

# KIC 008604805

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008604805-01	OBS	No	551.143784	198.715032	1820.4	3.544	15.9	9.2	0.77	5505	3.27	0.36
008604805-02	OBS	No	429.629342	147.187659	1350.2	4.333	13.7	5.6	0.77	5505	3.23	0.50
008604805-03	OBS	No	361.900617	335.745488	1090.8	3.318	13.7	7.2	0.77	5505	2.65	0.62
008604805-04	OBS	No	203.682617	235.938102	1523.9	2.500	10.2	-1.0	0.77	5505	2.99	1.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008604805-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008604805-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
008604805-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008604805-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—INCONSISTENT_TRANS—CENT_NOFITS

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

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

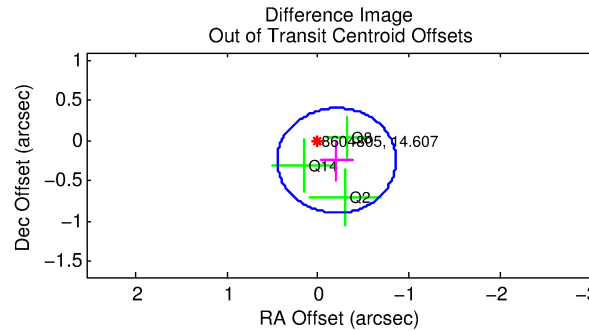
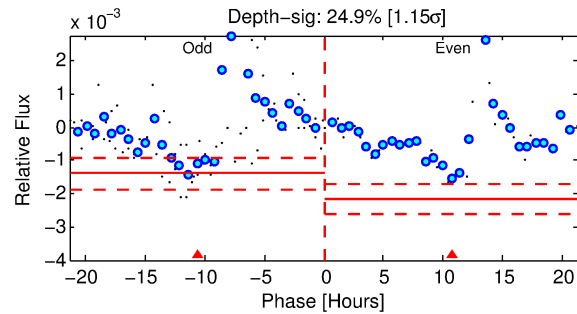
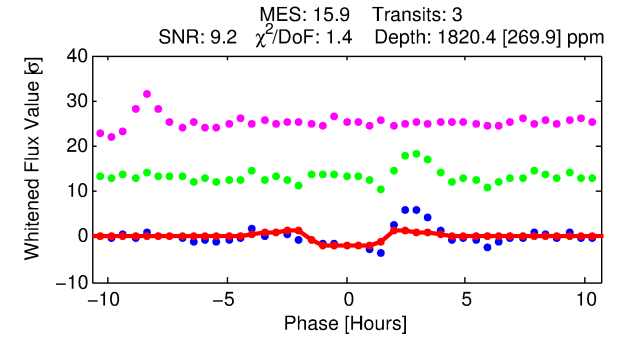
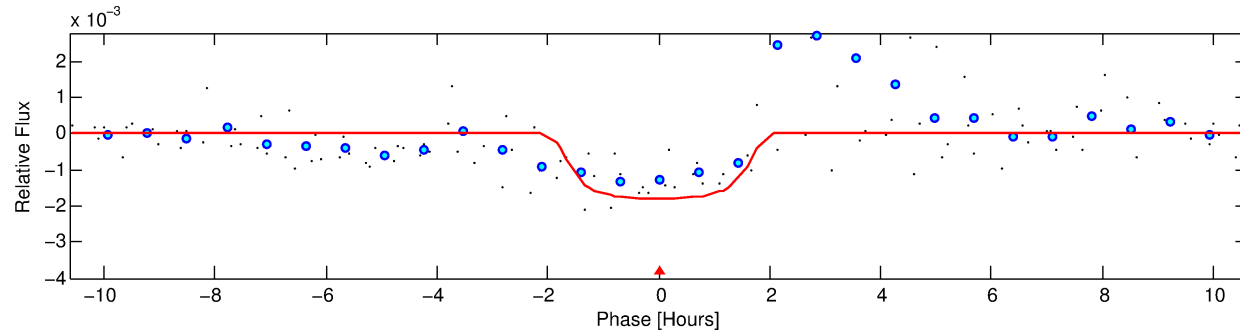
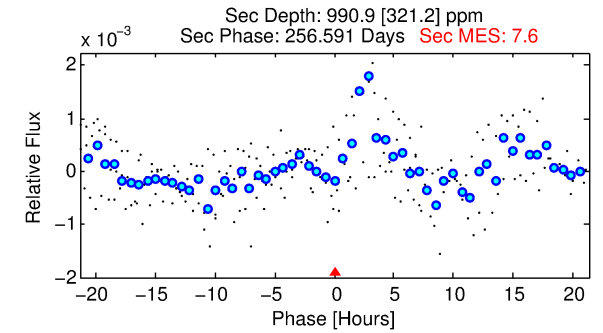
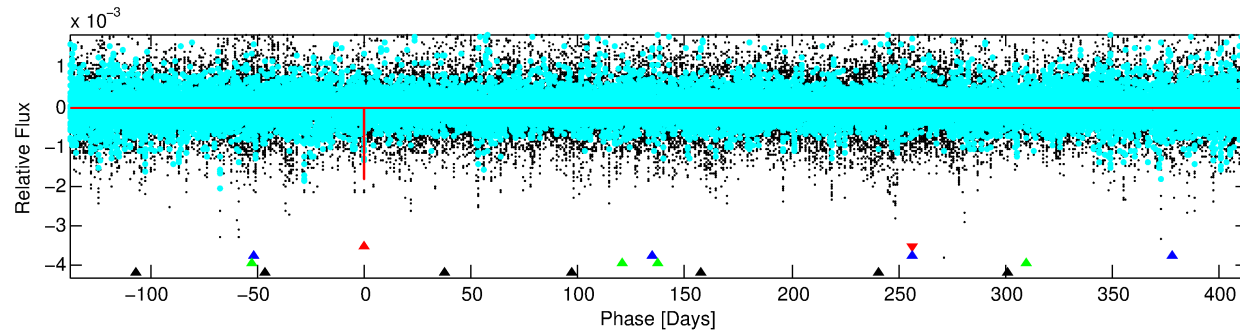
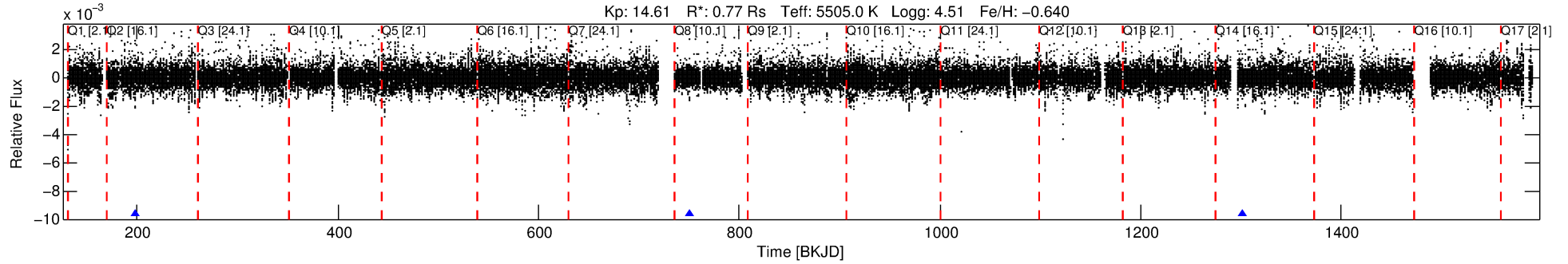
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008604805-01

No Significant Match Found

# DV One-Page Summary

KIC: 8604805 Candidate: 1 of 4 Period: 551.144 d



## DV Fit Results:

Period = 551.14378 [0.00528] d  
Epoch = 198.7150 [0.0058] BKJD  
Rp/R\* = 0.0388 [0.1787]  
a/R\* = 1234.20 [25446.70]  
b = 0.01 [1872.18]  
Seff = 0.36 [0.08]  
Teq = 197 [12] K  
Rp = 3.26 [15.05] Re  
a = 1.1720 [0.1579] AU  
Ag = 70241.63 [647639.03] [0.11 $\sigma$ ]  
Teffp = 4958 [11427] K [0.42 $\sigma$ ]

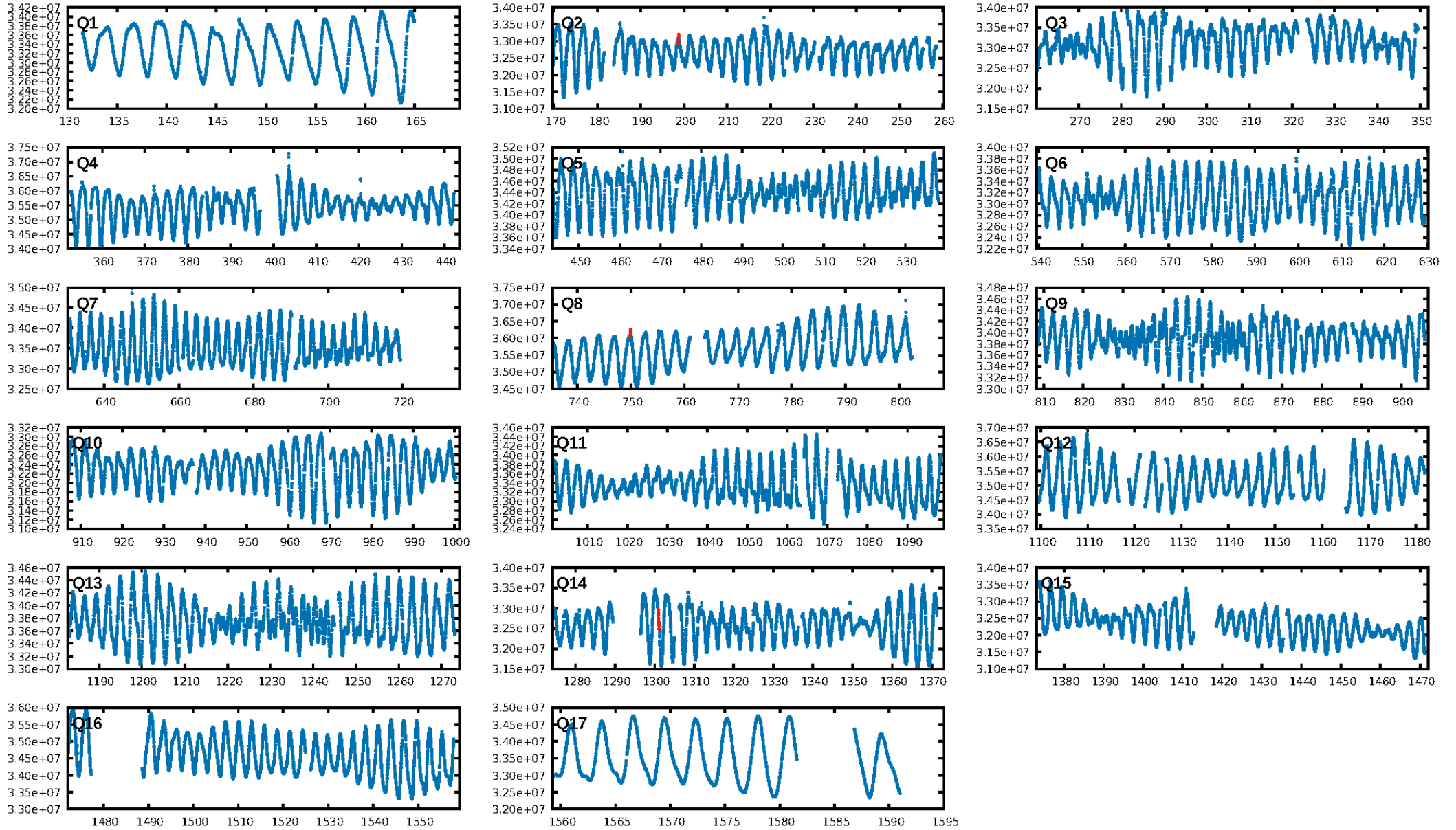
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [521.03 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 66.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.8723  
Centroid-sig: 25.7%  
Centroid-so: 0.894 arcsec [0.95 $\sigma$ ]  
OotOffset-rm: 0.322 arcsec [1.48 $\sigma$ ]  
OotOffset-st: 2/0/1/0 [3]  
KicOffset-rm: 0.237 arcsec [0.98 $\sigma$ ]  
KicOffset-st: 2/0/1/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

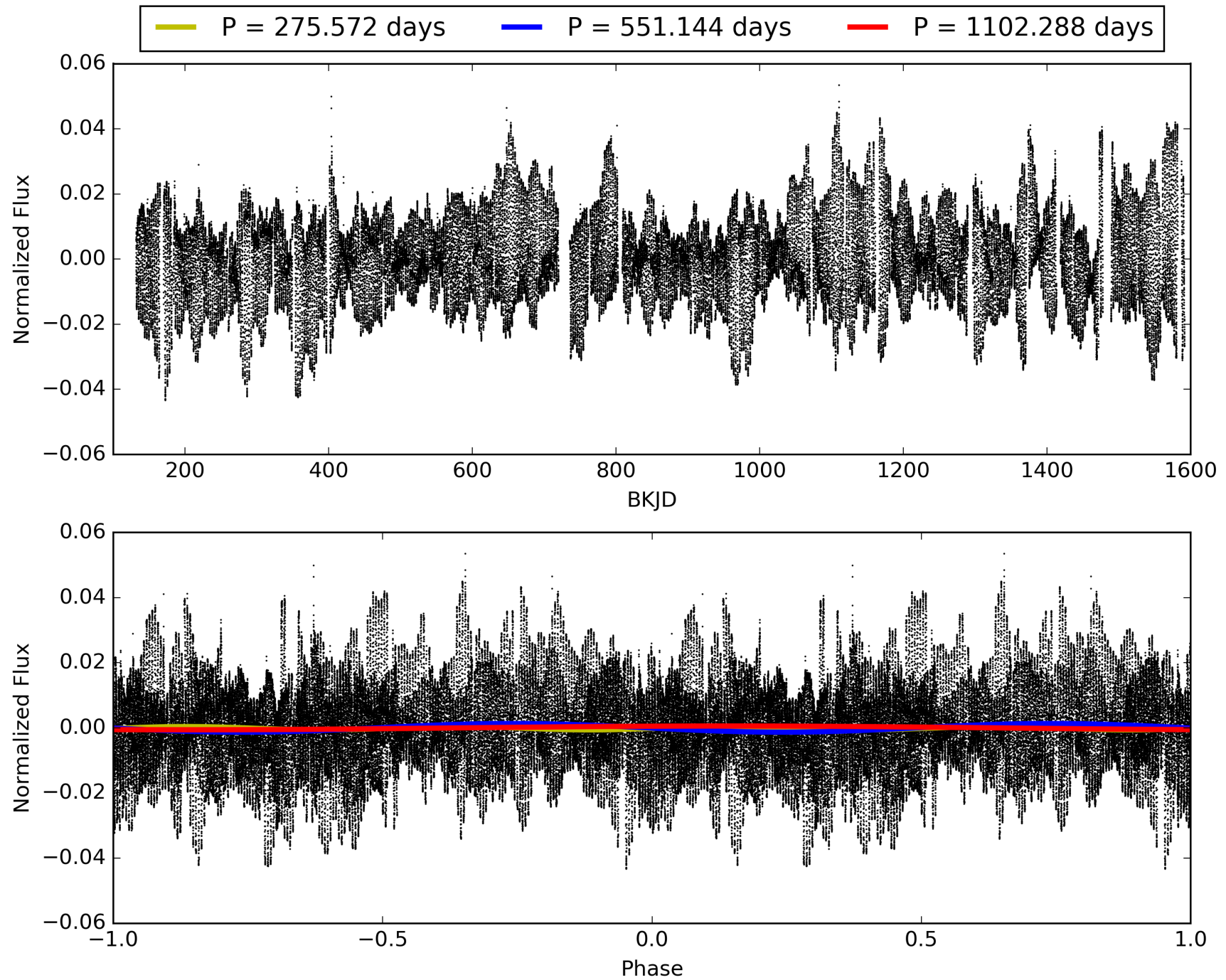
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:21:56 Z

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

# TCE 008604805-01, PDC Light Curves



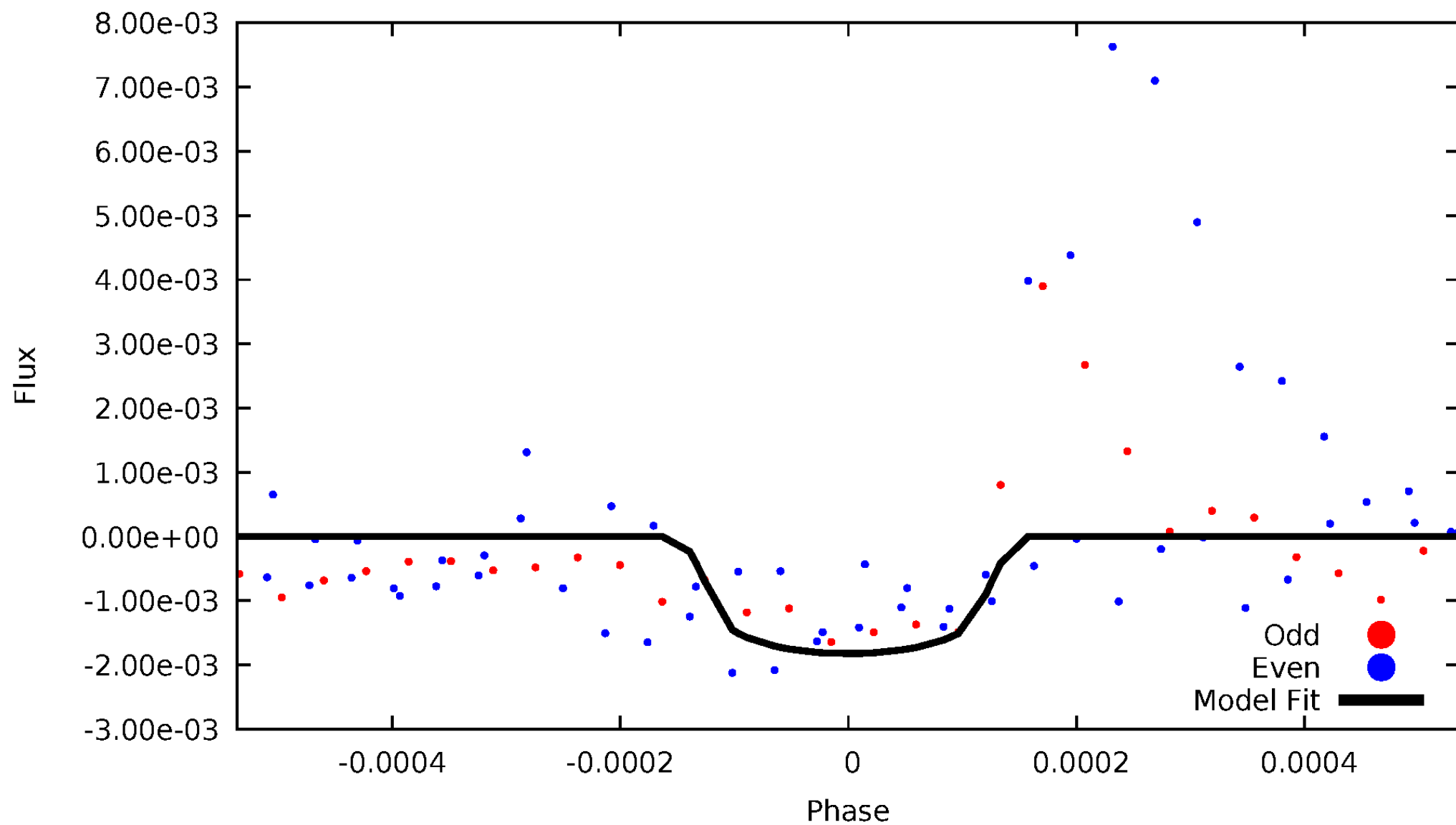
TCE 008604805-01





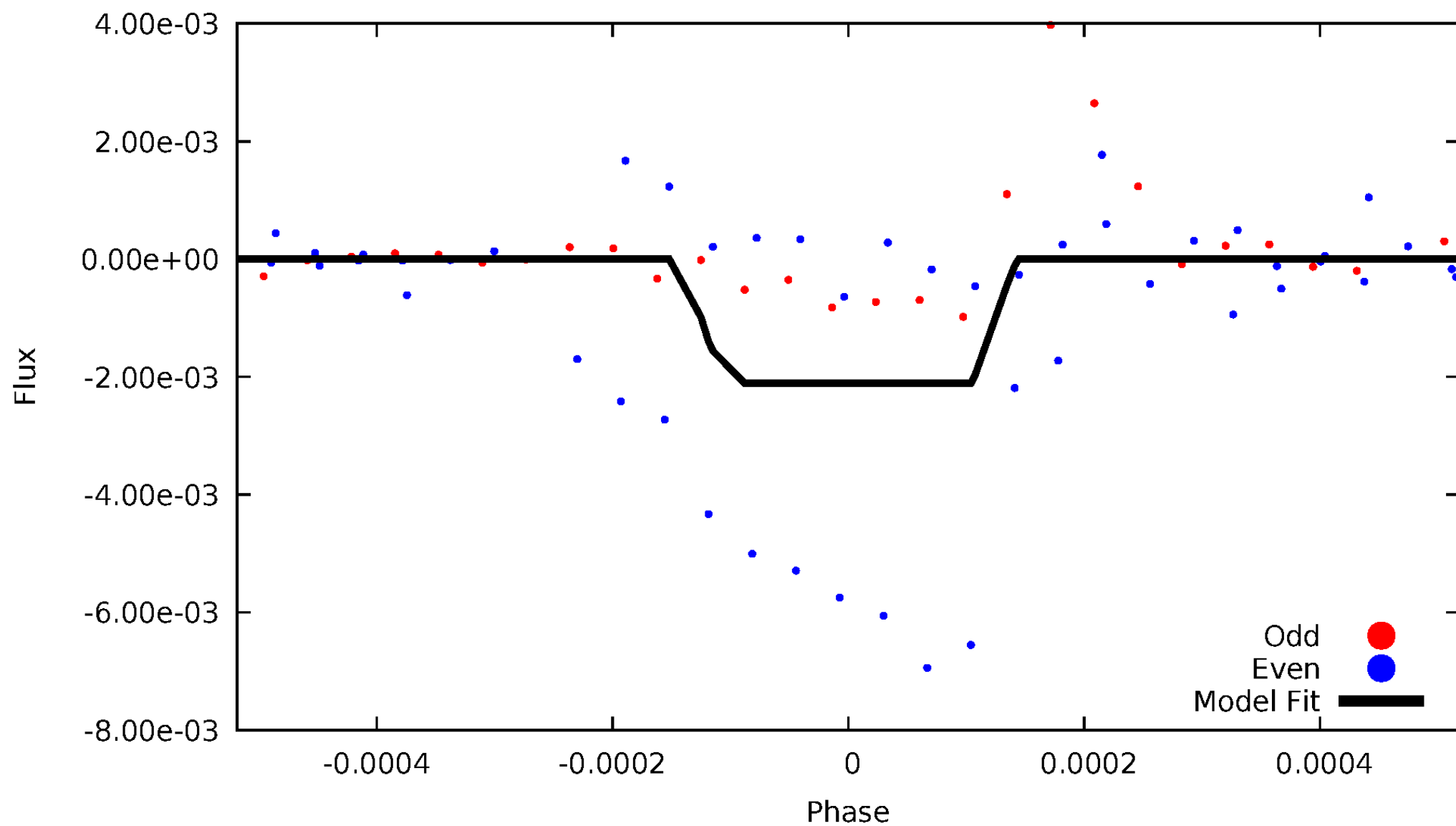
# DV Odd/Even

TCE 008604805-01



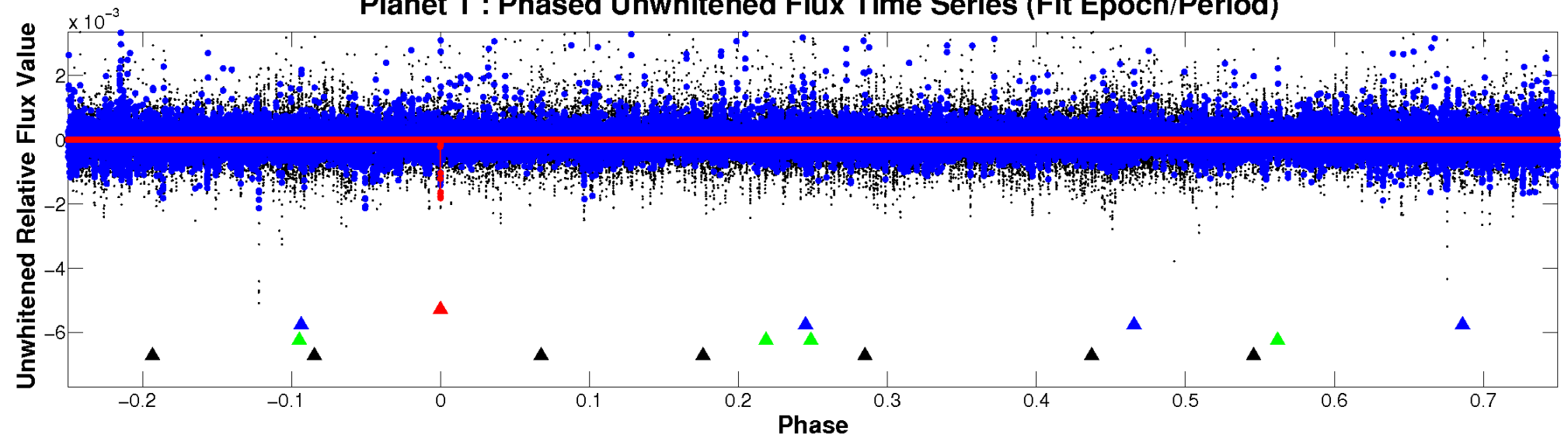
# ALT Odd/Even

TCE 008604805-01

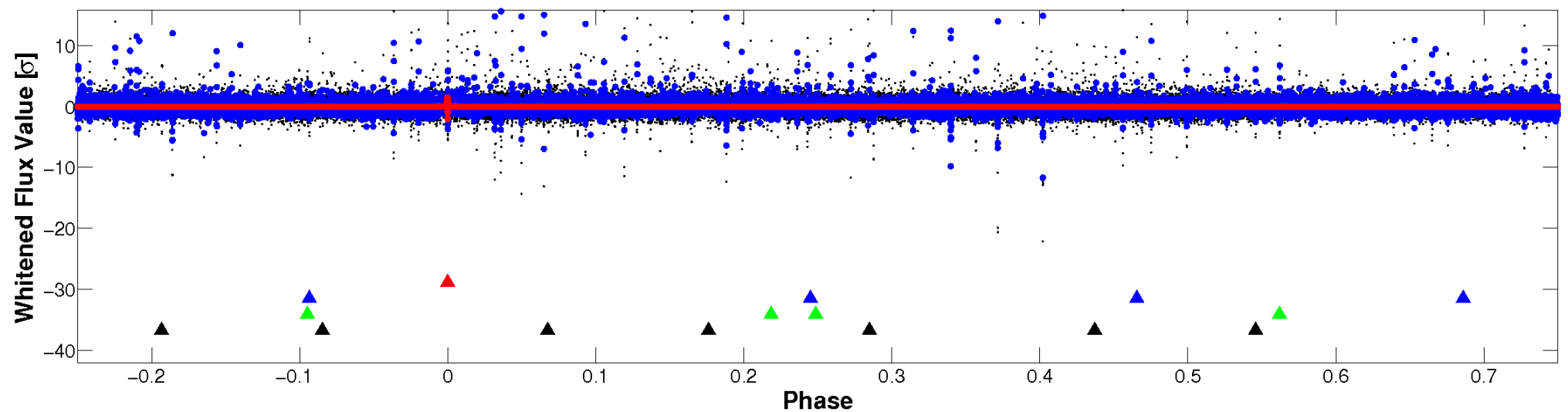


# Non-Whitened Vs. Whitened Light Curve

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

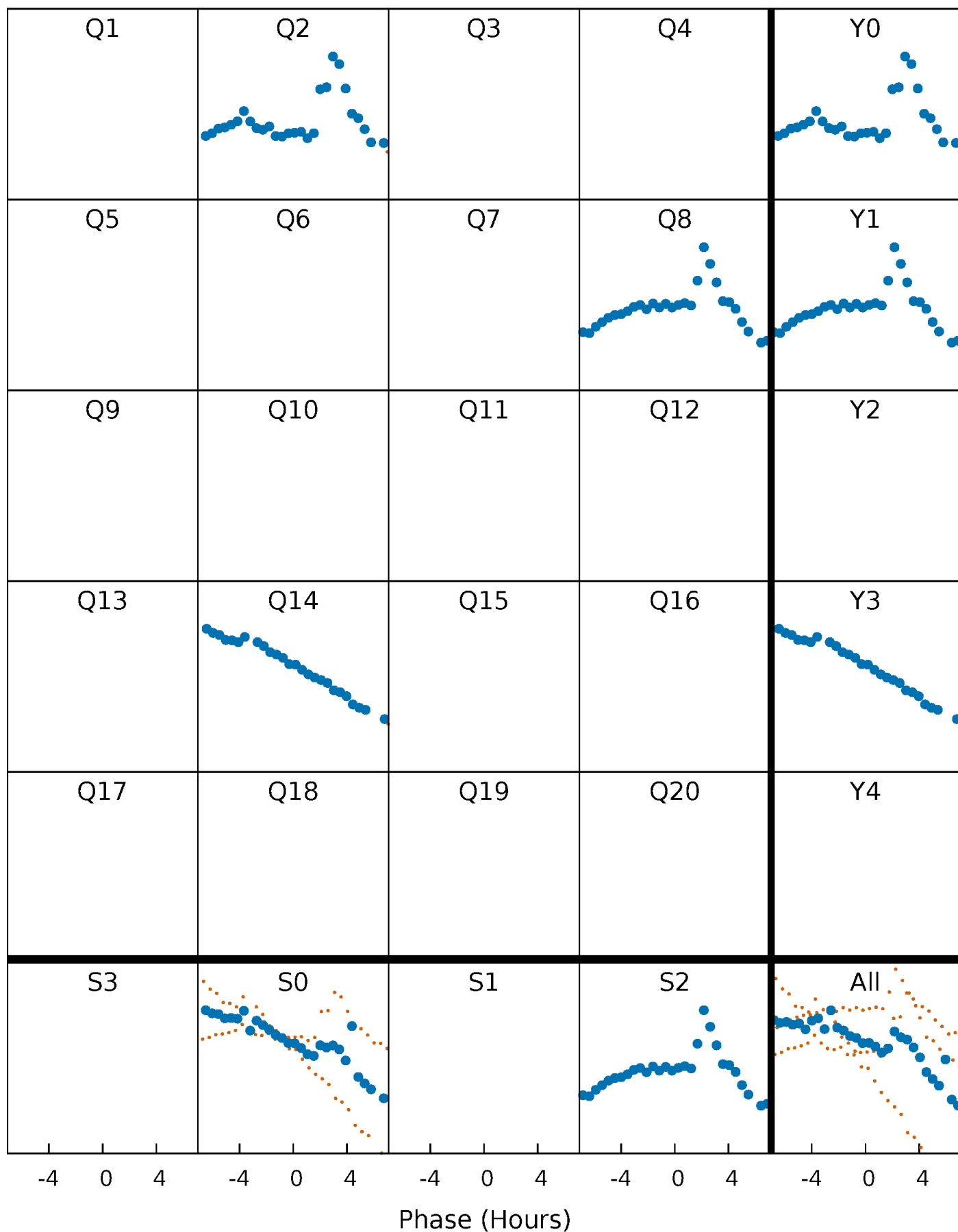


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



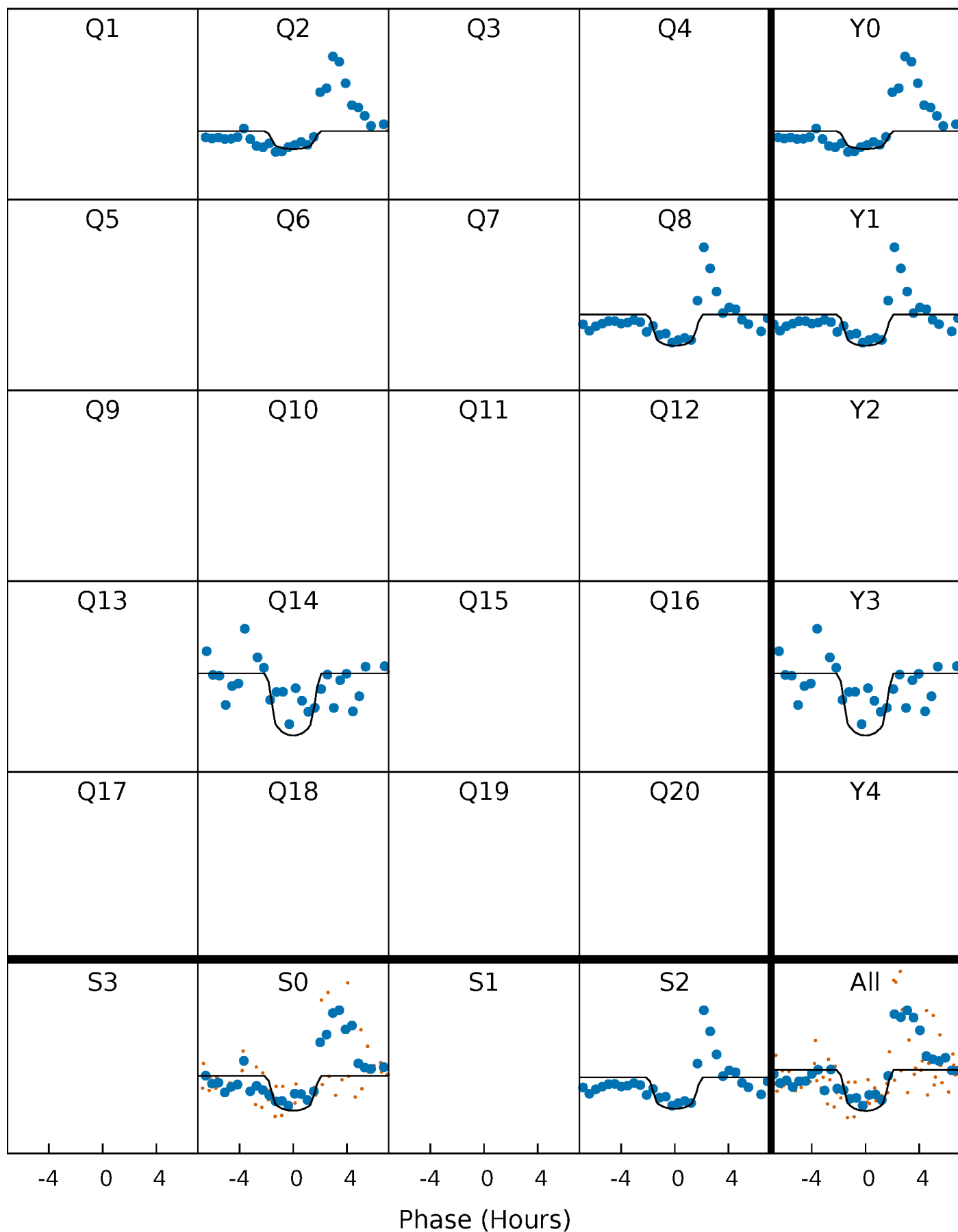
# PDC Quarter-Phased Transit Curves

TCE 008604805-01 P=551.143784 Days  $T_0=198.715032$  (BKJD)



# DV Quarter-Phased Transit Curves

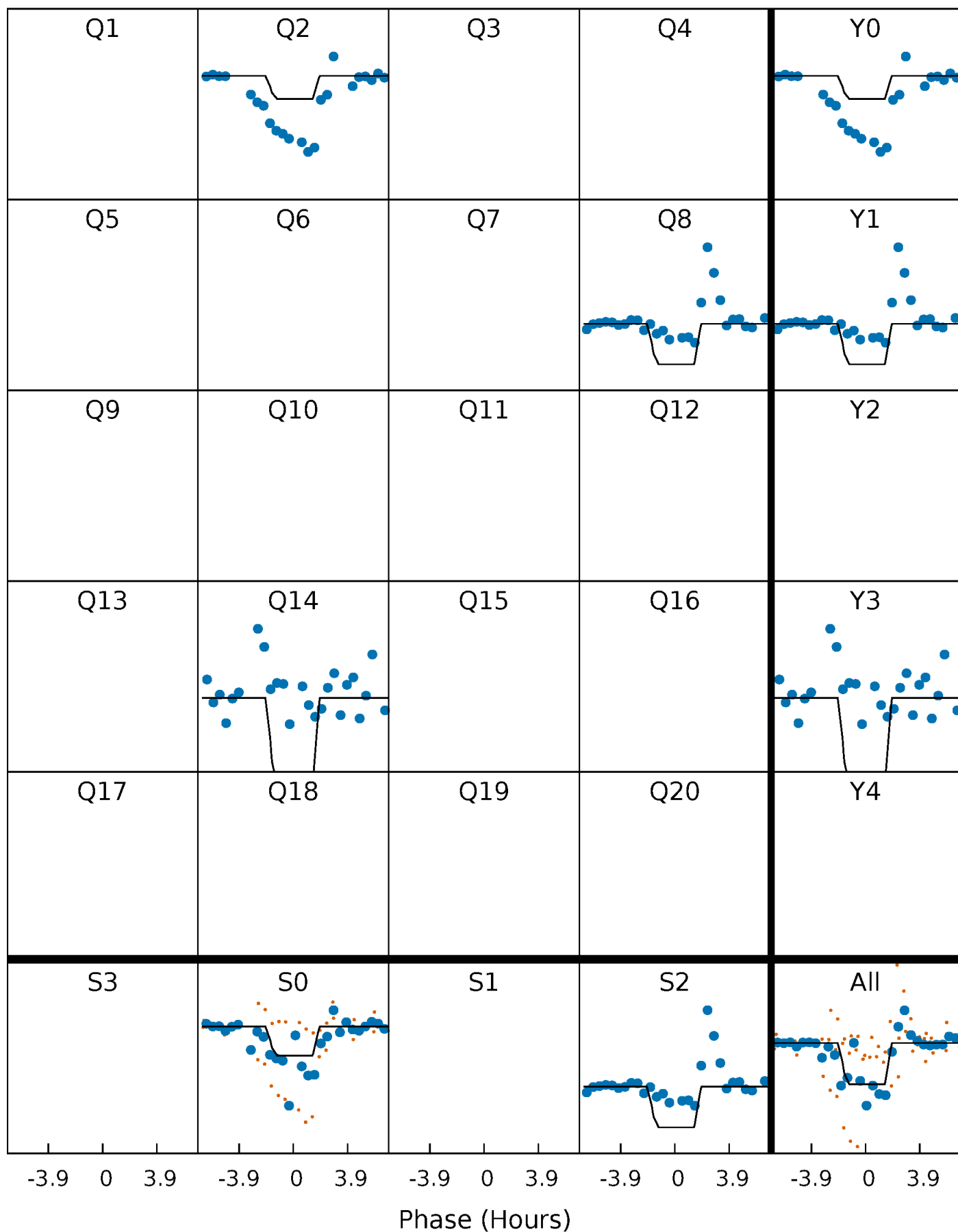
TCE 008604805-01 P=551.143784 Days  $T_0=198.715032$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

