

# KIC 008429528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008429528-01	OBS	No	0.588696	131.911433	20.3	1.290	10.0	6.7	1.88	7232	0.98	35976.97
008429528-02	OBS	No	196.594755	208.457454	1228.6	4.106	10.4	6.8	1.88	7232	8.16	15.53
008429528-03	OBS	No	0.979038	131.887917	46.4	2.463	9.1	7.0	1.88	7232	1.49	18259.13
008429528-04	OBS	No	251.313750	320.872502	1371.5	4.796	8.8	8.0	1.88	7232	12.83	11.19
008429528-05	OBS	No	289.797512	189.580744	1506.3	12.050	8.5	7.4	1.88	7232	8.52	9.26
008429528-06	OBS	No	408.017238	200.398953	959.4	8.818	7.8	7.3	1.88	7232	6.81	5.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008429528-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008429528-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008429528-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008429528-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
008429528-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT
008429528-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT

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

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

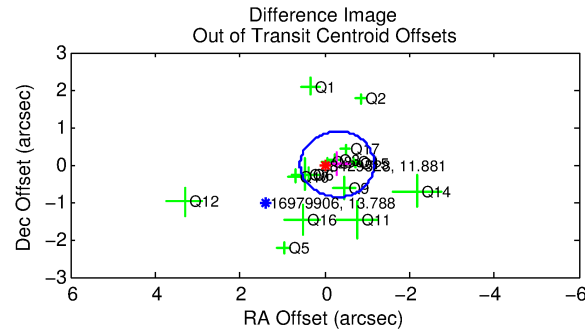
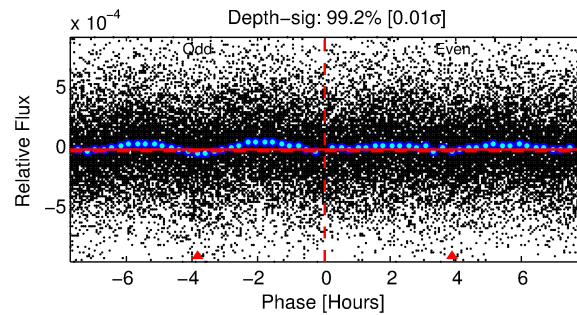
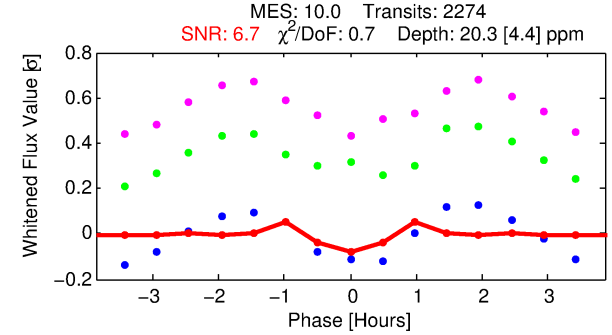
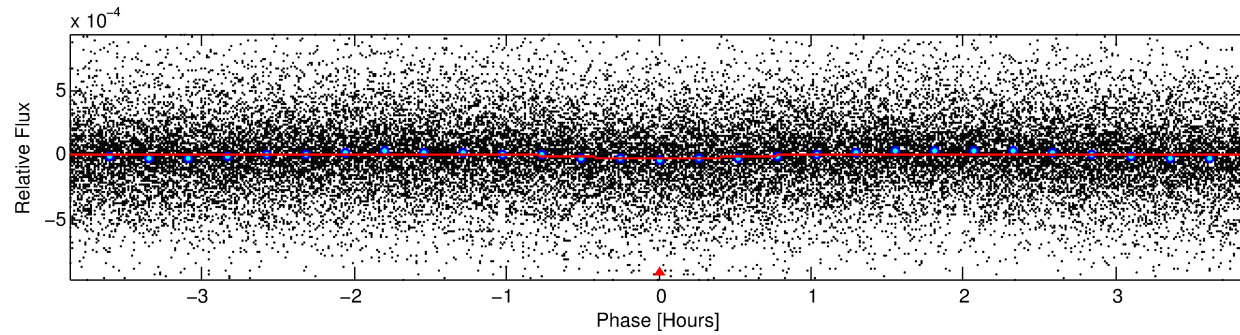
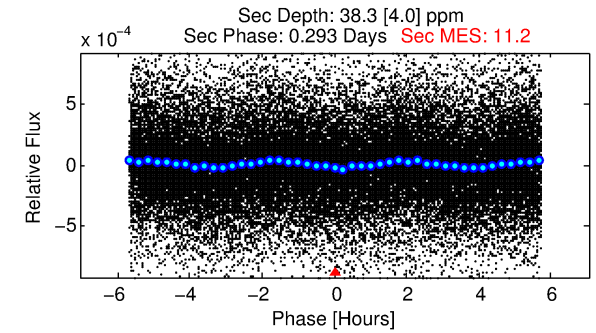
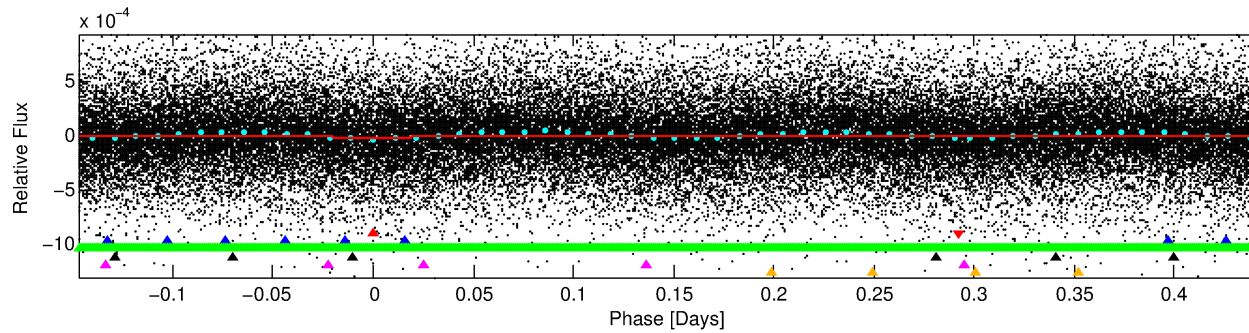
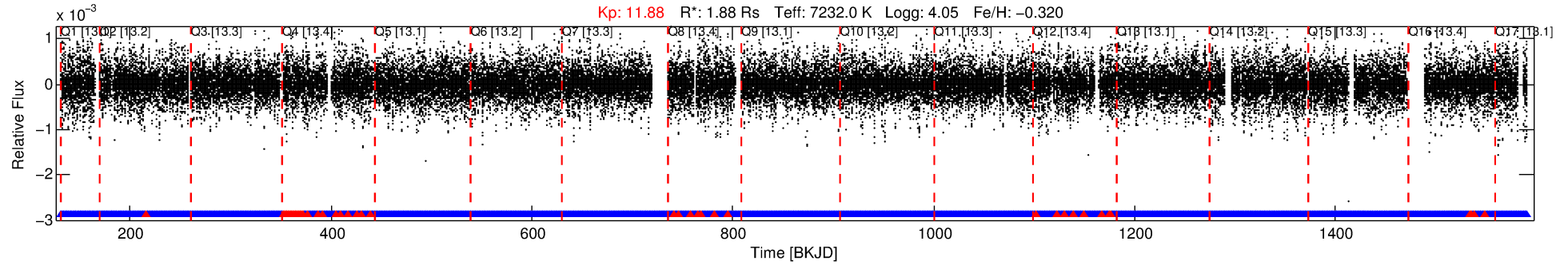
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008429528-01

No Significant Match Found

# DV One-Page Summary

KIC: 8429528 Candidate: 1 of 6 Period: 0.589 d



## DV Fit Results:

Period = 0.58870 [0.00002] d  
Epoch = 131.9114 [0.0016] BKJD  
 $R_p/R^* = 0.0048$  [0.0008]  
 $a/R^* = 1.82$  [1.00]  
 $b = 0.90$  [0.17]  
 $\text{Seff} = 35976.97$  [14977.03]  
 $T_{\text{eq}} = 3512$  [365] K  
 $R_p = 0.98$  [0.33]  $R_e$   
 $a = 0.0155$  [0.0039] AU  
 $A_g = 5.24$  [2.69] [1.58σ]  
 **$T_{\text{eff}} = 8214$  [785] K [5.43σ]**

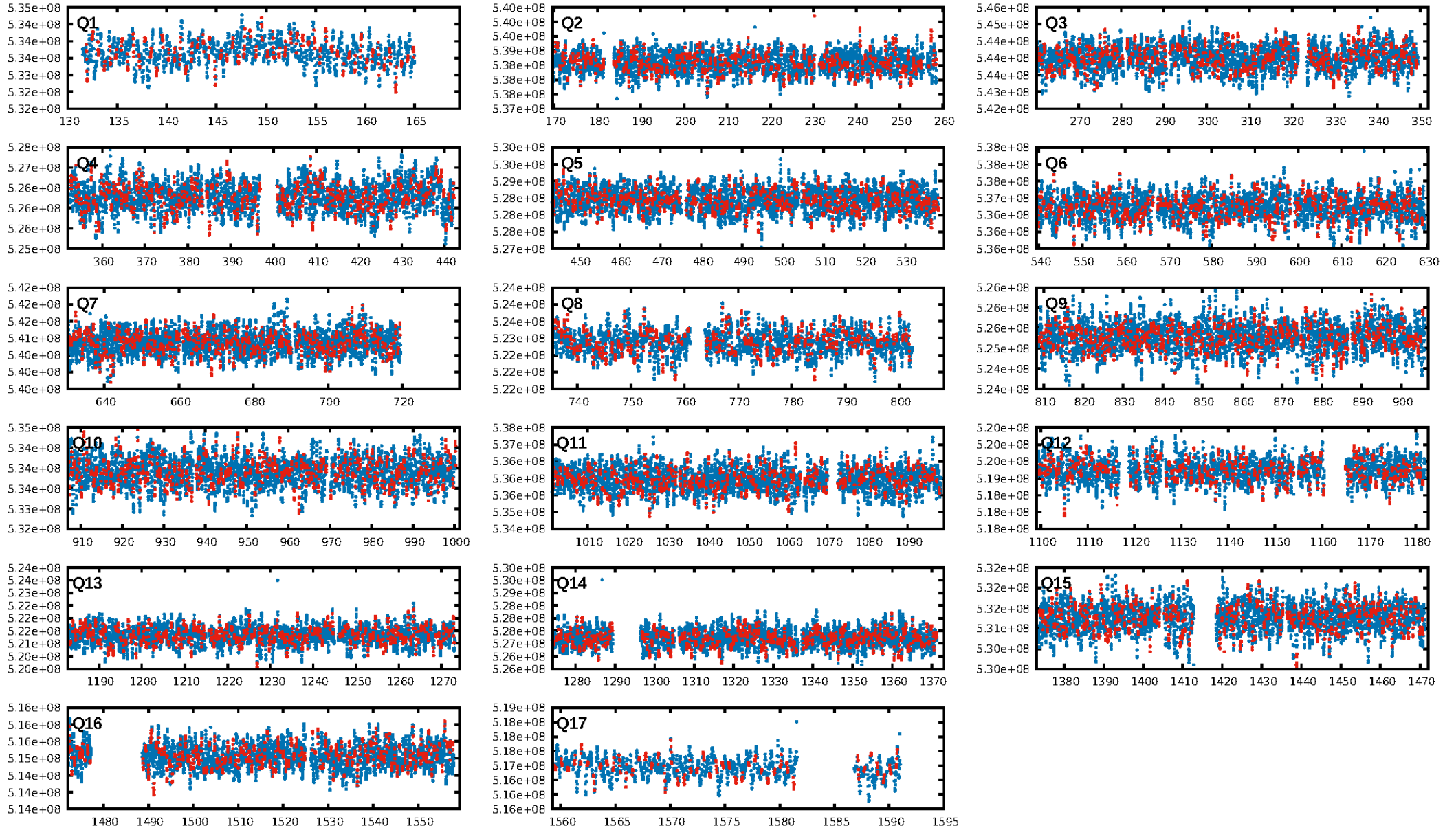
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.9% [3.37σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.64e-17  
RollingBand-fgt: 0.97 [2108/2172]  
GhostDiagnostic-chr: 2.352  
Centroid-sig: 6.0%  
Centroid-so: 0.926 arcsec [1.25σ]  
OotOffset-rm: 0.297 arcsec [1.02σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.249 arcsec [0.81σ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.62 [10/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:05:43 Z

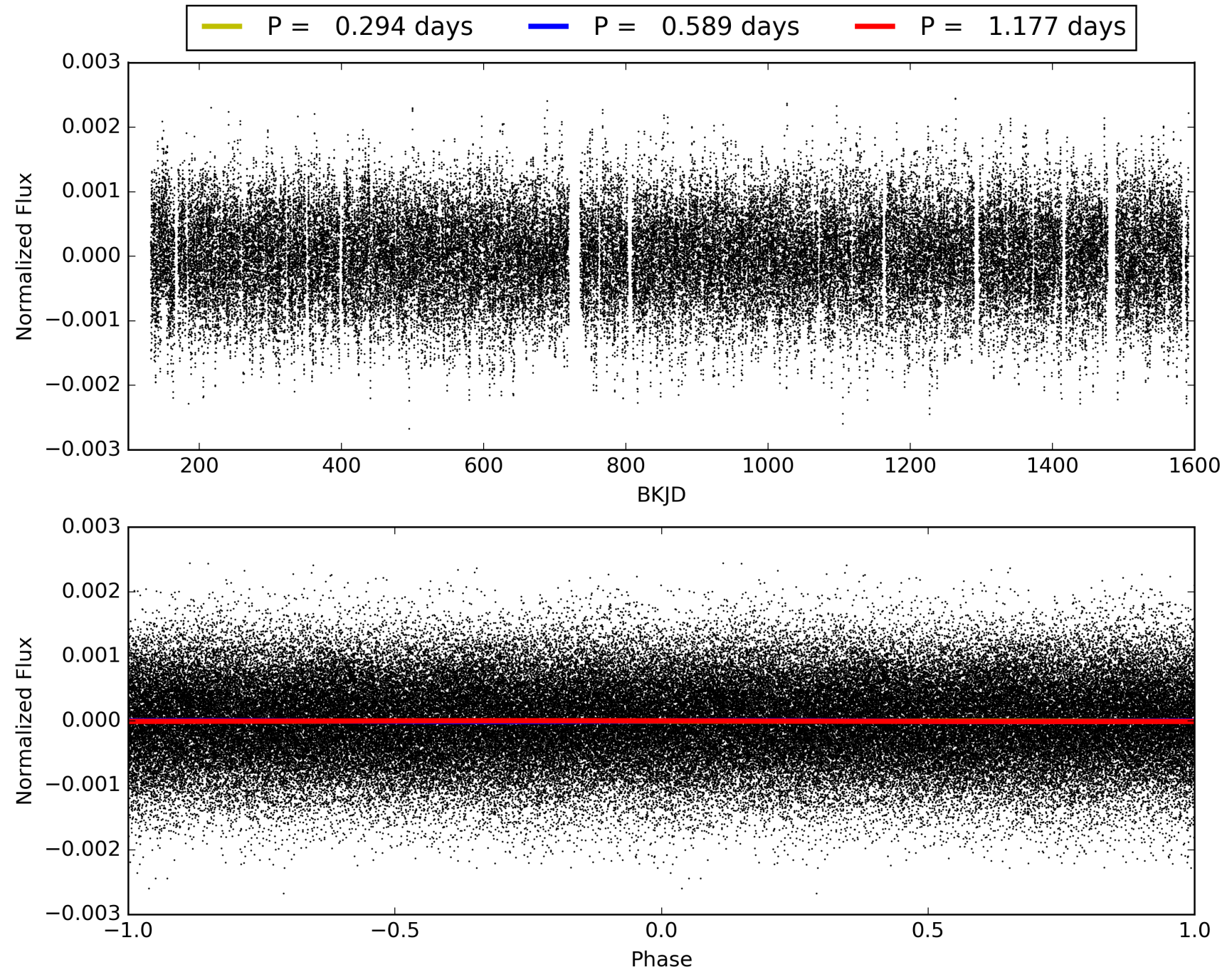
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008429528-01, PDC Light Curves





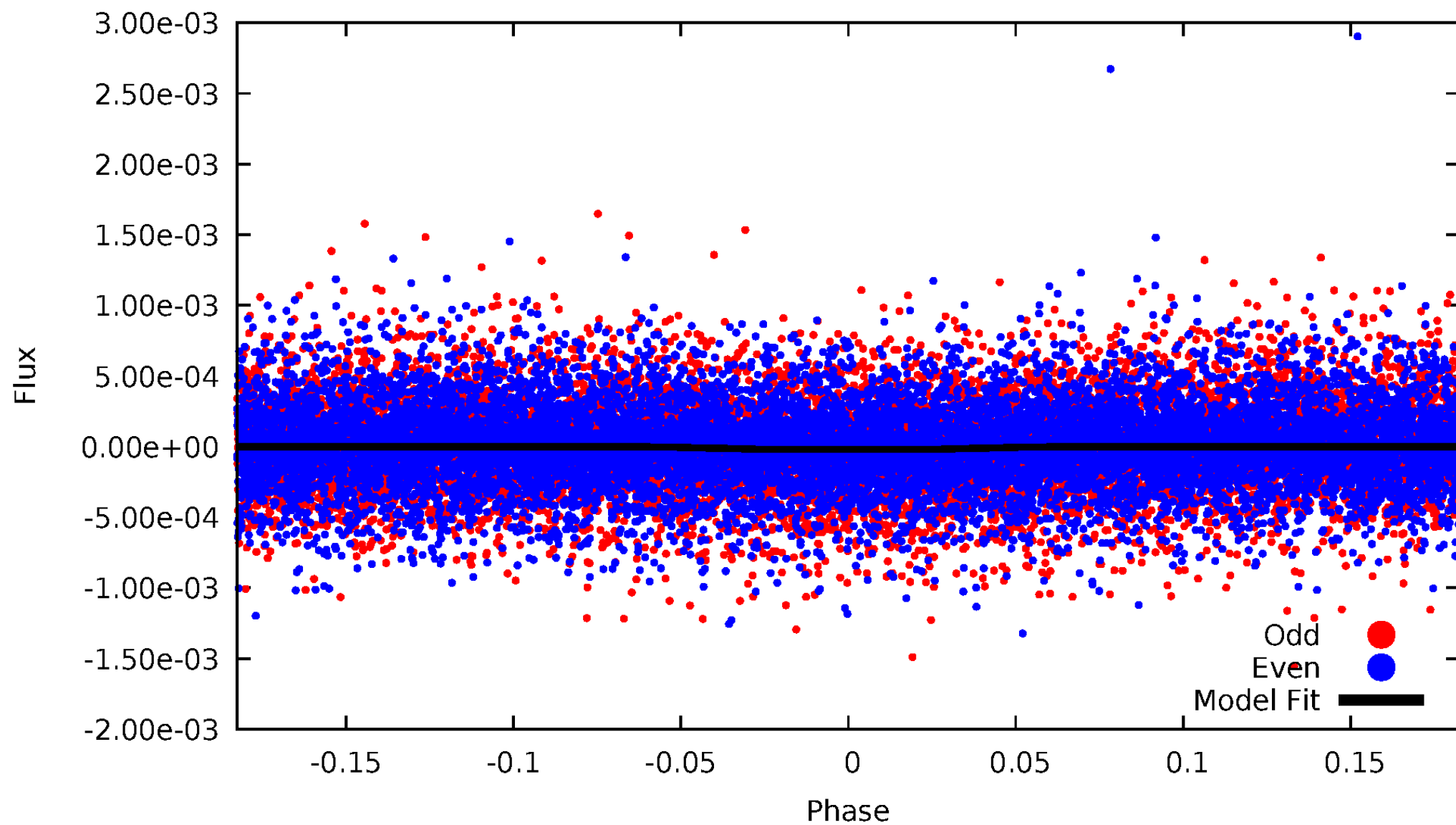
# TCE 008429528-01





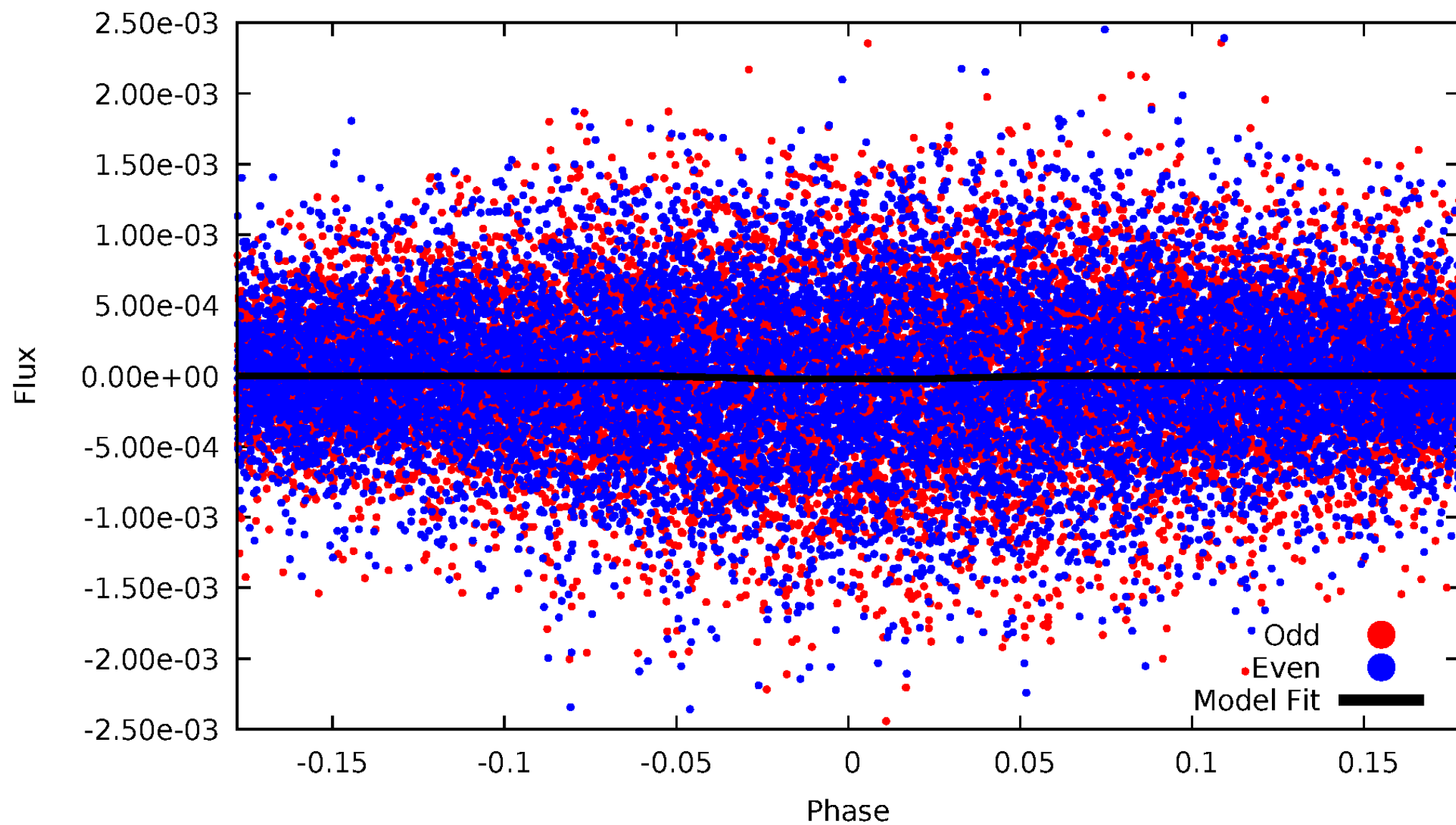
# DV Odd/Even

TCE 008429528-01

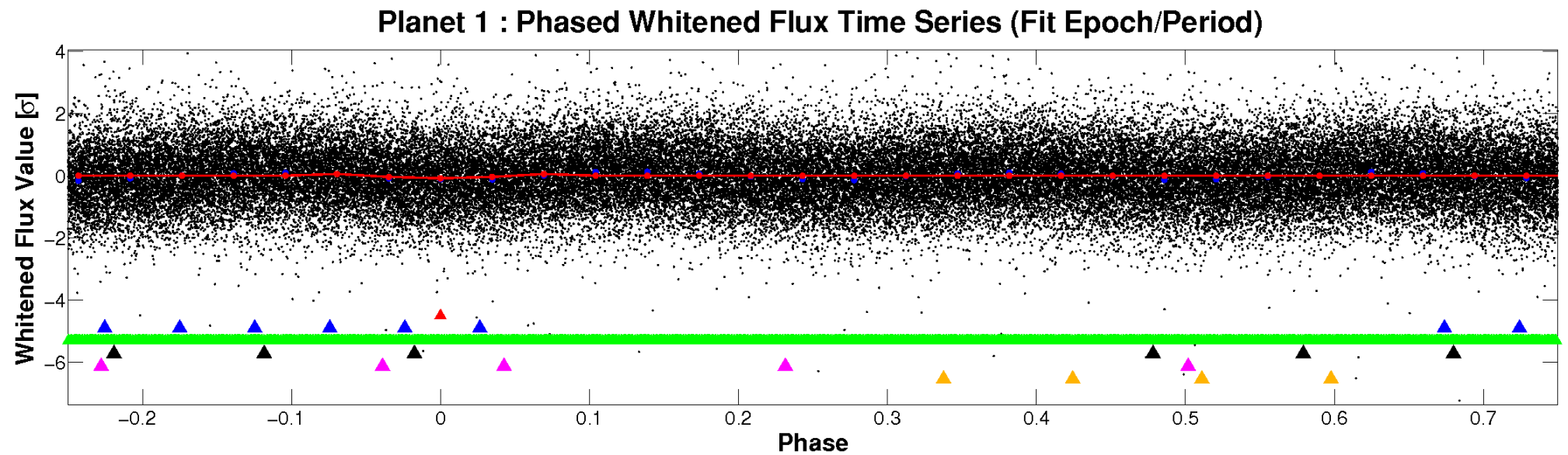
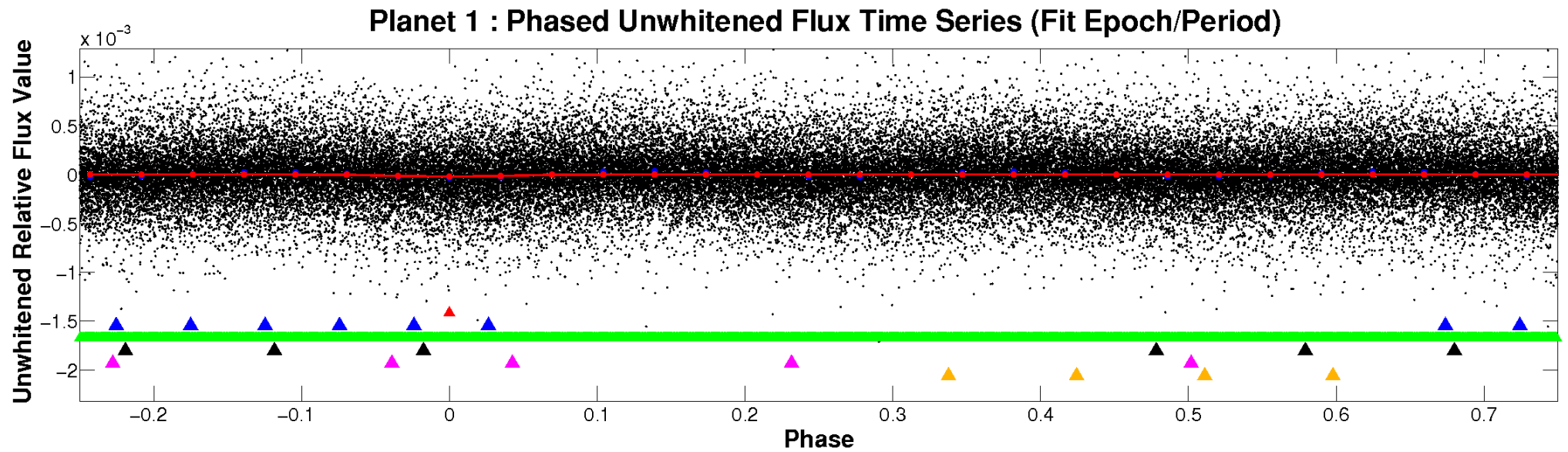


# ALT Odd/Even

TCE 008429528-01



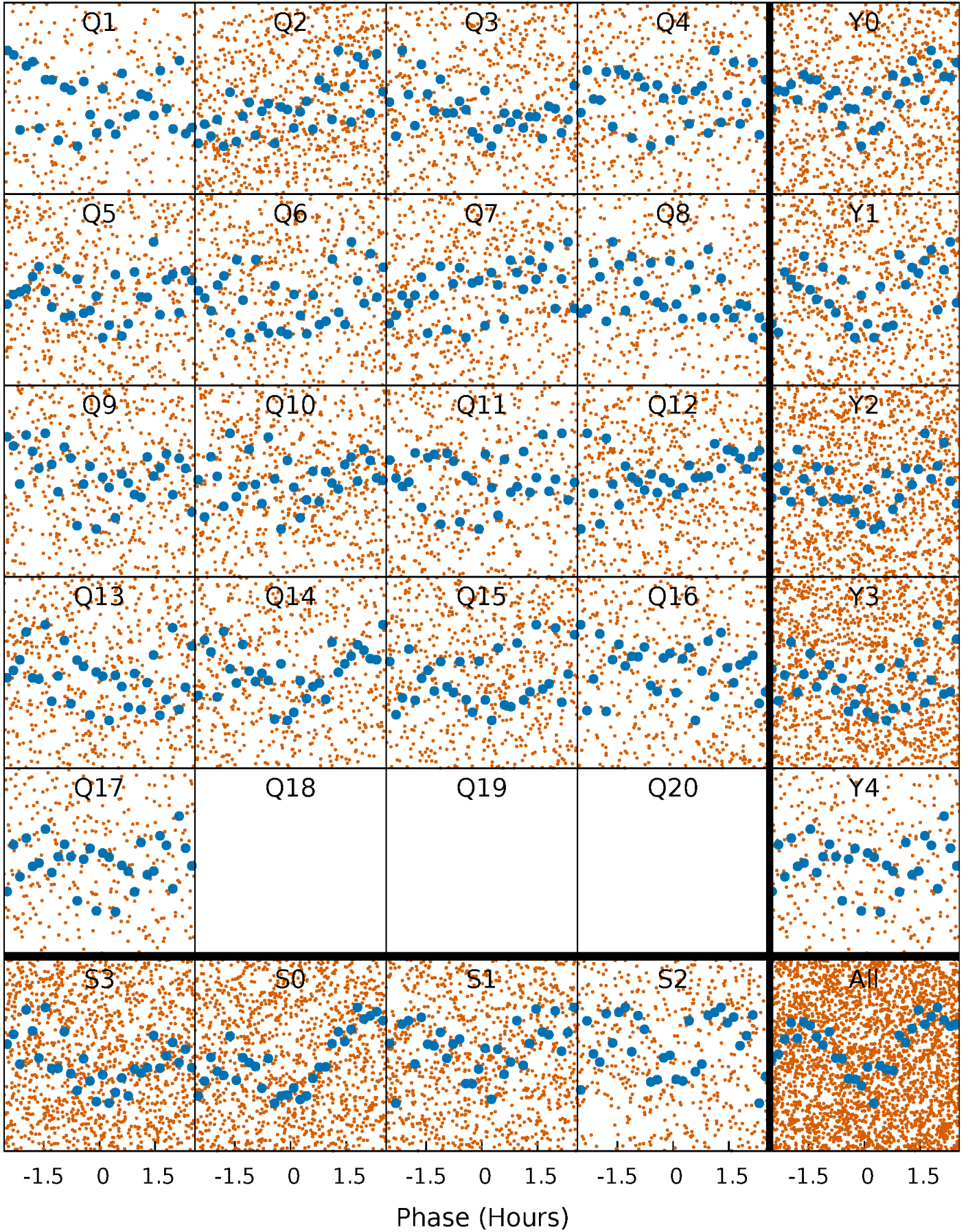
# Non-Whitened Vs. Whitened Light Curve





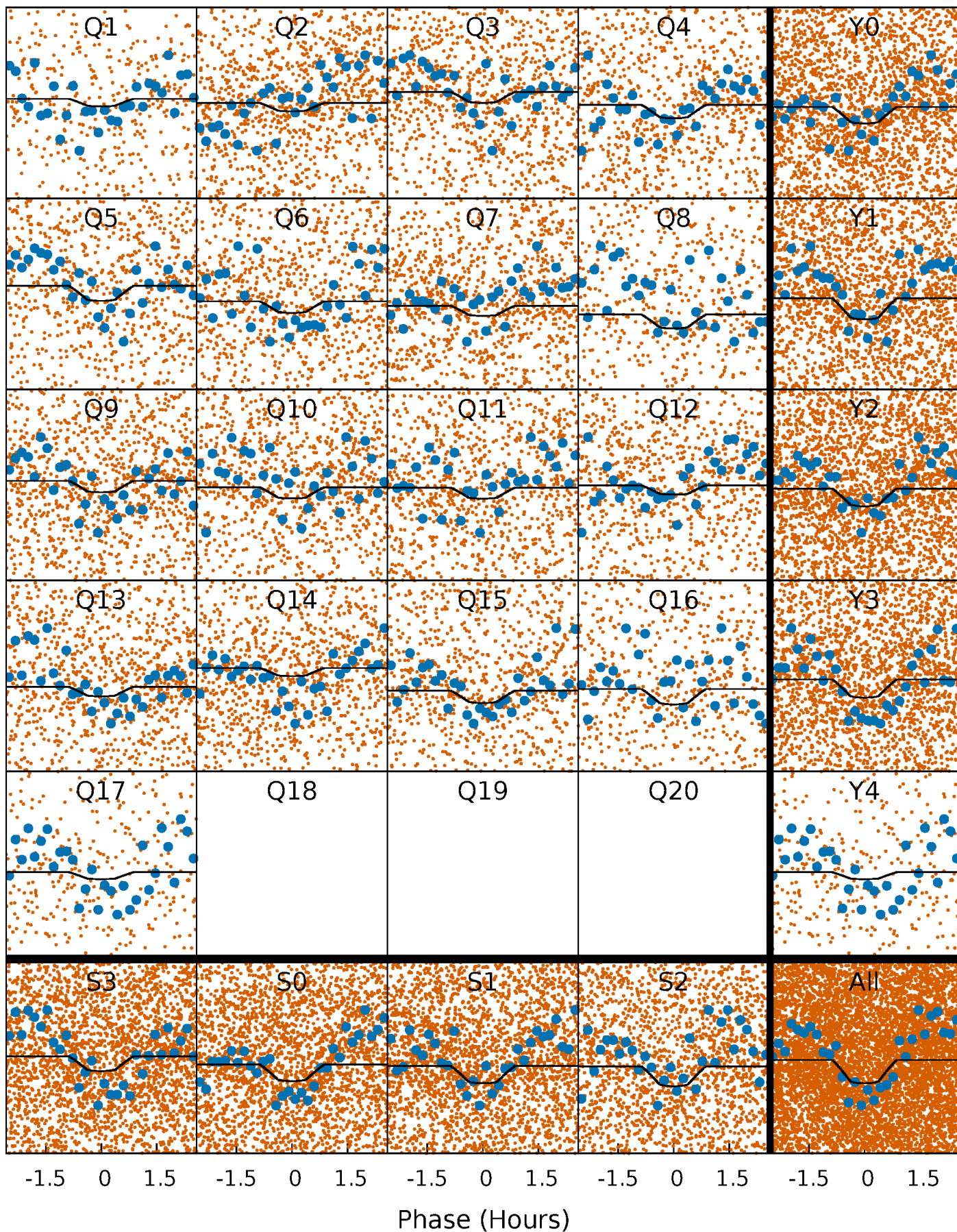
# PDC Quarter-Phased Transit Curves

TCE 008429528-01   P= 0.588696 Days    $T_0=131.911433$  (BKJD)



# DV Quarter-Phased Transit Curves

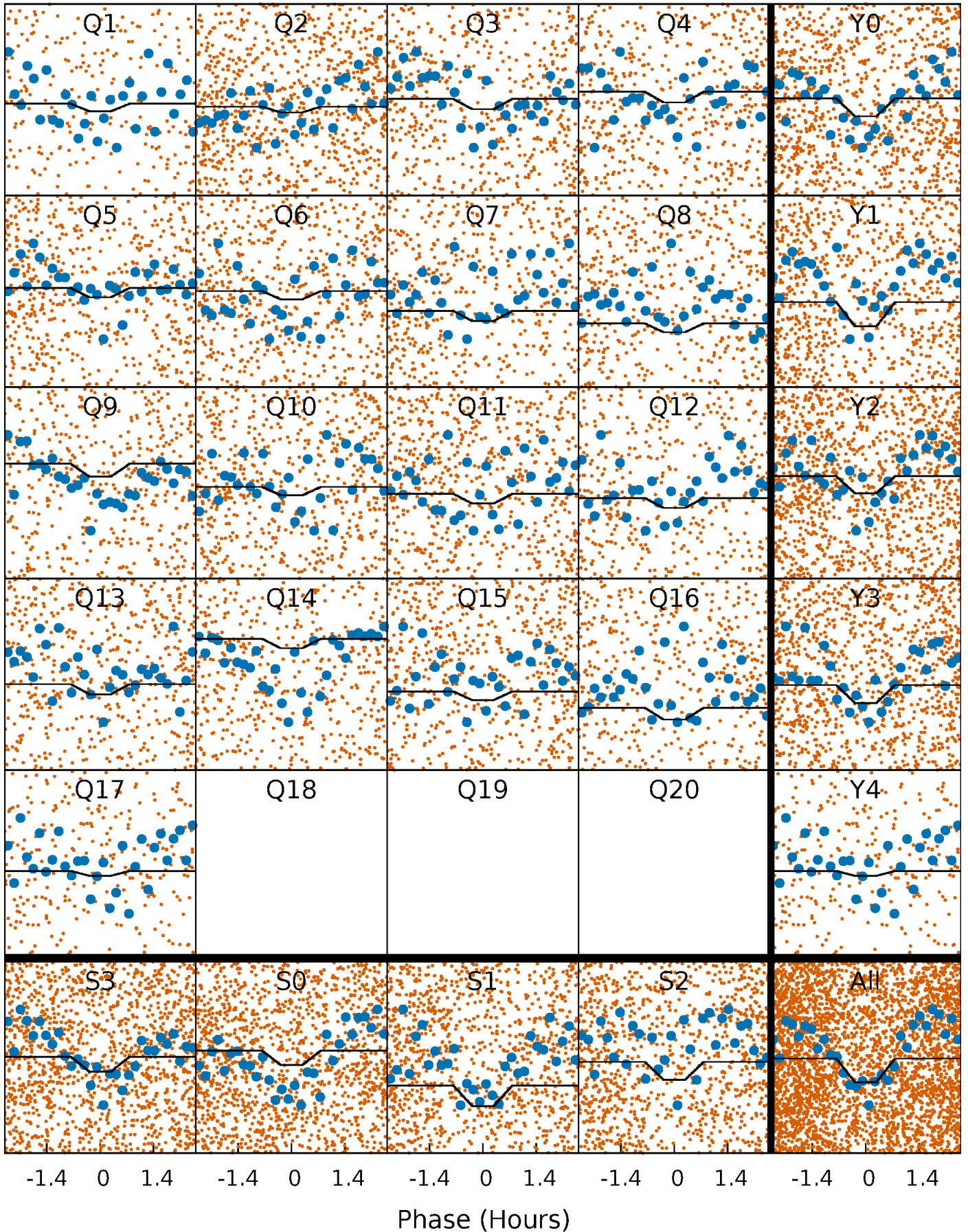
TCE 008429528-01 P= 0.588696 Days  $T_0=131.911433$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 008429528-01 P= 0.588698 Days  $T_0=131.911244$  (BKJD)

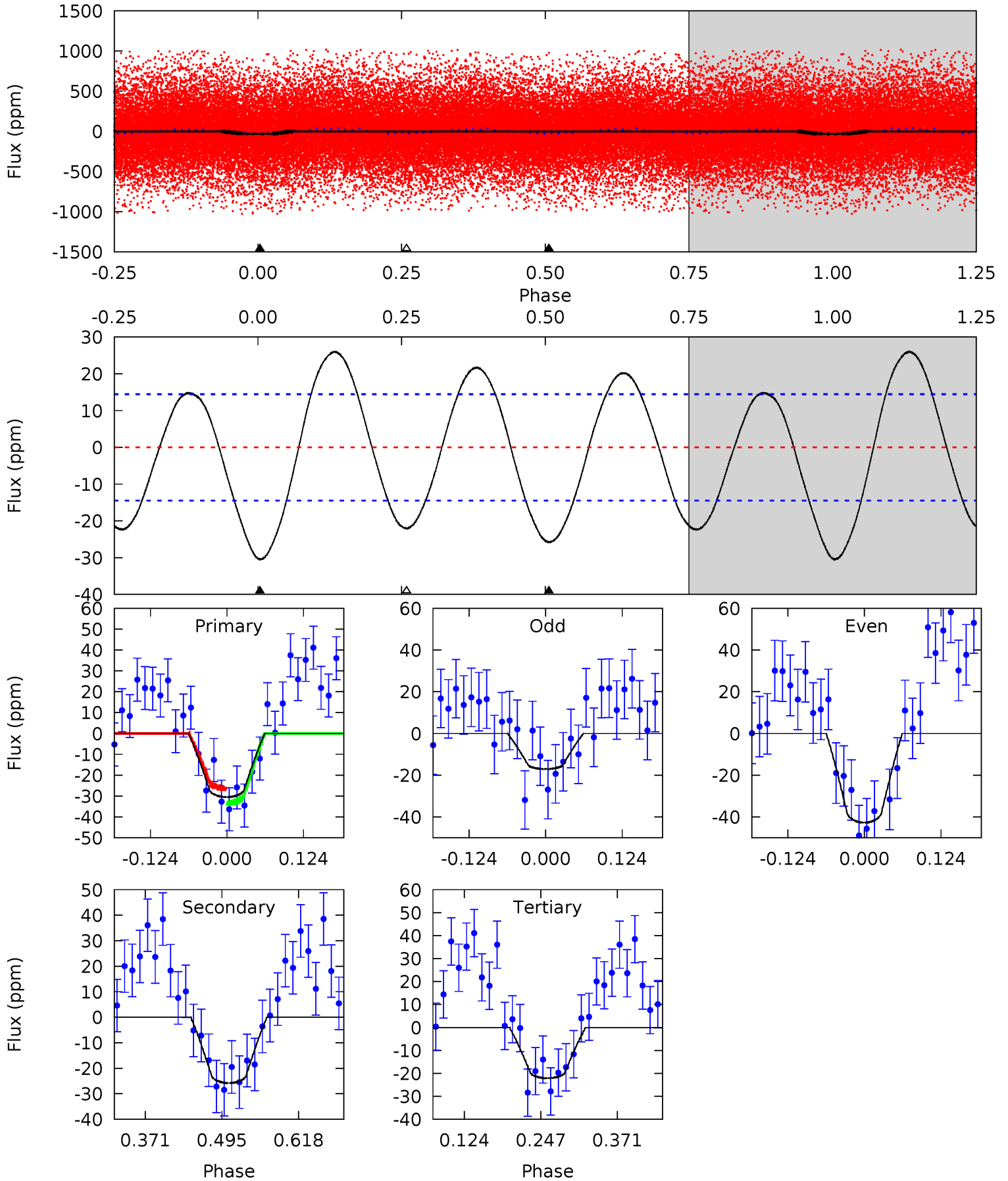




# DV Model-Shift Uniqueness Test

008429528-01, P = 0.588696 Days, E = 131.322737 Days

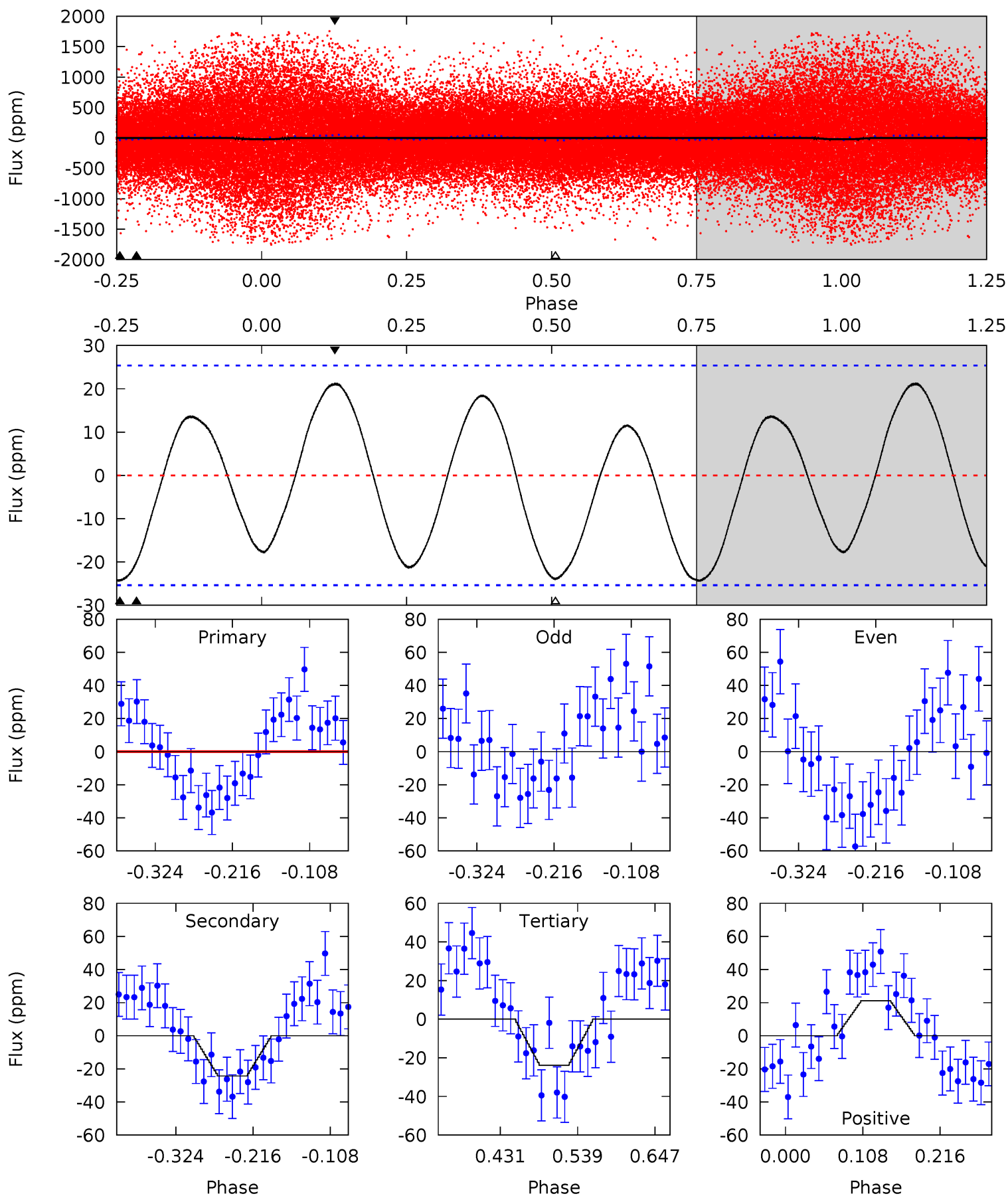
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.53	8.06	6.90	0	4.52	1.54	4.88	2.62	9.53	1.16	8.06	4.06	1.47	0.46	1.10



# Alt Model-Shift Uniqueness Test

008429528-01, P = 0.588698 Days, E = 131.322546 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
3.57	4.36	4.29	3.80	4.55	1.61	2.42	-0.71	-0.23	0.07	0.56	2.82	1.53	0.47	0.07



### Stellar Parameters For KIC 008429528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7232^{+228}_{-304}$	$4.047^{+0.214}_{-0.175}$	$-0.320^{+0.300}_{-0.300}$	$1.879^{+0.543}_{-0.543}$	$1.435^{+0.216}_{-0.265}$	$0.304^{+0.420}_{-0.132}$
	+3%/-4%	+5%/-4%	+94%/-94%	+29%/-29%	+15%/-18%	+138%/-43%
Source	KIC0	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 008429528-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-26 \pm 3$	$0.97^{+0.24}_{-0.20}$	$4891^{+379}_{-405}$	$7272^{+1008}_{-727}$	$3.631^{+2.265}_{-1.253}$
Alt.	$-24 \pm 6$	$0.97^{+0.23}_{-0.20}$	$4885^{+413}_{-384}$	$7087^{+1185}_{-825}$	$3.375^{+2.088}_{-1.323}$

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



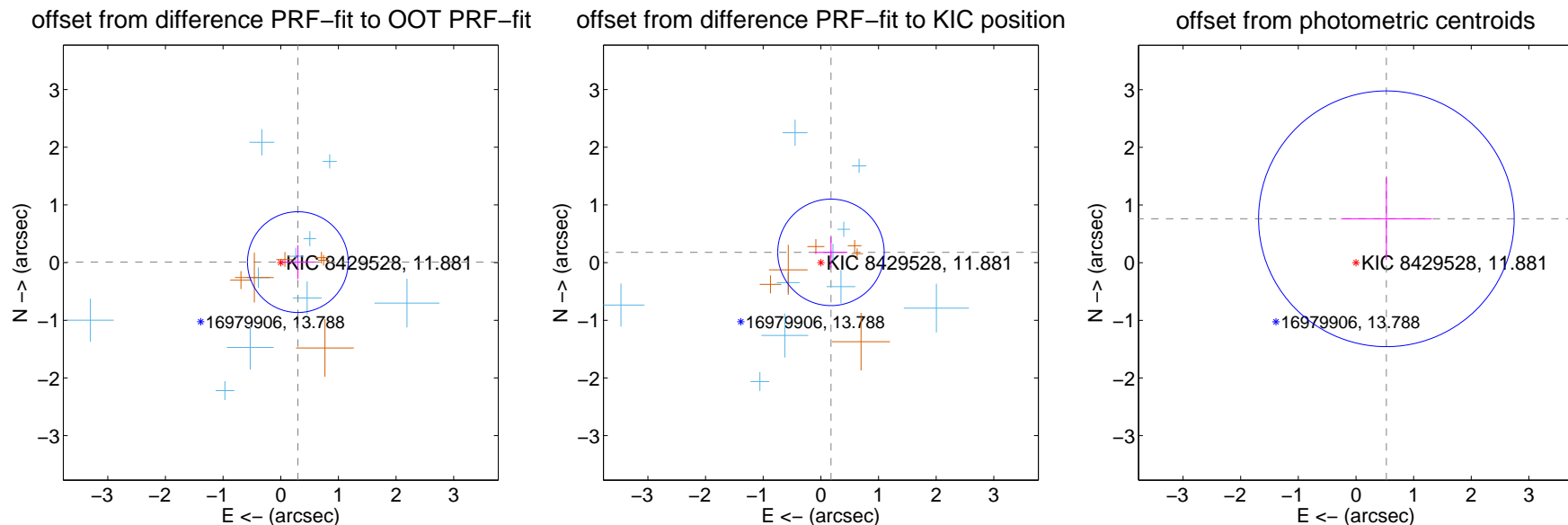
## DV Centroid Data

Supplemental centroid analysis for 008429528-01. **Kepler magnitude: 11.88.** Transit SNR 6.71

There are 10 quarters with good PRF difference image offsets

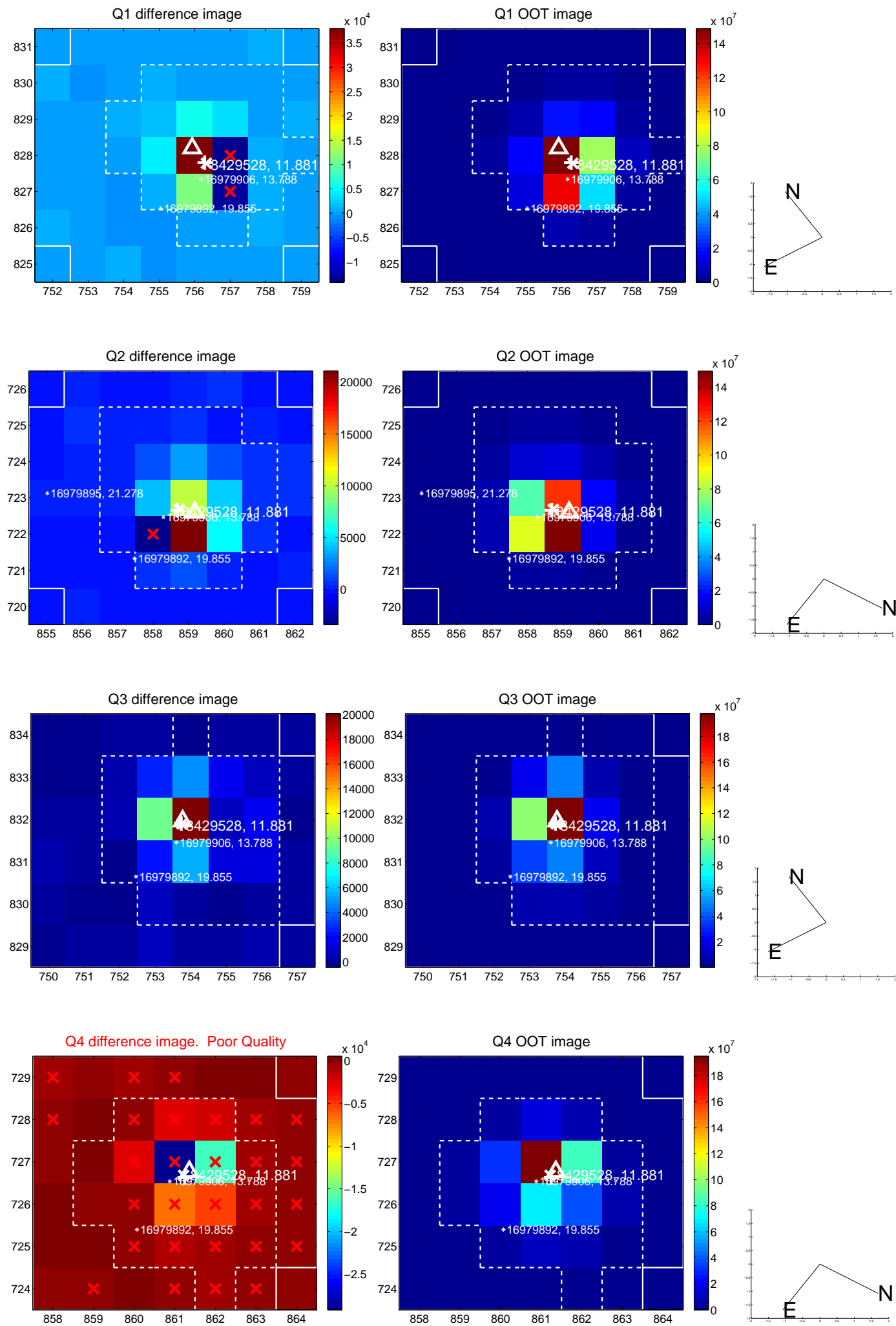
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.297 \pm 0.291$	1.02	$-0.297 \pm 0.289$	$0.008 \pm 0.293$
PRF-fit source offset from KIC position	$0.249 \pm 0.308$	0.81	$-0.175 \pm 0.287$	$0.177 \pm 0.266$
photometric centroid source offset	$0.93 \pm 0.74$	1.25	$-0.53 \pm 0.79$	$0.76 \pm 0.71$

