

# KIC 007899428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007899428-01	OBS	No	519.065250	306.318800	496.5	9.788	32.8	4.5	0.75	4914	1.67	0.23
007899428-02	OBS	No	425.576042	285.658159	975.6	2.843	40.6	11.5	0.75	4914	2.56	0.29
007899428-03	OBS	No	514.251769	162.234990	772.1	4.383	24.5	9.8	0.75	4914	4.31	0.23
007899428-04	OBS	No	526.920264	393.012445	31.8	0.551	23.9	0.4	0.75	4914	0.50	0.22
007899428-05	OBS	No	508.979840	425.187816	544.1	16.483	21.8	4.3	0.75	4914	1.82	0.23
007899428-06	OBS	No	468.572194	453.561311	235.4	1.303	24.9	2.5	0.75	4914	1.69	0.26
007899428-07	OBS	No	591.456205	273.496991	125.0	12.500	18.0	-1.0	0.75	4914	0.81	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

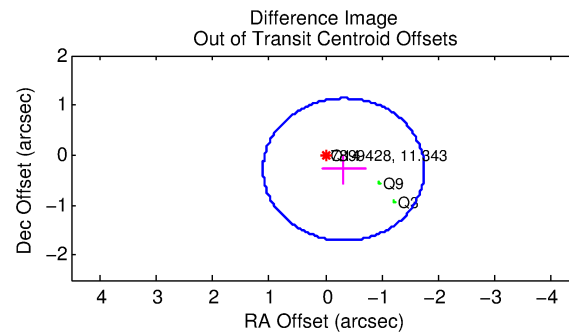
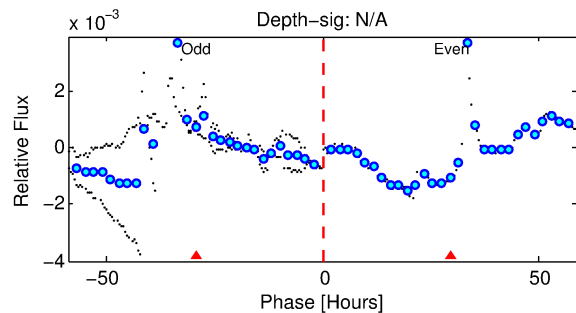
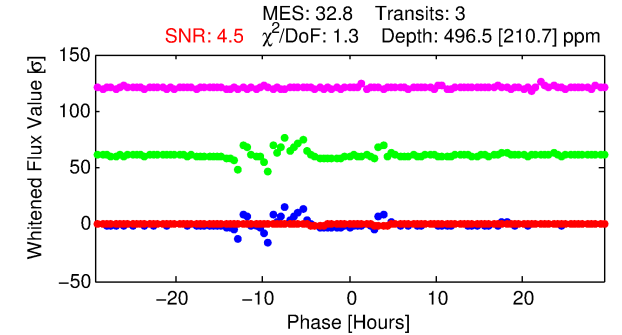
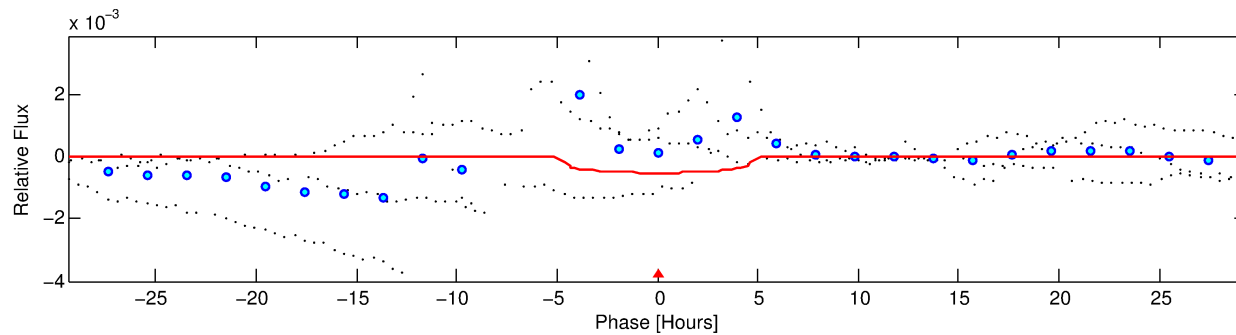
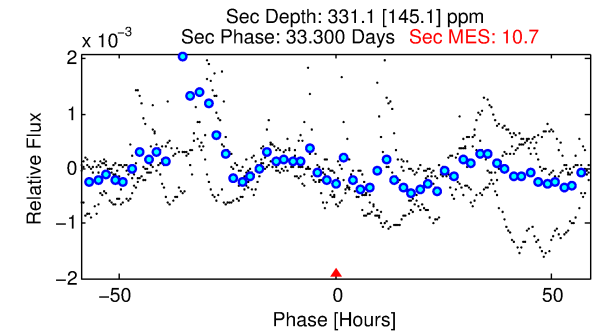
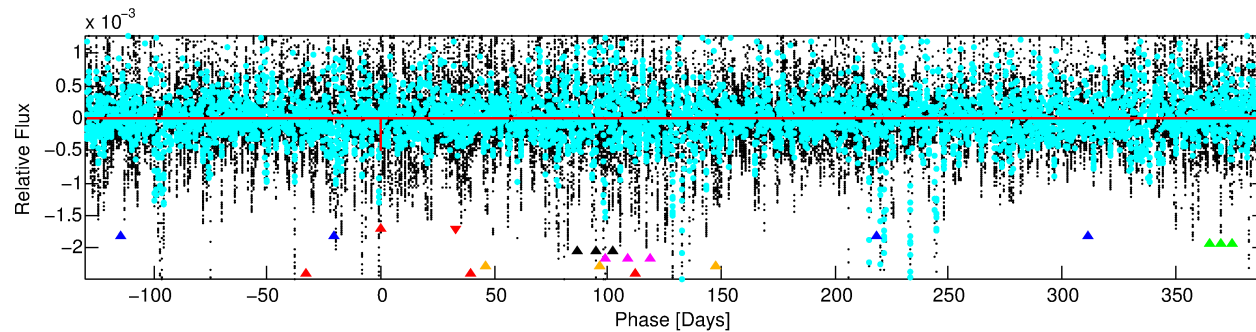
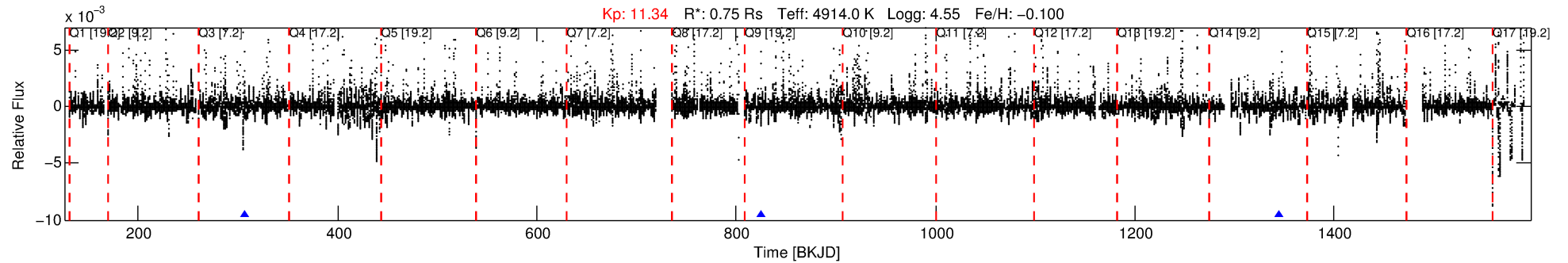
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-01

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 1 of 7 Period: 519.065 d



## DV Fit Results:

Period = 519.06525 [0.01065] d  
Epoch = 306.3188 [0.0146] BKJD  
 $R_p/R^* = 0.0205$  [0.0246]  
 $a/R^* = 366.66$  [1510.56]  
 $b = 0.47$  [6.87]  
 $\text{Seff} = 0.23$  [0.04]  
 $T_{\text{eq}} = 176$  [8] K  
 $R_p = 1.67$  [2.01]  $R_e$   
 $a = 1.1378$  [0.0971] AU  
 $A_g = 84796.63$  [207364.09] [0.41 $\sigma$ ]  
 $T_{\text{eff}} = 4634$  [2835] K [1.57 $\sigma$ ]

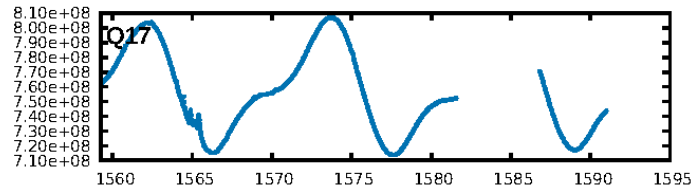
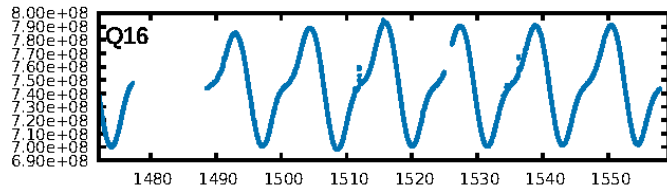
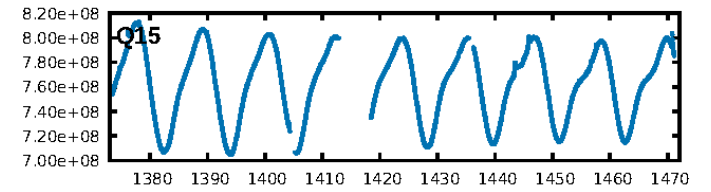
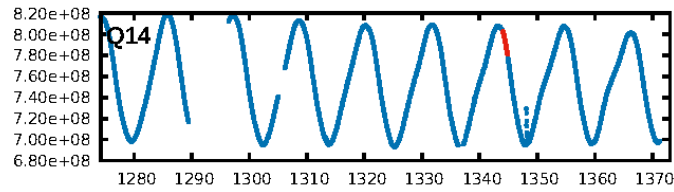
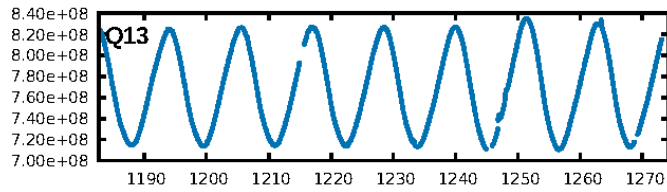
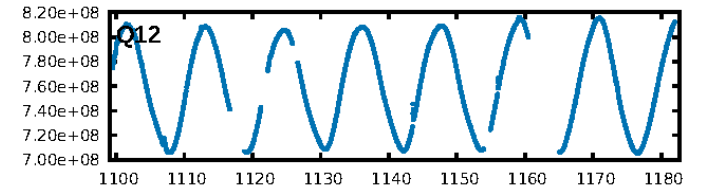
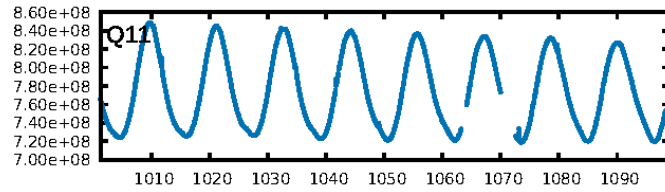
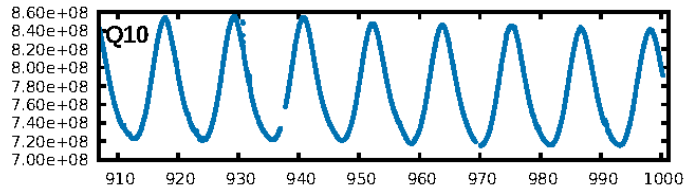
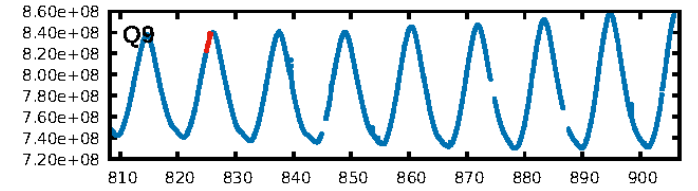
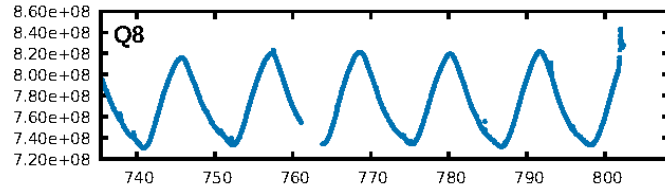
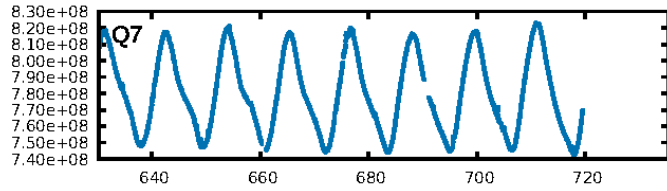
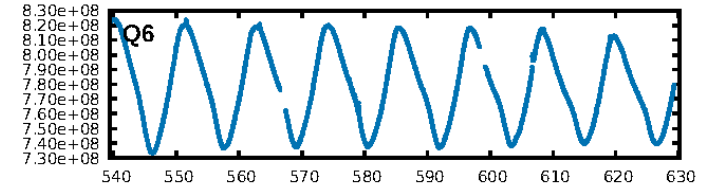
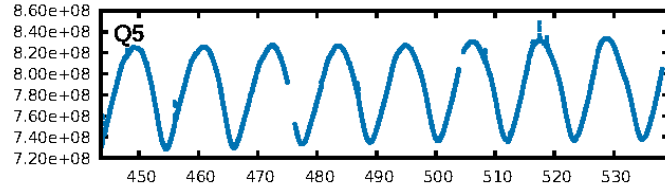
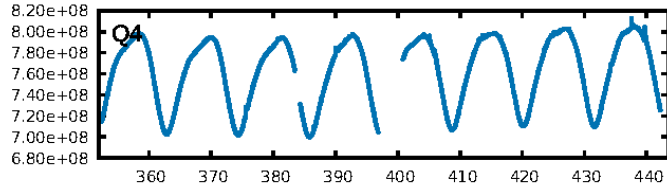
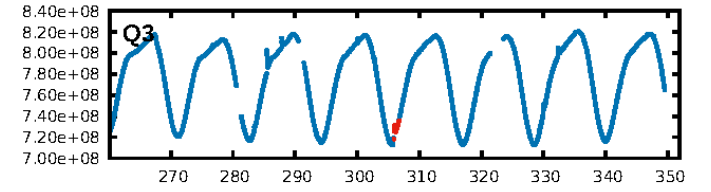
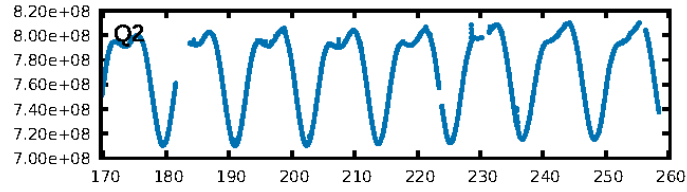
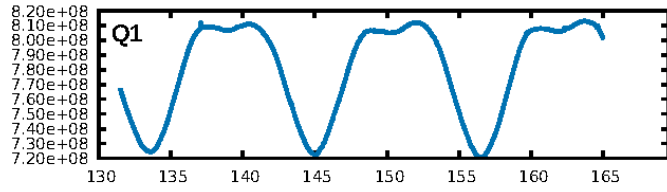
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.77 $\sigma$ ]  
LongPeriod-sig: 100.0% [19.23 $\sigma$ ]  
**ModelChiSquare2-sig: 0.1%**  
ModelChiSquareGof-sig: 96.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -100.5  
Centroid-sig: 95.8%  
Centroid-so: 0.164 arcsec [0.18 $\sigma$ ]  
OotOffset-rm: 0.433 arcsec [0.91 $\sigma$ ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-rm: 0.560 arcsec [1.26 $\sigma$ ]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

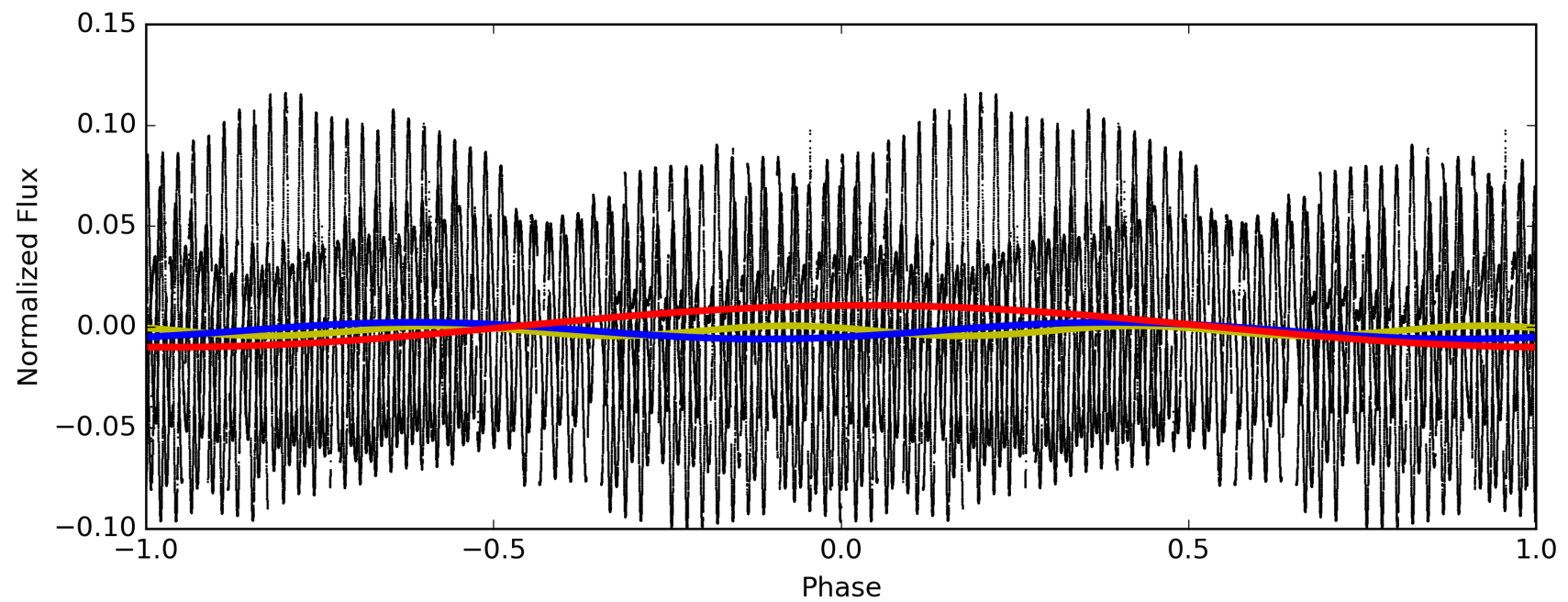
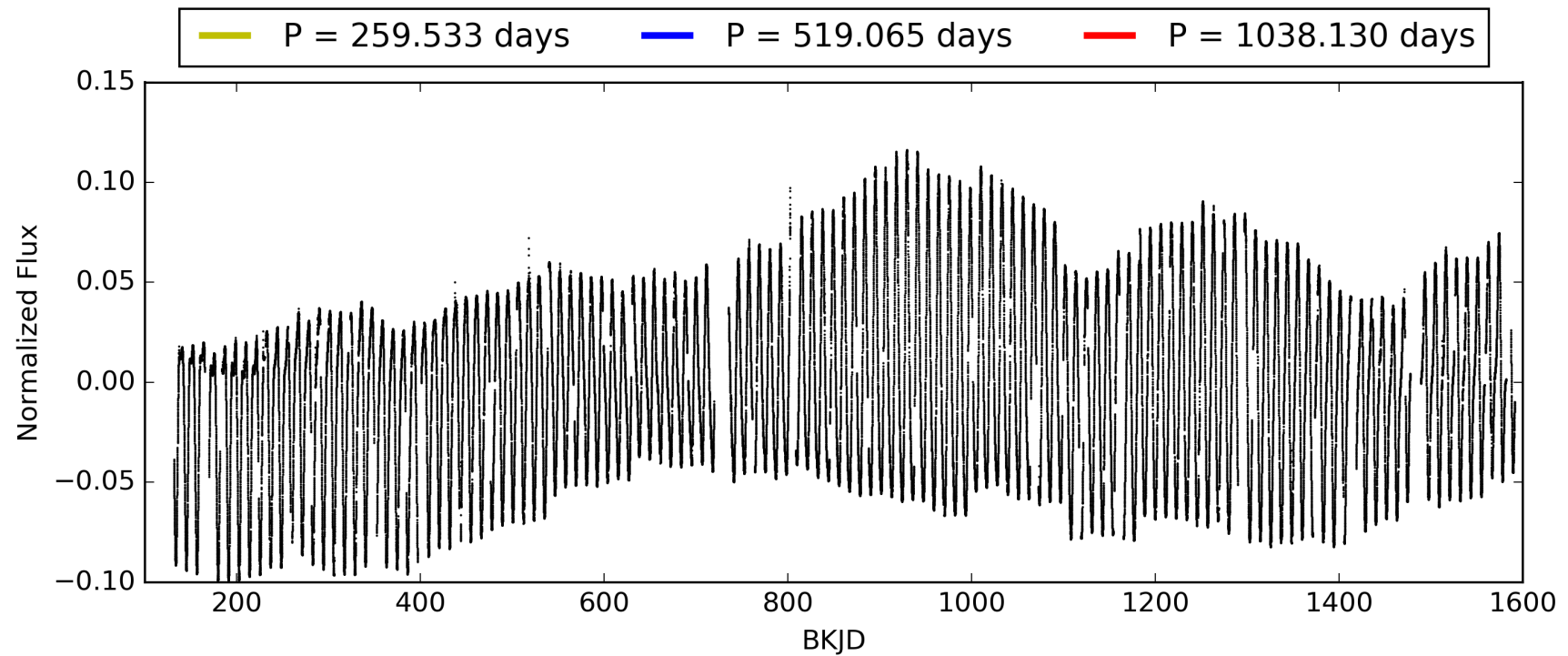
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:18:23 Z

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

# TCE 007899428-01, PDC Light Curves



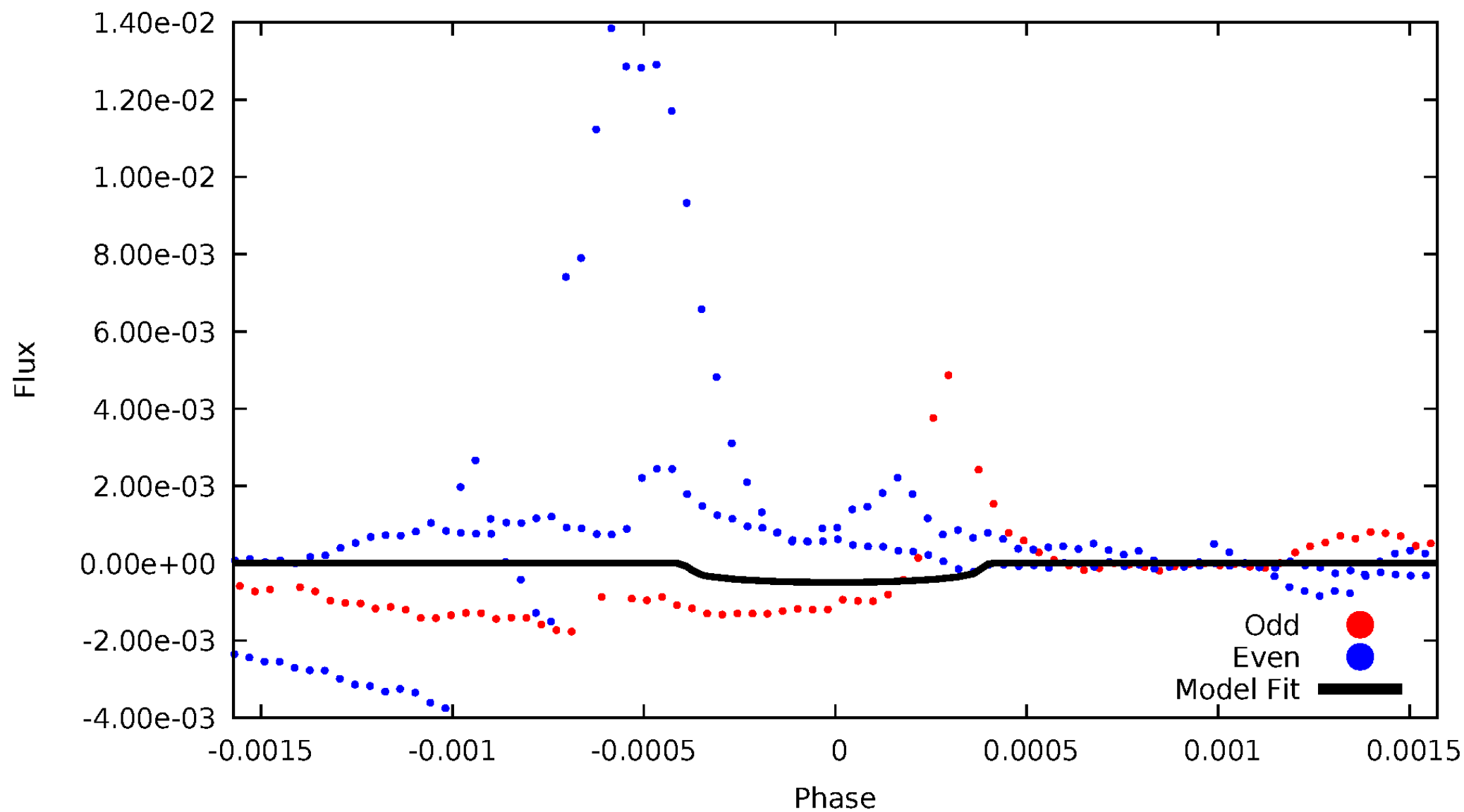
TCE 007899428-01





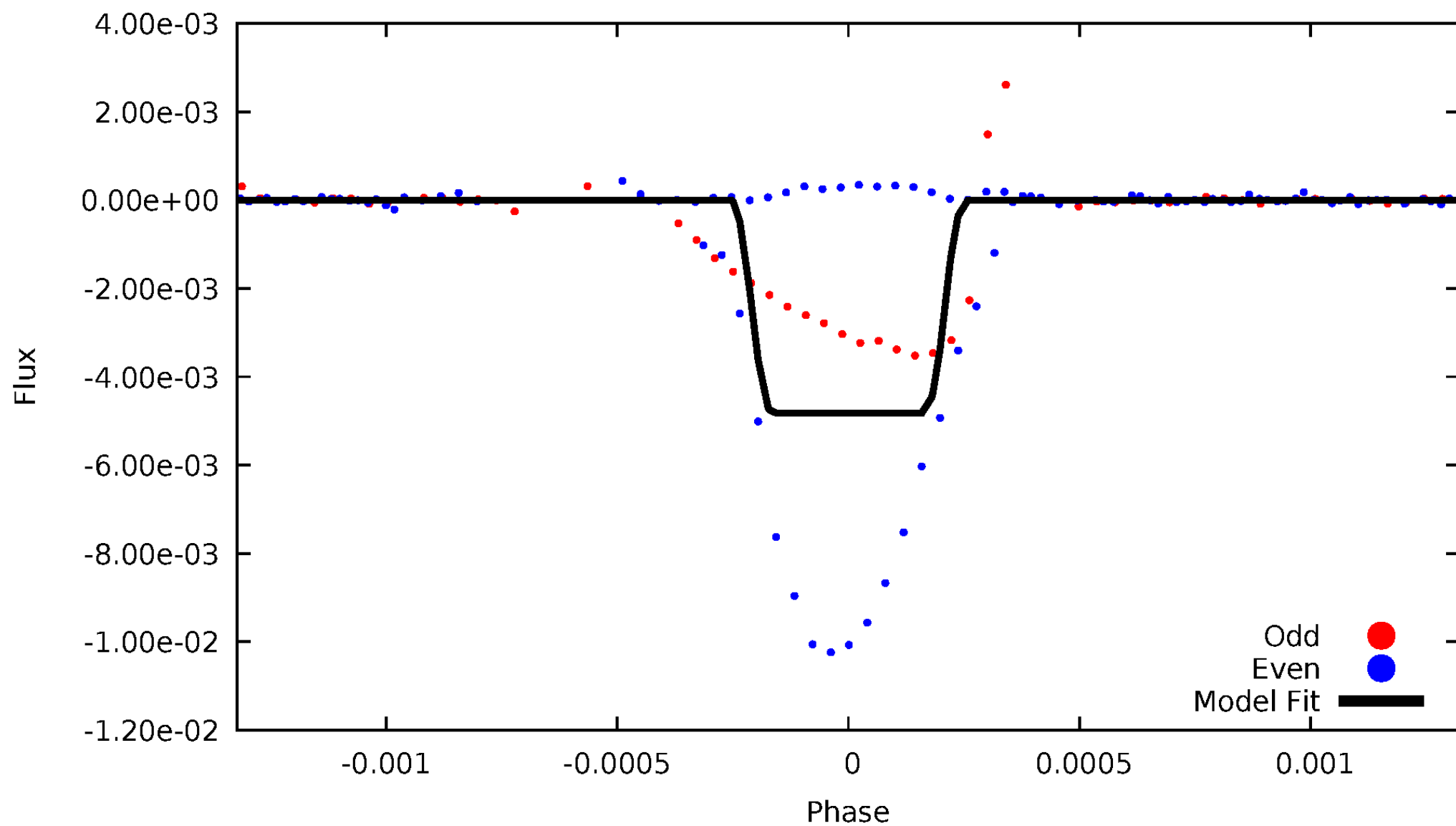
# DV Odd/Even

TCE 007899428-01



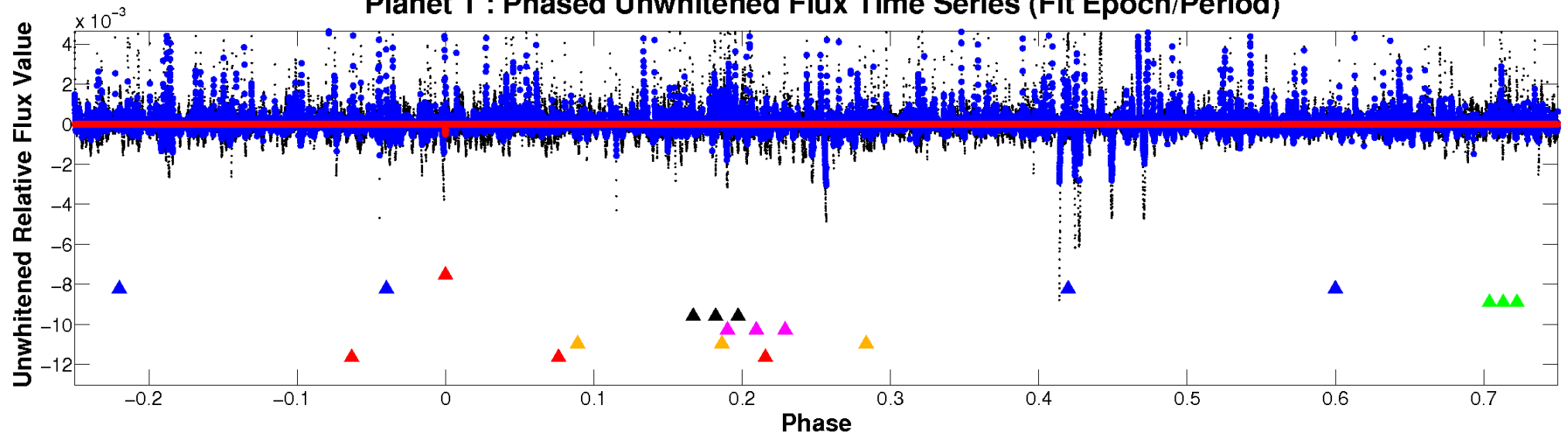
# ALT Odd/Even

TCE 007899428-01

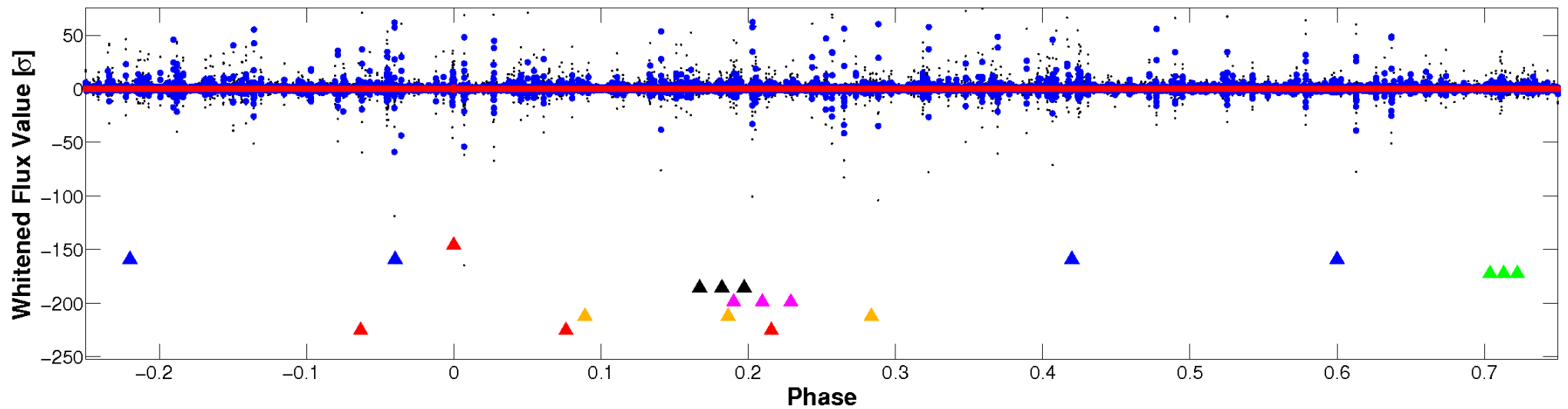


# Non-Whitened Vs. Whitened Light Curve

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

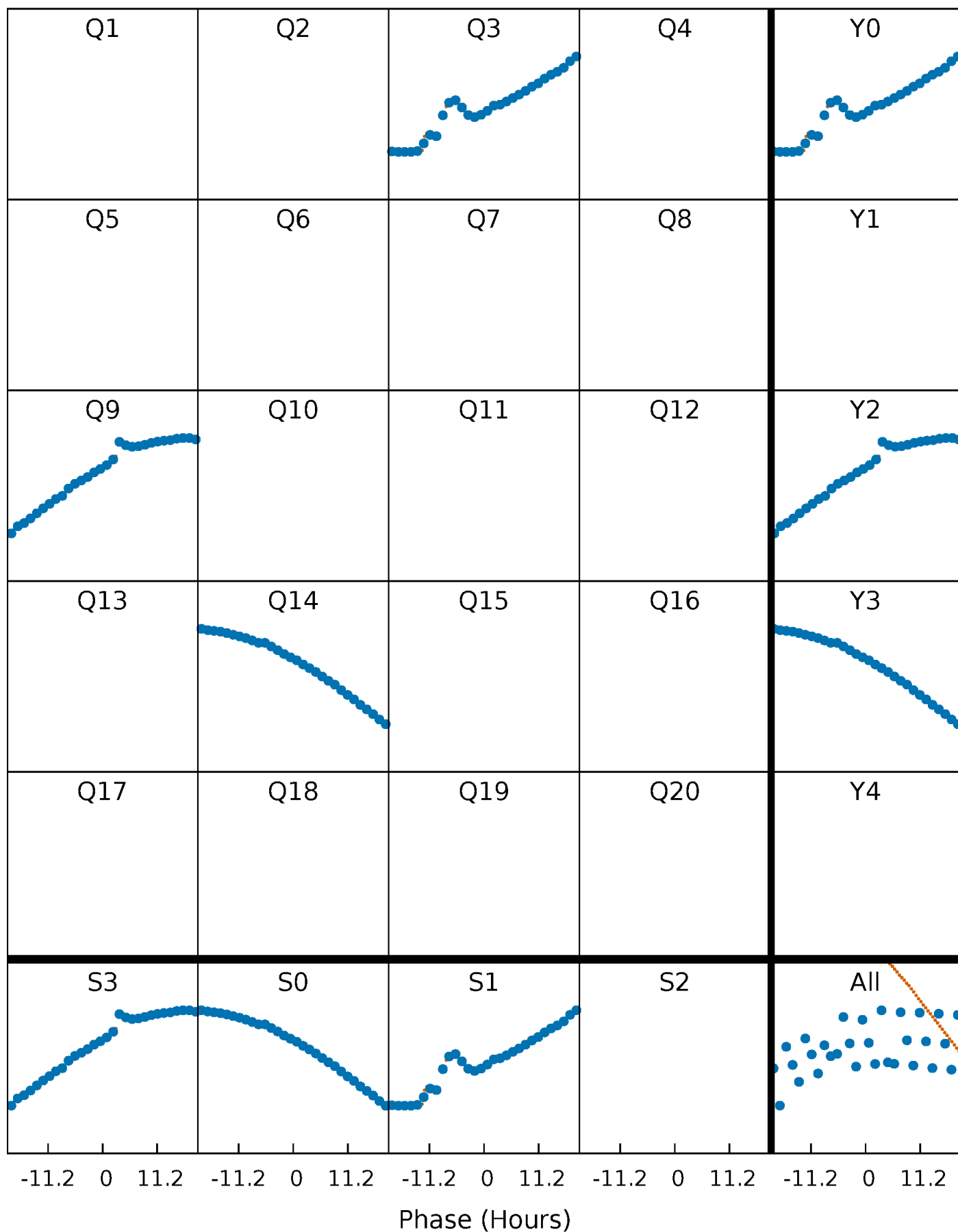


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



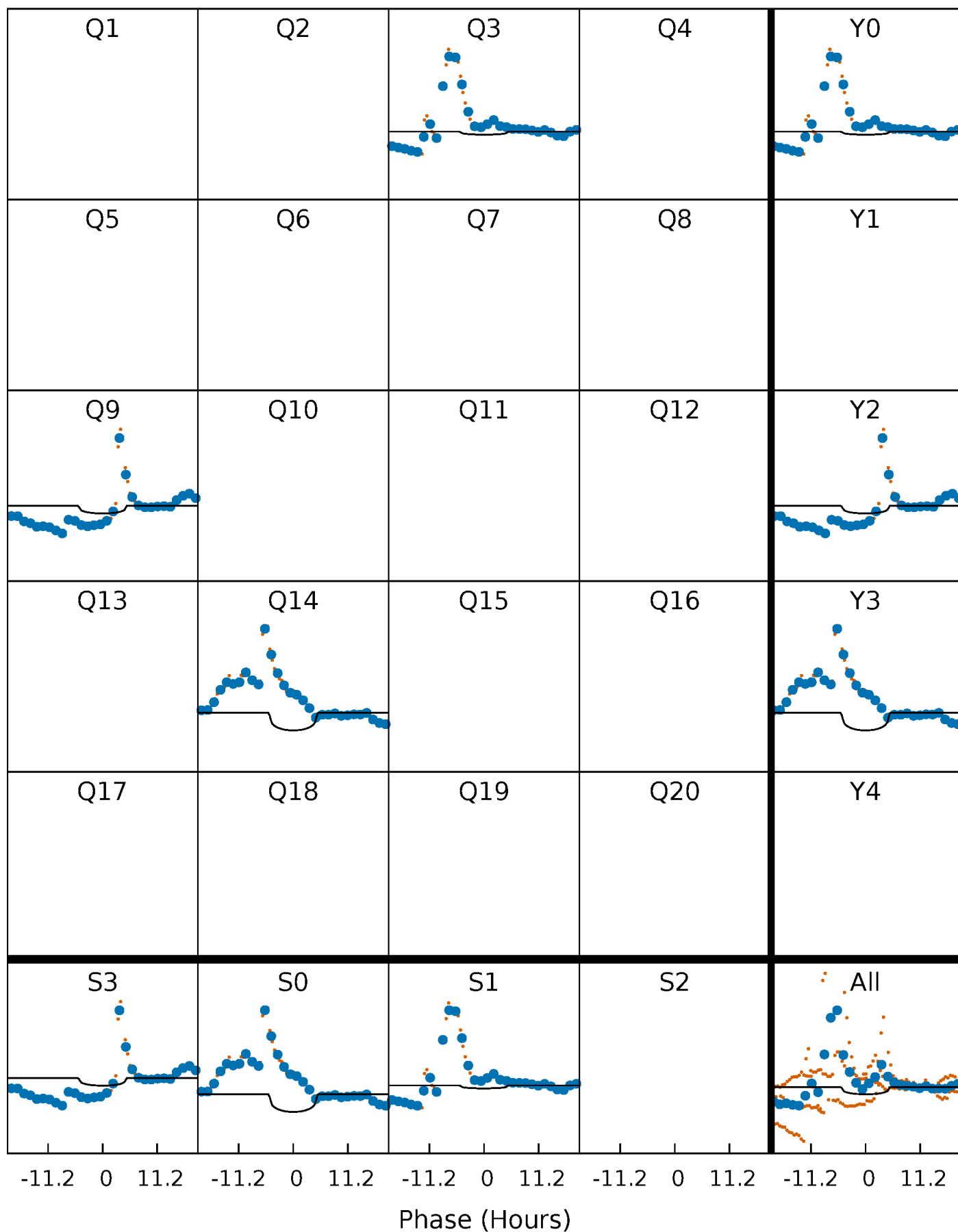
# PDC Quarter-Phased Transit Curves

TCE 007899428-01 P=519.065250 Days  $T_0=306.318800$  (BKJD)



# DV Quarter-Phased Transit Curves

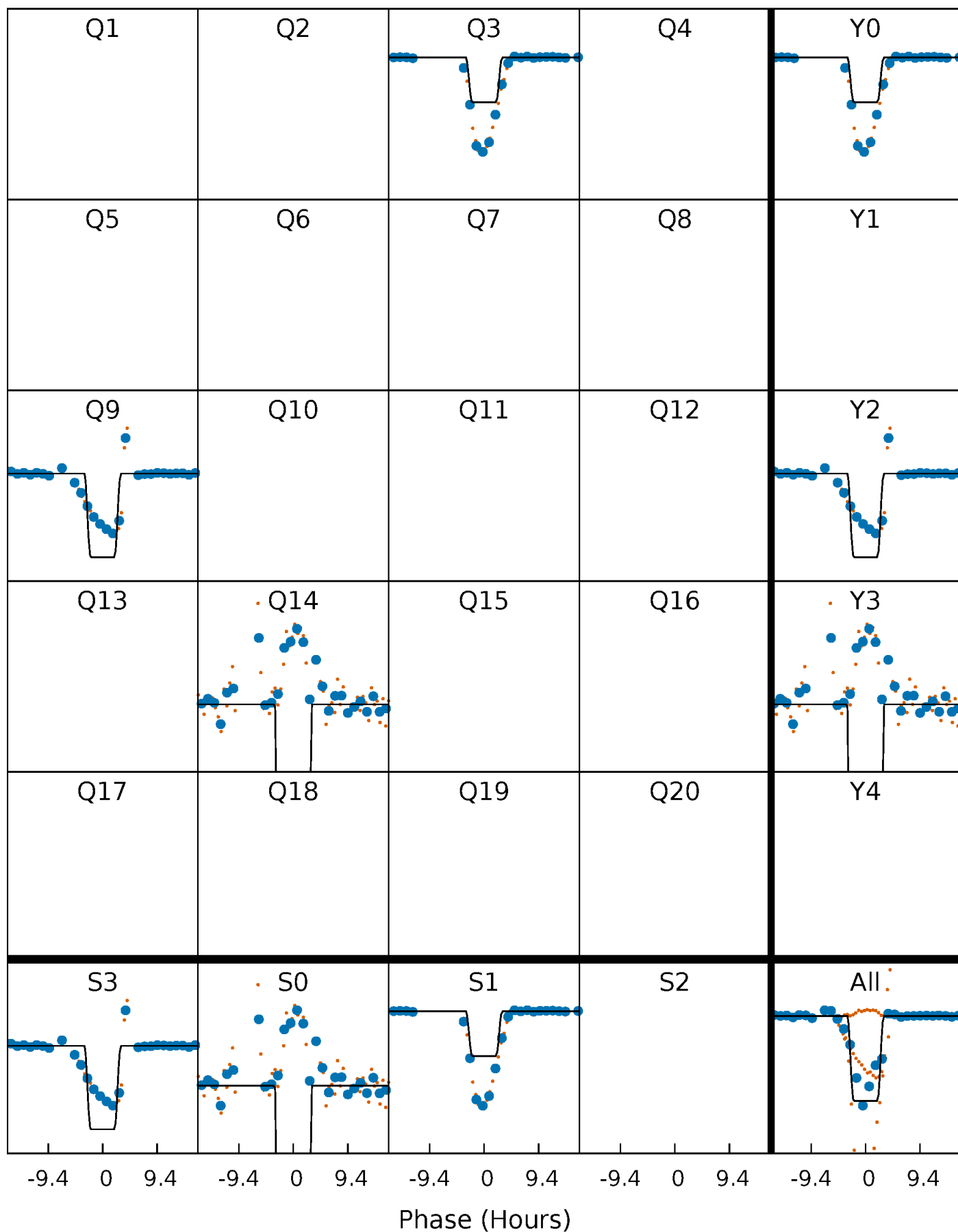
TCE 007899428-01 P=519.065250 Days  $T_0=306.318800$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

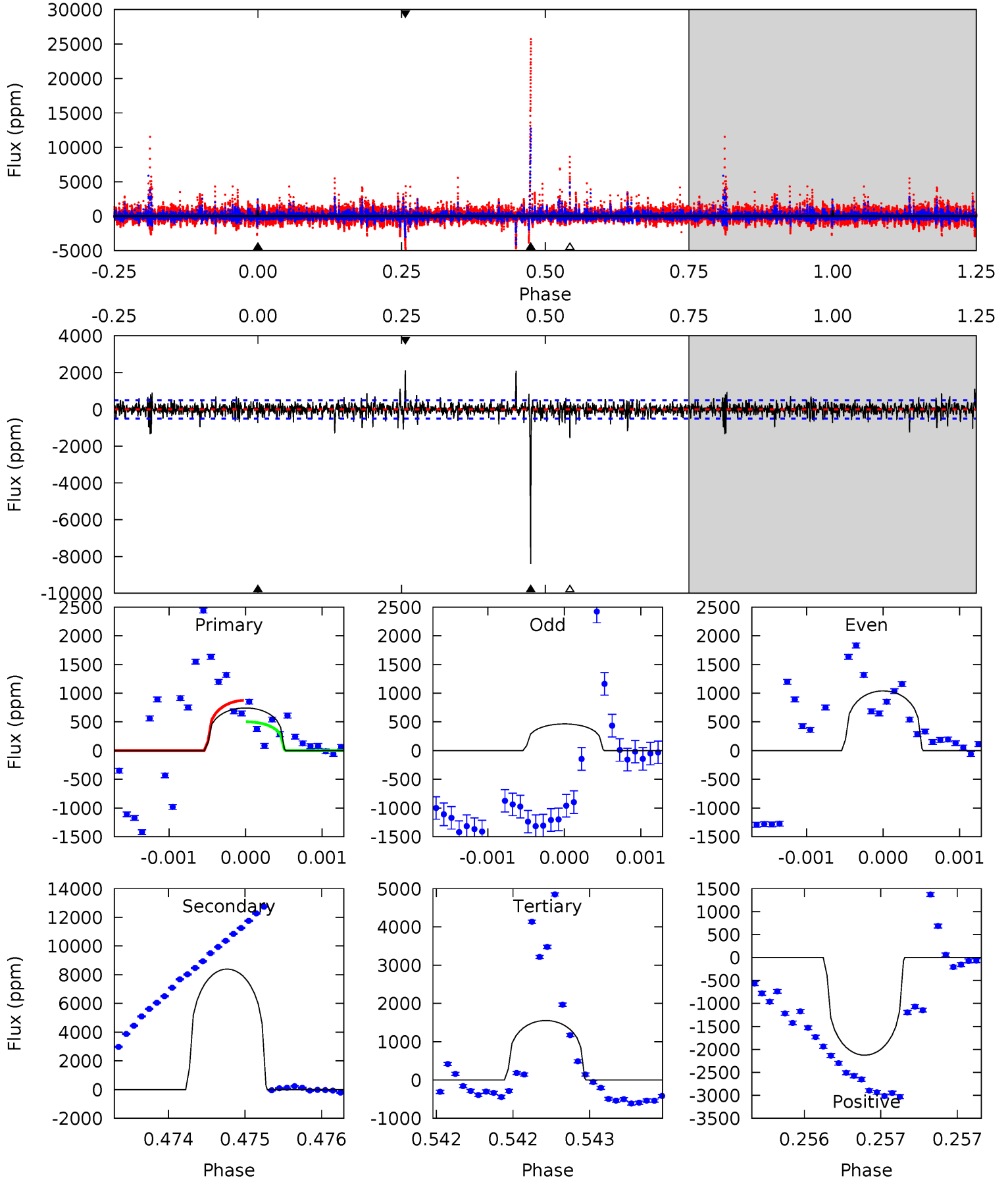
TCE 007899428-01 P=519.141836 Days  $T_0=306.218524$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-01, P = 519.065250 Days, E = 306.318800 Days

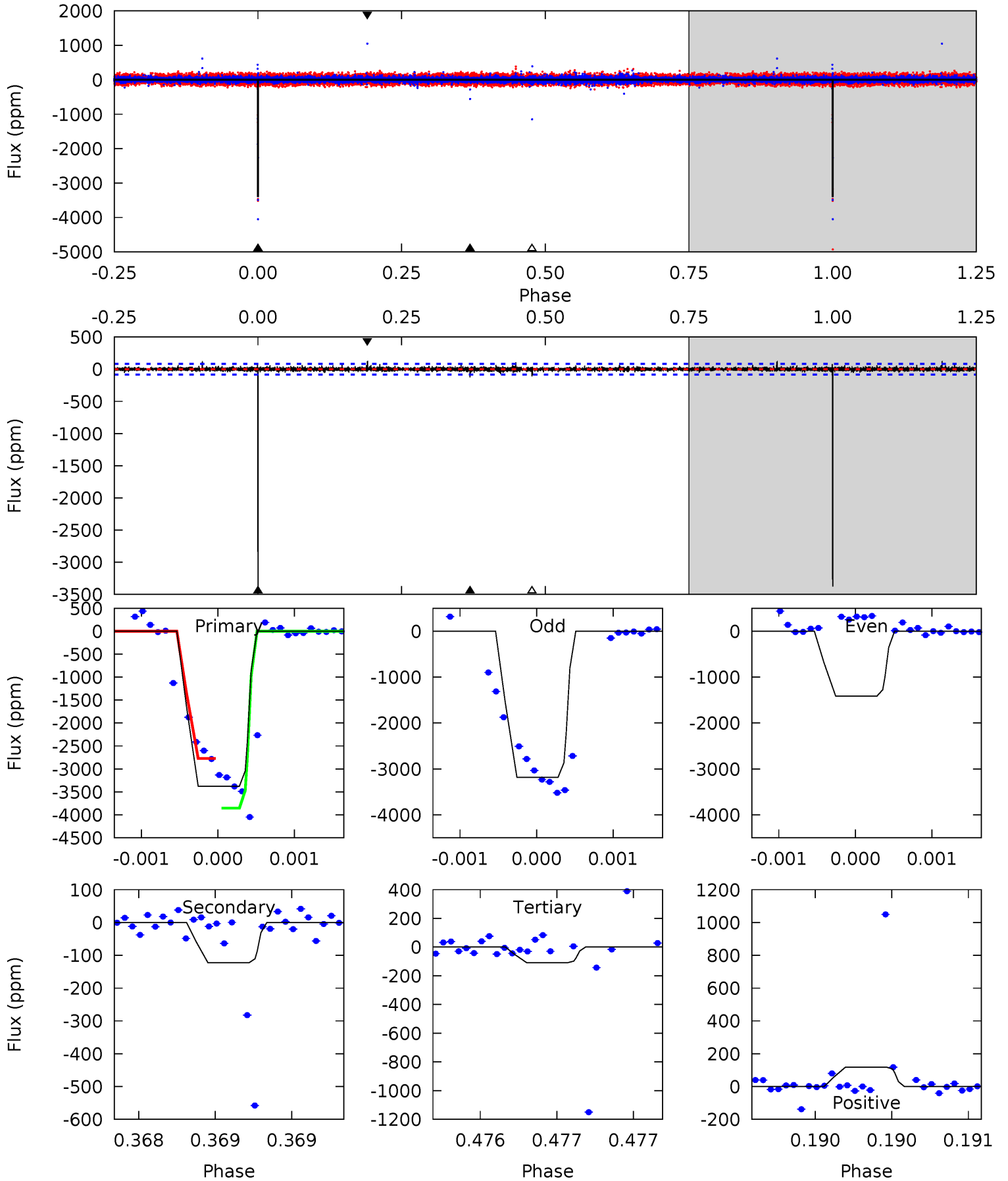
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.16	92.1	17.1	23.3	5.49	3.36	2.63	-8.90	-15.2	75.1	68.8	1.97	1.10	0.20	2.09



# Alt Model-Shift Uniqueness Test

007899428-01, P = 519.141836 Days, E = 306.218524 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
225.7	8.20	7.25	7.88	5.57	3.47	0.83	218.5	217.9	0.95	0.32	53.4	1.23	0.03	36.4



### Stellar Parameters For KIC 007899428

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-8396 \pm 91$	$2.23^{+1.65}_{-1.42}$	$244^{+10}_{-10}$	$9378^{+14946}_{-2724}$	$1243206^{+7899251}_{-831387}$
Alt.	$-123 \pm 15$	$5.63^{+1.95}_{-1.91}$	$245^{+10}_{-10}$	$2709^{+335}_{-200}$	$2780^{+3636}_{-1249}$

$T_{\text{max}}$  = 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

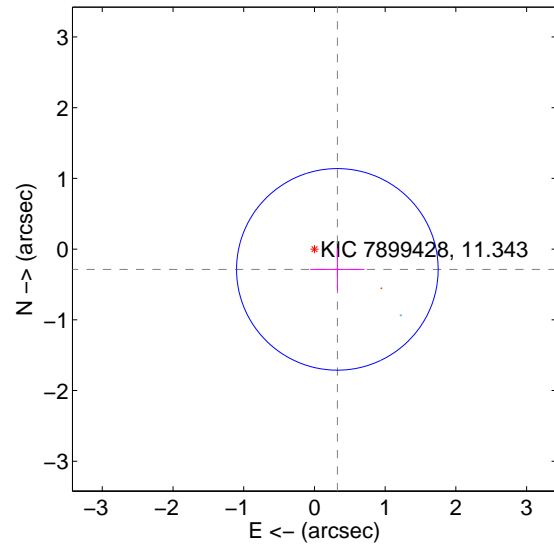
Supplemental centroid analysis for 007899428-01. **Kepler magnitude: 11.34.** Transit SNR 4.49

**There are 1 quarters with good PRF difference image offsets**

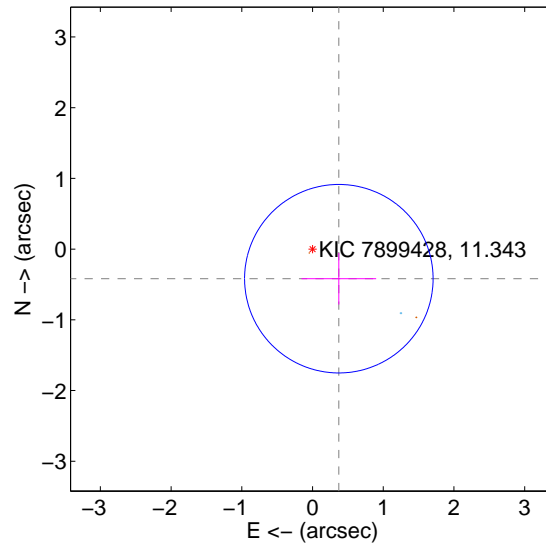
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.433 \pm 0.475$	0.91	$-0.324 \pm 0.382$	$-0.287 \pm 0.295$
PRF-fit source offset from KIC position	$0.560 \pm 0.444$	1.26	$-0.372 \pm 0.528$	$-0.419 \pm 0.365$
photometric centroid source offset	$0.16 \pm 0.90$	0.18	$-0.10 \pm 0.97$	$-0.13 \pm 0.85$

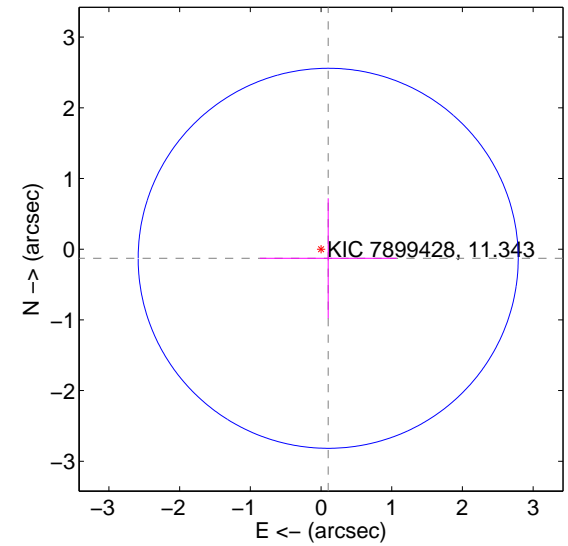
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



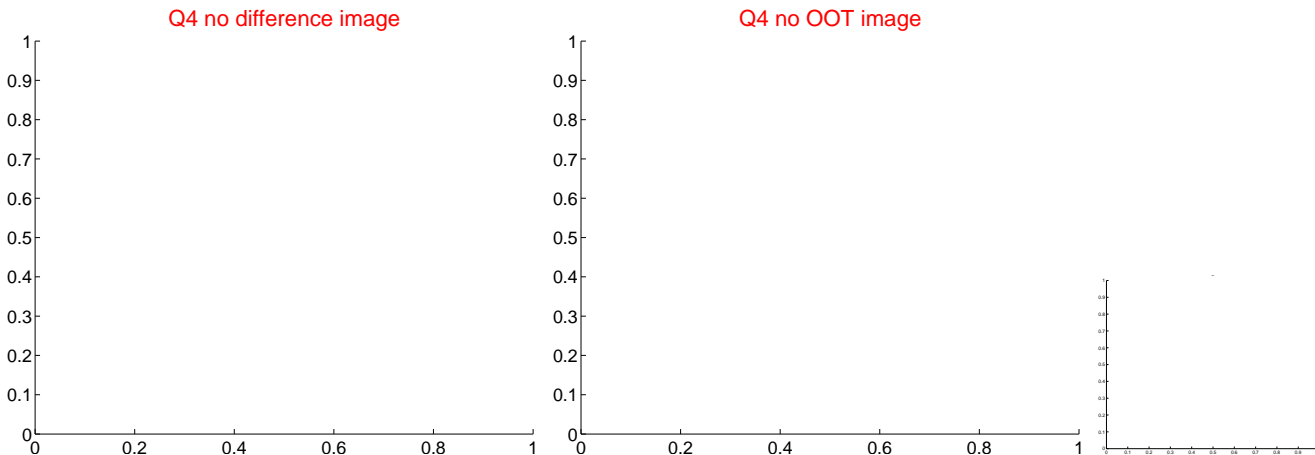
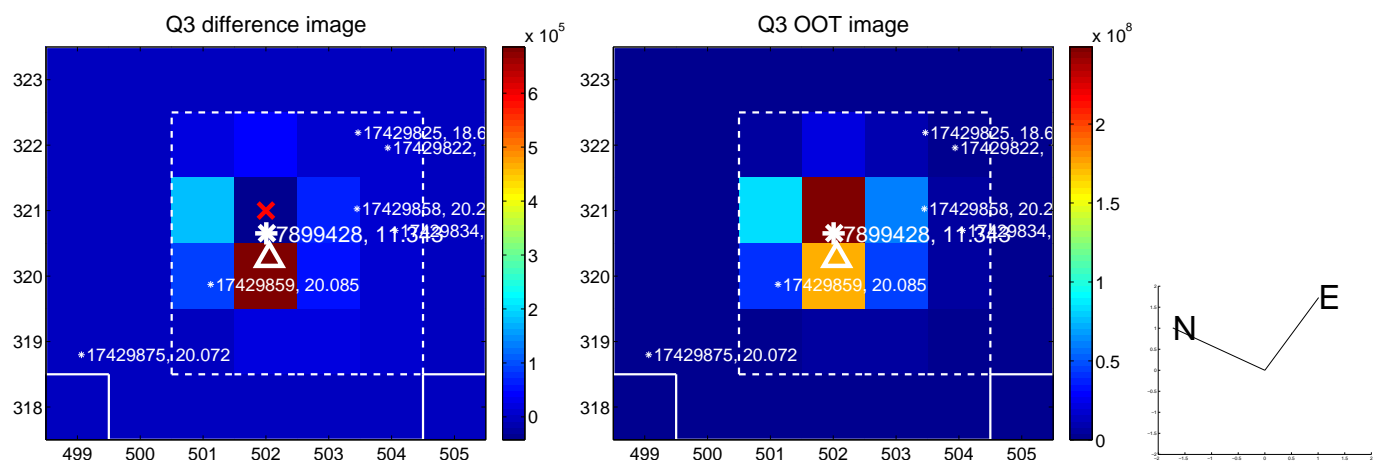
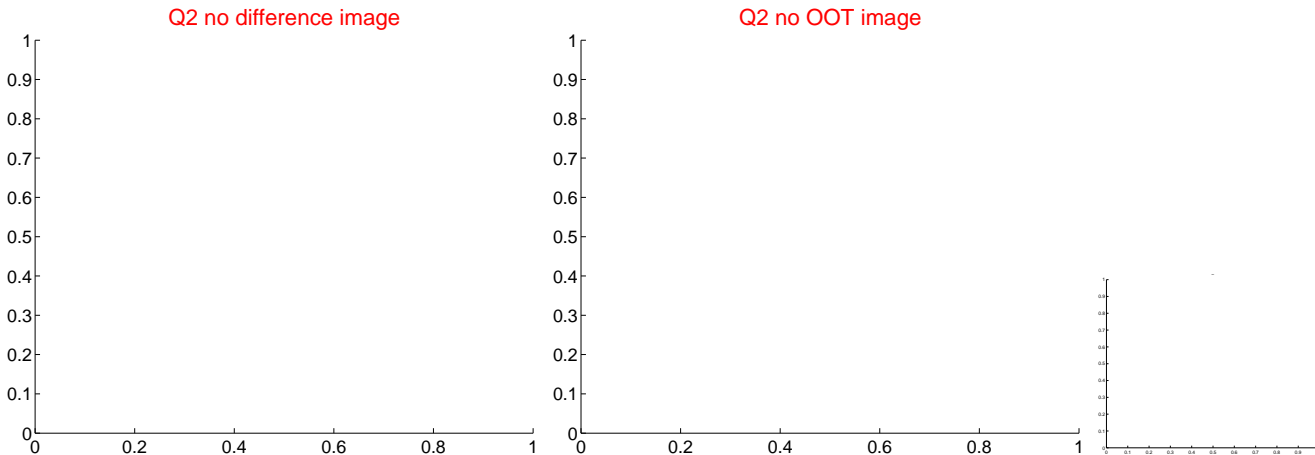
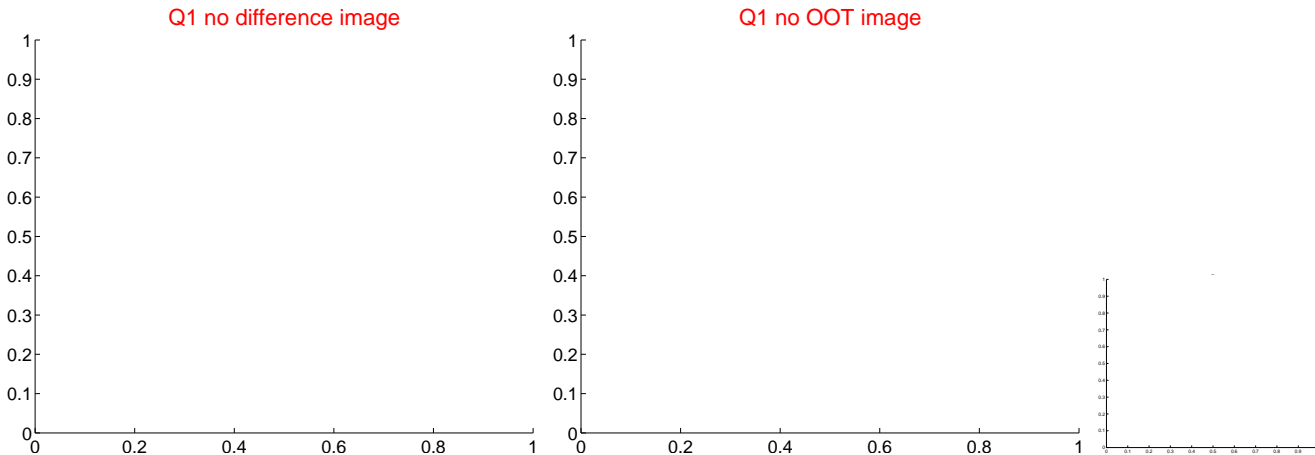
offset from photometric centroids



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.