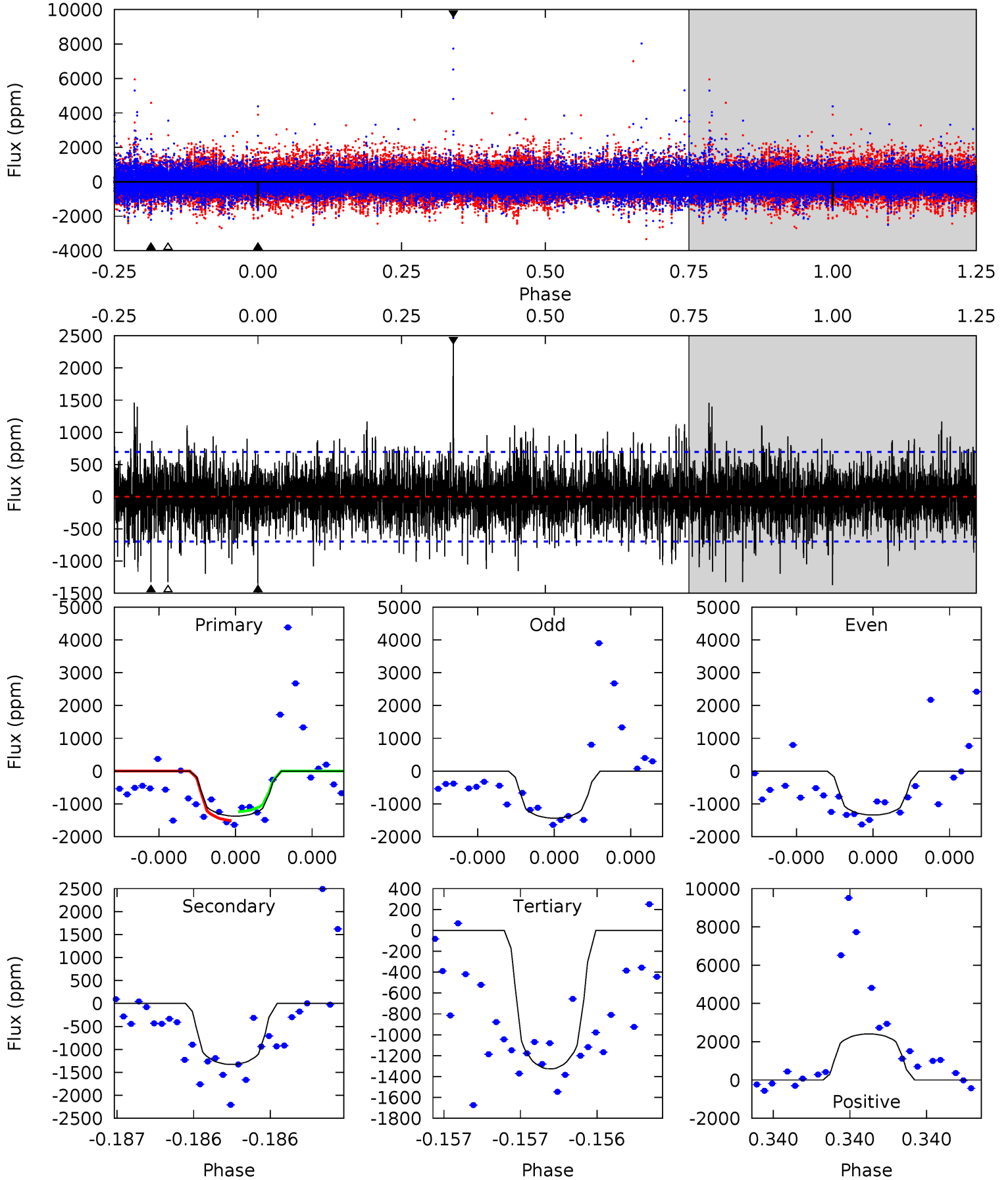
TCE 008604805-01 P=551.133980 Days  $T_0=198.724237$  (BKJD)



# DV Model-Shift Uniqueness Test

008604805-01, P = 551.143784 Days, E = 198.715032 Days

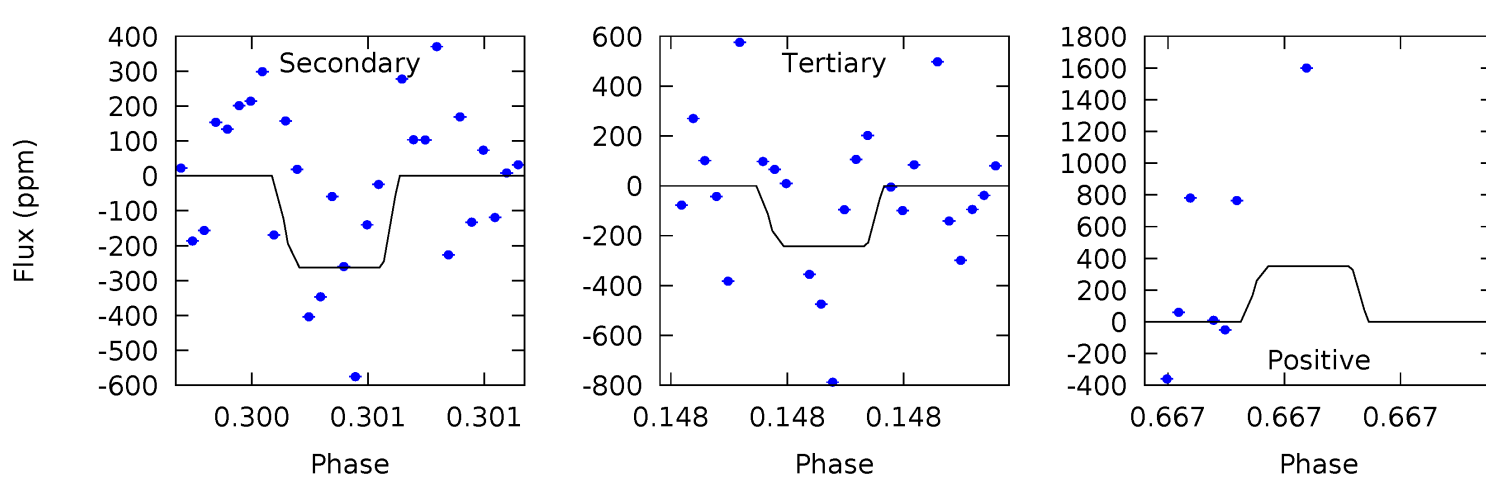
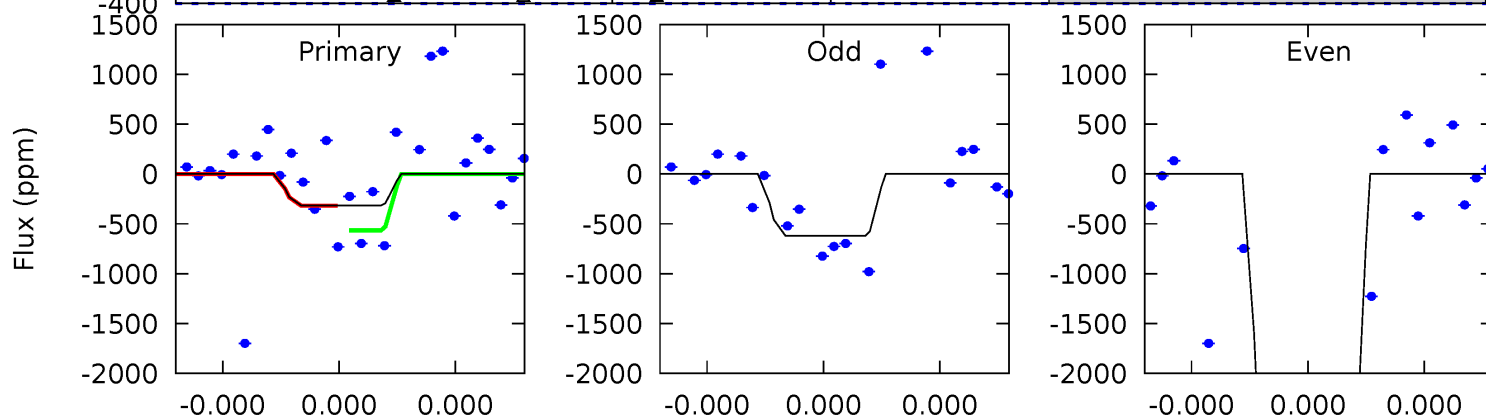
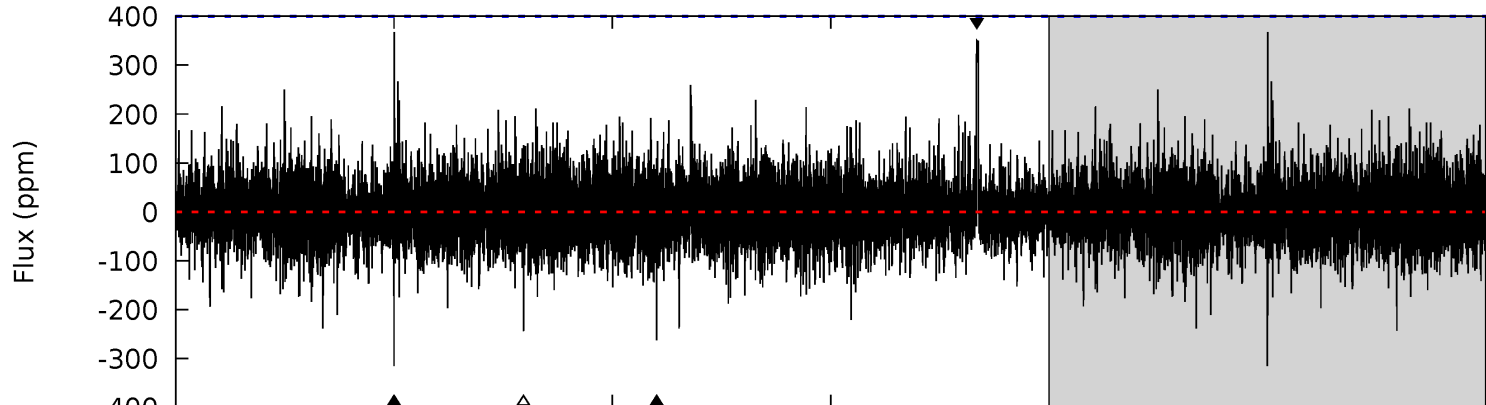
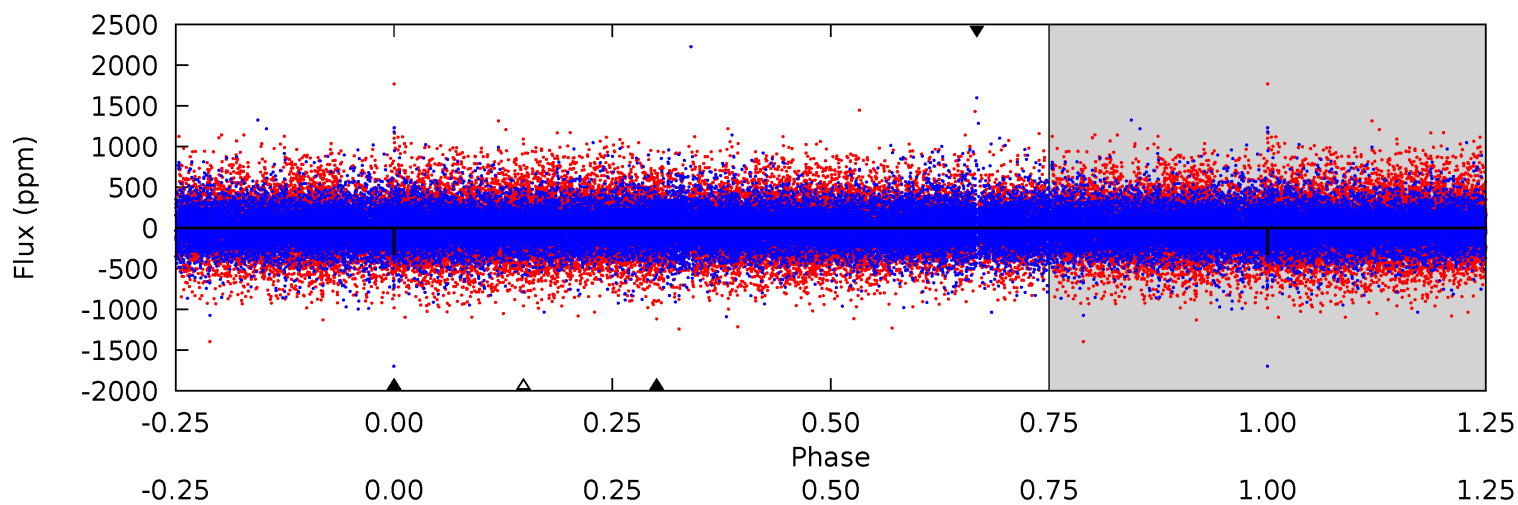
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.2	10.8	10.8	19.6	5.68	3.64	2.51	0.37	-8.45	0.00	-8.82	0.33	0.95	0.64	1.11



# Alt Model-Shift Uniqueness Test

008604805-01, P = 551.133980 Days, E = 198.724237 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.48	3.73	3.45	4.98	5.68	3.64	0.66	1.02	-0.50	0.28	-1.25	21.4	3.57	0.54	1.63



### Stellar Parameters For KIC 008604805

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5505^{+163}_{-163}$	$4.513^{+0.116}_{-0.105}$	$-0.640^{+0.350}_{-0.300}$	$0.771^{+0.117}_{-0.098}$	$0.706^{+0.099}_{-0.040}$	$2.169^{+0.972}_{-0.672}$
	+3%/-3%	+3%/-2%	+55%/-47%	+15%/-13%	+14%/-6%	+45%/-31%
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 008604805-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1327 \pm 122$	$11.63^{+11.75}_{-8.03}$	$275^{+14}_{-13}$	$3367^{+1691}_{-635}$	$7743^{+69304}_{-5995}$
Alt.	$-263 \pm 70$	$12.64^{+12.76}_{-9.07}$	$275^{+15}_{-14}$	$2622^{+1126}_{-407}$	$1279^{+15054}_{-986}$

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

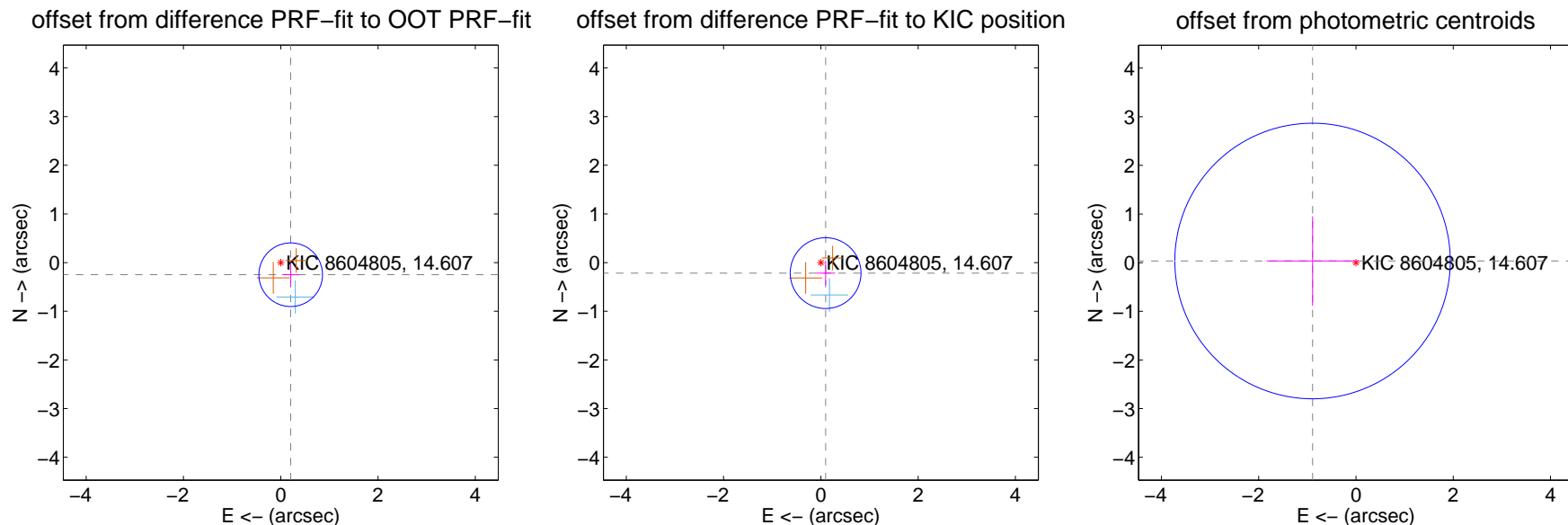
## DV Centroid Data

Supplemental centroid analysis for 008604805-01. Kepler magnitude: 14.61. Transit SNR 9.22

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

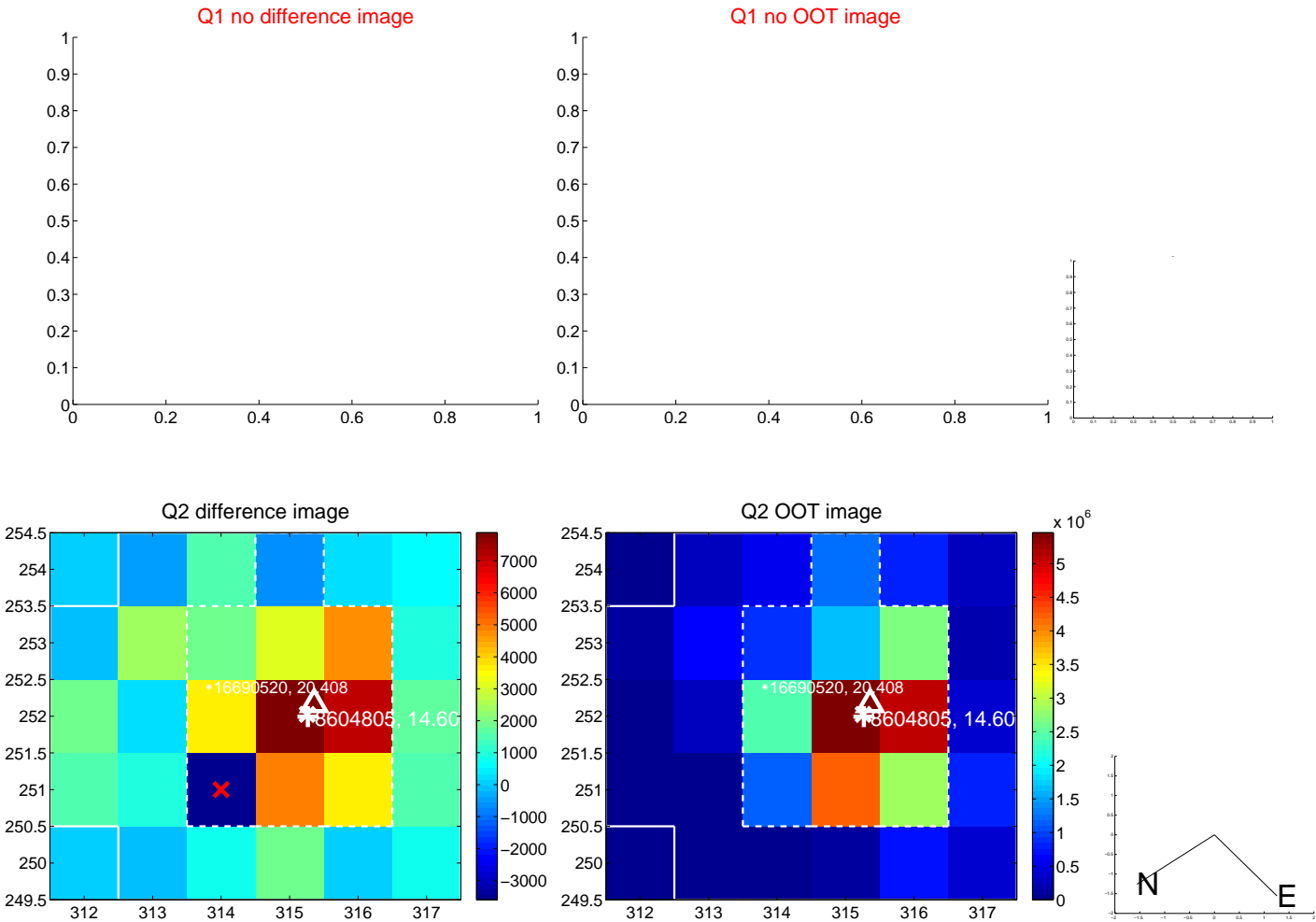
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.322 \pm 0.218$	1.48	$-0.205 \pm 0.174$	$-0.249 \pm 0.243$
PRF-fit source offset from KIC position	$0.237 \pm 0.243$	0.98	$-0.098 \pm 0.194$	$-0.216 \pm 0.251$
photometric centroid source offset	$0.89 \pm 0.94$	0.95	$0.89 \pm 0.94$	$0.03 \pm 0.92$



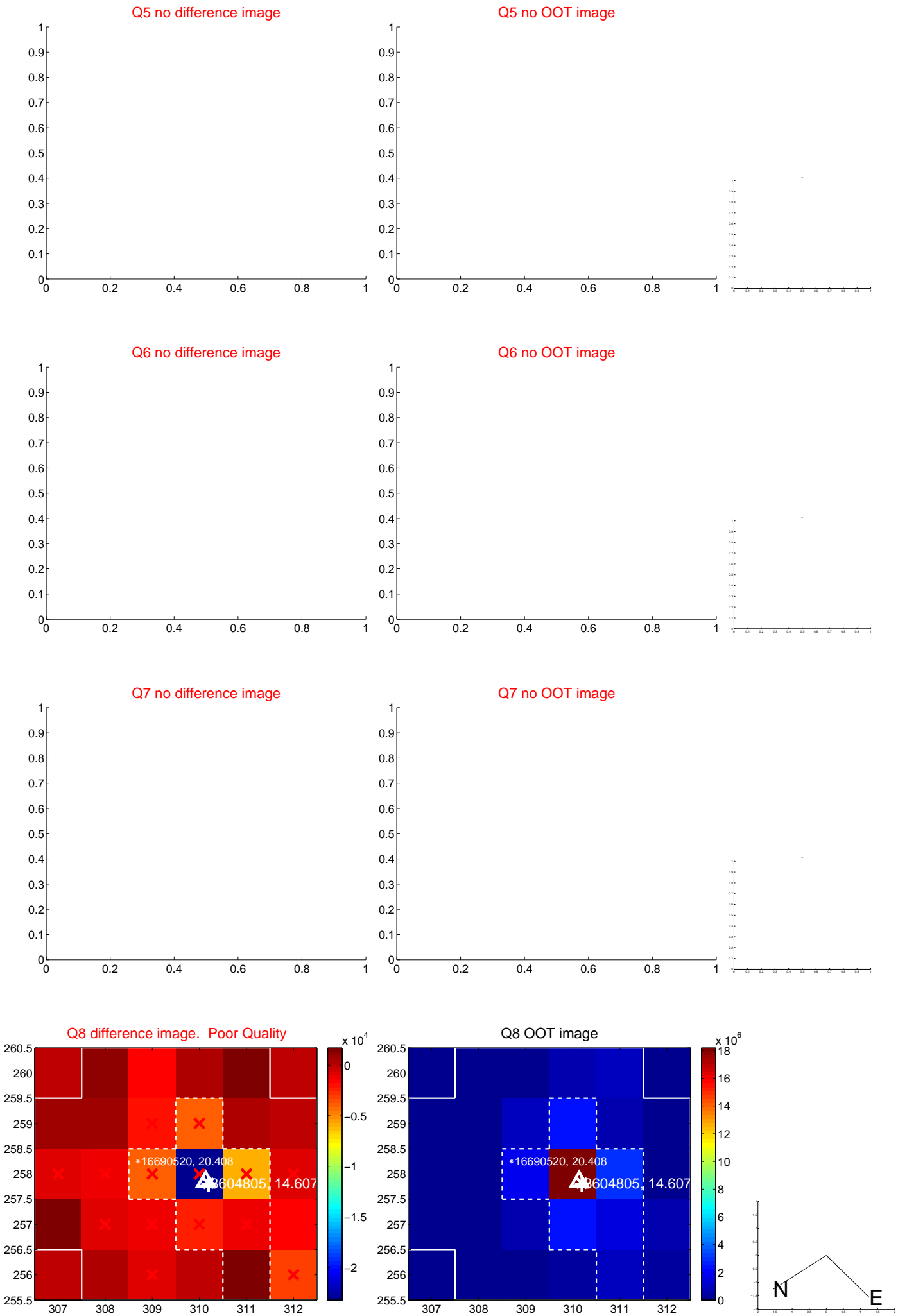
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



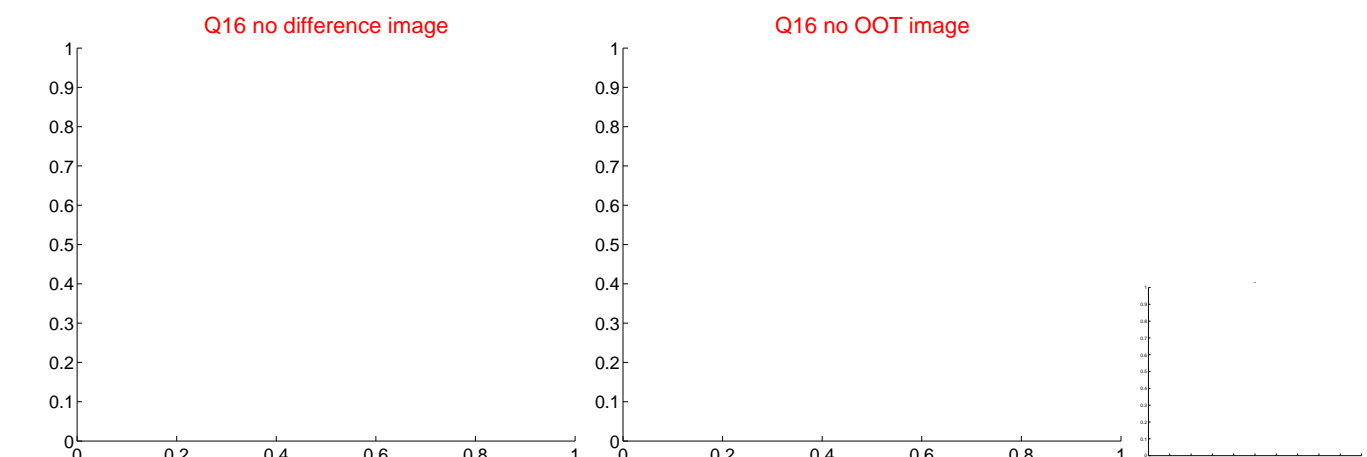
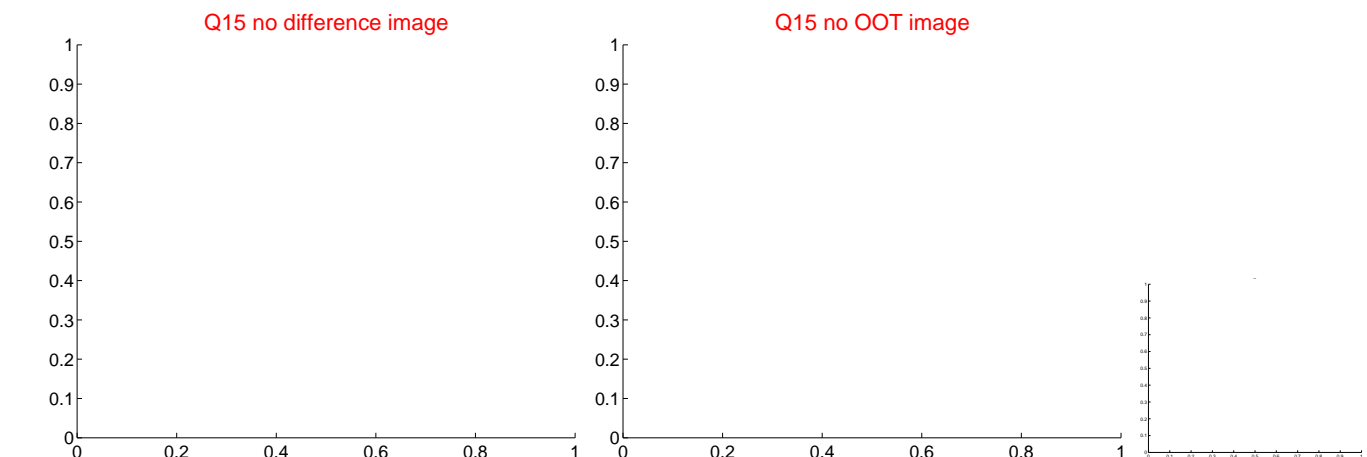
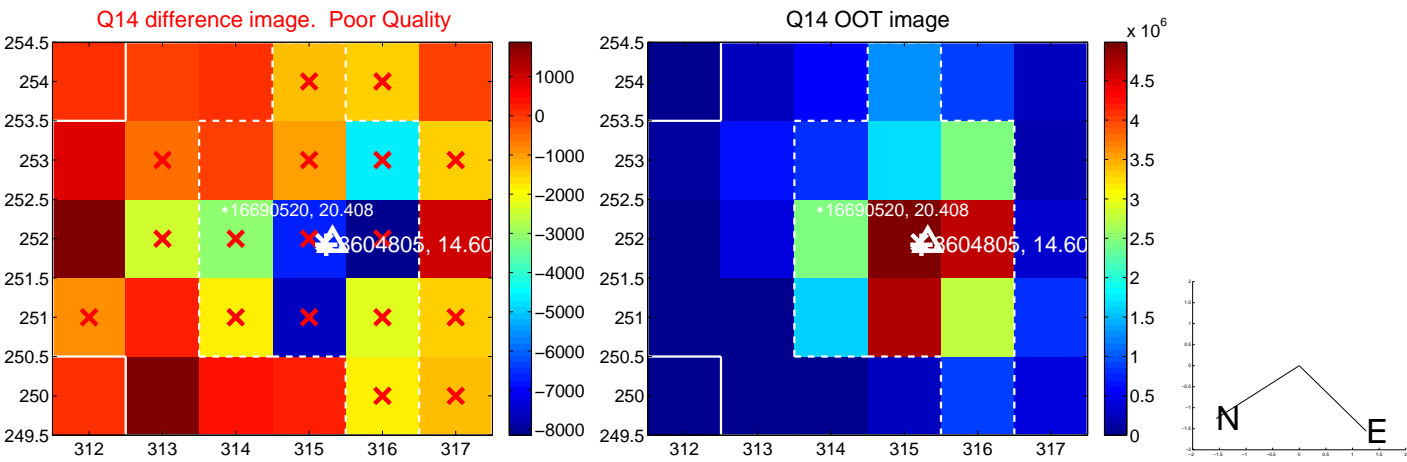
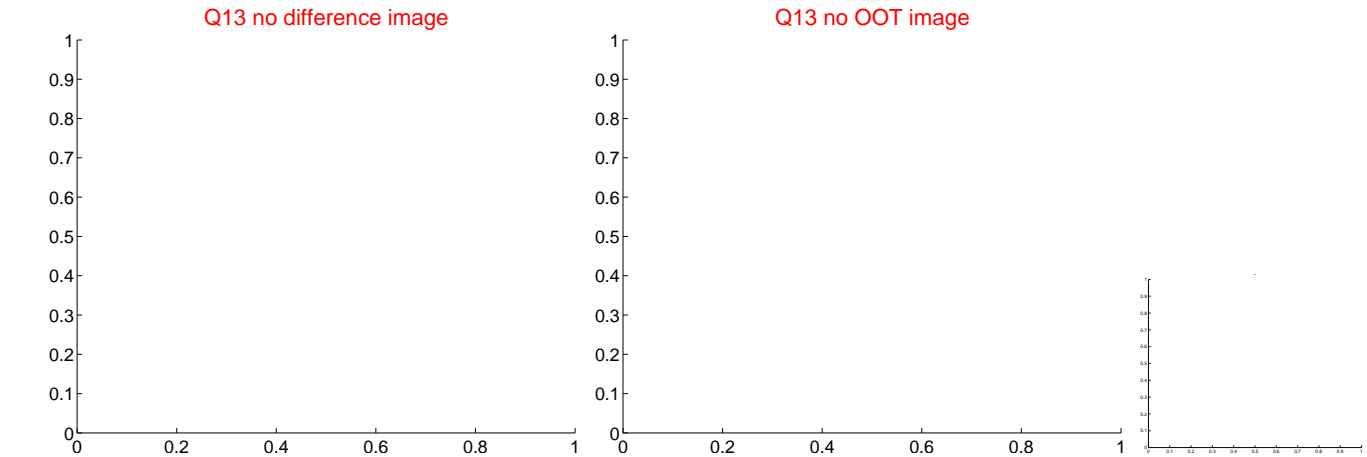
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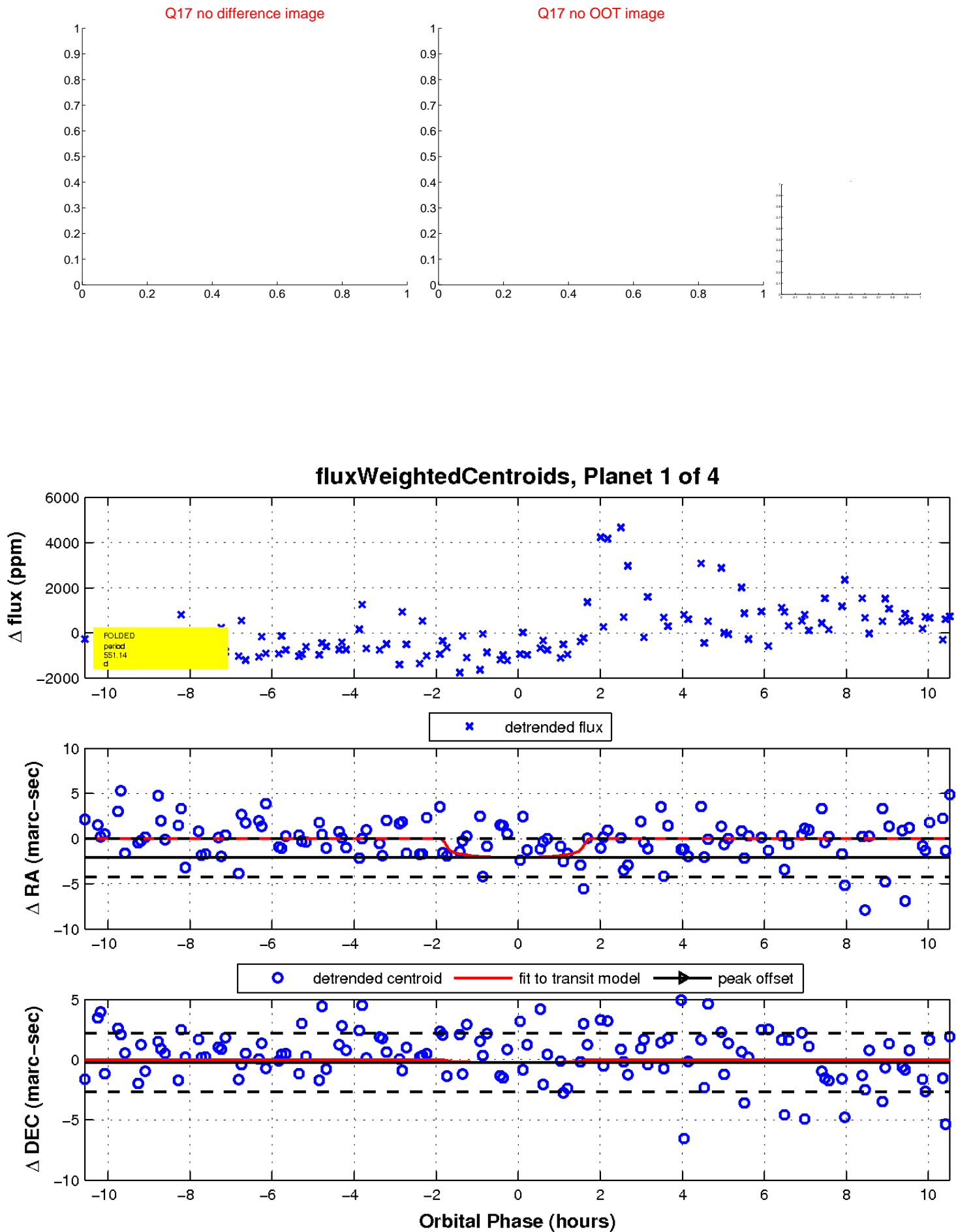
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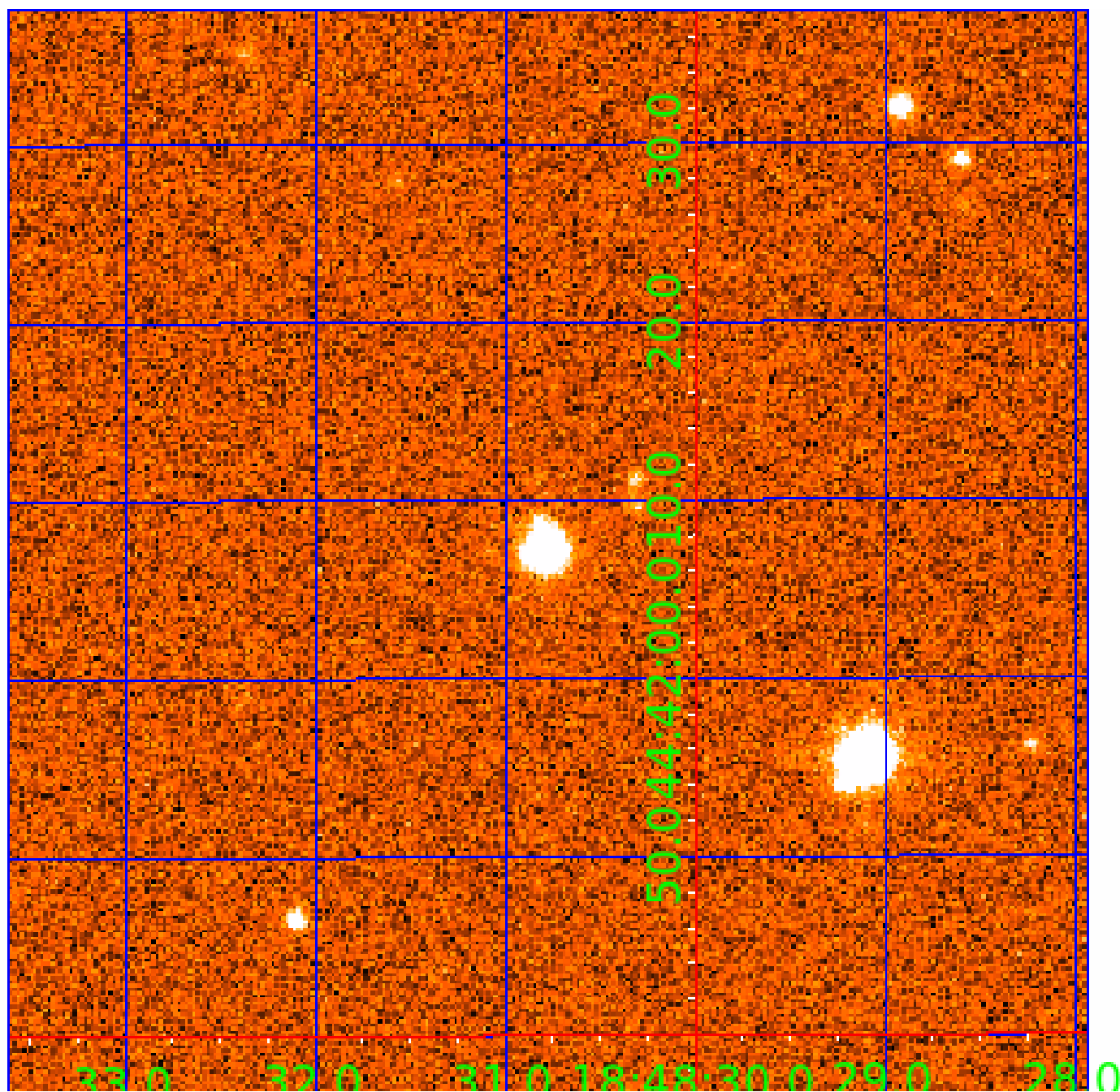
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UKIRT Image

Declination



# KIC 008604805

## 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

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008604805-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
008604805-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008604805-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—INCONSISTENT_TRANS—CENT_NOFITS