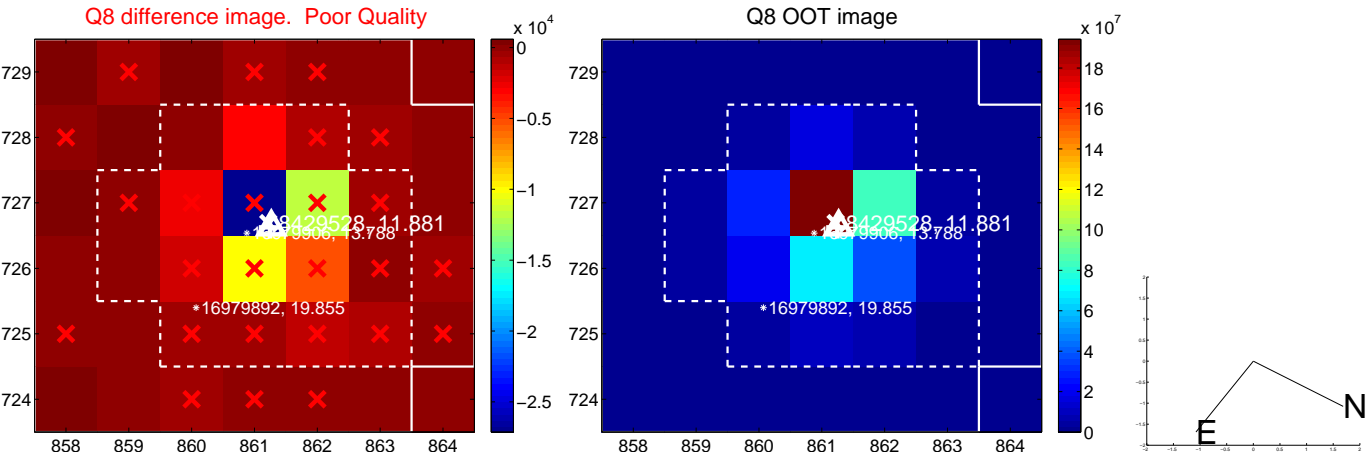
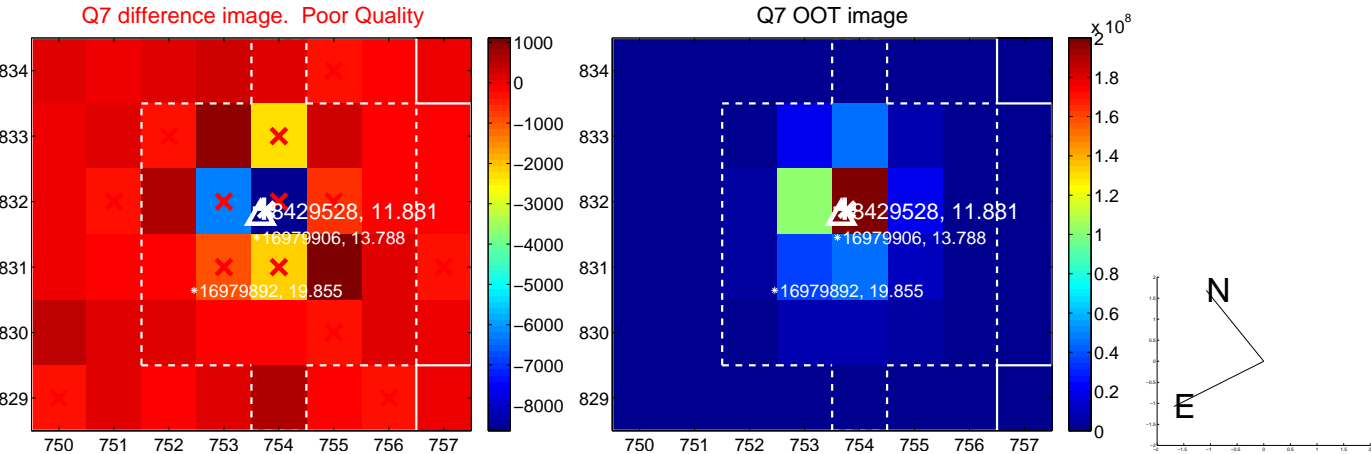
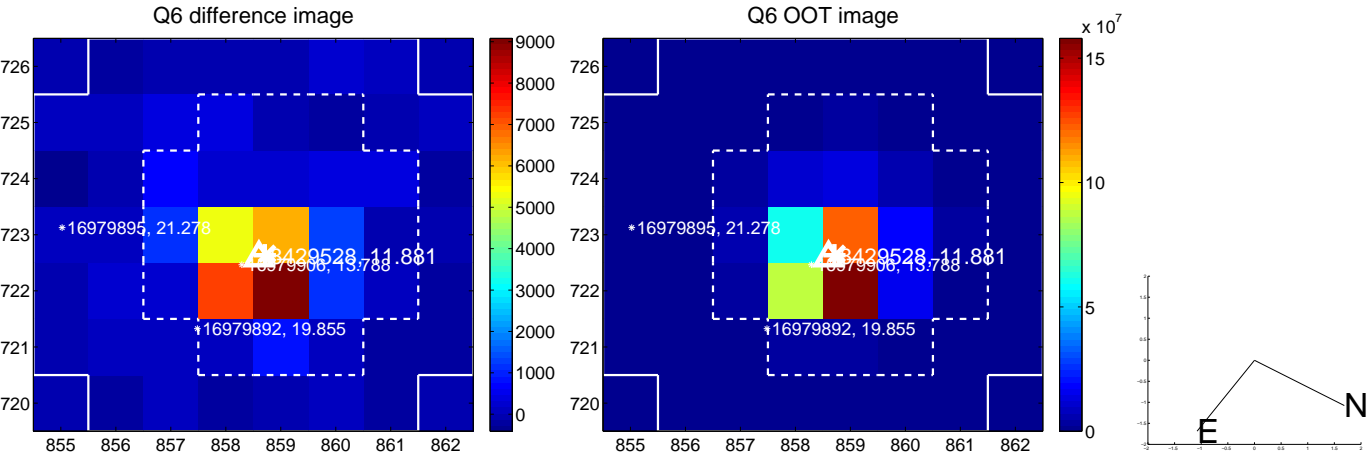
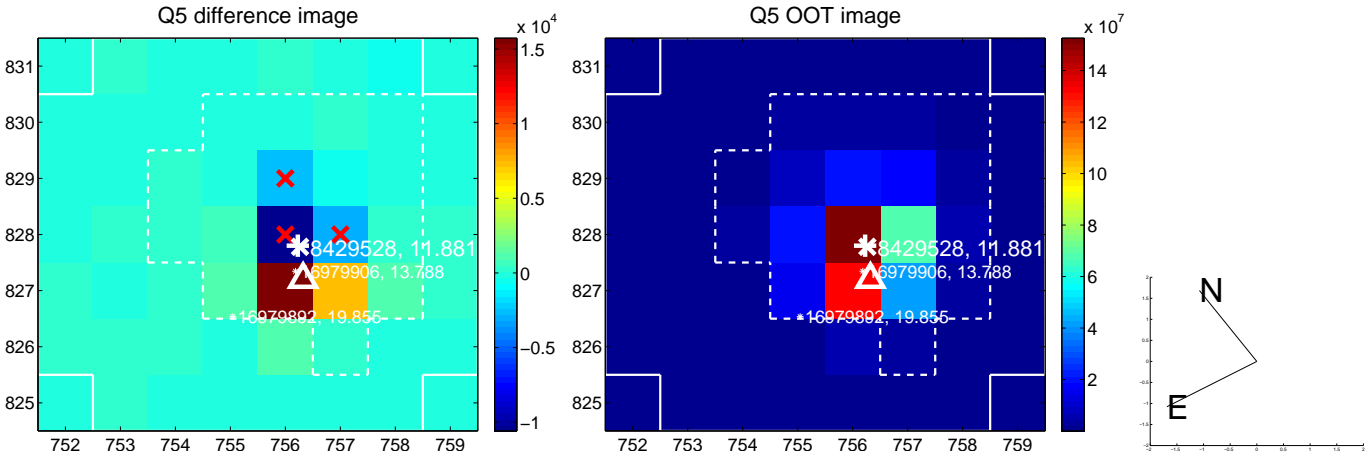


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

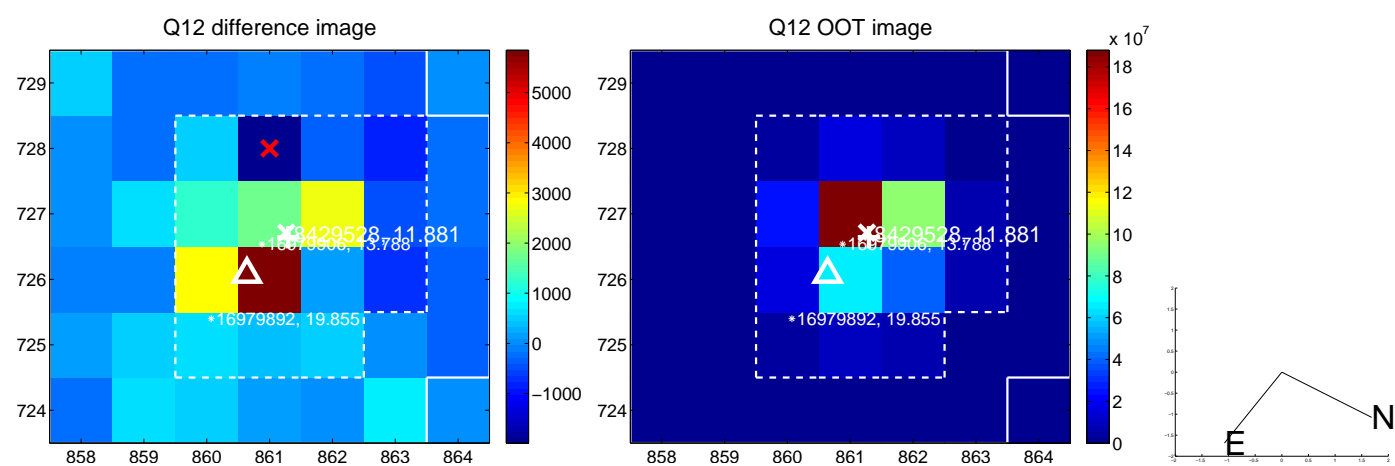
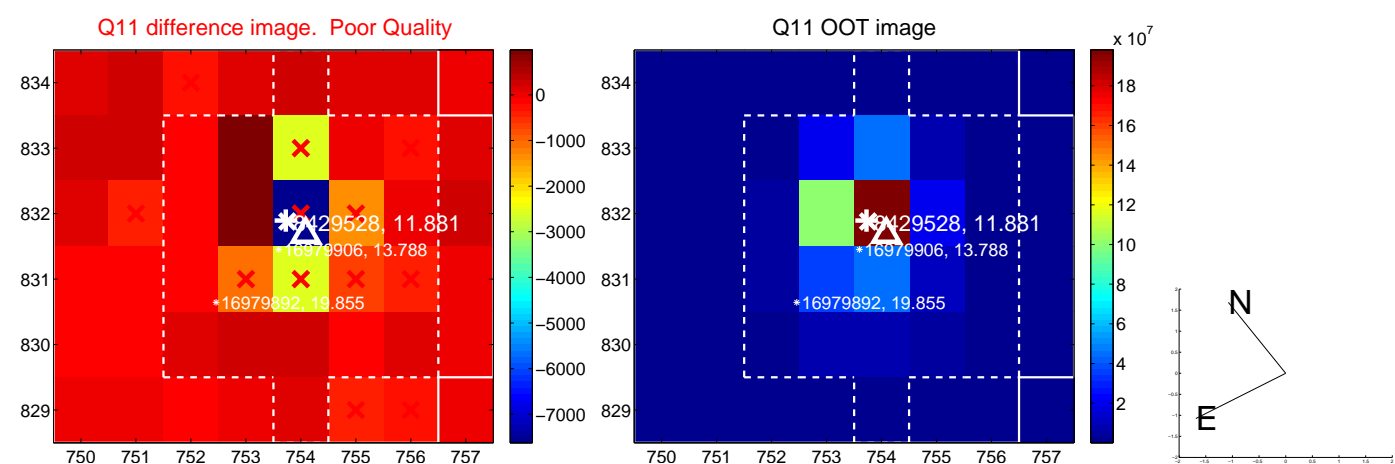
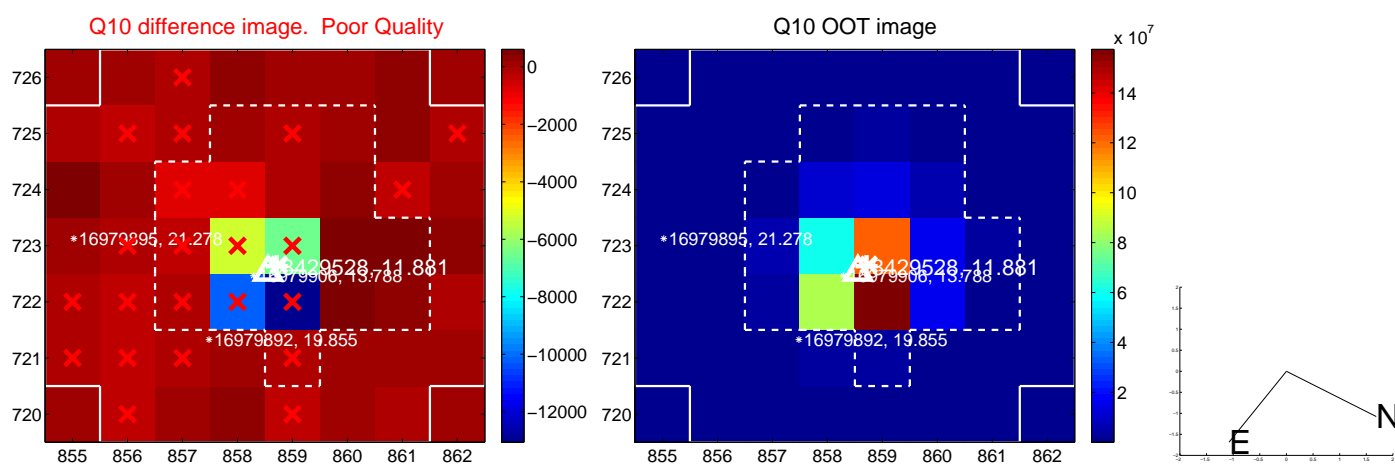
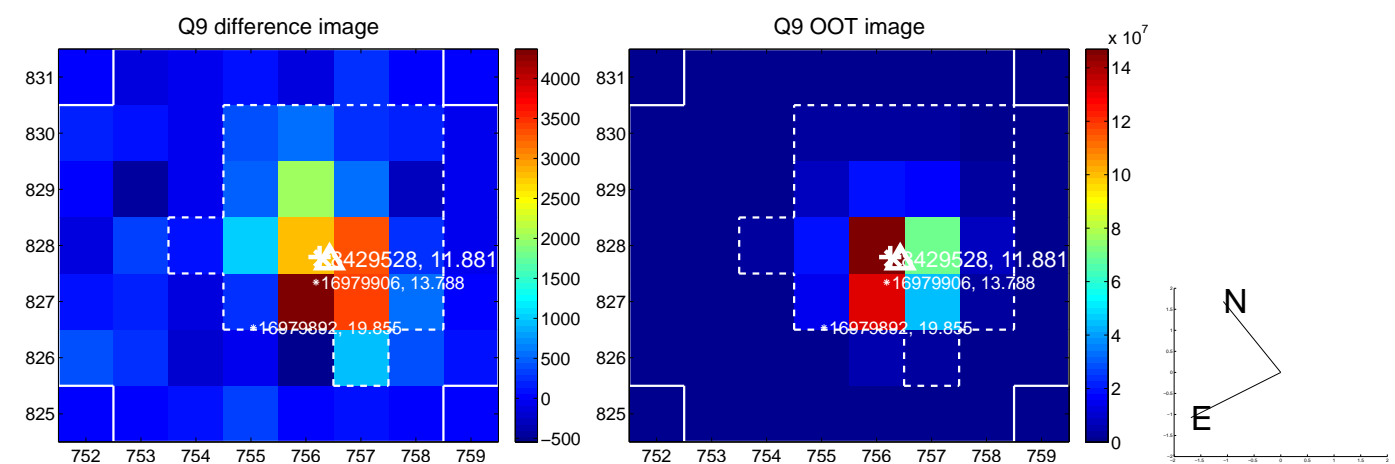


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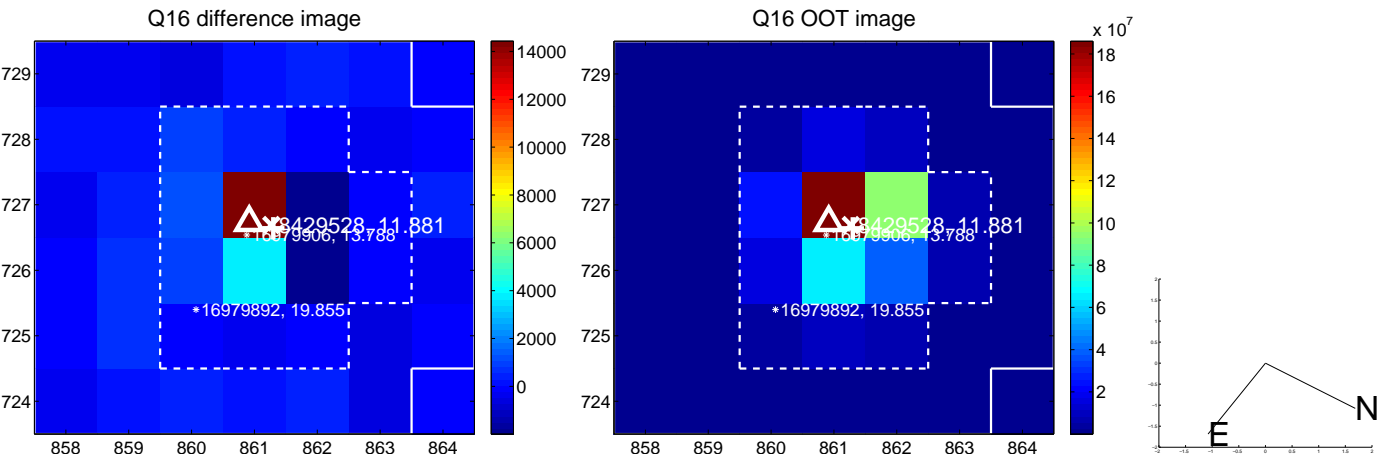
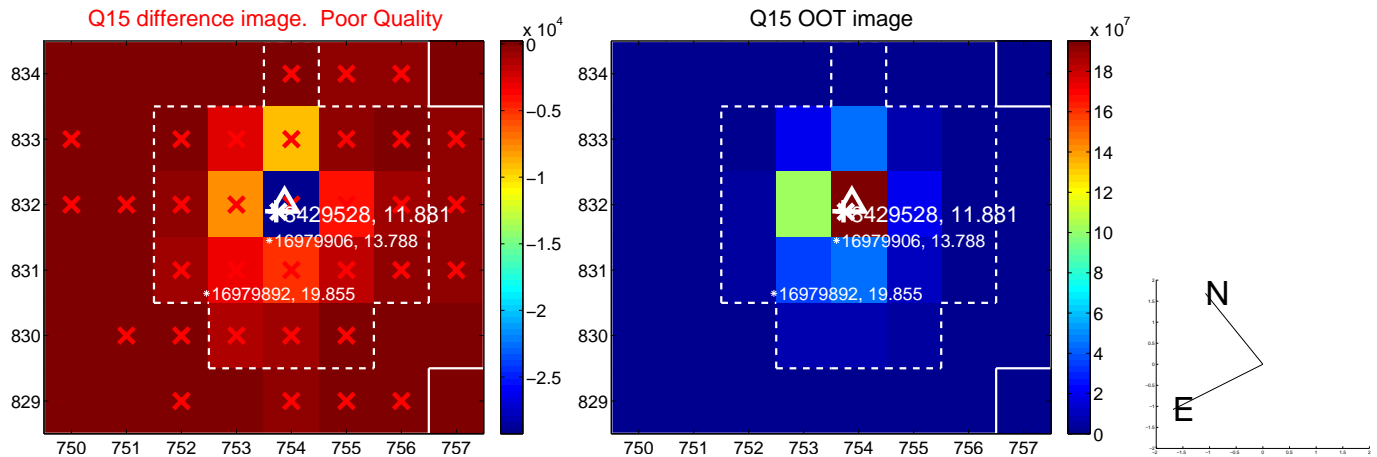
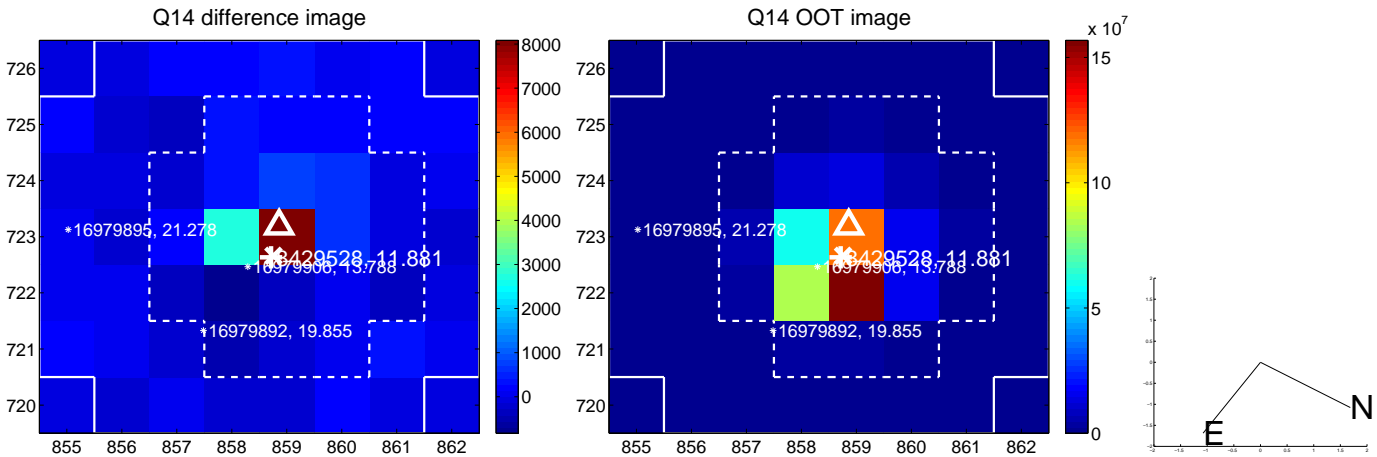
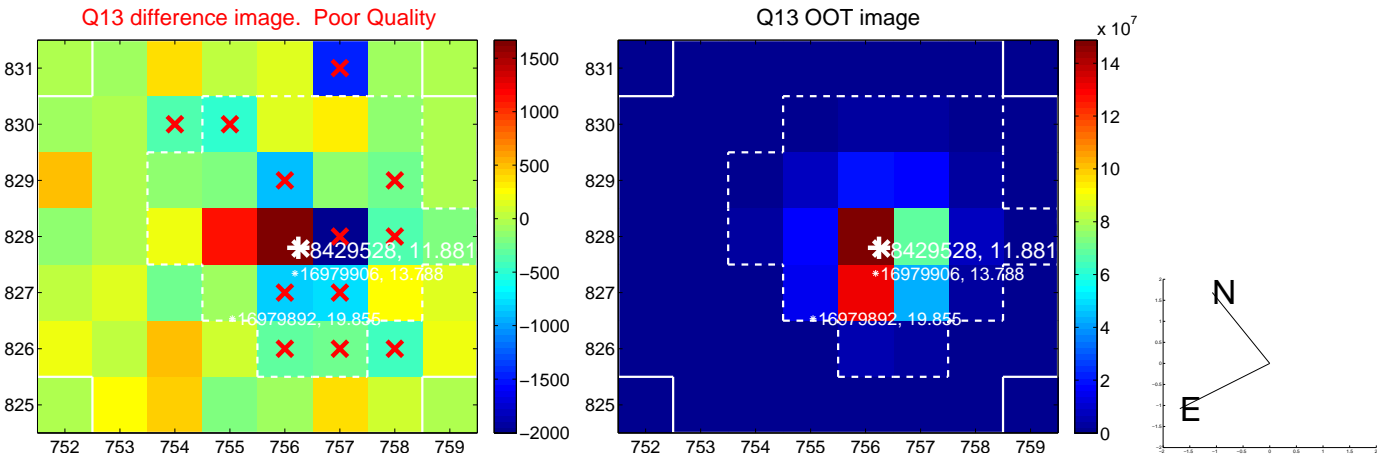




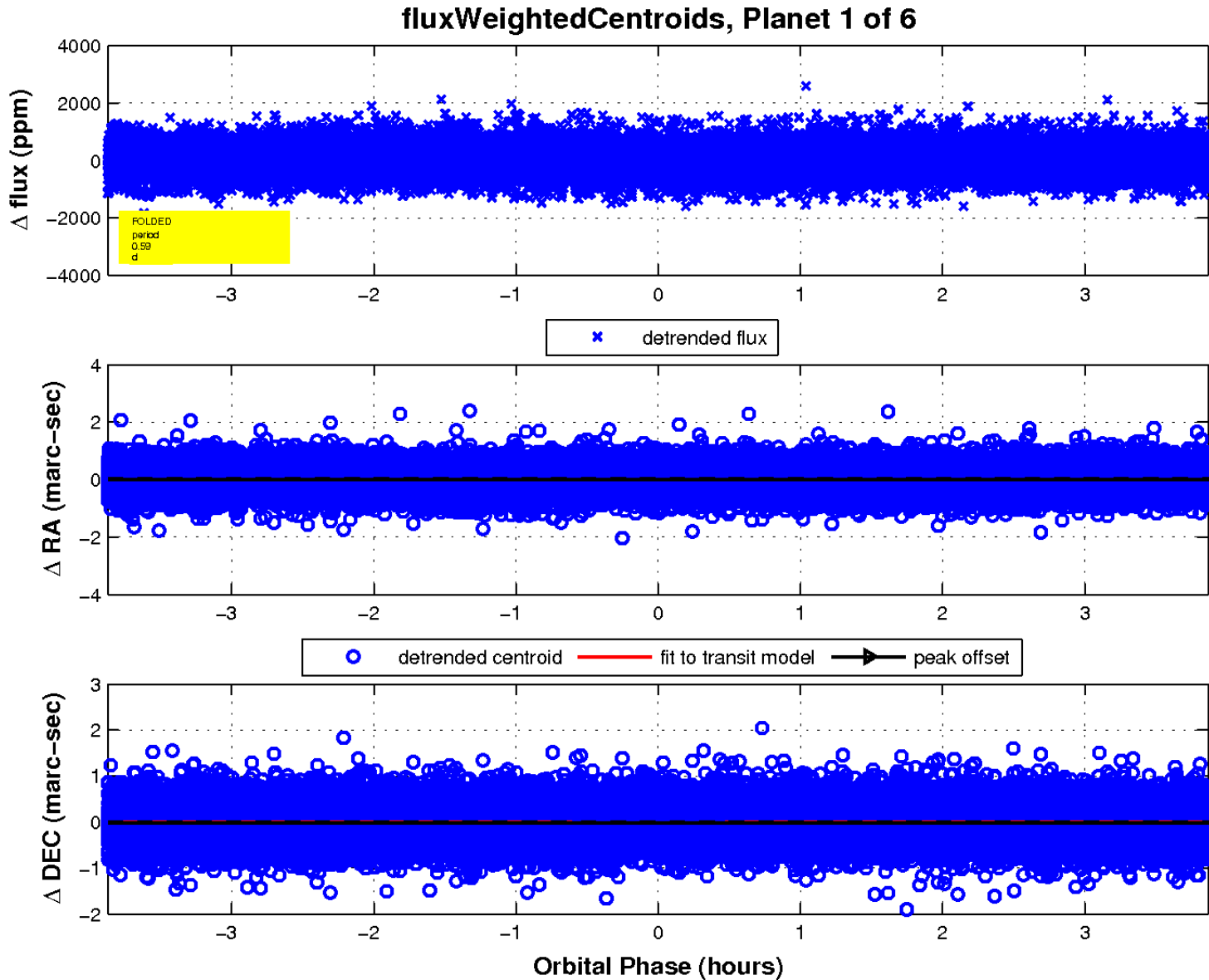
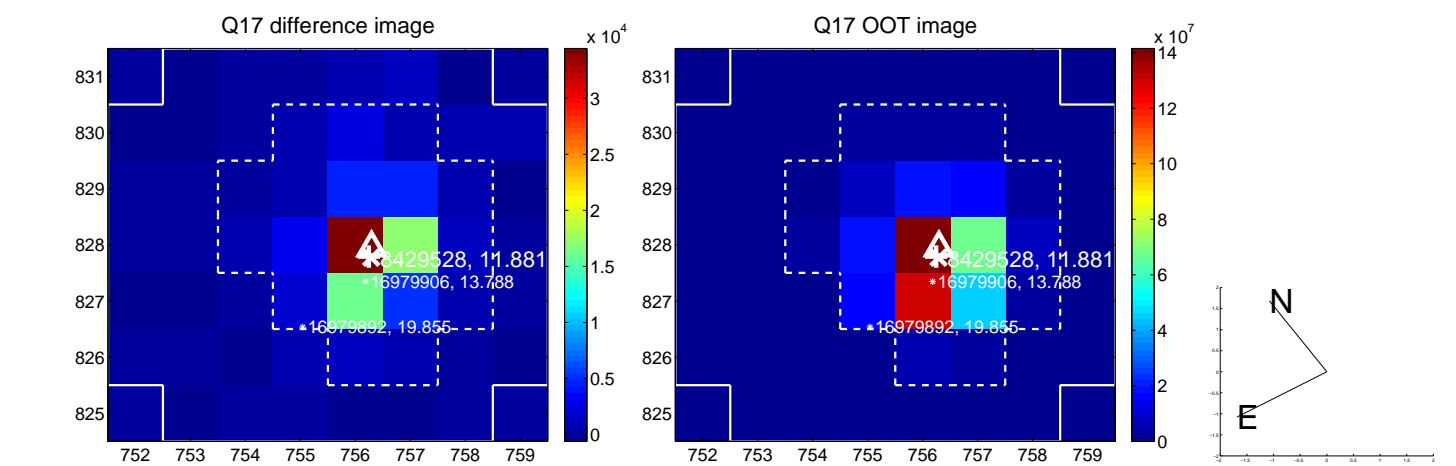
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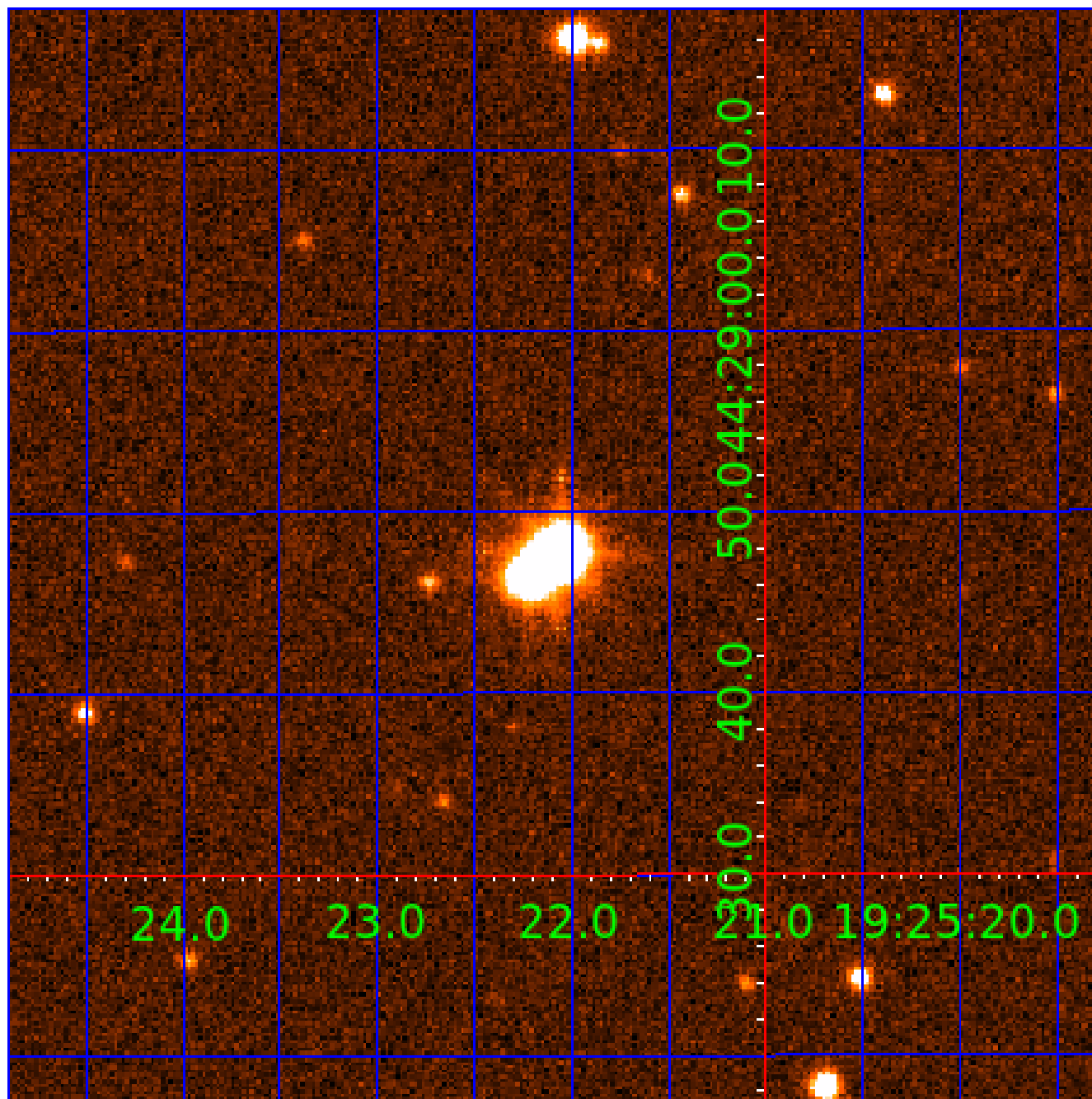


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UKIRT Image

Declination



# KIC 008429528

## Q1-17 DR25 TCE Parameters

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008429528-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
008429528-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT
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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.

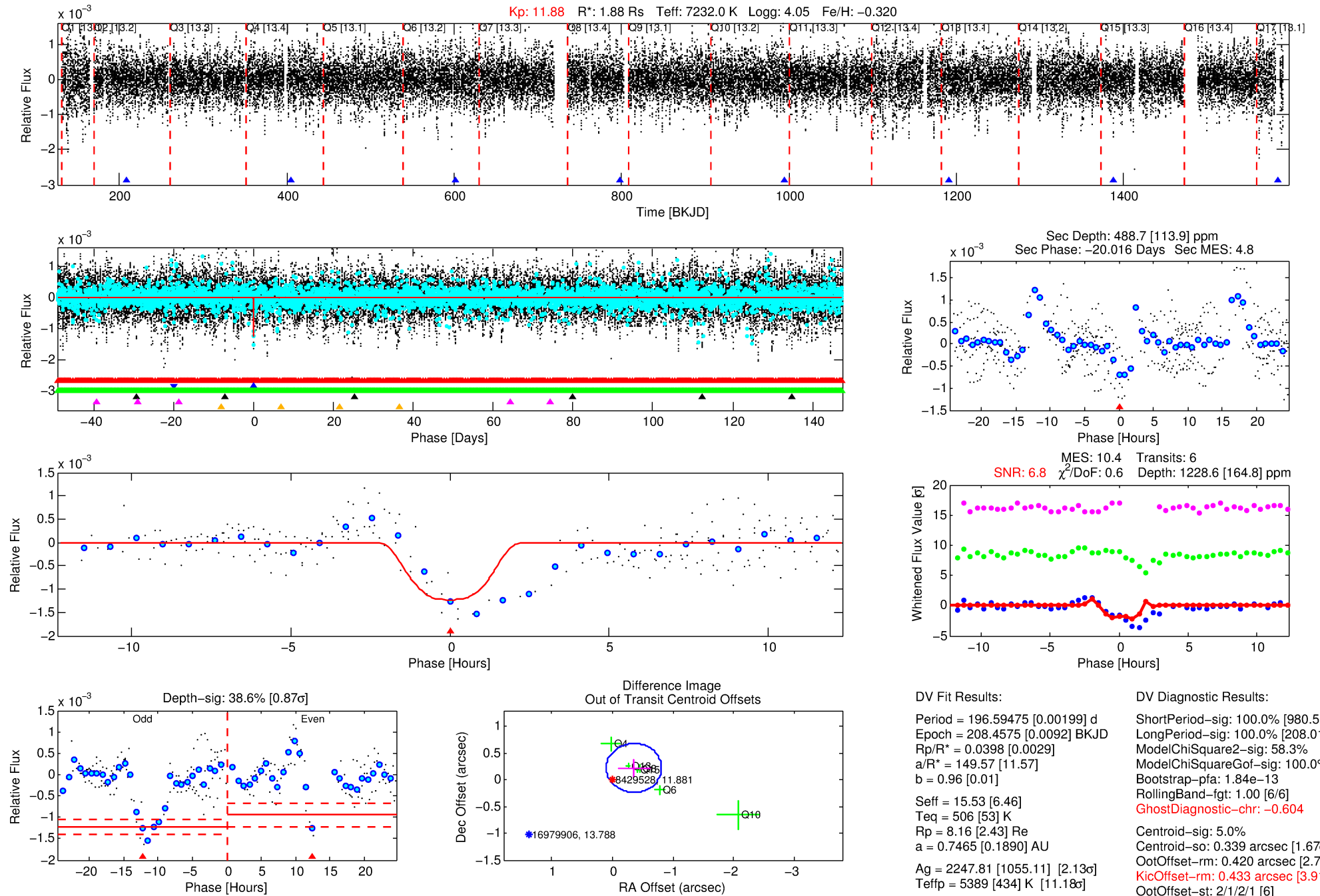
## Ephemeris Match Information For 008429528-02

No Significant Match Found



# DV One-Page Summary

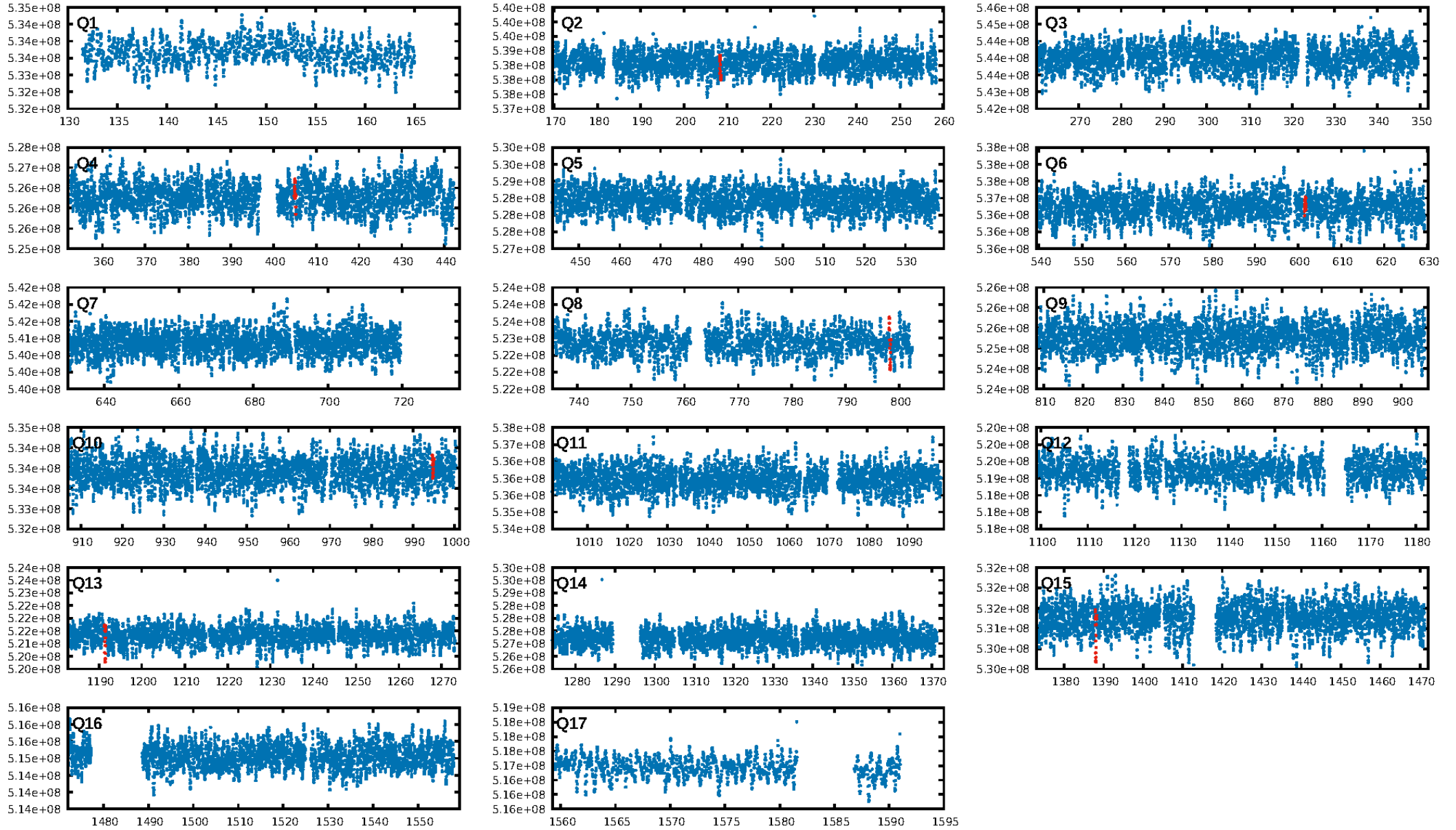
KIC: 8429528 Candidate: 2 of 6 Period: 196.595 d



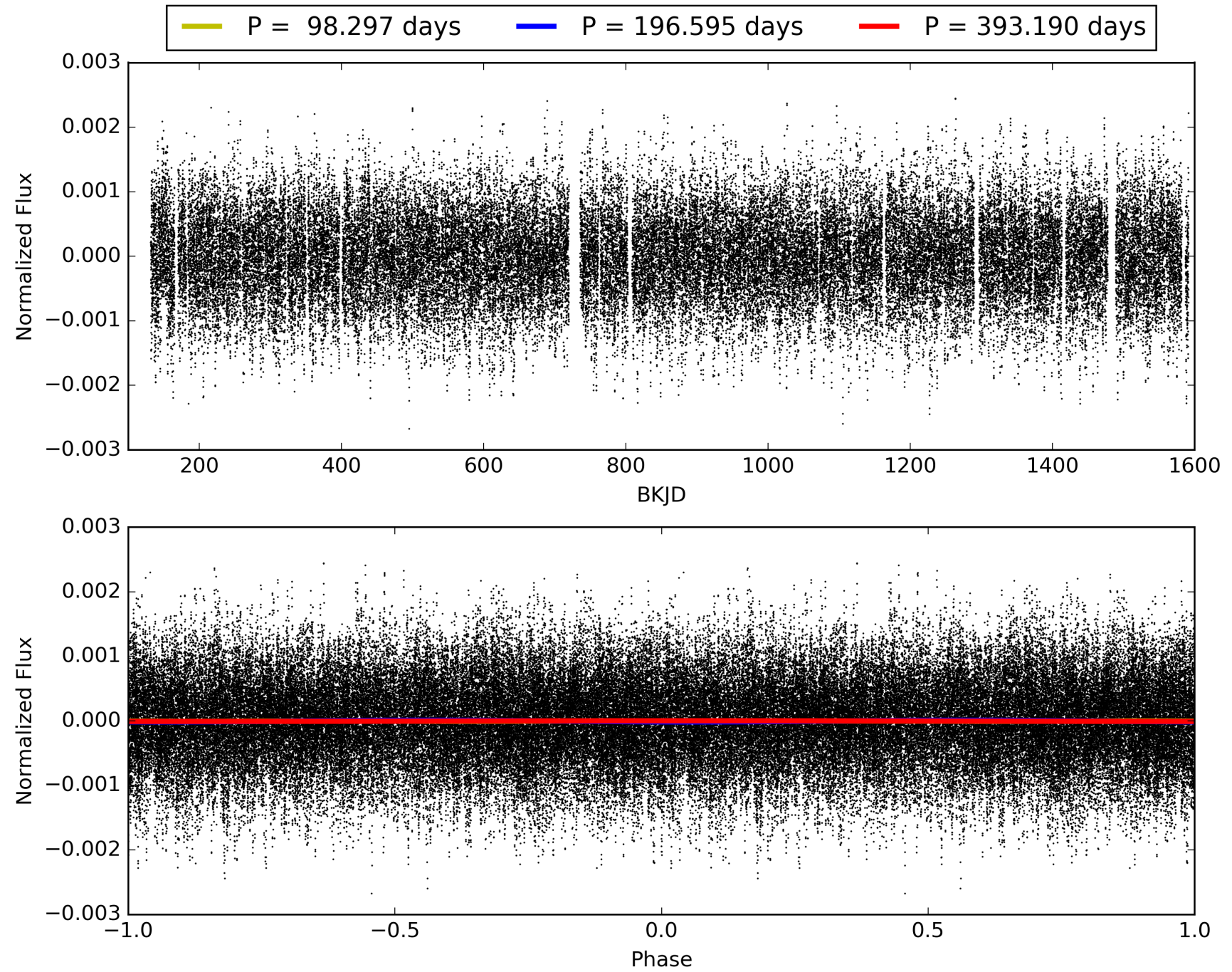
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:05:55 Z

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

# TCE 008429528-02, PDC Light Curves

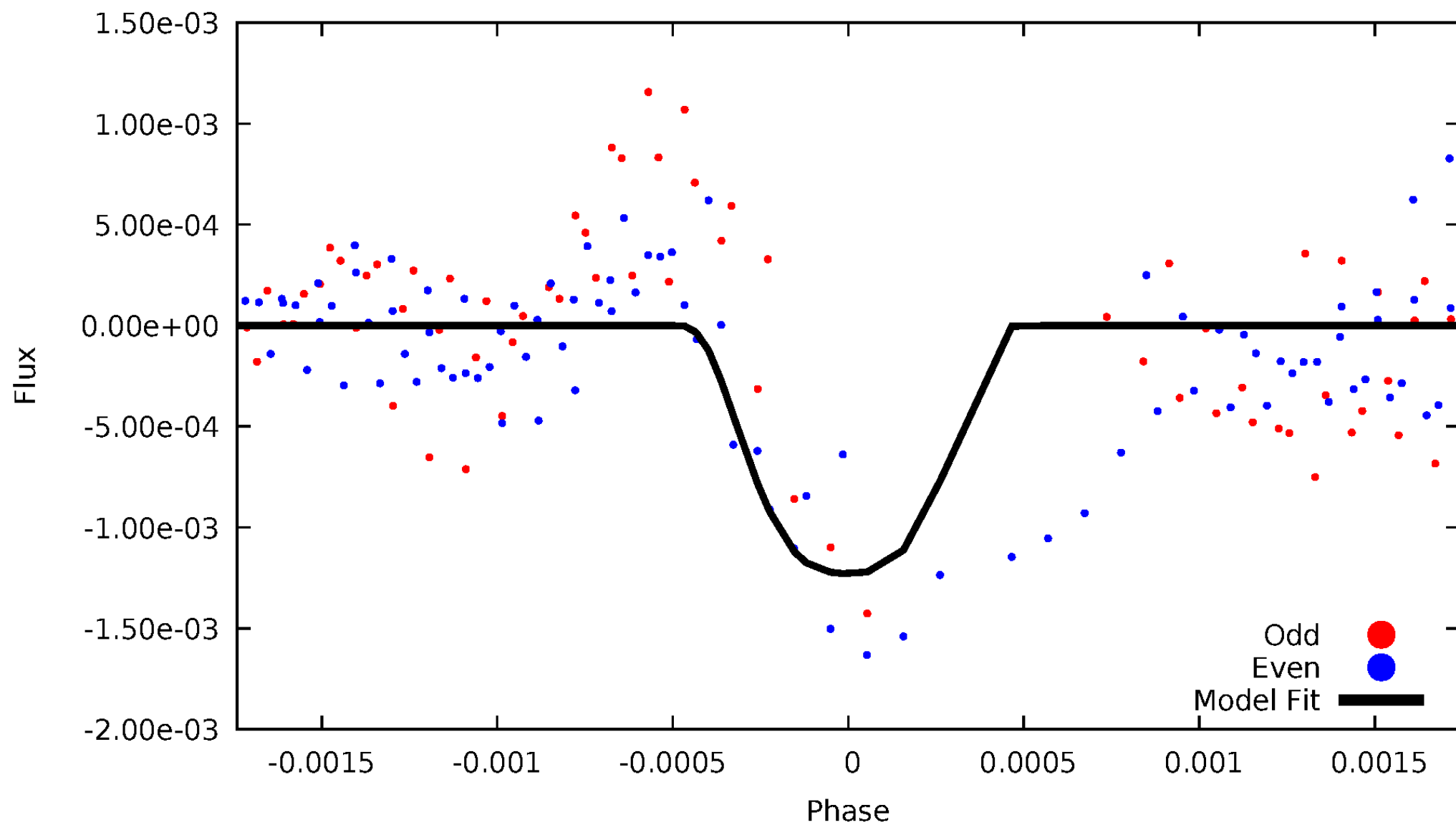


# TCE 008429528-02



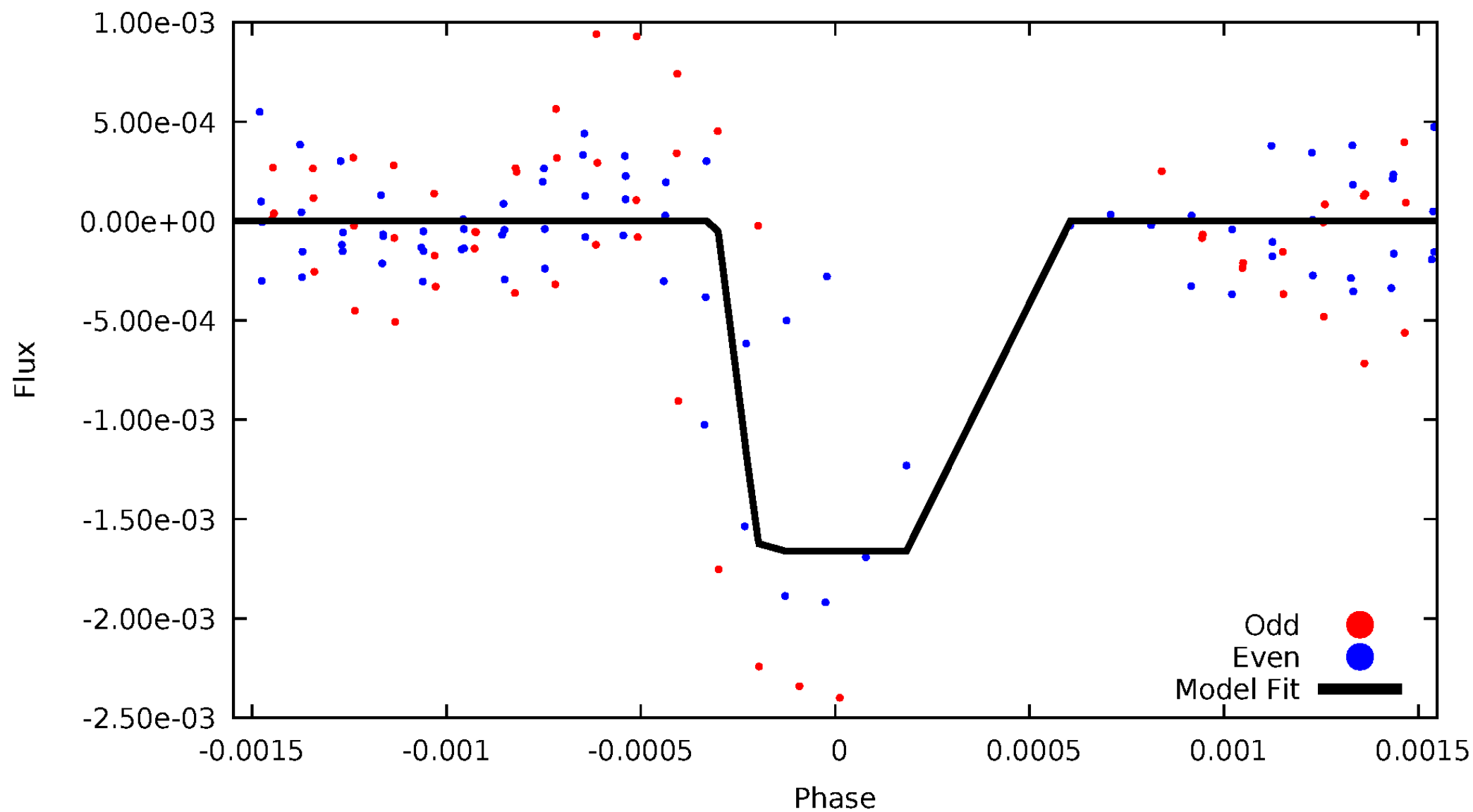
# DV Odd/Even

TCE 008429528-02



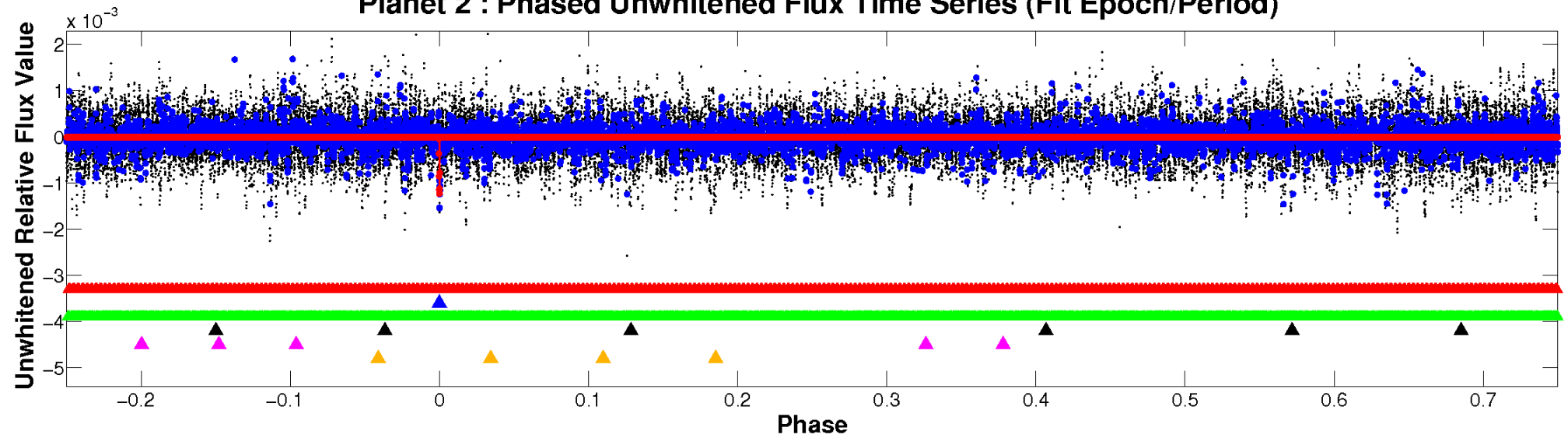
# ALT Odd/Even

TCE 008429528-02

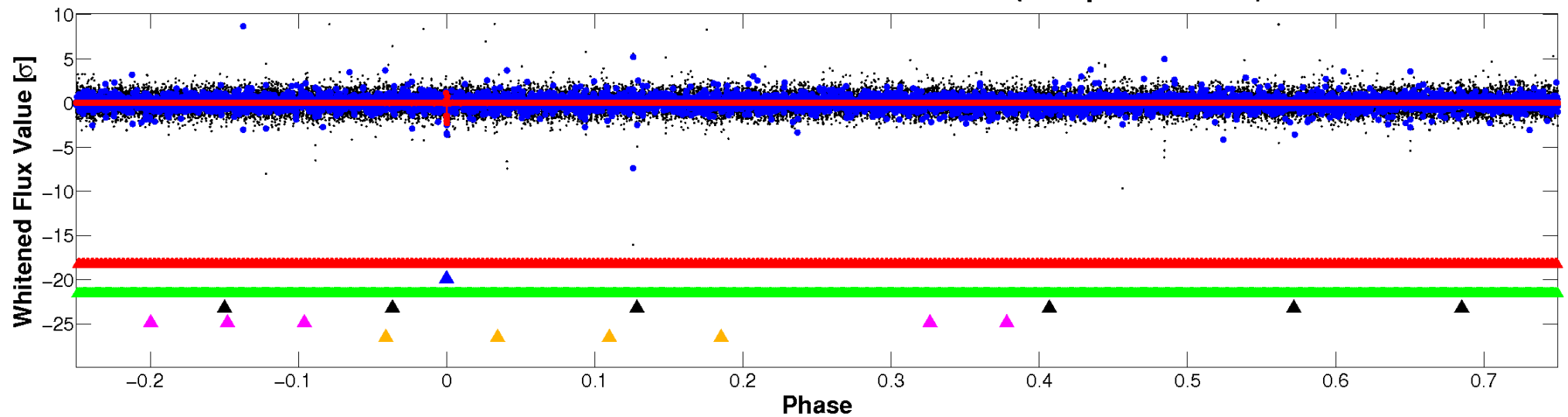


# Non-Whitened Vs. Whitened Light Curve

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



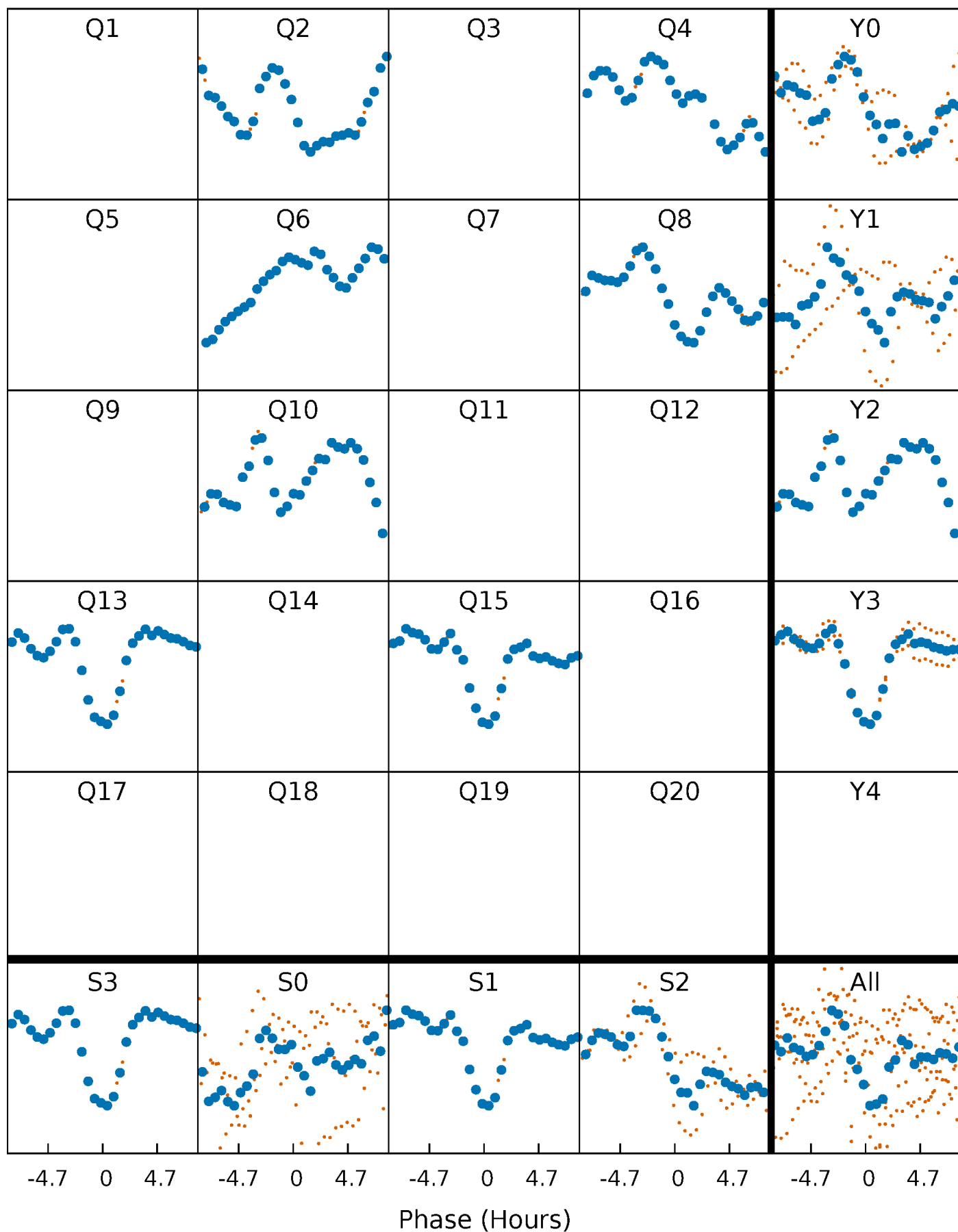
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





