

# KIC 008507979

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008507979-01	OBS	No	485.412840	267.169399	712.8	10.500	20.8	-1.0	0.56	3673	1.44	0.05
008507979-02	OBS	No	1.217481	132.056003	529.6	6.938	17.7	19.8	0.56	3673	1.24	150.83
008507979-03	OBS	No	63.204402	190.514768	597.2	1.959	9.5	2.1	0.56	3673	1.32	0.78
008507979-04	OBS	No	317.800217	150.799469	2545.5	4.825	9.7	8.4	0.56	3673	3.44	0.09
008507979-05	OBS	No	153.465914	240.607053	766.2	3.000	11.4	-1.0	0.56	3673	1.49	0.24
008507979-06	OBS	No	58.313574	179.490673	619.9	9.935	8.2	3.4	0.56	3673	1.34	0.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008507979-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008507979-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS

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

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

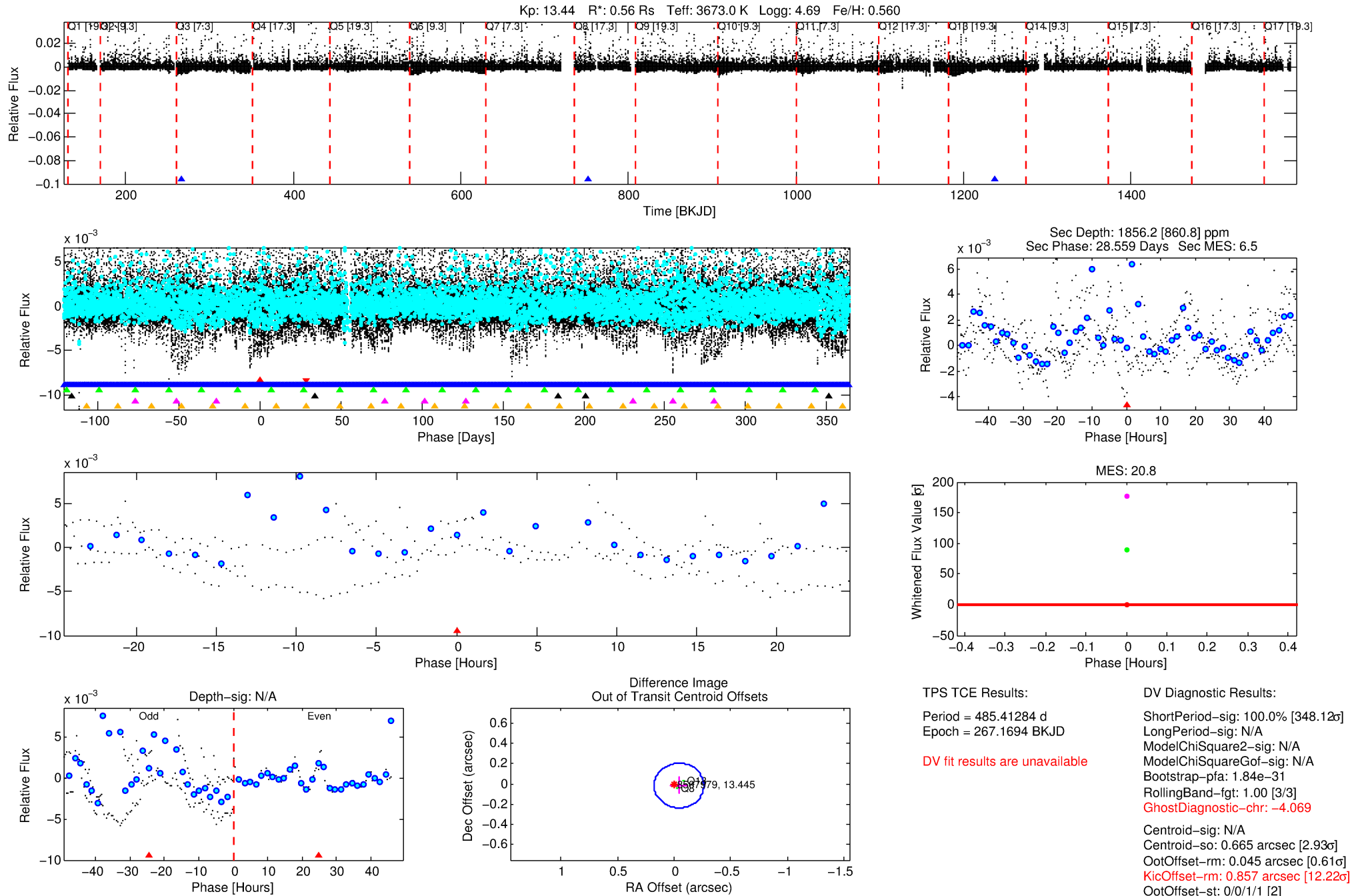
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008507979-01

No Significant Match Found

# DV One-Page Summary

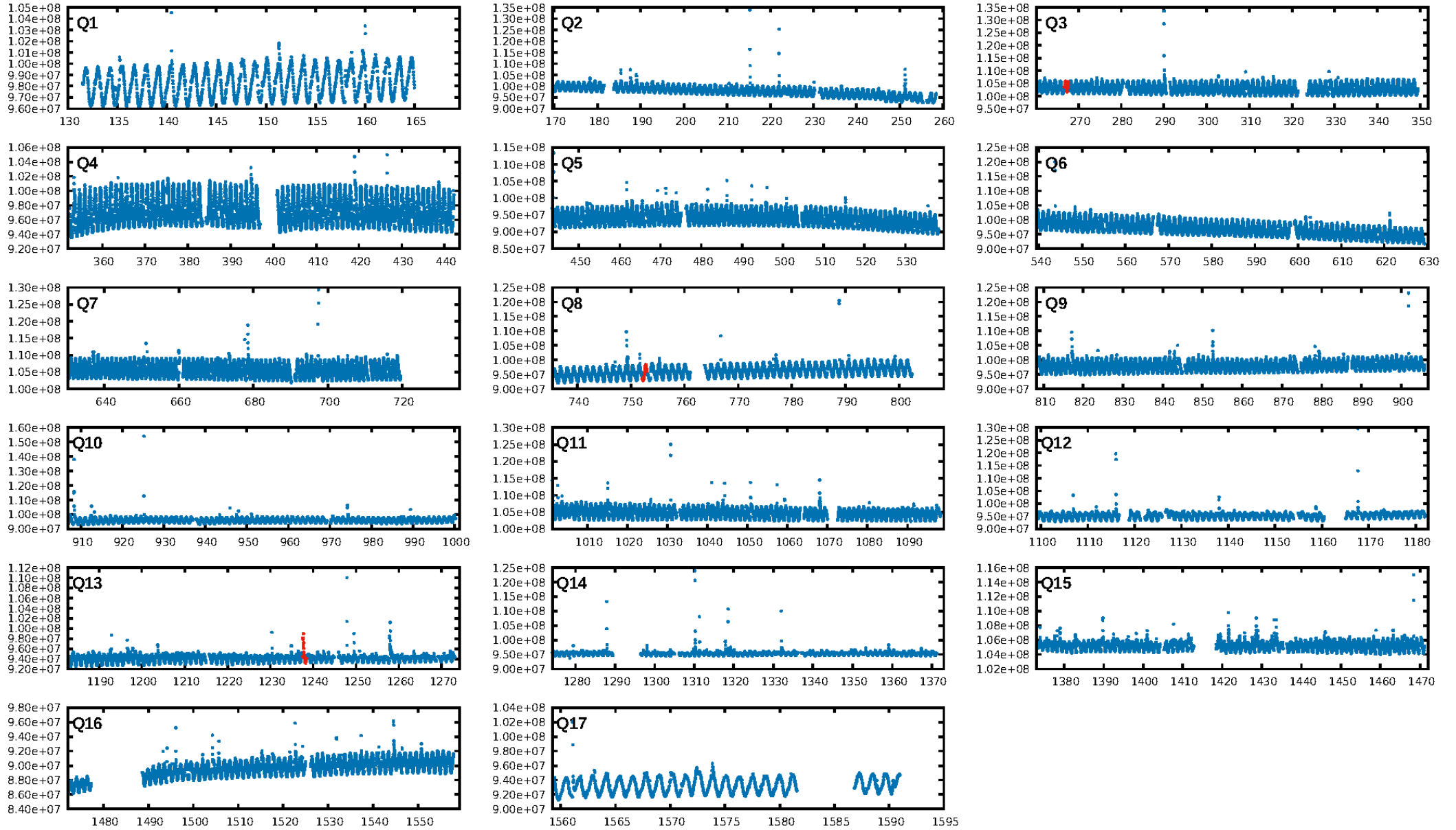
KIC: 8507979 Candidate: 1 of 6 Period: 485.413 d



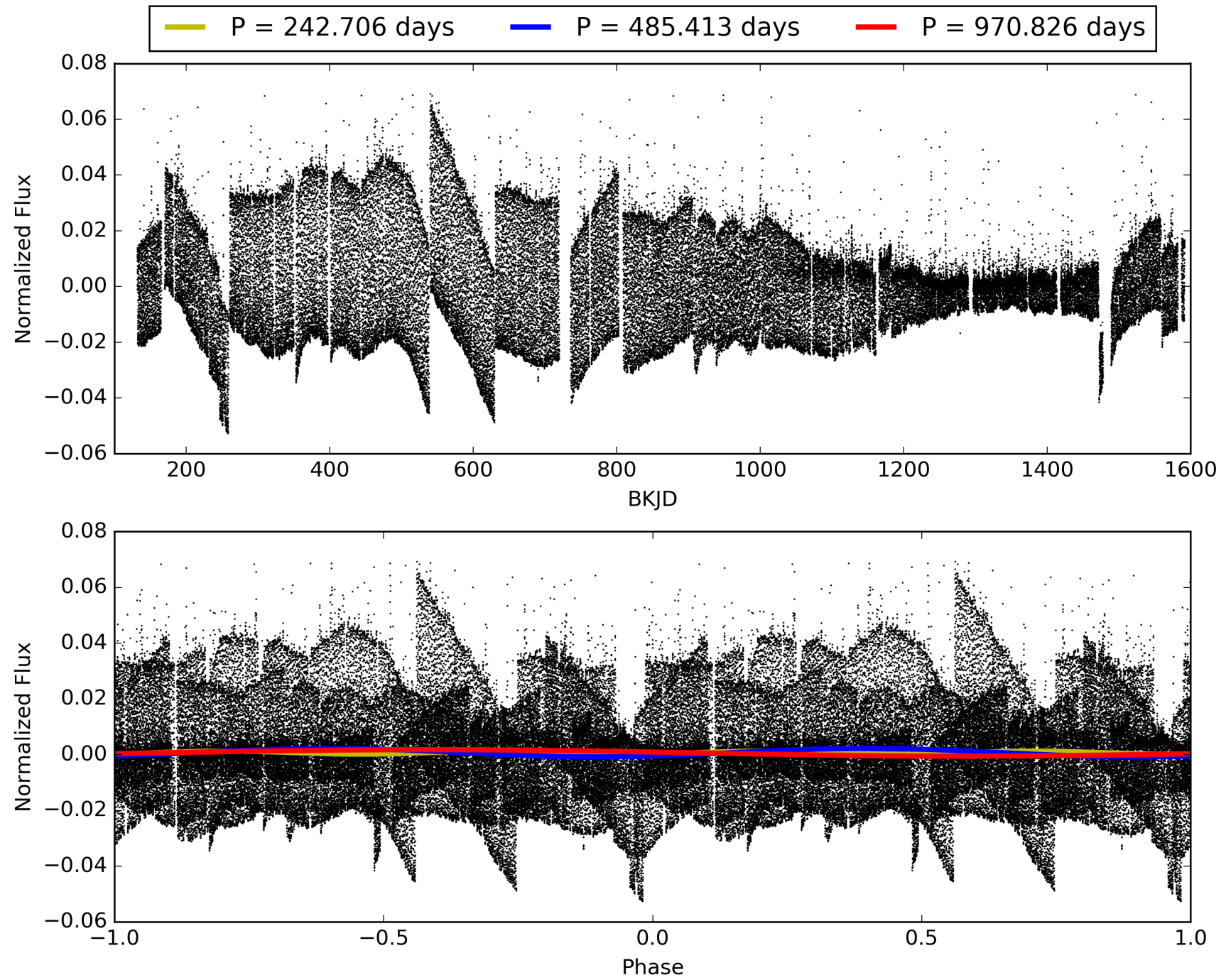
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:57:38 Z

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

# TCE 008507979-01, PDC Light Curves



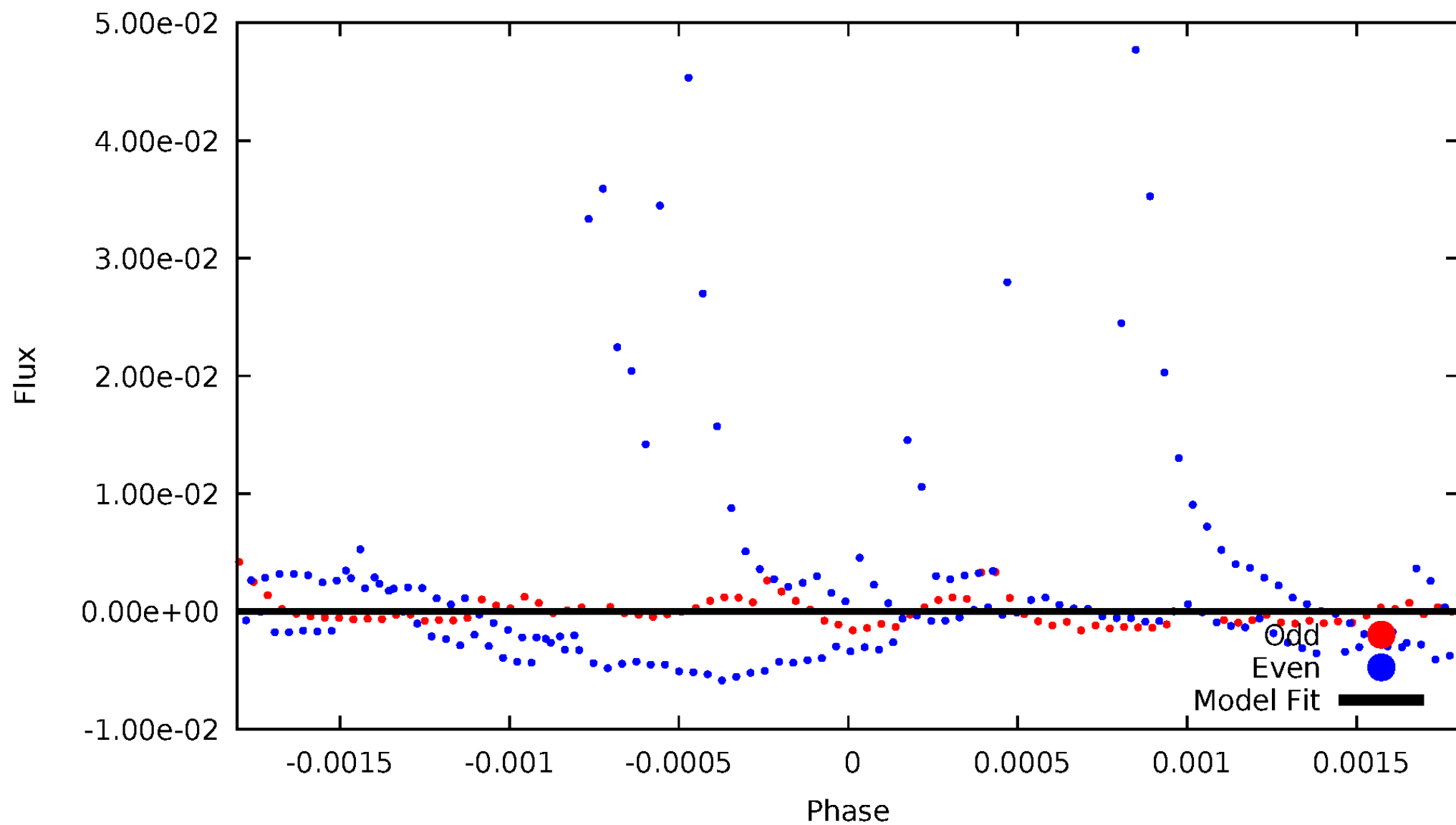
TCE 008507979-01





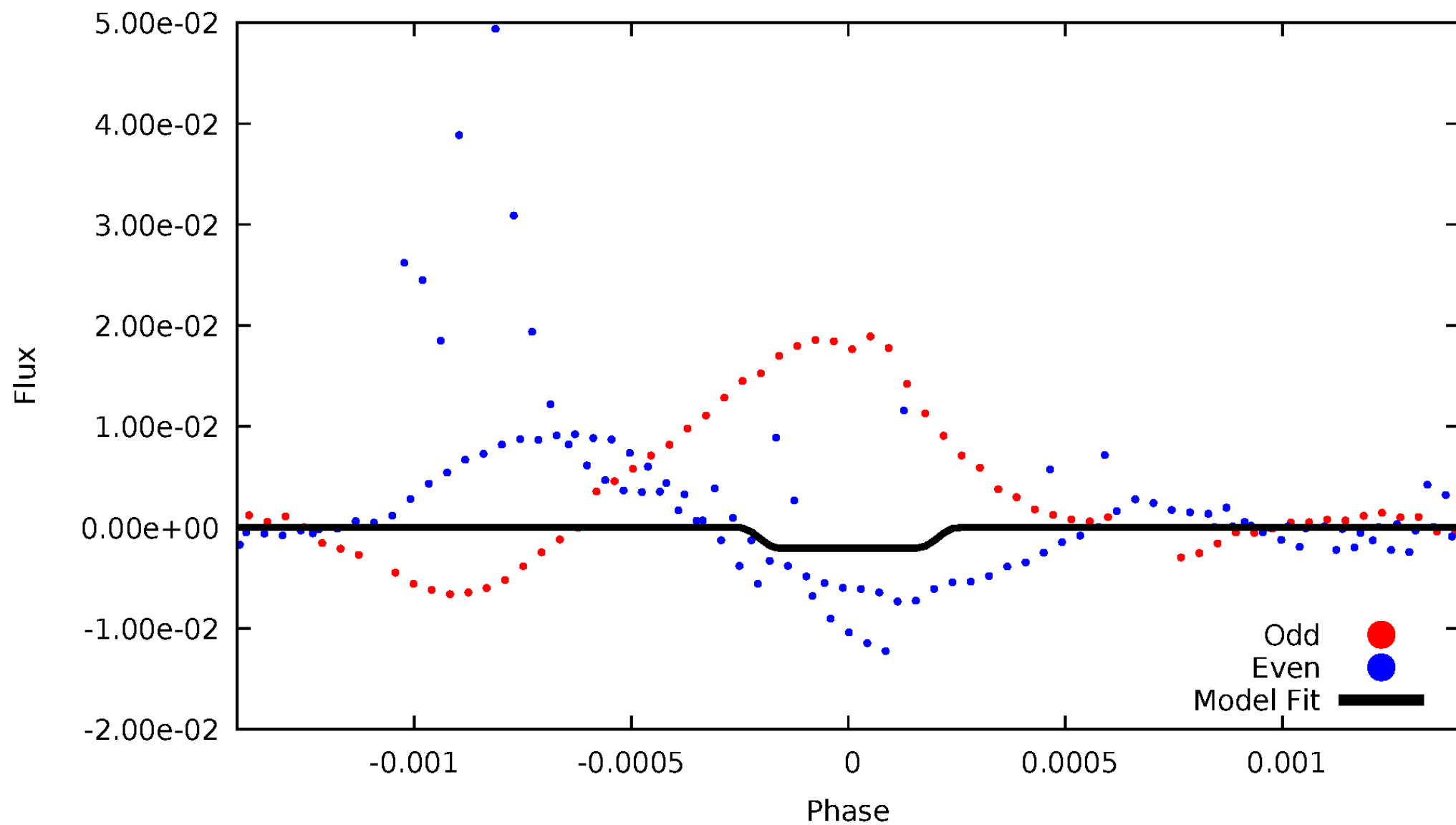
# DV Odd/Even

TCE 008507979-01



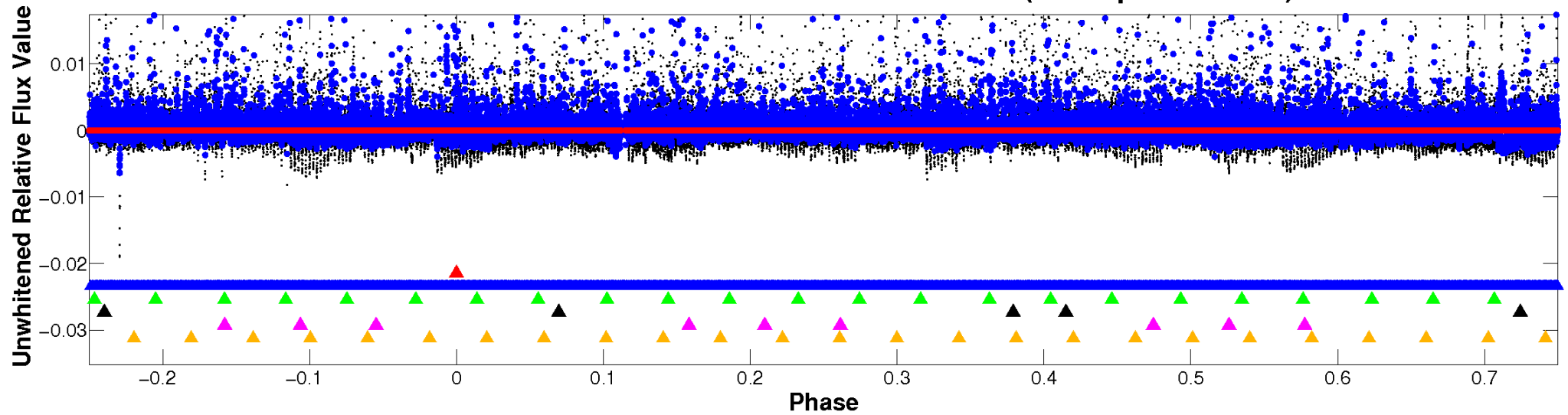
# ALT Odd/Even

TCE 008507979-01



# Non-Whitened Vs. Whitened Light Curve

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

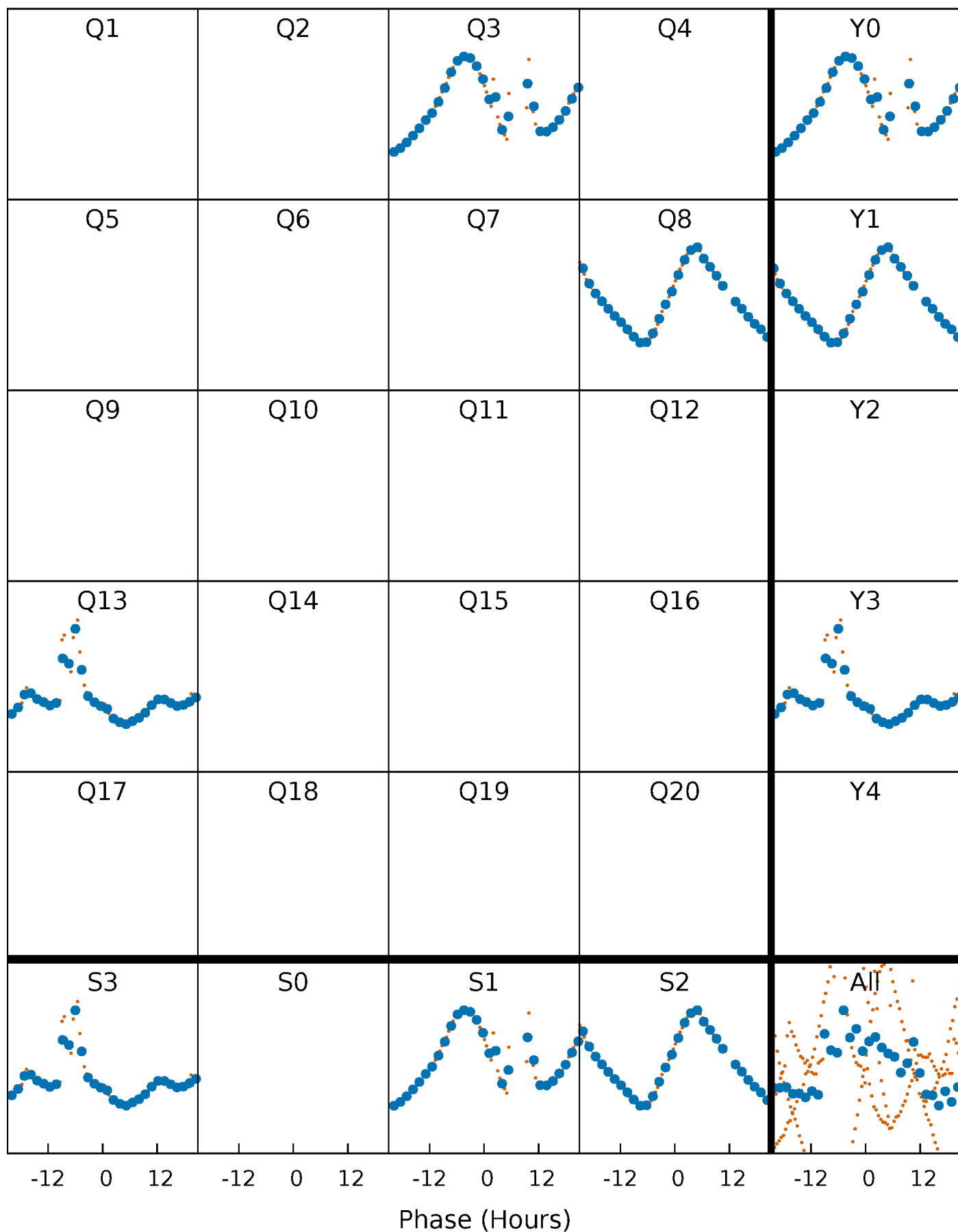


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



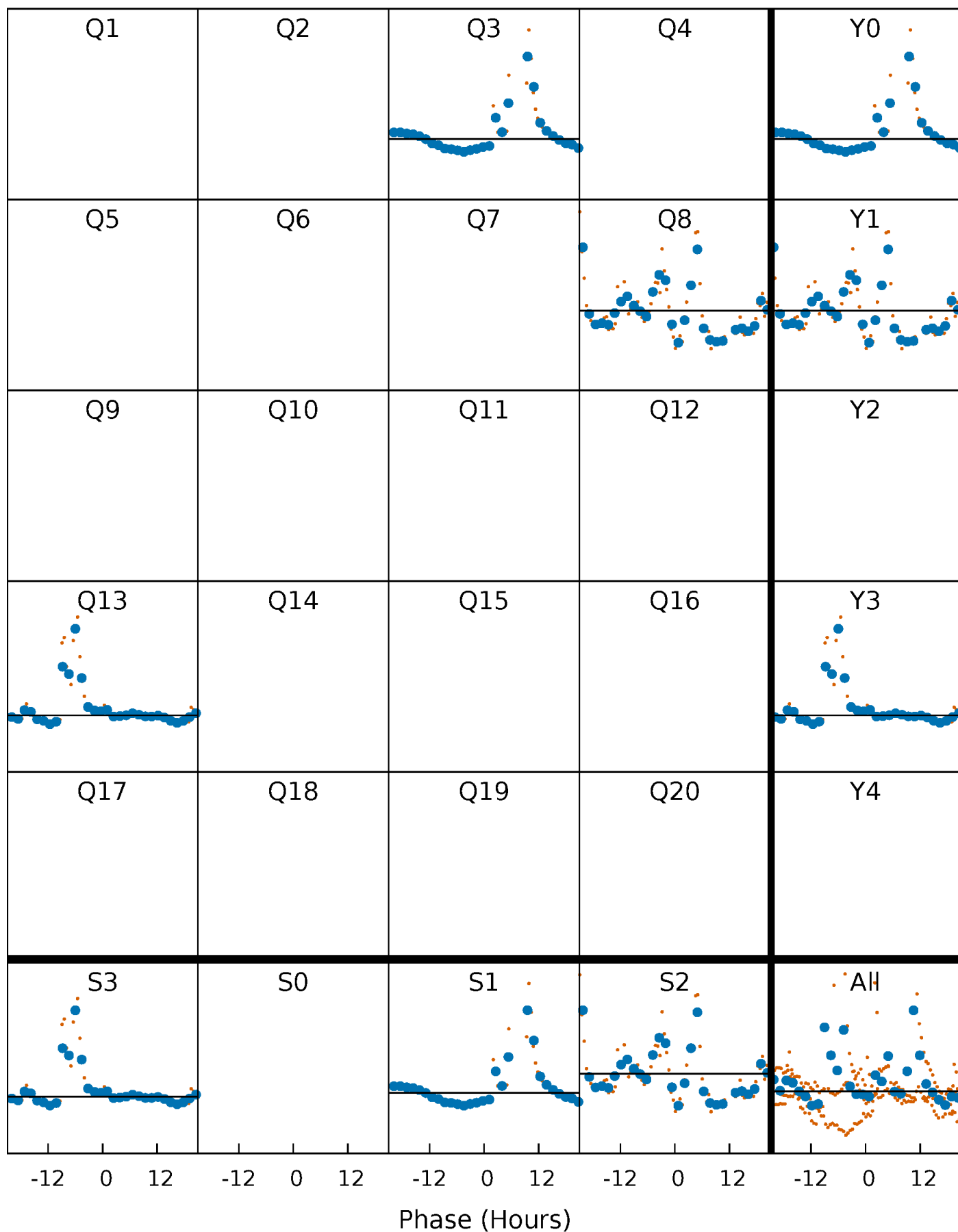
# PDC Quarter-Phased Transit Curves

TCE 008507979-01 P=485.412840 Days  $T_0=267.169399$  (BKJD)



# DV Quarter-Phased Transit Curves

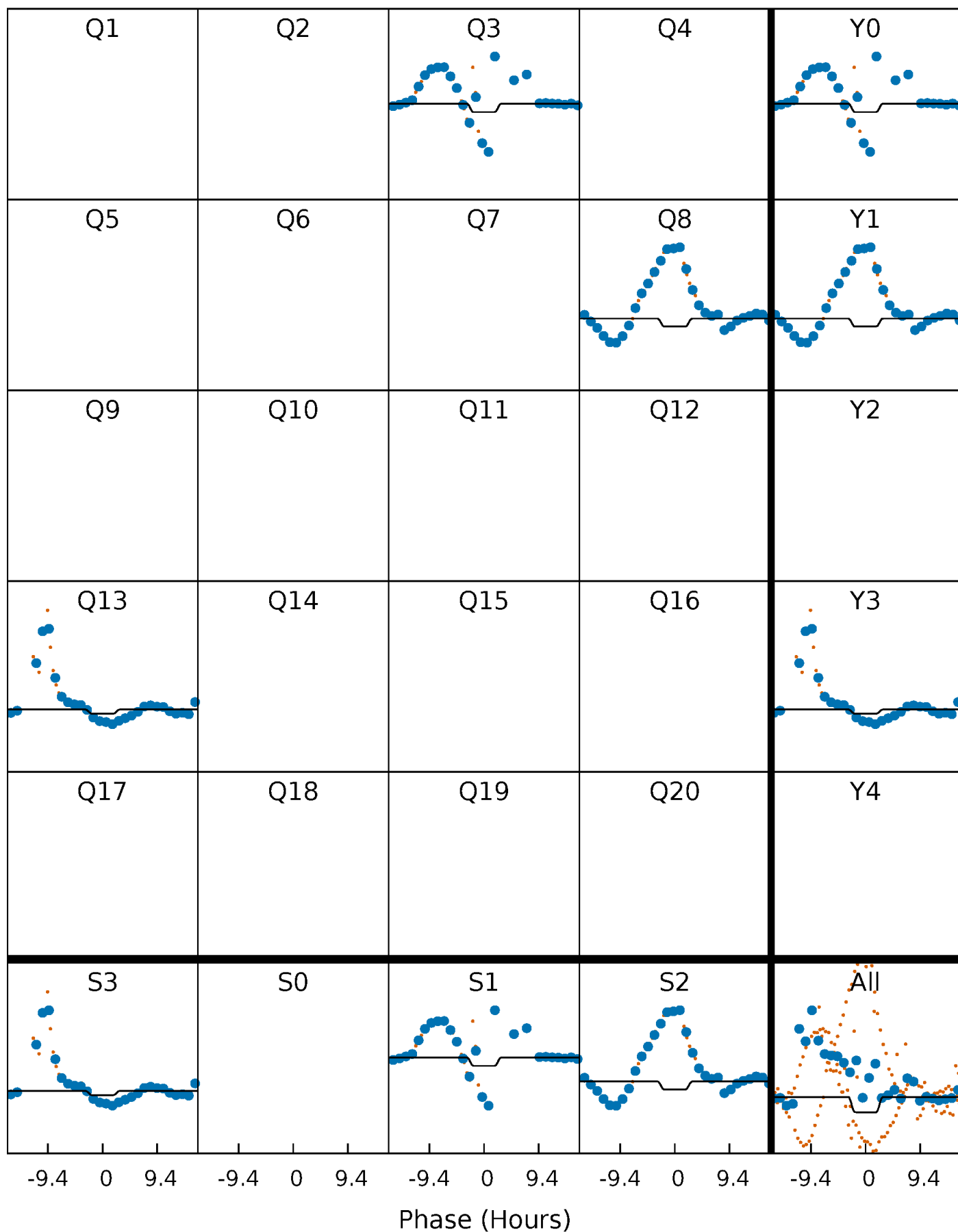
TCE 008507979-01 P=485.412840 Days  $T_0=267.169399$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

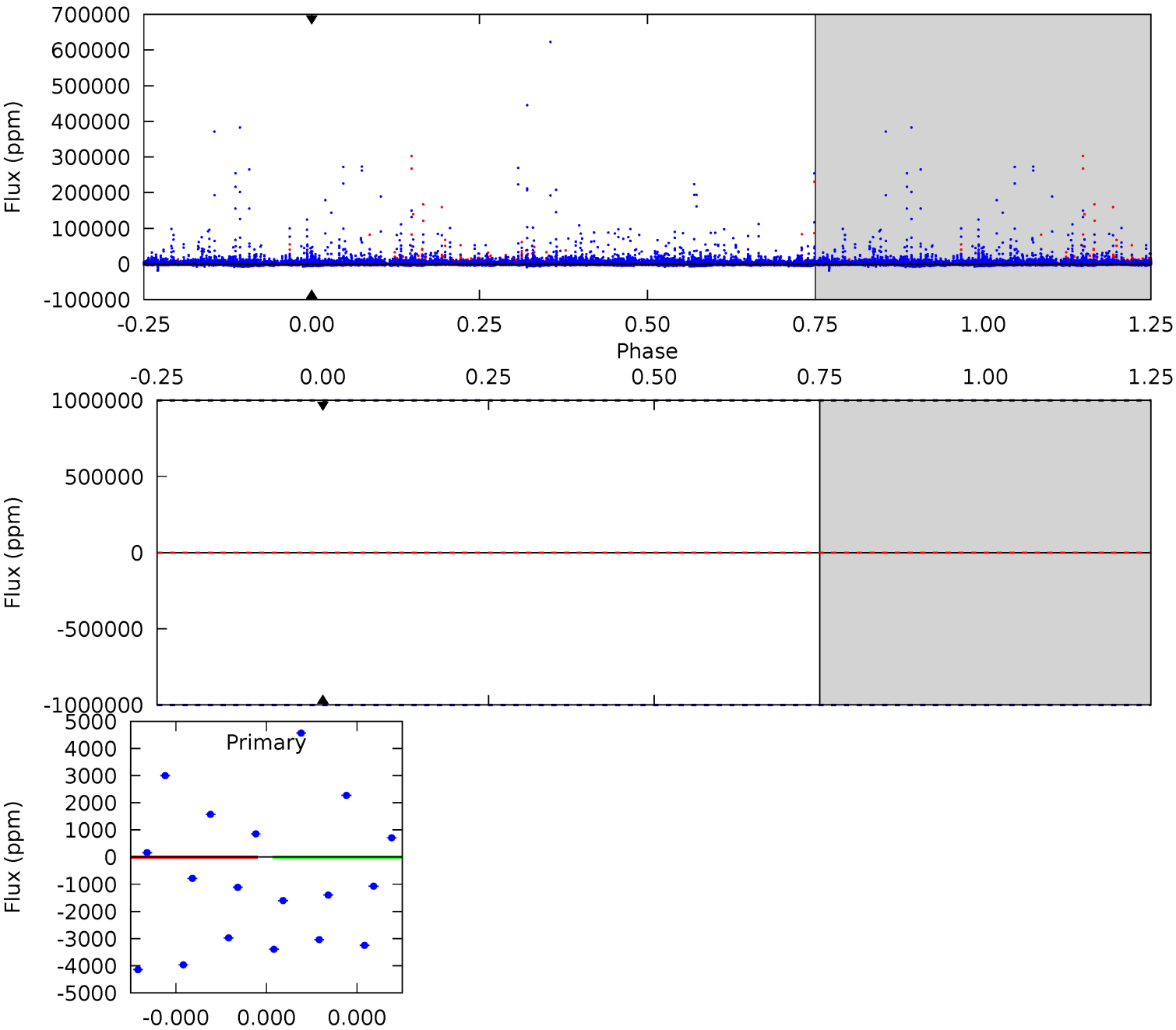
TCE 008507979-01 P=485.412840 Days  $T_0=267.335008$  (BKJD)



# DV Model-Shift Uniqueness Test

008507979-01, P = 485.412840 Days, E = 267.169399 Days

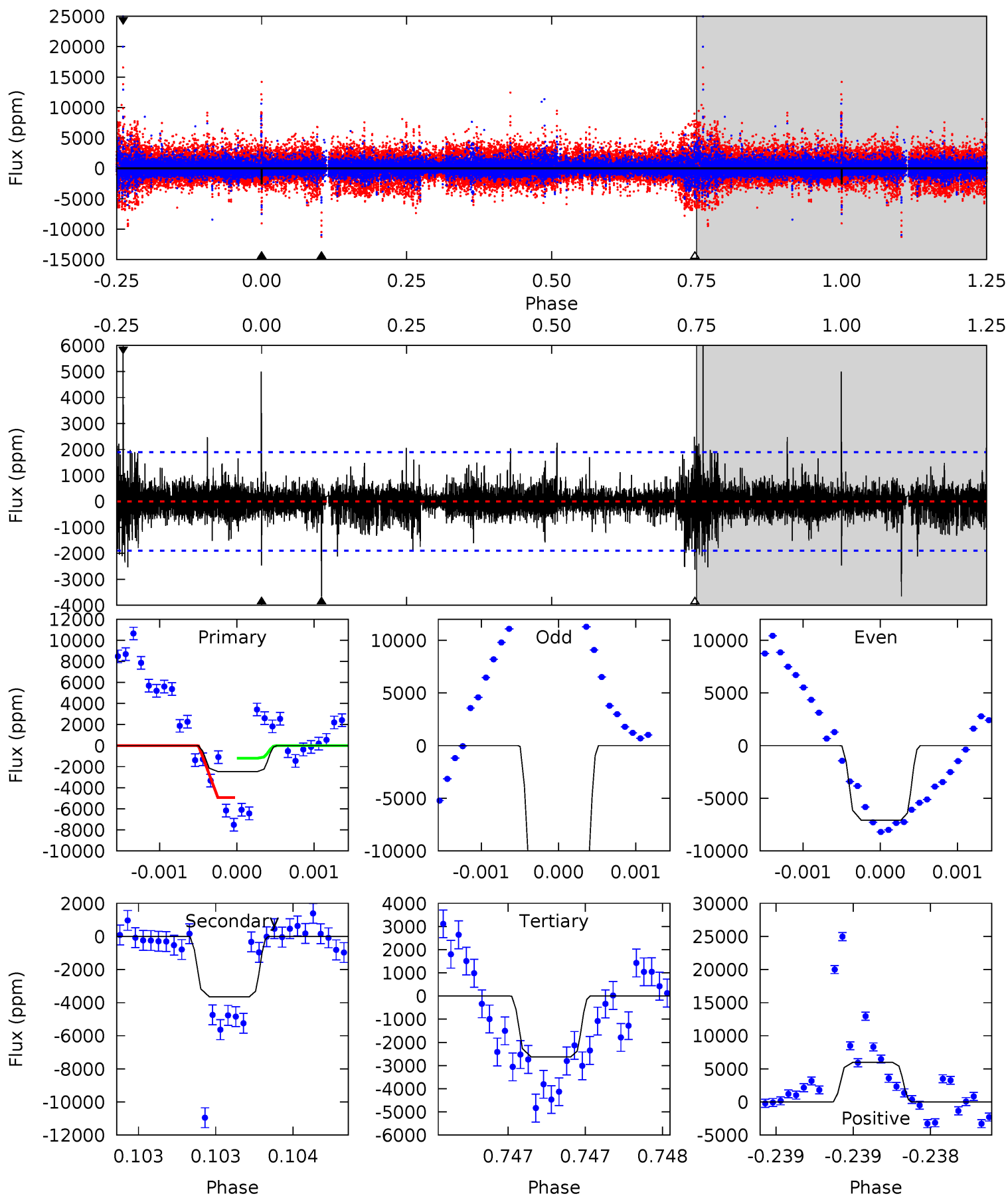
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008507979-01, P = 485.412840 Days, E = 267.335008 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.26	10.7	7.71	17.6	5.57	3.48	1.20	-0.45	-10.3	3.03	-6.86	17.0	-0.74	0.62	5.48



### Stellar Parameters For KIC 008507979

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3673^{+117}_{-147}$	$4.691^{+0.080}_{-0.020}$	$0.560^{+0.050}_{-0.300}$	$0.560^{+0.032}_{-0.081}$	$0.561^{+0.040}_{-0.069}$	$4.498^{+1.756}_{-0.469}$
	+3%/-4%	+2%/-0%	+9%/-54%	+6%/-14%	+7%/-12%	+39%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008507979-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$4.53^{+4.49}_{-3.19}$	$167^{+7}_{-7}$	$-3106^{+11170}_{-4390}$	$-49568.227^{+5481701.280}_{-4121798.471}$
Alt.	$-3654 \pm 340$	$5.15^{+5.19}_{-3.64}$	$168^{+6}_{-8}$	$3299^{+1734}_{-600}$	$79380^{+798727}_{-60513}$

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

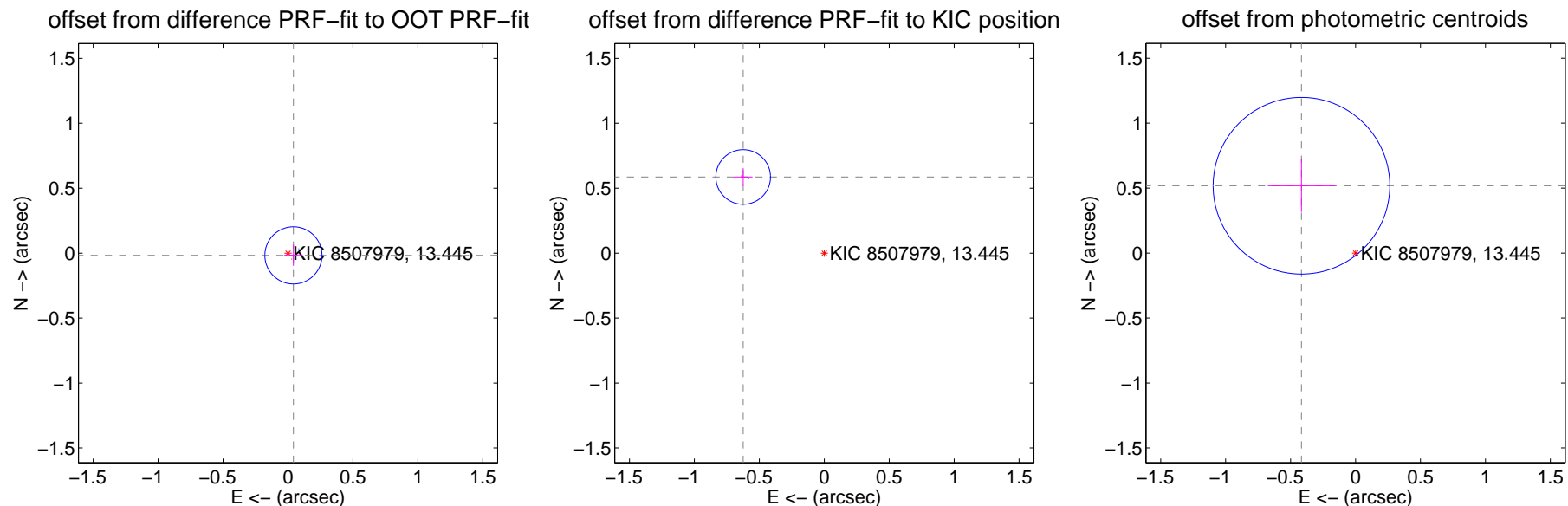
## DV Centroid Data

Supplemental centroid analysis for 008507979-01. Kepler magnitude: 13.45. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.045 \pm 0.073$	0.61	$-0.042 \pm 0.072$	$-0.017 \pm 0.080$
PRF-fit source offset from KIC position	$0.857 \pm 0.070$	12.22	$0.625 \pm 0.072$	$0.586 \pm 0.068$
photometric centroid source offset	$0.67 \pm 0.23$	2.93	$0.42 \pm 0.26$	$0.52 \pm 0.20$



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



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



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

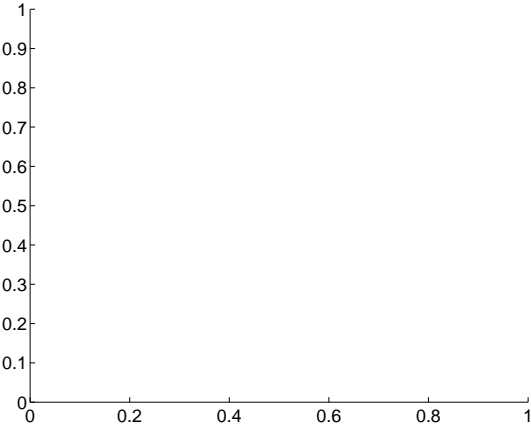
Q5 no difference image



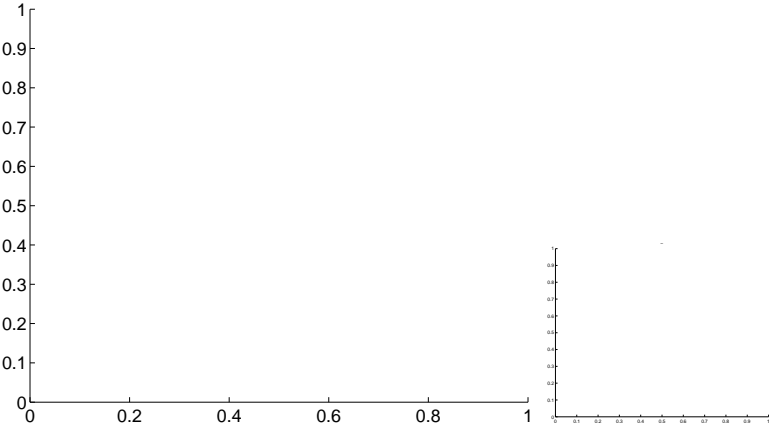
Q5 no OOT image



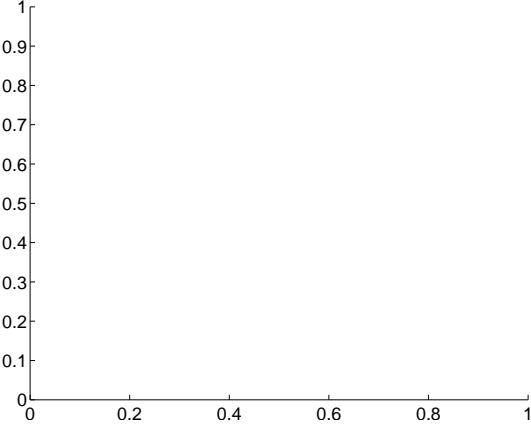
Q6 no difference image



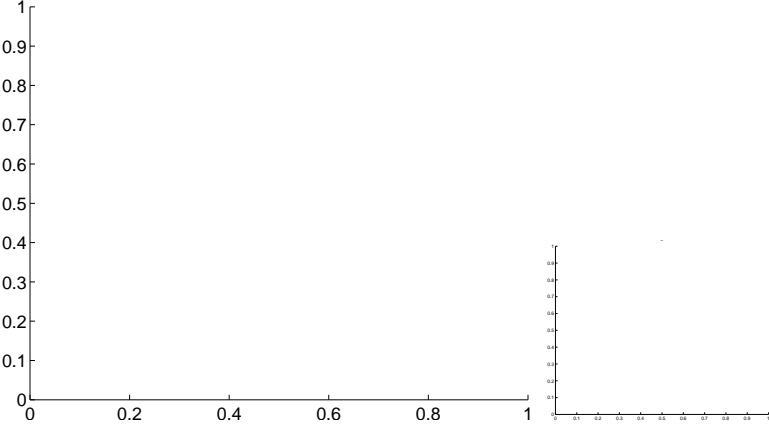
Q6 no OOT image



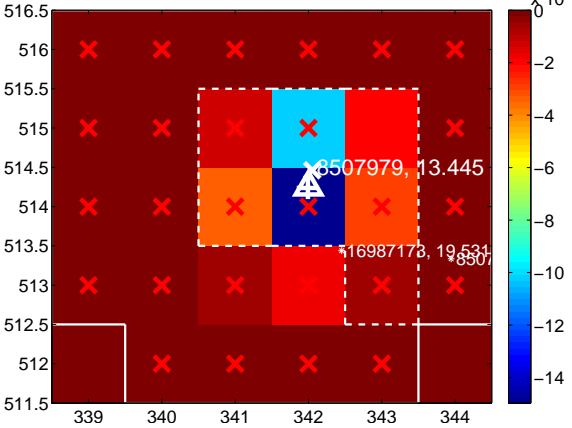
Q7 no difference image



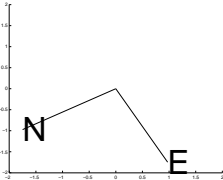
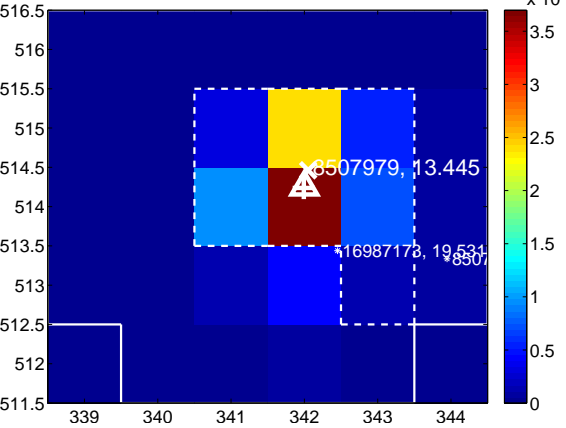
Q7 no OOT image



Q8 difference image. Poor Quality



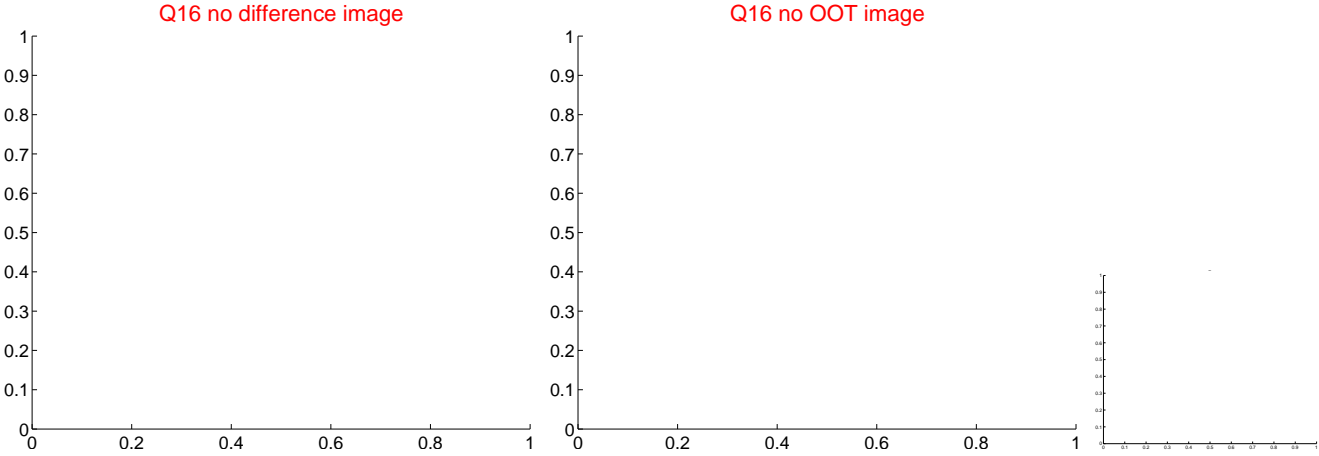
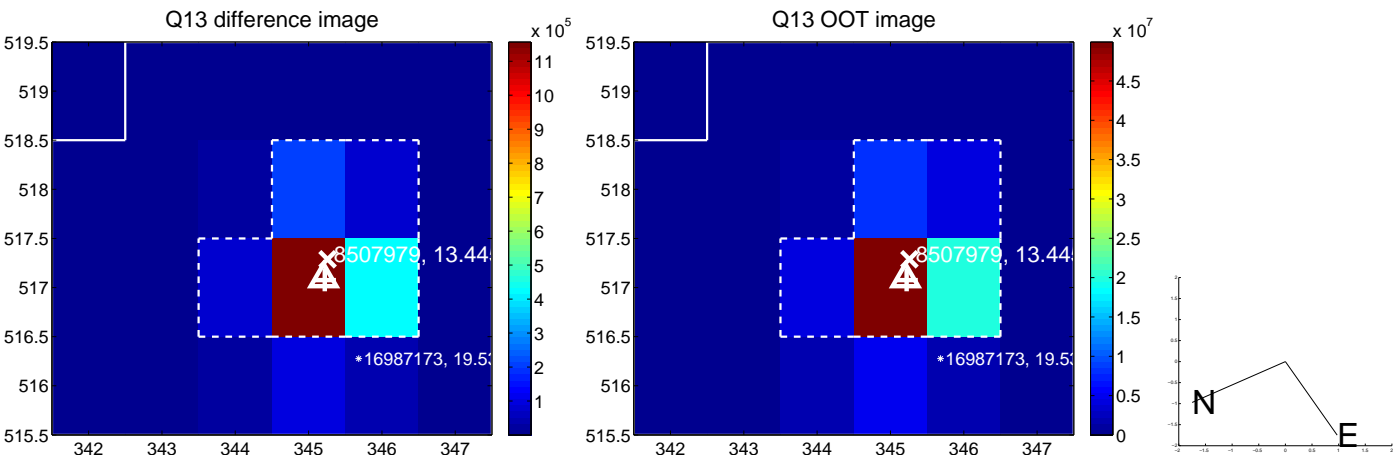
Q8 OOT image



