

# KIC 006470516

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006470516-01	OBS	3705.01	2.080409	131.837931	283094.1	4.500	9631.2	-1.0	2.12	8344	115.40	12953.89
006470516-02	OBS	No	2.080426	132.873402	57322.4	5.542	737.4	405.2	2.12	8344	85.80	12953.75
006470516-03	OBS	No	2.080993	131.752791	1742.5	6.000	10.3	-1.0	2.12	8344	8.94	12949.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006470516-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
006470516-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
006470516-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_ALT—RESIDUAL_TCE—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 006470516-01

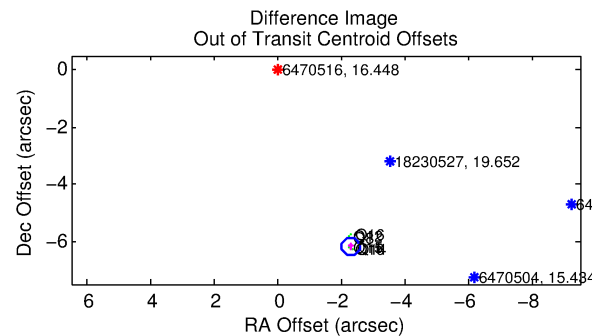
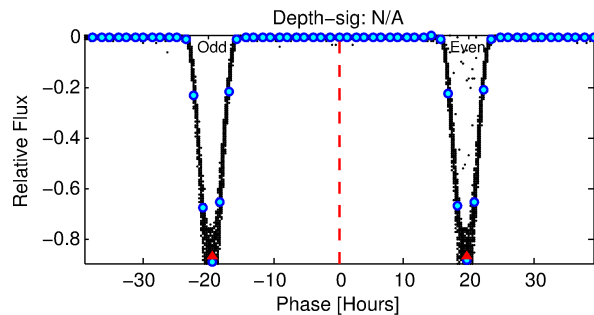
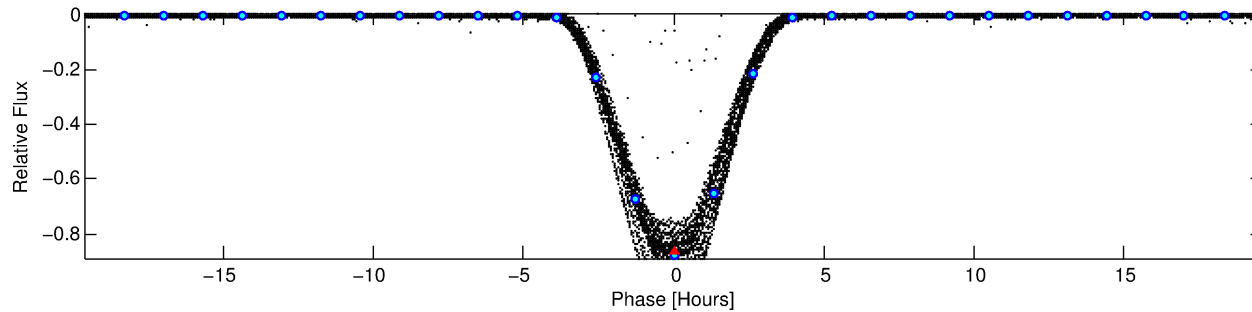
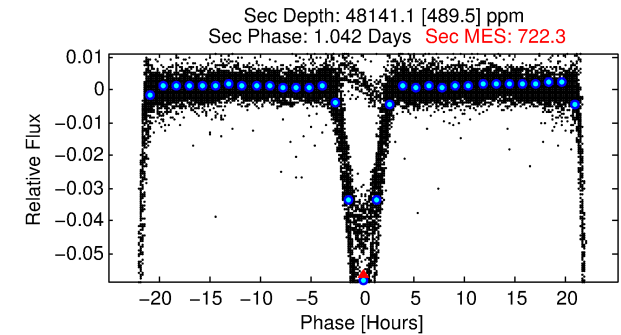
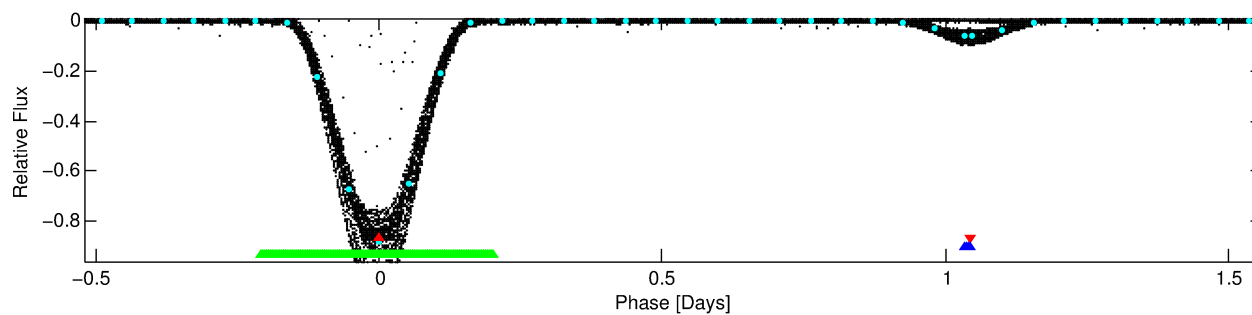
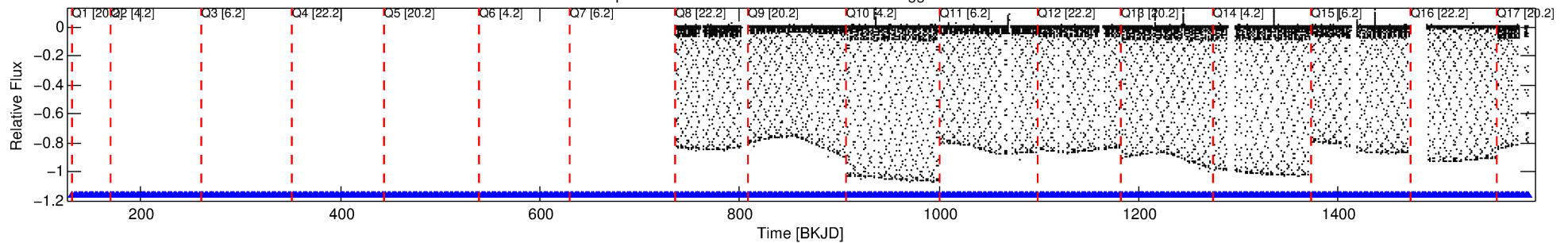
No Significant Match Found

# DV One-Page Summary

KIC: 6470516 Candidate: 1 of 3 Period: 2.080 d

KOI: K03705.01 Corr: 0.772

Kp: 16.45 R\*: 2.12 Rs Teff: 8344.0 K Logg: 4.04 Fe/H: -0.260



TPS TCE Results:

Period = 2.08041 d  
Epoch = 131.8379 BKJD

DV fit results are unavailable

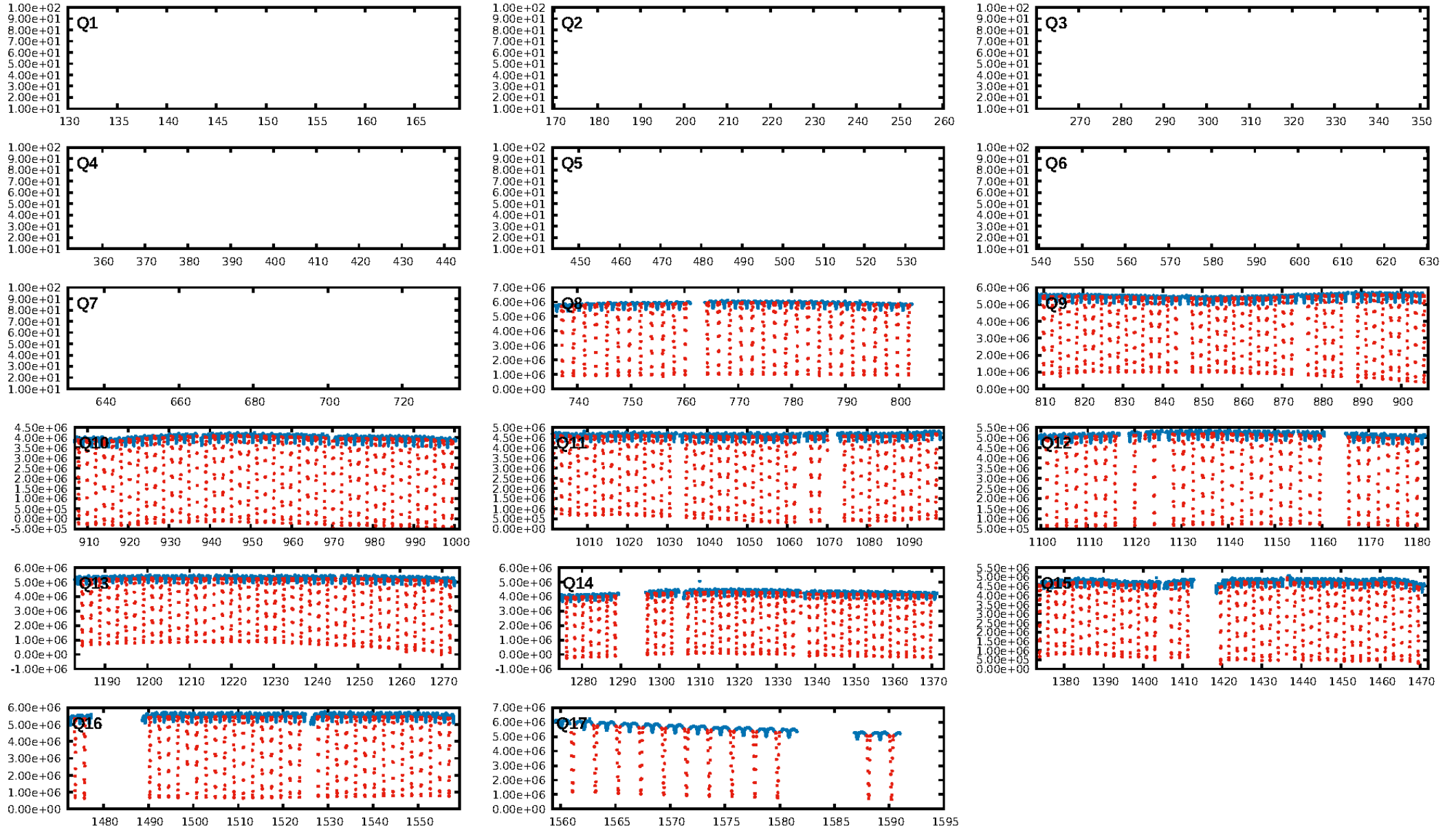
DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [359/359]  
GhostDiagnostic-chr: 1.33  
Centroid-sig: N/A  
Centroid-so: 3.938 arcsec [7111.33σ]  
OotOffset-rm: 6.593 arcsec [66.43σ]  
KicOffset-rm: 0.075 arcsec [0.99σ]  
OotOffset-st: 2/2/3/0 [7]  
KicOffset-st: 2/2/3/3 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 0.00 [0/10]

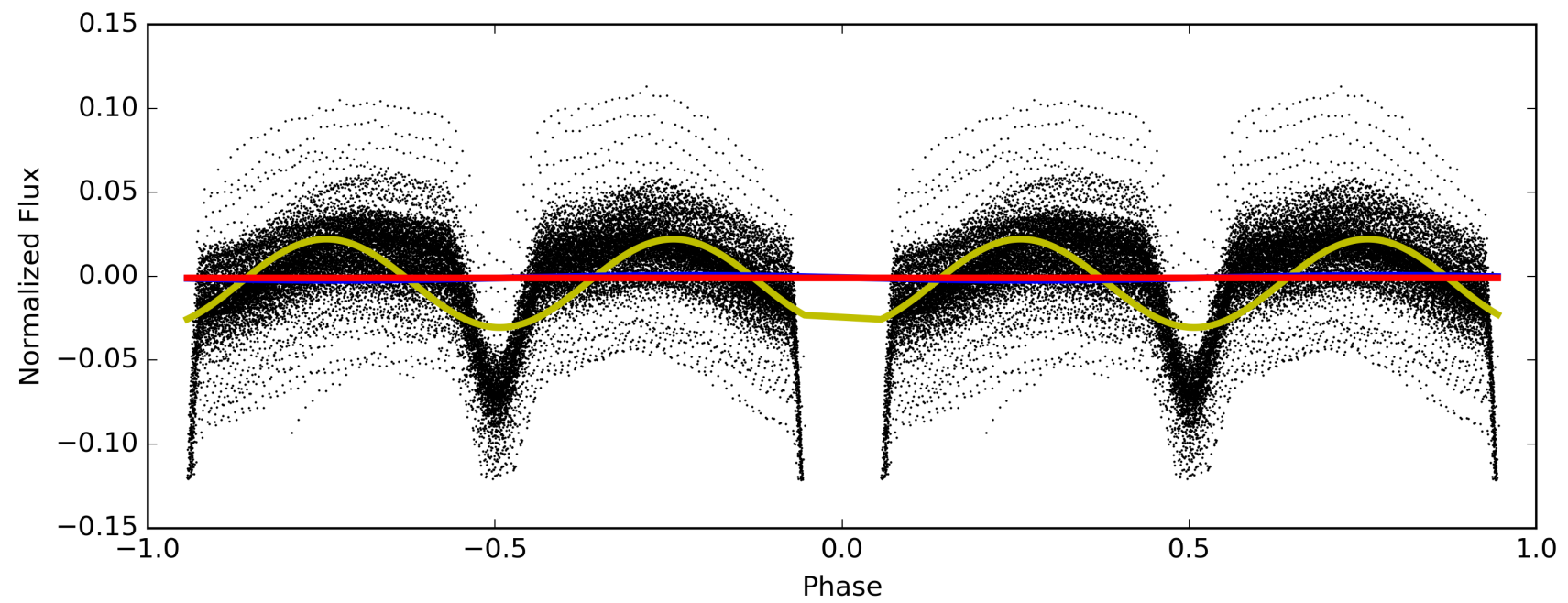
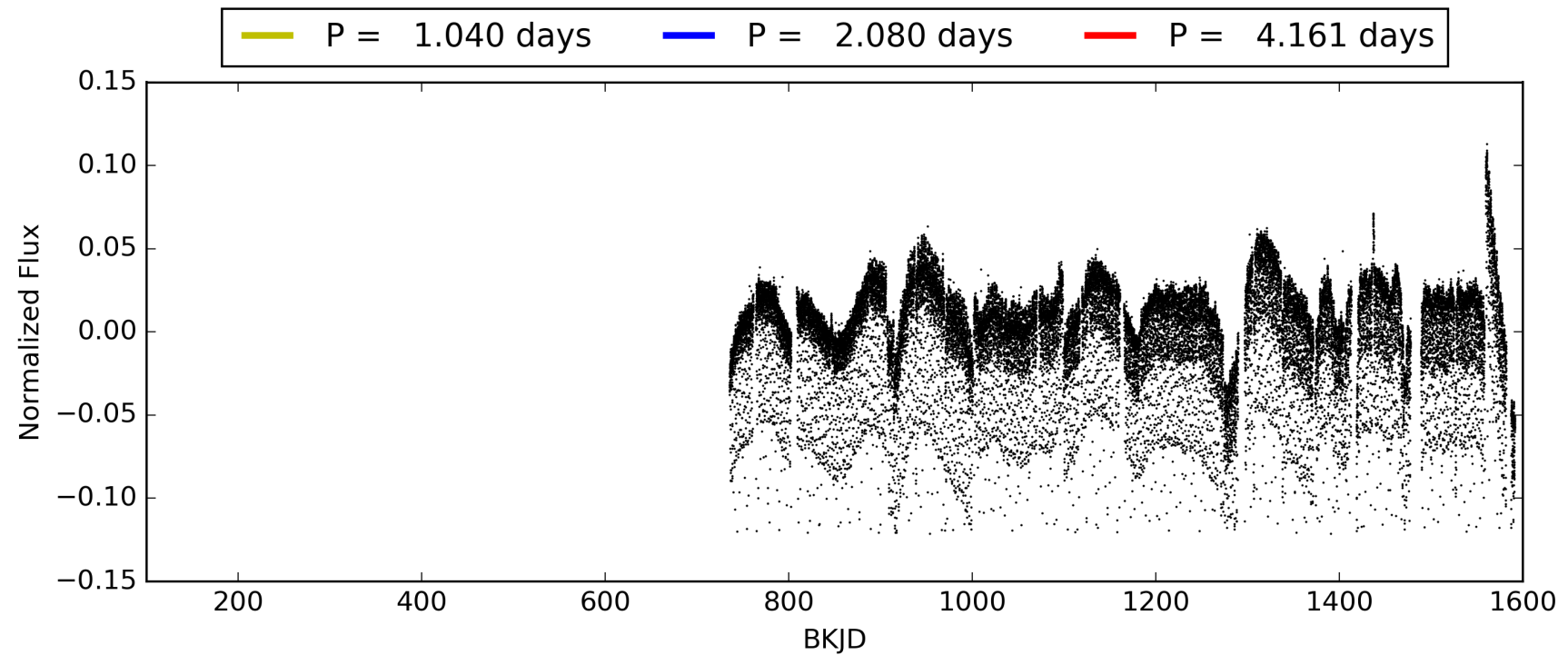
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:24:23 Z

