

# KIC 007428489

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007428489-01	OBS	No	1.096483	132.344469	28.6	5.909	13.7	14.7	2.34	7306	1.28	23085.28
007428489-02	OBS	No	158.772298	278.027901	245.3	7.286	14.5	8.0	2.34	7306	4.10	30.36
007428489-03	OBS	No	39.128461	163.023799	147.6	4.372	8.0	7.7	2.34	7306	3.32	196.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007428489-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
007428489-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007428489-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

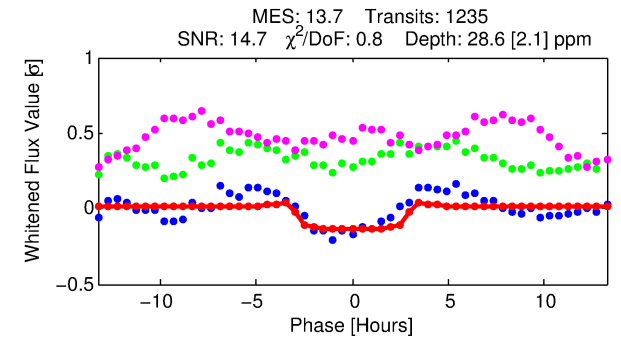
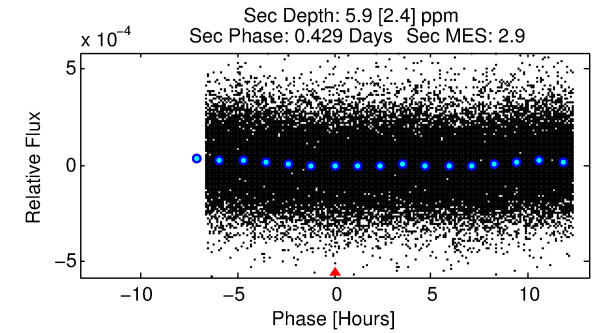
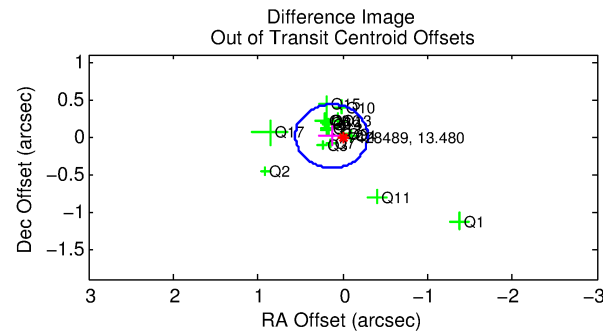
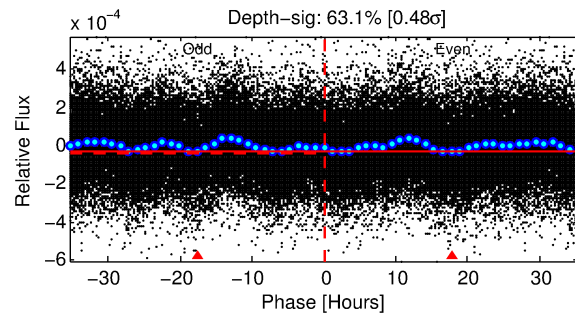
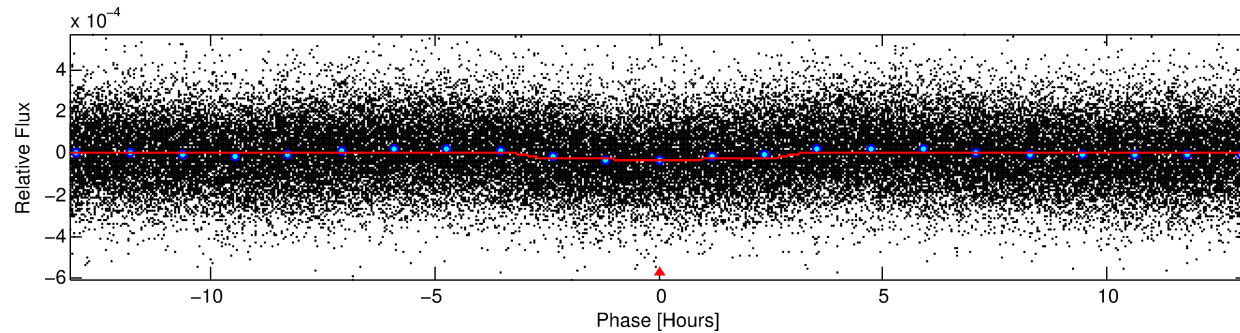
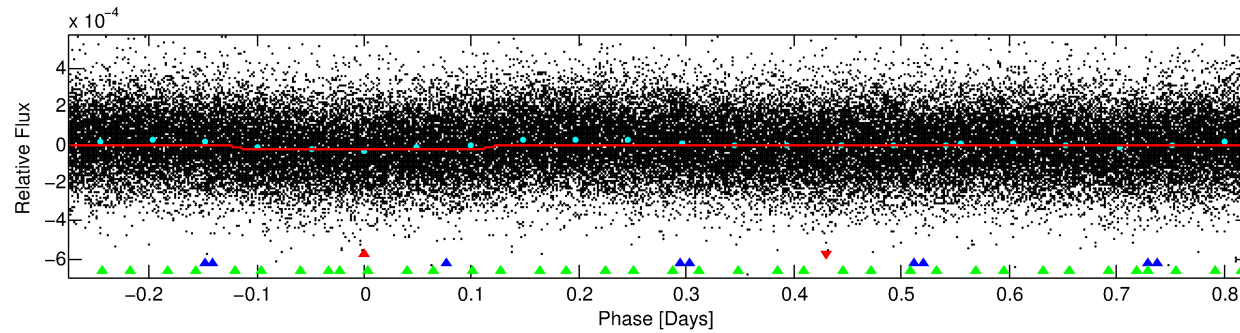
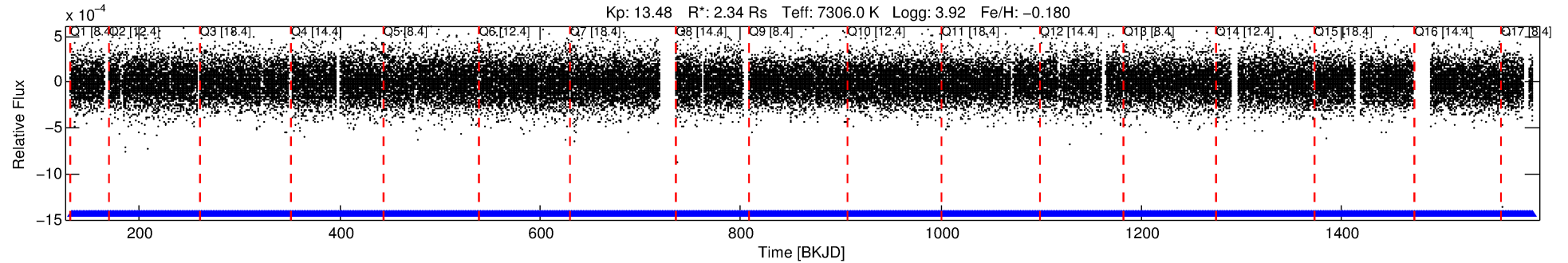
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007428489-01

No Significant Match Found

# DV One-Page Summary

KIC: 7428489 Candidate: 1 of 3 Period: 1.096 d



## DV Fit Results:

Period = 1.09648 [0.00001] d  
Epoch = 132.3445 [0.0033] BKJD  
Rp/R\* = 0.0050 [0.0020]  
a/R\* = 1.49 [1.80]  
b = 0.37 [5.23]  
Seff = 23085.28 [12900.33]  
Teq = 3143 [439] K  
Rp = 1.28 [0.68] Re  
a = 0.0246 [0.0082] AU  
Ag = 1.21 [1.25] [0.17 $\sigma$ ]  
Teffp = 5093 [1160] K [1.57 $\sigma$ ]

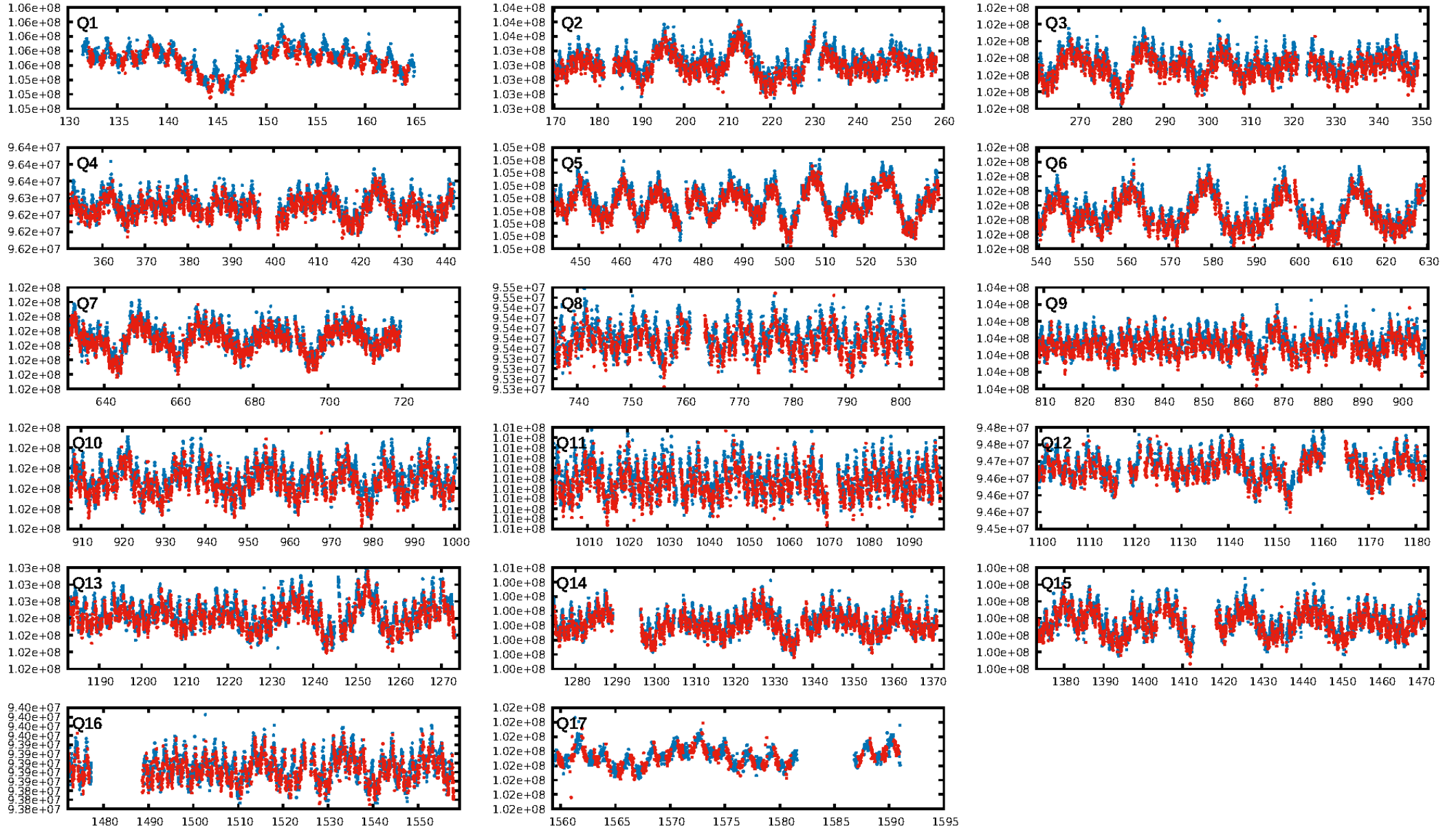
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [124.17 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.00e-28  
RollingBand-fgt: 1.00 [1181/1181]  
GhostDiagnostic-chr: 1.278  
Centroid-sig: 0.0%  
Centroid-so: 2.366 arcsec [4.09 $\sigma$ ]  
OotOffset-rm: 0.131 arcsec [0.92 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.015 arcsec [0.13 $\sigma$ ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

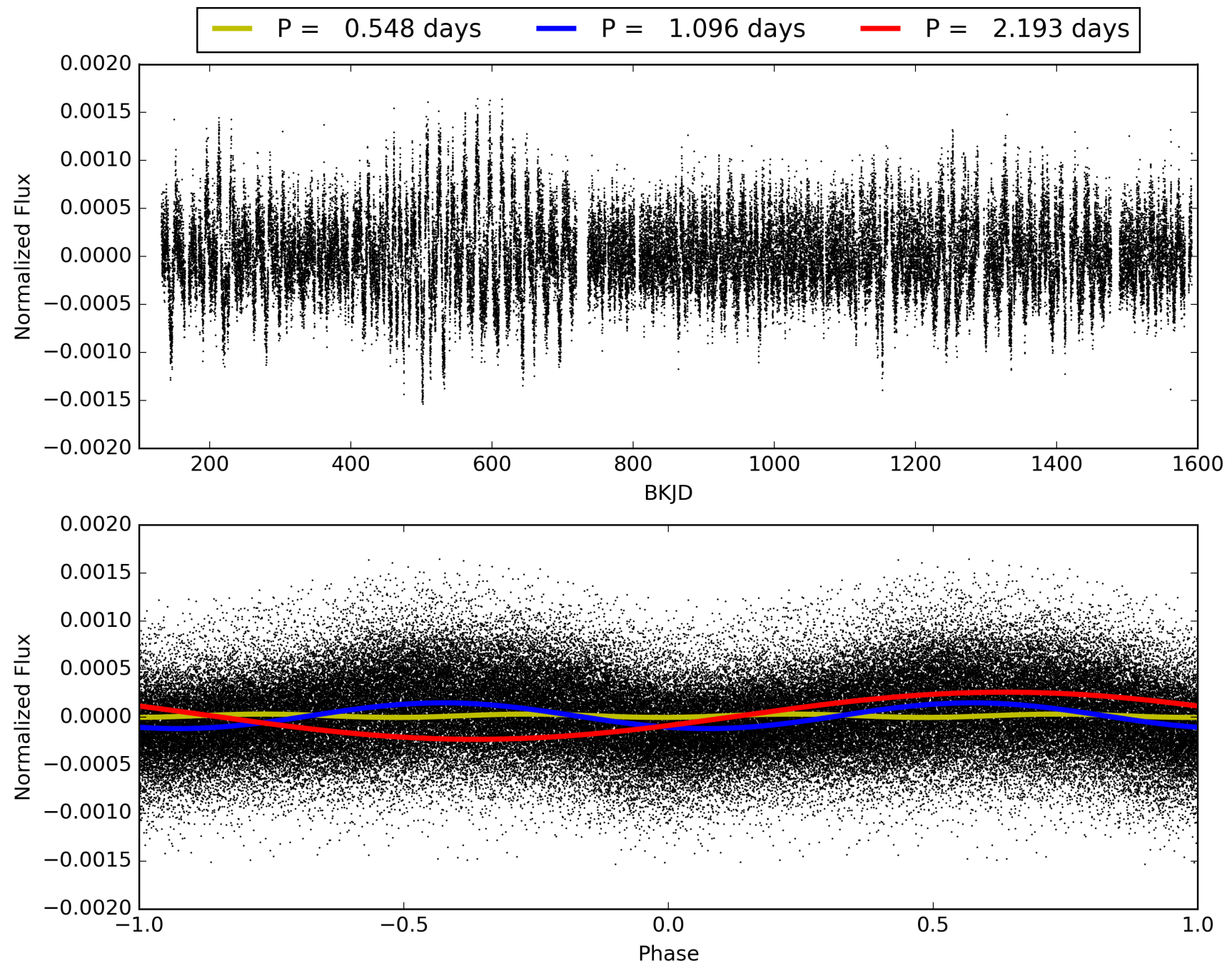
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:48:36 Z

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

# TCE 007428489-01, PDC Light Curves



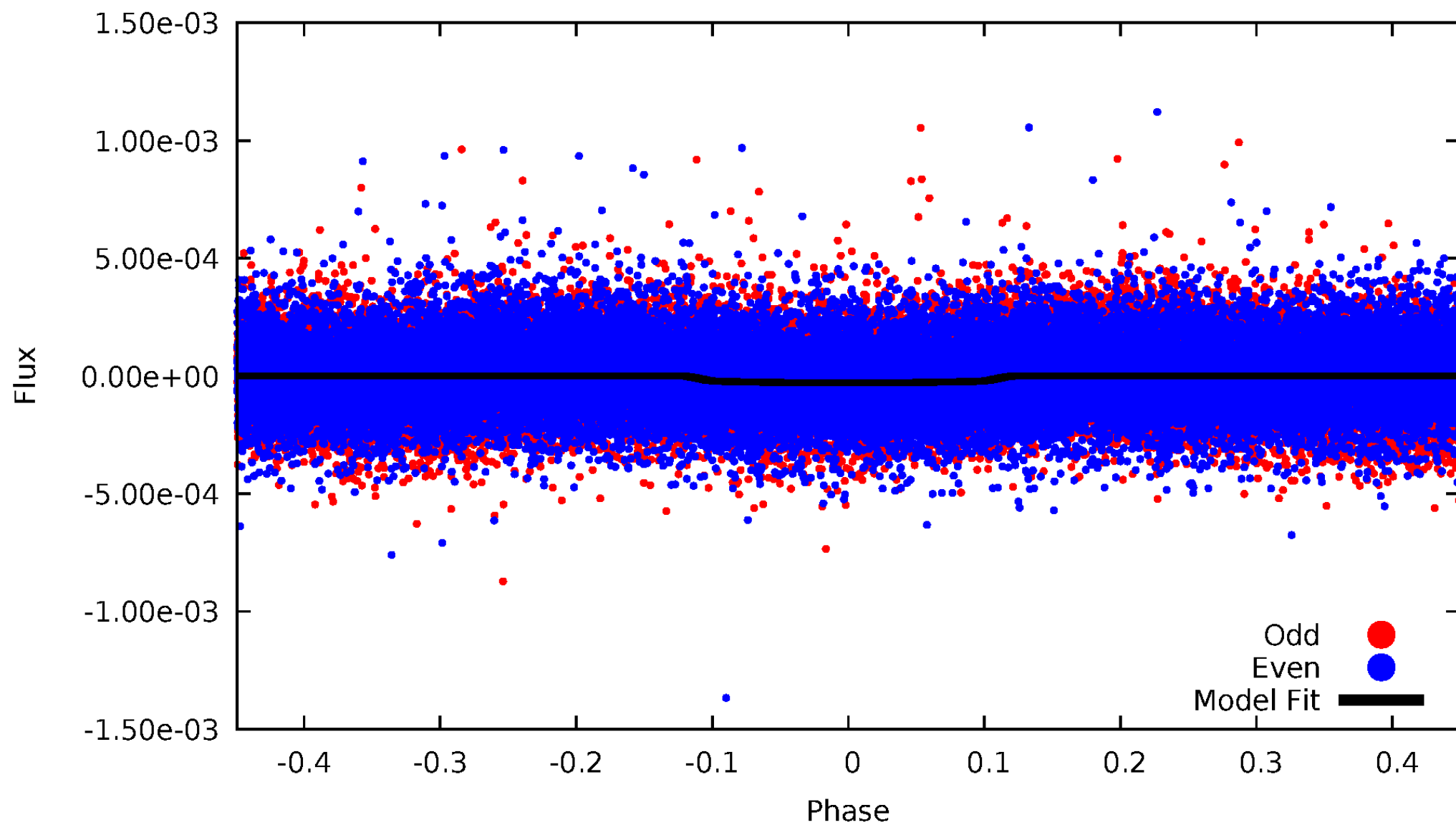
TCE 007428489-01





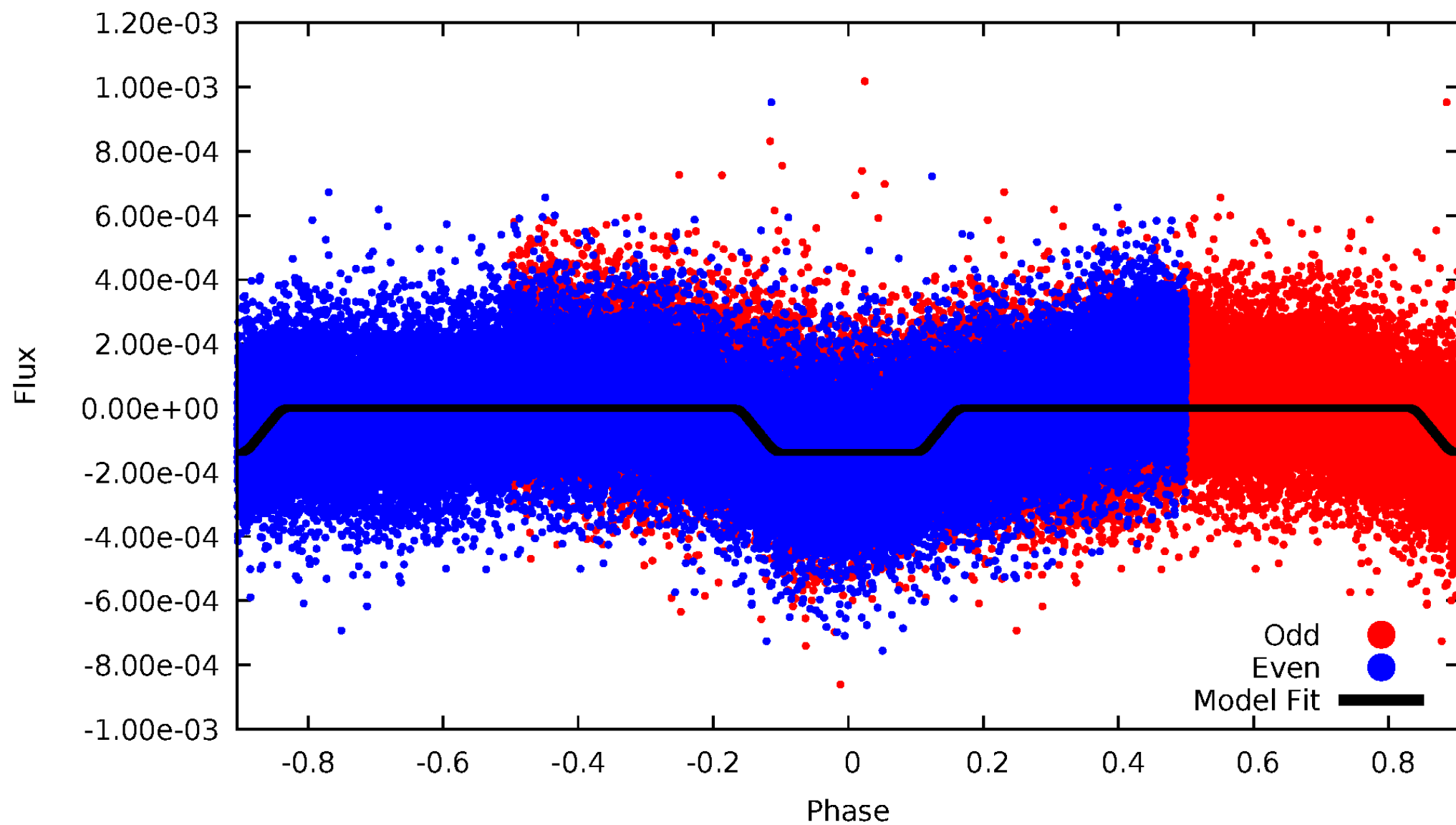
# DV Odd/Even

TCE 007428489-01



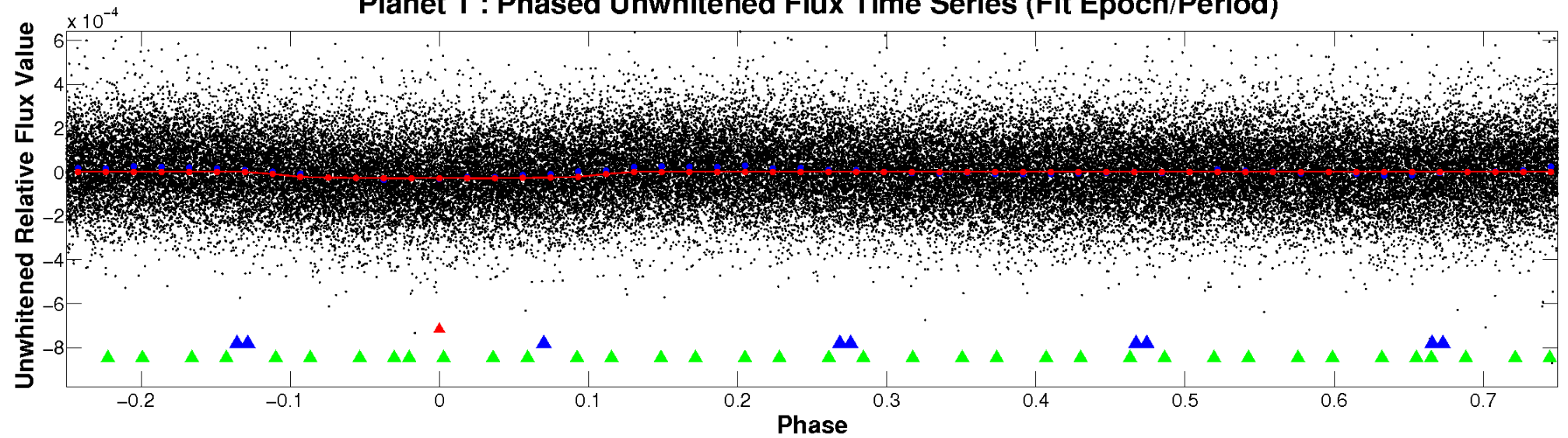
# ALT Odd/Even

TCE 007428489-01

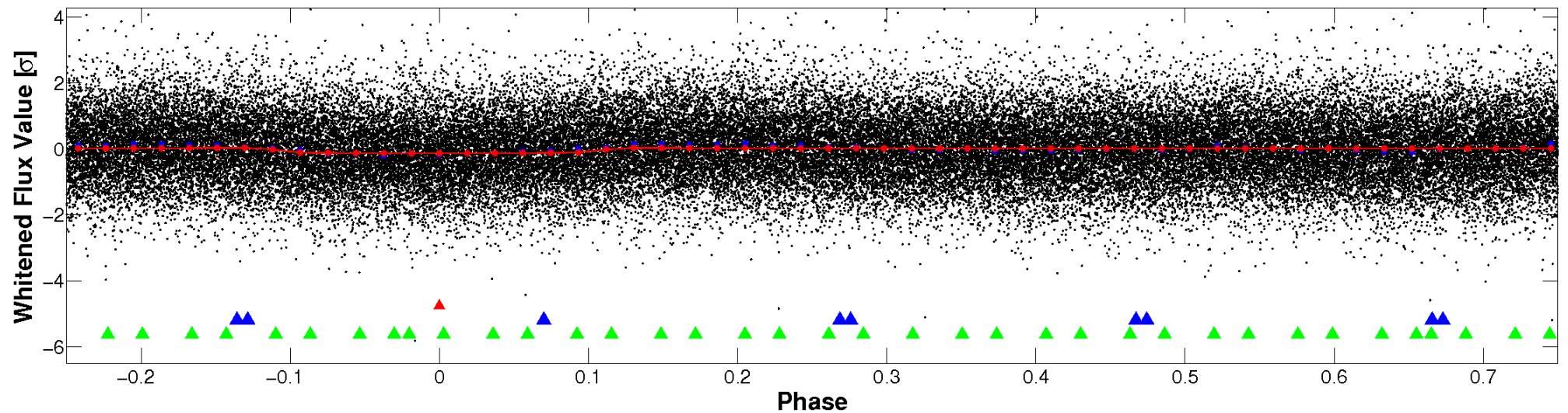


# Non-Whitened Vs. Whitened Light Curve

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

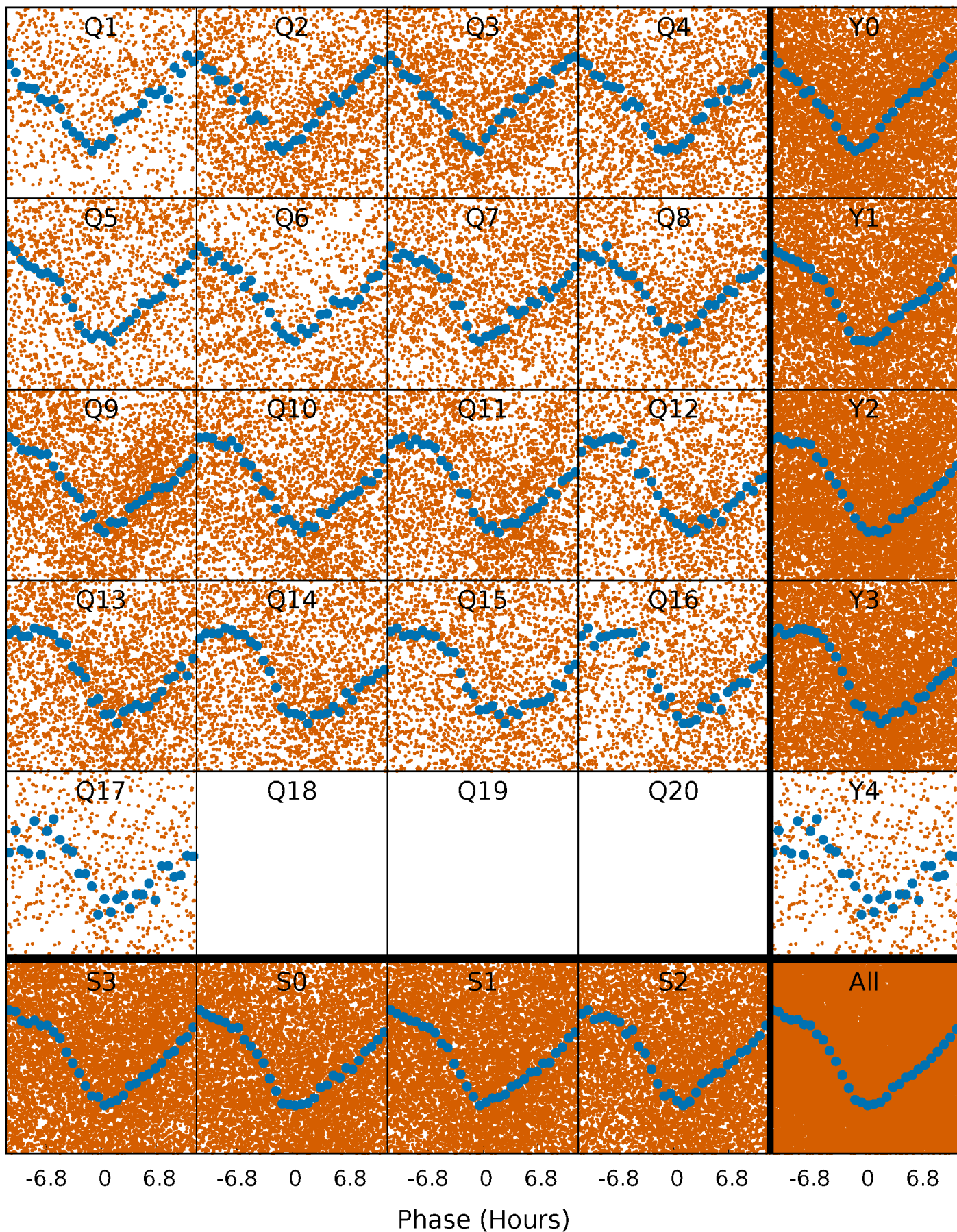


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

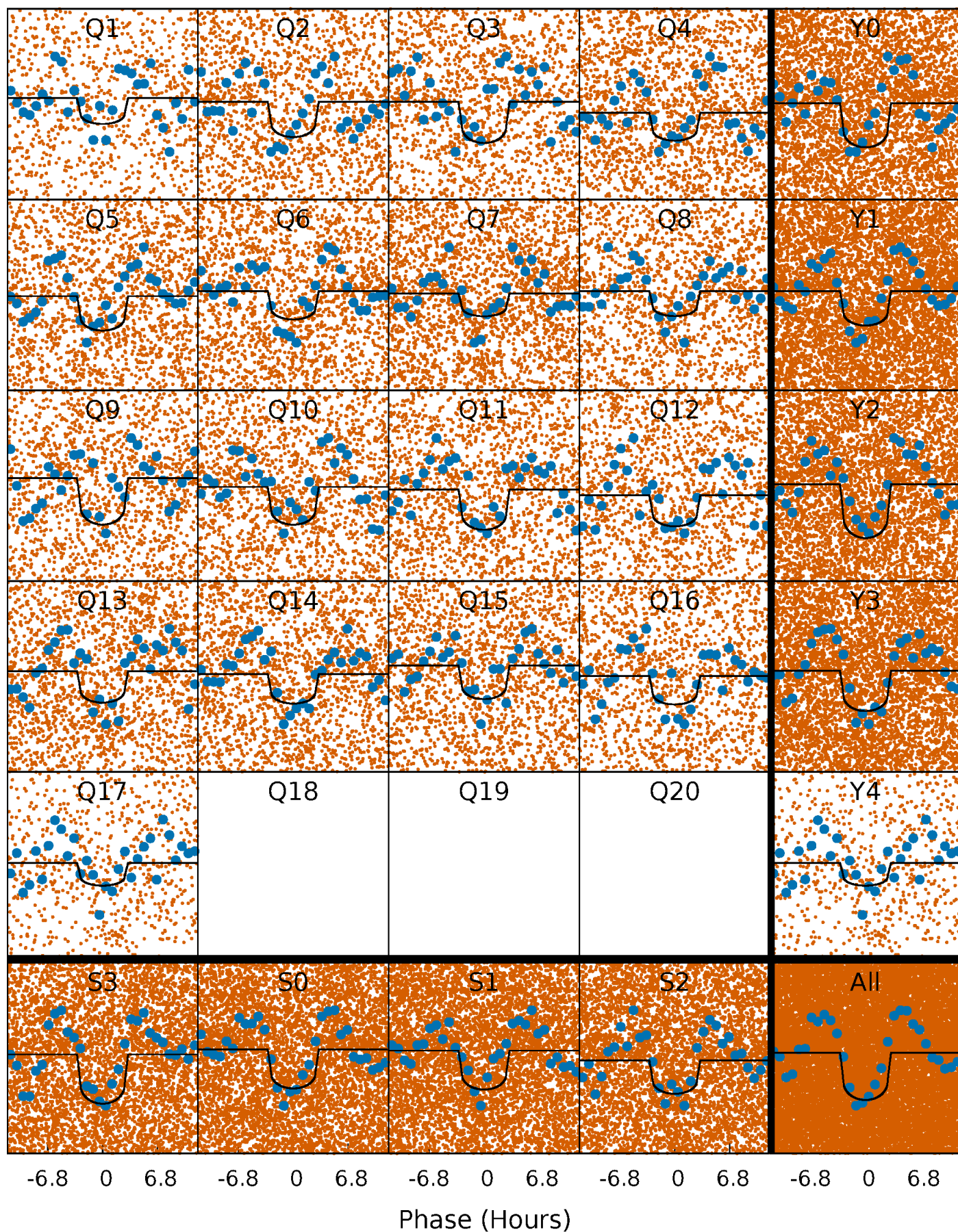
TCE 007428489-01 P= 1.096483 Days  $T_0=132.344469$  (BKJD)