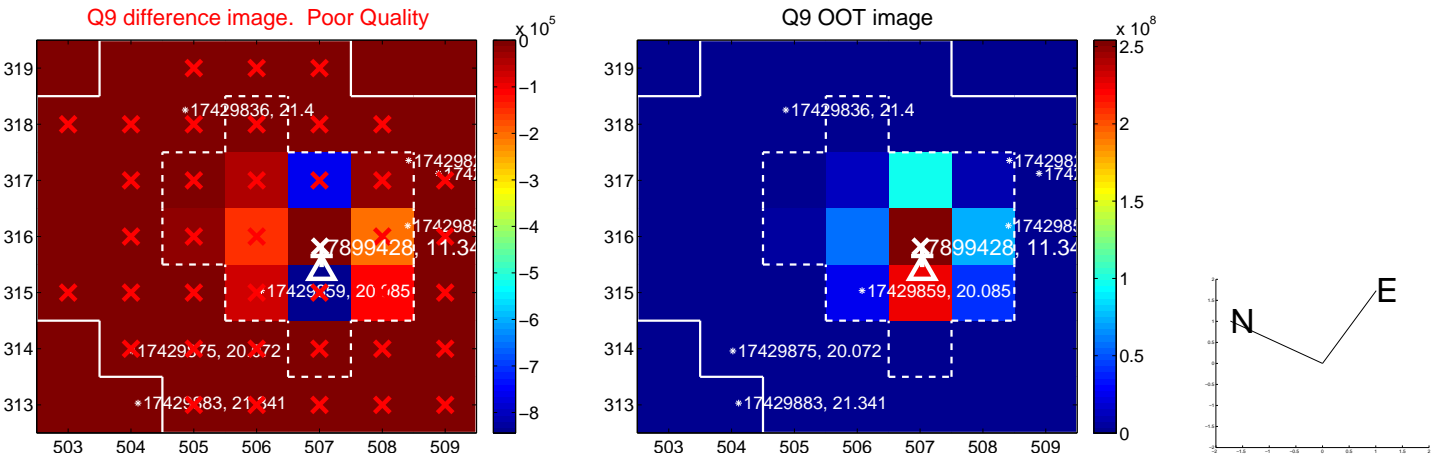
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



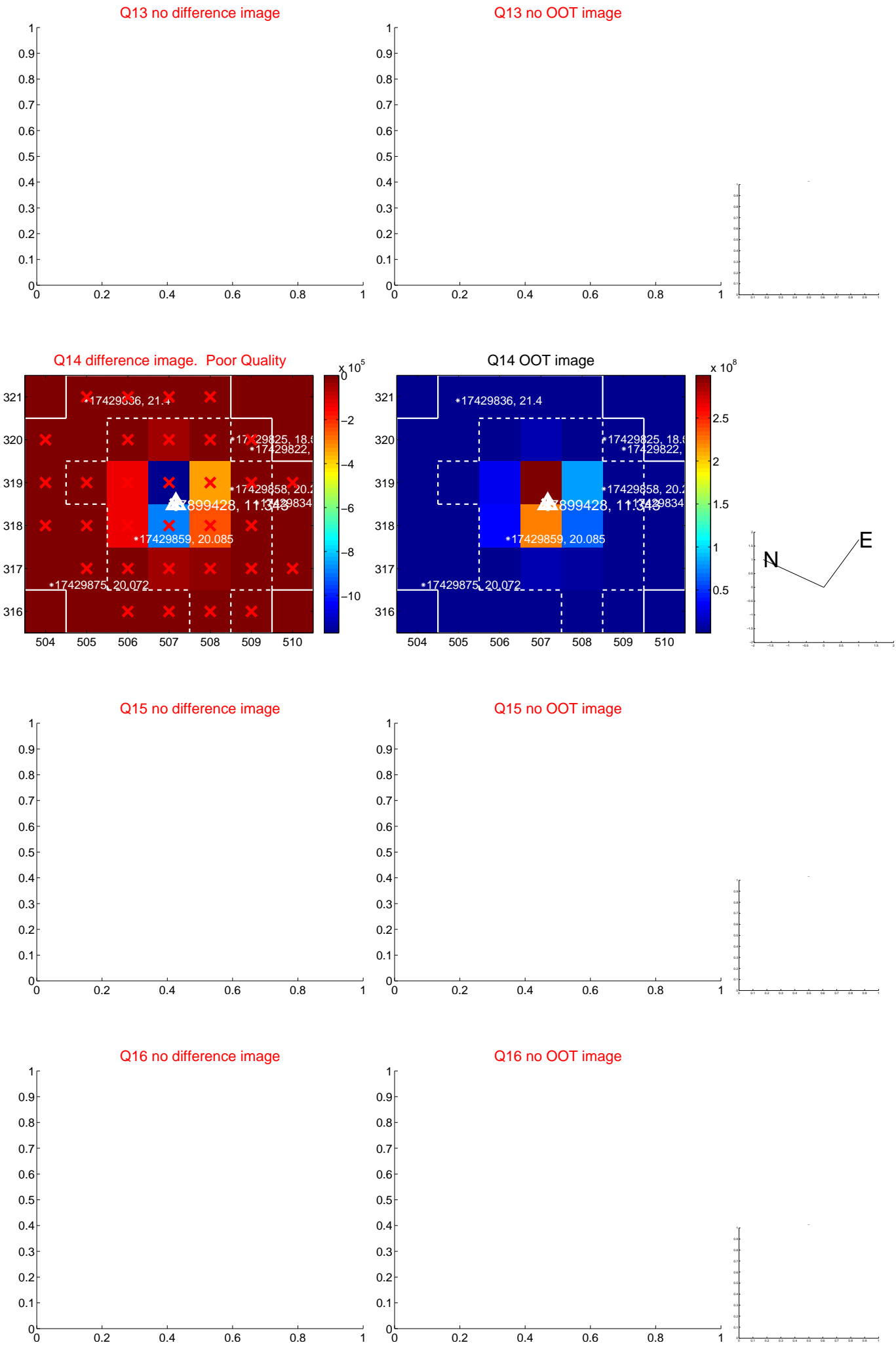
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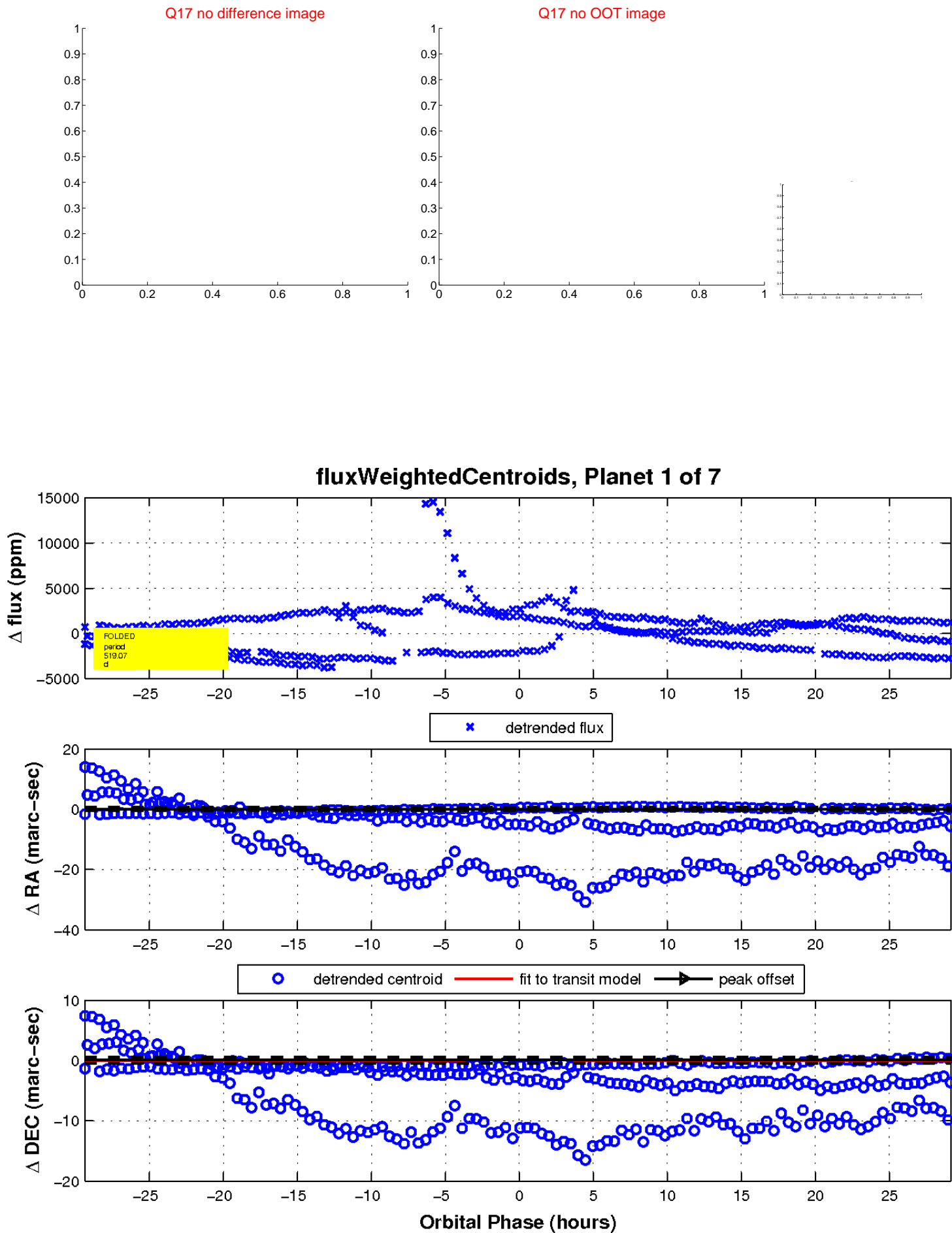
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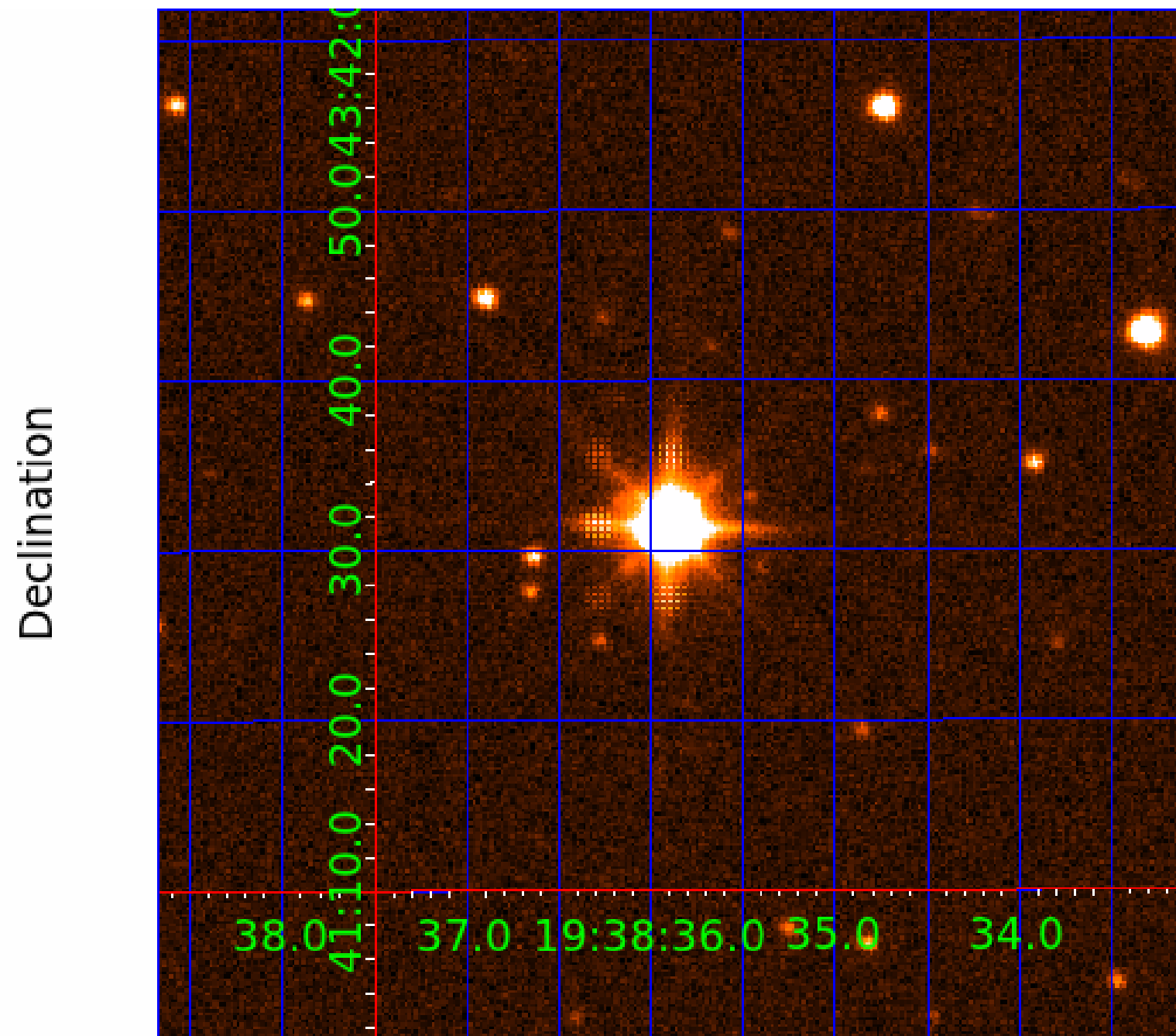


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 007899428

## Q1-17 DR25 TCE Parameters

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007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

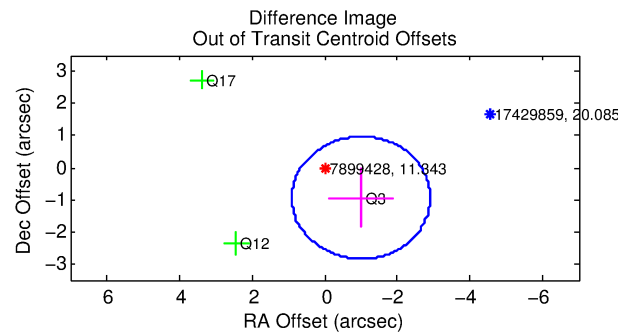
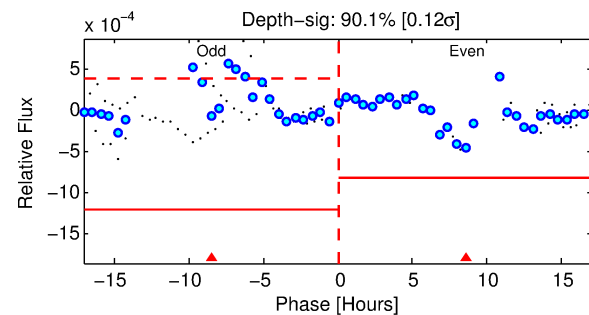
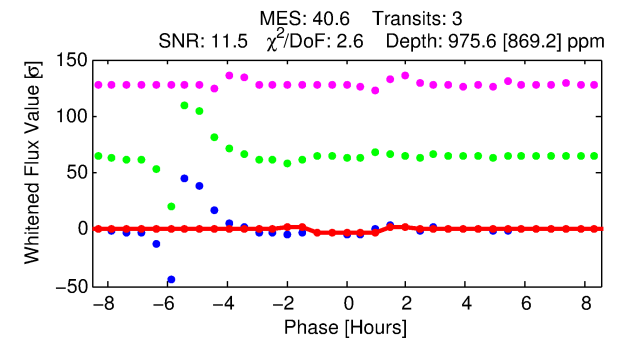
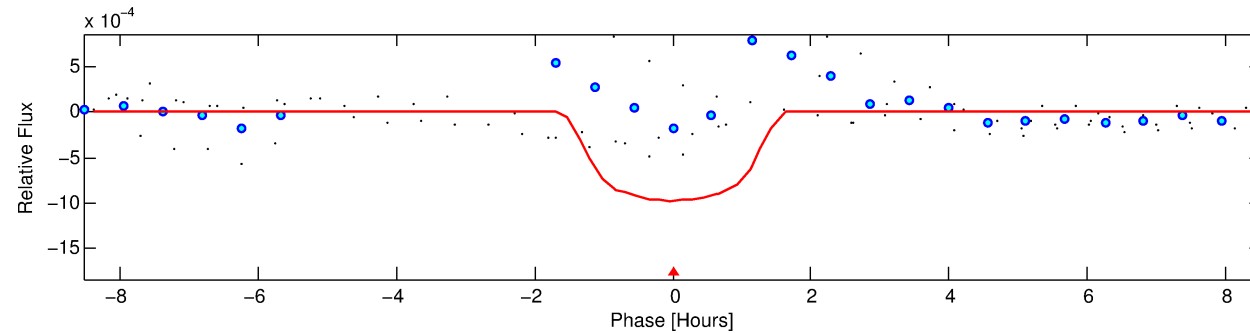
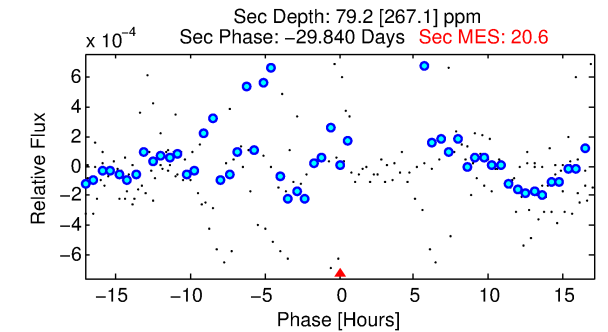
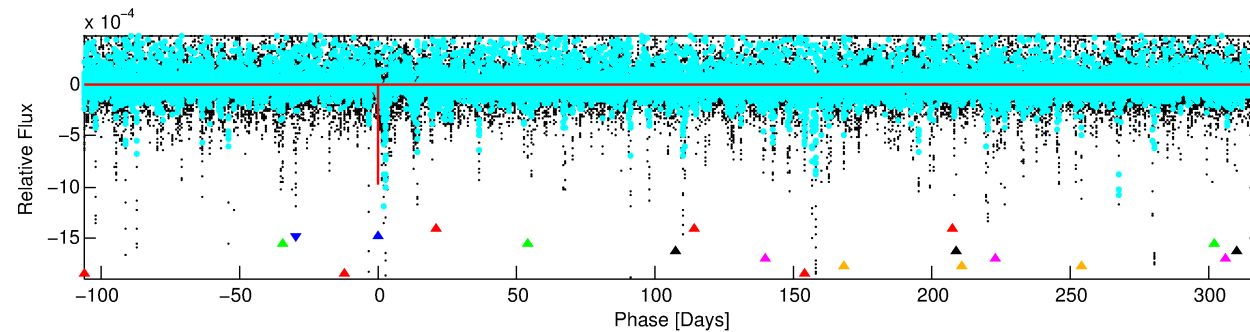
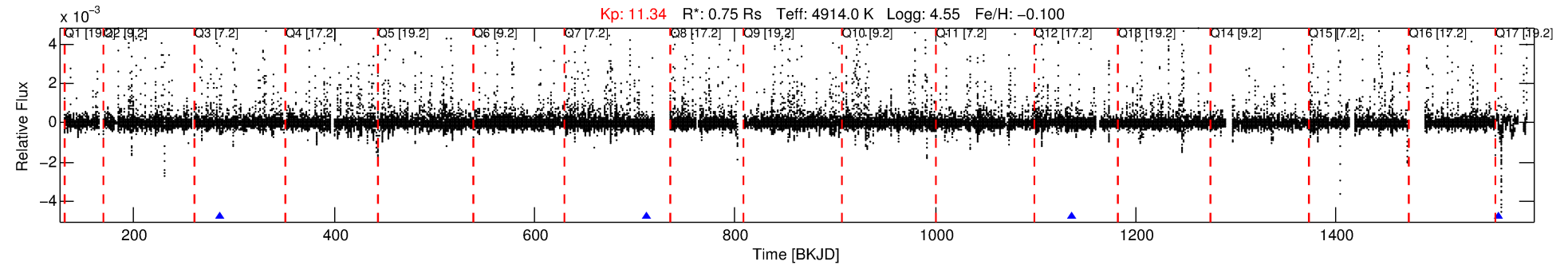
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-02

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 2 of 7 Period: 425.576 d



## DV Fit Results:

Period = 425.57604 [0.00961] d  
Epoch = 285.6582 [0.0223] BKJD  
Rp/R\* = 0.0315 [0.1517]  
a/R\* = 793.06 [13100.28]  
b = 0.76 [9.25]  
Seff = 0.29 [0.06]  
Teq = 188 [9] K  
Rp = 2.57 [12.37] Re  
a = 0.9967 [0.0851] AU  
Ag = 6582.26 [67229.26] [0.10 $\sigma$ ]  
Teffp = 2614 [6674] K [0.36 $\sigma$ ]

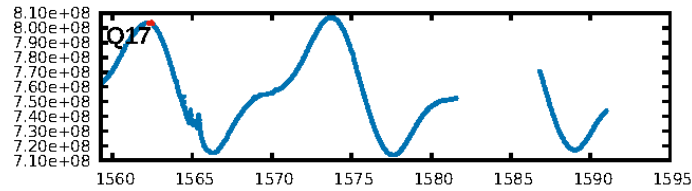
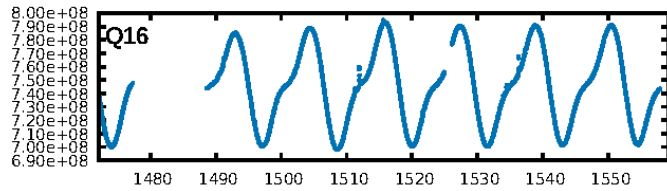
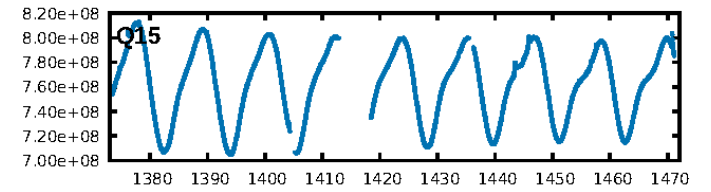
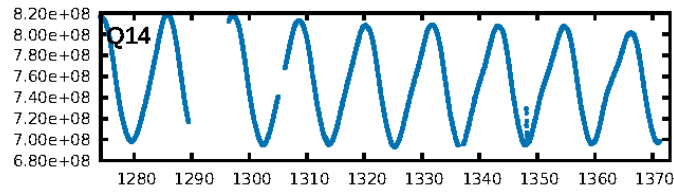
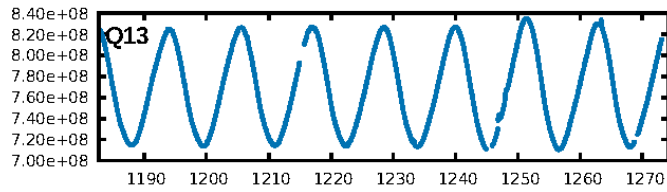
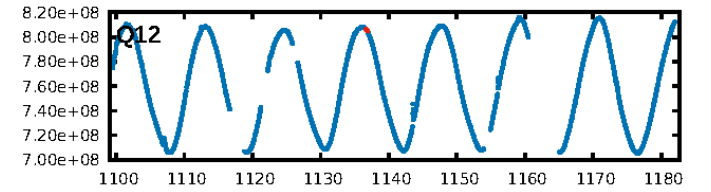
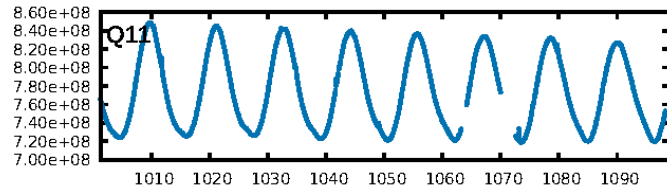
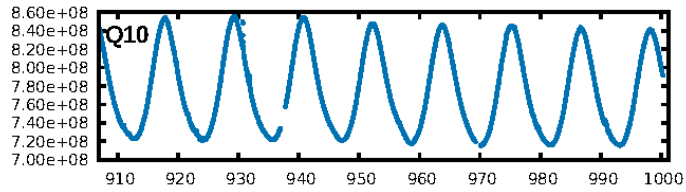
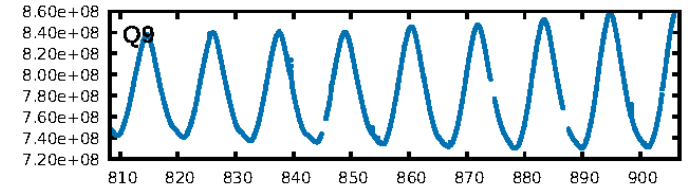
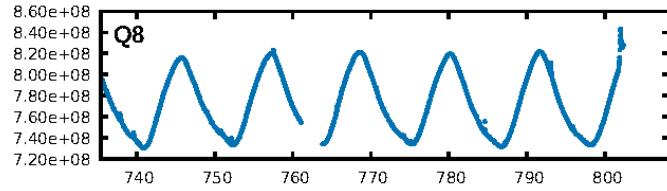
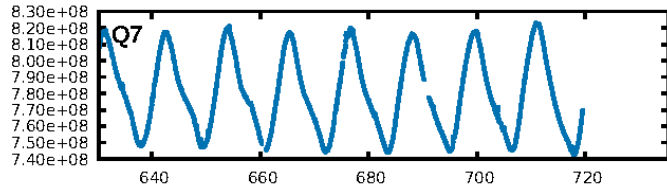
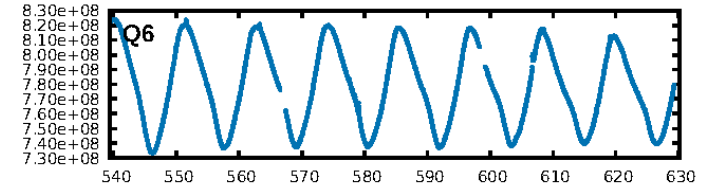
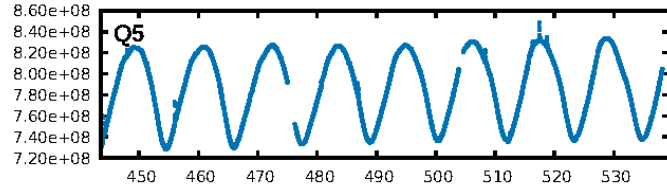
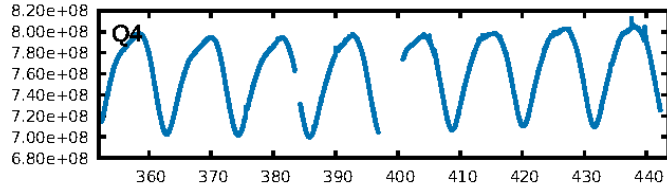
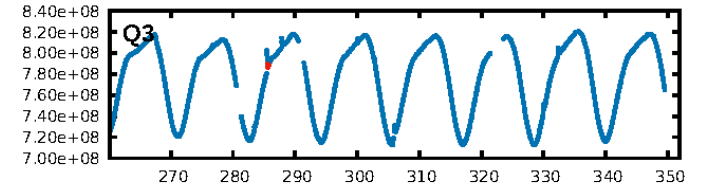
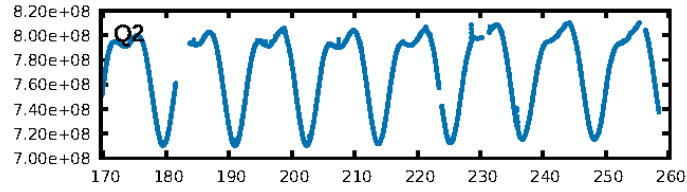
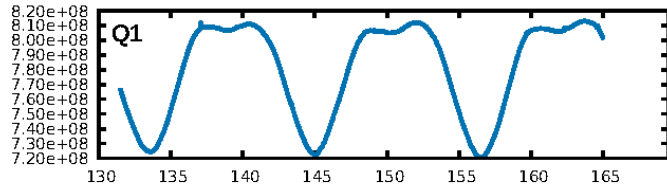
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [329.96 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.233  
Centroid-sig: 82.2%  
Centroid-so: 0.820 arcsec [0.42 $\sigma$ ]  
OotOffset-rm: 1.370 arcsec [2.16 $\sigma$ ]  
KicOffset-rm: 1.468 arcsec [1.50 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

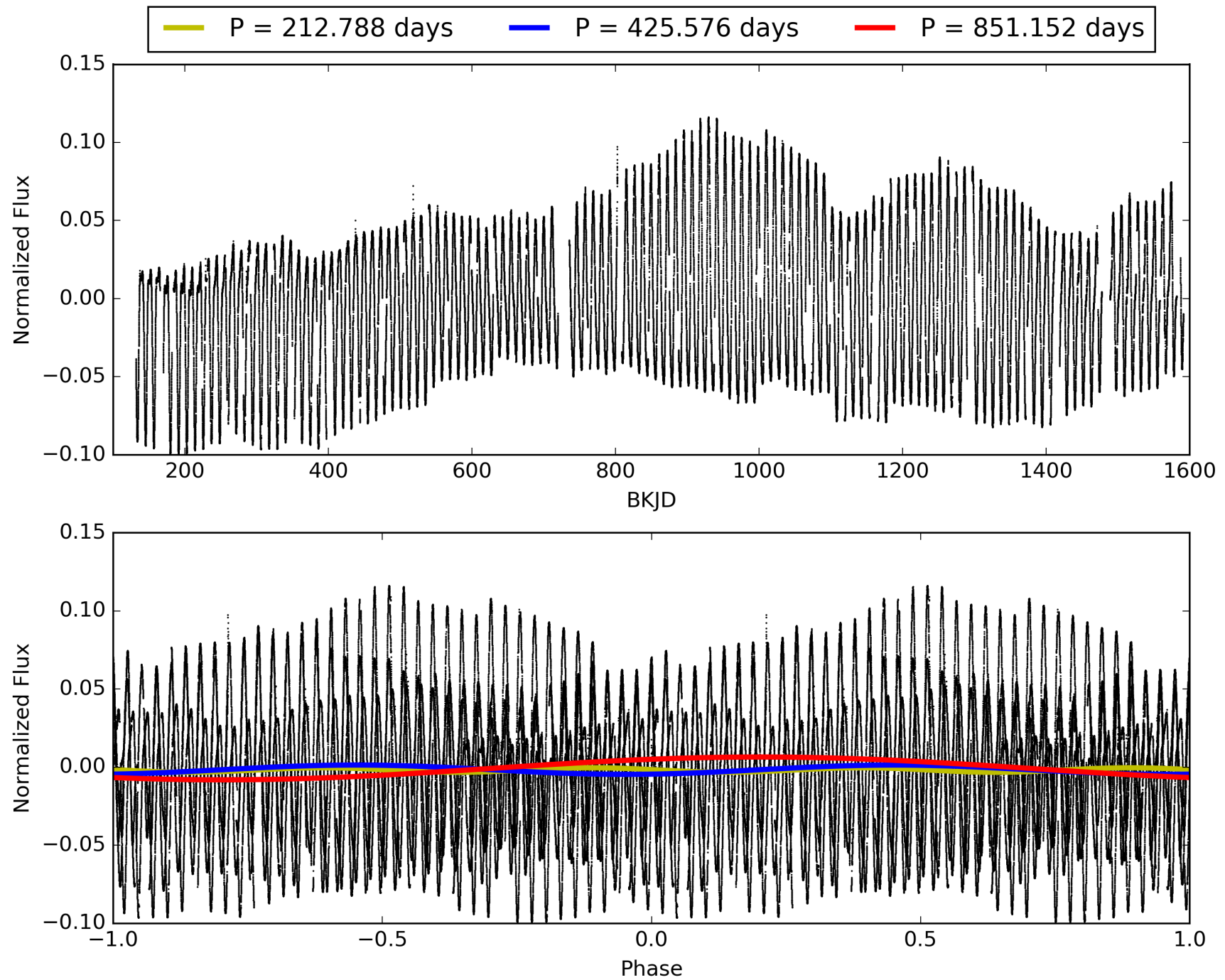
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007899428-02, PDC Light Curves



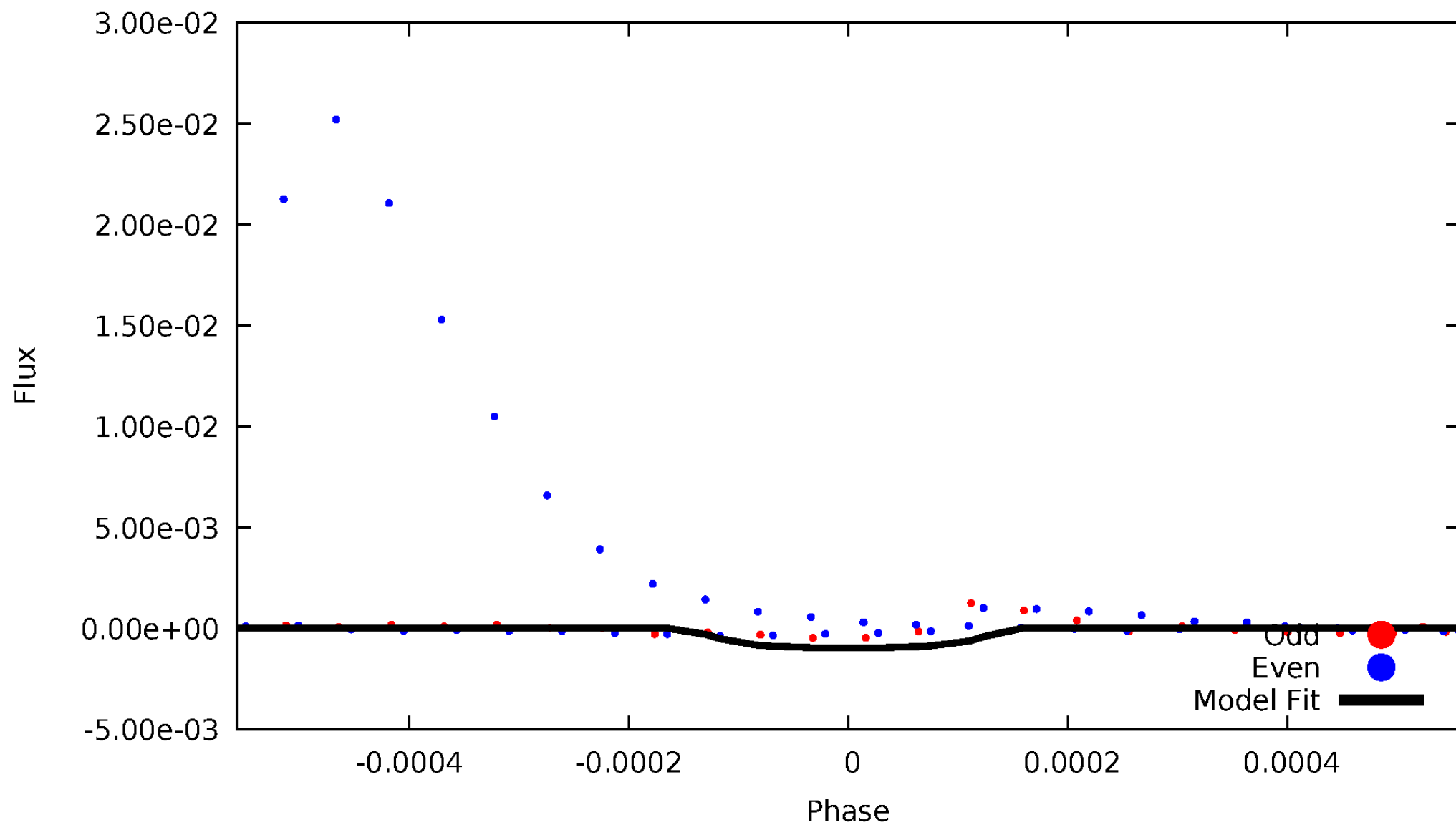
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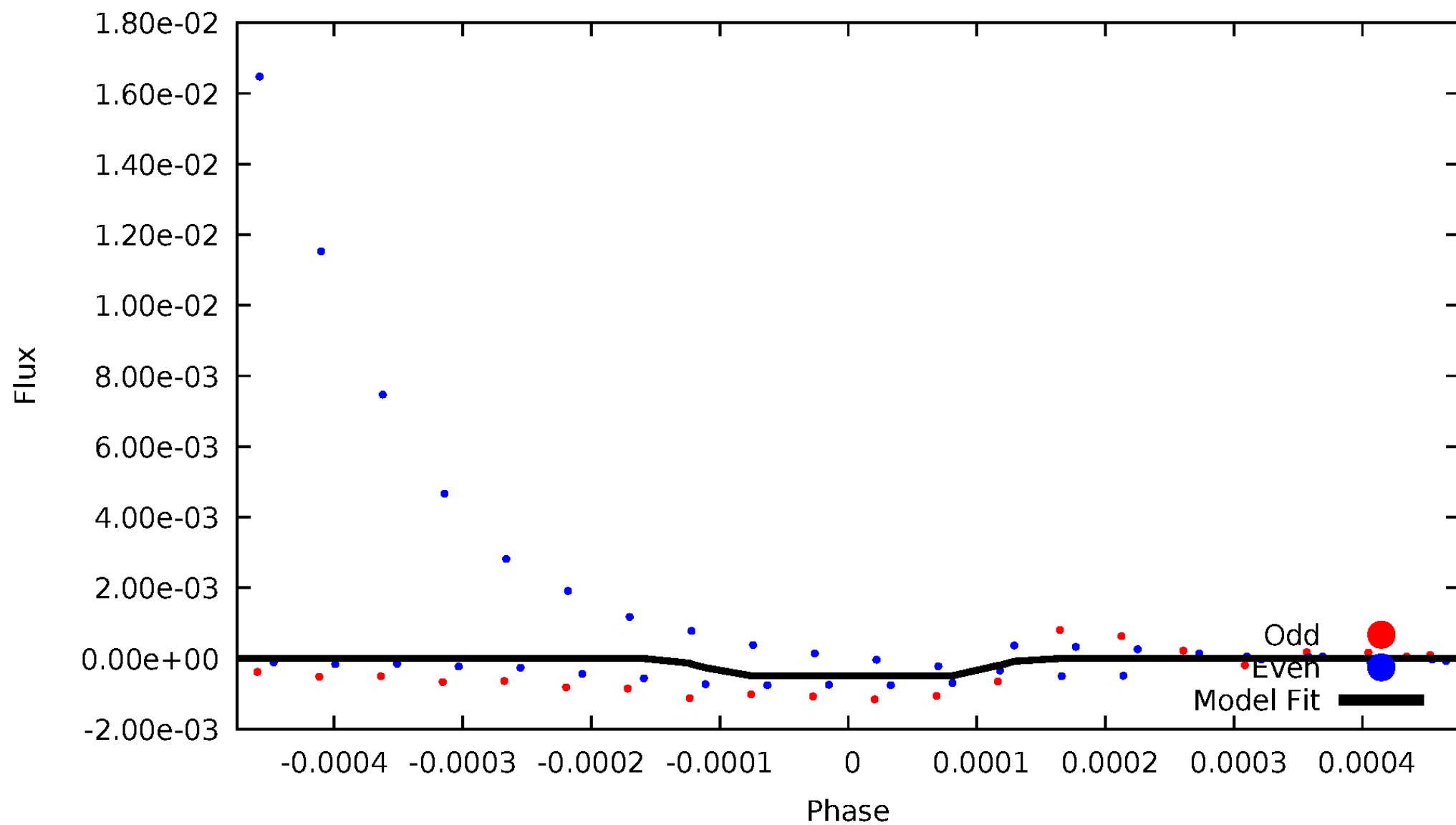
# DV Odd/Even

TCE 007899428-02



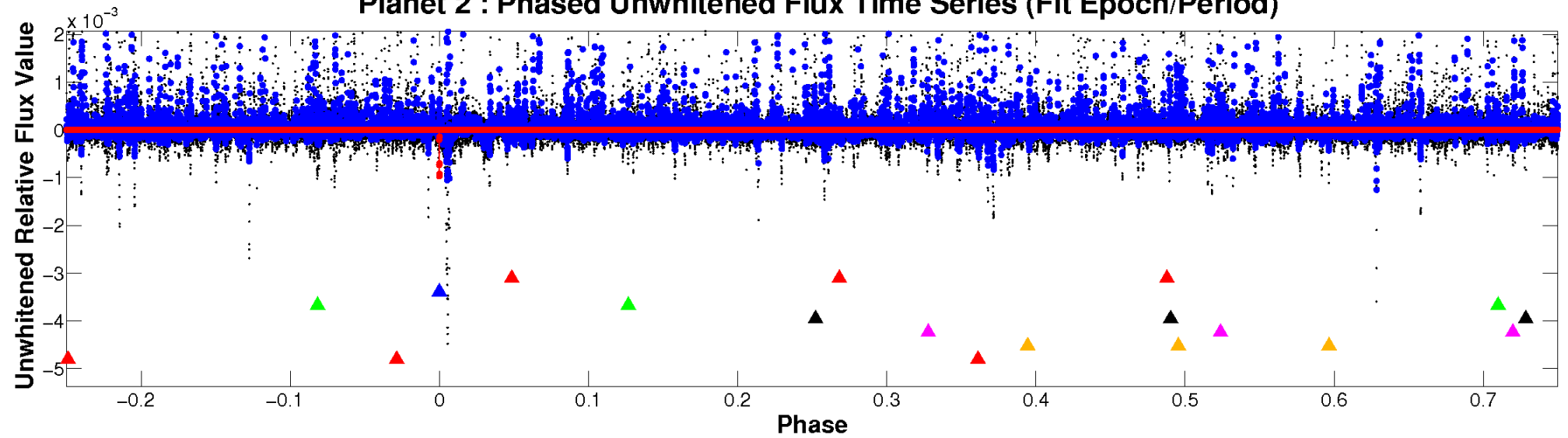
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TCE 007899428-02

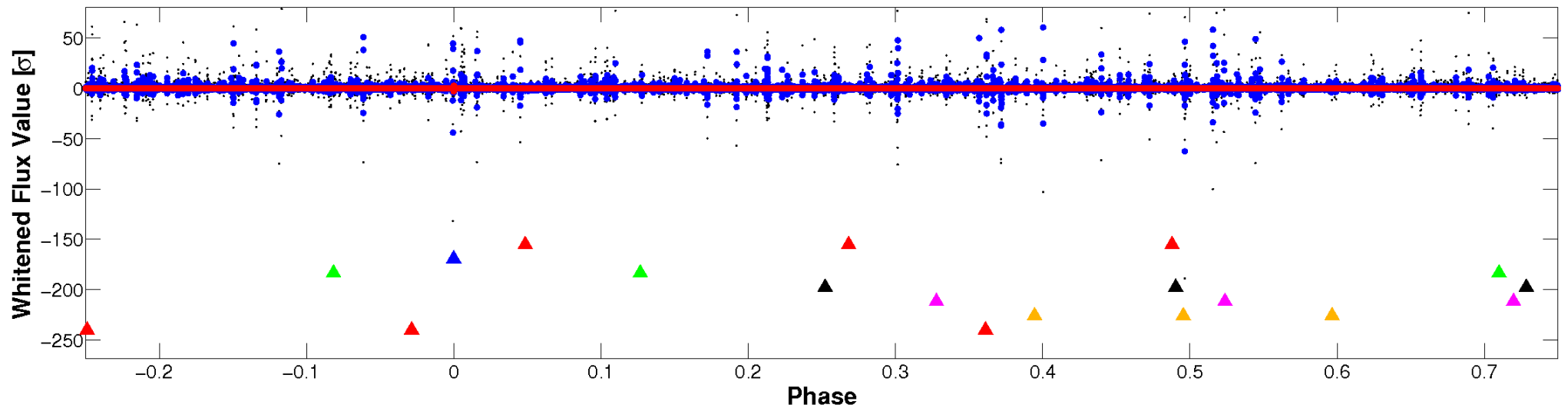


# Non-Whitened Vs. Whitened Light Curve

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

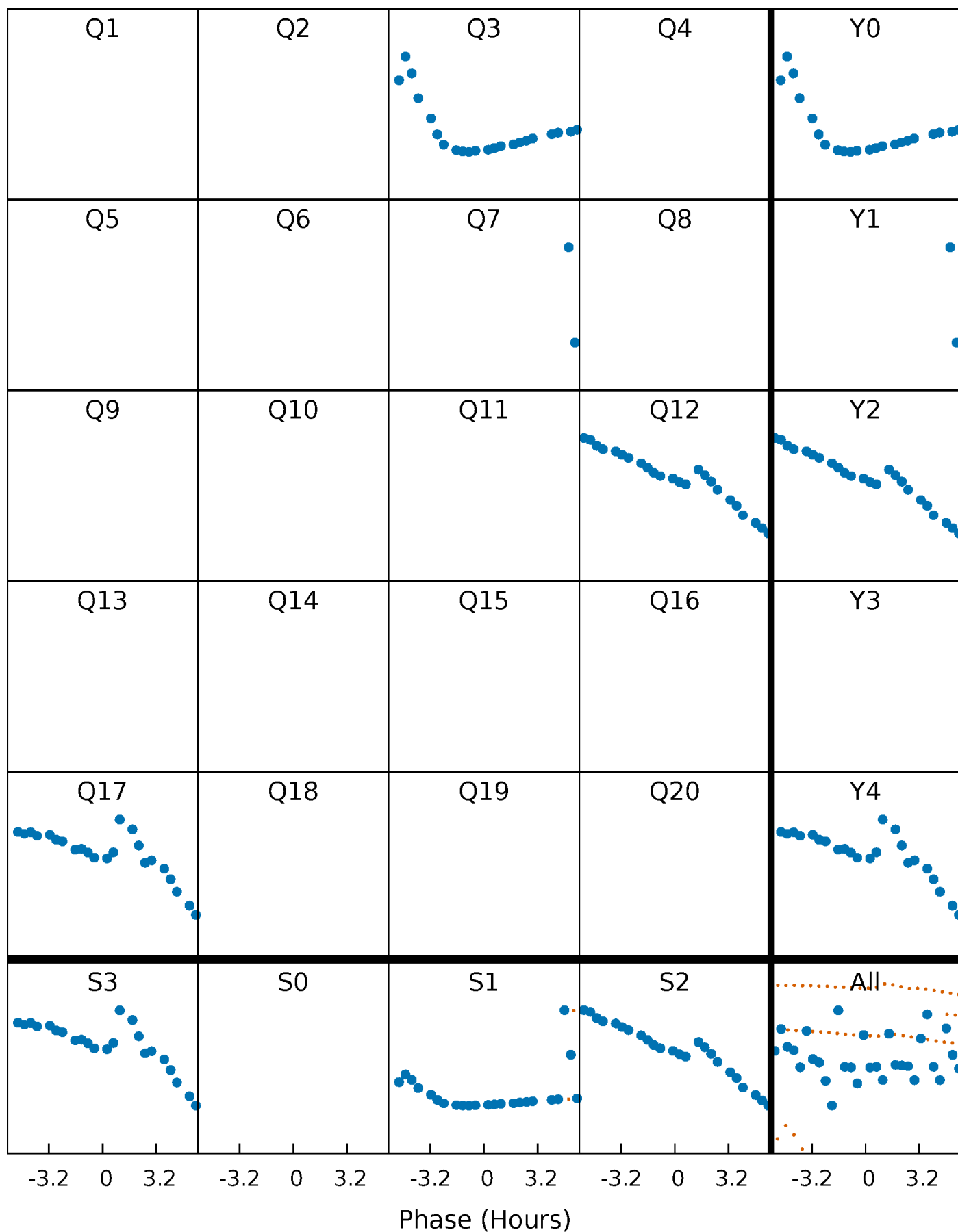


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



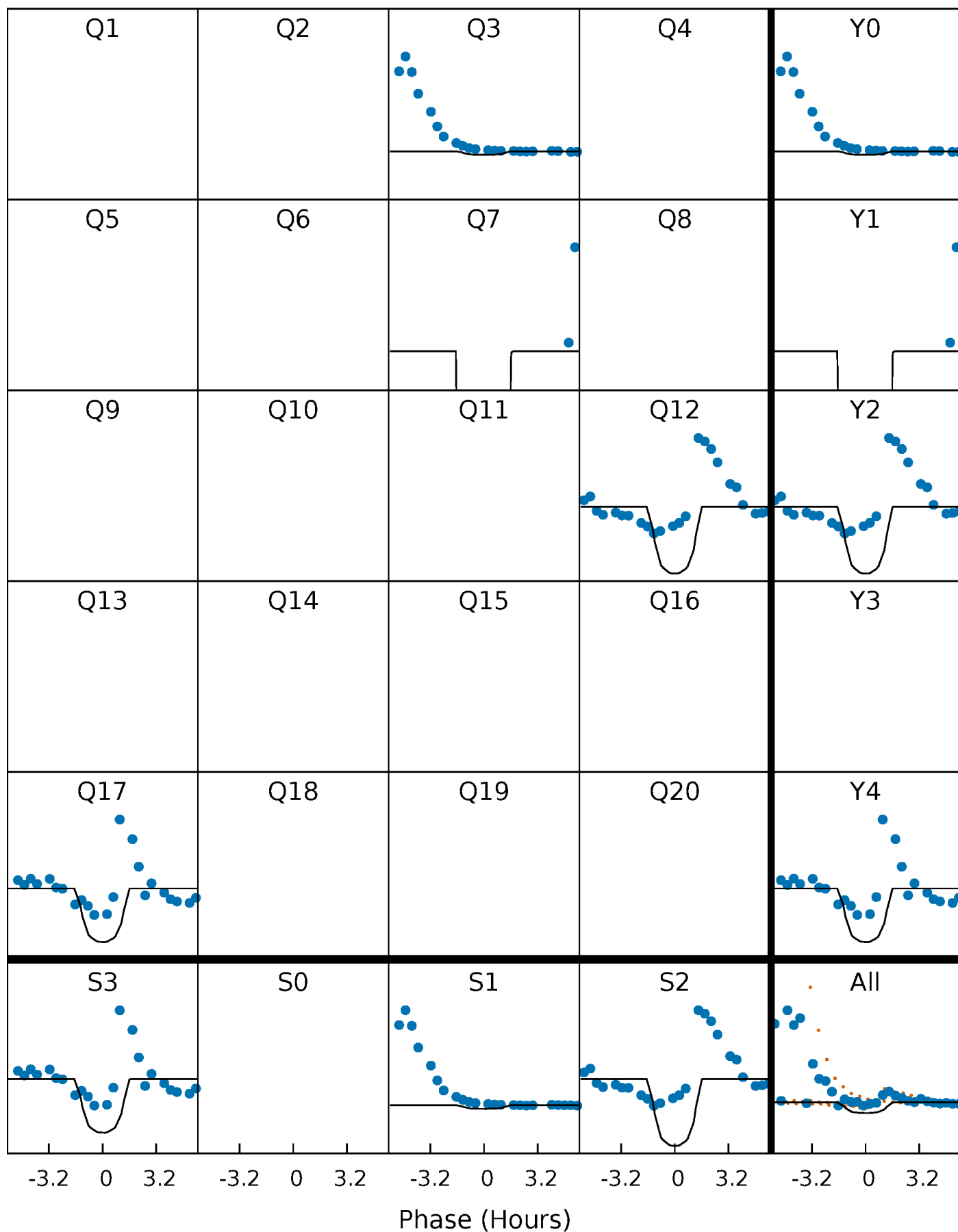
# PDC Quarter-Phased Transit Curves

TCE 007899428-02 P=425.576042 Days  $T_0=285.658159$  (BKJD)



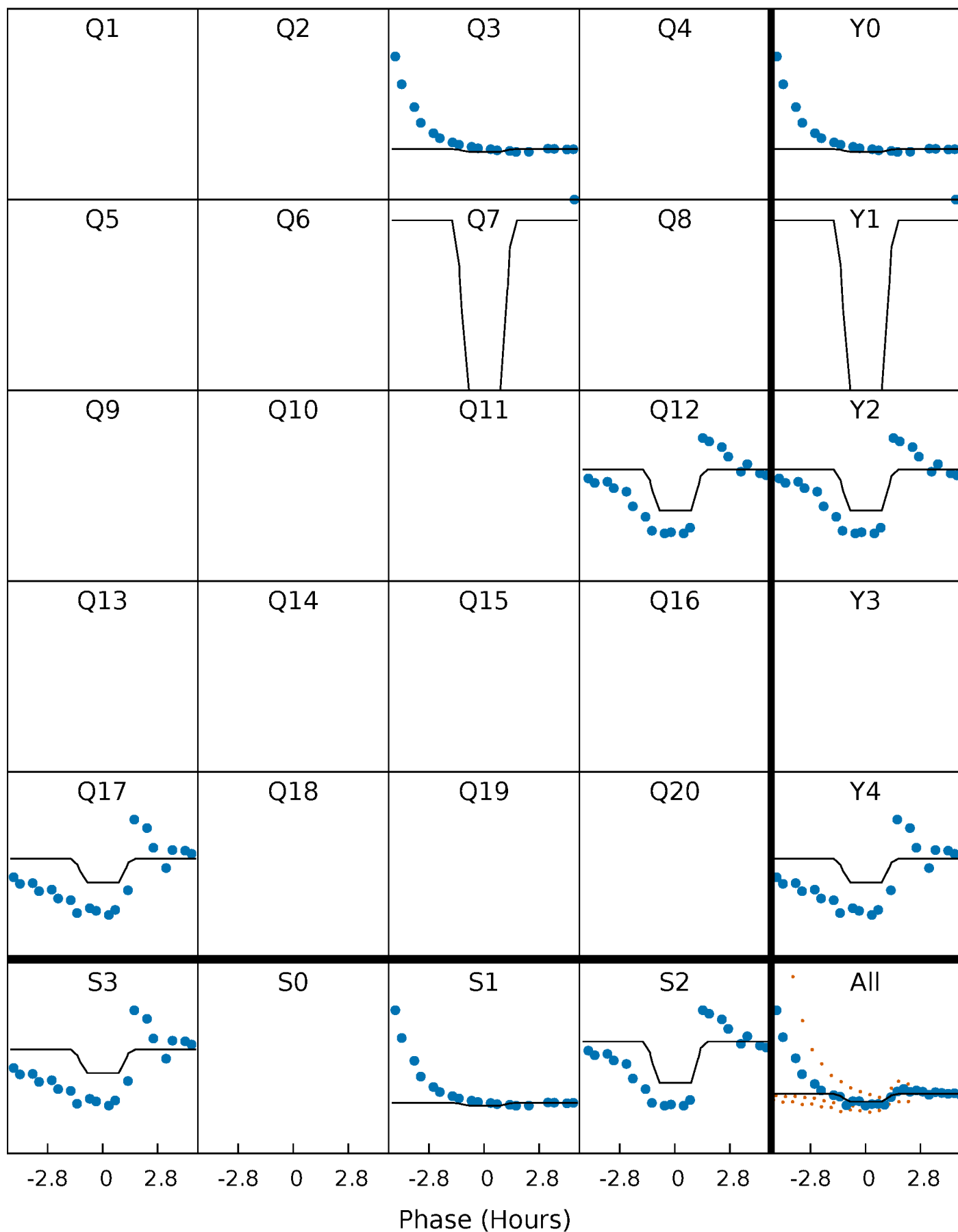
# DV Quarter-Phased Transit Curves

TCE 007899428-02     $P=425.576042$  Days     $T_0=285.658159$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

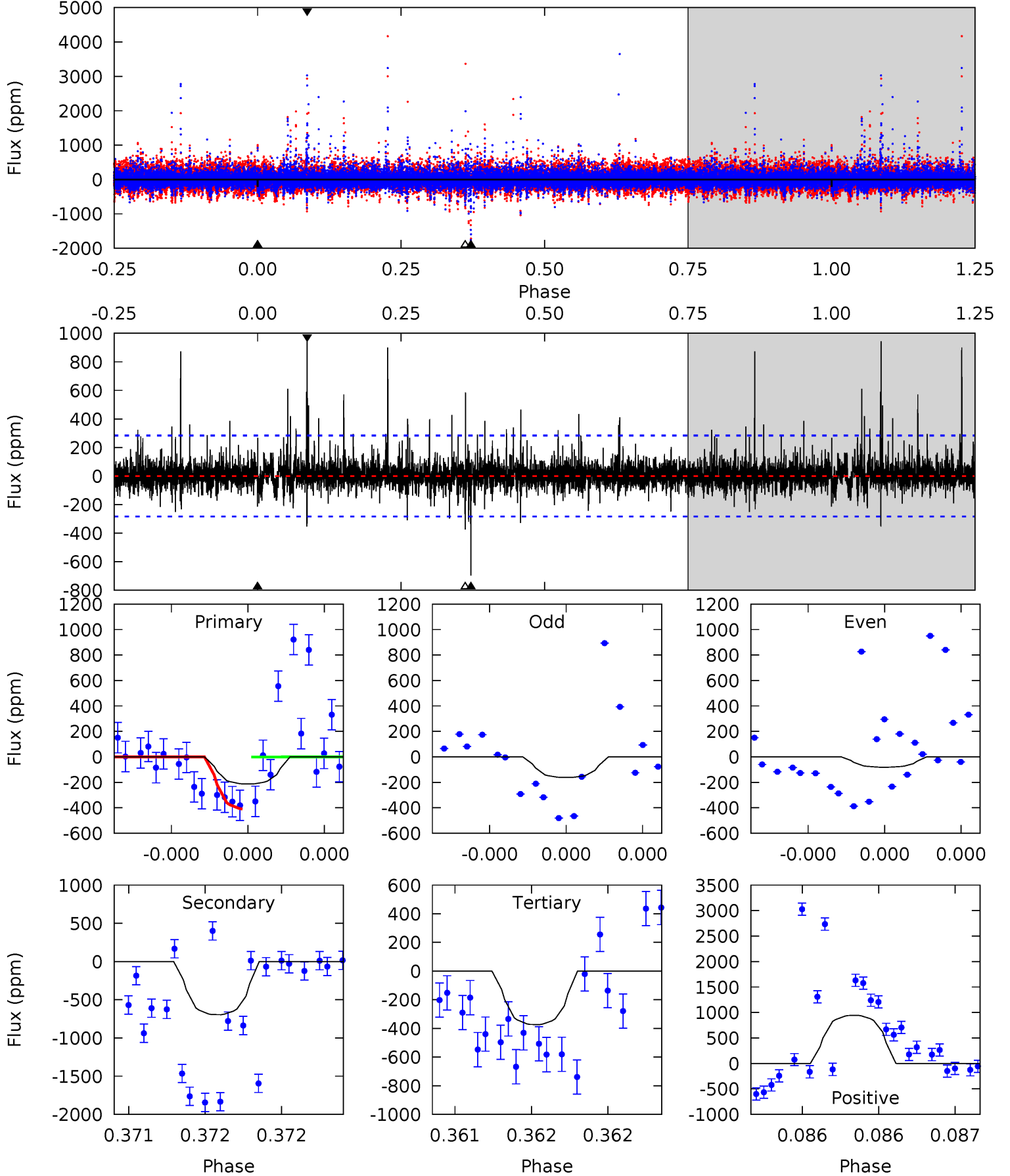
TCE 007899428-02 P=425.556132 Days  $T_0=285.695498$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-02, P = 425.576042 Days, E = 285.658159 Days

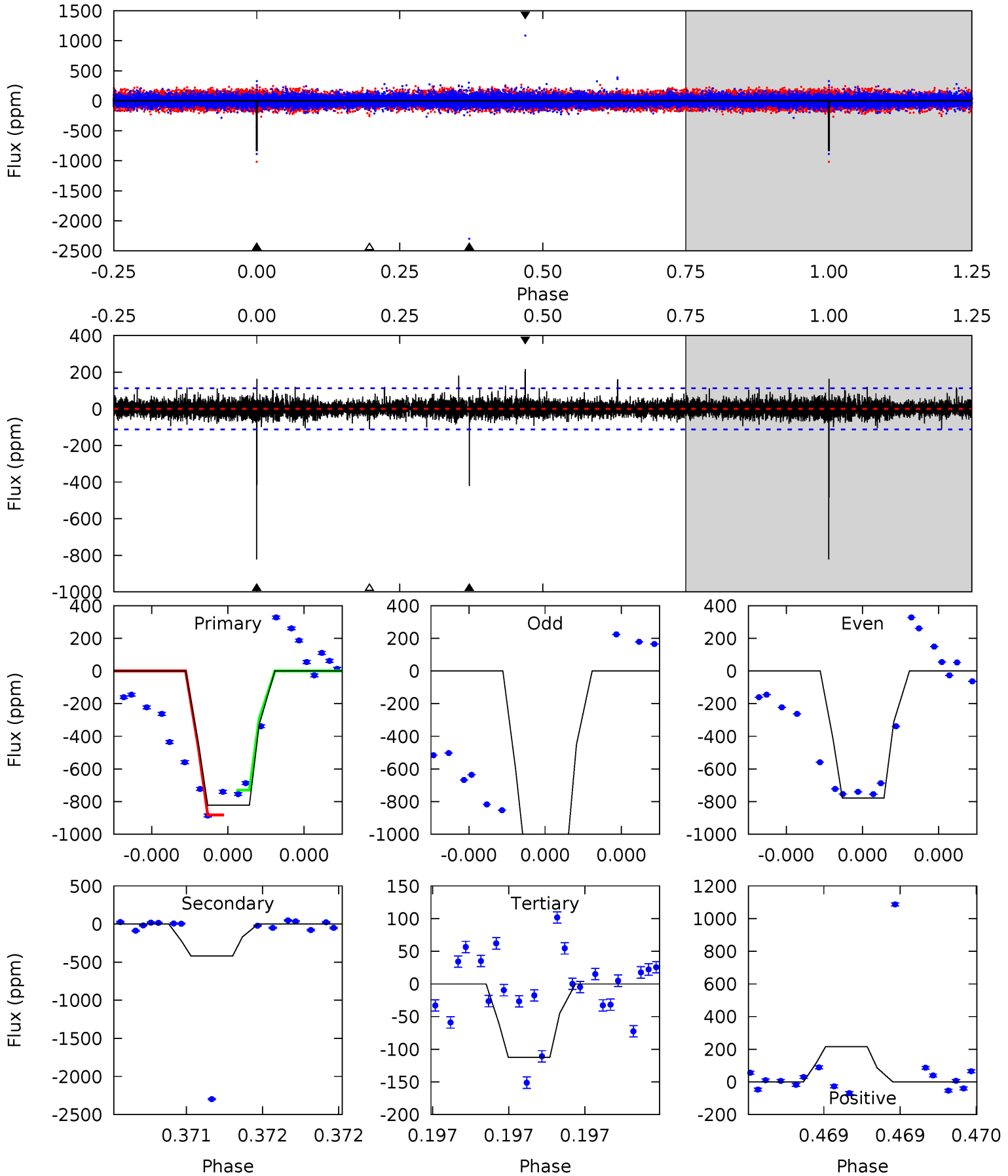
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.26	13.9	7.47	18.9	5.67	3.62	1.33	-3.21	-14.6	6.45	-4.98	0.30	-0.42	0.58	4.27



# Alt Model-Shift Uniqueness Test

007899428-02, P = 425.556132 Days, E = 285.695498 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
41.4	21.2	5.65	10.9	5.67	3.63	1.08	35.7	30.5	15.5	10.3	5.27	0.80	0.21	3.76





### Stellar Parameters For KIC 007899428

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-695 \pm 50$	$8.86^{+9.46}_{-6.03}$	$261^{+11}_{-11}$	$3000^{+1381}_{-503}$	$4752^{+41427}_{-3617}$
Alt.	$-420 \pm 20$	$9.49^{+8.83}_{-6.49}$	$261^{+11}_{-11}$	$2774^{+1139}_{-410}$	$2517^{+23543}_{-1830}$

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

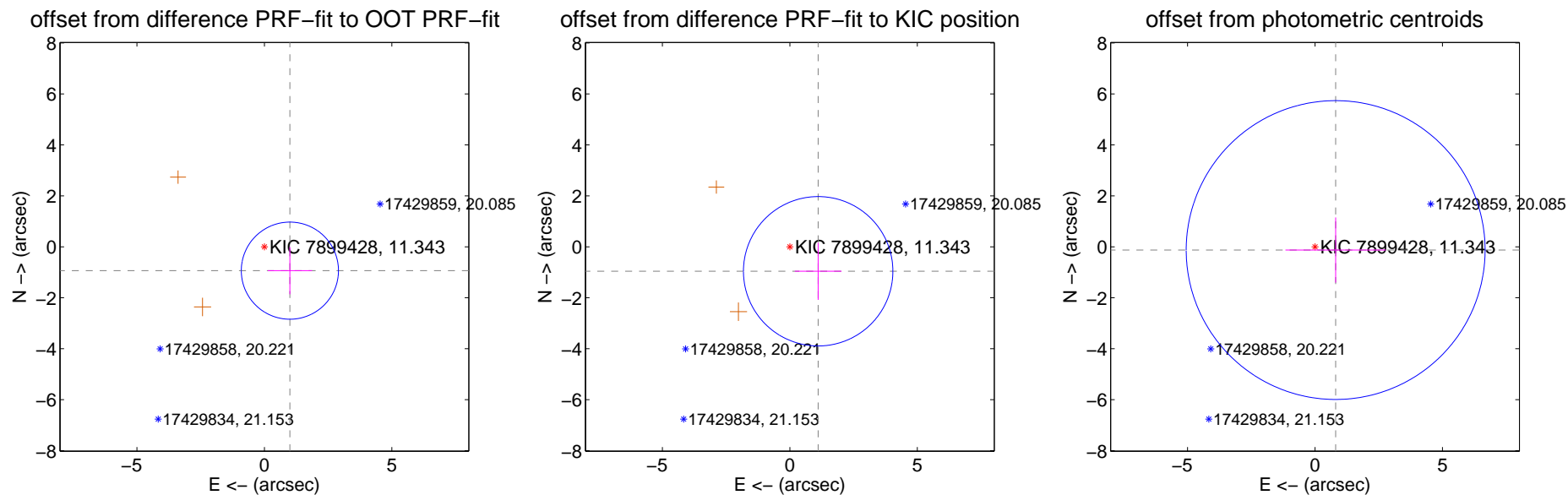
## DV Centroid Data

Supplemental centroid analysis for 007899428-02. **Kepler magnitude: 11.34.** Transit SNR 11.52

**There are 1 quarters with good PRF difference image offsets**

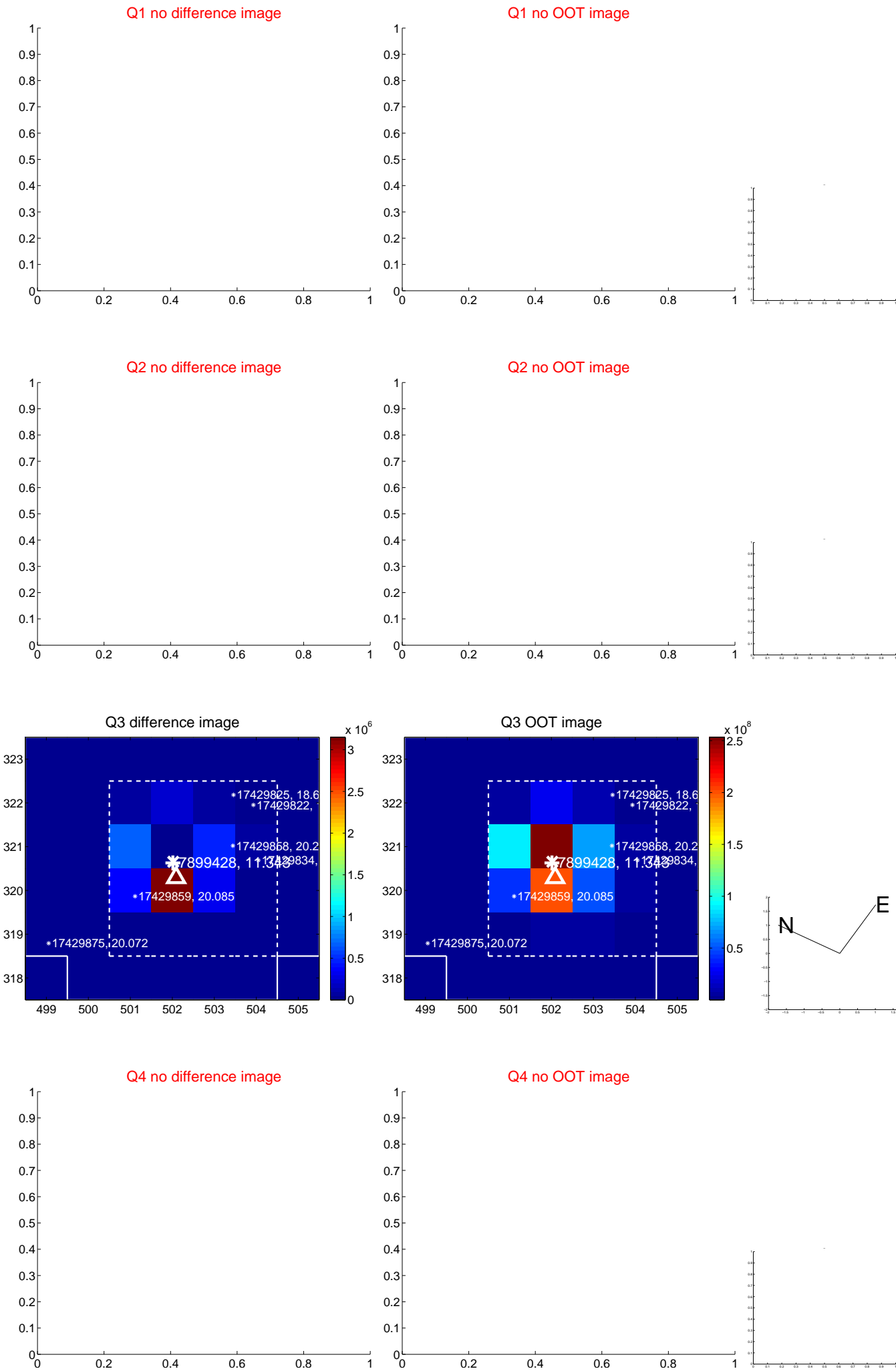
The direct PRF centroid is offset from the target star catalog position by about 0.64 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.370 \pm 0.635$	2.16	$-1.000 \pm 0.867$	$-0.936 \pm 0.927$
PRF-fit source offset from KIC position	$1.468 \pm 0.977$	1.50	$-1.111 \pm 0.917$	$-0.960 \pm 1.122$
photometric centroid source offset	$0.82 \pm 1.95$	0.42	$-0.81 \pm 1.97$	$-0.13 \pm 1.28$



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.

