

# KIC 009305136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009305136-01	OBS	No	2.856561	133.084044	54.2	18.894	9.6	12.2	0.67	5017	0.49	201.09
009305136-02	OBS	No	168.333018	289.490966	459.5	25.978	13.0	8.5	0.67	5017	1.48	0.88
009305136-03	OBS	No	126.747662	222.993463	489.2	10.773	12.1	8.8	0.67	5017	1.78	1.28
009305136-04	OBS	No	165.776208	288.185175	406.7	15.245	9.5	8.6	0.67	5017	1.50	0.90
009305136-05	OBS	No	84.931002	151.570416	902.2	1.789	8.6	8.9	0.67	5017	2.40	2.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009305136-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_KIC_POS—HALO_GHOST
009305136-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009305136-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305136-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009305136-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

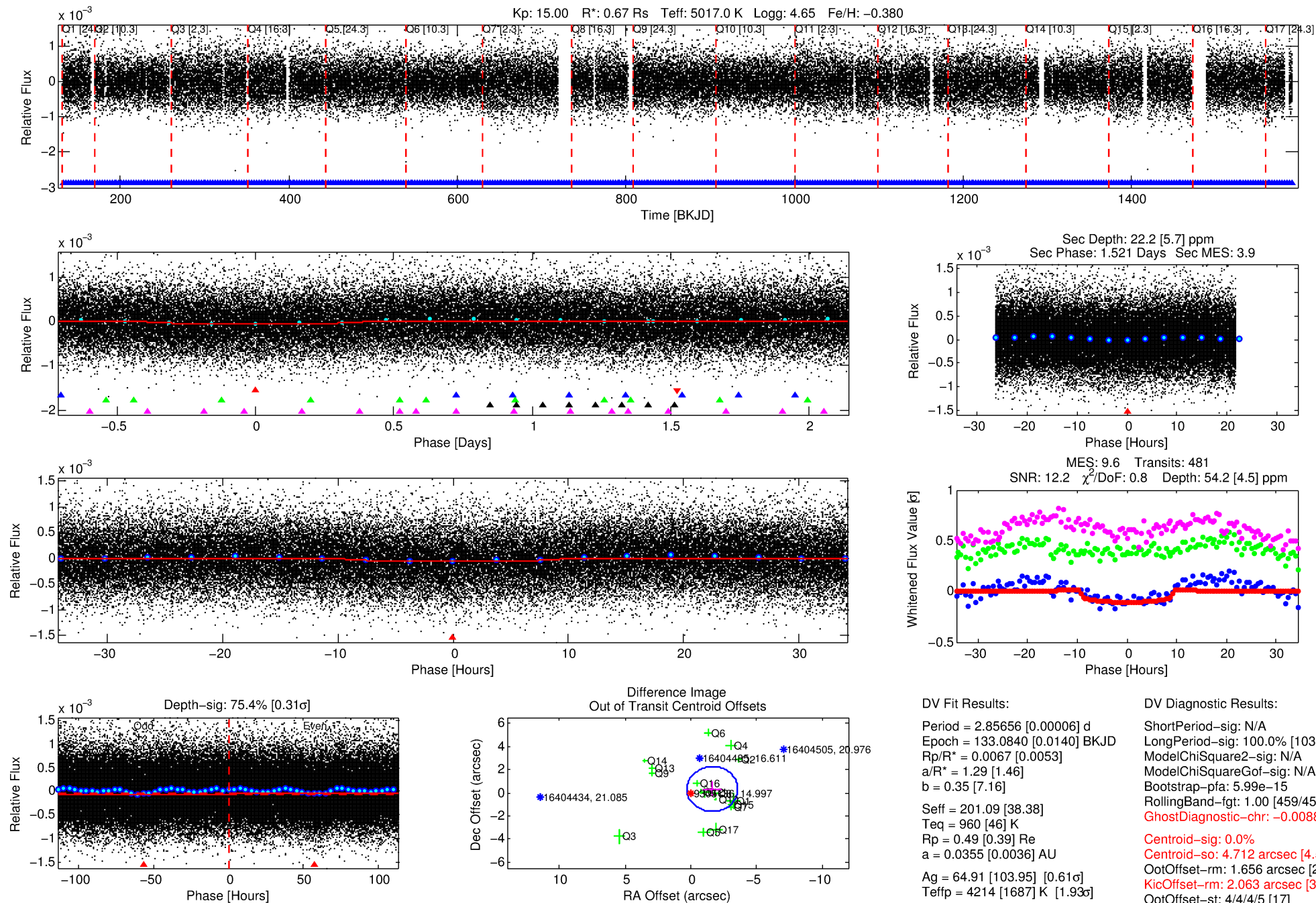
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009305136-01

No Significant Match Found

# DV One-Page Summary

KIC: 9305136 Candidate: 1 of 5 Period: 2.857 d



## DV Fit Results:

Period = 2.85656 [0.00006] d  
Epoch = 133.0840 [0.0140] BKJD  
Rp/R\* = 0.0067 [0.0053]  
a/R\* = 1.29 [1.46]  
b = 0.35 [7.16]  
Seff = 201.09 [38.38]  
Teff = 960 [46] K  
Rp = 0.49 [0.39] Re  
a = 0.0355 [0.0036] AU  
Ag = 64.91 [103.95] [0.61 $\sigma$ ]  
Teffp = 4214 [1687] K [1.93 $\sigma$ ]

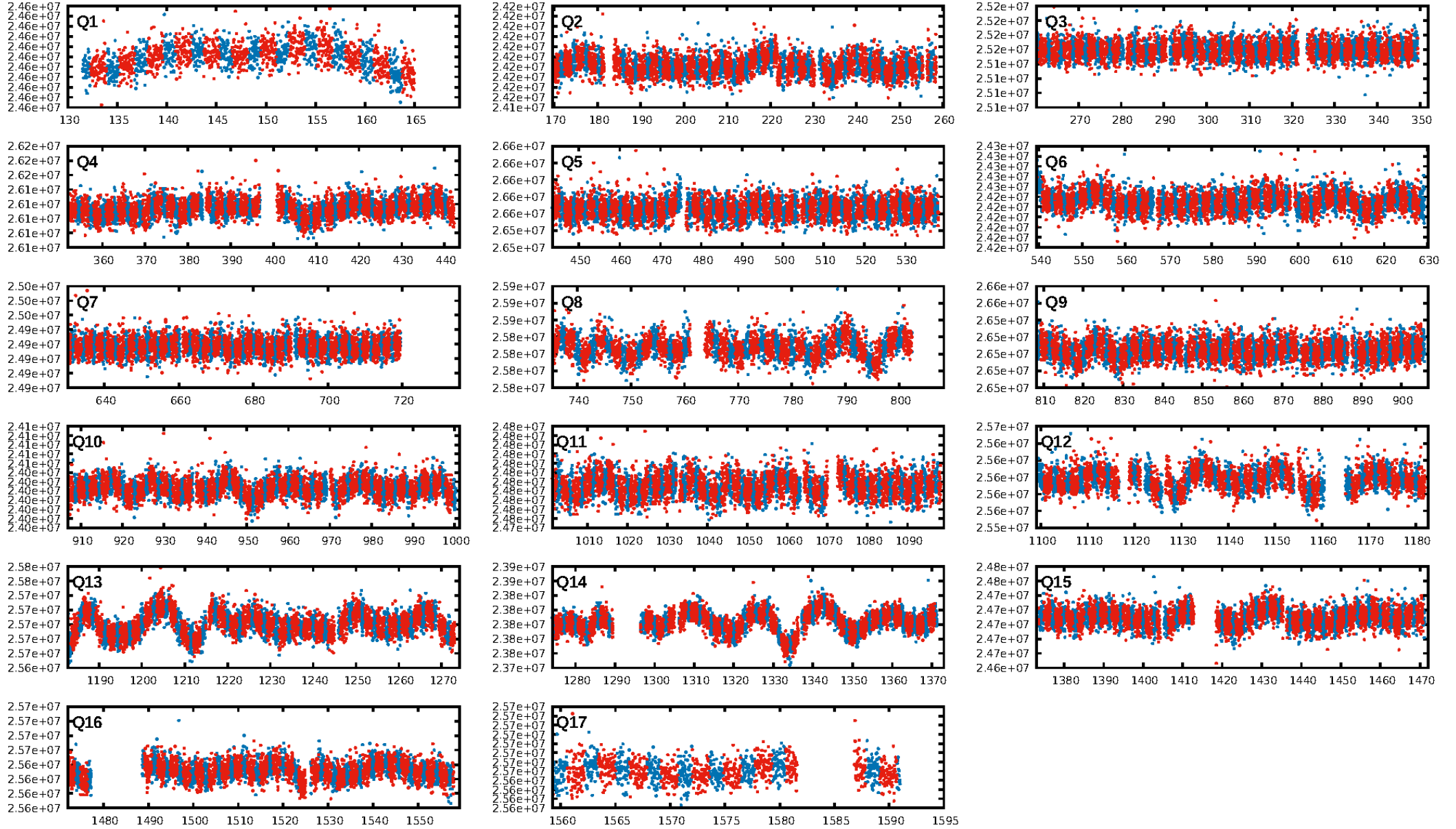
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [103.79 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.99e-15  
RollingBand-fgt: 1.00 [459/459]  
GhostDiagnostic-chr: -0.008864  
Centroid-sig: 0.0%  
Centroid-so: 4.712 arcsec [4.57 $\sigma$ ]  
OotOffset-rm: 1.656 arcsec [2.57 $\sigma$ ]  
KicOffset-rm: 2.063 arcsec [3.27 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.35 [6/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:31:07 Z

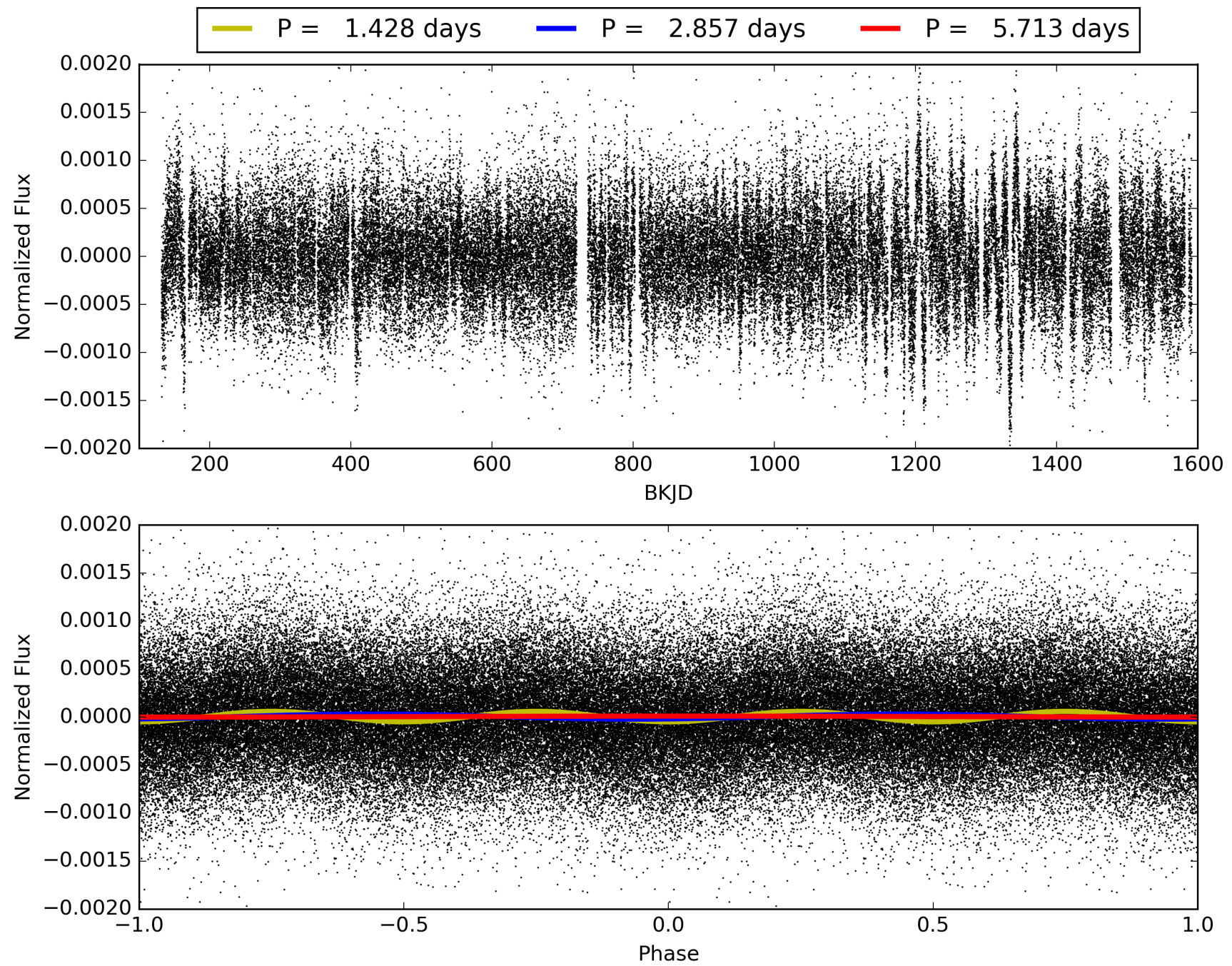
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009305136-01, PDC Light Curves





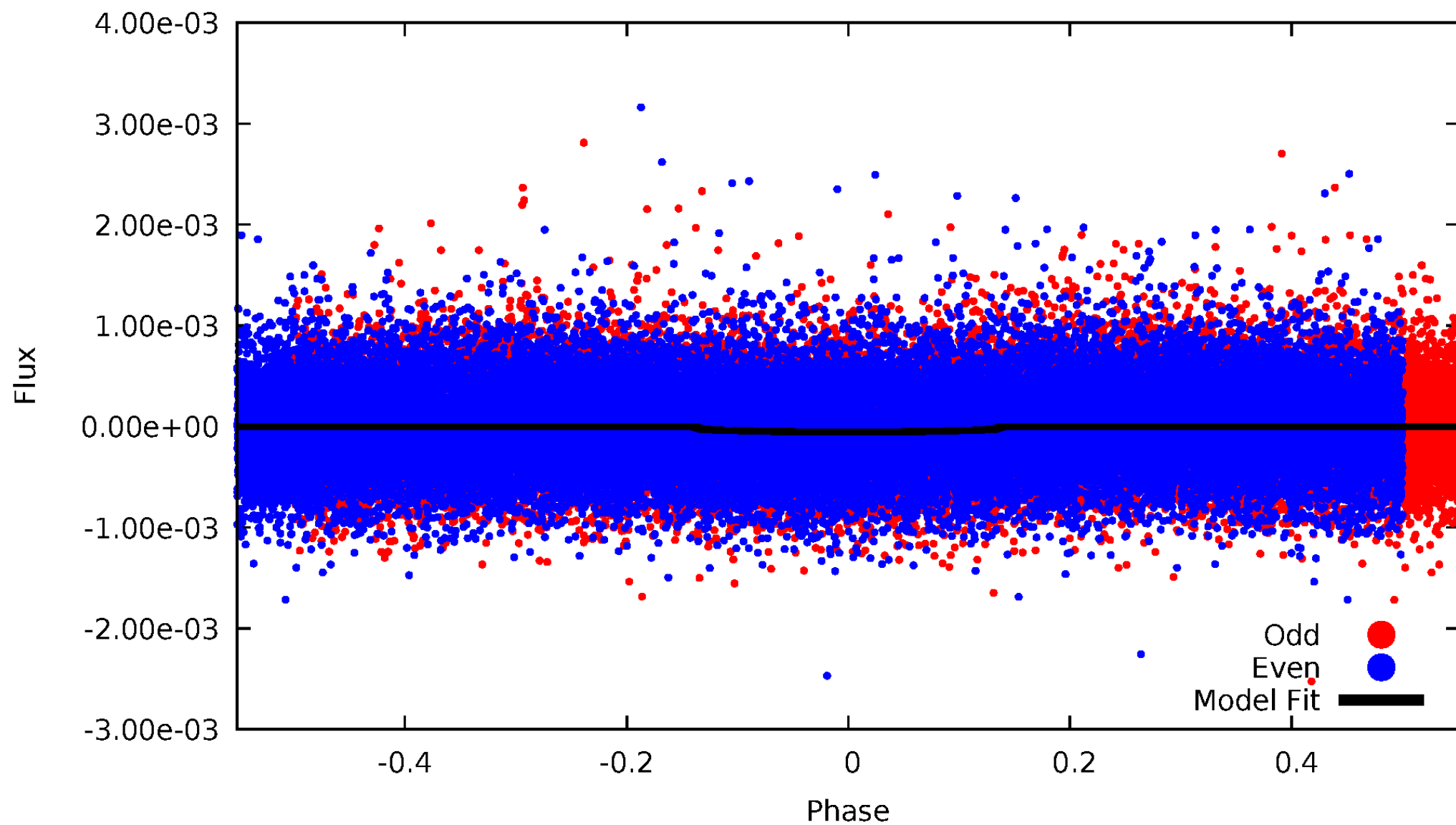
TCE 009305136-01





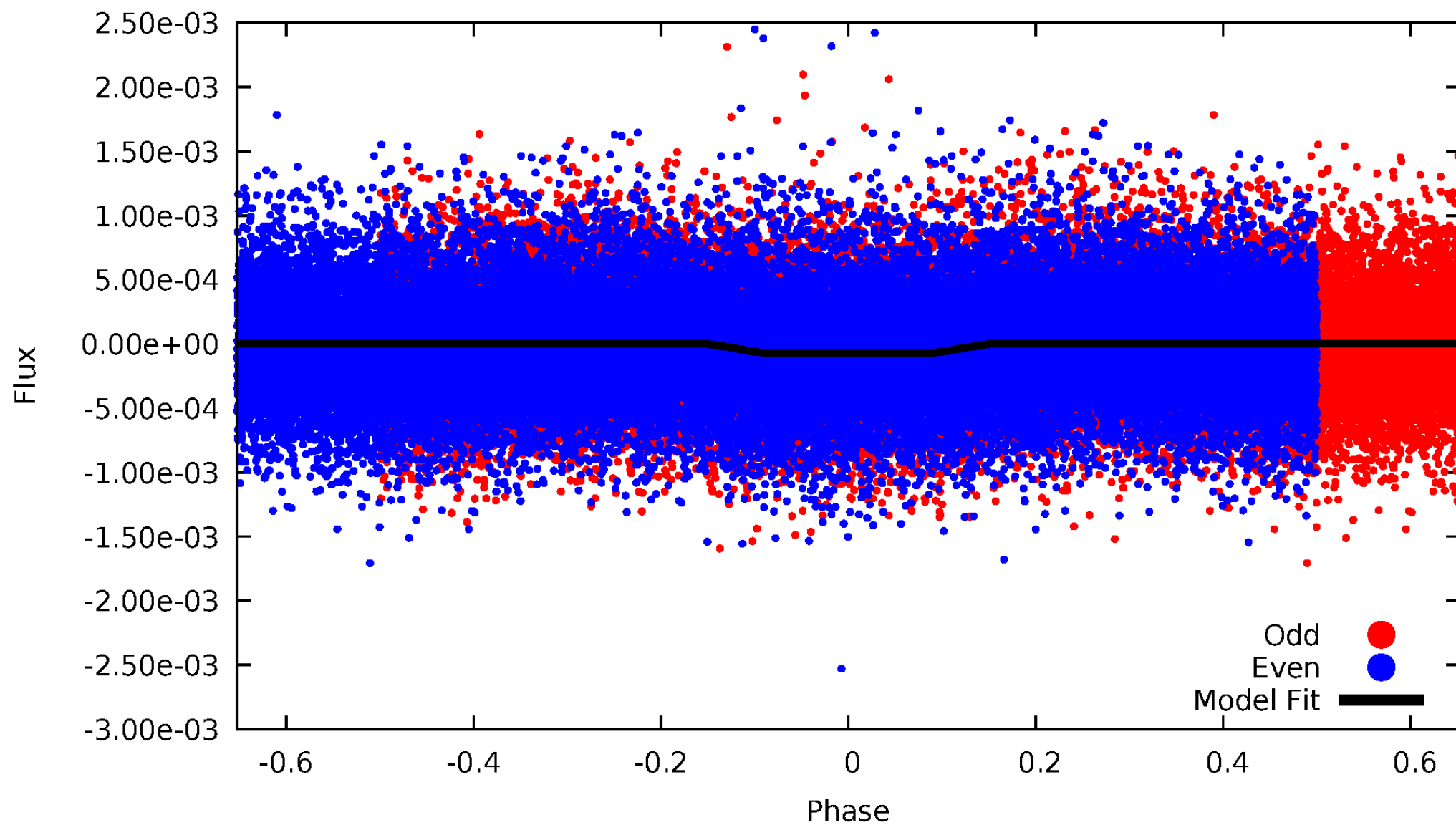
# DV Odd/Even

TCE 009305136-01

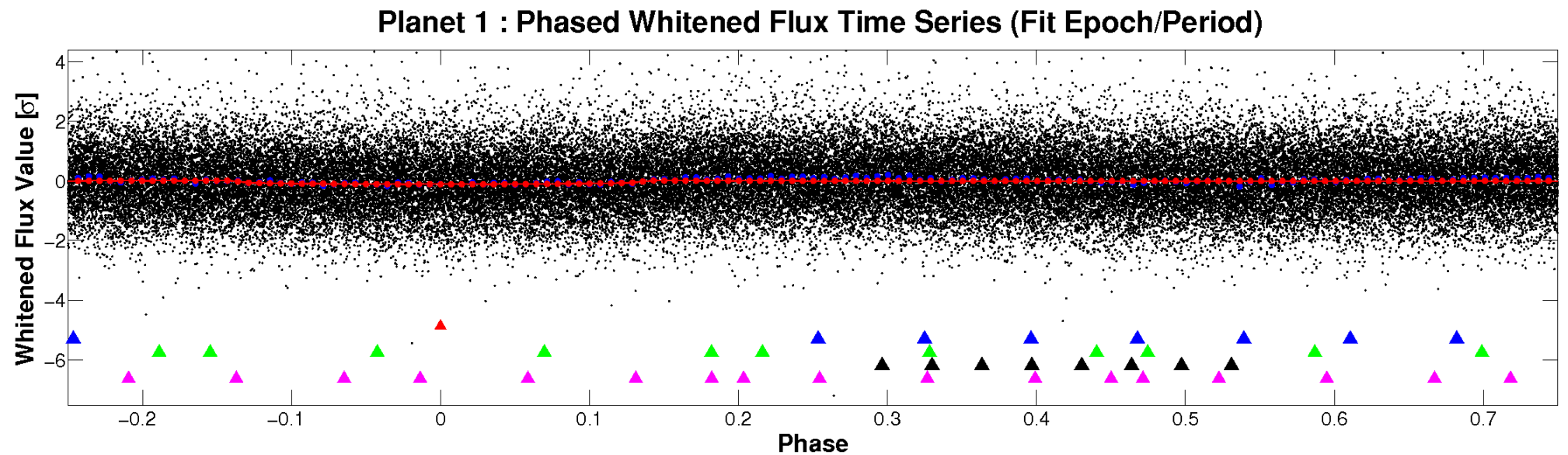
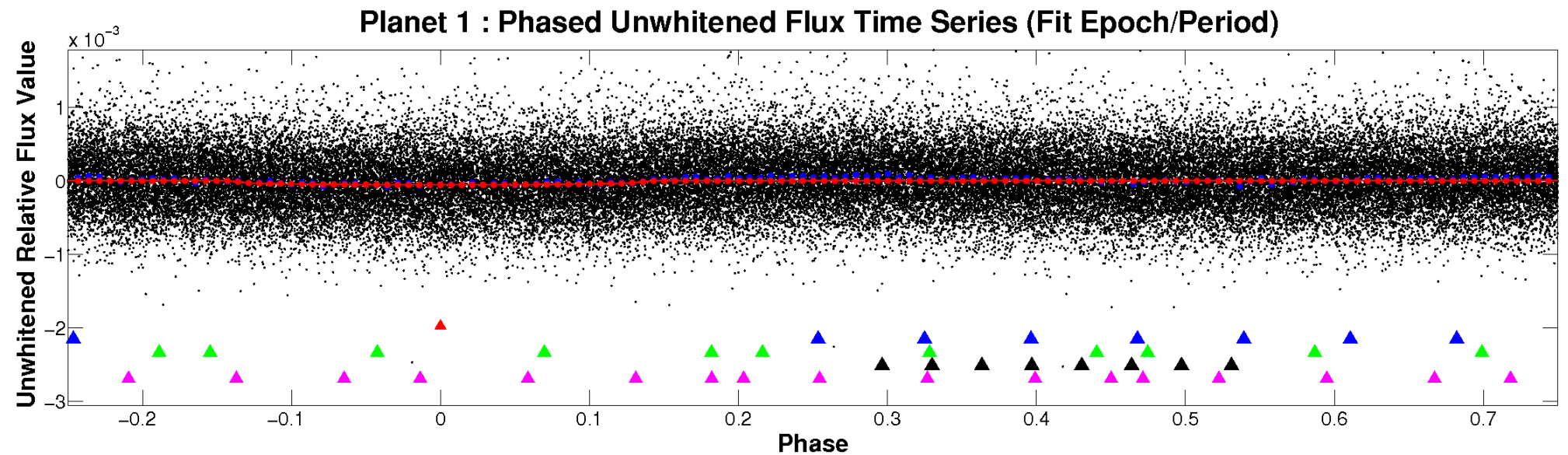


# ALT Odd/Even

TCE 009305136-01



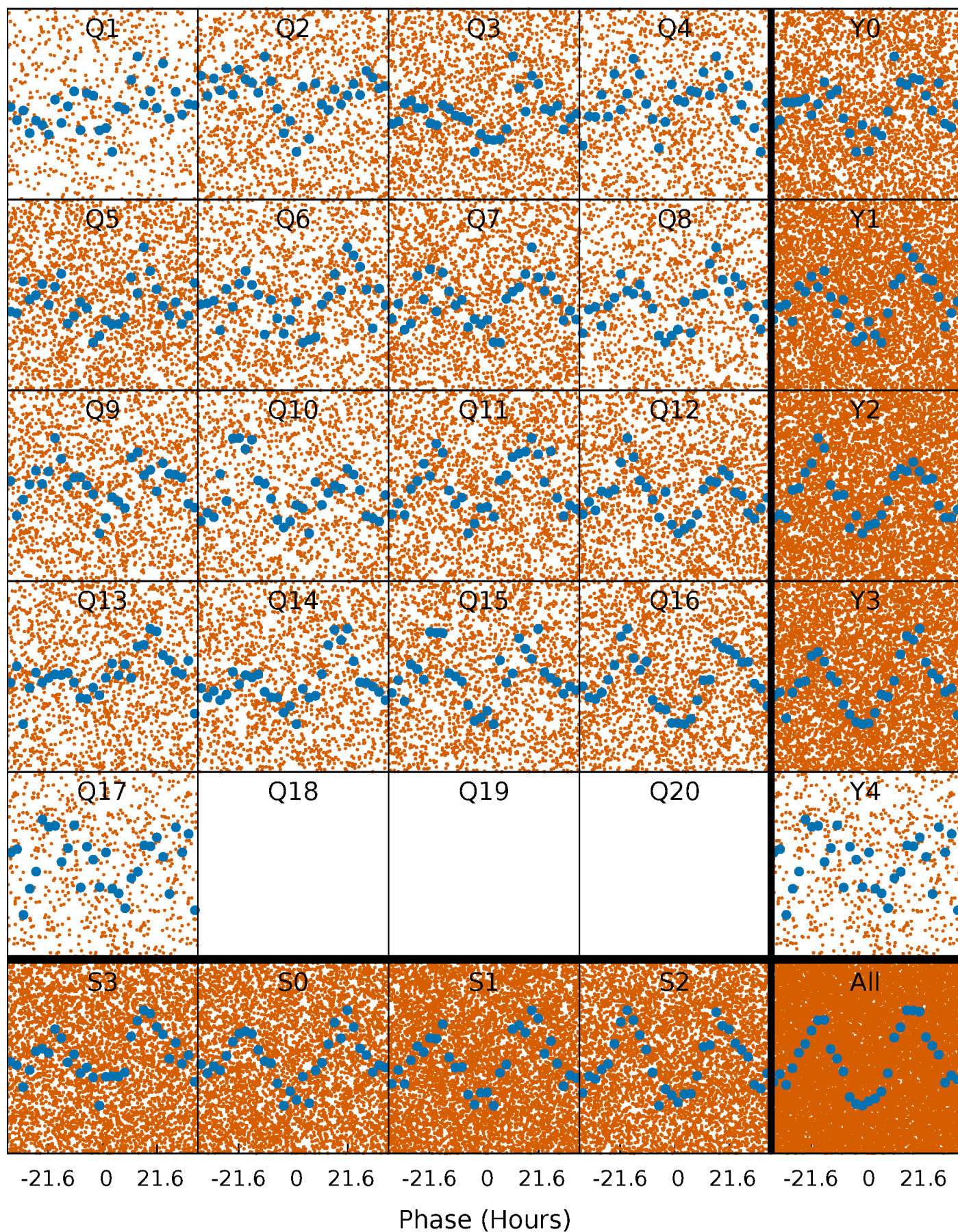
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