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

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

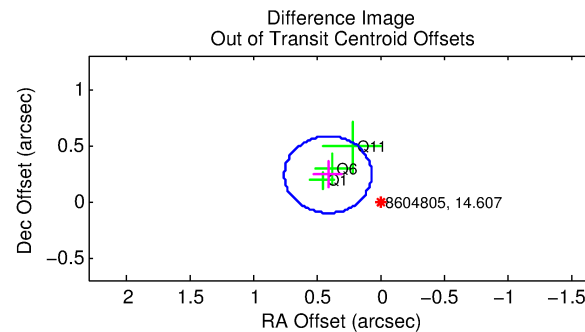
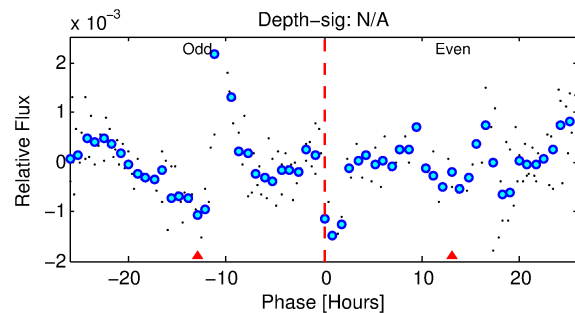
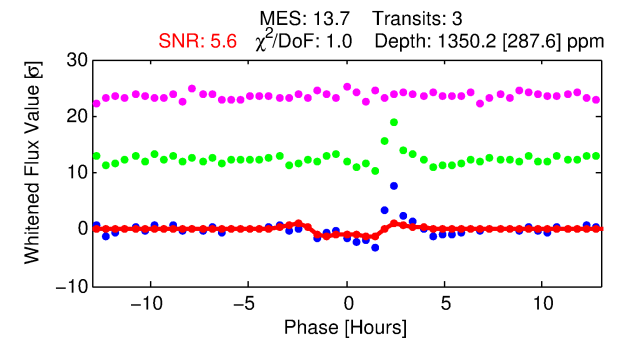
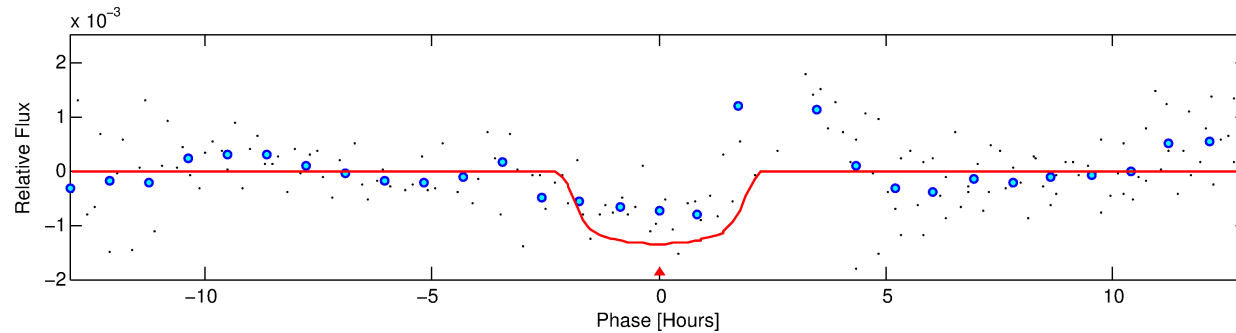
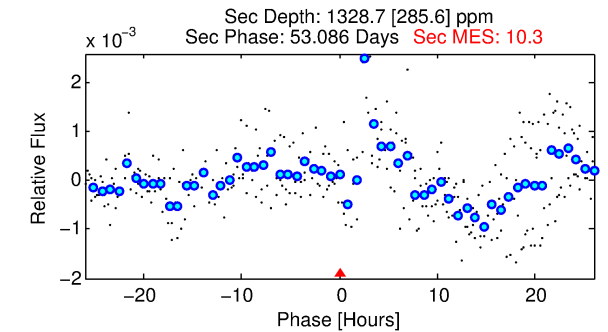
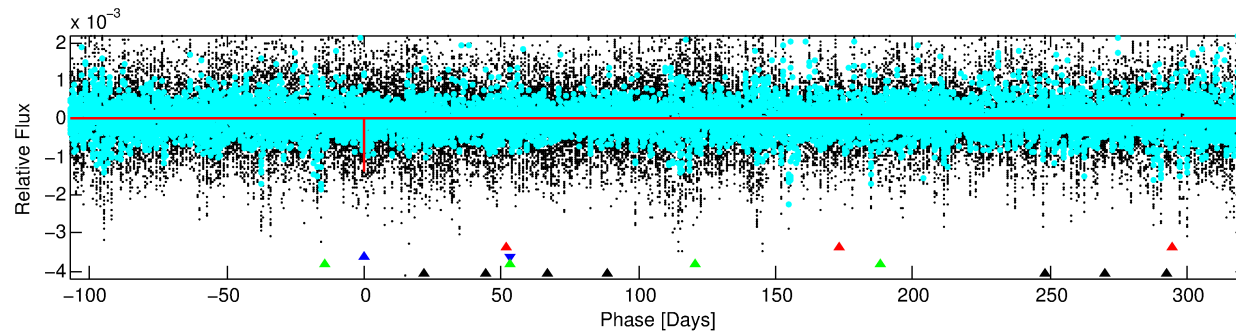
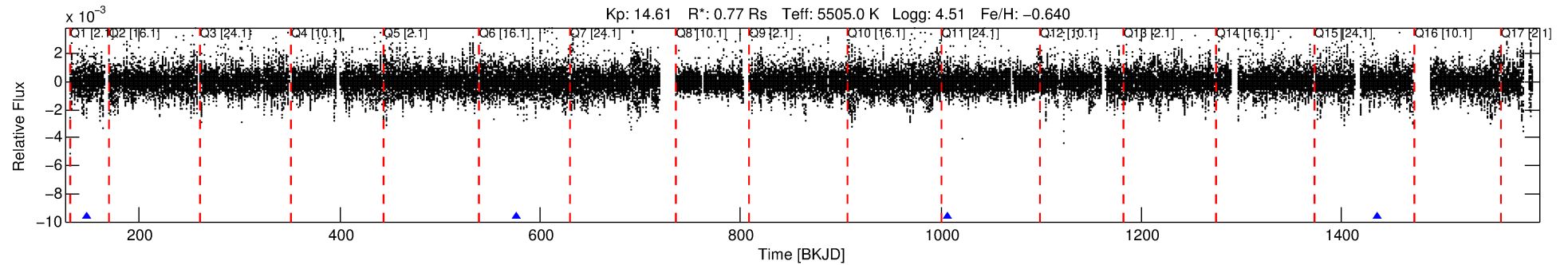
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008604805-02

No Significant Match Found

# DV One-Page Summary

KIC: 8604805 Candidate: 2 of 4 Period: 429.629 d



## DV Fit Results:

Period = 429.62934 [0.00526] d  
Epoch = 147.1877 [0.0075] BKJD  
Rp/R\* = 0.0384 [0.0091]  
a/R\* = 453.27 [377.17]  
b = 0.85 [0.28]  
Seff = 0.50 [0.12]  
Teq = 214 [13] K  
Rp = 3.23 [0.91] Re  
a = 0.9926 [0.1338] AU  
Ag = 69053.16 [38547.02] [1.79]  
**Teffp = 5364 [714] K [7.21]**

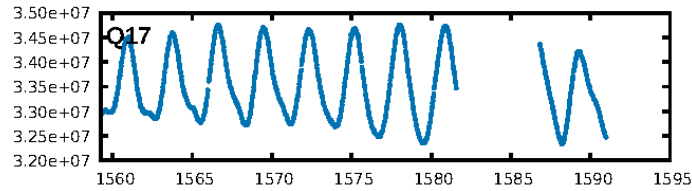
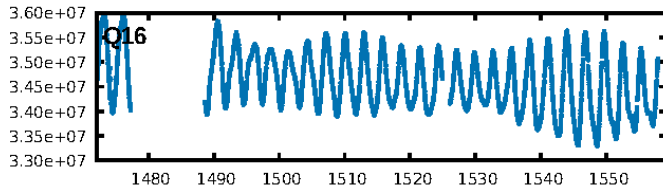
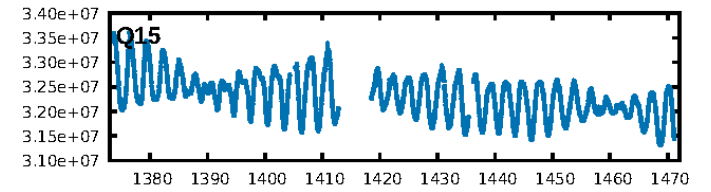
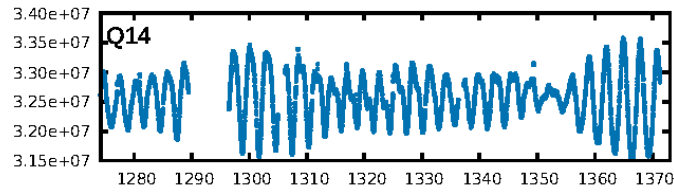
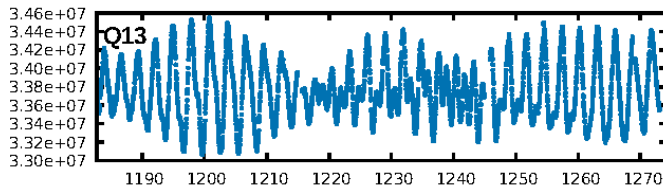
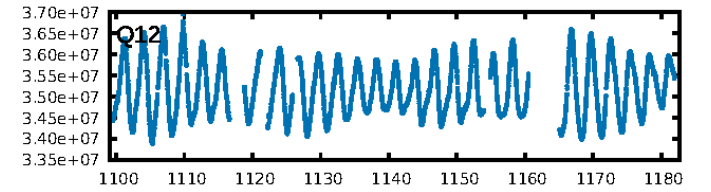
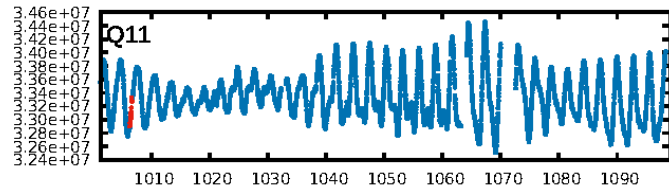
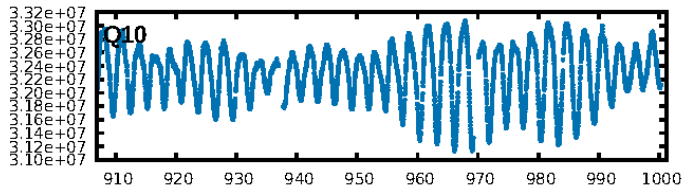
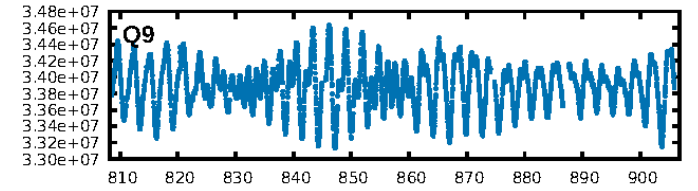
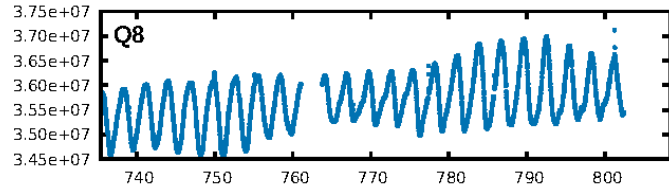
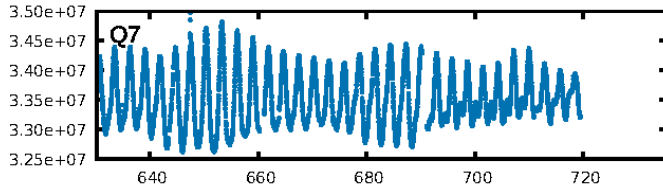
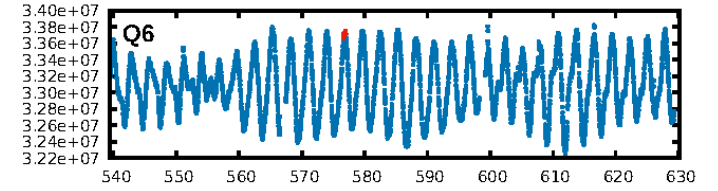
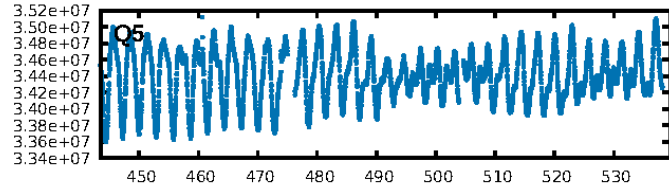
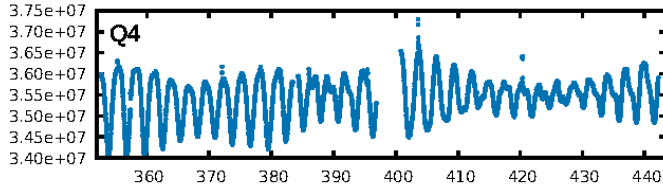
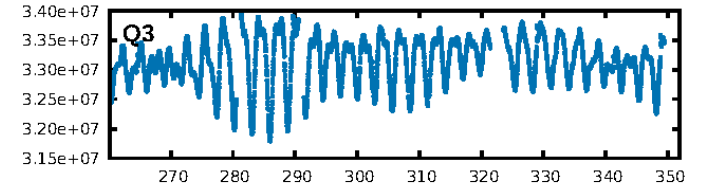
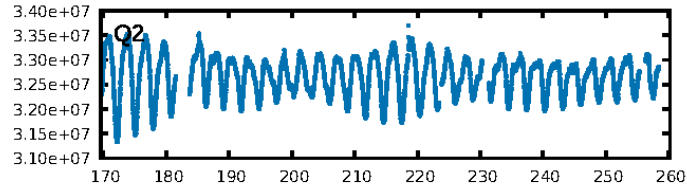
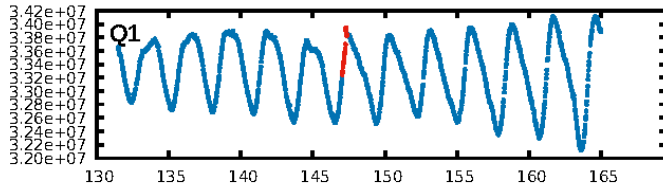
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [297.86]  
LongPeriod-sig: 100.0% [521.03]  
ModelChiSquare2-sig: 1.3%  
ModelChiSquareGof-sig: 81.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: 0.528**  
Centroid-sig: 44.3%  
Centroid-so: 0.699 arcsec [0.67]  
**OotOffset-rm: 0.479 arcsec [4.20]**  
**KicOffset-rm: 0.540 arcsec [4.74]**  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

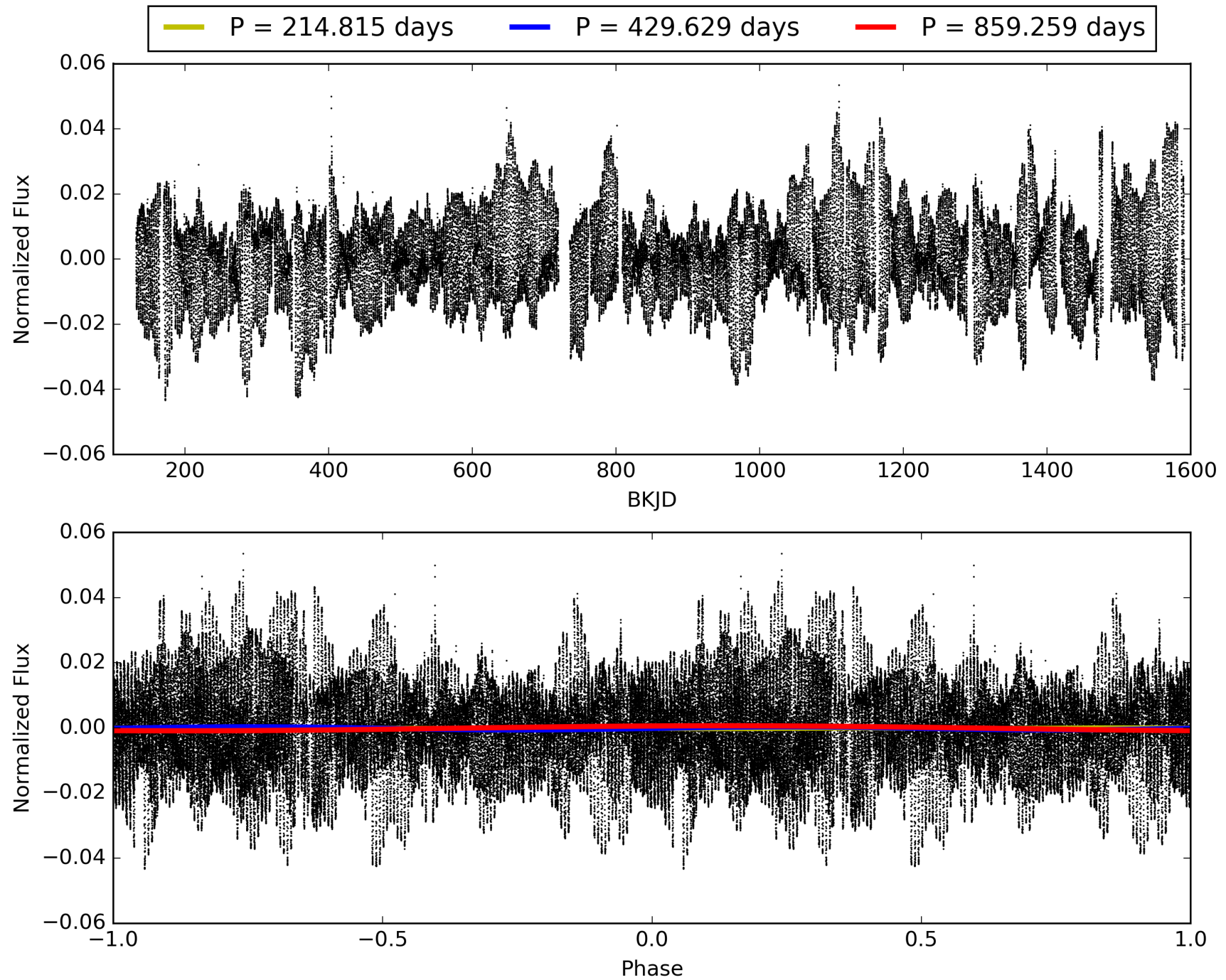
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:22:12 Z

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

# TCE 008604805-02, PDC Light Curves



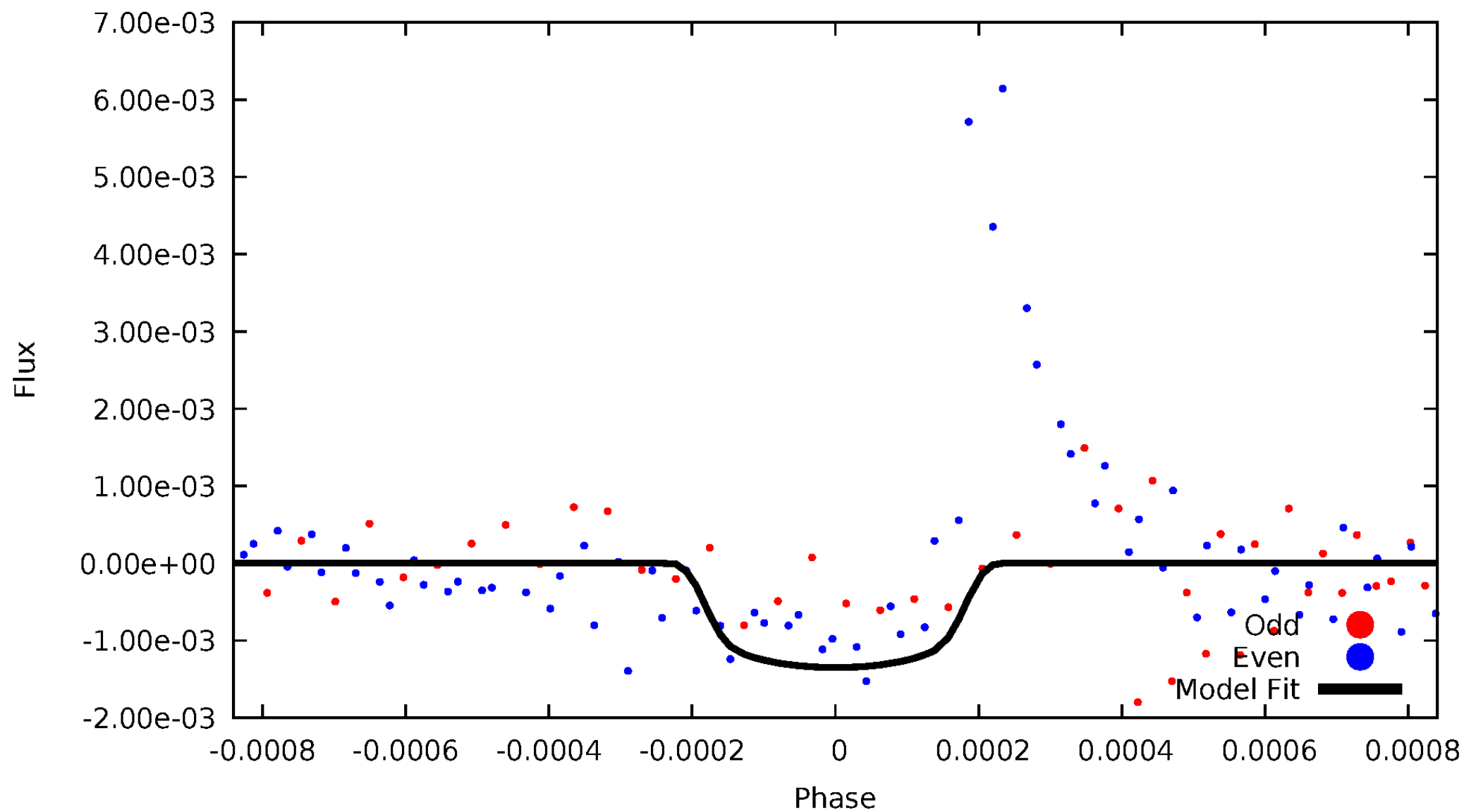
TCE 008604805-02





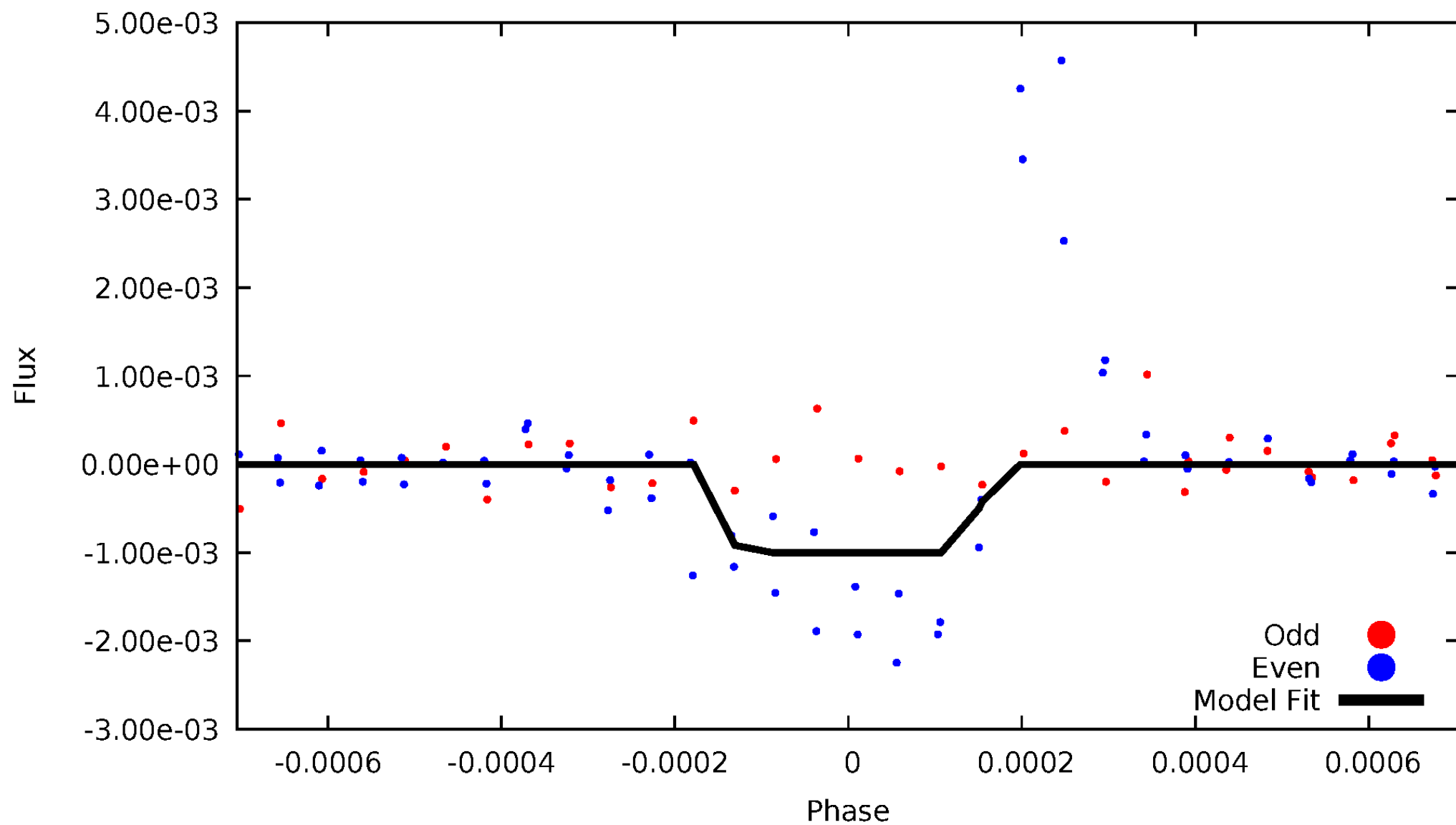
# DV Odd/Even

TCE 008604805-02



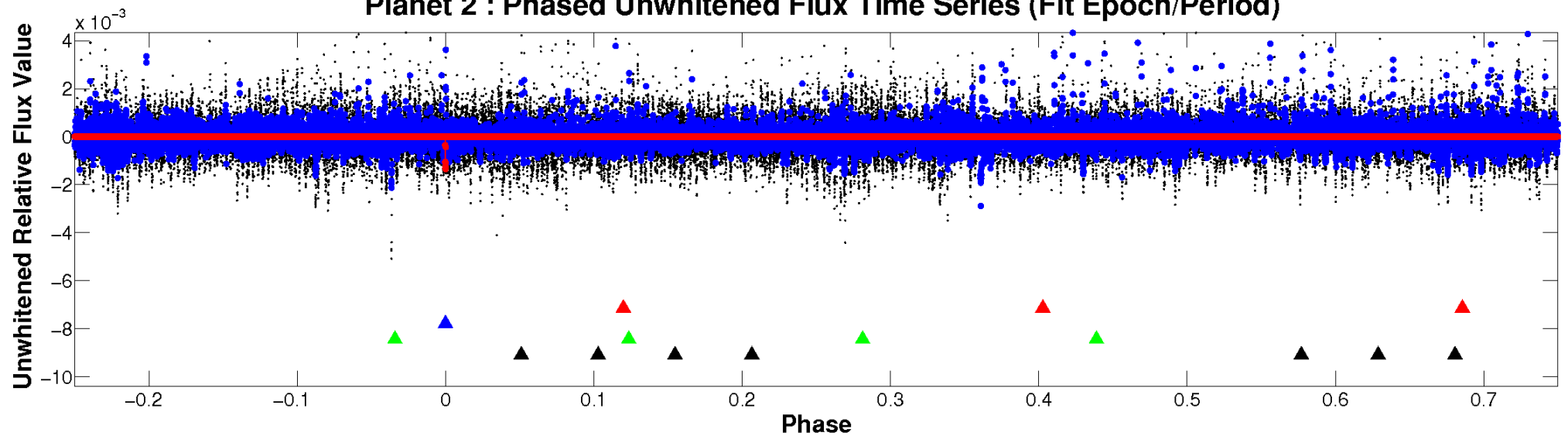
# ALT Odd/Even

TCE 008604805-02

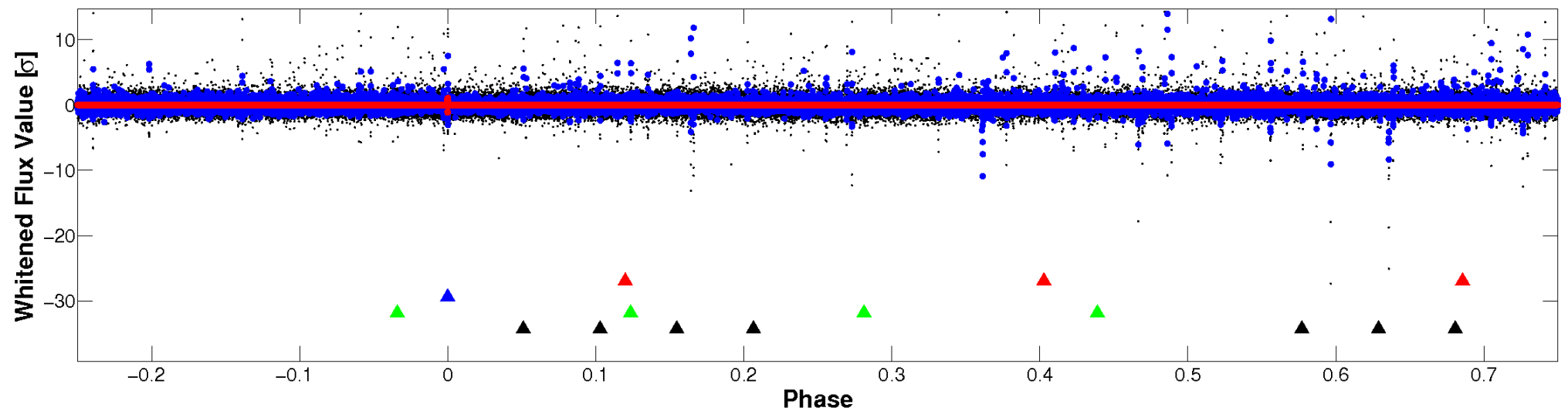


# Non-Whitened Vs. Whitened Light Curve

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

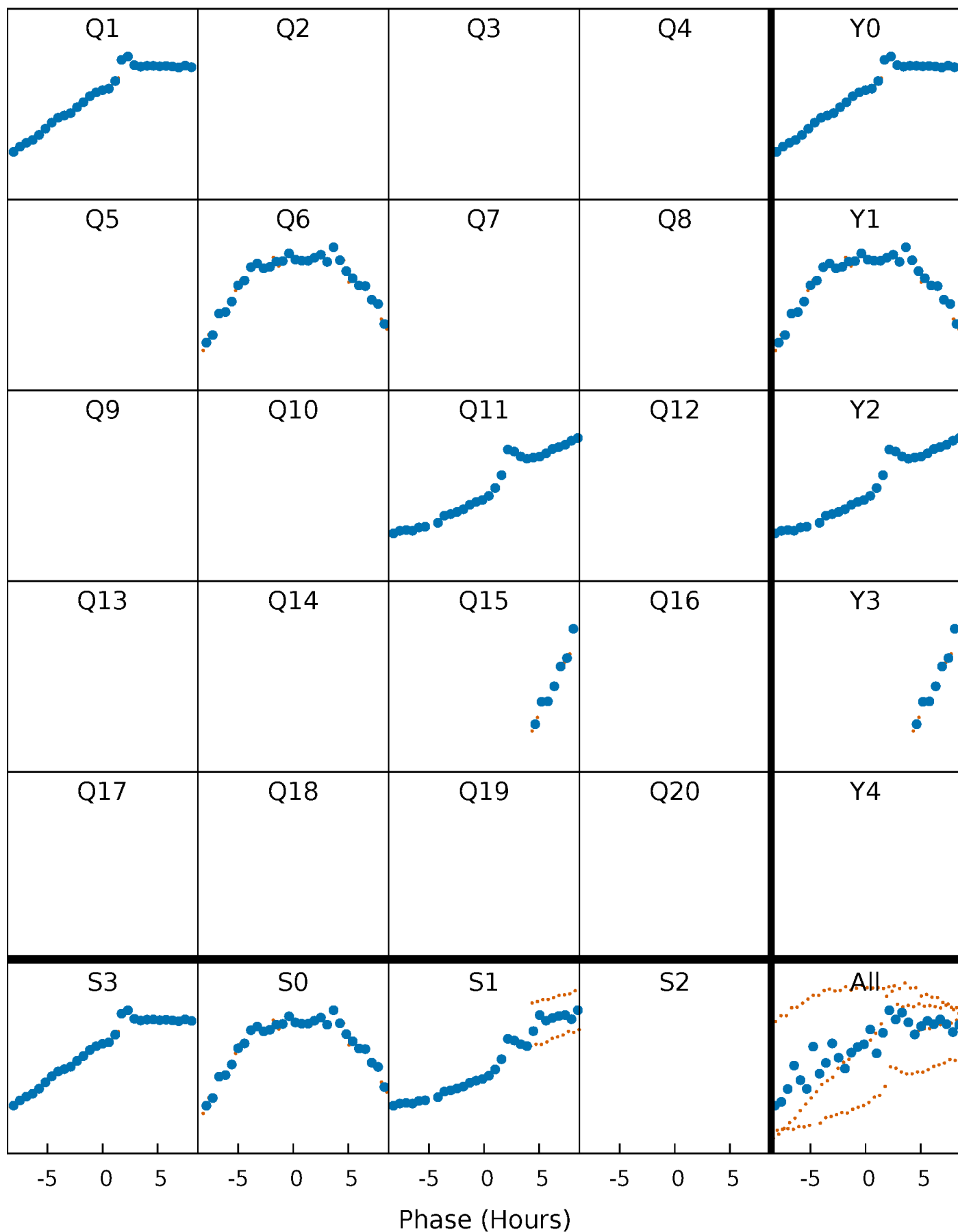


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



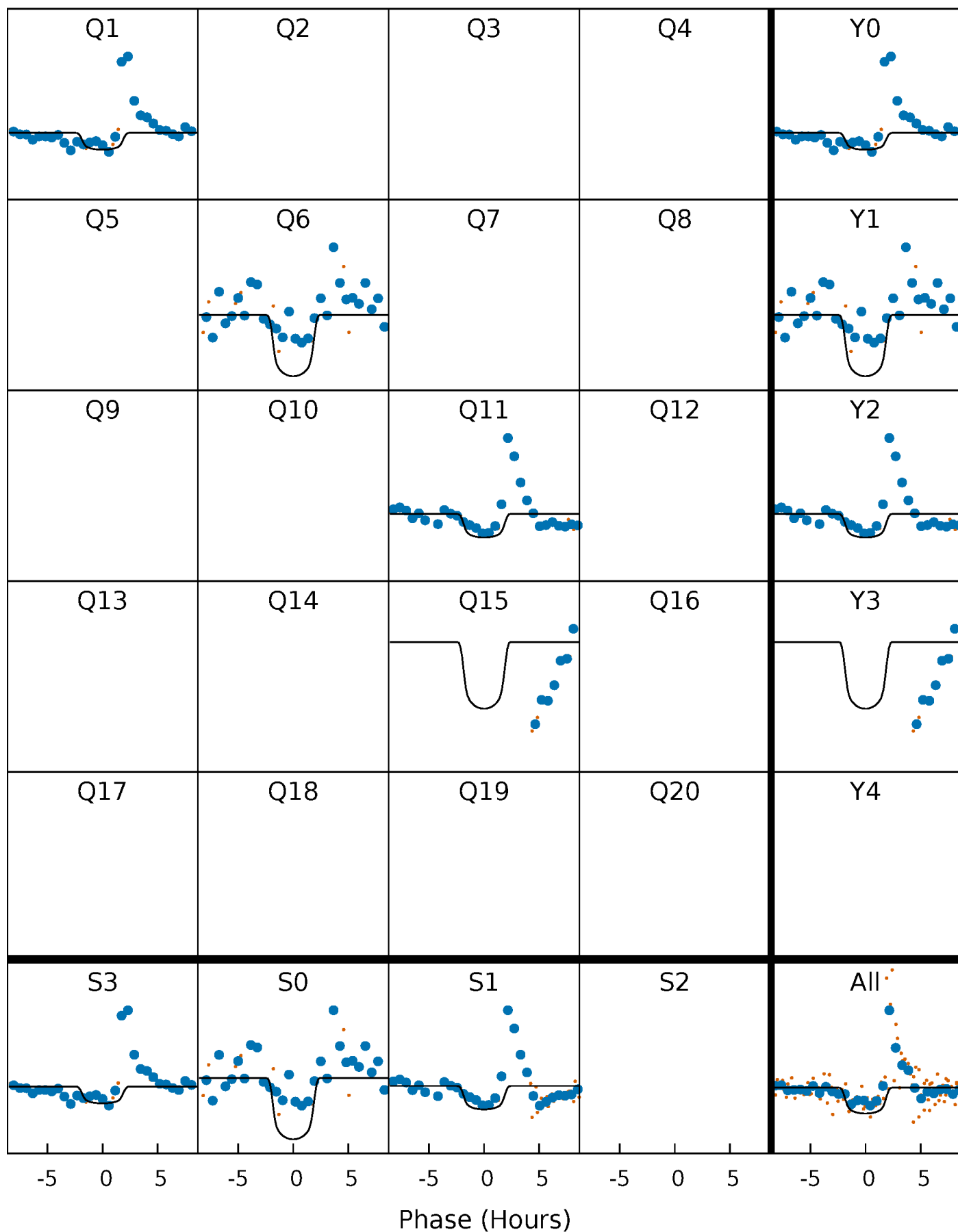
# PDC Quarter-Phased Transit Curves

TCE 008604805-02 P=429.629342 Days  $T_0=147.187659$  (BKJD)



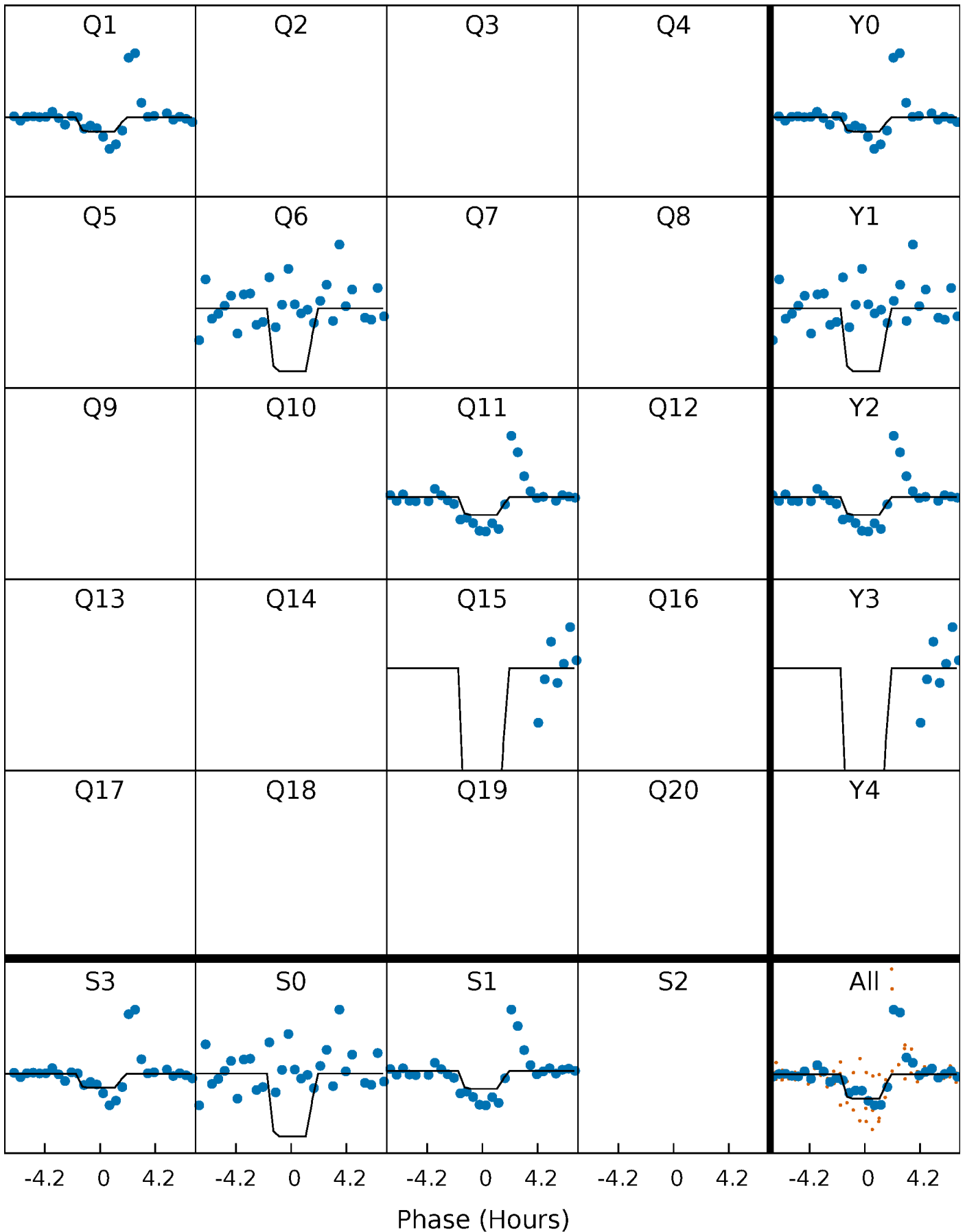
# DV Quarter-Phased Transit Curves

TCE 008604805-02 P=429.629342 Days  $T_0=147.187659$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