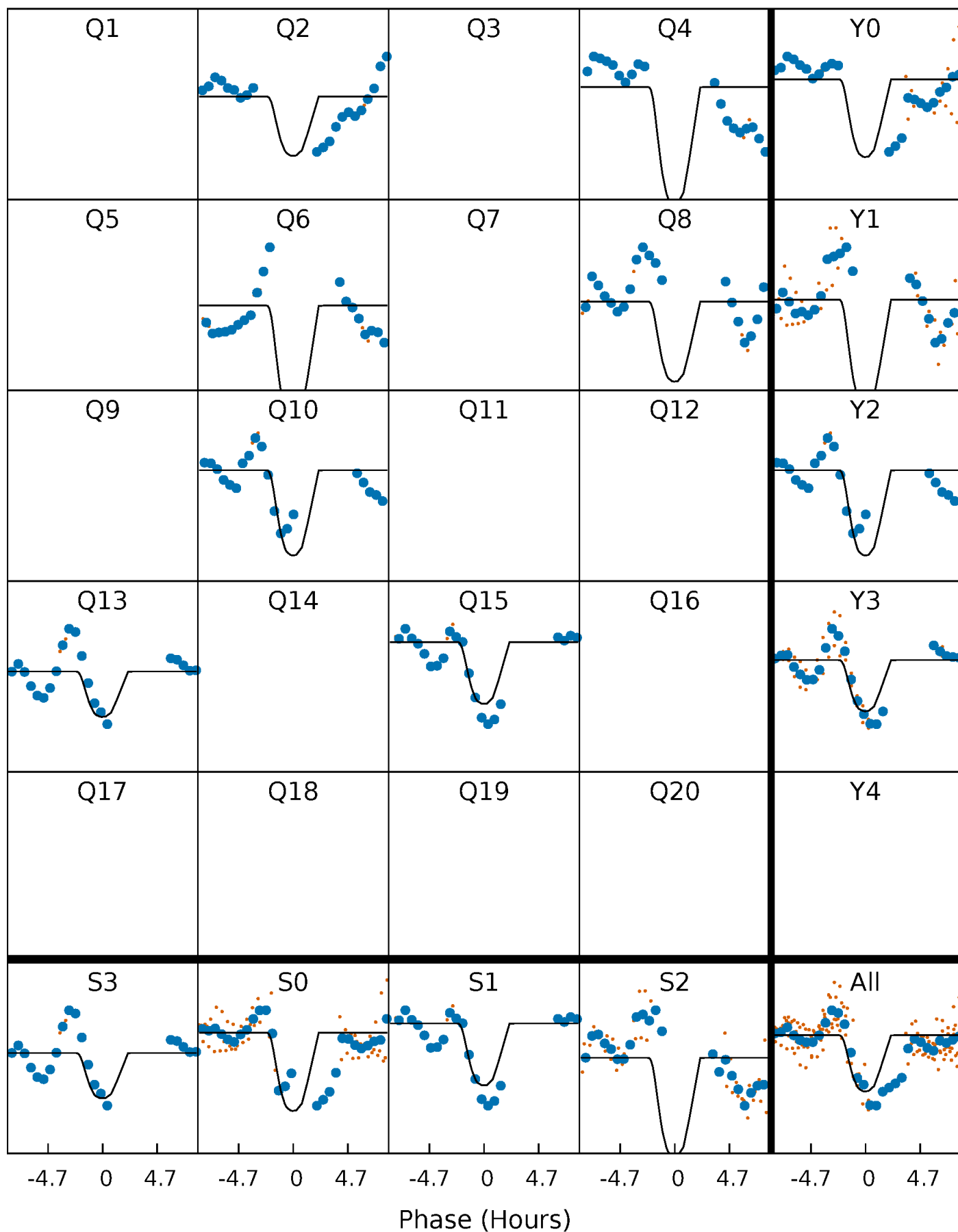
# PDC Quarter-Phased Transit Curves

TCE 008429528-02 P=196.594755 Days  $T_0=208.457454$  (BKJD)



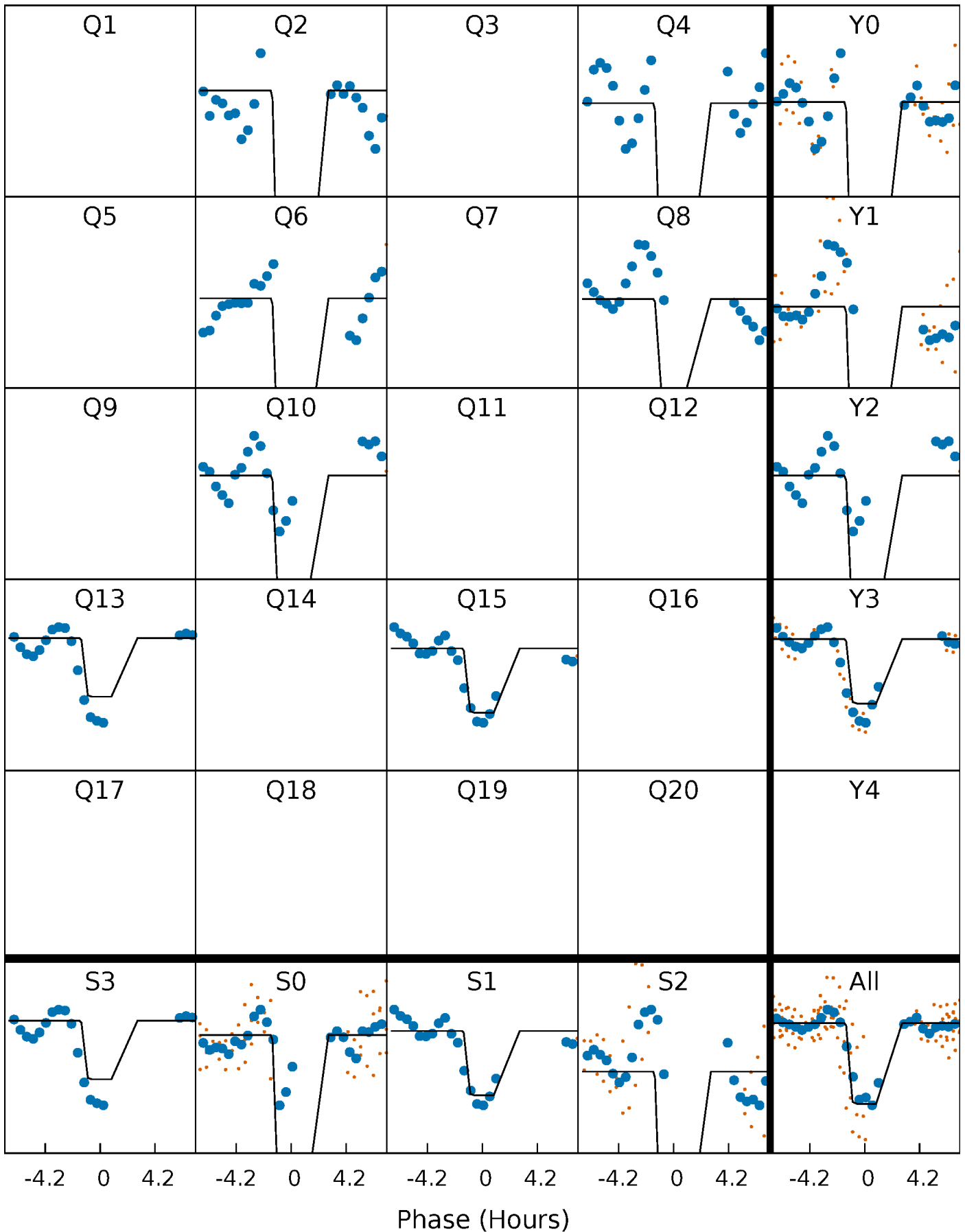
# DV Quarter-Phased Transit Curves

TCE 008429528-02     $P=196.594755$  Days     $T_0=208.457454$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

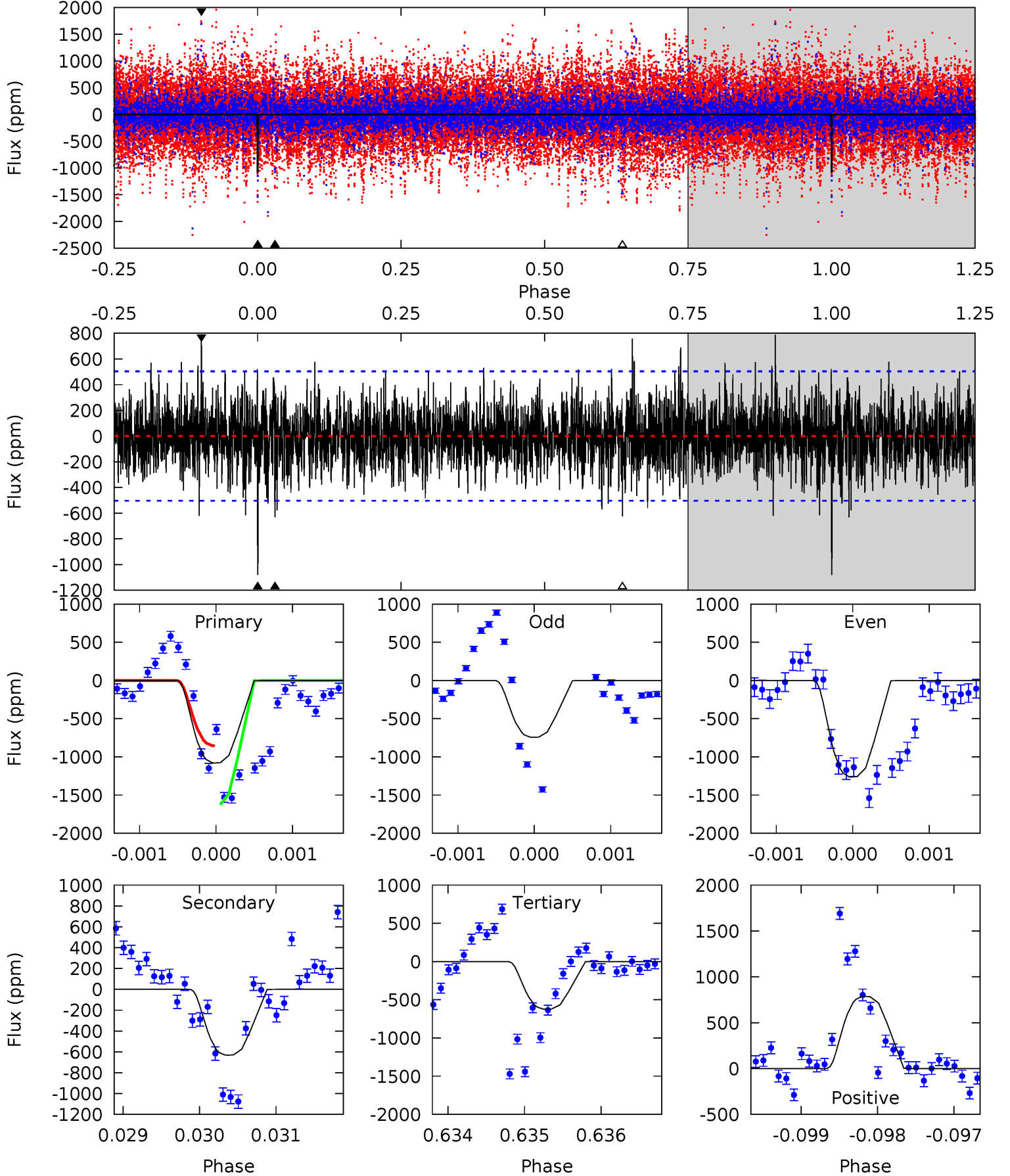
TCE 008429528-02 P=196.601887 Days  $T_0=208.430026$  (BKJD)



# DV Model-Shift Uniqueness Test

008429528-02,  $P = 196.594755$  Days,  $E = 11.862699$  Days

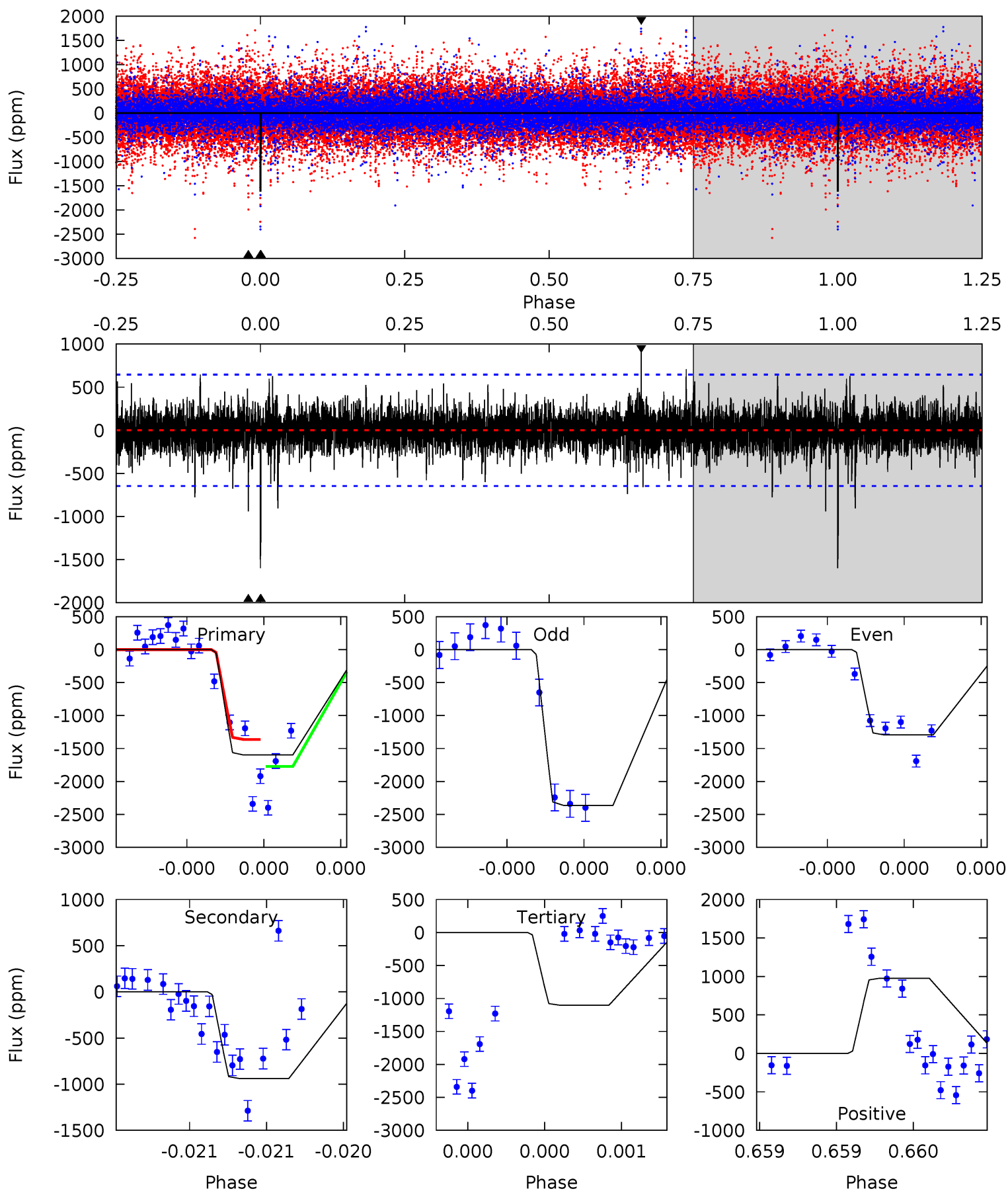
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	6.87	6.78	8.55	5.46	3.31	1.77	4.95	3.19	0.09	-1.68	2.80	0.70	0.42	3.31



# Alt Model-Shift Uniqueness Test

008429528-02, P = 196.601887 Days, E = 11.828139 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	8.12	9.53	8.45	5.58	3.49	1.22	4.28	5.37	-1.41	-0.33	4.46	1.03	0.38	1.39



### Stellar Parameters For KIC 008429528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7232^{+228}_{-304}$	$4.047^{+0.214}_{-0.175}$	$-0.320^{+0.300}_{-0.300}$	$1.879^{+0.543}_{-0.543}$	$1.435^{+0.216}_{-0.265}$	$0.304^{+0.420}_{-0.132}$
	+3%/-4%	+5%/-4%	+94%/-94%	+29%/-29%	+15%/-18%	+138%/-43%
Source	KIC0	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 008429528-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-632 \pm 92$	$8.05^{+1.42}_{-1.25}$	$704^{+55}_{-56}$	$5691^{+328}_{-319}$	$2914^{+1233}_{-816}$
Alt.	$-940 \pm 116$	$8.33^{+1.69}_{-1.48}$	$708^{+58}_{-63}$	$6178^{+384}_{-350}$	$4013^{+2063}_{-1130}$

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



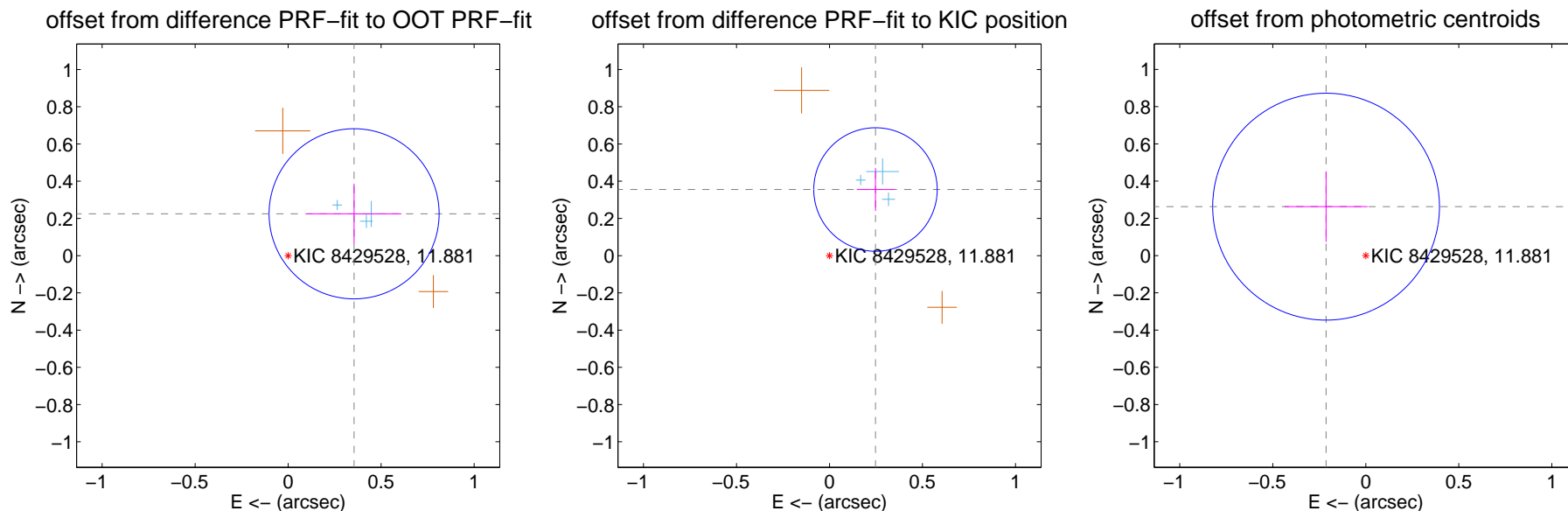
## DV Centroid Data

Supplemental centroid analysis for 008429528-02. **Kepler magnitude: 11.88.** Transit SNR 6.84

There are 4 quarters with good PRF difference image offsets

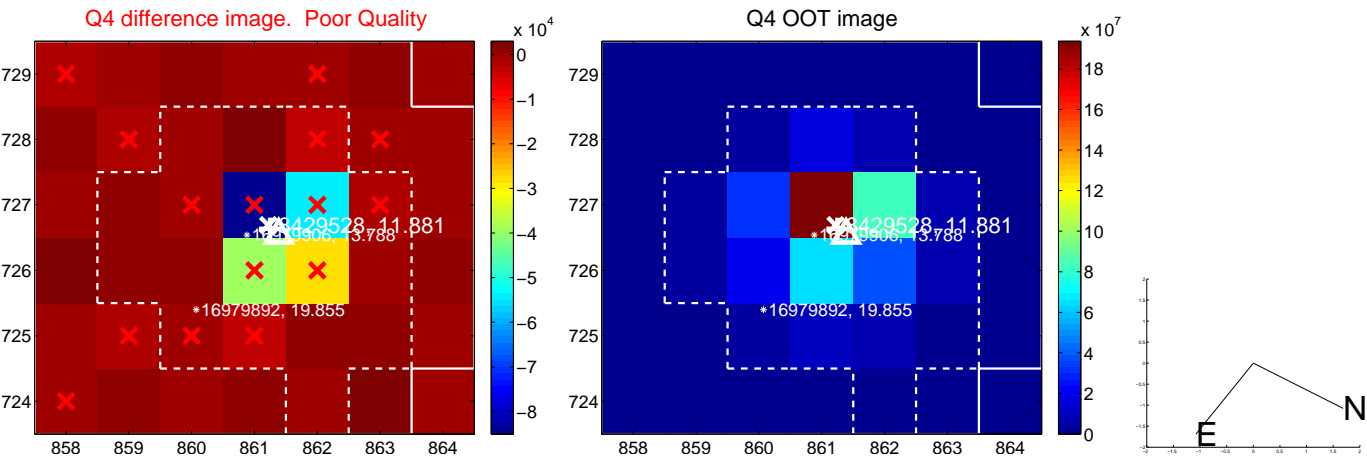
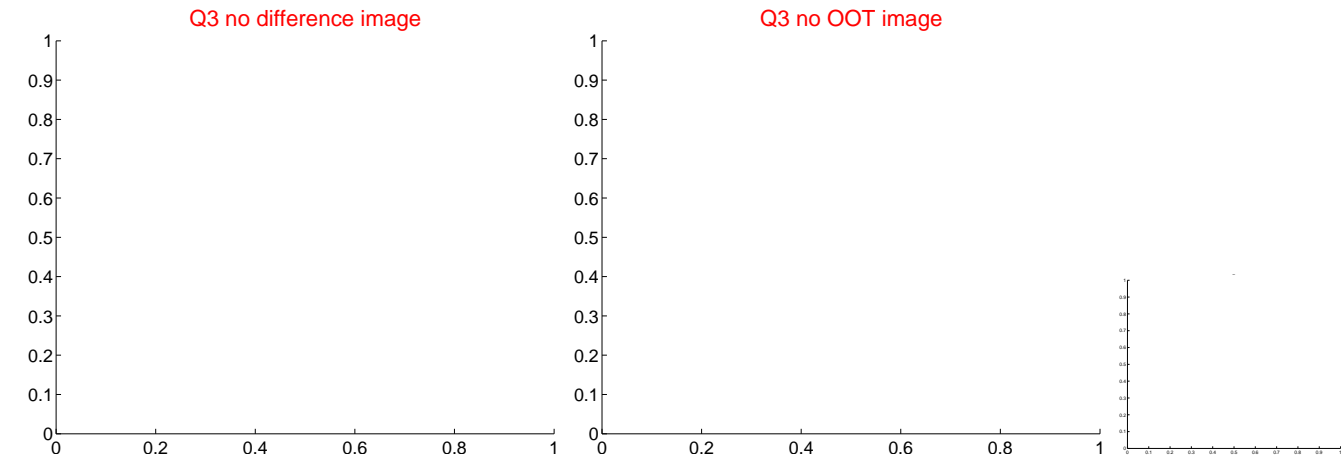
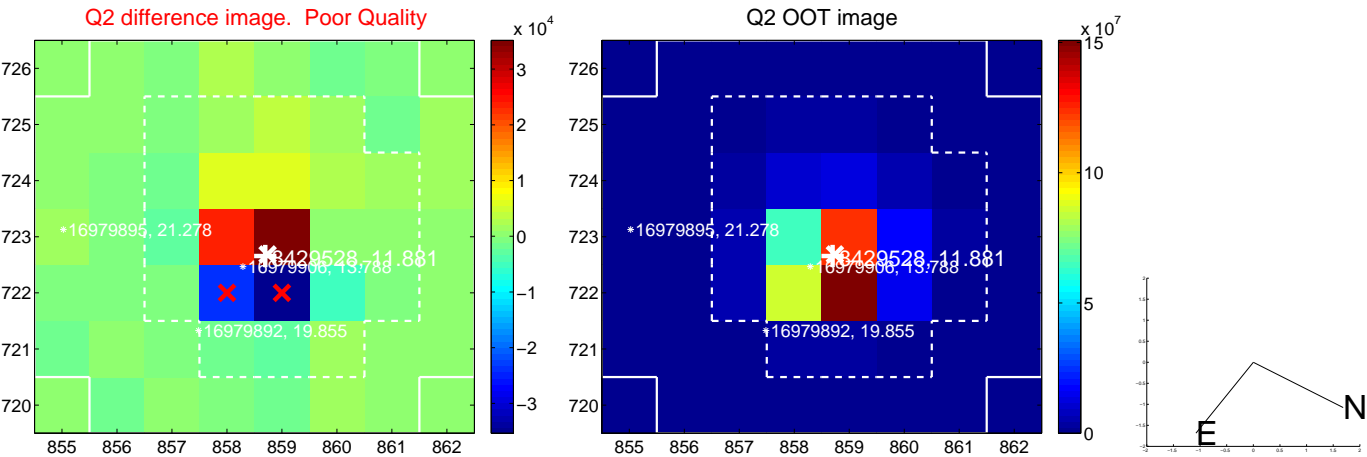
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.420 \pm 0.152$	2.76	$-0.355 \pm 0.255$	$0.225 \pm 0.162$
PRF-fit source offset from KIC position	<b><math>0.433 \pm 0.111</math></b>	<b>3.91</b>	$-0.247 \pm 0.101$	$0.355 \pm 0.115$
photometric centroid source offset	$0.34 \pm 0.20$	1.67	$0.21 \pm 0.22$	$0.26 \pm 0.19$

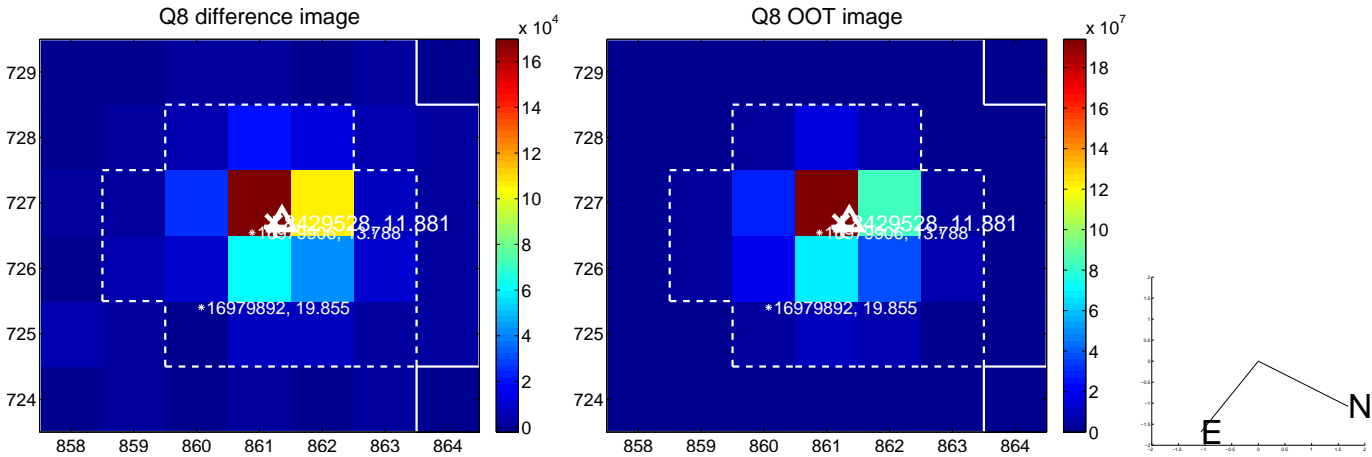
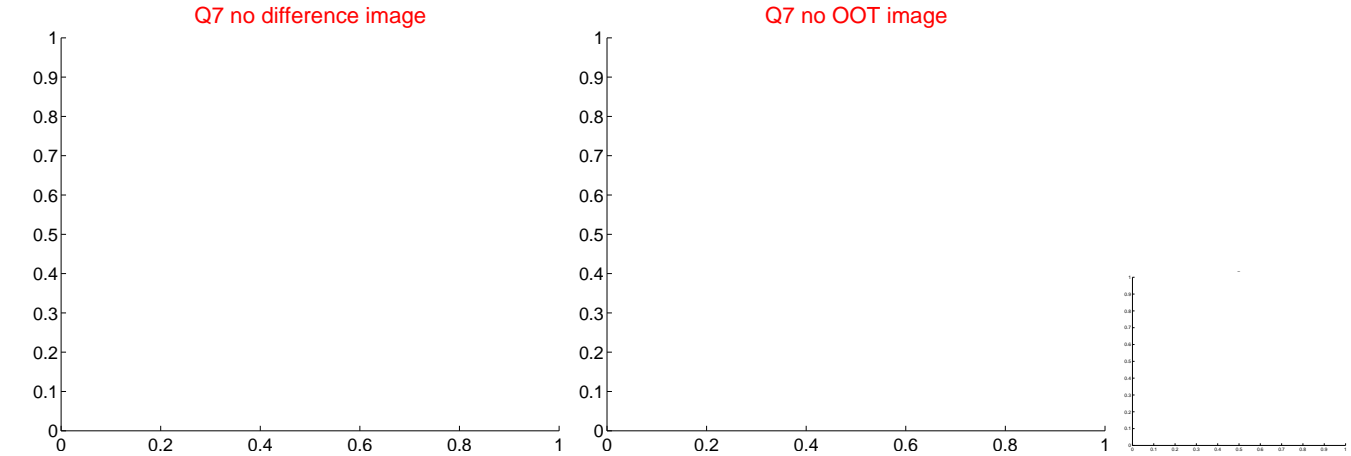
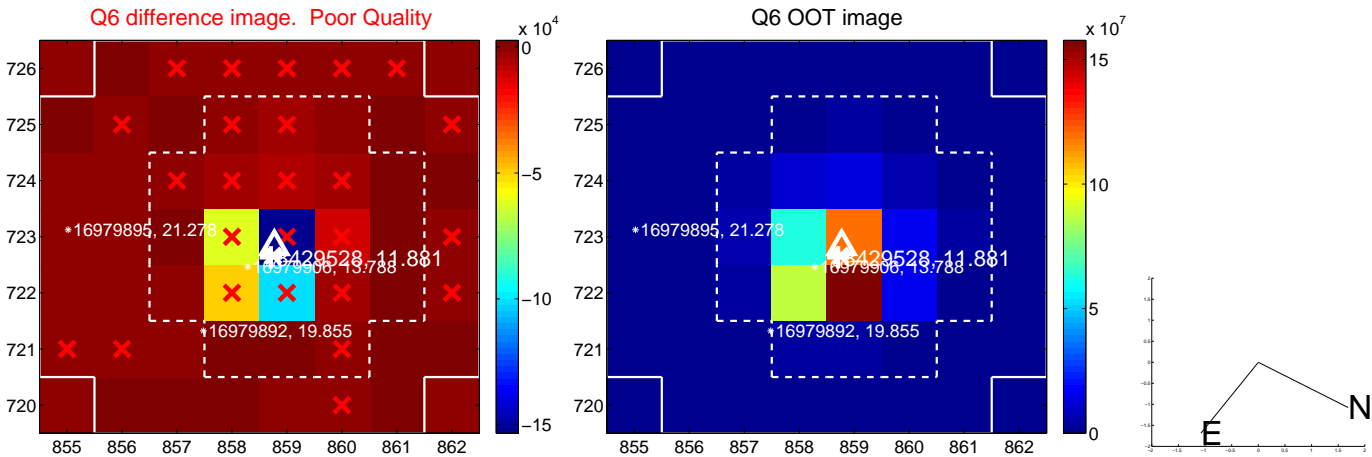
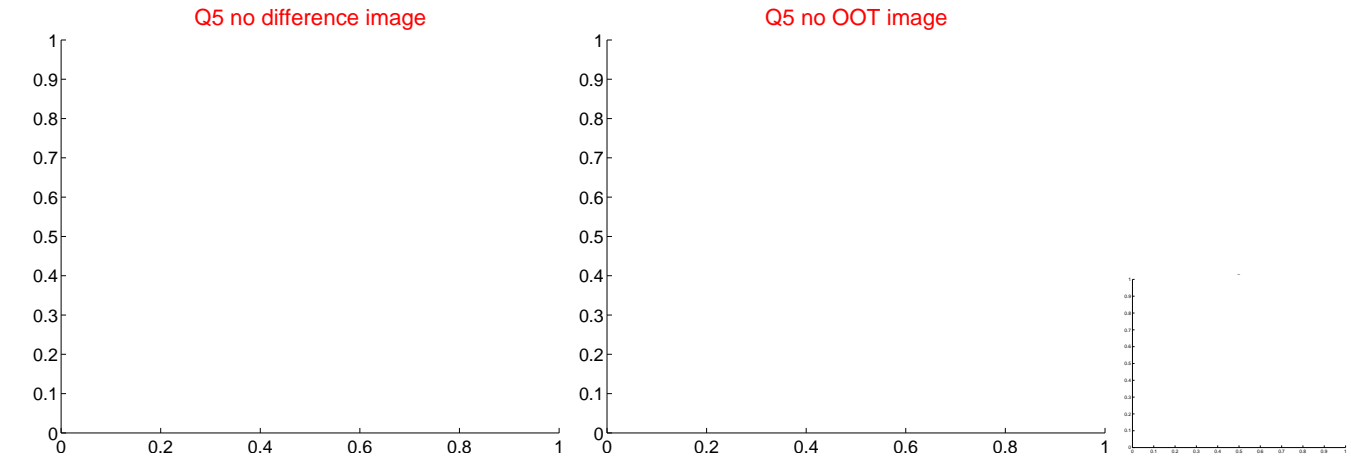


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

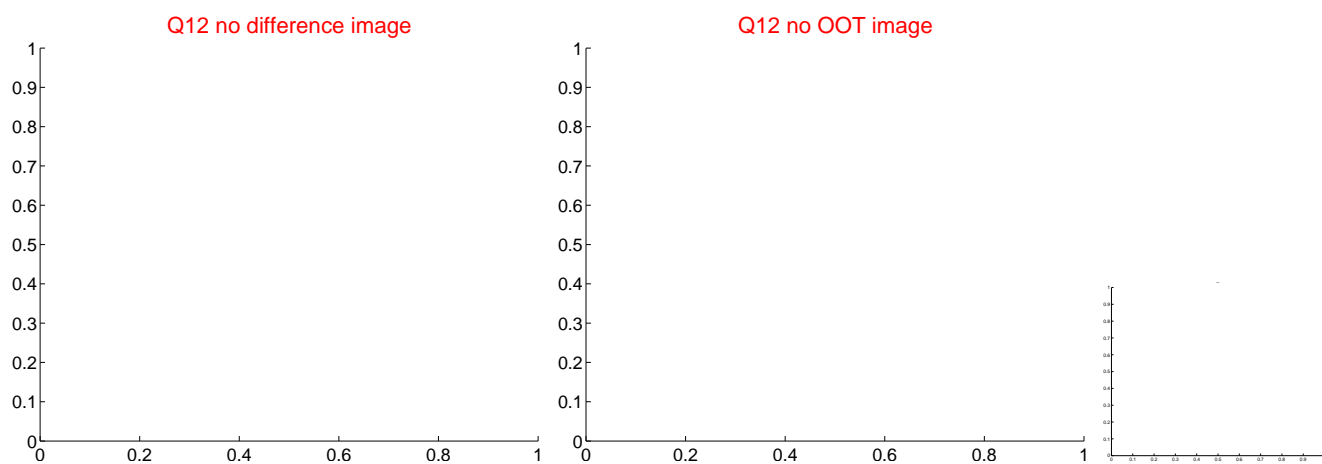
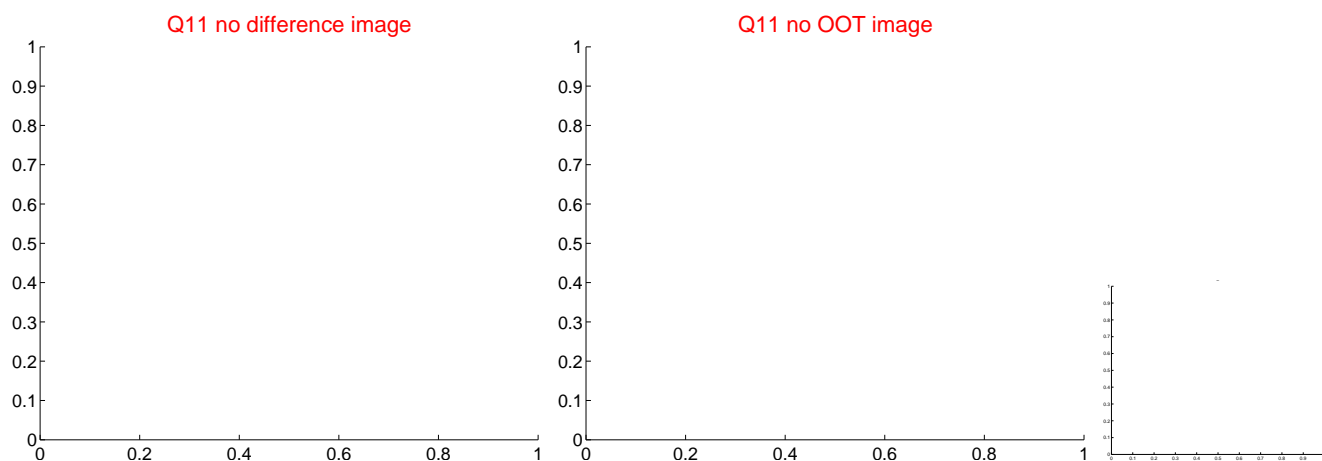
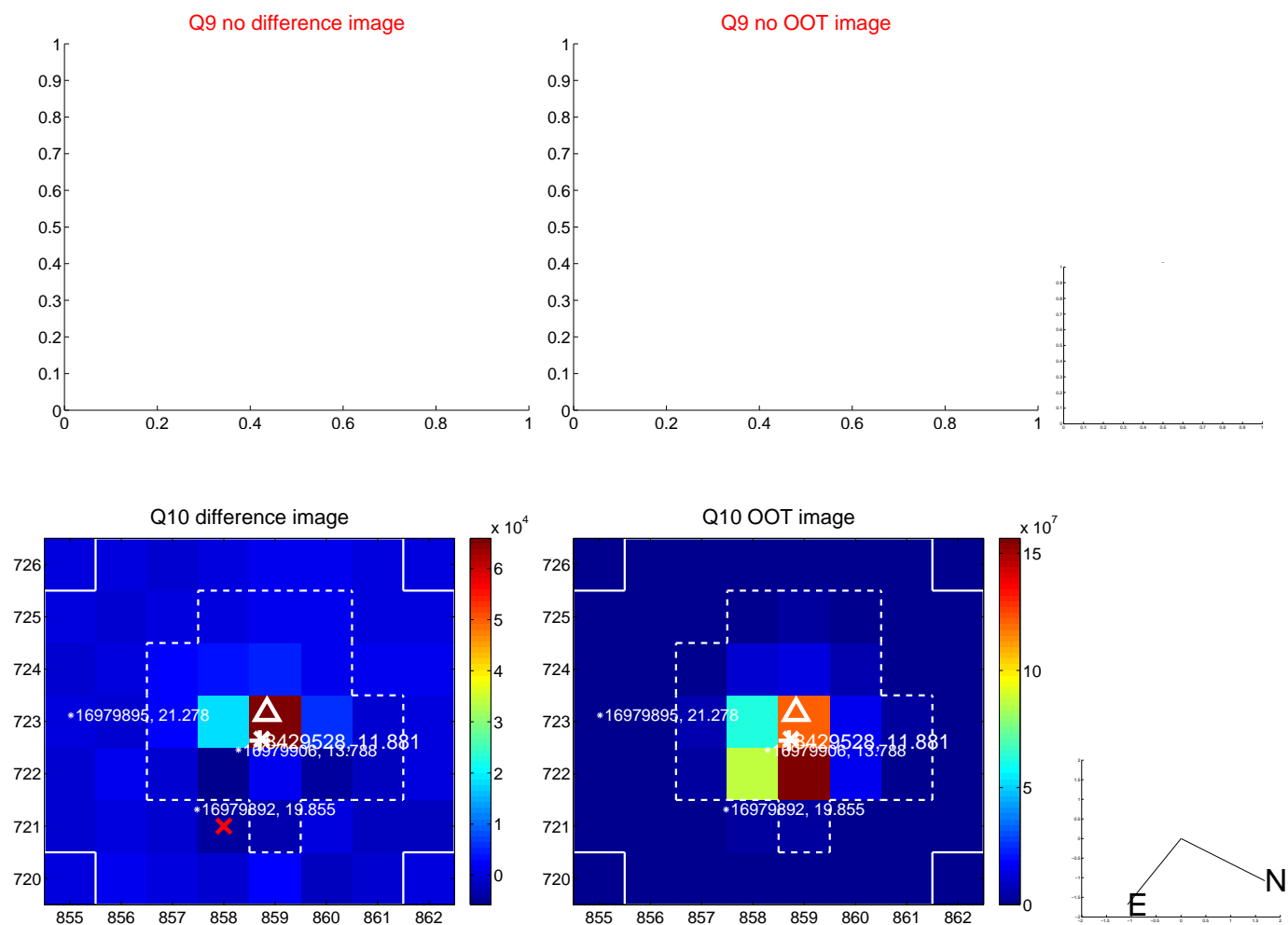
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



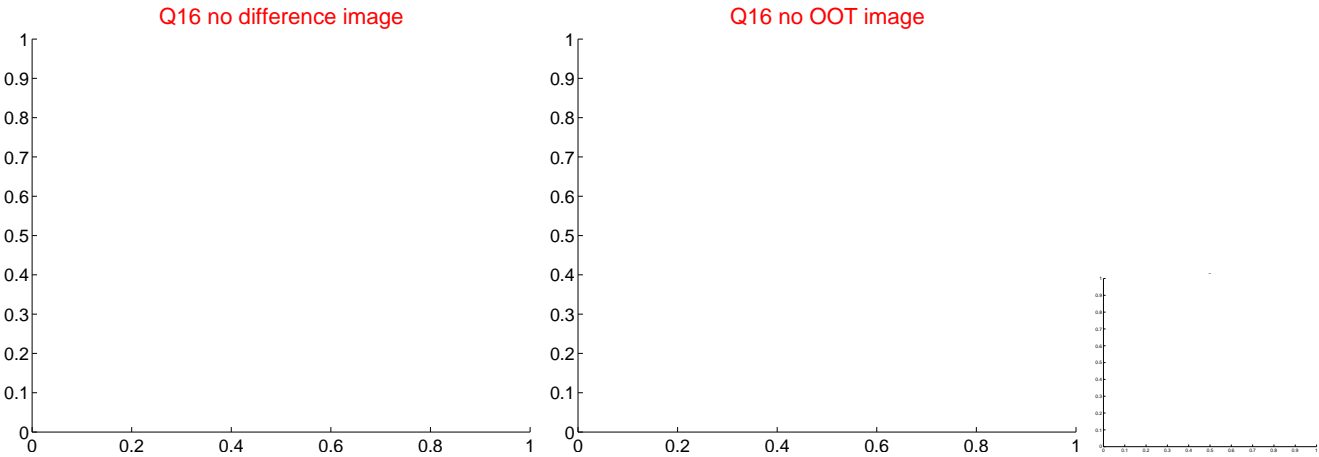
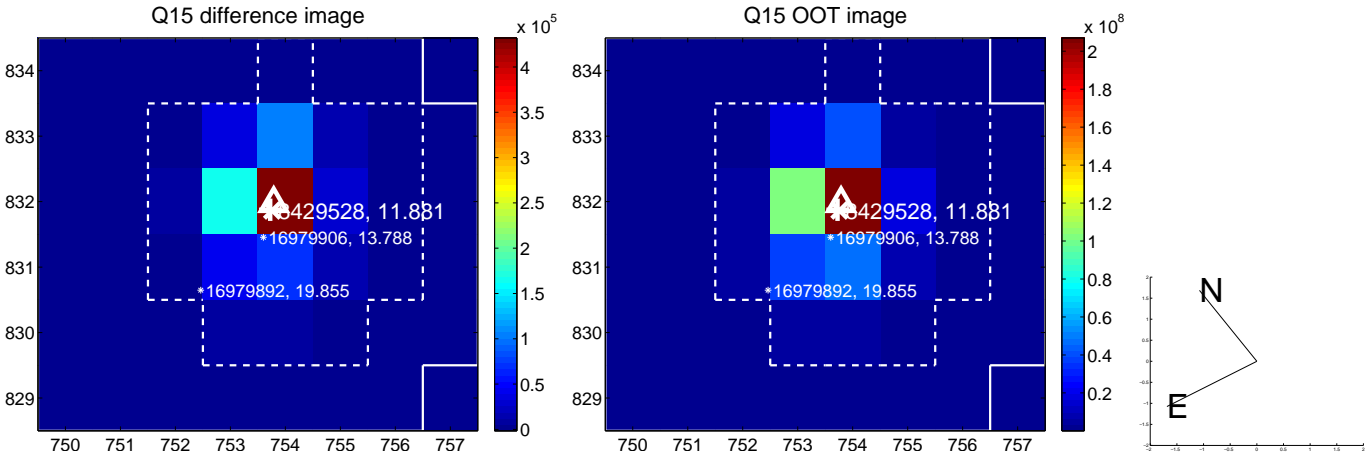
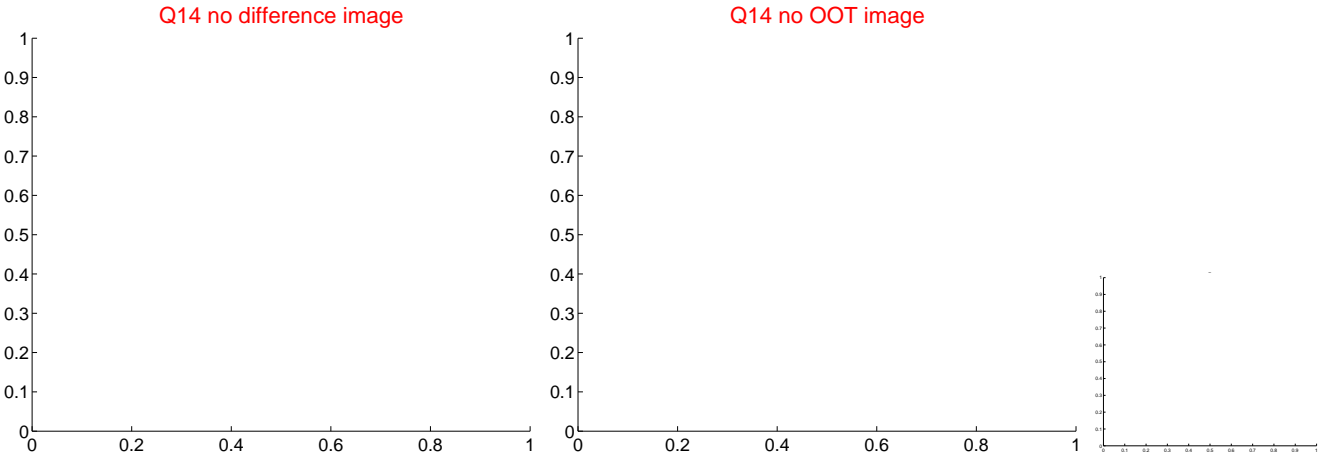
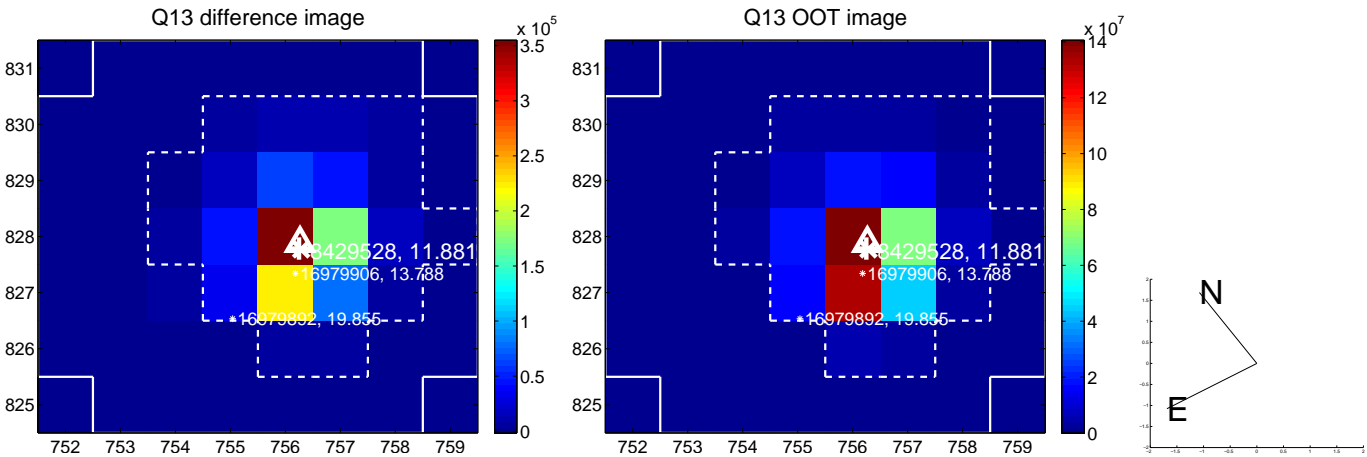
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

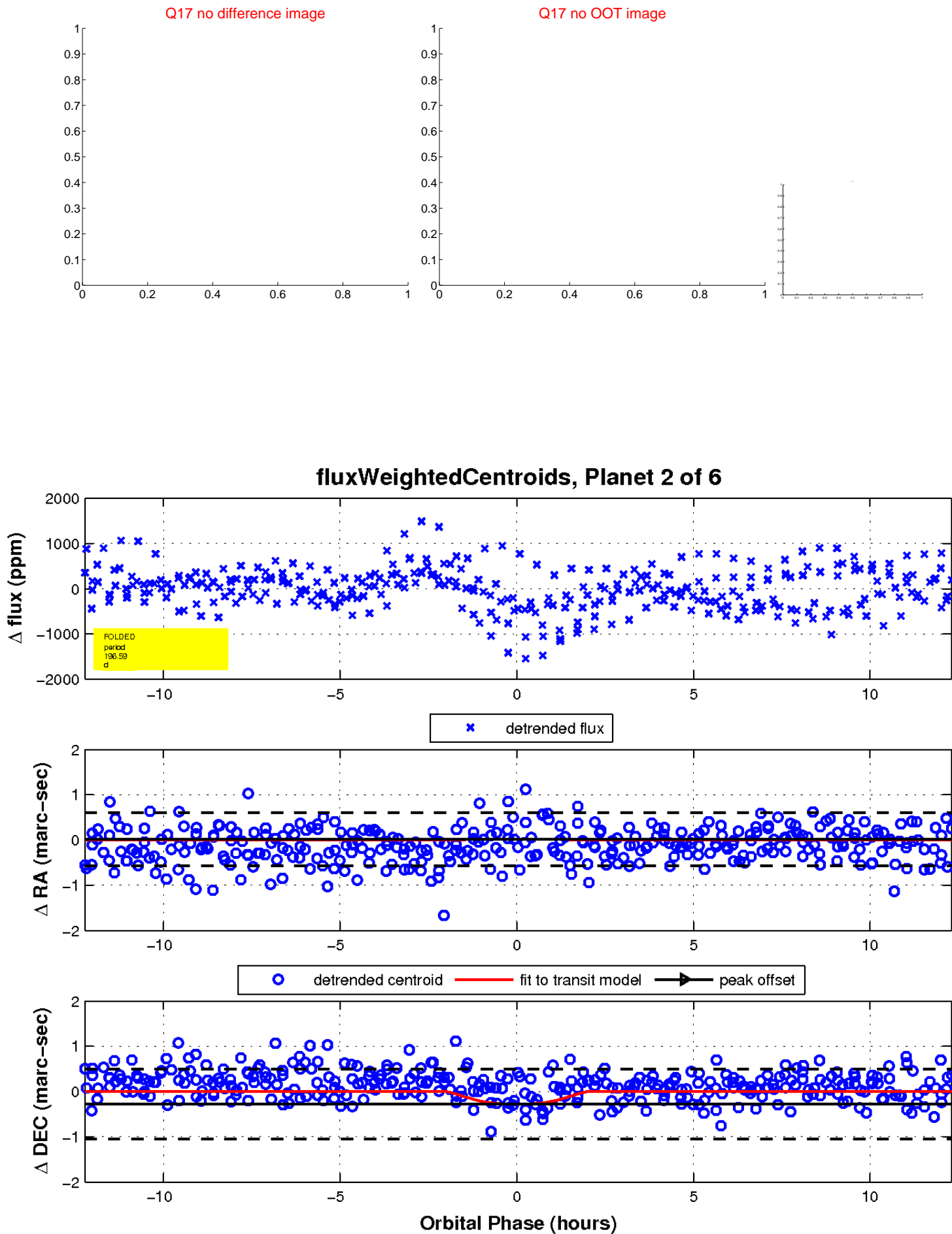


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



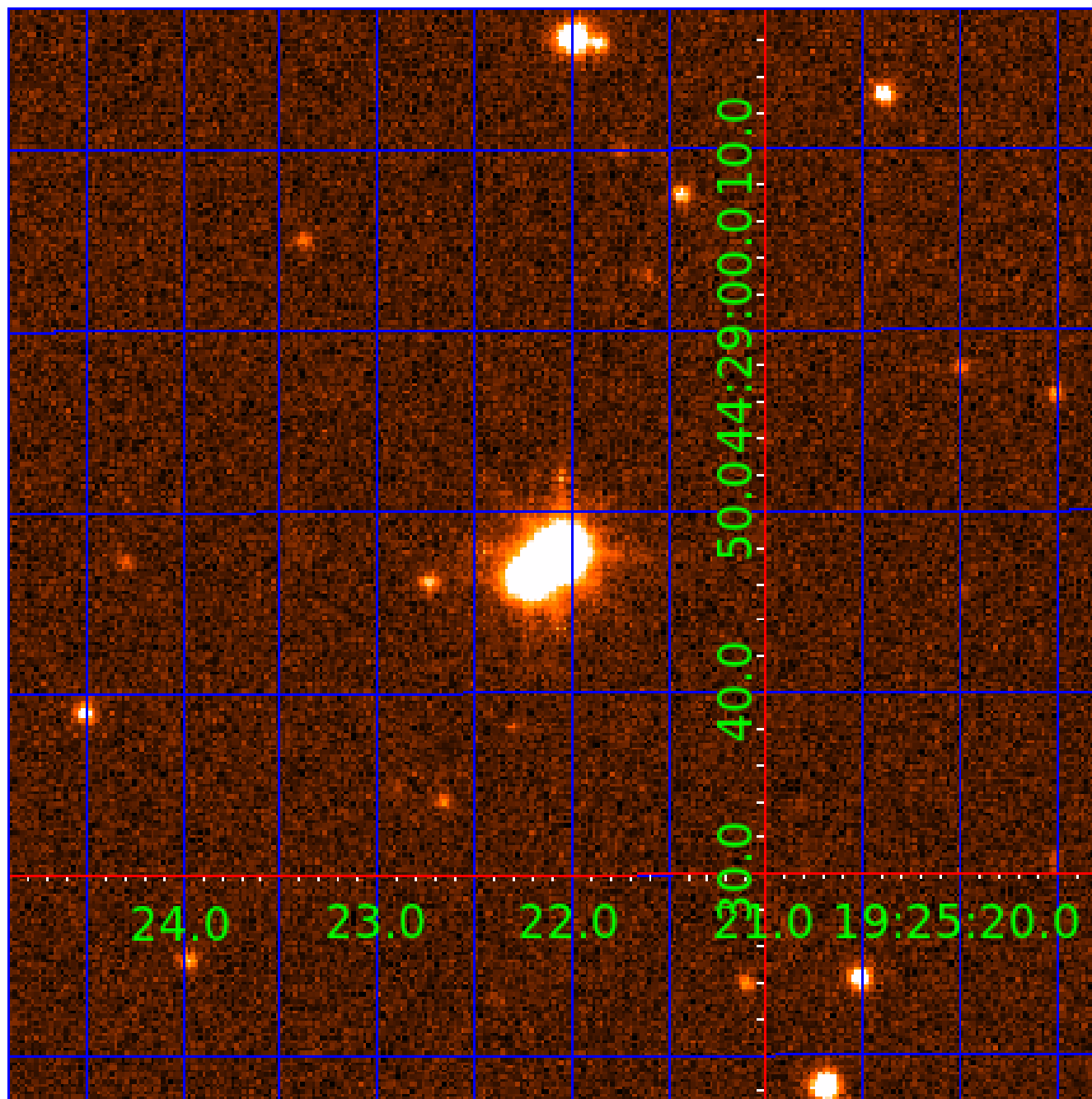


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008429528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008429528-01	OBS	No	0.588696	131.911433	20.3	1.290	10.0	6.7	1.88	7232	0.98	35976.97
008429528-02	OBS	No	196.594755	208.457454	1228.6	4.106	10.4	6.8	1.88	7232	8.16	15.53
008429528-03	OBS	No	0.979038	131.887917	46.4	2.463	9.1	7.0	1.88	7232	1.49	18259.13
008429528-04	OBS	No	251.313750	320.872502	1371.5	4.796	8.8	8.0	1.88	7232	12.83	11.19
008429528-05	OBS	No	289.797512	189.580744	1506.3	12.050	8.5	7.4	1.88	7232	8.52	9.26
008429528-06	OBS	No	408.017238	200.398953	959.4	8.818	7.8	7.3	1.88	7232	6.81	5.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008429528-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008429528-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008429528-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008429528-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
008429528-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT
008429528-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT

