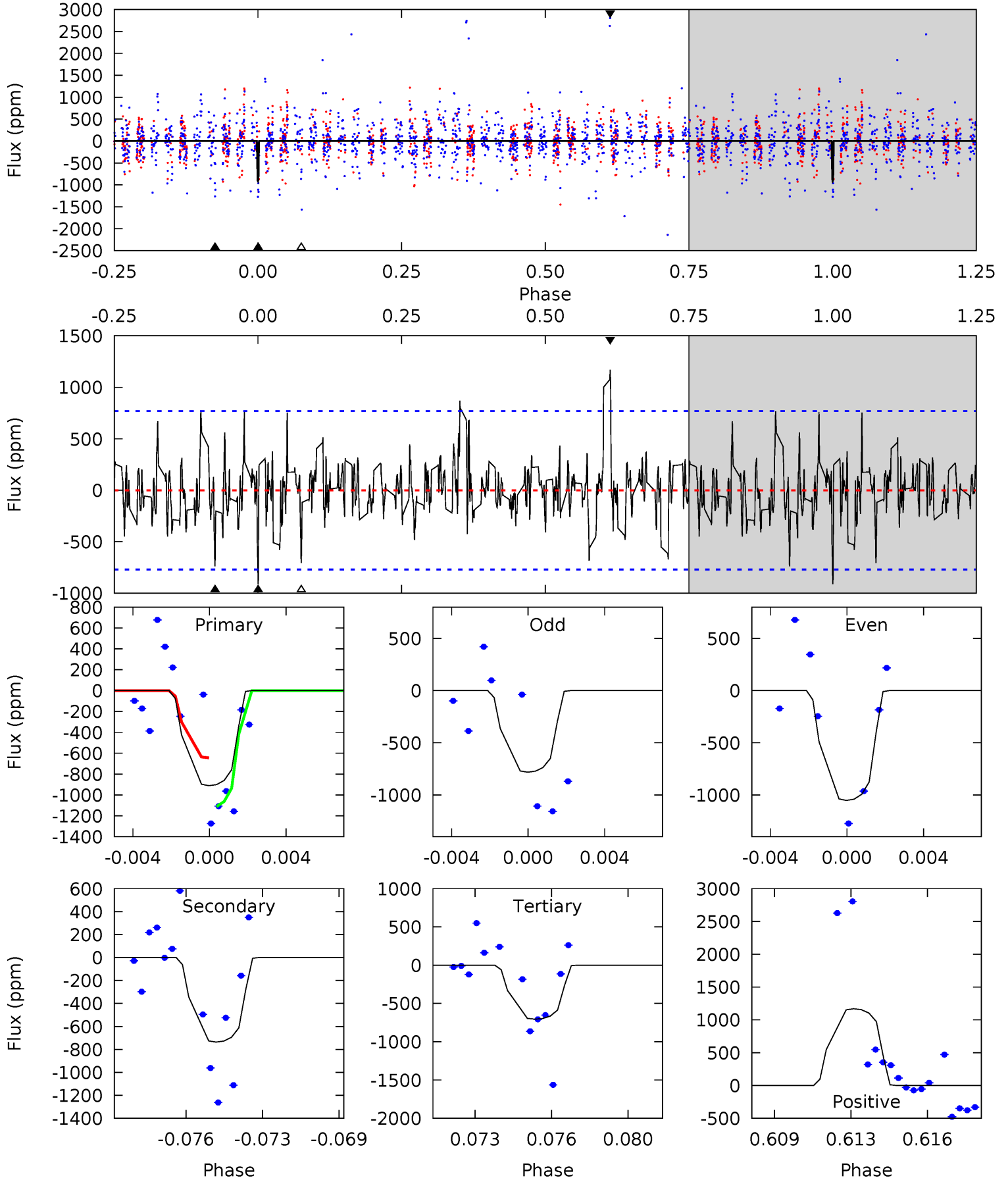
TCE 010851035-04 P= 32.943748 Days  $T_0=139.225145$  (BKJD)



# DV Model-Shift Uniqueness Test

010851035-04, P = 32.949798 Days, E = 106.261348 Days

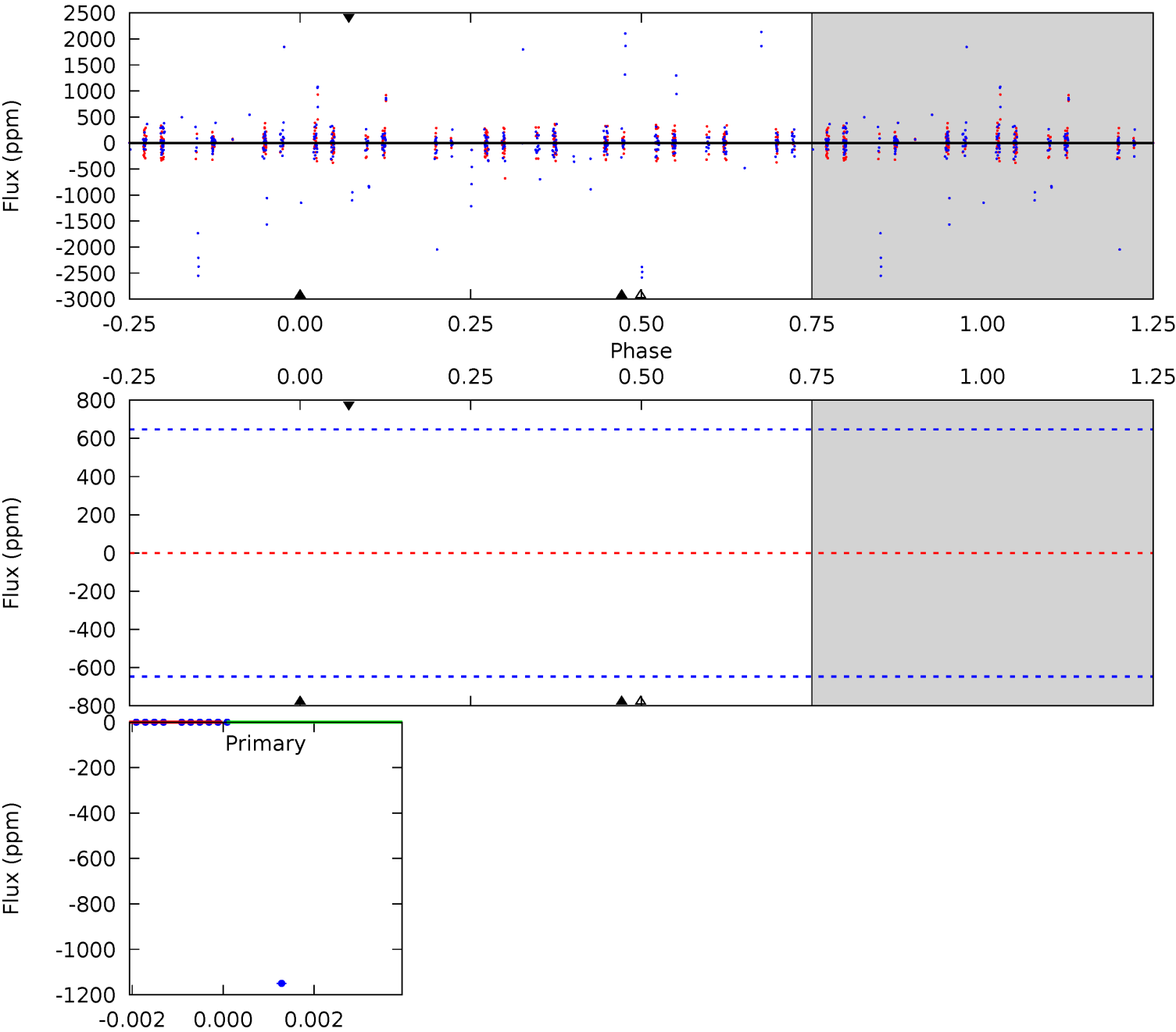
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.18	4.99	4.78	7.93	5.22	2.91	1.47	1.39	-1.75	0.21	-2.93	0.91	0	0.56	1.49