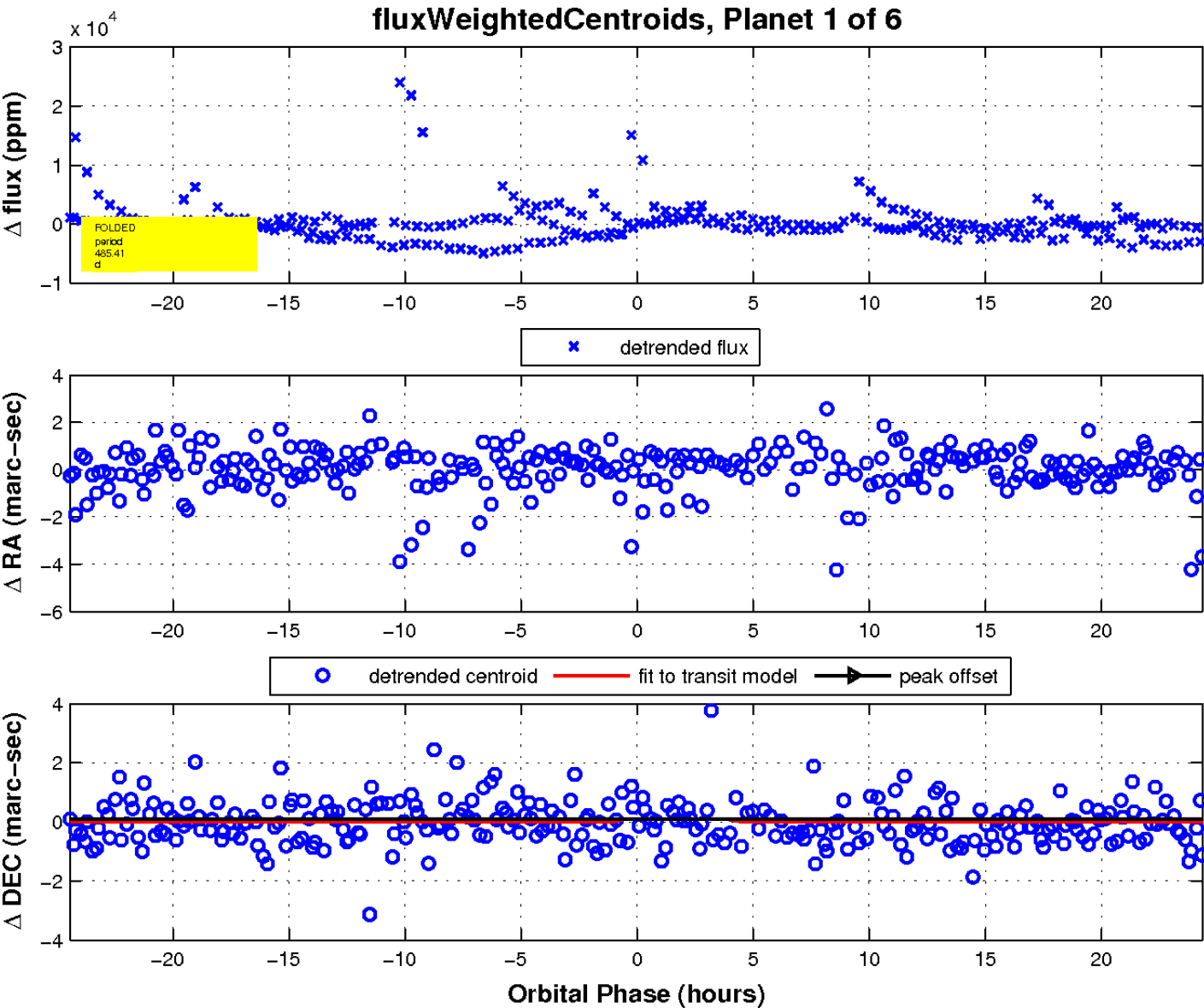
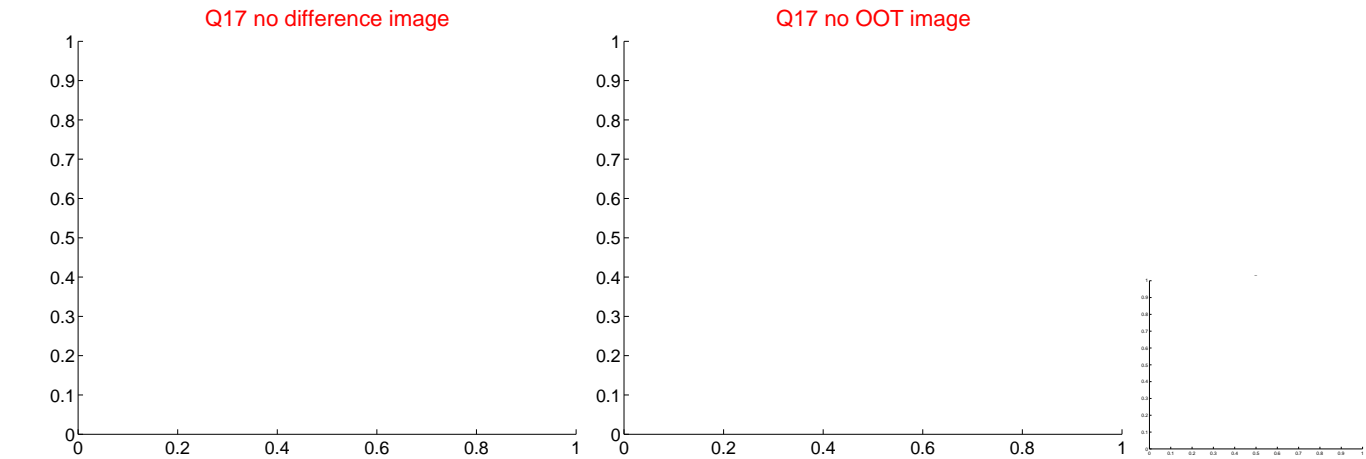
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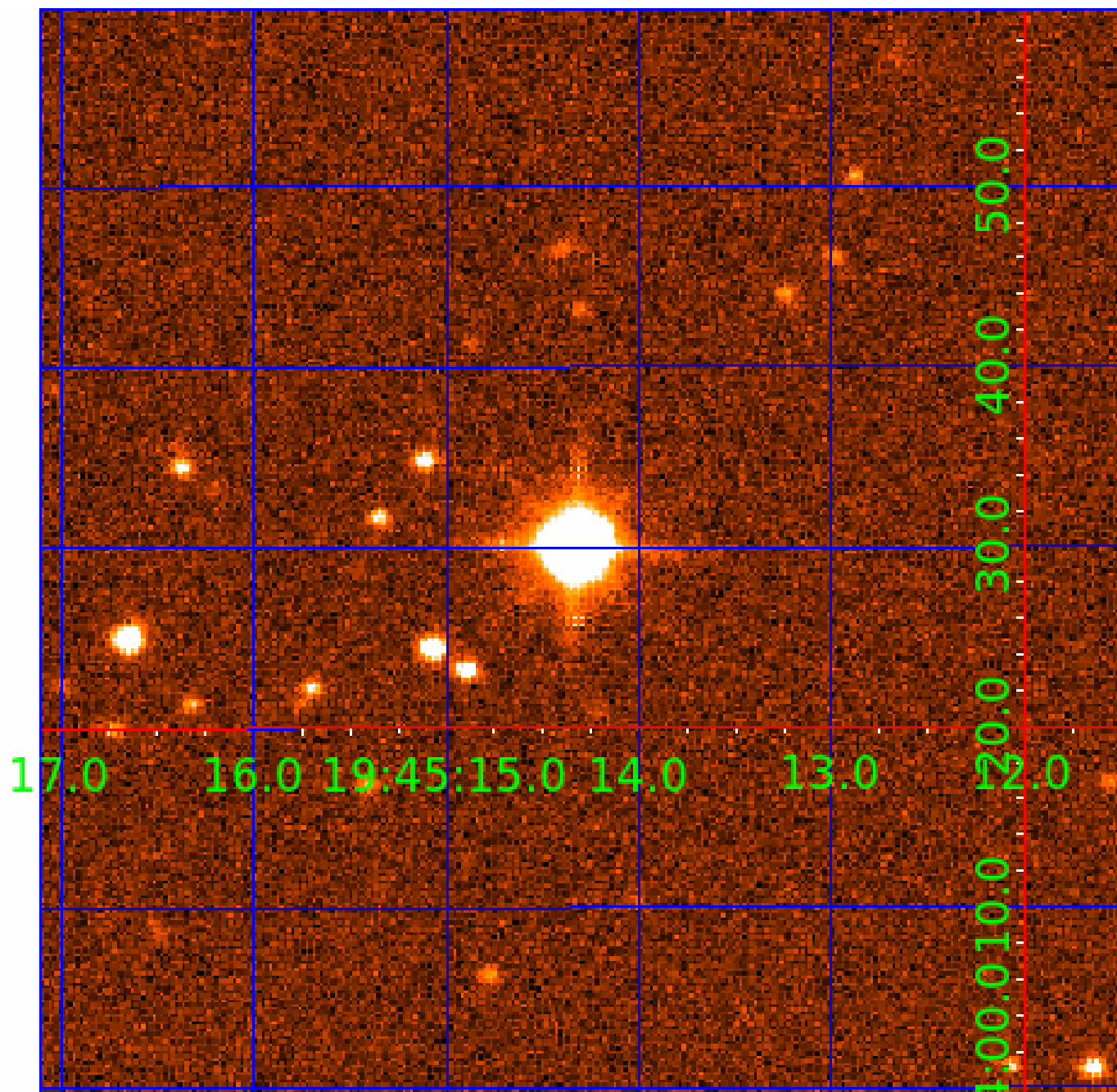
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UKIRT Image

Declination



# KIC 008507979

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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008507979-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008507979-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS

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

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

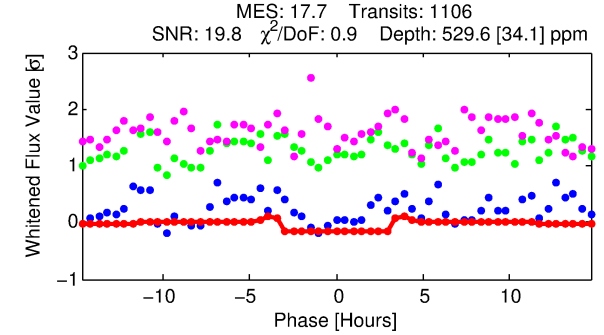
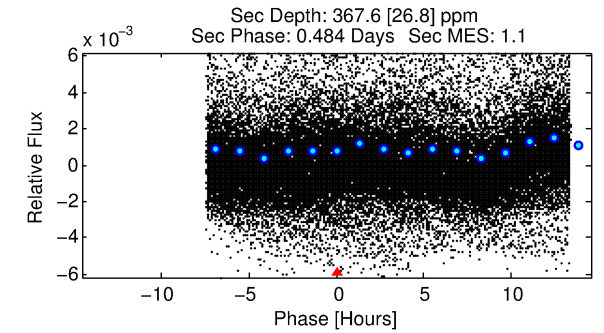
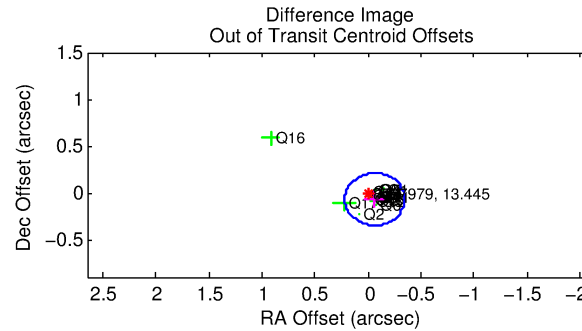
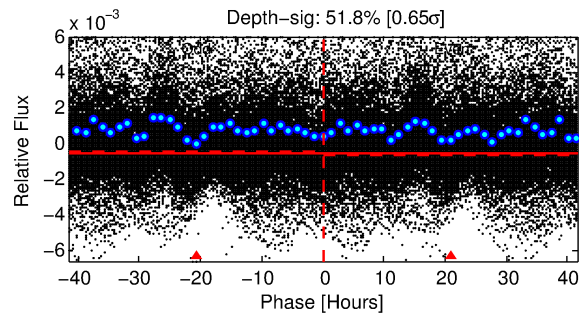
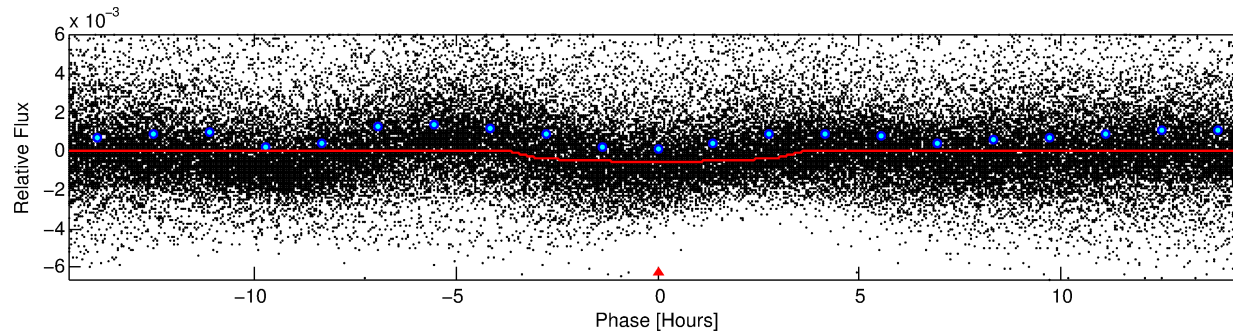
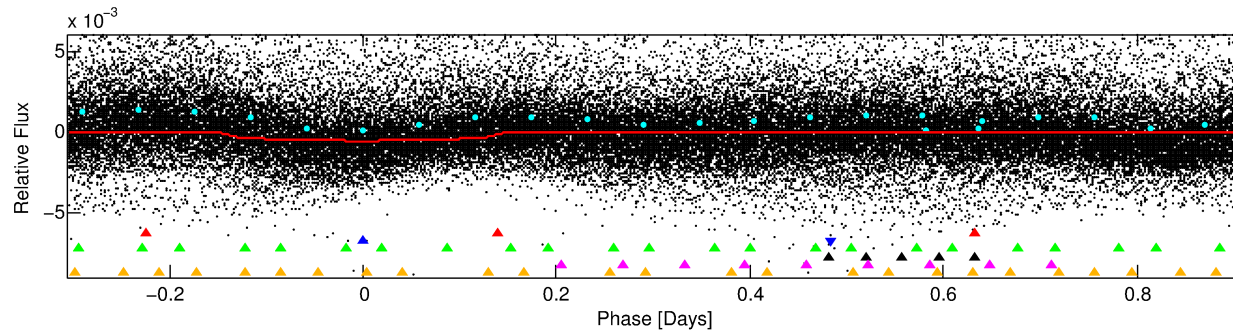
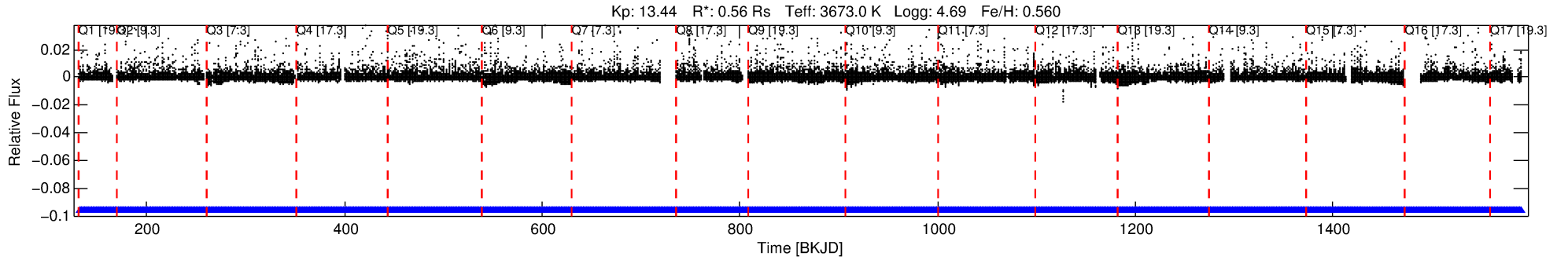
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008507979-02

No Significant Match Found

# DV One-Page Summary

KIC: 8507979 Candidate: 2 of 6 Period: 1.217 d



## DV Fit Results:

Period = 1.21748 [0.00001] d  
Epoch = 132.0560 [0.0014] BKJD  
Rp/R\* = 0.0202 [0.0042]  
a/R\* = 1.50 [0.55]  
b = 0.04 [17.51]  
Seff = 150.83 [33.73]  
Teq = 894 [50] K  
Rp = 1.24 [0.31] Re  
a = 0.0184 [0.0021] AU  
Ag = 44.81 [20.20] [2.17 $\sigma$ ]  
Teffp = 3575 [404] K [6.58 $\sigma$ ]

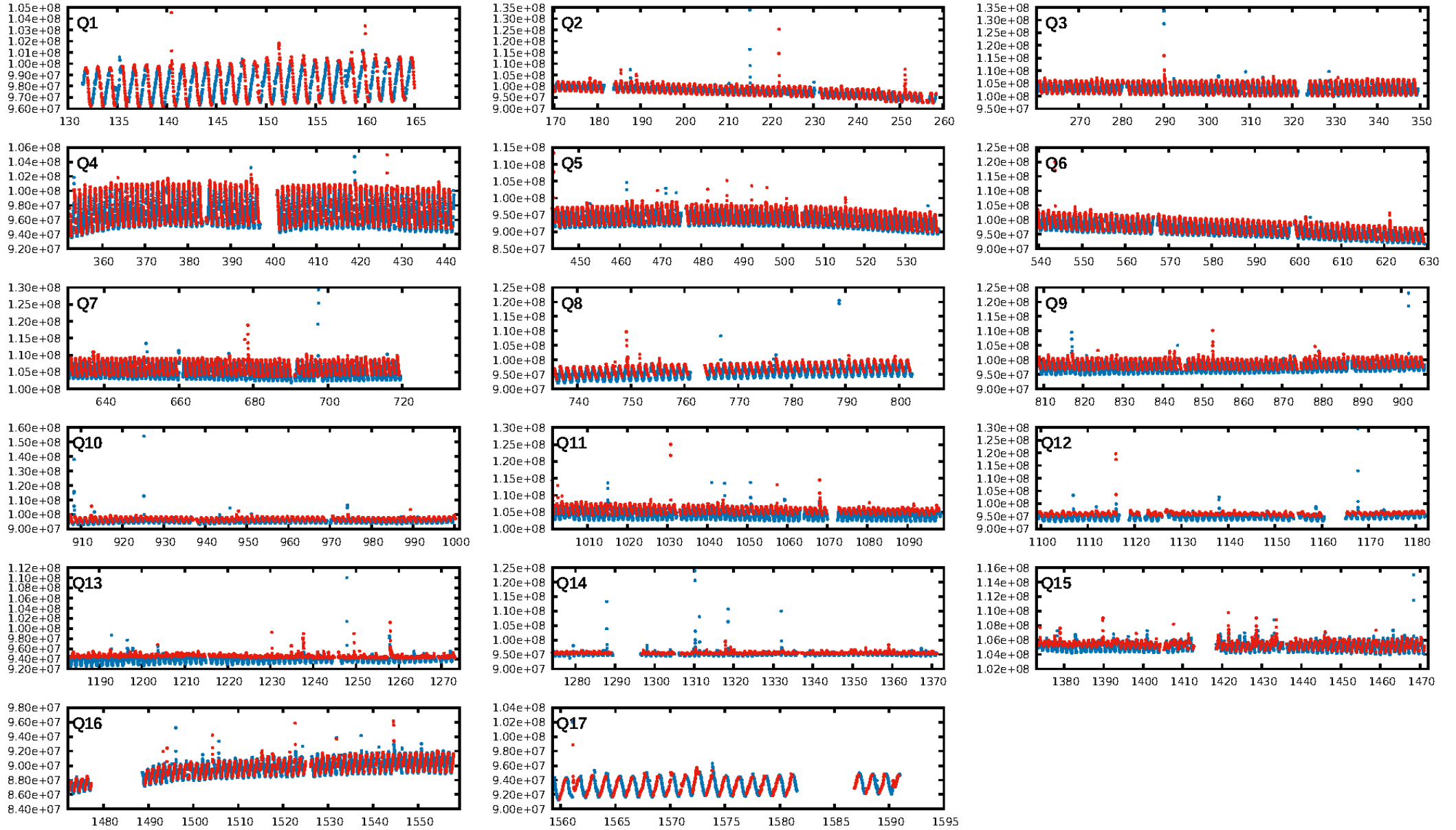
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [113.08 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.54e-47  
RollingBand-fgt: 1.00 [1056/1056]  
GhostDiagnostic-chr: 0.633  
Centroid-sig: N/A  
Centroid-so: 0.832 arcsec [20.22 $\sigma$ ]  
OotOffset-rm: 0.093 arcsec [0.99 $\sigma$ ]  
KicOffset-rm: 0.816 arcsec [7.34 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.00 [0/17]  
DiffImageOverlap-fno: 1.00 [17/17]

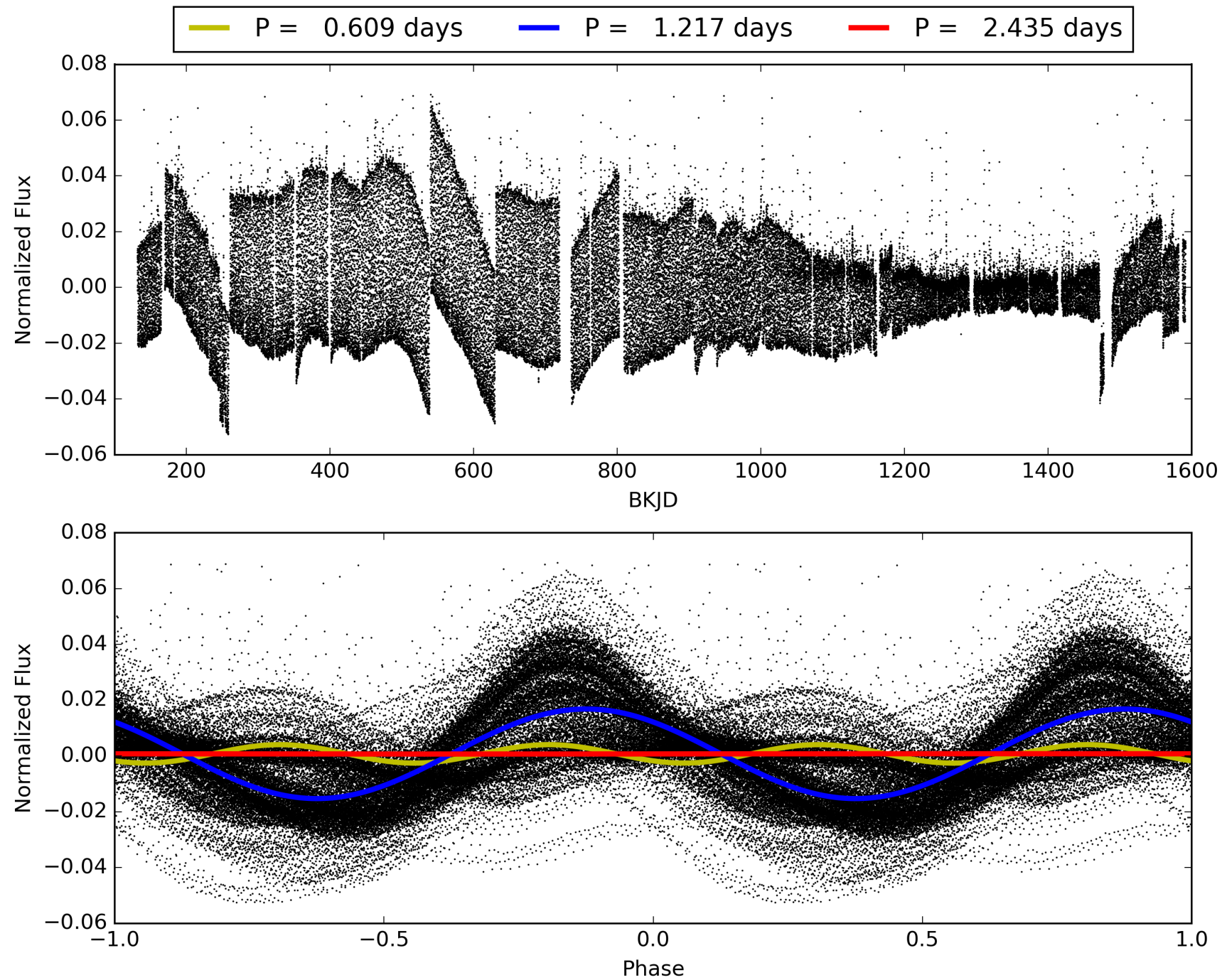
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:57:47 Z

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

# TCE 008507979-02, PDC Light Curves



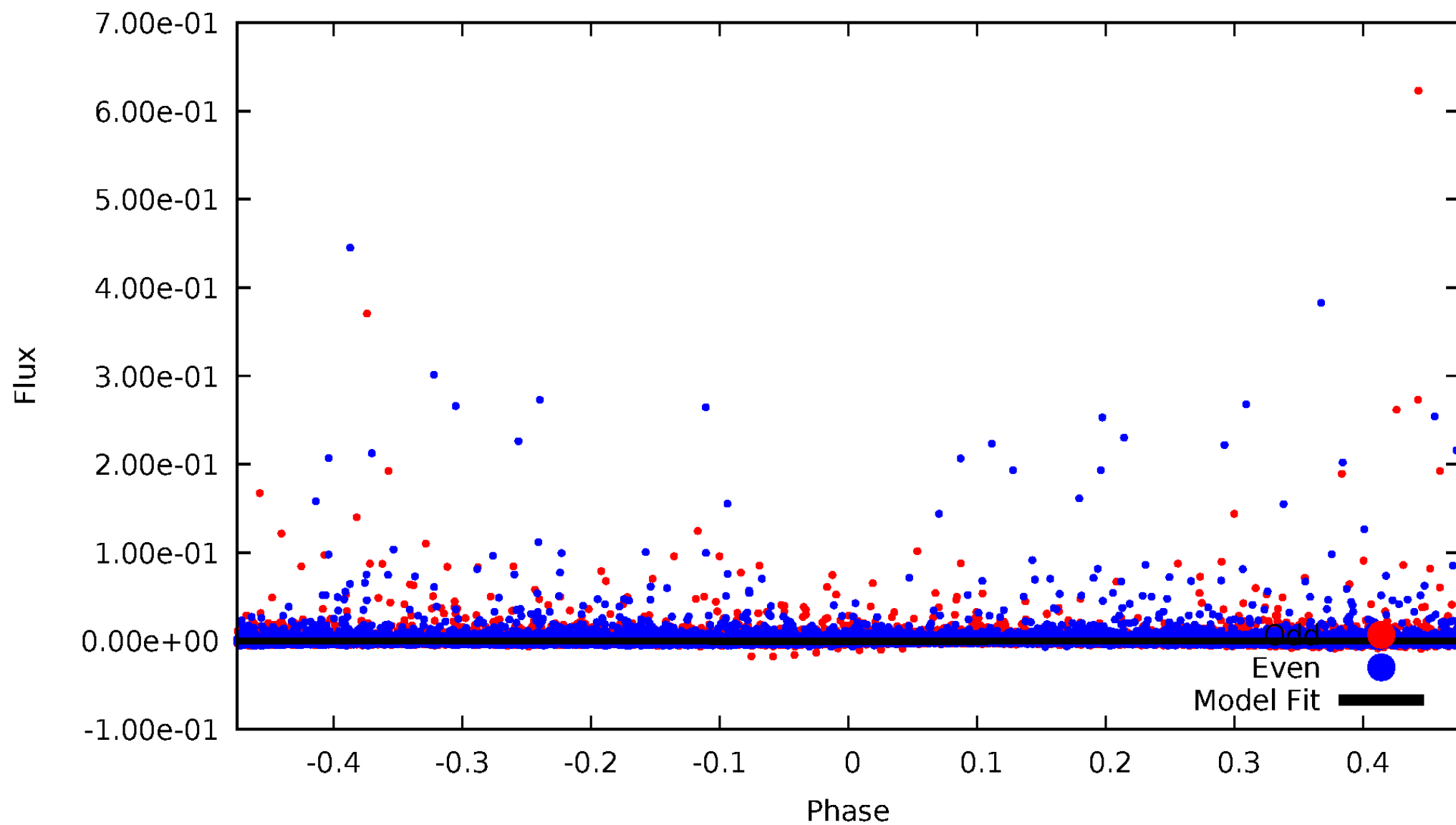
TCE 008507979-02





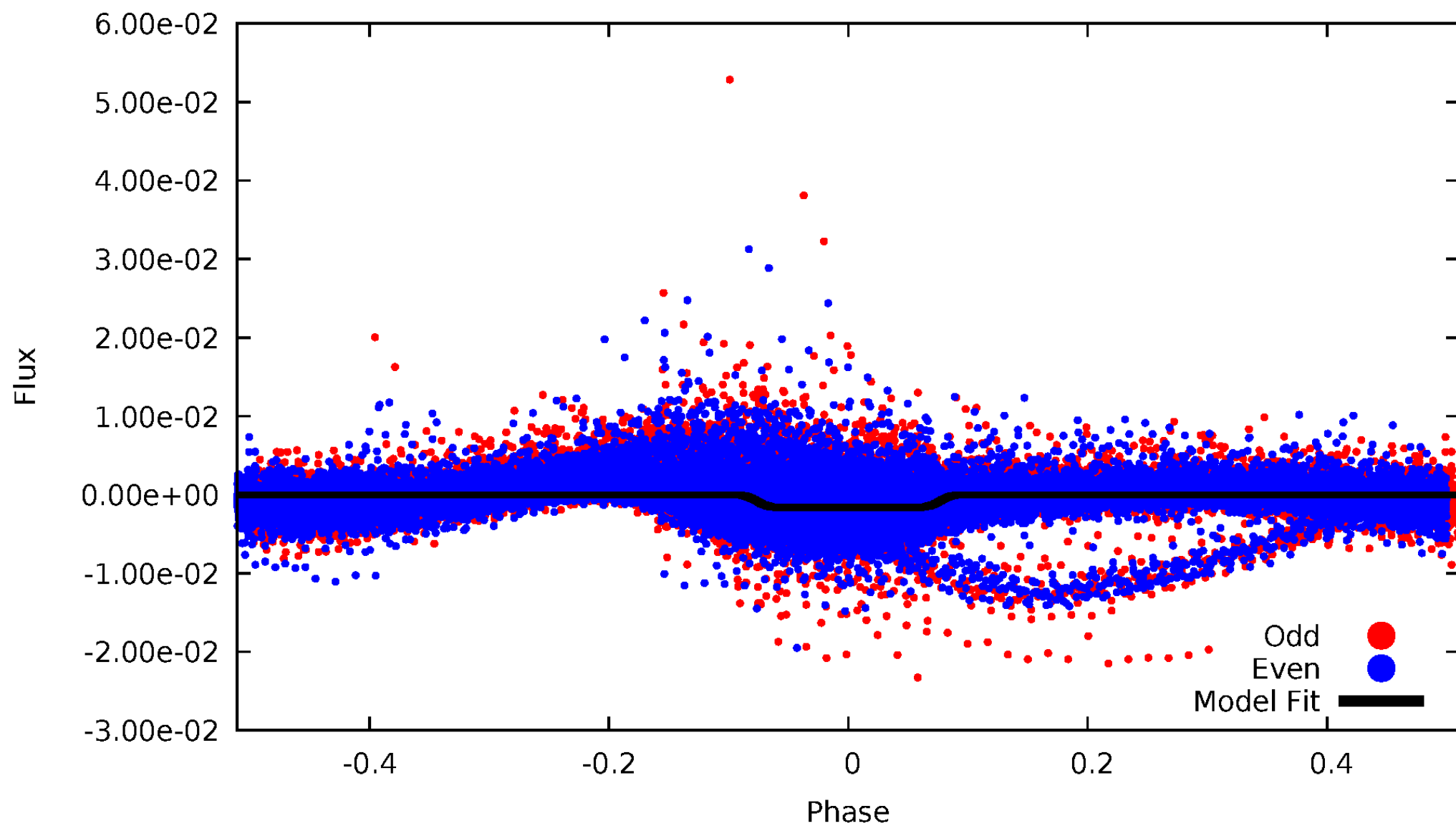
# DV Odd/Even

TCE 008507979-02



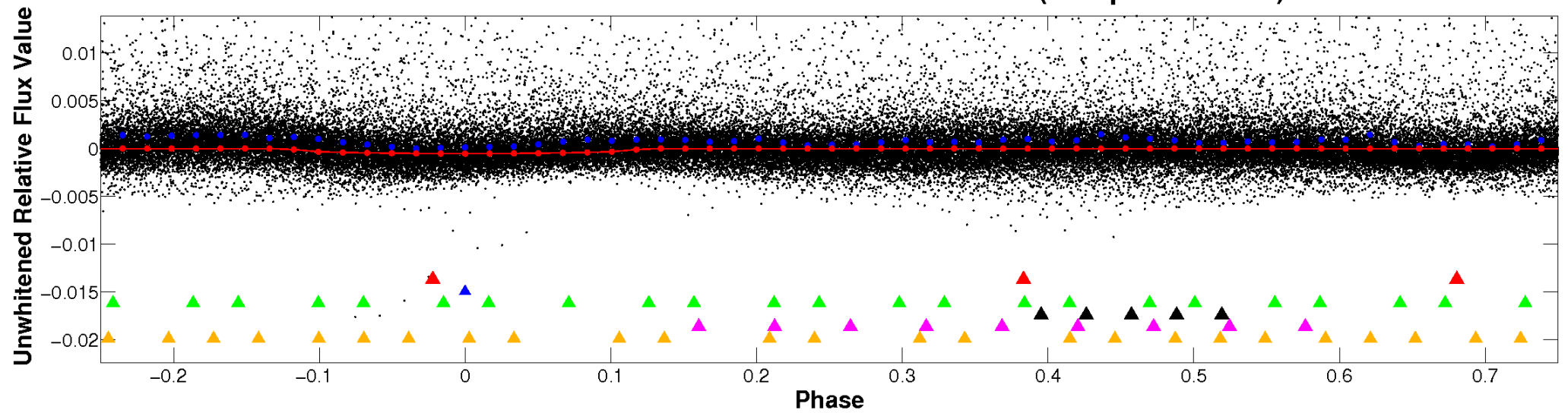
# ALT Odd/Even

TCE 008507979-02

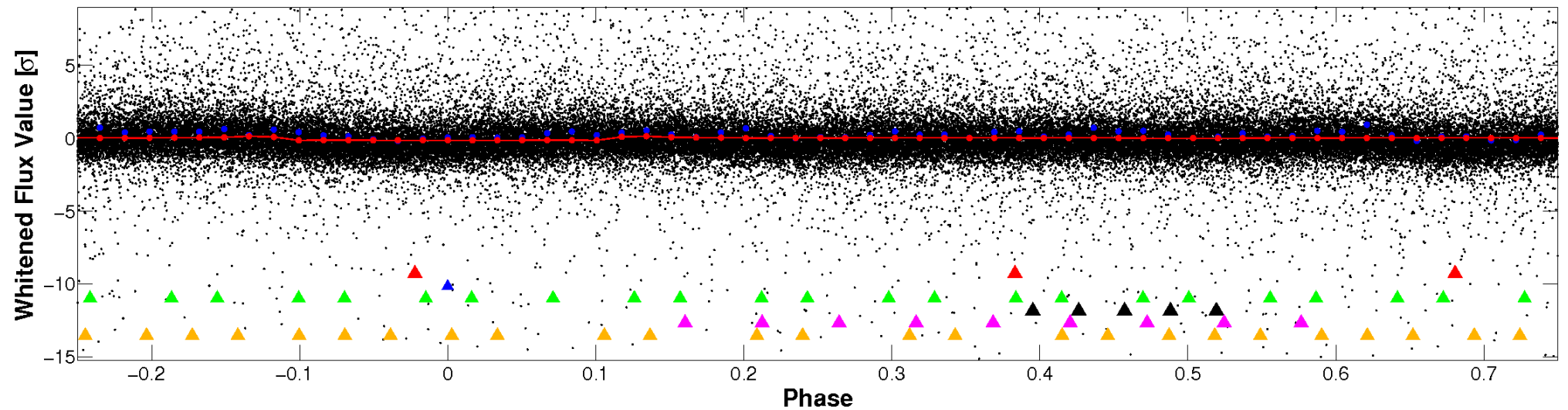


# Non-Whitened Vs. Whitened Light Curve

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

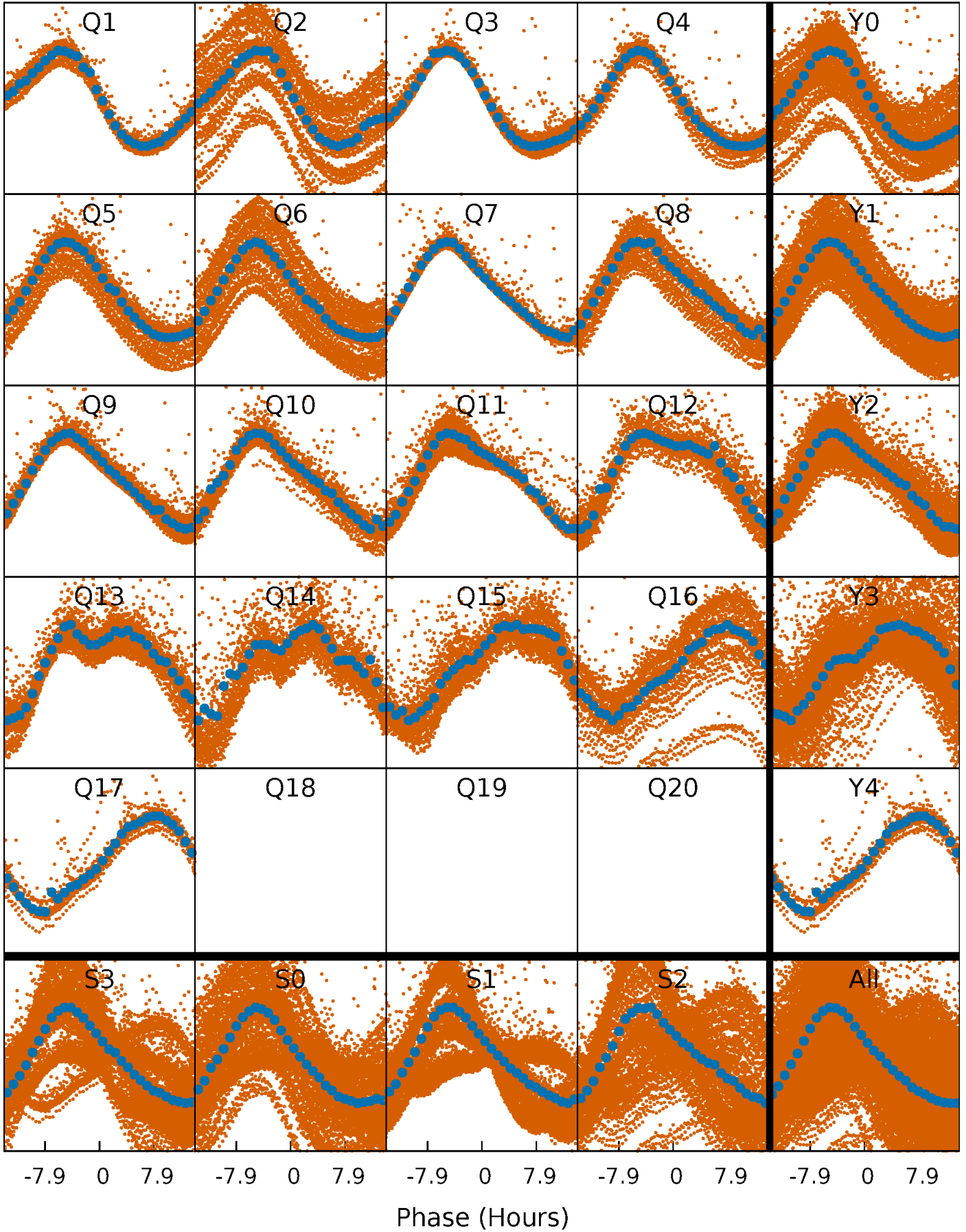


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



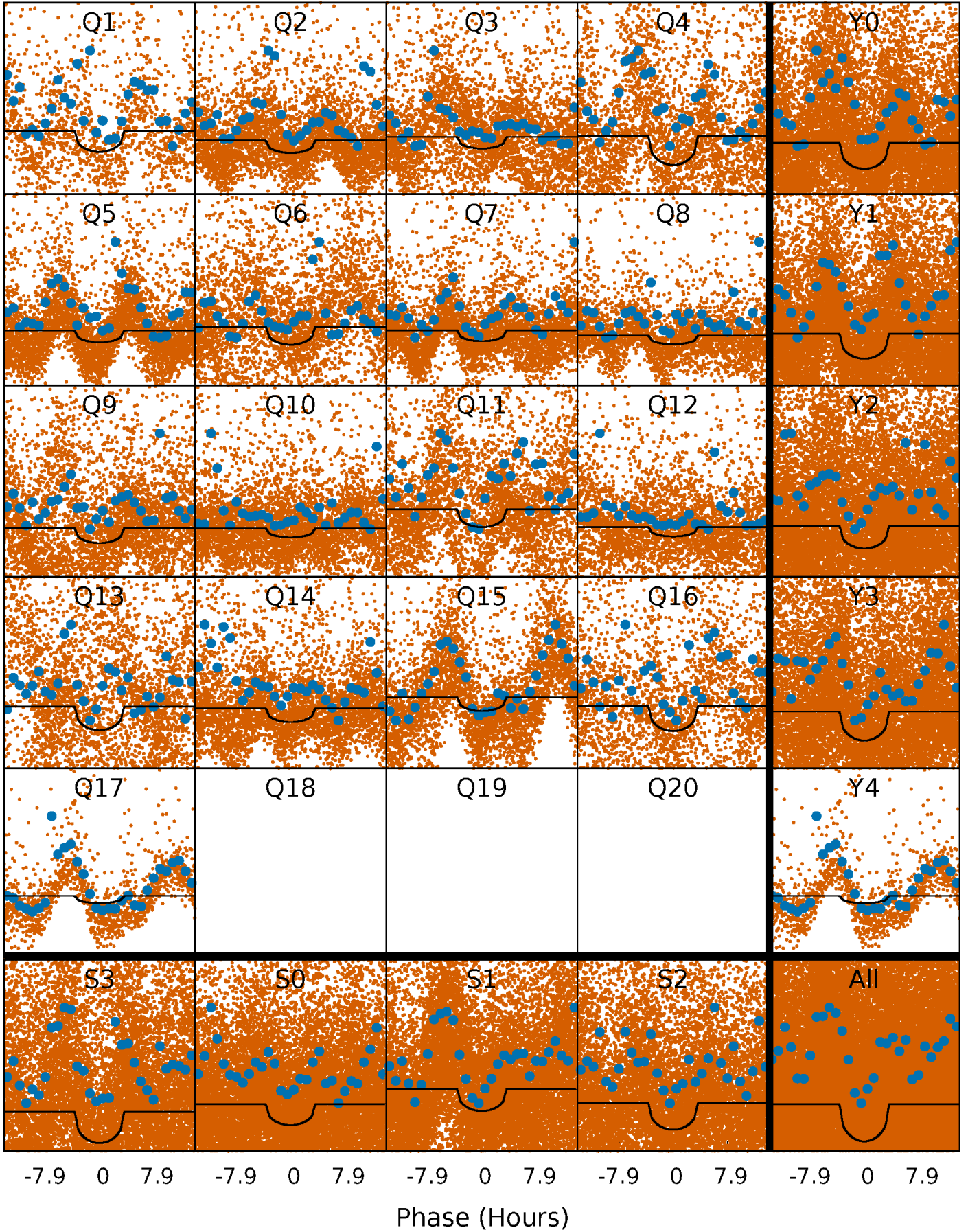
# PDC Quarter-Phased Transit Curves

TCE 008507979-02   P= 1.217481 Days    $T_0=132.056003$  (BKJD)



# DV Quarter-Phased Transit Curves

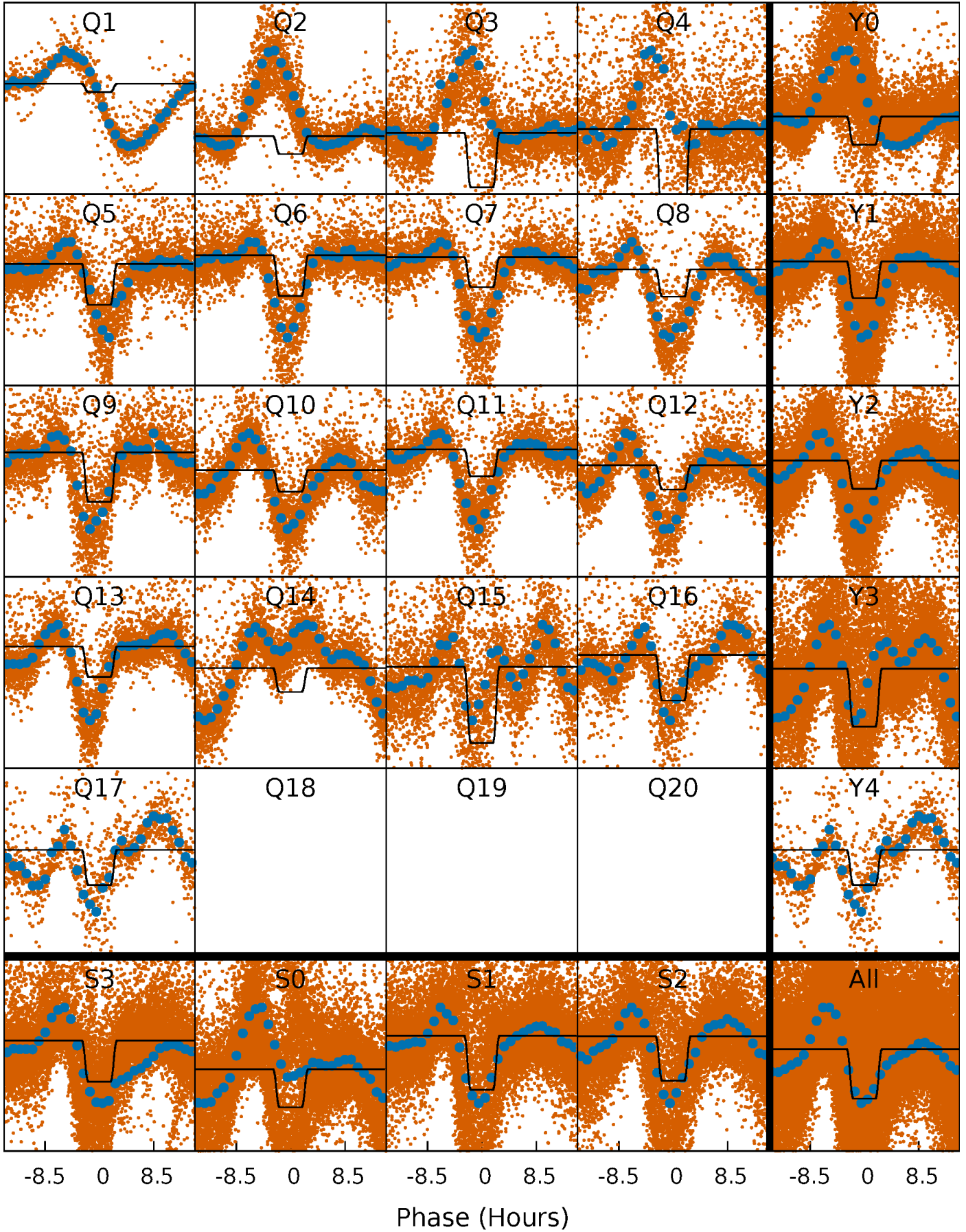
TCE 008507979-02   P= 1.217481 Days    $T_0=132.056003$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

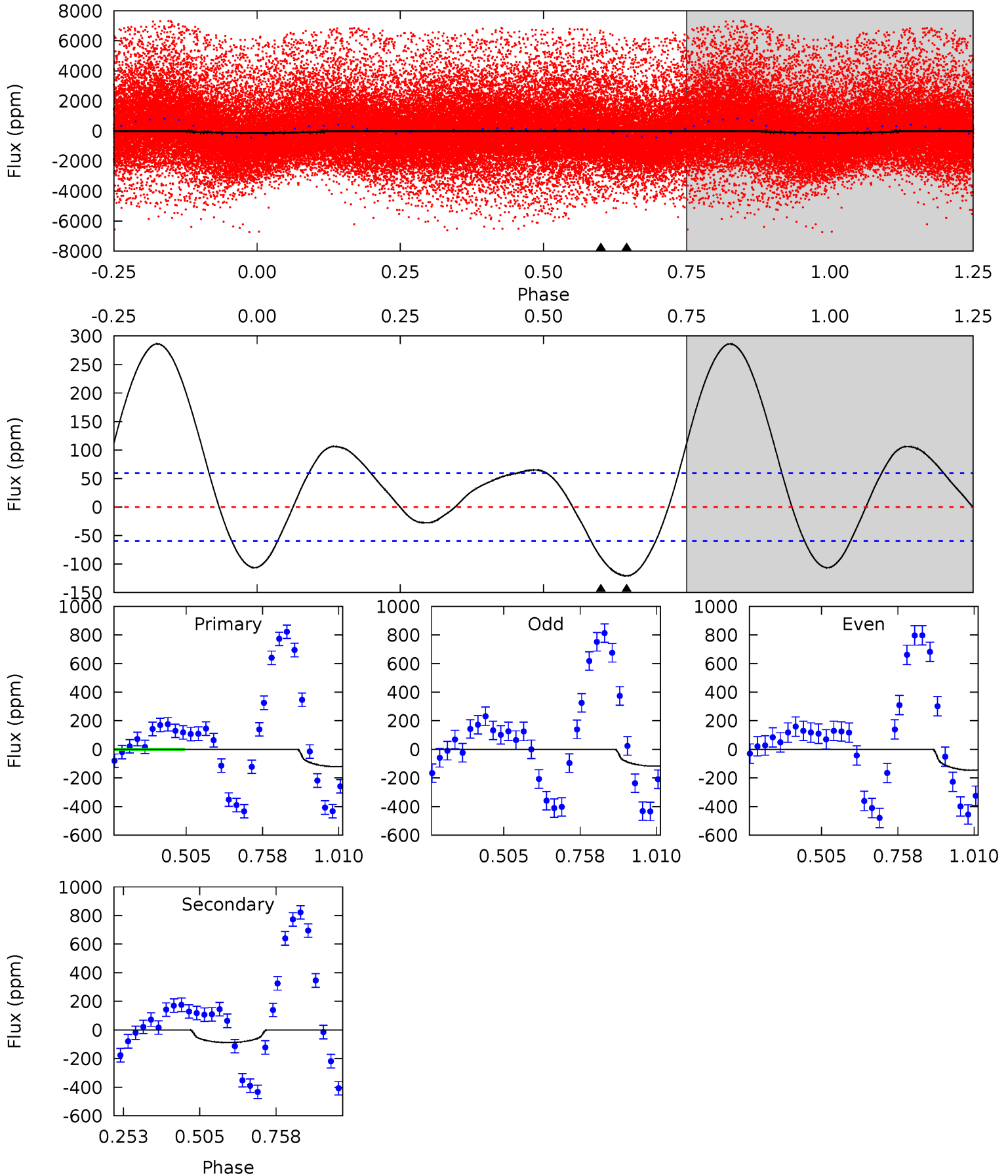
TCE 008507979-02   P= 1.217526 Days    $T_0=132.039735$  (BKJD)



# DV Model-Shift Uniqueness Test

008507979-02, P = 1.217481 Days, E = 130.838522 Days

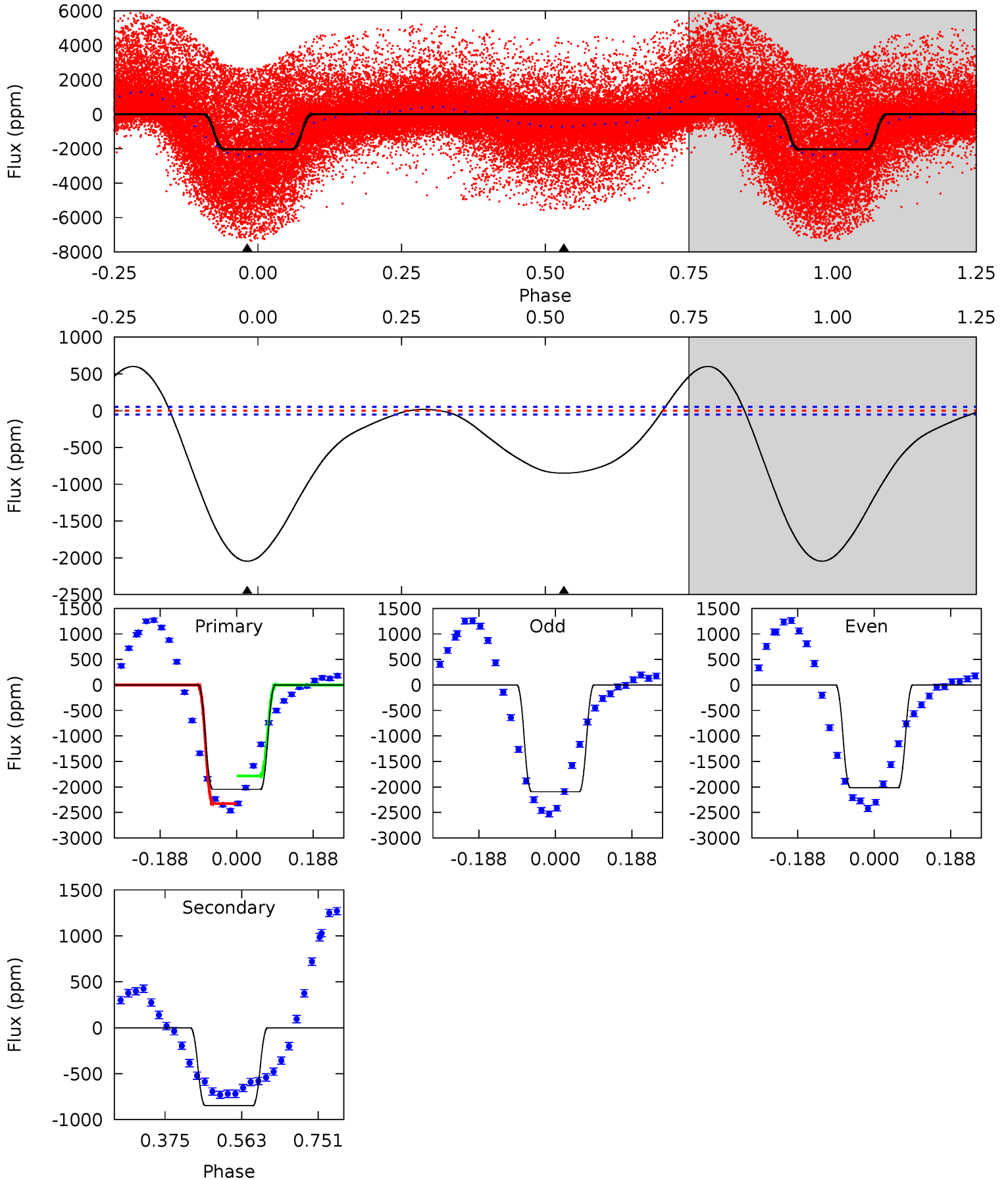
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.91	6.49	0	0	4.37	1.14	4.82	8.91	8.91	6.49	6.49	1.04	-8.81	0.70	9.93



# Alt Model-Shift Uniqueness Test

008507979-02, P = 1.217526 Days, E = 130.822209 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
169.7	70.4	0	0	4.43	1.32	22.0	169.7	169.7	70.4	70.4	3.26	0.78	0.23	21.2





### Stellar Parameters For KIC 008507979

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3673^{+117}_{-147}$	$4.691^{+0.080}_{-0.020}$	$0.560^{+0.050}_{-0.300}$	$0.560^{+0.032}_{-0.081}$	$0.561^{+0.040}_{-0.069}$	$4.498^{+1.756}_{-0.469}$
	+3%/-4%	+2%/-0%	+9%/-54%	+6%/-14%	+7%/-12%	+39%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008507979-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-88 \pm 14$	$1.22^{+0.25}_{-0.27}$	$1229^{+49}_{-51}$	$2888^{+218}_{-172}$	$11^{+7}_{-4}$
Alt.	$-848 \pm 12$	$2.42^{+0.30}_{-0.29}$	$1237^{+48}_{-62}$	$3301^{+166}_{-154}$	$27^{+8}_{-5}$