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

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

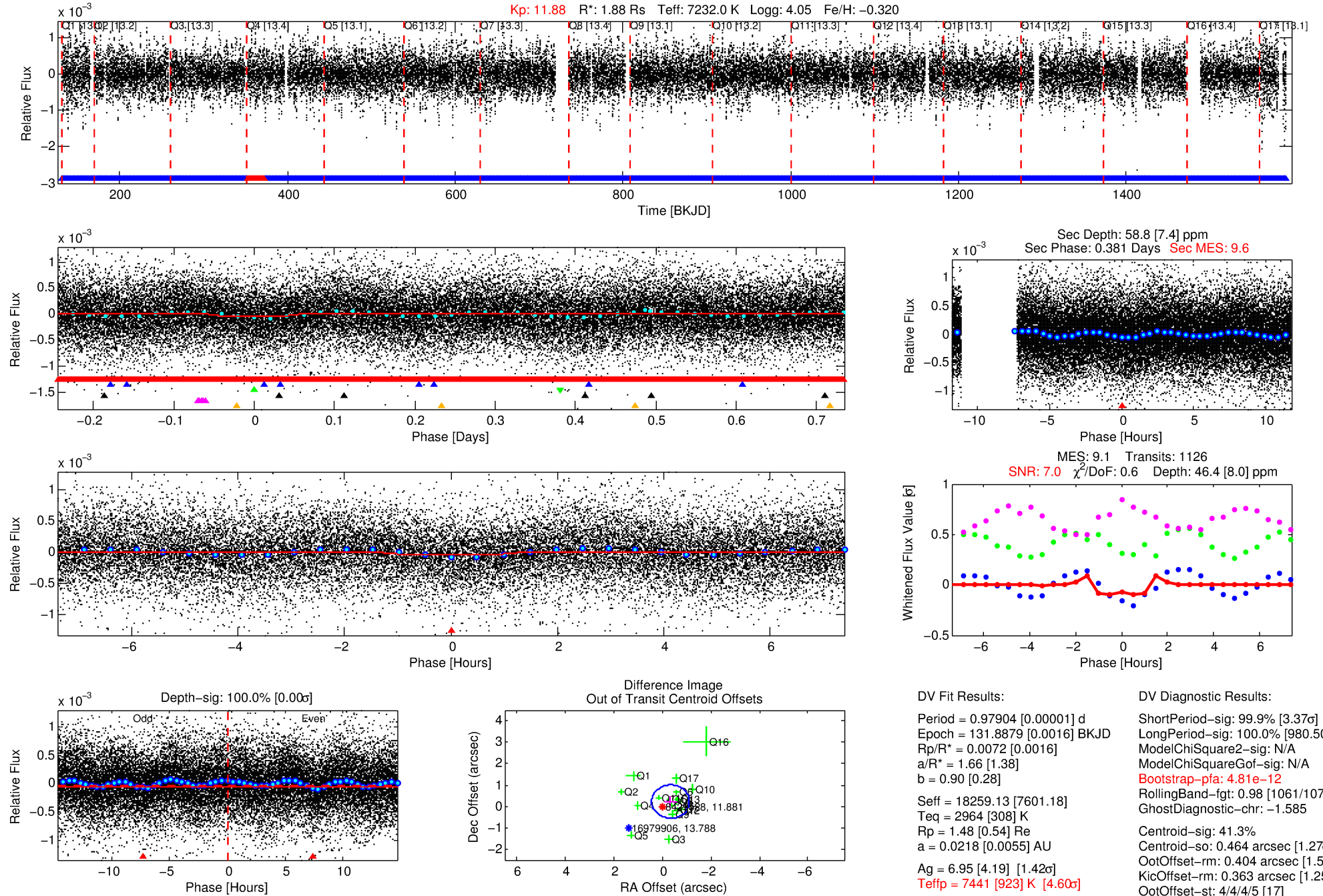
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008429528-03

No Significant Match Found

# DV One-Page Summary

KIC: 8429528 Candidate: 3 of 6 Period: 0.979 d



## DV Fit Results:

Period = 0.97904 [0.00001] d  
Epoch = 131.8879 [0.0016] BKJD  
Rp/R\* = 0.0072 [0.0016]  
a/R\* = 1.66 [1.38]  
b = 0.90 [0.28]  
Seff = 18259.13 [7601.18]  
Teq = 2964 [308] K  
Rp = 1.48 [0.54] Re  
a = 0.0218 [0.0055] AU  
Ag = 6.95 [4.19] [1.42σ]  
Teffp = 7441 [923] K [4.60σ]

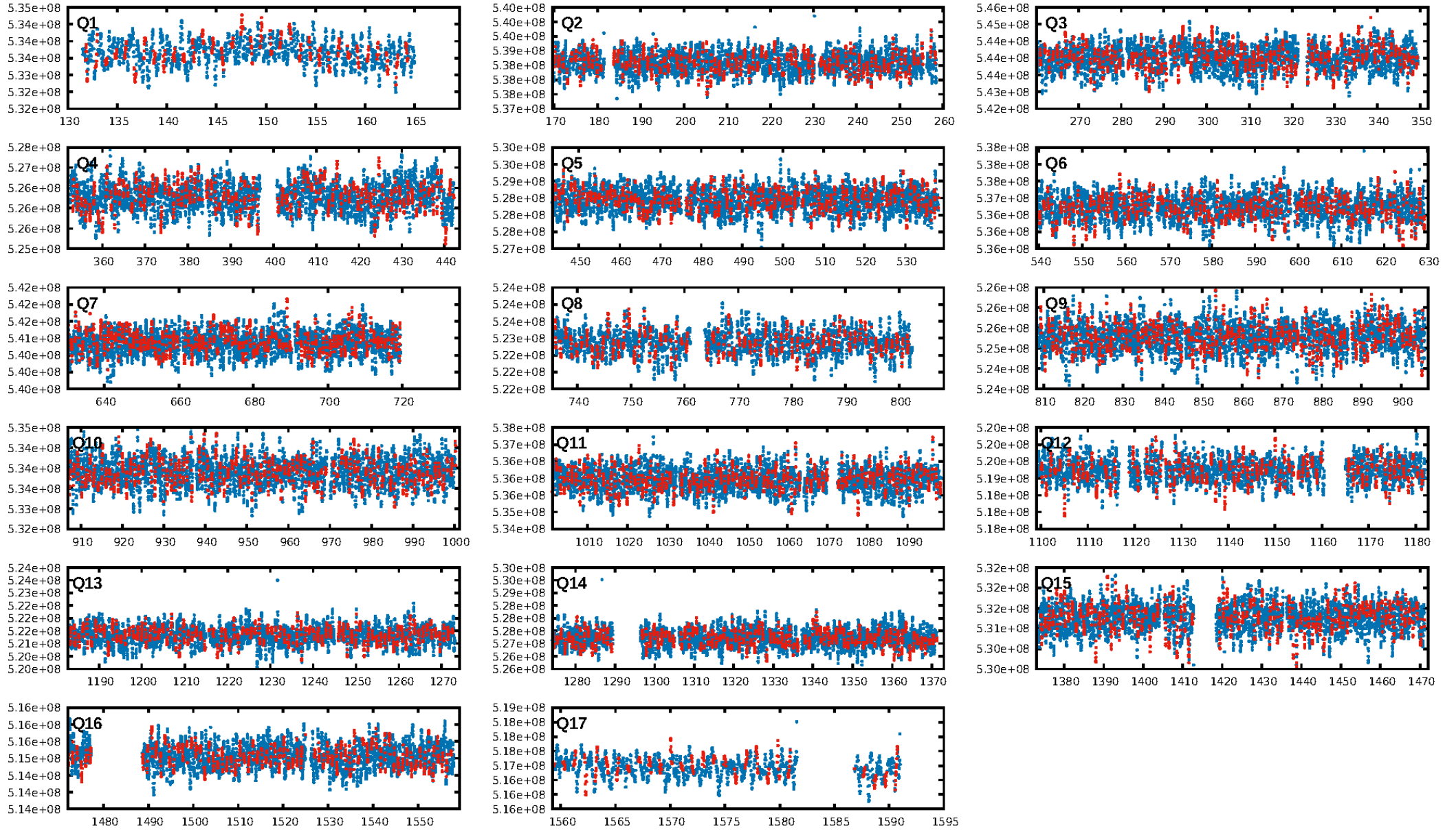
## DV Diagnostic Results:

ShortPeriod-sig: 99.9% [3.37σ]  
LongPeriod-sig: 100.0% [980.50σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.81e-12  
RollingBand-fgt: 0.98 [1061/1079]  
GhostDiagnostic-chr: -1.585  
Centroid-sig: 41.3%  
Centroid-so: 0.464 arcsec [1.27σ]  
OotOffset-rm: 0.404 arcsec [1.56σ]  
KicOffset-rm: 0.363 arcsec [1.25σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.53 [9/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:02 Z

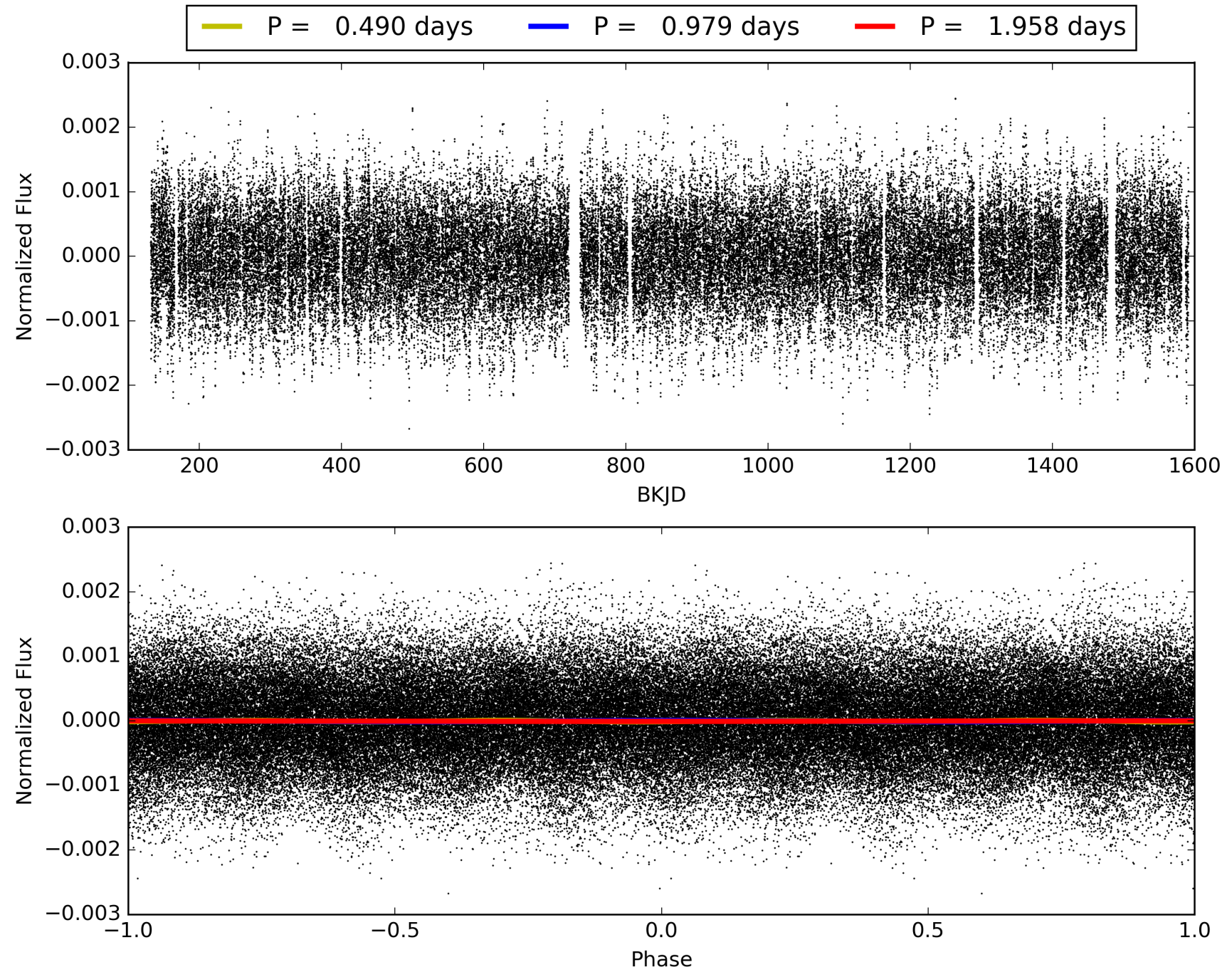
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008429528-03, PDC Light Curves



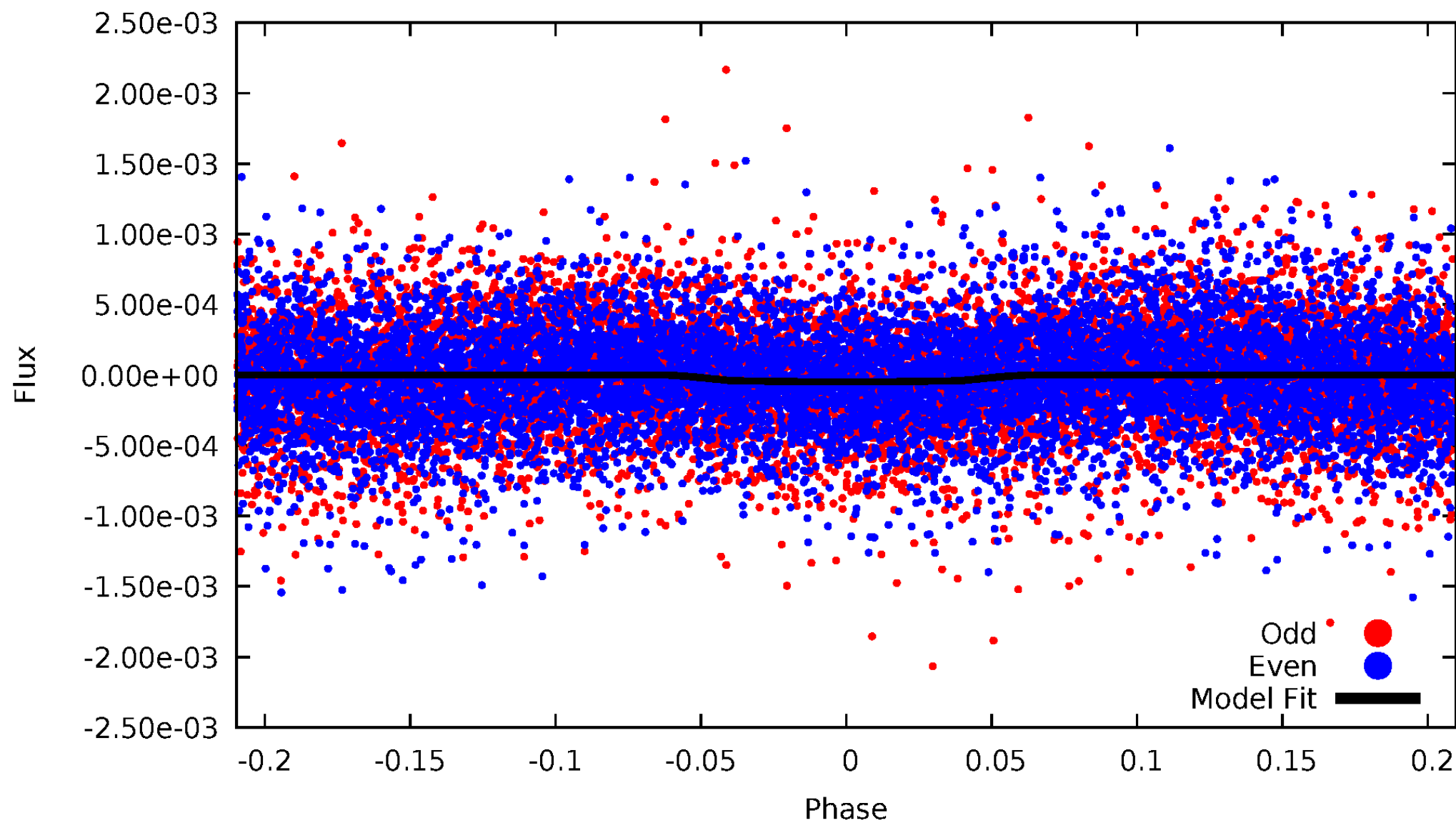


# TCE 008429528-03



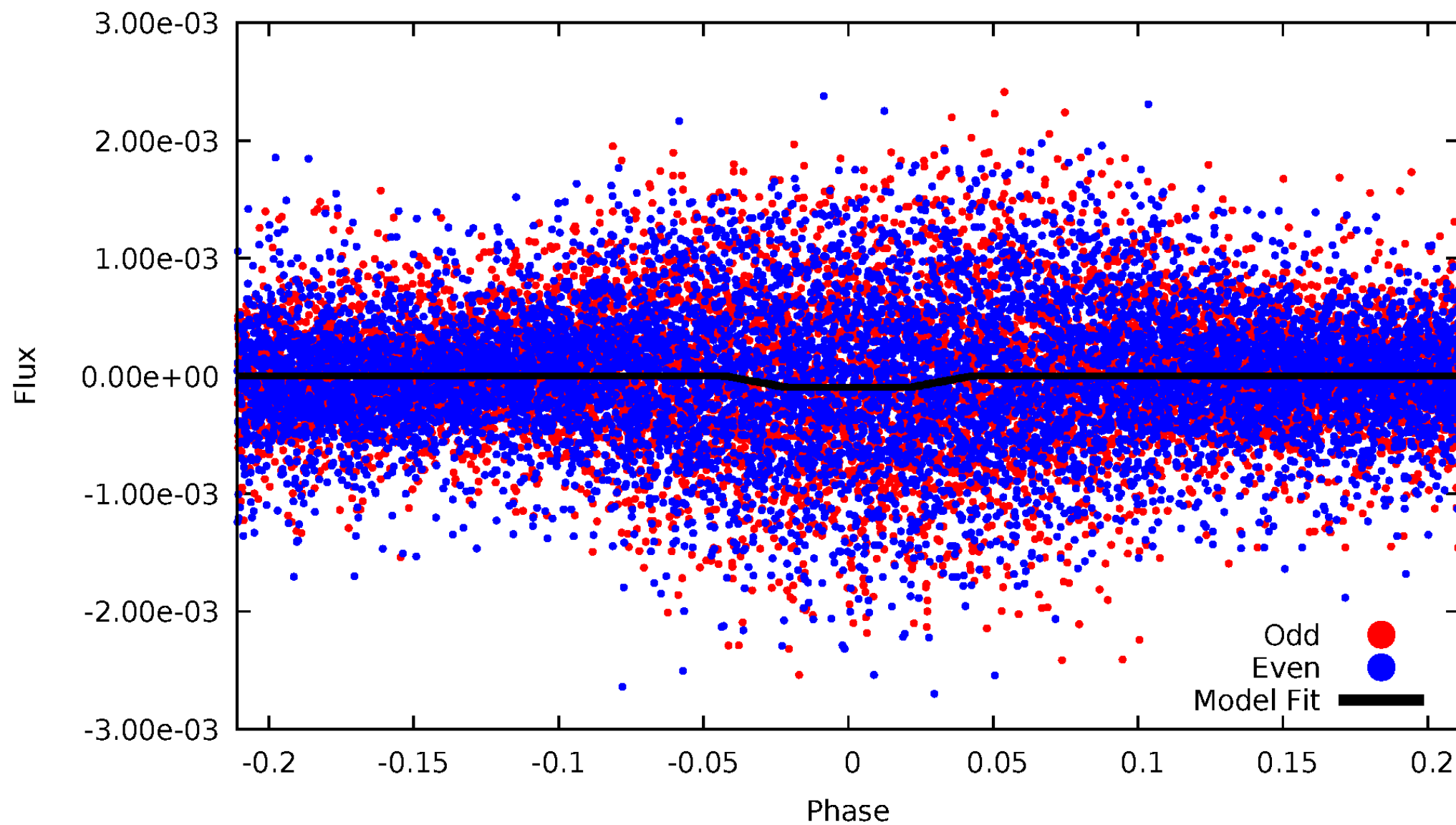
# DV Odd/Even

TCE 008429528-03



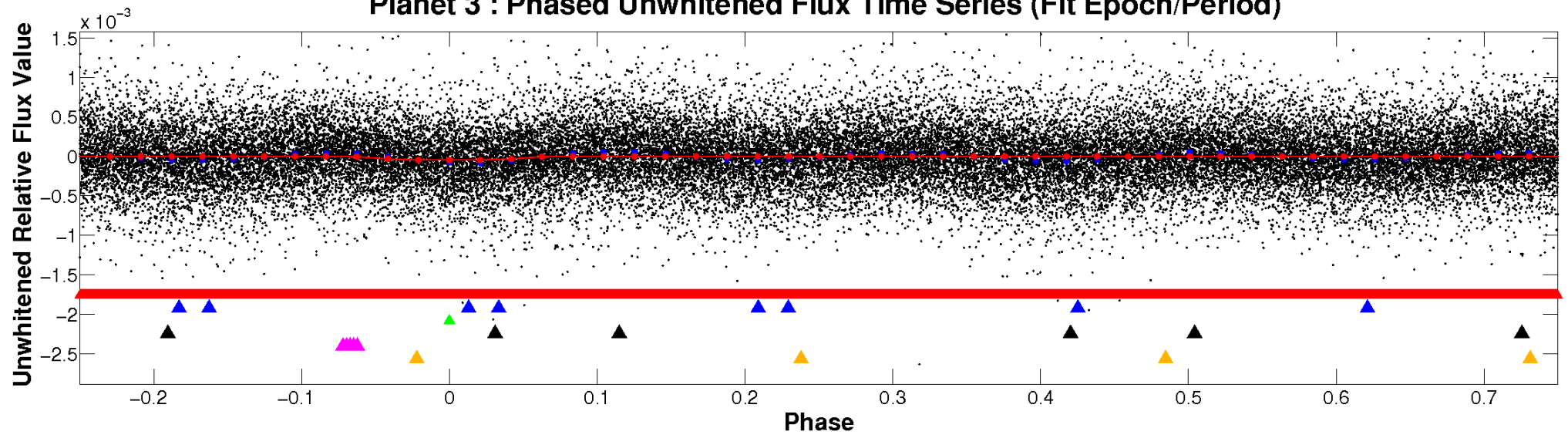
# ALT Odd/Even

TCE 008429528-03

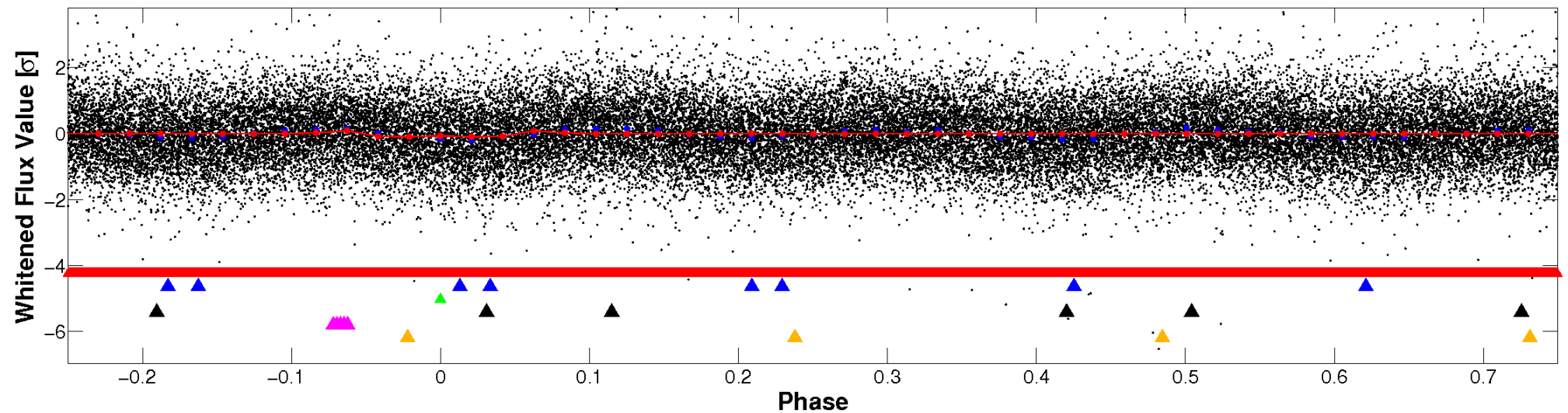


# Non-Whitened Vs. Whitened Light Curve

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



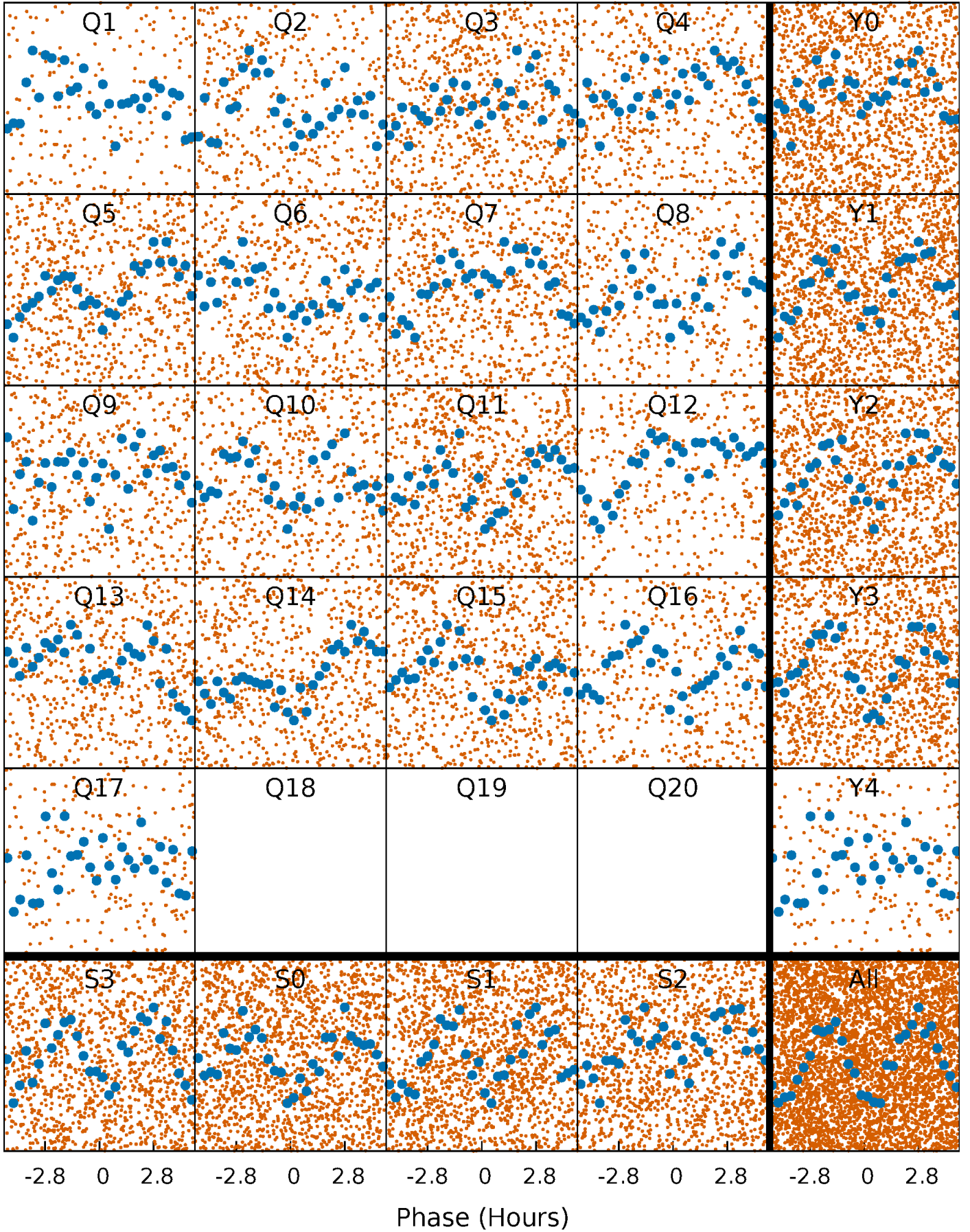
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





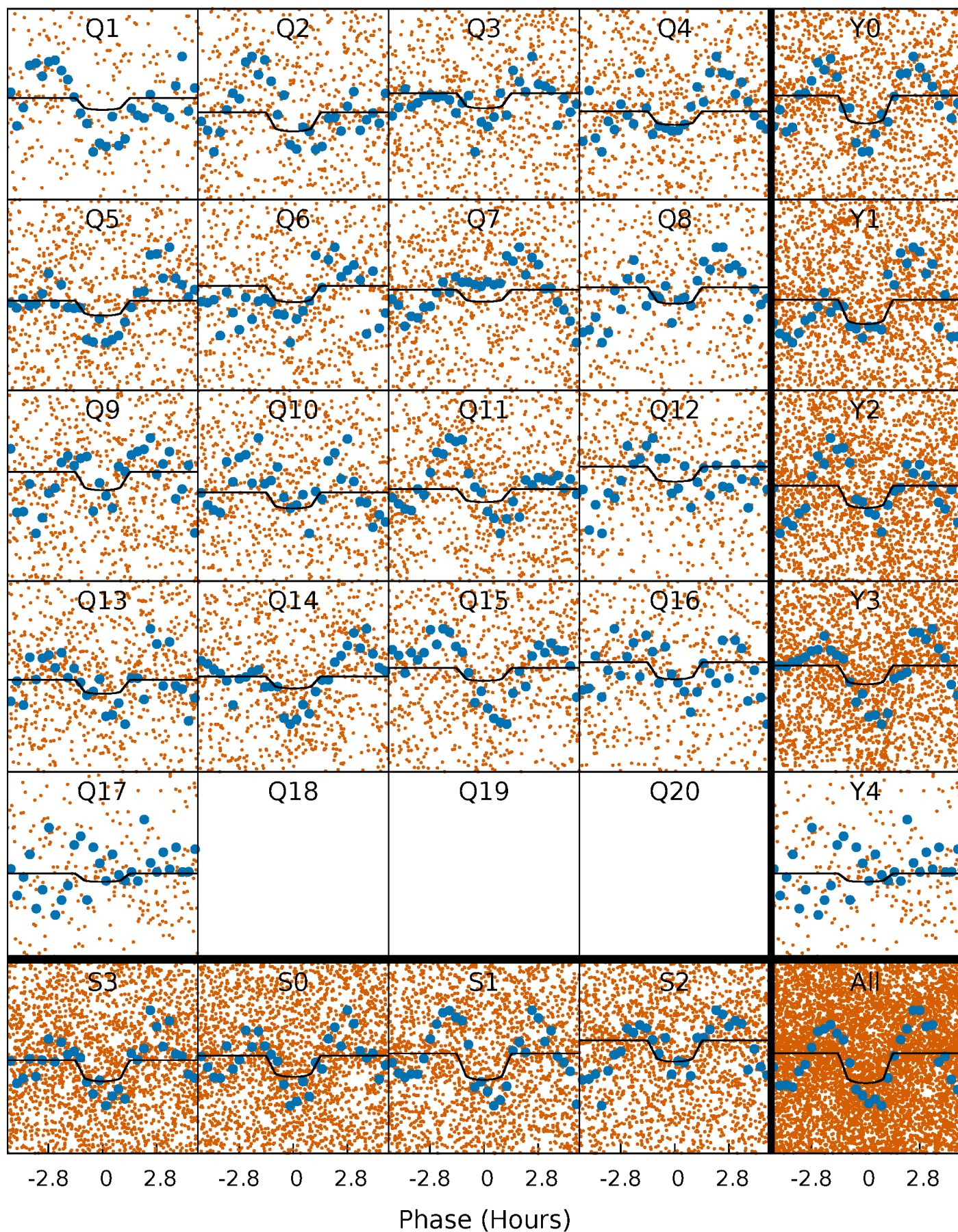
# PDC Quarter-Phased Transit Curves

TCE 008429528-03   P= 0.979038 Days    $T_0=131.887917$  (BKJD)



# DV Quarter-Phased Transit Curves

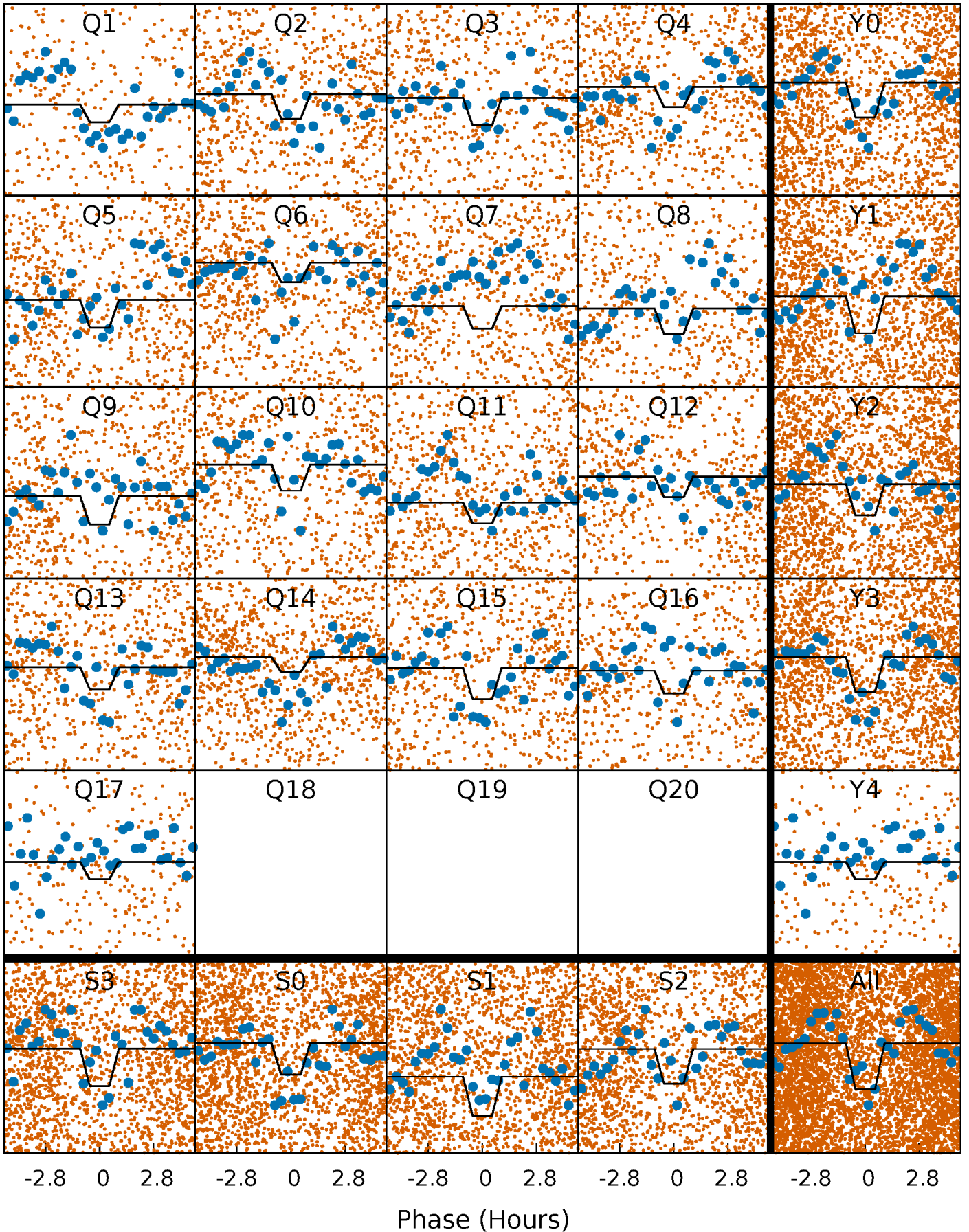
TCE 008429528-03   P= 0.979038 Days    $T_0=131.887917$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

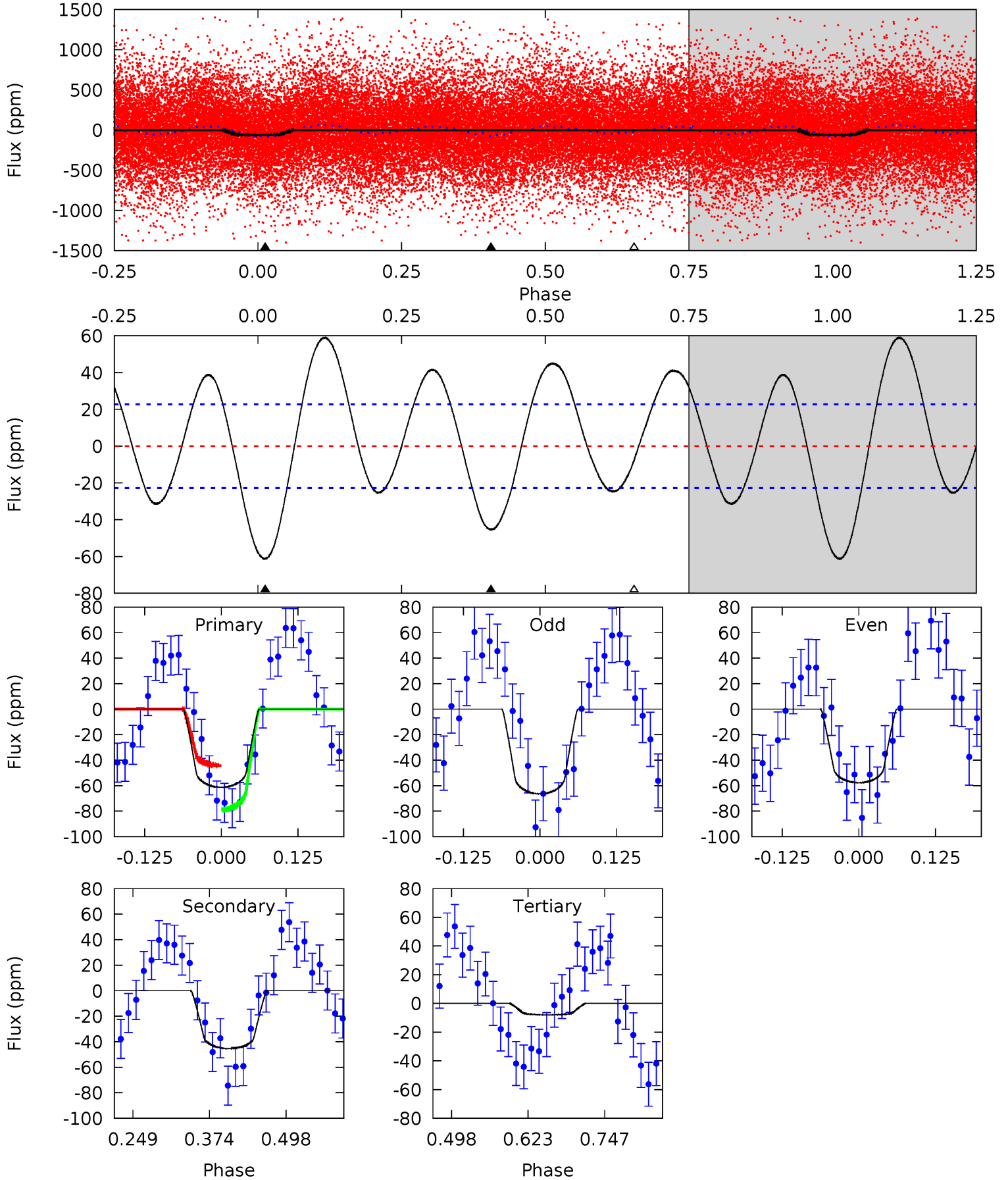
TCE 008429528-03 P= 0.979054 Days  $T_0=131.887303$  (BKJD)



# DV Model-Shift Uniqueness Test

008429528-03, P = 0.979038 Days, E = 130.908879 Days

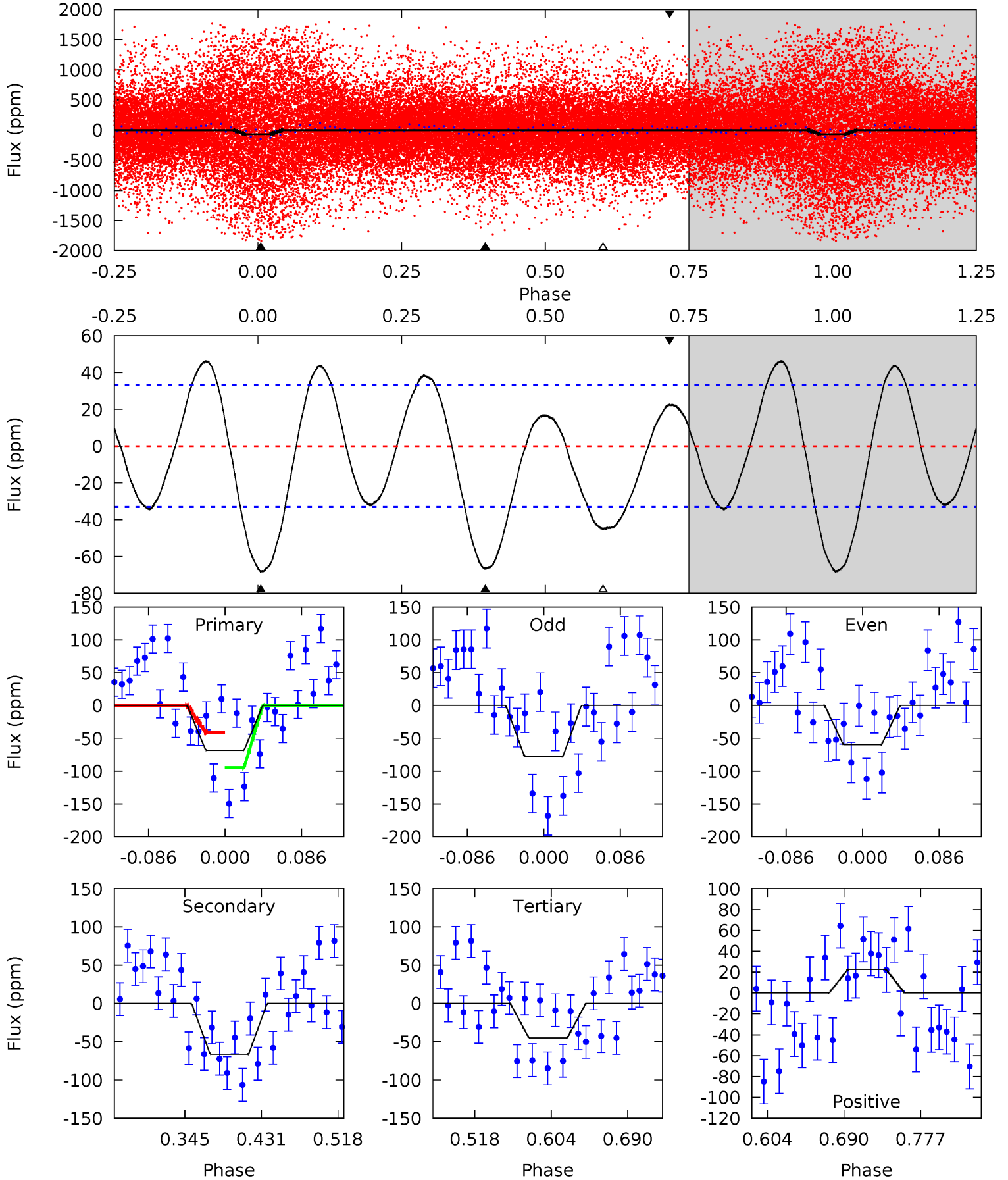
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	8.99	1.58	0	4.52	1.54	4.55	10.6	12.2	7.42	8.99	0.87	1.08	0.49	3.47



# Alt Model-Shift Uniqueness Test

008429528-03, P = 0.979054 Days, E = 130.908249 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
9.49	9.25	6.25	3.13	4.60	1.72	3.75	3.24	6.36	3.00	6.12	1.24	0.91	0.40	3.69



### Stellar Parameters For KIC 008429528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7232^{+228}_{-304}$	$4.047^{+0.214}_{-0.175}$	$-0.320^{+0.300}_{-0.300}$	$1.879^{+0.543}_{-0.543}$	$1.435^{+0.216}_{-0.265}$	$0.304^{+0.420}_{-0.132}$
	+3%/-4%	+5%/-4%	+94%/-94%	+29%/-29%	+15%/-18%	+138%/-43%
Source	KIC0	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 008429528-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-45 \pm 5$	$1.46^{+0.40}_{-0.38}$	$4119^{+325}_{-311}$	$6811^{+1243}_{-783}$	$5.519^{+4.308}_{-2.203}$
Alt.	$-67 \pm 7$	$2.00^{+0.50}_{-0.42}$	$4134^{+346}_{-337}$	$6350^{+774}_{-535}$	$4.337^{+2.505}_{-1.571}$

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

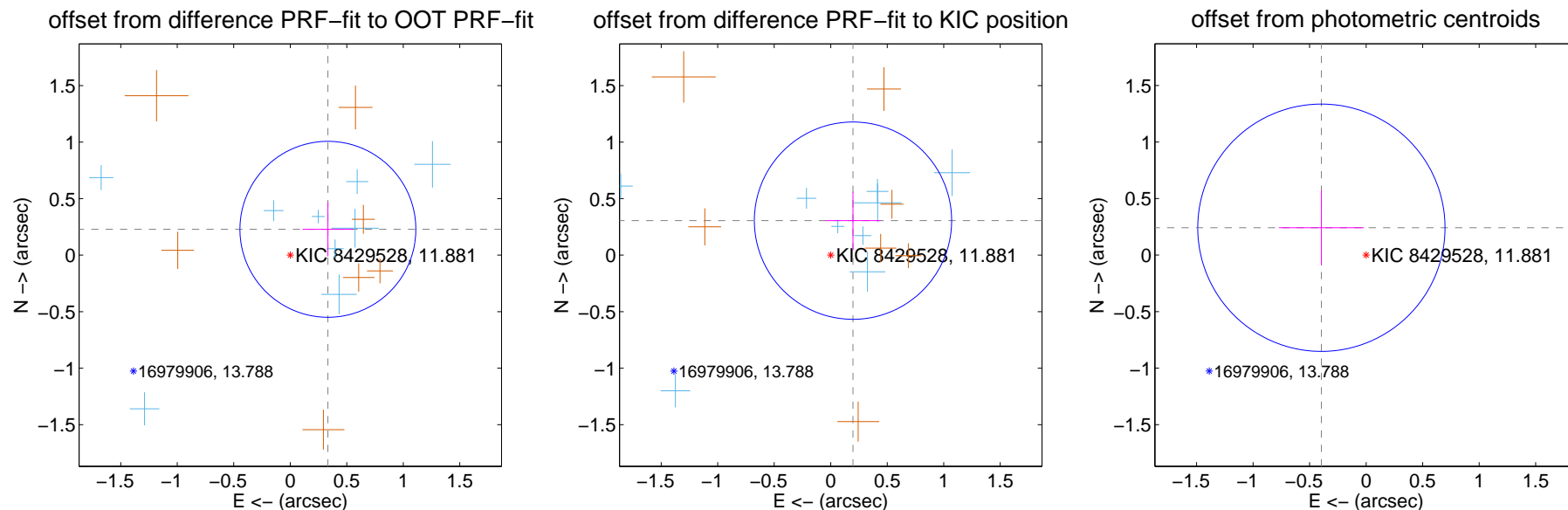
## DV Centroid Data

Supplemental centroid analysis for 008429528-03. **Kepler magnitude: 11.88.** Transit SNR 7.03

There are 9 quarters with good PRF difference image offsets

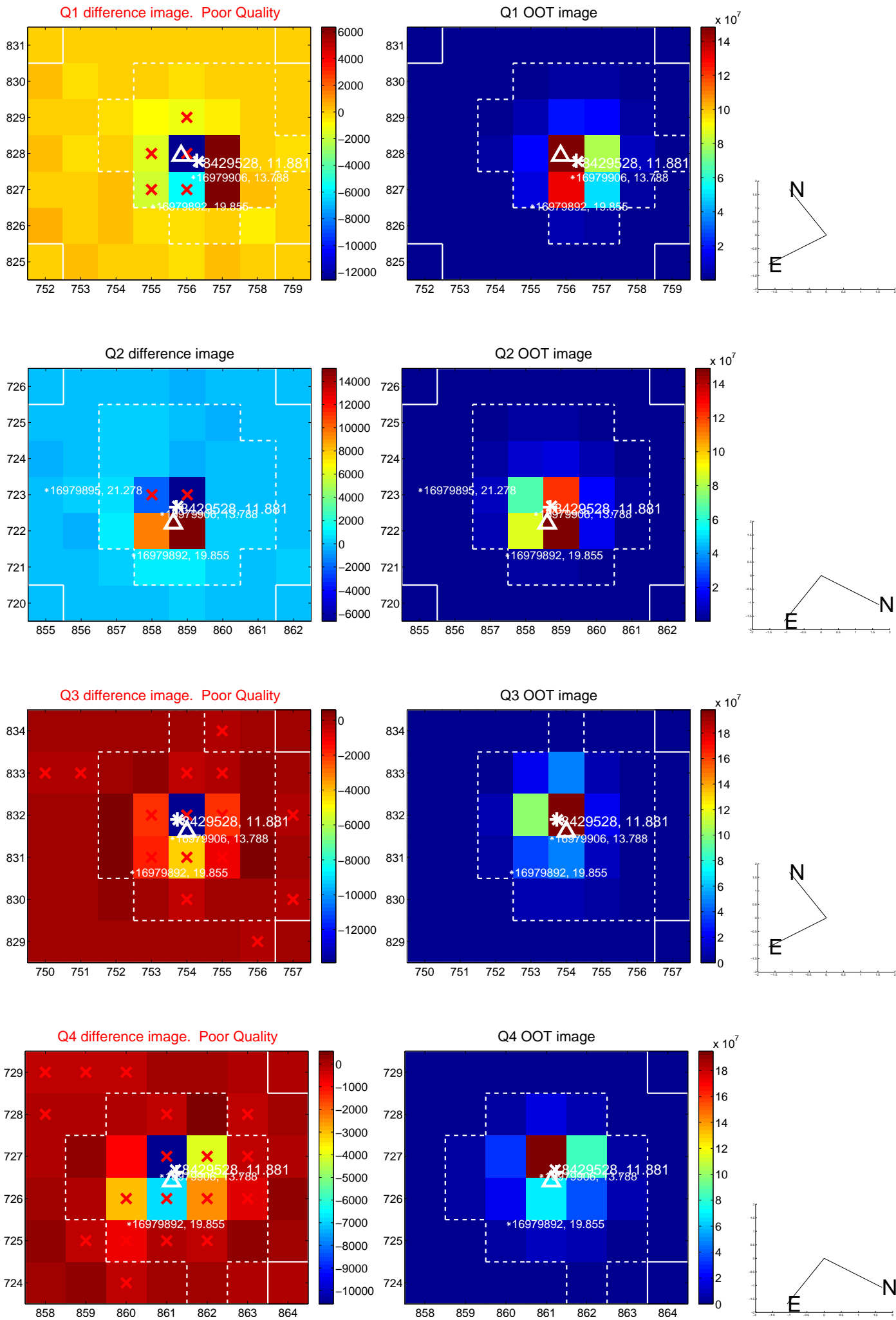
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.404 \pm 0.259$	1.56	$-0.333 \pm 0.225$	$0.229 \pm 0.240$
PRF-fit source offset from KIC position	$0.363 \pm 0.291$	1.25	$-0.197 \pm 0.243$	$0.305 \pm 0.256$
photometric centroid source offset	$0.46 \pm 0.36$	1.27	$0.40 \pm 0.38$	$0.24 \pm 0.33$



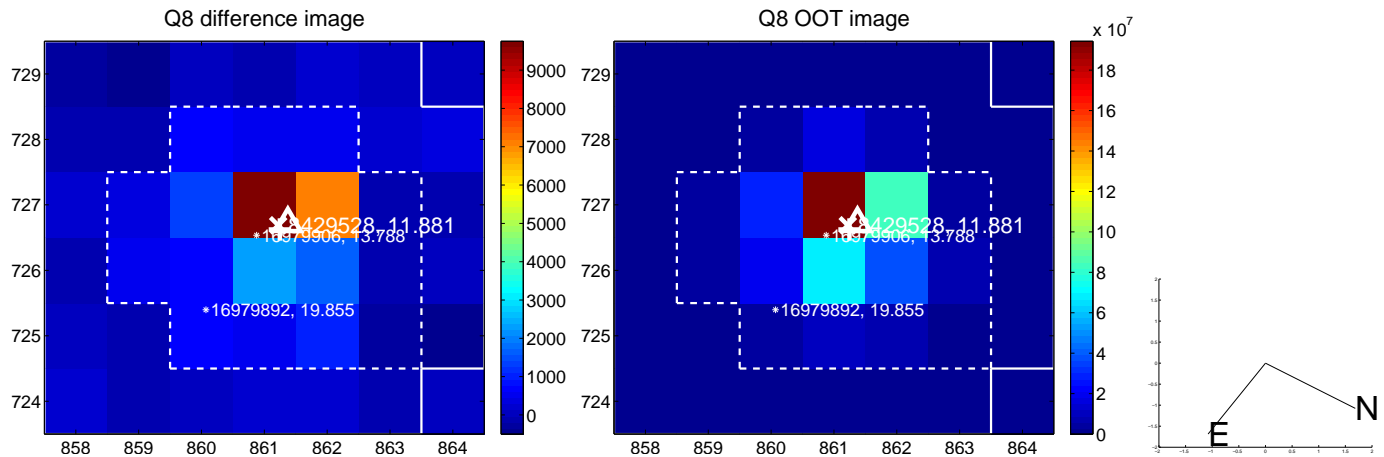
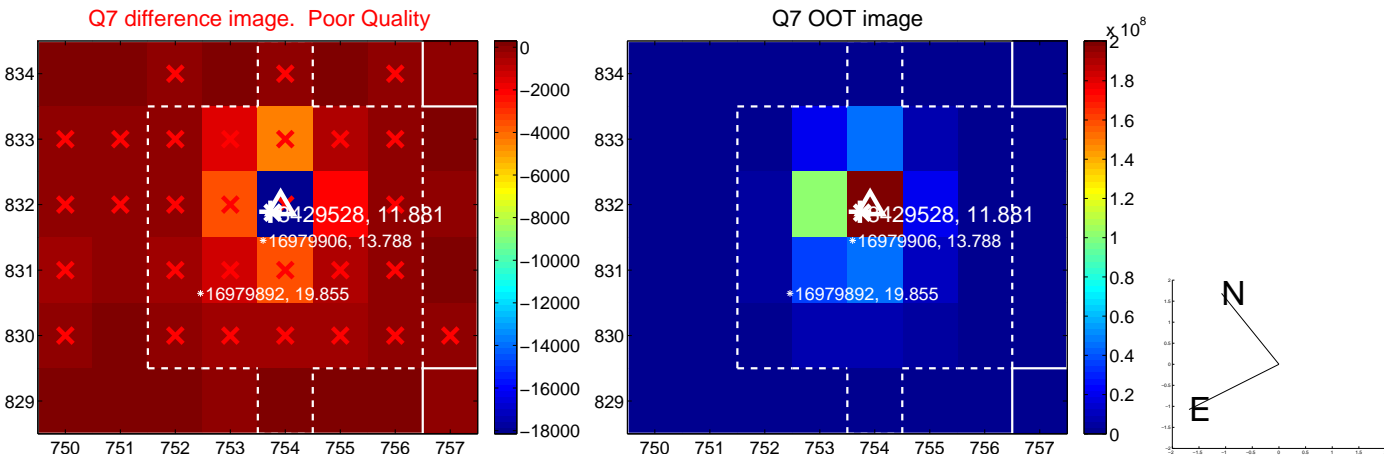
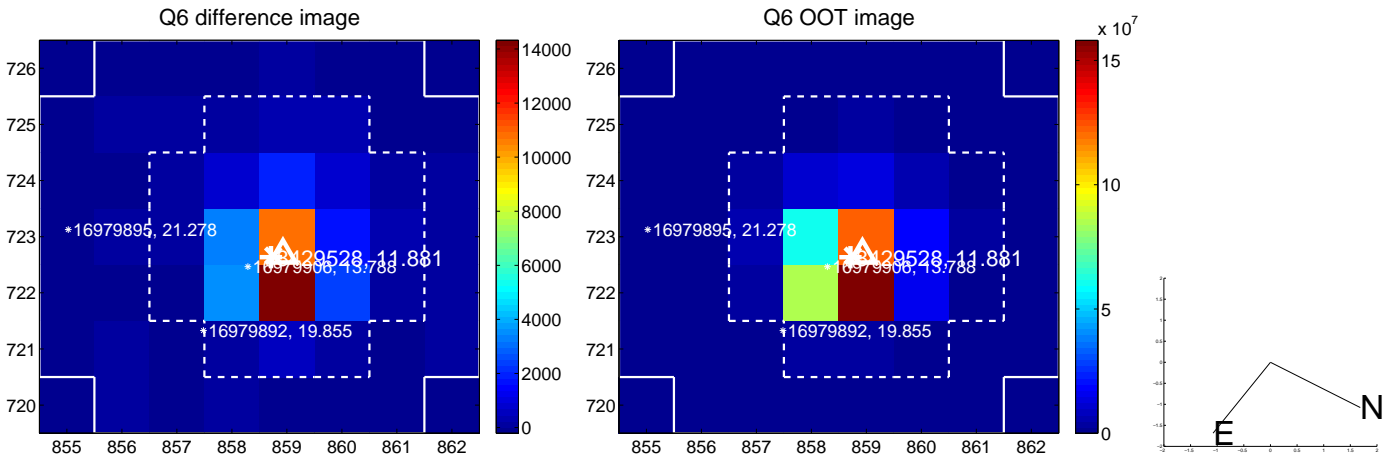
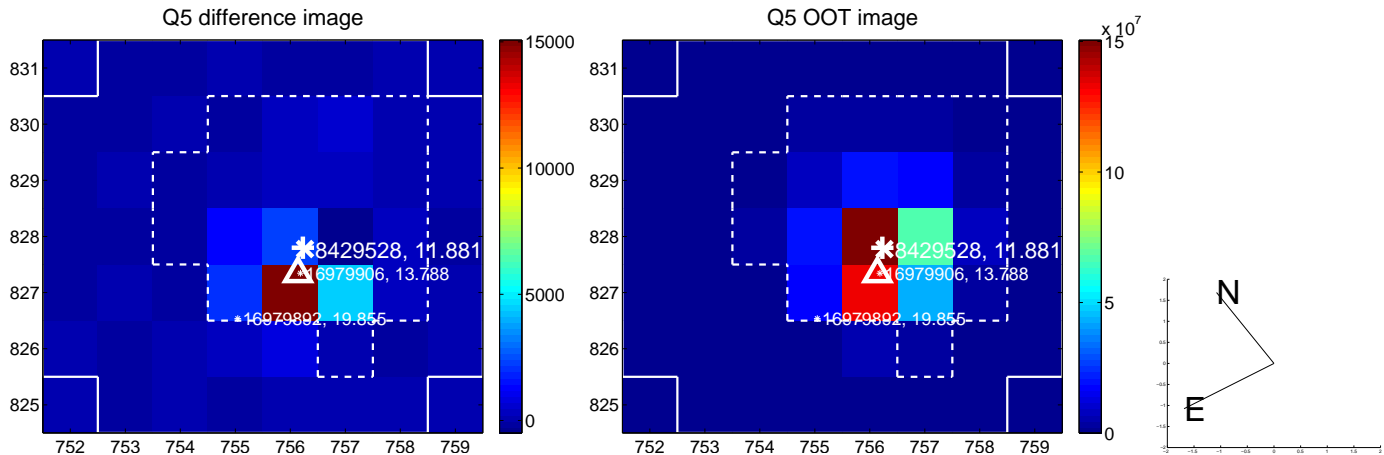
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



