

# KIC 002444769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002444769-01	OBS	No	3.001337	133.226612	16.1	18.084	7.8	7.2	1.02	6450	0.41	973.53
002444769-02	OBS	No	125.774820	201.647831	292.4	5.686	12.3	9.9	1.02	6450	1.93	6.69
002444769-03	OBS	No	102.071699	146.923760	149.9	4.921	7.7	7.8	1.02	6450	1.42	8.84
002444769-05	OBS	No	61.276073	175.297370	175.9	4.082	7.4	7.7	1.02	6450	1.58	17.45
002444769-06	OBS	No	63.555015	151.870476	162.0	7.072	8.0	7.7	1.02	6450	1.45	16.62
002444769-07	OBS	No	169.959063	155.423564	252.7	2.430	7.1	7.2	1.02	6450	1.90	4.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002444769-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002444769-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002444769-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002444769-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002444769-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002444769-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

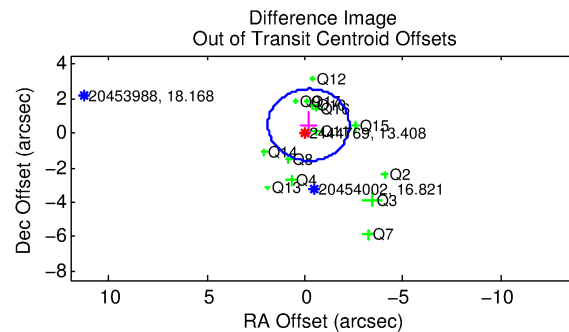
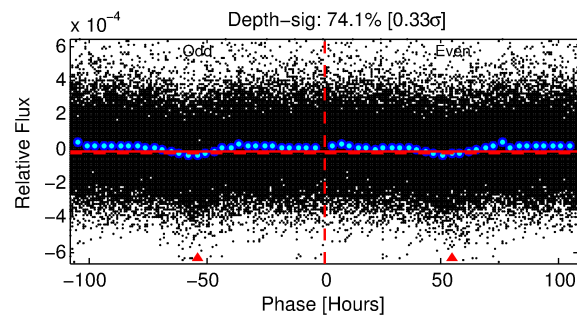
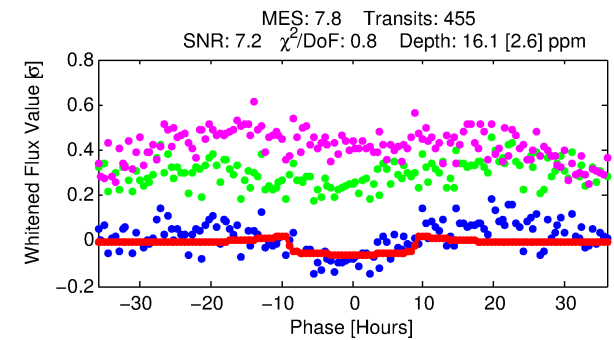
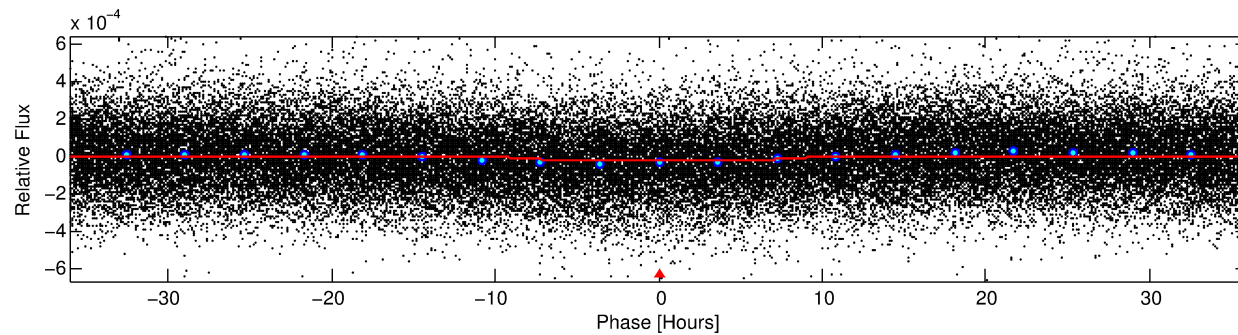
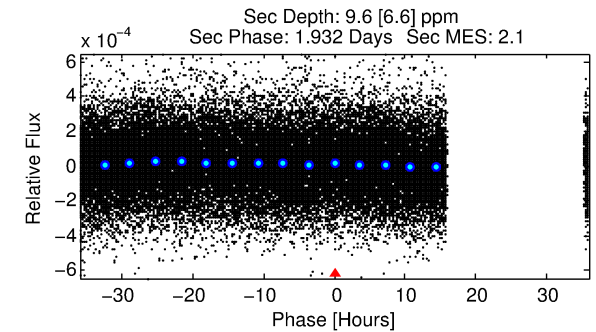
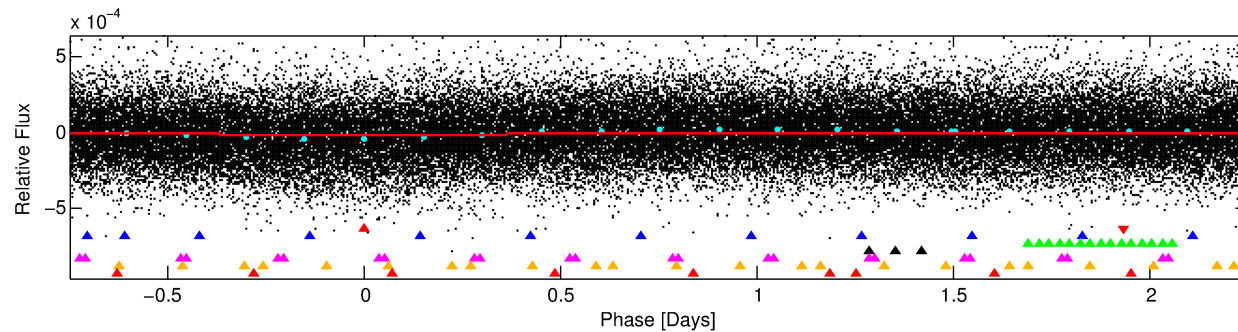
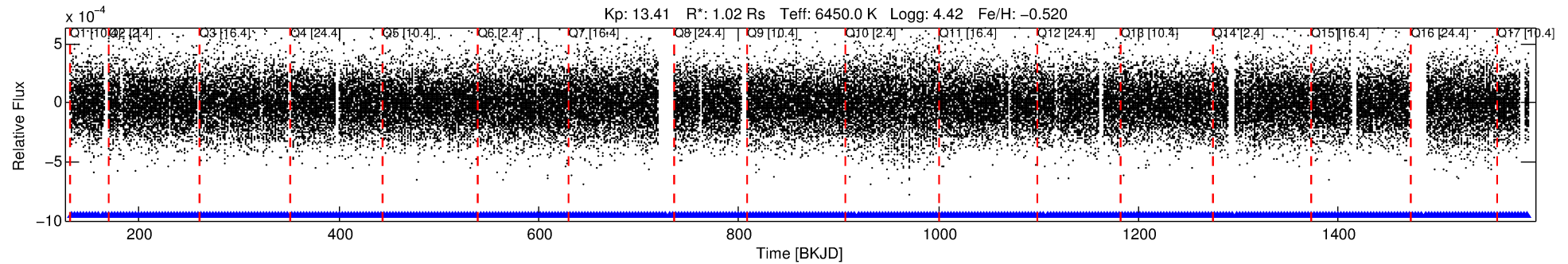
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002444769-01

No Significant Match Found

# DV One-Page Summary

KIC: 2444769 Candidate: 1 of 7 Period: 3.001 d



## DV Fit Results:

Period = 3.00134 [0.00007] d  
Epoch = 133.2266 [0.0151] BKJD  
Rp/R\* = 0.0037 [0.0038]  
a/R\* = 1.41 [3.95]  
b = 0.01 [422.69]  
Seff = 973.53 [378.29]  
Teq = 1424 [138] K  
Rp = 0.41 [0.45] Re  
a = 0.0408 [0.0104] AU  
Ag = 51.29 [113.67] [0.44σ]  
Teffp = 5893 [3224] K [1.38σ]

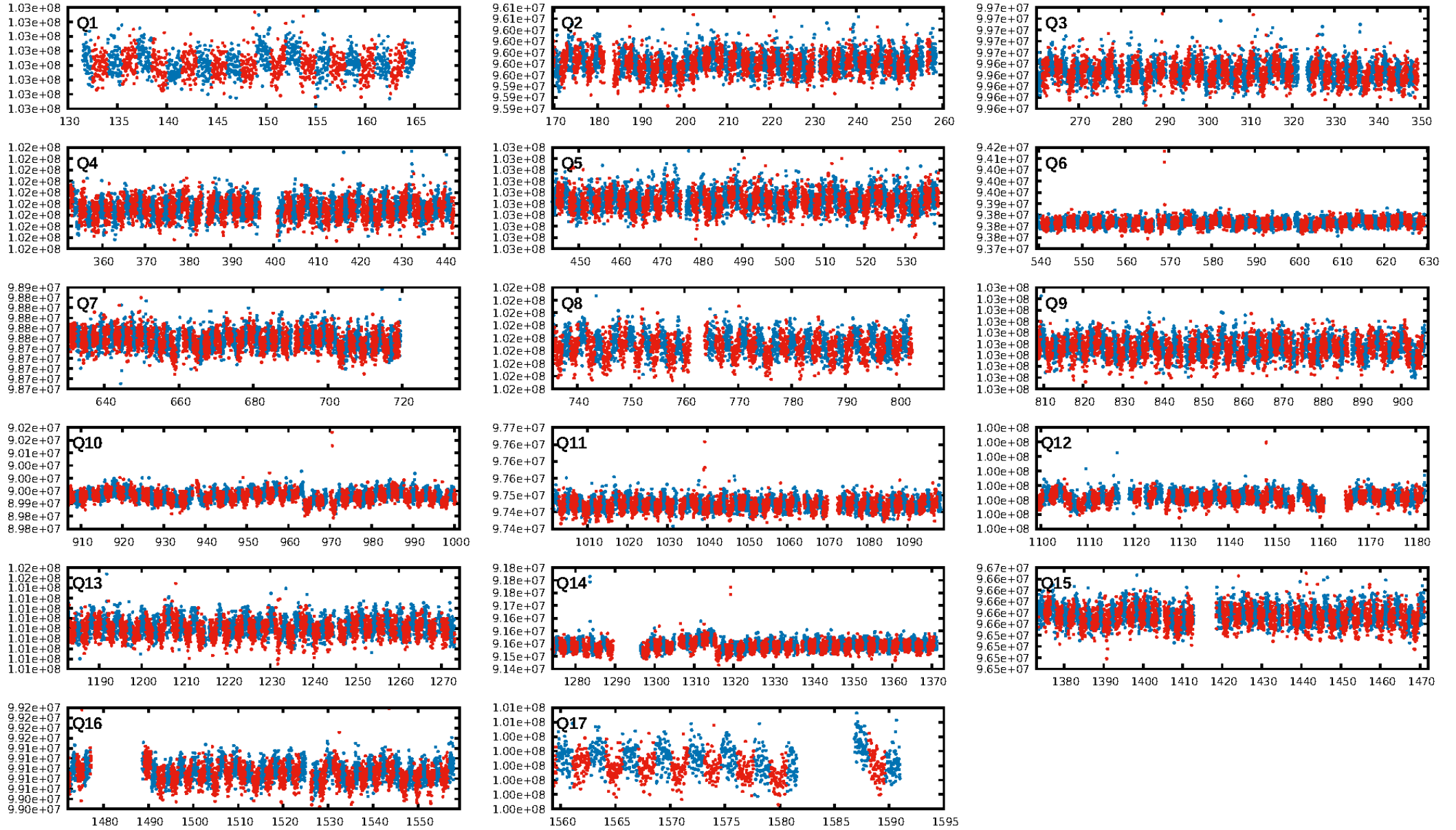
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [75.44σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.01e-11**  
RollingBand-fgt: 1.00 [435/435]  
GhostDiagnostic-chr: 2.745  
Centroid-sig: 57.1%  
Centroid-so: 1.269 arcsec [0.91σ]  
OotOffset-rm: 0.513 arcsec [0.74σ]  
KicOffset-rm: 0.413 arcsec [0.63σ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.71 [10/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:46:01 Z

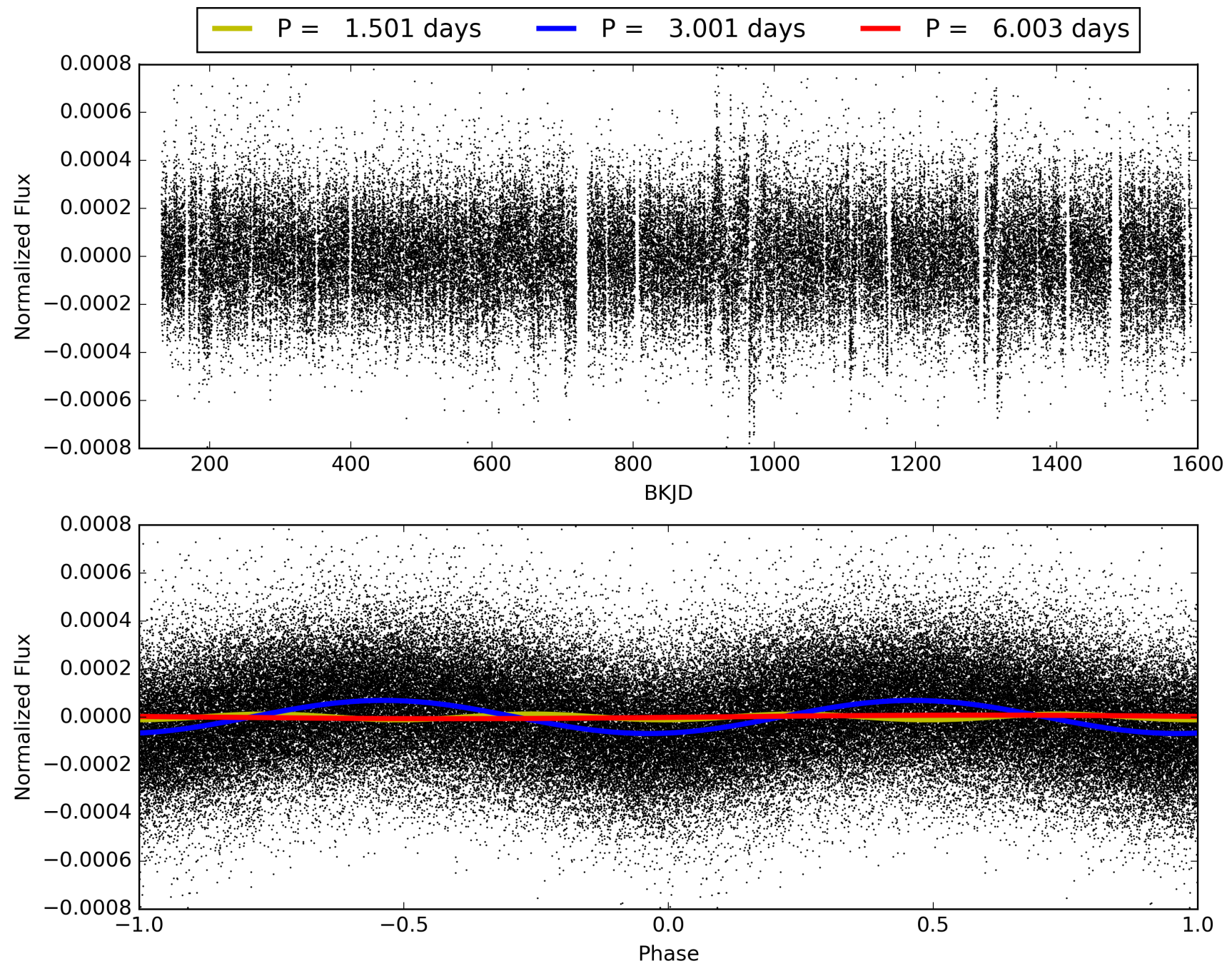
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002444769-01, PDC Light Curves





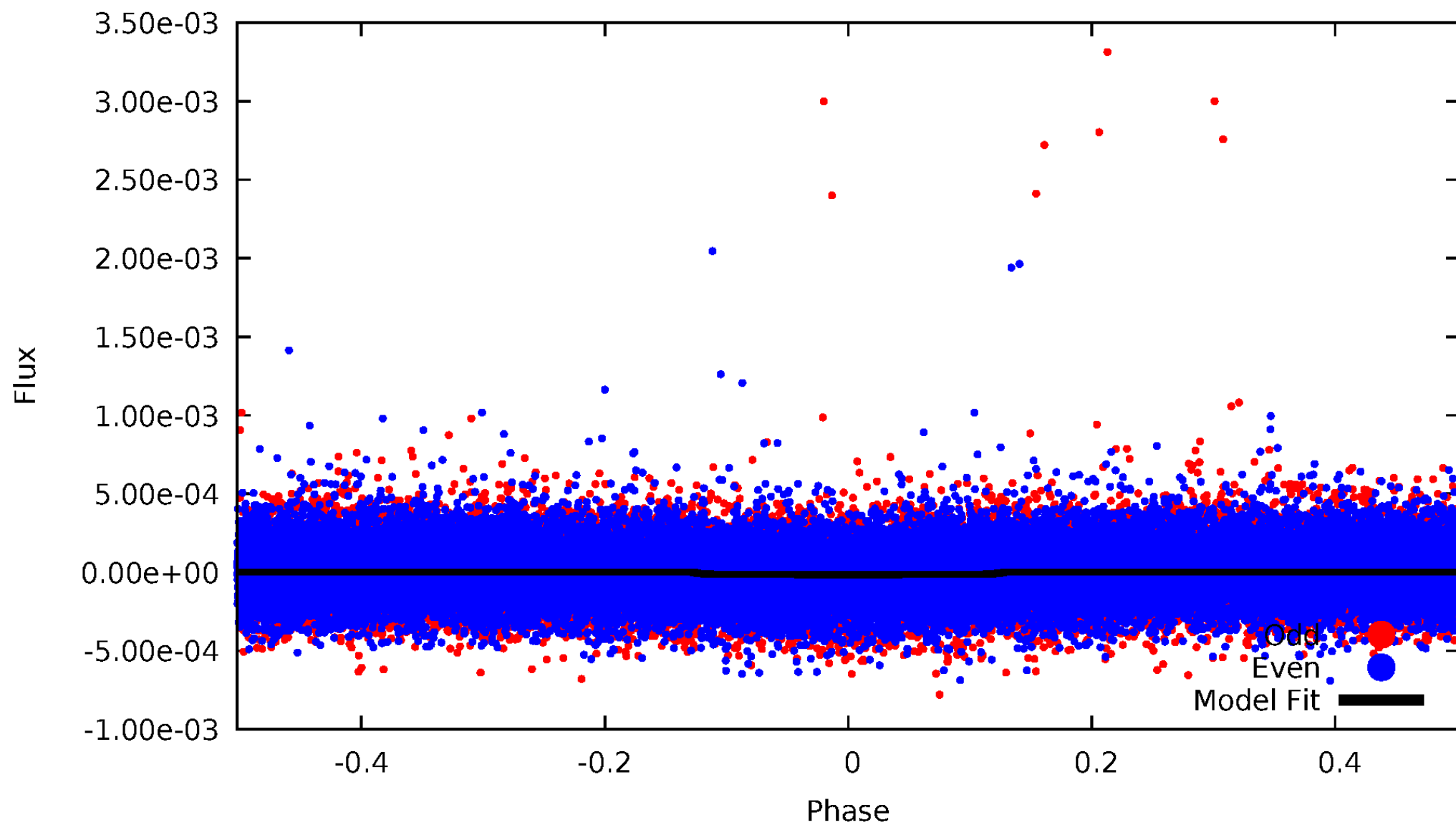
TCE 002444769-01





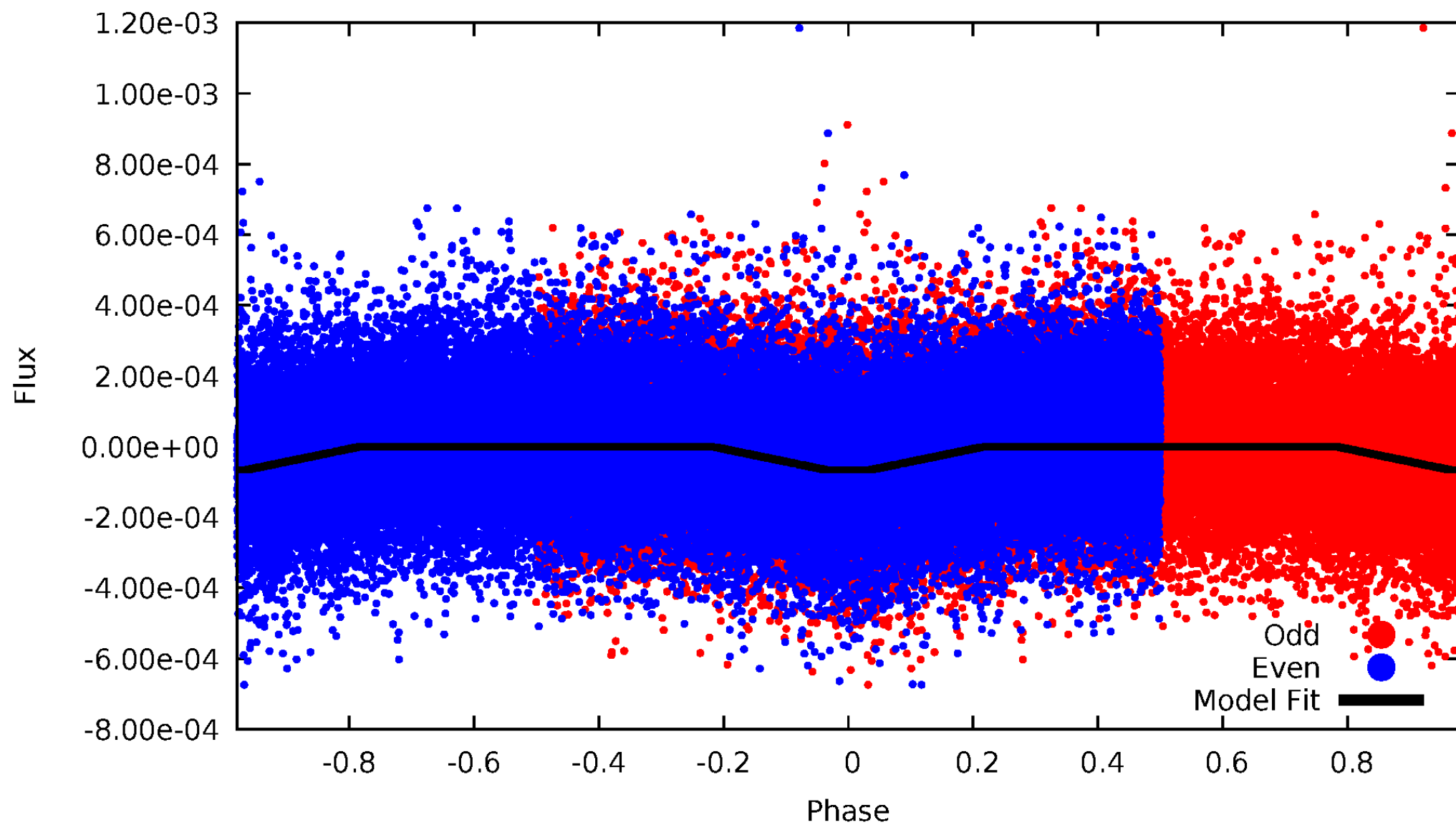
# DV Odd/Even

TCE 002444769-01

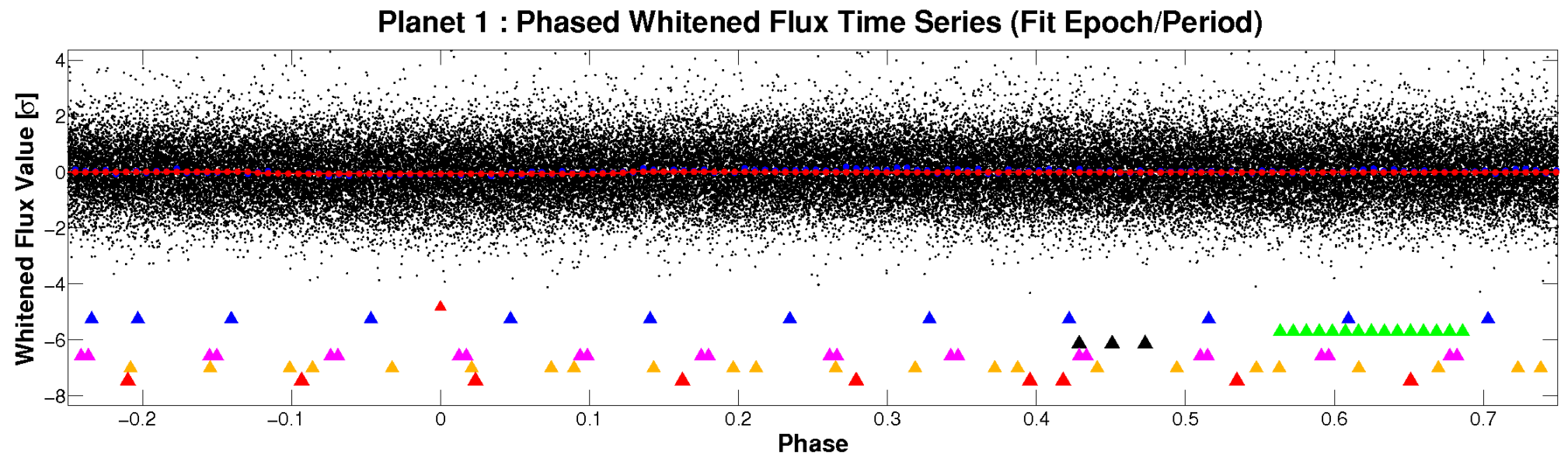
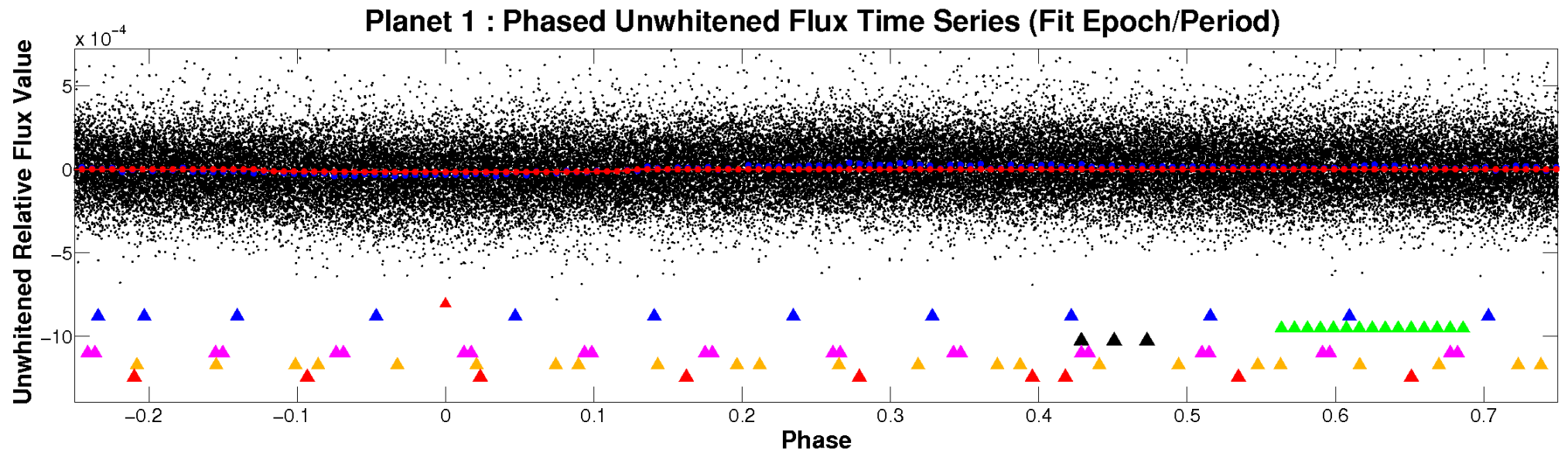


# ALT Odd/Even

TCE 002444769-01



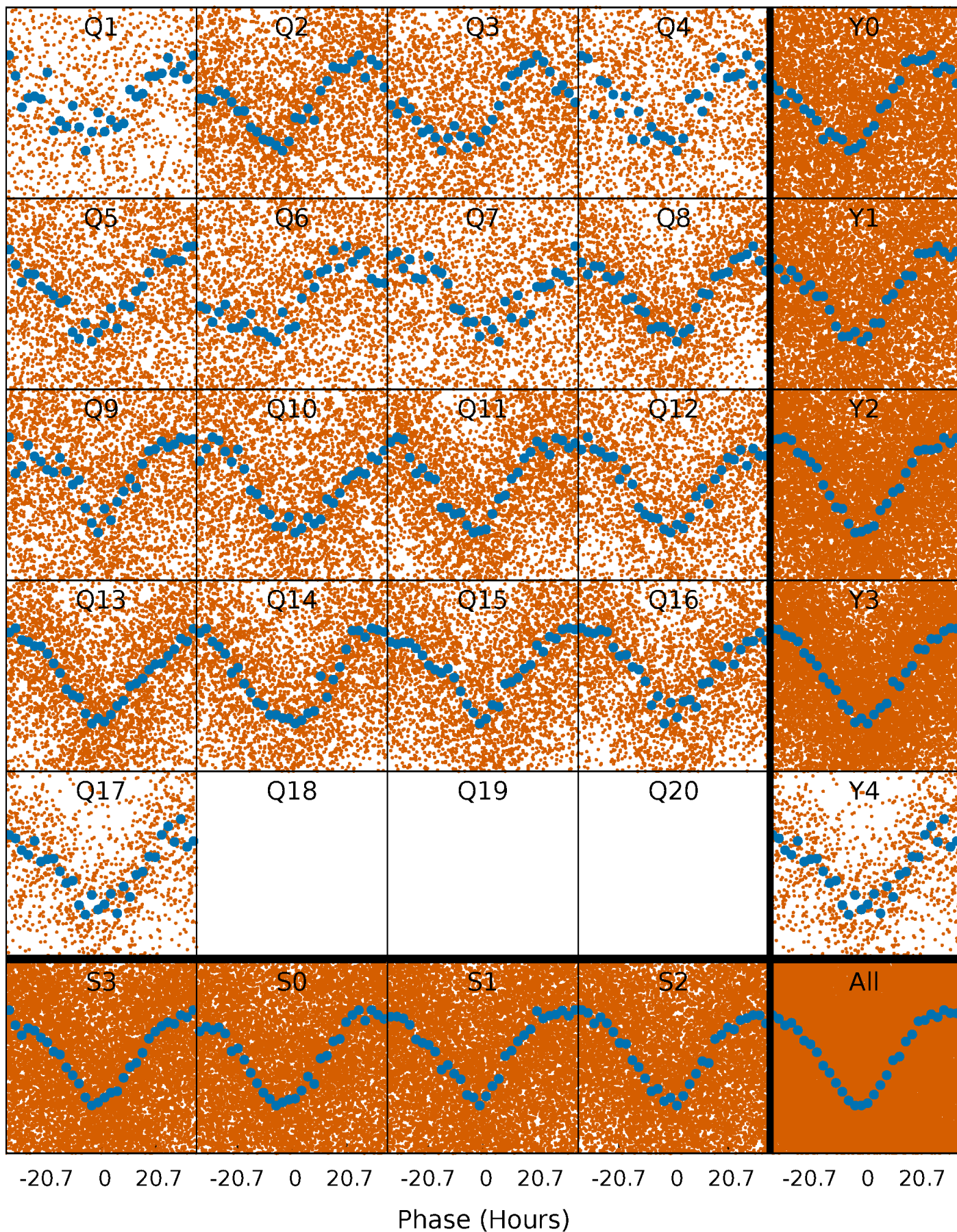
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

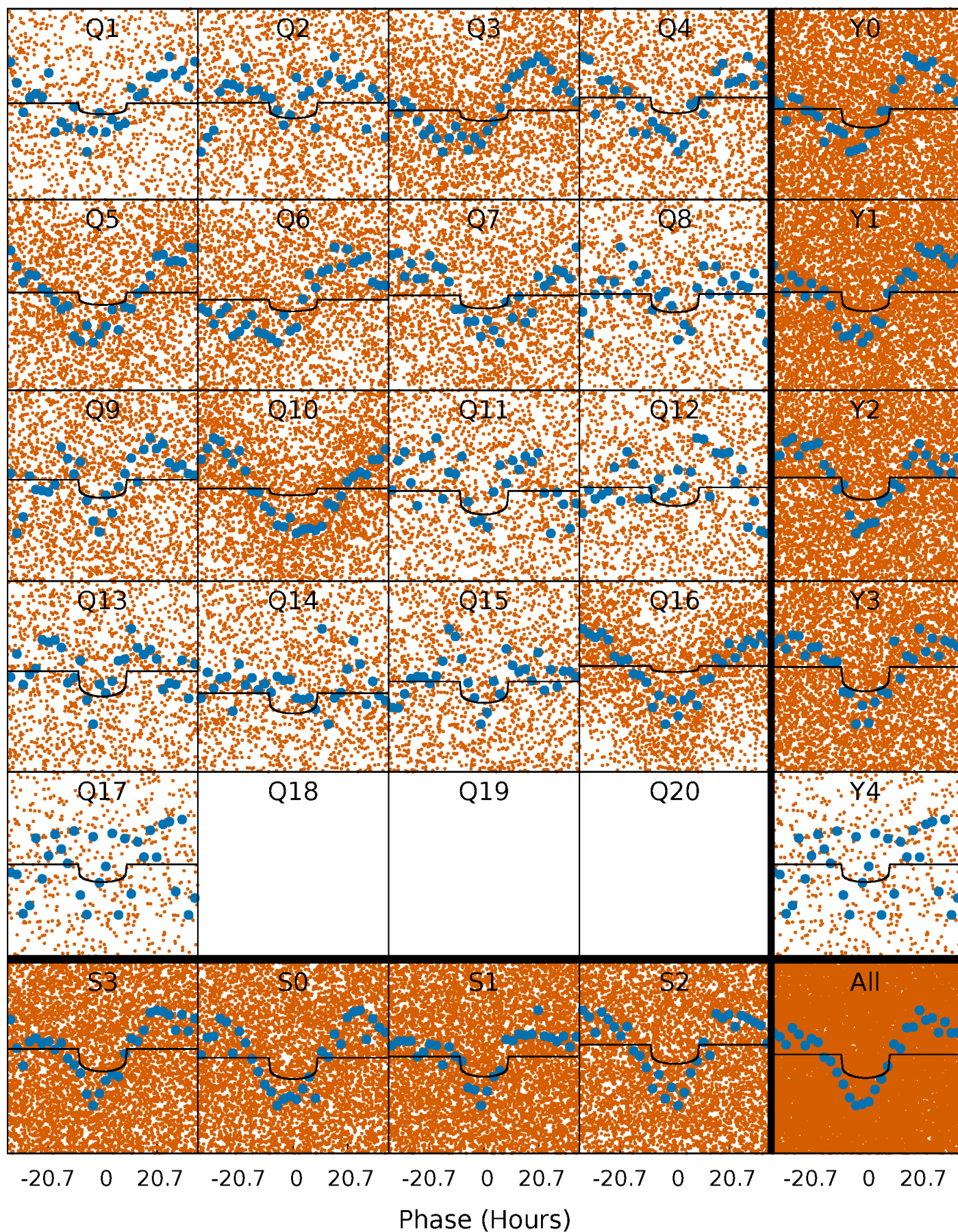
TCE 002444769-01 P= 3.001337 Days  $T_0=133.226612$  (BKJD)





# DV Quarter-Phased Transit Curves

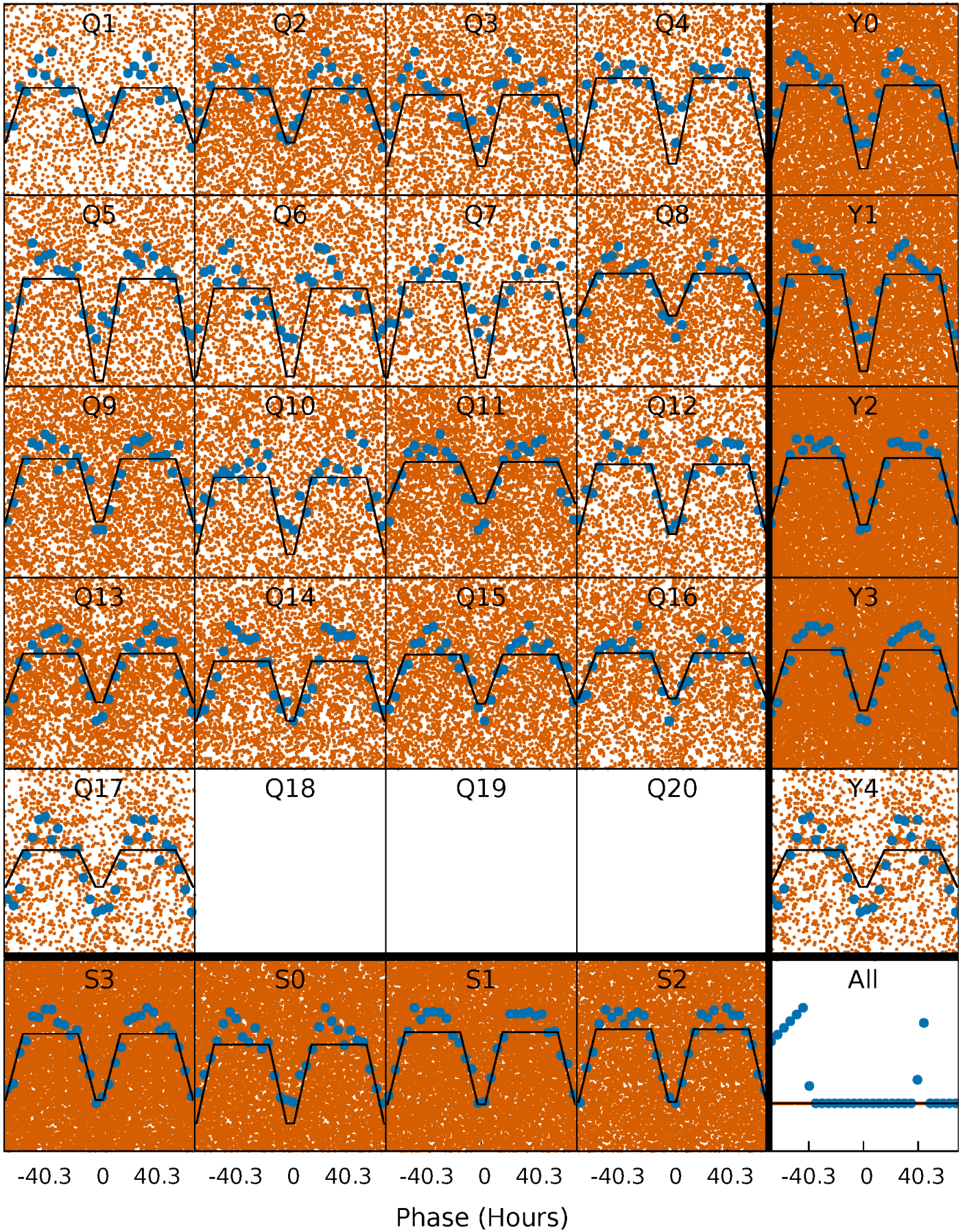
TCE 002444769-01 P= 3.001337 Days  $T_0=133.226612$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 002444769-01 P= 3.001264 Days  $T_0=133.169961$  (BKJD)

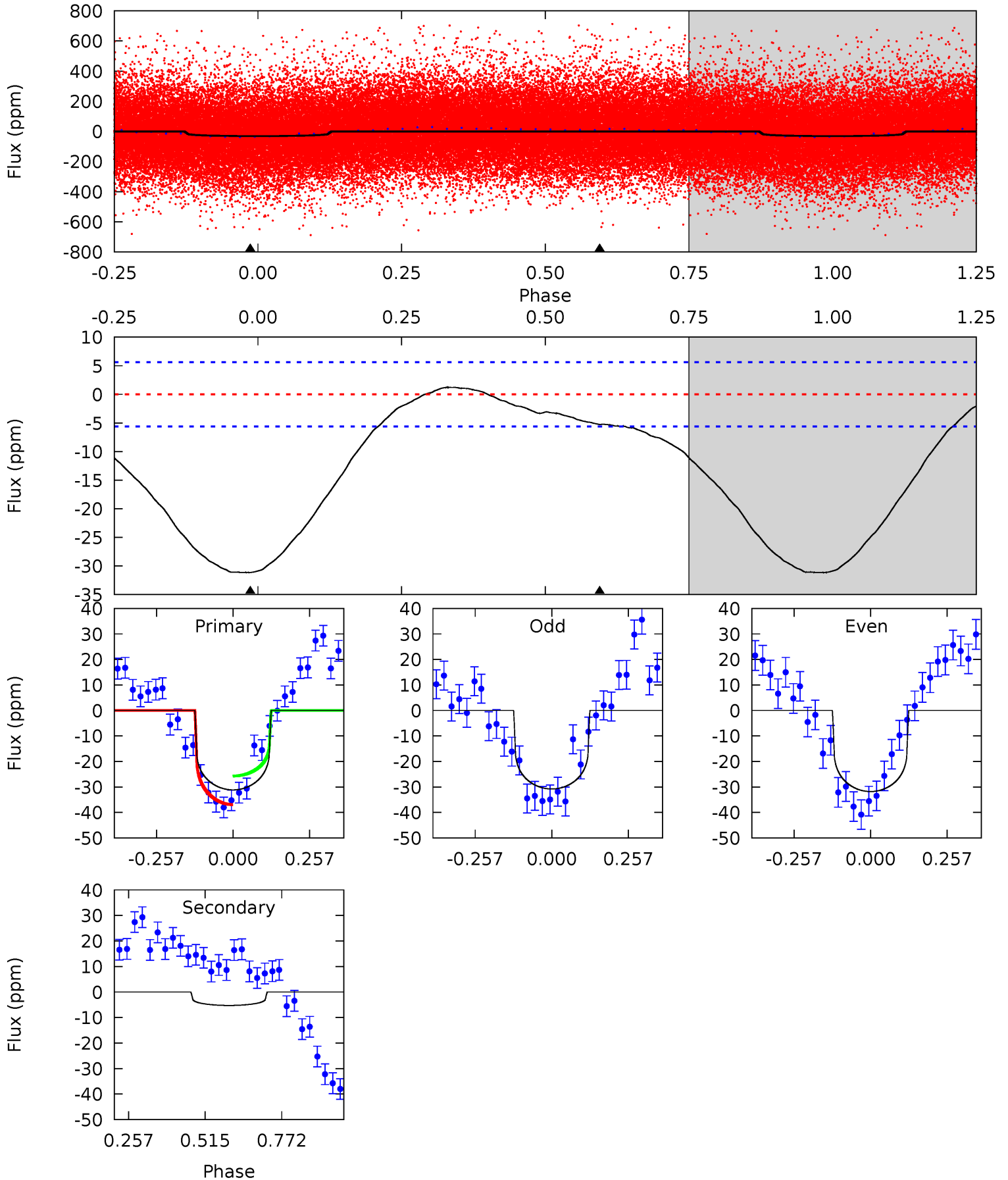




# DV Model-Shift Uniqueness Test

002444769-01, P = 3.001337 Days, E = 130.225275 Days

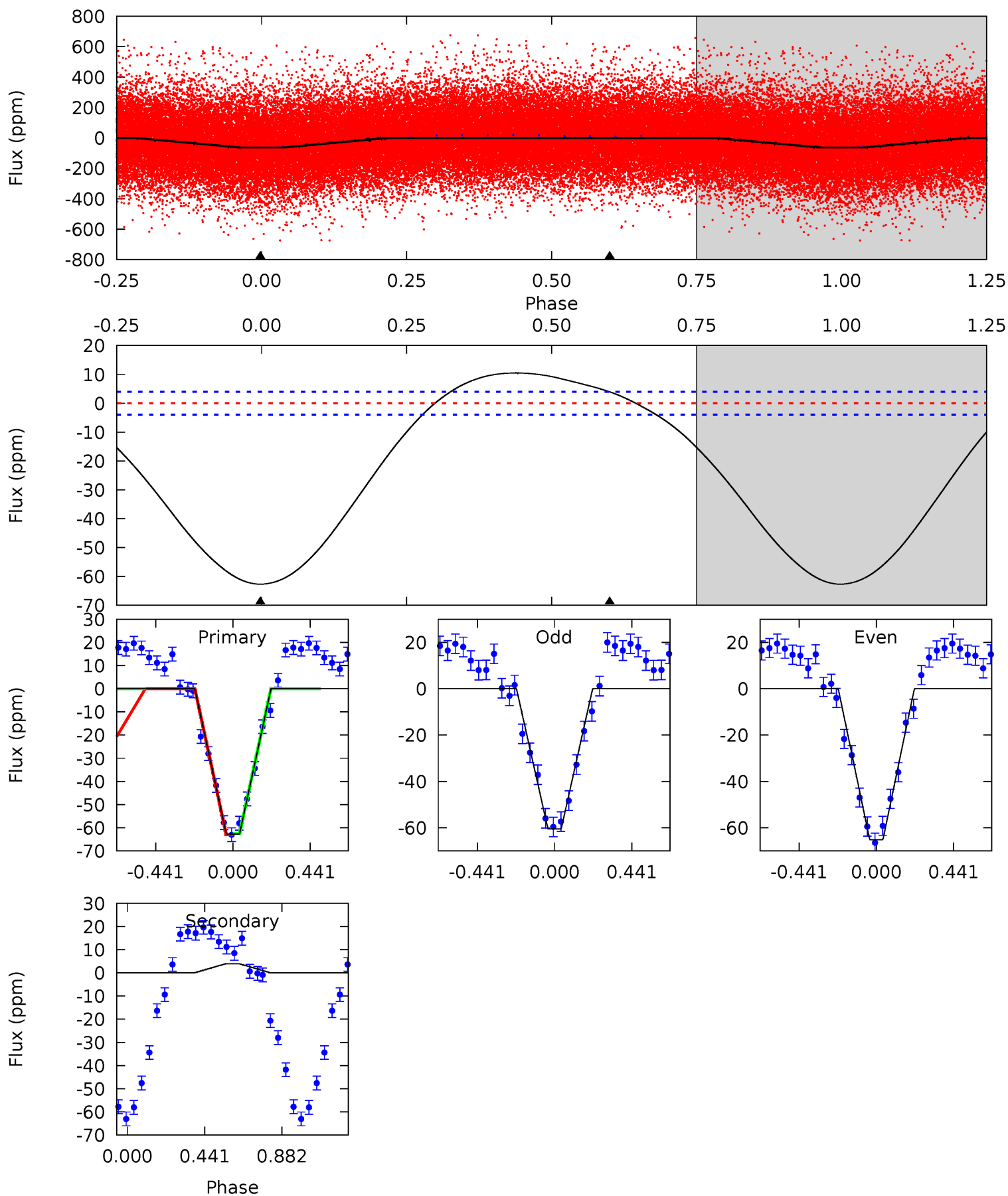
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.2	4.09	0	0	4.36	1.13	0.95	24.2	24.2	4.09	4.09	0.39	1.33	0.04	4.38



# Alt Model-Shift Uniqueness Test

002444769-01, P = 3.001264 Days, E = 130.168697 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
67.4	-4.23	0	0	4.24	0.77	5.23	67.4	67.4	-4.23	-4.23	2.48	1.00	0.14	0.31



### Stellar Parameters For KIC 002444769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6450^{+162}_{-194}$	$4.421^{+0.081}_{-0.202}$	$-0.520^{+0.300}_{-0.300}$	$1.022^{+0.308}_{-0.123}$	$1.004^{+0.133}_{-0.106}$	$1.325^{+0.467}_{-0.675}$
	+3%/-3%	+2%/-5%	+58%/-58%	+30%/-12%	+13%/-11%	+35%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 002444769-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-5 \pm 1$	$0.50^{+0.43}_{-0.31}$	$2017^{+147}_{-100}$	$4750^{+2926}_{-1012}$	$19^{+111}_{-14}$
Alt.	$4 \pm 1$	$0.97^{+0.47}_{-0.41}$	$2007^{+163}_{-92}$	$-3617^{+387}_{-734}$	$-3.652^{+2.049}_{-8.110}$

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



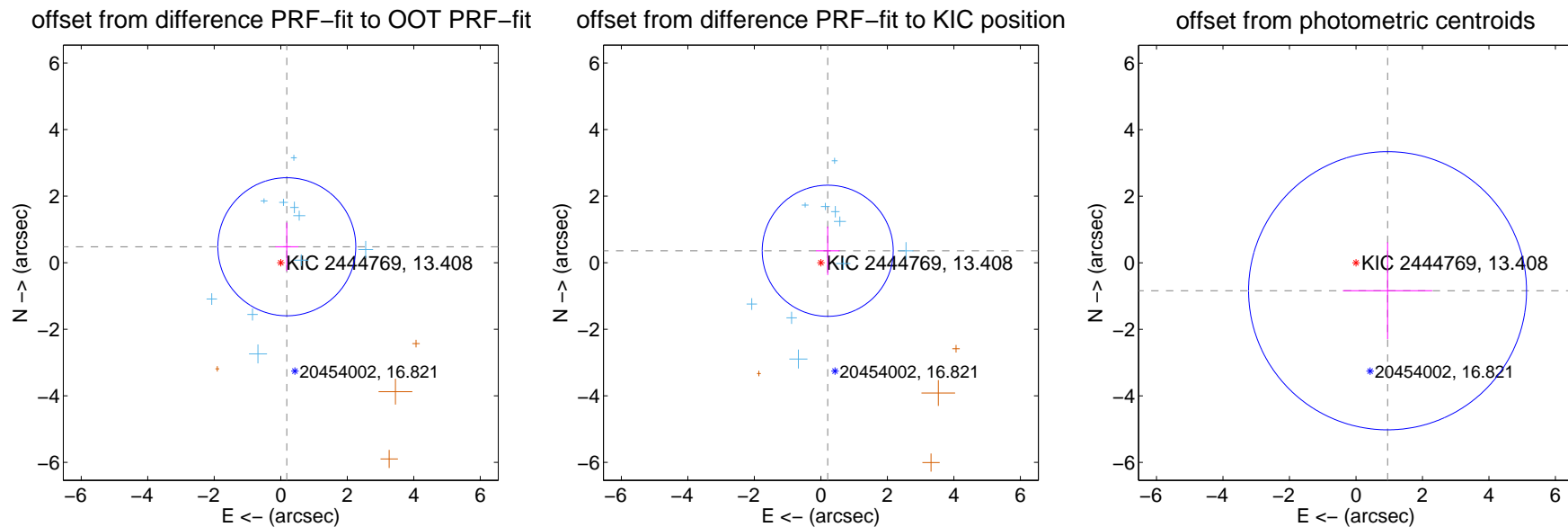
## DV Centroid Data

Supplemental centroid analysis for 002444769-01. Kepler magnitude: 13.41. Transit SNR 7.16

There are 10 quarters with good PRF difference image offsets

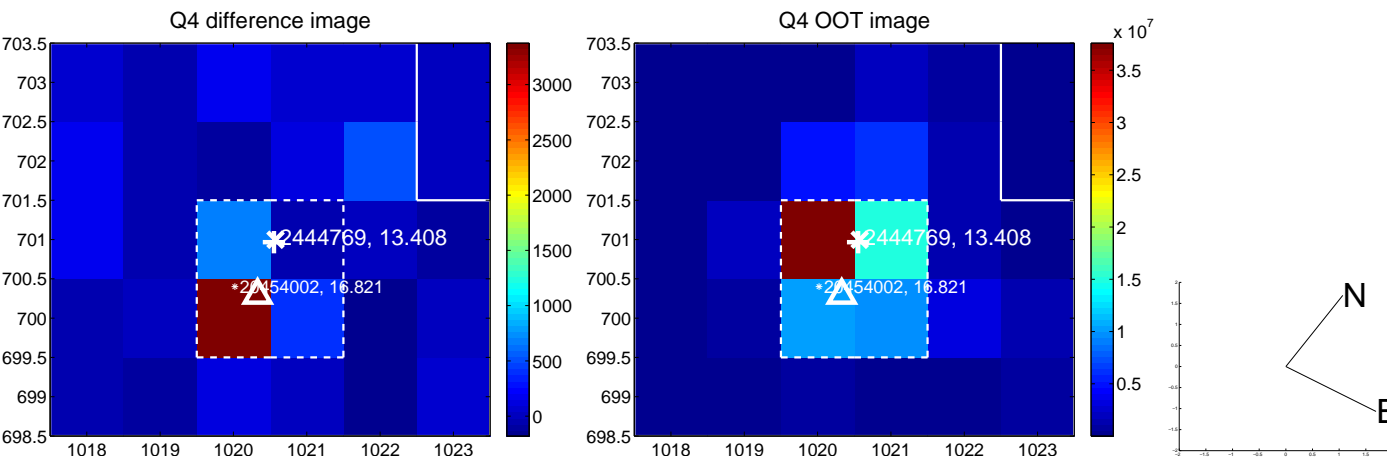
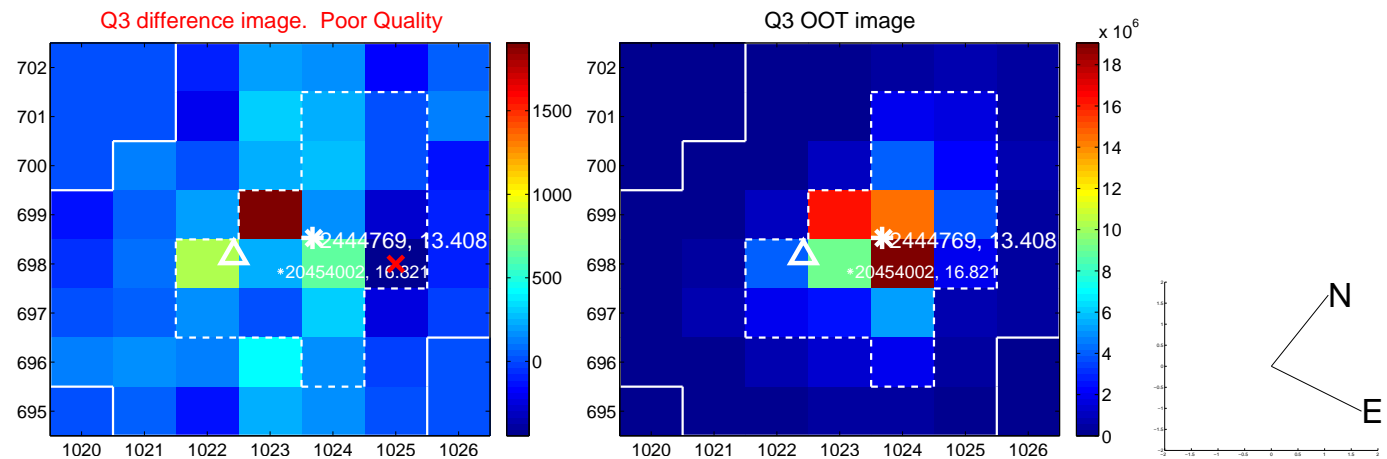
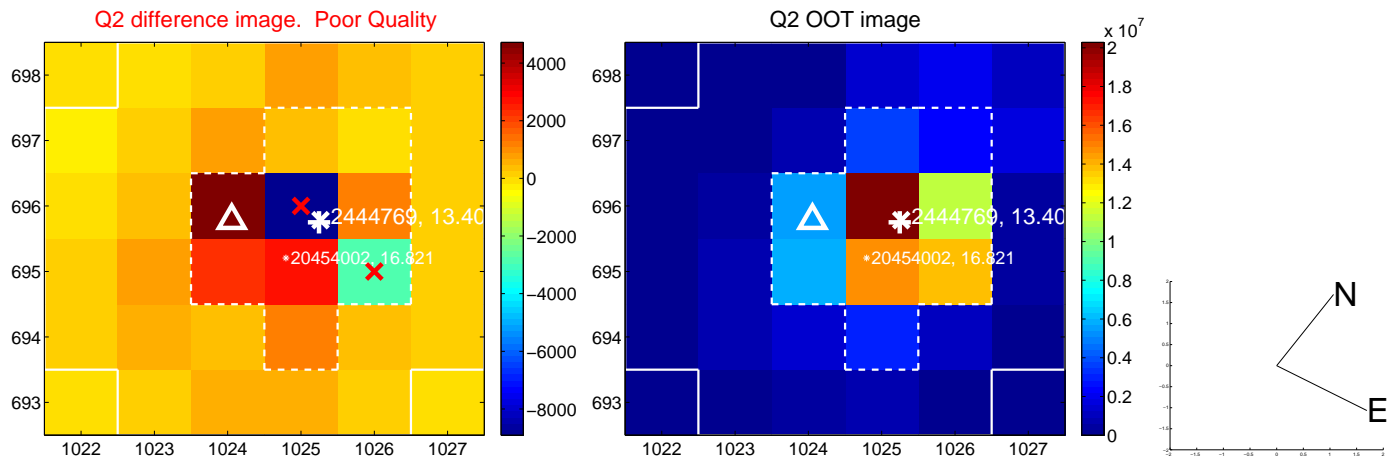
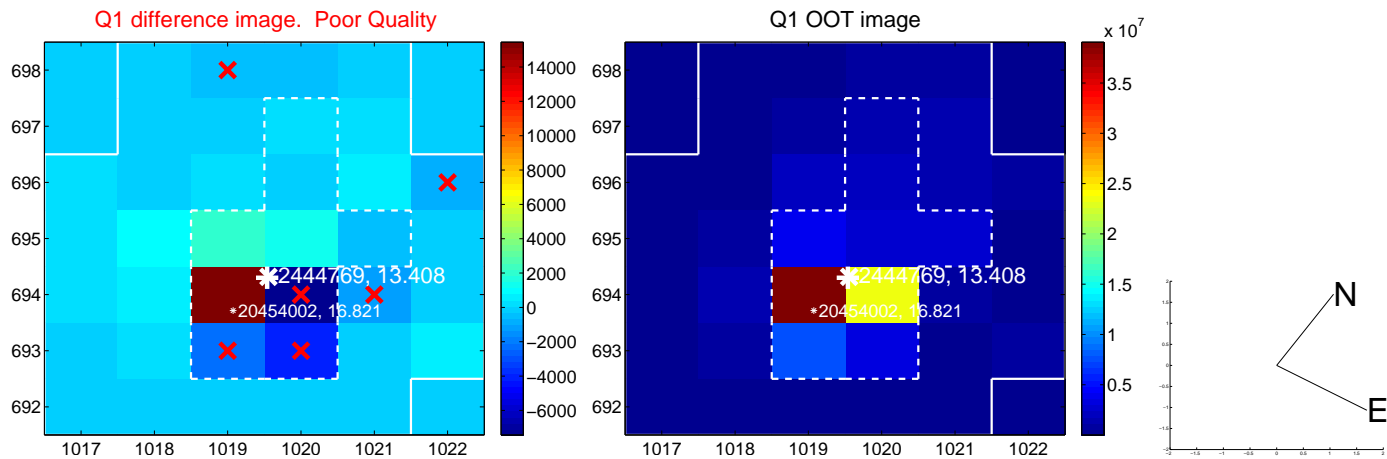
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.513 \pm 0.691$	0.74	$-0.182 \pm 0.345$	$0.479 \pm 0.728$
PRF-fit source offset from KIC position	$0.413 \pm 0.657$	0.63	$-0.206 \pm 0.357$	$0.358 \pm 0.729$
photometric centroid source offset	$1.27 \pm 1.39$	0.91	$-0.95 \pm 1.34$	$-0.84 \pm 1.45$