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

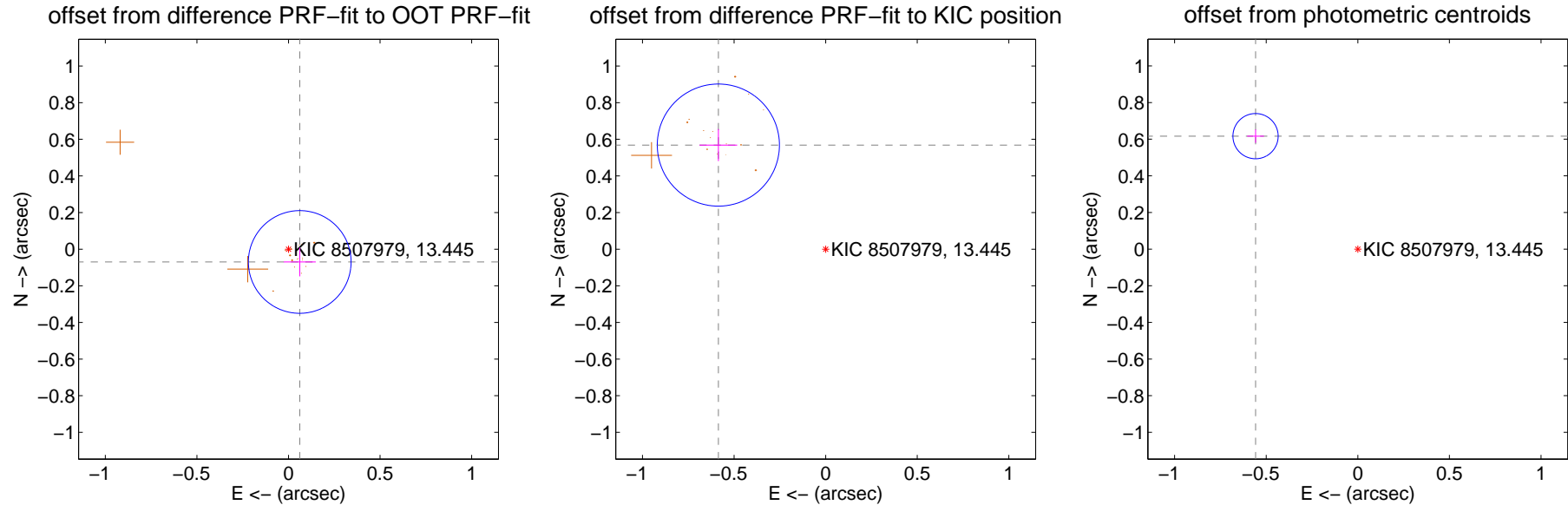
## DV Centroid Data

Supplemental centroid analysis for 008507979-02. Kepler magnitude: 13.45. Transit SNR 19.85

There are 0 quarters with good PRF difference image offsets

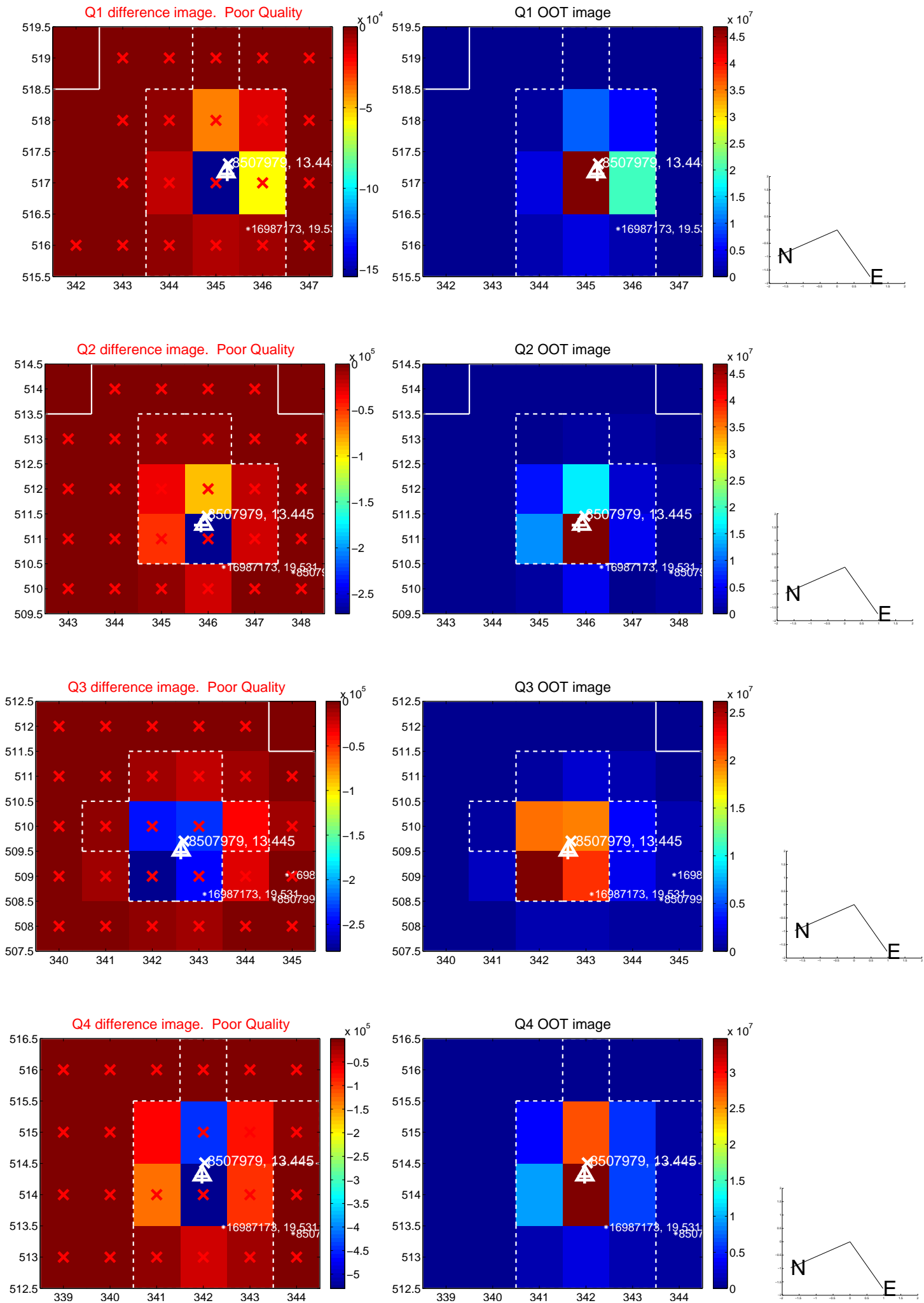
The direct PRF centroid is offset from the target star catalog position by about 0.96 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.093 \pm 0.093$	0.99	$-0.061 \pm 0.088$	$-0.070 \pm 0.078$
PRF-fit source offset from KIC position	$0.816 \pm 0.111$	7.34	$0.586 \pm 0.103$	$0.568 \pm 0.088$
photometric centroid source offset	$0.83 \pm 0.04$	20.22	$0.56 \pm 0.05$	$0.62 \pm 0.04$

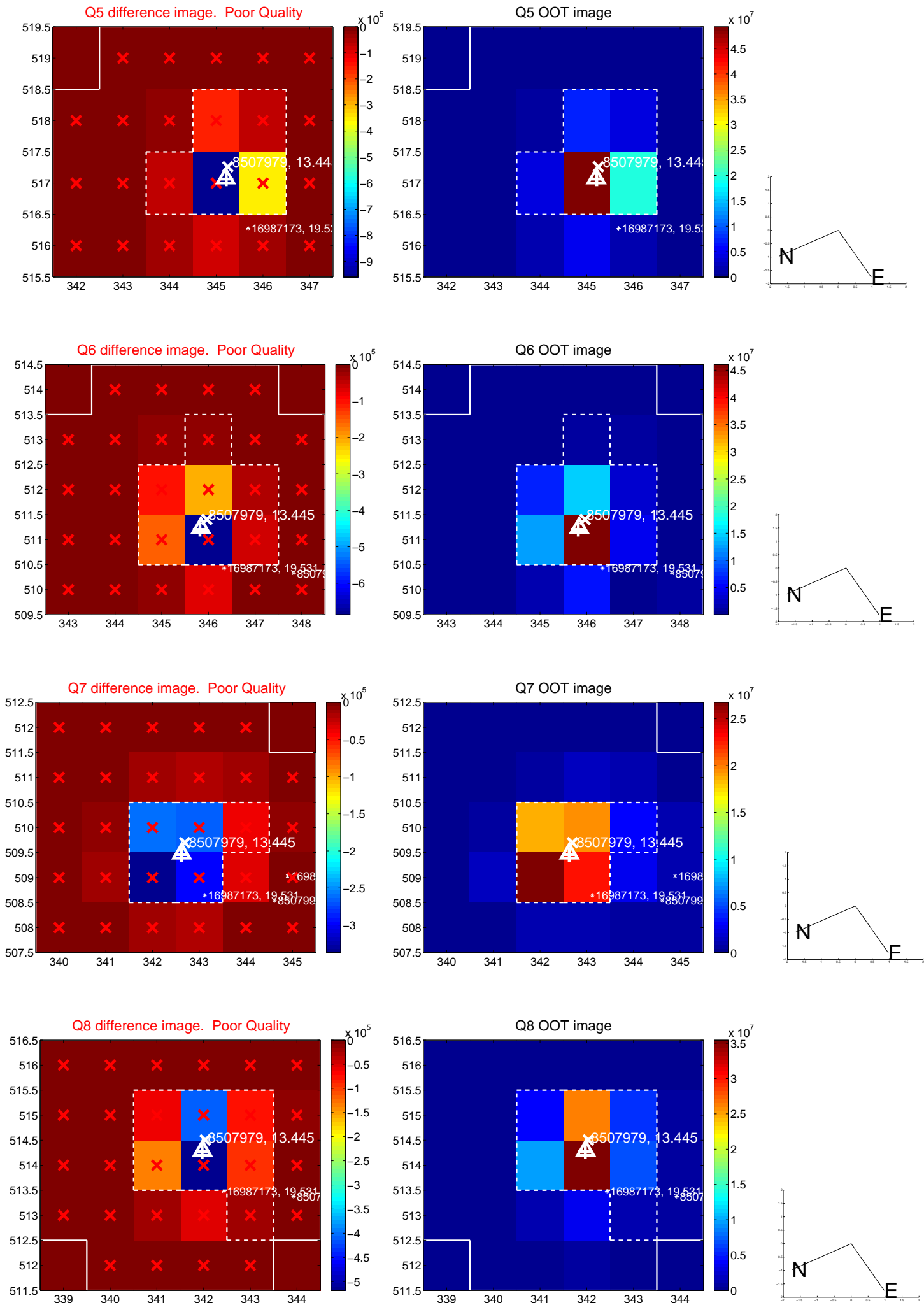


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

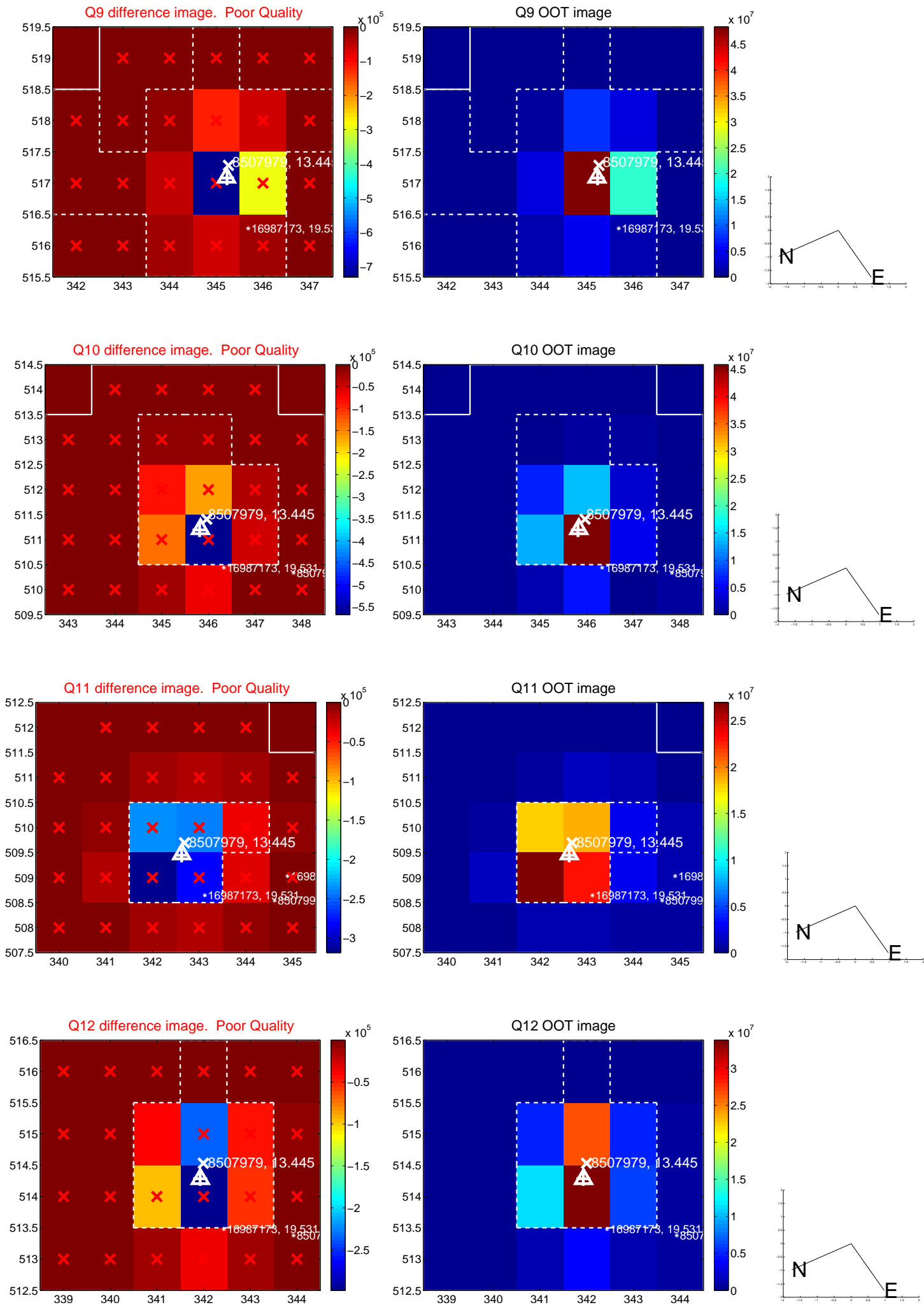
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



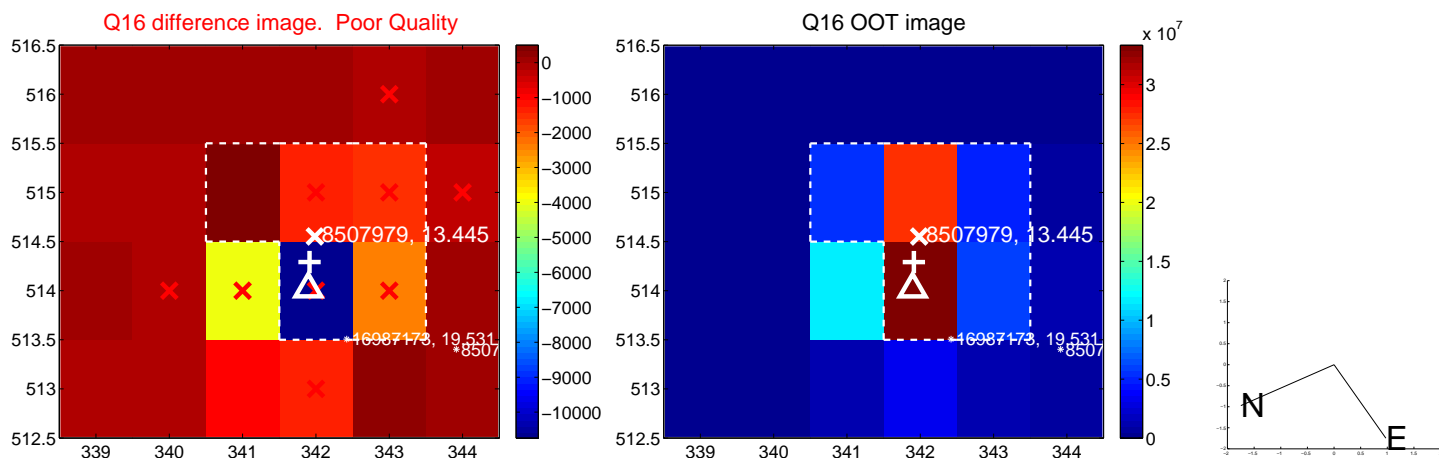
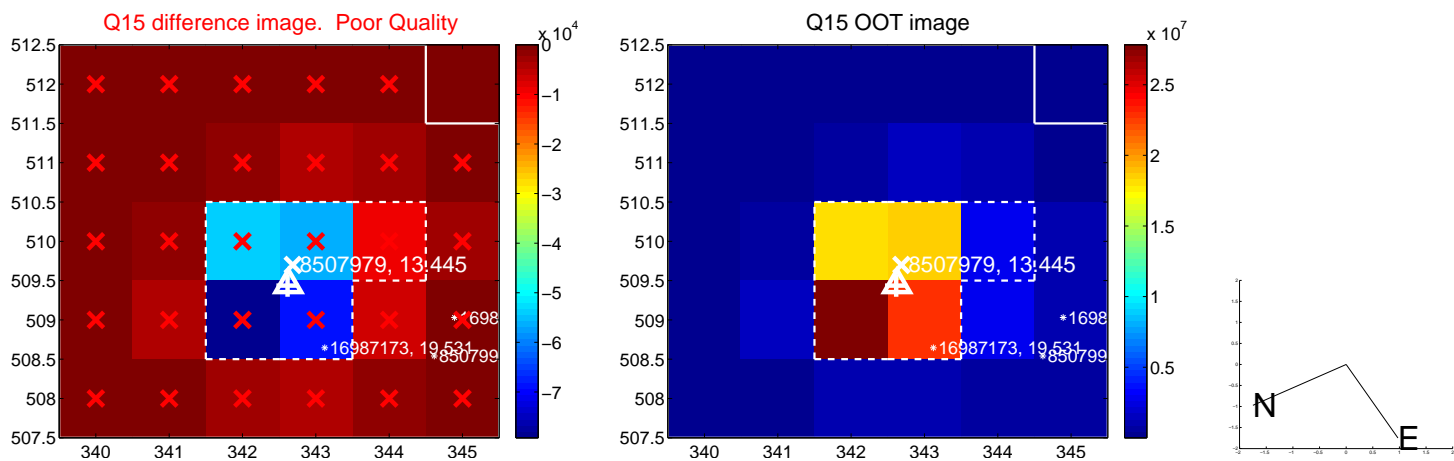
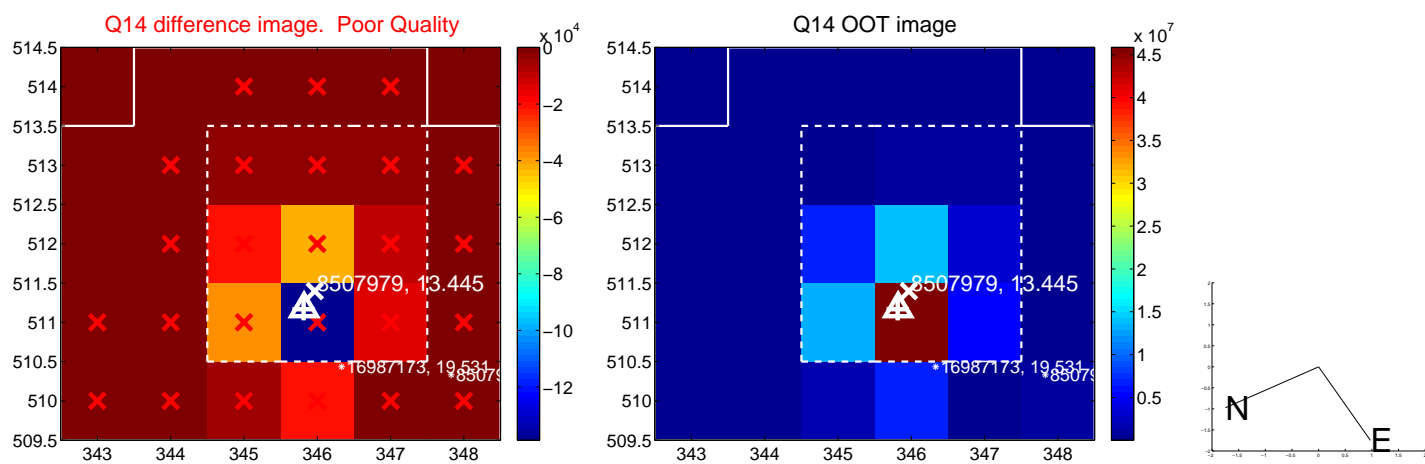
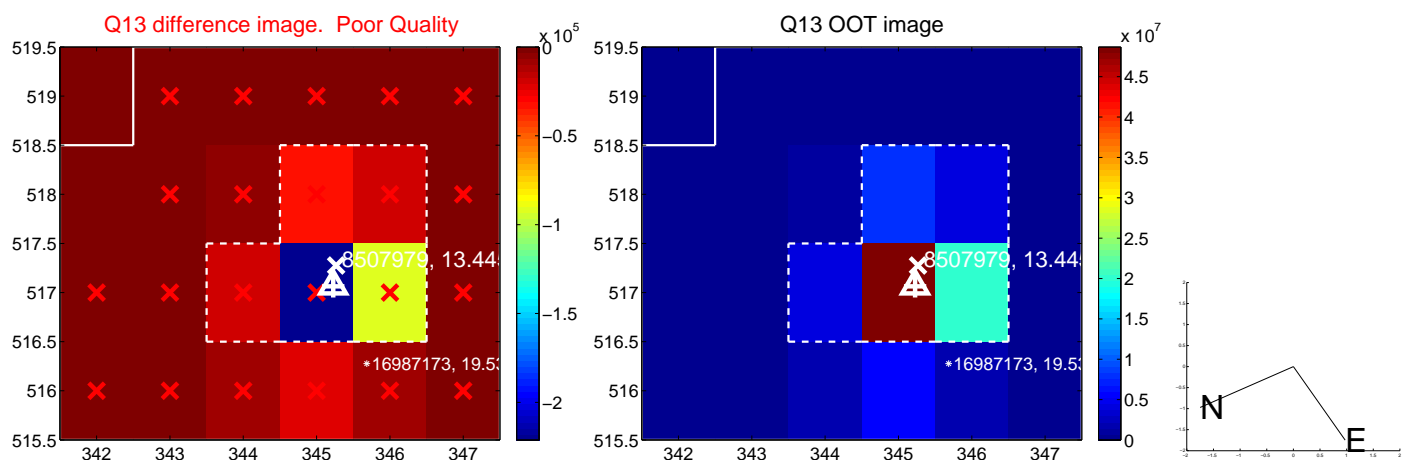
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



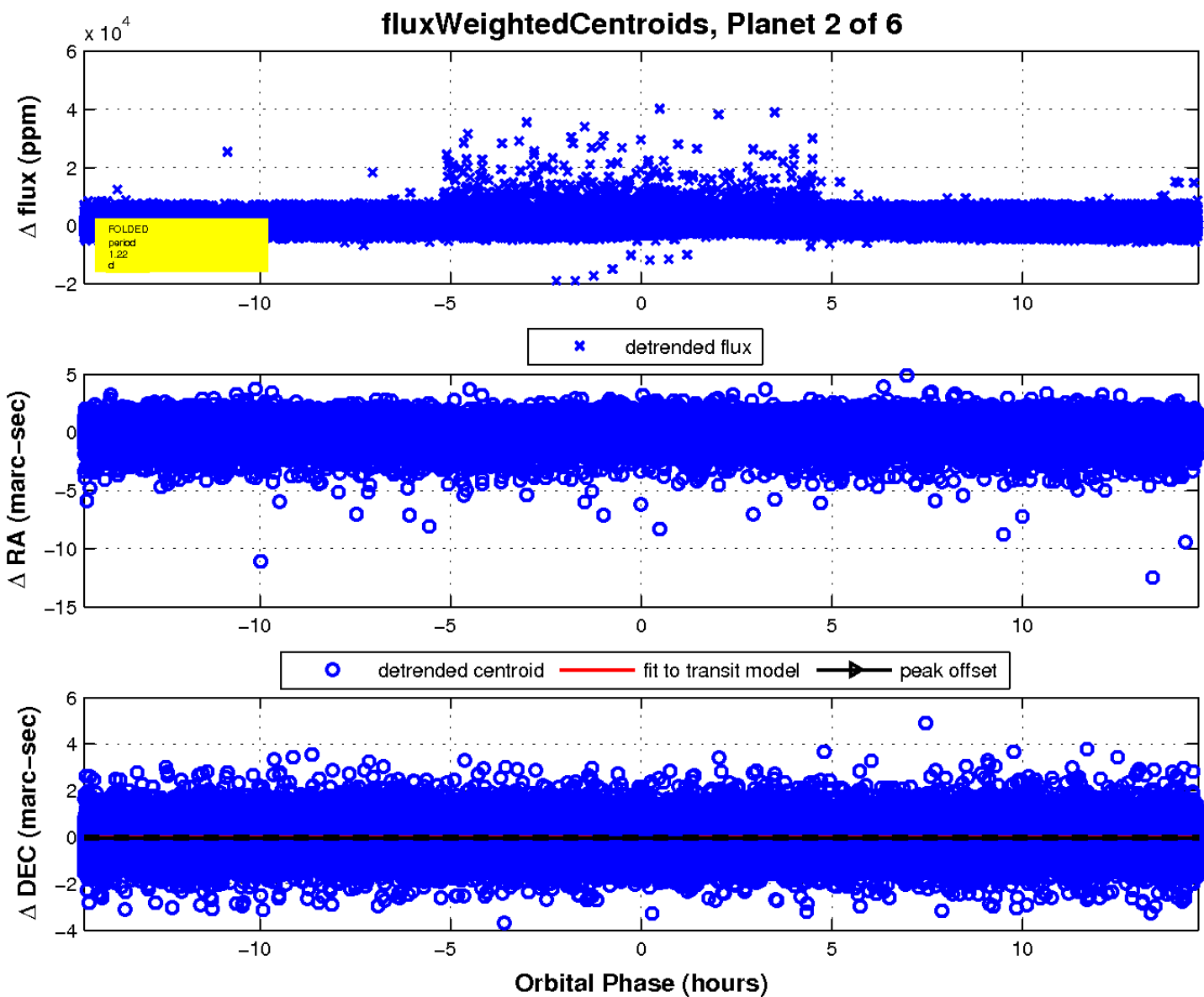
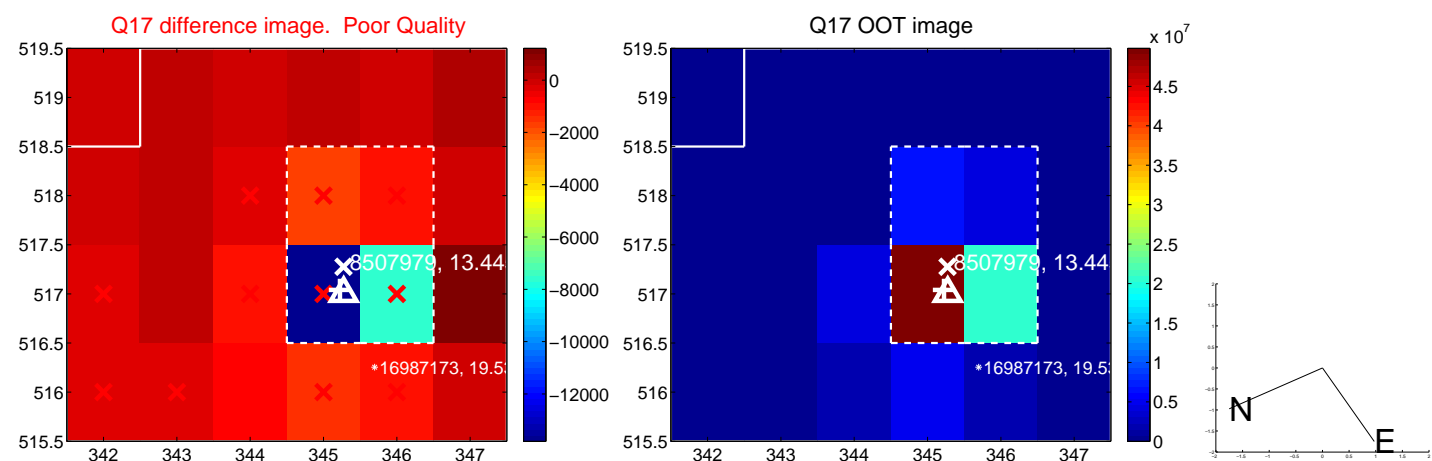
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

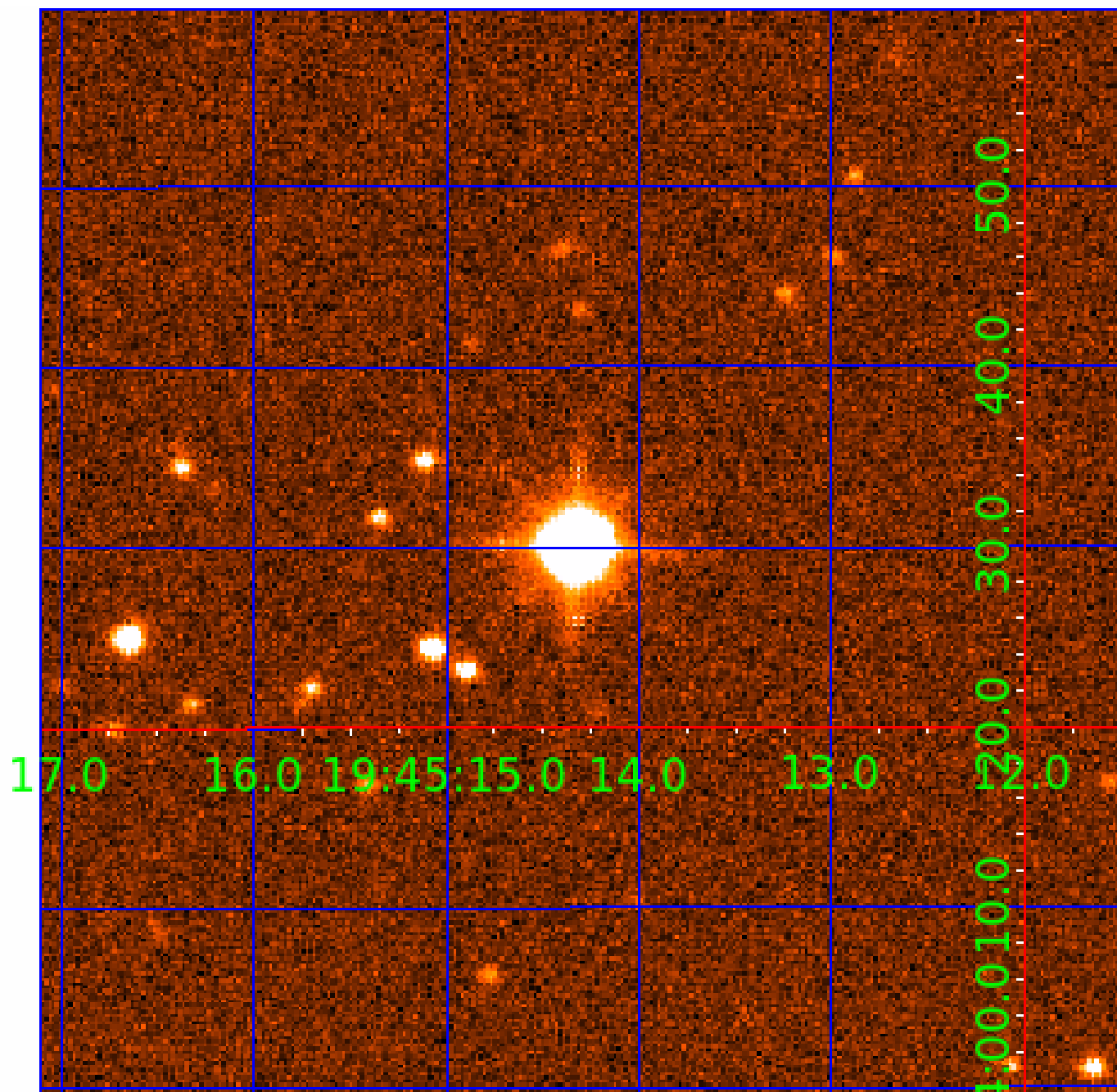


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008507979

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008507979-01	OBS	No	485.412840	267.169399	712.8	10.500	20.8	-1.0	0.56	3673	1.44	0.05
008507979-02	OBS	No	1.217481	132.056003	529.6	6.938	17.7	19.8	0.56	3673	1.24	150.83
008507979-03	OBS	No	63.204402	190.514768	597.2	1.959	9.5	2.1	0.56	3673	1.32	0.78
008507979-04	OBS	No	317.800217	150.799469	2545.5	4.825	9.7	8.4	0.56	3673	3.44	0.09
008507979-05	OBS	No	153.465914	240.607053	766.2	3.000	11.4	-1.0	0.56	3673	1.49	0.24
008507979-06	OBS	No	58.313574	179.490673	619.9	9.935	8.2	3.4	0.56	3673	1.34	0.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008507979-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008507979-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS

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

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

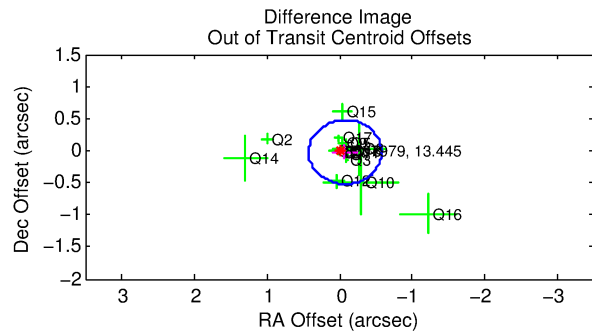
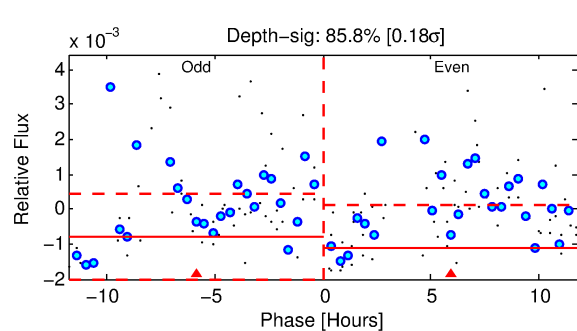
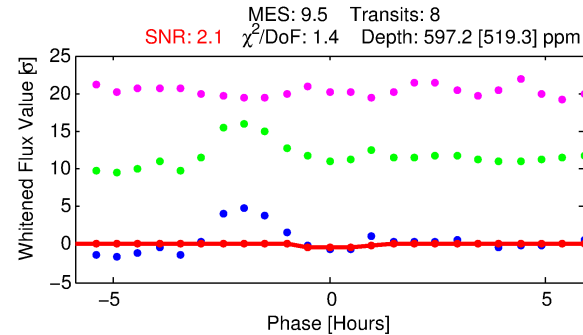
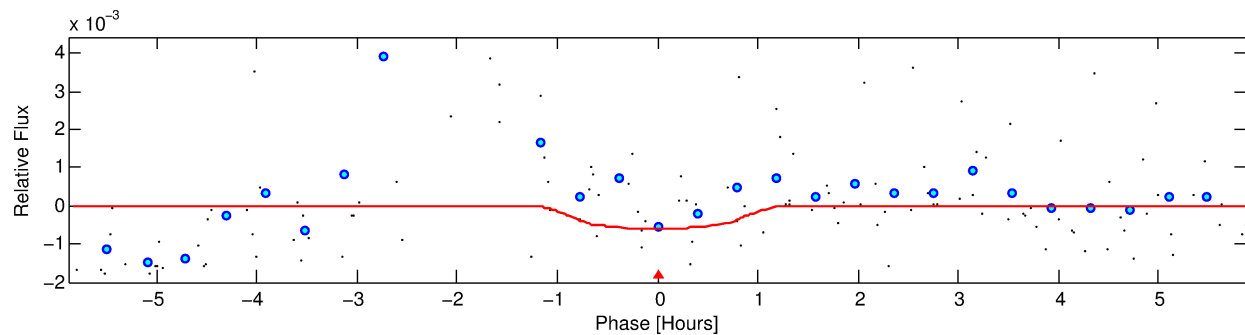
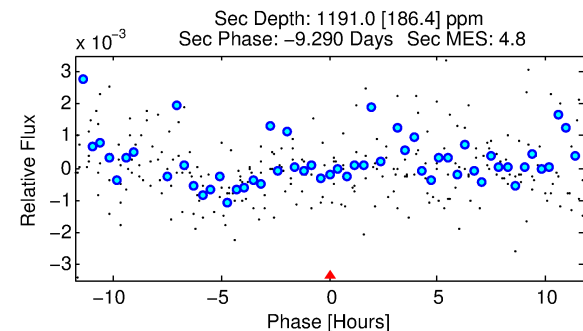
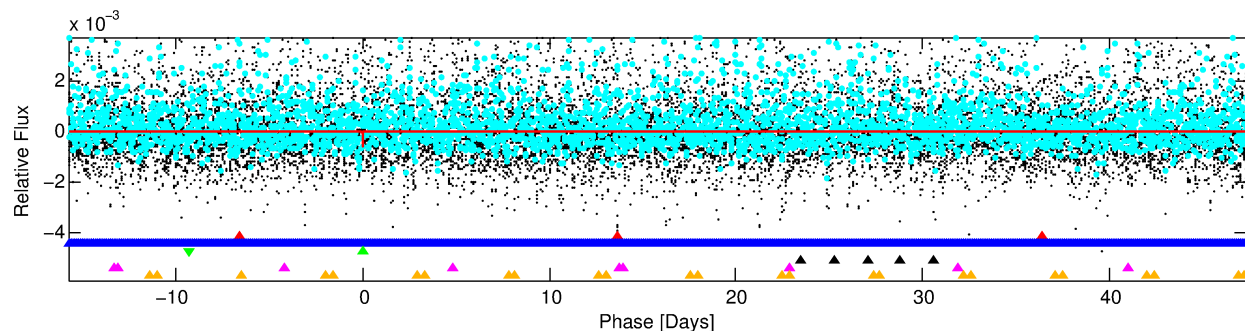
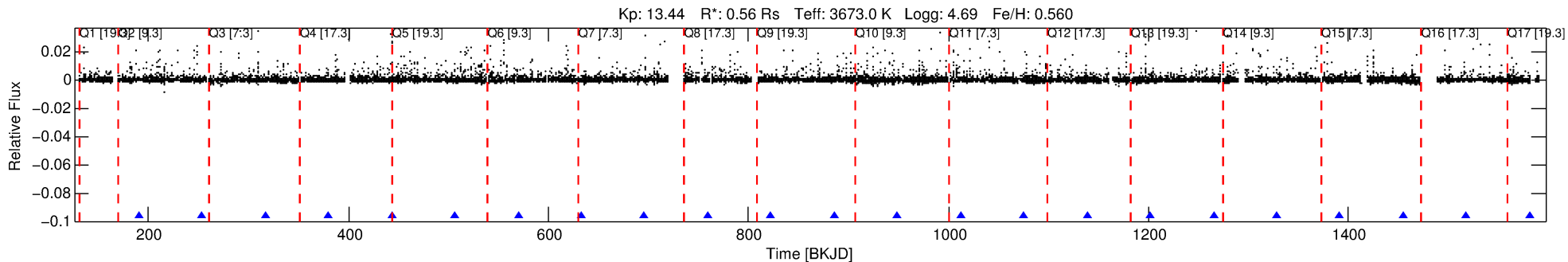
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008507979-03

No Significant Match Found

# DV One-Page Summary

KIC: 8507979 Candidate: 3 of 6 Period: 63.204 d



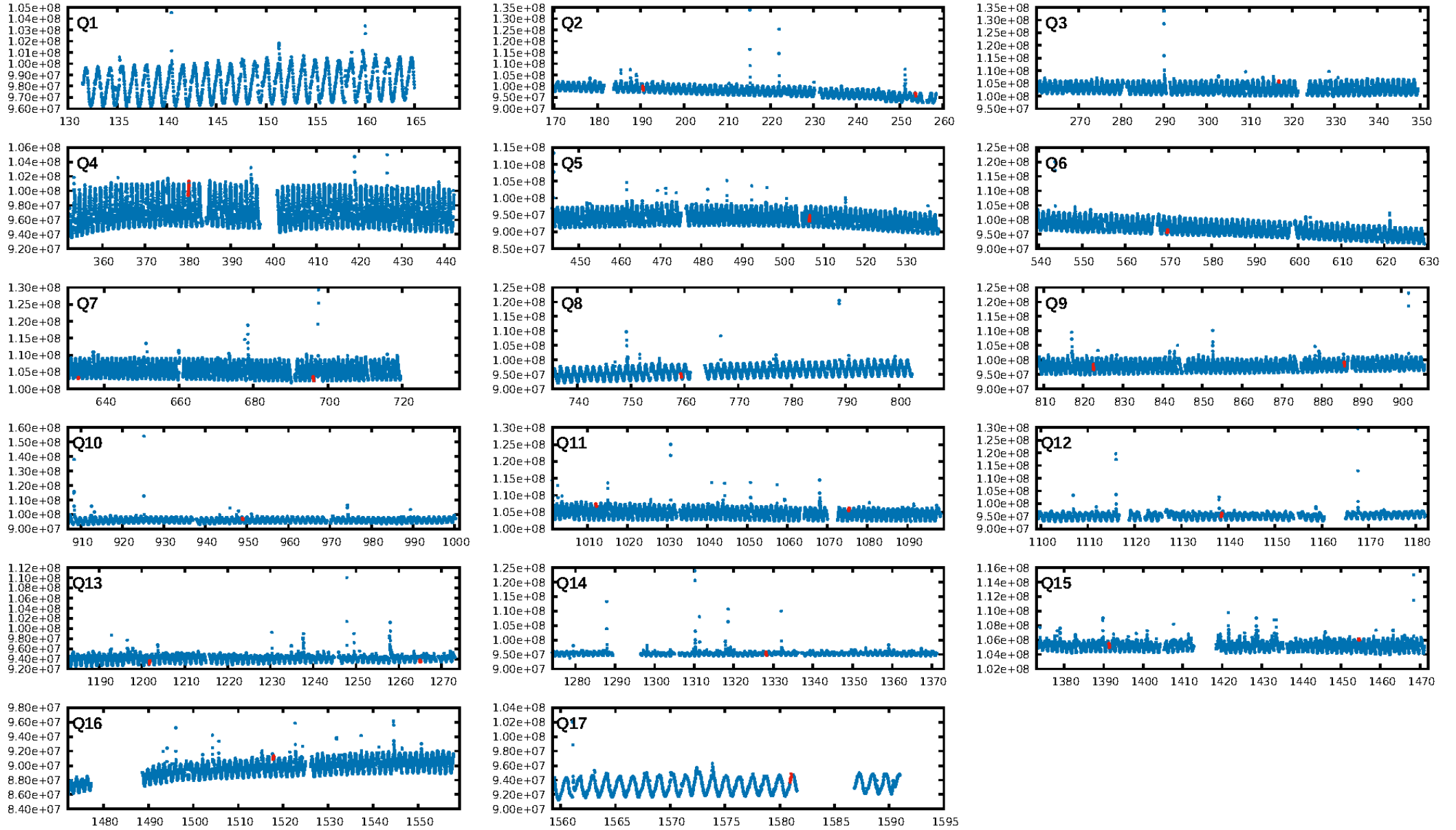
## DV Fit Results:

Period = 63.20440 [0.00370] d  
Epoch = 190.5148 [0.0406] BKJD  
Rp/R\* = 0.0216 [0.2122]  
a/R\* = 251.73 [7463.66]  
b = 0.02 [1660.66]  
Seff = 0.78 [0.17]  
Teq = 240 [13] K  
Rp = 1.32 [12.97] Re  
a = 0.2562 [0.0293] AU  
Ag = 24780.69 [487888.17] [0.05σ]  
Teffp = 4647 [22872] K [0.19σ]

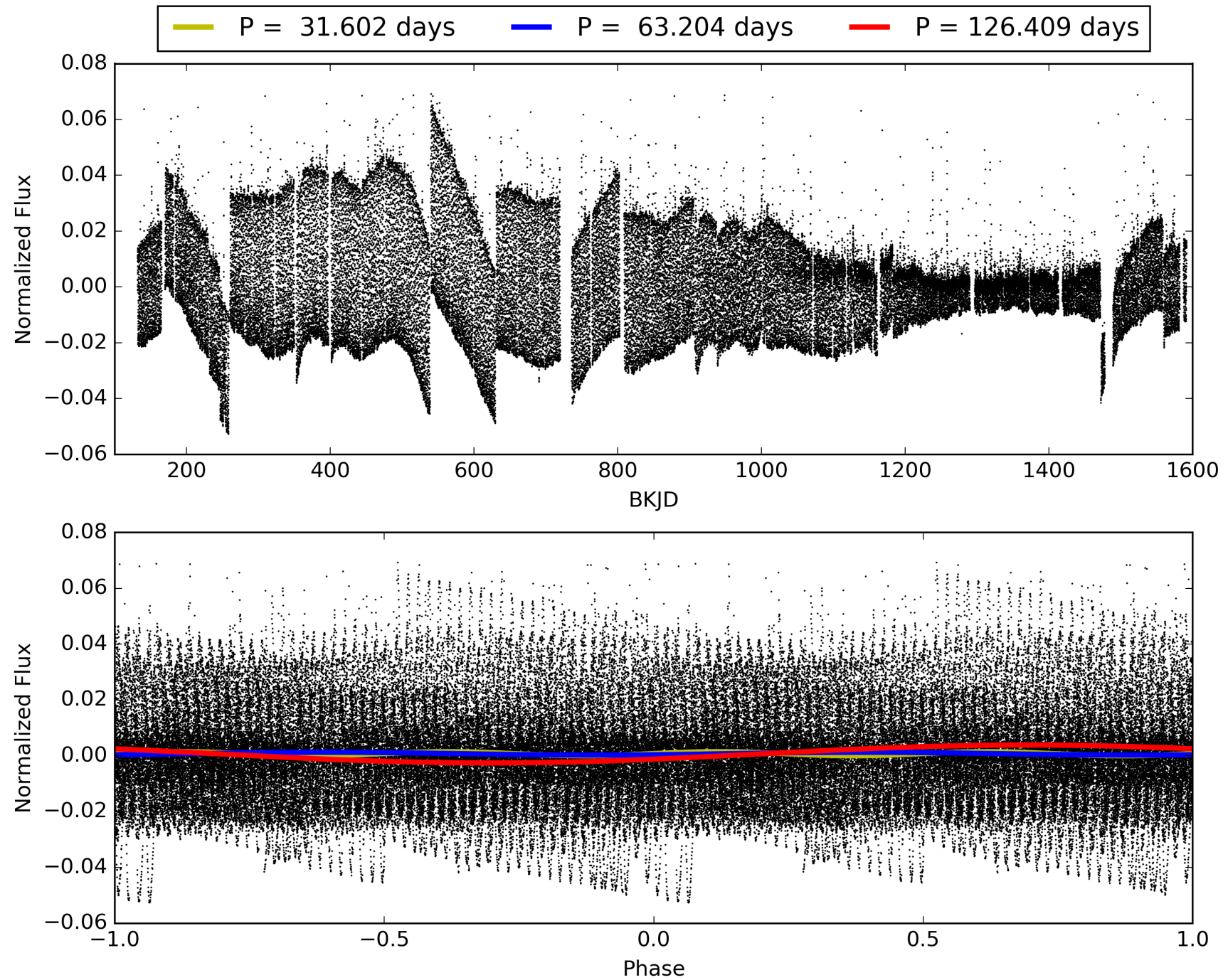
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [11.59σ]  
LongPeriod-sig: 100.0% [604.59σ]  
ModelChiSquare2-sig: 16.9%  
ModelChiSquareGof-sig: 98.6%  
**Bootstrap-pfa: 8.69e-12**  
RollingBand-fgt: 1.00 [8/8]  
**GhostDiagnostic-chr: 0.7813**  
Centroid-sig: N/A  
Centroid-so: 0.783 arcsec [1.84σ]  
OotOffset-rm: 0.079 arcsec [0.47σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.849 arcsec [5.93σ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.50 [8/16]  
DiffImageOverlap-fno: 0.38 [6/16]

# TCE 008507979-03, PDC Light Curves

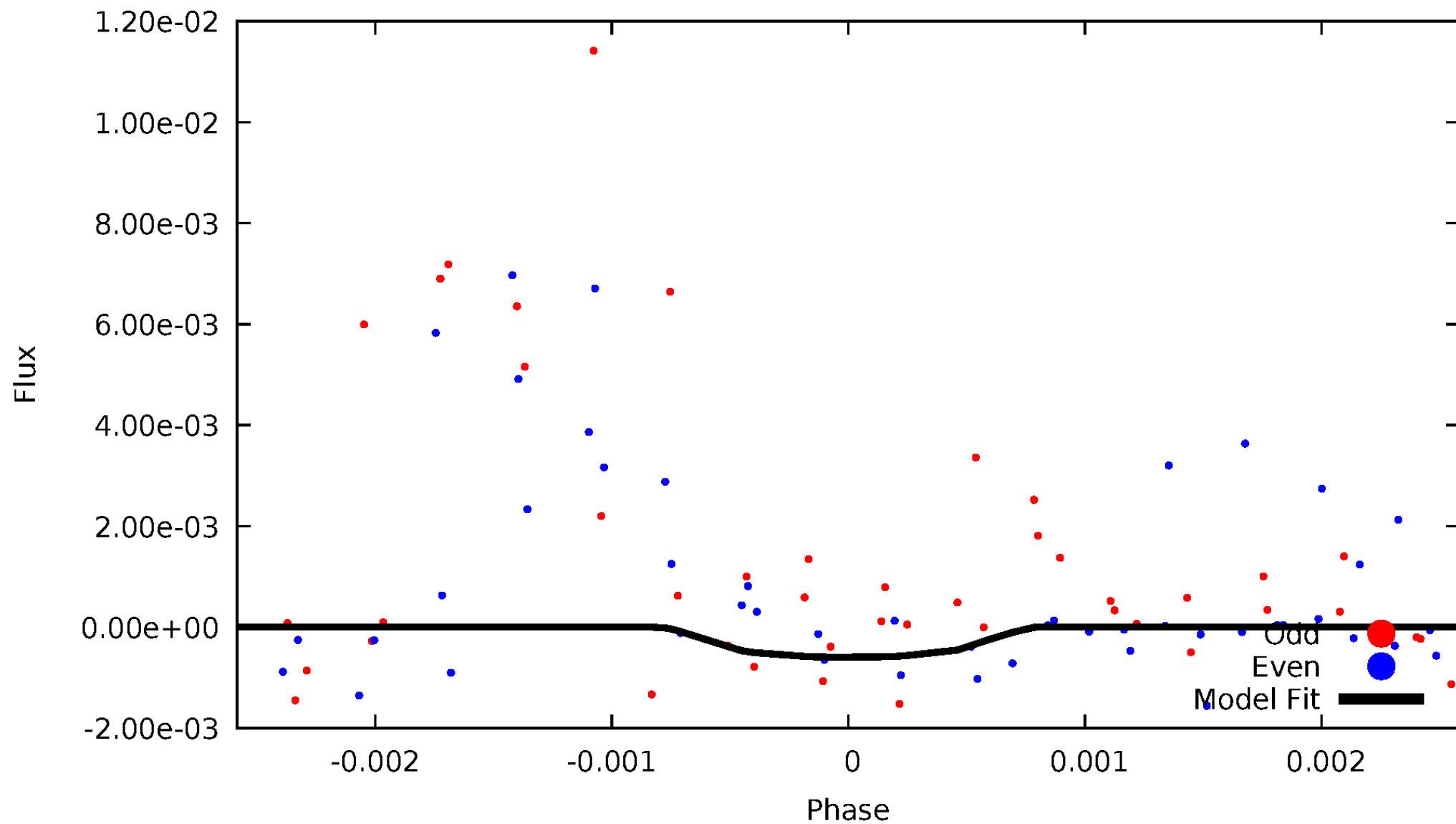


# TCE 008507979-03



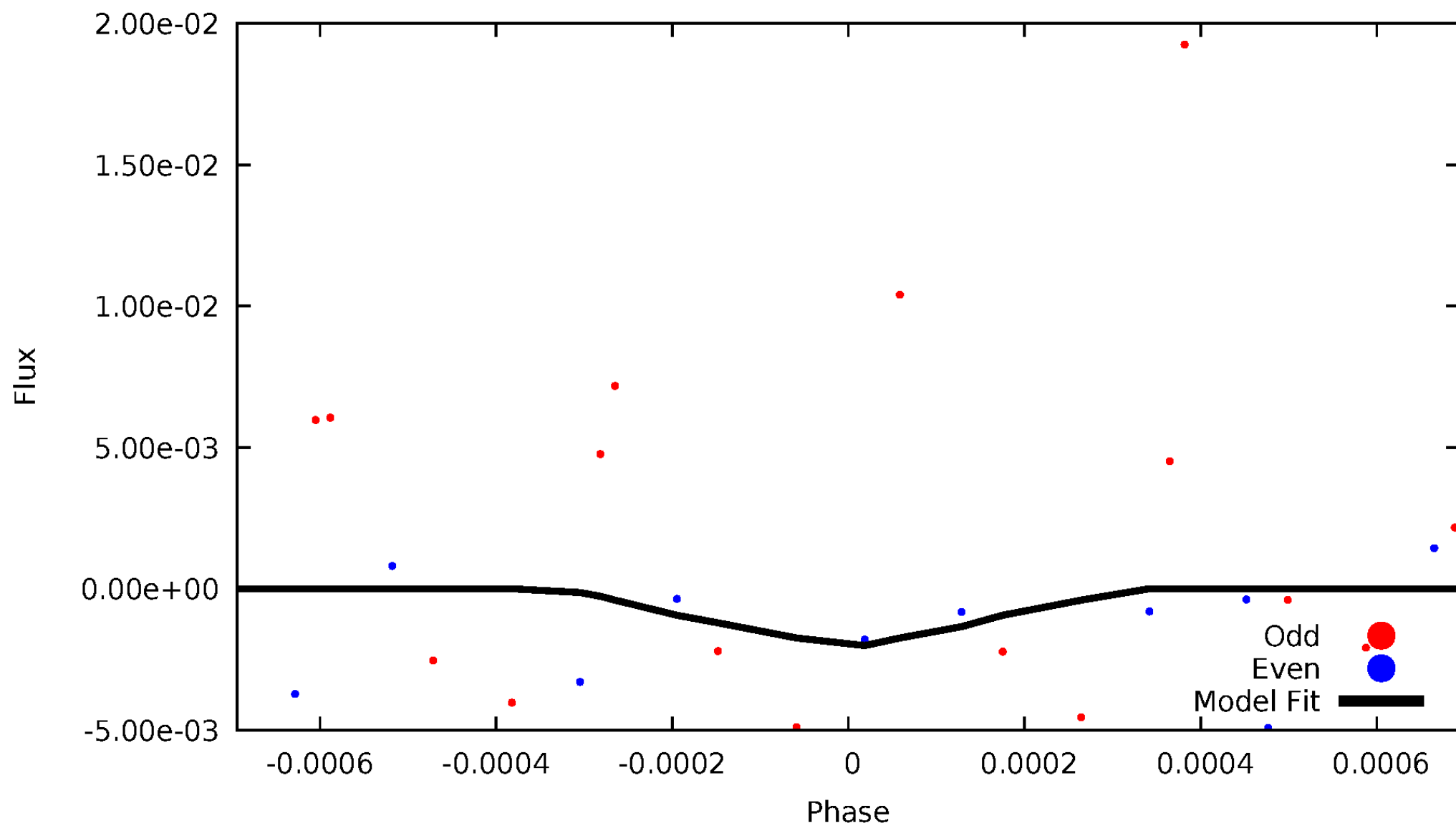
# DV Odd/Even

TCE 008507979-03



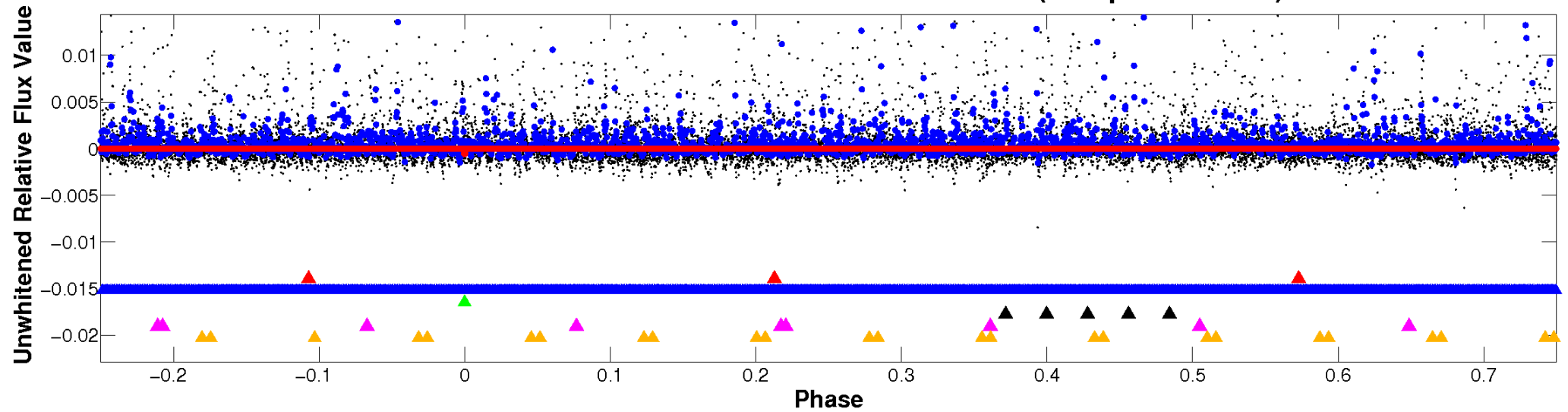
# ALT Odd/Even

TCE 008507979-03

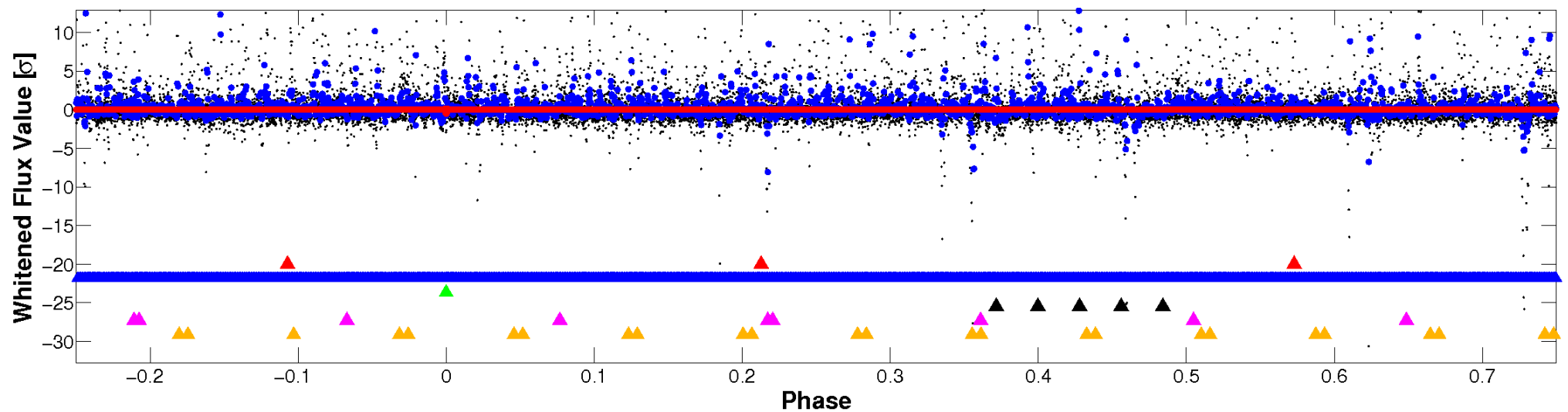


# Non-Whitened Vs. Whitened Light Curve

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



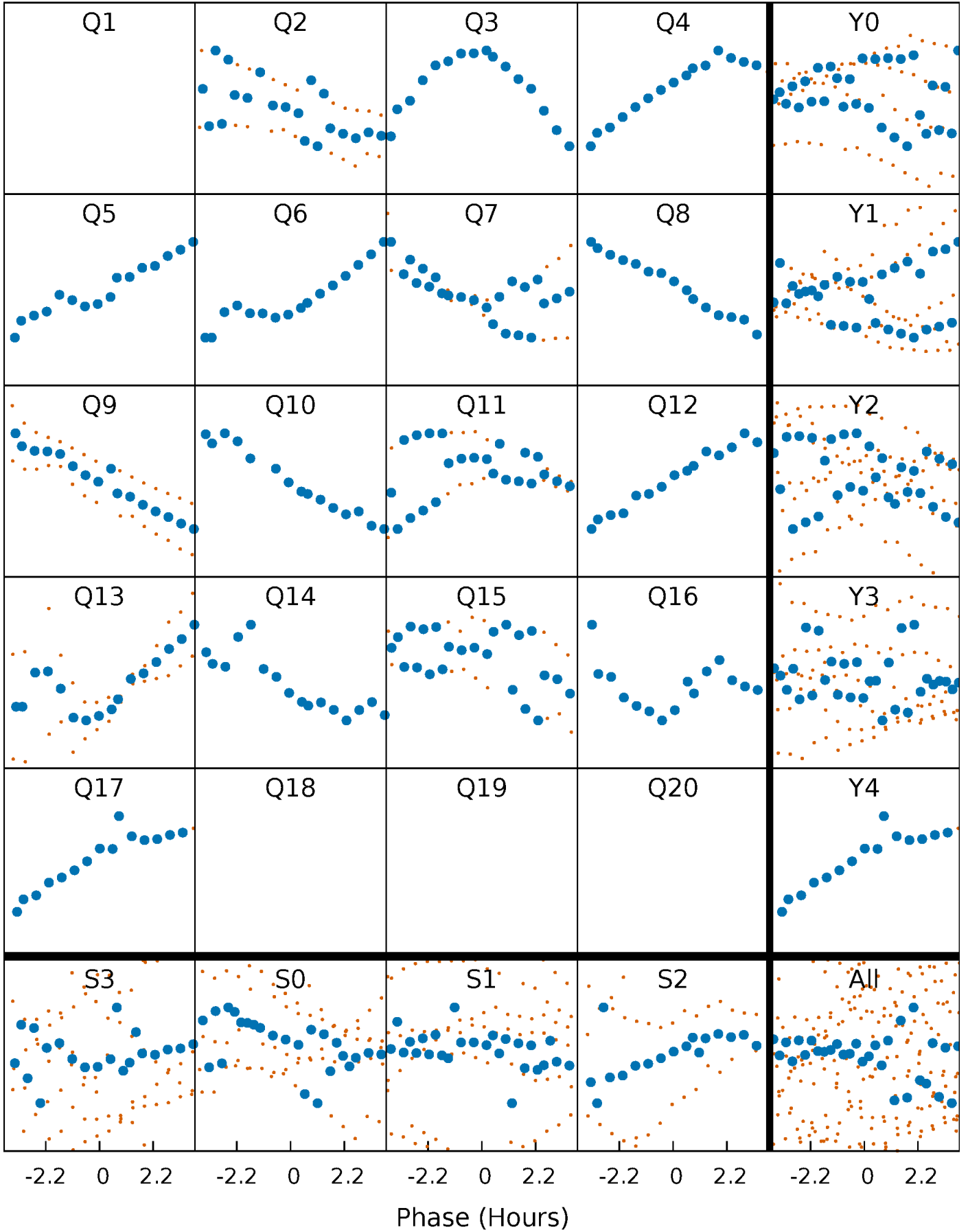
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

