

# KIC 010166297

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010166297-01	OBS	No	1.713252	131.587275	49.3	6.770	8.1	5.8	1.16	5798	0.97	1787.73
010166297-02	OBS	No	366.108048	254.215567	2192.0	3.383	9.3	10.3	1.16	5798	6.83	1.40
010166297-03	OBS	No	183.963598	254.462604	2010.0	2.670	7.8	8.6	1.16	5798	6.61	3.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010166297-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
010166297-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010166297-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

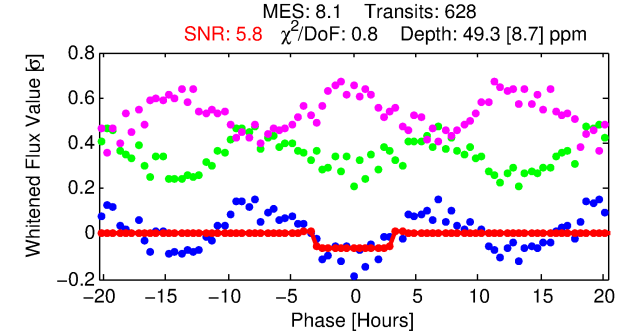
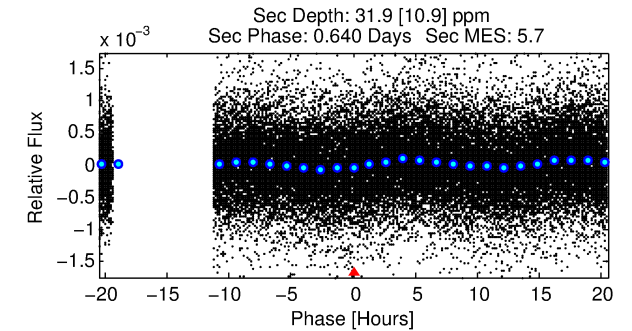
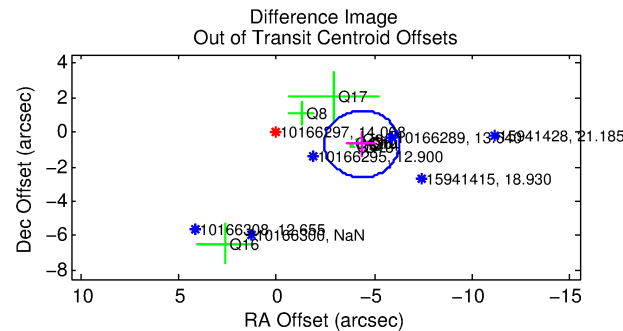
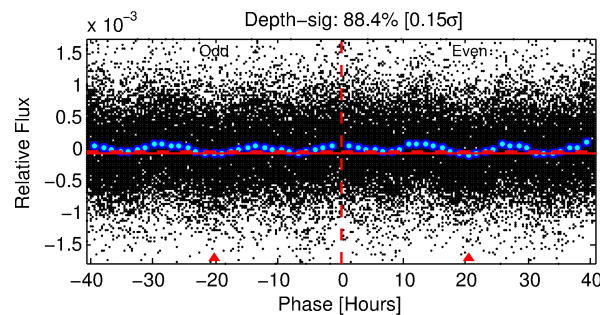
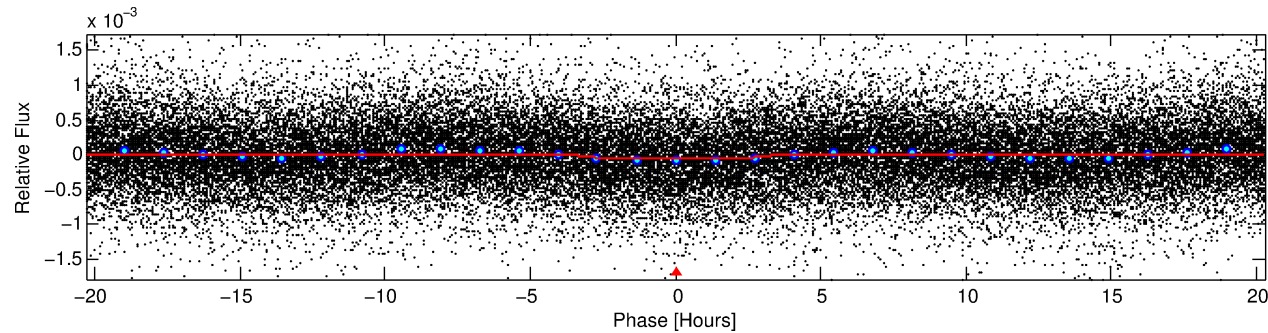
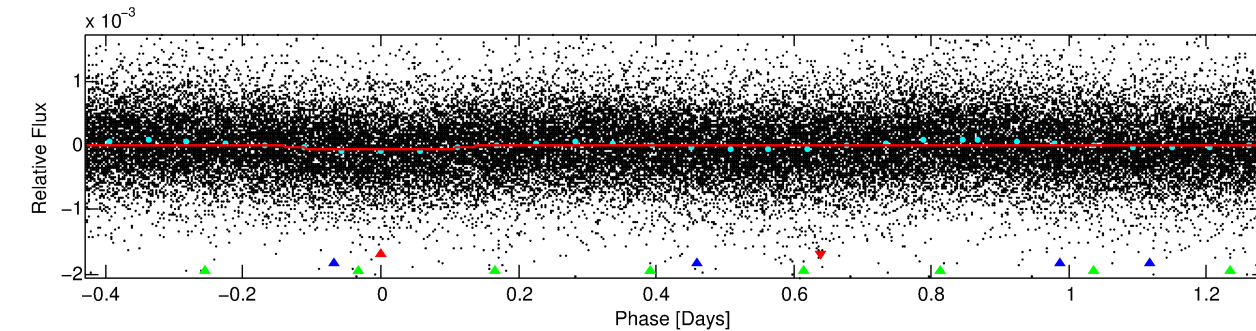
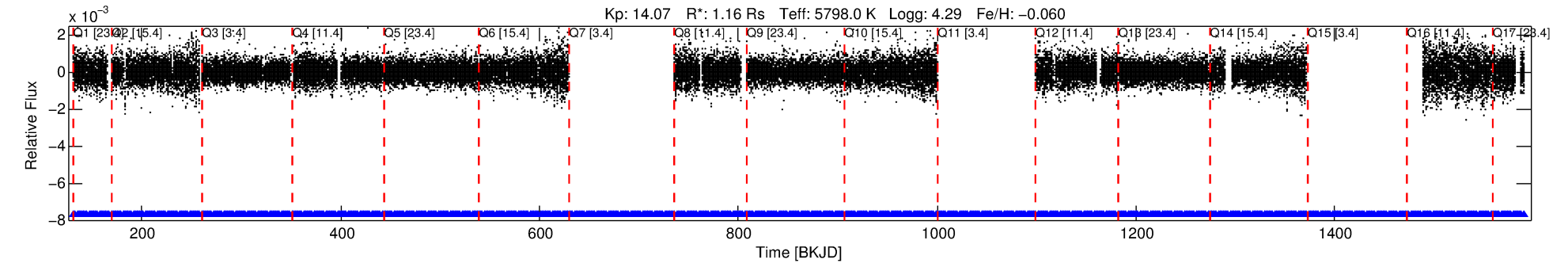
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010166297-01

No Significant Match Found

# DV One-Page Summary

KIC: 10166297 Candidate: 1 of 3 Period: 1.713 d



## DV Fit Results:

Period = 1.71325 [0.00004] d  
Epoch = 131.5873 [0.0078] BKJD  
Rp/R\* = 0.0076 [0.0032]  
a/R\* = 1.28 [1.02]  
b = 0.90 [0.43]  
Seff = 1787.73 [676.64]  
Teff = 1658 [157] K  
Rp = 0.97 [0.49] Re  
a = 0.0276 [0.0066] AU  
Ag = 14.25 [13.93] [0.95 $\sigma$ ]  
Teffp = 4981 [1138] K [2.89 $\sigma$ ]

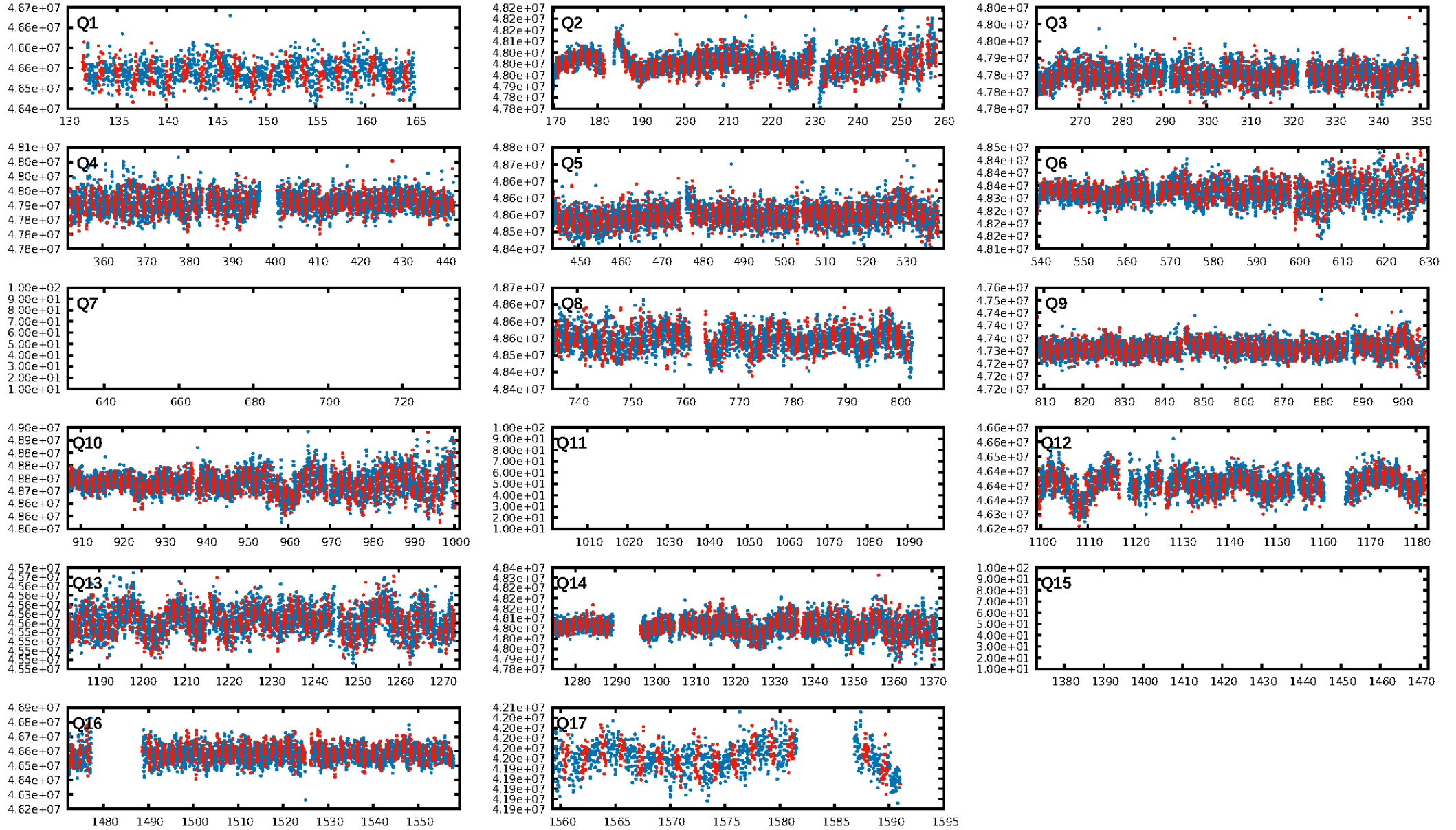
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [601.04 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.98e-13  
RollingBand-fgt: 1.00 [593/593]  
GhostDiagnostic-chr: -0.9554  
Centroid-sig: 31.6%  
Centroid-so: 4.136 arcsec [1.90 $\sigma$ ]  
OotOffset-rm: 4.407 arcsec [6.88 $\sigma$ ]  
KicOffset-rm: 5.823 arcsec [9.07 $\sigma$ ]  
OotOffset-st: 3/0/4/3 [10]  
KicOffset-st: 3/0/4/3 [10]  
DiffImageQuality-fgm: 0.60 [6/10]  
DiffImageOverlap-fno: 1.00 [14/14]

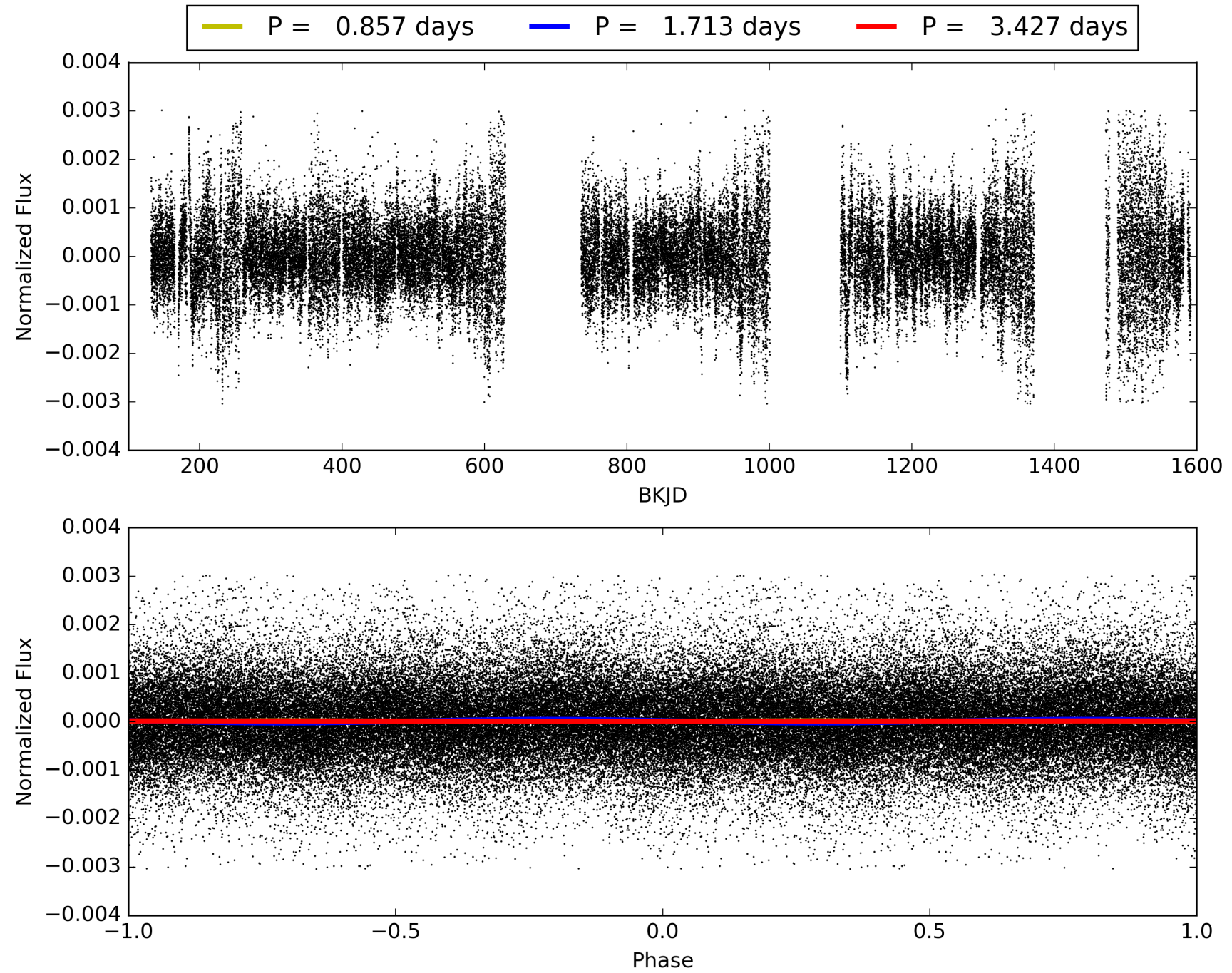
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010166297-01, PDC Light Curves

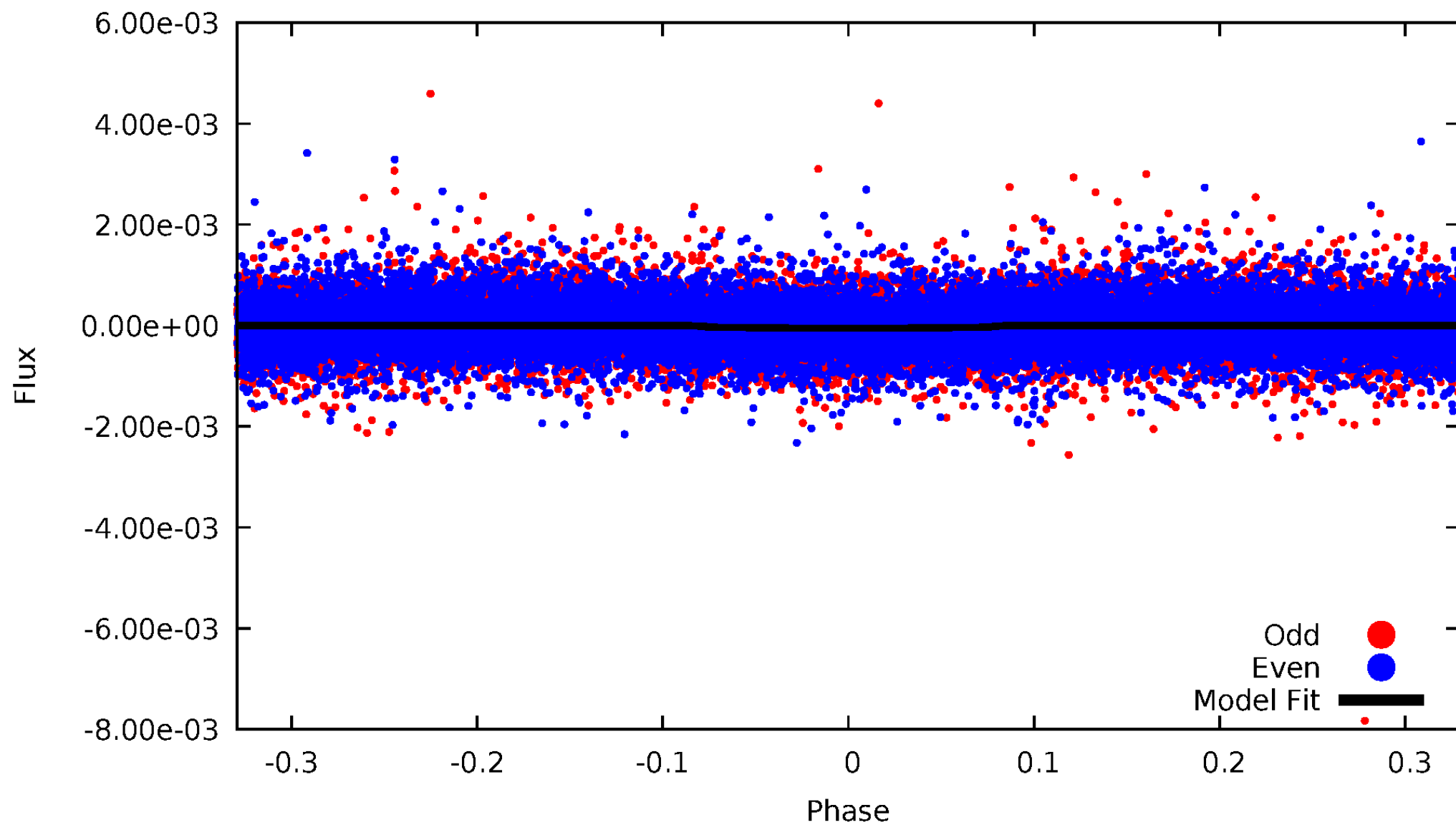


TCE 010166297-01



# DV Odd/Even

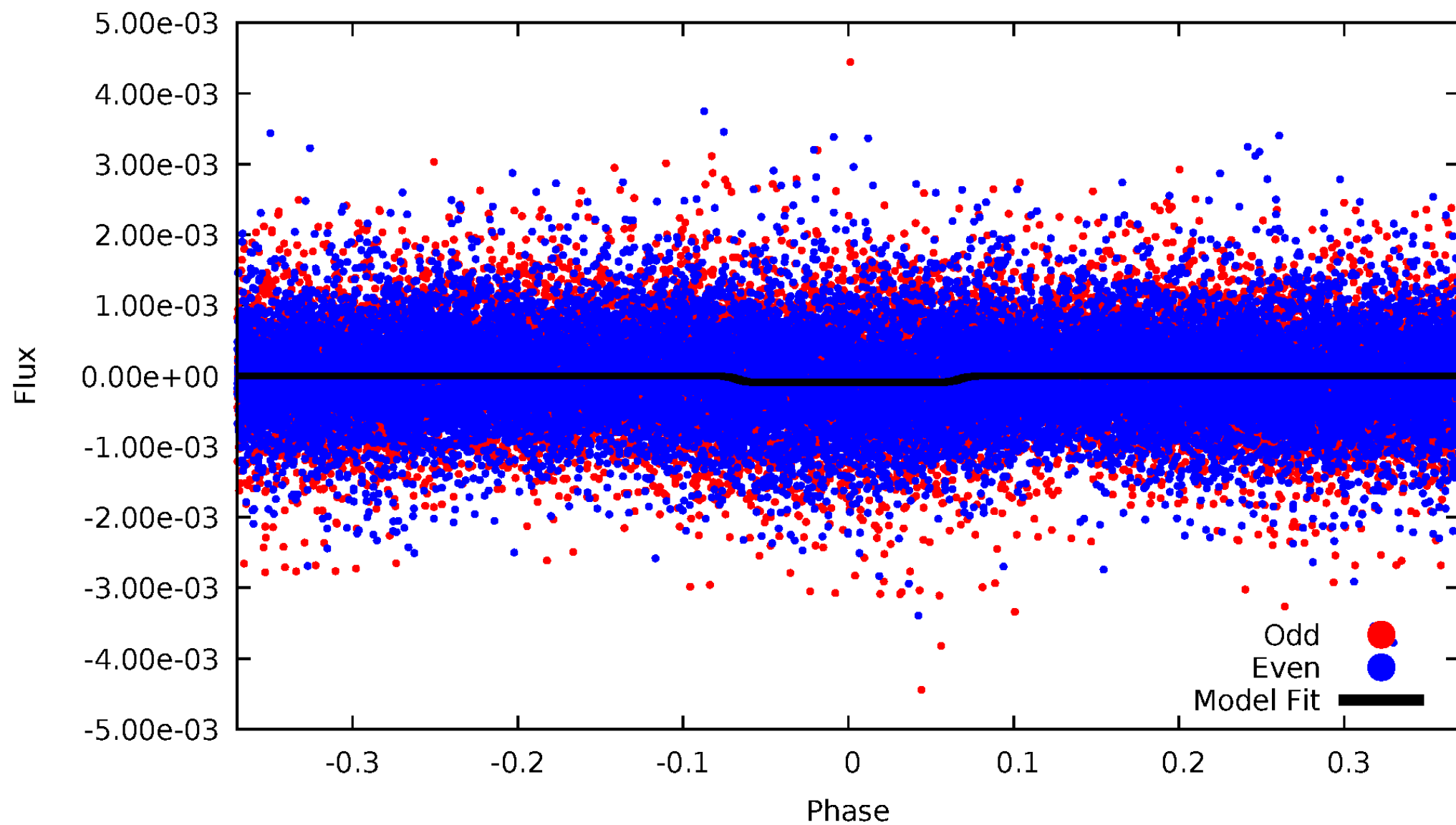
TCE 010166297-01





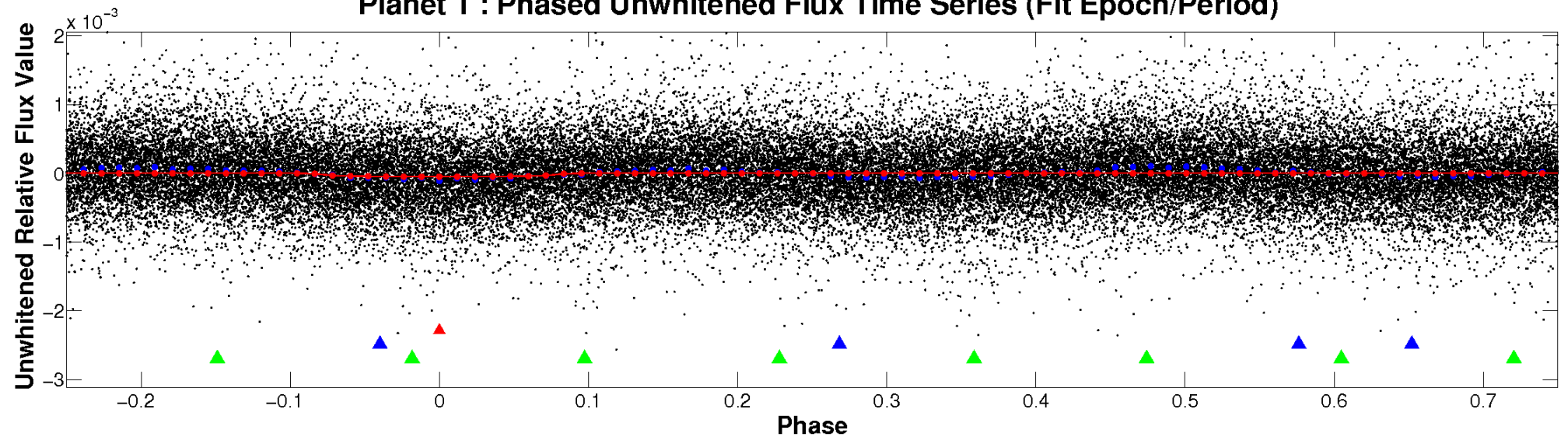
# ALT Odd/Even

TCE 010166297-01

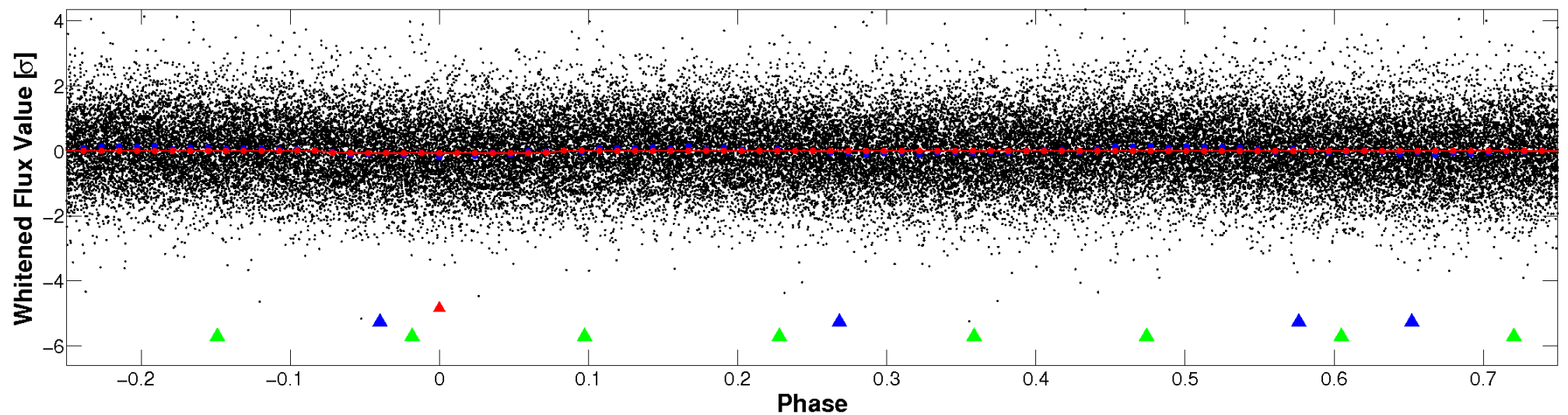


# Non-Whitened Vs. Whitened Light Curve

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

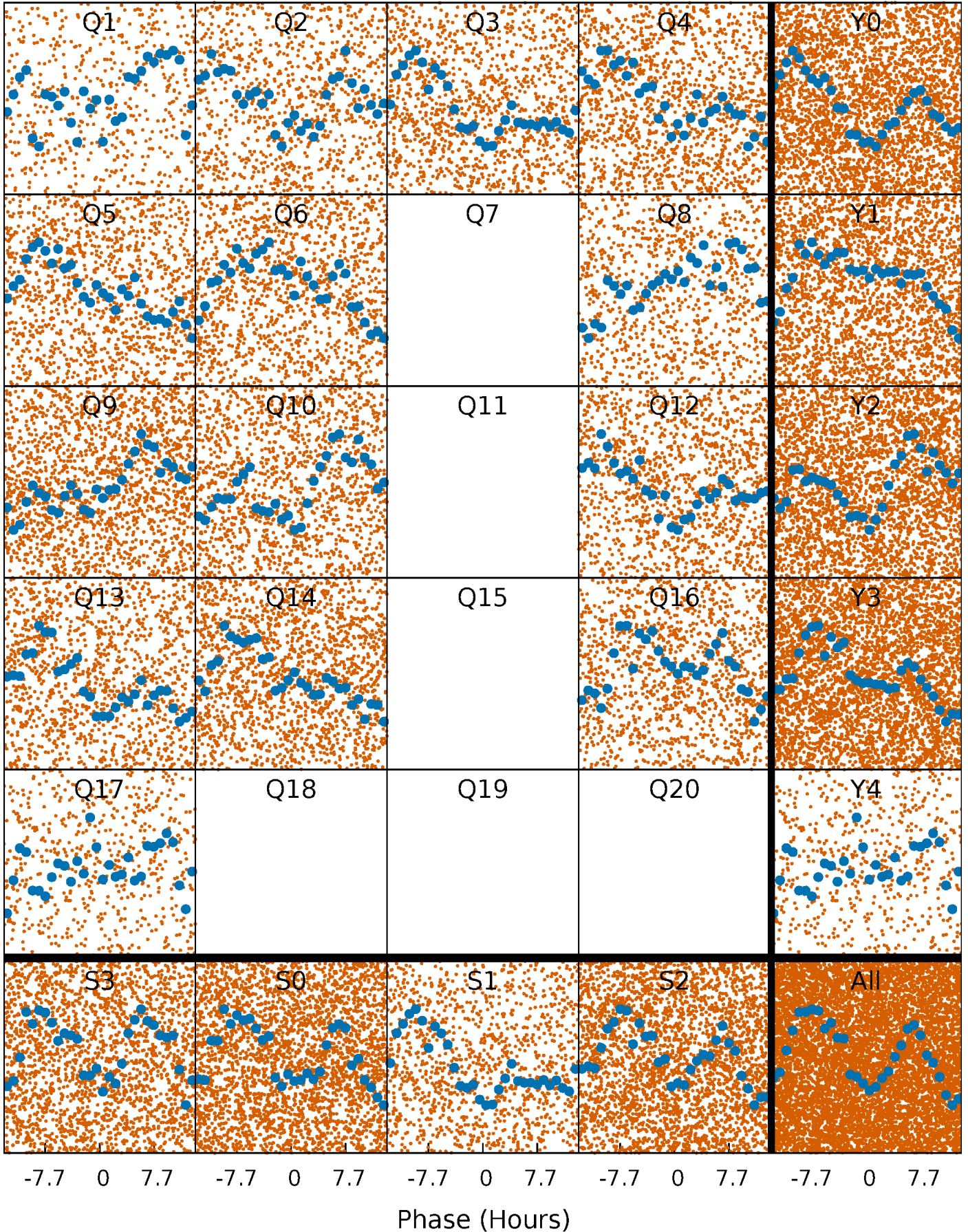


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

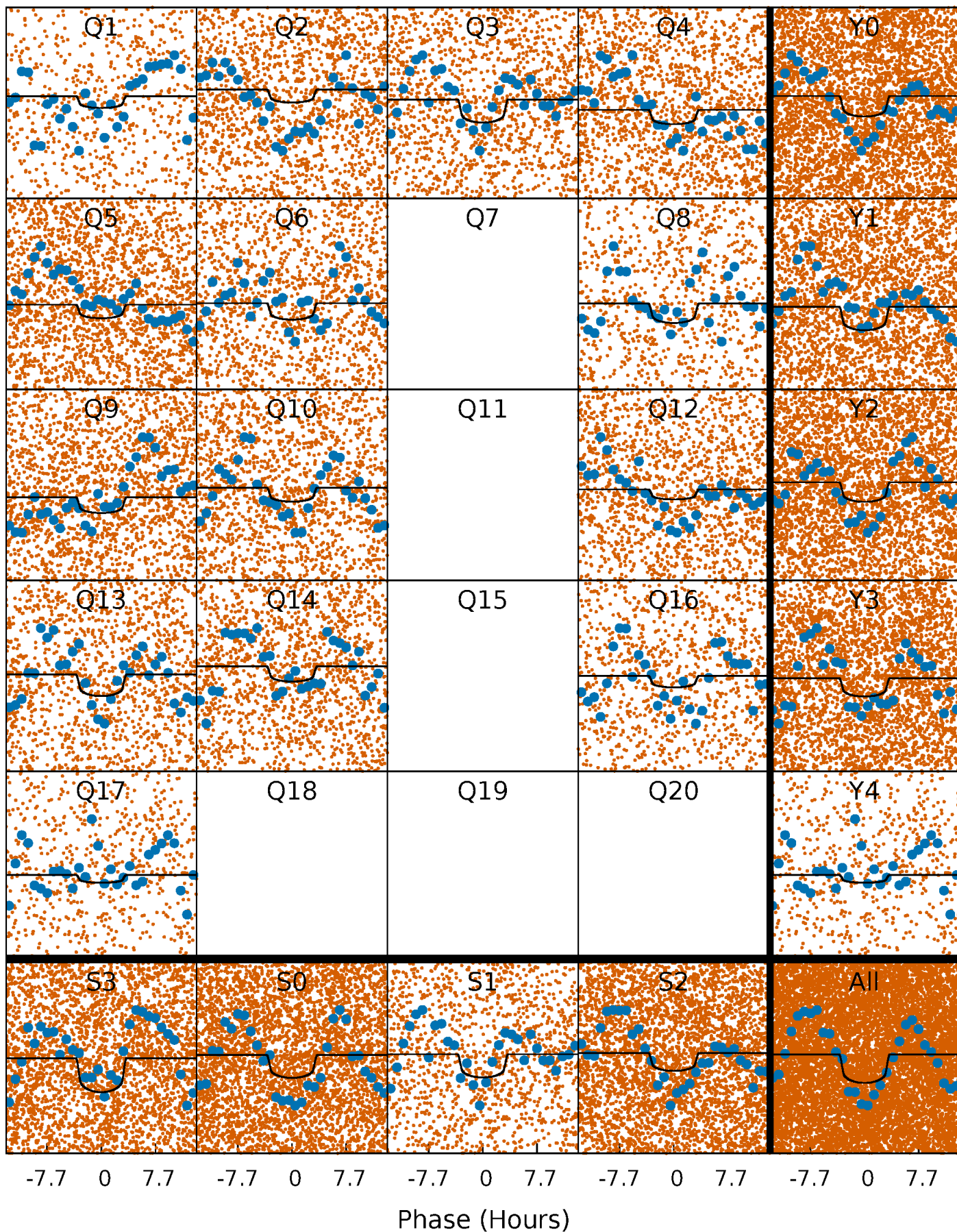
TCE 010166297-01 P= 1.713252 Days  $T_0=131.587275$  (BKJD)