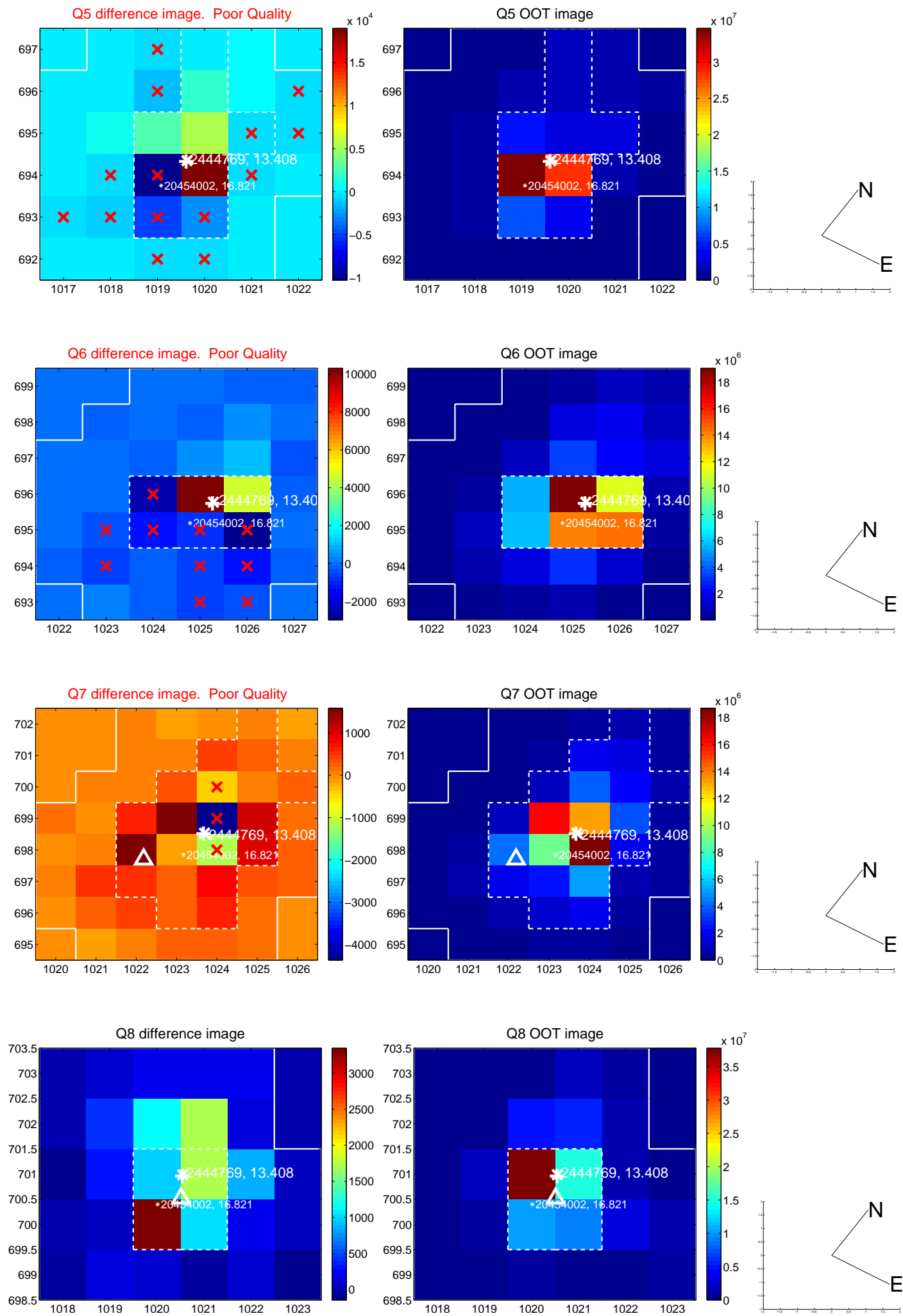


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

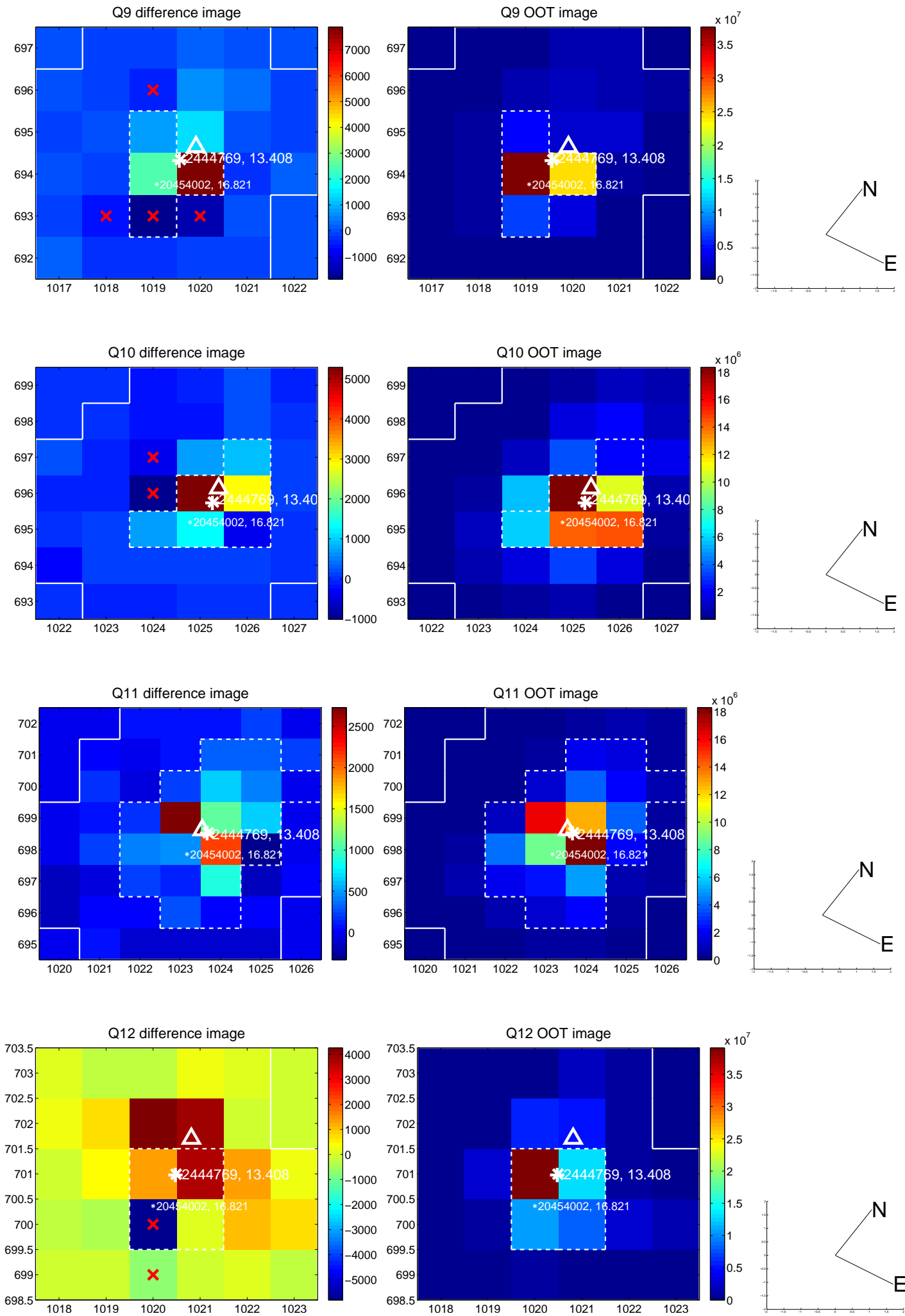


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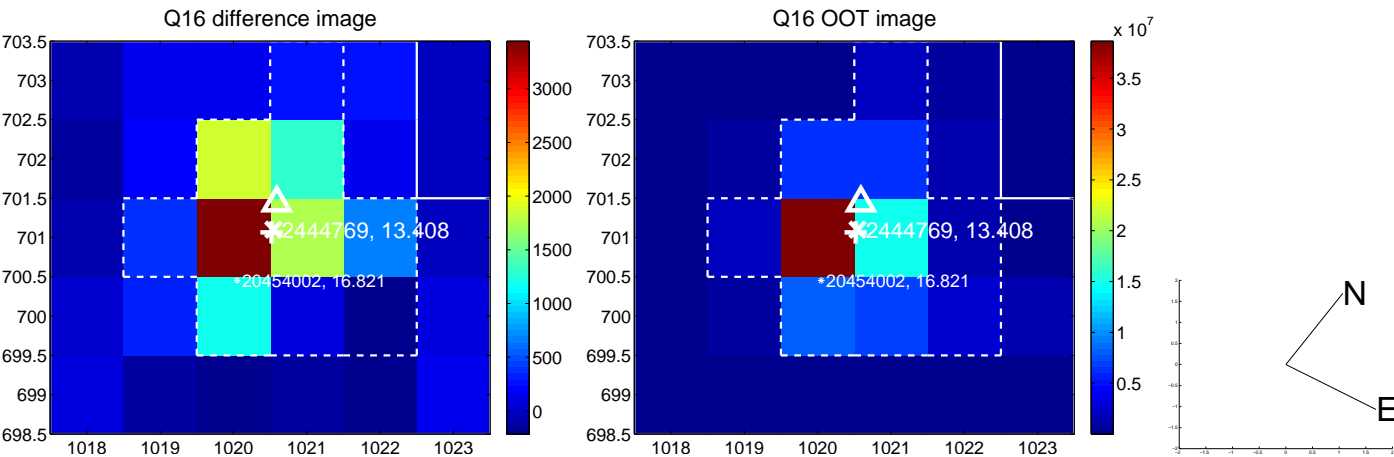
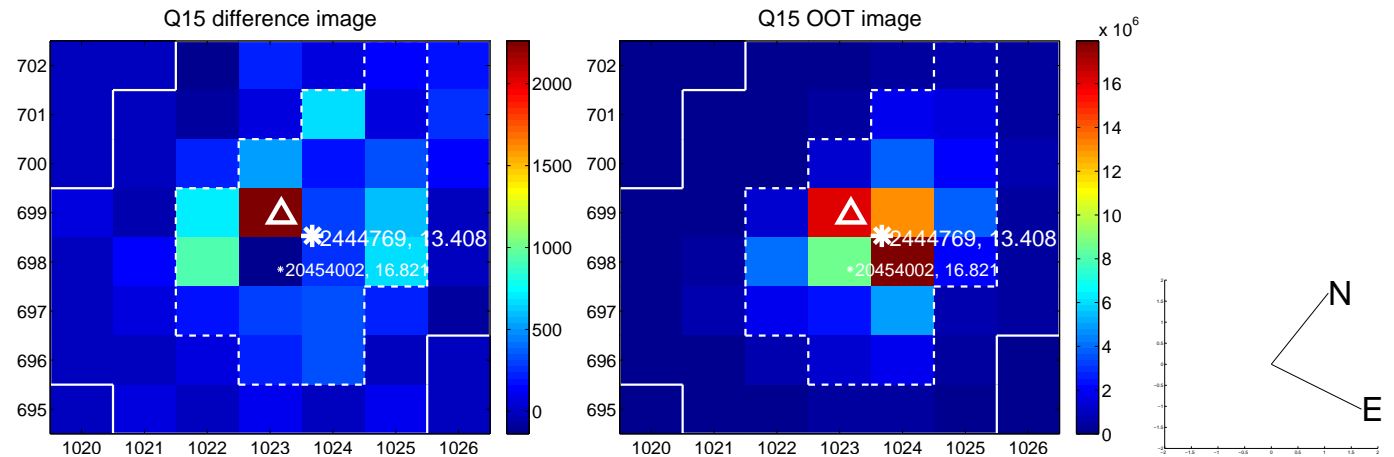
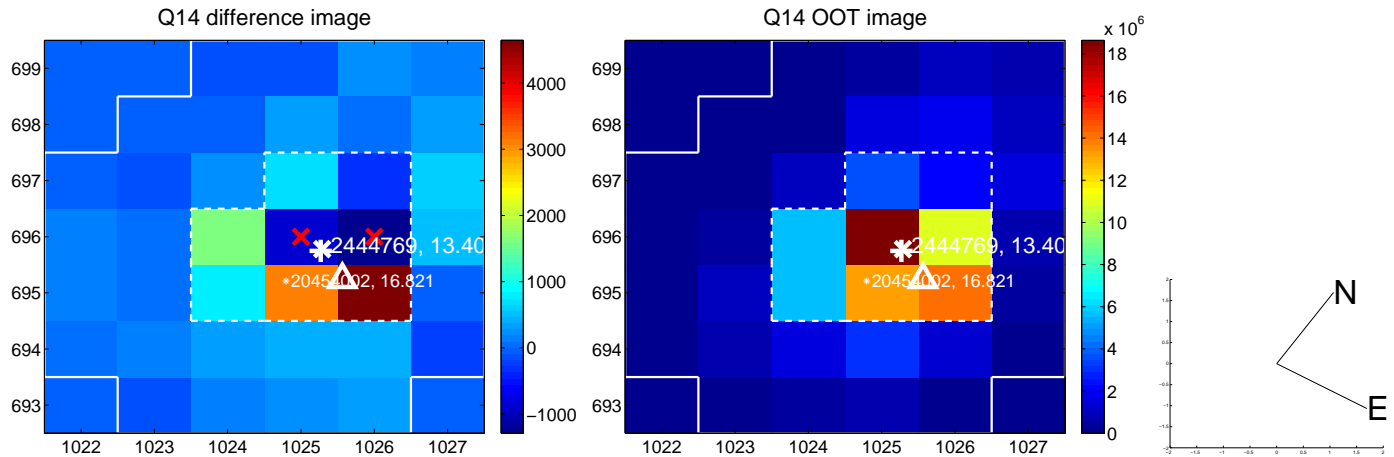
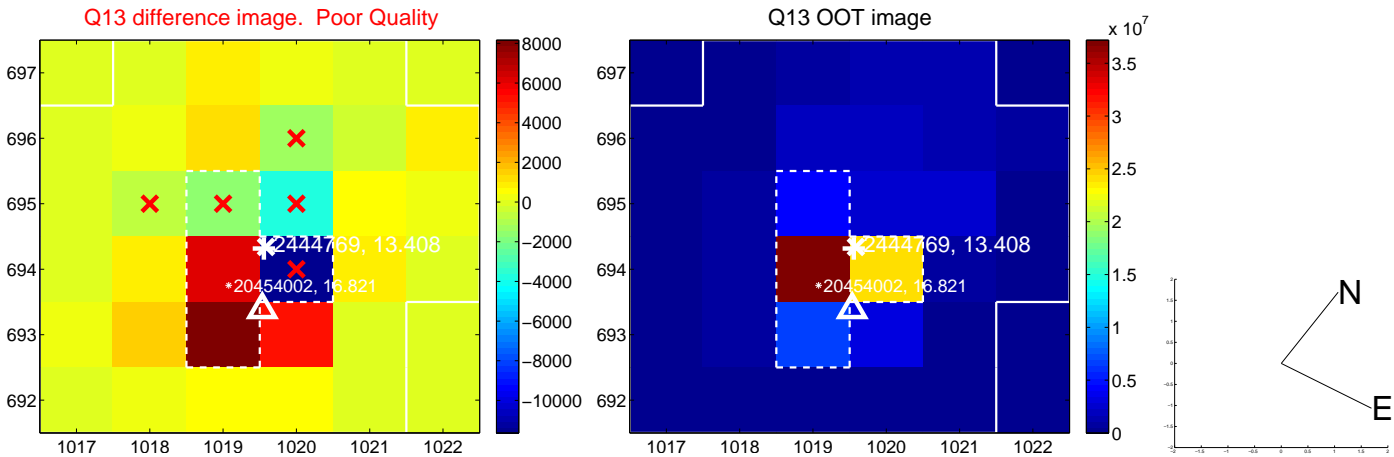




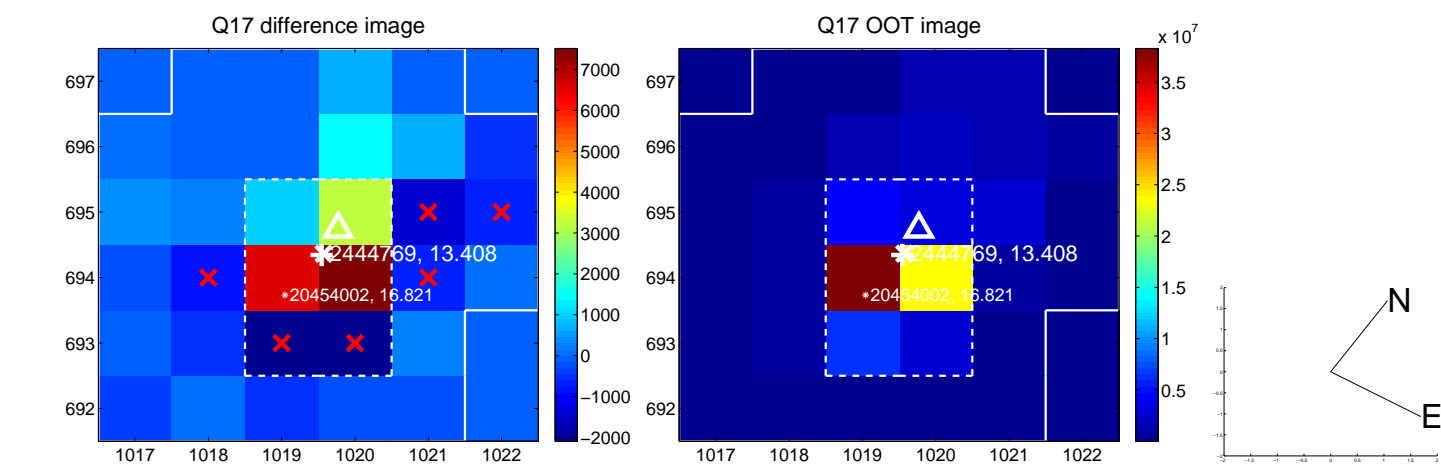
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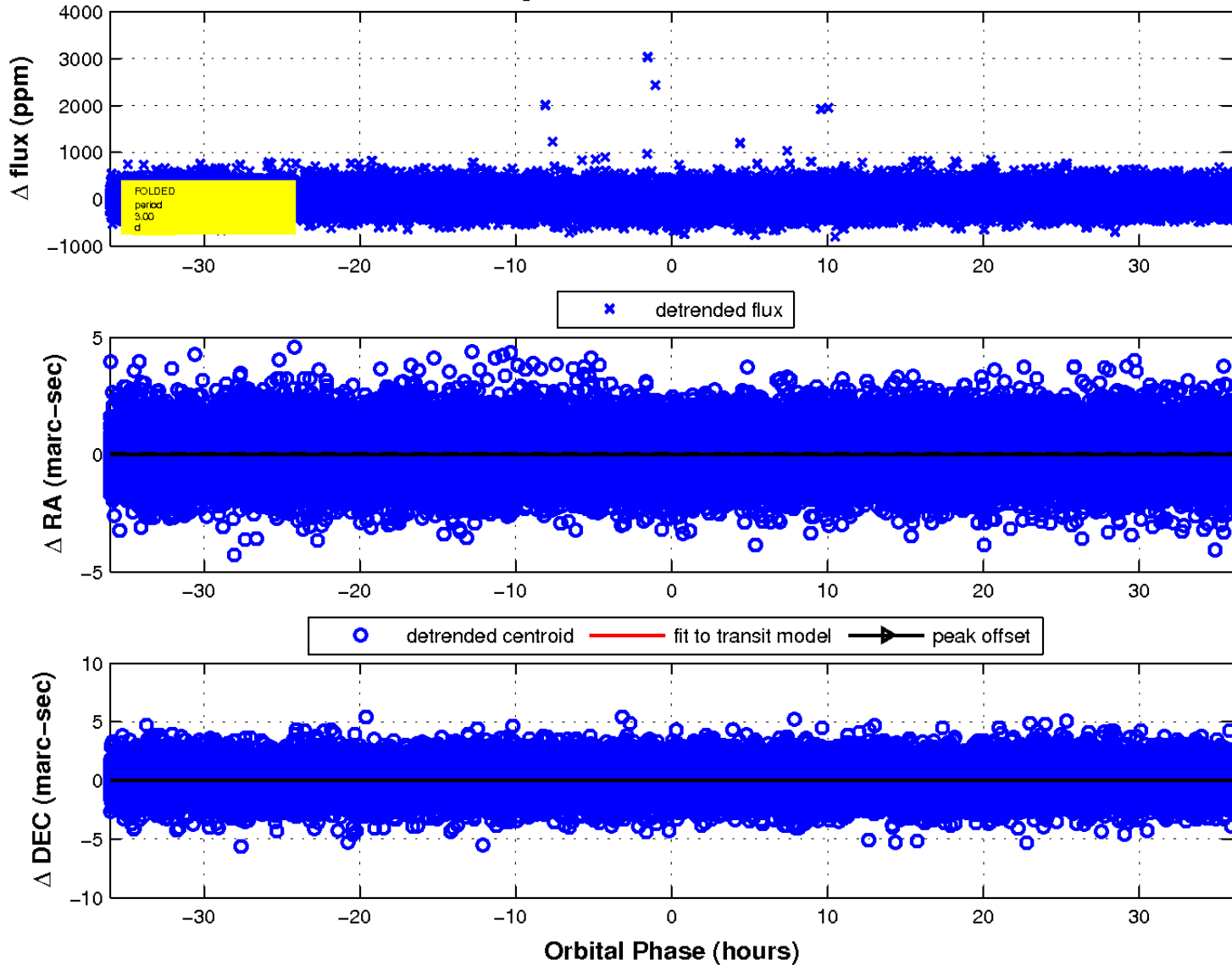
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

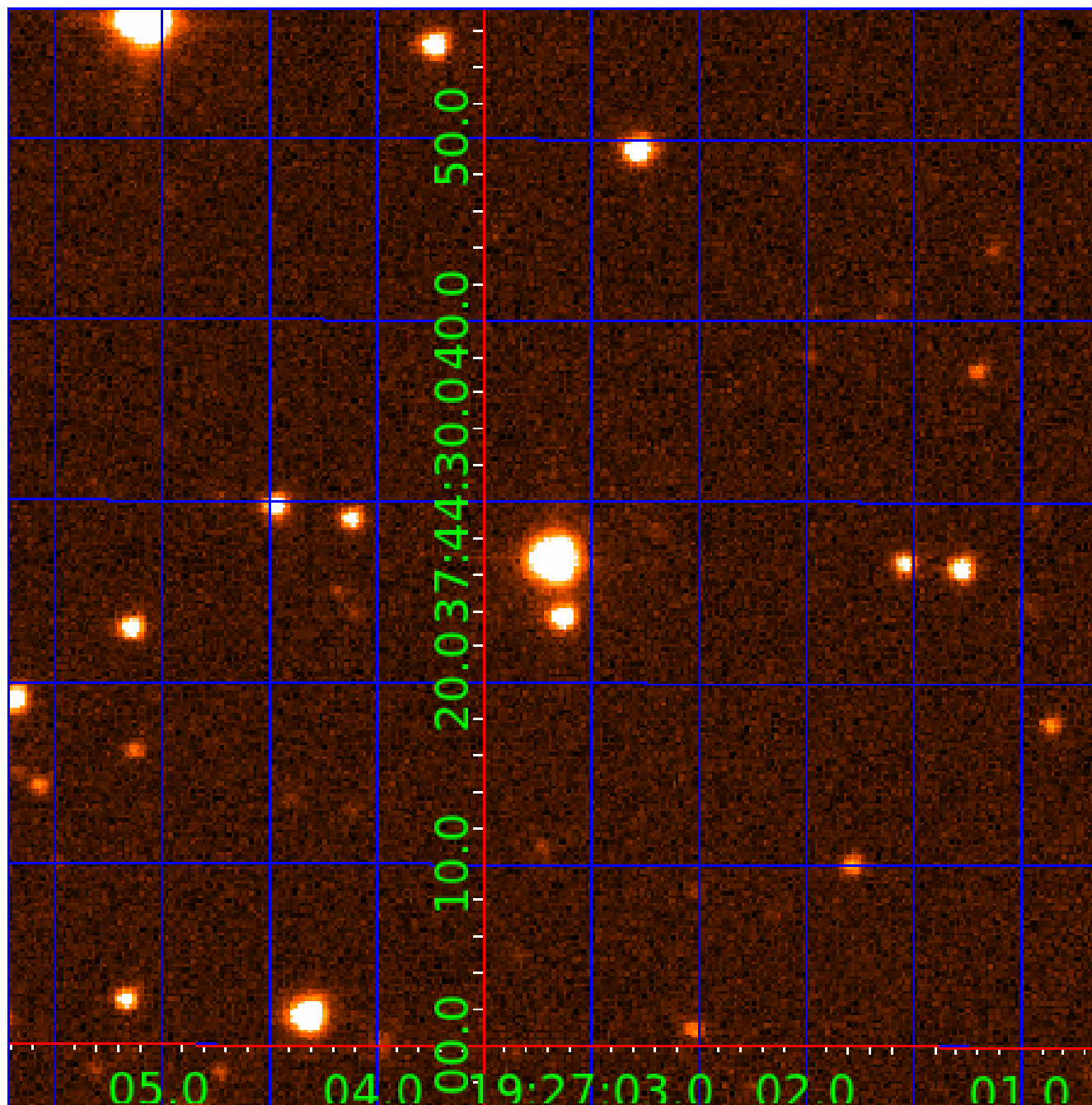


fluxWeightedCentroids, Planet 1 of 7



UKIRT Image

Declination



# KIC 002444769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002444769-01	OBS	No	3.001337	133.226612	16.1	18.084	7.8	7.2	1.02	6450	0.41	973.53
002444769-02	OBS	No	125.774820	201.647831	292.4	5.686	12.3	9.9	1.02	6450	1.93	6.69
002444769-03	OBS	No	102.071699	146.923760	149.9	4.921	7.7	7.8	1.02	6450	1.42	8.84
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002444769-07	OBS	No	169.959063	155.423564	252.7	2.430	7.1	7.2	1.02	6450	1.90	4.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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002444769-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002444769-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002444769-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002444769-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002444769-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

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

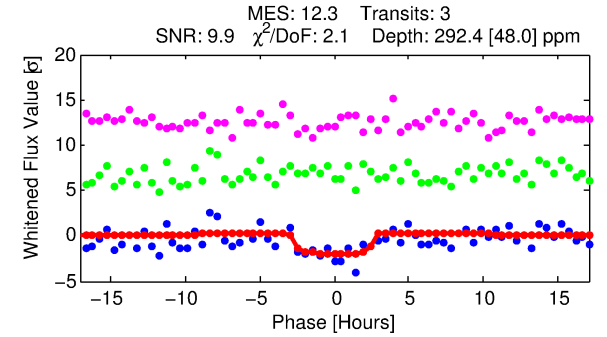
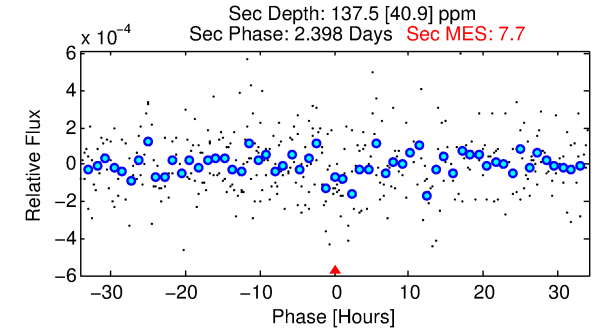
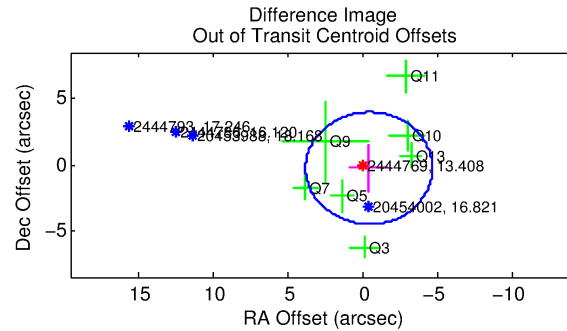
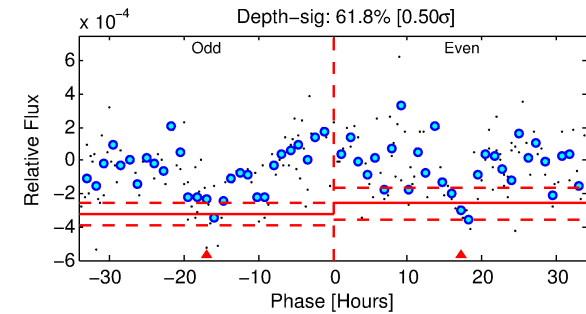
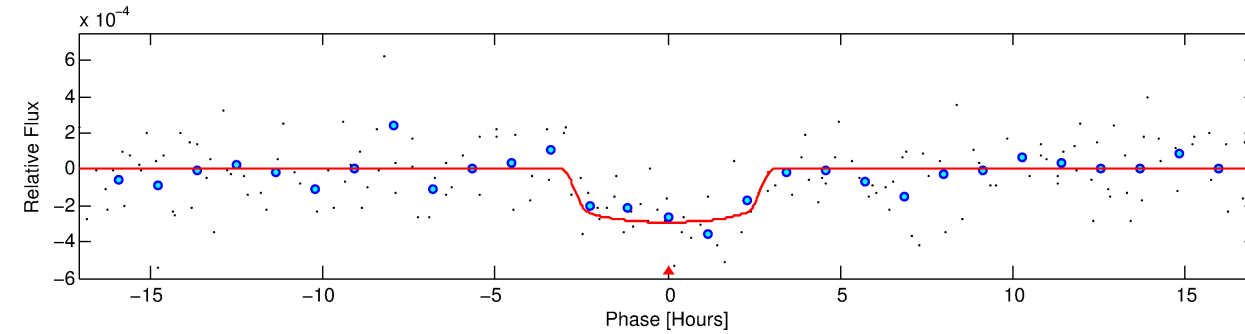
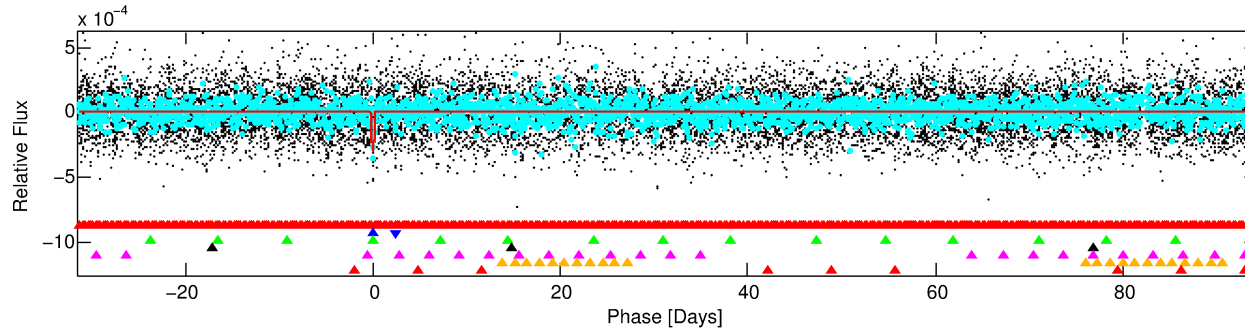
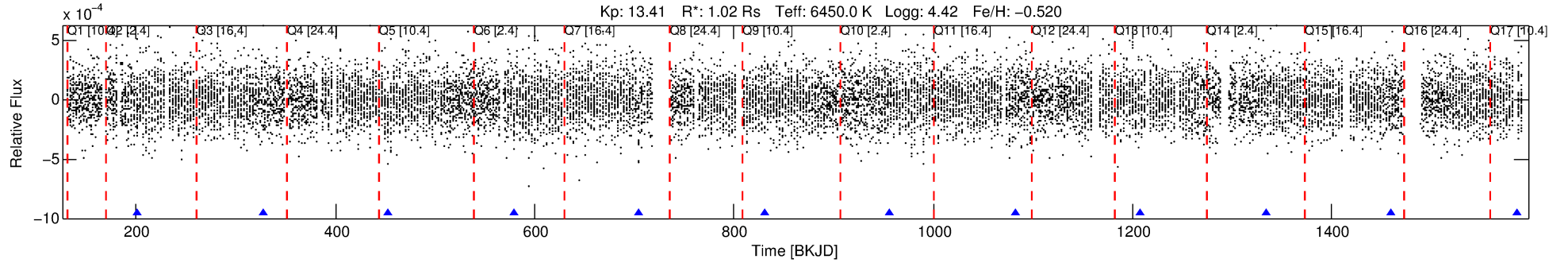
## Ephemeris Match Information For 002444769-02

No Significant Match Found



# DV One-Page Summary

KIC: 2444769 Candidate: 2 of 7 Period: 125.775 d



## DV Fit Results:

Period = 125.77482 [0.01044] d  
Epoch = 201.6478 [0.0369] BKJD  
Rp/R\* = 0.0173 [0.0127]  
a/R\* = 106.53 [443.42]  
b = 0.80 [1.90]  
Seff = 6.69 [2.60]  
Teq = 410 [40] K  
Rp = 1.93 [1.53] Re  
a = 0.4921 [0.1249] AU  
Ag = 4924.85 [7580.29] [0.65 $\sigma$ ]  
Teffp = 5311 [1990] K [2.46 $\sigma$ ]

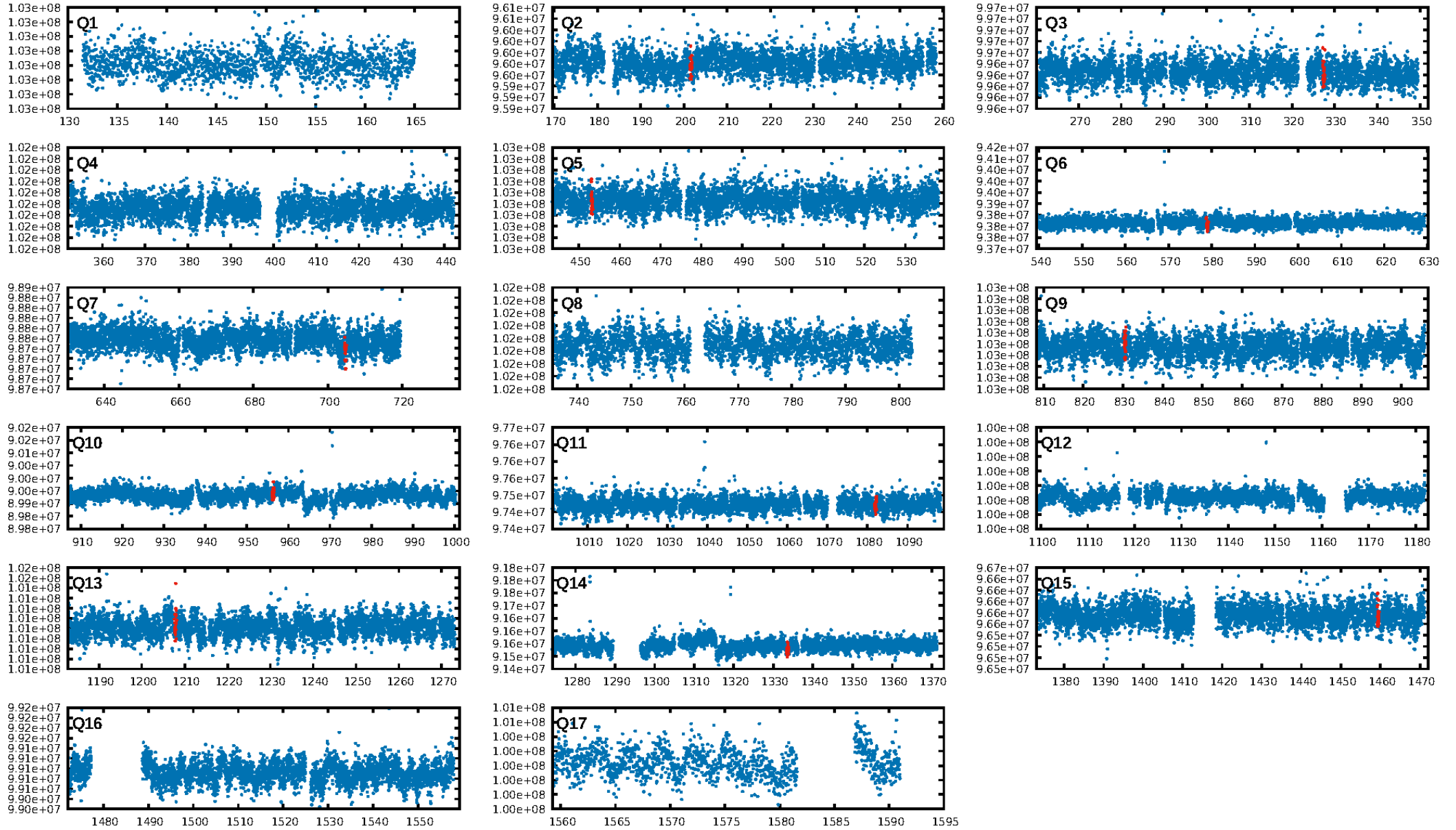
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [75.65 $\sigma$ ]  
LongPeriod-sig: 100.0% [171.48 $\sigma$ ]  
ModelChiSquare2-sig: 46.8%  
ModelChiSquareGof-sig: 51.8%  
Bootstrap-pfa: 5.97e-17  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.253  
Centroid-sig: 42.1%  
Centroid-so: 0.955 arcsec [1.12 $\sigma$ ]  
OotOffset-rm: 0.537 arcsec [0.38 $\sigma$ ]  
KicOffset-rm: 0.649 arcsec [0.44 $\sigma$ ]  
OotOffset-st: 1/3/0/3 [7]  
KicOffset-st: 1/3/0/3 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.36 [4/11]

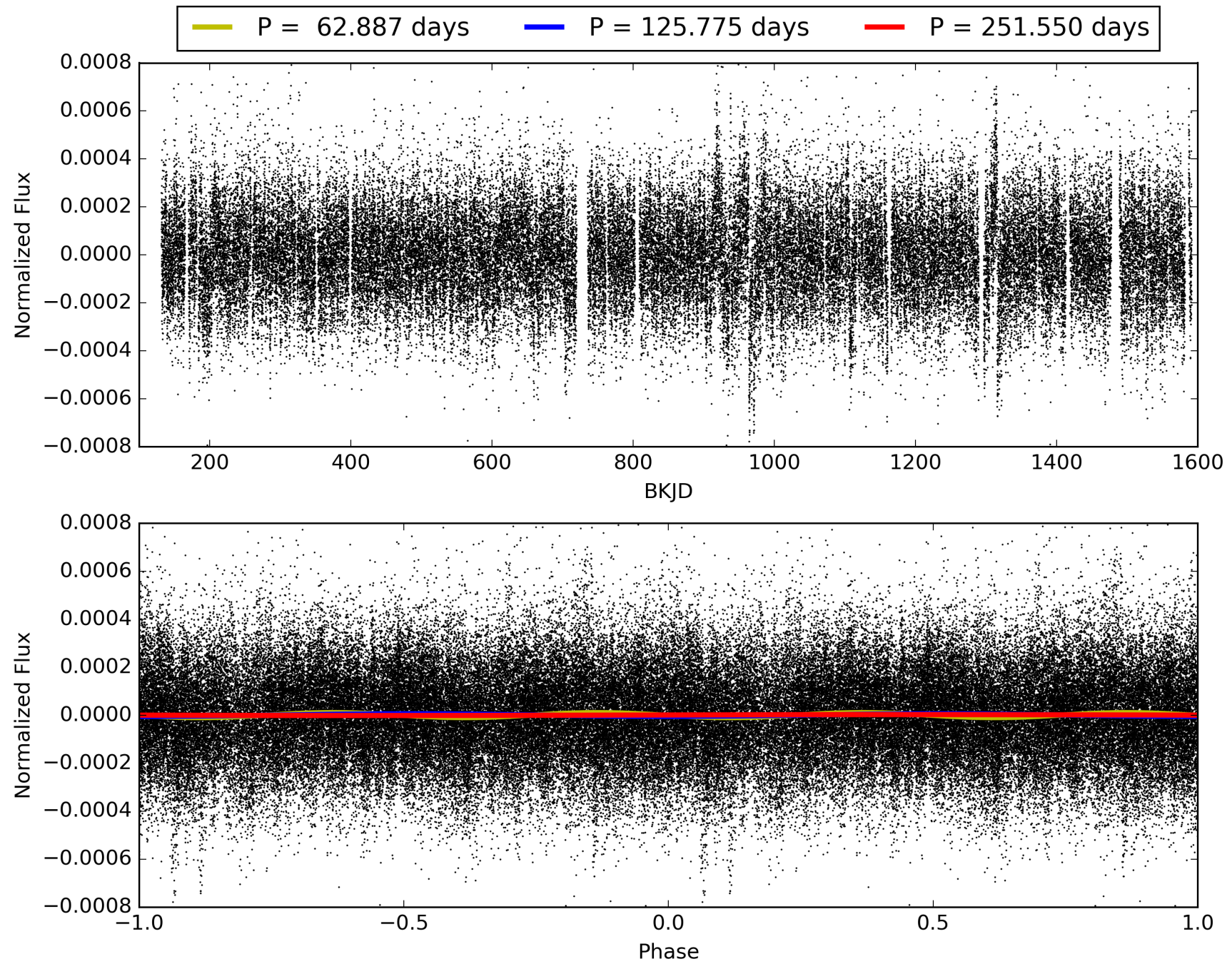
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:46:13 Z

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

# TCE 002444769-02, PDC Light Curves

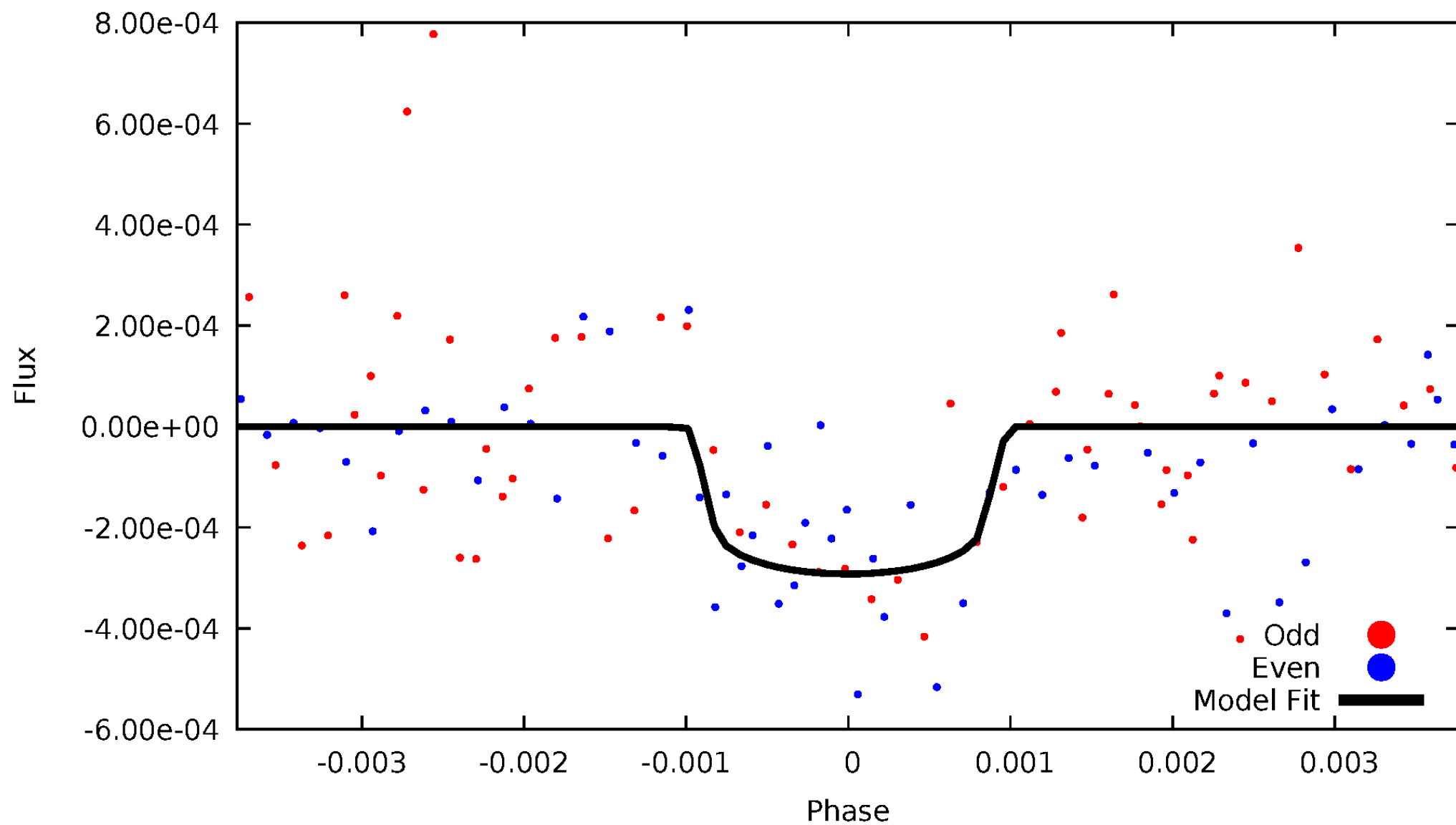


TCE 002444769-02



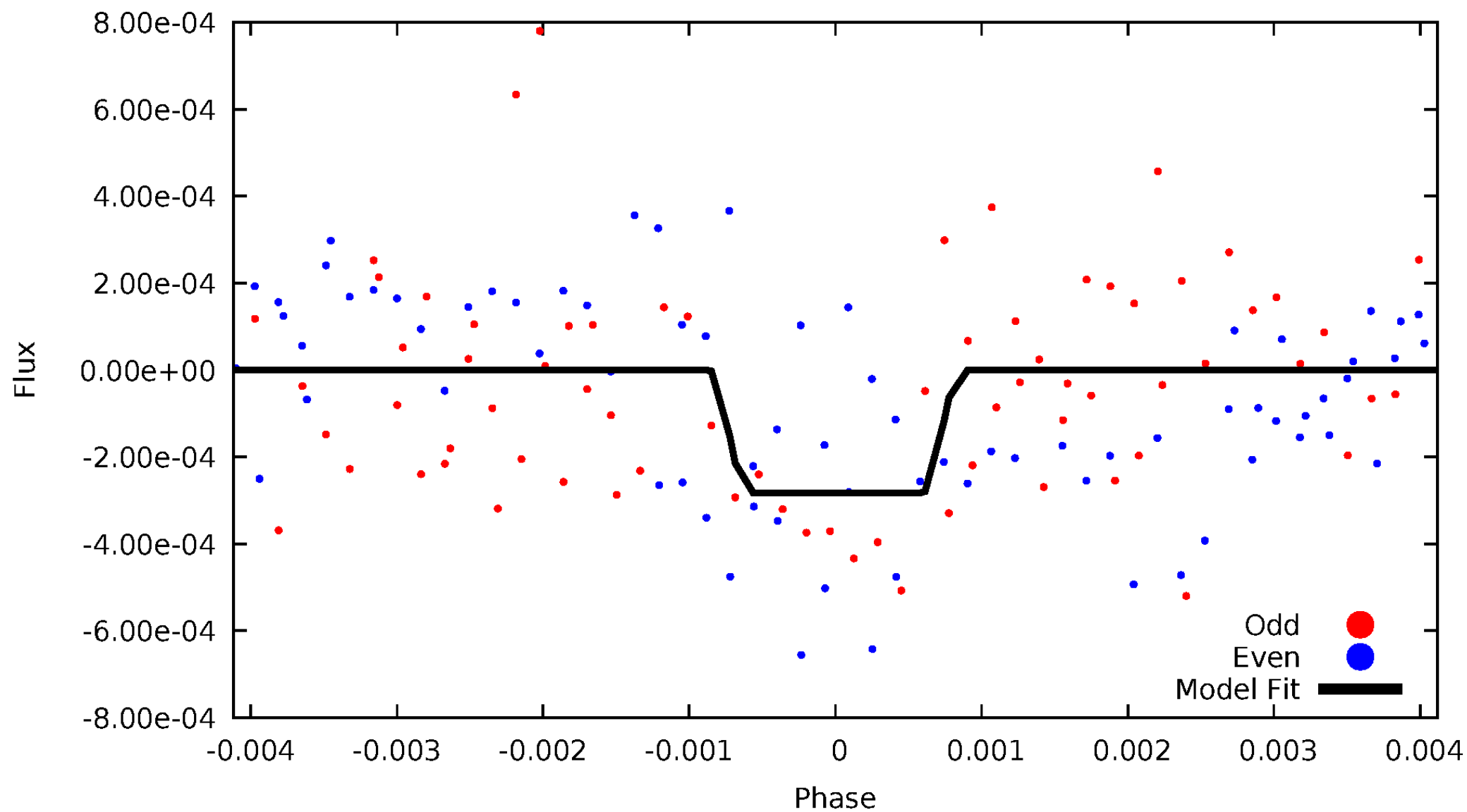
# DV Odd/Even

TCE 002444769-02



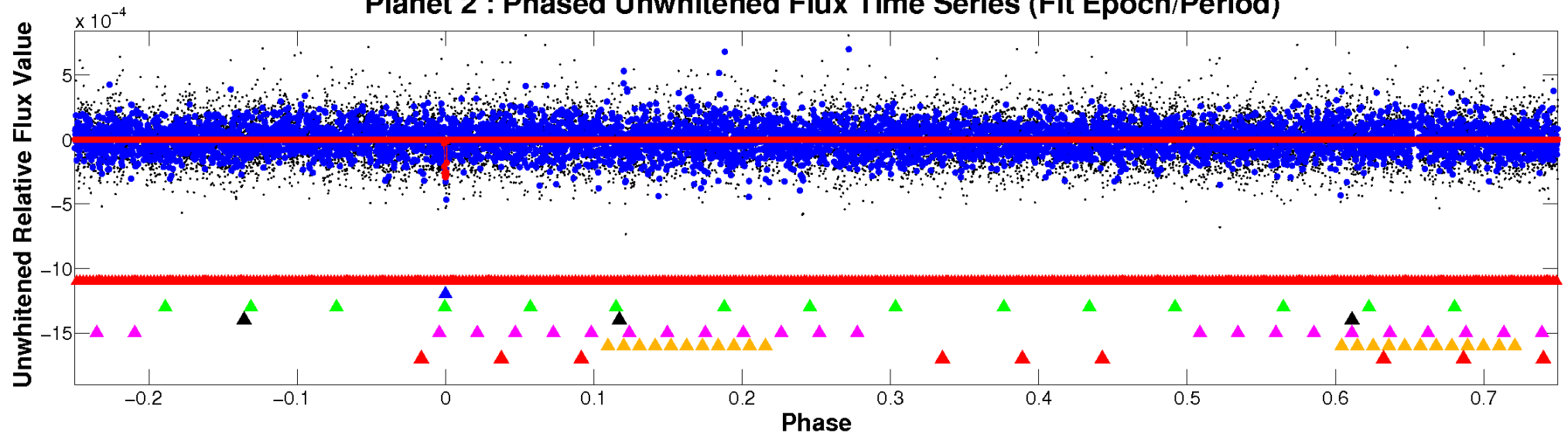
# ALT Odd/Even

TCE 002444769-02

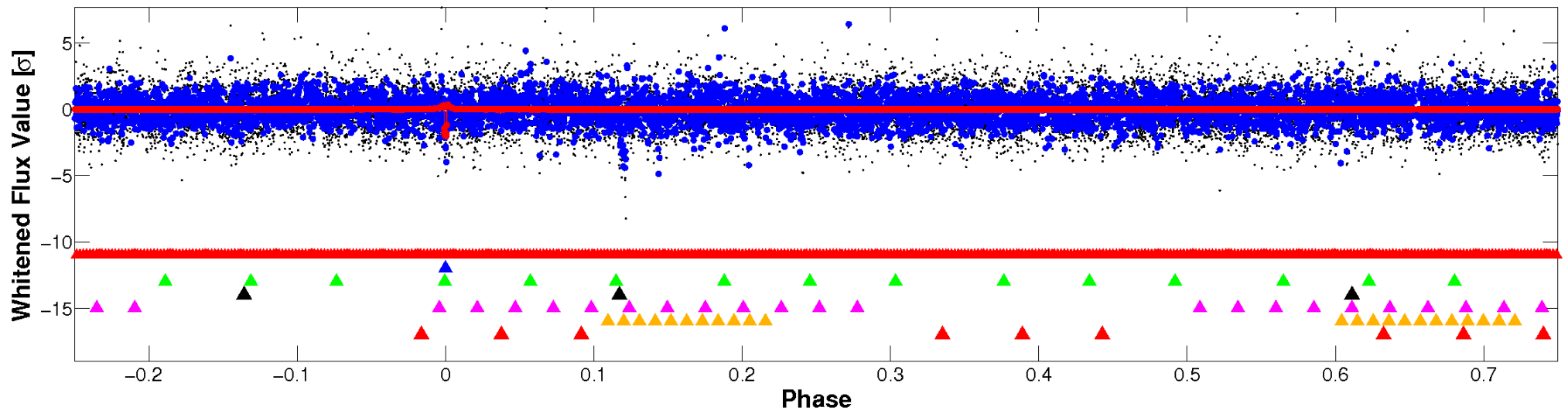


# Non-Whitened Vs. Whitened Light Curve

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



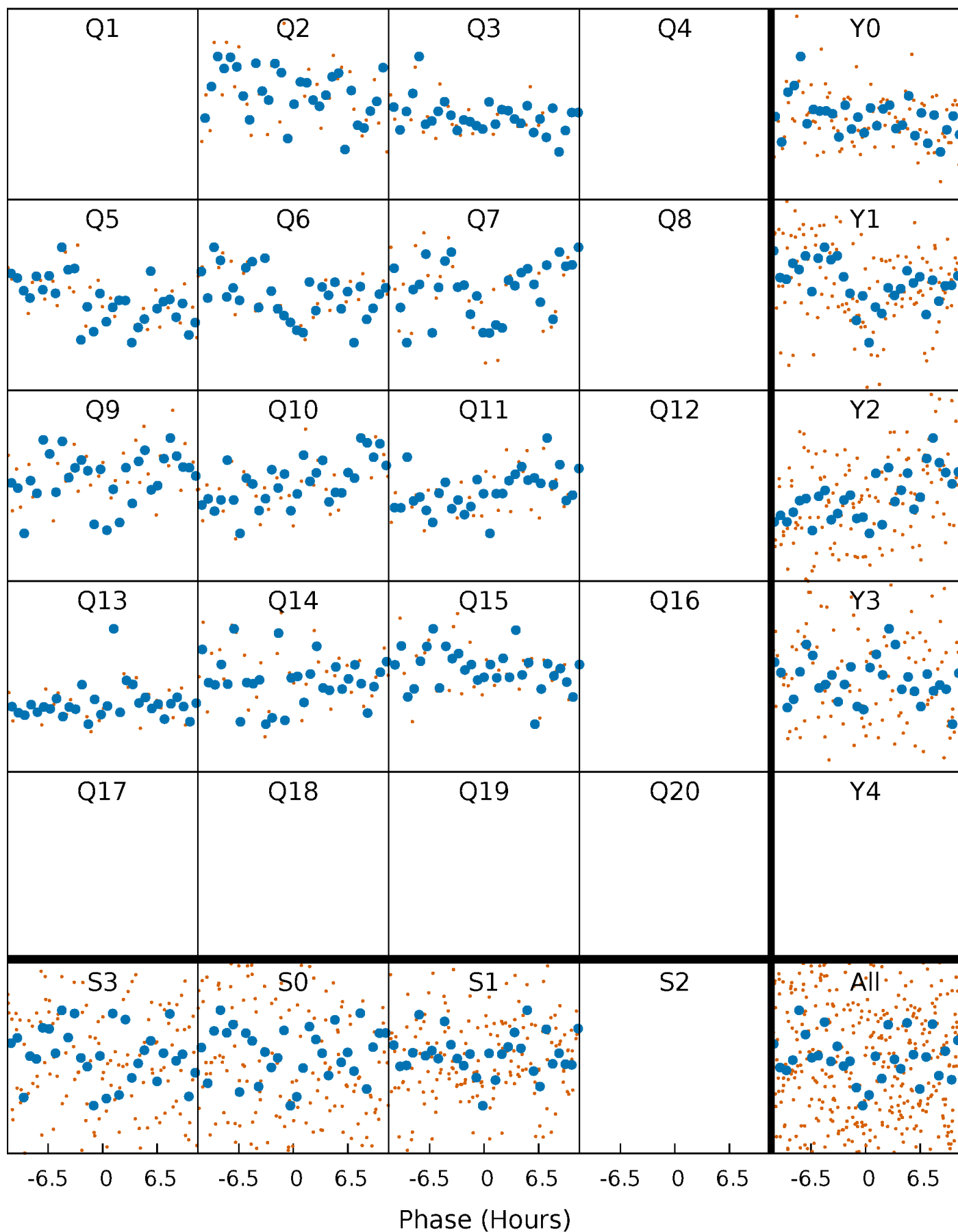
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





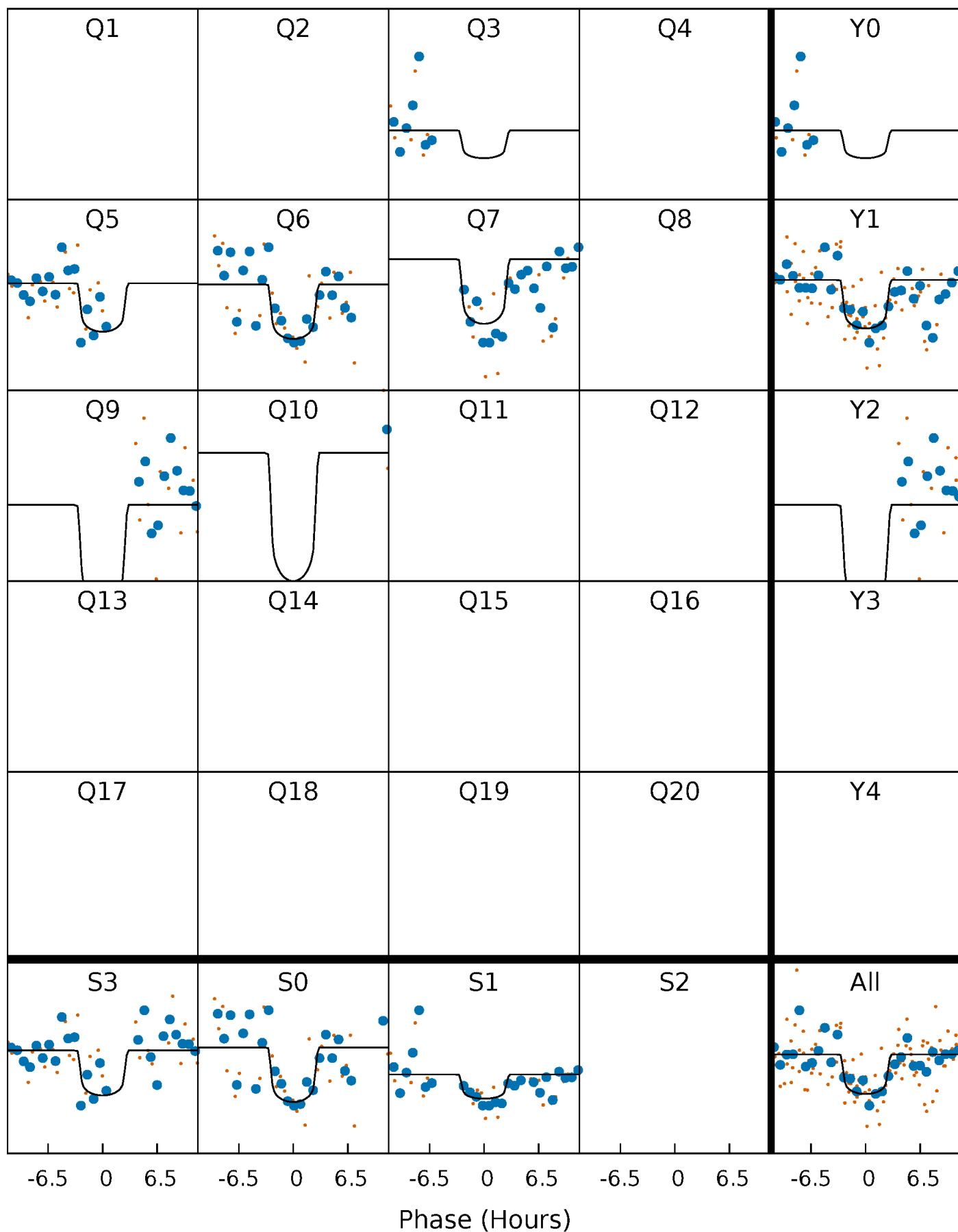
# PDC Quarter-Phased Transit Curves

TCE 002444769-02 P=125.774820 Days  $T_0=201.647831$  (BKJD)



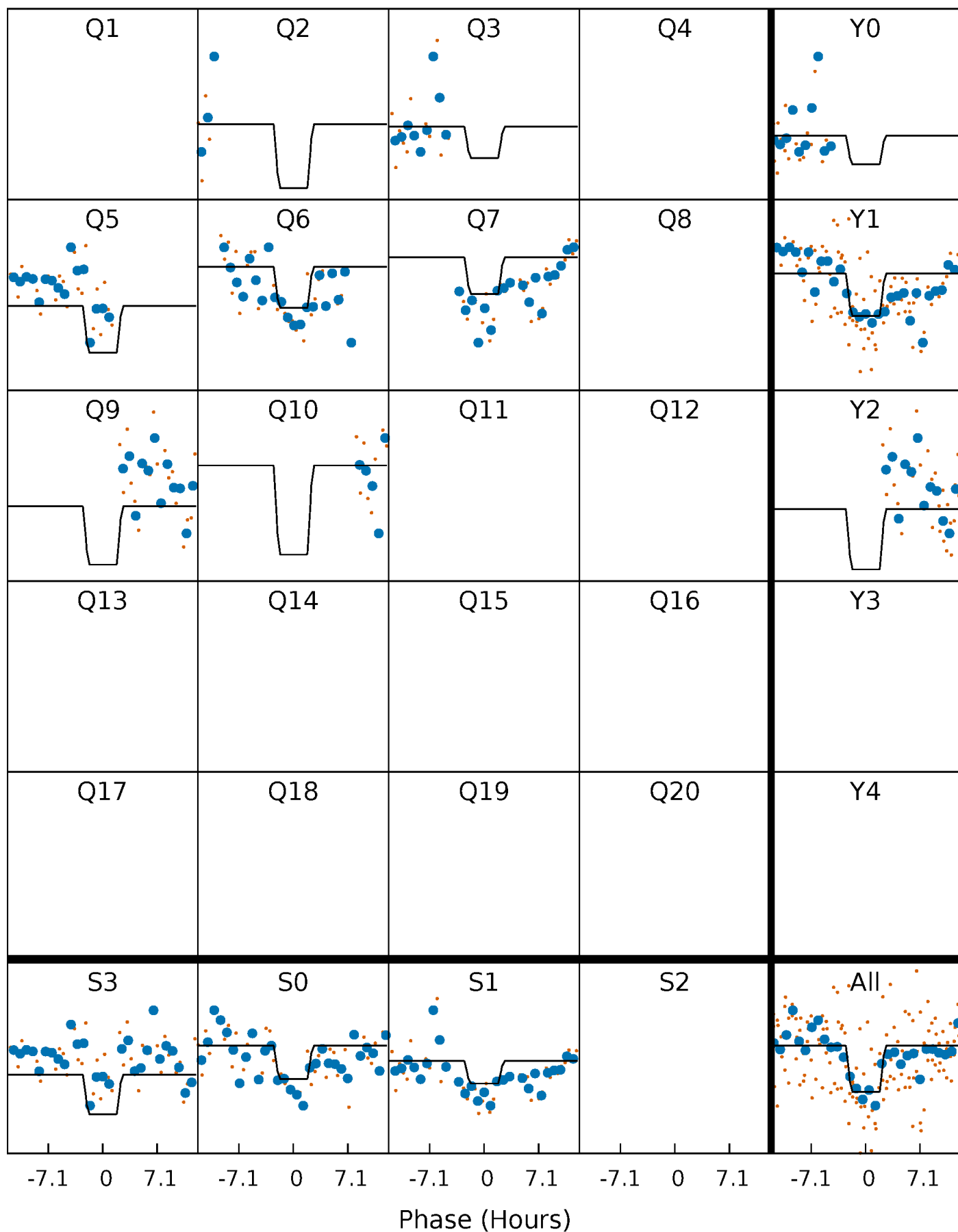
# DV Quarter-Phased Transit Curves

TCE 002444769-02   P=125.774820 Days    $T_0=201.647831$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

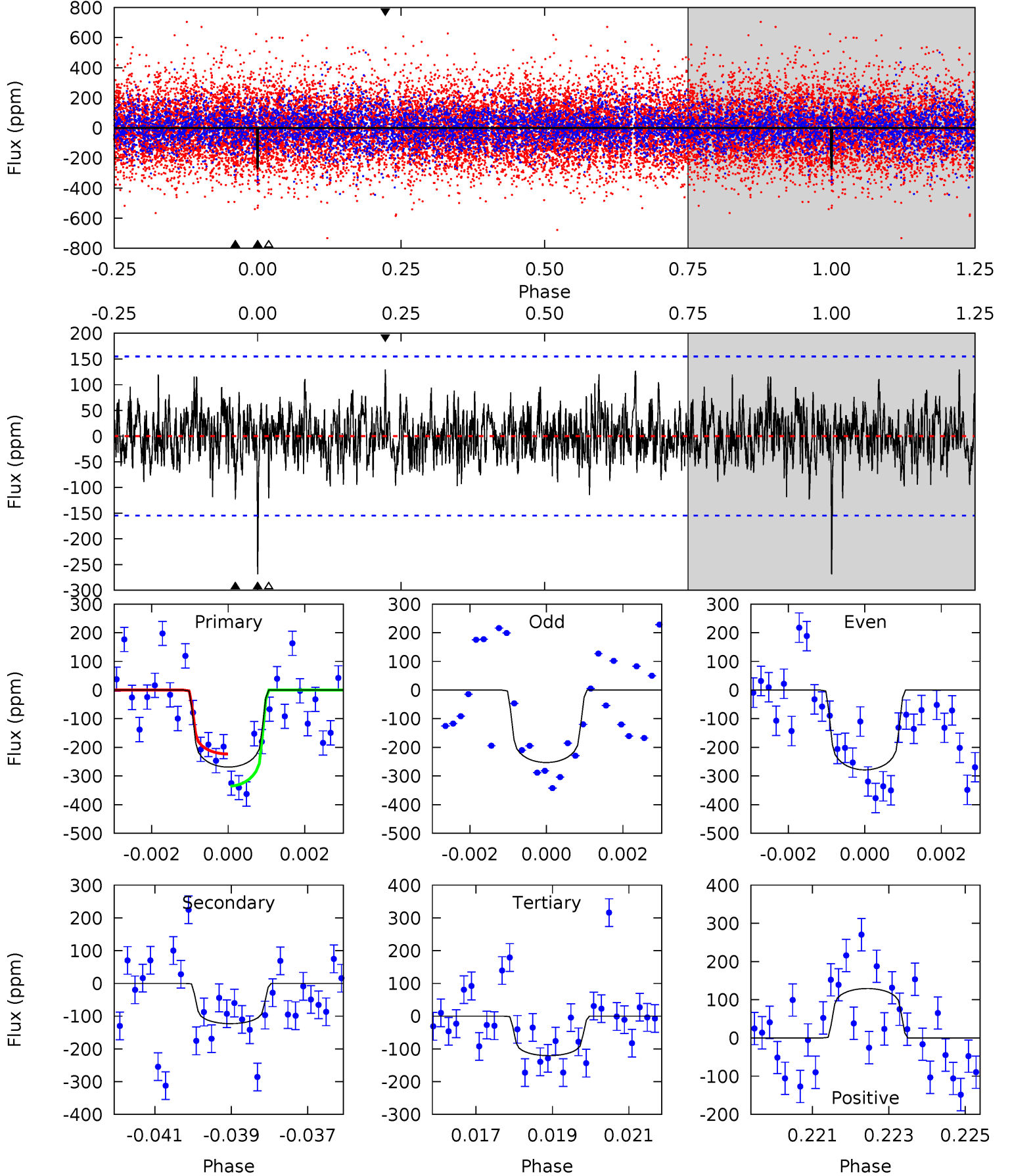
TCE 002444769-02 P=125.809429 Days  $T_0=201.546096$  (BKJD)