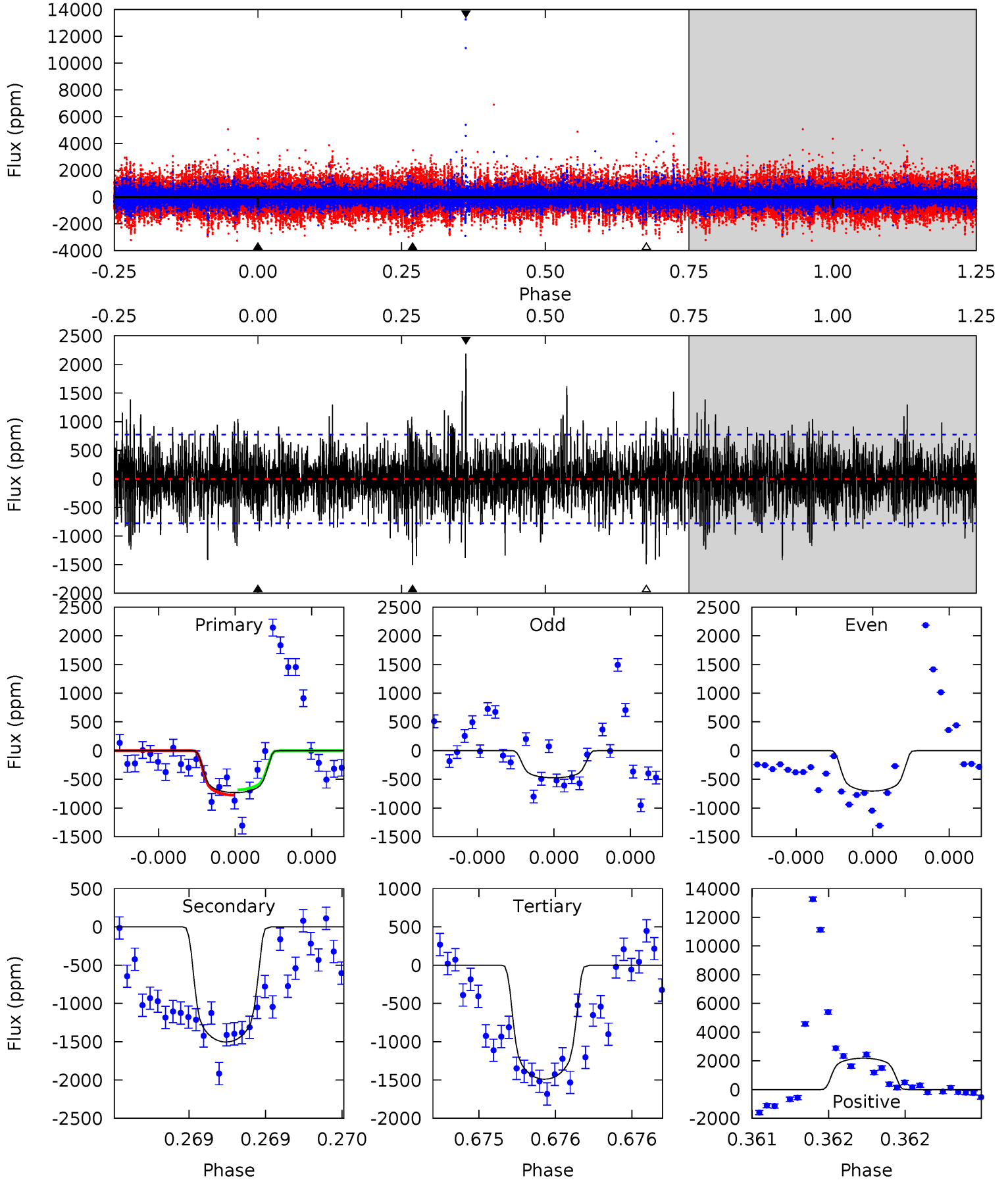
TCE 008604805-02 P=429.636032 Days  $T_0=147.182426$  (BKJD)



# DV Model-Shift Uniqueness Test

008604805-02, P = 429.629342 Days, E = 147.187659 Days

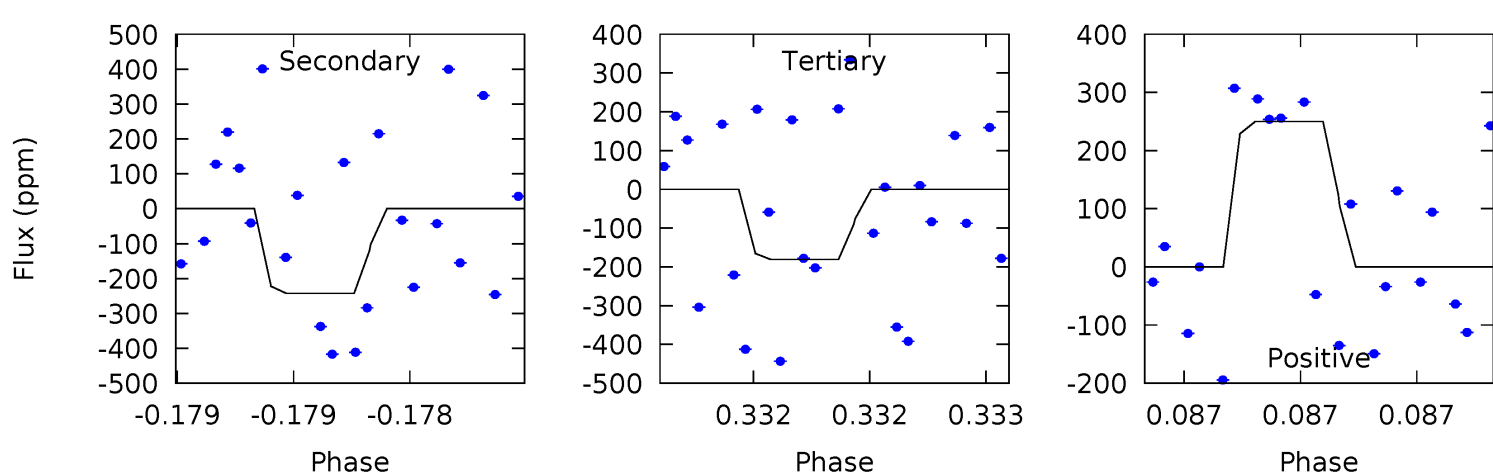
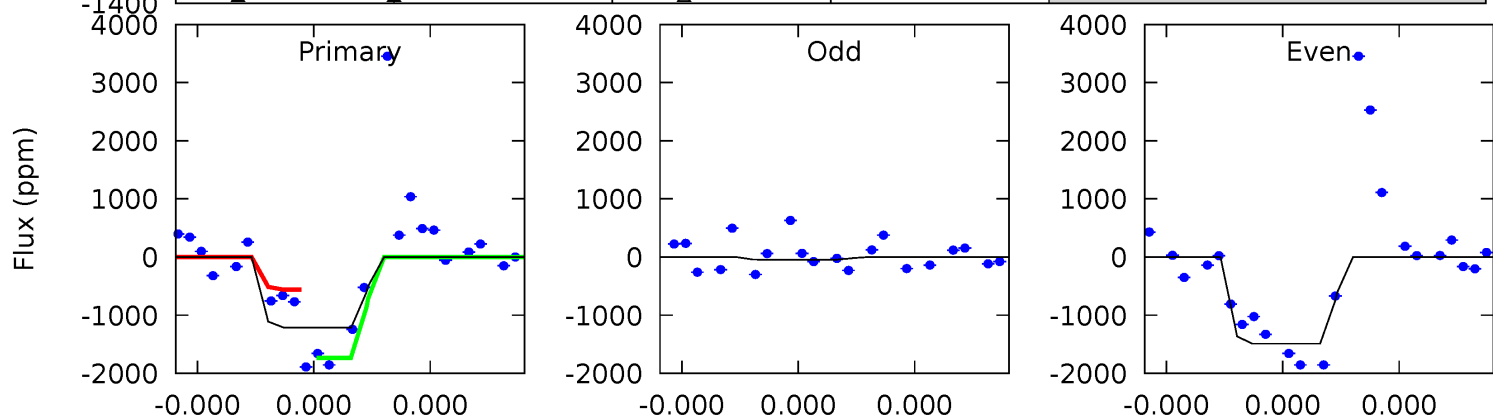
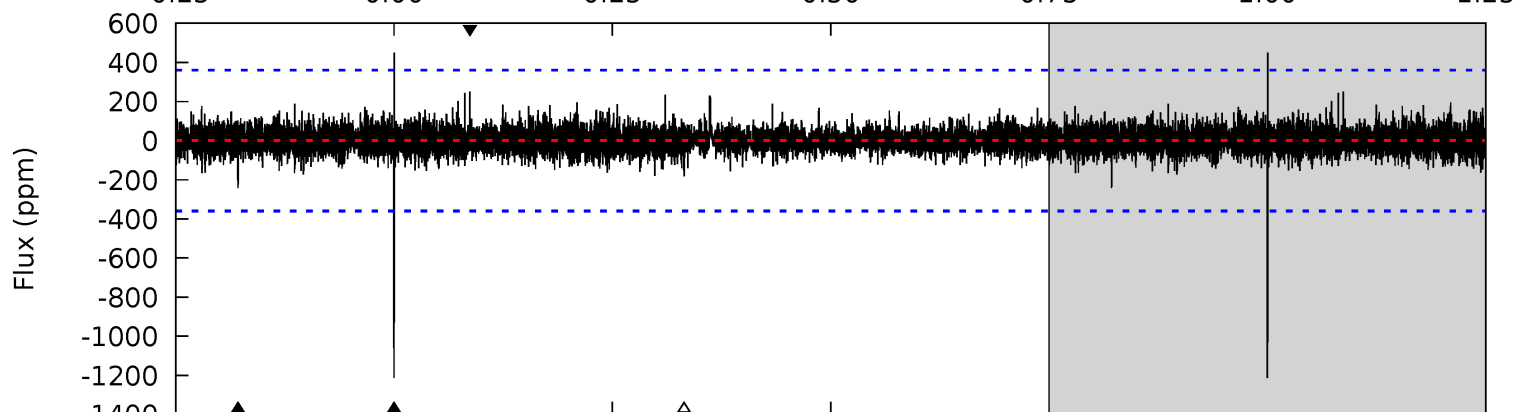
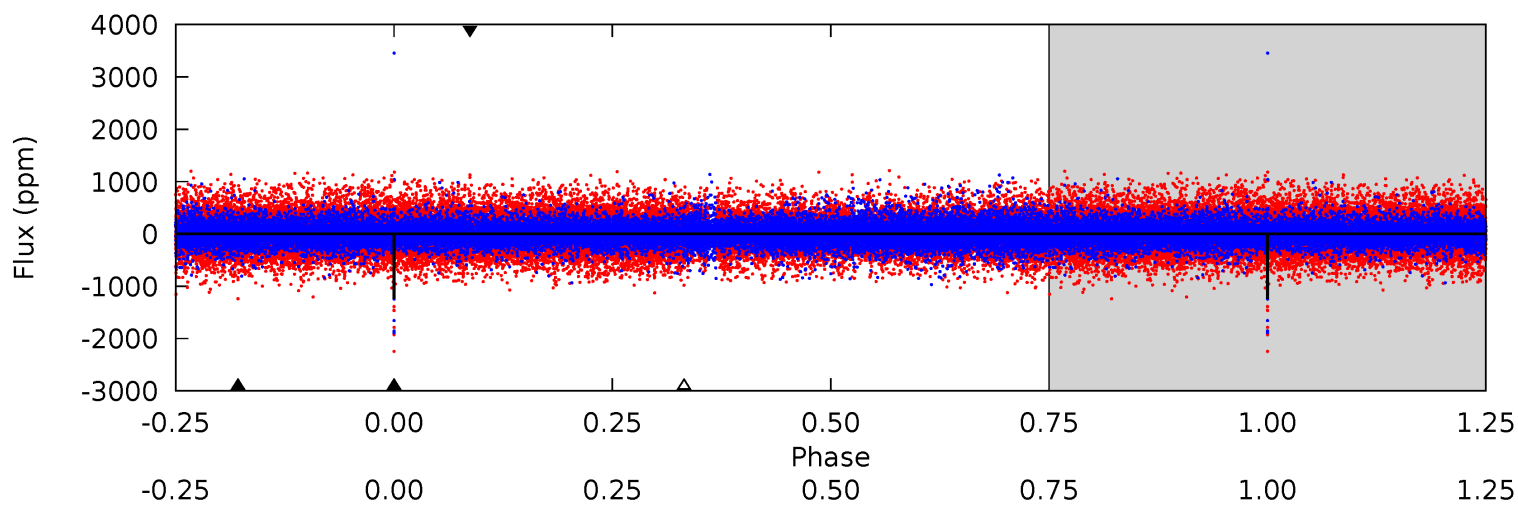
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.31	10.9	10.8	15.8	5.60	3.52	2.57	-5.47	-10.5	0.10	-4.94	0.77	1.04	0.59	0.34



# Alt Model-Shift Uniqueness Test

008604805-02, P = 429.636032 Days, E = 147.182426 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
19.0	3.80	2.83	3.92	5.64	3.59	0.66	16.2	15.1	0.97	-0.11	11.8	0.72	0.27	8.85





### Stellar Parameters For KIC 008604805

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5505^{+163}_{-163}$	$4.513^{+0.116}_{-0.105}$	$-0.640^{+0.350}_{-0.300}$	$0.771^{+0.117}_{-0.098}$	$0.706^{+0.099}_{-0.040}$	$2.169^{+0.972}_{-0.672}$
	+3%/-3%	+3%/-2%	+55%/-47%	+15%/-13%	+14%/-6%	+45%/-31%
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 008604805-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1504 \pm 138$	$3.21^{+0.85}_{-0.78}$	$298^{+15}_{-14}$	$5546^{+838}_{-539}$	$79837^{+63446}_{-29699}$
Alt.	$-243 \pm 64$	$2.67^{+0.85}_{-0.77}$	$299^{+15}_{-15}$	$4120^{+594}_{-413}$	$19061^{+19564}_{-8971}$

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

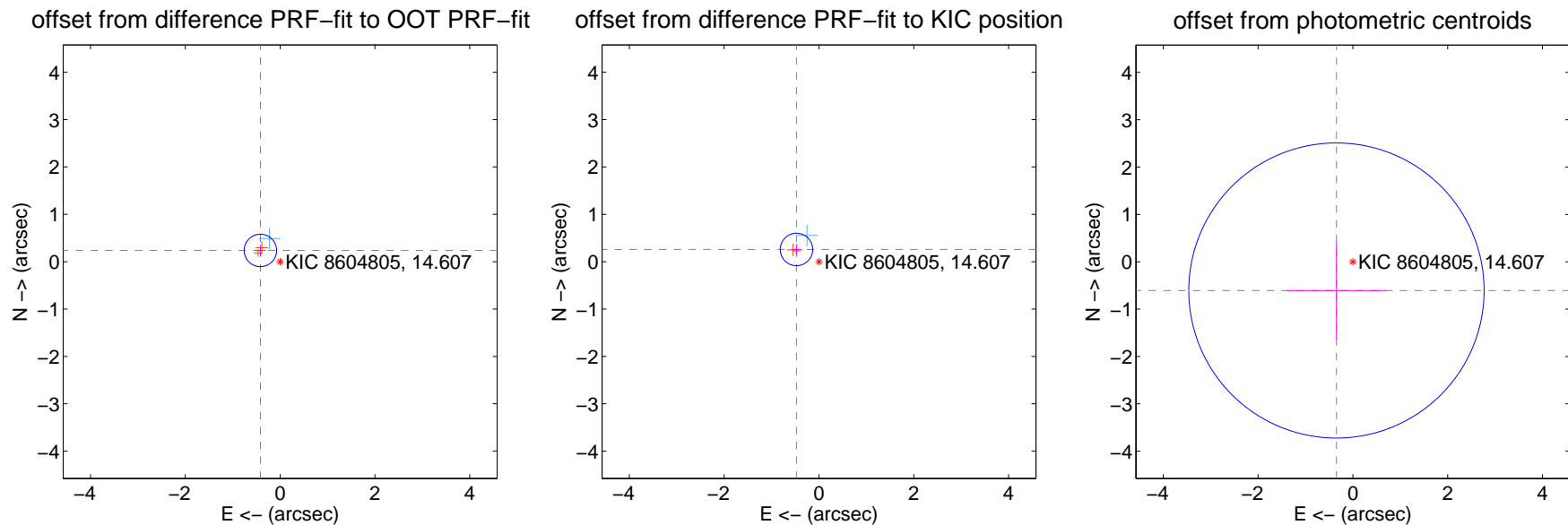
## DV Centroid Data

Supplemental centroid analysis for 008604805-02. Kepler magnitude: 14.61. Transit SNR 5.64

There are 1 quarters with good PRF difference image offsets

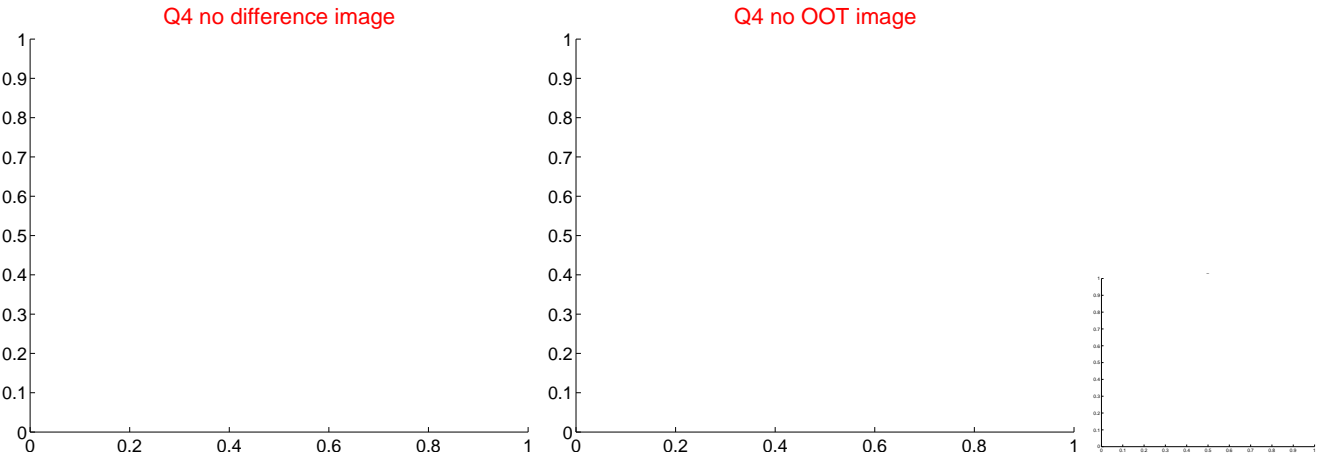
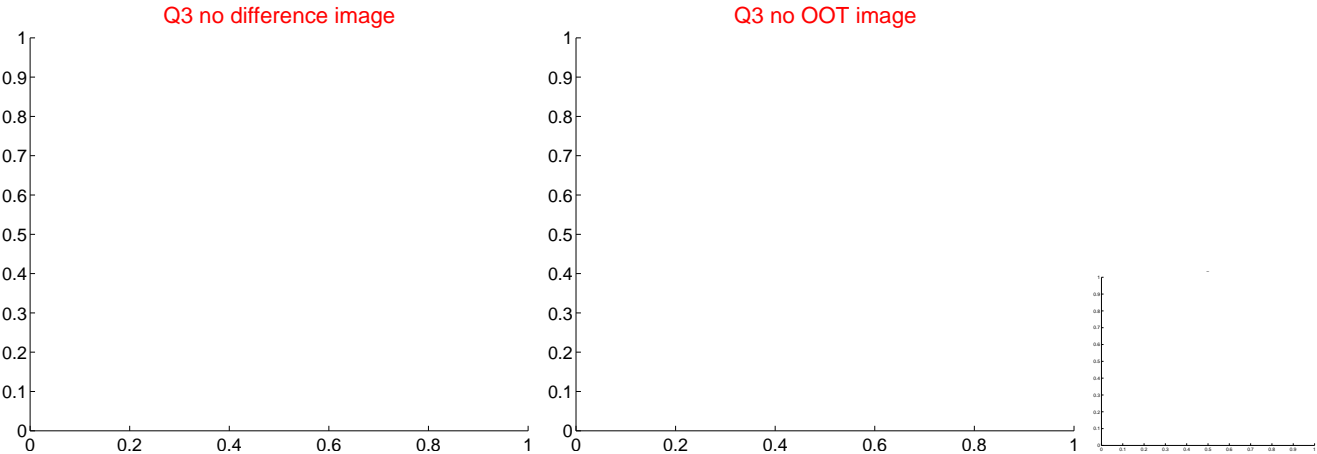
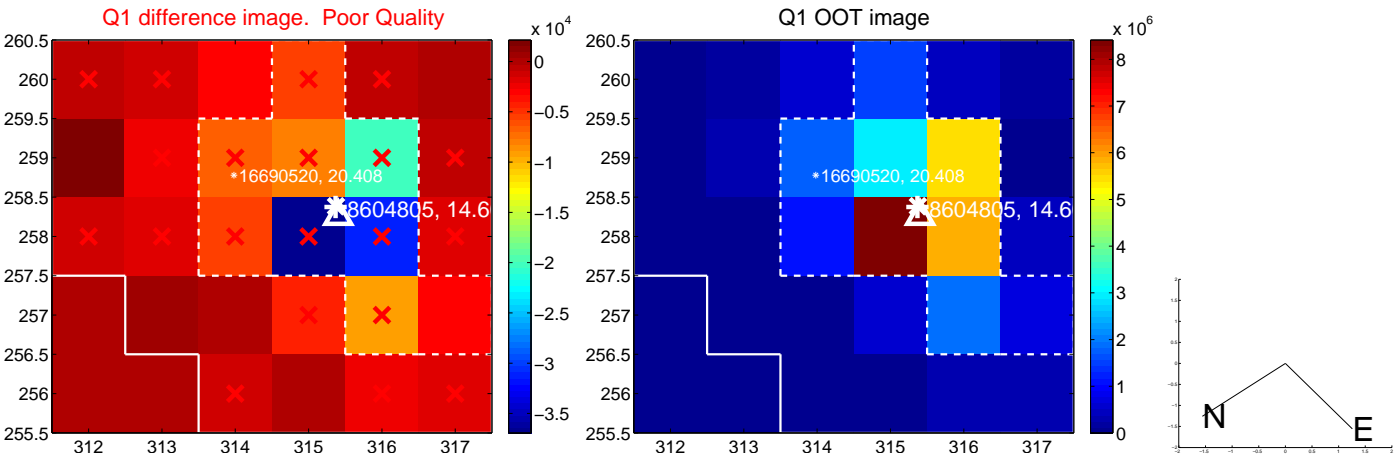
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.479 \pm 0.114$	4.20	$0.416 \pm 0.114$	$0.238 \pm 0.113$
PRF-fit source offset from KIC position	$0.540 \pm 0.114$	4.74	$0.475 \pm 0.114$	$0.258 \pm 0.113$
photometric centroid source offset	$0.70 \pm 1.04$	0.67	$0.35 \pm 1.05$	$-0.61 \pm 1.04$

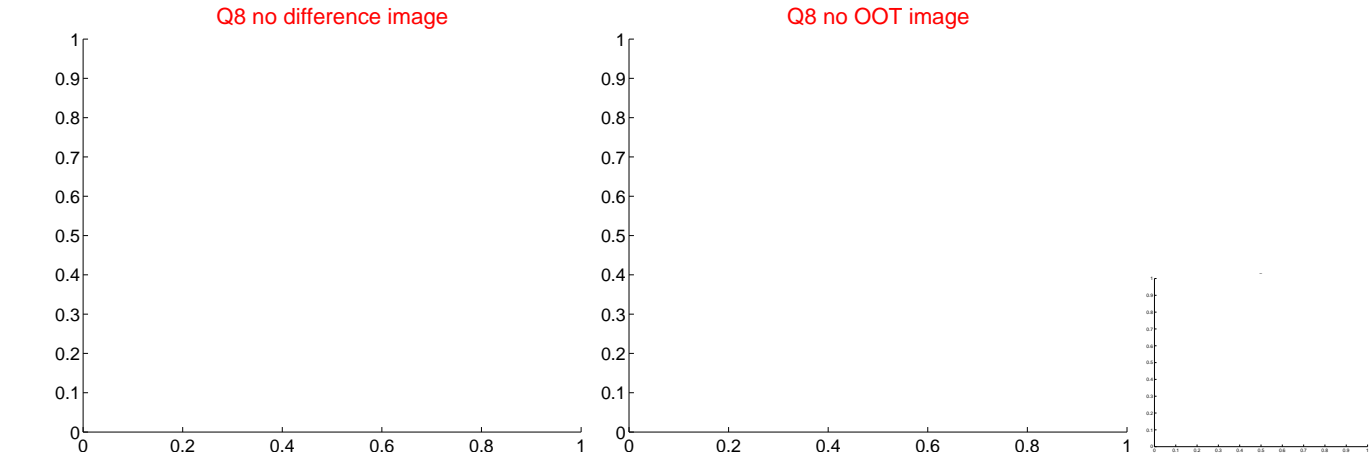
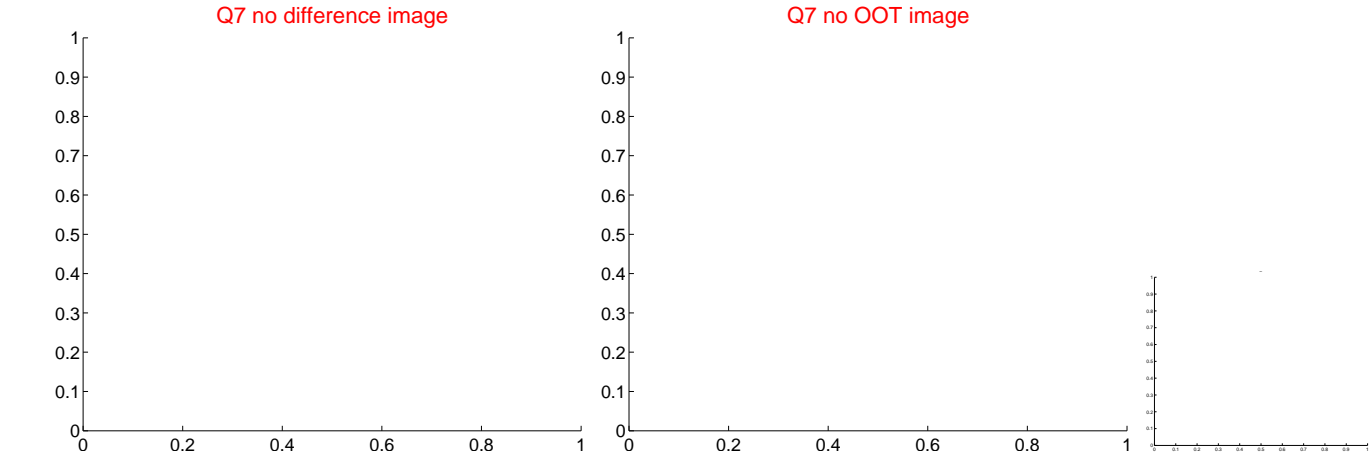
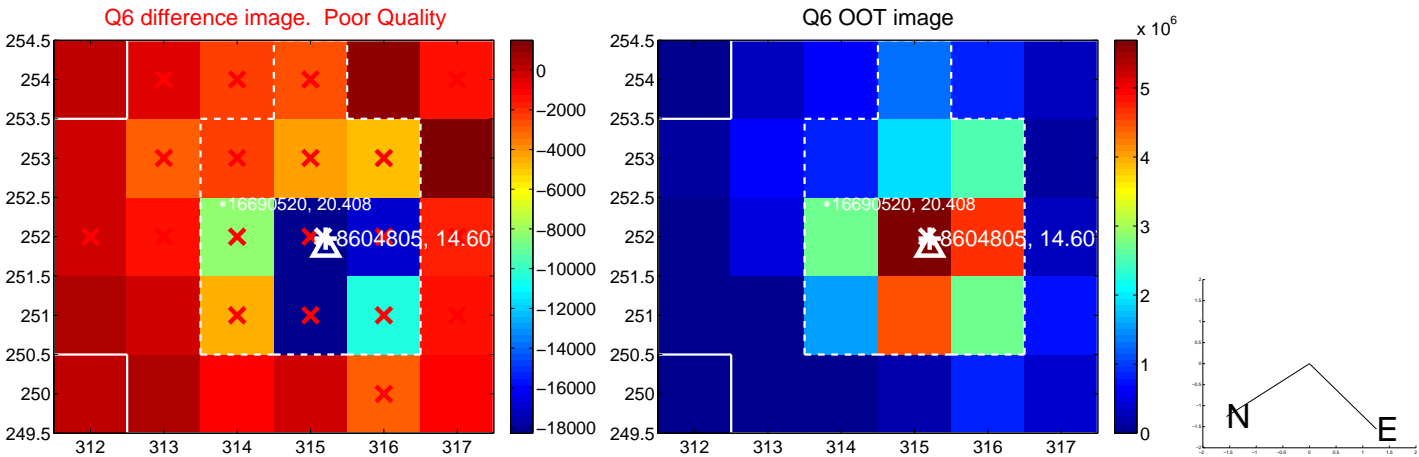
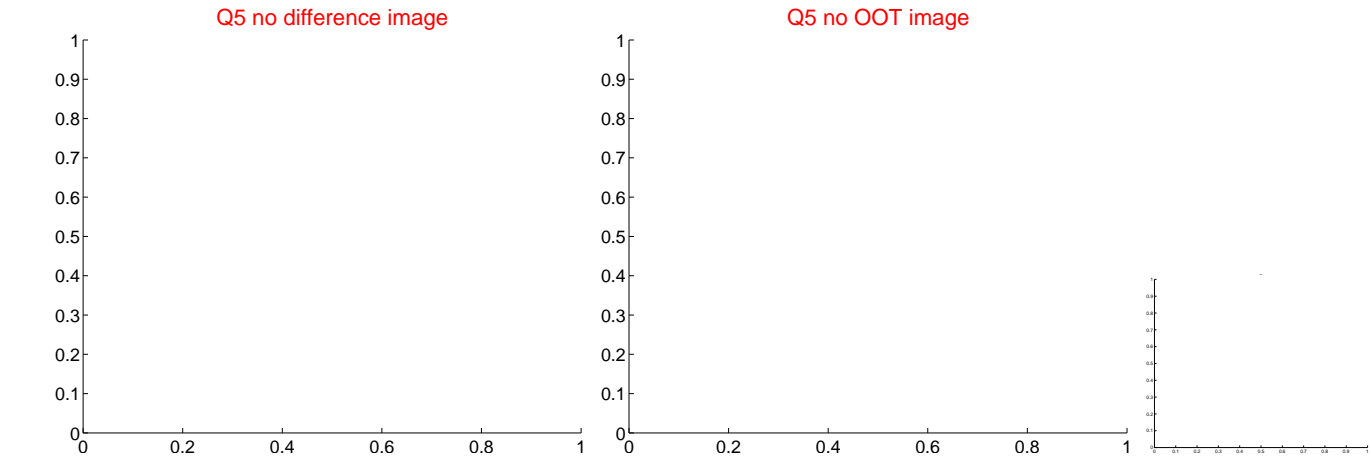


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

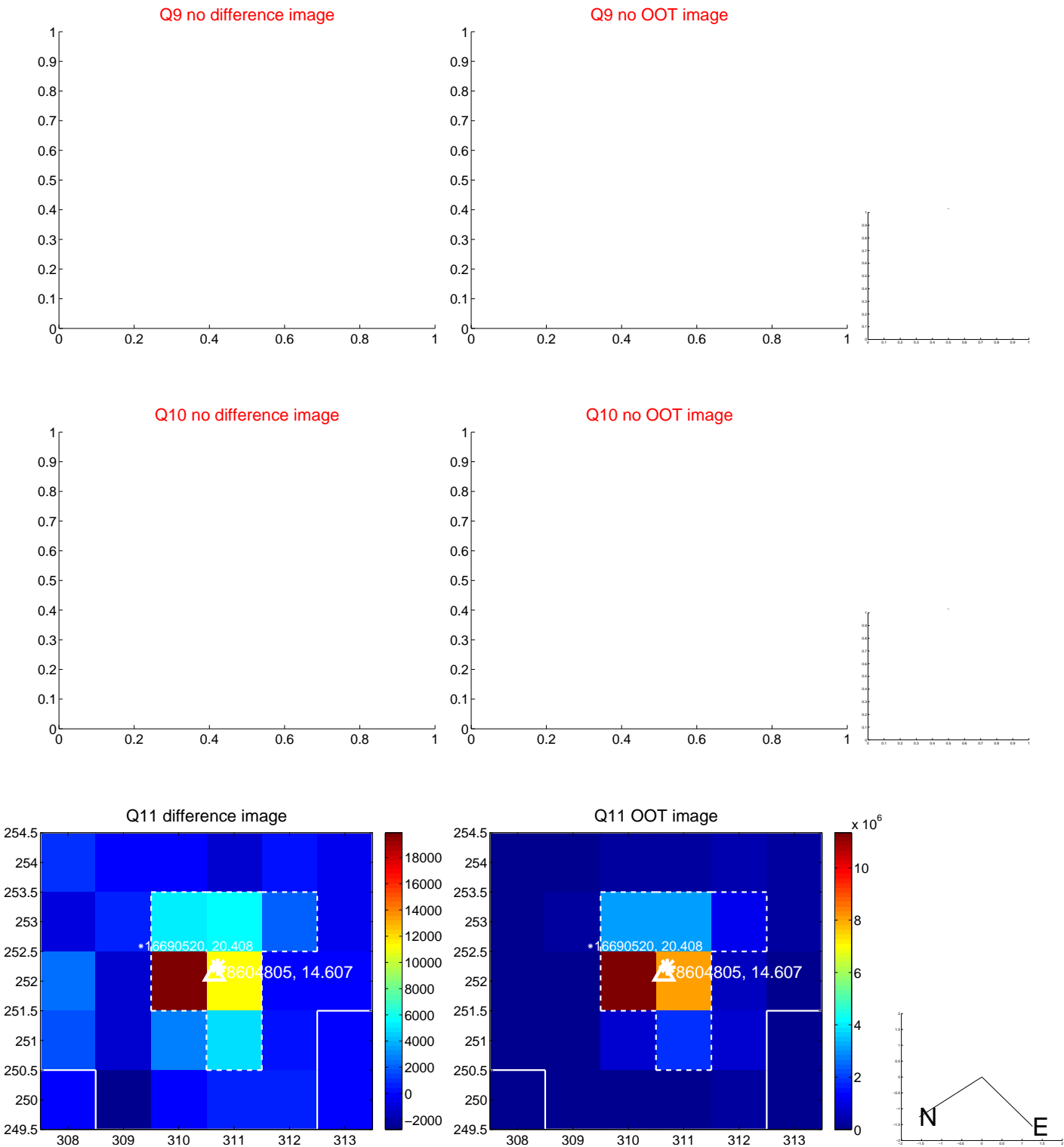
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



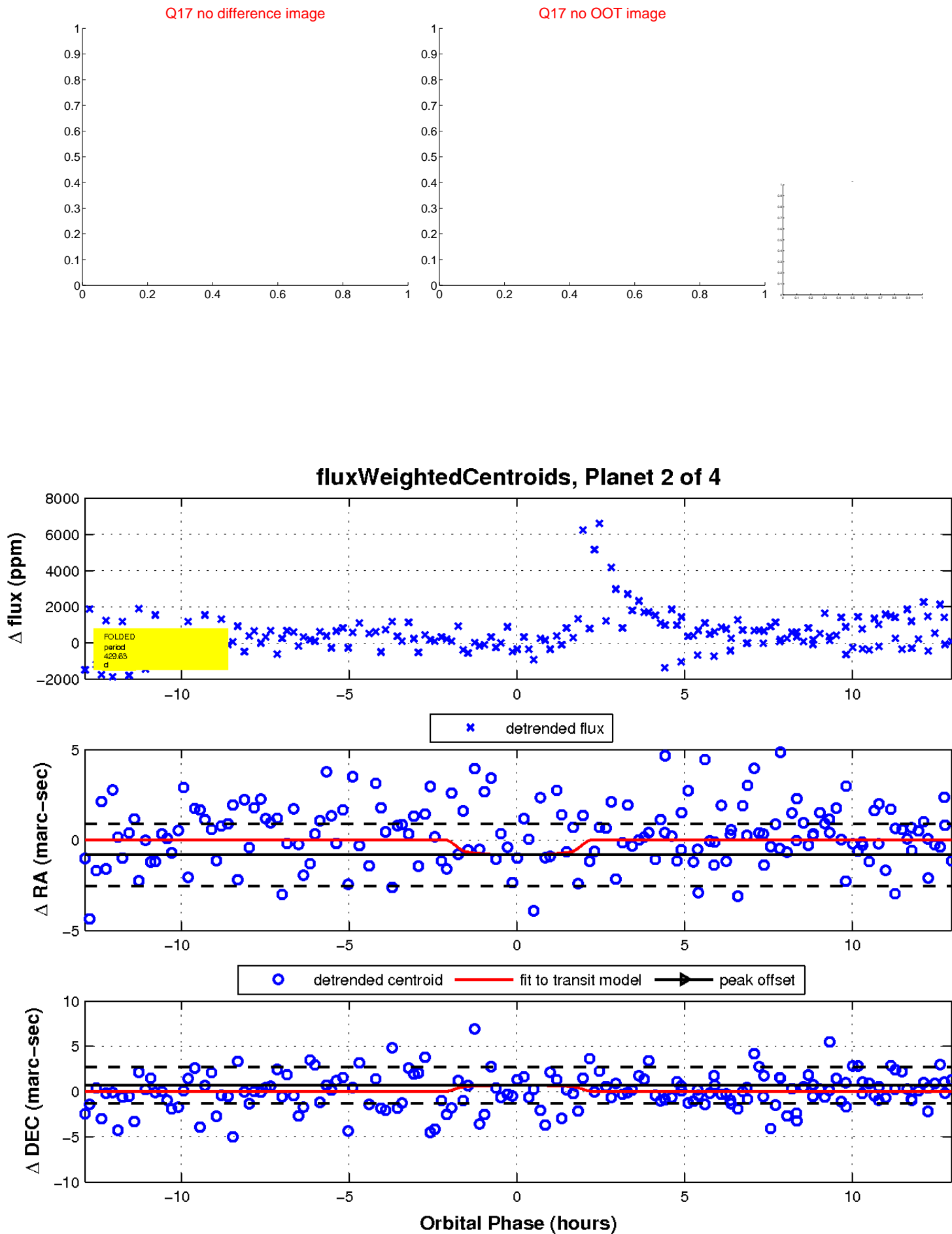
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