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

# TCE 006470516-01, PDC Light Curves

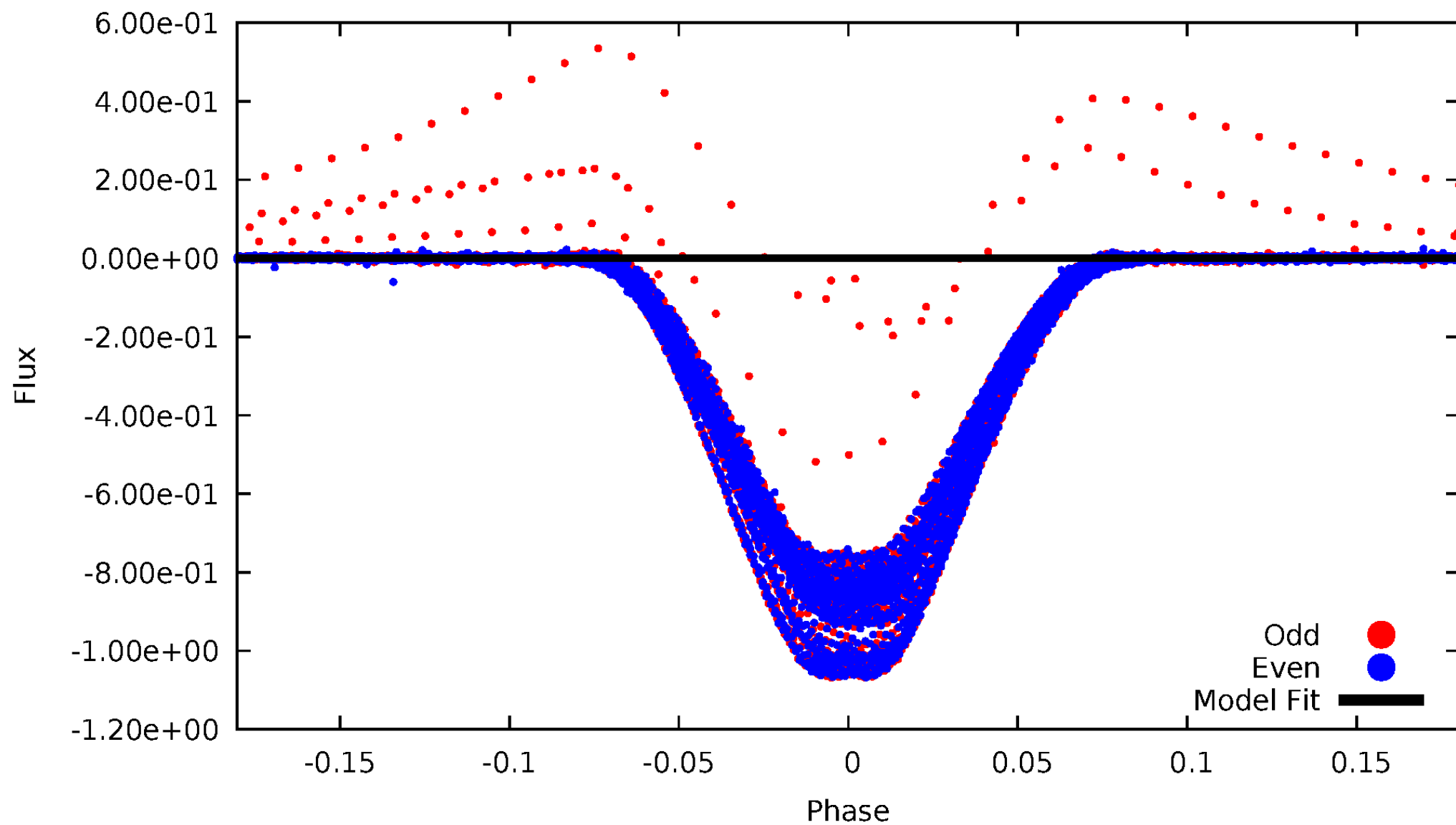


TCE 006470516-01



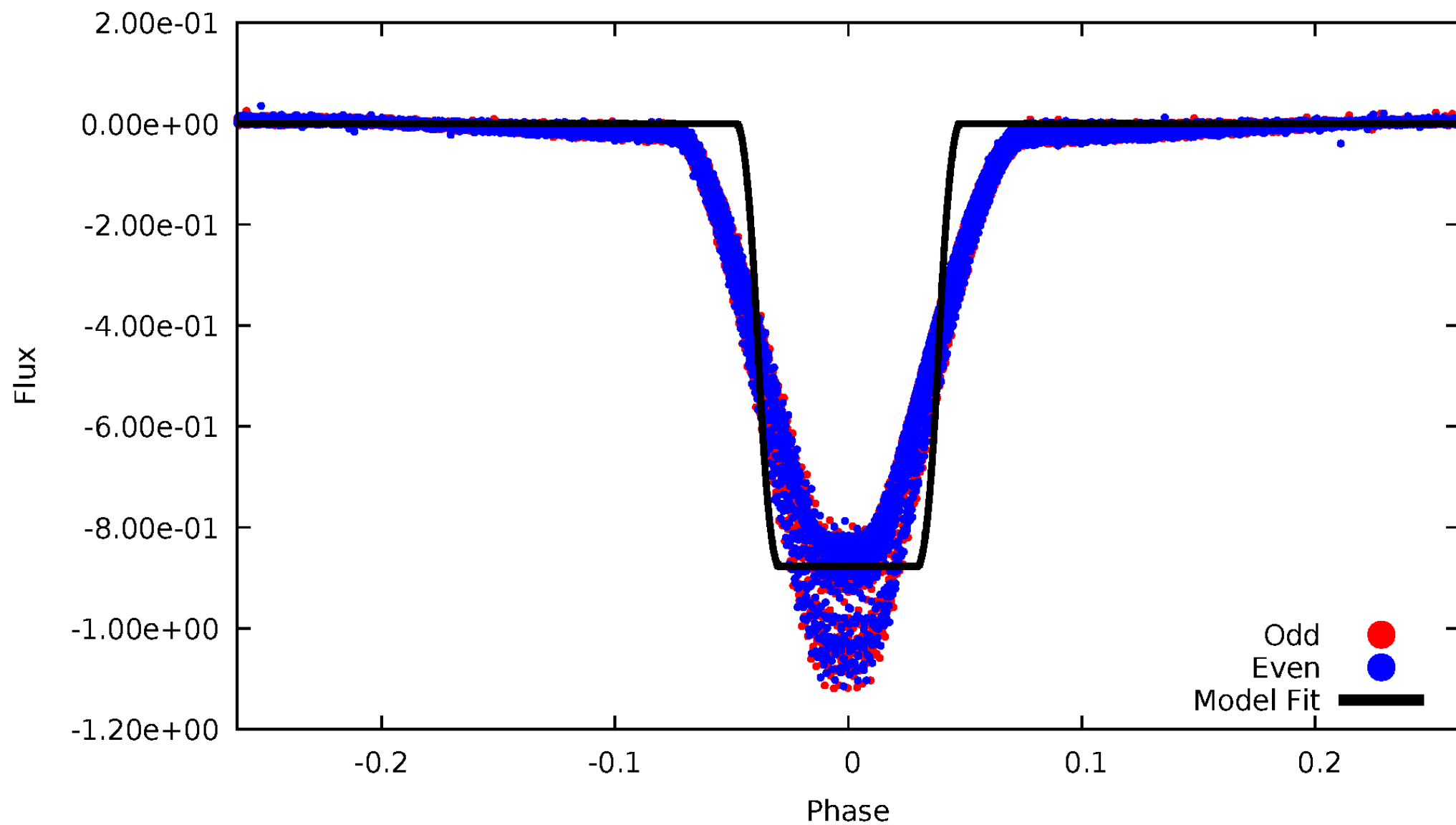
# DV Odd/Even

TCE 006470516-01



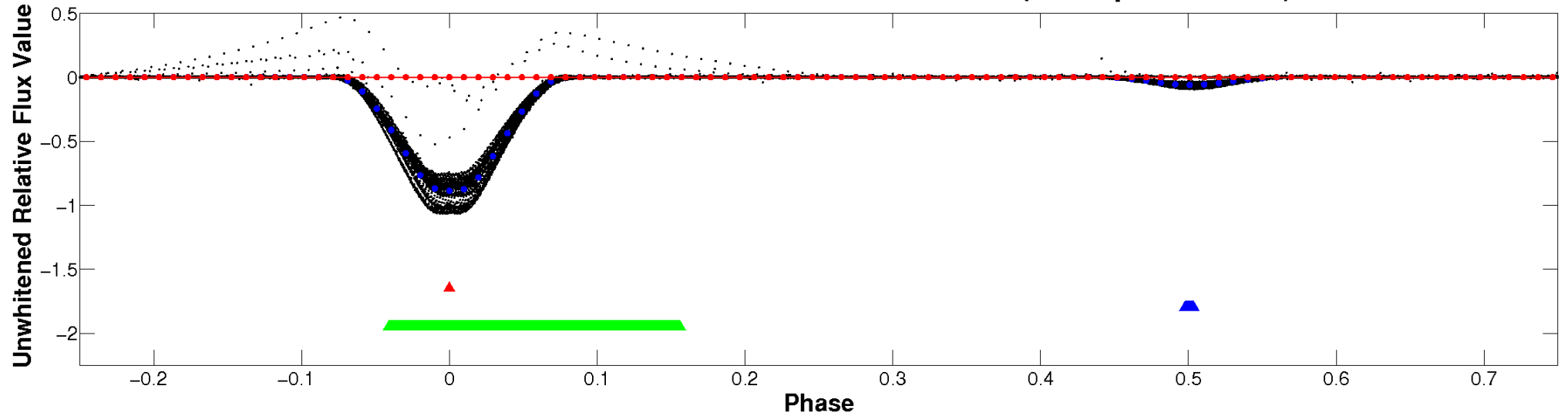
# ALT Odd/Even

TCE 006470516-01



# Non-Whitened Vs. Whitened Light Curve

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

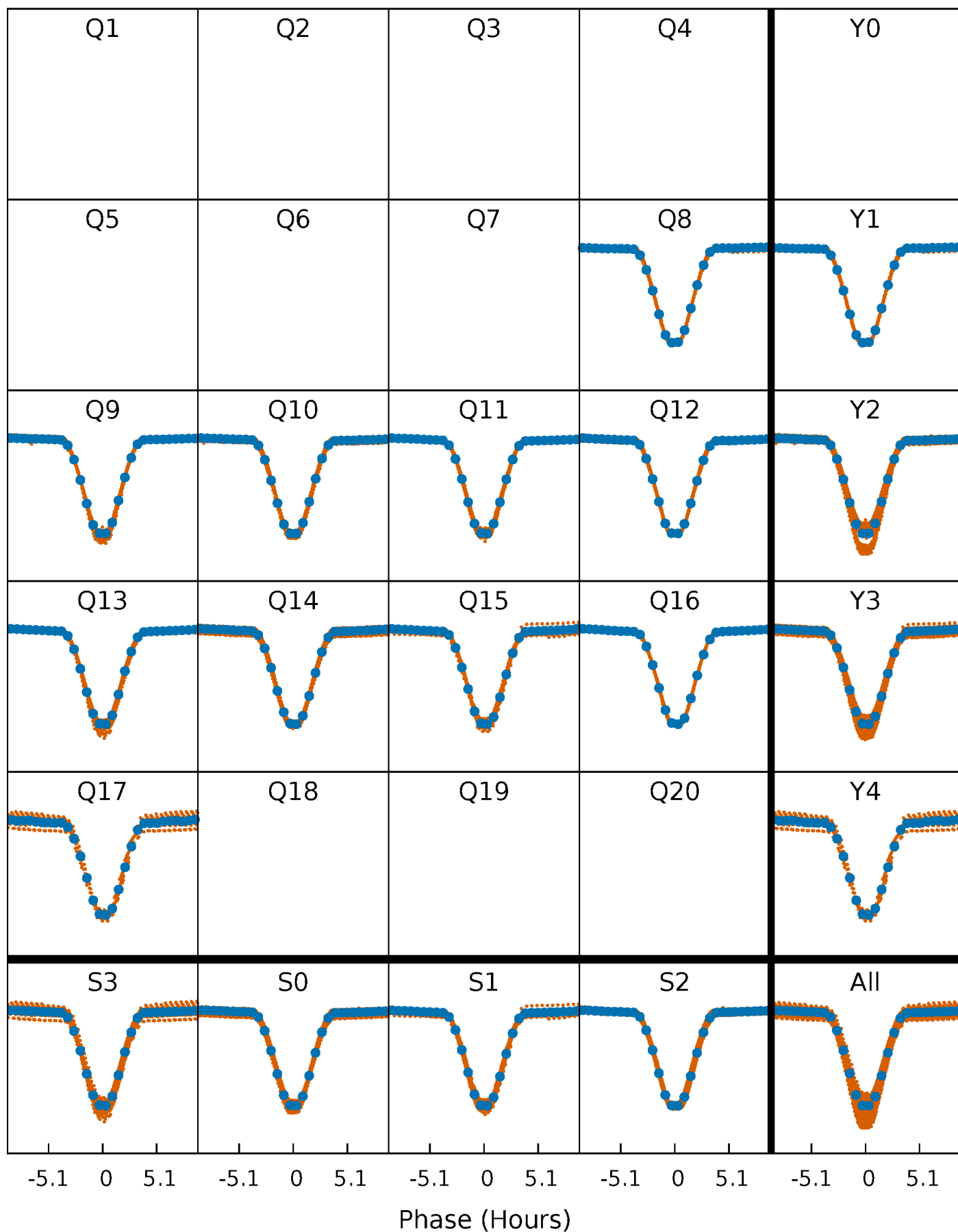


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

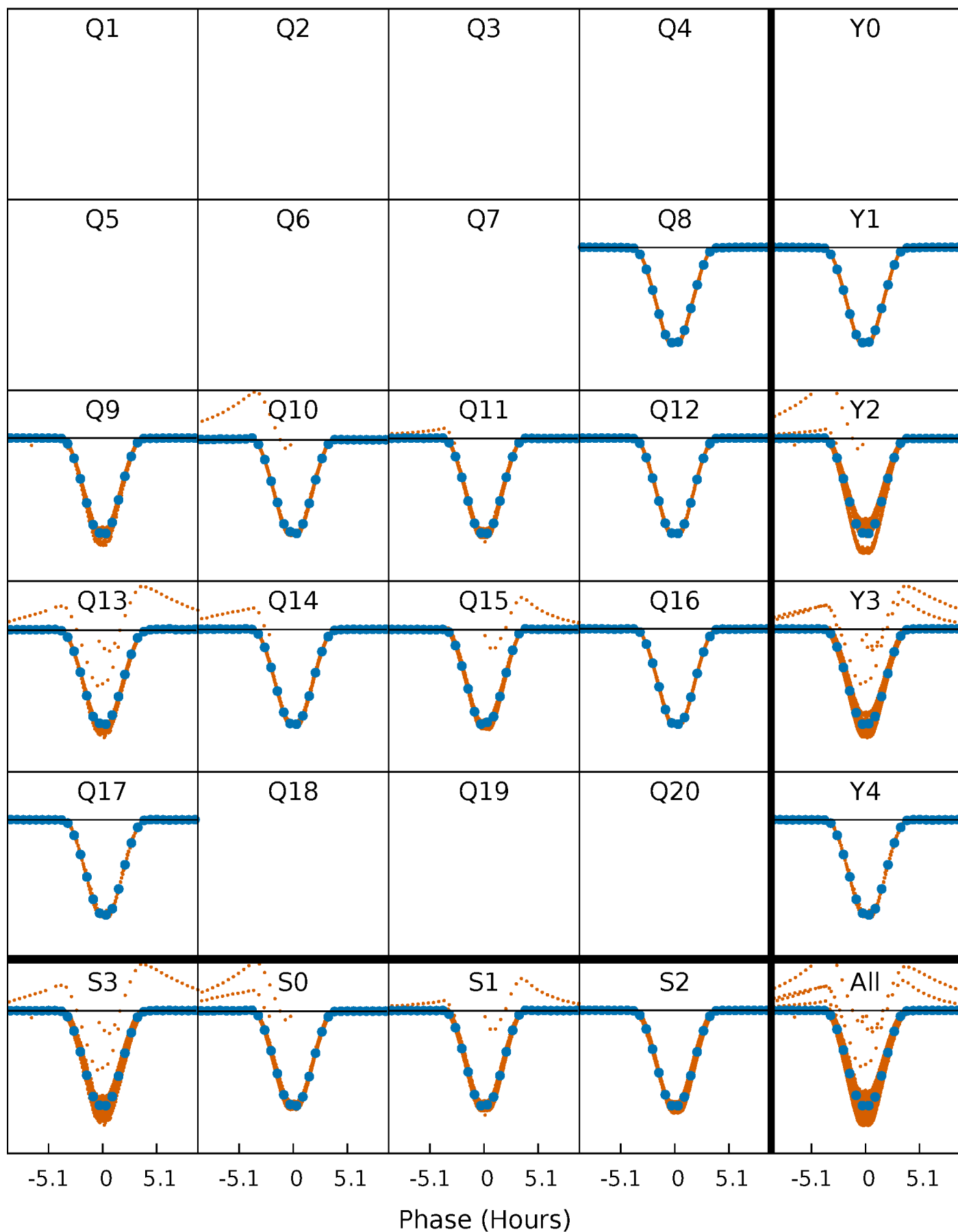
TCE 006470516-01 P= 2.080409 Days  $T_0=131.837931$  (BKJD)





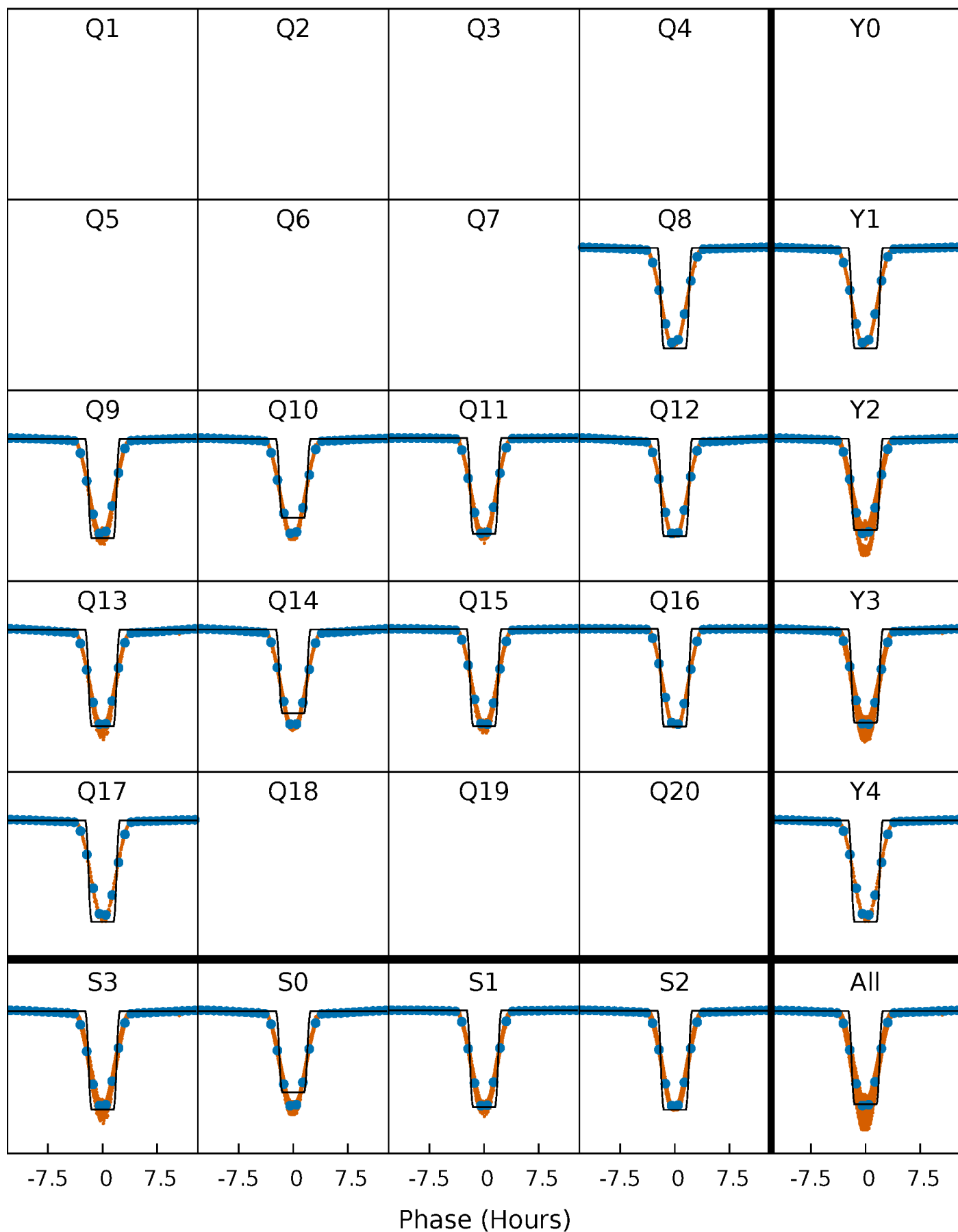
# DV Quarter-Phased Transit Curves

TCE 006470516-01 P= 2.080409 Days  $T_0=131.837931$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

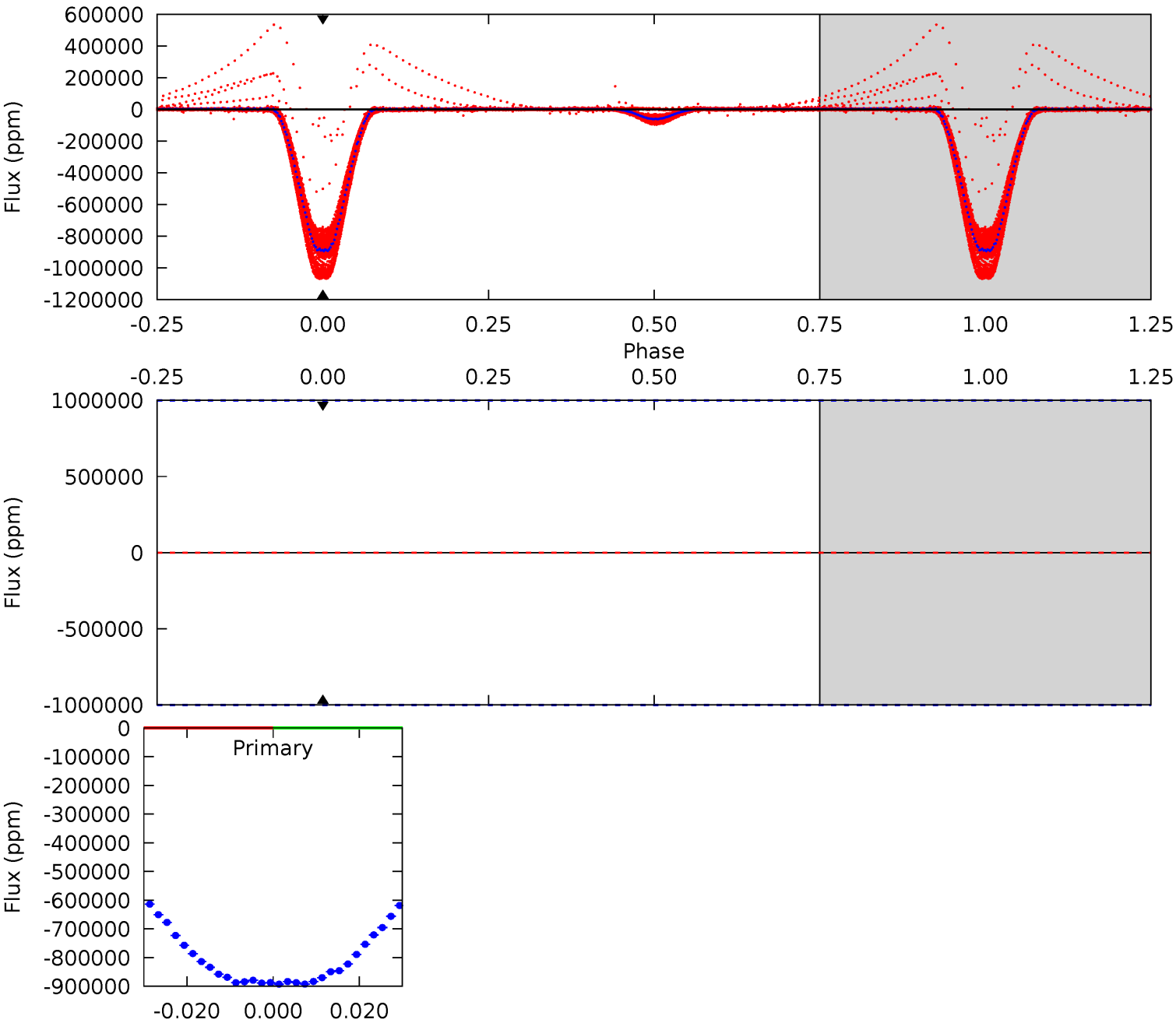
TCE 006470516-01 P= 2.080409 Days  $T_0=131.840333$  (BKJD)



# DV Model-Shift Uniqueness Test

006470516-01, P = 2.080409 Days, E = 131.837931 Days

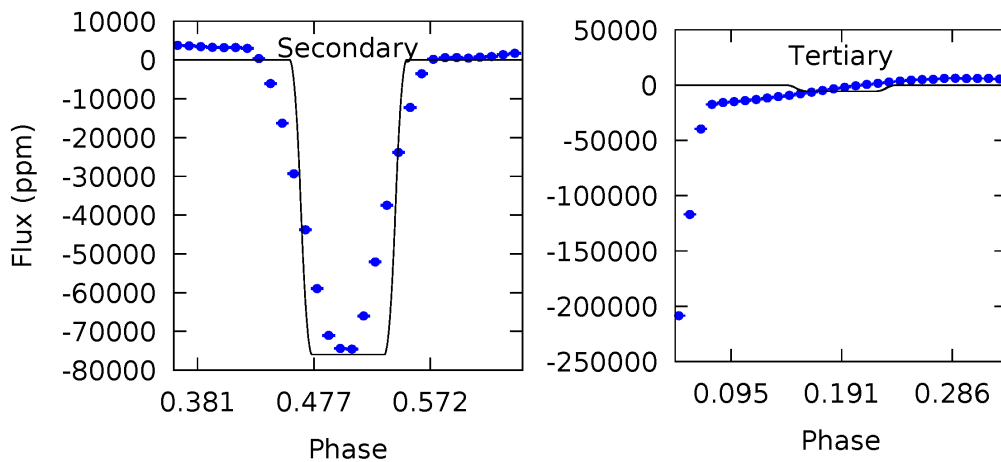
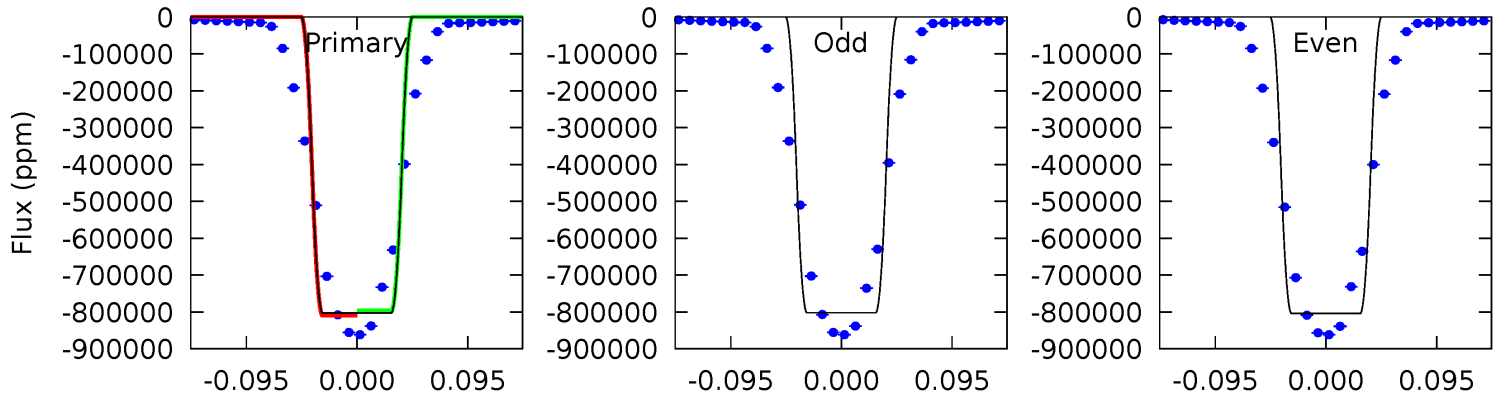
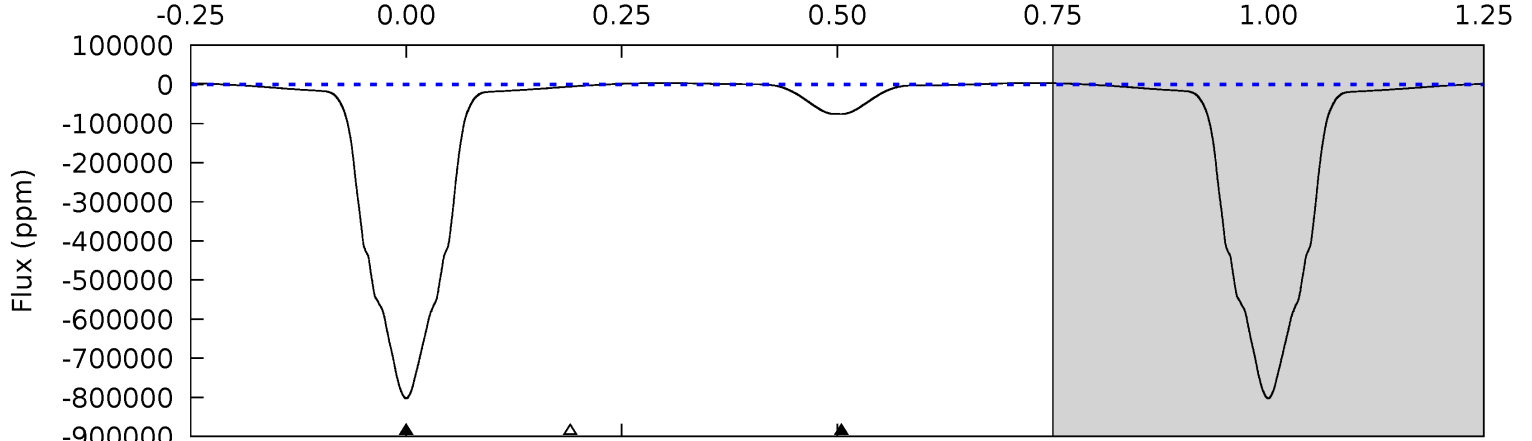
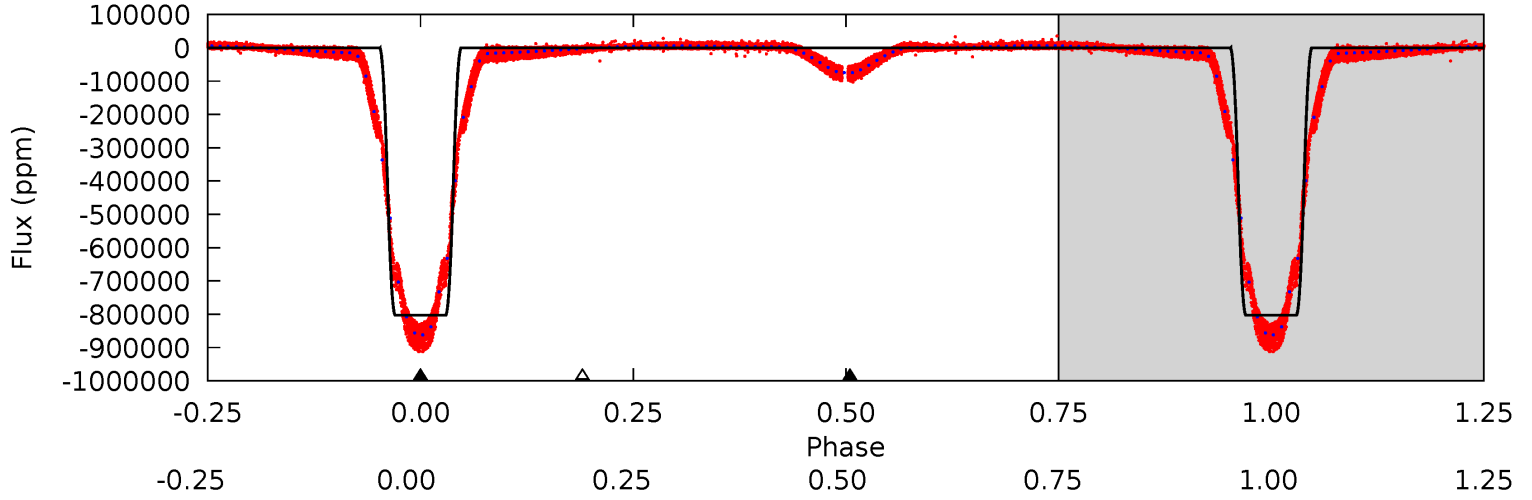
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006470516-01, P = 2.080409 Days, E = 131.840333 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
4159	393.6	29.2	0	4.57	1.67	33.5	4130	4159	364.4	393.6	4.67	1.04	0.00	33.0



### Stellar Parameters For KIC 006470516

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8344^{+233}_{-350}$	$4.040^{+0.192}_{-0.128}$	$-0.260^{+0.250}_{-0.300}$	$2.115^{+0.435}_{-0.532}$	$1.790^{+0.135}_{-0.293}$	$0.267^{+0.284}_{-0.103}$
	+3%/-4%	+5%/-3%	+96%/-115%	+21%/-25%	+8%/-16%	+106%/-39%
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 006470516-01 / KOI 3705.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$111.77^{+26.53}_{-25.60}$	$3771^{+239}_{-268}$	$-3561^{+10165}_{-2941}$	$-0.039^{+7.152}_{-6.477}$
Alt.	$-75962 \pm 193$	$212.18^{+34.21}_{-35.26}$	$3774^{+235}_{-274}$	$4413^{+261}_{-236}$	$1.479^{+0.640}_{-0.375}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