# Alt Model-Shift Uniqueness Test

010851035-04, P = 32.943748 Days, E = 106.281397 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
-nan	-nan	-nan	-nan	5.31	3.06	-nan	-nan	-nan	-nan	-nan	1.08	0	0.50	0



### Stellar Parameters For KIC 010851035

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7431^{+233}_{-311}$	$4.042^{+0.193}_{-0.158}$	$-0.160^{+0.250}_{-0.350}$	$1.985^{+0.525}_{-0.525}$	$1.580^{+0.213}_{-0.260}$	$0.284^{+0.326}_{-0.134}$
	+3%/-4%	+5%/-4%	+156%/-219%	+26%/-26%	+13%/-16%	+115%/-47%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010851035-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-737 \pm 148$	$7.45^{+5.23}_{-4.39}$	$1326^{+93}_{-103}$	$6386^{+4746}_{-1411}$	$373^{+1883}_{-240}$
Alt.	$1000000 \pm 122$	$3.64^{+4.06}_{-2.51}$	$1323^{+94}_{-100}$	$-1416814^{+1099012}_{-13212743}$	$-1163947.293^{+909757.295}_{-10271813.980}$

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

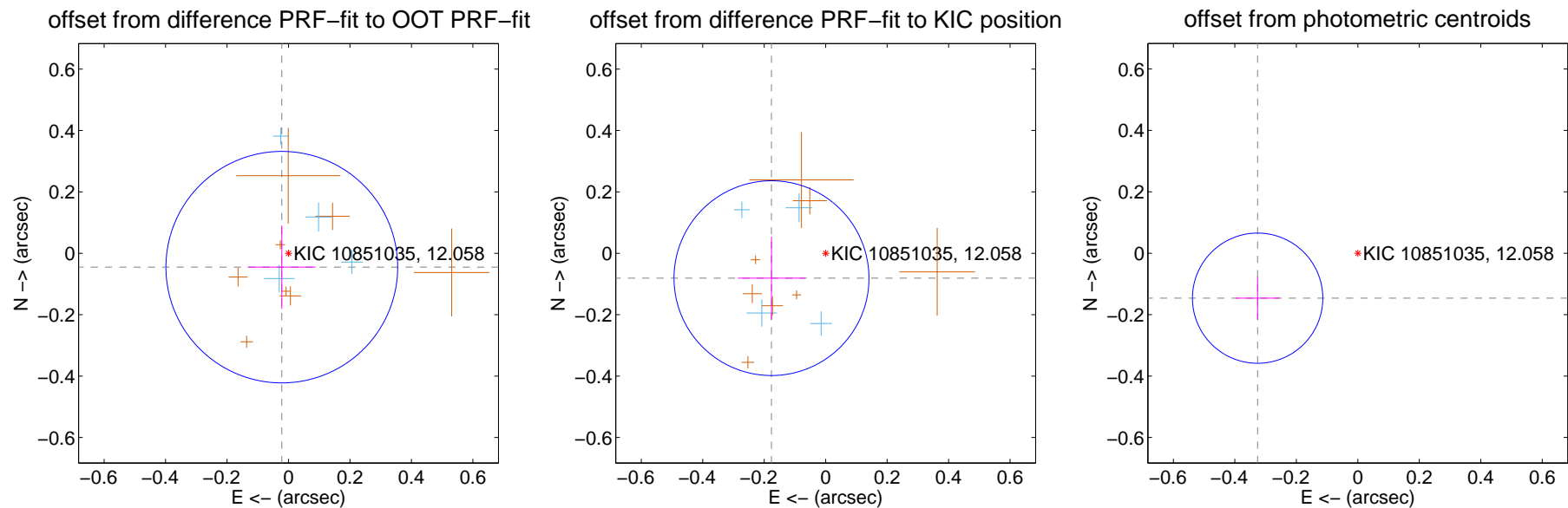
## DV Centroid Data

Supplemental centroid analysis for 010851035-04. Kepler magnitude: 12.06. Transit SNR 10.34