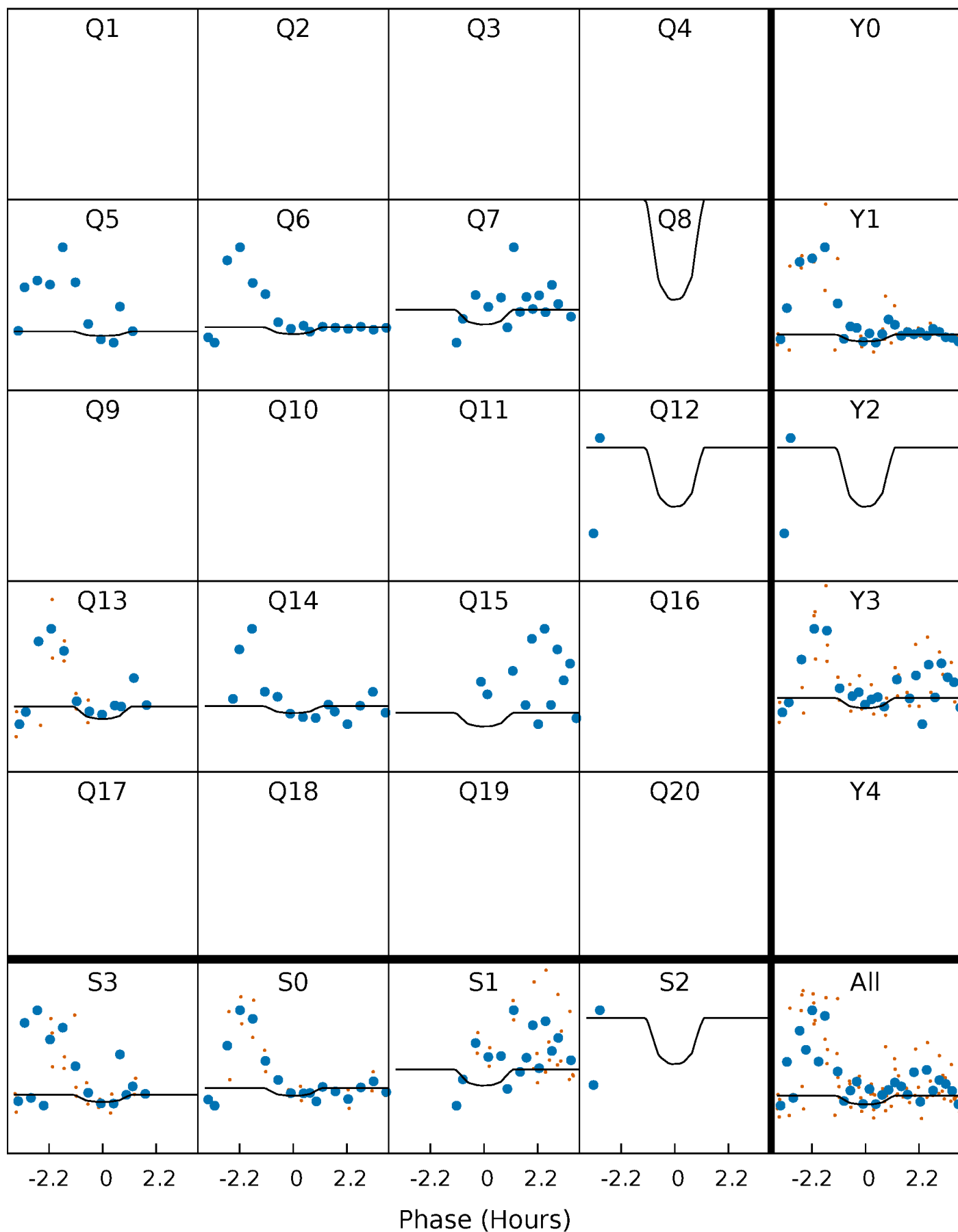
TCE 008507979-03   P= 63.204402 Days    $T_0=190.514768$  (BKJD)





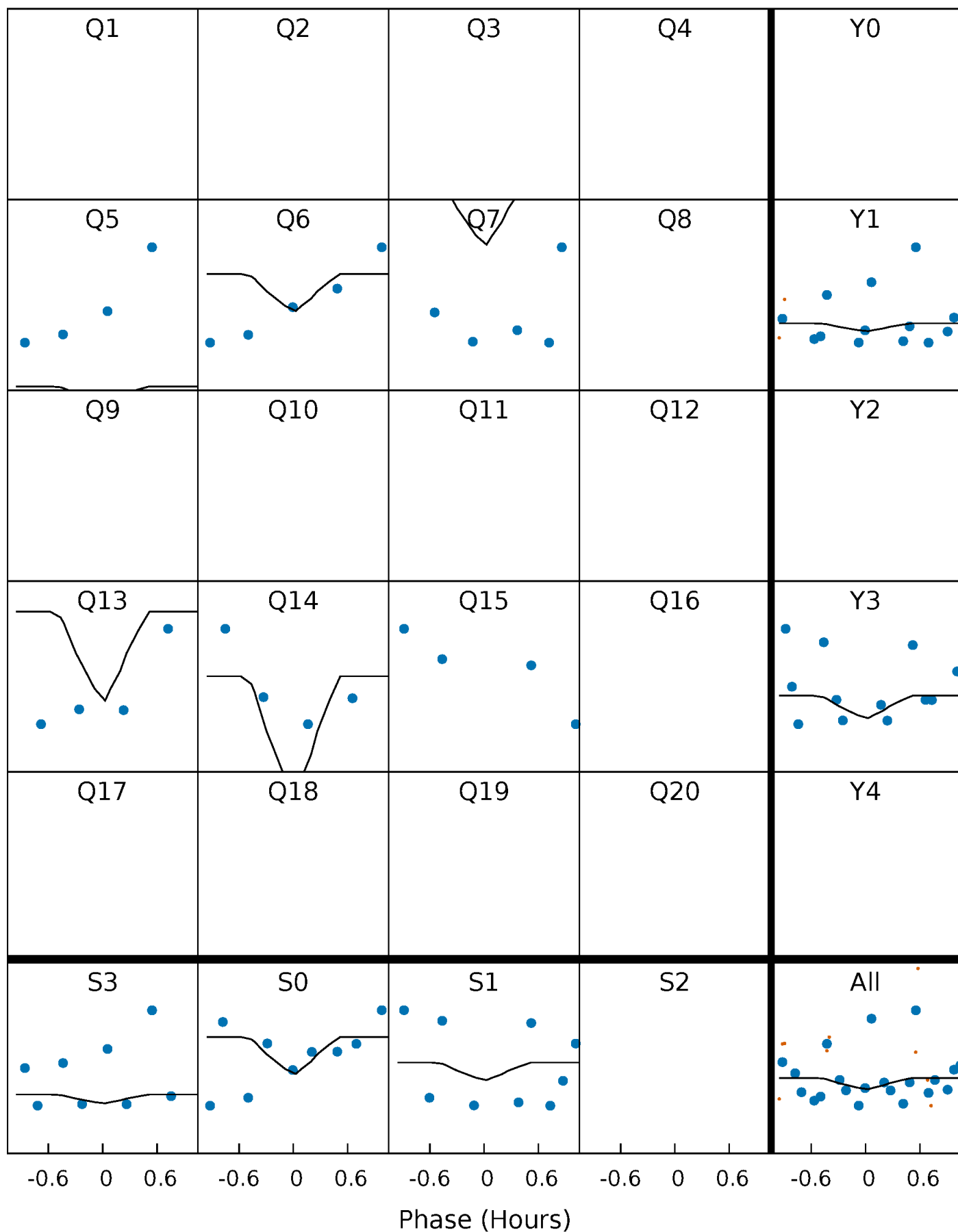
# DV Quarter-Phased Transit Curves

TCE 008507979-03   P= 63.204402 Days    $T_0=190.514768$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

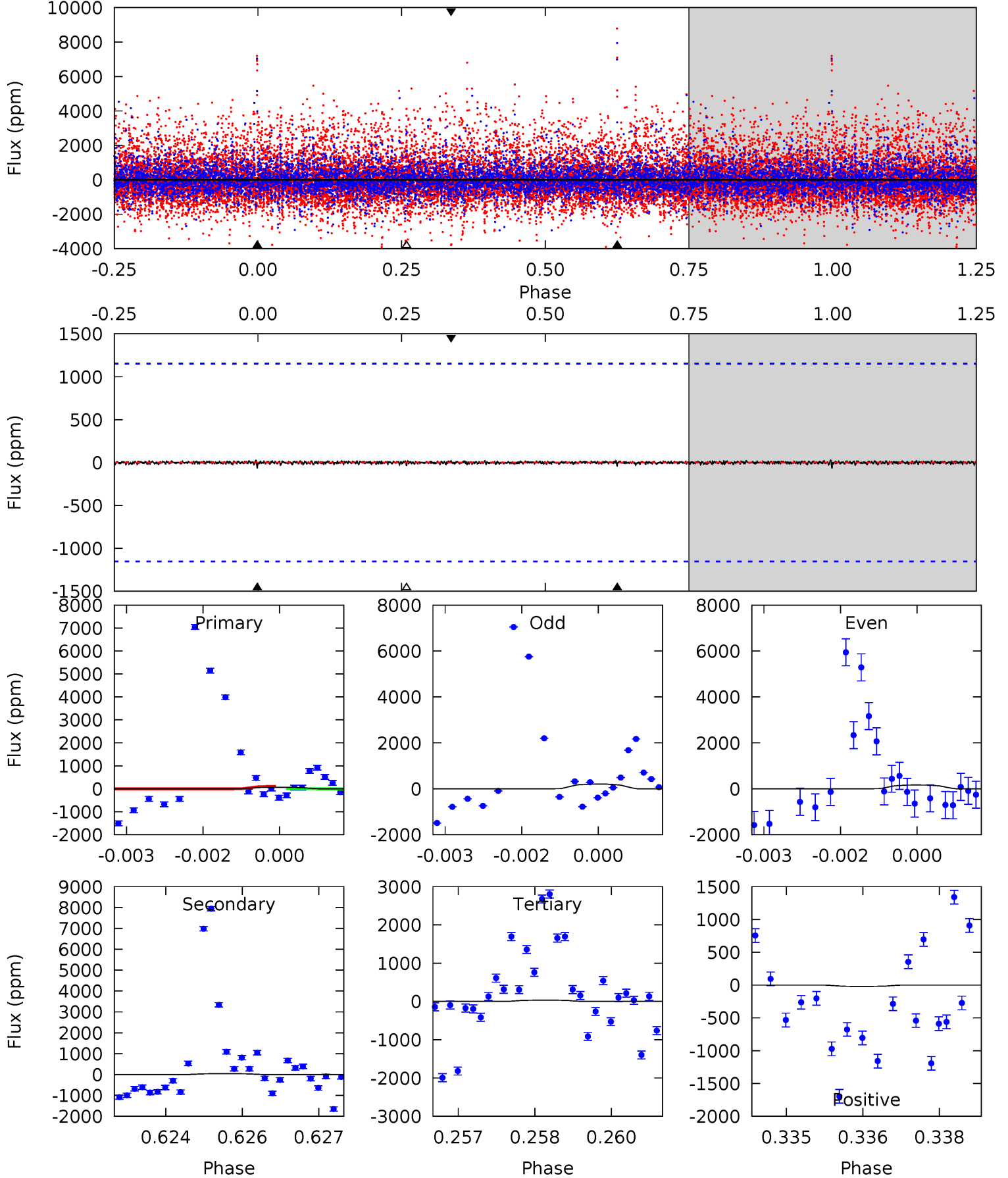
TCE 008507979-03 P= 63.205663 Days  $T_0=190.518408$  (BKJD)



# DV Model-Shift Uniqueness Test

008507979-03, P = 63.204402 Days, E = 127.310366 Days

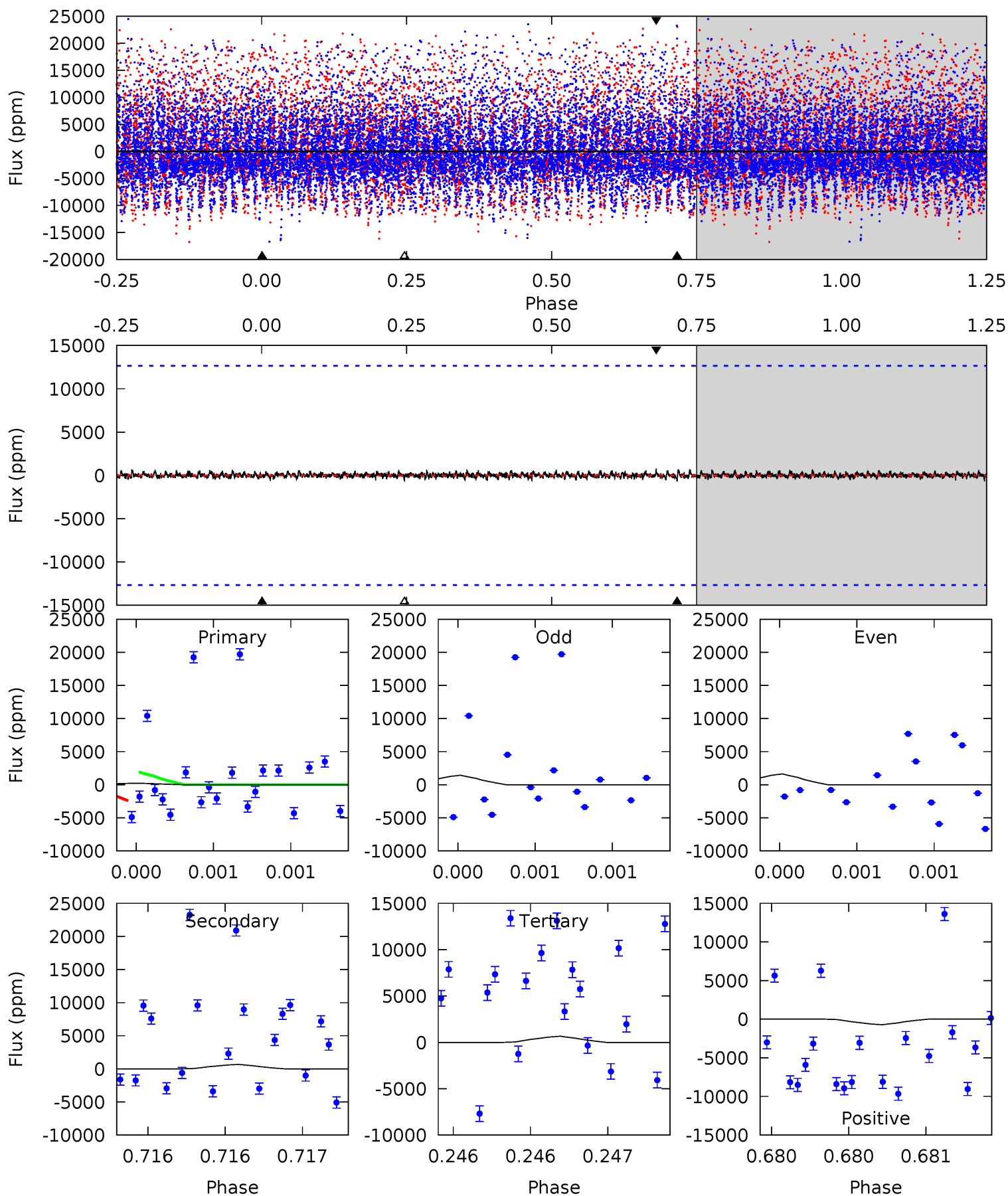
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.30	0.19	0.16	0.10	5.37	3.16	0.04	0.14	0.20	0.03	0.10	0.09	0.89	0.31	0.24



# Alt Model-Shift Uniqueness Test

008507979-03, P = 63.205663 Days, E = 127.312745 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
0.10	0.29	0.29	0.32	5.56	3.46	0.08	-0.19	-0.22	0.00	-0.02	0.04	0.05	0.52	0.11



### Stellar Parameters For KIC 008507979

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3673^{+117}_{-147}$	$4.691^{+0.080}_{-0.020}$	$0.560^{+0.050}_{-0.300}$	$0.560^{+0.032}_{-0.081}$	$0.561^{+0.040}_{-0.069}$	$4.498^{+1.756}_{-0.469}$
	+3%/-4%	+2%/-0%	+9%/-54%	+6%/-14%	+7%/-12%	+39%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008507979-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-41 \pm 214$	$8.95^{+9.72}_{-6.04}$	$330^{+13}_{-15}$	$1613^{+625}_{-3590}$	$10^{+243}_{-98}$
Alt.	$-671 \pm 2278$	$9.84^{+10.30}_{-6.88}$	$331^{+12}_{-14}$	$2055^{+945}_{-4596}$	$123^{+2509}_{-897}$

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

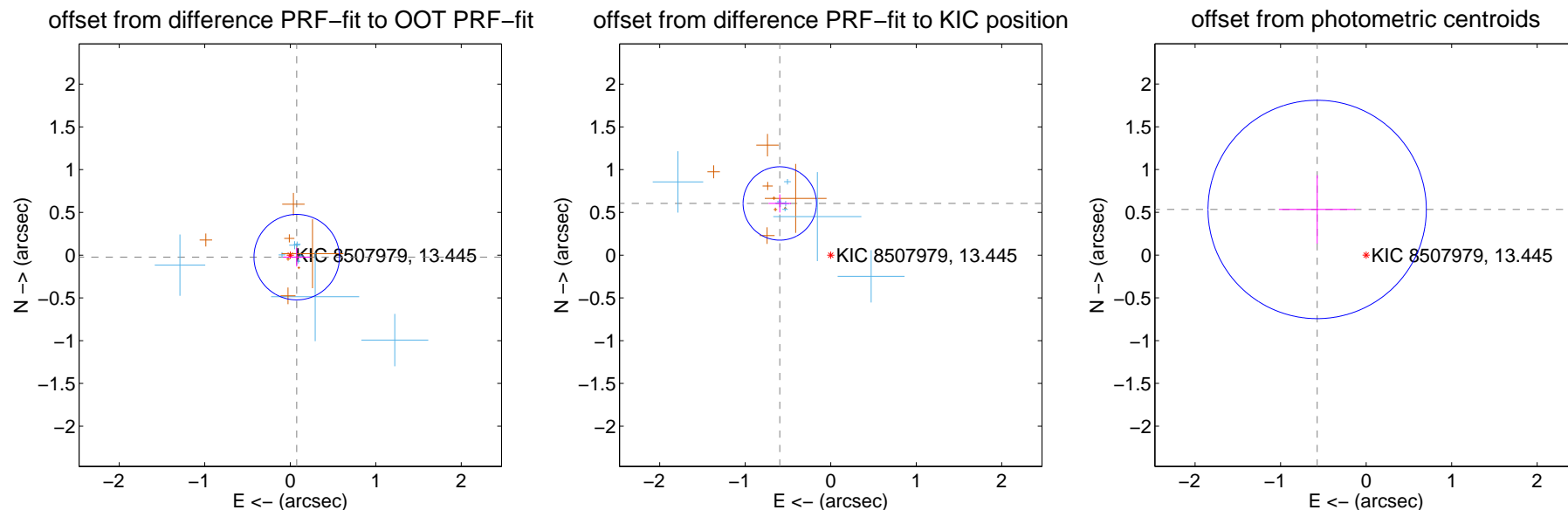
## DV Centroid Data

Supplemental centroid analysis for 008507979-03. Kepler magnitude: 13.45. Transit SNR 2.11

There are 8 quarters with good PRF difference image offsets

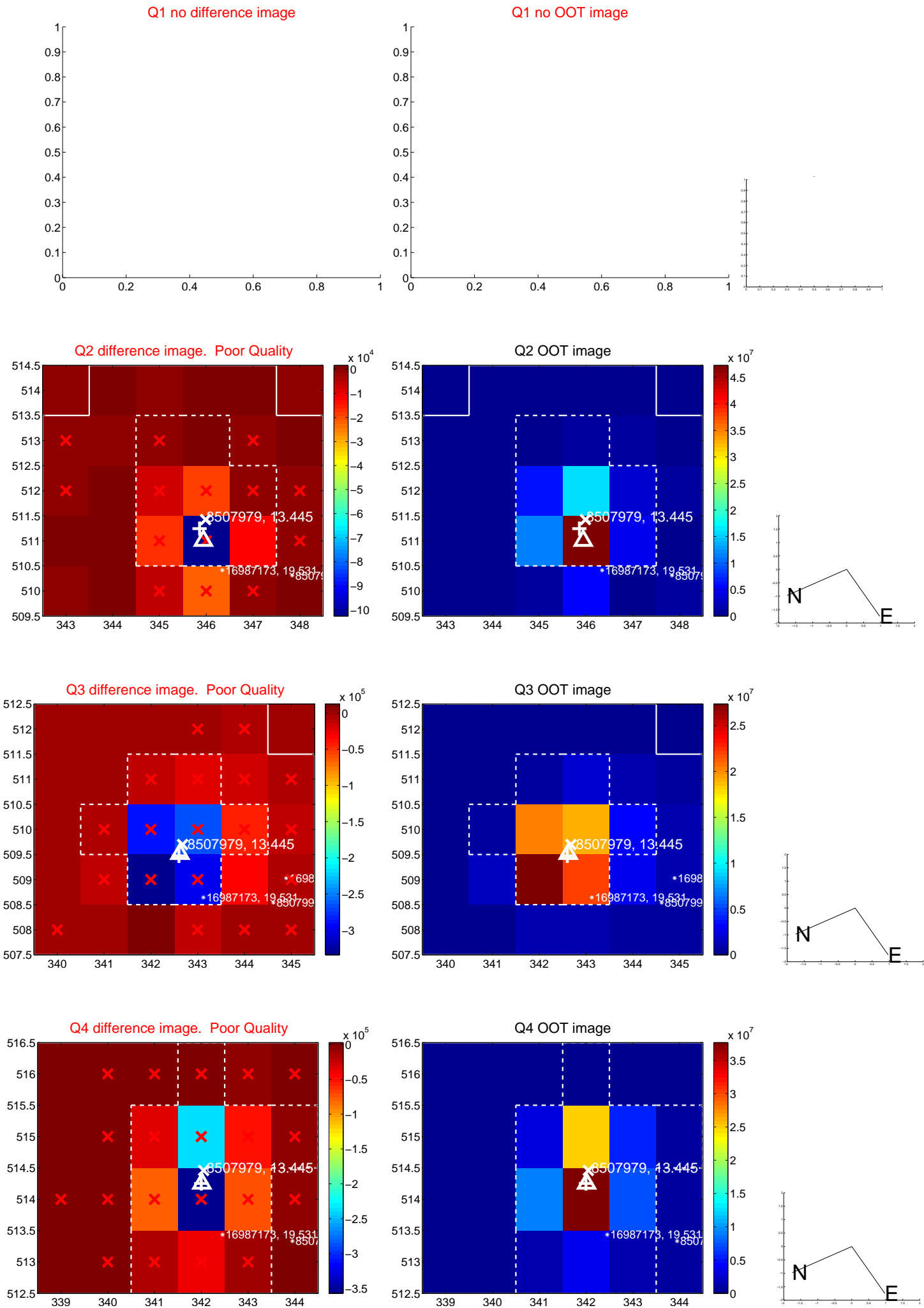
The direct PRF centroid is offset from the target star catalog position by about 0.95 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.079 \pm 0.167$	0.47	$-0.075 \pm 0.158$	$-0.023 \pm 0.109$
PRF-fit source offset from KIC position	$0.849 \pm 0.143$	5.93	$0.596 \pm 0.131$	$0.605 \pm 0.106$
photometric centroid source offset	$0.78 \pm 0.43$	1.84	$0.57 \pm 0.45$	$0.53 \pm 0.40$

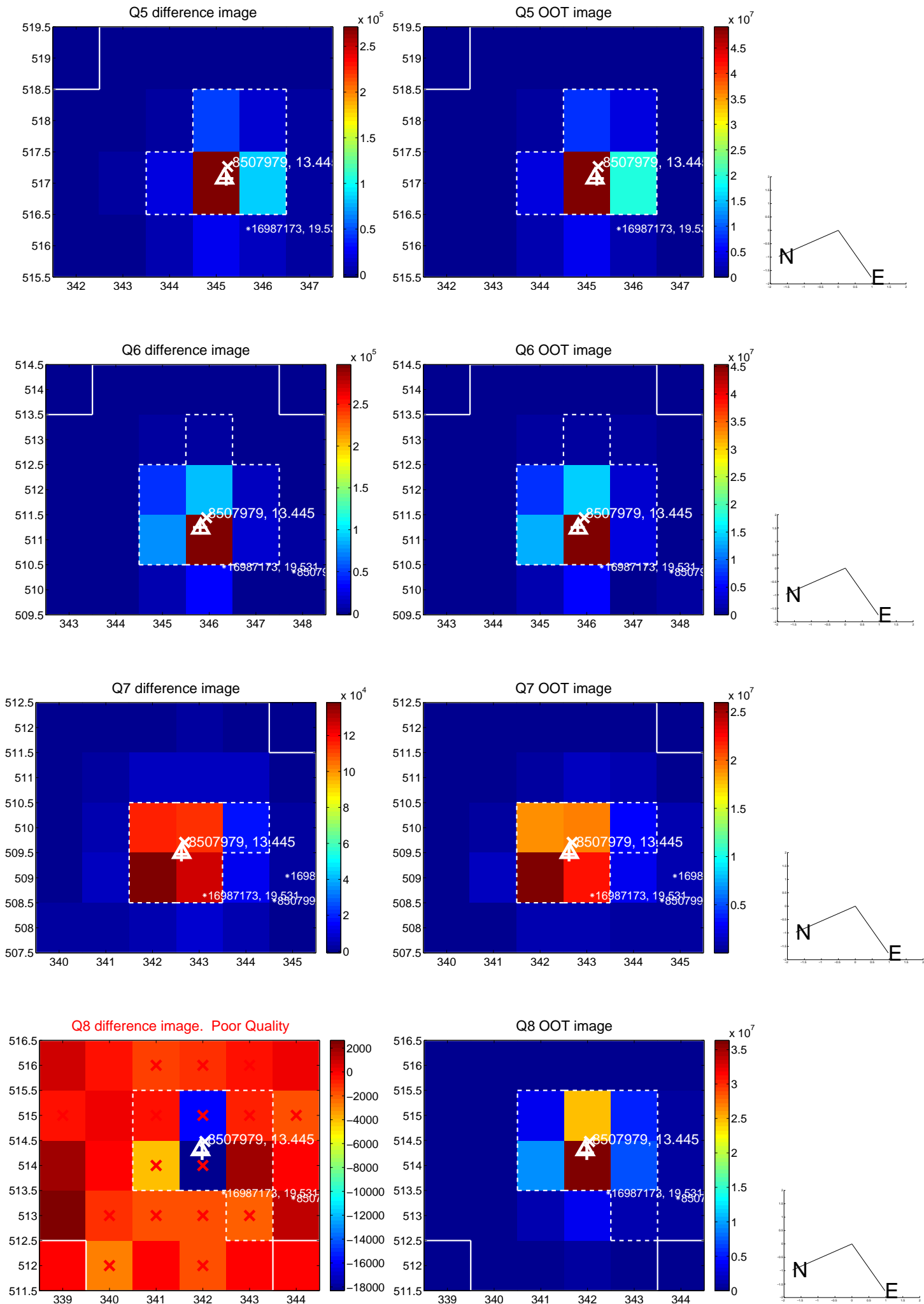


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

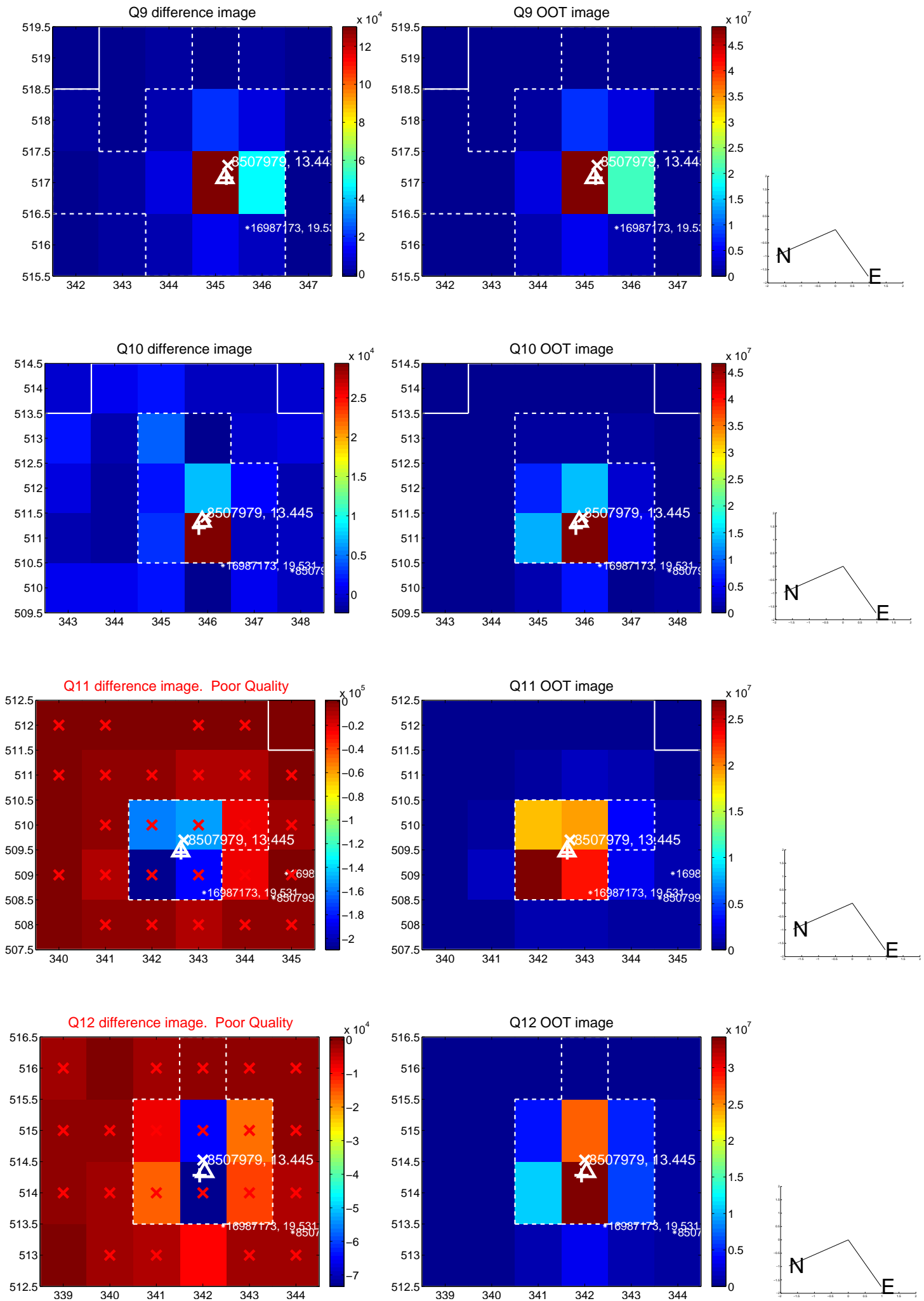


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

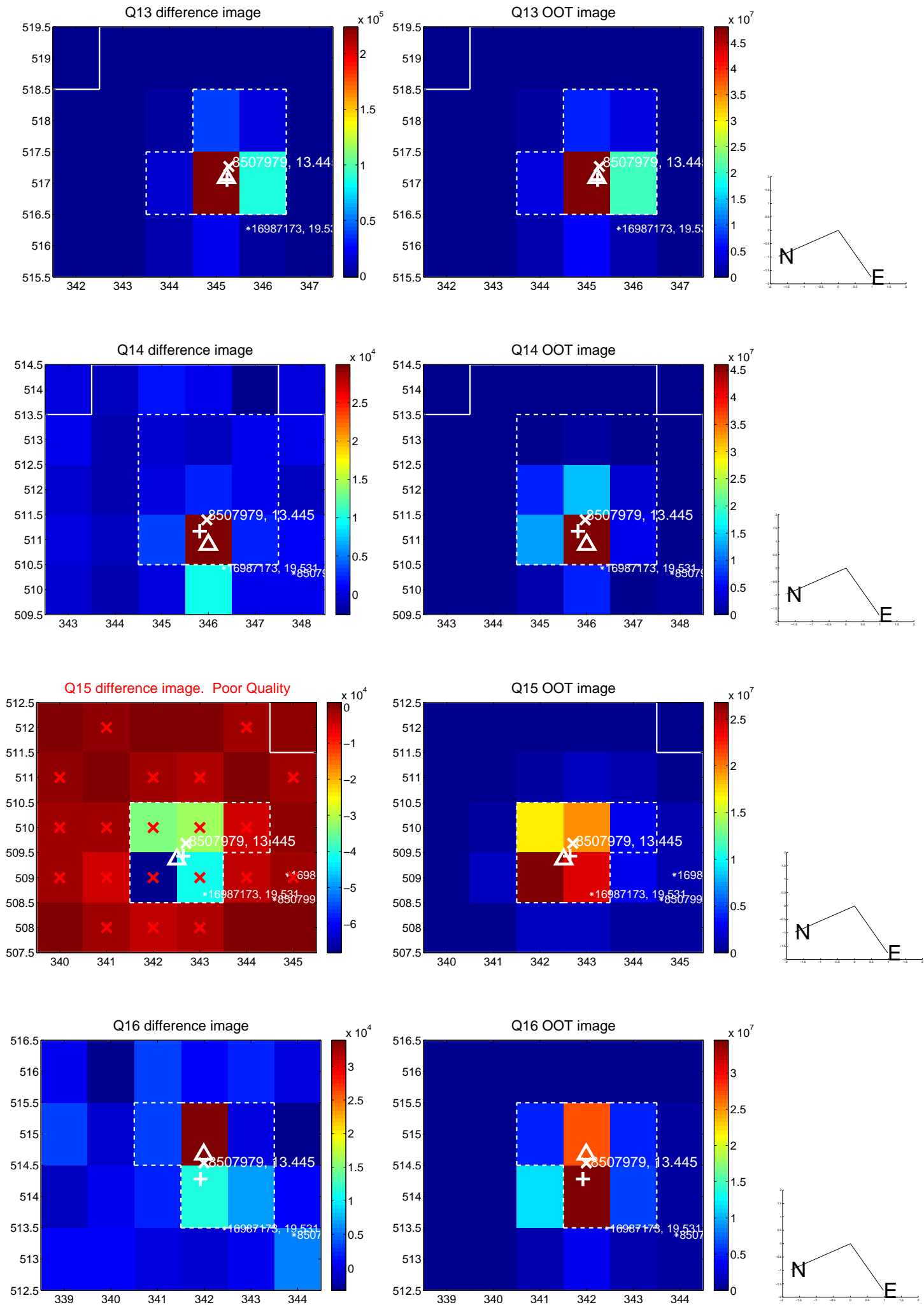




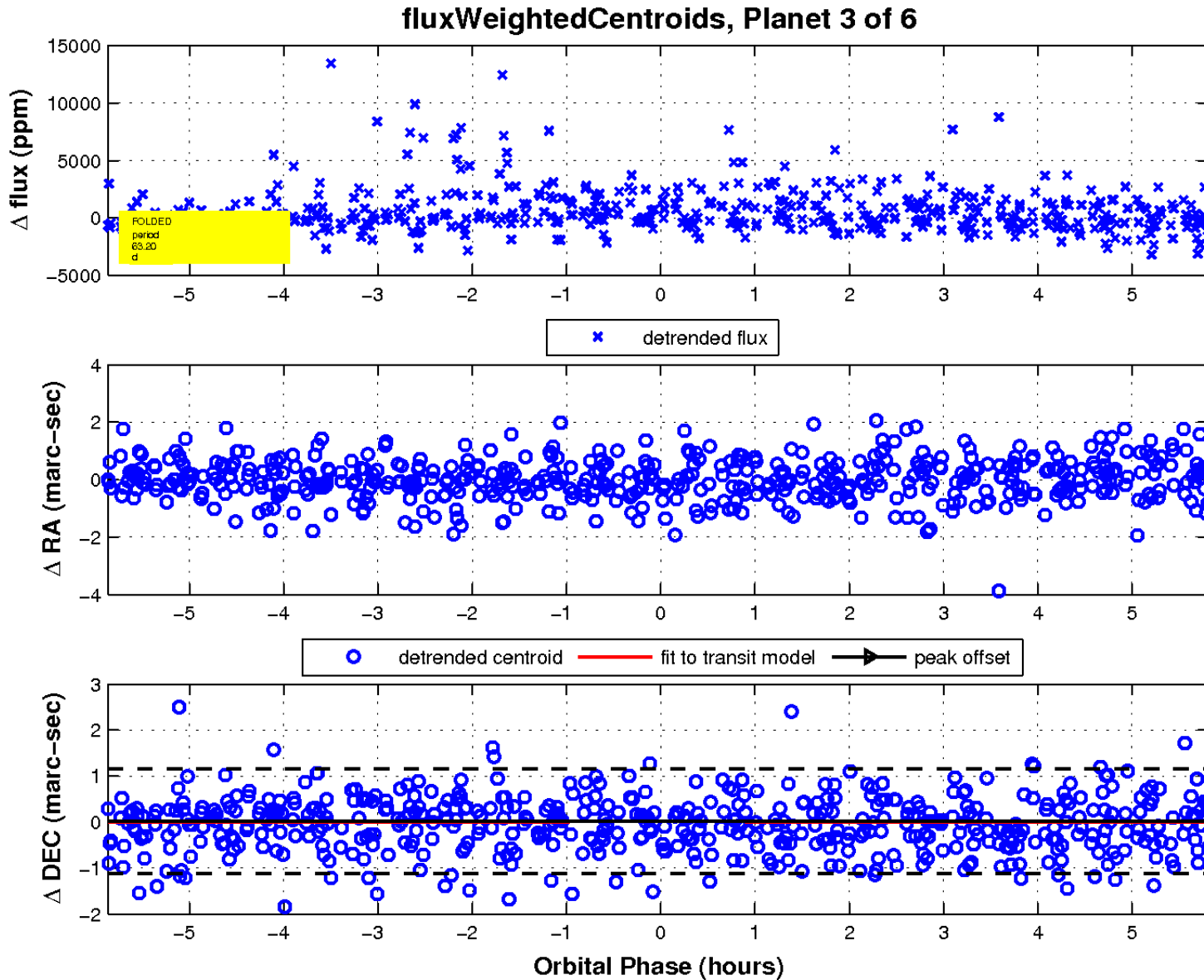
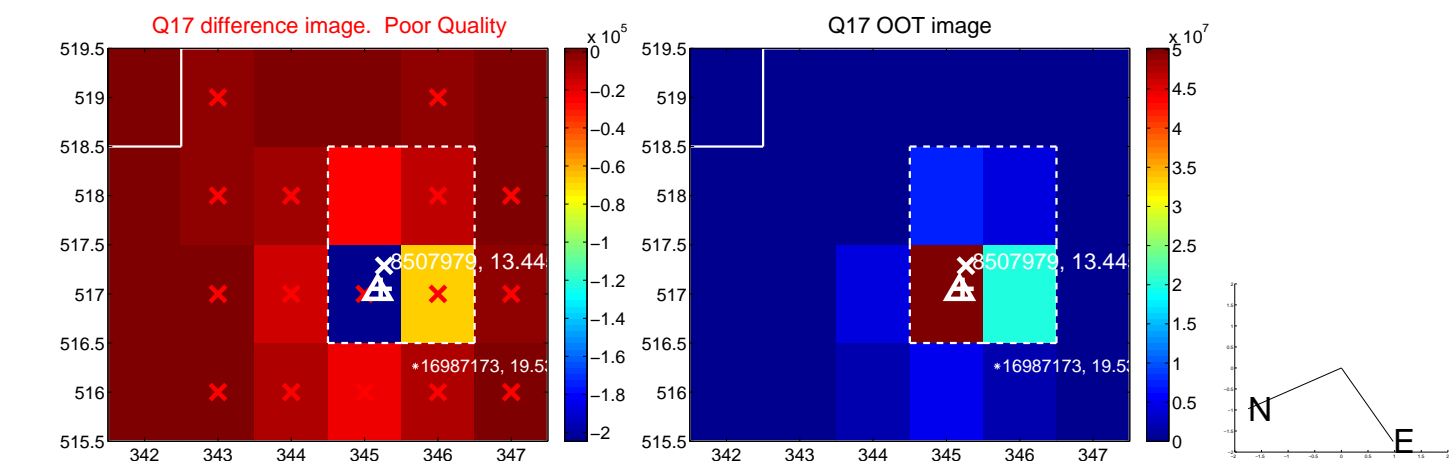
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

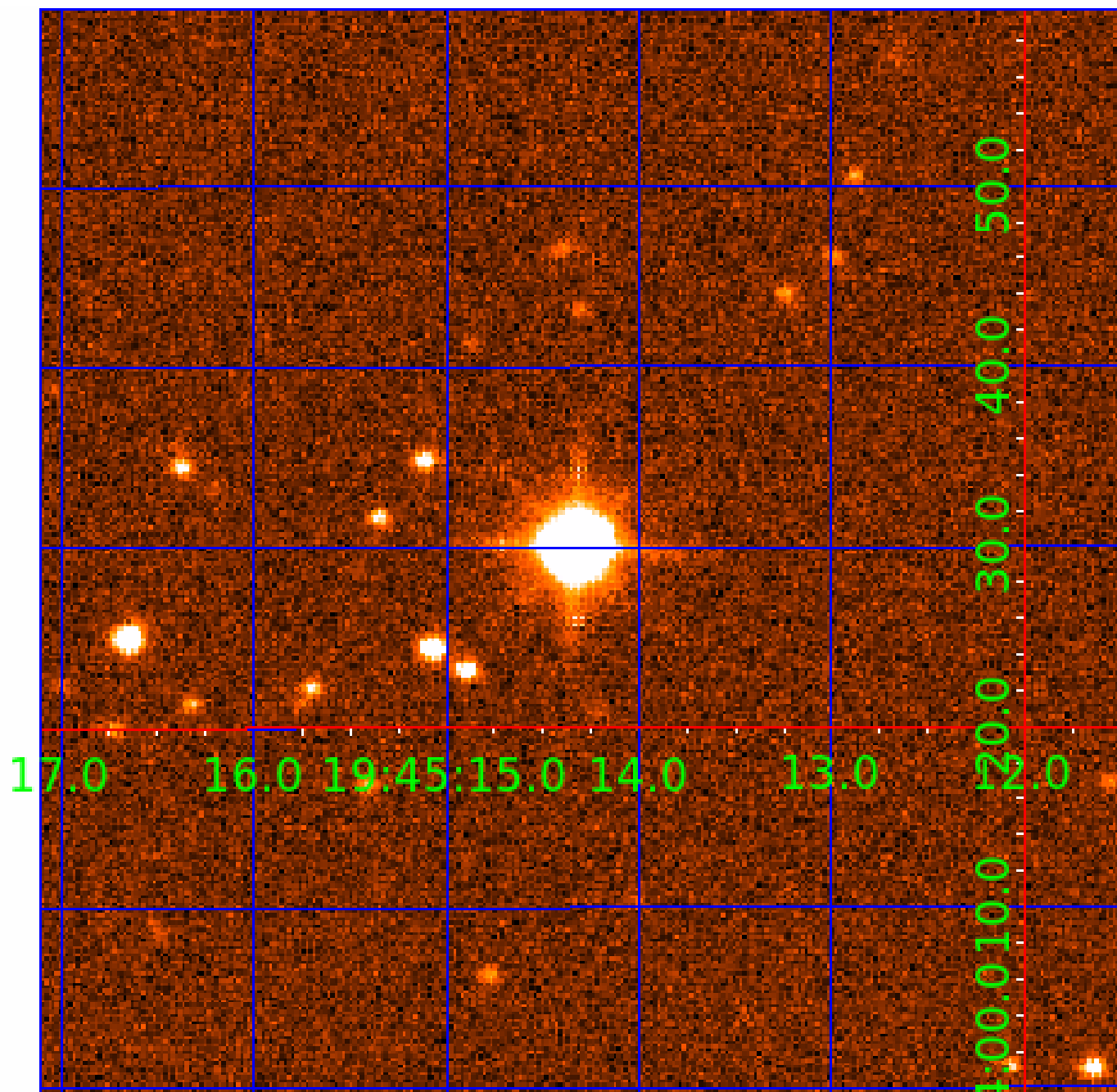


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008507979

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008507979-01	OBS	No	485.412840	267.169399	712.8	10.500	20.8	-1.0	0.56	3673	1.44	0.05
008507979-02	OBS	No	1.217481	132.056003	529.6	6.938	17.7	19.8	0.56	3673	1.24	150.83
008507979-03	OBS	No	63.204402	190.514768	597.2	1.959	9.5	2.1	0.56	3673	1.32	0.78
008507979-04	OBS	No	317.800217	150.799469	2545.5	4.825	9.7	8.4	0.56	3673	3.44	0.09
008507979-05	OBS	No	153.465914	240.607053	766.2	3.000	11.4	-1.0	0.56	3673	1.49	0.24
008507979-06	OBS	No	58.313574	179.490673	619.9	9.935	8.2	3.4	0.56	3673	1.34	0.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008507979-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008507979-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS

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

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

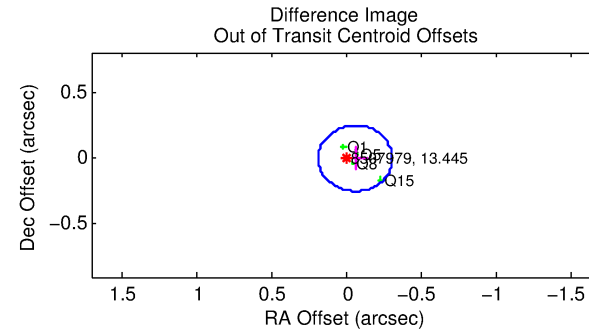
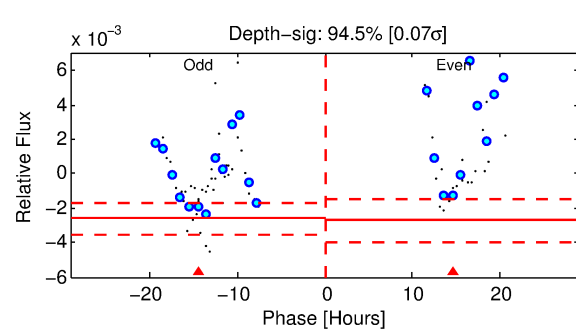
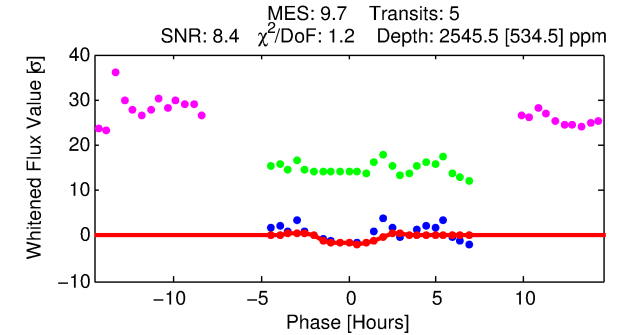
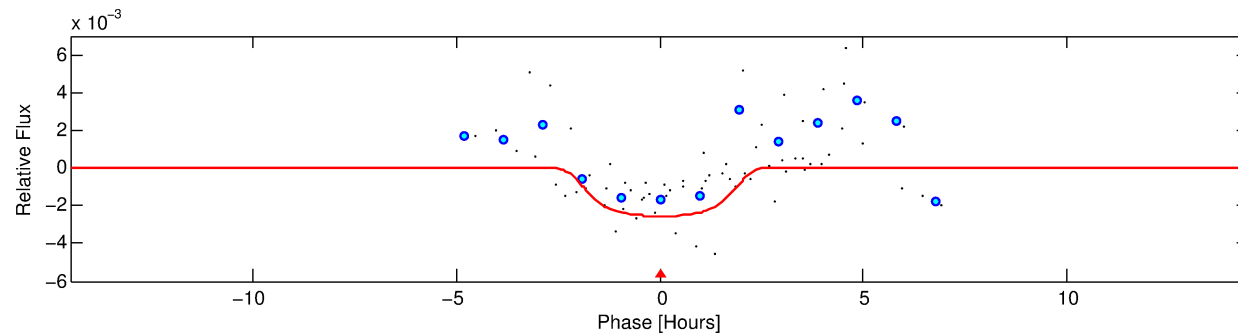
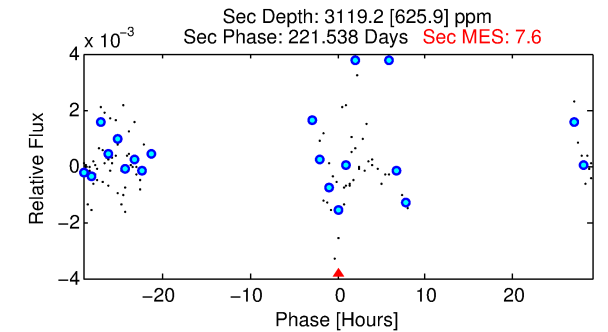
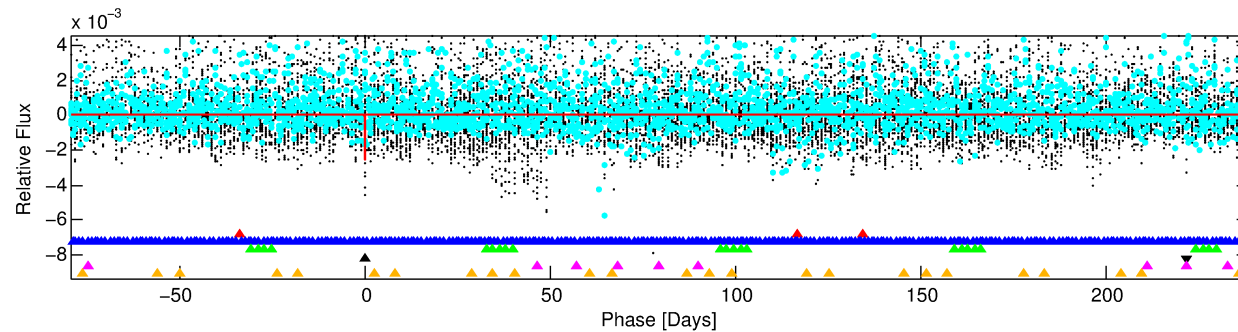
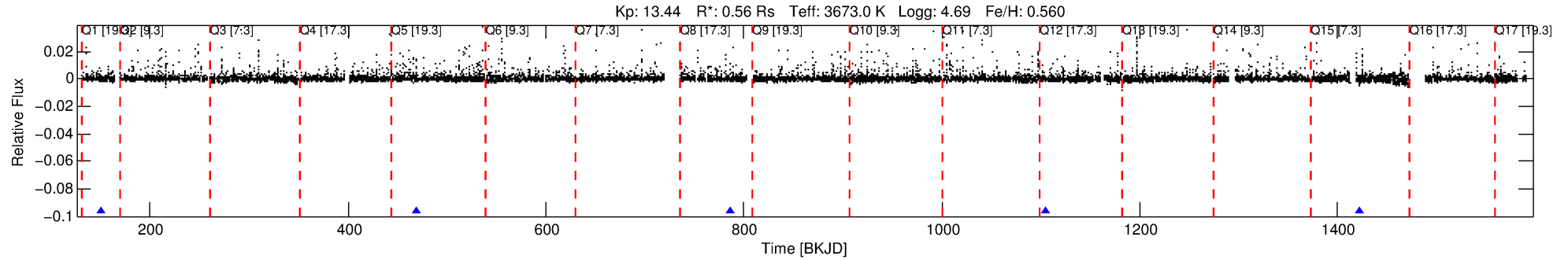
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008507979-04