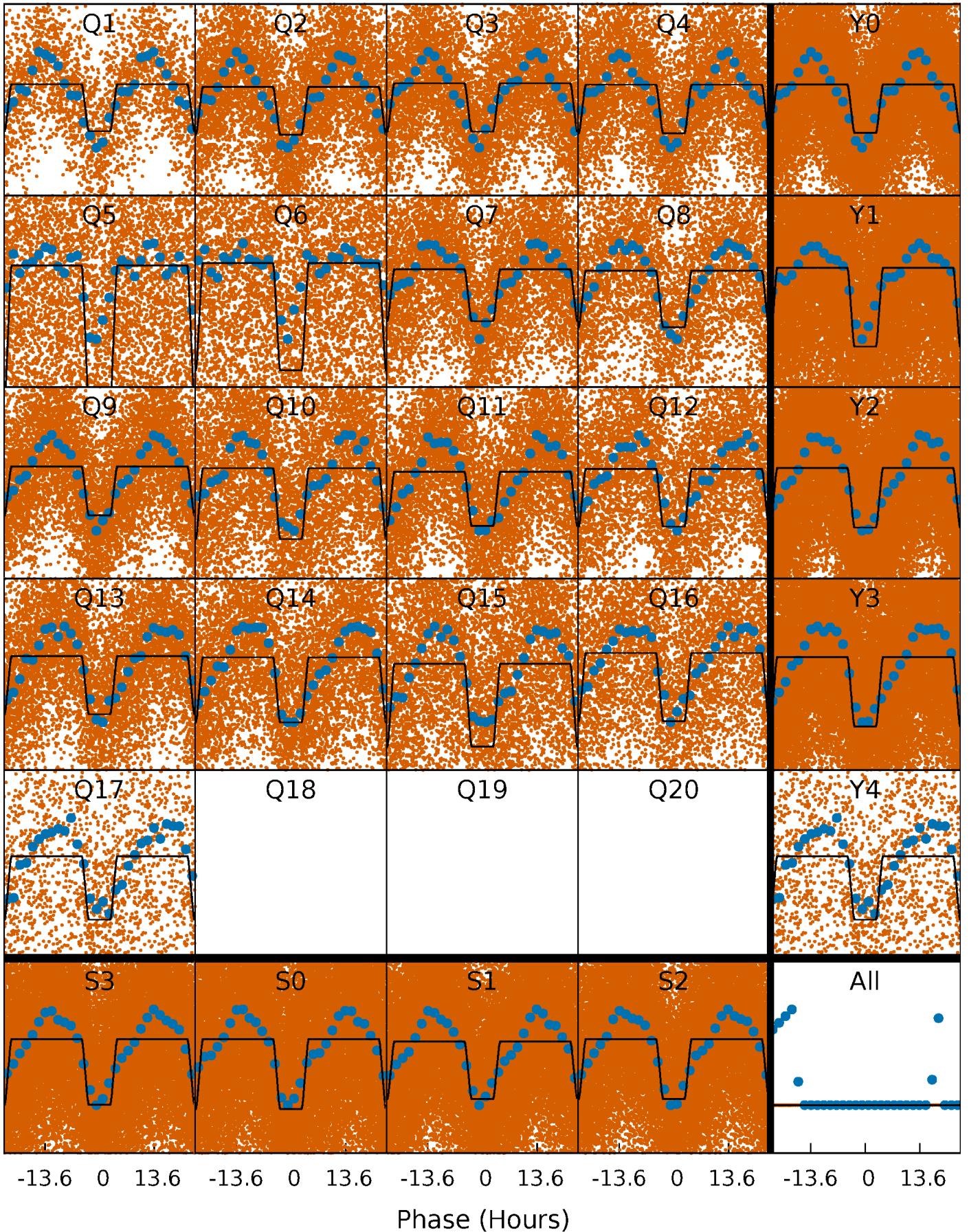
# DV Quarter-Phased Transit Curves

TCE 007428489-01 P= 1.096483 Days  $T_0=132.344469$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007428489-01 P= 1.096536 Days  $T_0=132.335203$  (BKJD)

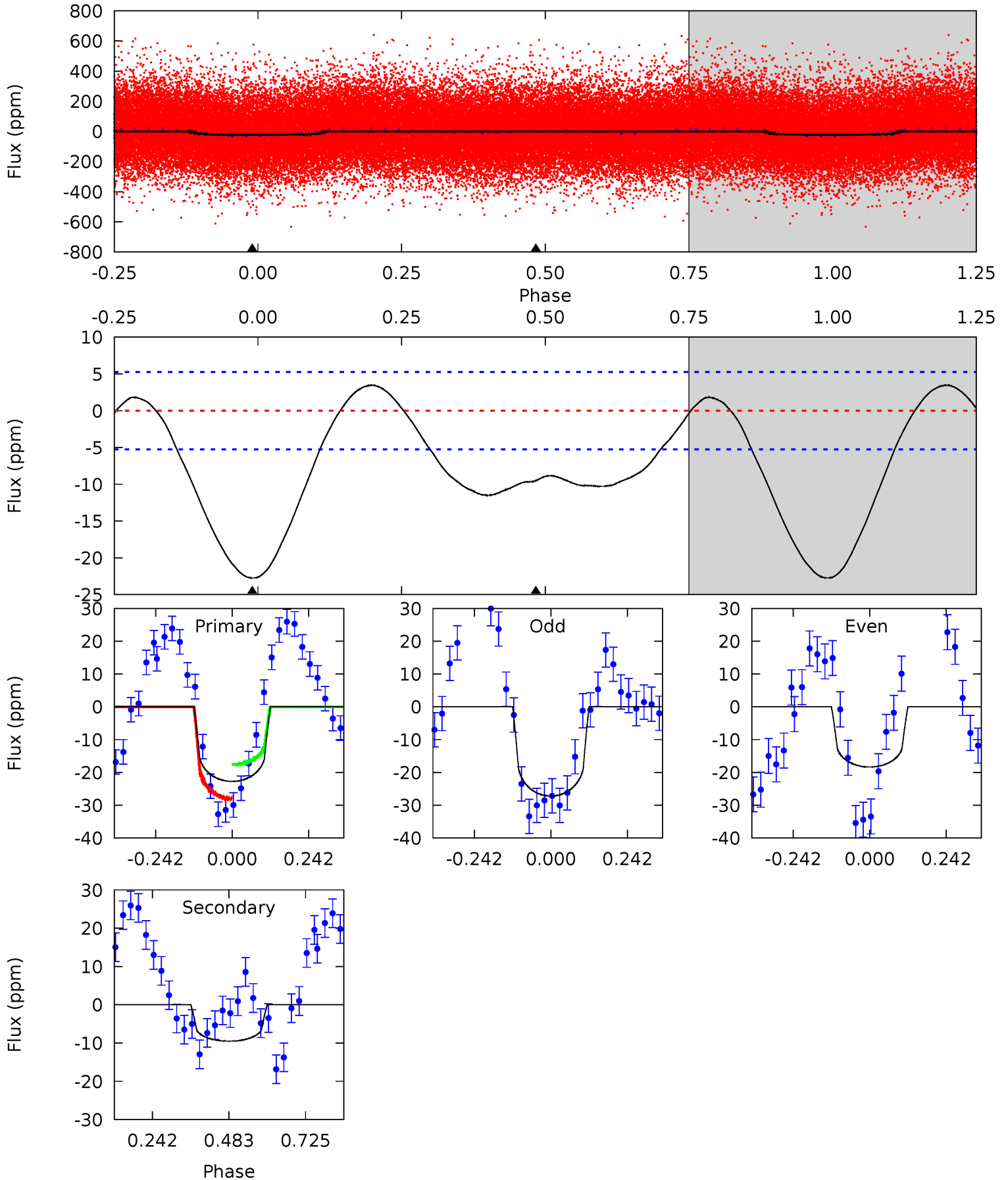




# DV Model-Shift Uniqueness Test

007428489-01, P = 1.096483 Days, E = 131.247986 Days

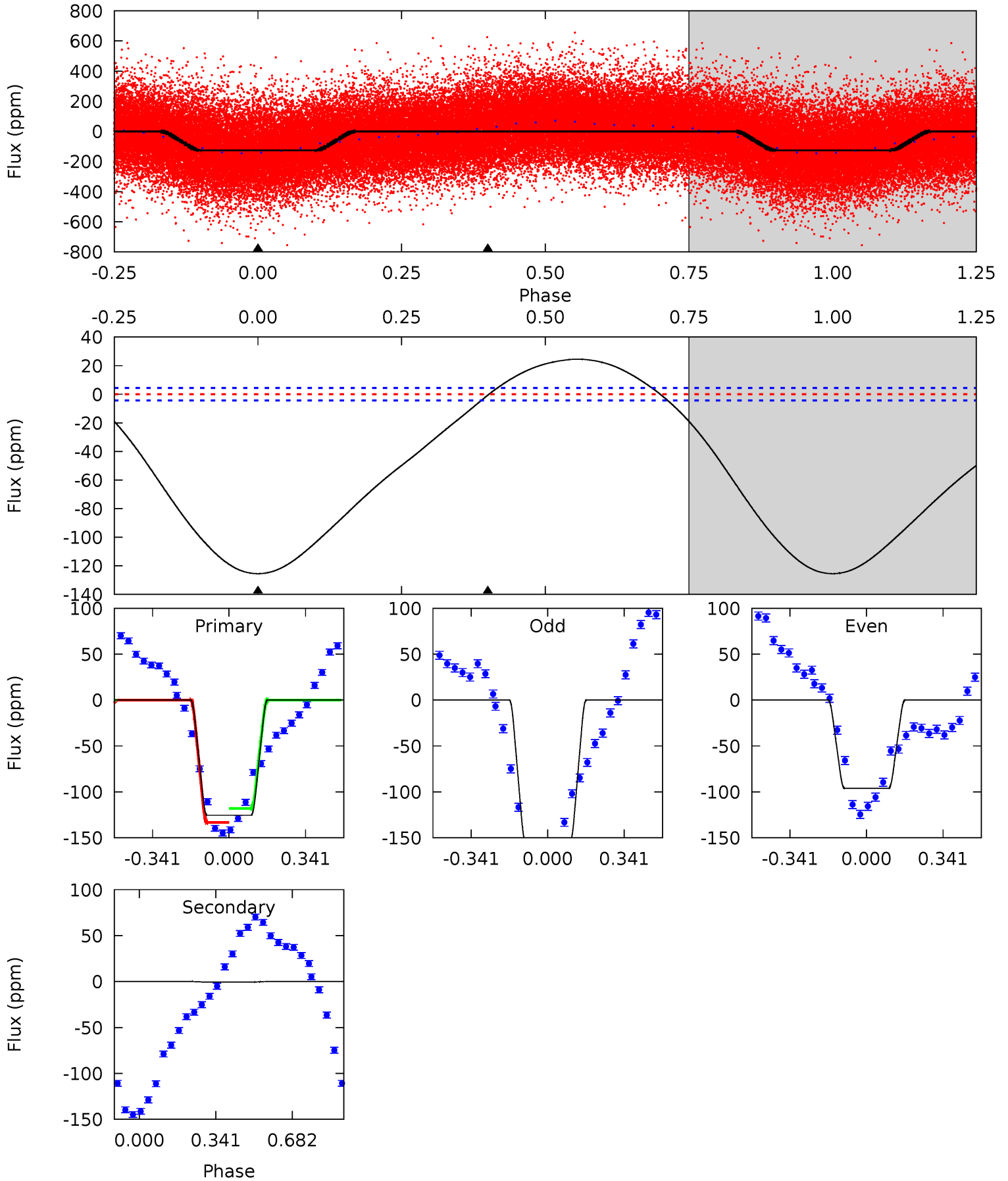
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	7.90	0	0	4.38	1.17	1.81	18.9	18.9	7.90	7.90	3.76	0.91	0.13	4.38



# Alt Model-Shift Uniqueness Test

007428489-01, P = 1.096536 Days, E = 131.238667 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
123.4	0.64	0	0	4.30	0.95	9.45	123.4	123.4	0.64	0.64	29.3	1.00	0.16	7.68





### Stellar Parameters For KIC 007428489

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$3.918^{+0.308}_{-0.132}$	$-0.180^{+0.250}_{-0.350}$	$2.342^{+0.485}_{-0.832}$	$1.653^{+0.167}_{-0.389}$	$0.181^{+0.397}_{-0.070}$
	+3%/-5%	+8%/-3%	+139%/-194%	+21%/-36%	+10%/-24%	+219%/-39%
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 007428489-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-10 \pm 1$	$1.21^{+0.55}_{-0.52}$	$4294^{+316}_{-425}$	$5417^{+1880}_{-893}$	$2.133^{+4.393}_{-1.114}$
Alt.	$-1 \pm 1$	$2.84^{+0.73}_{-0.69}$	$4304^{+328}_{-415}$	$-3787^{+291}_{-225}$	$0.026^{+0.046}_{-0.041}$

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

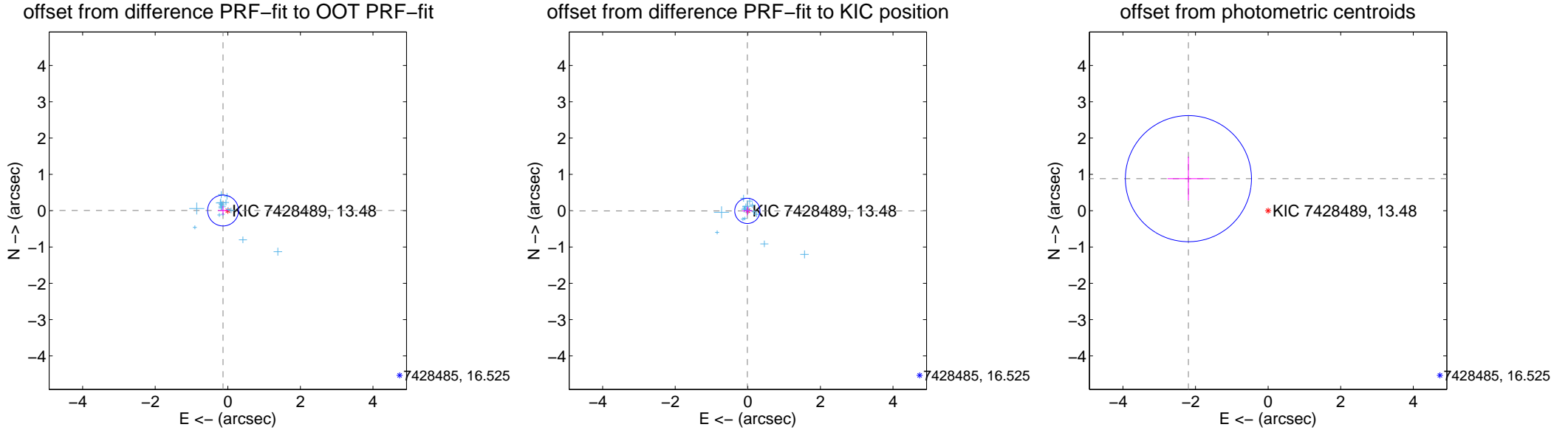
## DV Centroid Data

Supplemental centroid analysis for 007428489-01. Kepler magnitude: 13.48. Transit SNR 14.67

There are 17 quarters with good PRF difference image offsets

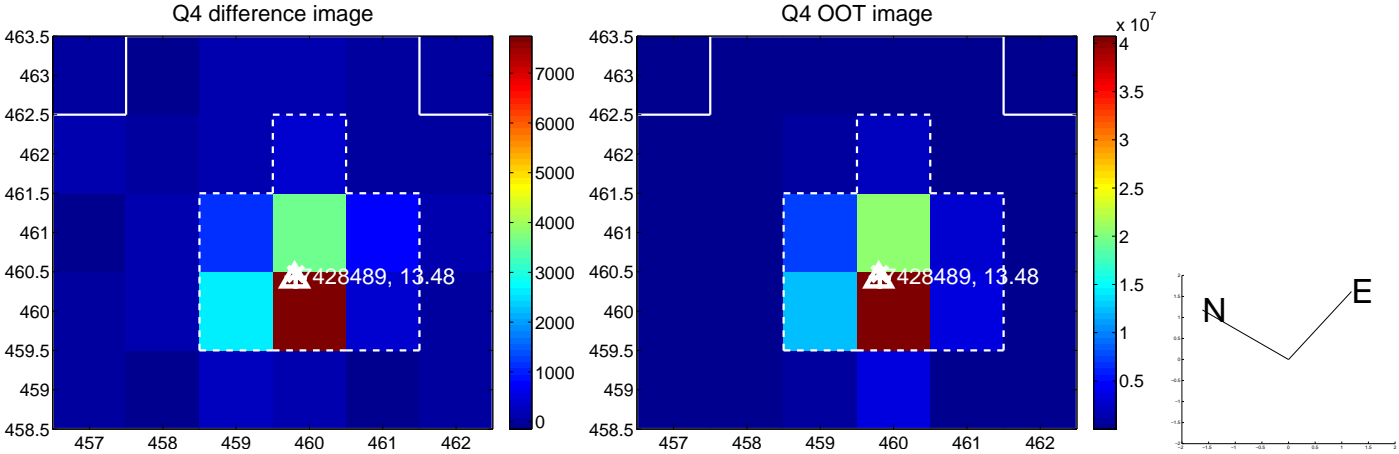
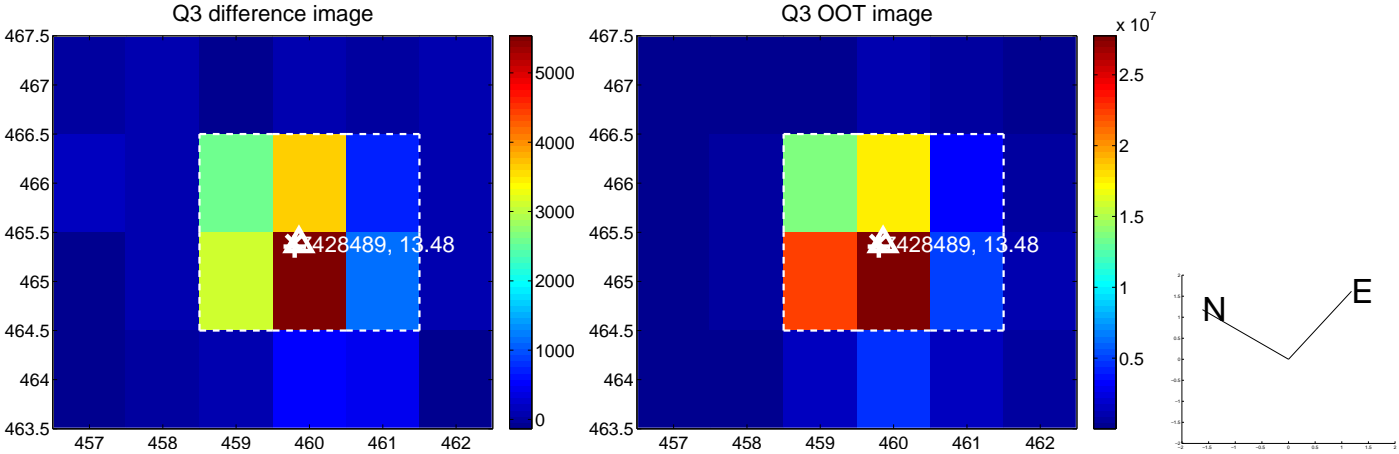
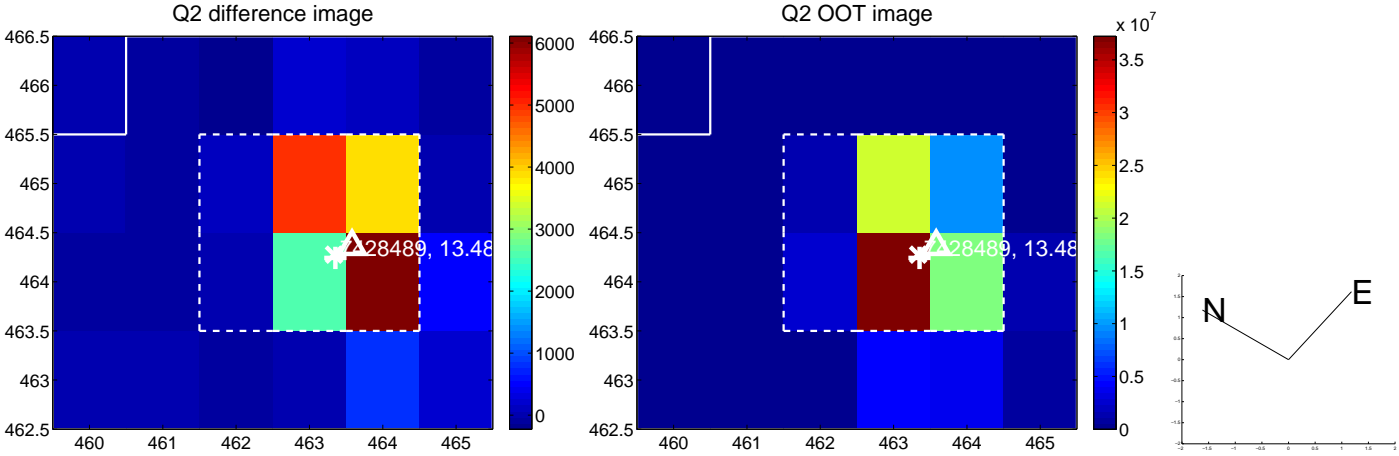
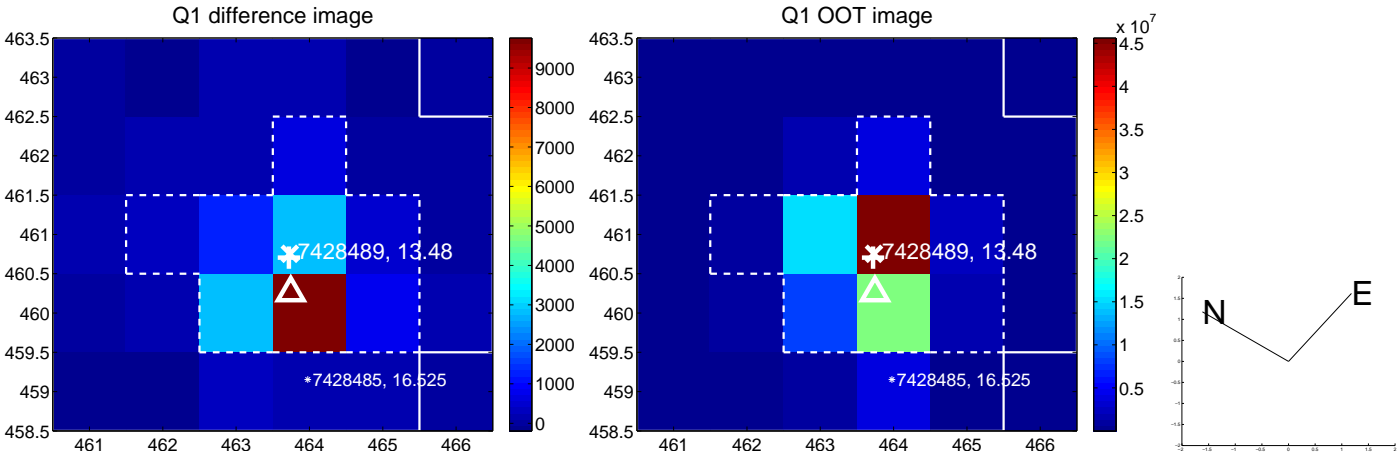
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.131 \pm 0.142$	0.92	$0.131 \pm 0.140$	$0.005 \pm 0.122$
PRF-fit source offset from KIC position	$0.015 \pm 0.116$	0.13	$0.014 \pm 0.136$	$-0.005 \pm 0.118$
photometric centroid source offset	$2.37 \pm 0.58$	4.09	$2.20 \pm 0.58$	$0.88 \pm 0.60$