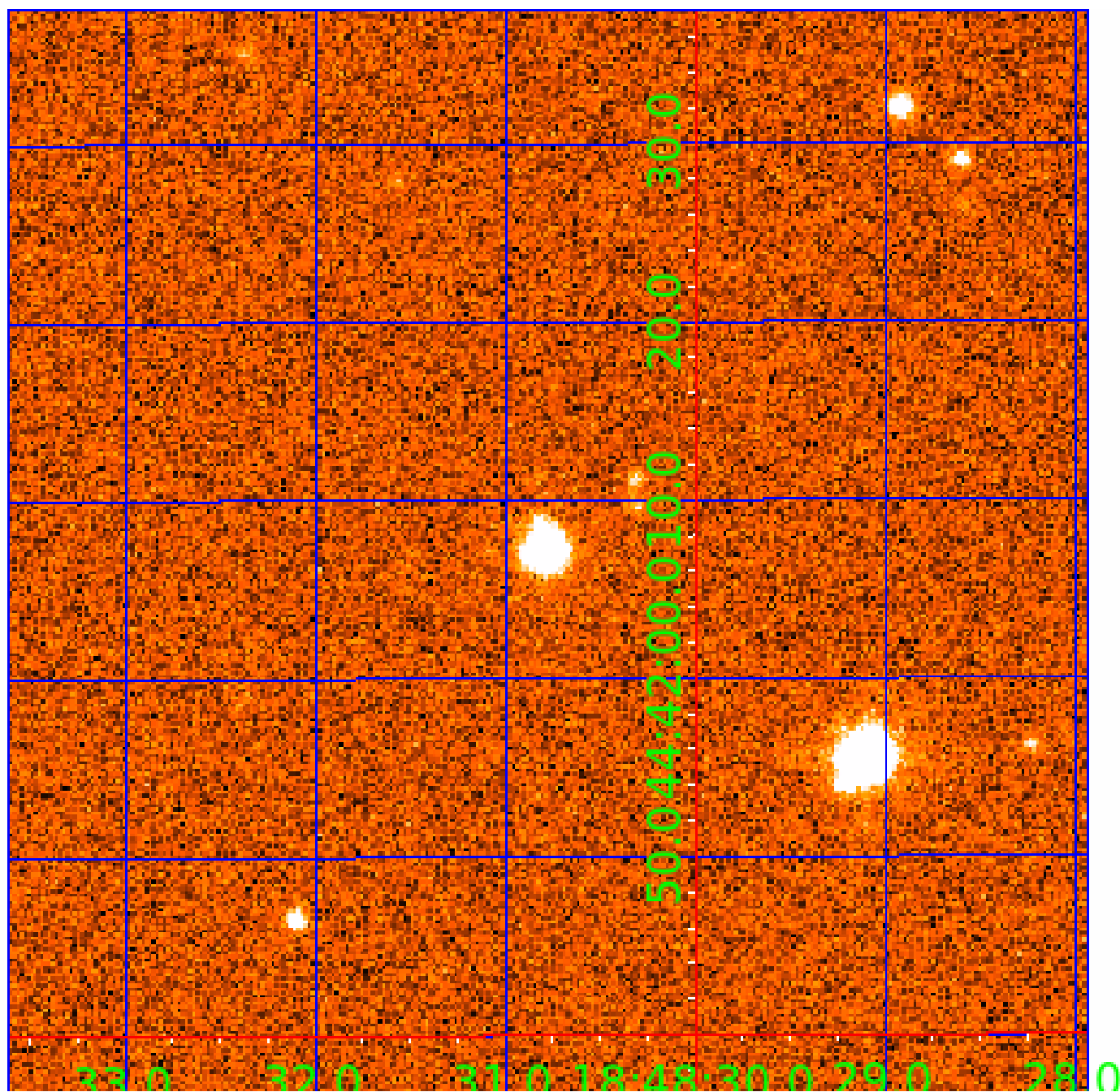


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 008604805

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008604805-01	OBS	No	551.143784	198.715032	1820.4	3.544	15.9	9.2	0.77	5505	3.27	0.36
008604805-02	OBS	No	429.629342	147.187659	1350.2	4.333	13.7	5.6	0.77	5505	3.23	0.50
008604805-03	OBS	No	361.900617	335.745488	1090.8	3.318	13.7	7.2	0.77	5505	2.65	0.62
008604805-04	OBS	No	203.682617	235.938102	1523.9	2.500	10.2	-1.0	0.77	5505	2.99	1.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008604805-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008604805-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
008604805-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008604805-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—INCONSISTENT_TRANS—CENT_NOFITS

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

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

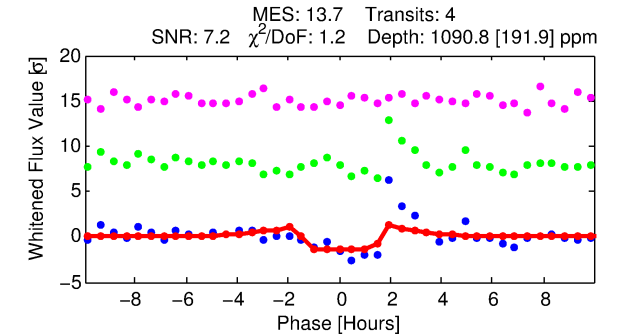
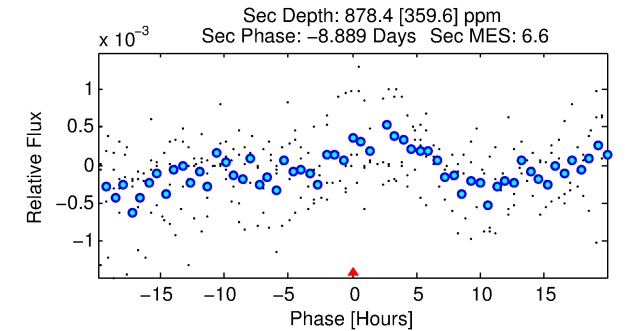
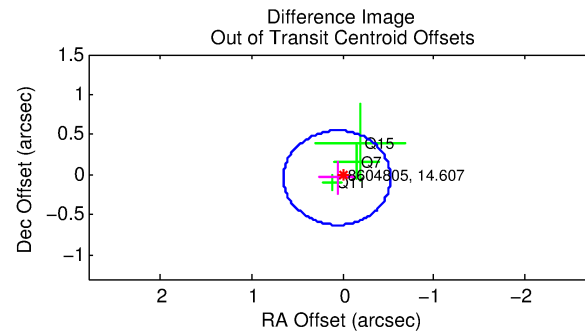
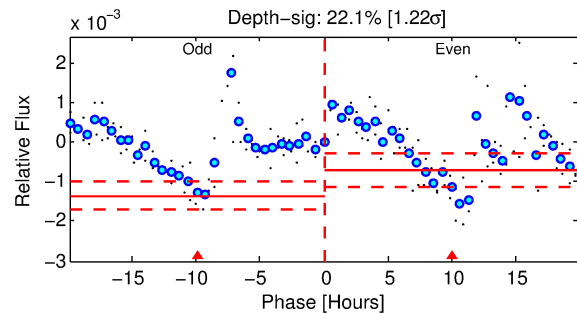
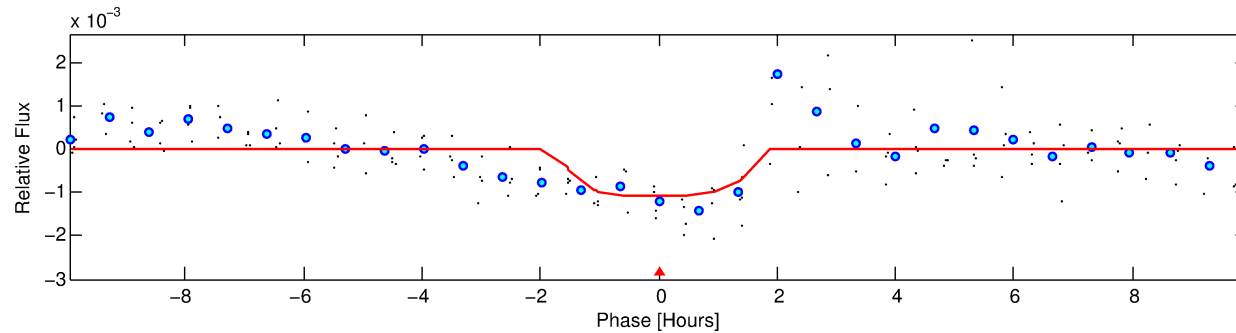
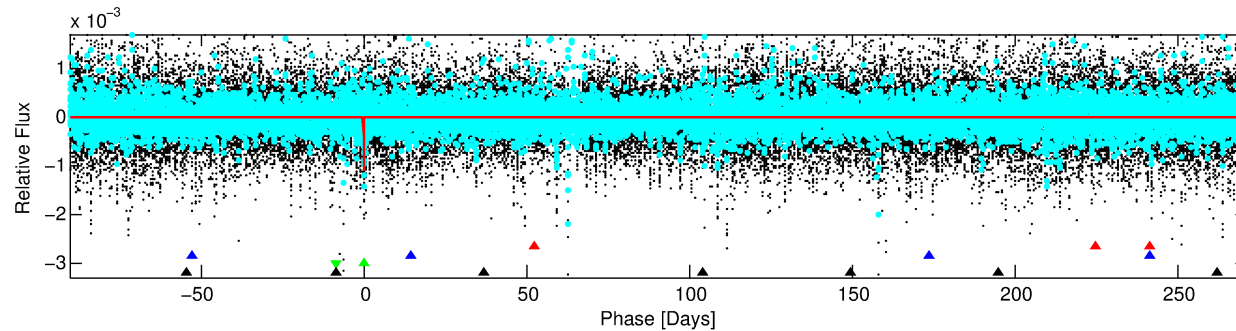
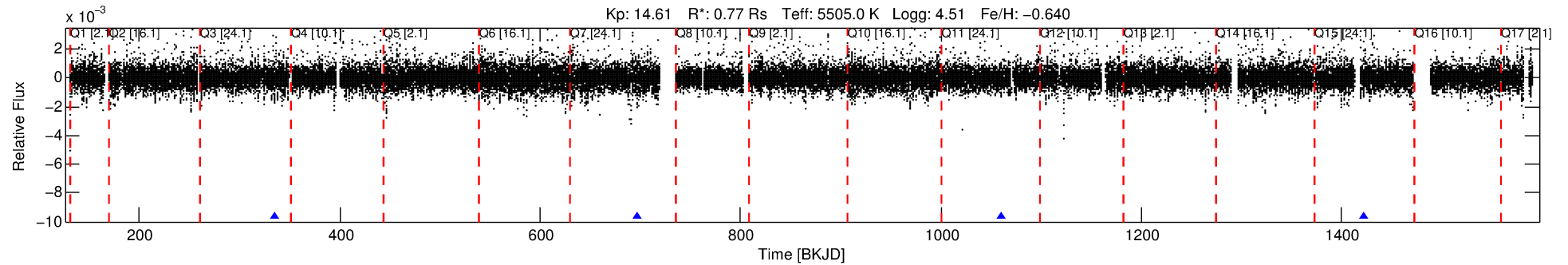
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008604805-03

No Significant Match Found

# DV One-Page Summary

KIC: 8604805 Candidate: 3 of 4 Period: 361.901 d



## DV Fit Results:

Period = 361.90062 [0.00423] d  
Epoch = 335.7455 [0.0069] BKJD  
Rp/R\* = 0.0315 [0.0784]  
a/R\* = 699.73 [7797.57]  
b = 0.60 [12.07]  
Seff = 0.62 [0.15]  
Teq = 227 [13] K  
Rp = 2.65 [6.61] Re  
a = 0.8854 [0.1193] AU  
Ag = 53821.43 [268646.97] [0.20 $\sigma$ ]  
Teffp = 5337 [6656] K [0.77 $\sigma$ ]

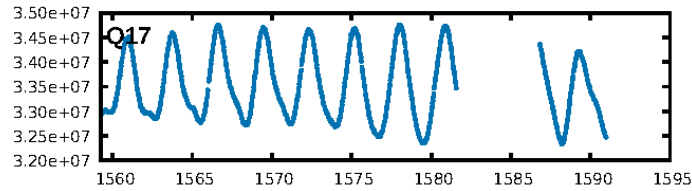
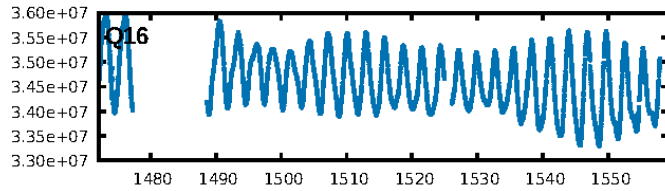
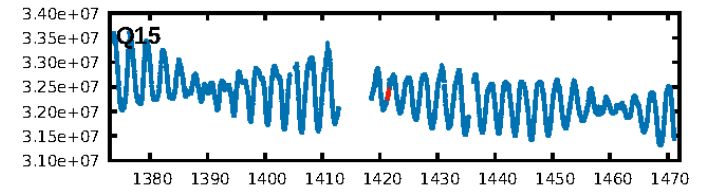
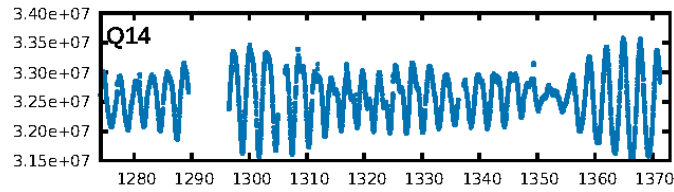
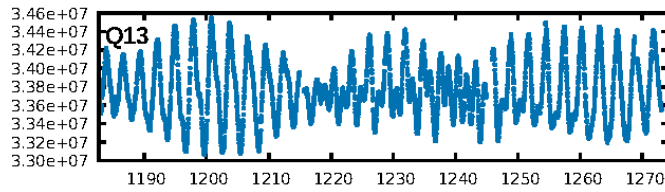
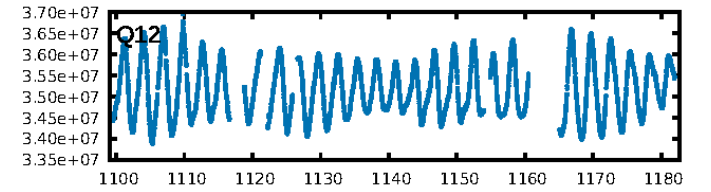
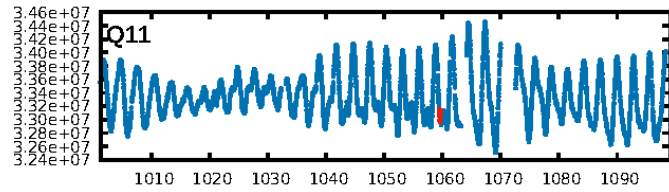
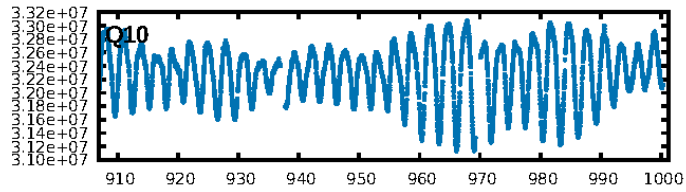
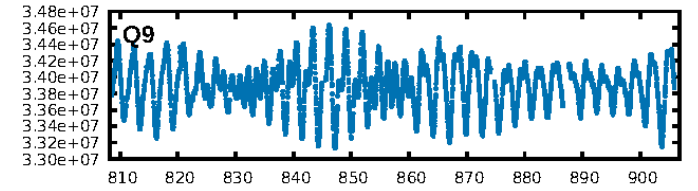
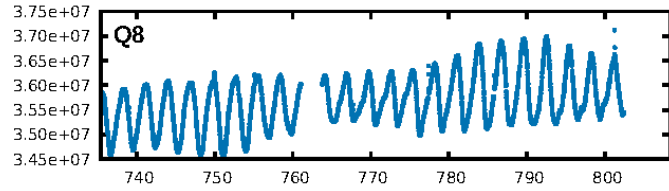
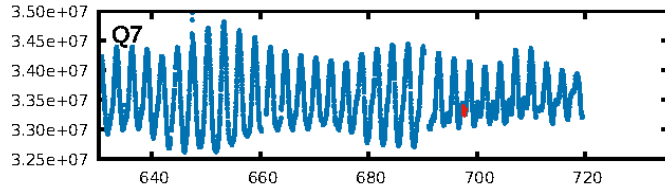
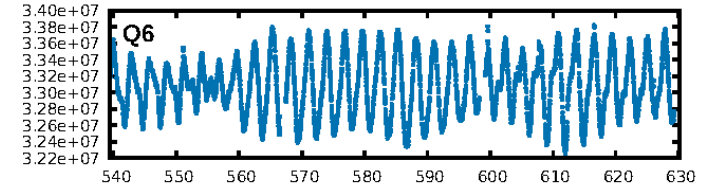
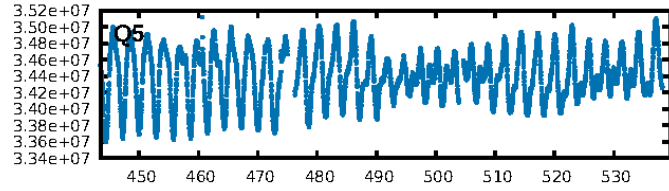
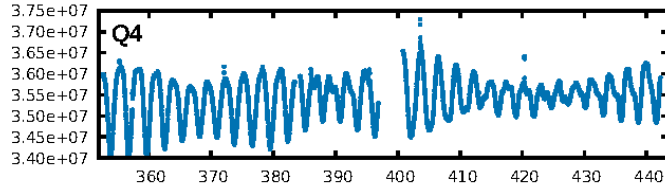
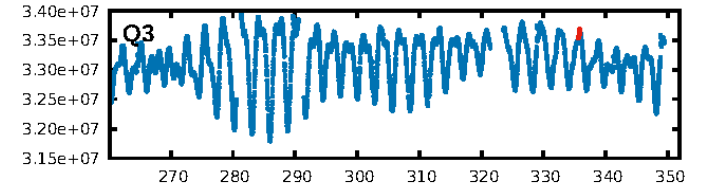
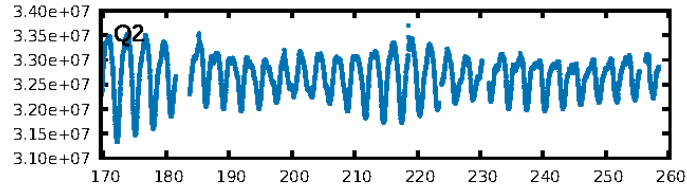
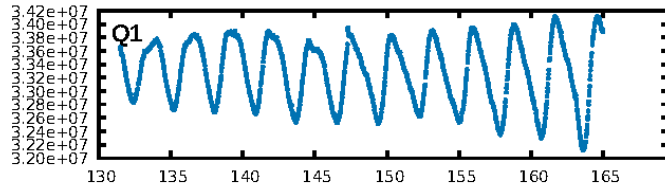
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [914.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [297.86 $\sigma$ ]  
ModelChiSquare2-sig: 17.8%  
ModelChiSquareGof-sig: 87.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -6.96  
Centroid-sig: 70.8%  
Centroid-so: 0.434 arcsec [0.38 $\sigma$ ]  
OotOffset-rm: 0.073 arcsec [0.37 $\sigma$ ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-rm: 0.150 arcsec [0.77 $\sigma$ ]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [4/4]

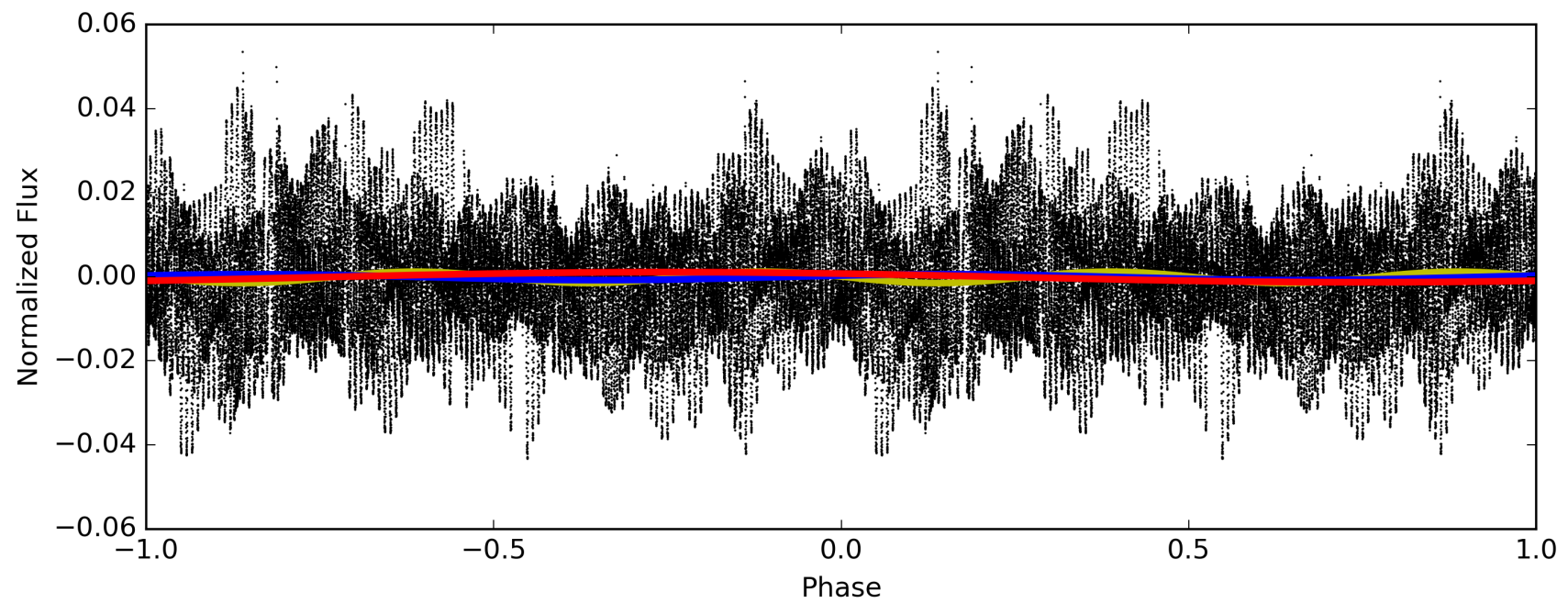
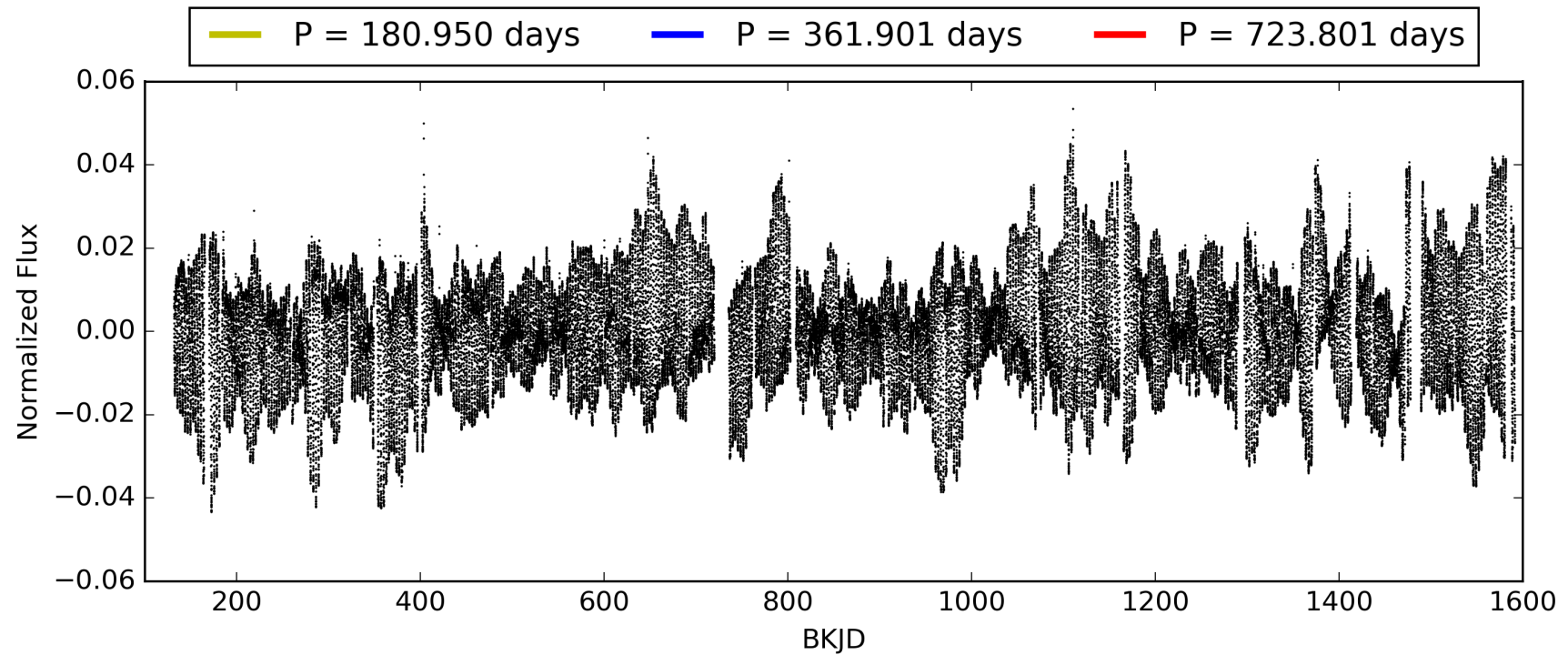
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:22:29 Z

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

# TCE 008604805-03, PDC Light Curves

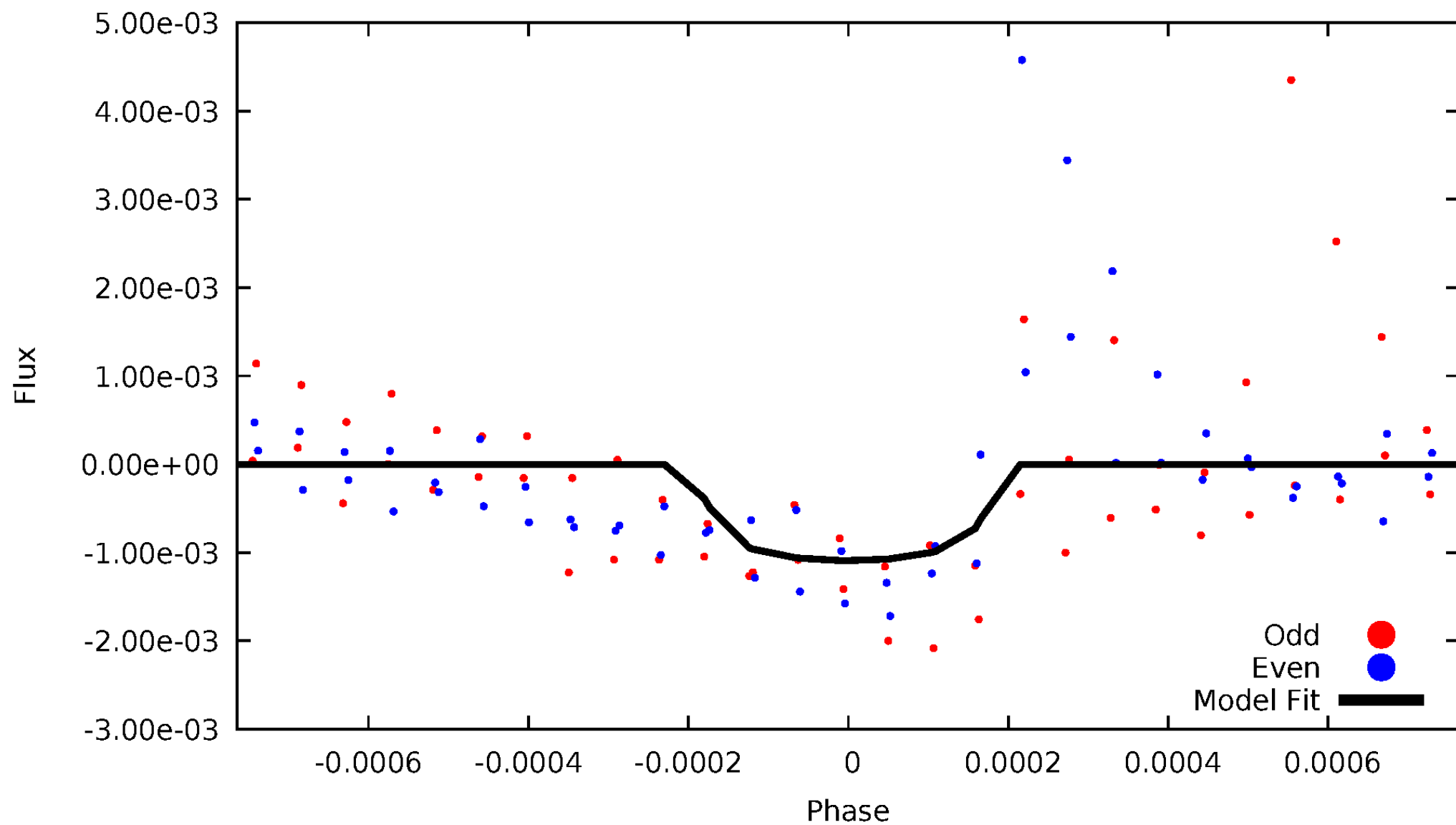


TCE 008604805-03



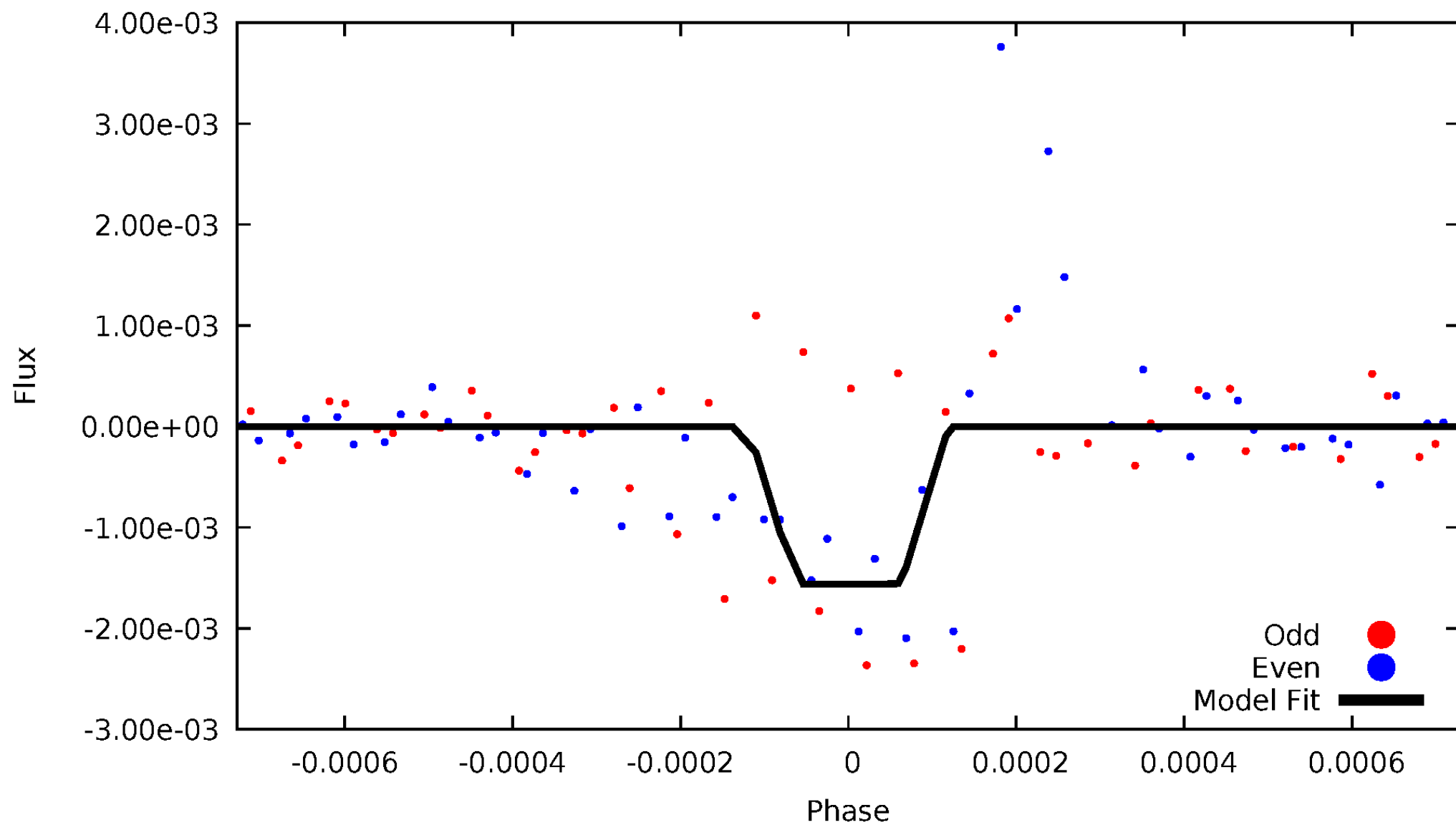
# DV Odd/Even

TCE 008604805-03



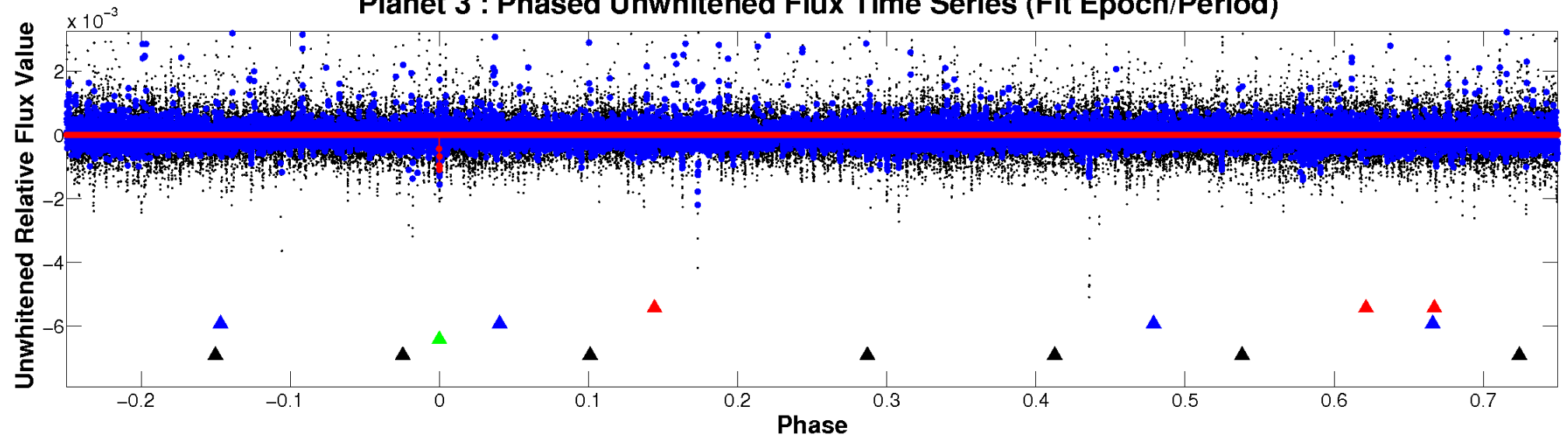
# ALT Odd/Even

TCE 008604805-03

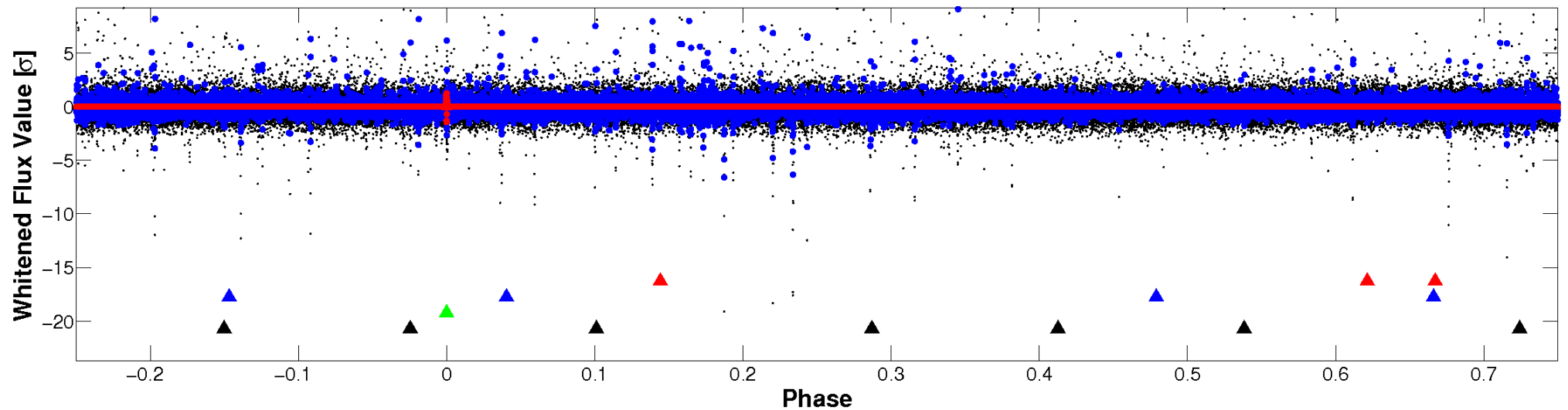


# Non-Whitened Vs. Whitened Light Curve

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

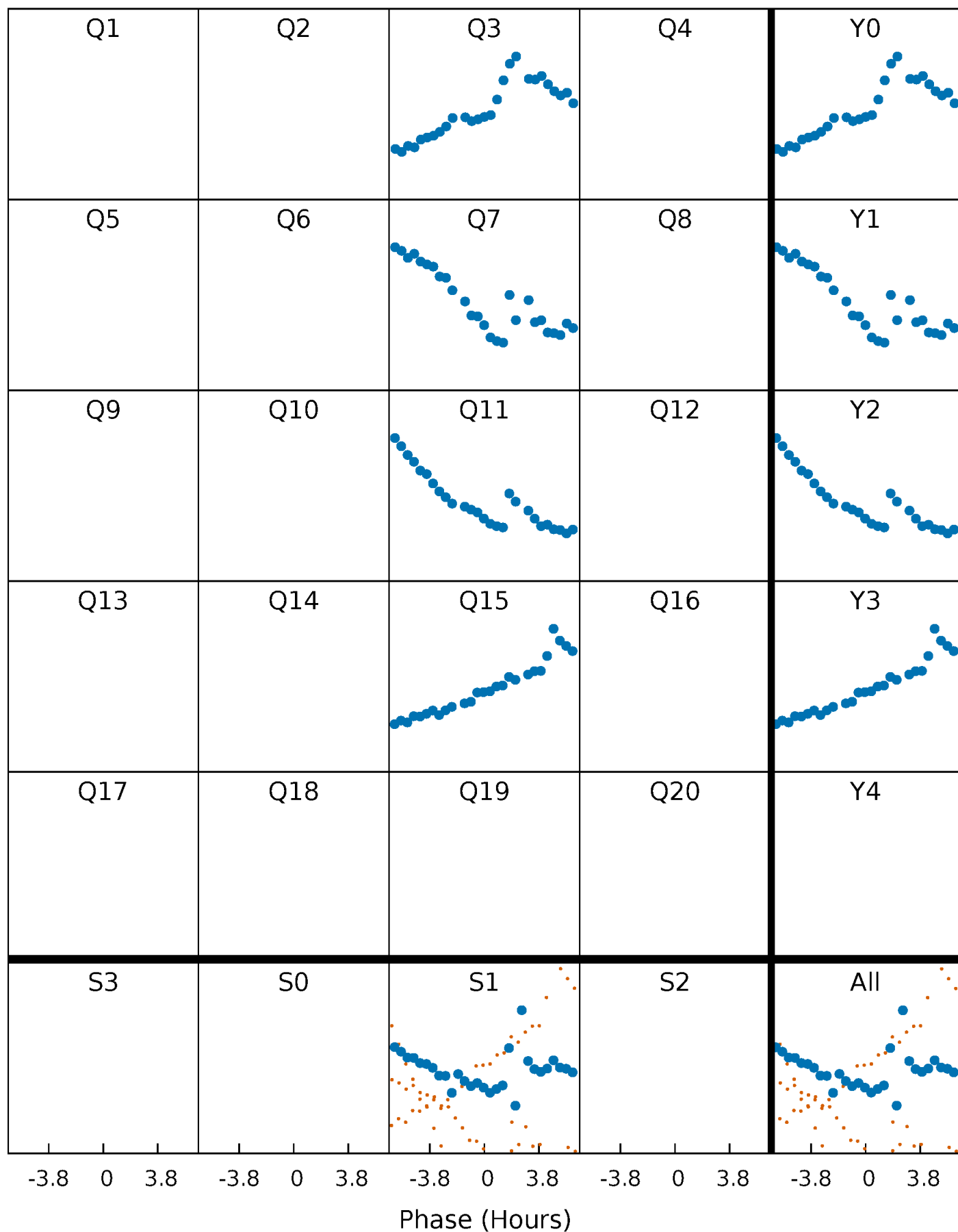


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

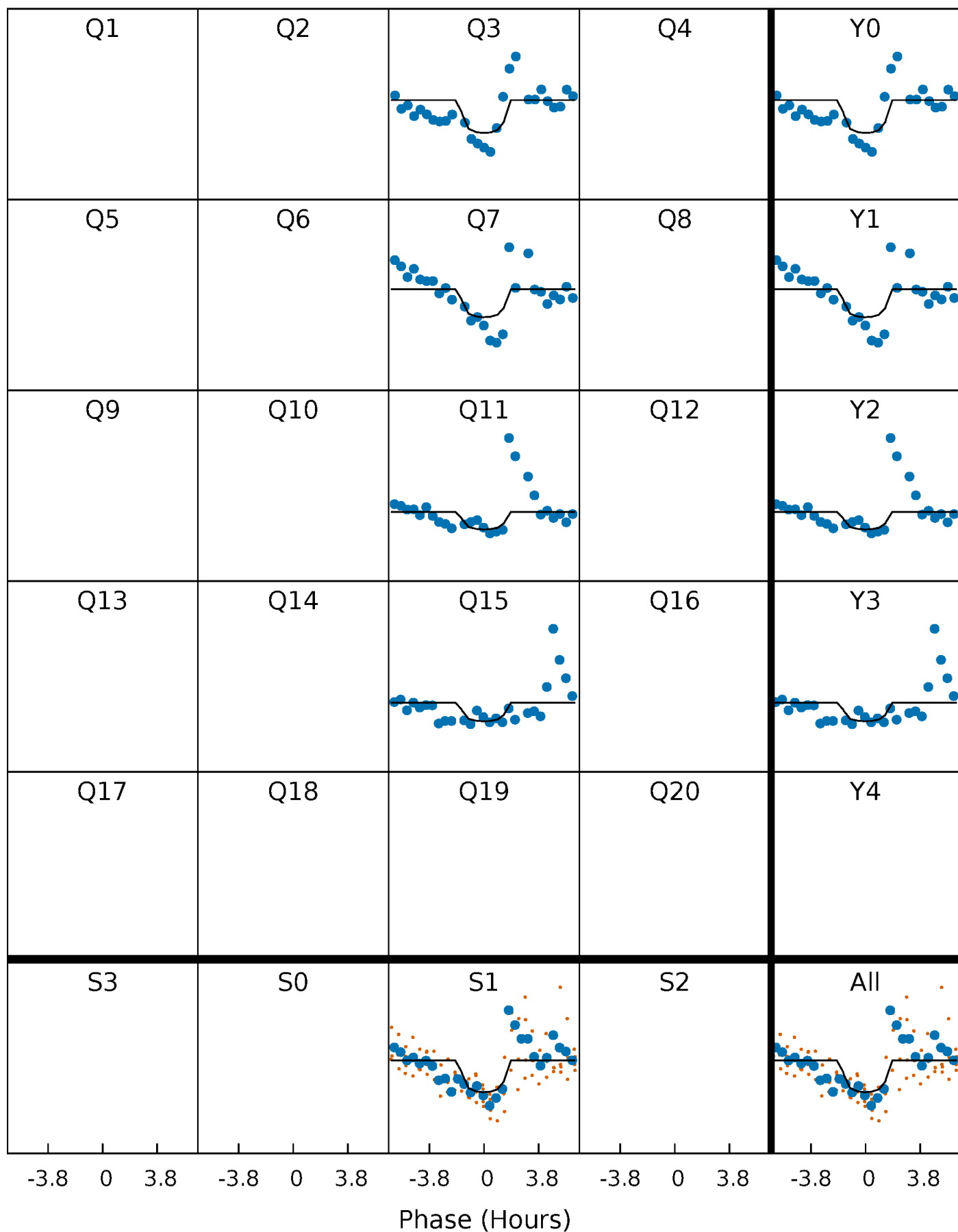
TCE 008604805-03 P=361.900617 Days  $T_0=335.745488$  (BKJD)