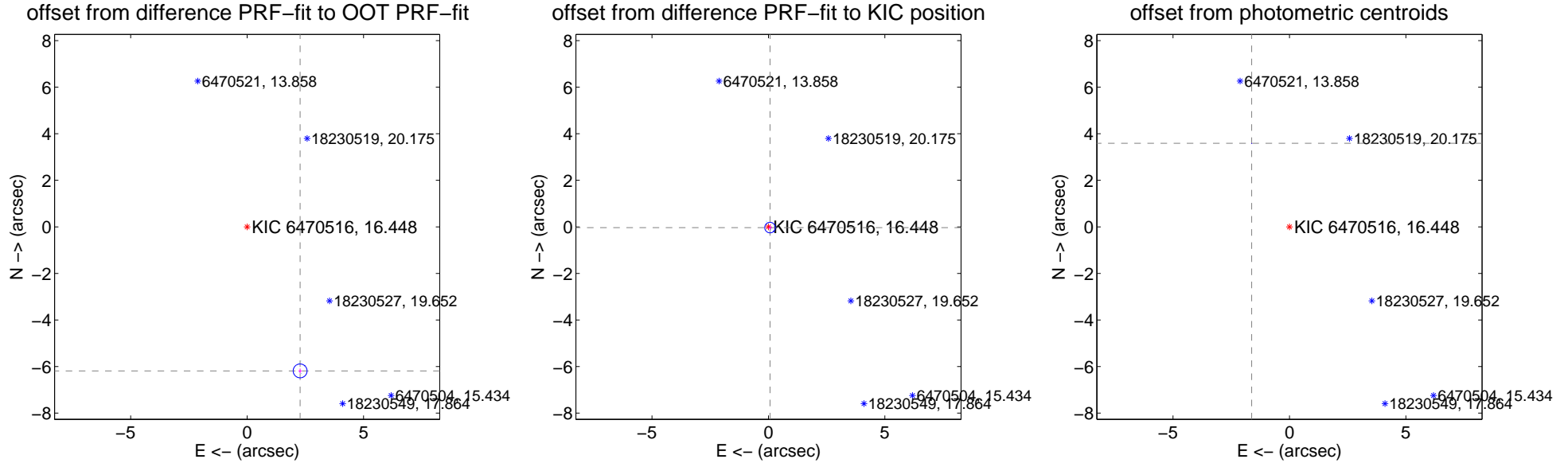
## DV Centroid Data

Supplemental centroid analysis for 006470516-01. Kepler magnitude: 16.45. Transit SNR -1.00

There are 10 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 6.39 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.593 \pm 0.099$	66.43	$-2.276 \pm 0.069$	$-6.188 \pm 0.101$
PRF-fit source offset from KIC position	$0.075 \pm 0.075$	0.99	$-0.068 \pm 0.071$	$-0.031 \pm 0.075$
photometric centroid source offset	$3.94 \pm 0.00$	7111.32	$1.62 \pm 0.00$	$3.59 \pm 0.00$



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.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



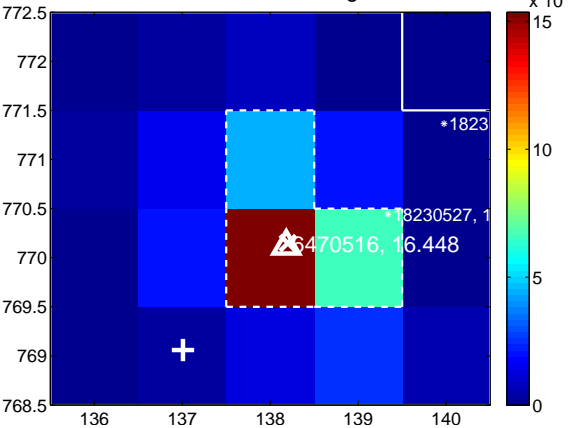
Q7 no difference image



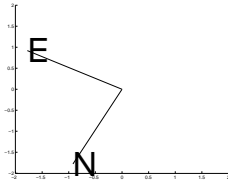
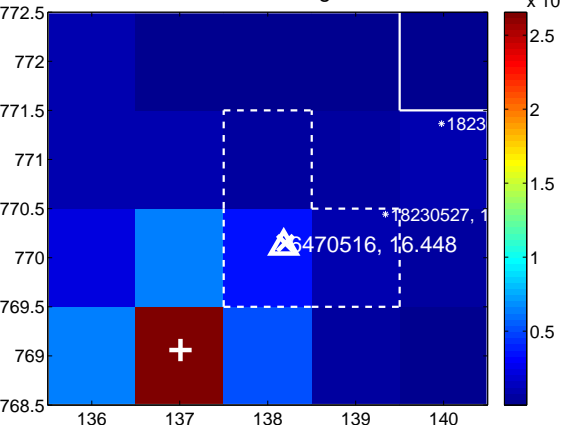
Q7 no OOT image



Q8 difference image

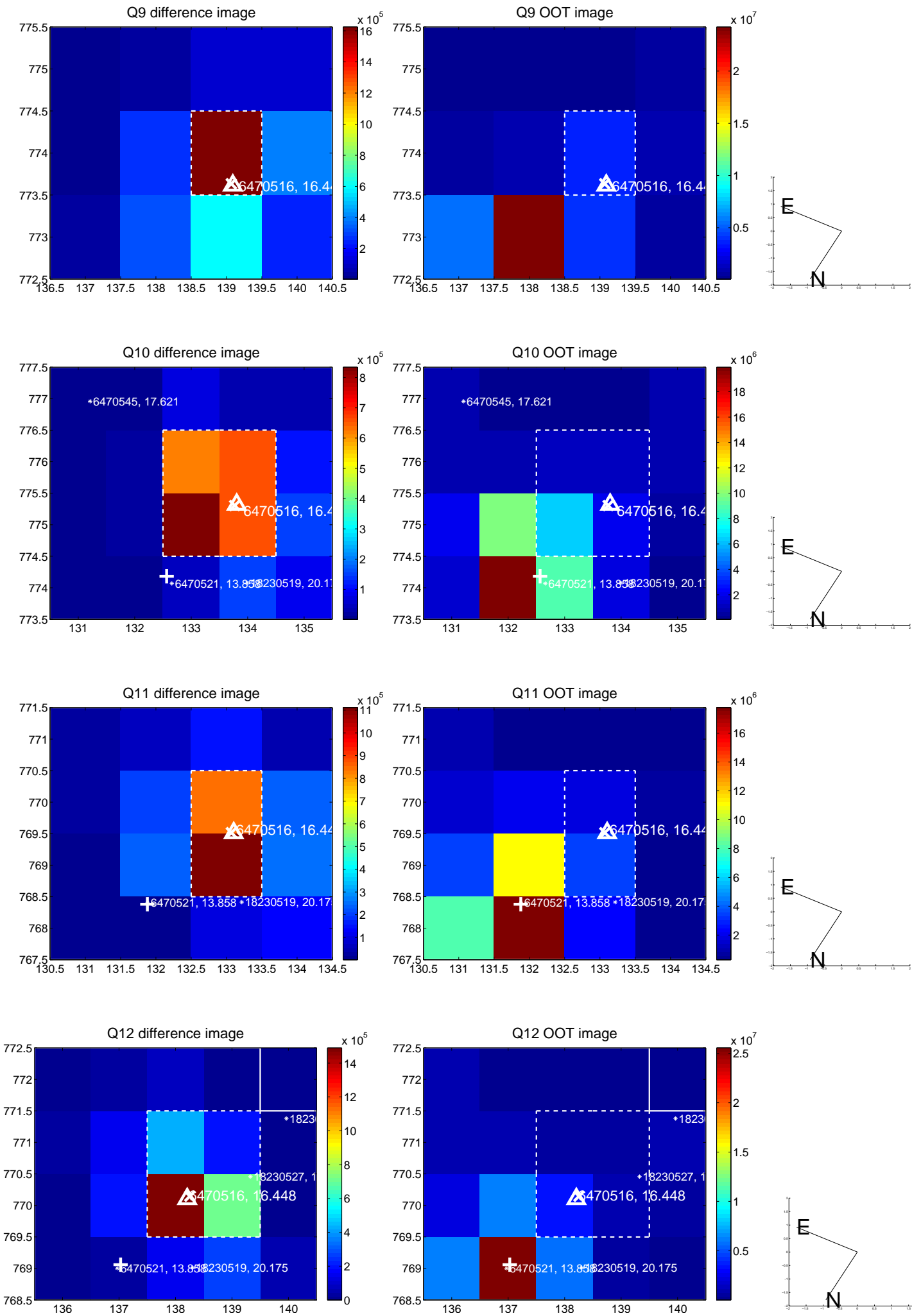


Q8 OOT image

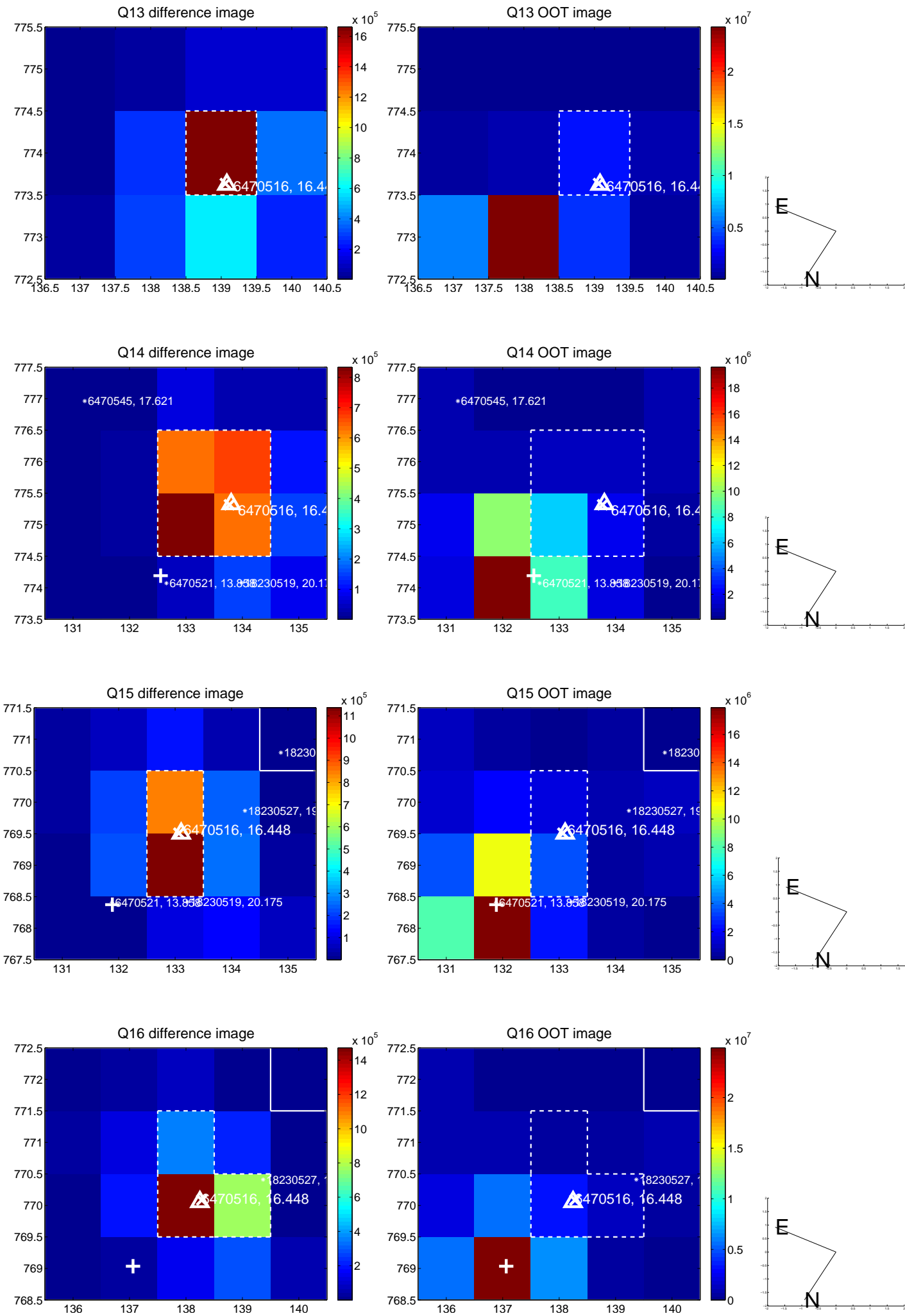




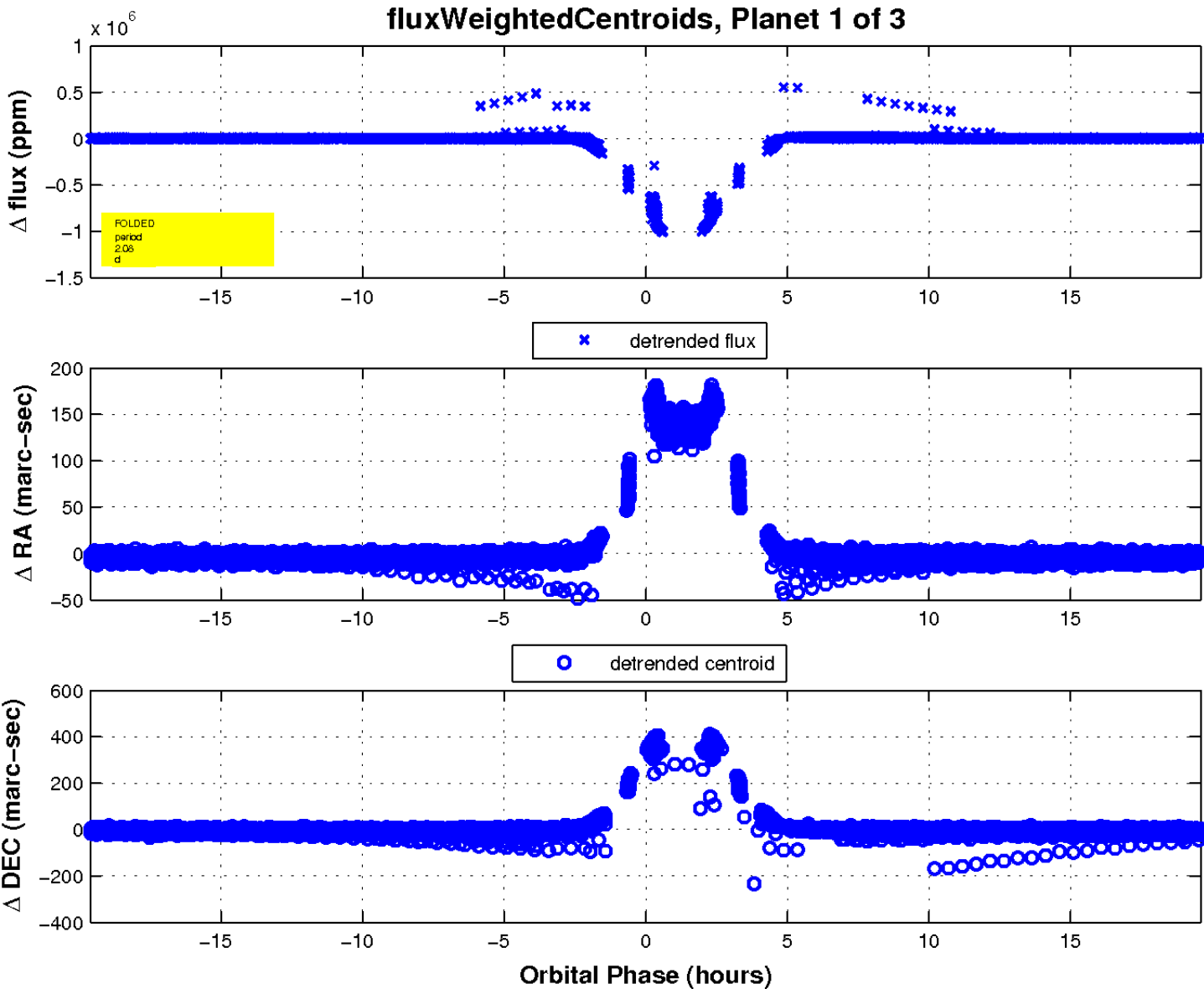
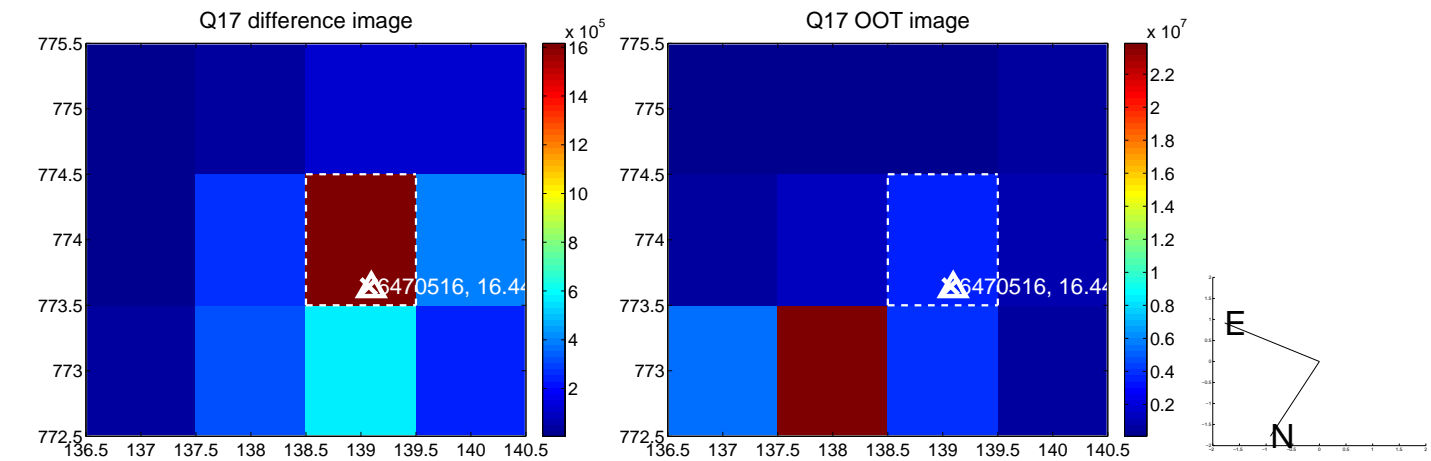
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

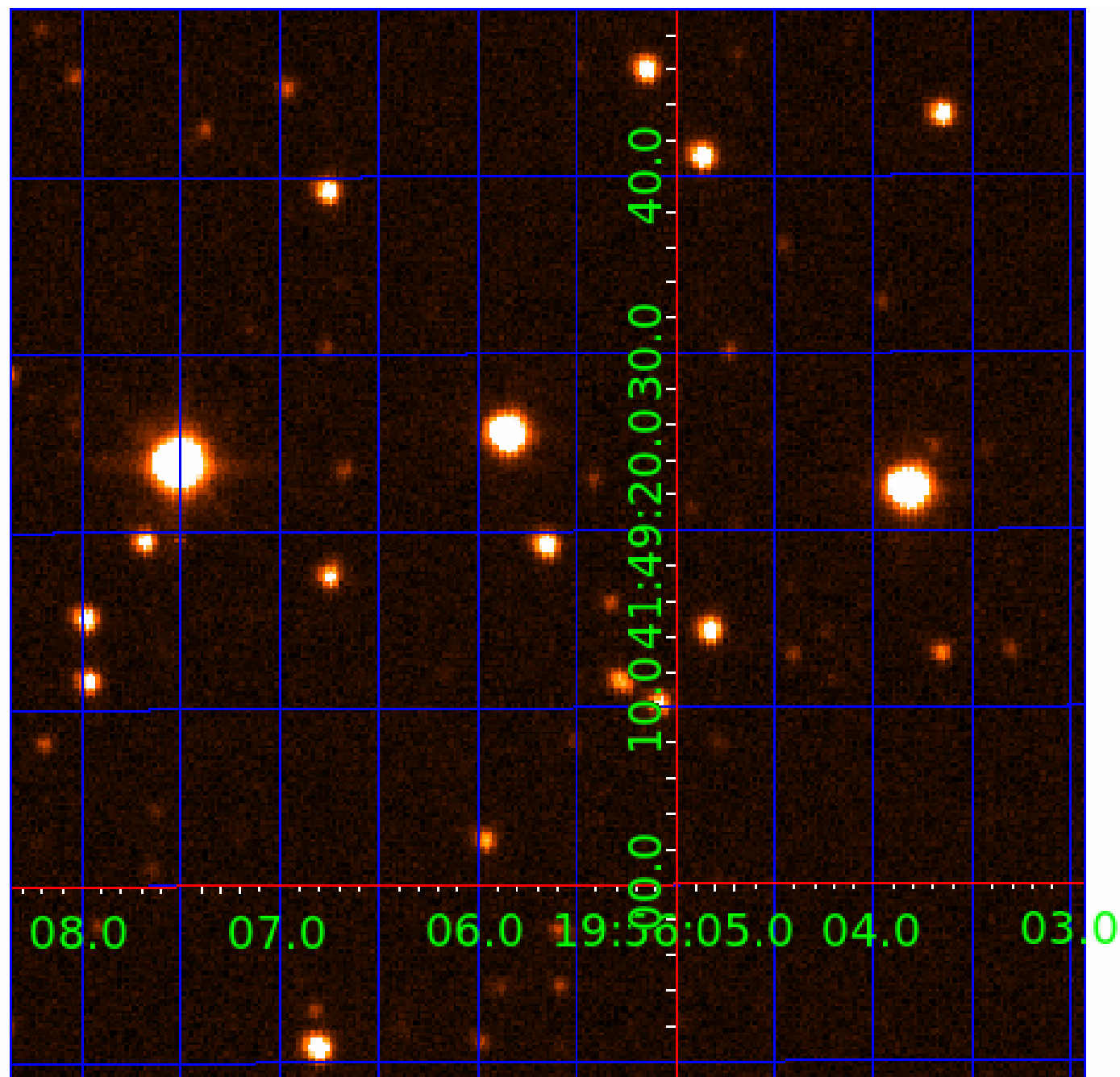


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006470516

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006470516-01	OBS	3705.01	2.080409	131.837931	283094.1	4.500	9631.2	-1.0	2.12	8344	115.40	12953.89
006470516-02	OBS	No	2.080426	132.873402	57322.4	5.542	737.4	405.2	2.12	8344	85.80	12953.75
006470516-03	OBS	No	2.080993	131.752791	1742.5	6.000	10.3	-1.0	2.12	8344	8.94	12949.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006470516-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
006470516-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
006470516-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_ALT—RESIDUAL_TCE—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.