# DV Model-Shift Uniqueness Test

002444769-02,  $P = 125.774820$  Days,  $E = 75.873011$  Days

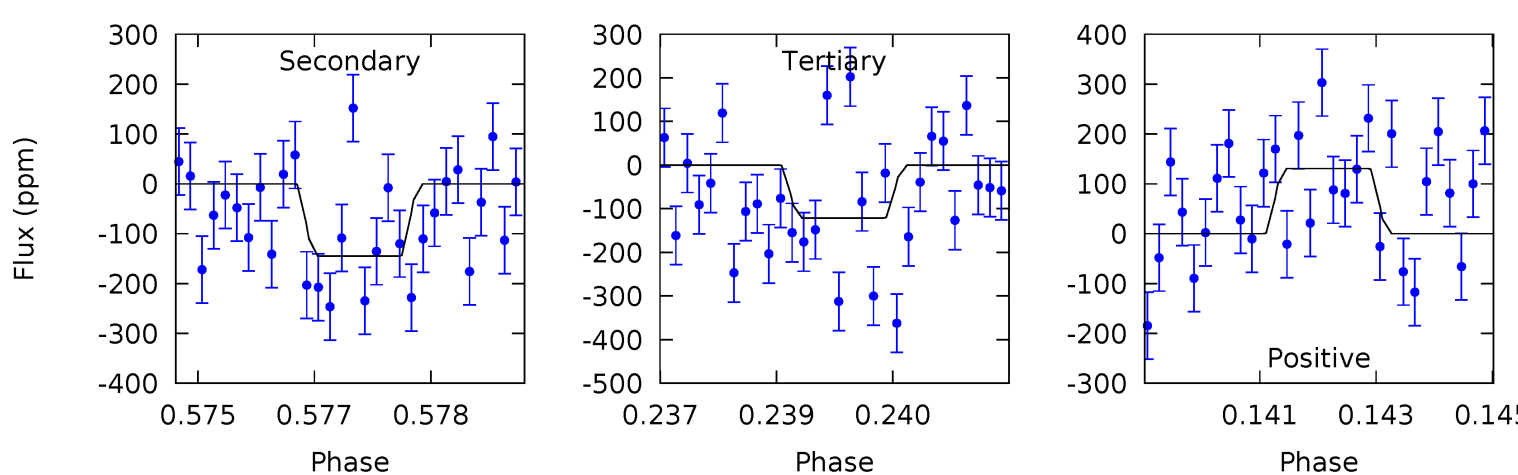
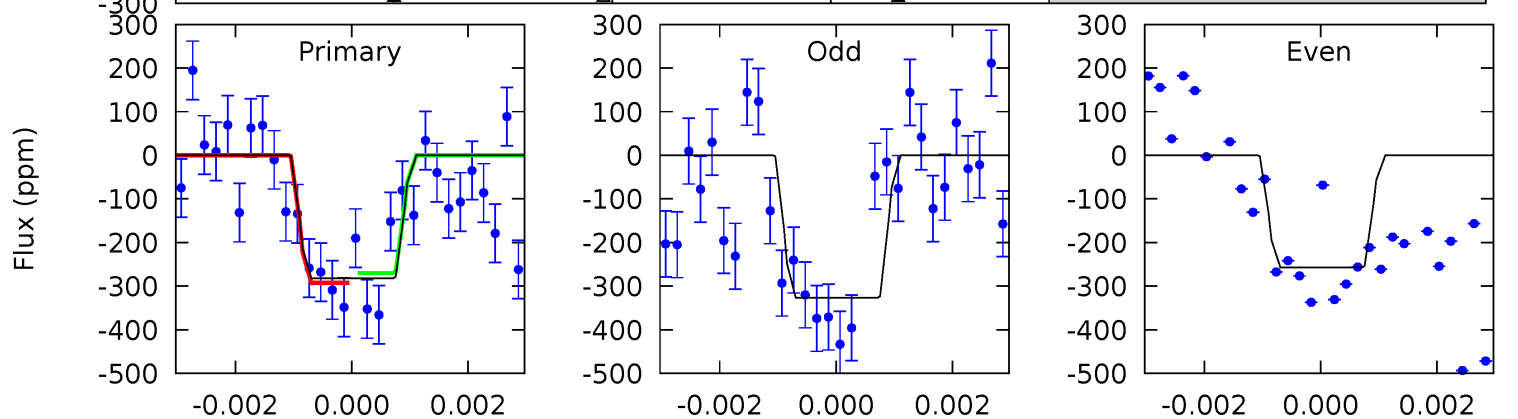
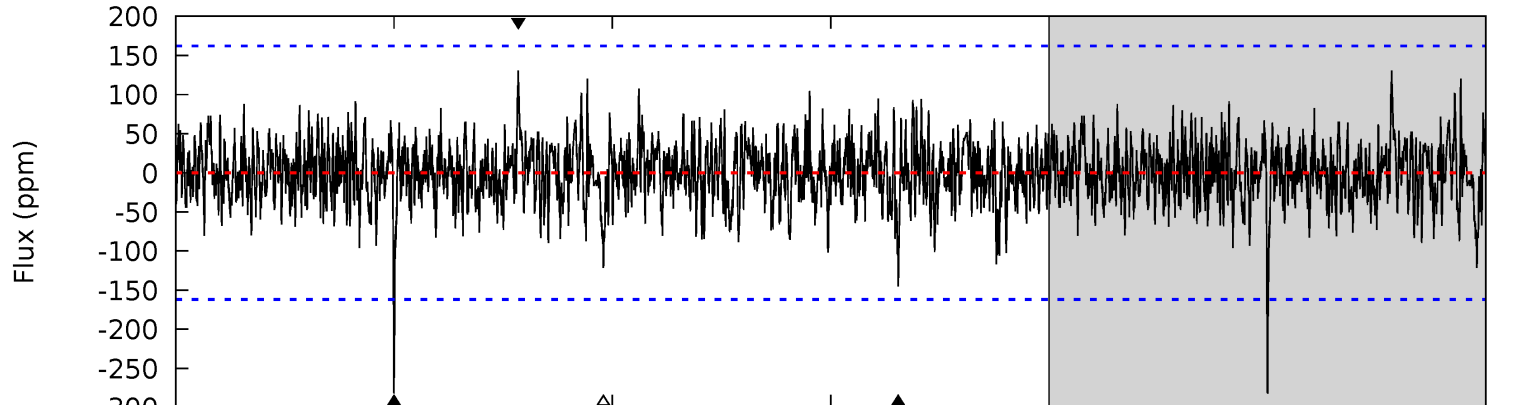
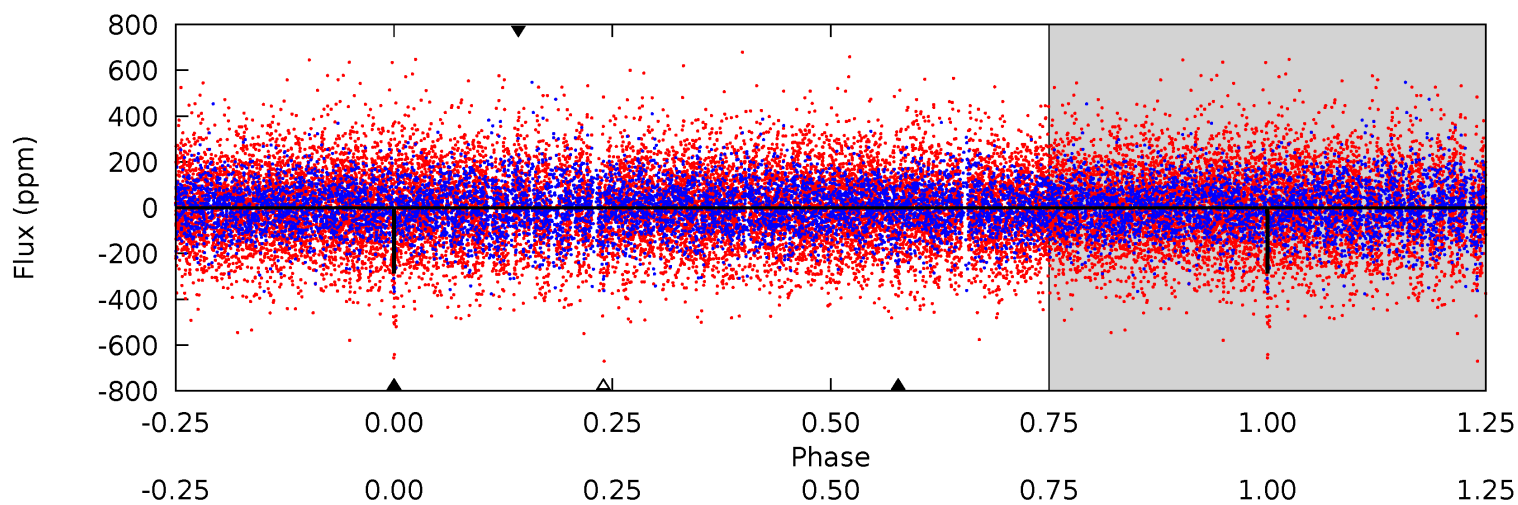
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.26	4.23	4.15	4.45	5.33	3.10	1.26	5.11	4.81	0.08	-0.22	0.43	1.04	0.32	1.89



# Alt Model-Shift Uniqueness Test

002444769-02, P = 125.809429 Days, E = 75.736667 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
9.33	4.80	4.02	4.32	5.36	3.15	1.12	5.32	5.01	0.78	0.48	1.11	0.80	0.32	0.37



### Stellar Parameters For KIC 002444769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6450^{+162}_{-194}$	$4.421^{+0.081}_{-0.202}$	$-0.520^{+0.300}_{-0.300}$	$1.022^{+0.308}_{-0.123}$	$1.004^{+0.133}_{-0.106}$	$1.325^{+0.467}_{-0.675}$
	+3%/-3%	+2%/-5%	+58%/-58%	+30%/-12%	+13%/-11%	+35%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 002444769-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-123 \pm 29$	$2.09^{+1.46}_{-1.28}$	$580^{+43}_{-30}$	$5105^{+2990}_{-937}$	$3688^{+19253}_{-2319}$
Alt.	$-145 \pm 30$	$2.13^{+1.44}_{-1.31}$	$580^{+39}_{-29}$	$5222^{+3402}_{-949}$	$4188^{+24436}_{-2746}$

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



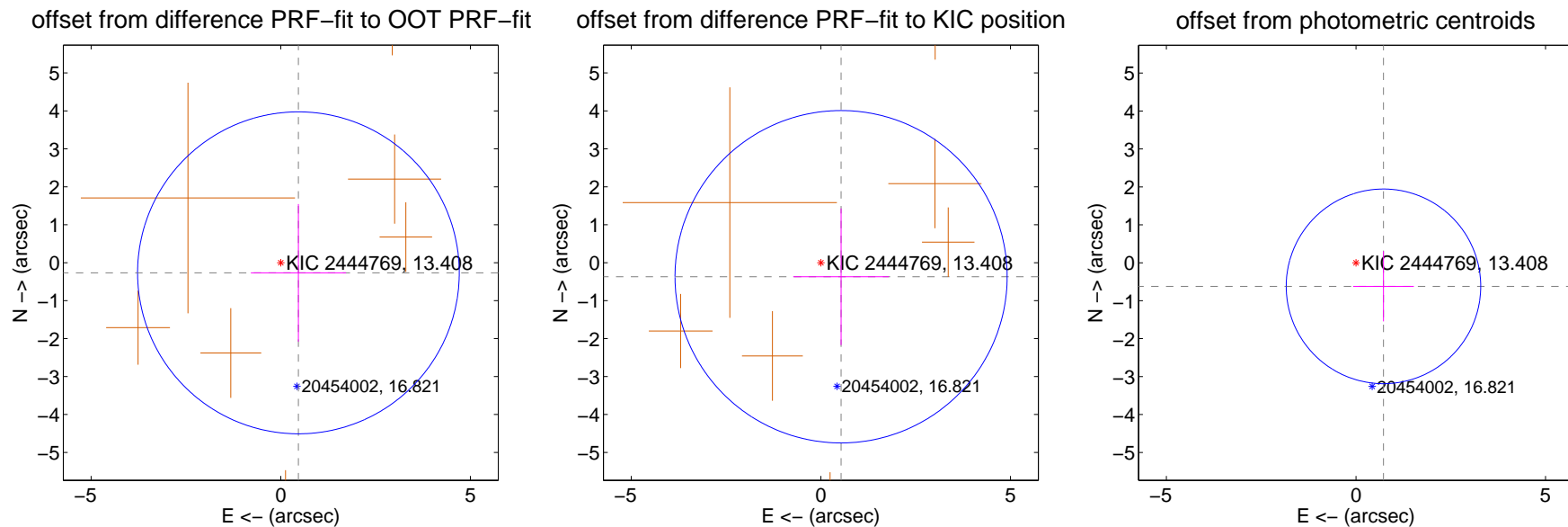
## DV Centroid Data

Supplemental centroid analysis for 002444769-02. Kepler magnitude: 13.41. Transit SNR 9.91

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

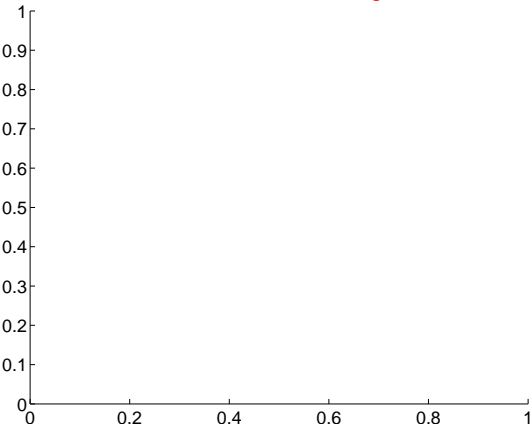
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.537 \pm 1.414$	0.38	$-0.466 \pm 1.256$	$-0.267 \pm 1.812$
PRF-fit source offset from KIC position	$0.649 \pm 1.460$	0.44	$-0.533 \pm 1.263$	$-0.370 \pm 1.800$
photometric centroid source offset	$0.96 \pm 0.86$	1.12	$-0.73 \pm 0.80$	$-0.62 \pm 0.92$



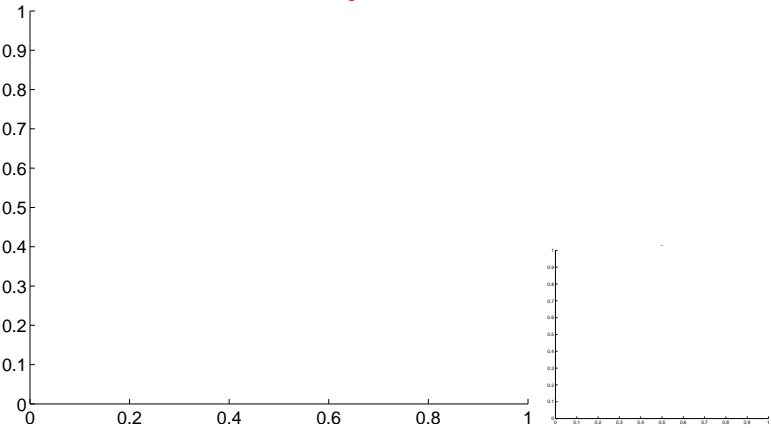
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

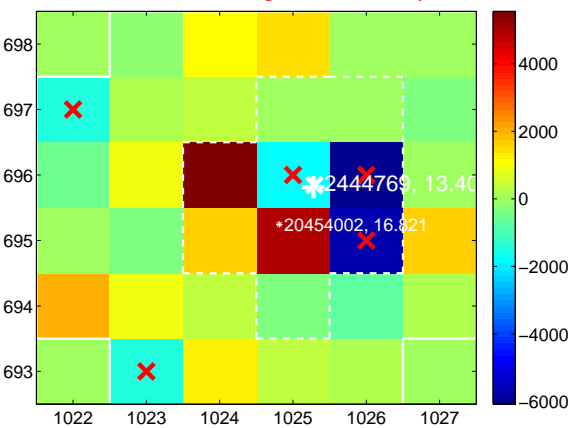
Q1 no difference image



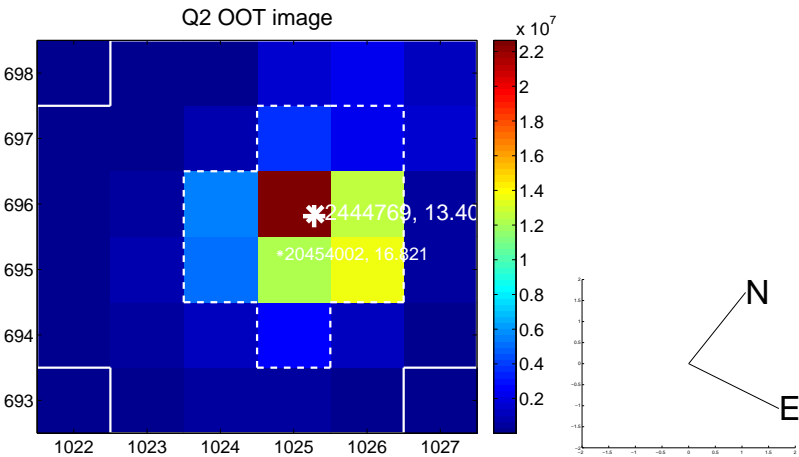
Q1 no OOT image



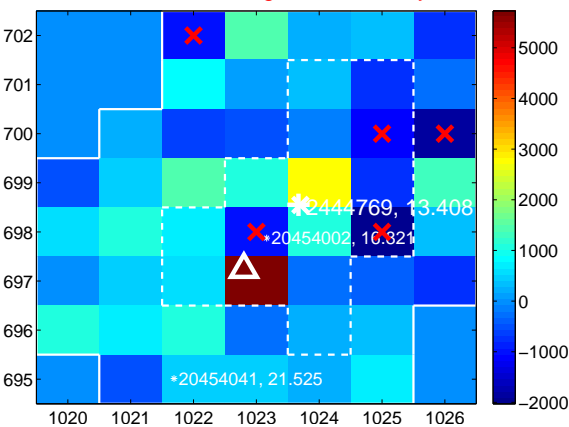
Q2 difference image. Poor Quality



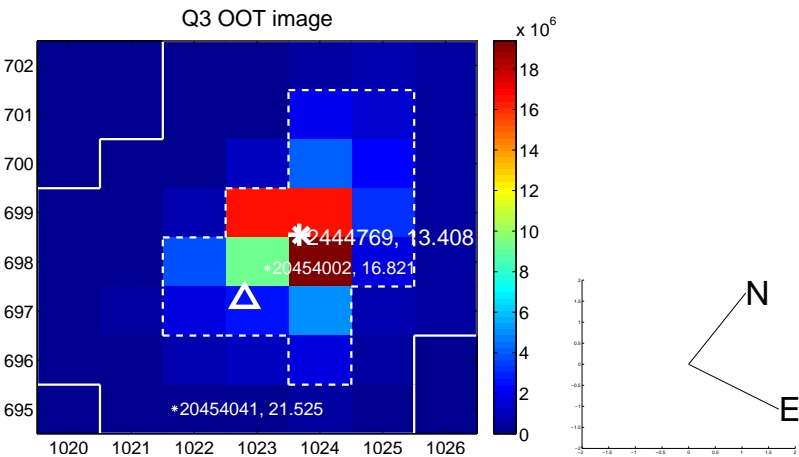
Q2 OOT image



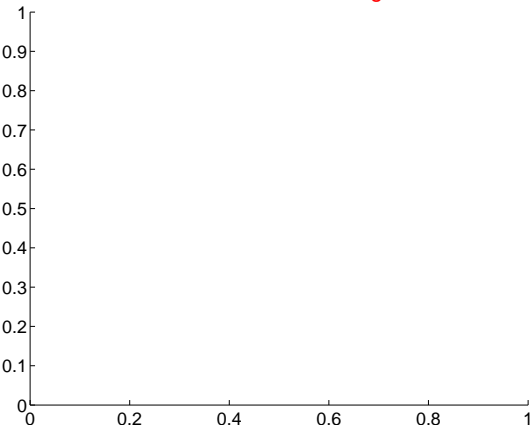
Q3 difference image. Poor Quality



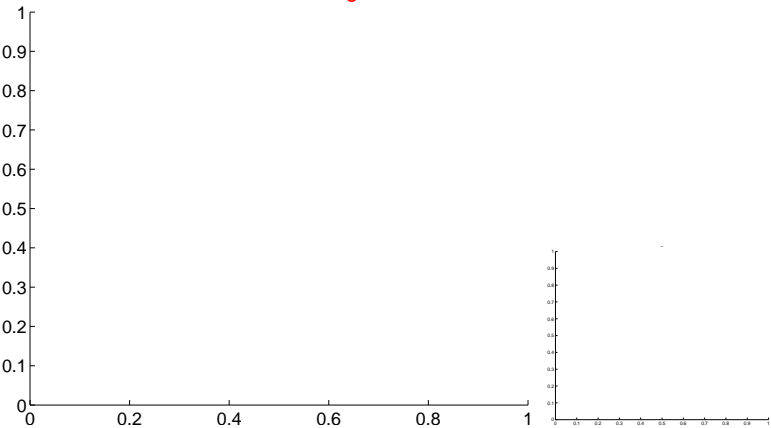
Q3 OOT image



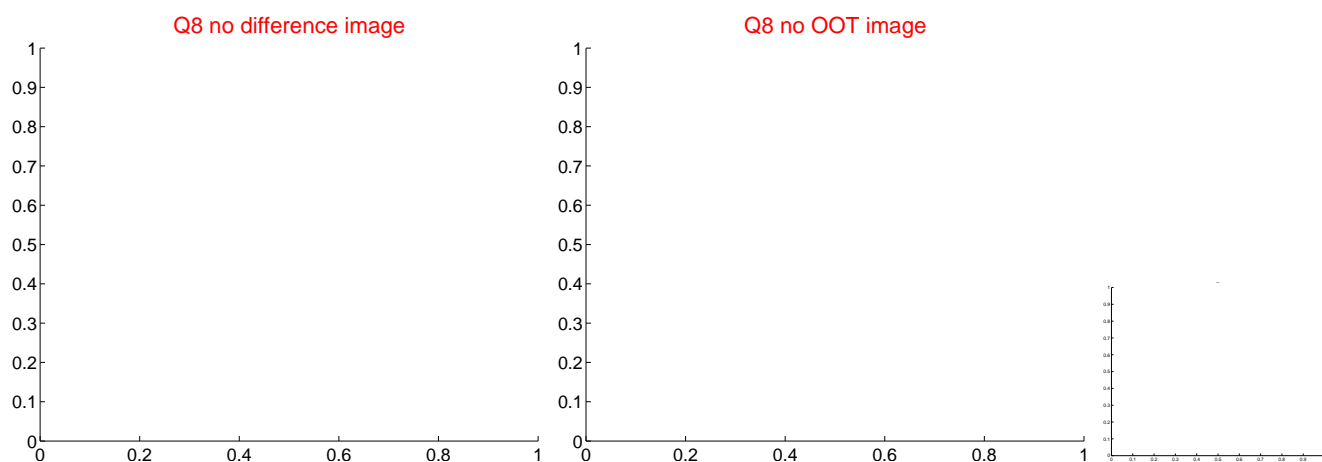
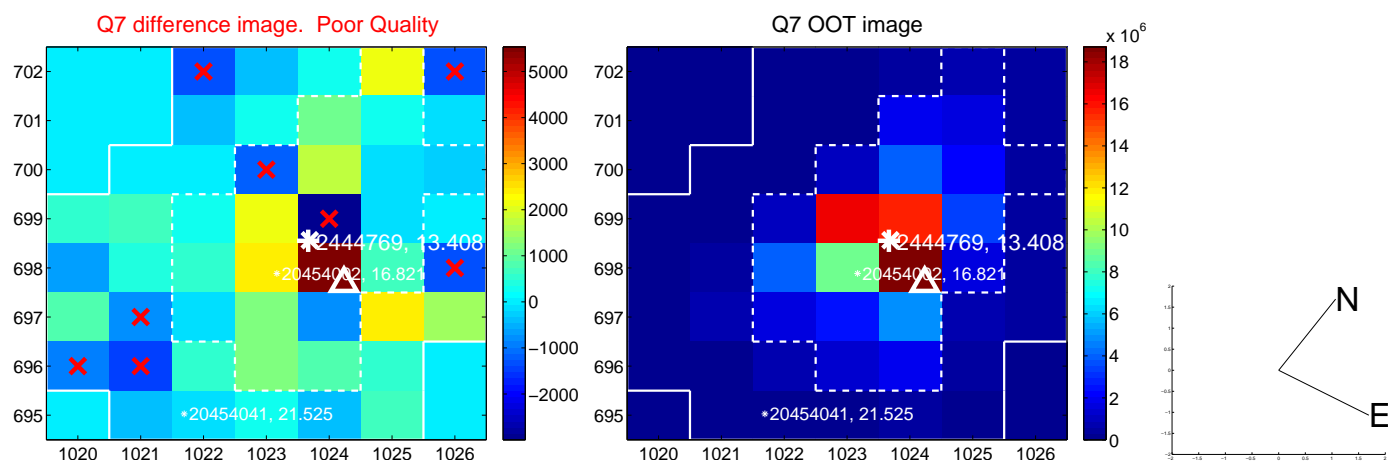
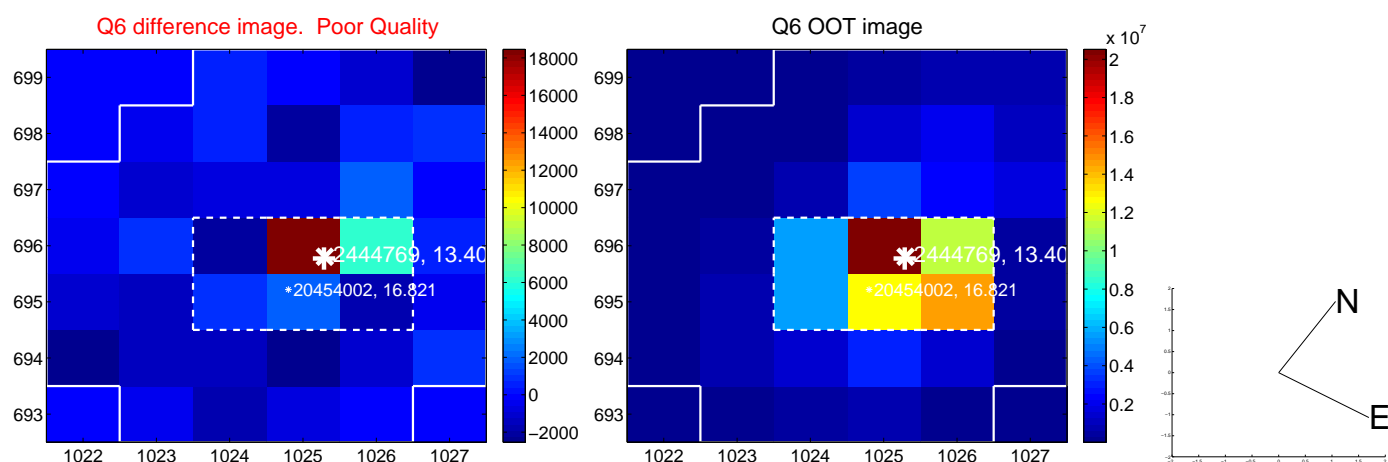
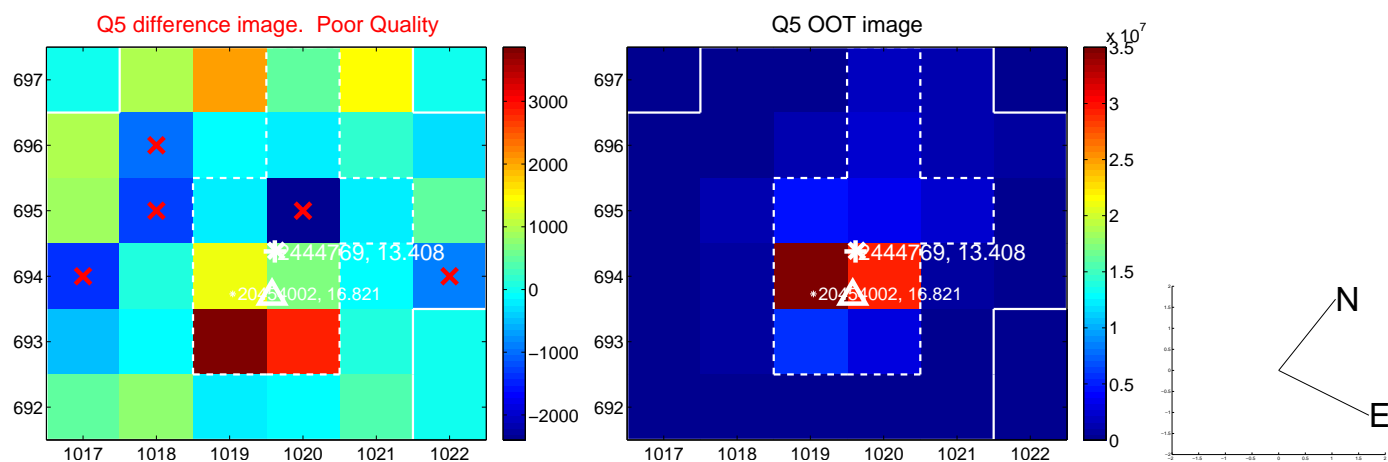
Q4 no difference image



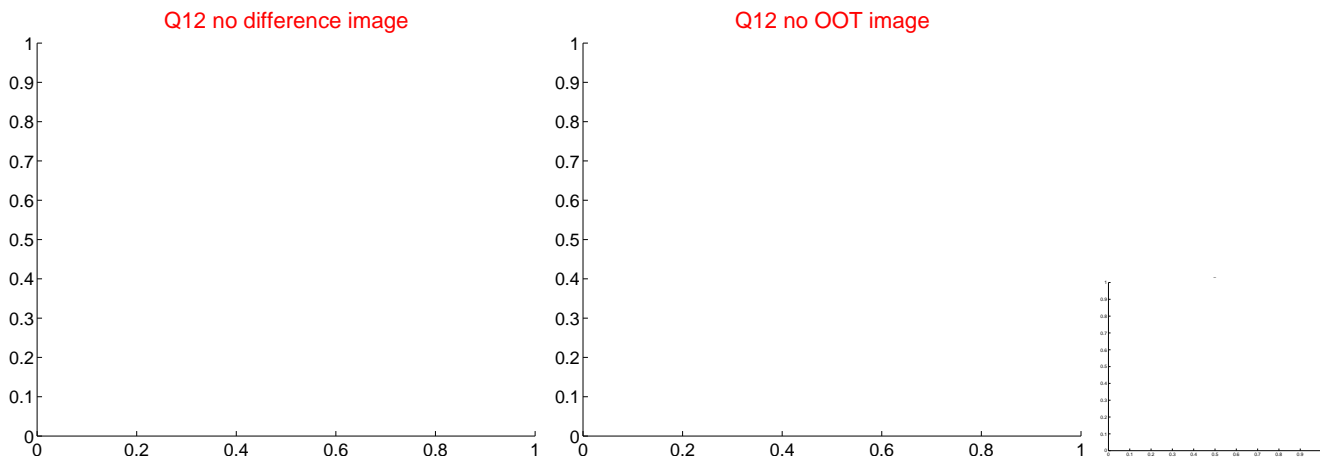
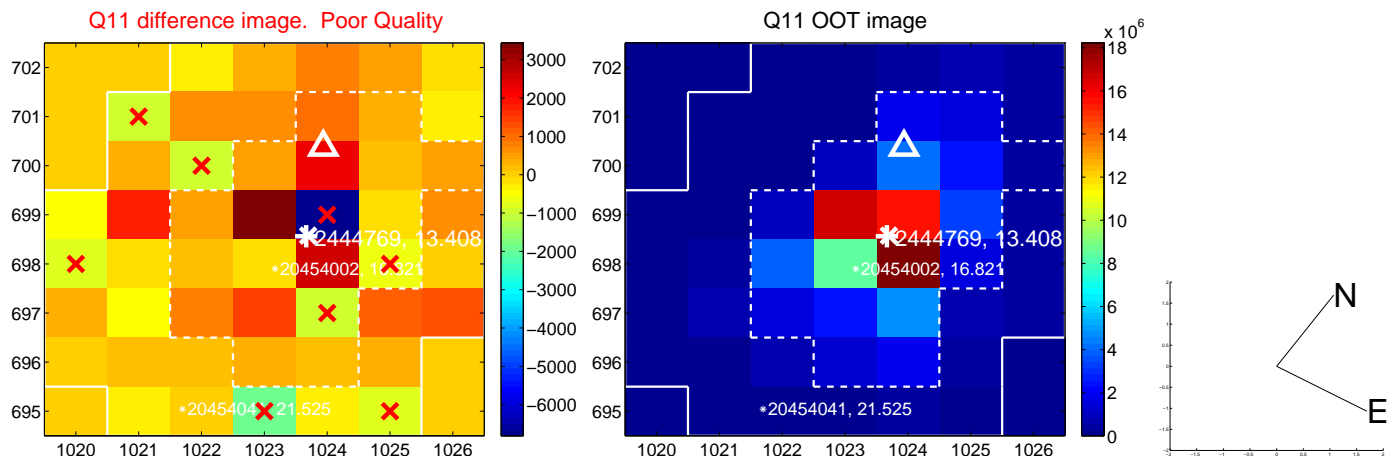
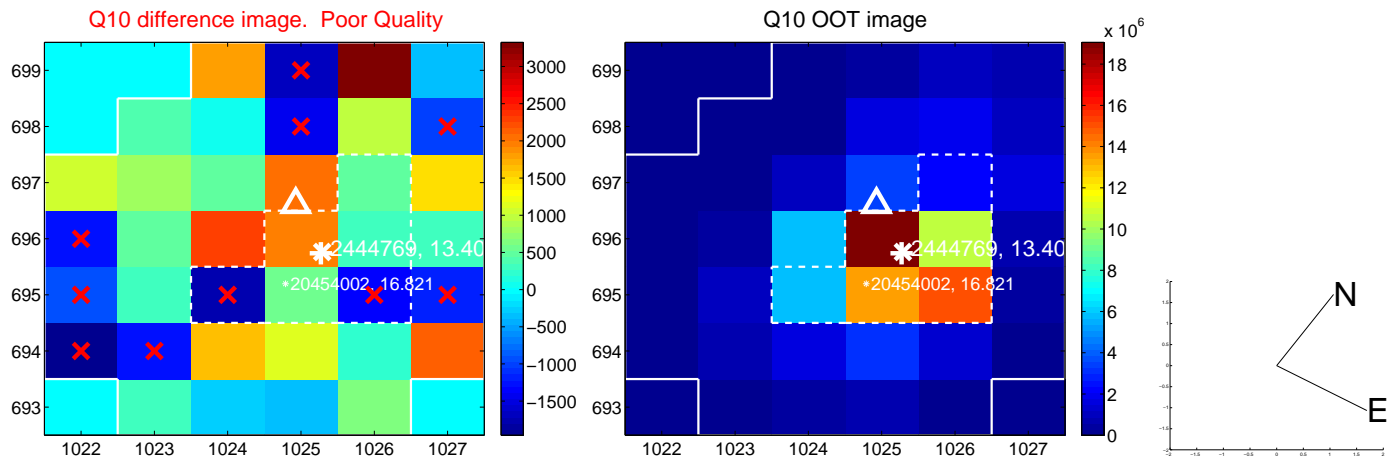
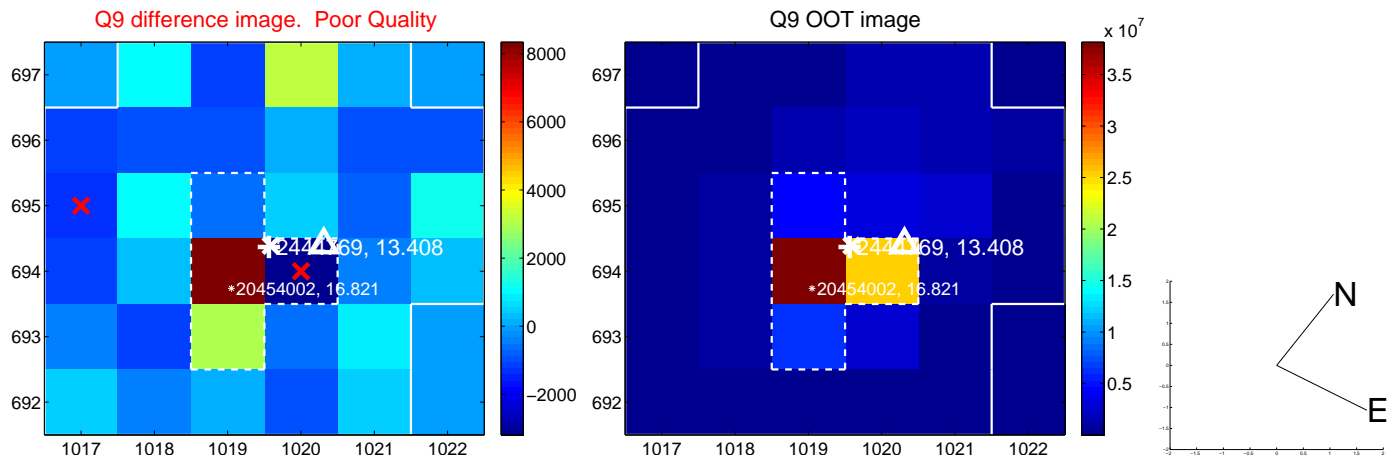
Q4 no OOT image



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

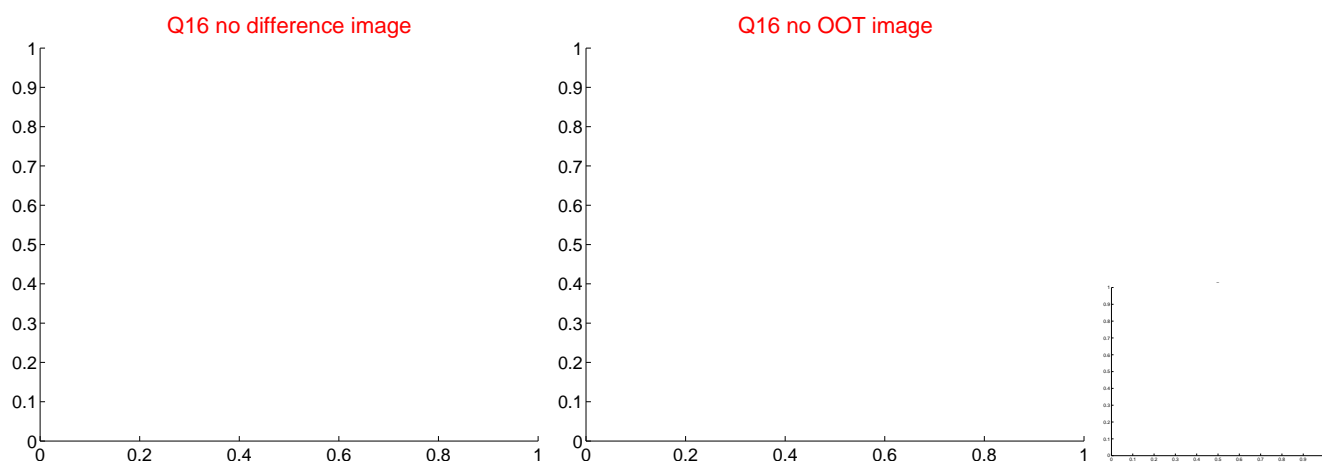
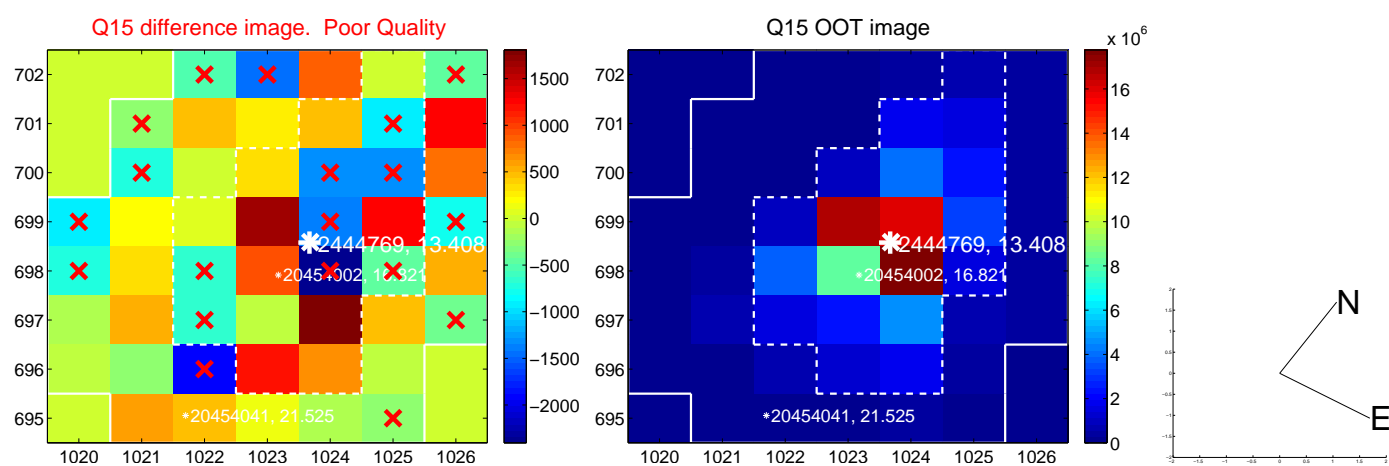
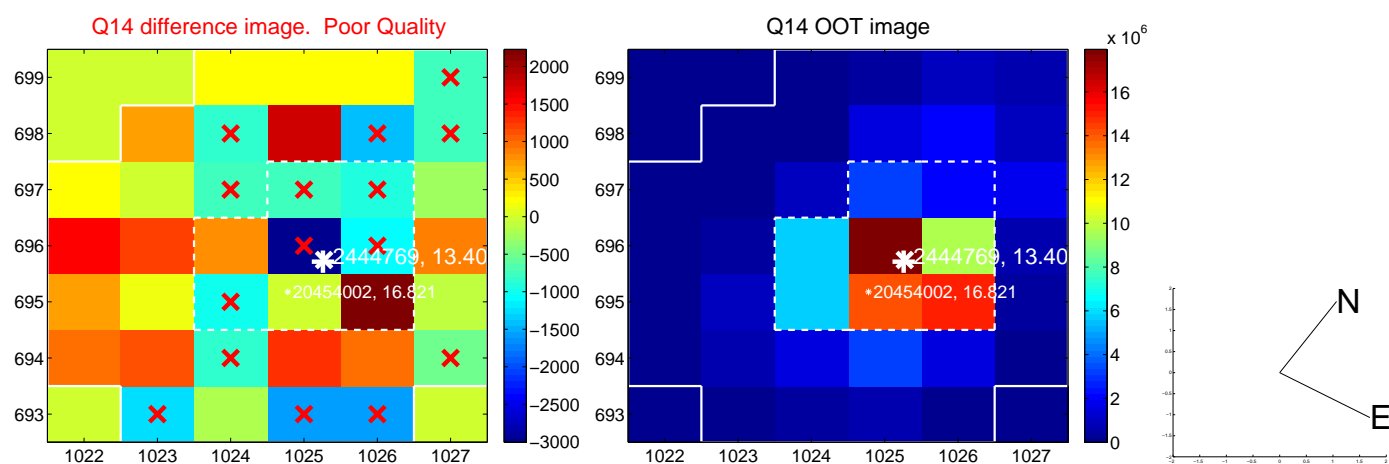
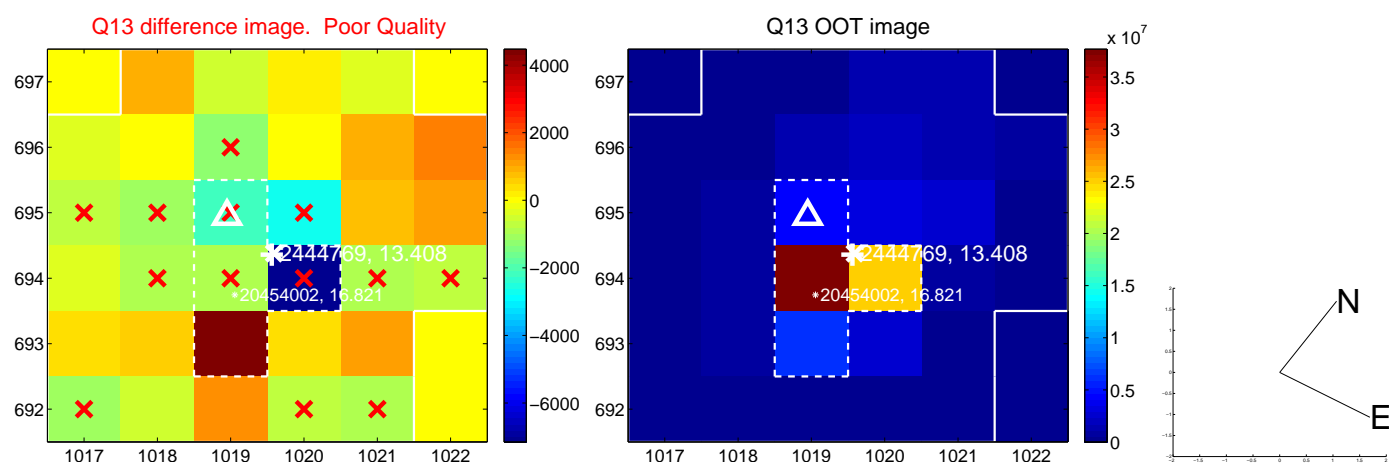


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

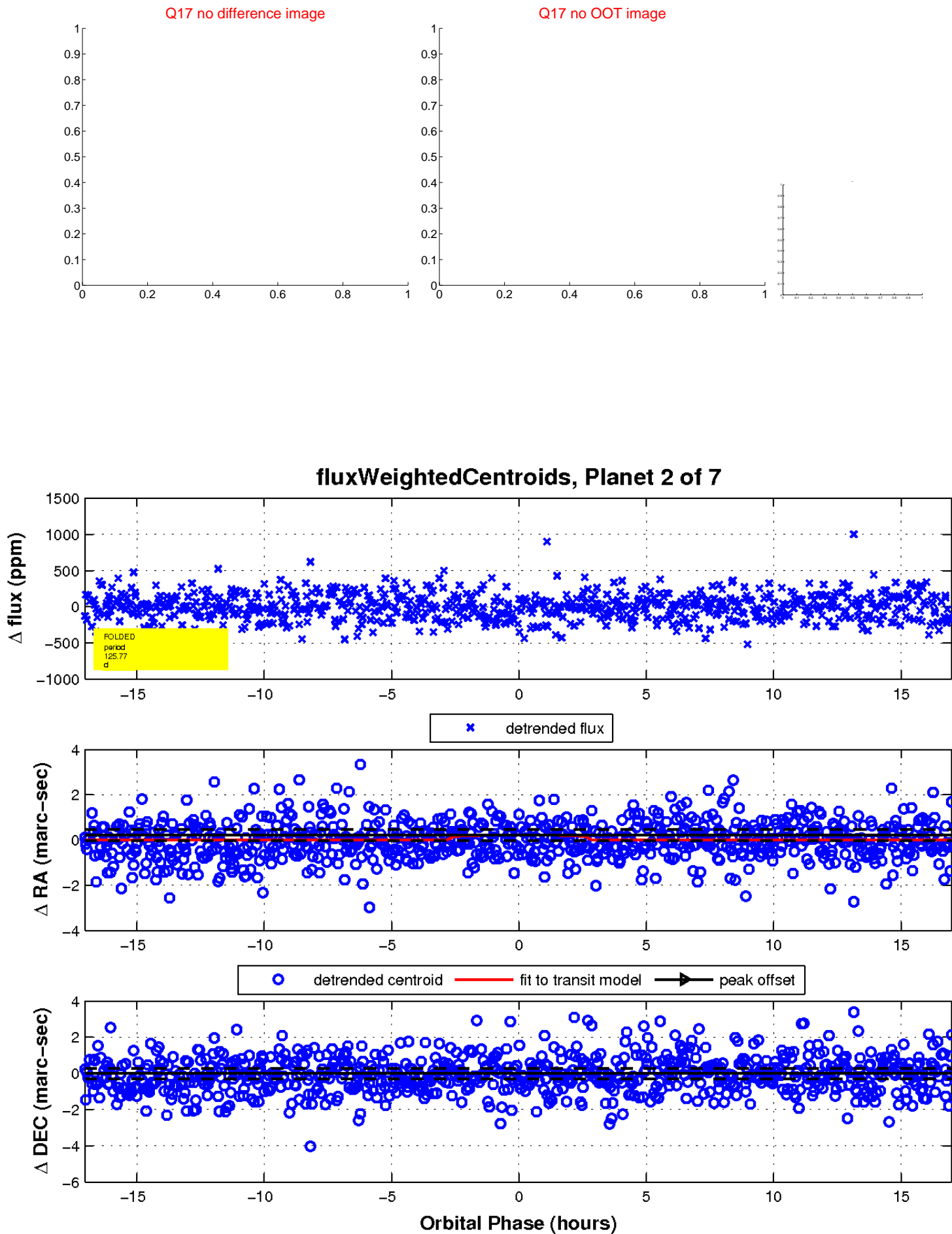




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

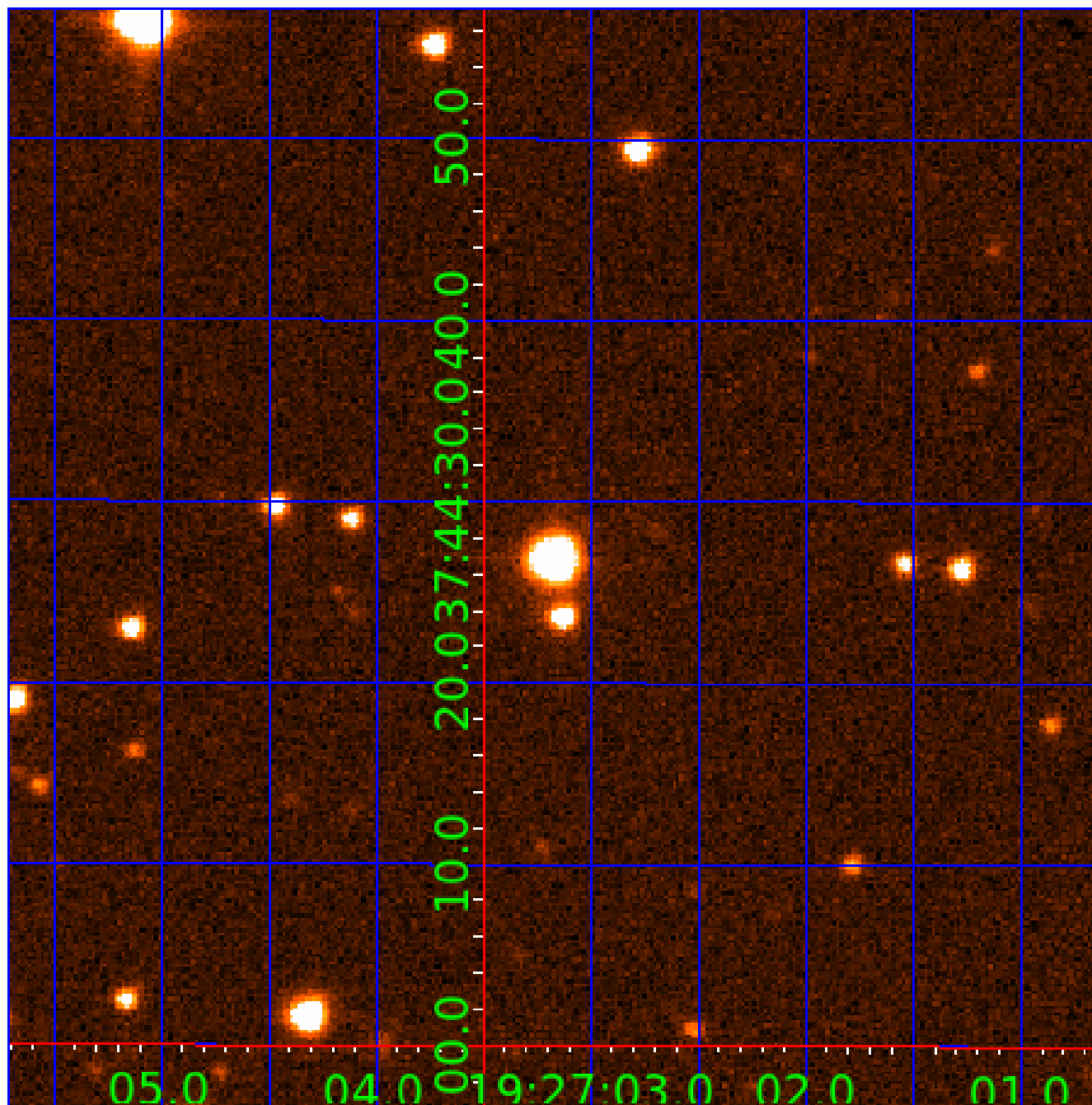


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002444769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002444769-01	OBS	No	3.001337	133.226612	16.1	18.084	7.8	7.2	1.02	6450	0.41	973.53
002444769-02	OBS	No	125.774820	201.647831	292.4	5.686	12.3	9.9	1.02	6450	1.93	6.69
002444769-03	OBS	No	102.071699	146.923760	149.9	4.921	7.7	7.8	1.02	6450	1.42	8.84
002444769-05	OBS	No	61.276073	175.297370	175.9	4.082	7.4	7.7	1.02	6450	1.58	17.45
002444769-06	OBS	No	63.555015	151.870476	162.0	7.072	8.0	7.7	1.02	6450	1.45	16.62
002444769-07	OBS	No	169.959063	155.423564	252.7	2.430	7.1	7.2	1.02	6450	1.90	4.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002444769-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002444769-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002444769-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002444769-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002444769-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002444769-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

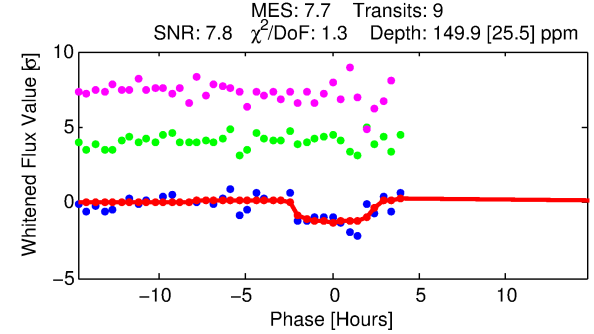
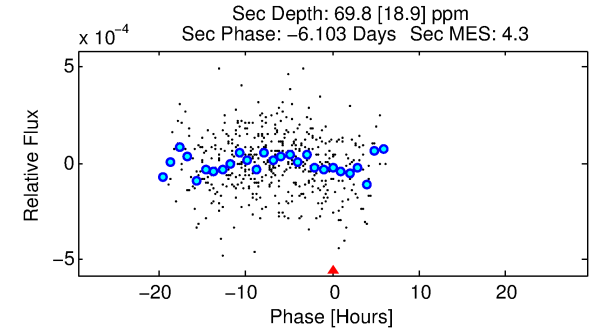
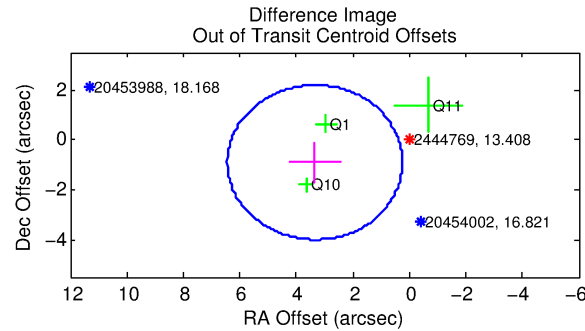
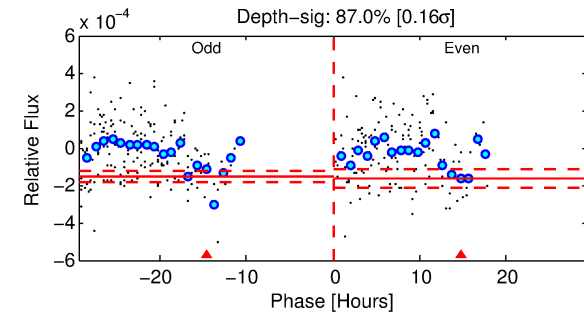
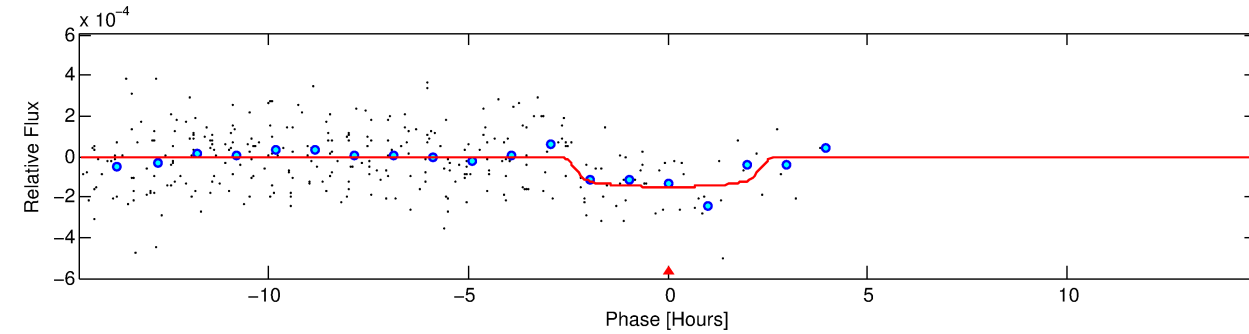
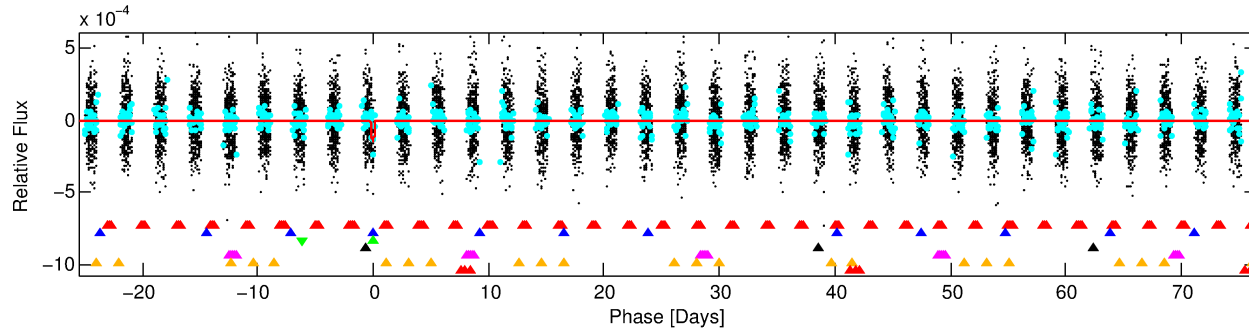
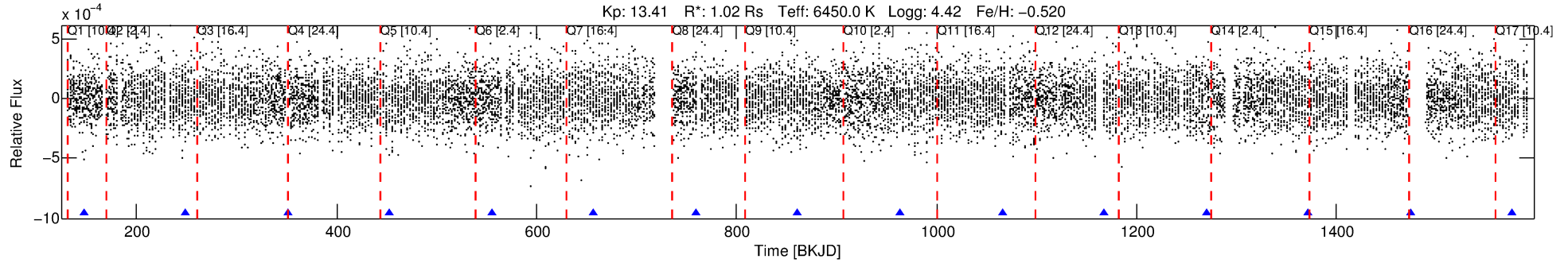
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002444769-03

No Significant Match Found

# DV One-Page Summary

KIC: 2444769 Candidate: 3 of 7 Period: 102.072 d



## DV Fit Results:

Period = 102.07170 [0.00298] d  
Epoch = 146.9238 [0.0138] BKJD  
Rp/R\* = 0.0127 [0.0094]  
a/R\* = 85.92 [357.64]  
b = 0.86 [1.33]  
Seff = 8.84 [3.43]  
Teq = 440 [43] K  
Rp = 1.42 [1.13] Re  
a = 0.4282 [0.1087] AU  
Ag = 3504.86 [5427.17] [0.65σ]  
Teffp = 5230 [1972] K [2.43σ]

## DV Diagnostic Results:

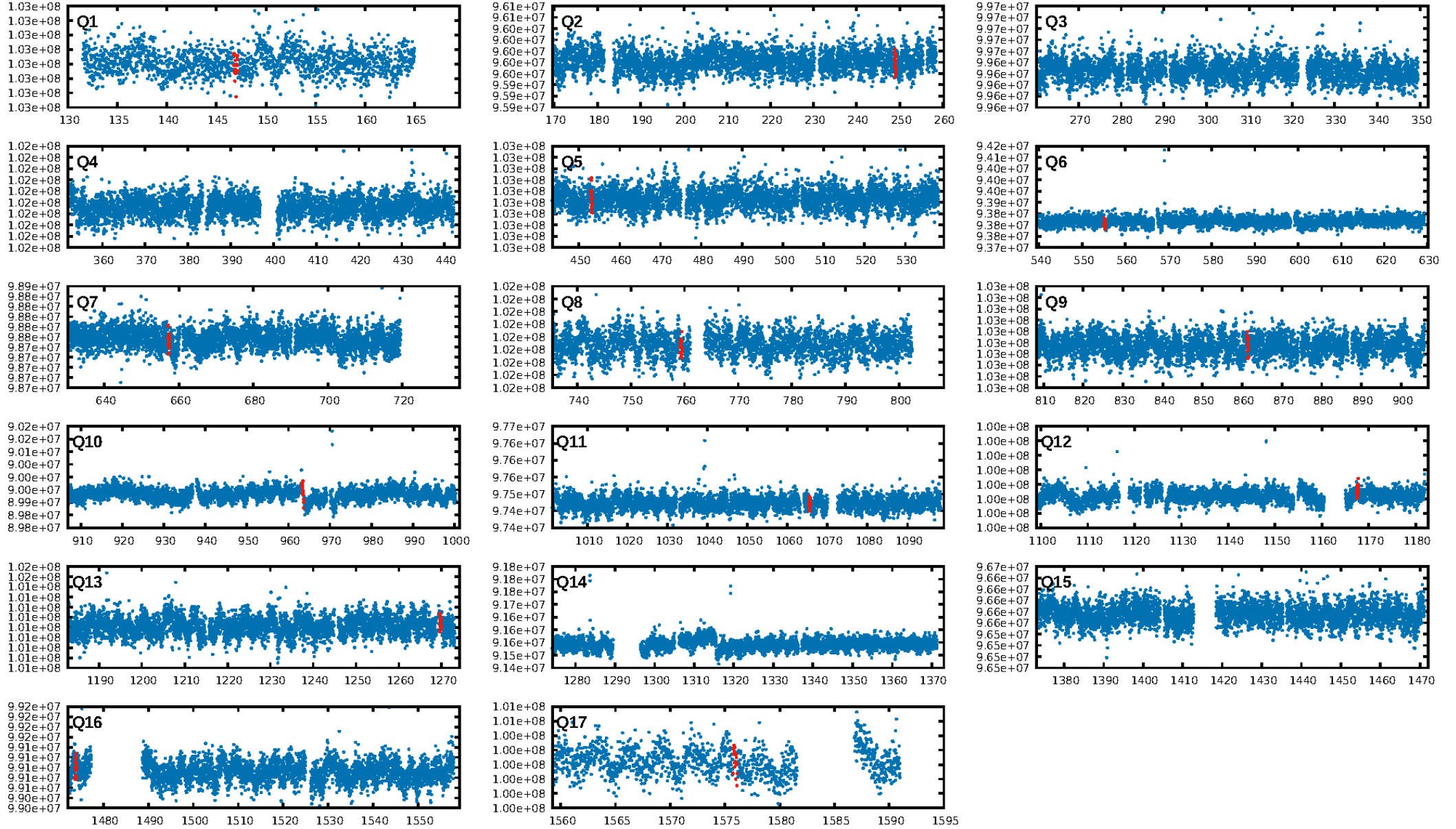
ShortPeriod-sig: 100.0% [107.29σ]  
LongPeriod-sig: 100.0% [75.65σ]  
ModelChiSquare2-sig: 88.9%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.12e-08**  
RollingBand-fgt: 1.00 [8/8]  
**GhostDiagnostic-chr: 0.3932**  
**Centroid-sig: 0.0%**  
Centroid-so: 3.711 arcsec [2.55σ]  
**OotOffset-rm: 3.468 arcsec [3.36σ]**  
**KicOffset-rm: 3.479 arcsec [3.27σ]**  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.83 [10/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:46:17 Z

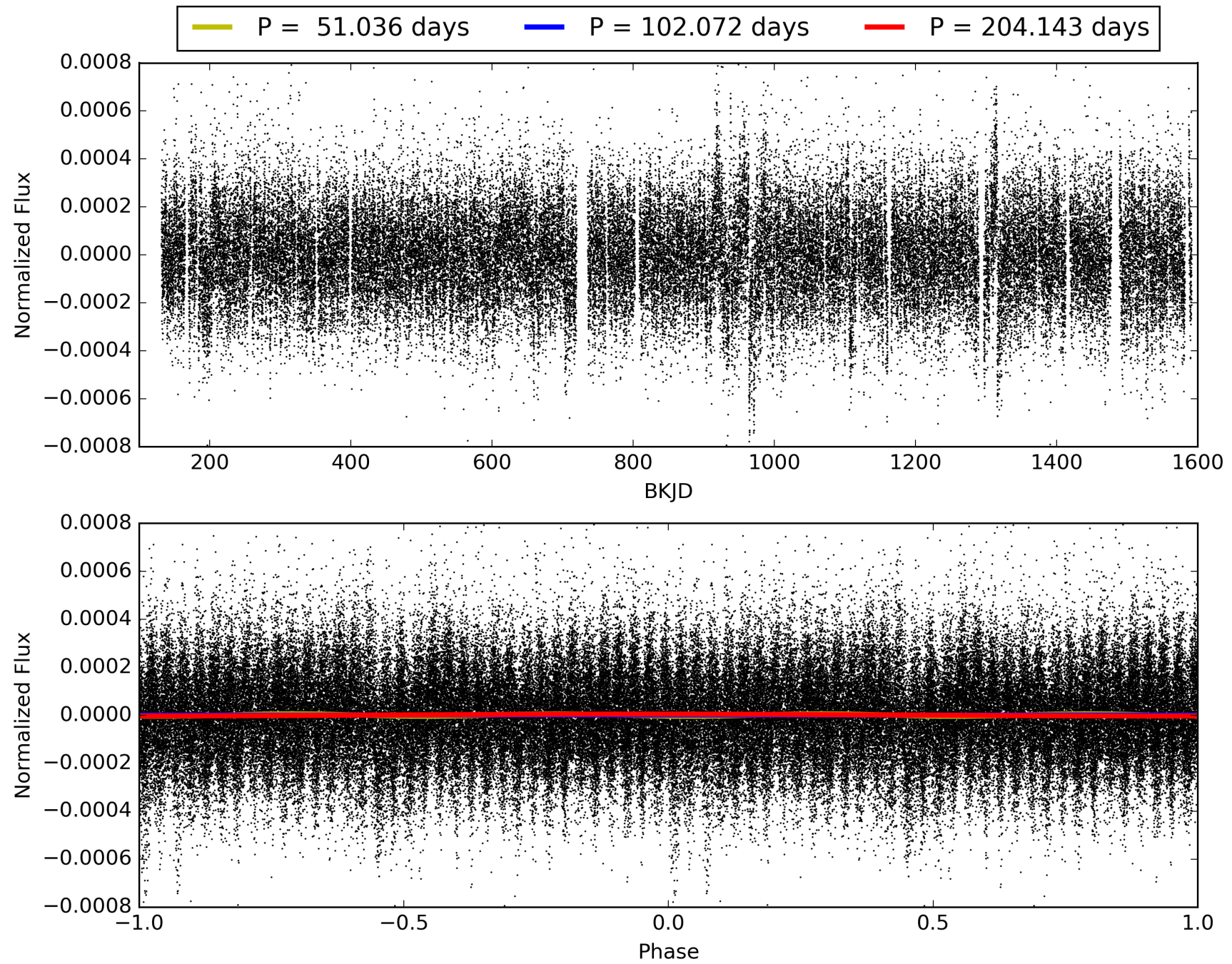
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 002444769-03, PDC Light Curves