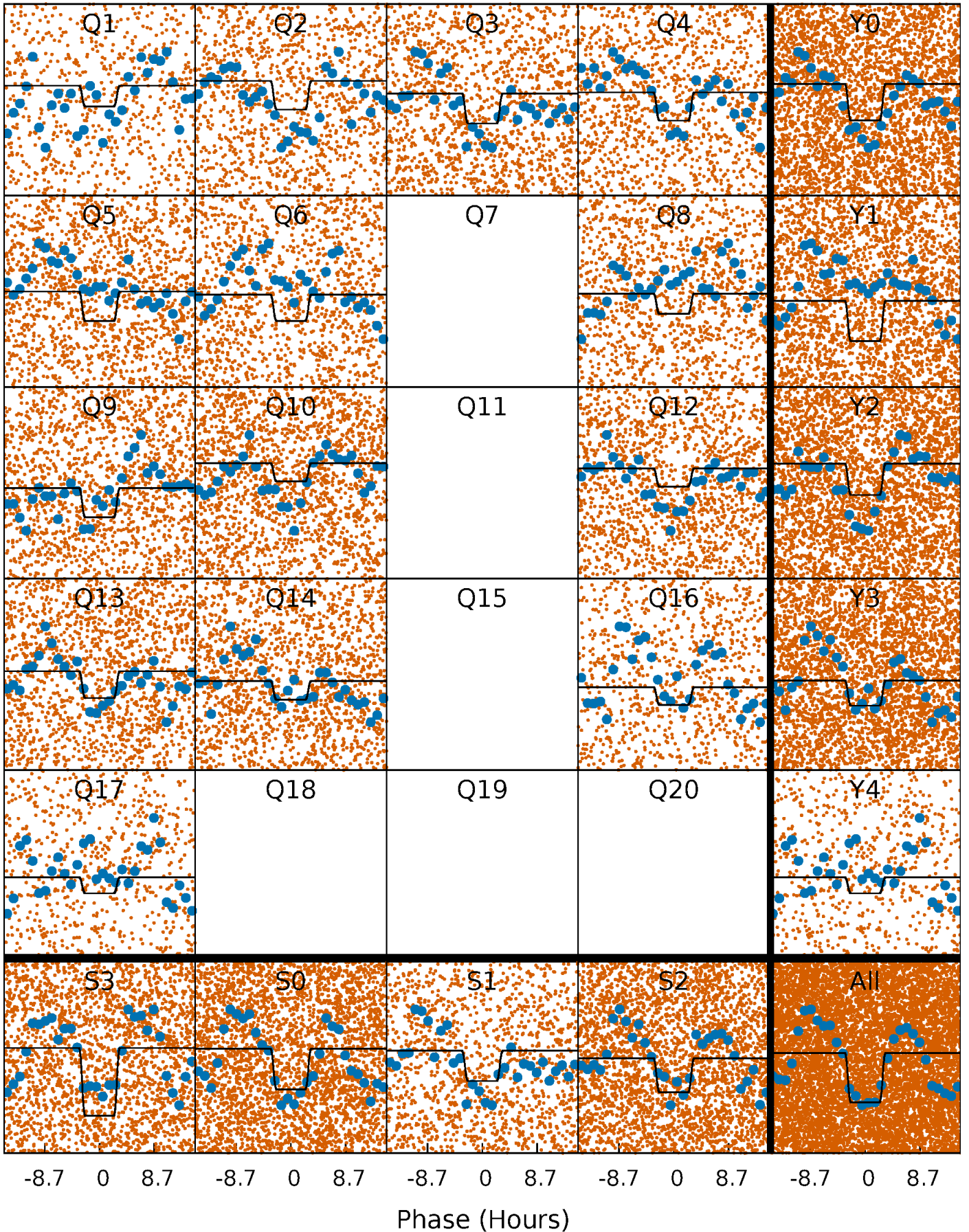
# DV Quarter-Phased Transit Curves

TCE 010166297-01 P= 1.713252 Days  $T_0=131.587275$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010166297-01 P= 1.713302 Days  $T_0=131.576890$  (BKJD)

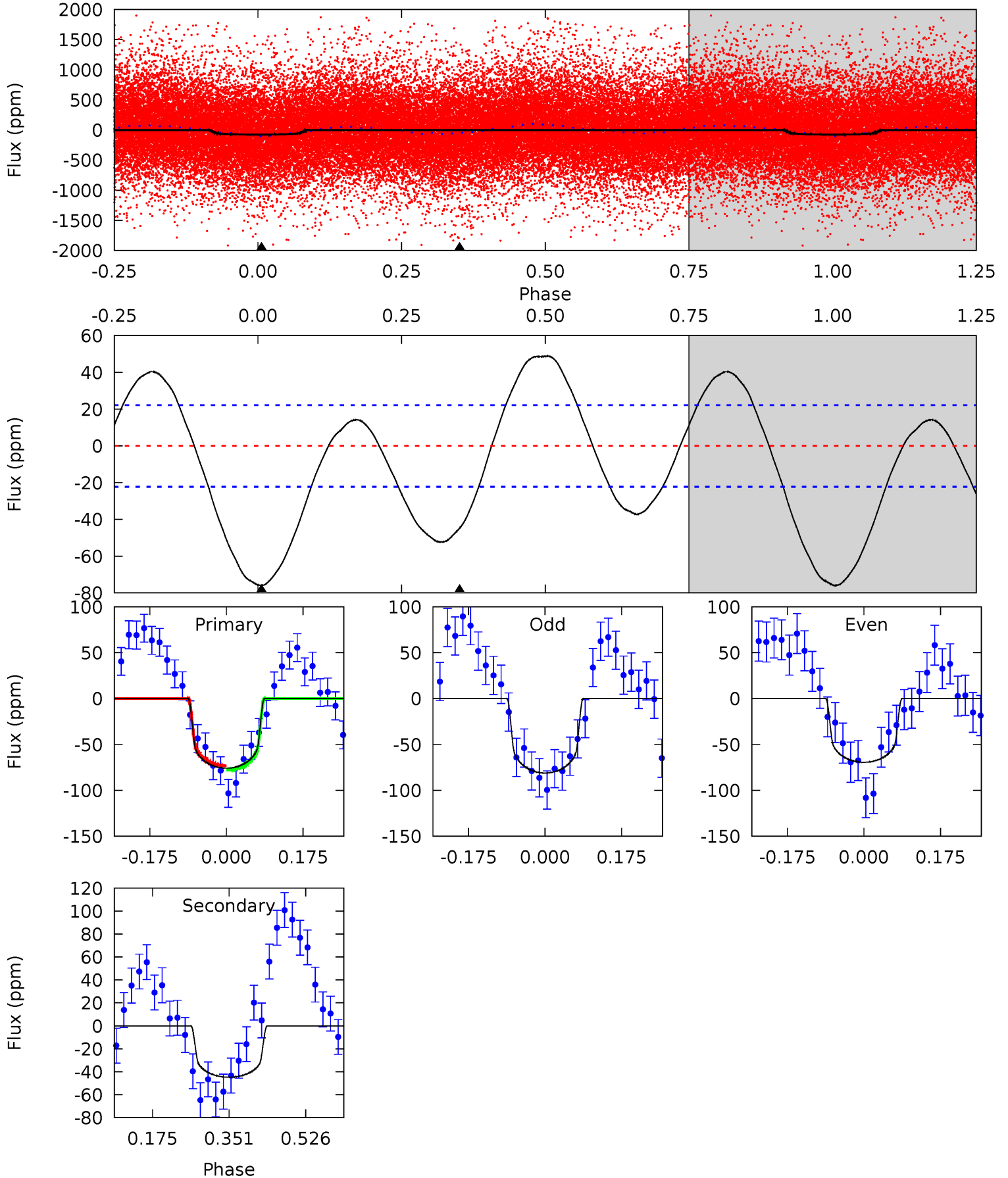




# DV Model-Shift Uniqueness Test

010166297-01, P = 1.713252 Days, E = 129.874023 Days

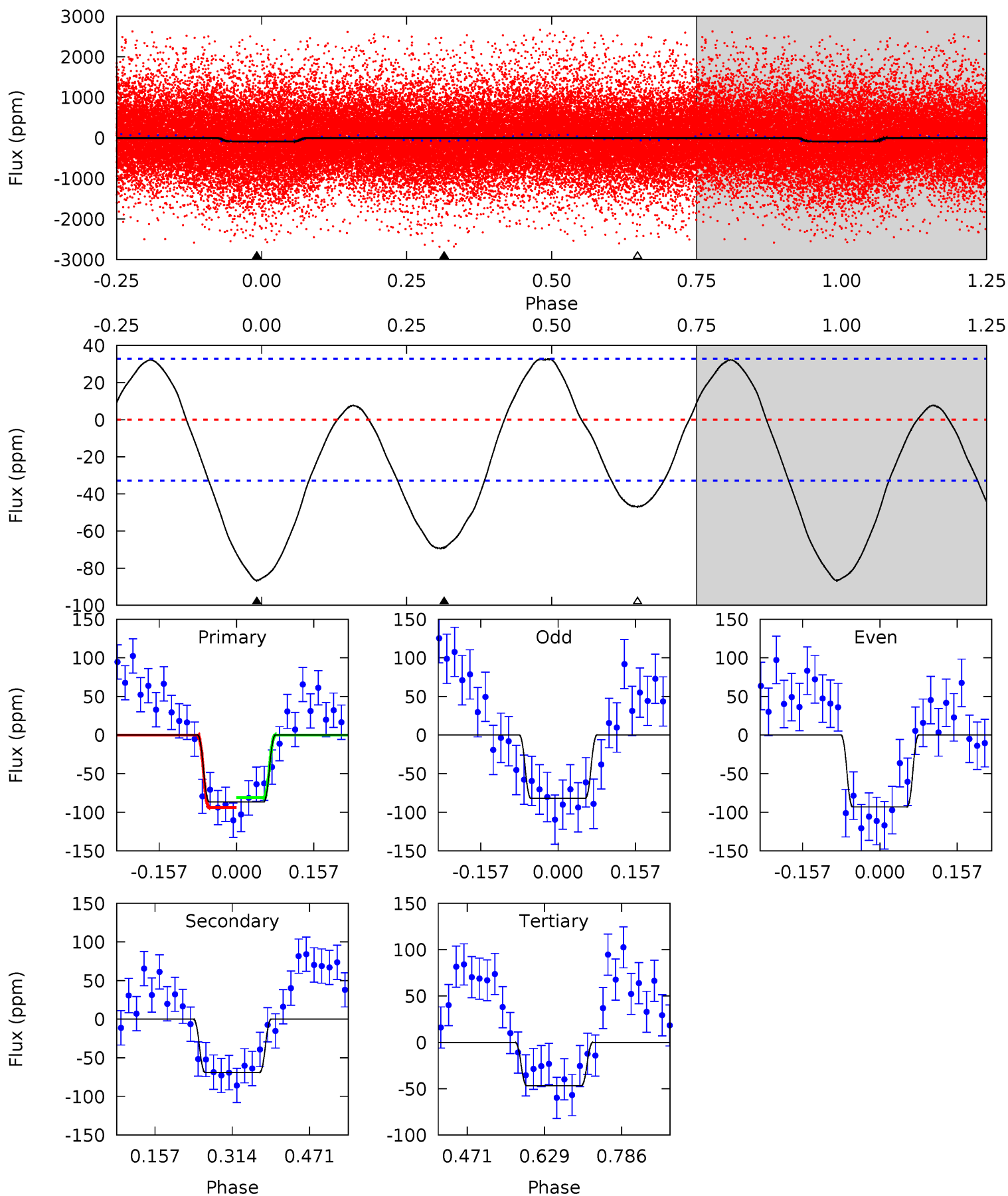
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	8.96	0	0	4.45	1.35	5.52	15.2	15.2	8.96	8.96	1.18	1.09	0.39	0.46



# Alt Model-Shift Uniqueness Test

010166297-01, P = 1.713302 Days, E = 129.863588 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
11.8	9.38	6.37	0	4.47	1.41	3.87	5.41	11.8	3.01	9.38	0.76	1.04	0.27	0.88





### Stellar Parameters For KIC 010166297

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5798^{+157}_{-157}$	$4.289^{+0.204}_{-0.185}$	$-0.060^{+0.300}_{-0.300}$	$1.159^{+0.318}_{-0.260}$	$0.952^{+0.139}_{-0.092}$	$0.862^{+0.859}_{-0.436}$
	+3%/-3%	+5%/-4%	+500%/-500%	+27%/-22%	+15%/-10%	+100%/-51%
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 010166297-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-45 \pm 5$	$0.94^{+0.47}_{-0.41}$	$2313^{+172}_{-161}$	$5505^{+1840}_{-844}$	$22^{+44}_{-13}$
Alt.	$-69 \pm 7$	$1.19^{+0.48}_{-0.39}$	$2300^{+188}_{-149}$	$5437^{+1197}_{-663}$	$21^{+27}_{-10}$

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

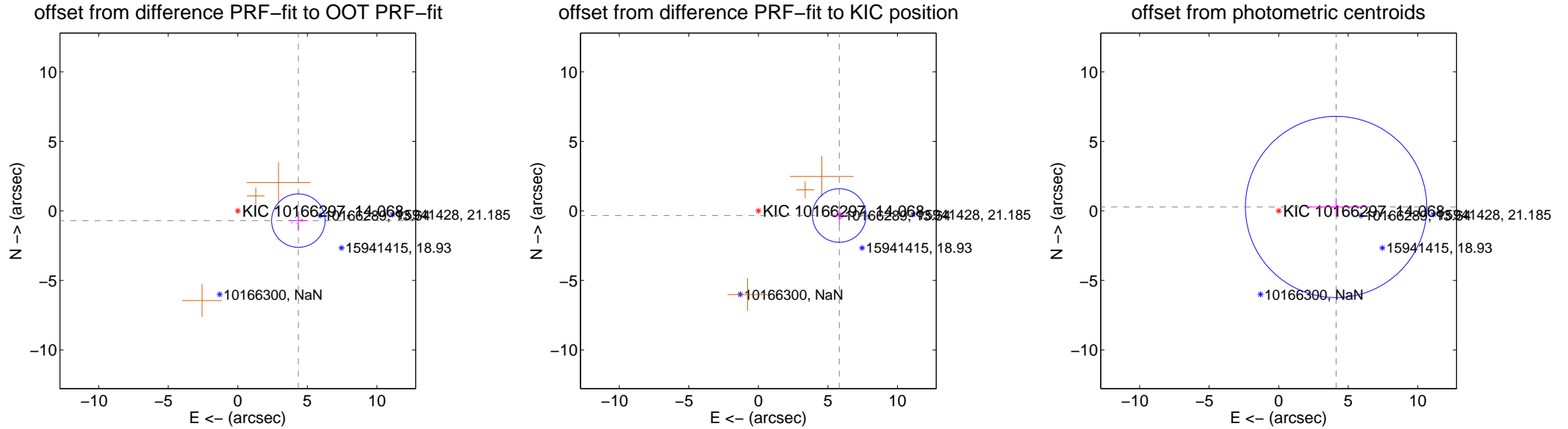
## DV Centroid Data

Supplemental centroid analysis for 010166297-01. Kepler magnitude: 14.07. Transit SNR 5.76

There are 6 quarters with good PRF difference image offsets

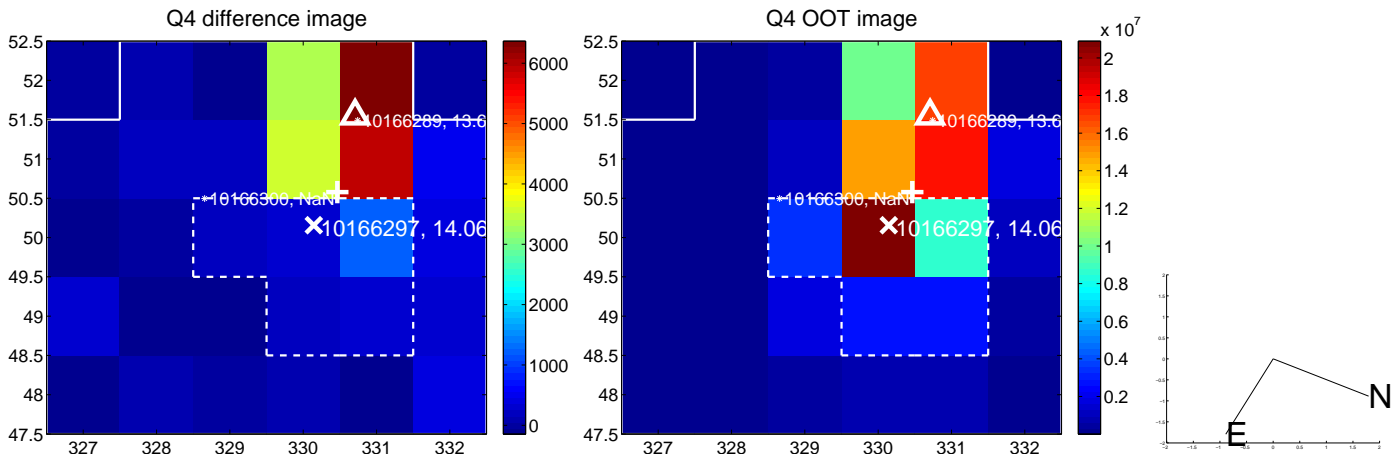
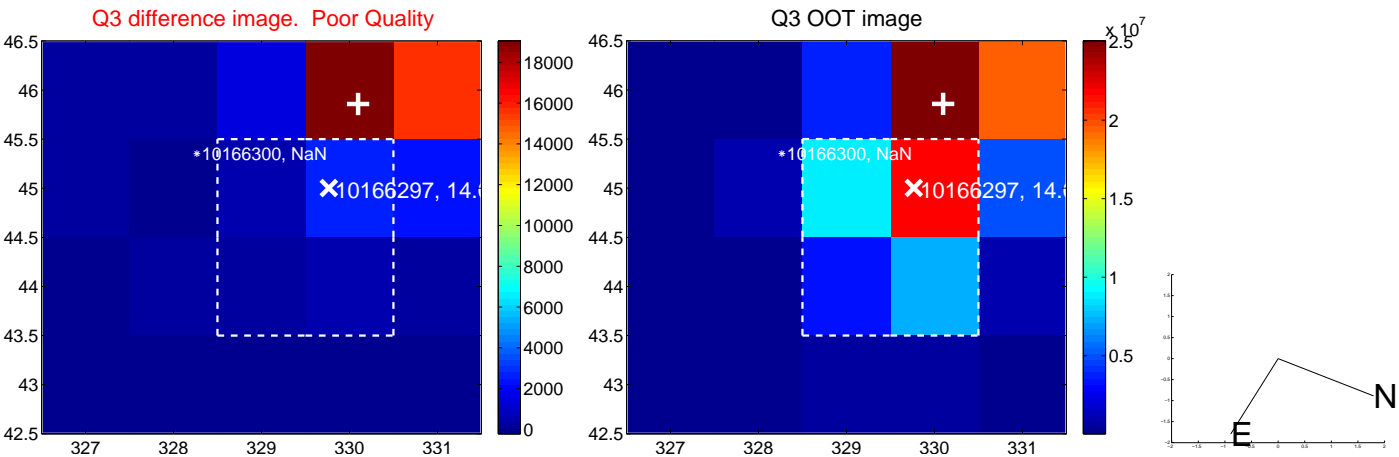
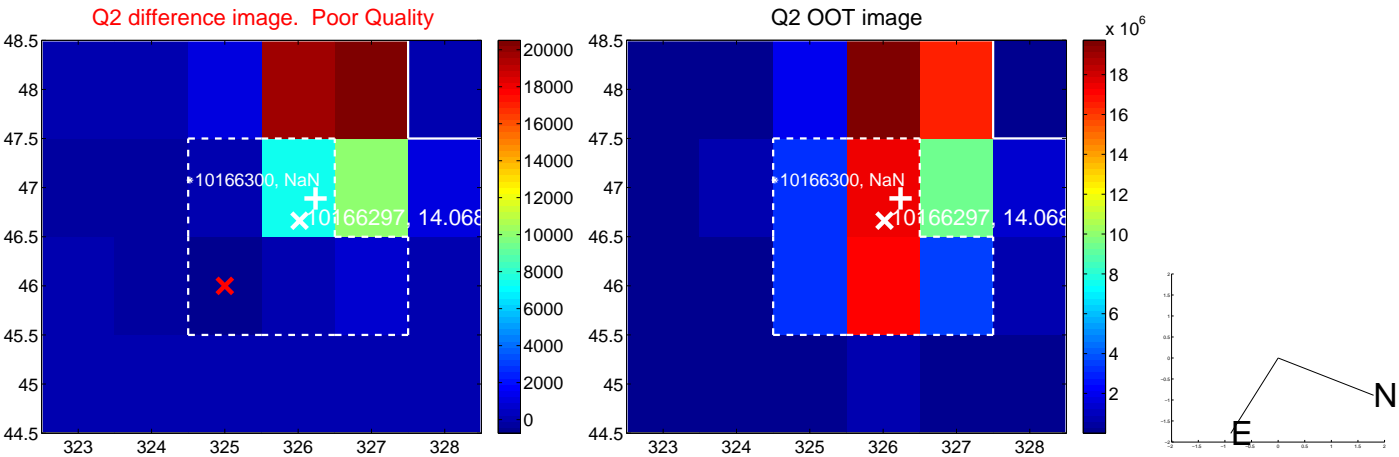
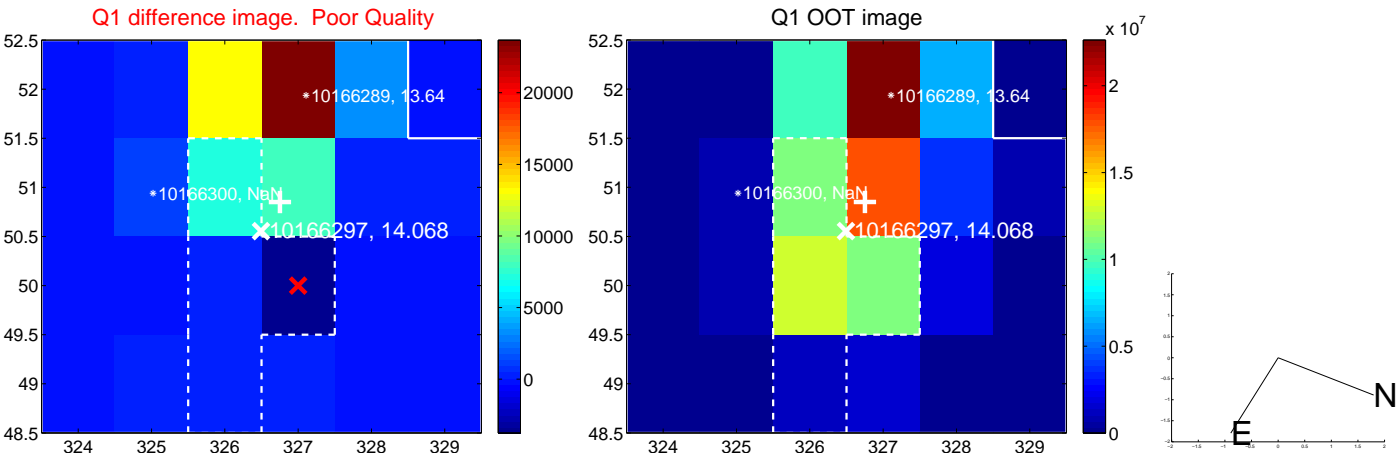
The direct PRF centroid is offset from the target star catalog position by about 1.69 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.407 \pm 0.641$	<b>6.88</b>	$-4.351 \pm 0.707$	$-0.698 \pm 0.673$
PRF-fit source offset from KIC position	$5.823 \pm 0.642$	<b>9.07</b>	$-5.814 \pm 0.671$	$-0.329 \pm 0.701$
photometric centroid source offset	$4.14 \pm 2.17$	1.90	$-4.13 \pm 2.18$	$0.28 \pm 0.65$

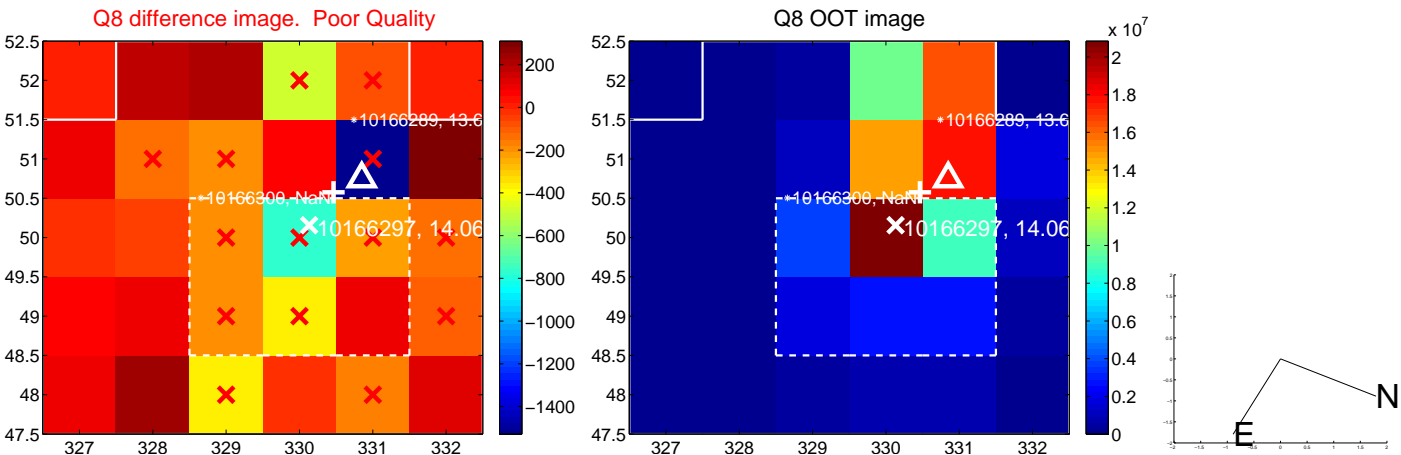
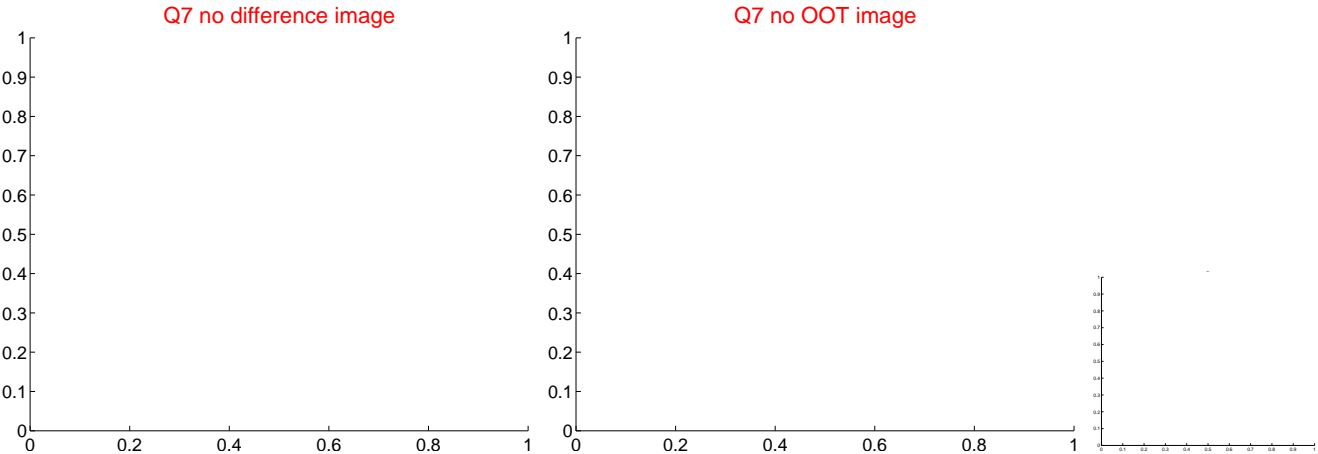
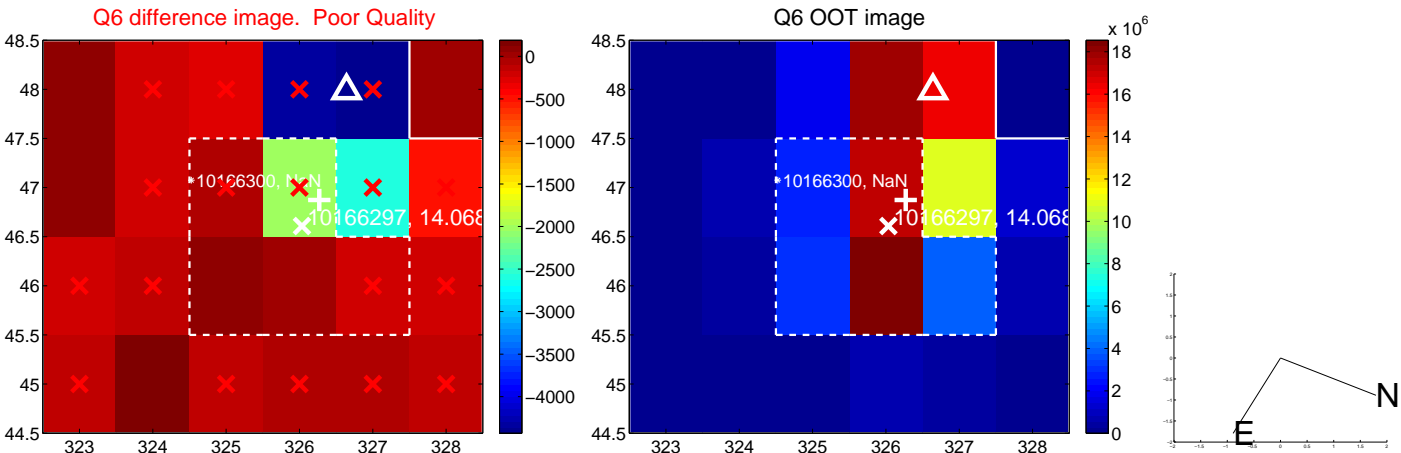
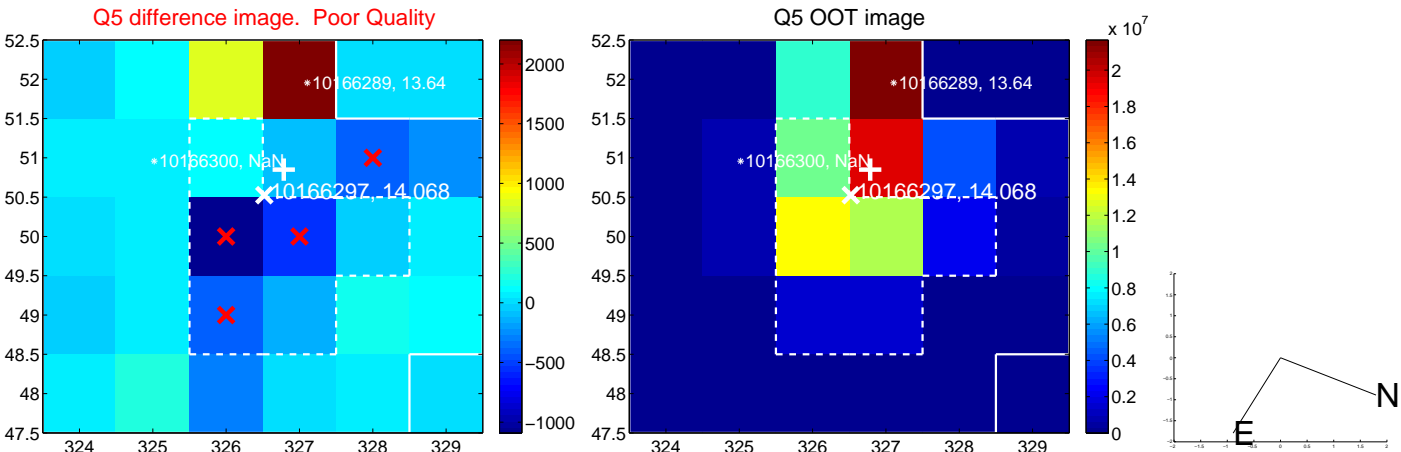