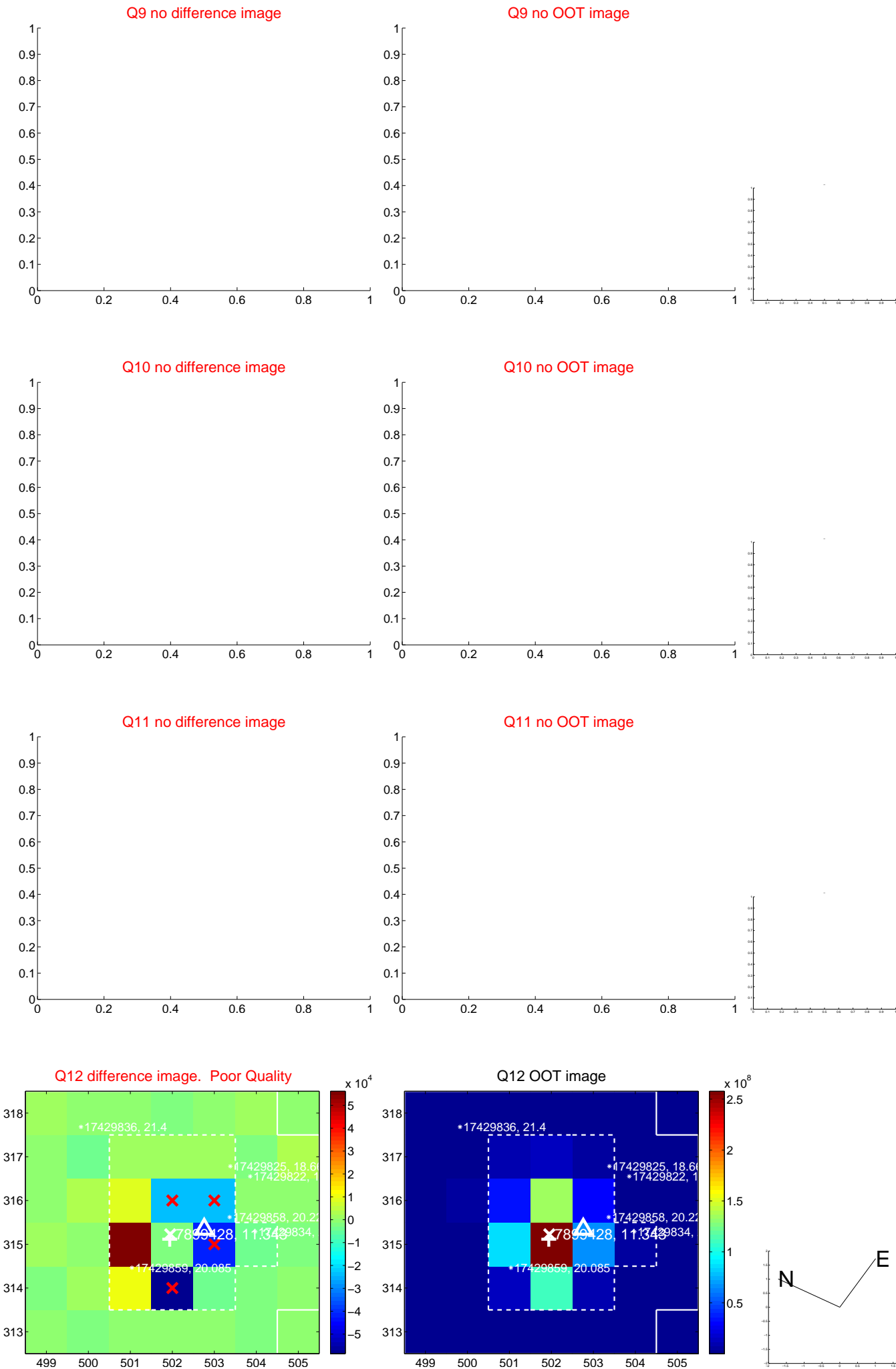
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



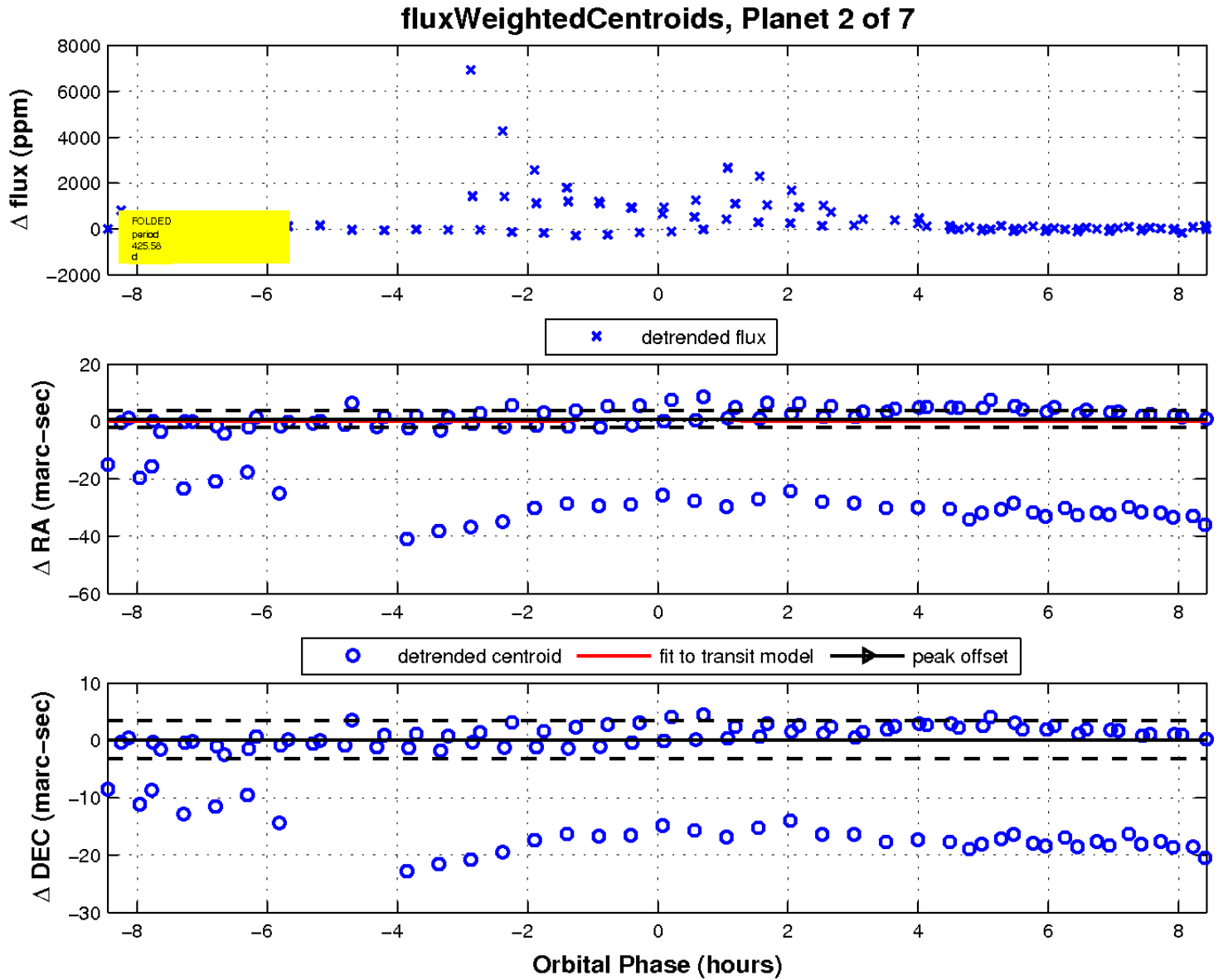
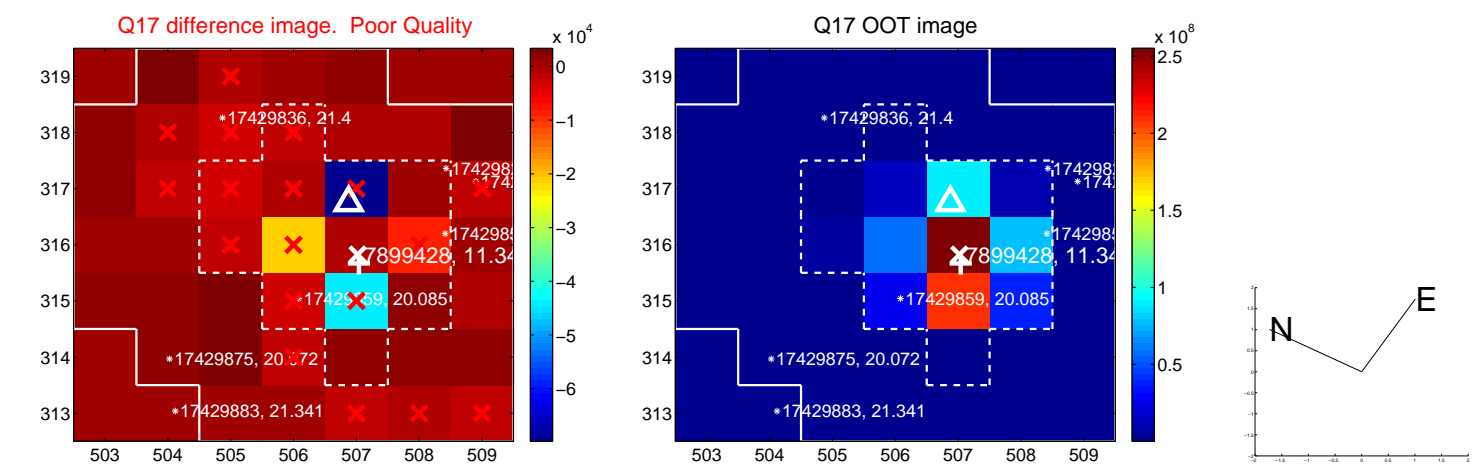
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



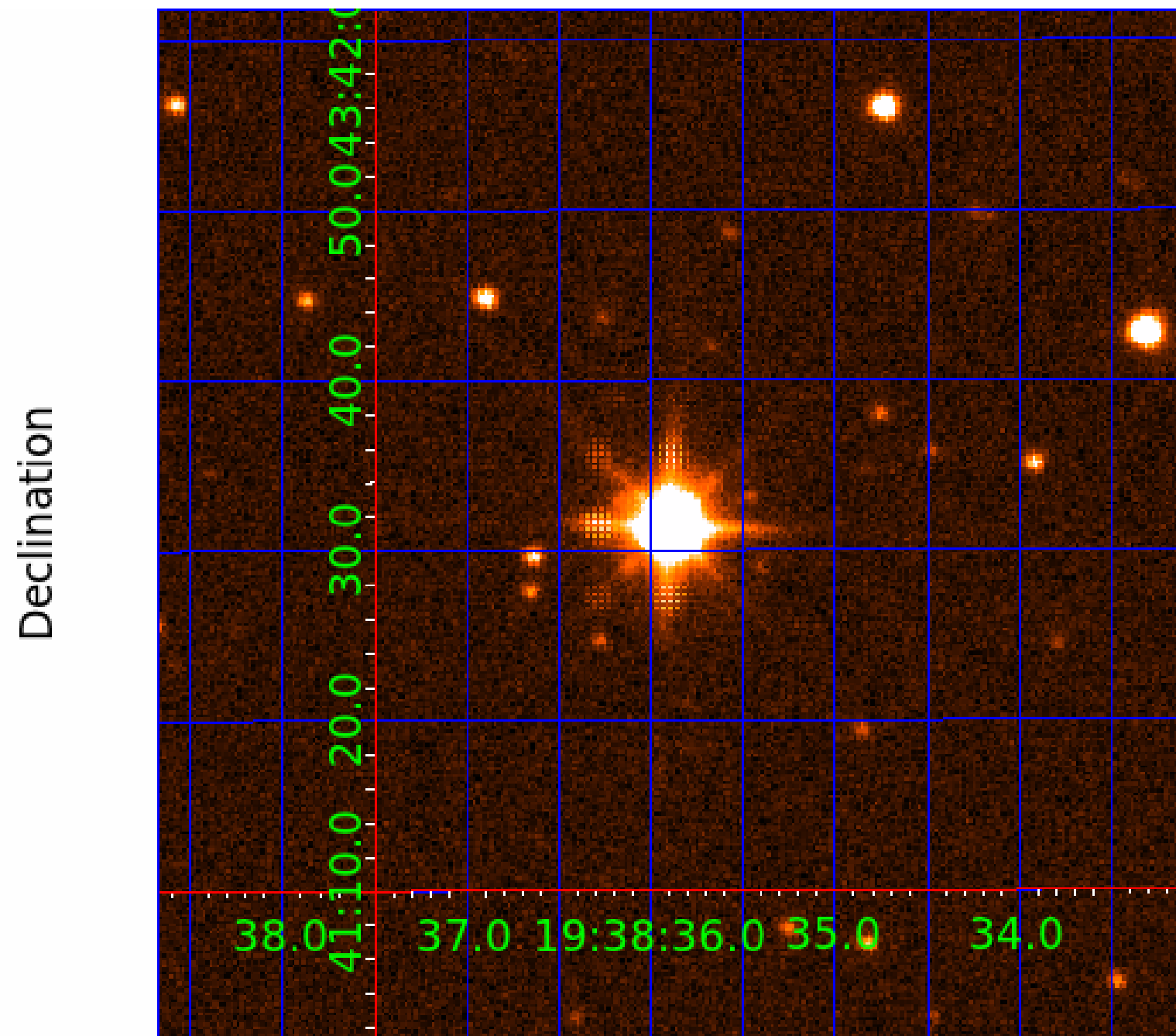
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 007899428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007899428-01	OBS	No	519.065250	306.318800	496.5	9.788	32.8	4.5	0.75	4914	1.67	0.23
007899428-02	OBS	No	425.576042	285.658159	975.6	2.843	40.6	11.5	0.75	4914	2.56	0.29
007899428-03	OBS	No	514.251769	162.234990	772.1	4.383	24.5	9.8	0.75	4914	4.31	0.23
007899428-04	OBS	No	526.920264	393.012445	31.8	0.551	23.9	0.4	0.75	4914	0.50	0.22
007899428-05	OBS	No	508.979840	425.187816	544.1	16.483	21.8	4.3	0.75	4914	1.82	0.23
007899428-06	OBS	No	468.572194	453.561311	235.4	1.303	24.9	2.5	0.75	4914	1.69	0.26
007899428-07	OBS	No	591.456205	273.496991	125.0	12.500	18.0	-1.0	0.75	4914	0.81	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

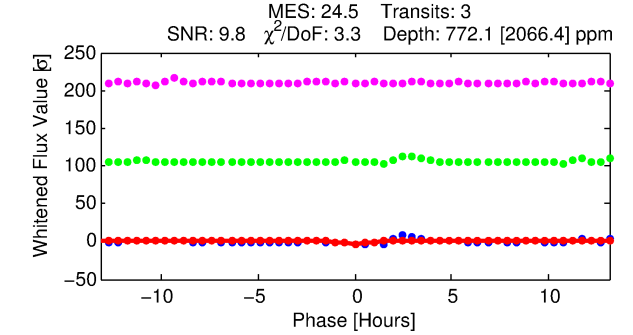
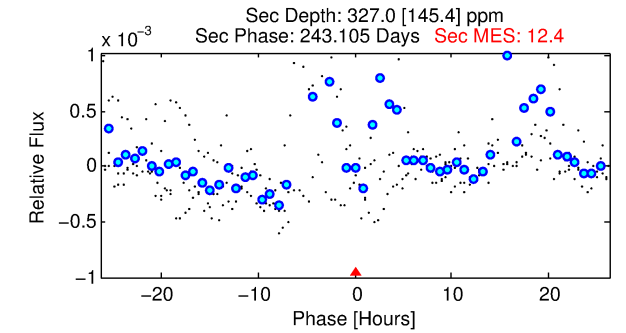
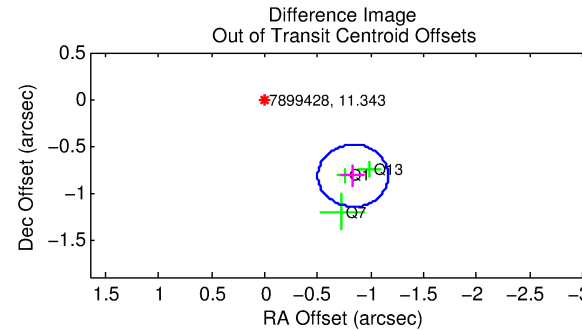
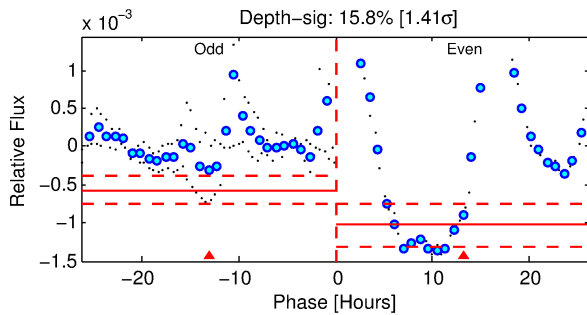
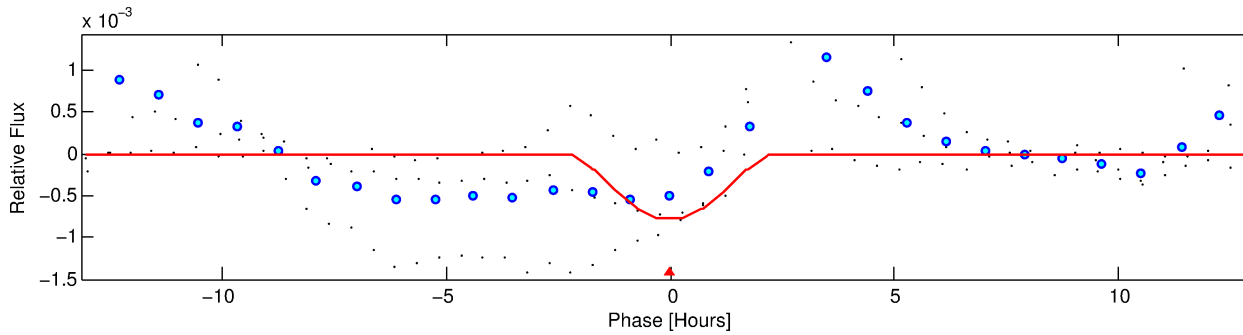
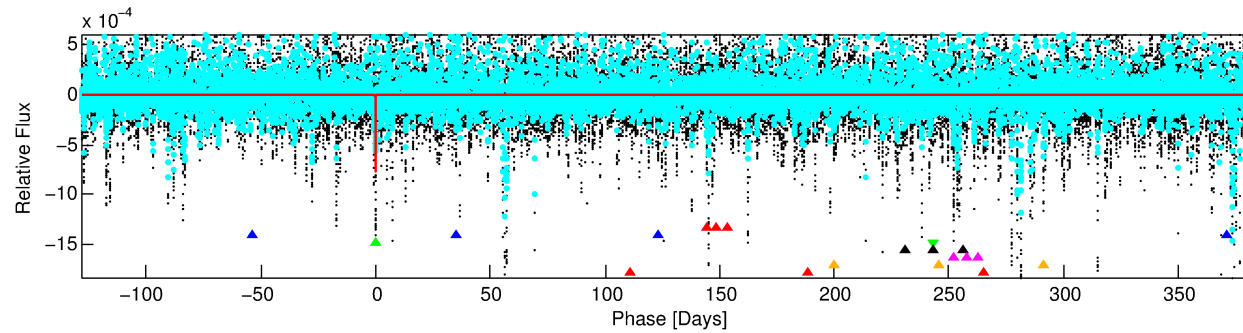
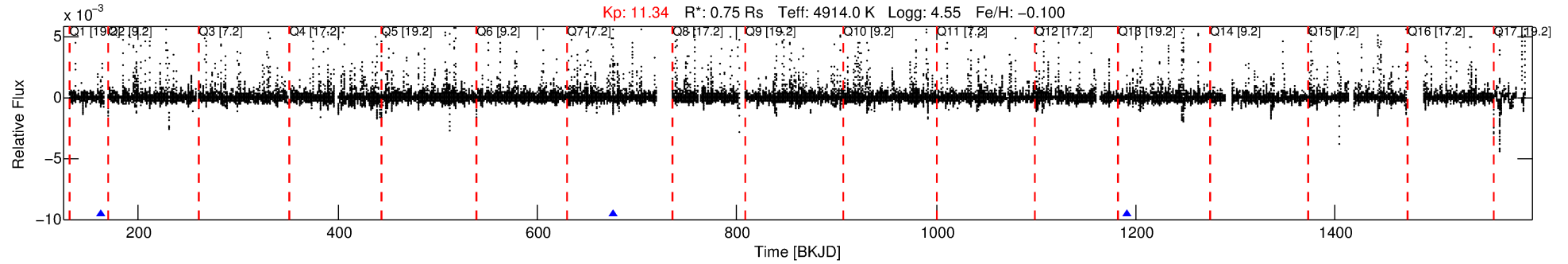
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-03

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 3 of 7 Period: 514.252 d



## DV Fit Results:

Period = 514.25177 [0.00800] d  
Epoch = 162.2350 [0.0099] BKJD  
 $R_p/R^* = 0.0528$  [0.1871]  
 $a/R^* = 295.20$  [246.60]  
 $b = 1.00$  [0.17]  
 $\text{Seff} = 0.23$  [0.04]  
 $T_{\text{eq}} = 176$  [8] K  
 $R_p = 4.31$  [15.26]  $R_e$   
 $a = 1.1307$  [0.0965] AU  
 $A_g = 12403.62$  [88040.88] [0.14 $\sigma$ ]  
 $T_{\text{eff}} = 2875$  [5102] K [0.53 $\sigma$ ]

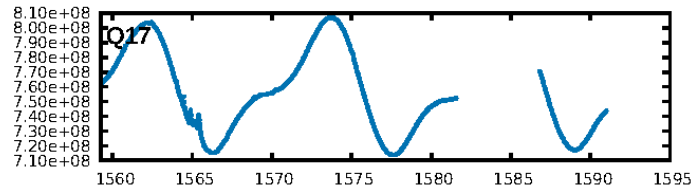
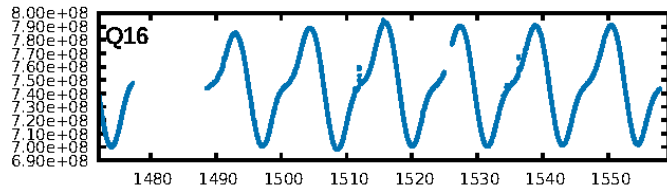
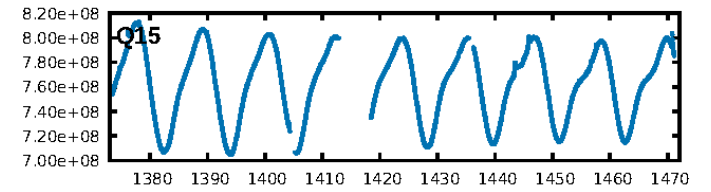
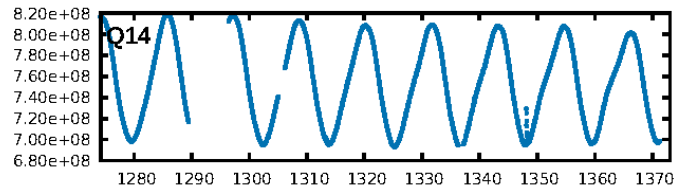
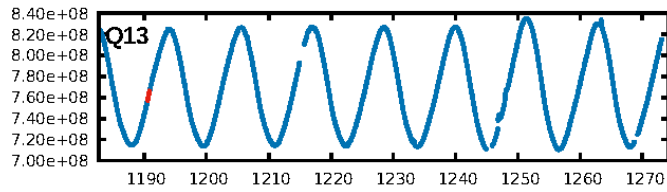
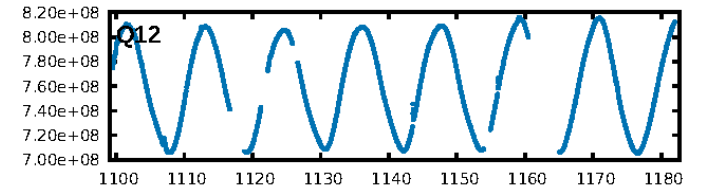
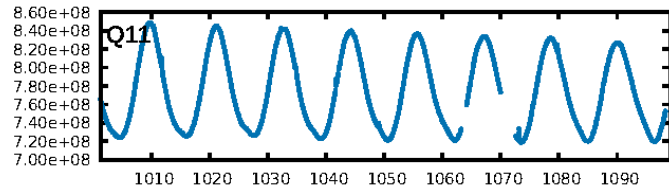
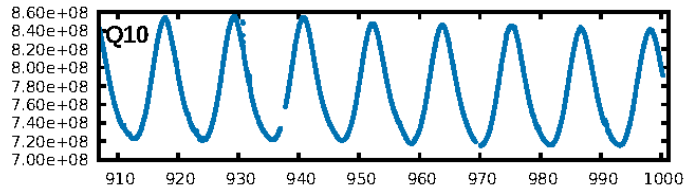
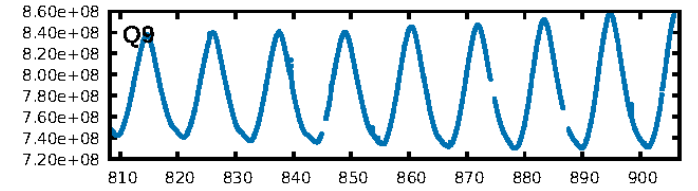
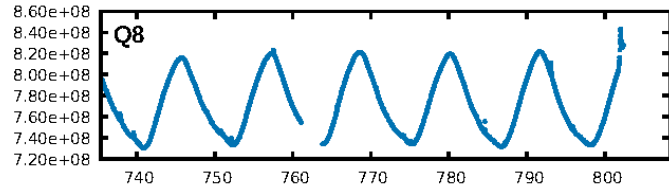
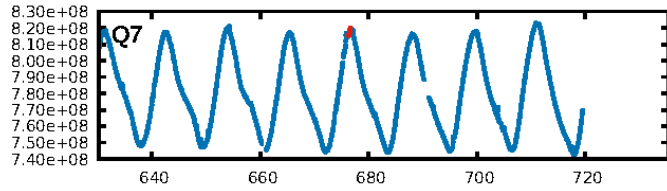
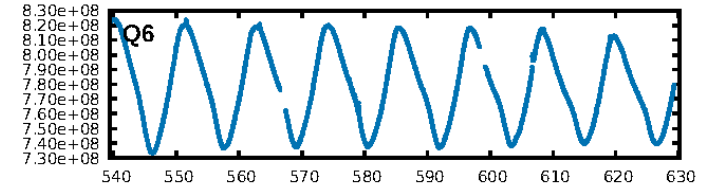
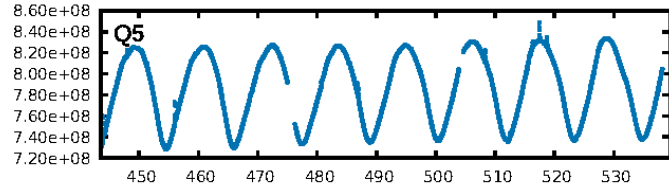
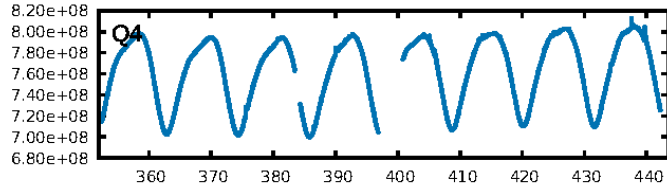
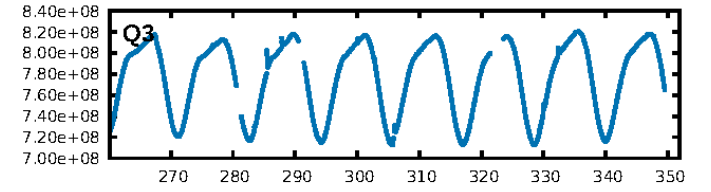
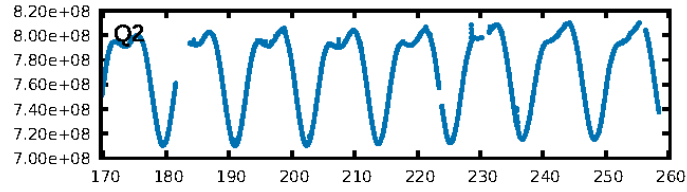
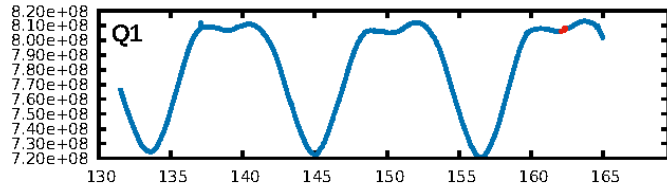
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.42 $\sigma$ ]  
LongPeriod-sig: 100.0% [10.77 $\sigma$ ]  
**ModelChiSquare2-sig: 0.0%**  
**ModelChiSquareGof-sig: 0.0%**  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 3.612  
Centroid-sig: 88.1%  
Centroid-so: 0.520 arcsec [0.25 $\sigma$ ]  
**OotOffset-rm: 1.166 arcsec [10.54 $\sigma$ ]**  
**KicOffset-rm: 1.719 arcsec [13.35 $\sigma$ ]**  
OotOffset-st: 0/1/0/2 [3]  
KicOffset-st: 0/1/0/2 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

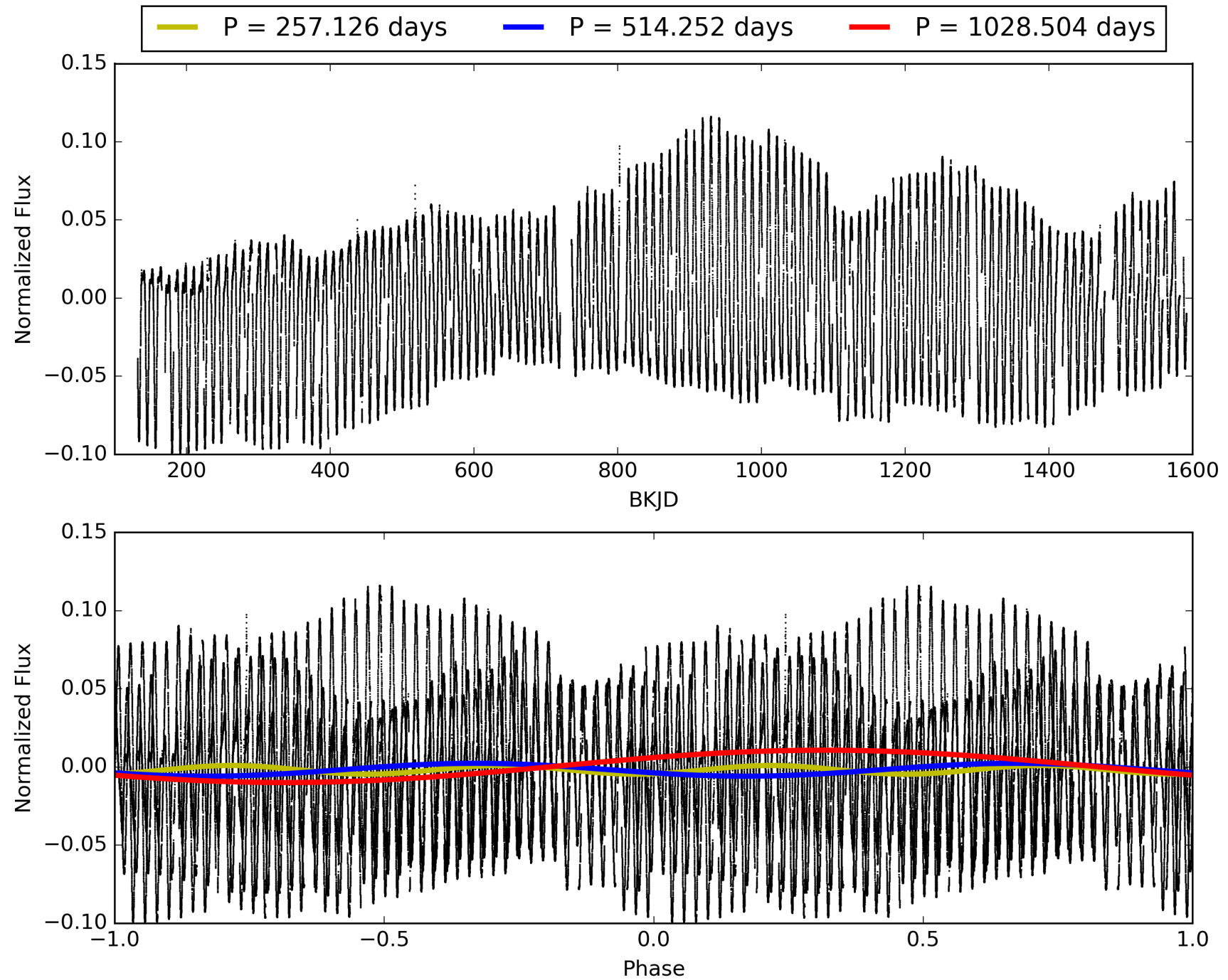
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:19:01 Z

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

# TCE 007899428-03, PDC Light Curves

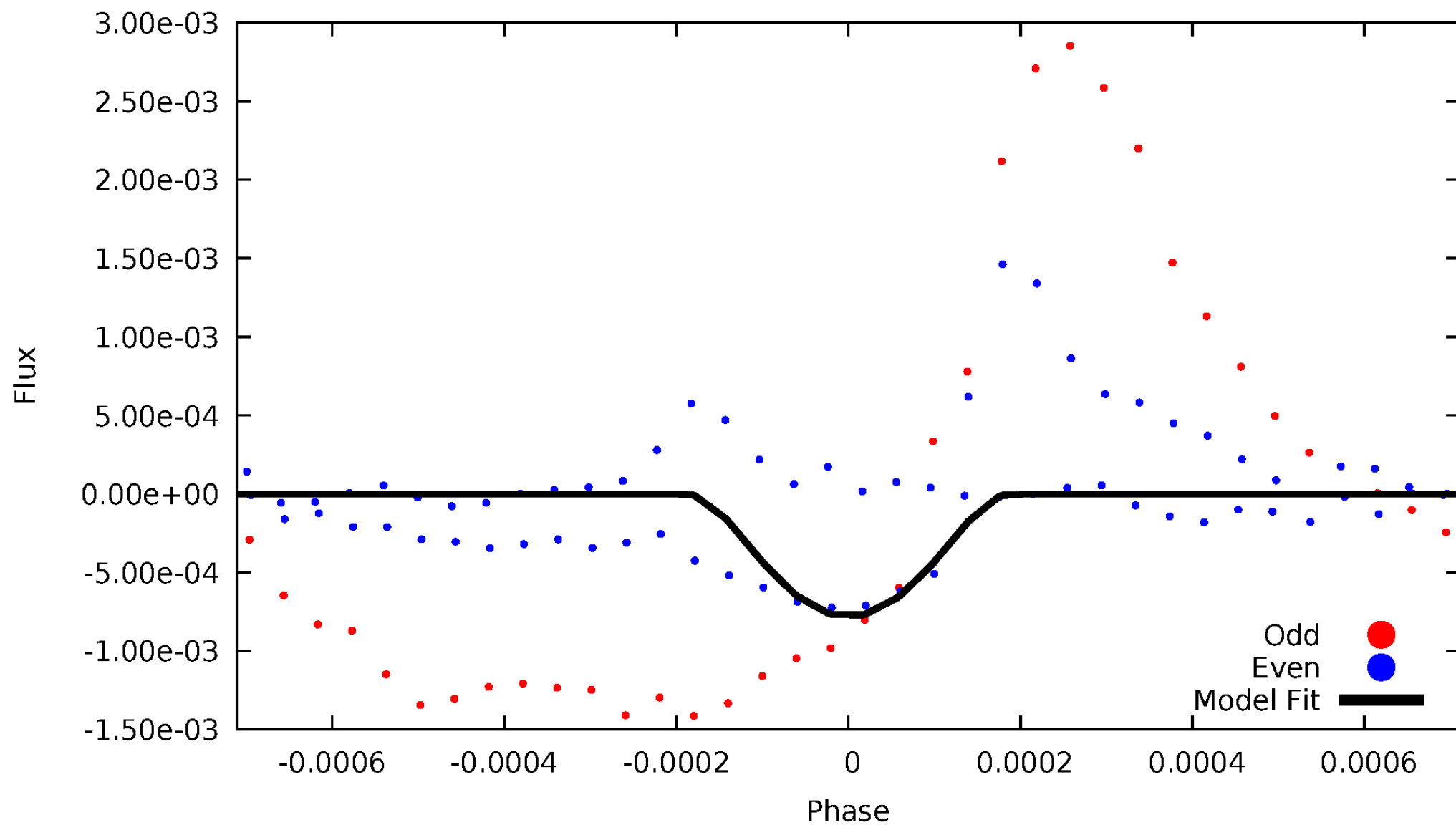


# TCE 007899428-03



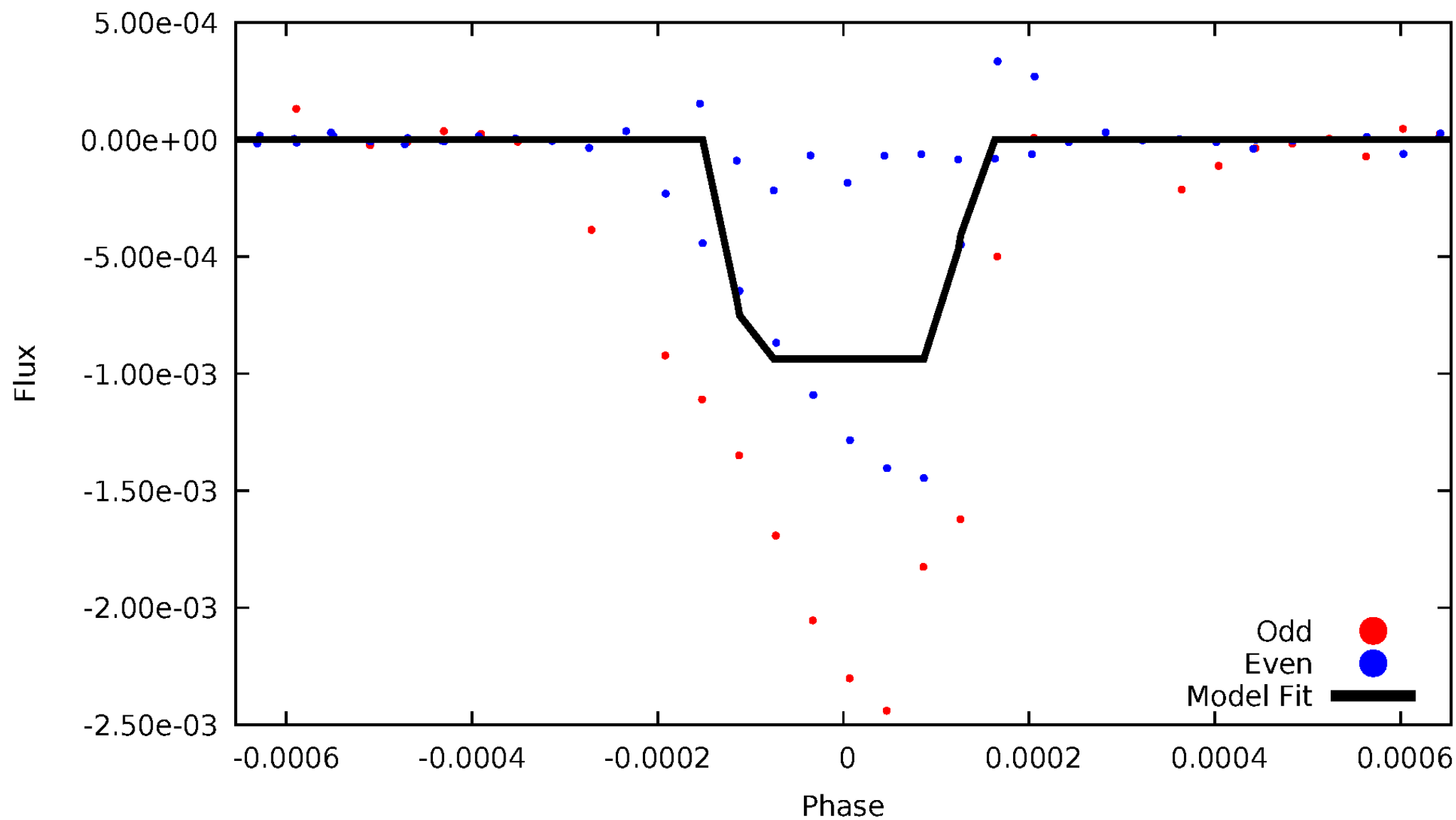
# DV Odd/Even

TCE 007899428-03



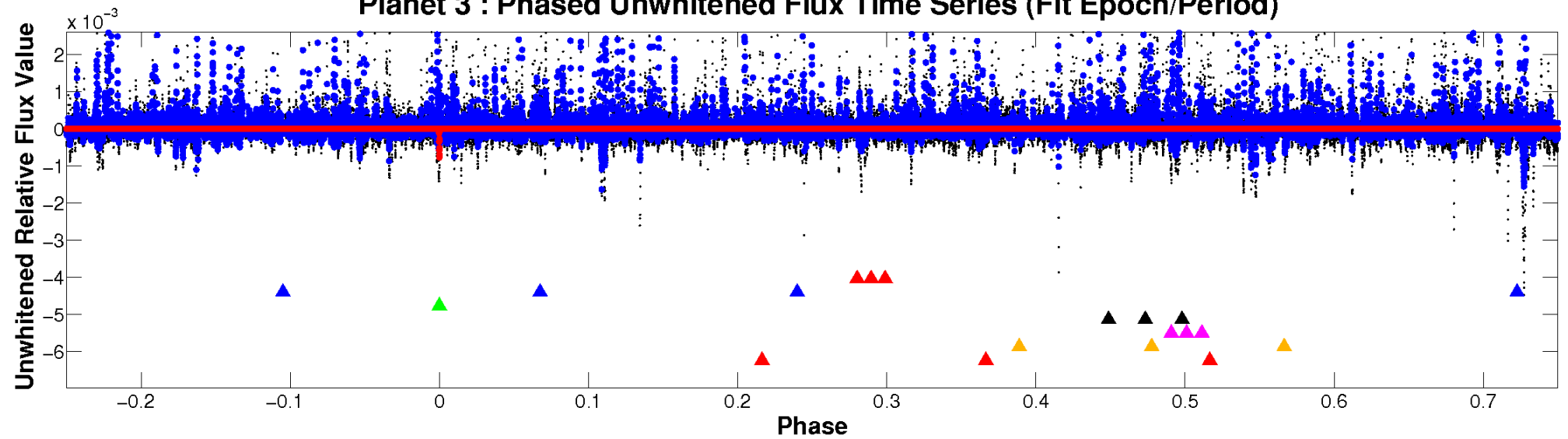
# ALT Odd/Even

TCE 007899428-03

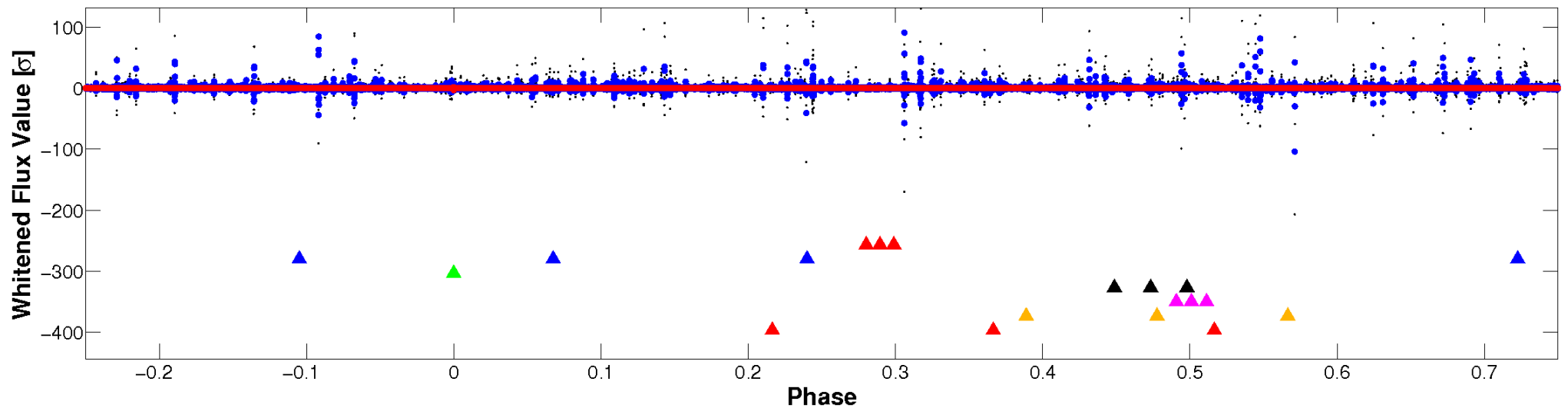


# Non-Whitened Vs. Whitened Light Curve

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

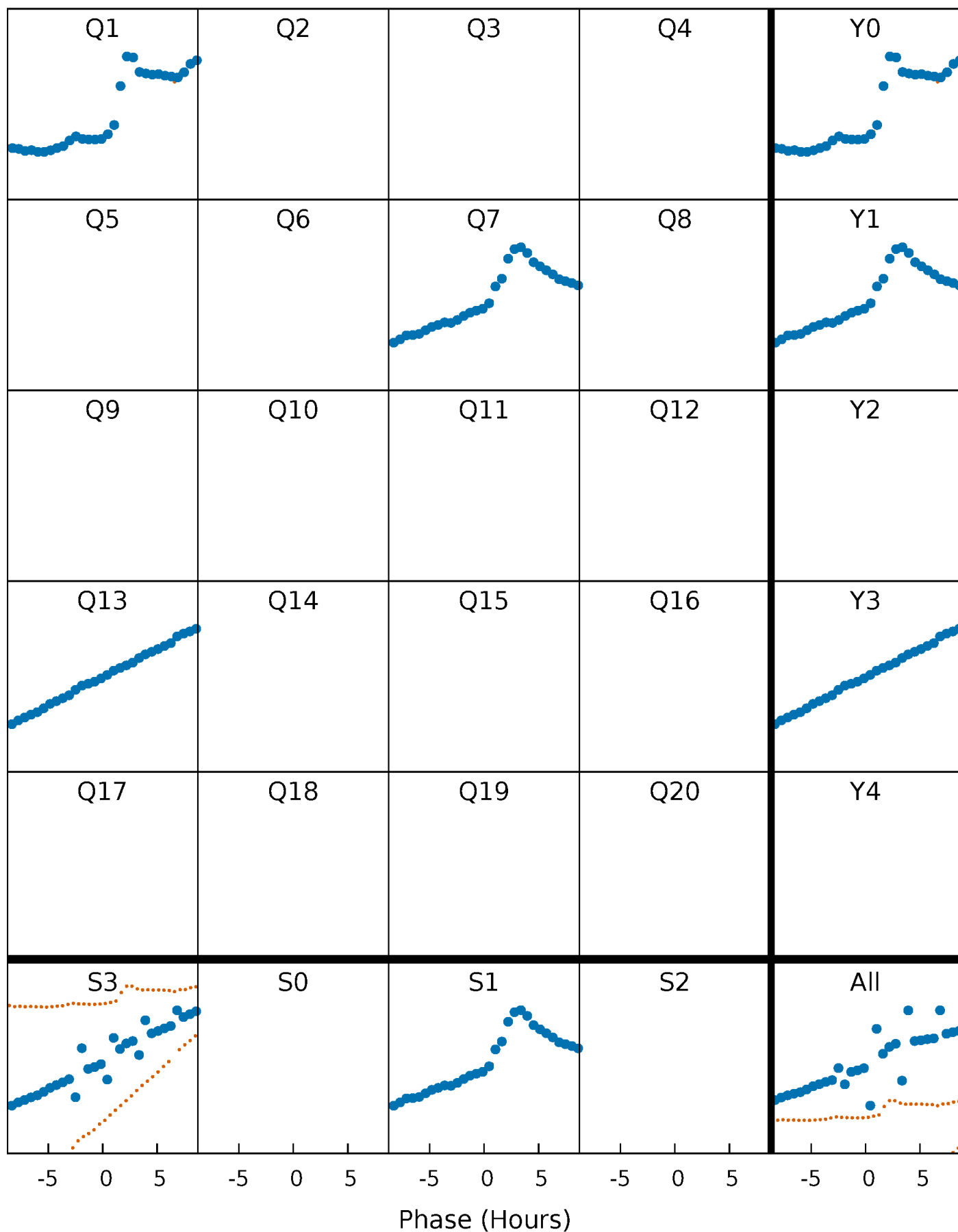


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

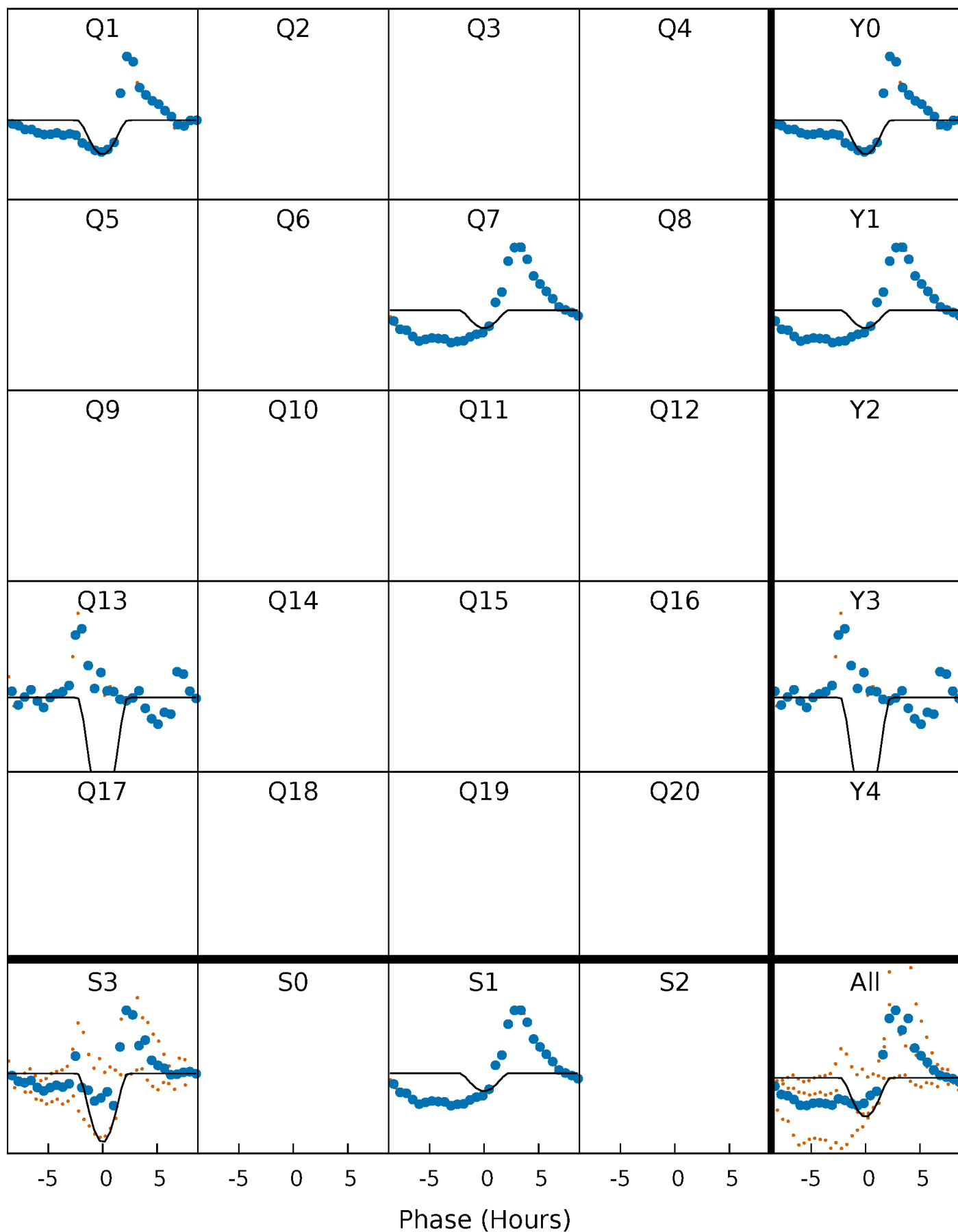
TCE 007899428-03     $P=514.251769$  Days     $T_0=162.234990$  (BKJD)





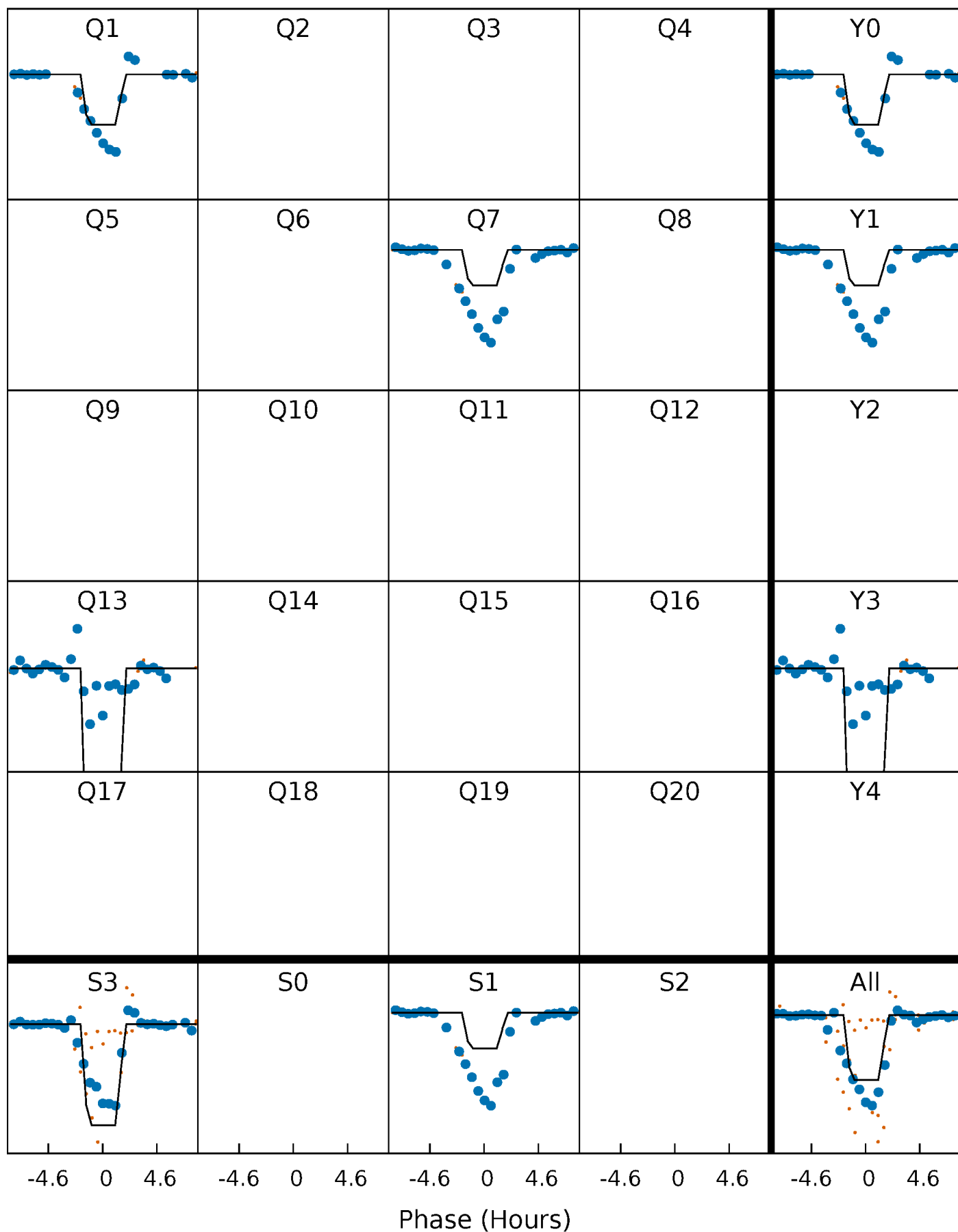
# DV Quarter-Phased Transit Curves

TCE 007899428-03     $P=514.251769$  Days     $T_0=162.234990$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

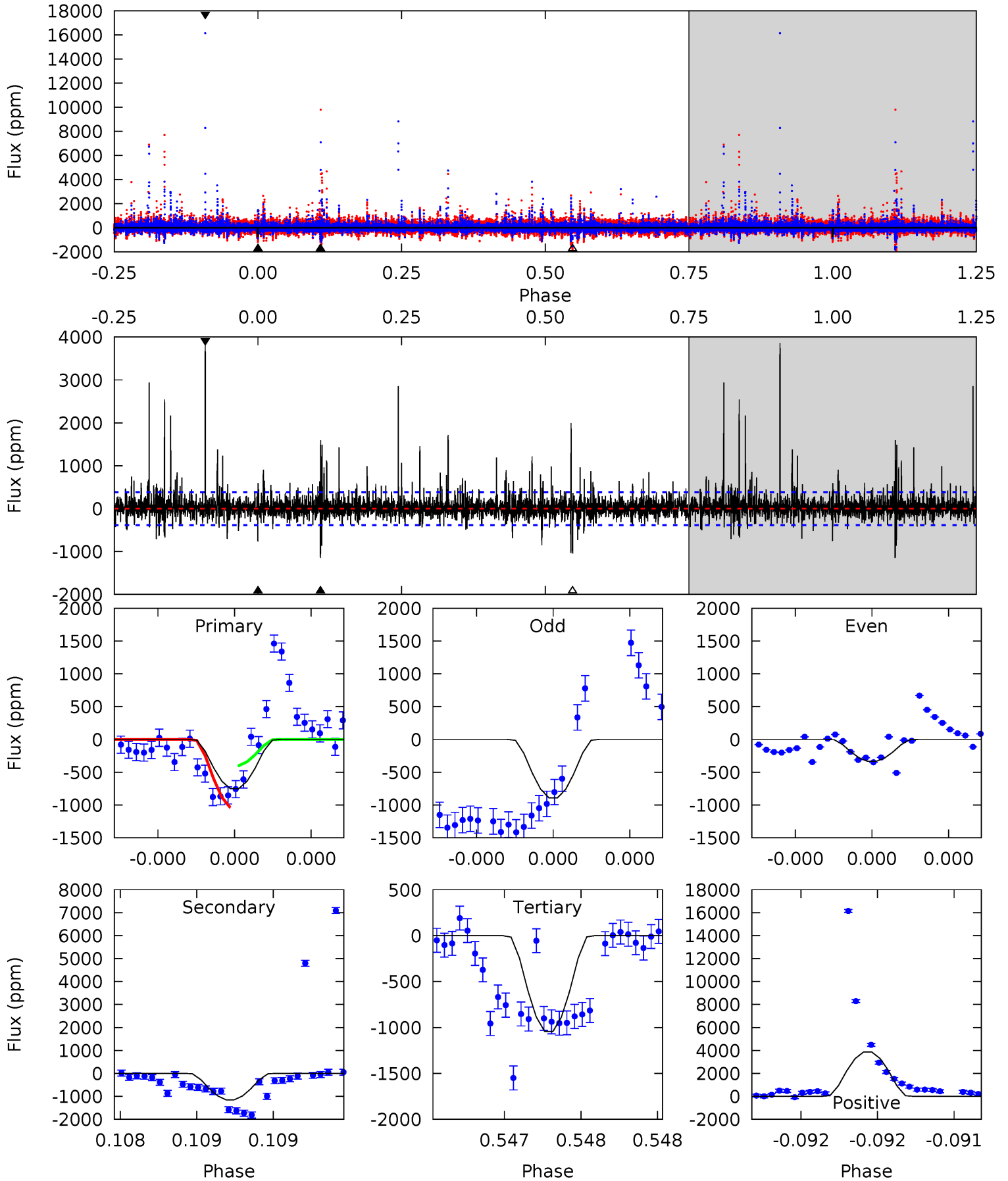
TCE 007899428-03   P=514.251405 Days    $T_0=162.241703$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-03, P = 514.251769 Days, E = 162.234990 Days