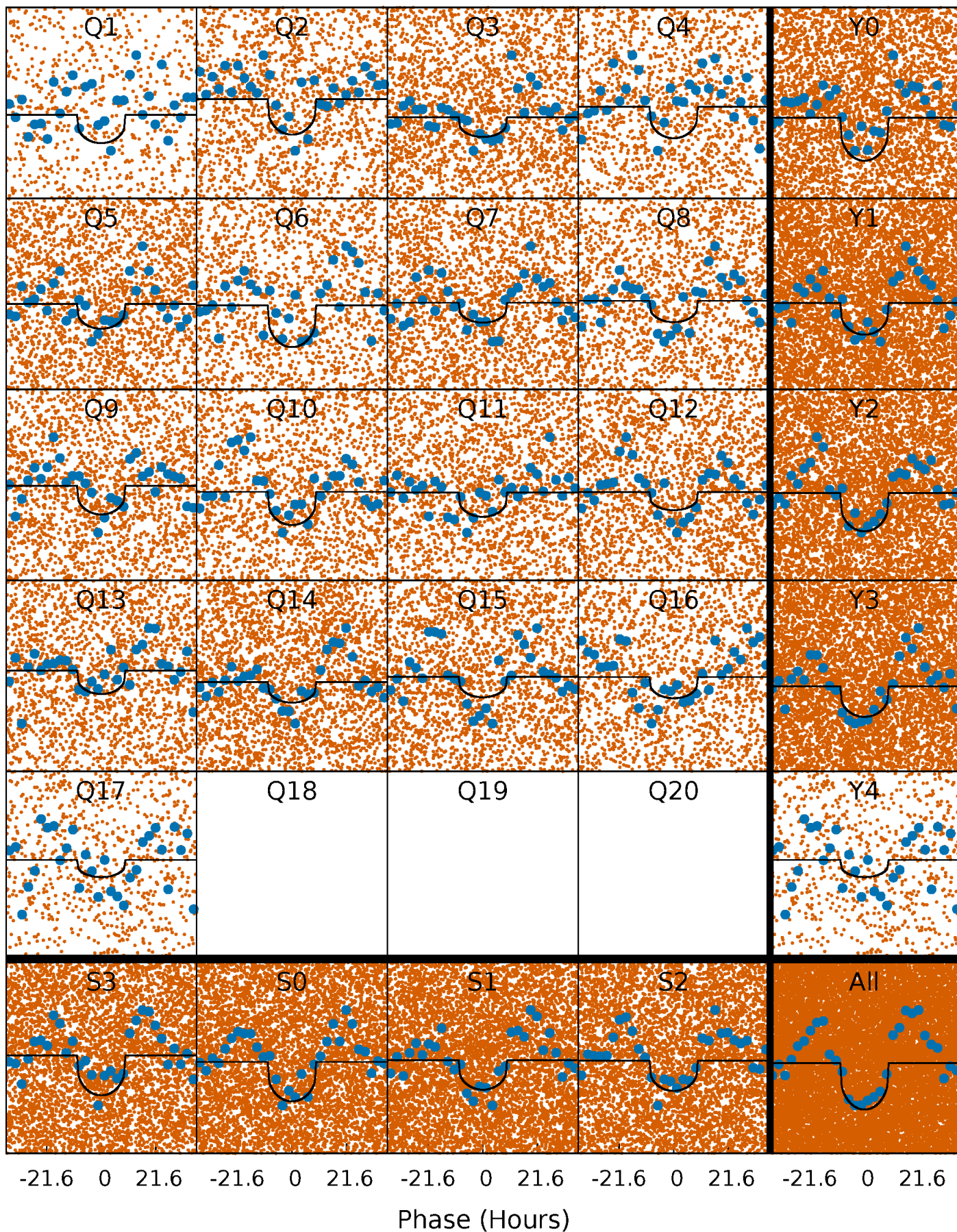
TCE 009305136-01 P= 2.856561 Days  $T_0=133.084044$  (BKJD)





# DV Quarter-Phased Transit Curves

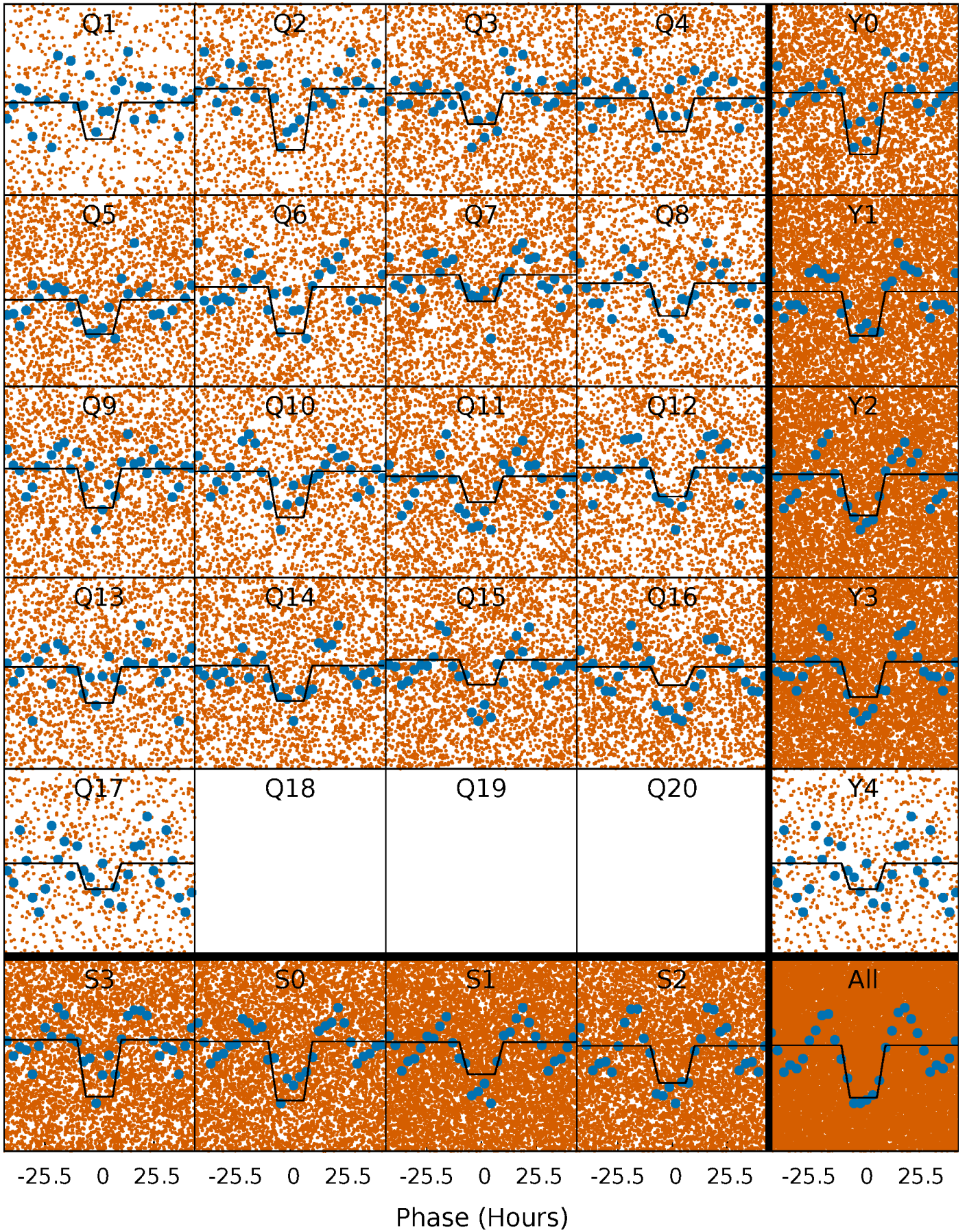
TCE 009305136-01 P= 2.856561 Days  $T_0=133.084044$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009305136-01   P= 2.856406 Days    $T_0=133.120769$  (BKJD)

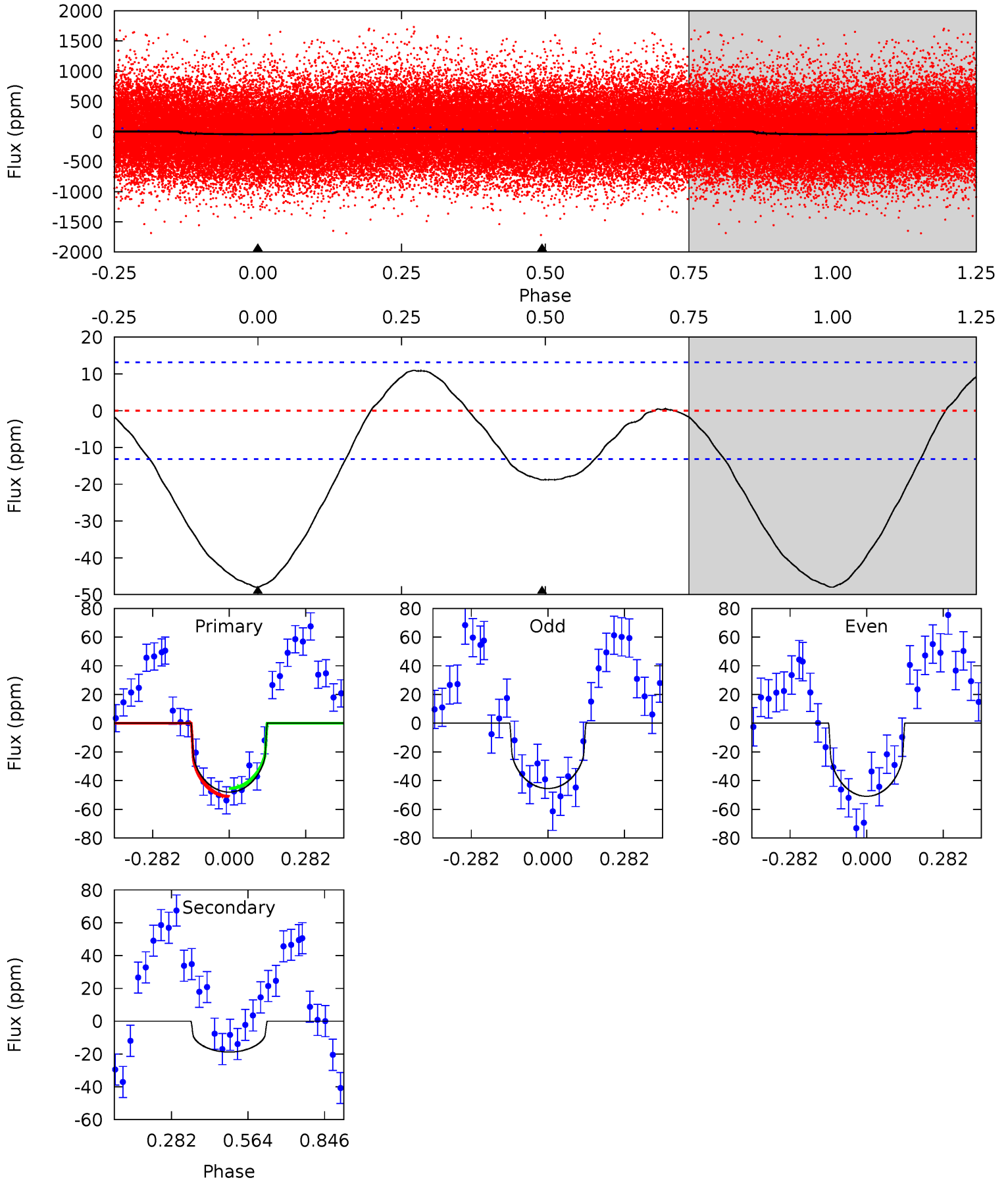




# DV Model-Shift Uniqueness Test

009305136-01, P = 2.856561 Days, E = 130.227483 Days

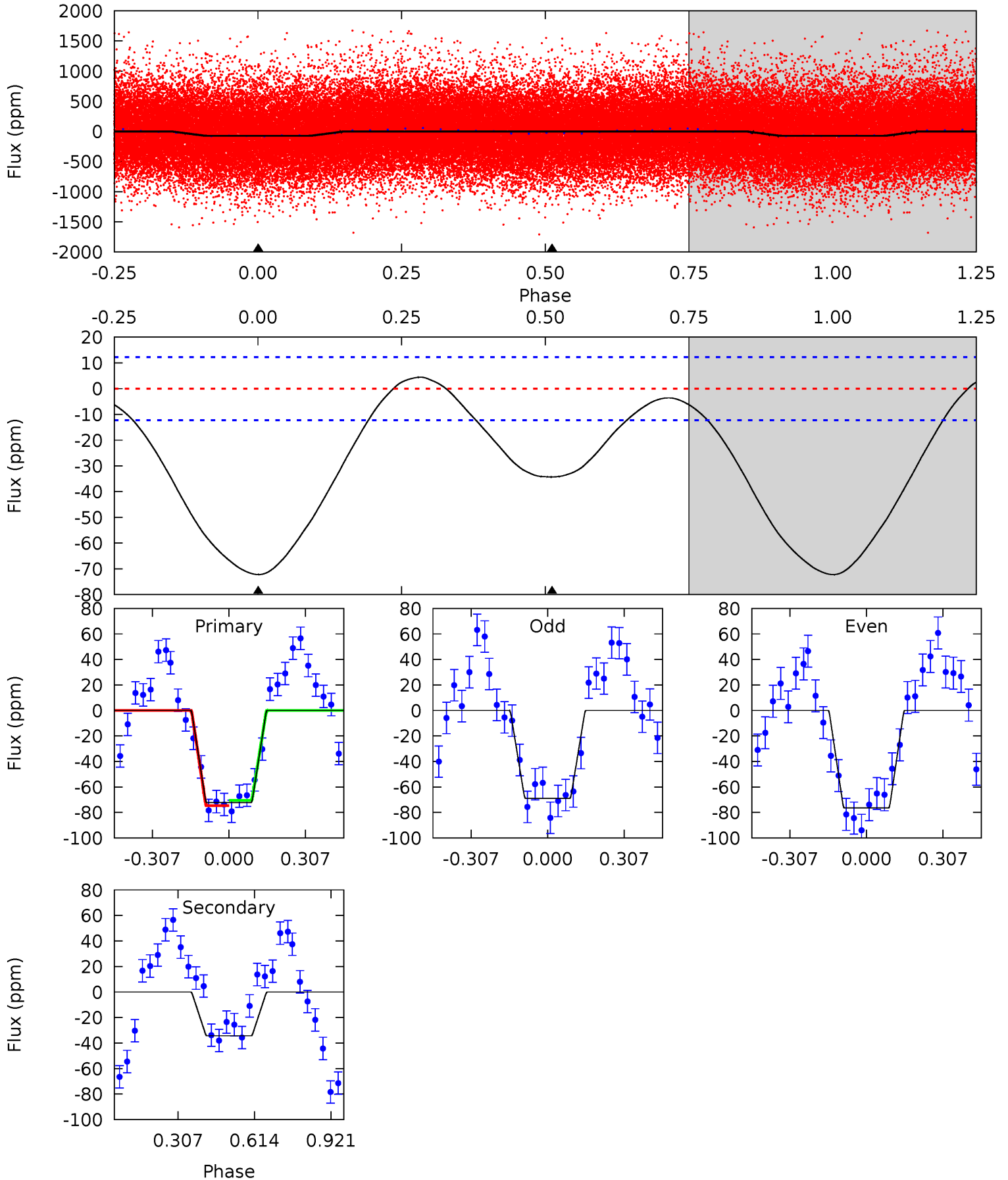
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	6.22	0	0	4.34	1.08	1.84	15.8	15.8	6.22	6.22	0.89	1.10	0.19	0.92



# Alt Model-Shift Uniqueness Test

009305136-01, P = 2.856406 Days, E = 130.264363 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
25.4	12.1	0	0	4.32	1.02	1.81	25.4	25.4	12.1	12.1	1.32	1.11	0.06	0.73



### Stellar Parameters For KIC 009305136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5017^{+166}_{-166}$	$4.652^{+0.030}_{-0.070}$	$-0.380^{+0.300}_{-0.300}$	$0.668^{+0.086}_{-0.050}$	$0.739^{+0.071}_{-0.078}$	$3.493^{+0.490}_{-0.866}$
	+3%/-3%	+1%/-2%	+79%/-79%	+13%/-7%	+10%/-11%	+14%/-25%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009305136-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-19 \pm 3$	$0.54^{+0.41}_{-0.31}$	$1350^{+57}_{-52}$	$4078^{+1806}_{-714}$	$43^{+209}_{-29}$
Alt.	$-34 \pm 3$	$0.63^{+0.36}_{-0.35}$	$1355^{+55}_{-51}$	$4317^{+1724}_{-663}$	$58^{+221}_{-35}$

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



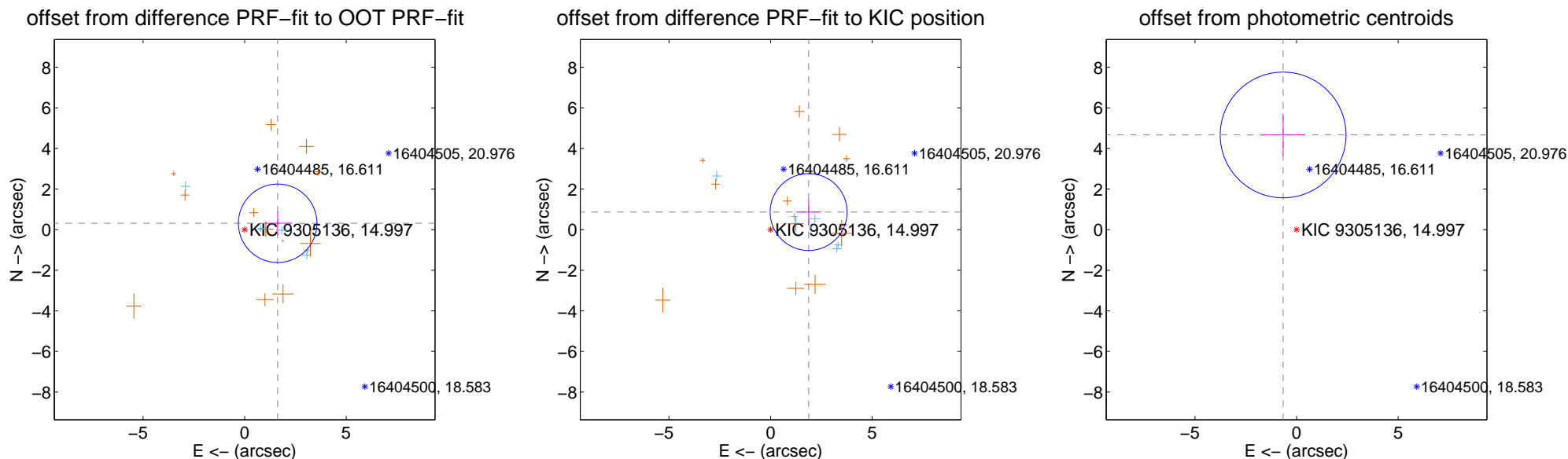
## DV Centroid Data

Supplemental centroid analysis for 009305136-01. Kepler magnitude: 15.00. Transit SNR 12.17

There are 6 quarters with good PRF difference image offsets

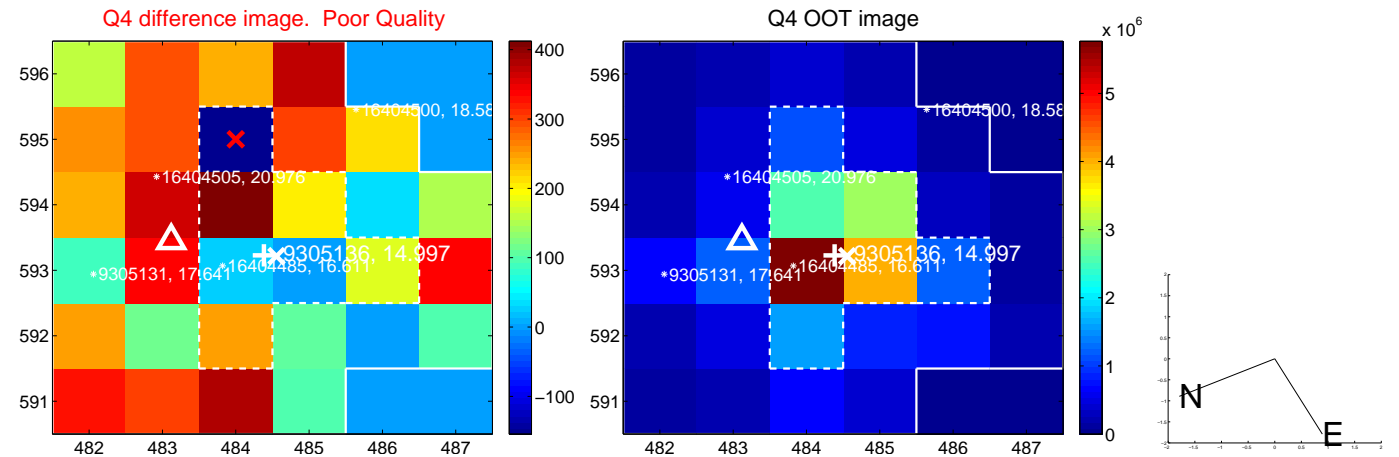
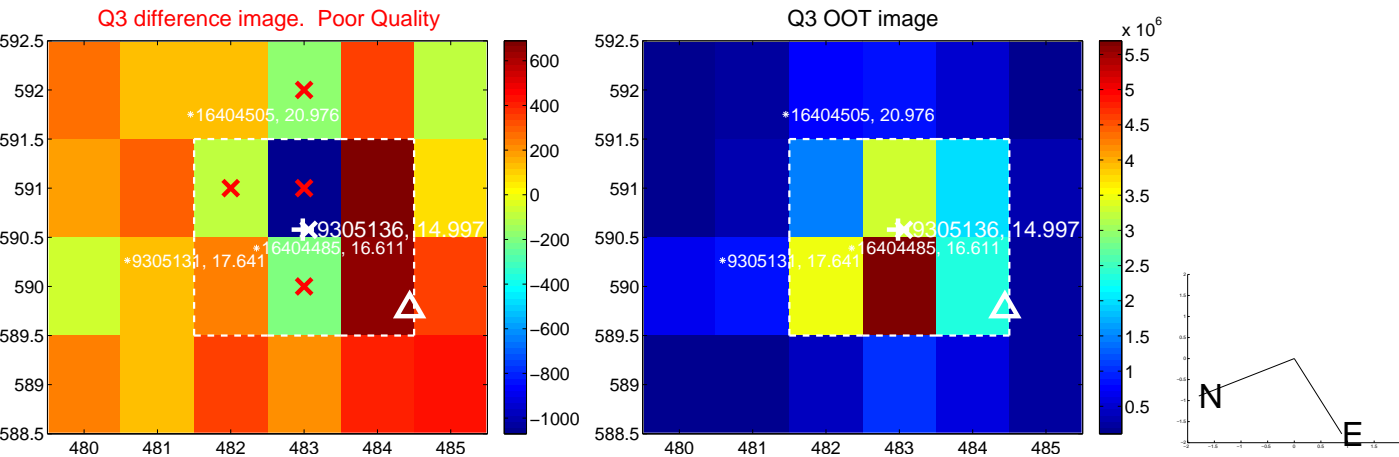
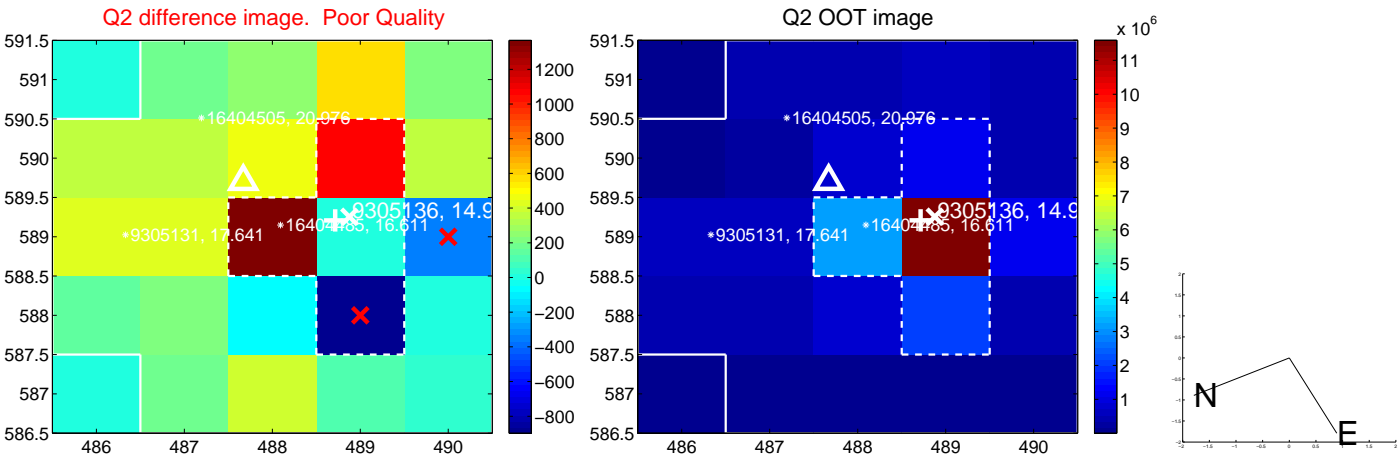
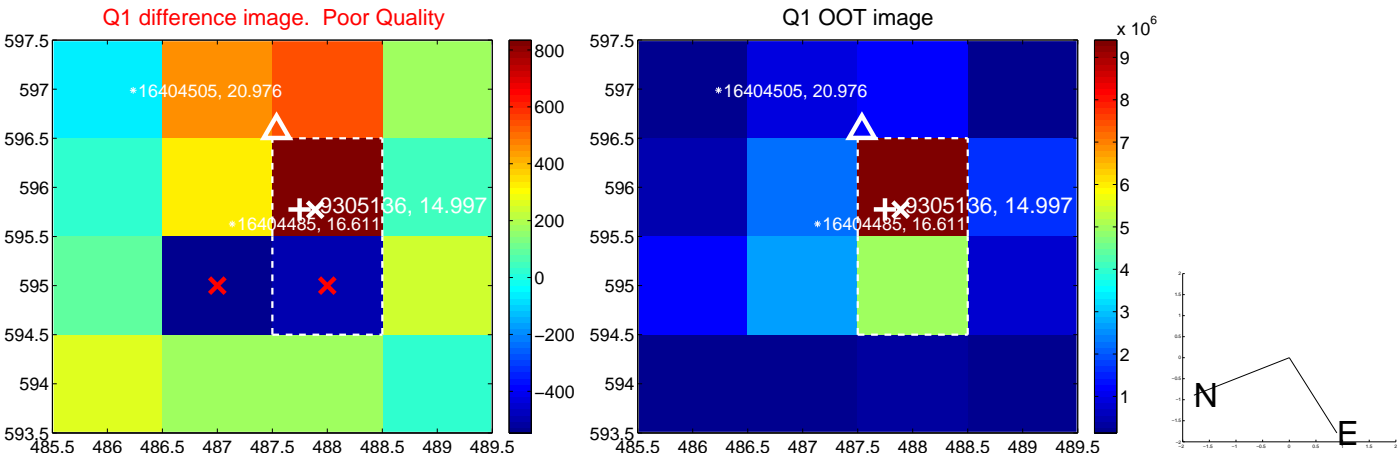
The direct PRF centroid is offset from the target star catalog position by about 0.57 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.656 \pm 0.644$	2.57	$-1.626 \pm 0.632$	$0.313 \pm 0.595$
PRF-fit source offset from KIC position	$2.063 \pm 0.632$	3.27	$-1.872 \pm 0.627$	$0.868 \pm 0.639$
photometric centroid source offset	$4.71 \pm 1.03$	4.57	$0.66 \pm 1.09$	$4.66 \pm 1.03$