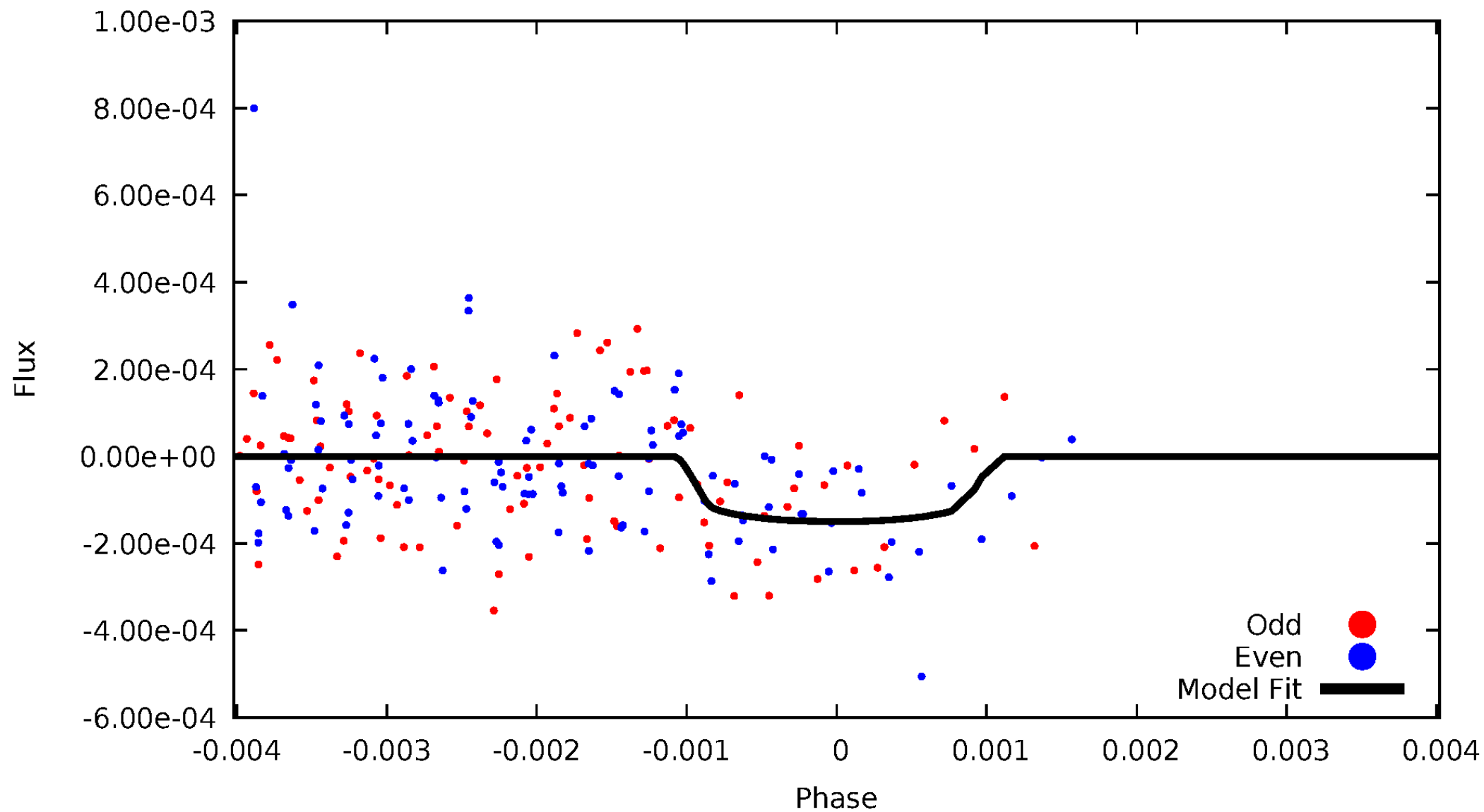


TCE 002444769-03



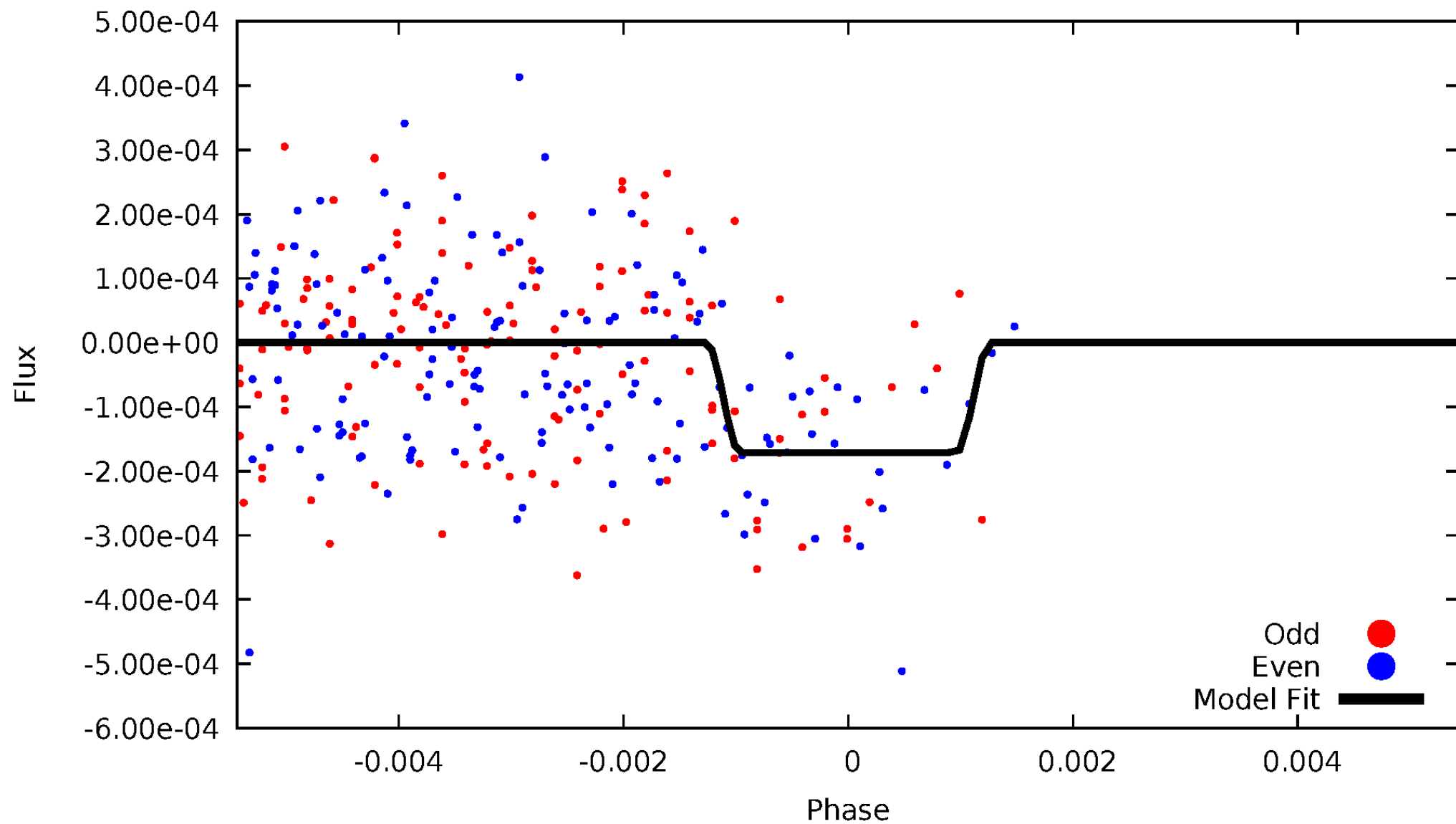
# DV Odd/Even

TCE 002444769-03



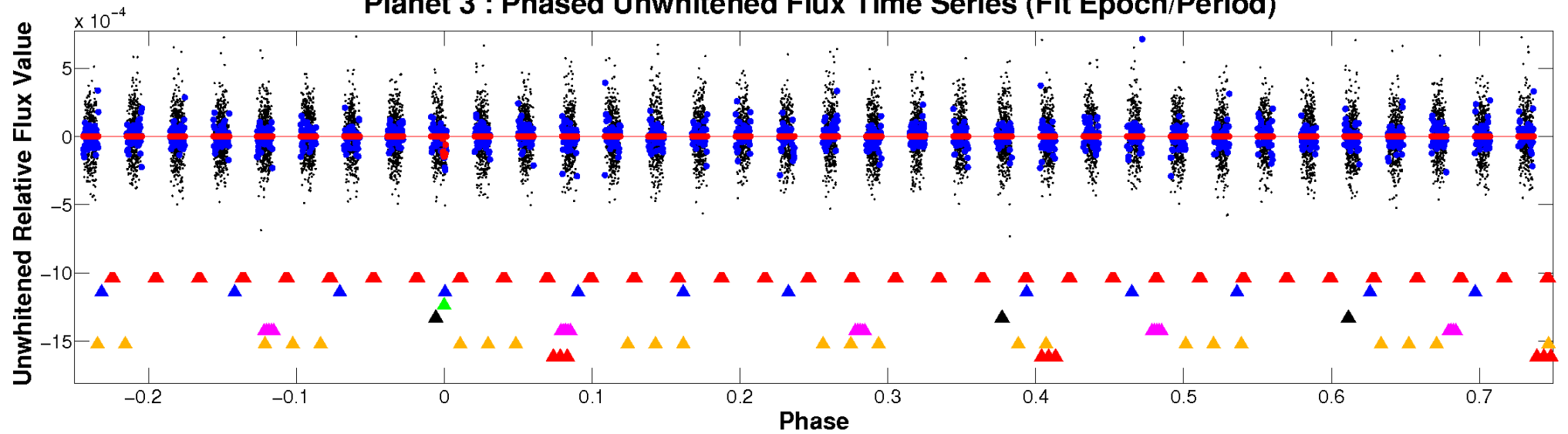
# ALT Odd/Even

TCE 002444769-03

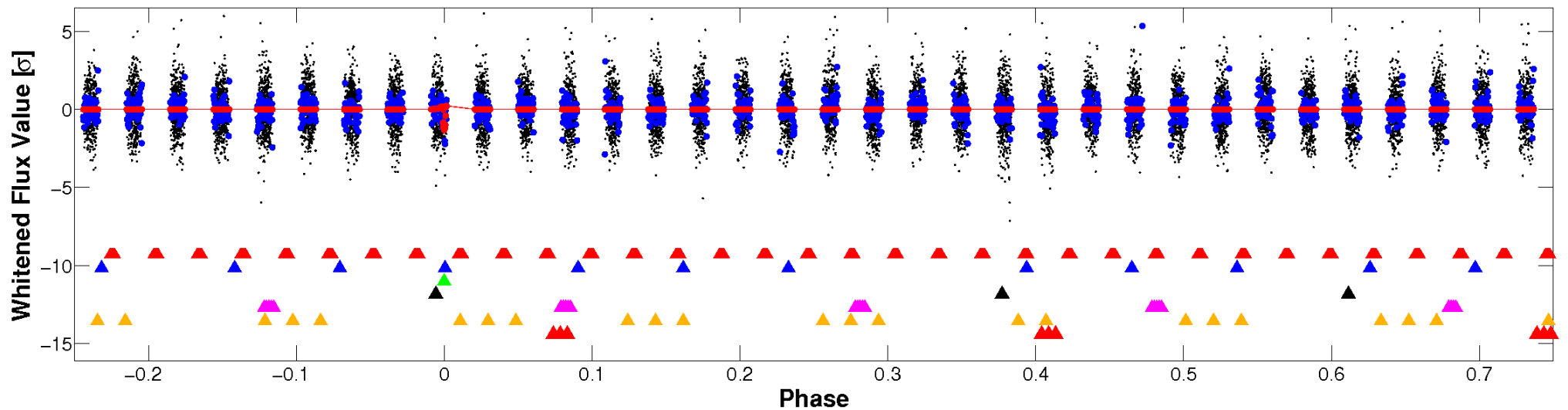


# Non-Whitened Vs. Whitened Light Curve

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

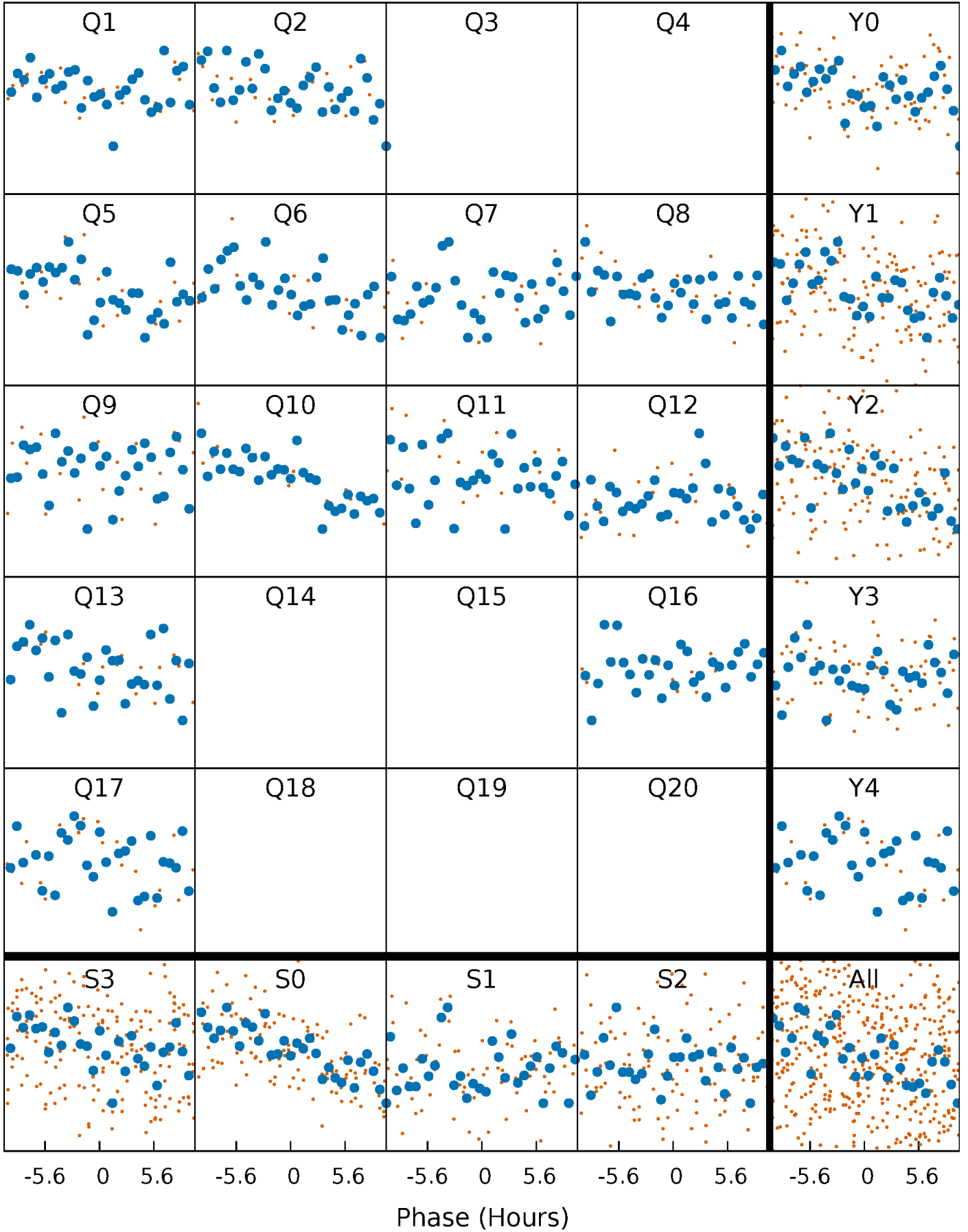


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

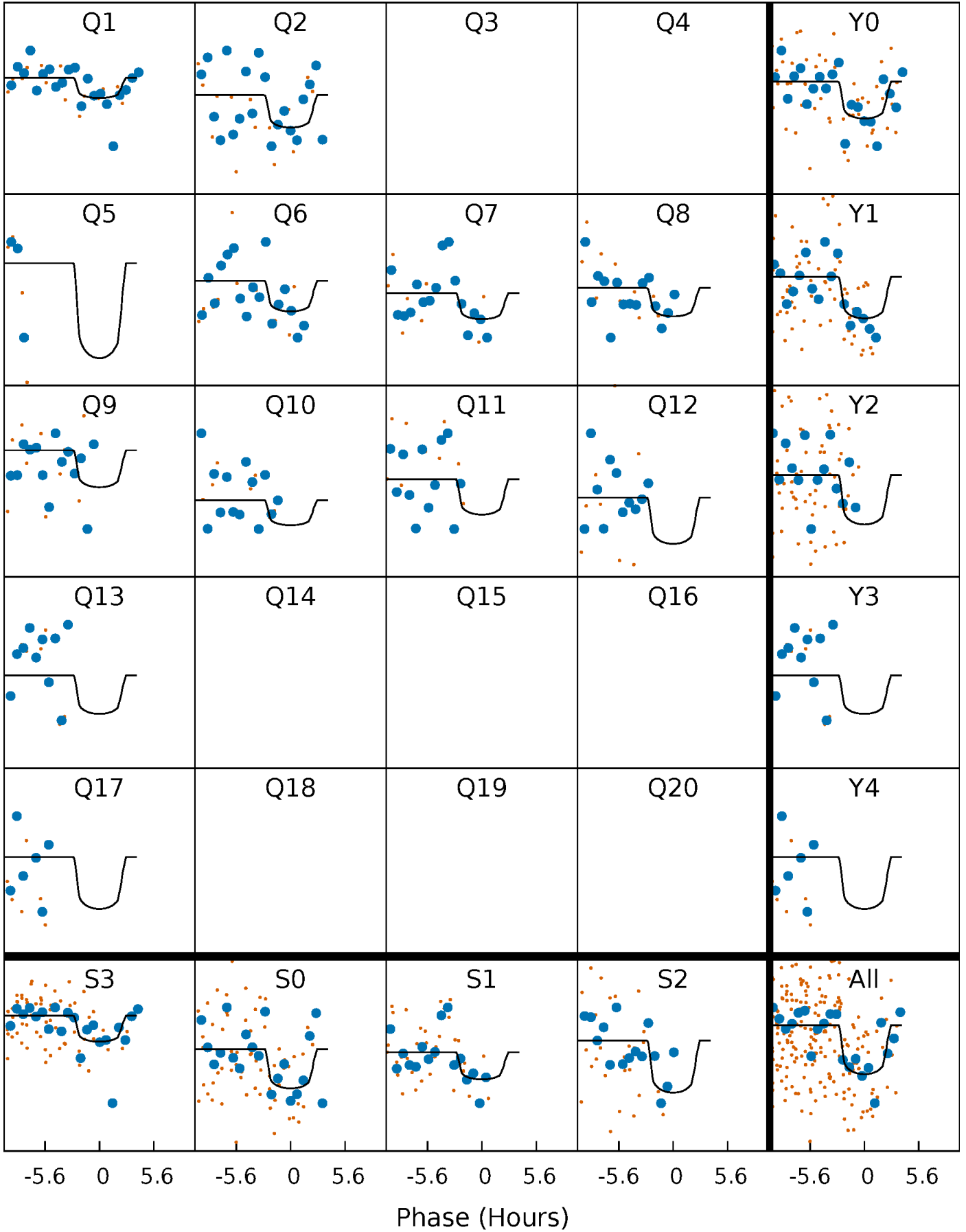
TCE 002444769-03   P=102.071699 Days    $T_0=146.923760$  (BKJD)





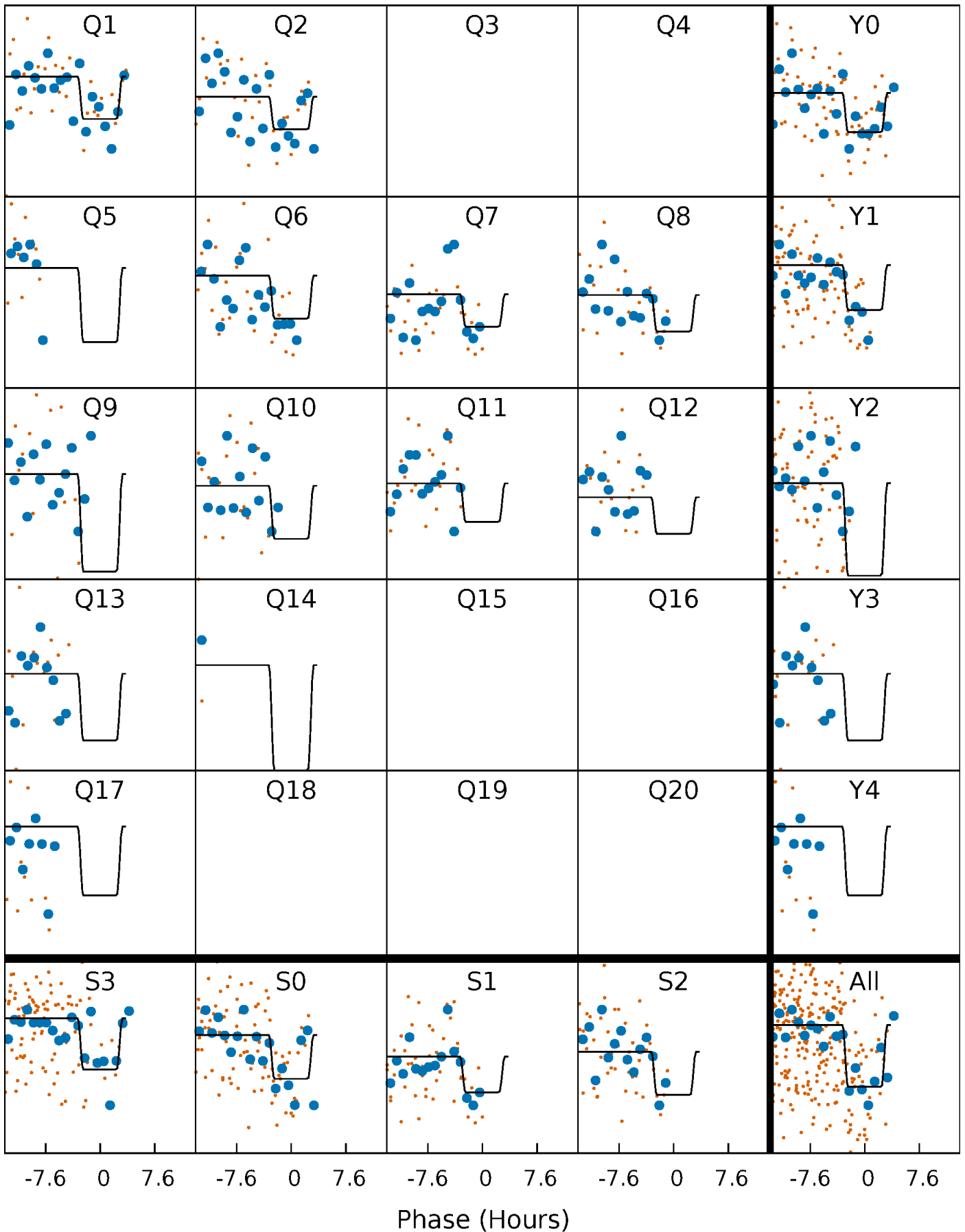
# DV Quarter-Phased Transit Curves

TCE 002444769-03   P=102.071699 Days    $T_0=146.923760$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

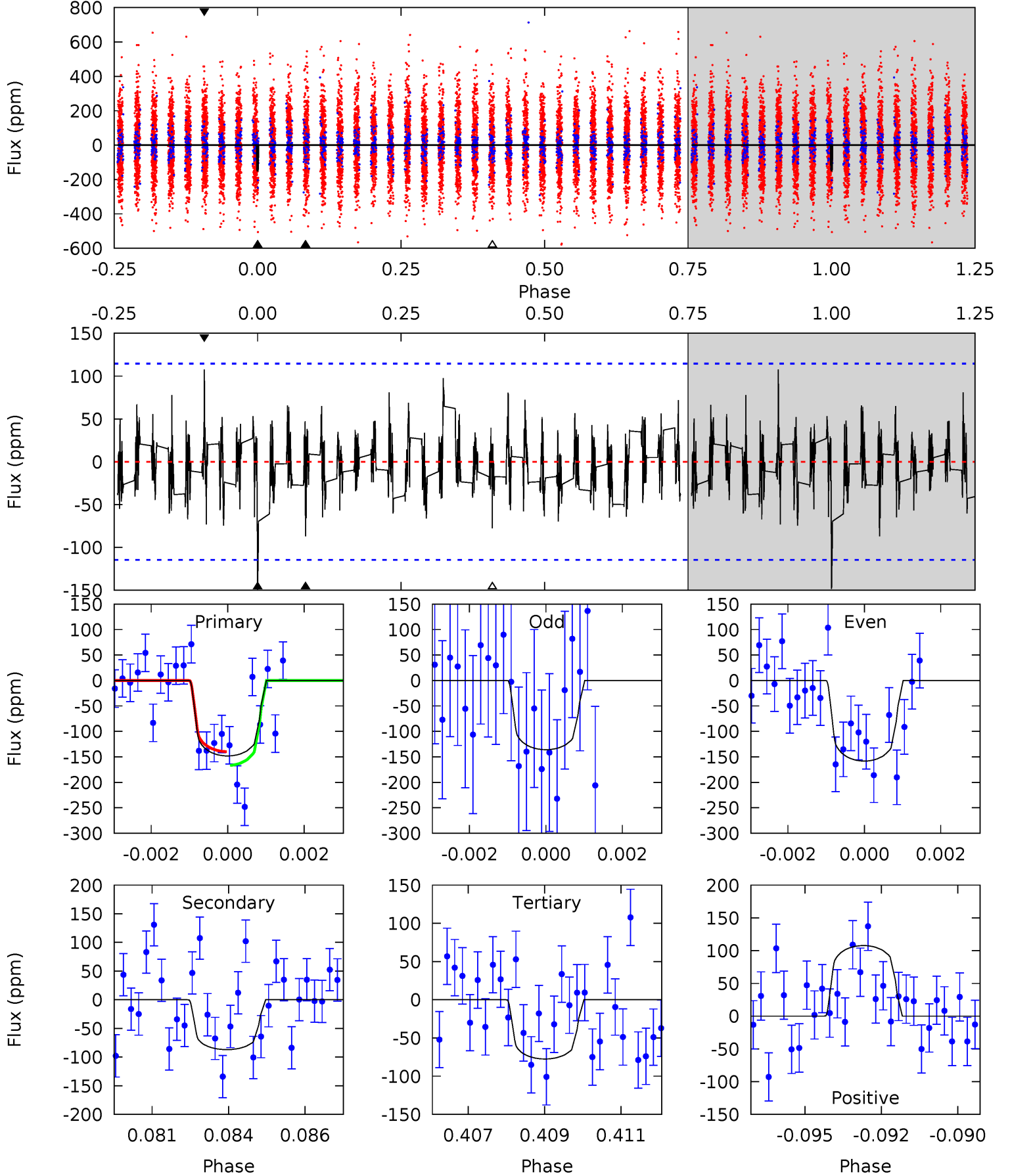
TCE 002444769-03 P=102.075634 Days  $T_0=146.932929$  (BKJD)



# DV Model-Shift Uniqueness Test

002444769-03, P = 102.071699 Days, E = 44.852061 Days

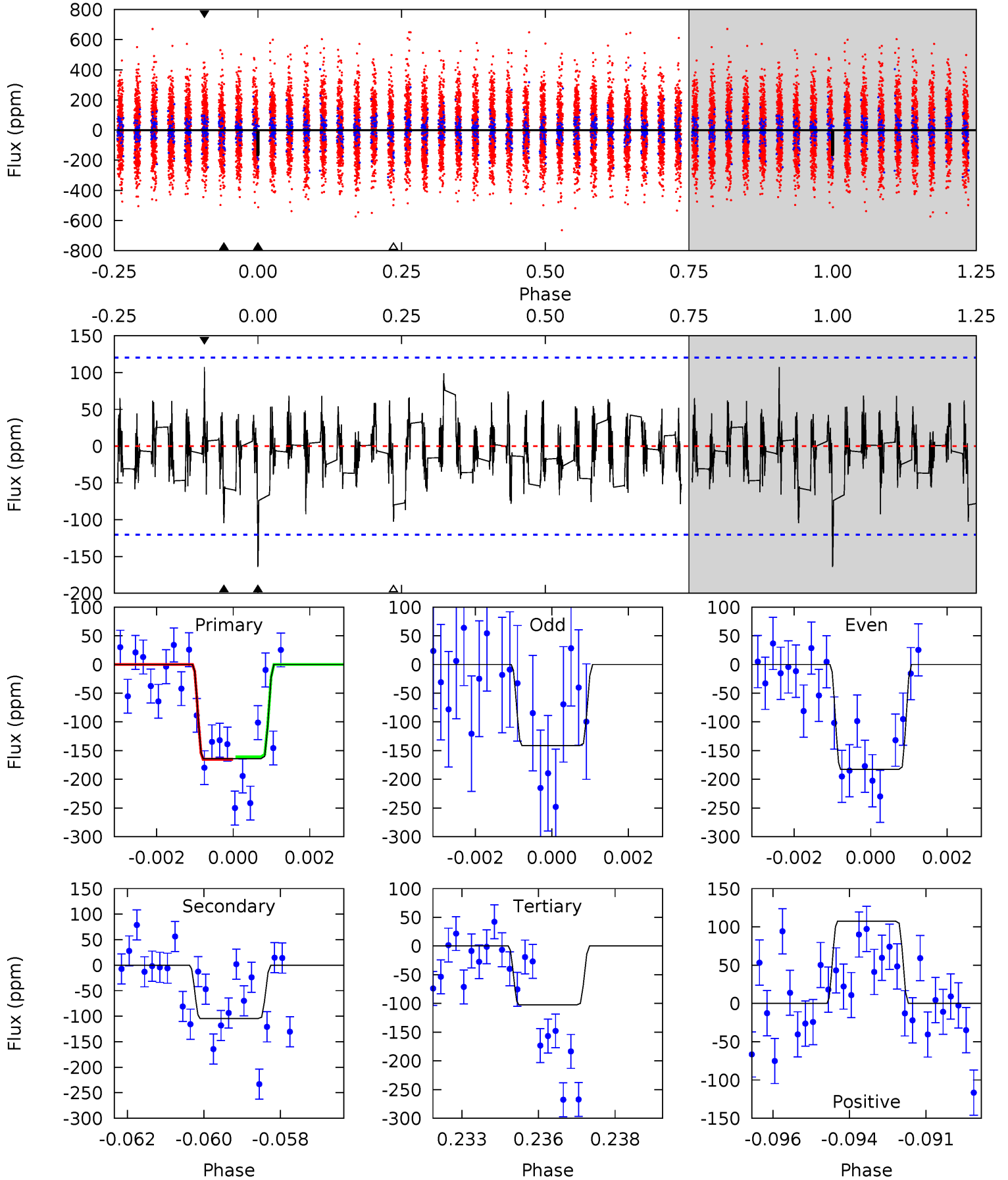
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.87	4.03	3.59	4.99	5.31	3.06	1.23	3.28	1.88	0.44	-0.96	0.52	1.01	0.42	0.56



# Alt Model-Shift Uniqueness Test

002444769-03, P = 102.075634 Days, E = 44.857295 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.21	4.59	4.50	4.72	5.29	3.04	1.19	2.70	2.48	0.09	-0.13	0.91	0.87	0.40	0.09



### Stellar Parameters For KIC 002444769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6450^{+162}_{-194}$	$4.421^{+0.081}_{-0.202}$	$-0.520^{+0.300}_{-0.300}$	$1.022^{+0.308}_{-0.123}$	$1.004^{+0.133}_{-0.106}$	$1.325^{+0.467}_{-0.675}$
	+3%/-3%	+2%/-5%	+58%/-58%	+30%/-12%	+13%/-11%	+35%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 002444769-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-87 \pm 22$	$1.66^{+1.04}_{-0.99}$	$623^{+47}_{-31}$	$5218^{+3189}_{-935}$	$3098^{+16881}_{-1950}$
Alt.	$-104 \pm 23$	$1.61^{+1.13}_{-0.89}$	$622^{+48}_{-31}$	$5515^{+3203}_{-1101}$	$4119^{+17971}_{-2764}$

$T_{\text{max}}$  = 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

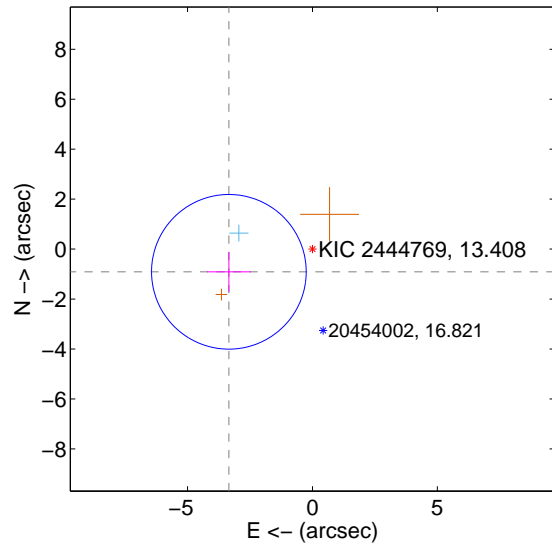
Supplemental centroid analysis for 002444769-03. Kepler magnitude: 13.41. Transit SNR 7.79

There are 1 quarters with good PRF difference image offsets

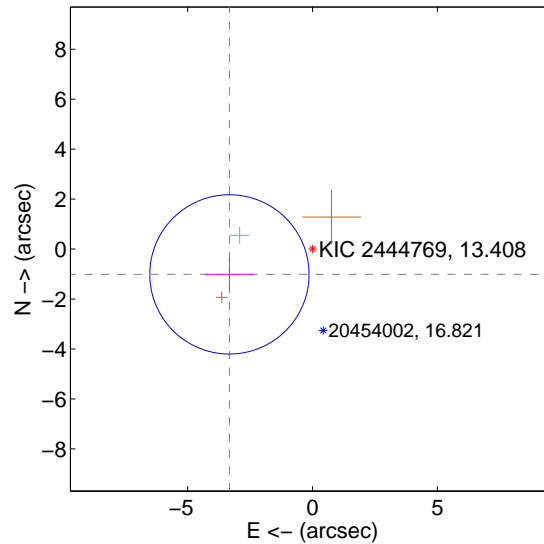
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.468 \pm 1.032$	3.36	$3.346 \pm 0.876$	$-0.910 \pm 0.798$
PRF-fit source offset from KIC position	$3.479 \pm 1.063$	3.27	$3.328 \pm 0.992$	$-1.013 \pm 0.652$
photometric centroid source offset	$3.71 \pm 1.46$	2.55	$3.24 \pm 1.42$	$1.80 \pm 1.56$

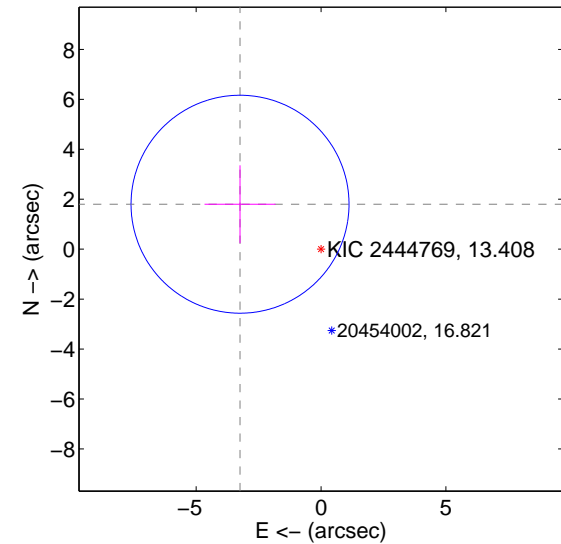
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



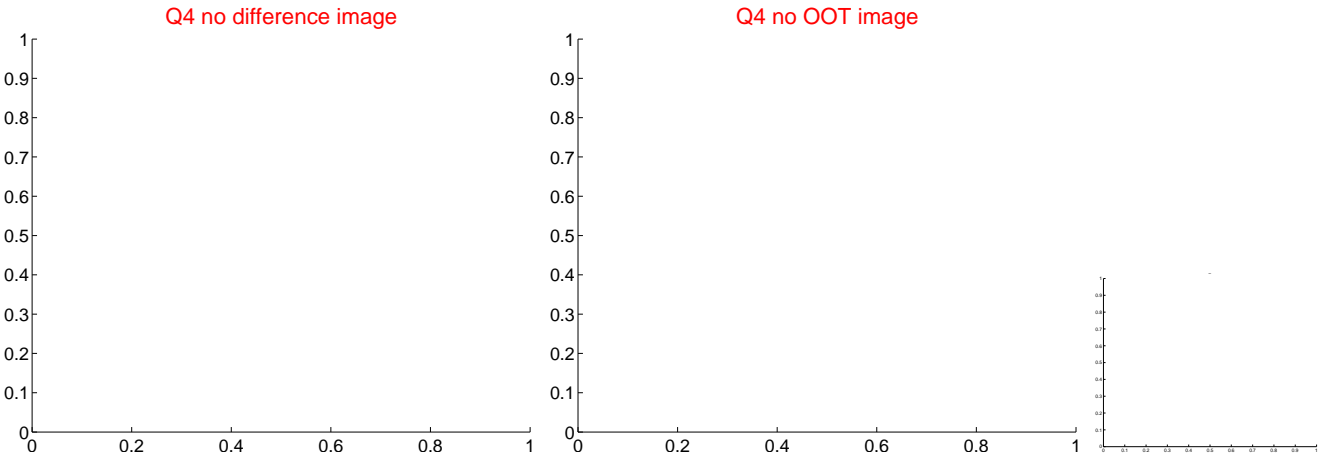
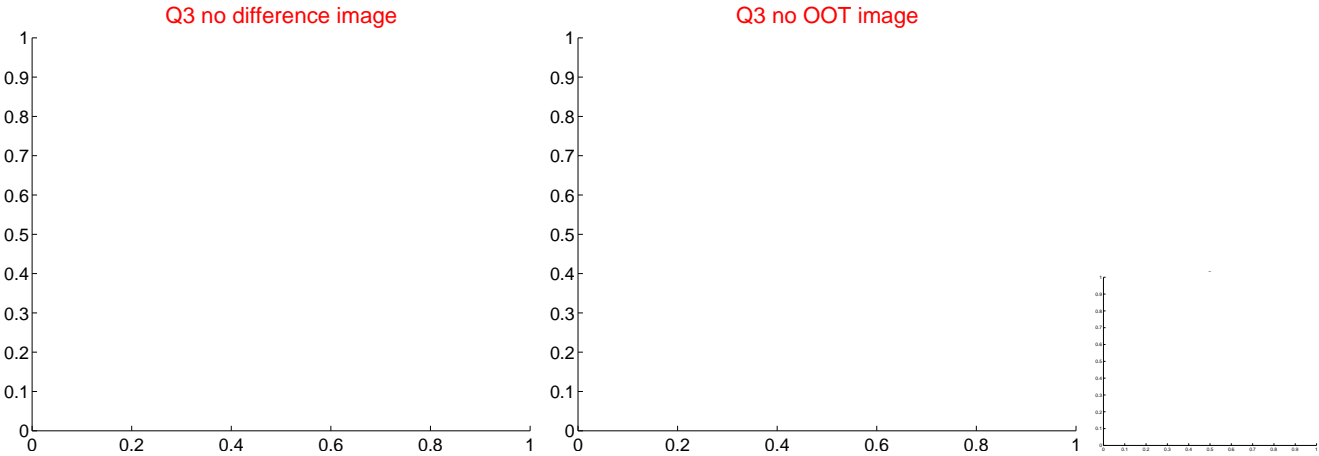
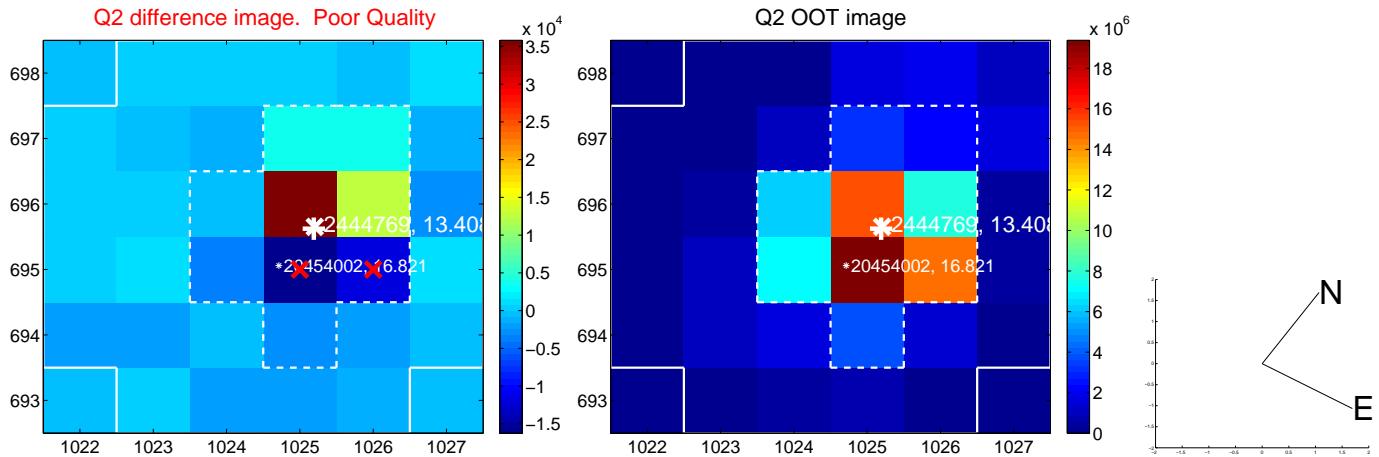
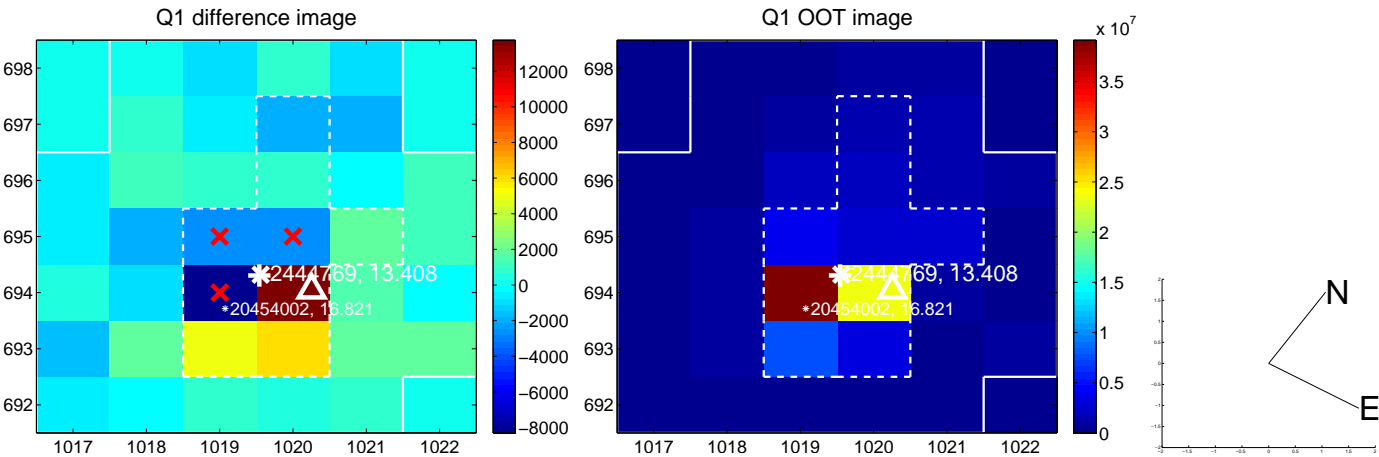
offset from photometric centroids



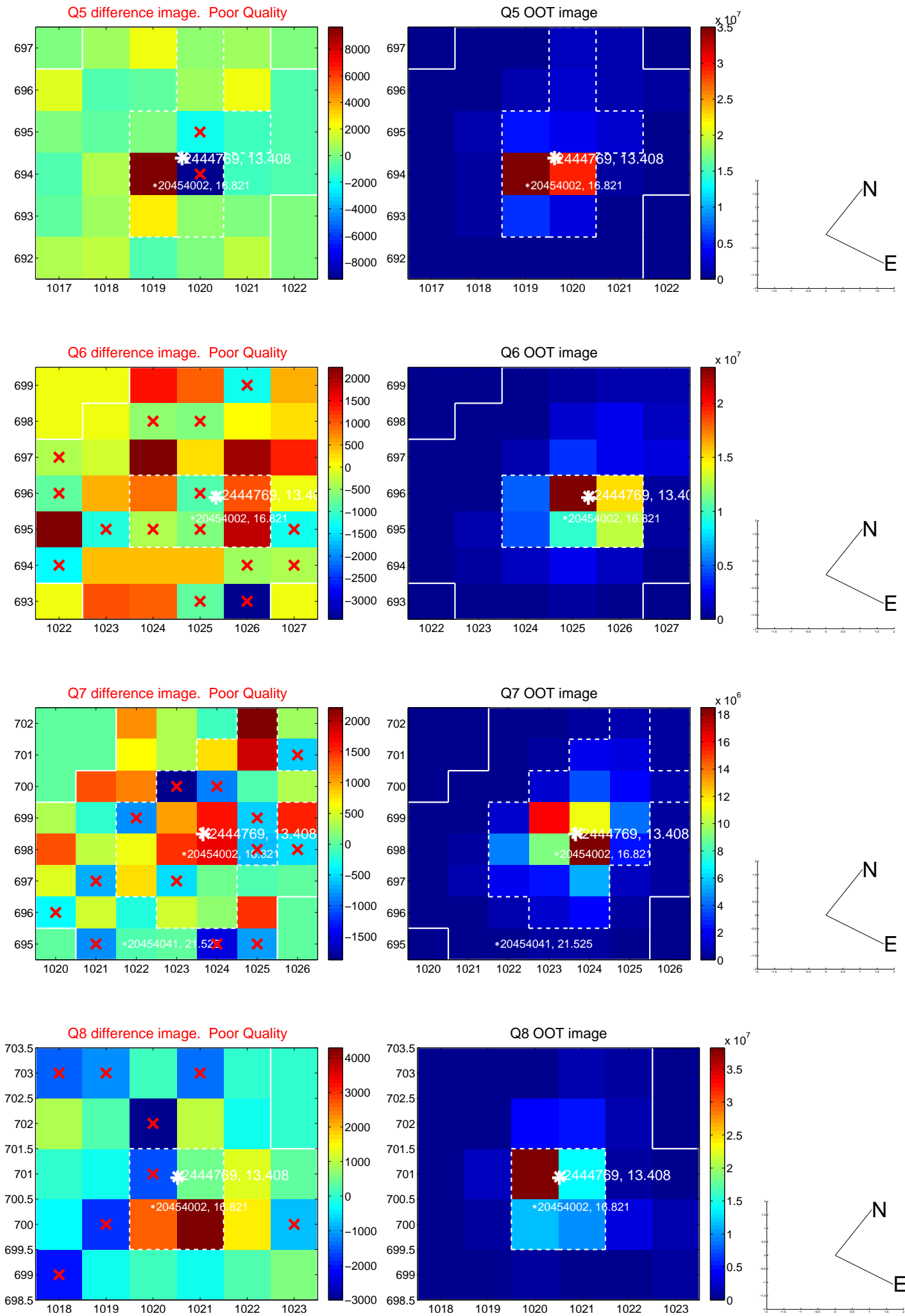
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



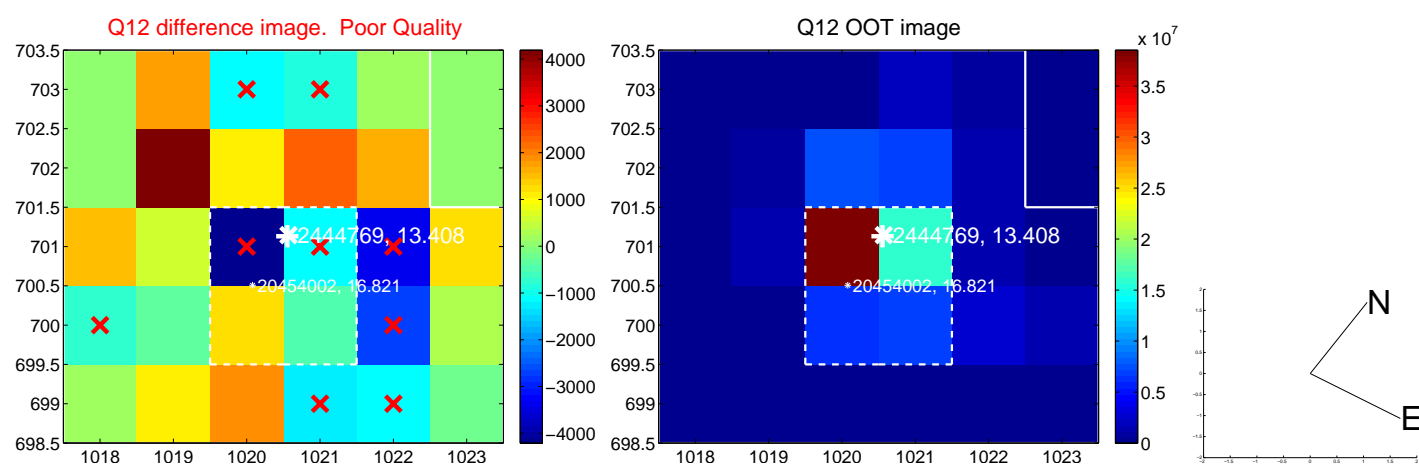
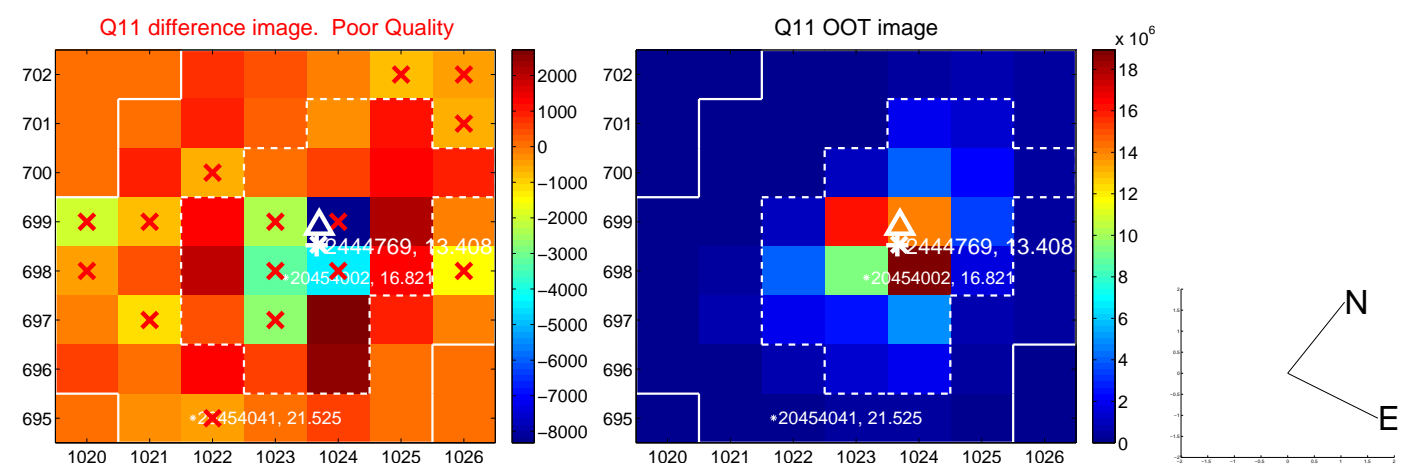
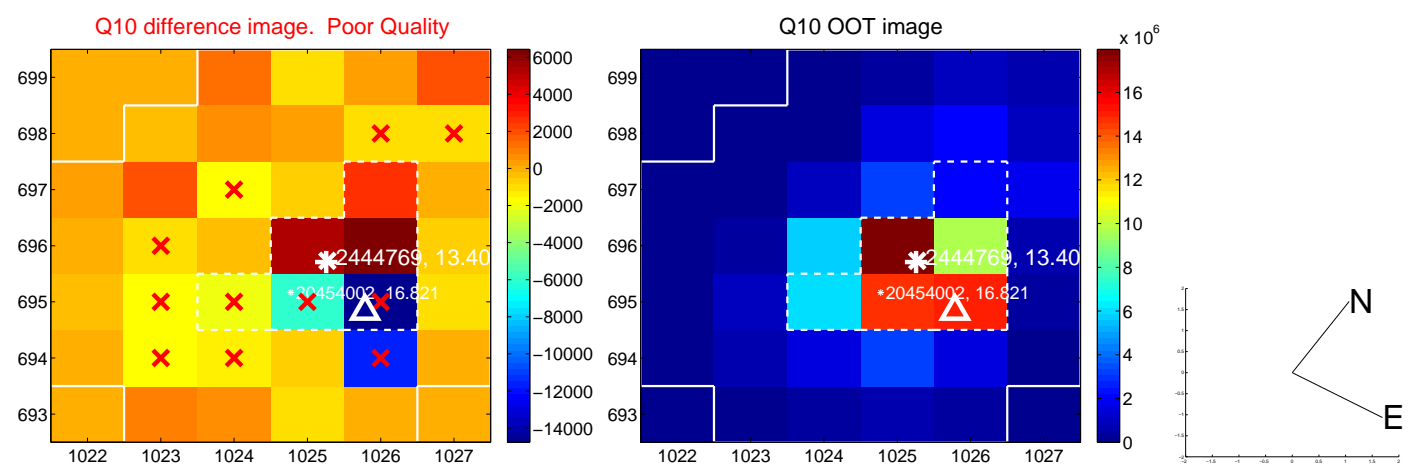
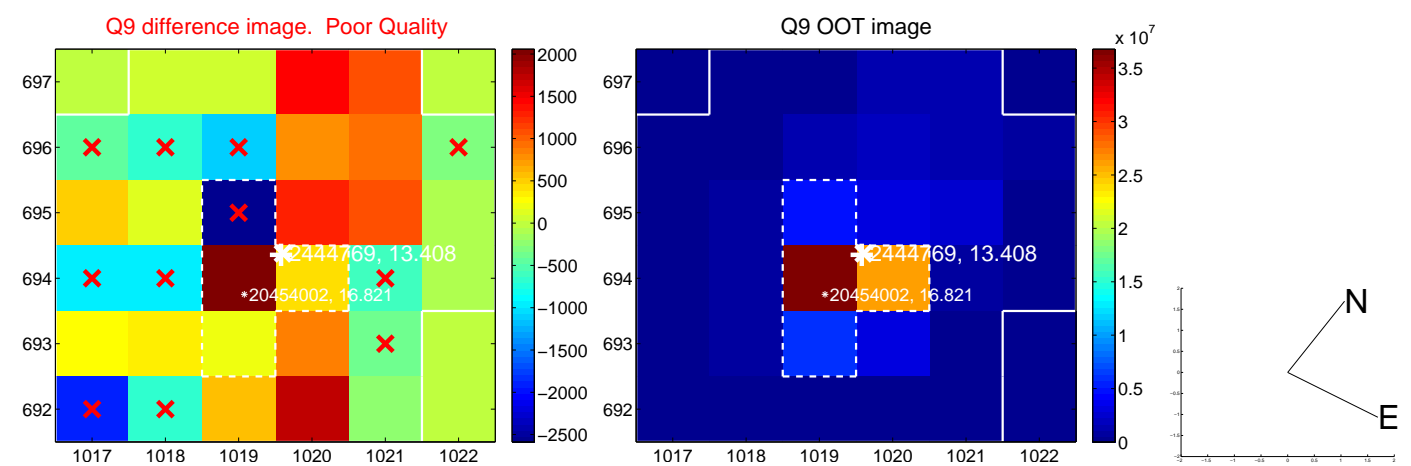
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



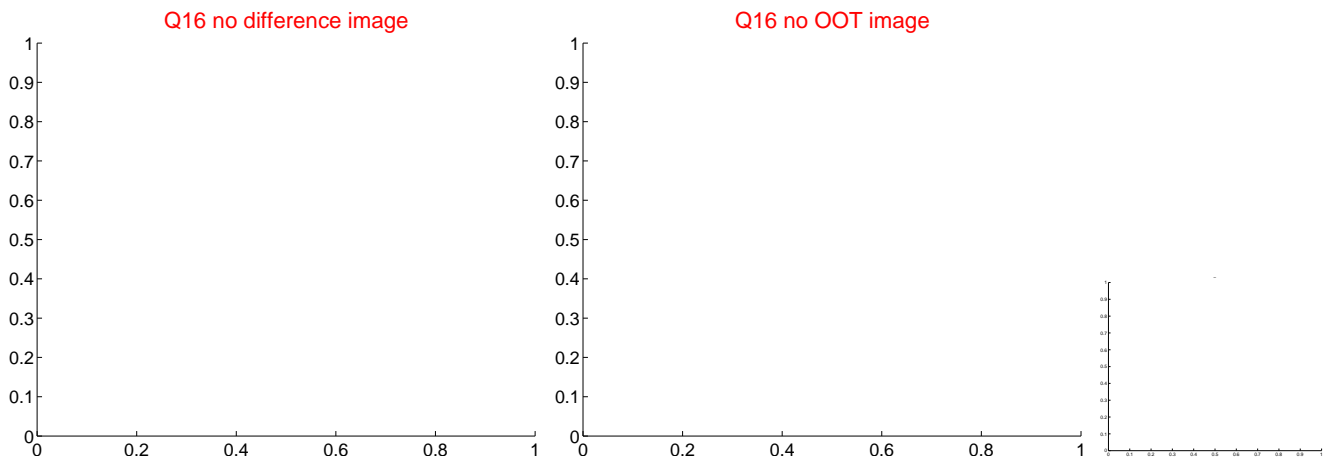
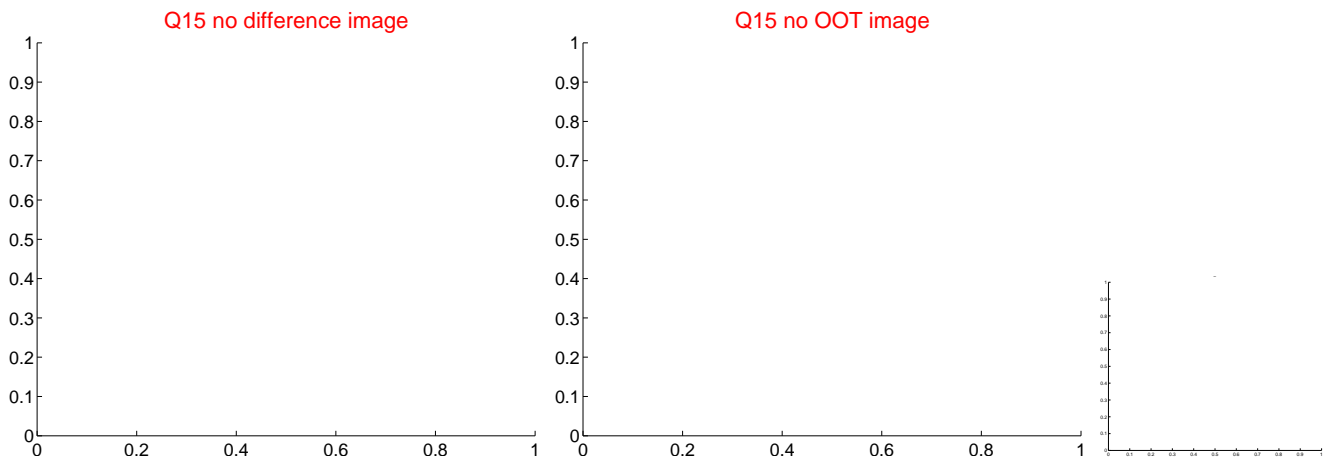
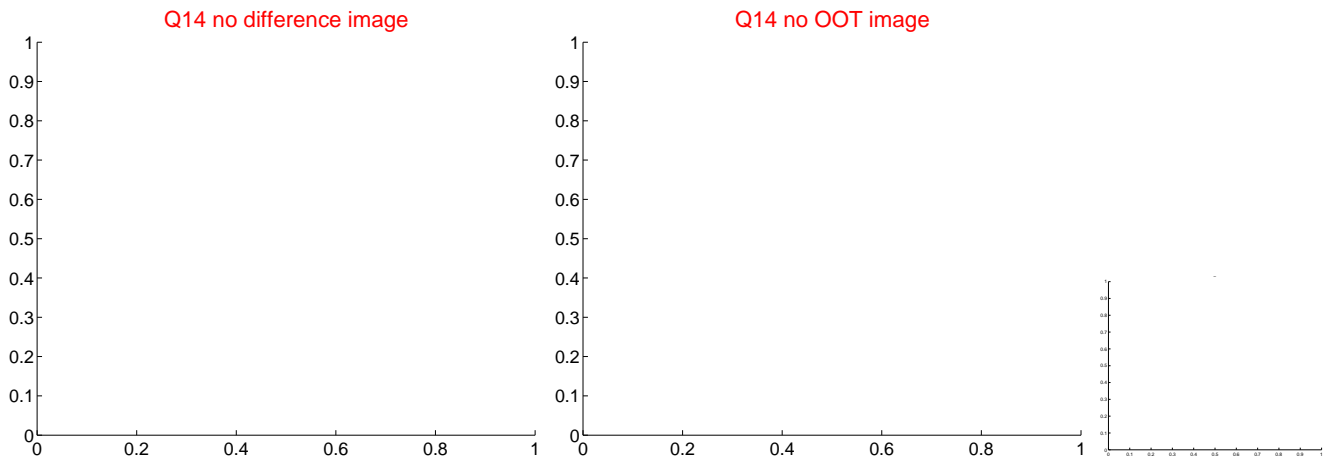
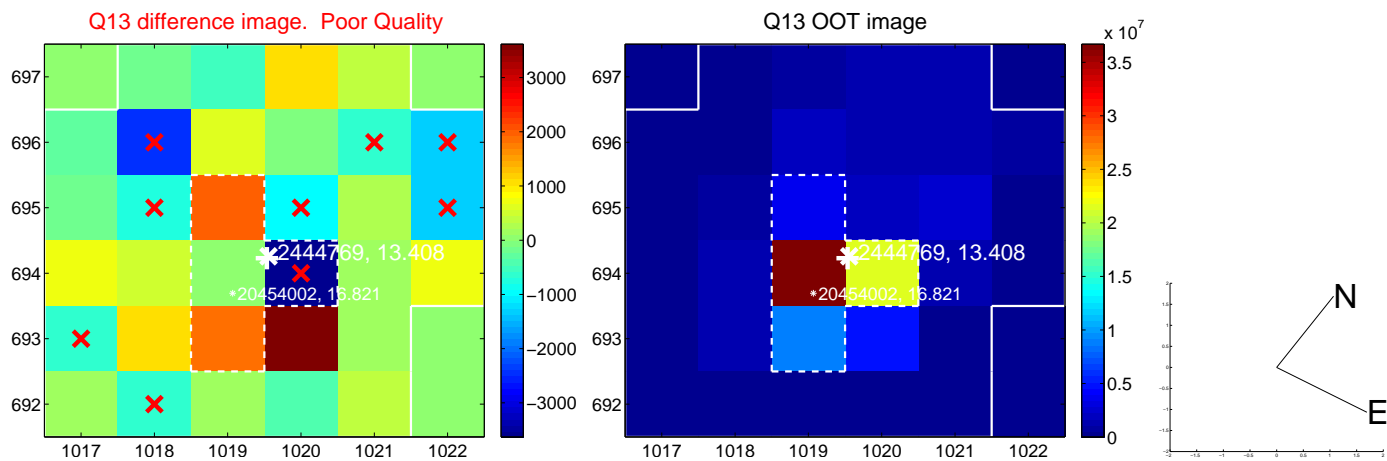
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



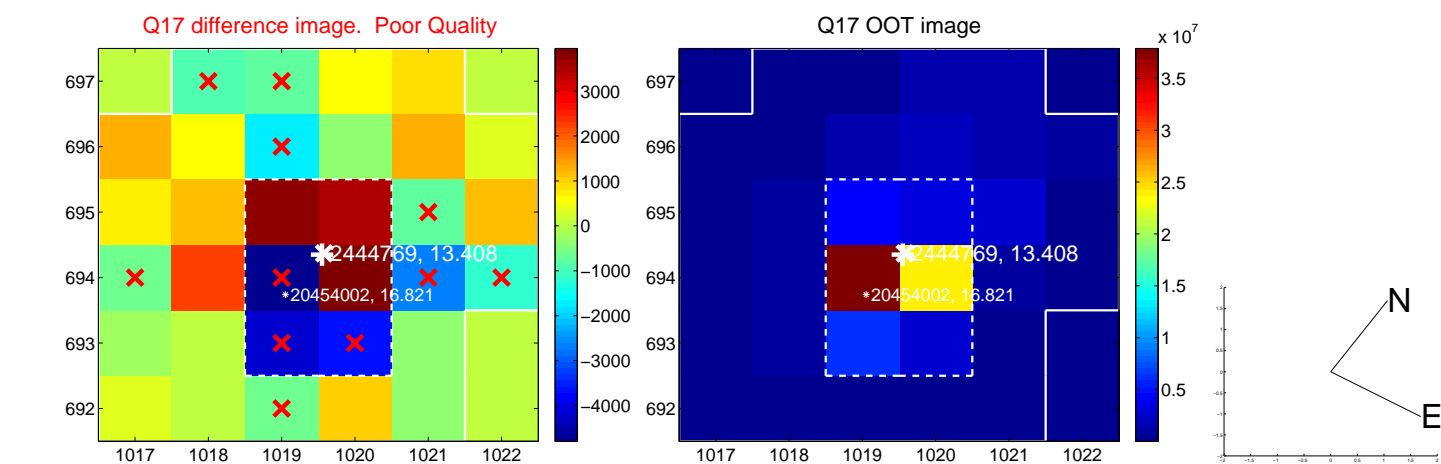
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