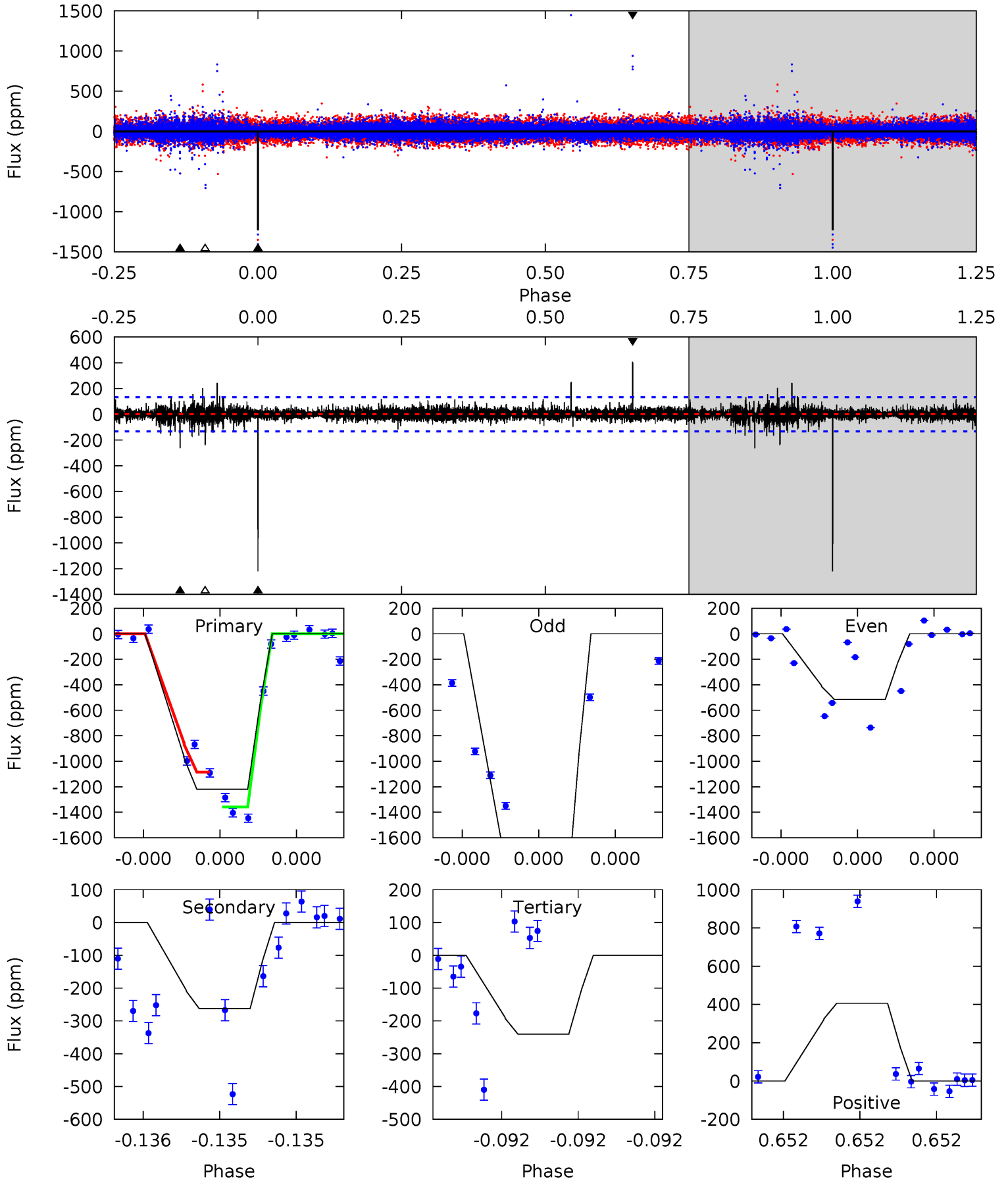
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	16.9	15.3	56.8	5.63	3.57	2.71	-4.30	-45.7	1.58	-39.9	1.80	0.67	0.77	4.71



# Alt Model-Shift Uniqueness Test

007899428-03, P = 514.251405 Days, E = 162.241703 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
52.4	11.3	10.3	17.4	5.70	3.67	0.98	42.1	35.0	0.95	-6.18	34.5	0.96	0.25	5.90



### Stellar Parameters For KIC 007899428

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1150 \pm 68$	$11.76^{+12.42}_{-8.55}$	$245^{+11}_{-11}$	$2990^{+1594}_{-511}$	$5974^{+71163}_{-4561}$
Alt.	$-262 \pm 23$	$10.50^{+11.58}_{-6.86}$	$246^{+10}_{-11}$	$2550^{+865}_{-402}$	$1667^{+12584}_{-1292}$

$T_{max}$  = 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

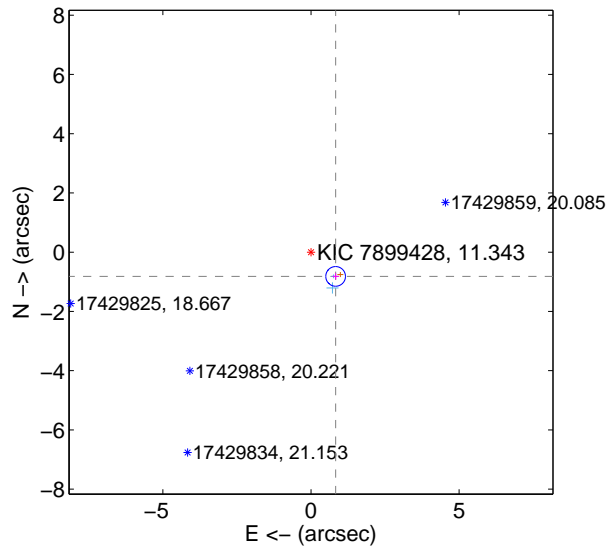
Supplemental centroid analysis for 007899428-03. **Kepler magnitude: 11.34.** Transit SNR 9.80

**There are 2 quarters with good PRF difference image offsets**

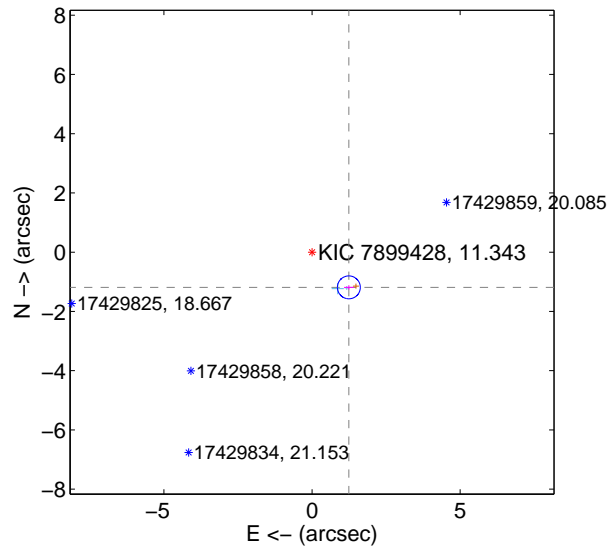
The direct PRF centroid is offset from the target star catalog position by about 0.63 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>1.166 \pm 0.111</math></b>	<b>10.54</b>	$-0.832 \pm 0.109$	$-0.818 \pm 0.113$
PRF-fit source offset from KIC position	<b><math>1.719 \pm 0.129</math></b>	<b>13.35</b>	$-1.244 \pm 0.165$	$-1.187 \pm 0.071$
photometric centroid source offset	$0.52 \pm 2.10$	0.25	$0.03 \pm 3.22$	$-0.52 \pm 2.09$

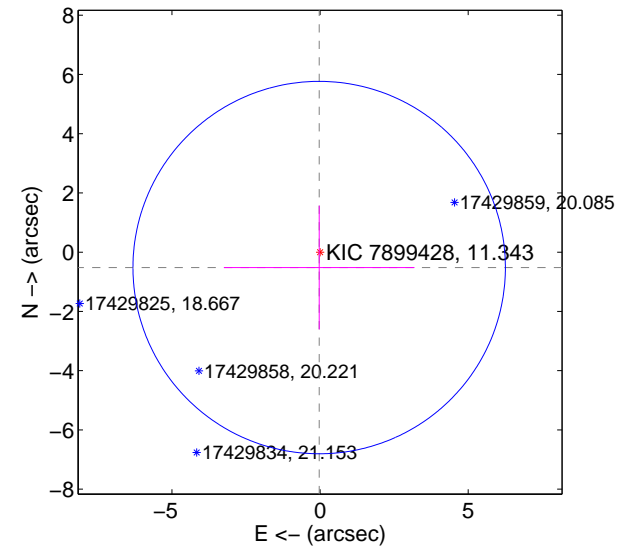
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

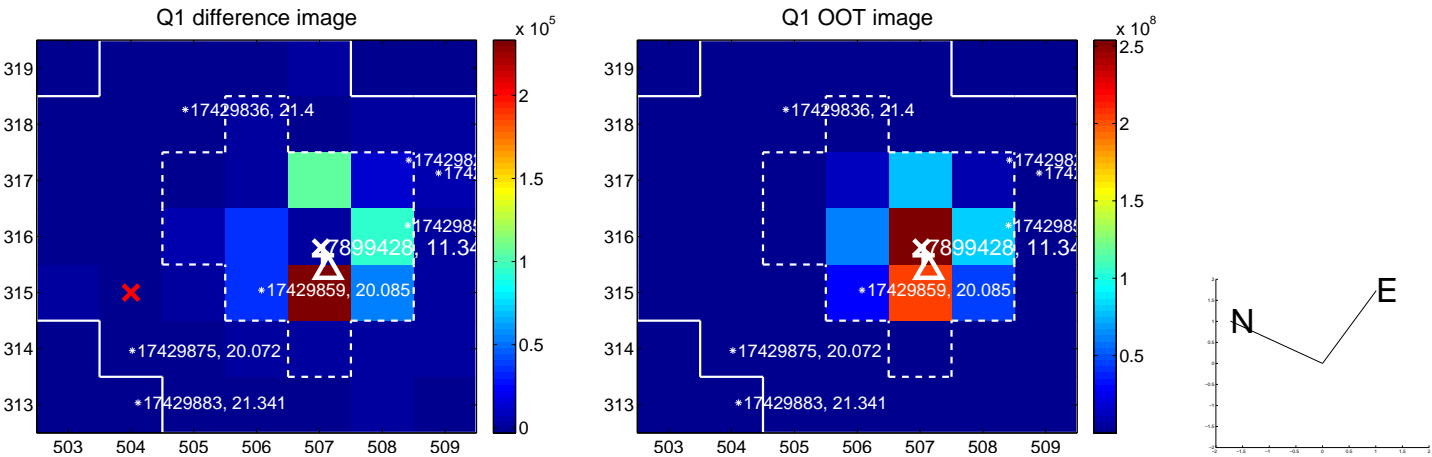


offset from photometric centroids

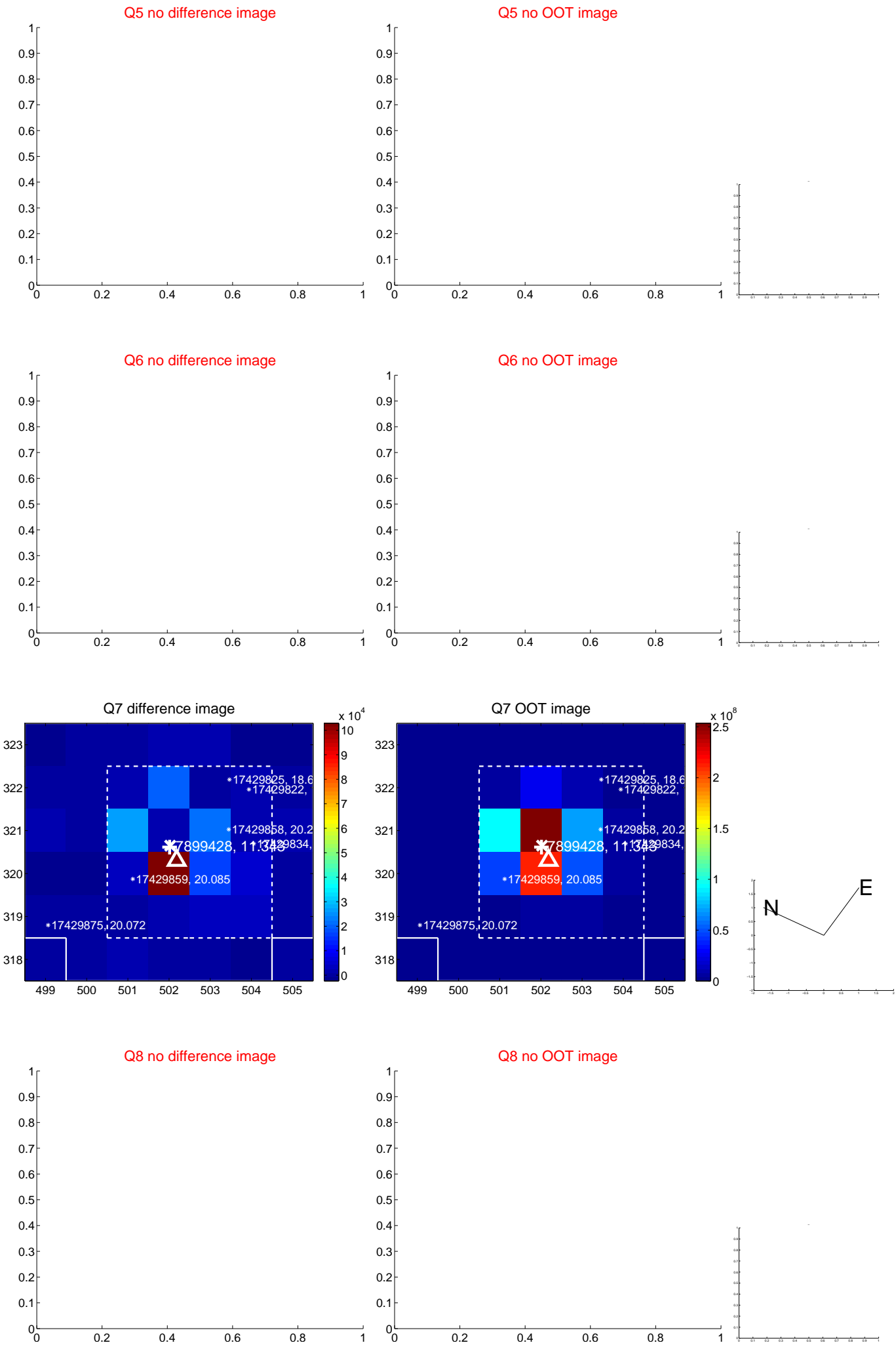


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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



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

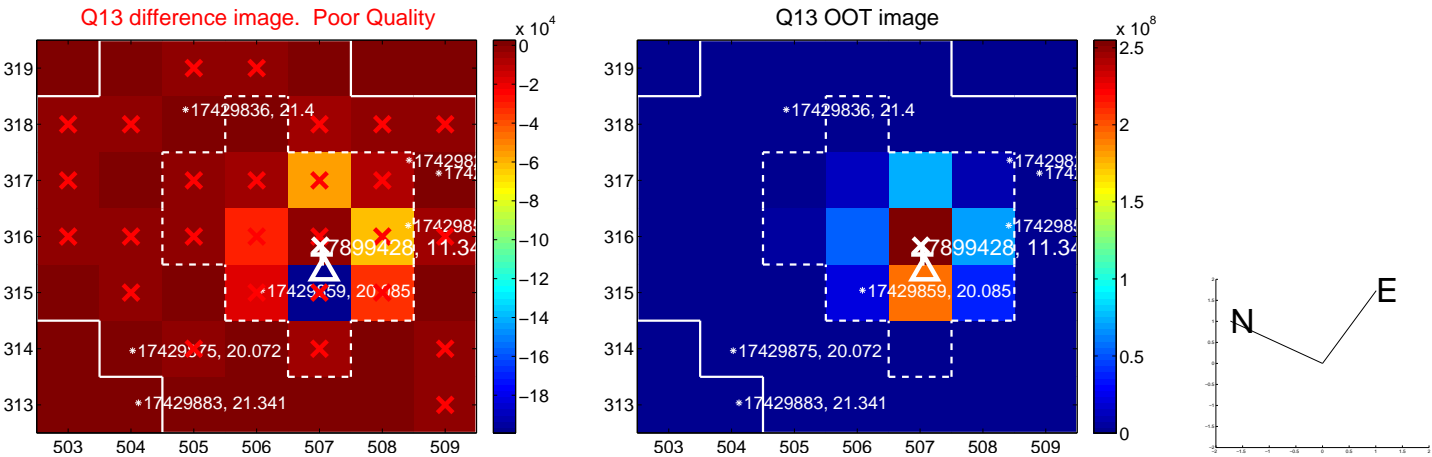




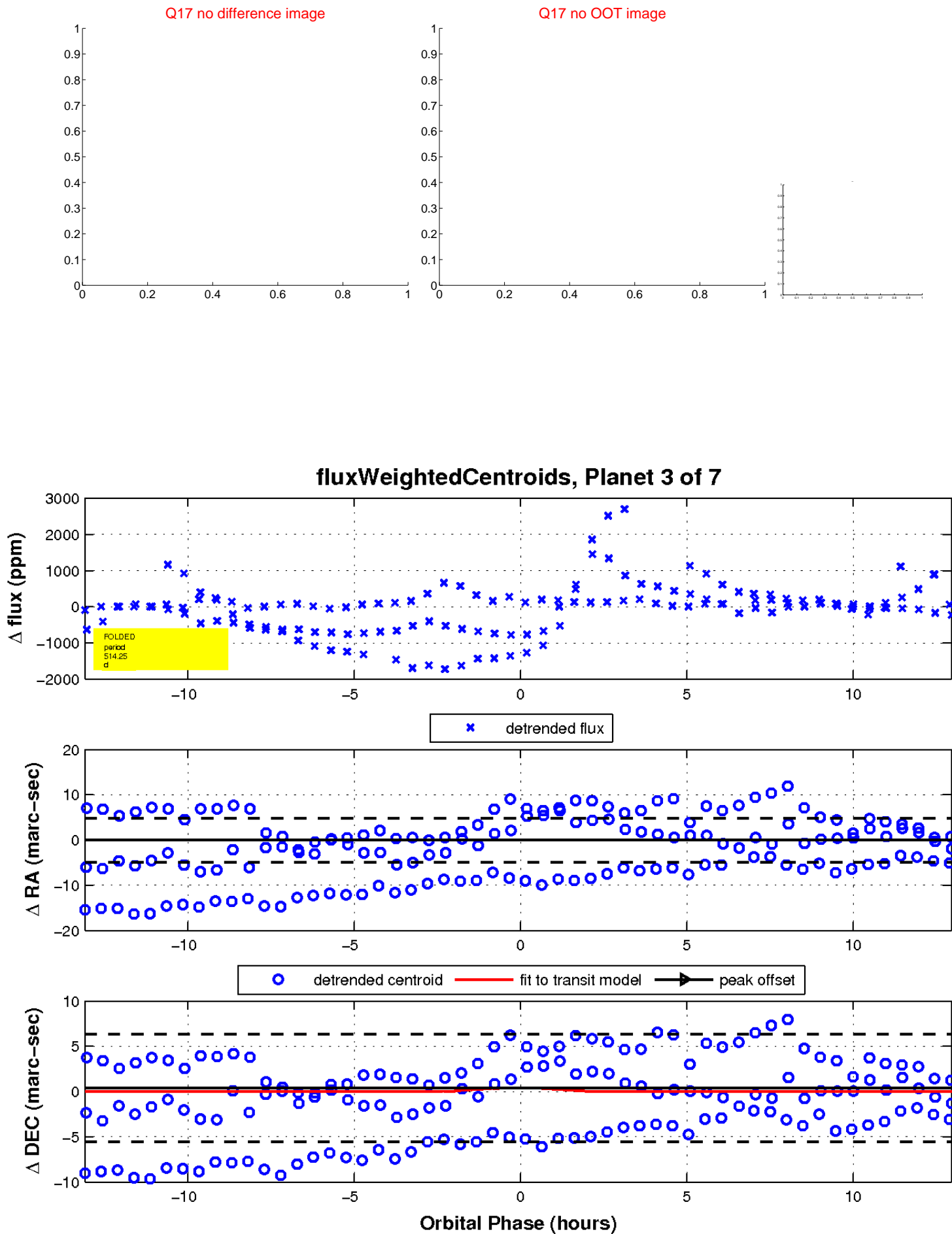
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



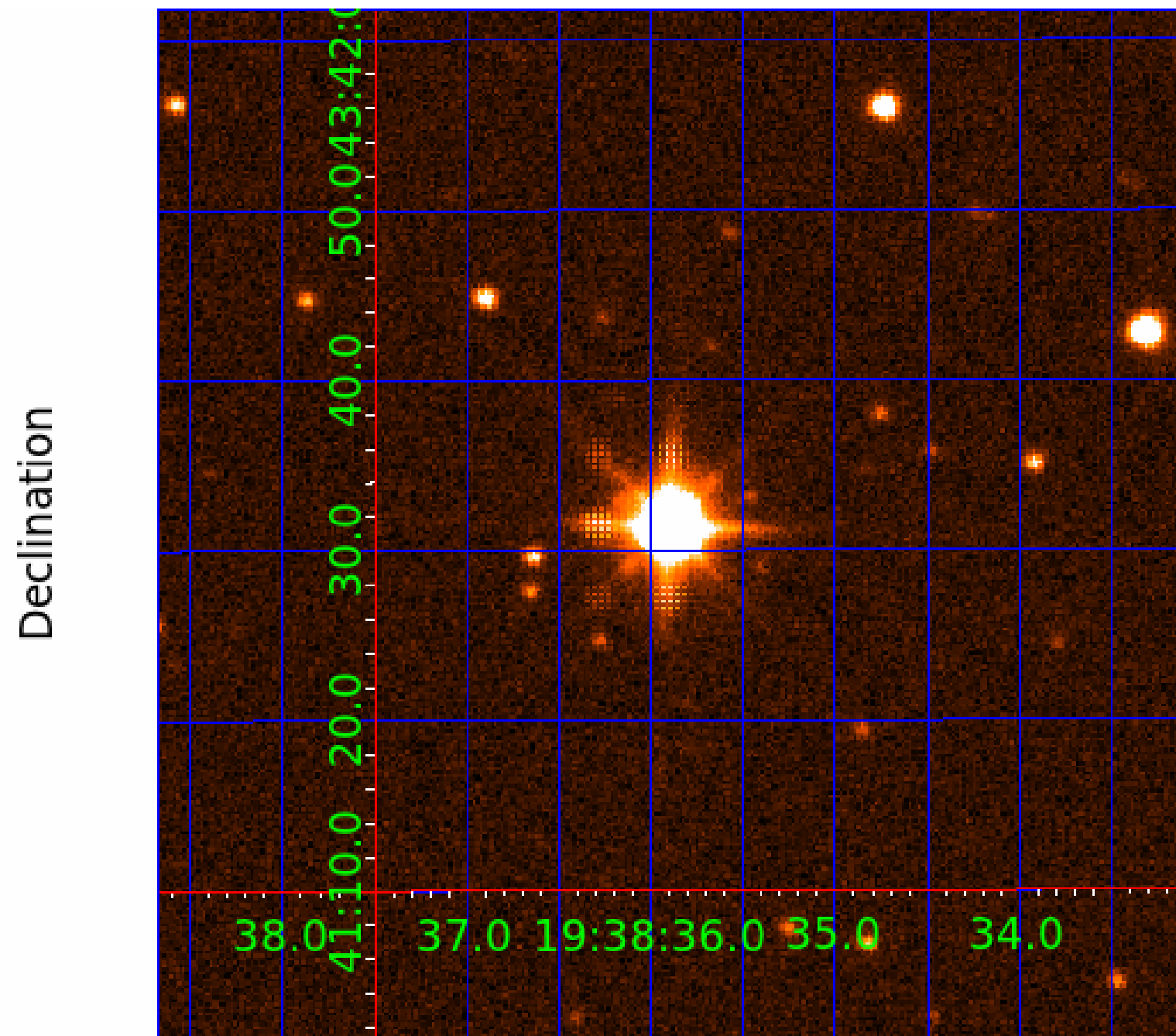
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 007899428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007899428-01	OBS	No	519.065250	306.318800	496.5	9.788	32.8	4.5	0.75	4914	1.67	0.23
007899428-02	OBS	No	425.576042	285.658159	975.6	2.843	40.6	11.5	0.75	4914	2.56	0.29
007899428-03	OBS	No	514.251769	162.234990	772.1	4.383	24.5	9.8	0.75	4914	4.31	0.23
007899428-04	OBS	No	526.920264	393.012445	31.8	0.551	23.9	0.4	0.75	4914	0.50	0.22
007899428-05	OBS	No	508.979840	425.187816	544.1	16.483	21.8	4.3	0.75	4914	1.82	0.23
007899428-06	OBS	No	468.572194	453.561311	235.4	1.303	24.9	2.5	0.75	4914	1.69	0.26
007899428-07	OBS	No	591.456205	273.496991	125.0	12.500	18.0	-1.0	0.75	4914	0.81	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

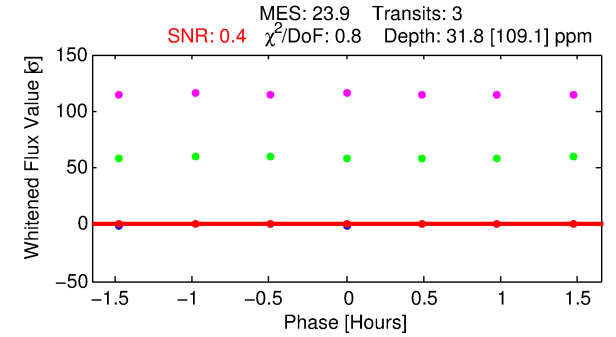
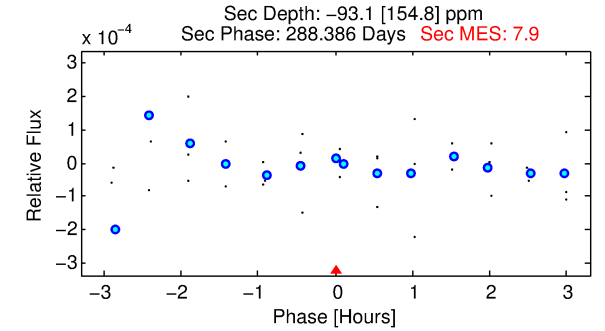
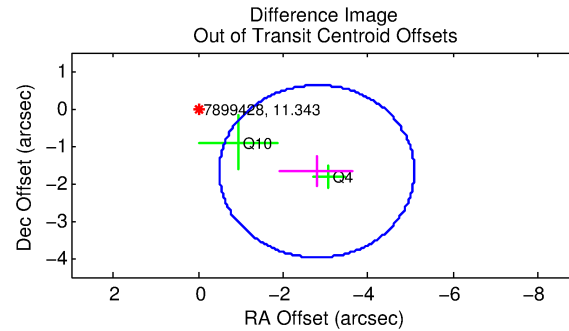
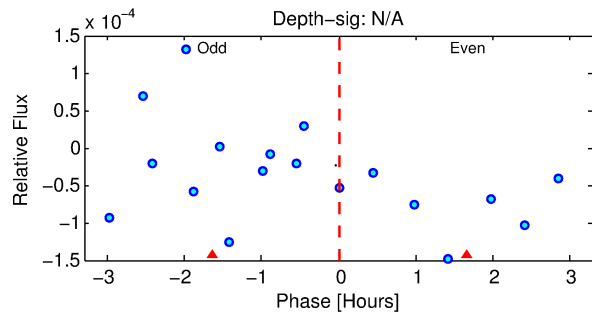
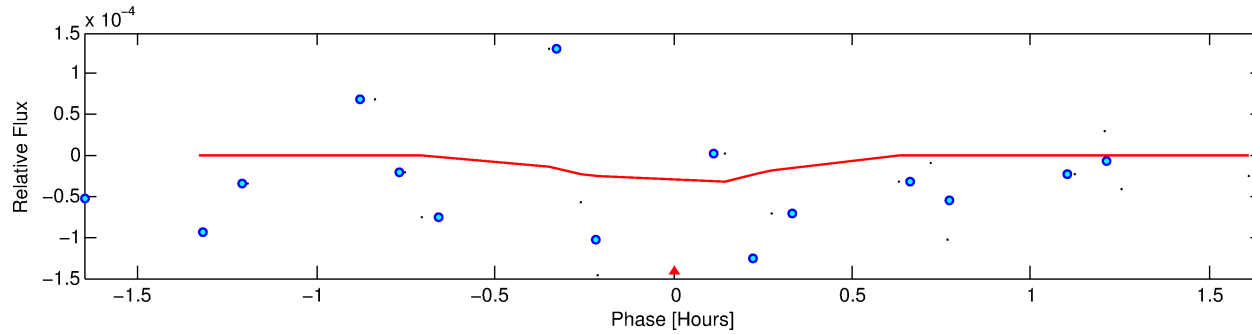
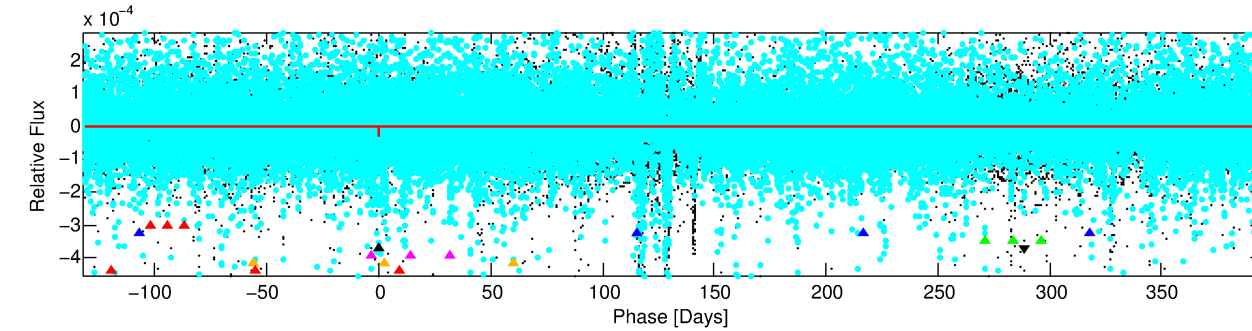
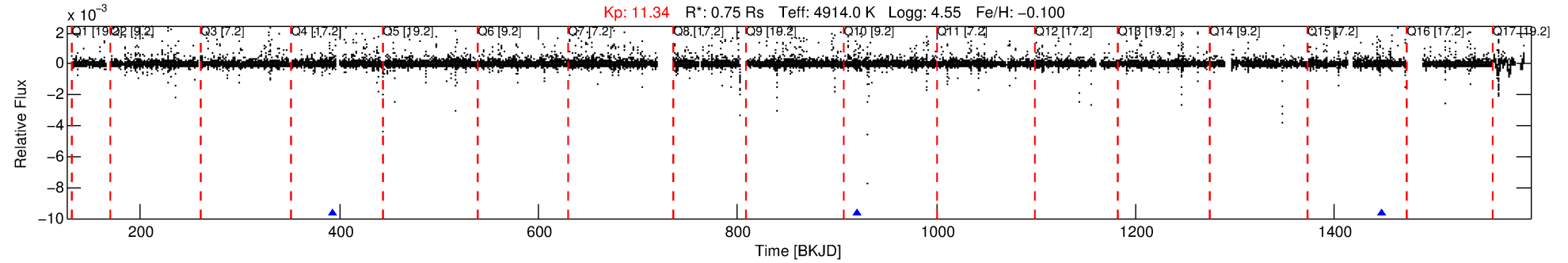
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-04

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 4 of 7 Period: 526.920 d



## DV Fit Results:

Period = 526.92026 [0.03744] d  
Epoch = 393.0124 [0.1036] BKJD  
Rp/R\* = 0.0061 [1.6432]  
a/R\* = 7355.67 [6814513.11]  
b = 0.01 [89626.52]  
Seff = 0.22 [0.04]  
Teq = 175 [8] K  
Rp = 0.50 [133.94] Re  
a = 1.1492 [0.0981] AU  
Ag = N/A  
Teffp = N/A

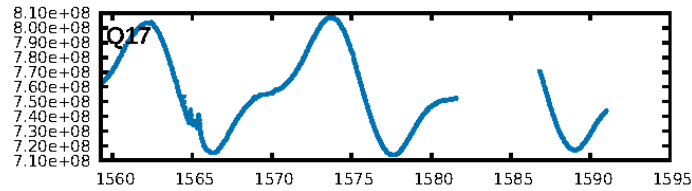
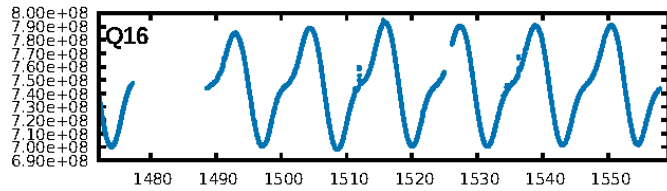
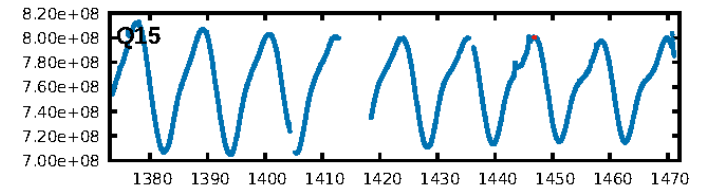
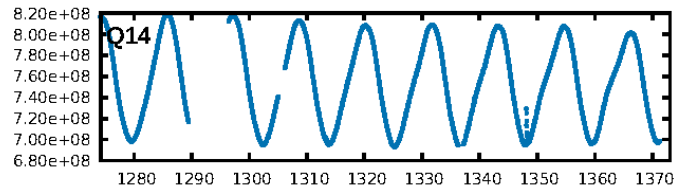
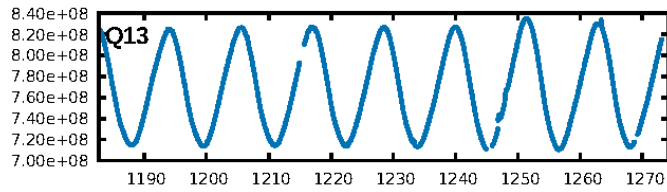
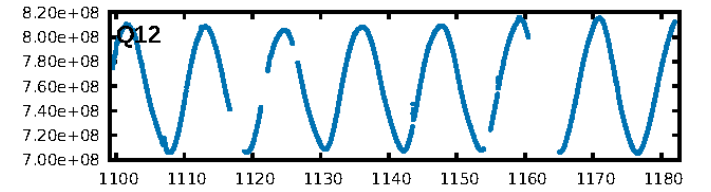
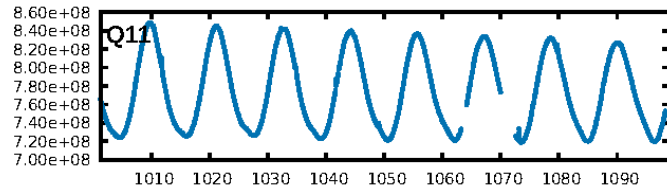
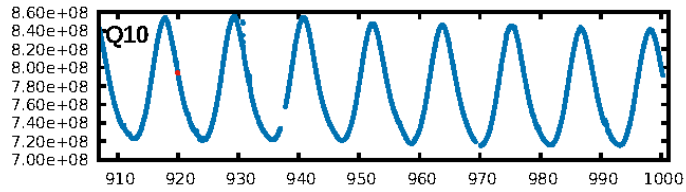
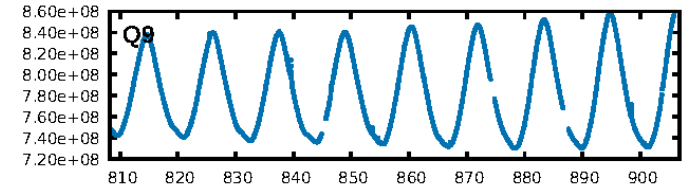
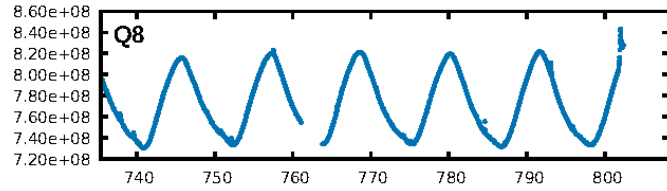
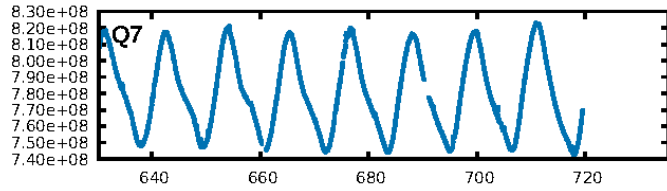
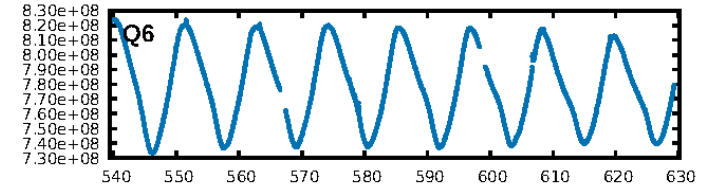
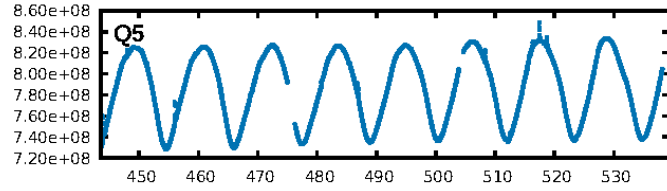
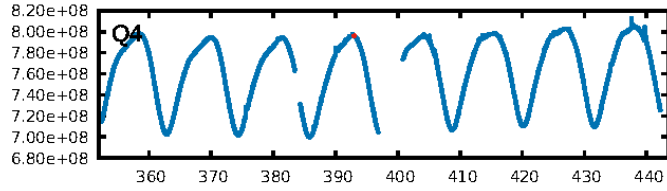
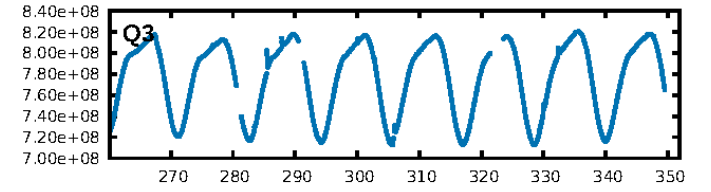
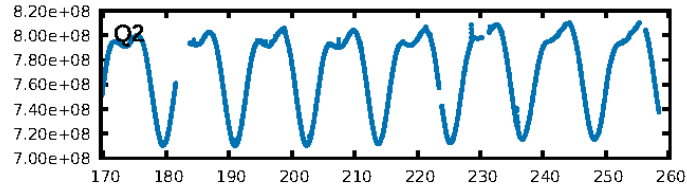
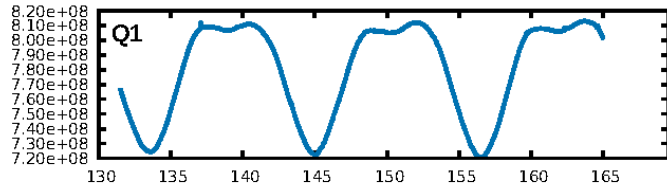
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.23σ]  
LongPeriod-sig: 100.0% [123.79σ]  
ModelChiSquare2-sig: 65.6%  
ModelChiSquareGof-sig: 93.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -31.77  
Centroid-sig: 86.2%  
Centroid-so: 4.875 arcsec [0.24σ]  
OotOffset-rm: 3.261 arcsec [4.25σ]  
KicOffset-rm: 3.642 arcsec [3.96σ]  
OotOffset-st: 1/0/1/0 [2]  
KicOffset-st: 1/0/1/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

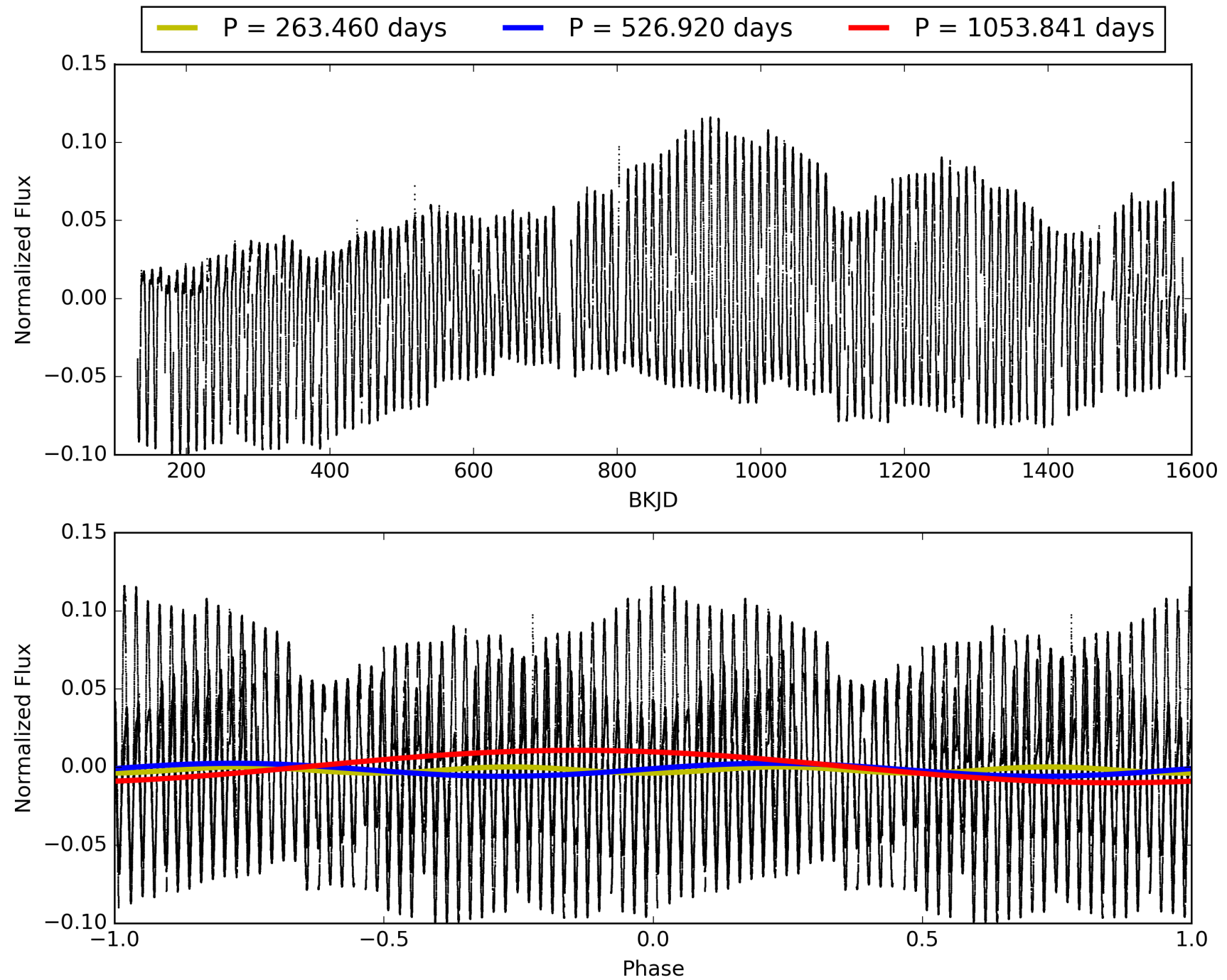
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:20:40 Z

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

# TCE 007899428-04, PDC Light Curves



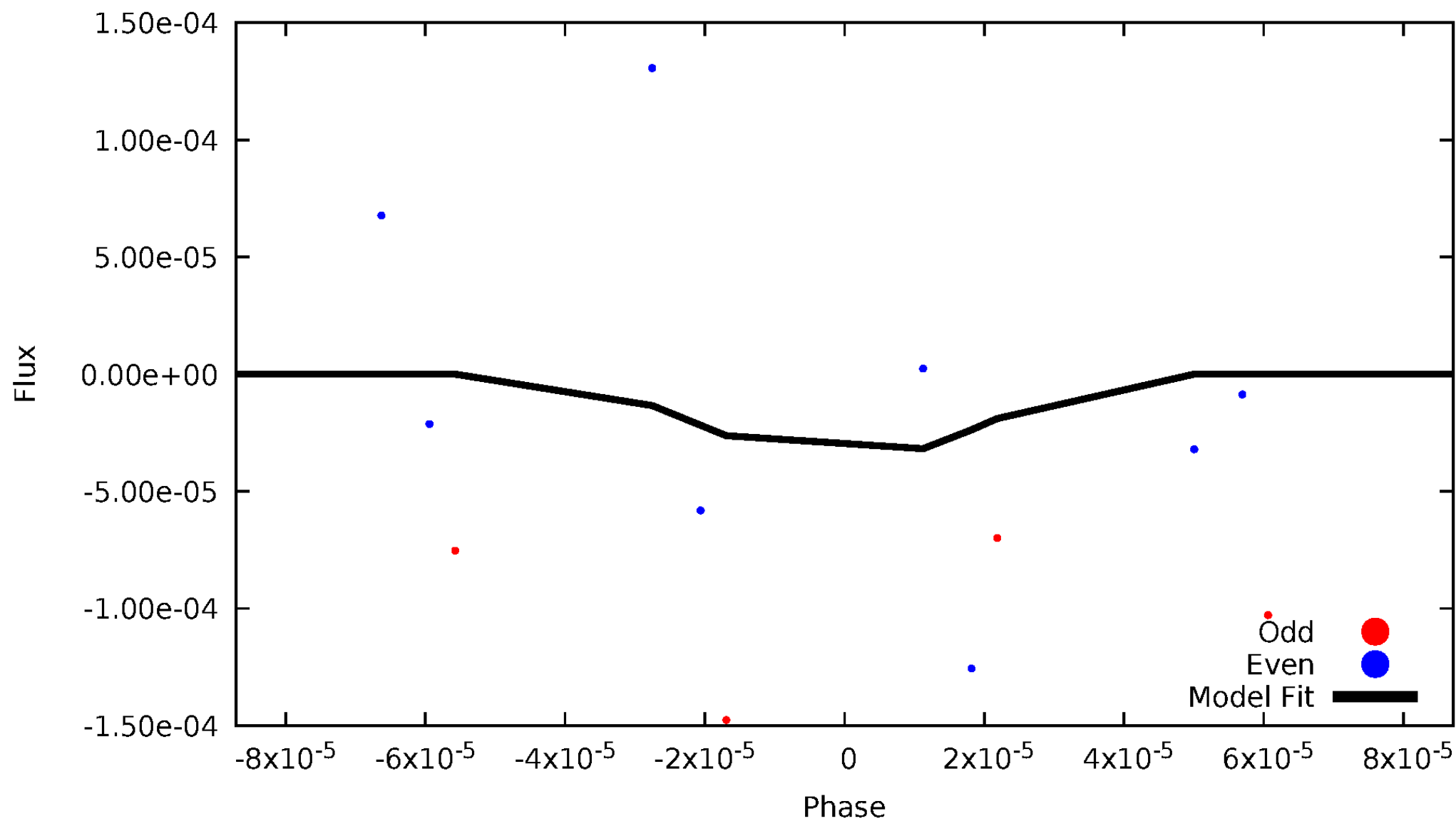
# TCE 007899428-04





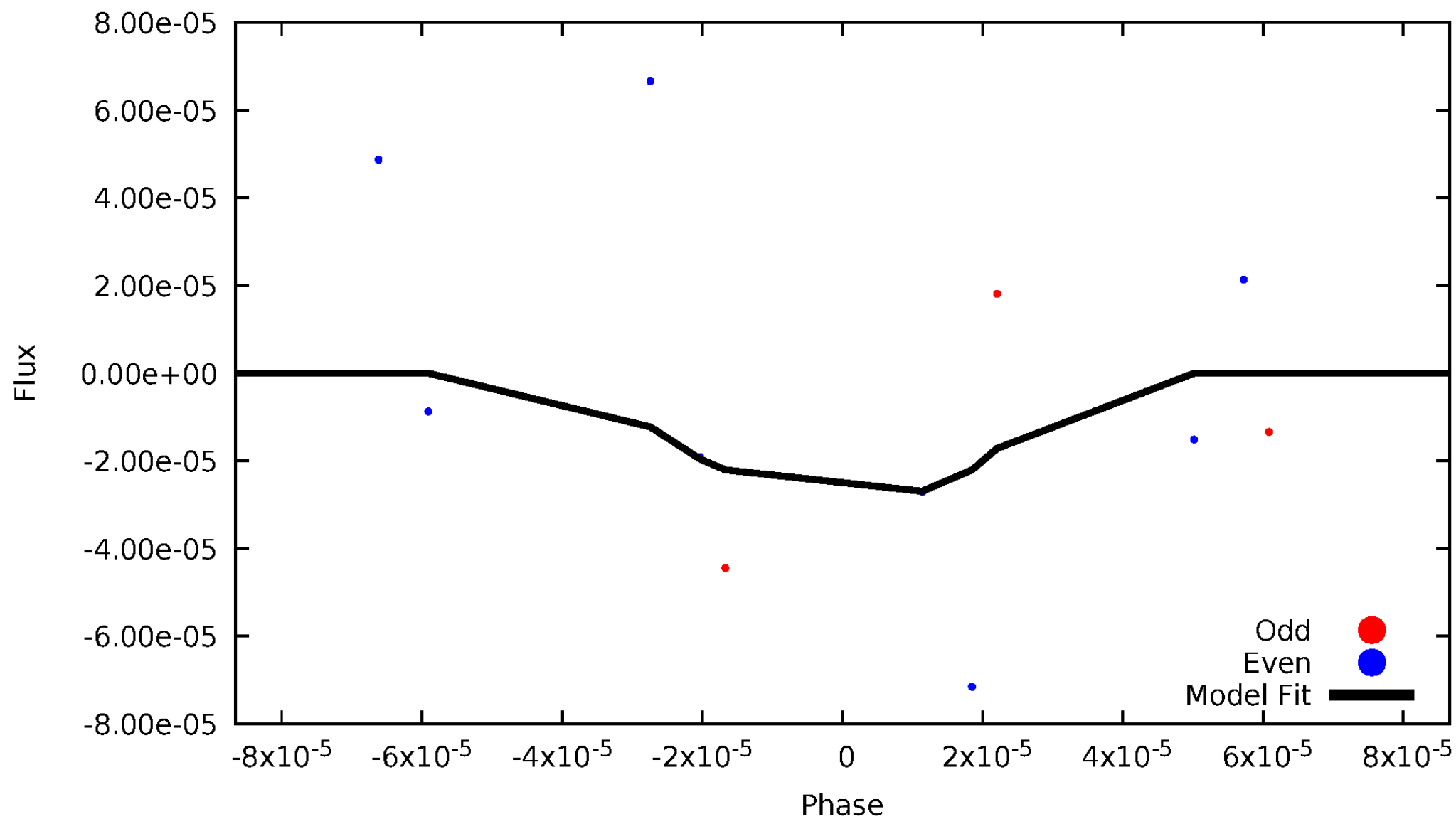
# DV Odd/Even

TCE 007899428-04



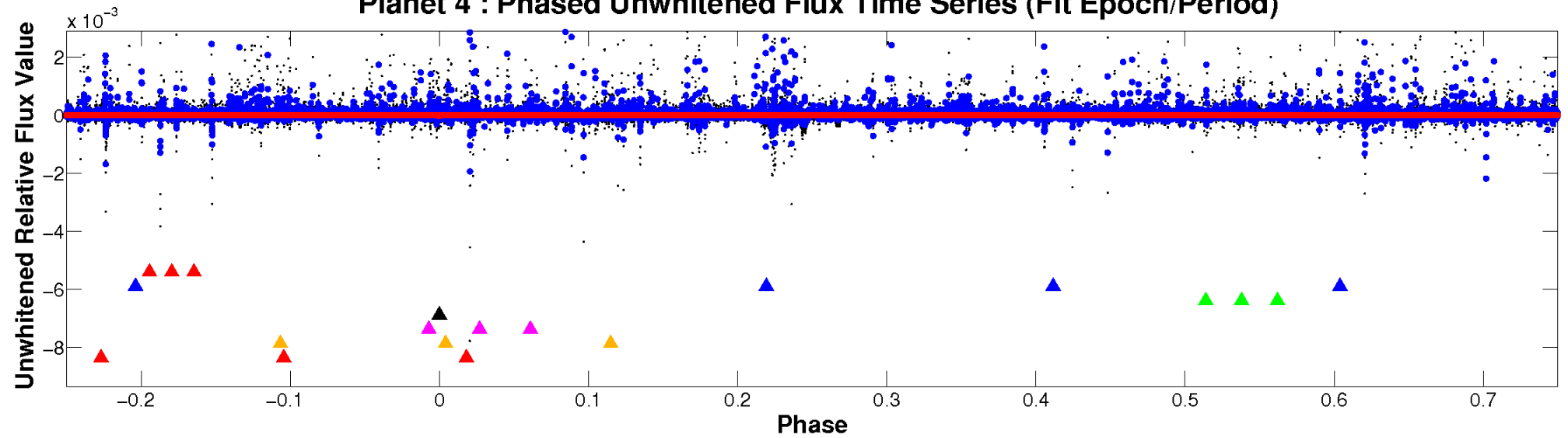
# ALT Odd/Even

TCE 007899428-04

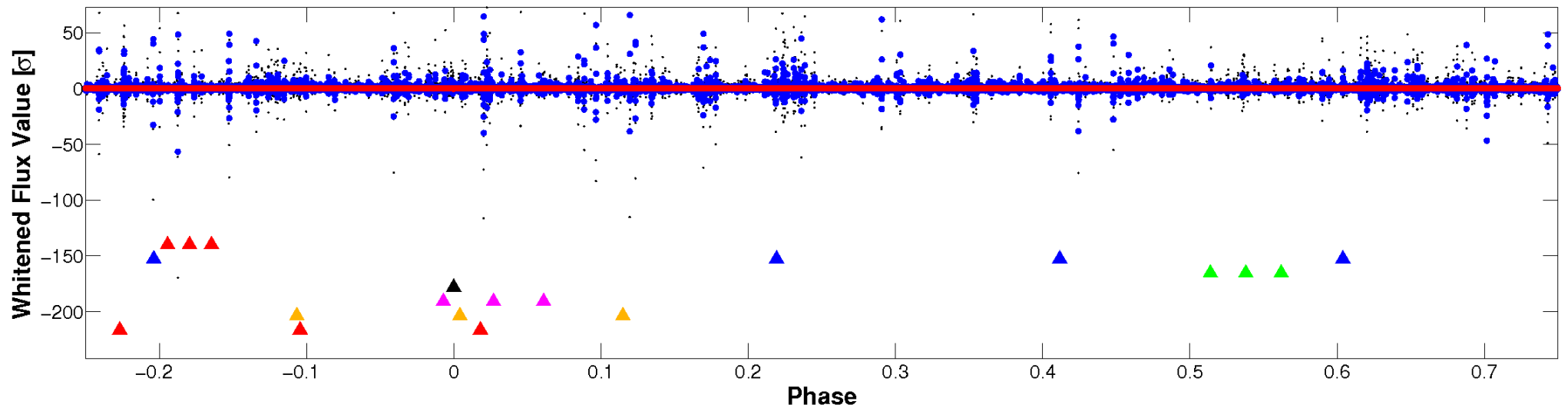


# Non-Whitened Vs. Whitened Light Curve

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

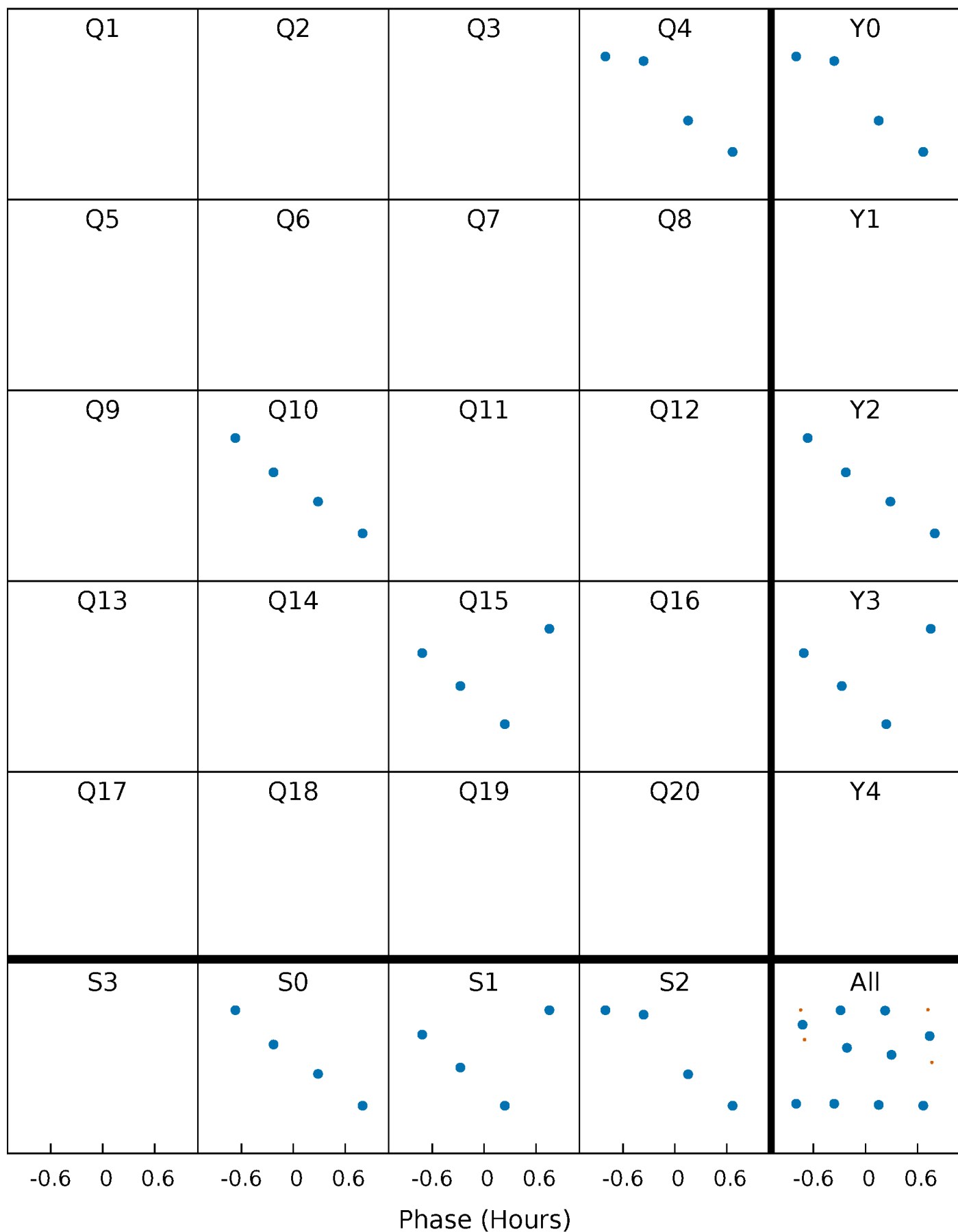


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



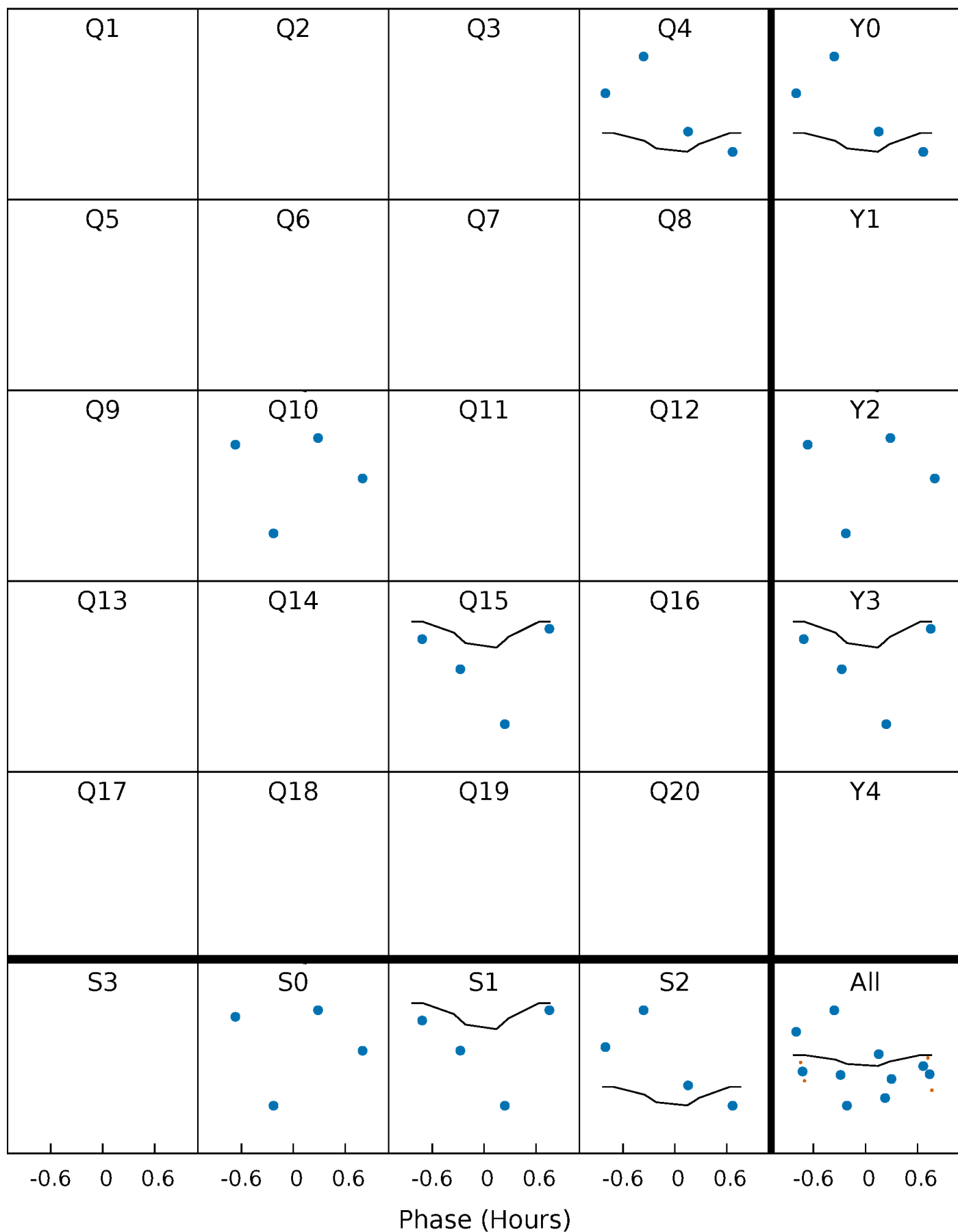
# PDC Quarter-Phased Transit Curves

TCE 007899428-04 P=526.920264 Days  $T_0=393.012445$  (BKJD)