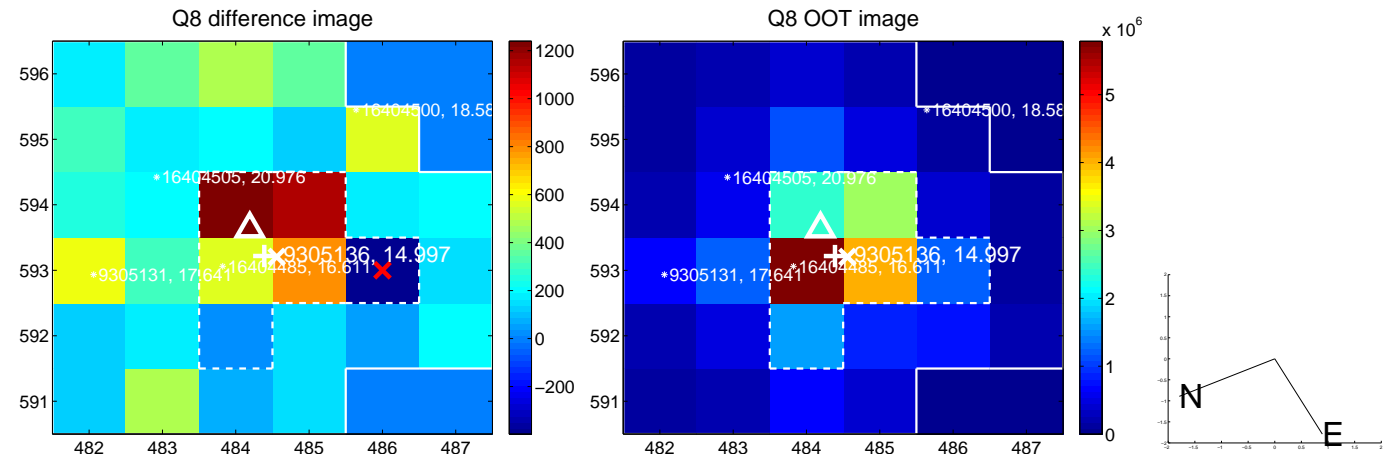
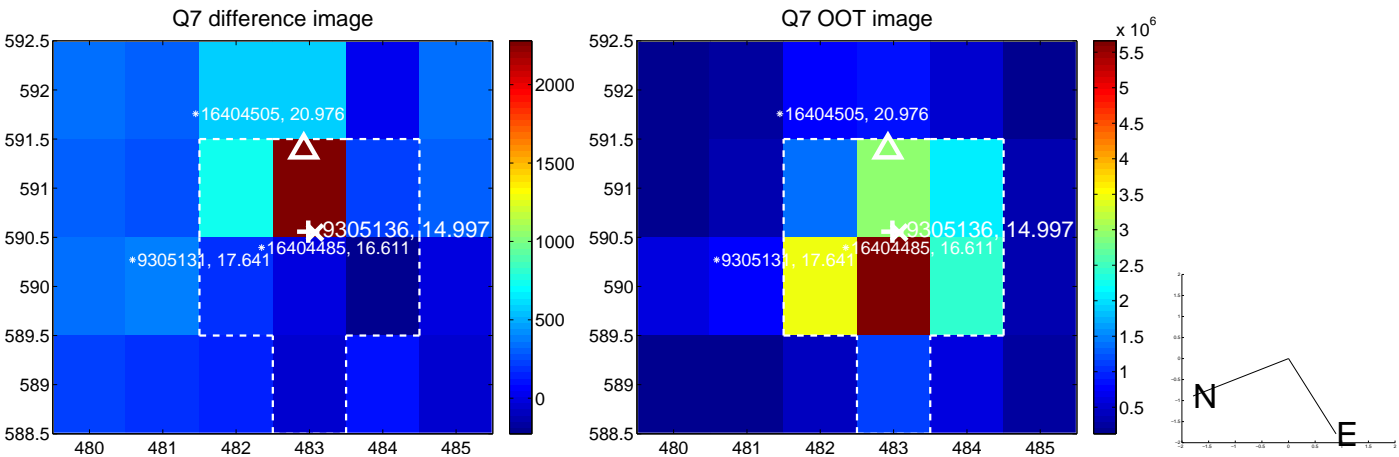
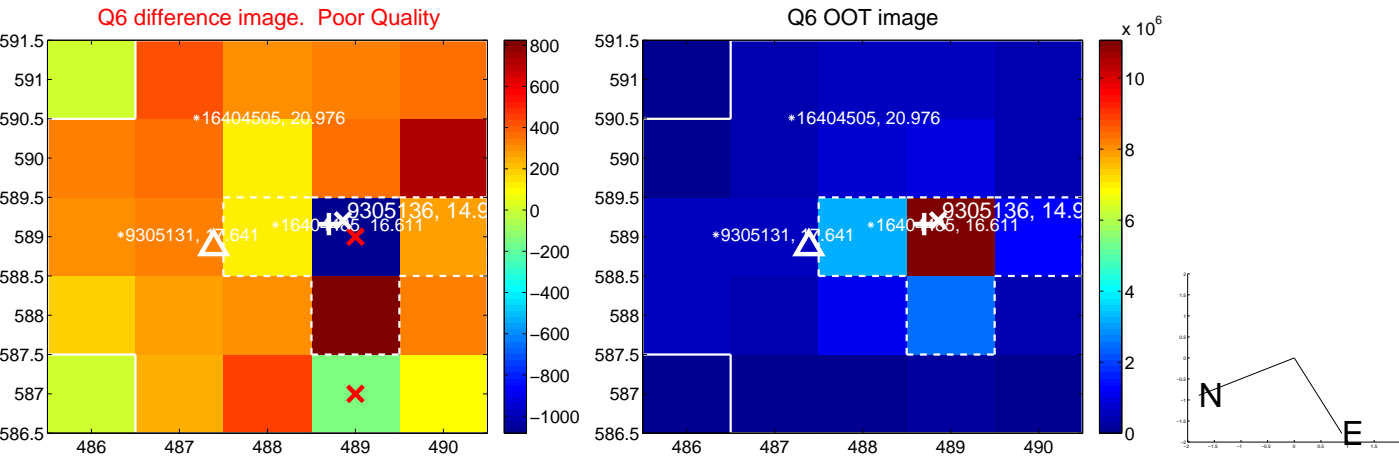
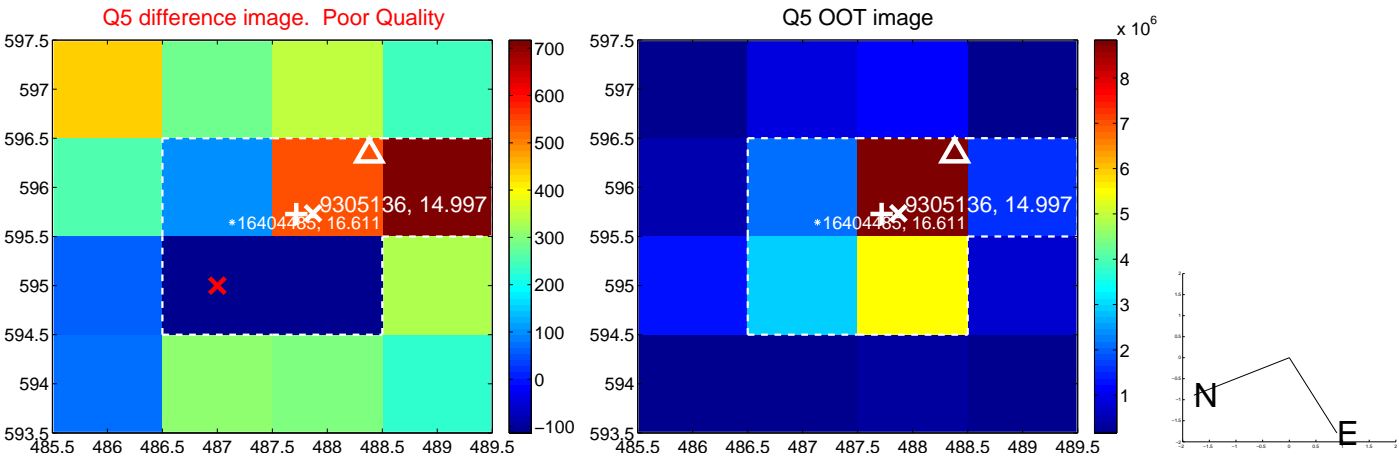


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

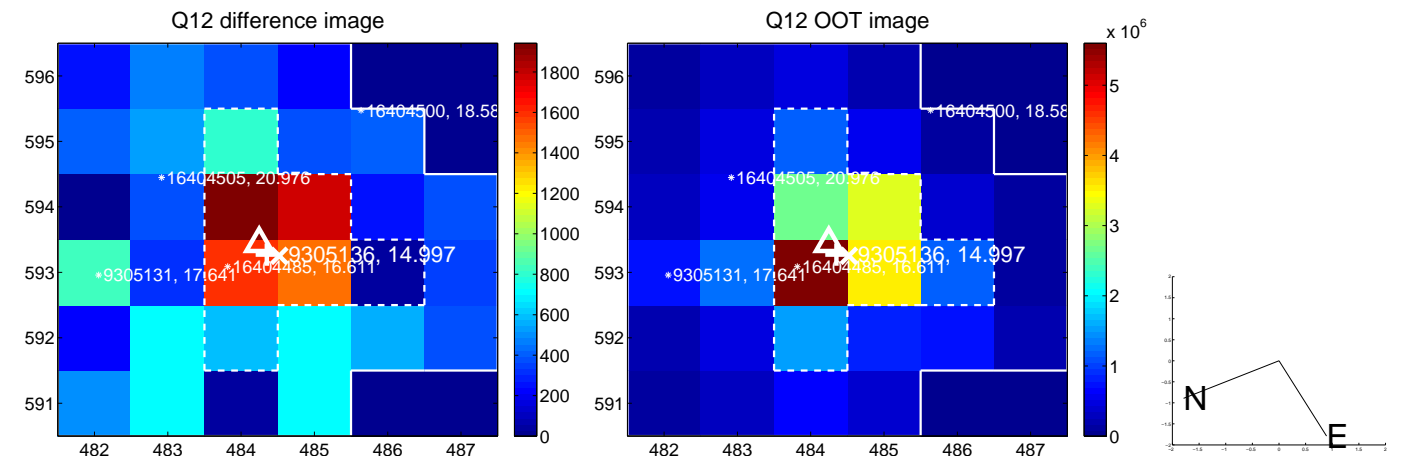
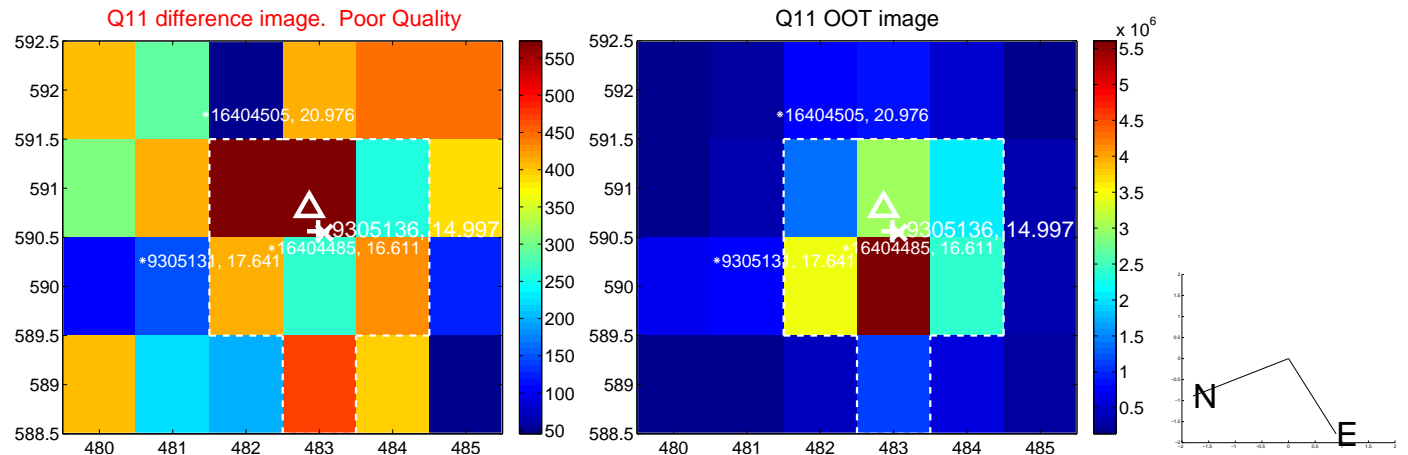
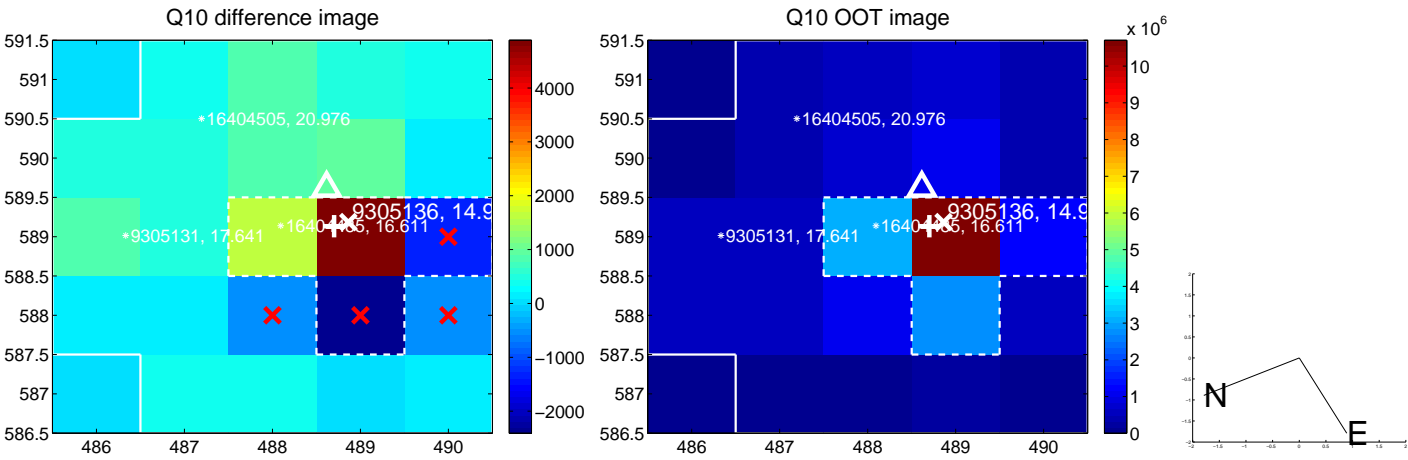
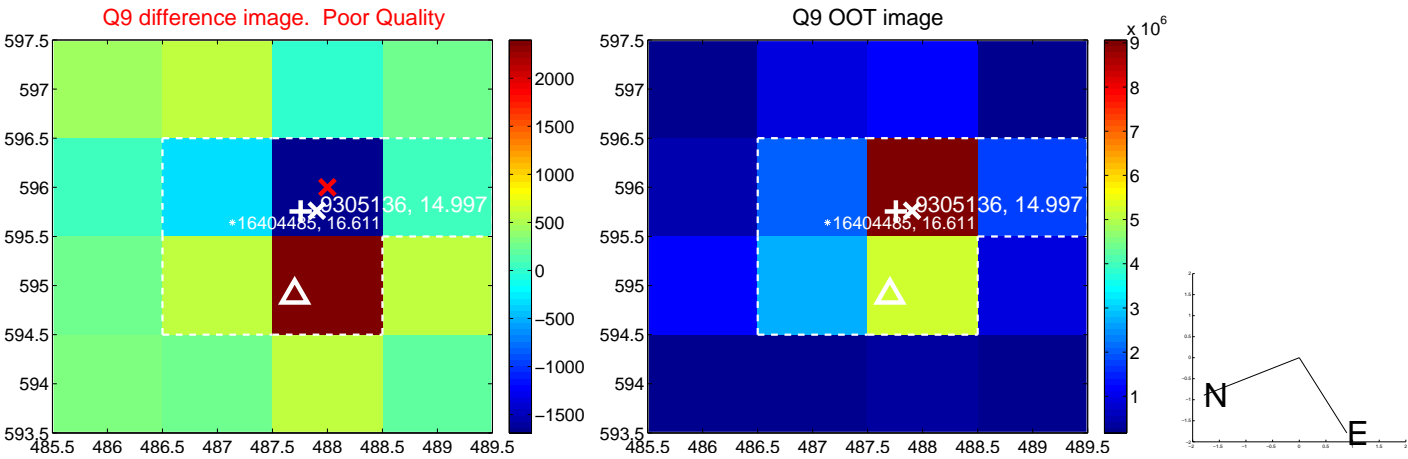


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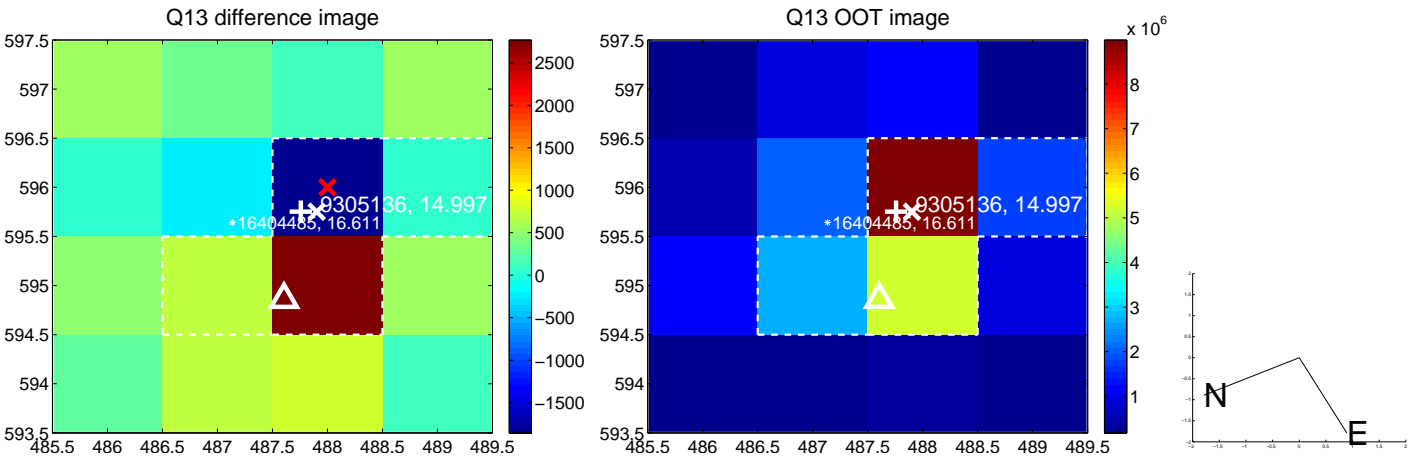




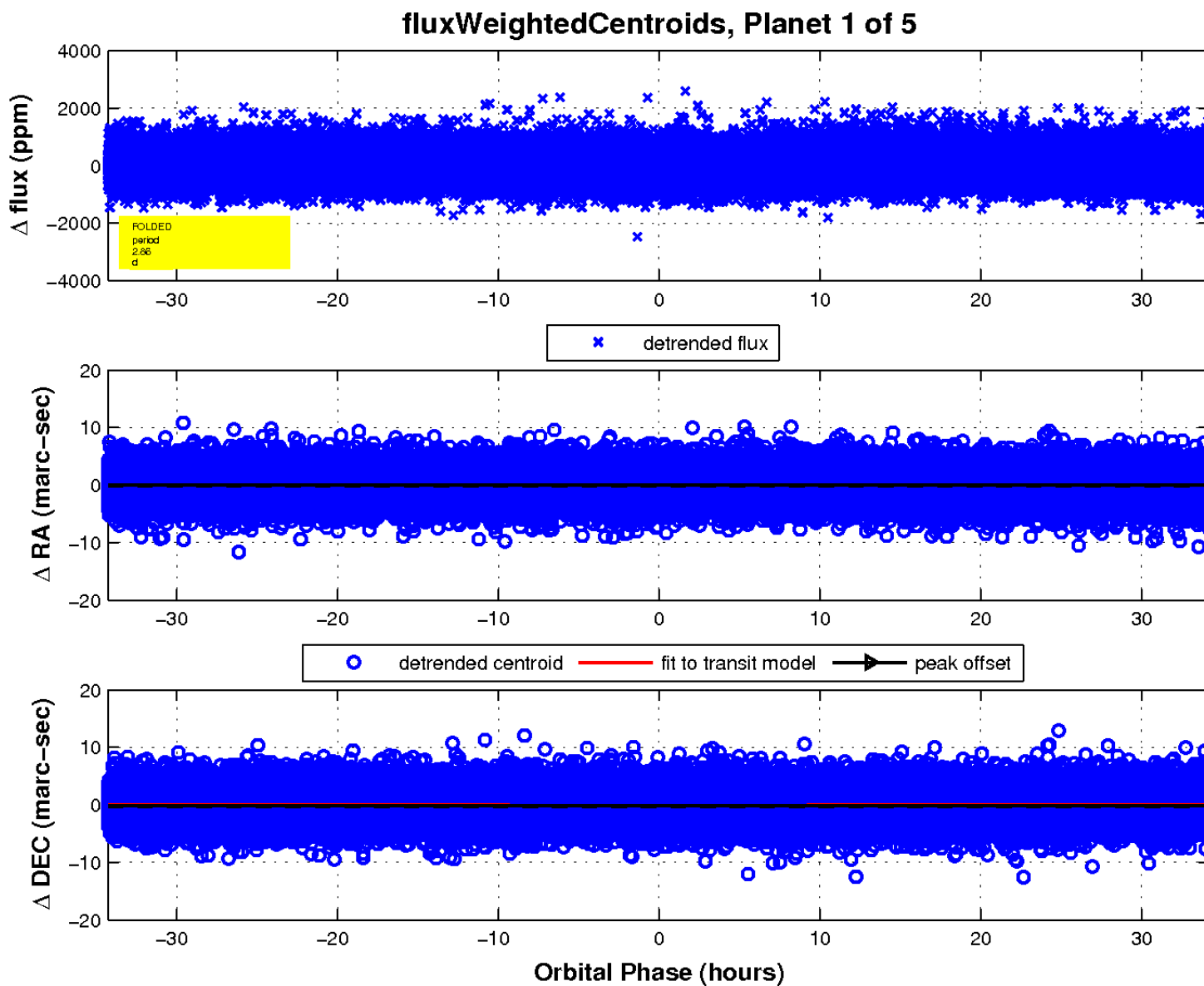
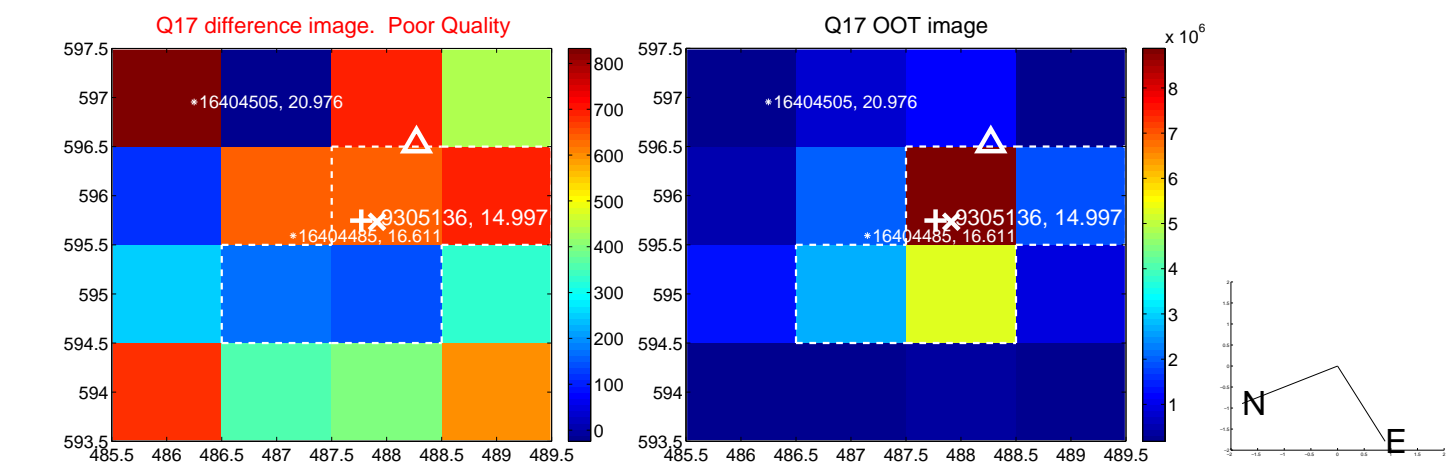
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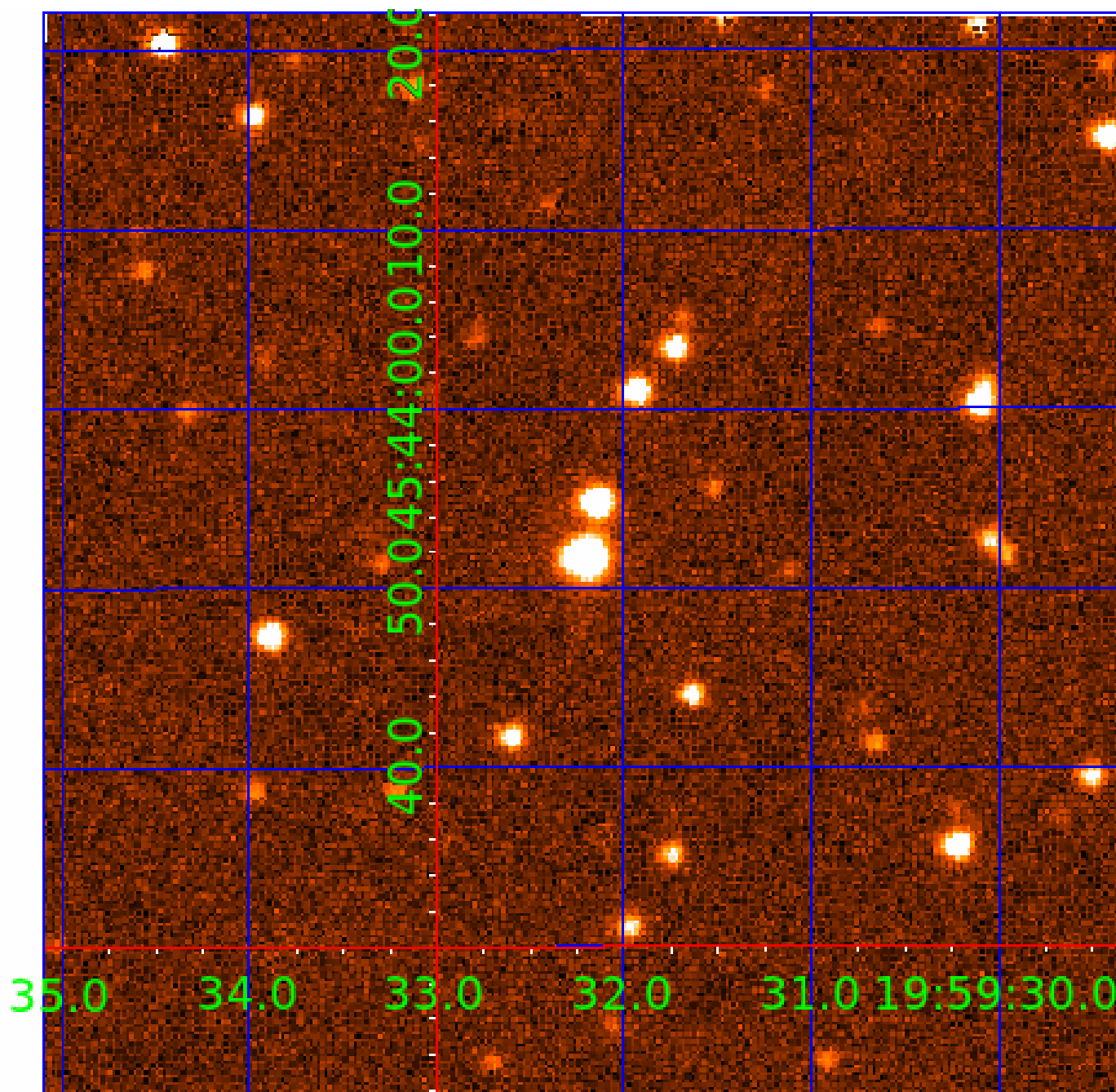


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009305136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009305136-01	OBS	No	2.856561	133.084044	54.2	18.894	9.6	12.2	0.67	5017	0.49	201.09
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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009305136-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009305136-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305136-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009305136-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

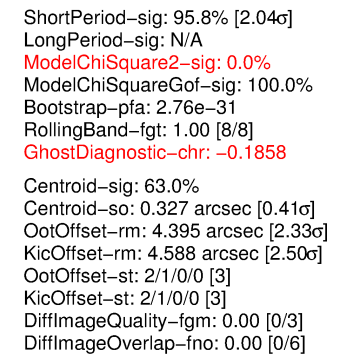
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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 009305136-02