No Significant Match Found

# DV One-Page Summary

KIC: 8507979 Candidate: 4 of 6 Period: 317.800 d



## DV Fit Results:

Period = 317.80022 [0.00655] d  
Epoch = 150.7995 [0.0194] BKJD  
Rp/R\* = 0.0564 [0.0108]  
a/R\* = 283.16 [141.38]  
b = 0.89 [0.11]  
Seff = 0.09 [0.02]  
Teq = 140 [8] K  
Rp = 3.44 [0.83] Re  
a = 0.7521 [0.0860] AU  
Ag = 81802.97 [37619.41] [2.17σ]  
**Teffp = 3656 [422] K [8.34σ]**

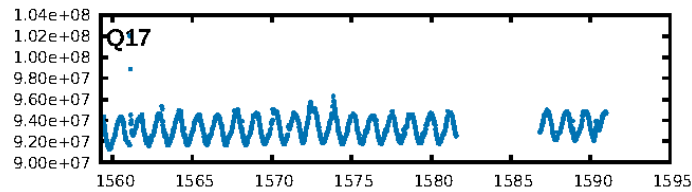
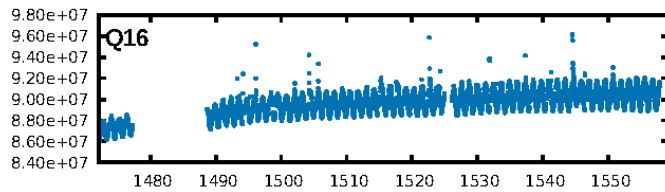
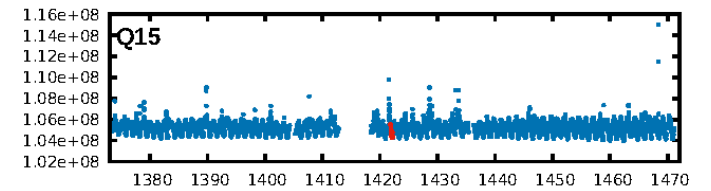
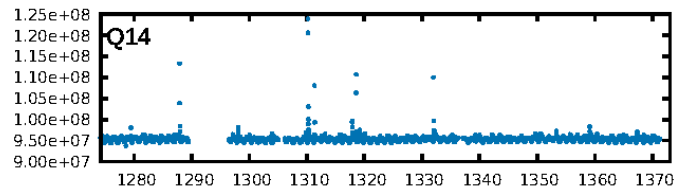
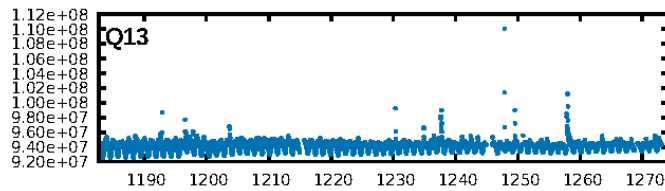
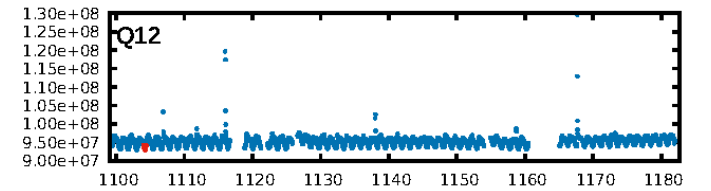
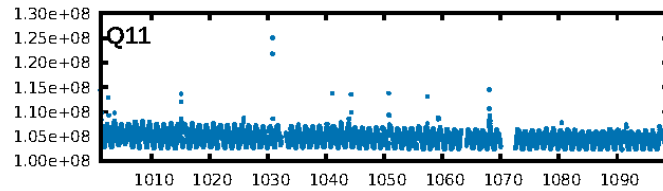
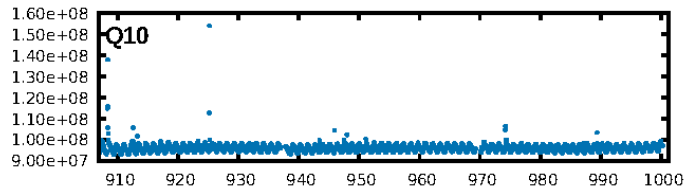
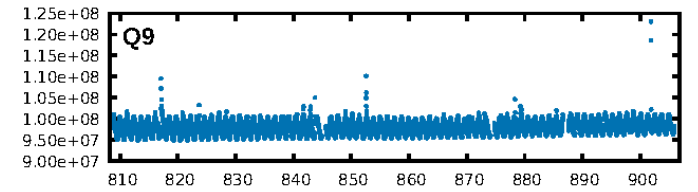
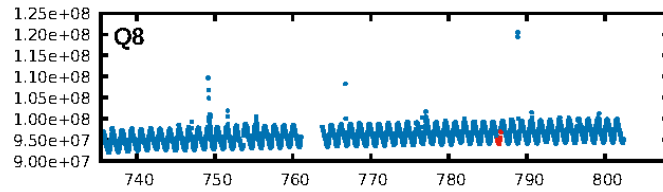
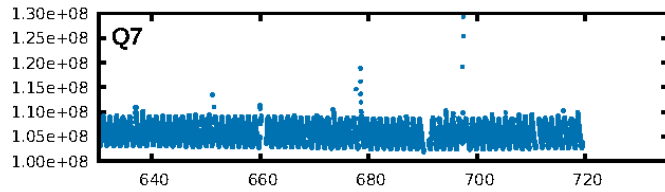
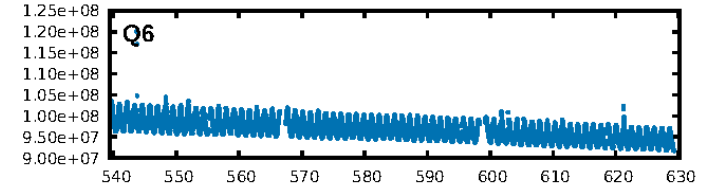
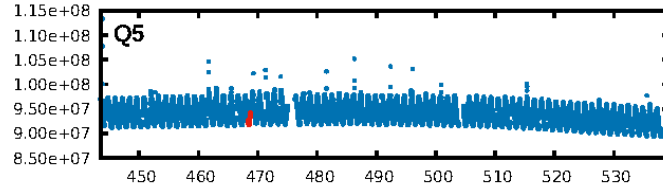
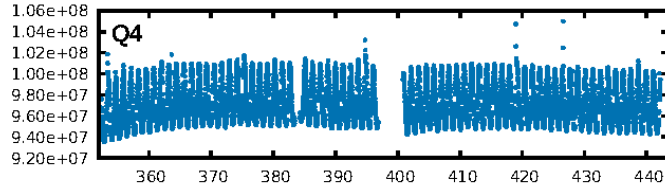
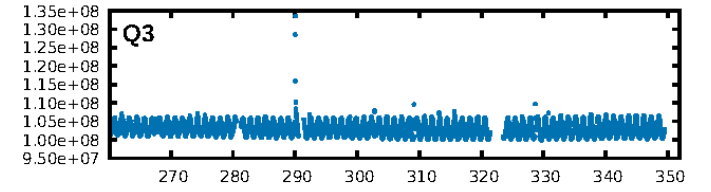
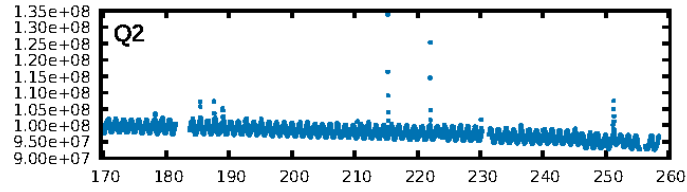
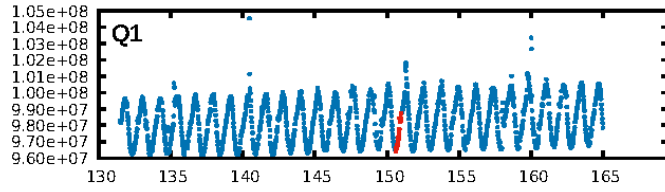
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [694.21σ]  
LongPeriod-sig: 100.0% [348.12σ]  
ModelChiSquare2-sig: 40.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.30e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -3.644  
Centroid-sig: N/A  
**Centroid-so: 0.810 arcsec [4.59σ]**  
OotOffset-rm: 0.063 arcsec [0.76σ]  
OotOffset-st: 0/1/1/2 [4]  
KicOffset-rm: **0.828 arcsec [10.82σ]**  
KicOffset-st: 0/1/1/2 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 0.25 [1/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:58:04 Z

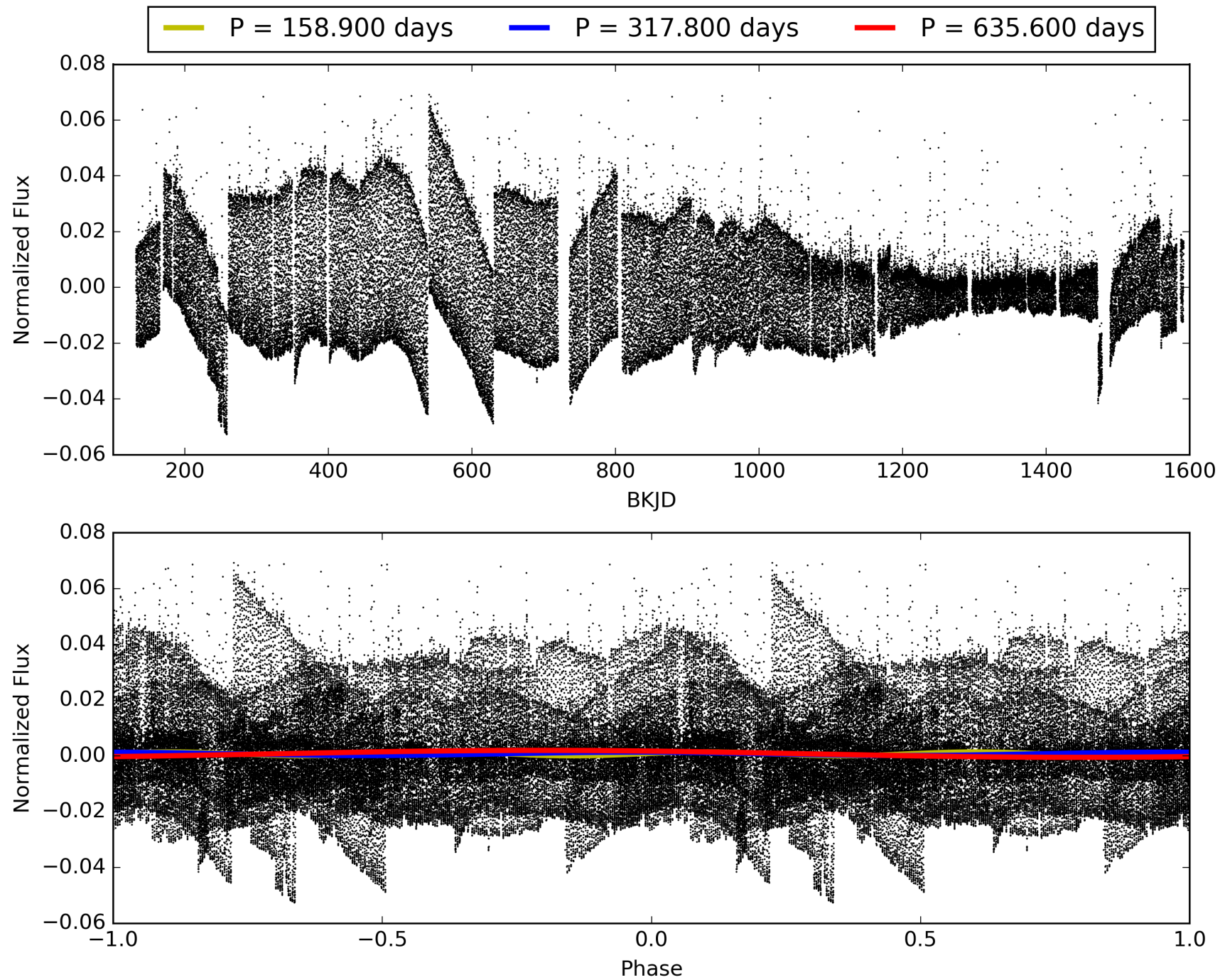
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008507979-04, PDC Light Curves





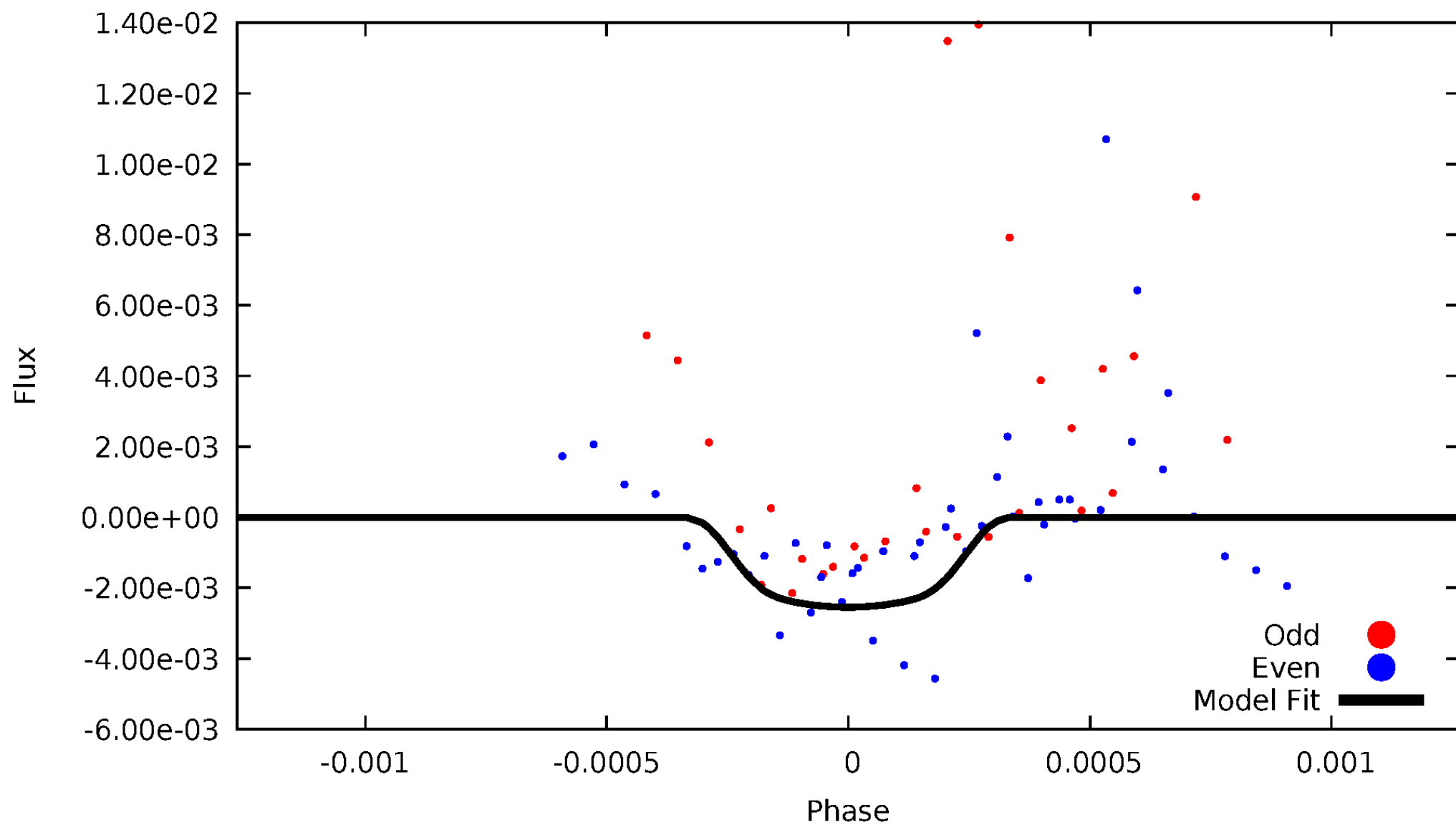
TCE 008507979-04





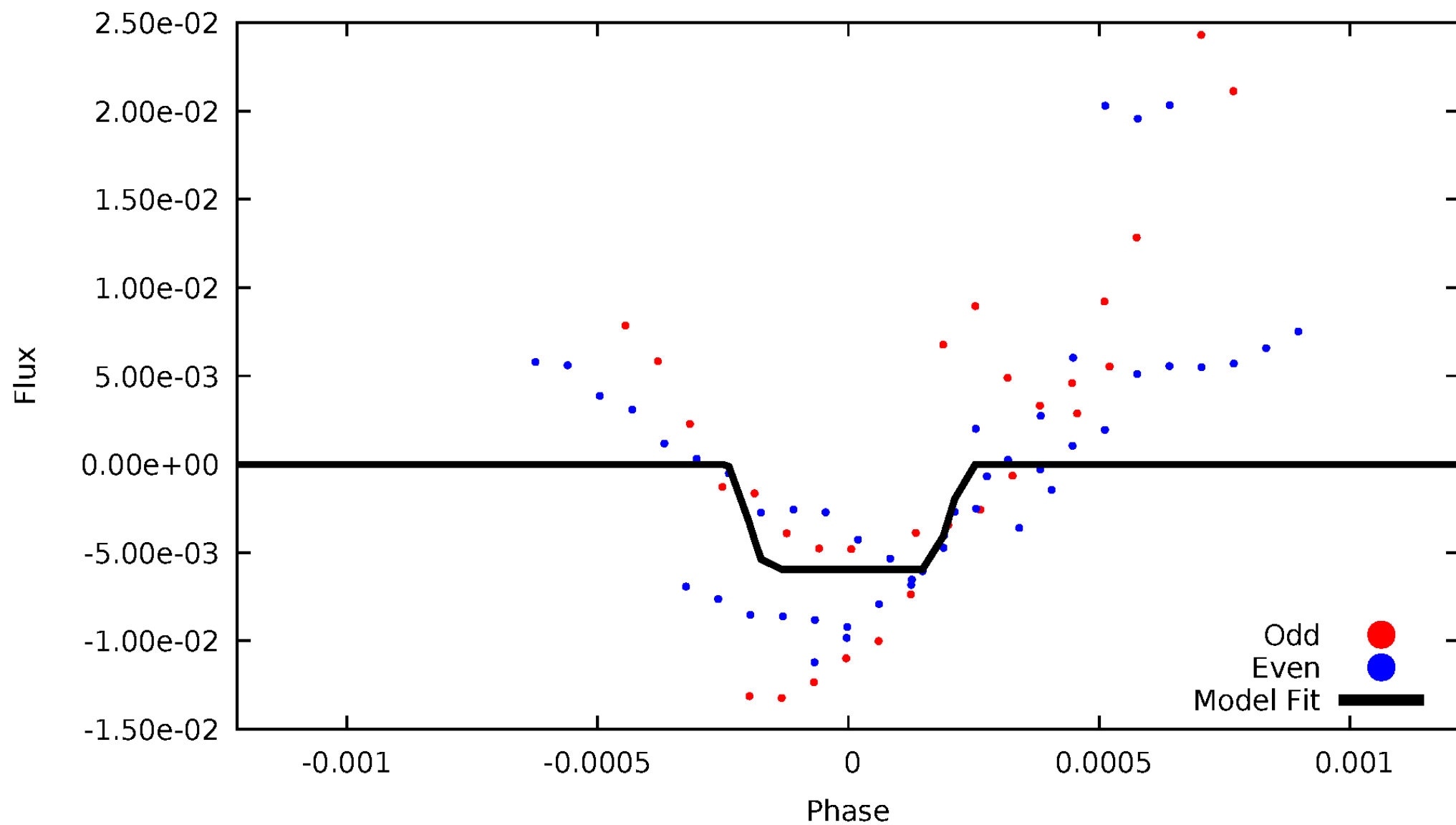
# DV Odd/Even

TCE 008507979-04



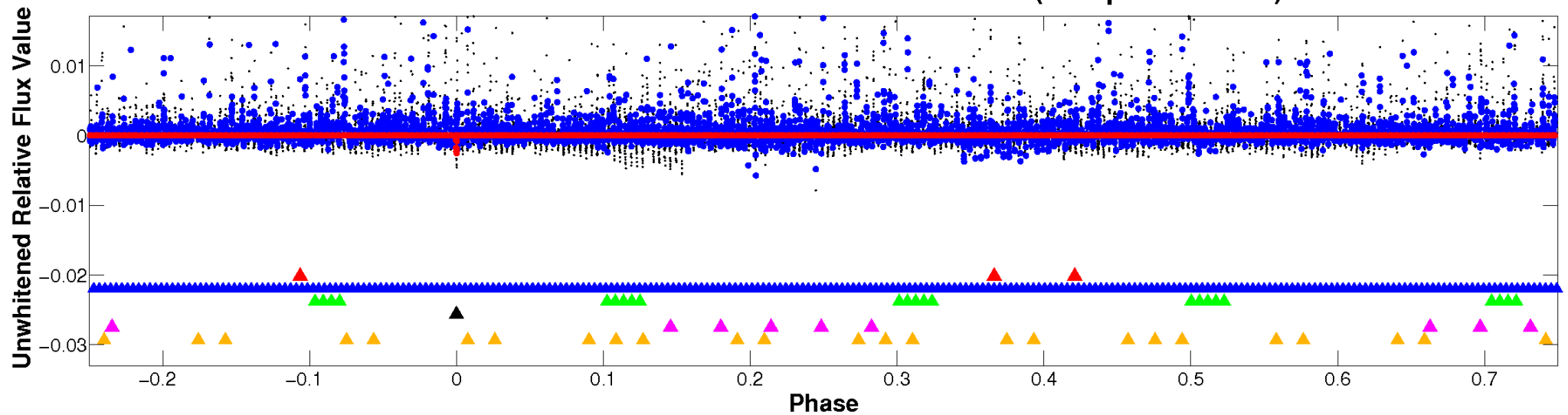
# ALT Odd/Even

TCE 008507979-04

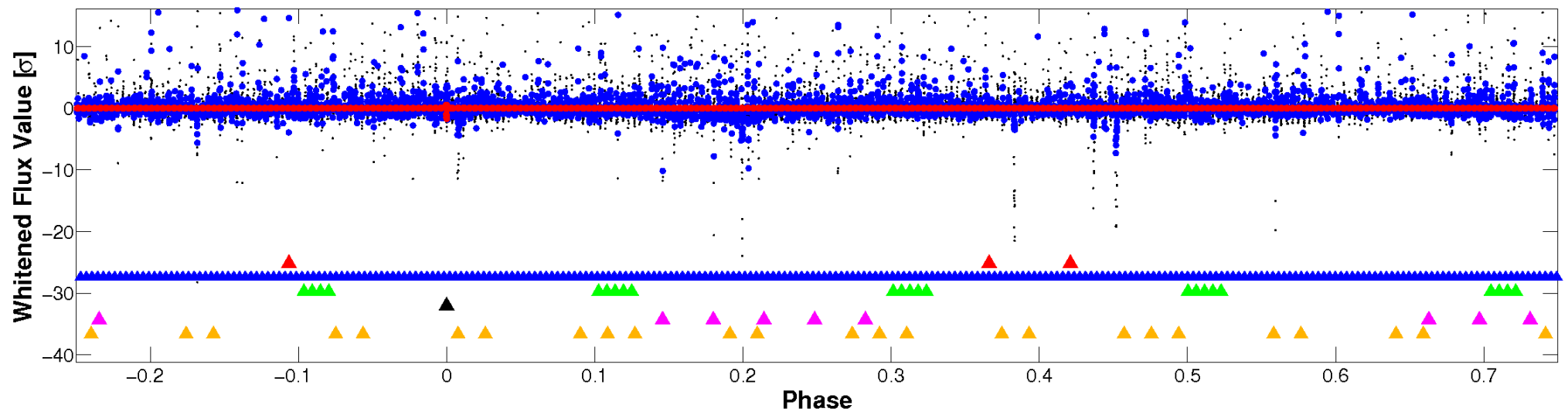


# Non-Whitened Vs. Whitened Light Curve

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

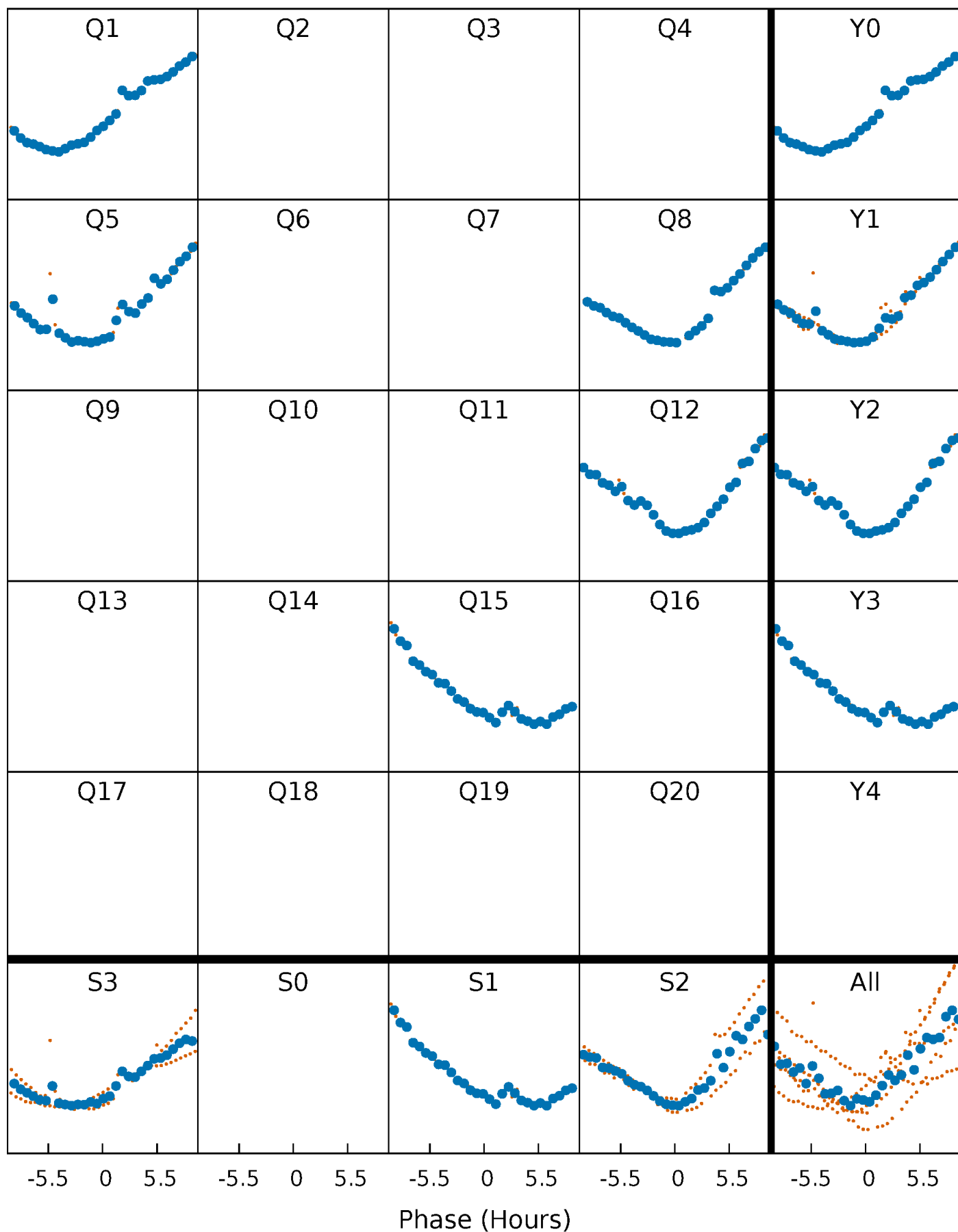


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



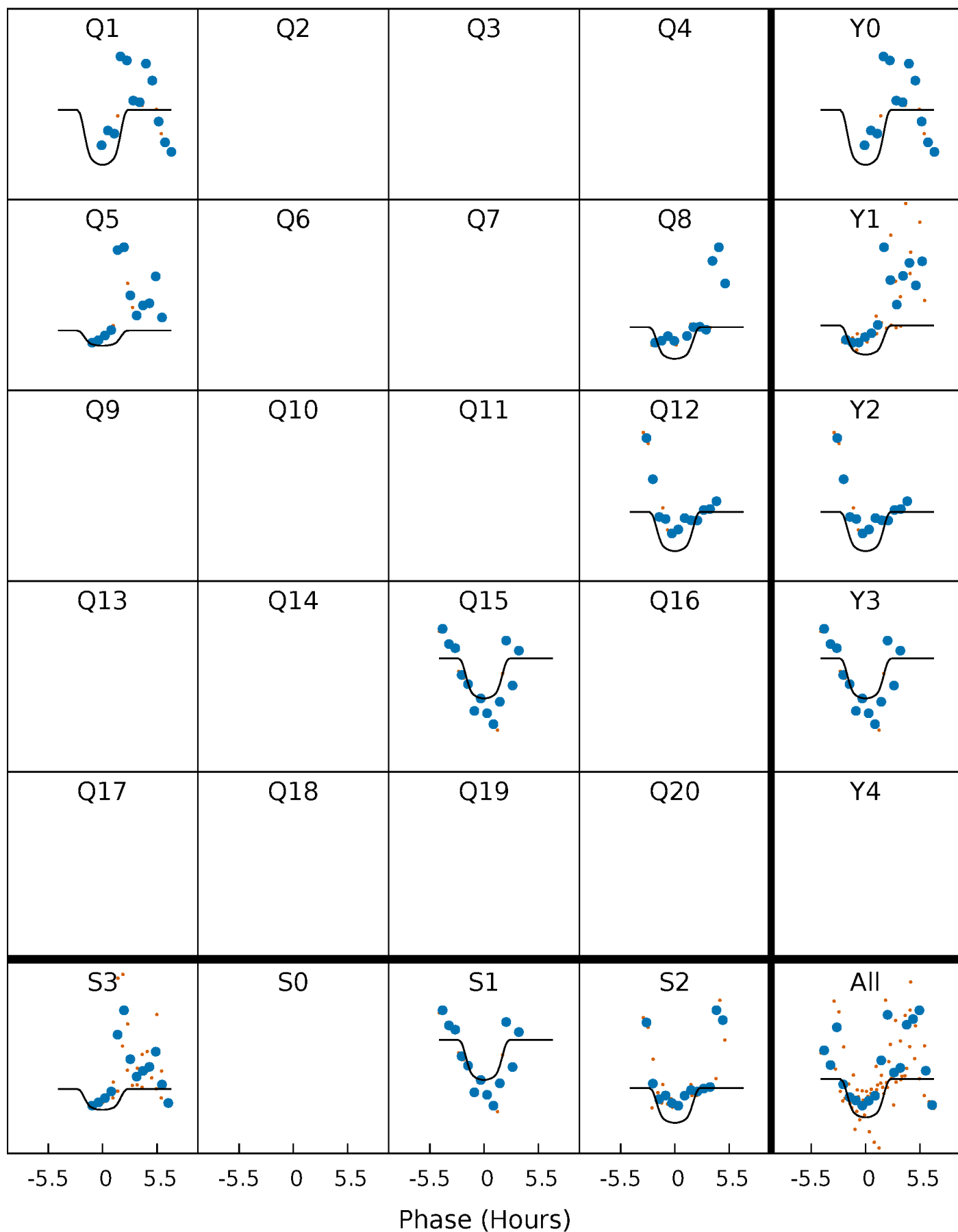
# PDC Quarter-Phased Transit Curves

TCE 008507979-04     $P=317.800217$  Days     $T_0=150.799469$  (BKJD)



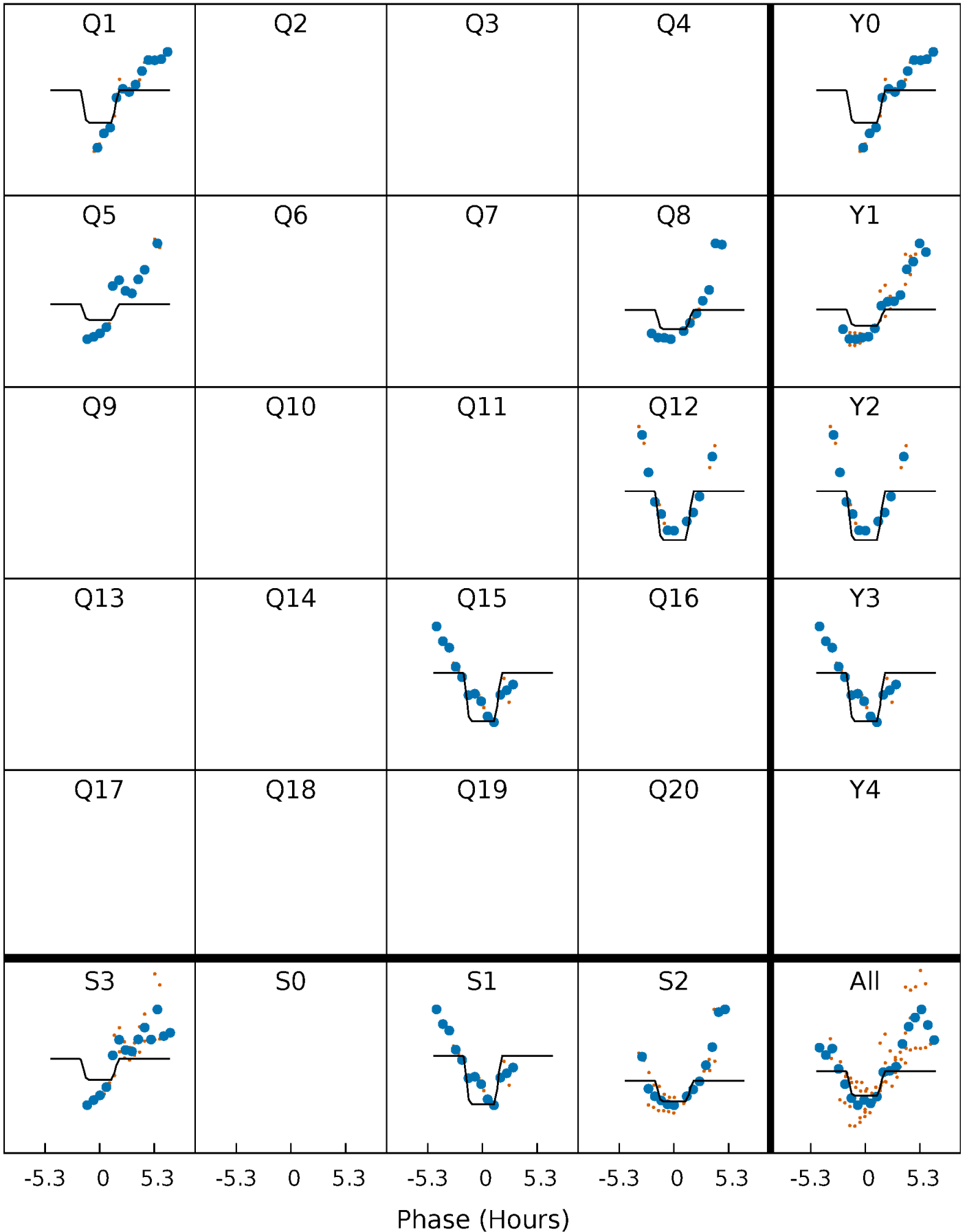
# DV Quarter-Phased Transit Curves

TCE 008507979-04 P=317.800217 Days  $T_0=150.799469$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

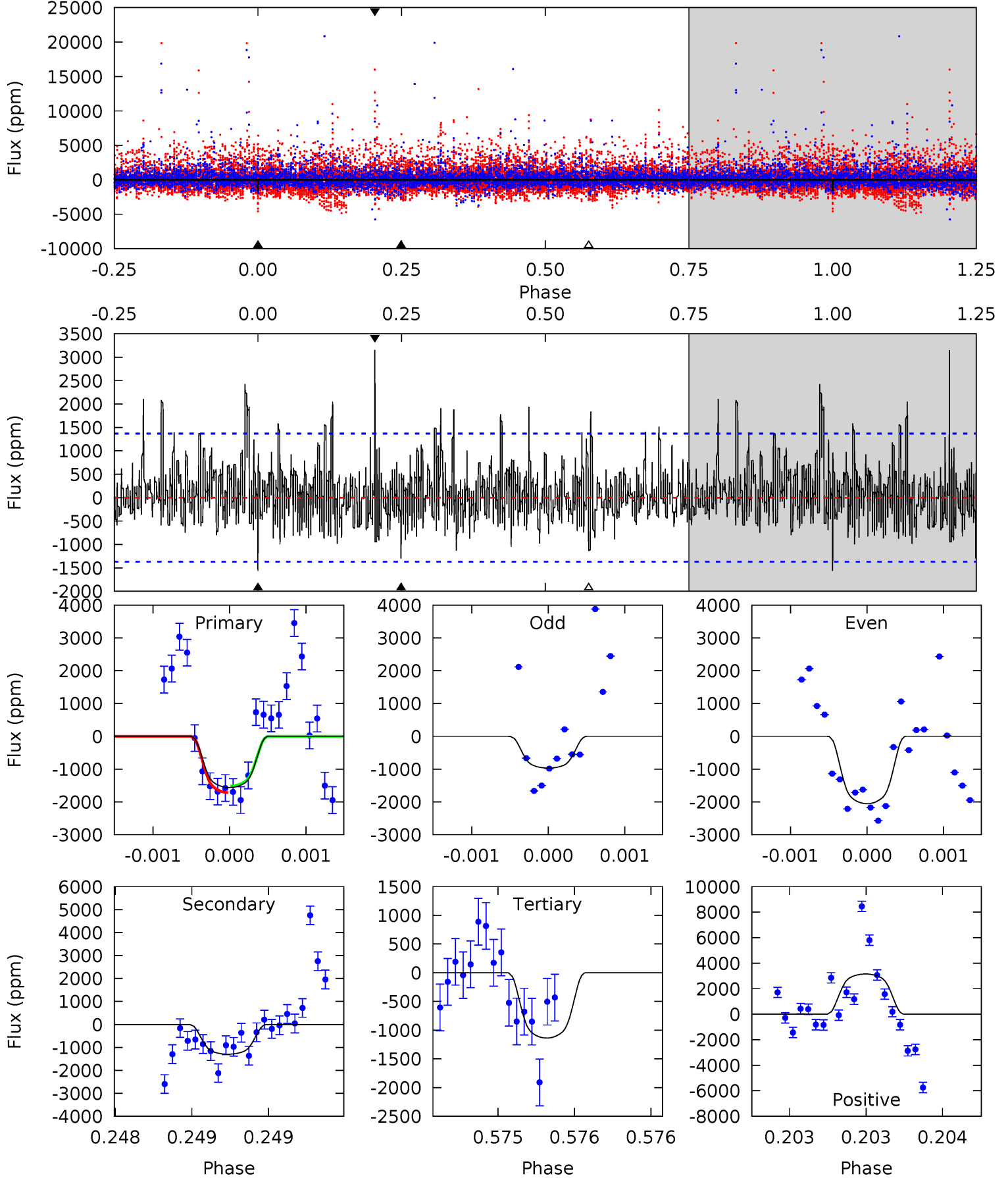
TCE 008507979-04 P=317.801831 Days  $T_0=150.803106$  (BKJD)



# DV Model-Shift Uniqueness Test

008507979-04, P = 317.800217 Days, E = 150.799469 Days

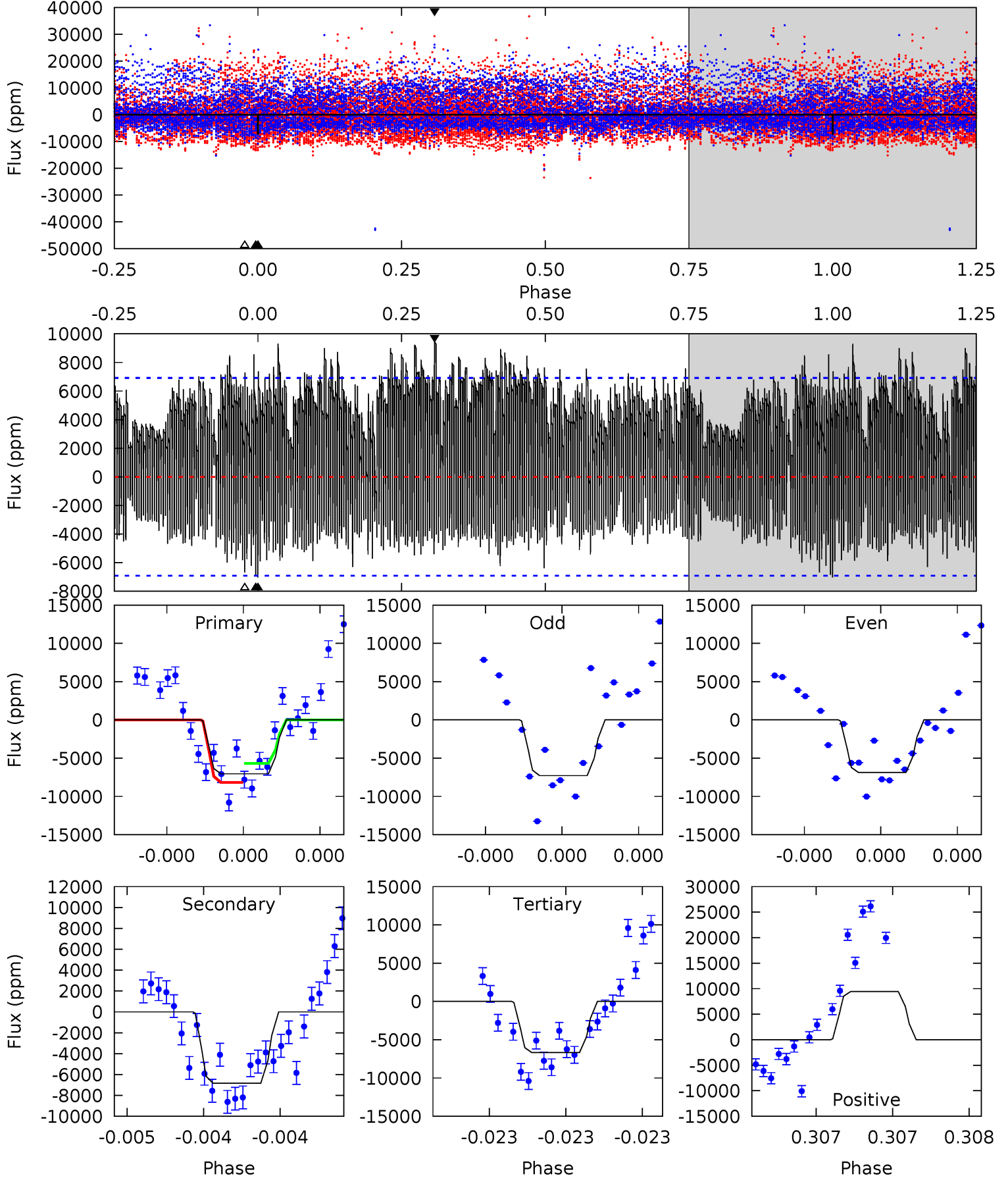
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.30	5.23	4.59	12.7	5.52	3.40	1.98	1.71	-6.42	0.64	-7.49	1.60	1.10	0.67	0.41



# Alt Model-Shift Uniqueness Test

008507979-04, P = 317.801831 Days, E = 150.803106 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.69	5.52	5.40	7.64	5.59	3.51	3.05	0.29	-1.95	0.12	-2.12	0.16	0.83	0.57	1.00





### Stellar Parameters For KIC 008507979

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3673^{+117}_{-147}$	$4.691^{+0.080}_{-0.020}$	$0.560^{+0.050}_{-0.300}$	$0.560^{+0.032}_{-0.081}$	$0.561^{+0.040}_{-0.069}$	$4.498^{+1.756}_{-0.469}$
	+3%/-4%	+2%/-0%	+9%/-54%	+6%/-14%	+7%/-12%	+39%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008507979-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1297 \pm 248$	$3.38^{+0.67}_{-0.67}$	$193^{+8}_{-9}$	$3176^{+258}_{-204}$	$35562^{+20478}_{-12016}$
Alt.	$-6830 \pm 1237$	$4.59^{+0.72}_{-0.72}$	$192^{+8}_{-8}$	$3731^{+295}_{-225}$	$101367^{+45434}_{-29032}$

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

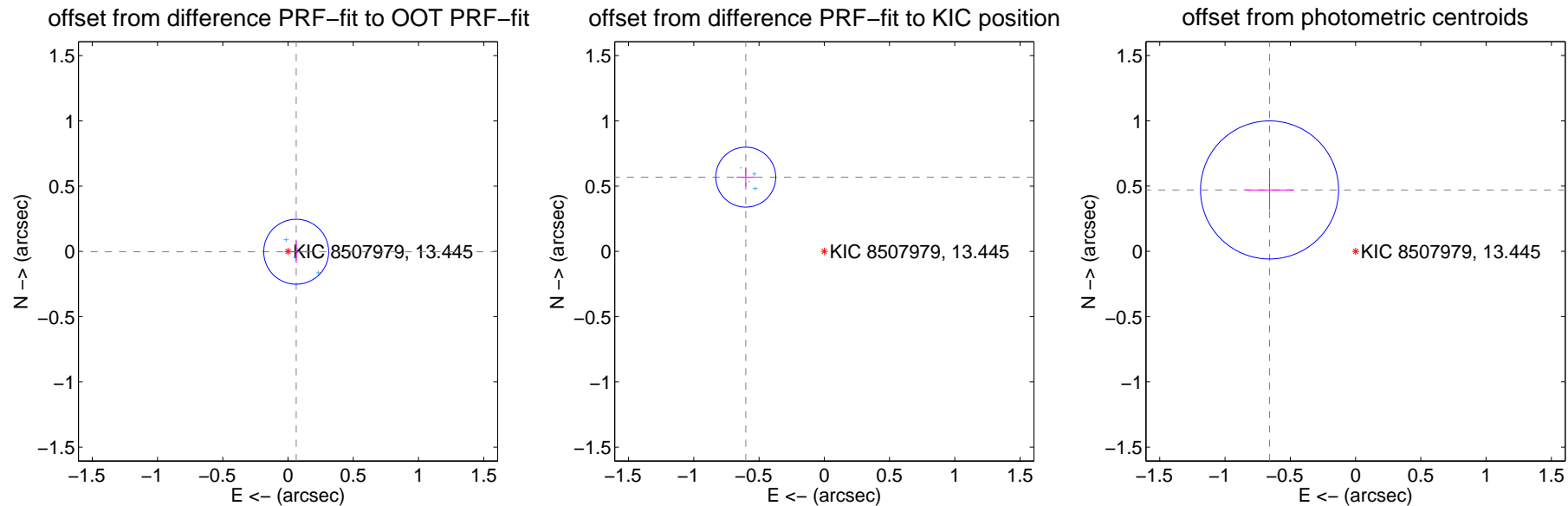
## DV Centroid Data

Supplemental centroid analysis for 008507979-04. Kepler magnitude: 13.45. Transit SNR 8.36

There are 4 quarters with good PRF difference image offsets

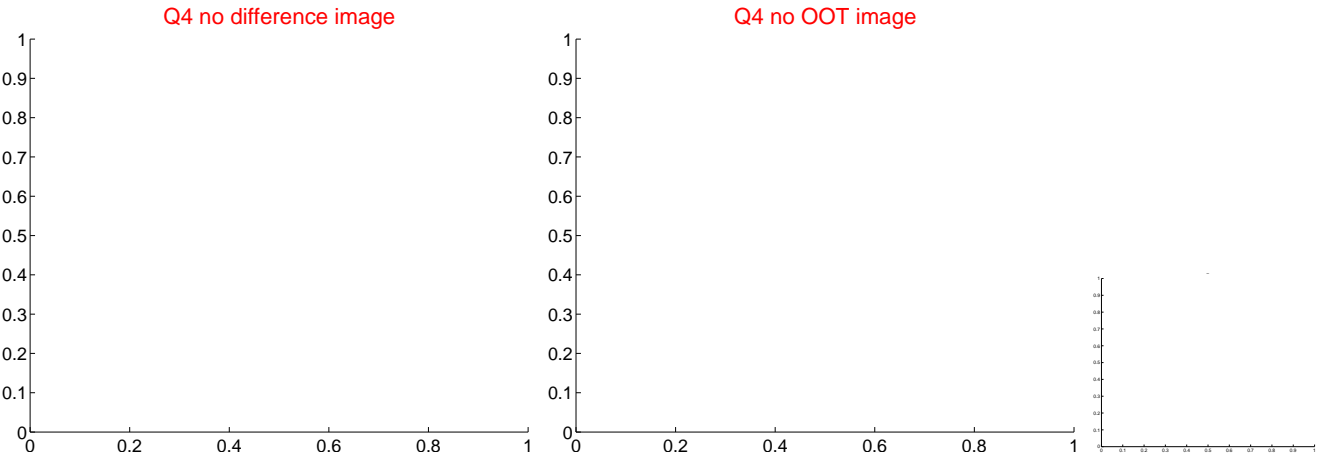
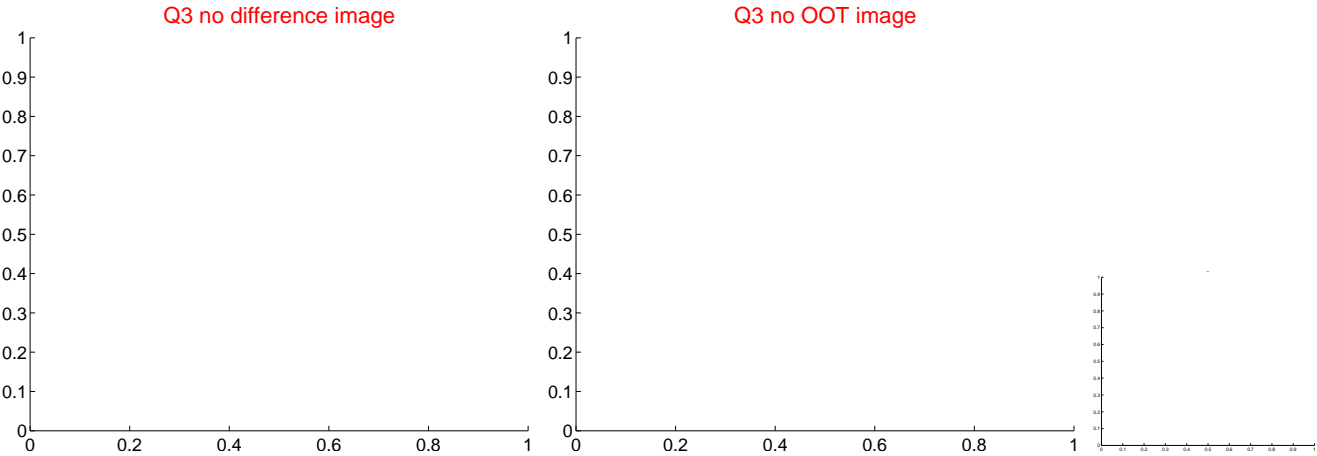
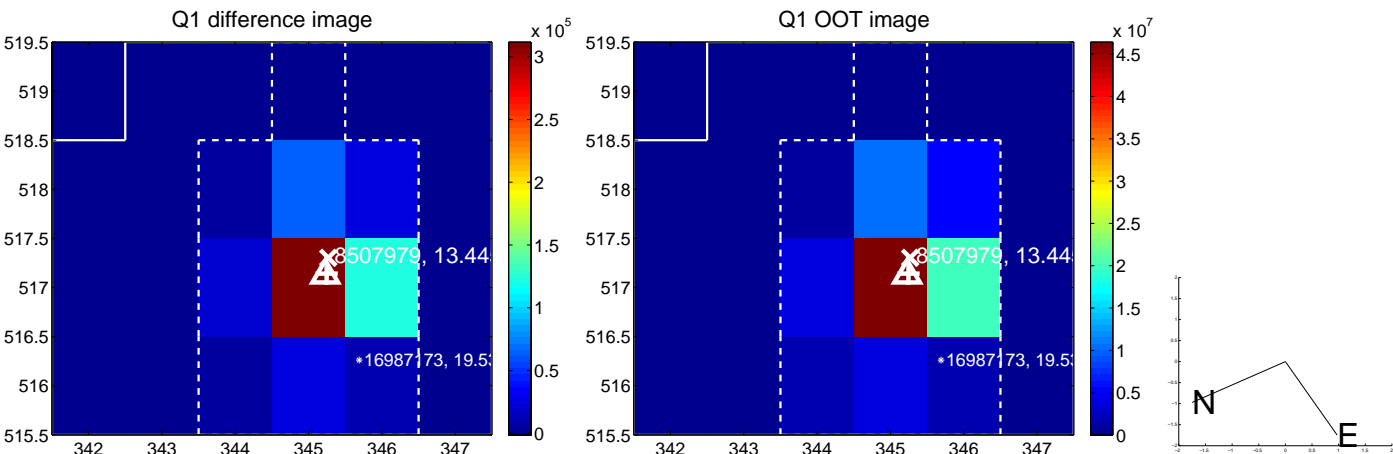
The direct PRF centroid is offset from the target star catalog position by about 1.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.063 \pm 0.083$	0.76	$-0.063 \pm 0.082$	$-0.002 \pm 0.085$
PRF-fit source offset from KIC position	$0.828 \pm 0.077$	10.82	$0.602 \pm 0.070$	$0.569 \pm 0.075$
photometric centroid source offset	$0.81 \pm 0.18$	4.59	$0.66 \pm 0.19$	$0.47 \pm 0.15$