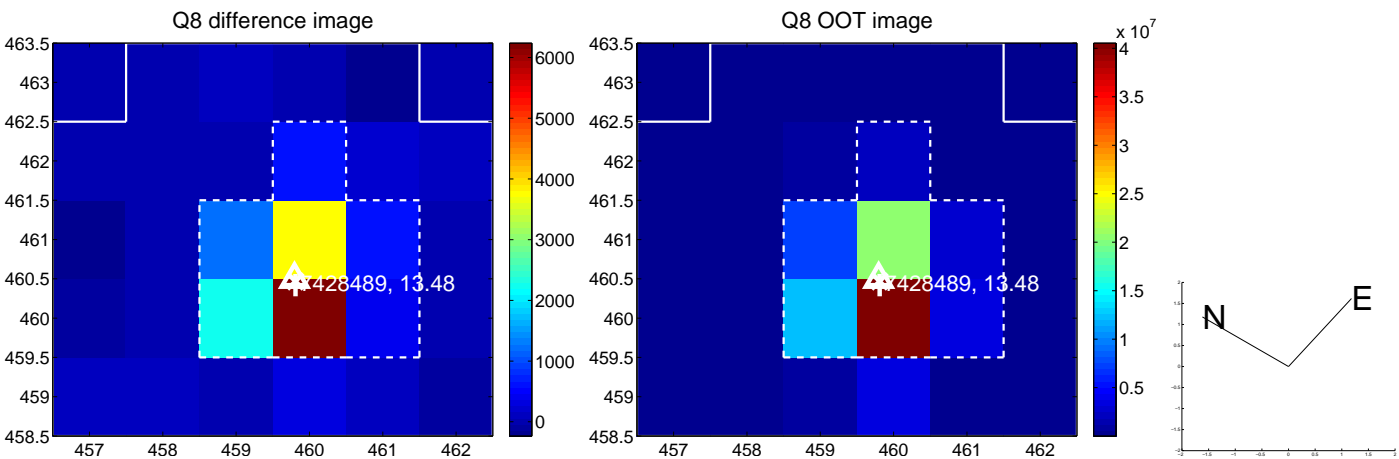
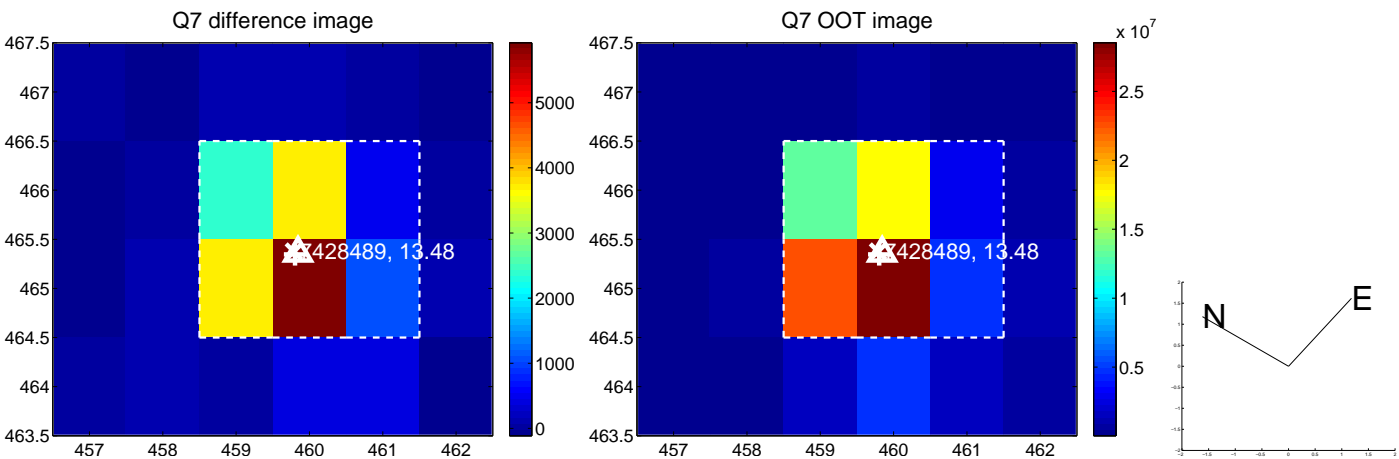
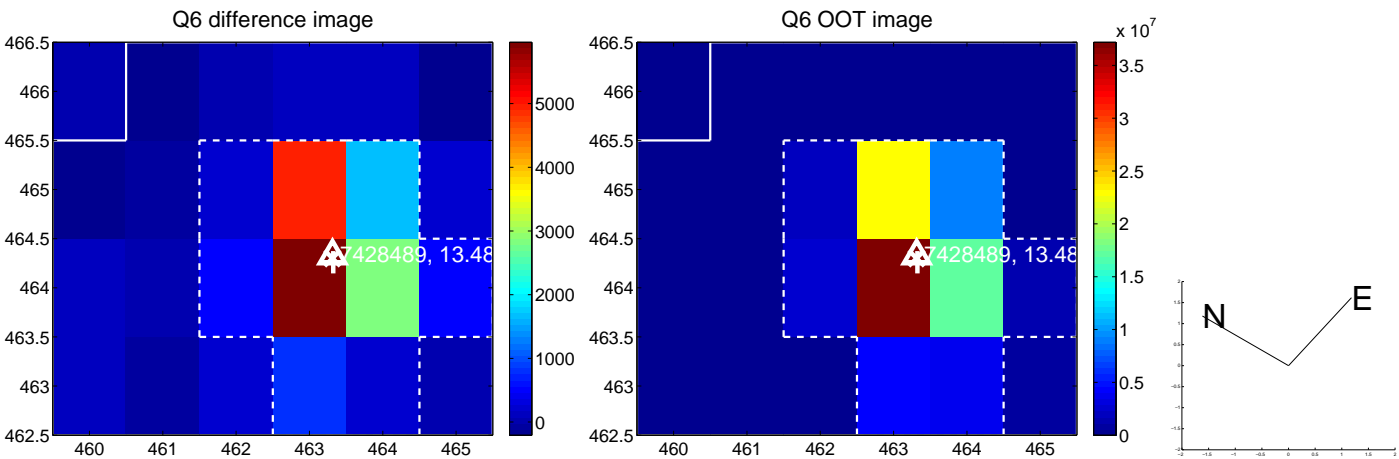
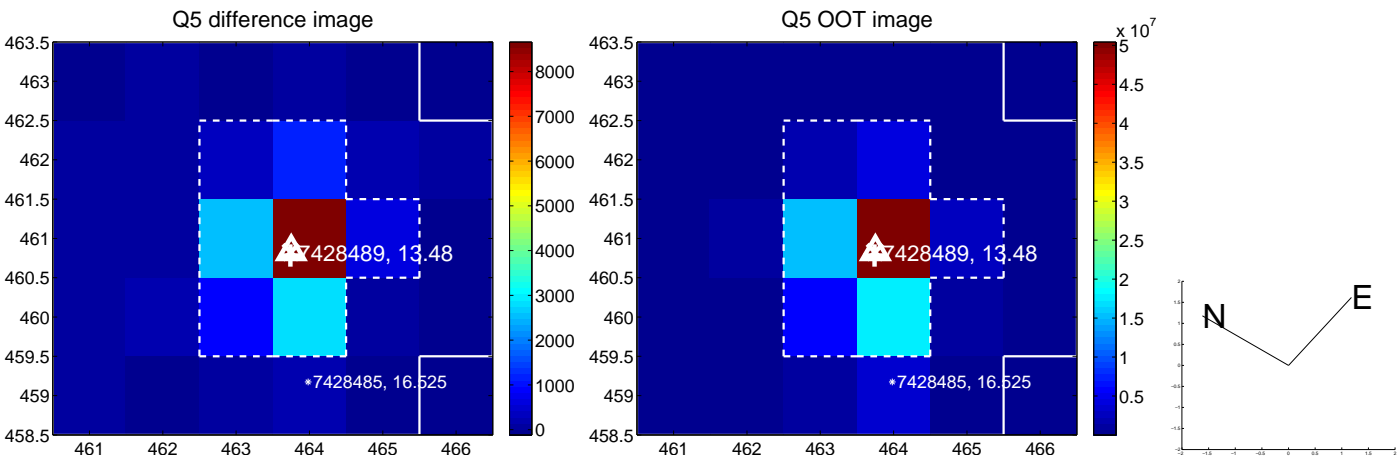


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

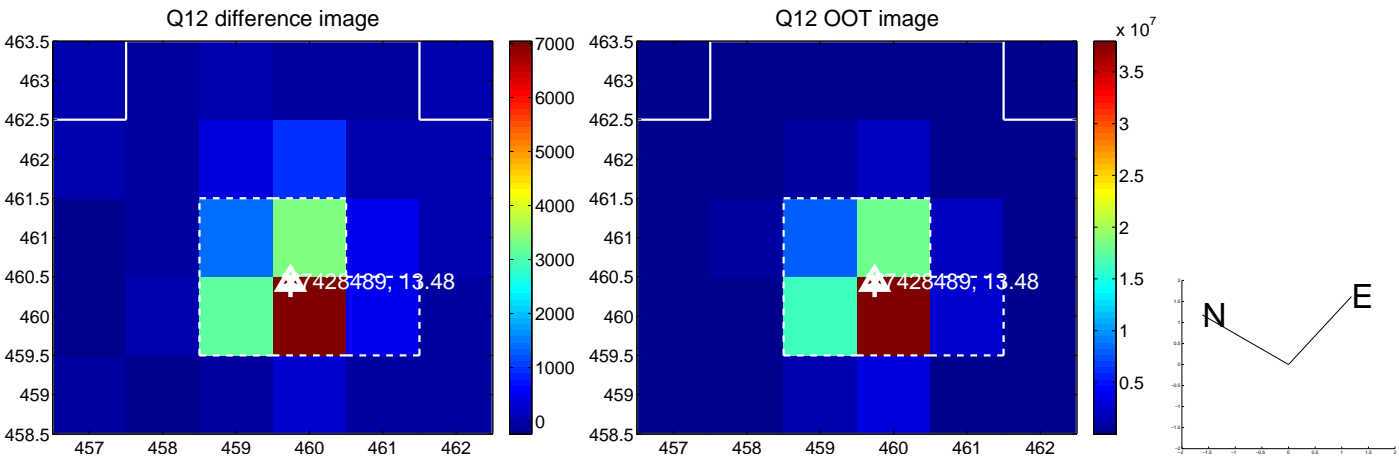
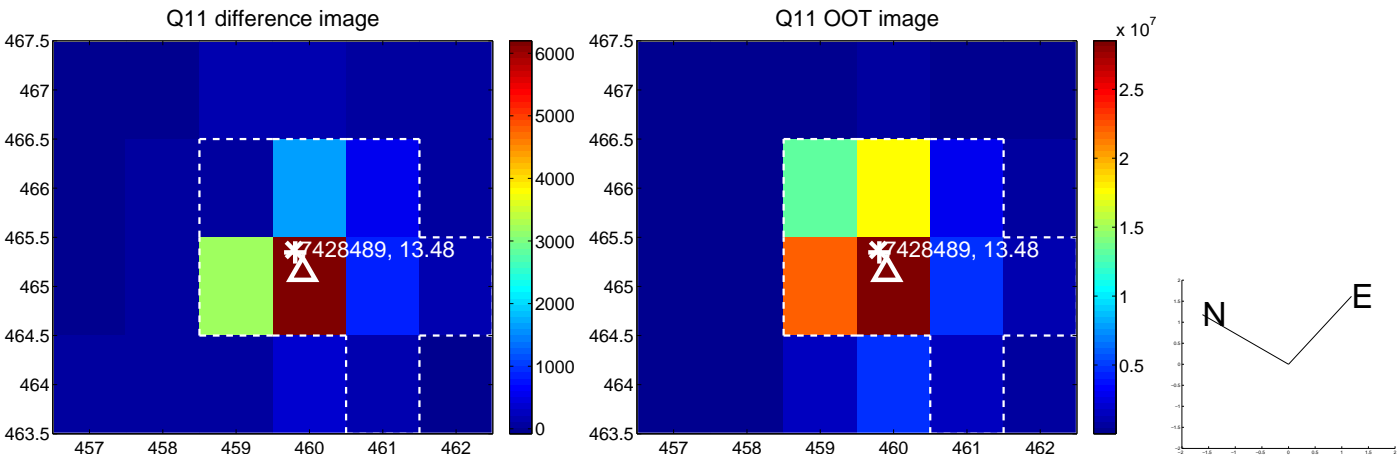
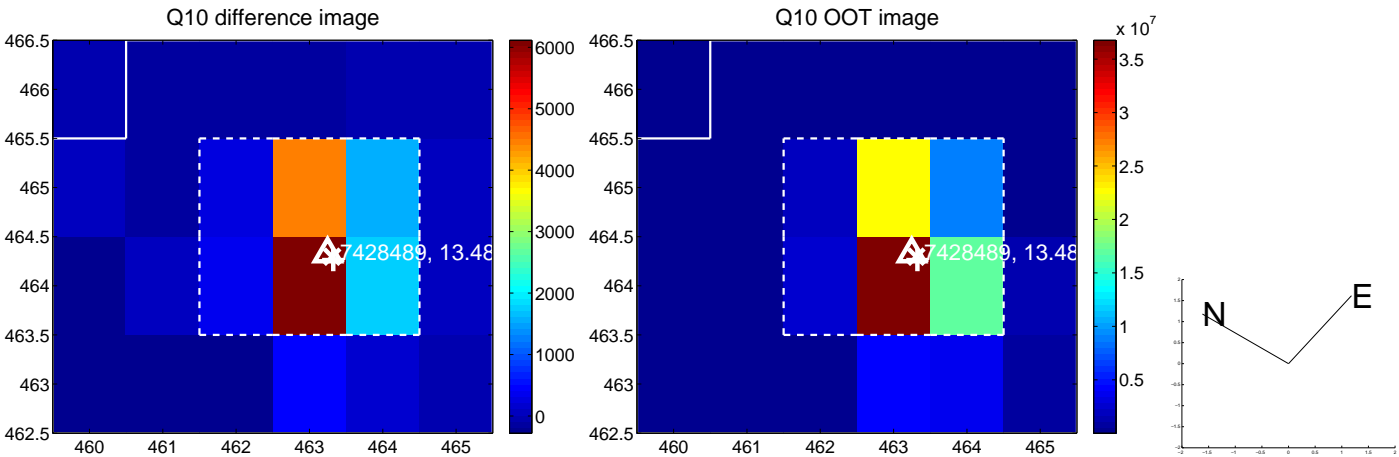
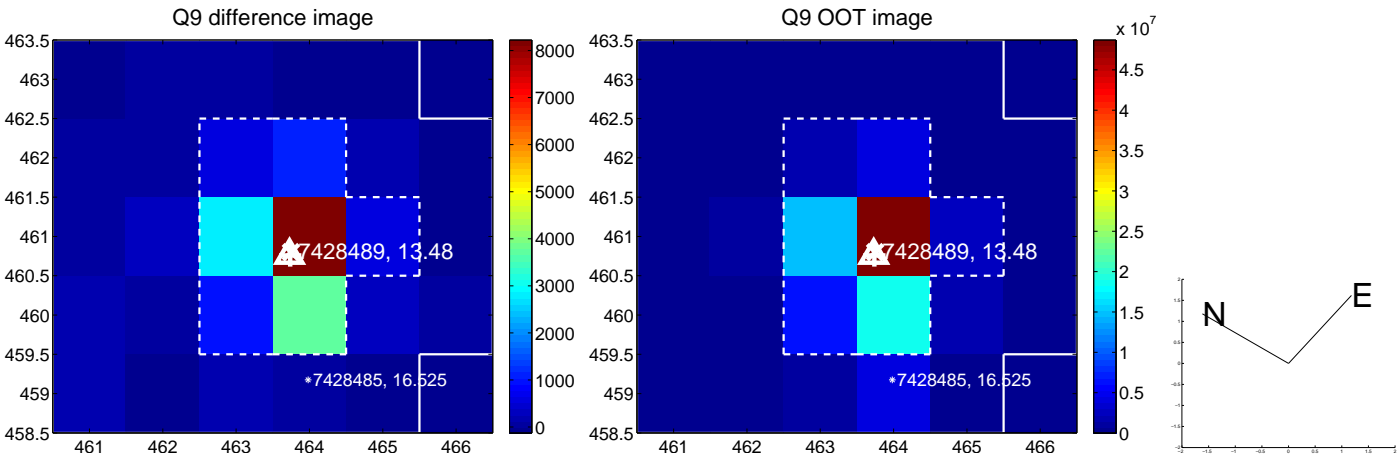


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

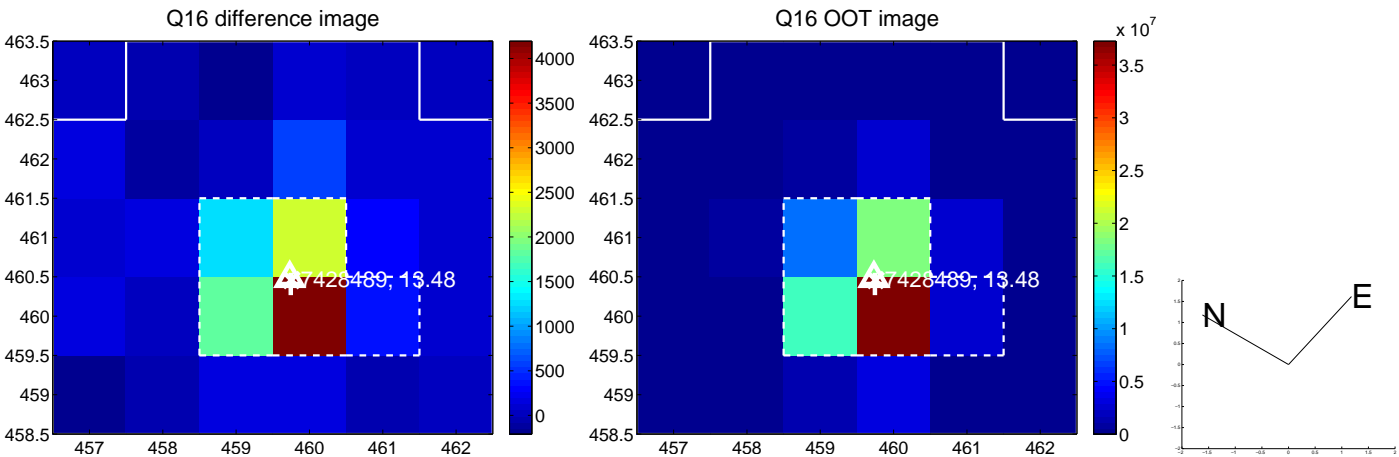
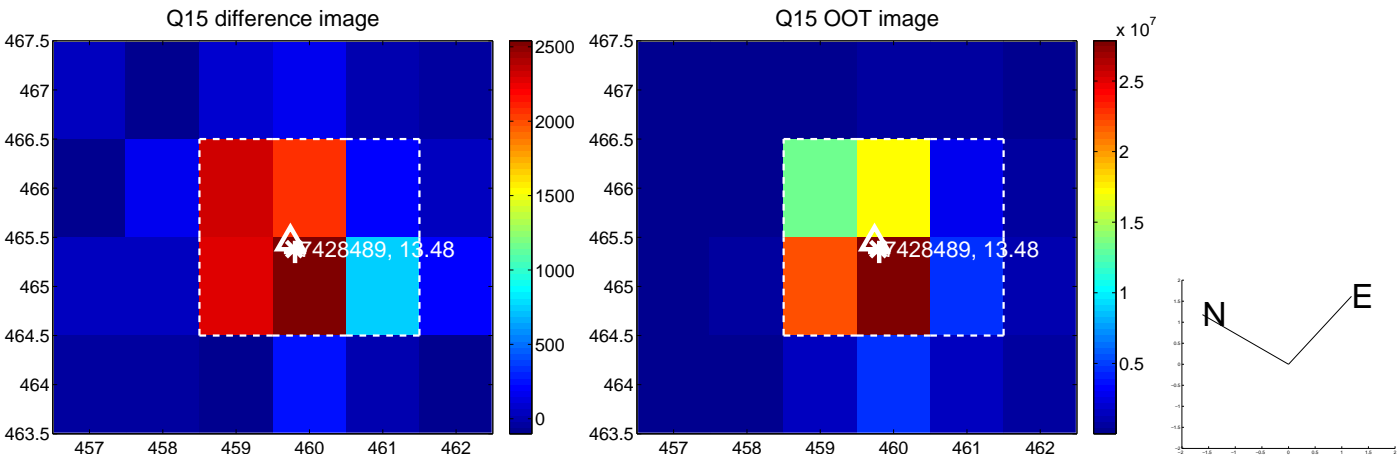
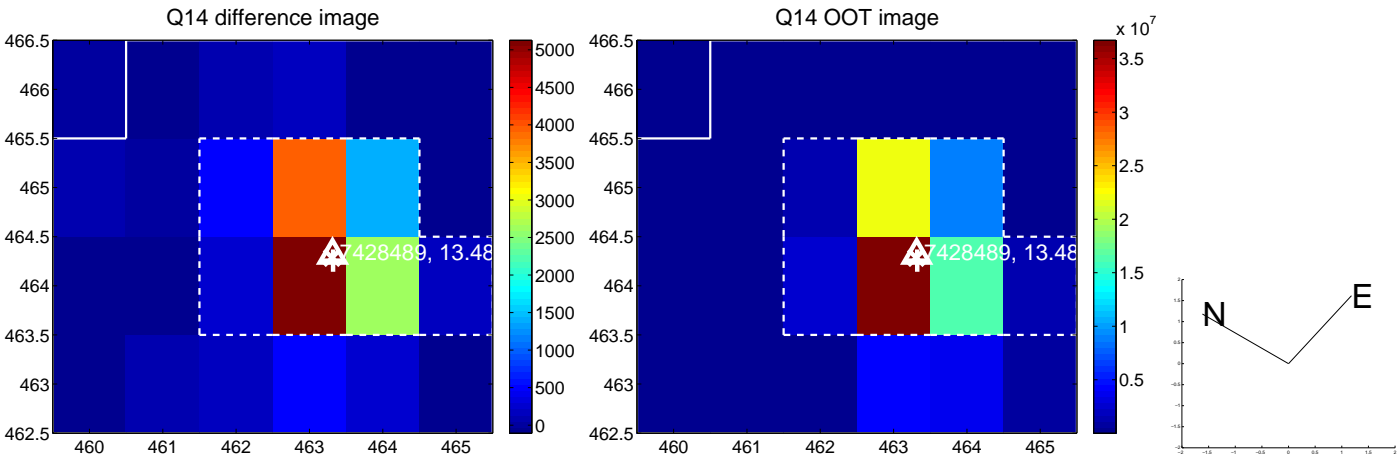
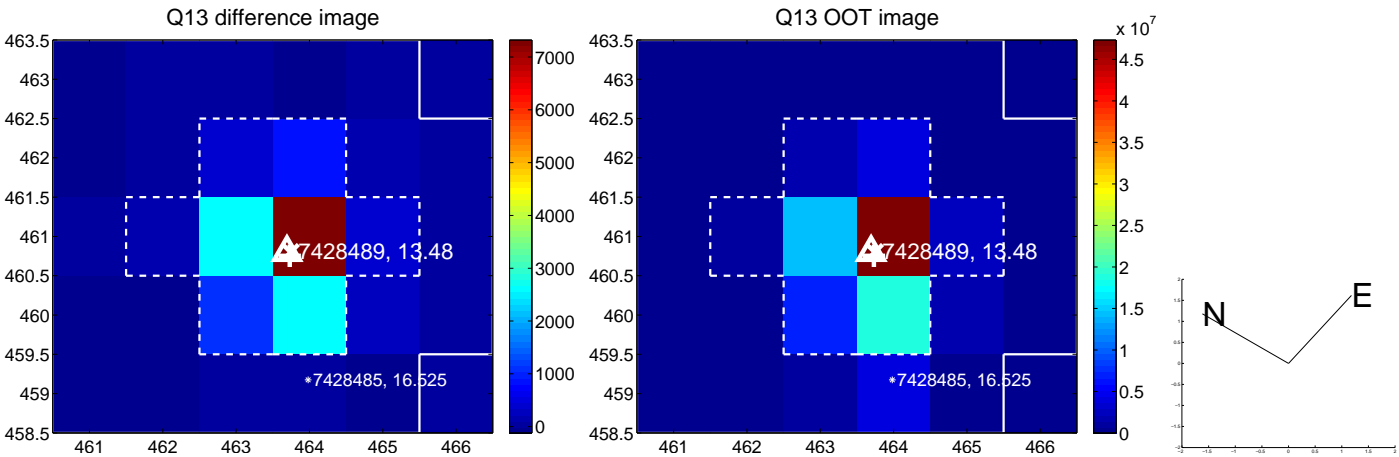




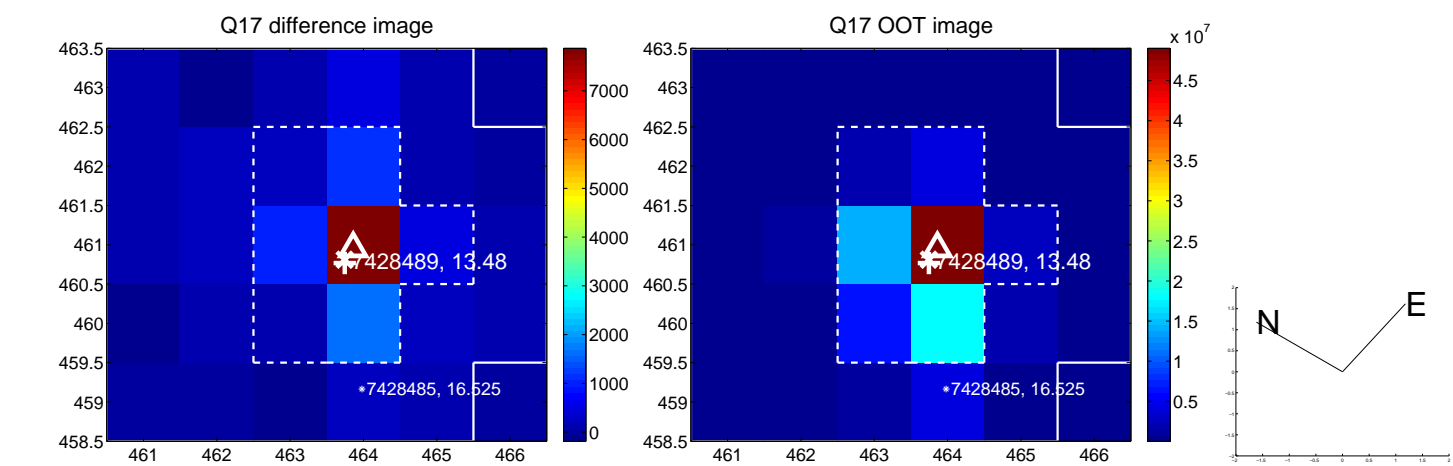
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



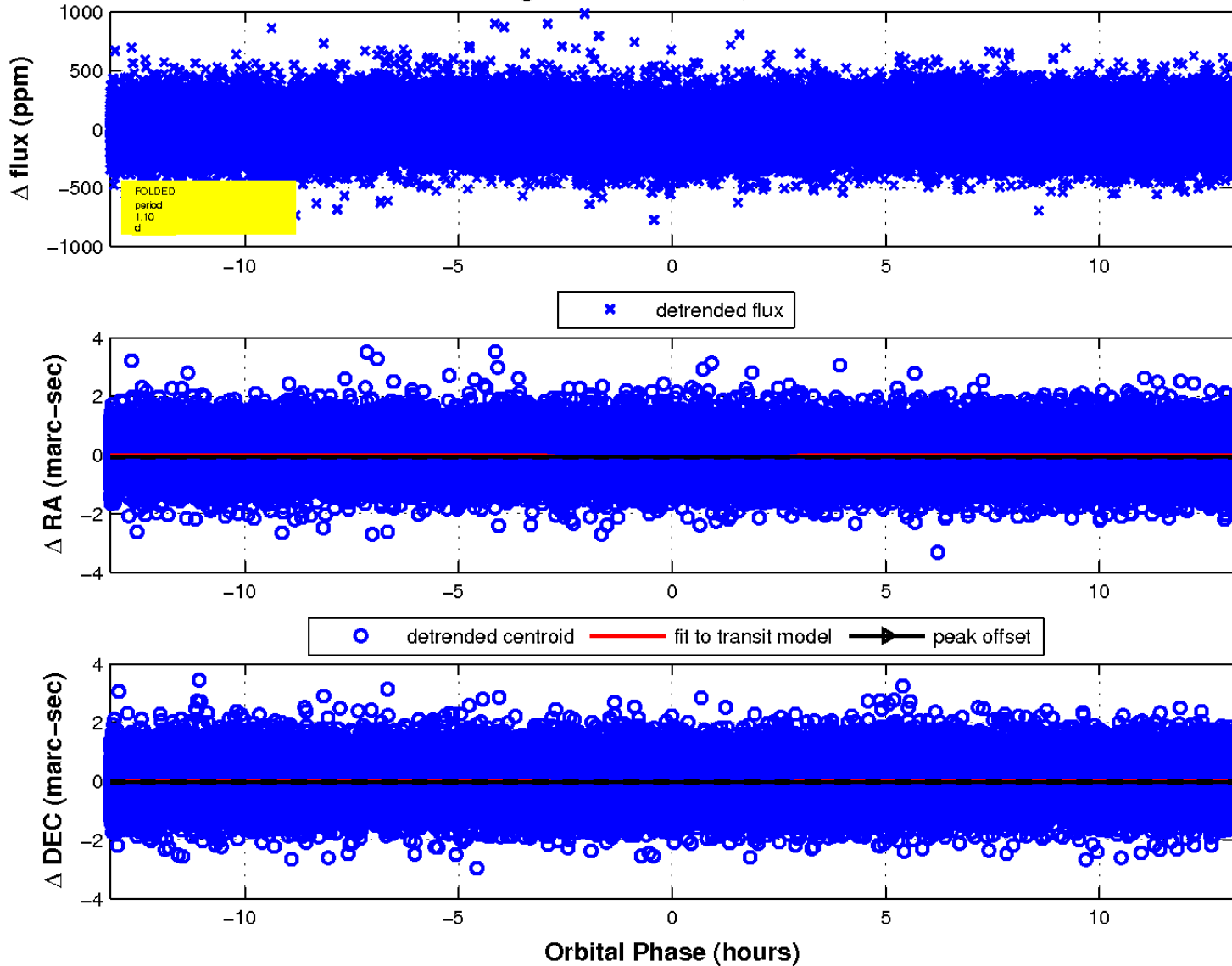
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

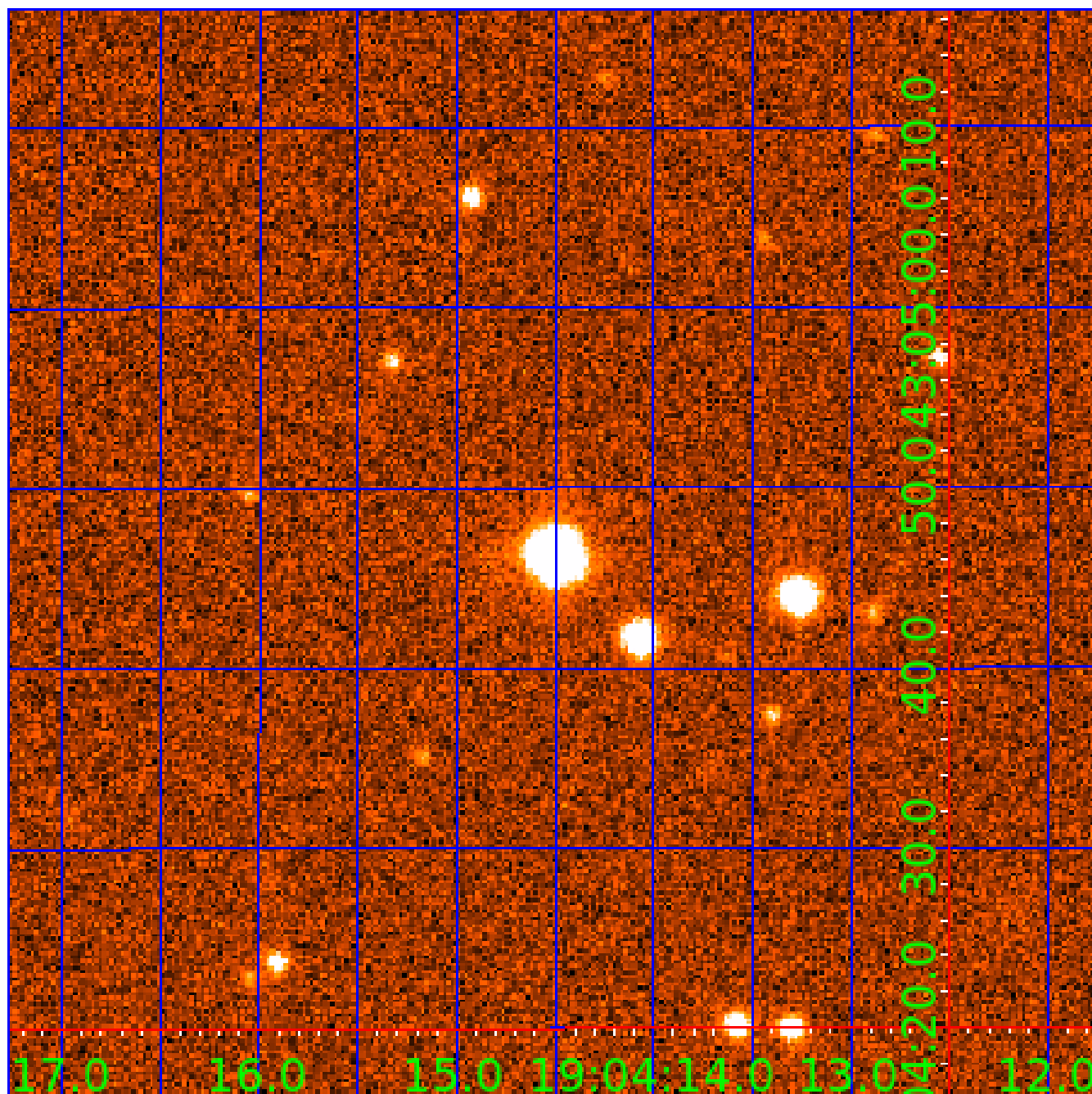


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 007428489

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007428489-01	OBS	No	1.096483	132.344469	28.6	5.909	13.7	14.7	2.34	7306	1.28	23085.28
007428489-02	OBS	No	158.772298	278.027901	245.3	7.286	14.5	8.0	2.34	7306	4.10	30.36
007428489-03	OBS	No	39.128461	163.023799	147.6	4.372	8.0	7.7	2.34	7306	3.32	196.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007428489-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
007428489-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007428489-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