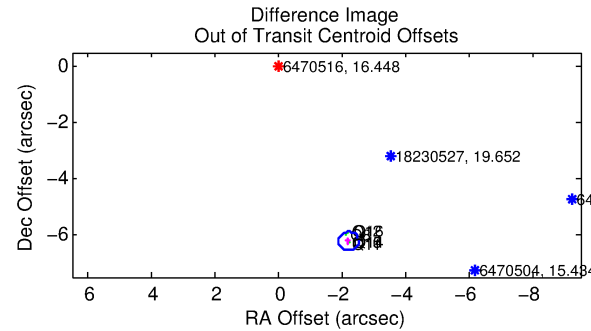
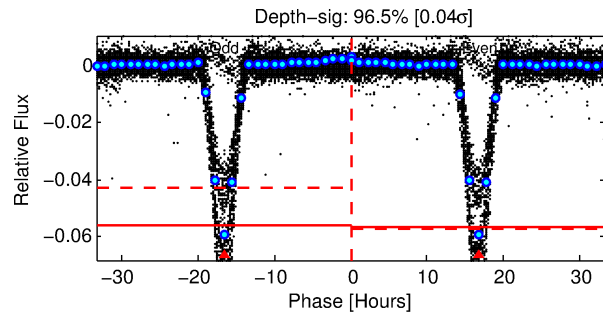
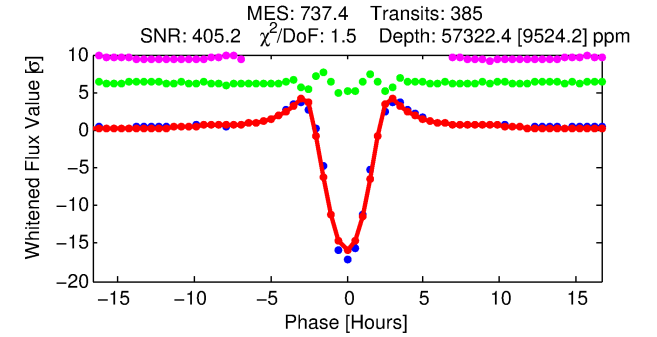
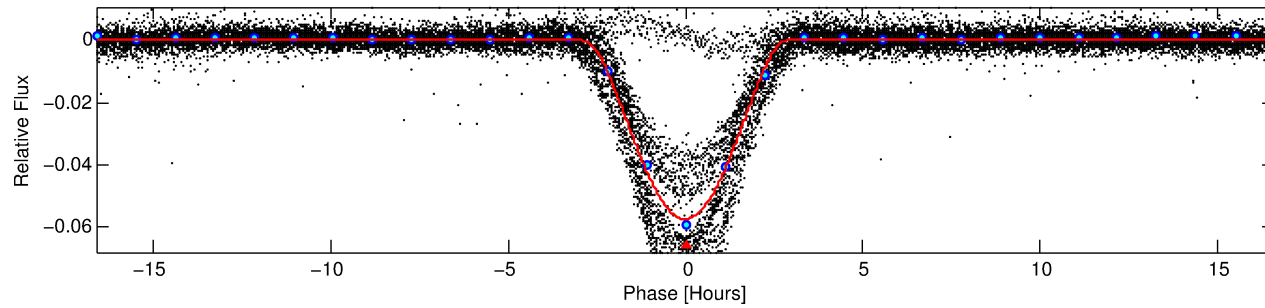
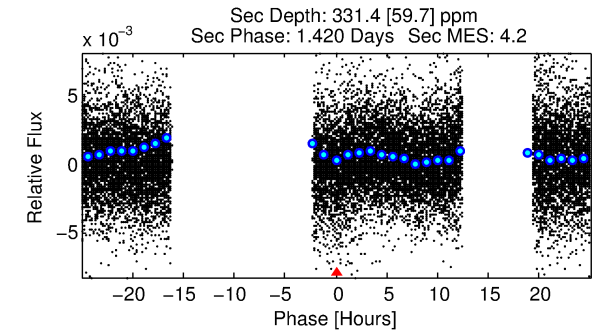
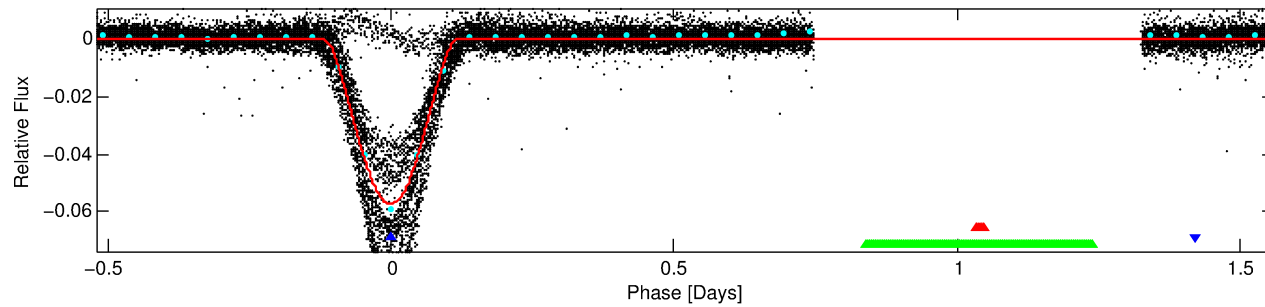
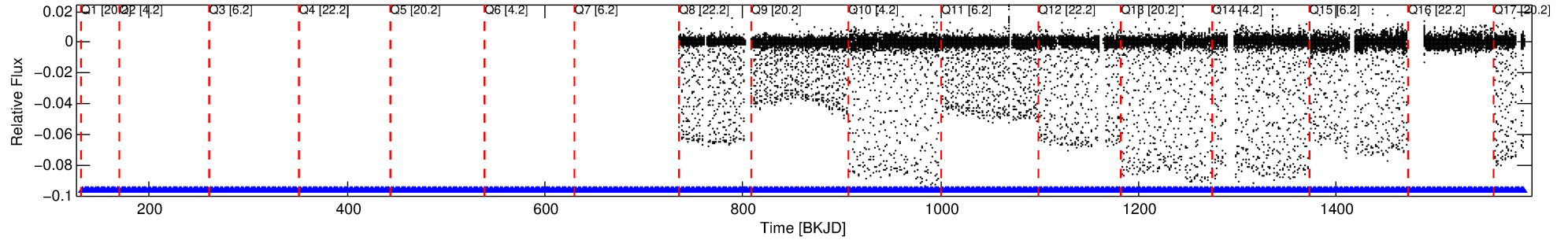
## Ephemeris Match Information For 006470516-02

No Significant Match Found

# DV One-Page Summary

KIC: 6470516 Candidate: 2 of 3 Period: 2.080 d  
KOI: K03705 Corr: No Ephemeris Match

Kp: 16.45 R\*: 2.12 Rs Teff: 8344.0 K Logg: 4.04 Fe/H: -0.260



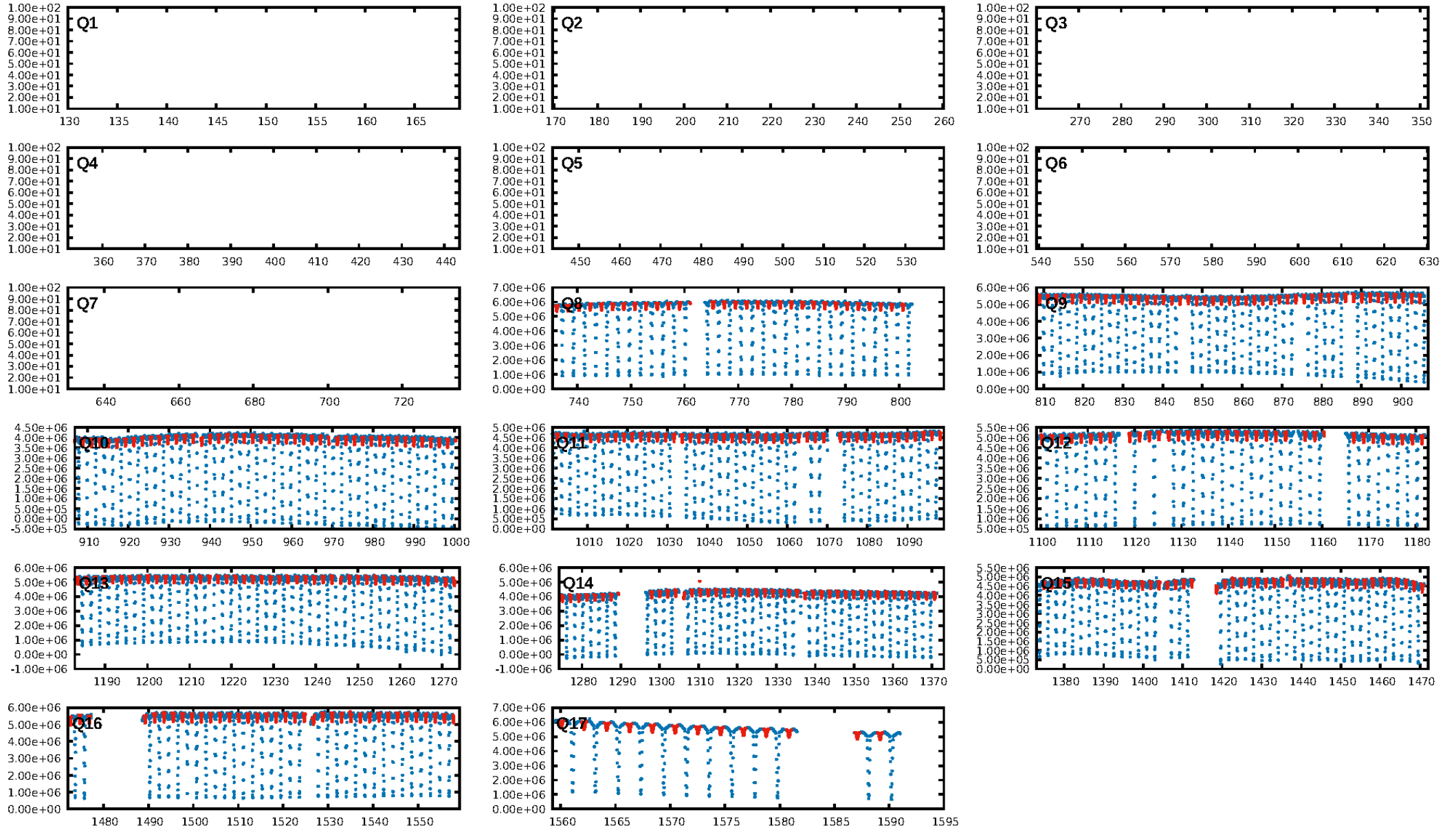
## DV Fit Results:

Period = 2.08043 [0.00000] d  
Epoch = 132.8734 [0.0002] BKJD  
Rp/R\* = 0.3718 [0.0589]  
a/R\* = 2.92 [0.03]  
b = 1.00 [0.04]  
Seff = 12953.75 [4900.88]  
Teff = 2720 [257] K  
Rp = 85.80 [25.50] Re  
a = 0.0387 [0.0086] AU  
Ag = 0.04 [0.02] [-52.08σ]  
Teffp = 1846 [185] K [-2.76σ]

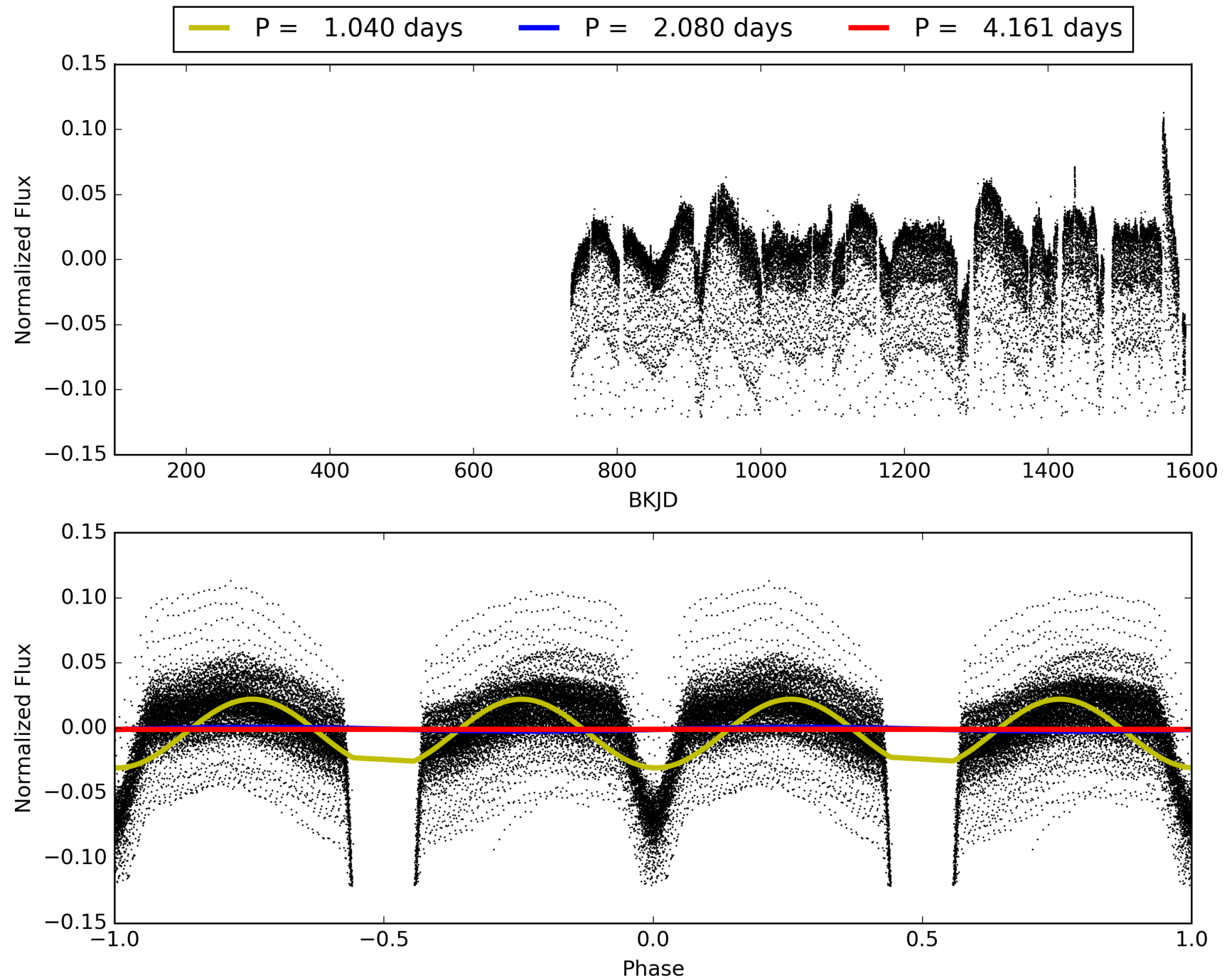
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [372/372]  
GhostDiagnostic-chr: 2.572  
Centroid-sig: N/A  
Centroid-so: 3.972 arcsec [675.75σ]  
OotOffset-rm: 6.597 arcsec [60.81σ]  
KicOffset-rm: 0.088 arcsec [1.22σ]  
OotOffset-st: 2/2/3/0 [7]  
KicOffset-st: 2/2/3/3 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 1.00 [10/10]