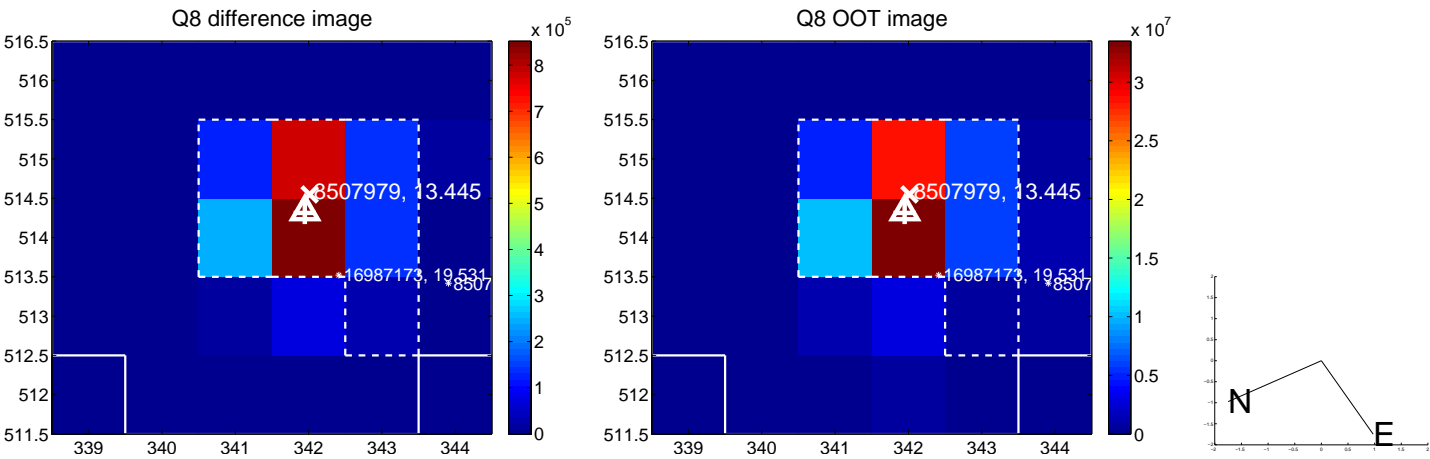
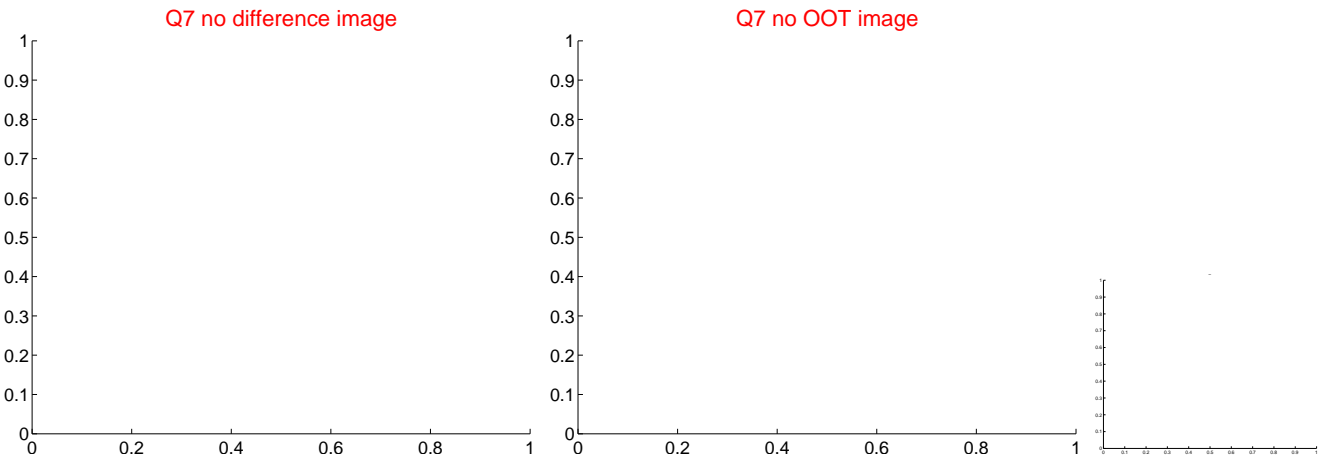
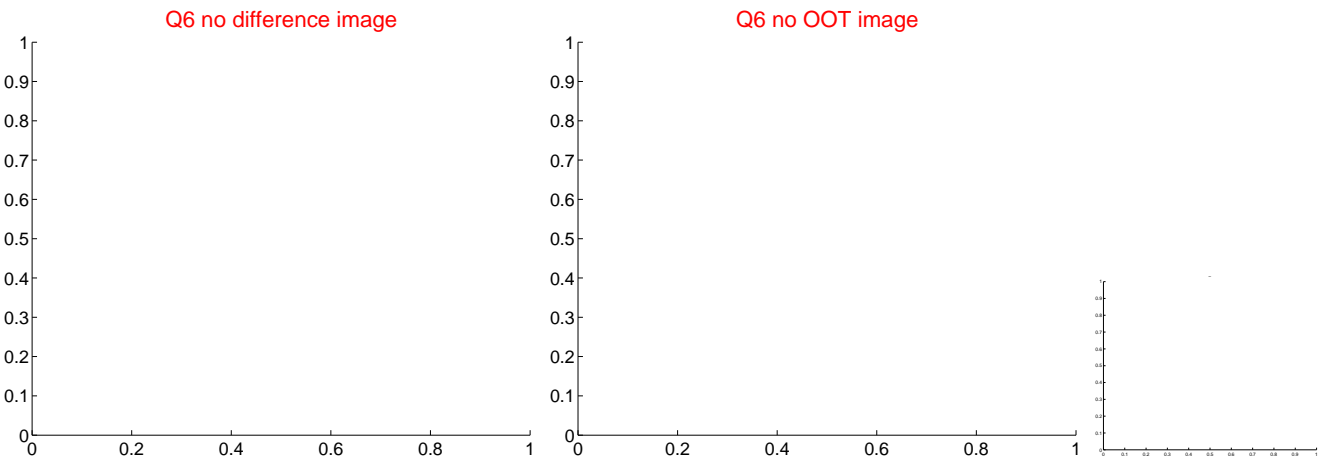
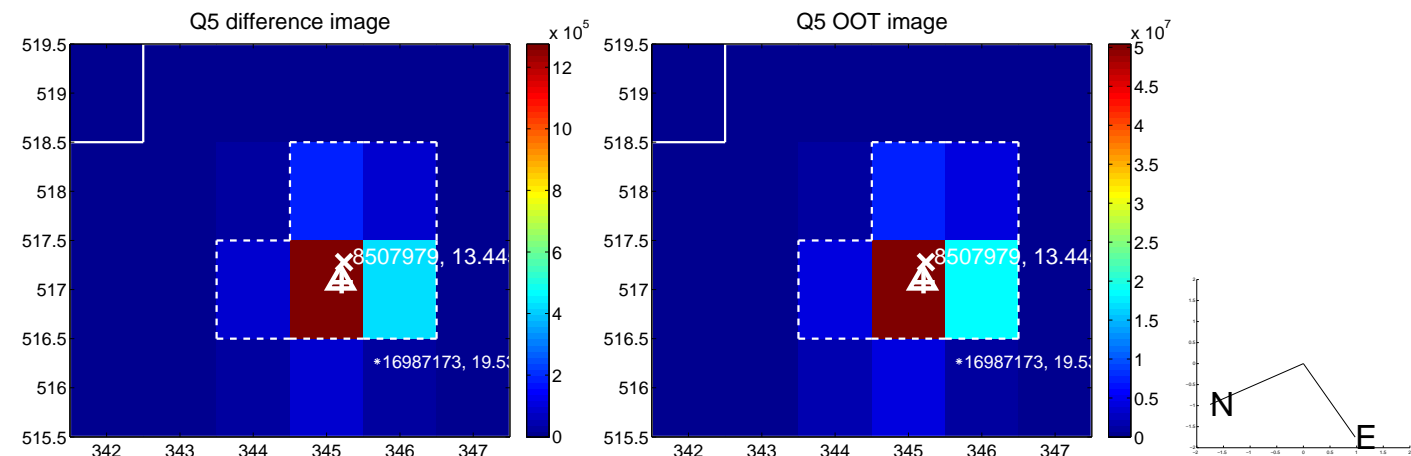


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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



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



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



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

Q13 no difference image



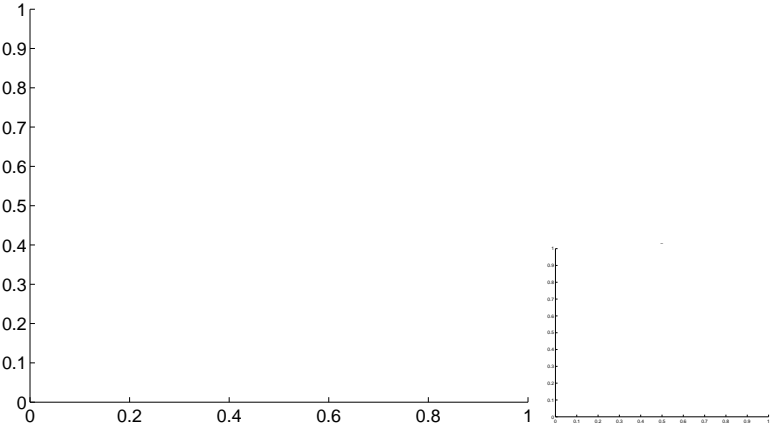
Q13 no OOT image



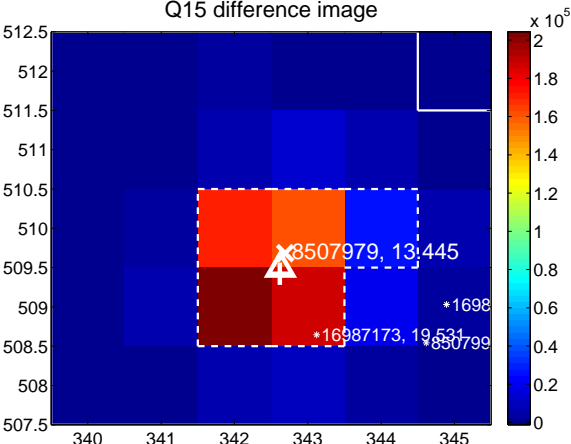
Q14 no difference image



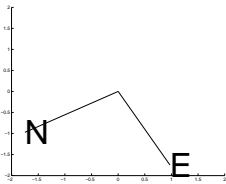
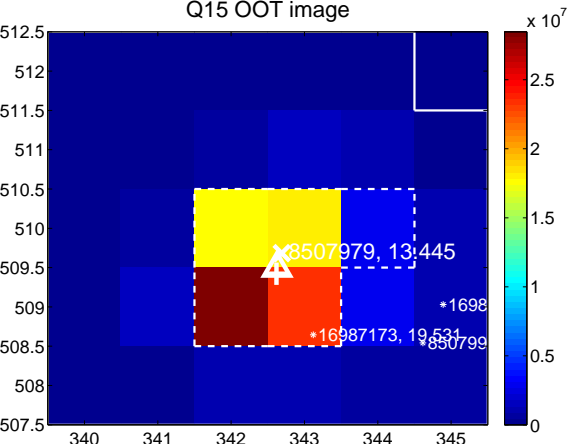
Q14 no OOT image



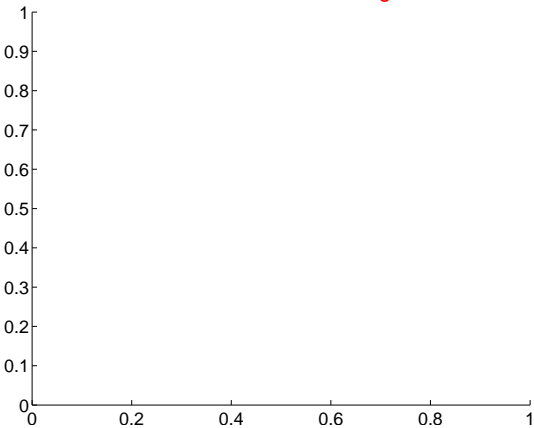
Q15 difference image



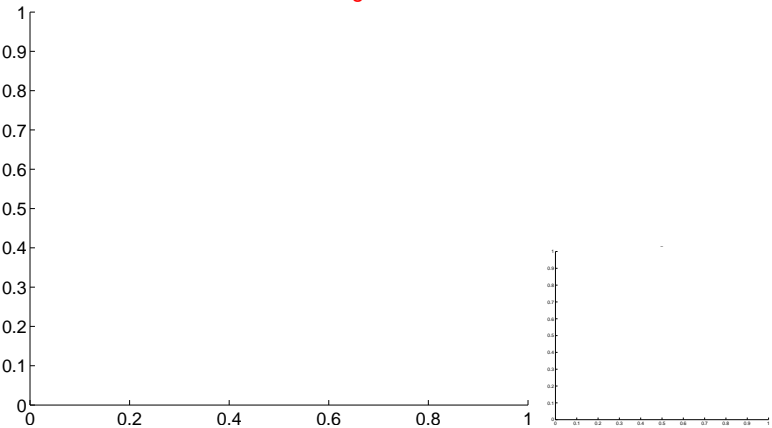
Q15 OOT image



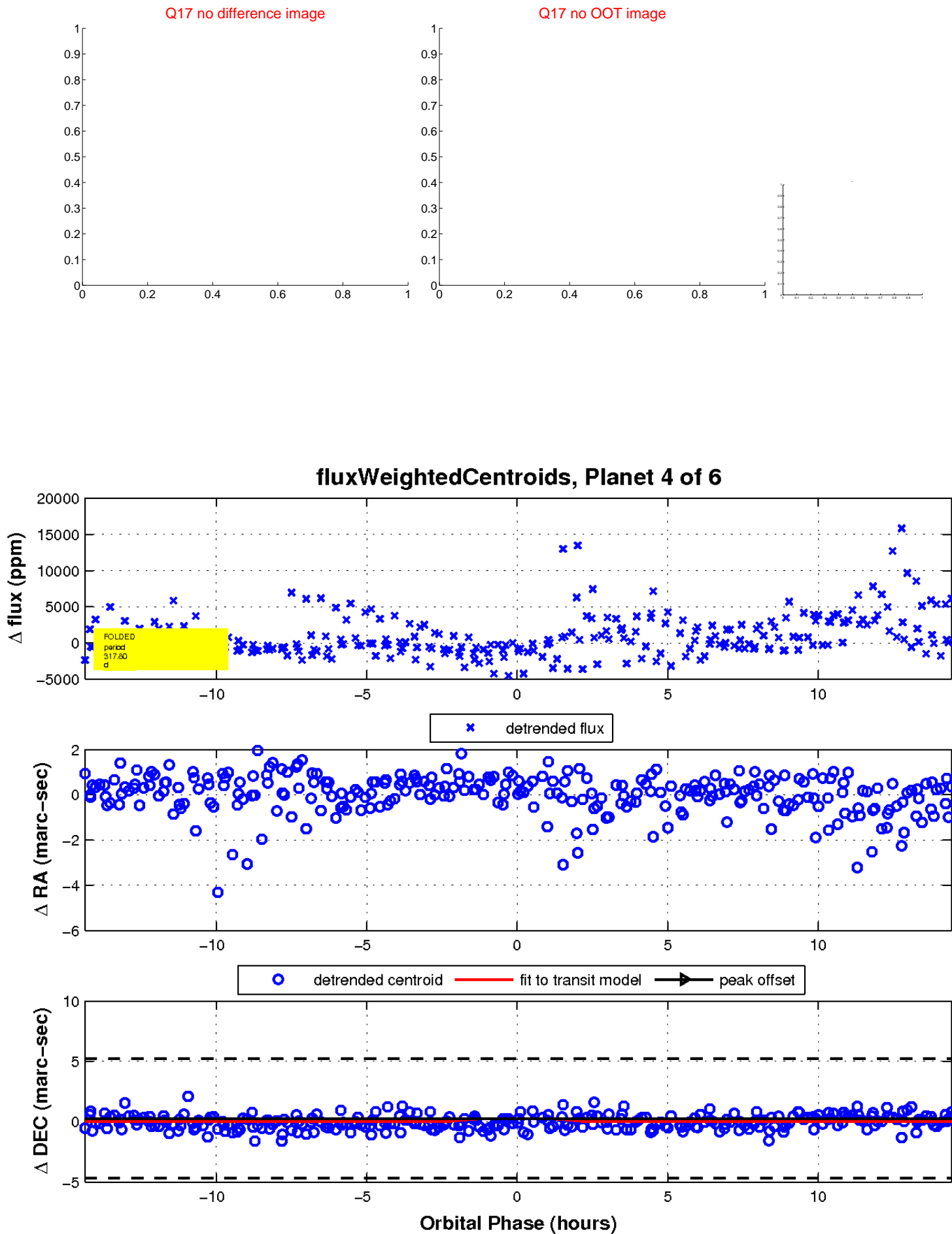
Q16 no difference image



Q16 no OOT image

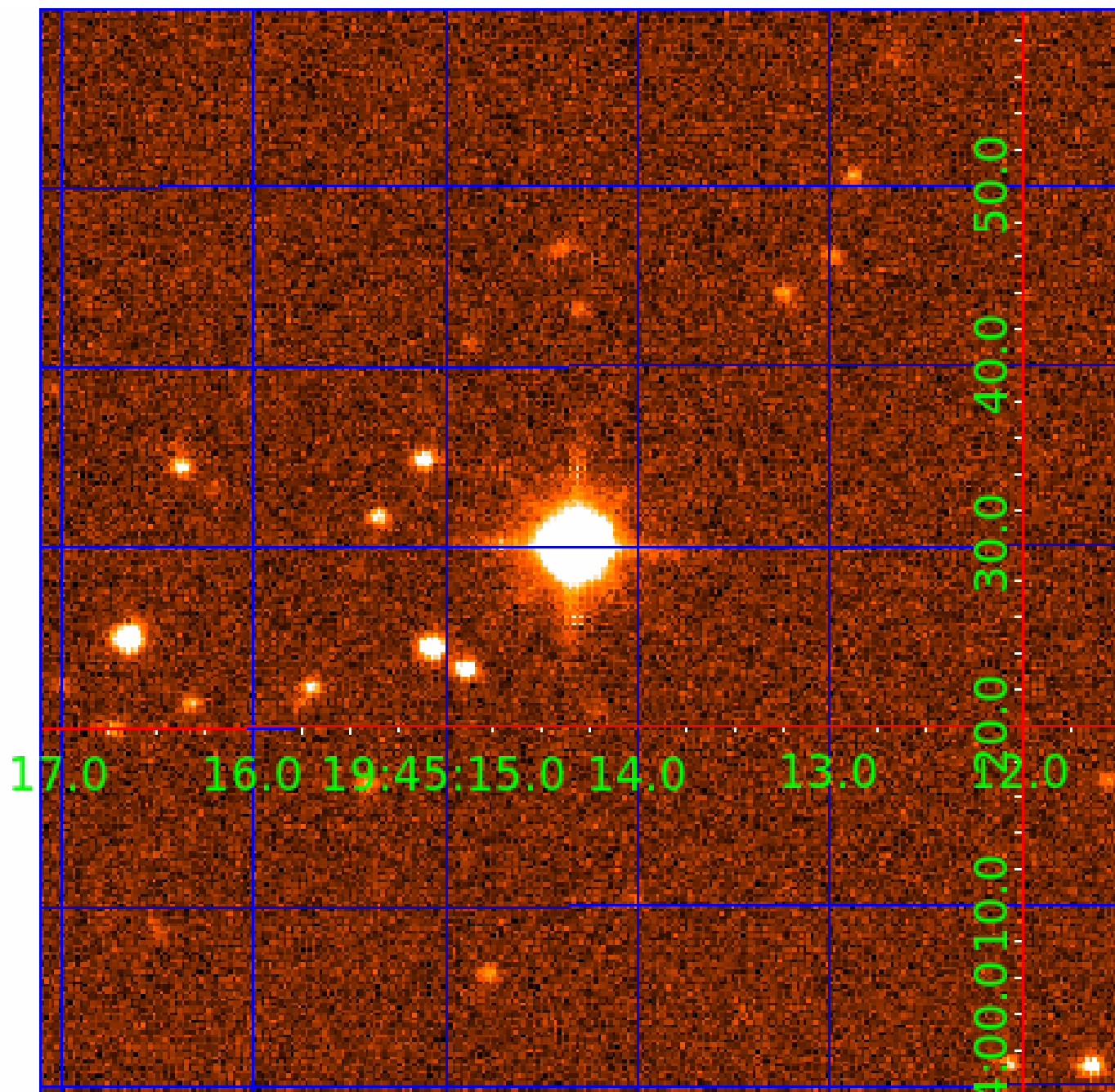


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008507979

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008507979-01	OBS	No	485.412840	267.169399	712.8	10.500	20.8	-1.0	0.56	3673	1.44	0.05
008507979-02	OBS	No	1.217481	132.056003	529.6	6.938	17.7	19.8	0.56	3673	1.24	150.83
008507979-03	OBS	No	63.204402	190.514768	597.2	1.959	9.5	2.1	0.56	3673	1.32	0.78
008507979-04	OBS	No	317.800217	150.799469	2545.5	4.825	9.7	8.4	0.56	3673	3.44	0.09
008507979-05	OBS	No	153.465914	240.607053	766.2	3.000	11.4	-1.0	0.56	3673	1.49	0.24
008507979-06	OBS	No	58.313574	179.490673	619.9	9.935	8.2	3.4	0.56	3673	1.34	0.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008507979-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008507979-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS

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

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

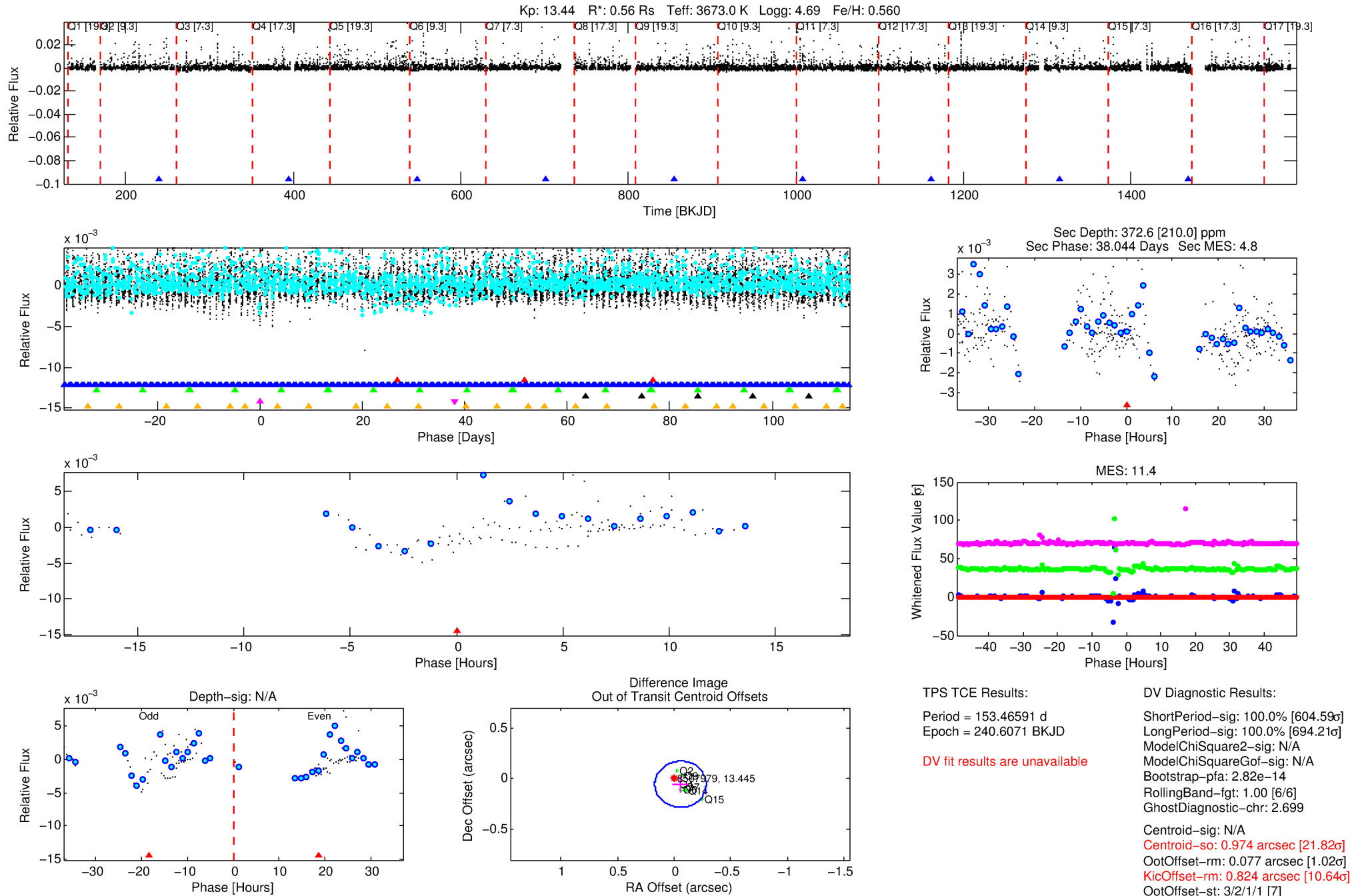
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008507979-05

No Significant Match Found

# DV One-Page Summary

KIC: 8507979 Candidate: 5 of 6 Period: 153.466 d



## TPS TCE Results:

Period = 153.46591 d  
Epoch = 240.6071 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

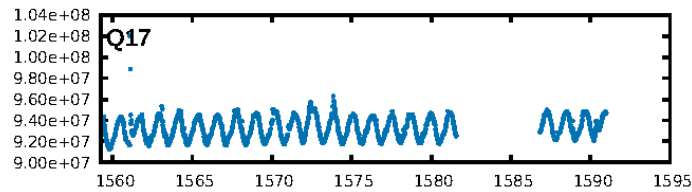
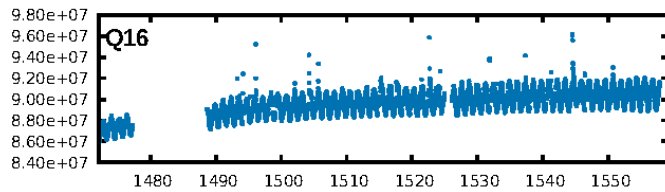
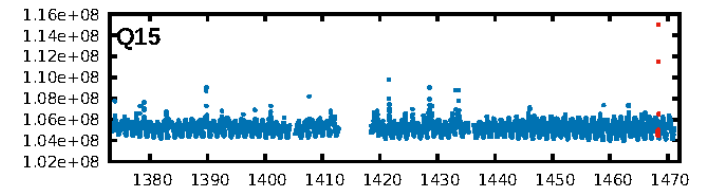
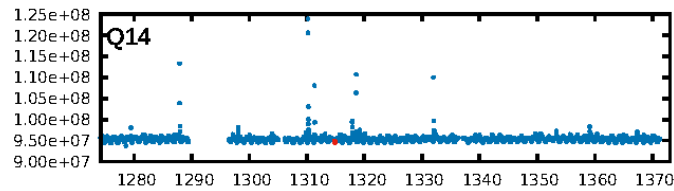
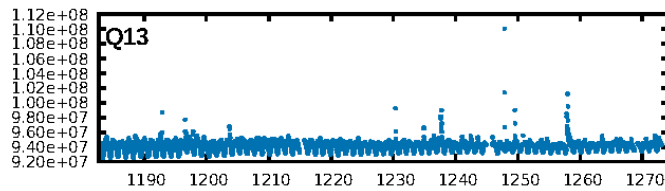
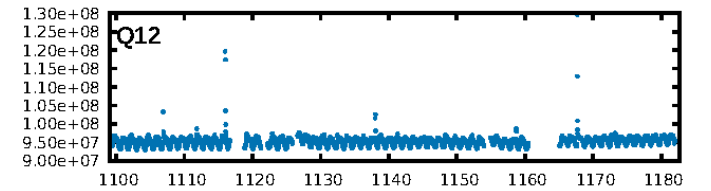
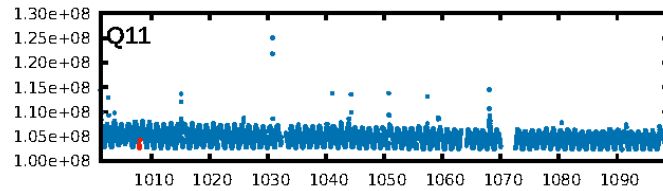
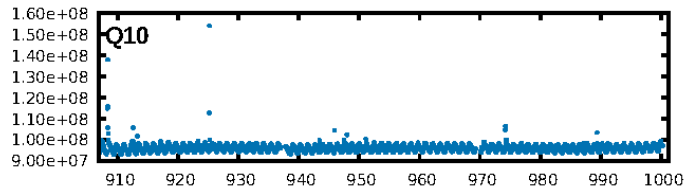
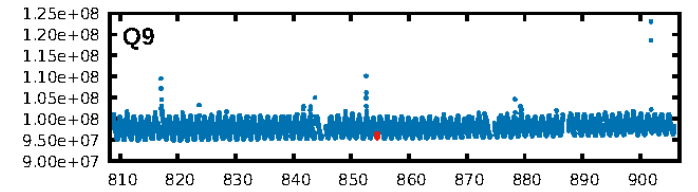
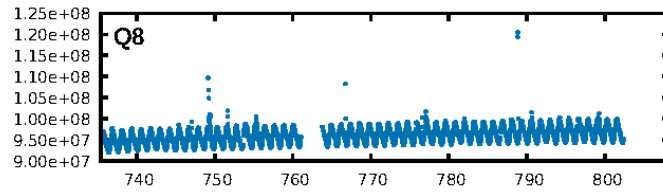
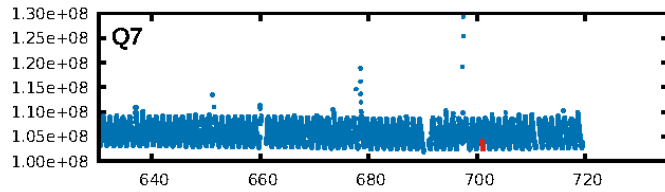
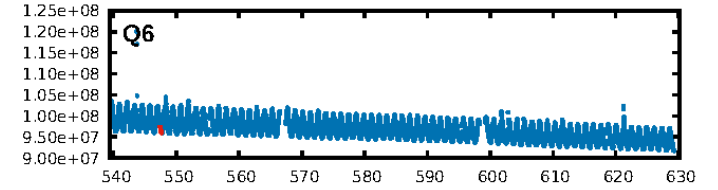
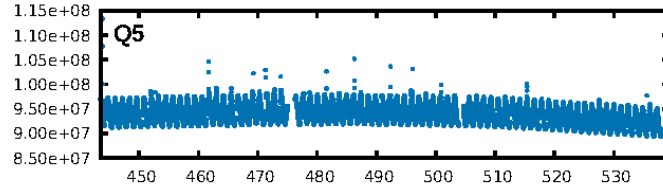
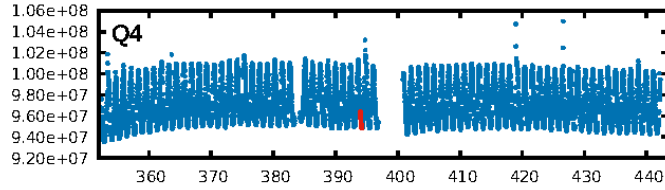
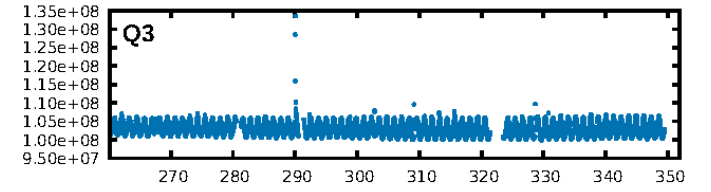
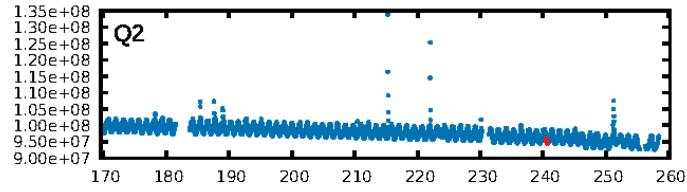
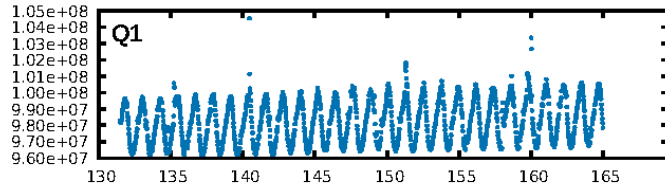
ShortPeriod-sig: 100.0% [604.59σ]  
LongPeriod-sig: 100.0% [694.21σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: 2.82e-14  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 2.699

Centroid-sig: N/A  
Centroid-so: 0.974 arcsec [21.82σ]  
OotOffset-rm: 0.077 arcsec [1.02σ]  
KicOffset-rm: 0.824 arcsec [10.64σ]  
OotOffset-st: 3/2/1/1 [7]  
KicOffset-st: 3/2/1/1 [7]  
DiffImageQuality-fgm: 0.86 [6/7]  
DiffImageOverlap-fno: 0.00 [0/7]

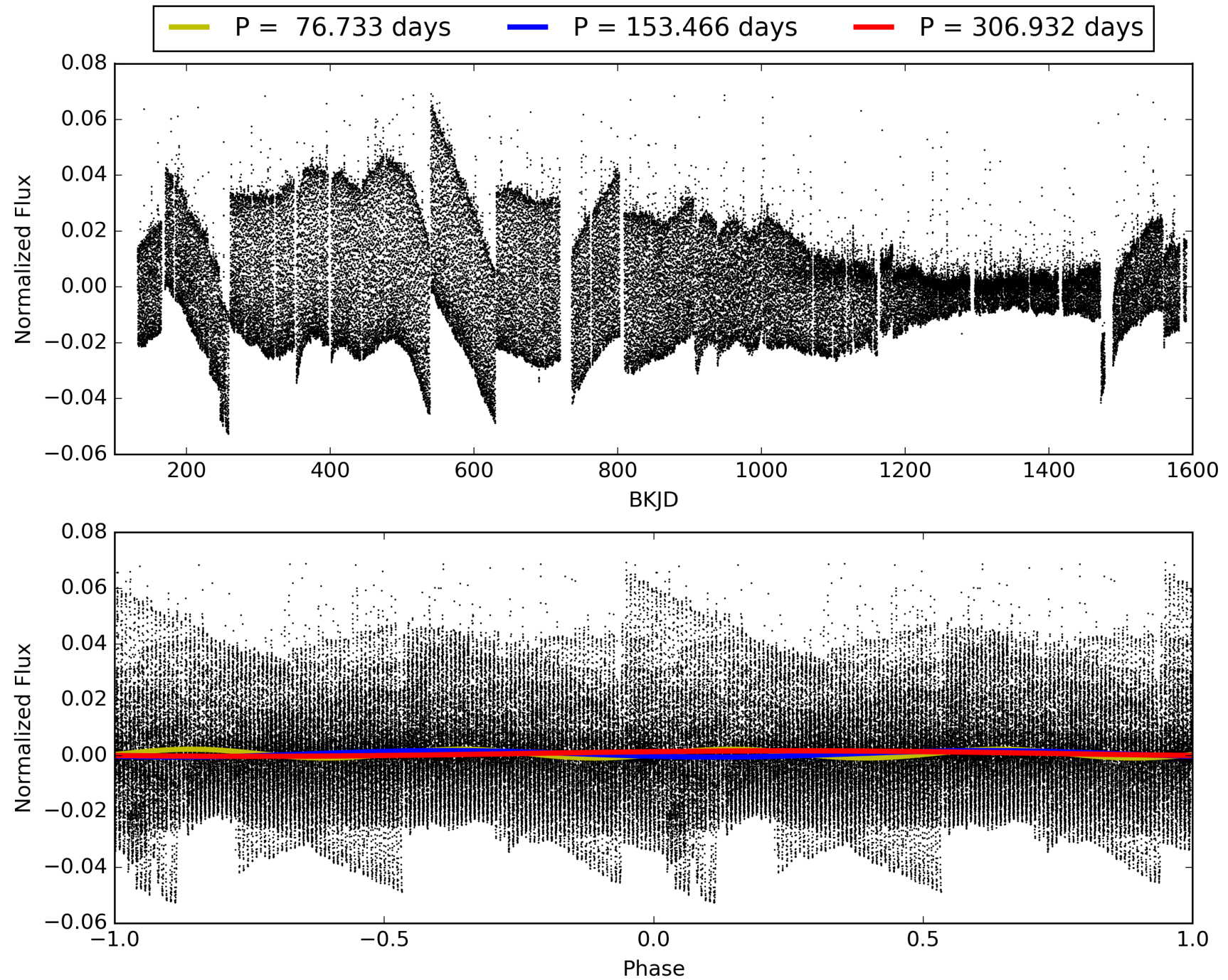
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:58:08 Z

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

# TCE 008507979-05, PDC Light Curves

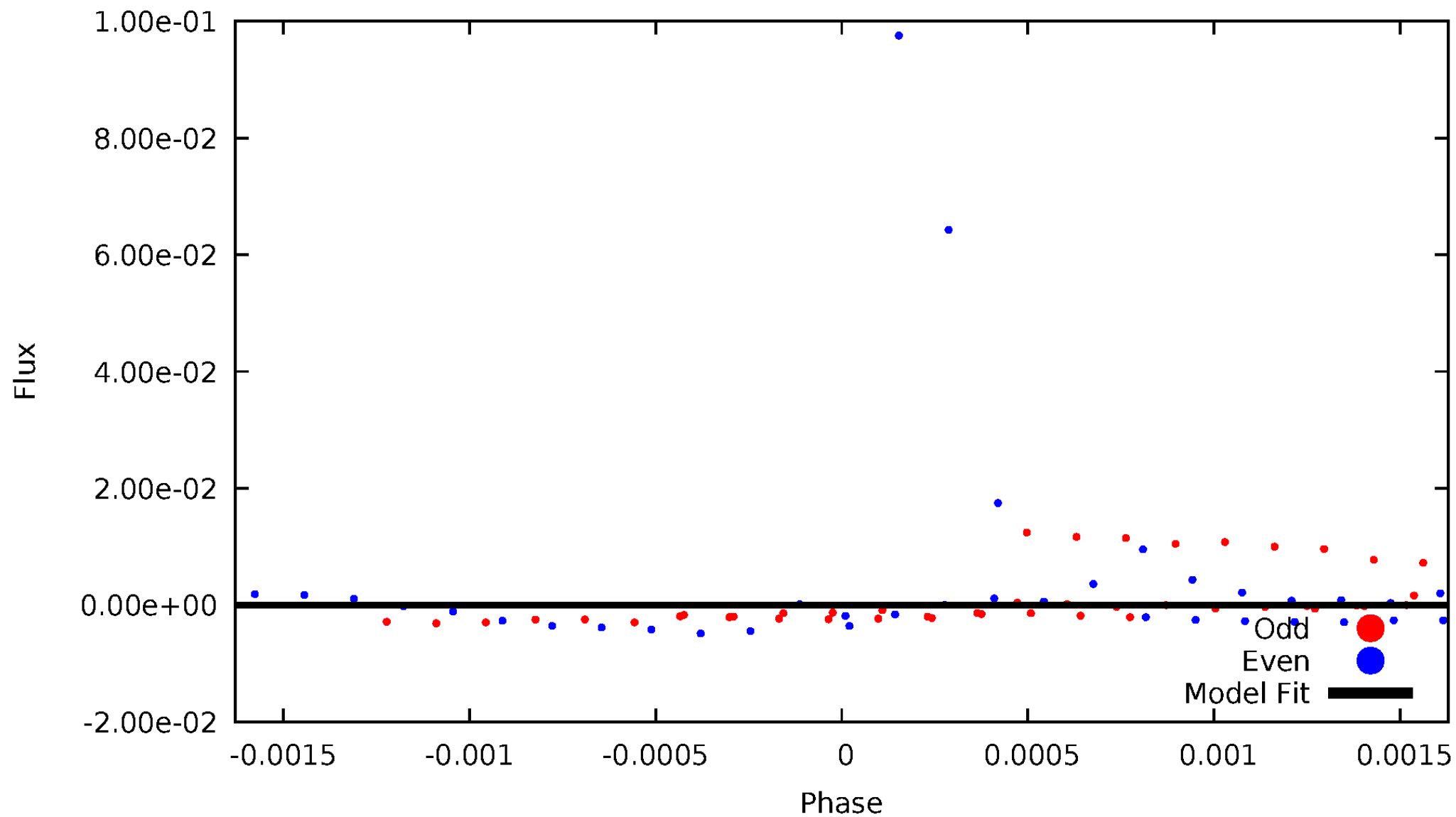


TCE 008507979-05



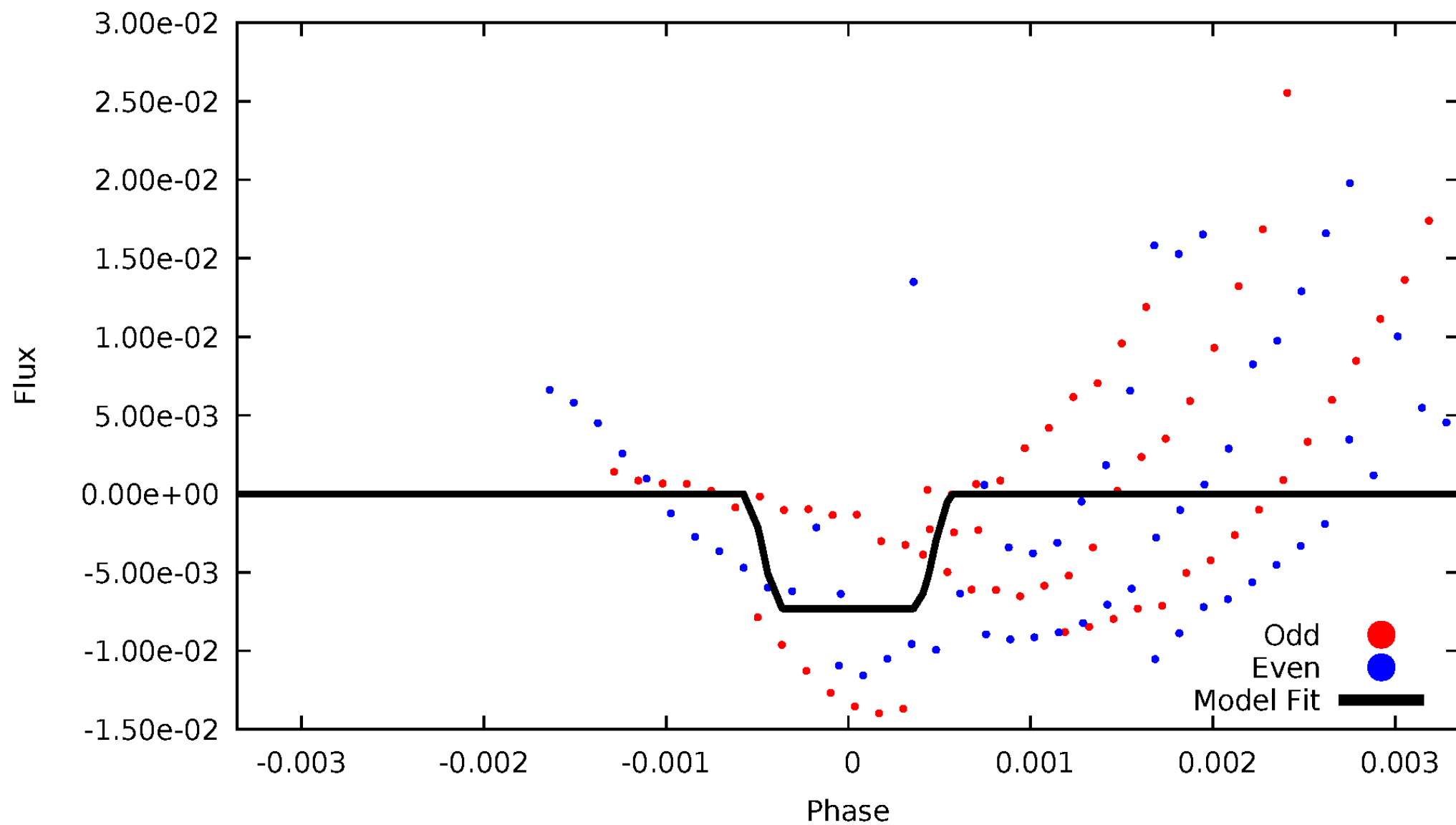
# DV Odd/Even

TCE 008507979-05



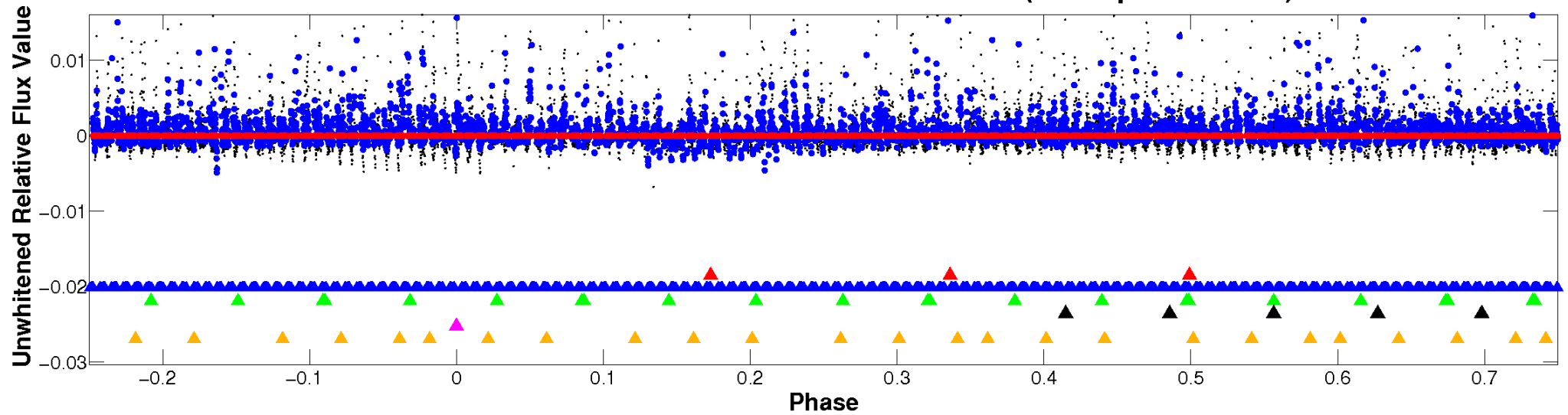
# ALT Odd/Even

TCE 008507979-05



# Non-Whitened Vs. Whitened Light Curve

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

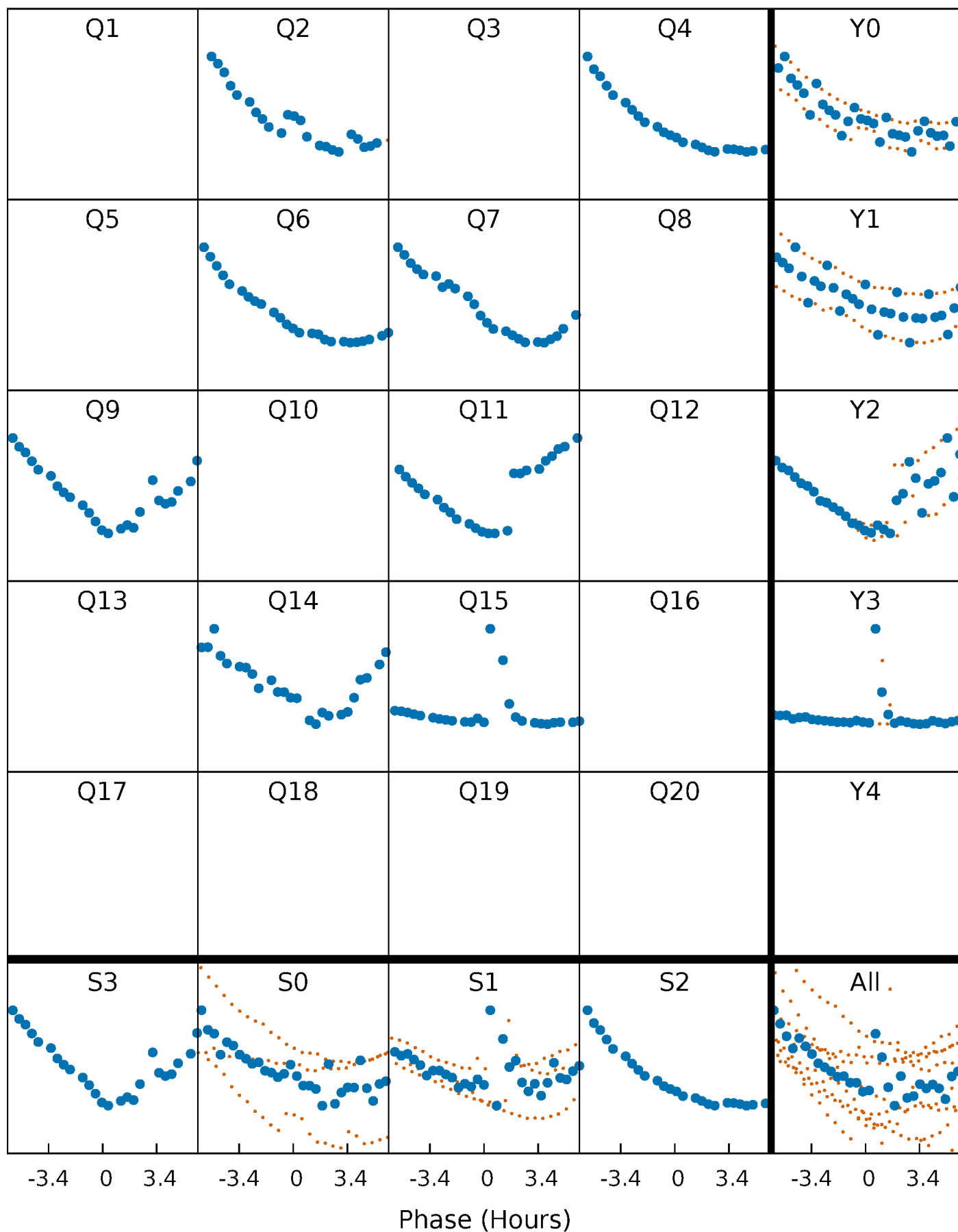


**Planet 5 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

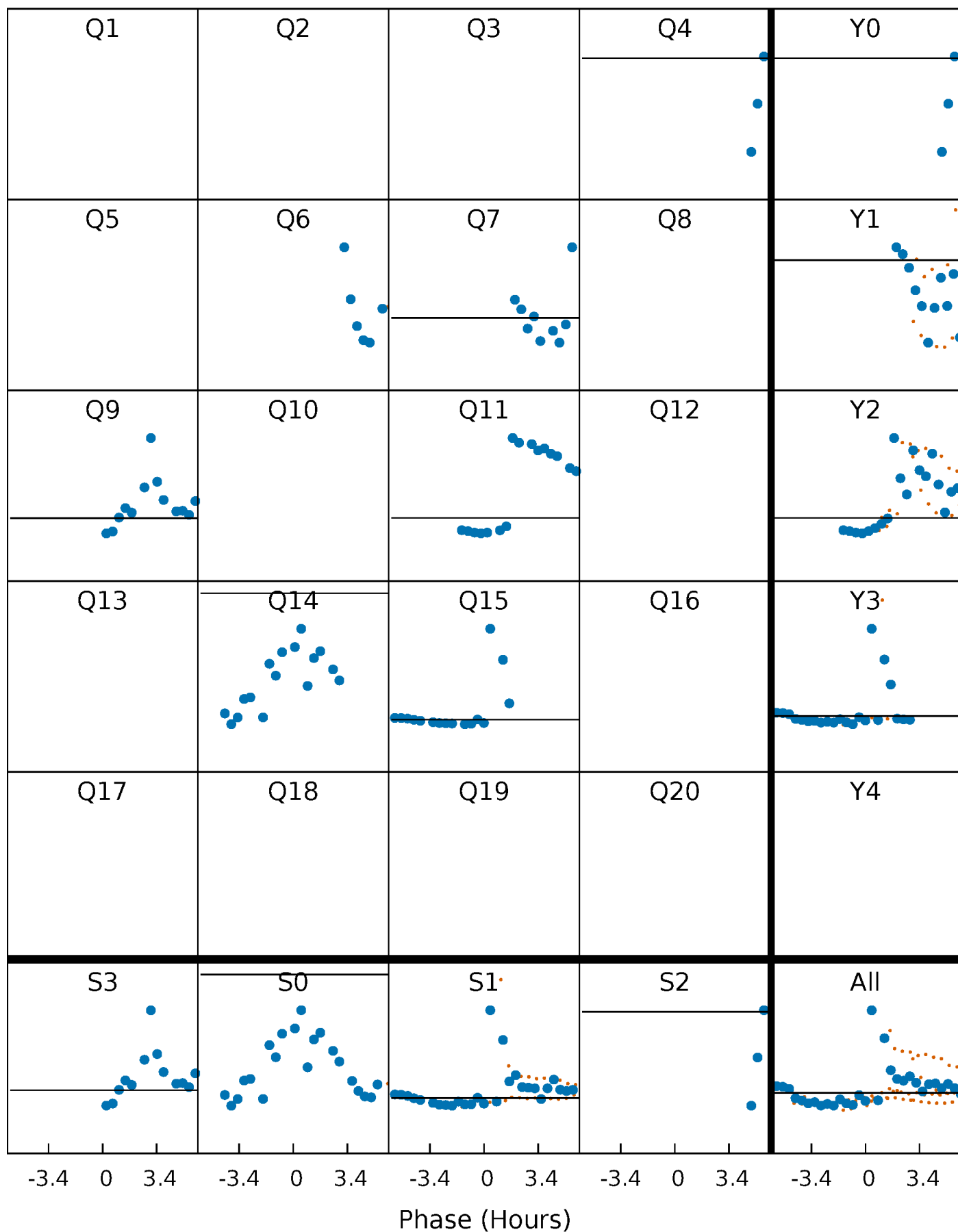
TCE 008507979-05   P=153.465914 Days    $T_0=240.607053$  (BKJD)