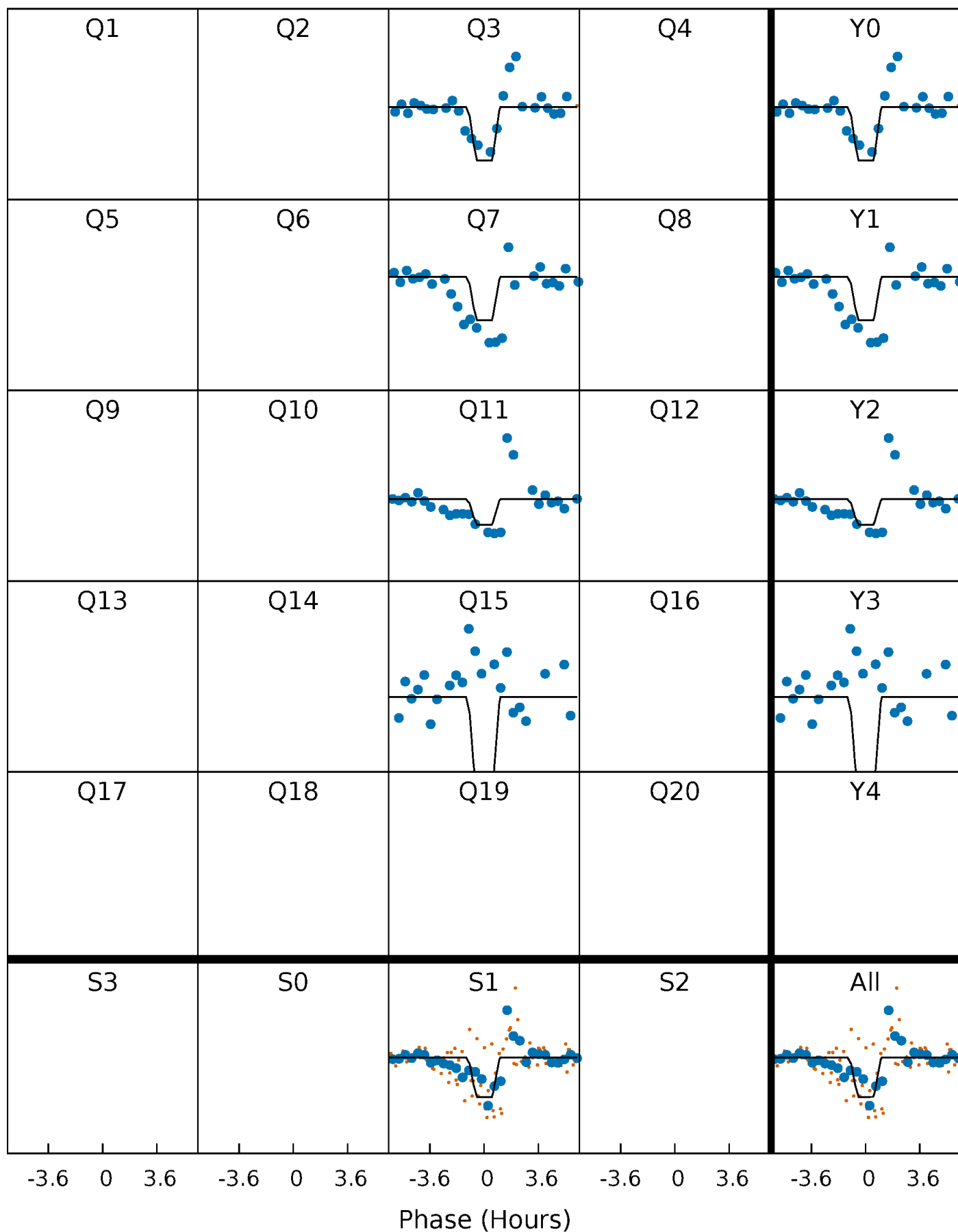
# DV Quarter-Phased Transit Curves

TCE 008604805-03 P=361.900617 Days  $T_0=335.745488$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

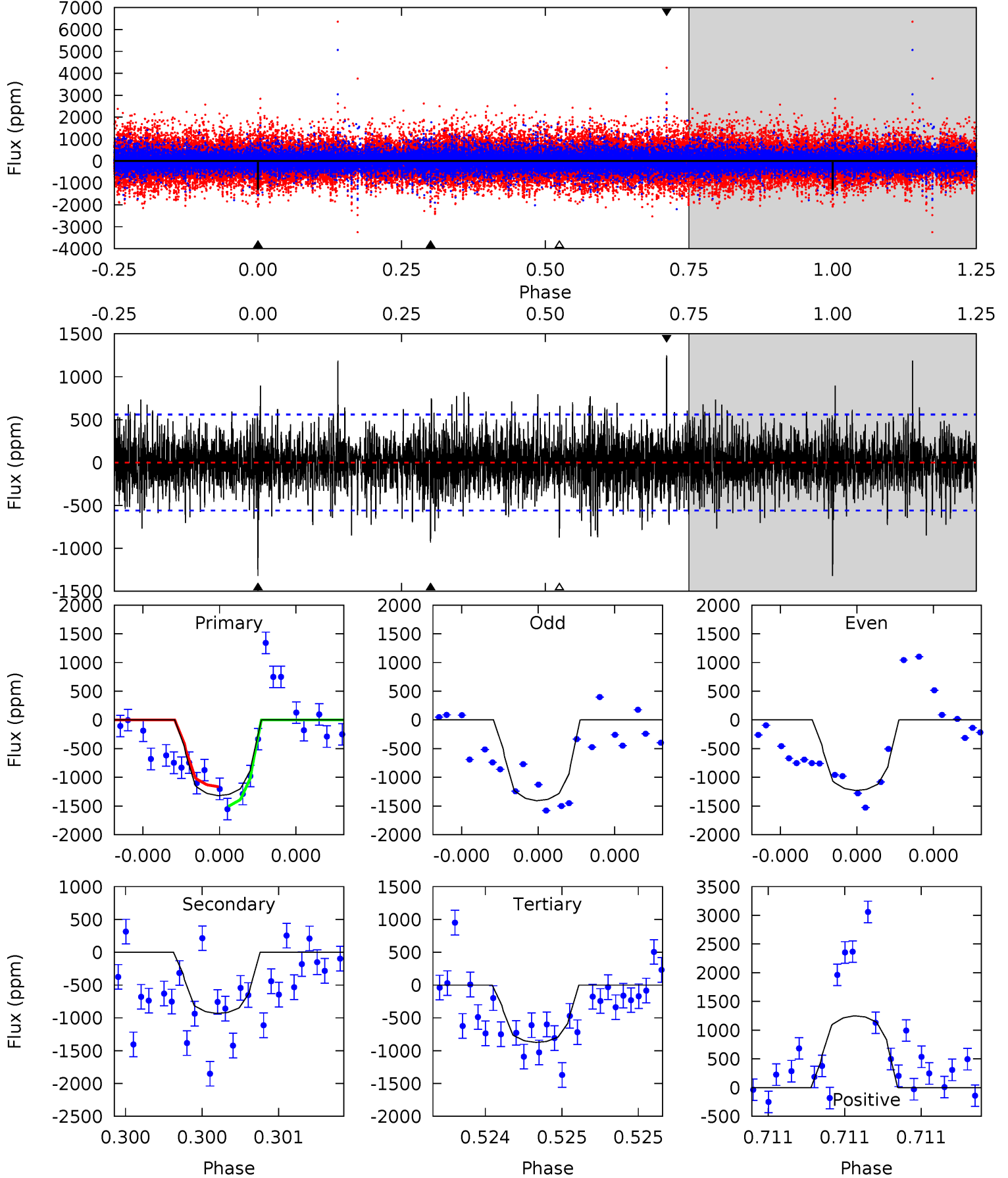
TCE 008604805-03     $P=361.903246$  Days     $T_0=335.753056$  (BKJD)



# DV Model-Shift Uniqueness Test

008604805-03, P = 361.900617 Days, E = 335.745488 Days

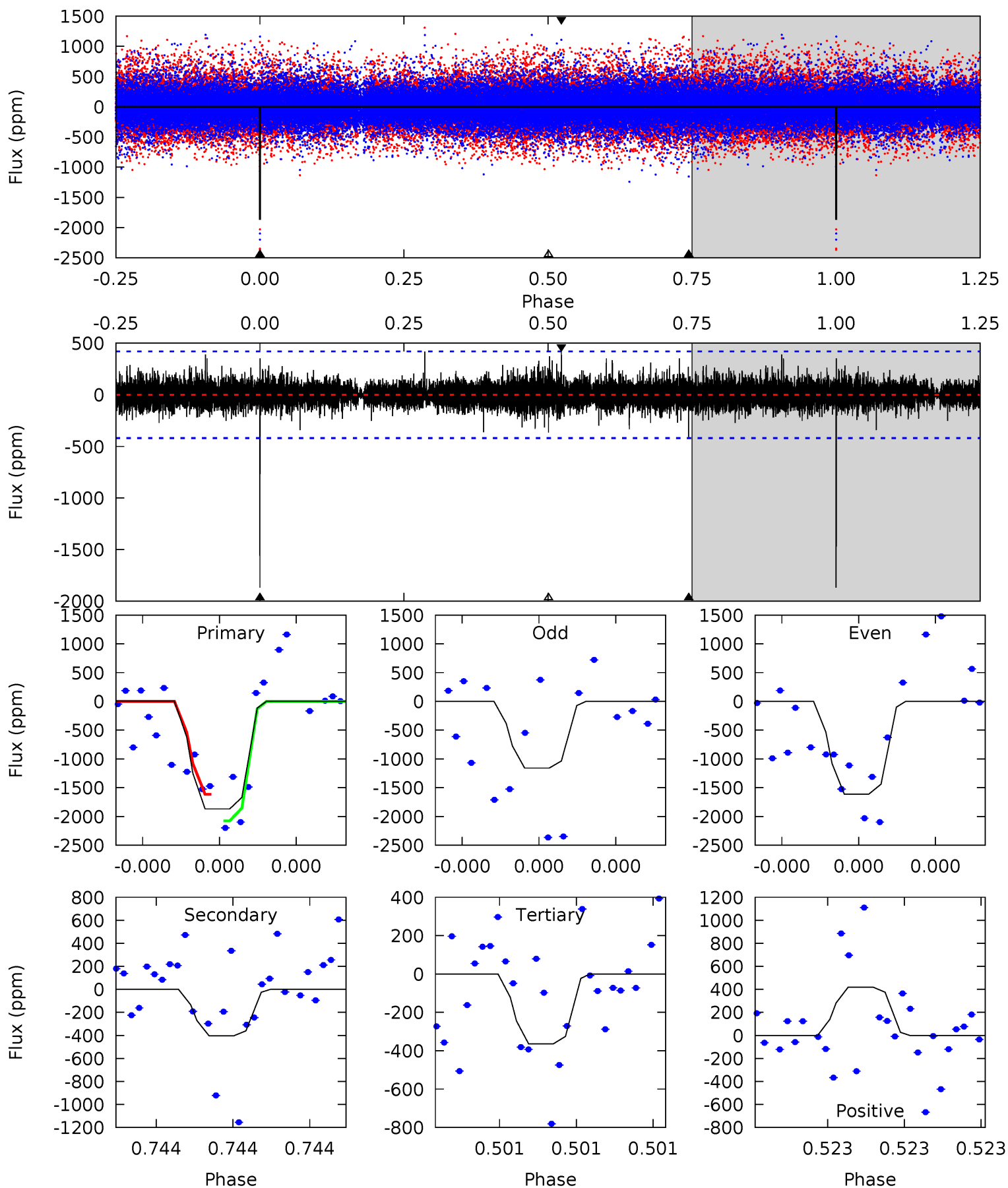
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.3	9.37	8.78	12.5	5.62	3.54	2.24	4.47	0.70	0.59	-3.18	0.85	1.07	0.49	1.71



# Alt Model-Shift Uniqueness Test

008604805-03, P = 361.903246 Days, E = 335.753056 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
25.4	5.49	4.94	5.70	5.70	3.68	1.01	20.4	19.7	0.54	-0.22	3.28	0.78	0.18	3.11



### Stellar Parameters For KIC 008604805

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5505^{+163}_{-163}$	$4.513^{+0.116}_{-0.105}$	$-0.640^{+0.350}_{-0.300}$	$0.771^{+0.117}_{-0.098}$	$0.706^{+0.099}_{-0.040}$	$2.169^{+0.972}_{-0.672}$
	+3%/-3%	+3%/-2%	+55%/-47%	+15%/-13%	+14%/-6%	+45%/-31%
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 008604805-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-932 \pm 100$	$5.34^{+5.24}_{-3.42}$	$317^{+15}_{-15}$	$4069^{+2351}_{-826}$	$14386^{+99253}_{-10791}$
Alt.	$-404 \pm 74$	$5.56^{+6.17}_{-3.69}$	$316^{+15}_{-15}$	$3487^{+1719}_{-653}$	$5511^{+43317}_{-4197}$

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

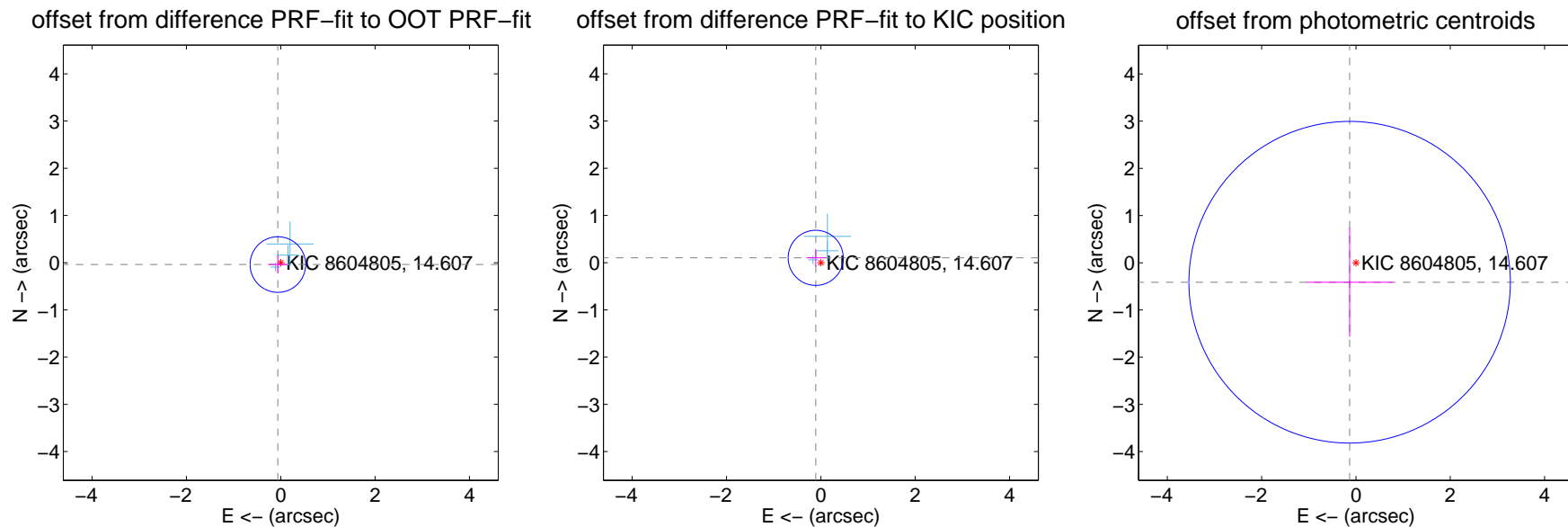
## DV Centroid Data

Supplemental centroid analysis for 008604805-03. Kepler magnitude: 14.61. Transit SNR 7.24

There are 3 quarters with good PRF difference image offsets

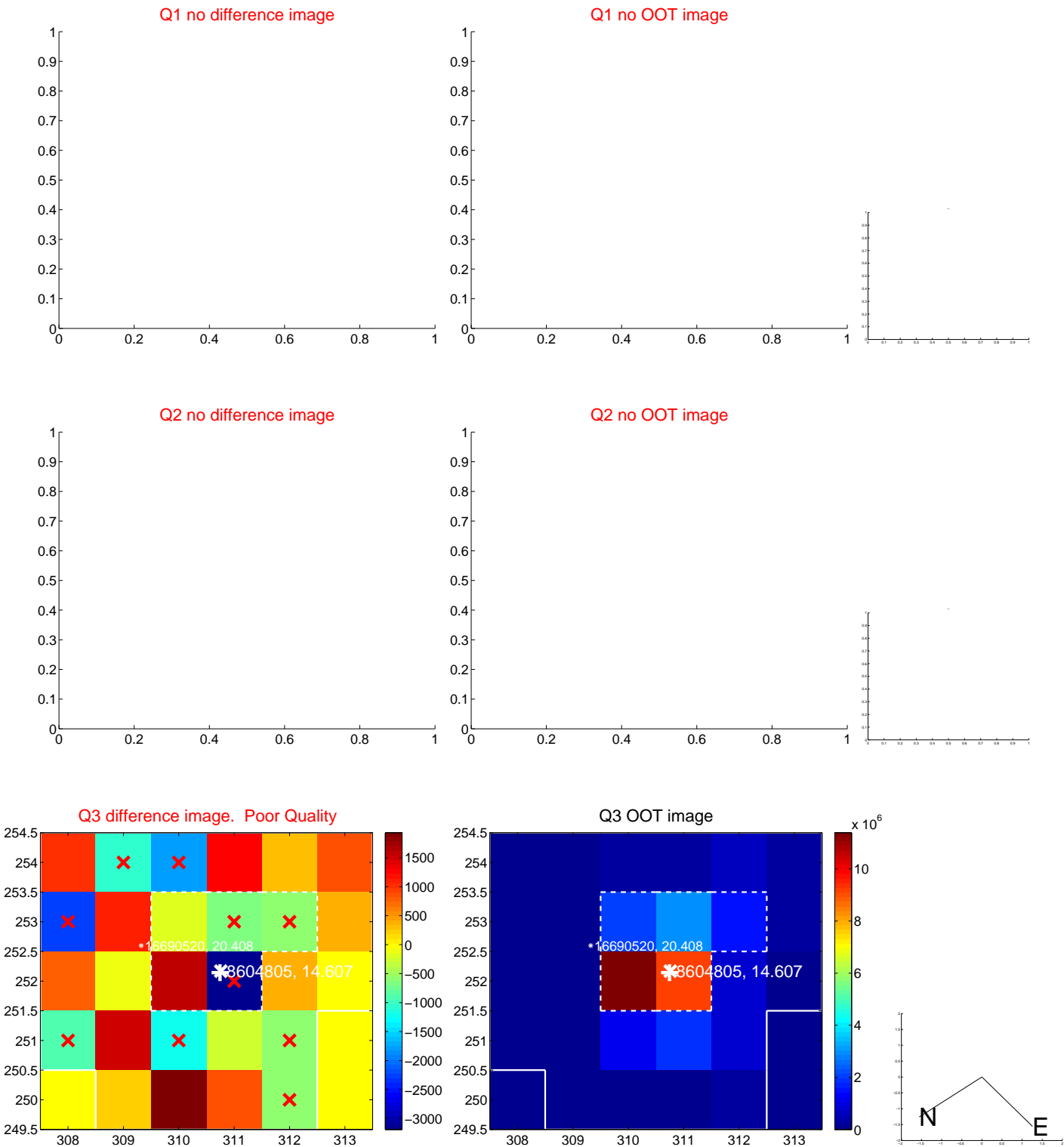
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.073 \pm 0.196$	0.37	$0.061 \pm 0.199$	$-0.039 \pm 0.190$
PRF-fit source offset from KIC position	$0.150 \pm 0.195$	0.77	$0.109 \pm 0.199$	$0.103 \pm 0.190$
photometric centroid source offset	$0.43 \pm 1.14$	0.38	$0.13 \pm 0.92$	$-0.41 \pm 1.16$



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

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



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

Q5 no difference image



Q5 no OOT image



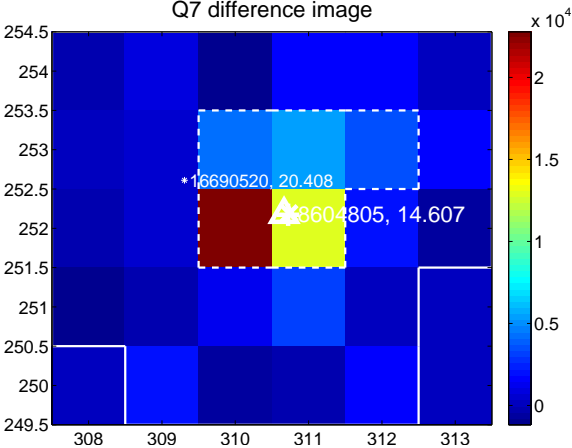
Q6 no difference image



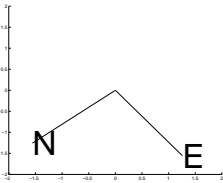
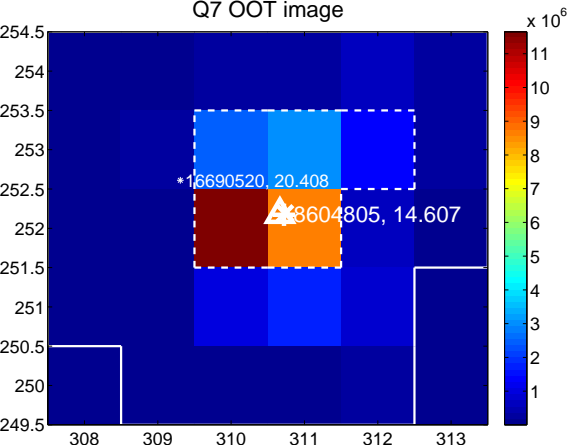
Q6 no OOT image



Q7 difference image



Q7 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



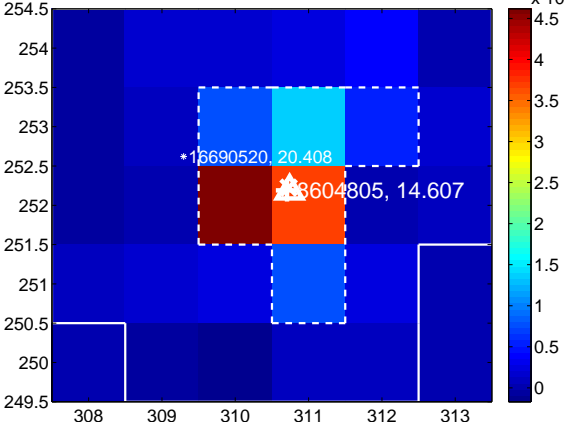
Q10 no difference image



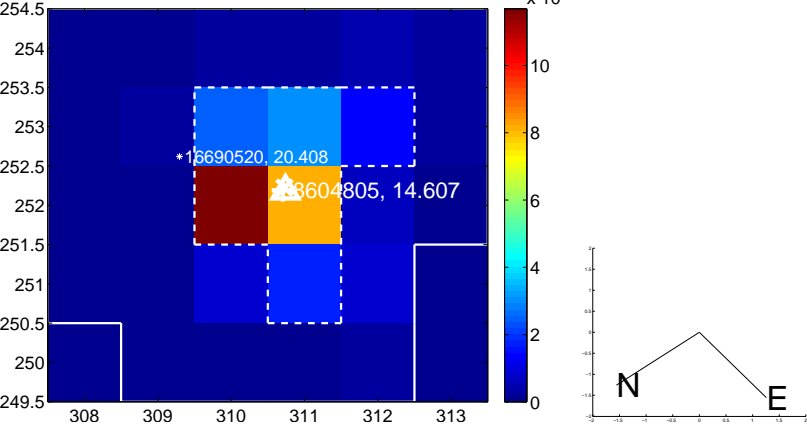
Q10 no OOT image



Q11 difference image



Q11 OOT image



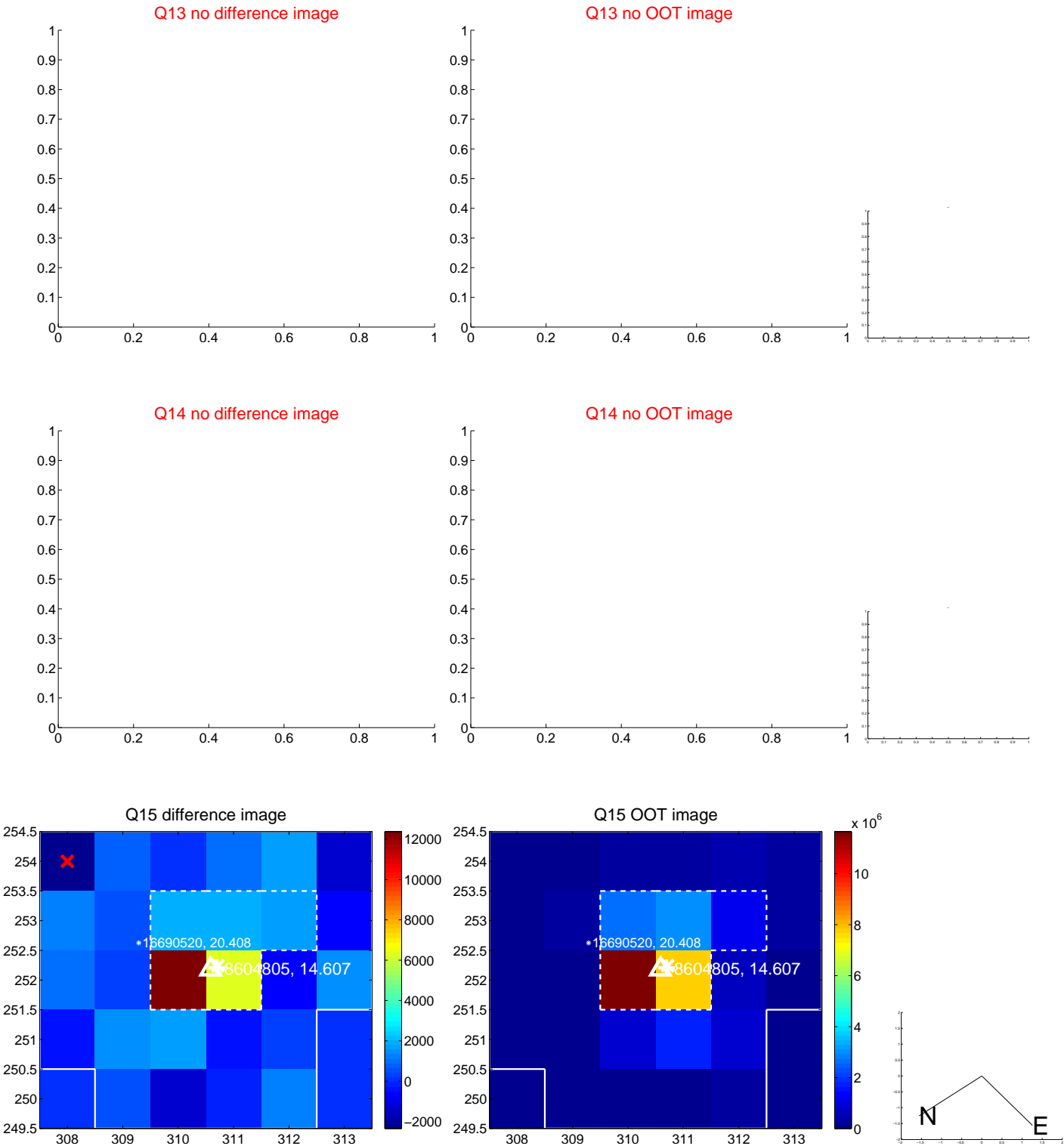
Q12 no difference image



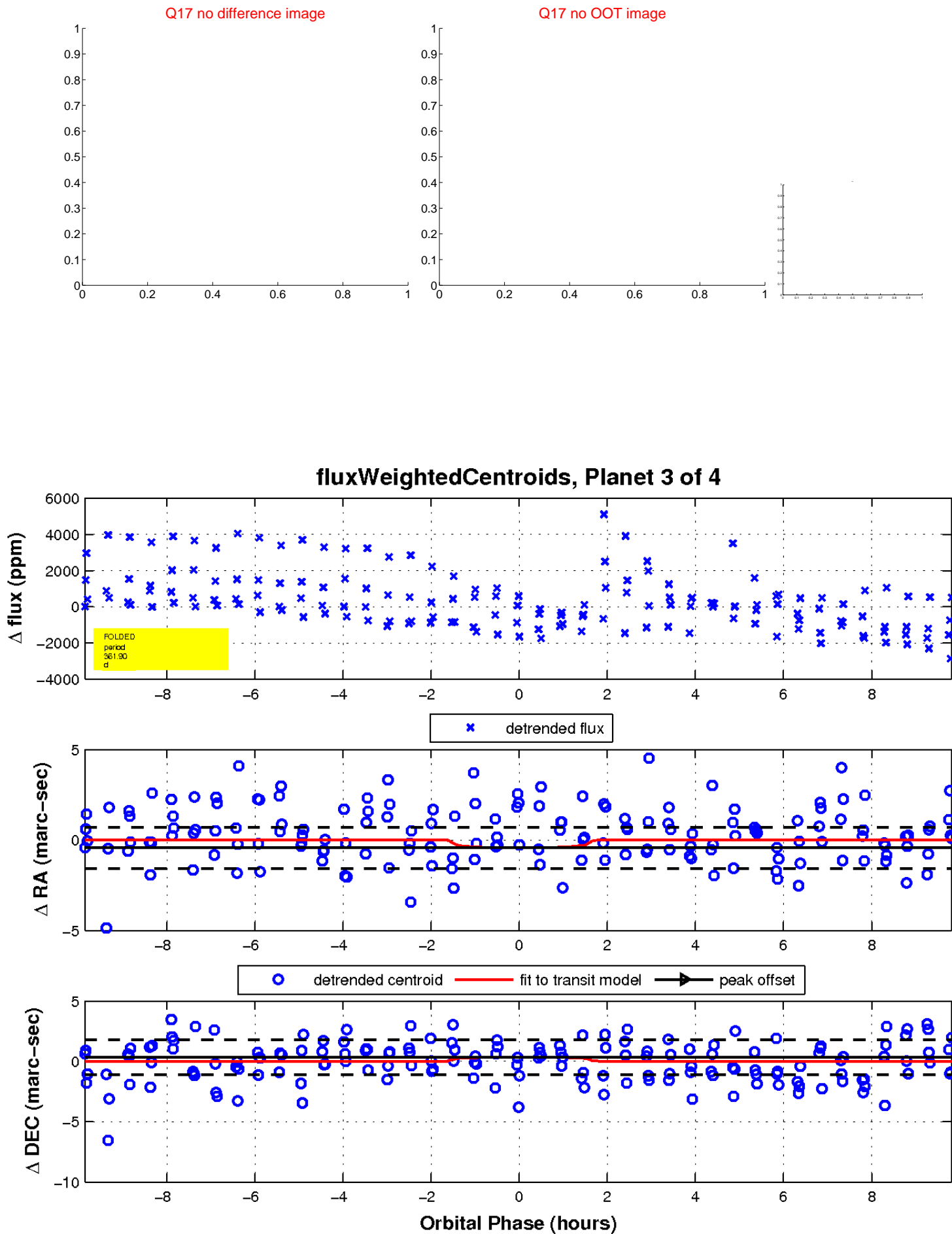
Q12 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

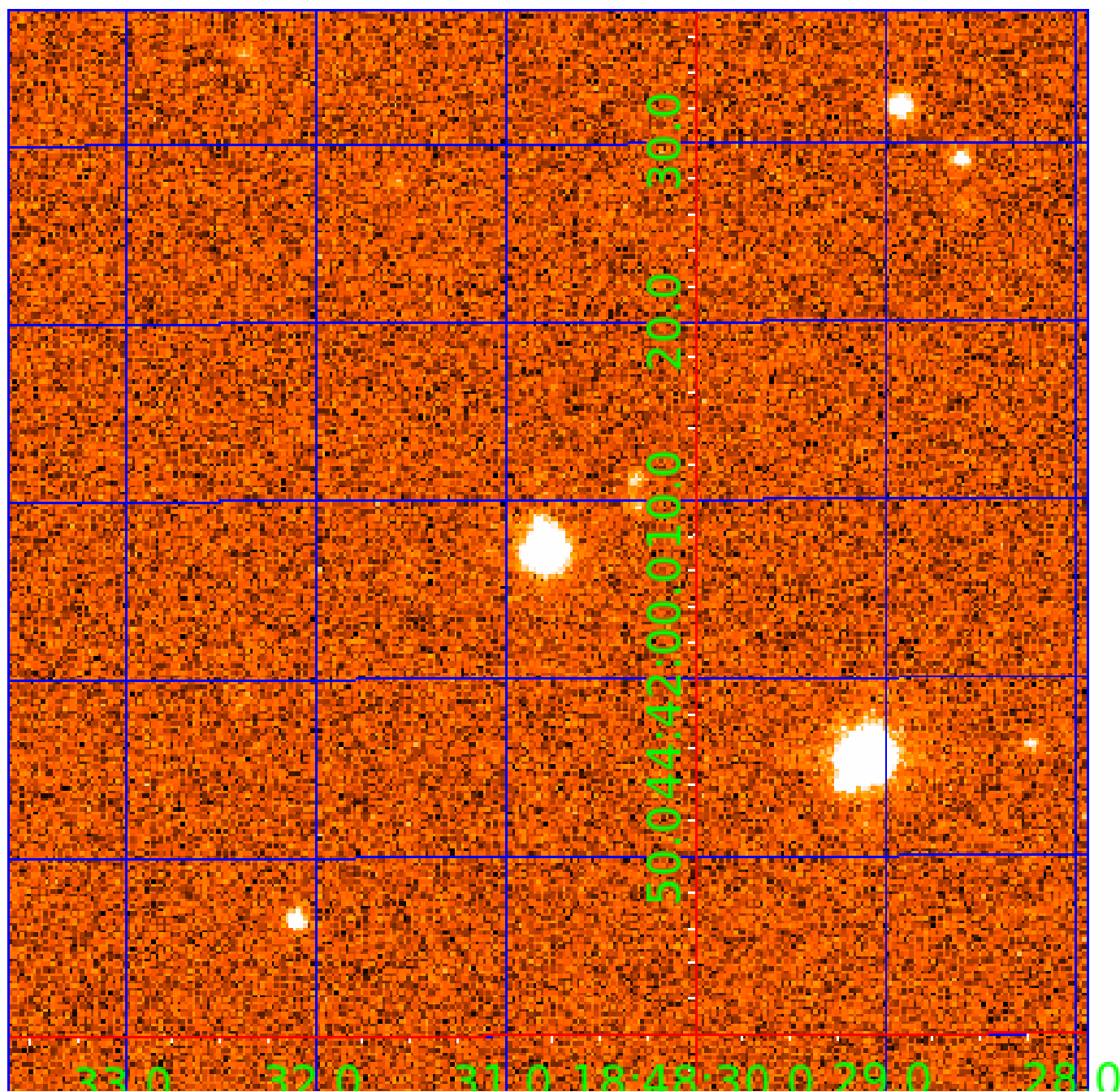


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 008604805

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008604805-01	OBS	No	551.143784	198.715032	1820.4	3.544	15.9	9.2	0.77	5505	3.27	0.36
008604805-02	OBS	No	429.629342	147.187659	1350.2	4.333	13.7	5.6	0.77	5505	3.23	0.50
008604805-03	OBS	No	361.900617	335.745488	1090.8	3.318	13.7	7.2	0.77	5505	2.65	0.62
008604805-04	OBS	No	203.682617	235.938102	1523.9	2.500	10.2	-1.0	0.77	5505	2.99	1.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008604805-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008604805-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_FEW_DIFFS
008604805-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008604805-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—INCONSISTENT_TRANS—CENT_NOFITS

