

# KIC 010425070

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010425070-01	OBS	No	385.880098	171.977936	1501.5	17.994	11.5	9.4	0.84	5648	3.77	0.63
010425070-02	OBS	No	372.443978	208.977167	1455.4	4.580	7.6	7.0	0.84	5648	3.41	0.66
010425070-03	OBS	8208.01	363.974278	198.974406	1813.6	4.035	7.4	7.3	0.84	5648	3.65	0.68
010425070-04	OBS	8208.02	395.139652	186.722706	2115.1	20.431	7.1	7.6	0.84	5648	4.58	0.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010425070-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-03	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-04	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

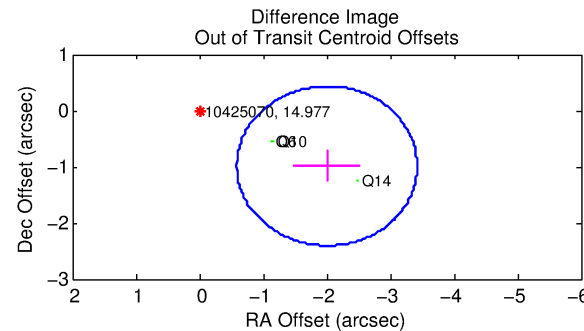
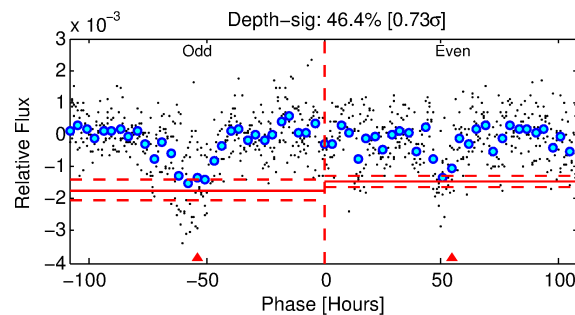
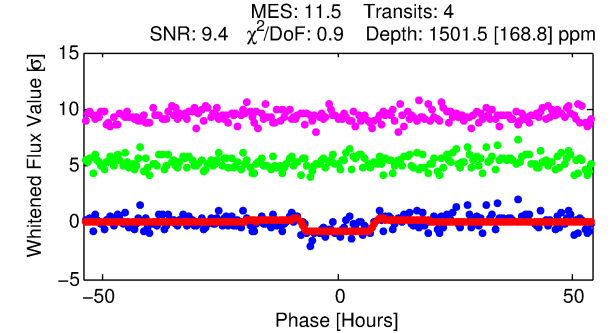
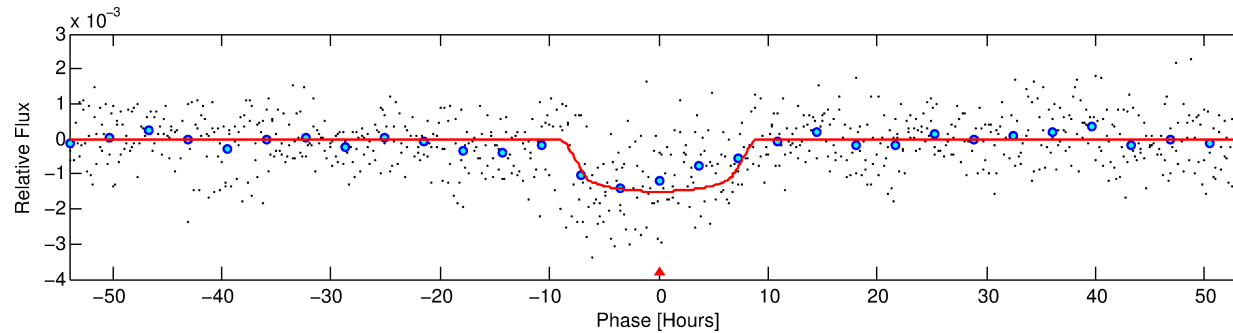
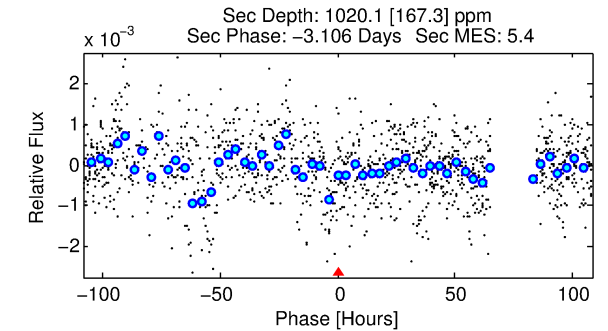
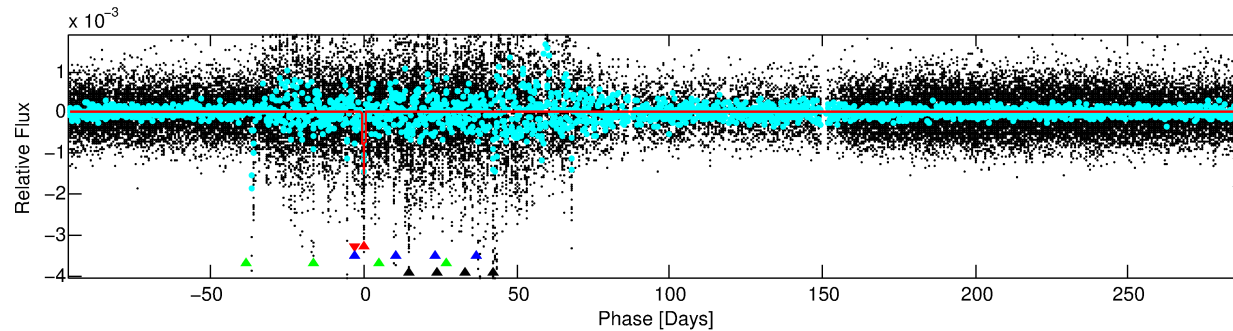
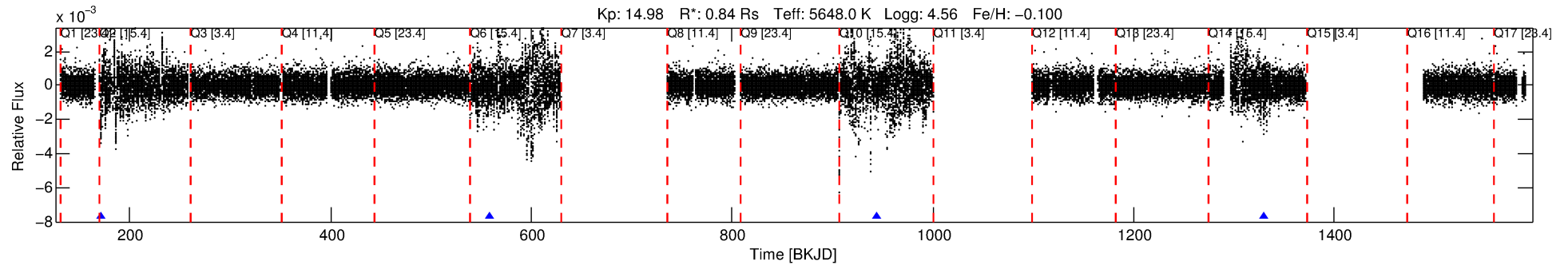
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010425070-01

No Significant Match Found

# DV One-Page Summary

KIC: 10425070 Candidate: 1 of 4 Period: 385.880 d



## DV Fit Results:

Period = 385.88010 [0.01133] d  
Epoch = 171.9779 [0.0232] BKJD  
 $R_p/R^* = 0.0411$  [0.0031]  
 $a/R^* = 94.71$  [18.48]  
 $b = 0.87$  [0.06]  
 $S_{\text{eff}} = 0.63$  [0.22]  
 $T_{\text{eq}} = 227$  [20] K  
 $R_p = 3.77$  [1.08]  $R_{\text{e}}$   
 $a = 1.0144$  [0.2358] AU  
 $A_g = 40595.46$  [16399.20] [2.48 $\sigma$ ]  
 $T_{\text{eff}} = 4979$  [314] K [15.10 $\sigma$ ]

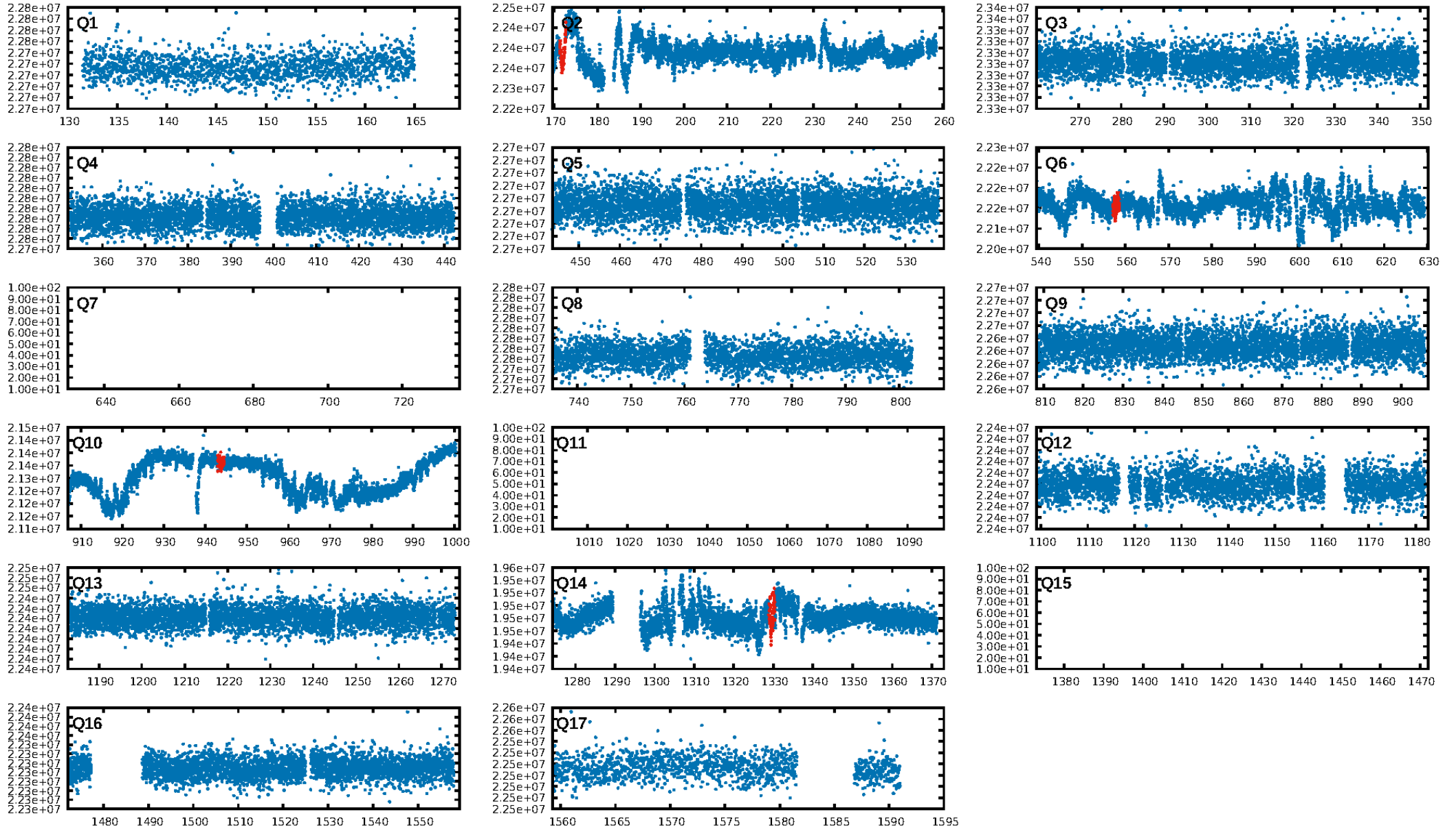
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.37 $\sigma$ ]  
LongPeriod-sig: 100.0% [8.16 $\sigma$ ]  
ModelChiSquare2-sig: 43.2%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 2.16e-13  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.119  
Centroid-sig: N/A  
Centroid-so: 26.407 arcsec [2.87 $\sigma$ ]  
OotOffset-rm: 2.234 arcsec [4.72 $\sigma$ ]  
KicOffset-rm: 6.480 arcsec [55.30 $\sigma$ ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 1.00 [4/4]

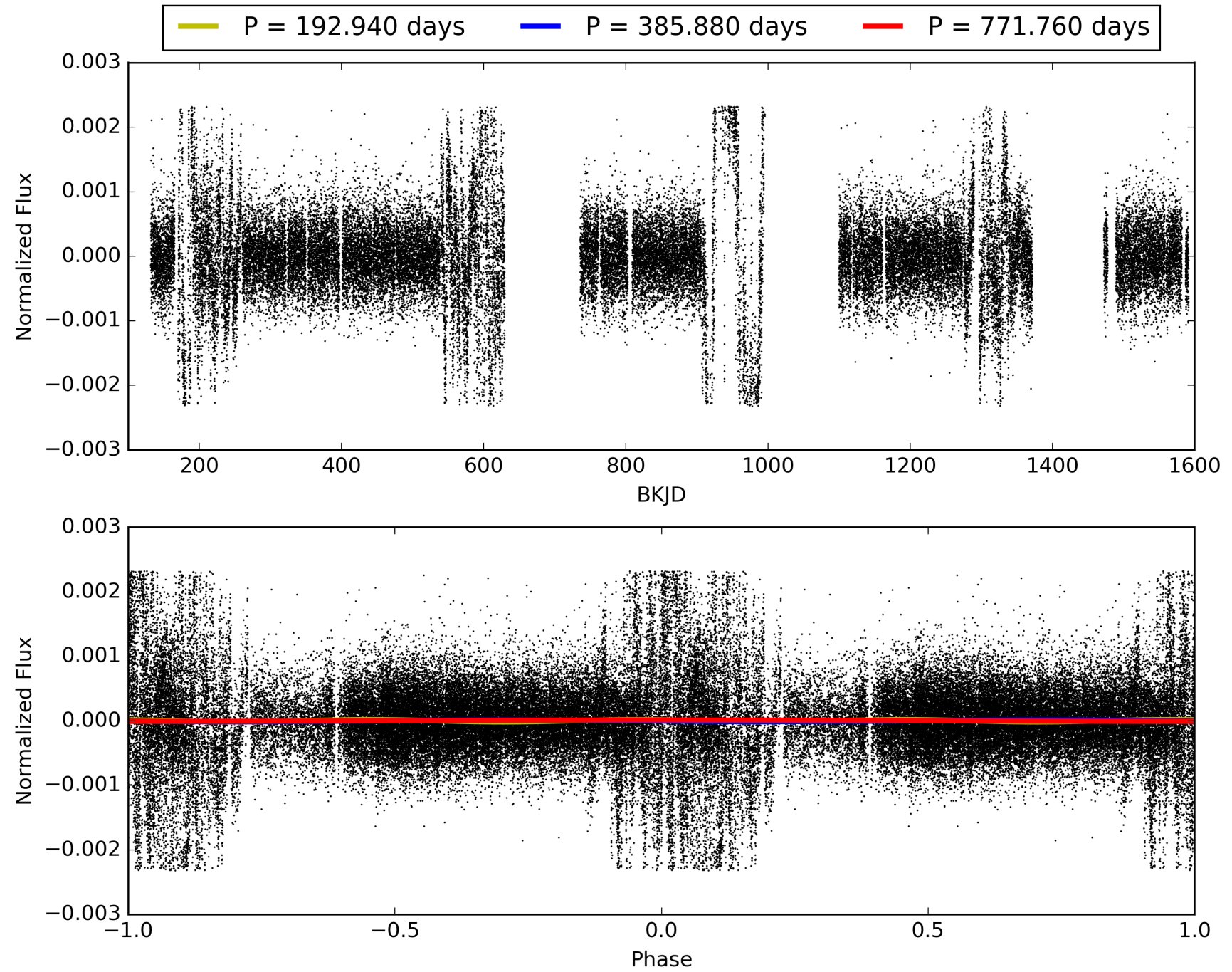
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:19:25 Z

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

# TCE 010425070-01, PDC Light Curves



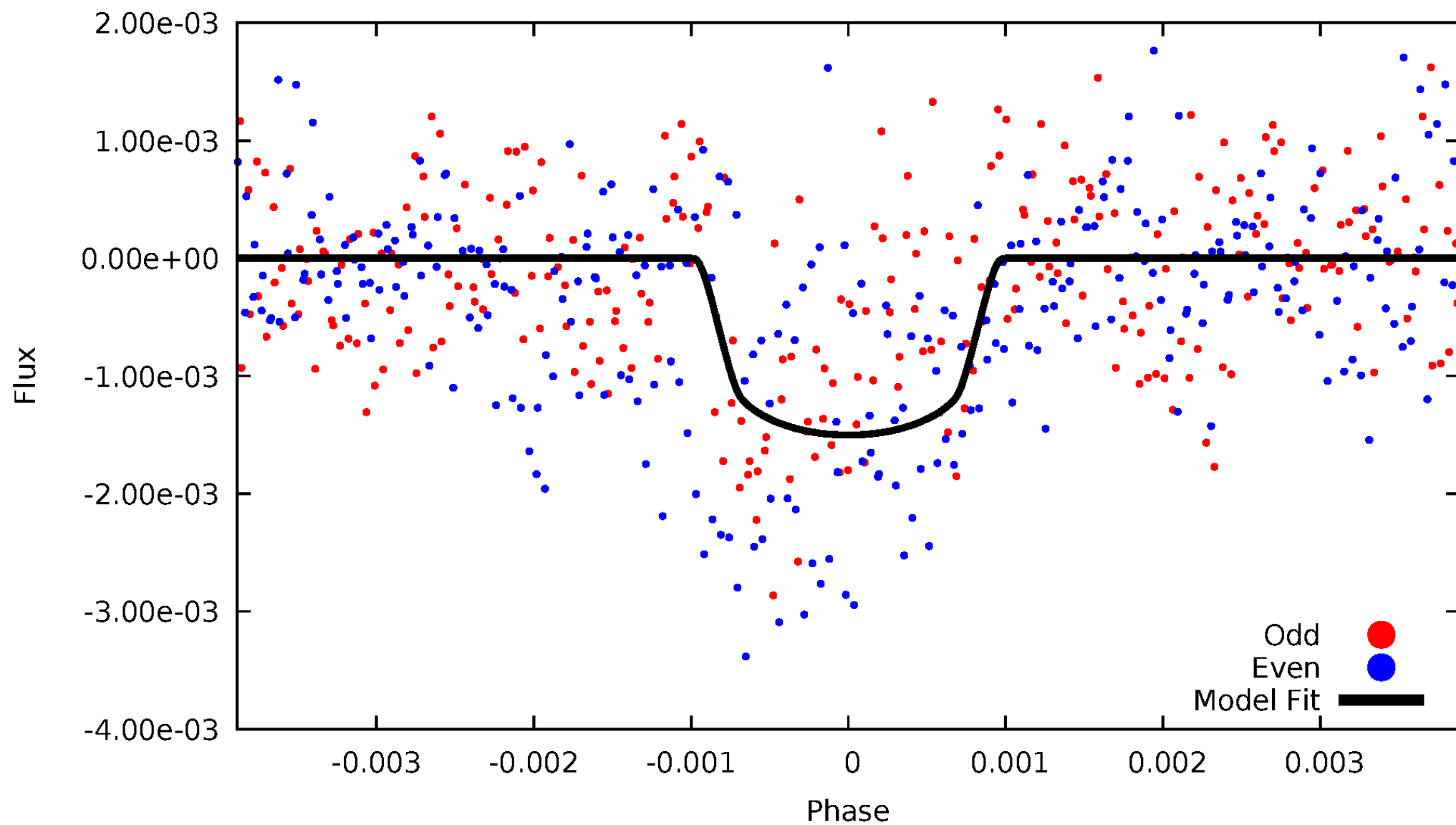
# TCE 010425070-01





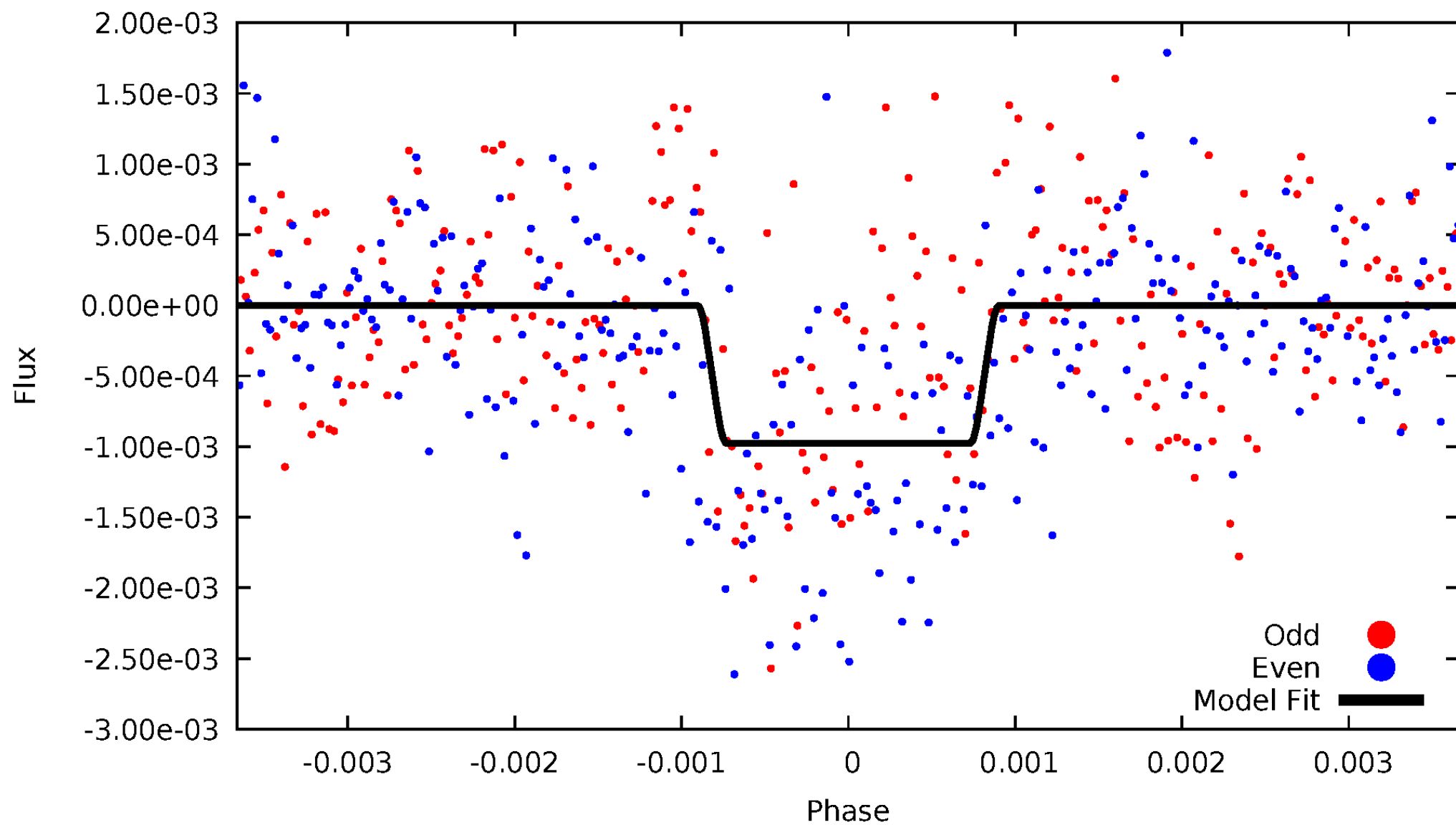
# DV Odd/Even

TCE 010425070-01



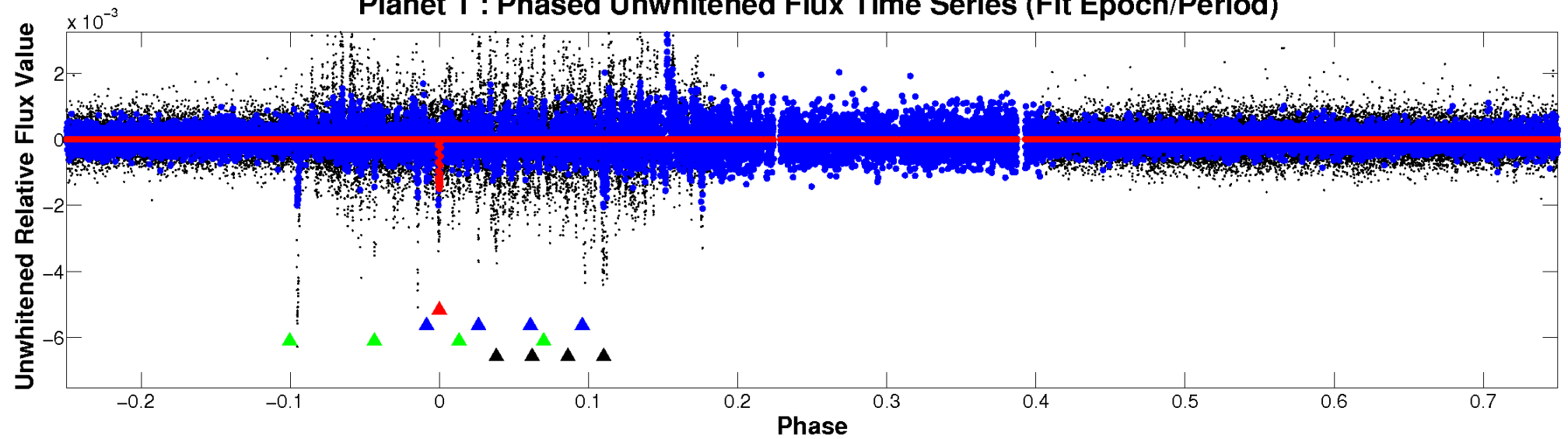
# ALT Odd/Even

TCE 010425070-01

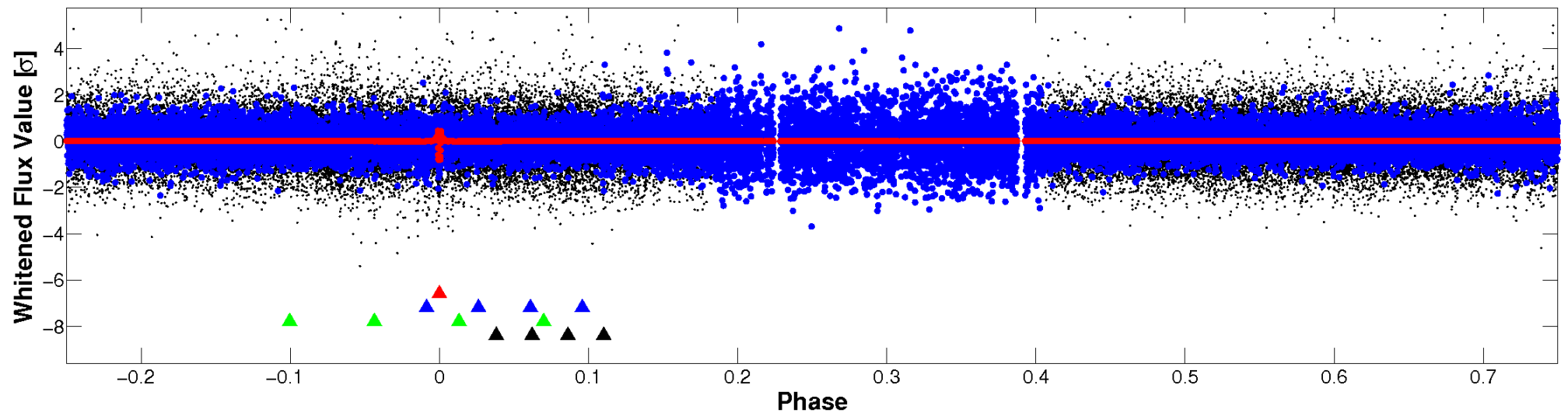


# Non-Whitened Vs. Whitened Light Curve

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



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



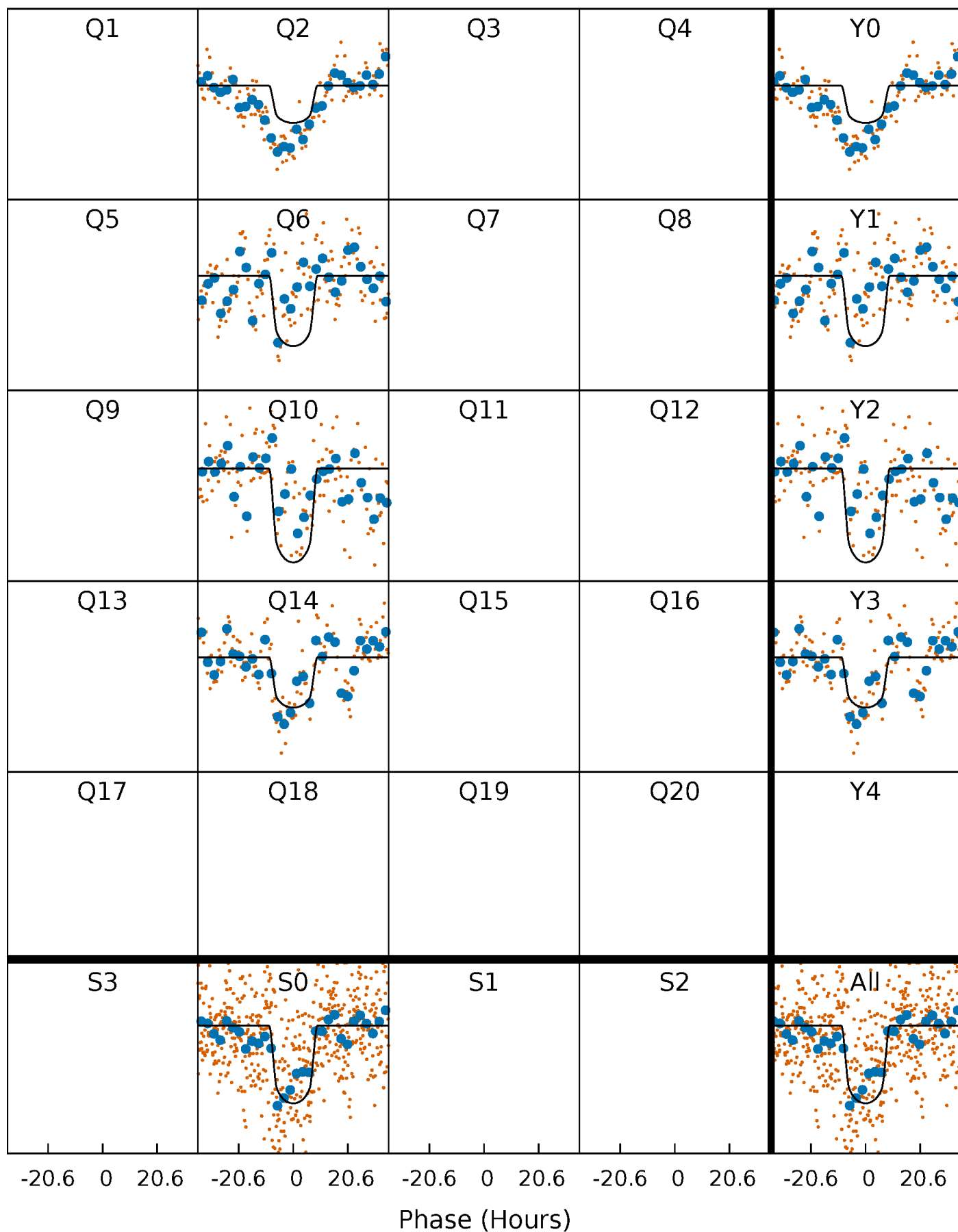
# PDC Quarter-Phased Transit Curves

TCE 010425070-01 P=385.880098 Days  $T_0=171.977936$  (BKJD)



# DV Quarter-Phased Transit Curves

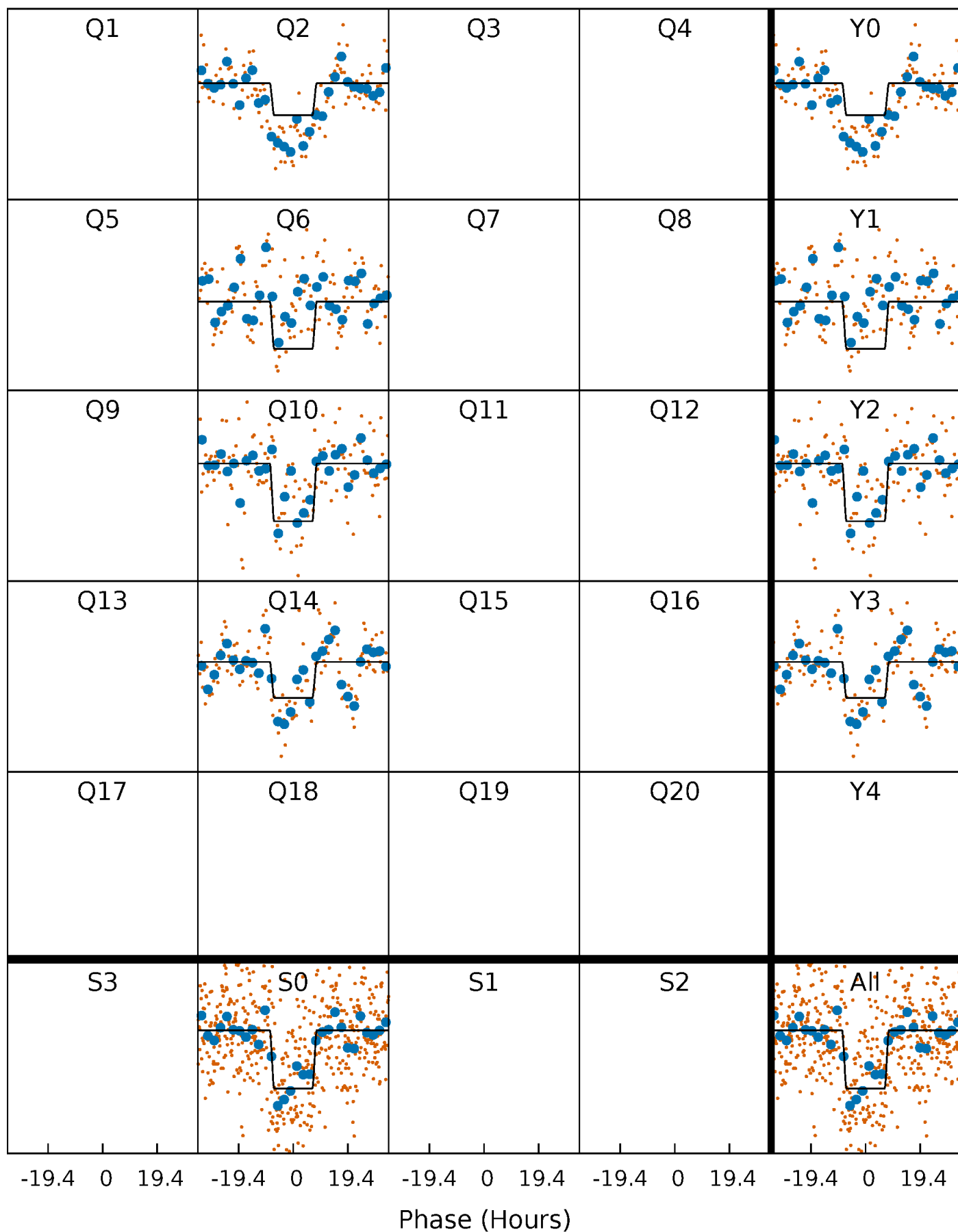
TCE 010425070-01 P=385.880098 Days  $T_0=171.977936$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

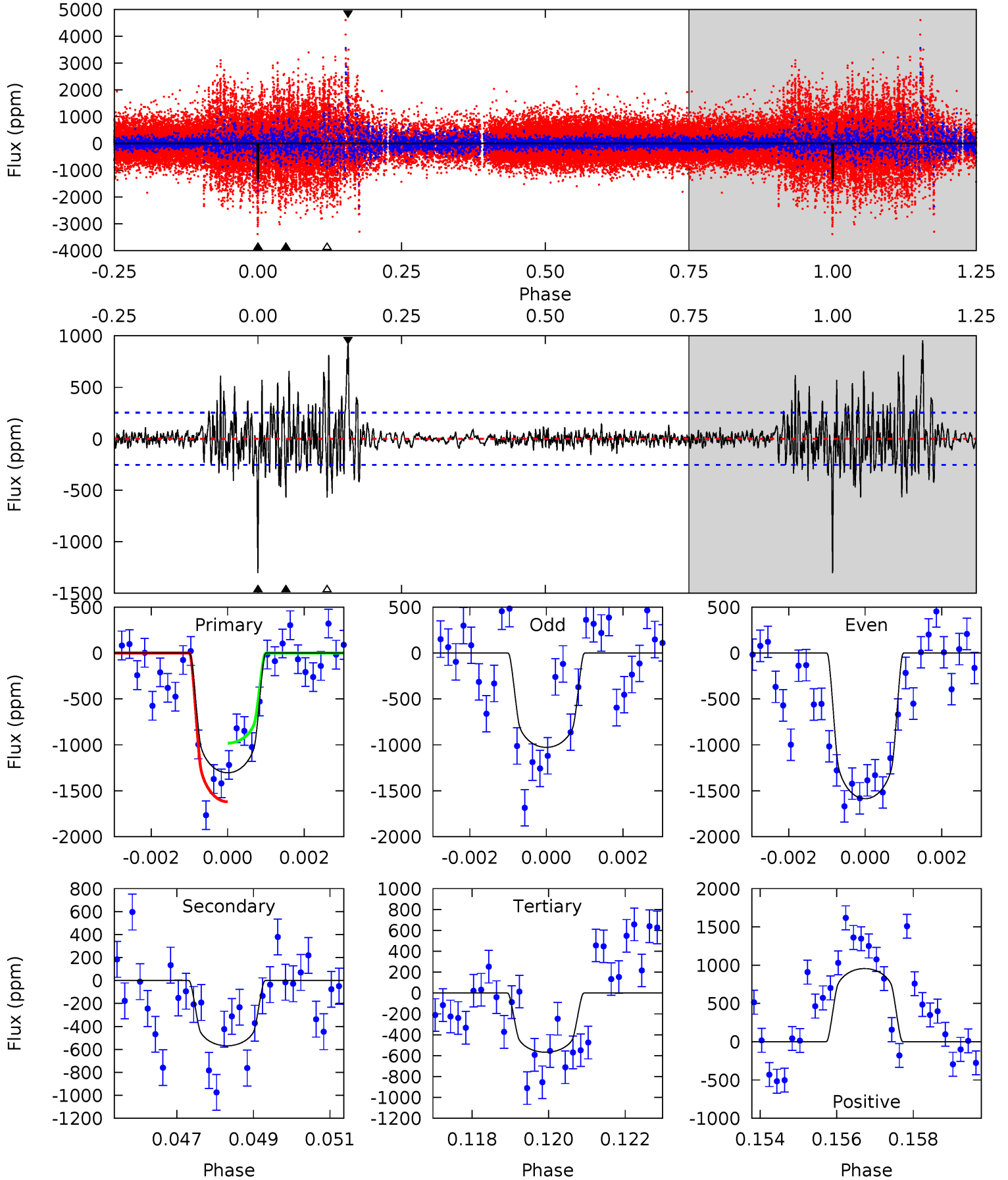
TCE 010425070-01 P=385.874158 Days  $T_0=171.990353$  (BKJD)