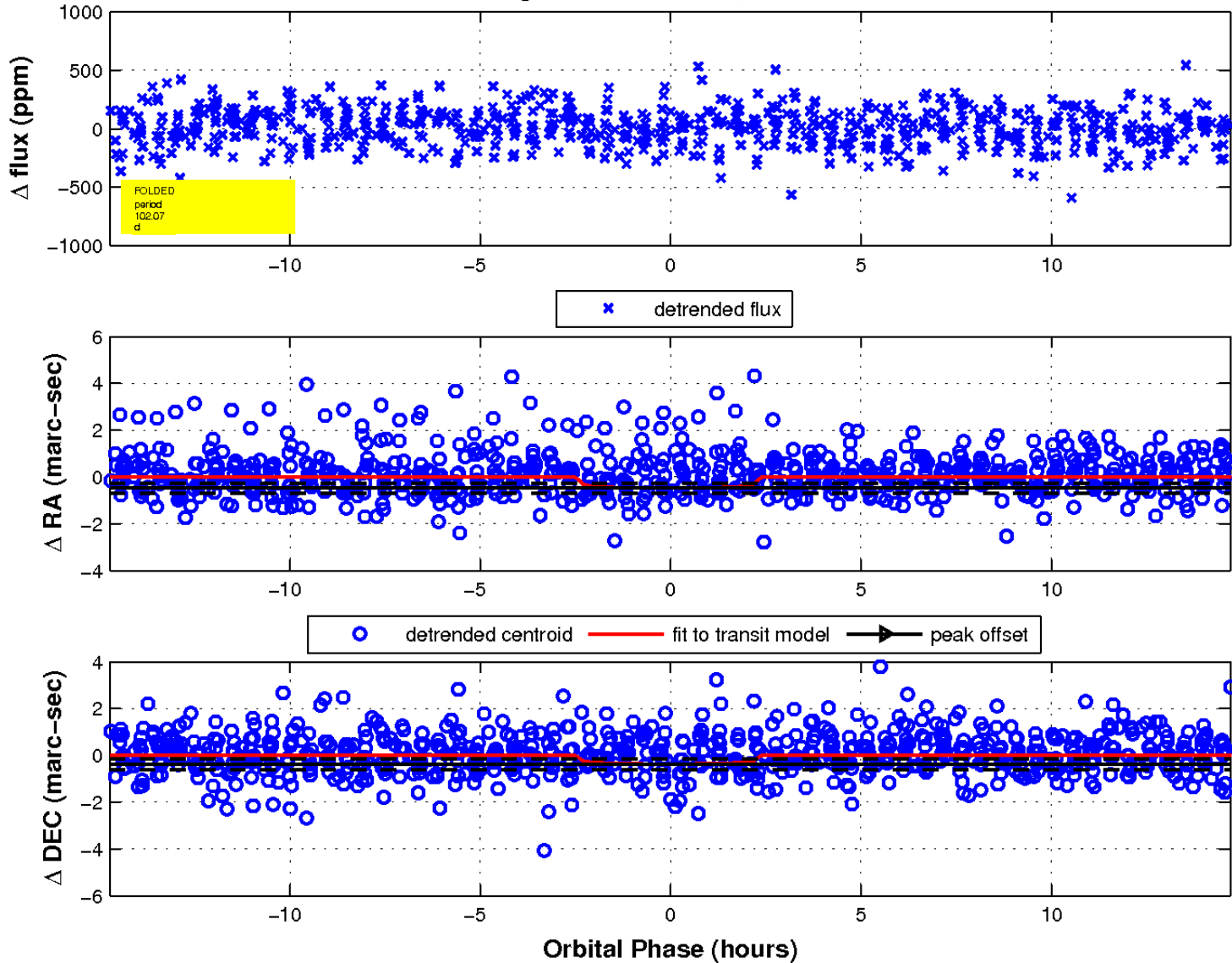
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

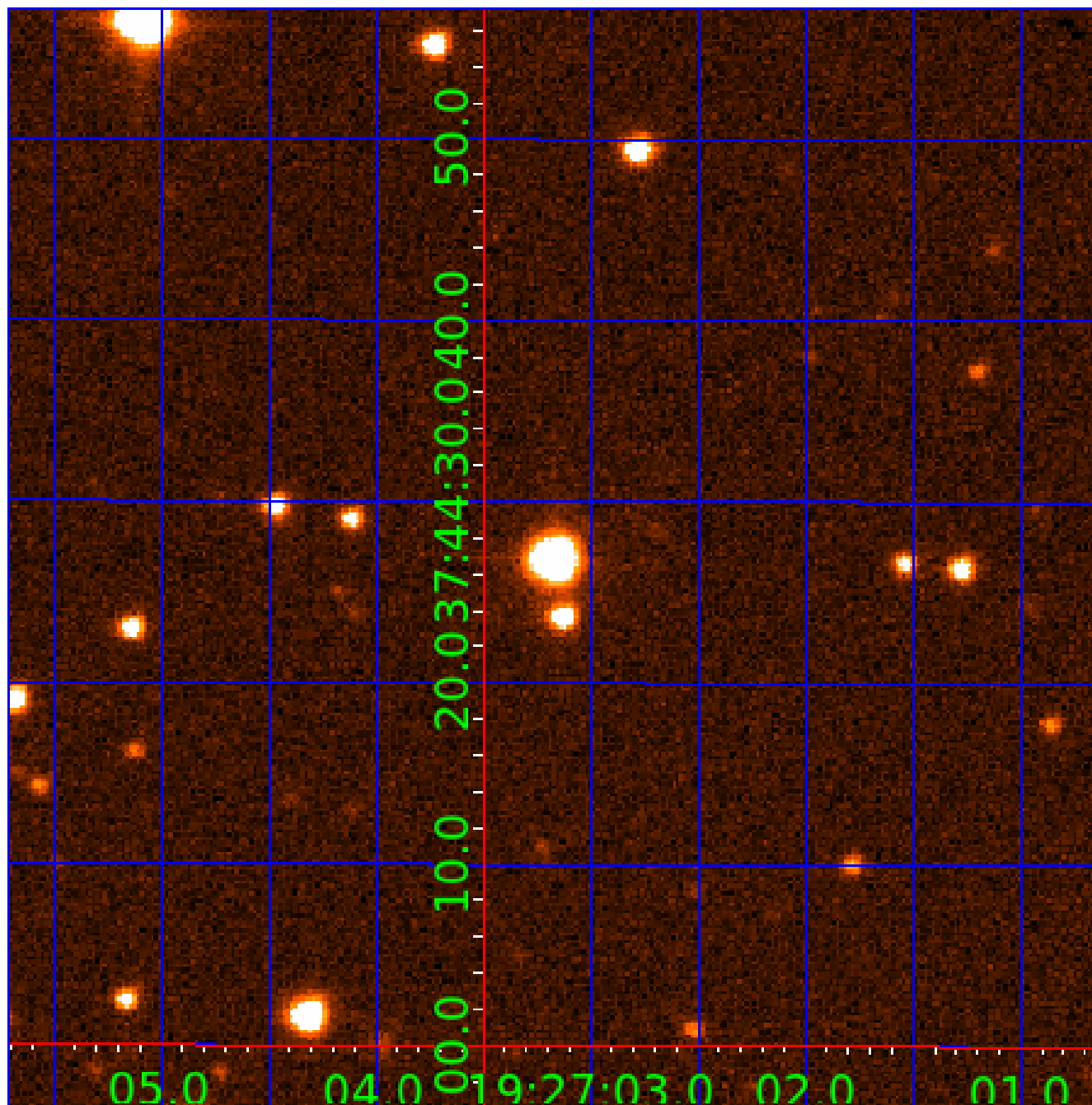


fluxWeightedCentroids, Planet 3 of 7



UKIRT Image

Declination





# KIC 002444769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002444769-01	OBS	No	3.001337	133.226612	16.1	18.084	7.8	7.2	1.02	6450	0.41	973.53
002444769-02	OBS	No	125.774820	201.647831	292.4	5.686	12.3	9.9	1.02	6450	1.93	6.69
002444769-03	OBS	No	102.071699	146.923760	149.9	4.921	7.7	7.8	1.02	6450	1.42	8.84
002444769-05	OBS	No	61.276073	175.297370	175.9	4.082	7.4	7.7	1.02	6450	1.58	17.45
002444769-06	OBS	No	63.555015	151.870476	162.0	7.072	8.0	7.7	1.02	6450	1.45	16.62
002444769-07	OBS	No	169.959063	155.423564	252.7	2.430	7.1	7.2	1.02	6450	1.90	4.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002444769-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002444769-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002444769-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002444769-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002444769-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002444769-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

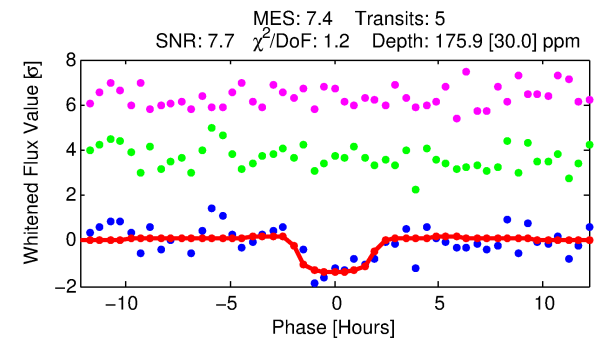
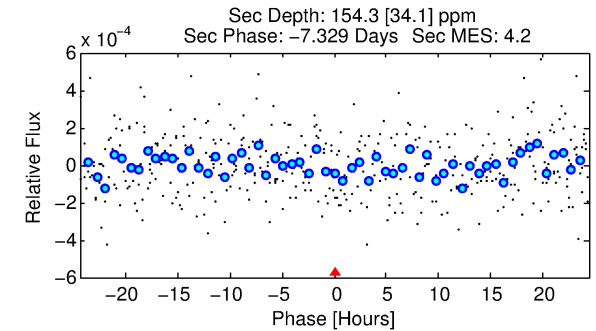
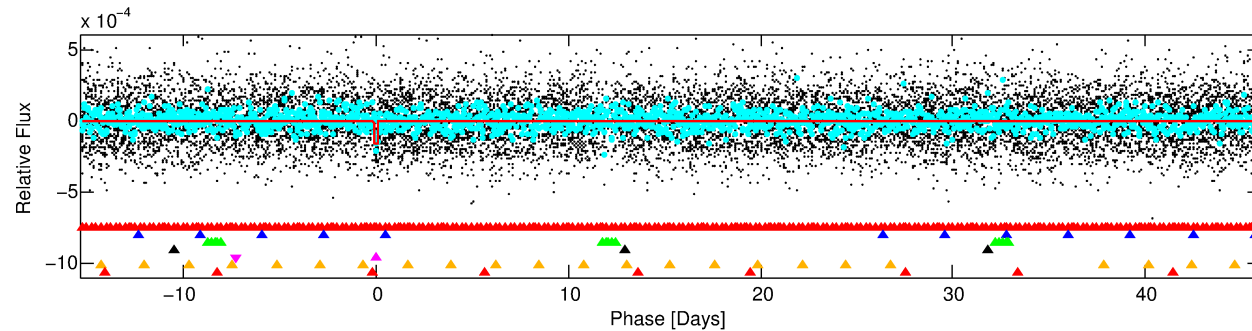
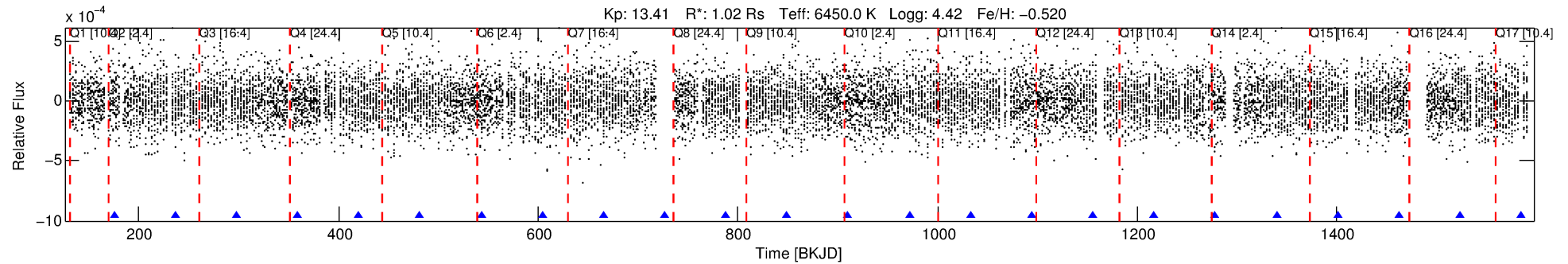
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002444769-05

No Significant Match Found

# DV One-Page Summary

KIC: 2444769 Candidate: 5 of 7 Period: 61.276 d

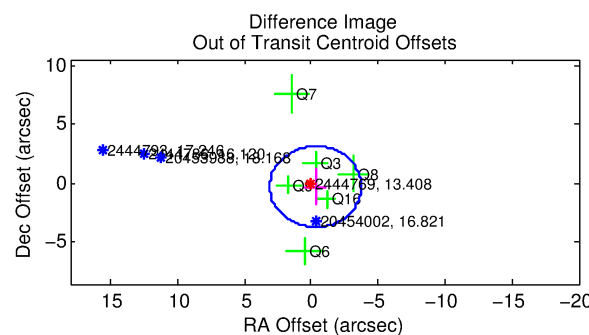
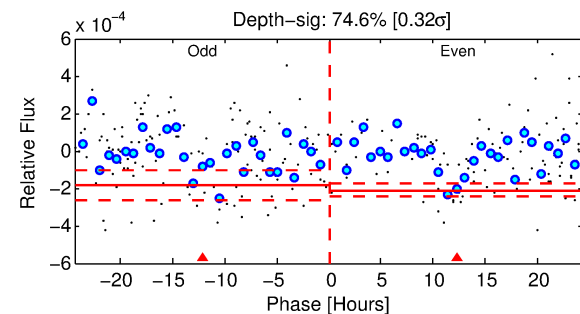
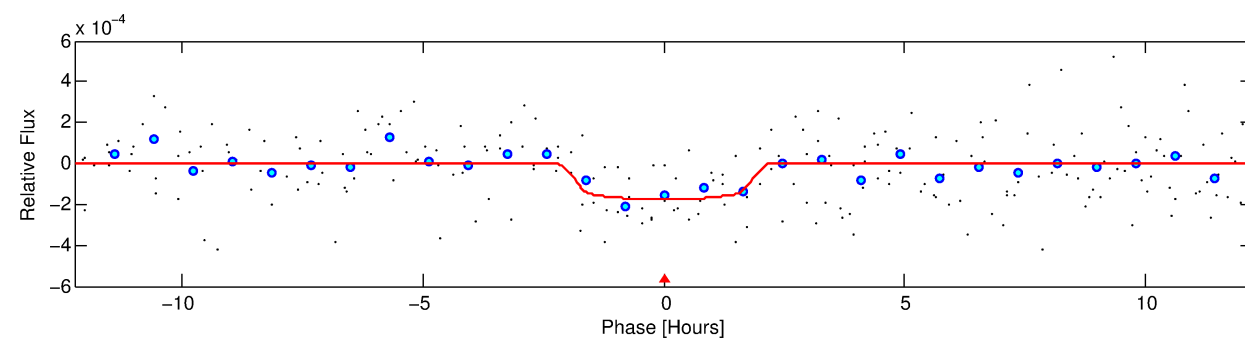


## DV Fit Results:

Period = 61.27607 [0.00132] d  
Epoch = 175.2974 [0.0144] BKJD  
Rp/R\* = 0.0142 [0.0107]  
a/R\* = 53.92 [238.83]  
b = 0.90 [0.95]  
Seff = 17.45 [6.78]  
Teq = 521 [51] K  
Rp = 1.58 [1.29] Re  
a = 0.3047 [0.0773] AU  
Ag = 3155.86 [4975.39] [0.63σ]  
Teff = 6039 [2321] K [2.38σ]

## DV Diagnostic Results:

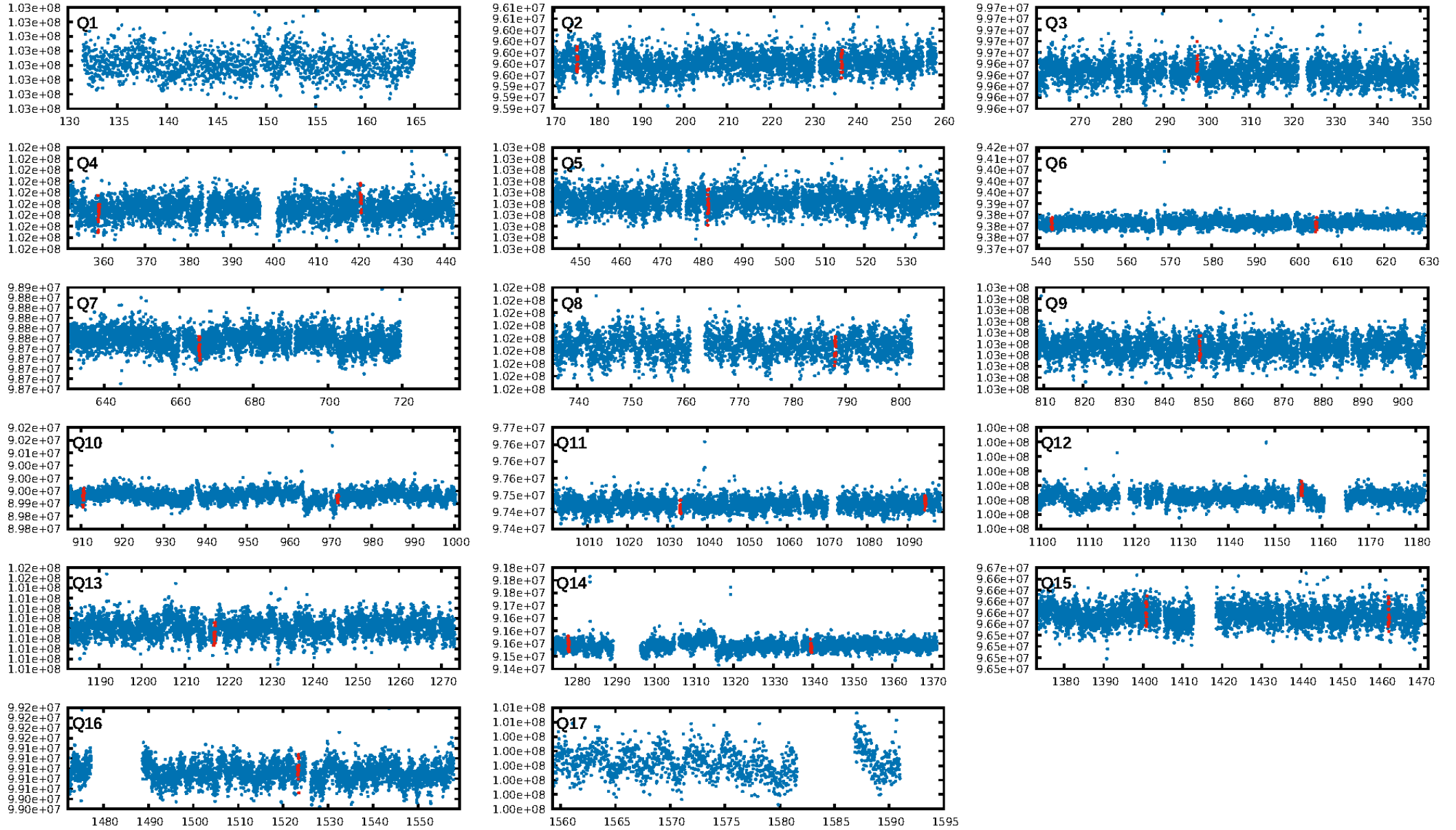
ShortPeriod-sig: 100.0% [75.44σ]  
LongPeriod-sig: 100.0% [6.70σ]  
ModelChiSquare2-sig: 74.0%  
ModelChiSquareGof-sig: 98.1%  
**Bootstrap-pfa: 1.49e-08**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 3.072  
Centroid-sig: 0.8%  
Centroid-so: 1.342 arcsec [1.17σ]  
OotOffset-rm: 0.414 arcsec [0.36σ]  
KicOffset-rm: 0.528 arcsec [0.39σ]  
OotOffset-st: 1/2/2/1 [6]  
KicOffset-st: 1/2/2/1 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.54 [7/13]



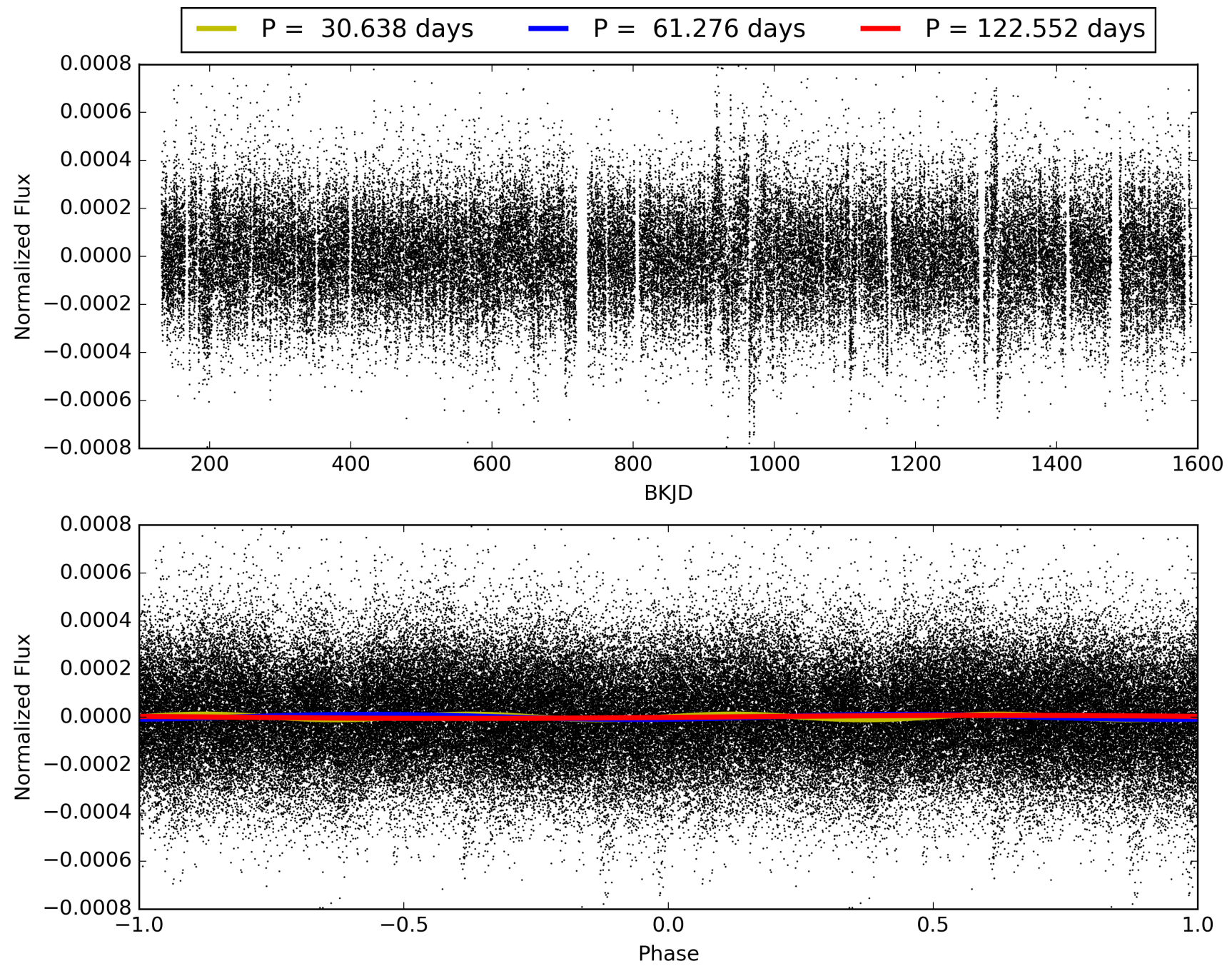
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:46:26 Z

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

# TCE 002444769-05, PDC Light Curves

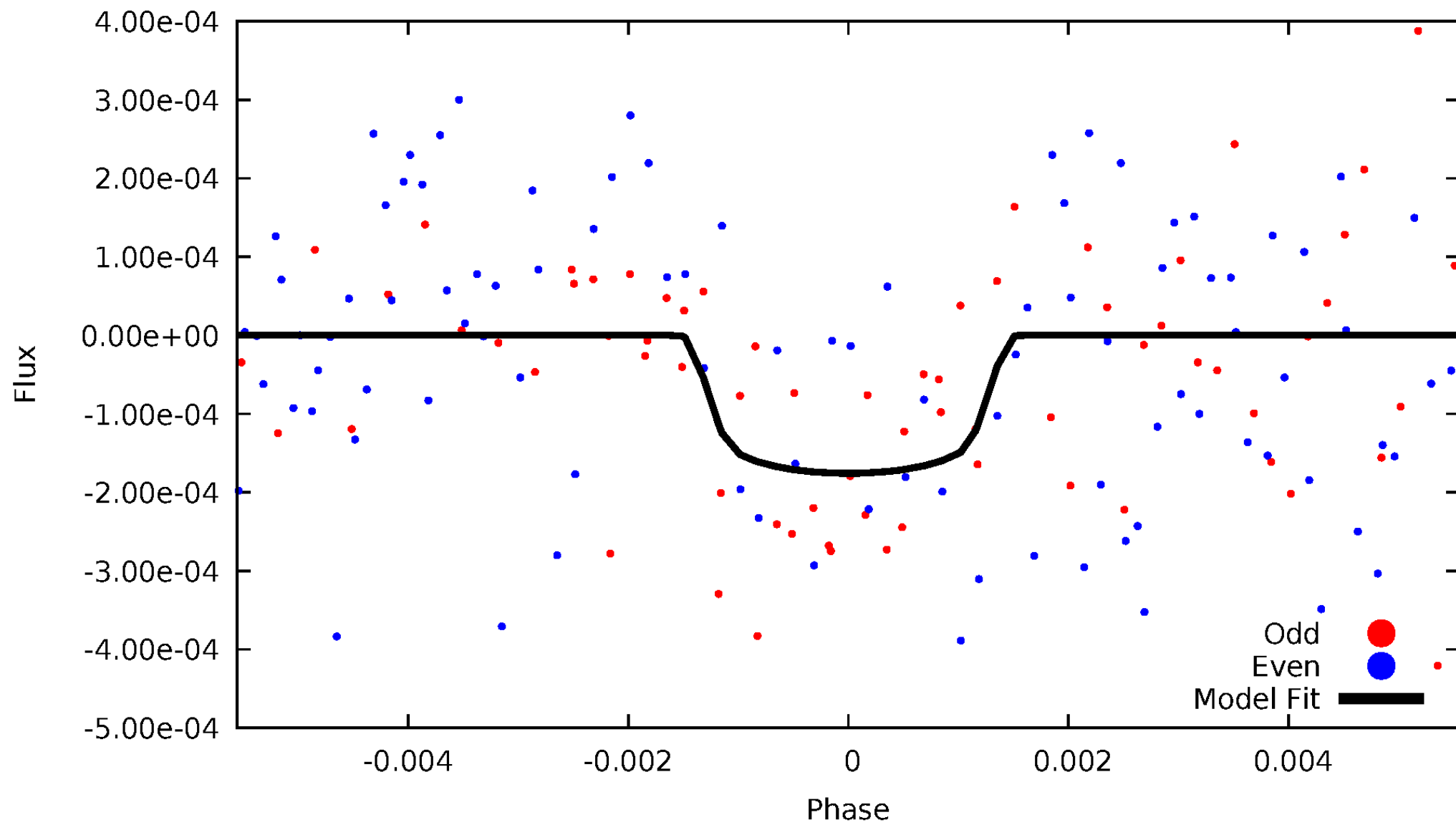


TCE 002444769-05



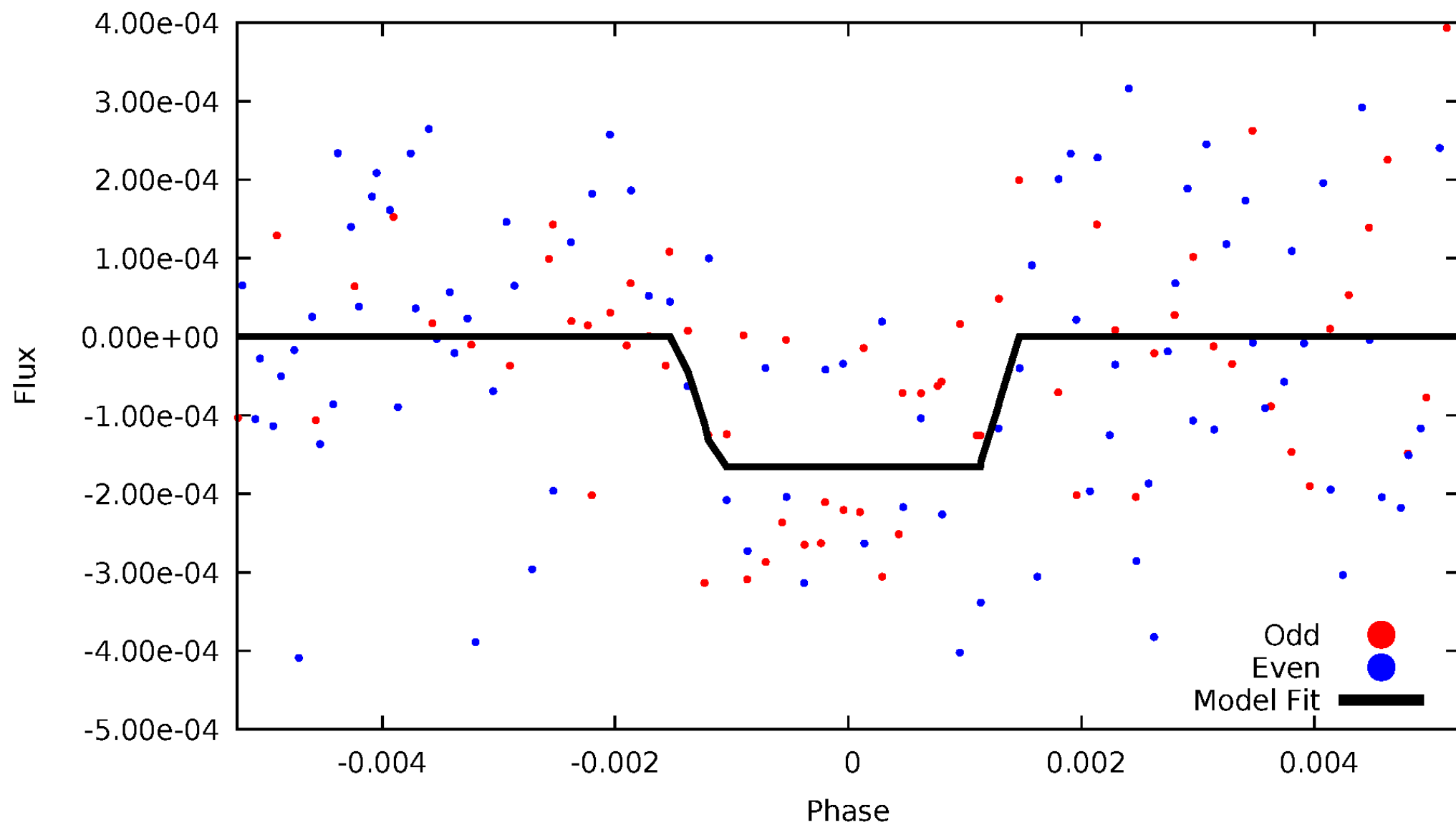
# DV Odd/Even

TCE 002444769-05



# ALT Odd/Even

TCE 002444769-05

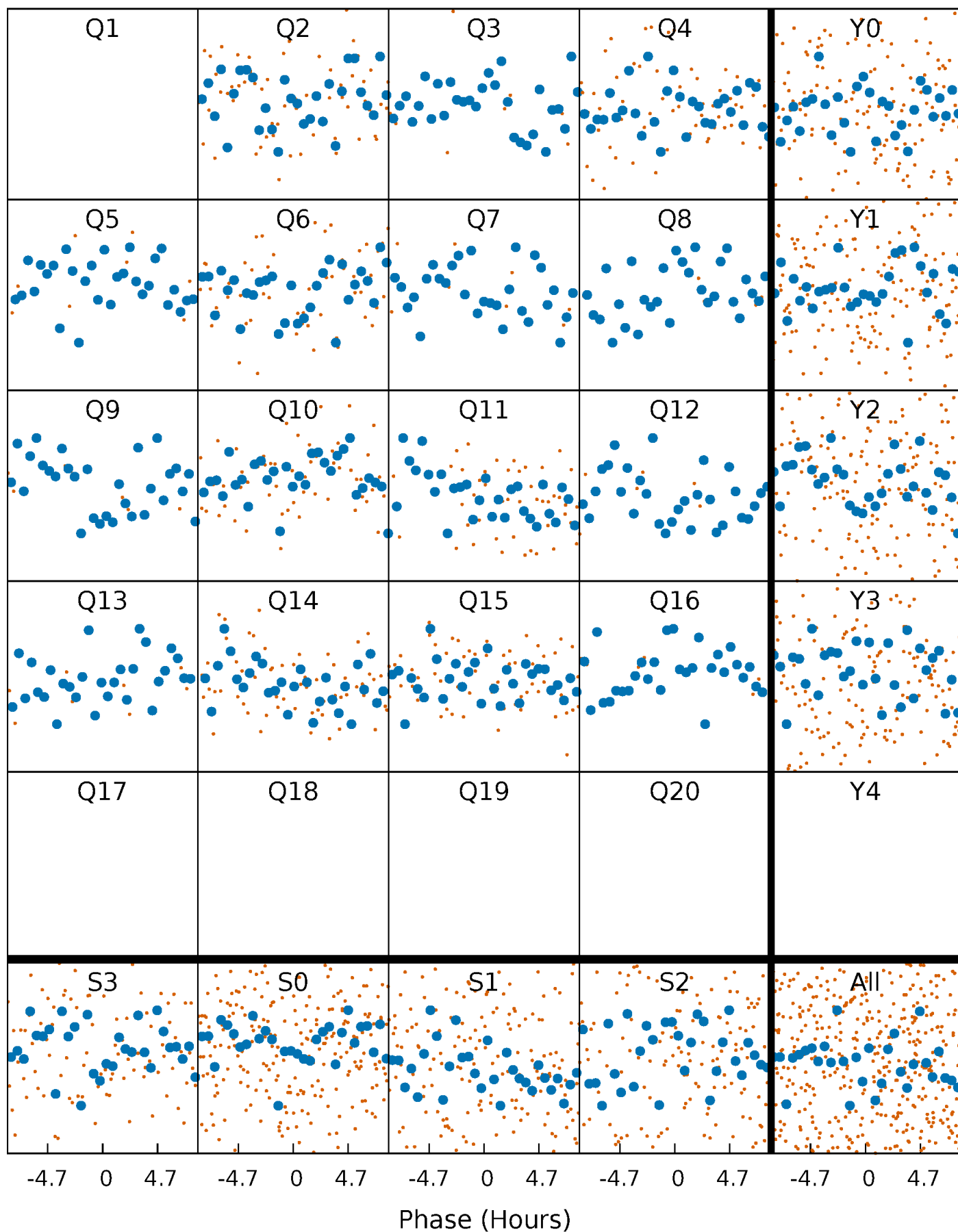






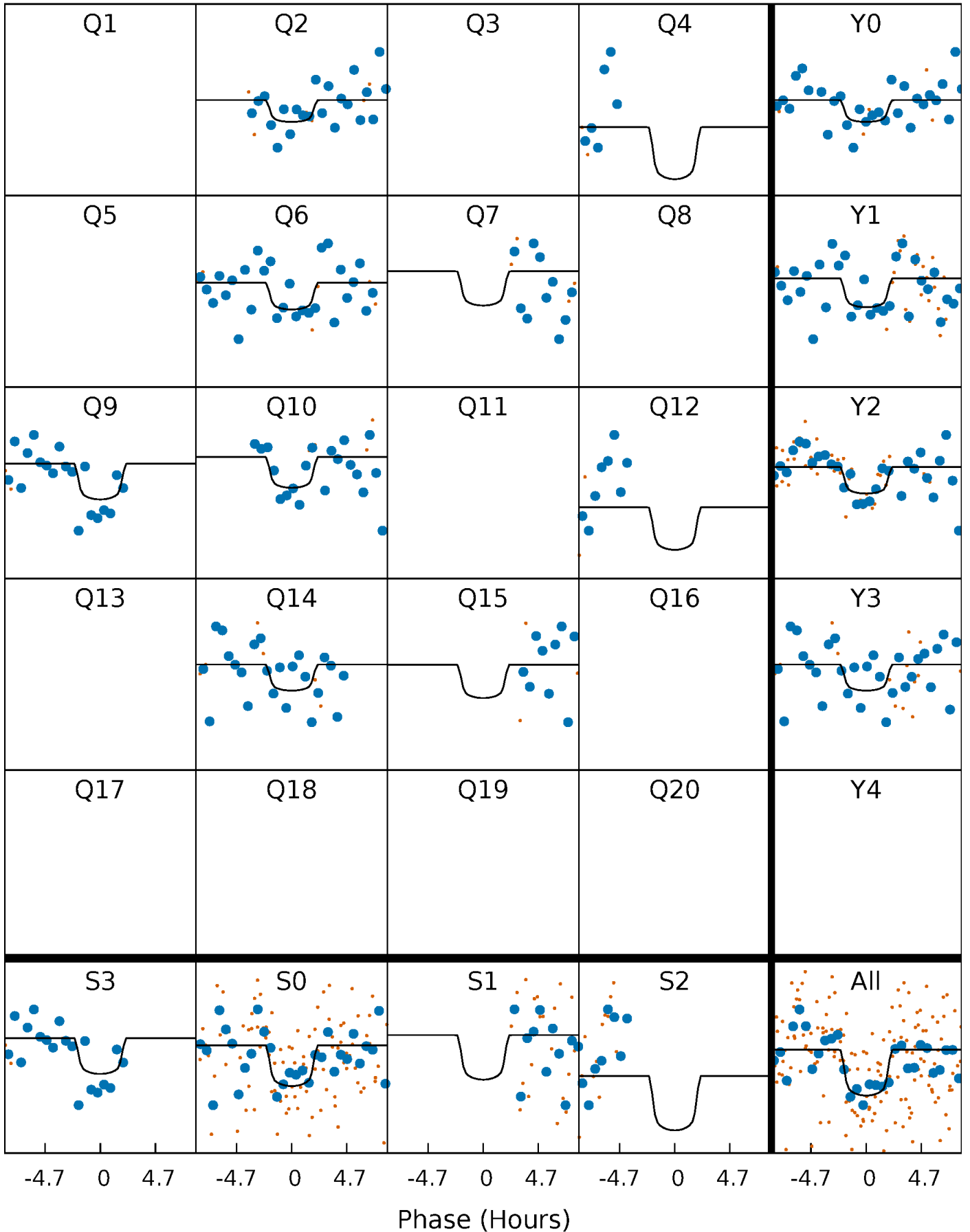
# PDC Quarter-Phased Transit Curves

TCE 002444769-05   P= 61.276073 Days    $T_0=175.297370$  (BKJD)



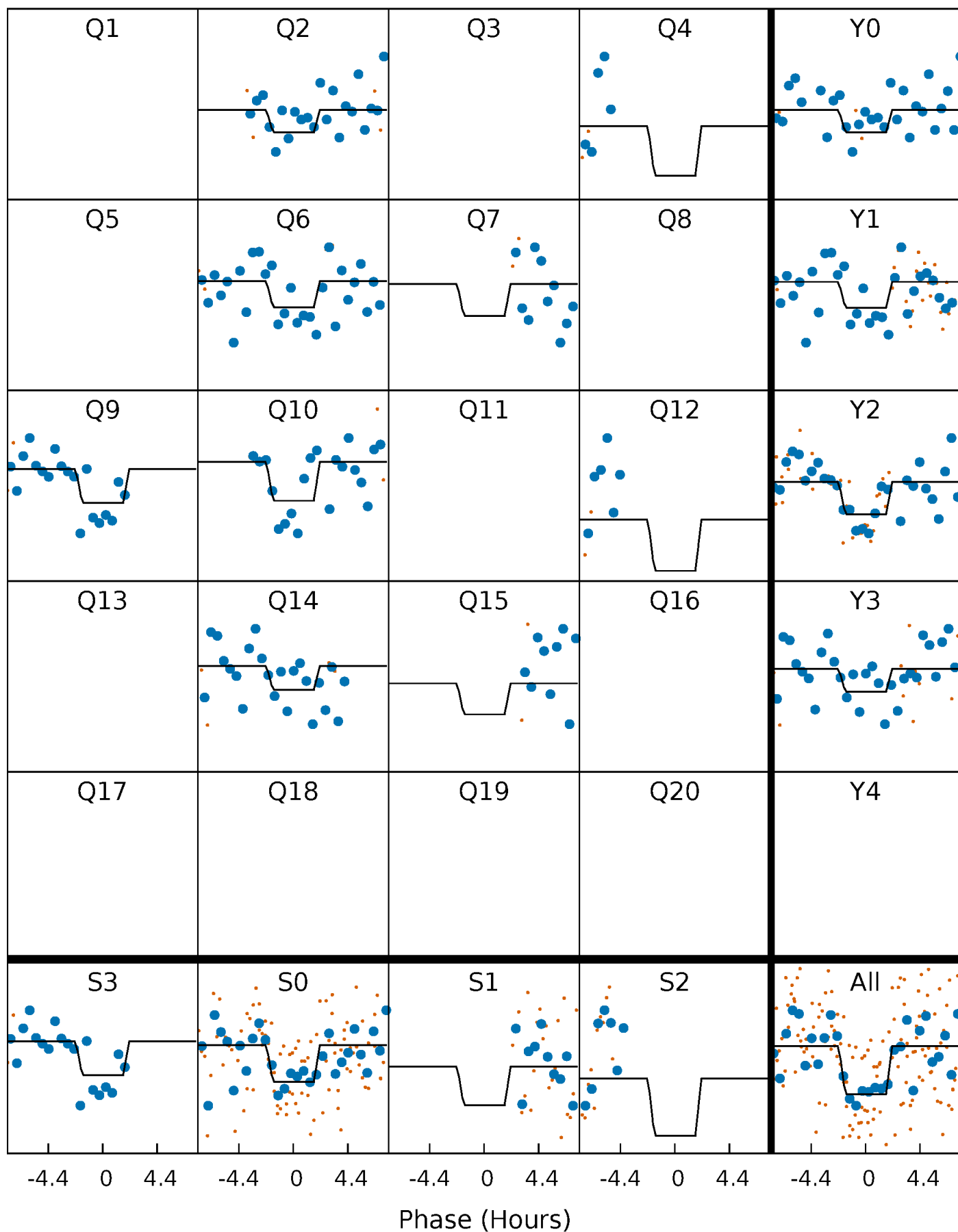
# DV Quarter-Phased Transit Curves

TCE 002444769-05   P= 61.276073 Days    $T_0=175.297370$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

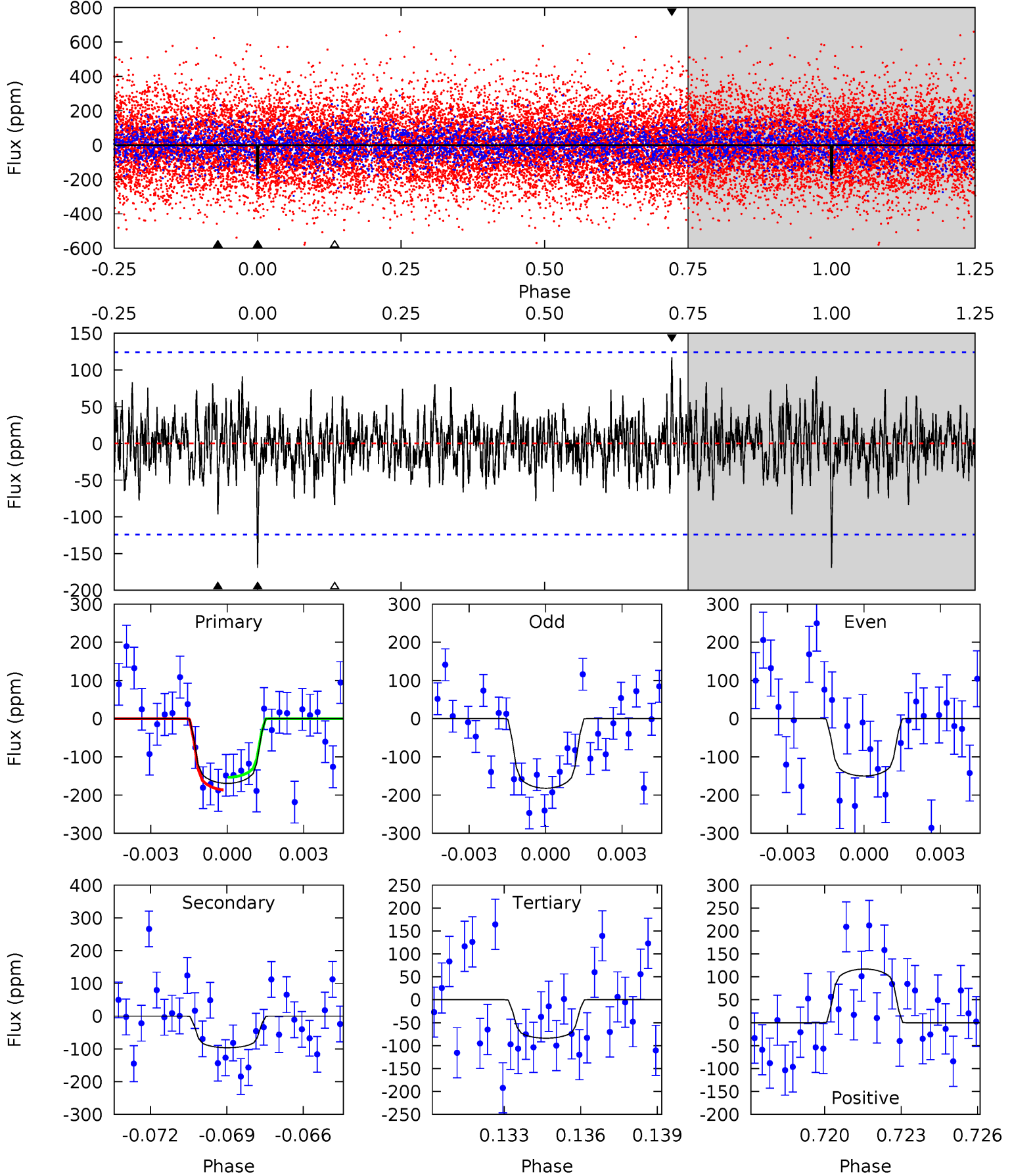
TCE 002444769-05    P= 61.276160 Days     $T_0=175.299863$  (BKJD)



# DV Model-Shift Uniqueness Test

002444769-05, P = 61.276073 Days, E = 114.021297 Days

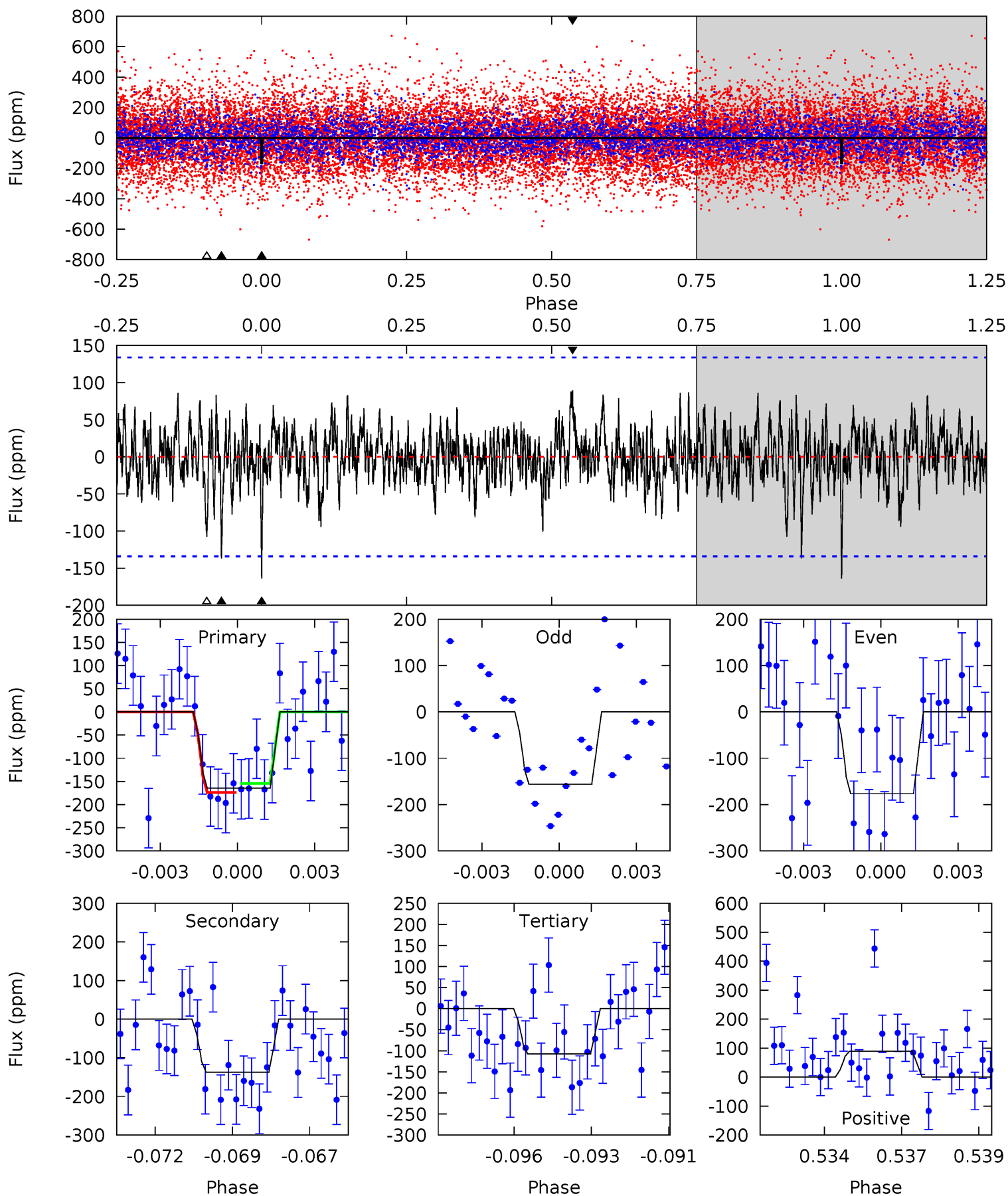
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.16	4.08	3.54	4.95	5.25	2.97	1.17	3.62	2.22	0.54	-0.87	0.67	1.04	0.41	0.70



# Alt Model-Shift Uniqueness Test

002444769-05, P = 61.276160 Days, E = 114.023703 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.46	5.39	4.23	3.52	5.27	3.00	1.19	2.23	2.94	1.16	1.87	0.40	0.98	0.35	0.38



### Stellar Parameters For KIC 002444769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6450^{+162}_{-194}$	$4.421^{+0.081}_{-0.202}$	$-0.520^{+0.300}_{-0.300}$	$1.022^{+0.308}_{-0.123}$	$1.004^{+0.133}_{-0.106}$	$1.325^{+0.467}_{-0.675}$
	+3%/-3%	+2%/-5%	+58%/-58%	+30%/-12%	+13%/-11%	+35%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 002444769-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-97 \pm 24$	$1.77^{+1.29}_{-1.02}$	$736^{+56}_{-37}$	$5234^{+2813}_{-1047}$	$1566^{+7394}_{-1062}$
Alt.	$-137 \pm 25$	$1.76^{+1.25}_{-1.09}$	$739^{+54}_{-37}$	$5678^{+3894}_{-1152}$	$2316^{+11881}_{-1560}$

$T_{\text{max}}$  = 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

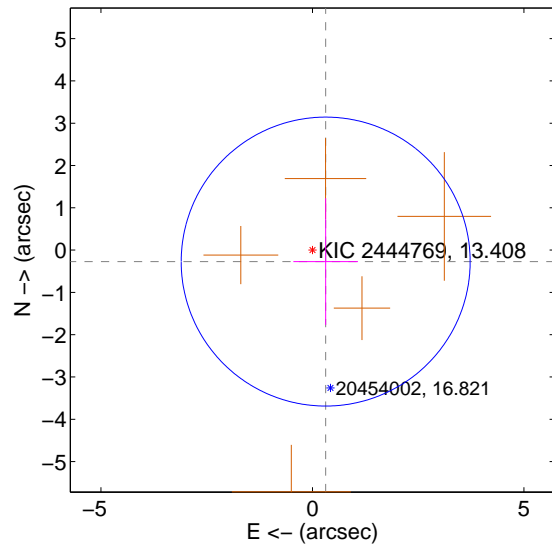
Supplemental centroid analysis for 002444769-05. Kepler magnitude: 13.41. Transit SNR 7.65

There are 0 quarters with good PRF difference image offsets

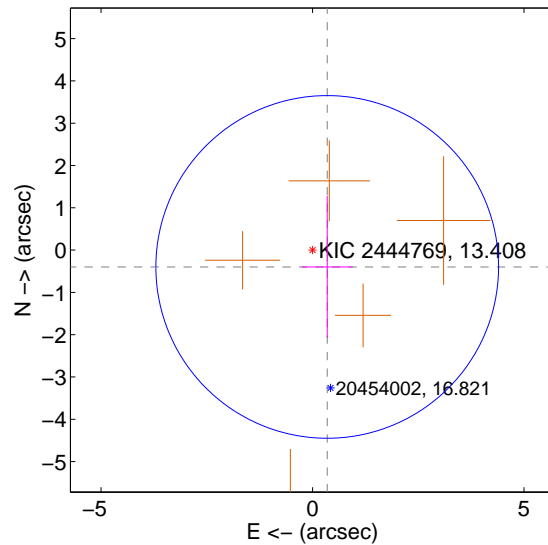
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.414 \pm 1.139$	0.36	$-0.313 \pm 0.763$	$-0.272 \pm 1.498$
PRF-fit source offset from KIC position	$0.528 \pm 1.350$	0.39	$-0.347 \pm 0.603$	$-0.398 \pm 1.678$
photometric centroid source offset	$1.34 \pm 1.14$	1.17	$-0.38 \pm 1.08$	$1.29 \pm 1.15$

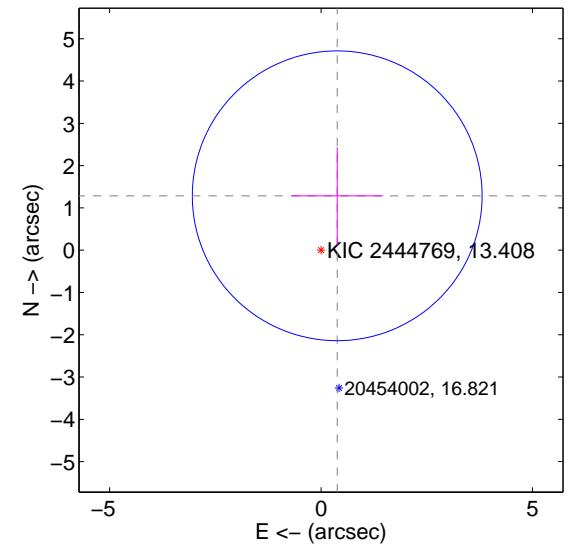
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

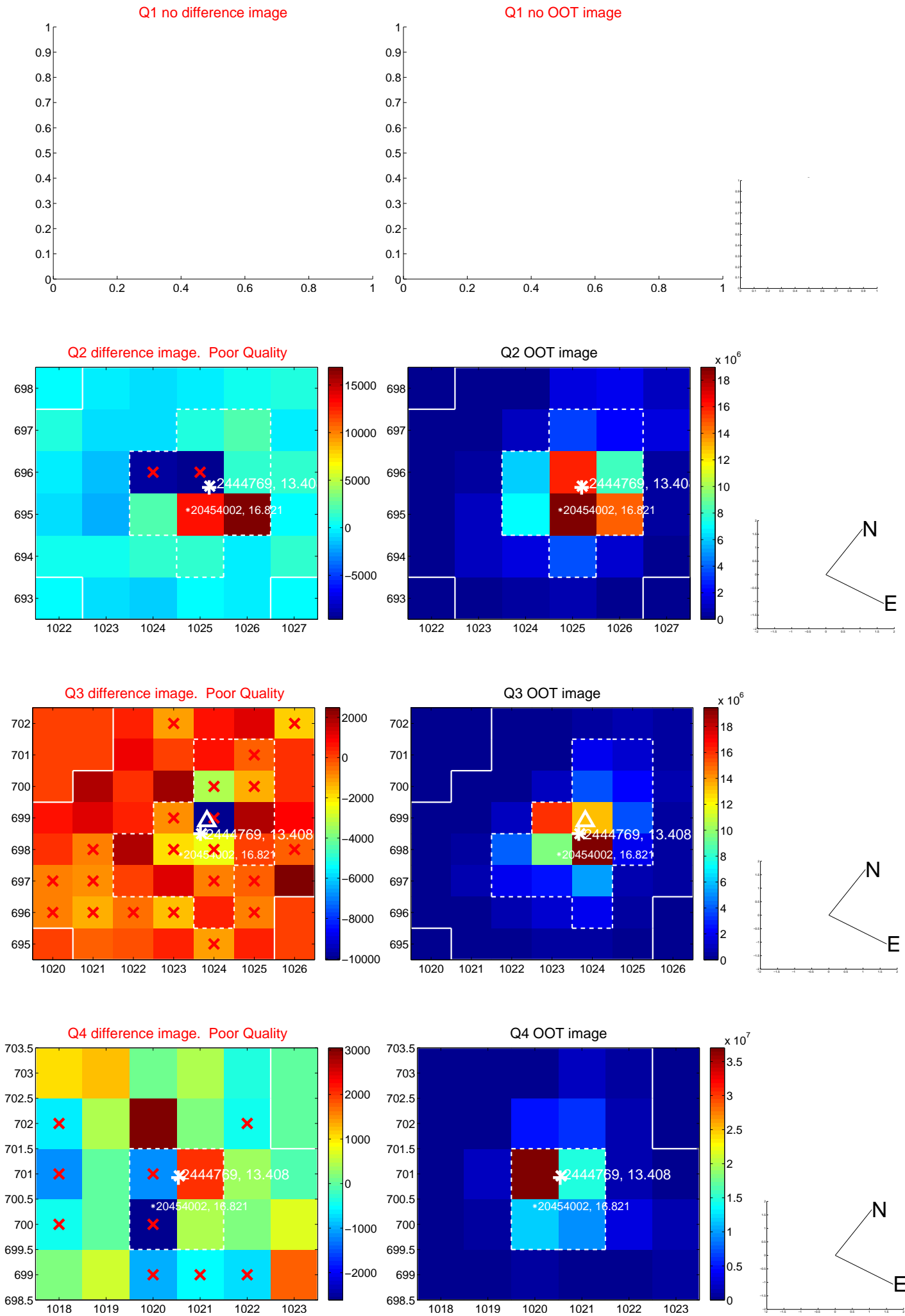


offset from photometric centroids

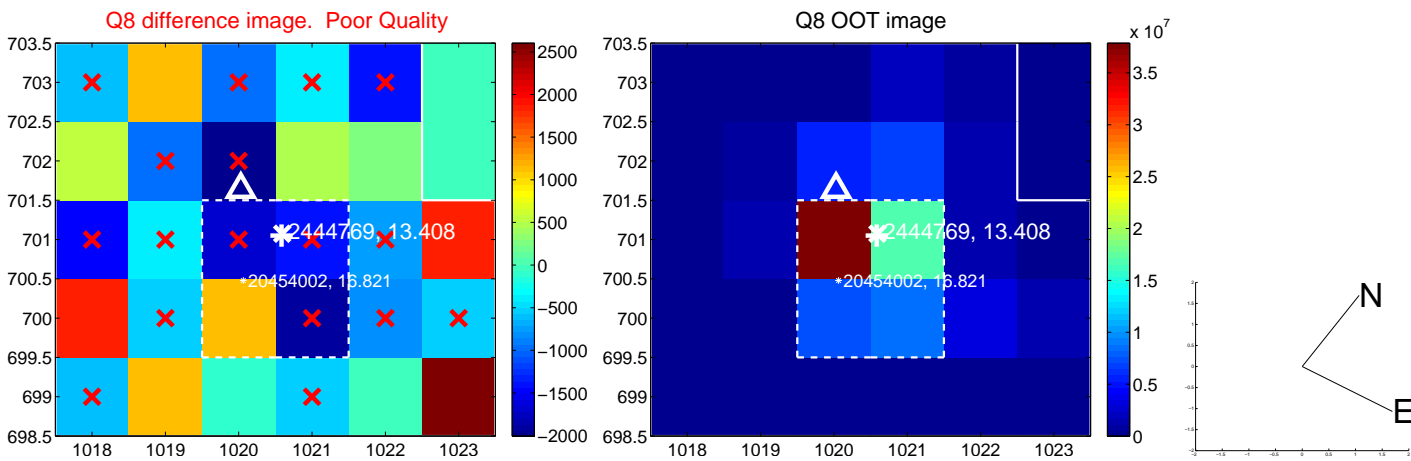
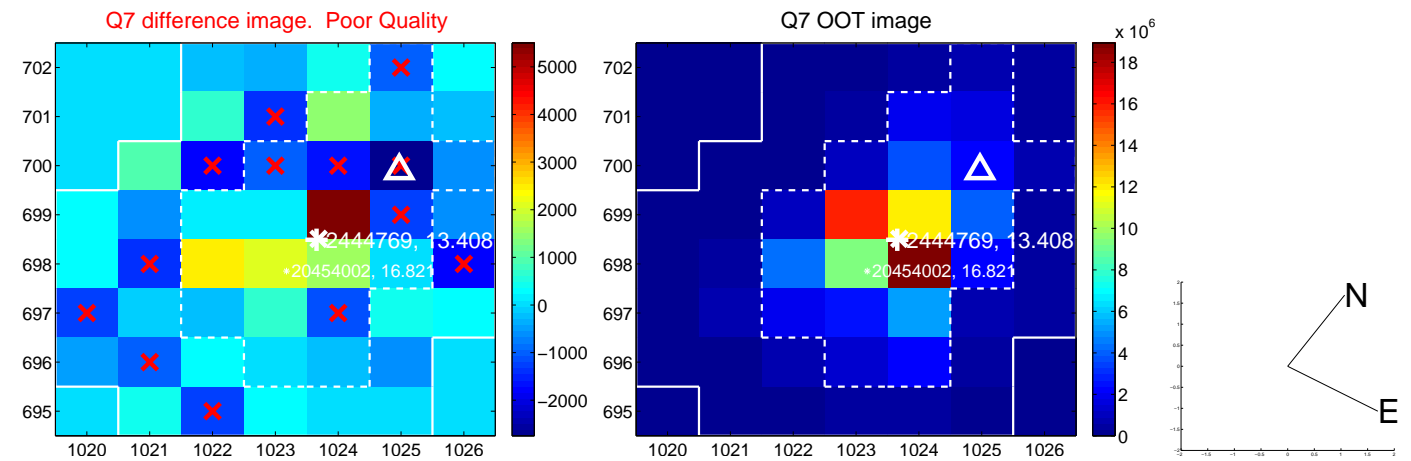
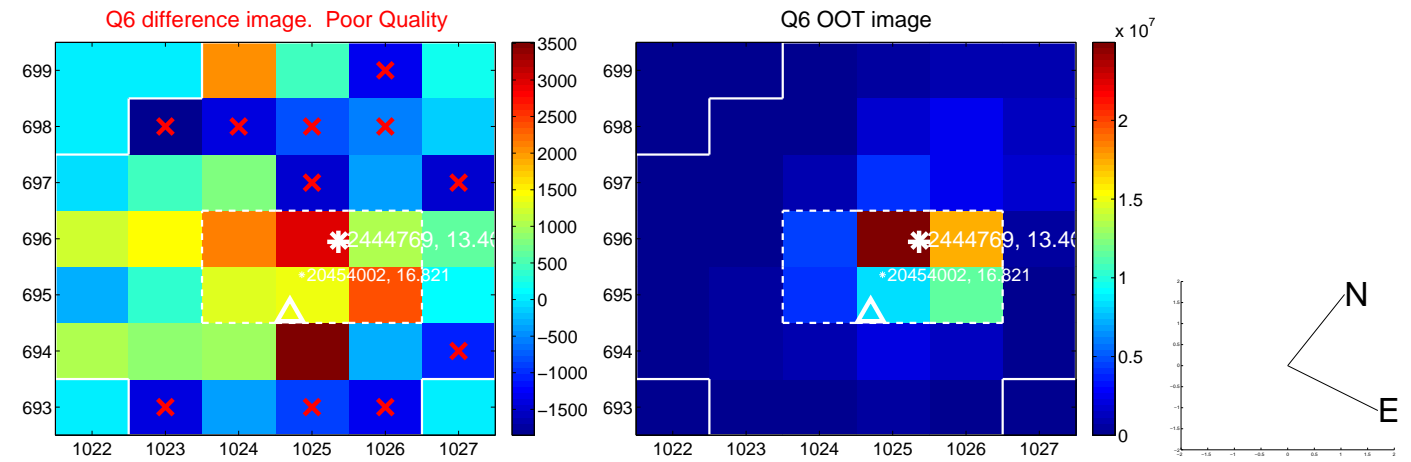
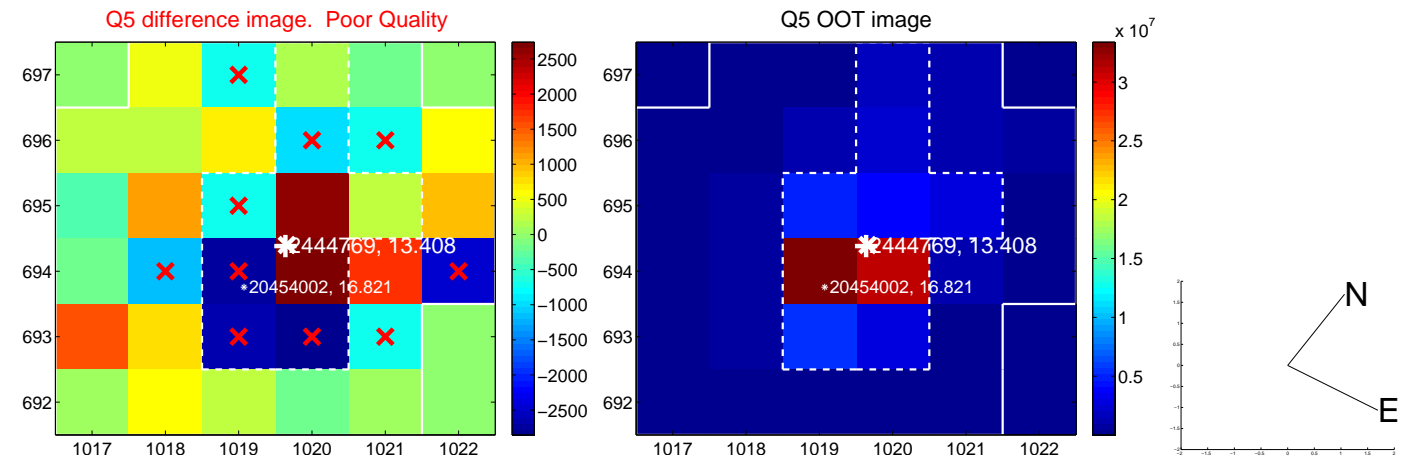