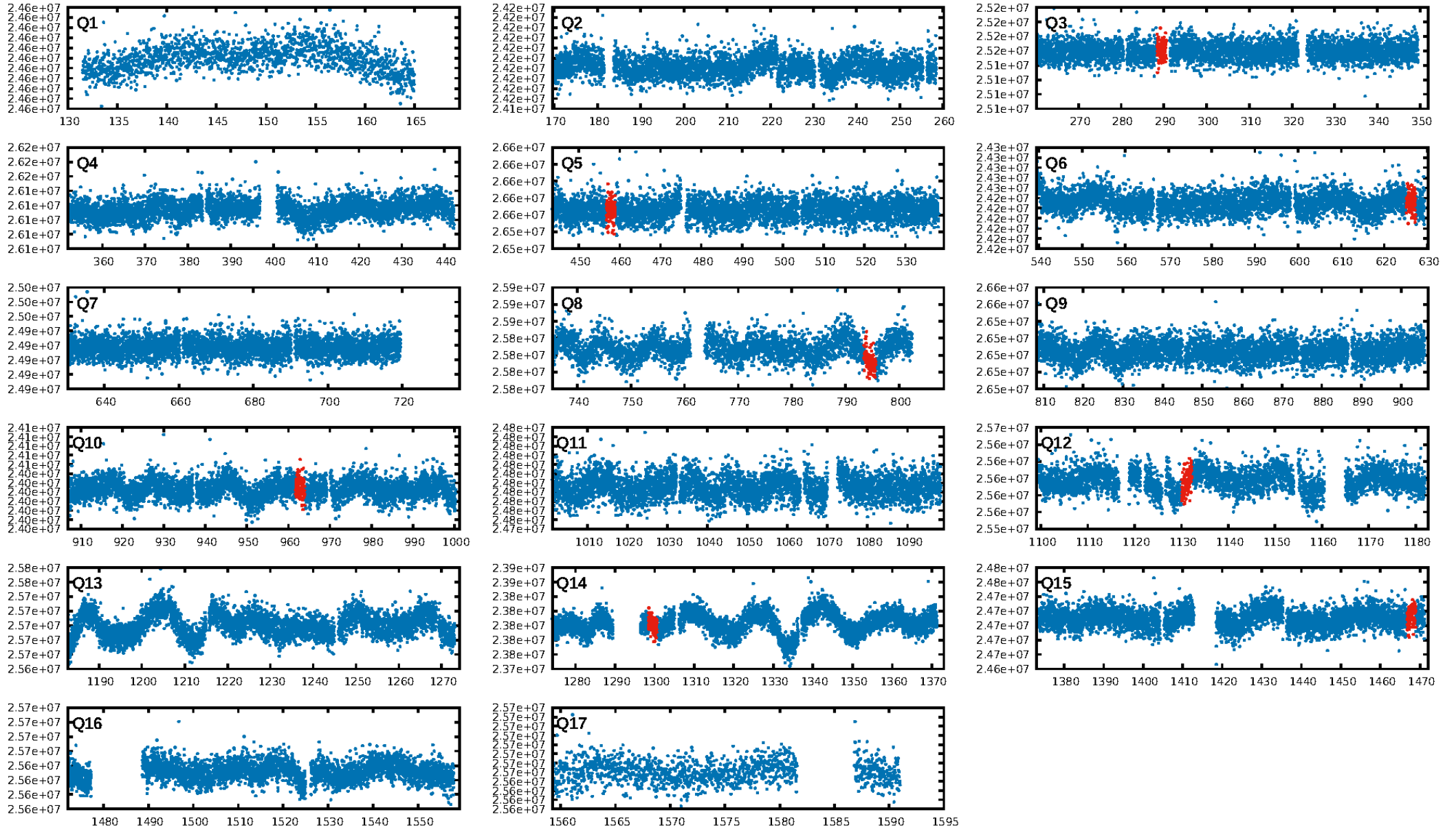
No Significant Match Found

KIC: 9305136    Candidate: 2 of 5    Period: 168.333 d

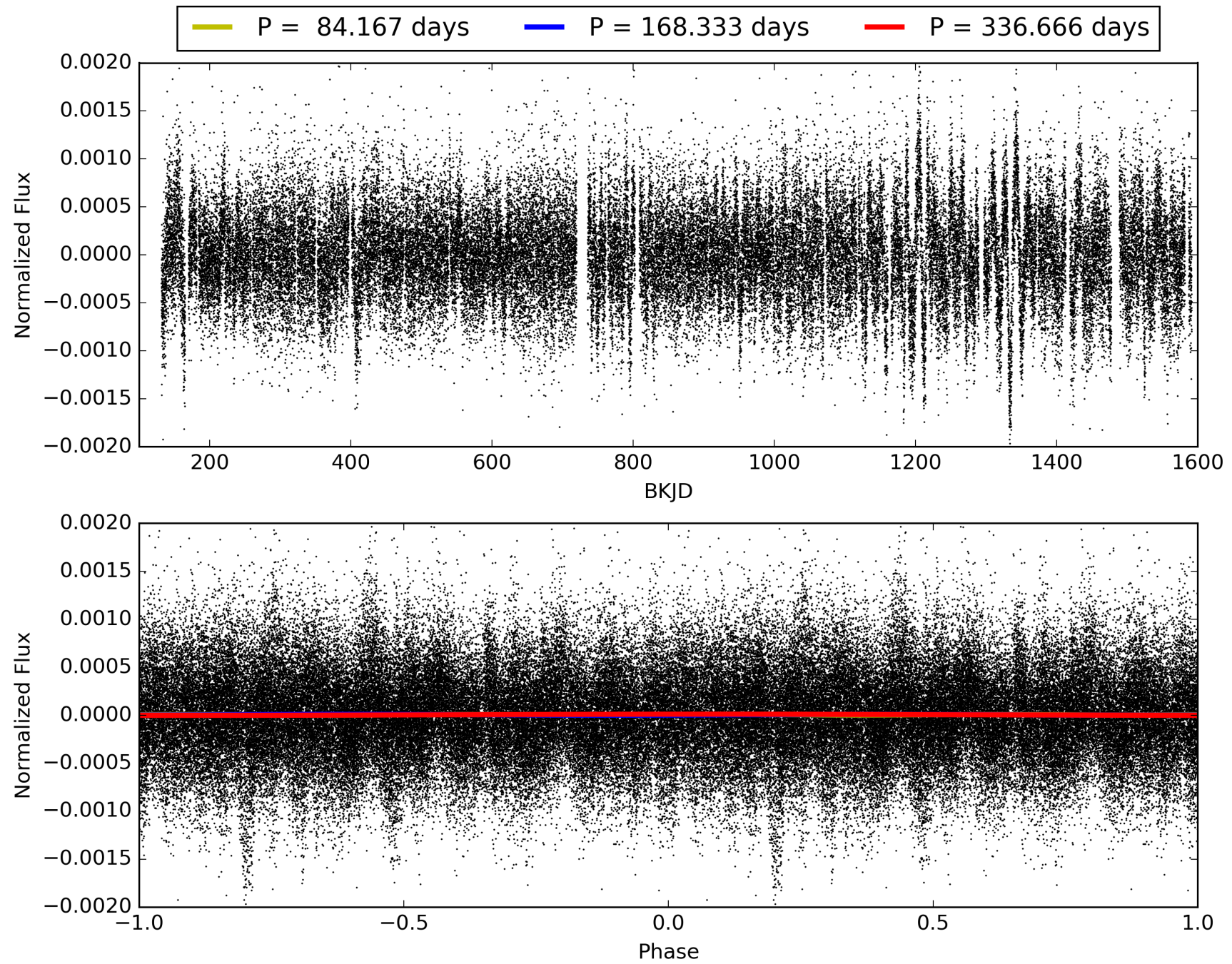




# TCE 009305136-02, PDC Light Curves

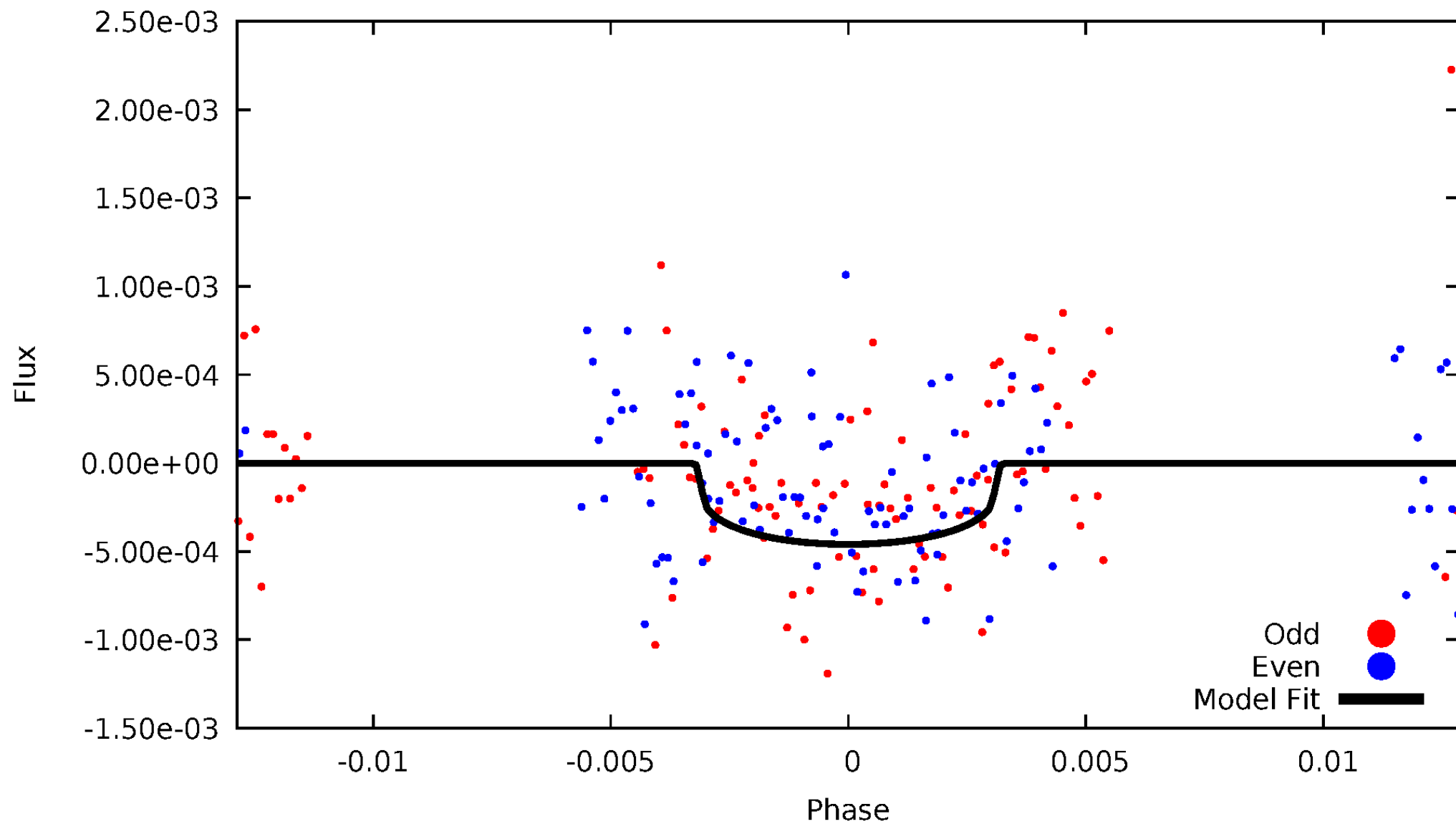


TCE 009305136-02



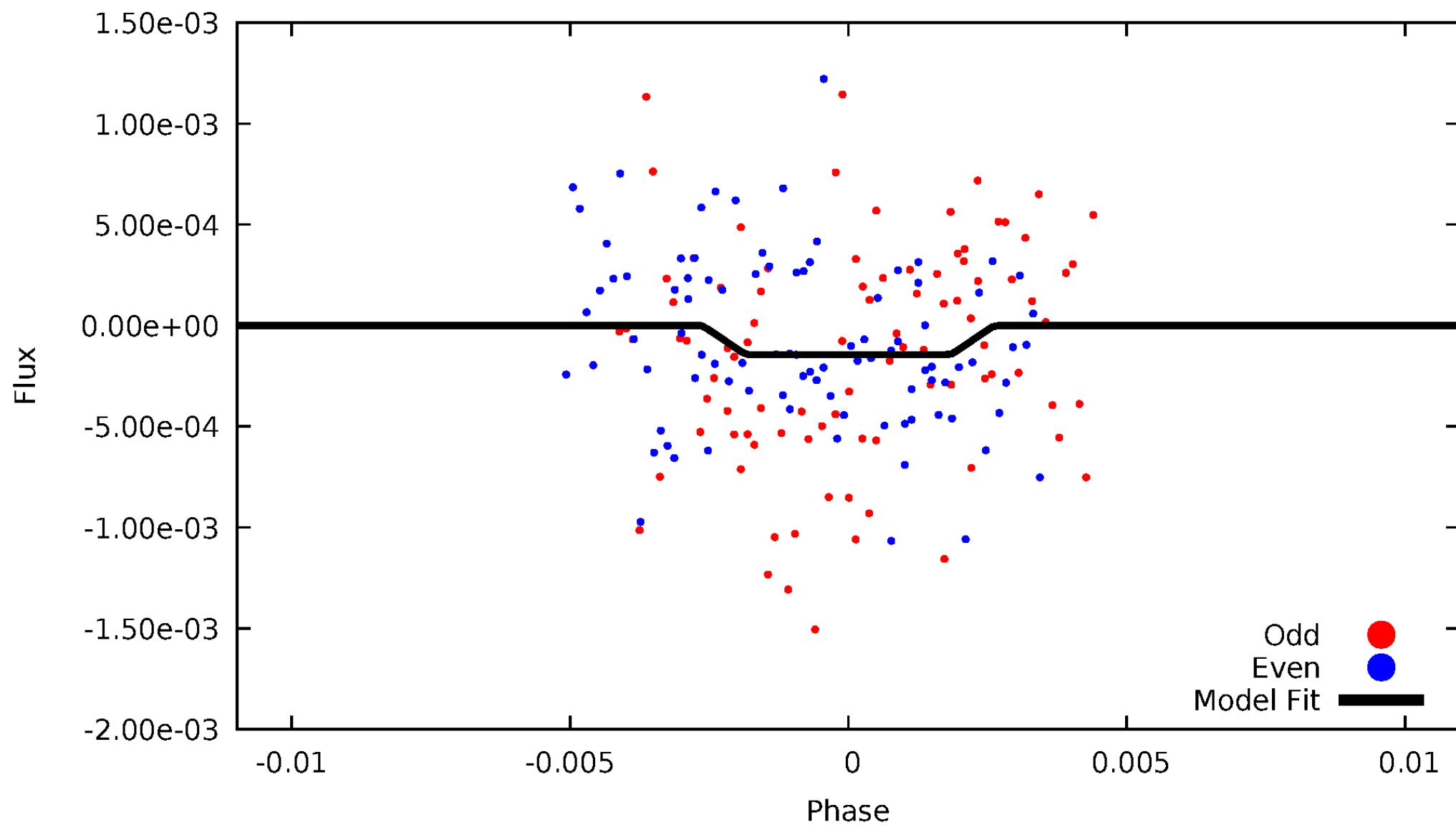
# DV Odd/Even

TCE 009305136-02



# ALT Odd/Even

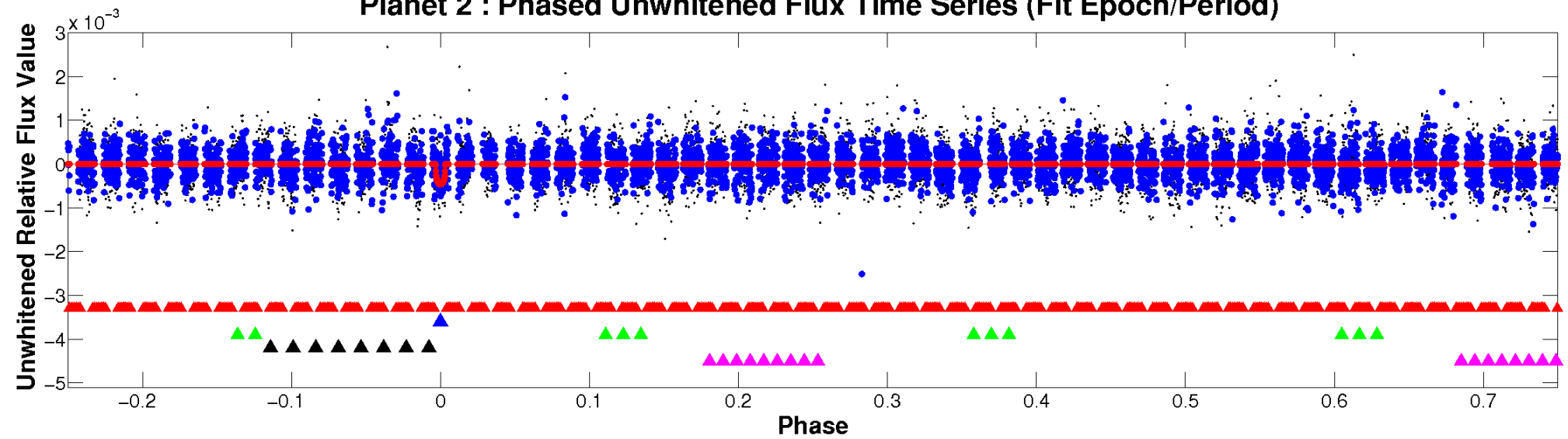
TCE 009305136-02



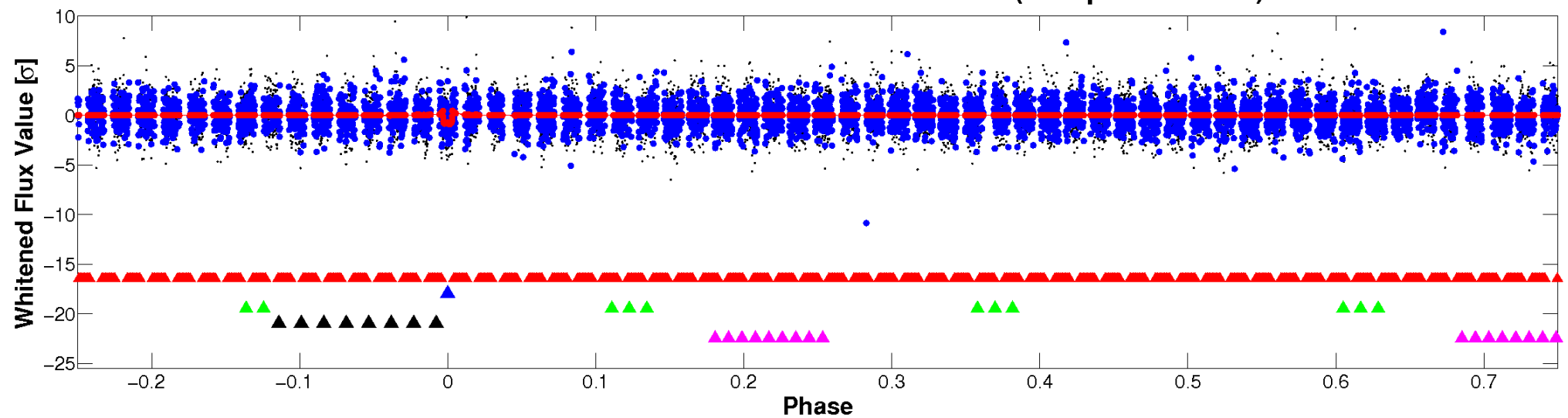


# Non-Whitened Vs. Whitened Light Curve

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

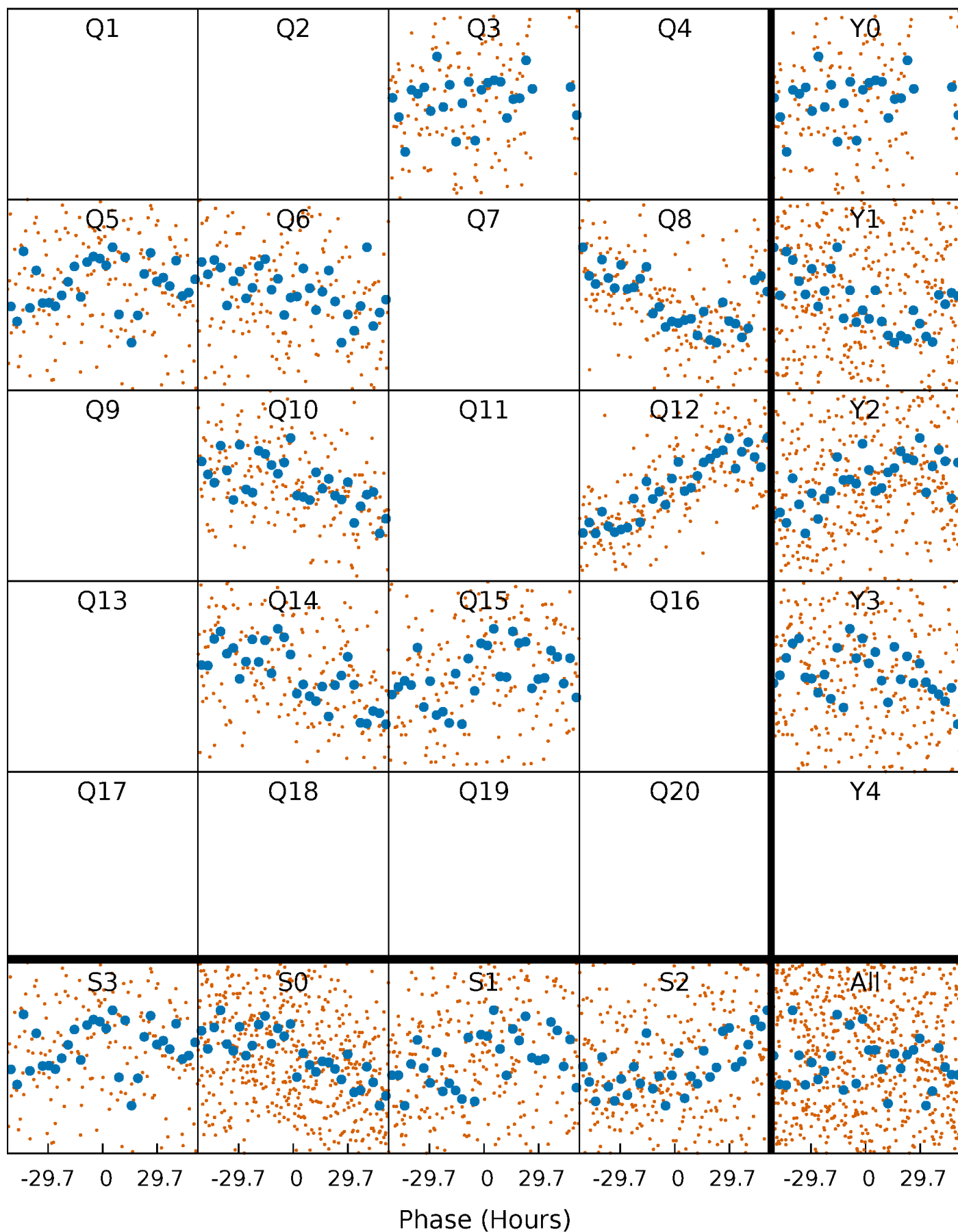


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



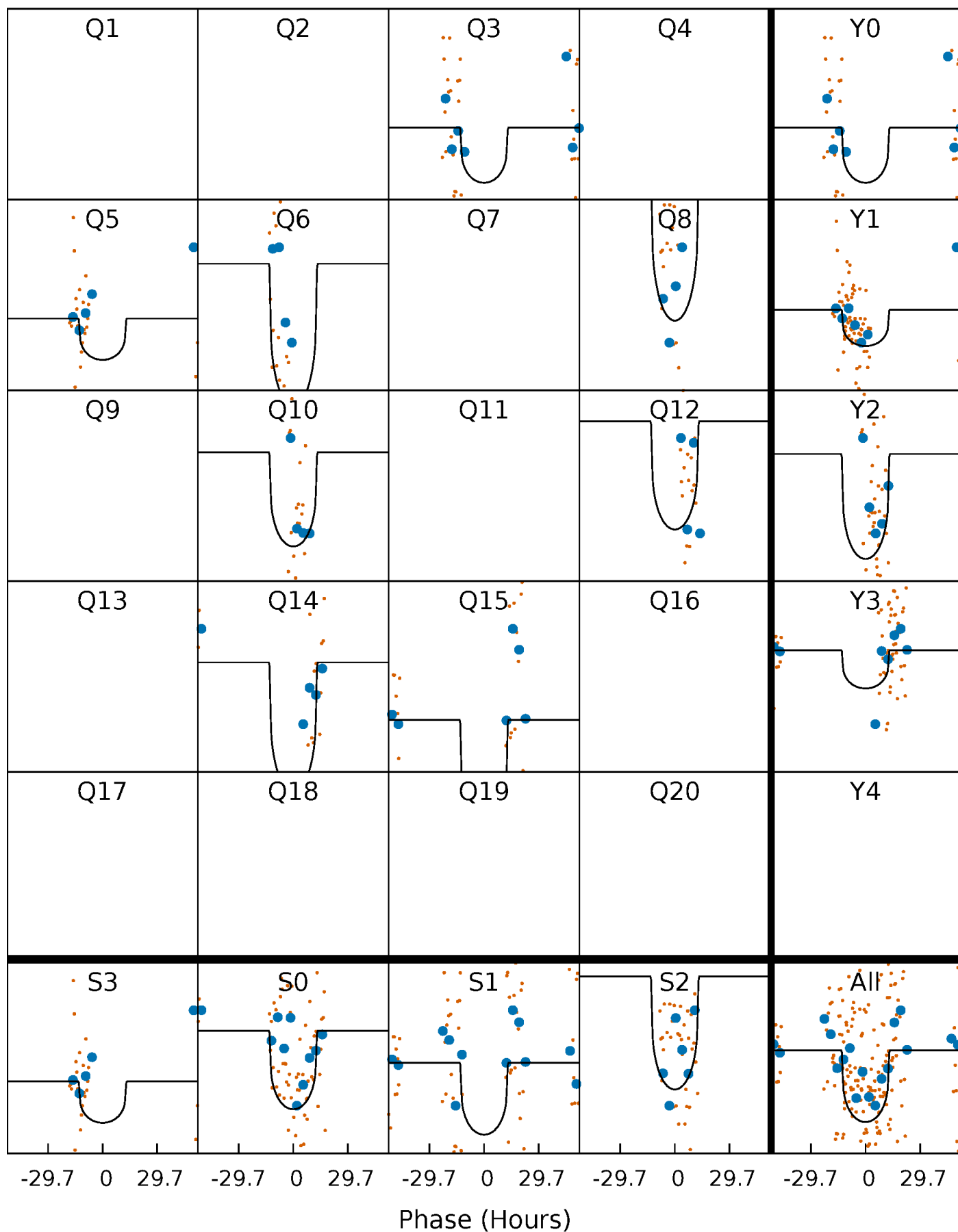
# PDC Quarter-Phased Transit Curves

TCE 009305136-02 P=168.333018 Days  $T_0=289.490966$  (BKJD)



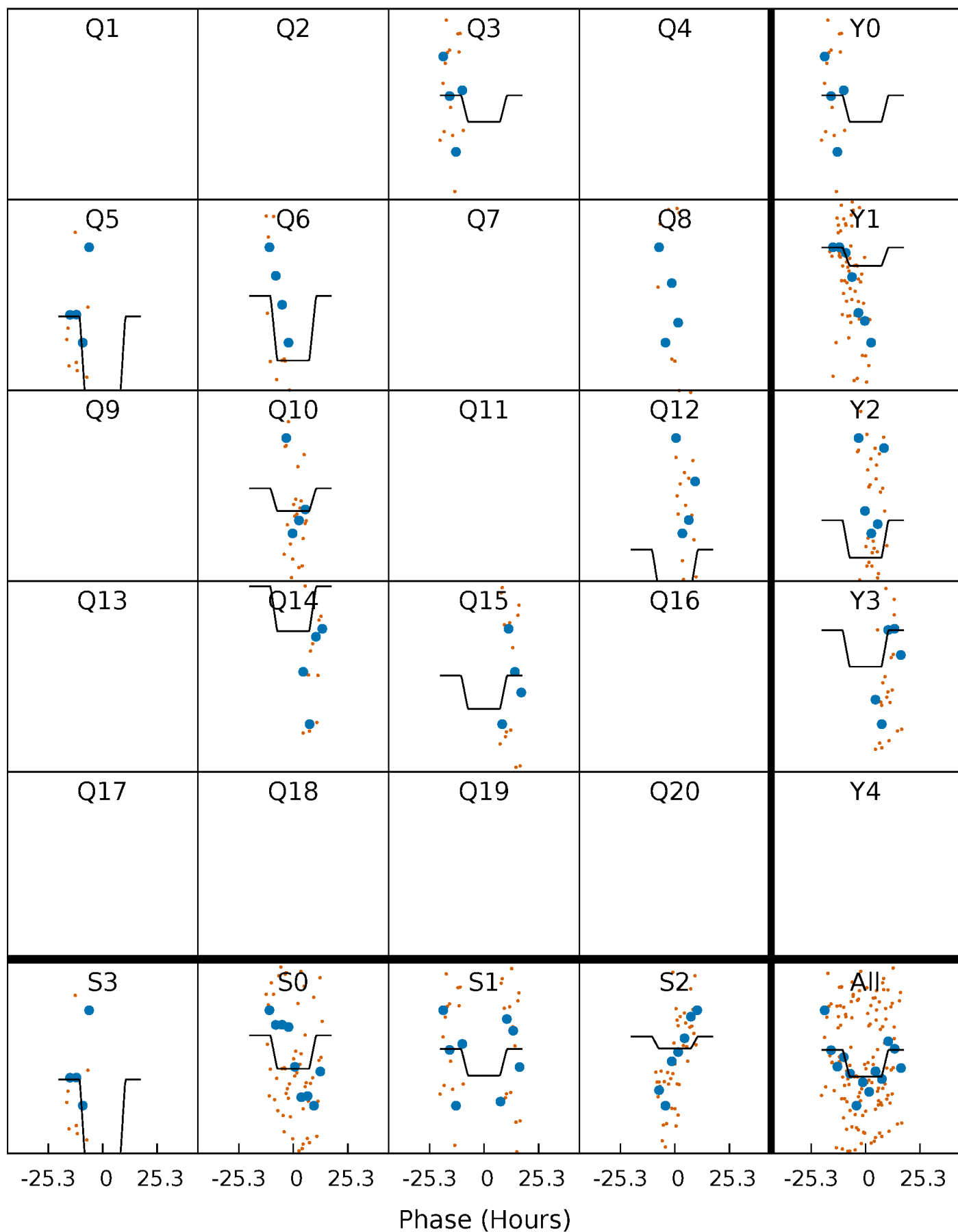
# DV Quarter-Phased Transit Curves

TCE 009305136-02   P=168.333018 Days    $T_0=289.490966$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009305136-02 P=168.372534 Days  $T_0=289.398690$  (BKJD)