# DV Model-Shift Uniqueness Test

010425070-01, P = 385.880098 Days, E = 171.977936 Days

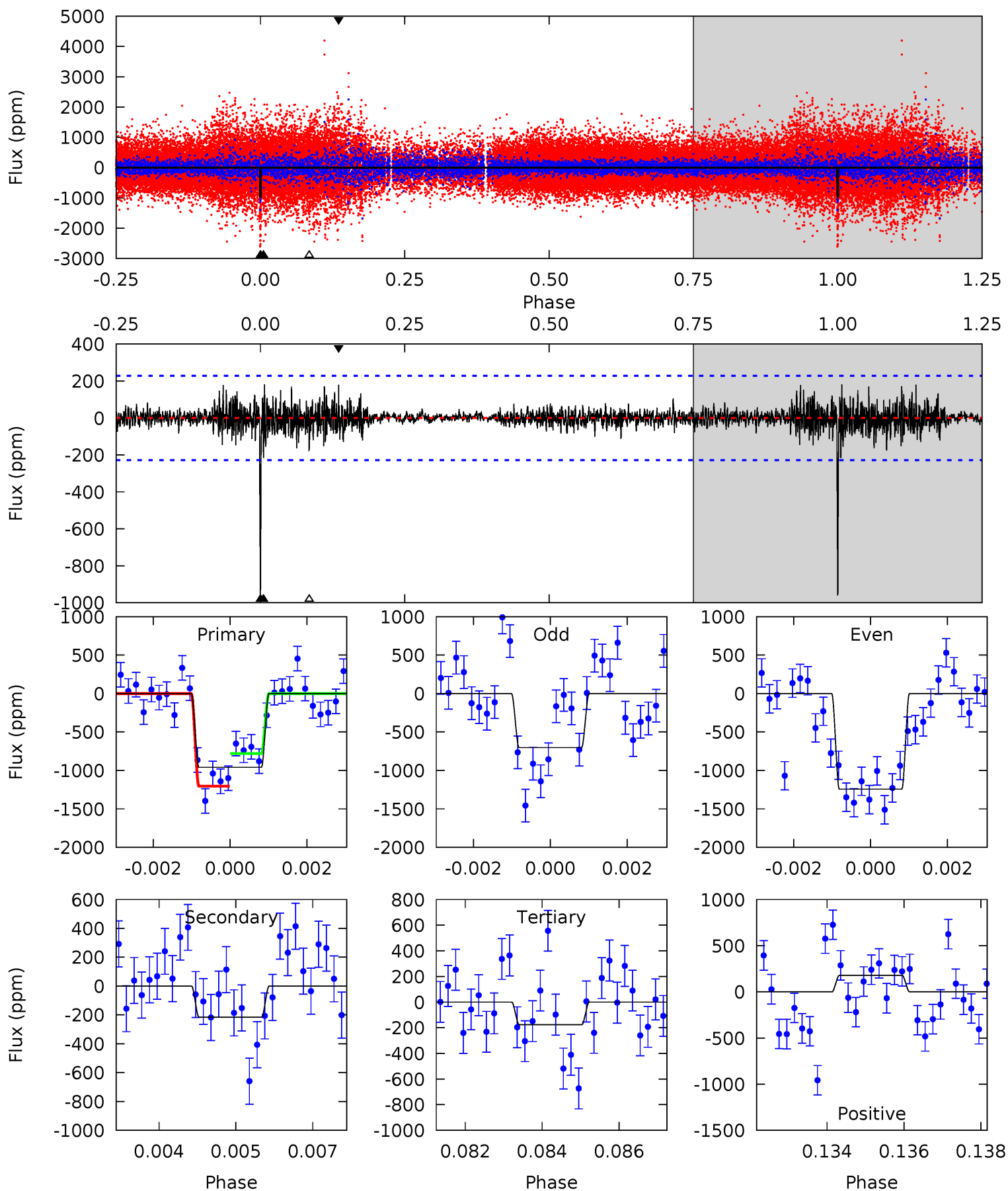
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.4	12.0	11.9	20.1	5.33	3.09	2.91	15.5	7.34	0.03	-8.14	5.50	1.21	0.42	6.42



# Alt Model-Shift Uniqueness Test

010425070-01, P = 385.874158 Days, E = 171.990353 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
22.5	5.06	4.13	4.20	5.35	3.12	0.88	18.3	18.2	0.93	0.86	6.19	1.07	0.16	4.81



### Stellar Parameters For KIC 010425070

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5648^{+169}_{-152}$	$4.559^{+0.034}_{-0.184}$	$-0.100^{+0.300}_{-0.300}$	$0.841^{+0.233}_{-0.078}$	$0.939^{+0.094}_{-0.104}$	$2.221^{+0.409}_{-1.089}$
	+3%/-3%	+1%/-4%	+300%/-300%	+28%/-9%	+10%/-11%	+18%/-49%
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 010425070-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-569 \pm 48$	$3.93^{+0.62}_{-0.39}$	$325^{+21}_{-14}$	$4477^{+192}_{-176}$	$20391^{+4753}_{-5014}$
Alt.	$-216 \pm 43$	$3.00^{+0.50}_{-0.37}$	$325^{+21}_{-14}$	$4135^{+223}_{-221}$	$13078^{+4546}_{-3815}$

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

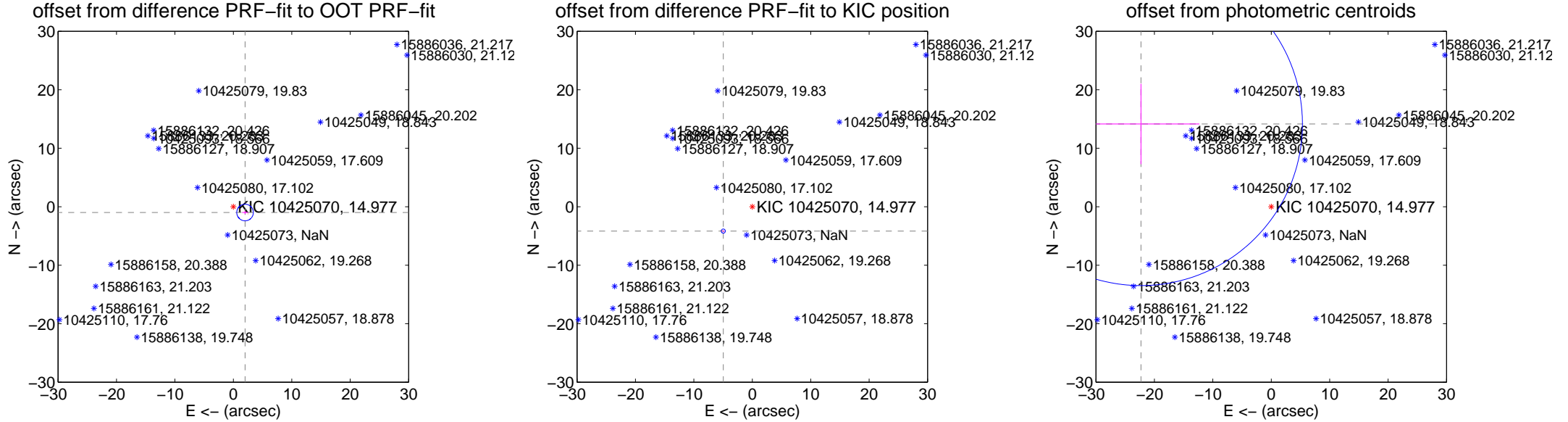
## DV Centroid Data

Supplemental centroid analysis for 010425070-01. Kepler magnitude: 14.98. Transit SNR 9.38

There are 0 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.94 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

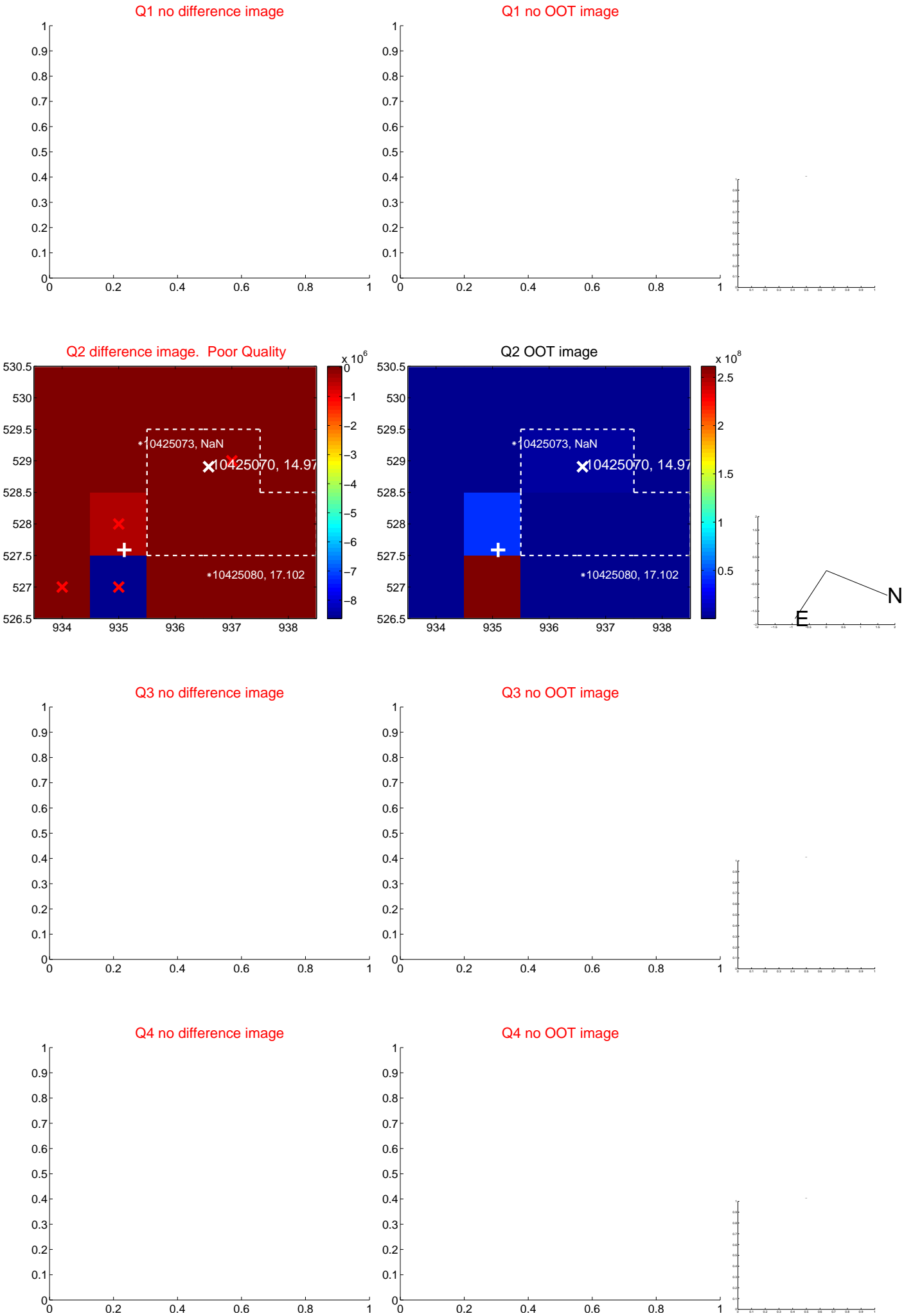
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.234 \pm 0.473$	4.72	$-2.004 \pm 0.510$	$-0.988 \pm 0.268$
PRF-fit source offset from KIC position	$6.480 \pm 0.117$	55.30	$4.964 \pm 0.132$	$-4.165 \pm 0.092$
photometric centroid source offset	$26.41 \pm 9.21$	2.87	$22.30 \pm 10.00$	$14.15 \pm 6.88$



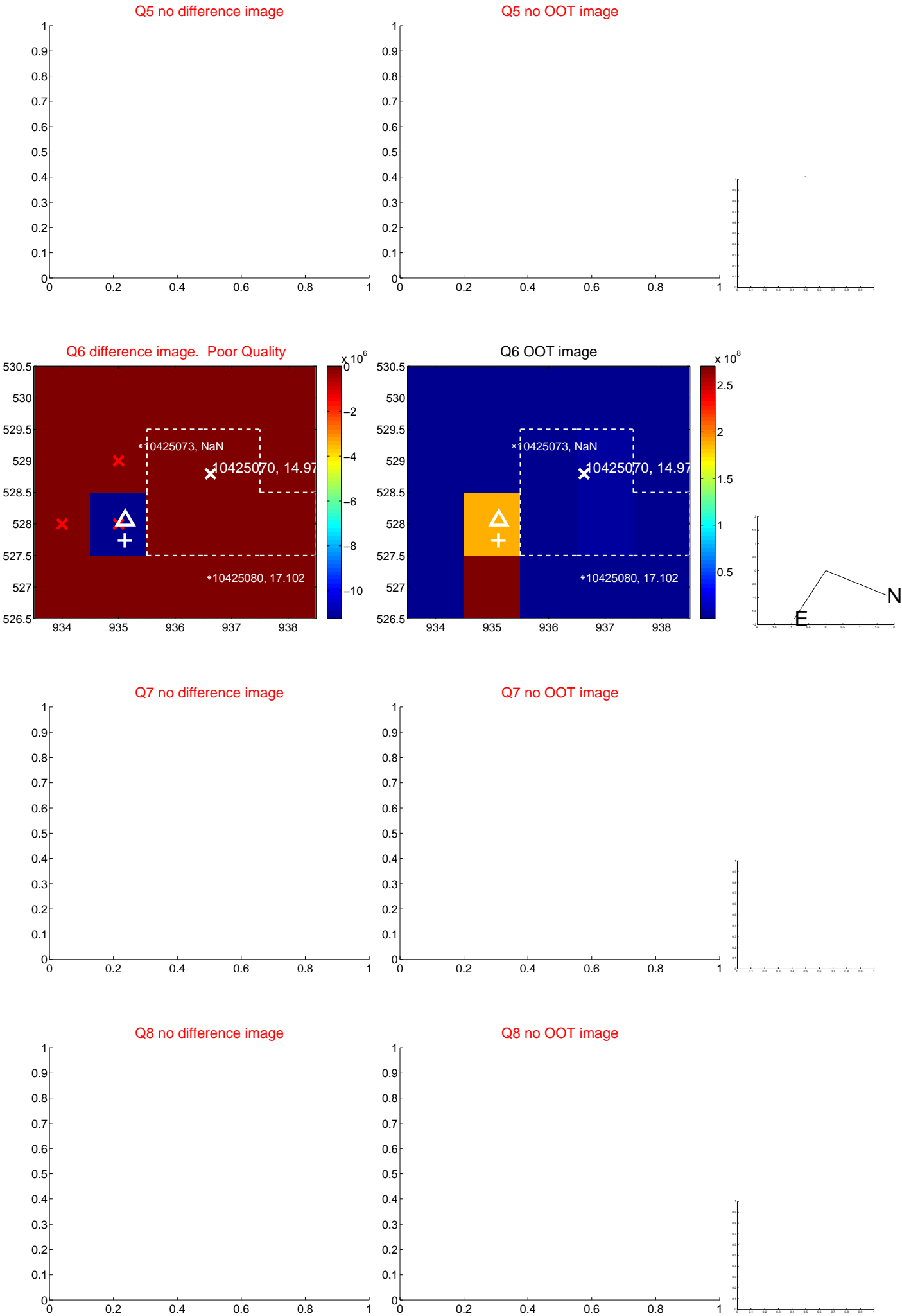
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

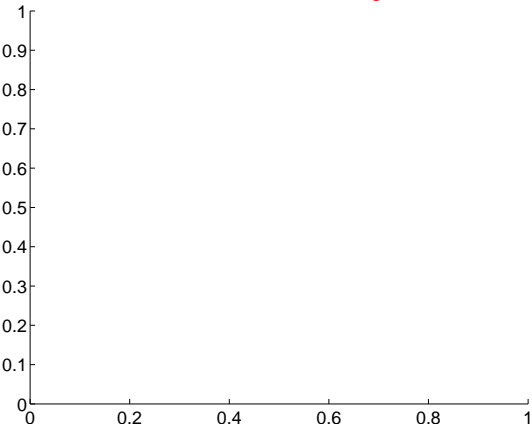


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

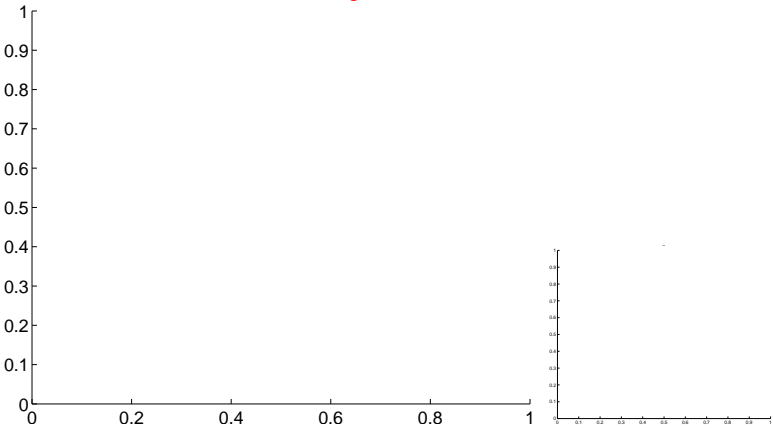


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

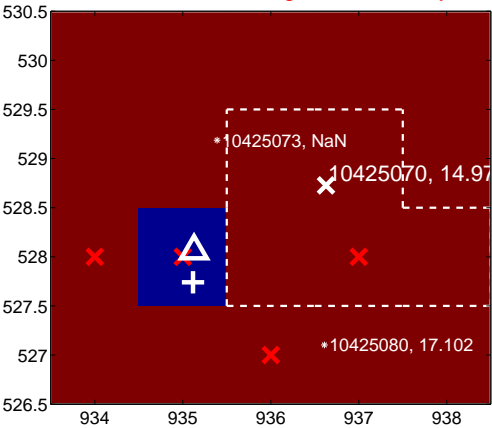
Q9 no difference image



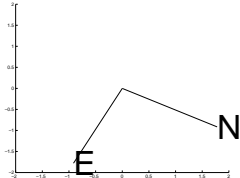
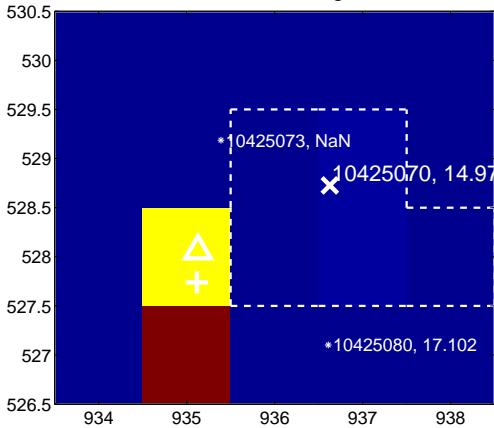
Q9 no OOT image



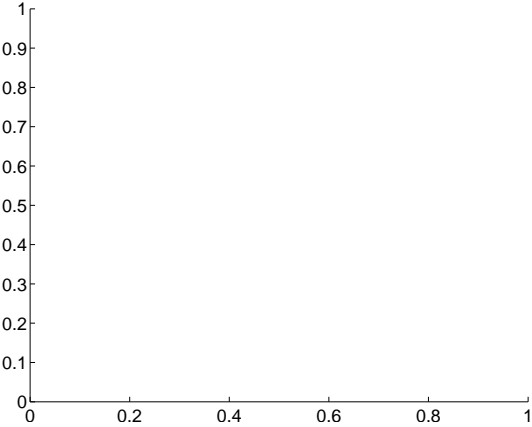
Q10 difference image. Poor Quality



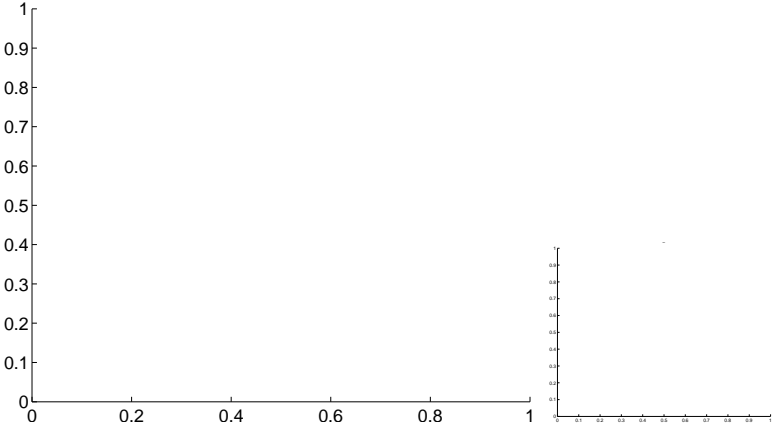
Q10 OOT image



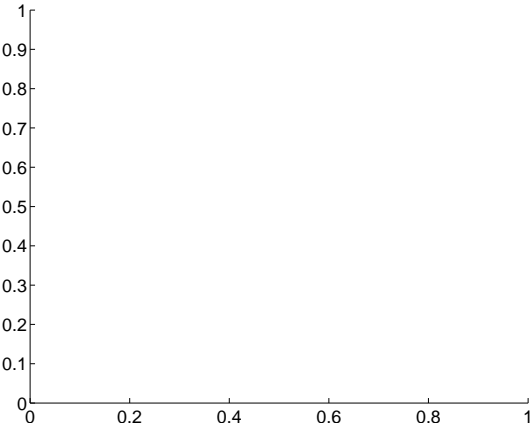
Q11 no difference image



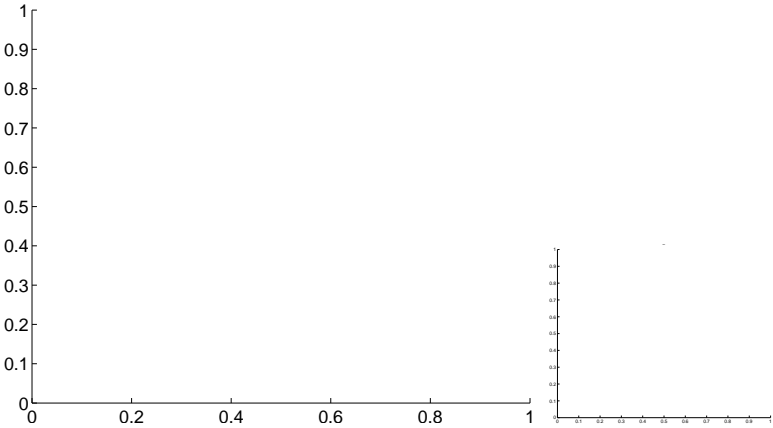
Q11 no OOT image



Q12 no difference image

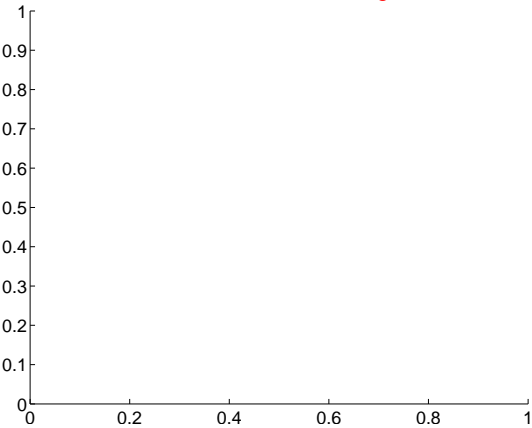


Q12 no OOT image

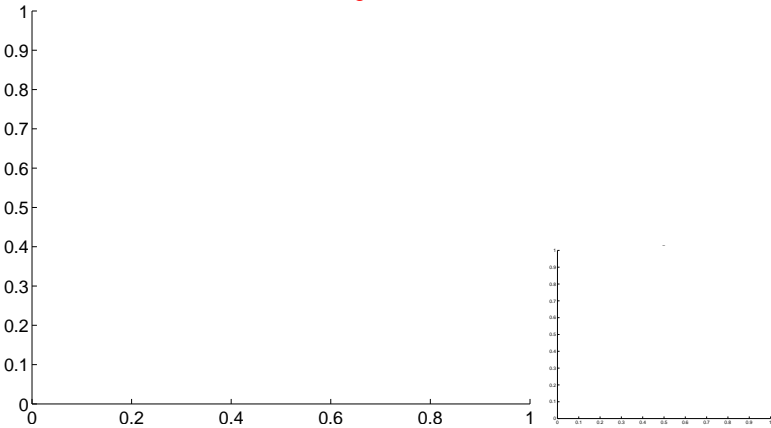


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

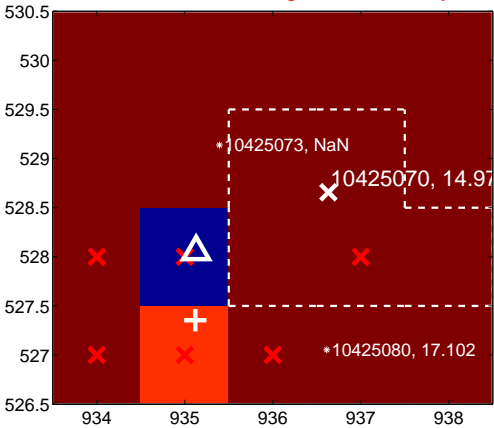
Q13 no difference image



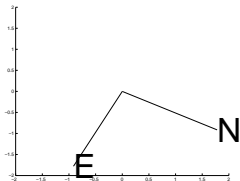
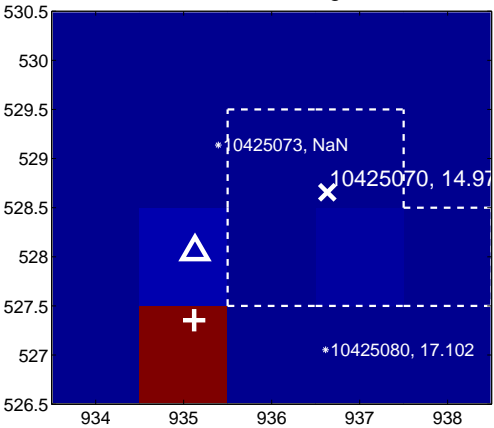
Q13 no OOT image



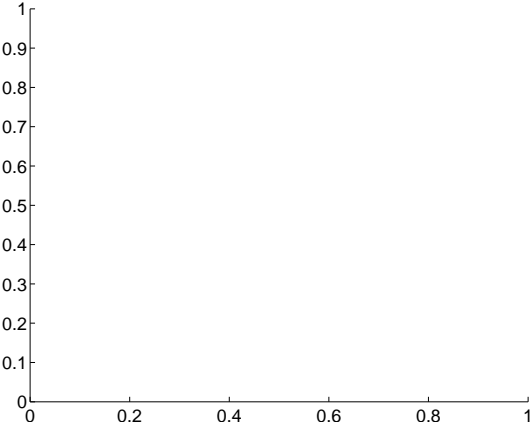
Q14 difference image. Poor Quality



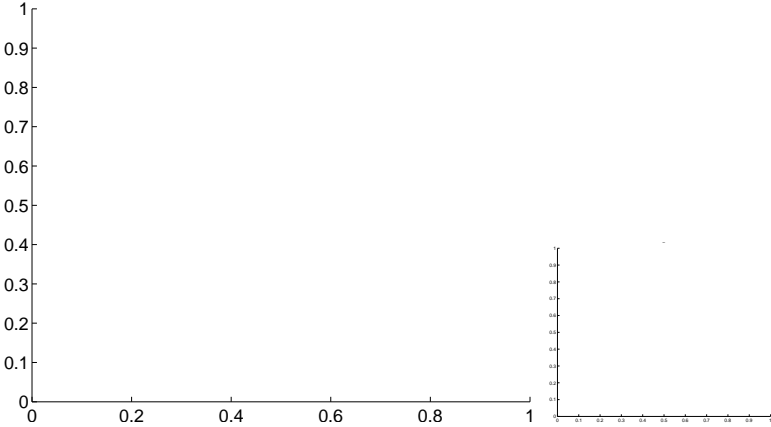
Q14 OOT image



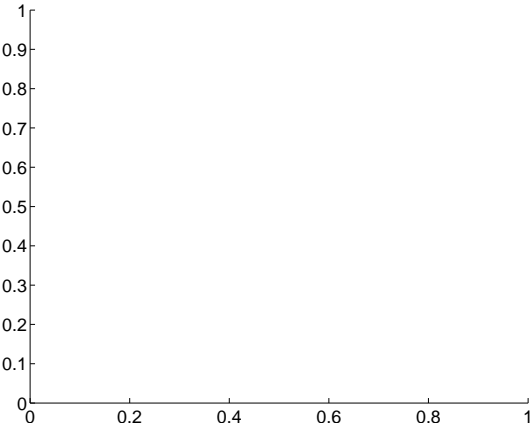
Q15 no difference image



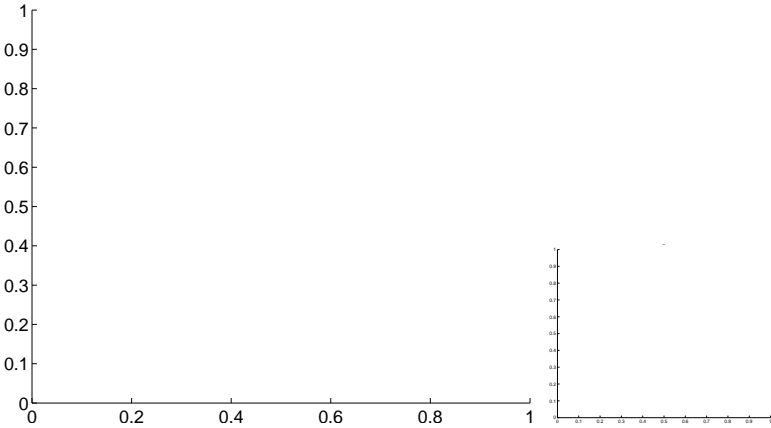
Q15 no OOT image



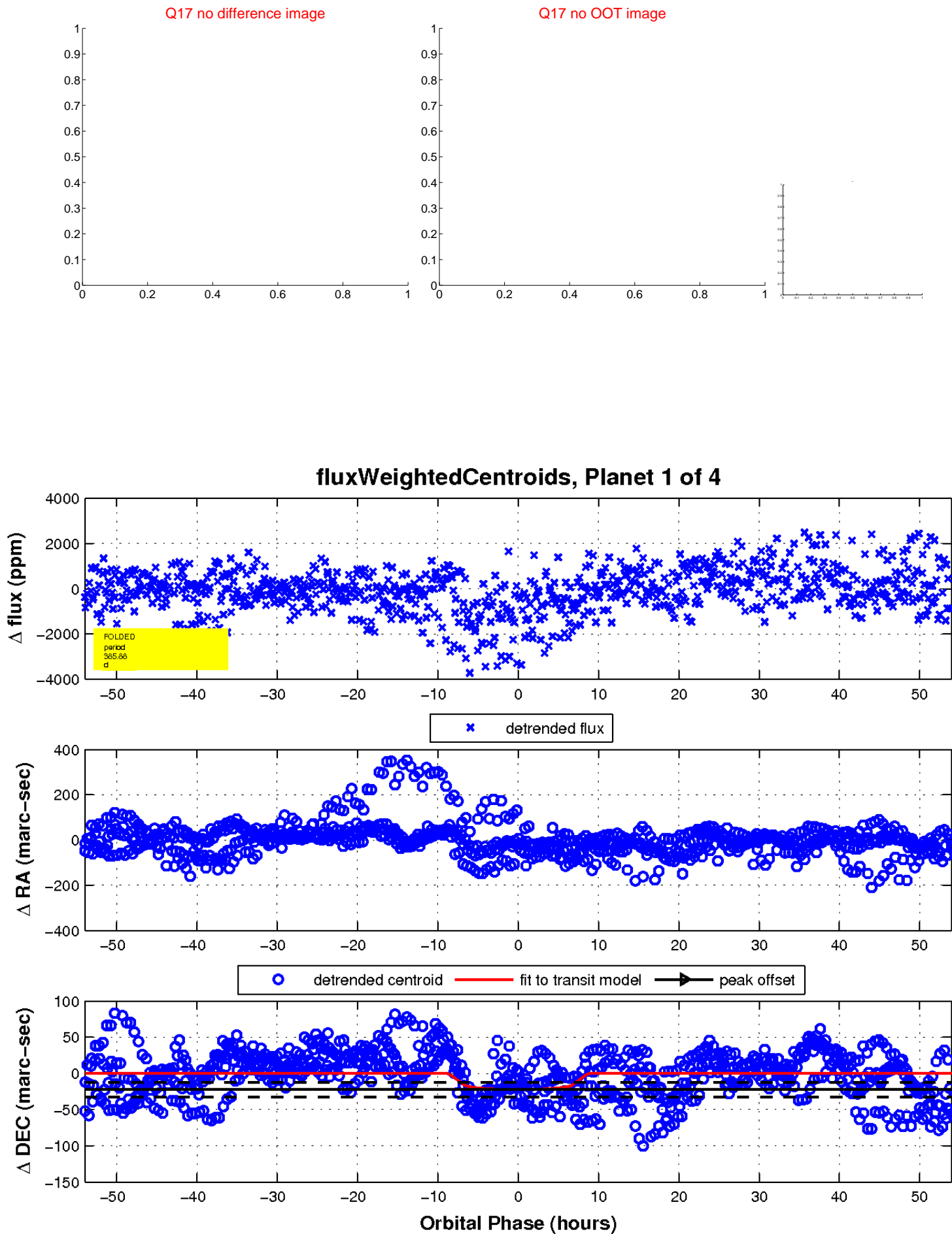
Q16 no difference image



Q16 no OOT image



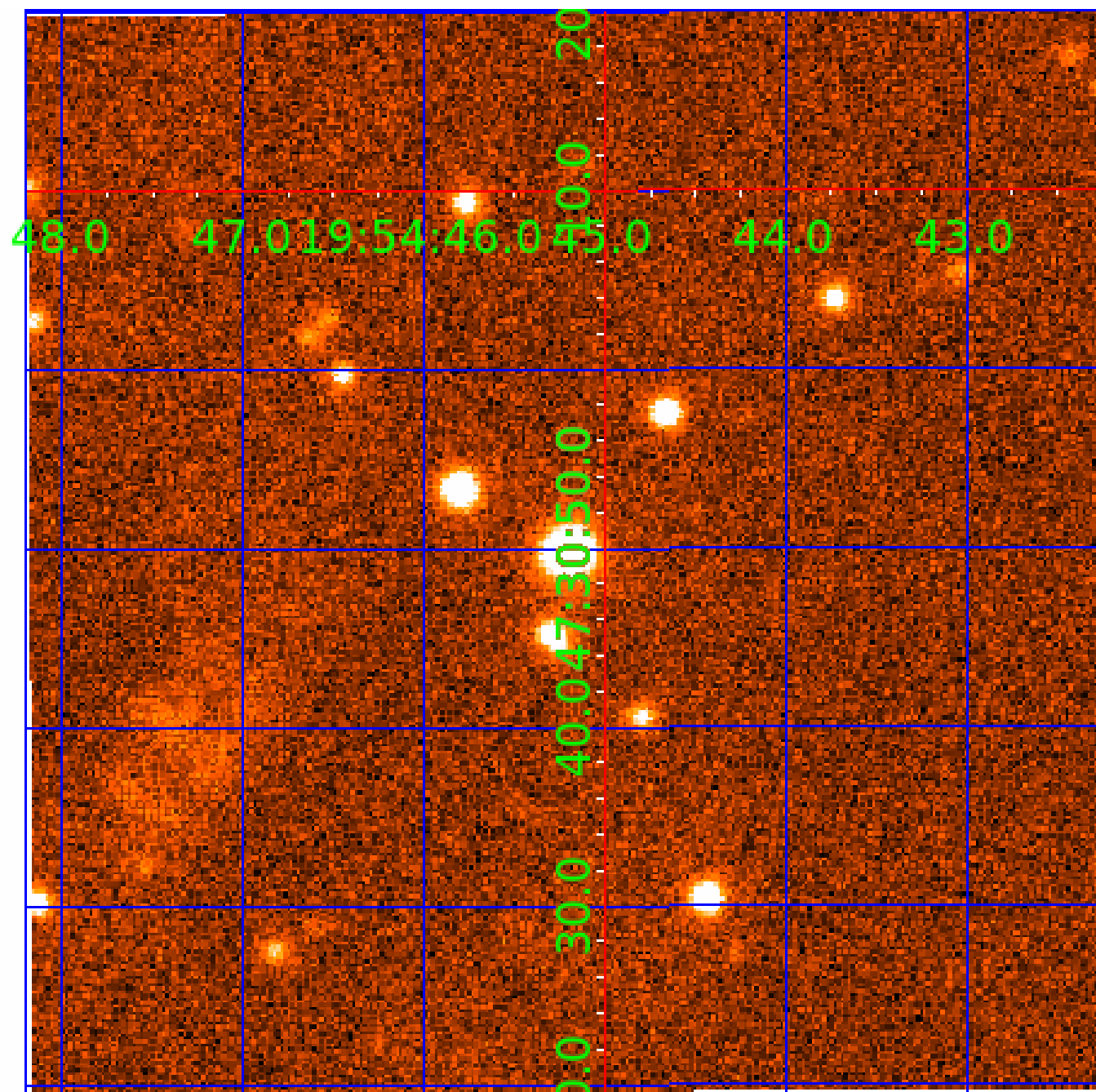
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 010425070