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

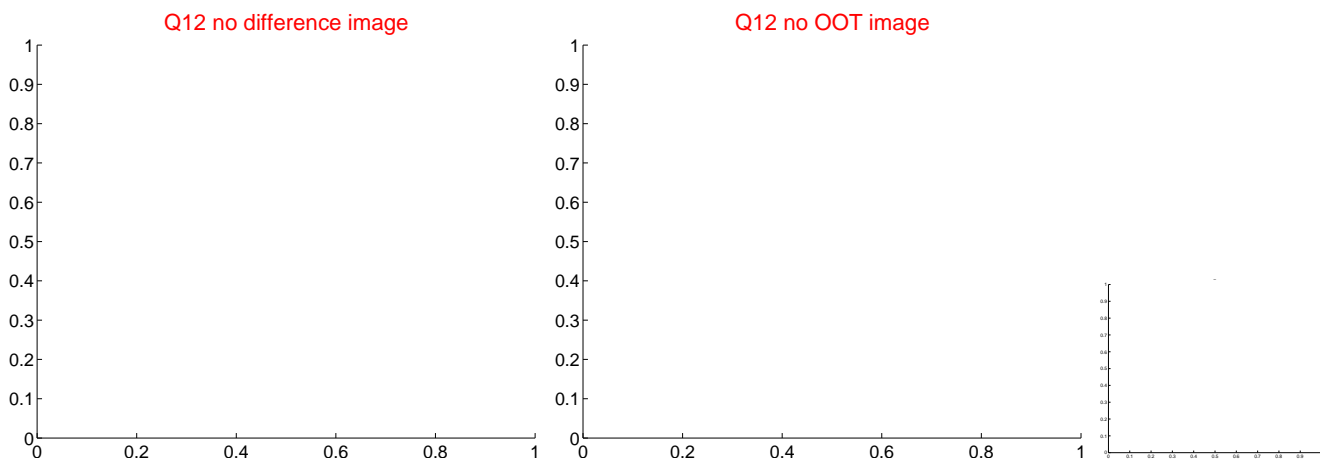
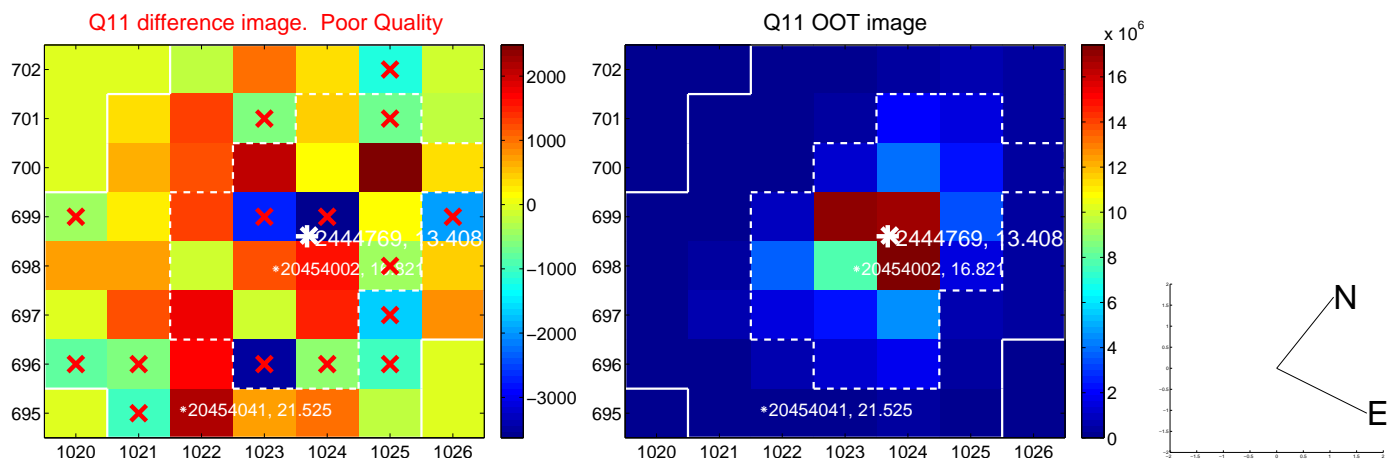
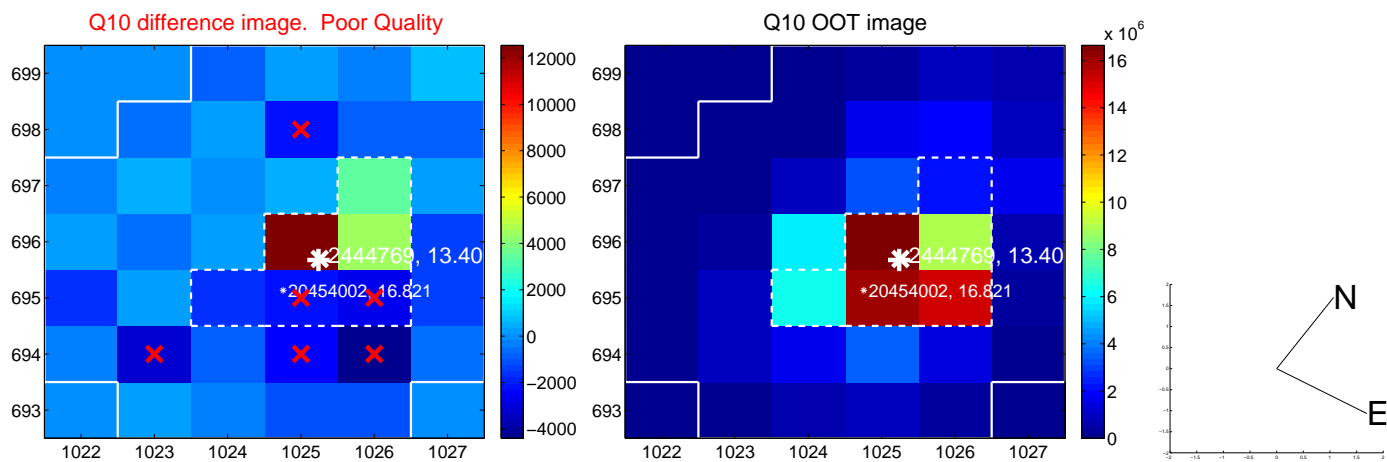
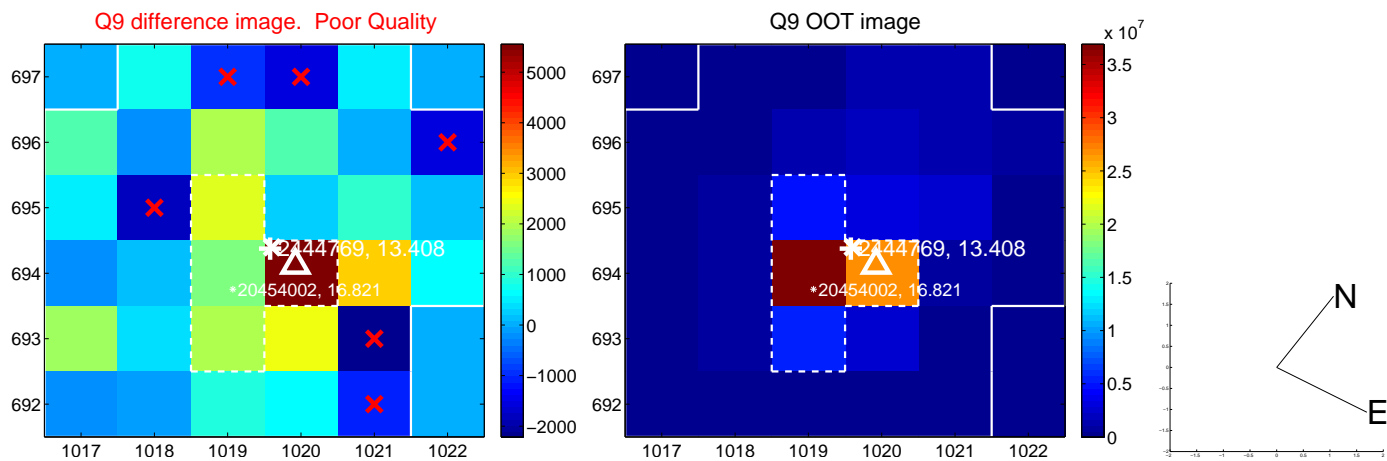
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



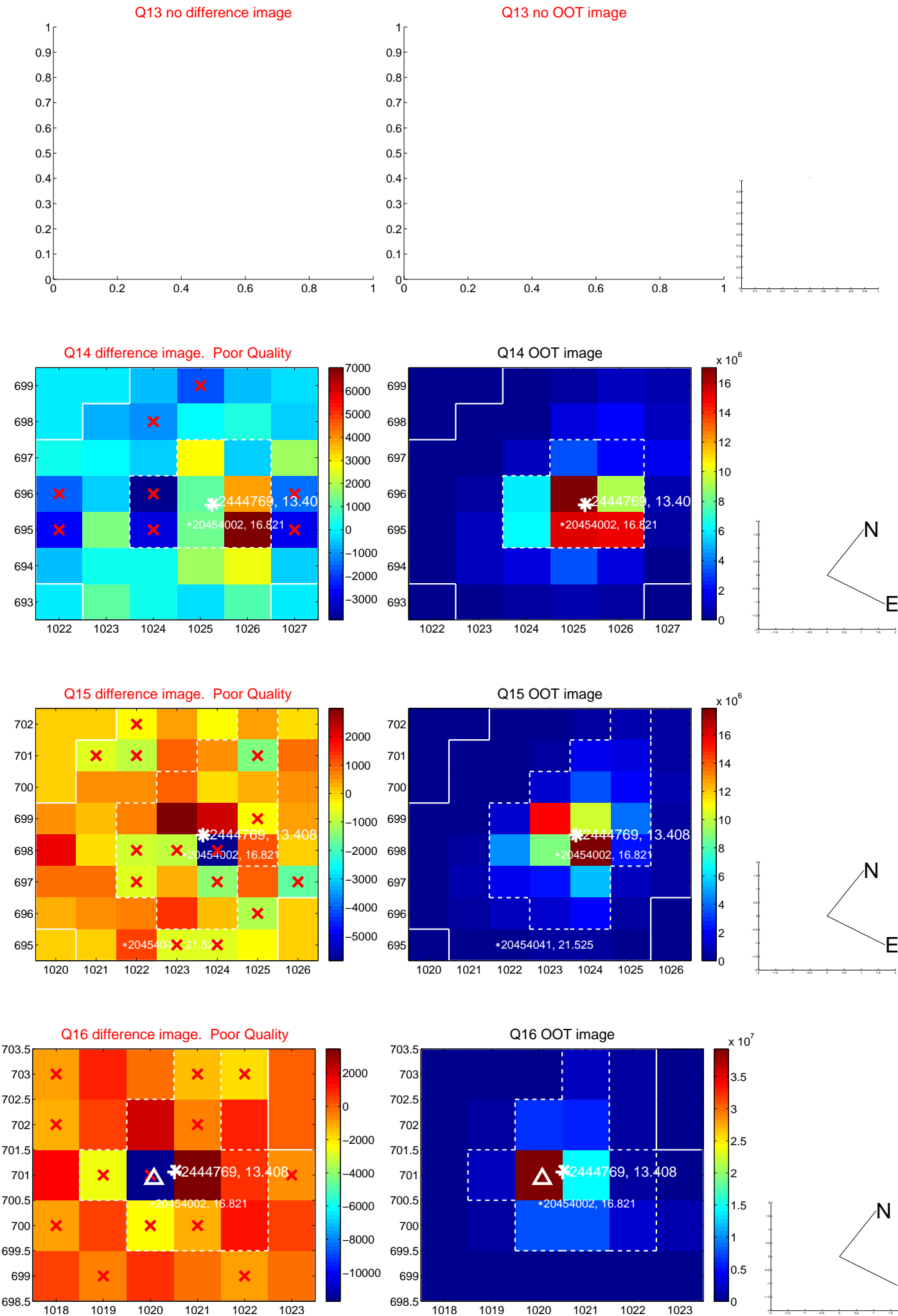
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



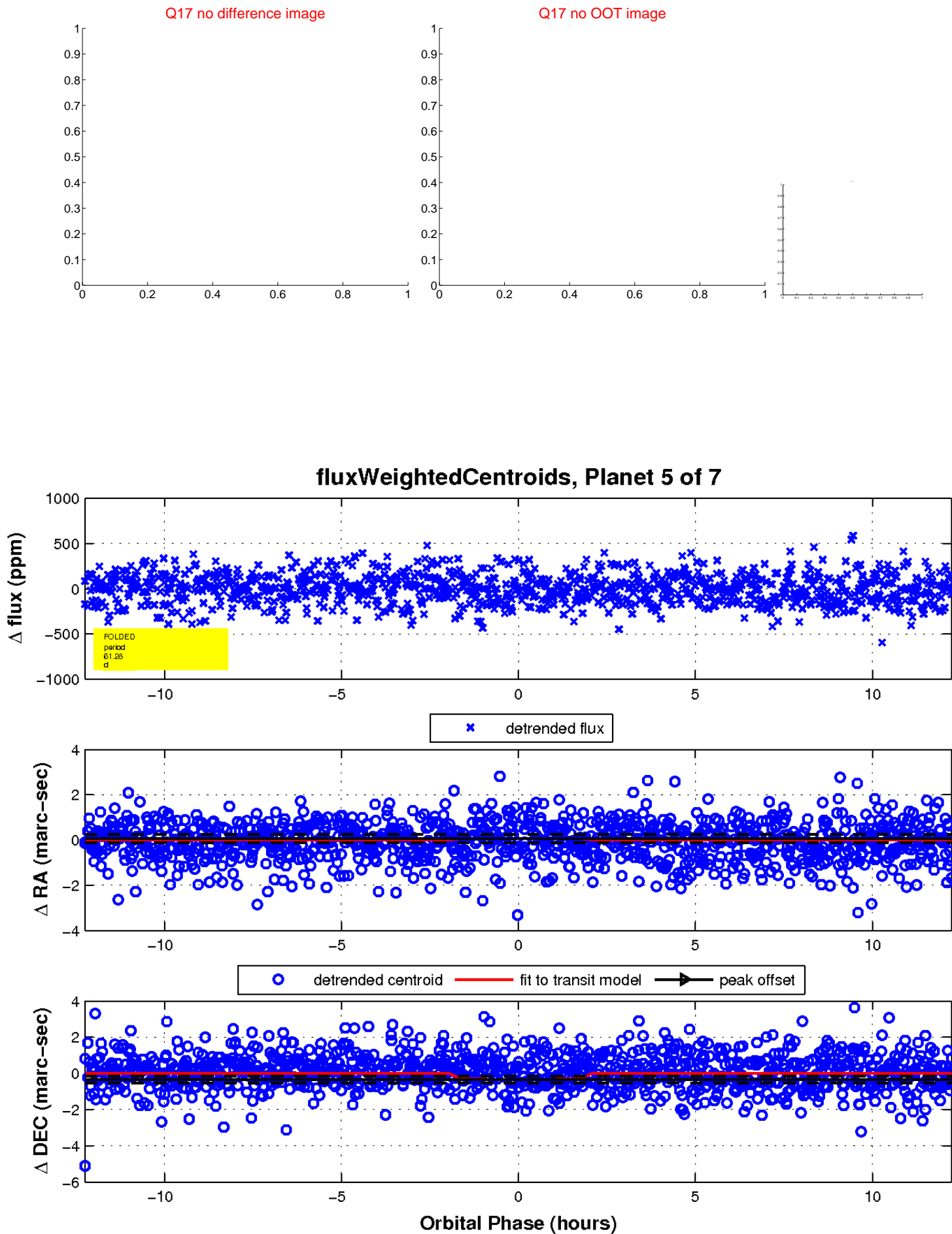
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

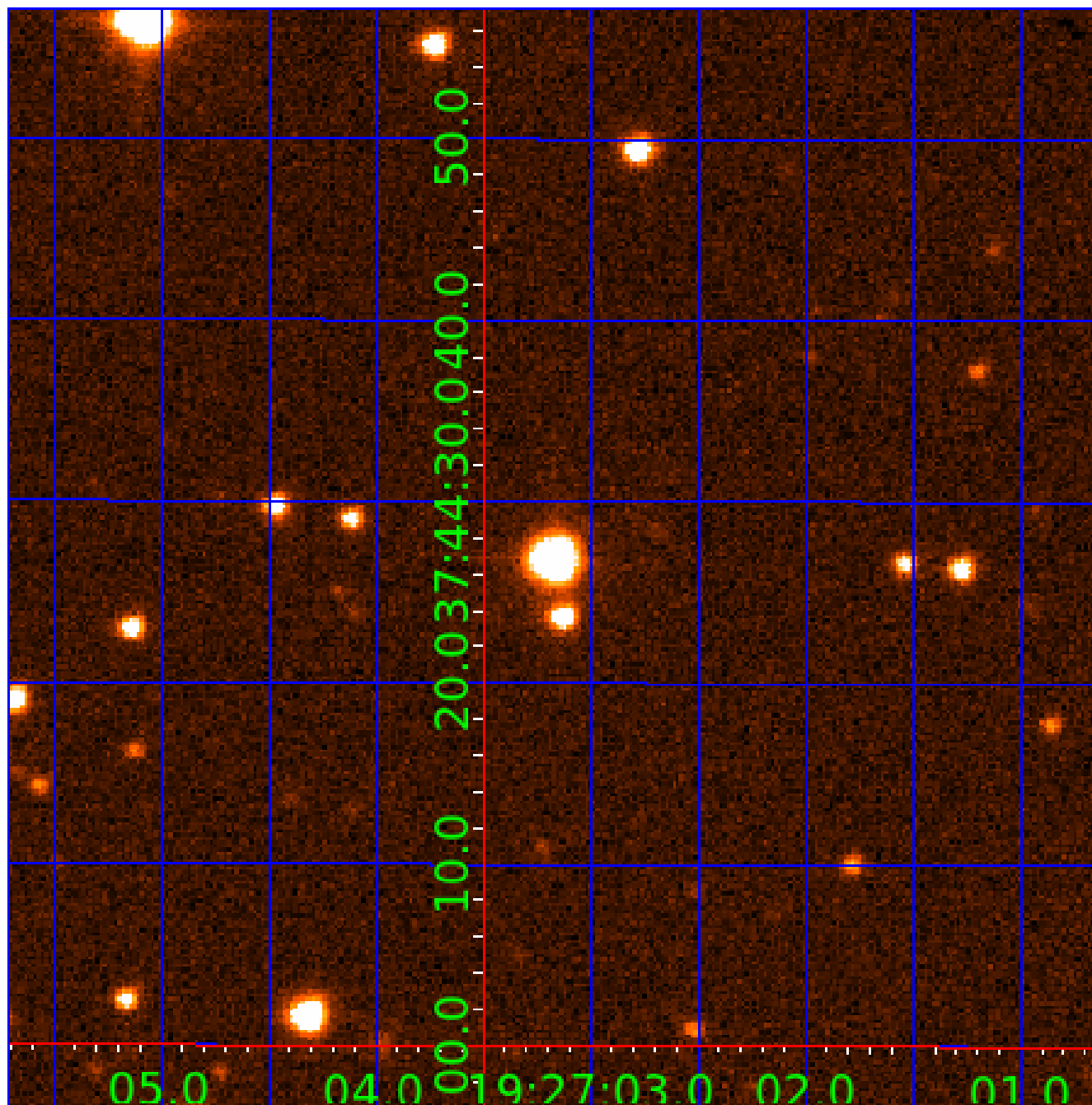


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 002444769

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002444769-01	OBS	No	3.001337	133.226612	16.1	18.084	7.8	7.2	1.02	6450	0.41	973.53
002444769-02	OBS	No	125.774820	201.647831	292.4	5.686	12.3	9.9	1.02	6450	1.93	6.69
002444769-03	OBS	No	102.071699	146.923760	149.9	4.921	7.7	7.8	1.02	6450	1.42	8.84
002444769-05	OBS	No	61.276073	175.297370	175.9	4.082	7.4	7.7	1.02	6450	1.58	17.45
002444769-06	OBS	No	63.555015	151.870476	162.0	7.072	8.0	7.7	1.02	6450	1.45	16.62
002444769-07	OBS	No	169.959063	155.423564	252.7	2.430	7.1	7.2	1.02	6450	1.90	4.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002444769-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002444769-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002444769-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002444769-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002444769-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002444769-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

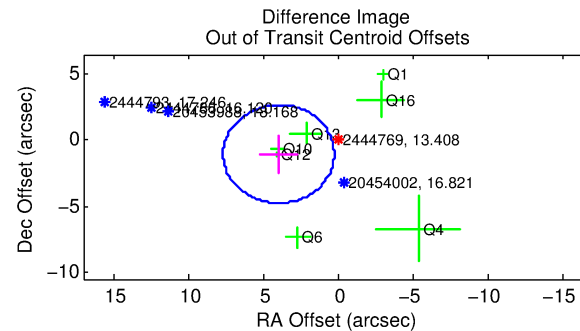
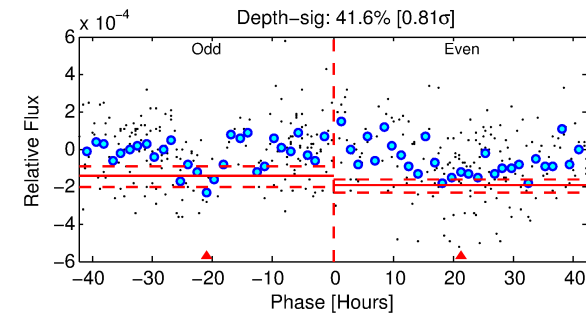
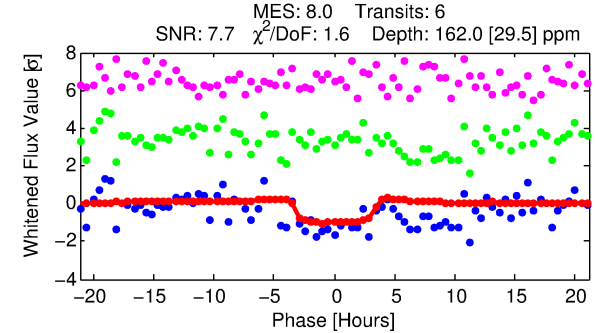
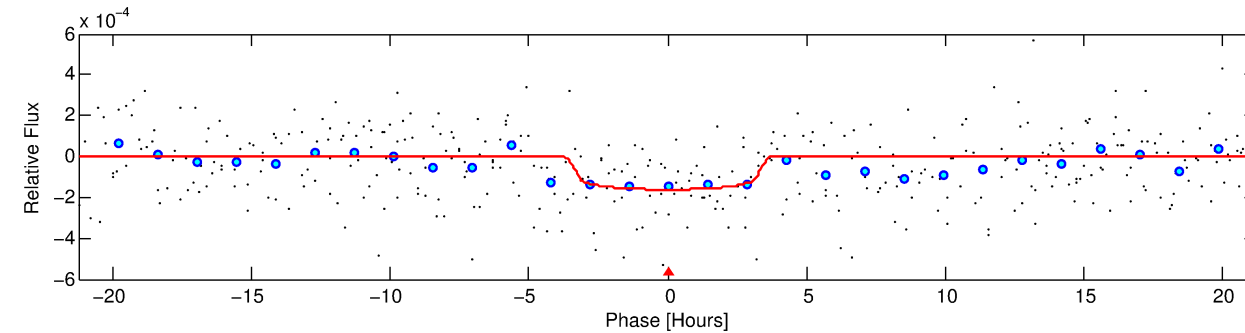
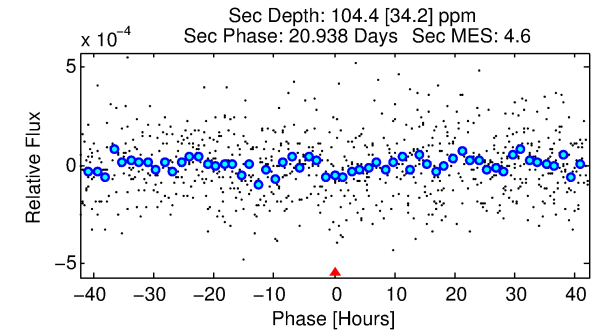
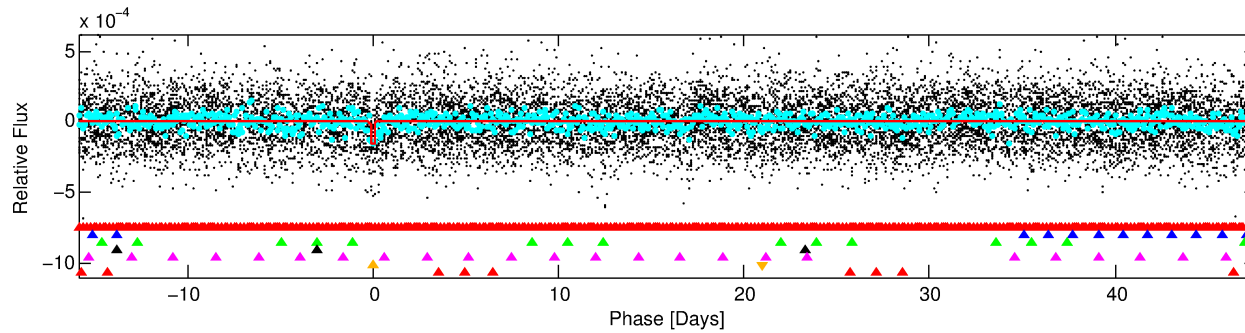
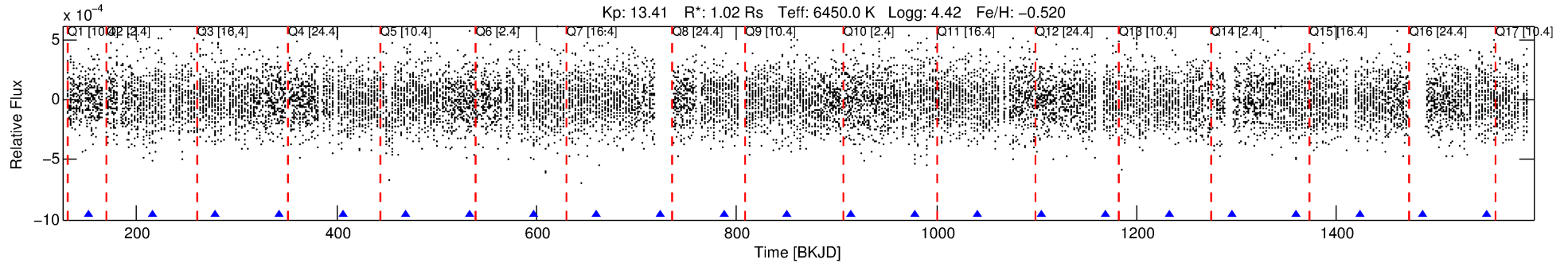
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002444769-06

No Significant Match Found

# DV One-Page Summary

KIC: 2444769 Candidate: 6 of 7 Period: 63.555 d



## DV Fit Results:

Period = 63.55502 [0.00148] d  
Epoch = 151.8705 [0.0179] BKJD  
Rp/R\* = 0.0130 [0.0099]  
a/R\* = 40.37 [173.23]  
b = 0.83 [1.68]  
Seff = 16.62 [6.46]  
Teq = 515 [50] K  
Rp = 1.45 [1.19] Re  
a = 0.3122 [0.0792] AU  
Ag = 2657.67 [4268.20] [0.62σ]  
Teffp = 5715 [2240] K [2.32σ]

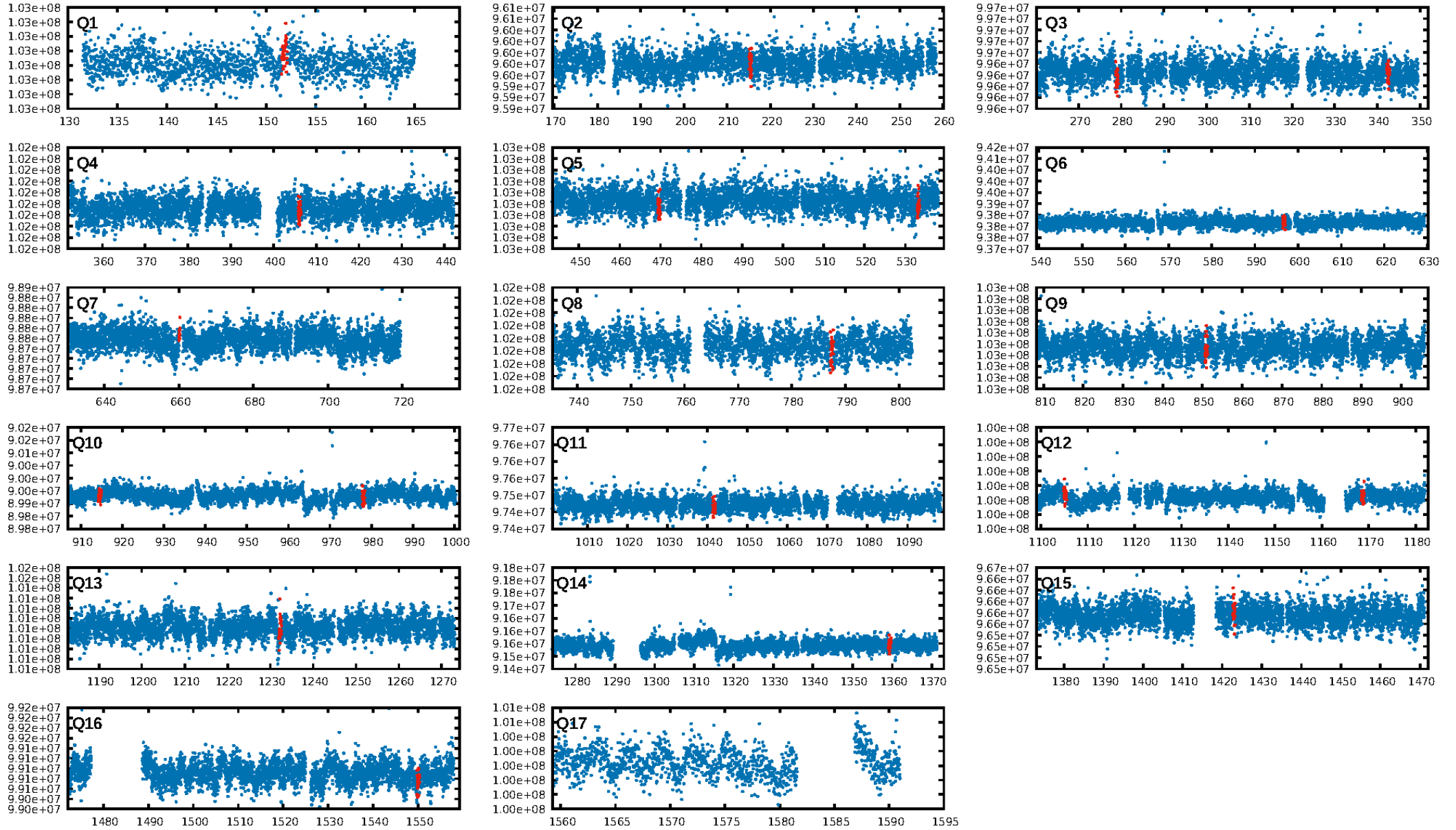
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.70σ]  
LongPeriod-sig: 100.0% [107.29σ]  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 95.9%  
**Bootstrap-pfa: 1.92e-09**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -1.343  
**Centroid-sig: 0.0%**  
Centroid-so: 2.254 arcsec [2.29σ]  
**OotOffset-rm: 4.077 arcsec [3.30σ]**  
**KicOffset-rm: 4.109 arcsec [3.07σ]**  
OotOffset-st: 2/0/3/2 [7]  
KicOffset-st: 2/0/3/2 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.36 [5/14]

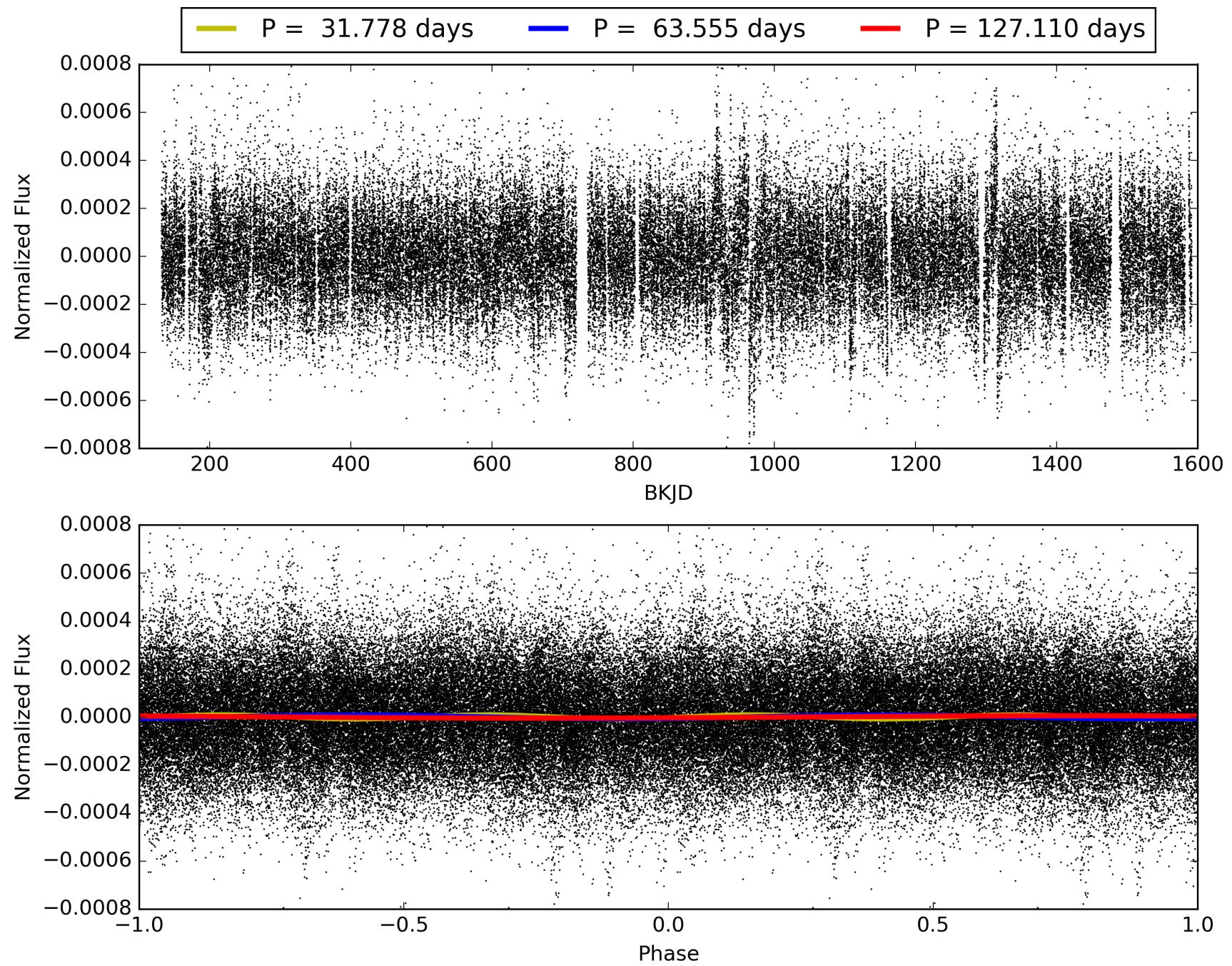
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:46:30 Z

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

# TCE 002444769-06, PDC Light Curves

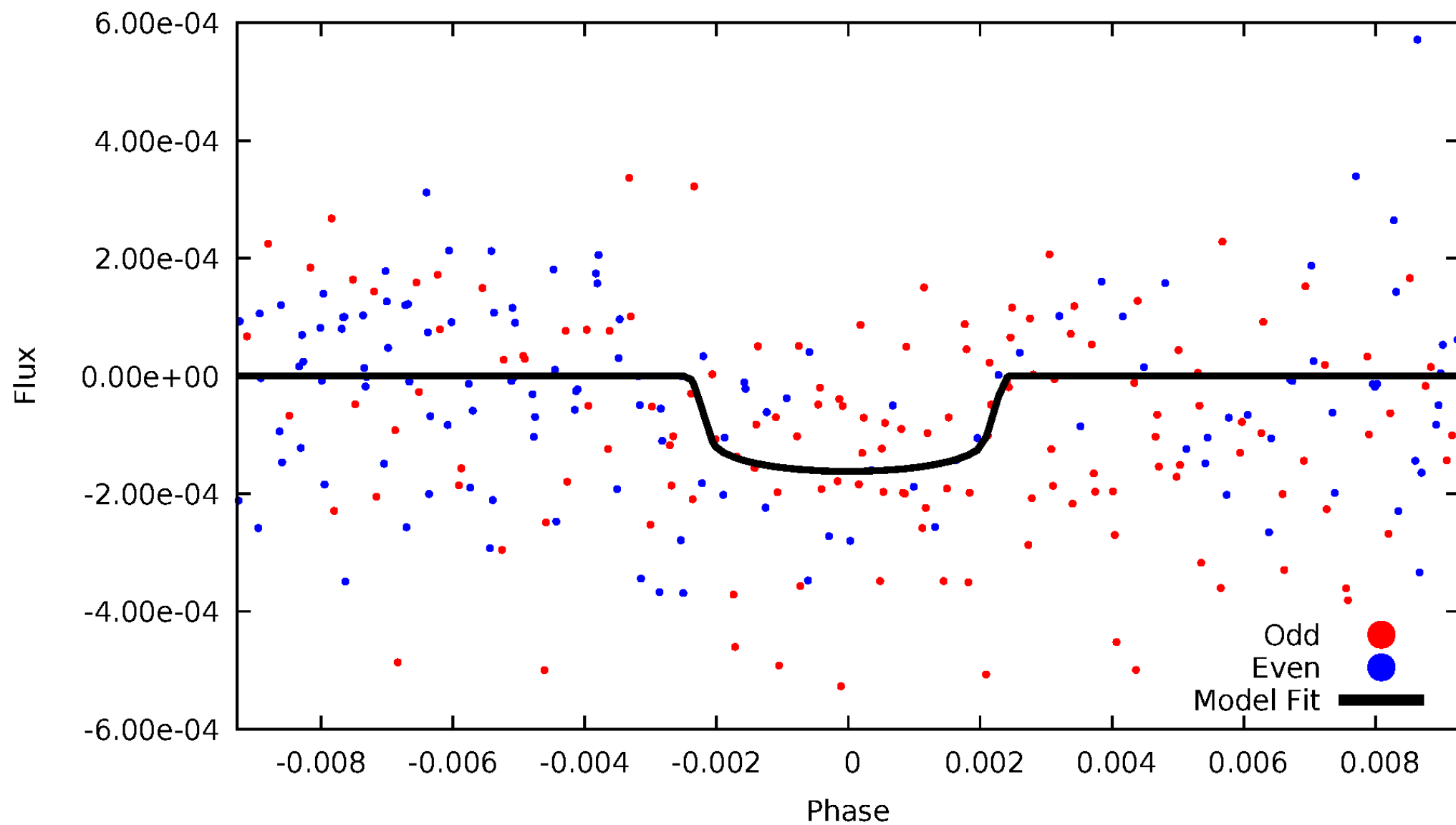


TCE 002444769-06



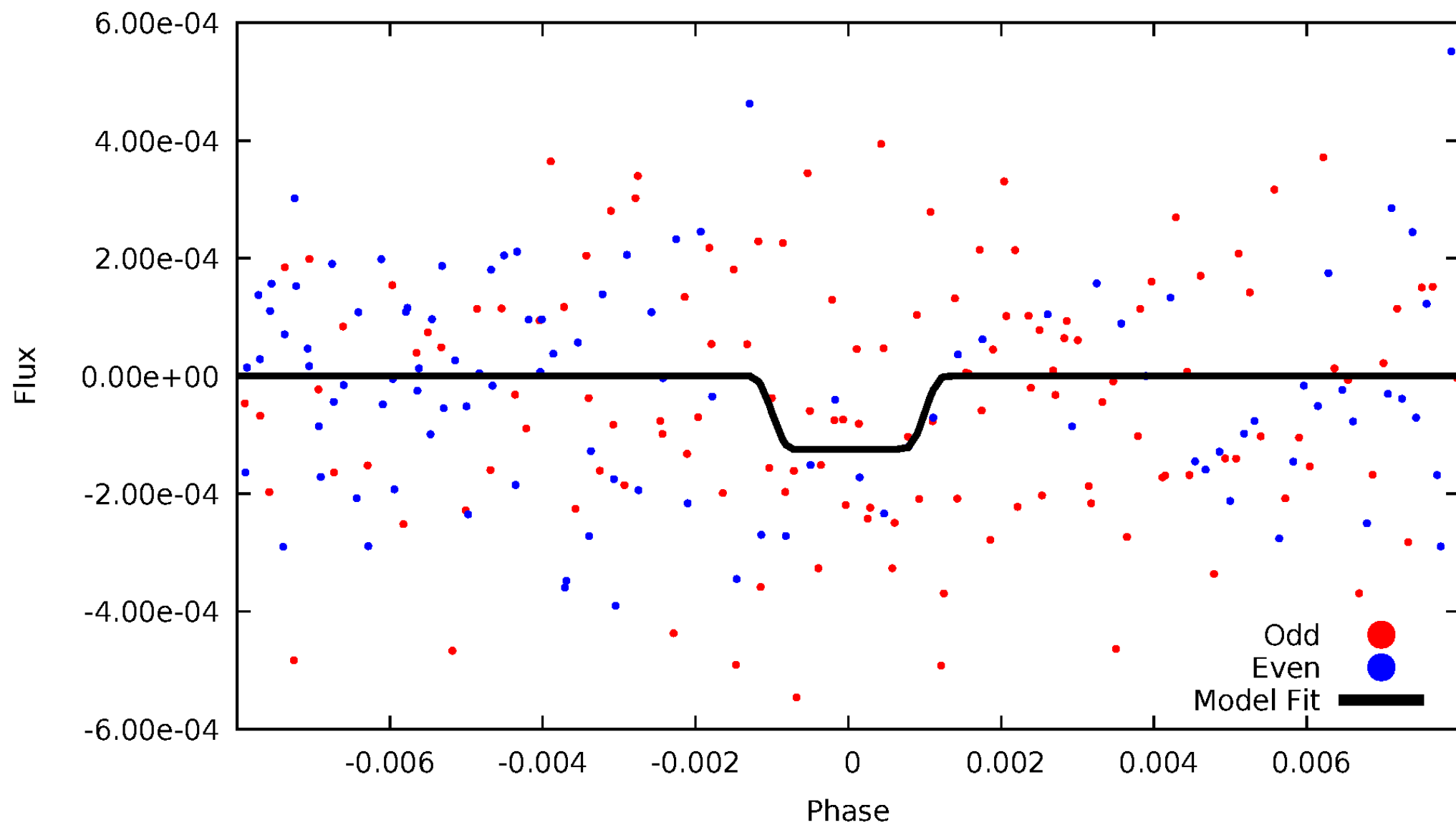
# DV Odd/Even

TCE 002444769-06



# ALT Odd/Even

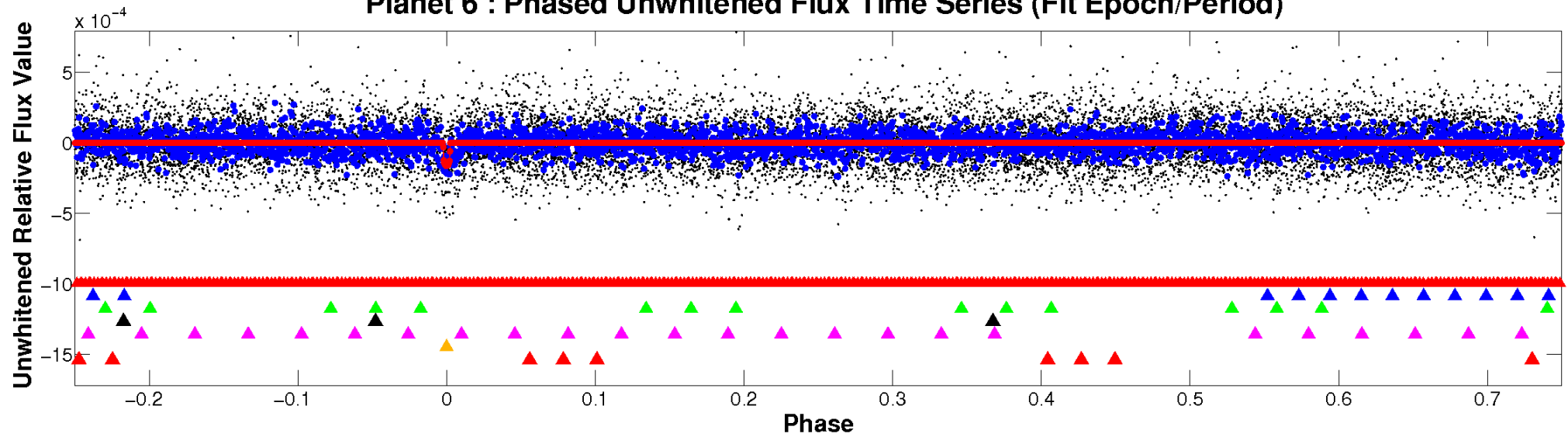
TCE 002444769-06



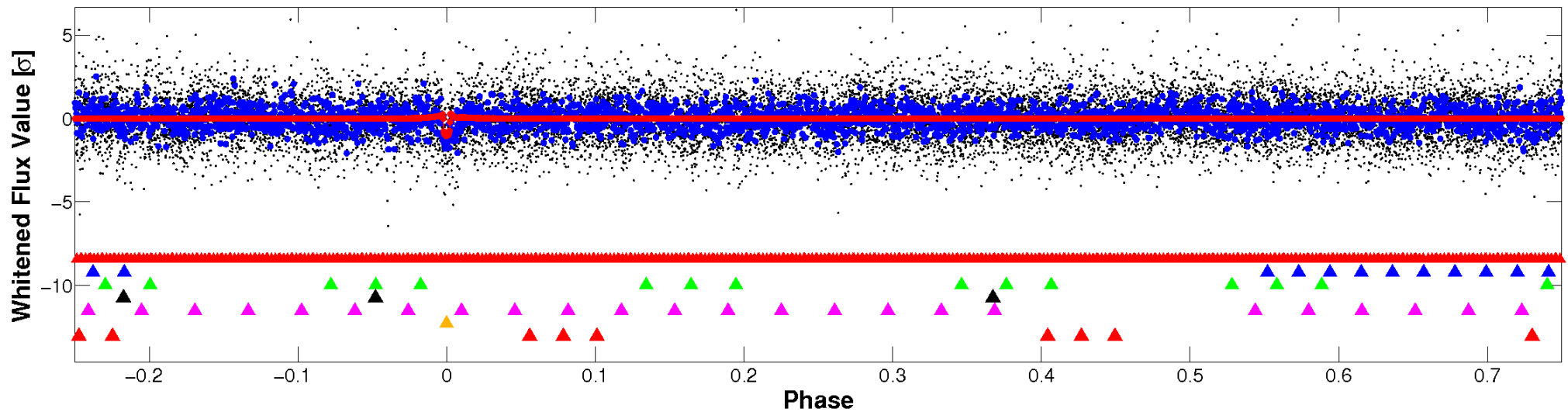


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



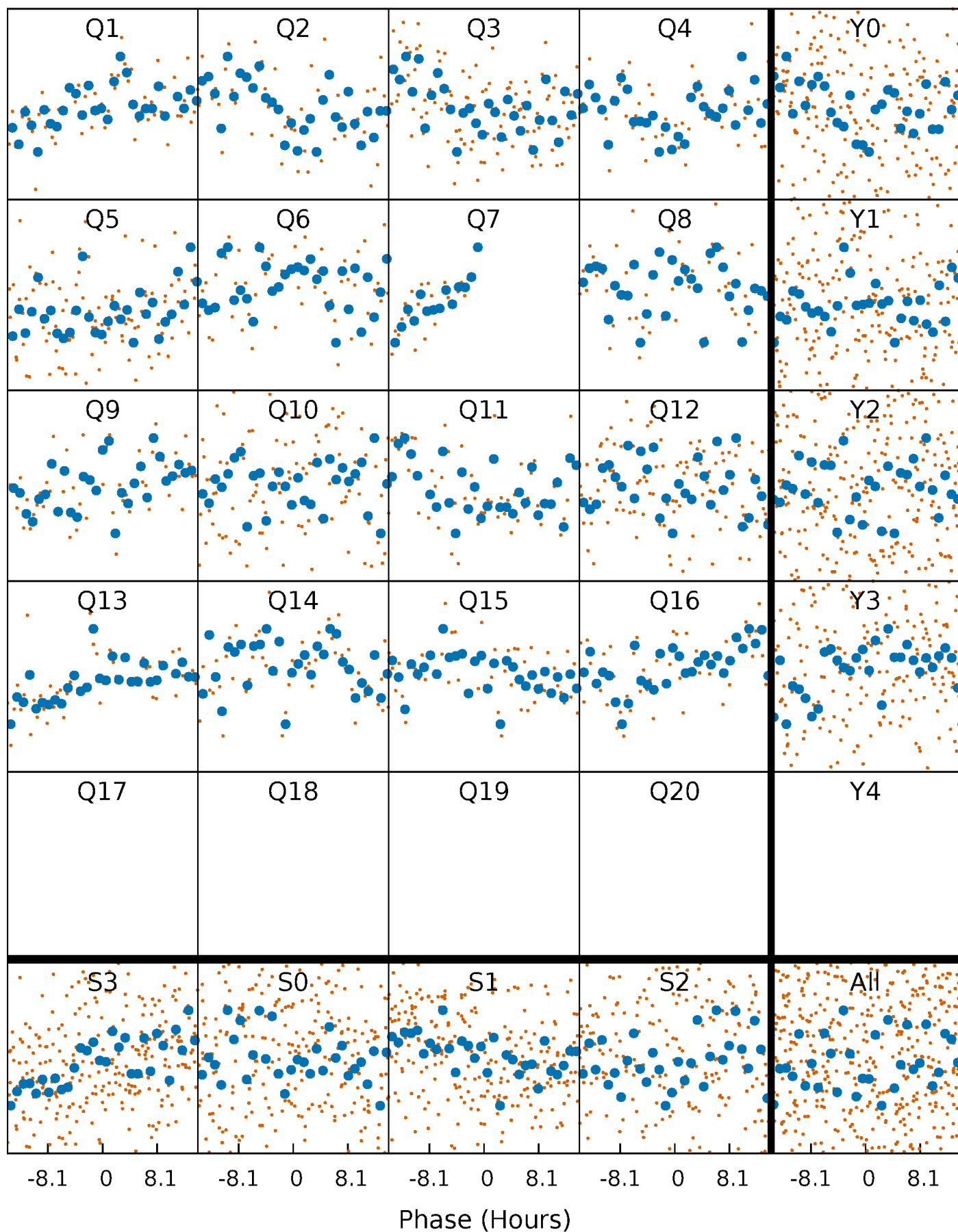
## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)





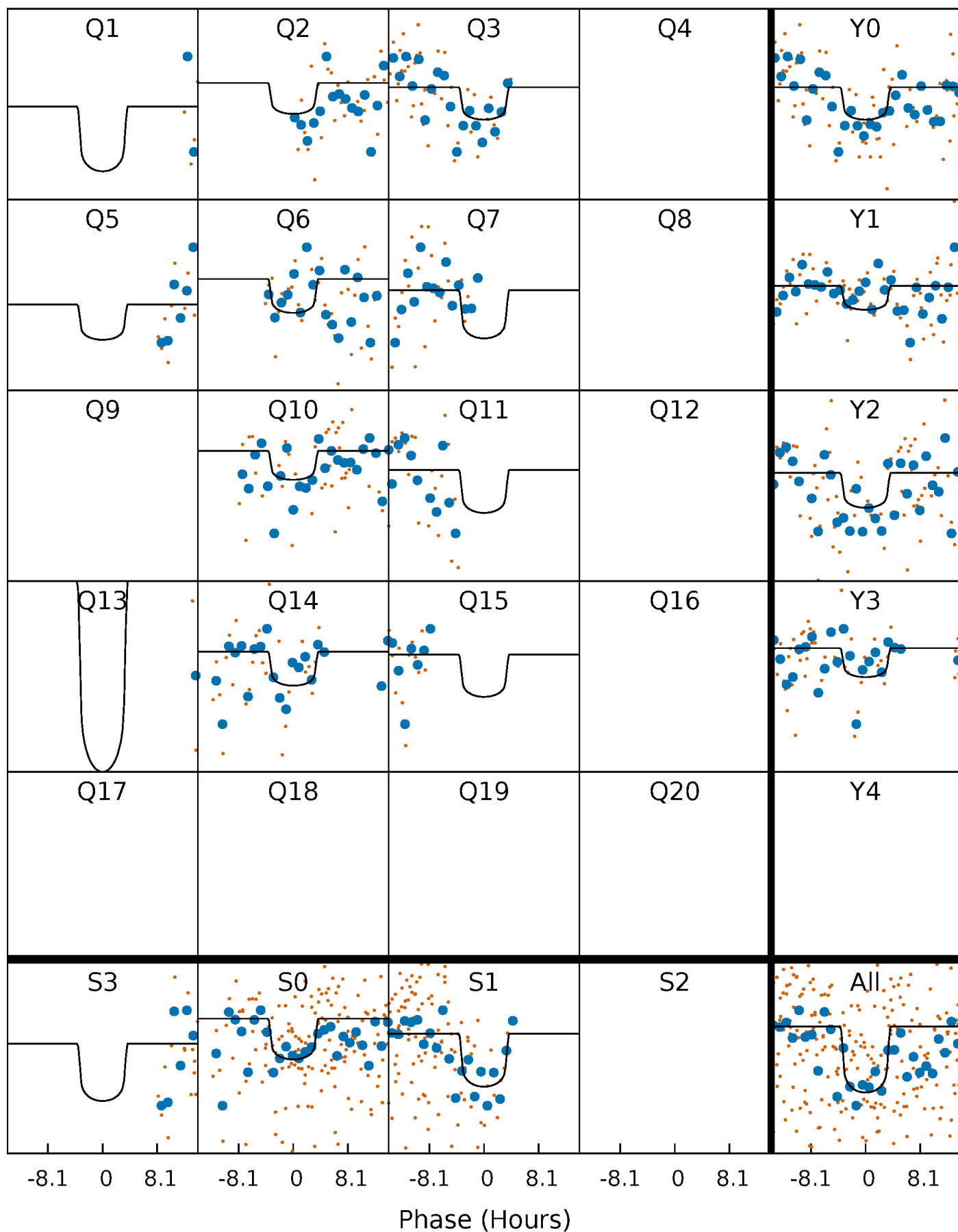
# PDC Quarter-Phased Transit Curves

TCE 002444769-06 P= 63.555015 Days  $T_0=151.870476$  (BKJD)



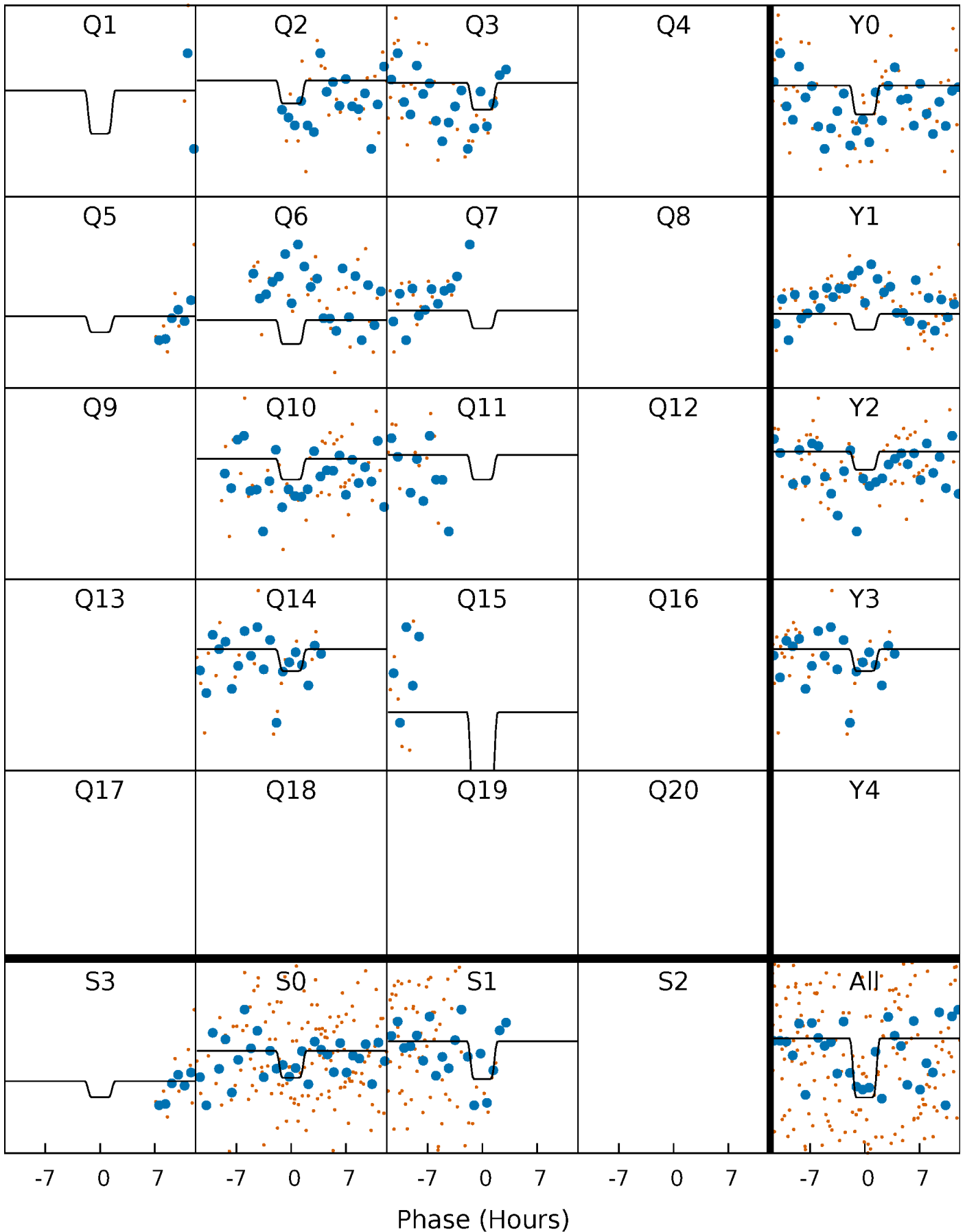
# DV Quarter-Phased Transit Curves

TCE 002444769-06 P= 63.555015 Days  $T_0=151.870476$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

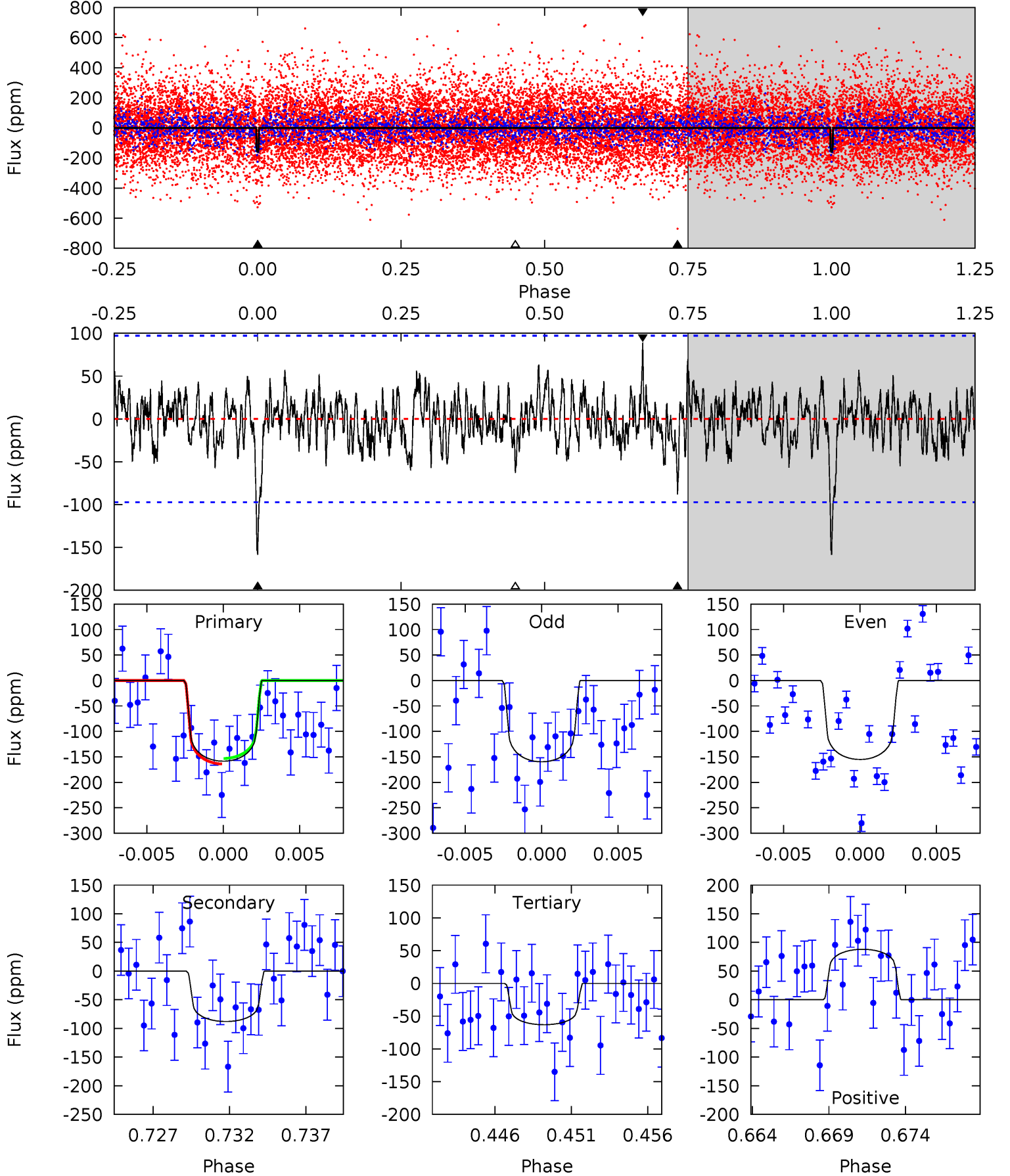
TCE 002444769-06 P= 63.553414 Days  $T_0=151.927434$  (BKJD)



# DV Model-Shift Uniqueness Test

002444769-06, P = 63.555015 Days, E = 88.315461 Days

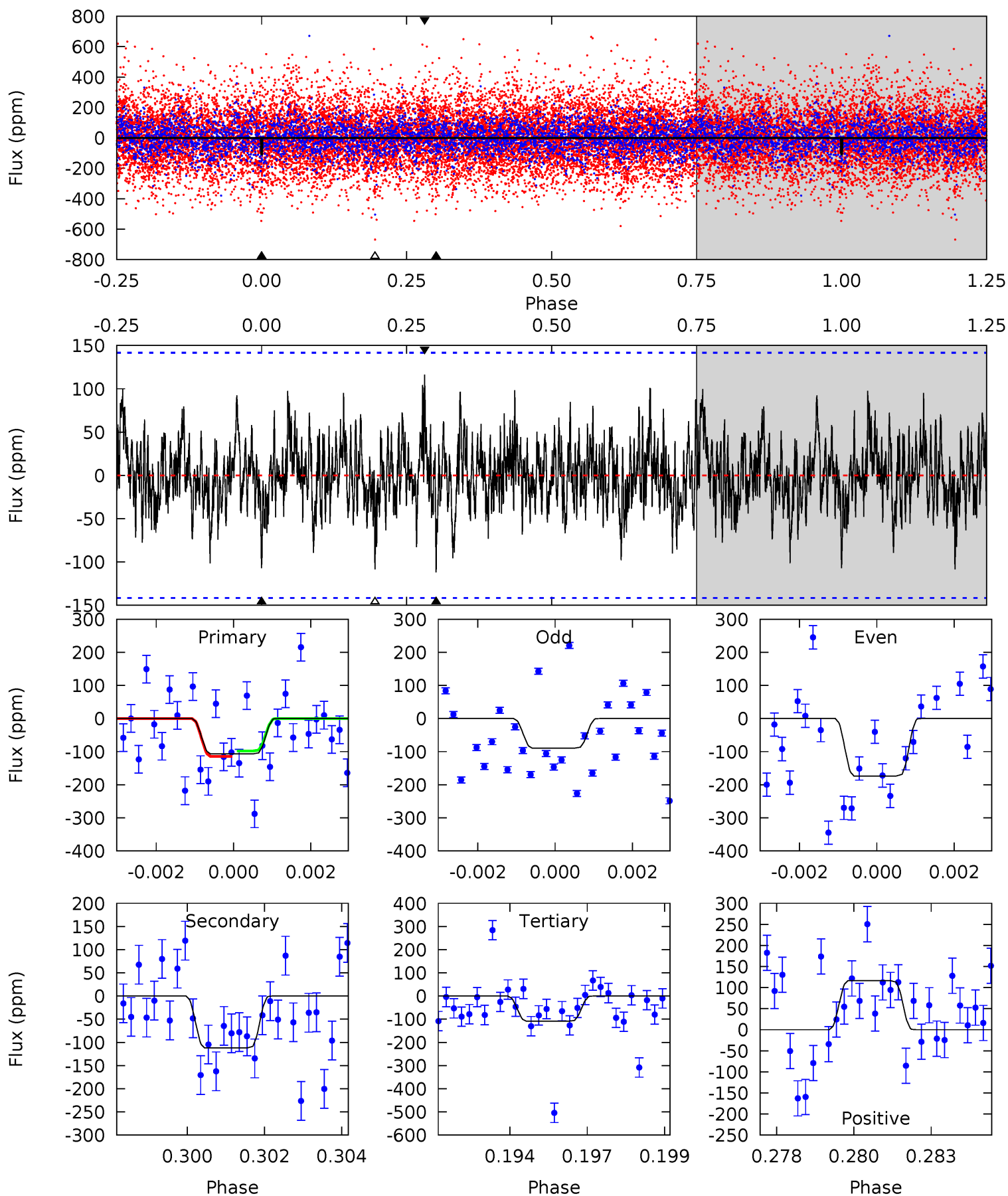
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.42	4.67	3.35	4.68	5.16	2.82	1.25	5.07	3.74	1.32	-0.01	0.11	0.89	0.36	0.29