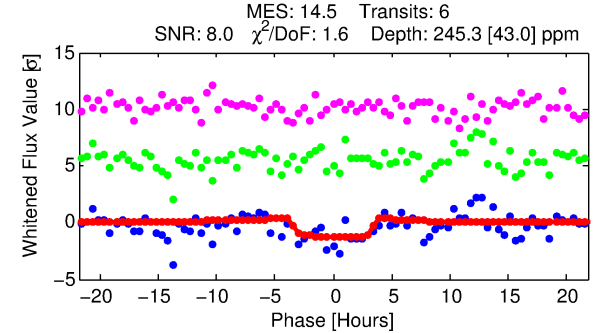
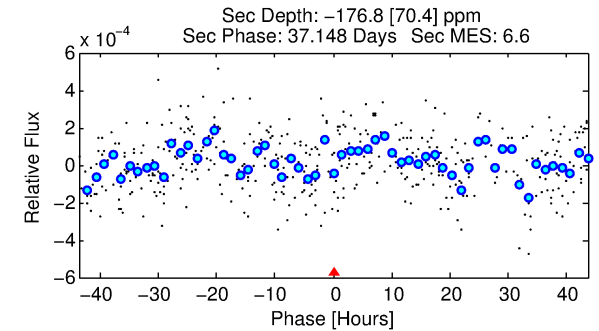
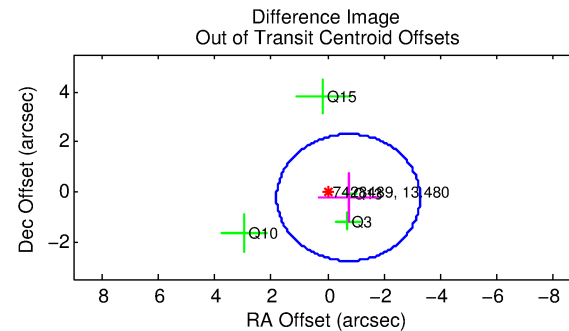
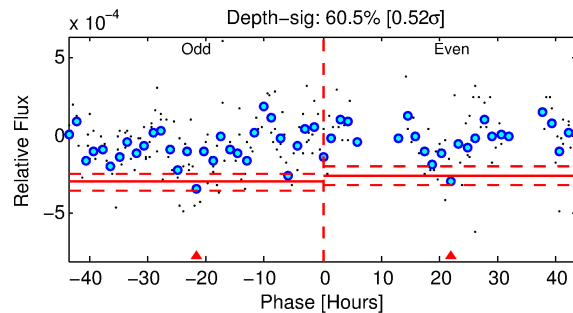
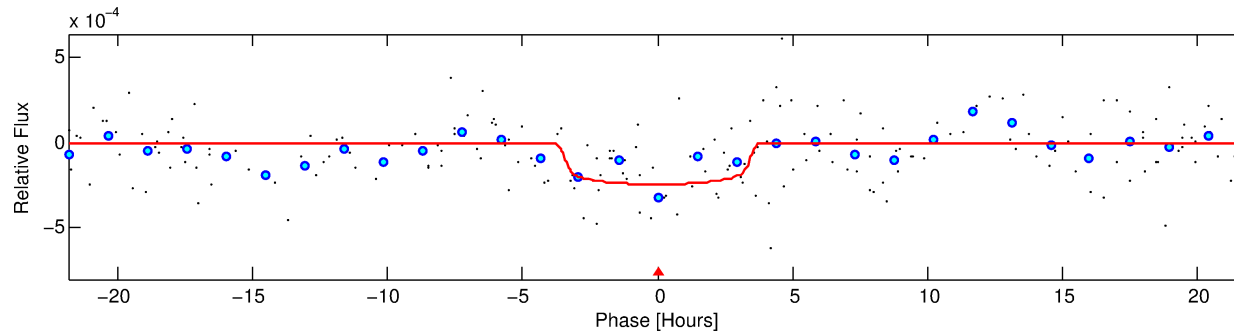
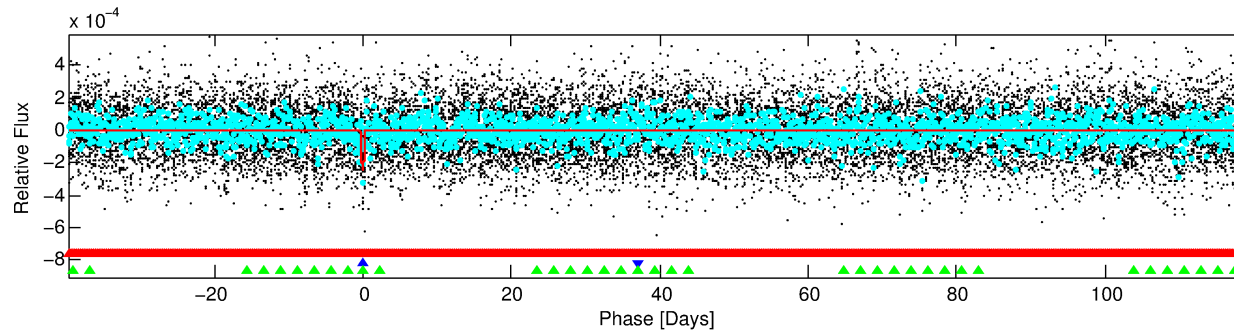
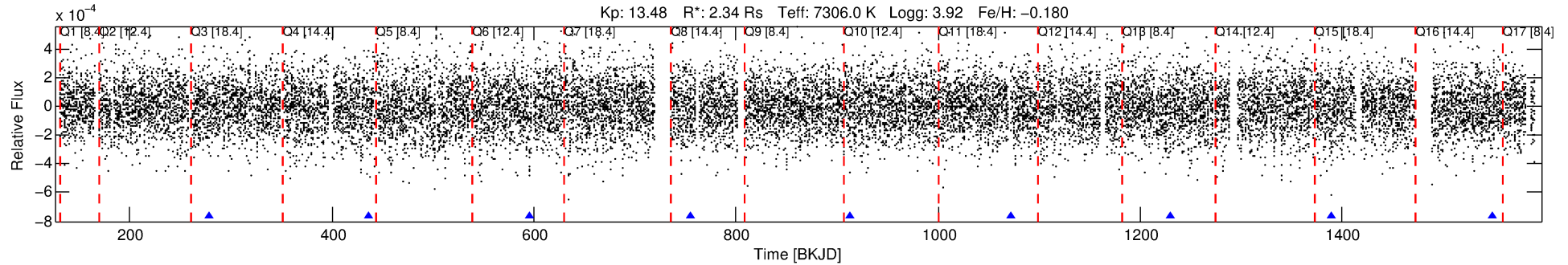
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007428489-02

No Significant Match Found

# DV One-Page Summary

KIC: 7428489 Candidate: 2 of 3 Period: 158.772 d



## DV Fit Results:

Period = 158.77230 [0.00363] d  
Epoch = 278.0279 [0.0190] BKJD  
Rp/R\* = 0.0161 [0.0071]  
a/R\* = 97.47 [239.33]  
b = 0.83 [0.93]  
Seff = 30.36 [16.97]  
Teq = 599 [84] K  
Rp = 4.10 [2.33] Re  
a = 0.6791 [0.2272] AU  
Ag = N/A  
Teffp = N/A

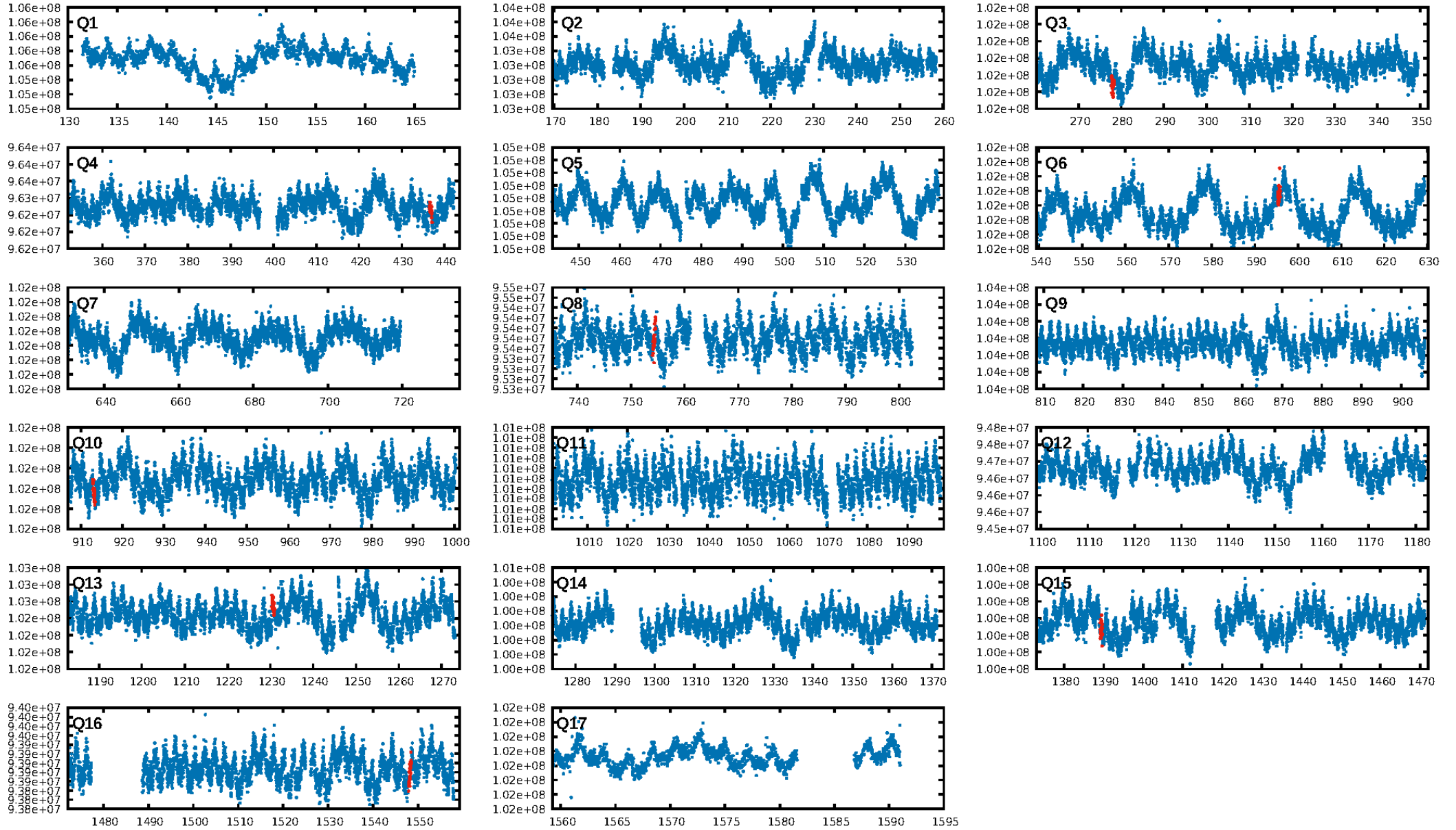
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [337.94σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.91e-24  
RollingBand-fgt: 1.00 [6/6]  
**GhostDiagnostic-chr: 0.3551**  
Centroid-sig: 95.9%  
Centroid-so: 0.270 arcsec [0.34σ]  
OotOffset-rm: 0.777 arcsec [0.92σ]  
KicOffset-rm: 0.846 arcsec [1.19σ]  
OotOffset-st: 1/2/0/1 [4]  
KicOffset-st: 1/2/0/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/7]

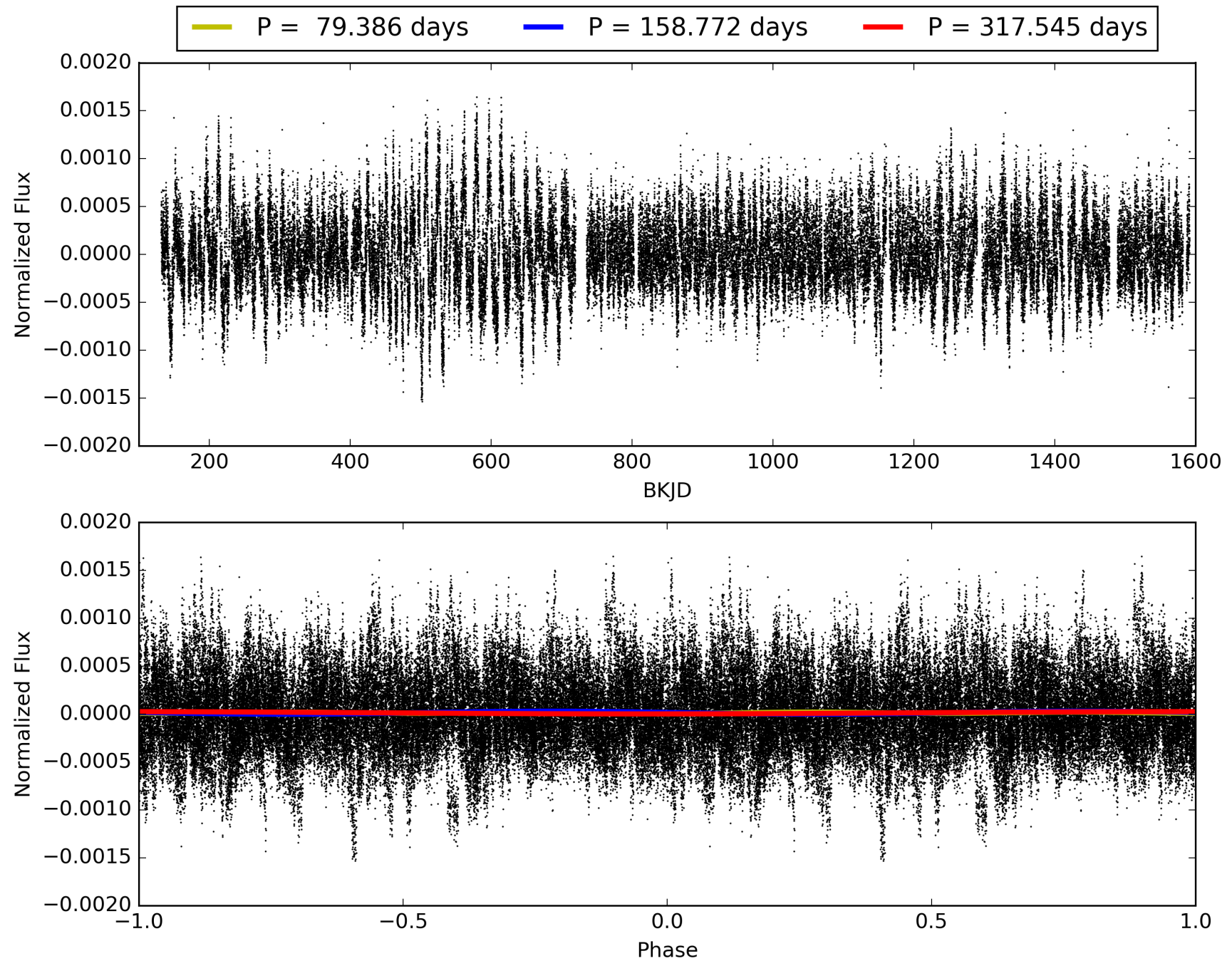
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:48:47 Z

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

# TCE 007428489-02, PDC Light Curves



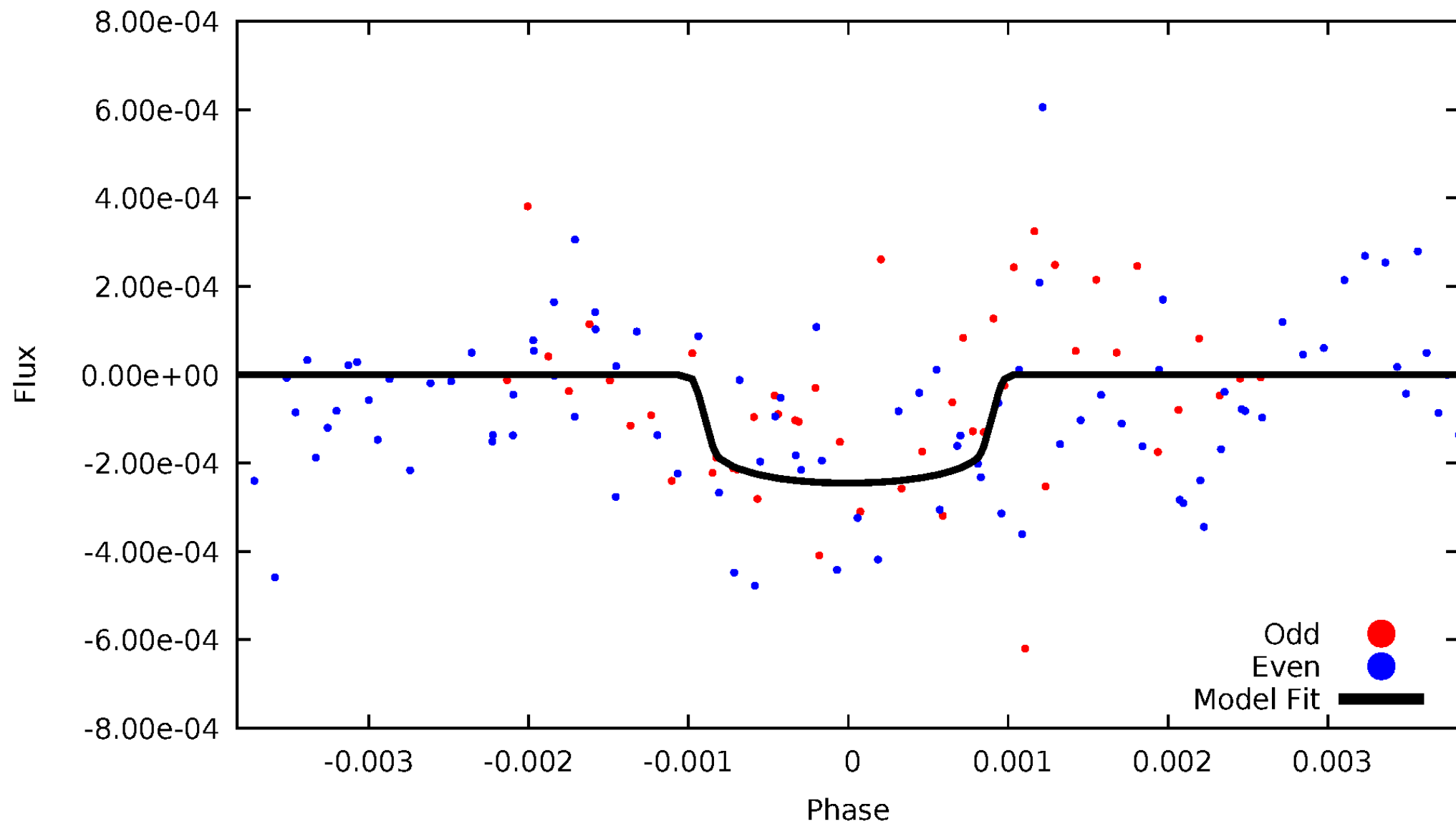
# TCE 007428489-02





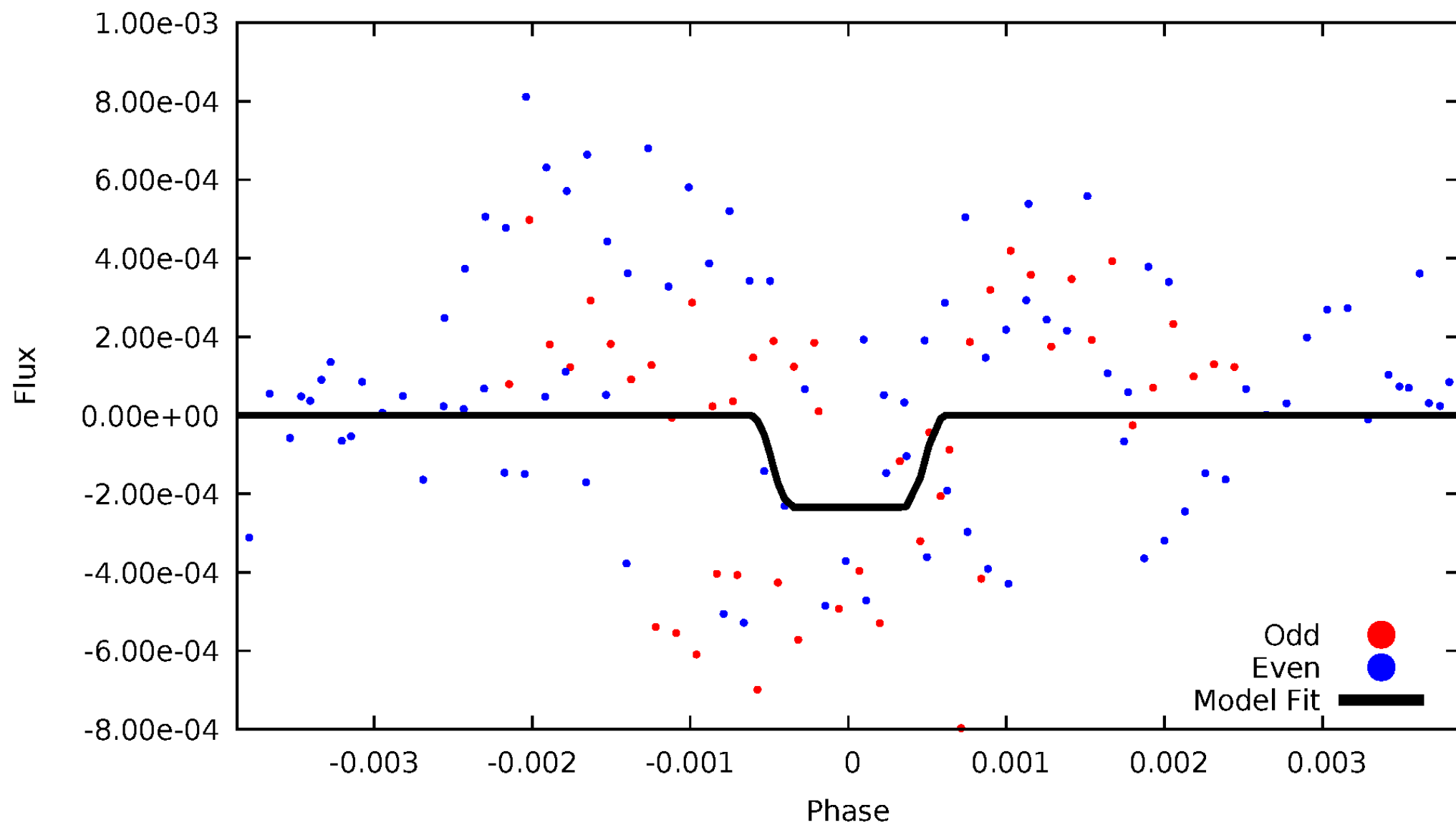
# DV Odd/Even

TCE 007428489-02



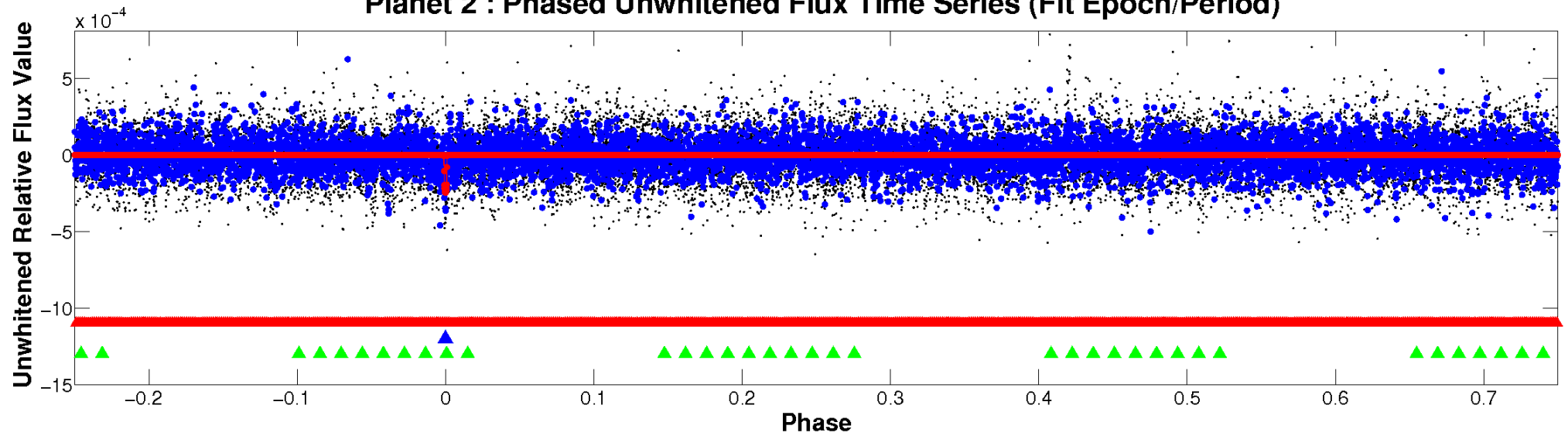
# ALT Odd/Even

TCE 007428489-02

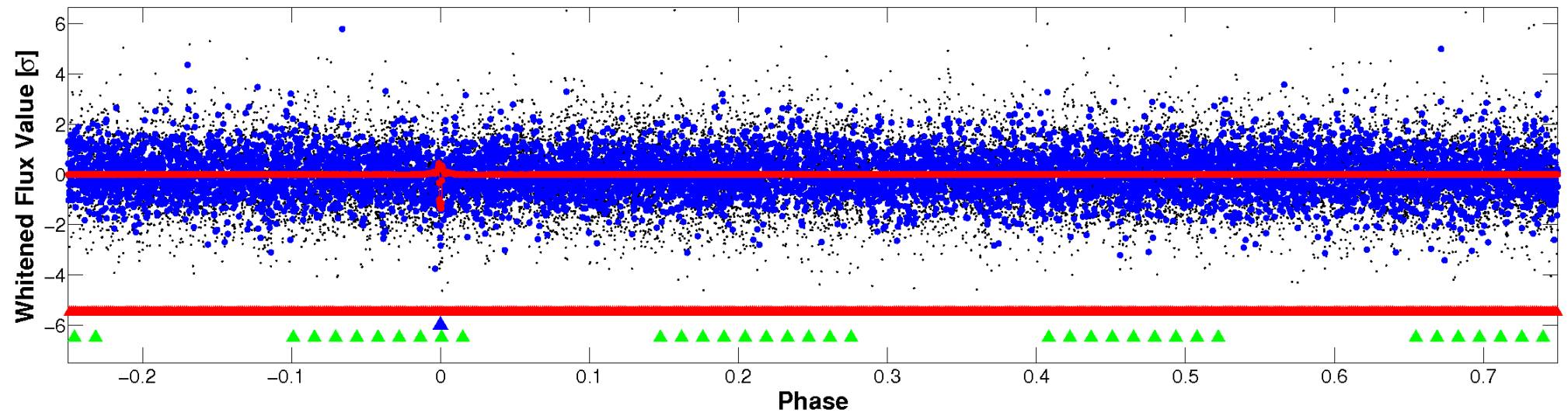


# Non-Whitened Vs. Whitened Light Curve

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

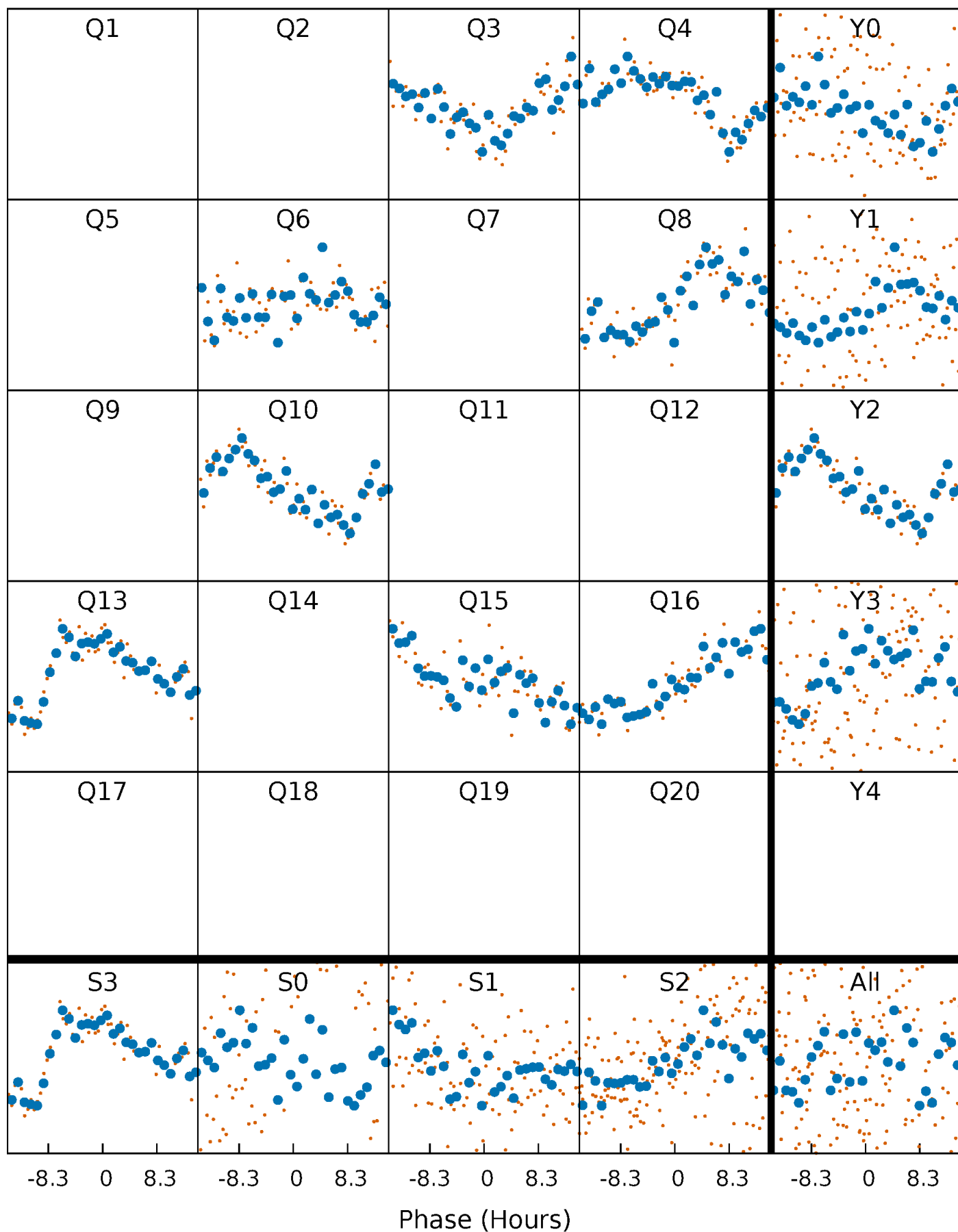


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

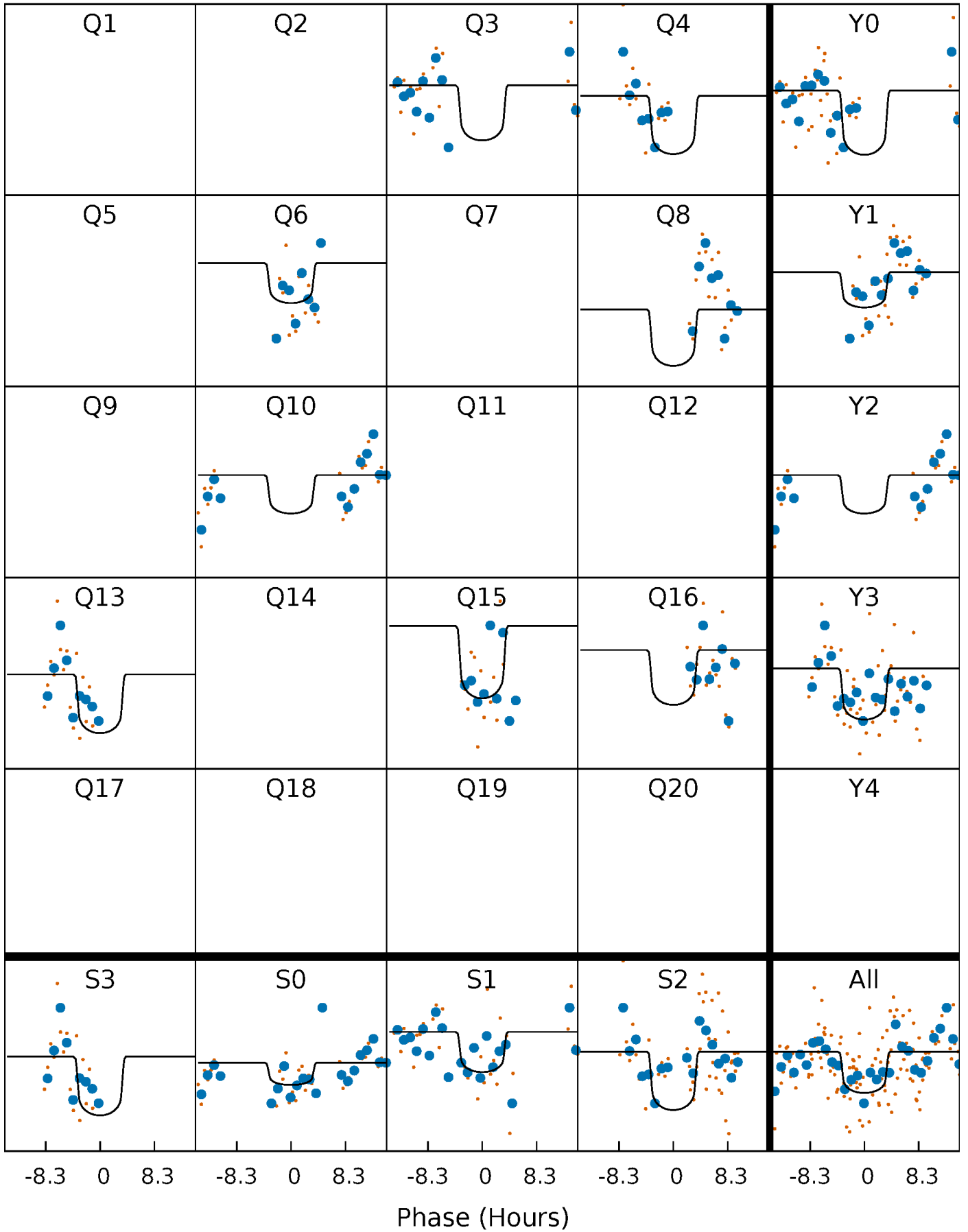
TCE 007428489-02 P=158.772298 Days  $T_0=278.027901$  (BKJD)