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010425070-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-03	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-04	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

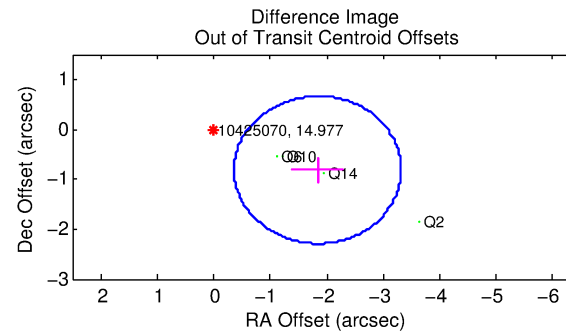
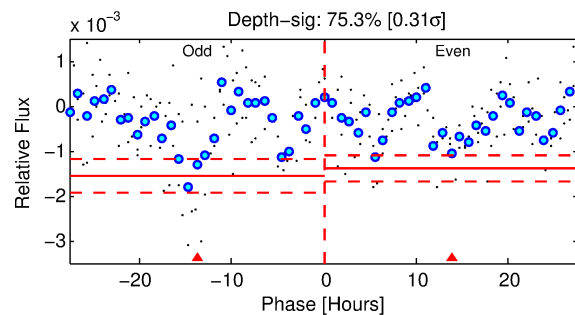
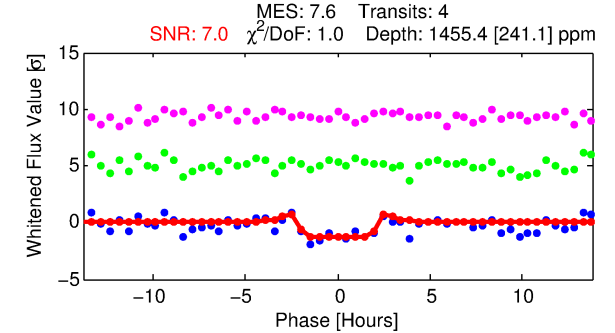
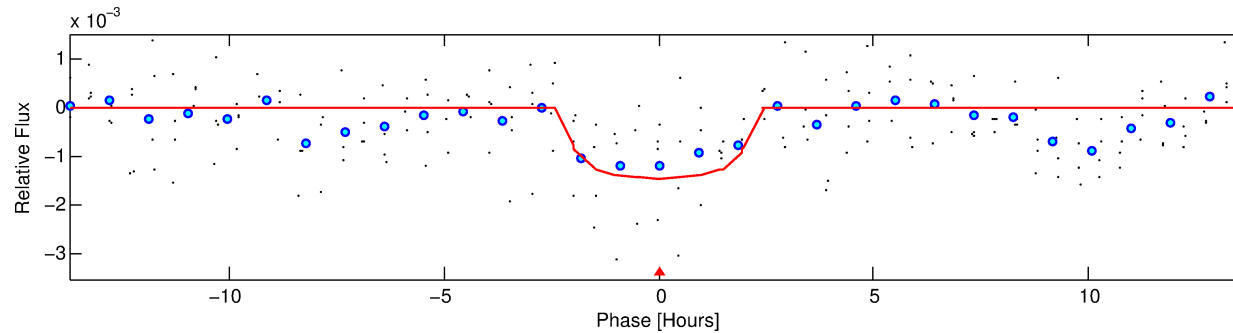
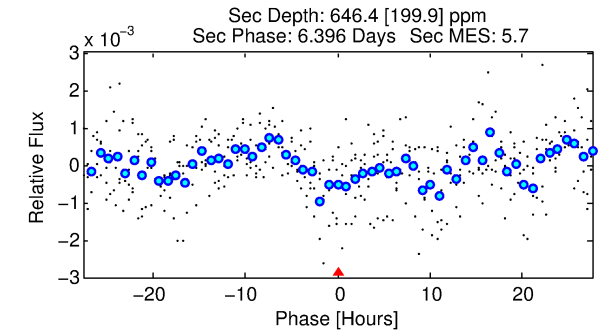
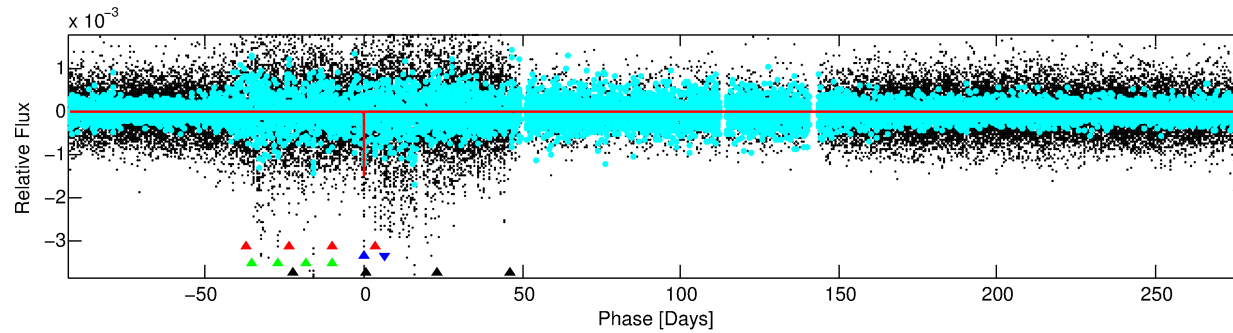
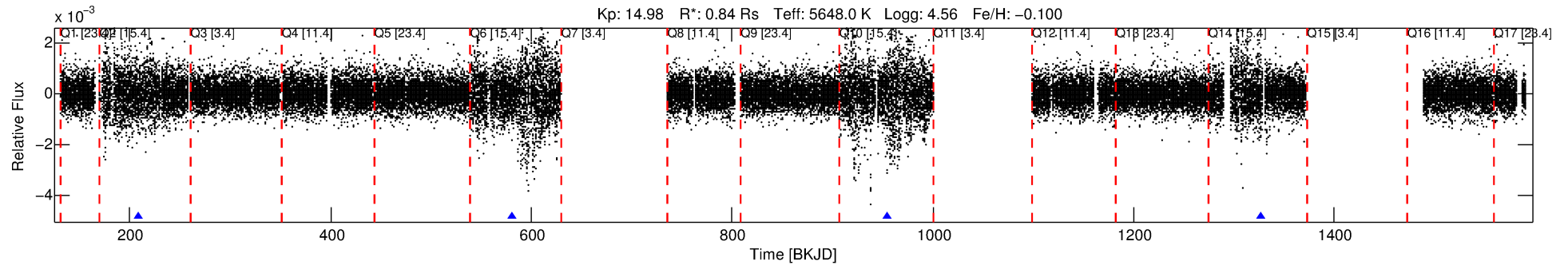
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010425070-02

No Significant Match Found

# DV One-Page Summary

KIC: 10425070 Candidate: 2 of 4 Period: 372.444 d



## DV Fit Results:

Period = 372.44398 [0.00446] d  
Epoch = 208.9772 [0.0082] BKJD  
Rp/R\* = 0.0371 [0.0216]  
a/R\* = 486.07 [1172.44]  
b = 0.68 [1.90]  
Seff = 0.66 [0.24]  
Teq = 230 [21] K  
Rp = 3.41 [2.20] Re  
a = 0.9907 [0.2303] AU  
Ag = 30090.48 [37660.63] [0.80σ]  
Teff = 4675 [1416] K [3.14σ]

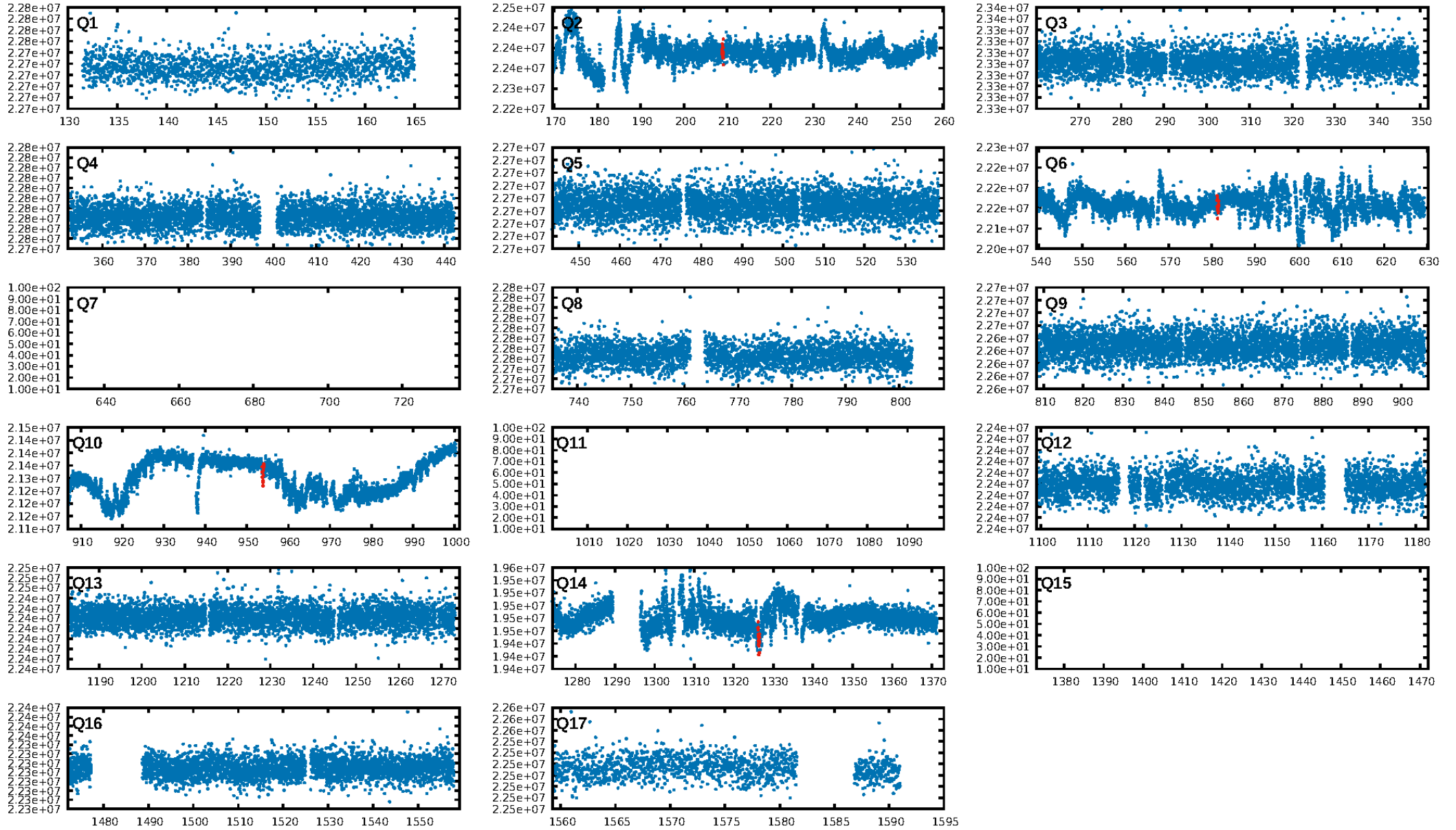
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.30σ]  
LongPeriod-sig: 100.0% [17.37σ]  
ModelChiSquare2-sig: 23.3%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 1.04e-07**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.1  
Centroid-sig: N/A  
**Centroid-so: 33.311 arcsec [3.32σ]**  
**OotOffset-rm: 2.011 arcsec [4.09σ]**  
**KicOffset-rm: 6.440 arcsec [30.06σ]**  
OotOffset-st: 4/0/0/0 [4]  
KicOffset-st: 4/0/0/0 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.75 [3/4]

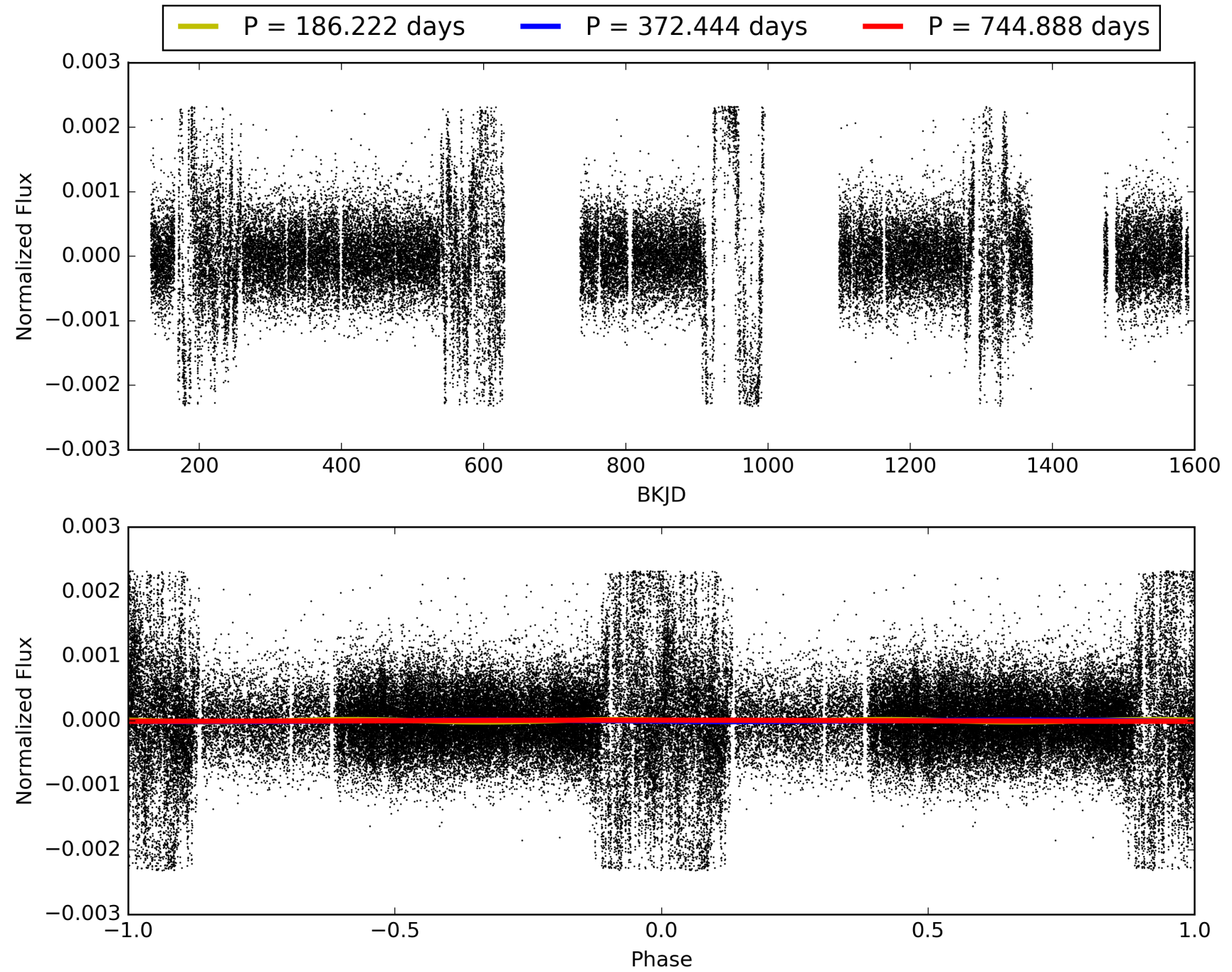
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:19:37 Z

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

# TCE 010425070-02, PDC Light Curves



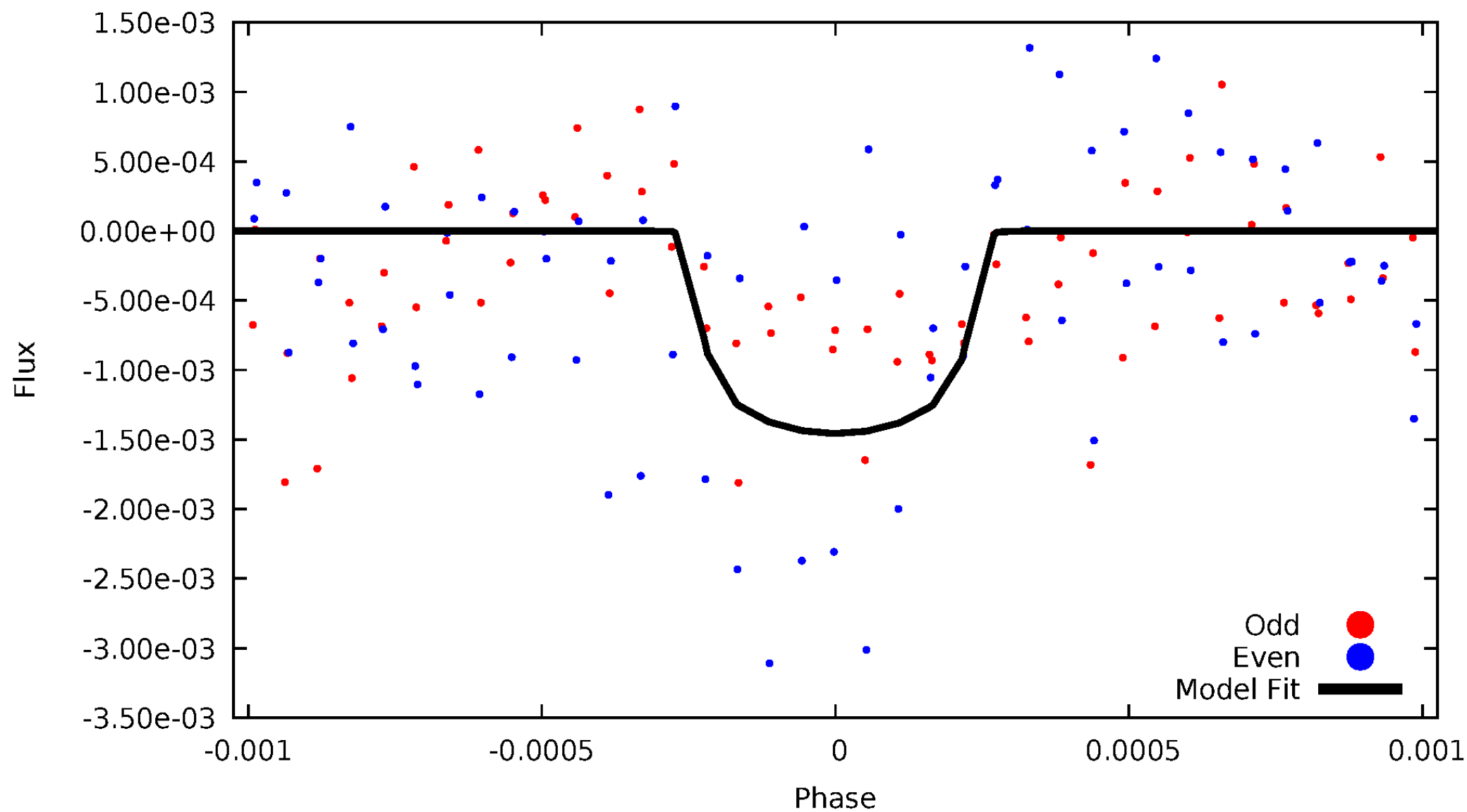
# TCE 010425070-02





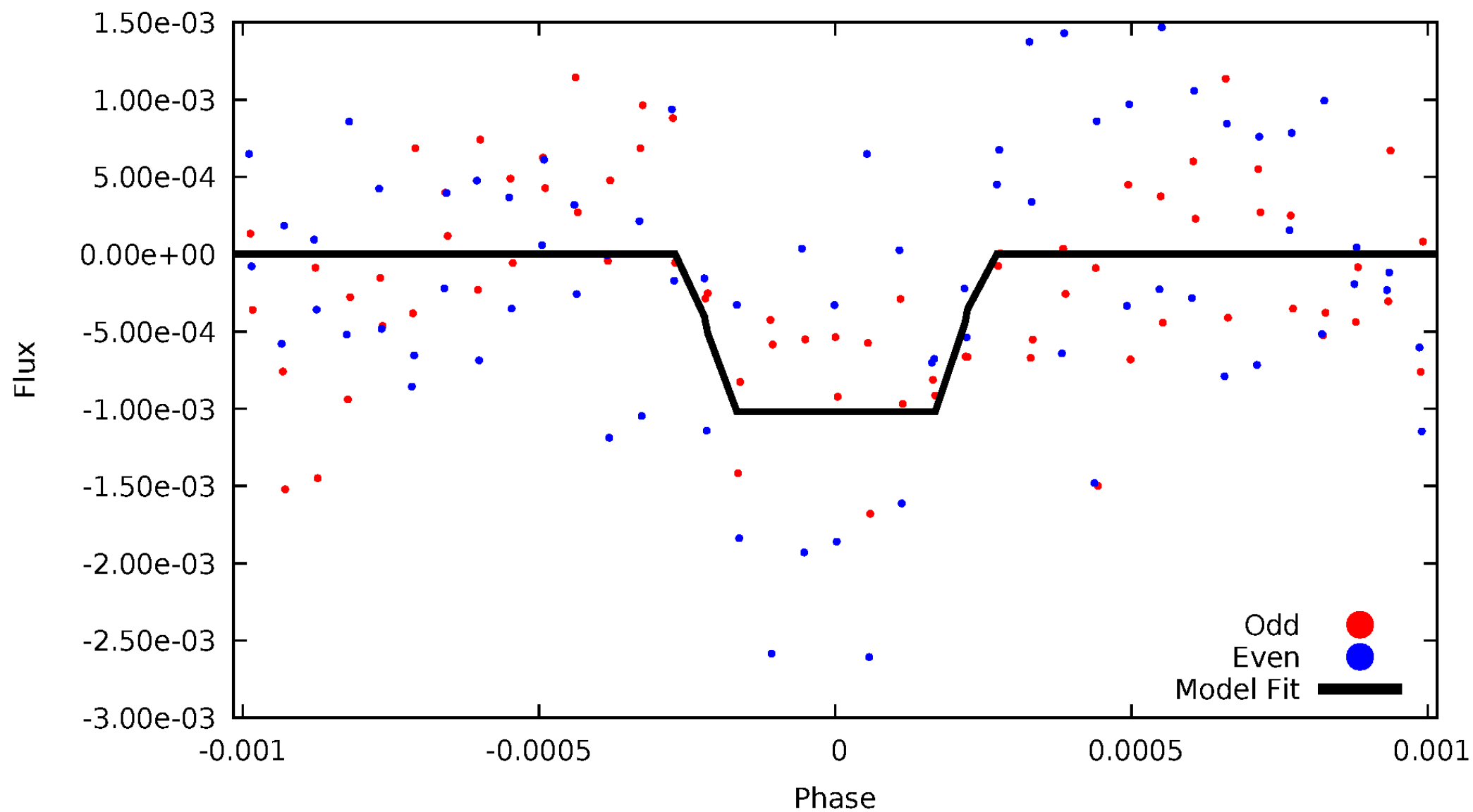
# DV Odd/Even

TCE 010425070-02



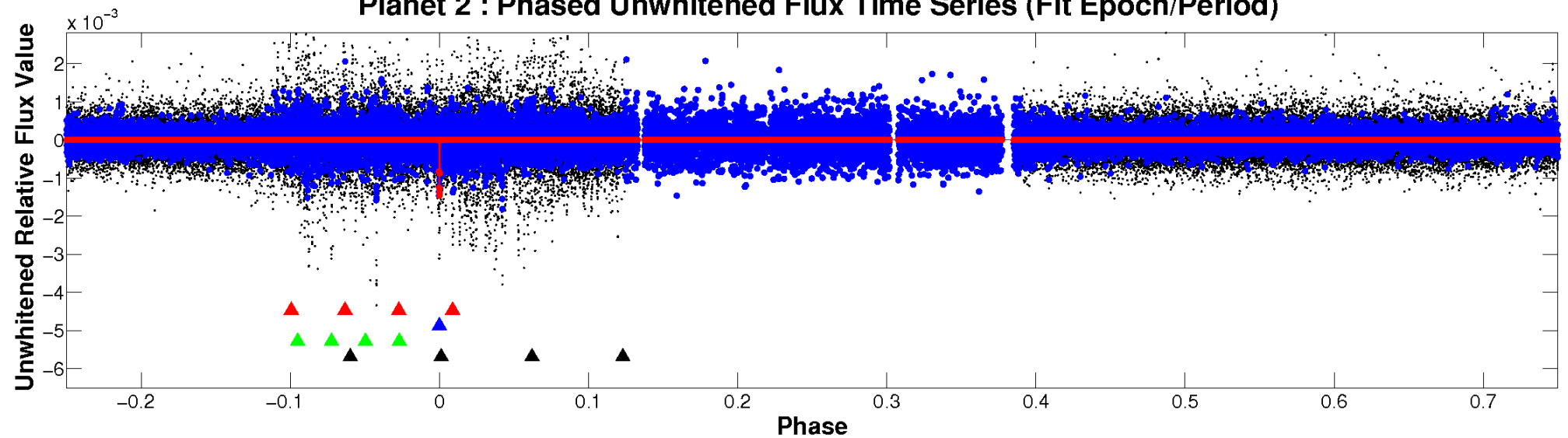
# ALT Odd/Even

TCE 010425070-02

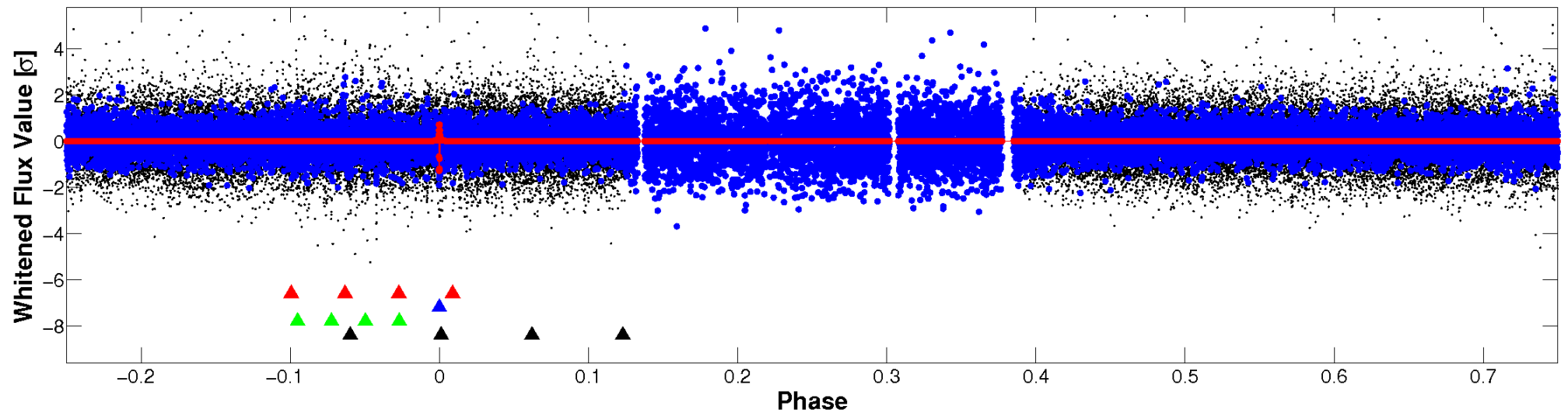


# Non-Whitened Vs. Whitened Light Curve

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

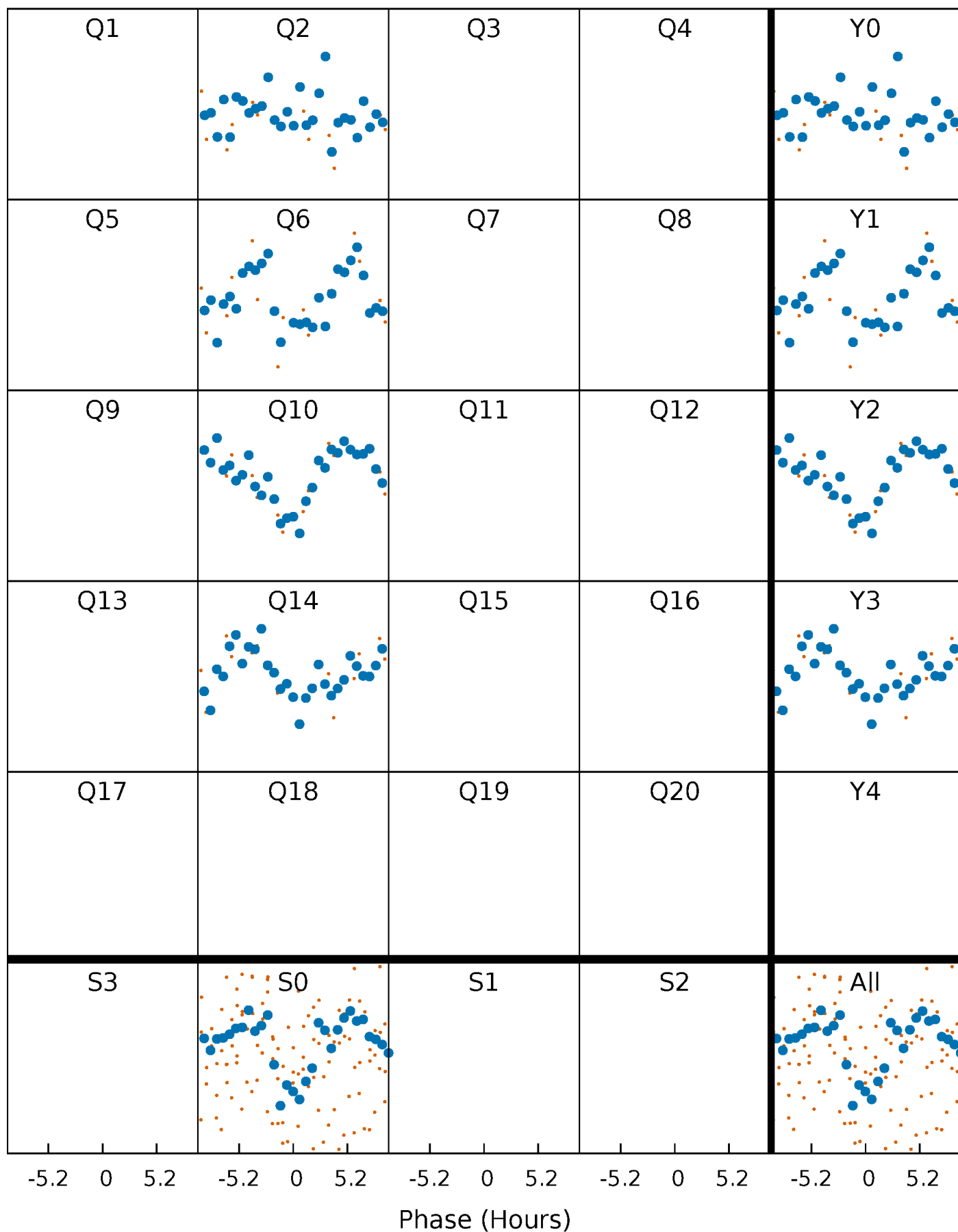


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



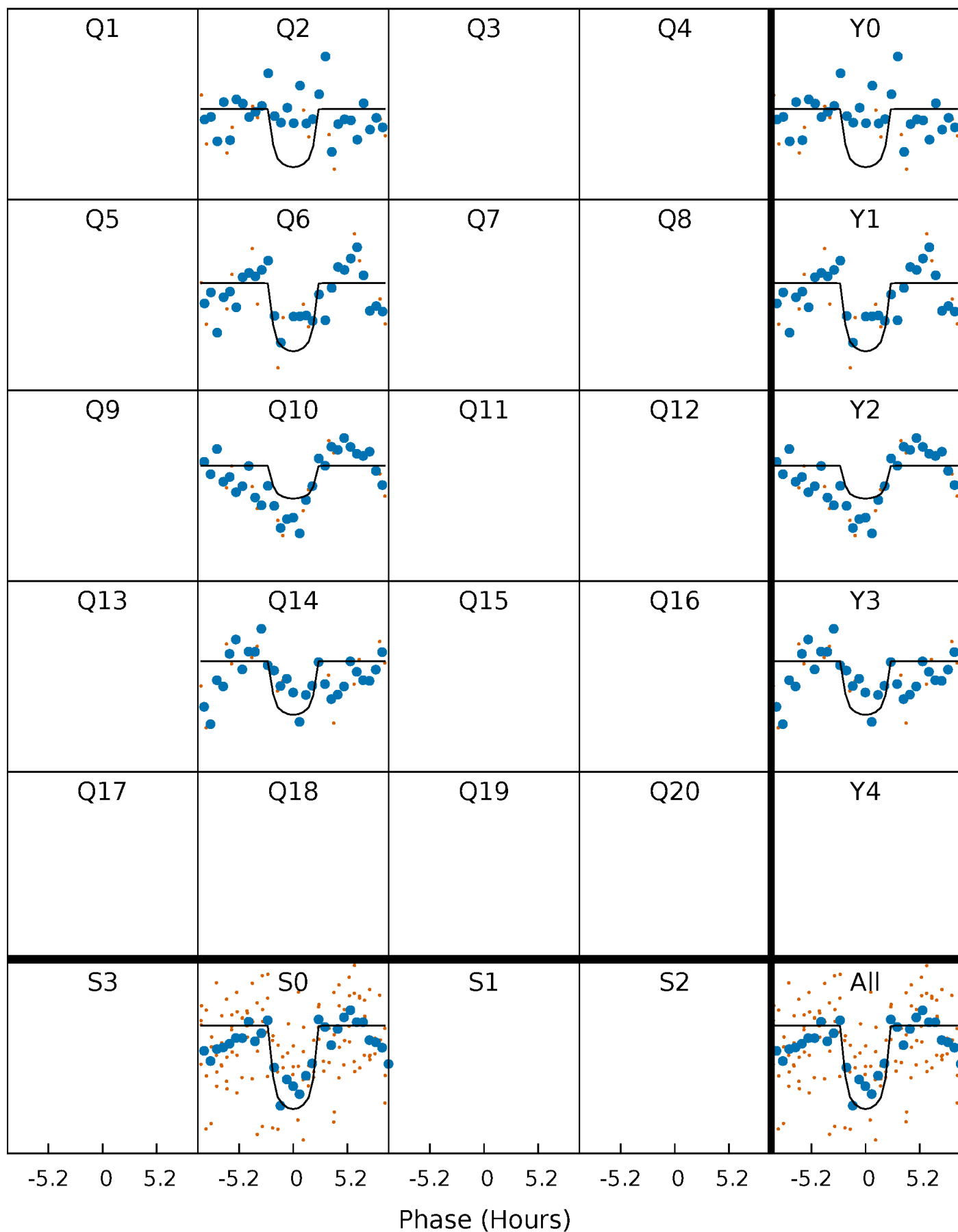
# PDC Quarter-Phased Transit Curves

TCE 010425070-02 P=372.443978 Days  $T_0=208.977167$  (BKJD)



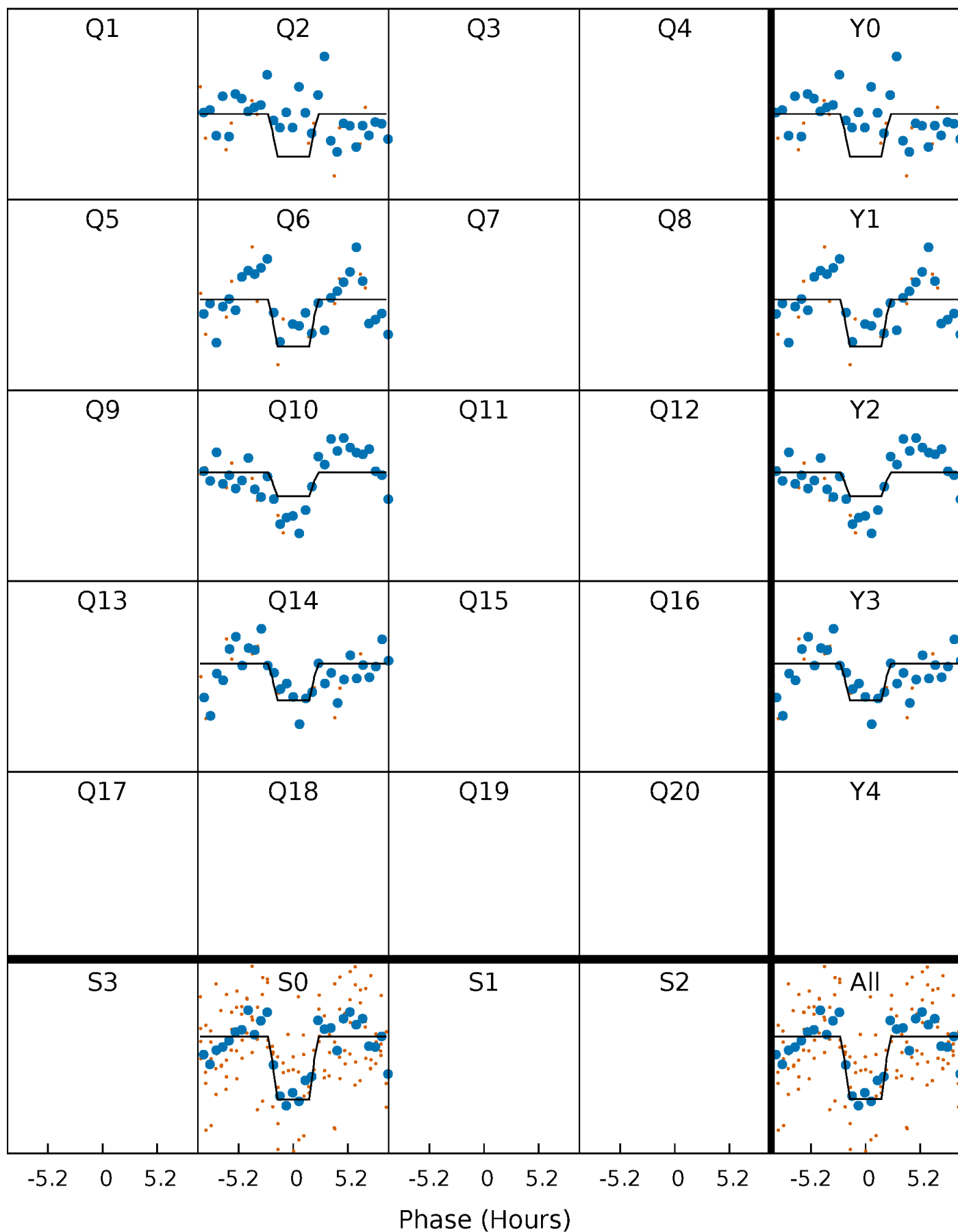
# DV Quarter-Phased Transit Curves

TCE 010425070-02 P=372.443978 Days  $T_0=208.977167$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