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

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

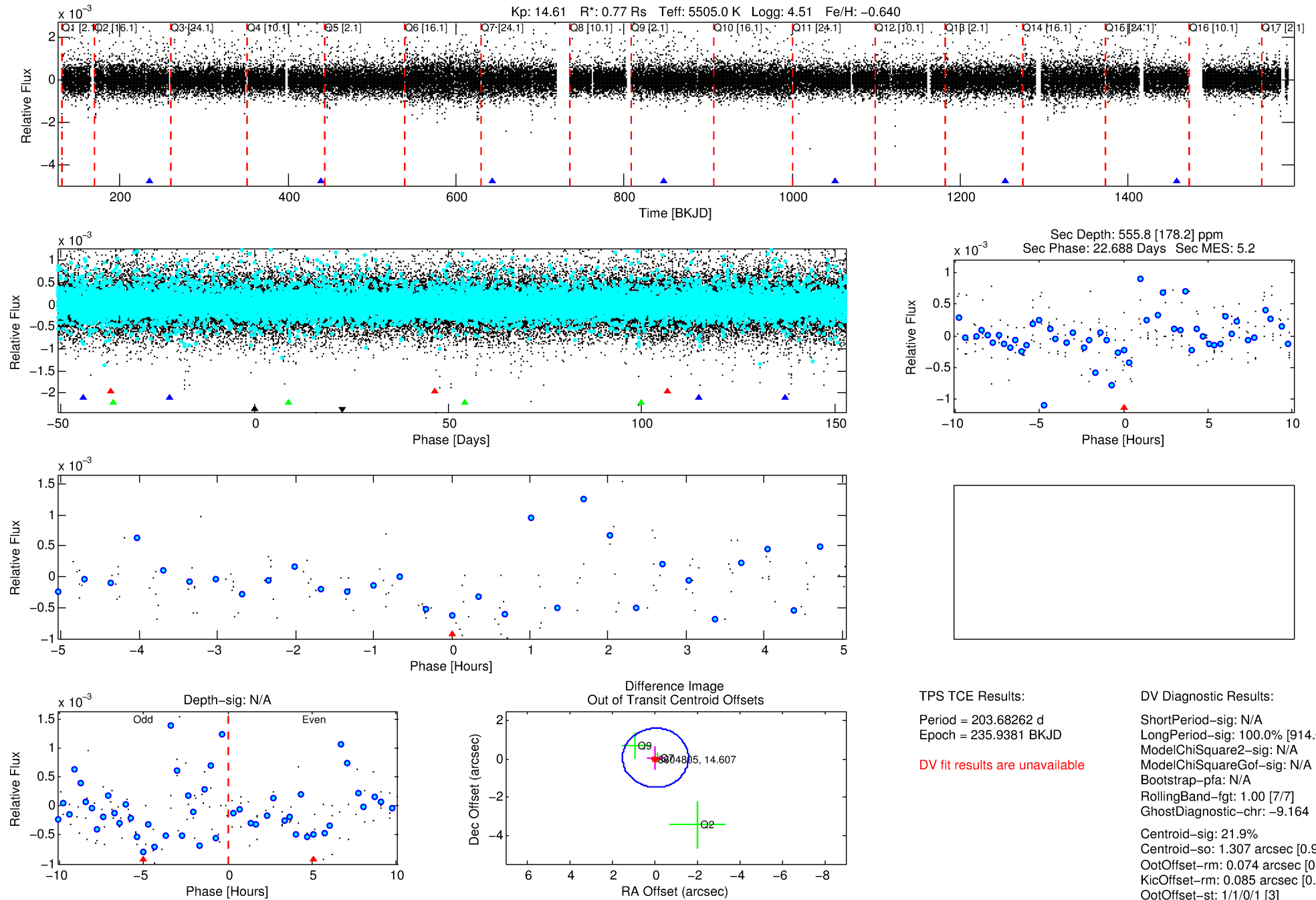
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008604805-04

No Significant Match Found

# DV One-Page Summary

KIC: 8604805 Candidate: 4 of 4 Period: 203.683 d



## TPS TCE Results:

Period = 203.68262 d  
Epoch = 235.9381 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

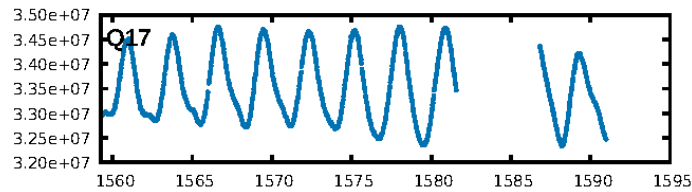
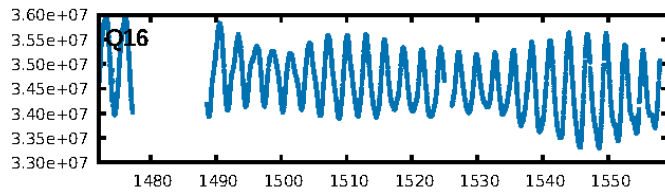
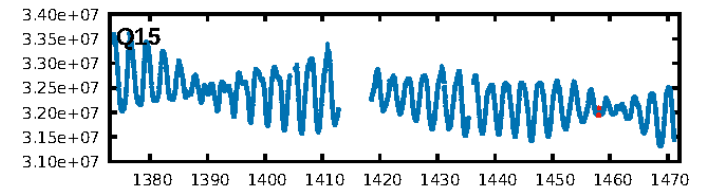
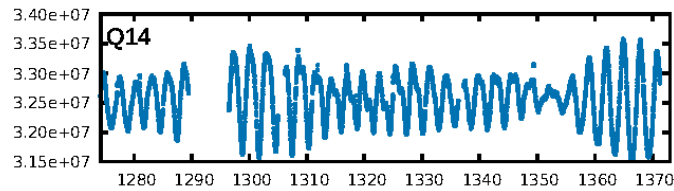
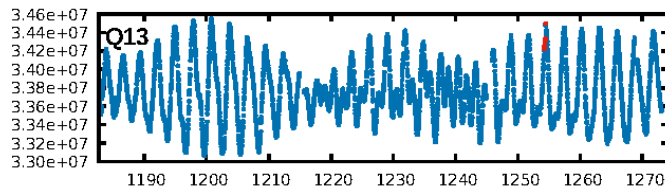
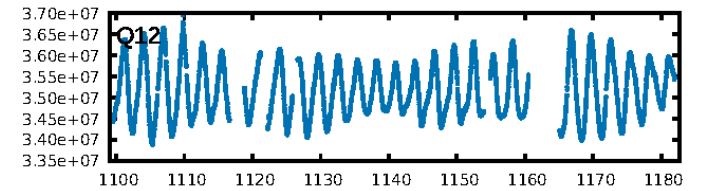
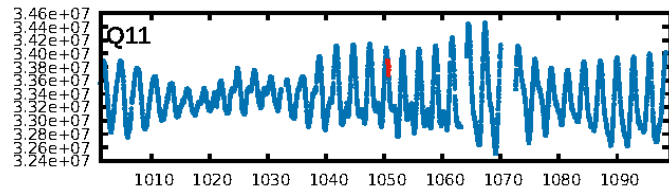
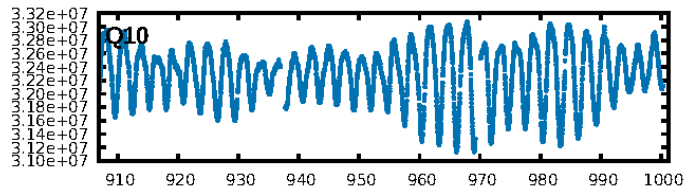
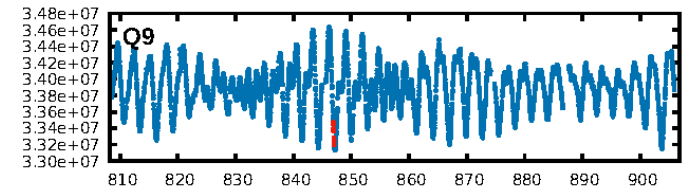
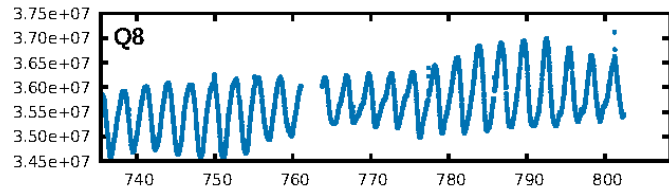
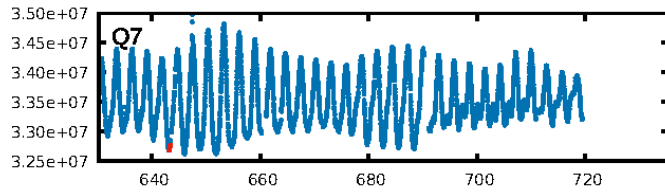
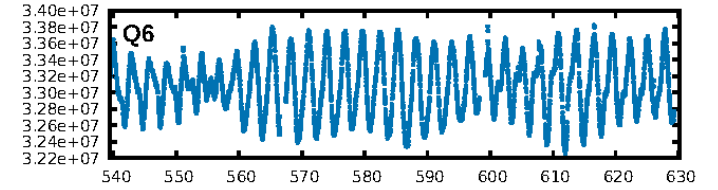
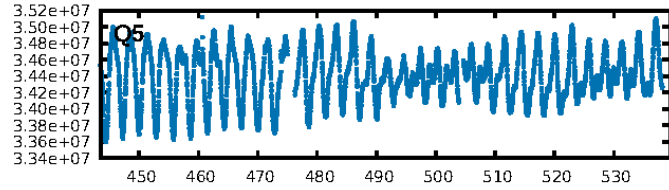
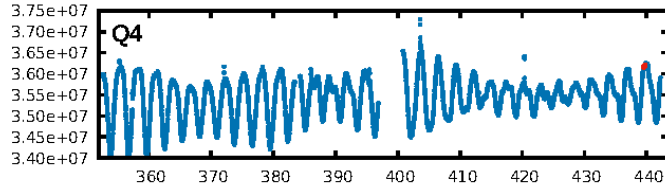
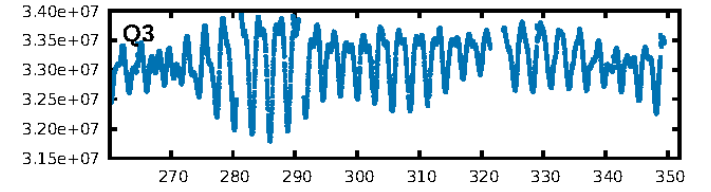
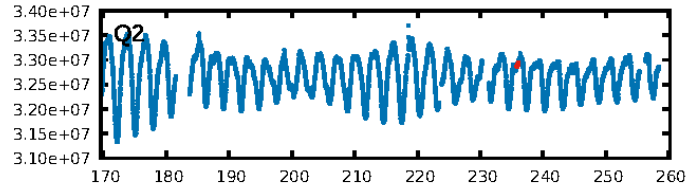
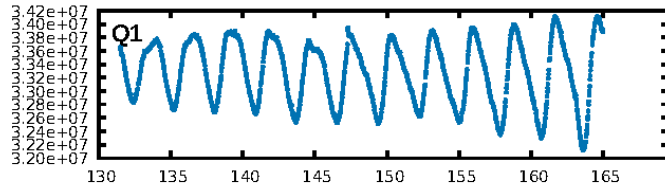
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [914.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -9.164

Centroid-sig: 21.9%  
Centroid-so: 1.307 arcsec [0.97 $\sigma$ ]  
OotOffset-rm: 0.074 arcsec [0.14 $\sigma$ ]  
KicOffset-rm: 0.085 arcsec [0.15 $\sigma$ ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [7/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:22:46 Z

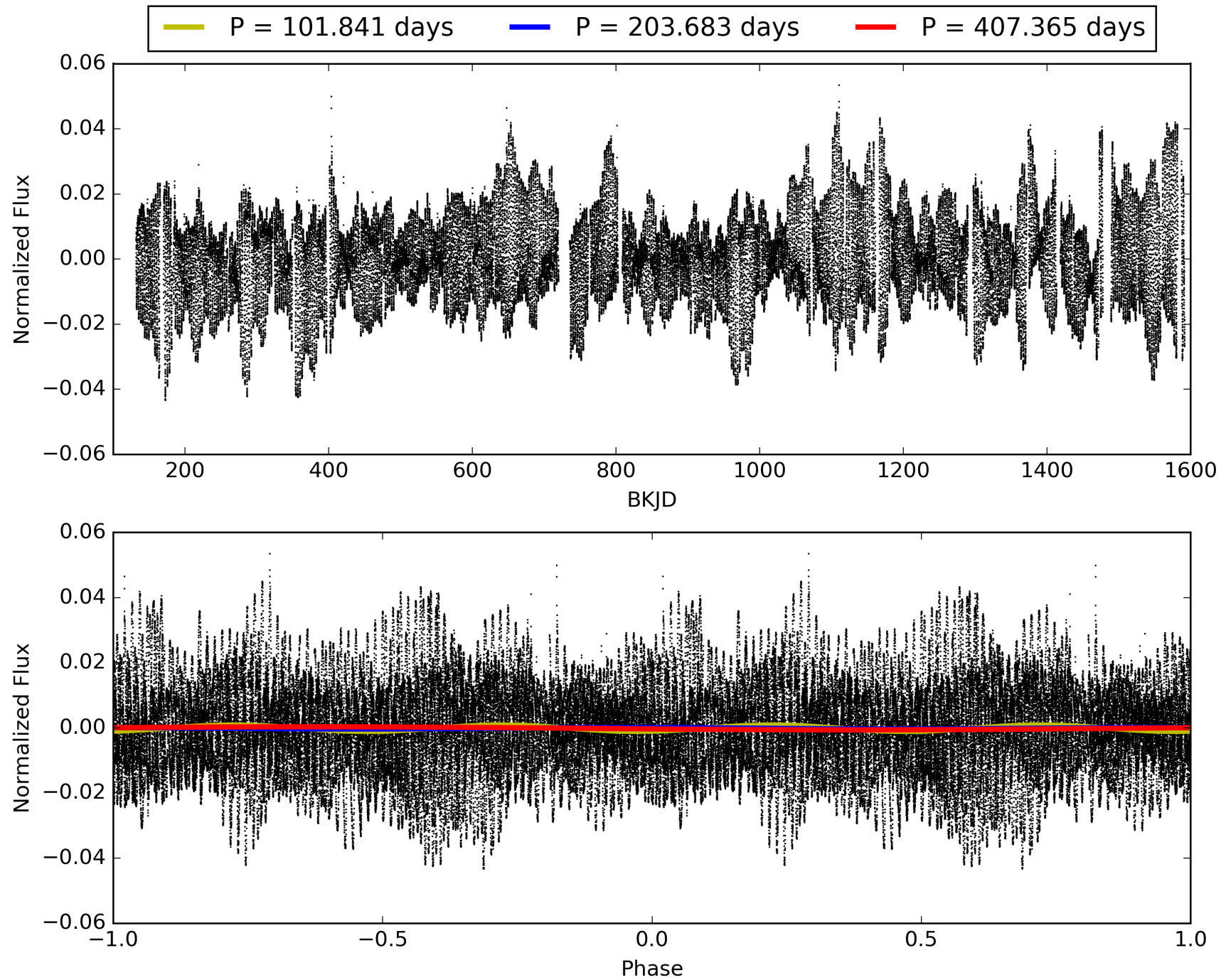
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008604805-04, PDC Light Curves





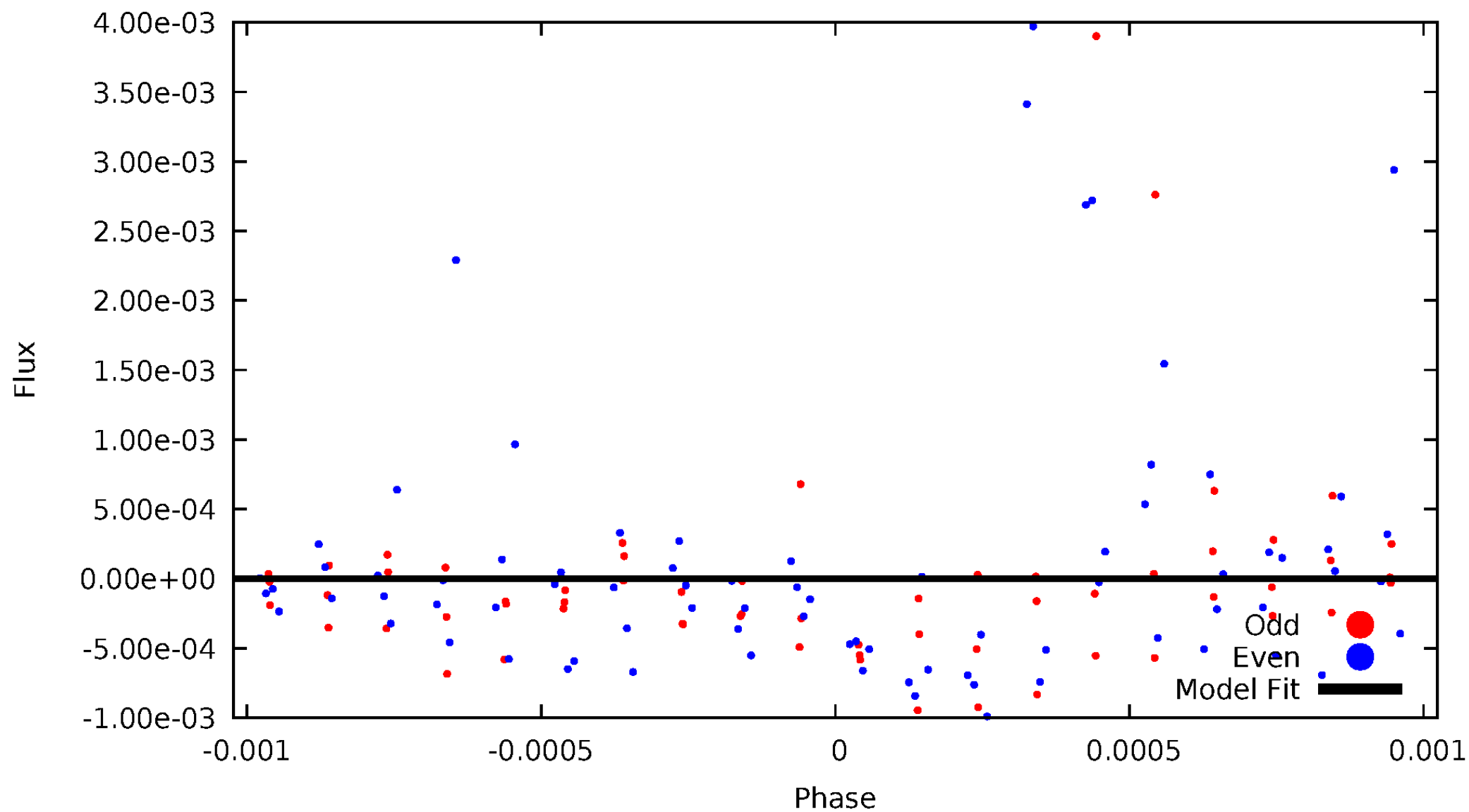
TCE 008604805-04





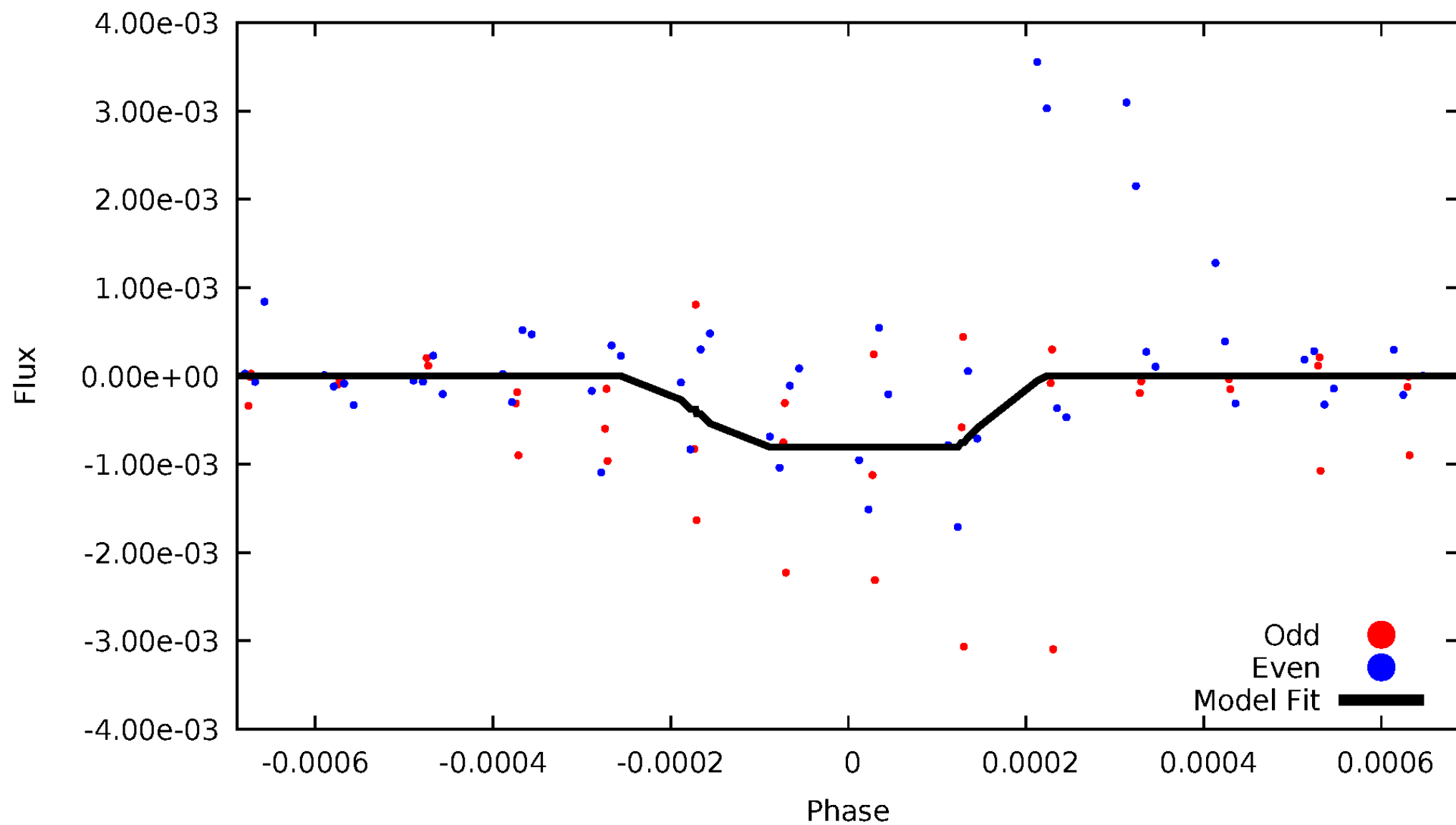
# DV Odd/Even

TCE 008604805-04



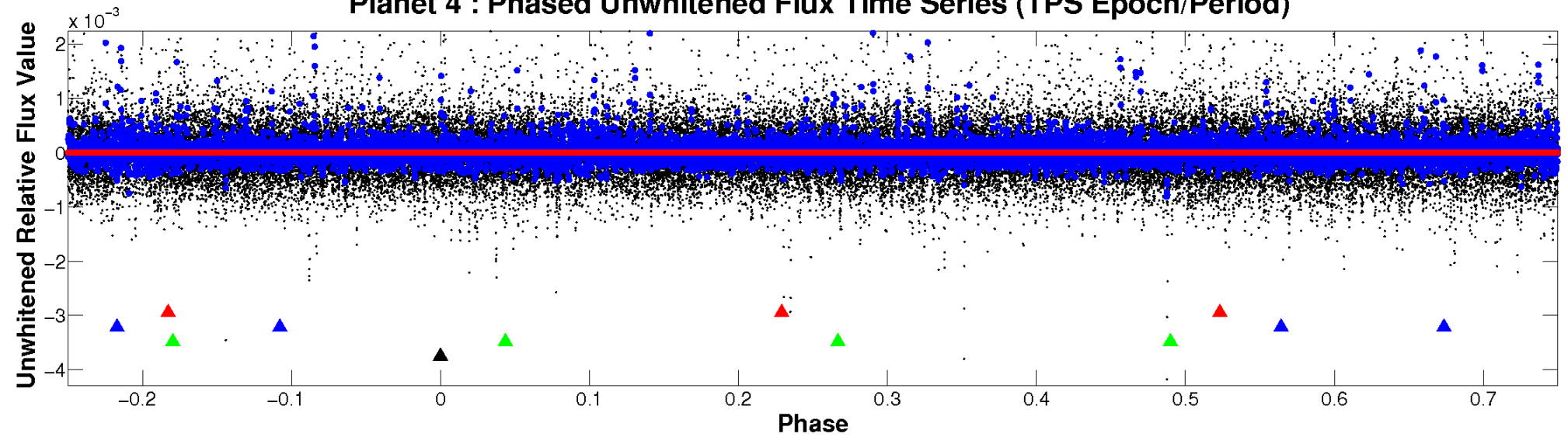
# ALT Odd/Even

TCE 008604805-04



# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

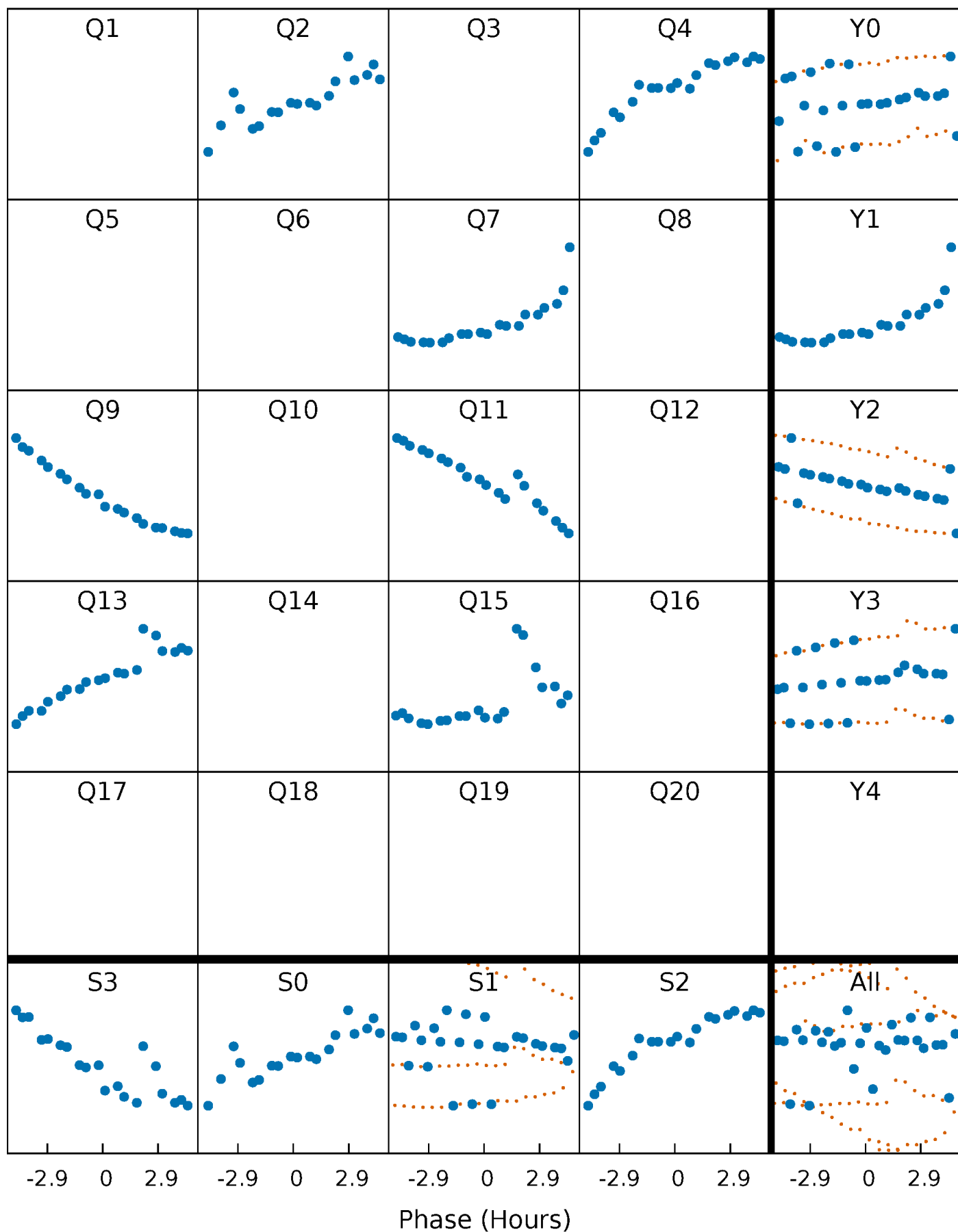


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



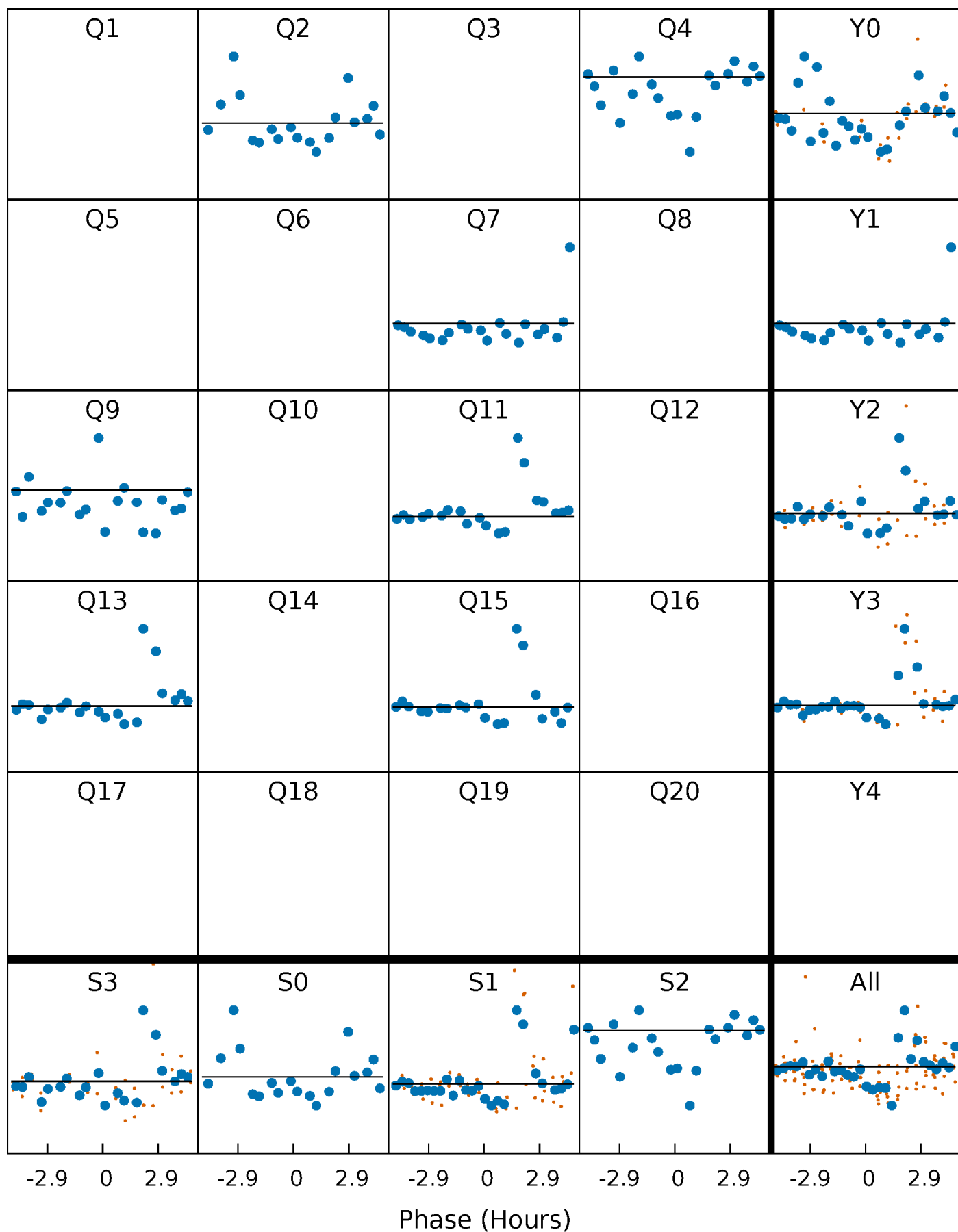
# PDC Quarter-Phased Transit Curves

TCE 008604805-04 P=203.682617 Days  $T_0=235.938102$  (BKJD)



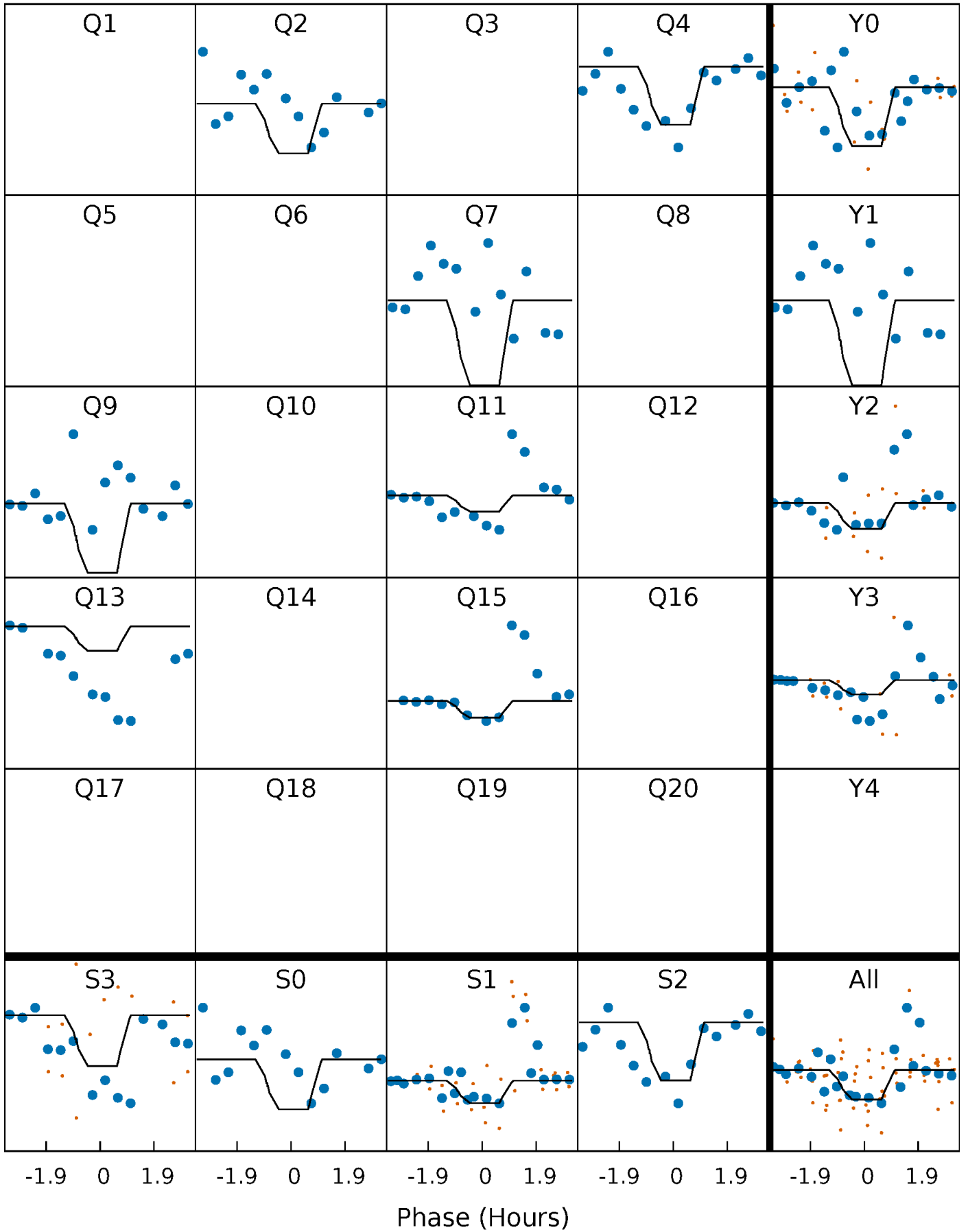
# DV Quarter-Phased Transit Curves

TCE 008604805-04 P=203.682617 Days  $T_0=235.938102$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

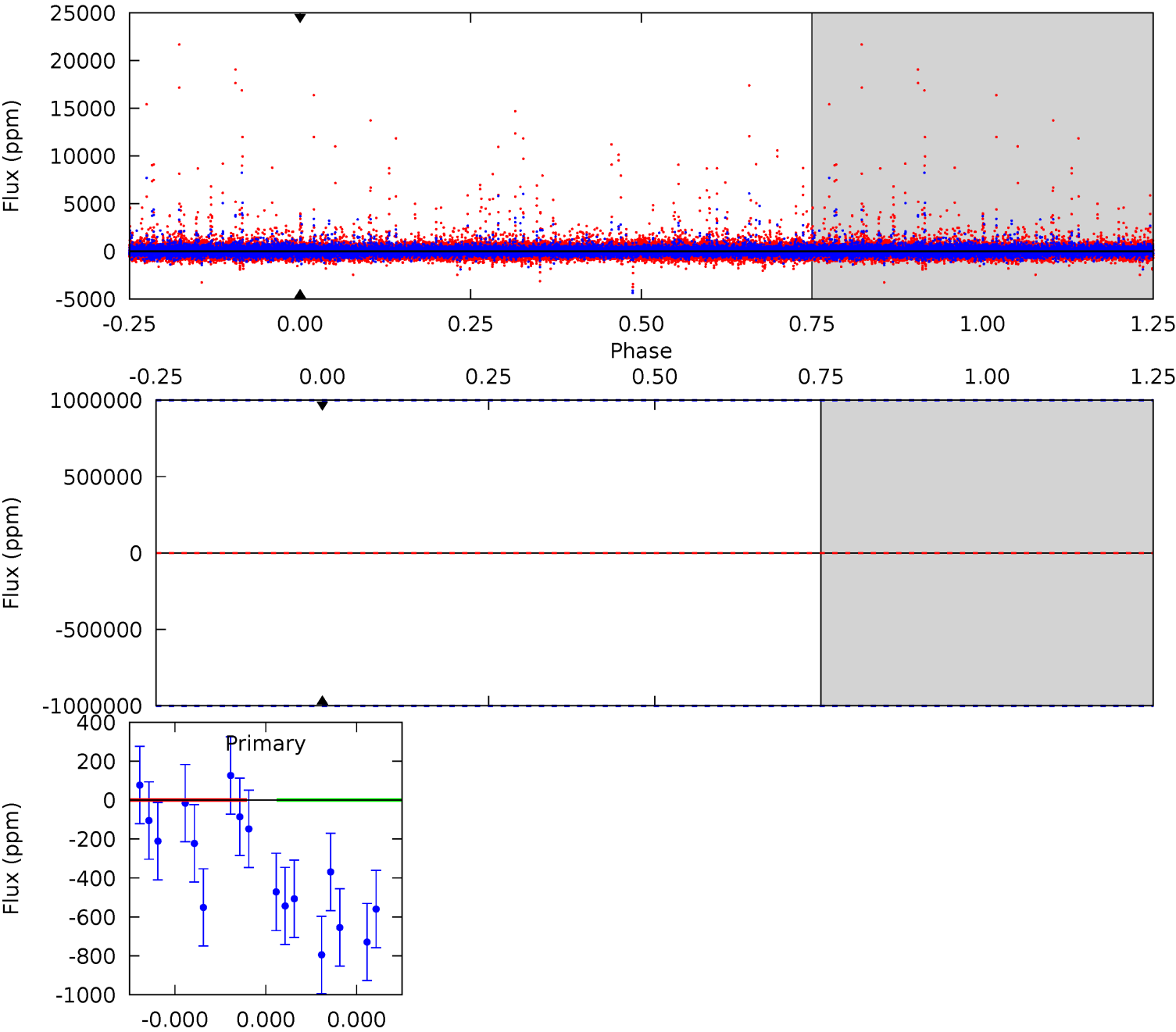
TCE 008604805-04 P=203.682617 Days  $T_0=235.961067$  (BKJD)