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

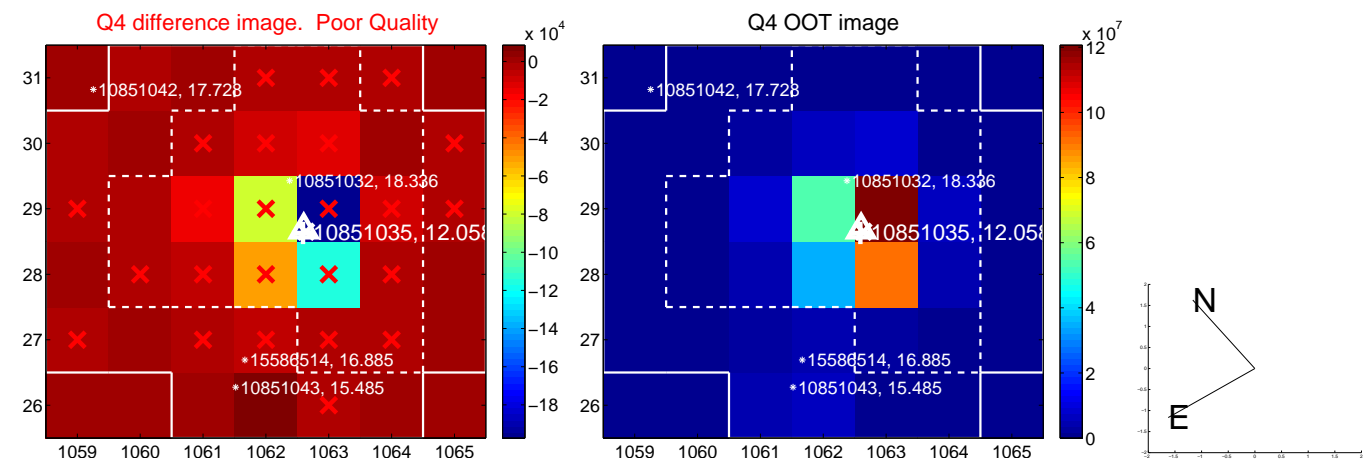
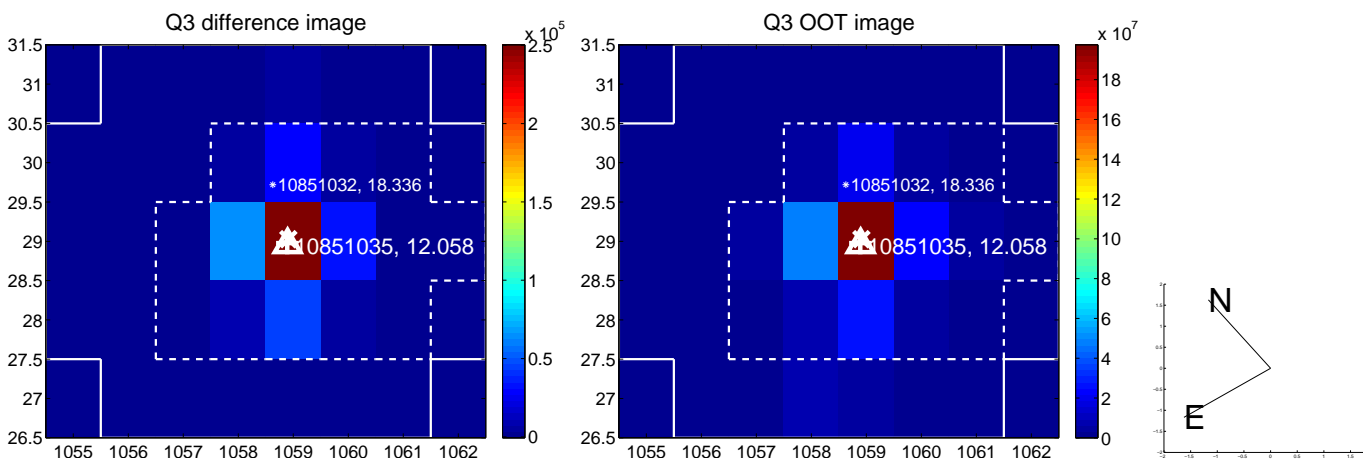
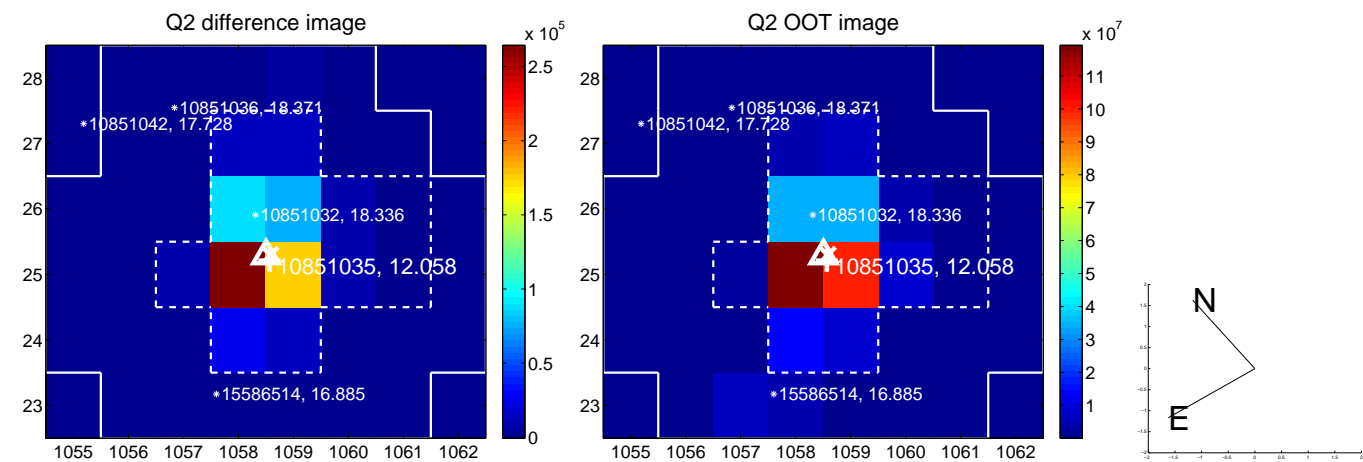
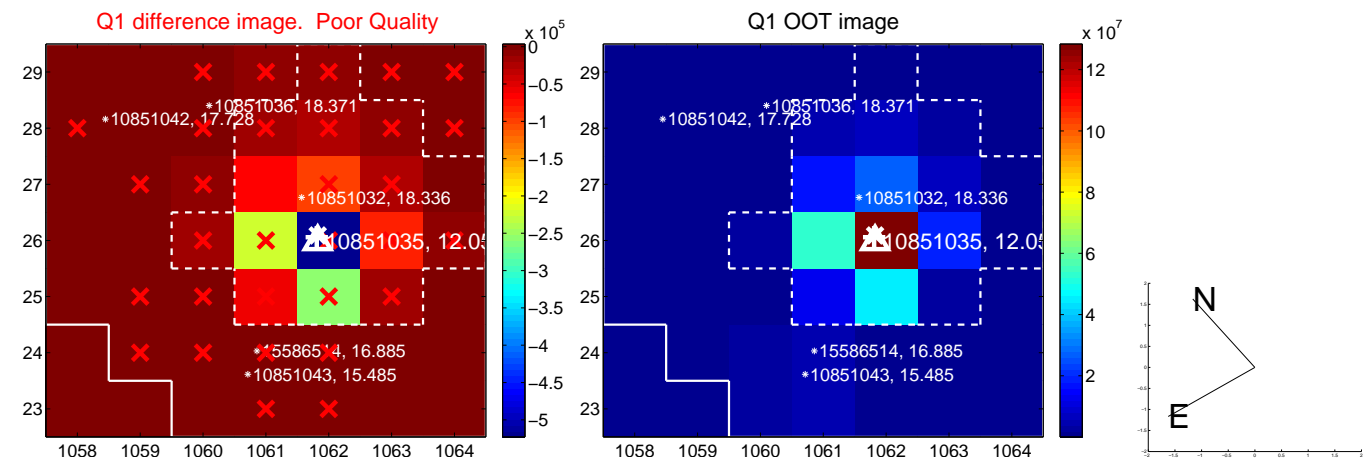
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.050 \pm 0.126$	0.40	$0.022 \pm 0.110$	$-0.045 \pm 0.136$
PRF-fit source offset from KIC position	$0.194 \pm 0.106$	1.83	$0.176 \pm 0.109$	$-0.081 \pm 0.135$
photometric centroid source offset	$0.36 \pm 0.07$	5.06	$0.33 \pm 0.07$	$-0.15 \pm 0.07$