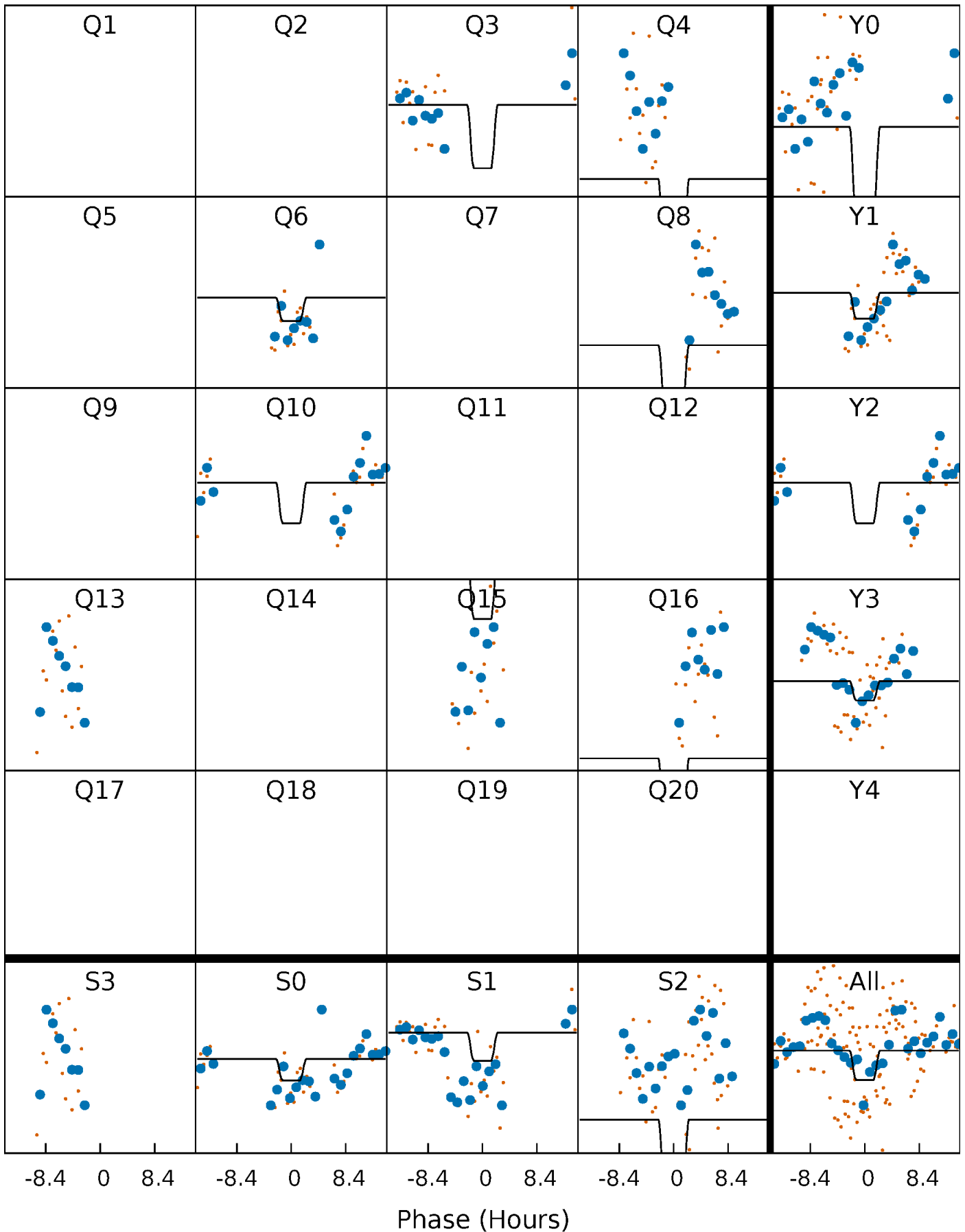
# DV Quarter-Phased Transit Curves

TCE 007428489-02     $P=158.772298$  Days     $T_0=278.027901$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

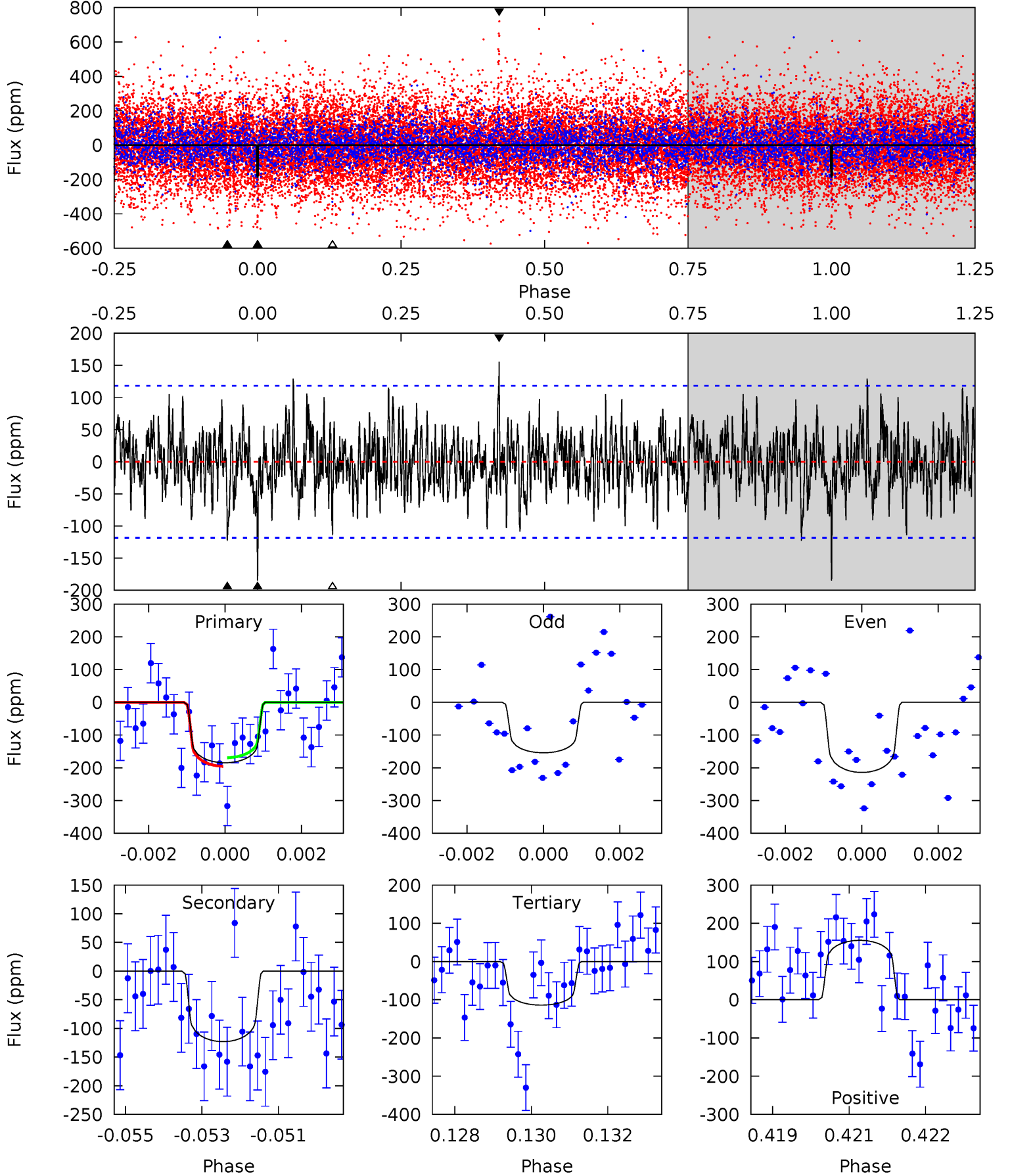
TCE 007428489-02 P=158.782384 Days  $T_0=278.019610$  (BKJD)



# DV Model-Shift Uniqueness Test

007428489-02, P = 158.772298 Days, E = 119.255603 Days

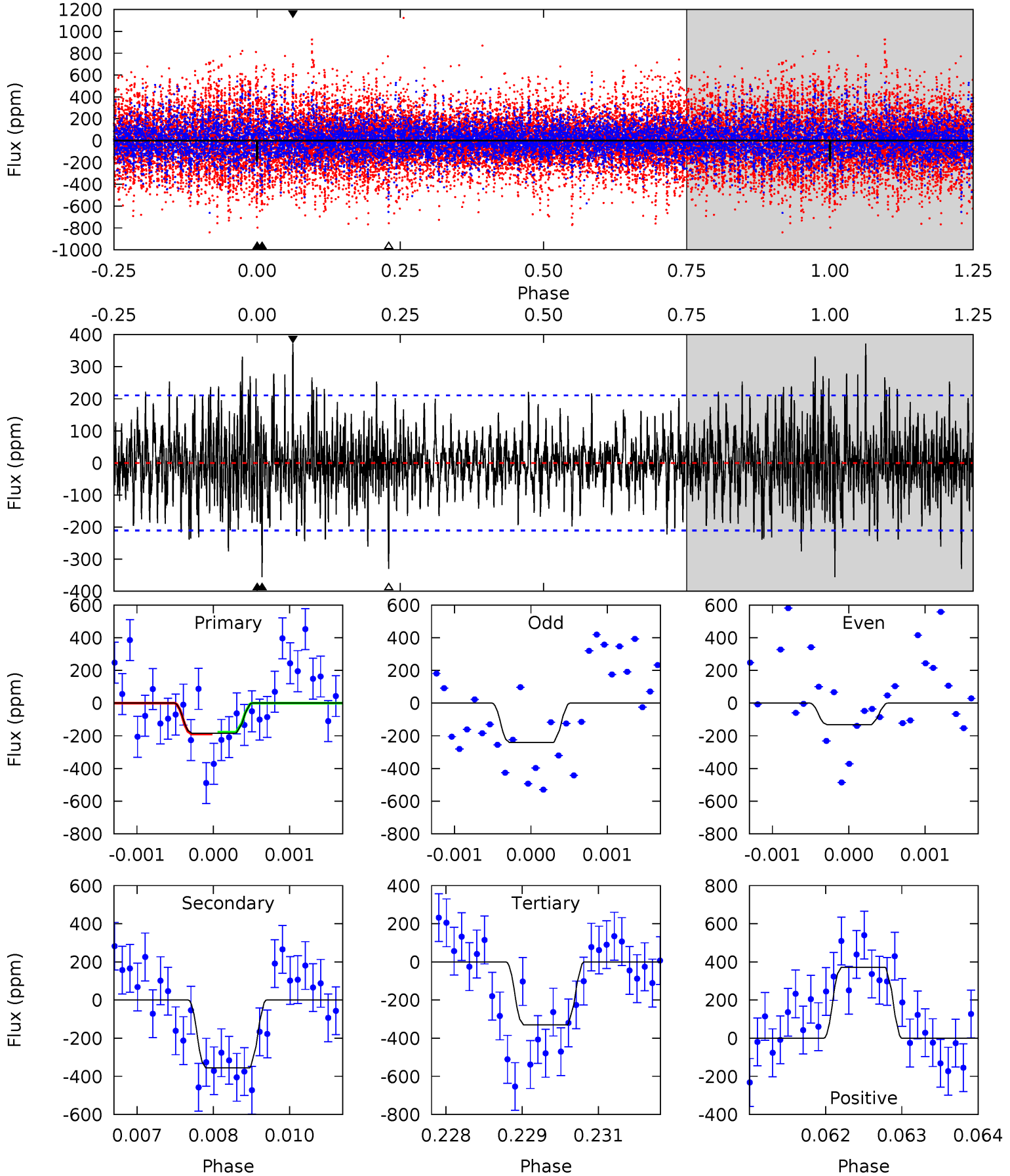
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.31	5.54	5.13	7.00	5.33	3.09	1.71	3.18	1.31	0.41	-1.46	1.35	1.04	0.46	0.59



# Alt Model-Shift Uniqueness Test

007428489-02, P = 158.782384 Days, E = 119.237226 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
4.73	9.16	8.49	9.56	5.42	3.24	2.11	-3.76	-4.83	0.66	-0.40	1.40	1.15	0.51	0.14





### Stellar Parameters For KIC 007428489

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$3.918^{+0.308}_{-0.132}$	$-0.180^{+0.250}_{-0.350}$	$2.342^{+0.485}_{-0.832}$	$1.653^{+0.167}_{-0.389}$	$0.181^{+0.397}_{-0.070}$
	+3%/-5%	+8%/-3%	+139%/-194%	+21%/-36%	+10%/-24%	+219%/-39%
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 007428489-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-123 \pm 22$	$3.99^{+1.85}_{-1.83}$	$816^{+68}_{-73}$	$5831^{+2340}_{-852}$	$1919^{+4697}_{-1070}$
Alt.	$-356 \pm 39$	$3.62^{+1.84}_{-1.71}$	$817^{+67}_{-81}$	$8195^{+4863}_{-1605}$	$6899^{+16432}_{-4049}$

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

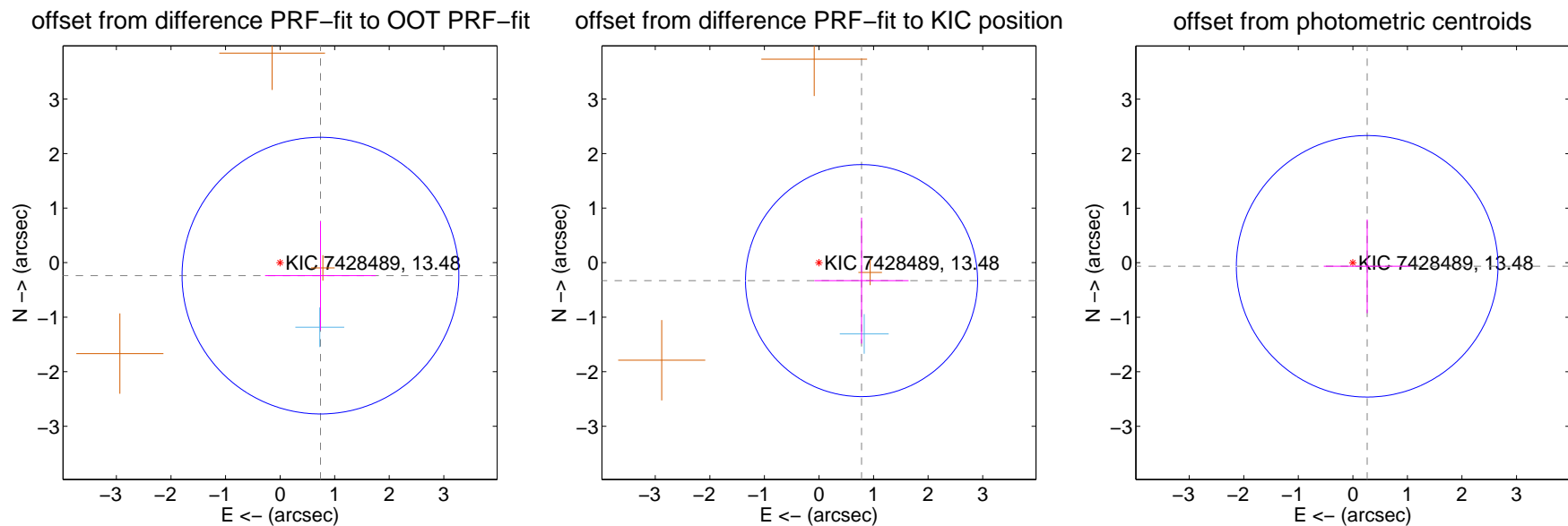
## DV Centroid Data

Supplemental centroid analysis for 007428489-02. Kepler magnitude: 13.48. Transit SNR 8.02

There are 1 quarters with good PRF difference image offsets

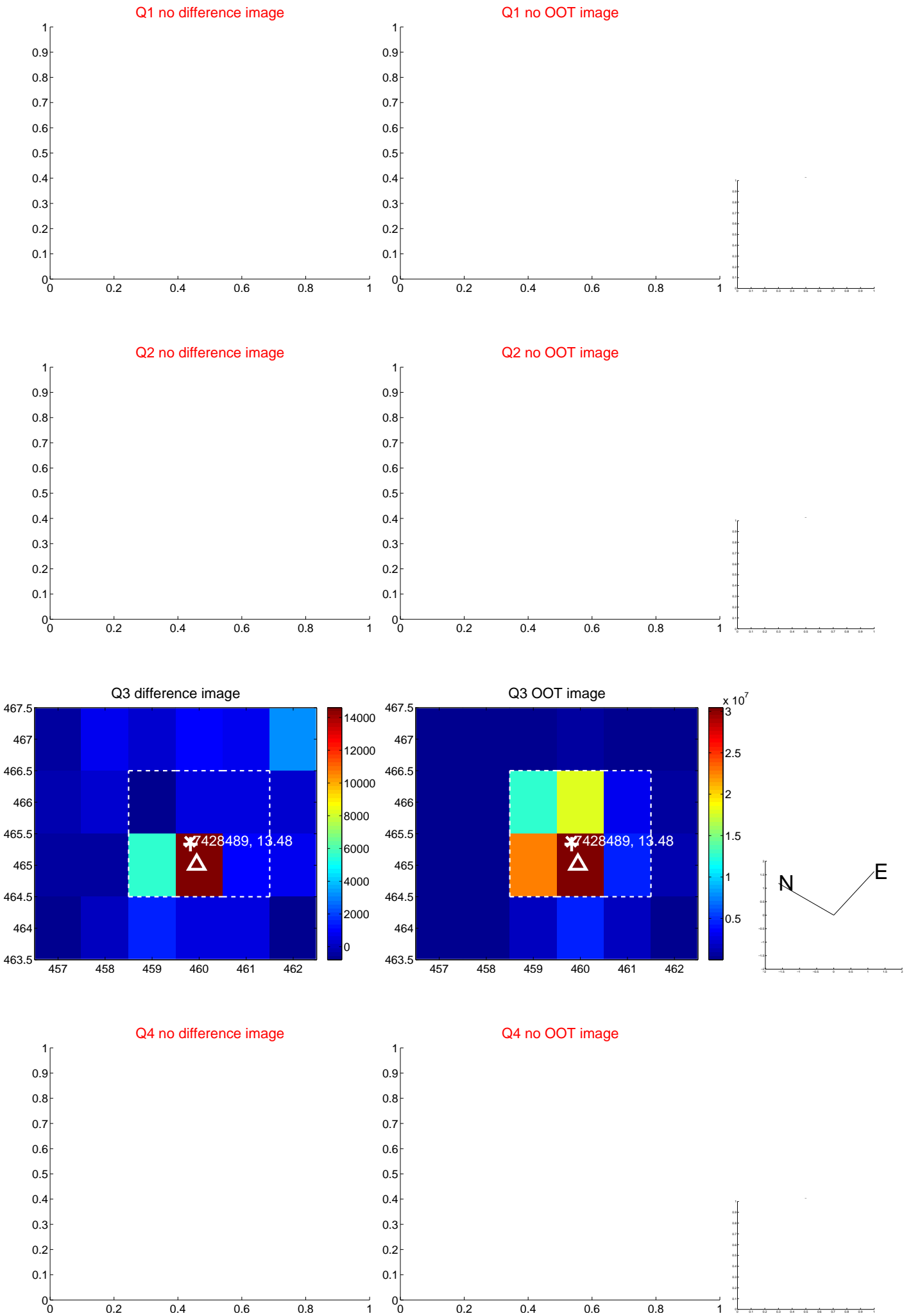
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.777 \pm 0.846$	0.92	$-0.740 \pm 1.015$	$-0.238 \pm 0.997$
PRF-fit source offset from KIC position	$0.846 \pm 0.709$	1.19	$-0.780 \pm 0.863$	$-0.329 \pm 1.154$
photometric centroid source offset	$0.27 \pm 0.80$	0.34	$-0.26 \pm 0.80$	$-0.07 \pm 0.86$

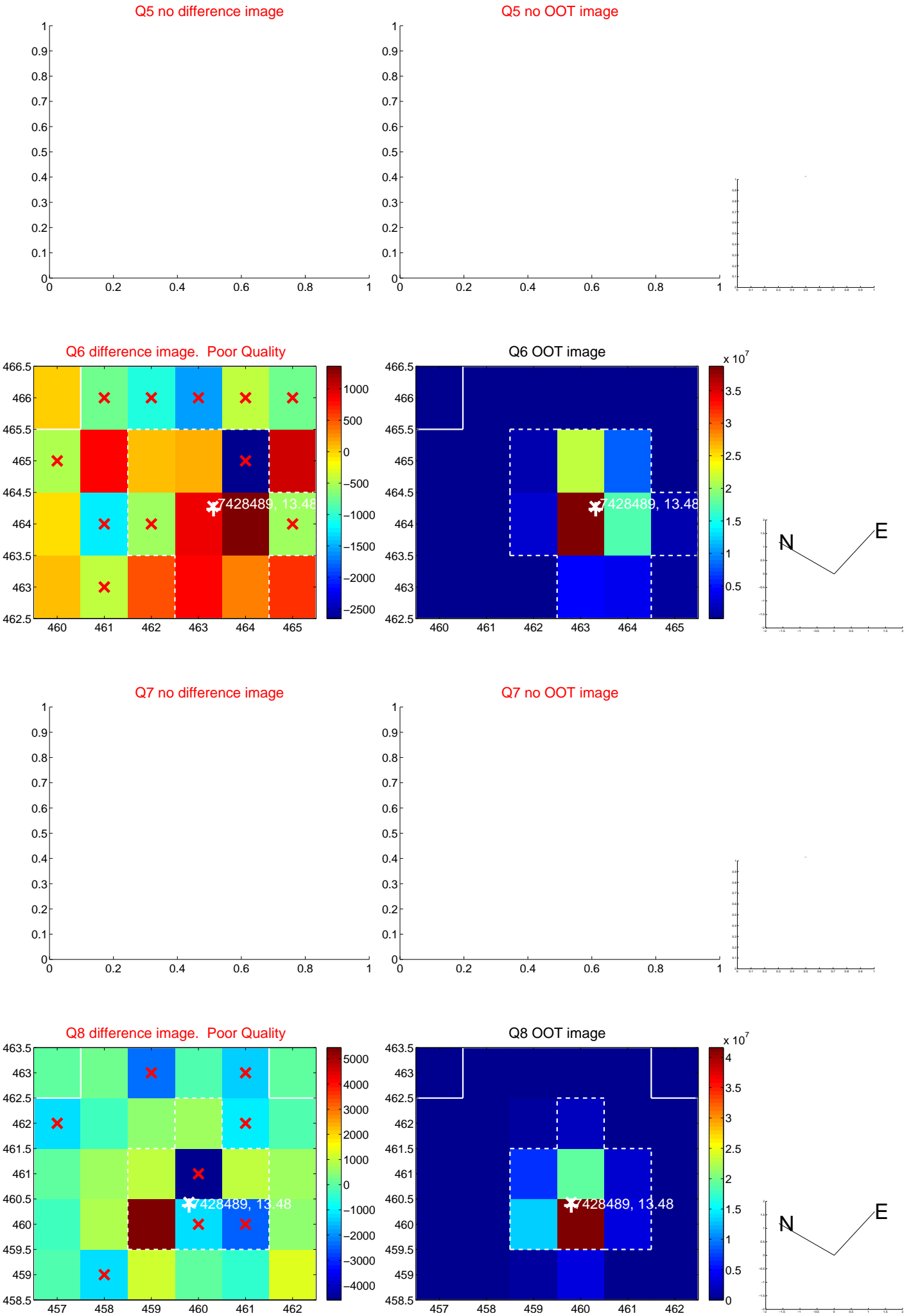


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

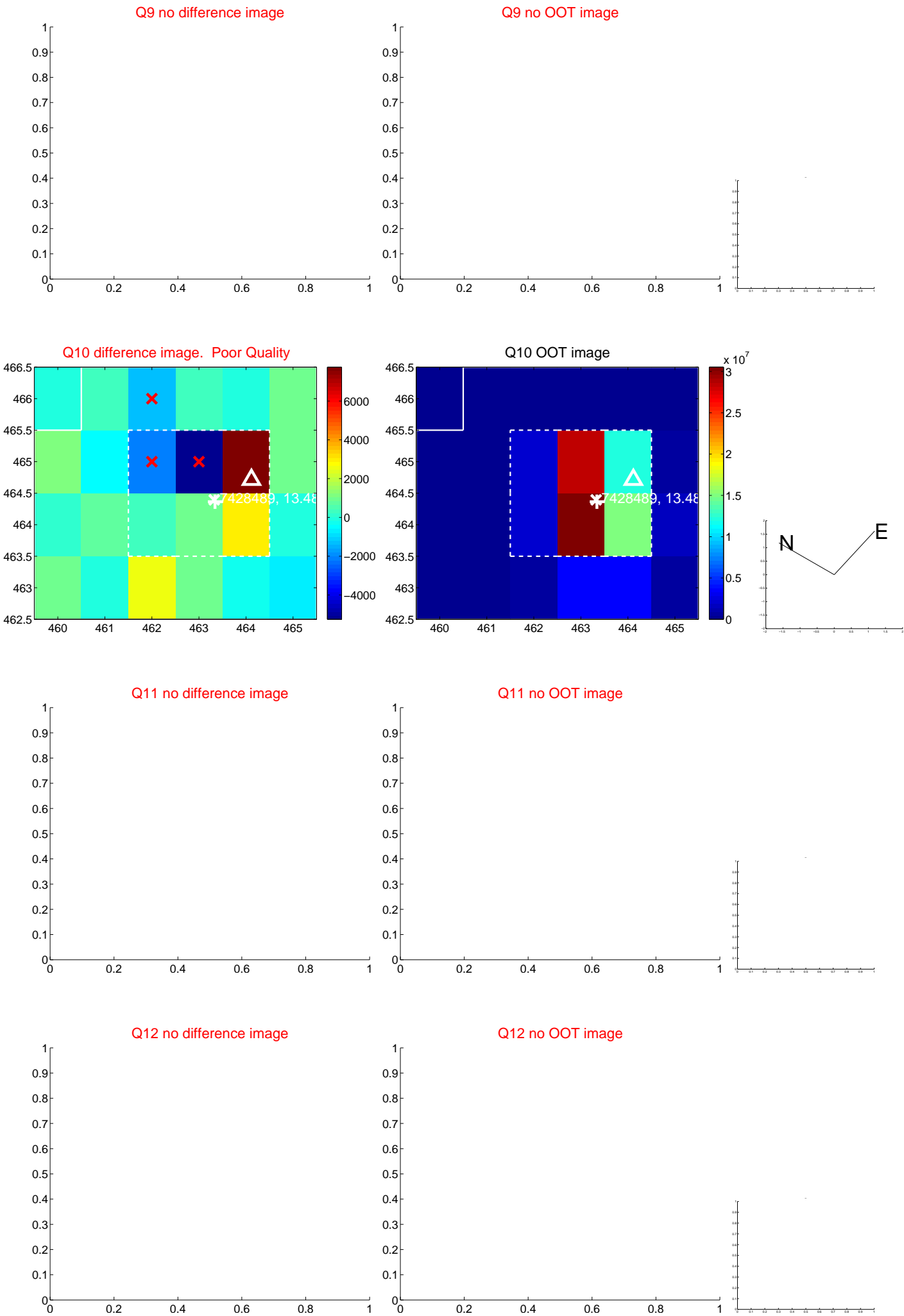
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