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

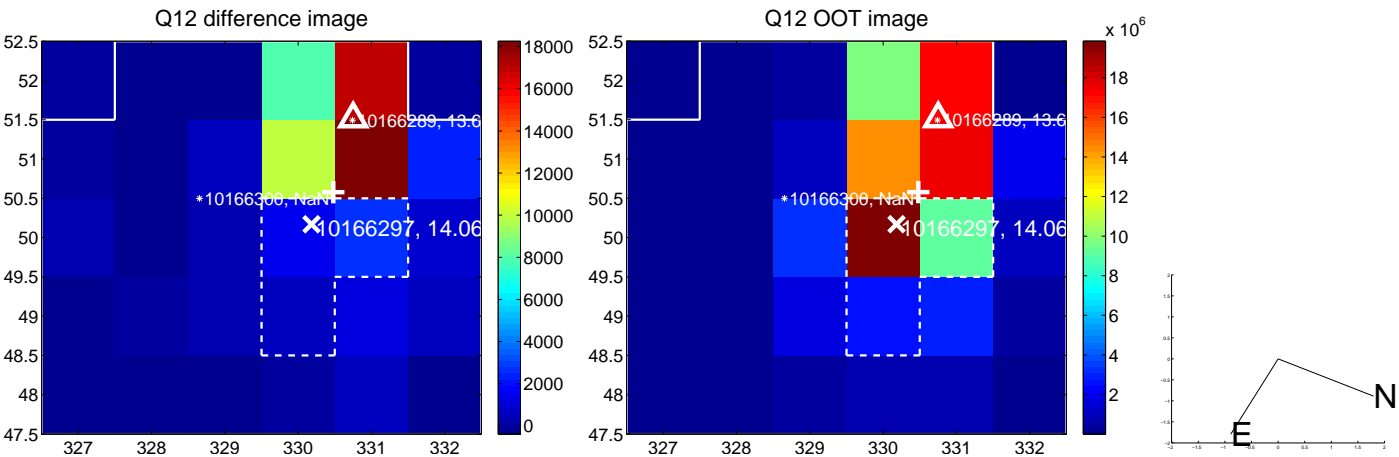
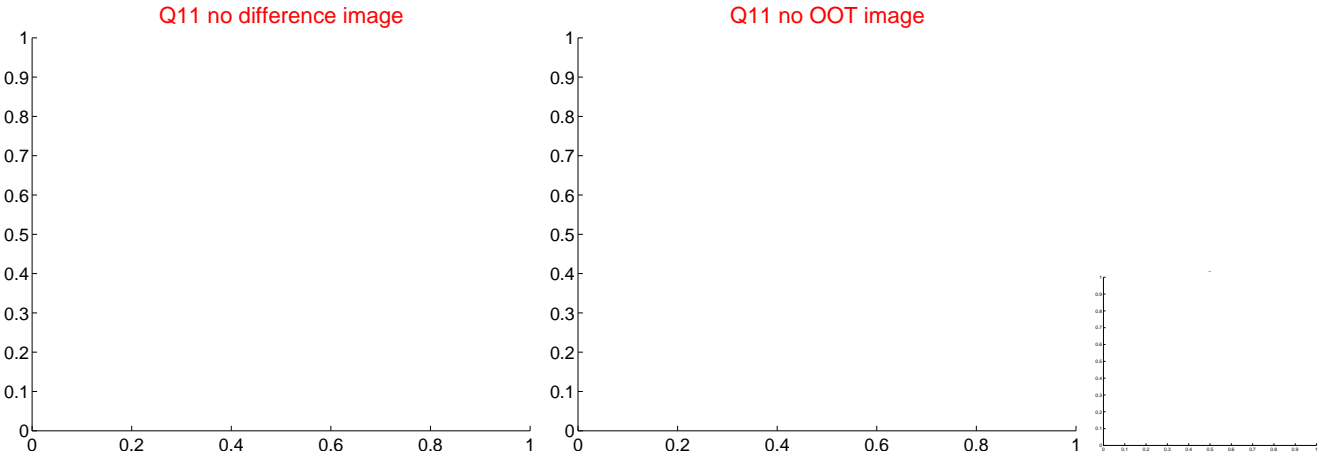
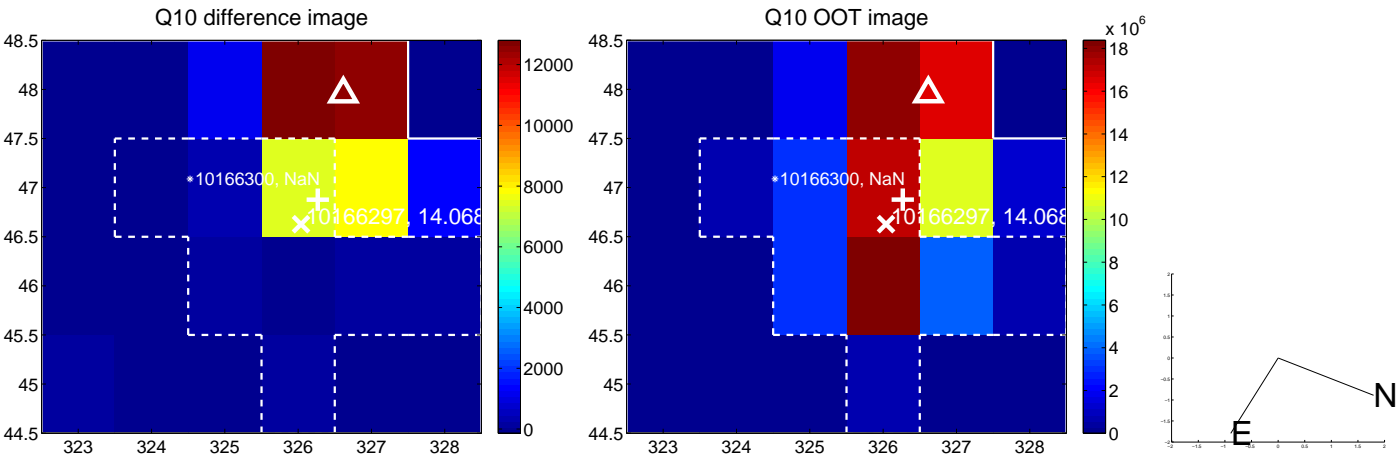
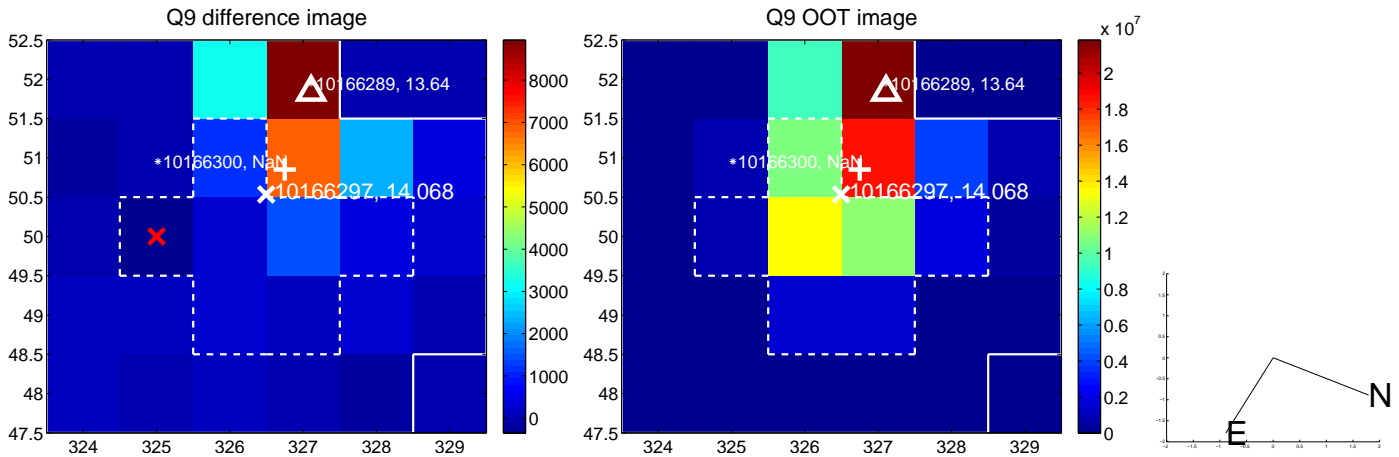


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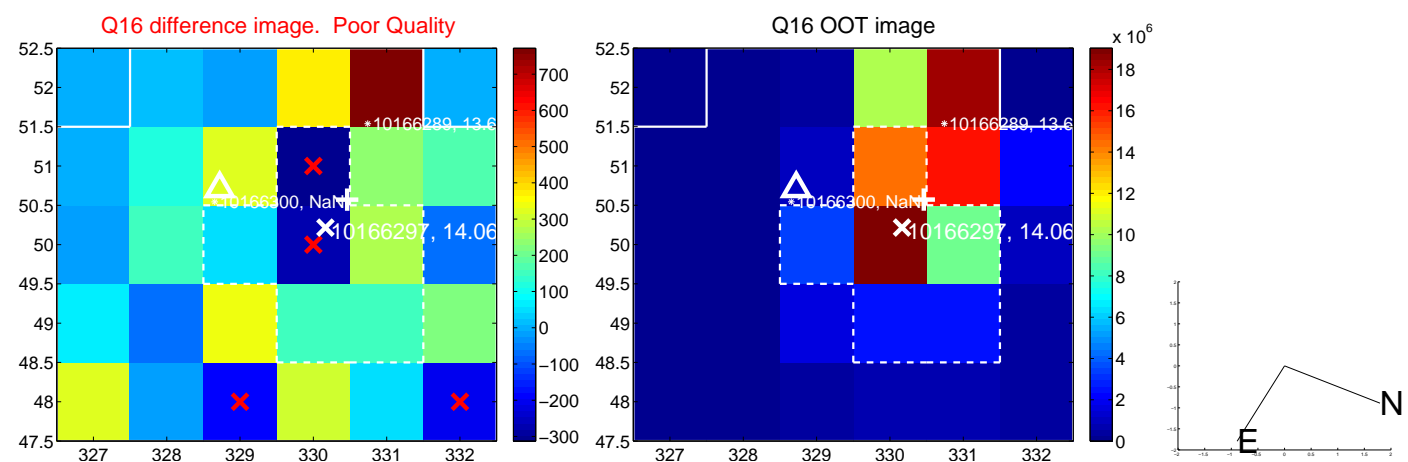
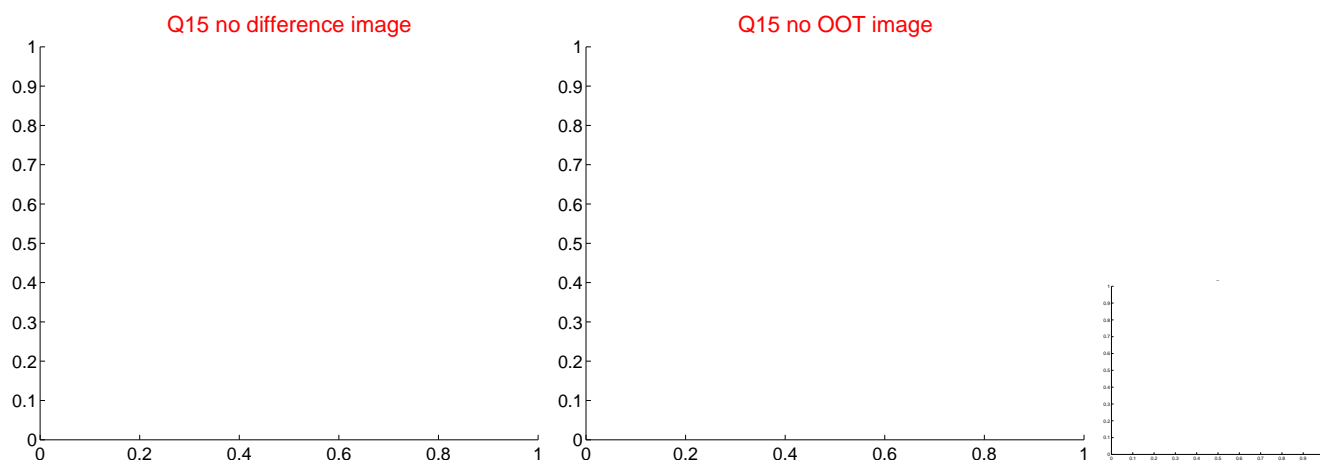
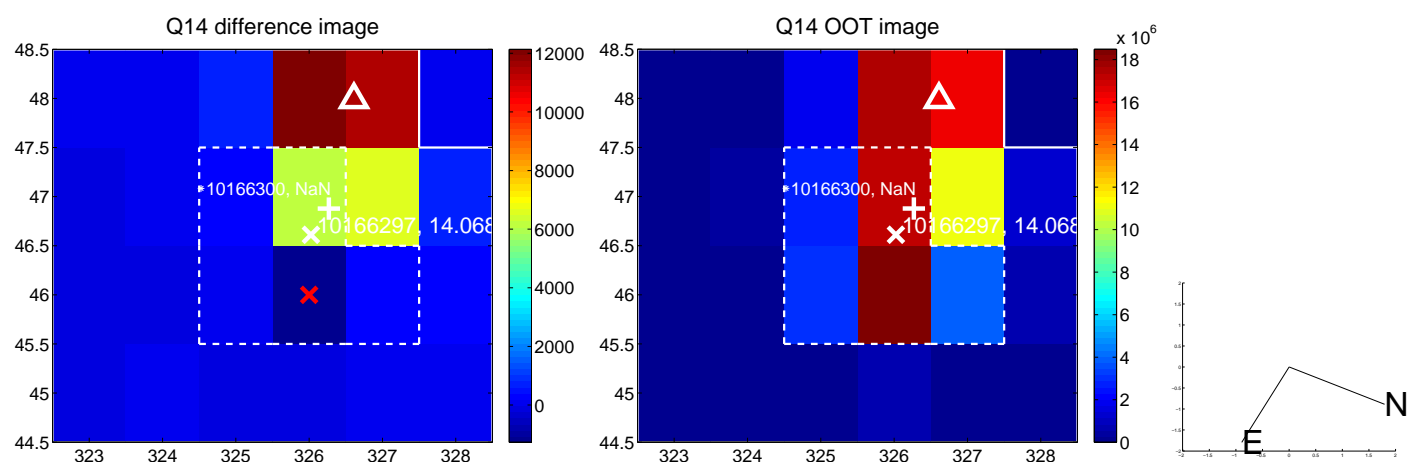
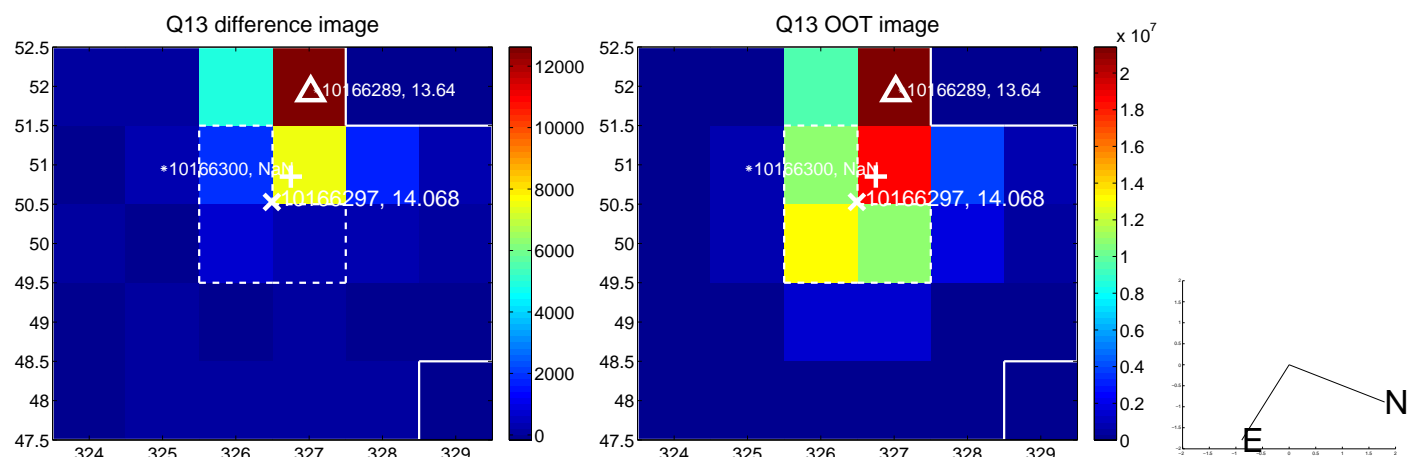




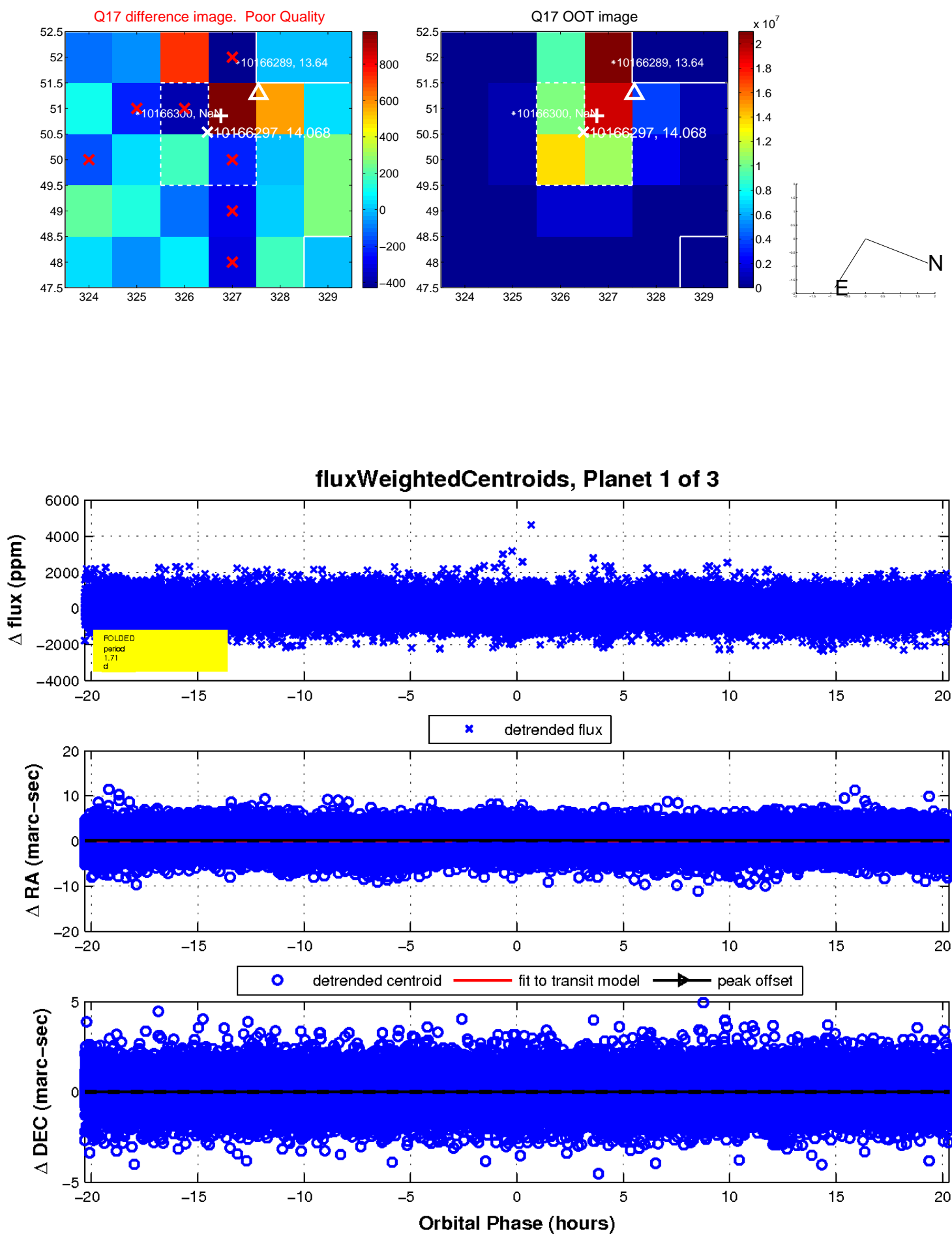
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



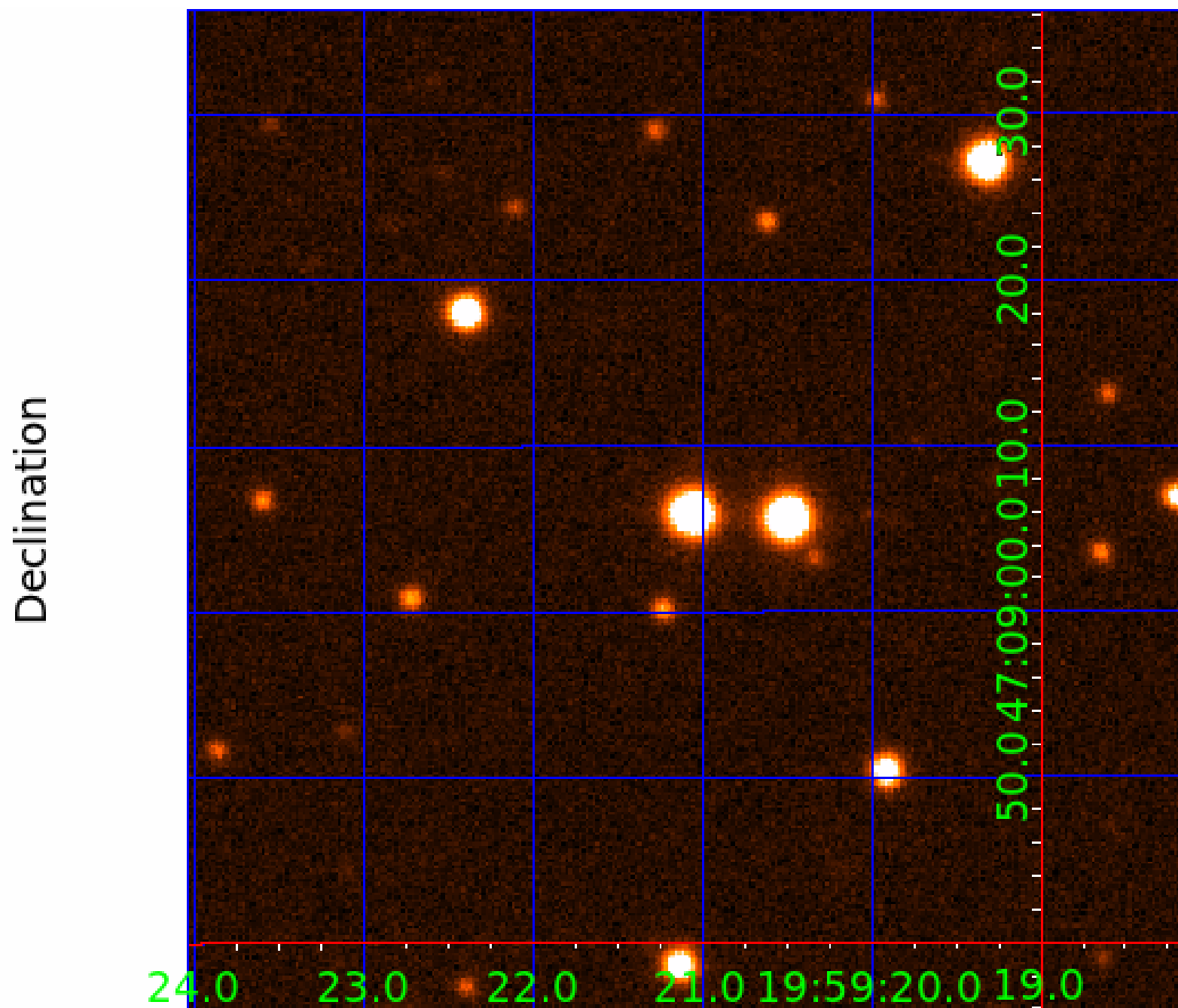
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 010166297

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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010166297-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010166297-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

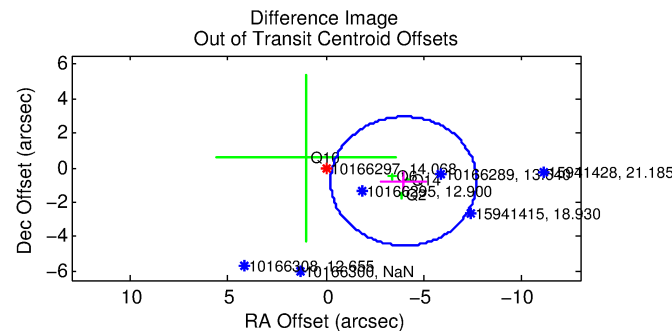
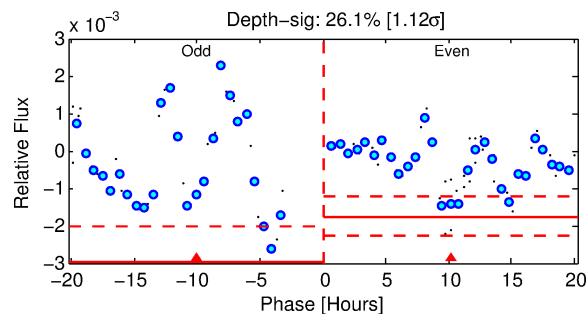
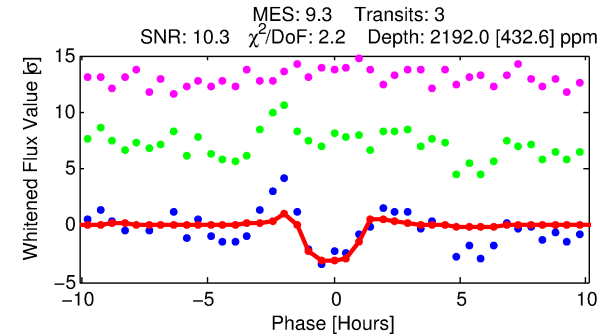
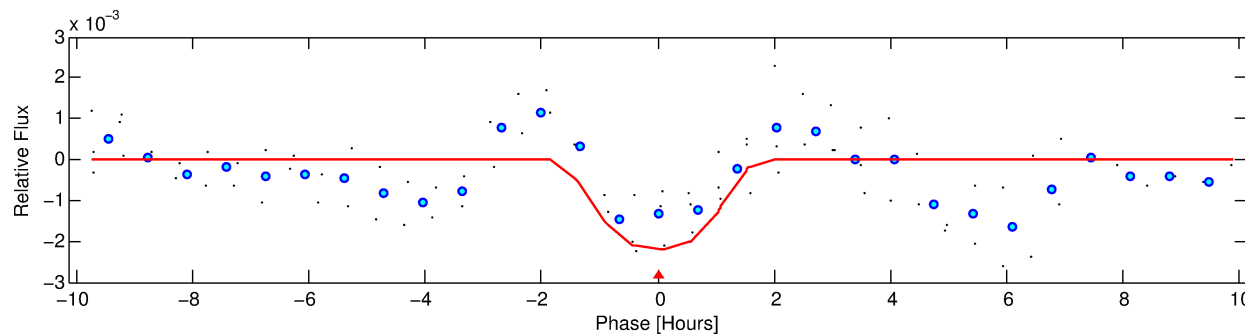
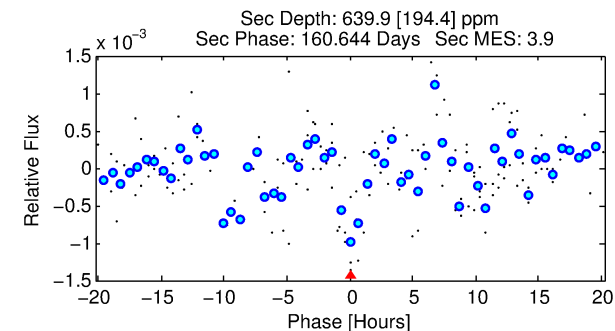
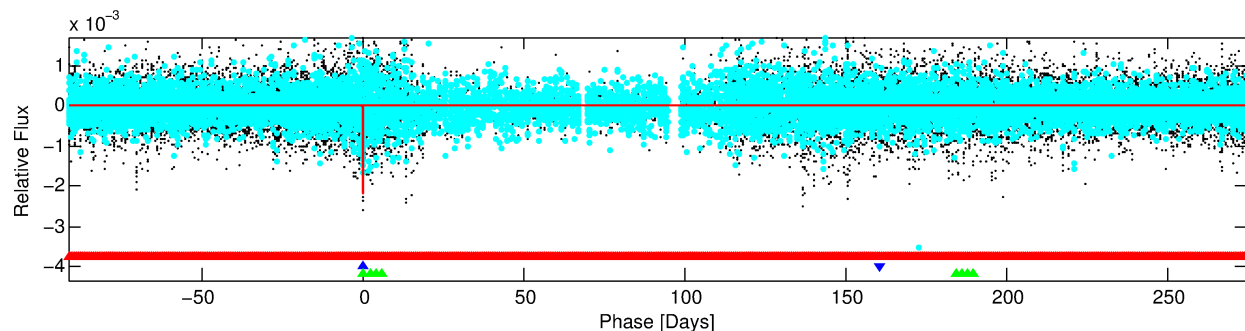
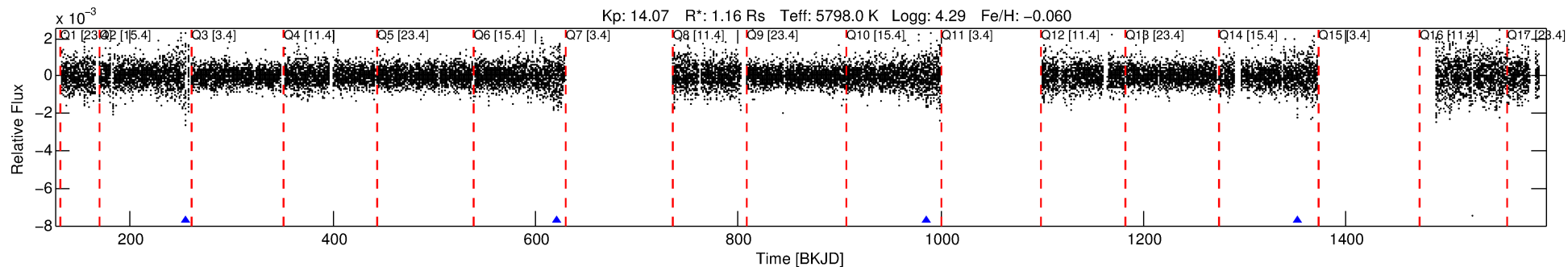
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Ephemeris Match Information For 010166297-02