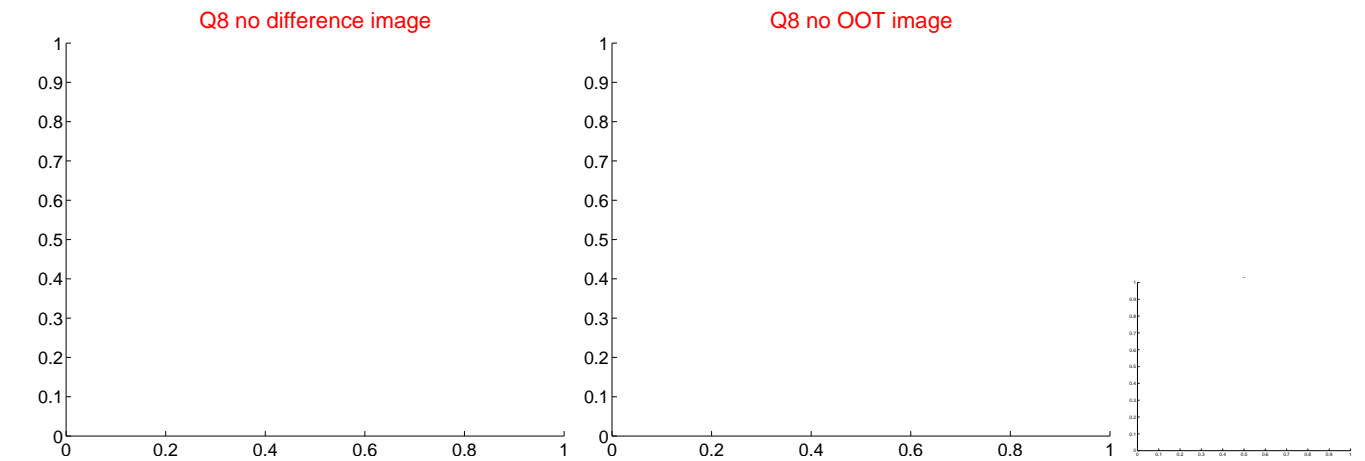
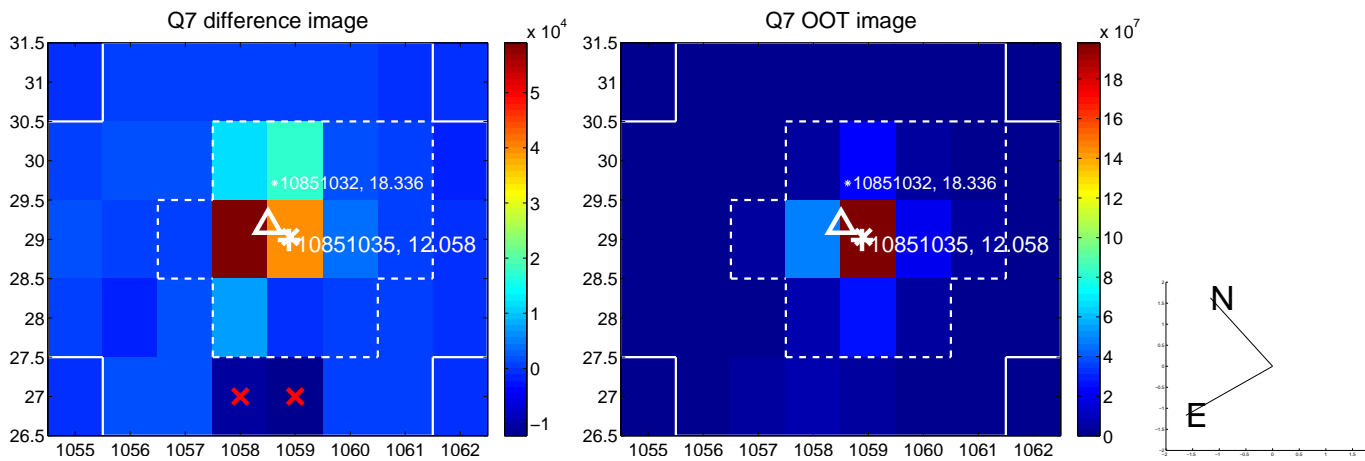
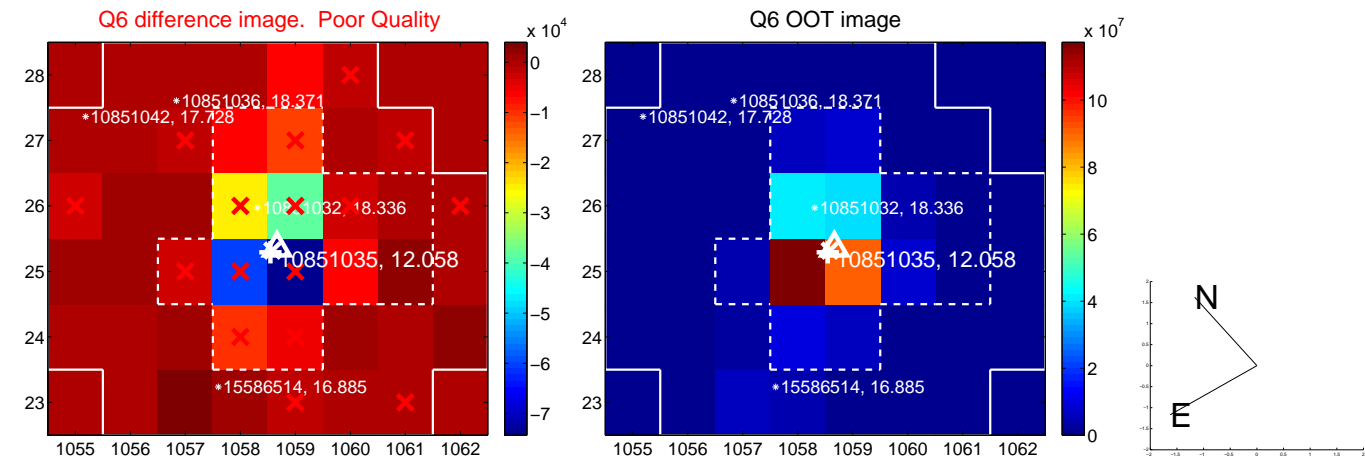
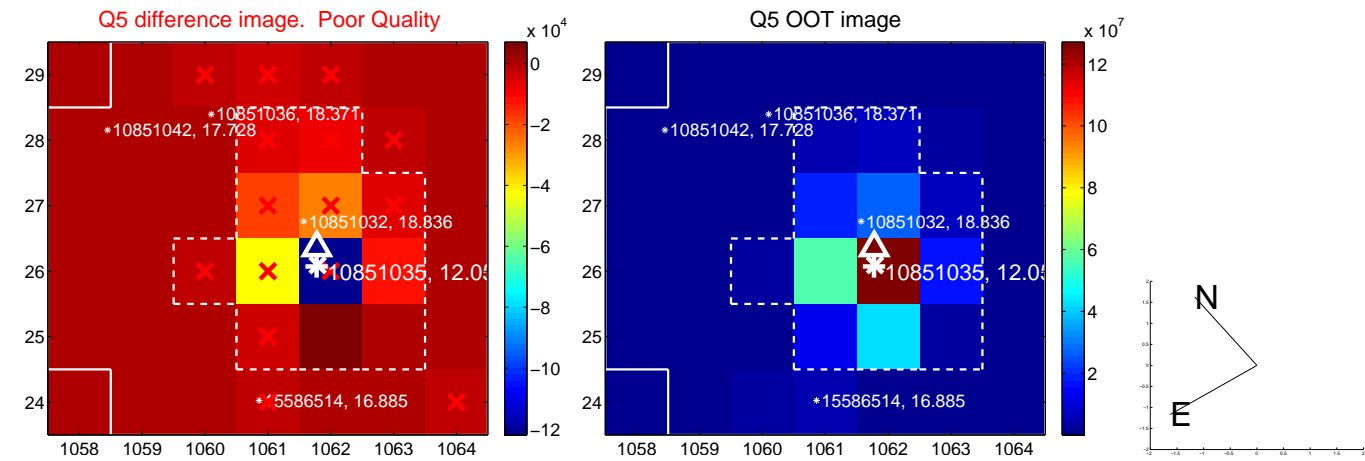
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