# TCE 006470516-02, PDC Light Curves



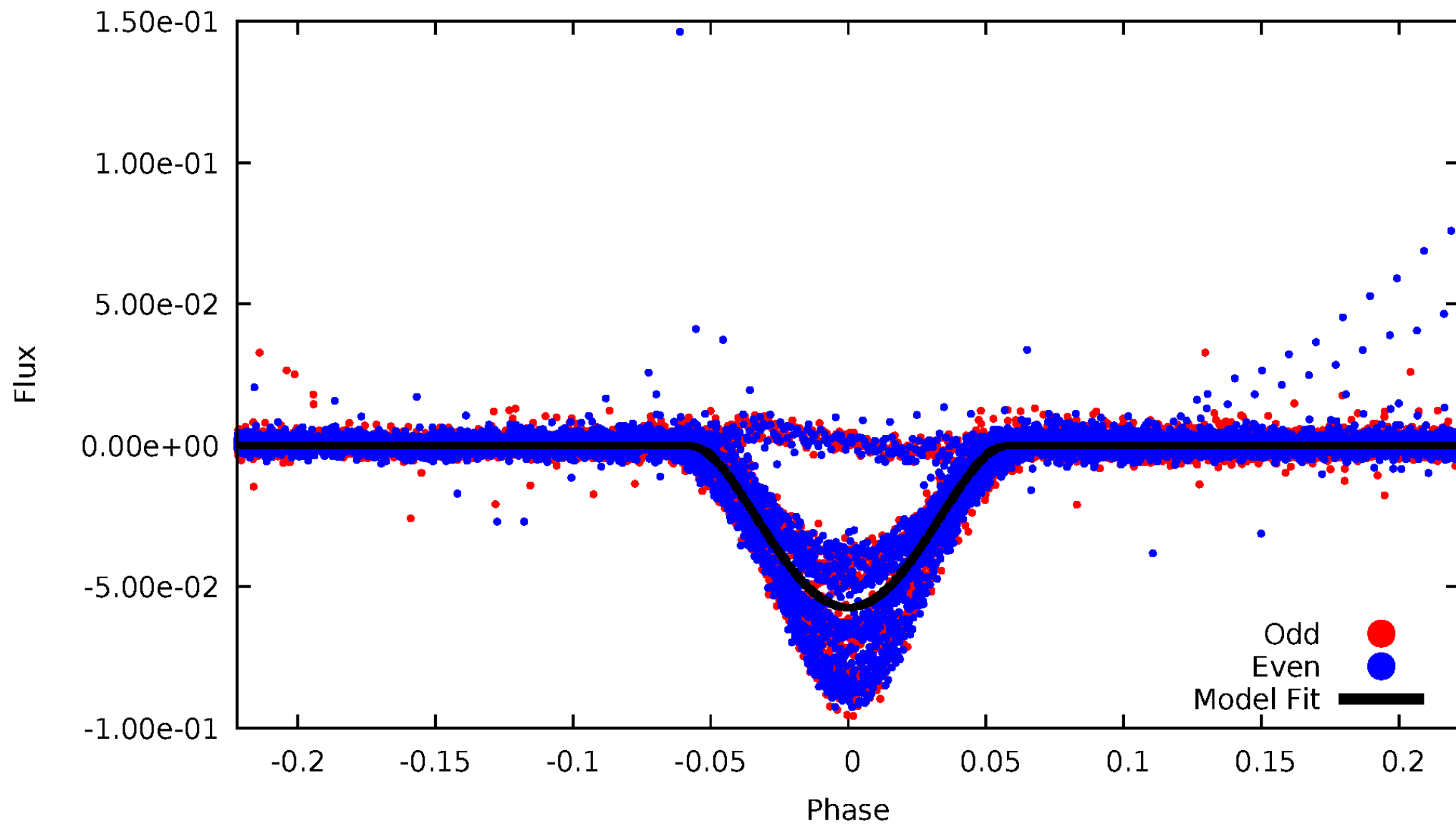
TCE 006470516-02





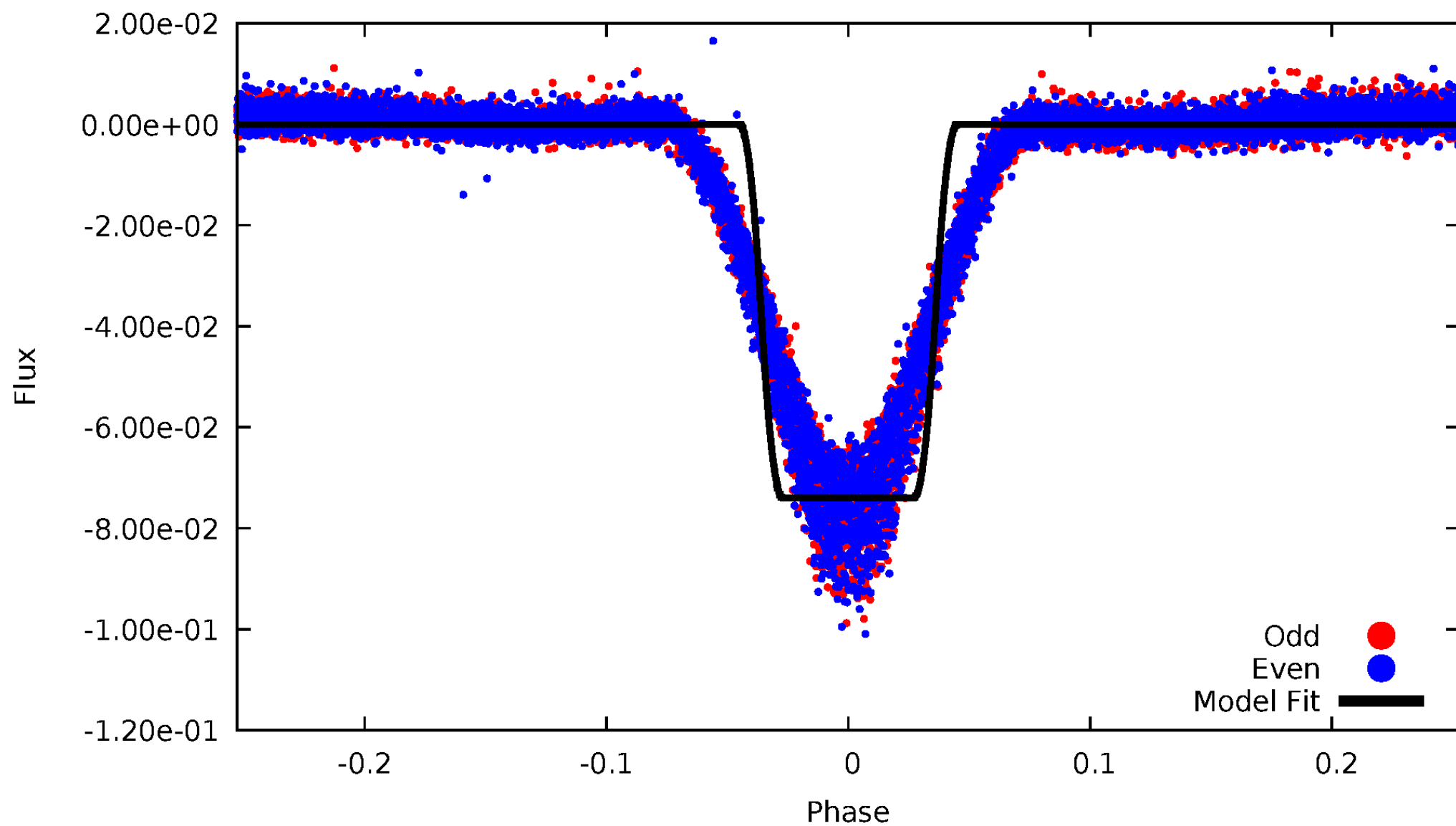
# DV Odd/Even

TCE 006470516-02



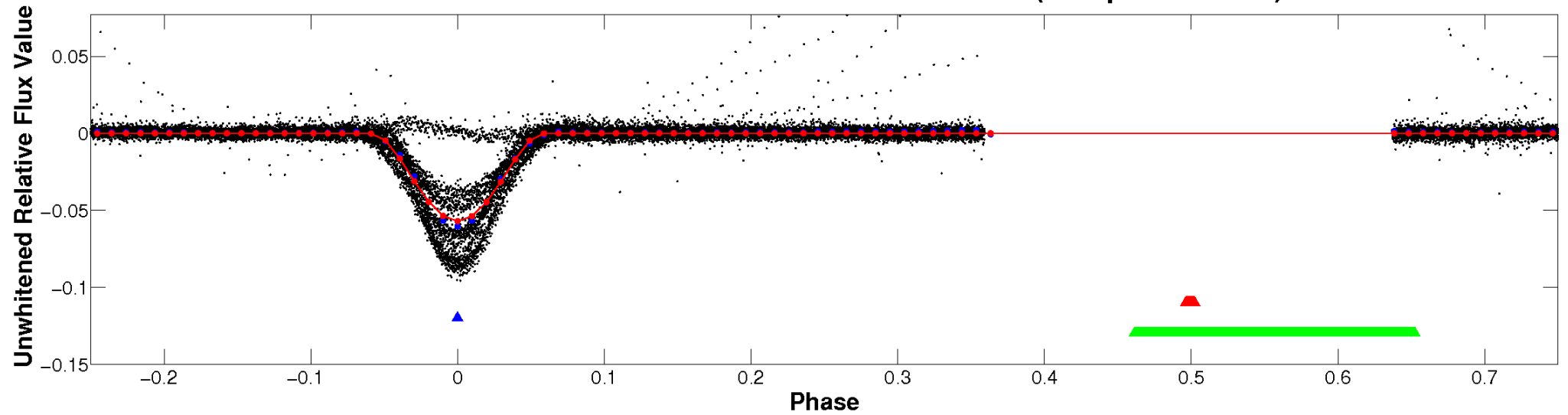
# ALT Odd/Even

TCE 006470516-02

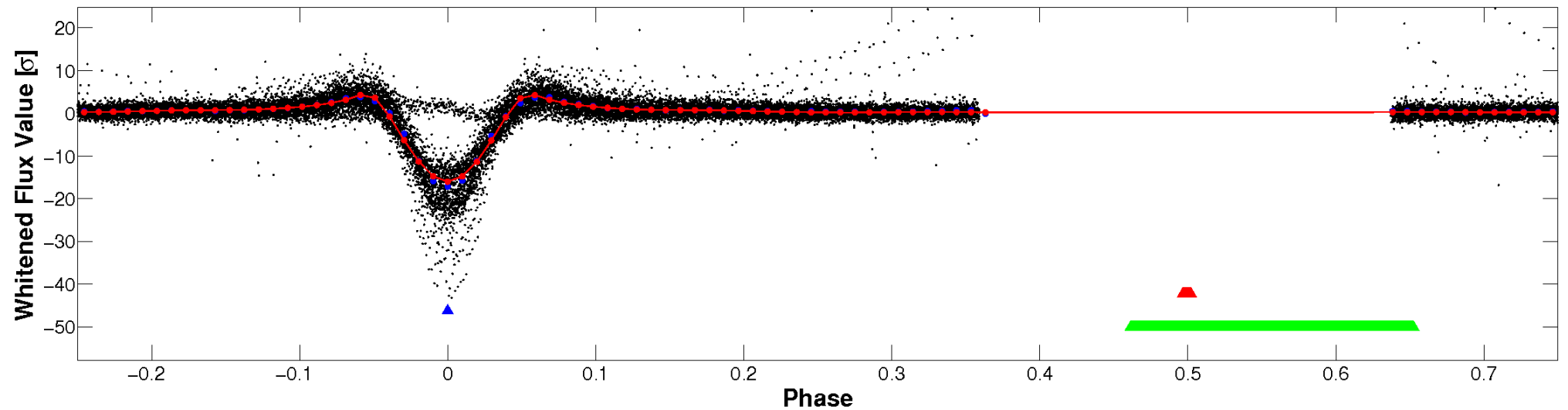


# Non-Whitened Vs. Whitened Light Curve

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

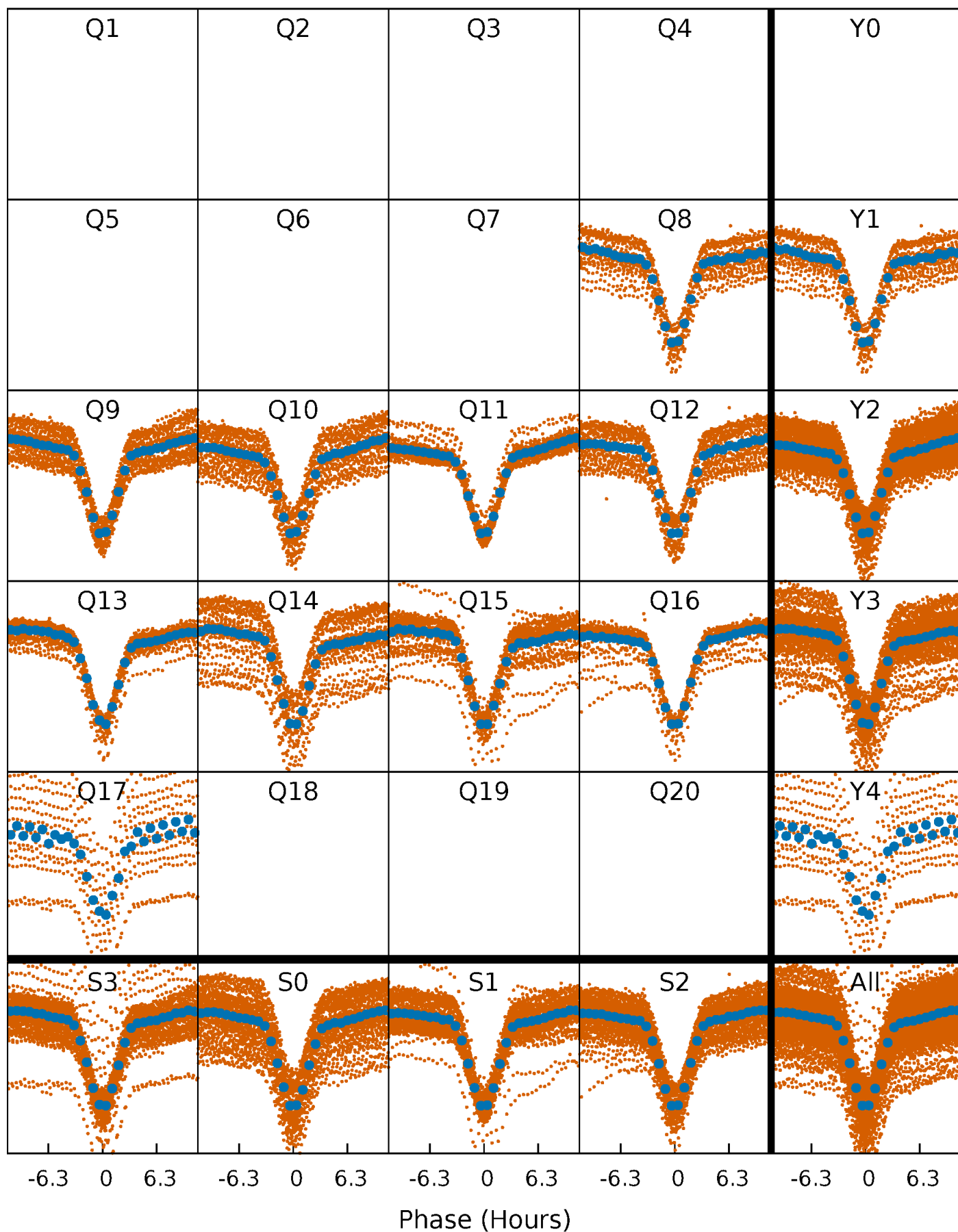


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



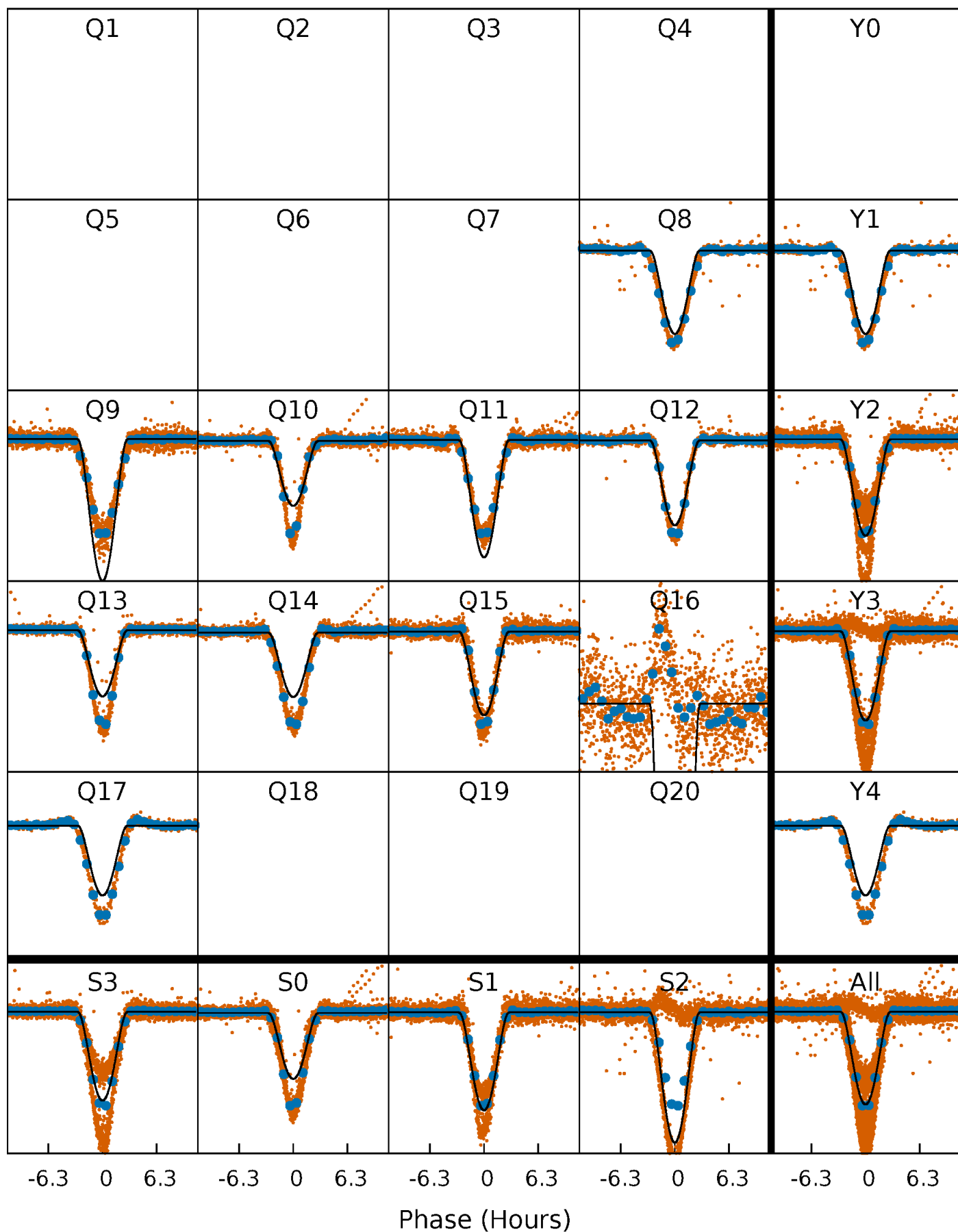
# PDC Quarter-Phased Transit Curves

TCE 006470516-02   P= 2.080426 Days    $T_0=132.873402$  (BKJD)



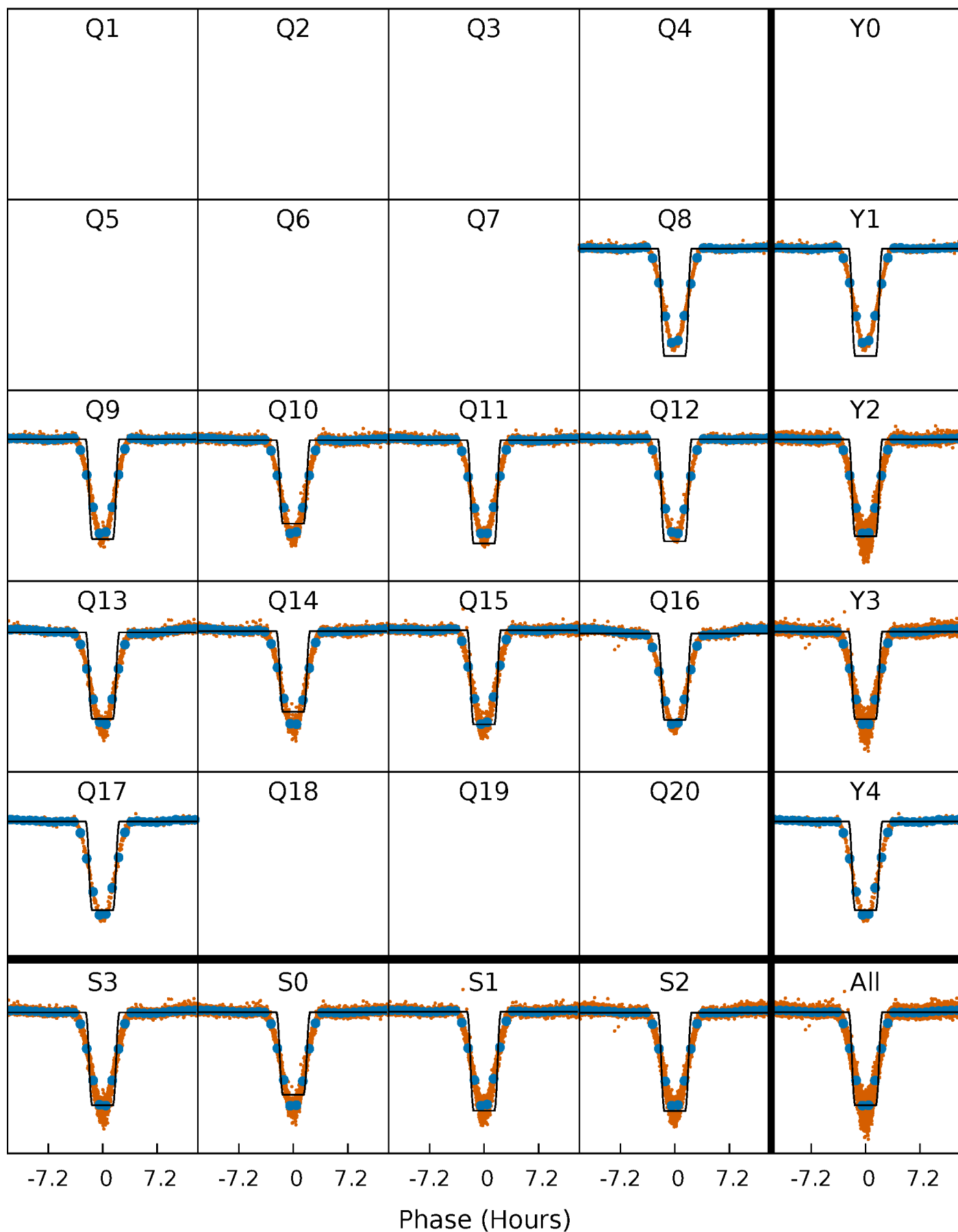
# DV Quarter-Phased Transit Curves

TCE 006470516-02   P= 2.080426 Days    $T_0=132.873402$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

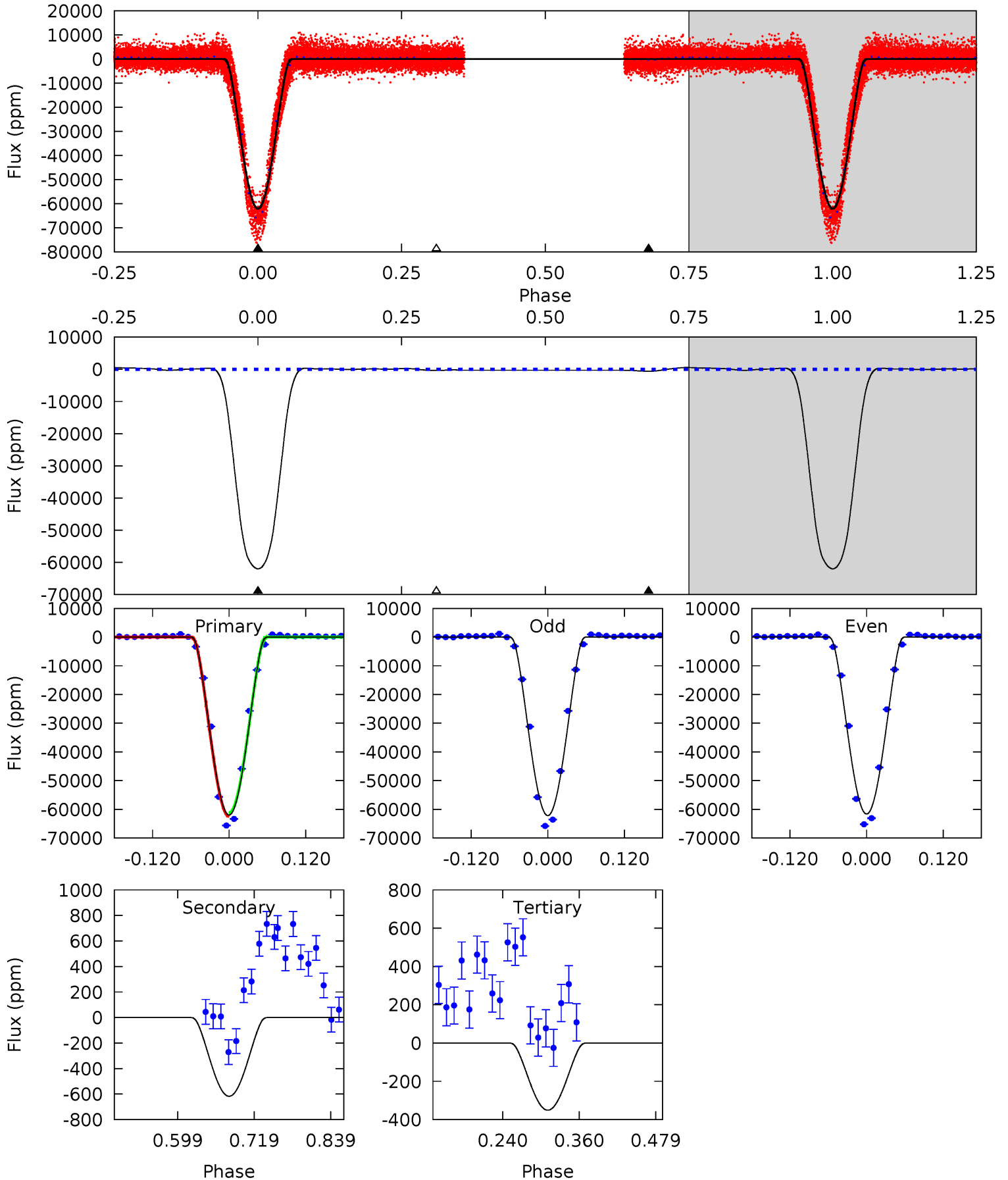
TCE 006470516-02     $P = 2.080435$  Days     $T_0 = 132.868849$  (BKJD)



# DV Model-Shift Uniqueness Test

006470516-02, P = 2.080426 Days, E = 132.873402 Days

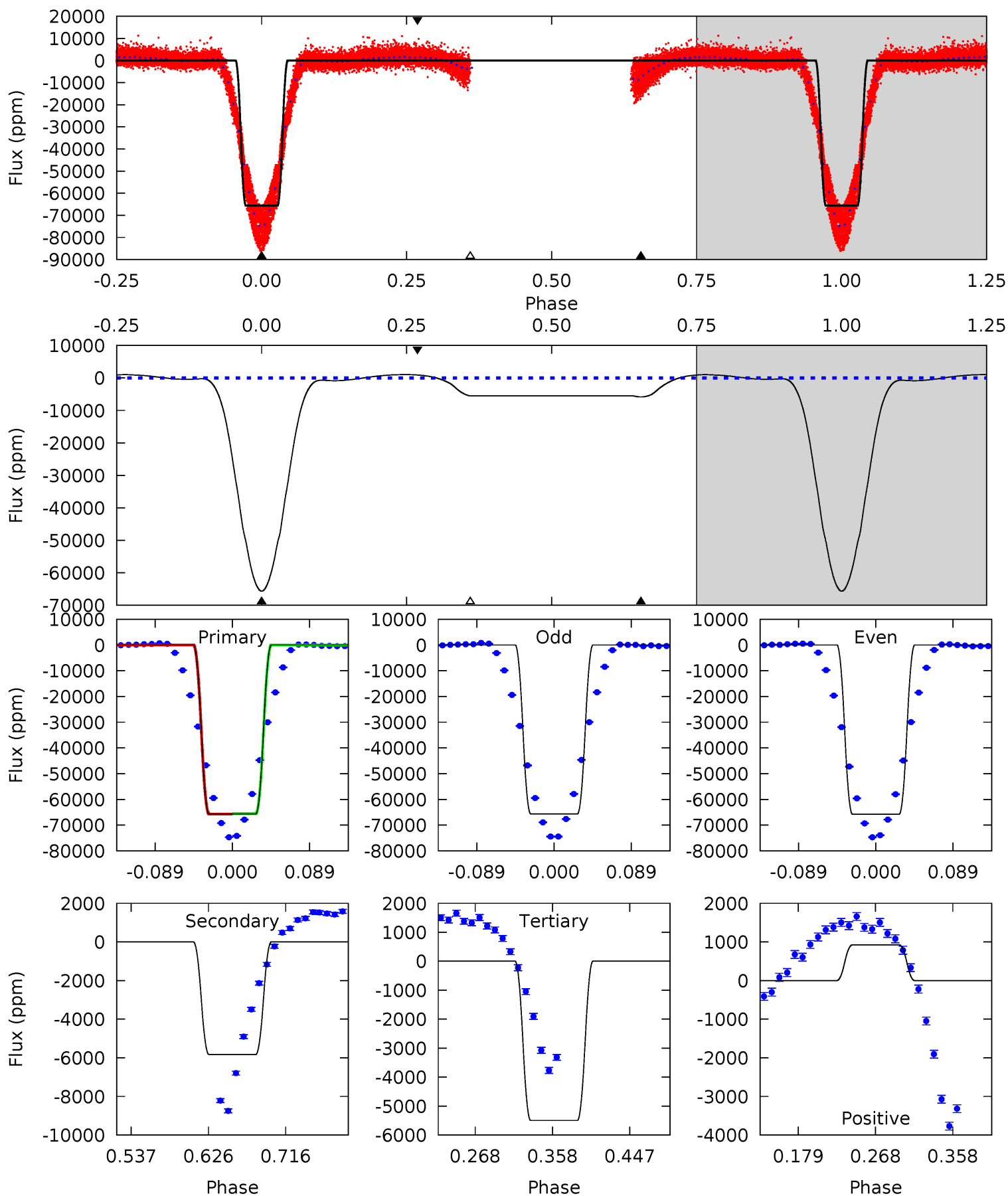
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1478	14.7	8.37	0	4.53	1.56	4.17	1470	1478	6.36	14.7	6.48	0.91	0.01	13.8



# Alt Model-Shift Uniqueness Test

006470516-02, P = 2.080435 Days, E = 132.868849 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
1588	141.1	132.9	22.3	4.59	1.70	30.8	1455	1565	8.15	118.7	1.40	1.01	0.02	2.40





### Stellar Parameters For KIC 006470516

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$8344^{+233}_{-350}$	$4.040^{+0.192}_{-0.128}$	$-0.260^{+0.250}_{-0.300}$	$2.115^{+0.435}_{-0.532}$	$1.790^{+0.135}_{-0.293}$	$0.267^{+0.284}_{-0.103}$
	+3%/-4%	+5%/-3%	+96%/-115%	+21%/-25%	+8%/-16%	+106%/-39%
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 006470516-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-617 \pm 42$	$84.79^{+16.97}_{-17.38}$	$3769^{+235}_{-290}$	$-3323^{+213}_{-156}$	$0.072^{+0.040}_{-0.022}$
Alt.	$-5832 \pm 41$	$61.48^{+16.31}_{-15.23}$	$3773^{+238}_{-270}$	$4232^{+550}_{-433}$	$1.251^{+0.902}_{-0.459}$

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

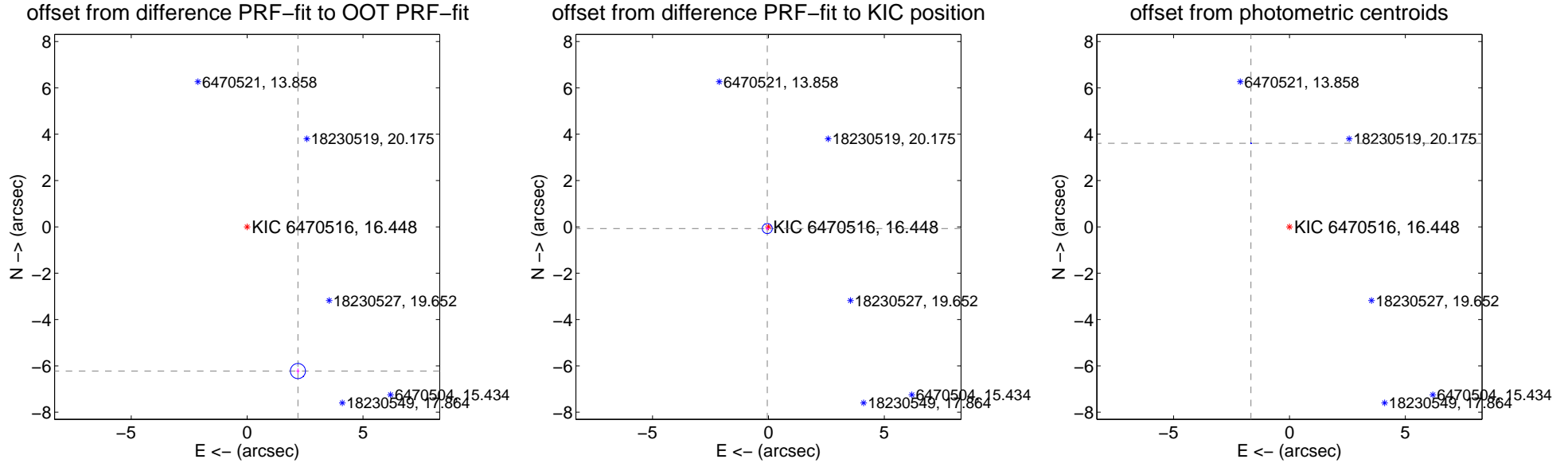
## DV Centroid Data

Supplemental centroid analysis for 006470516-02. Kepler magnitude: 16.45. Transit SNR 405.23

There are 10 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 6.38 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.597 \pm 0.108$	60.81	$-2.191 \pm 0.068$	$-6.222 \pm 0.113$
PRF-fit source offset from KIC position	$0.088 \pm 0.072$	1.22	$0.049 \pm 0.073$	$-0.073 \pm 0.072$
photometric centroid source offset	$3.97 \pm 0.01$	675.75	$1.66 \pm 0.00$	$3.61 \pm 0.01$



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

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



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

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



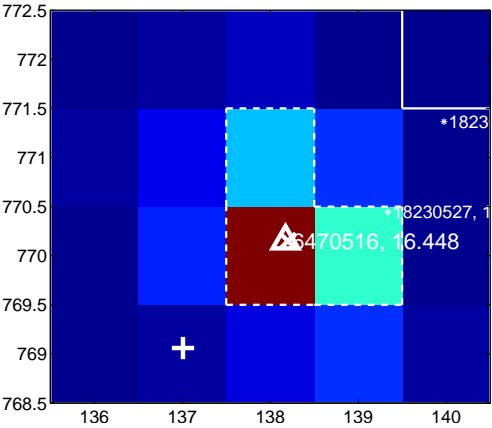
Q7 no difference image



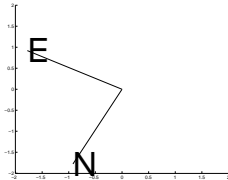
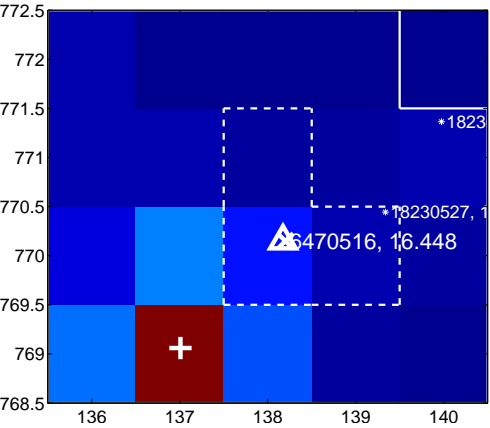
Q7 no OOT image