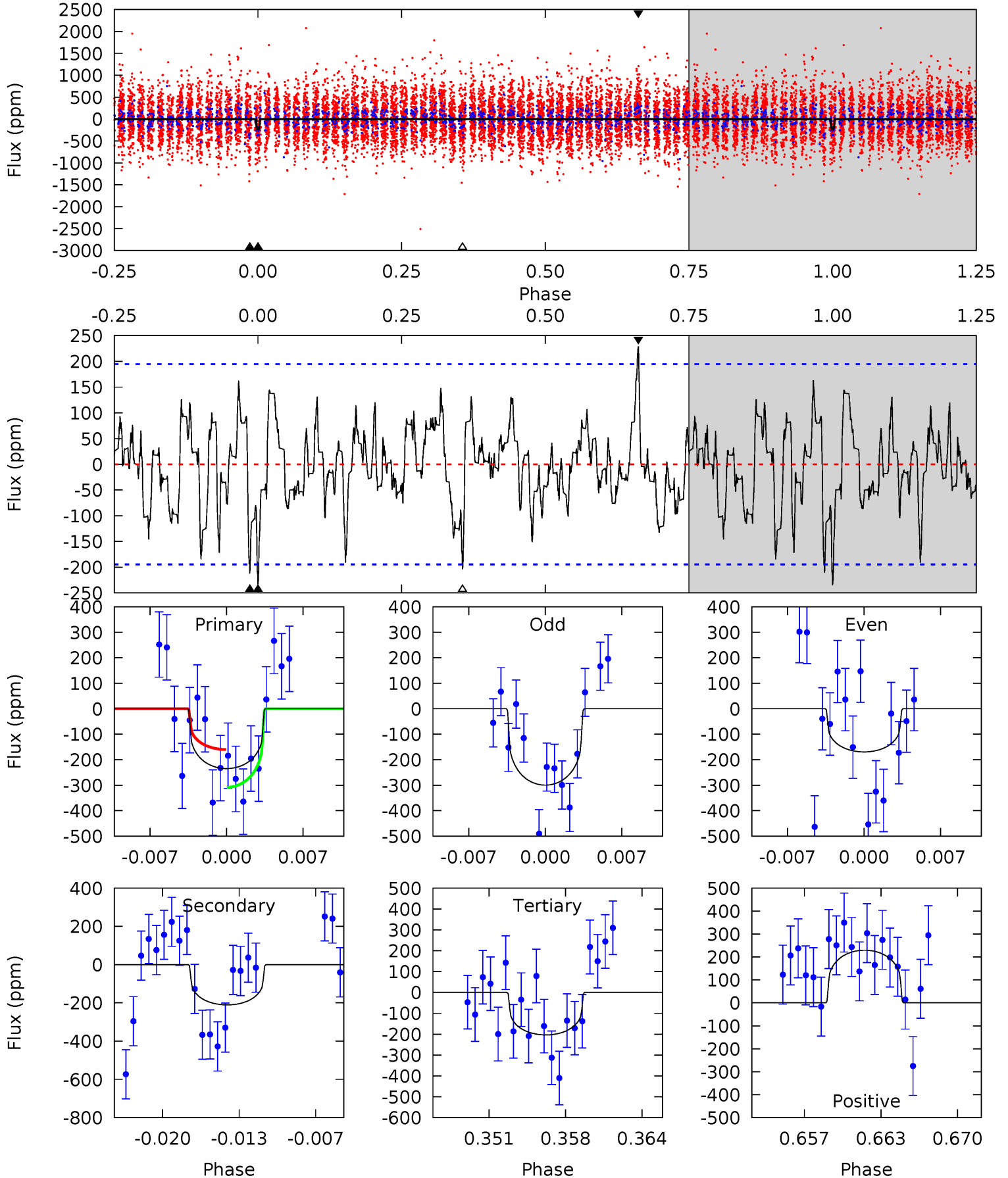




# DV Model-Shift Uniqueness Test

009305136-02, P = 168.333018 Days, E = 121.157948 Days

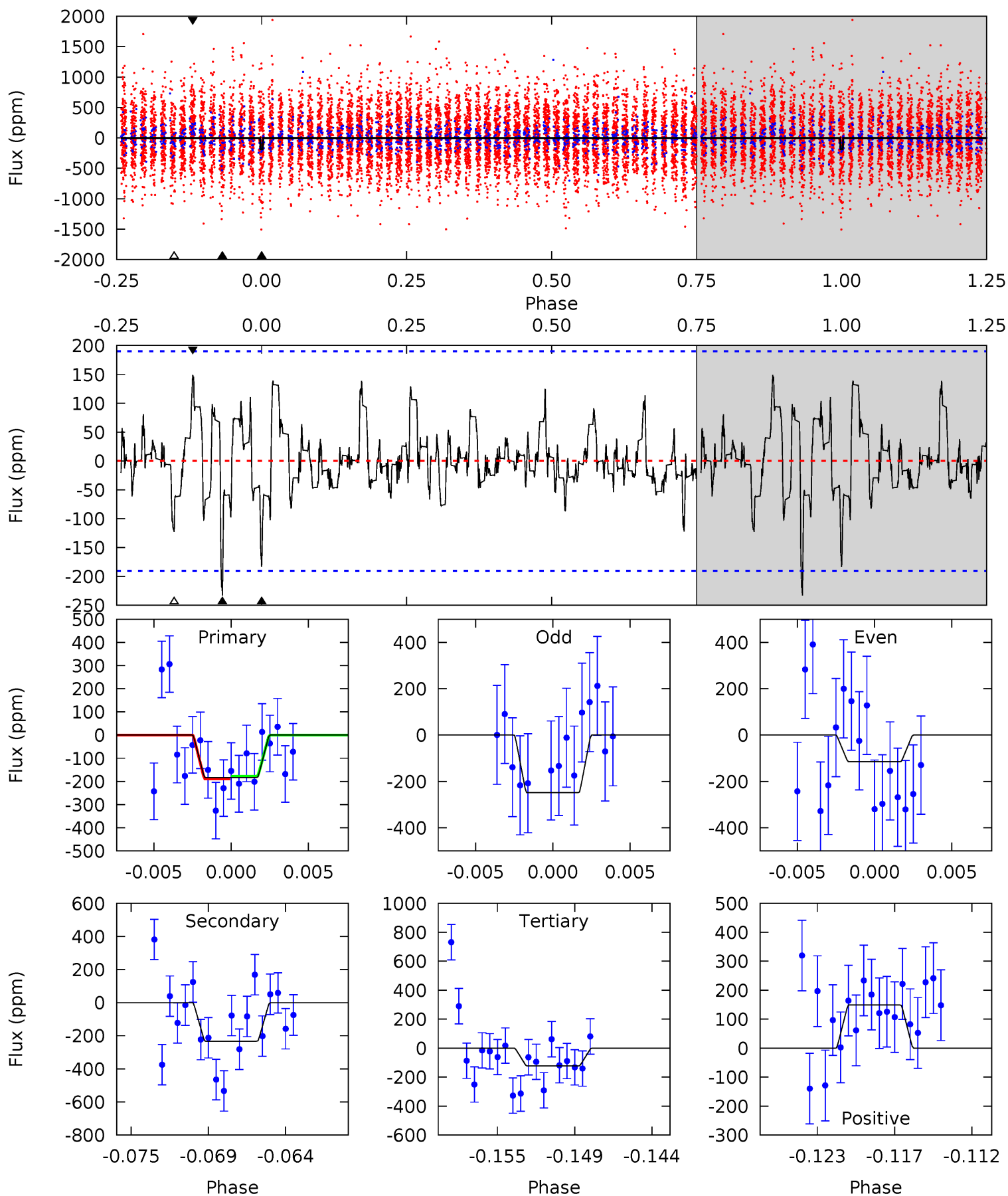
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.16	5.52	5.34	6.01	5.11	2.72	1.83	0.82	0.14	0.18	-0.49	1.72	1.21	0.49	1.95



# Alt Model-Shift Uniqueness Test

009305136-02, P = 168.372534 Days, E = 121.026156 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	6.31	3.32	4.03	5.15	2.79	1.24	1.64	0.93	2.98	2.27	1.81	1.58	0.39	0.15



### Stellar Parameters For KIC 009305136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5017^{+166}_{-166}$	$4.652^{+0.030}_{-0.070}$	$-0.380^{+0.300}_{-0.300}$	$0.668^{+0.086}_{-0.050}$	$0.739^{+0.071}_{-0.078}$	$3.493^{+0.490}_{-0.866}$
	+3%/-3%	+1%/-2%	+79%/-79%	+13%/-7%	+10%/-11%	+14%/-25%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009305136-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-211 \pm 38$	$1.45^{+0.73}_{-0.61}$	$348^{+14}_{-13}$	$4444^{+1258}_{-663}$	$15811^{+34689}_{-9114}$
Alt.	$-233 \pm 37$	$0.97^{+0.68}_{-0.55}$	$349^{+14}_{-14}$	$5355^{+3217}_{-1062}$	$38310^{+172279}_{-25173}$

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

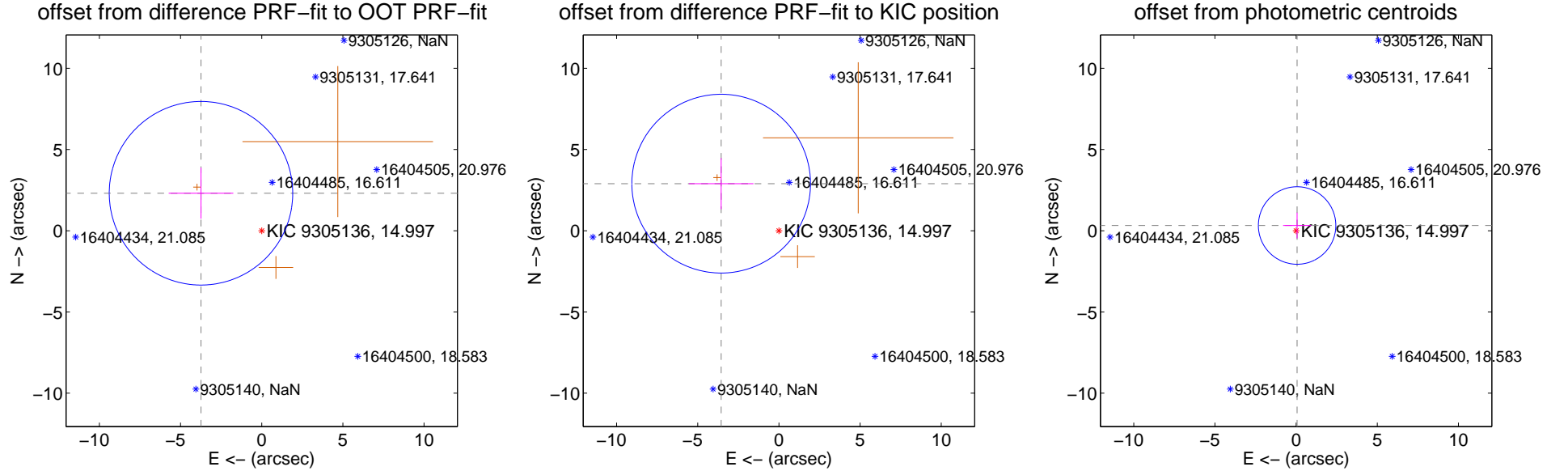
## DV Centroid Data

Supplemental centroid analysis for 009305136-02. Kepler magnitude: 15.00. Transit SNR 8.45

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.395 \pm 1.884$	2.33	$3.741 \pm 1.990$	$2.307 \pm 1.570$
PRF-fit source offset from KIC position	$4.588 \pm 1.834$	2.50	$3.557 \pm 1.990$	$2.898 \pm 1.570$
photometric centroid source offset	$0.33 \pm 0.80$	0.41	$-0.06 \pm 0.86$	$0.32 \pm 0.79$



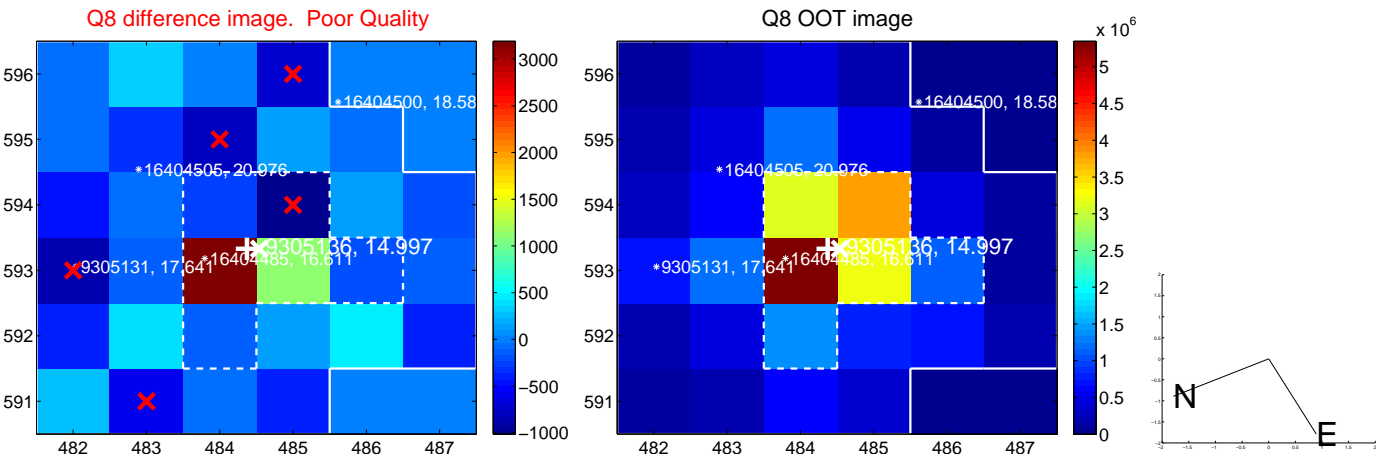
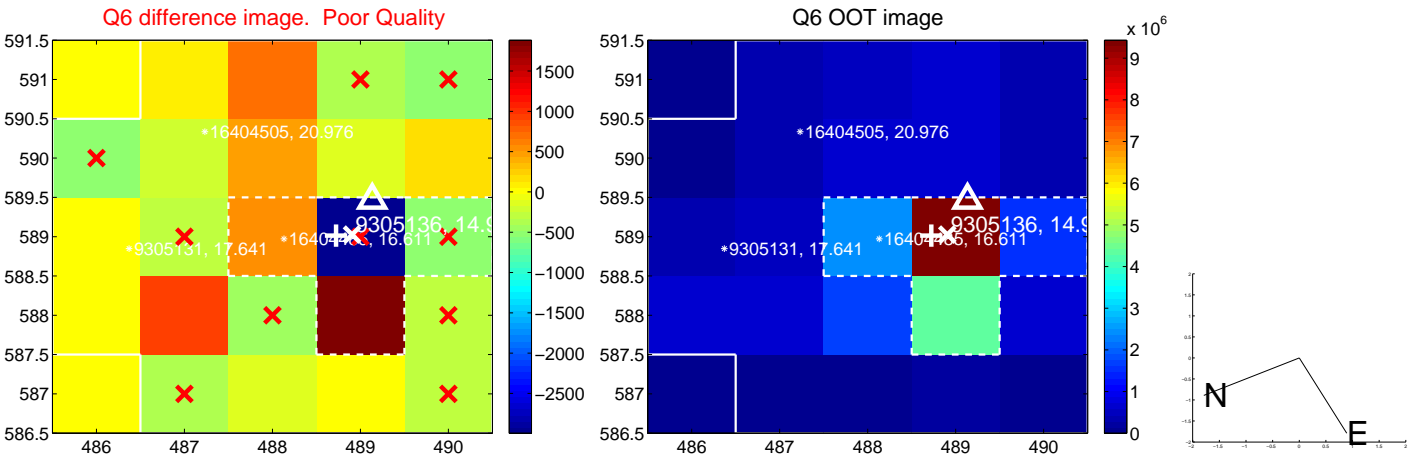
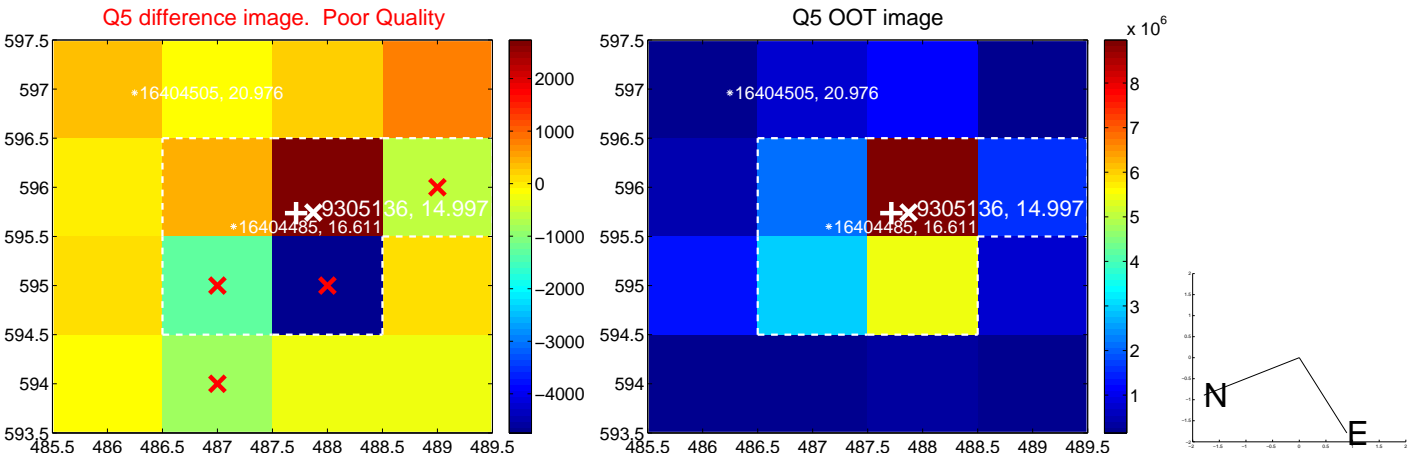
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



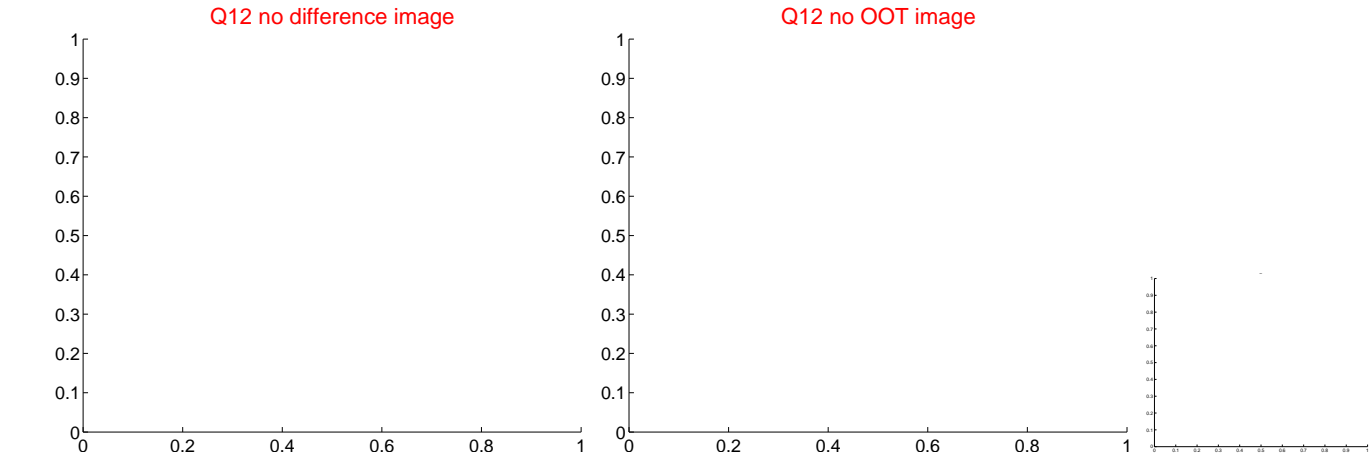
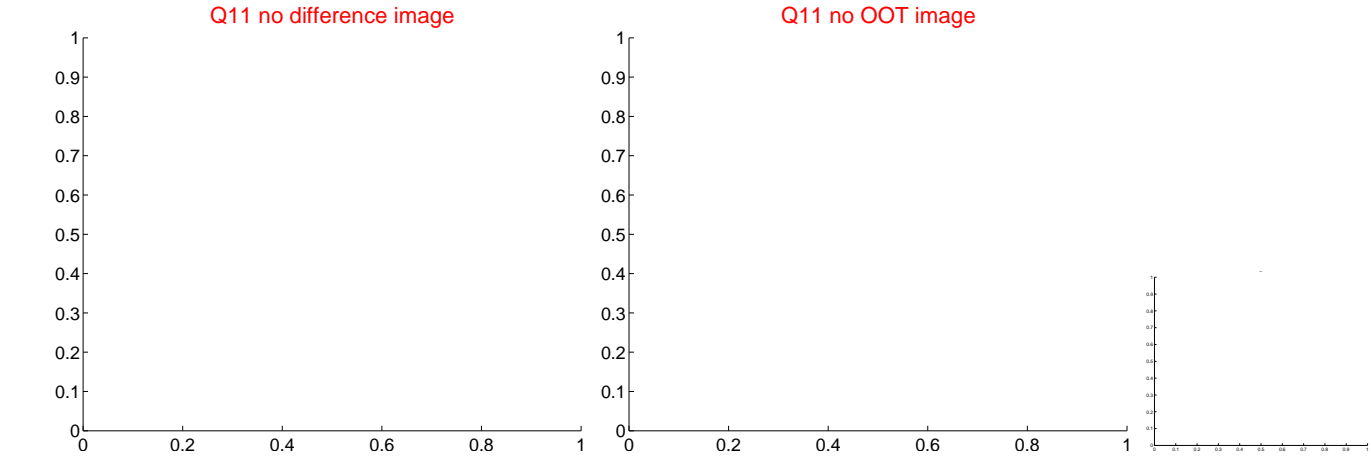
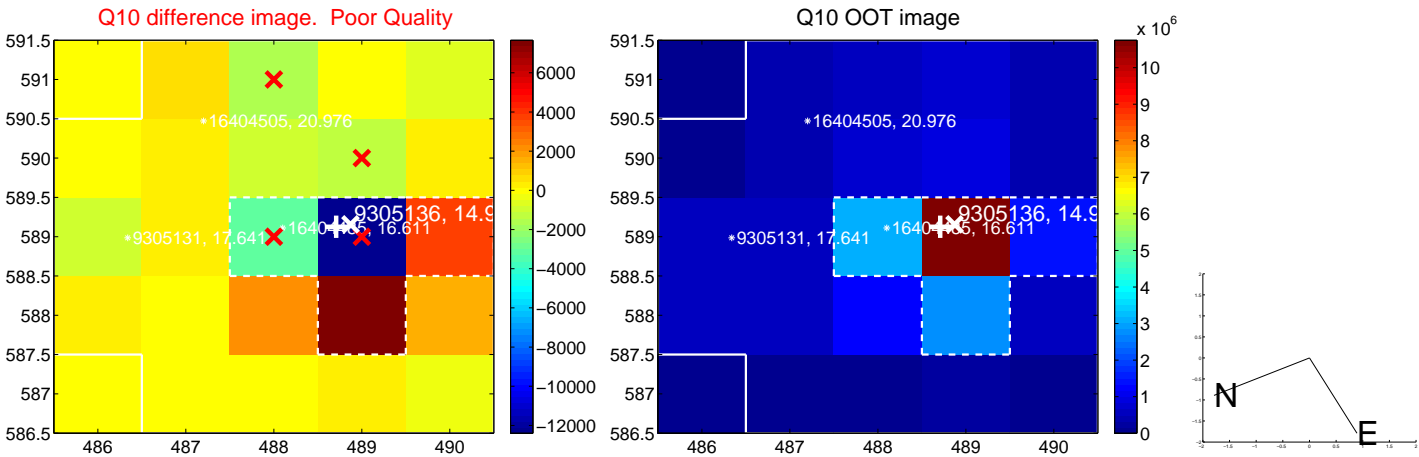
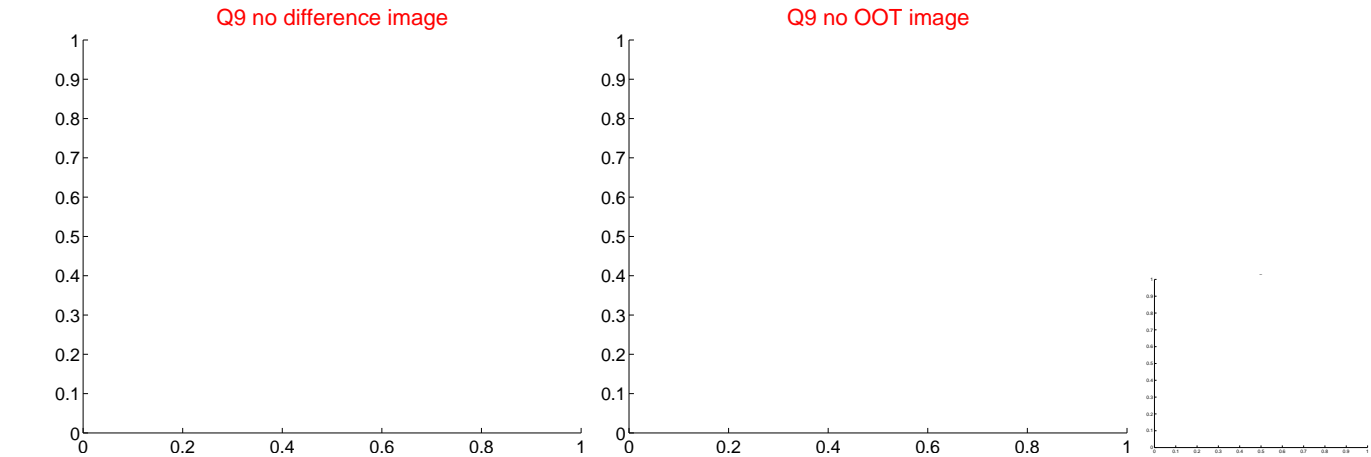
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



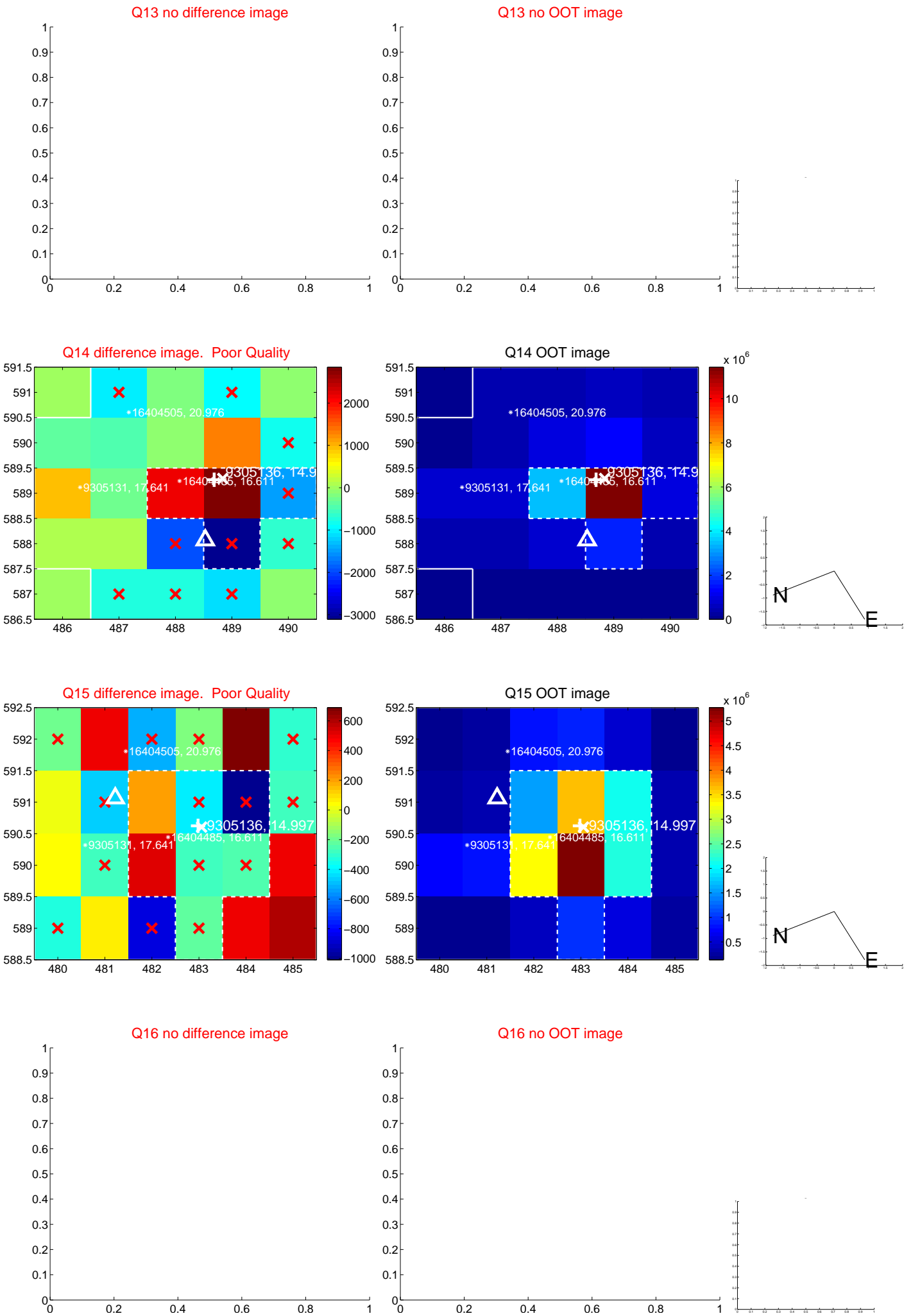
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