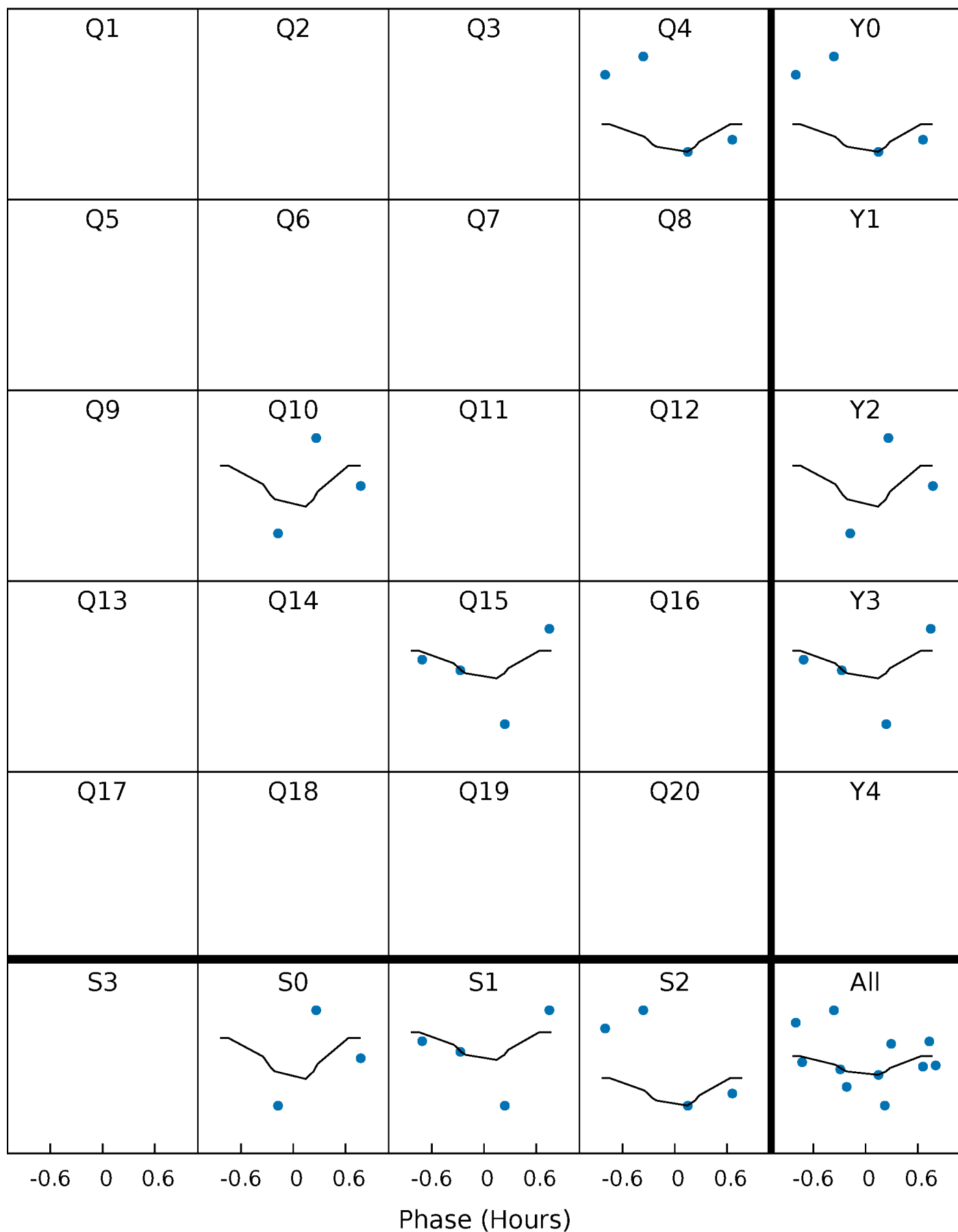
# DV Quarter-Phased Transit Curves

TCE 007899428-04 P=526.920264 Days  $T_0=393.012445$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

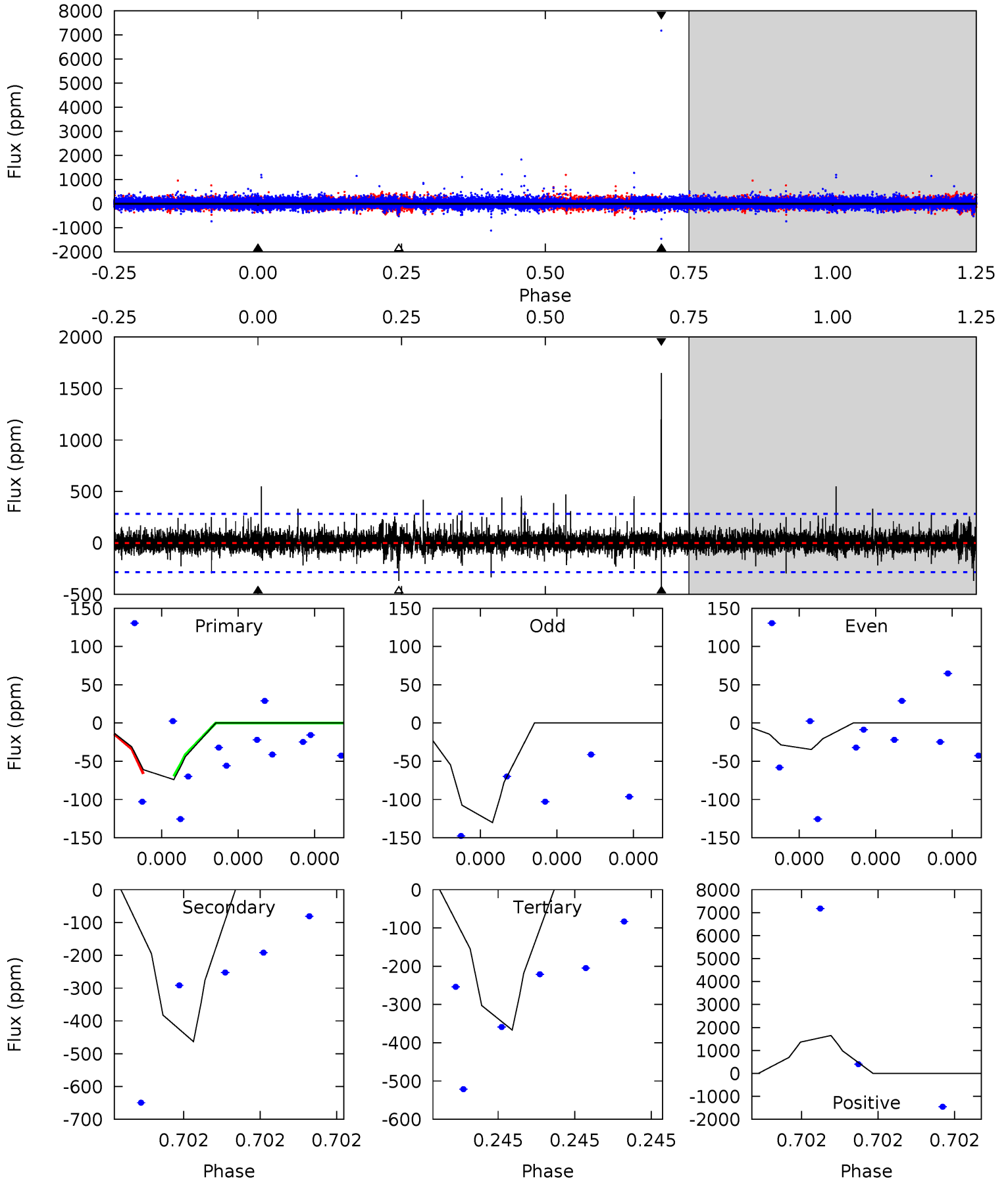
TCE 007899428-04 P=526.920212 Days  $T_0=393.012386$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-04, P = 526.920264 Days, E = 393.012445 Days

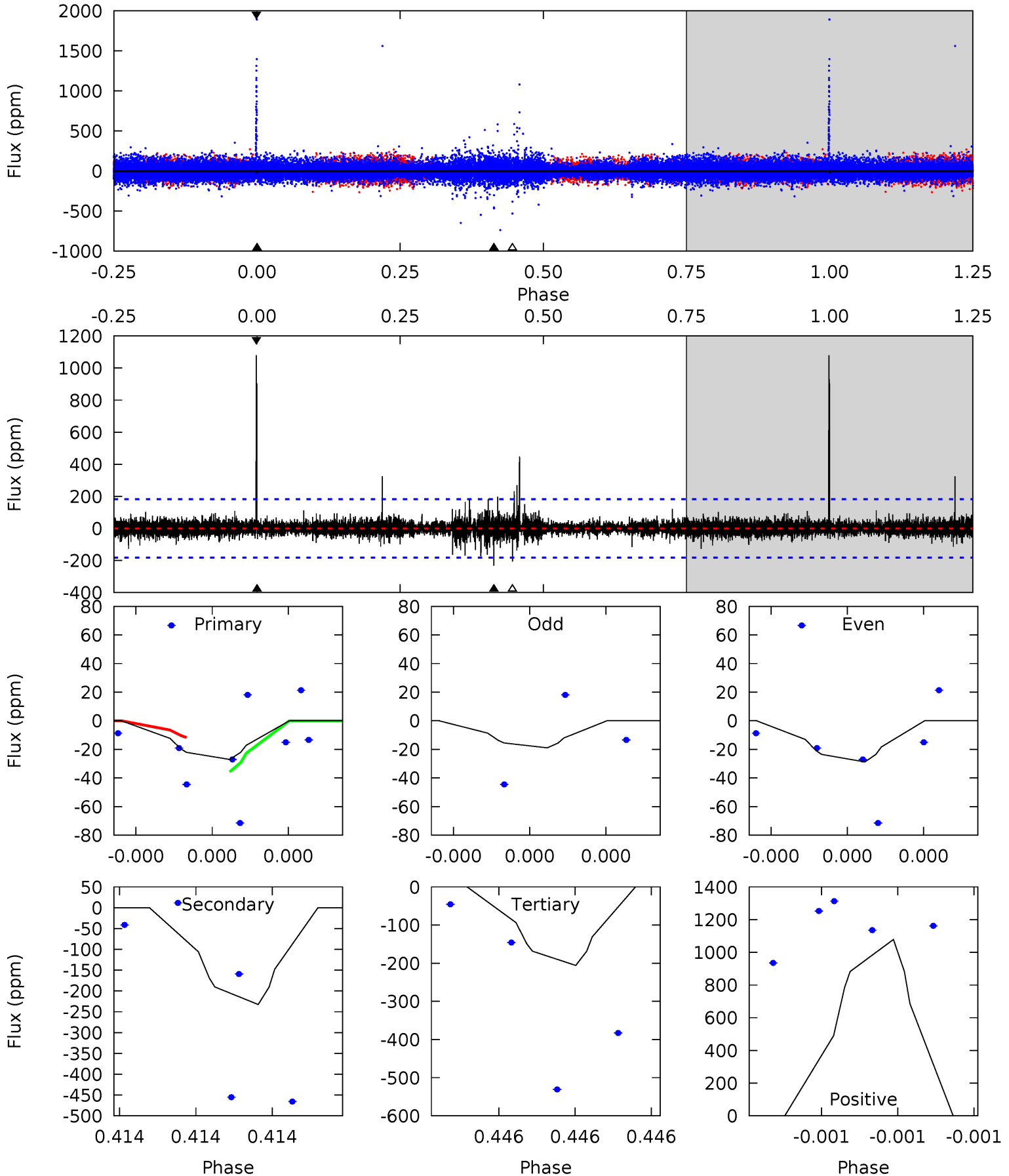
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.54	9.67	7.65	34.4	5.90	3.97	1.01	-6.11	-32.9	2.02	-24.8	0.56	0.61	0.78	0.03



# Alt Model-Shift Uniqueness Test

007899428-04, P = 526.920212 Days, E = 393.012386 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.89	7.62	6.75	35.3	5.96	4.06	0.99	-5.86	-34.5	0.88	-27.7	0.09	1.16	0.82	0.40





### Stellar Parameters For KIC 007899428

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-463 \pm 48$	$94.11^{+99.06}_{-64.75}$	$244^{+10}_{-11}$	$1706^{+424}_{-198}$	$37^{+357}_{-28}$
Alt.	$-233 \pm 31$	$94.65^{+96.48}_{-68.97}$	$244^{+10}_{-10}$	$1607^{+459}_{-191}$	$19^{+244}_{-14}$

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

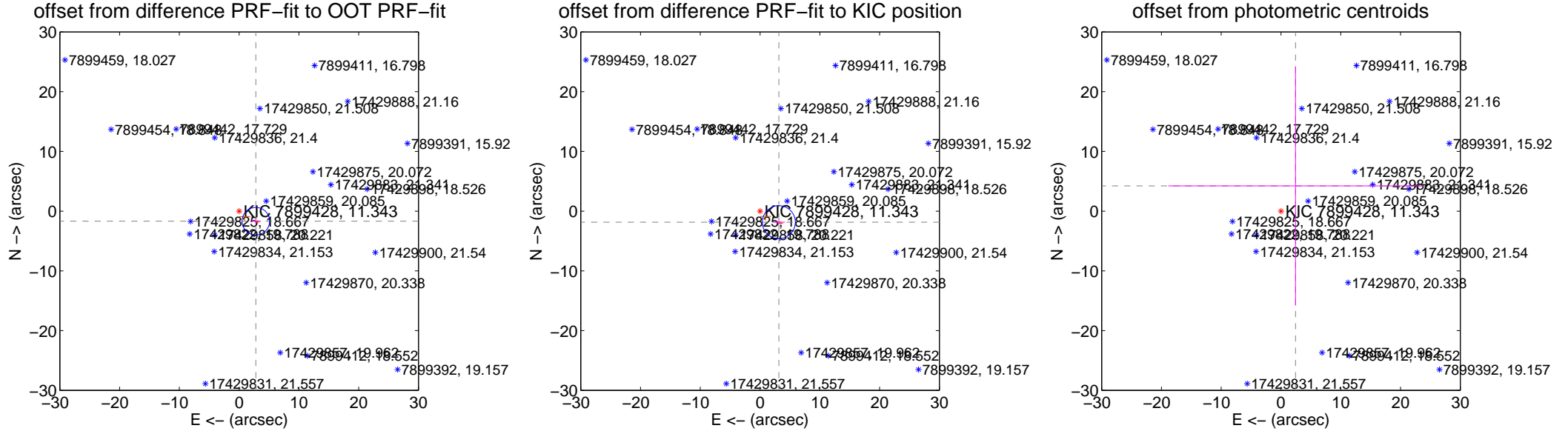
## DV Centroid Data

Supplemental centroid analysis for 007899428-04. **Kepler magnitude: 11.34.** Transit SNR 0.44

**There are 0 quarters with good PRF difference image offsets**

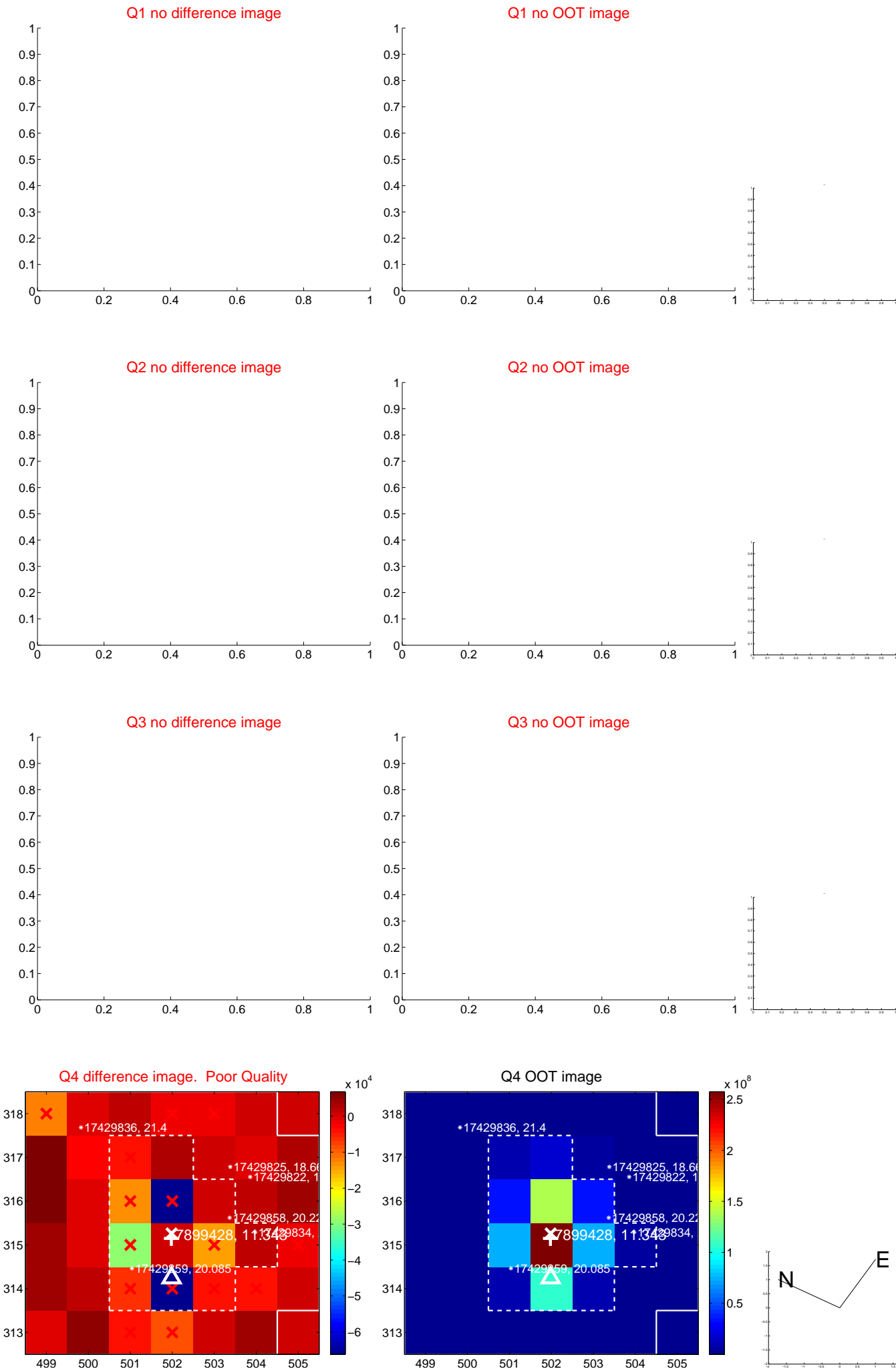
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>3.261 <math>\pm</math> 0.767</b>	<b>4.25</b>	-2.795 $\pm$ 0.863	-1.680 $\pm$ 0.398
PRF-fit source offset from KIC position	<b>3.642 <math>\pm</math> 0.920</b>	<b>3.96</b>	-3.138 $\pm$ 1.027	-1.847 $\pm$ 0.500
photometric centroid source offset	4.88 $\pm$ 20.35	0.24	-2.44 $\pm$ 21.29	4.22 $\pm$ 20.03



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.

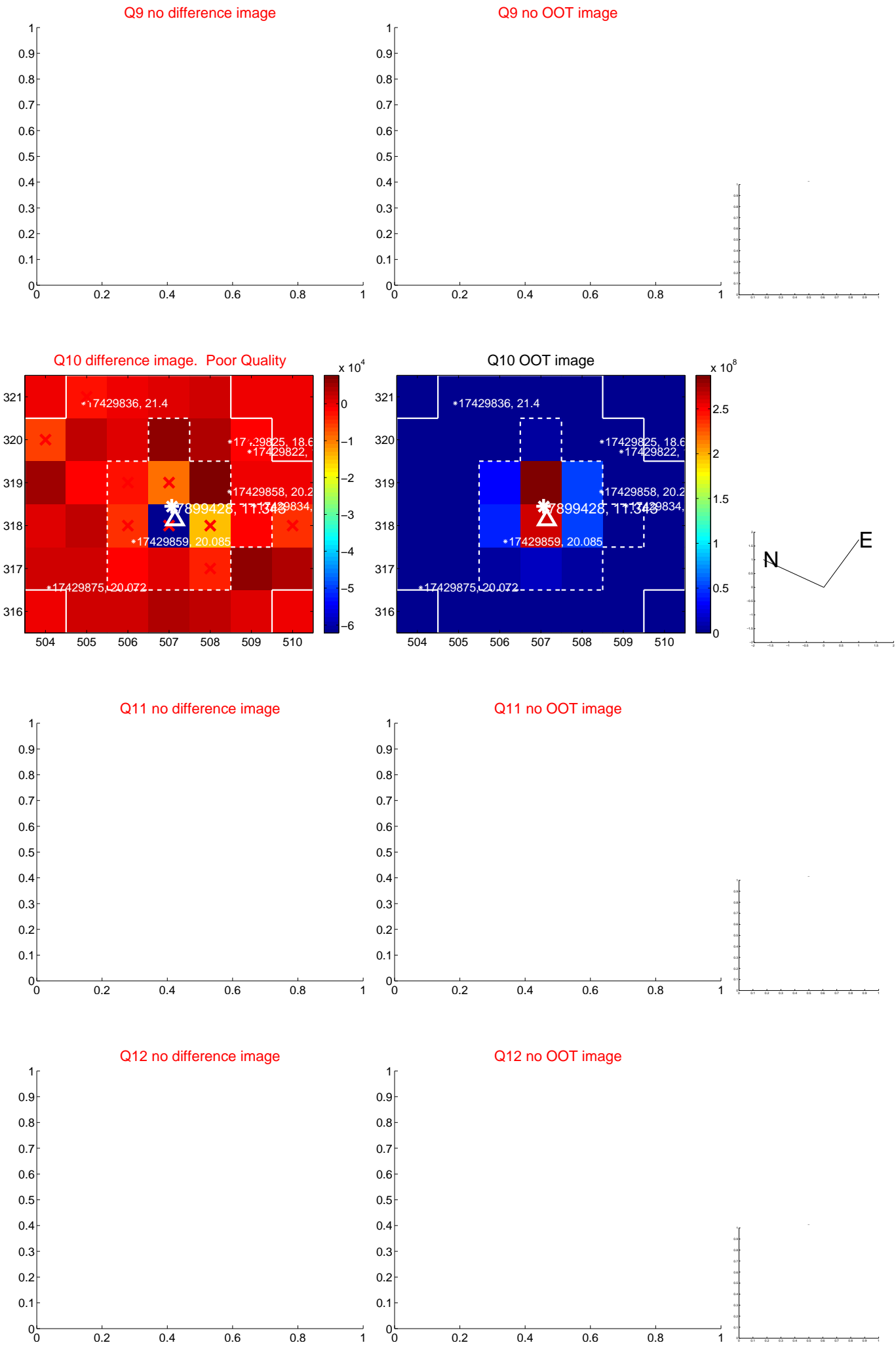
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

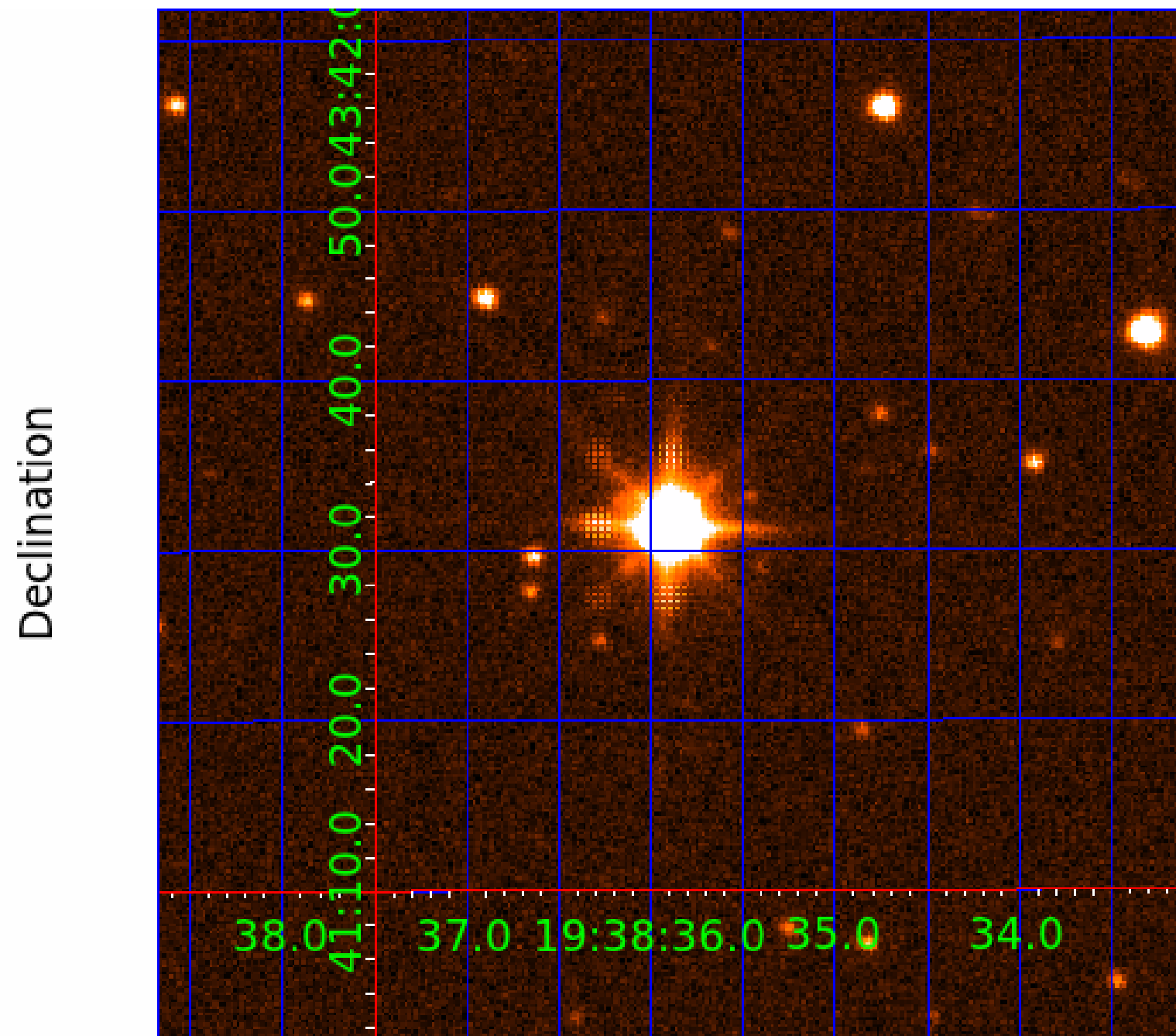


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



;

UKIRT Image





# KIC 007899428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007899428-01	OBS	No	519.065250	306.318800	496.5	9.788	32.8	4.5	0.75	4914	1.67	0.23
007899428-02	OBS	No	425.576042	285.658159	975.6	2.843	40.6	11.5	0.75	4914	2.56	0.29
007899428-03	OBS	No	514.251769	162.234990	772.1	4.383	24.5	9.8	0.75	4914	4.31	0.23
007899428-04	OBS	No	526.920264	393.012445	31.8	0.551	23.9	0.4	0.75	4914	0.50	0.22
007899428-05	OBS	No	508.979840	425.187816	544.1	16.483	21.8	4.3	0.75	4914	1.82	0.23
007899428-06	OBS	No	468.572194	453.561311	235.4	1.303	24.9	2.5	0.75	4914	1.69	0.26
007899428-07	OBS	No	591.456205	273.496991	125.0	12.500	18.0	-1.0	0.75	4914	0.81	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

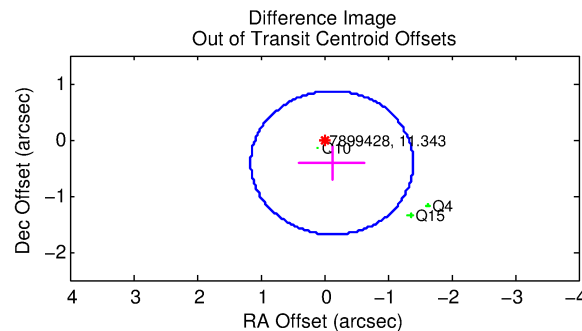
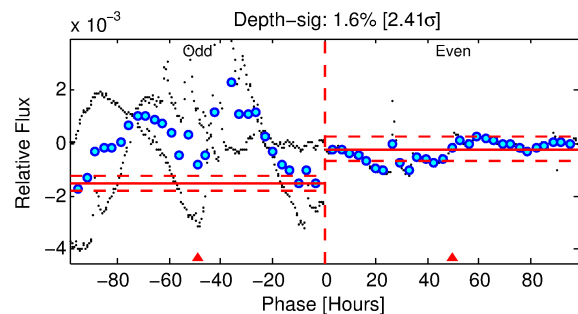
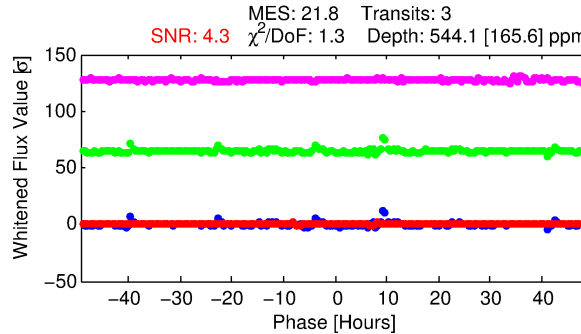
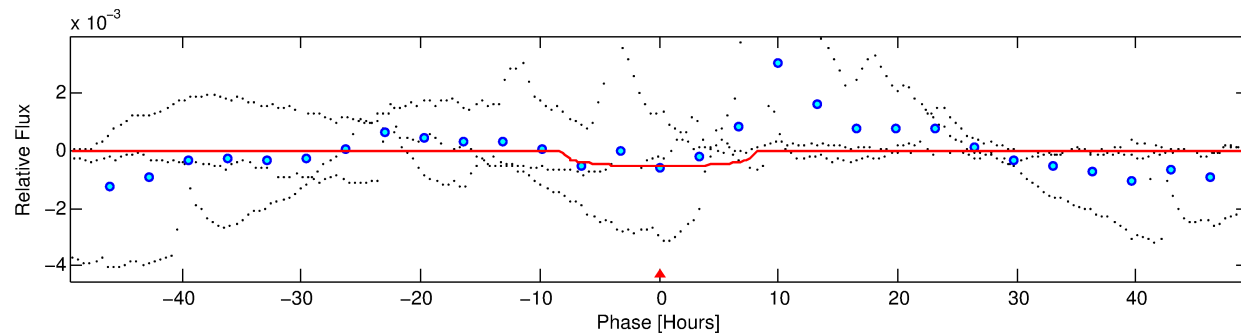
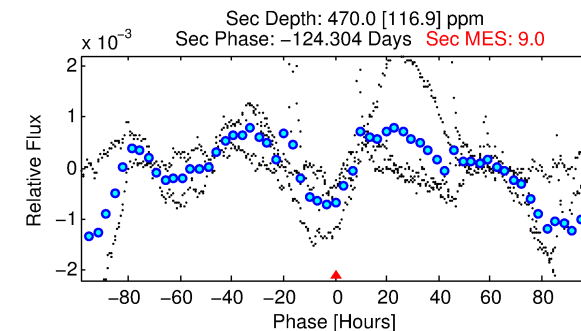
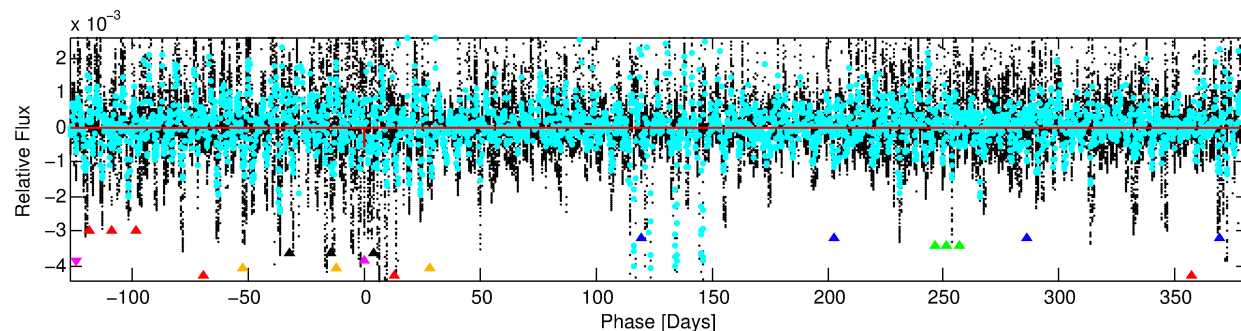
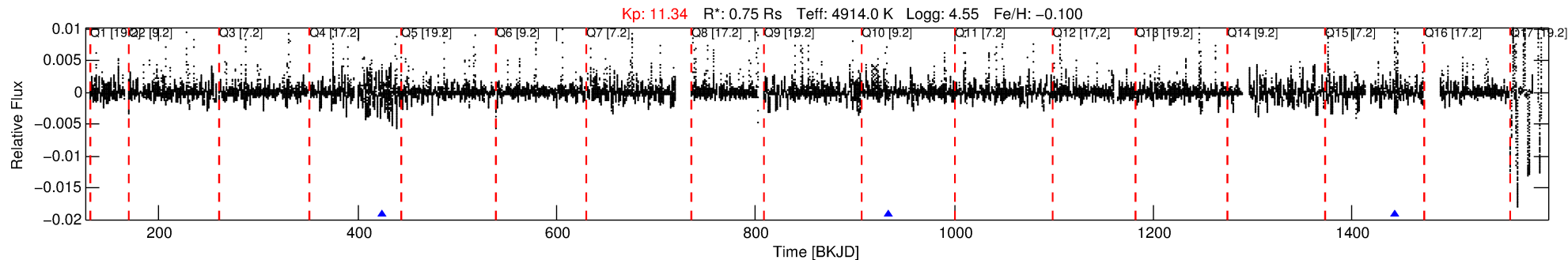
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-05

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 5 of 7 Period: 508.980 d



## DV Fit Results:

Period = 508.97984 [0.00709] d  
Epoch = 425.1878 [0.0097] BKJD  
Rp/R\* = 0.0223 [0.0056]  
a/R\* = 187.72 [110.28]  
b = 0.64 [0.54]  
Seff = 0.23 [0.04]  
Teq = 177 [8] K  
Rp = 1.82 [0.49] Re  
a = 1.1230 [0.0959] AU  
Ag = 98531.47 [56373.73] [1.75σ]  
Teffp = 4843 [699] K [6.68σ]

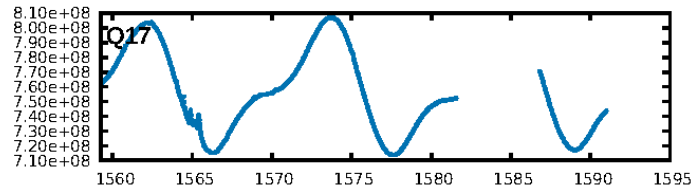
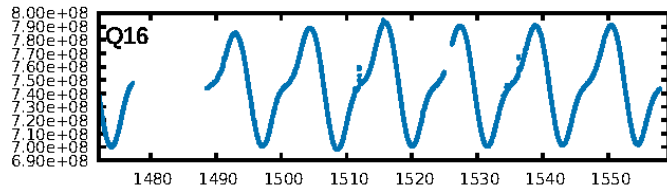
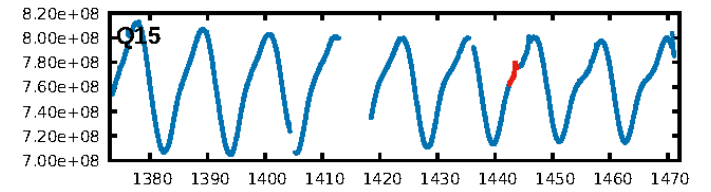
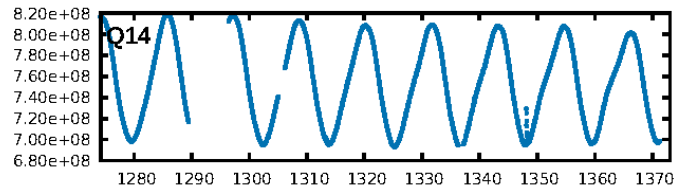
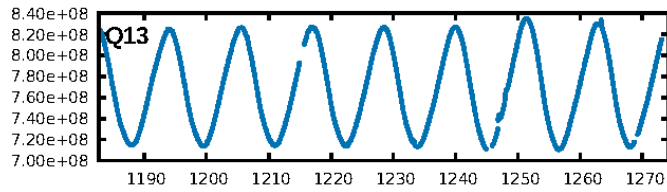
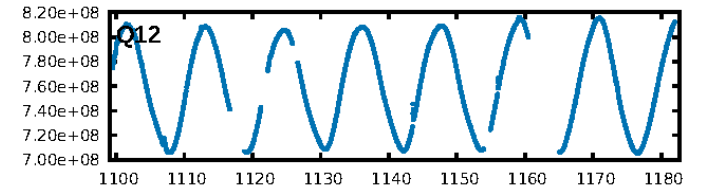
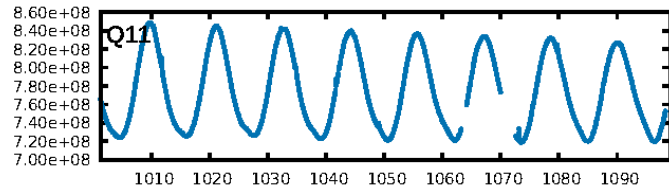
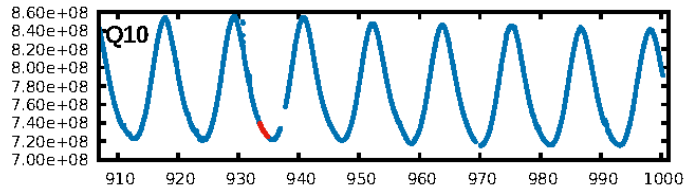
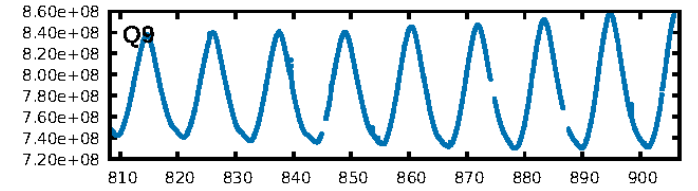
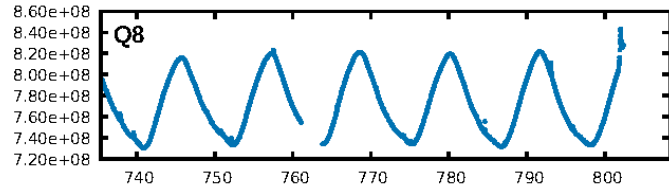
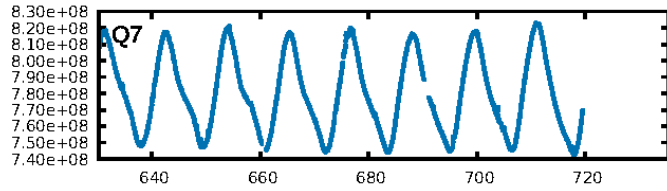
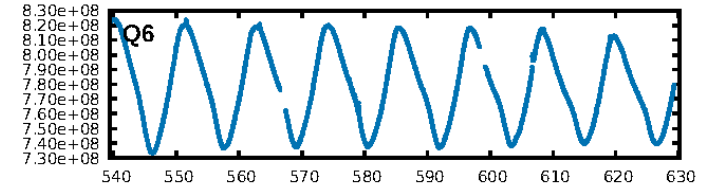
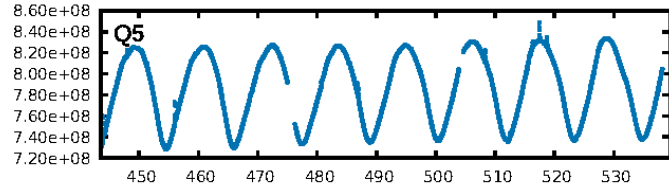
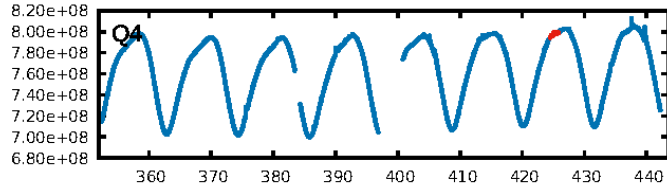
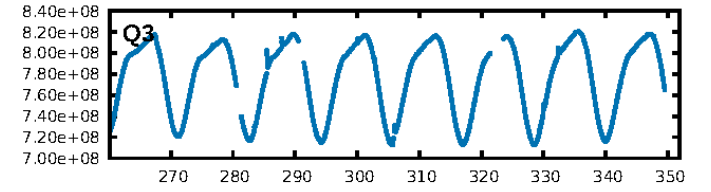
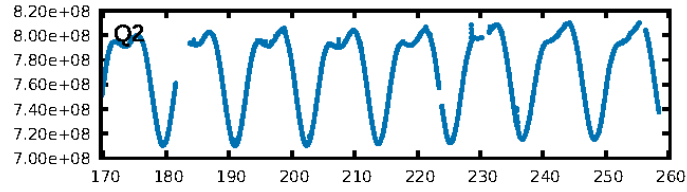
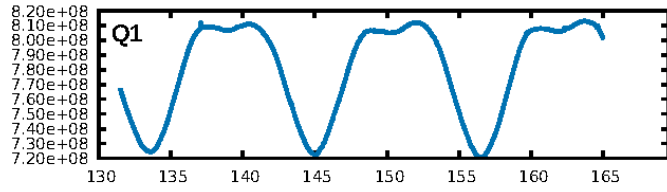
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [58.65σ]  
LongPeriod-sig: 100.0% [7.42σ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 46.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.523  
Centroid-sig: 25.3%  
Centroid-so: 1.209 arcsec [0.92σ]  
OotOffset-rm: 0.431 arcsec [1.01σ]  
KicOffset-rm: 0.459 arcsec [0.87σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

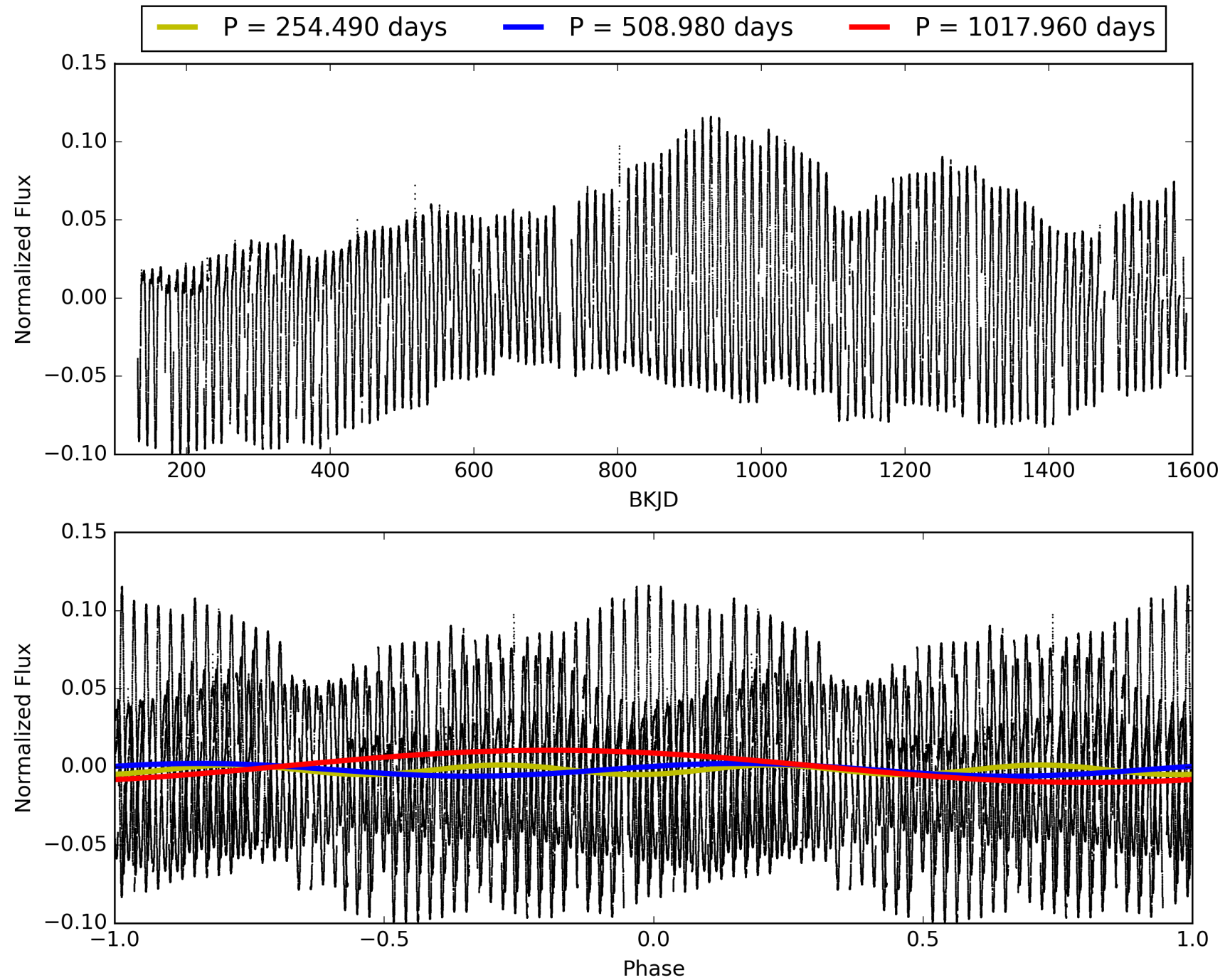
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:20:50 Z

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

# TCE 007899428-05, PDC Light Curves

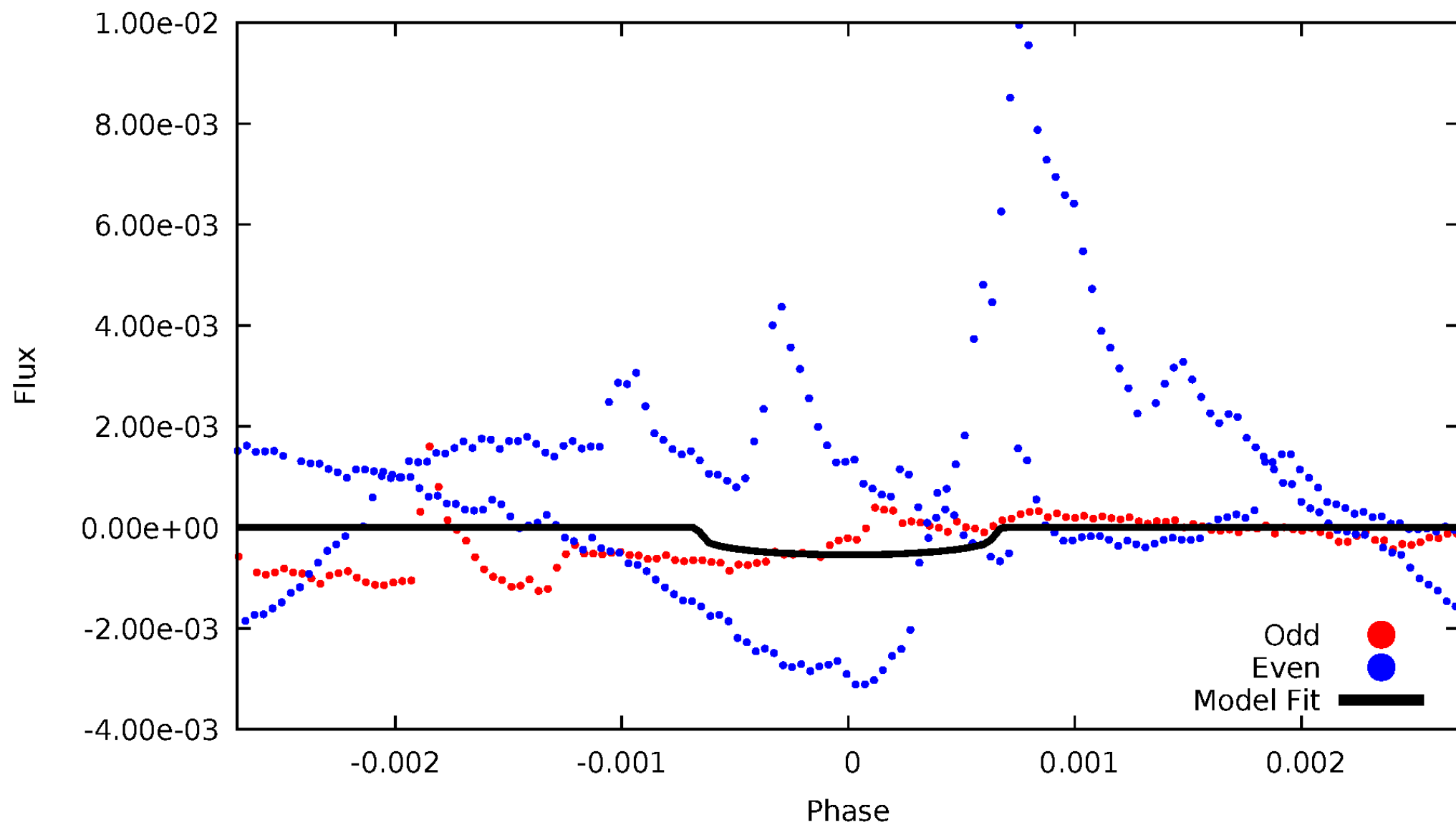


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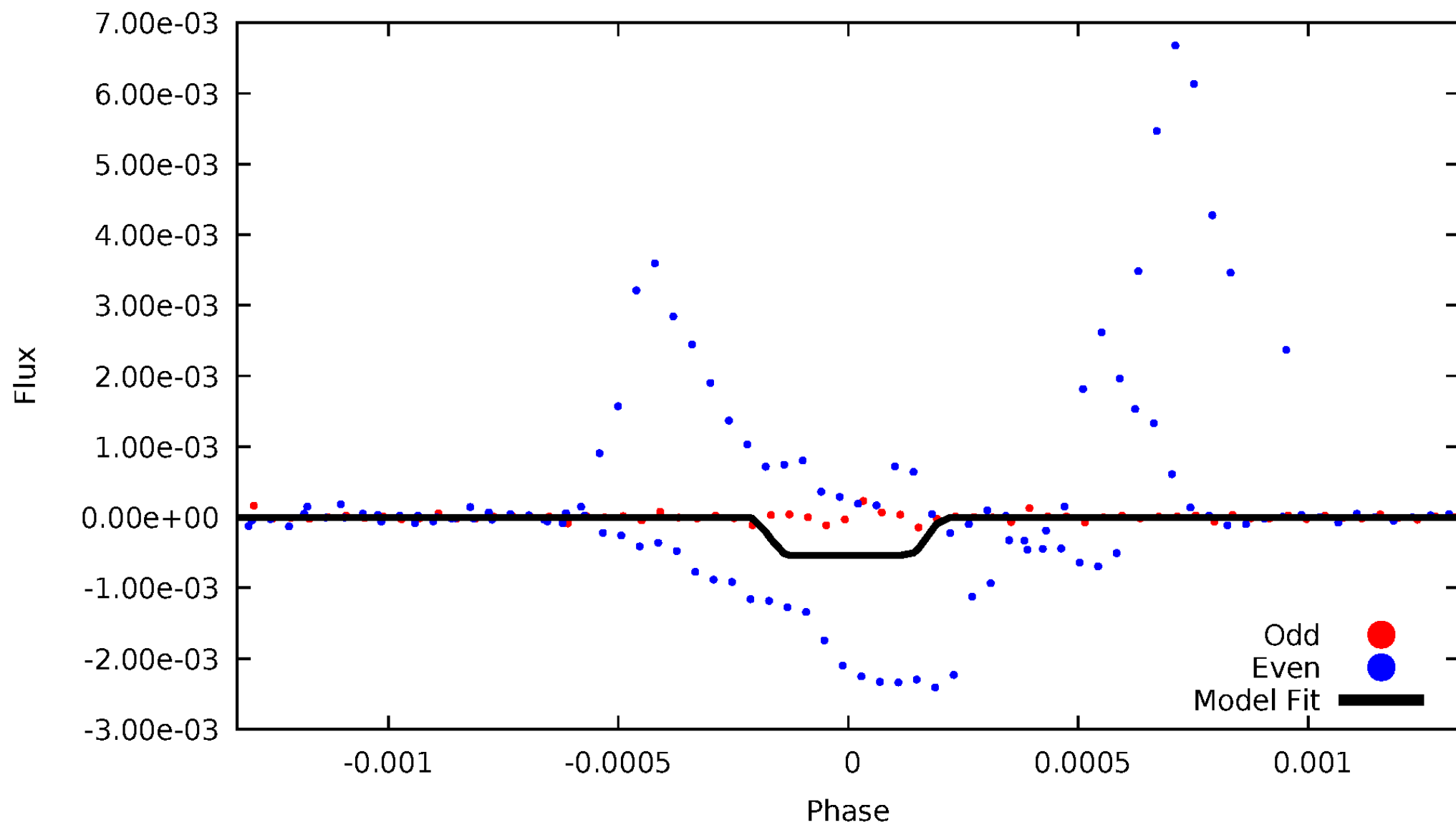
# DV Odd/Even

TCE 007899428-05



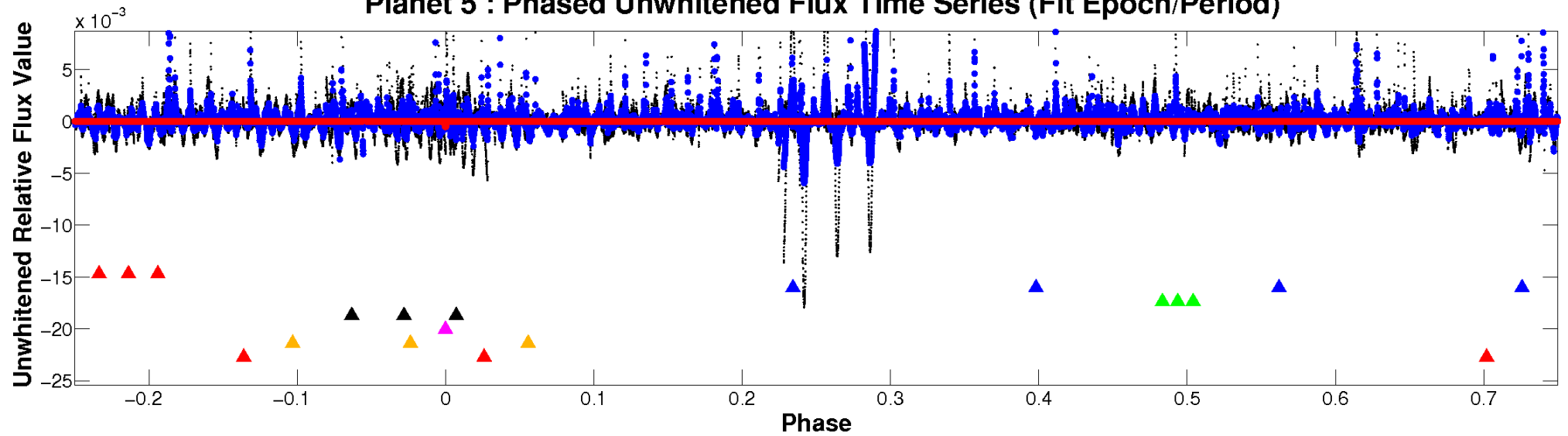
# ALT Odd/Even

TCE 007899428-05

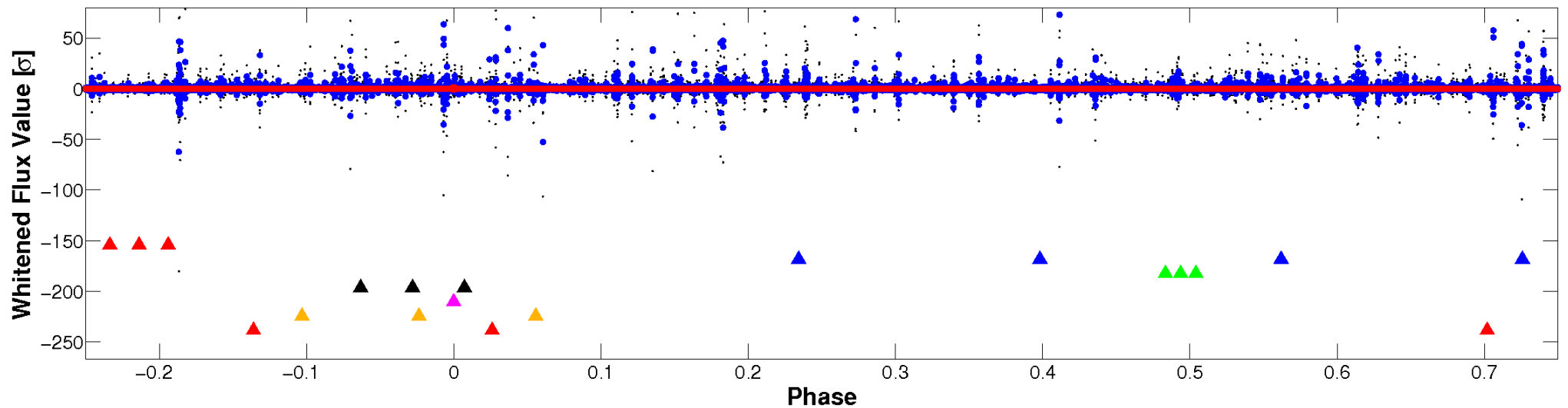


# Non-Whitened Vs. Whitened Light Curve

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

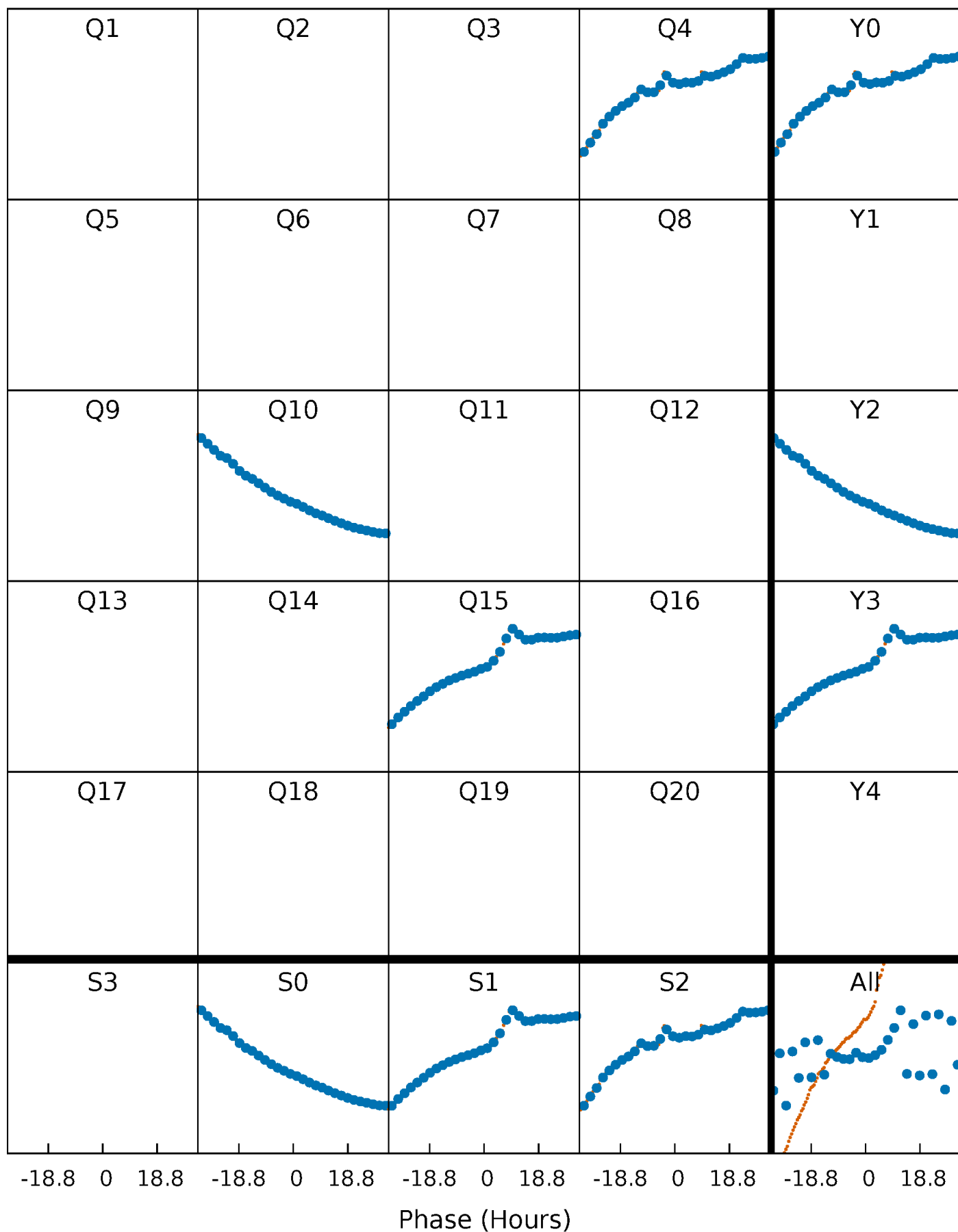


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

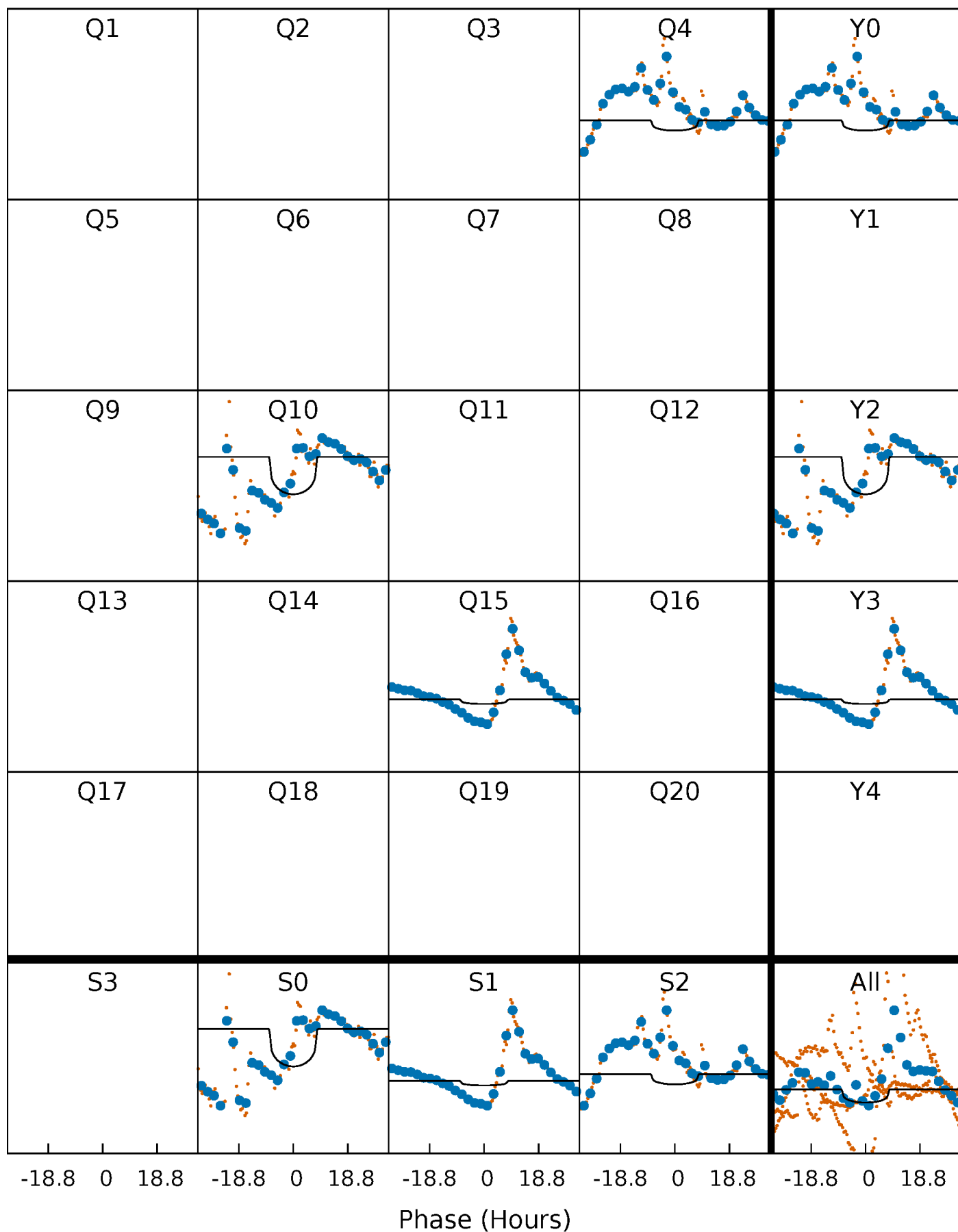
TCE 007899428-05     $P=508.979840$  Days     $T_0=425.187816$  (BKJD)