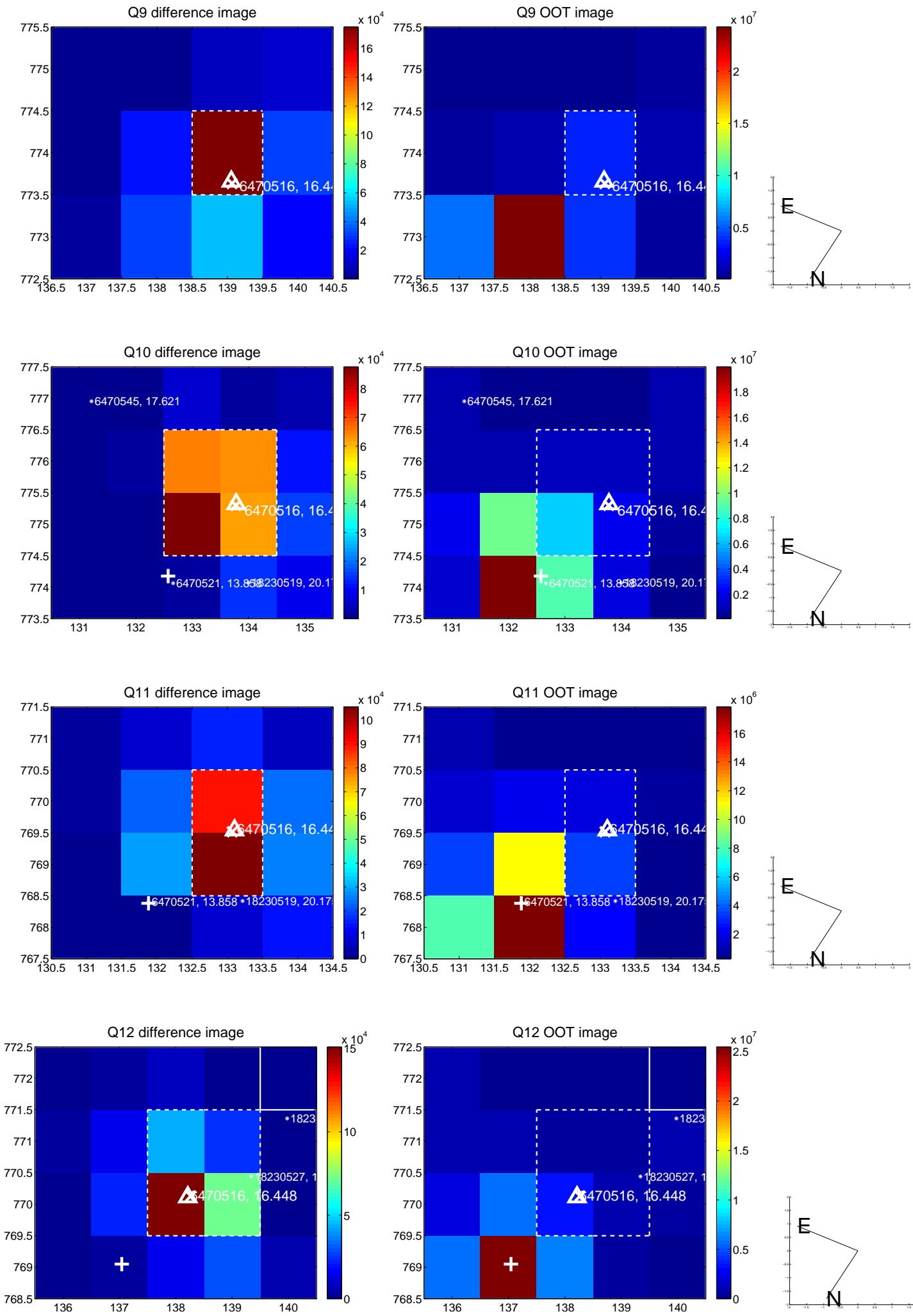
Q8 difference image



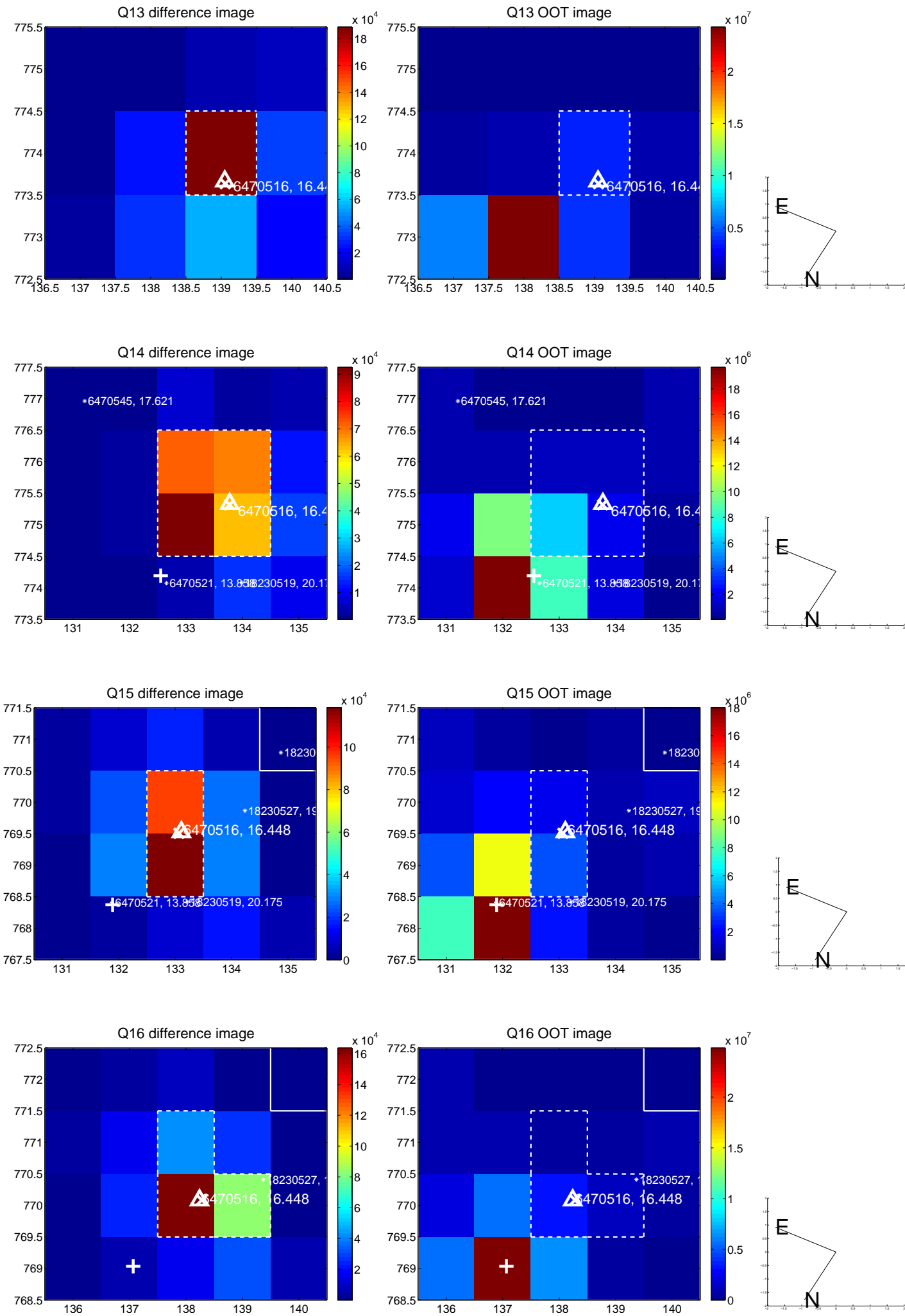
Q8 OOT image



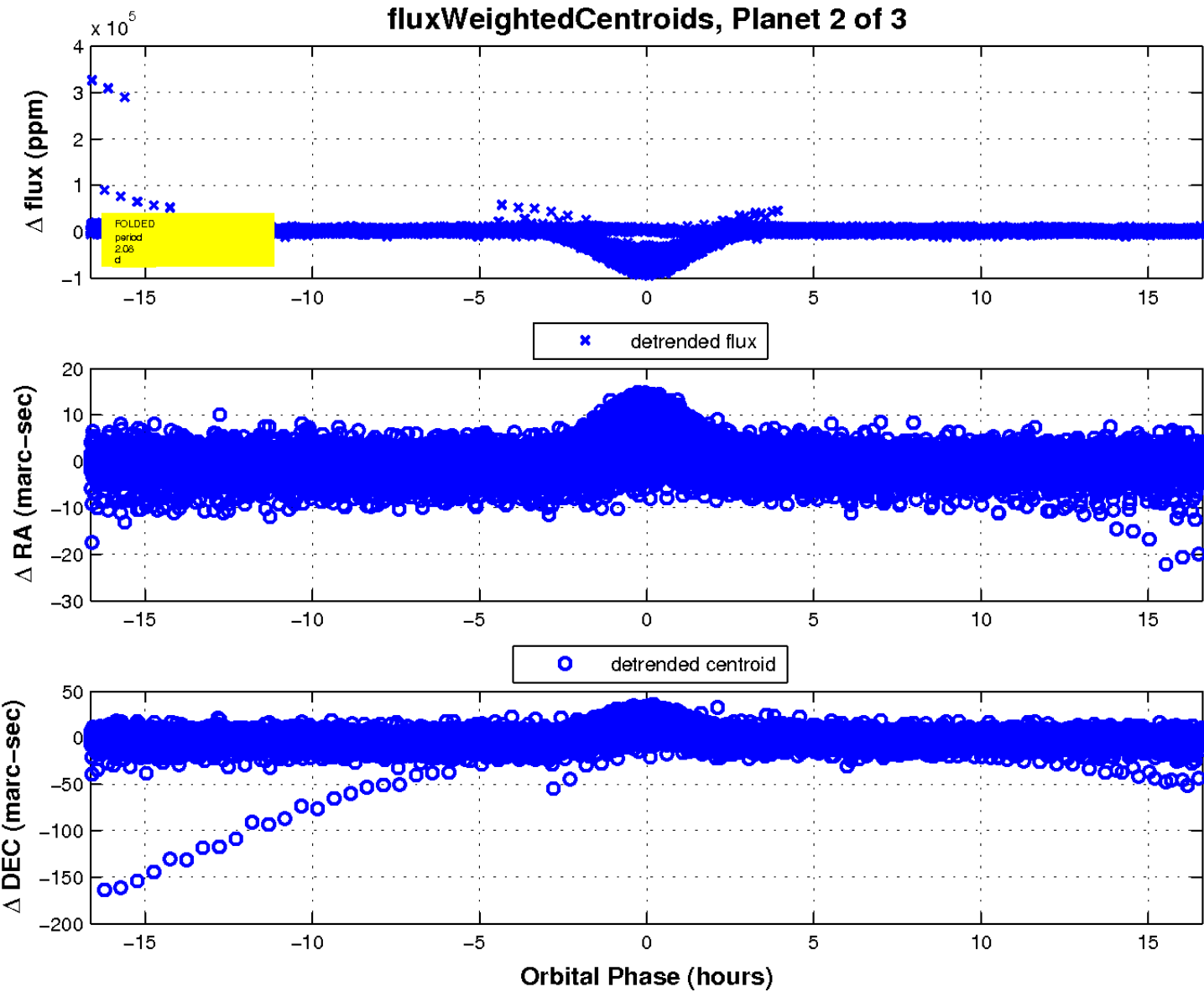
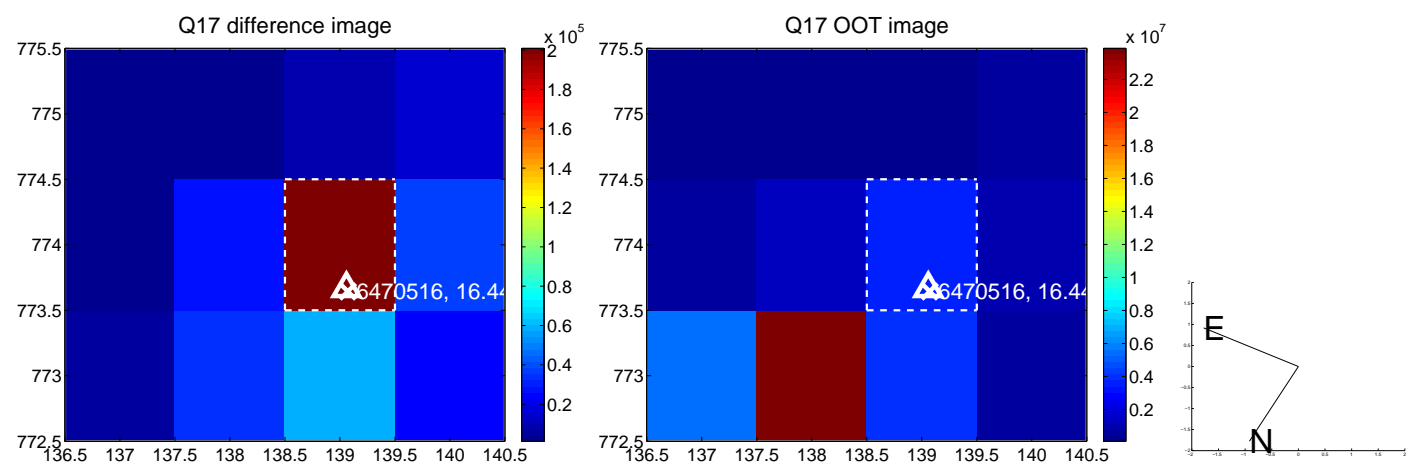
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

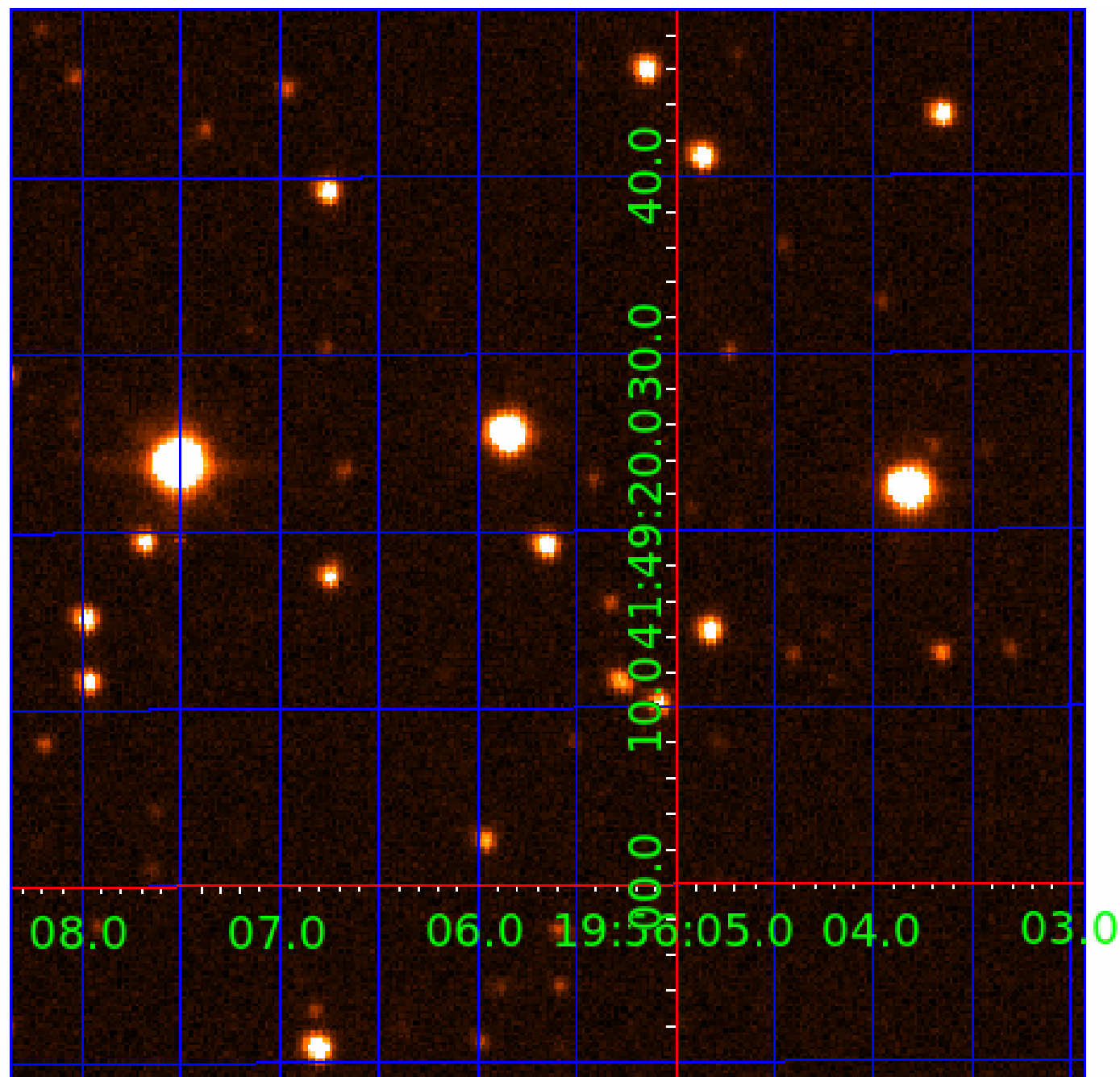


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006470516

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006470516-01	OBS	3705.01	2.080409	131.837931	283094.1	4.500	9631.2	-1.0	2.12	8344	115.40	12953.89
006470516-02	OBS	No	2.080426	132.873402	57322.4	5.542	737.4	405.2	2.12	8344	85.80	12953.75
006470516-03	OBS	No	2.080993	131.752791	1742.5	6.000	10.3	-1.0	2.12	8344	8.94	12949.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006470516-01	OBS	FP	0.00	0	1	0	0	SWEET_EB—MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS
006470516-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS
006470516-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_ALT—RESIDUAL_TCE—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.

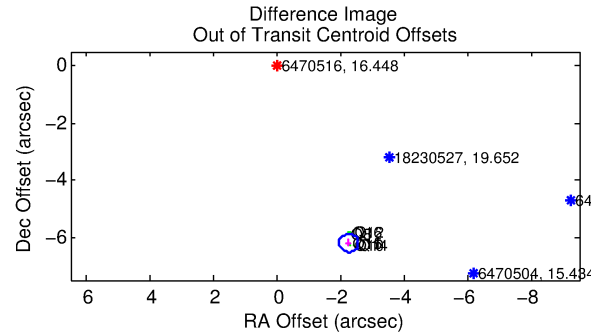
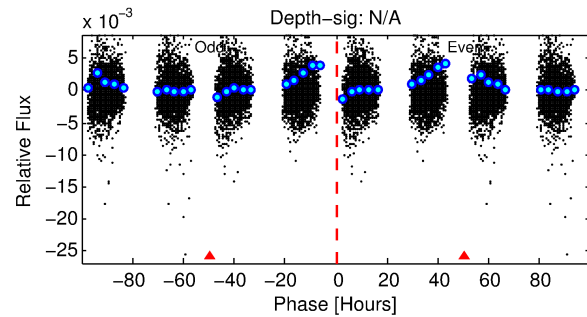
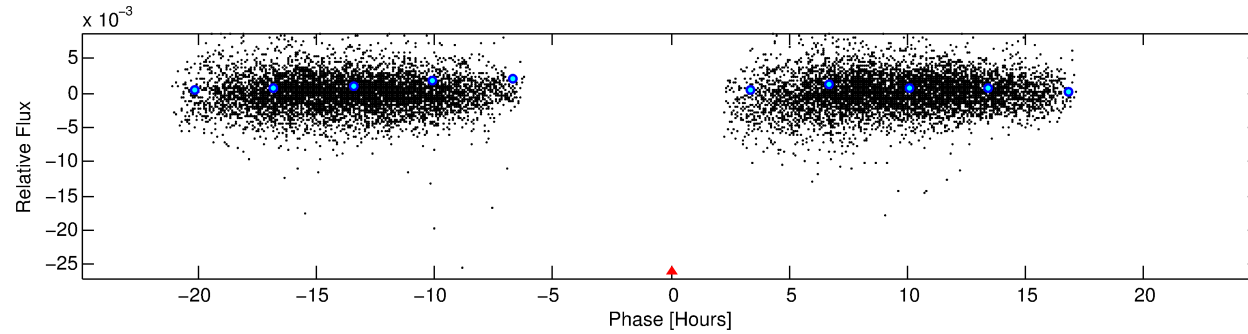
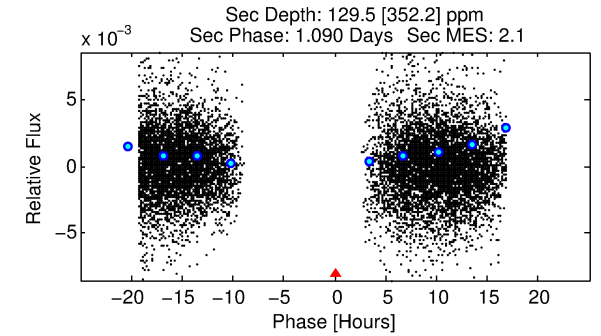
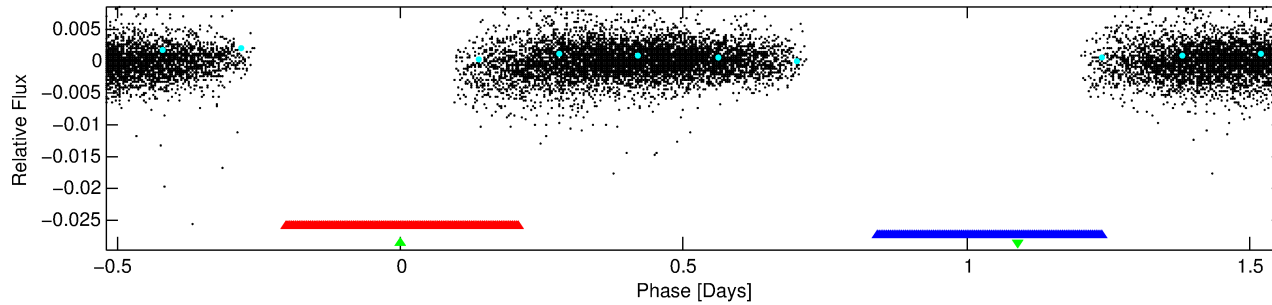
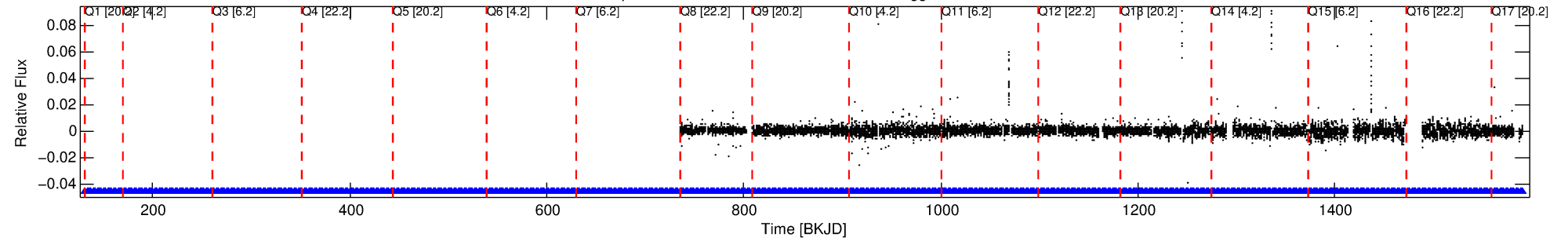
## Ephemeris Match Information For 006470516-03

No Significant Match Found

# DV One-Page Summary

KIC: 6470516 Candidate: 3 of 3 Period: 2.081 d  
KOI: K03705 Corr: No Ephemeris Match

Kp: 16.45 R\*: 2.12 Rs Teff: 8344.0 K Logg: 4.04 Fe/H: -0.260



## TPS TCE Results:

Period = 2.08099 d  
Epoch = 131.7528 BKJD

DV fit results are unavailable

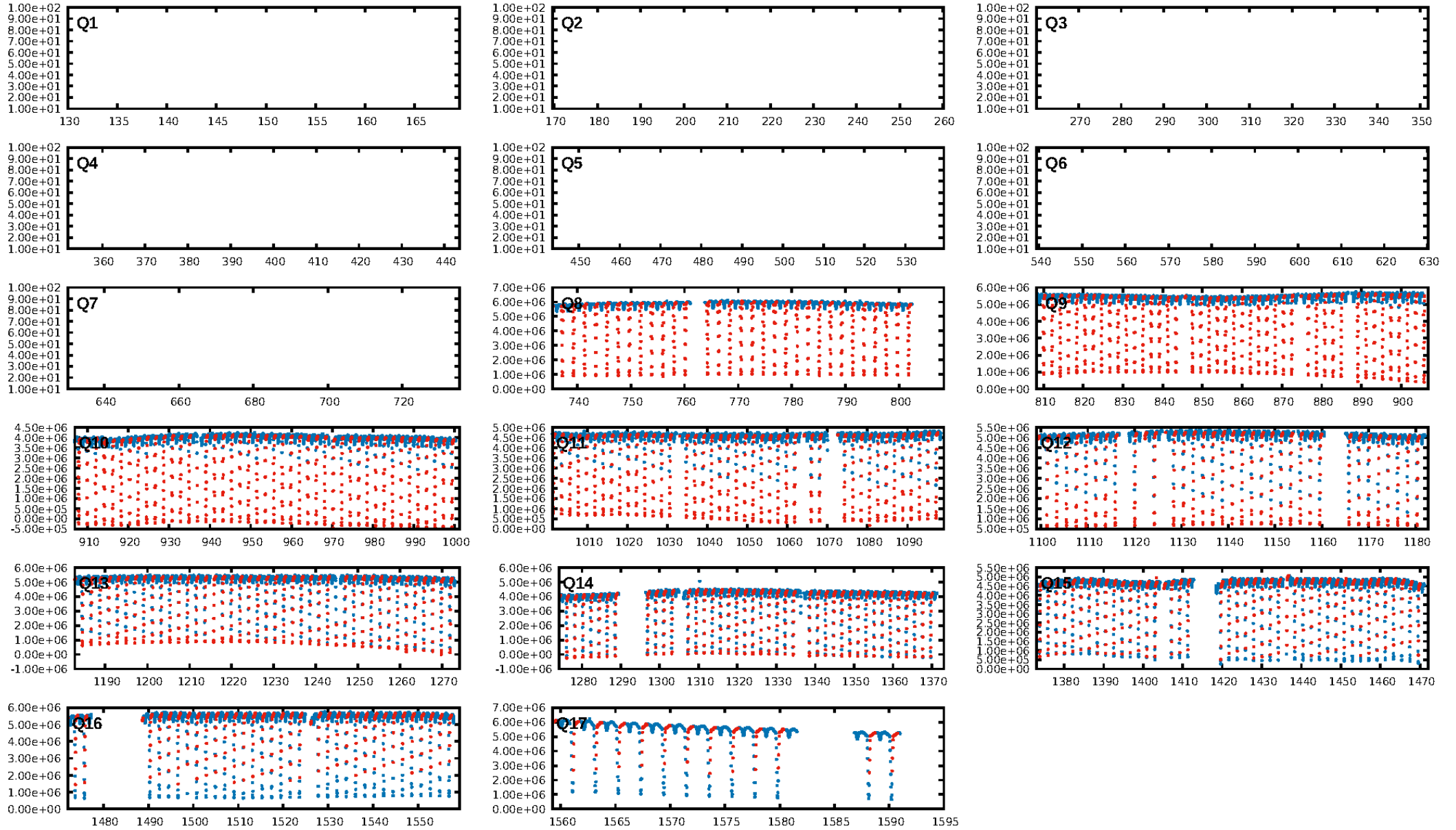
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [370/370]  
GhostDiagnostic-chr: 6.273  
Centroid-sig: N/A  
Centroid-so: 2.085 arcsec [202.48 $\sigma$ ]  
OotOffset-rm: 6.603 arcsec [63.95 $\sigma$ ]  
KicOffset-rm: 0.116 arcsec [1.53 $\sigma$ ]  
OotOffset-st: 2/2/3/0 [7]  
KicOffset-st: 2/2/3/3 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 0.00 [0/10]