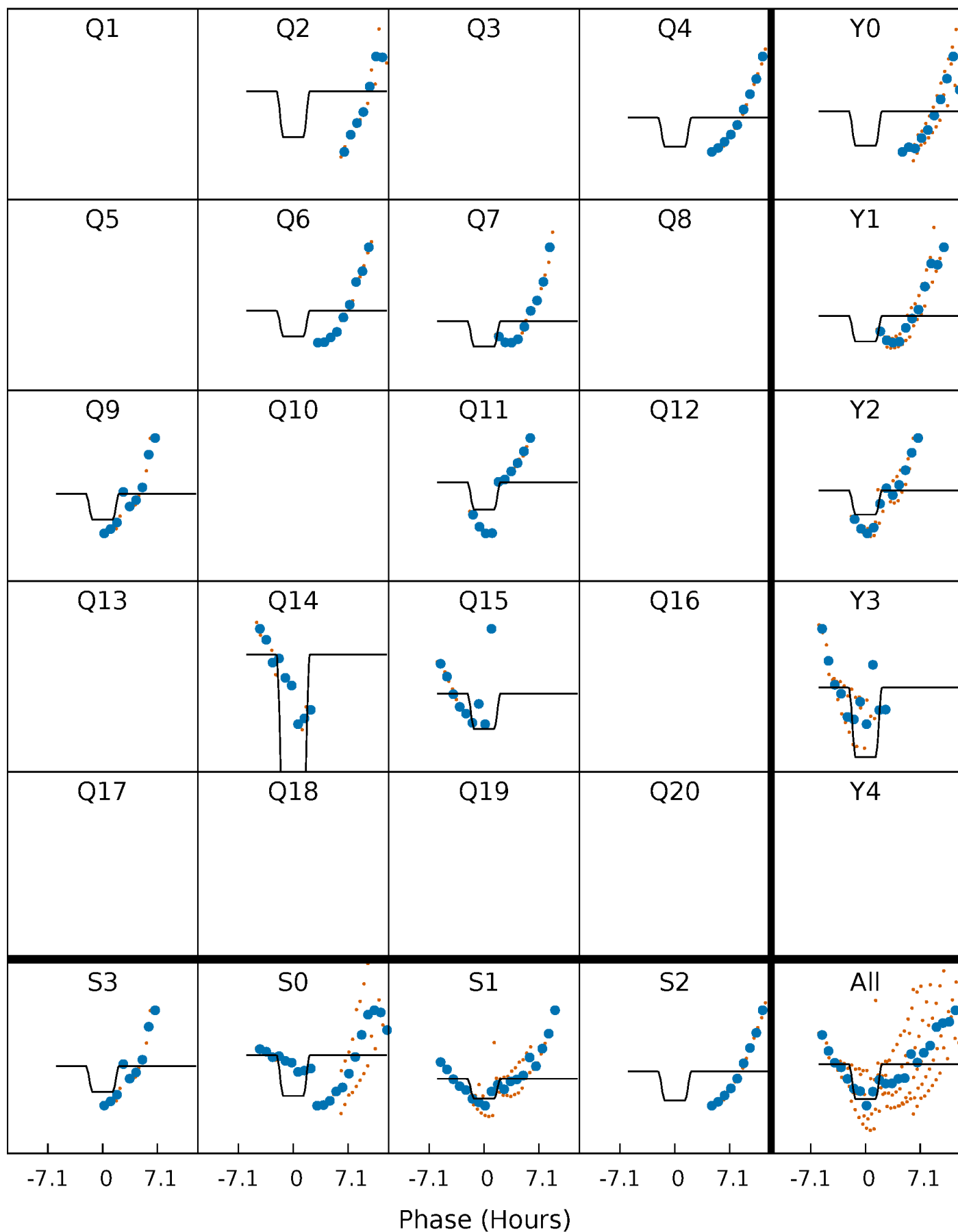
# DV Quarter-Phased Transit Curves

TCE 008507979-05 P=153.465914 Days  $T_0=240.607053$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

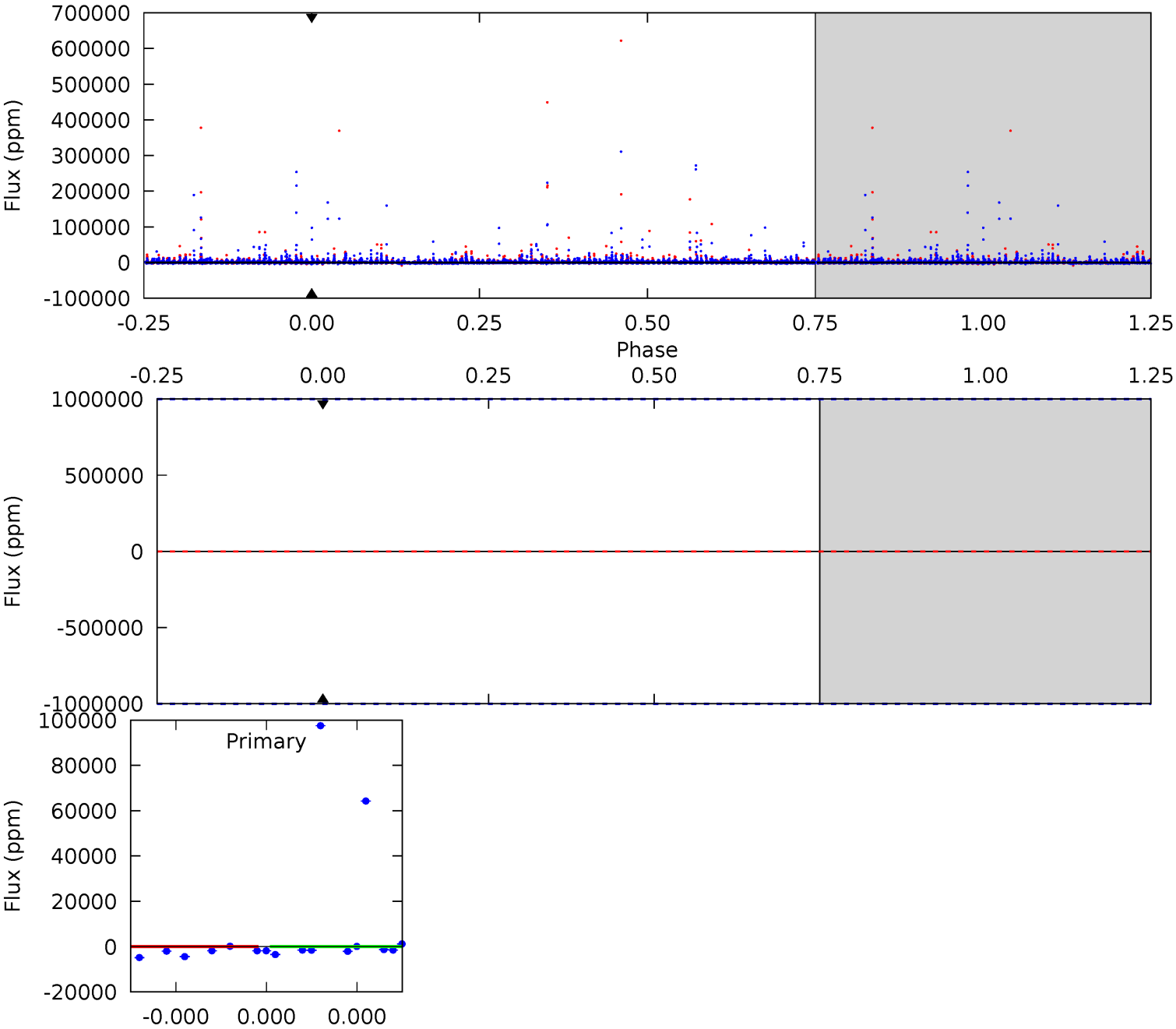
TCE 008507979-05 P=153.465914 Days  $T_0=240.616646$  (BKJD)



# DV Model-Shift Uniqueness Test

008507979-05, P = 153.465914 Days, E = 87.141139 Days

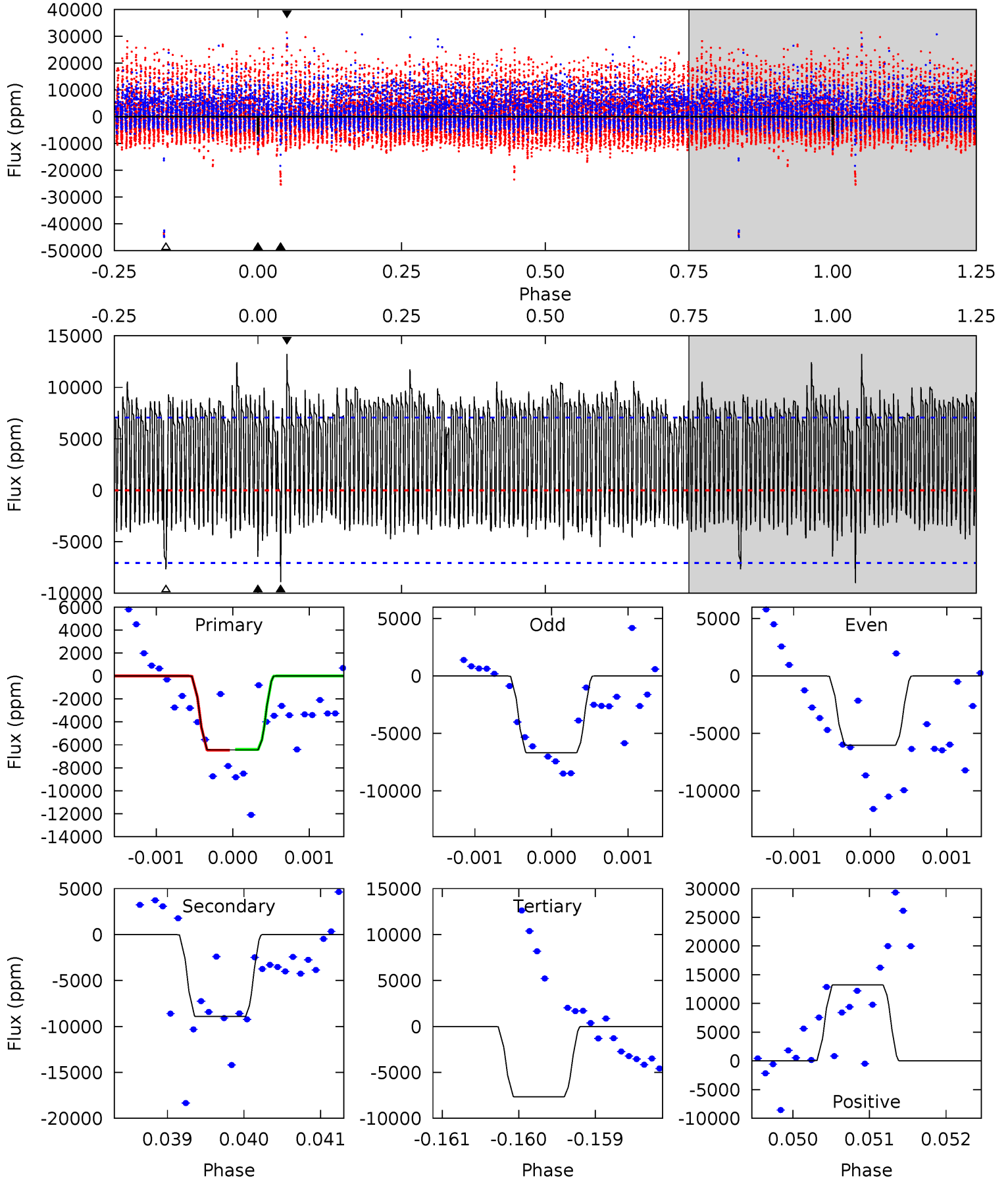
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008507979-05, P = 153.465914 Days, E = 87.150732 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
4.96	6.87	5.90	10.2	5.44	3.27	3.10	-0.95	-5.23	0.97	-3.32	0.24	1.26	0.60	0.02



### Stellar Parameters For KIC 008507979

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3673^{+117}_{-147}$	$4.691^{+0.080}_{-0.020}$	$0.560^{+0.050}_{-0.300}$	$0.560^{+0.032}_{-0.081}$	$0.561^{+0.040}_{-0.069}$	$4.498^{+1.756}_{-0.469}$
	+3%/-4%	+2%/-0%	+9%/-54%	+6%/-14%	+7%/-12%	+39%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008507979-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$4.61^{+4.80}_{-3.24}$	$246^{+10}_{-12}$	$2730^{+5172}_{-10128}$	$5002^{+1081156}_{-854502}$
Alt.	$-8920 \pm 1298$	$6.28^{+5.63}_{-4.21}$	$246^{+10}_{-12}$	$3511^{+1901}_{-579}$	$25576^{+229636}_{-18054}$

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

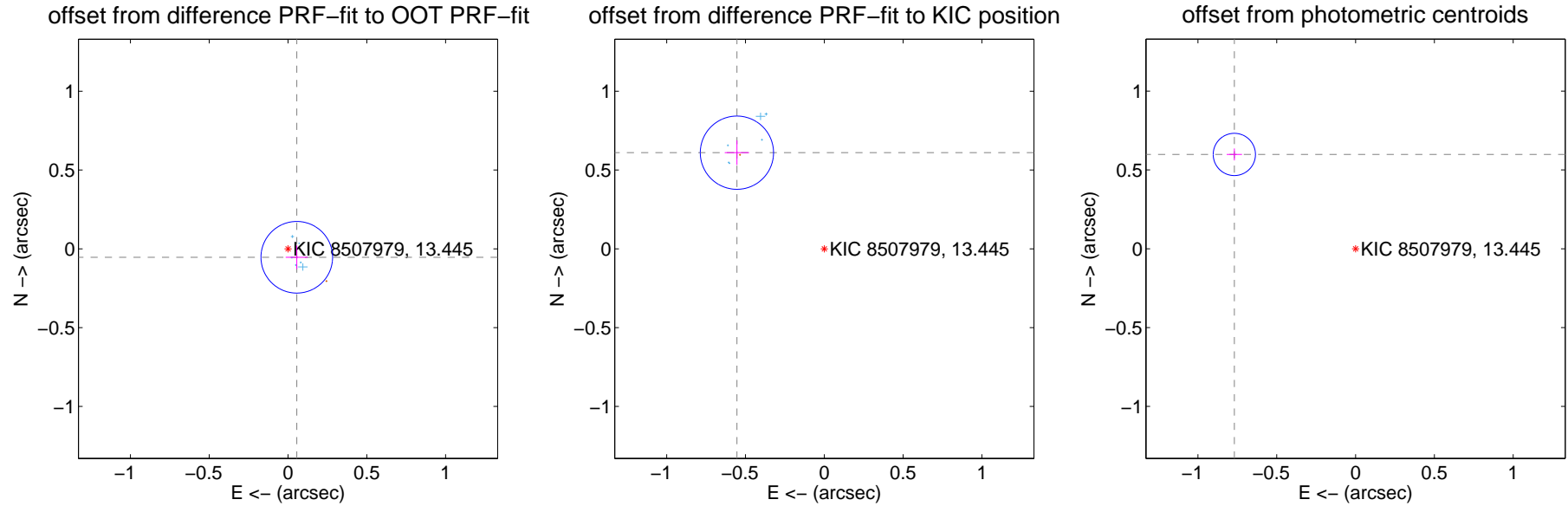
## DV Centroid Data

Supplemental centroid analysis for 008507979-05. Kepler magnitude: 13.45. Transit SNR -1.00

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.077 \pm 0.076$	1.02	$-0.056 \pm 0.070$	$-0.054 \pm 0.074$
PRF-fit source offset from KIC position	$0.824 \pm 0.077$	10.64	$0.555 \pm 0.077$	$0.610 \pm 0.078$
photometric centroid source offset	$0.97 \pm 0.04$	21.82	$0.77 \pm 0.05$	$0.60 \pm 0.04$



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

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

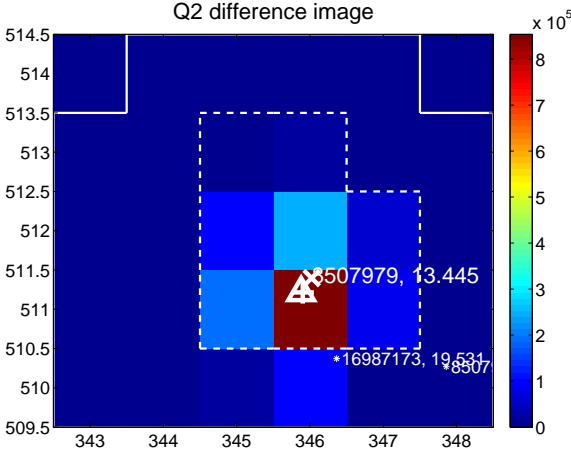
Q1 no difference image



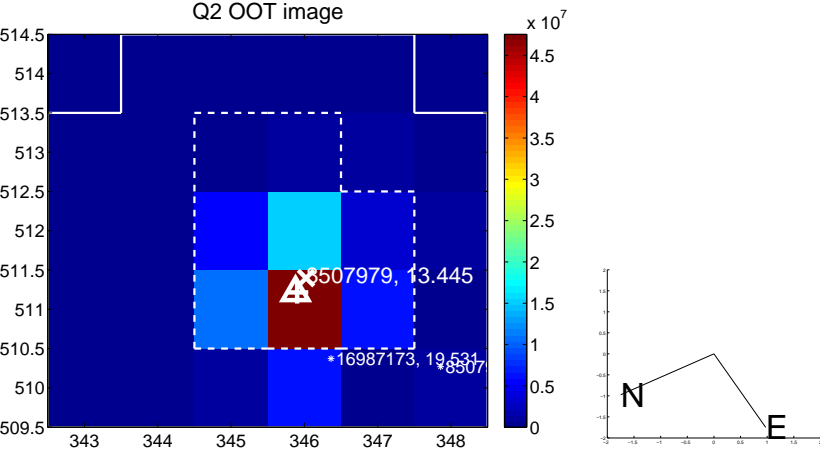
Q1 no OOT image



Q2 difference image



Q2 OOT image



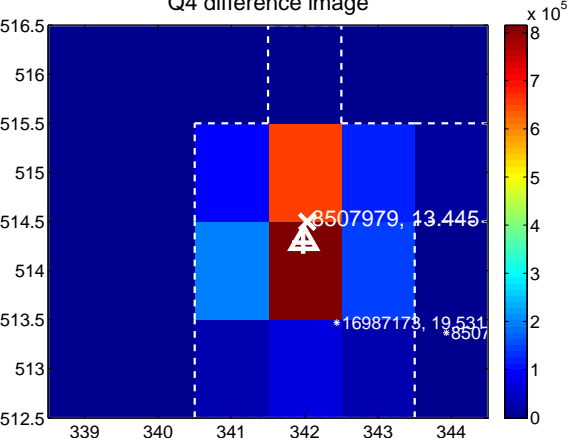
Q3 no difference image



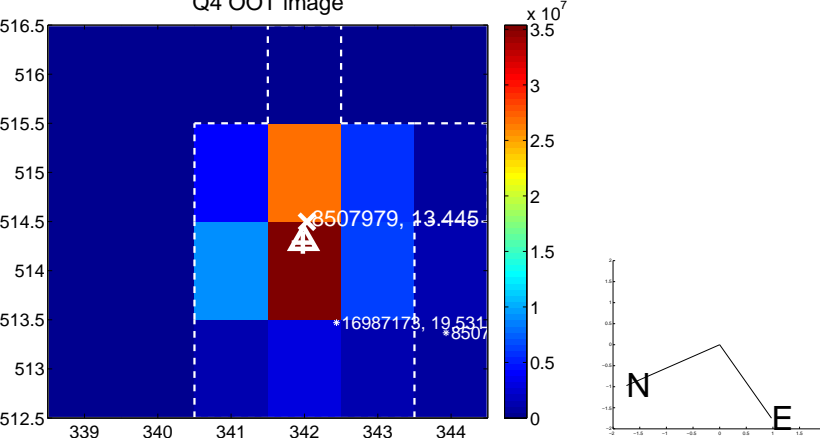
Q3 no OOT image



Q4 difference image



Q4 OOT image



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

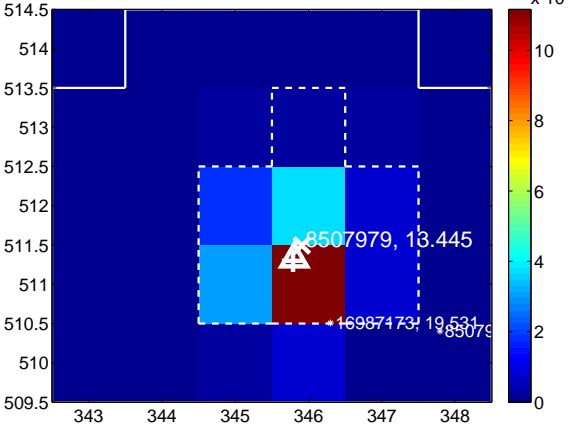
Q5 no difference image



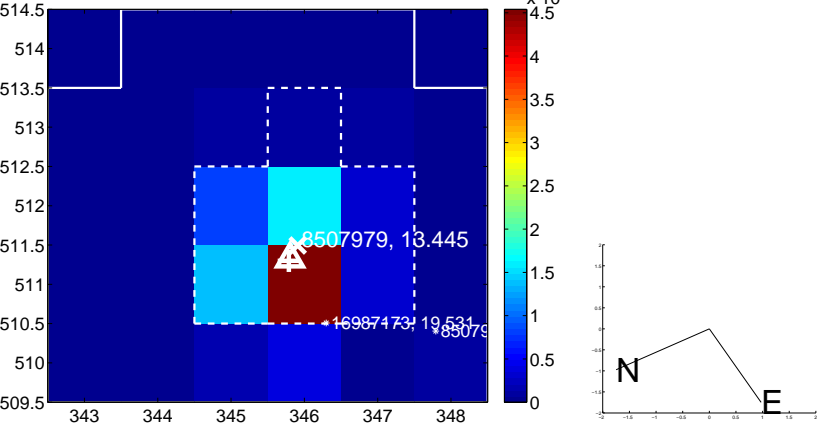
Q5 no OOT image



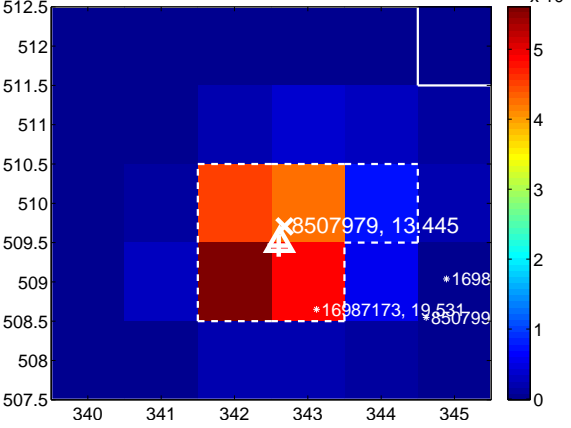
Q6 difference image



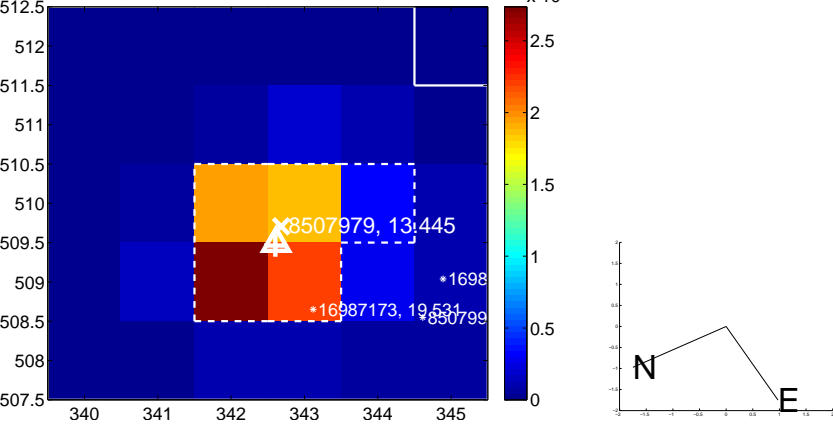
Q6 OOT image



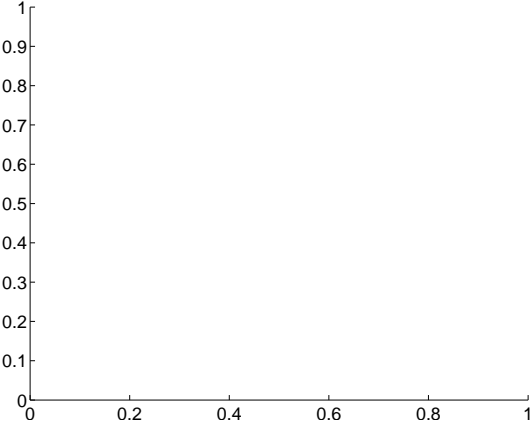
Q7 difference image



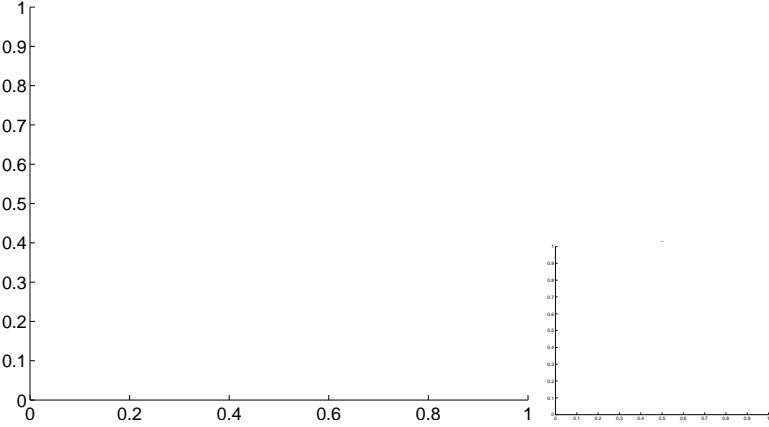
Q7 OOT image



Q8 no difference image

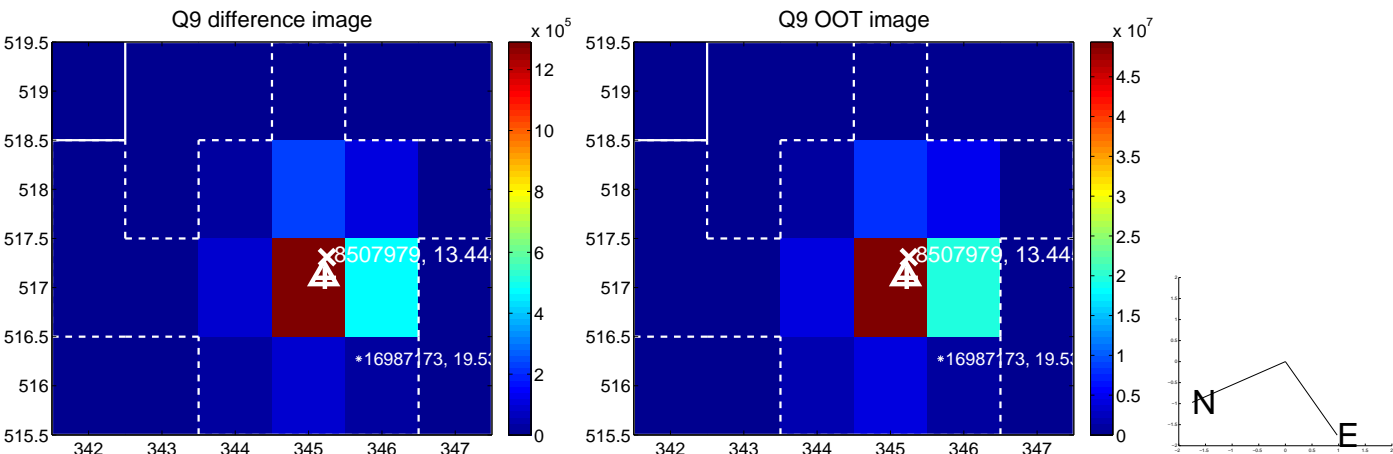


Q8 no OOT image





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



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

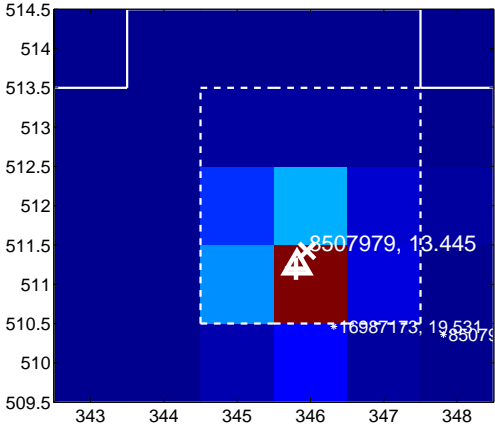
Q13 no difference image



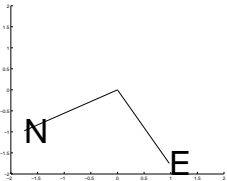
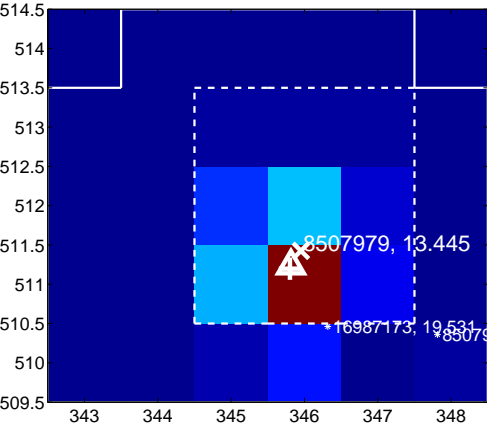
Q13 no OOT image



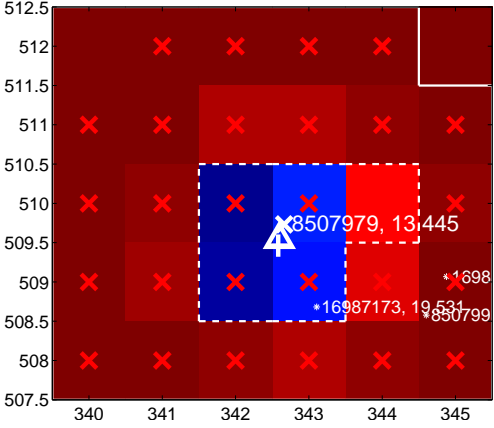
Q14 difference image



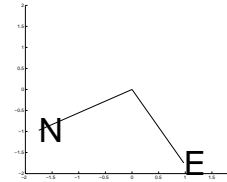
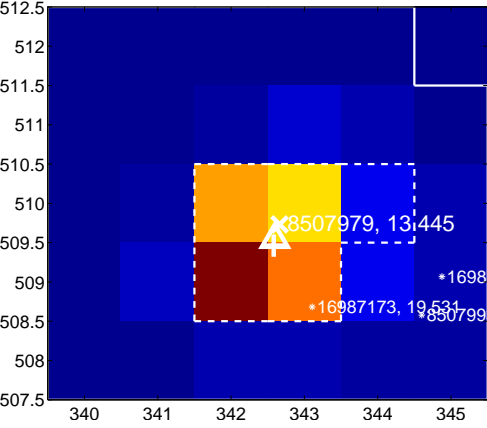
Q14 OOT image



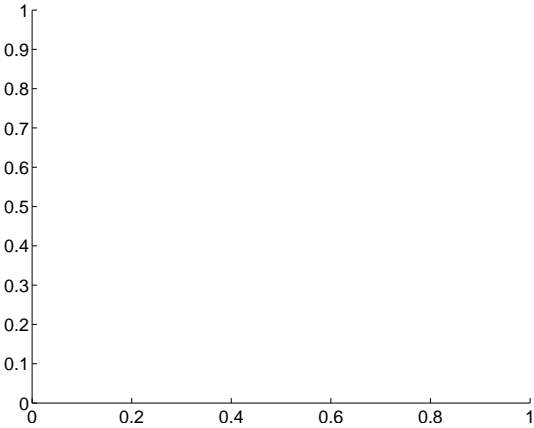
Q15 difference image. Poor Quality



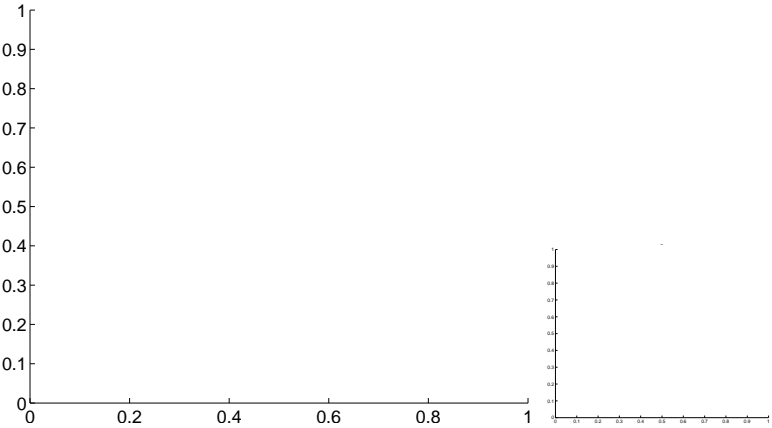
Q15 OOT image



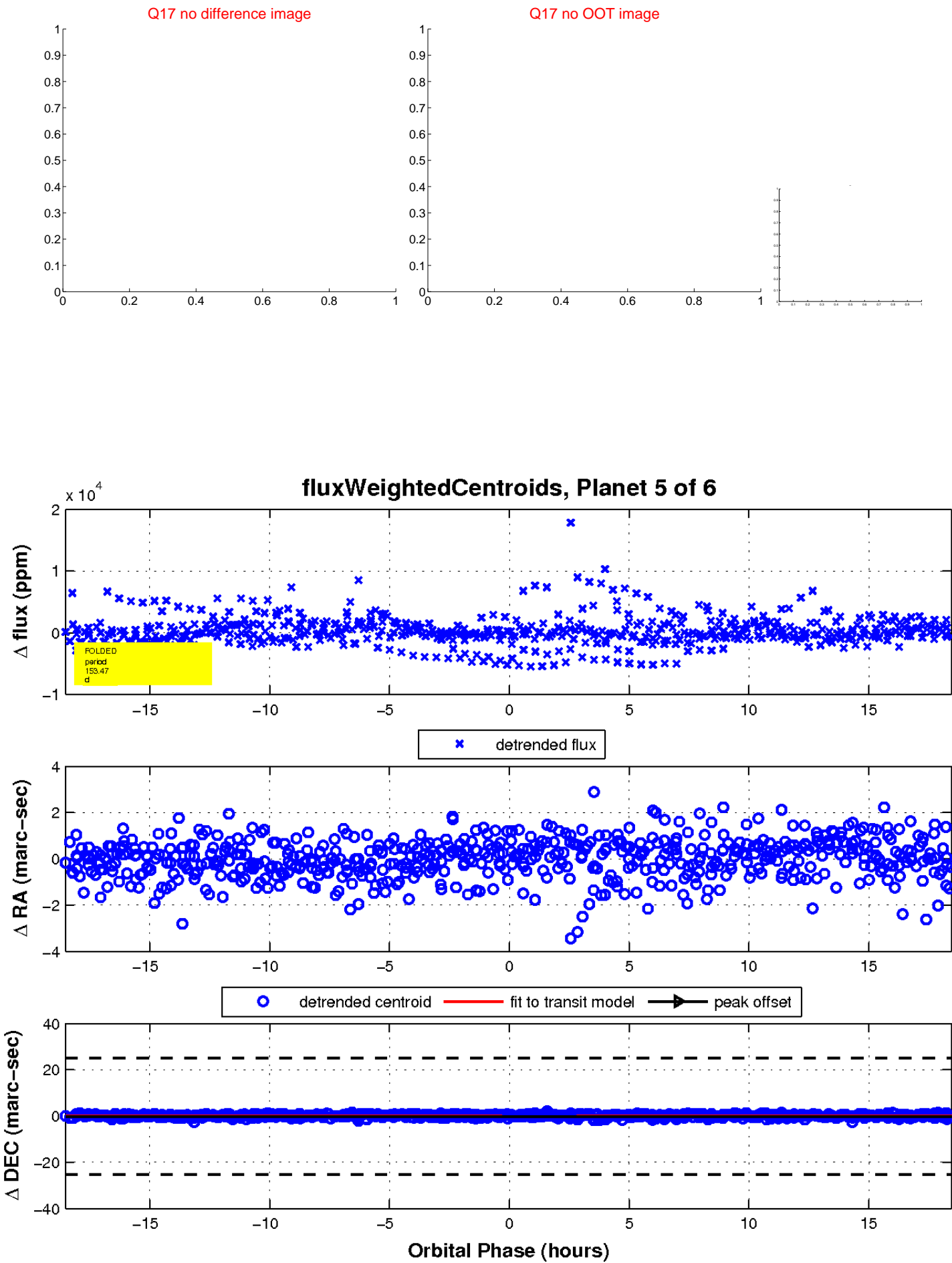
Q16 no difference image



Q16 no OOT image

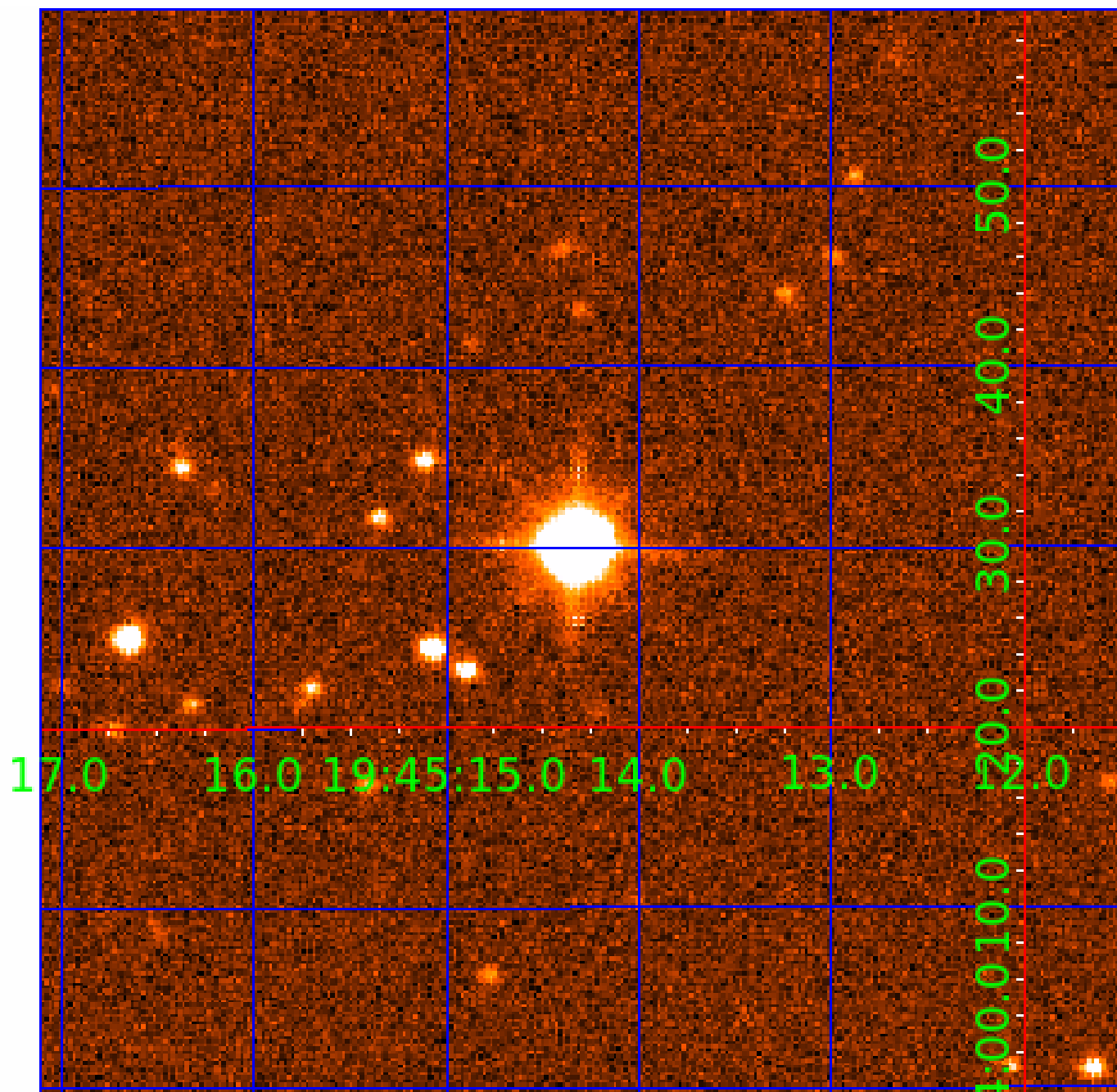


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008507979

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008507979-01	OBS	No	485.412840	267.169399	712.8	10.500	20.8	-1.0	0.56	3673	1.44	0.05
008507979-02	OBS	No	1.217481	132.056003	529.6	6.938	17.7	19.8	0.56	3673	1.24	150.83
008507979-03	OBS	No	63.204402	190.514768	597.2	1.959	9.5	2.1	0.56	3673	1.32	0.78
008507979-04	OBS	No	317.800217	150.799469	2545.5	4.825	9.7	8.4	0.56	3673	3.44	0.09
008507979-05	OBS	No	153.465914	240.607053	766.2	3.000	11.4	-1.0	0.56	3673	1.49	0.24
008507979-06	OBS	No	58.313574	179.490673	619.9	9.935	8.2	3.4	0.56	3673	1.34	0.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008507979-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
008507979-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS
008507979-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
008507979-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS

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

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

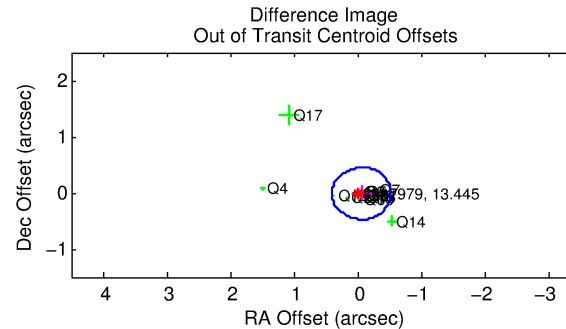
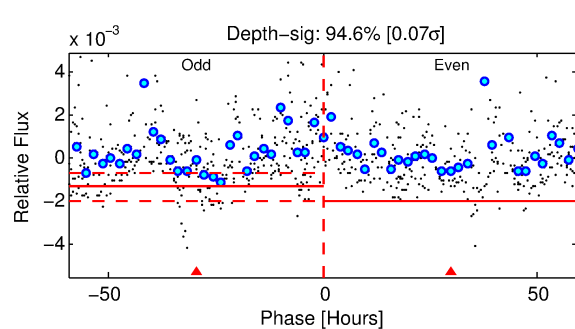
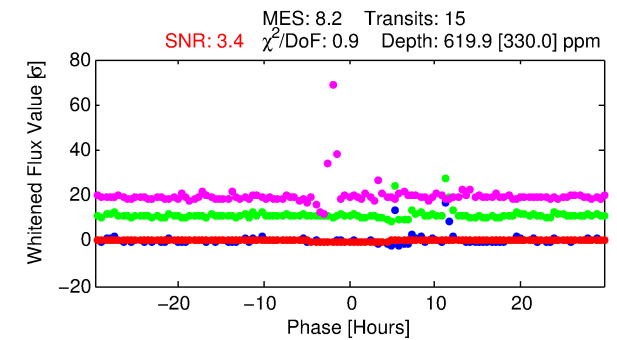
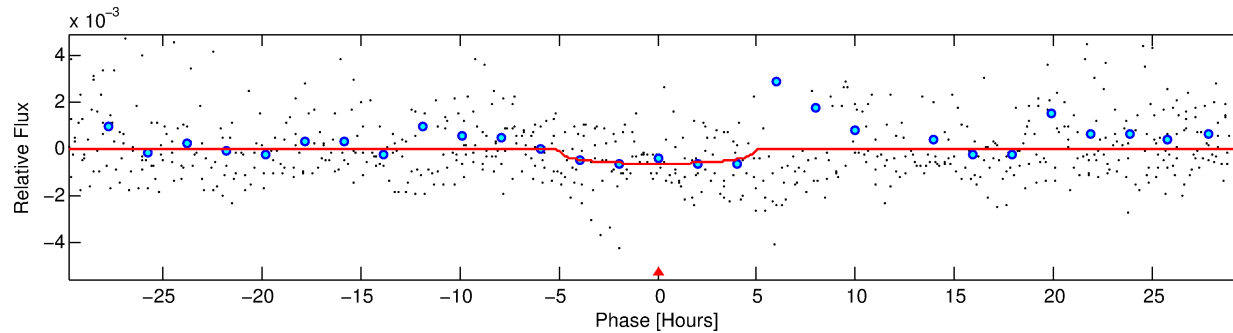
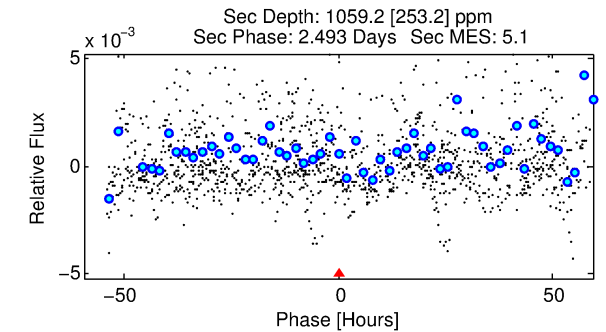
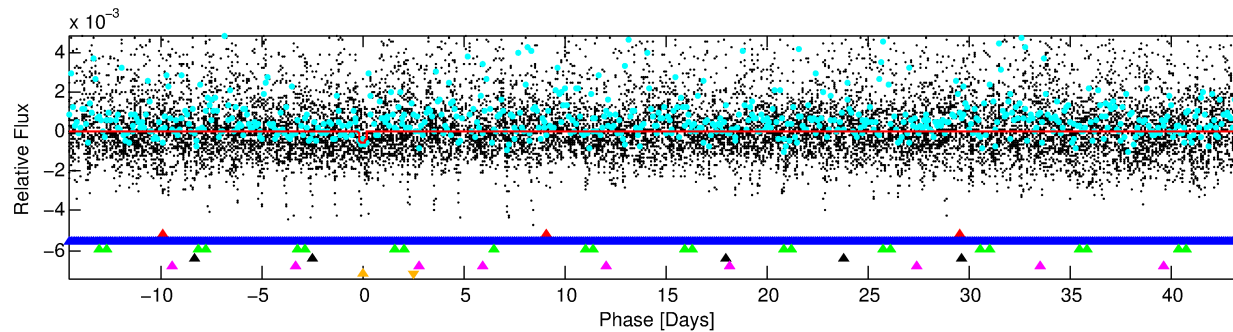
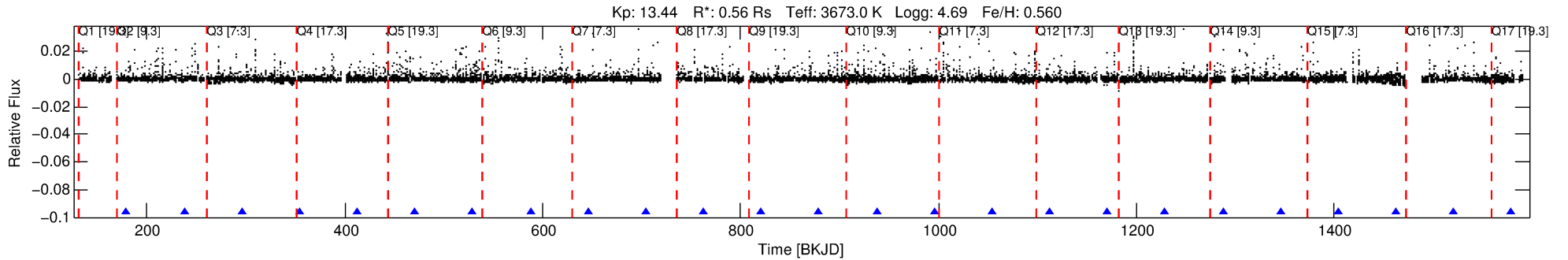
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008507979-06

No Significant Match Found

# DV One-Page Summary

KIC: 8507979 Candidate: 6 of 6 Period: 58.314 d



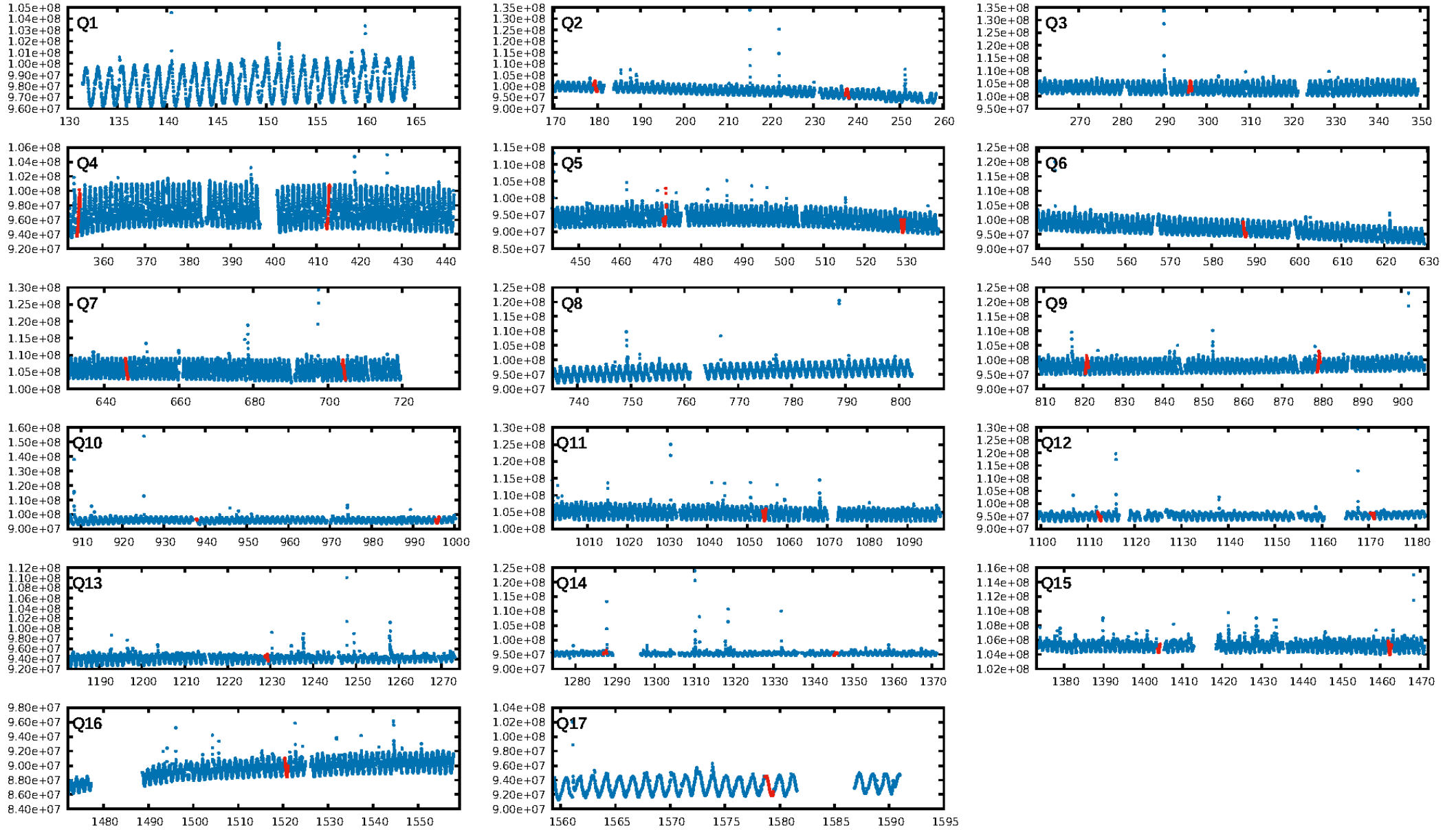
## DV Fit Results:

Period = 58.31357 [0.00319] d  
Epoch = 179.4907 [0.0436] BKJD  
Rp/R\* = 0.0219 [0.0629]  
a/R\* = 45.80 [411.16]  
b = 0.03 [297.39]  
Seff = 0.87 [0.19]  
Teq = 246 [14] K  
Rp = 1.34 [3.85] Re  
a = 0.2428 [0.0278] AU  
Ag = 19200.86 [110508.54] [0.17σ]  
Teffp = 4478 [6444] K [0.66σ]

## DV Diagnostic Results:

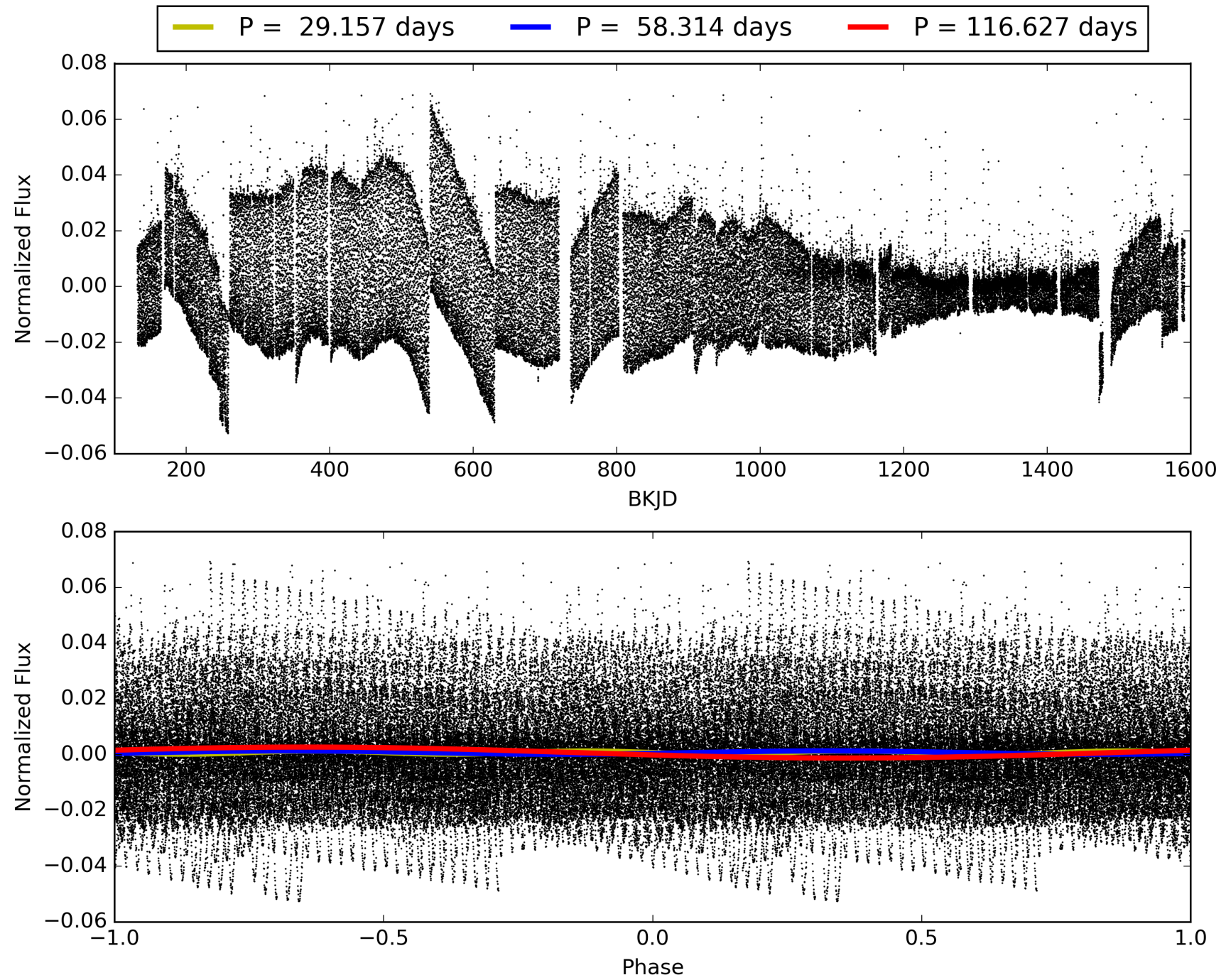
ShortPeriod-sig: 100.0% [113.08σ]  
LongPeriod-sig: 100.0% [11.59σ]  
ModelChiSquare2-sig: 5.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.39e-09  
RollingBand-fgt: 1.00 [14/14]  
GhostDiagnostic-chr: 0.5193  
Centroid-sig: N/A  
Centroid-so: 0.789 arcsec [3.35σ]  
OotOffset-rm: 0.066 arcsec [0.43σ]  
KicOffset-rm: 0.924 arcsec [6.11σ]  
OotOffset-st: 4/4/3/3 [14]  
KicOffset-st: 4/4/3/3 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 008507979-06, PDC Light Curves