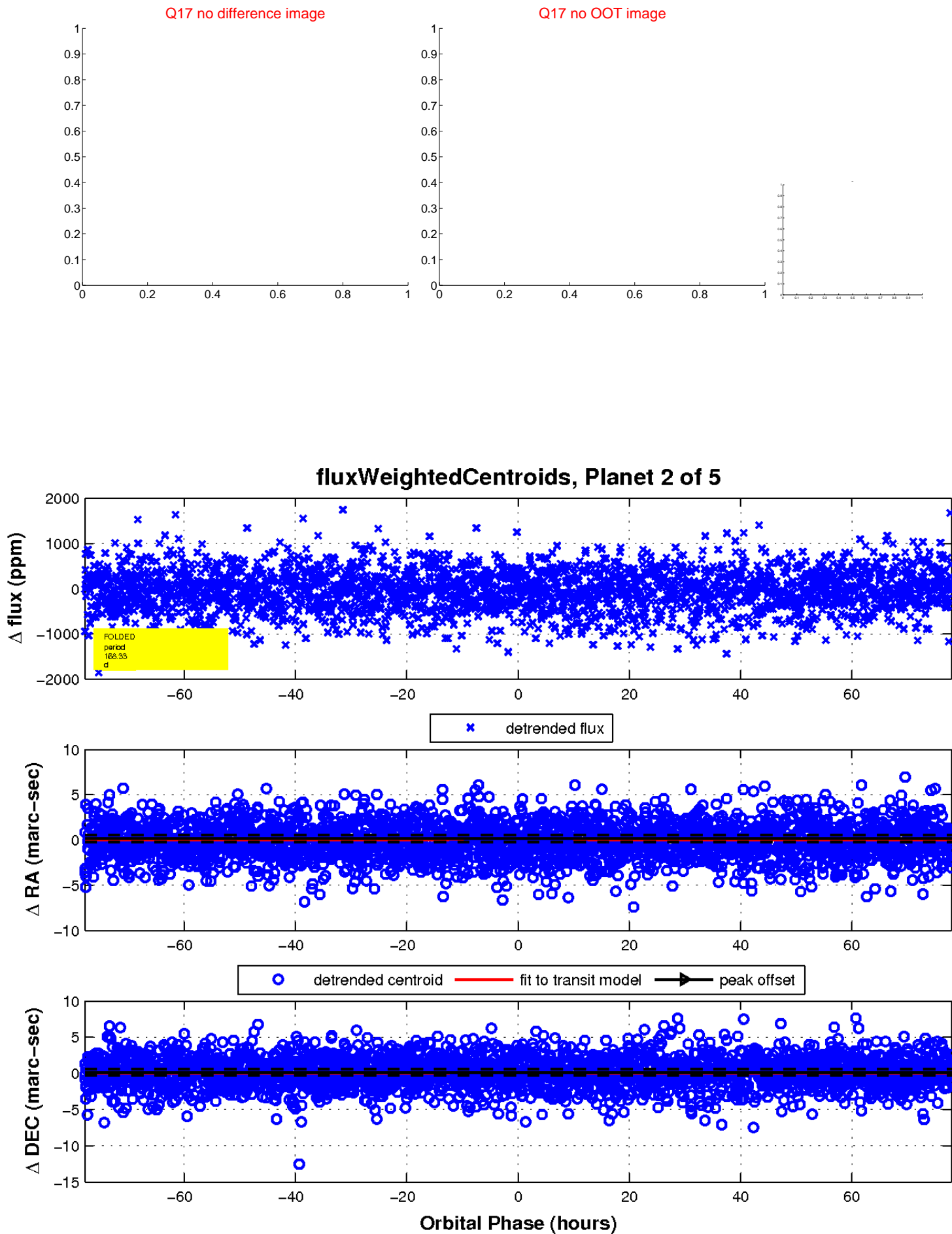
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



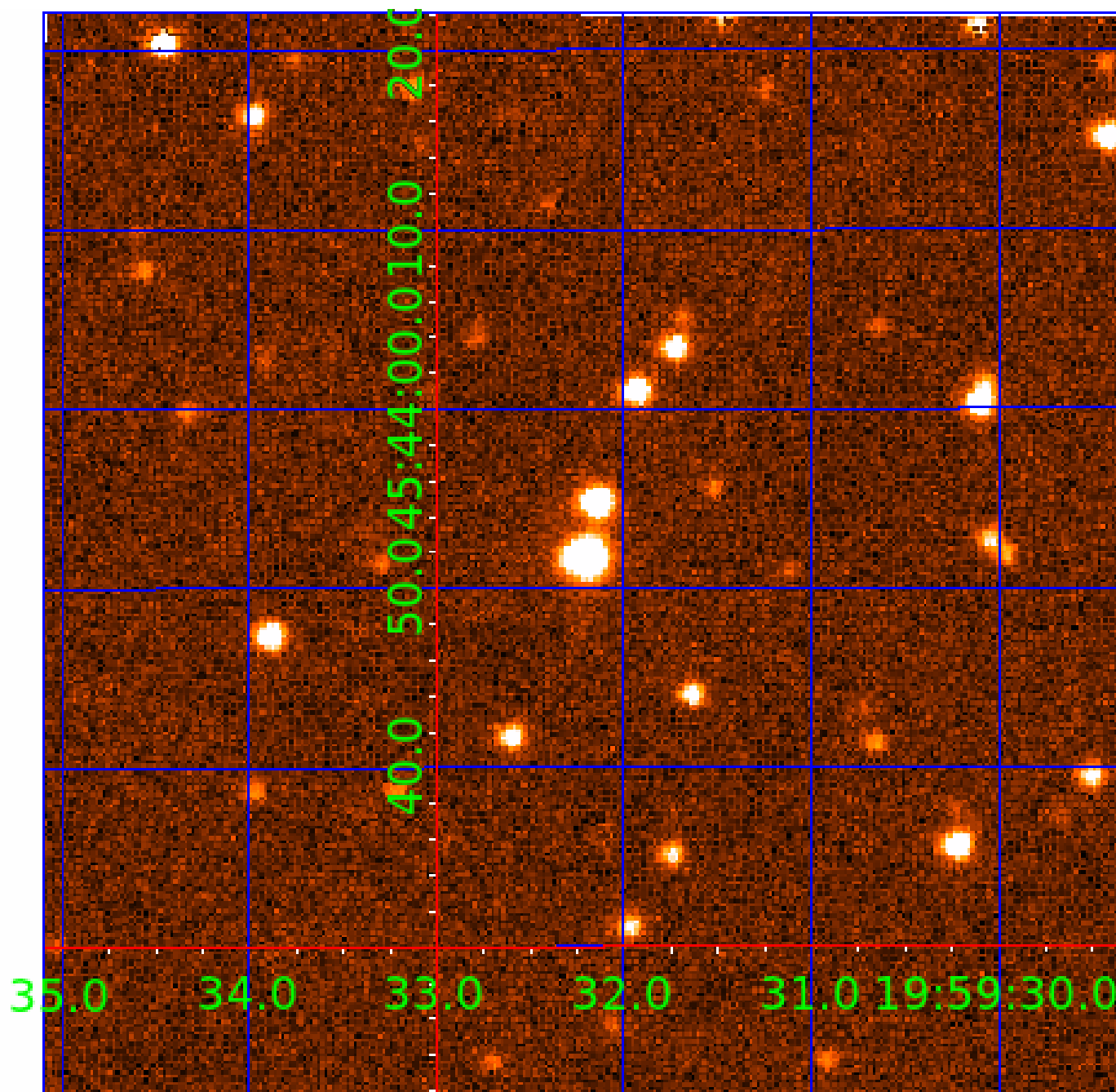
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 009305136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009305136-01	OBS	No	2.856561	133.084044	54.2	18.894	9.6	12.2	0.67	5017	0.49	201.09
009305136-02	OBS	No	168.333018	289.490966	459.5	25.978	13.0	8.5	0.67	5017	1.48	0.88
009305136-03	OBS	No	126.747662	222.993463	489.2	10.773	12.1	8.8	0.67	5017	1.78	1.28
009305136-04	OBS	No	165.776208	288.185175	406.7	15.245	9.5	8.6	0.67	5017	1.50	0.90
009305136-05	OBS	No	84.931002	151.570416	902.2	1.789	8.6	8.9	0.67	5017	2.40	2.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009305136-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_KIC_POS—HALO_GHOST
009305136-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009305136-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305136-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009305136-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

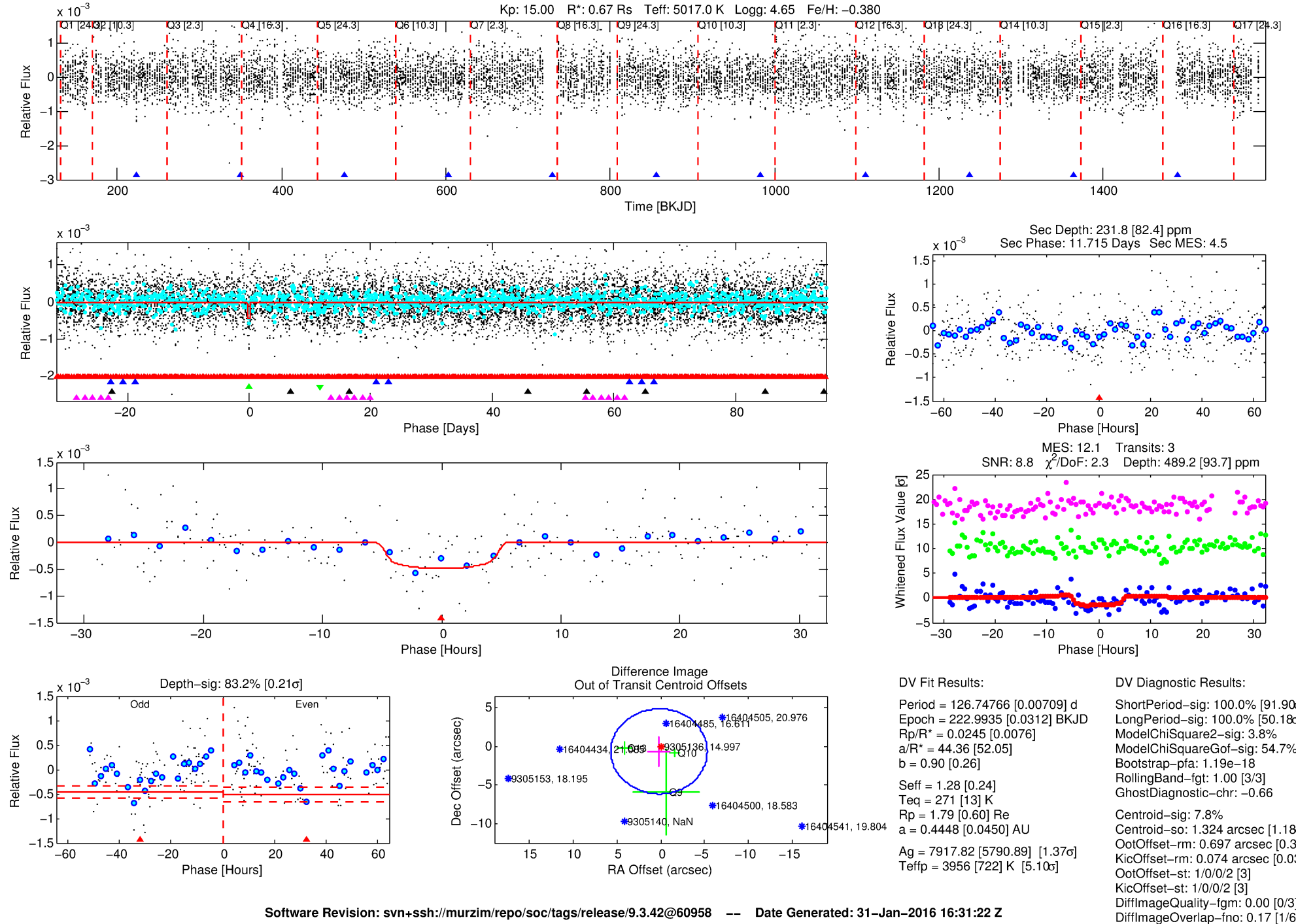
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009305136-03

No Significant Match Found

# DV One-Page Summary

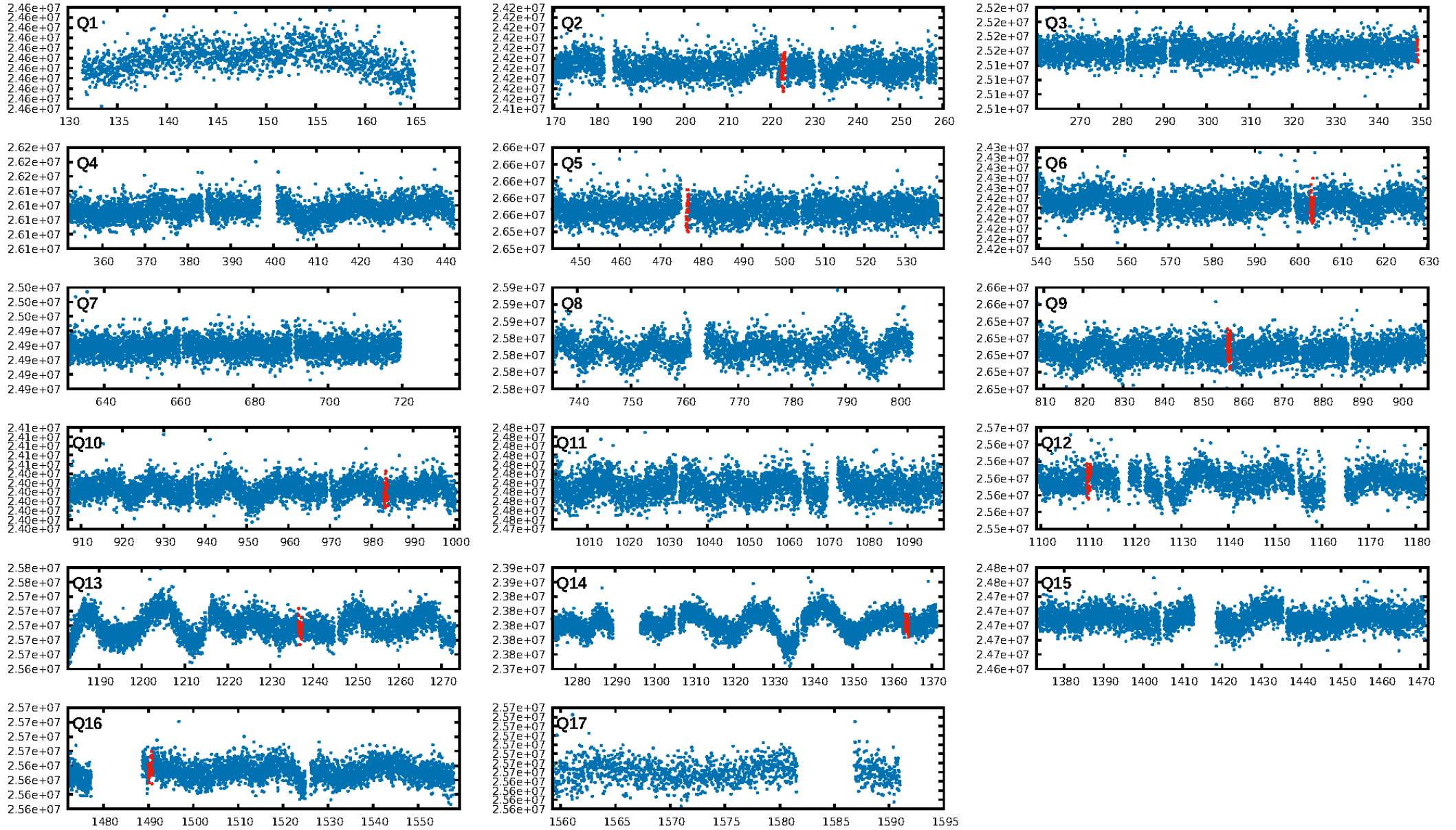
KIC: 9305136 Candidate: 3 of 5 Period: 126.748 d



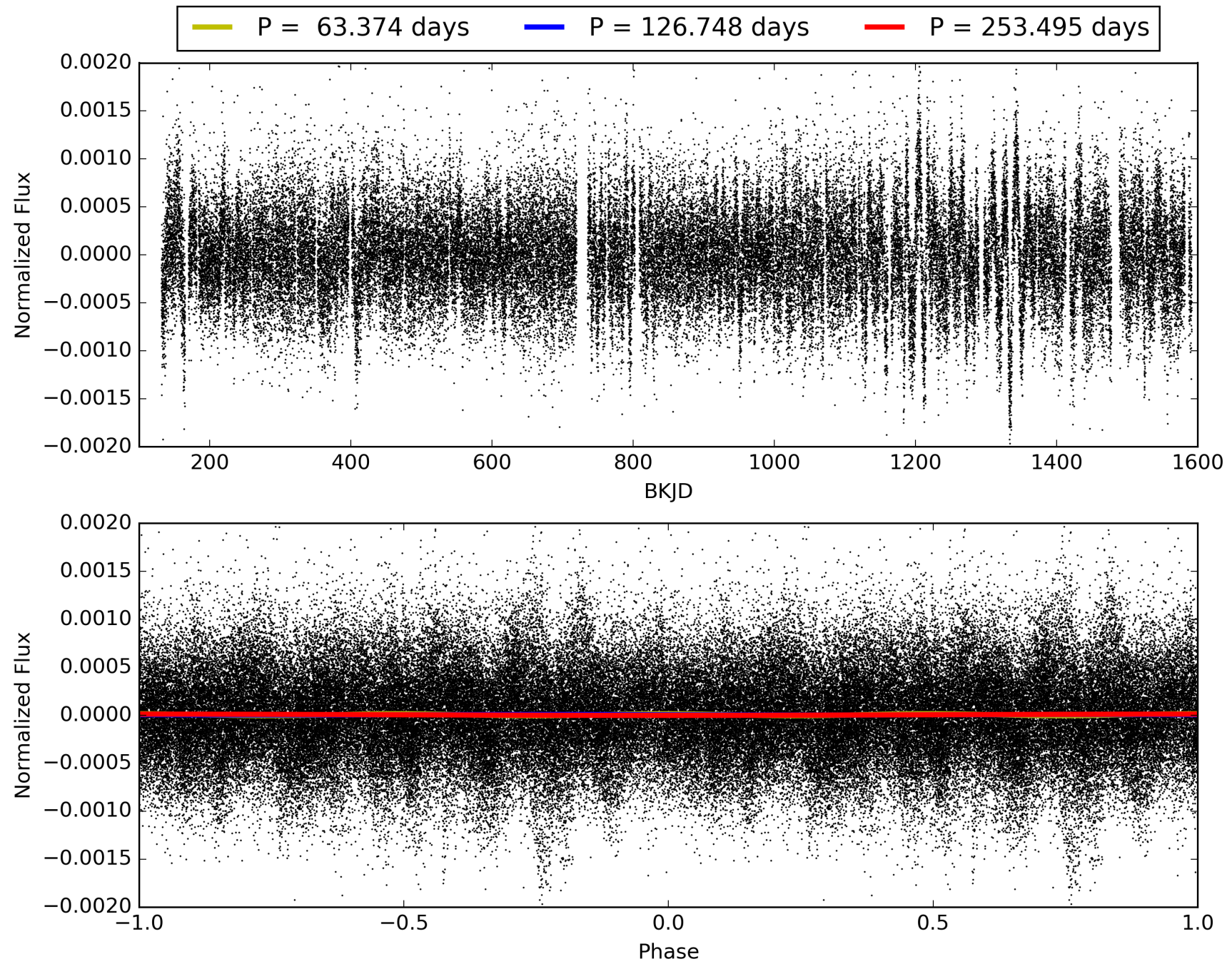
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:31:22 Z