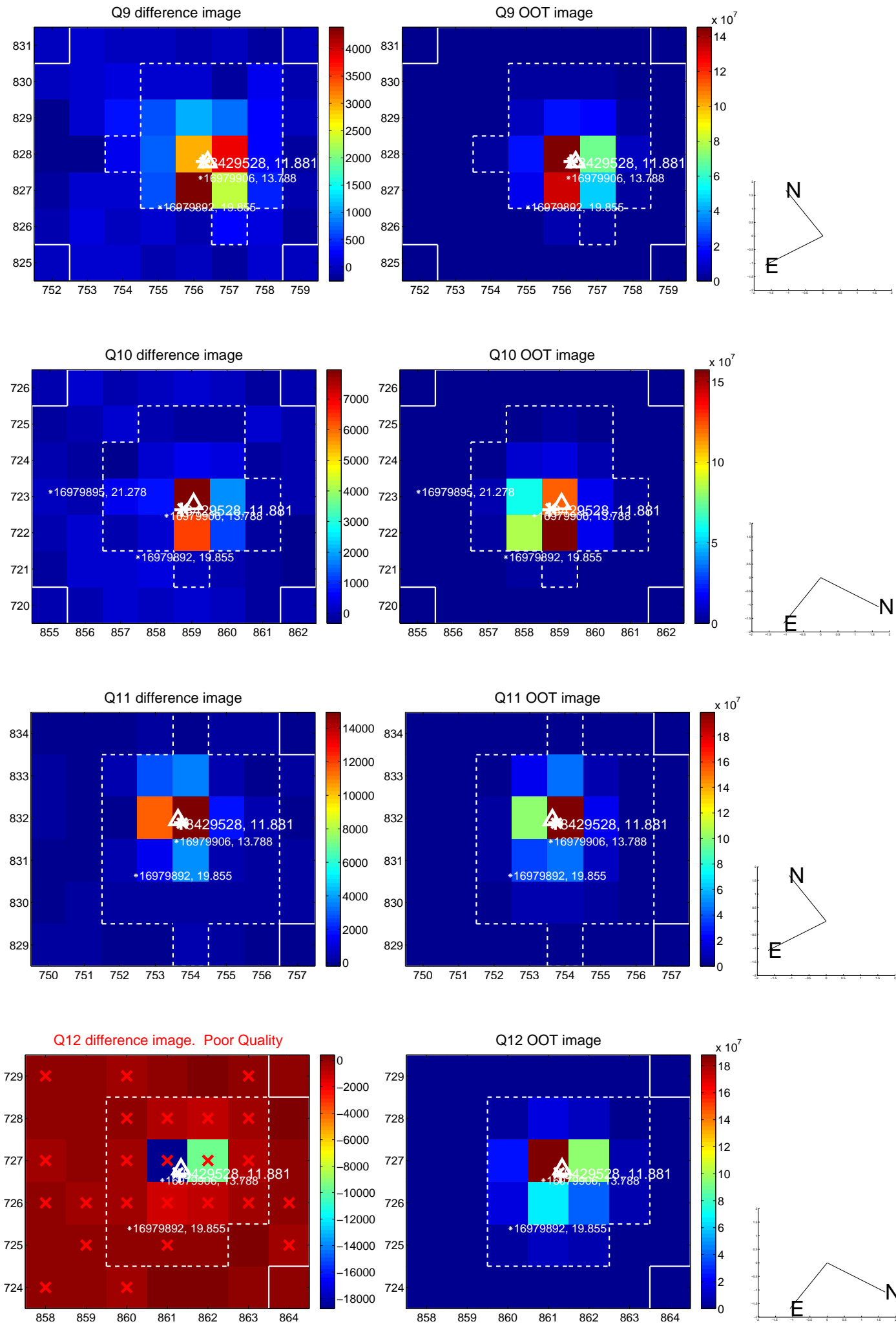


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

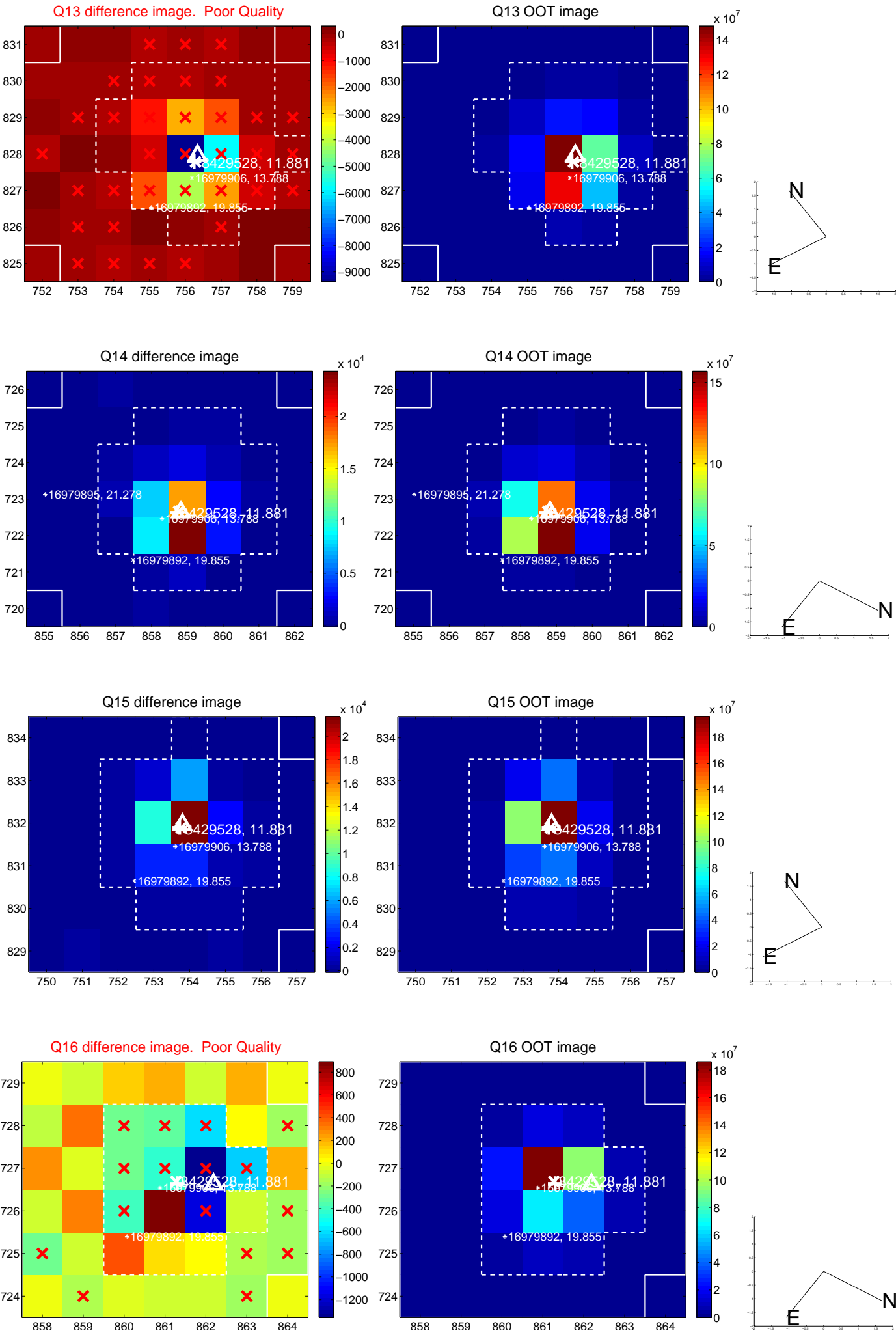




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



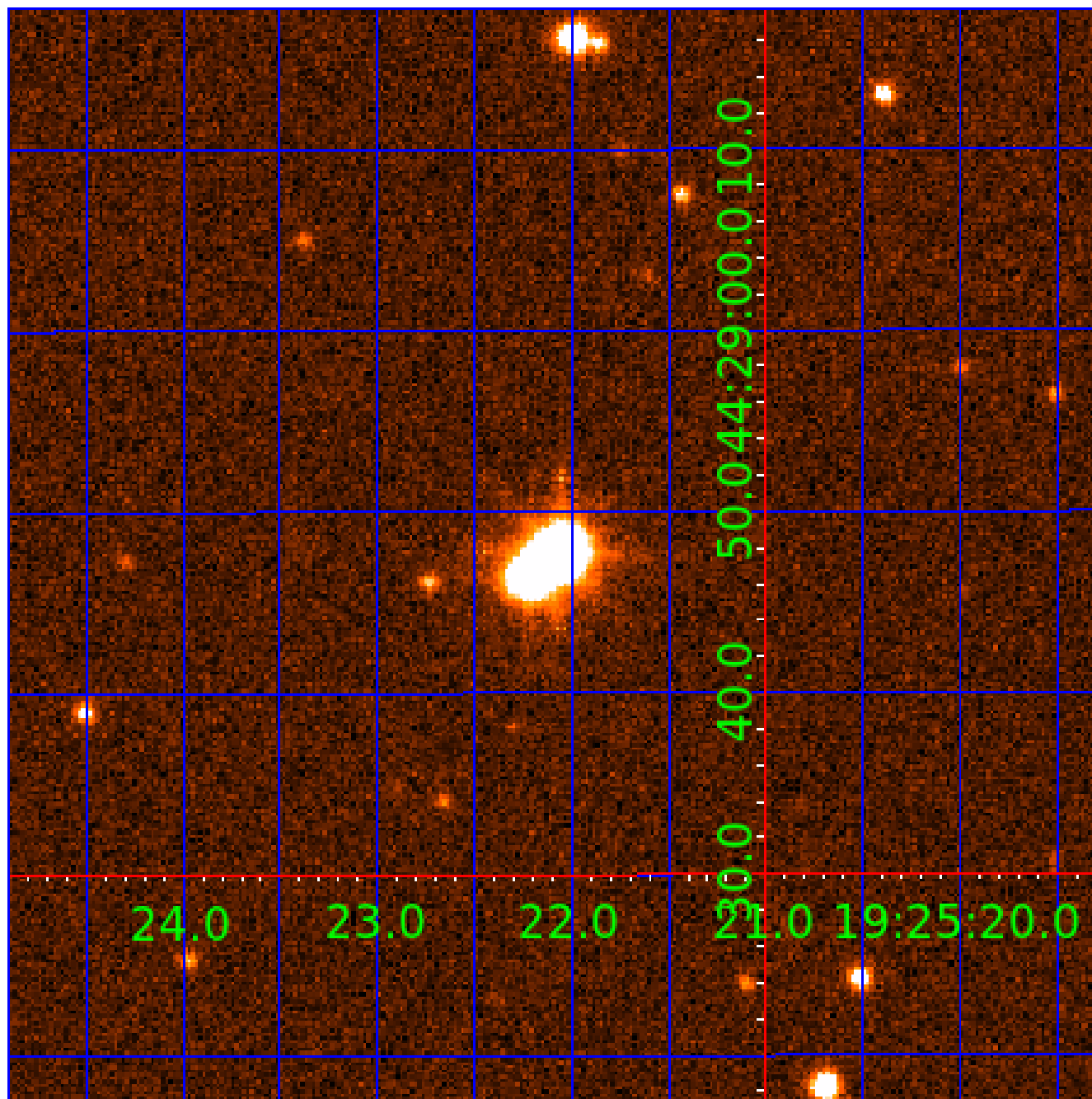
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 008429528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008429528-01	OBS	No	0.588696	131.911433	20.3	1.290	10.0	6.7	1.88	7232	0.98	35976.97
008429528-02	OBS	No	196.594755	208.457454	1228.6	4.106	10.4	6.8	1.88	7232	8.16	15.53
008429528-03	OBS	No	0.979038	131.887917	46.4	2.463	9.1	7.0	1.88	7232	1.49	18259.13
008429528-04	OBS	No	251.313750	320.872502	1371.5	4.796	8.8	8.0	1.88	7232	12.83	11.19
008429528-05	OBS	No	289.797512	189.580744	1506.3	12.050	8.5	7.4	1.88	7232	8.52	9.26
008429528-06	OBS	No	408.017238	200.398953	959.4	8.818	7.8	7.3	1.88	7232	6.81	5.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008429528-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008429528-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008429528-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008429528-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
008429528-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT
008429528-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT

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

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

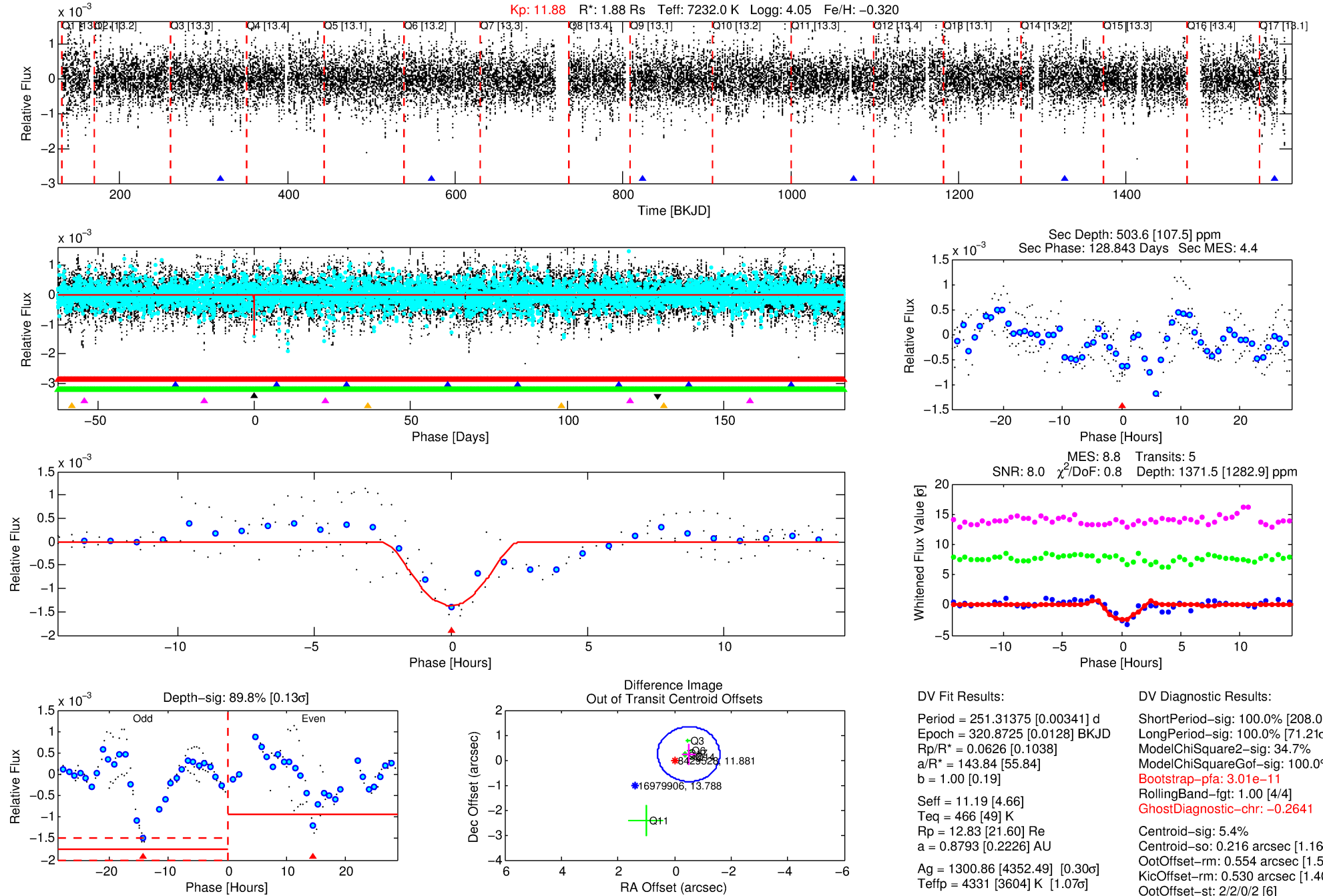
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008429528-04

No Significant Match Found

# DV One-Page Summary

KIC: 8429528 Candidate: 4 of 6 Period: 251.314 d

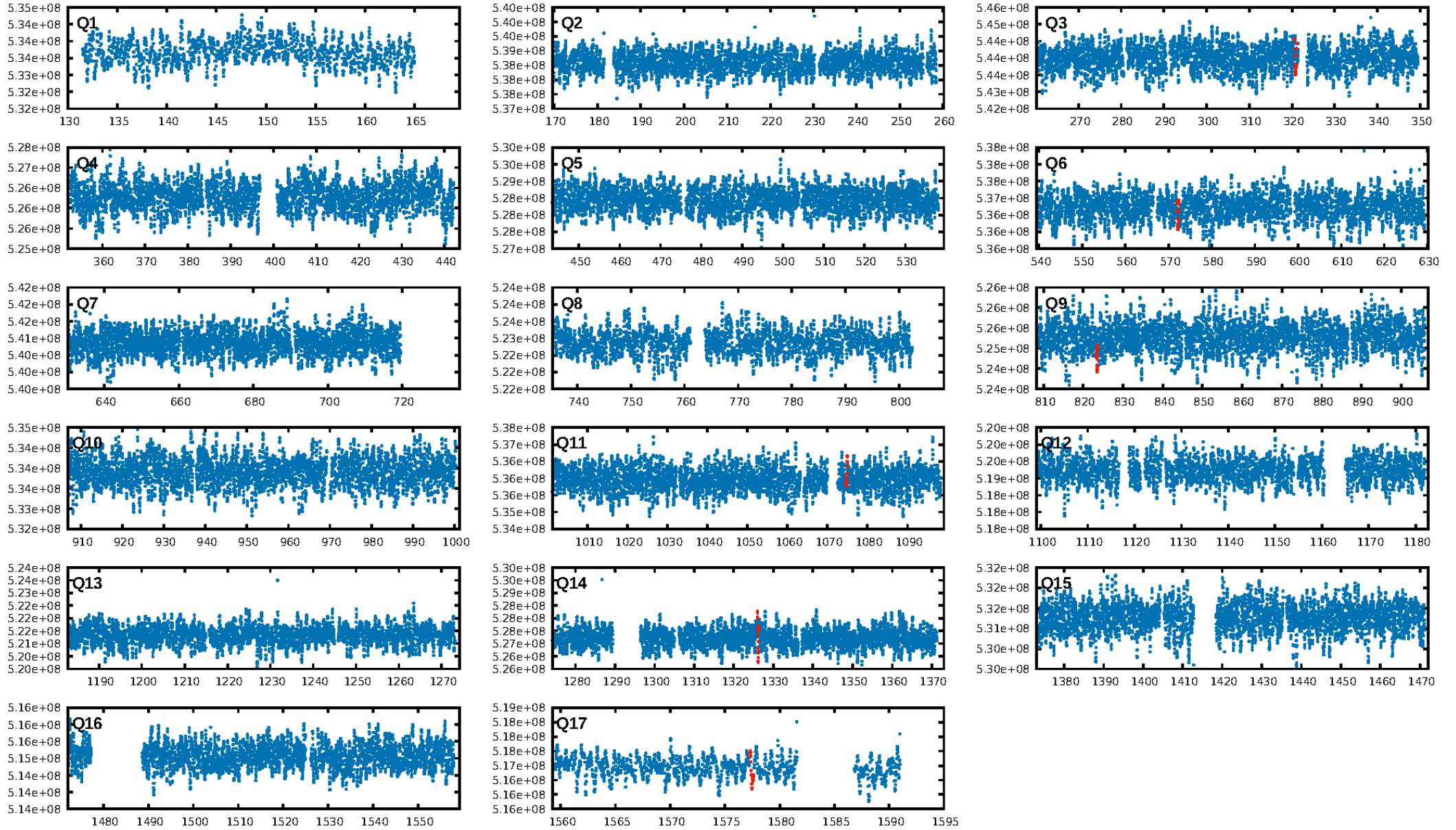


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:11 Z

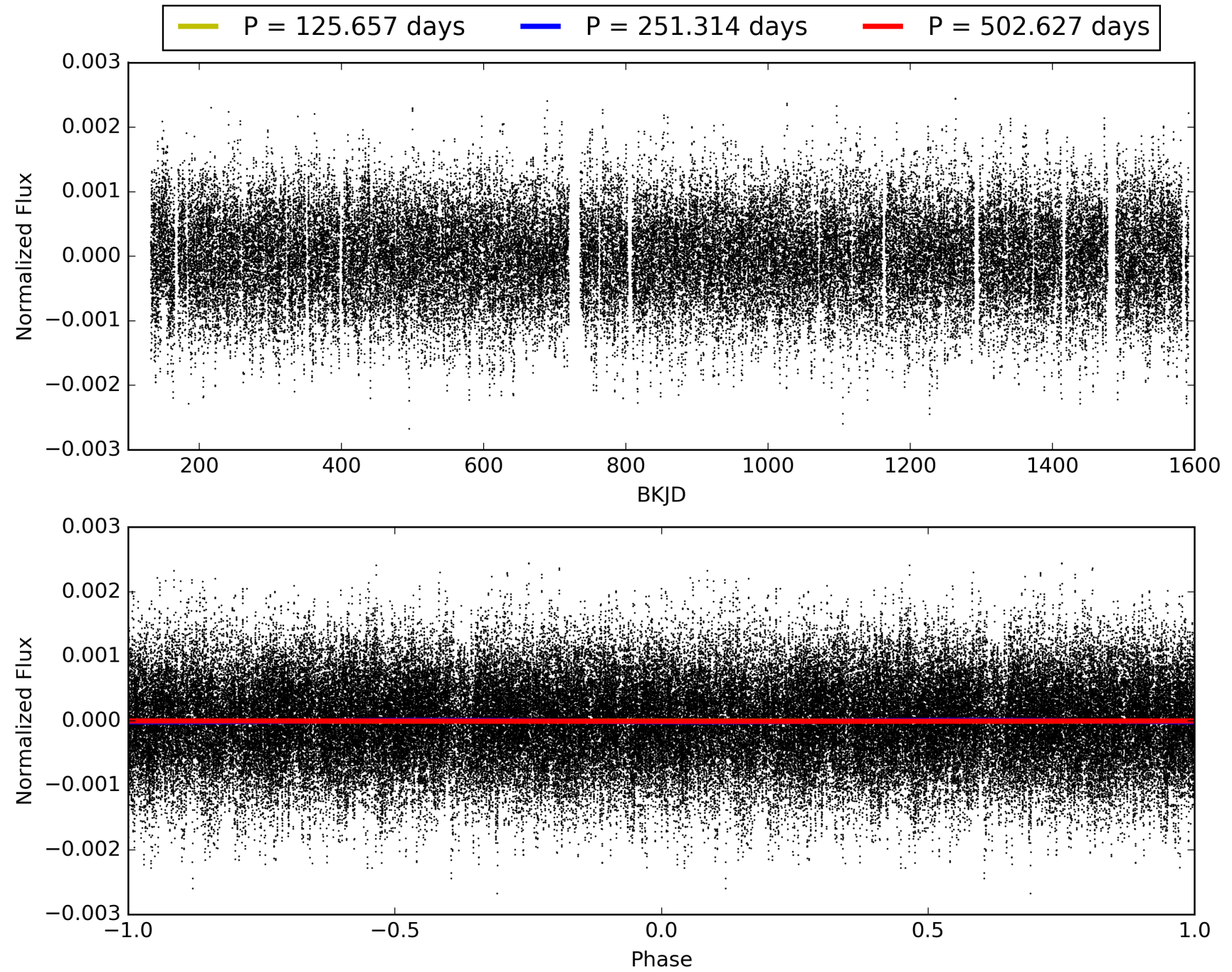
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008429528-04, PDC Light Curves

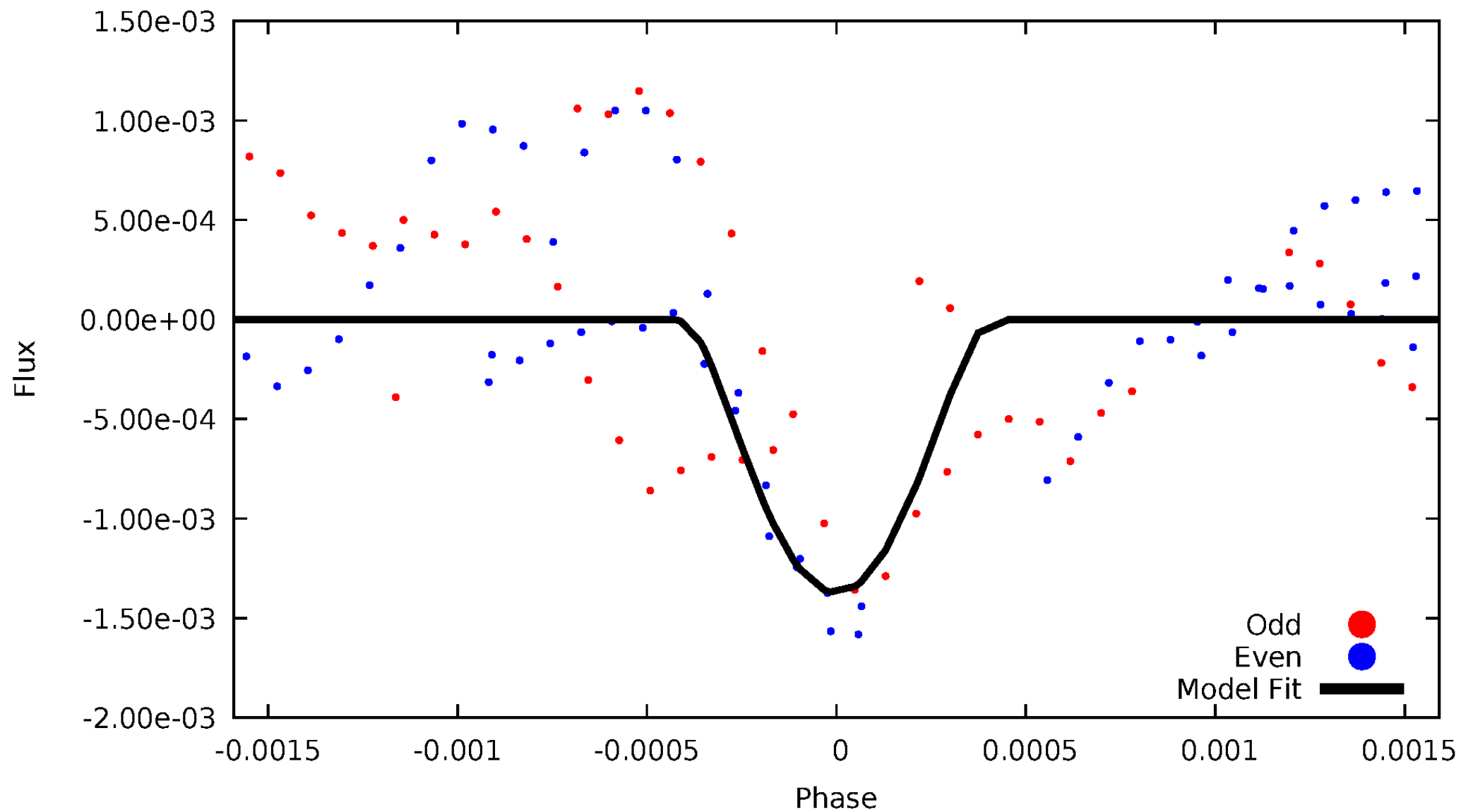


# TCE 008429528-04



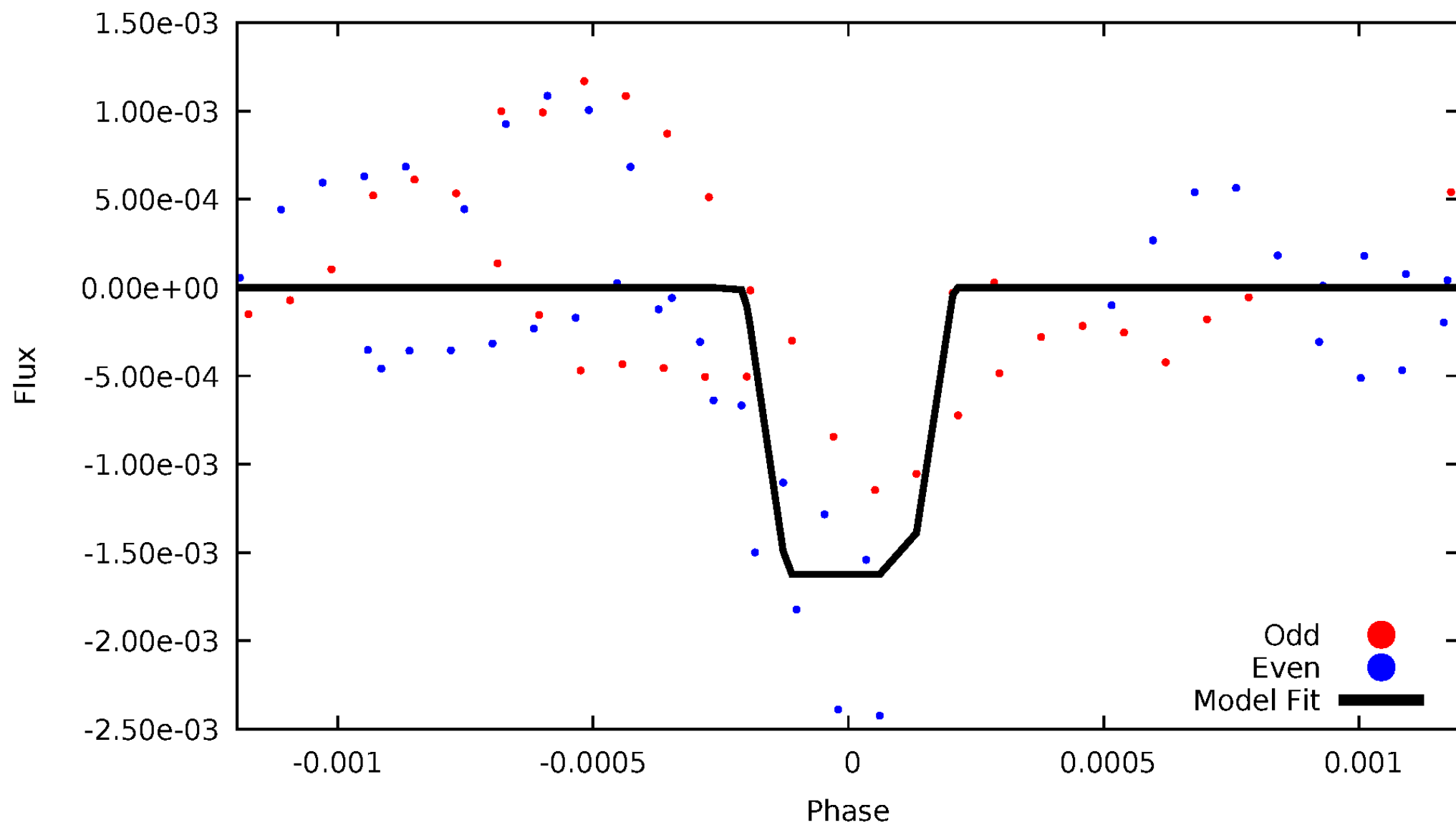
# DV Odd/Even

TCE 008429528-04



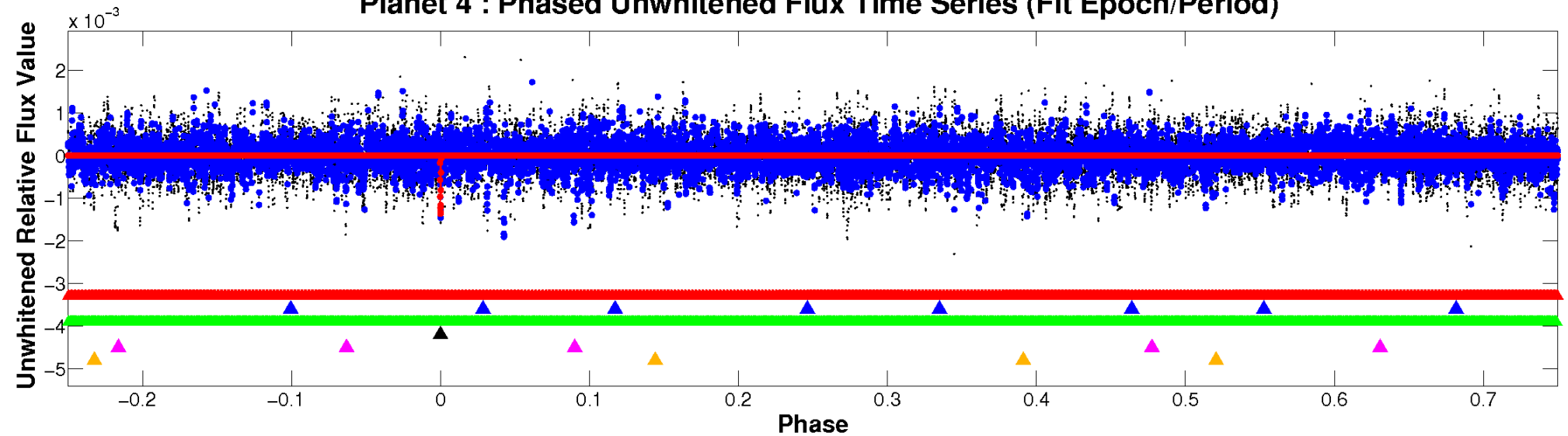
# ALT Odd/Even

TCE 008429528-04

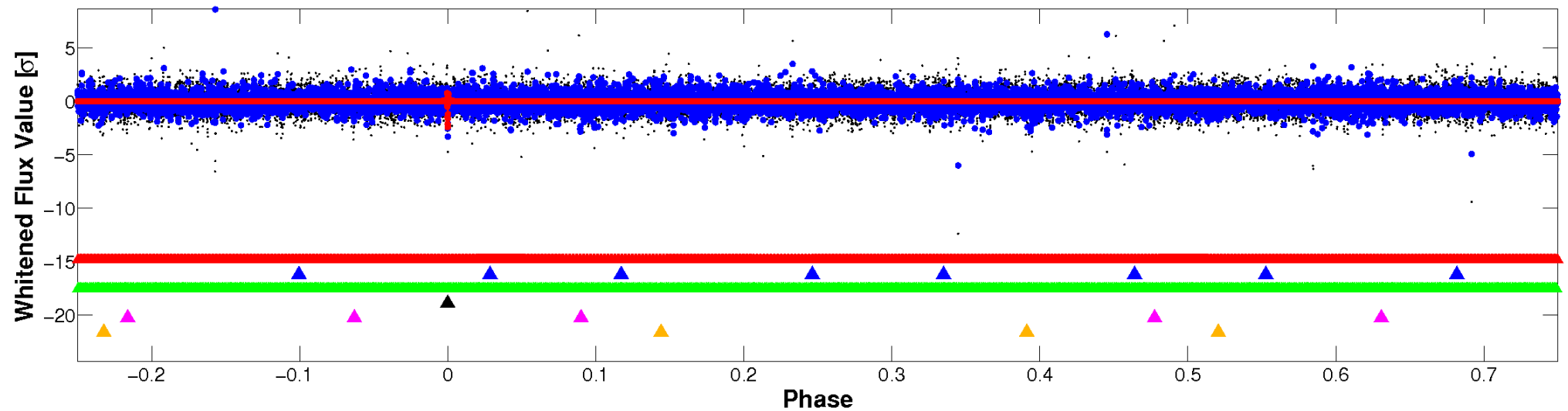


# Non-Whitened Vs. Whitened Light Curve

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

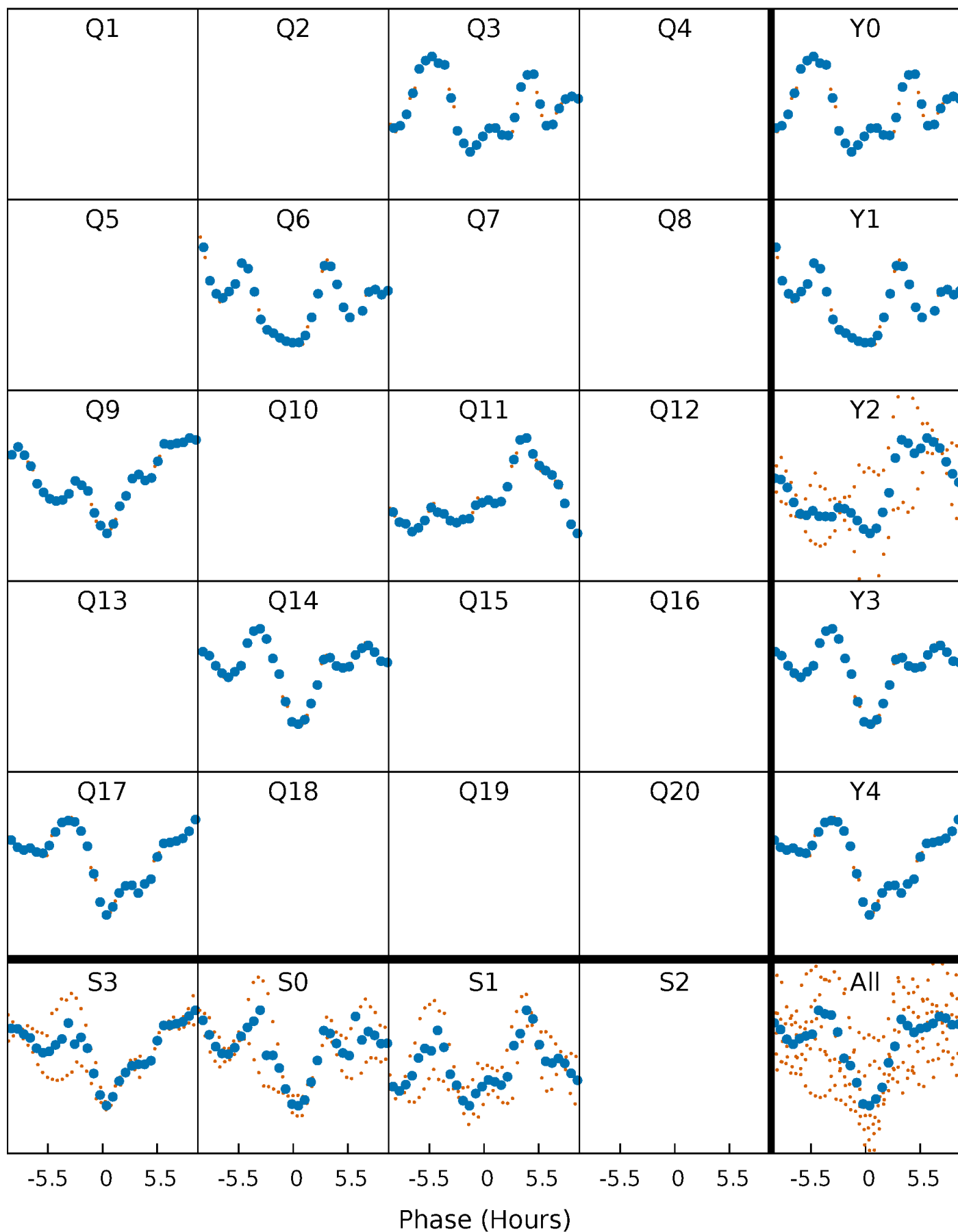


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

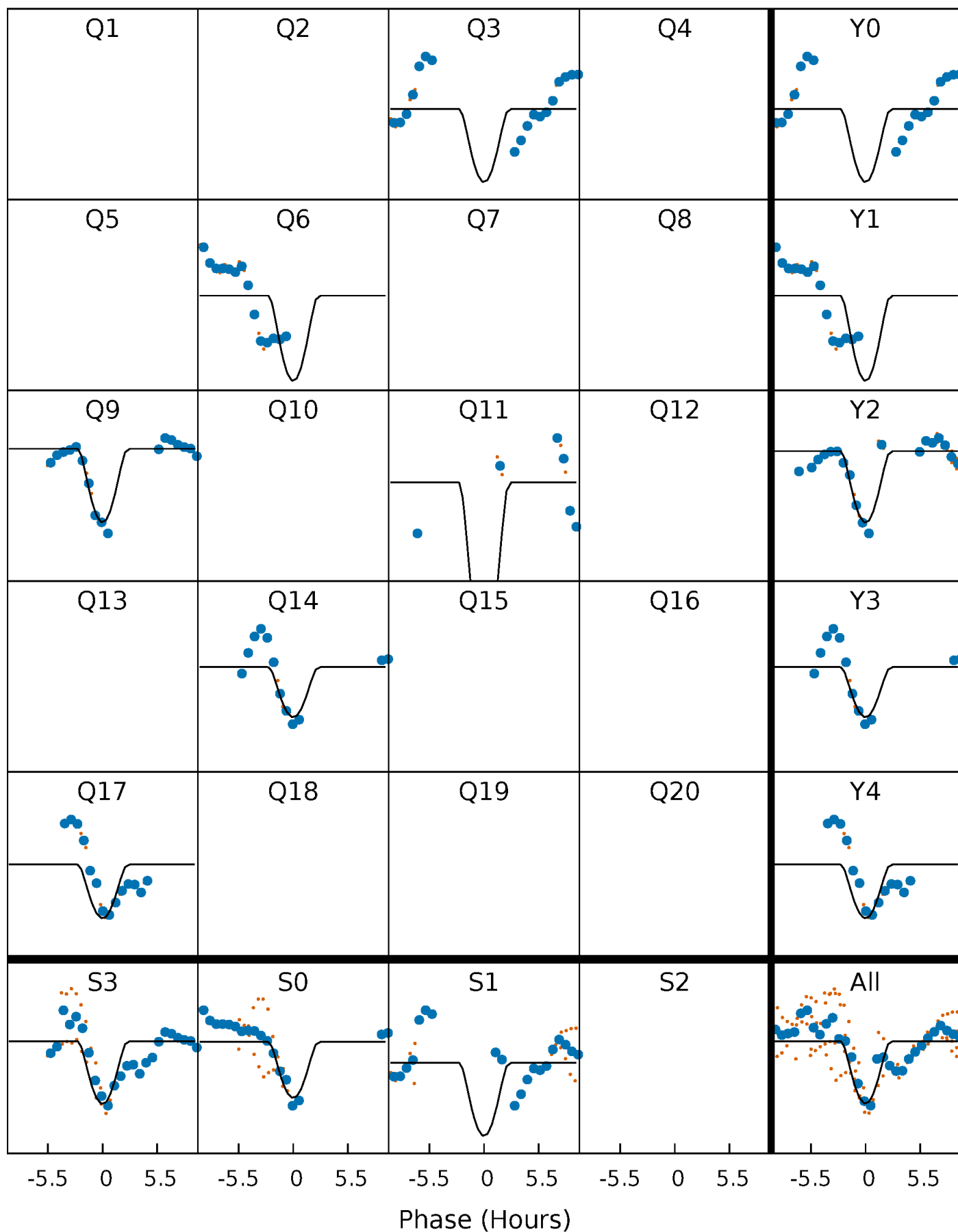
TCE 008429528-04     $P=251.313750$  Days     $T_0=320.872502$  (BKJD)





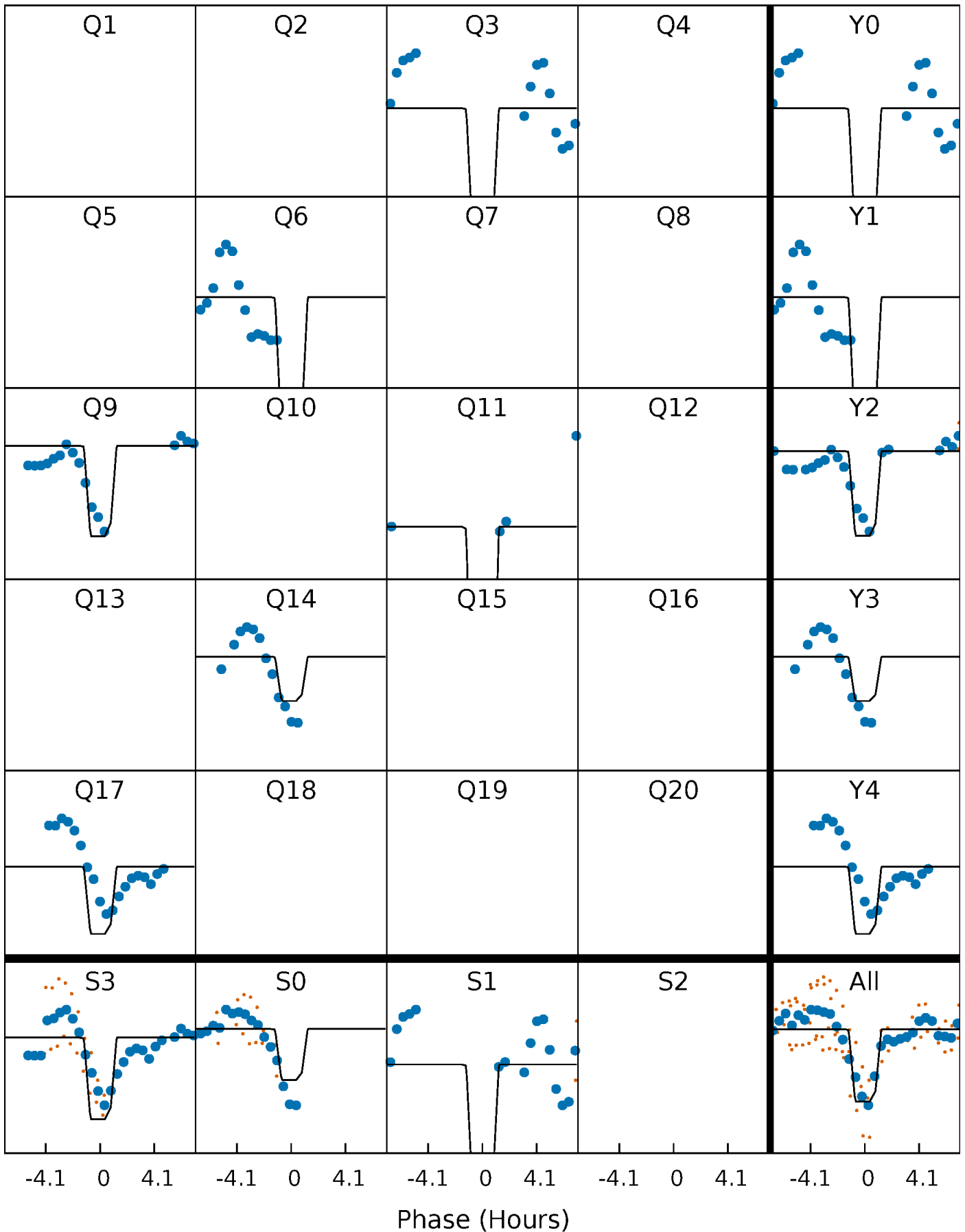
# DV Quarter-Phased Transit Curves

TCE 008429528-04   P=251.313750 Days    $T_0=320.872502$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

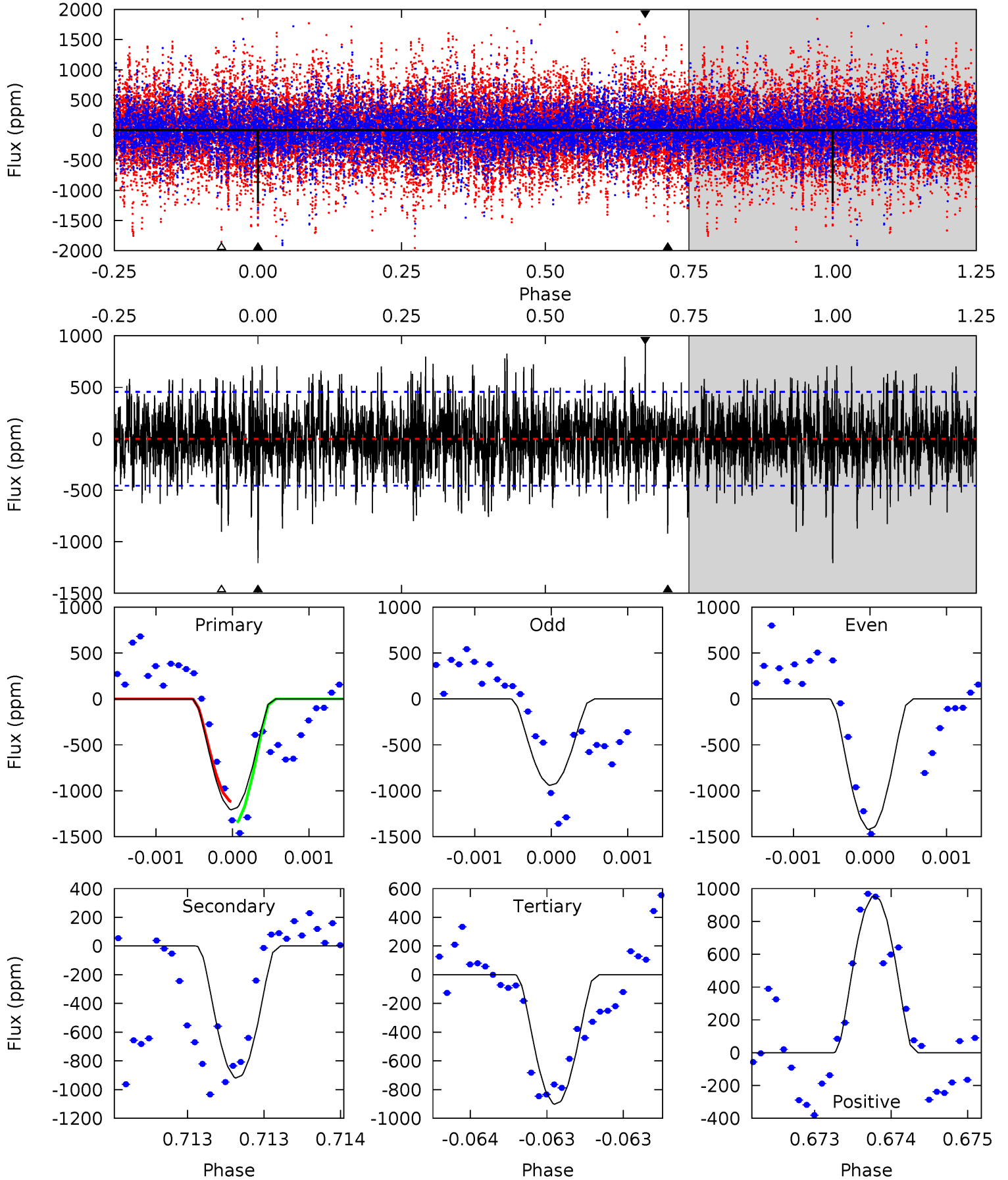
TCE 008429528-04 P=251.311493 Days  $T_0=320.882816$  (BKJD)



# DV Model-Shift Uniqueness Test

008429528-04, P = 251.313750 Days, E = 69.558752 Days

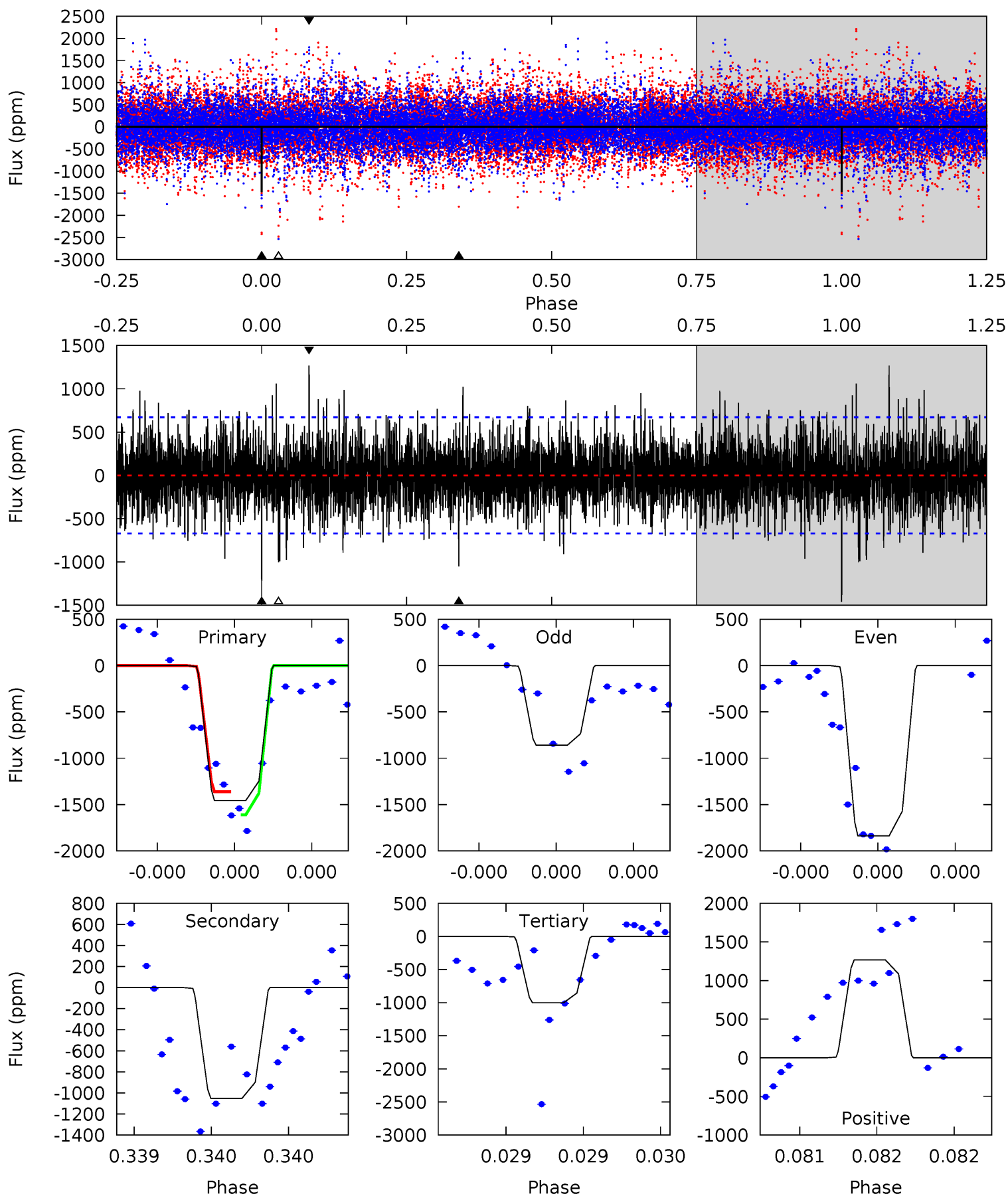
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	11.1	10.9	11.5	5.49	3.35	2.95	3.68	3.05	0.21	-0.41	2.89	0.81	0.44	1.22



# Alt Model-Shift Uniqueness Test

008429528-04, P = 251.311493 Days, E = 69.571323 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	8.77	8.36	10.6	5.60	3.52	2.12	3.82	1.59	0.42	-1.81	4.08	1.11	0.47	0.99



### Stellar Parameters For KIC 008429528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7232^{+228}_{-304}$	$4.047^{+0.214}_{-0.175}$	$-0.320^{+0.300}_{-0.300}$	$1.879^{+0.543}_{-0.543}$	$1.435^{+0.216}_{-0.265}$	$0.304^{+0.420}_{-0.132}$
	+3%/-4%	+5%/-4%	+94%/-94%	+29%/-29%	+15%/-18%	+138%/-43%
Source	KIC0	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 008429528-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-920 \pm 83$	$20.31^{+18.33}_{-13.18}$	$654^{+50}_{-54}$	$4202^{+2442}_{-781}$	$907^{+6648}_{-646}$
Alt.	$-1050 \pm 120$	$17.07^{+17.87}_{-12.27}$	$650^{+51}_{-50}$	$4602^{+4188}_{-1026}$	$1482^{+18273}_{-1121}$

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

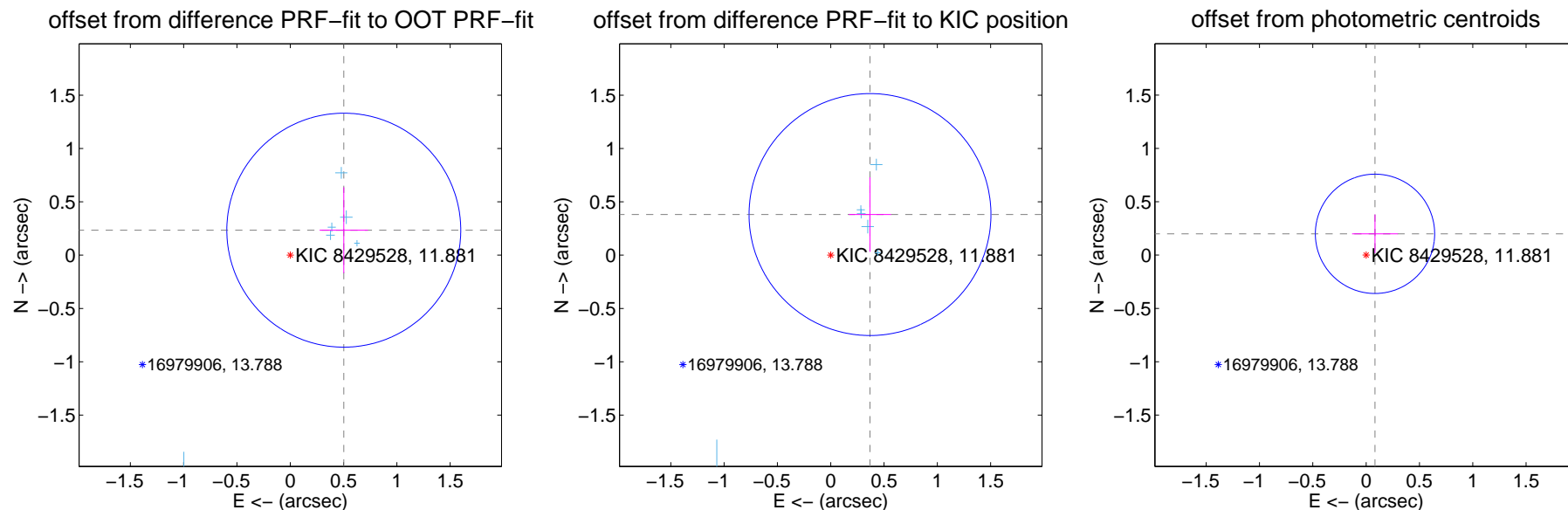
## DV Centroid Data

Supplemental centroid analysis for 008429528-04. **Kepler magnitude: 11.88.** Transit SNR 8.00