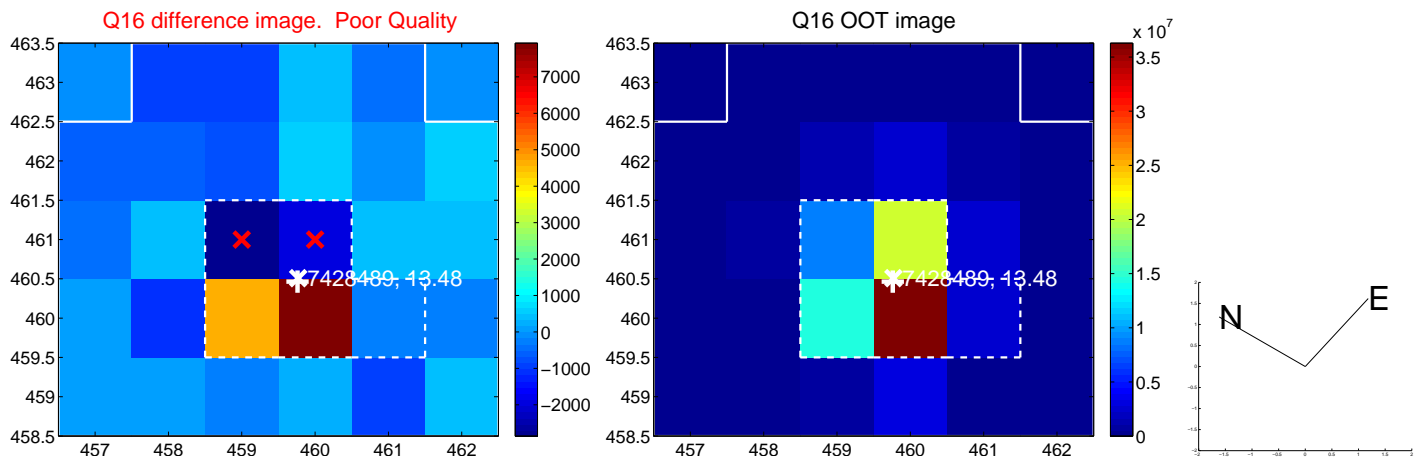
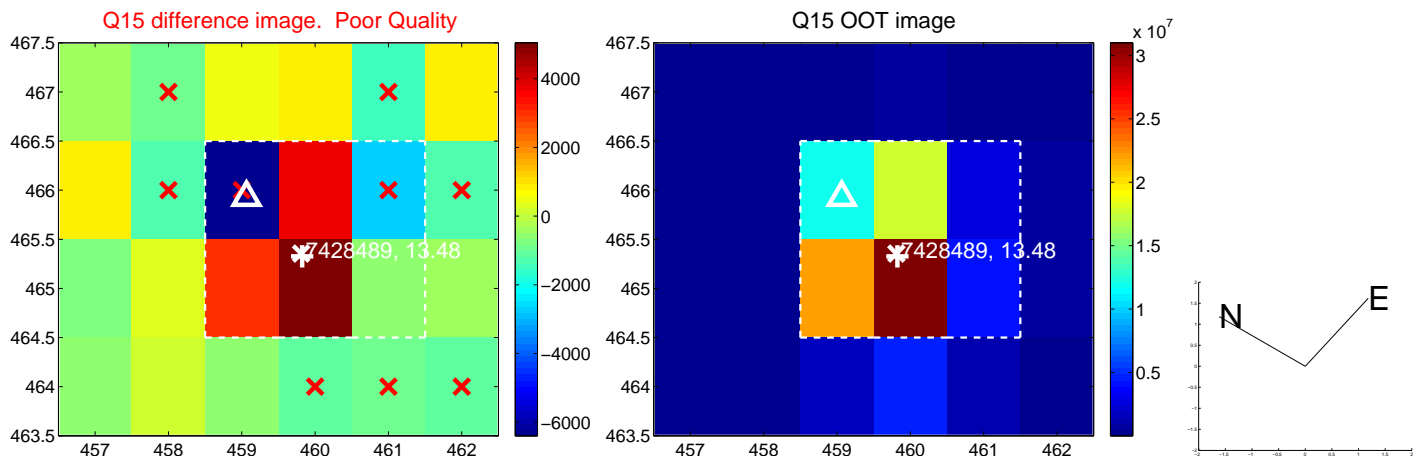
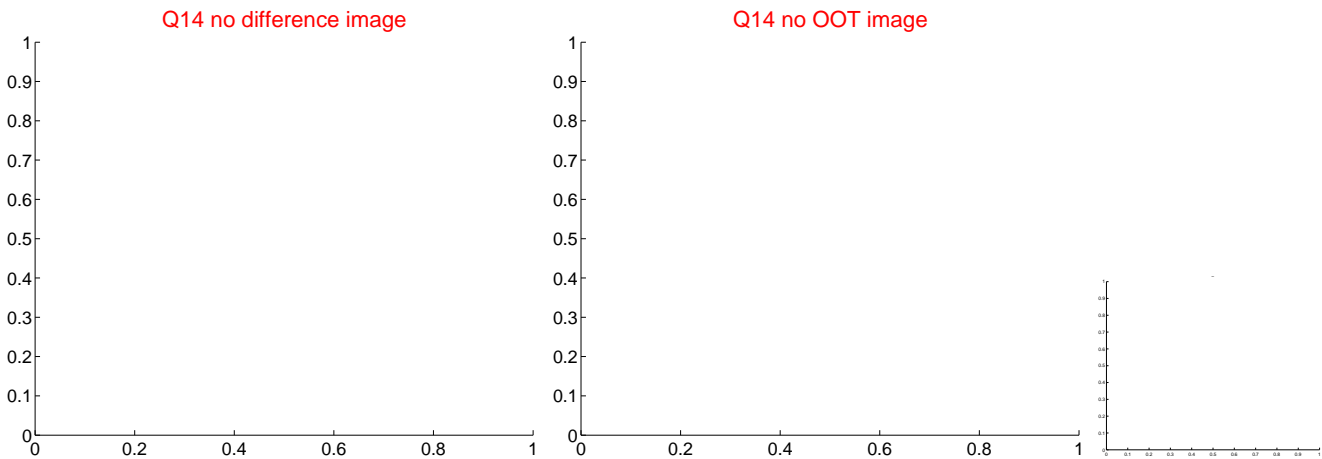
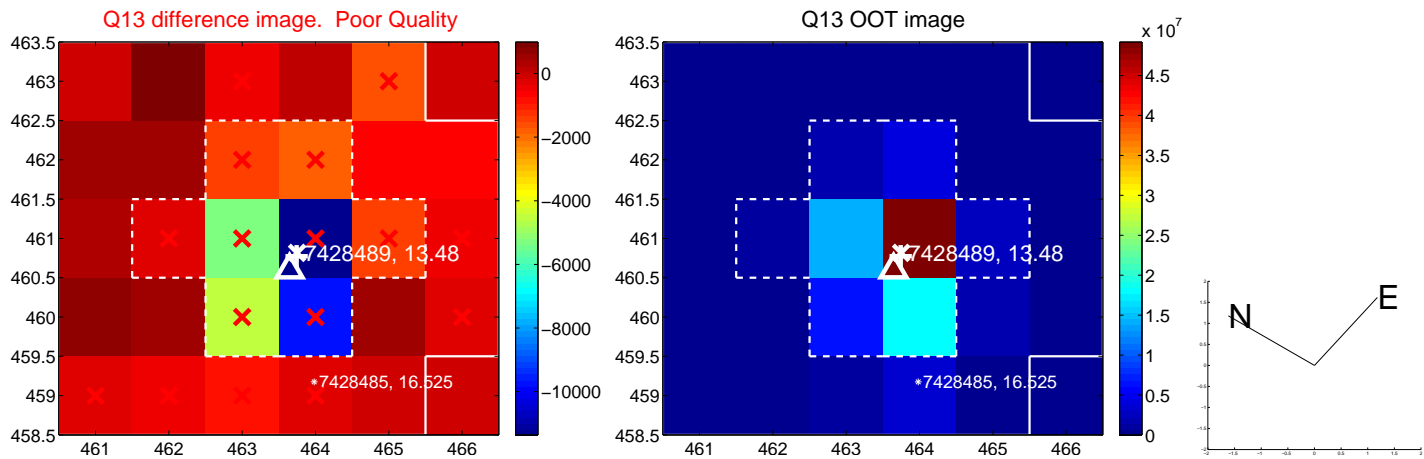


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

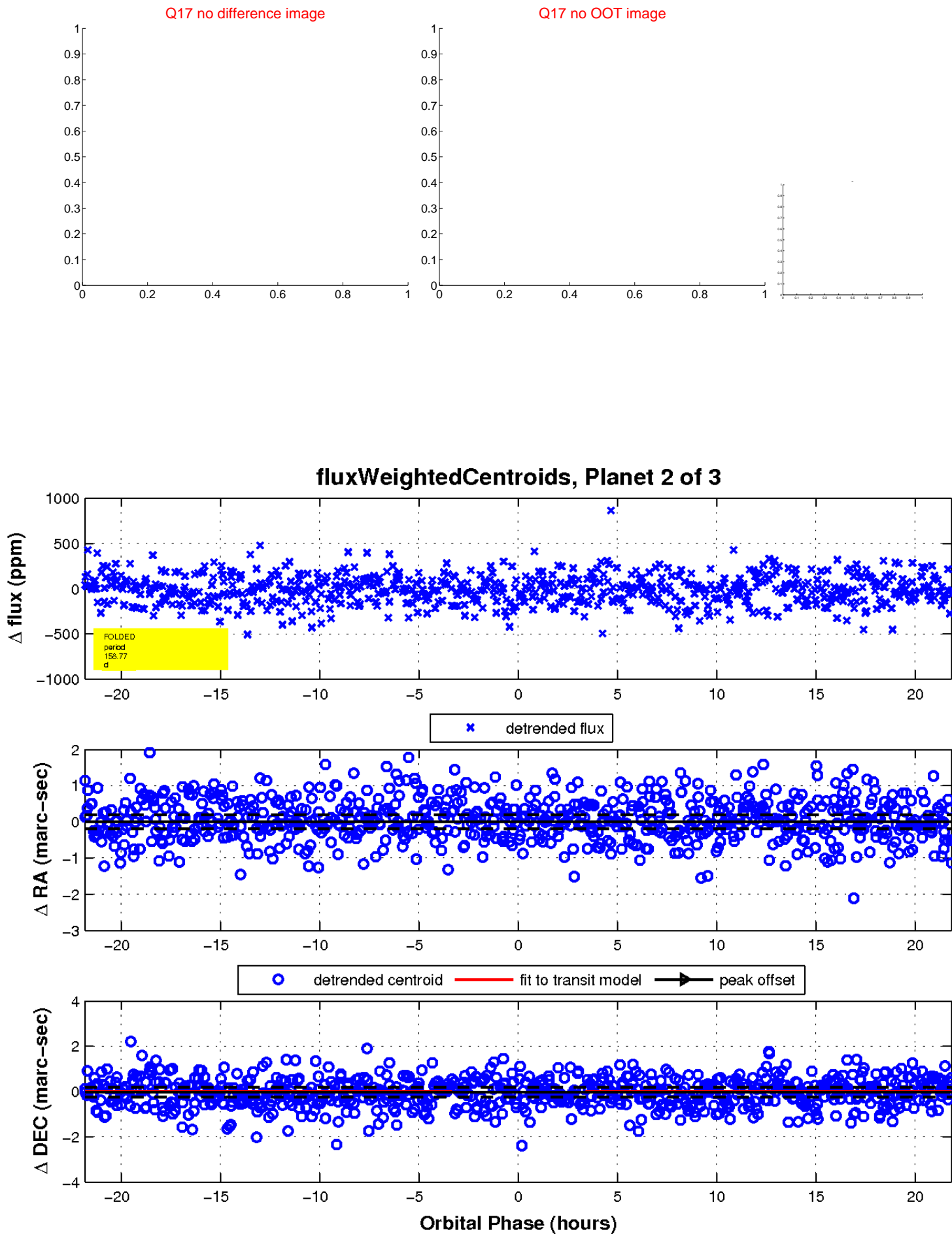




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

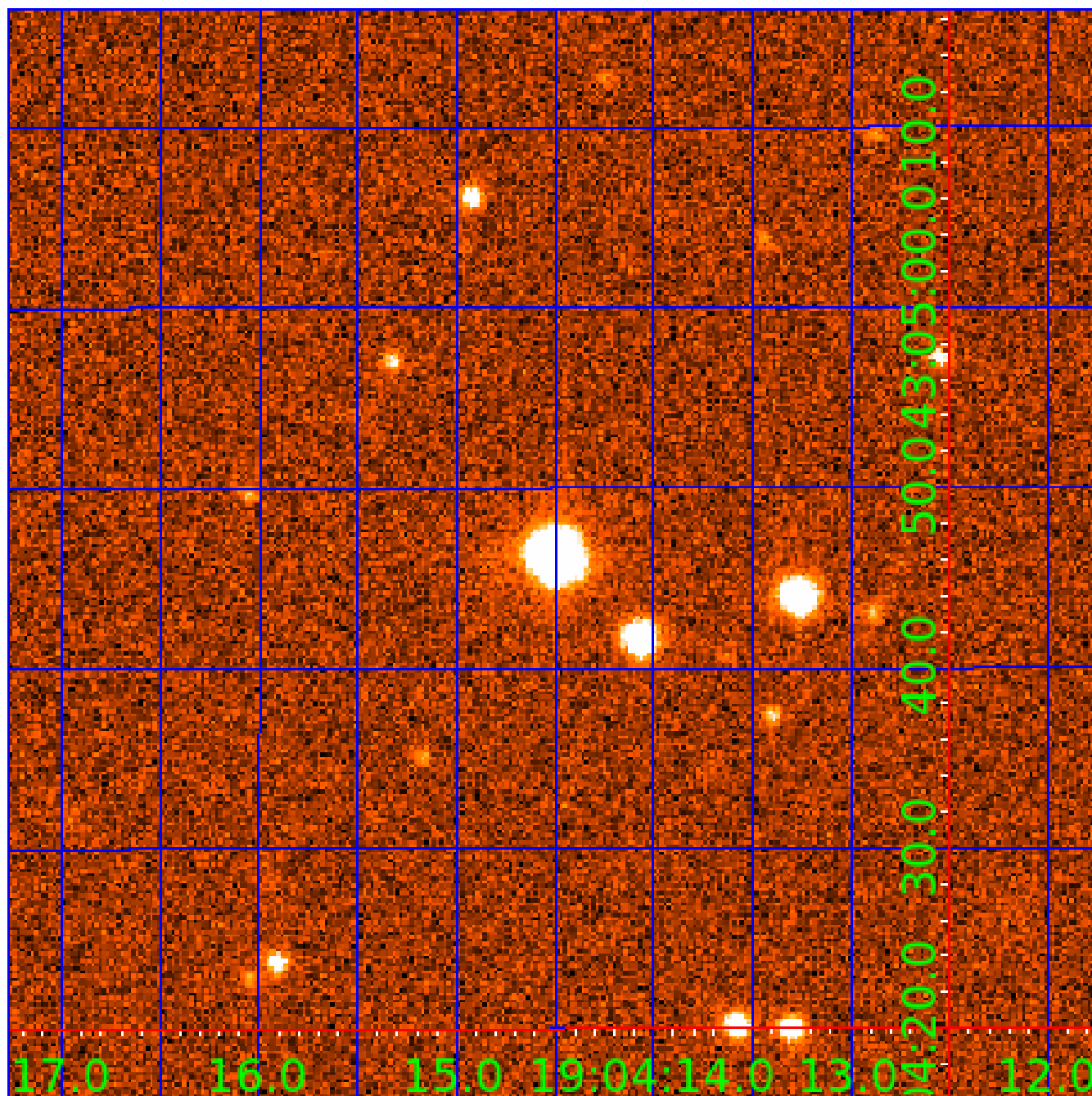


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007428489

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007428489-01	OBS	No	1.096483	132.344469	28.6	5.909	13.7	14.7	2.34	7306	1.28	23085.28
007428489-02	OBS	No	158.772298	278.027901	245.3	7.286	14.5	8.0	2.34	7306	4.10	30.36
007428489-03	OBS	No	39.128461	163.023799	147.6	4.372	8.0	7.7	2.34	7306	3.32	196.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007428489-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
007428489-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007428489-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

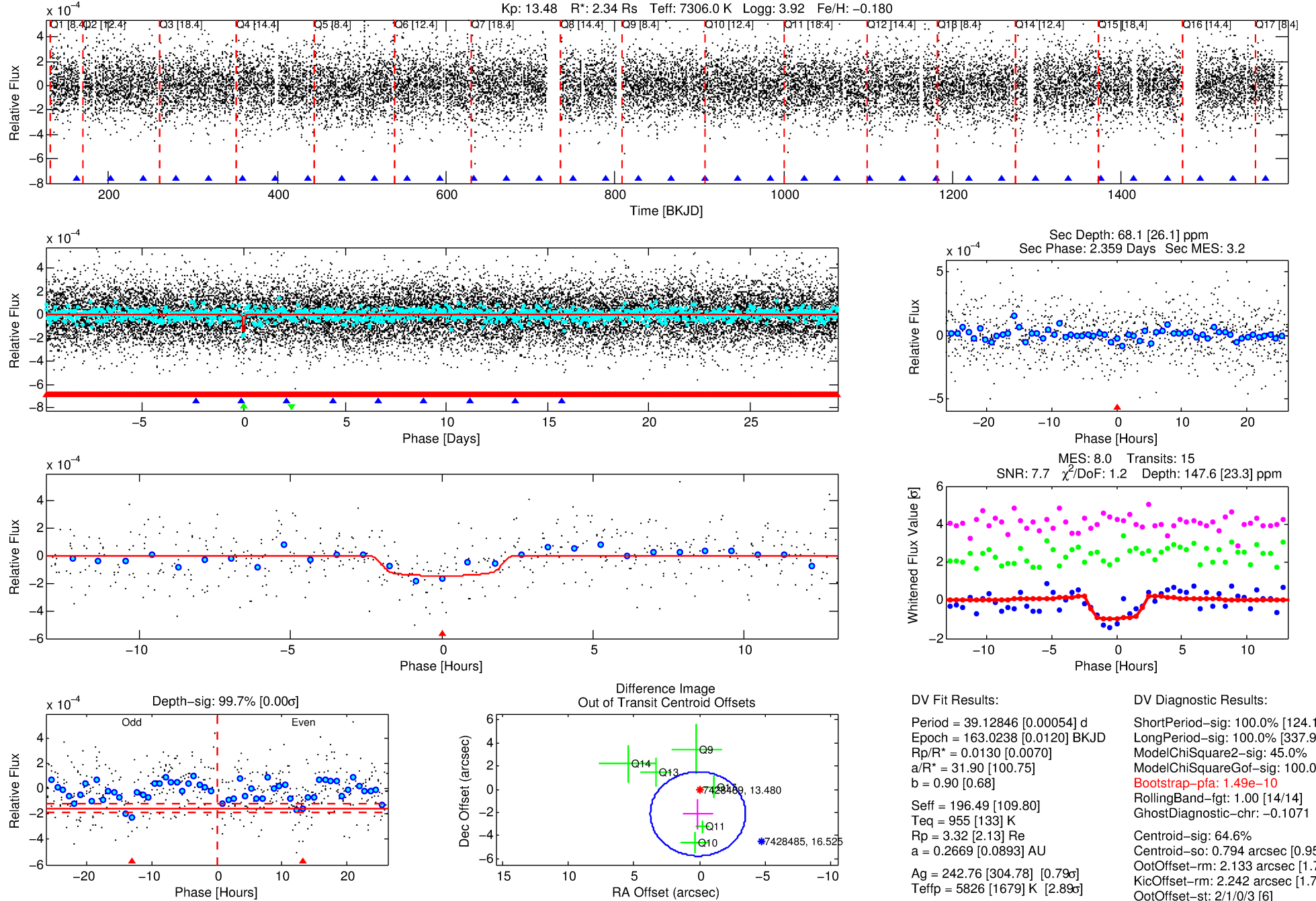
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007428489-03

No Significant Match Found

# DV One-Page Summary

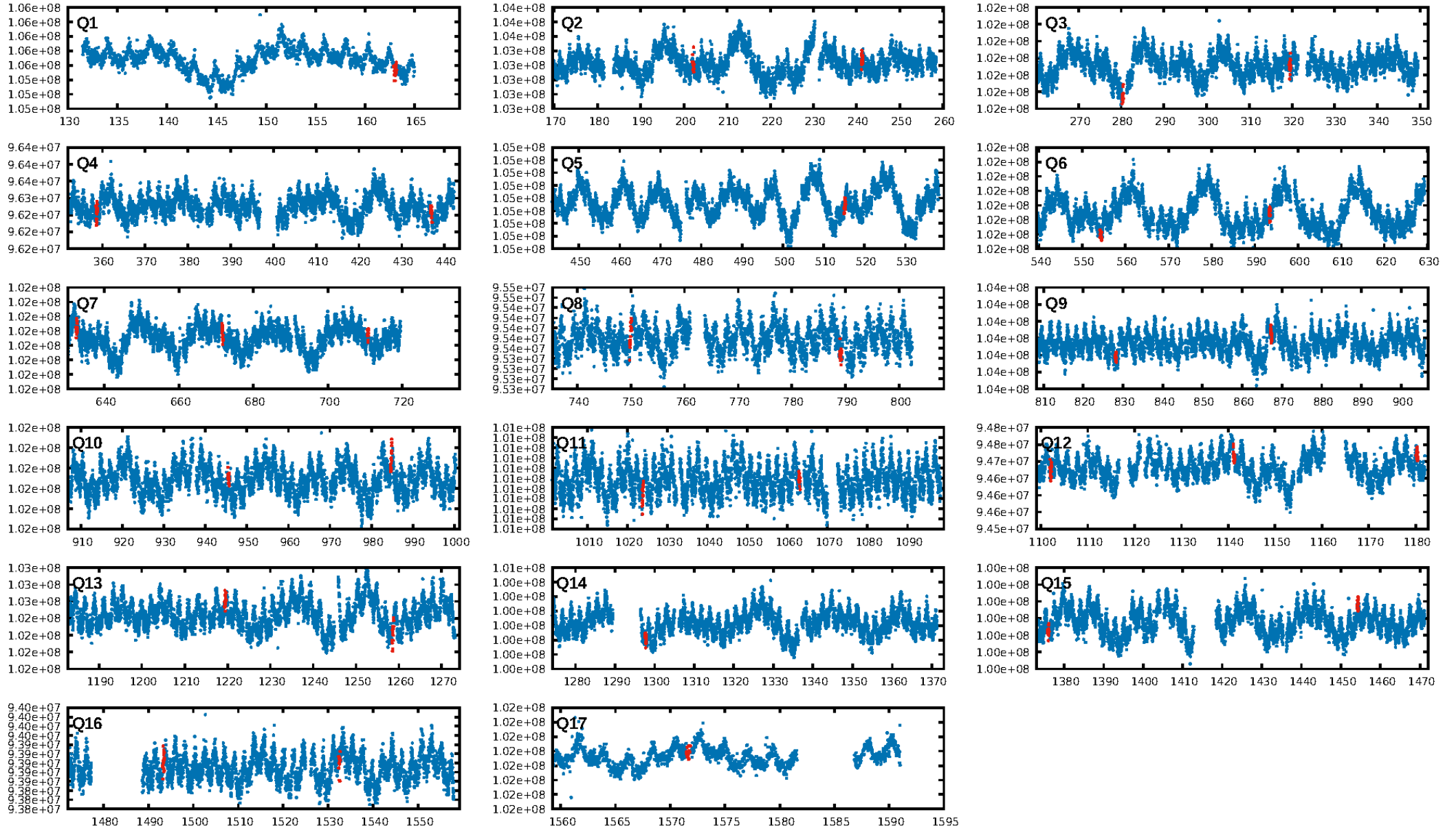
KIC: 7428489 Candidate: 3 of 3 Period: 39.128 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:48:51 Z

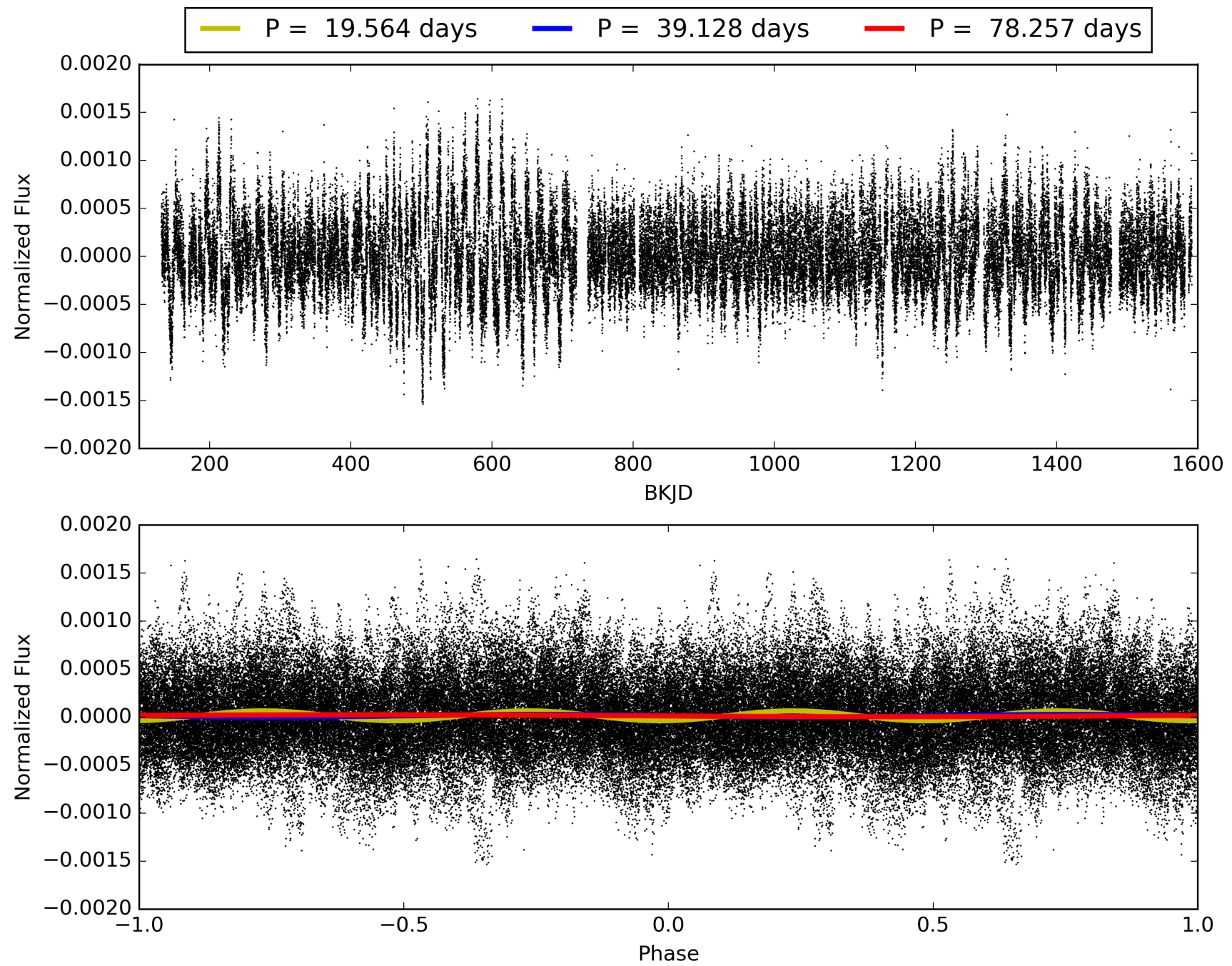
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007428489-03, PDC Light Curves