# Alt Model-Shift Uniqueness Test

002444769-06, P = 63.553414 Days, E = 88.374020 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
4.00	4.19	4.06	4.35	5.29	3.04	1.23	-0.06	-0.35	0.13	-0.16	1.32	0.55	0.51	0.31



### Stellar Parameters For KIC 002444769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6450^{+162}_{-194}$	$4.421^{+0.081}_{-0.202}$	$-0.520^{+0.300}_{-0.300}$	$1.022^{+0.308}_{-0.123}$	$1.004^{+0.133}_{-0.106}$	$1.325^{+0.467}_{-0.675}$
	+3%/-3%	+2%/-5%	+58%/-58%	+30%/-12%	+13%/-11%	+35%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 002444769-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-88 \pm 19$	$1.71^{+1.12}_{-1.05}$	$727^{+55}_{-37}$	$5176^{+3229}_{-938}$	$1569^{+9080}_{-980}$
Alt.	$-112 \pm 27$	$1.55^{+1.04}_{-0.95}$	$725^{+54}_{-34}$	$5741^{+4253}_{-1195}$	$2459^{+14840}_{-1599}$

$T_{\text{max}}$  = 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

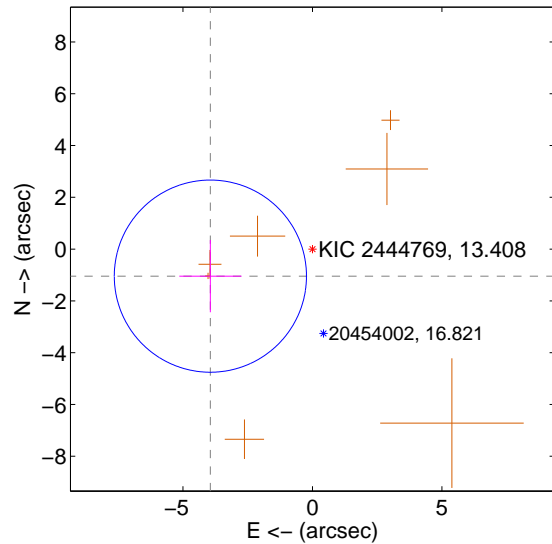
Supplemental centroid analysis for 002444769-06. Kepler magnitude: 13.41. Transit SNR 7.68

There are 0 quarters with good PRF difference image offsets

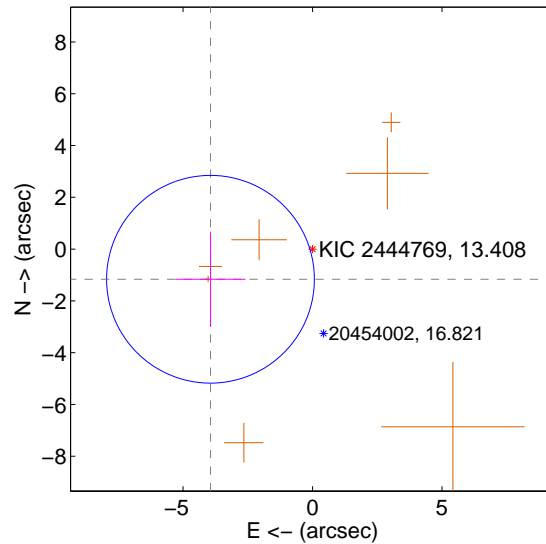
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.077 \pm 1.237$	3.30	$3.941 \pm 1.202$	$-1.045 \pm 1.394$
PRF-fit source offset from KIC position	$4.109 \pm 1.337$	3.07	$3.940 \pm 1.349$	$-1.165 \pm 1.838$
photometric centroid source offset	$2.25 \pm 0.99$	2.29	$1.67 \pm 0.96$	$1.52 \pm 1.02$

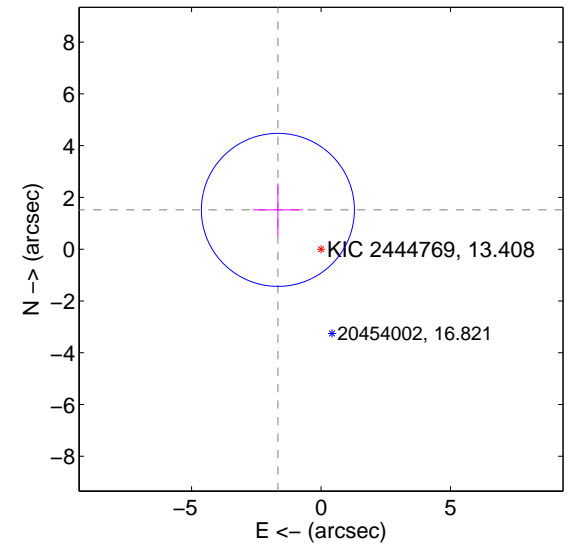
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



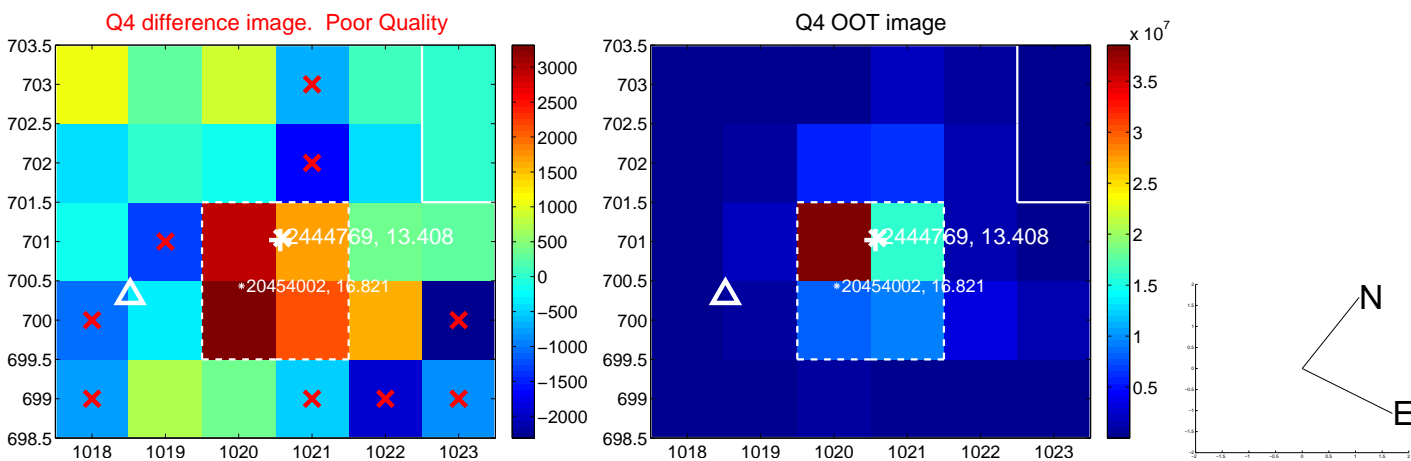
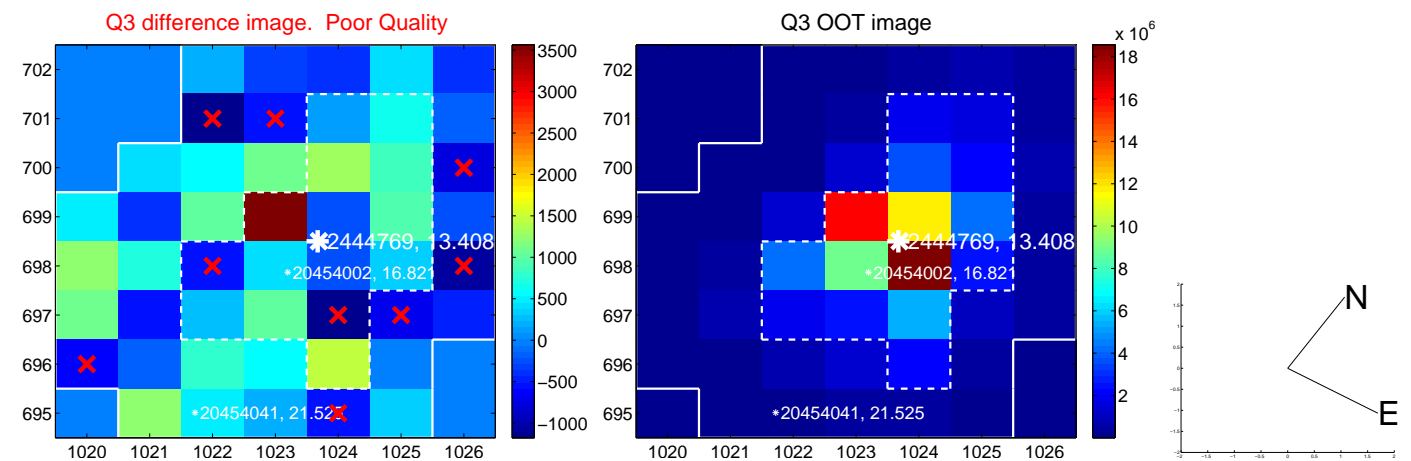
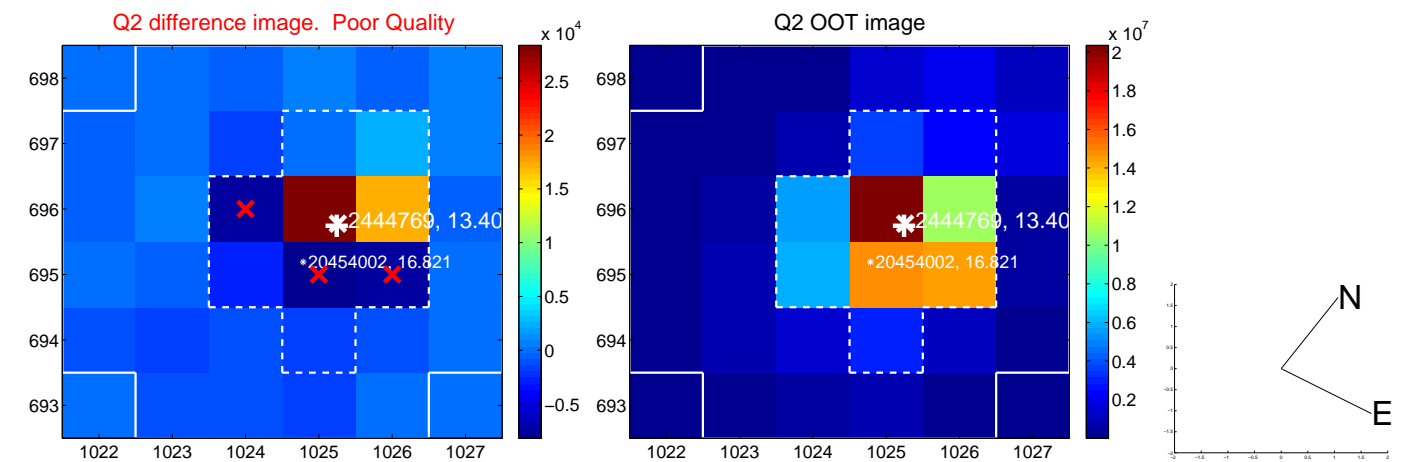
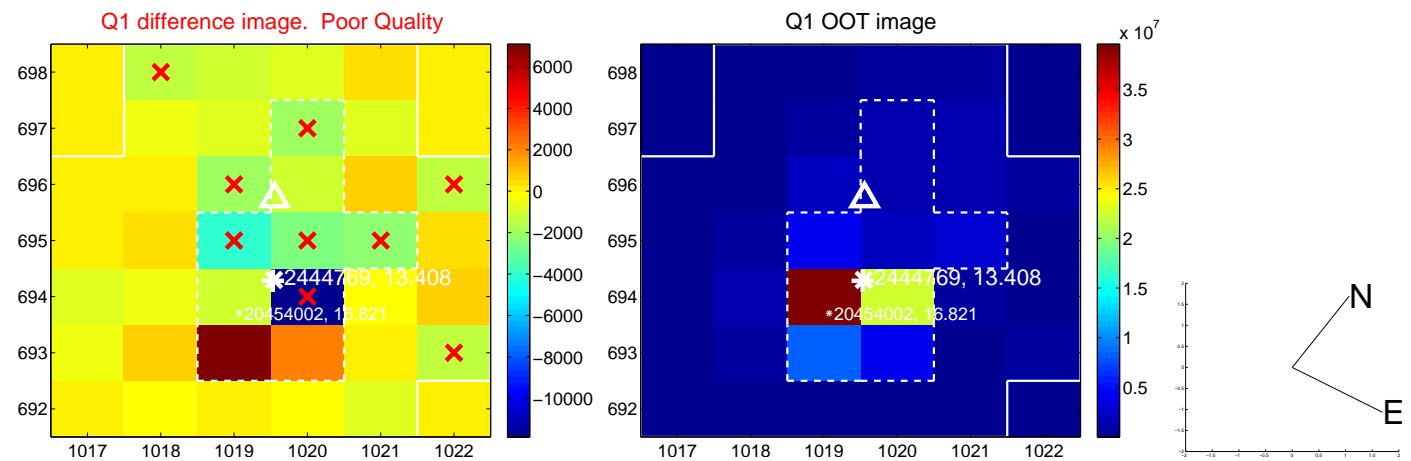
offset from photometric centroids



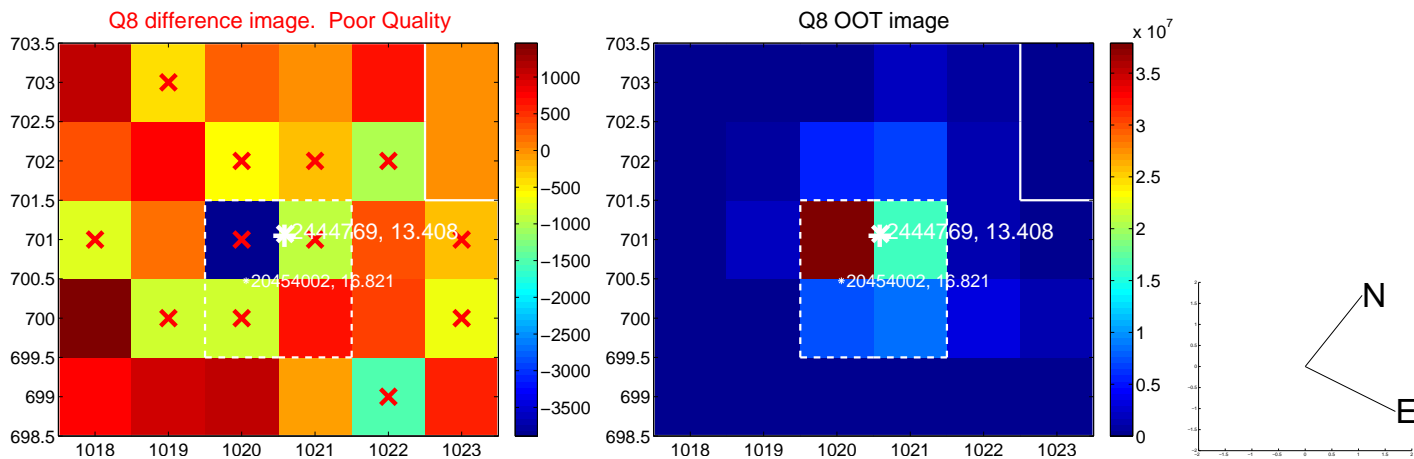
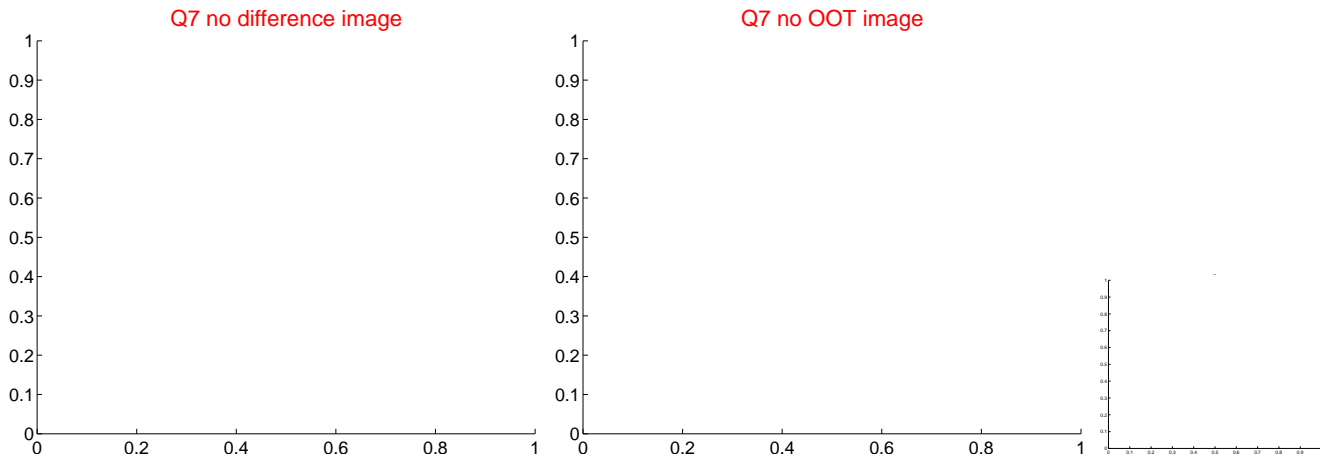
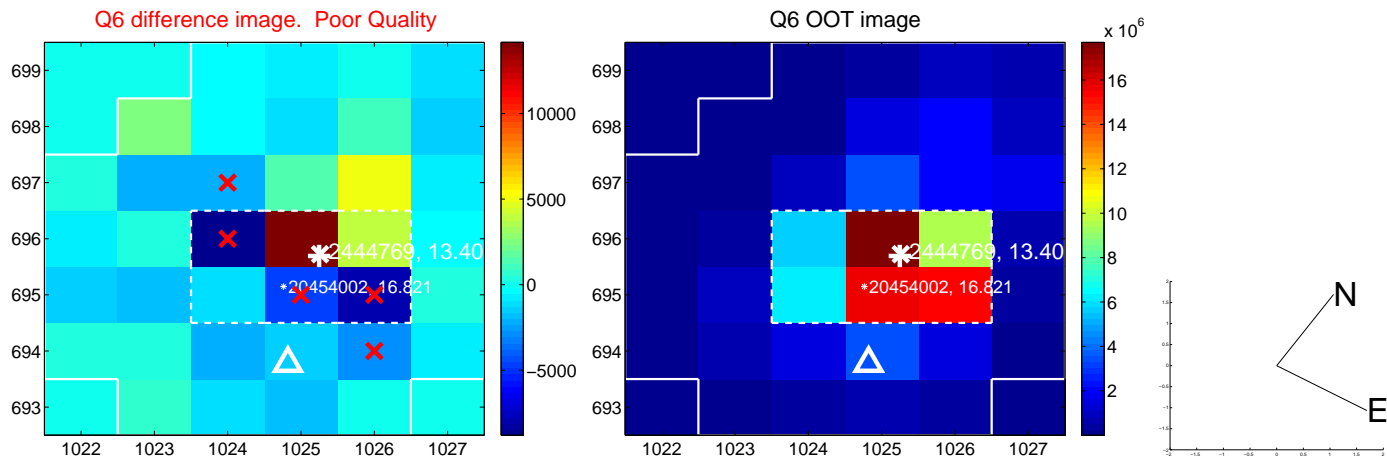
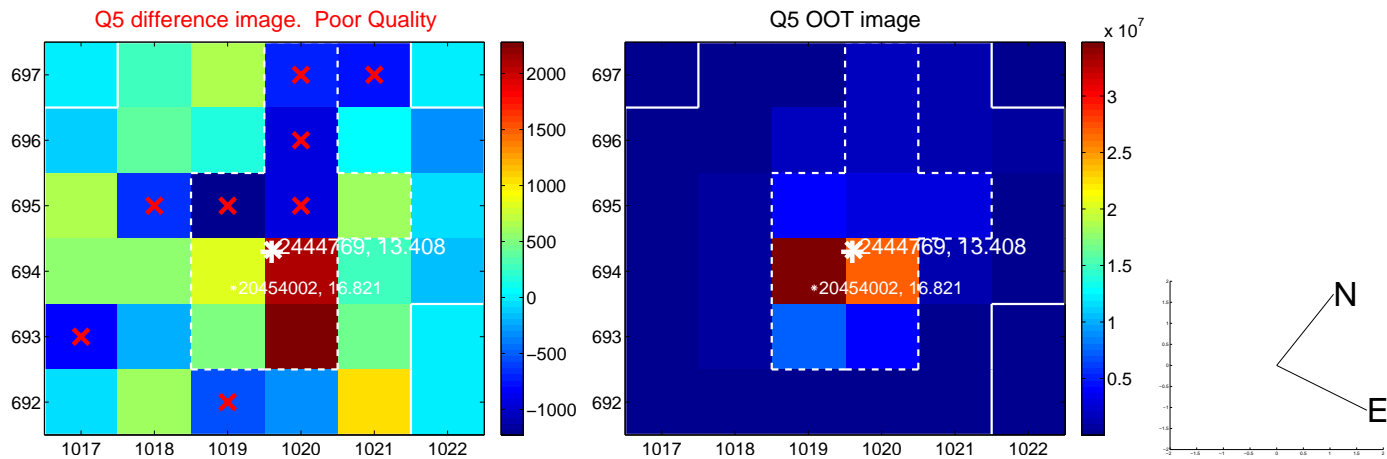
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



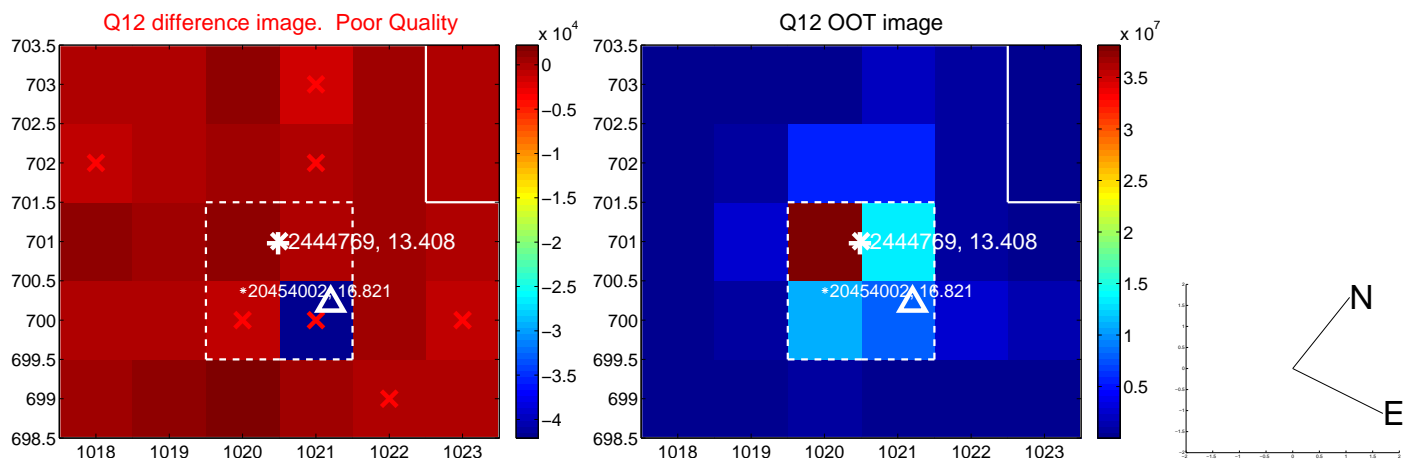
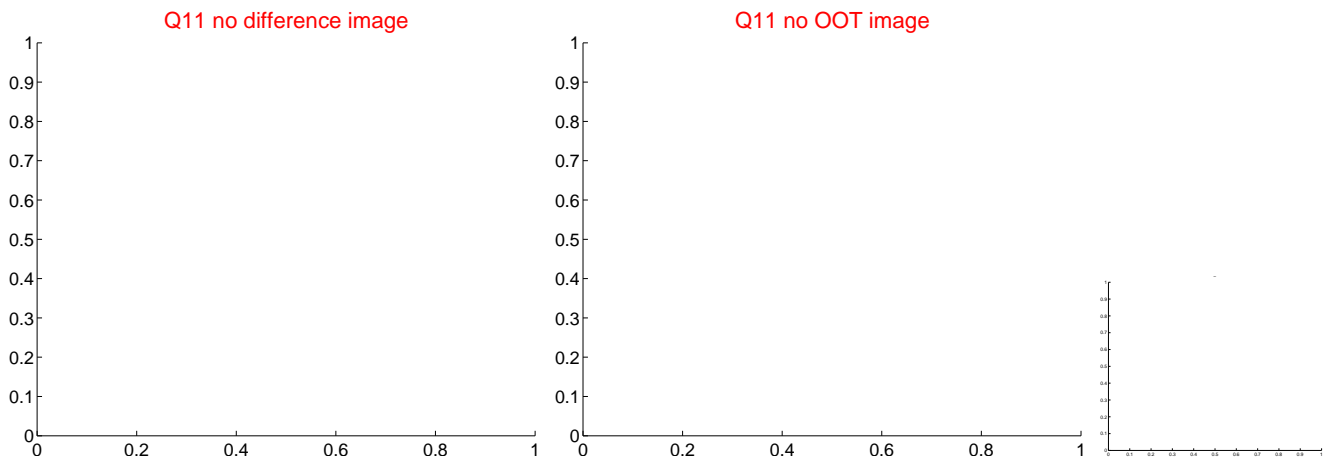
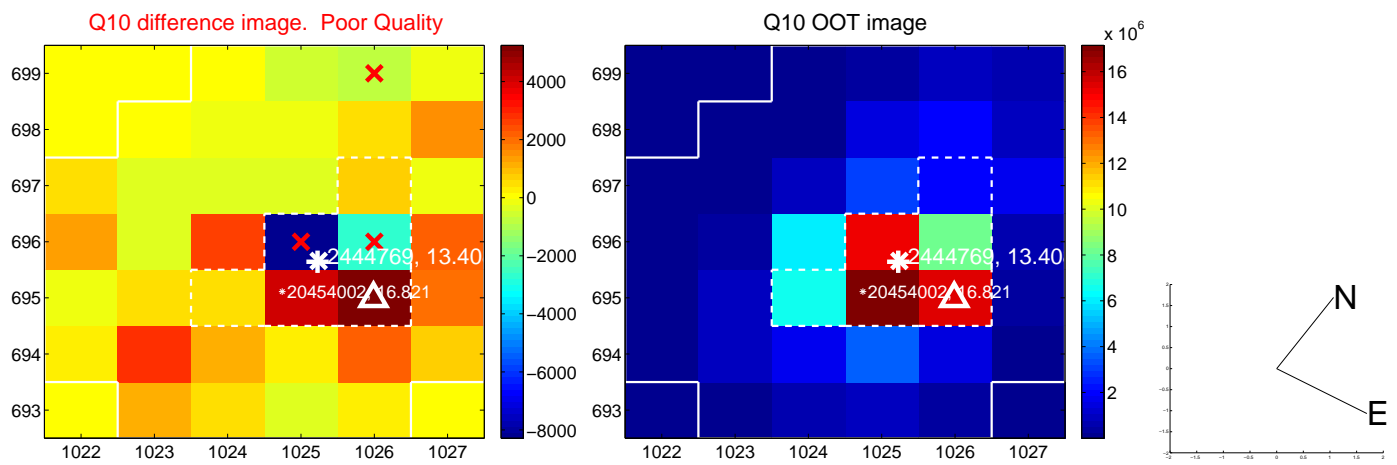
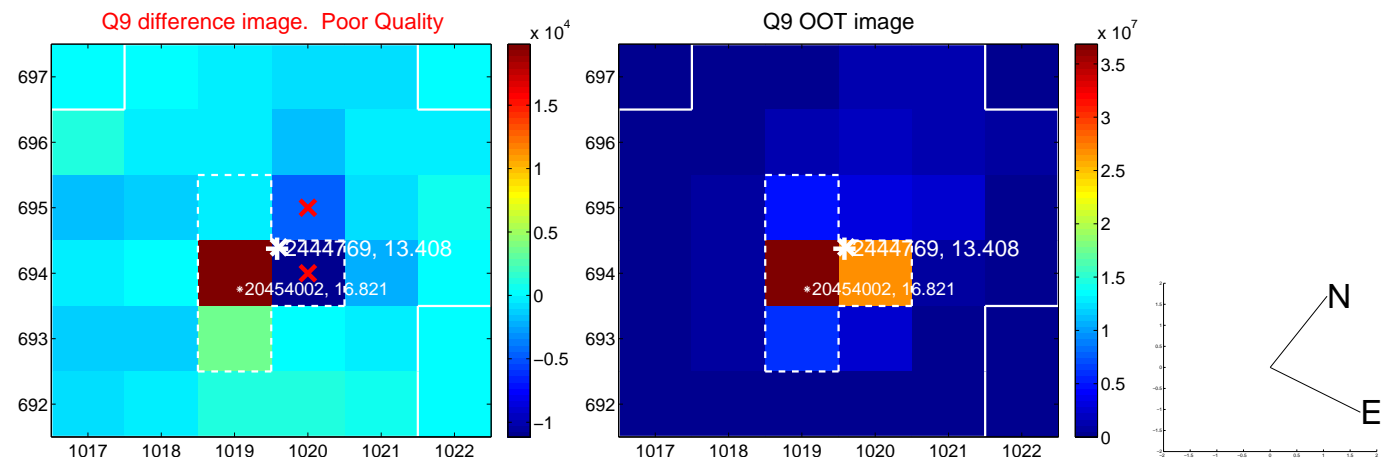
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



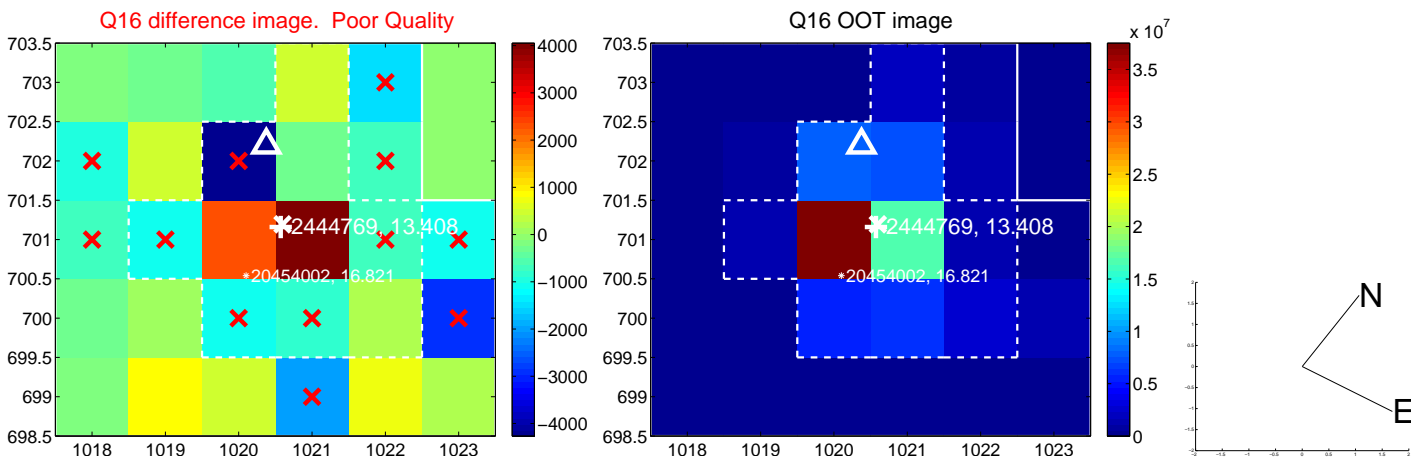
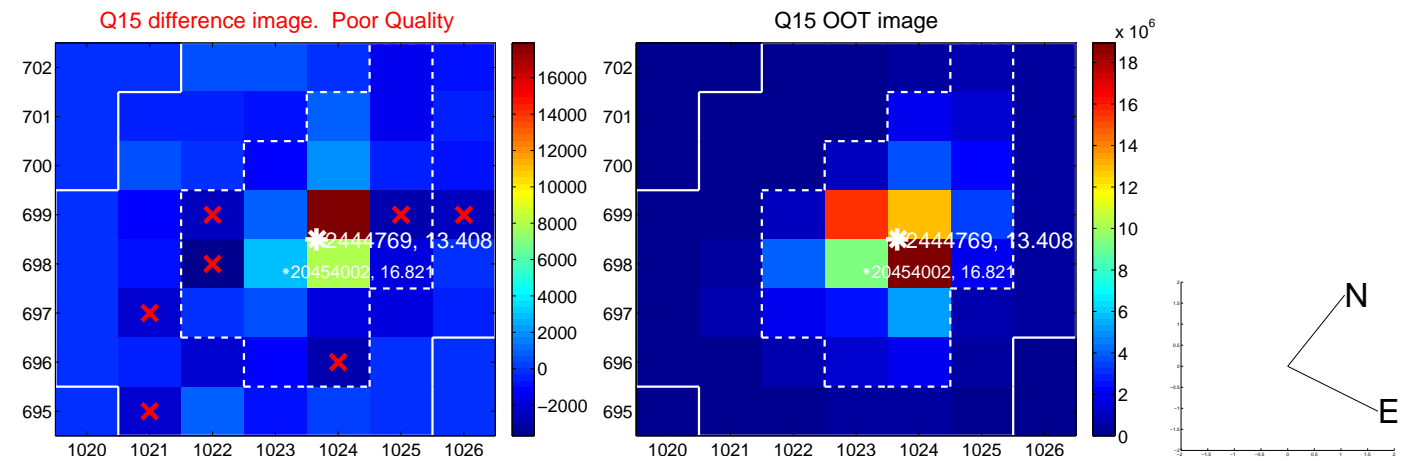
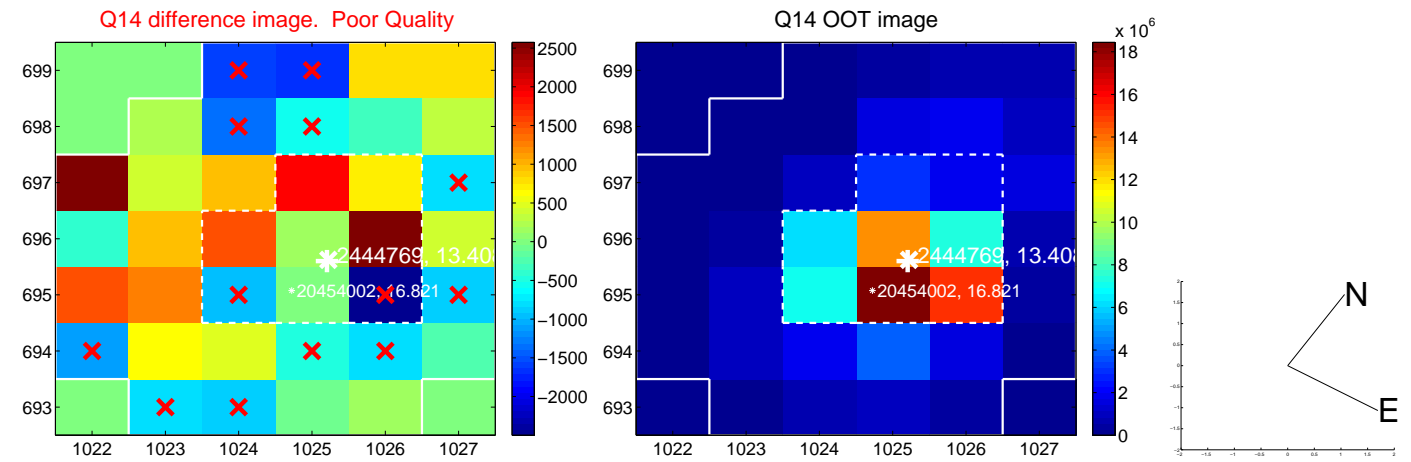
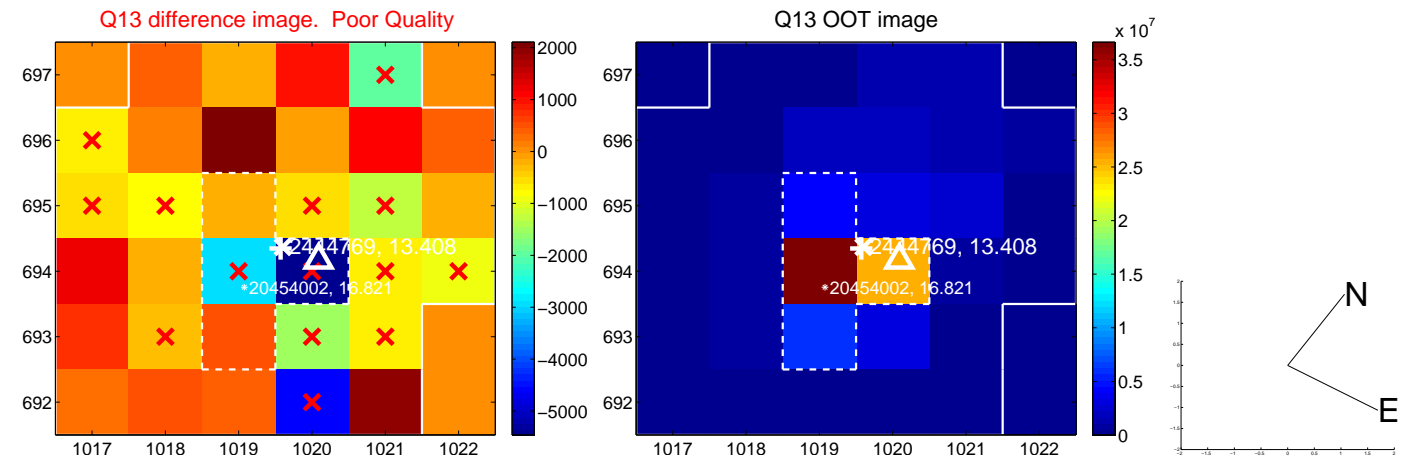
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



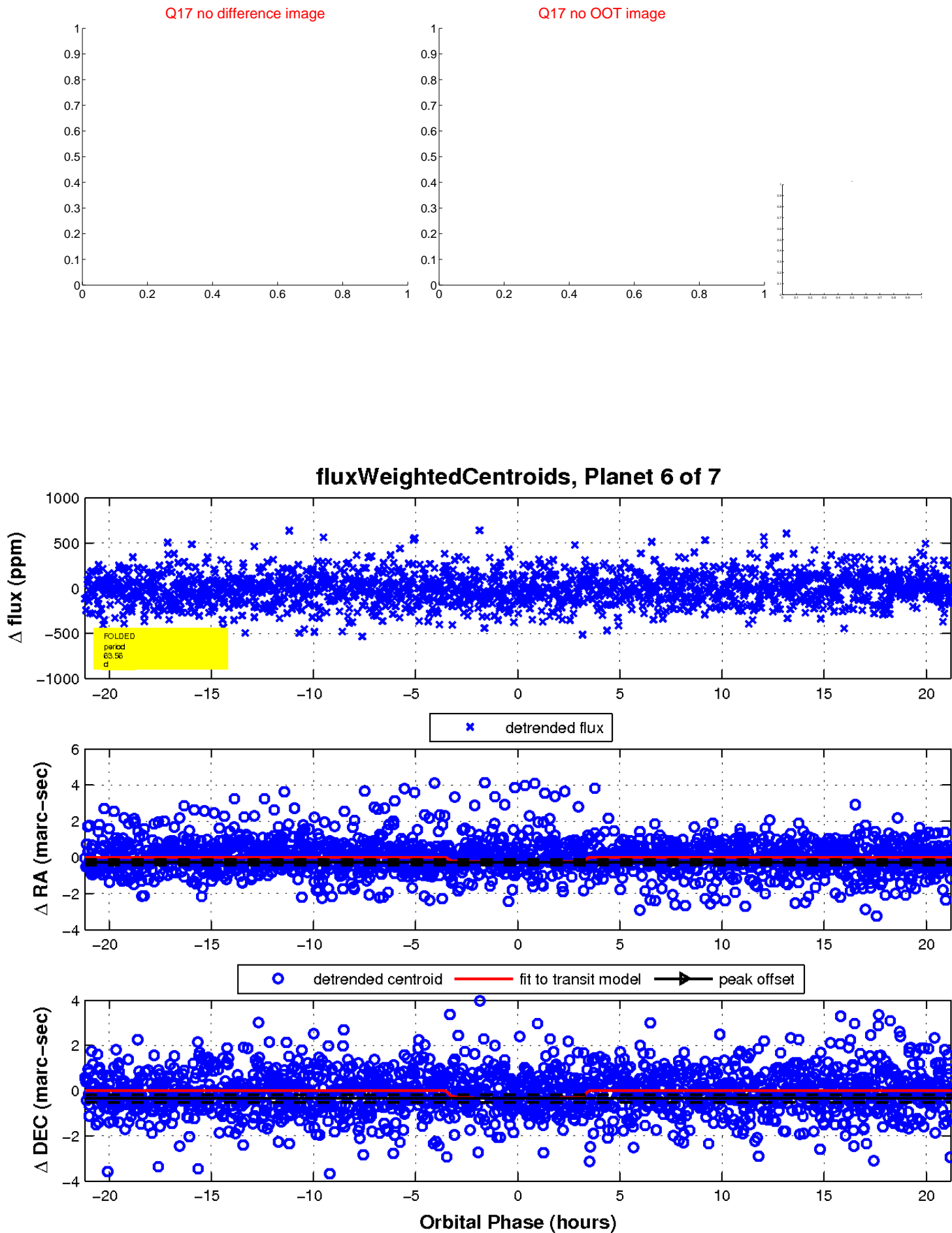
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

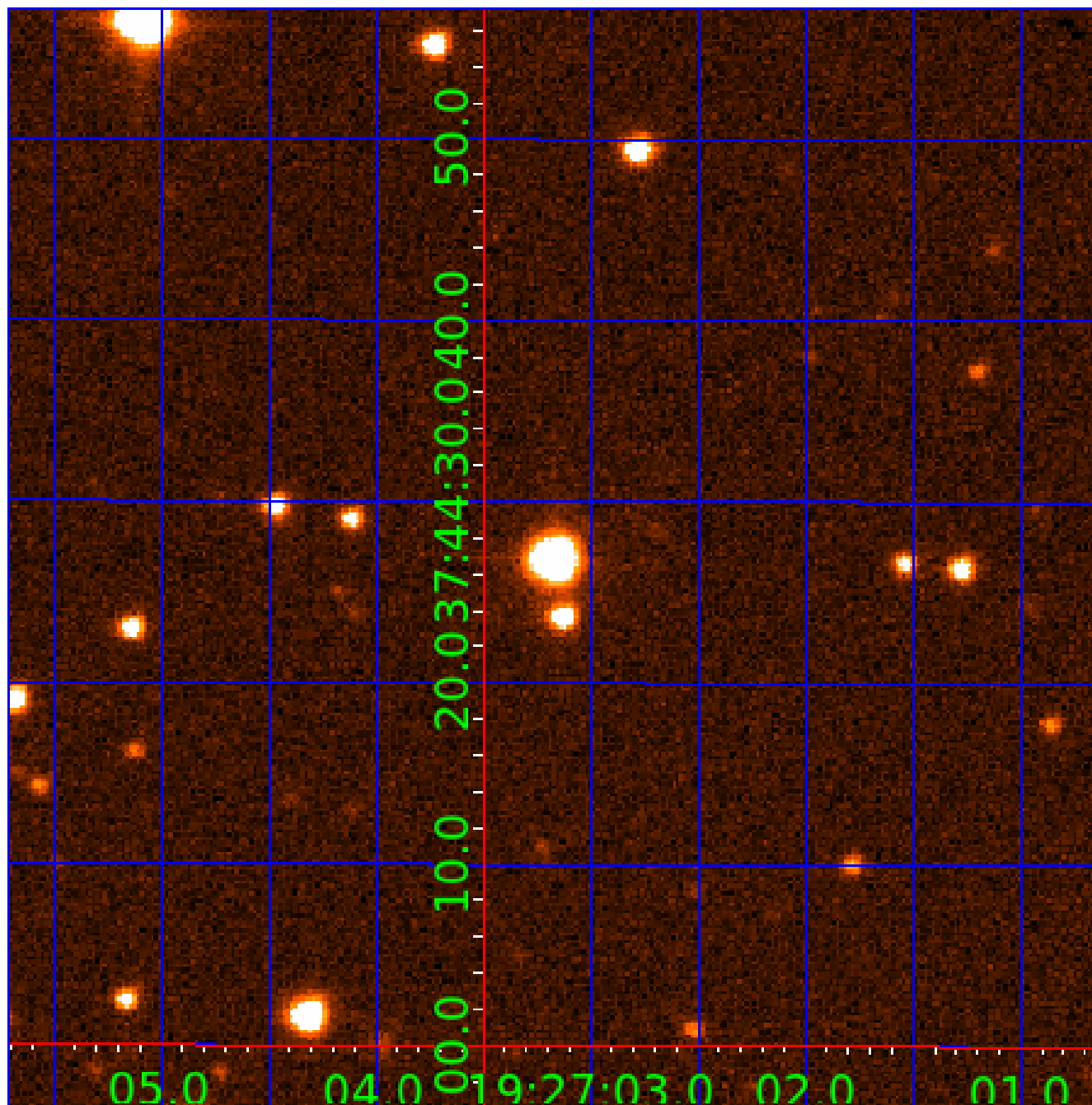


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 002444769

## Q1-17 DR25 TCE Parameters

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002444769-01	OBS	No	3.001337	133.226612	16.1	18.084	7.8	7.2	1.02	6450	0.41	973.53
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002444769-03	OBS	No	102.071699	146.923760	149.9	4.921	7.7	7.8	1.02	6450	1.42	8.84
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002444769-06	OBS	No	63.555015	151.870476	162.0	7.072	8.0	7.7	1.02	6450	1.45	16.62
002444769-07	OBS	No	169.959063	155.423564	252.7	2.430	7.1	7.2	1.02	6450	1.90	4.48

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002444769-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
002444769-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
002444769-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002444769-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002444769-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002444769-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

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

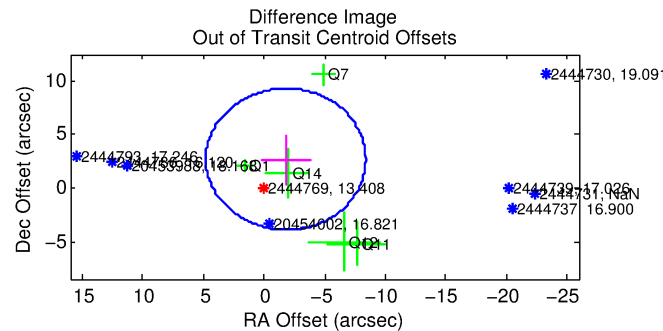
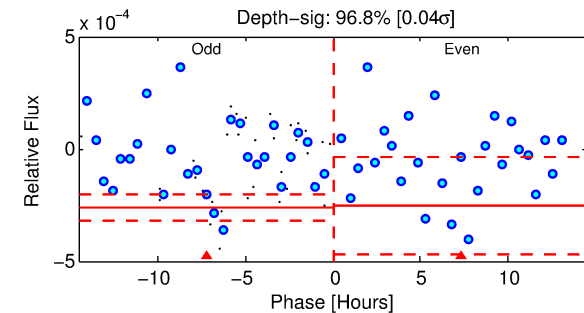
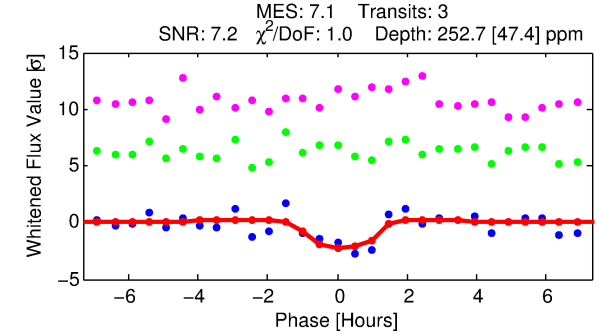
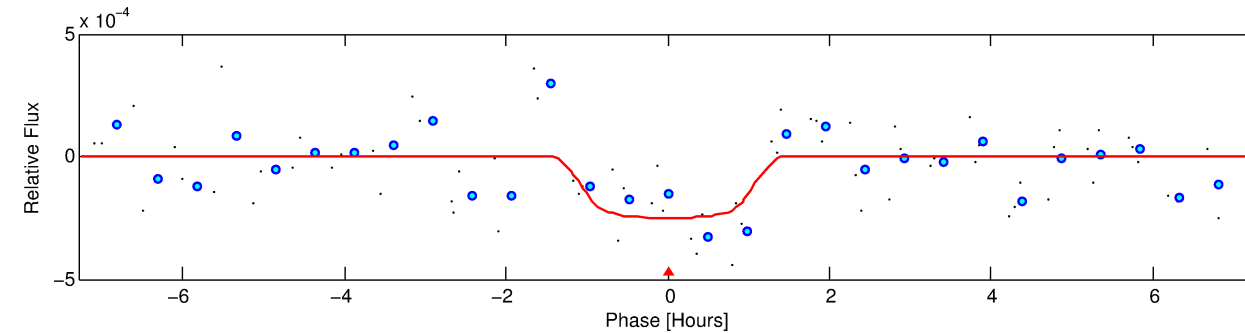
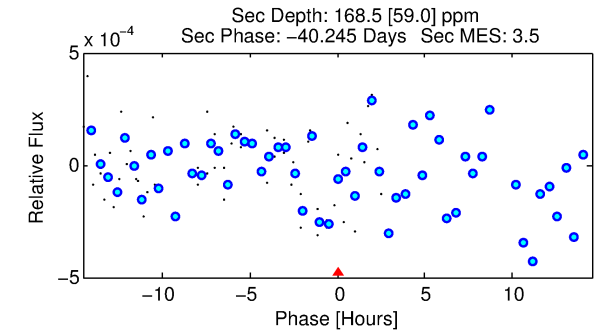
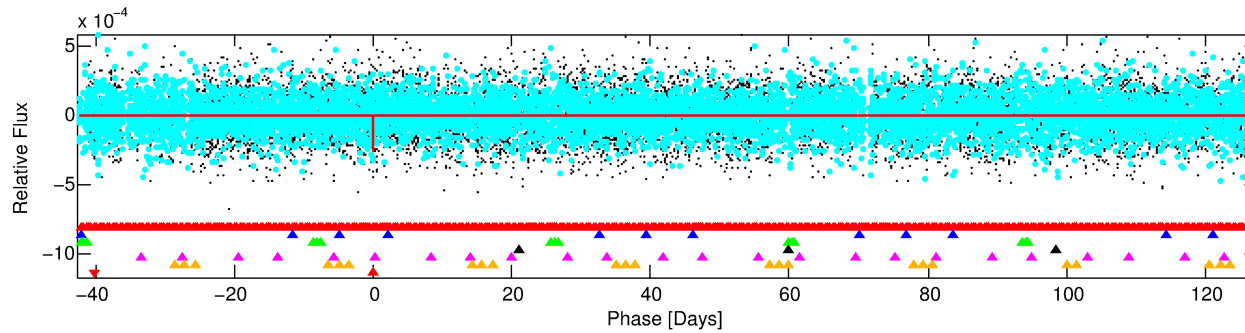
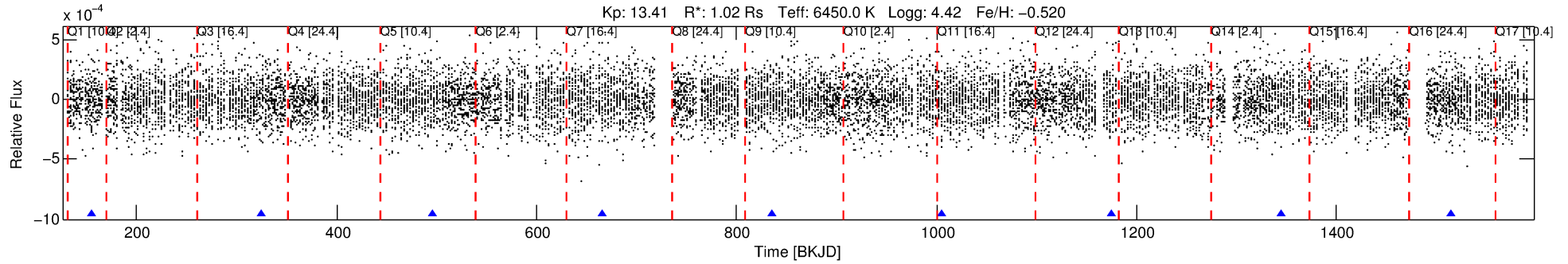
## Ephemeris Match Information For 002444769-07

No Significant Match Found



# DV One-Page Summary

KIC: 2444769 Candidate: 7 of 7 Period: 169.959 d



## DV Fit Results:

Period = 169.95906 [0.00158] d  
Epoch = 155.4236 [0.0080] BKJD  
Rp/R\* = 0.0170 [0.0156]  
a/R\* = 252.74 [1313.26]  
b = 0.90 [1.11]  
Seff = 4.48 [1.74]  
Teq = 371 [36] K  
Rp = 1.90 [1.83] Re  
a = 0.6015 [0.1526] AU  
Ag = 9303.44 [17675.60] [0.53σ]  
Teff = 5632 [2629] K [2.00σ]

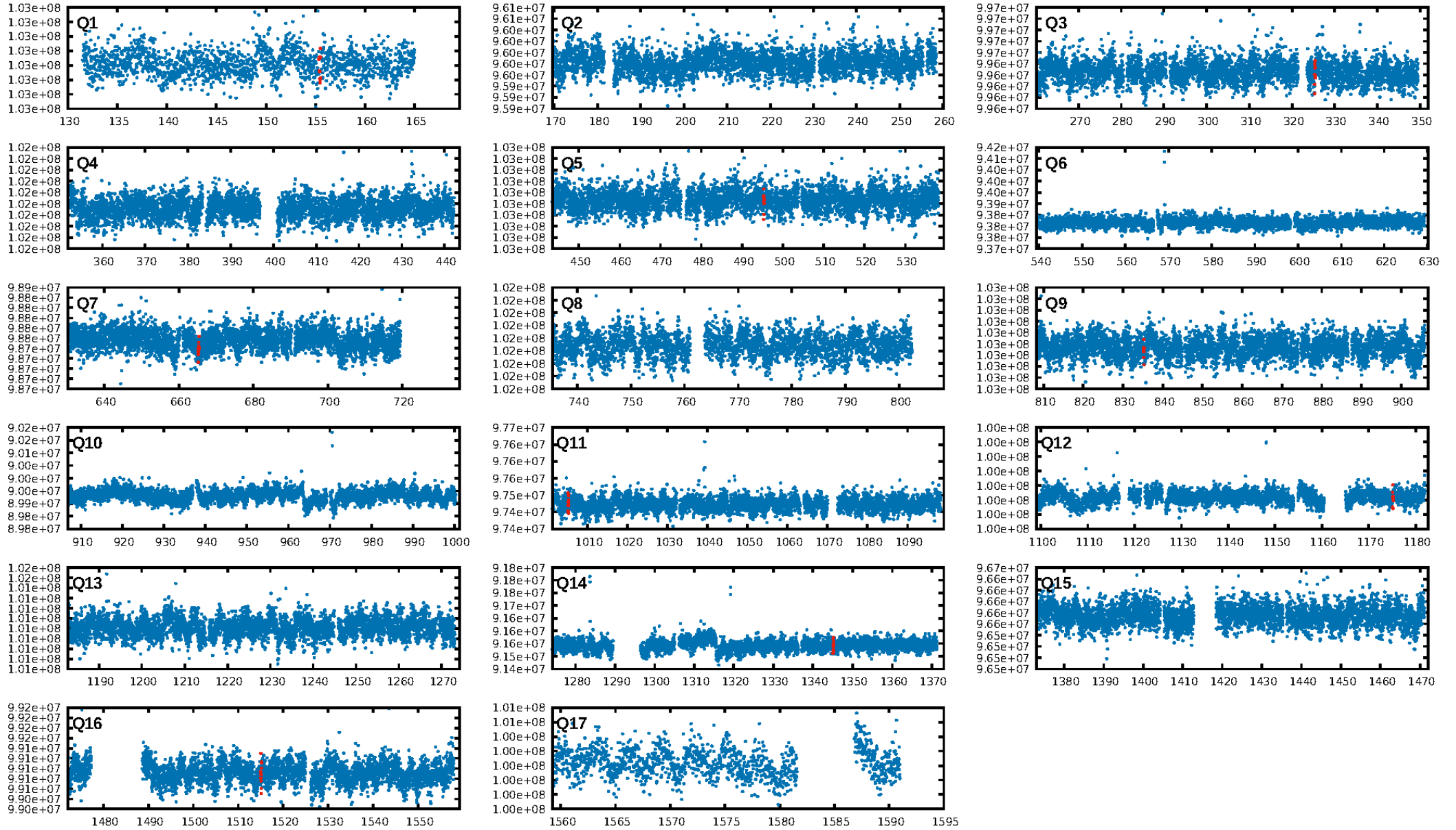
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [171.48σ]  
LongPeriod-sig: 100.0% [957.62σ]  
ModelChiSquare2-sig: 90.0%  
ModelChiSquareGof-sig: 95.3%  
**Bootstrap-pfa: 5.08e-08**  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -0.1624  
Centroid-sig: 56.0%  
Centroid-so: 1.208 arcsec [0.79σ]  
OotOffset-rm: 3.242 arcsec [1.47σ]  
OotOffset-st: 1/2/1/1 [5]  
KicOffset-rm: 3.220 arcsec [1.47σ]  
KicOffset-st: 1/2/1/1 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.44 [4/9]

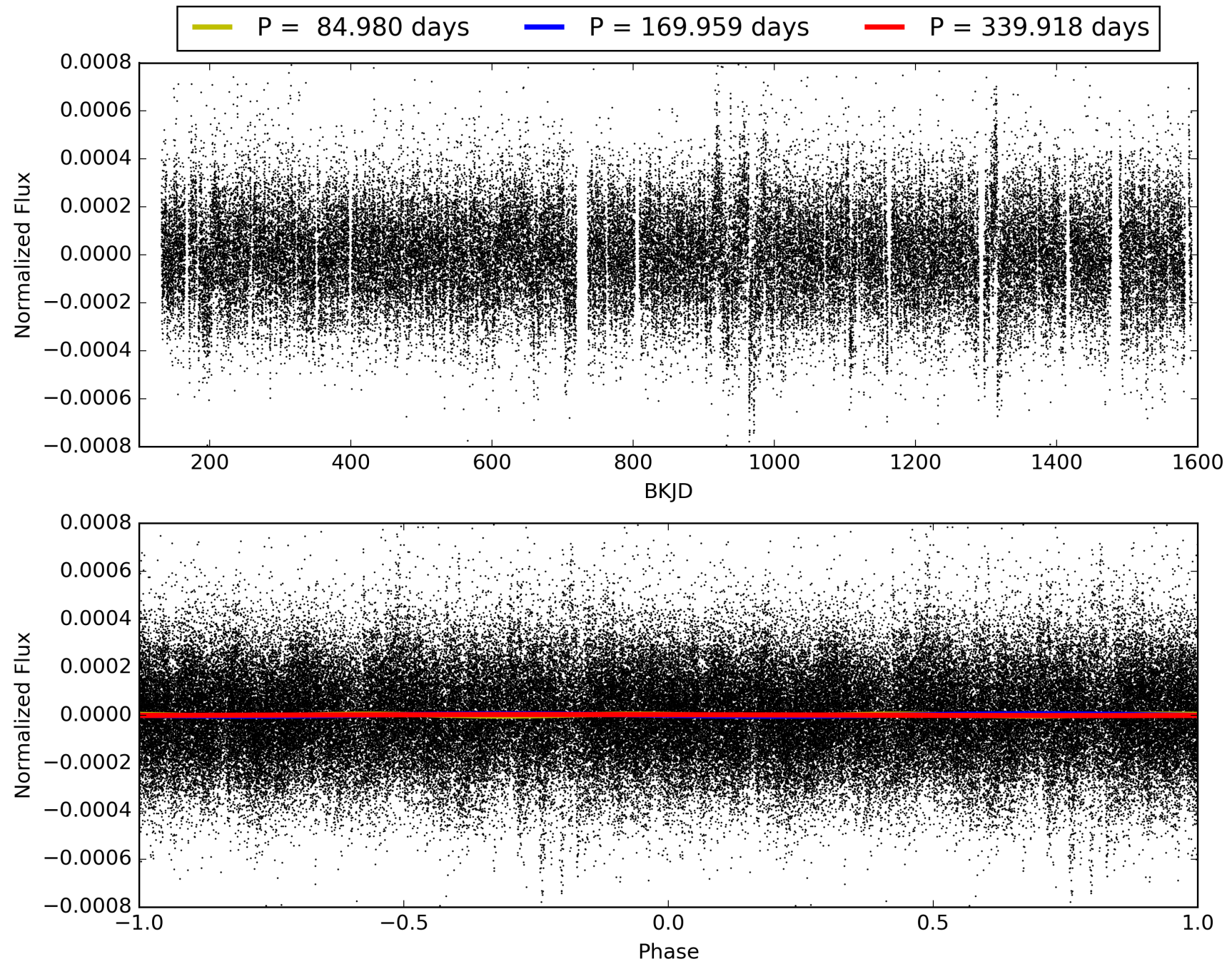
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 14:46:35 Z