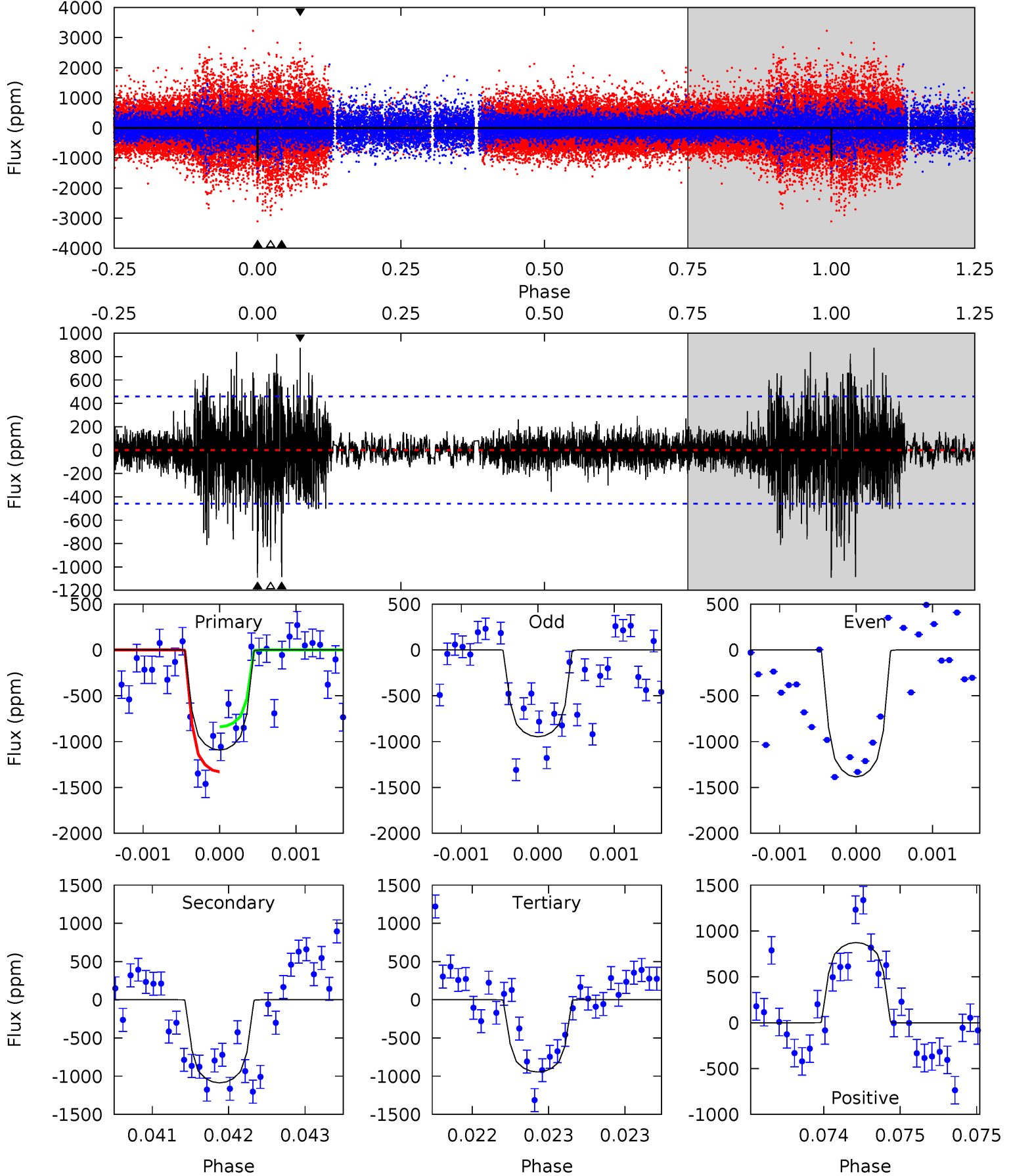
TCE 010425070-02 P=372.442498 Days  $T_0=208.978335$  (BKJD)



# DV Model-Shift Uniqueness Test

010425070-02, P = 372.443978 Days, E = 208.977167 Days

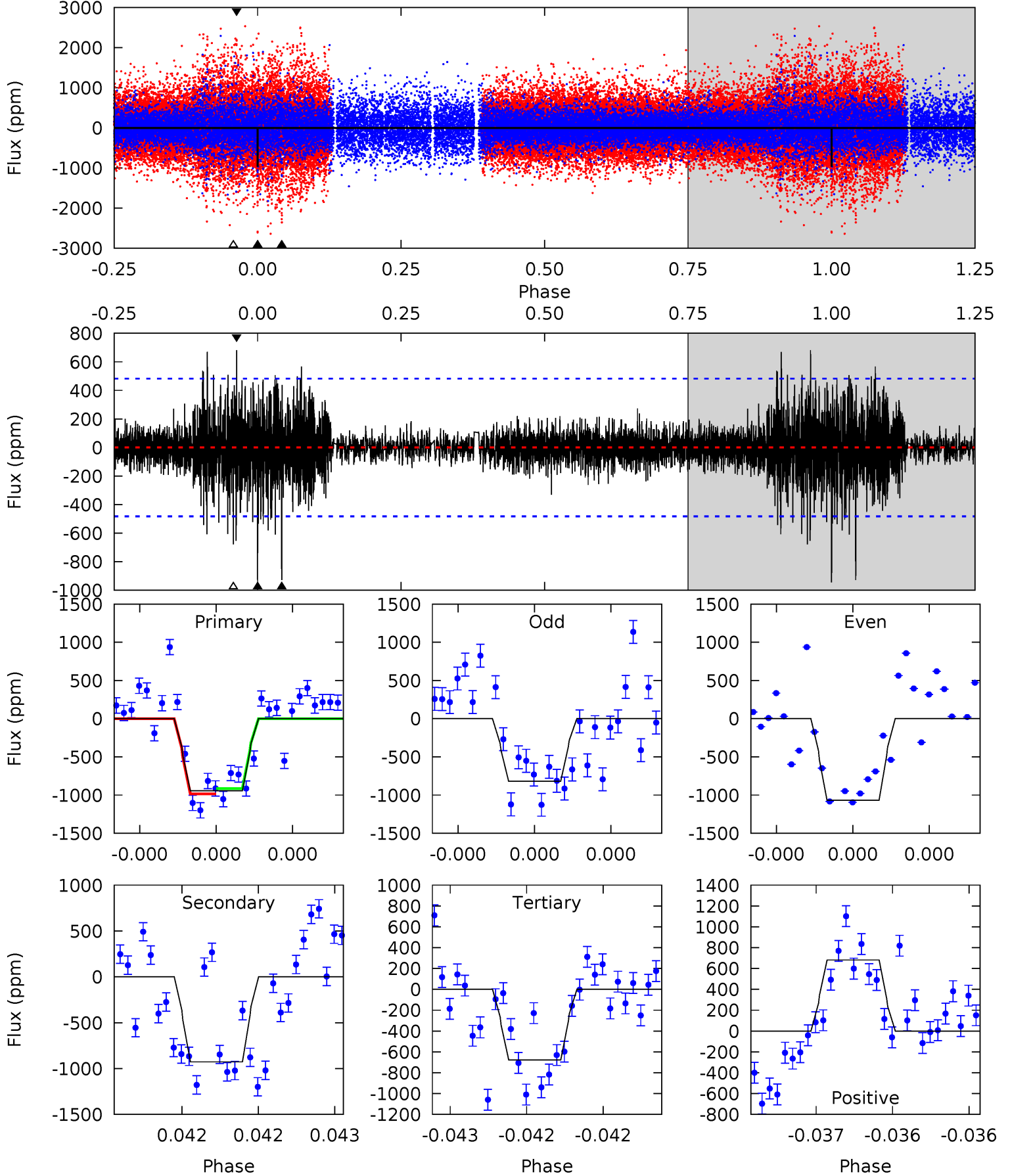
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	13.1	11.4	10.5	5.54	3.43	1.91	1.77	2.63	1.70	2.57	2.56	1.19	0.44	2.92



# Alt Model-Shift Uniqueness Test

010425070-02, P = 372.442498 Days, E = 208.978335 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	10.7	7.83	7.87	5.58	3.49	1.40	3.08	3.04	2.89	2.84	1.40	1.12	0.42	0.40





### Stellar Parameters For KIC 010425070

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5648^{+169}_{-152}$	$4.559^{+0.034}_{-0.184}$	$-0.100^{+0.300}_{-0.300}$	$0.841^{+0.233}_{-0.078}$	$0.939^{+0.094}_{-0.104}$	$2.221^{+0.409}_{-1.089}$
	+3%/-3%	+1%/-4%	+300%/-300%	+28%/-9%	+10%/-11%	+18%/-49%
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 010425070-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1087 \pm 83$	$3.61^{+2.15}_{-2.00}$	$330^{+22}_{-14}$	$5337^{+2807}_{-913}$	$44019^{+166593}_{-26467}$
Alt.	$-927 \pm 87$	$3.18^{+1.96}_{-1.71}$	$329^{+20}_{-13}$	$5483^{+2915}_{-1039}$	$49186^{+185393}_{-30774}$

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

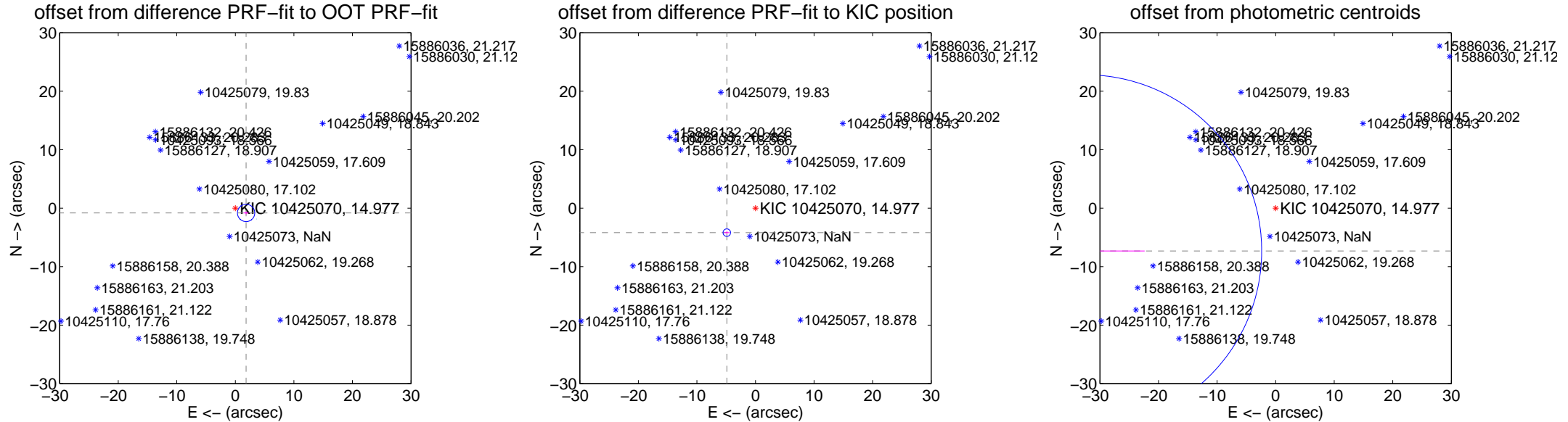
## DV Centroid Data

Supplemental centroid analysis for 010425070-02. Kepler magnitude: 14.98. Transit SNR 7.04

There are 2 quarters with good PRF difference image offsets

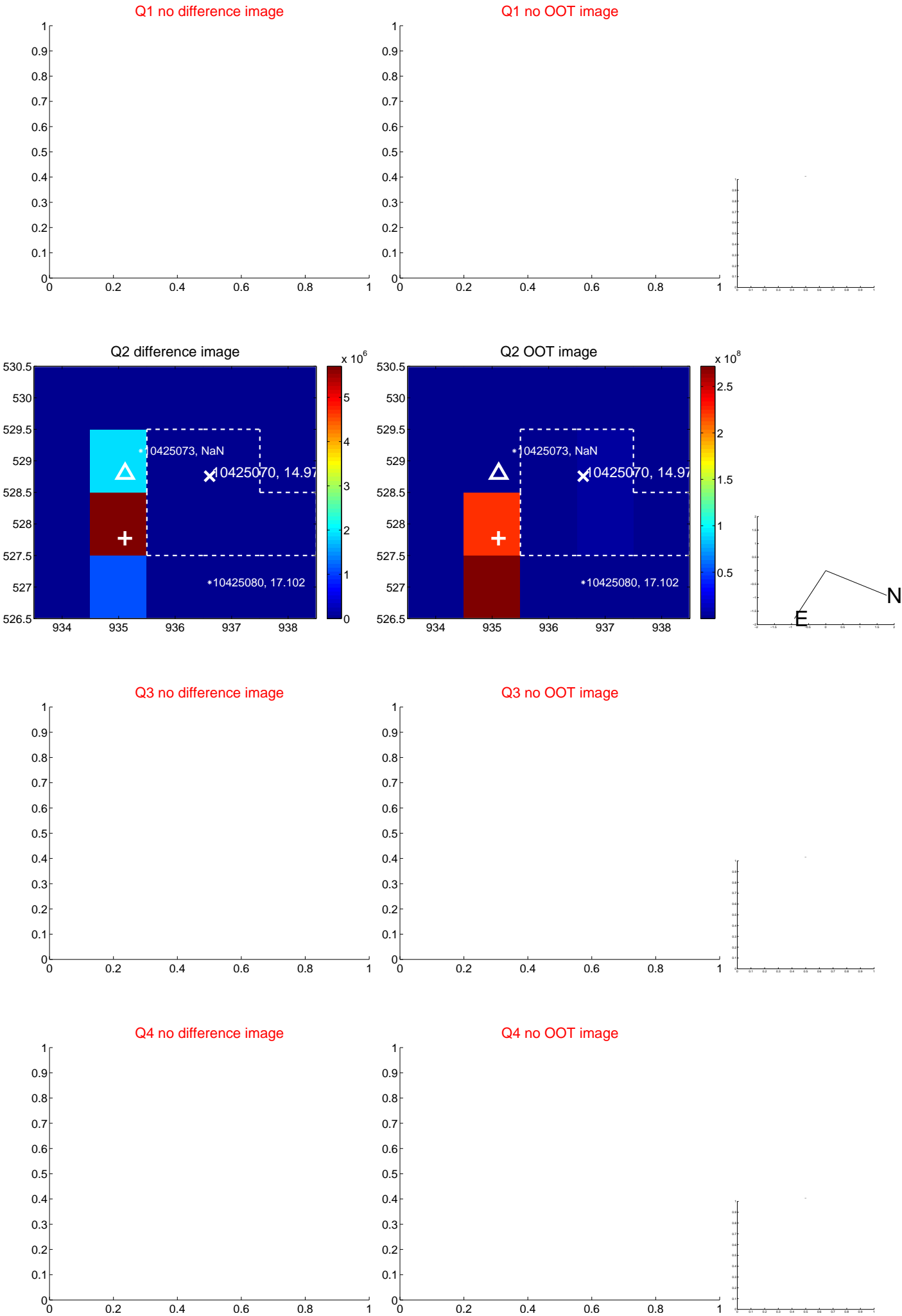
The OOT PRF centroid is offset from the target star catalog position by about 7.60 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.011 \pm 0.492$	4.09	$-1.839 \pm 0.439$	$-0.815 \pm 0.236$
PRF-fit source offset from KIC position	$6.440 \pm 0.214$	30.06	$4.895 \pm 0.484$	$-4.184 \pm 0.257$
photometric centroid source offset	$33.31 \pm 10.04$	3.32	$32.50 \pm 10.13$	$-7.31 \pm 8.02$

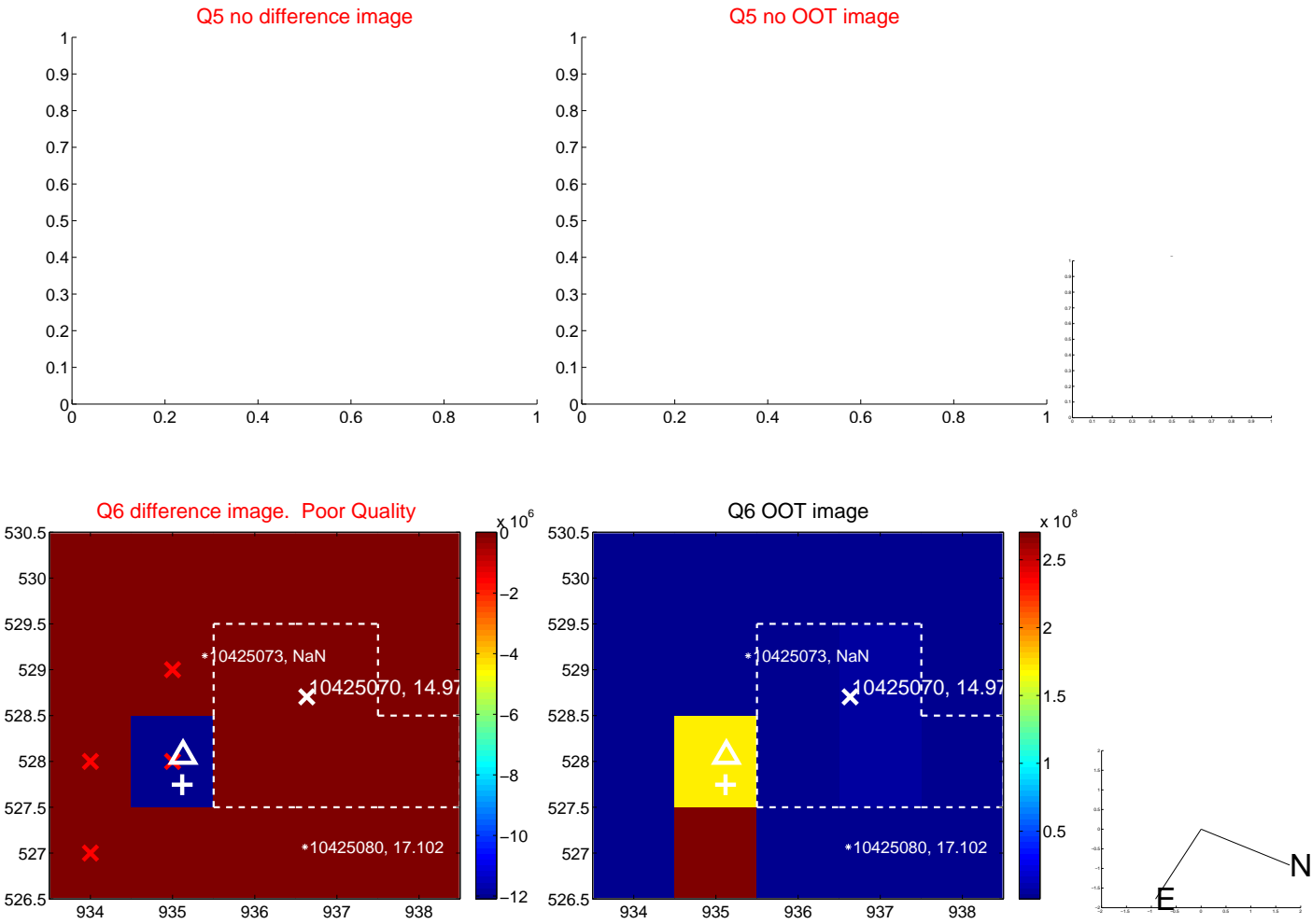


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

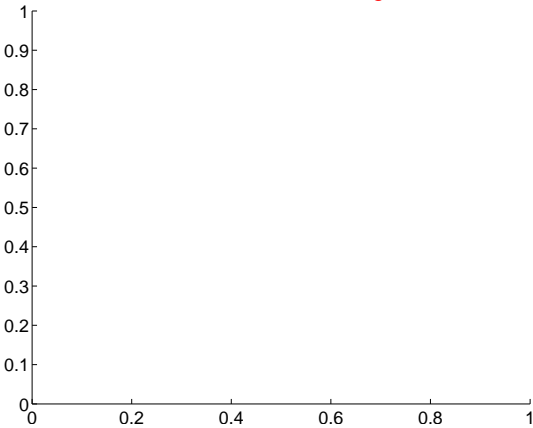


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

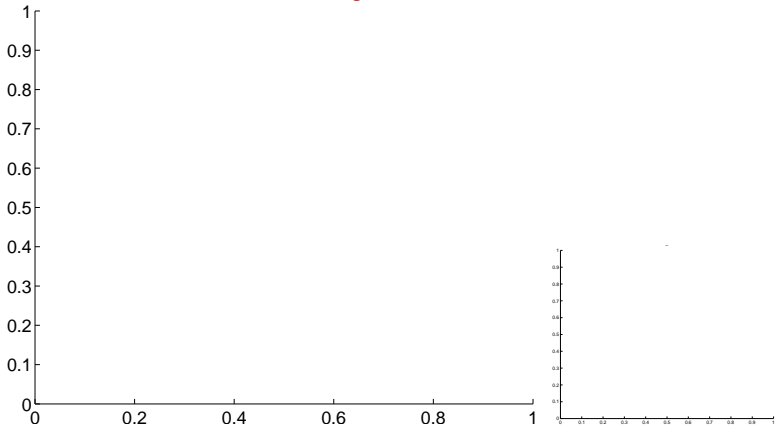


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

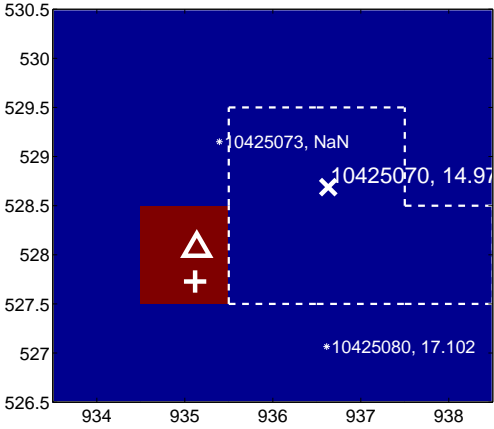
Q9 no difference image



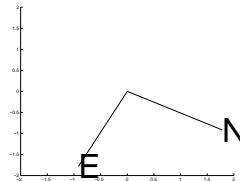
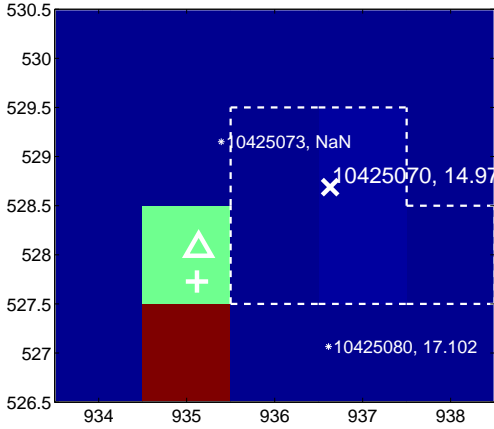
Q9 no OOT image



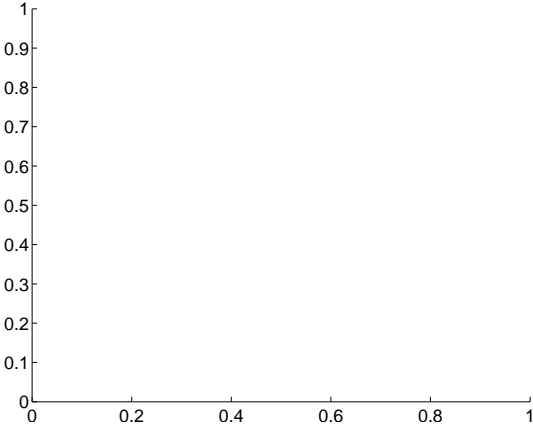
Q10 difference image



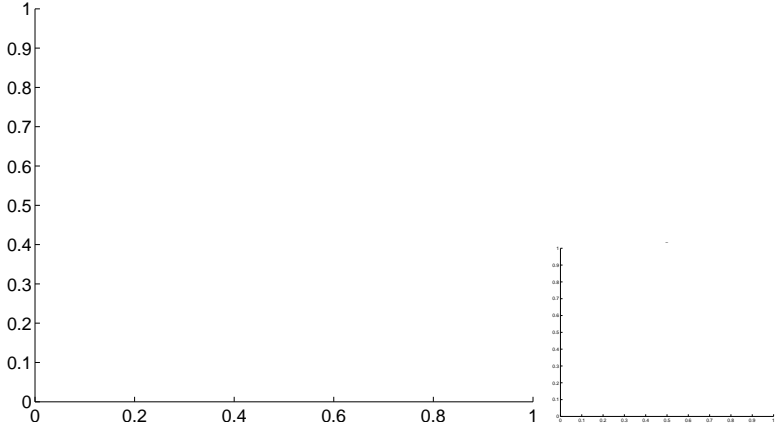
Q10 OOT image



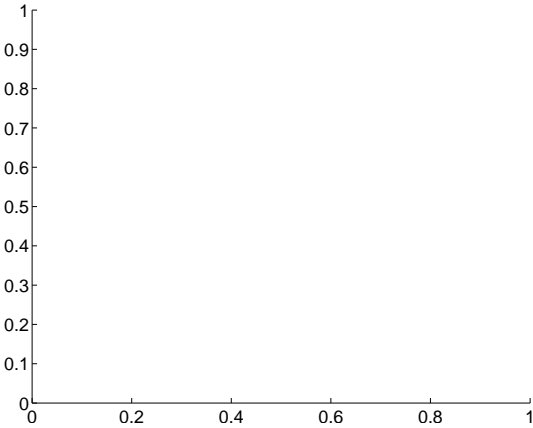
Q11 no difference image



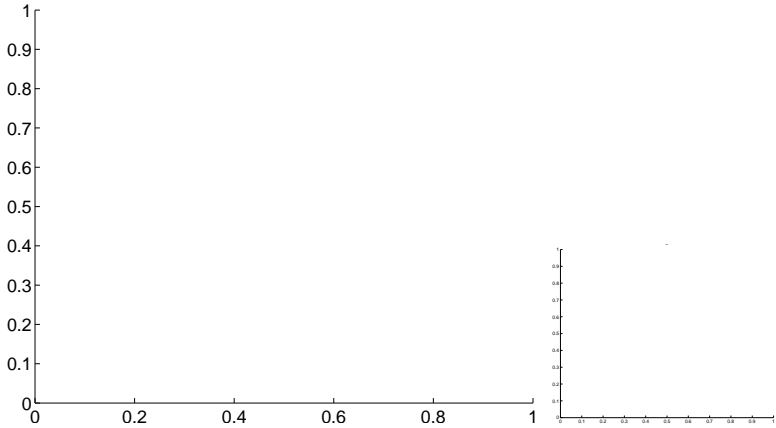
Q11 no OOT image



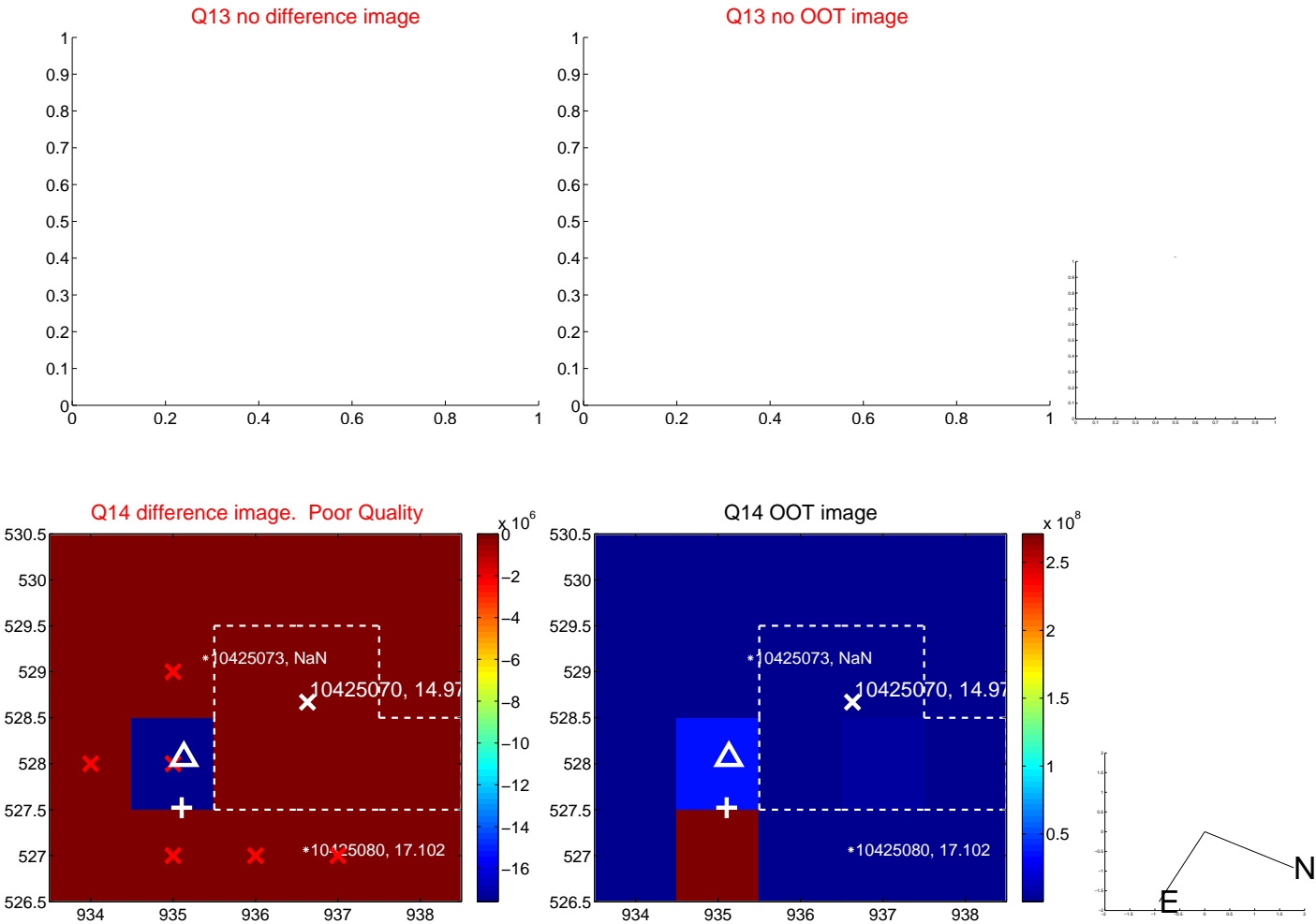
Q12 no difference image



Q12 no OOT image



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



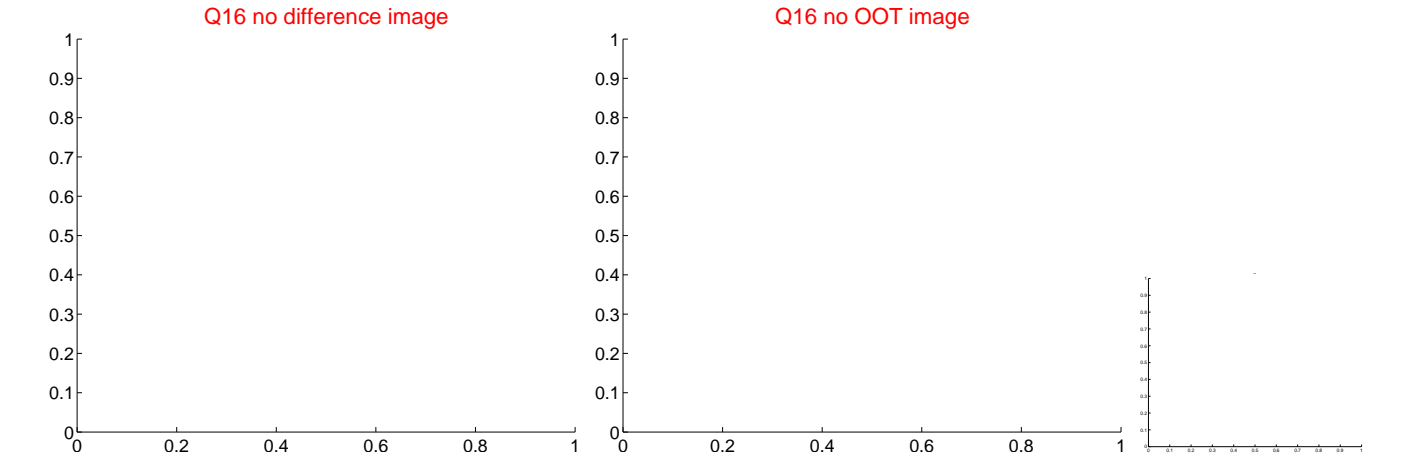
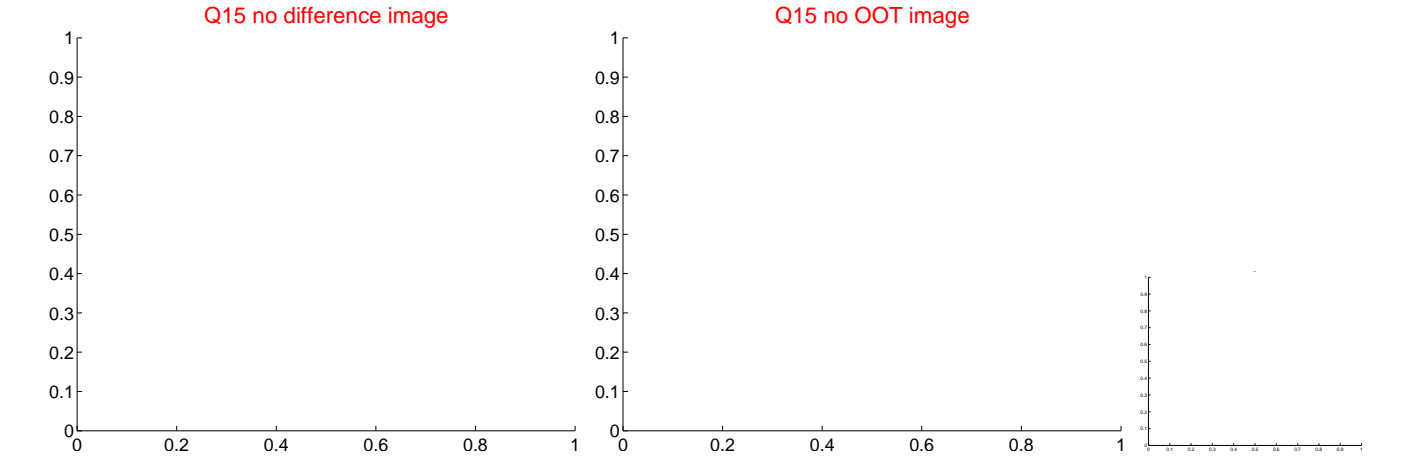
Q14 difference image. Poor Quality