DV Model-Shift Uniqueness Test

008604805-04, P = 203.682617 Days, E = 32.255485 Days

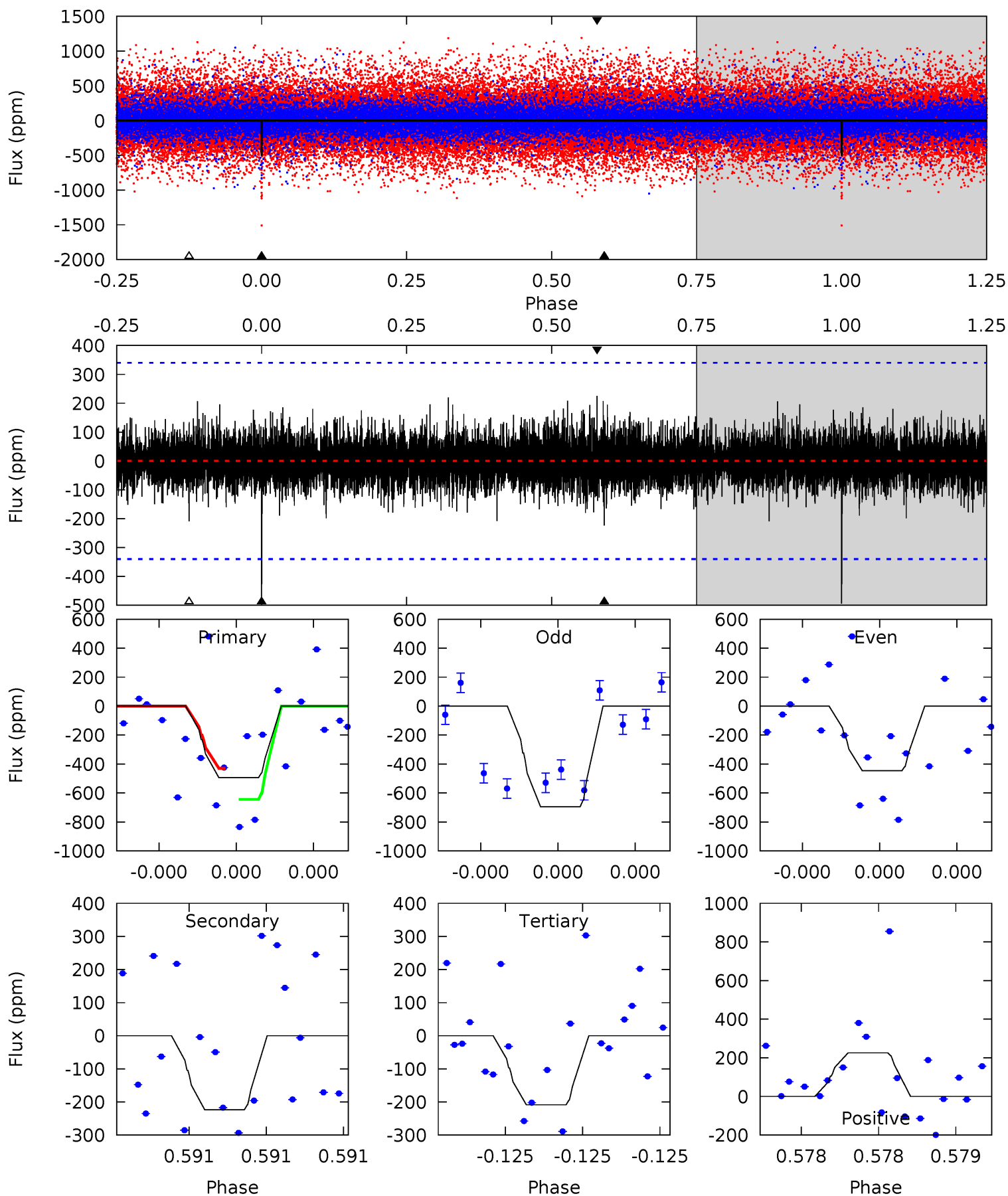
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008604805-04, P = 203.682617 Days, E = 32.278450 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
8.16	3.69	3.44	3.72	5.62	3.55	0.85	4.71	4.43	0.25	-0.03	2.03	1.07	0.31	1.74





### Stellar Parameters For KIC 008604805

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5505^{+163}_{-163}$	$4.513^{+0.116}_{-0.105}$	$-0.640^{+0.350}_{-0.300}$	$0.771^{+0.117}_{-0.098}$	$0.706^{+0.099}_{-0.040}$	$2.169^{+0.972}_{-0.672}$
	+3%/-3%	+3%/-2%	+55%/-47%	+15%/-13%	+14%/-6%	+45%/-31%
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 008604805-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$7.03^{+6.43}_{-5.07}$	$384^{+19}_{-19}$	$3183^{+13054}_{-18516}$	$1932^{+683017}_{-628158}$
Alt.	$-223 \pm 61$	$6.68^{+6.33}_{-4.47}$	$383^{+19}_{-18}$	$3036^{+1375}_{-525}$	$1011^{+8743}_{-775}$

$T_{max}$  = 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

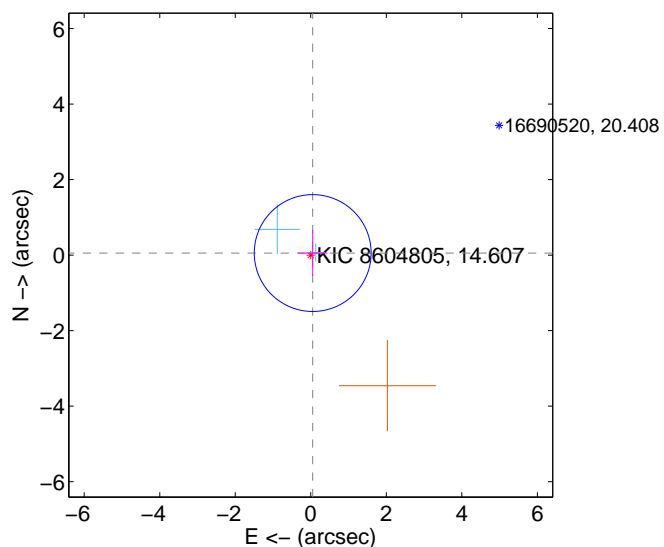
Supplemental centroid analysis for 008604805-04. Kepler magnitude: 14.61. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

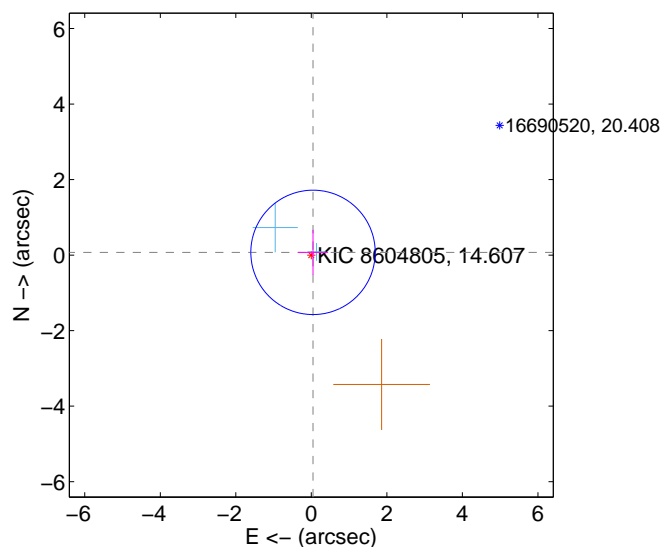
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.074 \pm 0.516$	0.14	$-0.050 \pm 0.390$	$0.054 \pm 0.604$
PRF-fit source offset from KIC position	$0.085 \pm 0.549$	0.15	$-0.044 \pm 0.400$	$0.072 \pm 0.595$
photometric centroid source offset	$1.31 \pm 1.34$	0.97	$-0.70 \pm 1.28$	$-1.10 \pm 1.37$

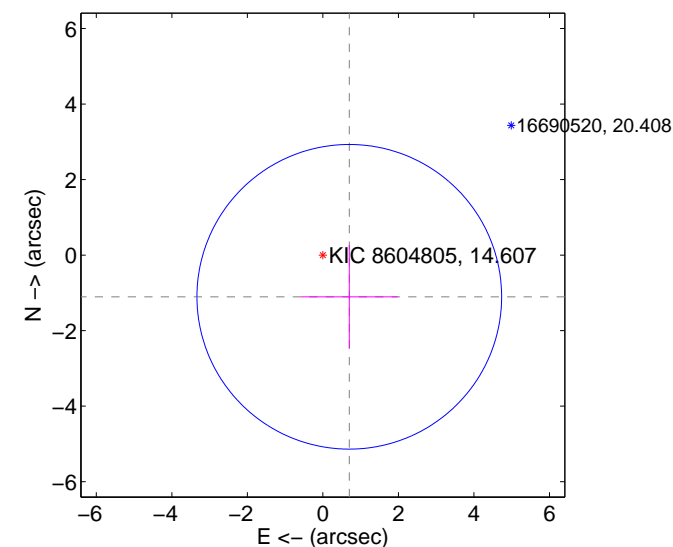
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

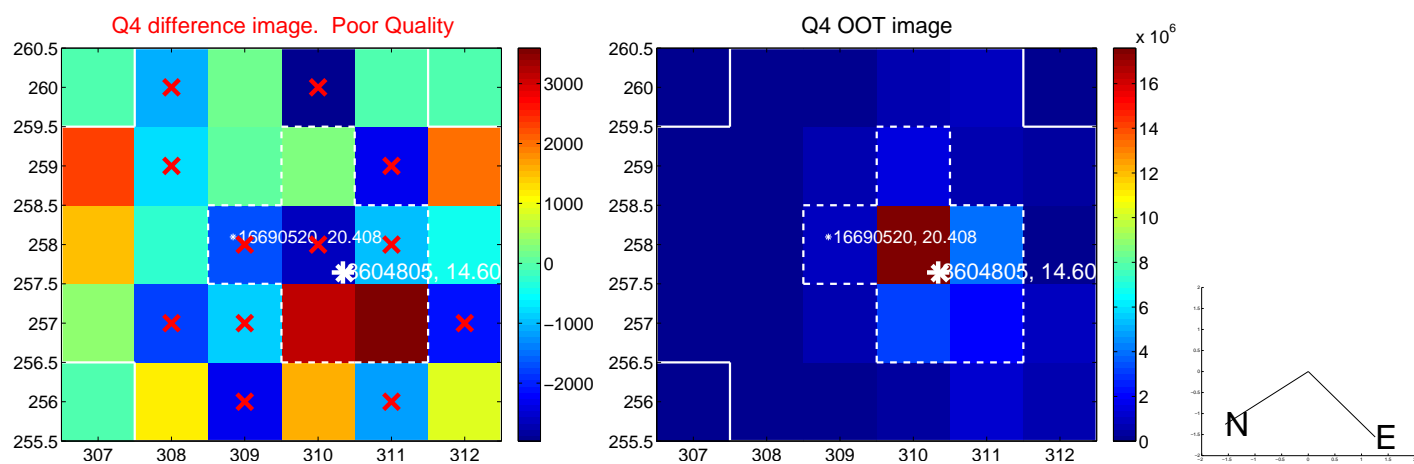
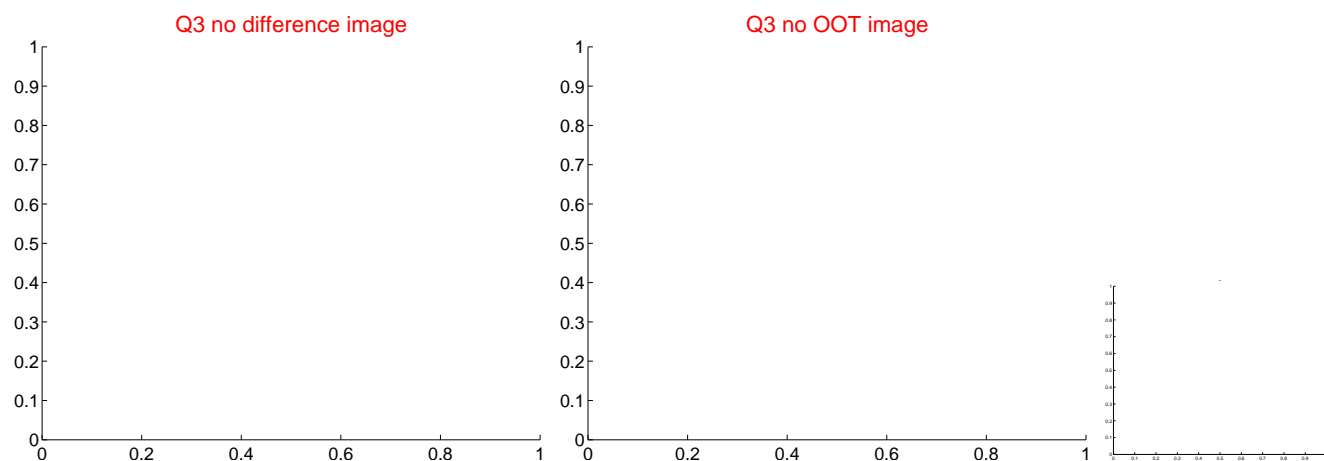
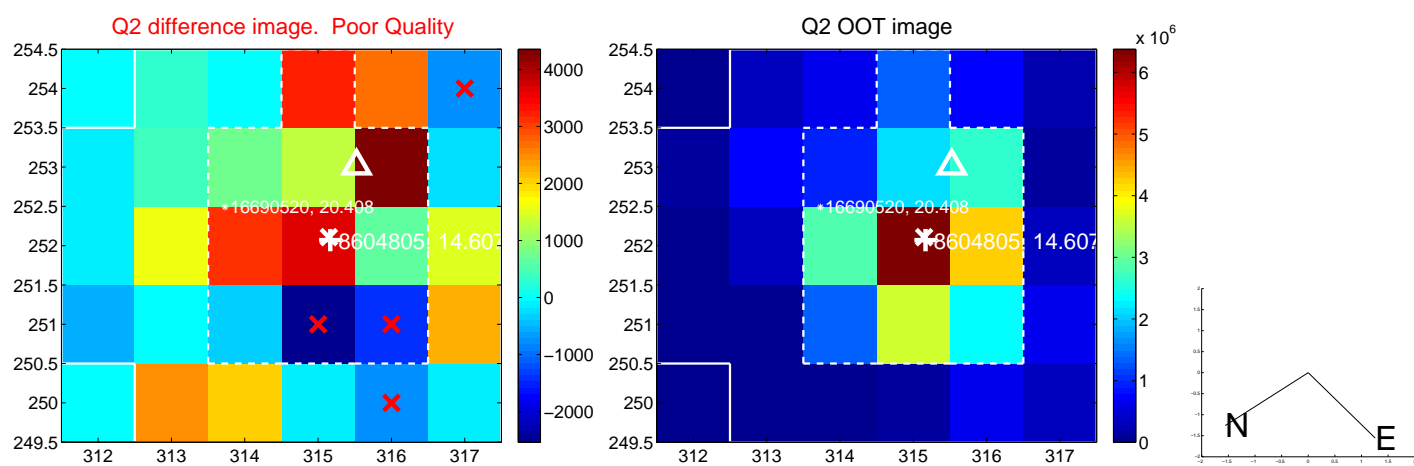
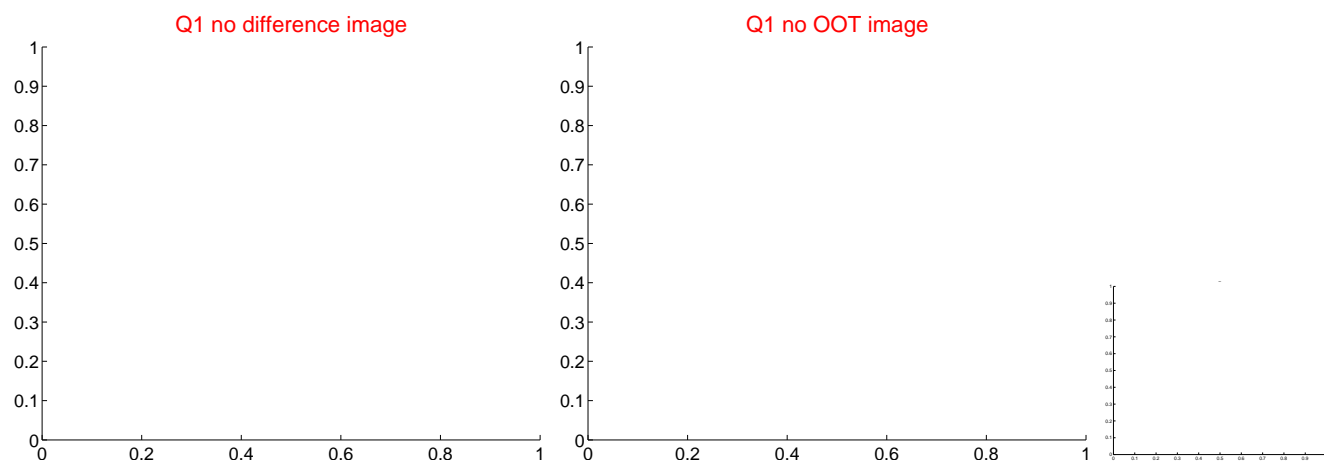


offset from photometric centroids

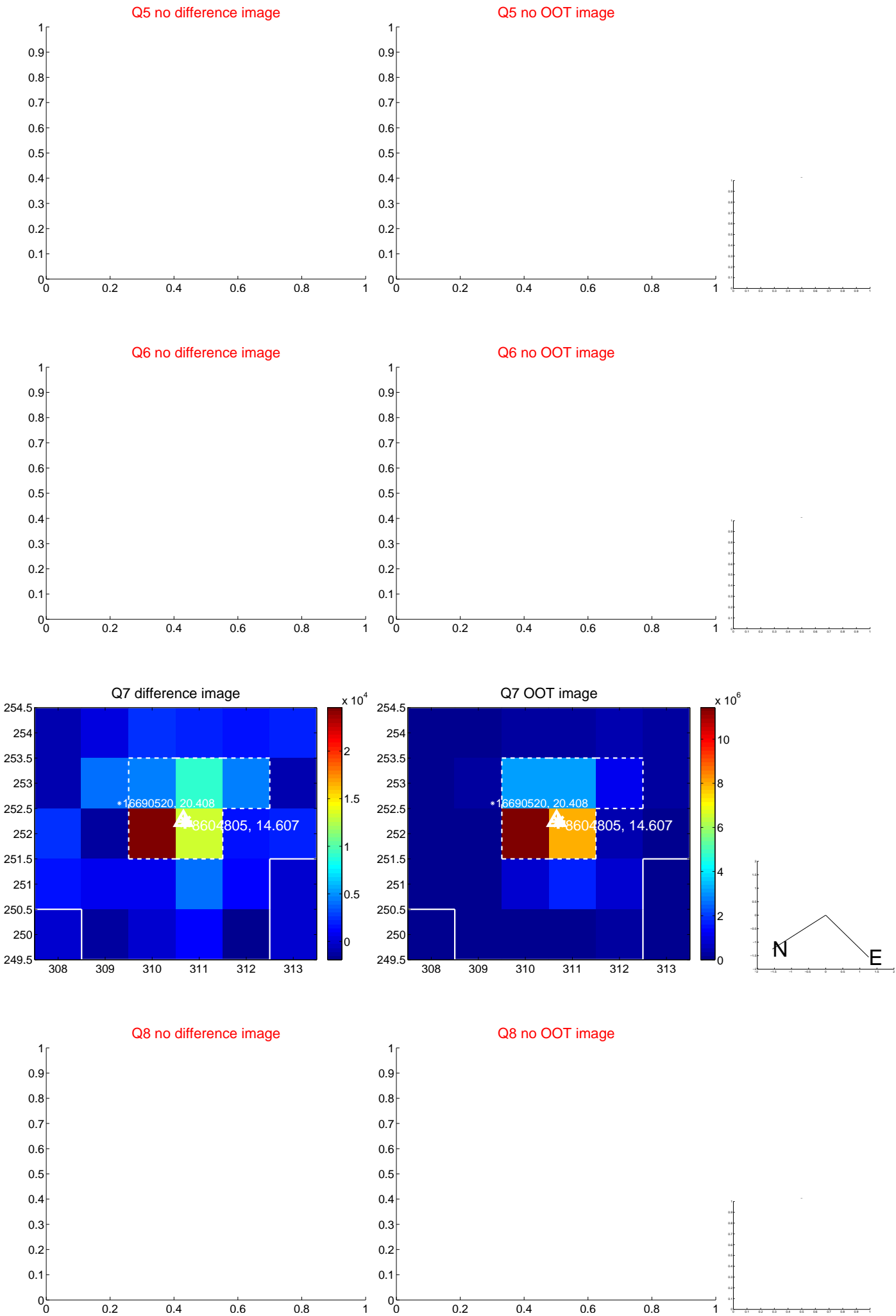


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

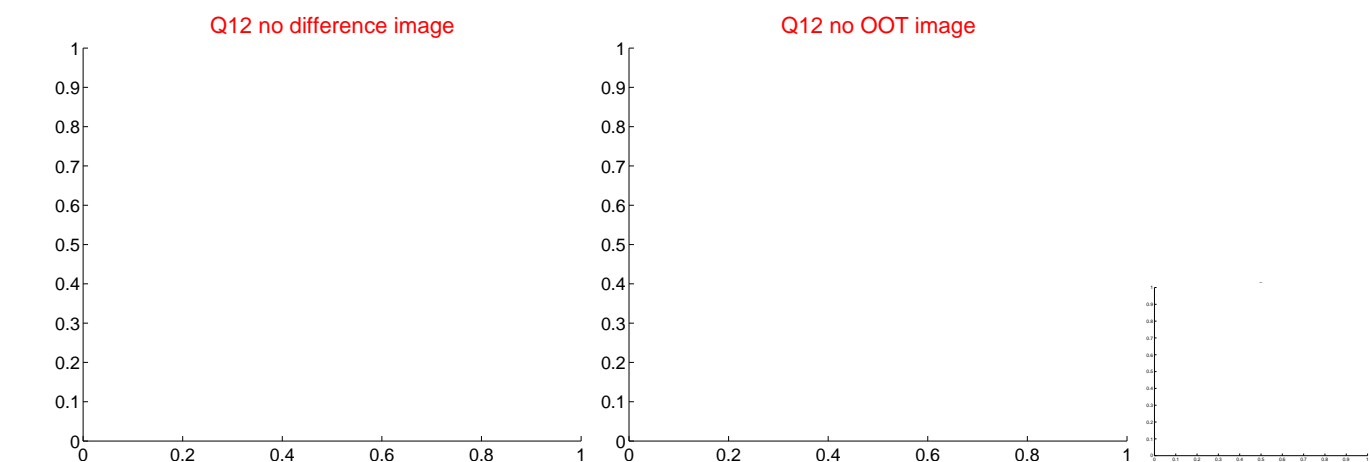
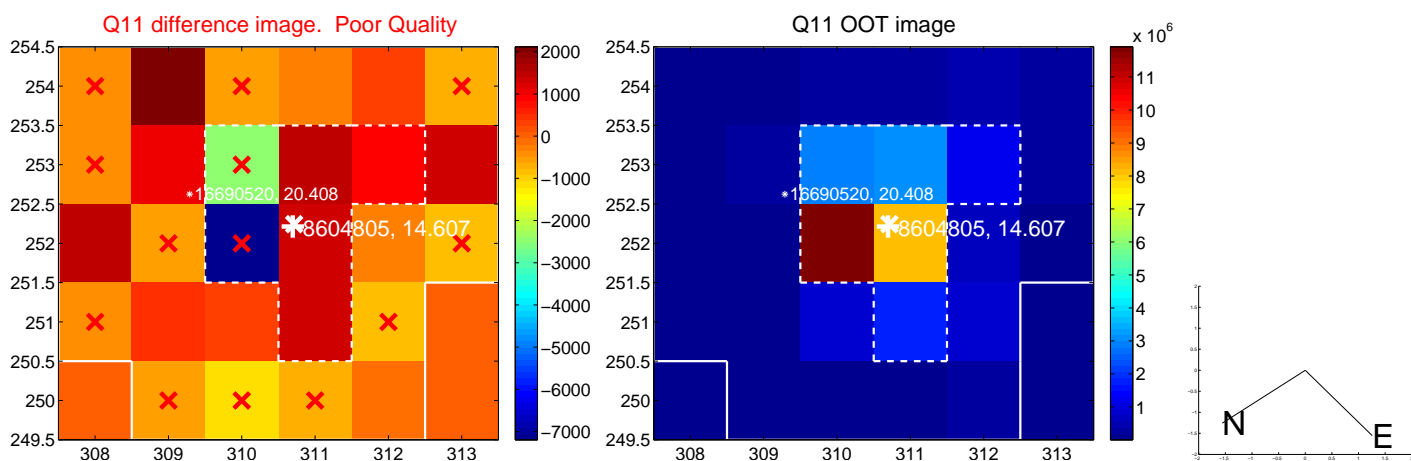
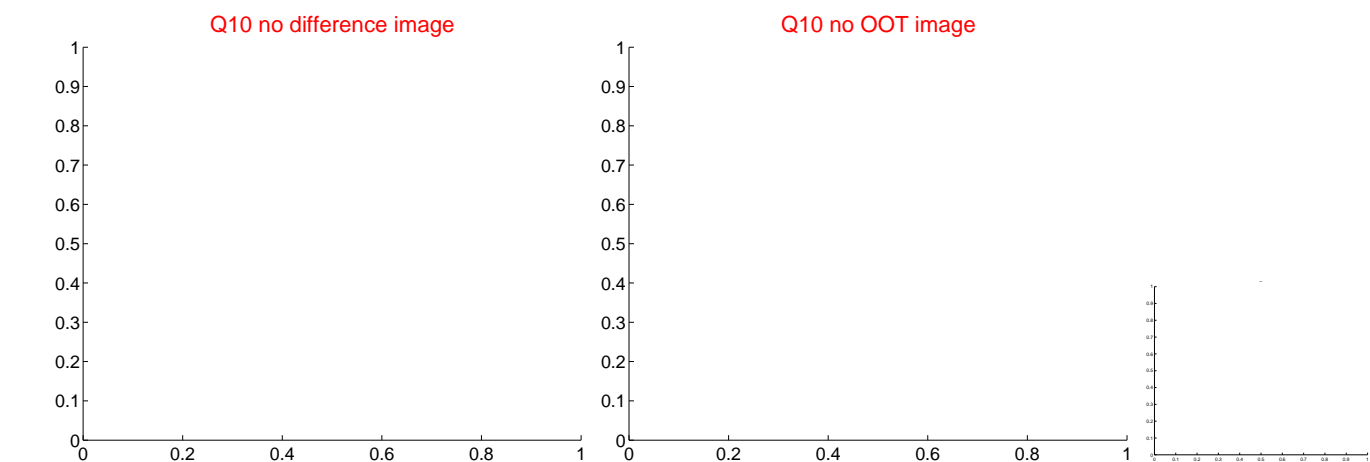
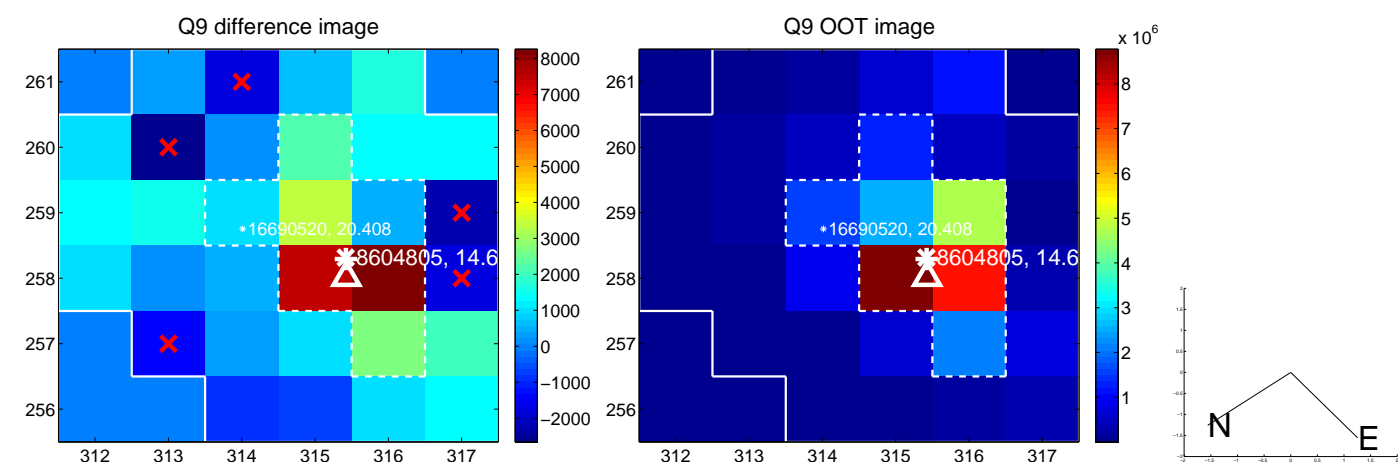
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



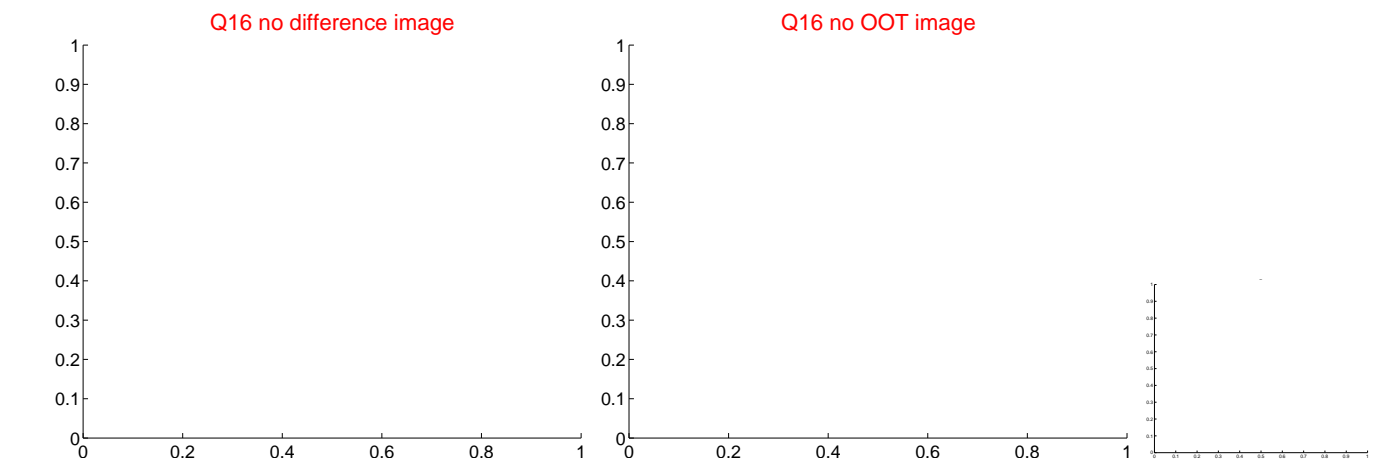
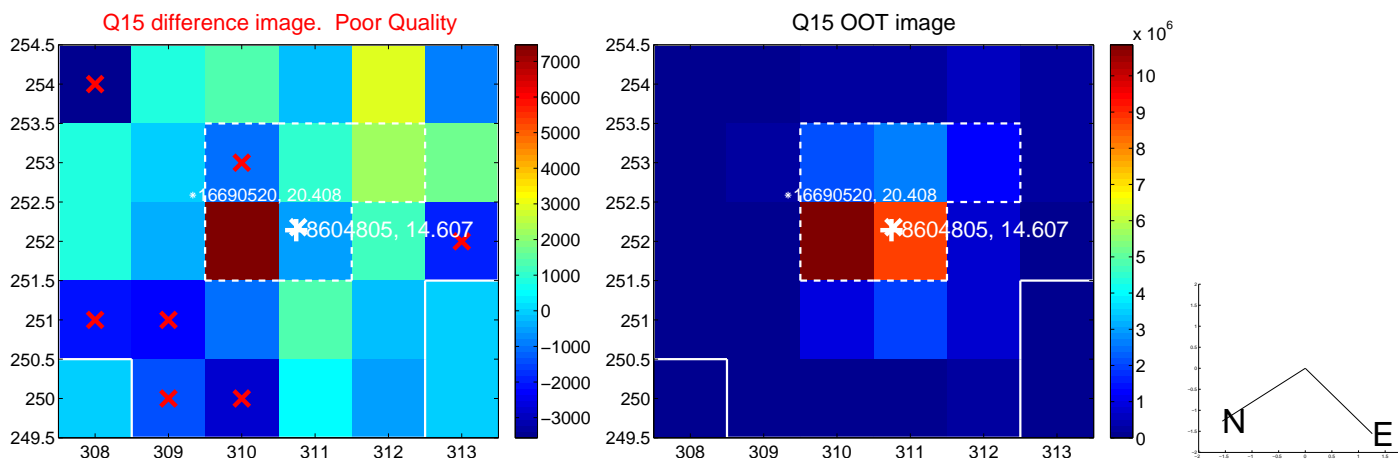
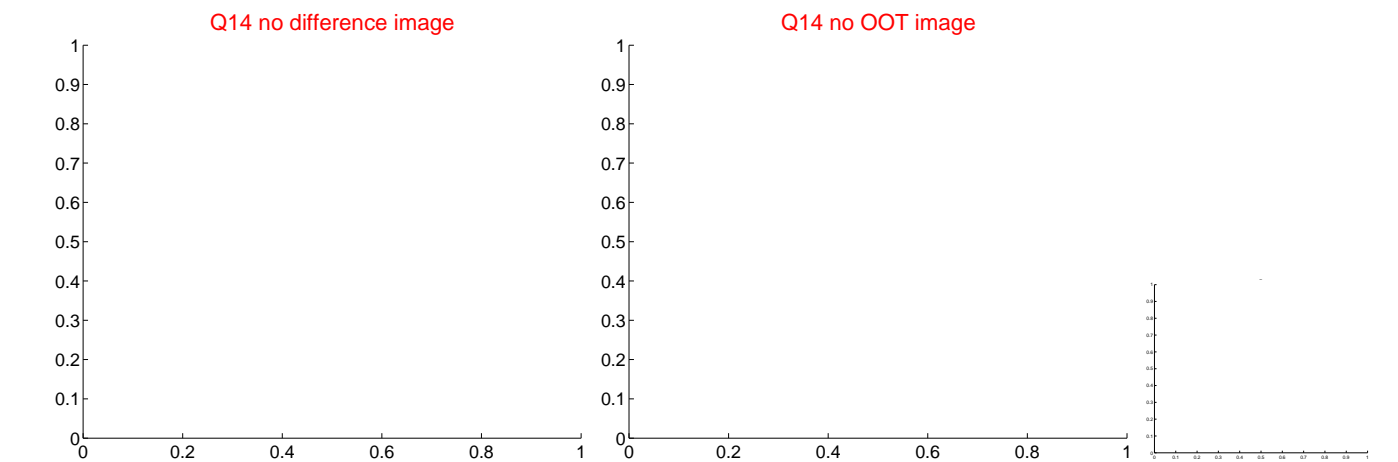
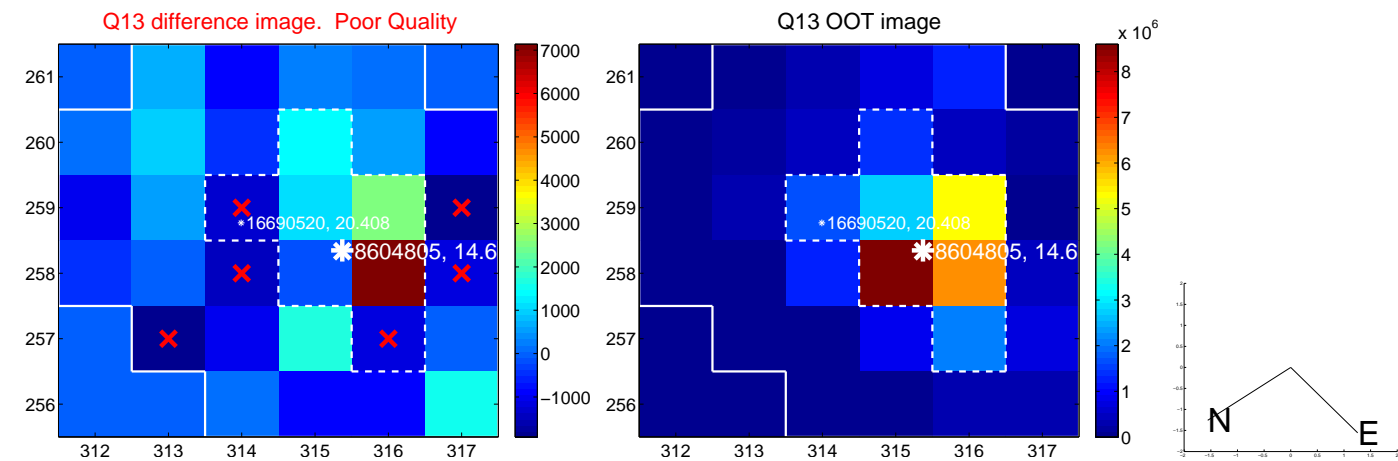
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



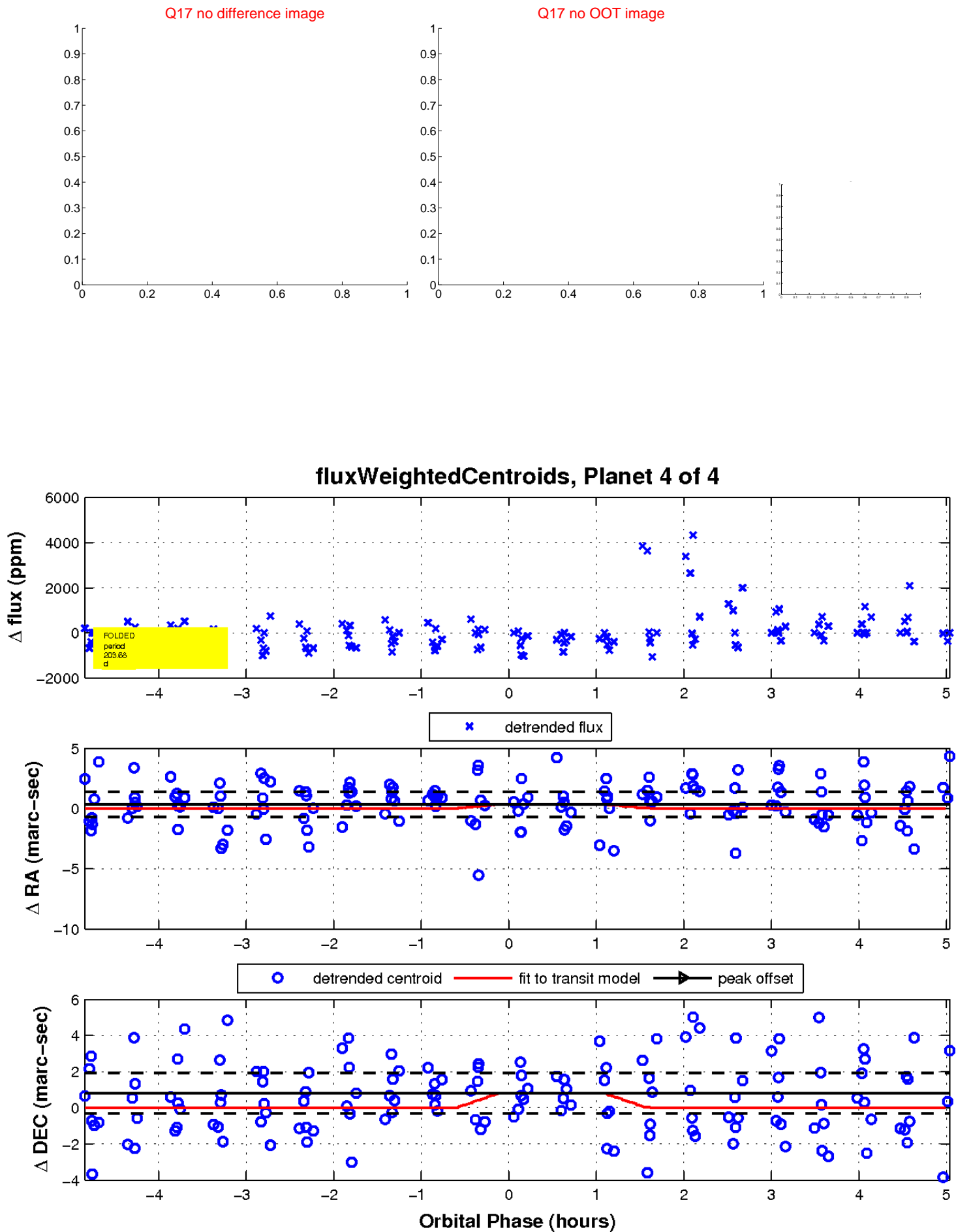
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