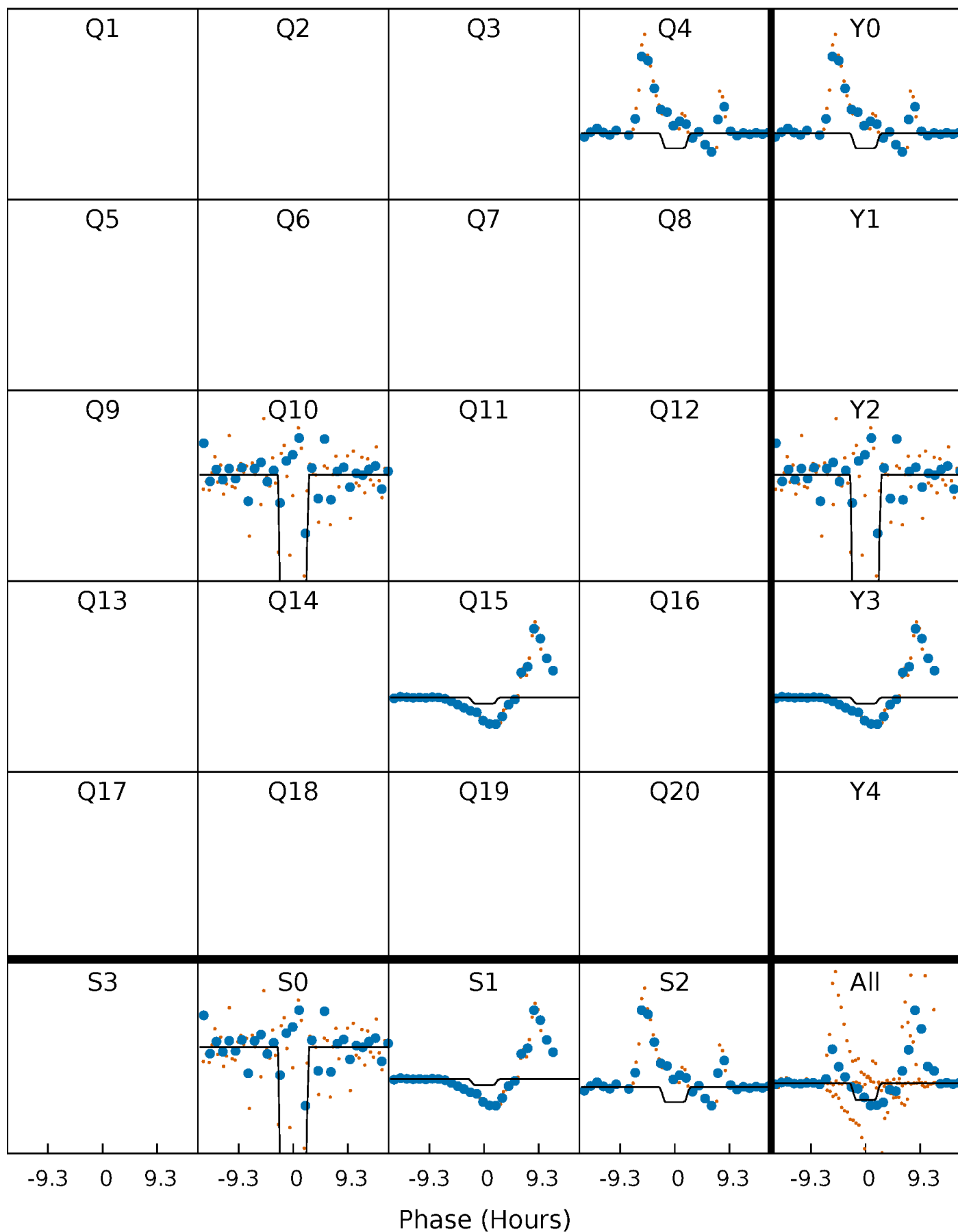
# DV Quarter-Phased Transit Curves

TCE 007899428-05     $P=508.979840$  Days     $T_0=425.187816$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

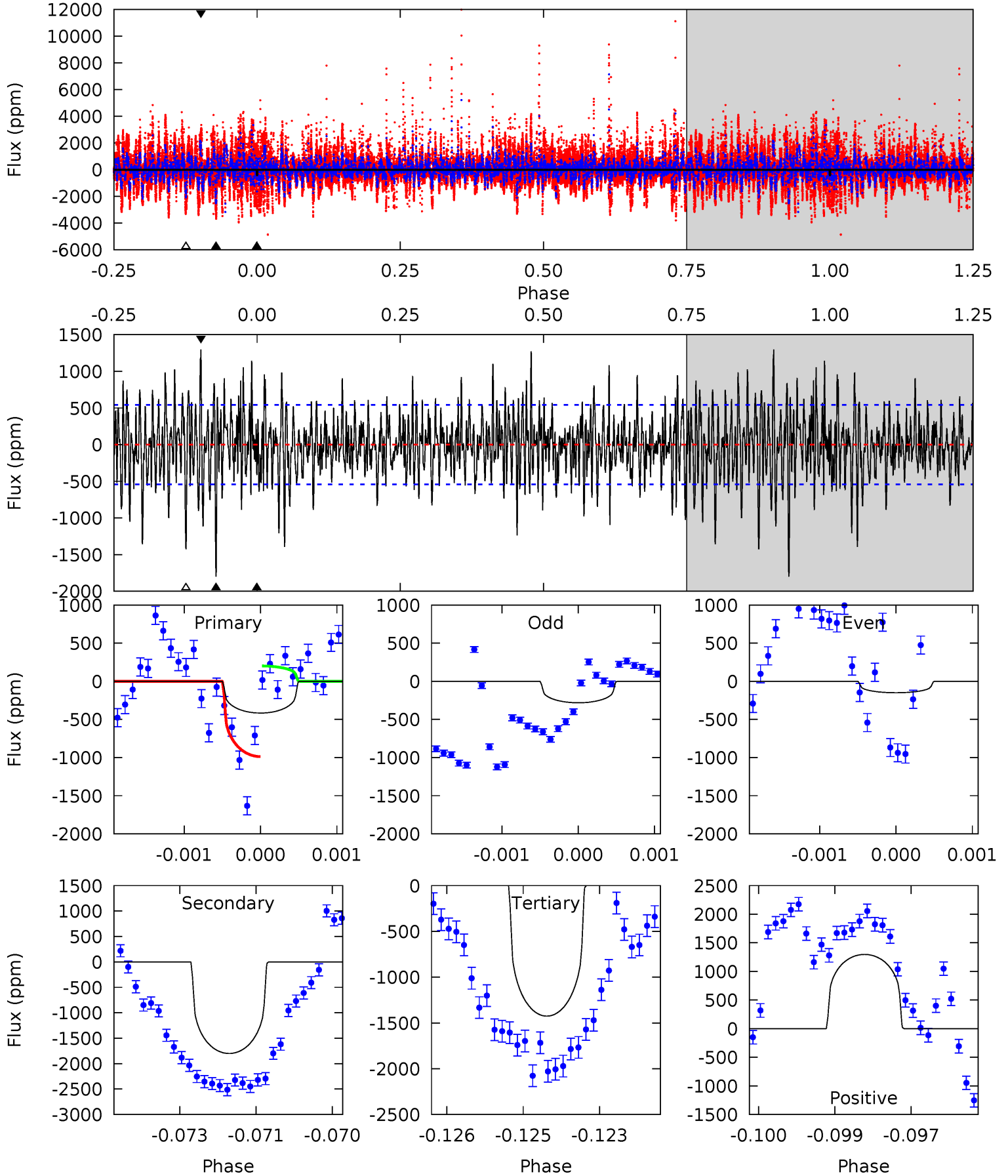
TCE 007899428-05     $P=508.959113$  Days     $T_0=425.251999$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-05, P = 508.979840 Days, E = 425.187816 Days

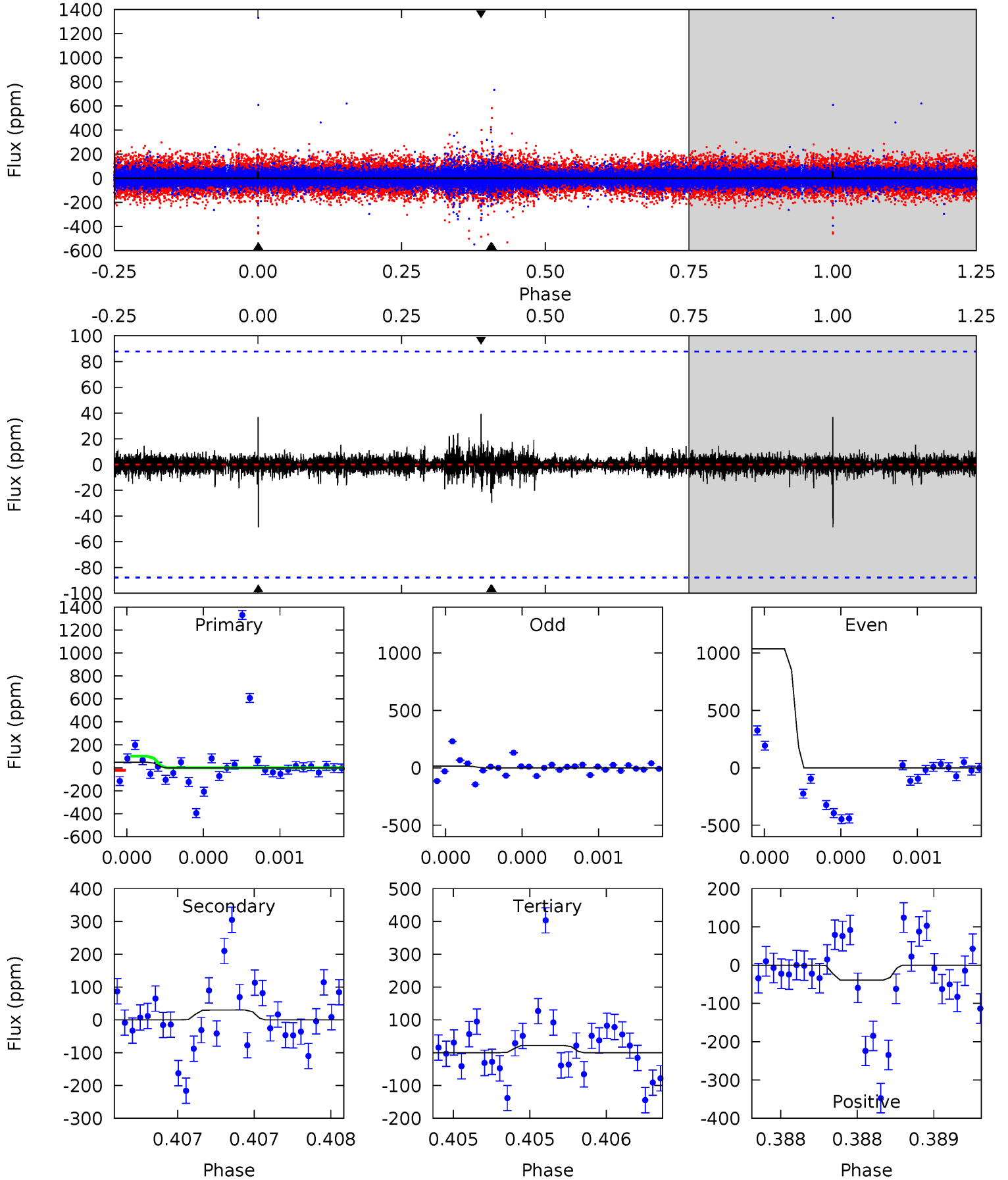
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.14	17.9	14.2	12.9	5.40	3.20	3.71	-10.0	-8.76	3.73	5.01	0.44	0.69	0.42	3.95



# Alt Model-Shift Uniqueness Test

007899428-05, P = 508.959113 Days, E = 425.251999 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
3.11	1.90	1.41	2.50	5.60	3.52	0.21	1.70	0.60	0.49	-0.60	32.9	-34.2	0.45	2.52



### Stellar Parameters For KIC 007899428

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1800 \pm 101$	$1.81^{+0.45}_{-0.43}$	$246^{+10}_{-10}$	$6653^{+1189}_{-759}$	$384519^{+292910}_{-139650}$
Alt.	$-30 \pm 16$	$1.91^{+0.46}_{-0.48}$	$246^{+11}_{-10}$	$2957^{+358}_{-342}$	$5356^{+6324}_{-3175}$

$T_{\text{max}}$  = 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

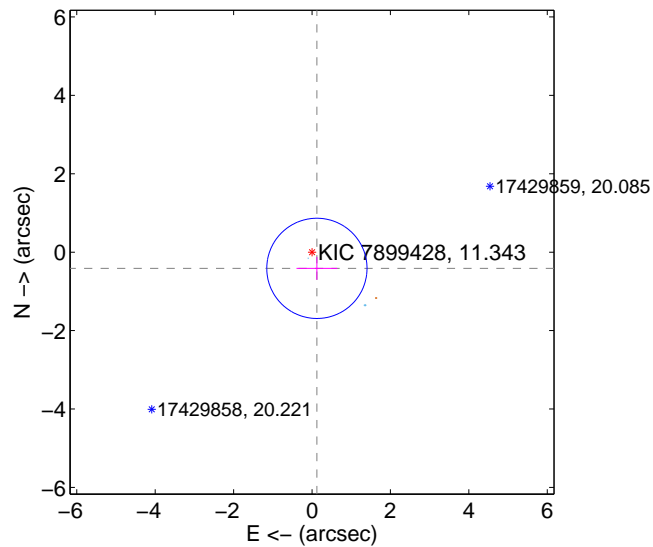
Supplemental centroid analysis for 007899428-05. **Kepler magnitude: 11.34.** Transit SNR 4.34

**There are 2 quarters with good PRF difference image offsets**

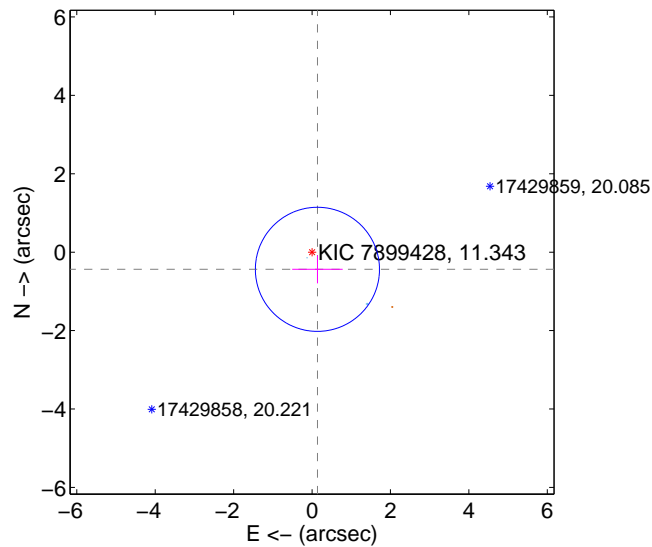
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.431 \pm 0.426$	1.01	$-0.125 \pm 0.520$	$-0.413 \pm 0.293$
PRF-fit source offset from KIC position	$0.459 \pm 0.528$	0.87	$-0.137 \pm 0.645$	$-0.438 \pm 0.357$
photometric centroid source offset	$1.21 \pm 1.31$	0.92	$0.43 \pm 1.54$	$-1.13 \pm 1.28$

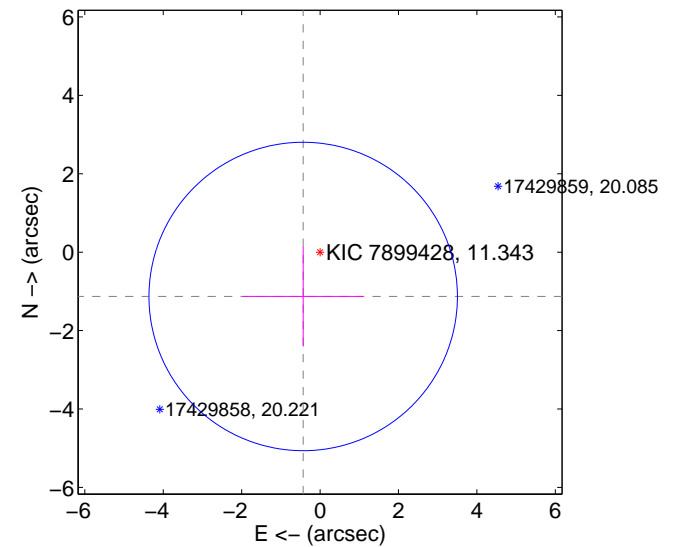
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

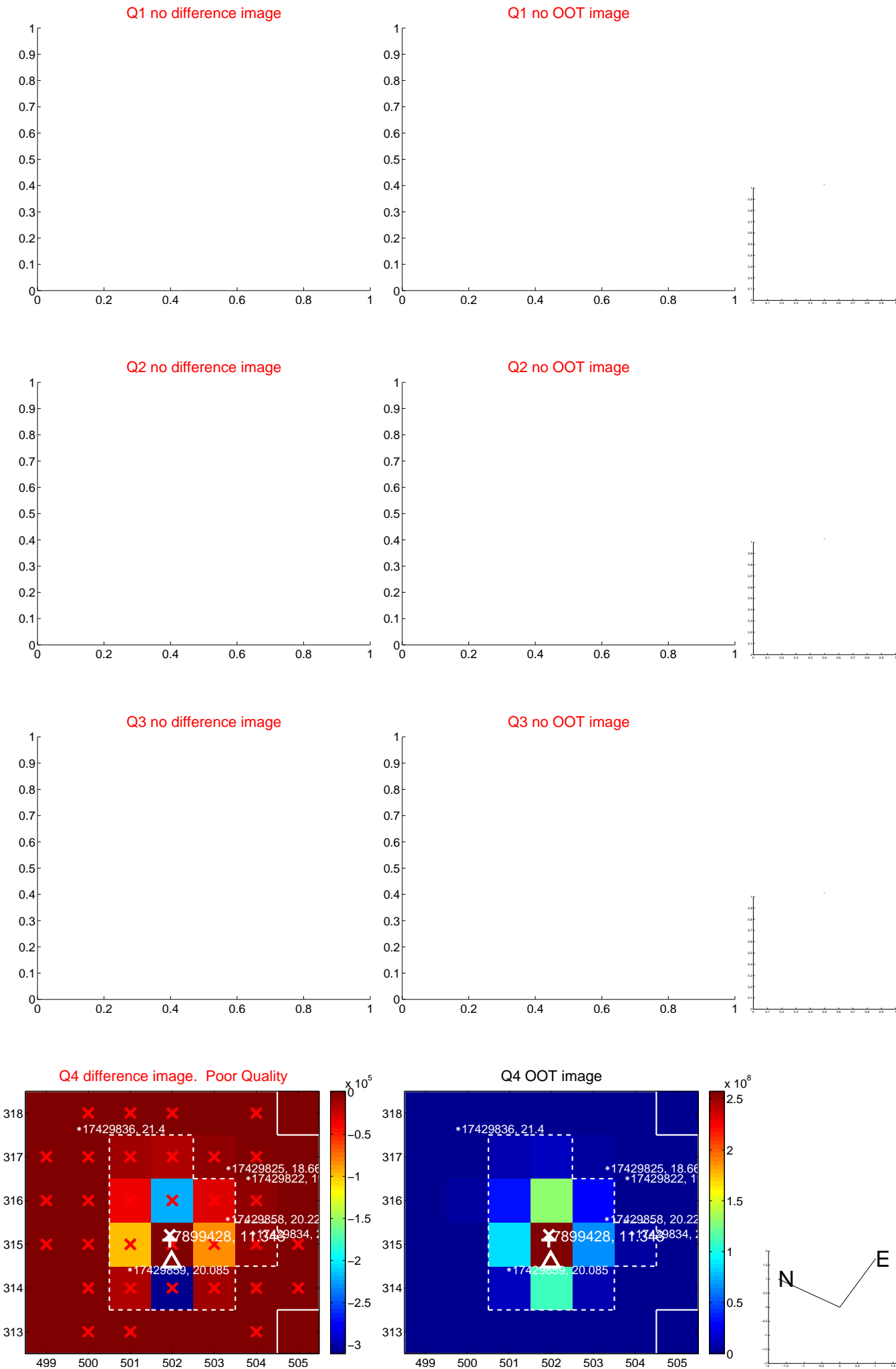


offset from photometric centroids



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.

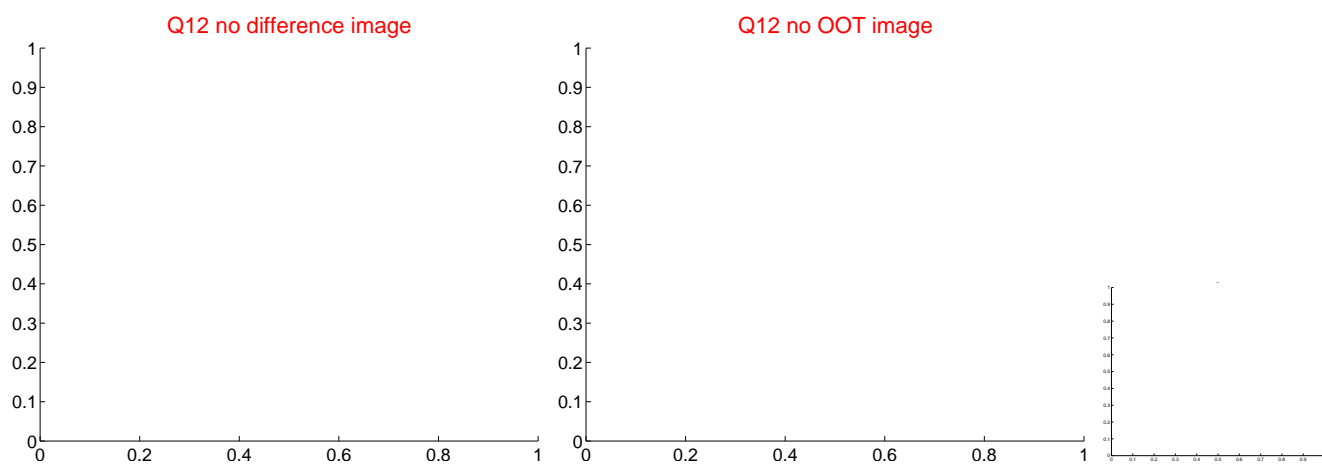
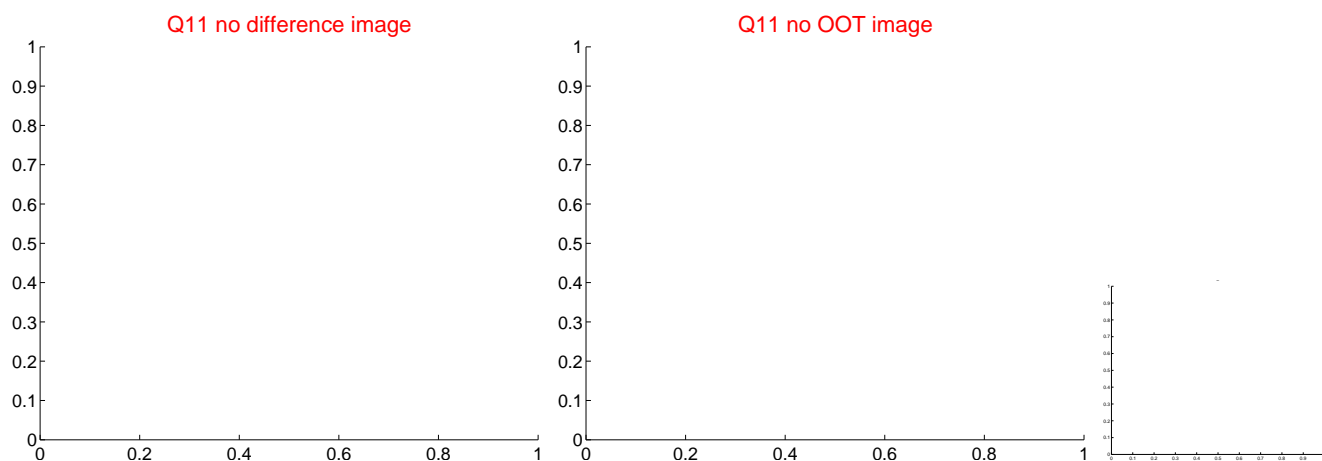
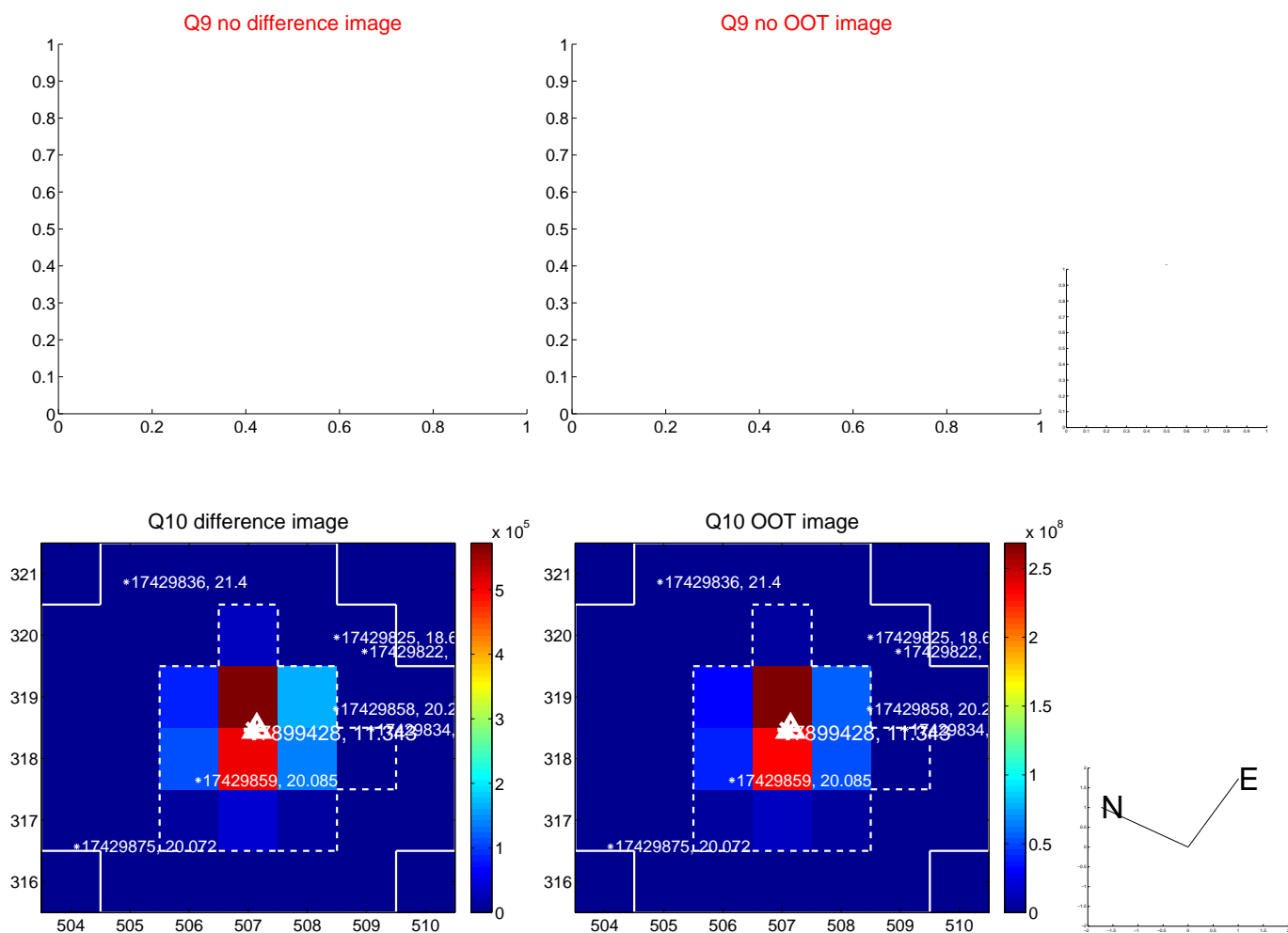


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

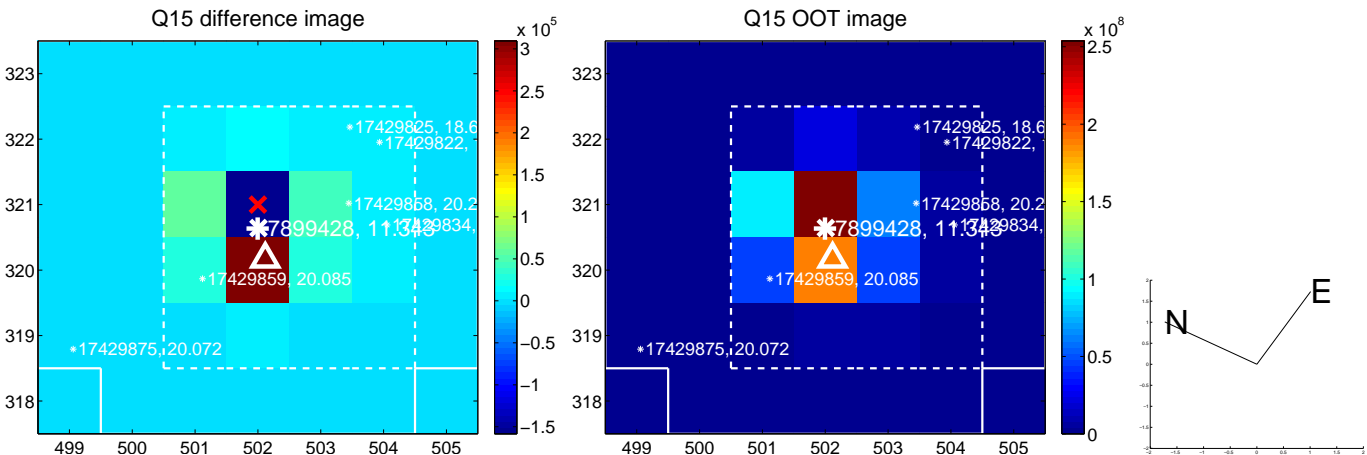




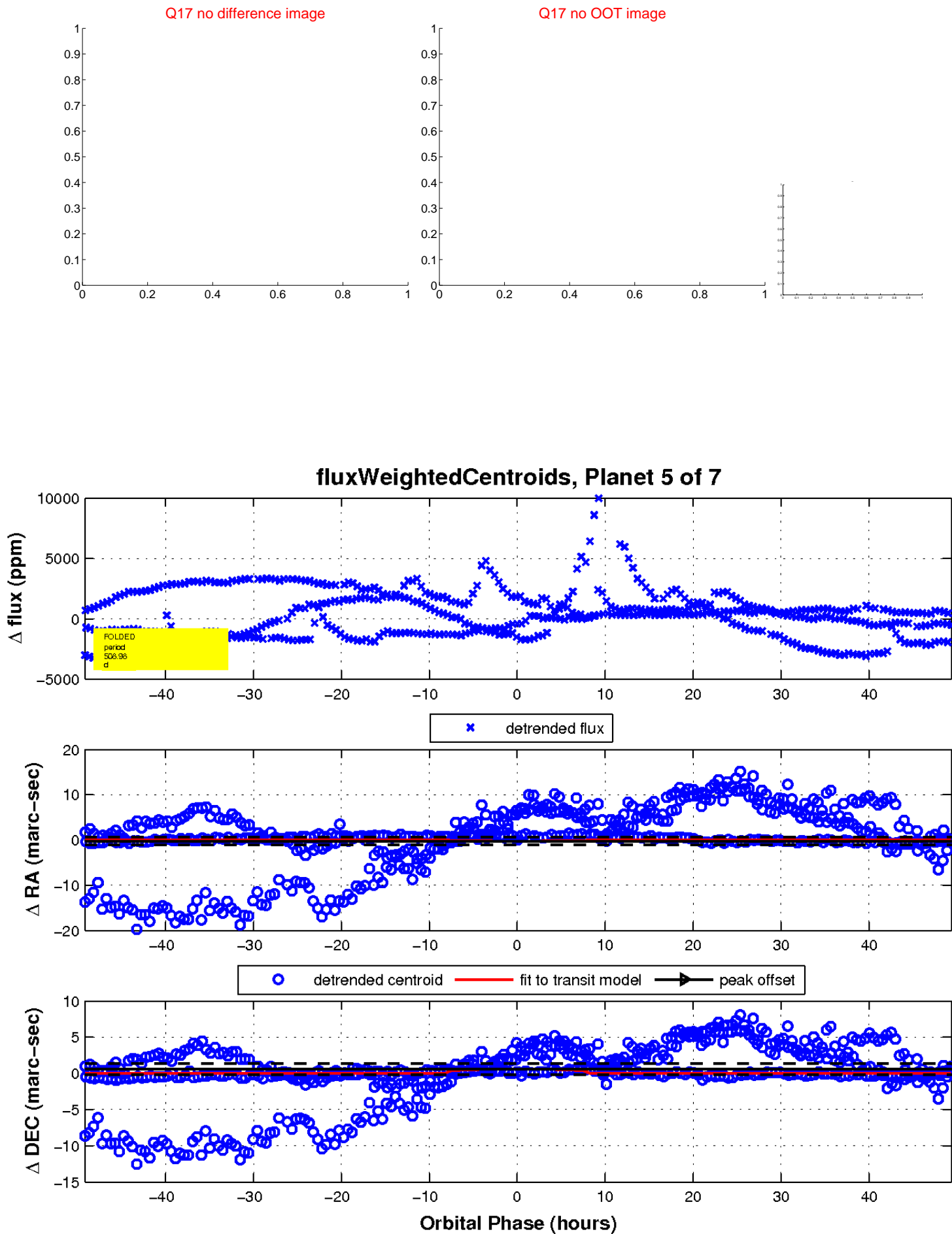
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



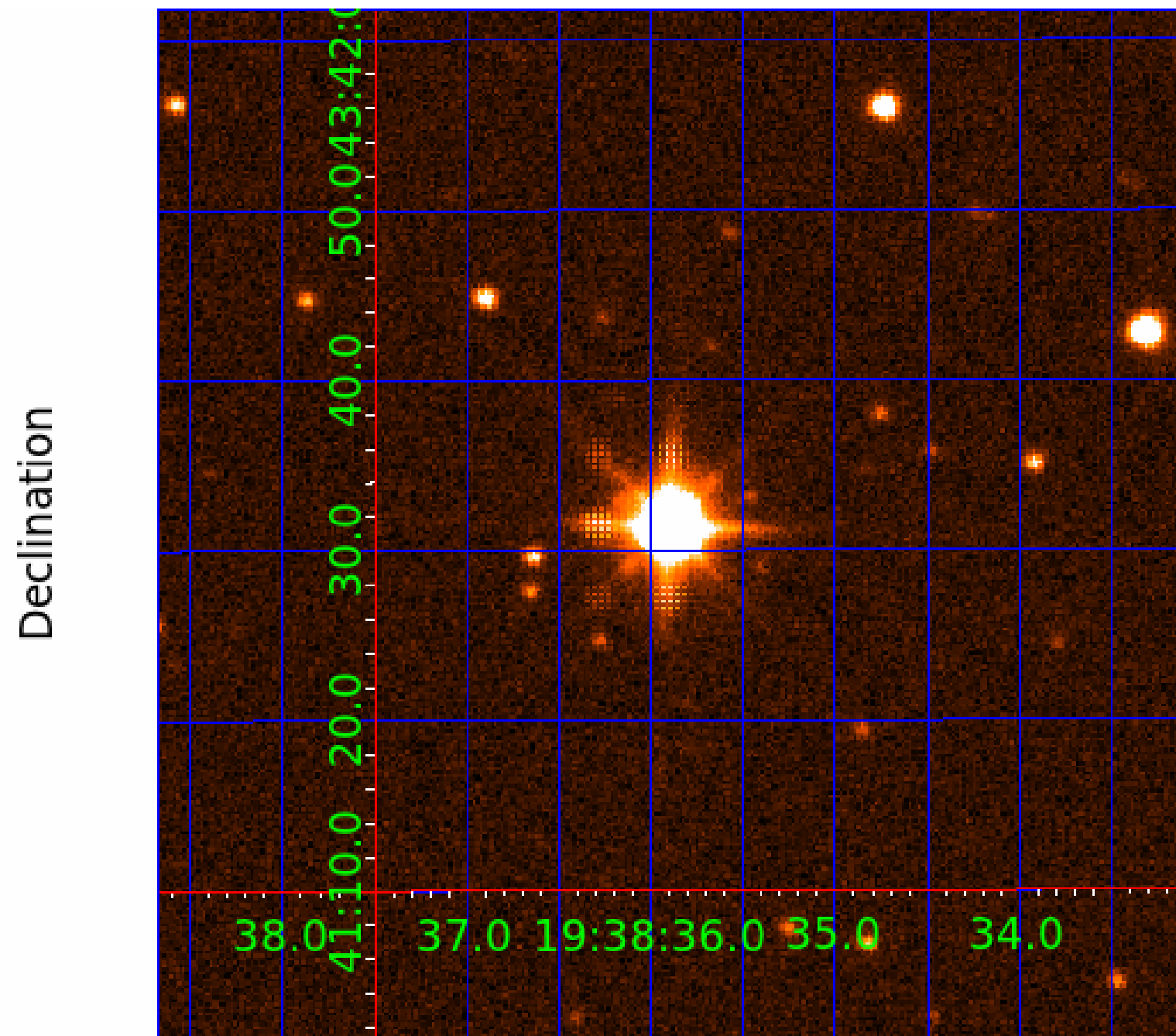
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



# KIC 007899428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007899428-01	OBS	No	519.065250	306.318800	496.5	9.788	32.8	4.5	0.75	4914	1.67	0.23
007899428-02	OBS	No	425.576042	285.658159	975.6	2.843	40.6	11.5	0.75	4914	2.56	0.29
007899428-03	OBS	No	514.251769	162.234990	772.1	4.383	24.5	9.8	0.75	4914	4.31	0.23
007899428-04	OBS	No	526.920264	393.012445	31.8	0.551	23.9	0.4	0.75	4914	0.50	0.22
007899428-05	OBS	No	508.979840	425.187816	544.1	16.483	21.8	4.3	0.75	4914	1.82	0.23
007899428-06	OBS	No	468.572194	453.561311	235.4	1.303	24.9	2.5	0.75	4914	1.69	0.26
007899428-07	OBS	No	591.456205	273.496991	125.0	12.500	18.0	-1.0	0.75	4914	0.81	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

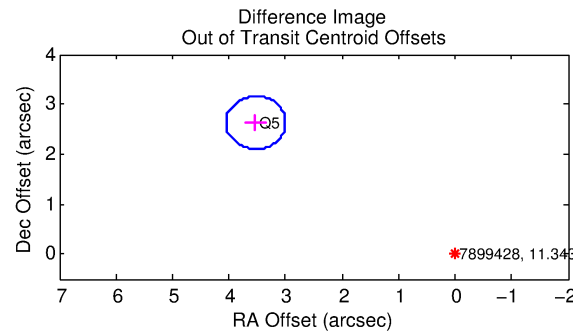
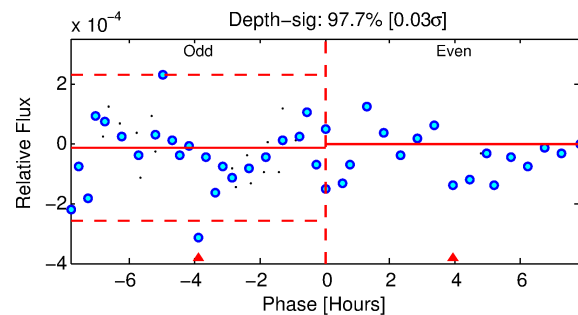
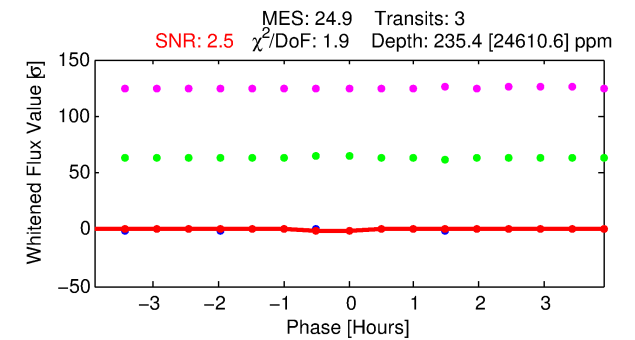
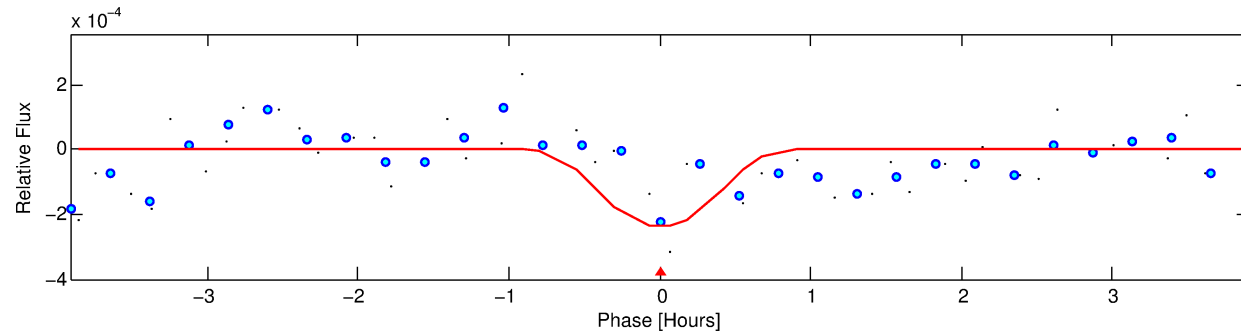
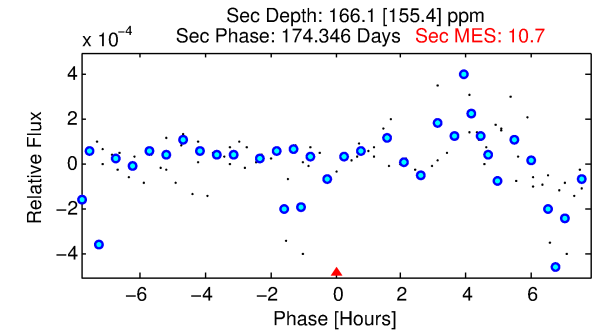
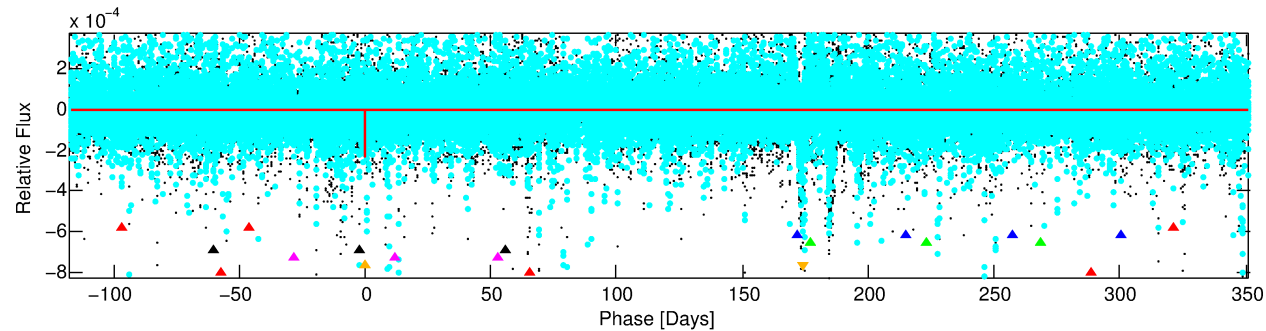
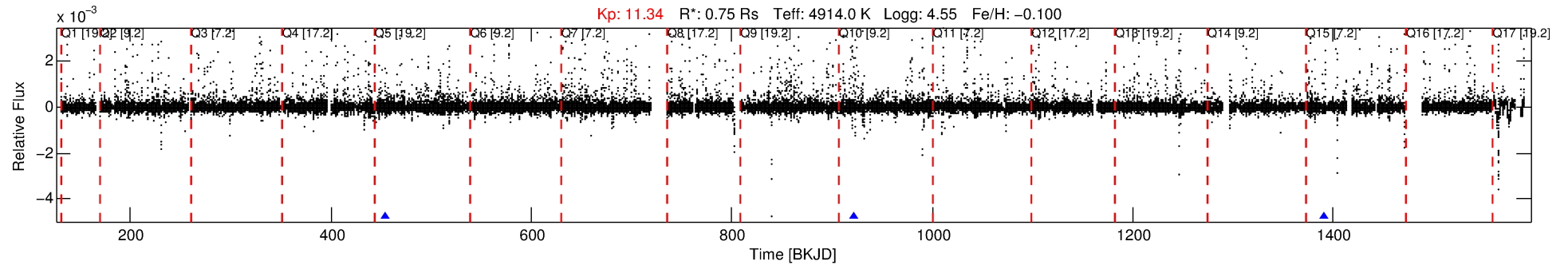
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-06

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 6 of 7 Period: 468.572 d



## DV Fit Results:

Period = 468.57219 [0.50084] d  
Epoch = 453.5613 [0.2637] BKJD  
 $R_p/R^* = 0.0208$  [2.7144]  
 $a/R^* = 795.26$  [177247.12]  
 $b = 0.98$  [13.58]  
 $\text{Seff} = 0.26$  [0.05]  
 $T_{\text{eq}} = 182$  [9] K  
 $R_p = 1.69$  [221.26]  $R_{\text{e}}$   
 $a = 1.0627$  [0.0907] AU  
 $A_g = 35960.59$  [9392689.94] [0.00σ]  
 $T_{\text{eff}} = 3870$  [252687] K [0.01σ]

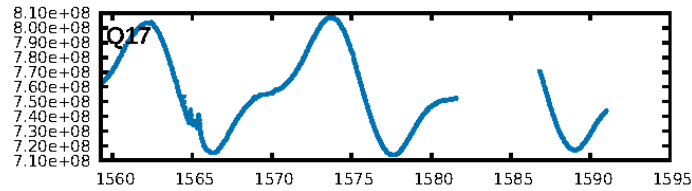
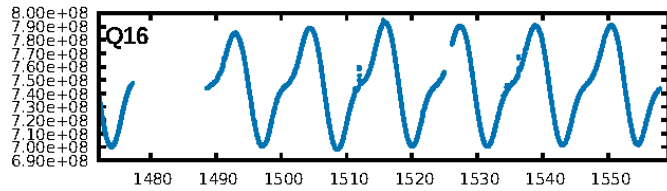
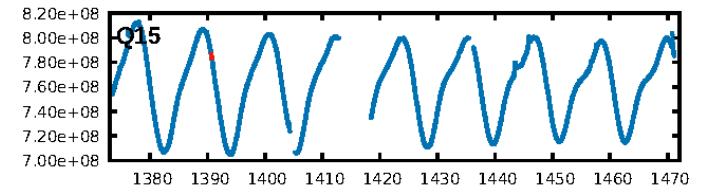
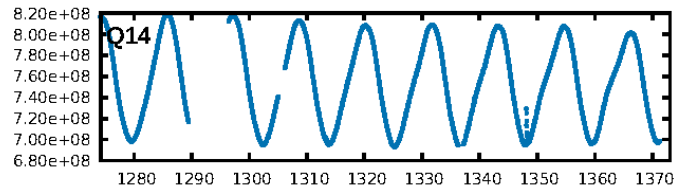
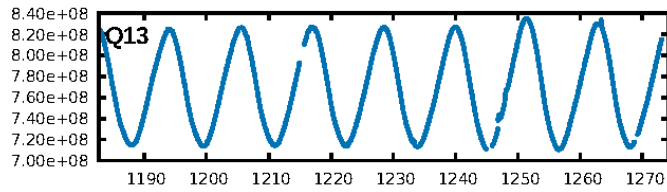
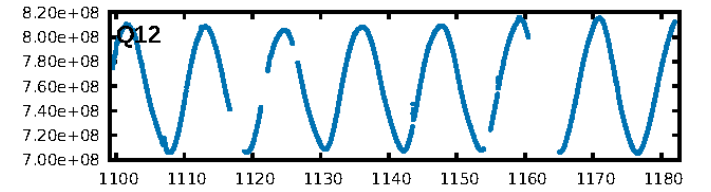
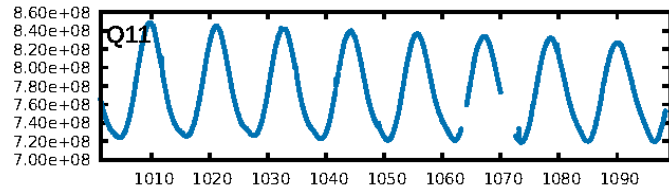
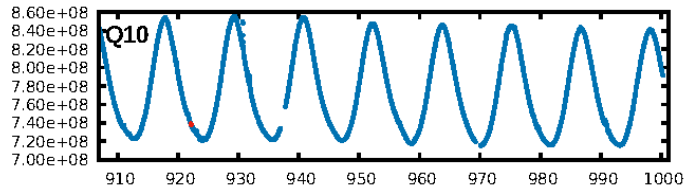
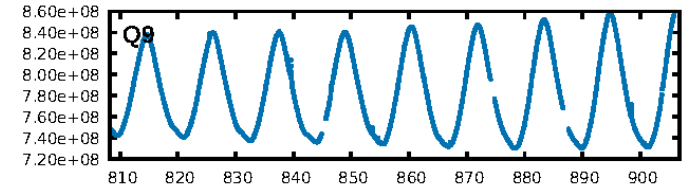
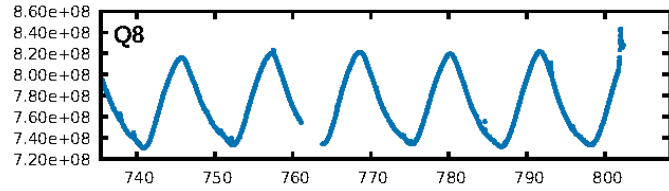
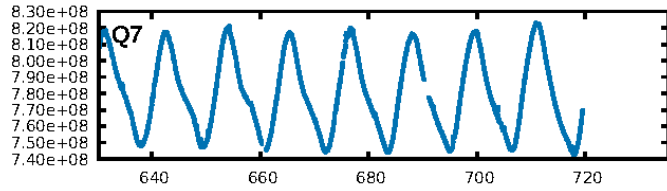
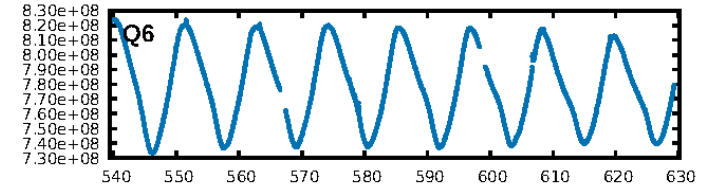
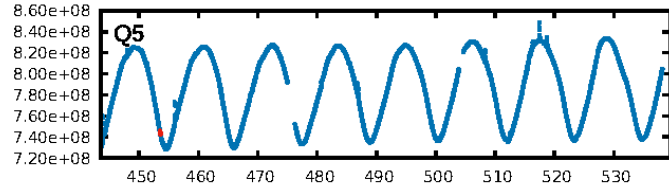
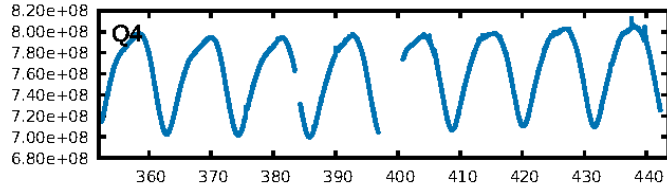
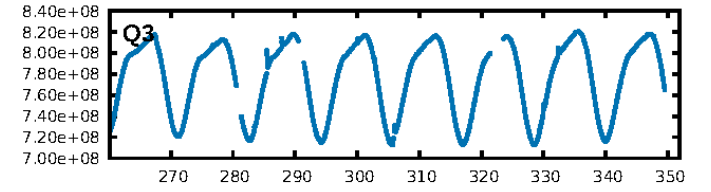
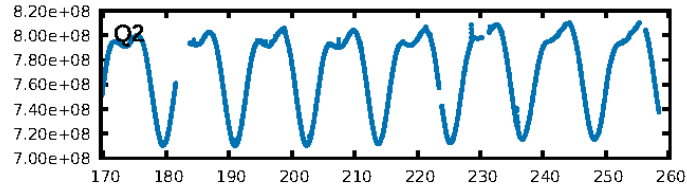
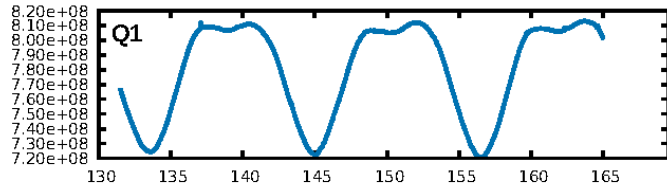
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [329.96σ]  
LongPeriod-sig: 100.0% [58.65σ]  
ModelChiSquare2-sig: 86.7%  
ModelChiSquareGof-sig: 98.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -4.195  
Centroid-sig: 42.9%  
Centroid-so: 1.718 arcsec [0.66σ]  
**OotOffset-rm: 4.402 arcsec [25.03σ]**  
**KicOffset-rm: 3.788 arcsec [21.53σ]**  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

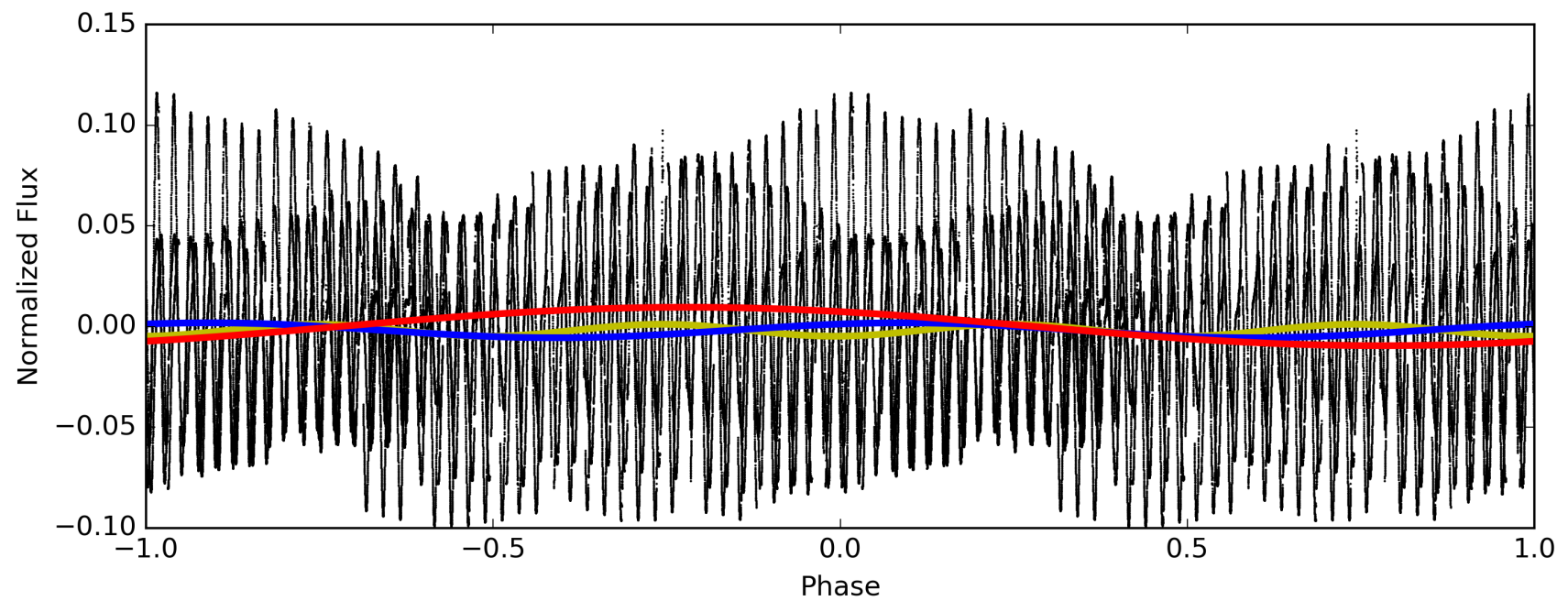
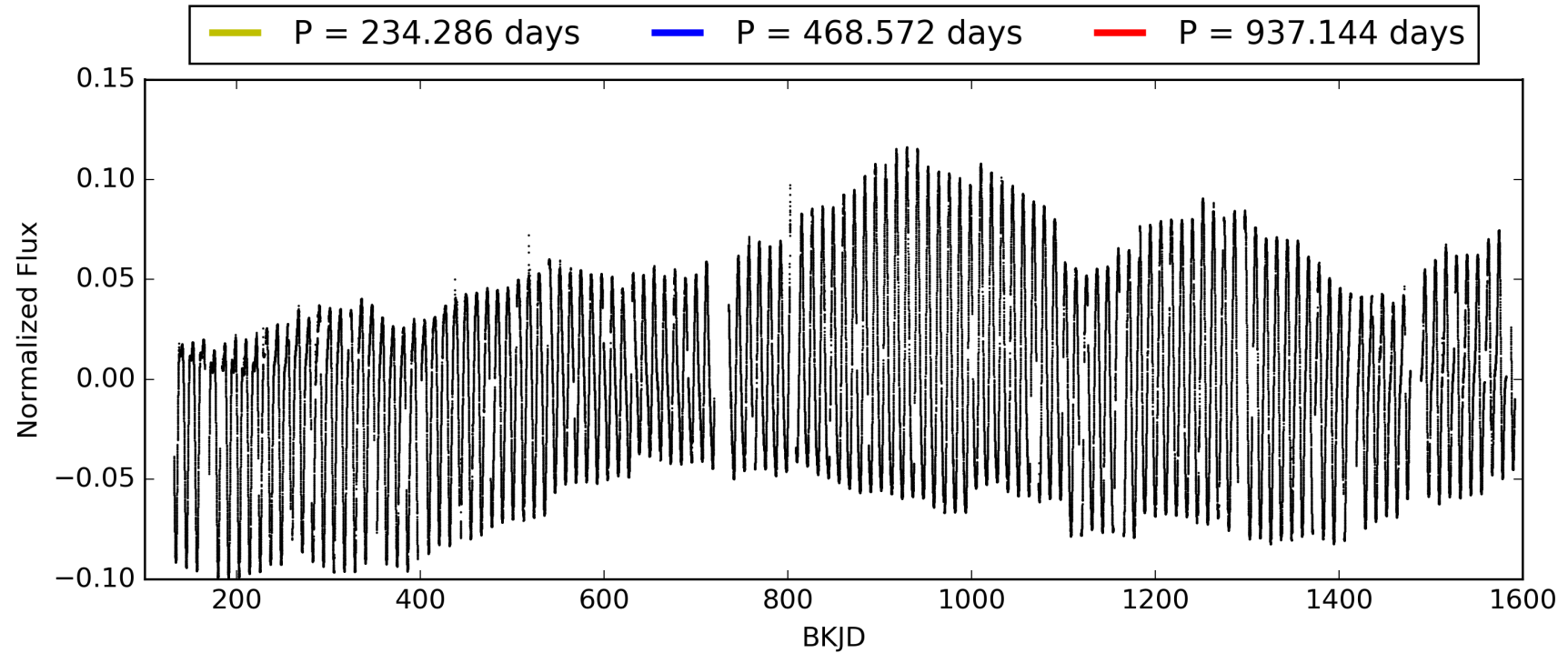
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:21:31 Z

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

# TCE 007899428-06, PDC Light Curves



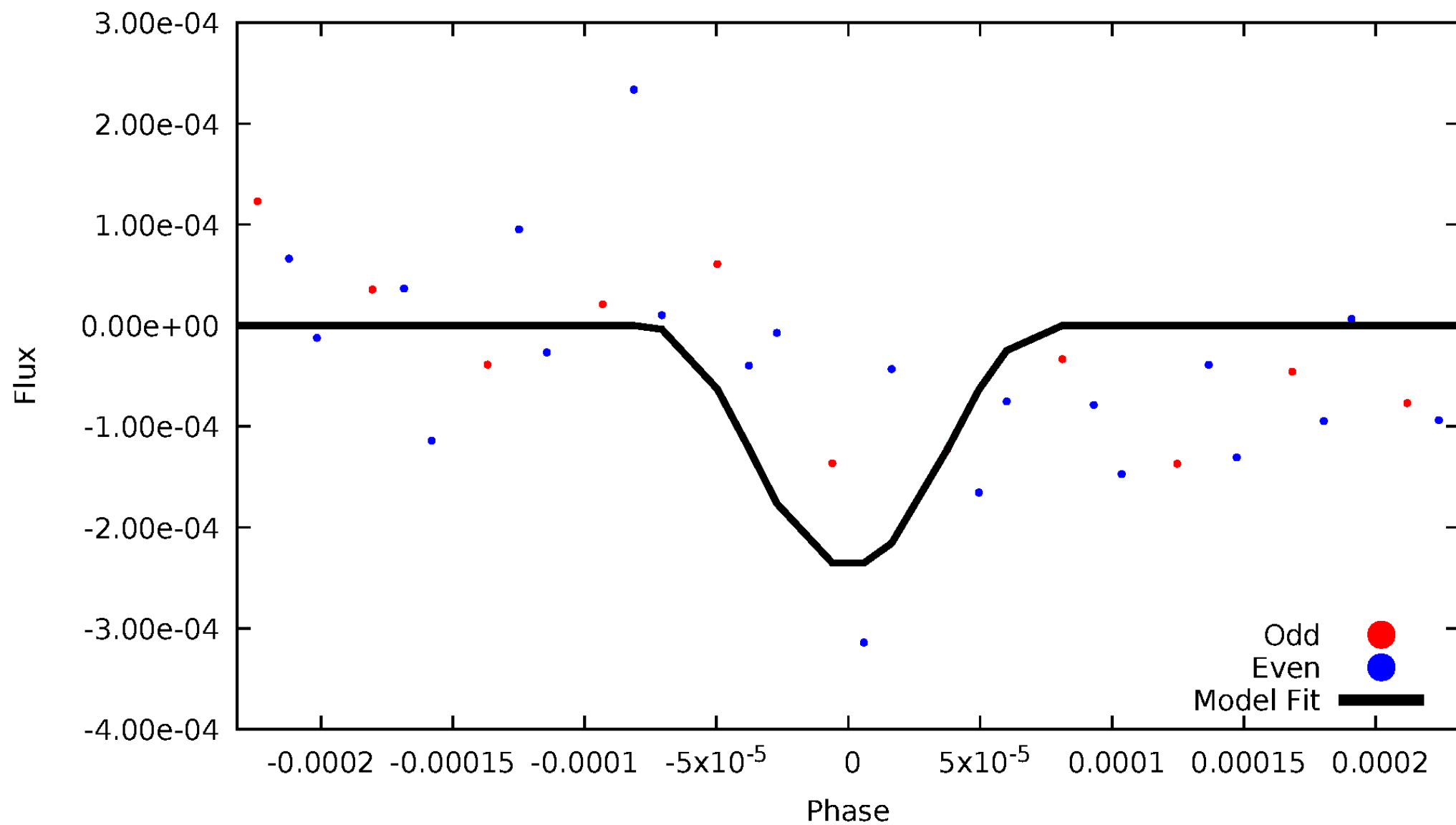
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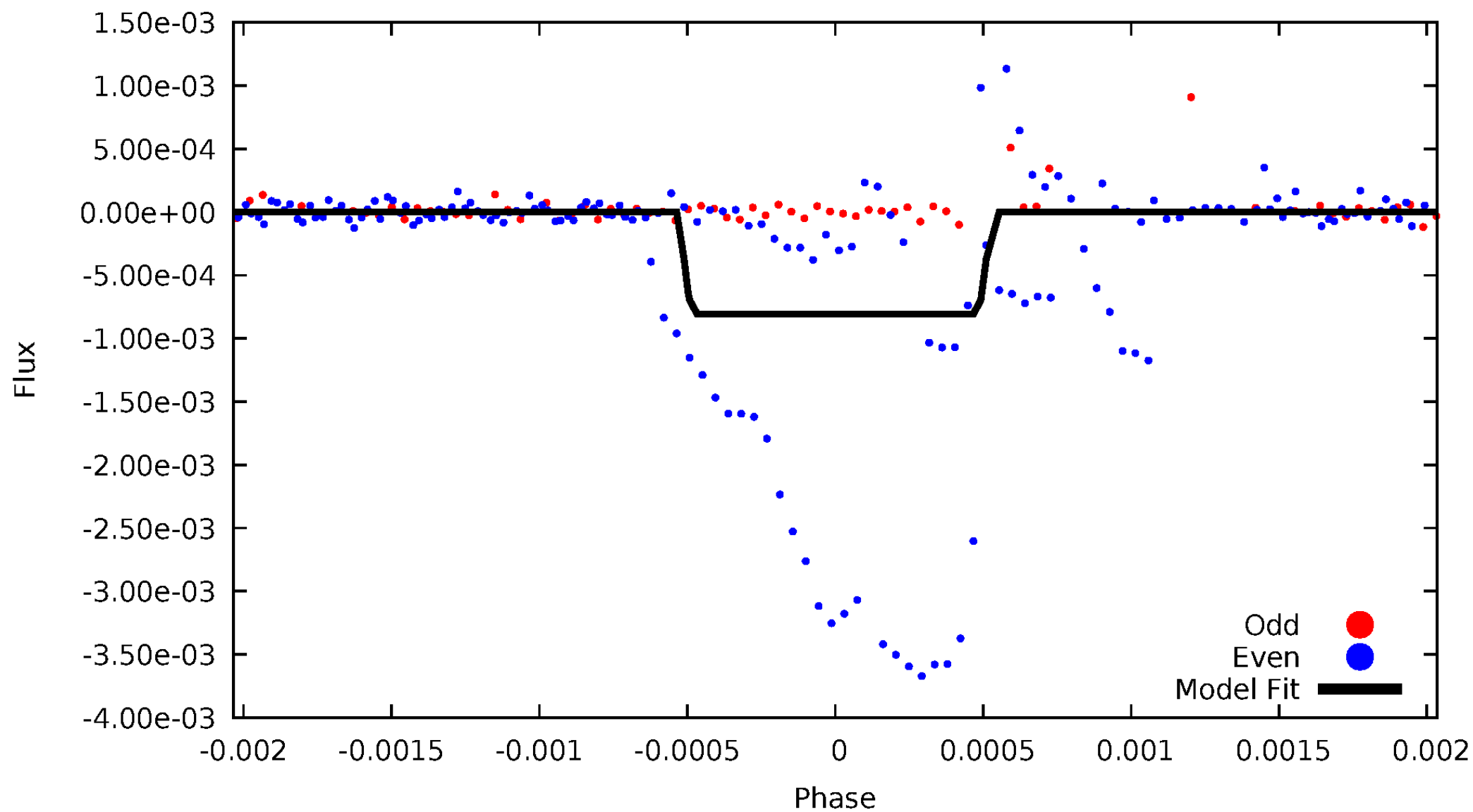
# DV Odd/Even