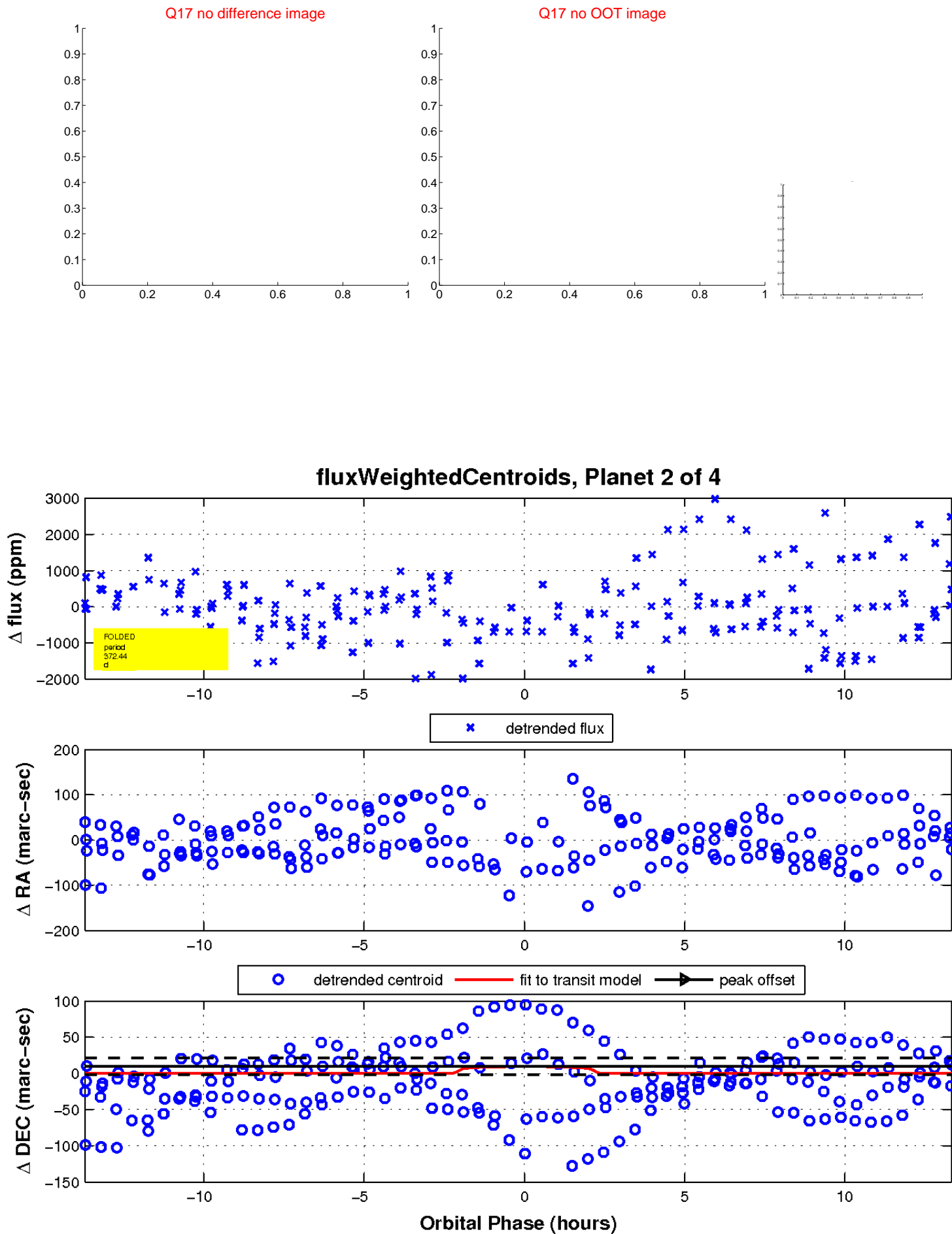
Q14 OOT image





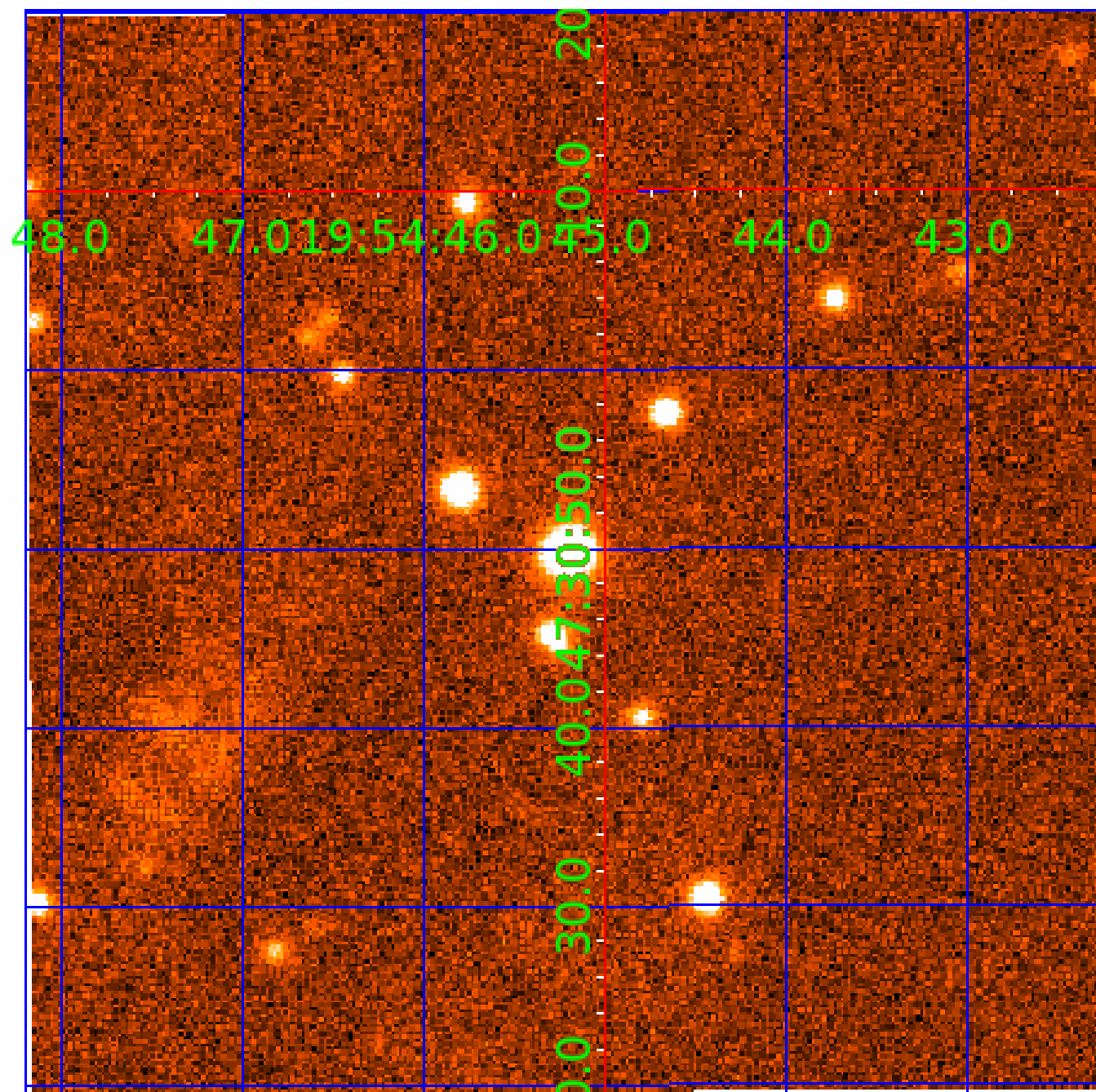


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010425070

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010425070-01	OBS	No	385.880098	171.977936	1501.5	17.994	11.5	9.4	0.84	5648	3.77	0.63
010425070-02	OBS	No	372.443978	208.977167	1455.4	4.580	7.6	7.0	0.84	5648	3.41	0.66
010425070-03	OBS	8208.01	363.974278	198.974406	1813.6	4.035	7.4	7.3	0.84	5648	3.65	0.68
010425070-04	OBS	8208.02	395.139652	186.722706	2115.1	20.431	7.1	7.6	0.84	5648	4.58	0.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010425070-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-03	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-04	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

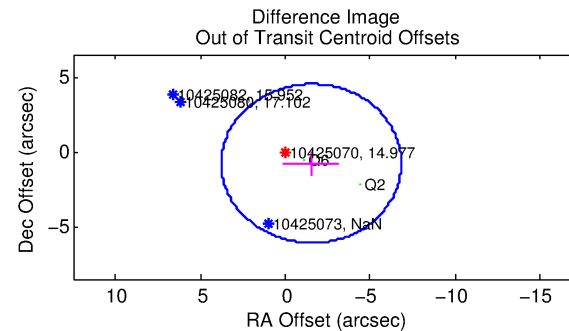
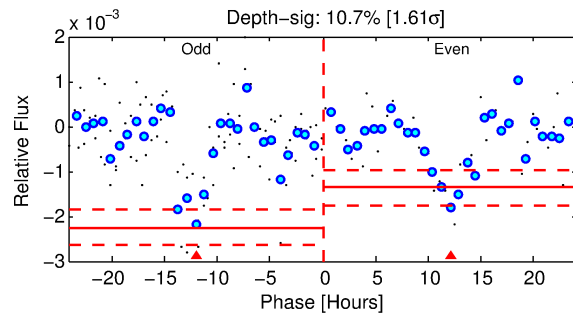
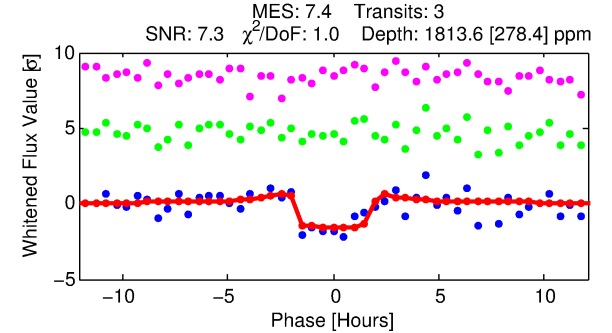
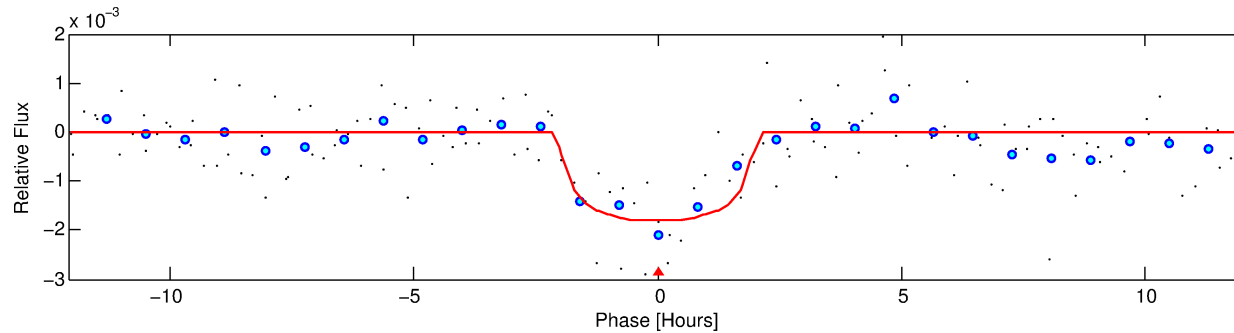
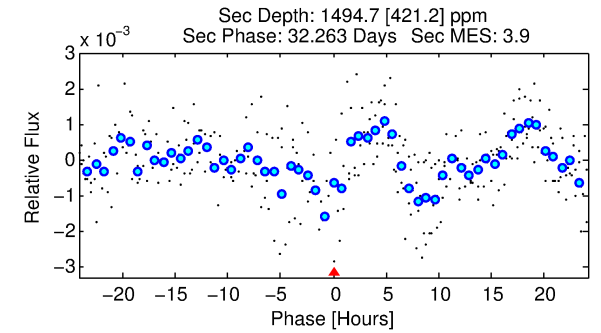
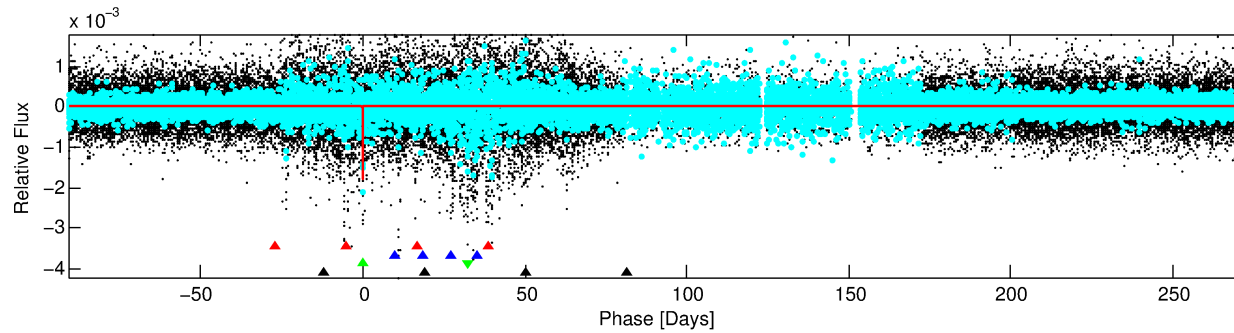
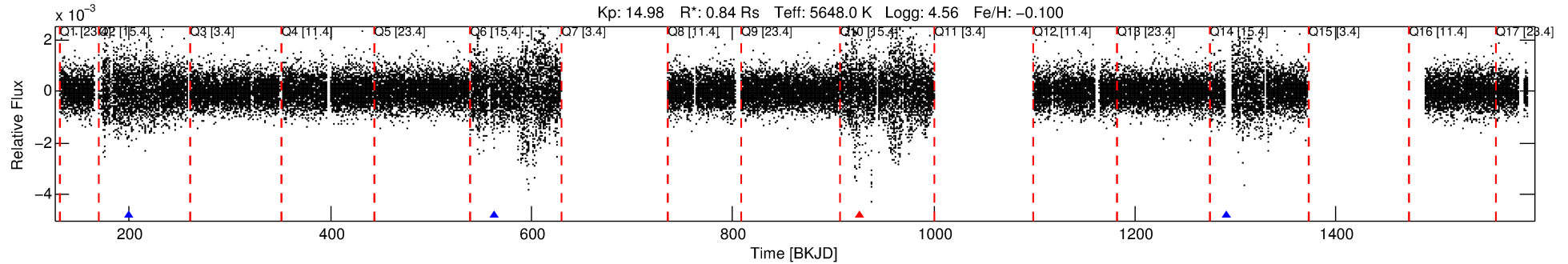
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010425070-03

No Significant Match Found

# DV One-Page Summary

KIC: 10425070 Candidate: 3 of 4 Period: 363.974 d



## DV Fit Results:

Period = 363.97428 [0.00745] d  
Epoch = 198.9744 [0.0086] BKJD  
Rp/R\* = 0.0398 [0.0378]  
a/R\* = 630.29 [2501.40]  
b = 0.49 [6.11]  
Seff = 0.68 [0.24]  
Teq = 231 [21] K  
Rp = 3.65 [3.61] Re  
a = 0.9756 [0.2268] AU  
Ag = 58631.66 [114291.90] [0.51σ]  
Teffp = 5566 [2677] K [1.99σ]

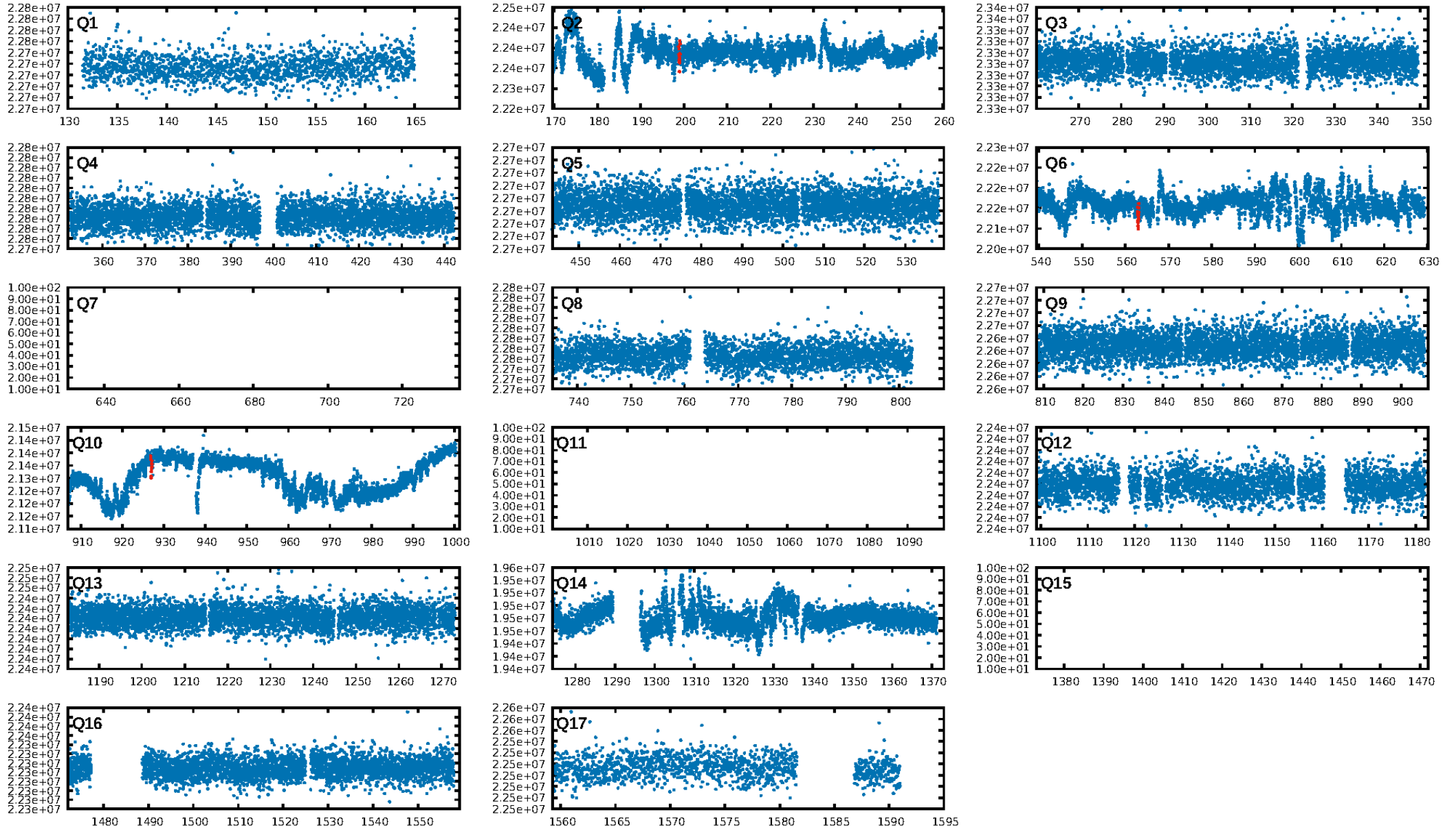
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [33.30σ]  
ModelChiSquare2-sig: 15.6%  
ModelChiSquareGof-sig: 92.4%  
Bootstrap-pfa: 6.63e-11  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: -1.218  
Centroid-sig: N/A  
Centroid-so: 39.789 arcsec [4.05σ]  
OotOffset-rm: 1.736 arcsec [0.98σ]  
KicOffset-rm: 6.433 arcsec [5.80σ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [3/3]

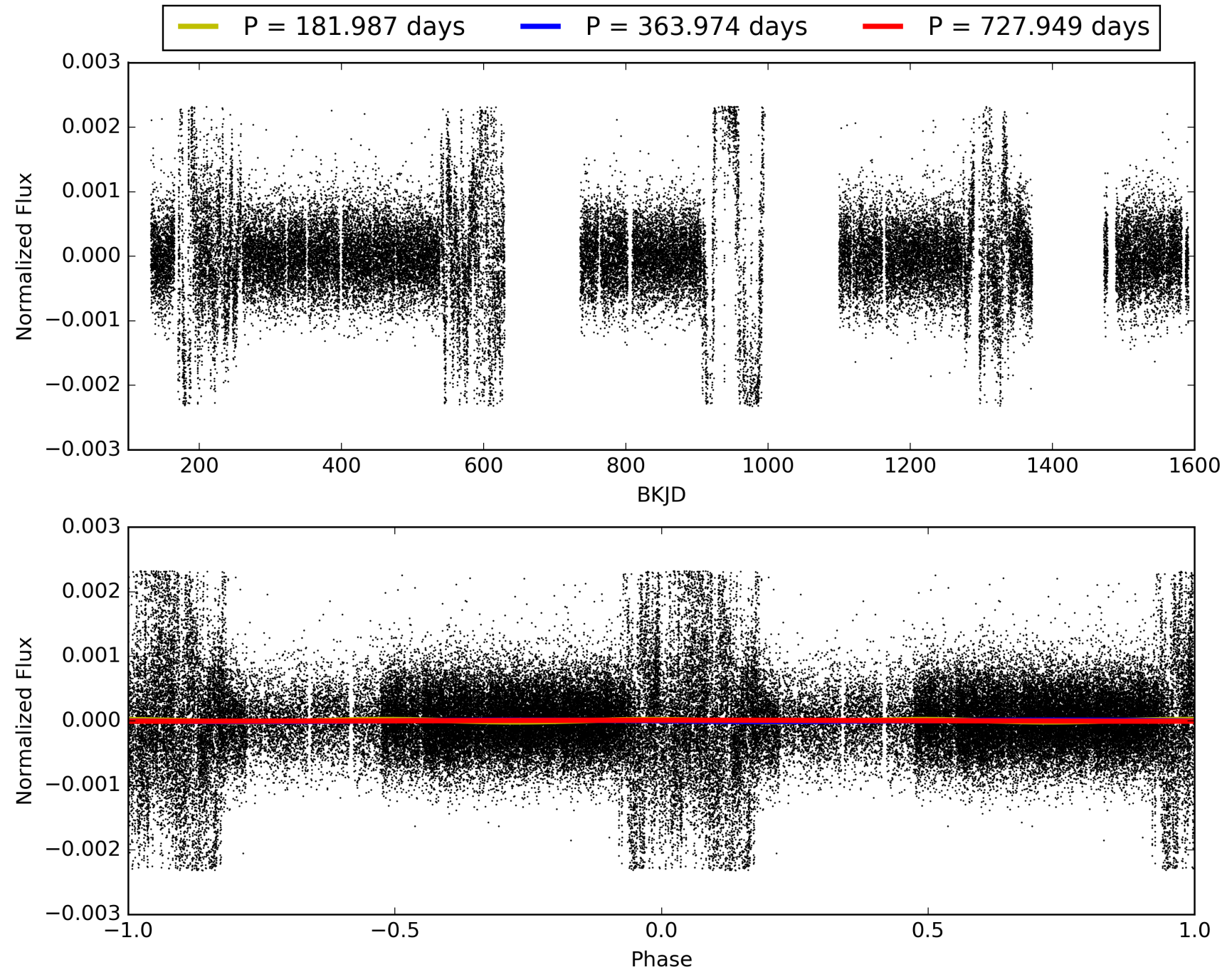
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:19:50 Z

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

# TCE 010425070-03, PDC Light Curves

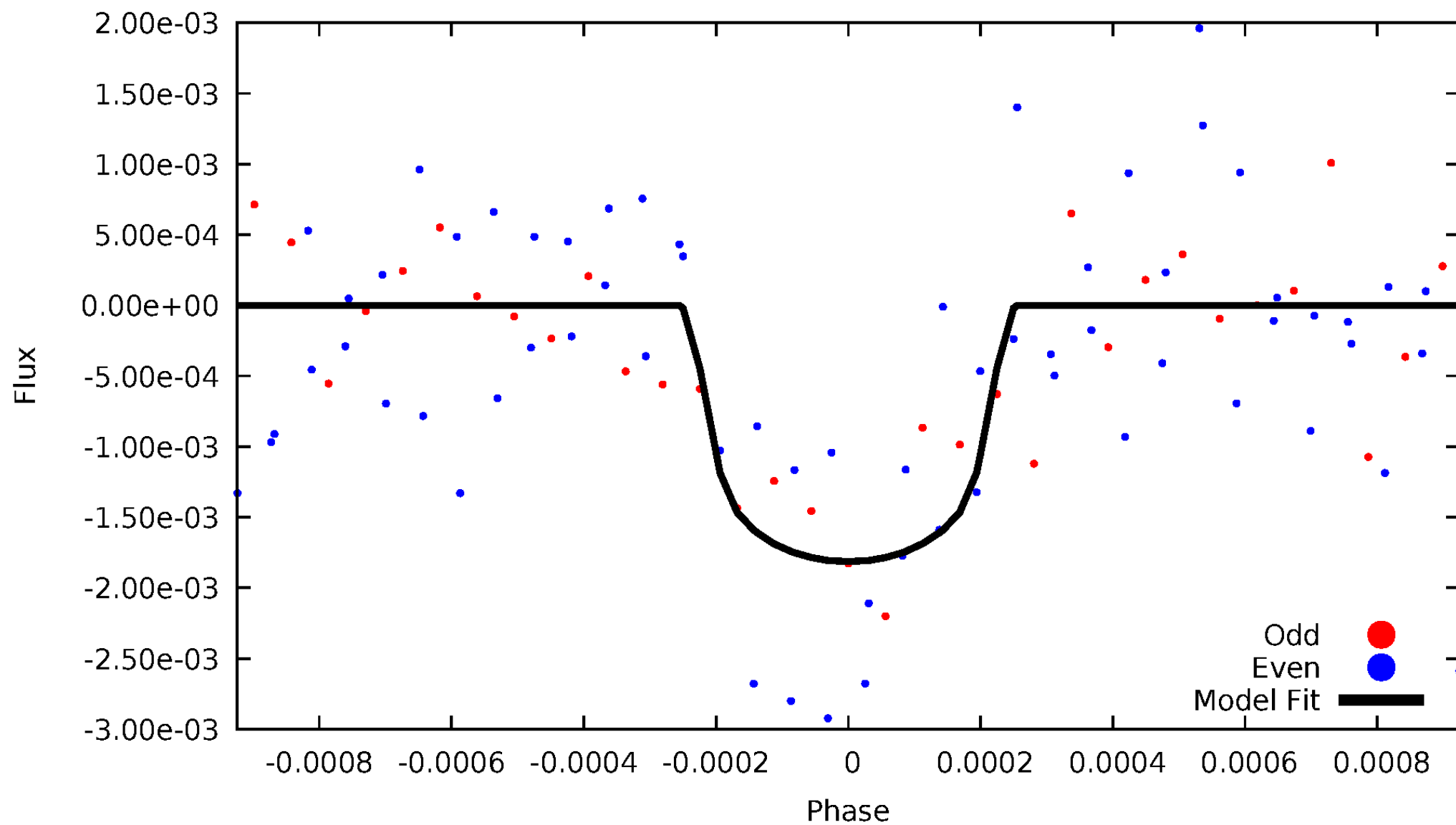


# TCE 010425070-03



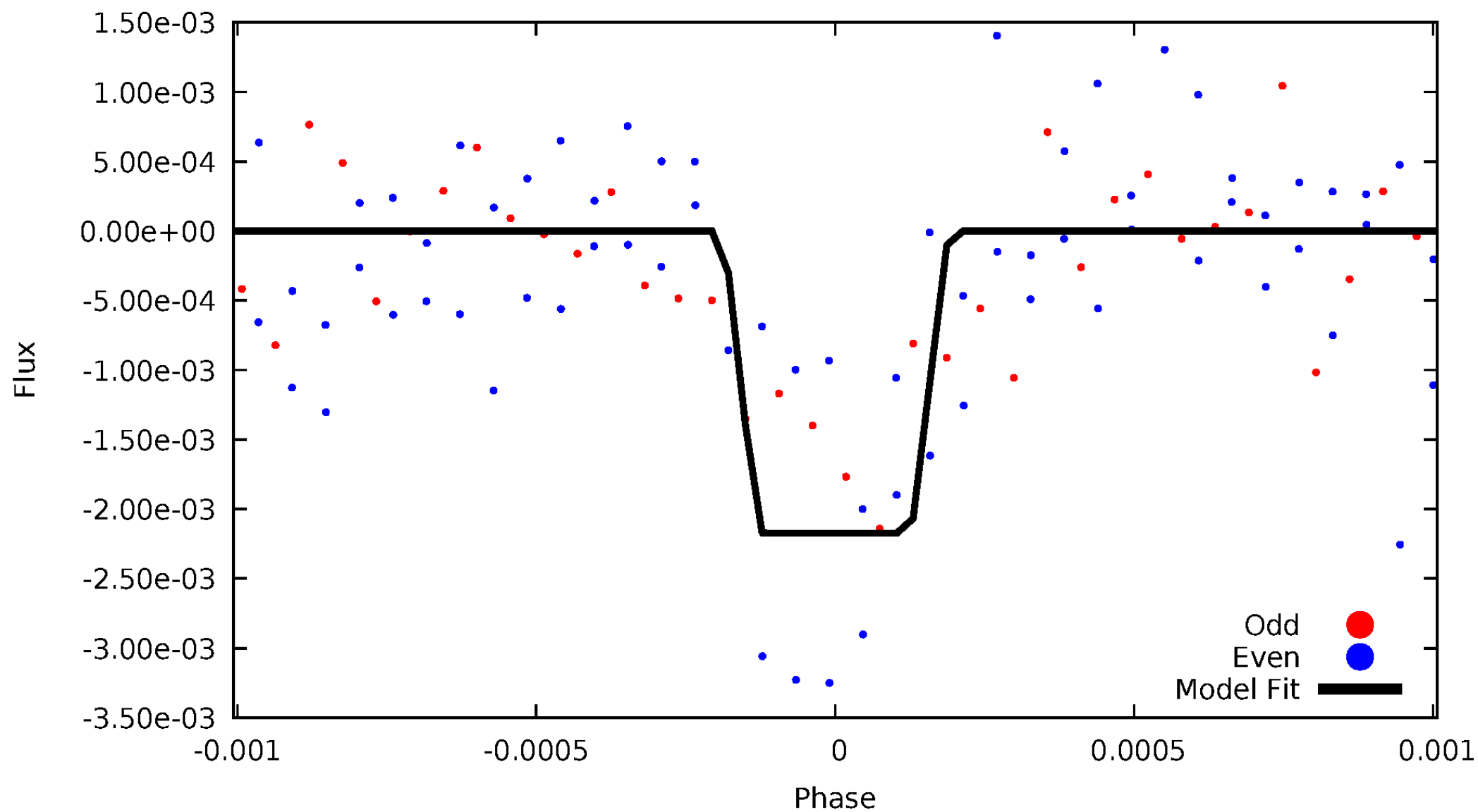
# DV Odd/Even

TCE 010425070-03



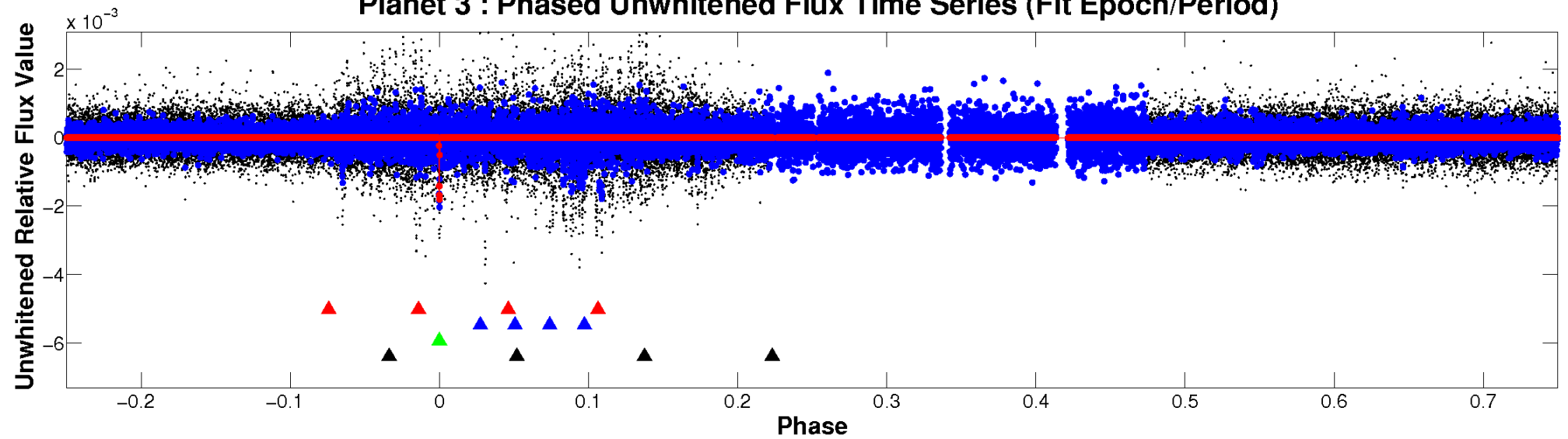
# ALT Odd/Even

TCE 010425070-03

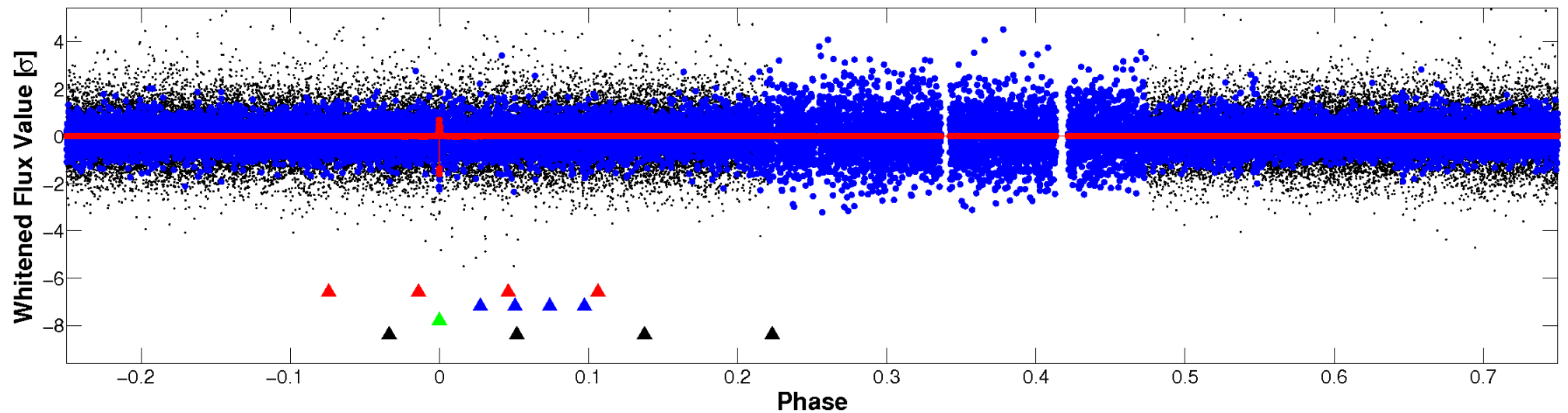


# Non-Whitened Vs. Whitened Light Curve

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

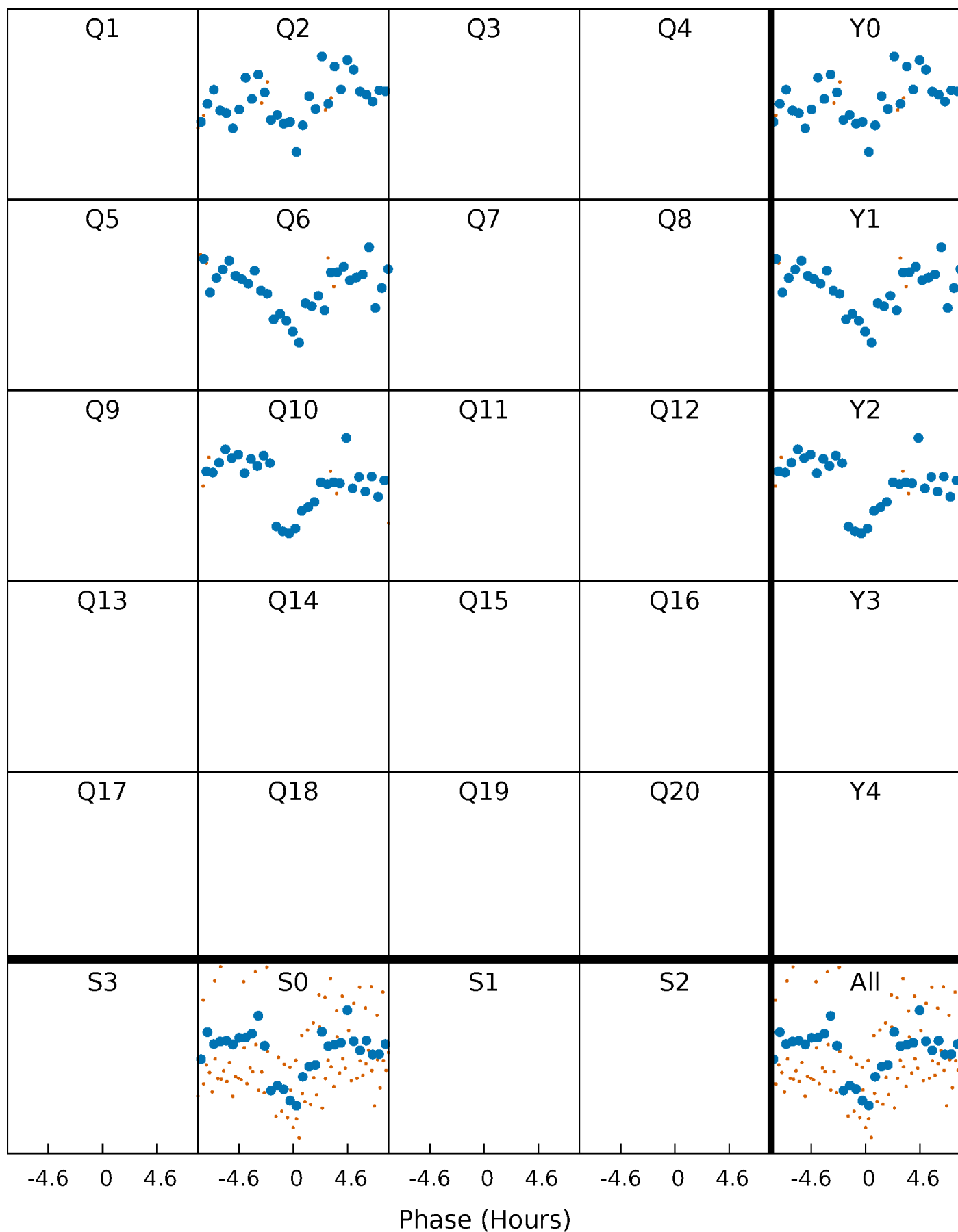


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

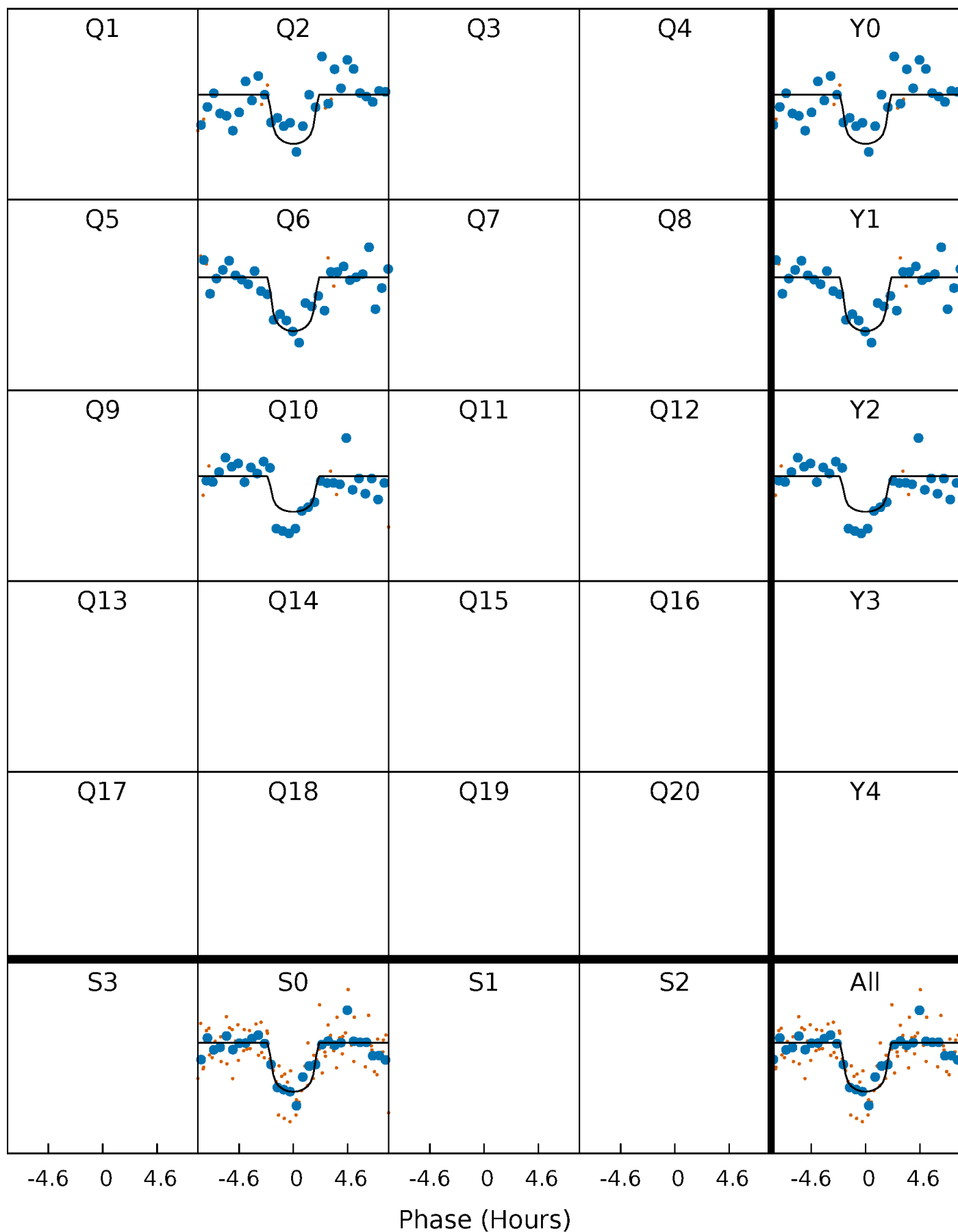
TCE 010425070-03     $P=363.974278$  Days     $T_0=198.974406$  (BKJD)