No Significant Match Found

# DV One-Page Summary

KIC: 10166297 Candidate: 2 of 3 Period: 366.108 d



## DV Fit Results:

Period = 366.10805 [0.00379] d  
Epoch = 254.2156 [0.0073] BKJD  
Rp/R\* = 0.0540 [0.0076]  
a/R\* = 392.89 [86.95]  
b = 0.94 [0.03]  
Seff = 1.40 [0.53]  
Teq = 277 [26] K  
Rp = 6.83 [2.10] Re  
a = 0.9859 [0.2374] AU  
Ag = 7331.88 [4030.48] [1.82σ]  
Teff = 3968 [424] K [8.69σ]

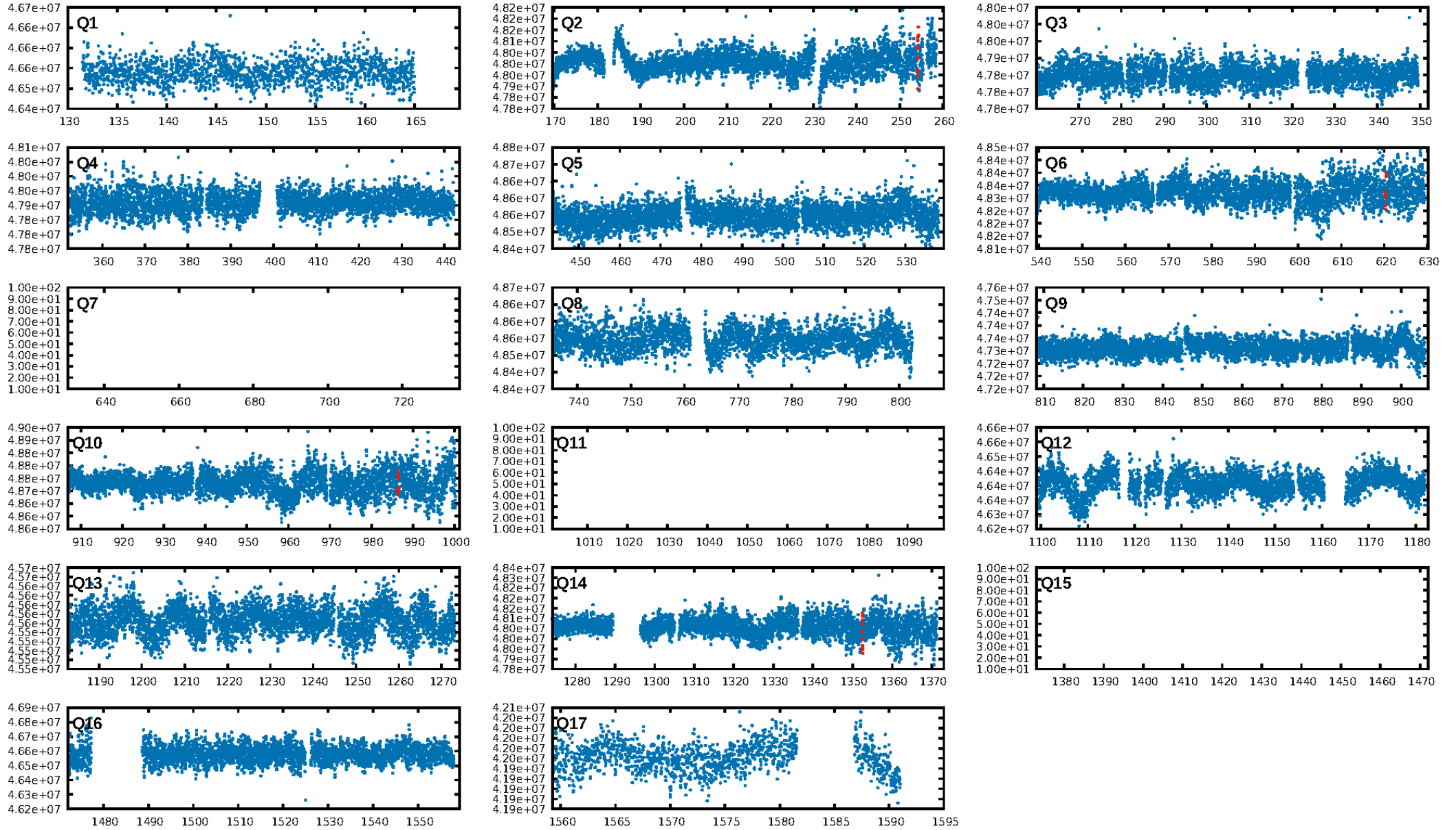
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1014.37σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 24.7%  
ModelChiSquareGof-sig: 63.5%  
**Bootstrap-pfa: 8.62e-12**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.2299**  
Centroid-sig: 7.6%  
Centroid-so: 3.475 arcsec [3.31σ]  
OotOffset-rm: 4.053 arcsec [3.26σ]  
KicOffset-rm: 5.688 arcsec [4.95σ]  
OotOffset-st: 4/0/0/0 [4]  
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DiffImageOverlap-fno: 0.25 [1/4]

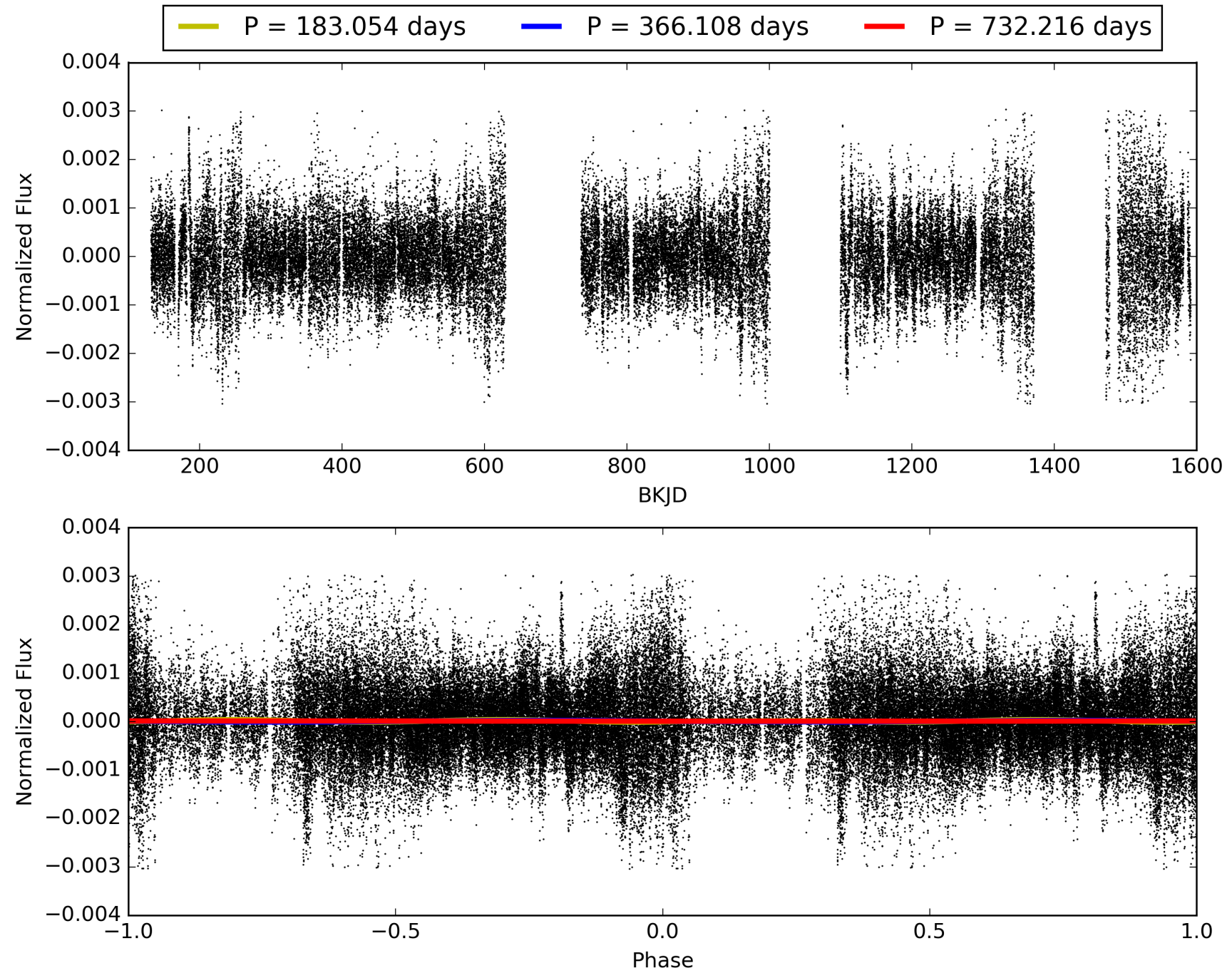
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010166297-02, PDC Light Curves

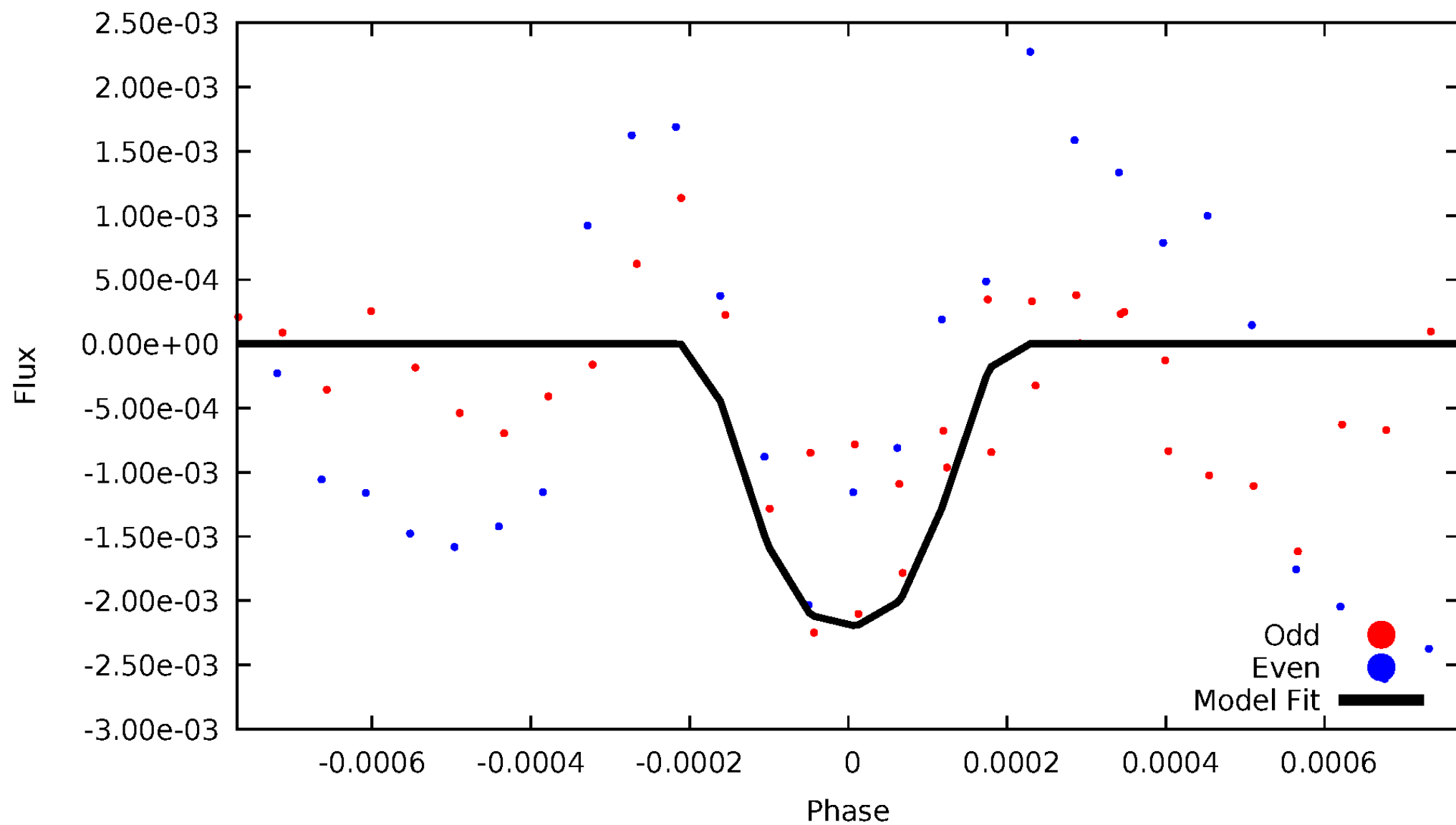


TCE 010166297-02



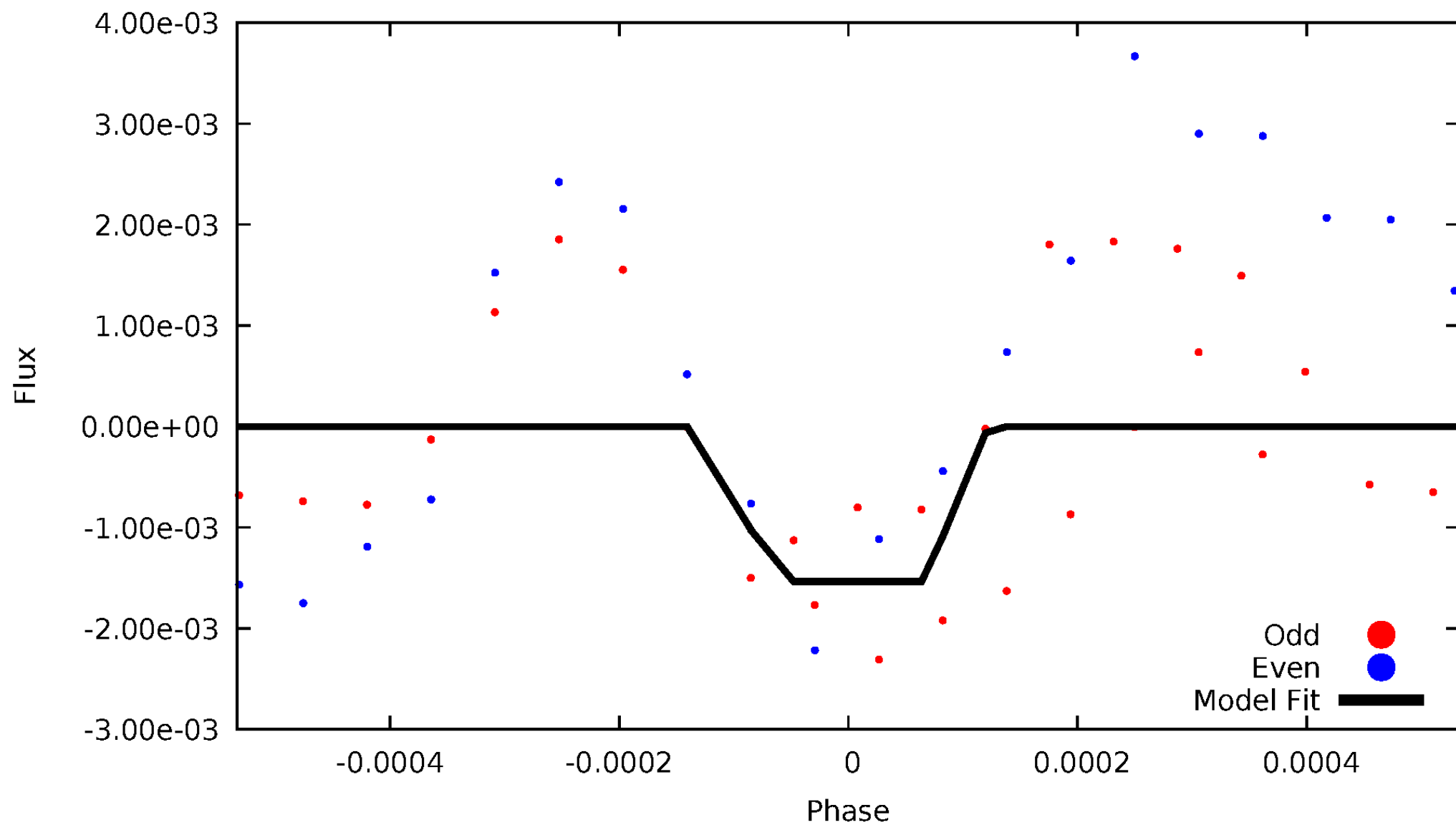
# DV Odd/Even

TCE 010166297-02



# ALT Odd/Even

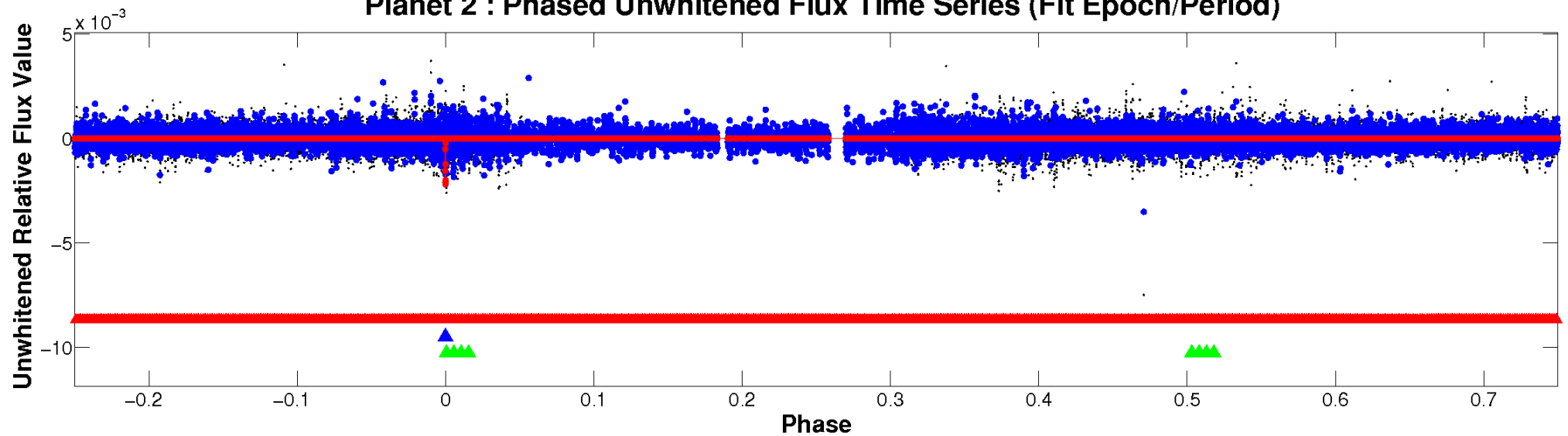
TCE 010166297-02



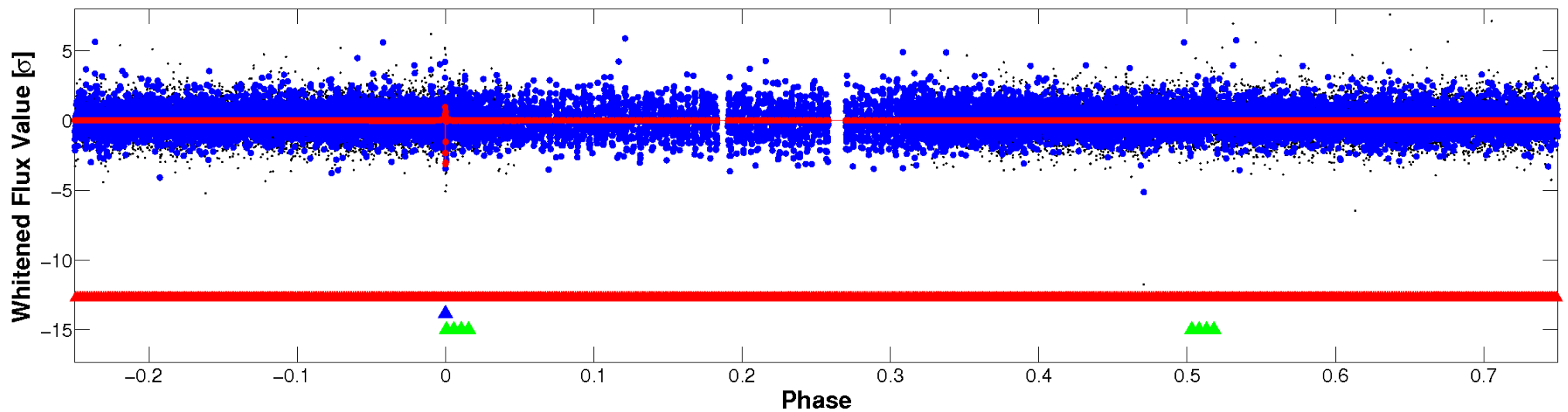


# Non-Whitened Vs. Whitened Light Curve

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



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



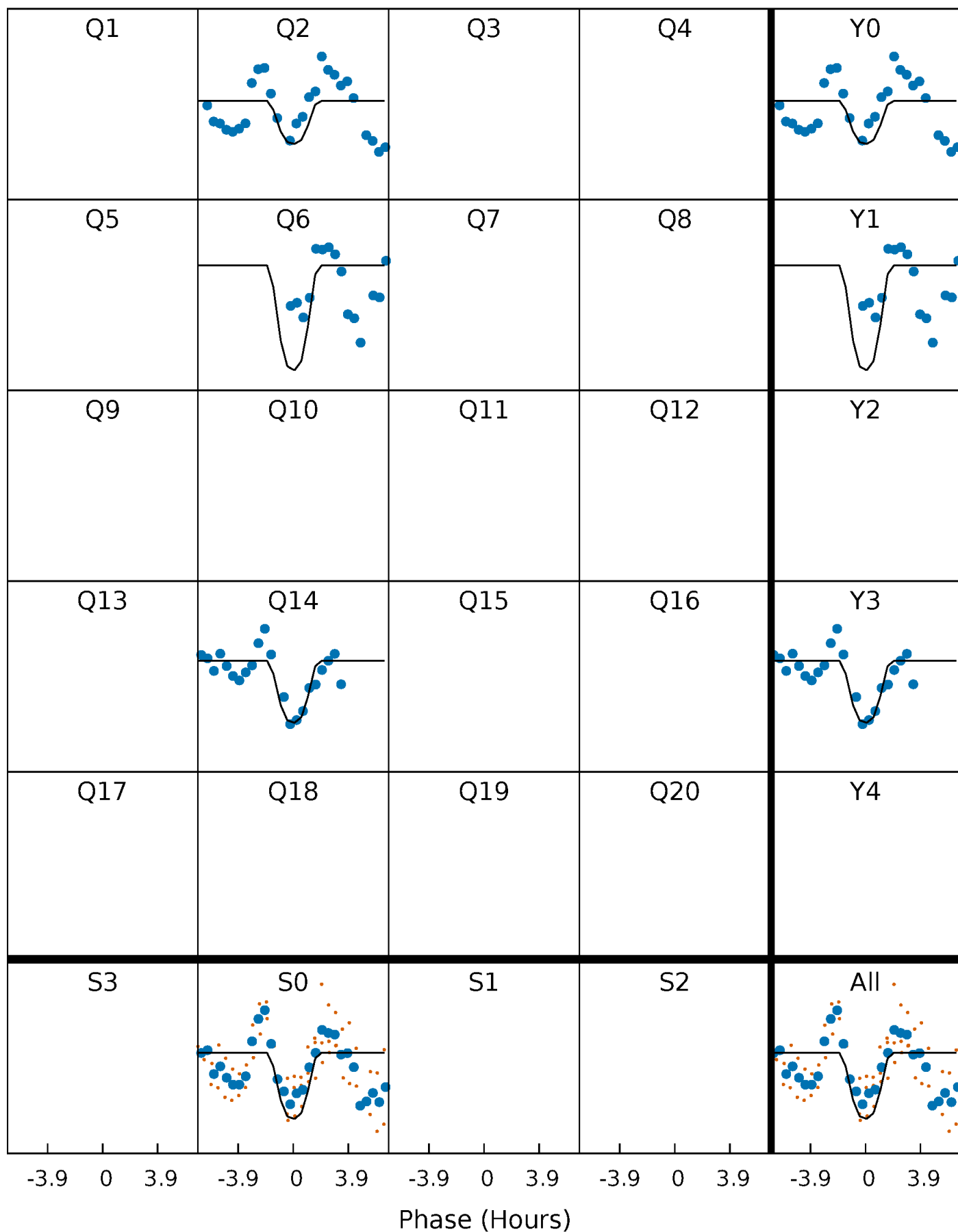
# PDC Quarter-Phased Transit Curves

TCE 010166297-02     $P=366.108048$  Days     $T_0=254.215567$  (BKJD)



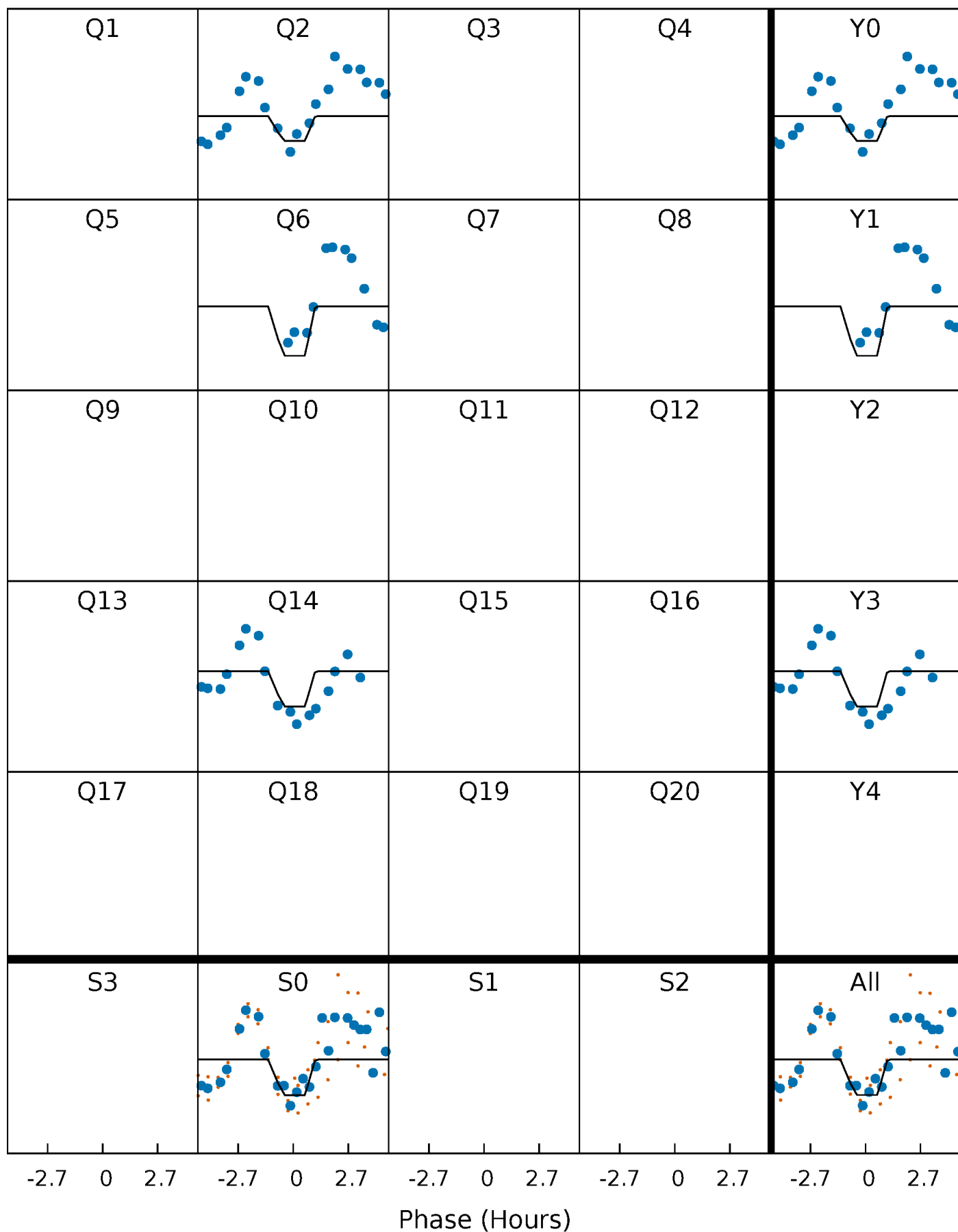
# DV Quarter-Phased Transit Curves

TCE 010166297-02 P=366.108048 Days  $T_0=254.215567$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

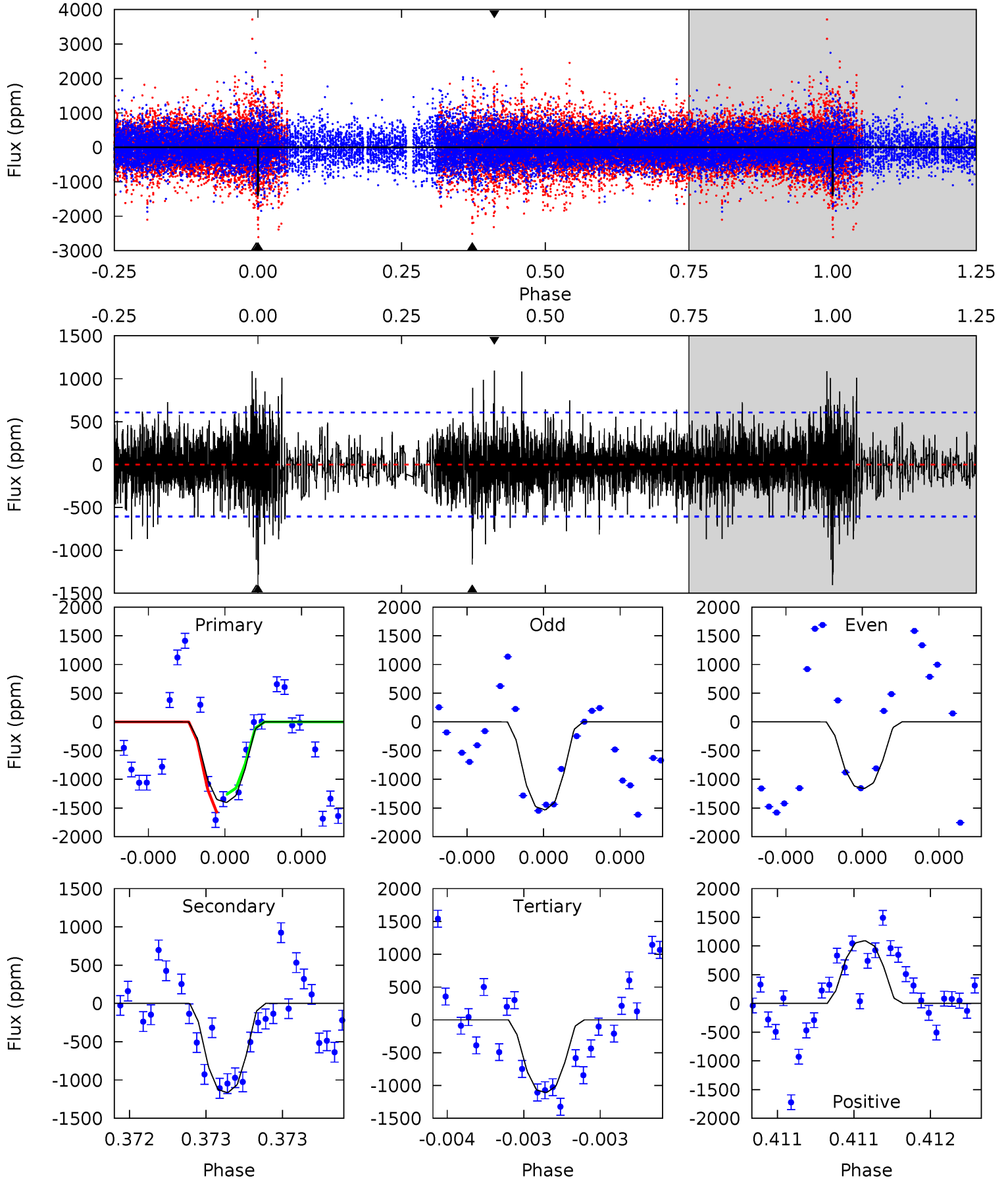
TCE 010166297-02 P=366.115687 Days  $T_0=254.208000$  (BKJD)