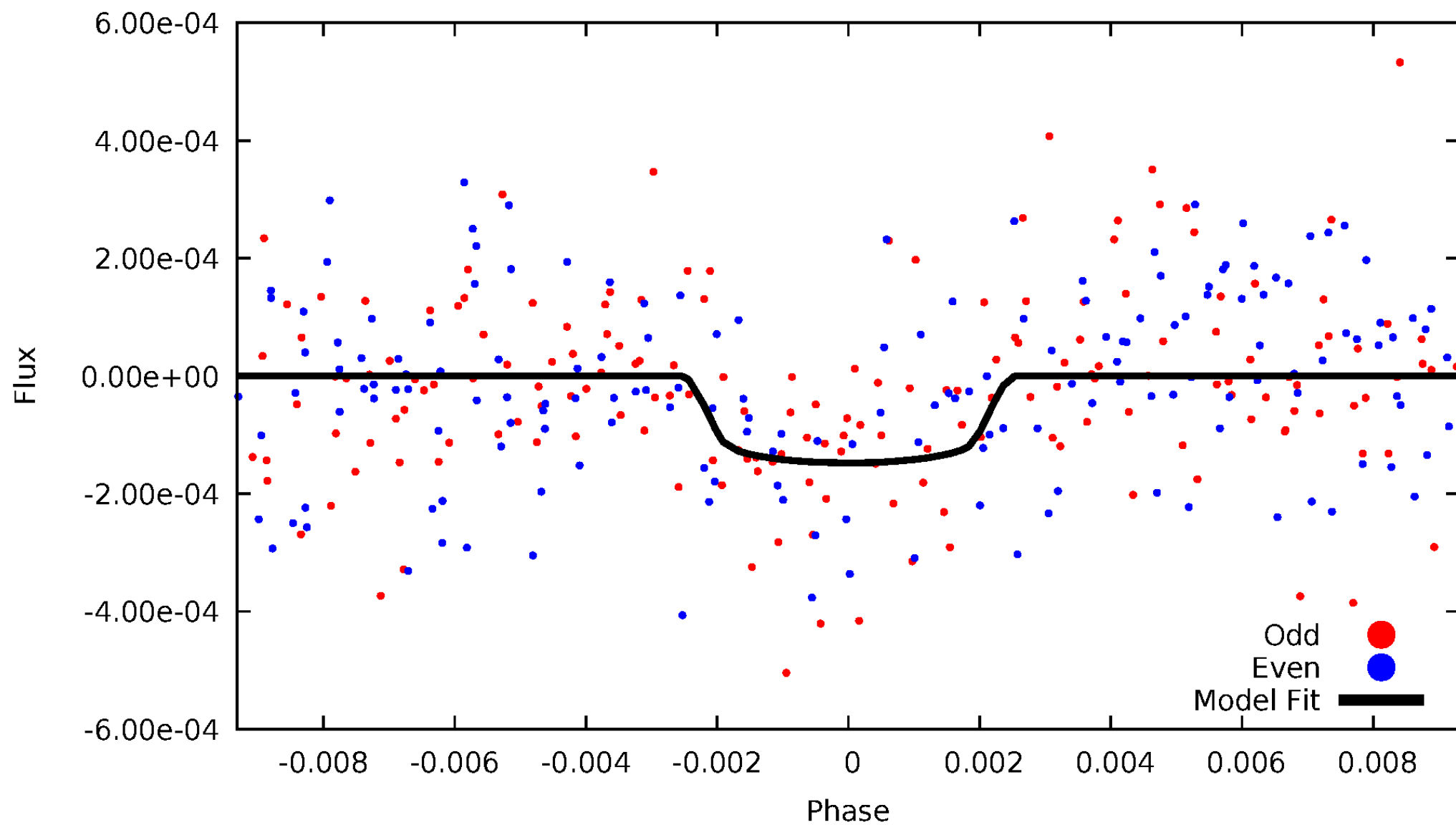


TCE 007428489-03



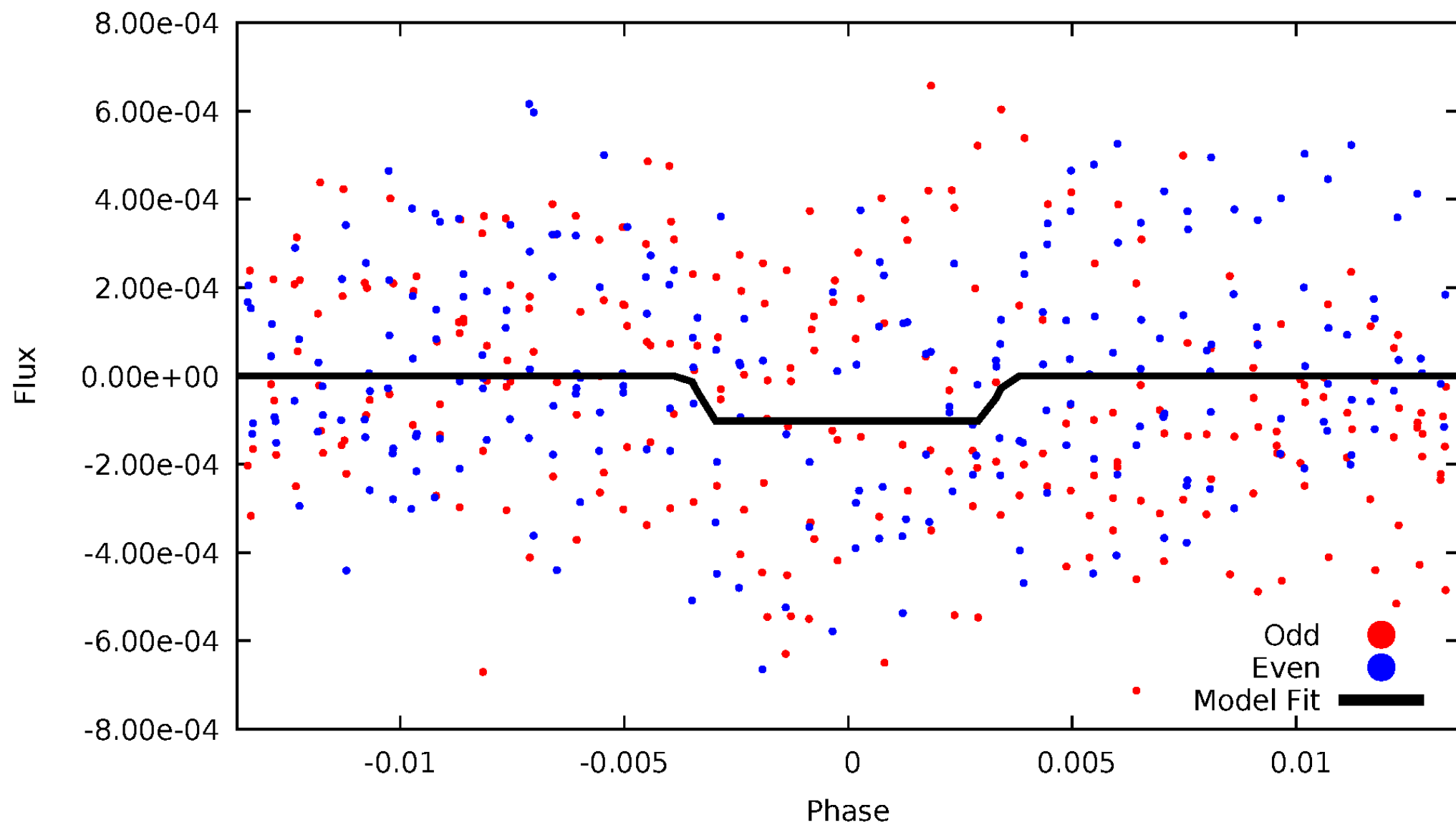
# DV Odd/Even

TCE 007428489-03

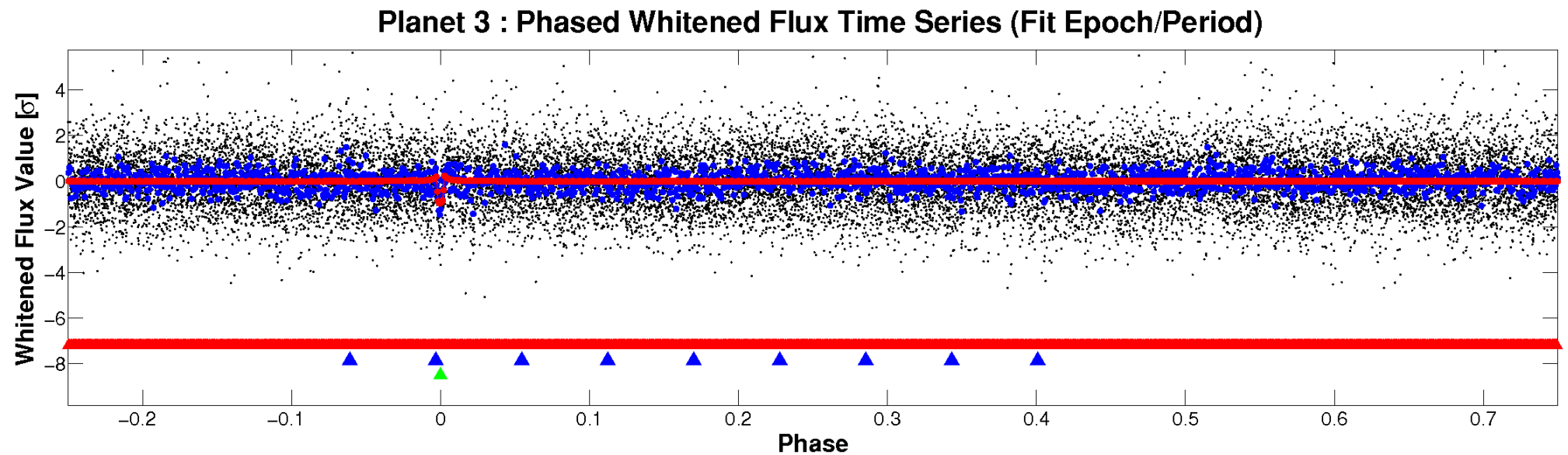
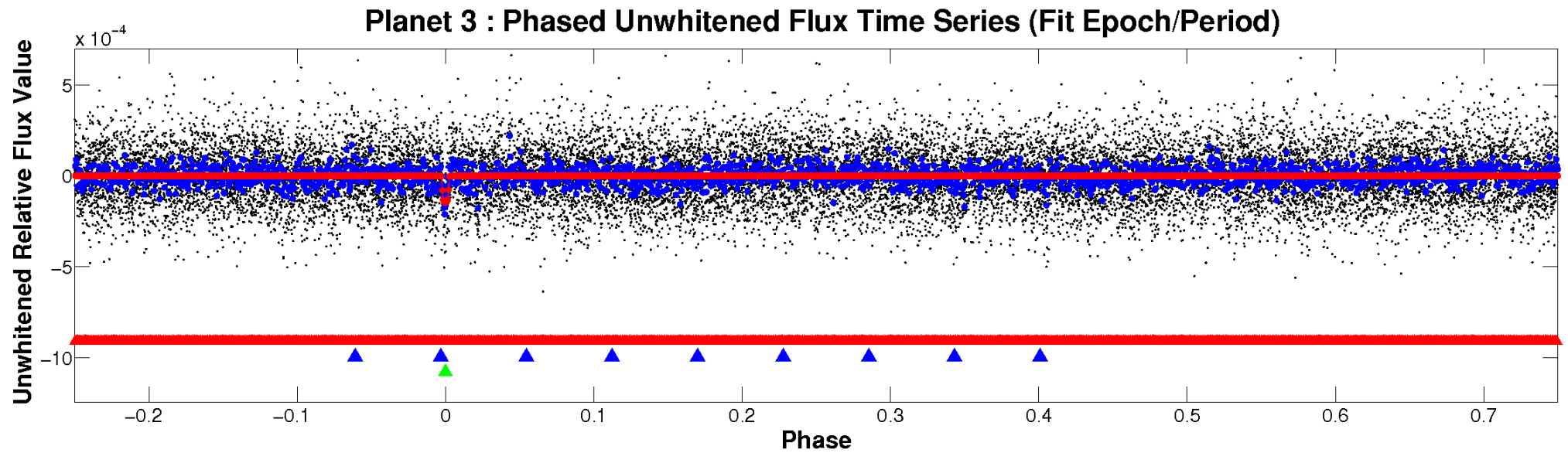


# ALT Odd/Even

TCE 007428489-03

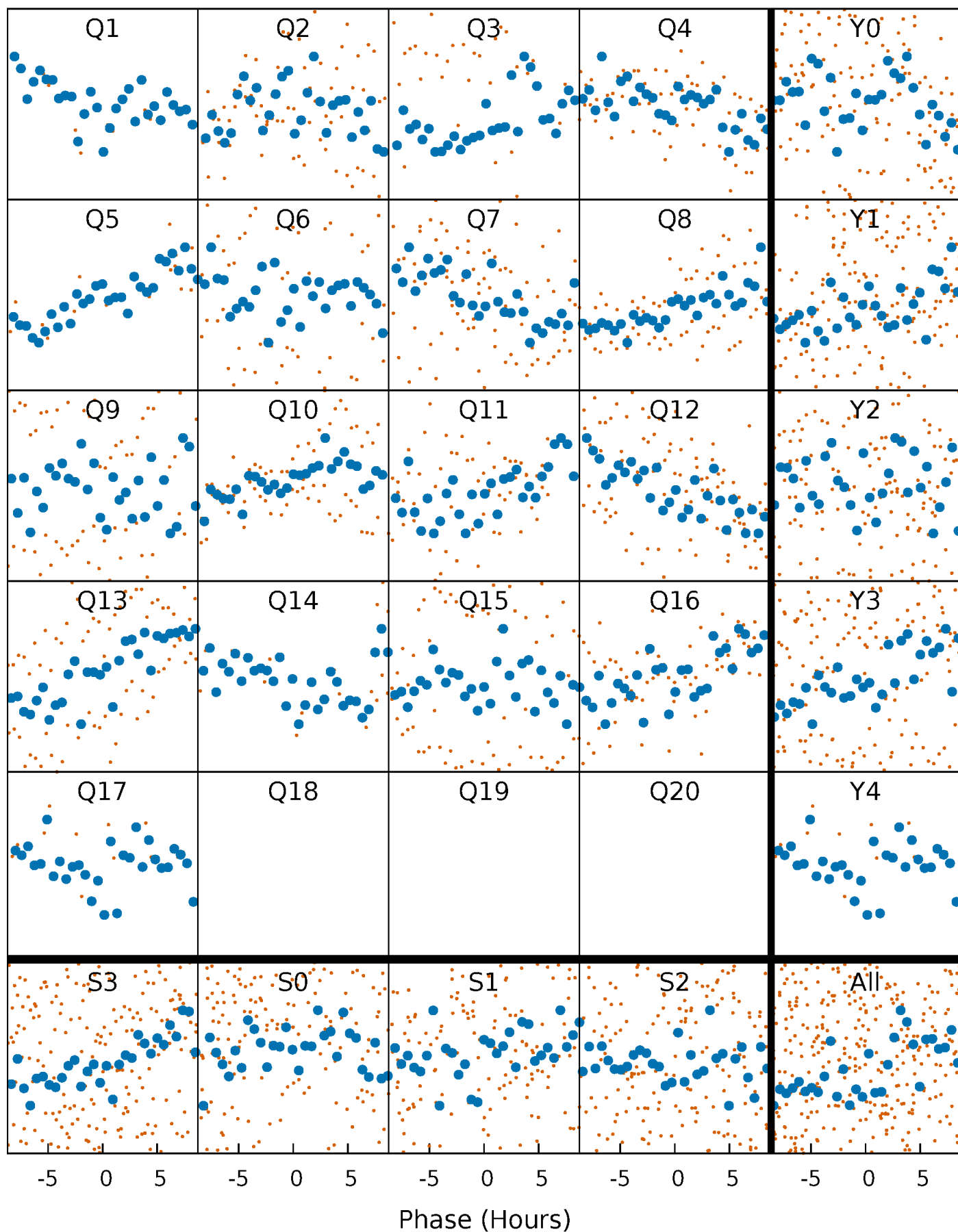


# Non-Whitened Vs. Whitened Light Curve



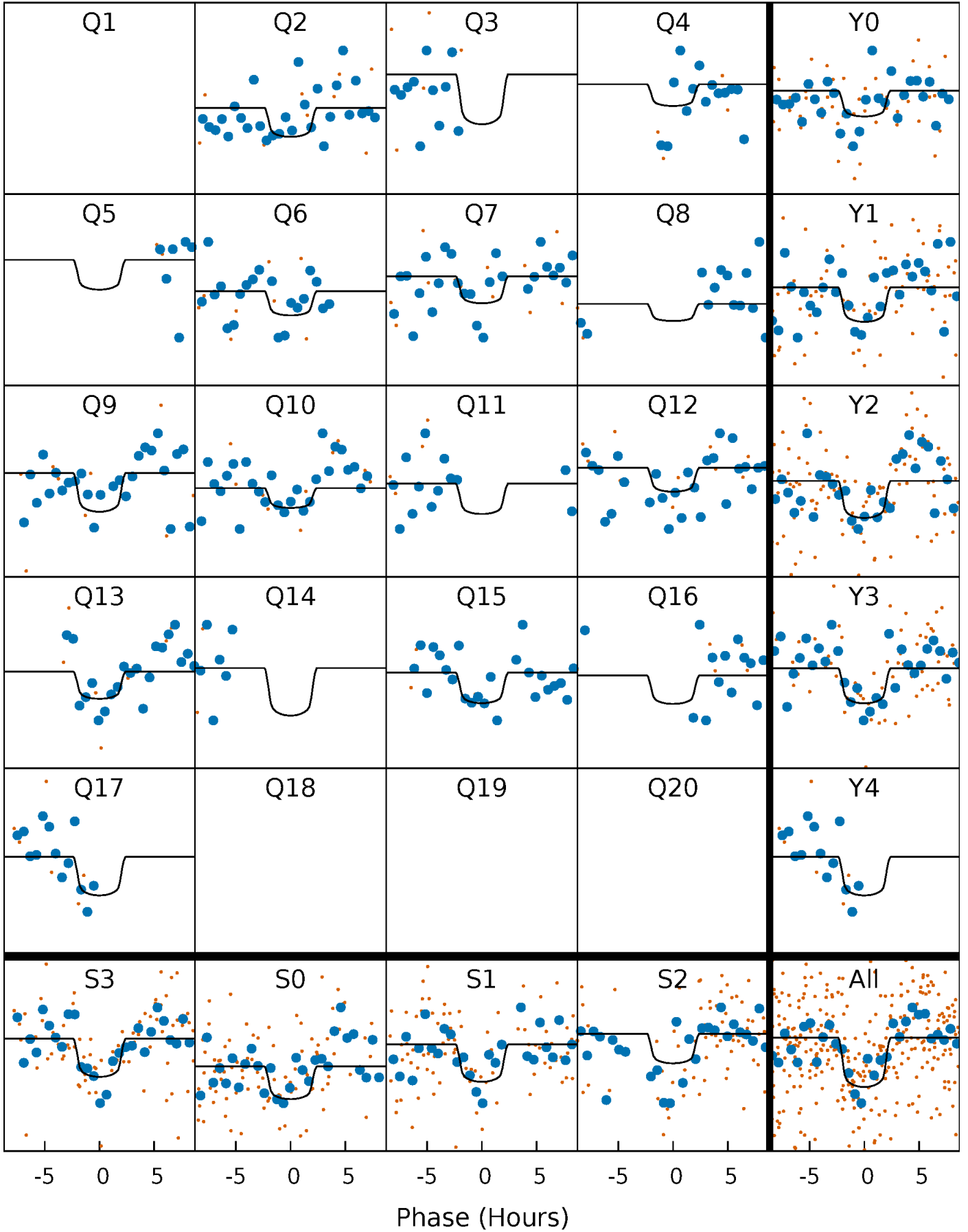
# PDC Quarter-Phased Transit Curves

TCE 007428489-03 P= 39.128461 Days  $T_0=163.023799$  (BKJD)



# DV Quarter-Phased Transit Curves

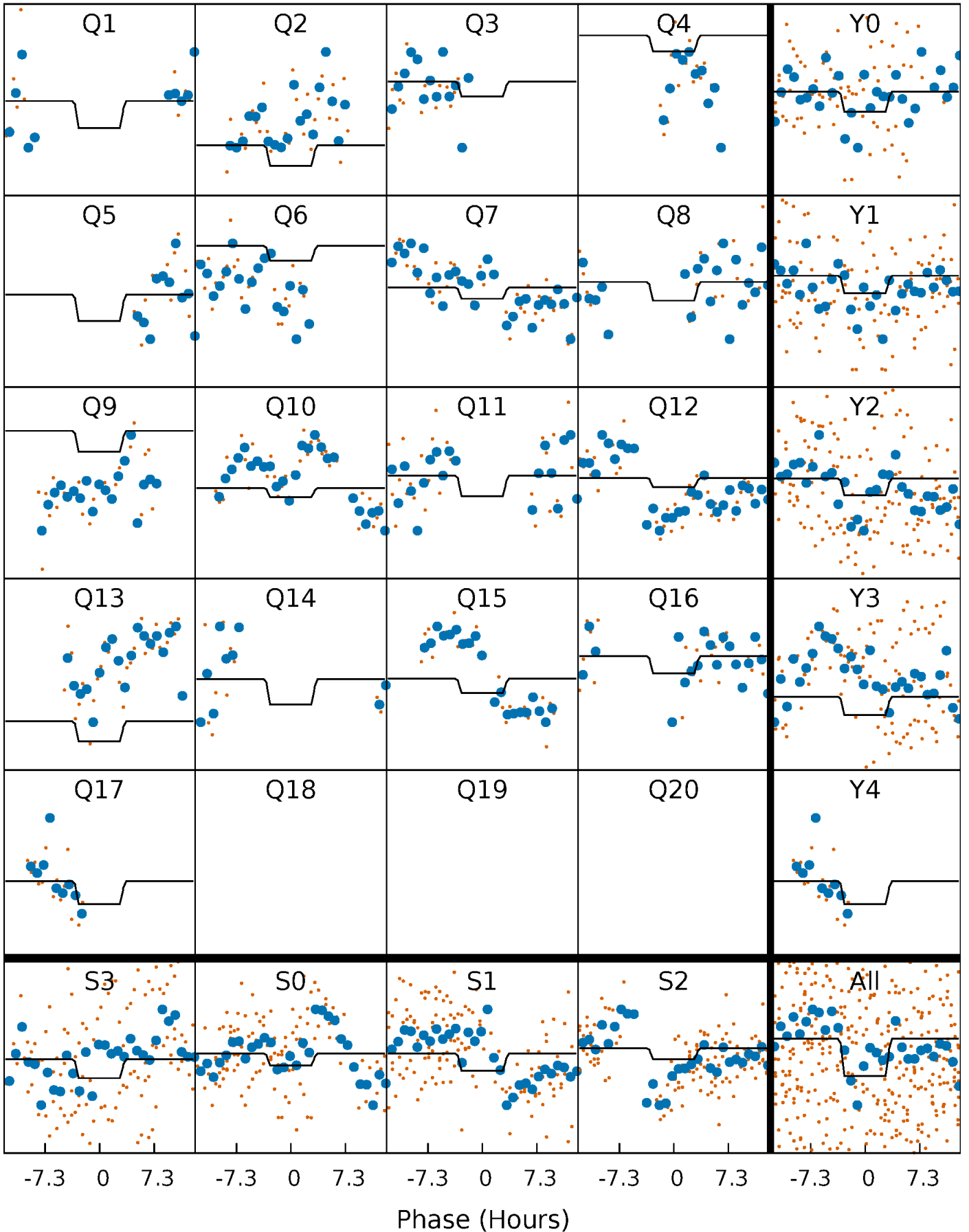
TCE 007428489-03 P= 39.128461 Days  $T_0=163.023799$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

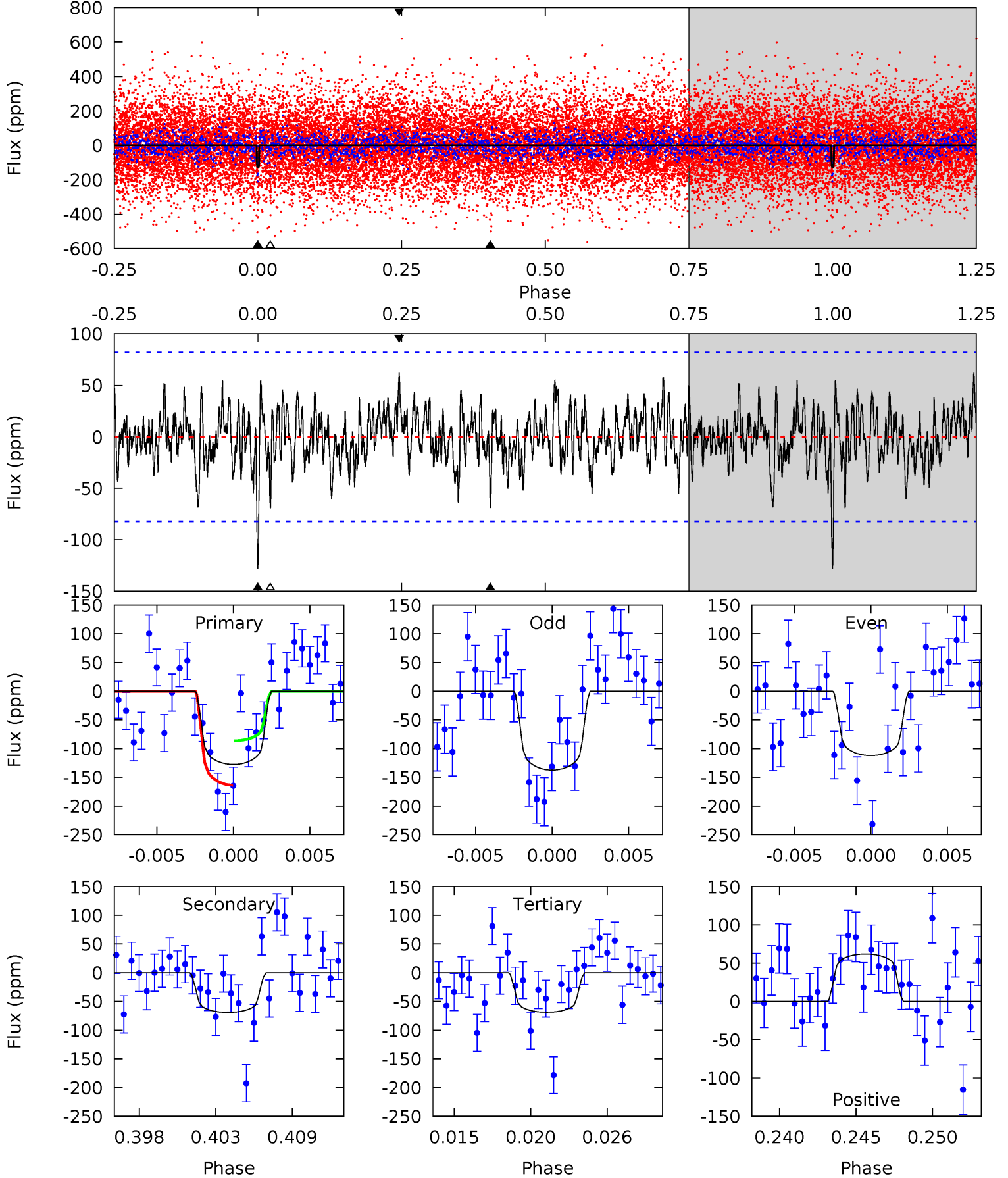
TCE 007428489-03     $P = 39.130335$  Days     $T_0 = 163.032174$  (BKJD)



# DV Model-Shift Uniqueness Test

007428489-03, P = 39.128461 Days, E = 123.895338 Days

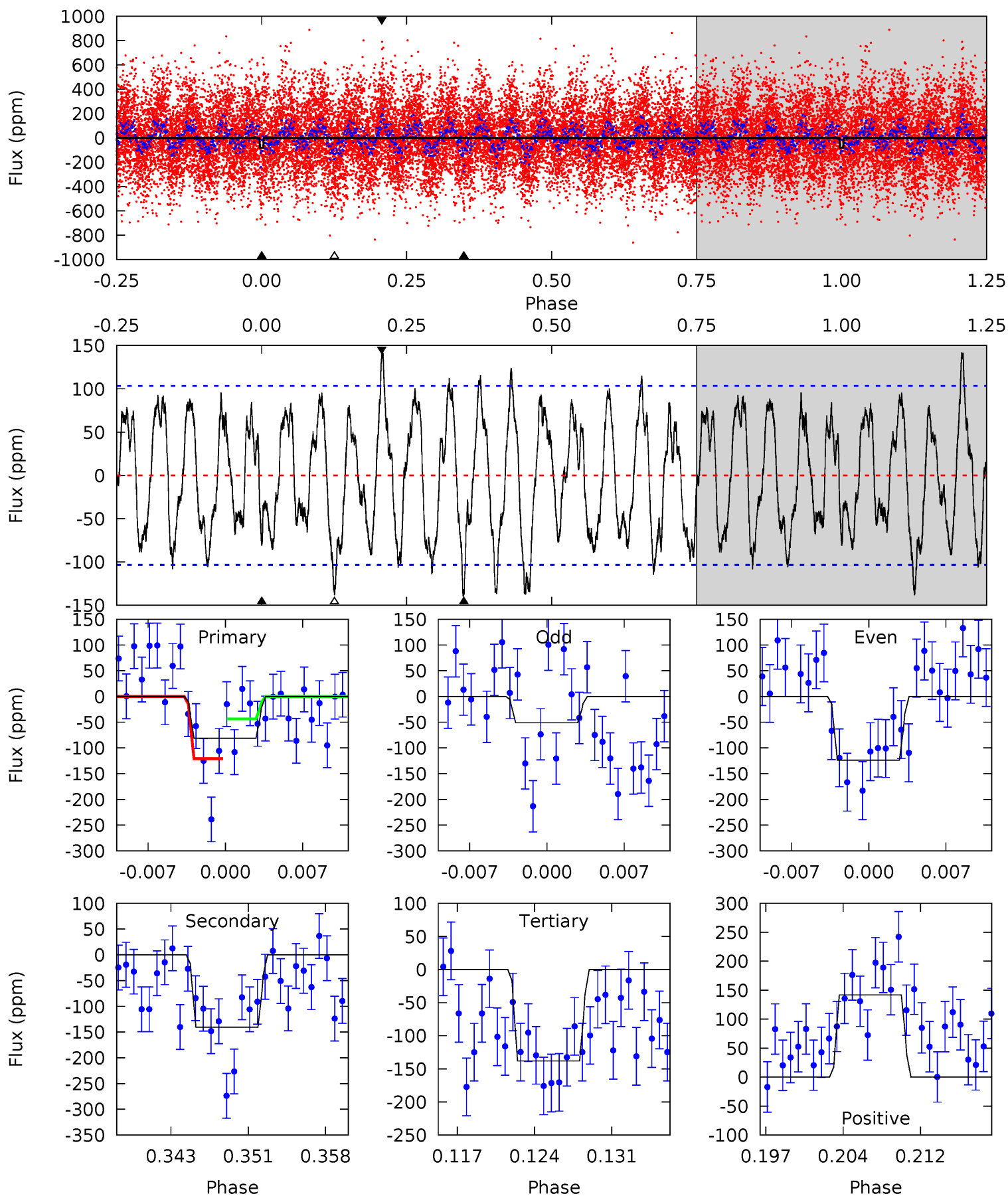
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.03	4.35	4.33	3.90	5.15	2.80	1.37	3.70	4.13	0.02	0.44	0.79	0.92	0.33	2.43



# Alt Model-Shift Uniqueness Test

007428489-03, P = 39.130335 Days, E = 123.901839 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	6.93	6.80	6.99	5.09	2.68	3.15	-2.81	-3.00	0.12	-0.06	1.77	0.60	0.50	1.90



### Stellar Parameters For KIC 007428489

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$3.918^{+0.308}_{-0.132}$	$-0.180^{+0.250}_{-0.350}$	$2.342^{+0.485}_{-0.832}$	$1.653^{+0.167}_{-0.389}$	$0.181^{+0.397}_{-0.070}$
	+3%/-5%	+8%/-3%	+139%/-194%	+21%/-36%	+10%/-24%	+219%/-39%
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 007428489-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-69 \pm 16$	$3.06^{+1.95}_{-1.48}$	$1310^{+101}_{-126}$	$5707^{+2723}_{-1030}$	$277^{+817}_{-179}$
Alt.	$-141 \pm 20$	$2.56^{+1.62}_{-1.46}$	$1305^{+105}_{-124}$	$7675^{+6594}_{-1704}$	$818^{+3517}_{-506}$

$T_{max}$  = 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

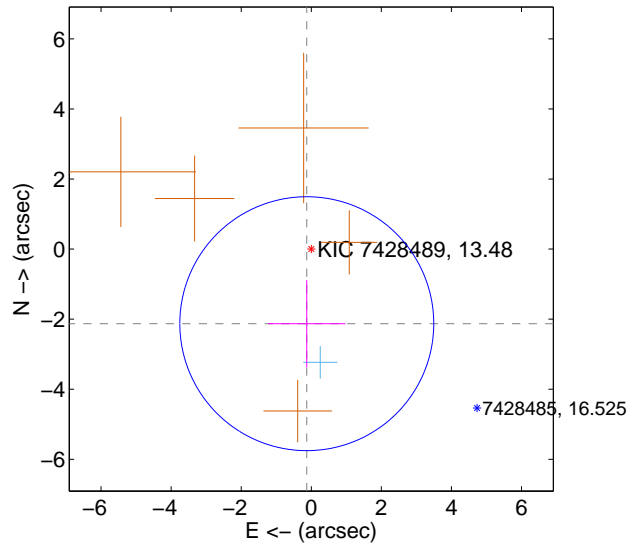
Supplemental centroid analysis for 007428489-03. Kepler magnitude: 13.48. Transit SNR 7.74

There are 1 quarters with good PRF difference image offsets

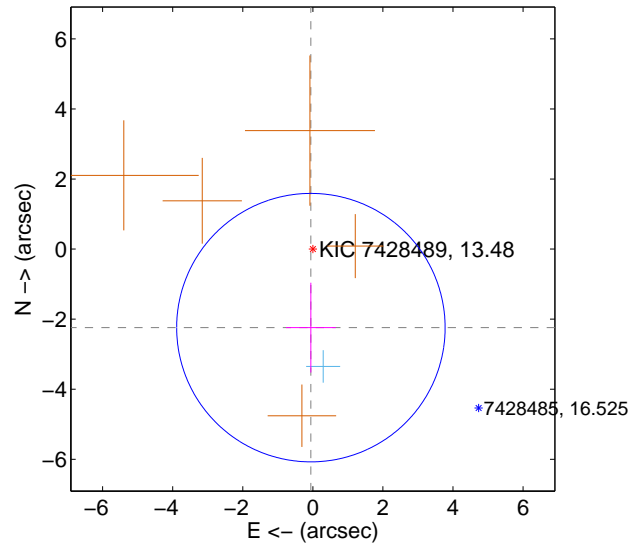
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.133 \pm 1.208$	1.77	$0.128 \pm 1.105$	$-2.129 \pm 1.245$
PRF-fit source offset from KIC position	$2.242 \pm 1.277$	1.76	$0.056 \pm 0.712$	$-2.242 \pm 1.281$
photometric centroid source offset	$0.79 \pm 0.84$	0.95	$-0.64 \pm 0.82$	$-0.47 \pm 0.86$

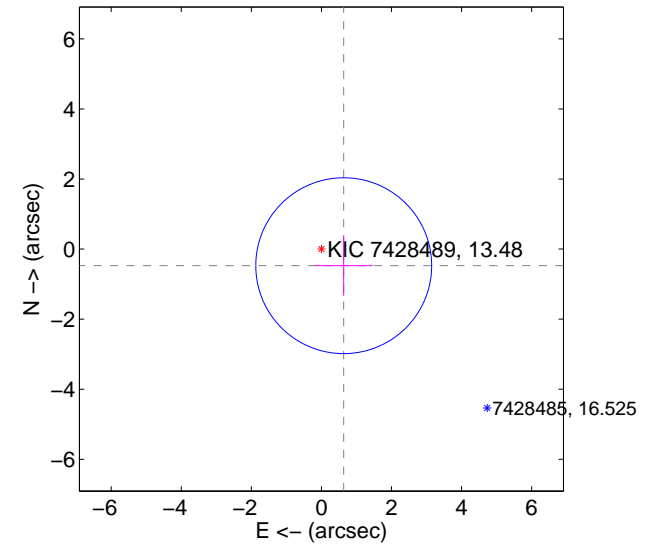
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