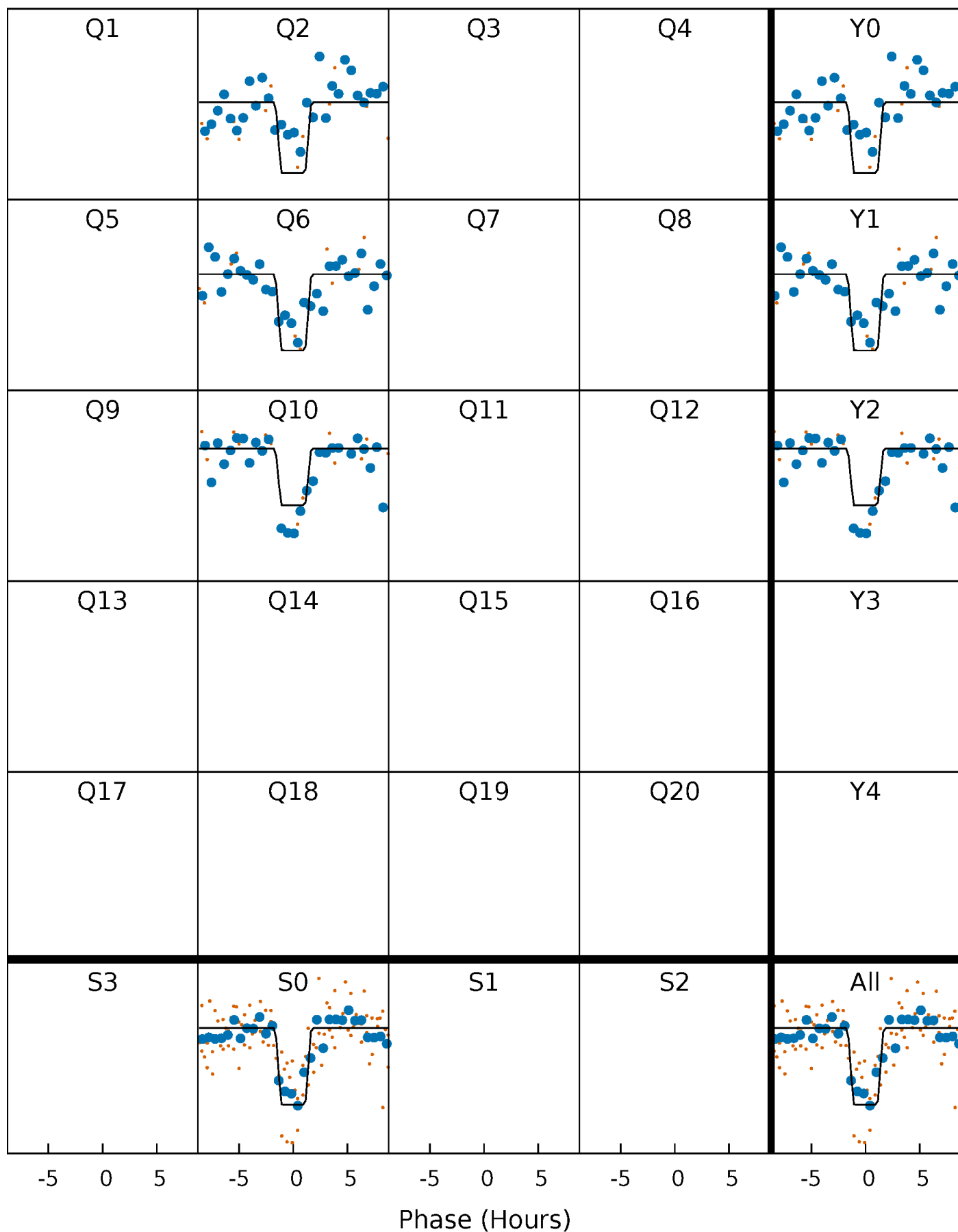
# DV Quarter-Phased Transit Curves

TCE 010425070-03     $P=363.974278$  Days     $T_0=198.974406$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

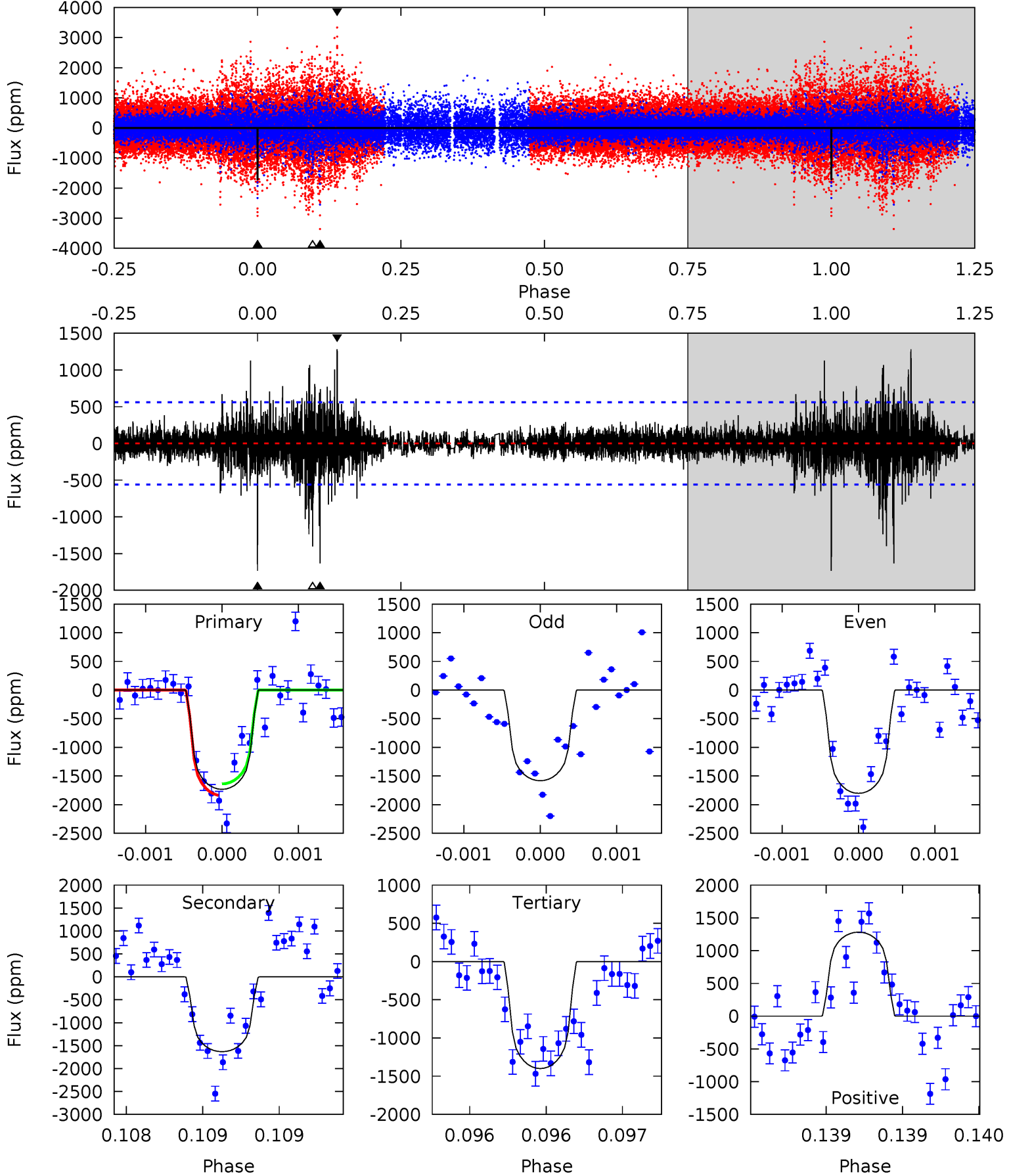
TCE 010425070-03     $P=363.973187$  Days     $T_0=198.968946$  (BKJD)



# DV Model-Shift Uniqueness Test

010425070-03, P = 363.974278 Days, E = 198.974406 Days

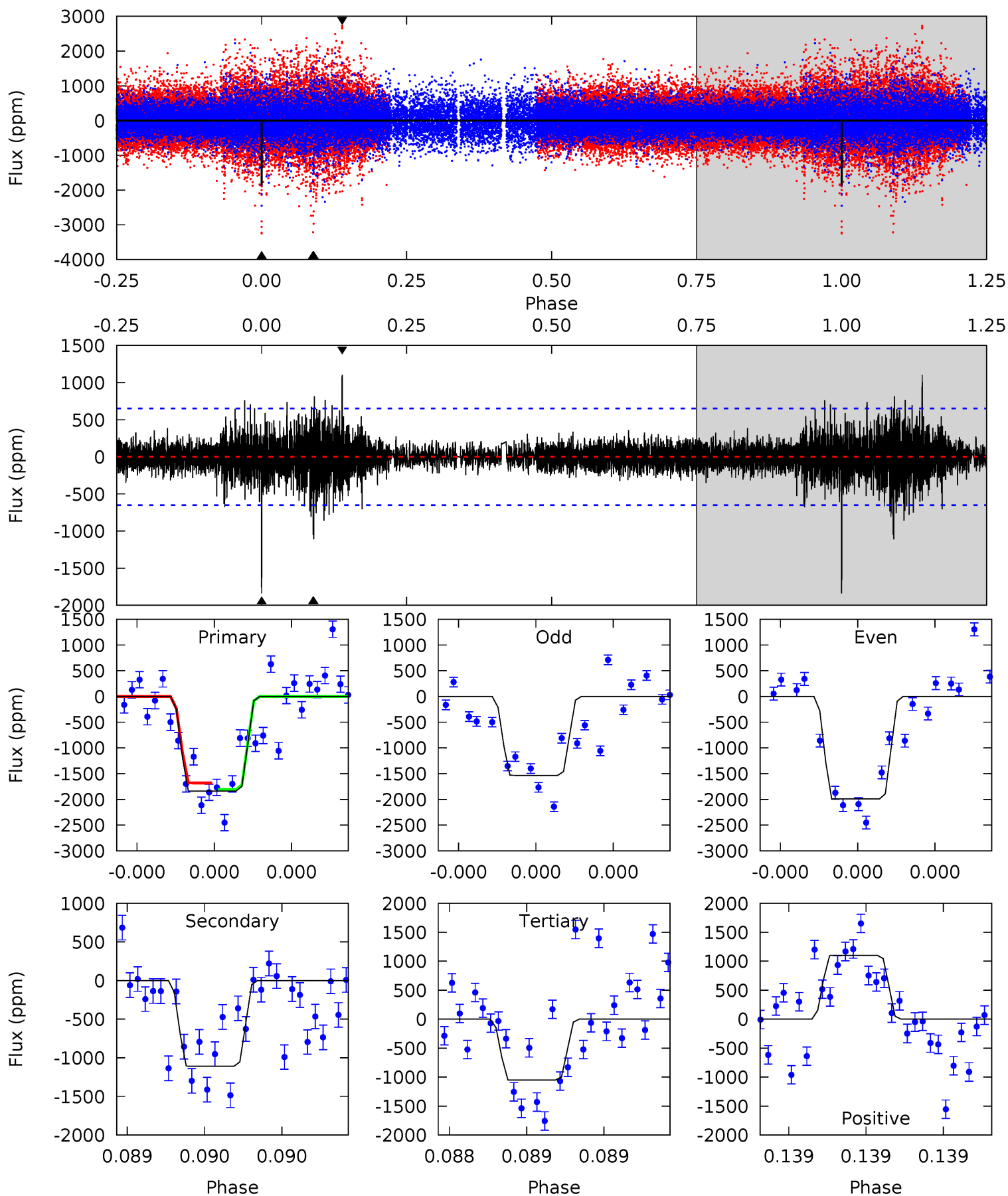
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	16.2	13.9	12.7	5.56	3.46	1.73	3.30	4.47	2.31	3.48	1.00	1.10	0.43	0.96



# Alt Model-Shift Uniqueness Test

010425070-03, P = 363.973187 Days, E = 198.968946 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
15.9	9.58	9.08	9.52	5.63	3.56	1.35	6.81	6.37	0.50	0.06	1.79	1.20	0.37	0.51



### Stellar Parameters For KIC 010425070

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5648^{+169}_{-152}$	$4.559^{+0.034}_{-0.184}$	$-0.100^{+0.300}_{-0.300}$	$0.841^{+0.233}_{-0.078}$	$0.939^{+0.094}_{-0.104}$	$2.221^{+0.409}_{-1.089}$
	+3%/-3%	+1%/-4%	+300%/-300%	+28%/-9%	+10%/-11%	+18%/-49%
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 010425070-03 / KOI 8208.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1633 \pm 101$	$4.40^{+3.48}_{-2.73}$	$332^{+21}_{-14}$	$5363^{+3608}_{-1084}$	$44085^{+249159}_{-30405}$
Alt.	$-1109 \pm 116$	$5.15^{+3.40}_{-3.18}$	$331^{+21}_{-15}$	$4613^{+2652}_{-805}$	$21398^{+129799}_{-13619}$

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

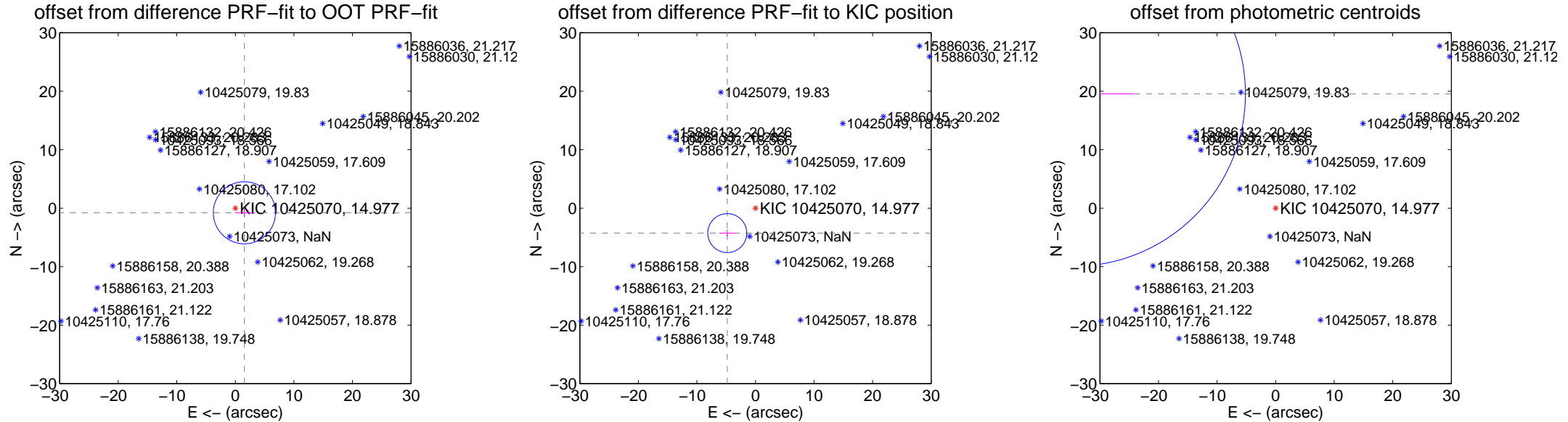
## DV Centroid Data

Supplemental centroid analysis for 010425070-03. Kepler magnitude: 14.98. Transit SNR 7.30

There are 0 quarters with good PRF difference image offsets

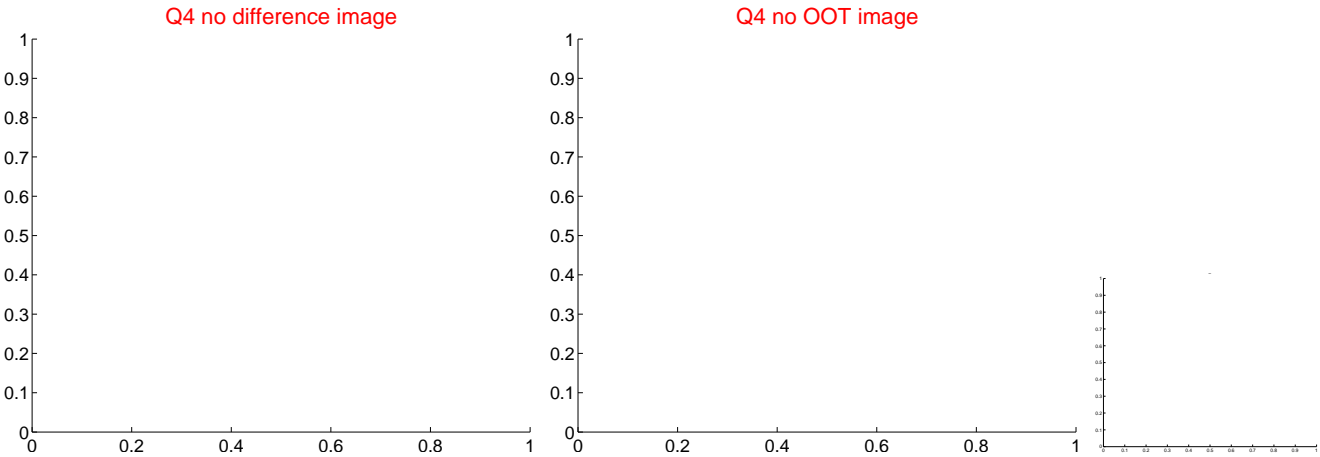
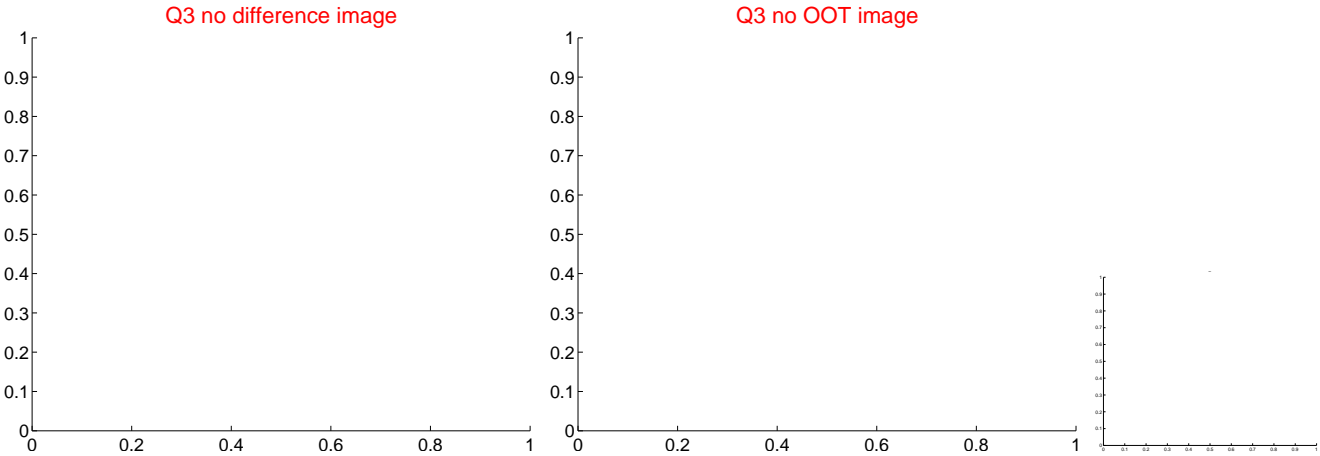
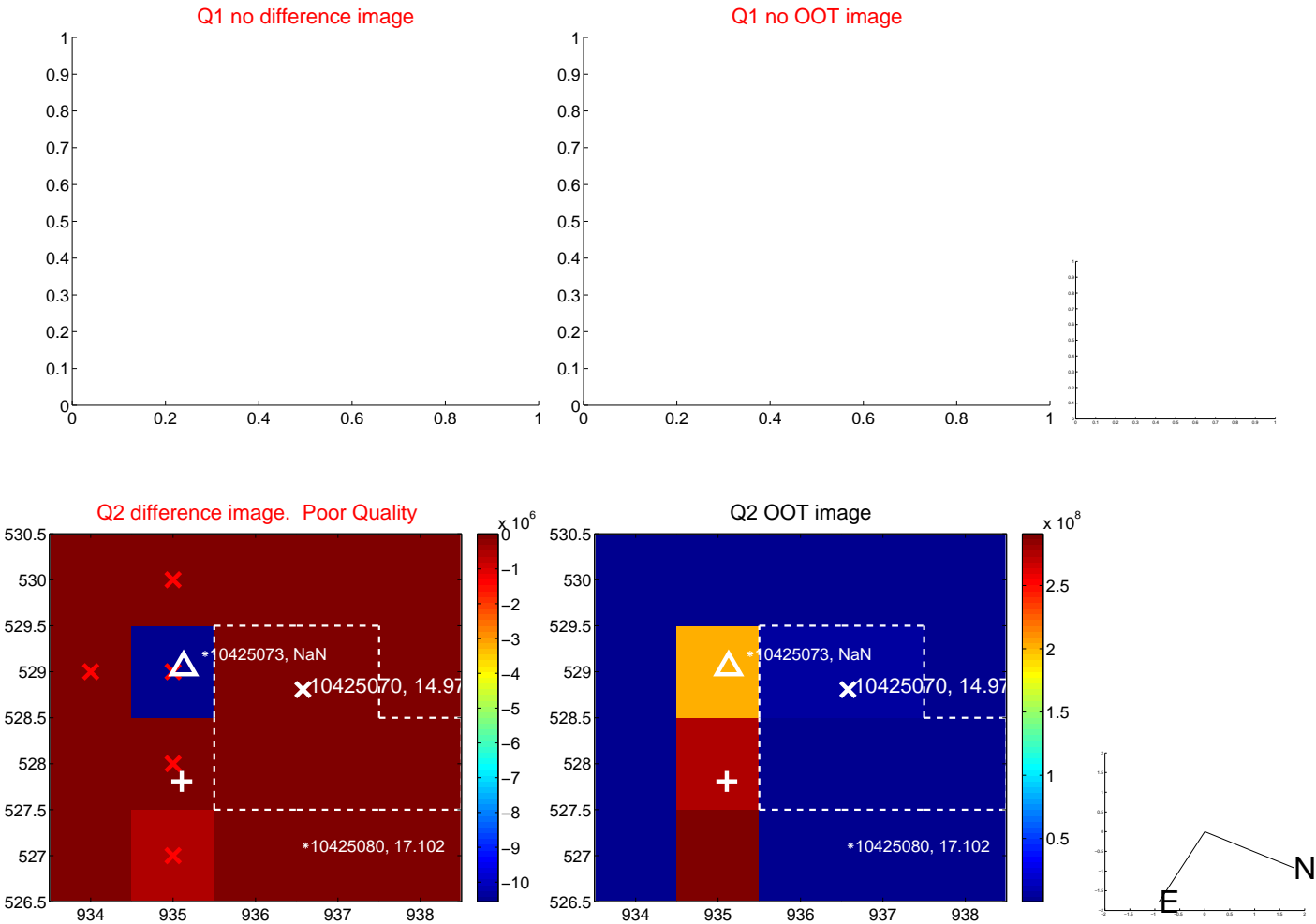
The OOT PRF centroid is offset from the target star catalog position by about 7.28 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.736 \pm 1.768$	0.98	$-1.546 \pm 1.587$	$-0.789 \pm 0.783$
PRF-fit source offset from KIC position	$6.433 \pm 1.109$	5.80	$4.819 \pm 1.371$	$-4.262 \pm 0.633$
photometric centroid source offset	$39.79 \pm 9.83$	4.05	$34.66 \pm 10.49$	$19.54 \pm 7.41$

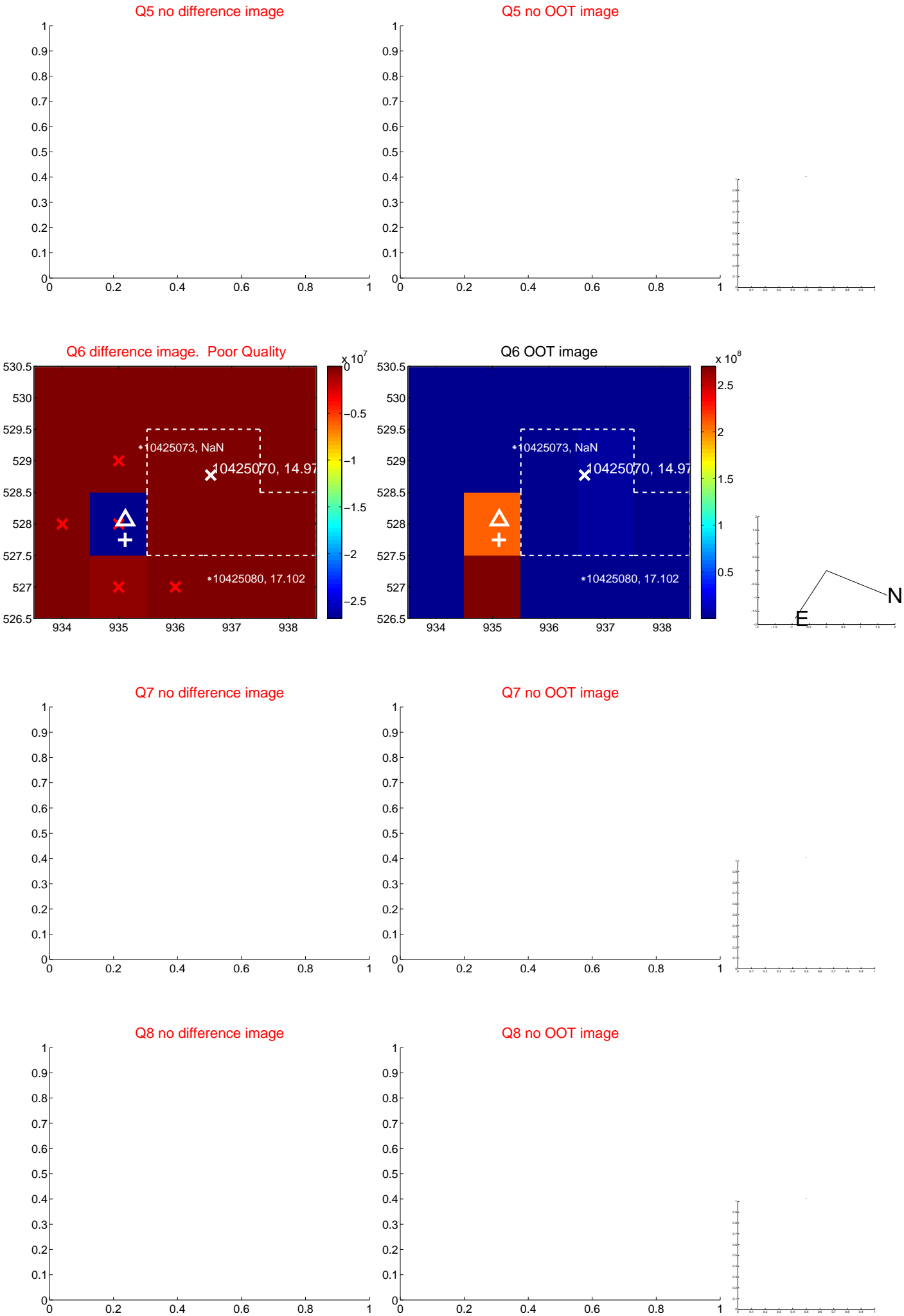


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

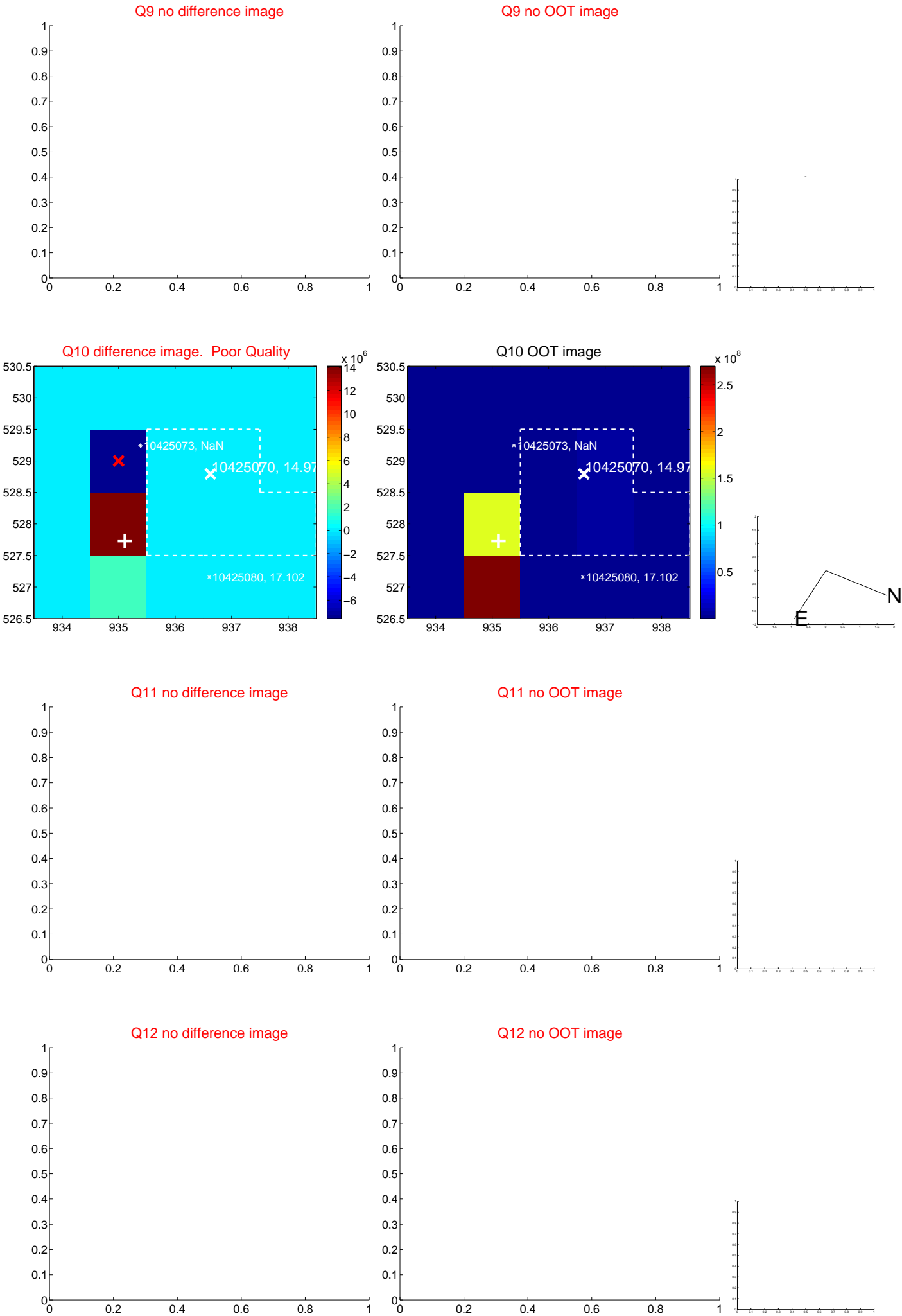


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





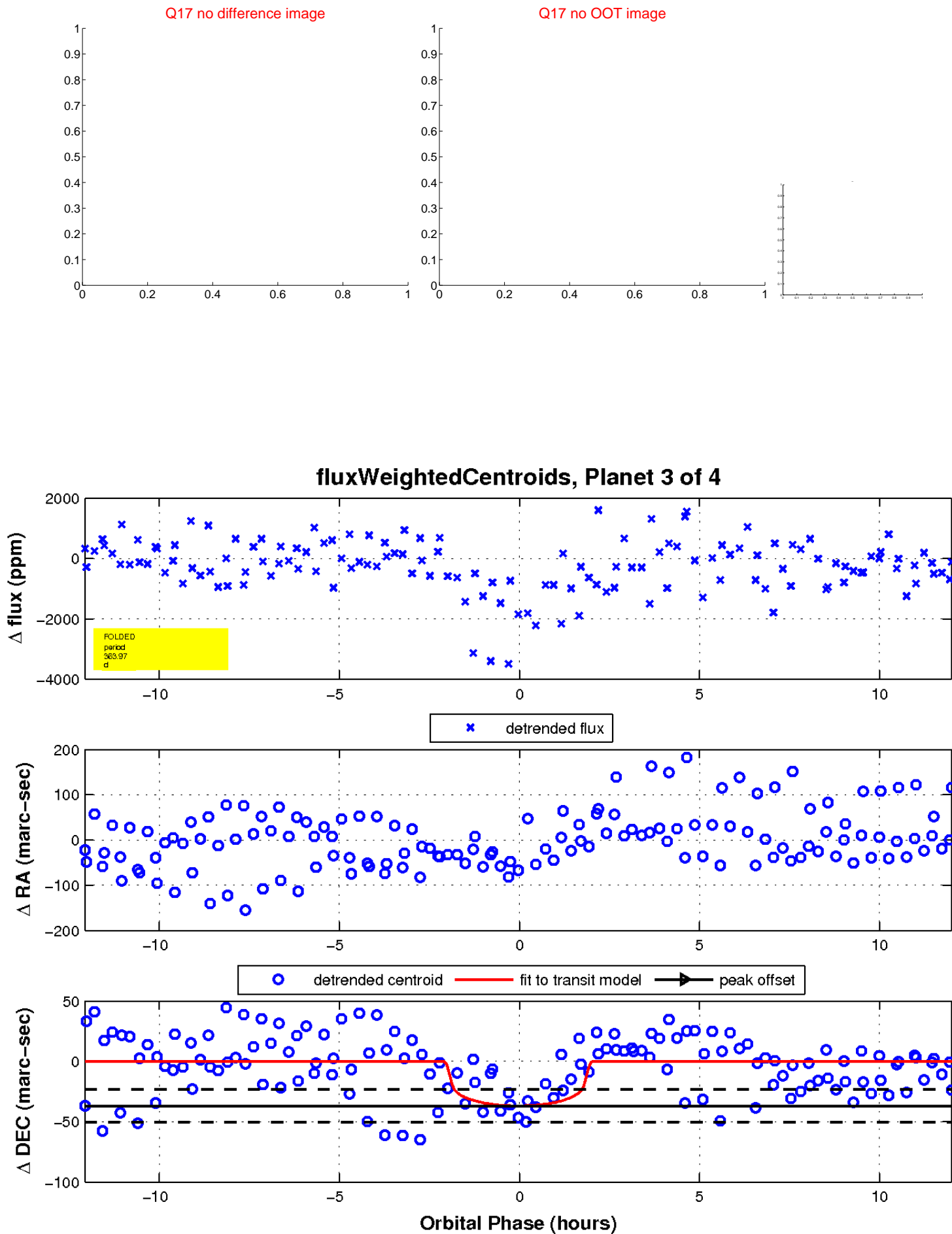
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