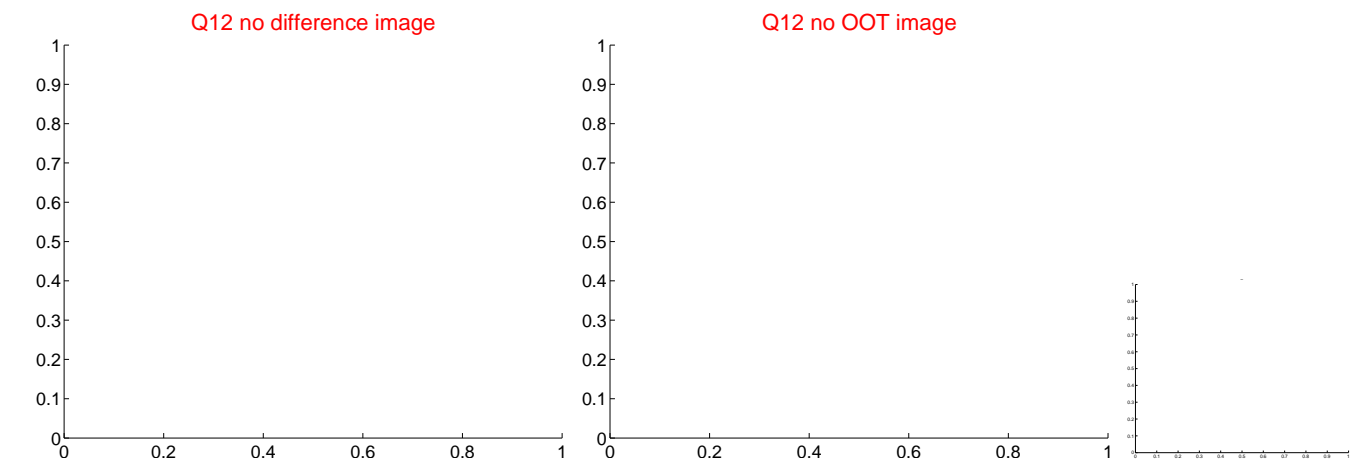
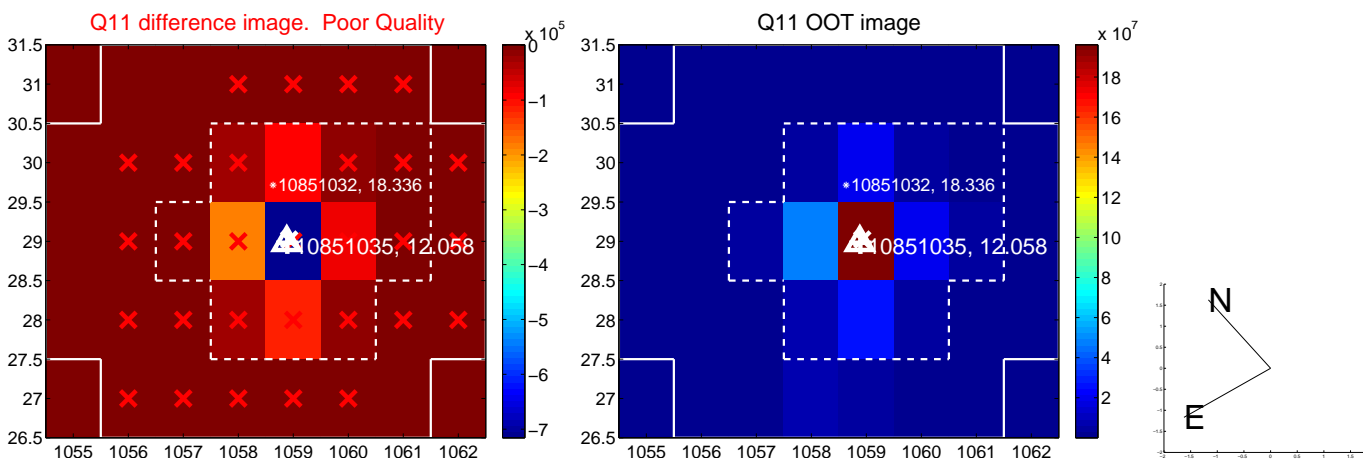
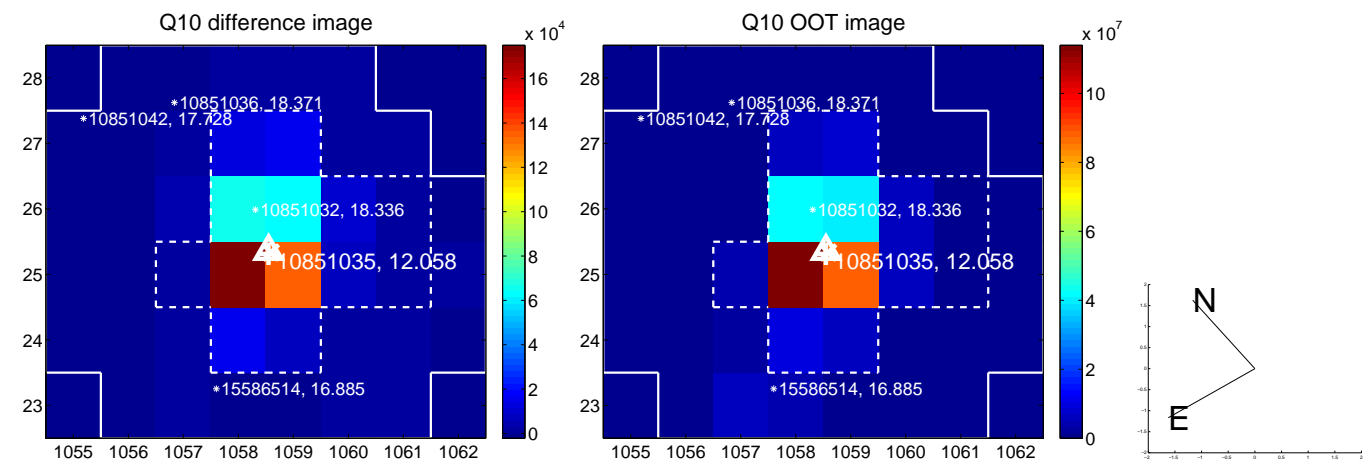
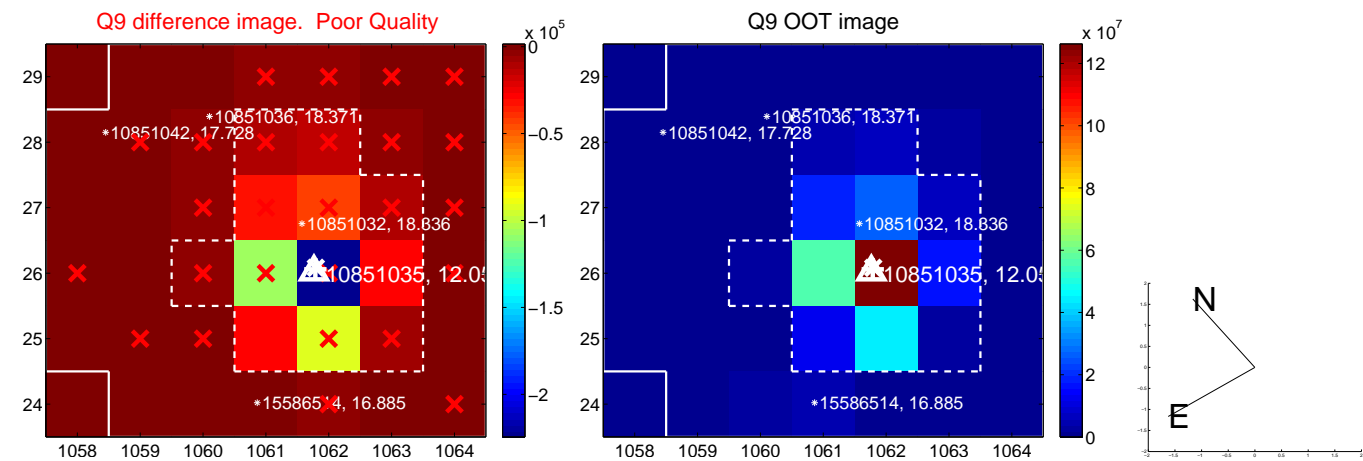
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