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

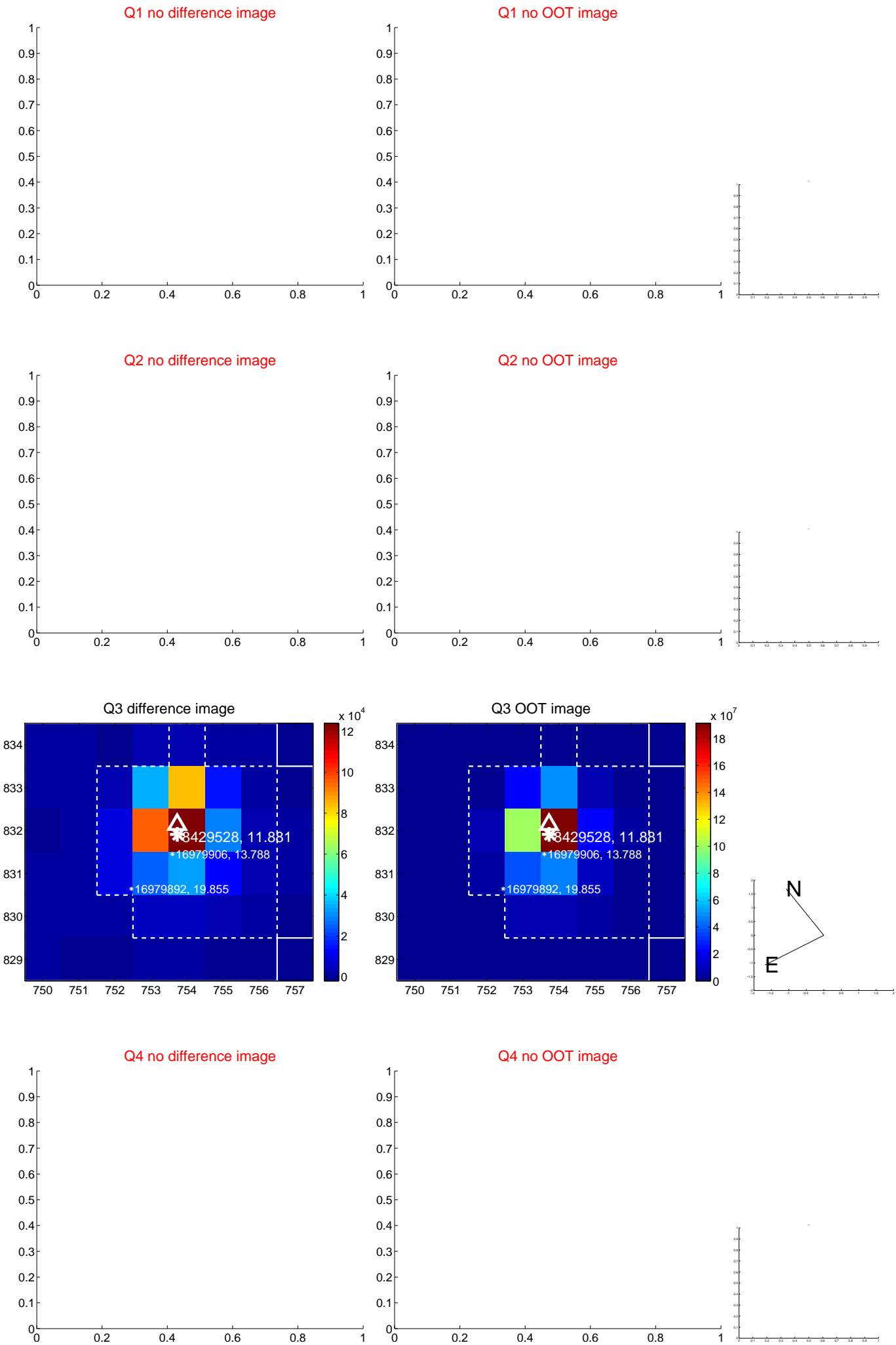
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.554 \pm 0.366$	1.51	$-0.502 \pm 0.227$	$0.234 \pm 0.402$
PRF-fit source offset from KIC position	$0.530 \pm 0.378$	1.40	$-0.368 \pm 0.199$	$0.381 \pm 0.349$
photometric centroid source offset	$0.22 \pm 0.19$	1.16	$-0.08 \pm 0.21$	$0.20 \pm 0.18$



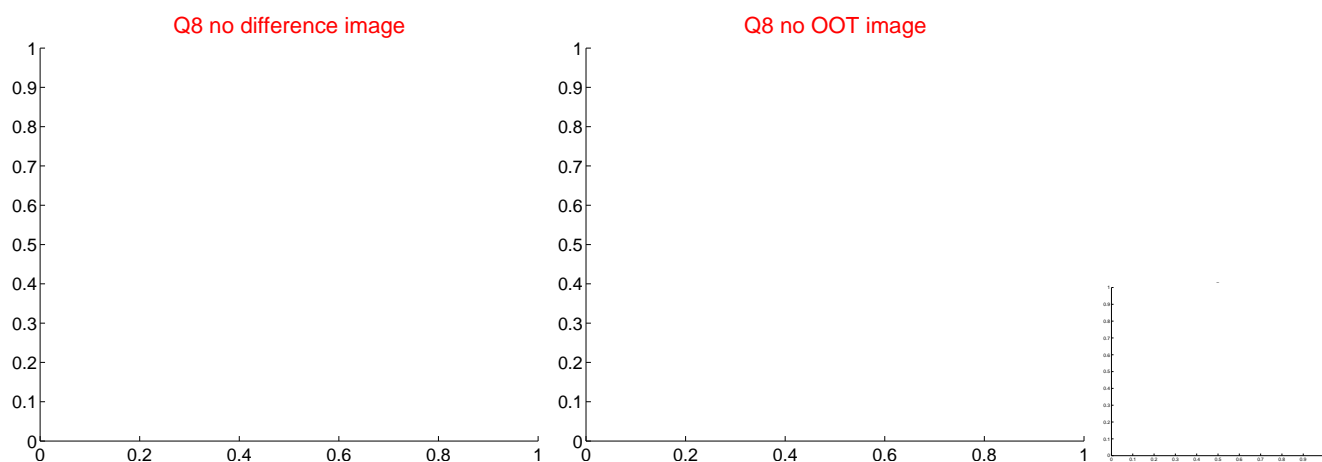
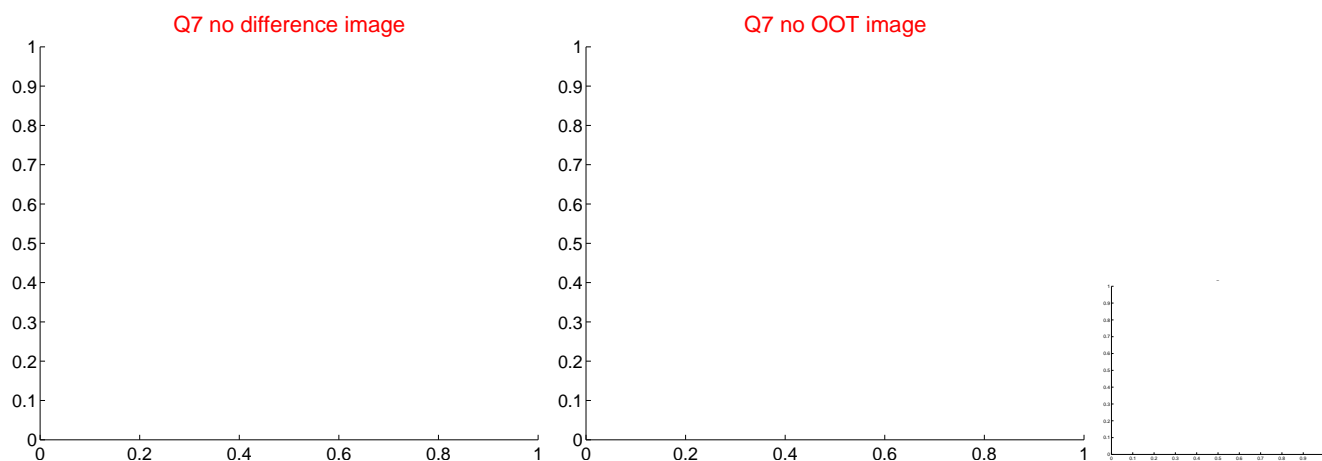
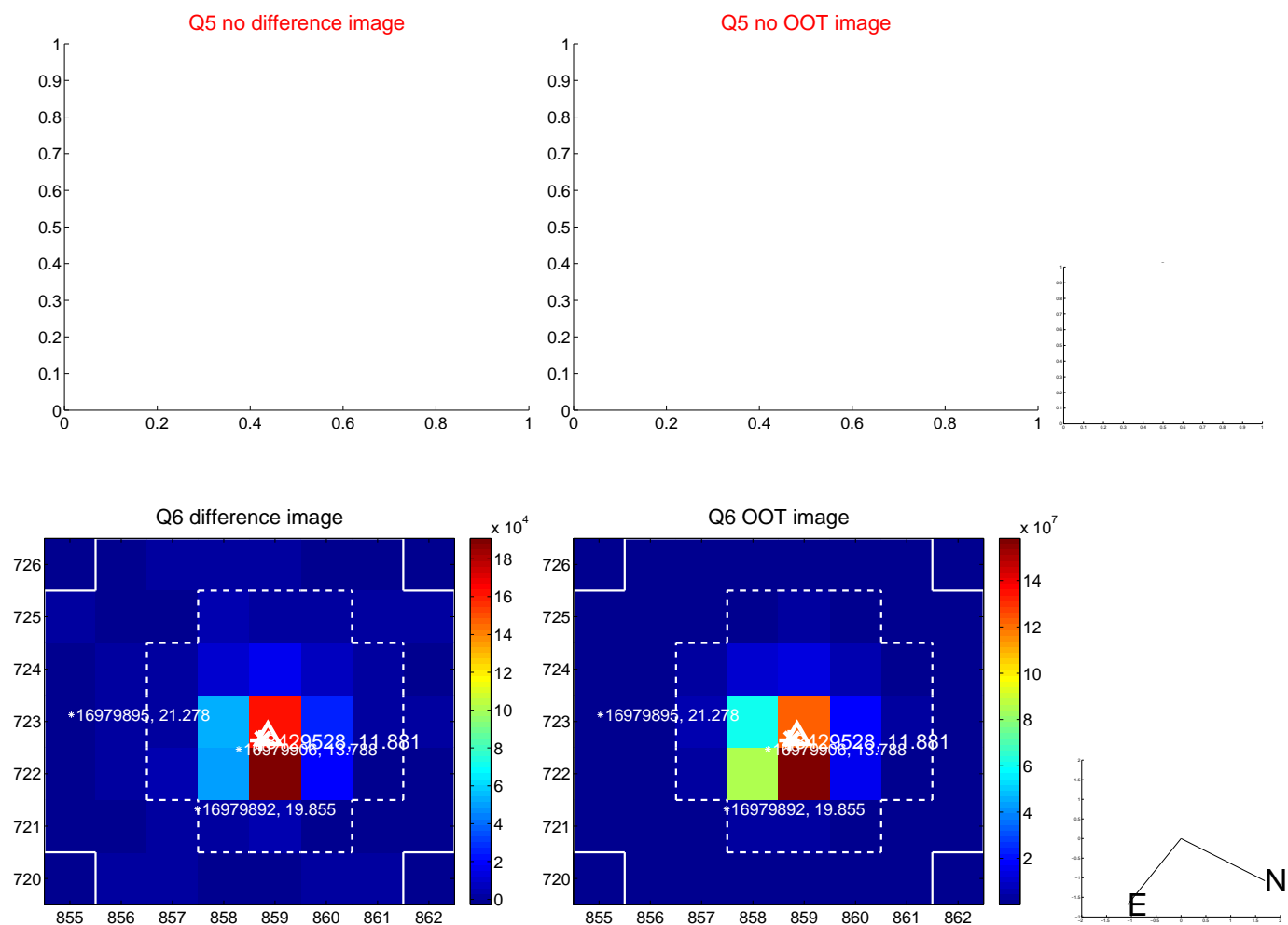
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



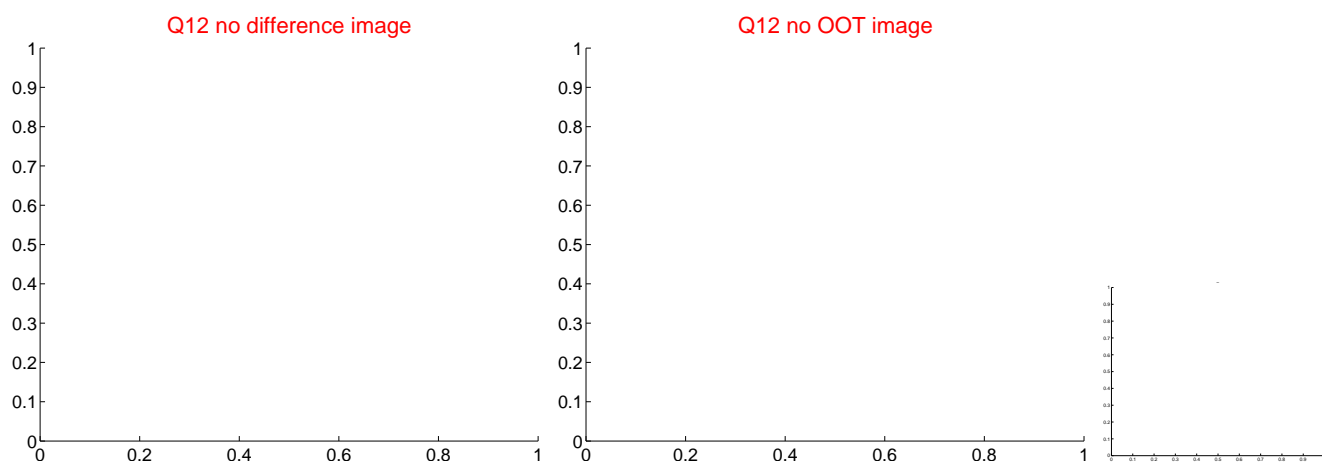
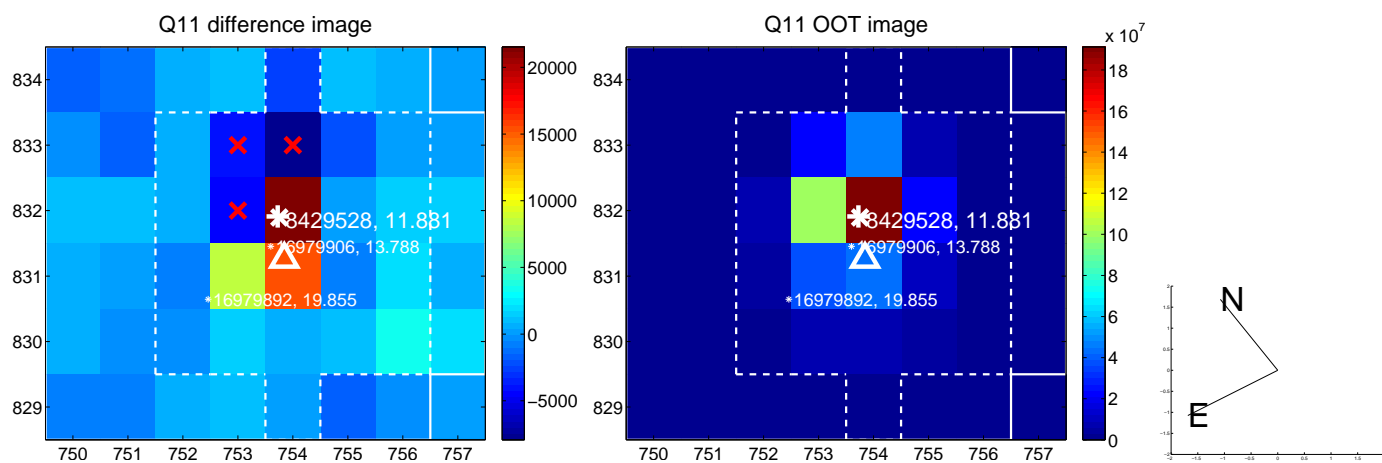
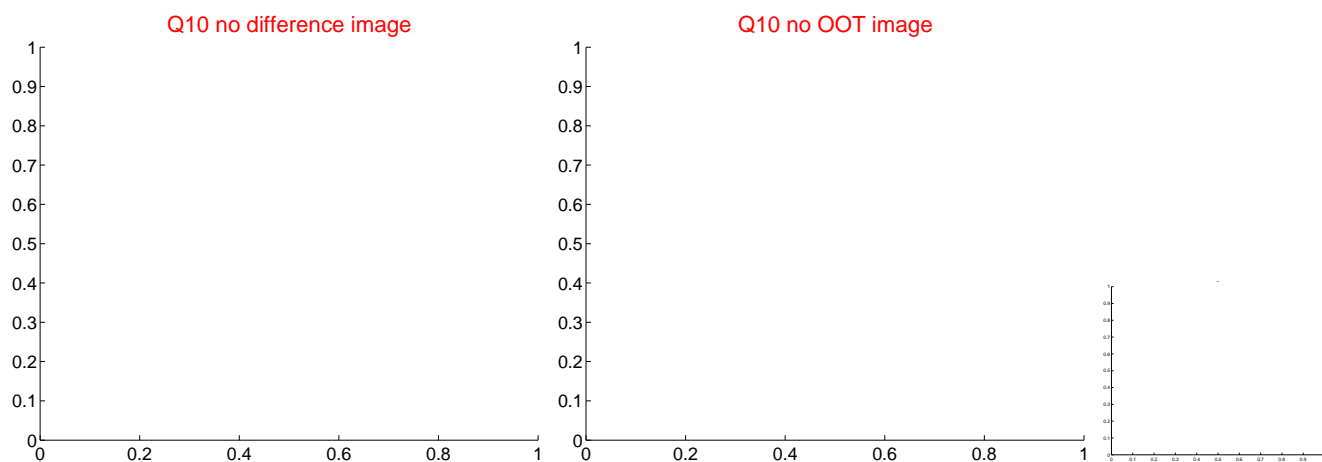
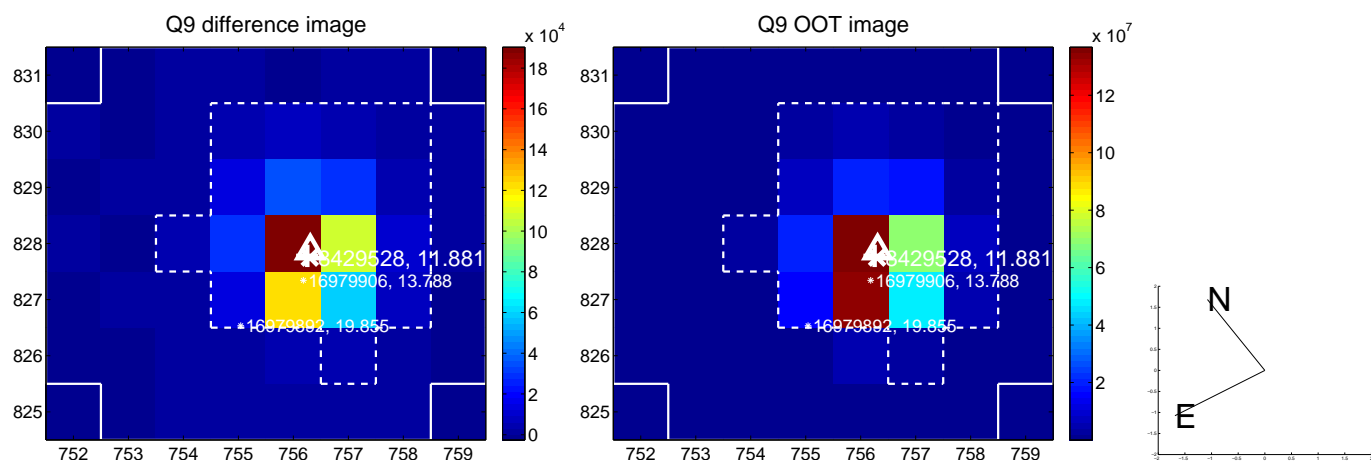
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



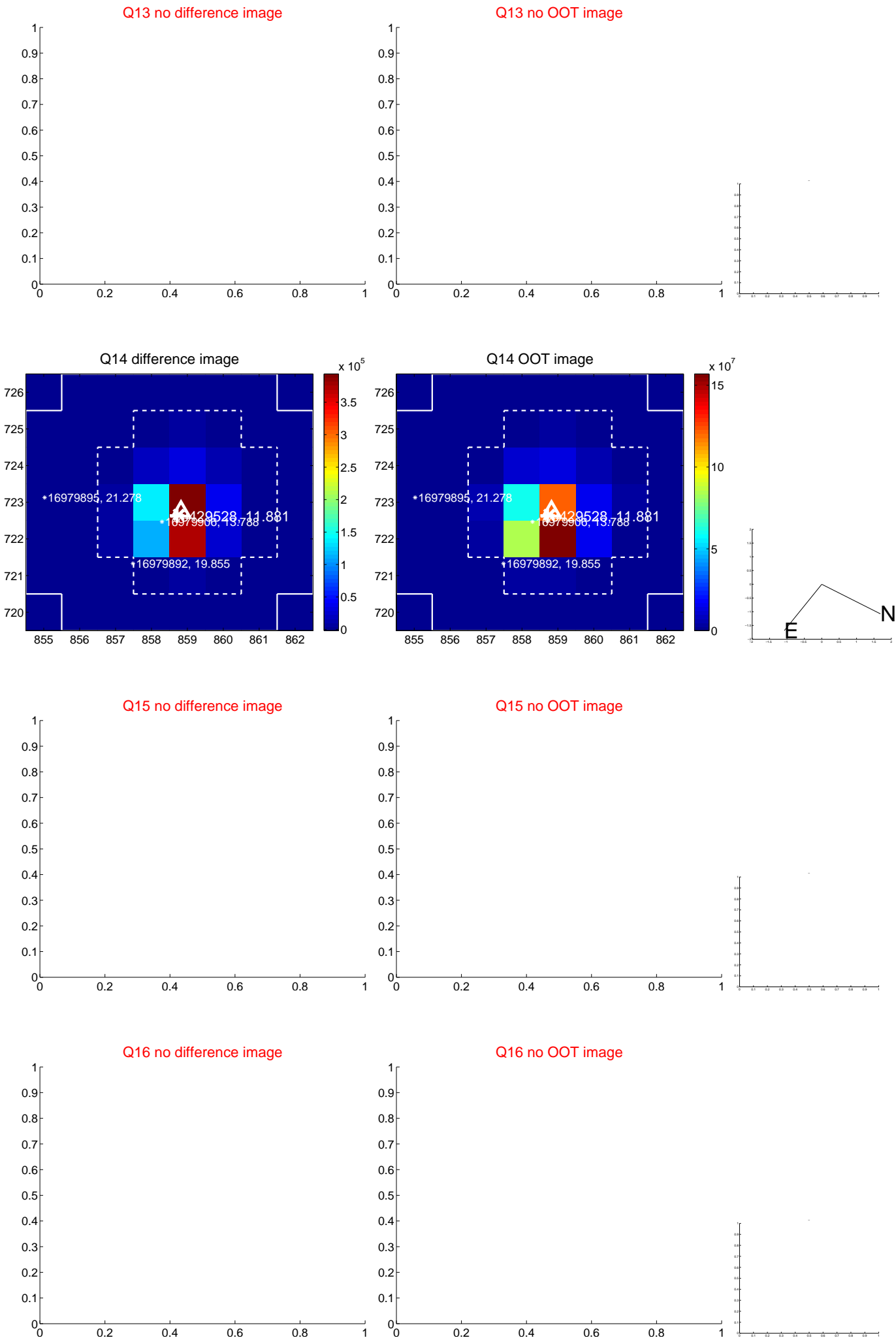
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



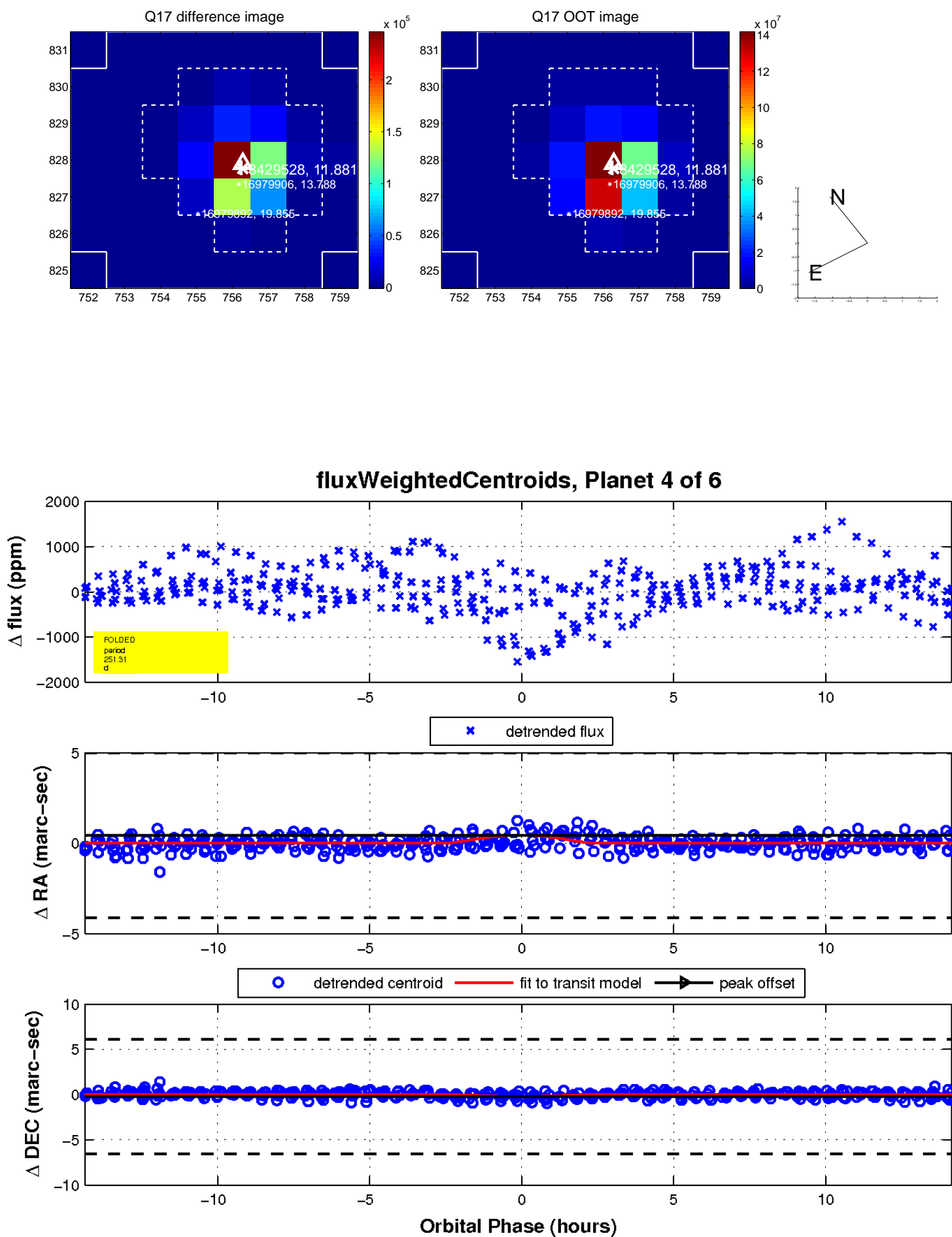
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

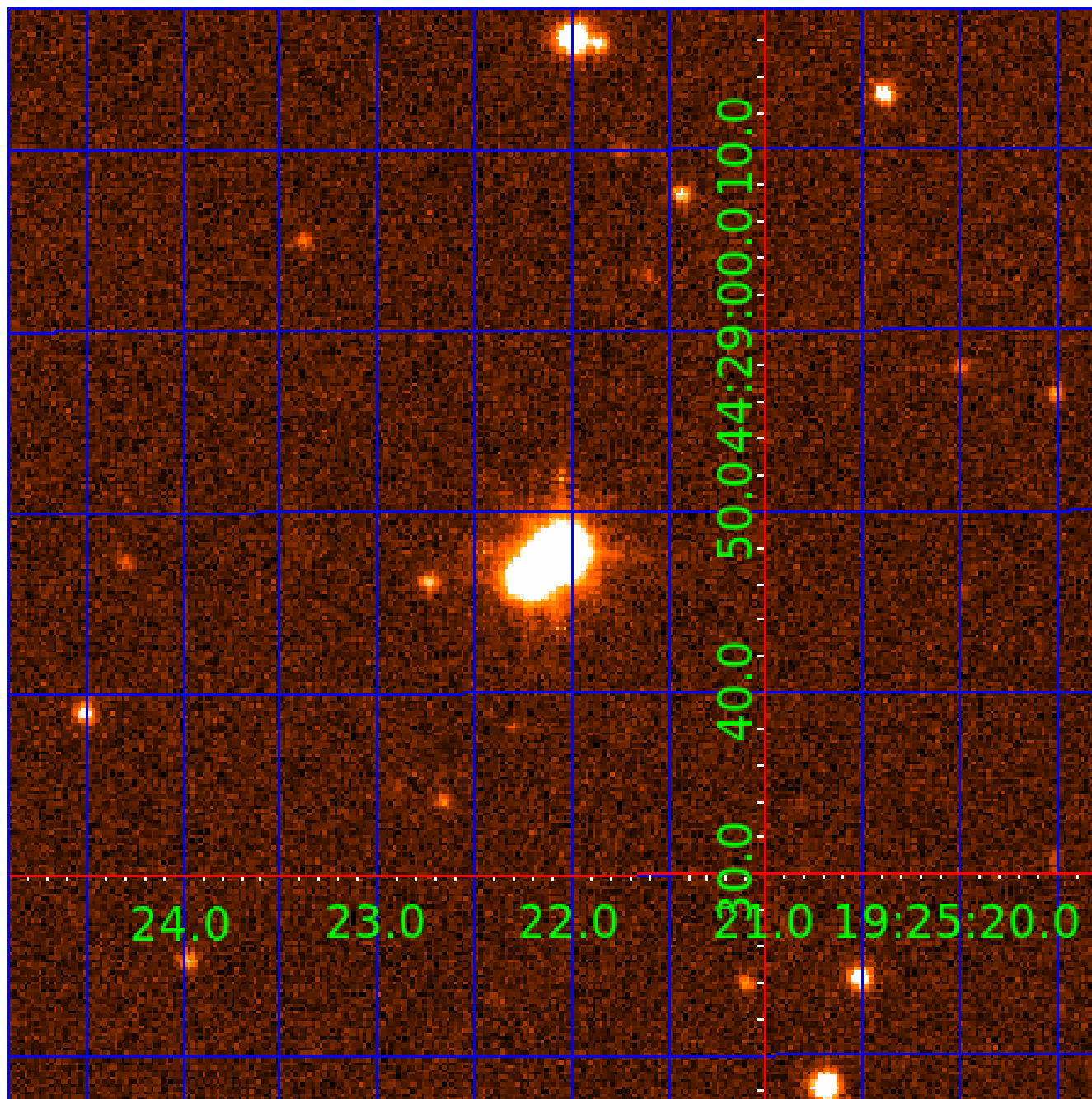


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008429528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008429528-01	OBS	No	0.588696	131.911433	20.3	1.290	10.0	6.7	1.88	7232	0.98	35976.97
008429528-02	OBS	No	196.594755	208.457454	1228.6	4.106	10.4	6.8	1.88	7232	8.16	15.53
008429528-03	OBS	No	0.979038	131.887917	46.4	2.463	9.1	7.0	1.88	7232	1.49	18259.13
008429528-04	OBS	No	251.313750	320.872502	1371.5	4.796	8.8	8.0	1.88	7232	12.83	11.19
008429528-05	OBS	No	289.797512	189.580744	1506.3	12.050	8.5	7.4	1.88	7232	8.52	9.26
008429528-06	OBS	No	408.017238	200.398953	959.4	8.818	7.8	7.3	1.88	7232	6.81	5.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008429528-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008429528-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008429528-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008429528-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
008429528-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT
008429528-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT

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

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

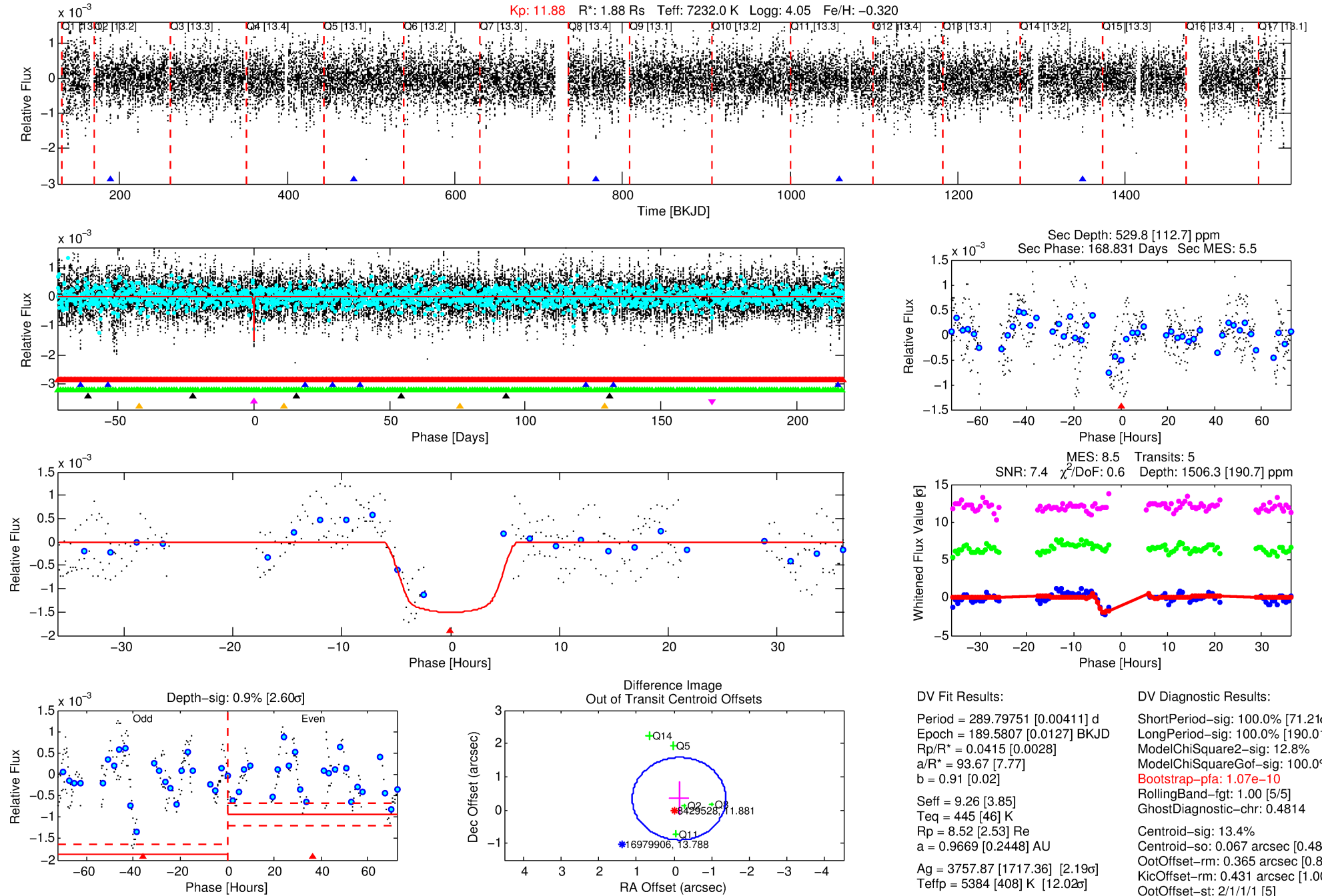
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008429528-05

No Significant Match Found

# DV One-Page Summary

KIC: 8429528 Candidate: 5 of 6 Period: 289.798 d



## DV Fit Results:

Period = 289.79751 [0.00411] d  
Epoch = 189.5807 [0.0127] BKJD  
Rp/R\* = 0.0415 [0.0028]  
a/R\* = 93.67 [7.77]  
b = 0.91 [0.02]  
Seff = 9.26 [3.85]  
Teq = 445 [46] K  
Rp = 8.52 [2.53] Re  
a = 0.9669 [0.2448] AU  
Ag = 3757.87 [1717.36] [2.19 $\sigma$ ]  
Teff = 5384 [408] K [12.02 $\sigma$ ]

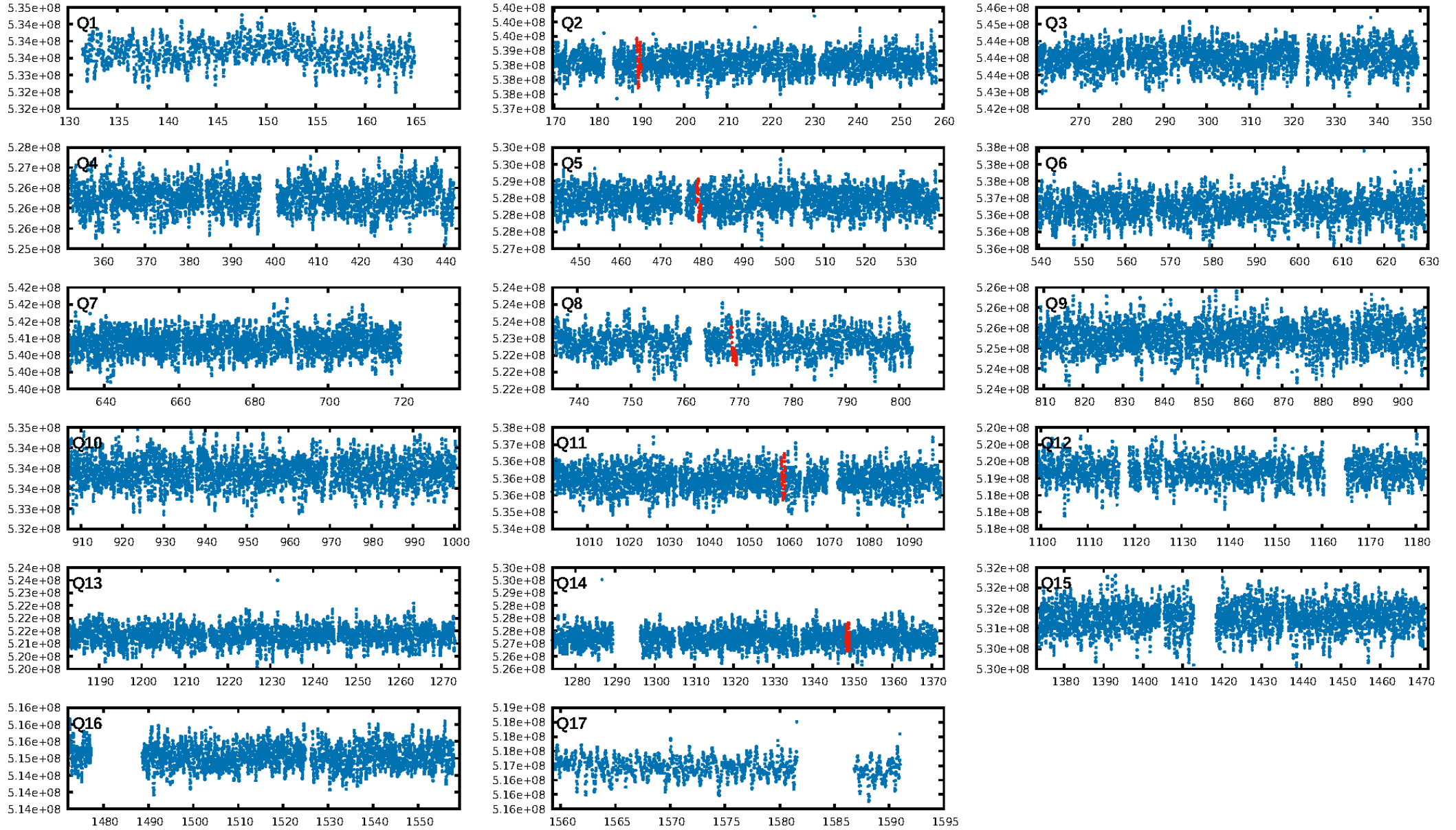
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [71.21 $\sigma$ ]  
LongPeriod-sig: 100.0% [190.01 $\sigma$ ]  
ModelChiSquare2-sig: 12.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.07e-10**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 0.4814  
Centroid-sig: 13.4%  
Centroid-so: 0.067 arcsec [0.48 $\sigma$ ]  
OotOffset-rm: 0.365 arcsec [0.88 $\sigma$ ]  
KicOffset-rm: 0.431 arcsec [1.00 $\sigma$ ]  
OotOffset-st: 2/1/1/1 [5]  
KicOffset-st: 2/1/1/1 [5]  
DiffImageQuality-fgm: 0.80 [4/5]  
DiffImageOverlap-fno: 0.00 [0/5]

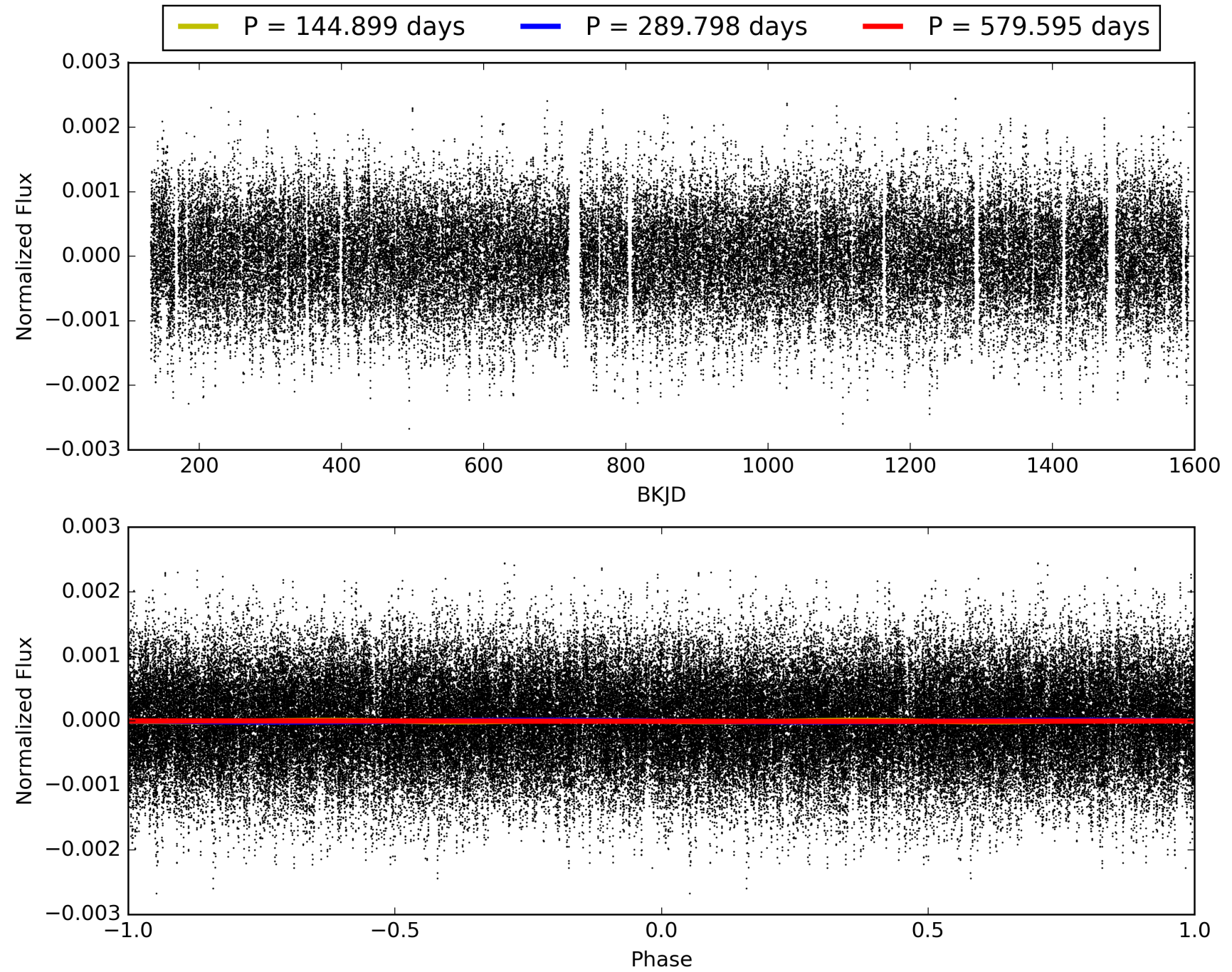
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:17 Z

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

# TCE 008429528-05, PDC Light Curves

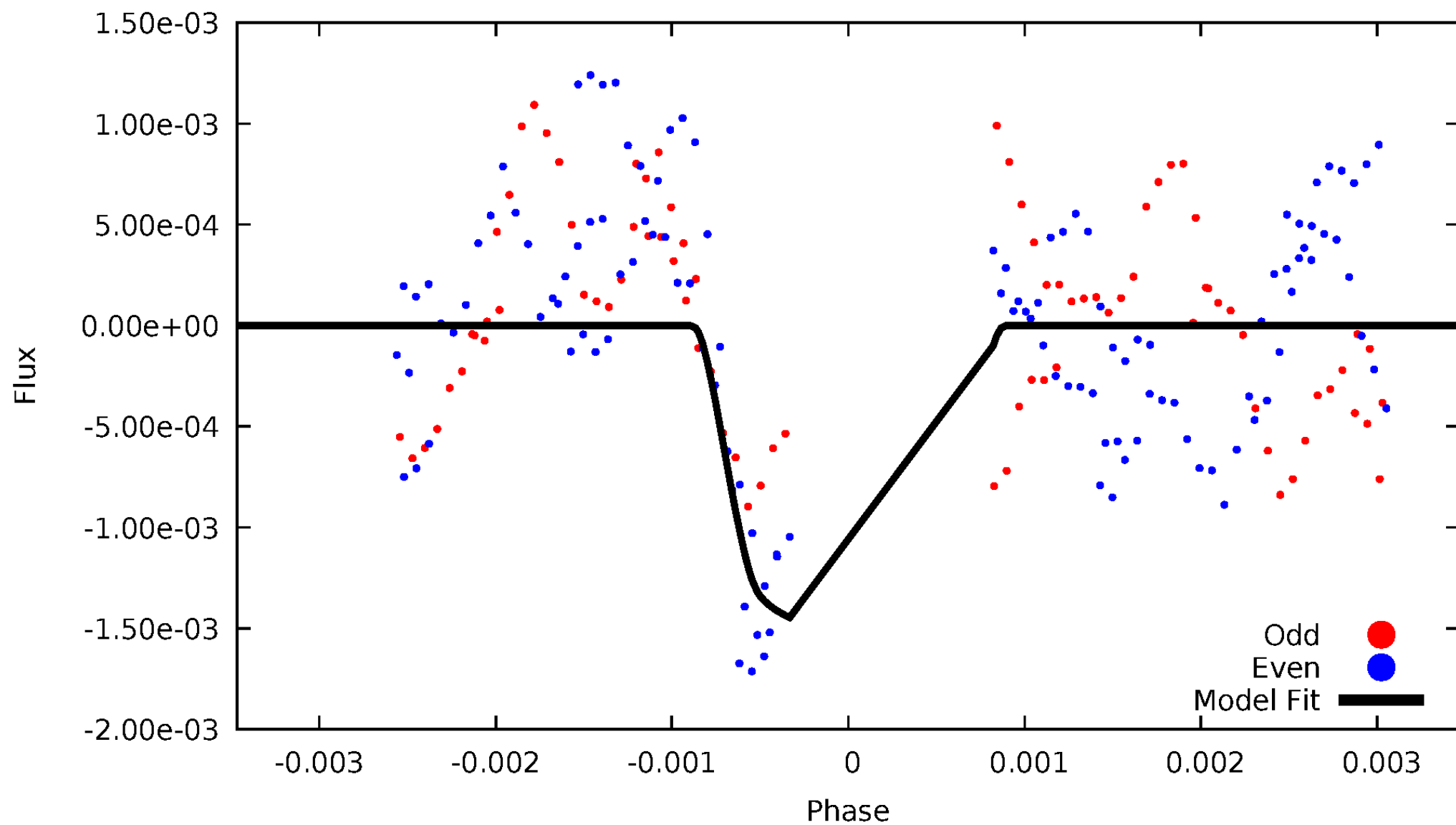


# TCE 008429528-05



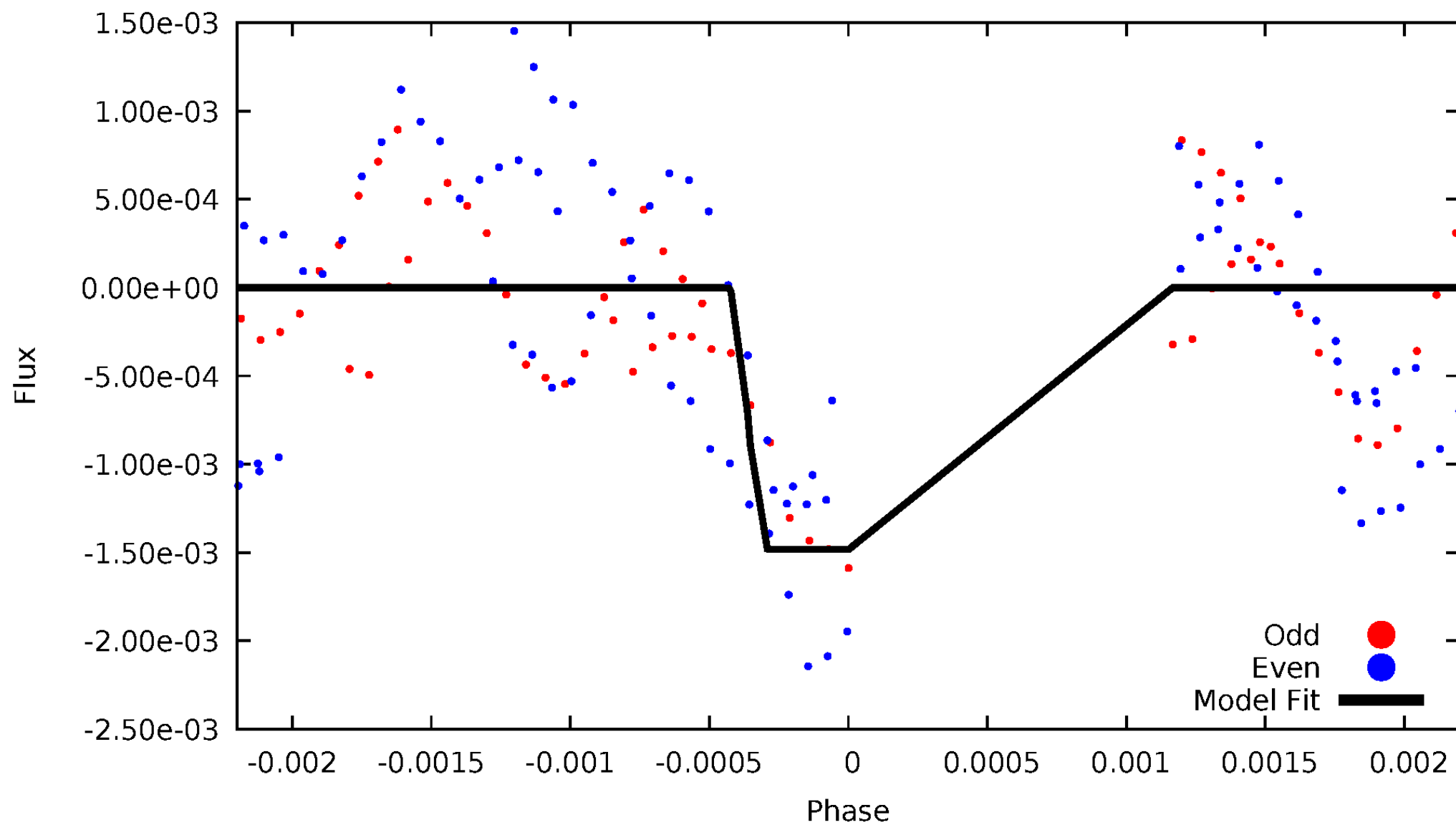
# DV Odd/Even

TCE 008429528-05



# ALT Odd/Even

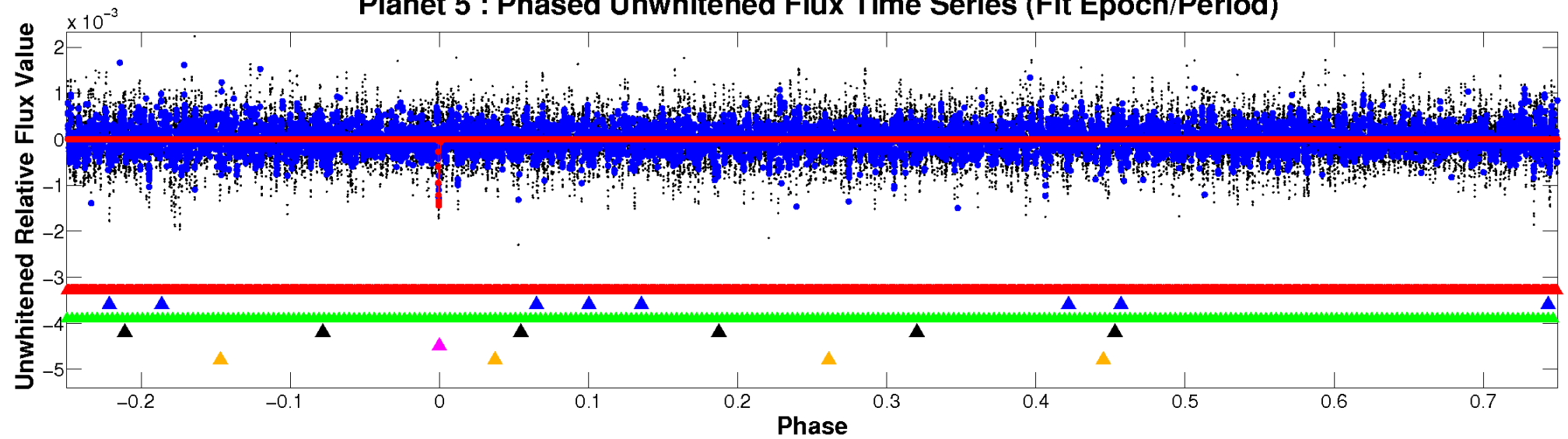
TCE 008429528-05



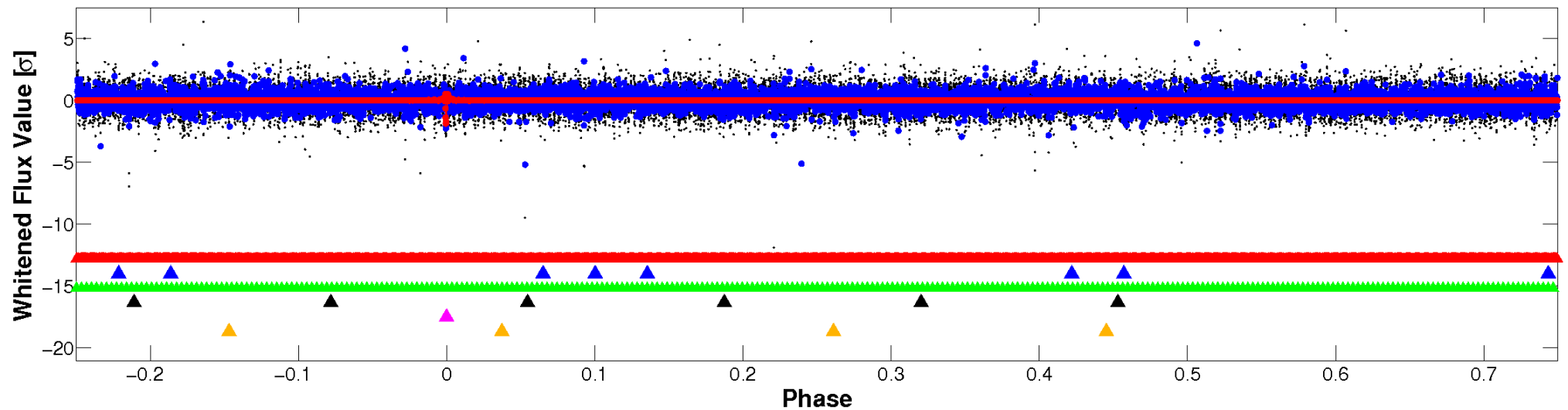


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

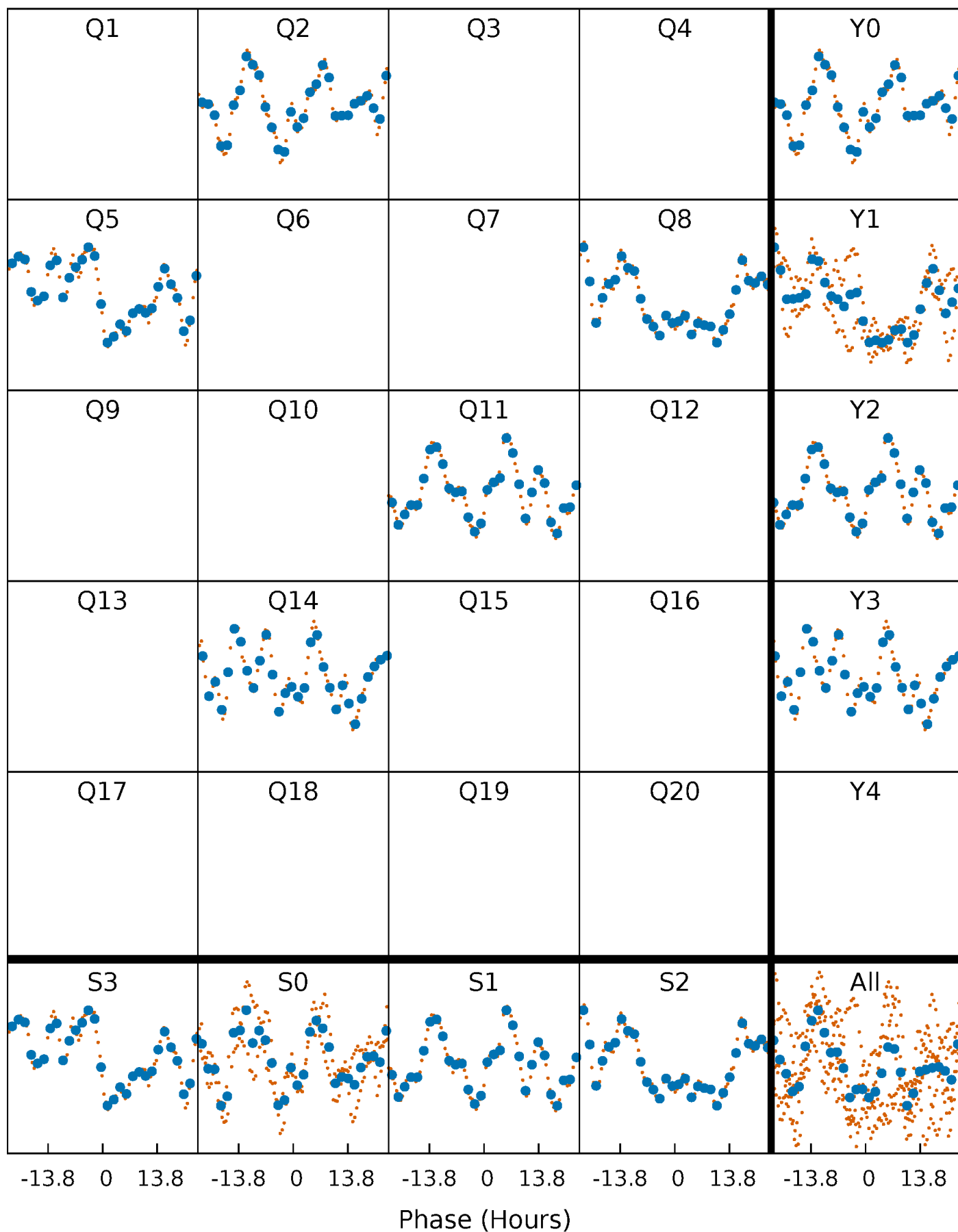


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



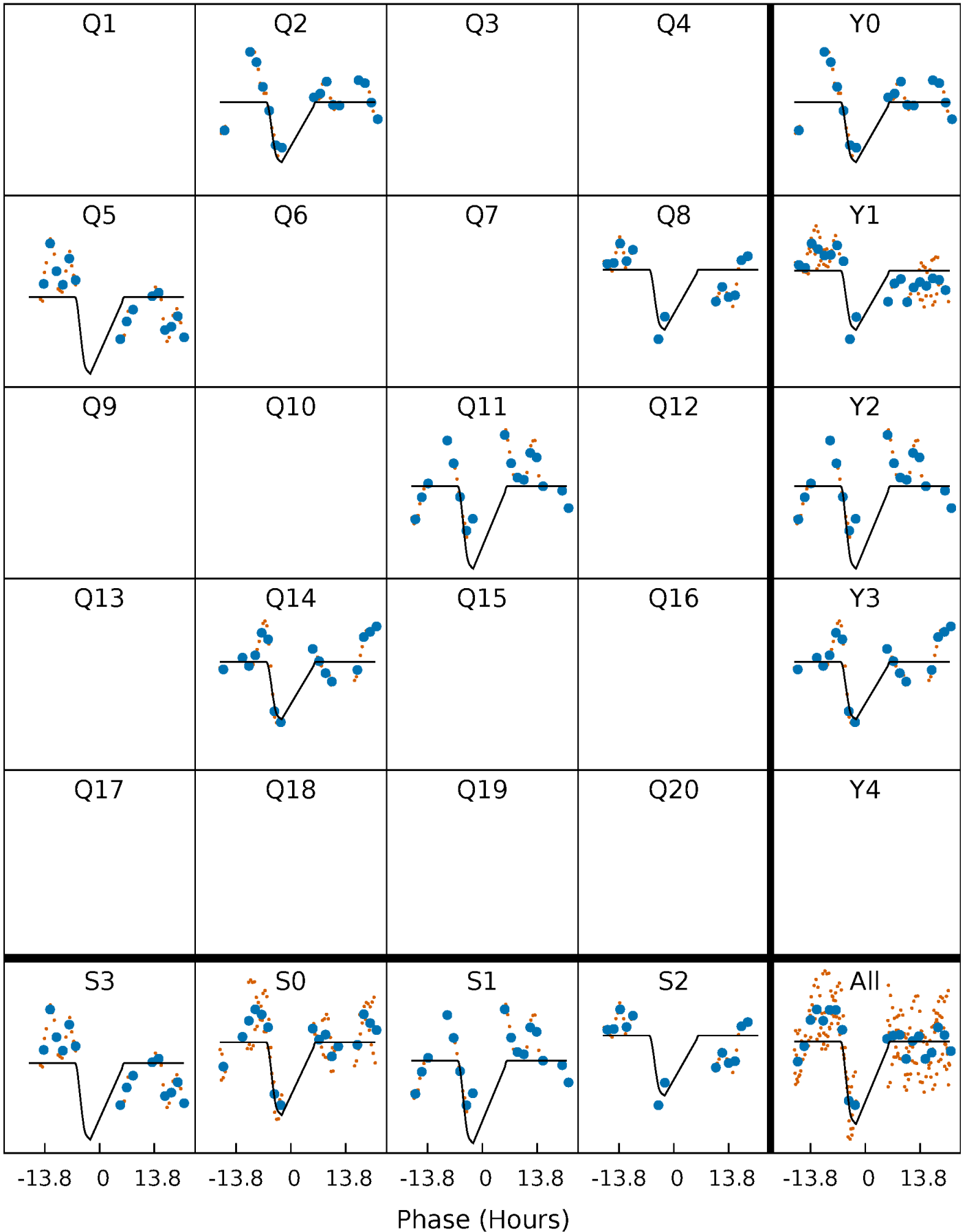
# PDC Quarter-Phased Transit Curves

TCE 008429528-05     $P=289.797512$  Days     $T_0=189.580744$  (BKJD)