TCE 007899428-06



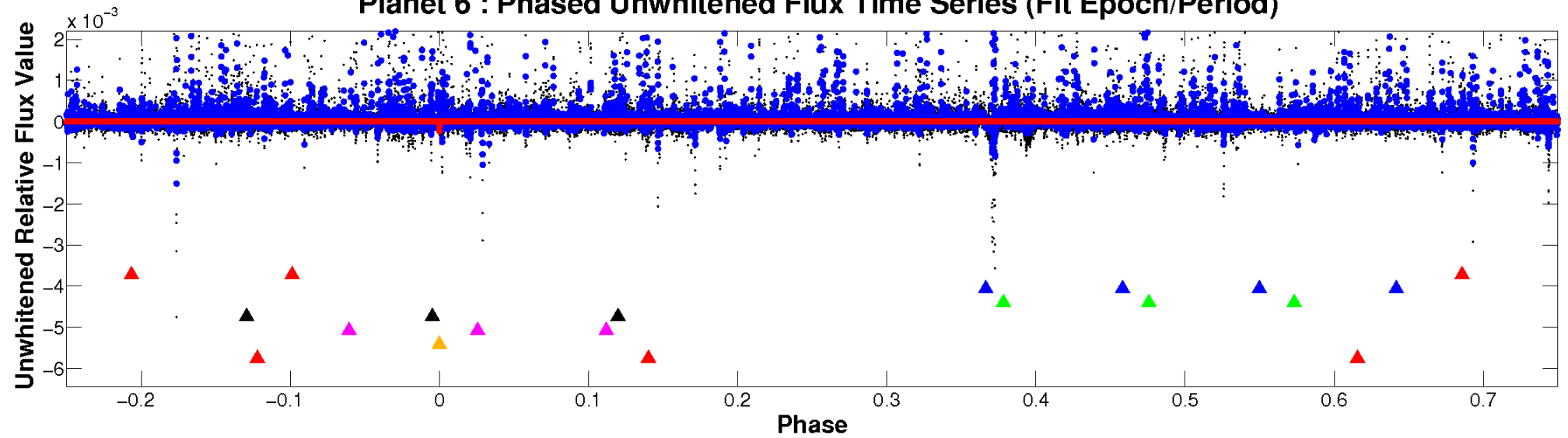
# ALT Odd/Even

TCE 007899428-06

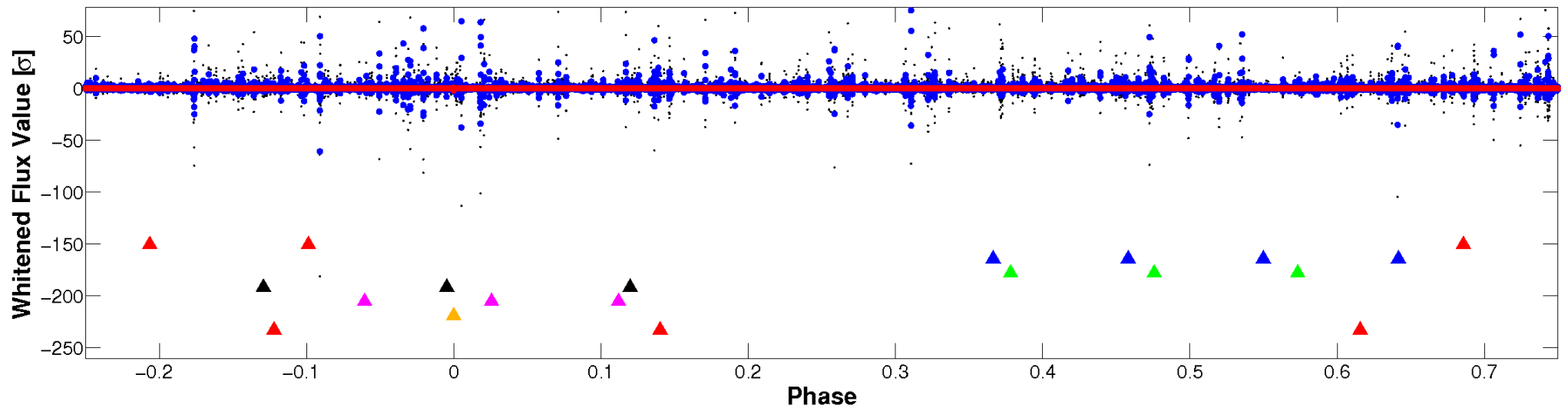


# Non-Whitened Vs. Whitened Light Curve

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

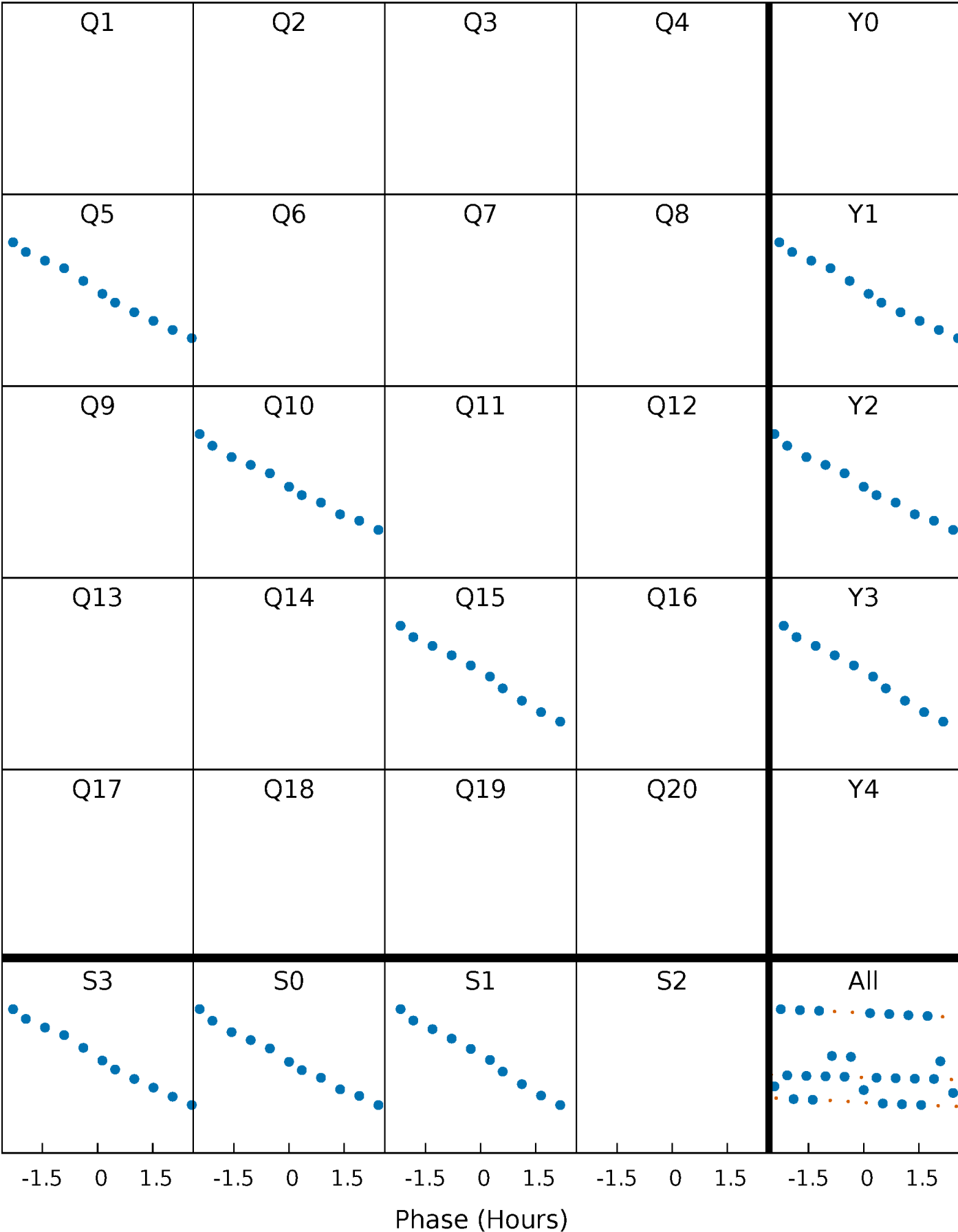


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



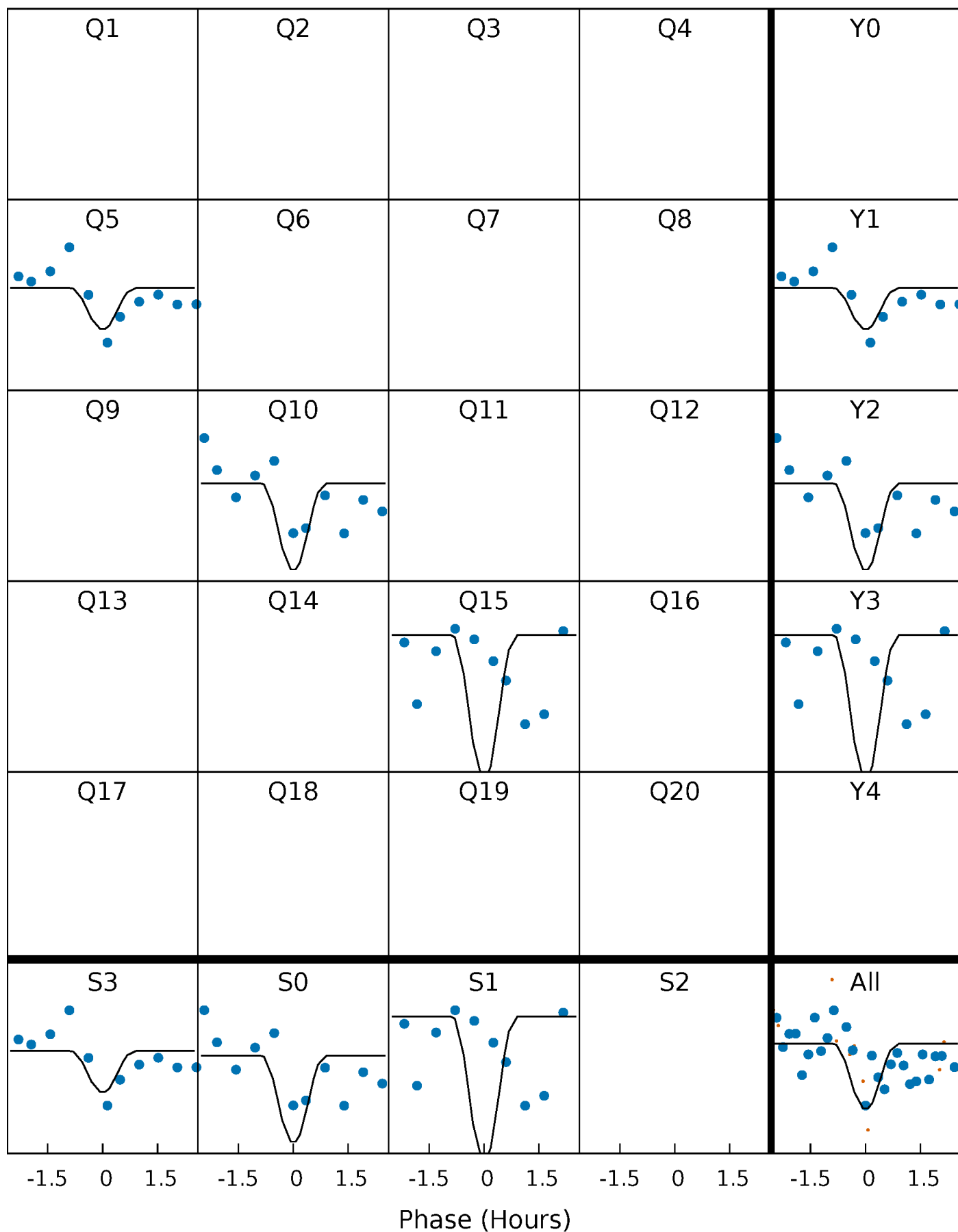
PDC Quarter-Phased Transit Curves

TCE 007899428-06    P=468.572194 Days    T<sub>0</sub>=453.561311 (BKJD)



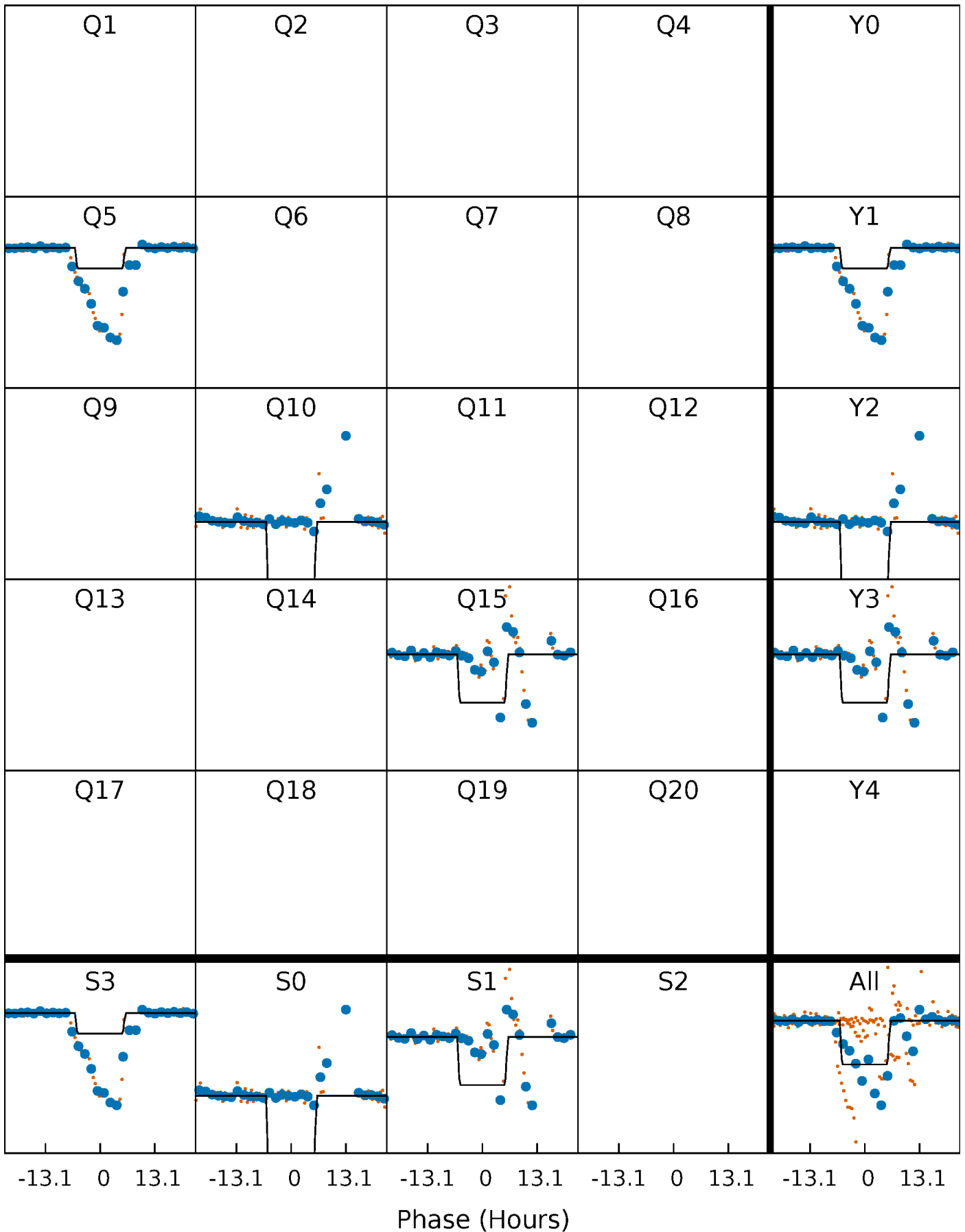
# DV Quarter-Phased Transit Curves

TCE 007899428-06     $P=468.572194$  Days     $T_0=453.561311$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

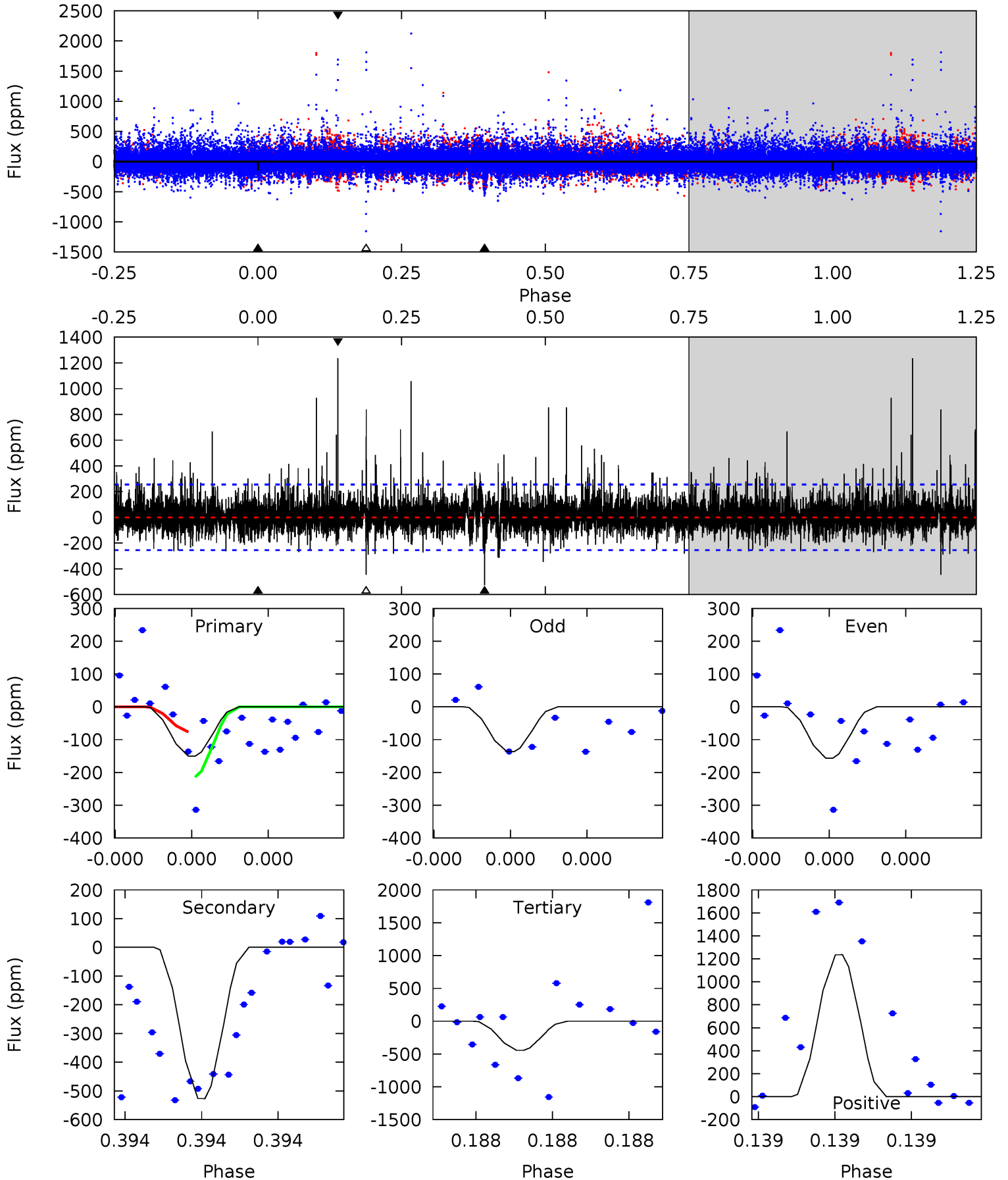
TCE 007899428-06     $P=468.732244$  Days     $T_0=453.835658$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-06, P = 468.572194 Days, E = 453.561311 Days

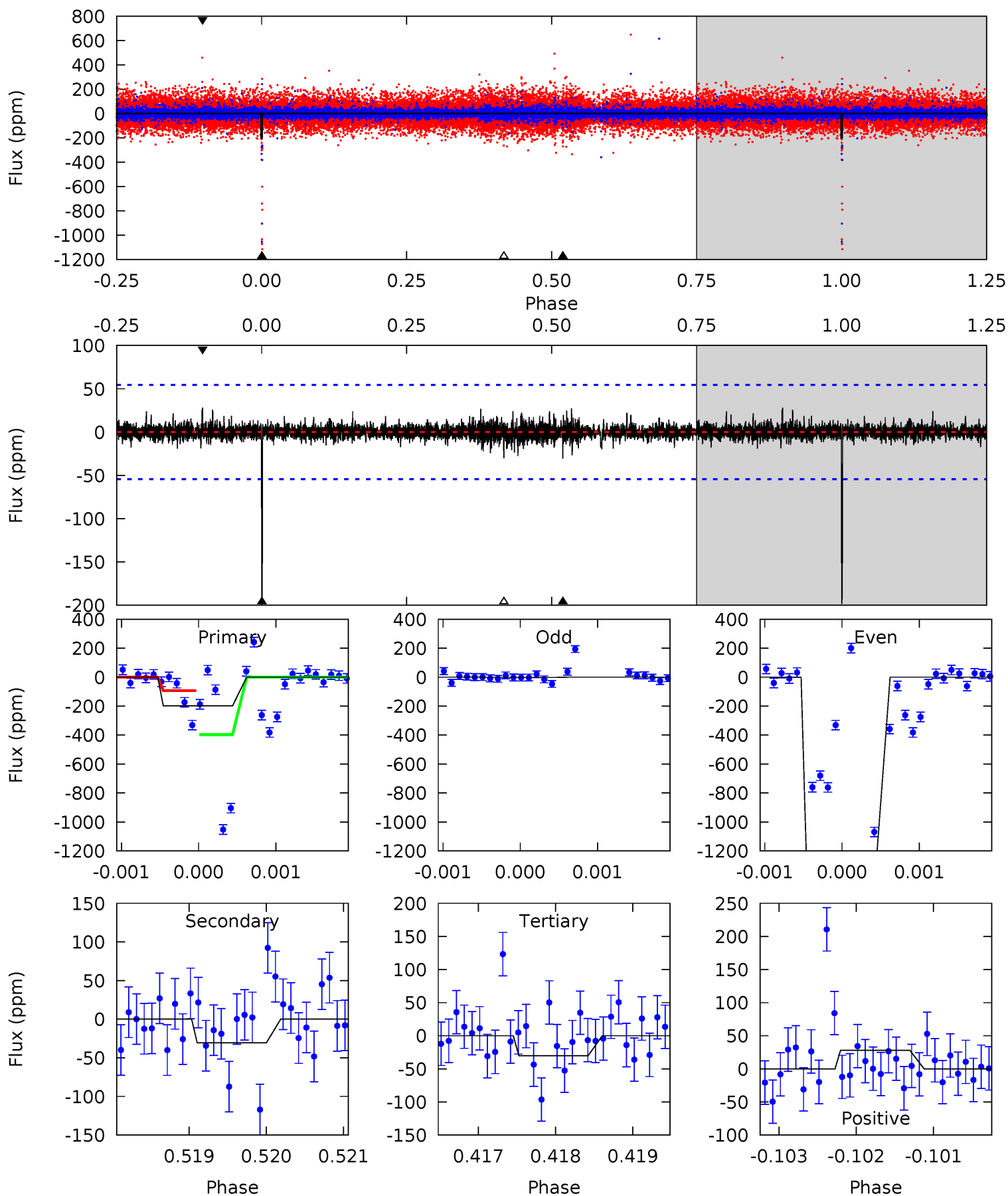
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.43	12.0	10.1	28.1	5.80	3.82	1.77	-6.70	-24.7	1.88	-16.1	0.07	1.11	0.70	1.55



# Alt Model-Shift Uniqueness Test

007899428-06, P = 468.732244 Days, E = 453.835658 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	3.05	3.03	2.82	5.45	3.28	0.49	16.8	17.0	0.02	0.23	63.7	4.18	0.12	0





### Stellar Parameters For KIC 007899428

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-527 \pm 44$	$148.68^{+159.48}_{-102.41}$	$253^{+11}_{-10}$	$1594^{+382}_{-190}$	$15^{+143}_{-11}$
Alt.	$-30 \pm 10$	$145.69^{+156.59}_{-99.39}$	$253^{+10}_{-10}$	$1243^{+284}_{-2359}$	$0.870^{+8.317}_{-0.687}$

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

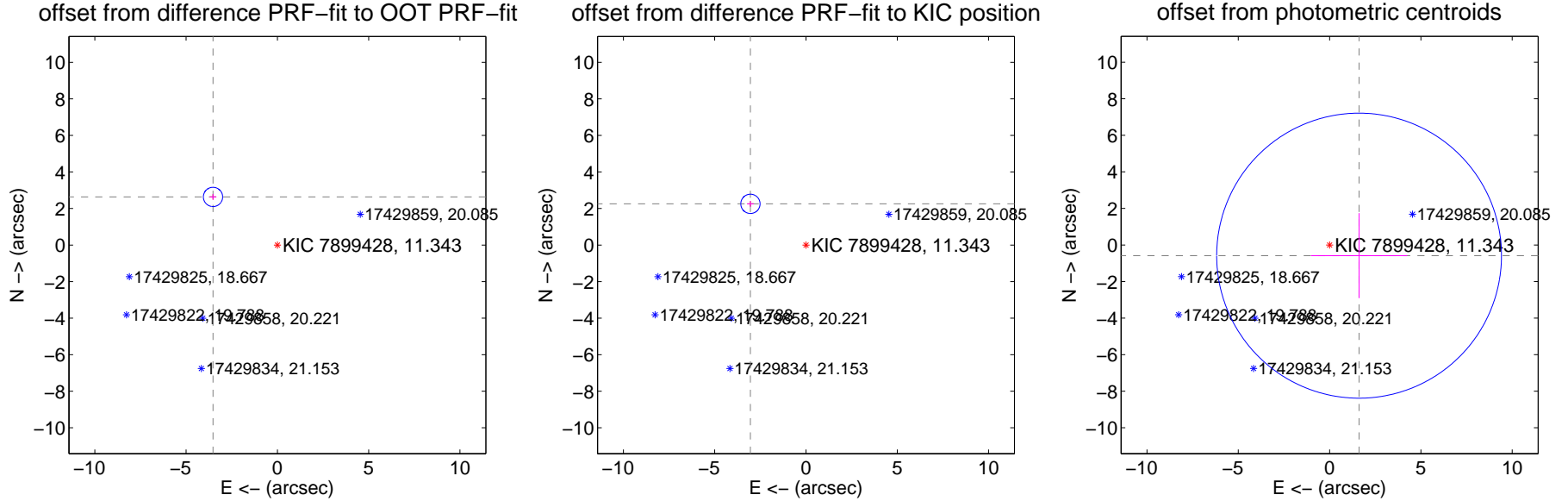
## DV Centroid Data

Supplemental centroid analysis for 007899428-06. **Kepler magnitude: 11.34.** Transit SNR 2.49

**There are 0 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.61 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.402 \pm 0.176</math></b>	<b>25.03</b>	$3.527 \pm 0.183$	$2.634 \pm 0.162$
PRF-fit source offset from KIC position	<b><math>3.788 \pm 0.176</math></b>	<b>21.53</b>	$3.044 \pm 0.183$	$2.256 \pm 0.162$
photometric centroid source offset	$1.72 \pm 2.60$	0.66	$-1.61 \pm 2.63$	$-0.59 \pm 2.33$

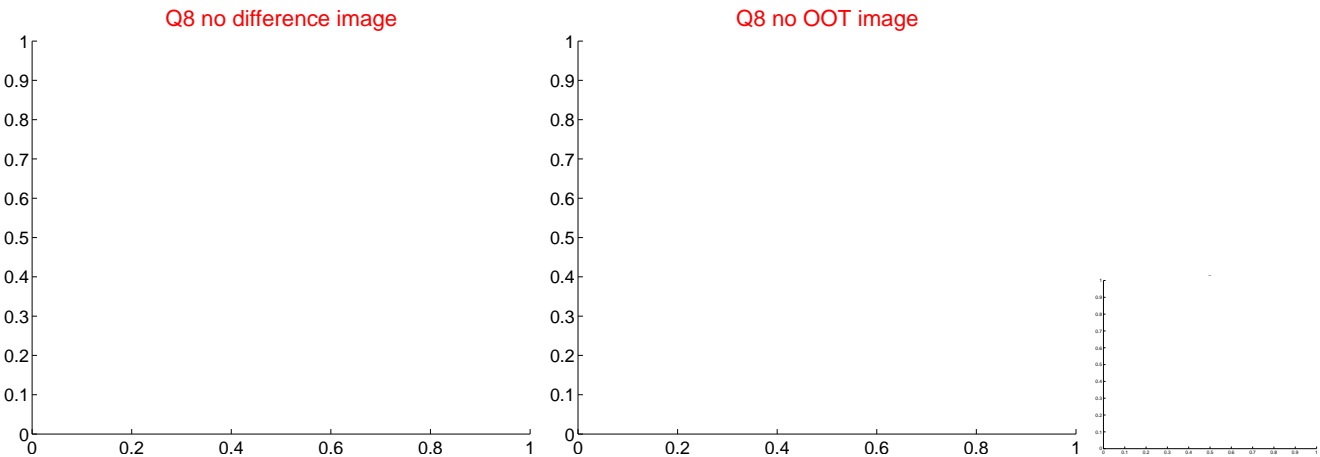
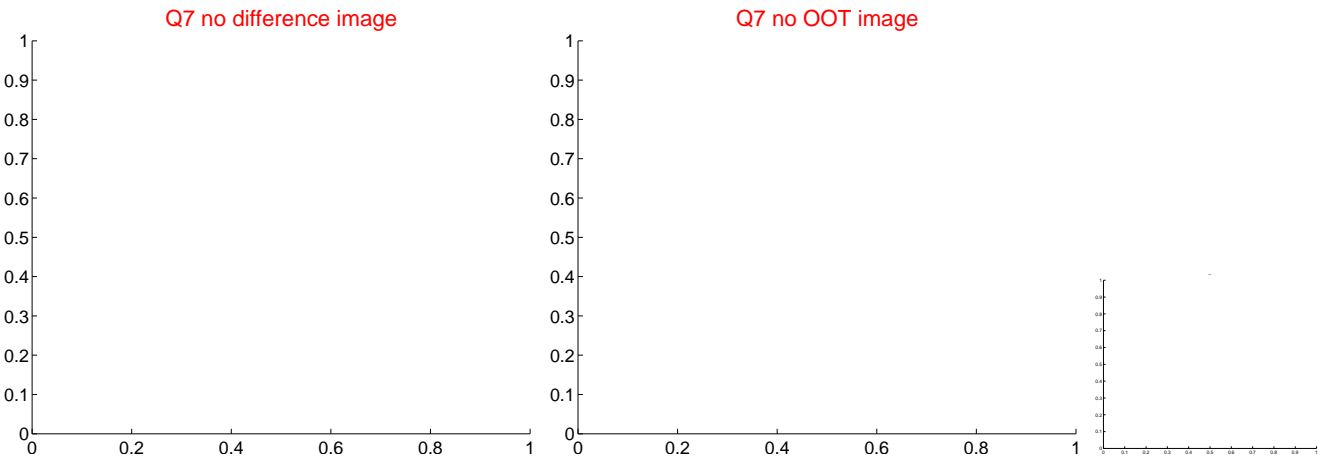
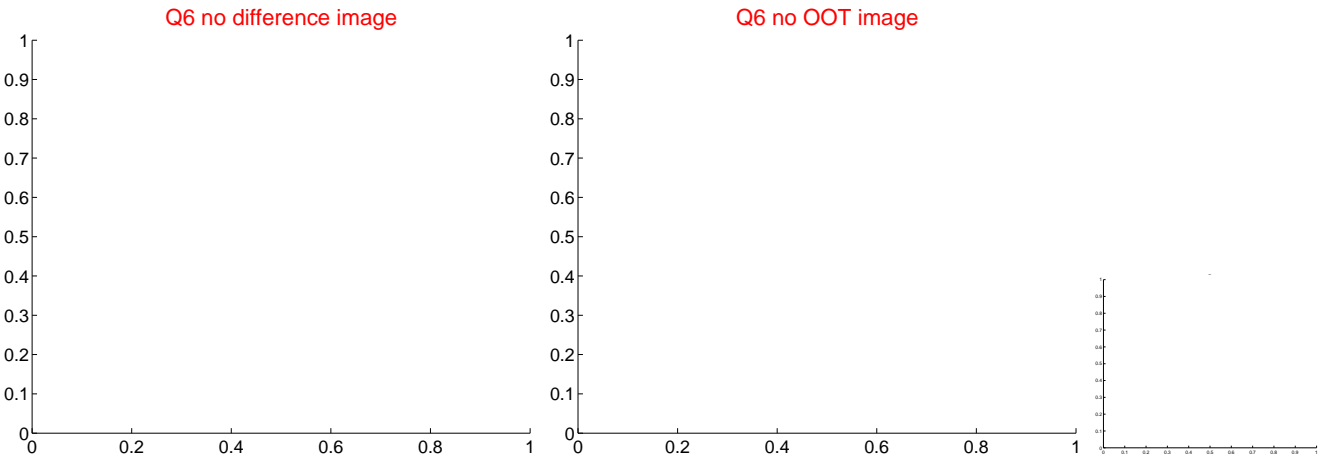
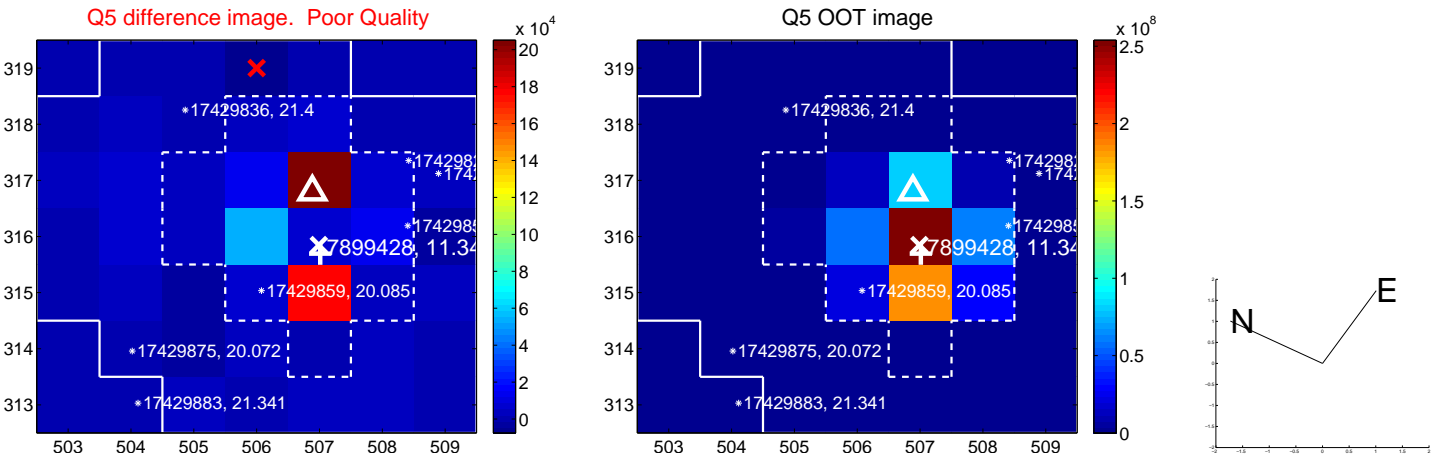


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

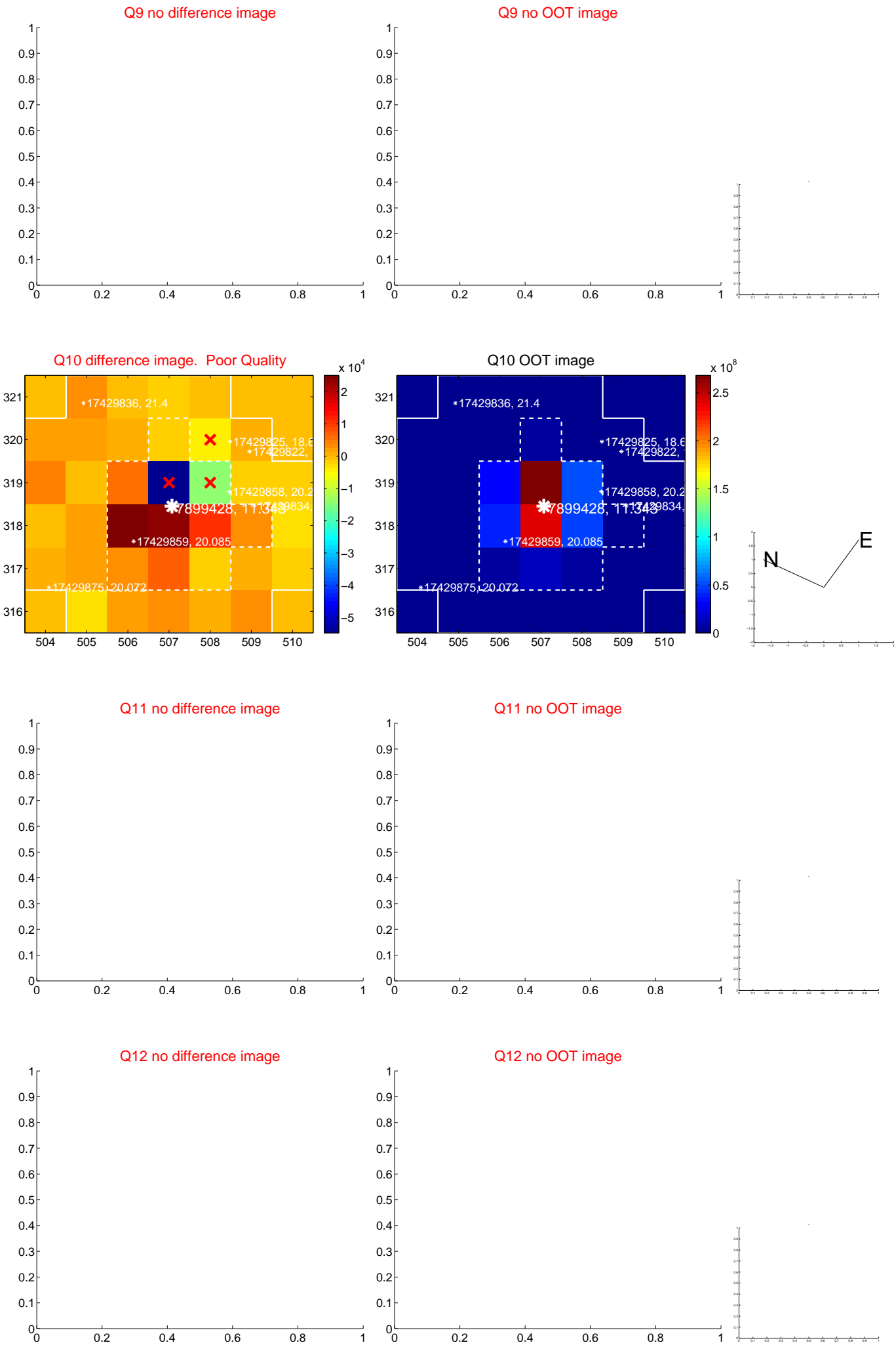
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



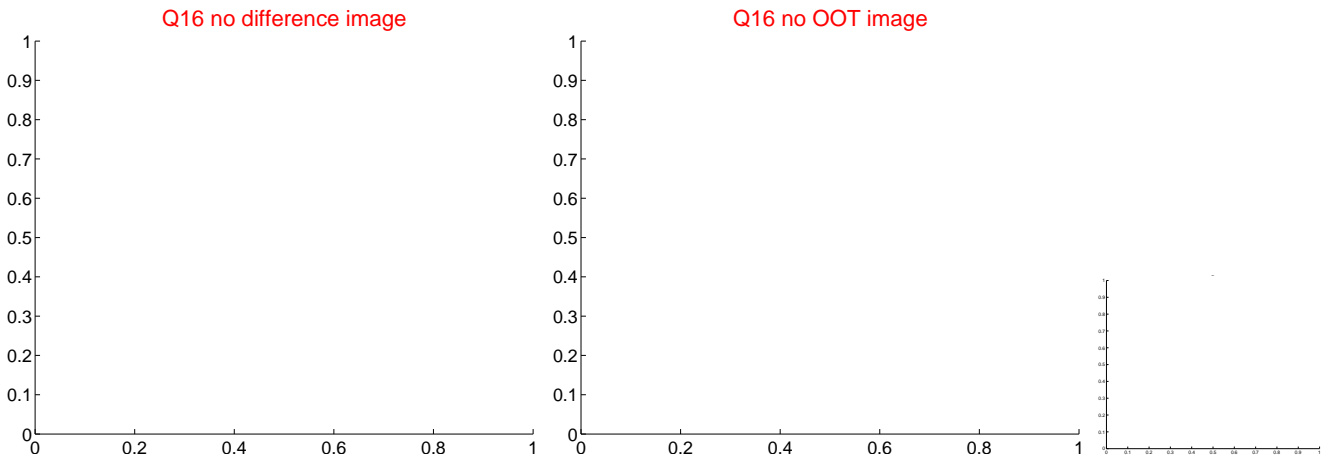
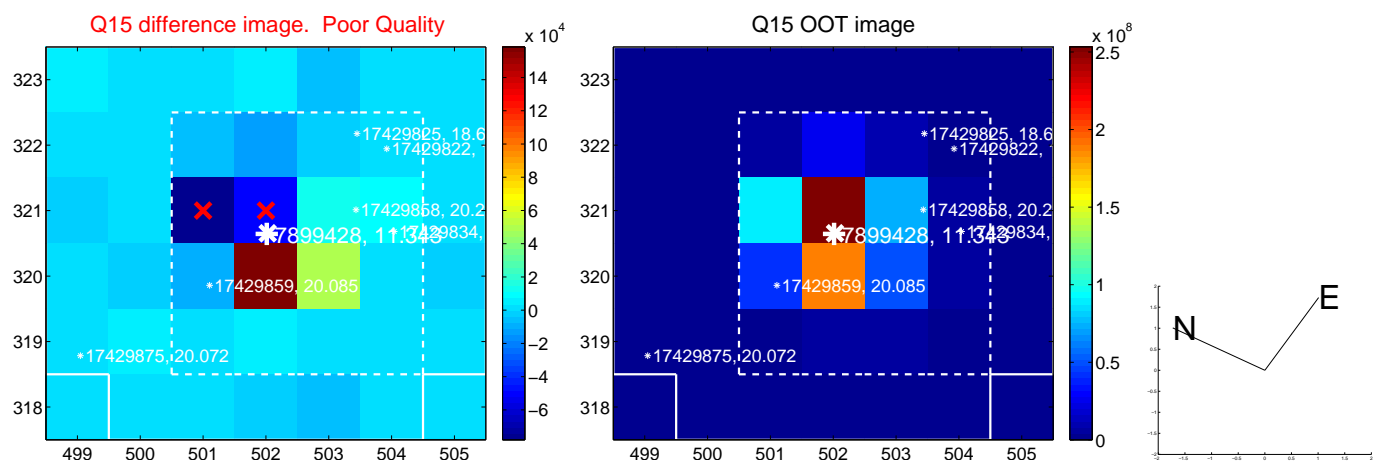
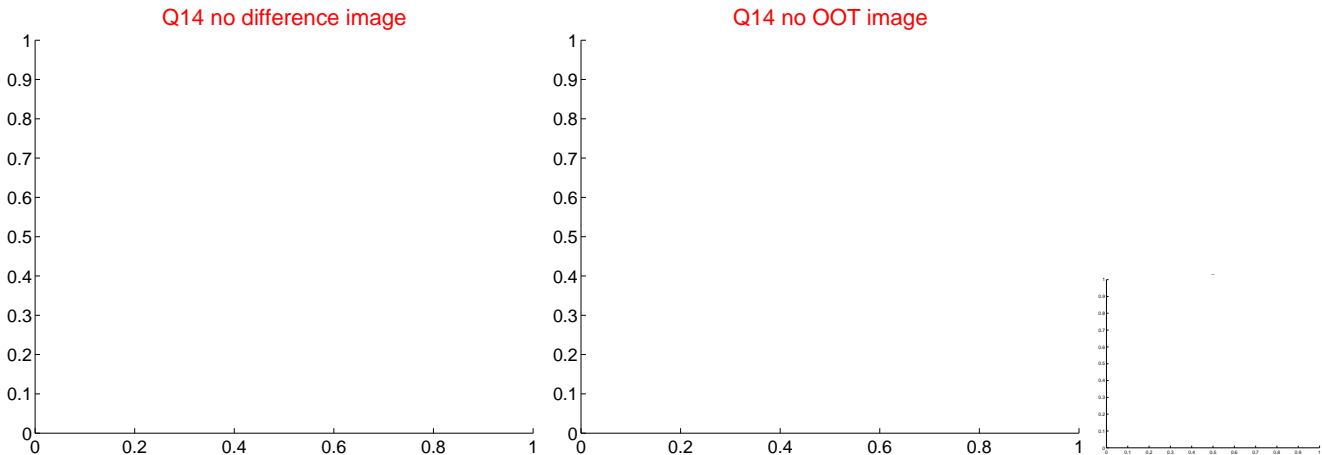
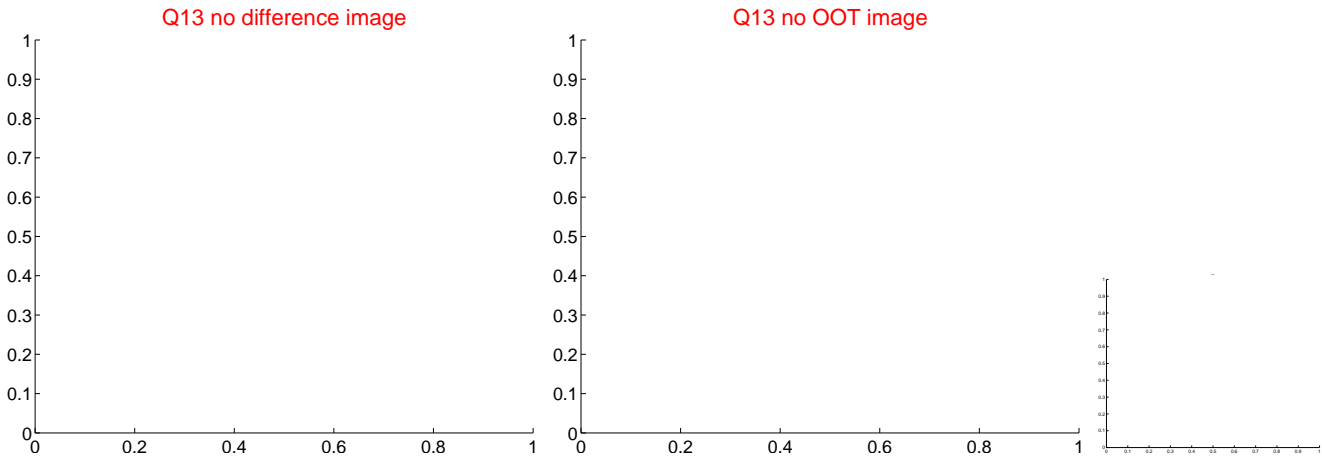
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



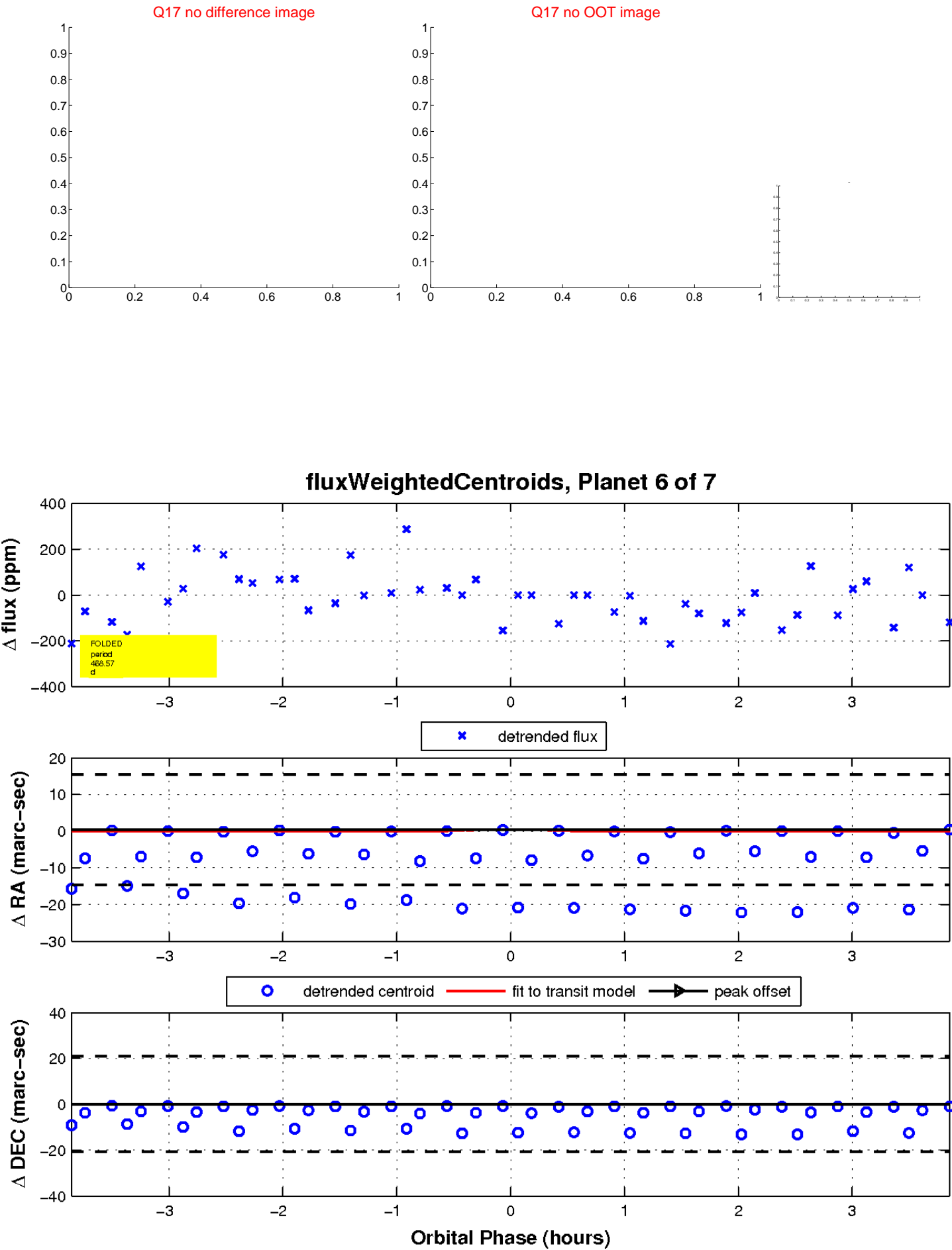
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



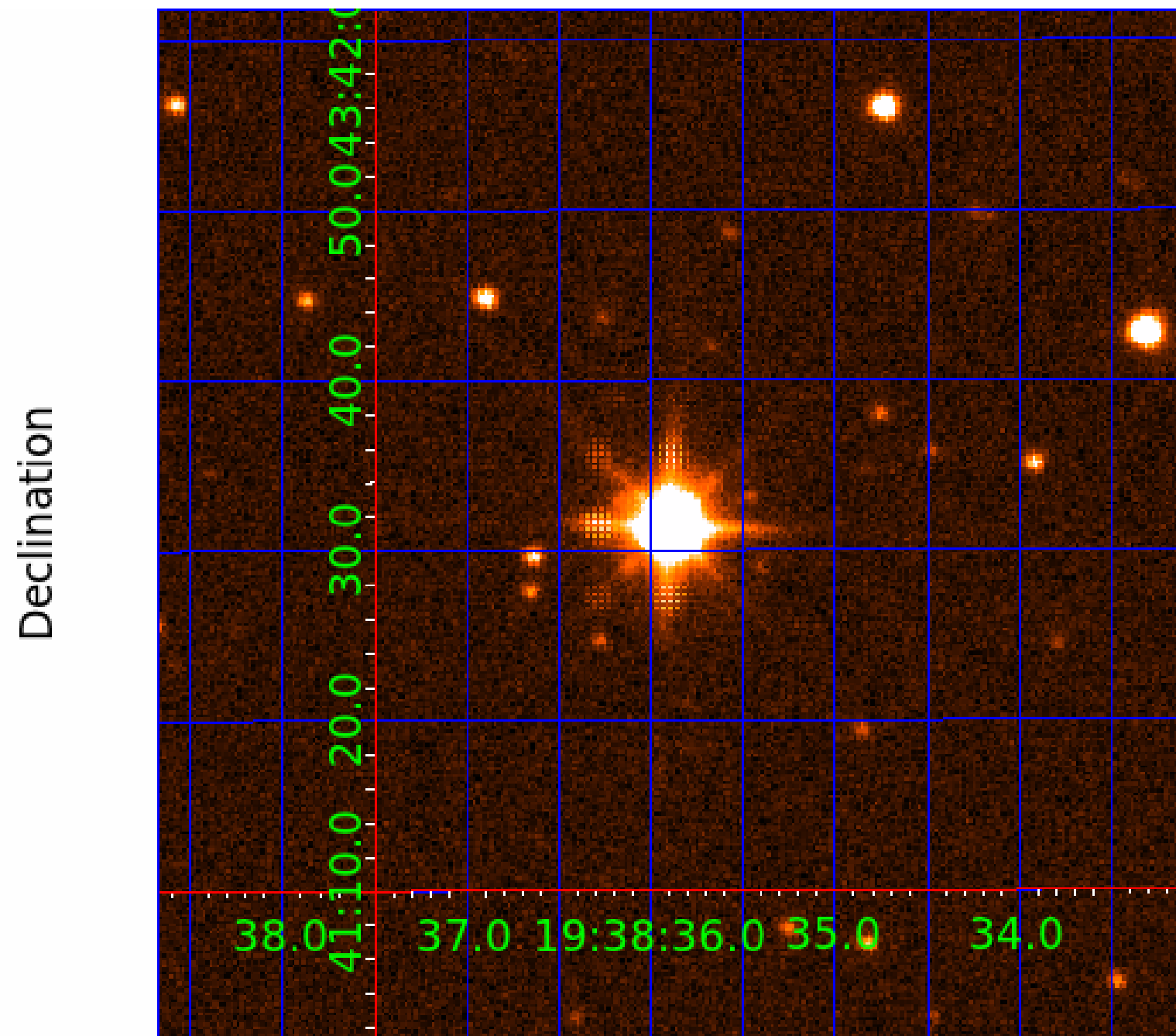
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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



UKIRT Image





# KIC 007899428

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007899428-01	OBS	No	519.065250	306.318800	496.5	9.788	32.8	4.5	0.75	4914	1.67	0.23
007899428-02	OBS	No	425.576042	285.658159	975.6	2.843	40.6	11.5	0.75	4914	2.56	0.29
007899428-03	OBS	No	514.251769	162.234990	772.1	4.383	24.5	9.8	0.75	4914	4.31	0.23
007899428-04	OBS	No	526.920264	393.012445	31.8	0.551	23.9	0.4	0.75	4914	0.50	0.22
007899428-05	OBS	No	508.979840	425.187816	544.1	16.483	21.8	4.3	0.75	4914	1.82	0.23
007899428-06	OBS	No	468.572194	453.561311	235.4	1.303	24.9	2.5	0.75	4914	1.69	0.26
007899428-07	OBS	No	591.456205	273.496991	125.0	12.500	18.0	-1.0	0.75	4914	0.81	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007899428-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED
007899428-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST
007899428-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS— CENT_SATURATED
007899428-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007899428-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED
007899428-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_SATURATED
007899428-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED

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

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

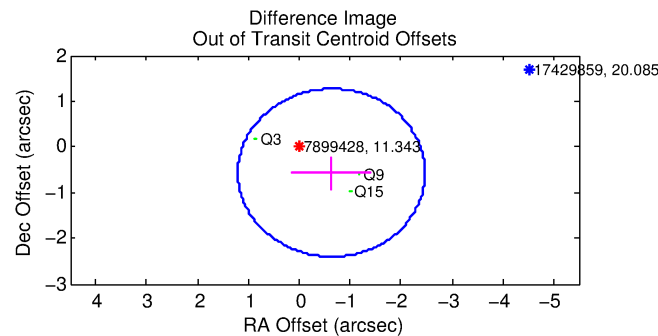
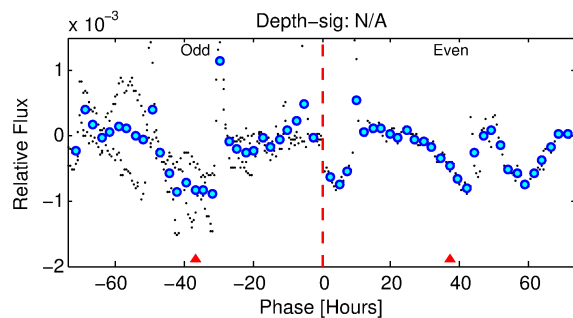
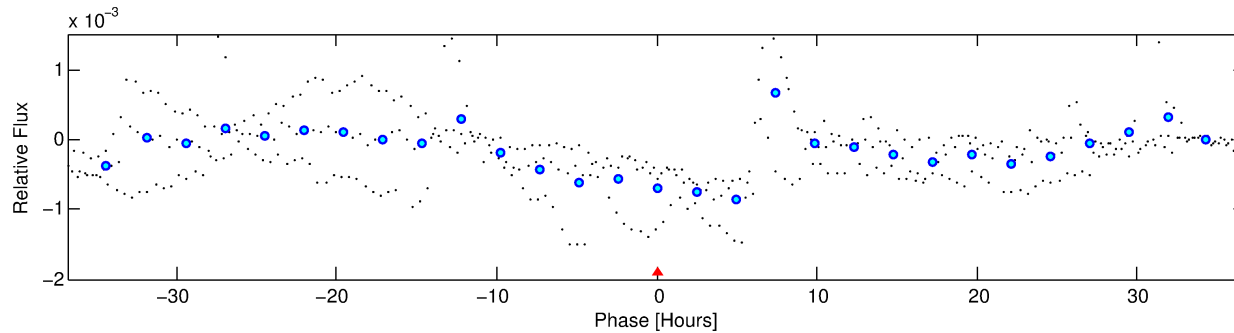
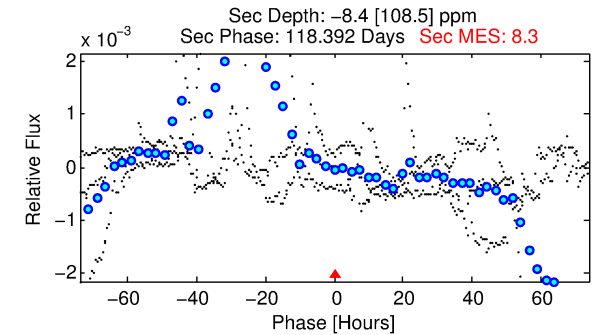
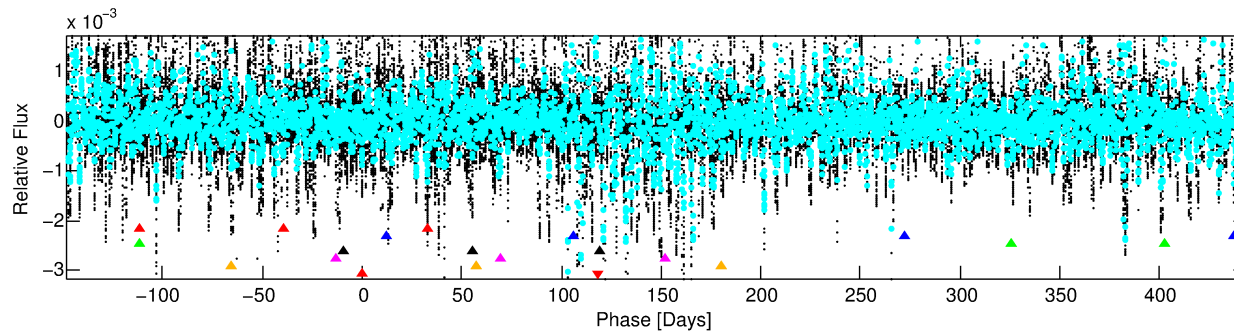
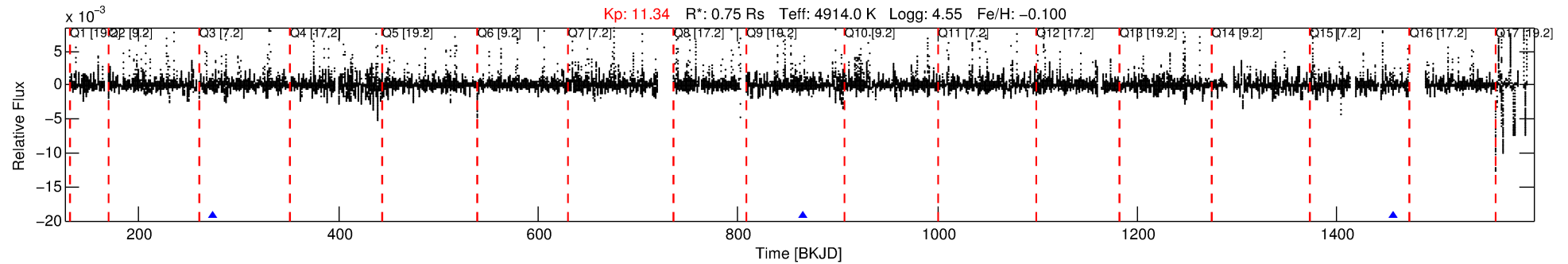
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007899428-07

No Significant Match Found

# DV One-Page Summary

KIC: 7899428 Candidate: 7 of 7 Period: 591.456 d



## TPS TCE Results:

Period = 591.45621 d  
Epoch = 273.4970 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