# DV Model-Shift Uniqueness Test

010166297-02, P = 366.108048 Days, E = 254.215567 Days

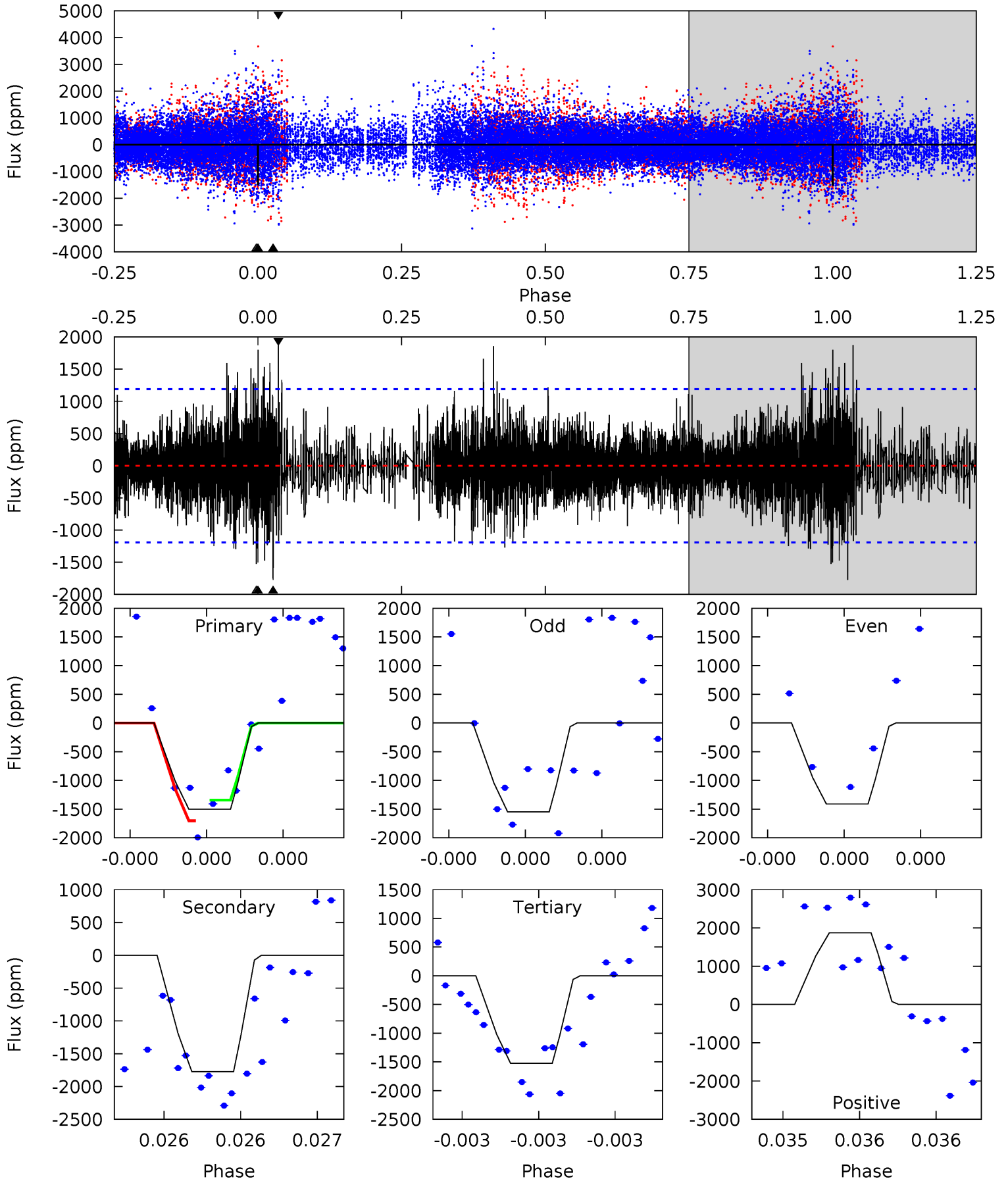
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	10.7	10.2	10.1	5.59	3.51	2.09	2.72	2.86	0.52	0.66	1.71	1.19	0.44	1.46



# Alt Model-Shift Uniqueness Test

010166297-02, P = 366.115687 Days, E = 254.208000 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.22	8.53	7.33	9.01	5.73	3.71	1.74	-0.11	-1.79	1.20	-0.48	0.32	1.07	0.51	0.84





### Stellar Parameters For KIC 010166297

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5798^{+157}_{-157}$	$4.289^{+0.204}_{-0.185}$	$-0.060^{+0.300}_{-0.300}$	$1.159^{+0.318}_{-0.260}$	$0.952^{+0.139}_{-0.092}$	$0.862^{+0.859}_{-0.436}$
	+3%/-3%	+5%/-4%	+500%/-500%	+27%/-22%	+15%/-10%	+100%/-51%
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 010166297-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1164 \pm 108$	$6.86^{+1.41}_{-1.42}$	$385^{+28}_{-28}$	$4740^{+316}_{-289}$	$13603^{+7337}_{-4439}$
Alt.	$-1773 \pm 208$	$4.91^{+1.30}_{-1.04}$	$388^{+28}_{-27}$	$6021^{+756}_{-533}$	$38598^{+26716}_{-14015}$

$T_{max}$  = 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

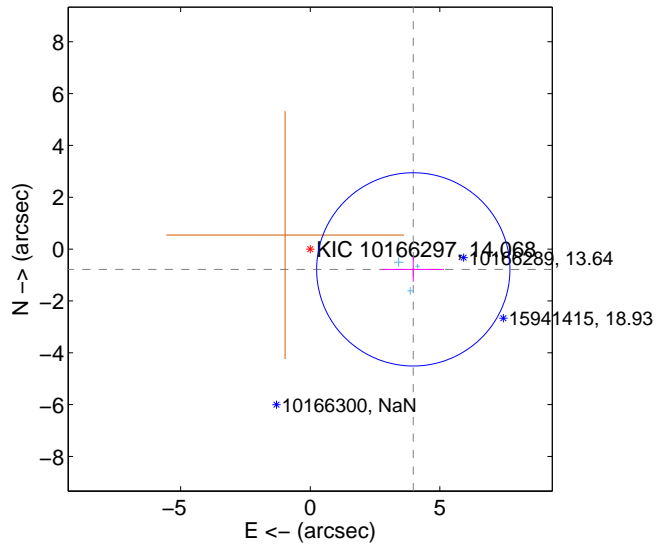
Supplemental centroid analysis for 010166297-02. Kepler magnitude: 14.07. Transit SNR 10.27

There are 3 quarters with good PRF difference image offsets

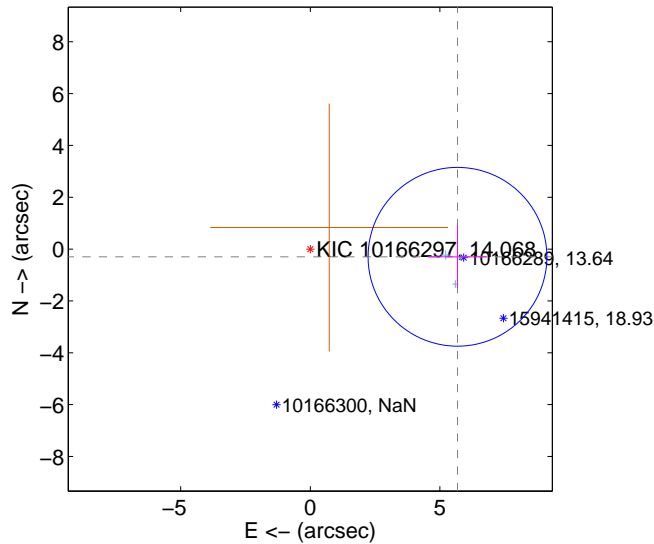
The direct PRF centroid is offset from the target star catalog position by about 1.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.053 \pm 1.243$	3.26	$-3.977 \pm 1.183$	$-0.783 \pm 0.478$
PRF-fit source offset from KIC position	$5.688 \pm 1.150$	4.95	$-5.680 \pm 1.150$	$-0.297 \pm 1.199$
photometric centroid source offset	$3.48 \pm 1.05$	3.31	$-3.47 \pm 1.05$	$0.17 \pm 0.32$

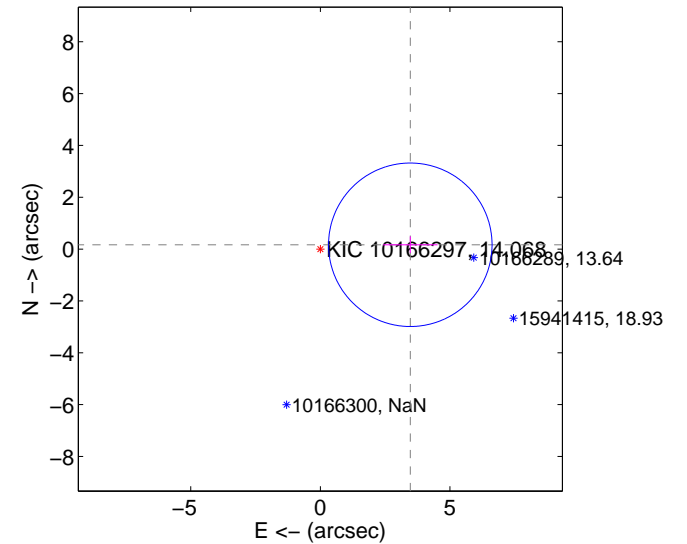
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



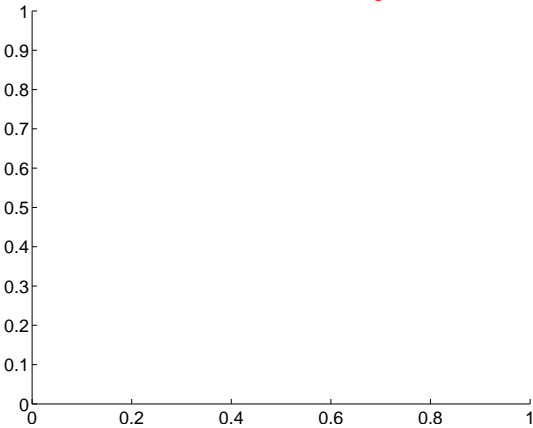
offset from photometric centroids



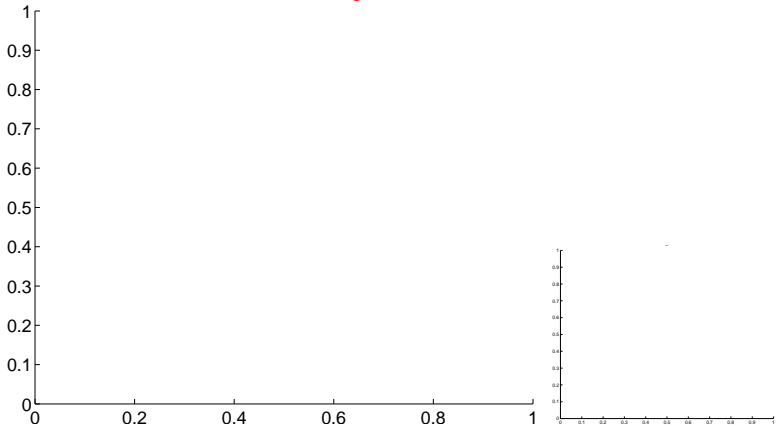
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

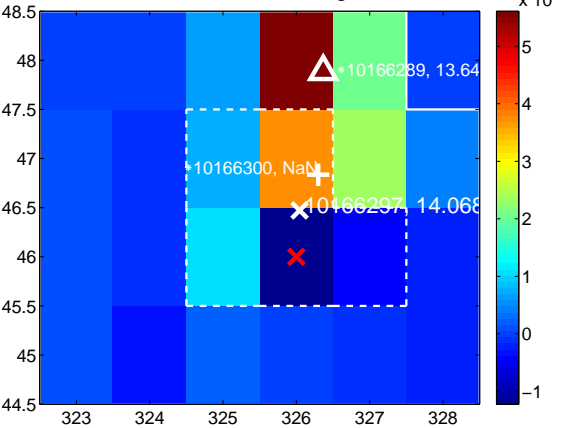
Q1 no difference image



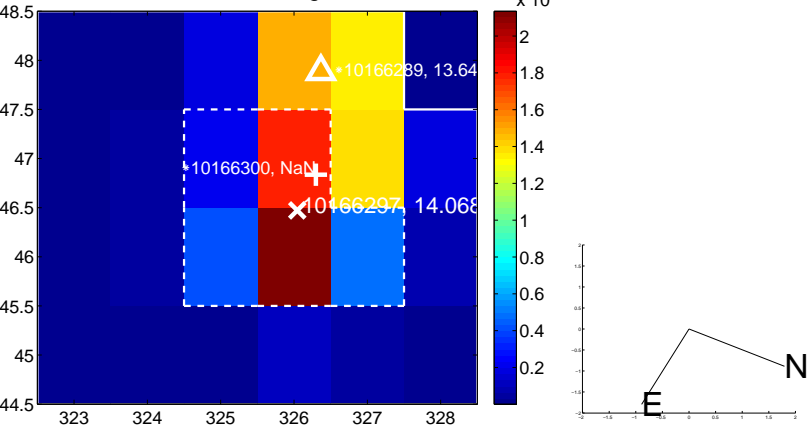
Q1 no OOT image



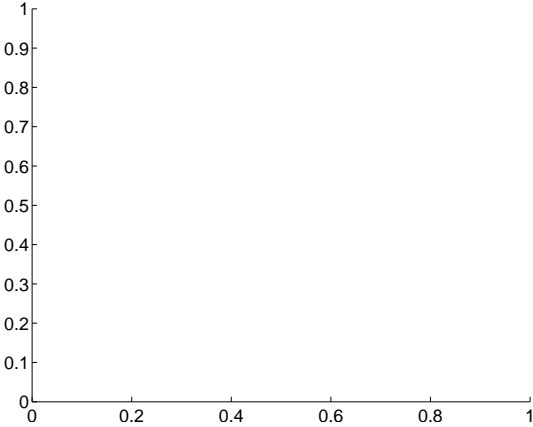
Q2 difference image



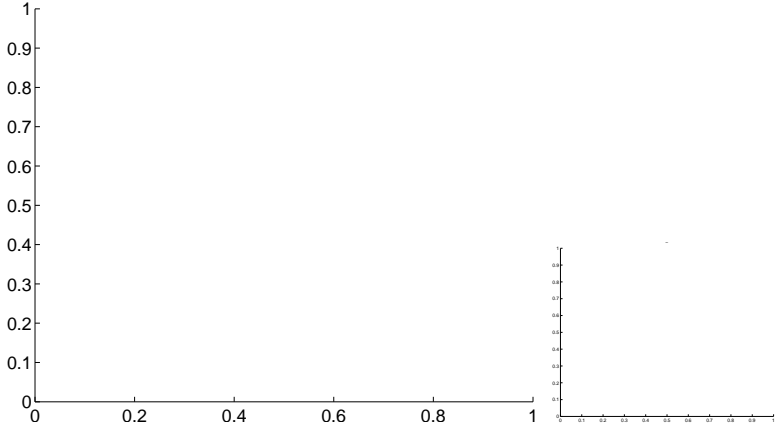
Q2 OOT image



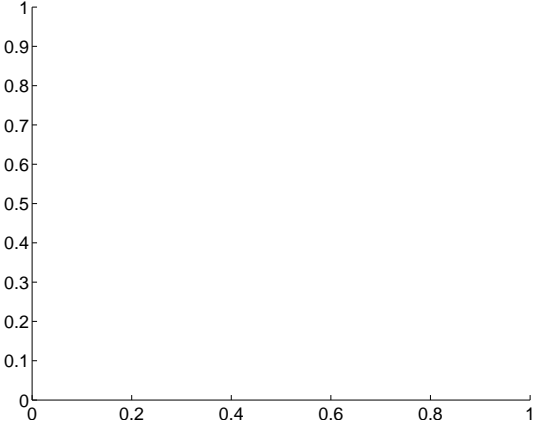
Q3 no difference image



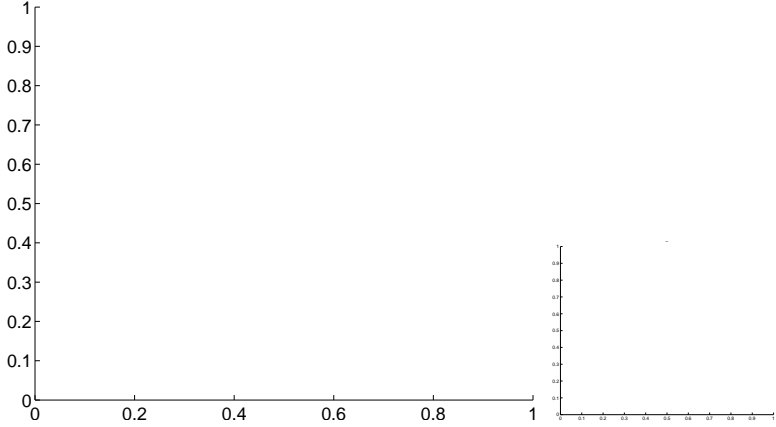
Q3 no OOT image



Q4 no difference image

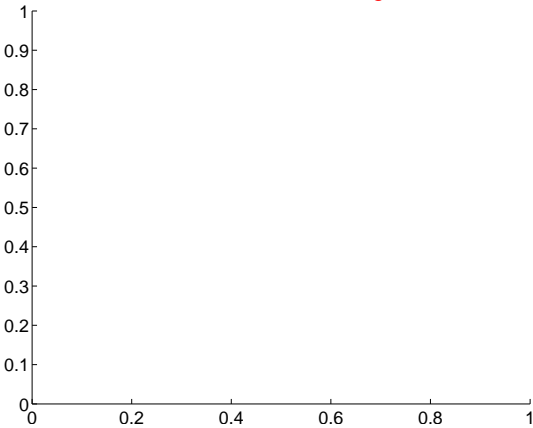


Q4 no OOT image

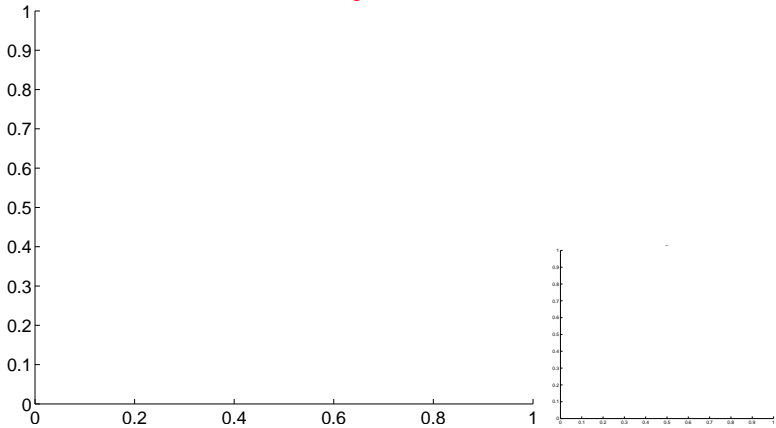


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

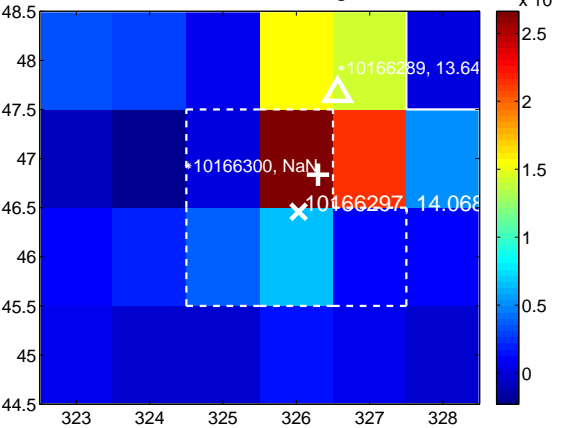
Q5 no difference image



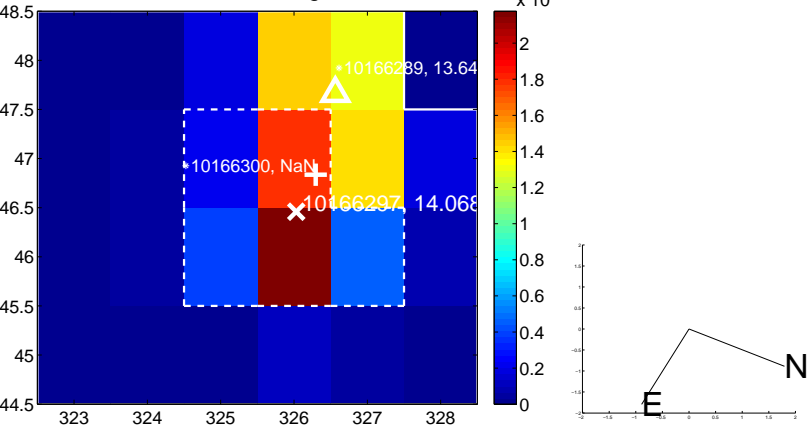
Q5 no OOT image



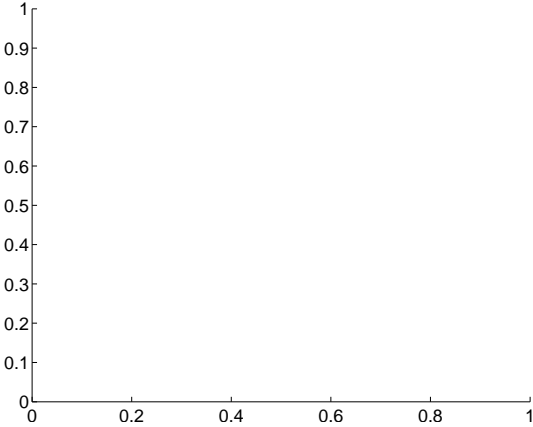
Q6 difference image



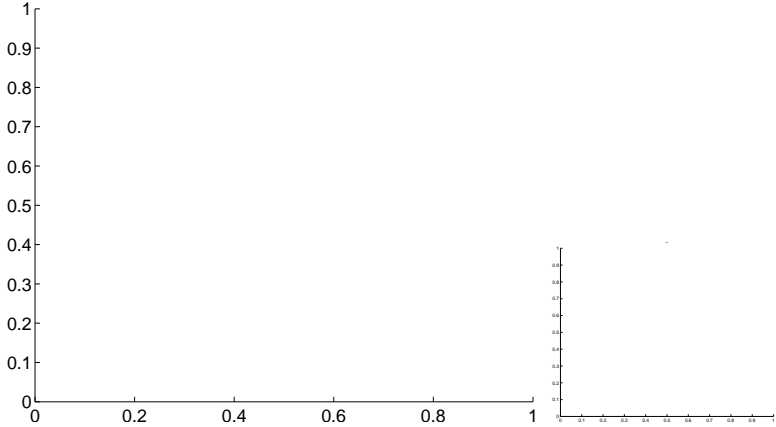
Q6 OOT image



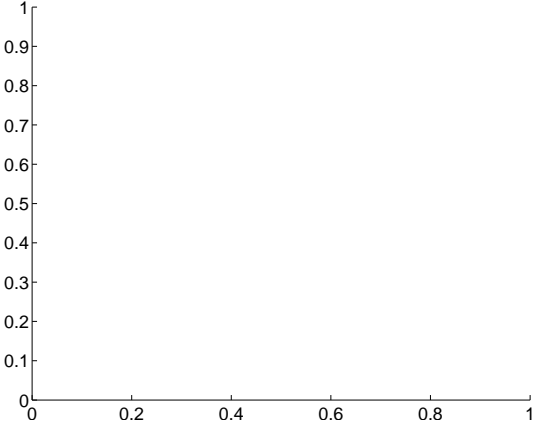
Q7 no difference image



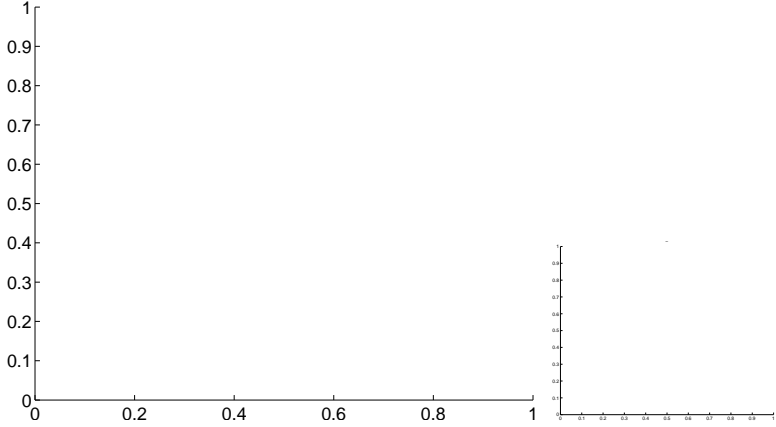
Q7 no OOT image



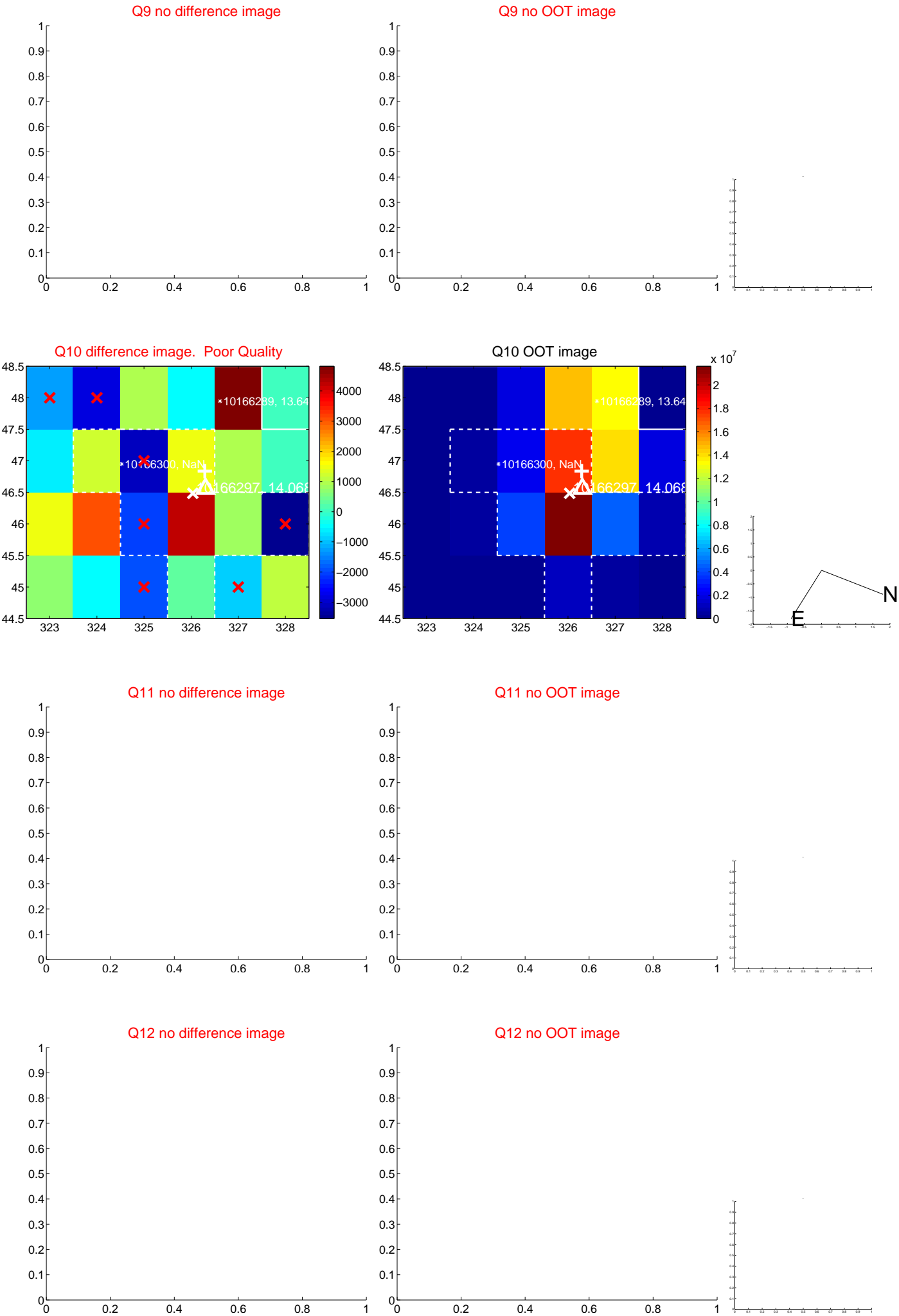
Q8 no difference image



Q8 no OOT image

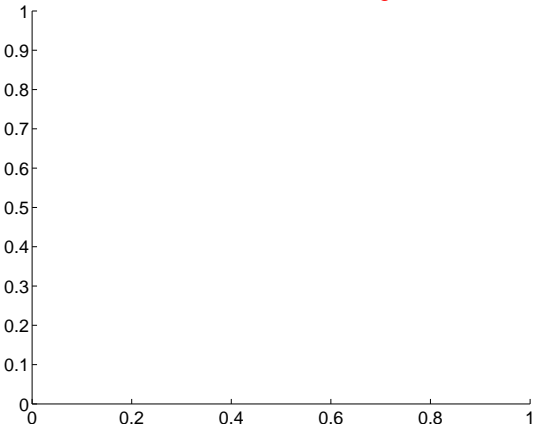


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

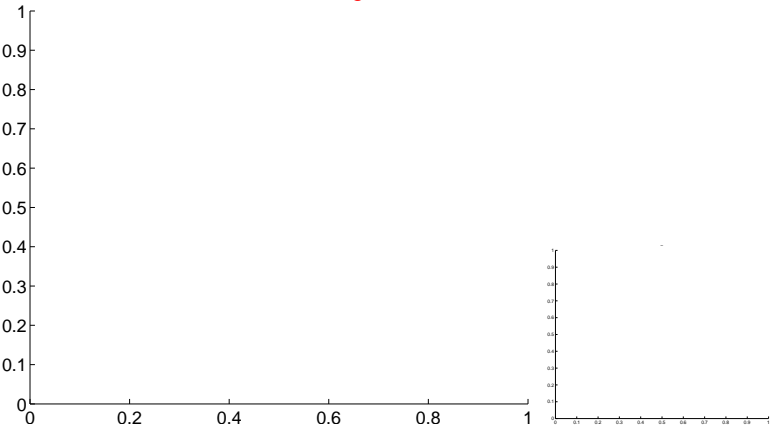


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

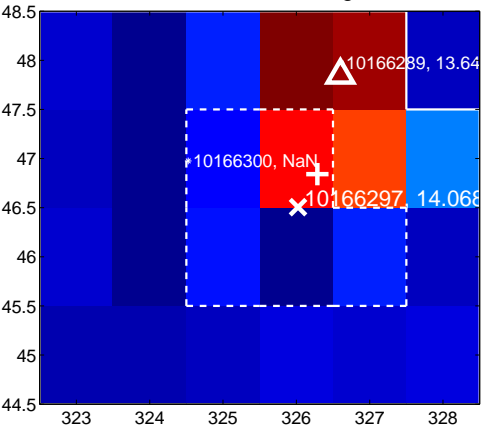
Q13 no difference image



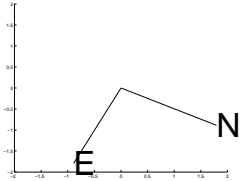
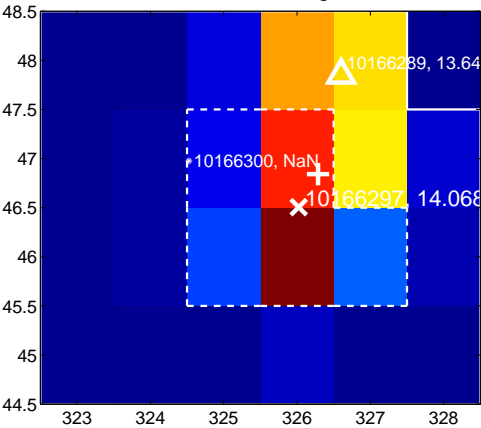
Q13 no OOT image