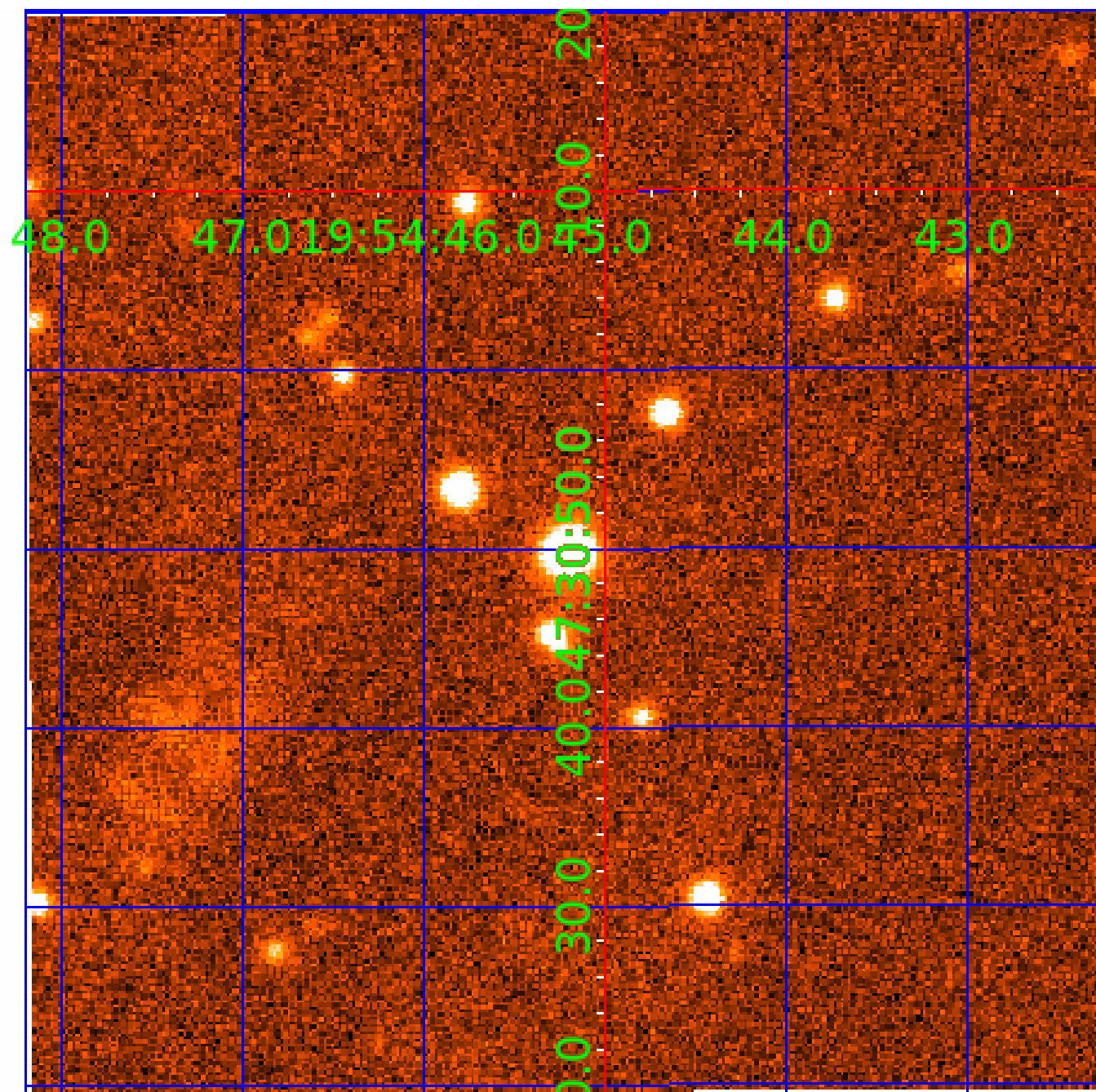


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010425070

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010425070-01	OBS	No	385.880098	171.977936	1501.5	17.994	11.5	9.4	0.84	5648	3.77	0.63
010425070-02	OBS	No	372.443978	208.977167	1455.4	4.580	7.6	7.0	0.84	5648	3.41	0.66
010425070-03	OBS	8208.01	363.974278	198.974406	1813.6	4.035	7.4	7.3	0.84	5648	3.65	0.68
010425070-04	OBS	8208.02	395.139652	186.722706	2115.1	20.431	7.1	7.6	0.84	5648	4.58	0.61

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010425070-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-03	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010425070-04	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

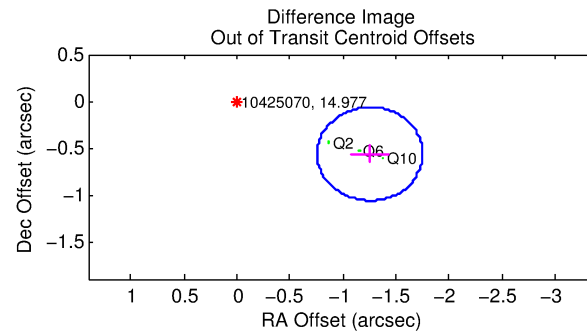
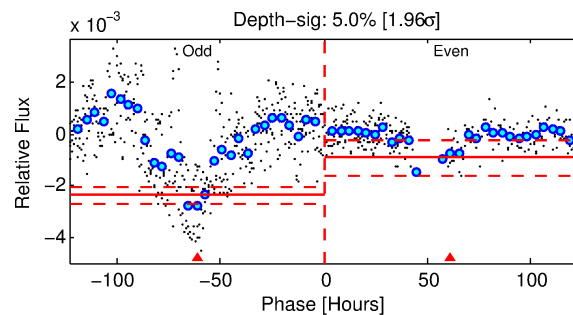
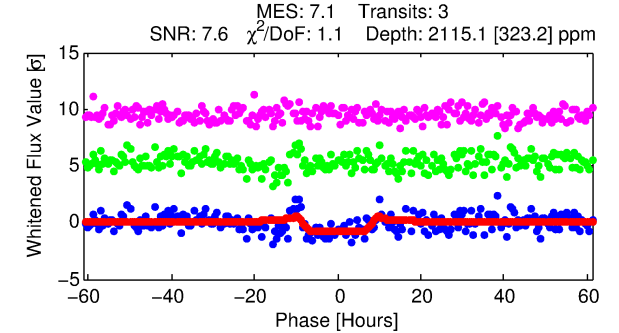
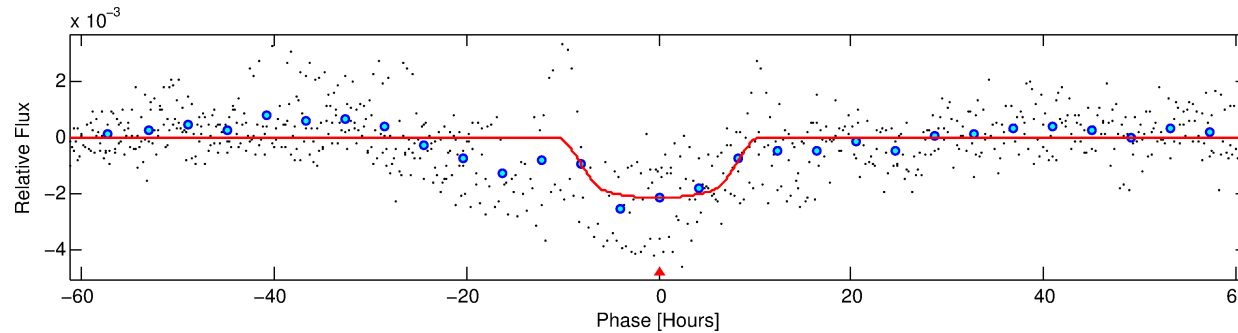
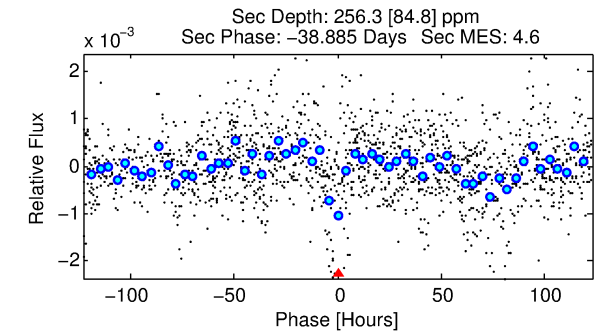
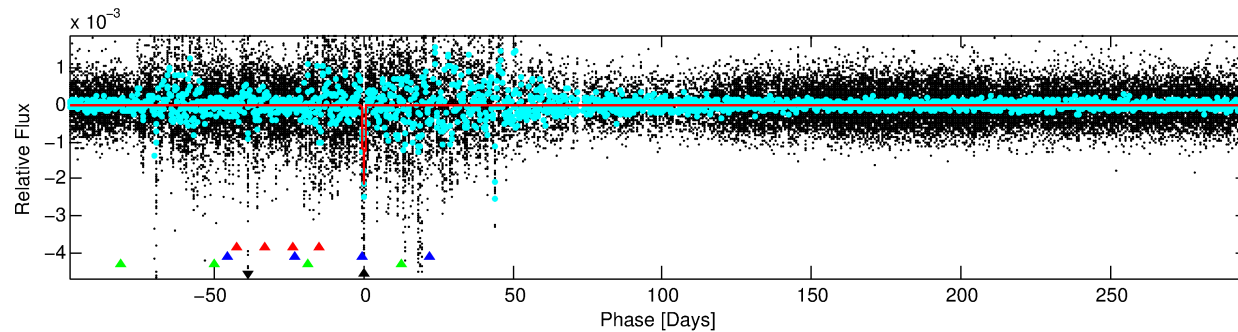
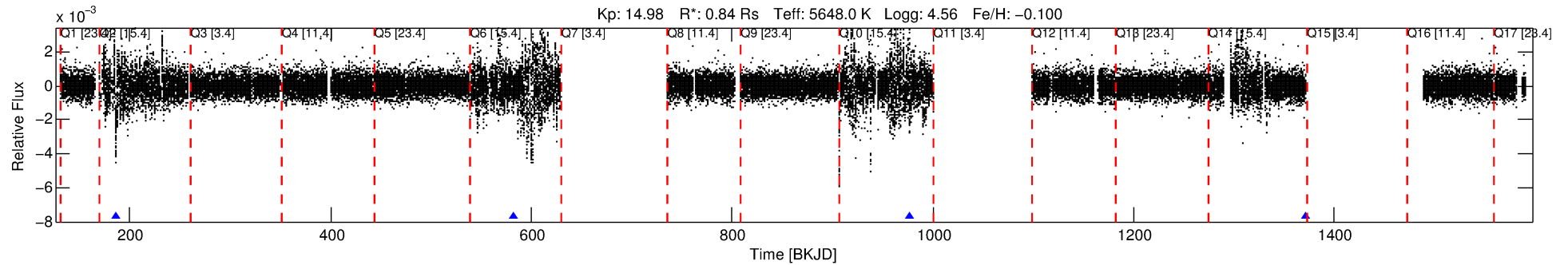
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010425070-04

No Significant Match Found

# DV One-Page Summary

KIC: 10425070 Candidate: 4 of 4 Period: 395.140 d



## DV Fit Results:

Period = 395.13965 [0.02280] d  
Epoch = 186.7227 [0.0297] BKJD  
 $R_p/R^*$  = 0.0499 [0.0045]  
 $a/R^*$  = 82.10 [14.59]  
 $b$  = 0.89 [0.04]  
 $S_{\text{eff}}$  = 0.61 [0.22]  
 $T_{\text{eq}}$  = 225 [20] K  
 $R_p$  = 4.58 [1.33]  $R_{\text{e}}$   
 $a$  = 1.0305 [0.2396] AU  
 $A_g$  = 7153.18 [3619.75] [1.98σ]  
 $T_{\text{eff}}$  = 3201 [317] K [9.38σ]

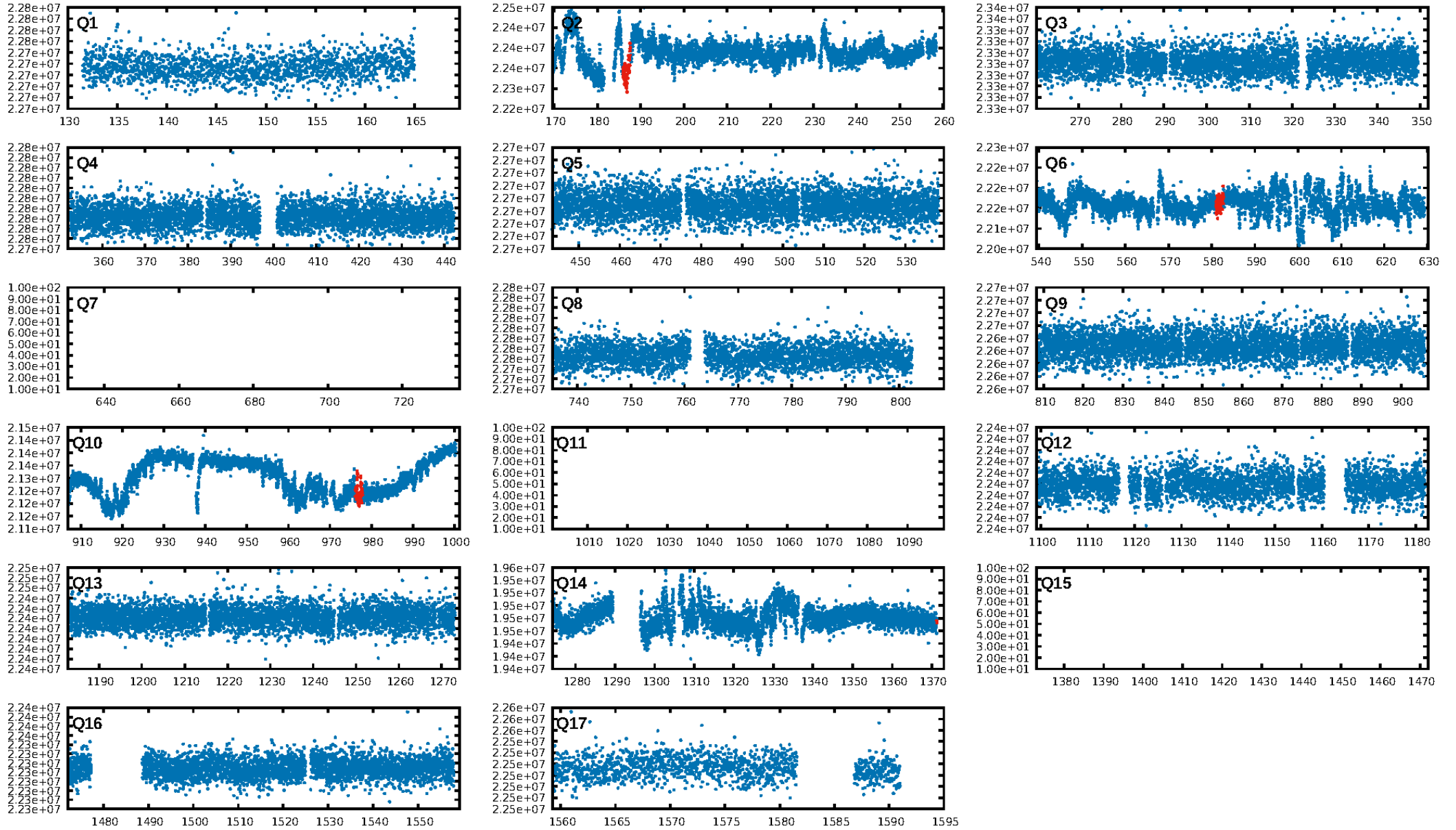
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.16σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 6.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 3.32e-07**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -1.445**  
Centroid-sig: N/A  
Centroid-so: 19.324 arcsec [2.18σ]  
**OotOffset-rm: 1.377 arcsec [8.29σ]**  
**KicOffset-rm: 6.375 arcsec [22.82σ]**  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.67 [2/3]

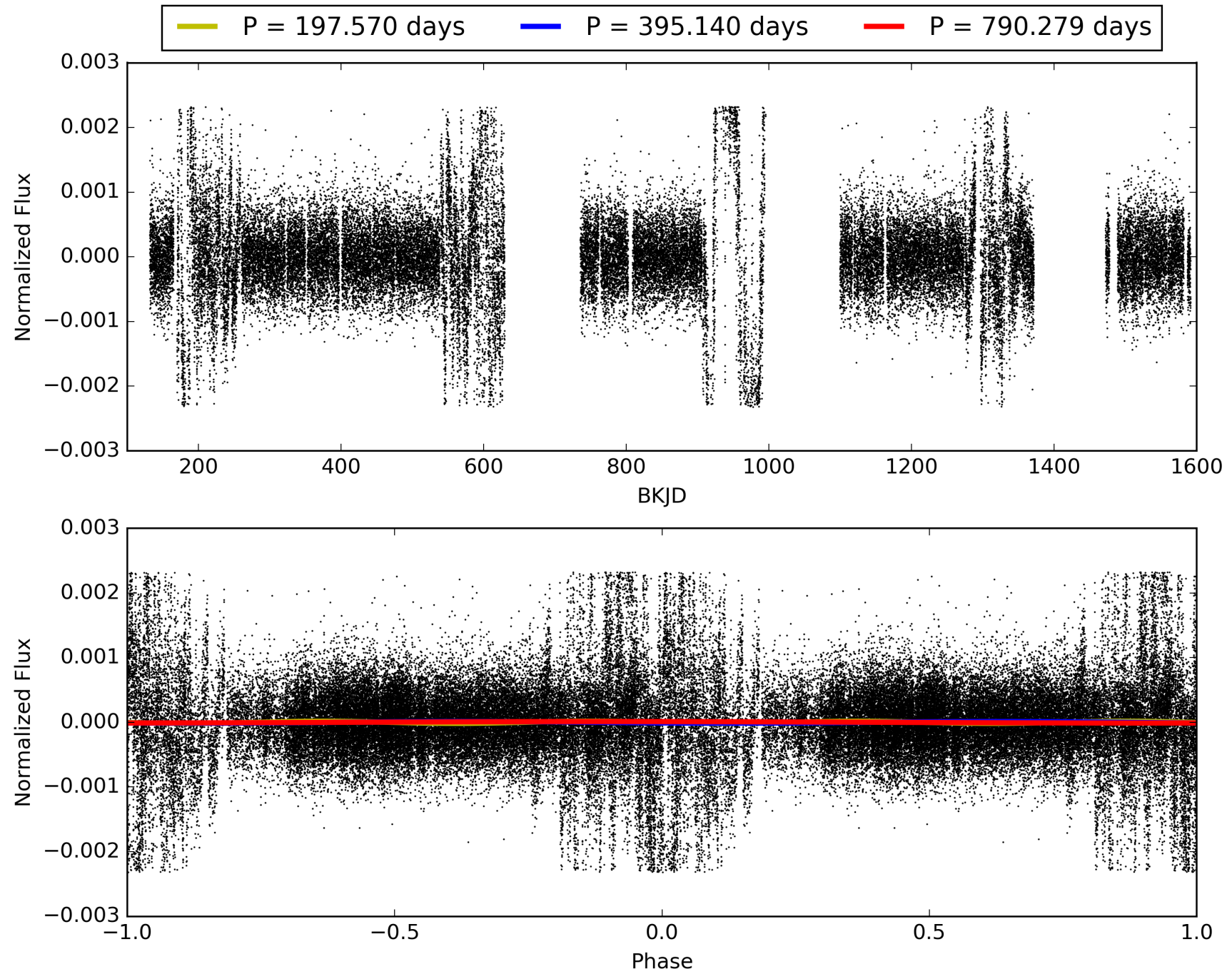
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:19:57 Z

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

# TCE 010425070-04, PDC Light Curves



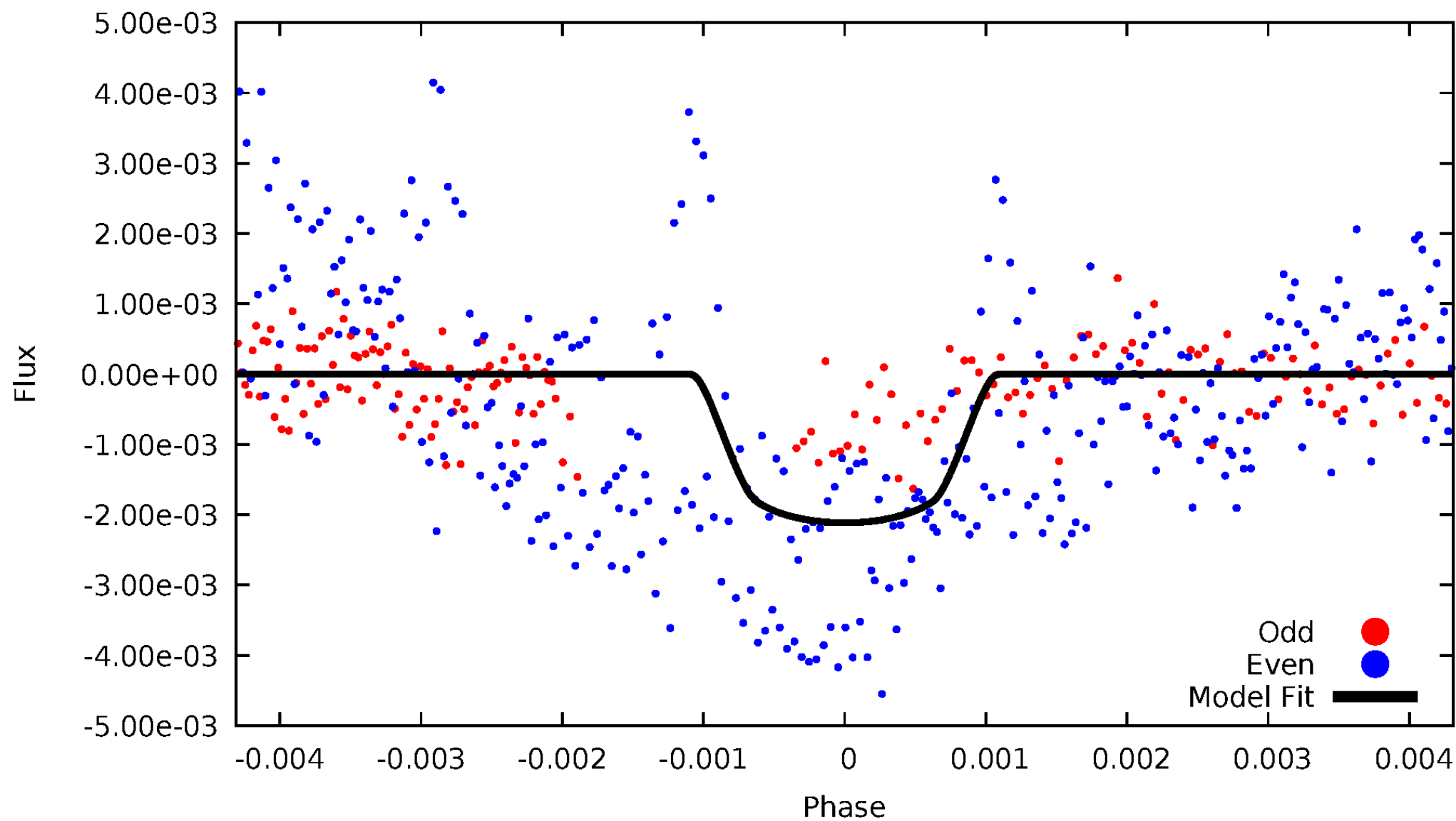
TCE 010425070-04





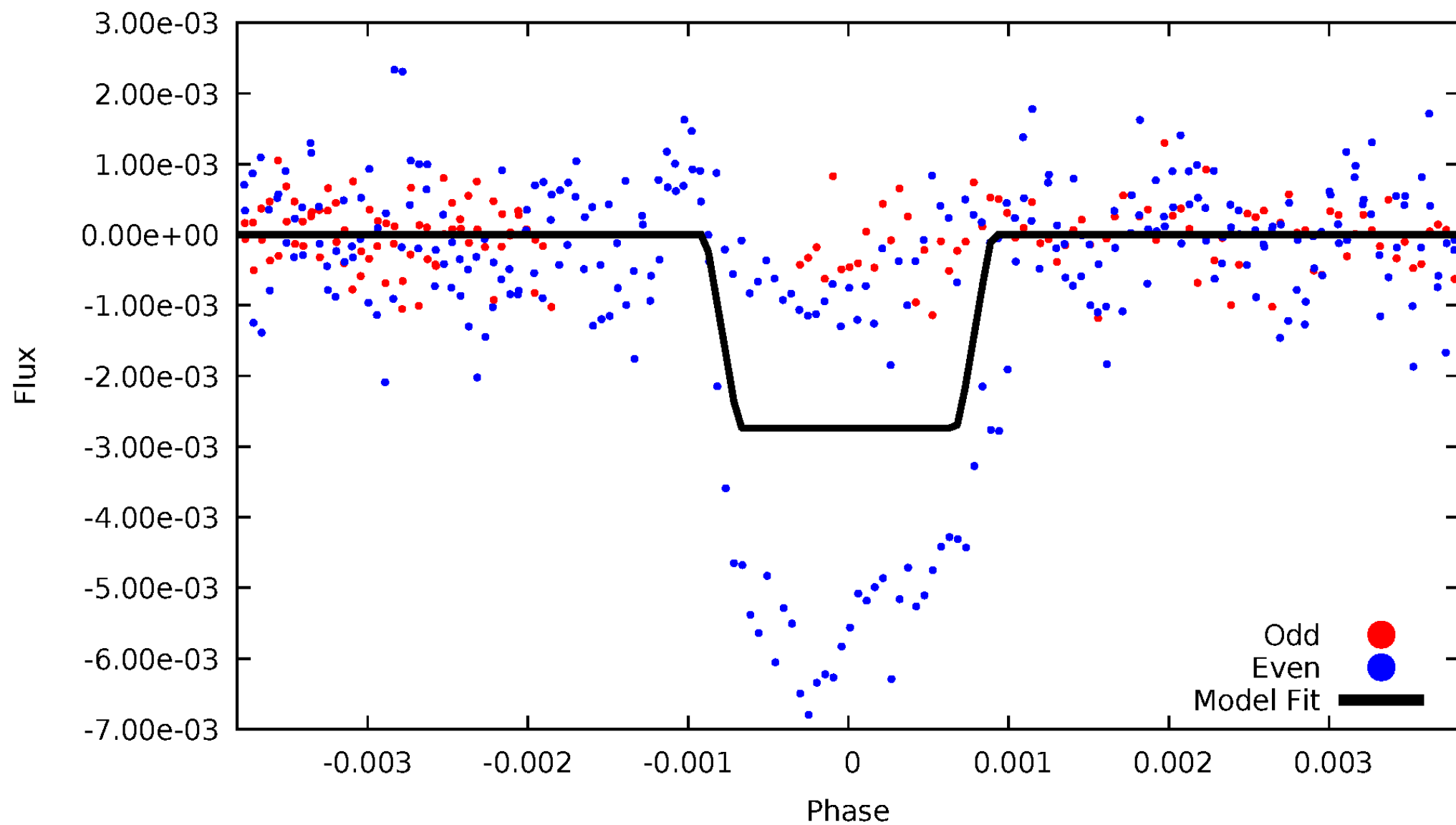
# DV Odd/Even

TCE 010425070-04



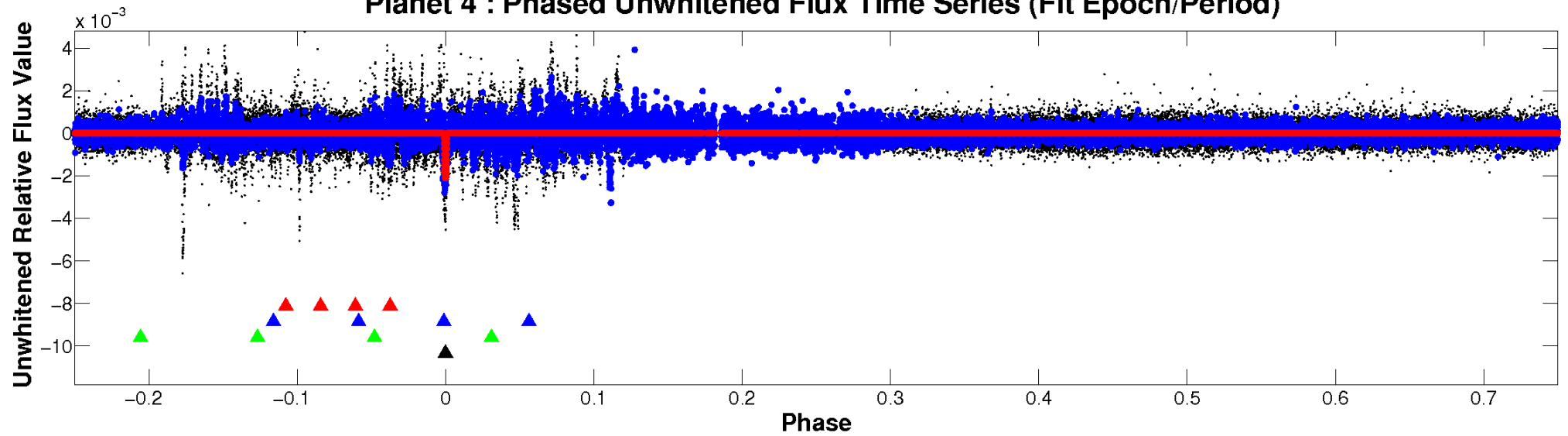
# ALT Odd/Even

TCE 010425070-04

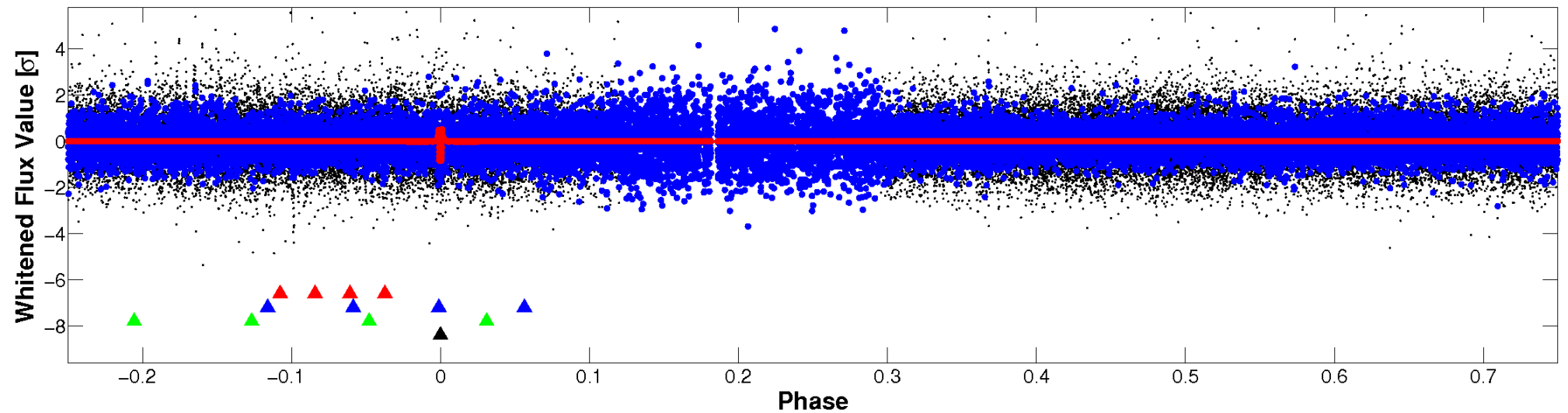


# Non-Whitened Vs. Whitened Light Curve

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



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



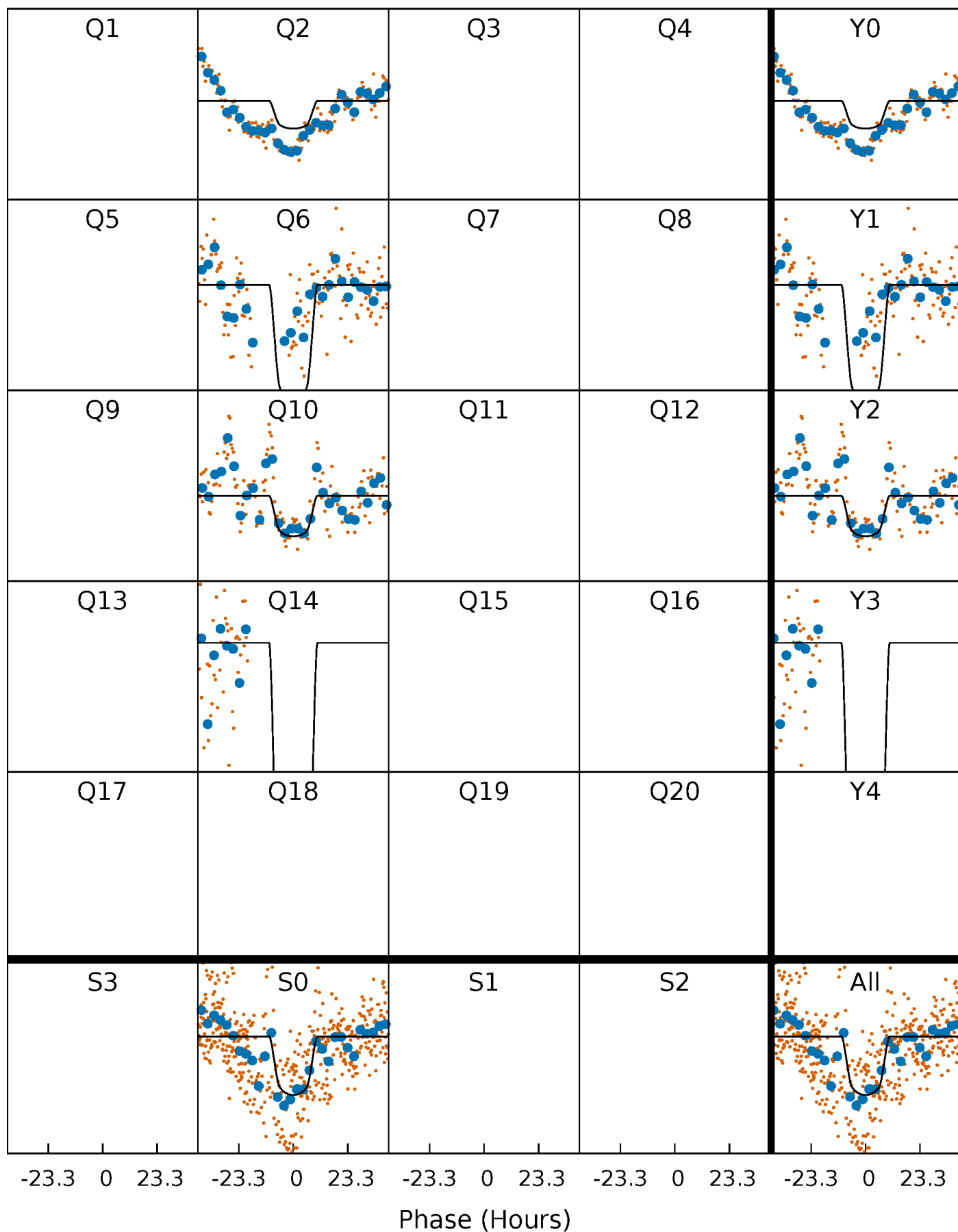
# PDC Quarter-Phased Transit Curves

TCE 010425070-04     $P=395.139652$  Days     $T_0=186.722706$  (BKJD)



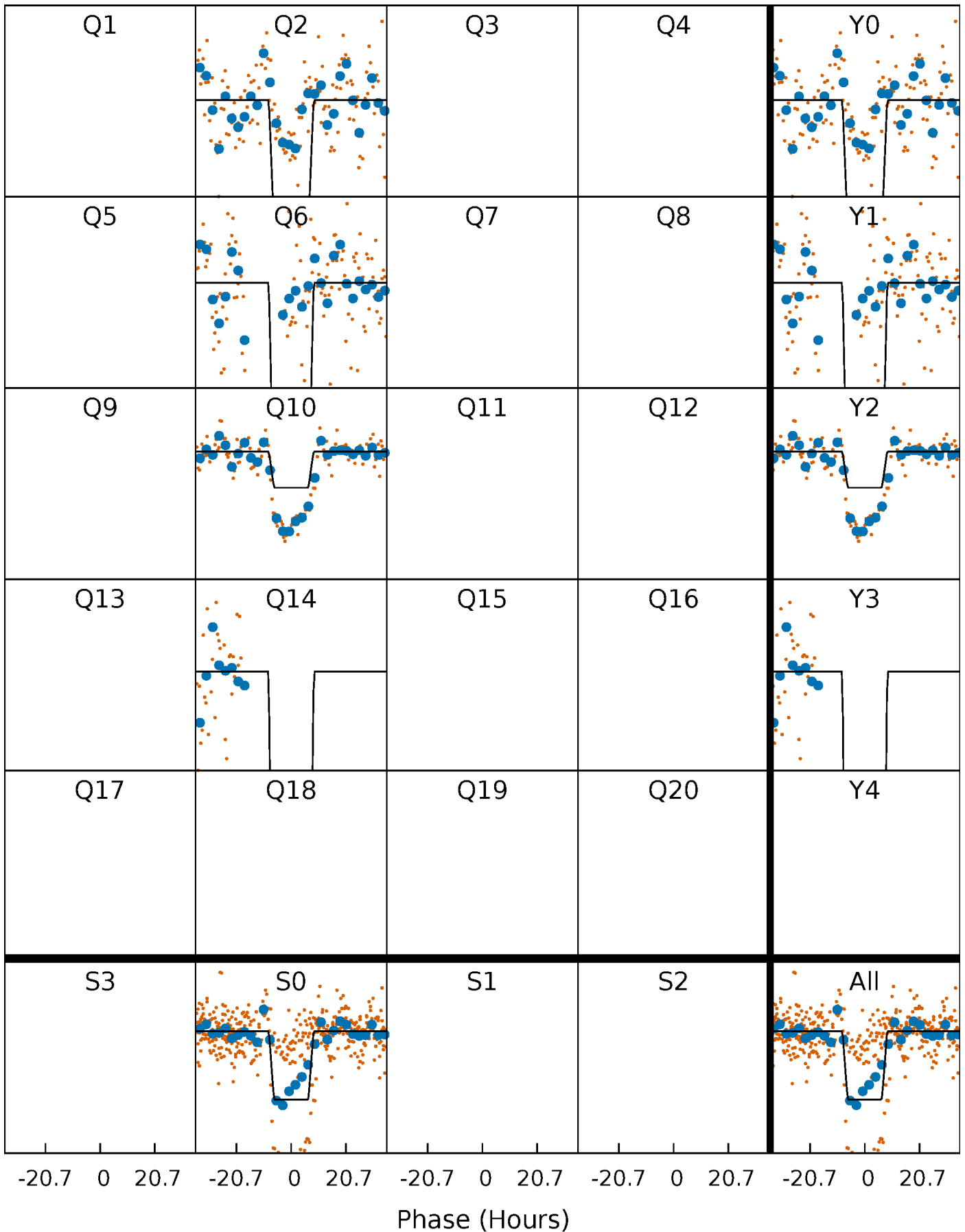
# DV Quarter-Phased Transit Curves

TCE 010425070-04     $P=395.139652$  Days     $T_0=186.722706$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