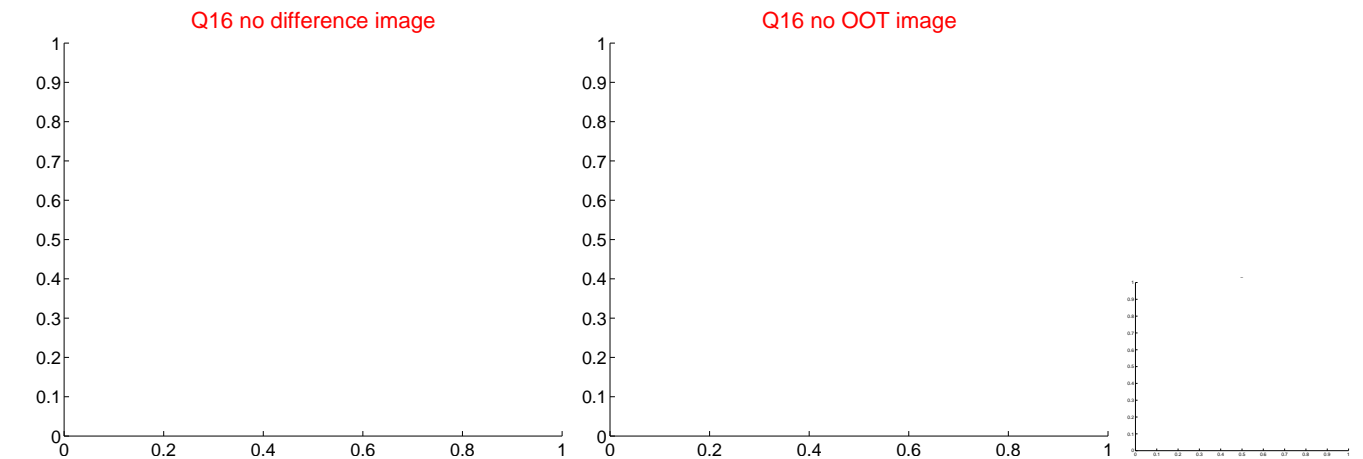
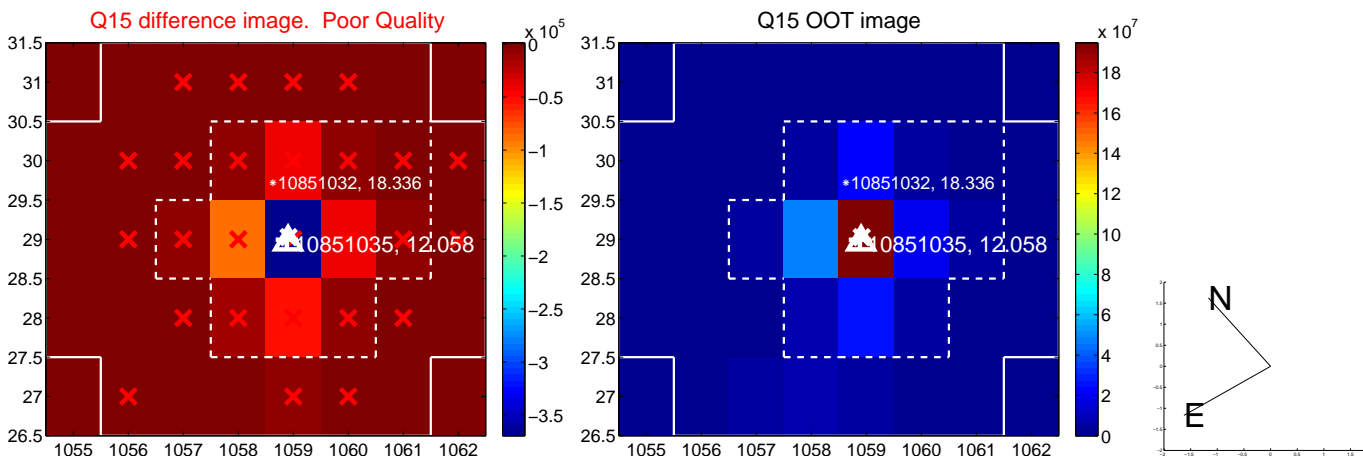
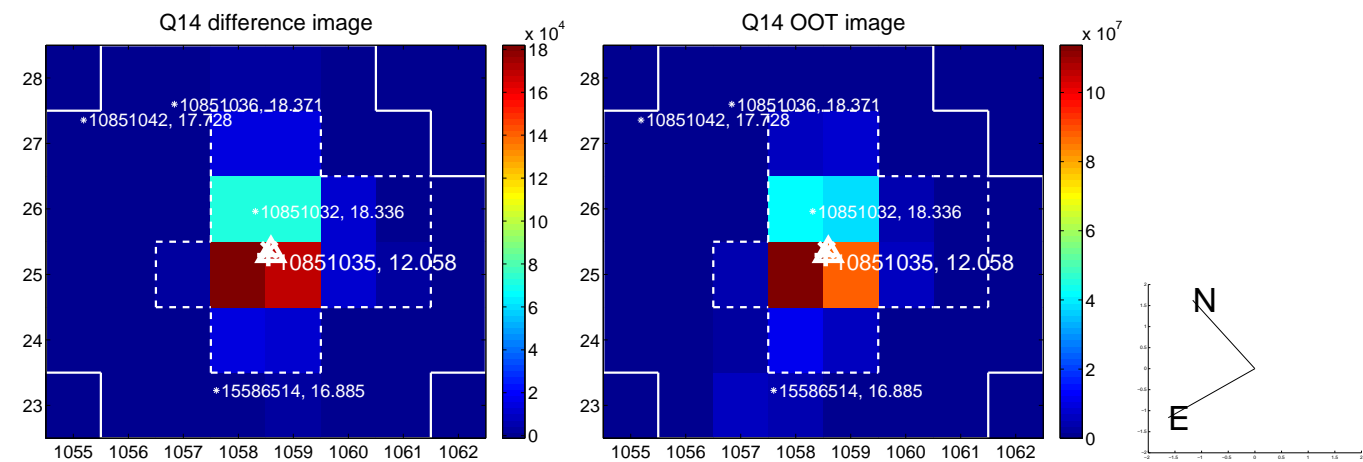
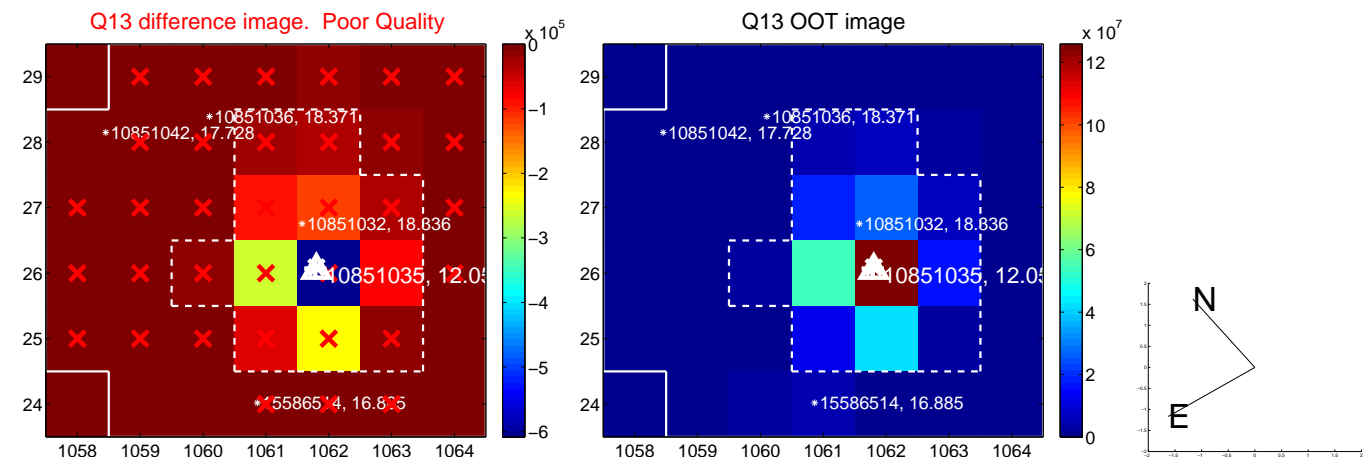
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