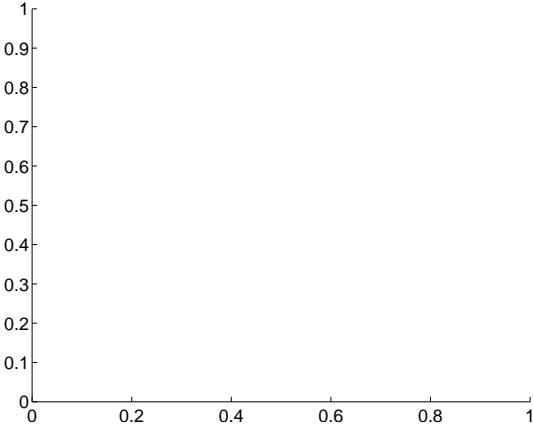
Q14 difference image



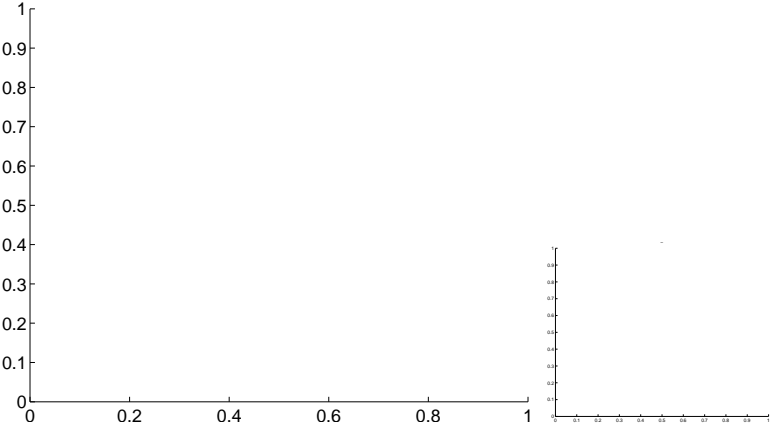
Q14 OOT image



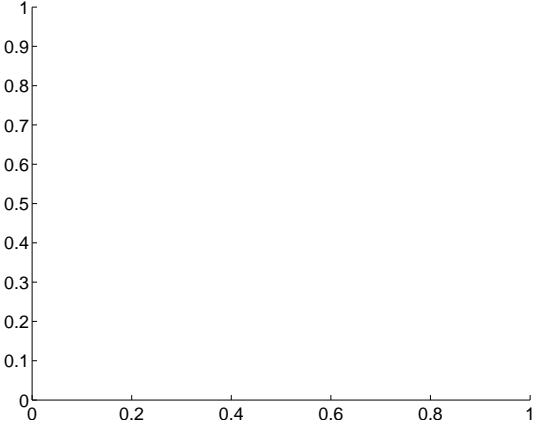
Q15 no difference image



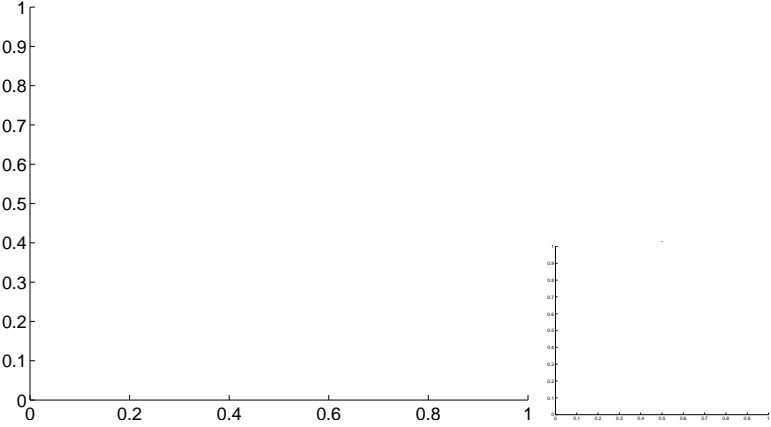
Q15 no OOT image



Q16 no difference image

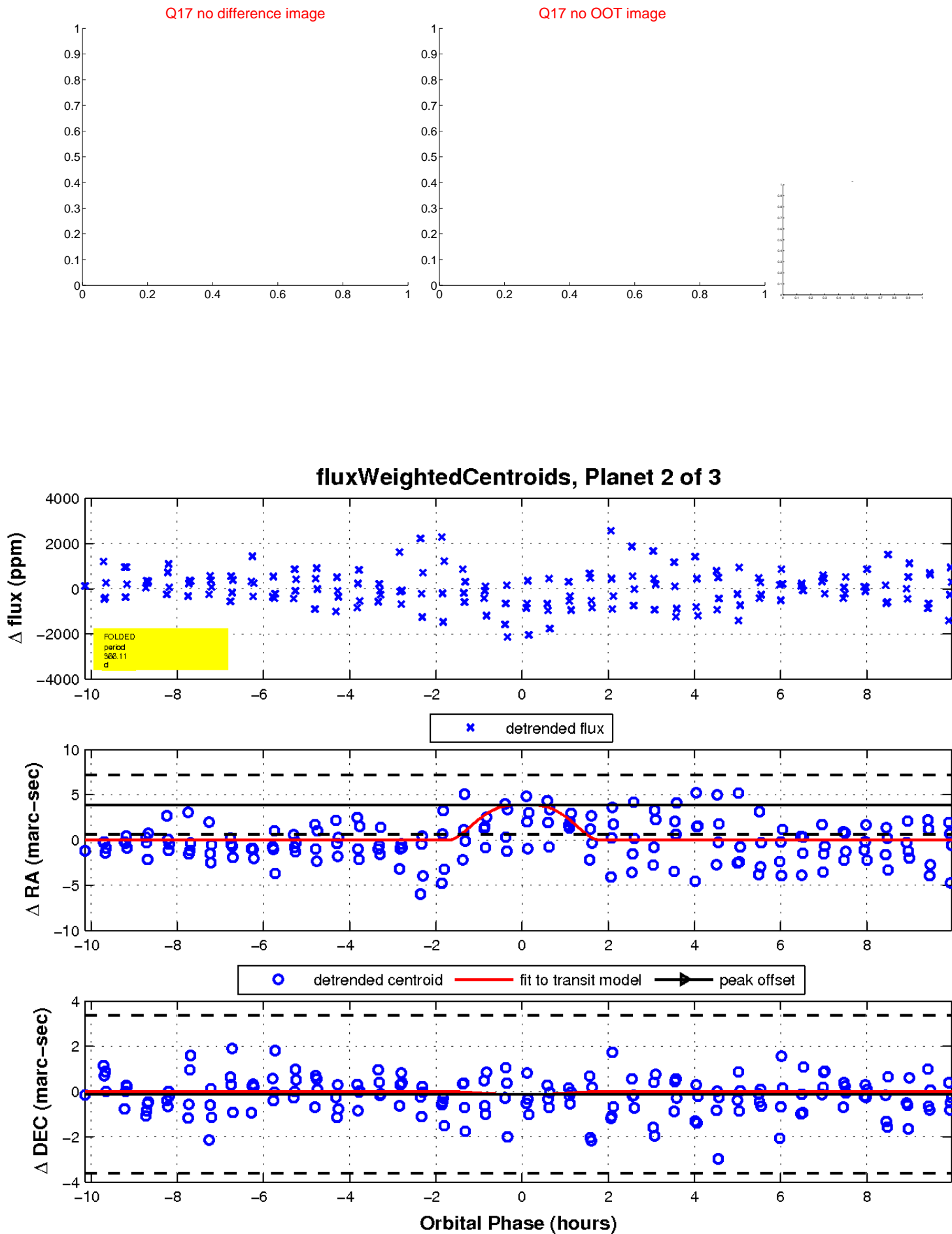


Q16 no OOT image

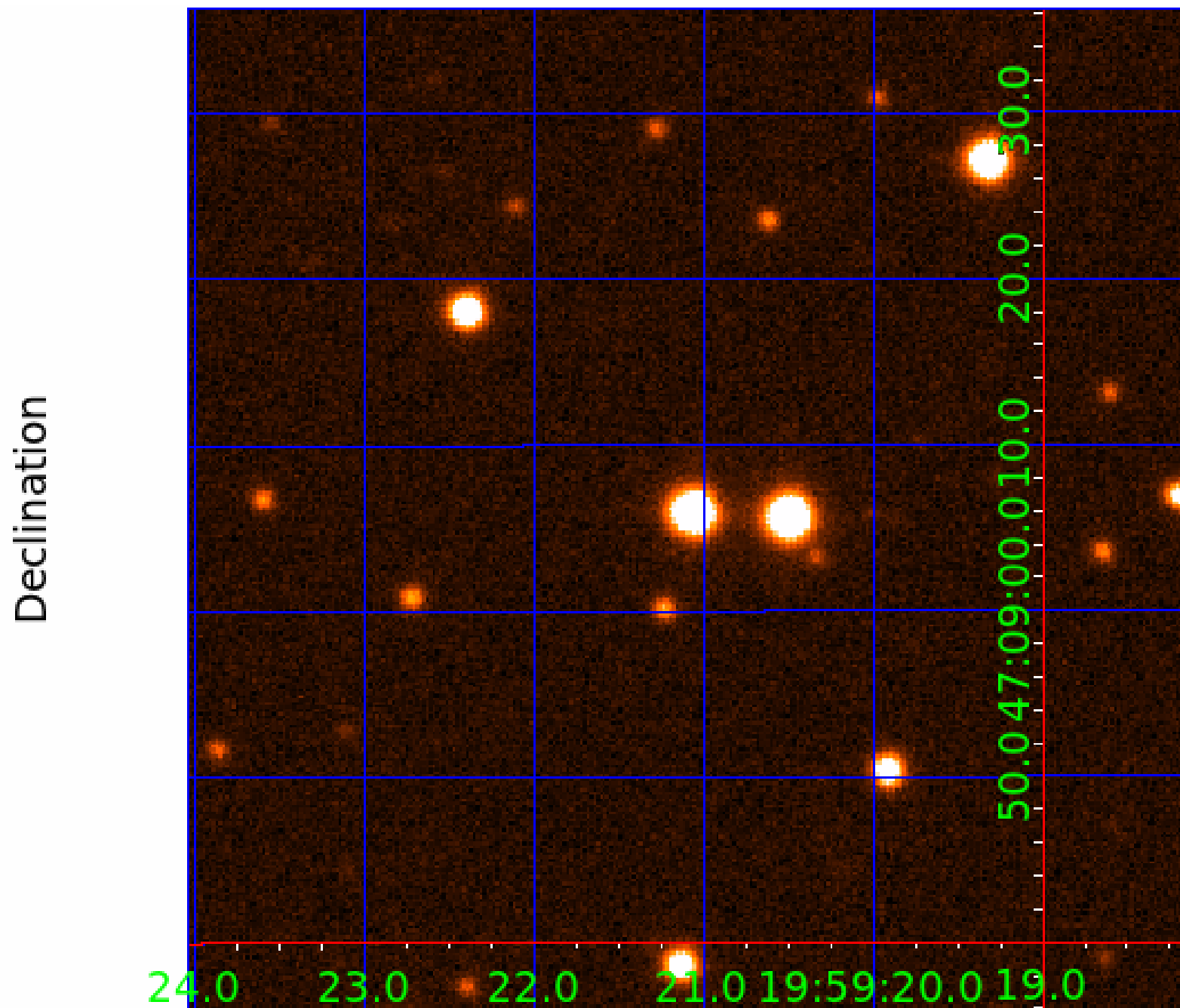




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 010166297

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010166297-01	OBS	No	1.713252	131.587275	49.3	6.770	8.1	5.8	1.16	5798	0.97	1787.73
010166297-02	OBS	No	366.108048	254.215567	2192.0	3.383	9.3	10.3	1.16	5798	6.83	1.40
010166297-03	OBS	No	183.963598	254.462604	2010.0	2.670	7.8	8.6	1.16	5798	6.61	3.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010166297-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
010166297-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010166297-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

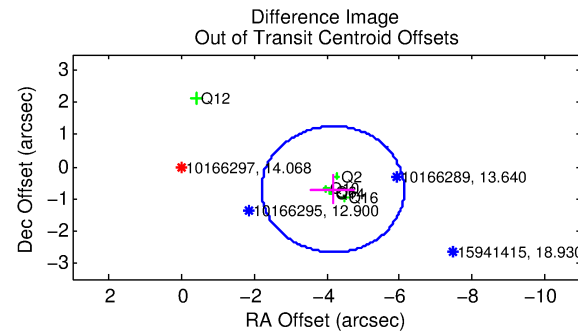
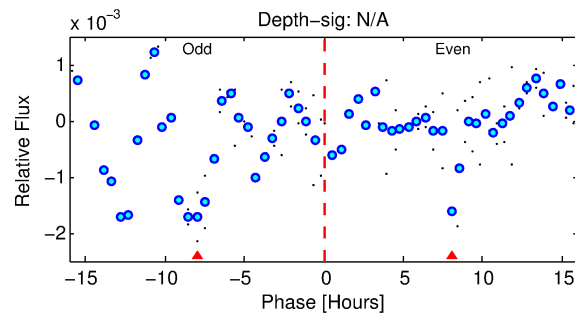
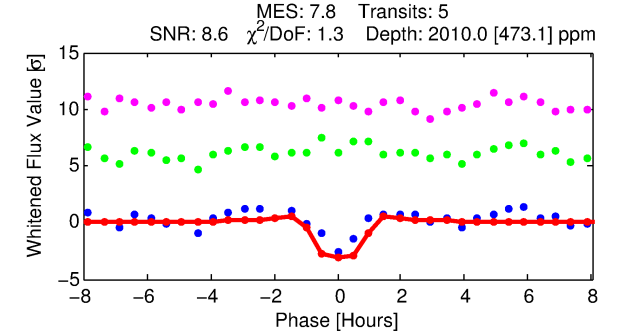
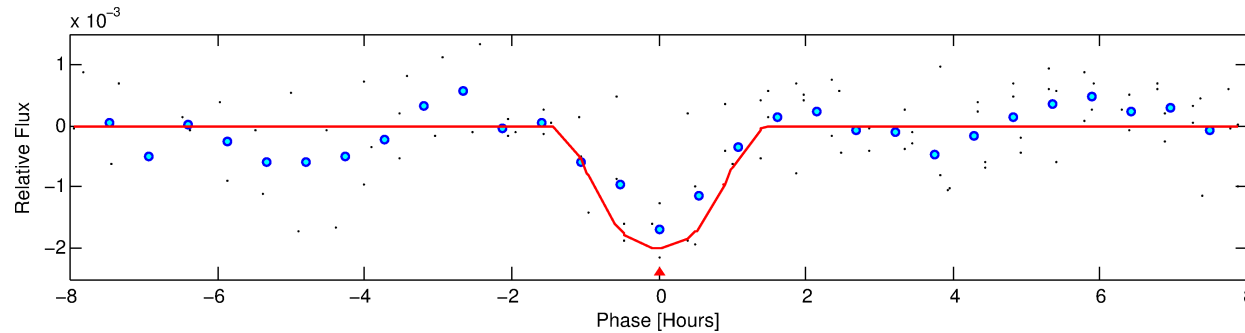
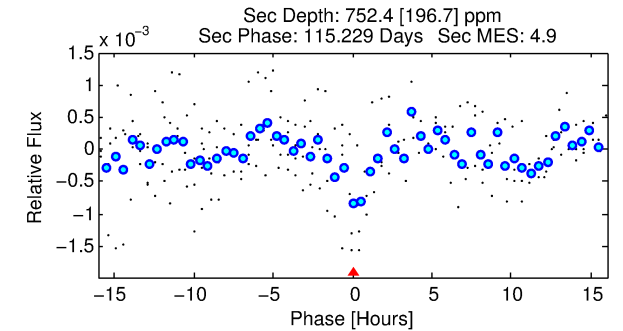
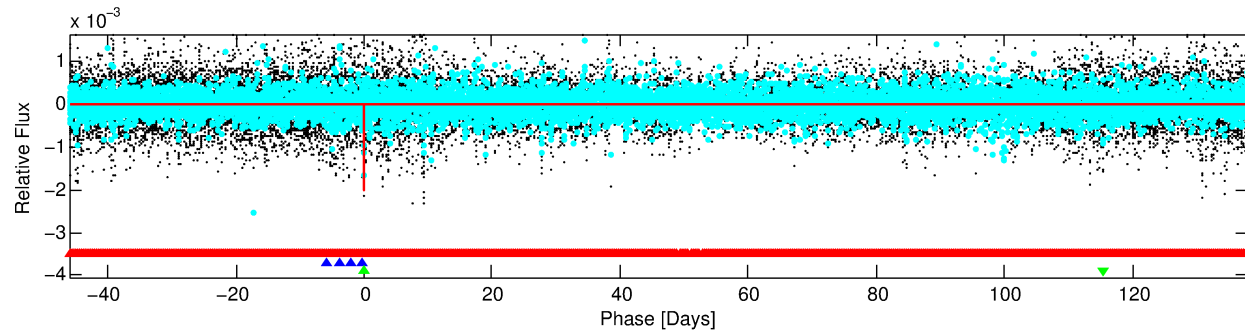
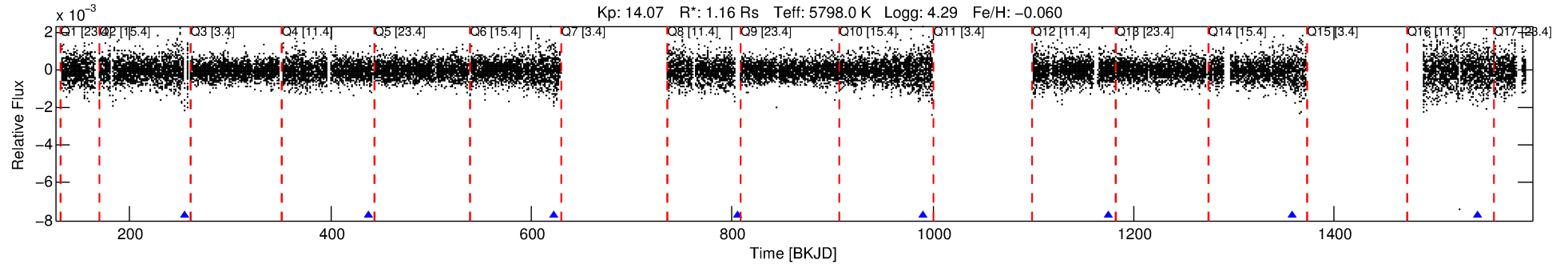
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010166297-03

No Significant Match Found

# DV One-Page Summary

KIC: 10166297 Candidate: 3 of 3 Period: 183.964 d



## DV Fit Results:

Period = 183.96360 [0.00153] d  
Epoch = 254.4626 [0.0074] BKJD  
Rp/R\* = 0.0523 [0.0101]  
a/R\* = 242.66 [66.64]  
b = 0.95 [0.04]  
Seff = 3.50 [1.33]  
Teq = 349 [33] K  
Rp = 6.61 [2.22] Re  
a = 0.6231 [0.1500] AU  
Ag = 3677.39 [2172.70] [1.69σ]  
Teff = 4200 [503] K [7.64σ]

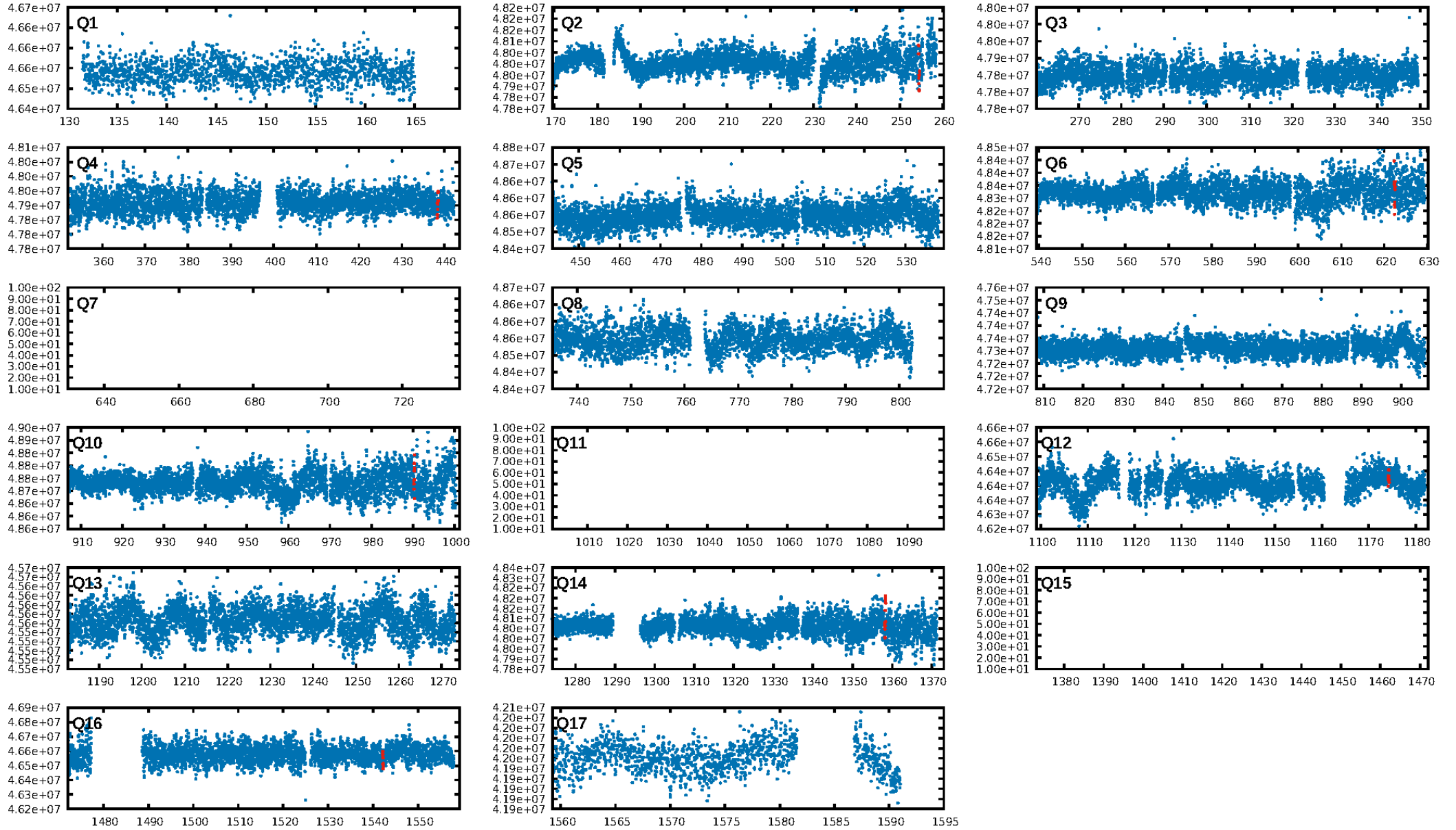
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [601.04σ]  
LongPeriod-sig: 100.0% [1014.37σ]  
ModelChiSquare2-sig: 41.0%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.14e-09**  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: -0.002483**  
Centroid-sig: 0.5%  
Centroid-so: 3.959 arcsec [4.69σ]  
OotOffset-rm: 4.230 arcsec [6.46σ]  
KicOffset-rm: 5.930 arcsec [11.09σ]  
OotOffset-st: 4/0/2/0 [6]  
KicOffset-st: 4/0/2/0 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 0.43 [3/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:34:55 Z

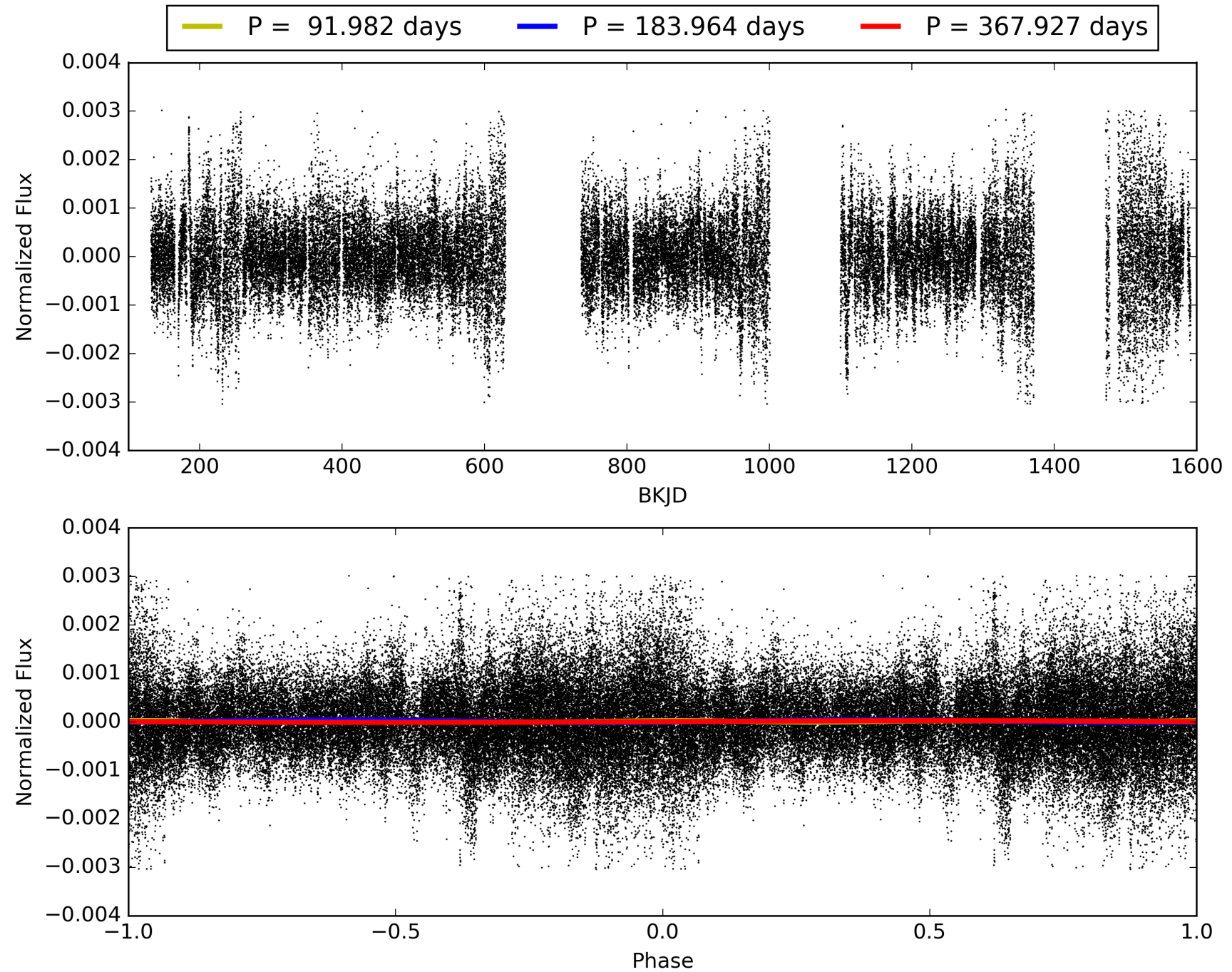
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010166297-03, PDC Light Curves