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

# TCE 009305136-03, PDC Light Curves



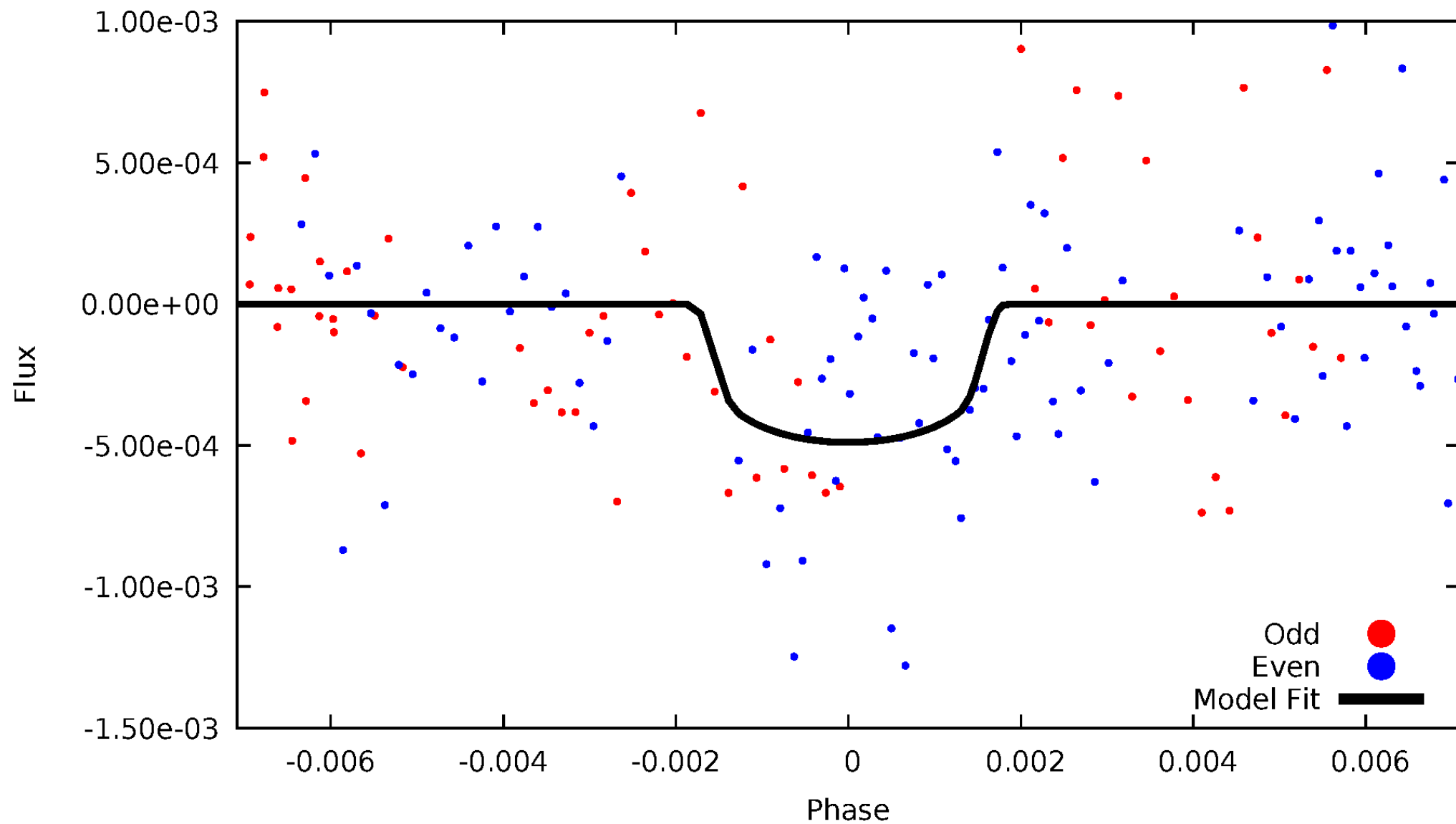
TCE 009305136-03





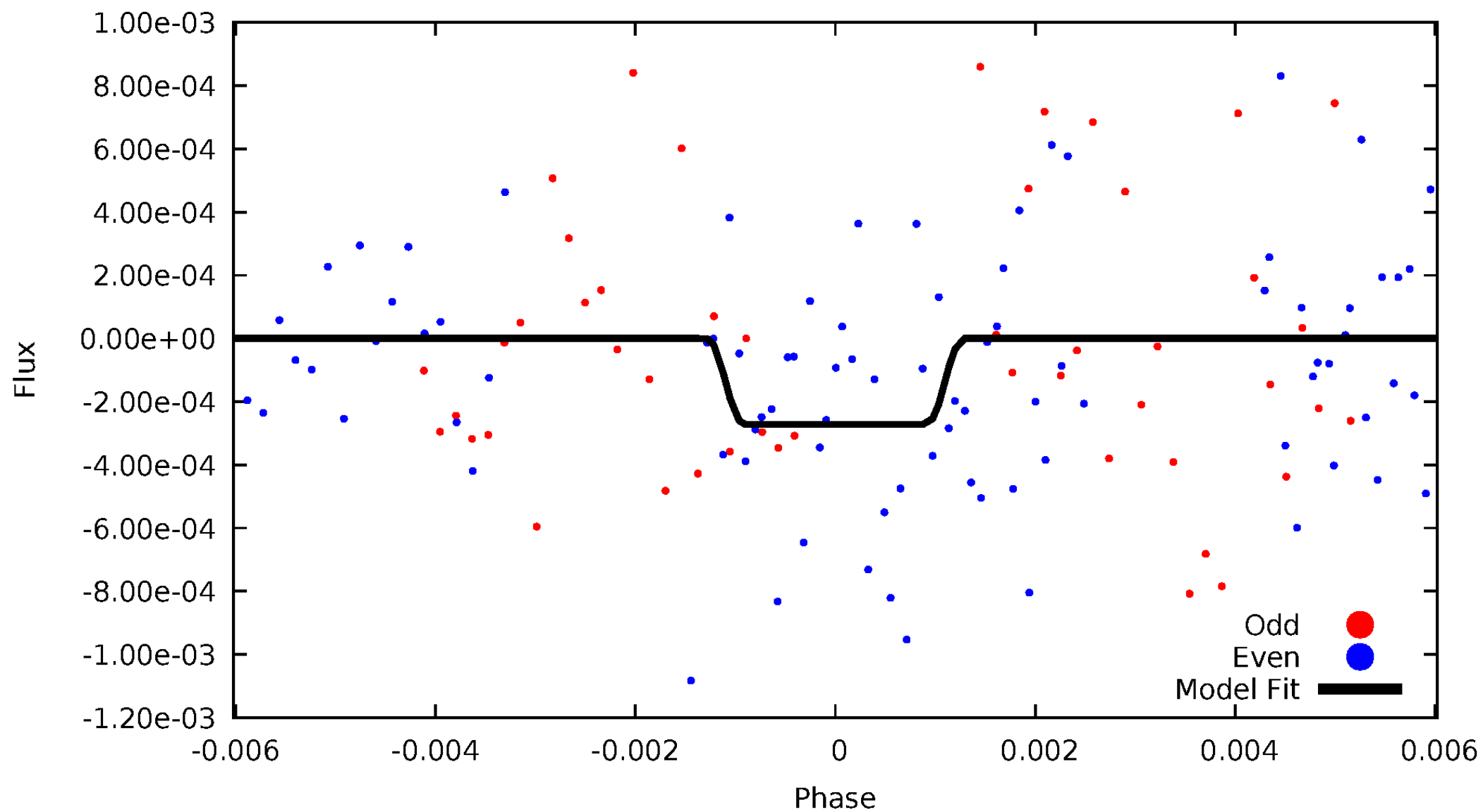
# DV Odd/Even

TCE 009305136-03



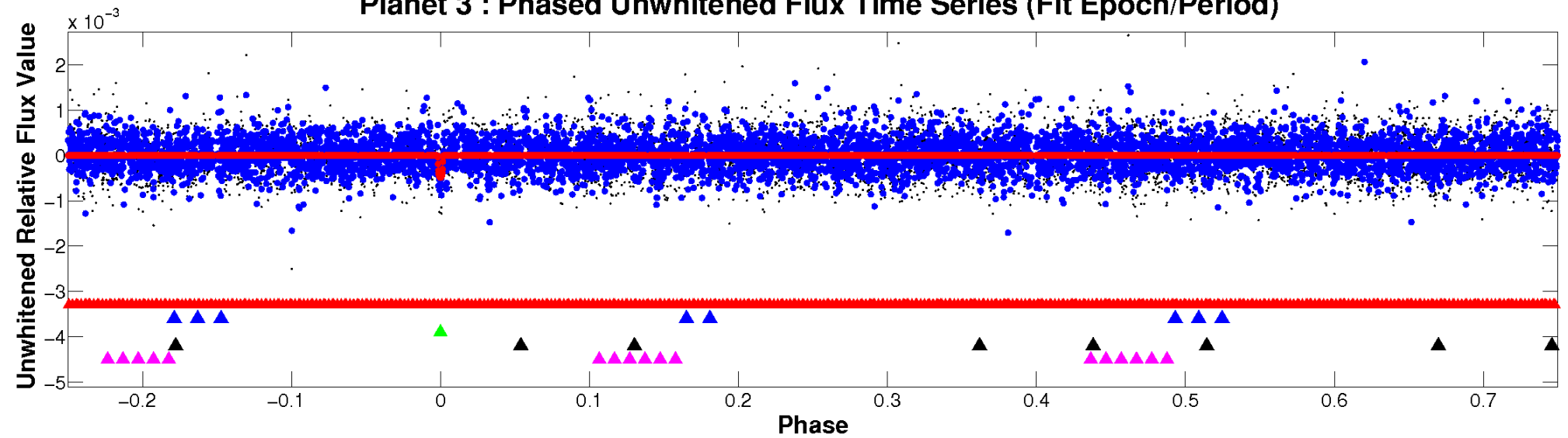
# ALT Odd/Even

TCE 009305136-03

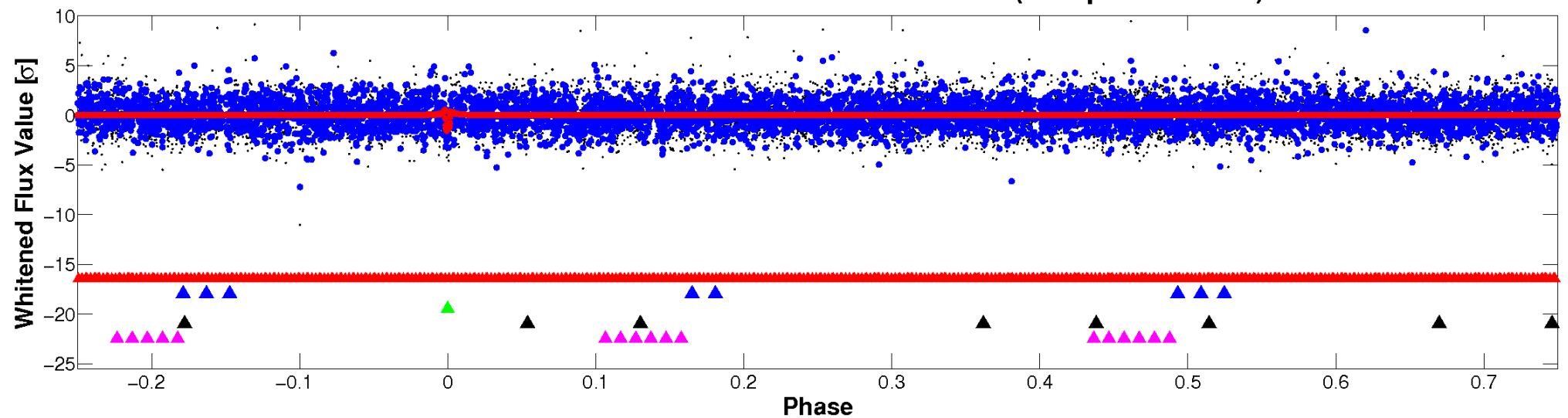


# Non-Whitened Vs. Whitened Light Curve

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

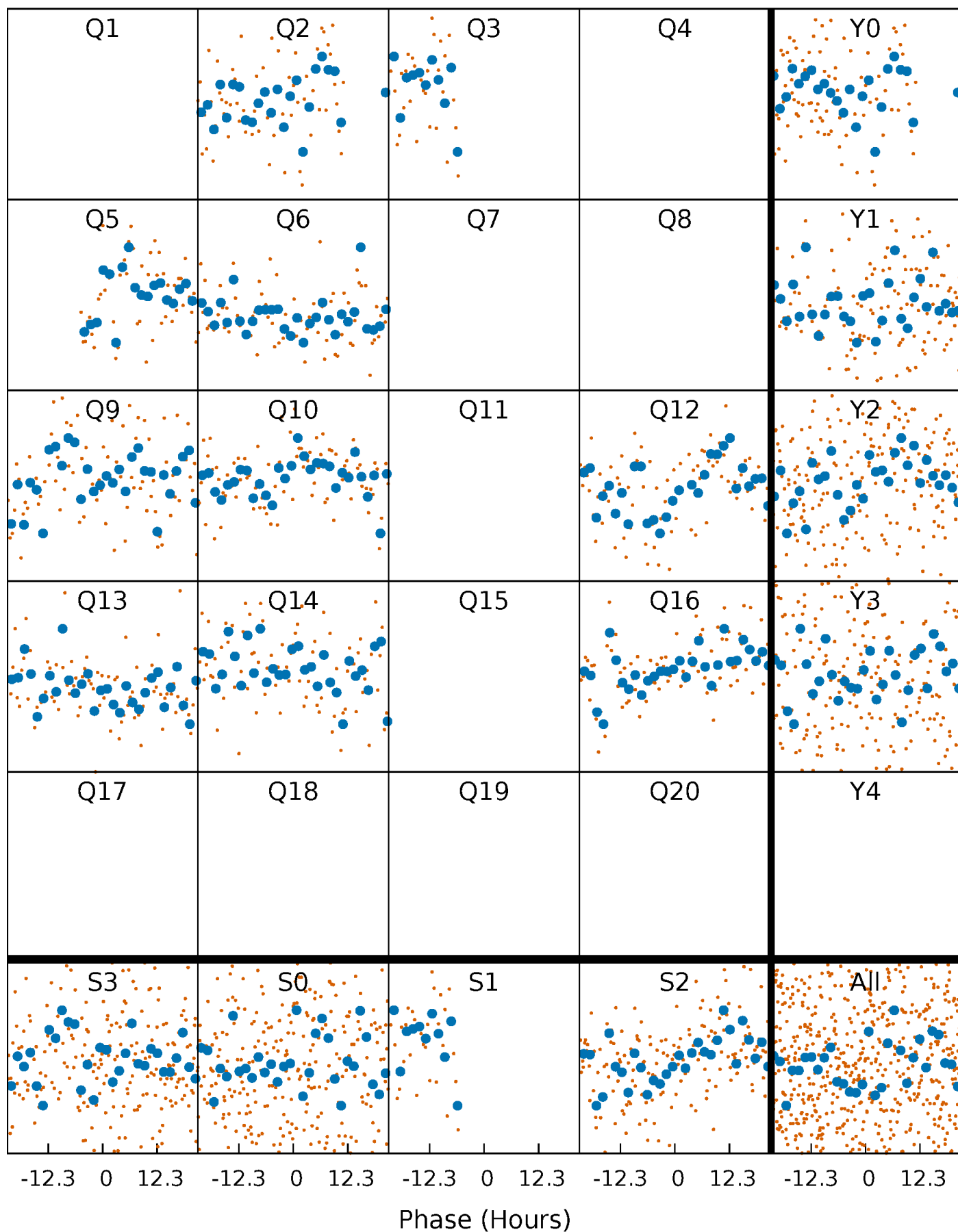


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



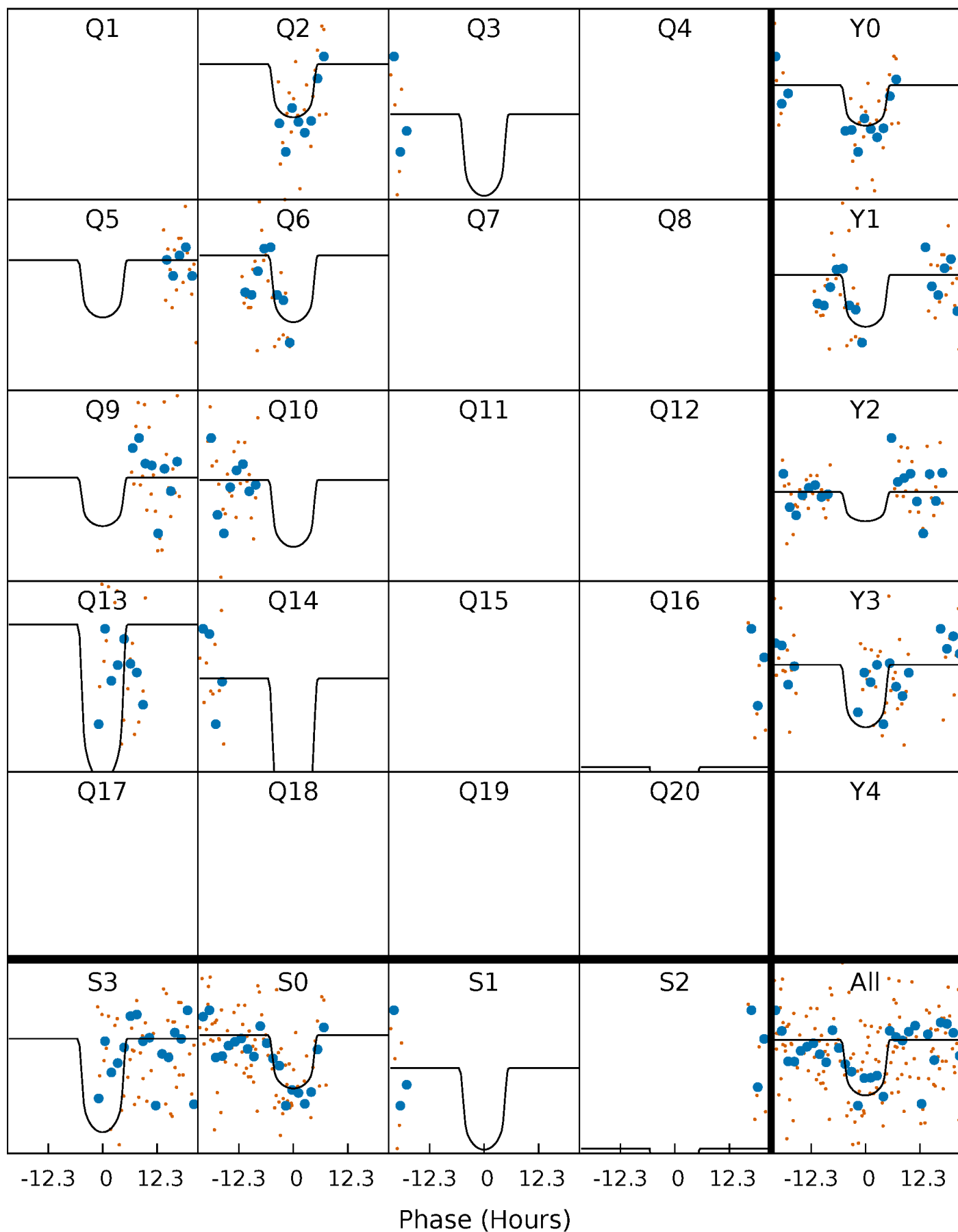
# PDC Quarter-Phased Transit Curves

TCE 009305136-03 P=126.747662 Days  $T_0=222.993463$  (BKJD)



# DV Quarter-Phased Transit Curves

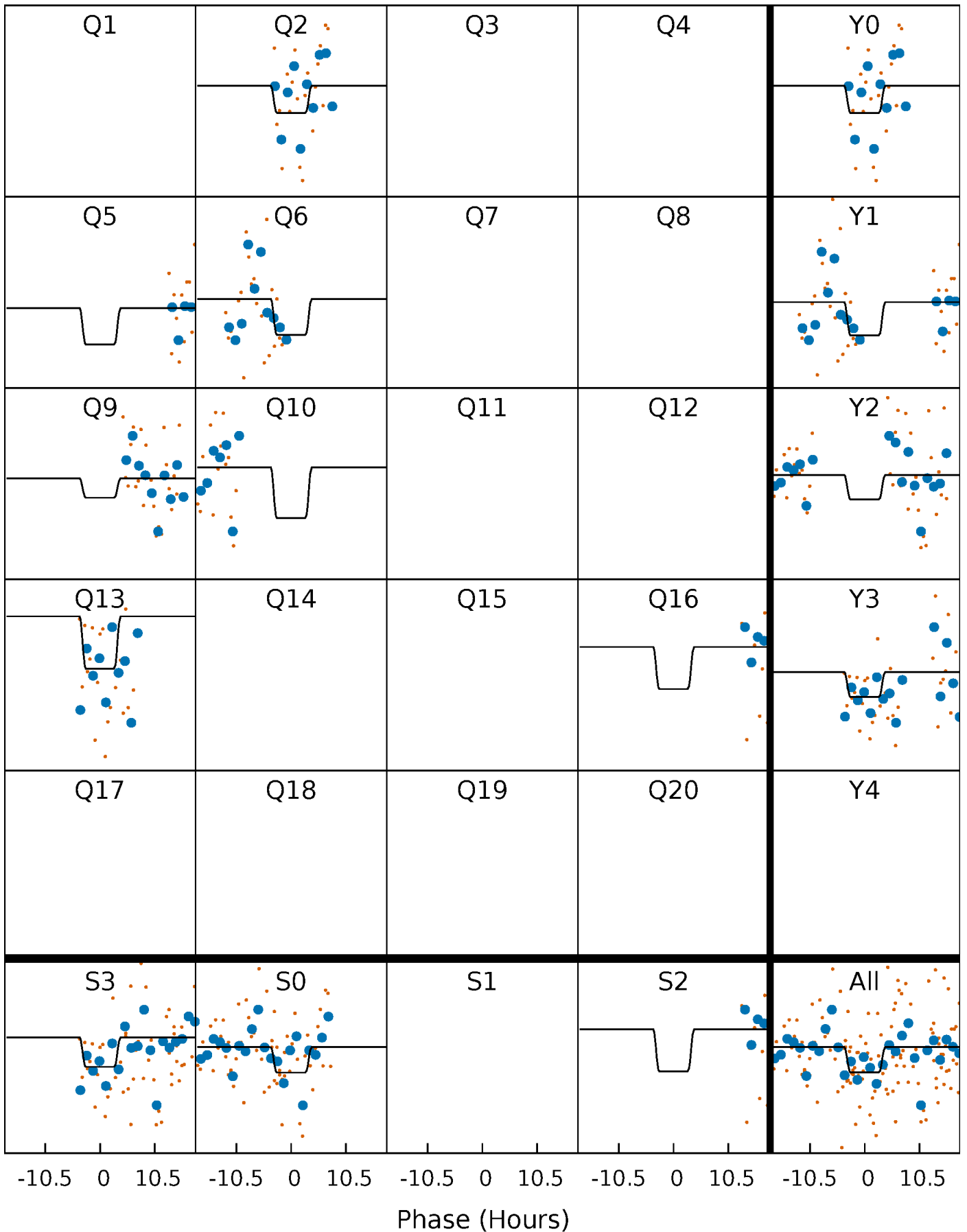
TCE 009305136-03 P=126.747662 Days  $T_0=222.993463$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

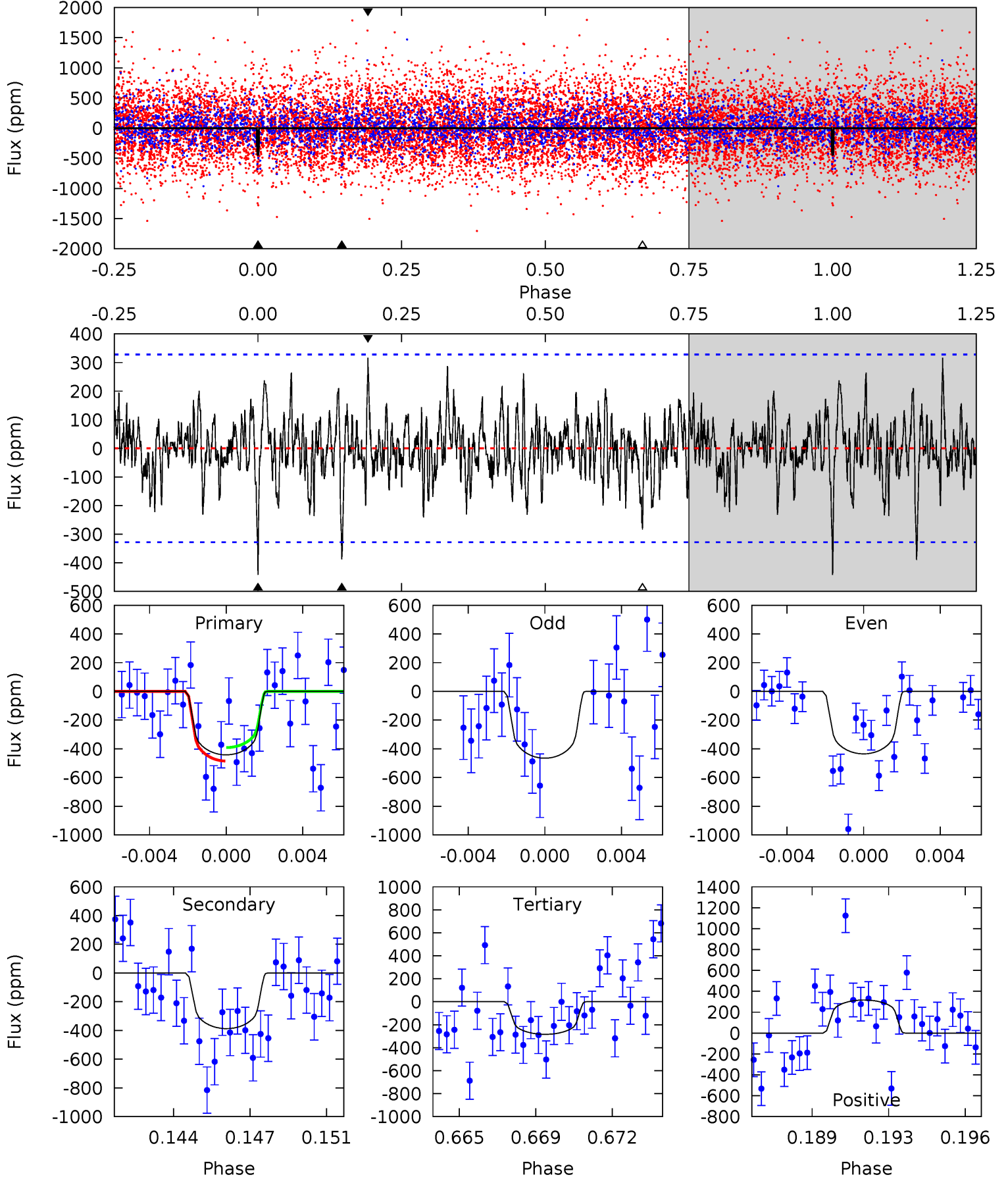
TCE 009305136-03 P=126.762995 Days  $T_0=222.986776$  (BKJD)



# DV Model-Shift Uniqueness Test

009305136-03, P = 126.747662 Days, E = 96.245801 Days

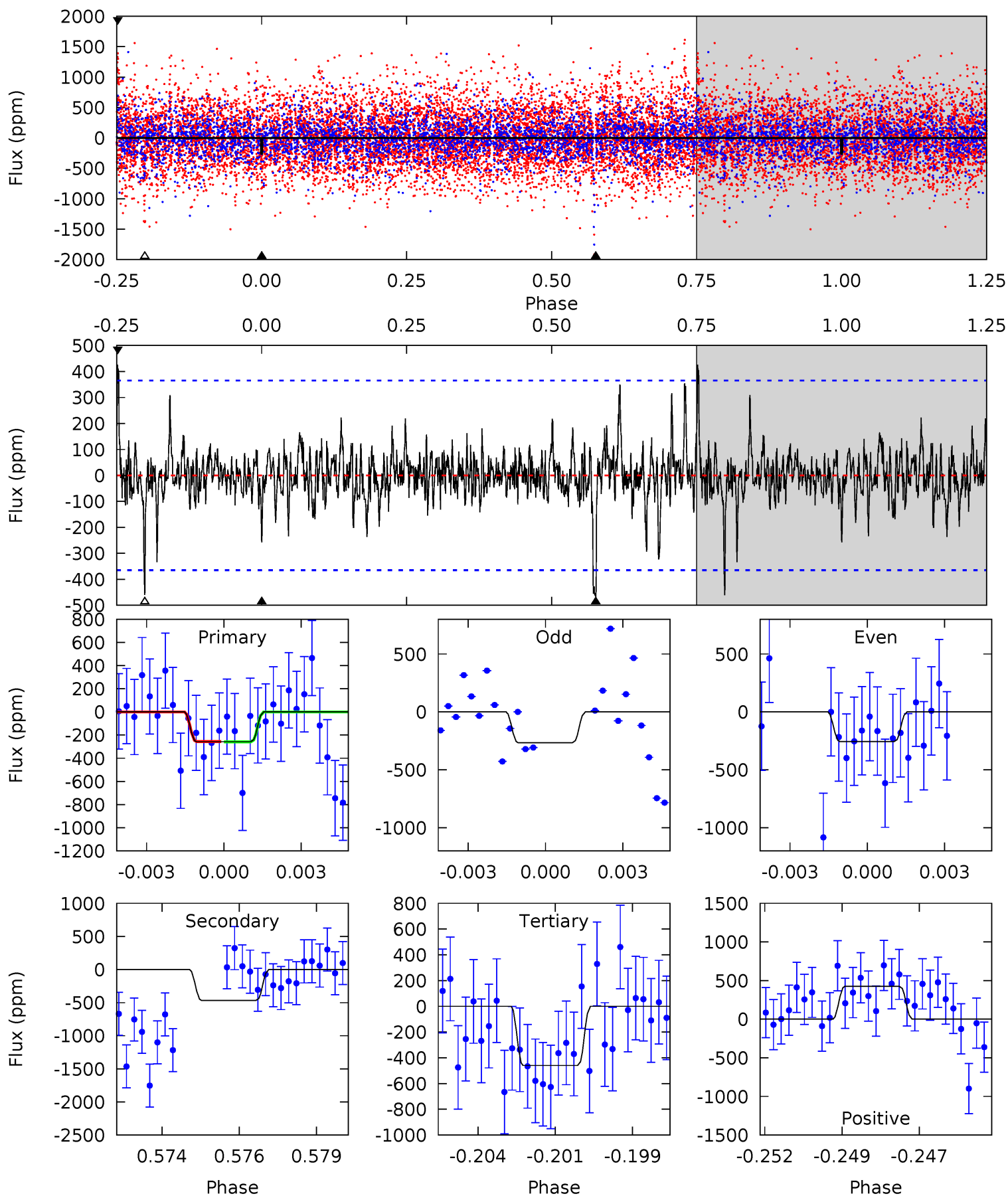
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.04	6.17	4.52	5.04	5.22	2.92	1.37	2.52	2.00	1.65	1.13	0.20	0.91	0.42	0.75



# Alt Model-Shift Uniqueness Test

009305136-03, P = 126.762995 Days, E = 96.223781 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
3.72	6.75	6.65	6.16	5.28	3.02	1.25	-2.93	-2.44	0.10	0.59	0.05	0.98	0.48	0.02



### Stellar Parameters For KIC 009305136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5017^{+166}_{-166}$	$4.652^{+0.030}_{-0.070}$	$-0.380^{+0.300}_{-0.300}$	$0.668^{+0.086}_{-0.050}$	$0.739^{+0.071}_{-0.078}$	$3.493^{+0.490}_{-0.866}$
	+3%/-3%	+1%/-2%	+79%/-79%	+13%/-7%	+10%/-11%	+14%/-25%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009305136-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-387 \pm 63$	$1.82^{+0.54}_{-0.56}$	$381^{+16}_{-14}$	$4612^{+727}_{-501}$	$13130^{+12829}_{-5611}$
Alt.	$-467 \pm 69$	$1.20^{+0.58}_{-0.54}$	$382^{+16}_{-14}$	$5710^{+2119}_{-965}$	$34200^{+80922}_{-18677}$

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

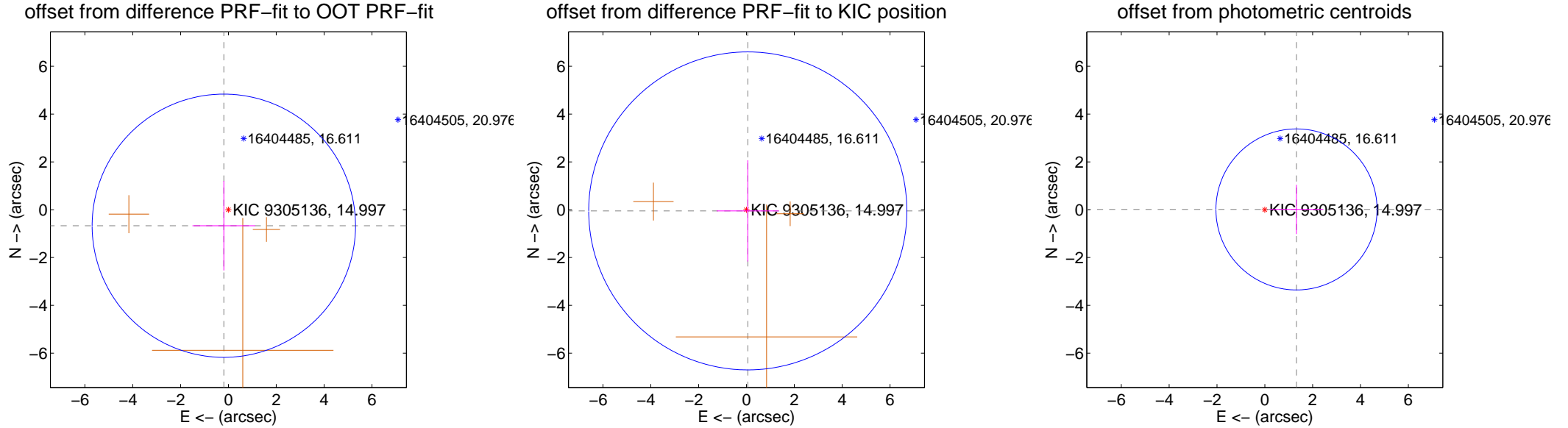
## DV Centroid Data

Supplemental centroid analysis for 009305136-03. Kepler magnitude: 15.00. Transit SNR 8.77

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.59 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.697 \pm 1.835$	0.38	$0.193 \pm 1.310$	$-0.670 \pm 1.871$
PRF-fit source offset from KIC position	$0.074 \pm 2.216$	0.03	$-0.054 \pm 1.303$	$-0.050 \pm 2.119$
photometric centroid source offset	$1.32 \pm 1.12$	1.18	$-1.32 \pm 1.12$	$0.01 \pm 1.03$



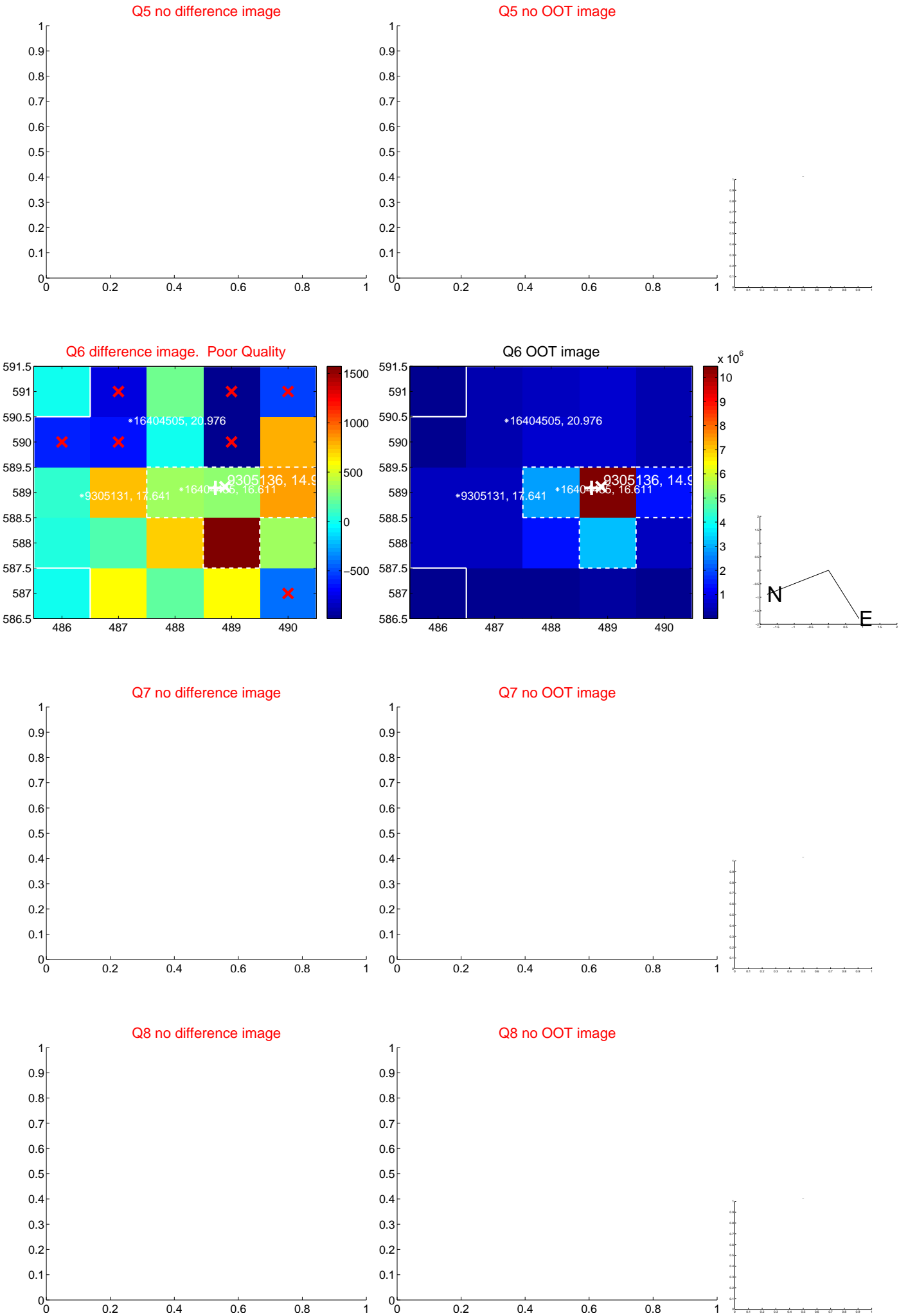
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



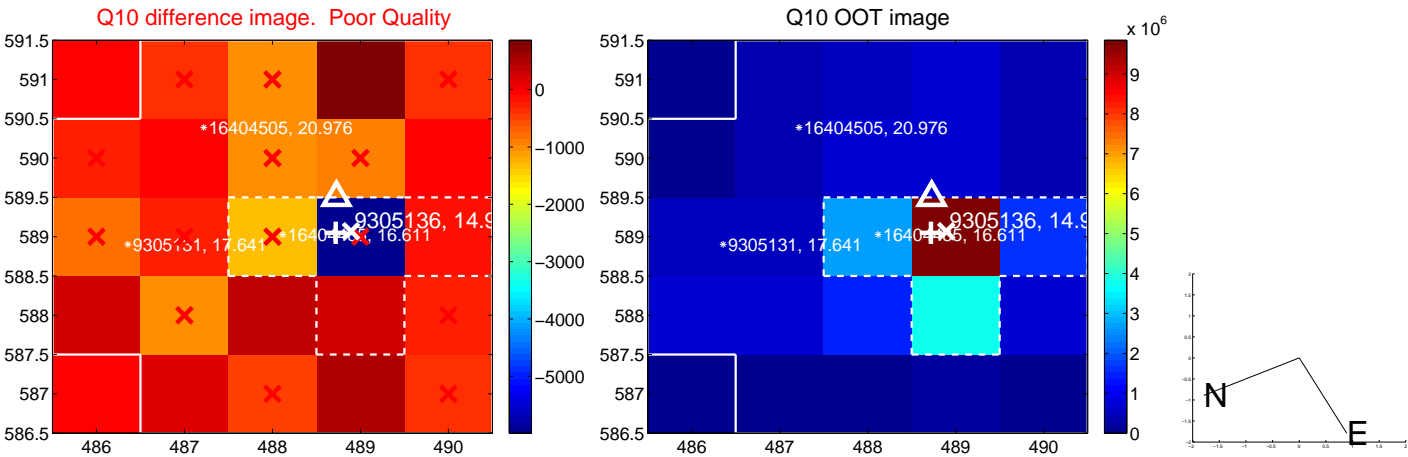
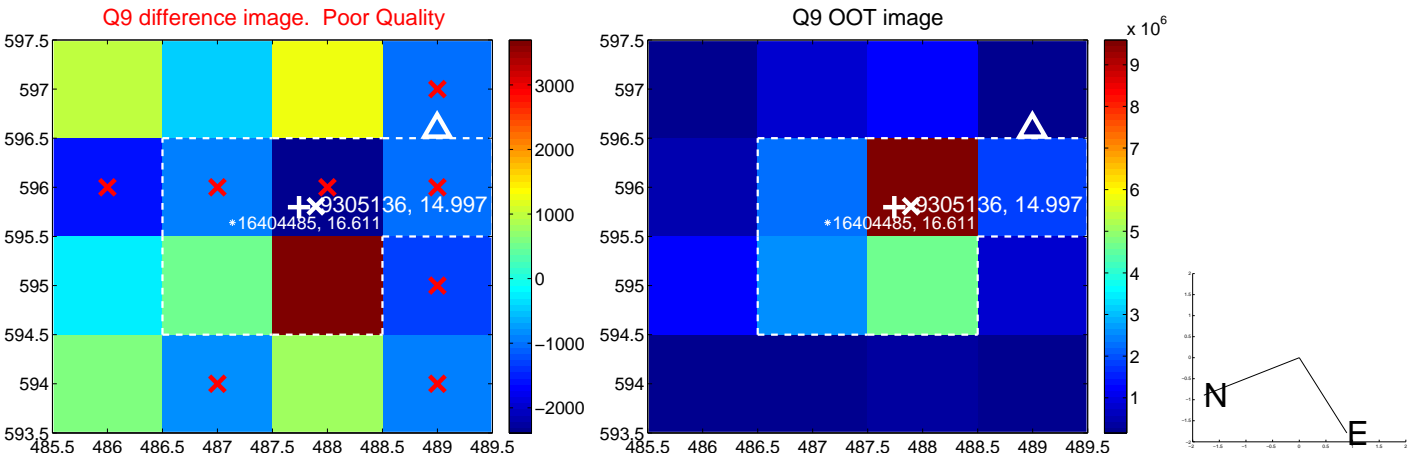
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