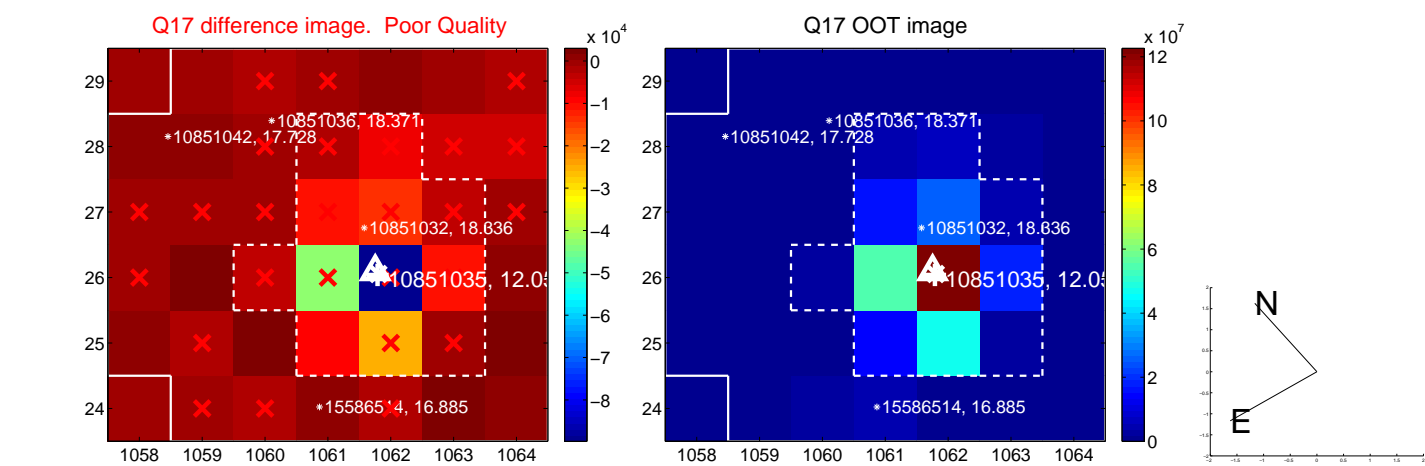
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