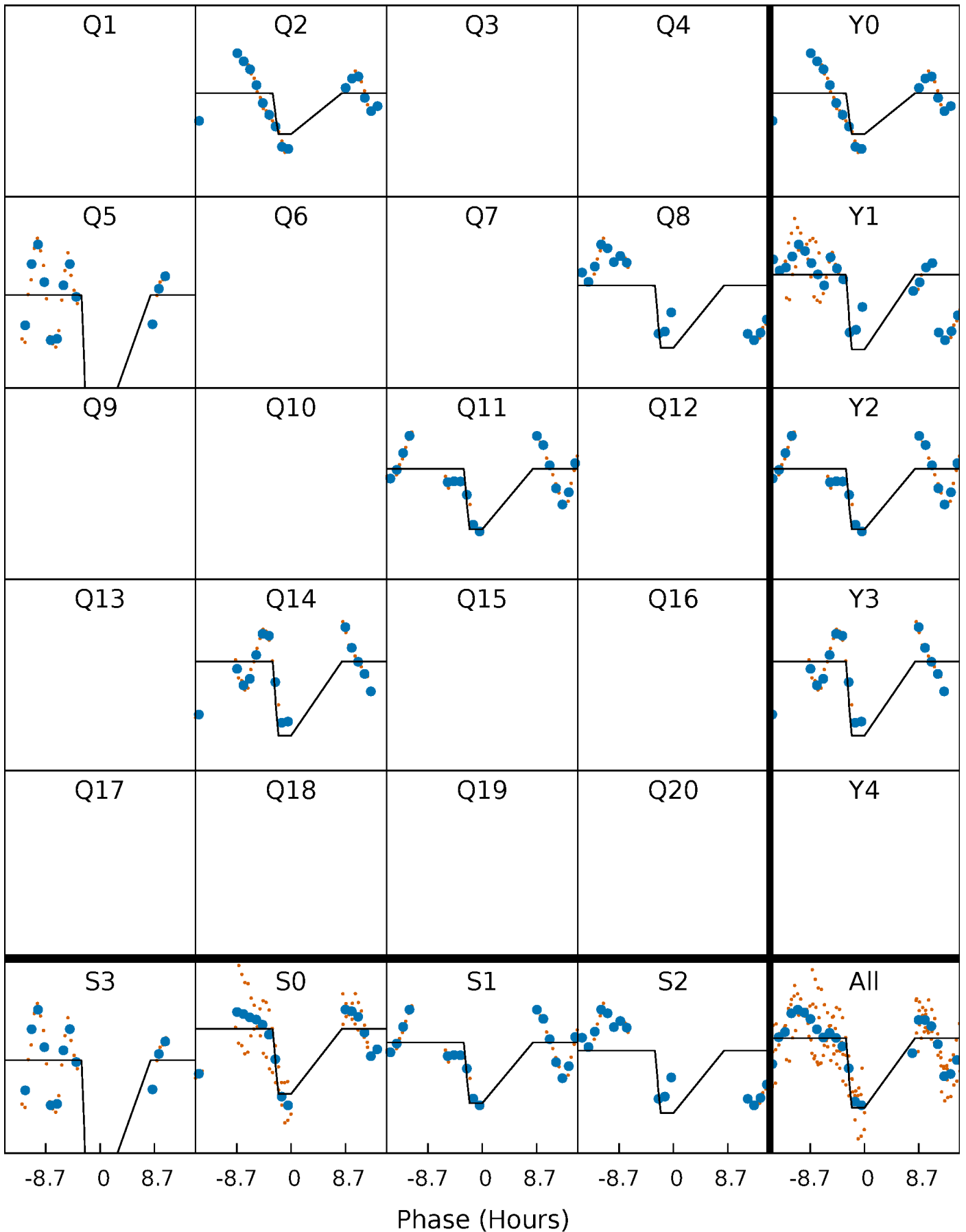
# DV Quarter-Phased Transit Curves

TCE 008429528-05     $P=289.797512$  Days     $T_0=189.580744$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

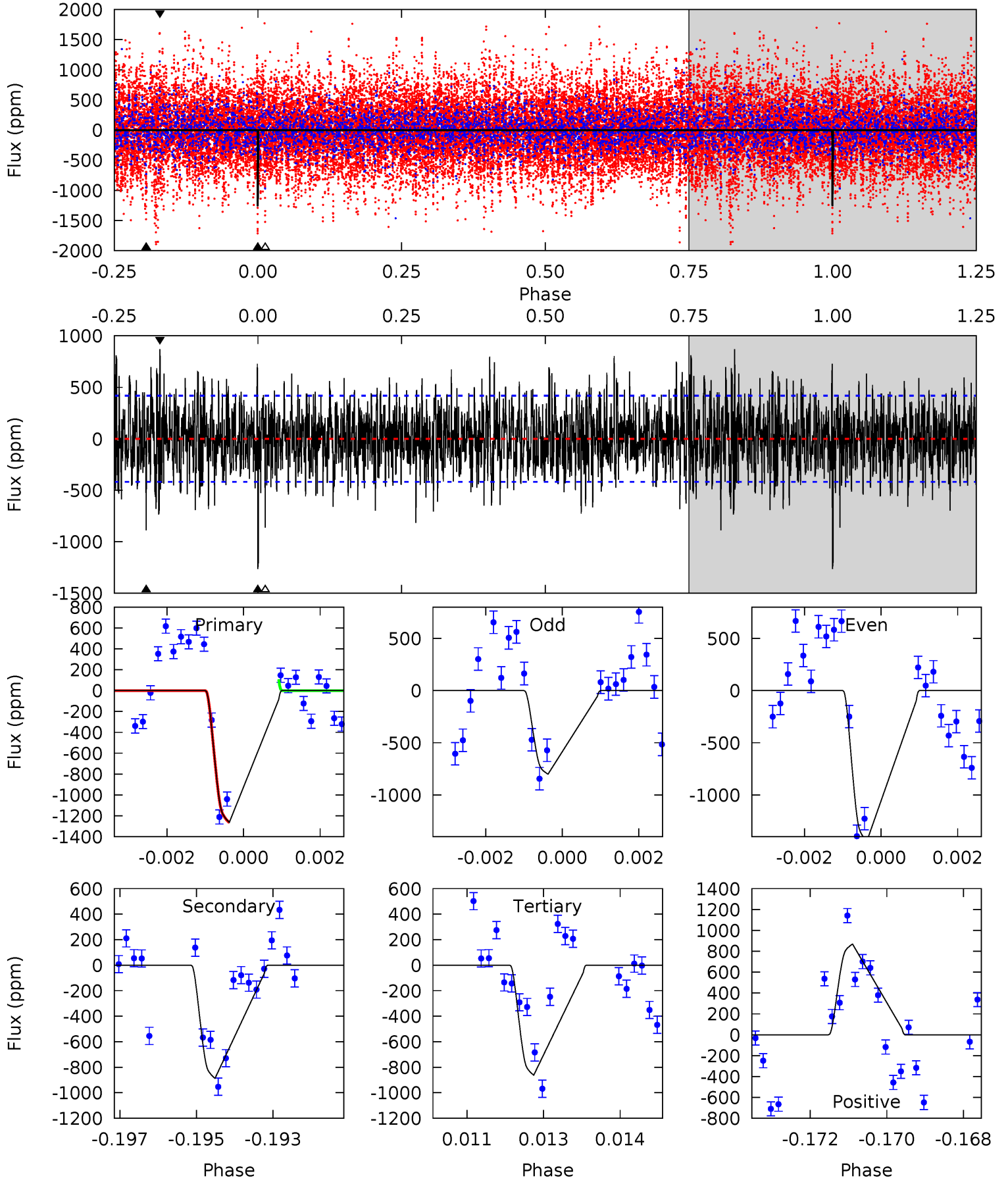
TCE 008429528-05     $P=289.794836$  Days     $T_0=189.485163$  (BKJD)



# DV Model-Shift Uniqueness Test

008429528-05, P = 289.797512 Days, E = 189.580744 Days

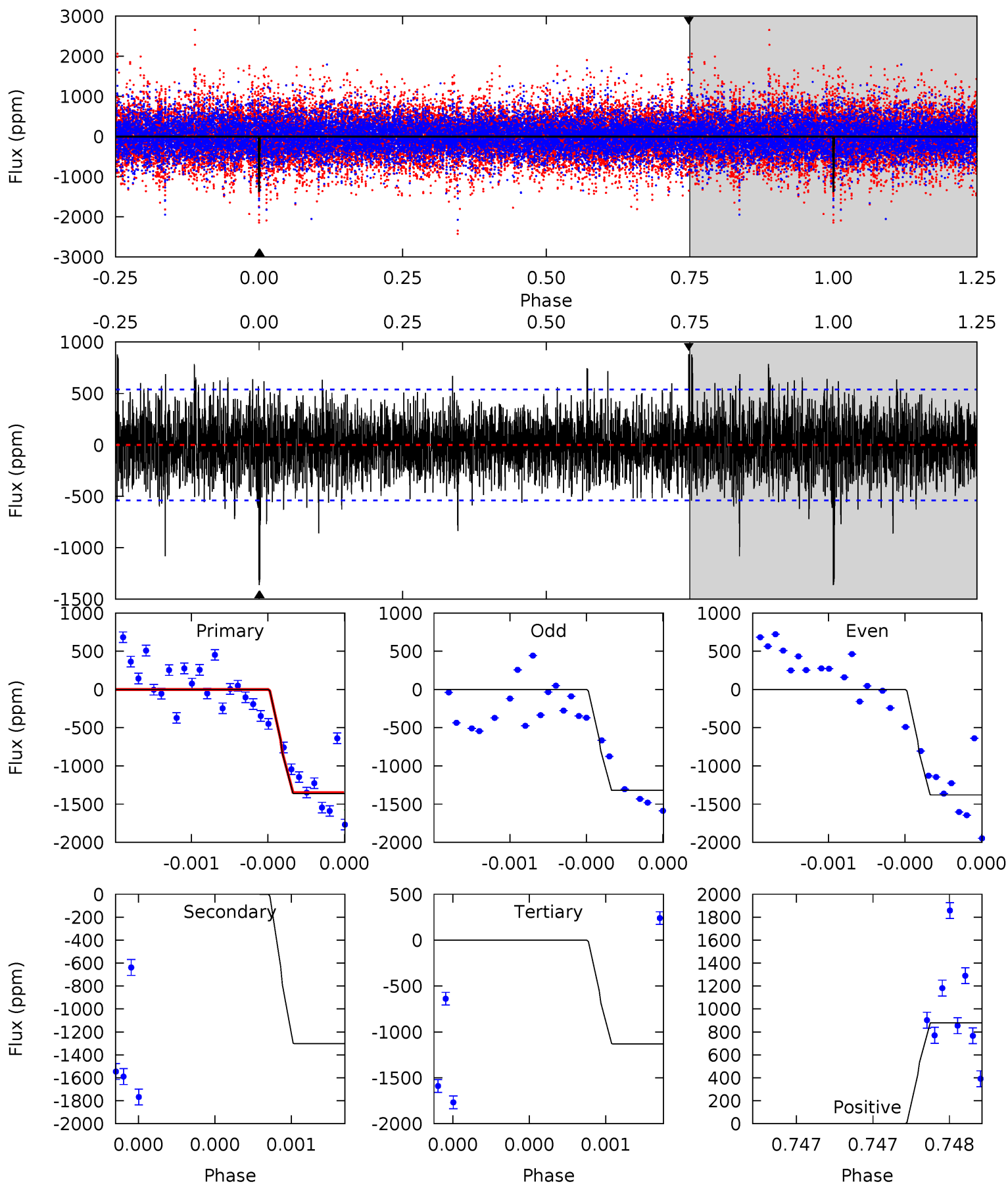
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	11.3	11.0	11.1	5.35	3.12	3.03	5.12	5.03	0.31	0.22	3.89	2.31	0.41	4.96



# Alt Model-Shift Uniqueness Test

008429528-05, P = 289.794836 Days, E = 189.485163 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	13.5	11.7	9.15	5.60	3.52	2.21	2.41	5.01	1.78	4.38	0.27	0	0.39	1.73





### Stellar Parameters For KIC 008429528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7232^{+228}_{-304}$	$4.047^{+0.214}_{-0.175}$	$-0.320^{+0.300}_{-0.300}$	$1.879^{+0.543}_{-0.543}$	$1.435^{+0.216}_{-0.265}$	$0.304^{+0.420}_{-0.132}$
	+3%/-4%	+5%/-4%	+94%/-94%	+29%/-29%	+15%/-18%	+138%/-43%
Source	KIC0	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 008429528-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-886 \pm 78$	$8.57^{+1.54}_{-1.44}$	$621^{+52}_{-53}$	$6051^{+317}_{-304}$	$6246^{+2581}_{-1813}$
Alt.	$-1302 \pm 96$	$7.98^{+1.32}_{-1.36}$	$621^{+53}_{-49}$	$6952^{+420}_{-424}$	$10584^{+4266}_{-2947}$

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

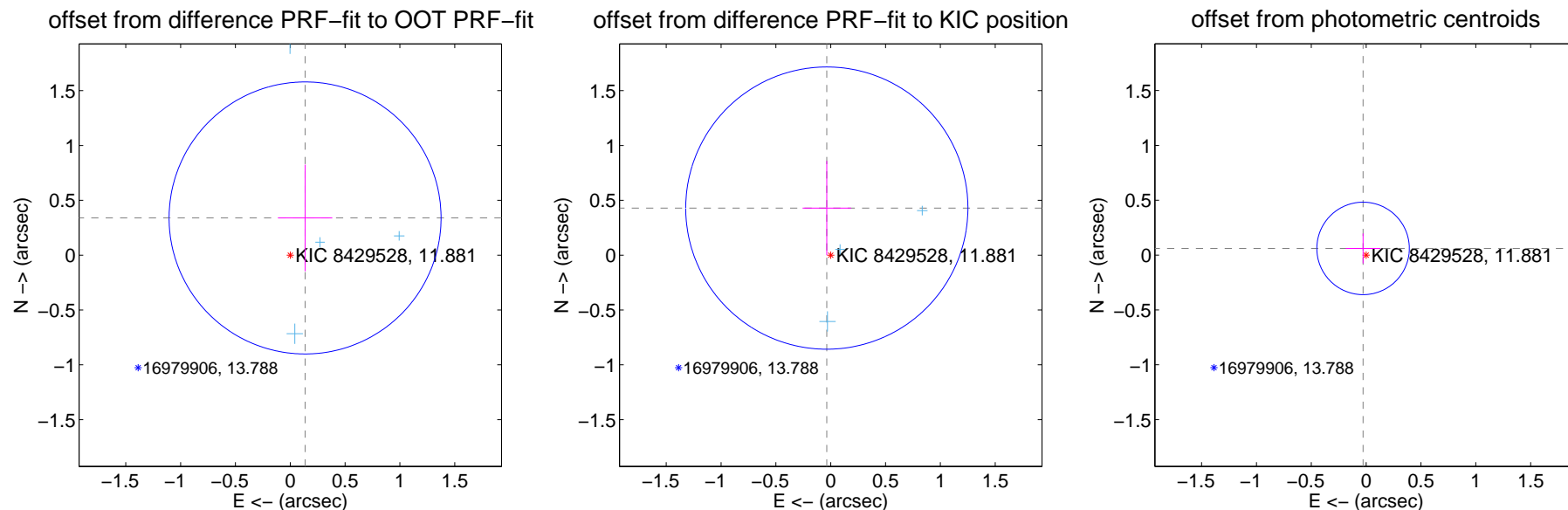
## DV Centroid Data

Supplemental centroid analysis for 008429528-05. **Kepler magnitude: 11.88.** Transit SNR 7.42

There are 4 quarters with good PRF difference image offsets

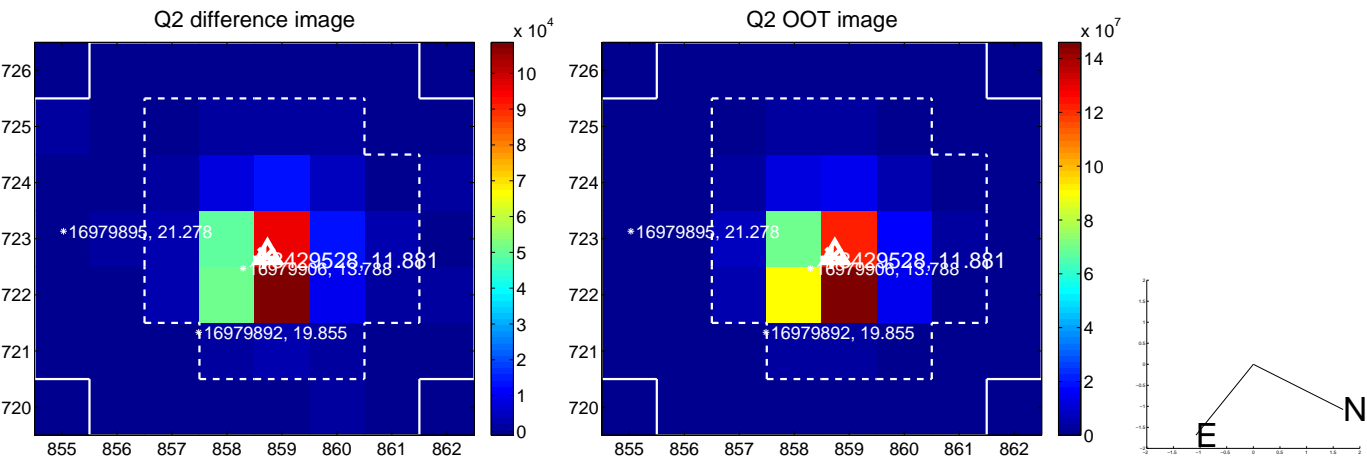
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.365 \pm 0.413$	0.88	$-0.135 \pm 0.248$	$0.339 \pm 0.487$
PRF-fit source offset from KIC position	$0.431 \pm 0.429$	1.00	$0.036 \pm 0.221$	$0.429 \pm 0.430$
photometric centroid source offset	$0.07 \pm 0.14$	0.48	$0.03 \pm 0.16$	$0.06 \pm 0.14$

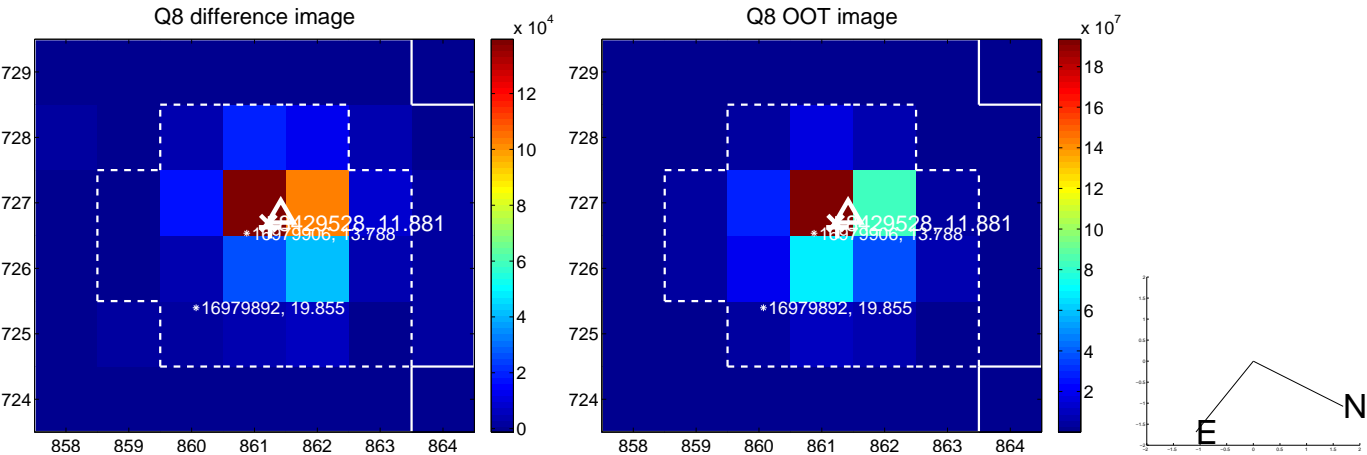
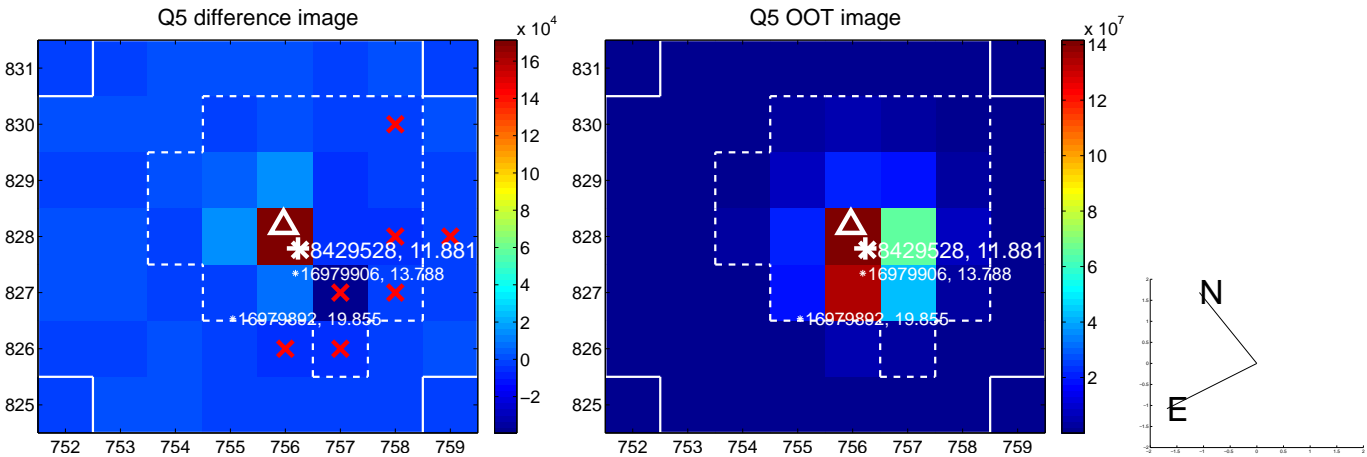


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

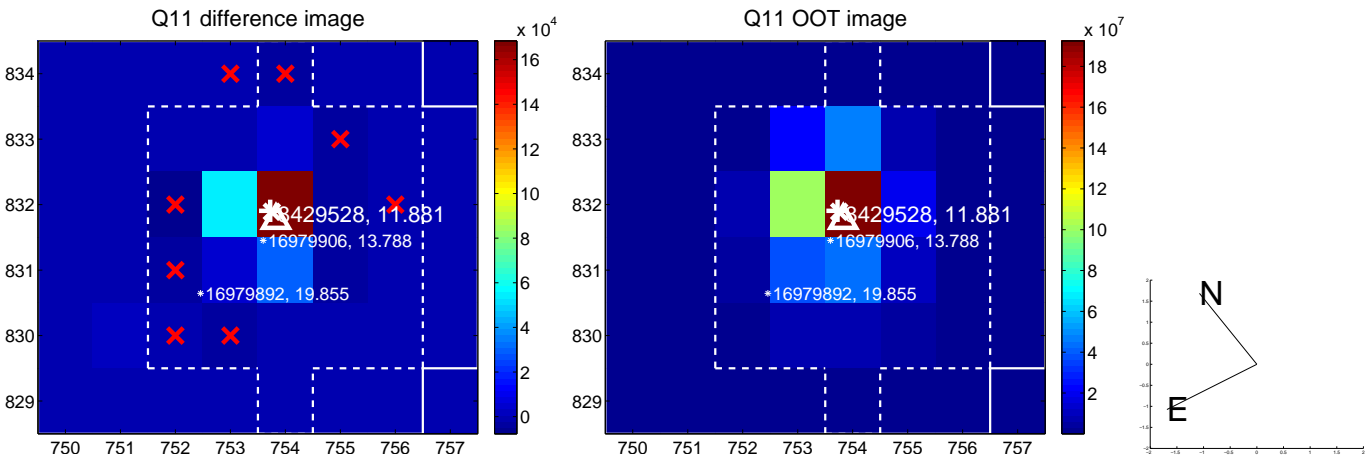
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



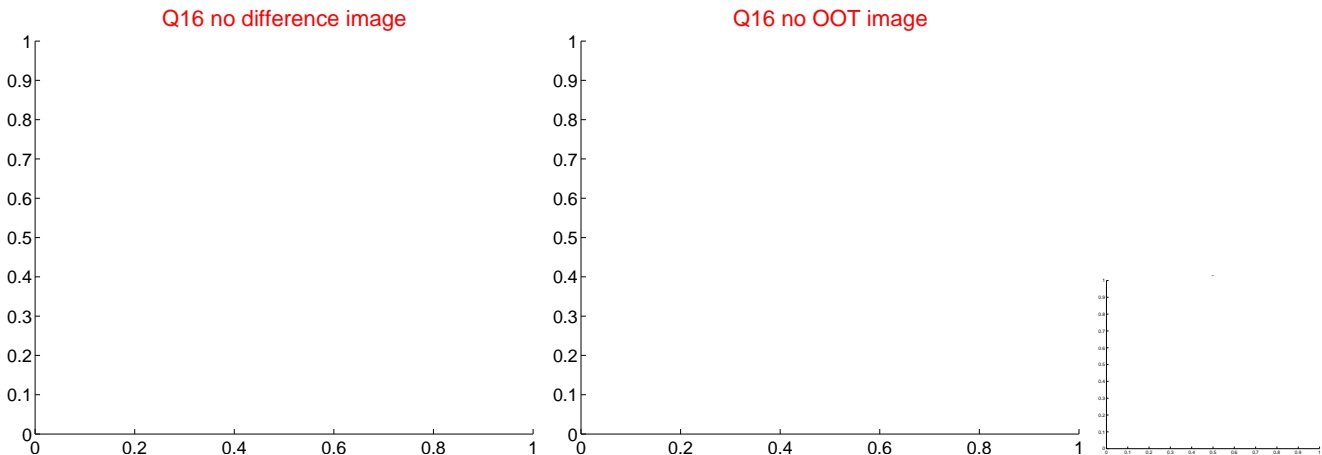
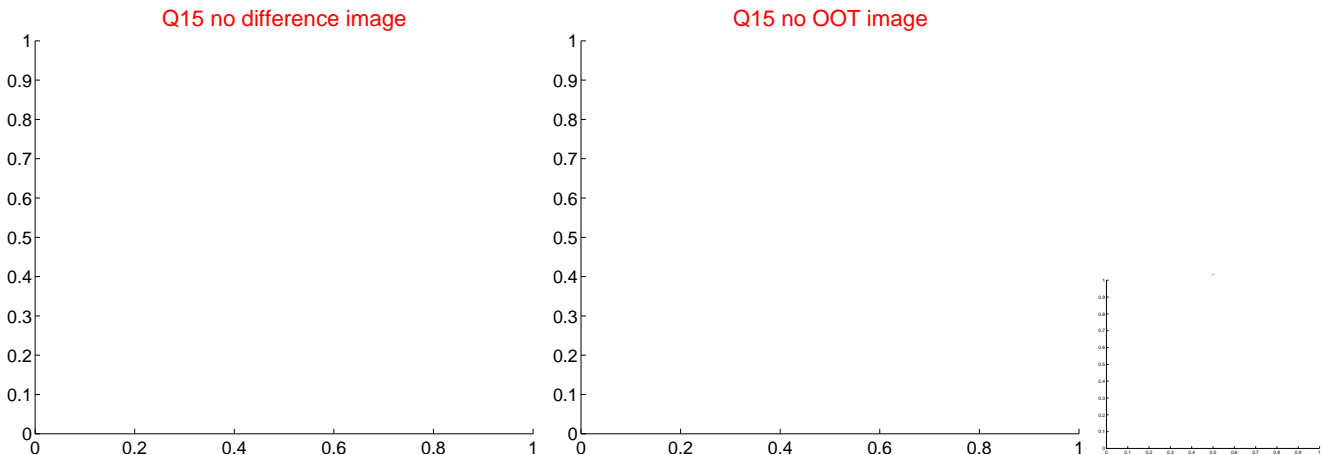
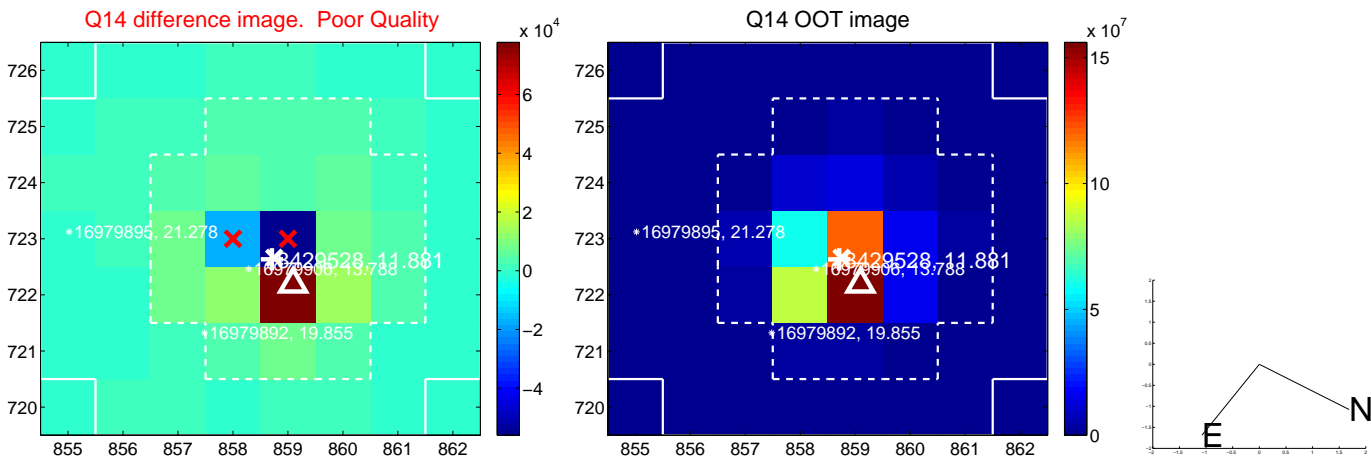
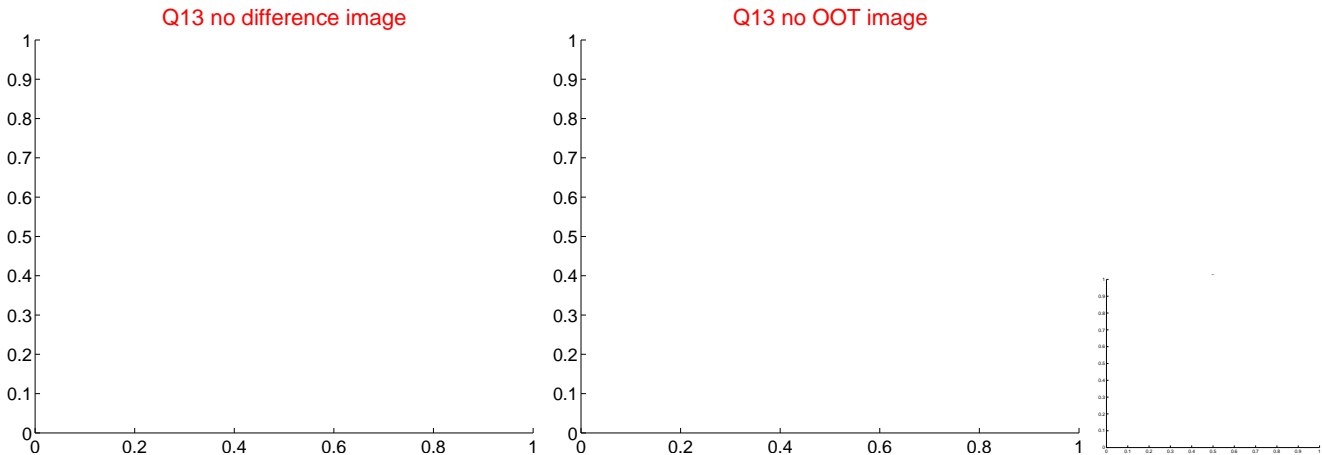
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



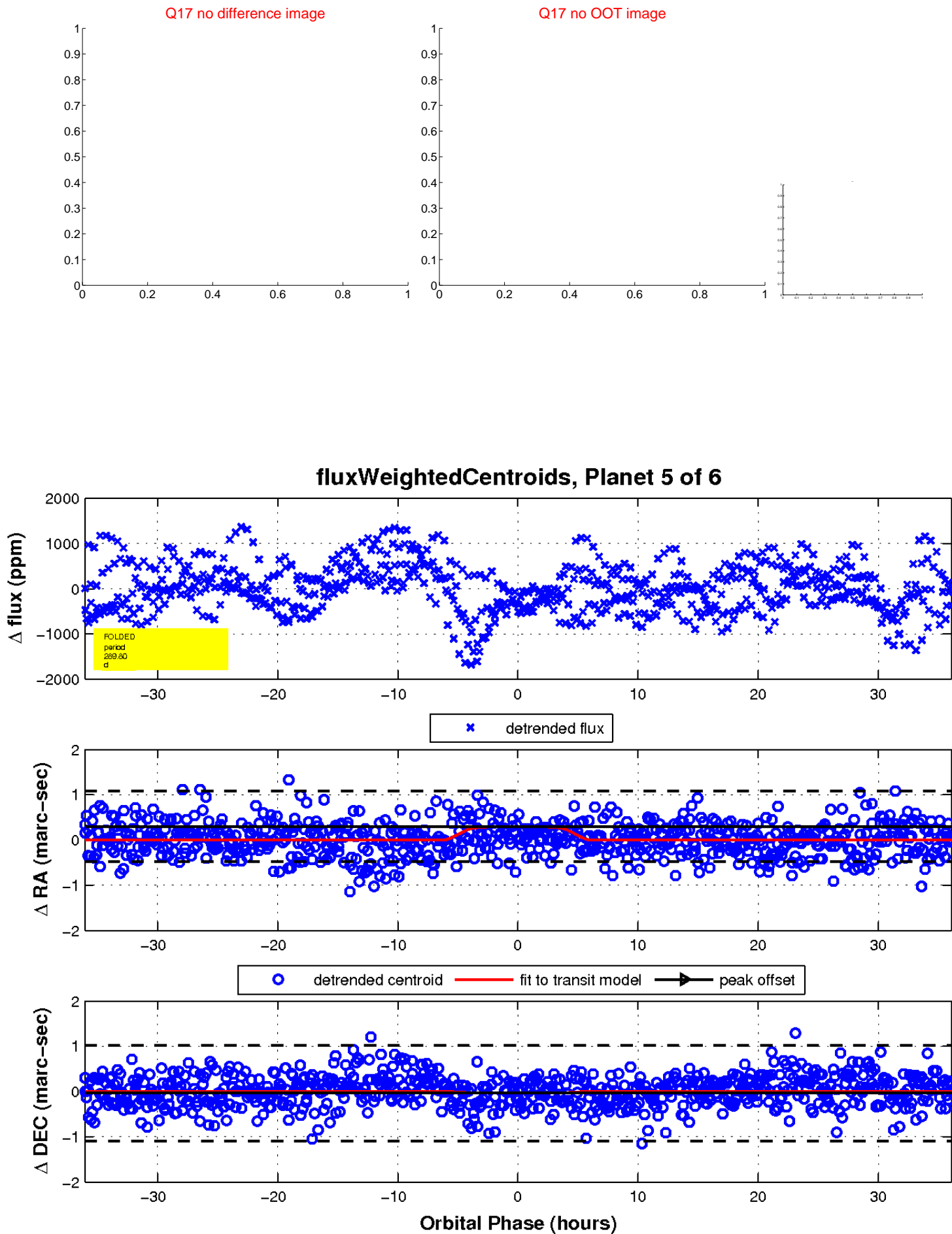
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



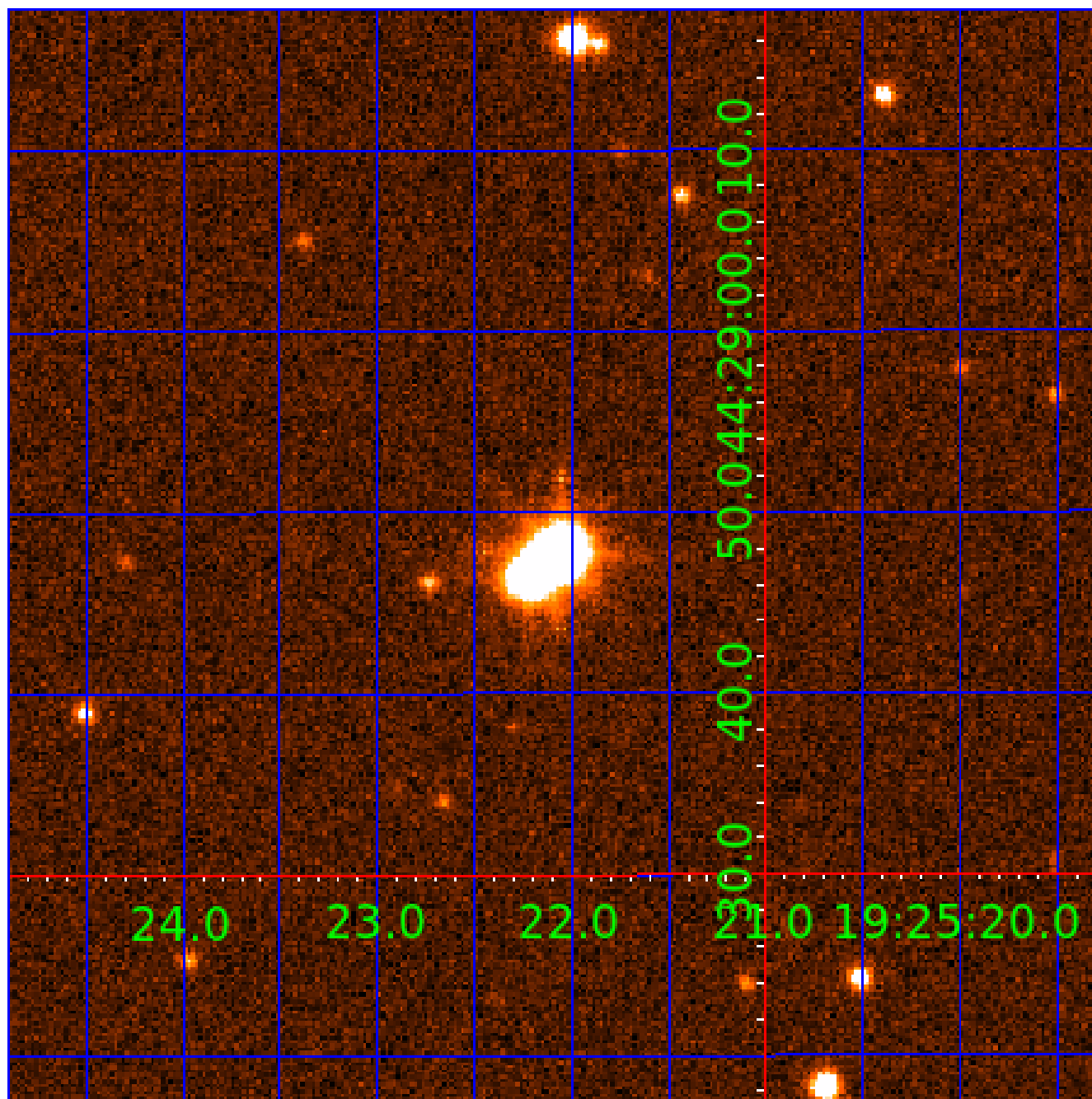
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 008429528

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008429528-01	OBS	No	0.588696	131.911433	20.3	1.290	10.0	6.7	1.88	7232	0.98	35976.97
008429528-02	OBS	No	196.594755	208.457454	1228.6	4.106	10.4	6.8	1.88	7232	8.16	15.53
008429528-03	OBS	No	0.979038	131.887917	46.4	2.463	9.1	7.0	1.88	7232	1.49	18259.13
008429528-04	OBS	No	251.313750	320.872502	1371.5	4.796	8.8	8.0	1.88	7232	12.83	11.19
008429528-05	OBS	No	289.797512	189.580744	1506.3	12.050	8.5	7.4	1.88	7232	8.52	9.26
008429528-06	OBS	No	408.017238	200.398953	959.4	8.818	7.8	7.3	1.88	7232	6.81	5.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008429528-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
008429528-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS
008429528-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008429528-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
008429528-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT
008429528-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT

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

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

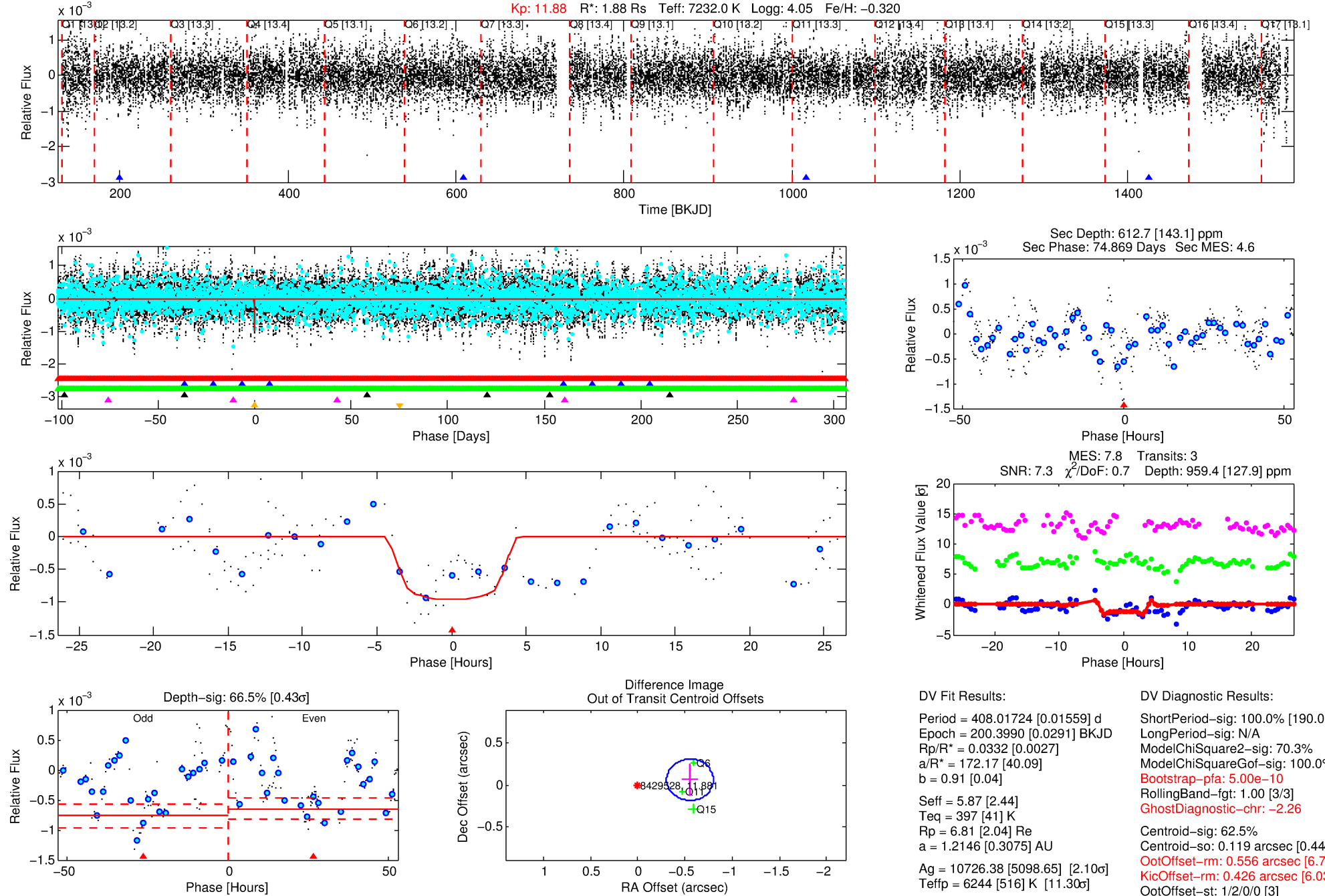
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008429528-06

No Significant Match Found

# DV One-Page Summary

KIC: 8429528 Candidate: 6 of 6 Period: 408.017 d



## DV Fit Results:

Period = 408.01724 [0.01559] d  
Epoch = 200.3990 [0.0291] BKJD  
Rp/R\* = 0.0332 [0.0027]  
a/R\* = 172.17 [40.09]  
b = 0.91 [0.04]  
Seff = 5.87 [2.44]  
Teff = 397 [41] K  
Rp = 6.81 [2.04] Re  
a = 1.2146 [0.3075] AU  
Ag = 10726.38 [5098.65] [2.10σ]  
Teffp = 6244 [516] K [11.30σ]

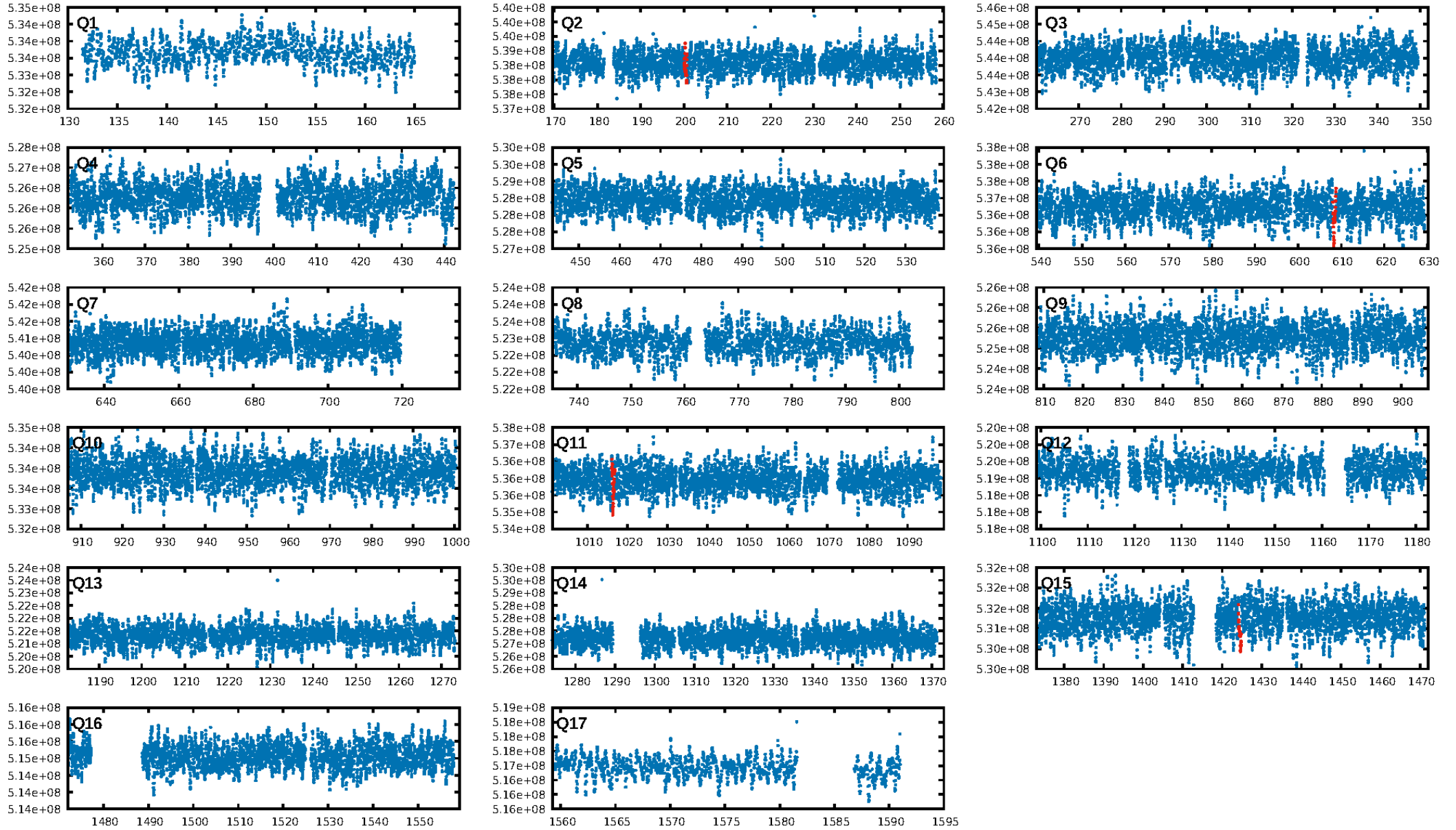
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [190.01σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 70.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.00e-10**  
**RollingBand-fgt: 1.00 [3/3]**  
**GhostDiagnostic-chr: -2.26**  
Centroid-sig: 62.5%  
Centroid-so: 0.119 arcsec [0.44σ]  
**OotOffset-rm: 0.556 arcsec [6.74σ]**  
**KicOffset-rm: 0.426 arcsec [6.03σ]**  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/3]

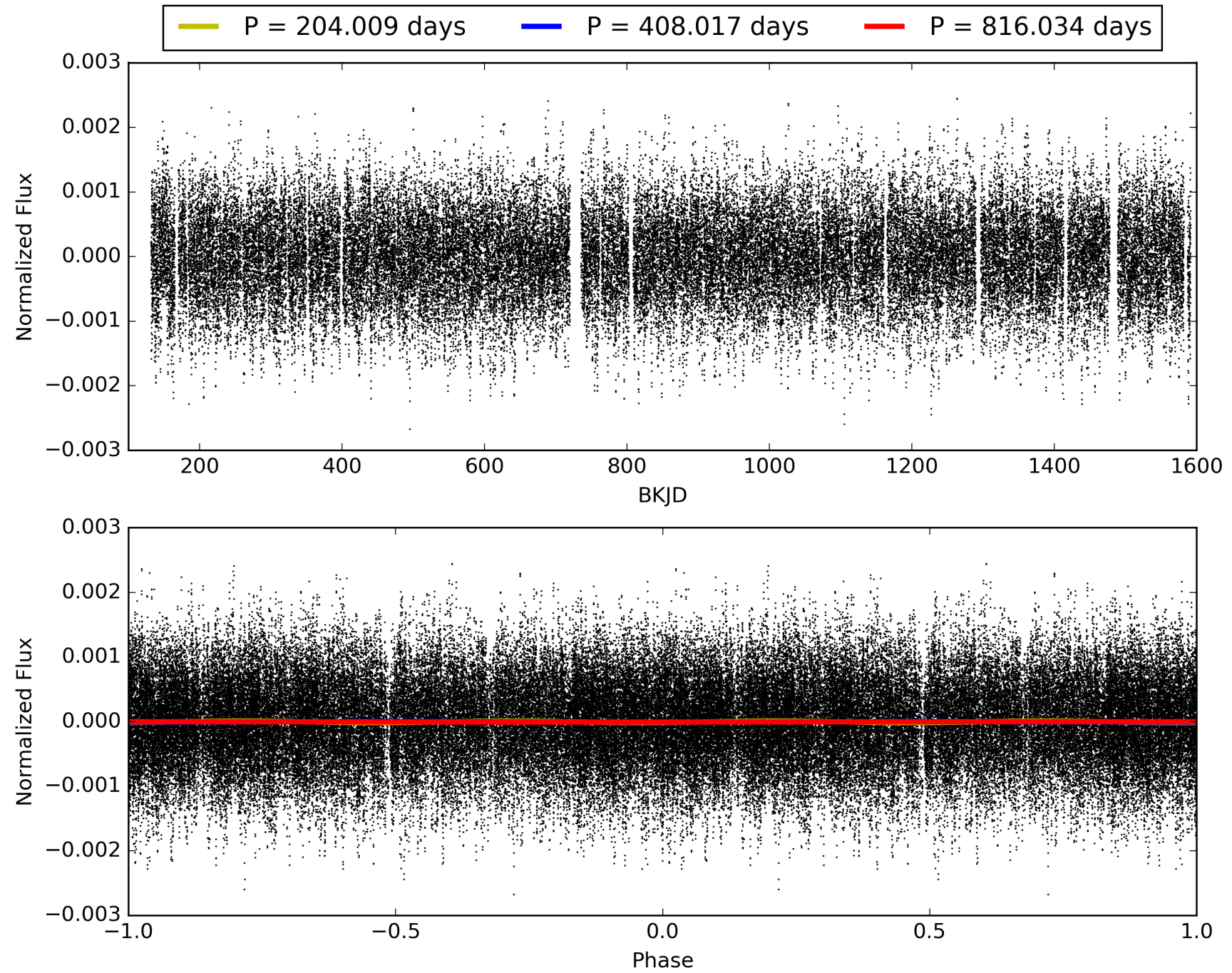
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:06:24 Z