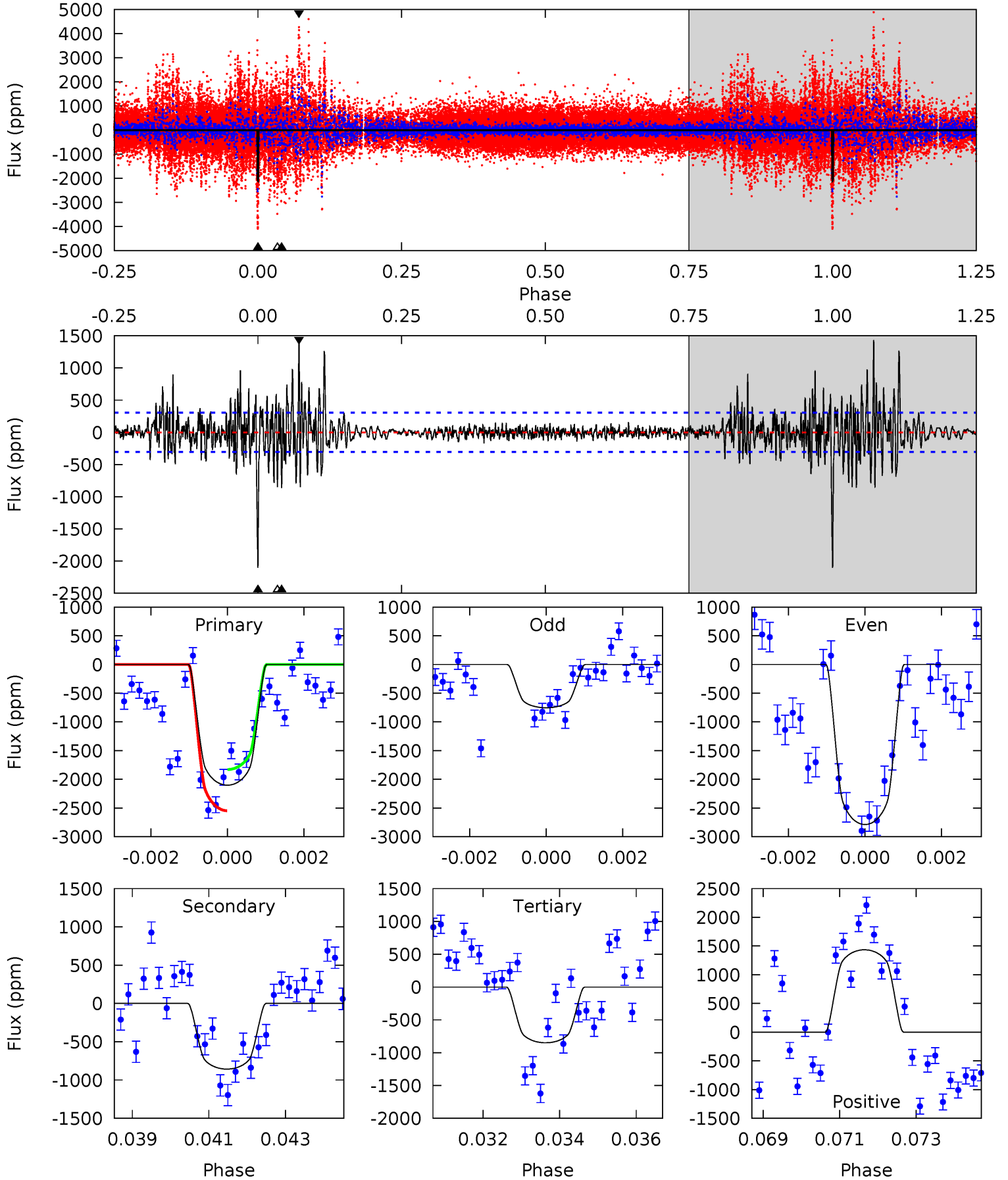
TCE 010425070-04     $P=395.123750$  Days     $T_0=186.723181$  (BKJD)



# DV Model-Shift Uniqueness Test

010425070-04, P = 395.139652 Days, E = 186.722706 Days

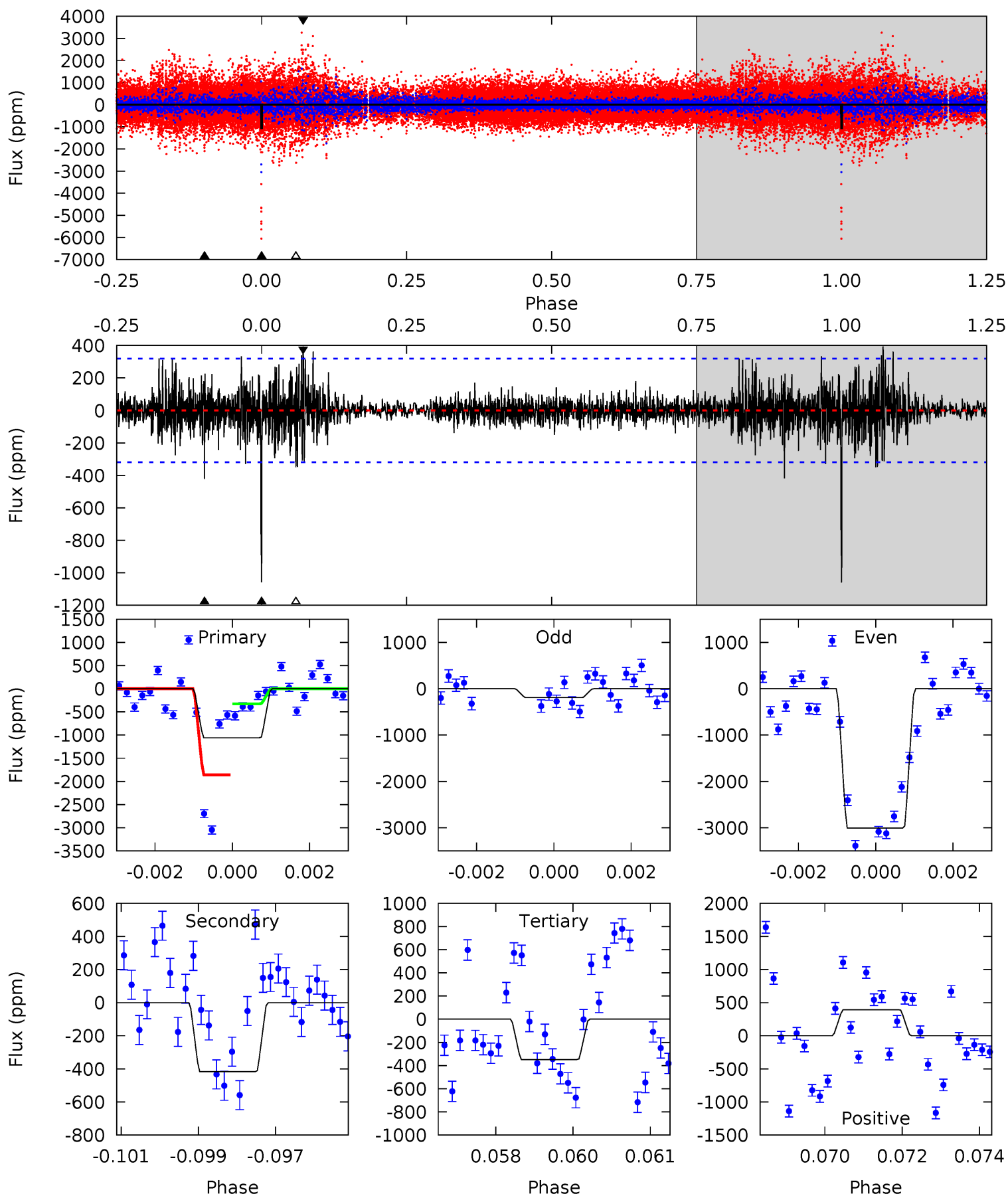
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.6	14.9	14.8	25.0	5.31	3.07	3.21	21.8	11.6	0.14	-10.1	15.2	1.16	0.41	6.20



# Alt Model-Shift Uniqueness Test

010425070-04, P = 395.123750 Days, E = 186.723181 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
17.7	6.99	5.84	6.58	5.35	3.12	1.15	11.9	11.1	1.15	0.41	23.5	3.49	0.27	0





### Stellar Parameters For KIC 010425070

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5648^{+169}_{-152}$	$4.559^{+0.034}_{-0.184}$	$-0.100^{+0.300}_{-0.300}$	$0.841^{+0.233}_{-0.078}$	$0.939^{+0.094}_{-0.104}$	$2.221^{+0.409}_{-1.089}$
	+3%/-3%	+1%/-4%	+300%/-300%	+28%/-9%	+10%/-11%	+18%/-49%
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 010425070-04 / KOI 8208.02

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-858 \pm 57$	$4.73^{+0.84}_{-0.56}$	$323^{+23}_{-14}$	$4514^{+225}_{-197}$	$21913^{+5952}_{-5699}$
Alt.	$-417 \pm 60$	$5.01^{+0.78}_{-0.58}$	$323^{+20}_{-13}$	$3872^{+185}_{-153}$	$9367^{+2866}_{-2377}$

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

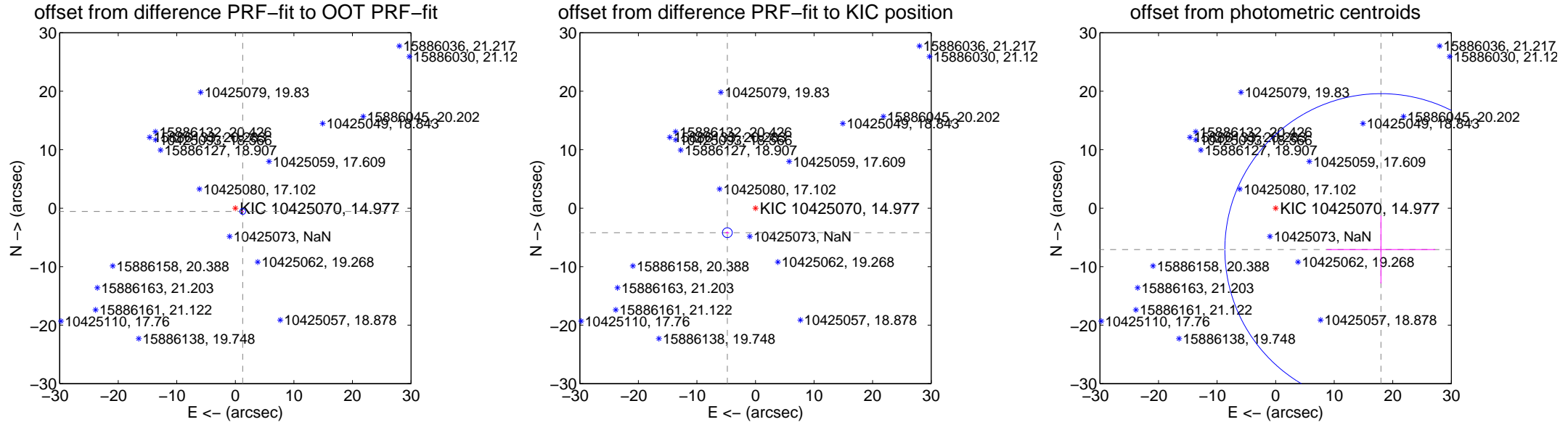
## DV Centroid Data

Supplemental centroid analysis for 010425070-04. Kepler magnitude: 14.98. Transit SNR 7.60

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 7.02 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

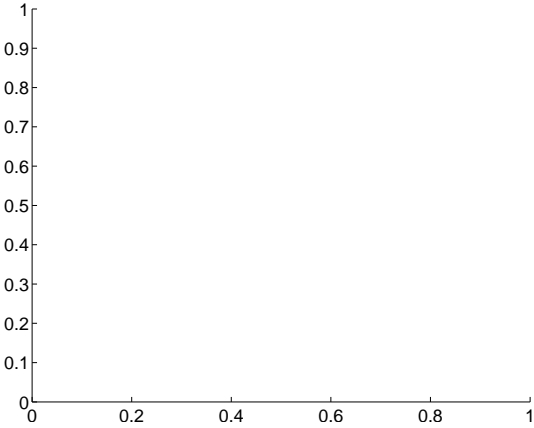
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.377 \pm 0.166$	8.29	$-1.256 \pm 0.178$	$-0.564 \pm 0.085$
PRF-fit source offset from KIC position	$6.375 \pm 0.279$	22.82	$4.806 \pm 0.327$	$-4.189 \pm 0.200$
photometric centroid source offset	$19.32 \pm 8.88$	2.18	$-17.98 \pm 9.27$	$-7.08 \pm 5.80$



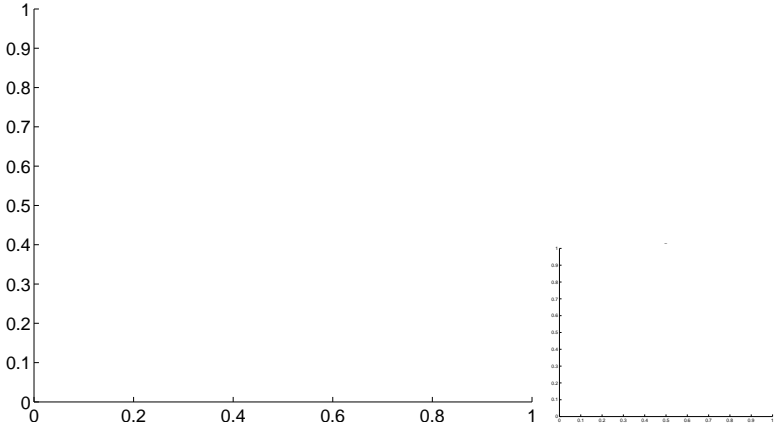
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

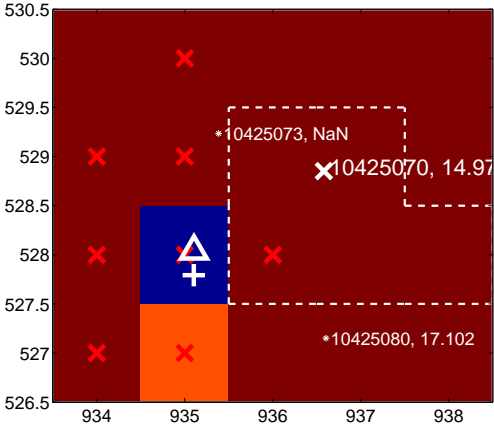
Q1 no difference image



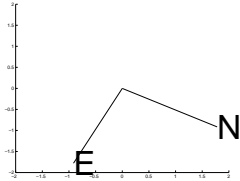
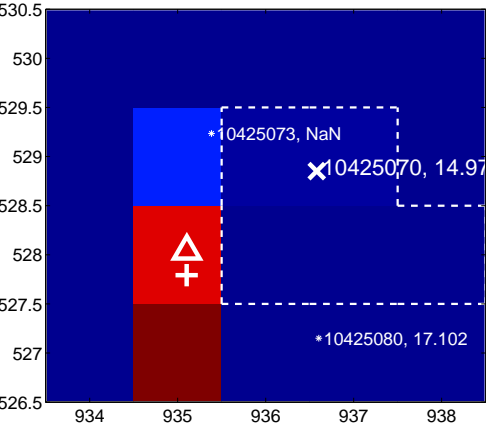
Q1 no OOT image



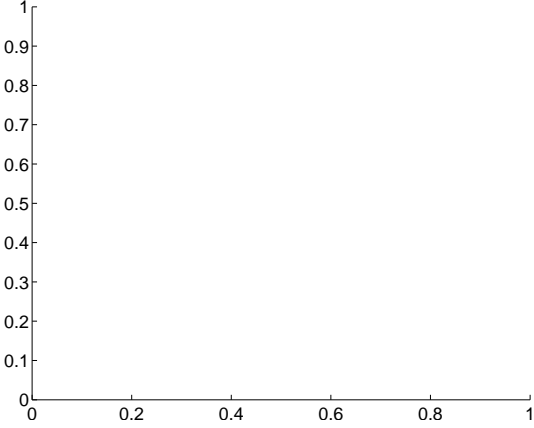
Q2 difference image. Poor Quality



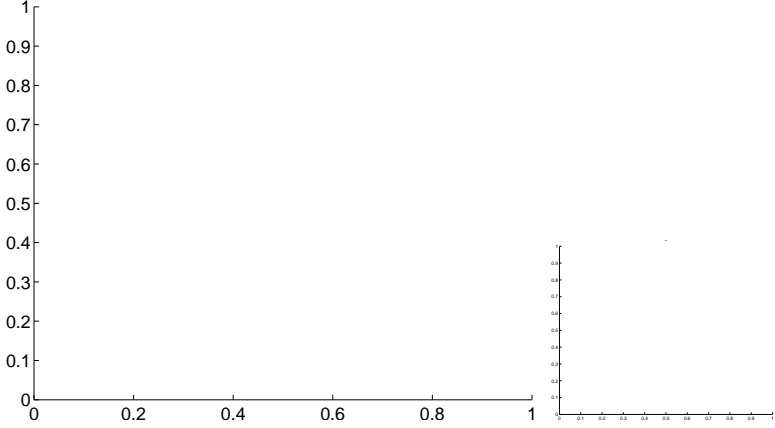
Q2 OOT image



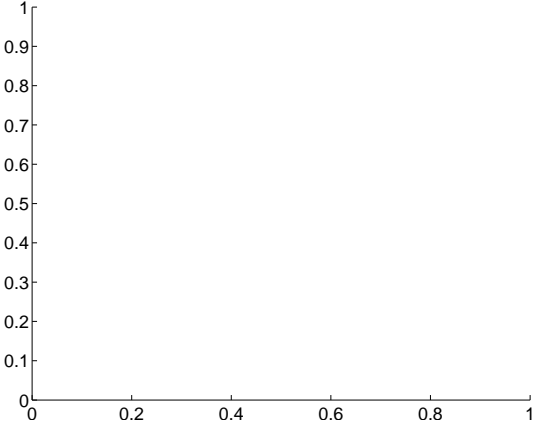
Q3 no difference image



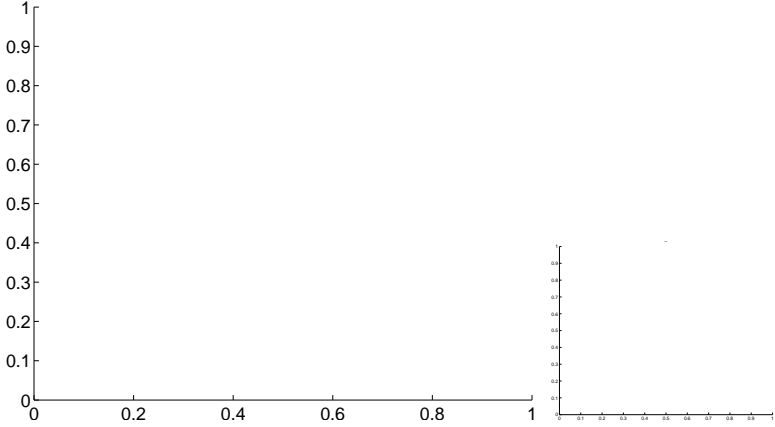
Q3 no OOT image



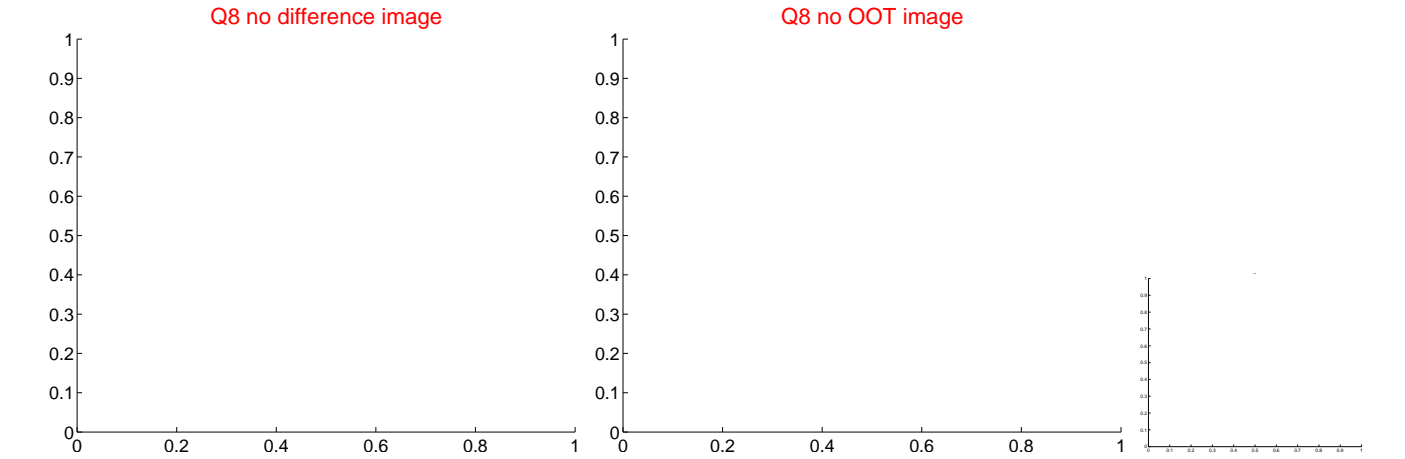
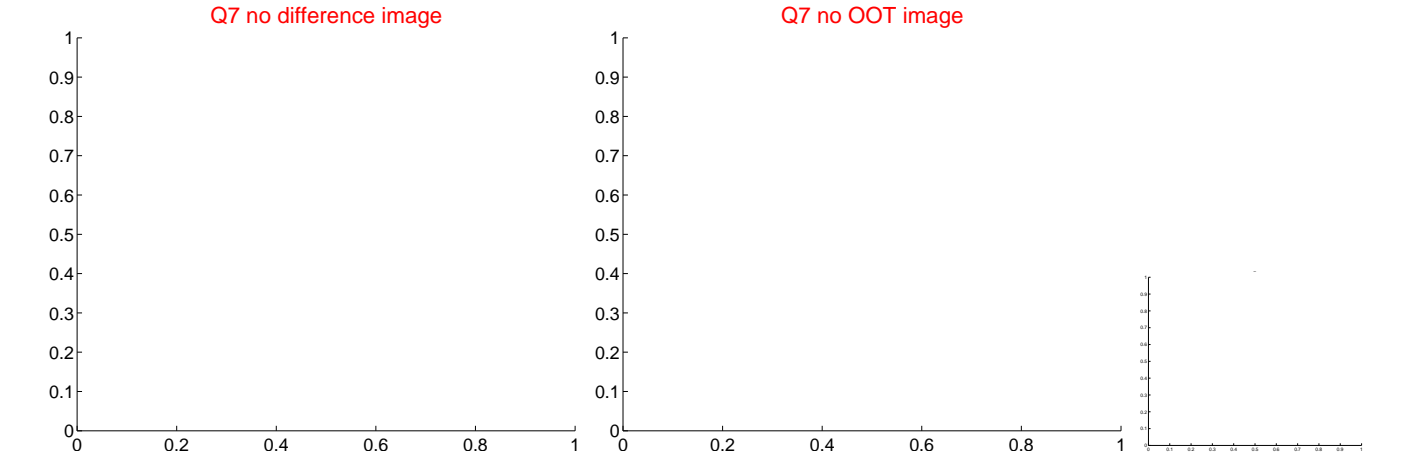
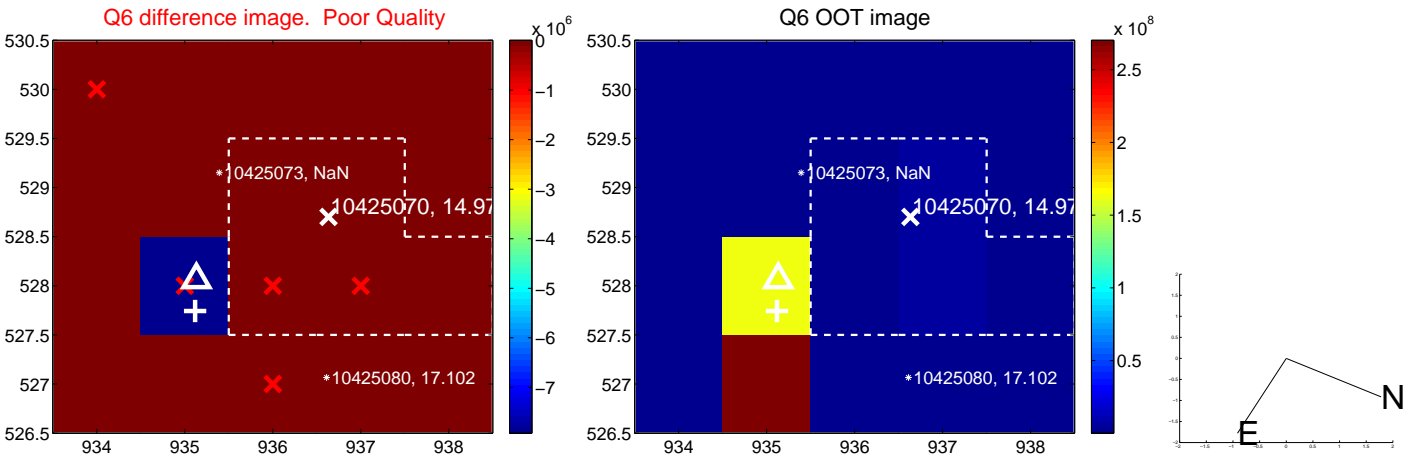
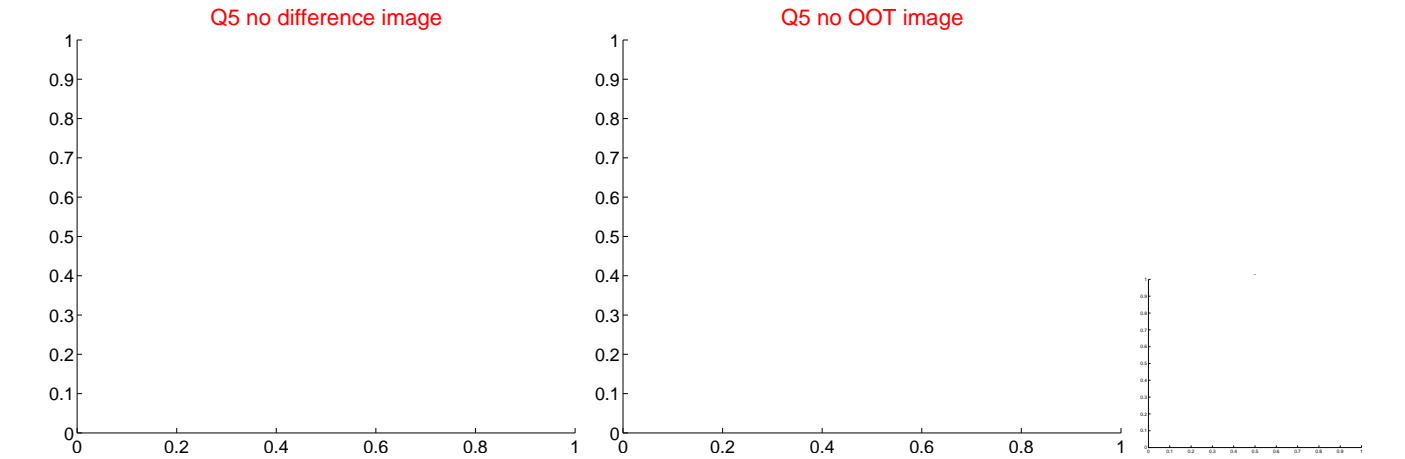
Q4 no difference image



Q4 no OOT image

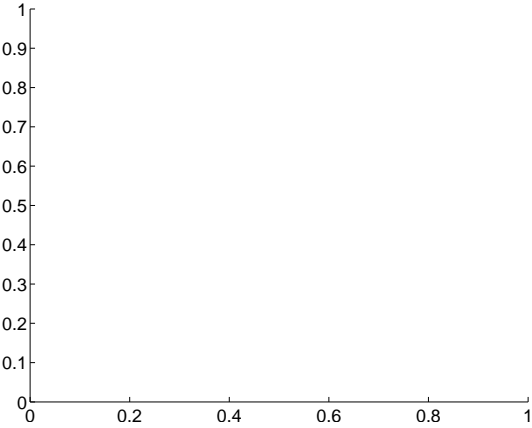


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

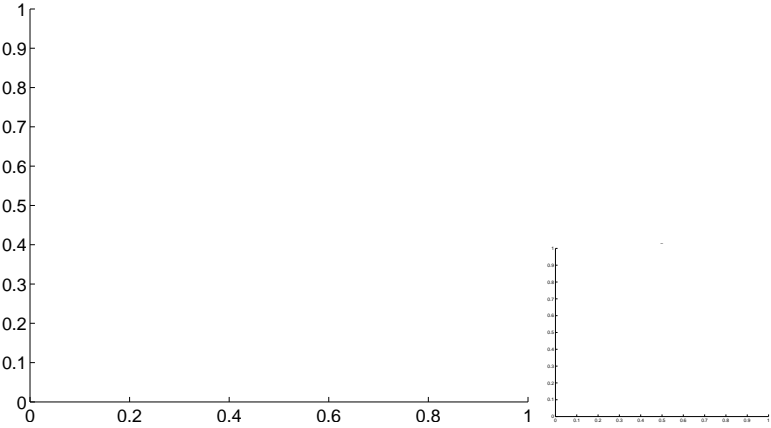


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

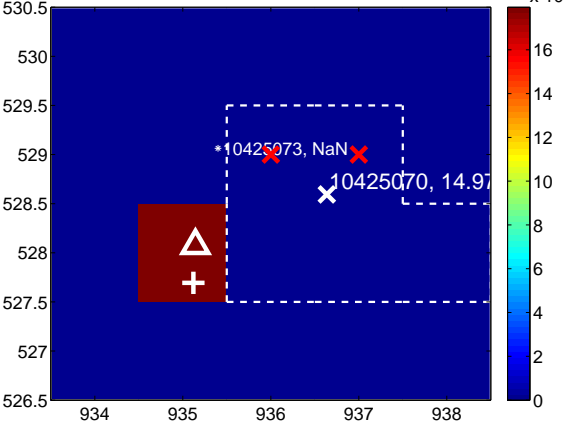
Q9 no difference image



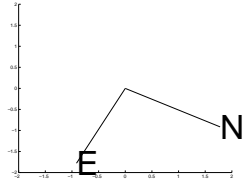
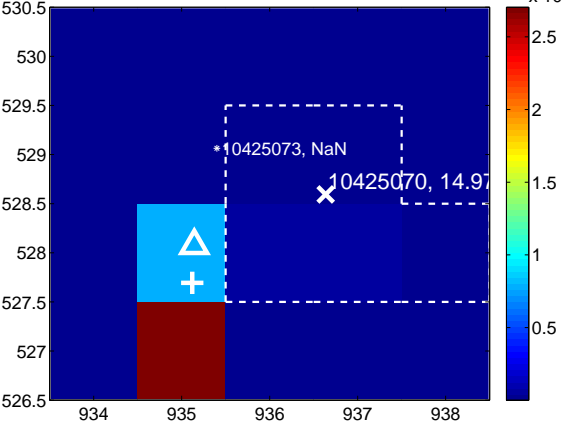
Q9 no OOT image



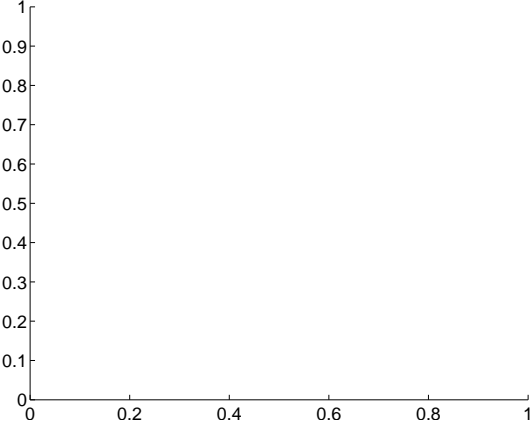
Q10 difference image



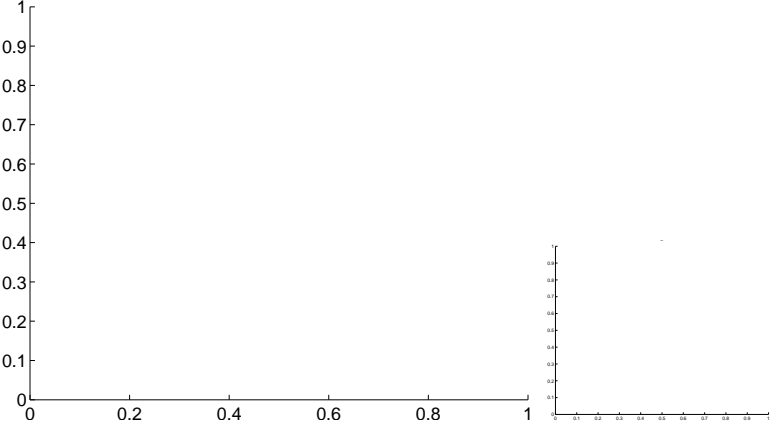
Q10 OOT image



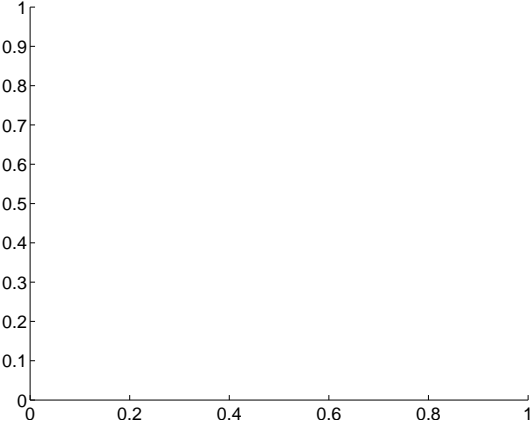
Q11 no difference image



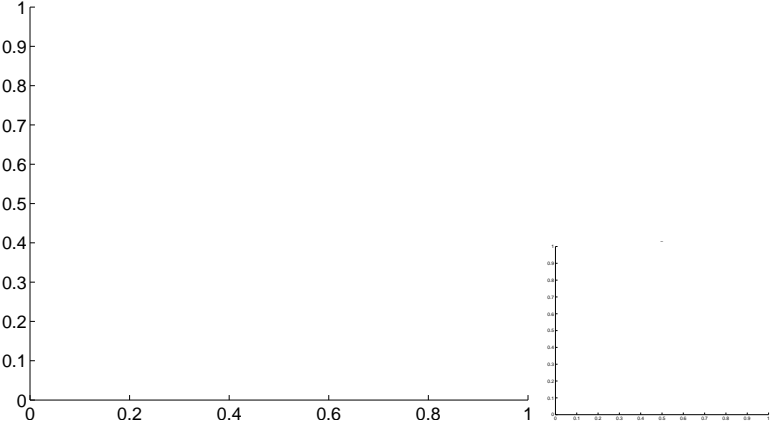
Q11 no OOT image



Q12 no difference image



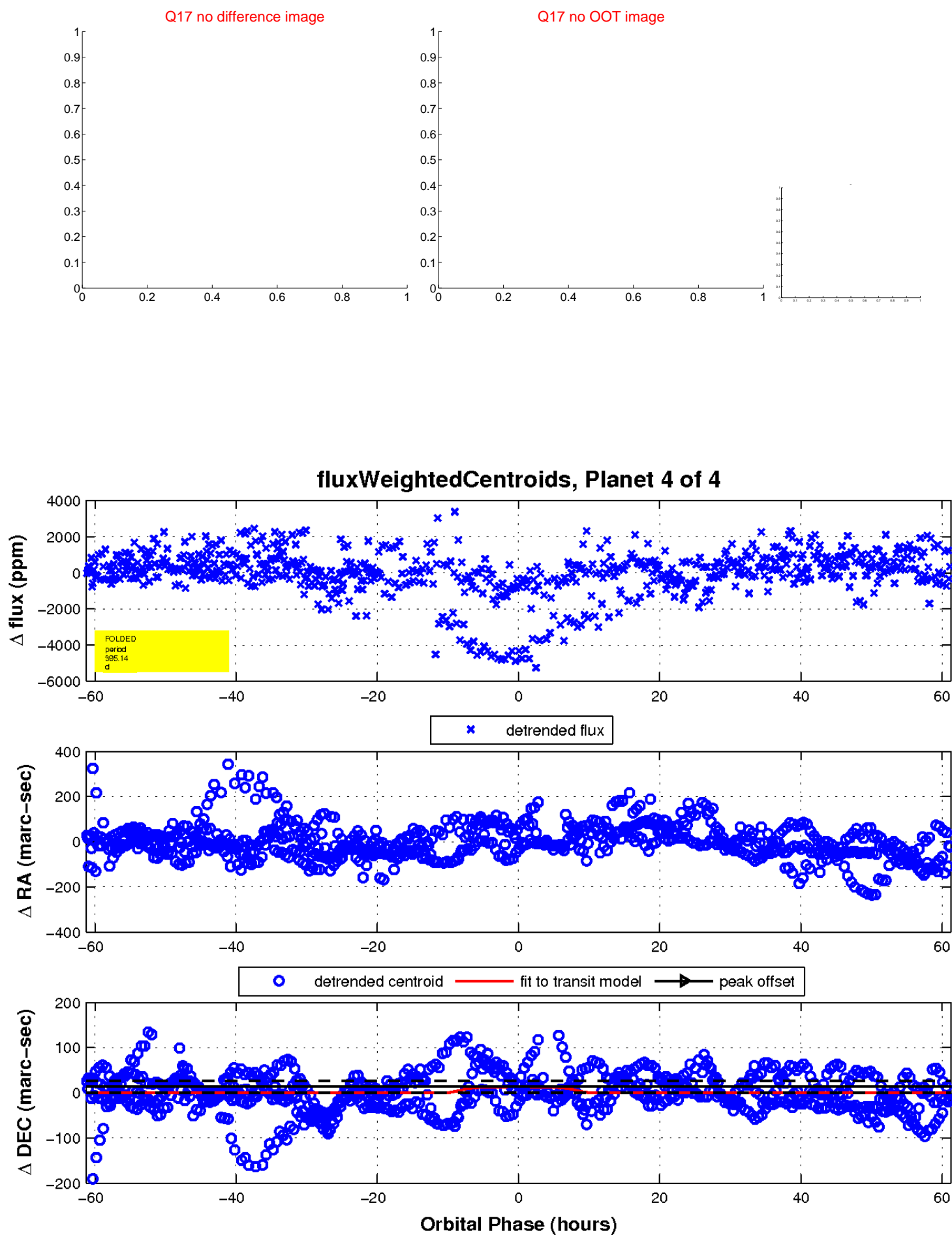
Q12 no OOT image



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.



UKIRT Image

Declination