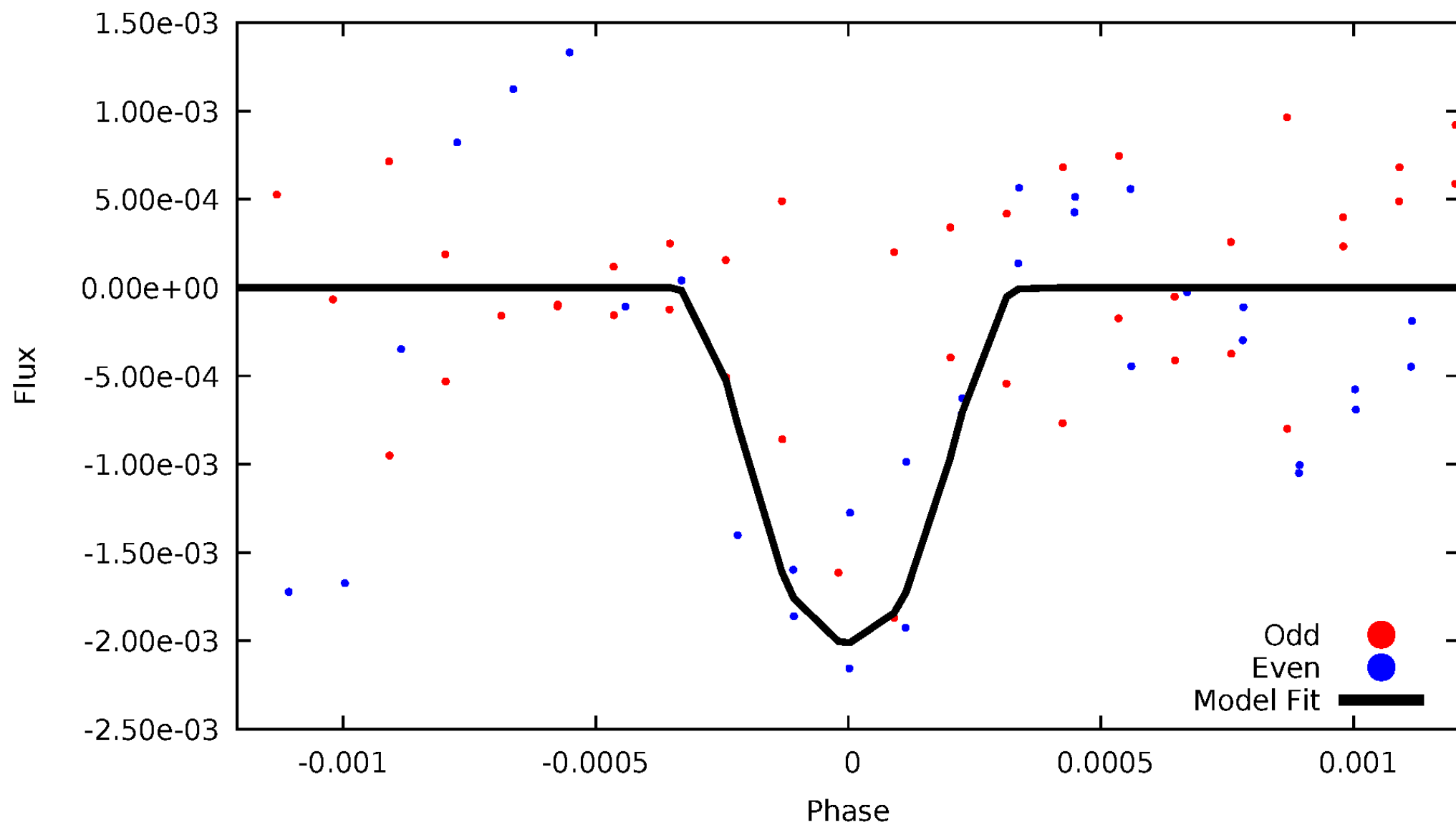


# TCE 010166297-03



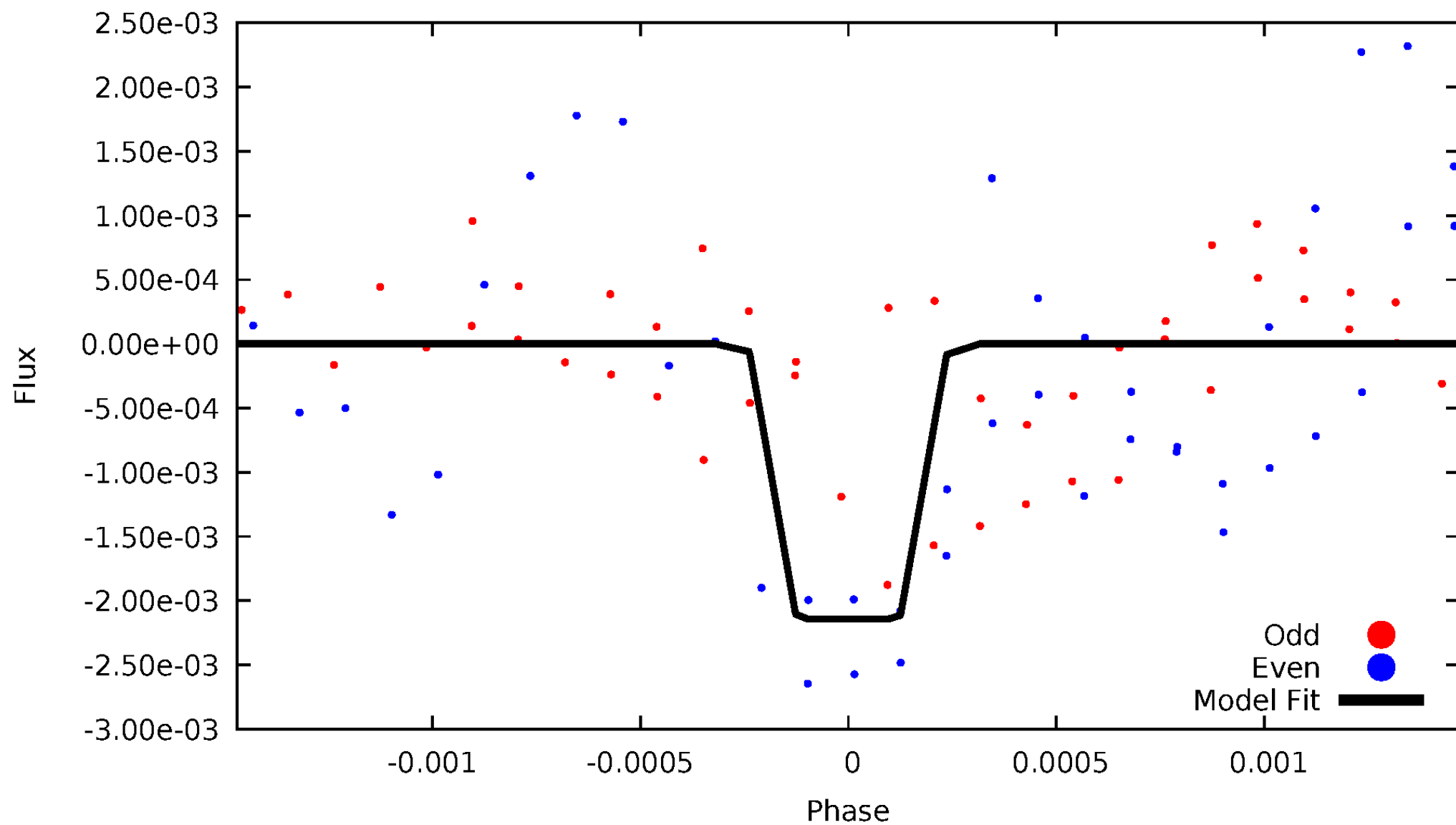
# DV Odd/Even

TCE 010166297-03



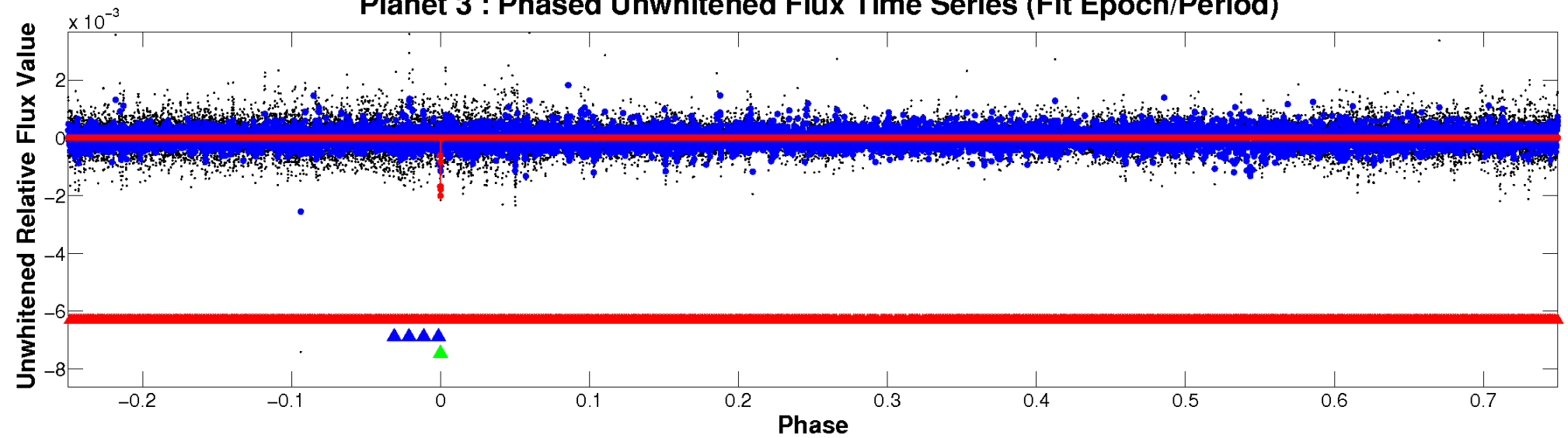
# ALT Odd/Even

TCE 010166297-03

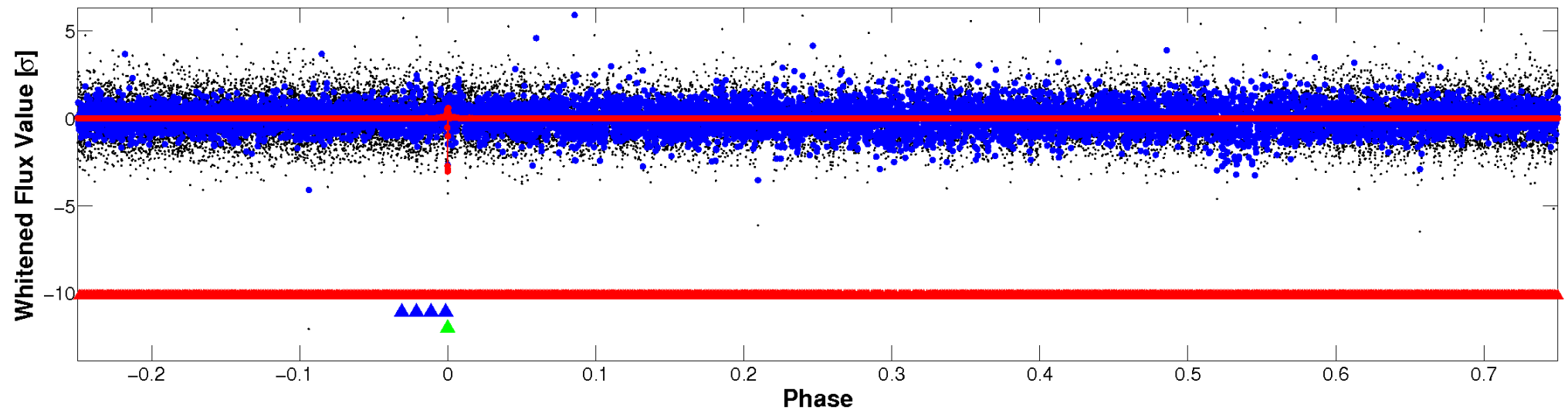


# Non-Whitened Vs. Whitened Light Curve

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

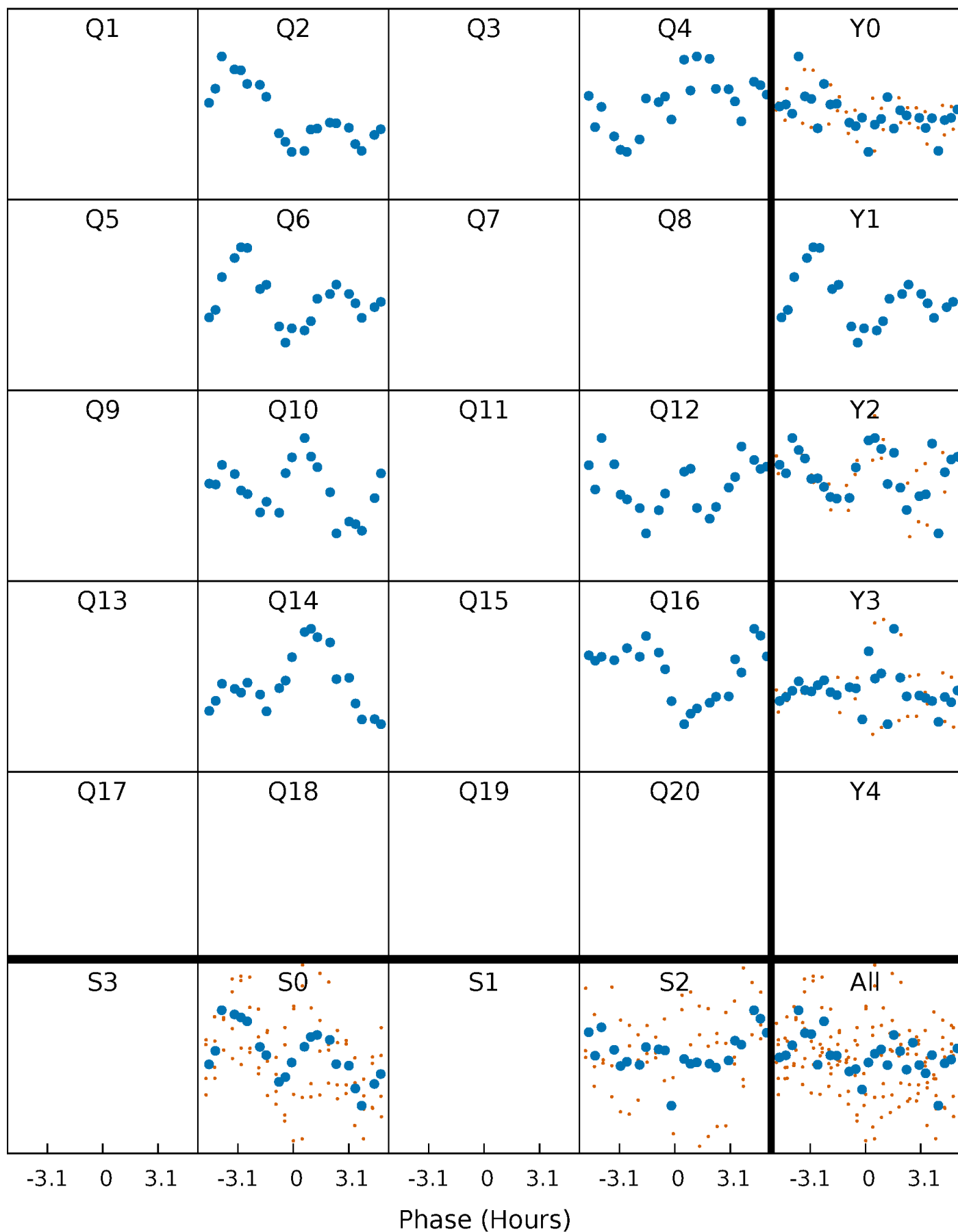


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



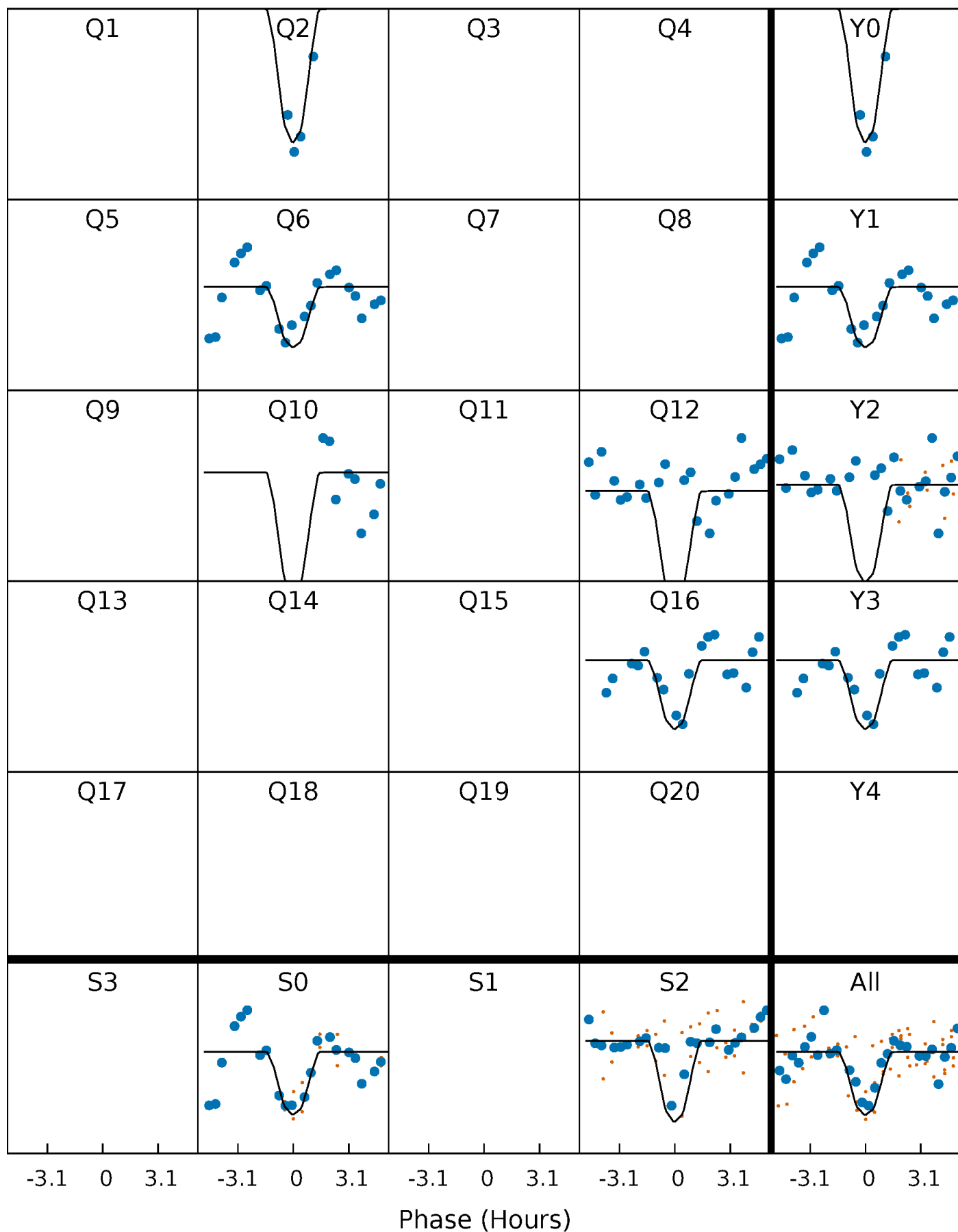
# PDC Quarter-Phased Transit Curves

TCE 010166297-03 P=183.963598 Days  $T_0=254.462604$  (BKJD)



# DV Quarter-Phased Transit Curves

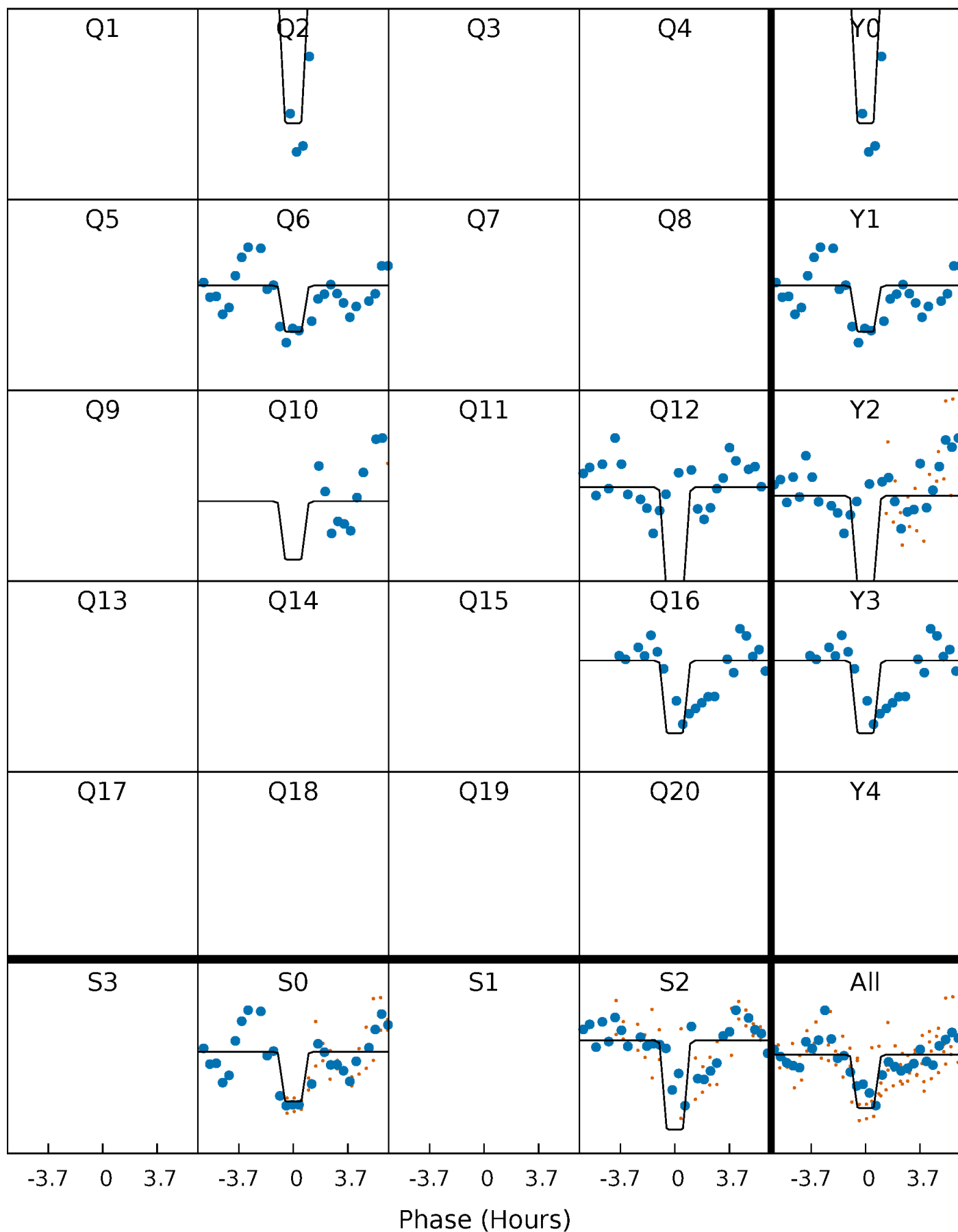
TCE 010166297-03     $P=183.963598$  Days     $T_0=254.462604$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

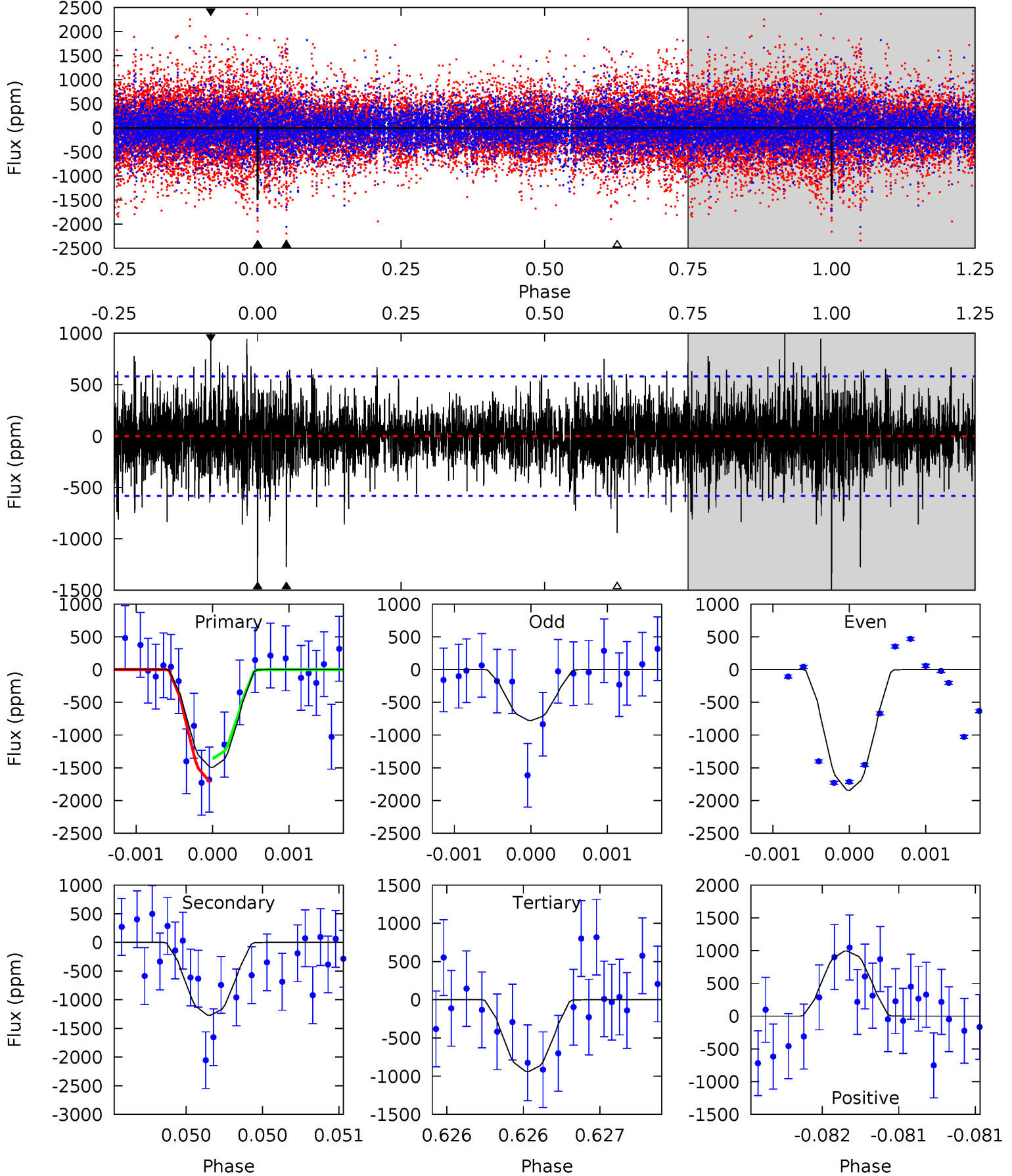
TCE 010166297-03     $P=183.963863$  Days     $T_0=254.460233$  (BKJD)



# DV Model-Shift Uniqueness Test

010166297-03,  $P = 183.963598$  Days,  $E = 70.499006$  Days

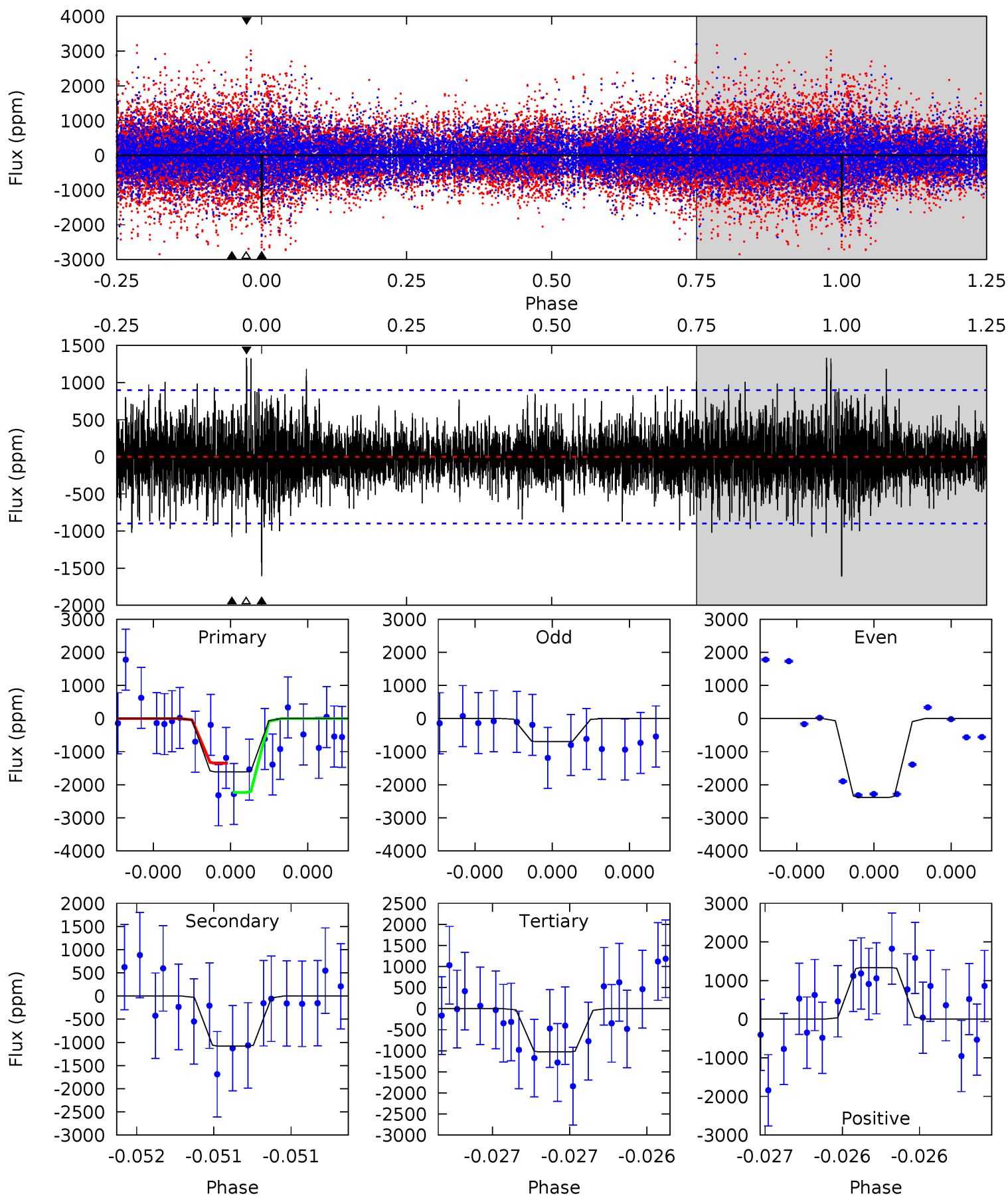
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	12.1	8.98	9.50	5.55	3.44	2.03	5.28	4.77	3.16	2.64	5.30	0.76	0.40	1.58



# Alt Model-Shift Uniqueness Test

010166297-03, P = 183.963863 Days, E = 70.496370 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	6.71	6.38	8.30	5.58	3.49	1.73	3.64	1.72	0.33	-1.59	5.17	0.82	0.45	2.69



### Stellar Parameters For KIC 010166297

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5798^{+157}_{-157}$	$4.289^{+0.204}_{-0.185}$	$-0.060^{+0.300}_{-0.300}$	$1.159^{+0.318}_{-0.260}$	$0.952^{+0.139}_{-0.092}$	$0.862^{+0.859}_{-0.436}$
	+3%/-3%	+5%/-4%	+500%/-500%	+27%/-22%	+15%/-10%	+100%/-51%
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 010166297-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1272 \pm 105$	$6.63^{+1.76}_{-1.51}$	$488^{+40}_{-35}$	$4878^{+547}_{-330}$	$6292^{+4338}_{-2455}$
Alt.	$-1079 \pm 161$	$5.95^{+1.64}_{-1.61}$	$489^{+37}_{-35}$	$4967^{+611}_{-423}$	$6478^{+6019}_{-2566}$

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

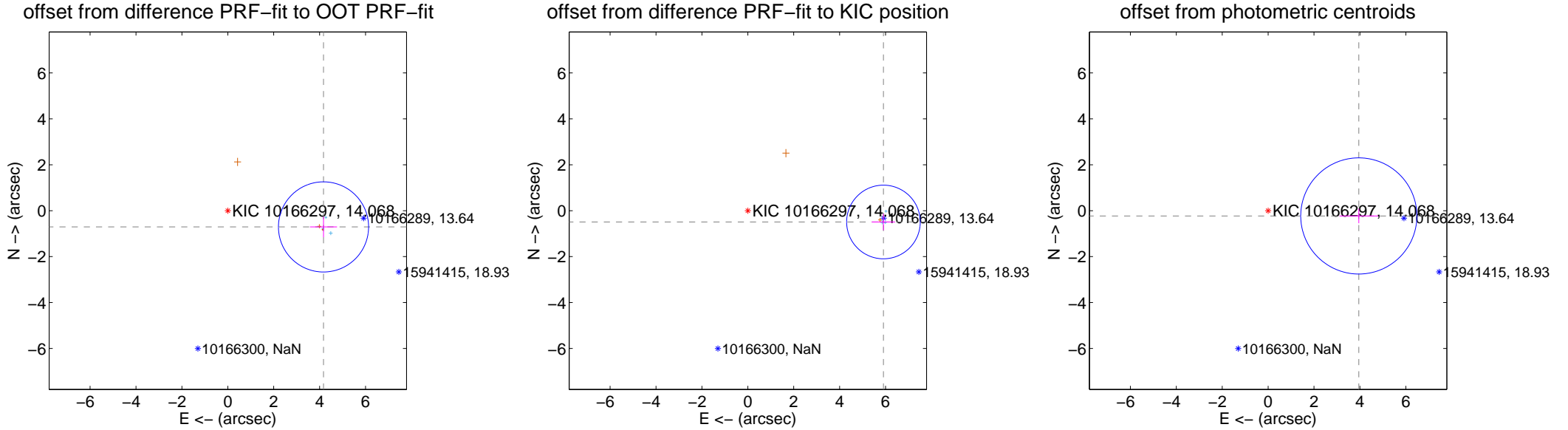
## DV Centroid Data

Supplemental centroid analysis for 010166297-03. Kepler magnitude: 14.07. Transit SNR 8.59

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.45 arcsec

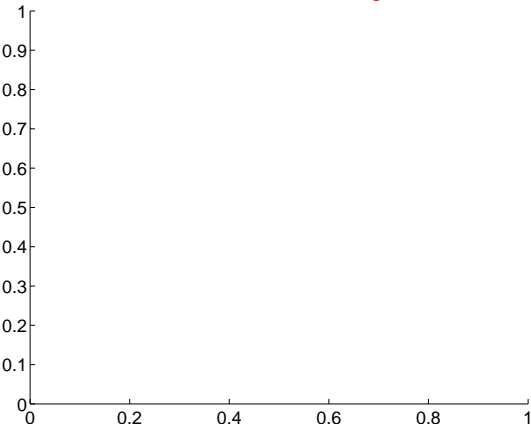
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.230 \pm 0.655$	6.46	$-4.171 \pm 0.591$	$-0.707 \pm 0.447$
PRF-fit source offset from KIC position	$5.930 \pm 0.535$	11.09	$-5.910 \pm 0.508$	$-0.492 \pm 0.361$
photometric centroid source offset	$3.96 \pm 0.84$	4.69	$-3.95 \pm 0.84$	$-0.23 \pm 0.32$