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

# TCE 008429528-06, PDC Light Curves

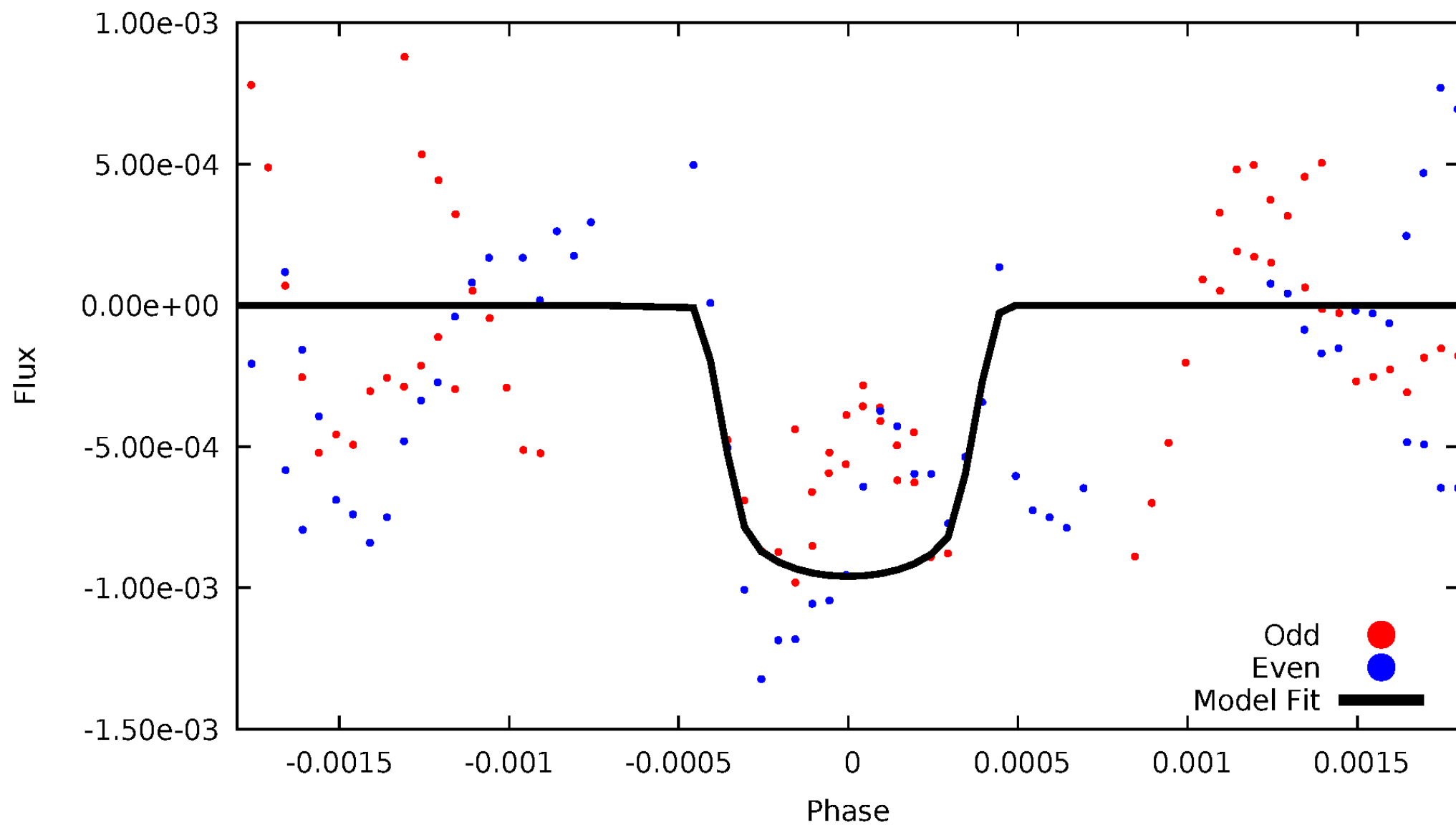


TCE 008429528-06



# DV Odd/Even

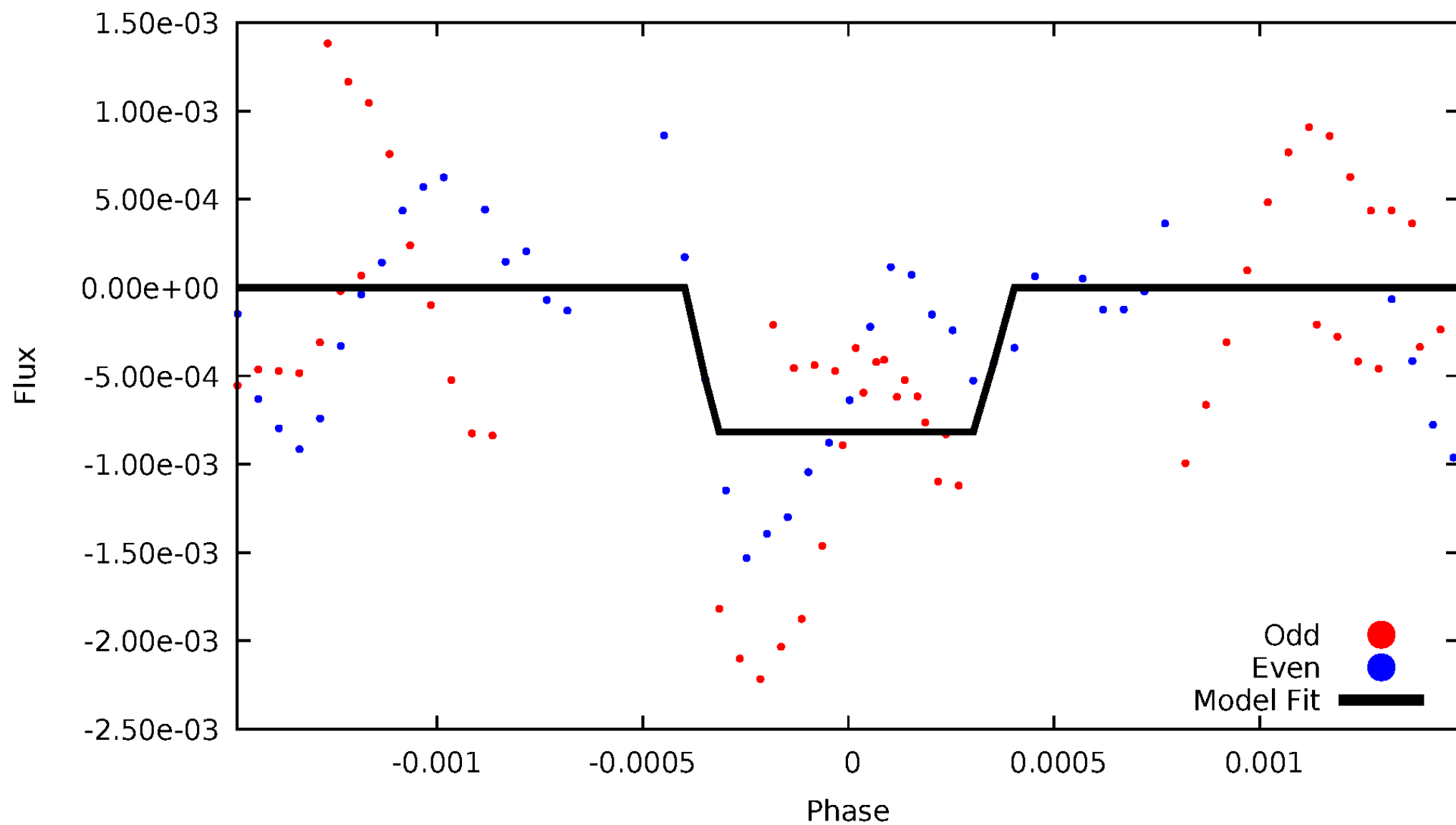
TCE 008429528-06





# ALT Odd/Even

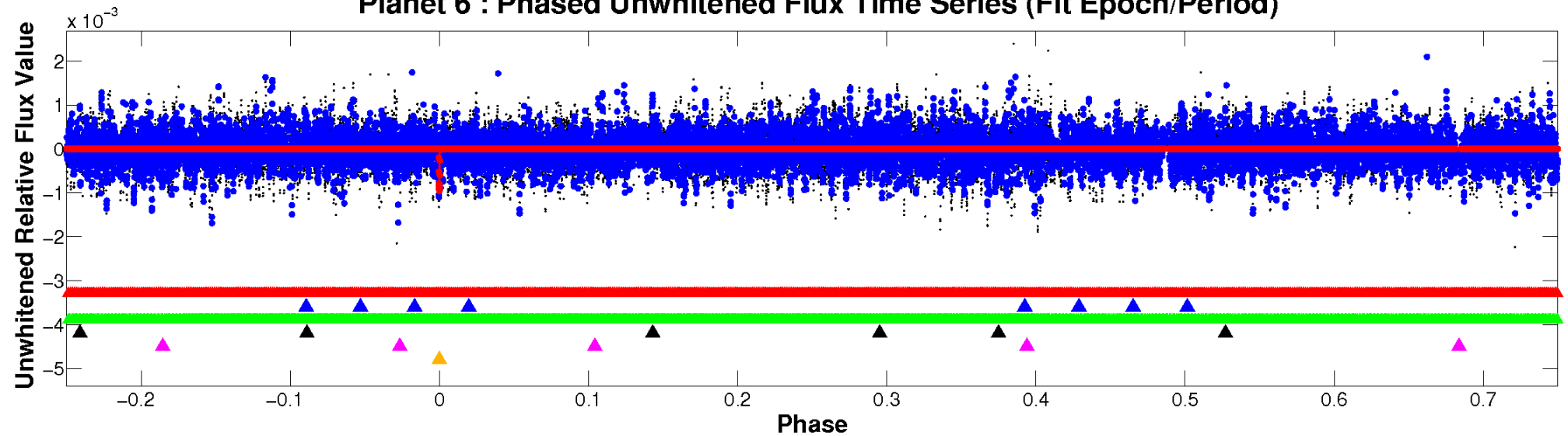
TCE 008429528-06



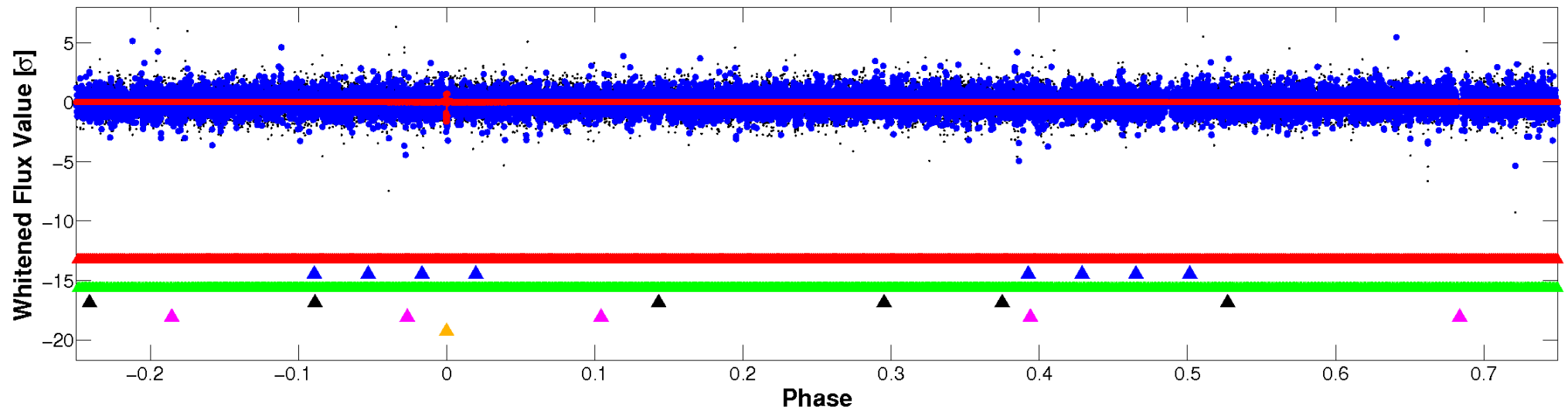


# Non-Whitened Vs. Whitened Light Curve

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

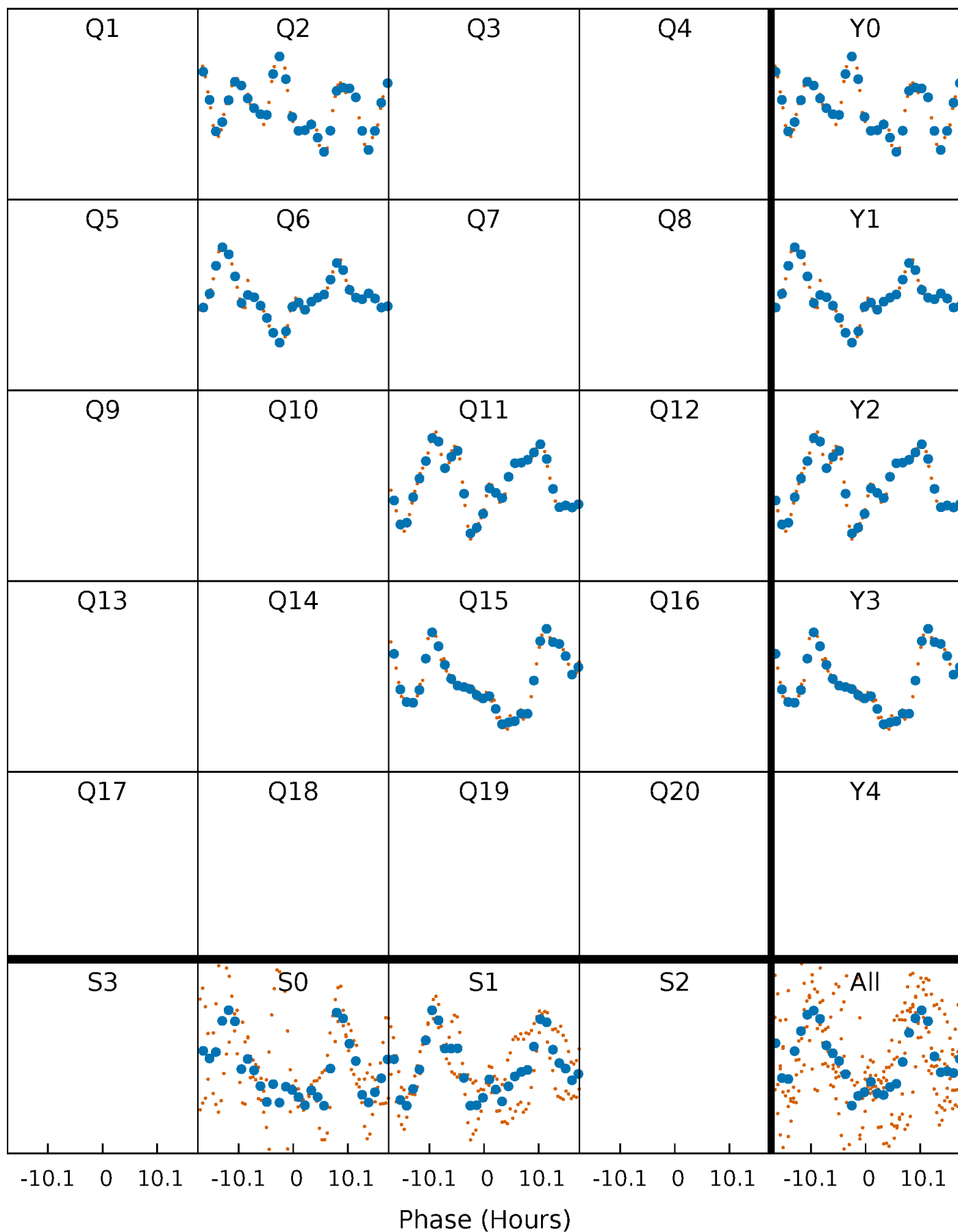


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



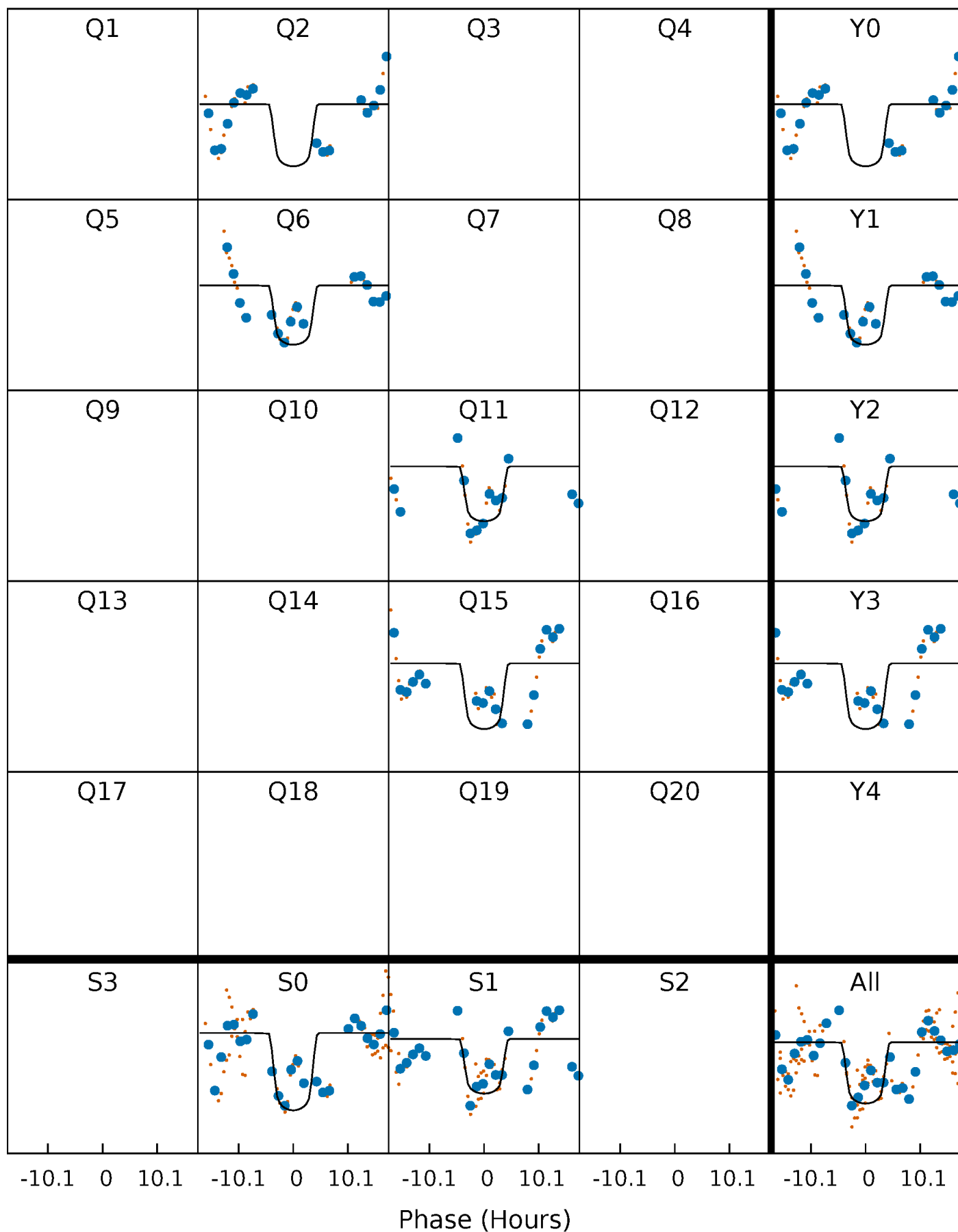
# PDC Quarter-Phased Transit Curves

TCE 008429528-06 P=408.017238 Days  $T_0=200.398953$  (BKJD)



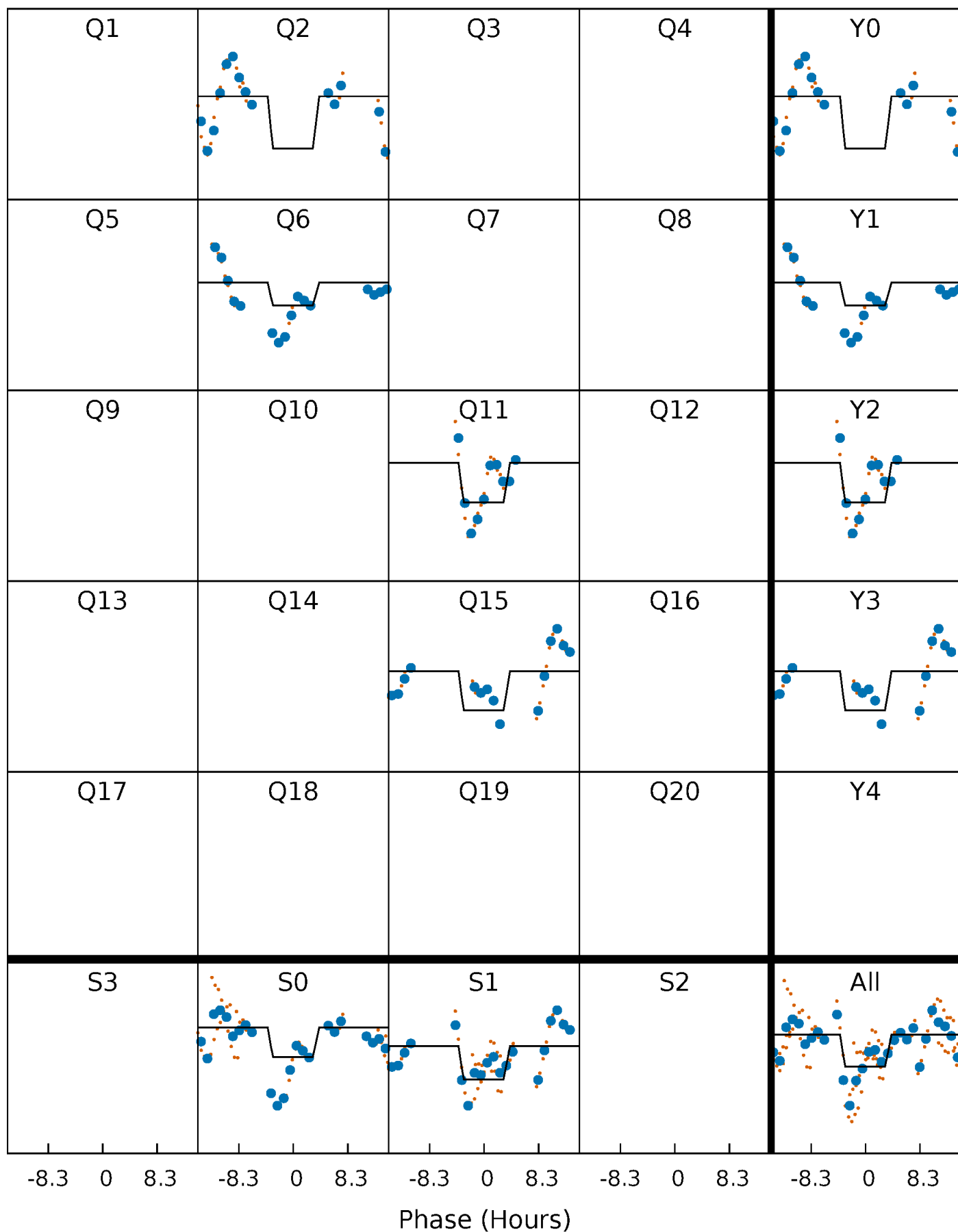
# DV Quarter-Phased Transit Curves

TCE 008429528-06 P=408.017238 Days  $T_0=200.398953$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

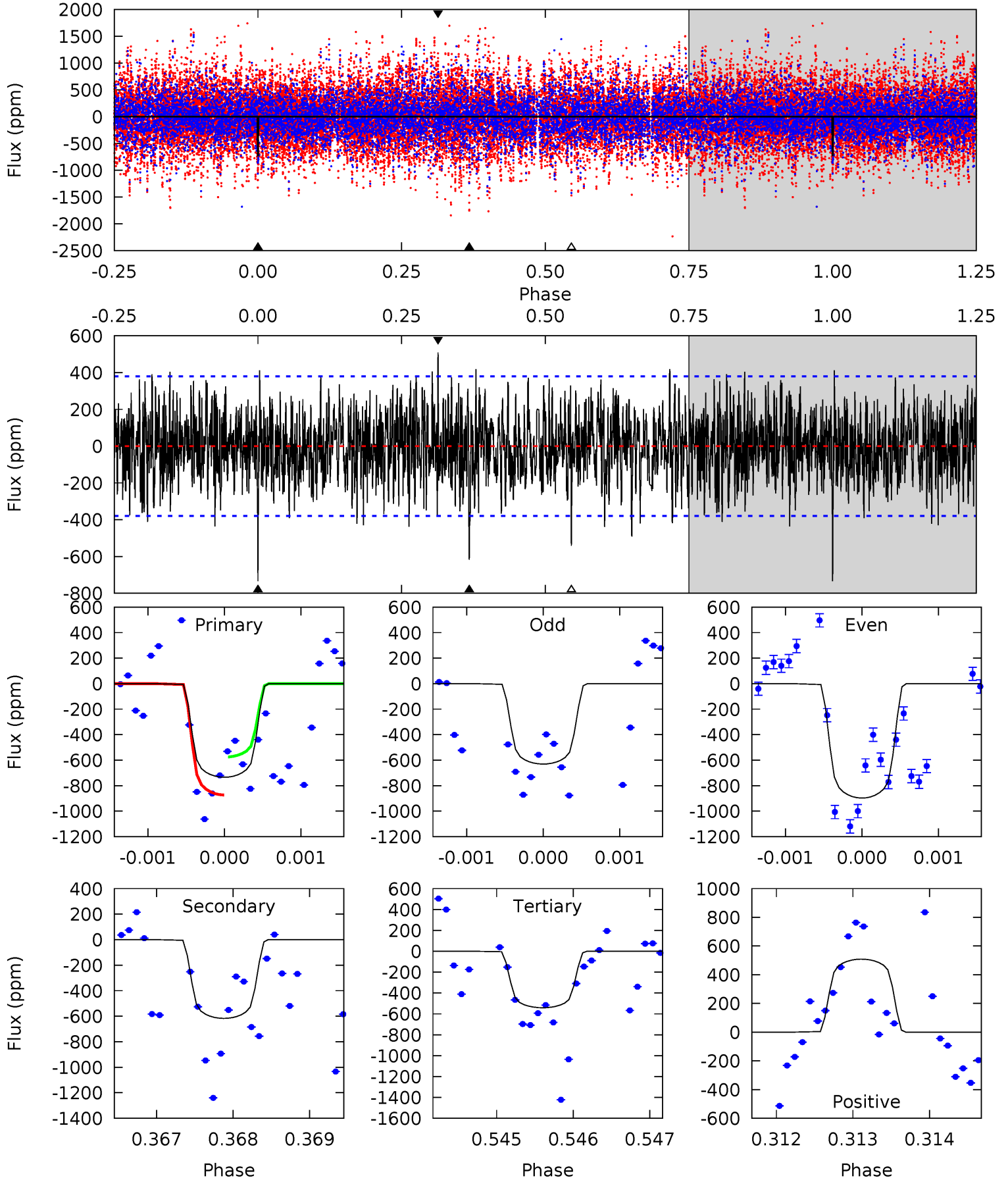
TCE 008429528-06 P=408.030948 Days  $T_0=200.367922$  (BKJD)



# DV Model-Shift Uniqueness Test

008429528-06, P = 408.017238 Days, E = 200.398953 Days

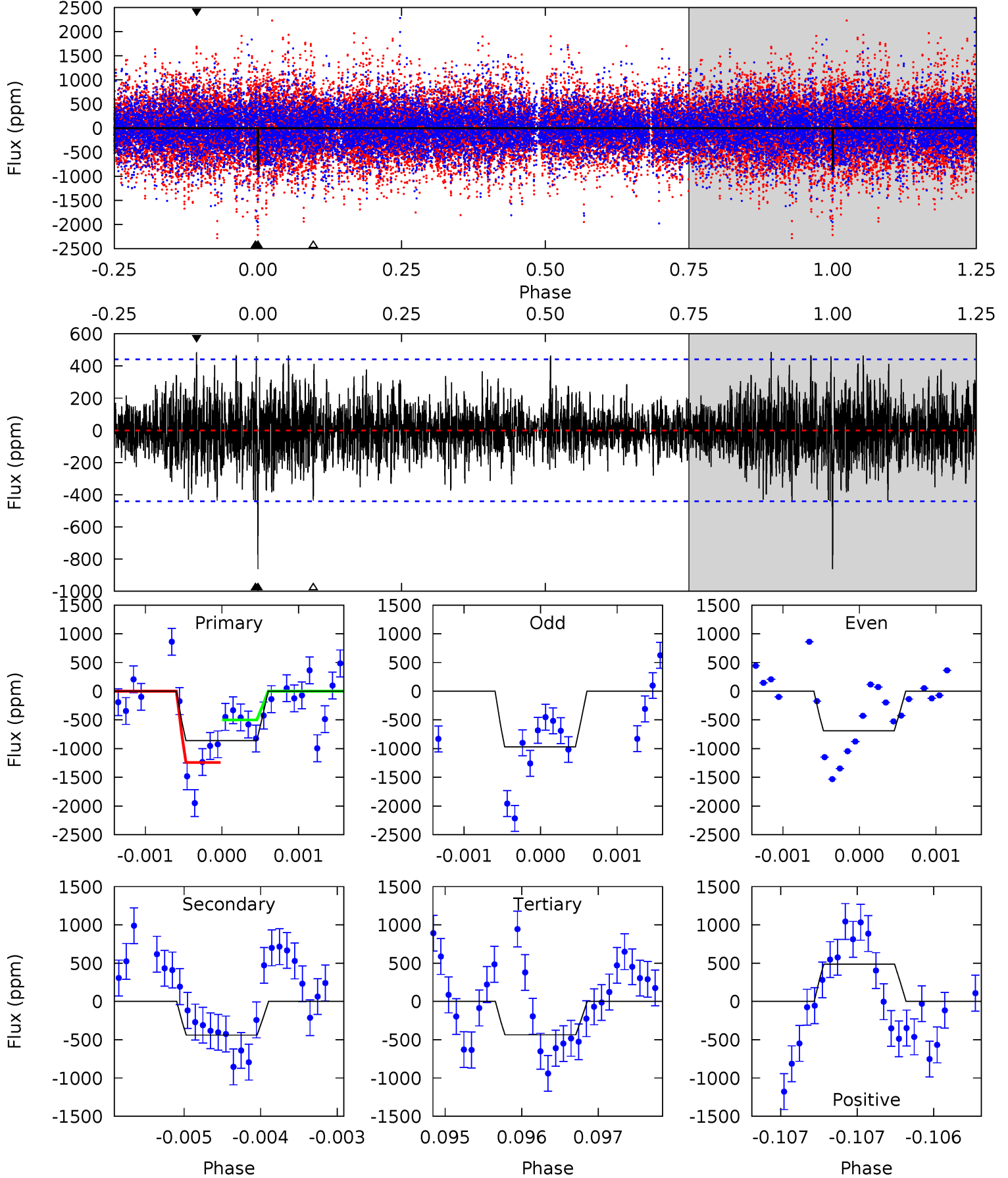
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	8.91	7.81	7.34	5.48	3.34	2.13	2.78	3.25	1.10	1.57	1.91	1.07	0.41	2.15



# Alt Model-Shift Uniqueness Test

008429528-06, P = 408.030948 Days, E = 200.367922 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	5.51	5.46	6.09	5.52	3.40	1.51	5.33	4.70	0.05	-0.59	1.75	1.24	0.36	4.64



### Stellar Parameters For KIC 008429528

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7232^{+228}_{-304}$	$4.047^{+0.214}_{-0.175}$	$-0.320^{+0.300}_{-0.300}$	$1.879^{+0.543}_{-0.543}$	$1.435^{+0.216}_{-0.265}$	$0.304^{+0.420}_{-0.132}$
	+3%/-4%	+5%/-4%	+94%/-94%	+29%/-29%	+15%/-18%	+138%/-43%
Source	KIC0	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 008429528-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-617 \pm 69$	$6.76^{+1.12}_{-1.07}$	$551^{+40}_{-45}$	$6174^{+387}_{-355}$	$10911^{+4660}_{-2893}$
Alt.	$-440 \pm 80$	$5.80^{+1.13}_{-1.01}$	$552^{+47}_{-46}$	$6100^{+454}_{-446}$	$10435^{+5195}_{-3372}$

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



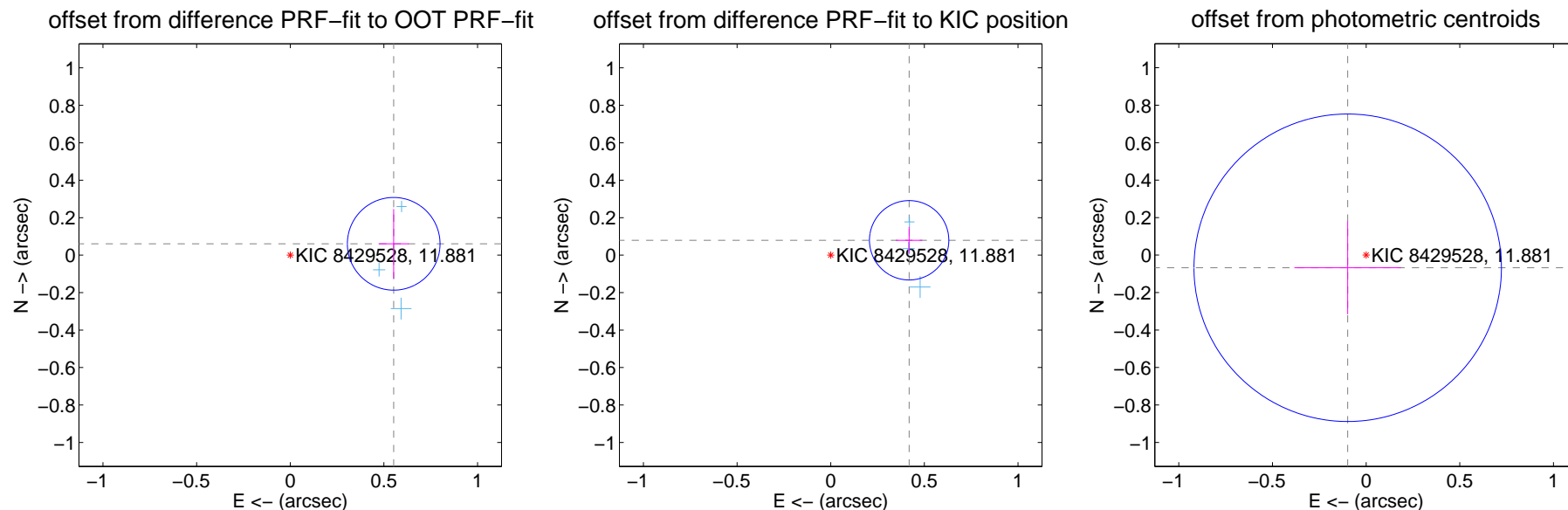
## DV Centroid Data

Supplemental centroid analysis for 008429528-06. **Kepler magnitude: 11.88.** Transit SNR 7.34

**There are 3 quarters with good PRF difference image offsets**

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>0.556 \pm 0.082</math></b>	<b>6.74</b>	$-0.552 \pm 0.080$	$0.061 \pm 0.185$
PRF-fit source offset from KIC position	<b><math>0.426 \pm 0.071</math></b>	<b>6.03</b>	$-0.419 \pm 0.071$	$0.079 \pm 0.071$
photometric centroid source offset	$0.12 \pm 0.27$	0.44	$0.10 \pm 0.28$	$-0.07 \pm 0.25$

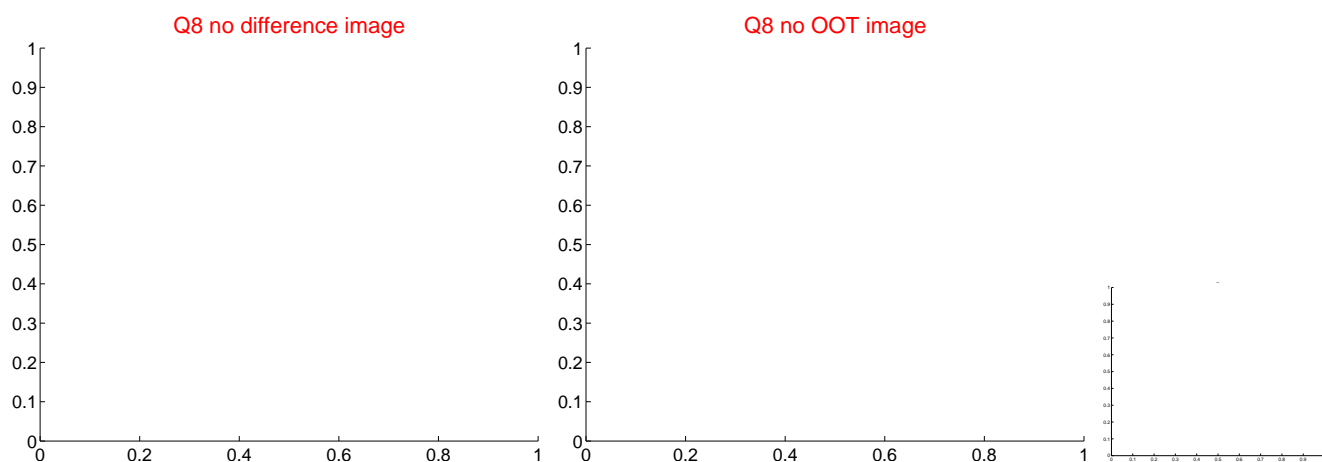
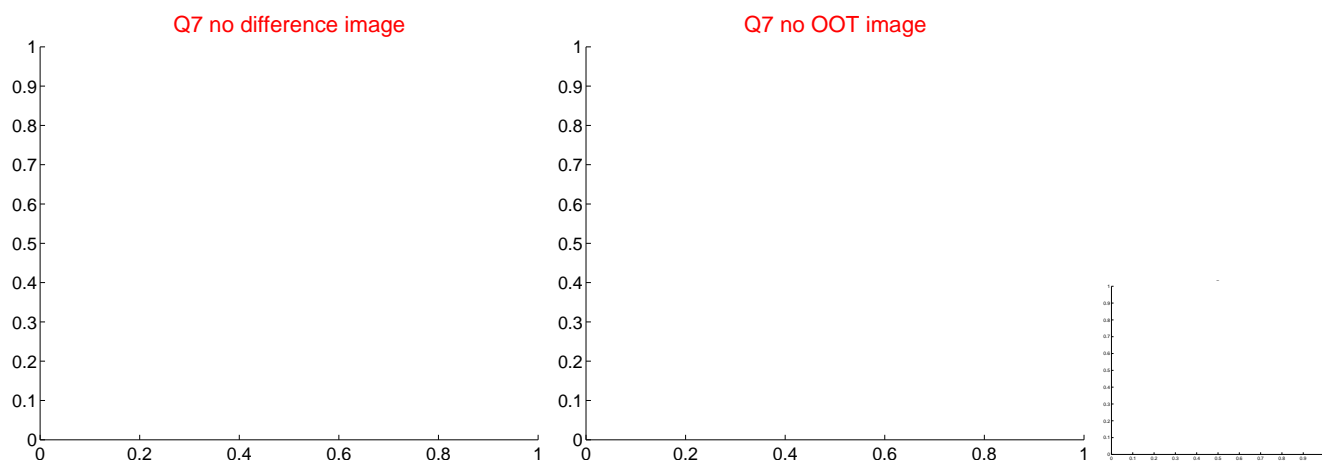
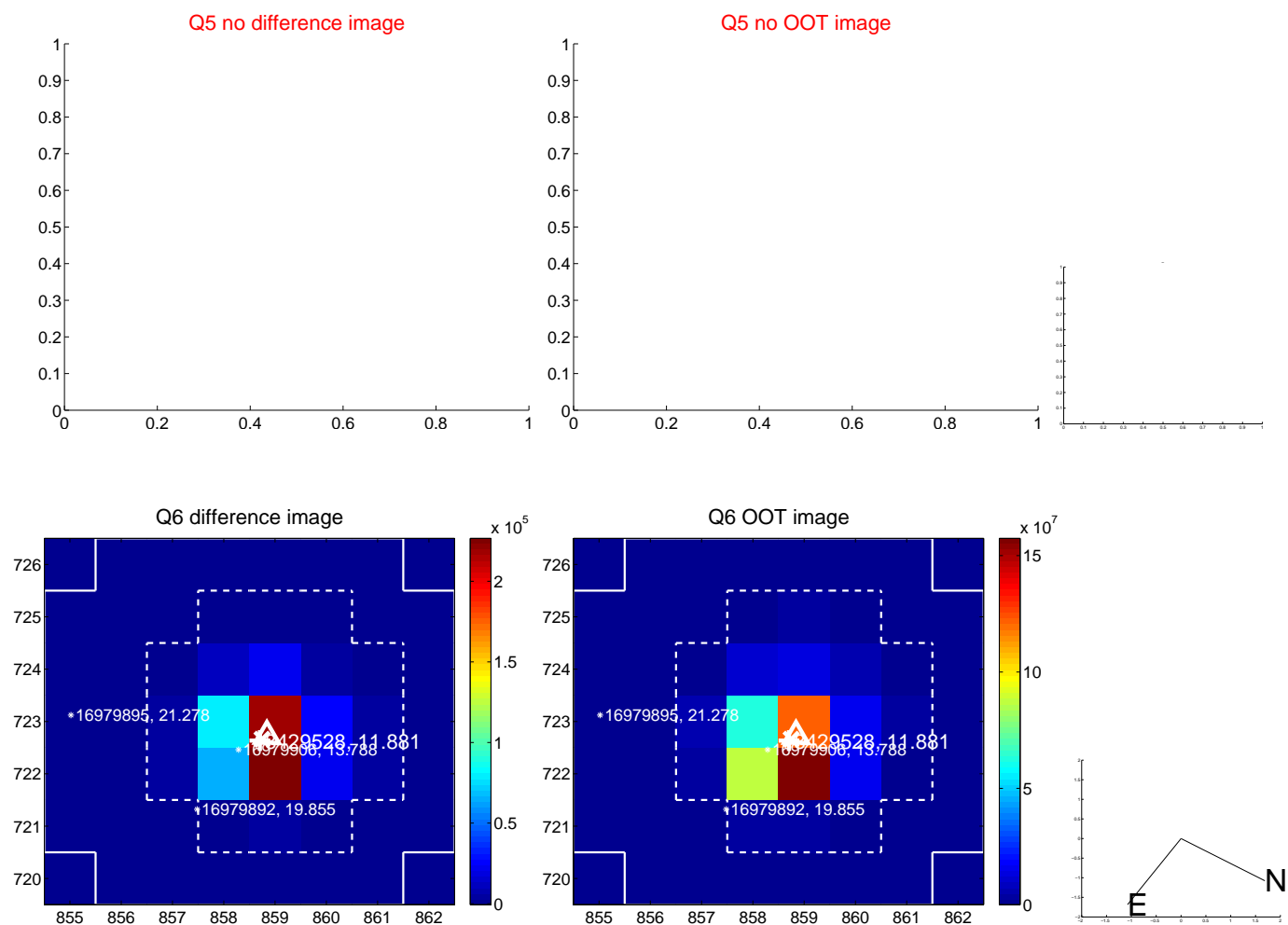


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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



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

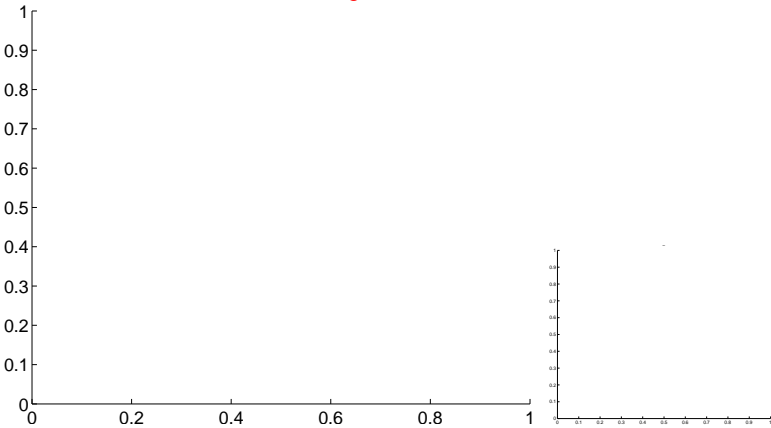


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

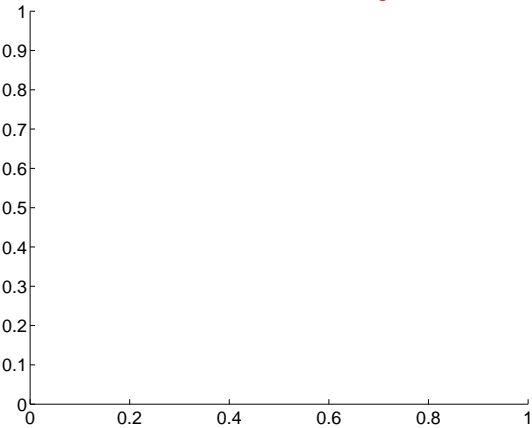
Q9 no difference image



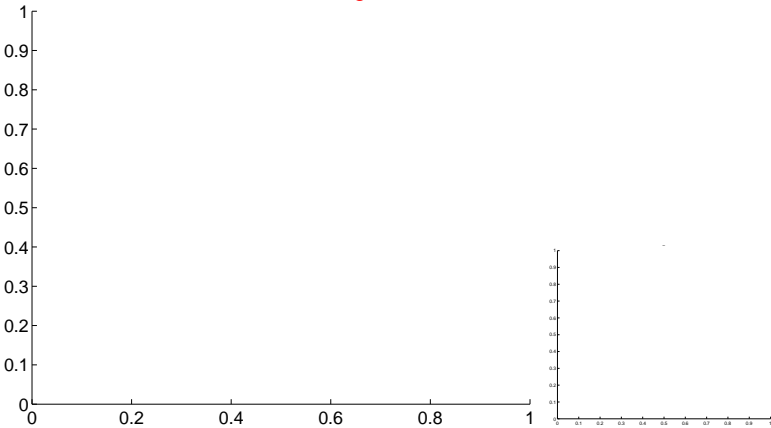
Q9 no OOT image



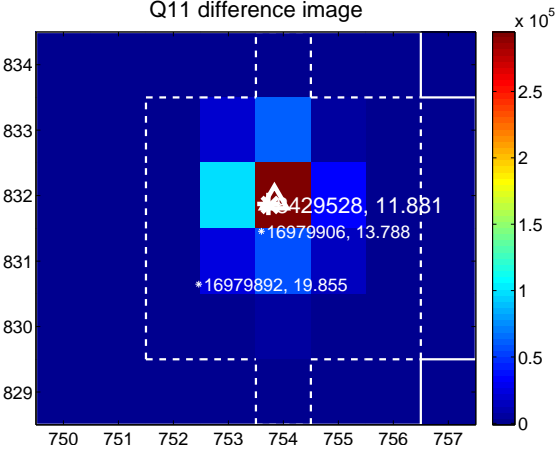
Q10 no difference image



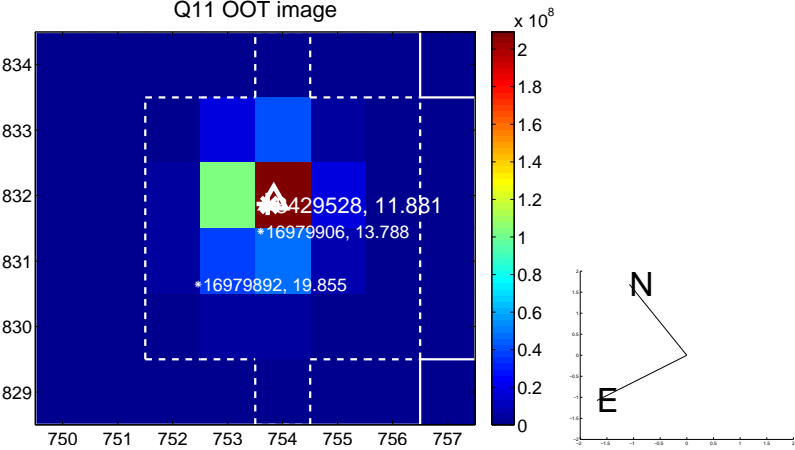
Q10 no OOT image



Q11 difference image



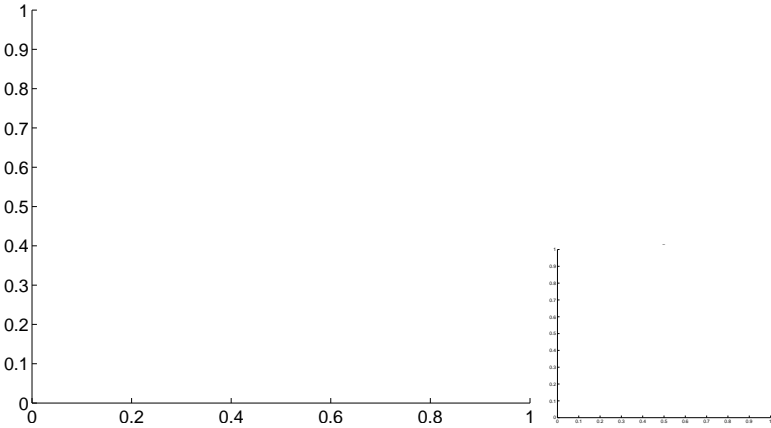
Q11 OOT image



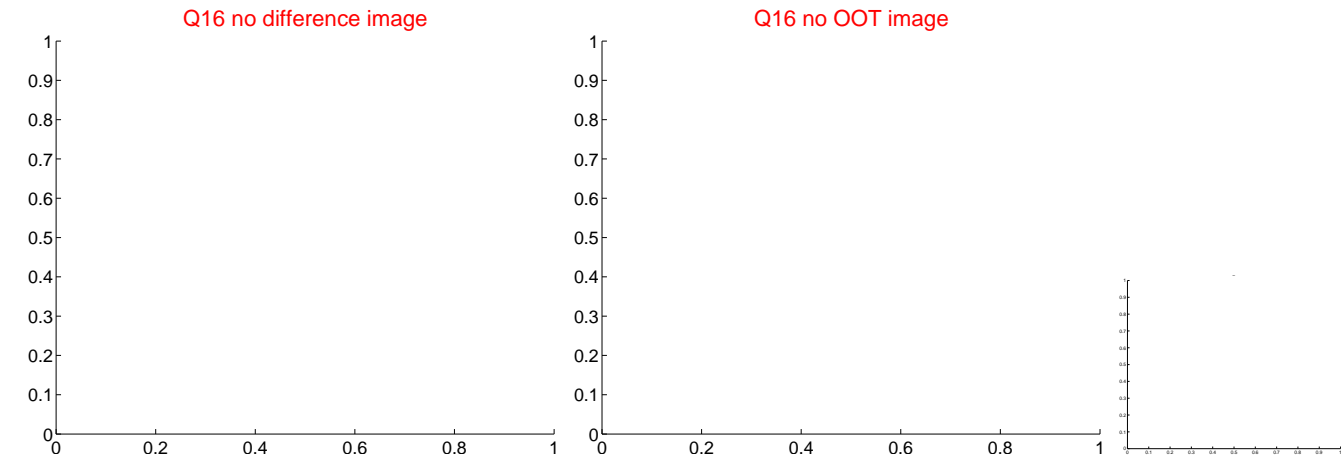
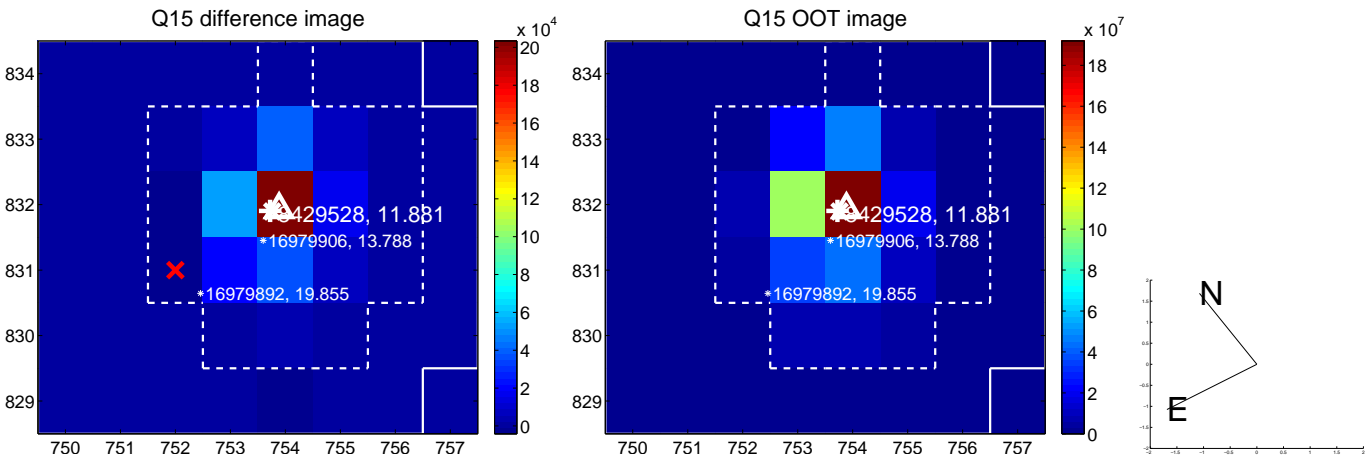
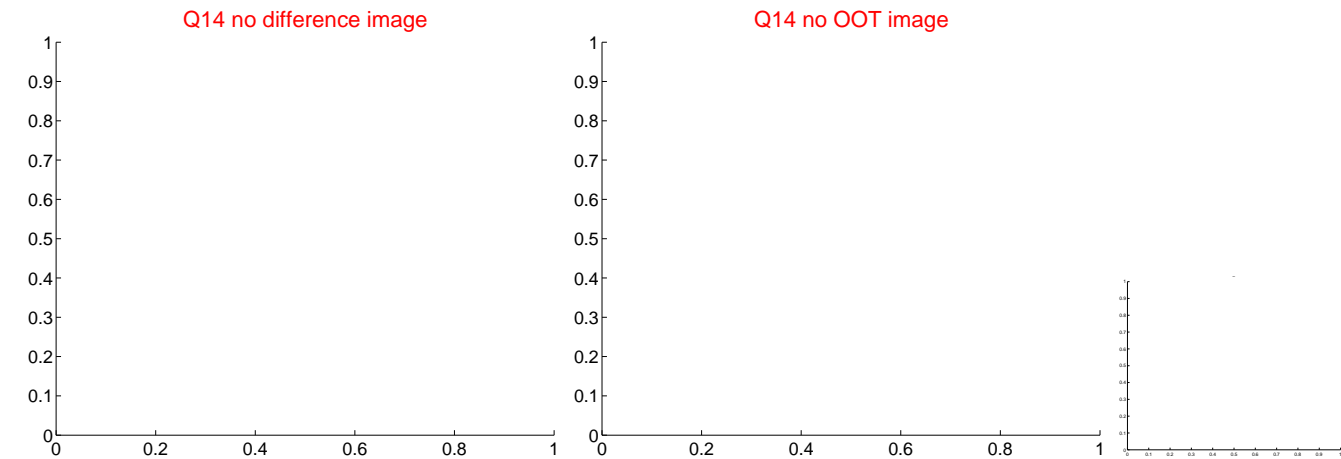
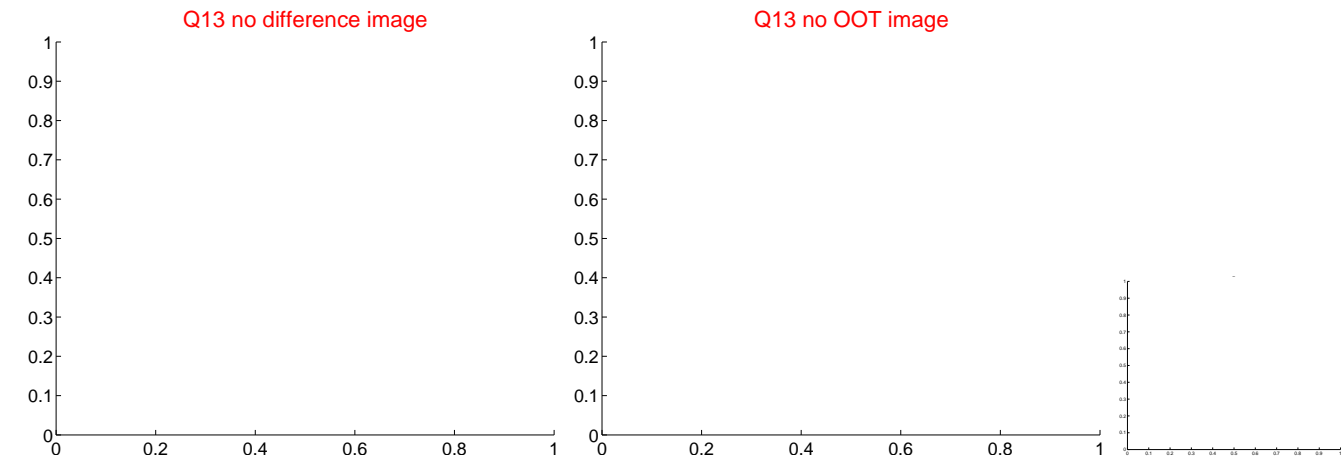
Q12 no difference image



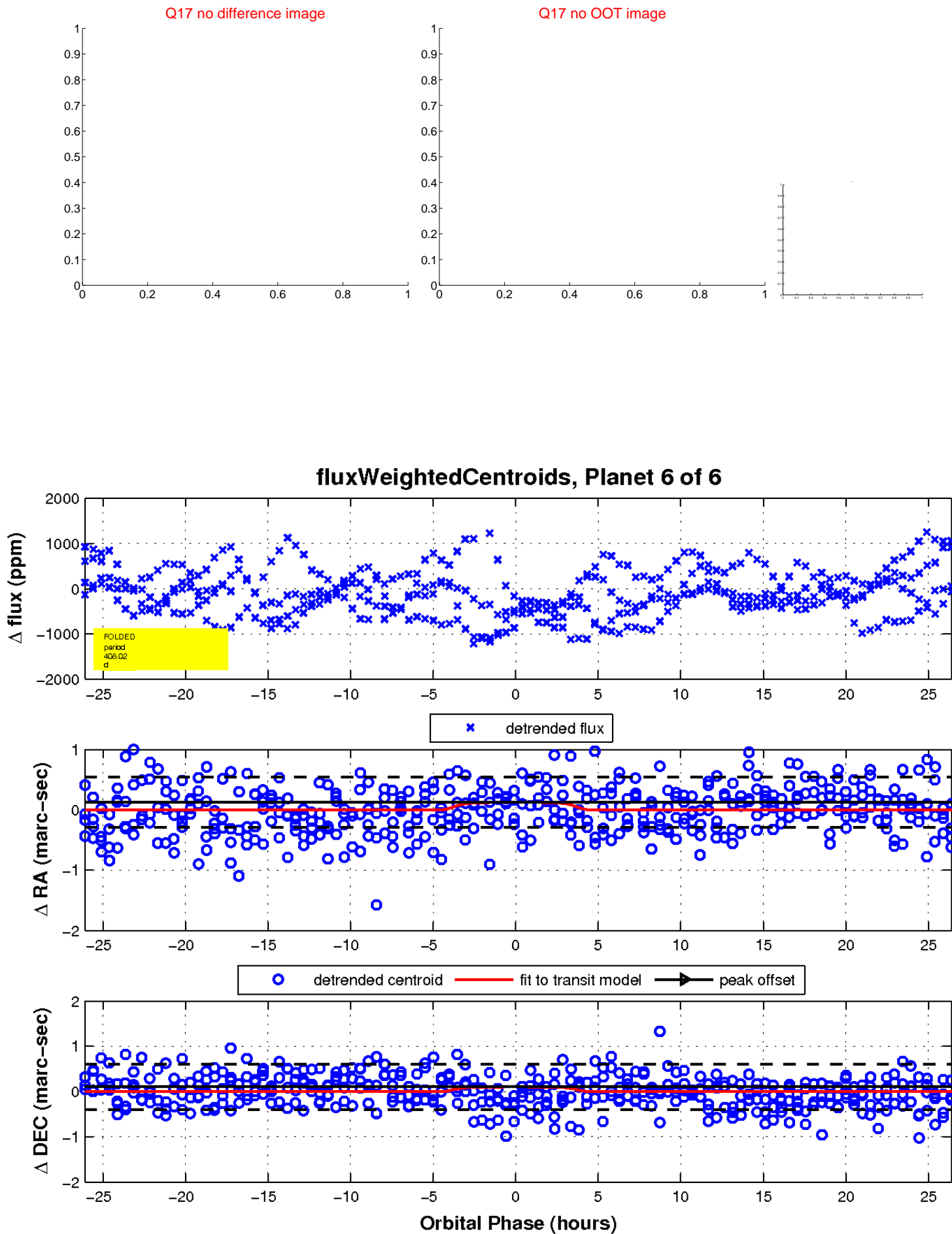
Q12 no OOT image



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



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



UKIRT Image

Declination