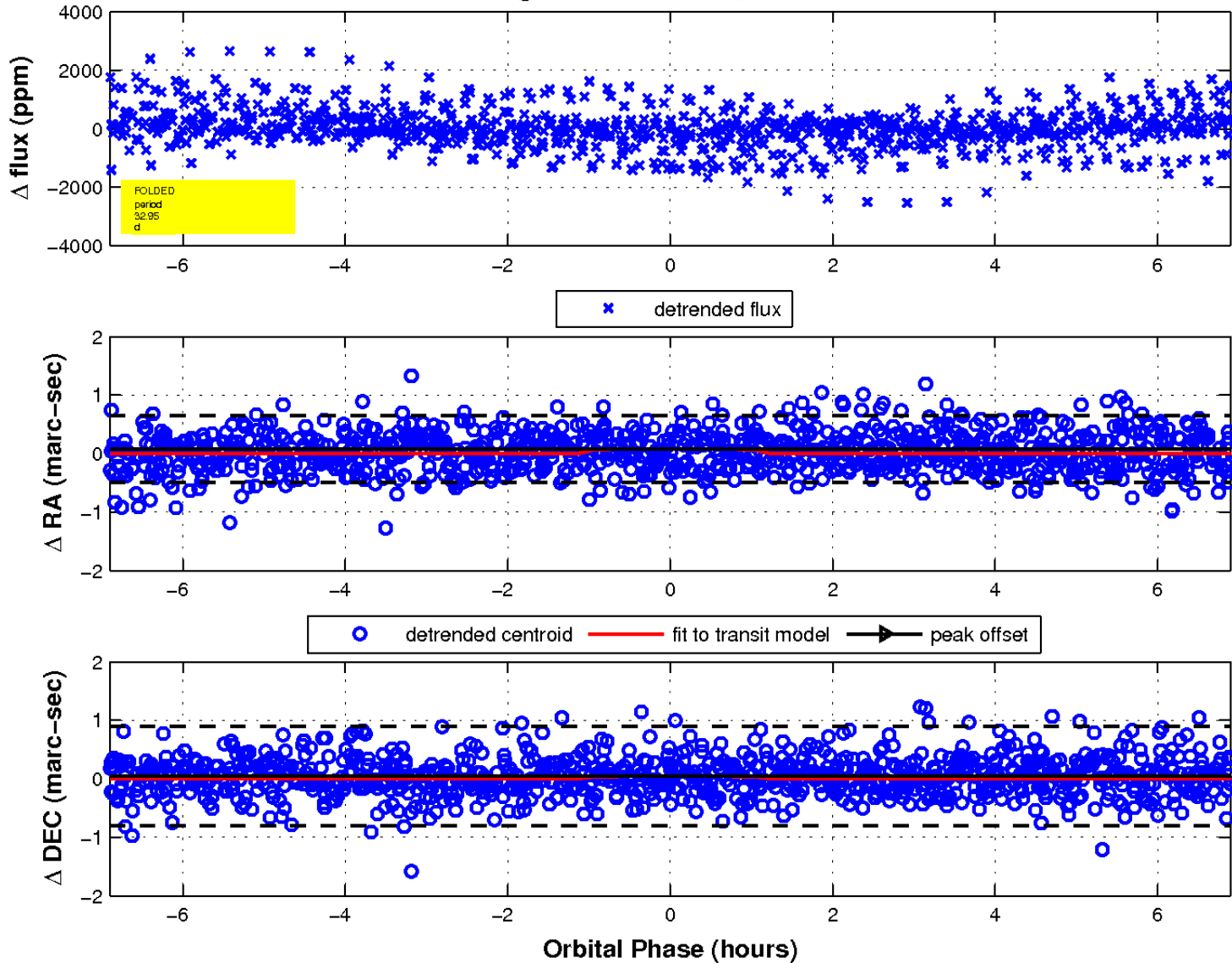
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