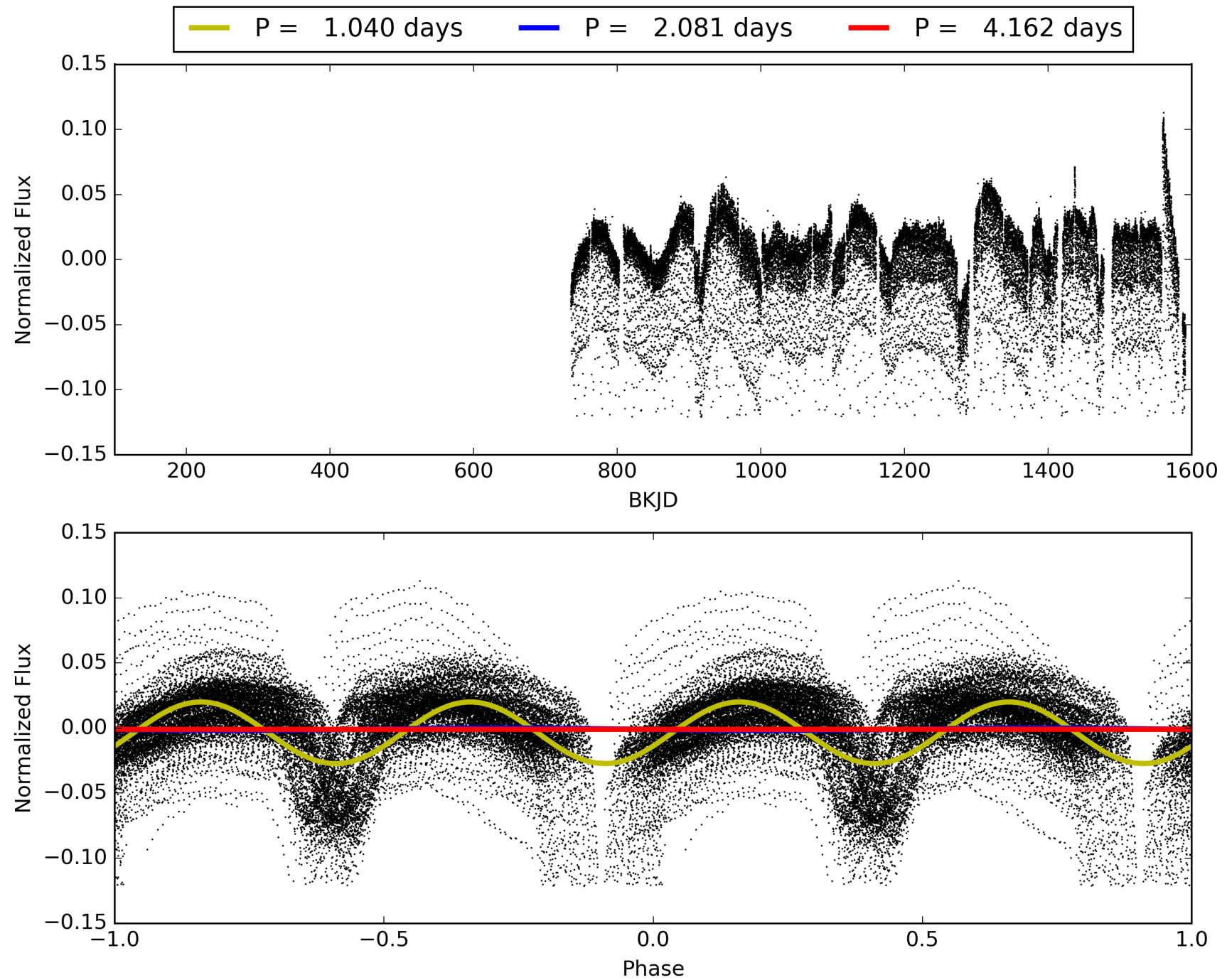
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:24:39 Z

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

# TCE 006470516-03, PDC Light Curves

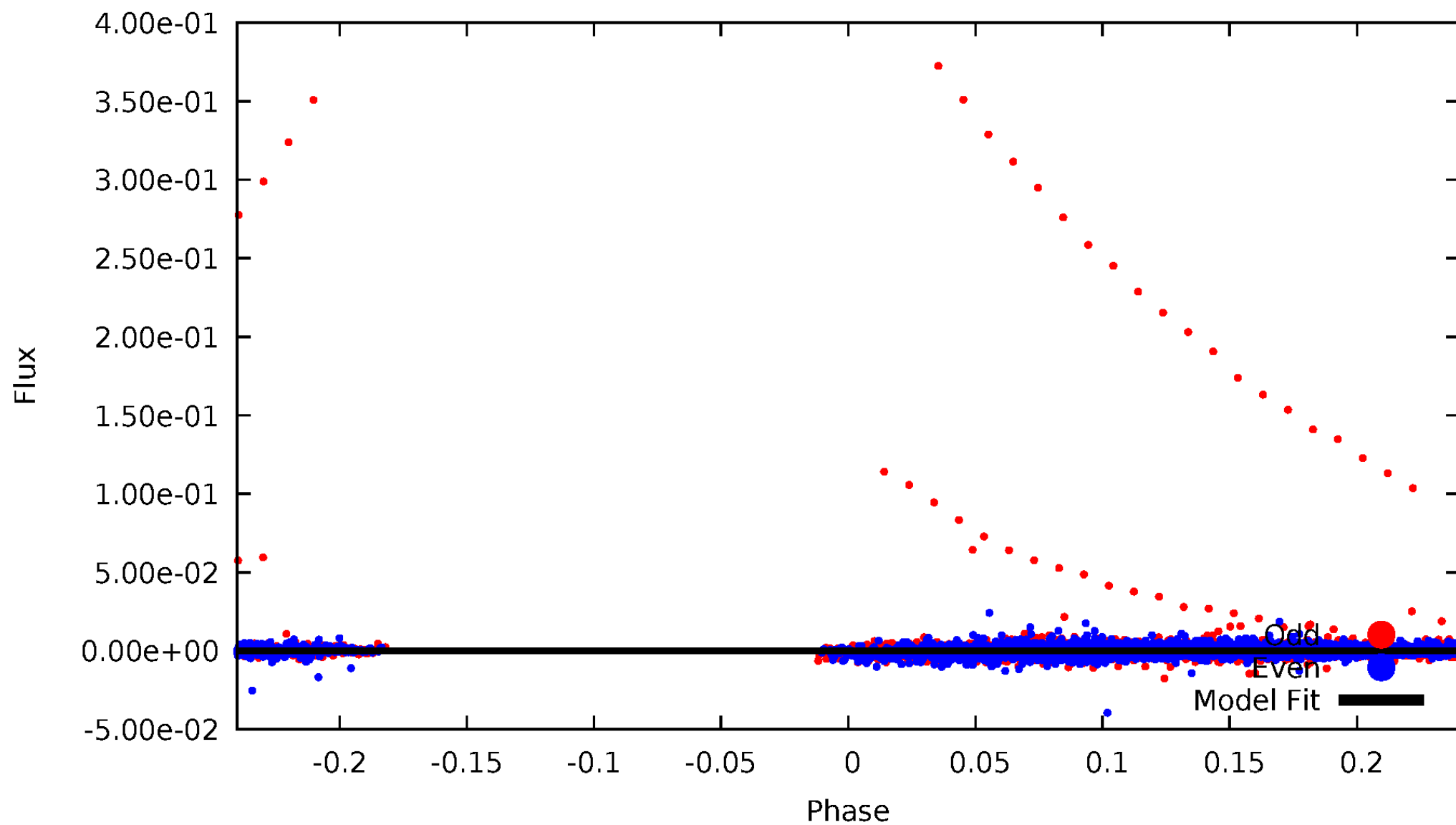


TCE 006470516-03



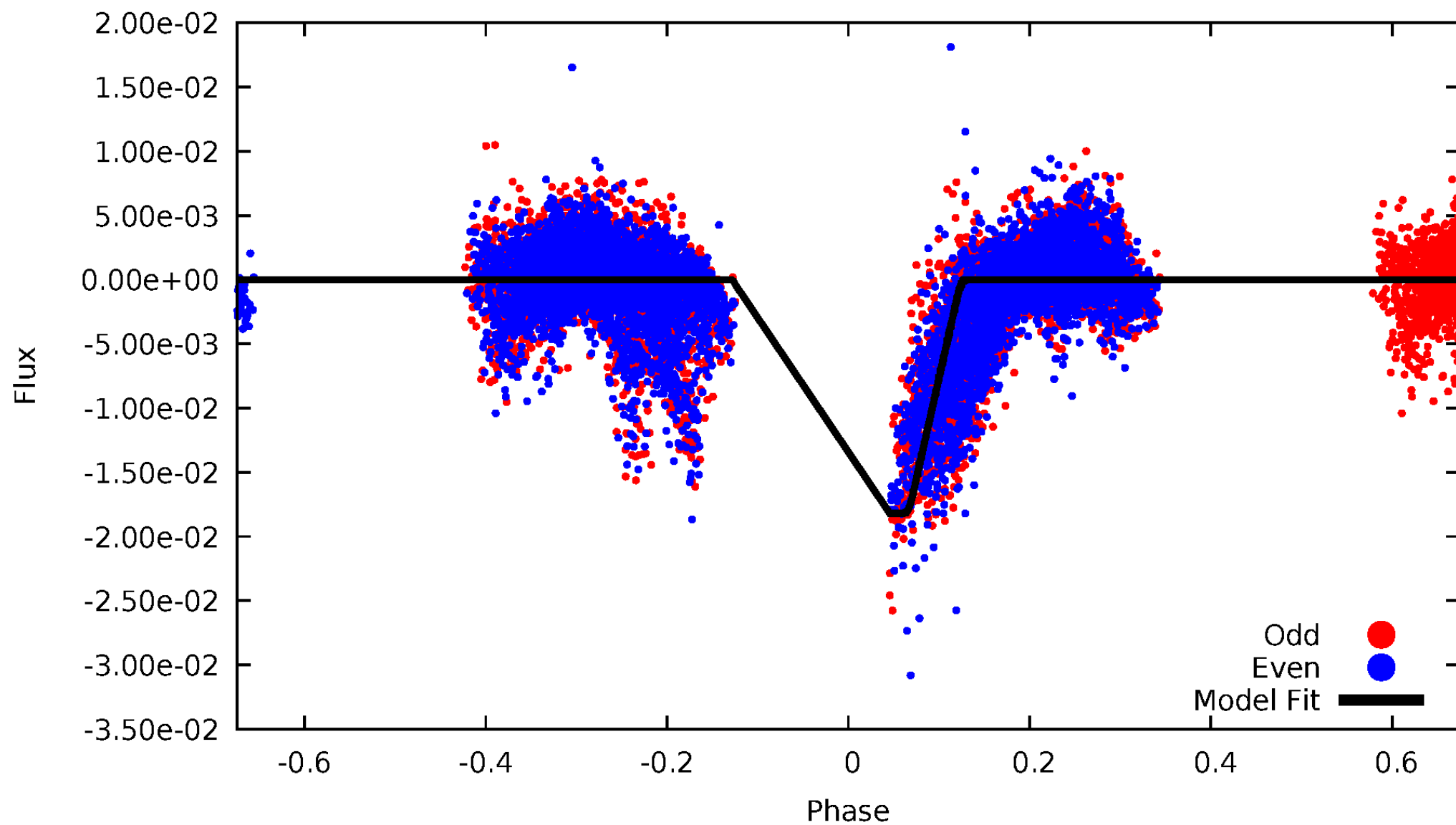
# DV Odd/Even

TCE 006470516-03



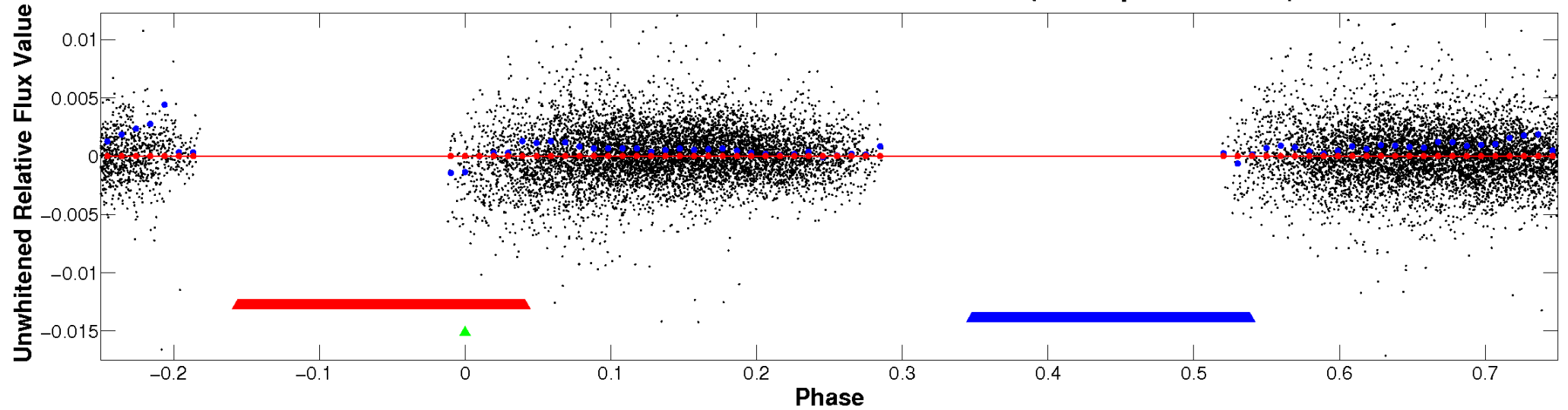
# ALT Odd/Even

TCE 006470516-03



# Non-Whitened Vs. Whitened Light Curve

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

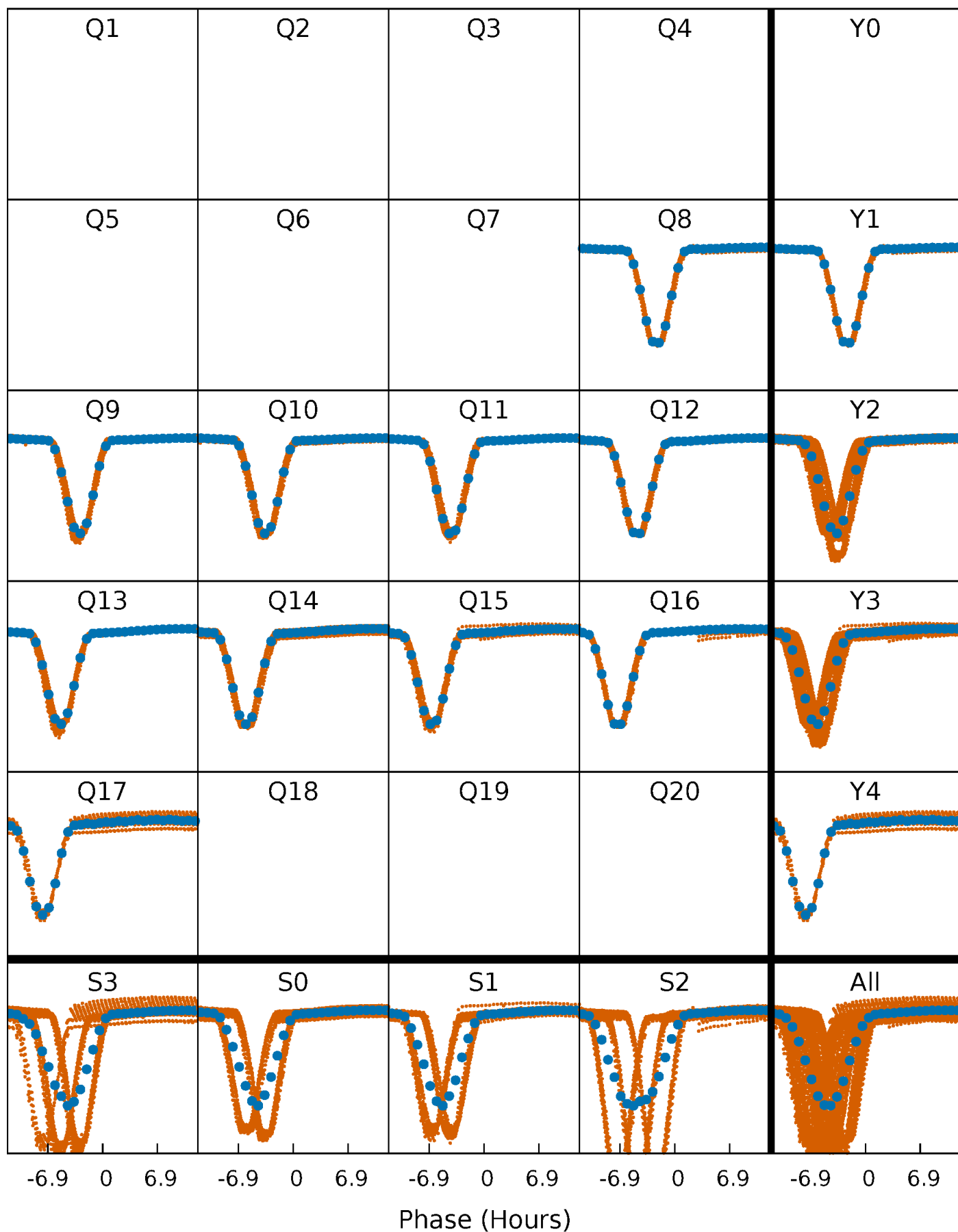


**Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

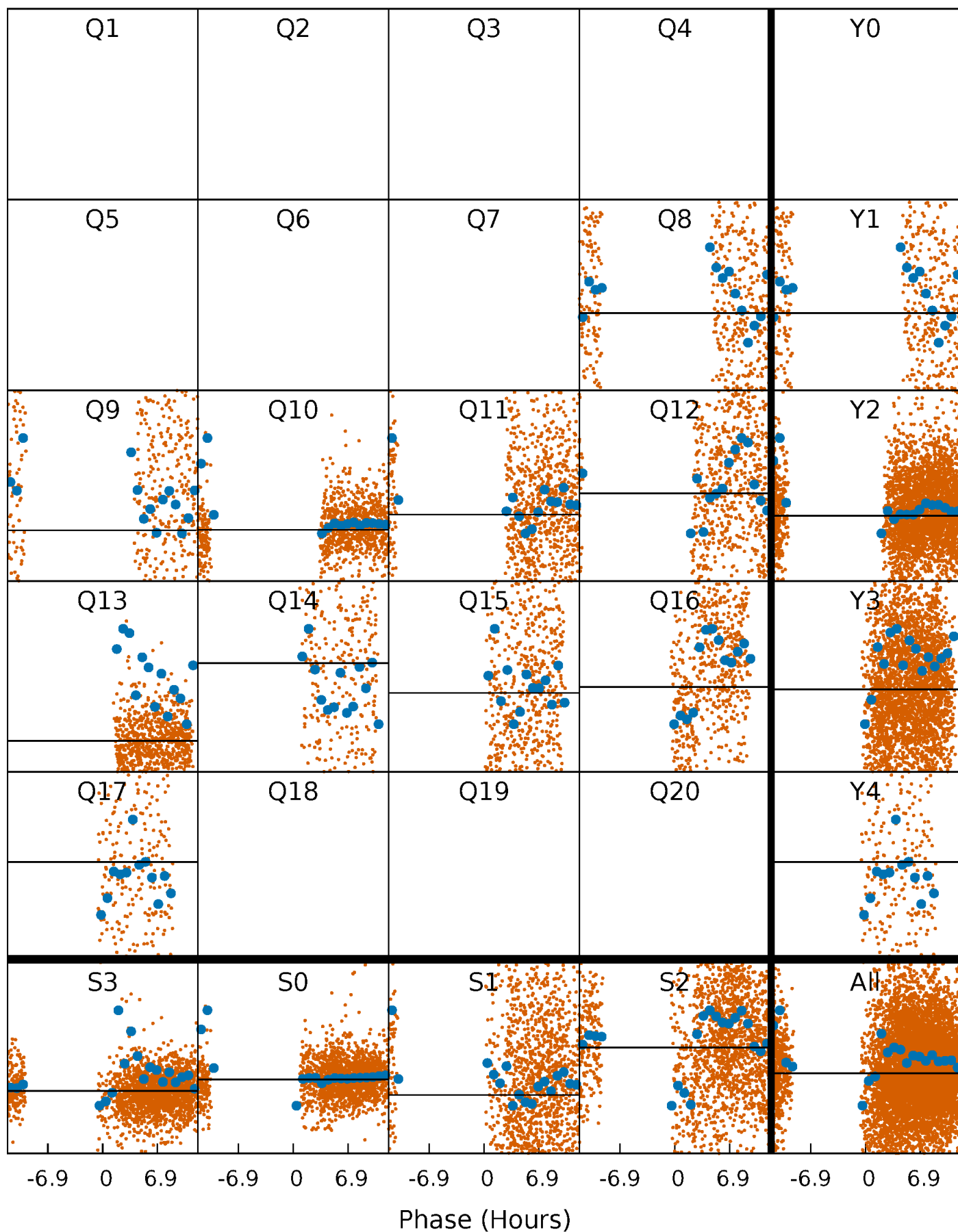
TCE 006470516-03 P= 2.080993 Days  $T_0=131.752791$  (BKJD)





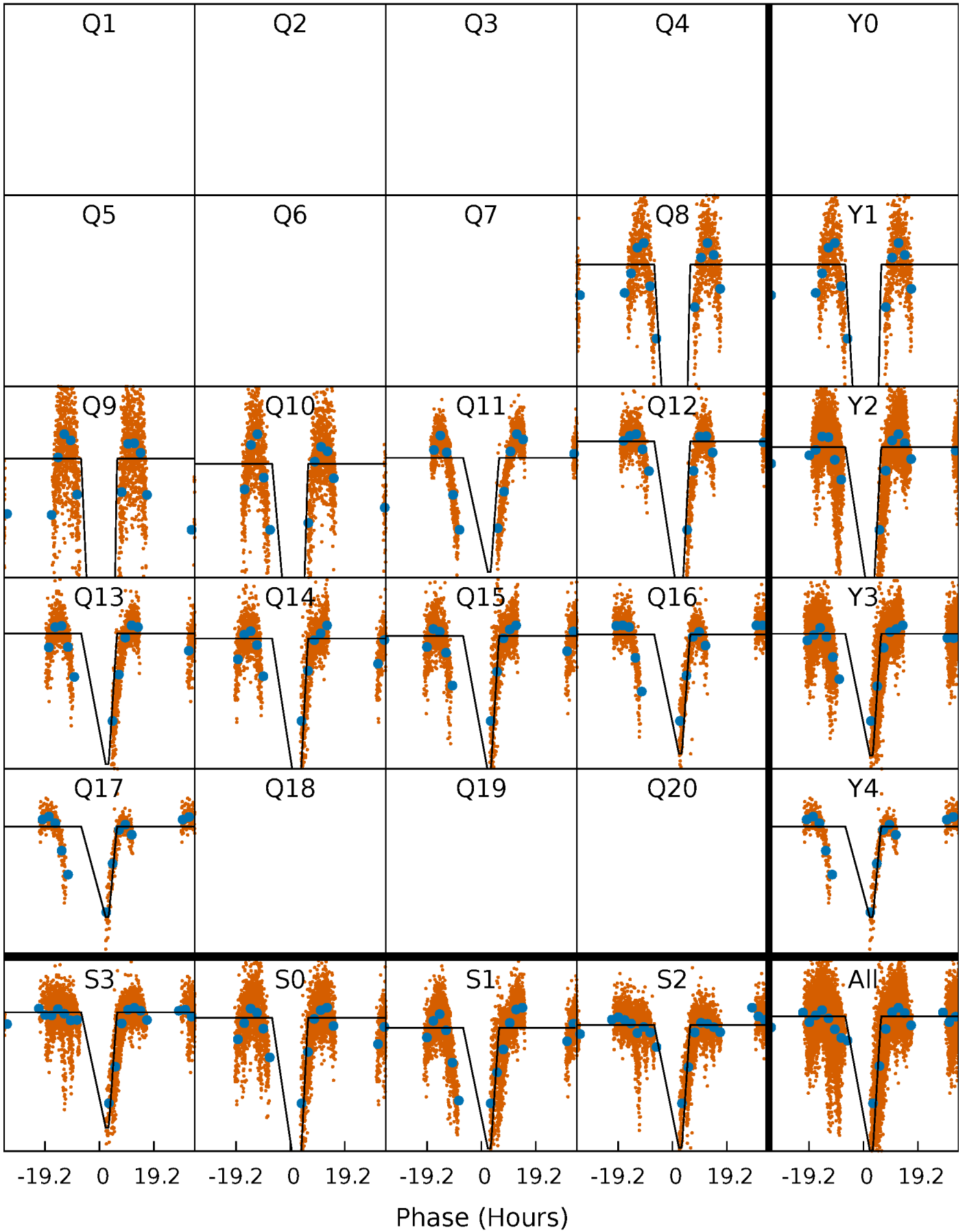
# DV Quarter-Phased Transit Curves

TCE 006470516-03 P= 2.080993 Days  $T_0=131.752791$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