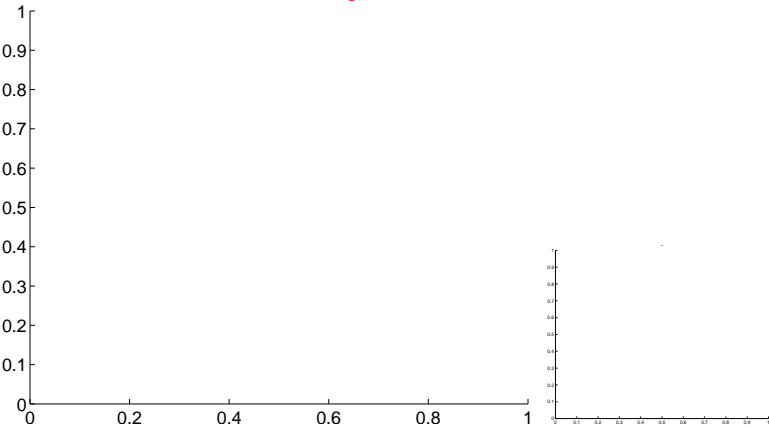
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

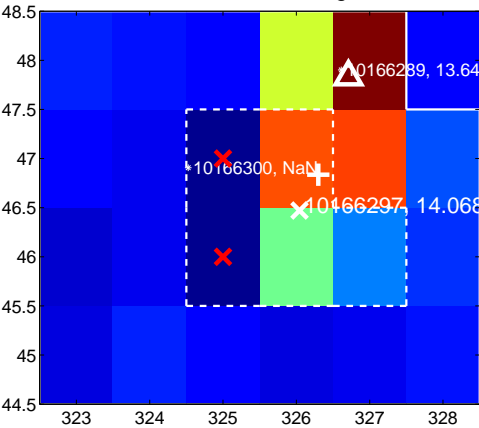
Q1 no difference image



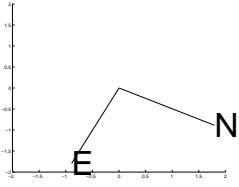
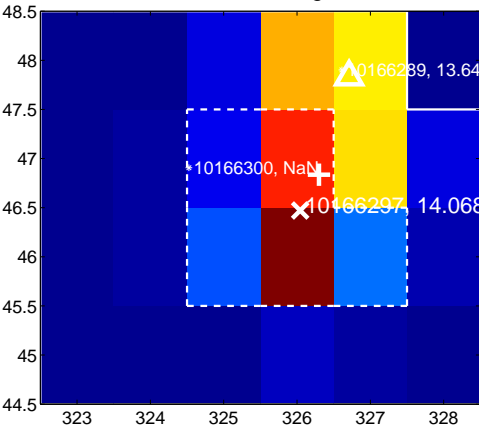
Q1 no OOT image



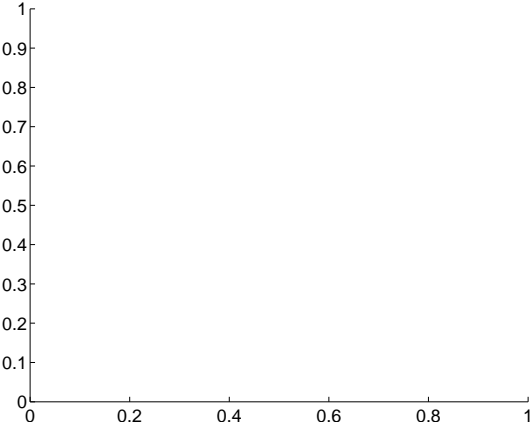
Q2 difference image



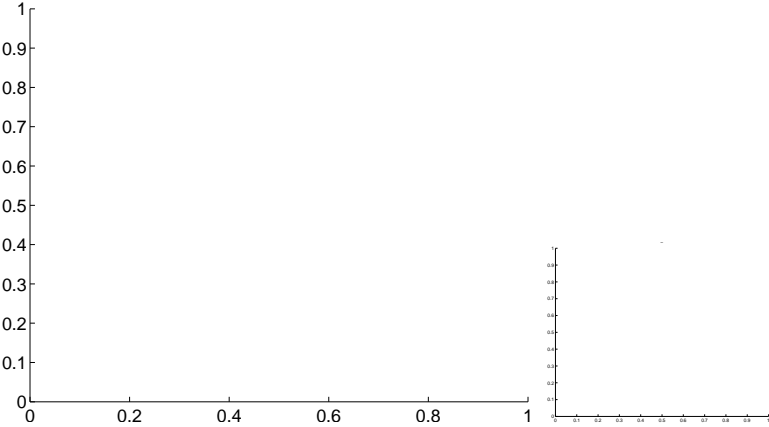
Q2 OOT image



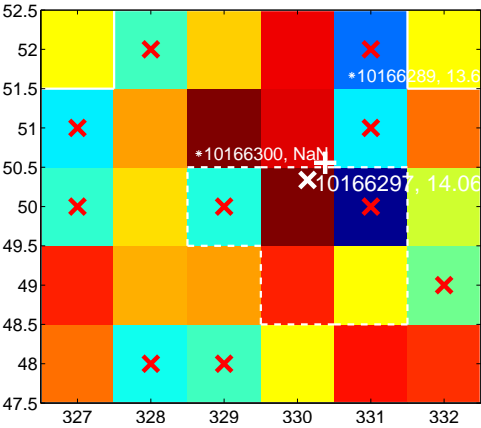
Q3 no difference image



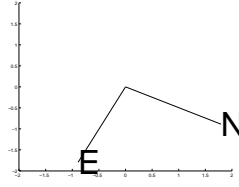
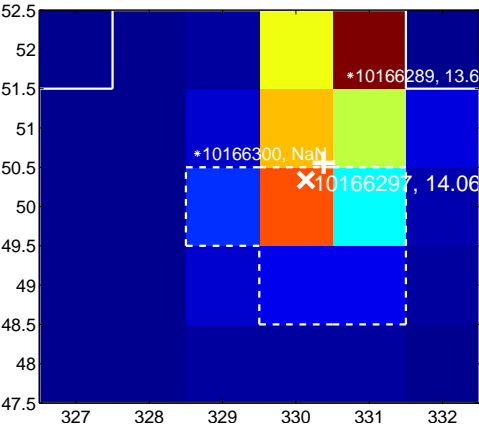
Q3 no OOT image



Q4 difference image. Poor Quality

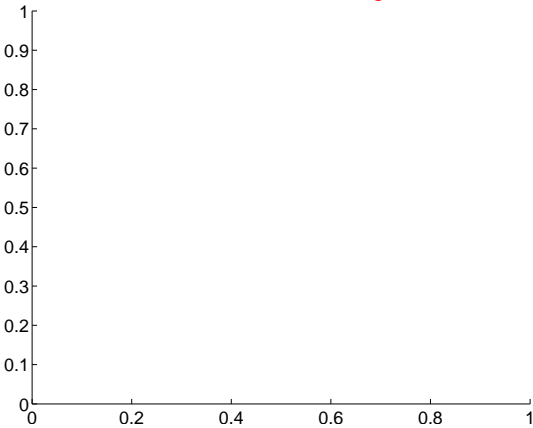


Q4 OOT image

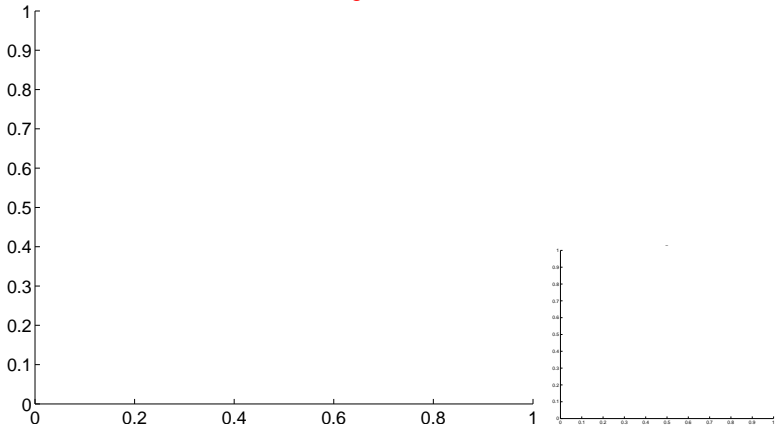


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

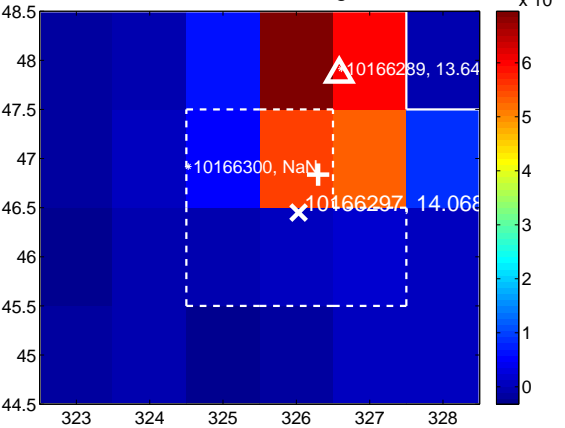
Q5 no difference image



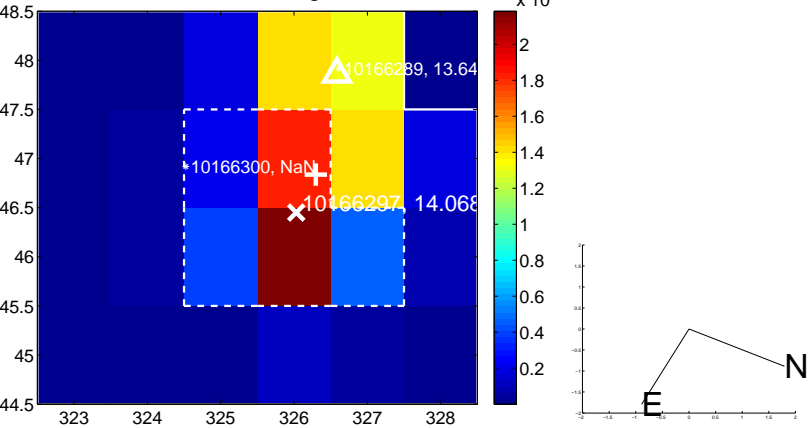
Q5 no OOT image



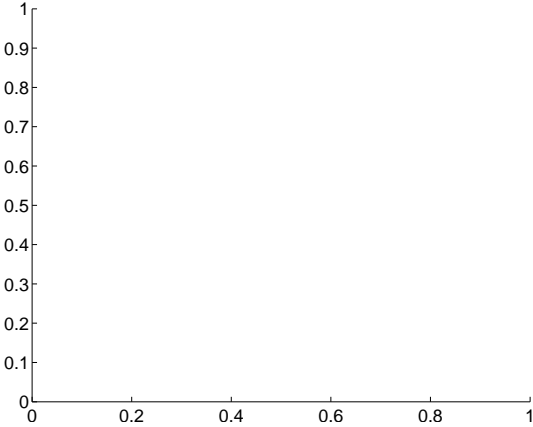
Q6 difference image



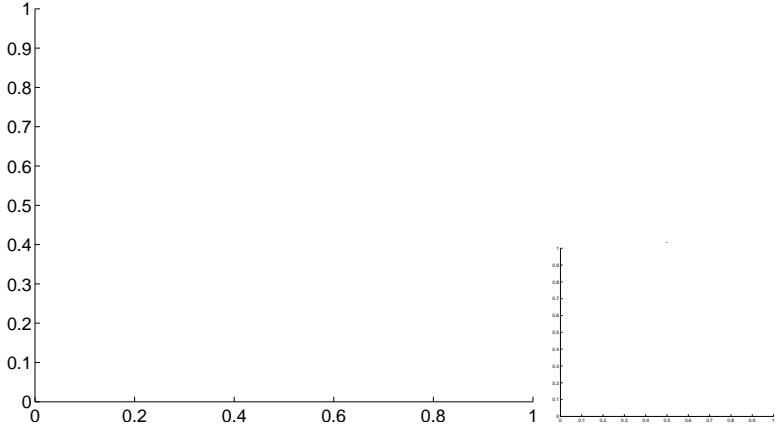
Q6 OOT image



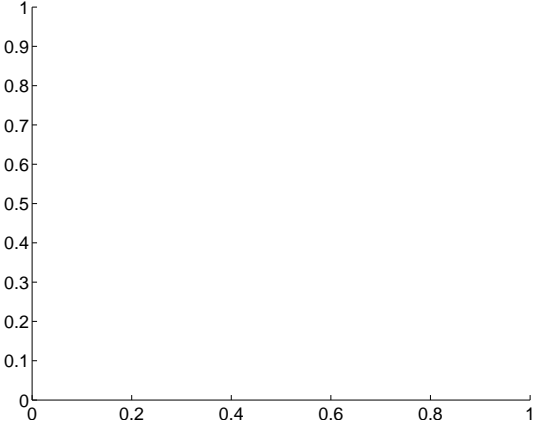
Q7 no difference image



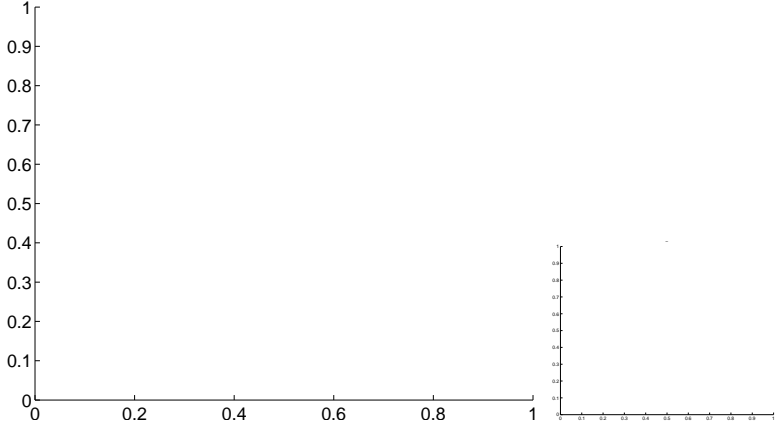
Q7 no OOT image



Q8 no difference image



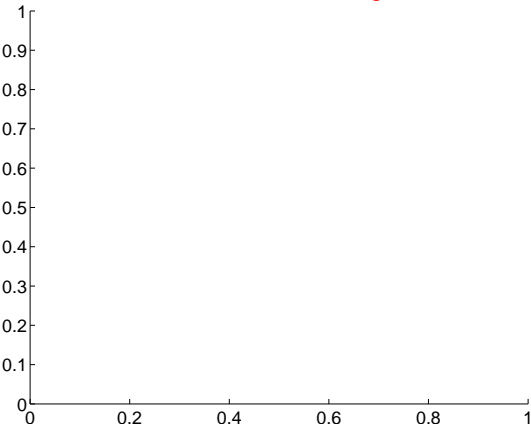
Q8 no OOT image



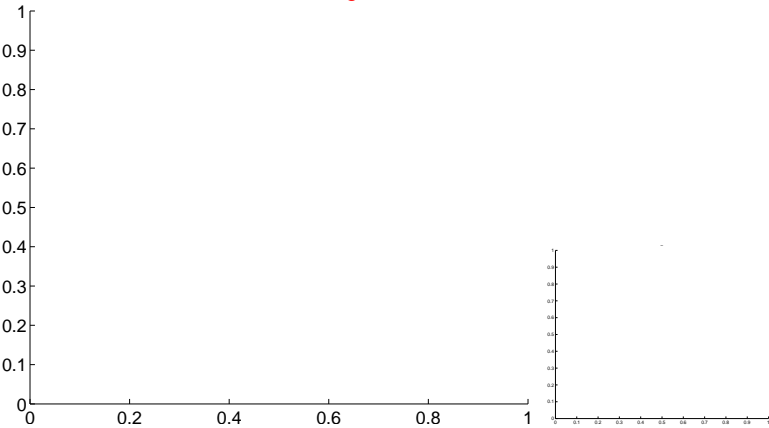


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

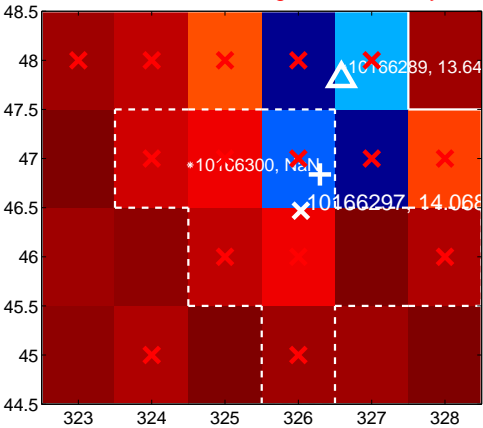
Q9 no difference image



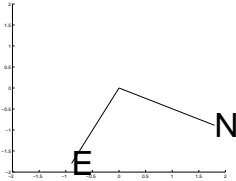
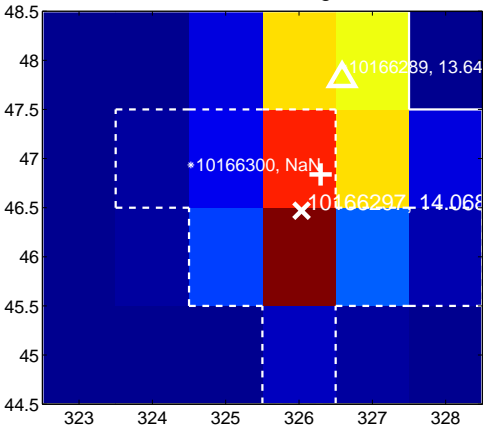
Q9 no OOT image



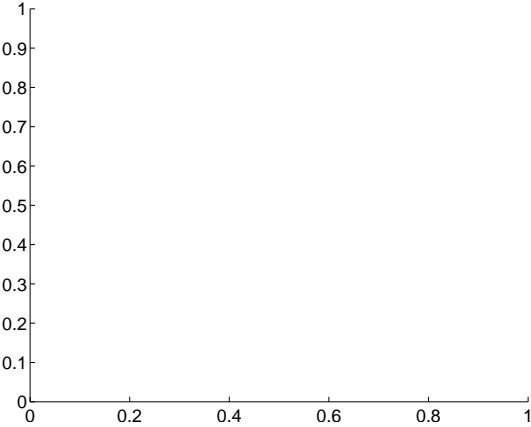
Q10 difference image. Poor Quality



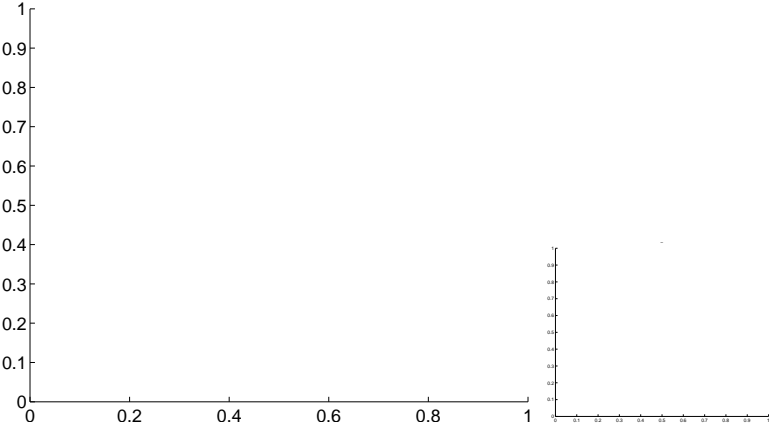
Q10 OOT image



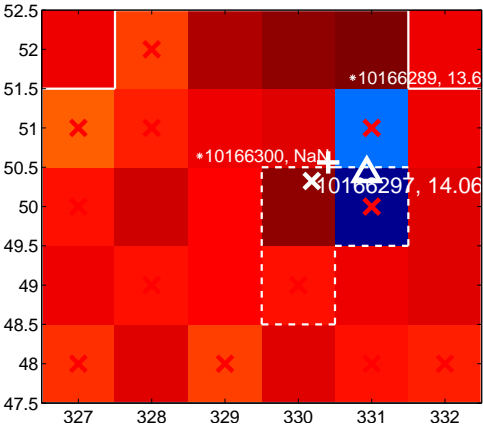
Q11 no difference image



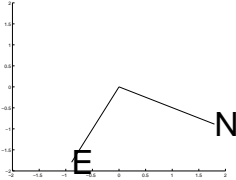
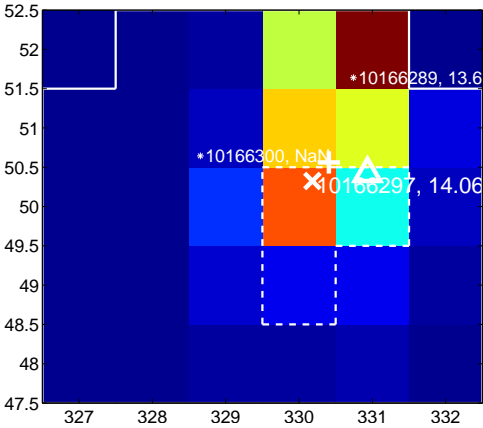
Q11 no OOT image



Q12 difference image. Poor Quality

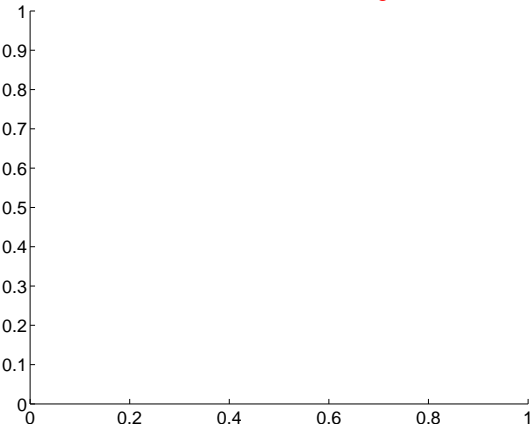


Q12 OOT image

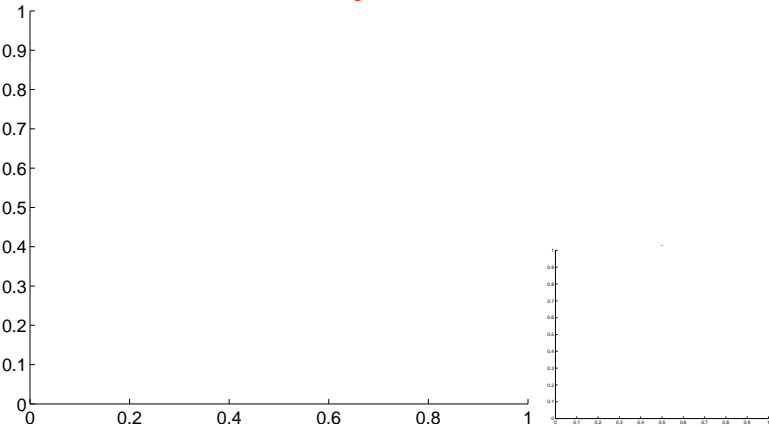


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

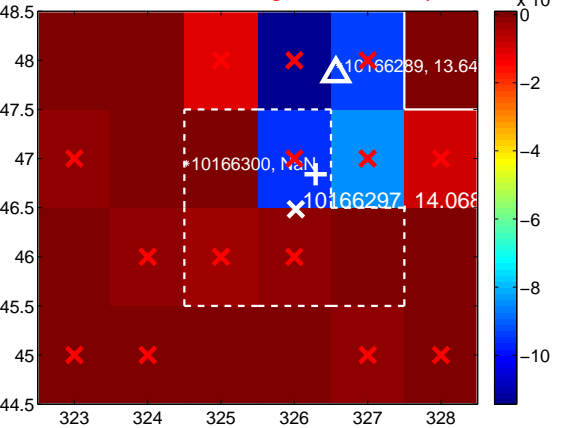
Q13 no difference image



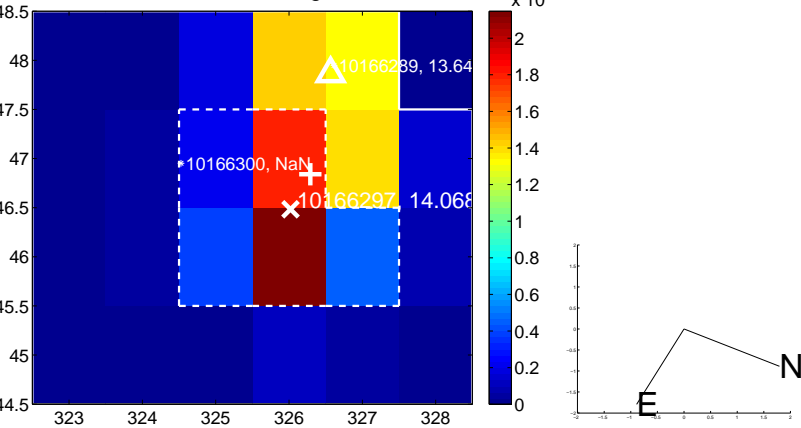
Q13 no OOT image



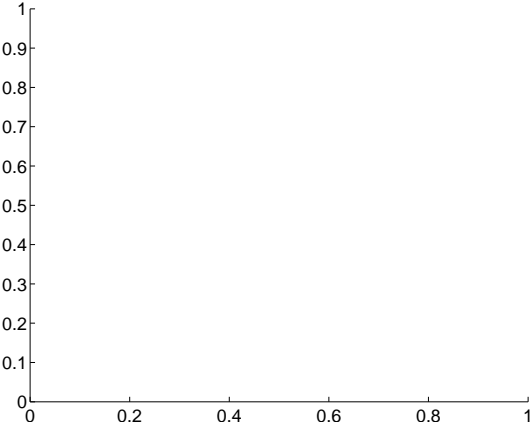
Q14 difference image. Poor Quality



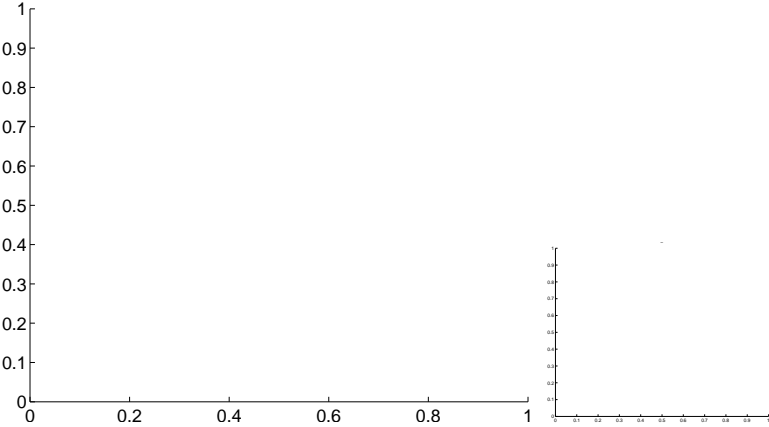
Q14 OOT image



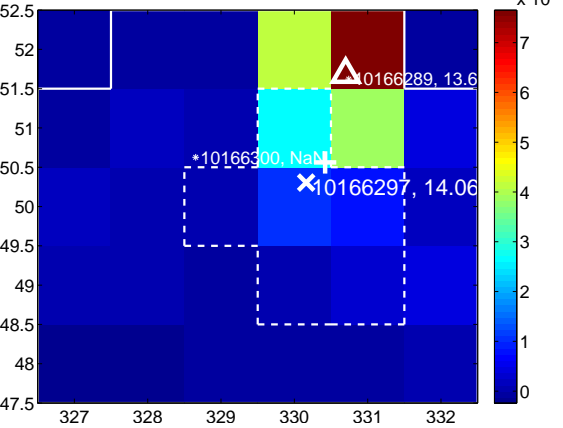
Q15 no difference image



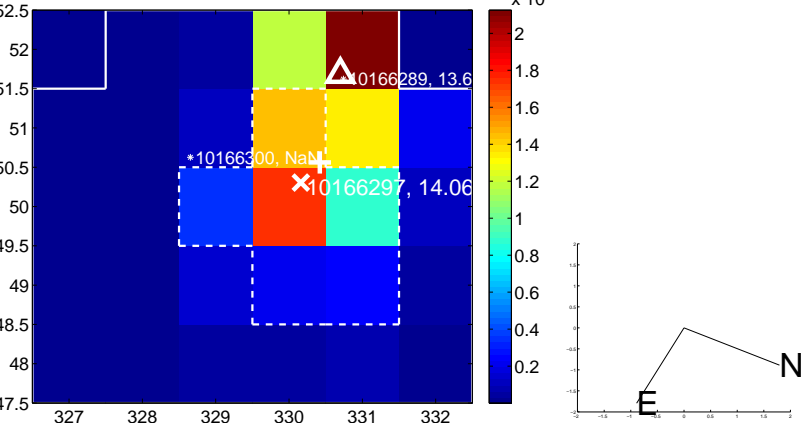
Q15 no OOT image



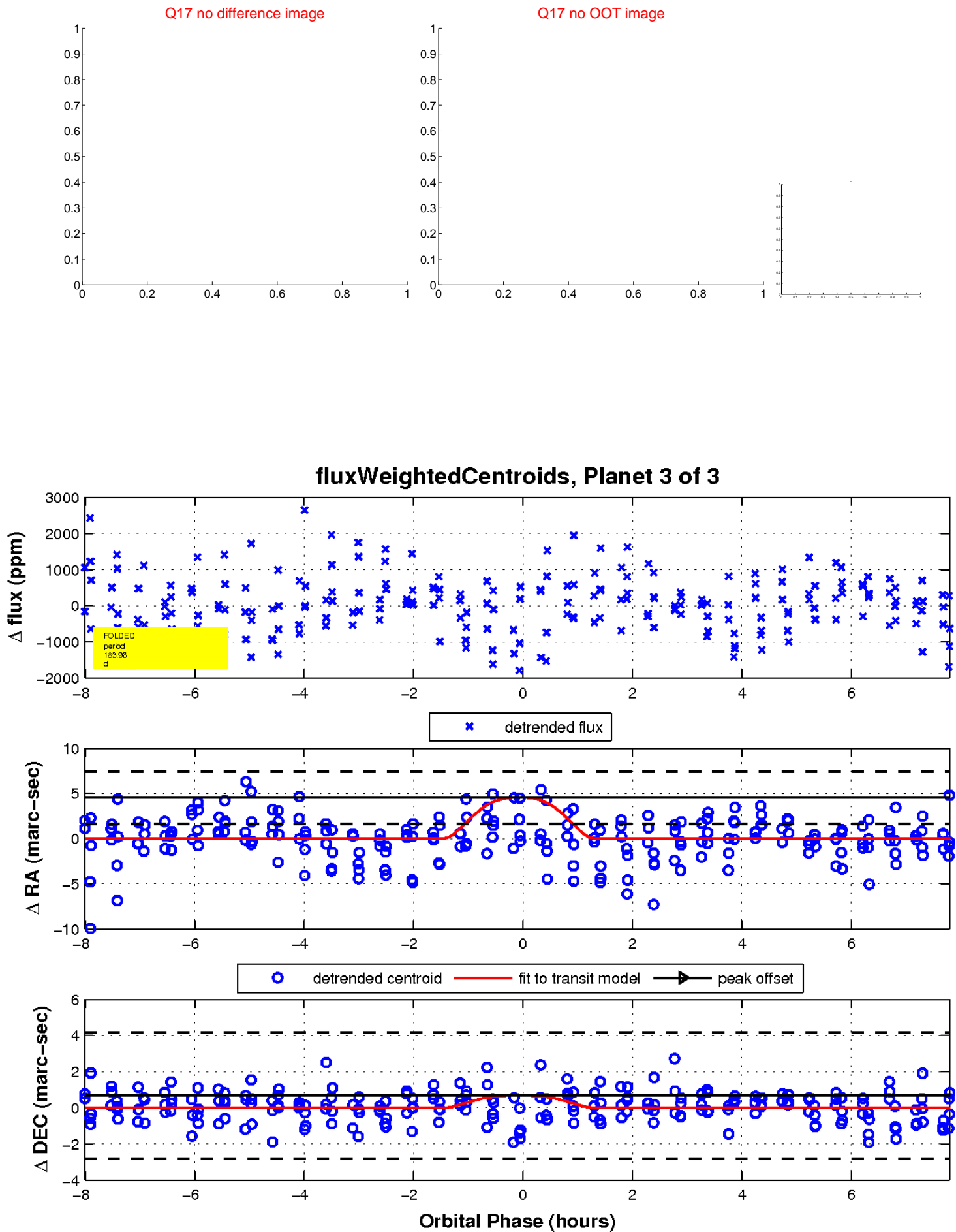
Q16 difference image



Q16 OOT image



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



UKIRT Image