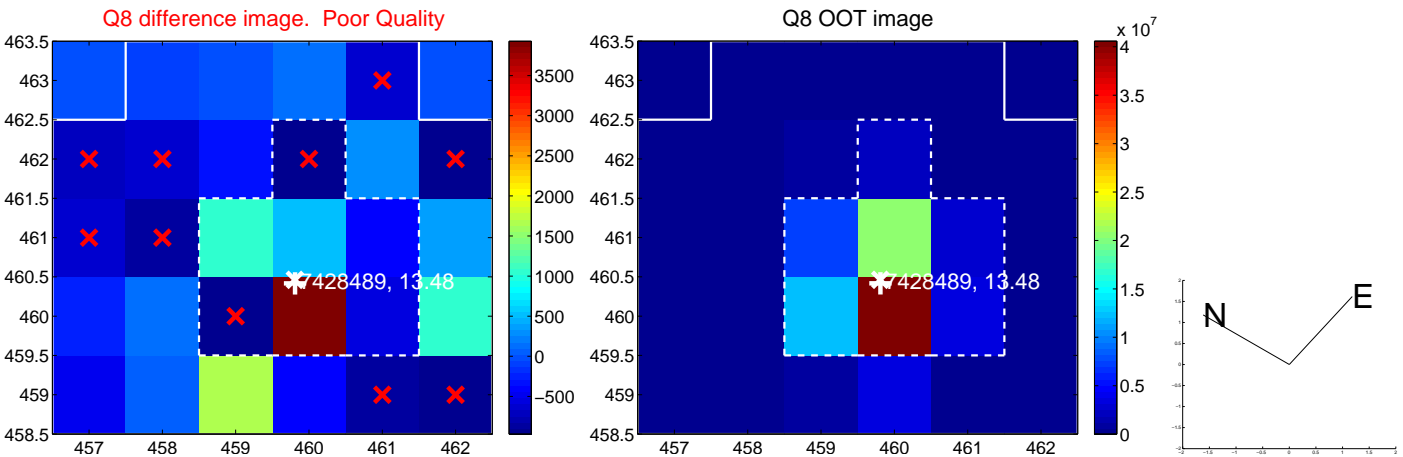
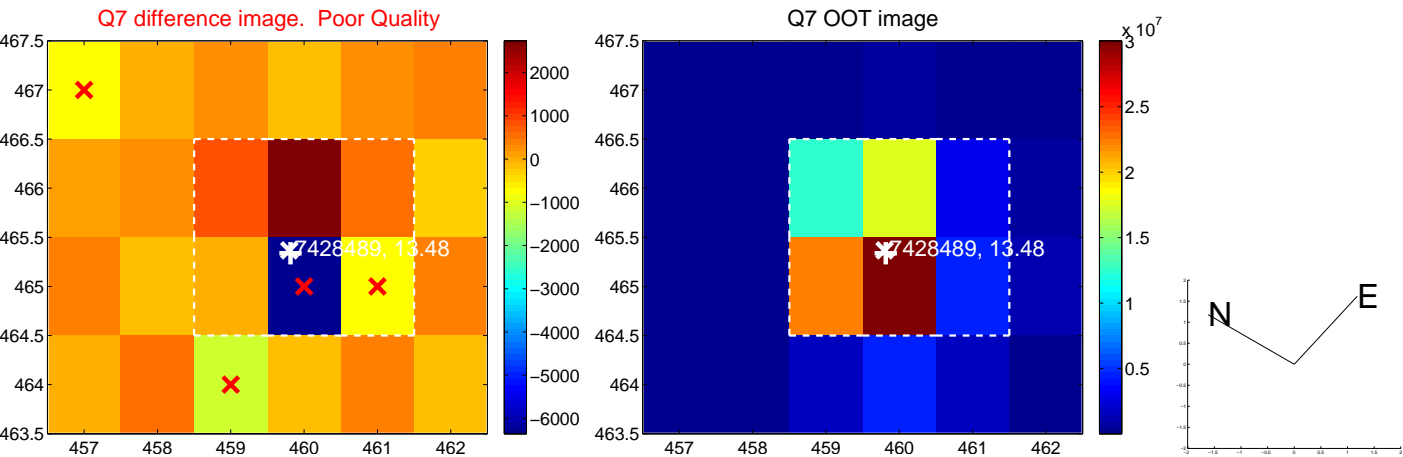
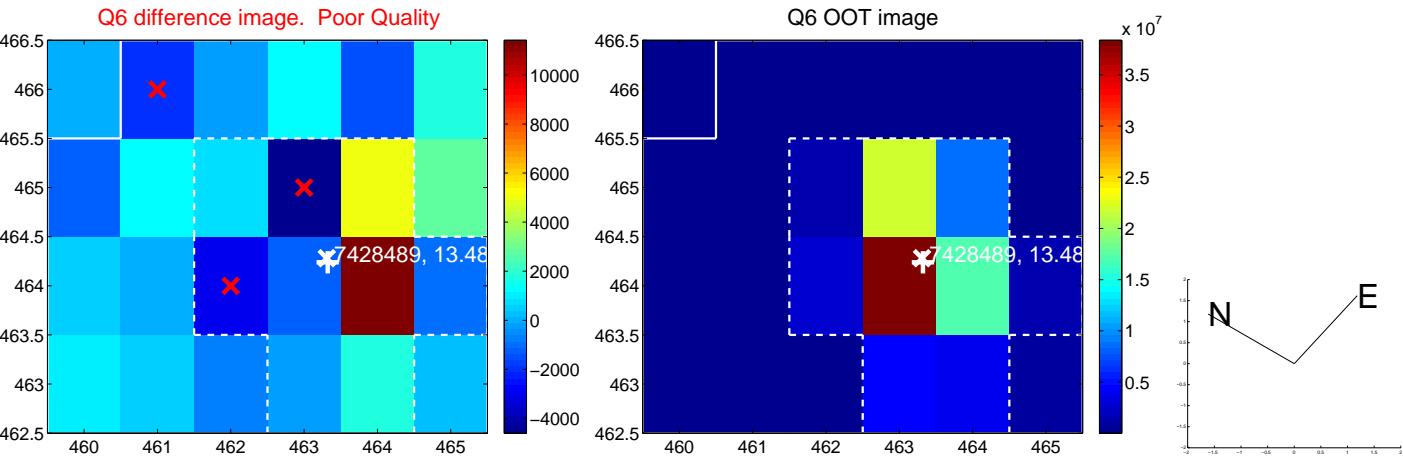
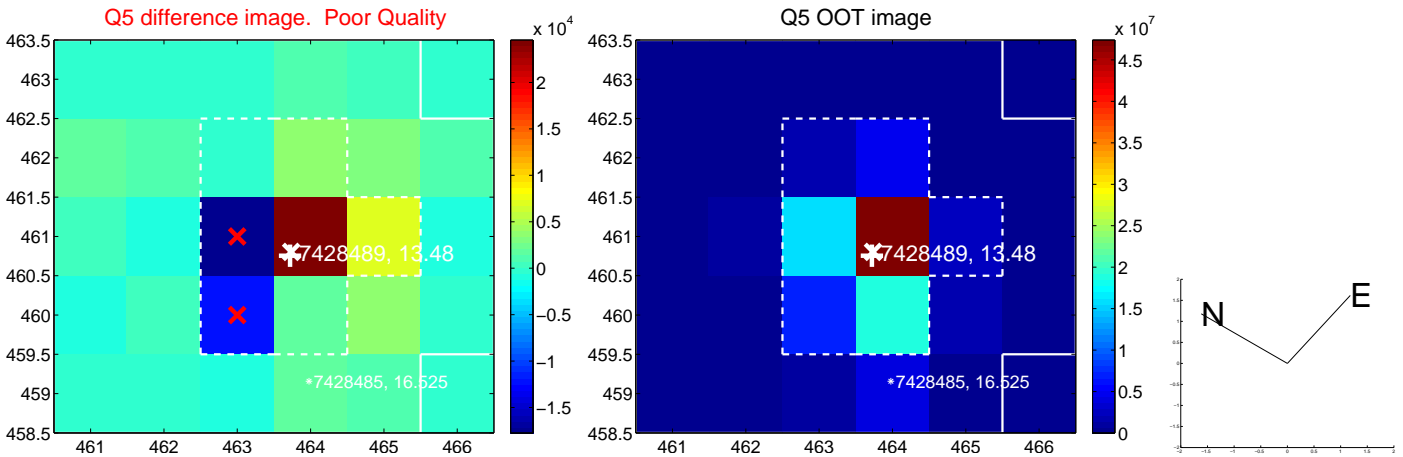


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

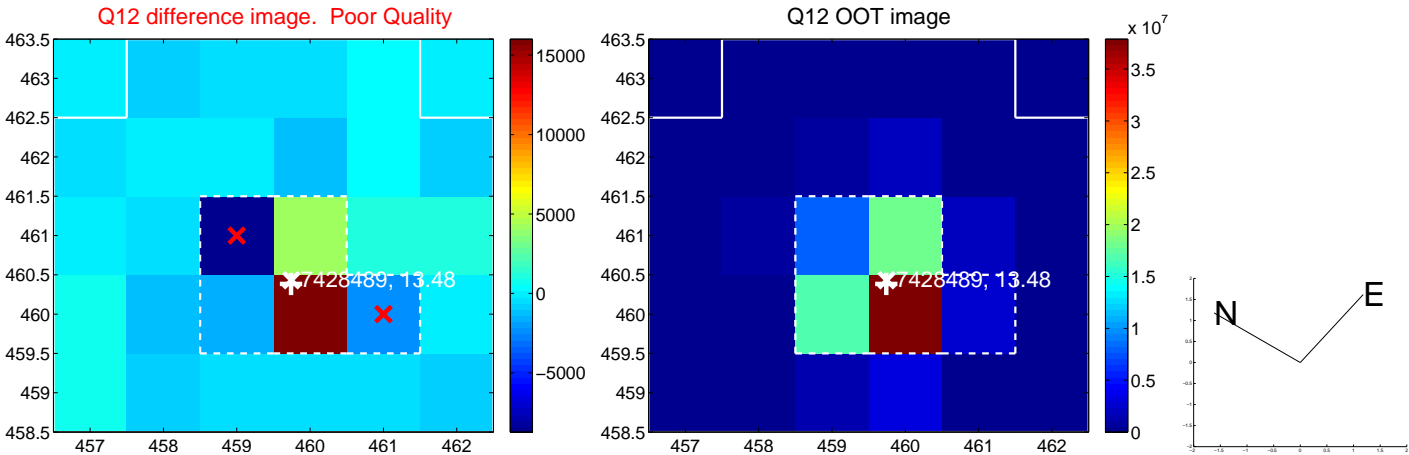
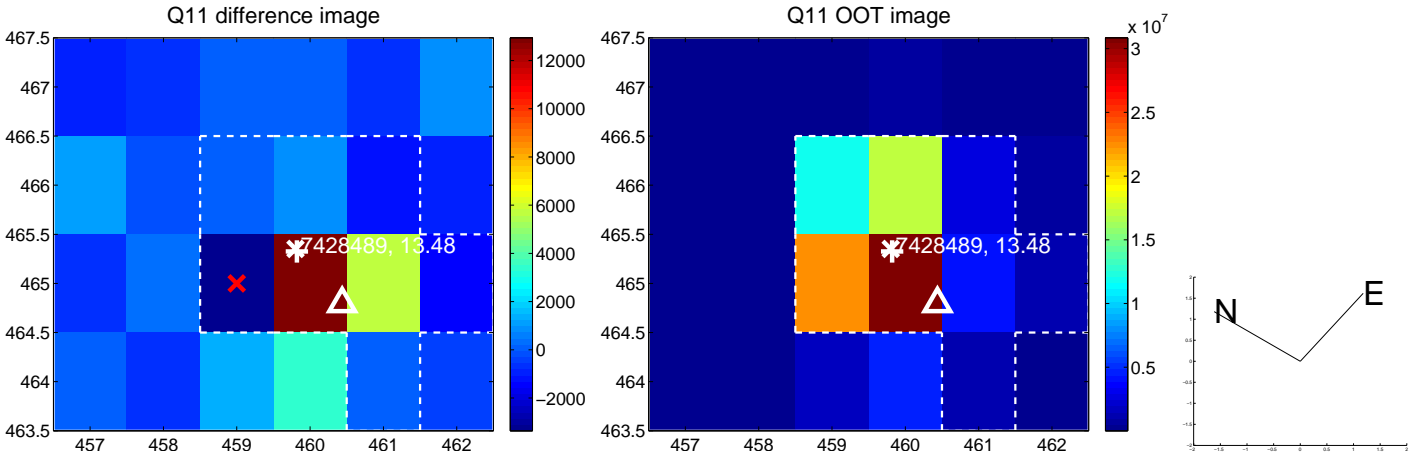
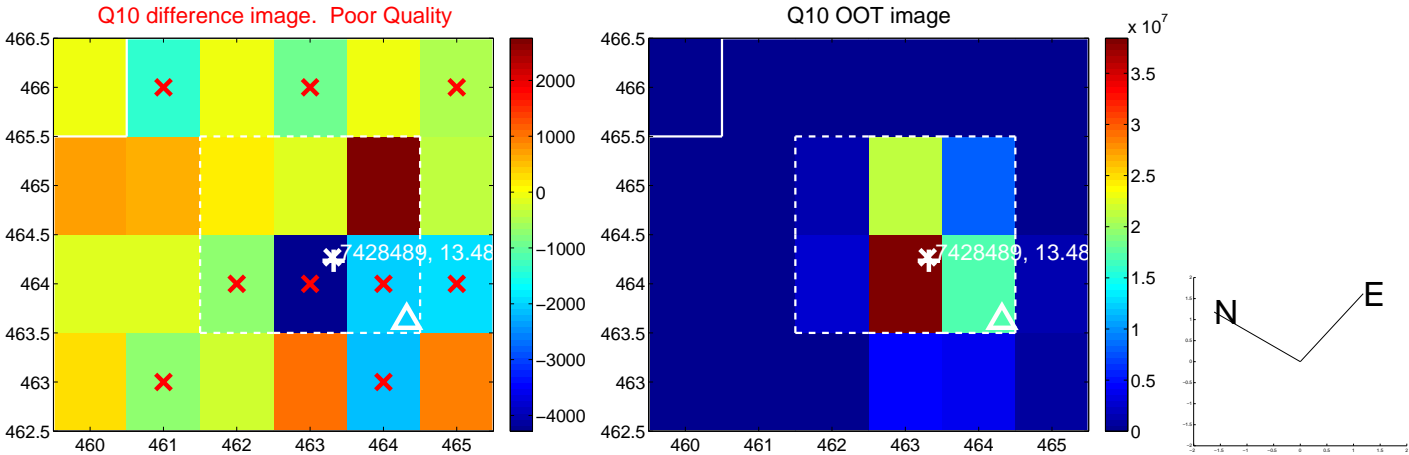
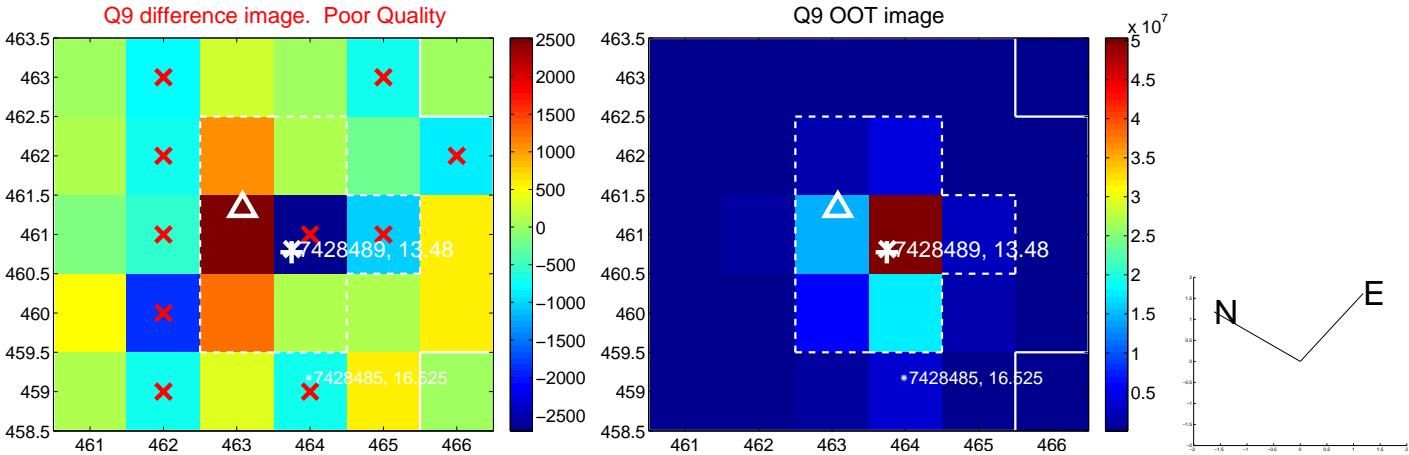




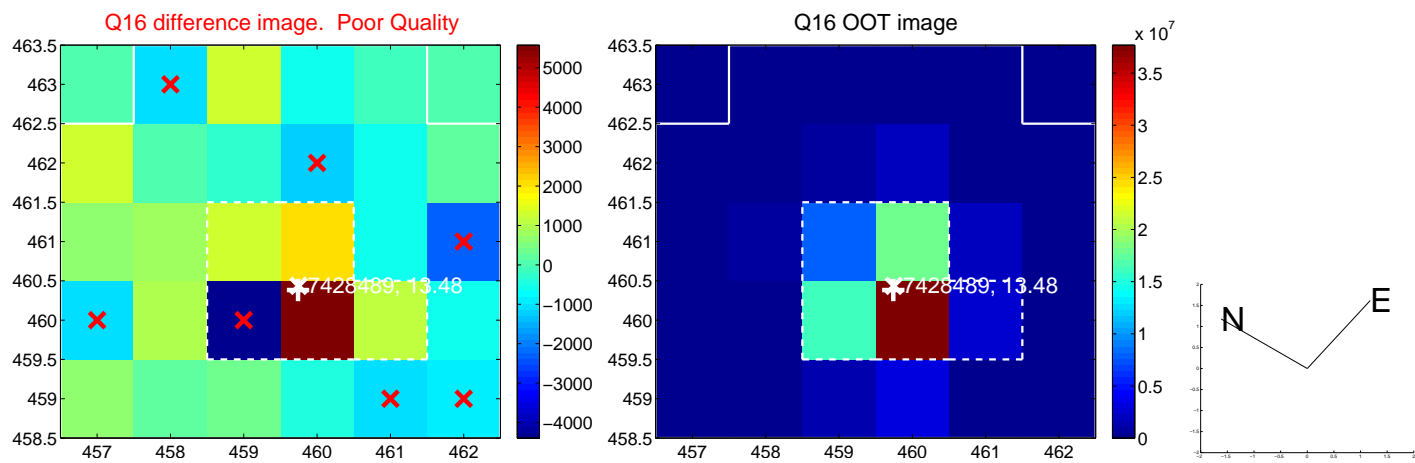
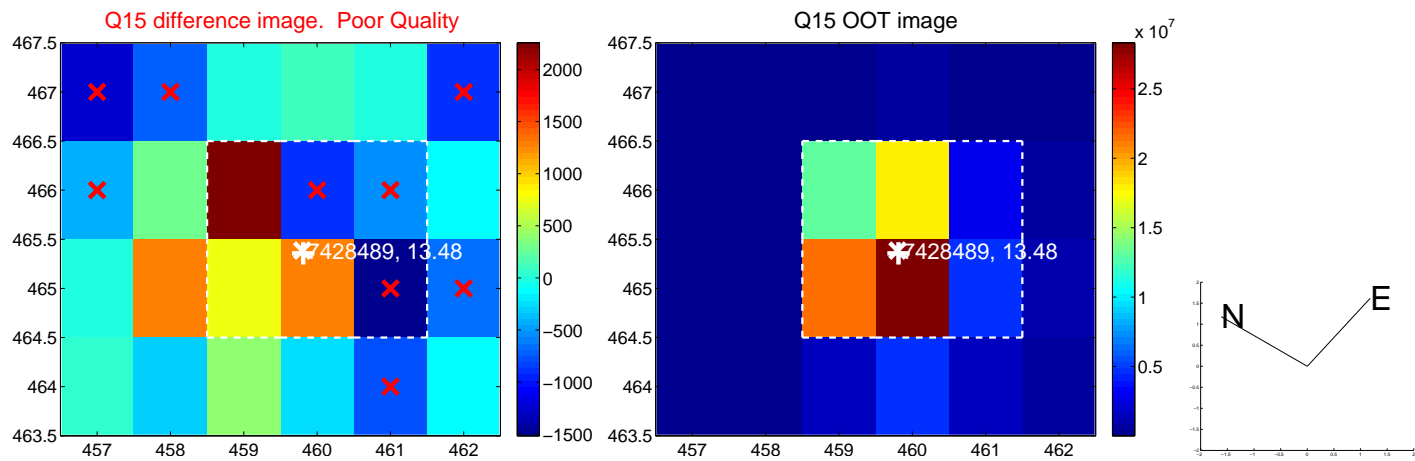
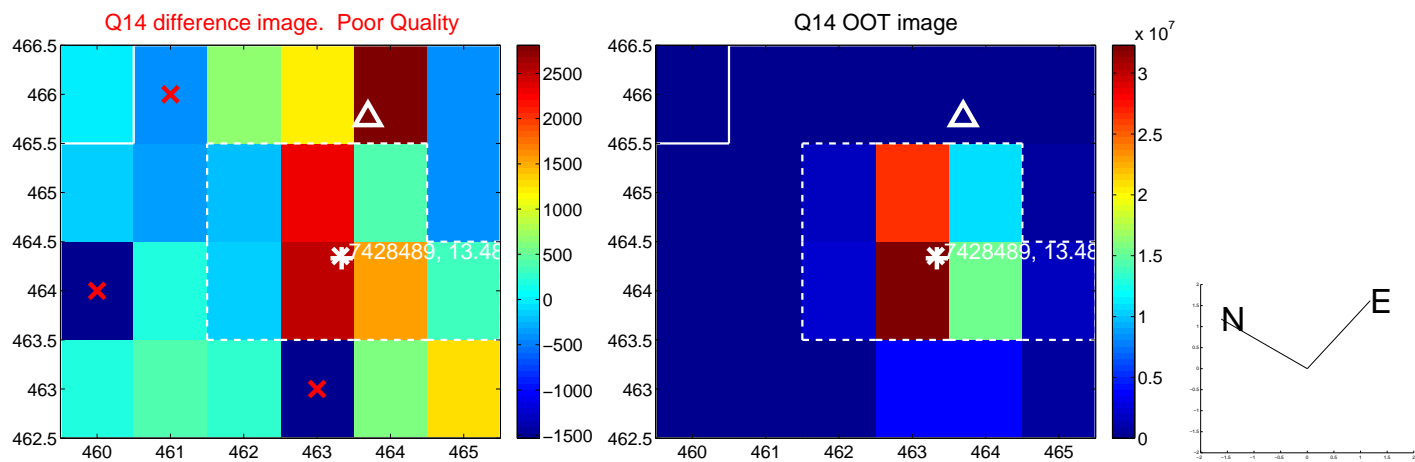
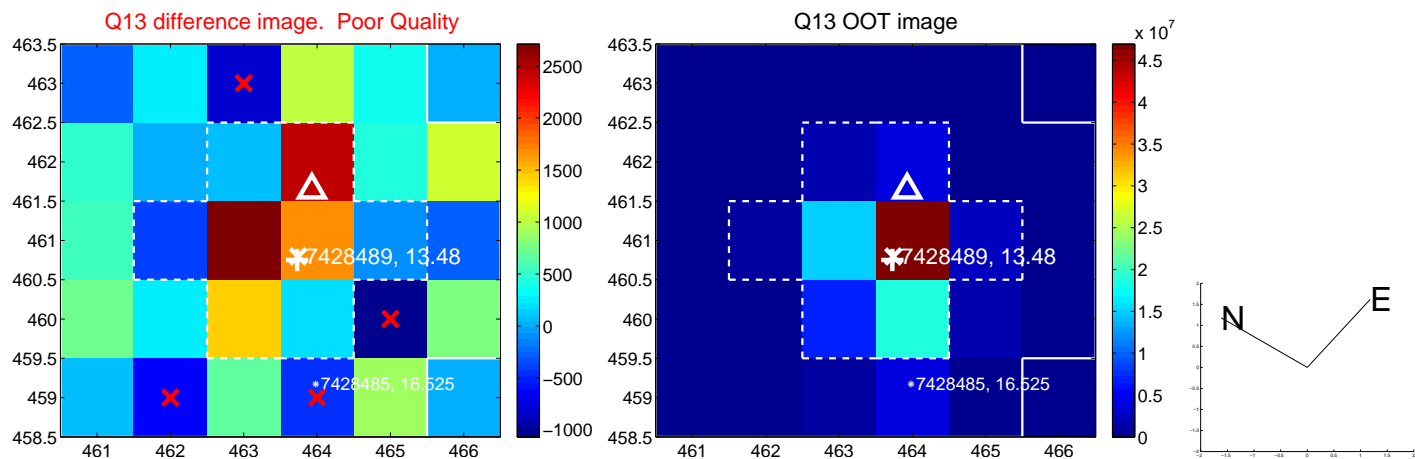
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



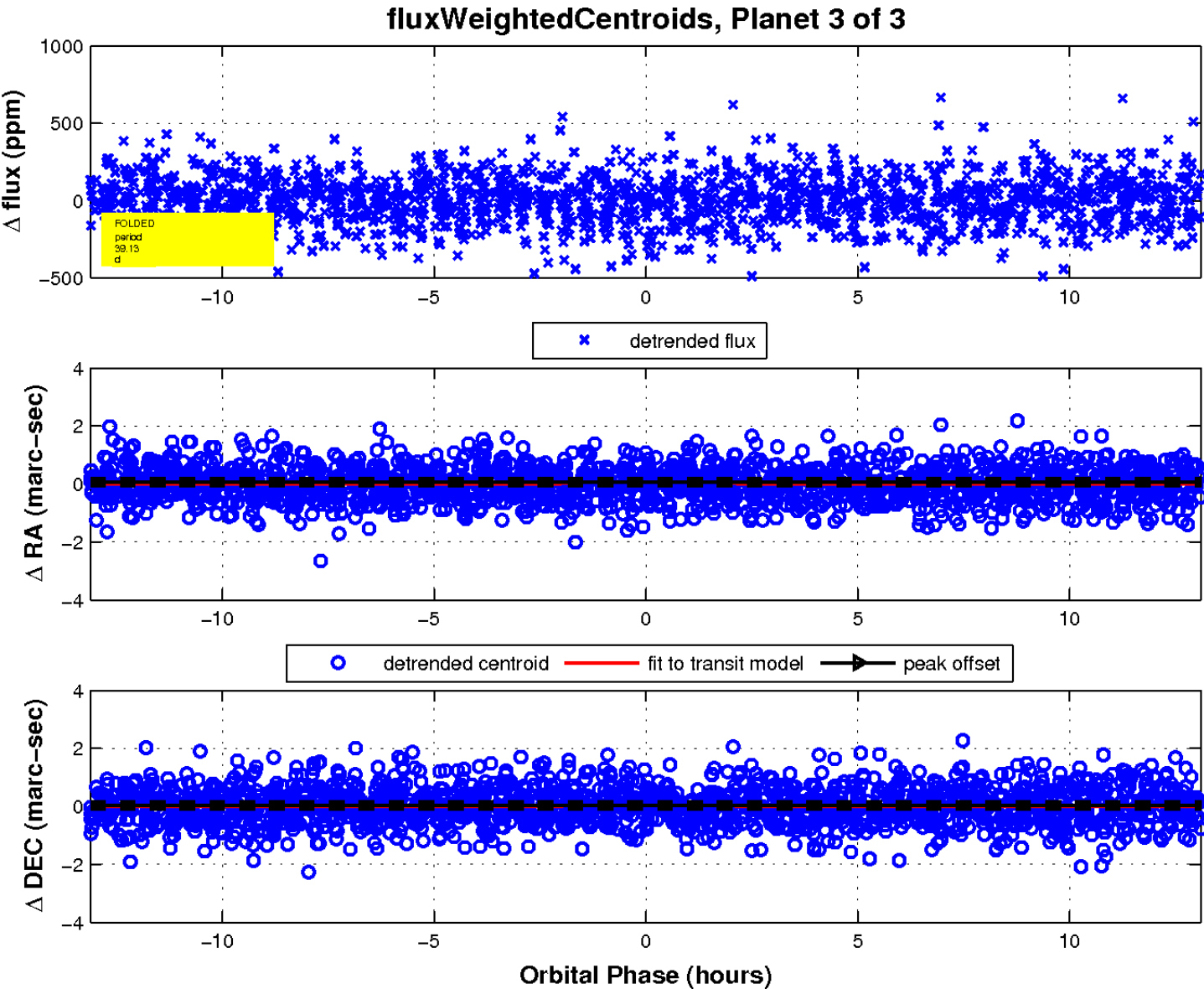
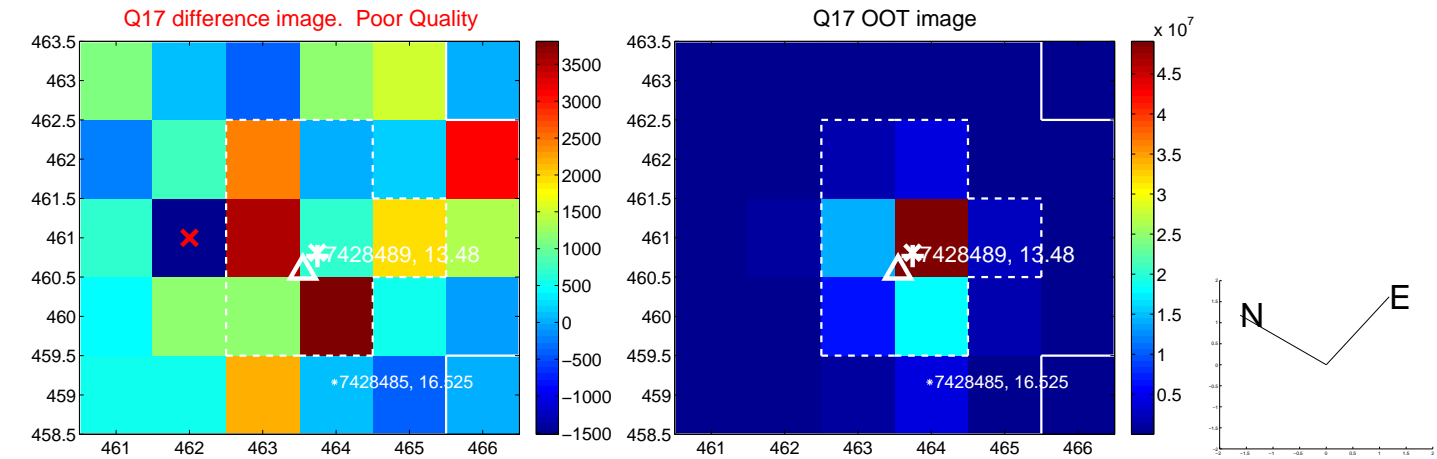
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