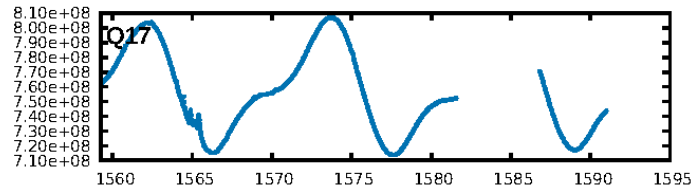
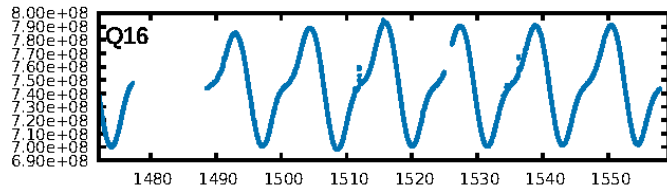
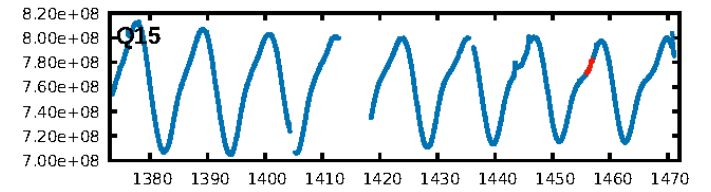
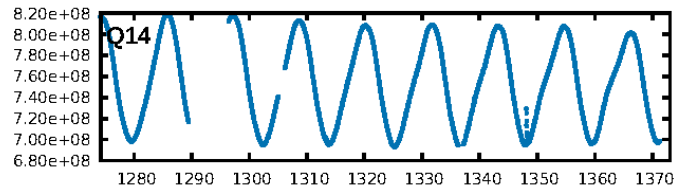
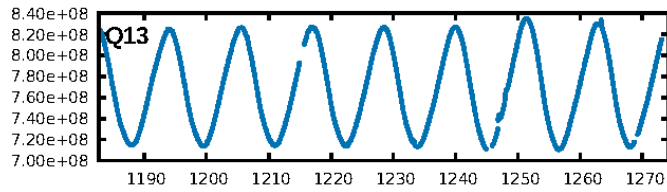
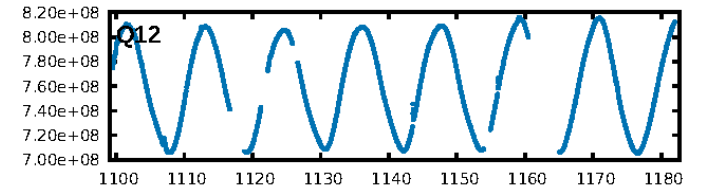
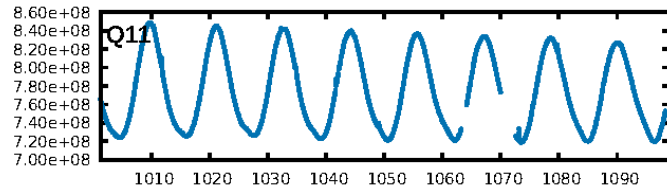
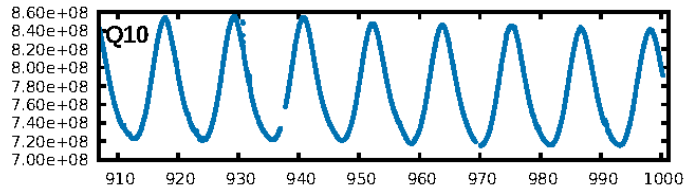
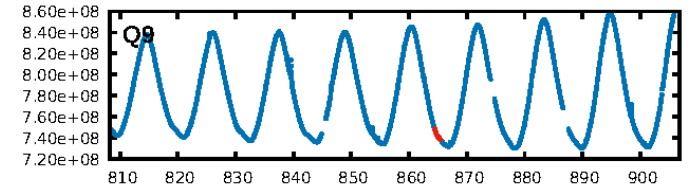
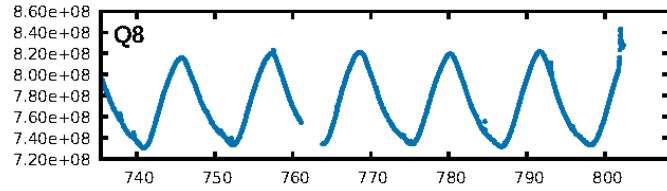
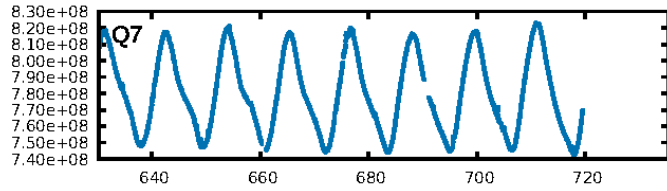
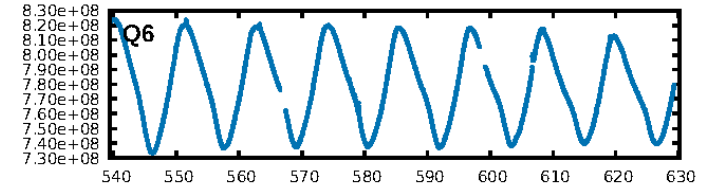
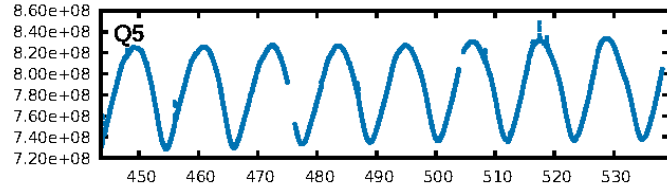
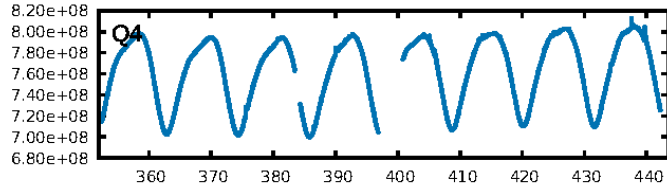
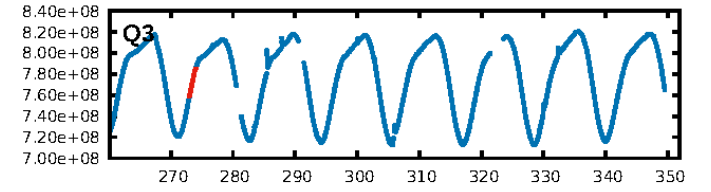
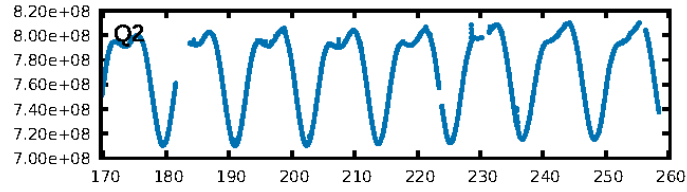
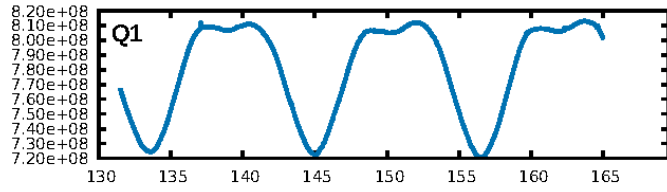
ShortPeriod-sig: 100.0% [123.79 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.433

Centroid-sig: 9.4%  
Centroid-so: 3.977 arcsec [1.45 $\sigma$ ]  
OotOffset-rm: 0.850 arcsec [1.39 $\sigma$ ]  
KicOffset-rm: 1.225 arcsec [2.34 $\sigma$ ]  
OotOffset-st: 0/2/0/1 [3]  
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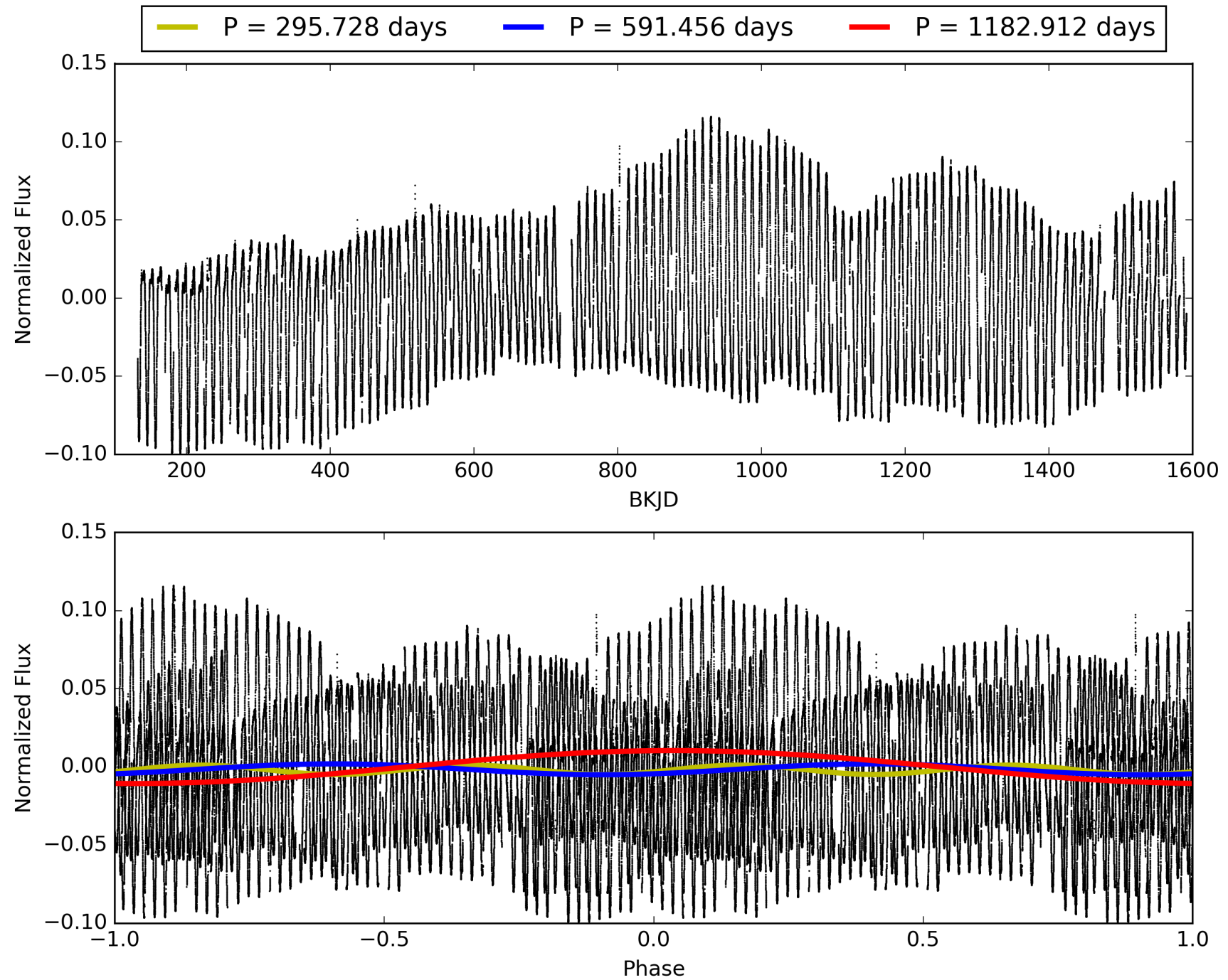
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:21:43 Z

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

# TCE 007899428-07, PDC Light Curves

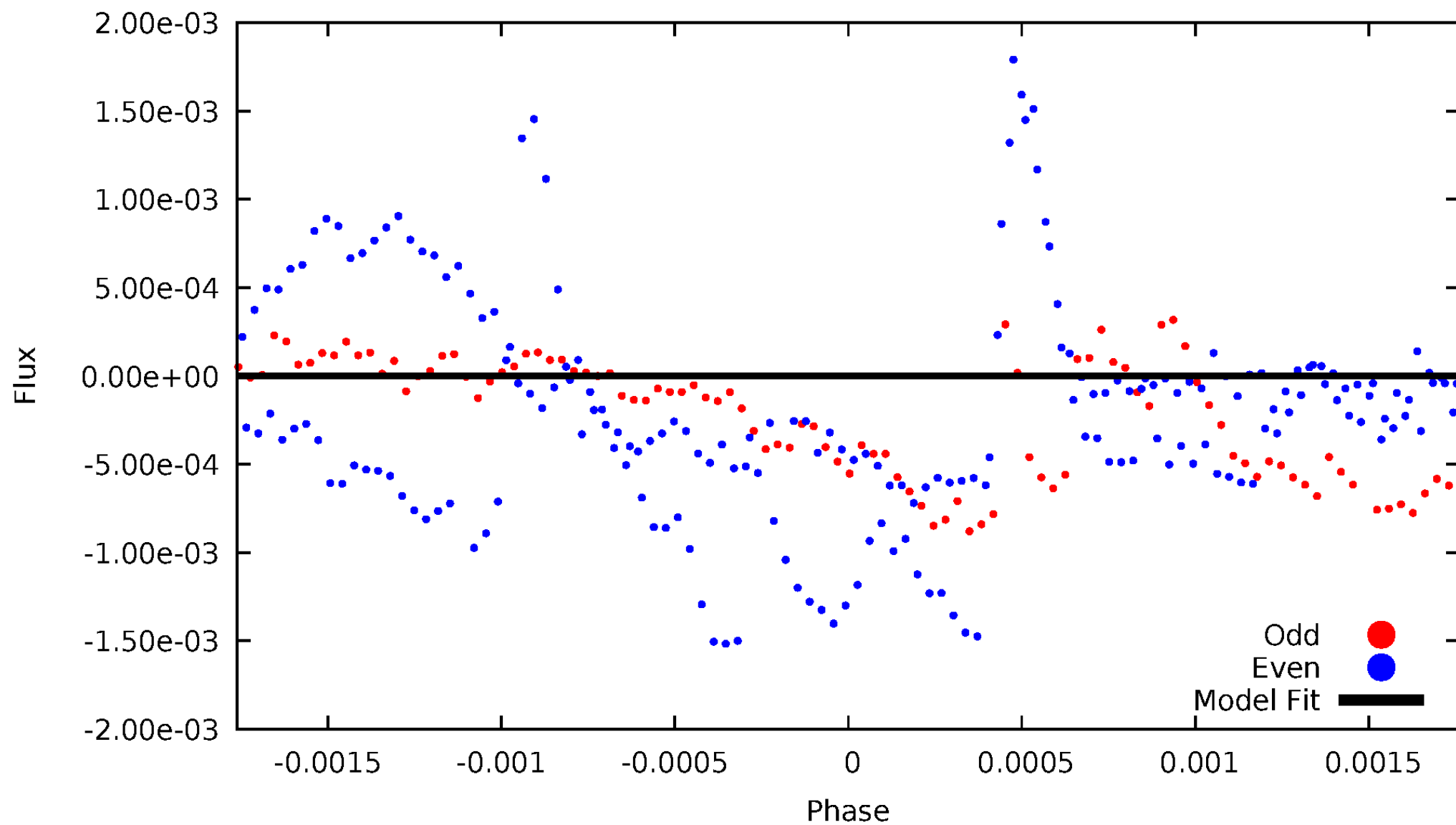


# TCE 007899428-07



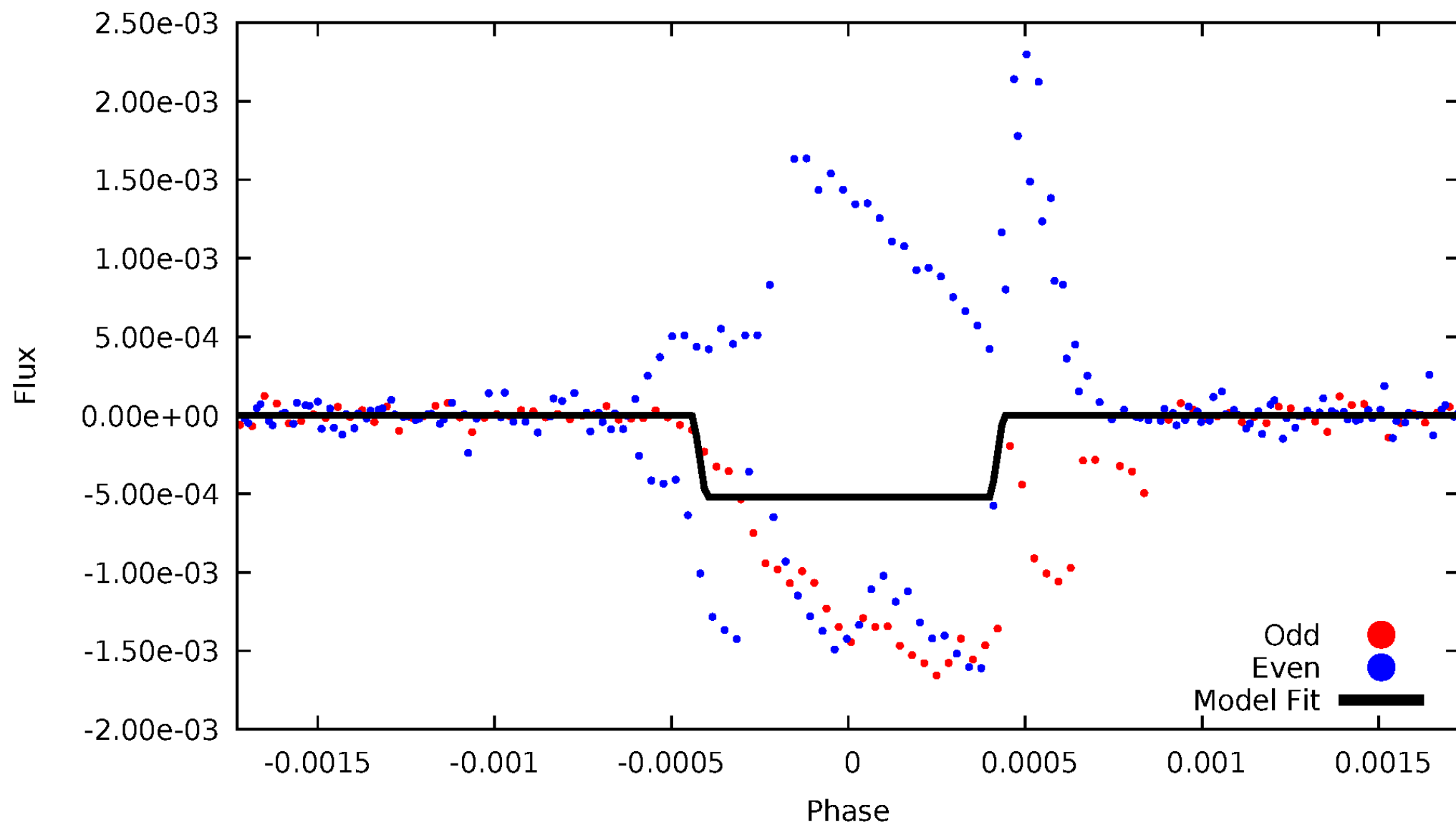
# DV Odd/Even

TCE 007899428-07



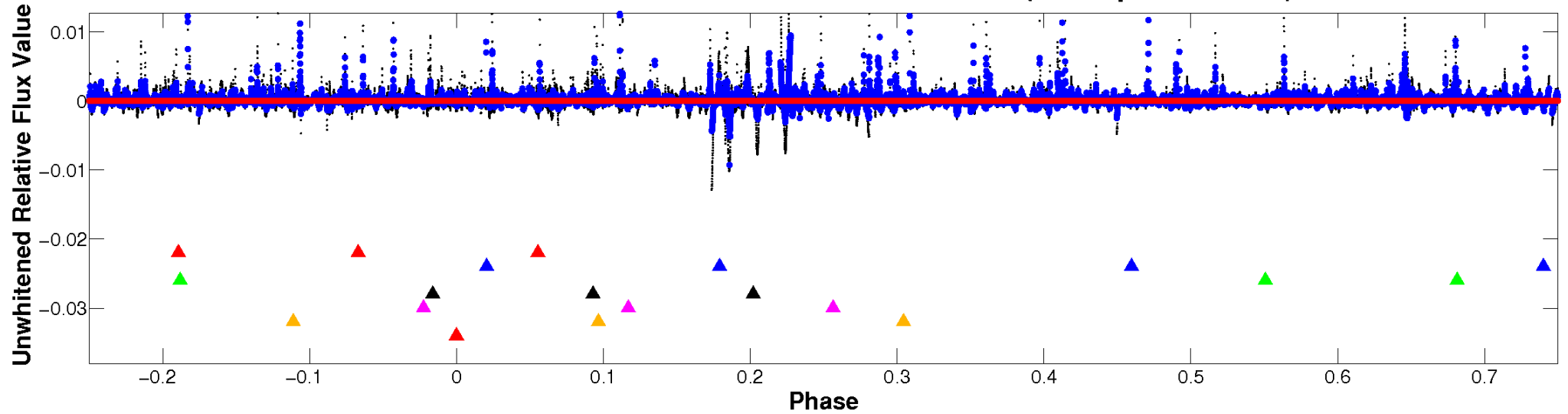
# ALT Odd/Even

TCE 007899428-07



# Non-Whitened Vs. Whitened Light Curve

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

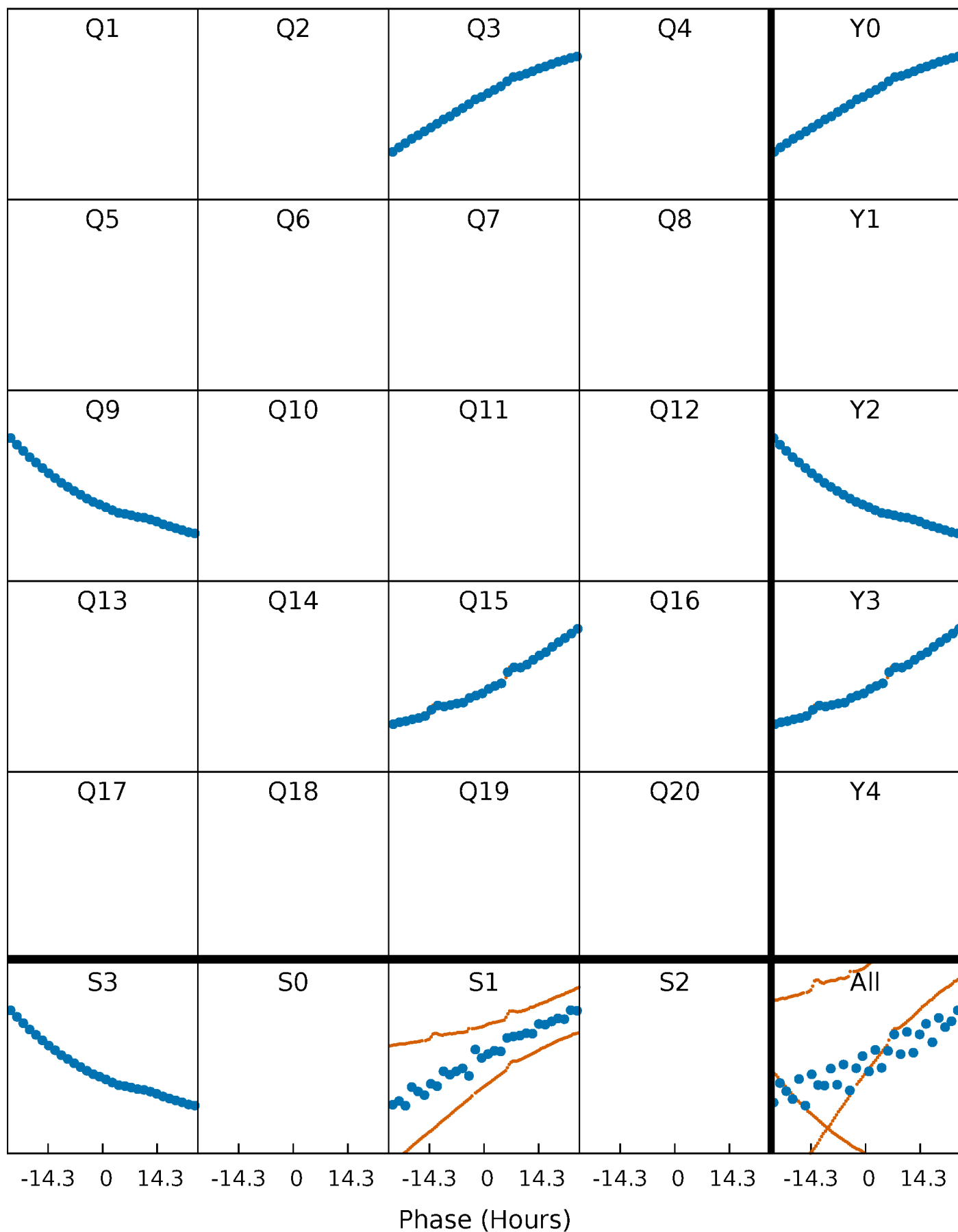


**Planet 7 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

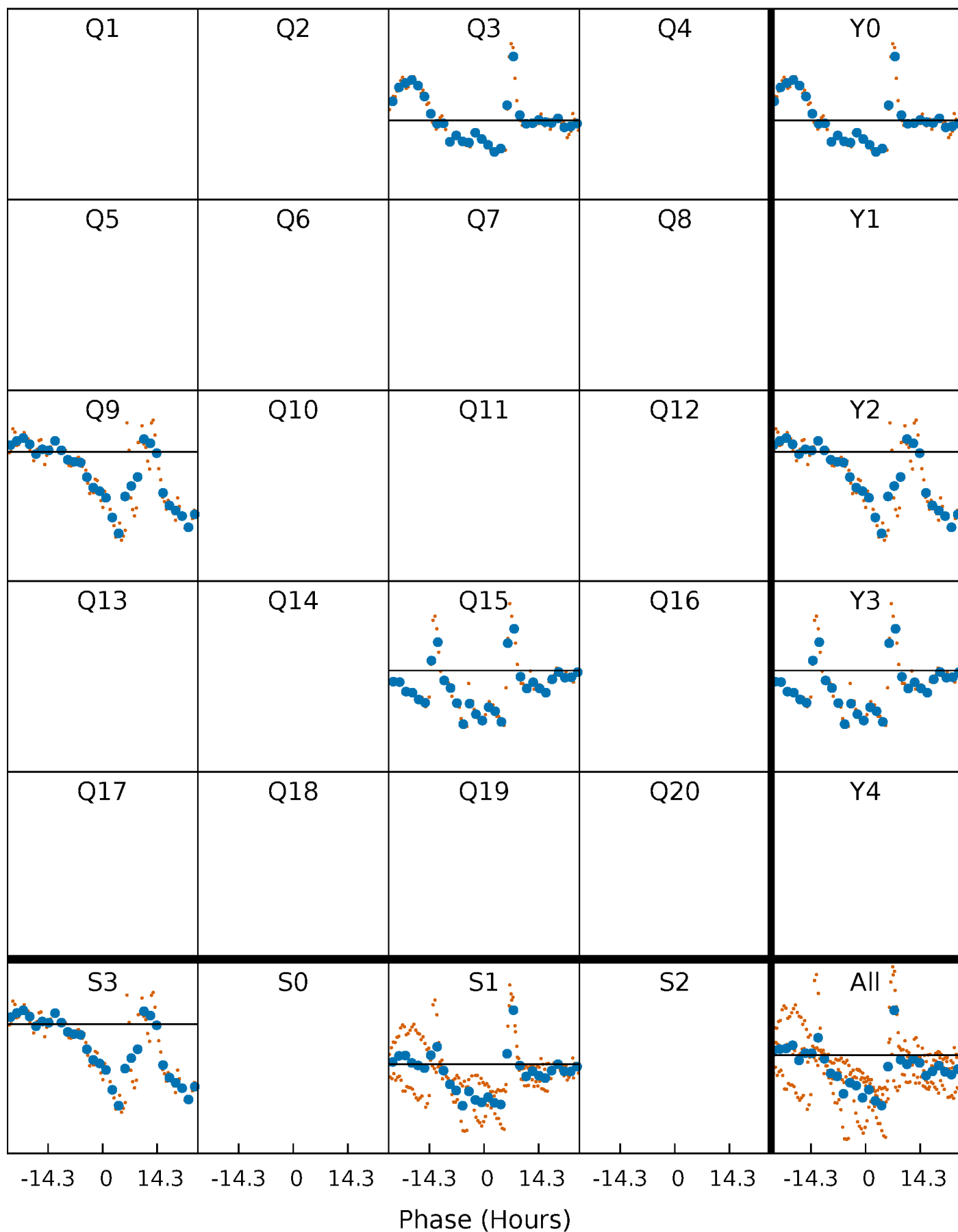
TCE 007899428-07     $P=591.456205$  Days     $T_0=273.496991$  (BKJD)





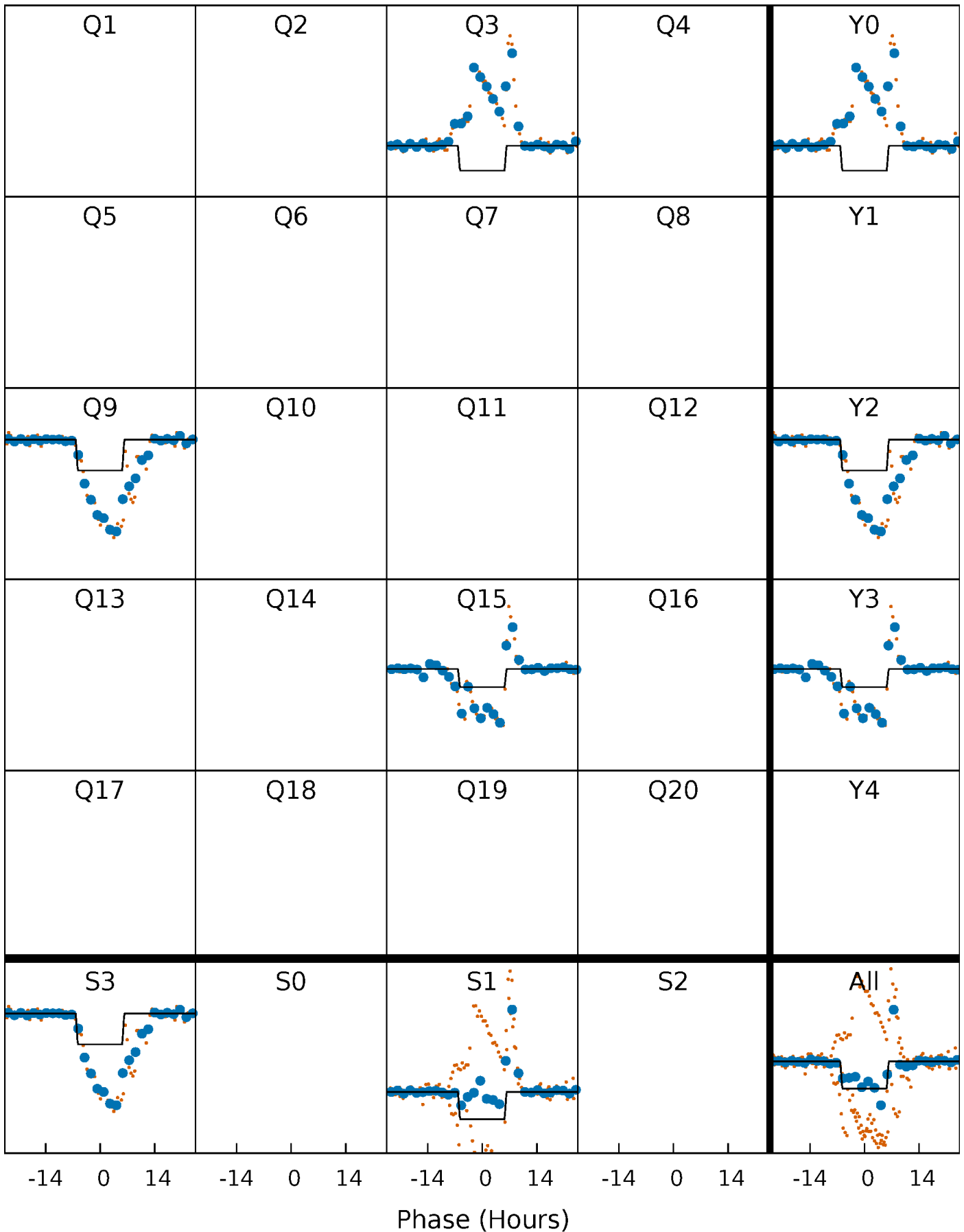
# DV Quarter-Phased Transit Curves

TCE 007899428-07     $P=591.456205$  Days     $T_0=273.496991$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

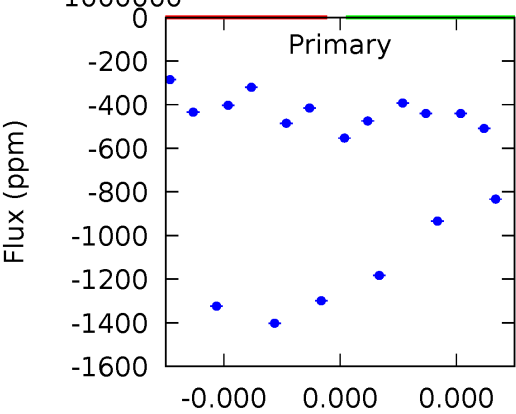
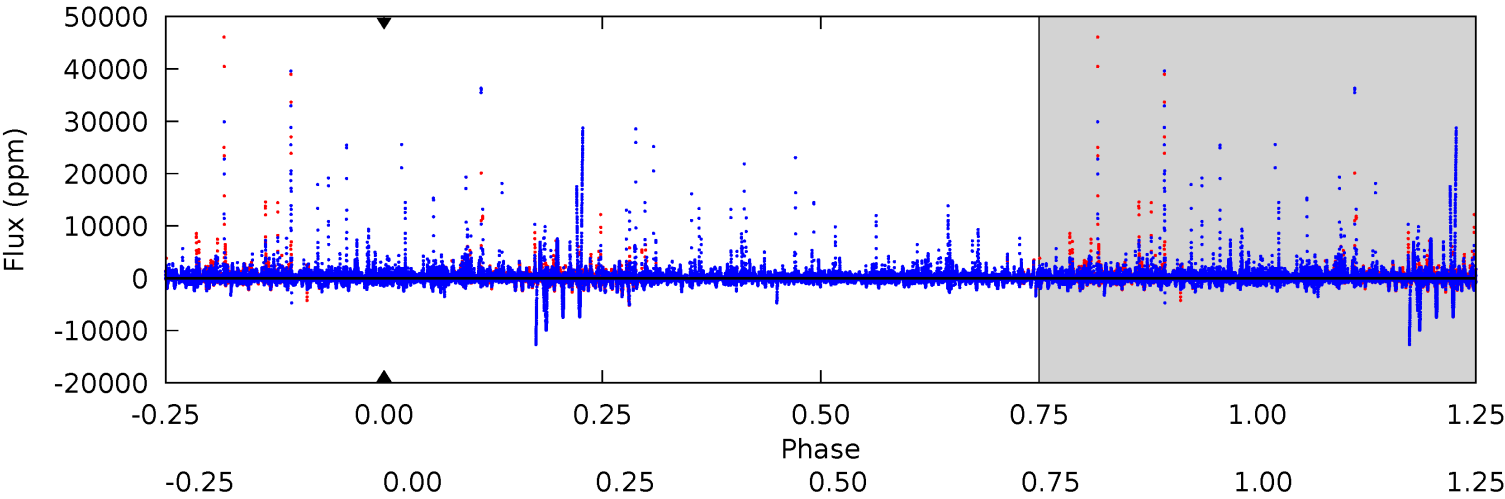
TCE 007899428-07 P=591.456205 Days  $T_0=273.494777$  (BKJD)



# DV Model-Shift Uniqueness Test

007899428-07, P = 591.456205 Days, E = 273.496991 Days

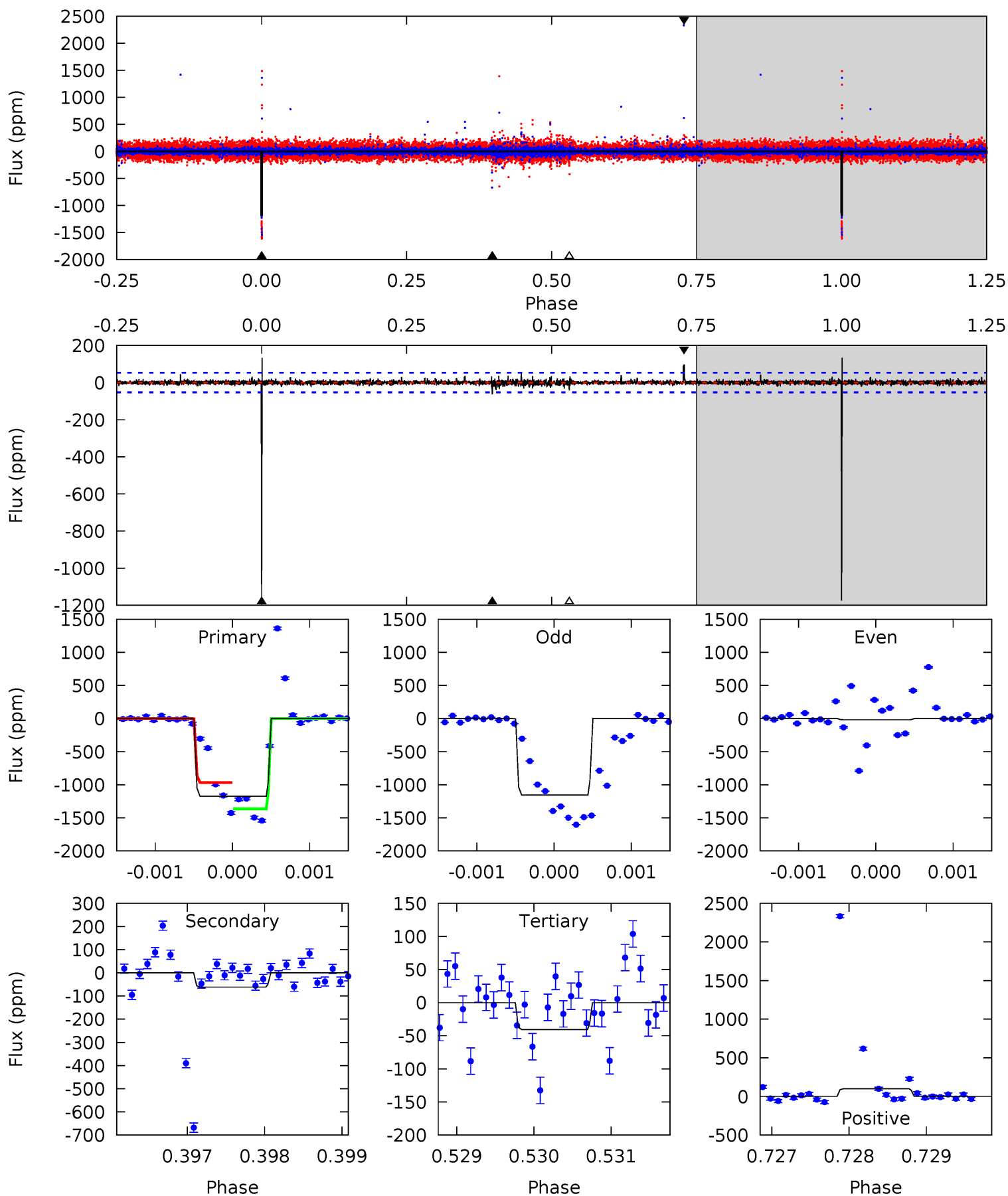
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007899428-07, P = 591.456205 Days, E = 273.494777 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
121.1	6.34	4.19	10.1	5.47	3.32	0.66	116.9	111.0	2.16	-3.75	48.0	0.41	0.10	20.2



### Stellar Parameters For KIC 007899428

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4914^{+177}_{-177}$	$4.554^{+0.066}_{-0.044}$	$-0.100^{+0.300}_{-0.300}$	$0.747^{+0.063}_{-0.077}$	$0.729^{+0.085}_{-0.054}$	$2.462^{+0.674}_{-0.398}$
	+4%/-4%	+1%/-1%	+300%/-300%	+8%/-10%	+12%/-7%	+27%/-16%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007899428-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$5.74^{+6.18}_{-3.94}$	$235^{+10}_{-11}$	$2350^{+12784}_{-16887}$	$1367^{+4544958}_{-4334558}$
Alt.	$-62 \pm 10$	$6.23^{+6.43}_{-4.25}$	$234^{+10}_{-10}$	$2411^{+886}_{-352}$	$1360^{+11474}_{-1037}$

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

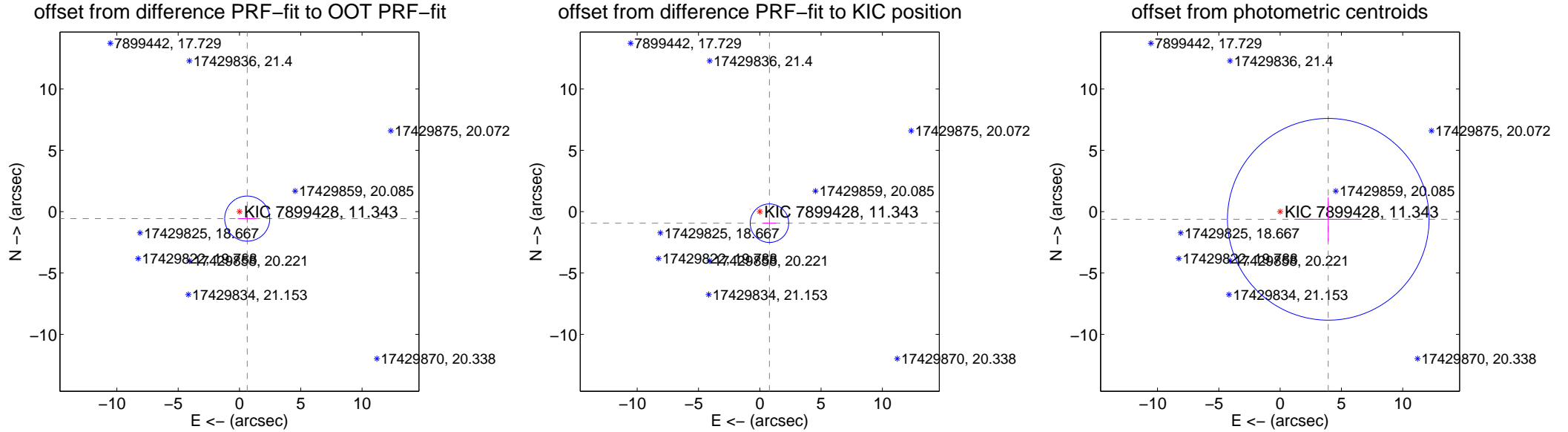
## DV Centroid Data

Supplemental centroid analysis for 007899428-07. **Kepler magnitude: 11.34.** Transit SNR -1.00

**There are 2 quarters with good PRF difference image offsets**

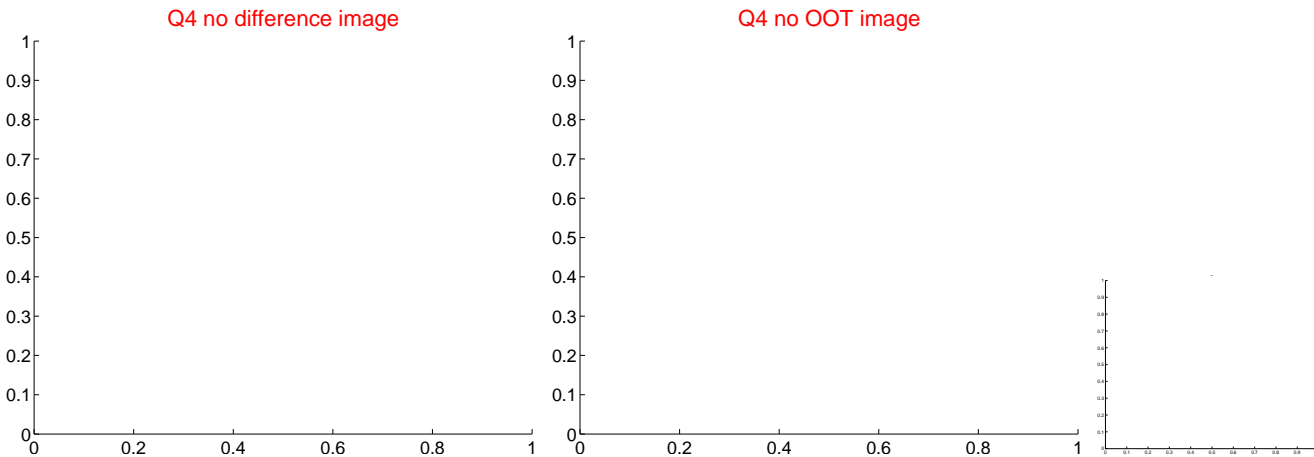
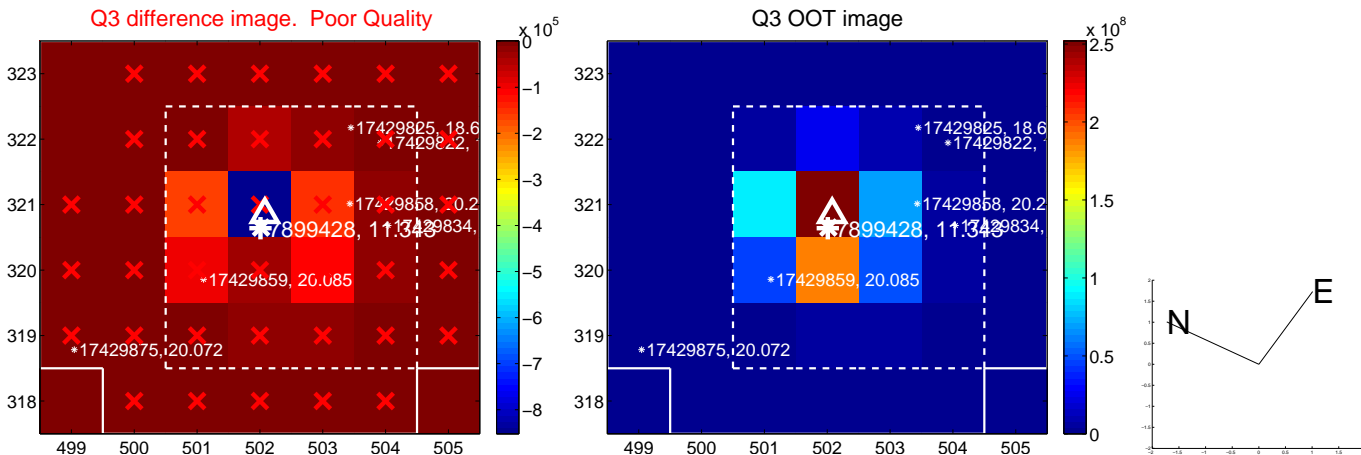
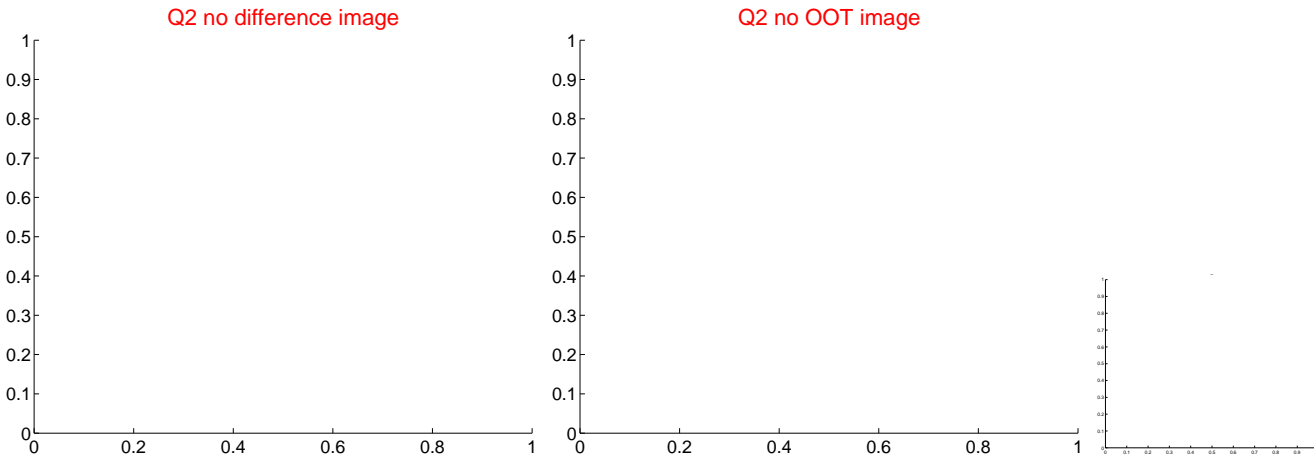
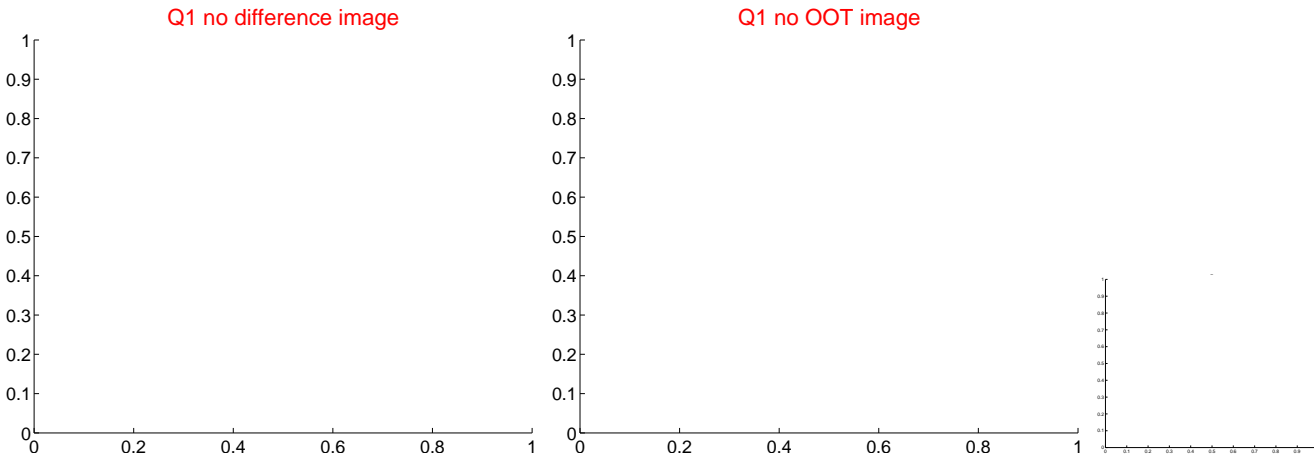
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.850 \pm 0.613$	1.39	$-0.634 \pm 0.761$	$-0.566 \pm 0.346$
PRF-fit source offset from KIC position	$1.225 \pm 0.524$	2.34	$-0.788 \pm 0.522$	$-0.938 \pm 0.260$
photometric centroid source offset	$3.98 \pm 2.74$	1.45	$-3.93 \pm 2.76$	$-0.62 \pm 1.80$



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

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

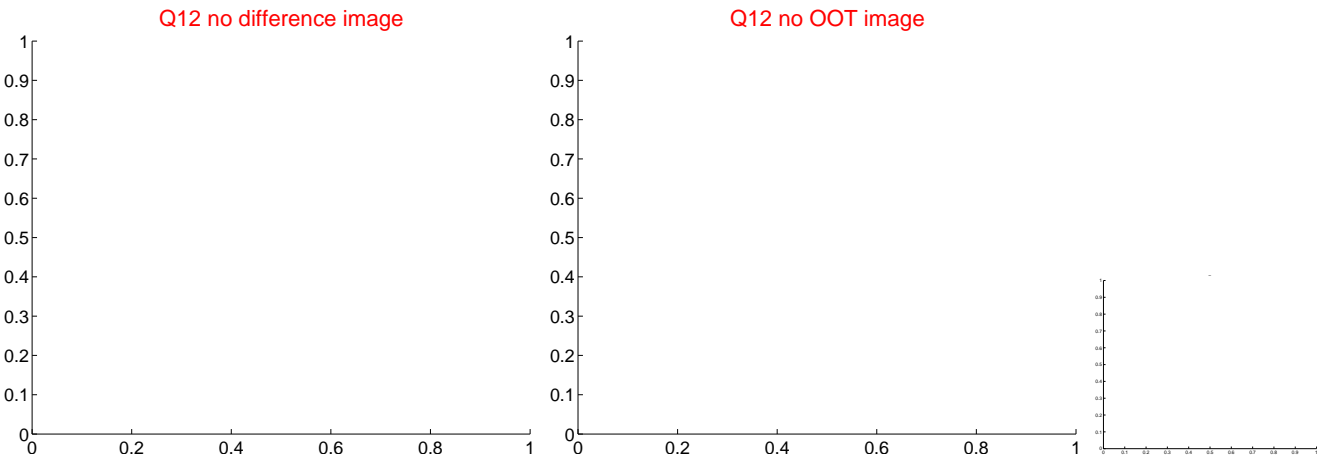
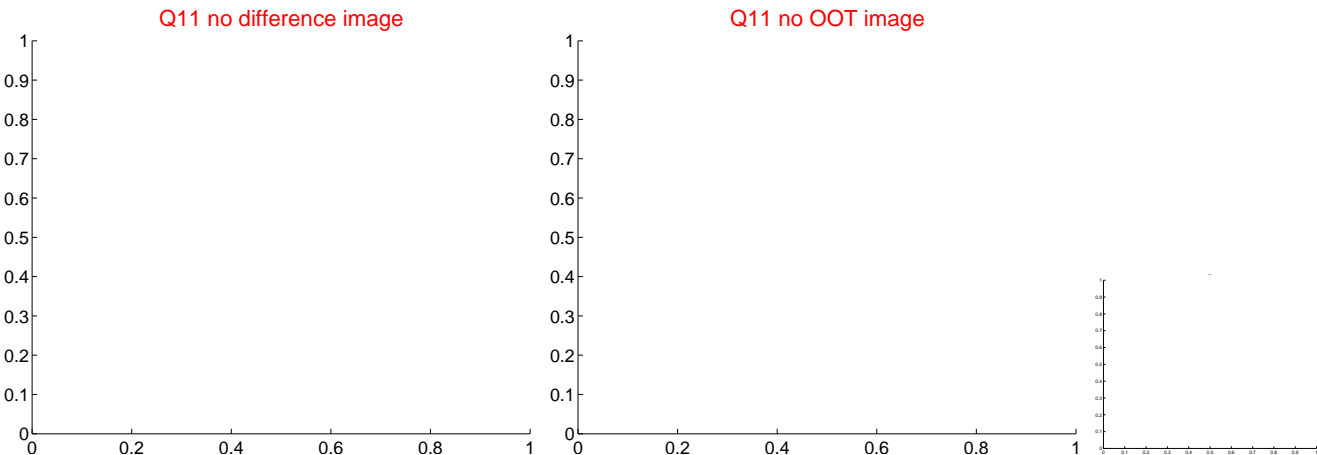
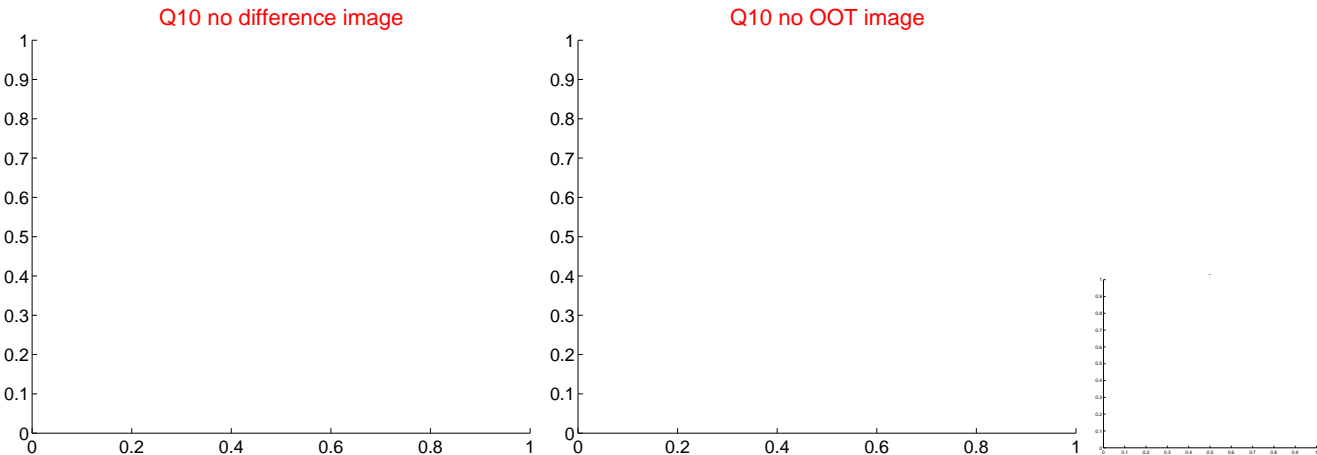
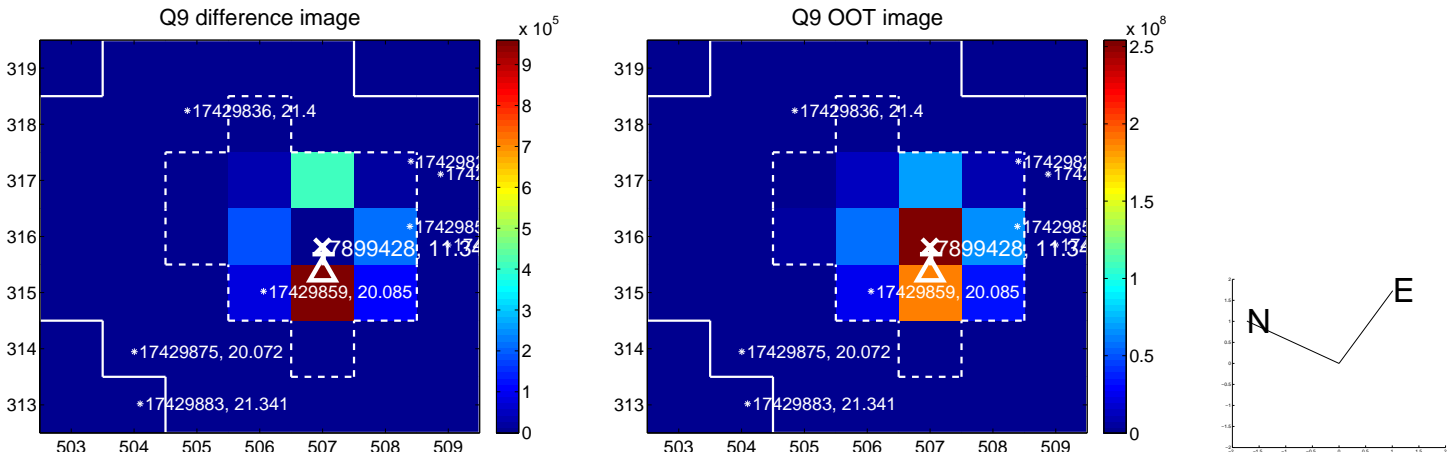


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

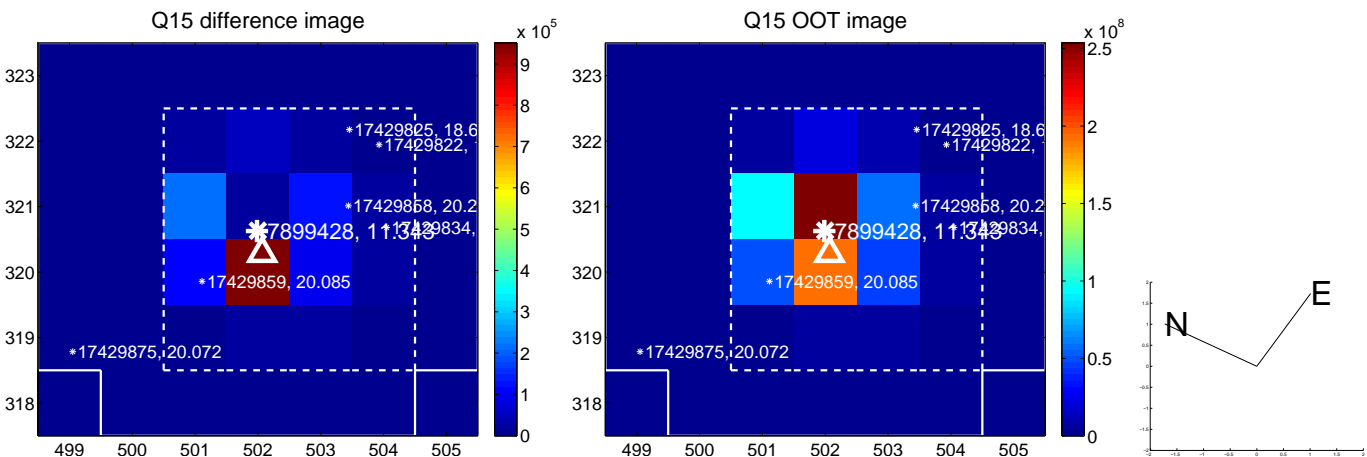




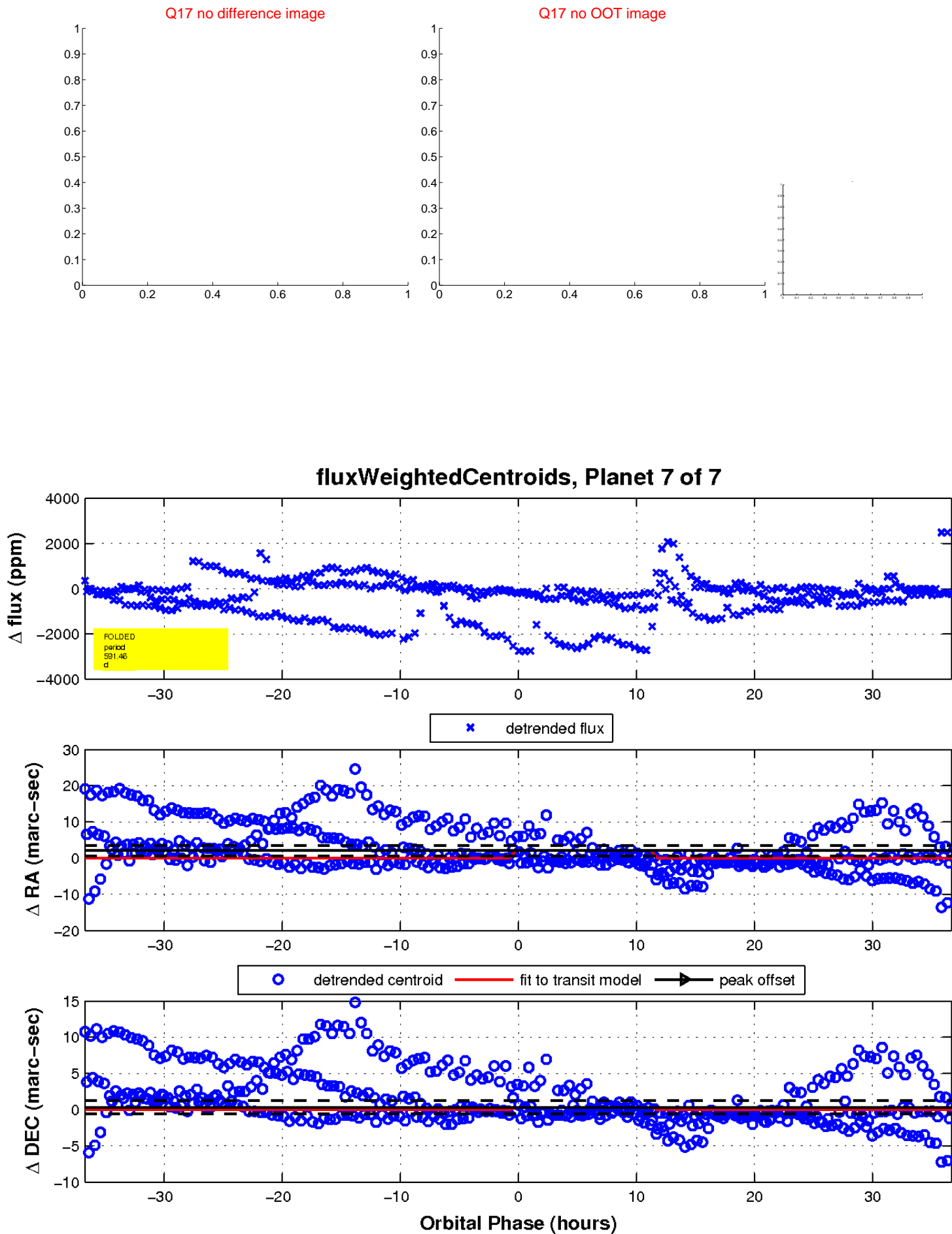
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