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

# TCE 002444769-07, PDC Light Curves

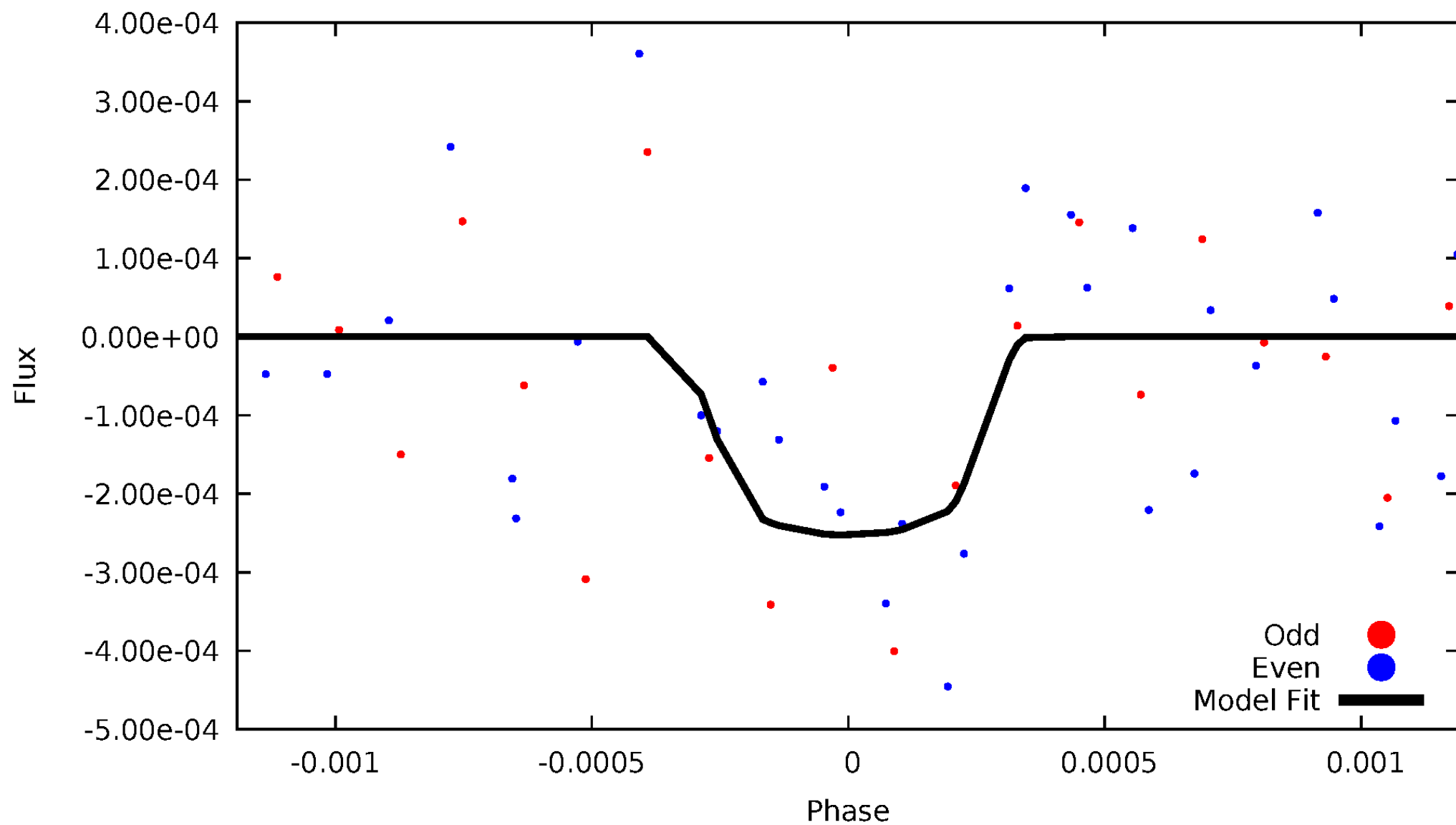


TCE 002444769-07



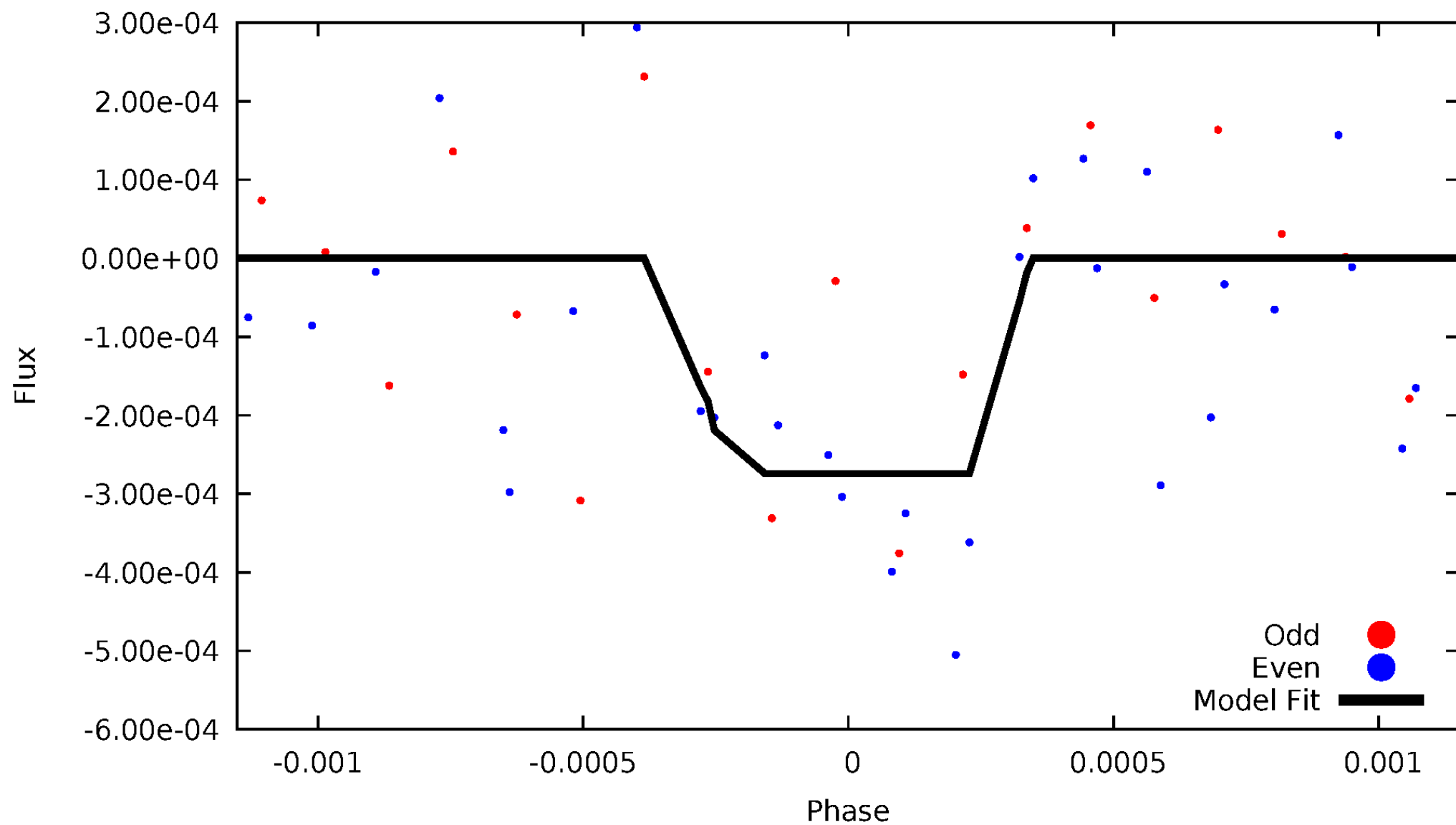
# DV Odd/Even

TCE 002444769-07



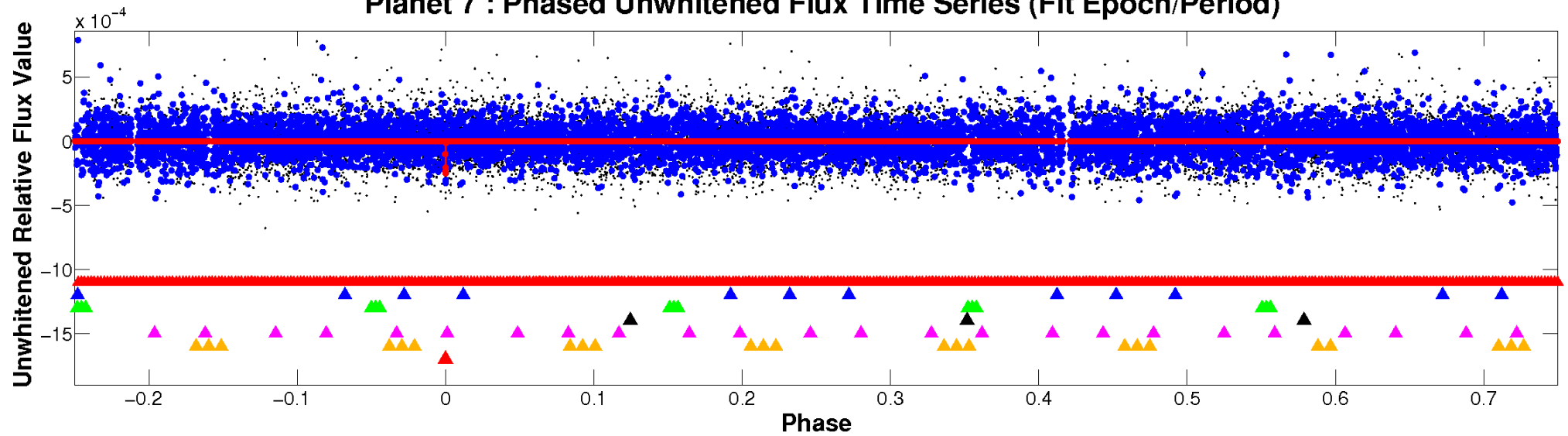
# ALT Odd/Even

TCE 002444769-07

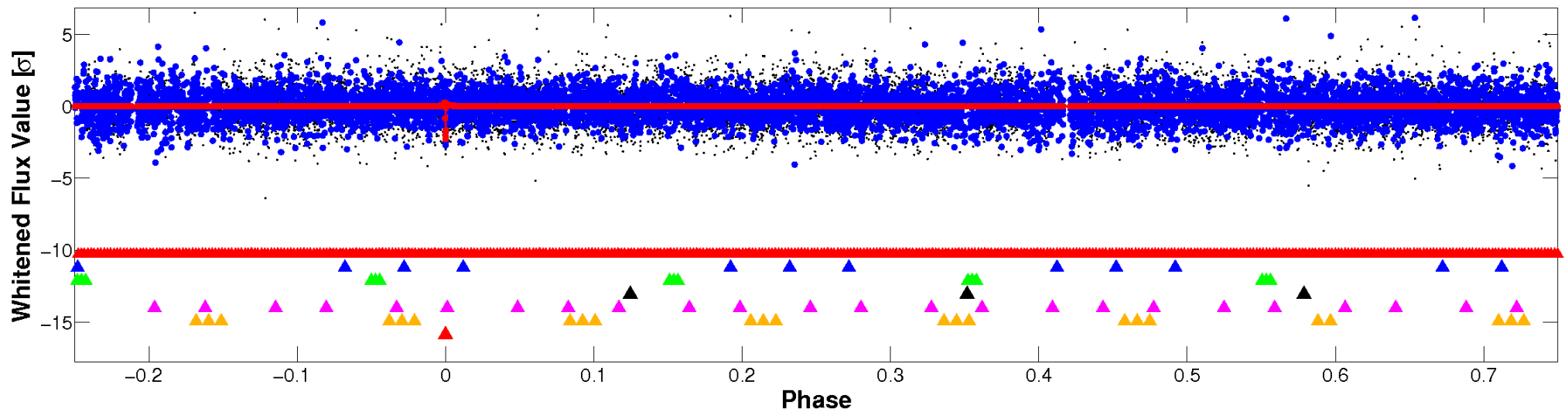


# Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



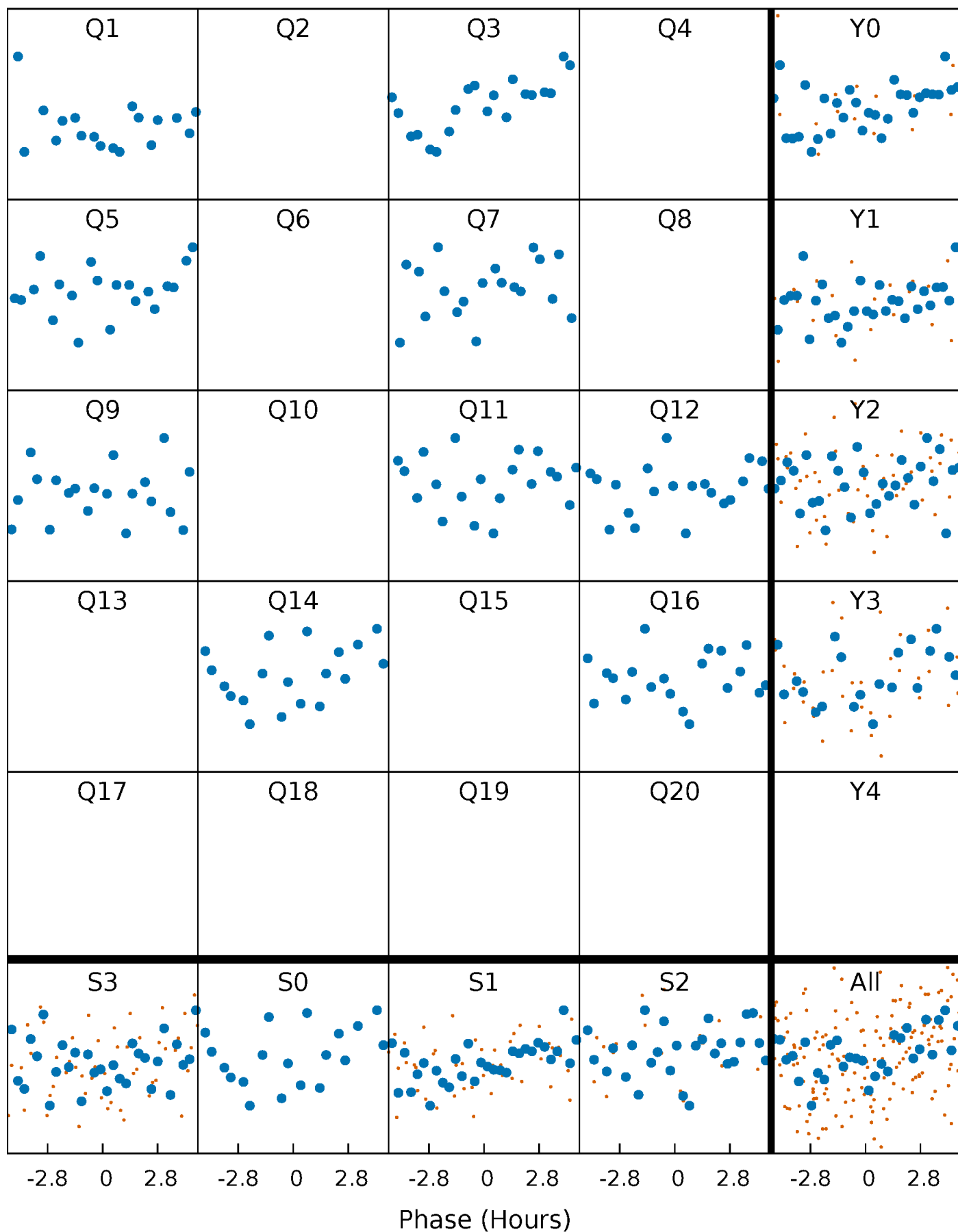
Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

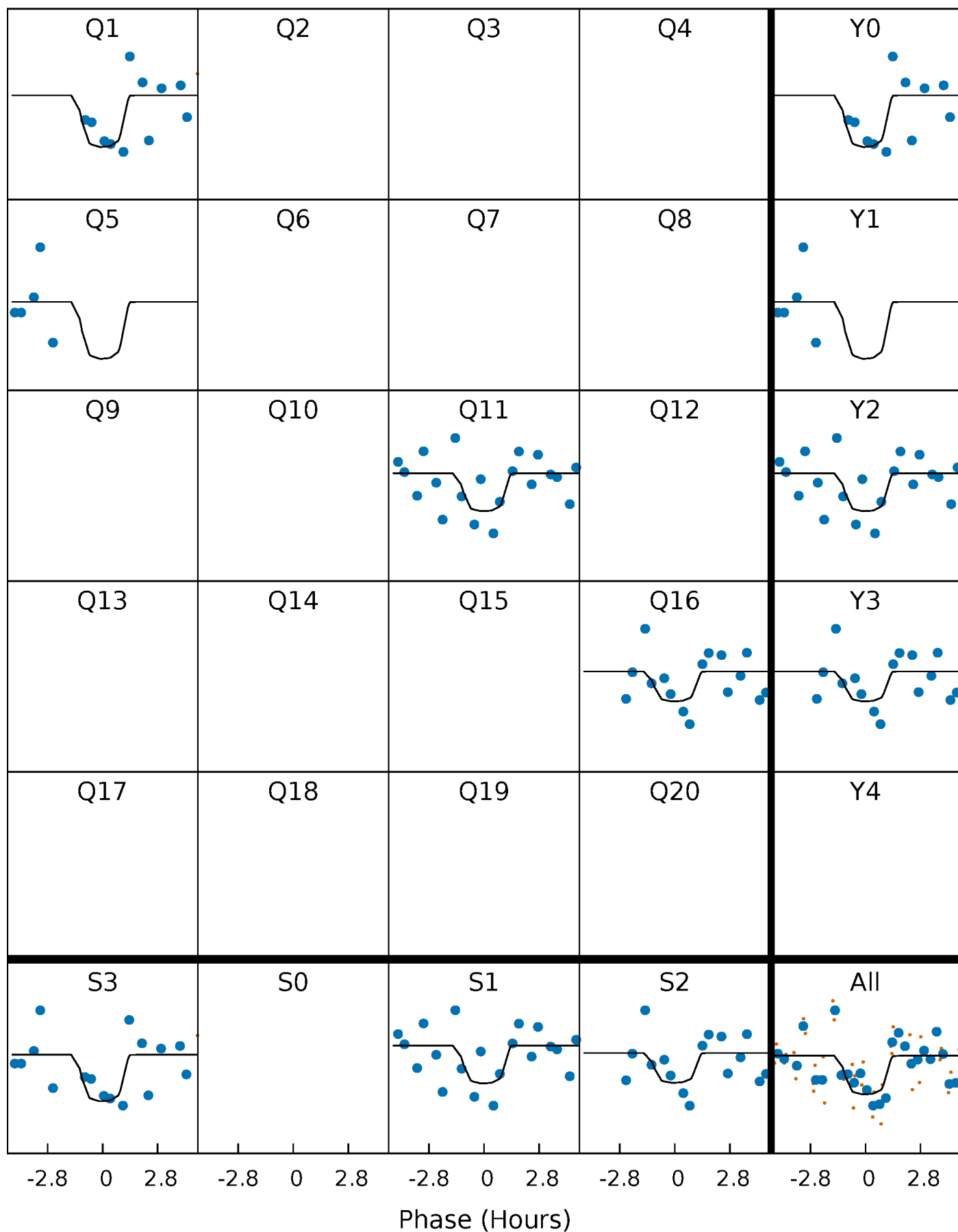
TCE 002444769-07 P=169.959063 Days  $T_0=155.423564$  (BKJD)





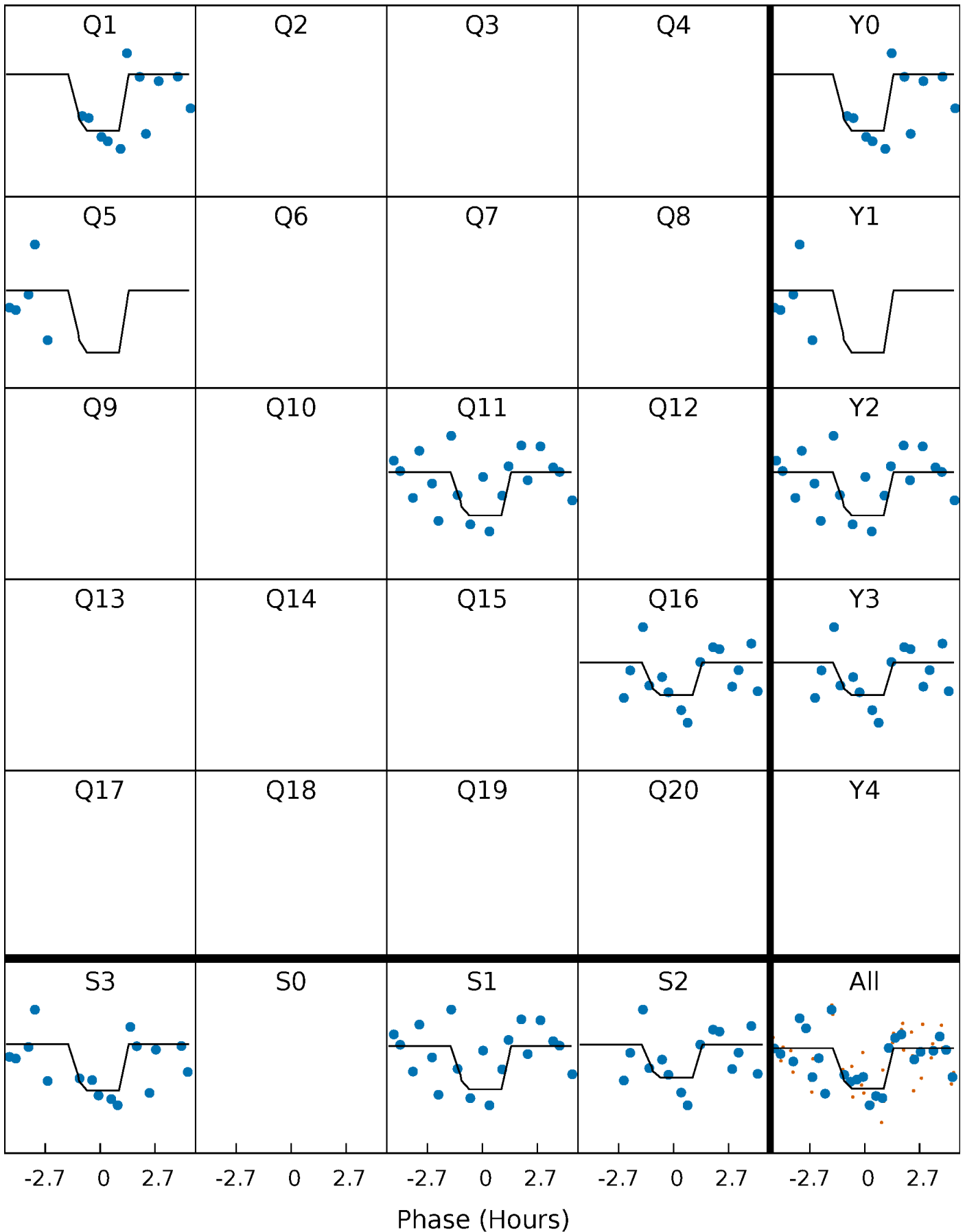
# DV Quarter-Phased Transit Curves

TCE 002444769-07 P=169.959063 Days  $T_0=155.423564$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

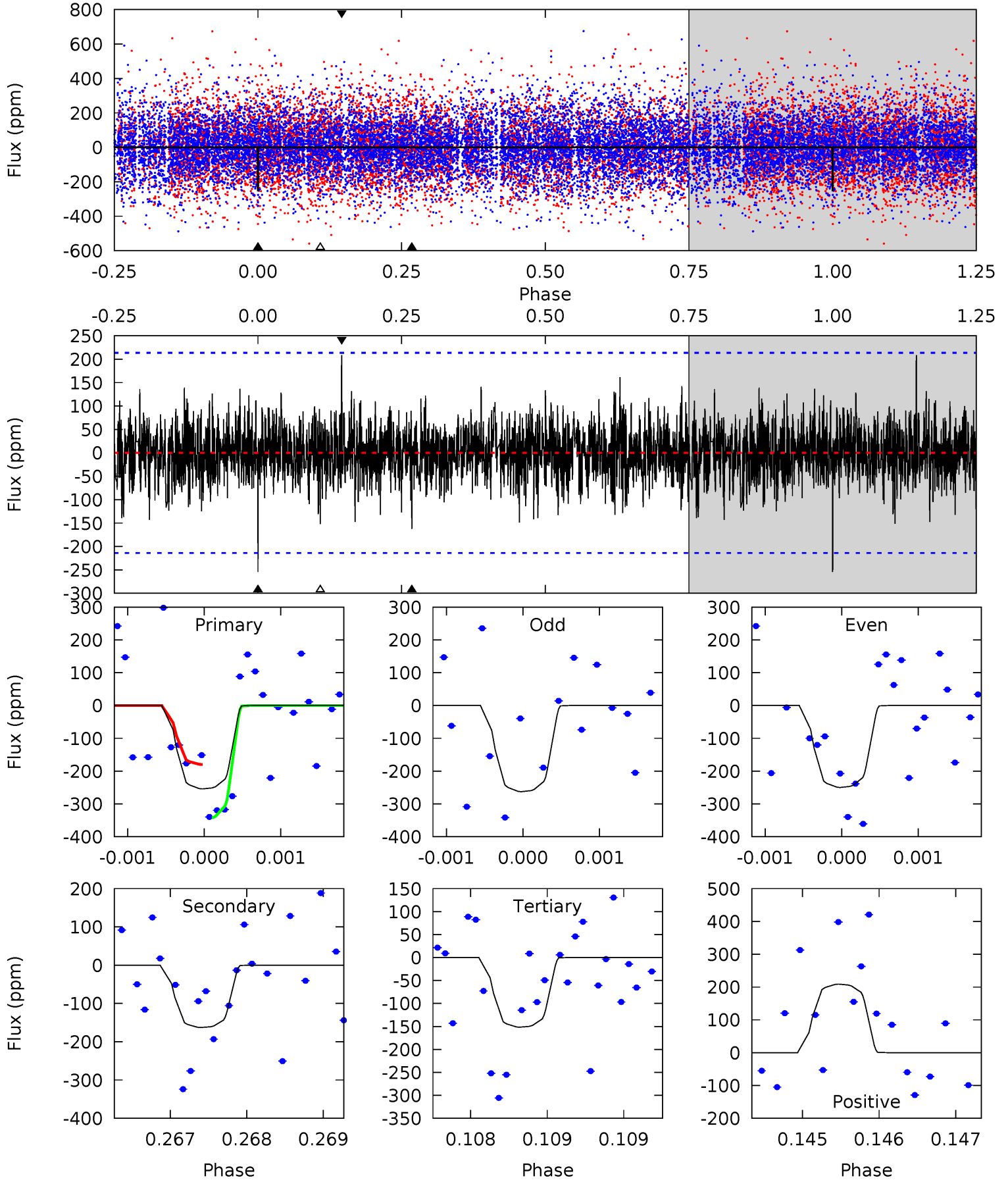
TCE 002444769-07 P=169.958940 Days  $T_0=155.423034$  (BKJD)



# DV Model-Shift Uniqueness Test

002444769-07, P = 169.959063 Days, E = 155.423564 Days

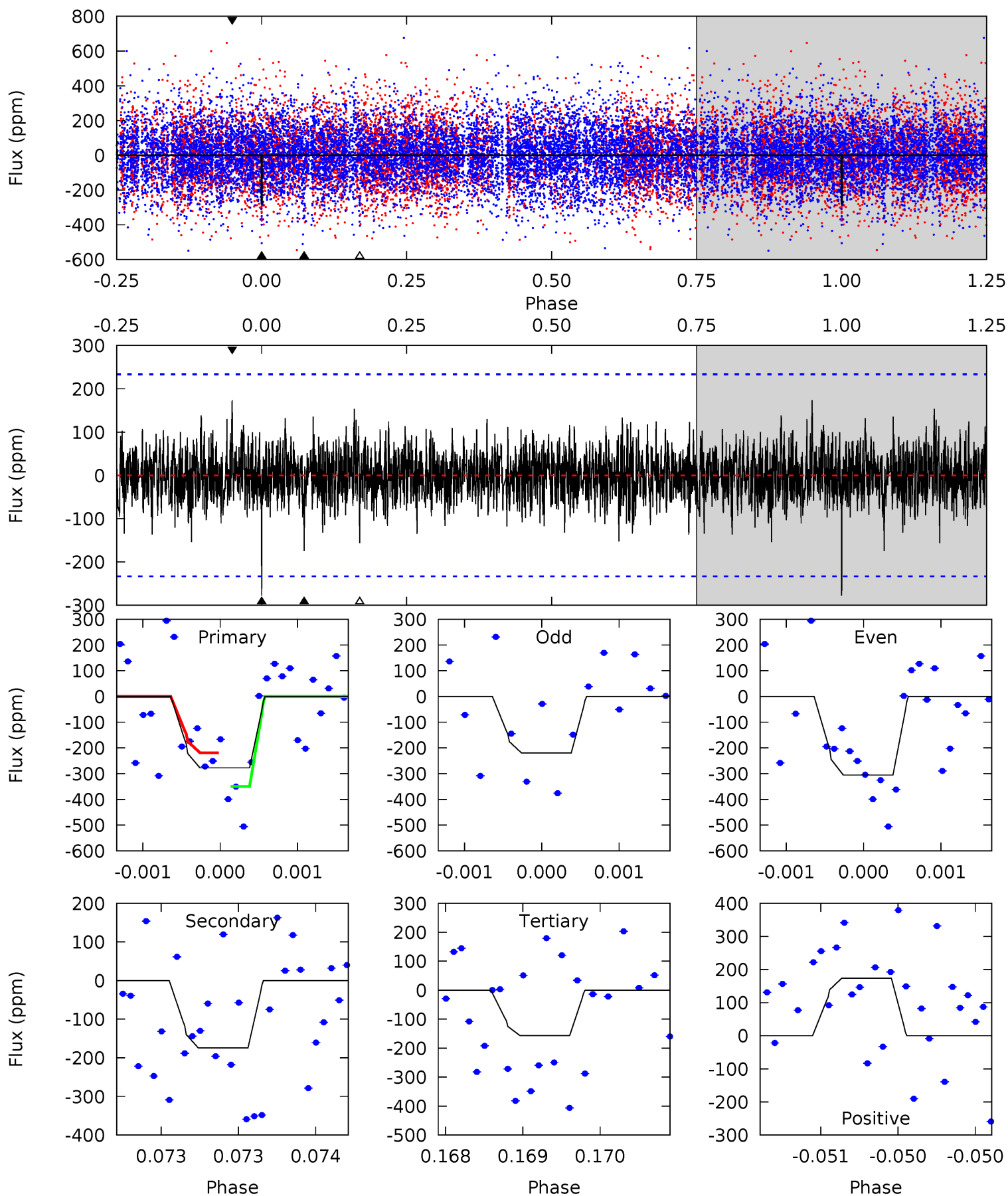
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.56	4.20	3.91	5.39	5.51	3.39	1.14	2.65	1.17	0.29	-1.19	0.15	0.97	0.45	2.09



# Alt Model-Shift Uniqueness Test

002444769-07, P = 169.958940 Days, E = 155.423034 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.59	4.15	3.73	4.13	5.54	3.43	1.04	2.86	2.46	0.42	0.02	0.91	0.94	0.39	1.56



### Stellar Parameters For KIC 002444769

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6450^{+162}_{-194}$	$4.421^{+0.081}_{-0.202}$	$-0.520^{+0.300}_{-0.300}$	$1.022^{+0.308}_{-0.123}$	$1.004^{+0.133}_{-0.106}$	$1.325^{+0.467}_{-0.675}$
	+3%/-3%	+2%/-5%	+58%/-58%	+30%/-12%	+13%/-11%	+35%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 002444769-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-163 \pm 39$	$2.18^{+1.64}_{-1.33}$	$524^{+37}_{-26}$	$5322^{+3240}_{-1136}$	$6632^{+37937}_{-4607}$
Alt.	$-175 \pm 42$	$2.22^{+1.71}_{-1.34}$	$526^{+36}_{-26}$	$5305^{+3805}_{-1056}$	$6822^{+40624}_{-4738}$

$T_{\text{max}}$  = 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

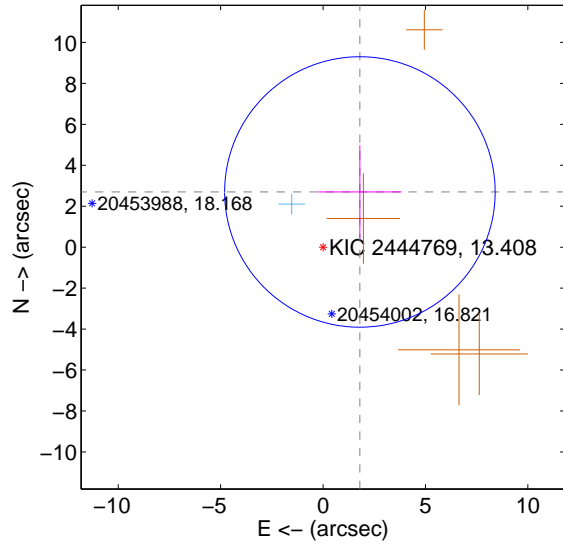
Supplemental centroid analysis for 002444769-07. Kepler magnitude: 13.41. Transit SNR 7.16

There are 1 quarters with good PRF difference image offsets

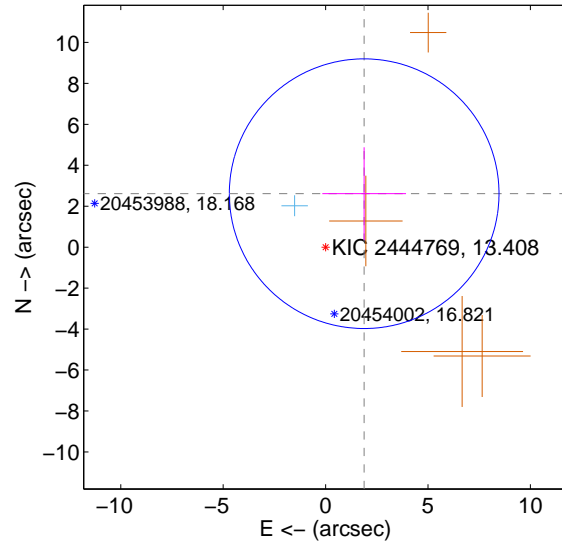
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.242 \pm 2.202$	1.47	$-1.800 \pm 2.026$	$2.696 \pm 2.276$
PRF-fit source offset from KIC position	$3.220 \pm 2.195$	1.47	$-1.884 \pm 2.044$	$2.612 \pm 2.269$
photometric centroid source offset	$1.21 \pm 1.53$	0.79	$1.10 \pm 1.51$	$-0.49 \pm 1.65$

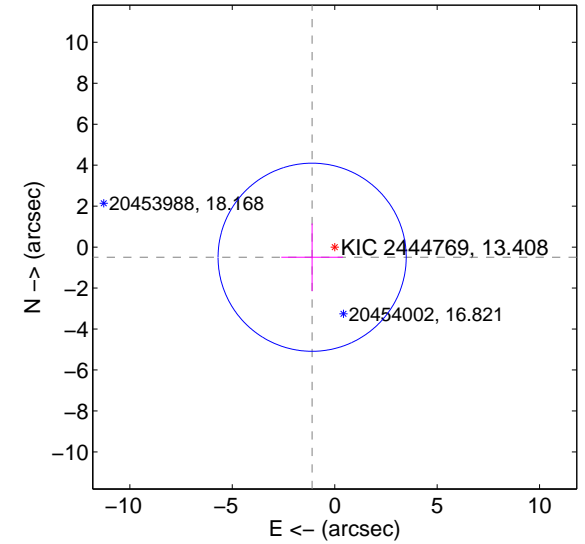
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

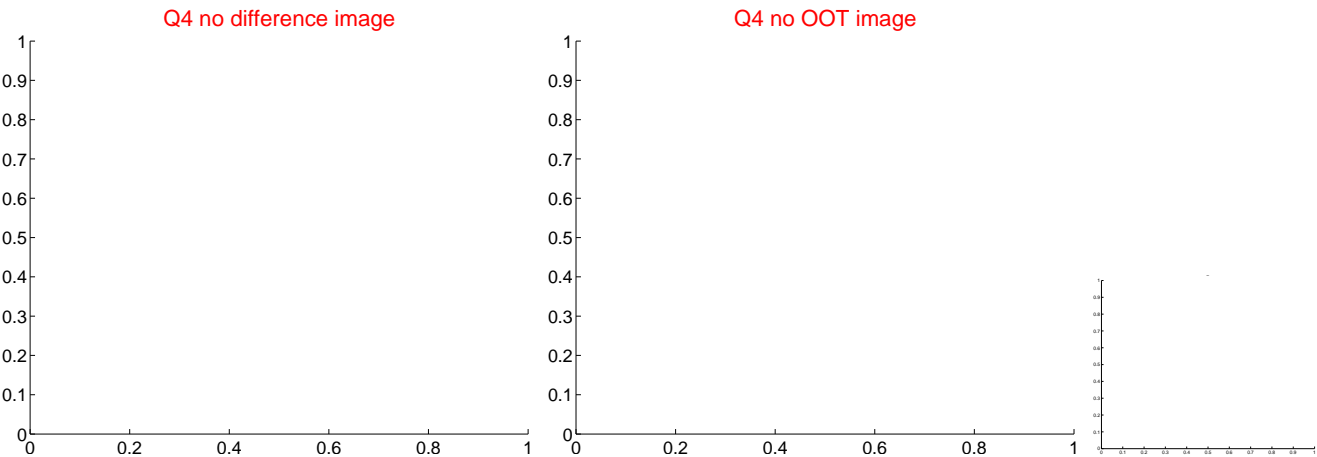
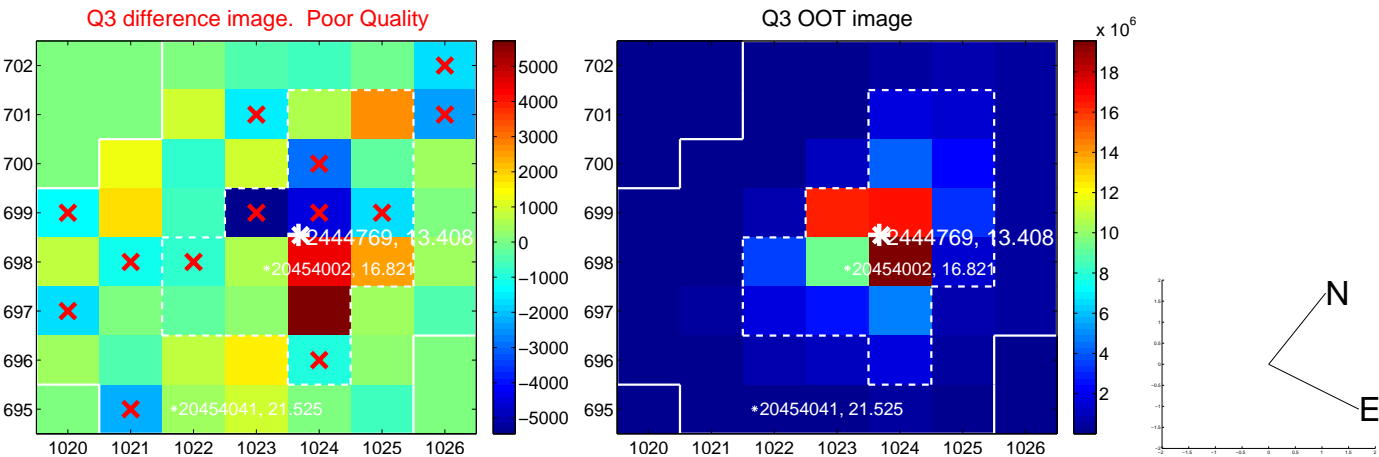
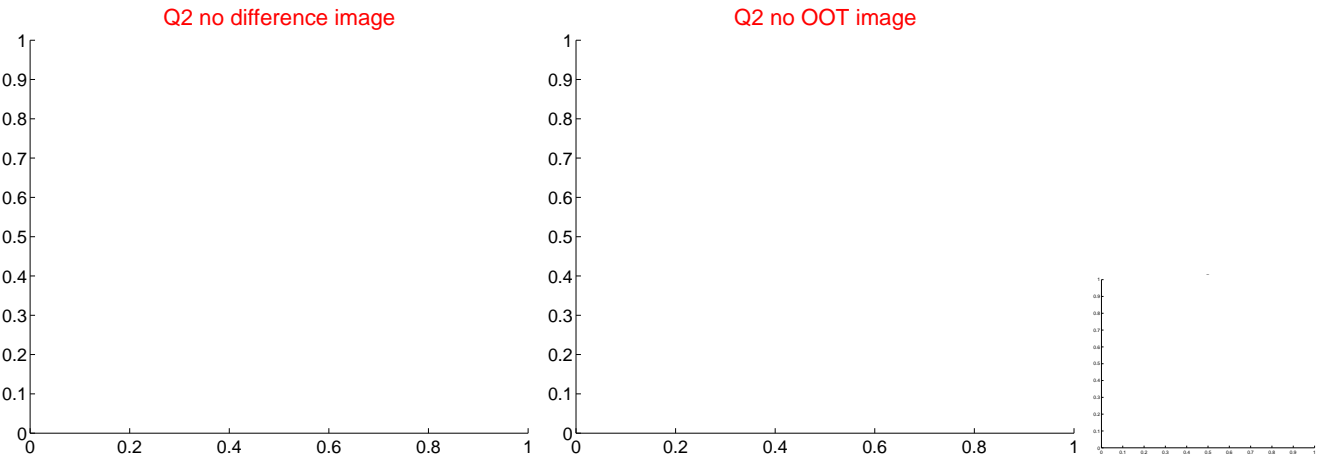
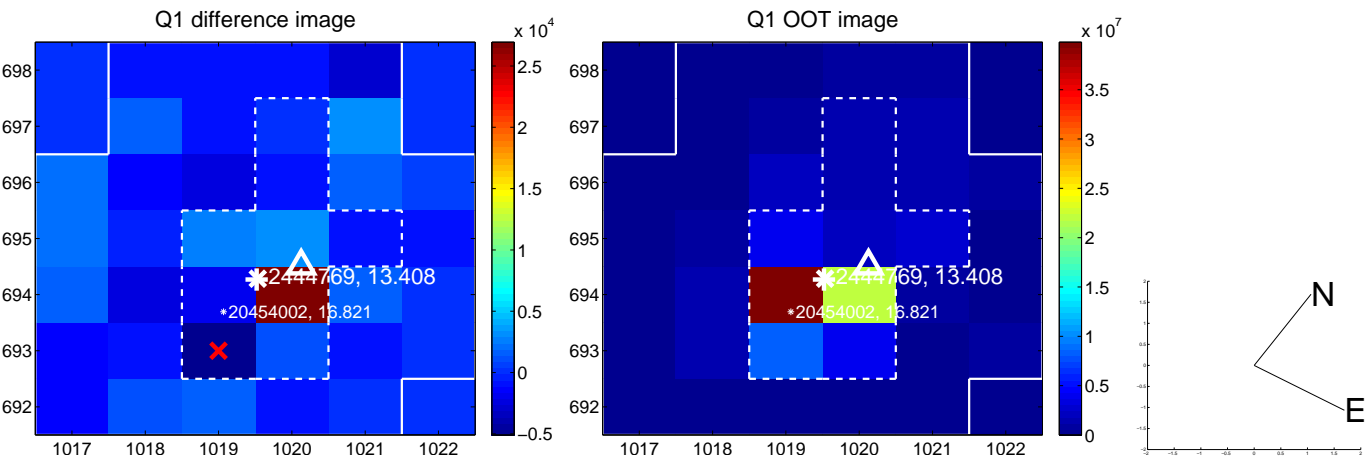


offset from photometric centroids



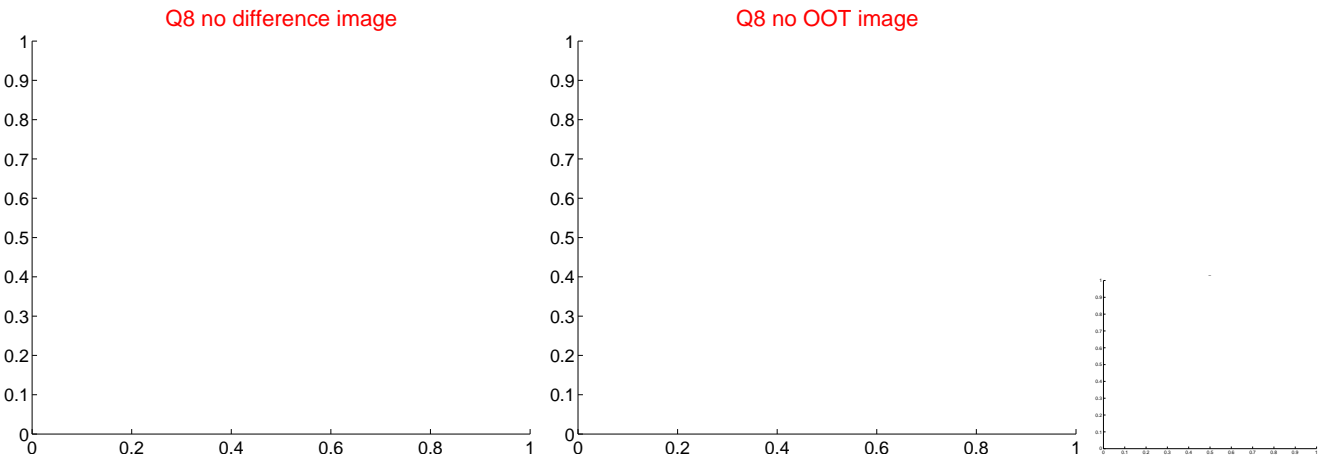
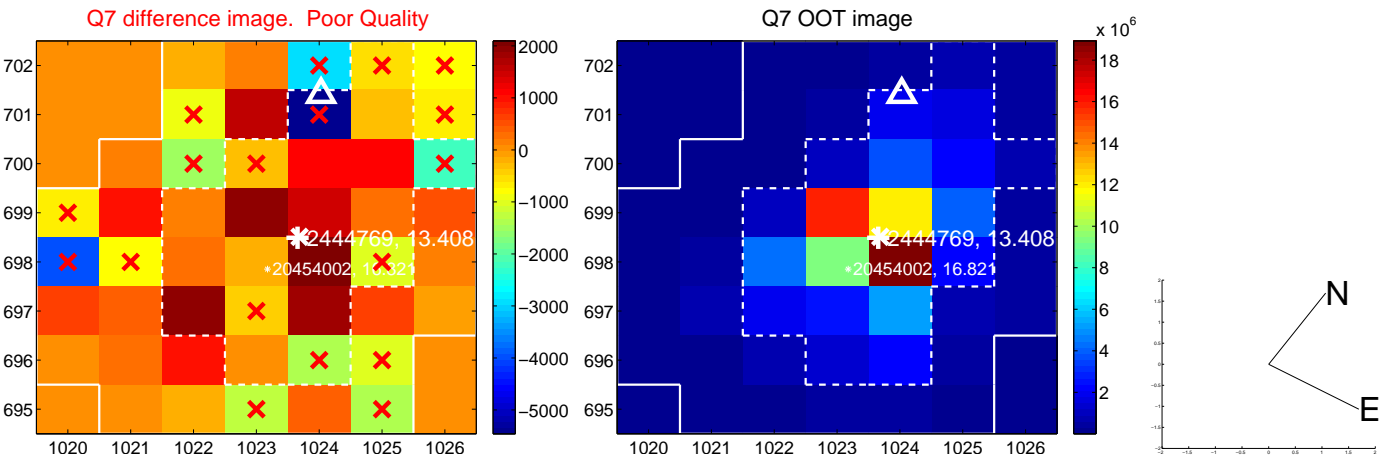
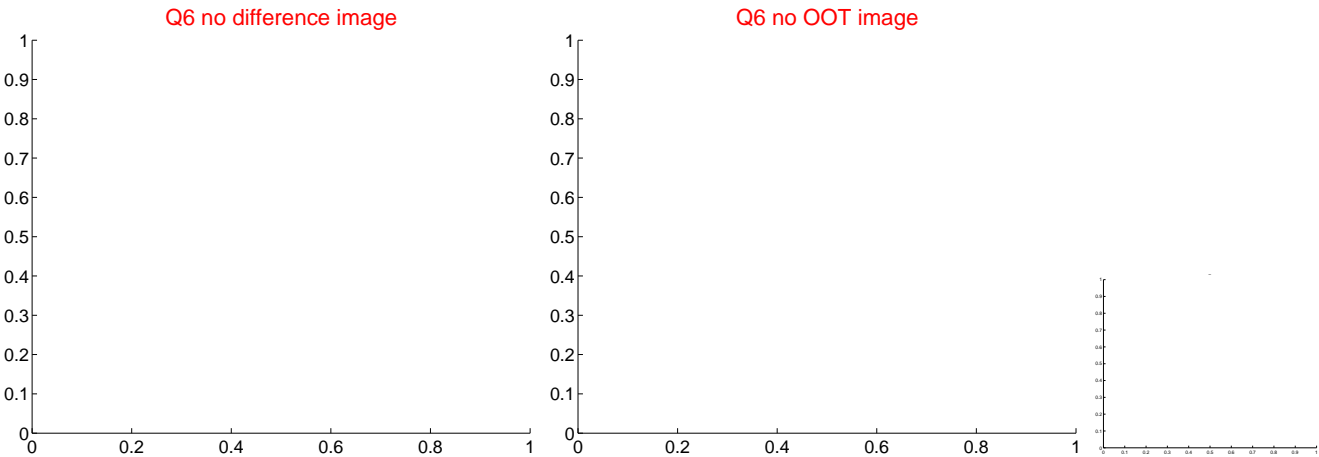
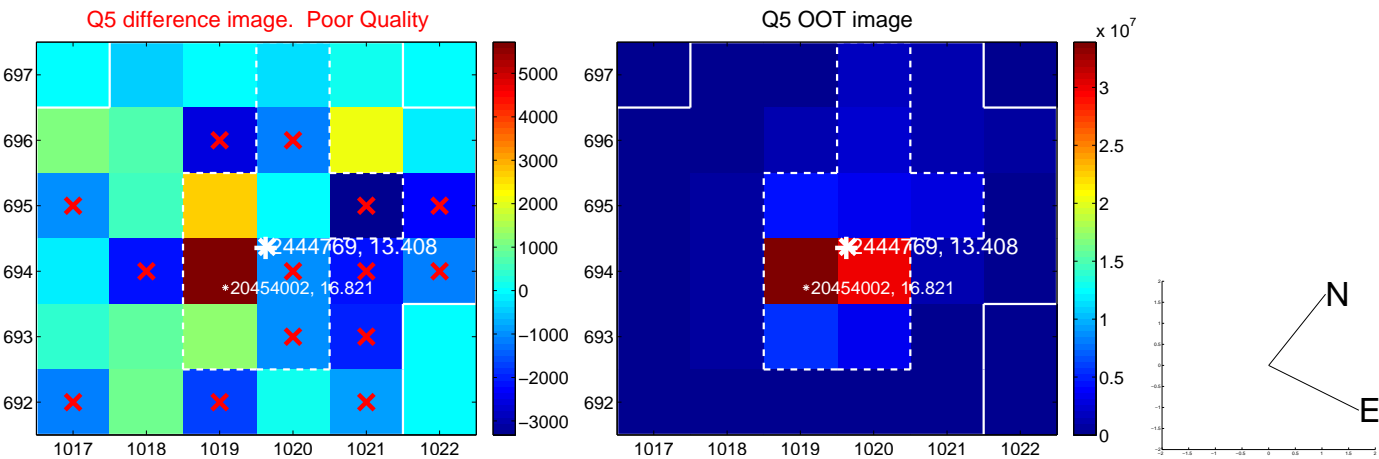
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

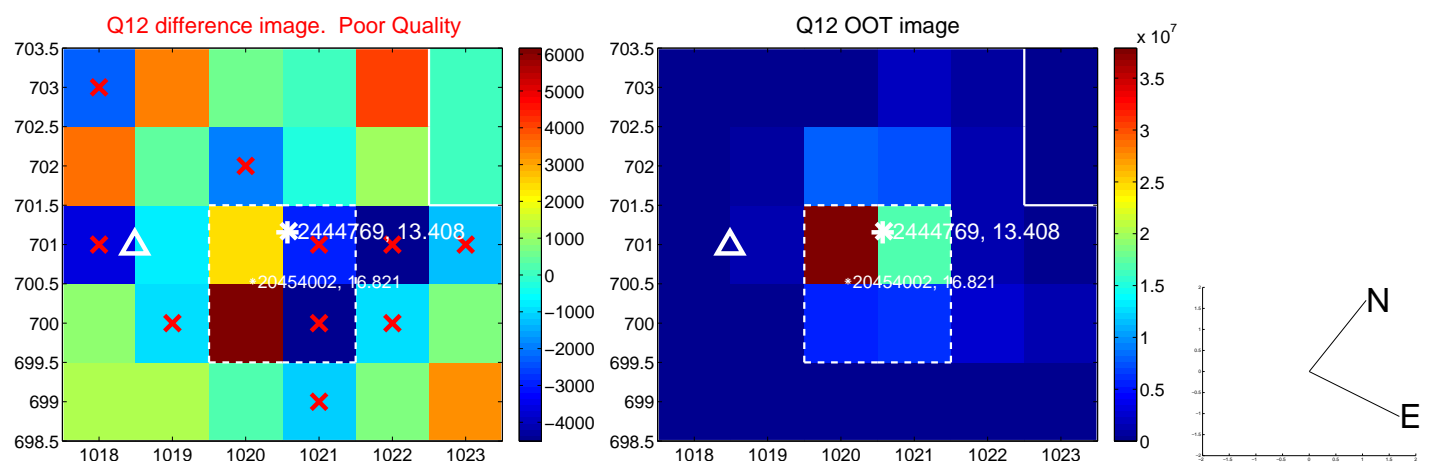
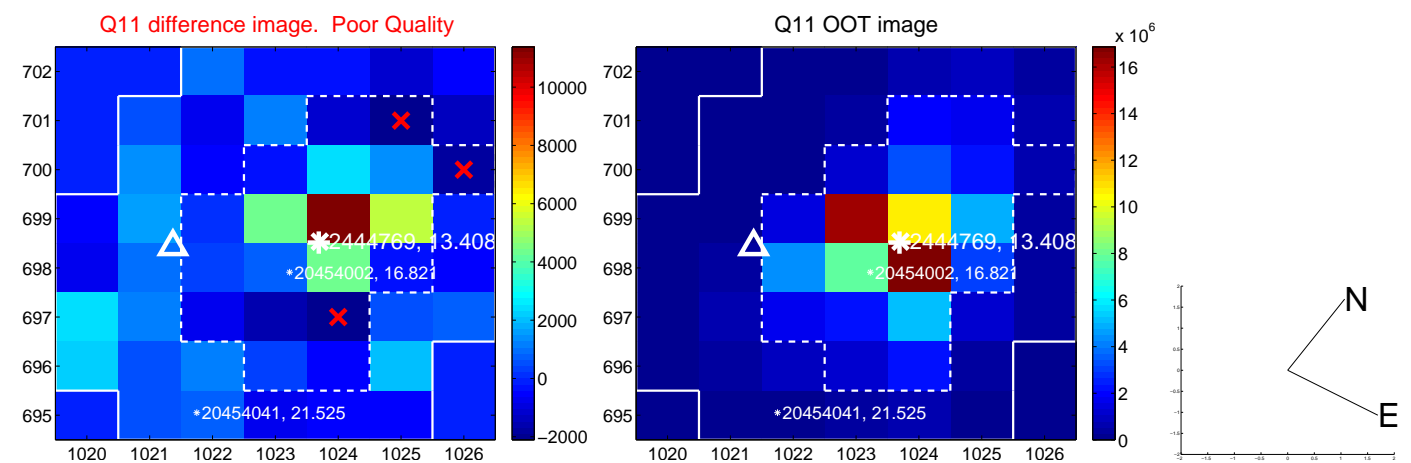
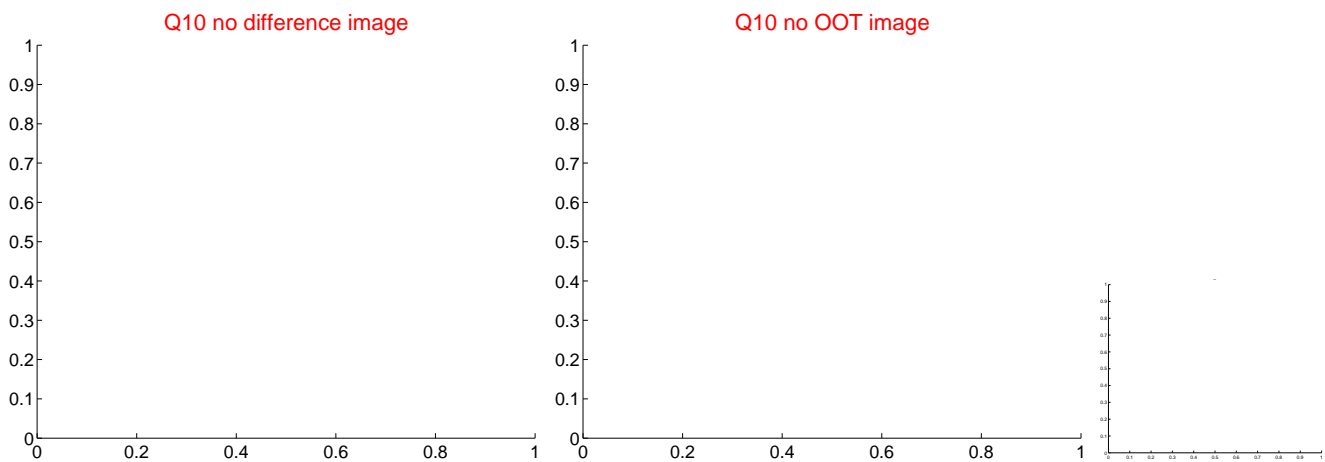
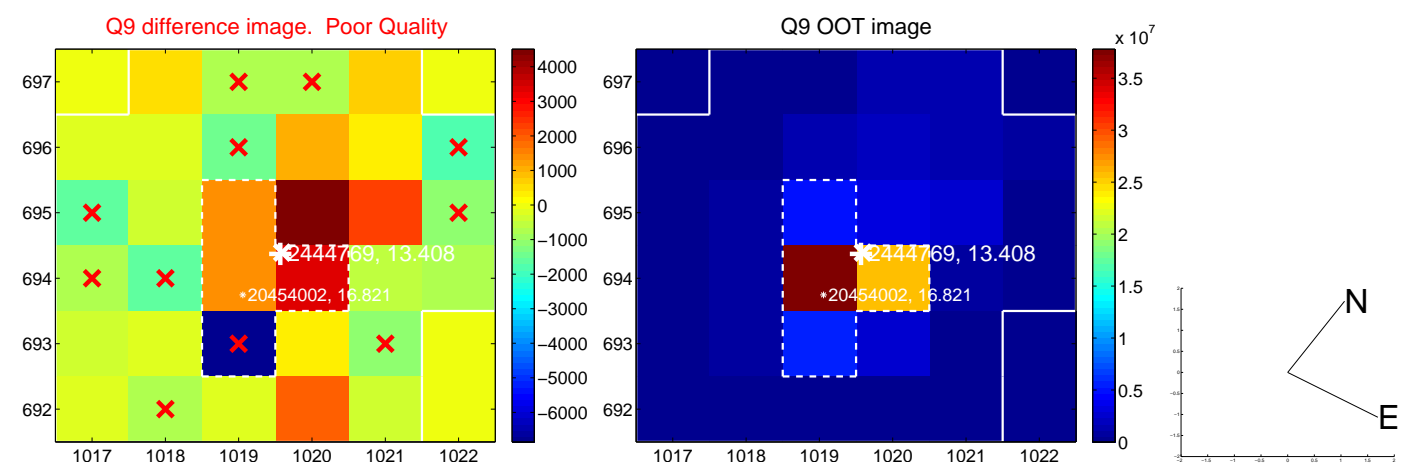




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

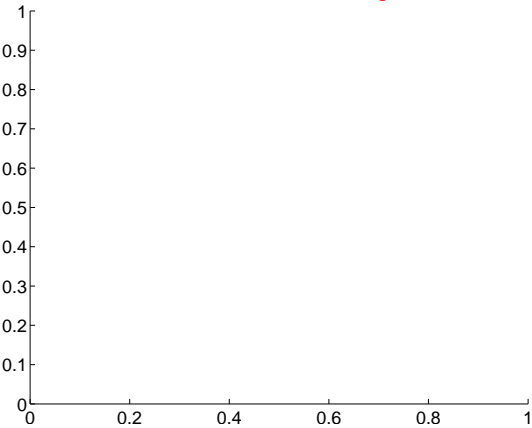


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

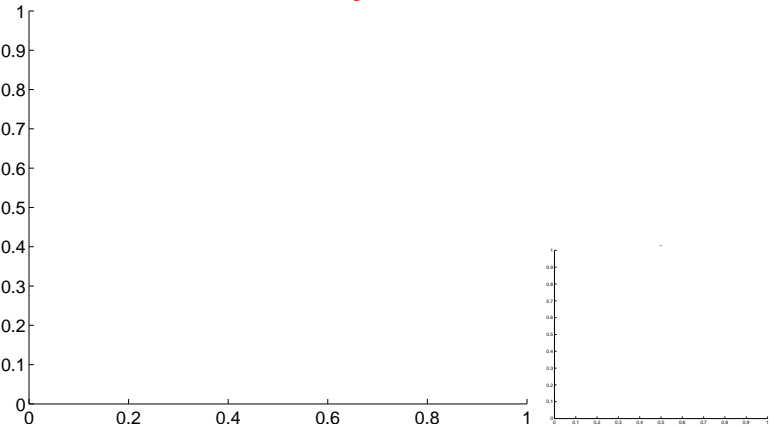


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

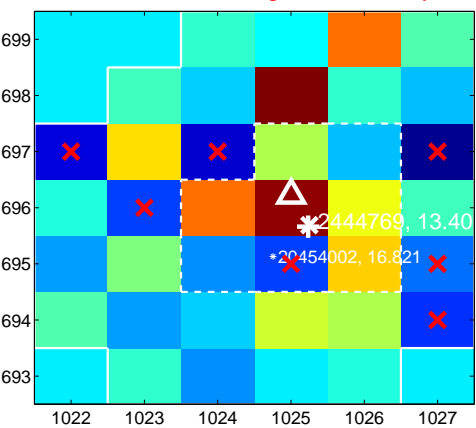
Q13 no difference image



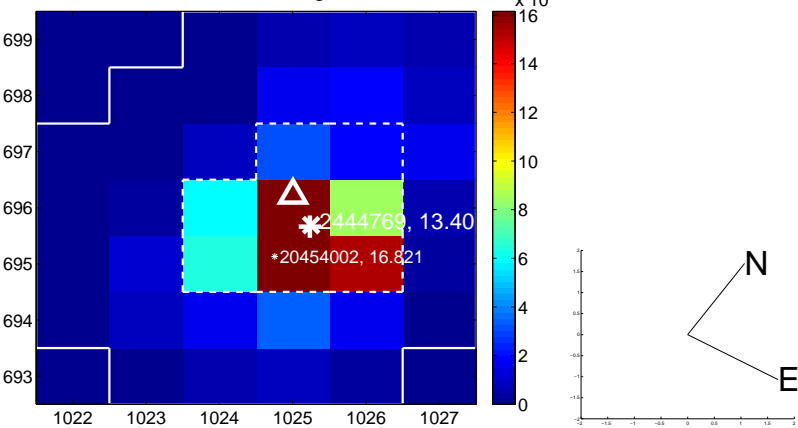
Q13 no OOT image



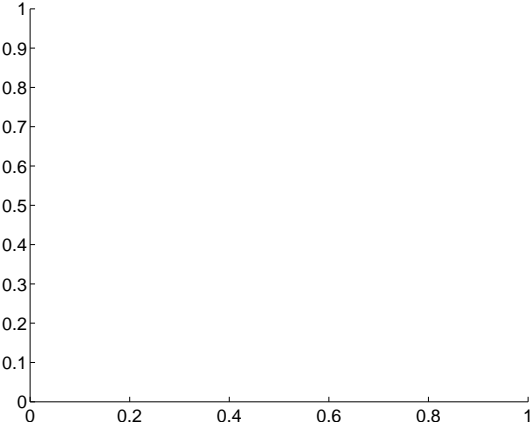
Q14 difference image. Poor Quality



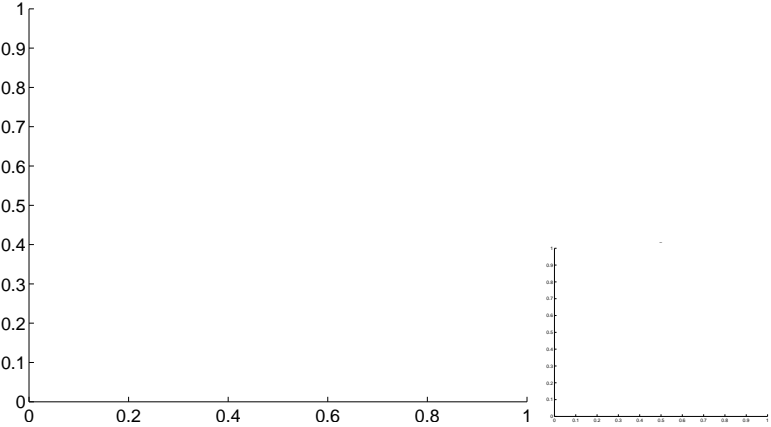
Q14 OOT image



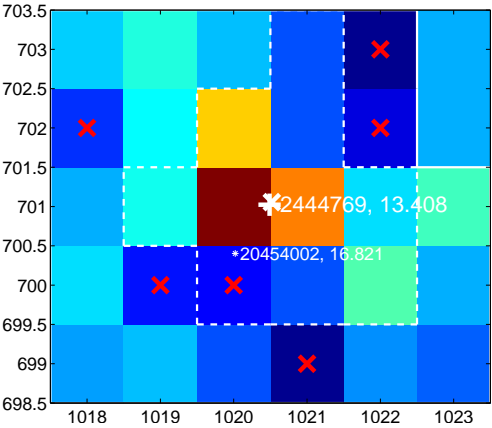
Q15 no difference image



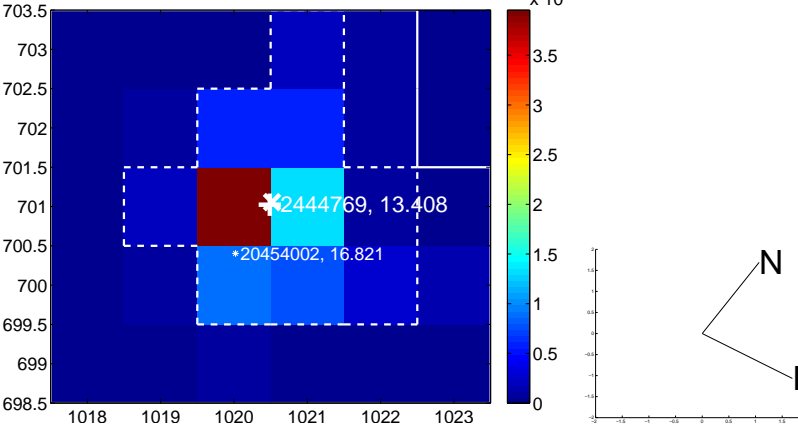
Q15 no OOT image



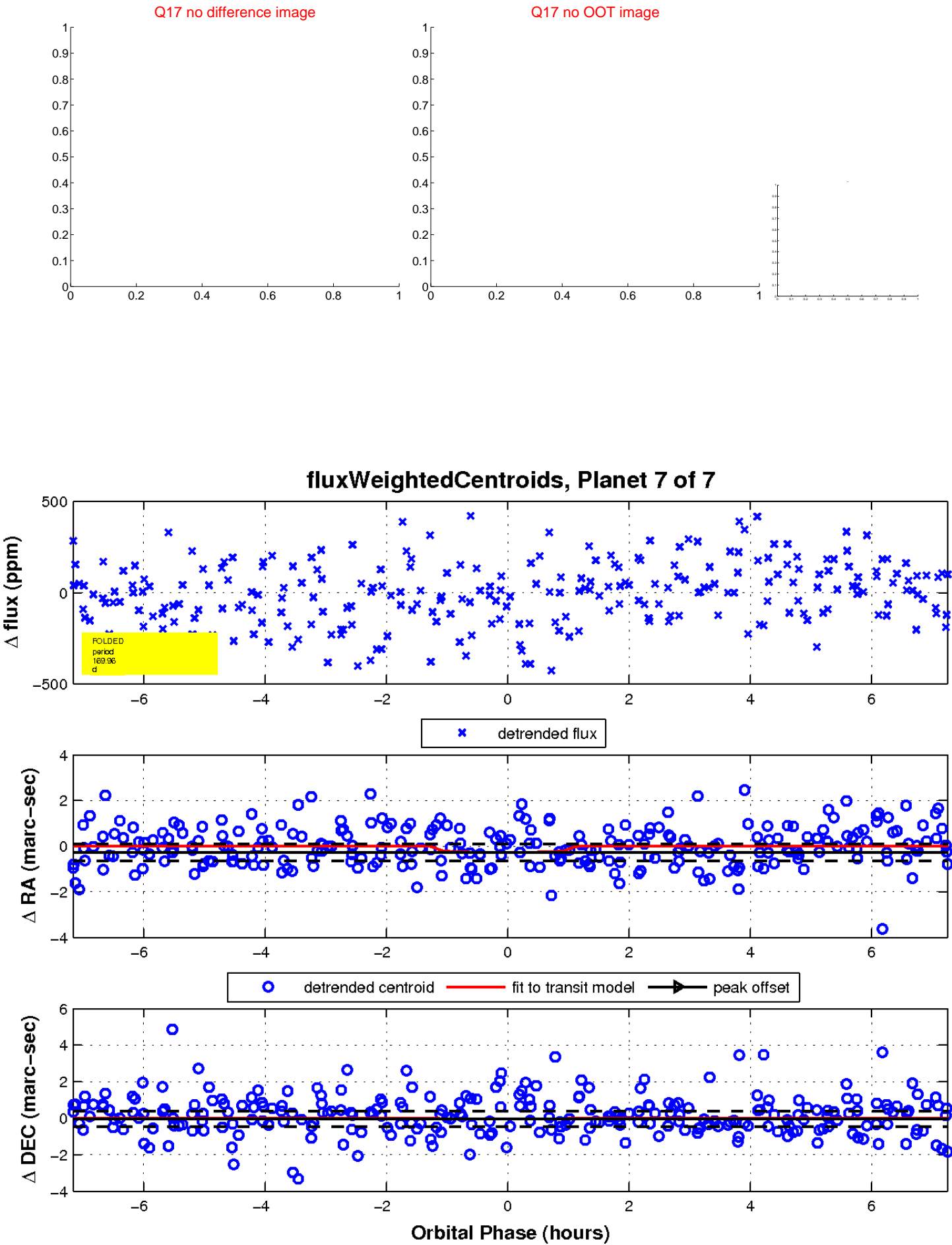
Q16 difference image. Poor Quality



Q16 OOT image



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



UKIRT Image

Declination