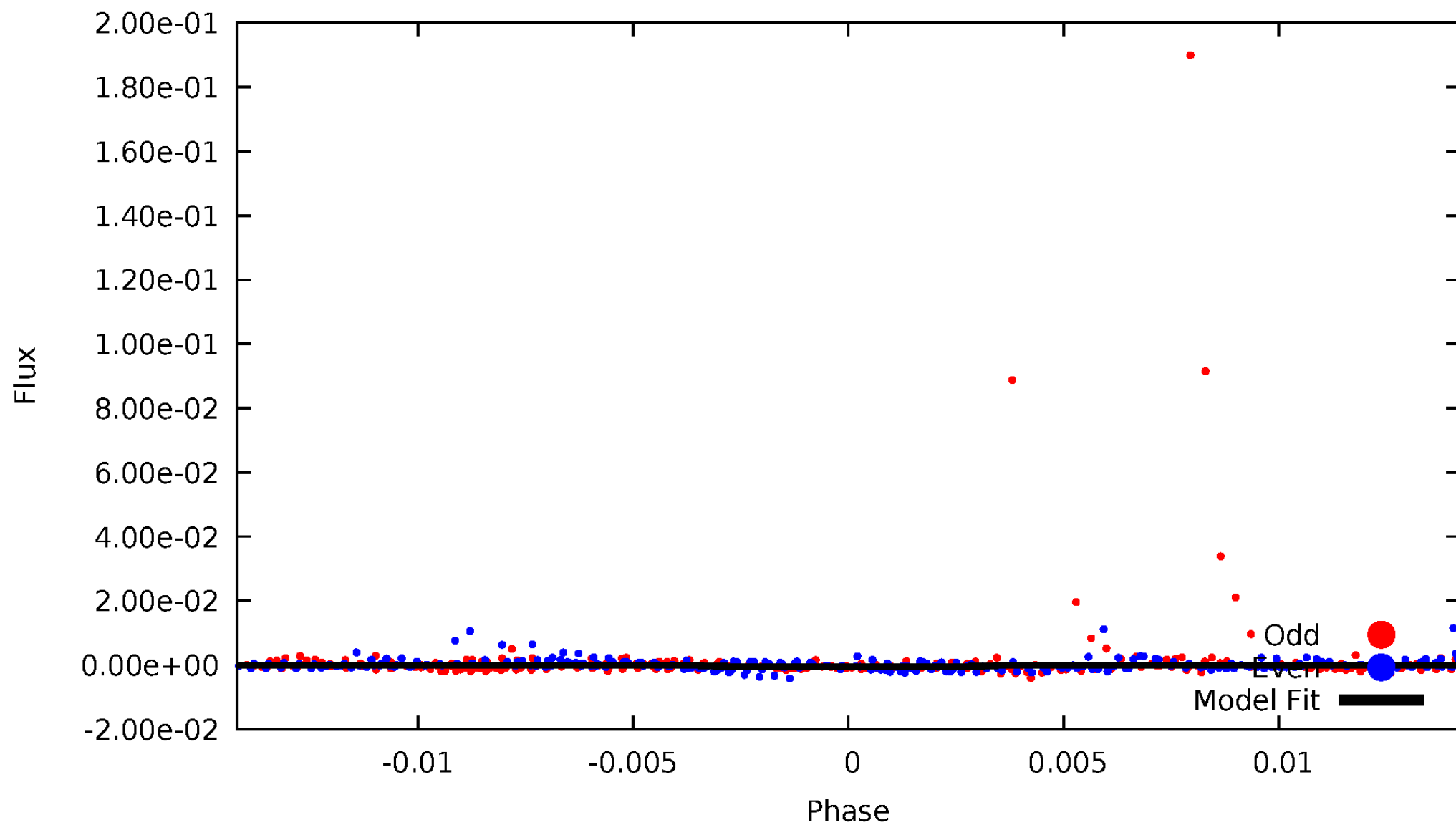
TCE 008507979-06





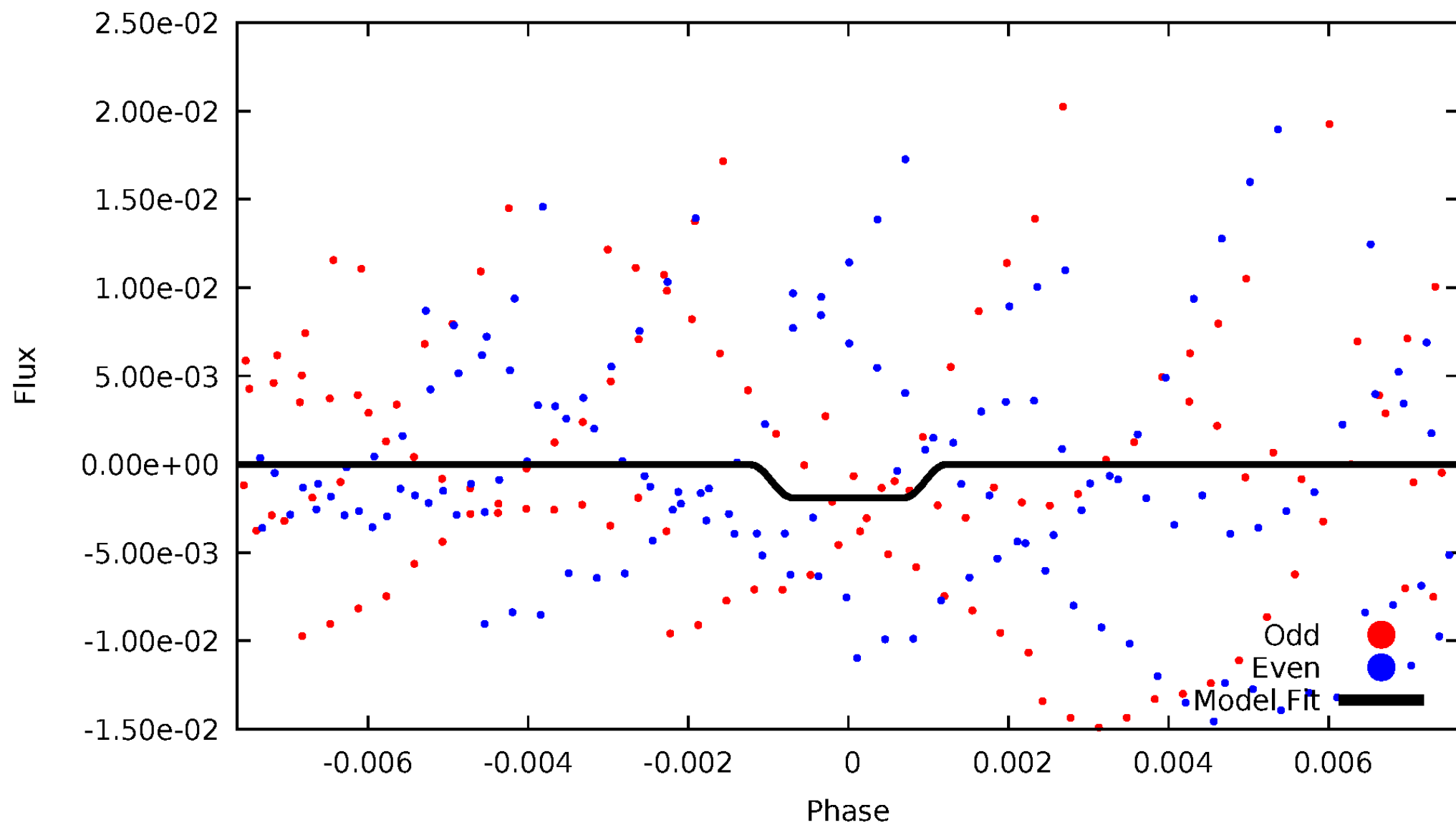
# DV Odd/Even

TCE 008507979-06



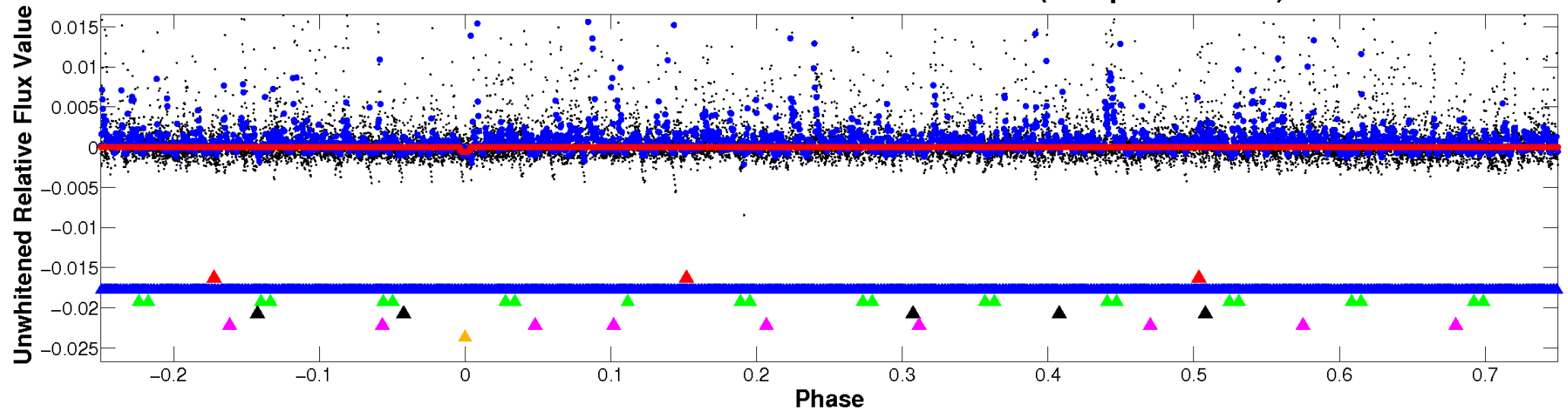
# ALT Odd/Even

TCE 008507979-06

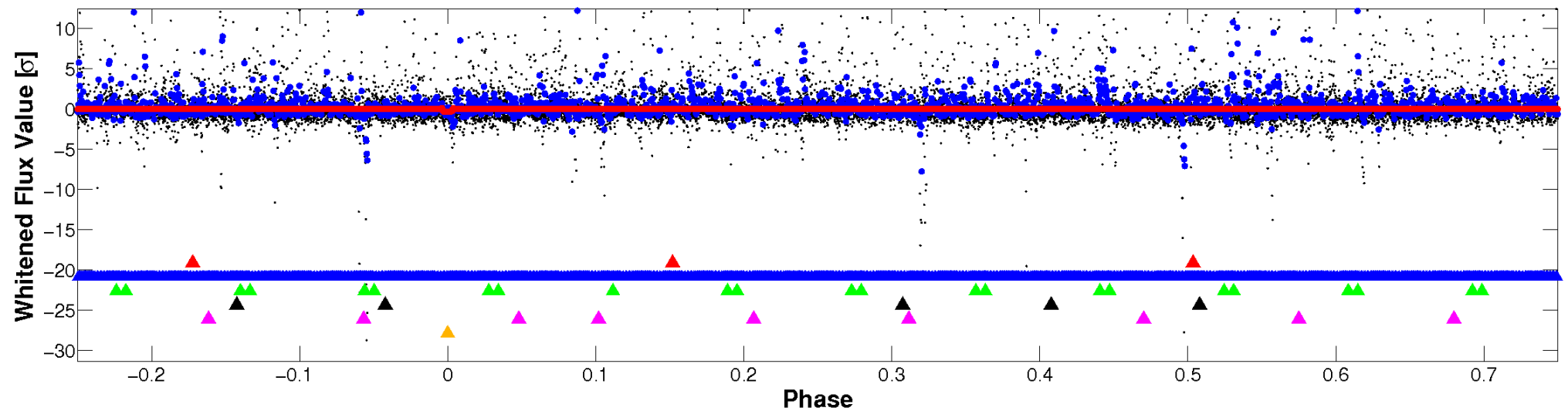


# Non-Whitened Vs. Whitened Light Curve

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

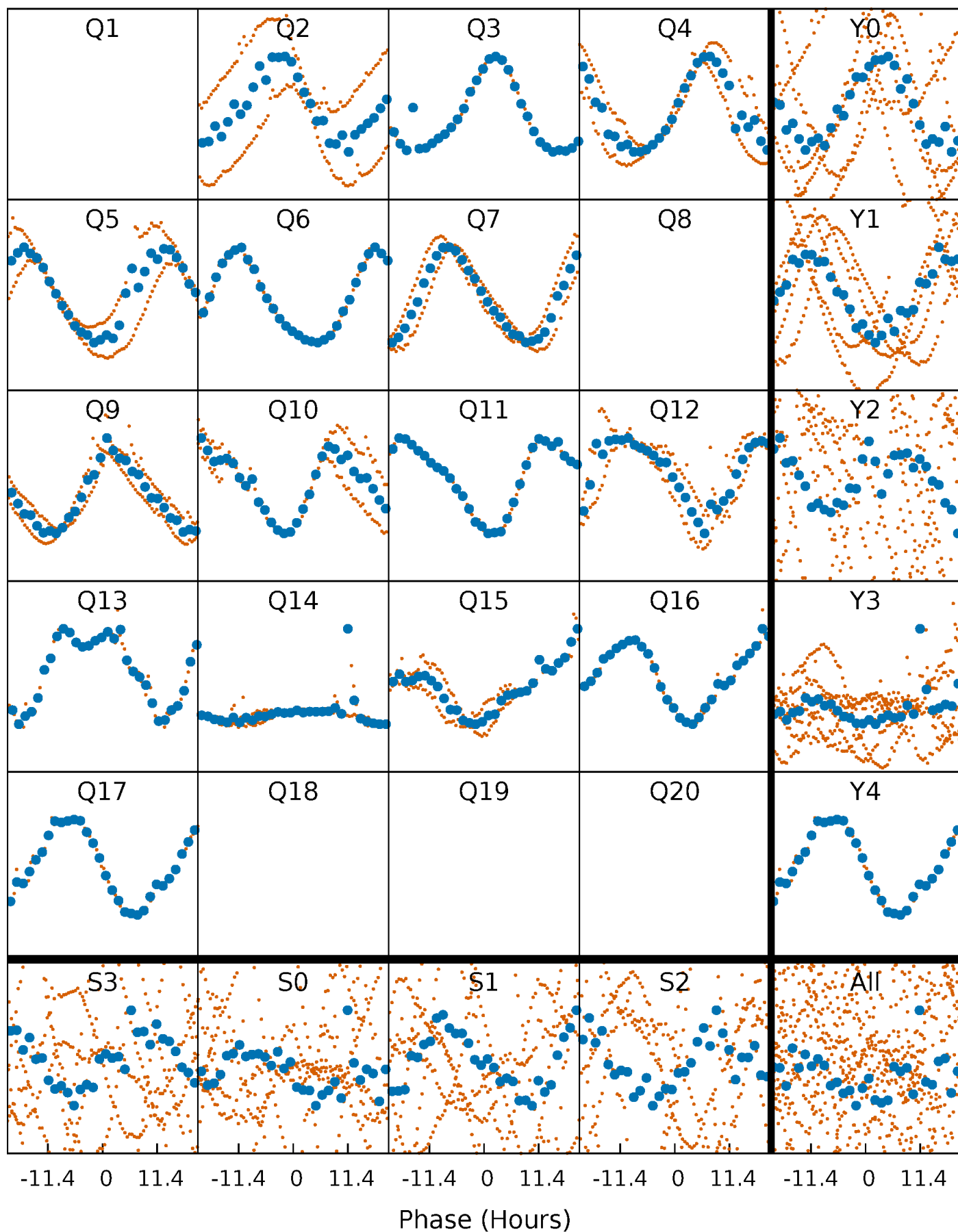


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



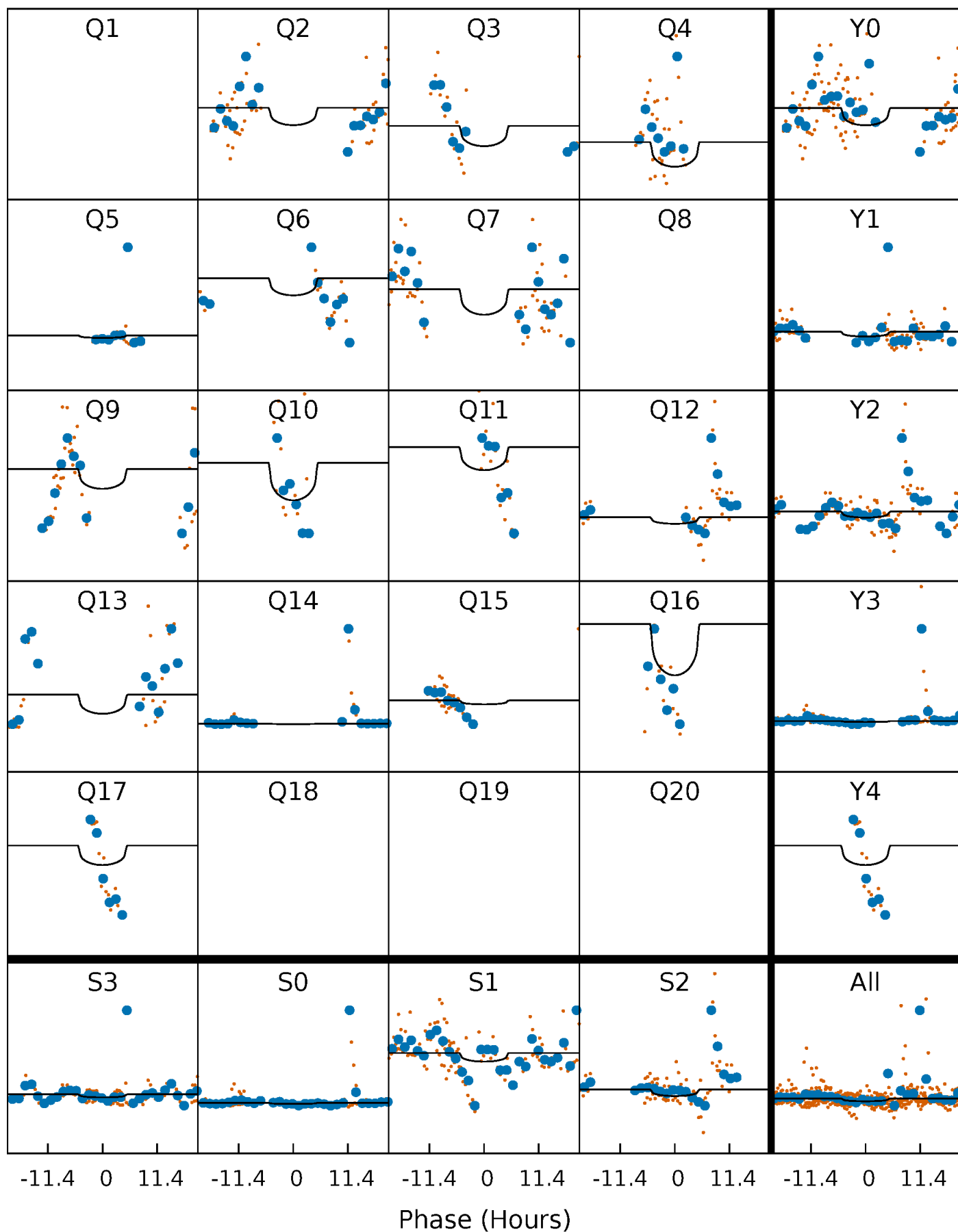
# PDC Quarter-Phased Transit Curves

TCE 008507979-06 P= 58.313574 Days  $T_0=179.490673$  (BKJD)



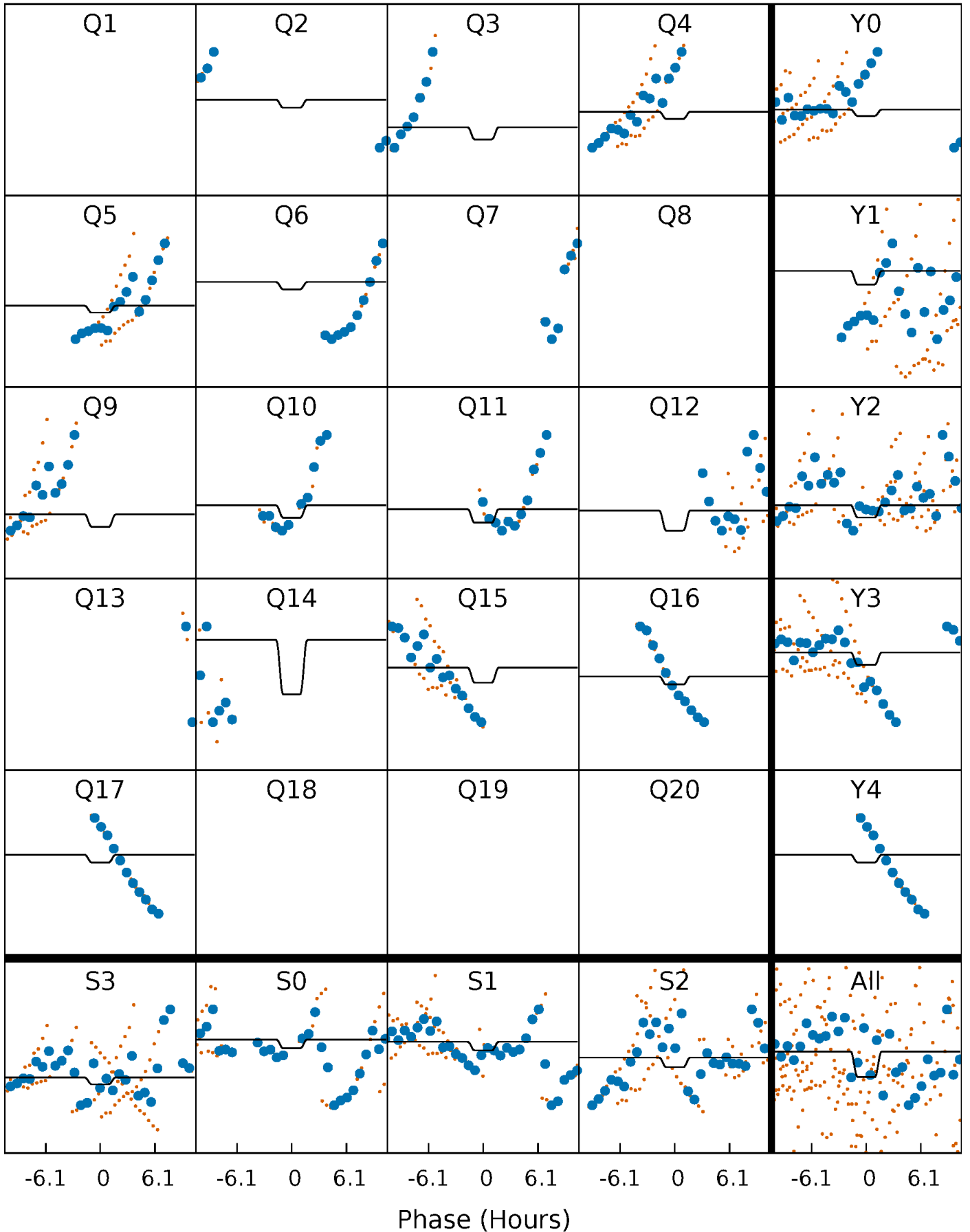
# DV Quarter-Phased Transit Curves

TCE 008507979-06     $P = 58.313574$  Days     $T_0 = 179.490673$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

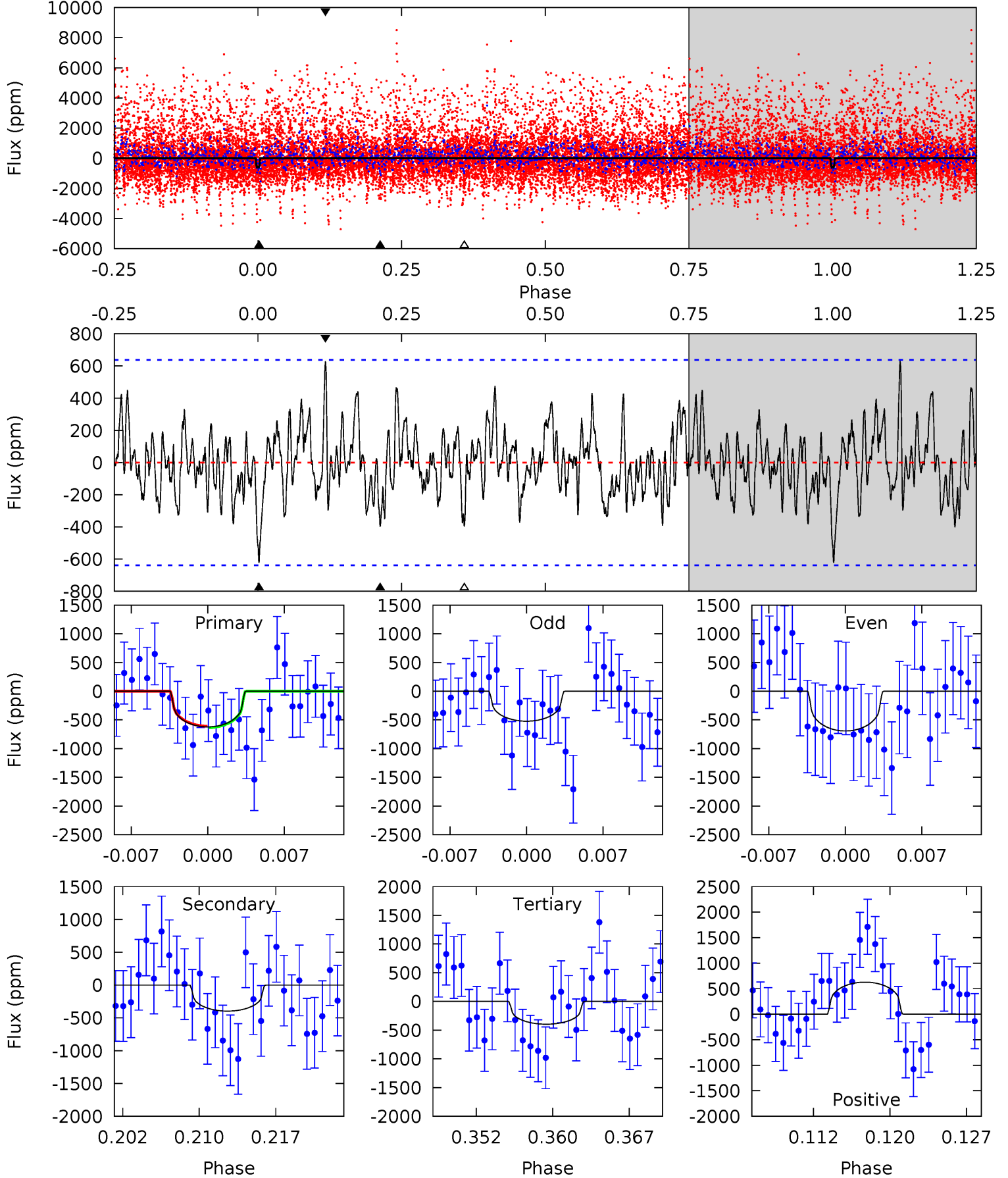
TCE 008507979-06     $P = 58.306314$  Days     $T_0 = 179.572222$  (BKJD)



# DV Model-Shift Uniqueness Test

008507979-06, P = 58.313574 Days, E = 121.177099 Days

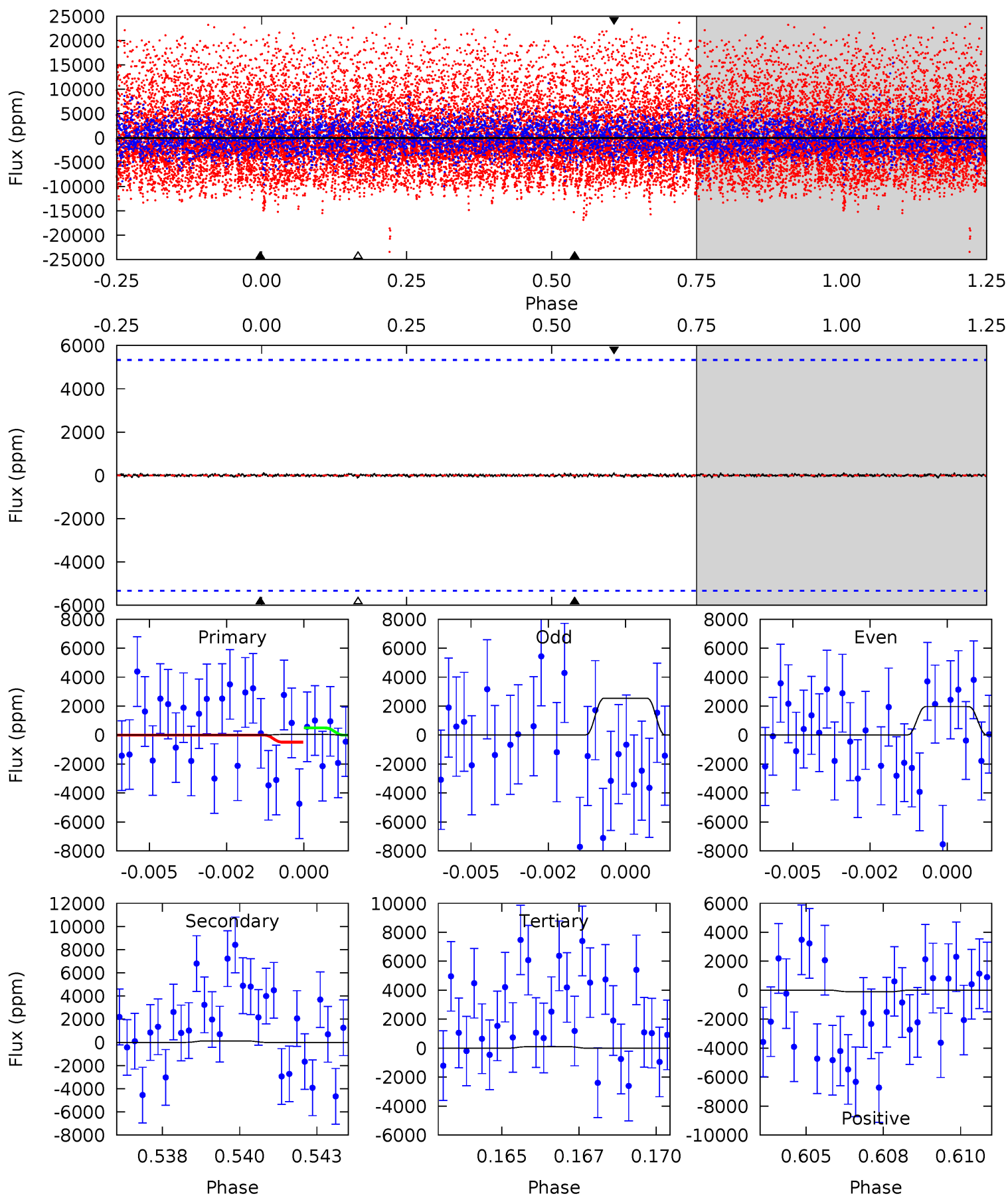
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.95	3.16	3.16	5.00	5.08	2.67	1.38	1.80	-0.05	0.01	-1.84	0.61	1.35	0.50	0.10



# Alt Model-Shift Uniqueness Test

008507979-06, P = 58.306314 Days, E = 121.265908 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
0.04	0.12	0.10	0.10	5.29	3.03	0.03	-0.05	-0.06	0.02	0.02	0.29	0.40	0.46	0.00





### Stellar Parameters For KIC 008507979

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3673^{+117}_{-147}$	$4.691^{+0.080}_{-0.020}$	$0.560^{+0.050}_{-0.300}$	$0.560^{+0.032}_{-0.081}$	$0.561^{+0.040}_{-0.069}$	$4.498^{+1.756}_{-0.469}$
	+3%/-4%	+2%/-0%	+9%/-54%	+6%/-14%	+7%/-12%	+39%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 008507979-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-397 \pm 126$	$3.08^{+3.02}_{-2.13}$	$339^{+13}_{-15}$	$2731^{+1171}_{-411}$	$1305^{+12333}_{-969}$
Alt.	$-121 \pm 1007$	$3.73^{+3.42}_{-2.63}$	$339^{+13}_{-15}$	$2263^{+1218}_{-5221}$	$301^{+6588}_{-2393}$

$T_{\text{max}}$  = 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

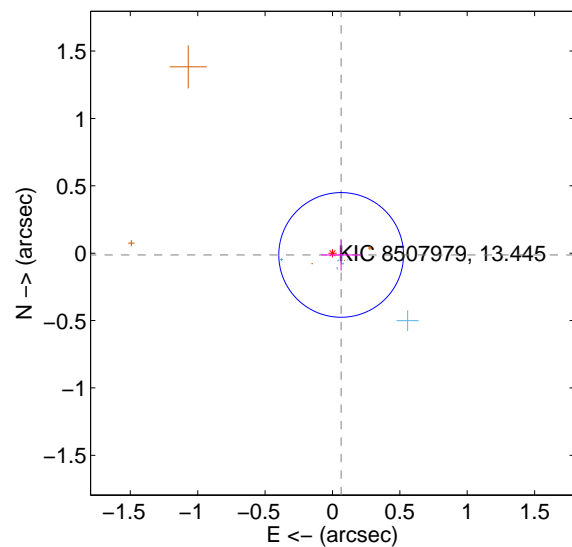
Supplemental centroid analysis for 008507979-06. Kepler magnitude: 13.45. Transit SNR 3.35

There are 8 quarters with good PRF difference image offsets

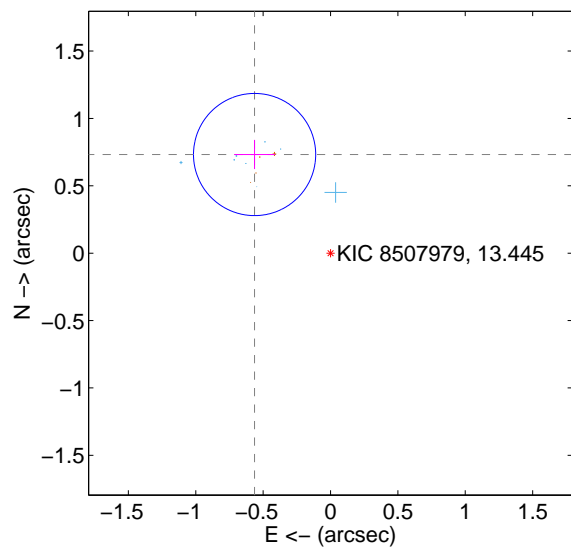
The direct PRF centroid is offset from the target star catalog position by about 0.95 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.066 \pm 0.154$	0.43	$-0.064 \pm 0.147$	$-0.013 \pm 0.115$
PRF-fit source offset from KIC position	$0.924 \pm 0.151$	6.11	$0.563 \pm 0.152$	$0.732 \pm 0.108$
photometric centroid source offset	$0.79 \pm 0.24$	3.35	$0.51 \pm 0.28$	$0.60 \pm 0.20$

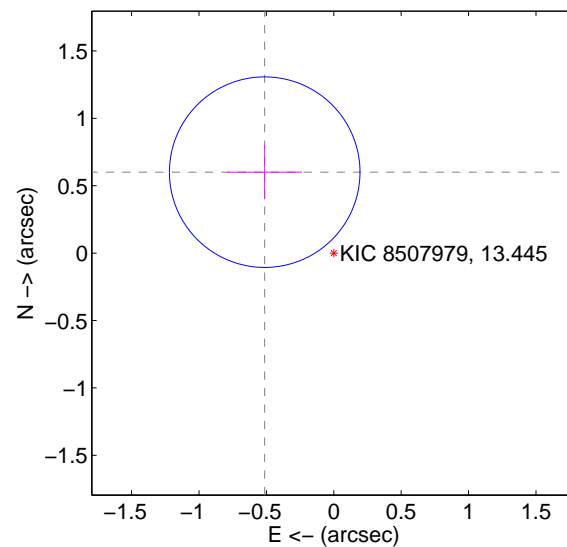
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

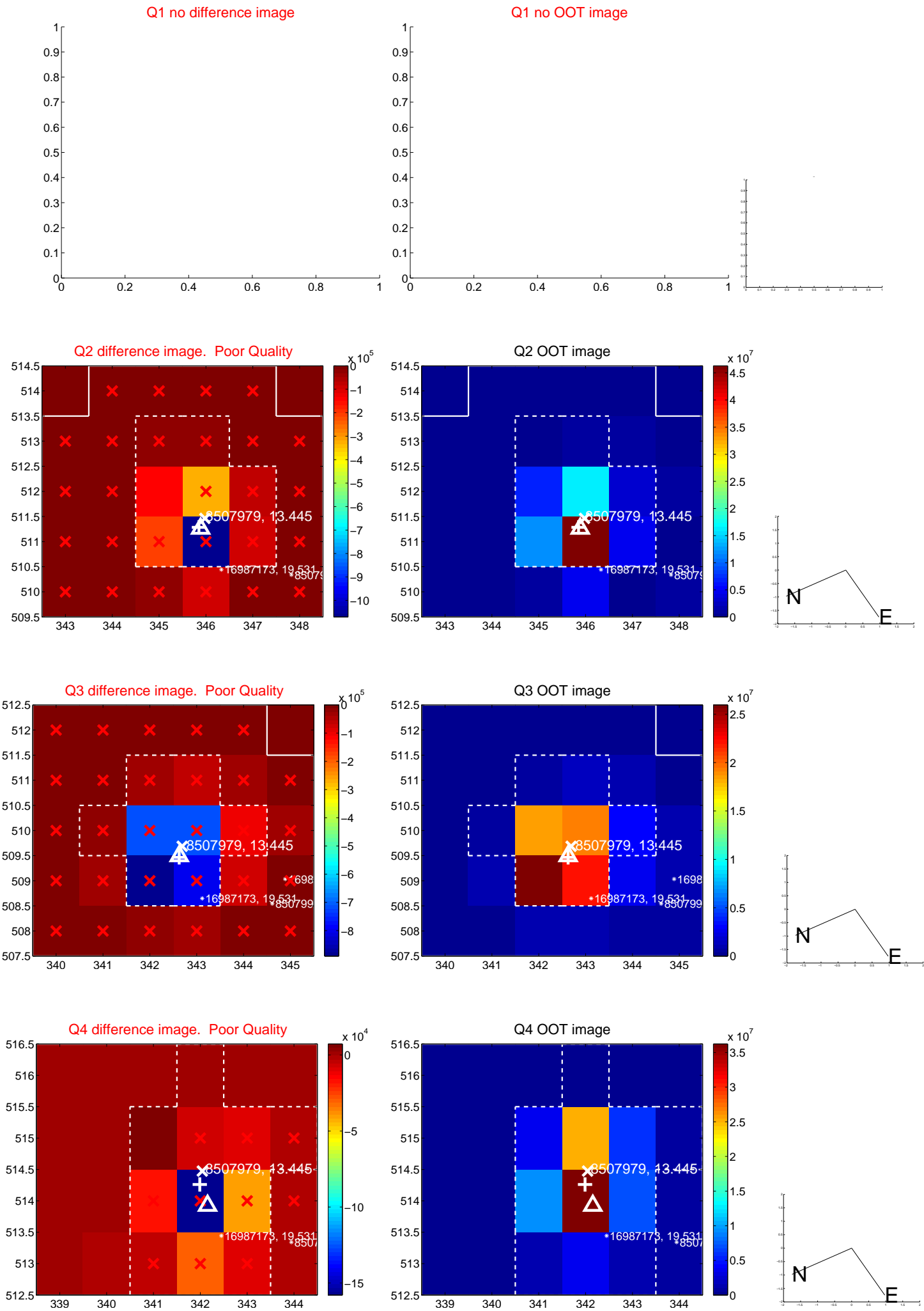


offset from photometric centroids

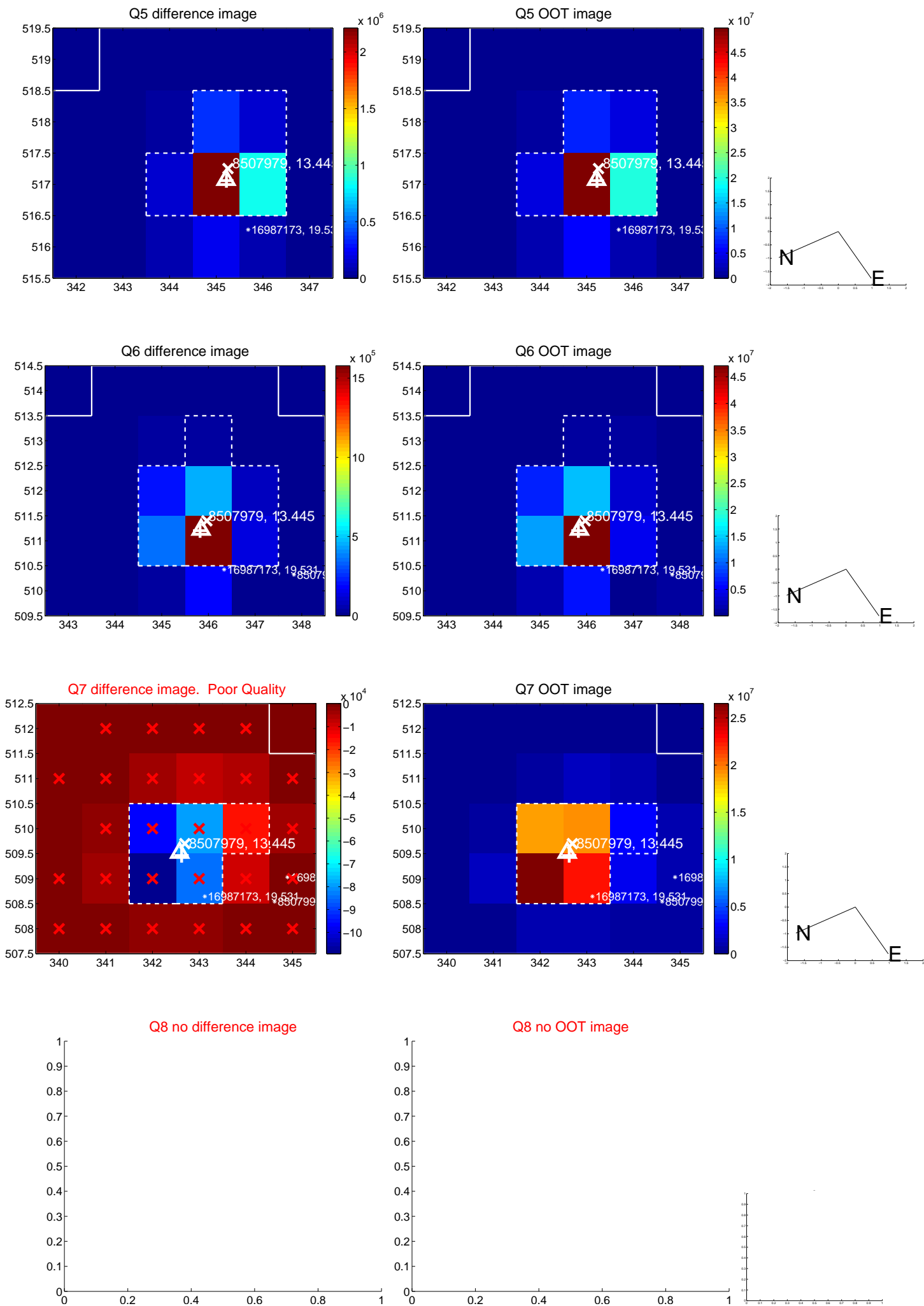


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

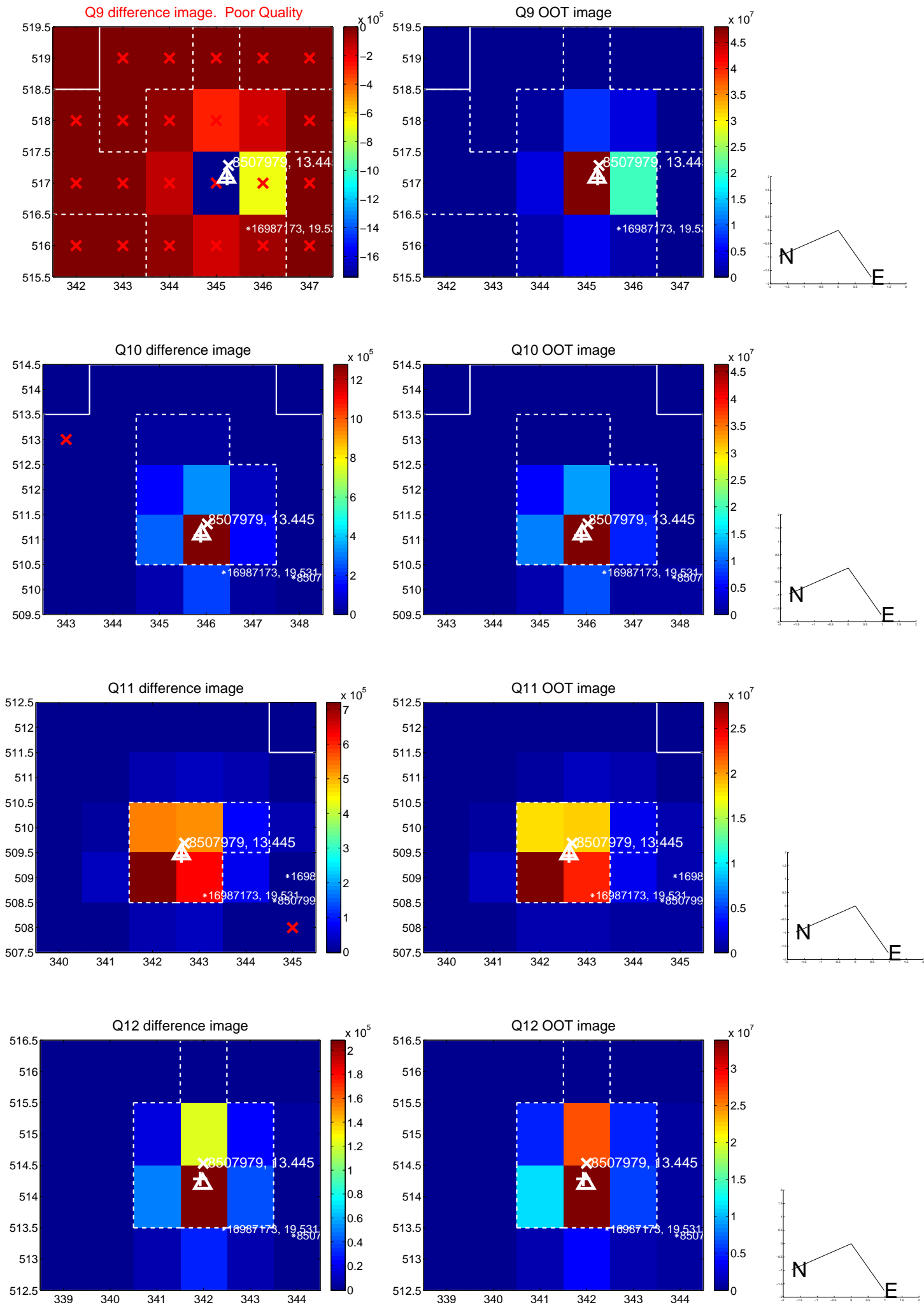
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



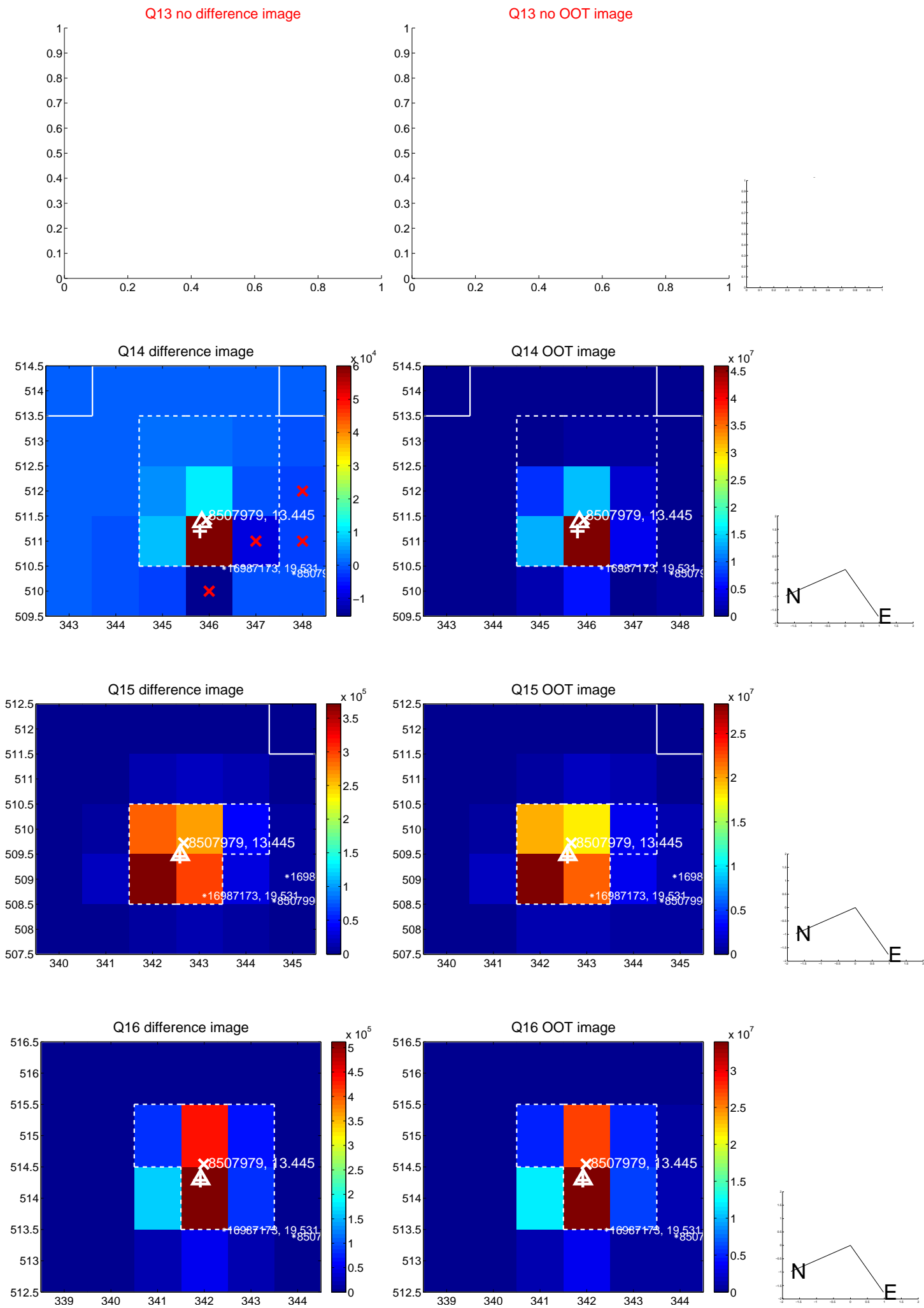
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



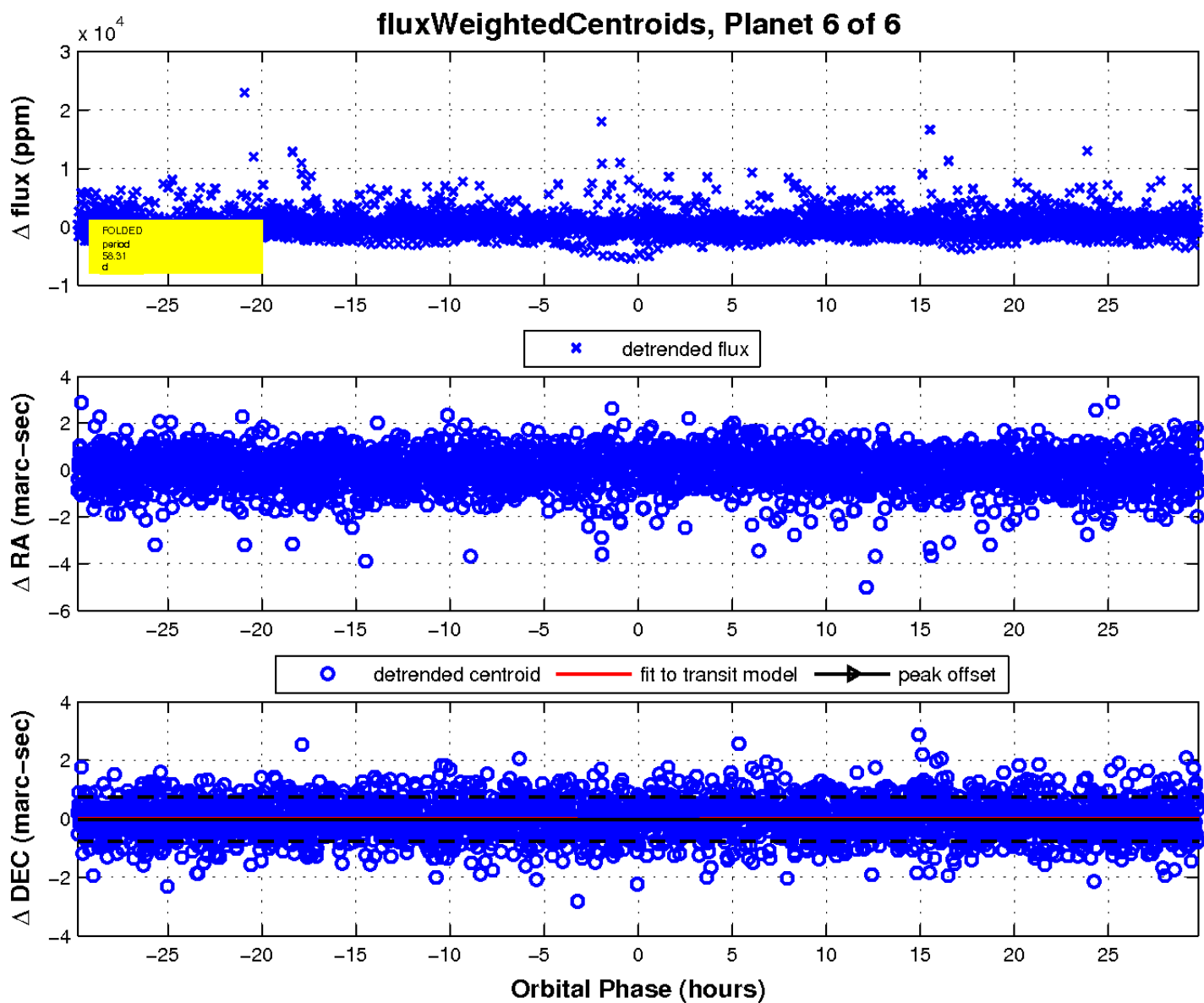
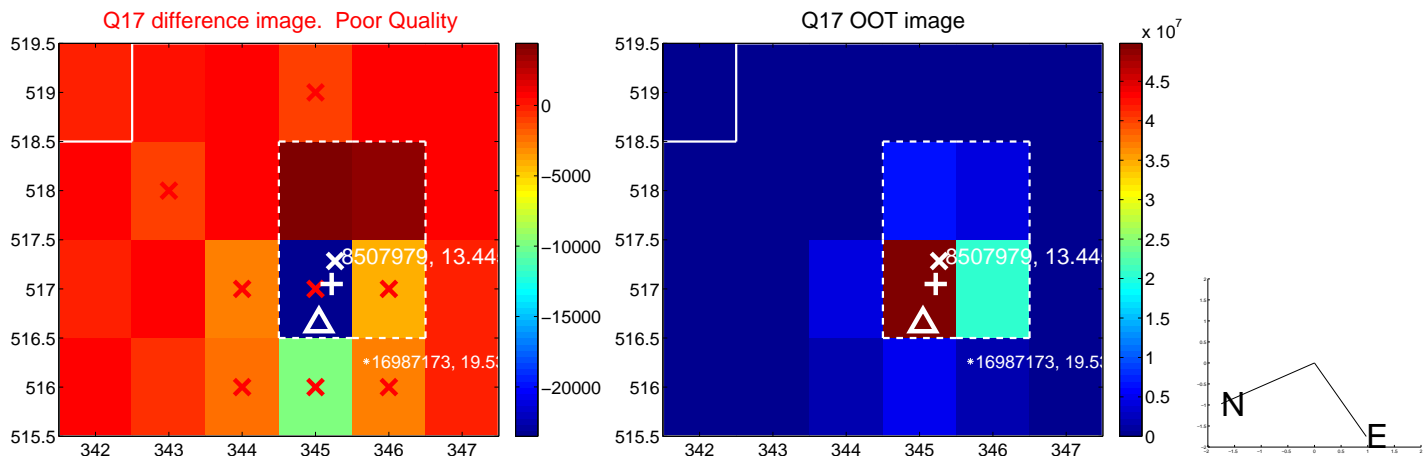
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