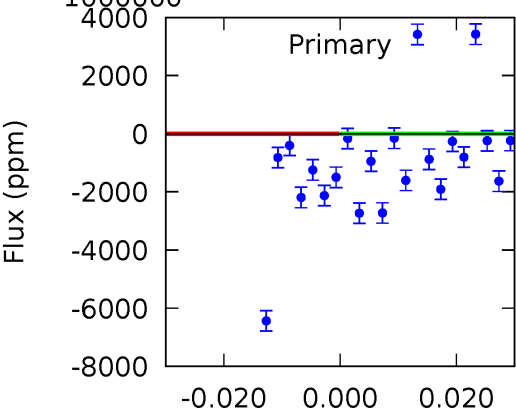
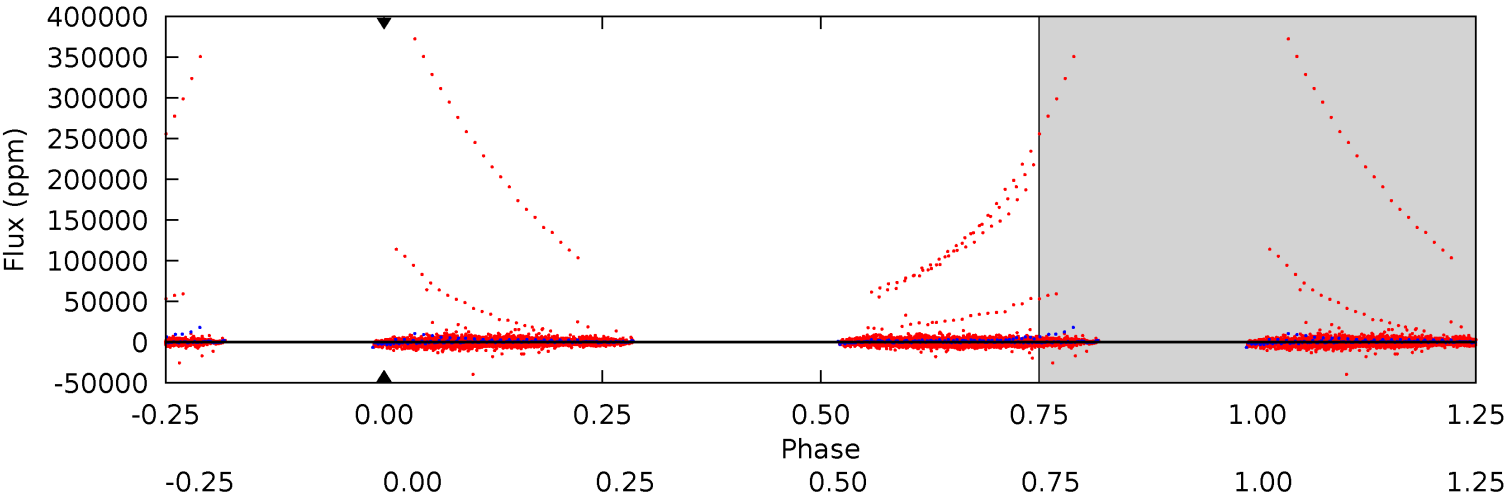
TCE 006470516-03   P= 2.080993 Days    $T_0=131.633235$  (BKJD)



DV Model-Shift Uniqueness Test

006470516-03, P = 2.080993 Days, E = 131.752791 Days

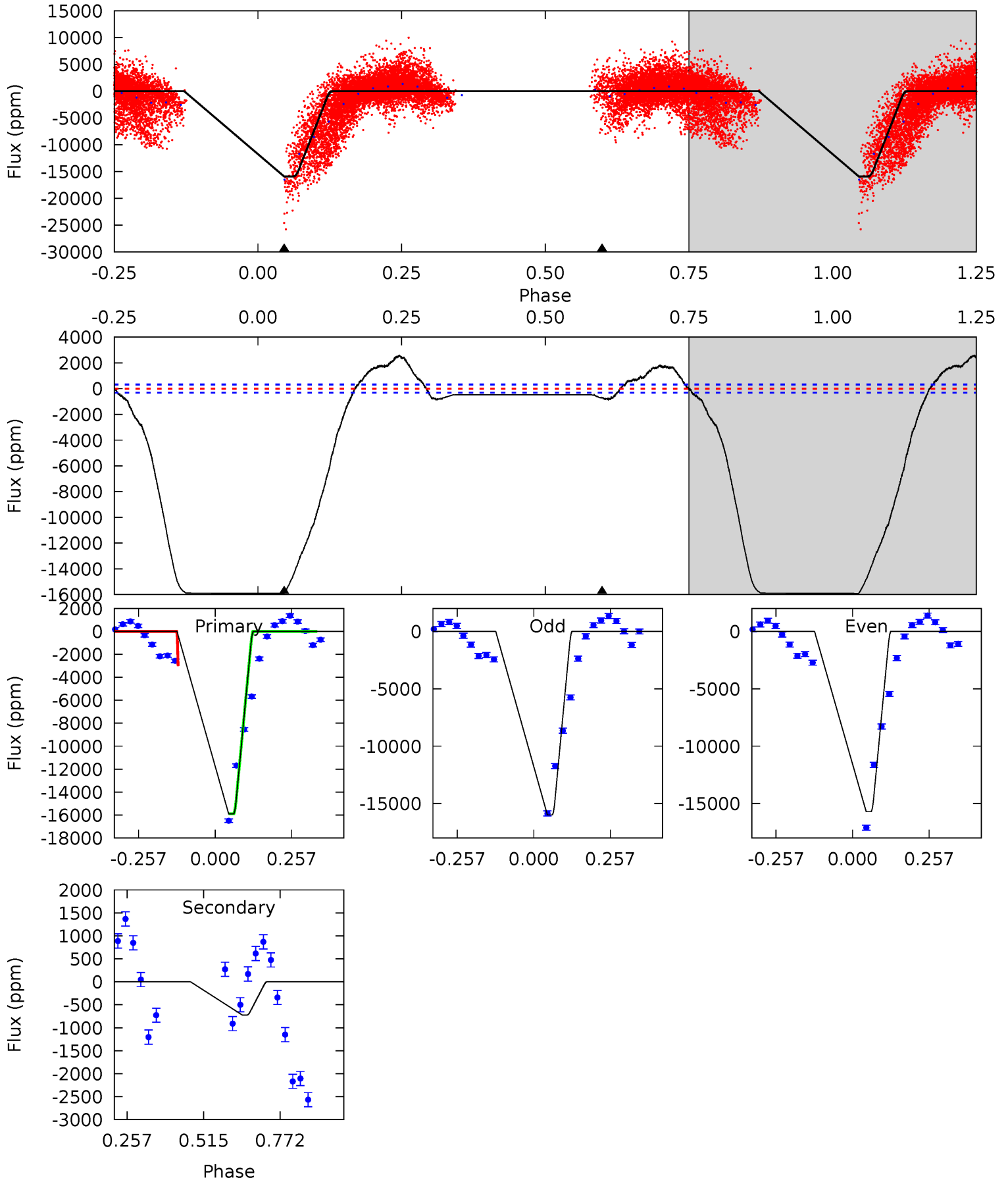
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006470516-03, P = 2.080993 Days, E = 131.633235 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
217.9	9.91	0	0	4.36	1.13	37.9	217.9	217.9	9.91	9.91	1.93	1.49	0.14	13.7



### Stellar Parameters For KIC 006470516

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8344^{+233}_{-350}$	$4.040^{+0.192}_{-0.128}$	$-0.260^{+0.250}_{-0.300}$	$2.115^{+0.435}_{-0.532}$	$1.790^{+0.135}_{-0.293}$	$0.267^{+0.284}_{-0.103}$
	+3%/-4%	+5%/-3%	+96%/-115%	+21%/-25%	+8%/-16%	+106%/-39%
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 006470516-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$19.51^{+17.09}_{-13.13}$	$3759^{+266}_{-267}$	$-4581^{+41350}_{-29500}$	$-1.222^{+332.264}_{-300.132}$
Alt.	$-724 \pm 73$	$31.89^{+23.09}_{-17.32}$	$3762^{+255}_{-266}$	$3415^{+1724}_{-6404}$	$0.592^{+2.281}_{-0.398}$

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

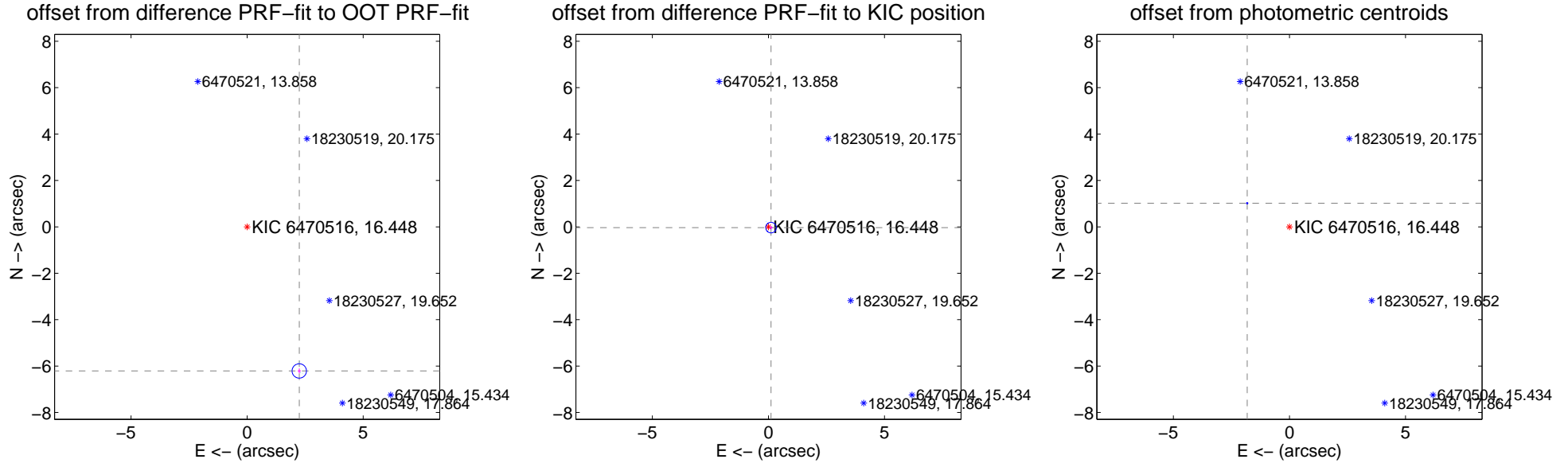
## DV Centroid Data

Supplemental centroid analysis for 006470516-03. Kepler magnitude: 16.45. Transit SNR -1.00

There are 10 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 6.39 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.603 \pm 0.103$	63.95	$-2.246 \pm 0.069$	$-6.209 \pm 0.105$
PRF-fit source offset from KIC position	$0.116 \pm 0.076$	1.53	$-0.111 \pm 0.073$	$-0.032 \pm 0.075$
photometric centroid source offset	$2.09 \pm 0.01$	202.48	$1.82 \pm 0.01$	$1.02 \pm 0.02$



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.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



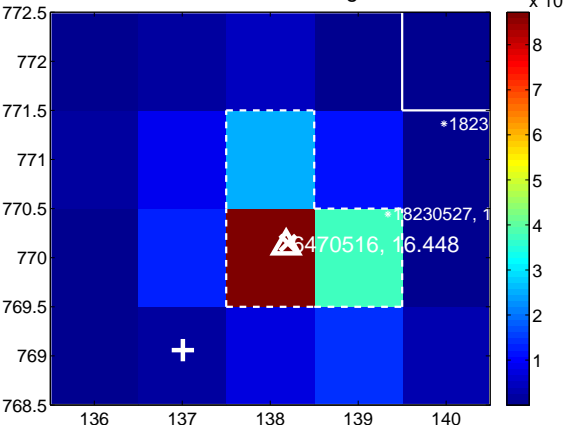
Q7 no difference image



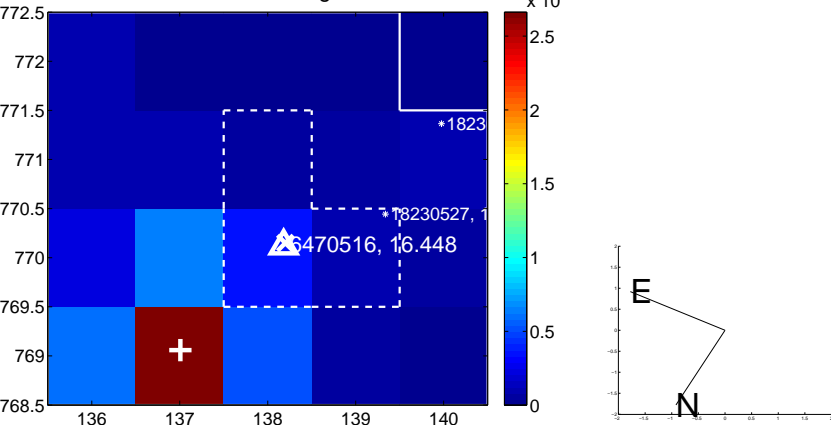
Q7 no OOT image



Q8 difference image

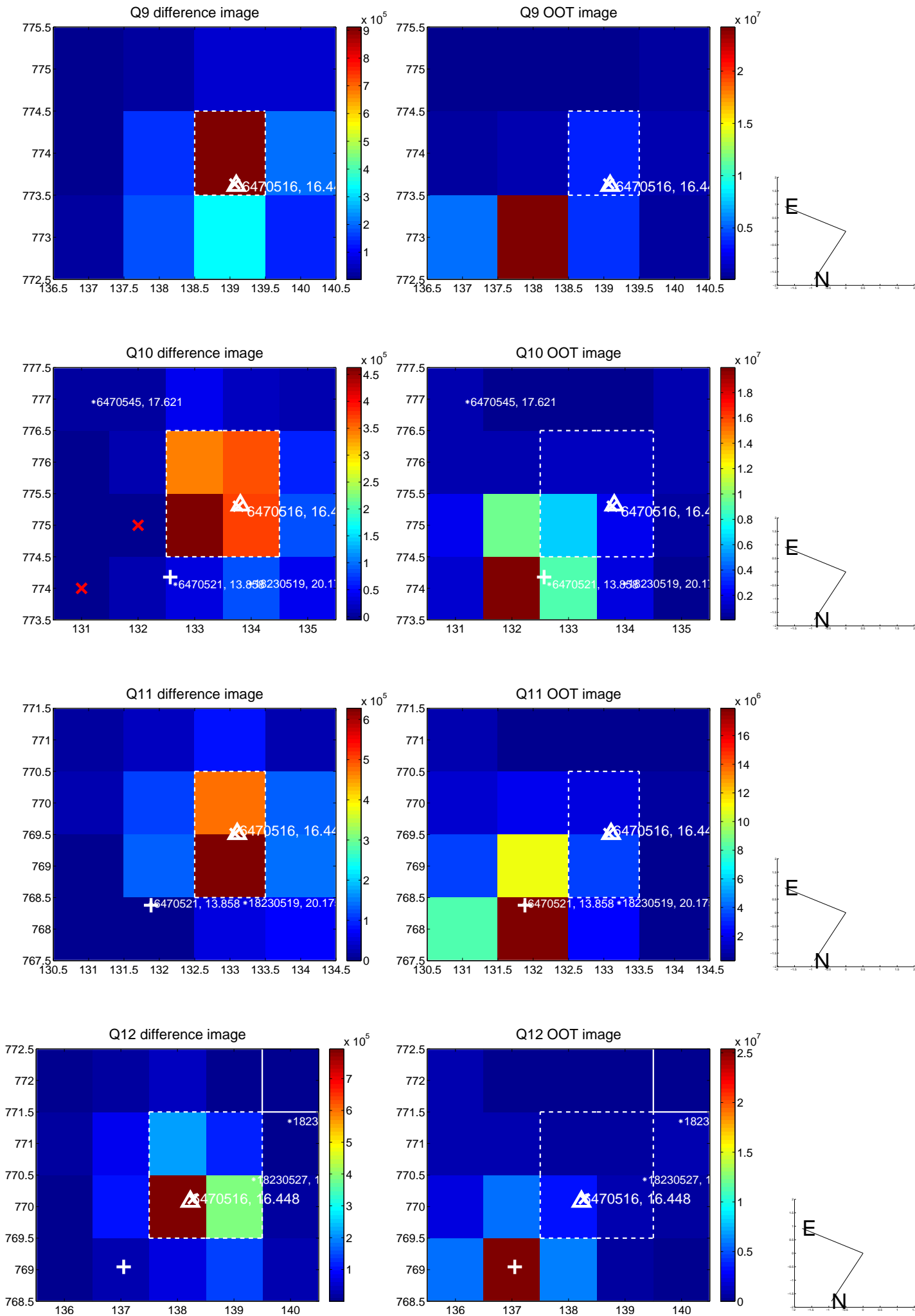


Q8 OOT image

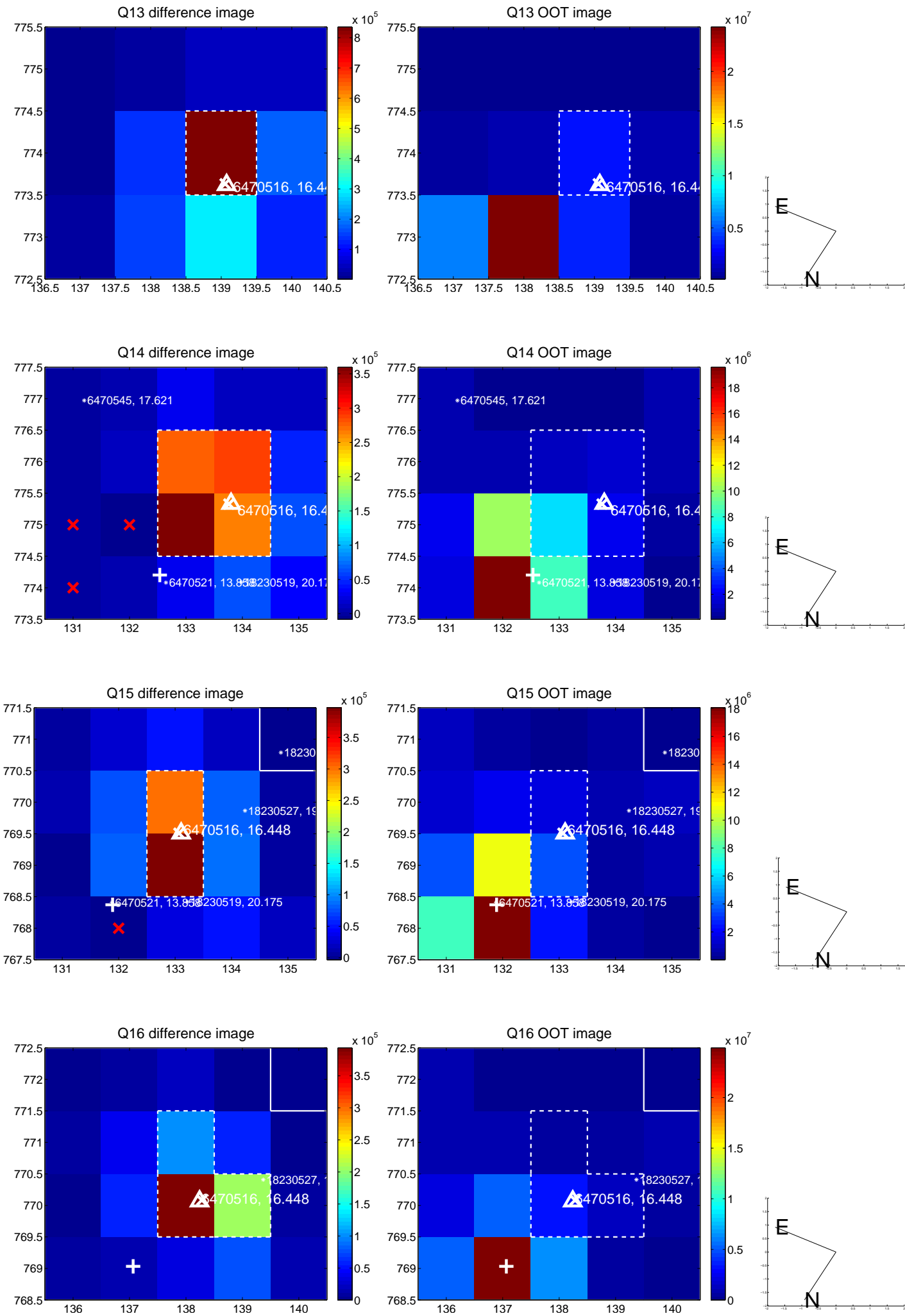




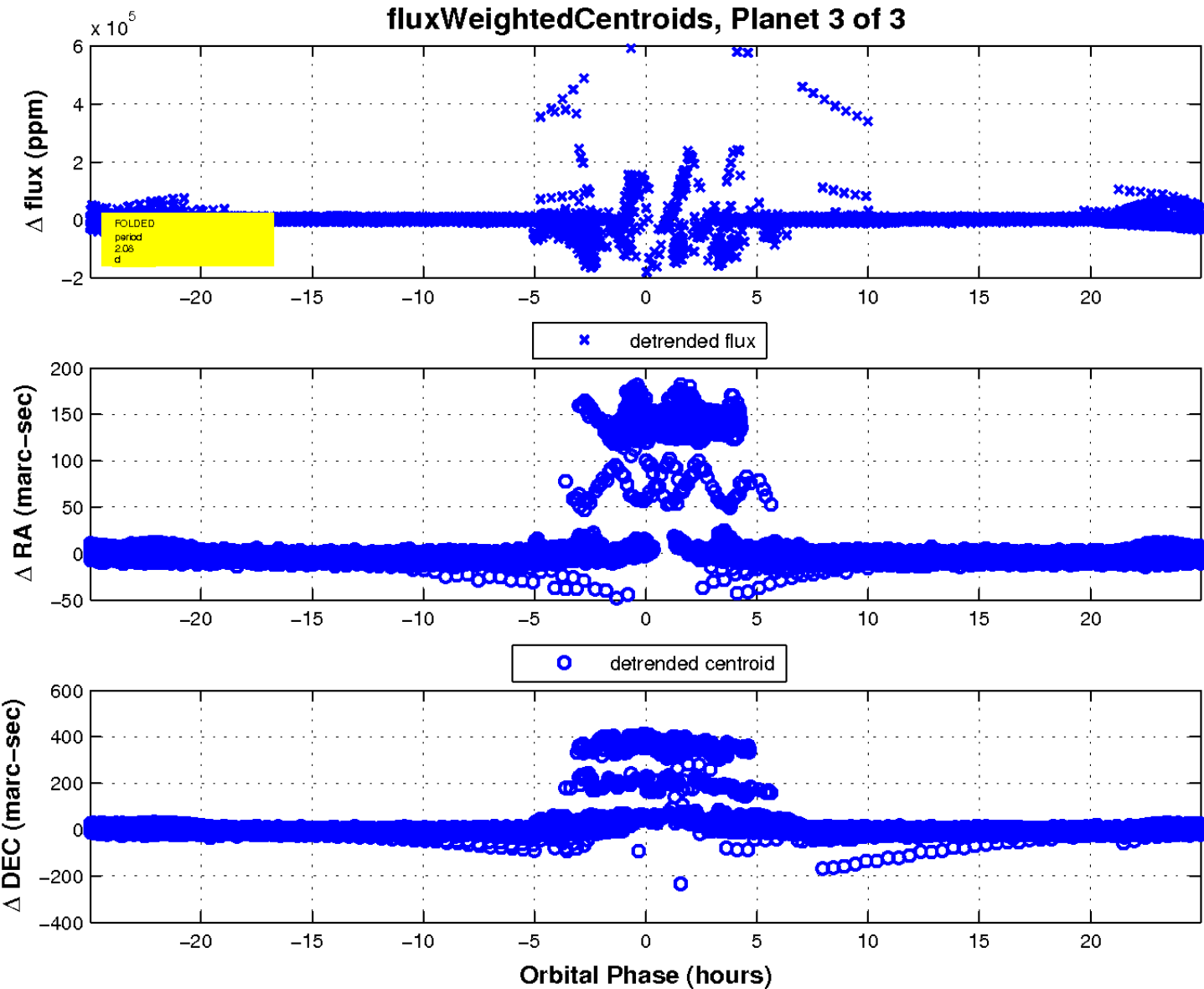
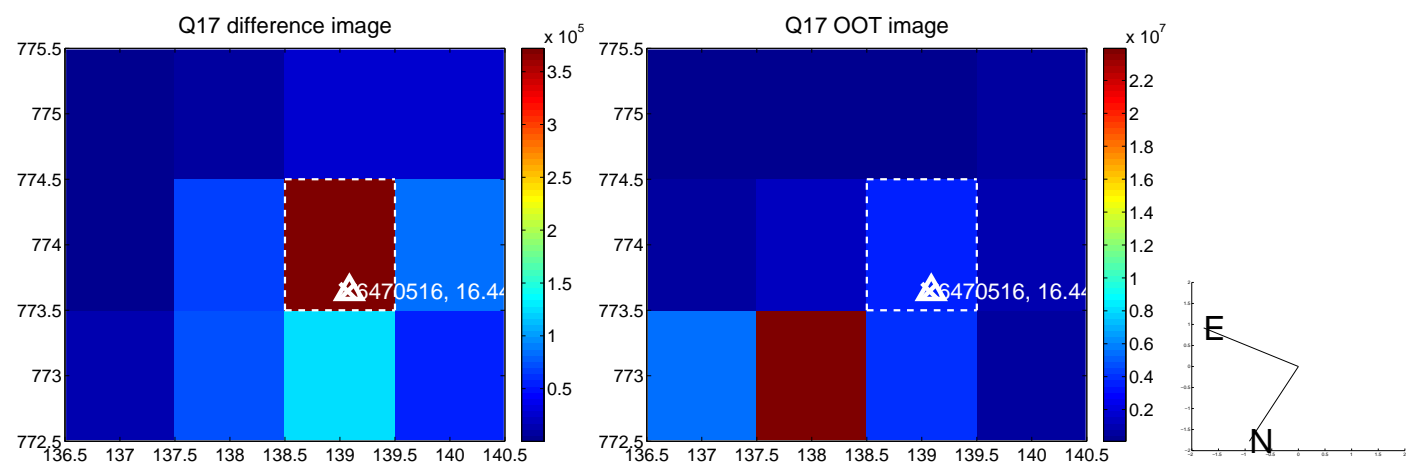
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