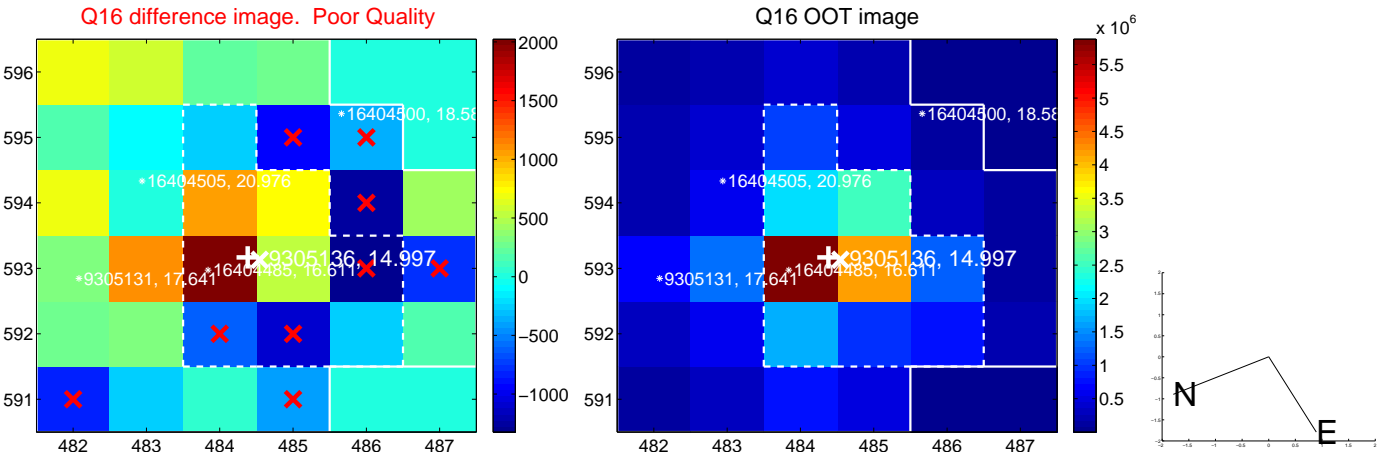
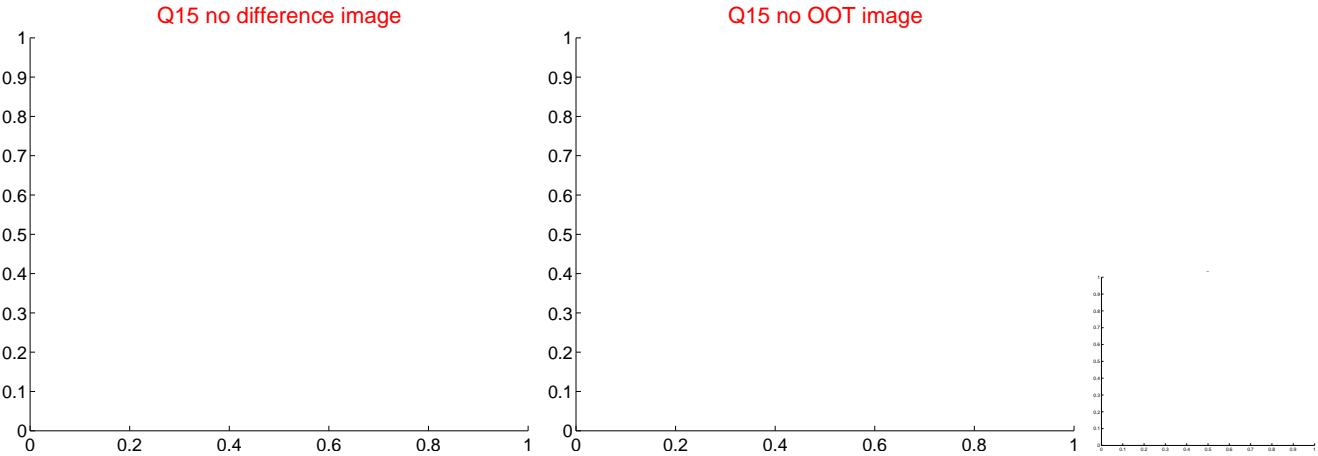
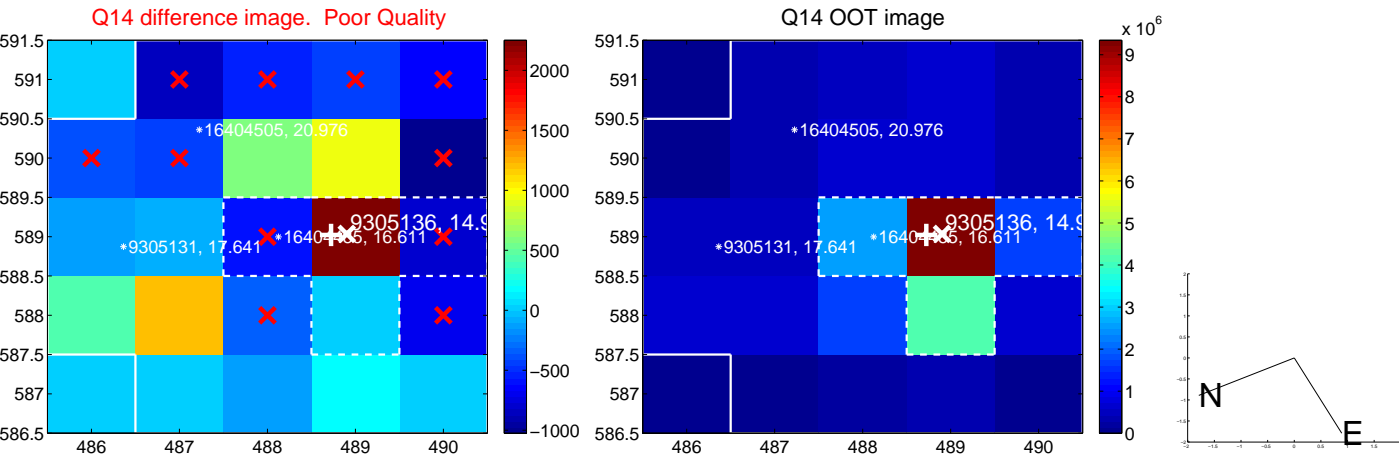
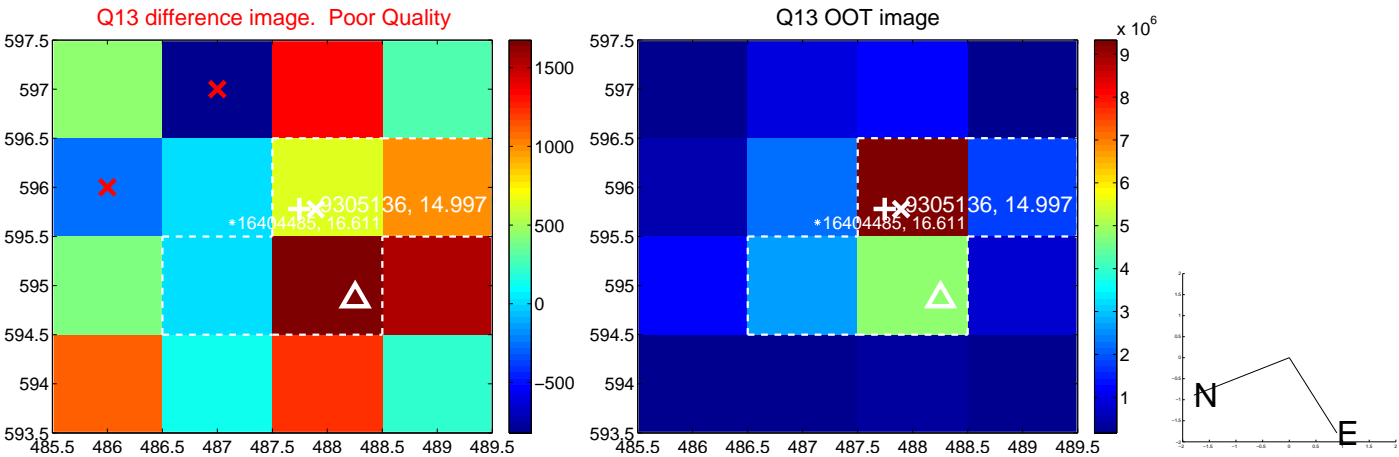
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



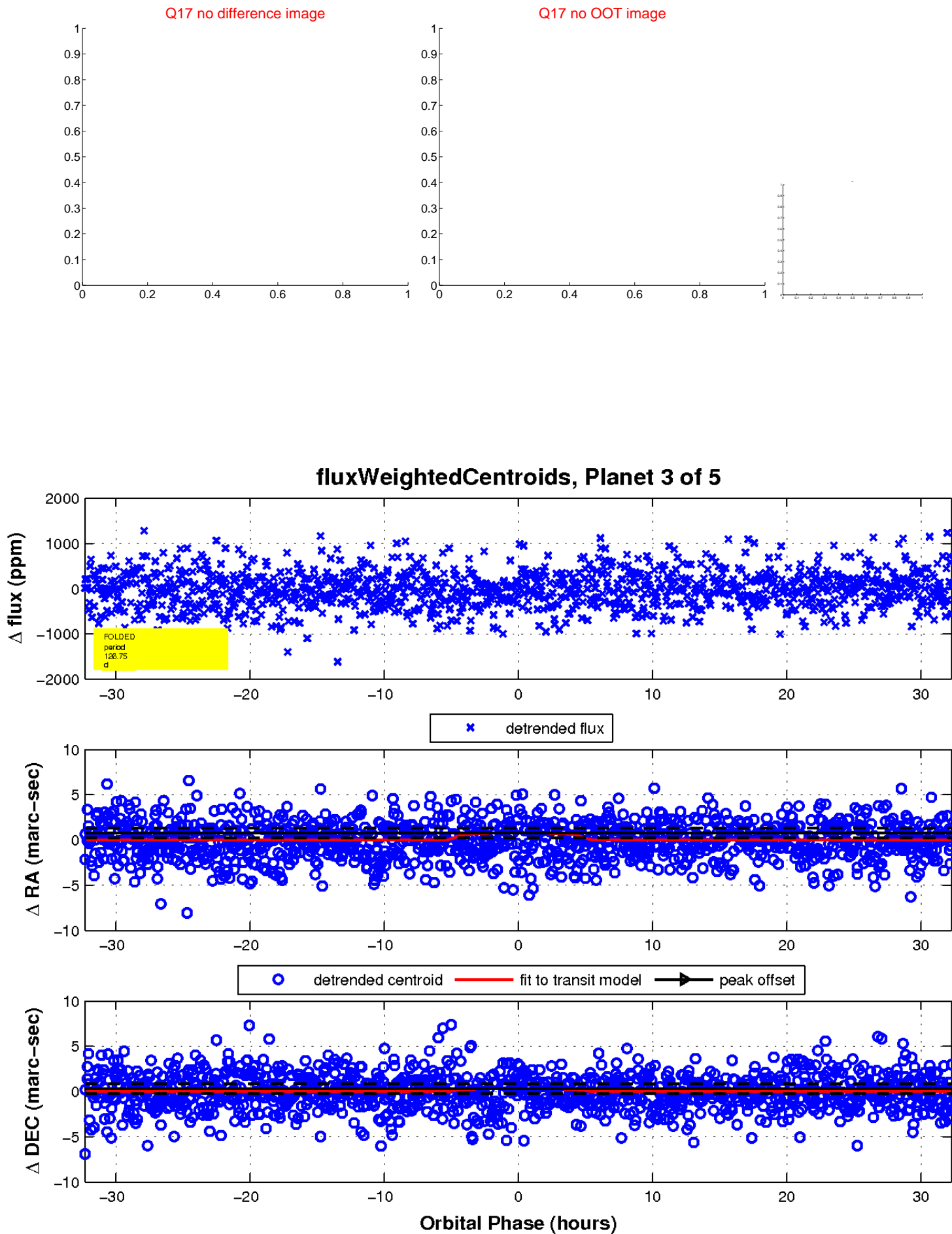
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

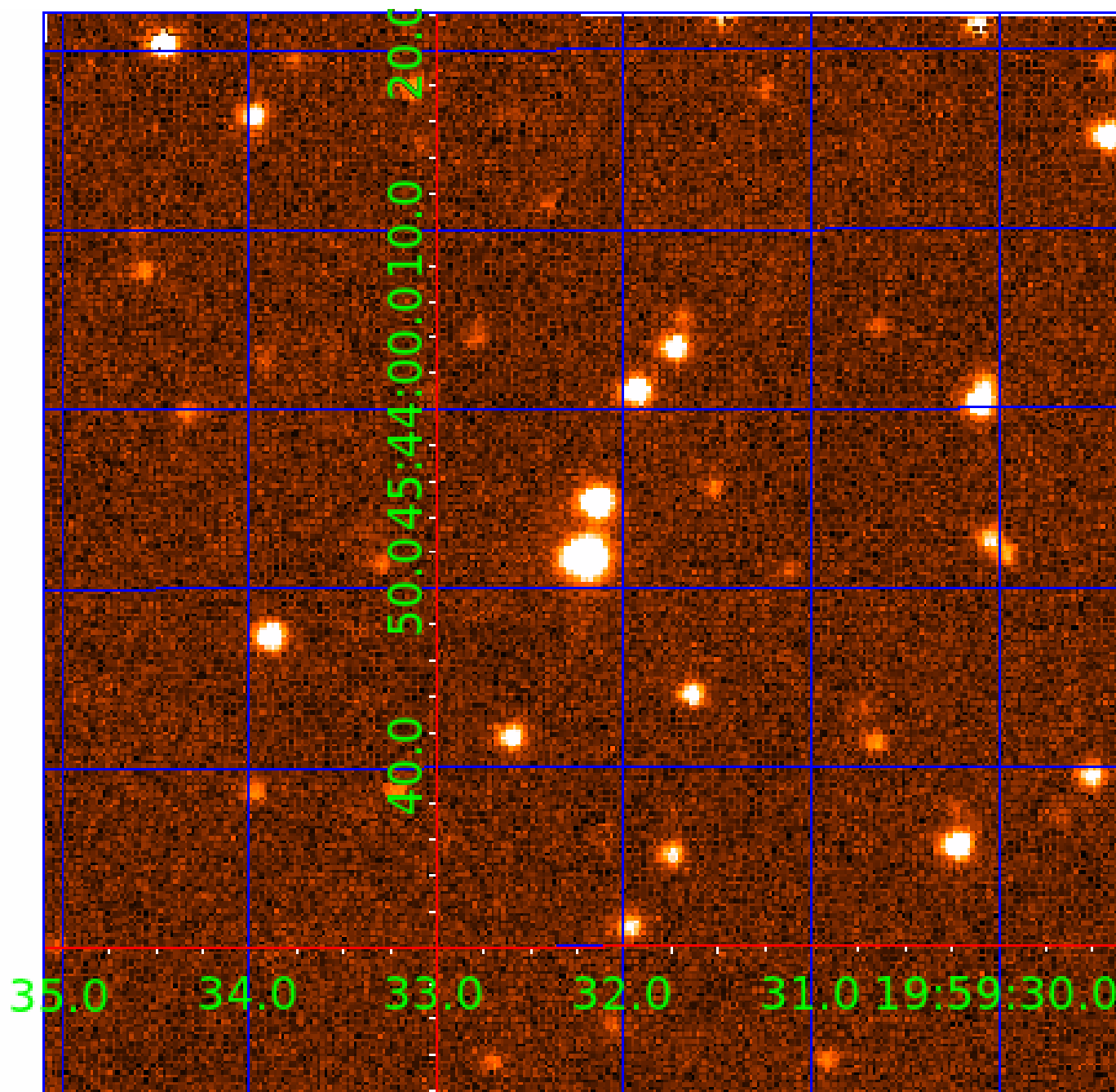


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009305136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009305136-01	OBS	No	2.856561	133.084044	54.2	18.894	9.6	12.2	0.67	5017	0.49	201.09
009305136-02	OBS	No	168.333018	289.490966	459.5	25.978	13.0	8.5	0.67	5017	1.48	0.88
009305136-03	OBS	No	126.747662	222.993463	489.2	10.773	12.1	8.8	0.67	5017	1.78	1.28
009305136-04	OBS	No	165.776208	288.185175	406.7	15.245	9.5	8.6	0.67	5017	1.50	0.90
009305136-05	OBS	No	84.931002	151.570416	902.2	1.789	8.6	8.9	0.67	5017	2.40	2.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009305136-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_KIC_POS—HALO_GHOST
009305136-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009305136-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305136-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009305136-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

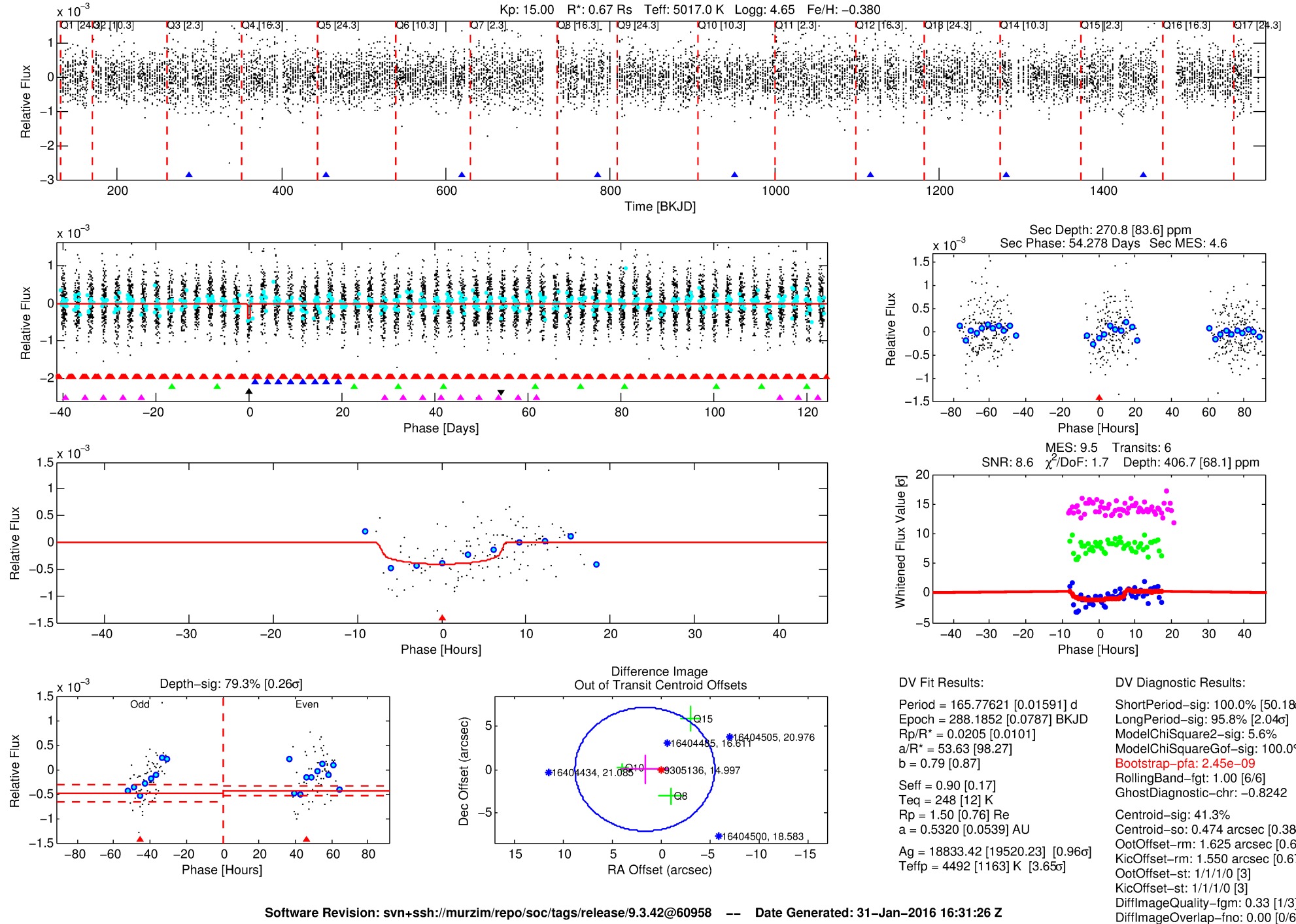
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009305136-04

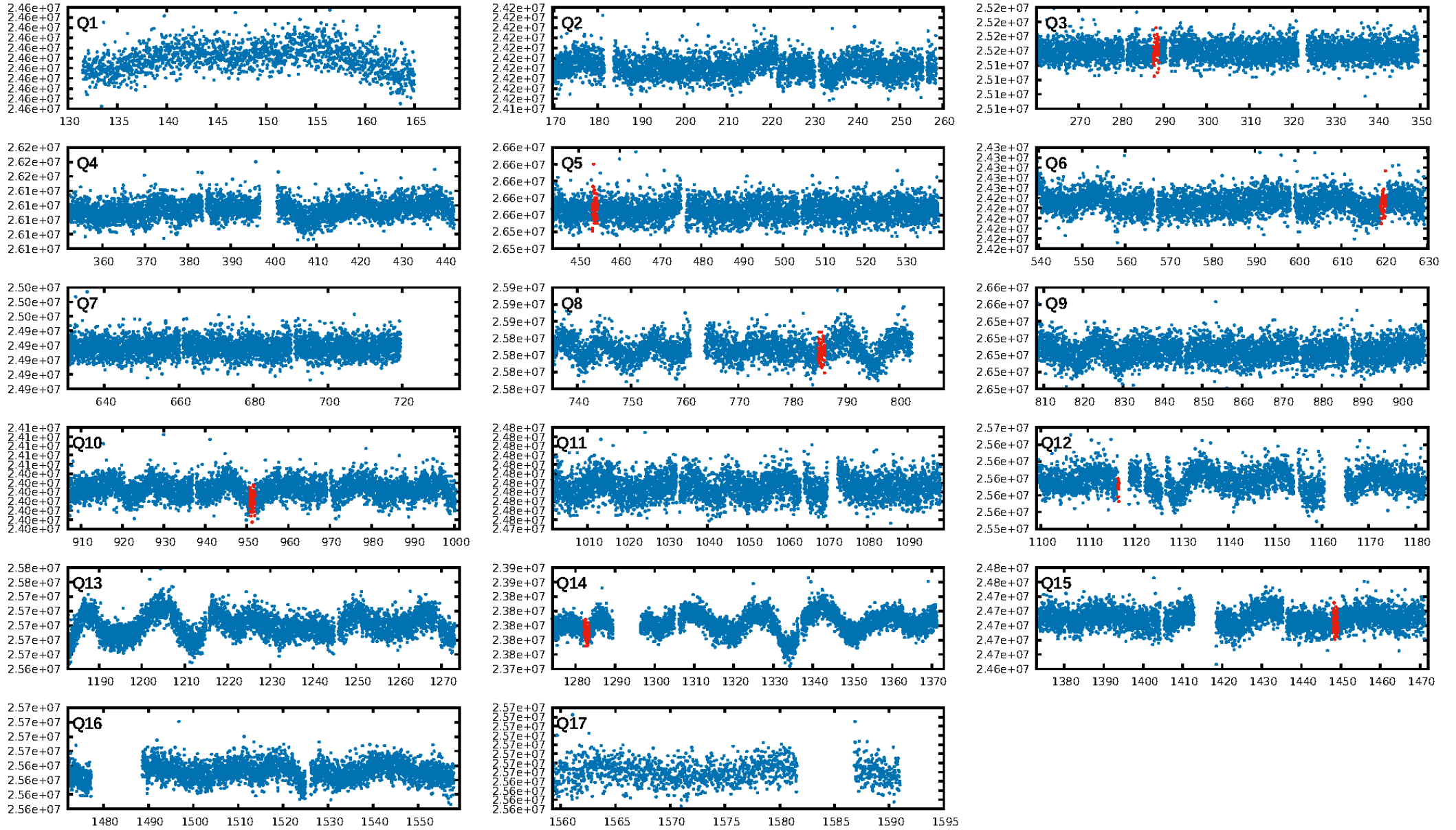
No Significant Match Found

# DV One-Page Summary

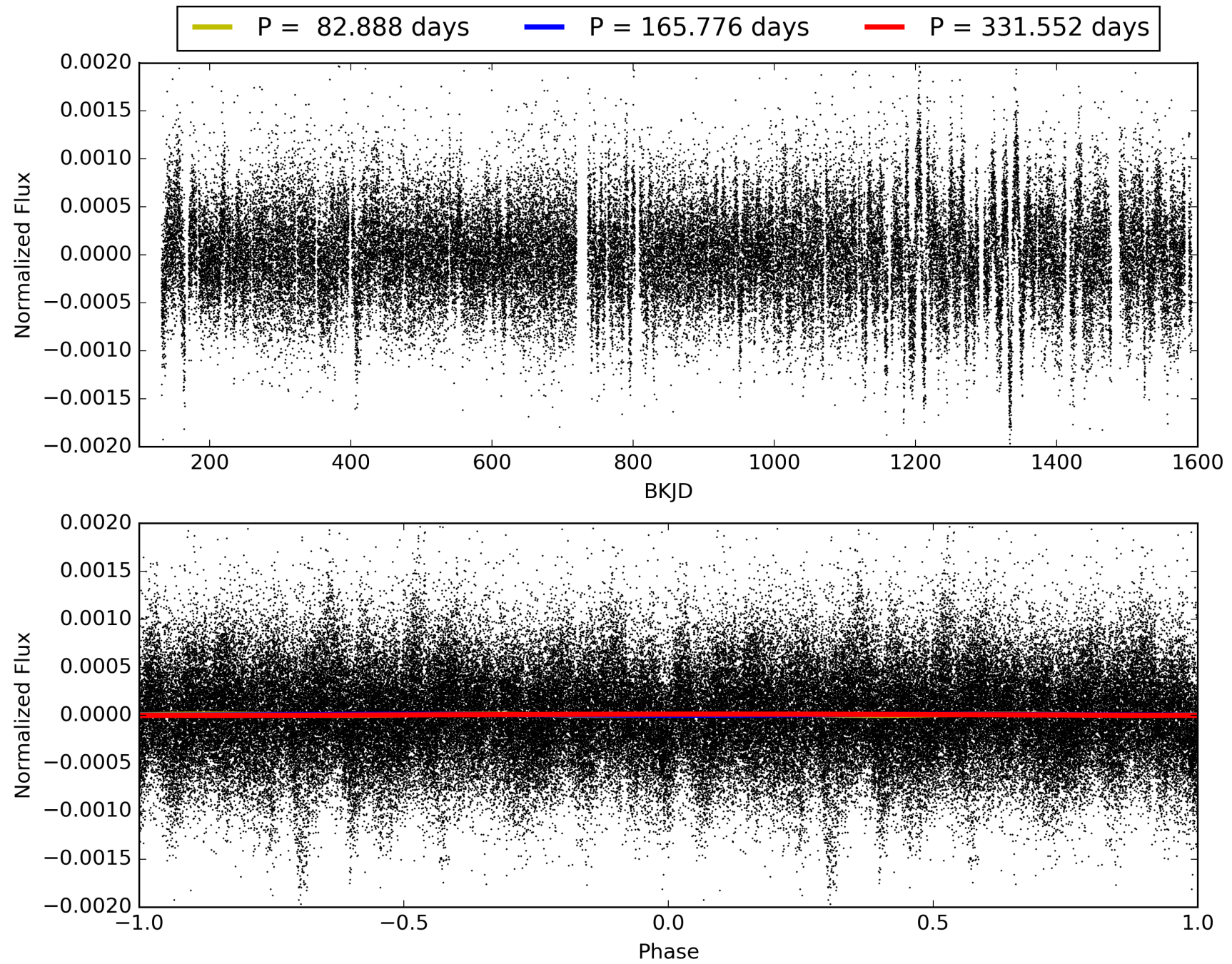
KIC: 9305136 Candidate: 4 of 5 Period: 165.776 d



# TCE 009305136-04, PDC Light Curves

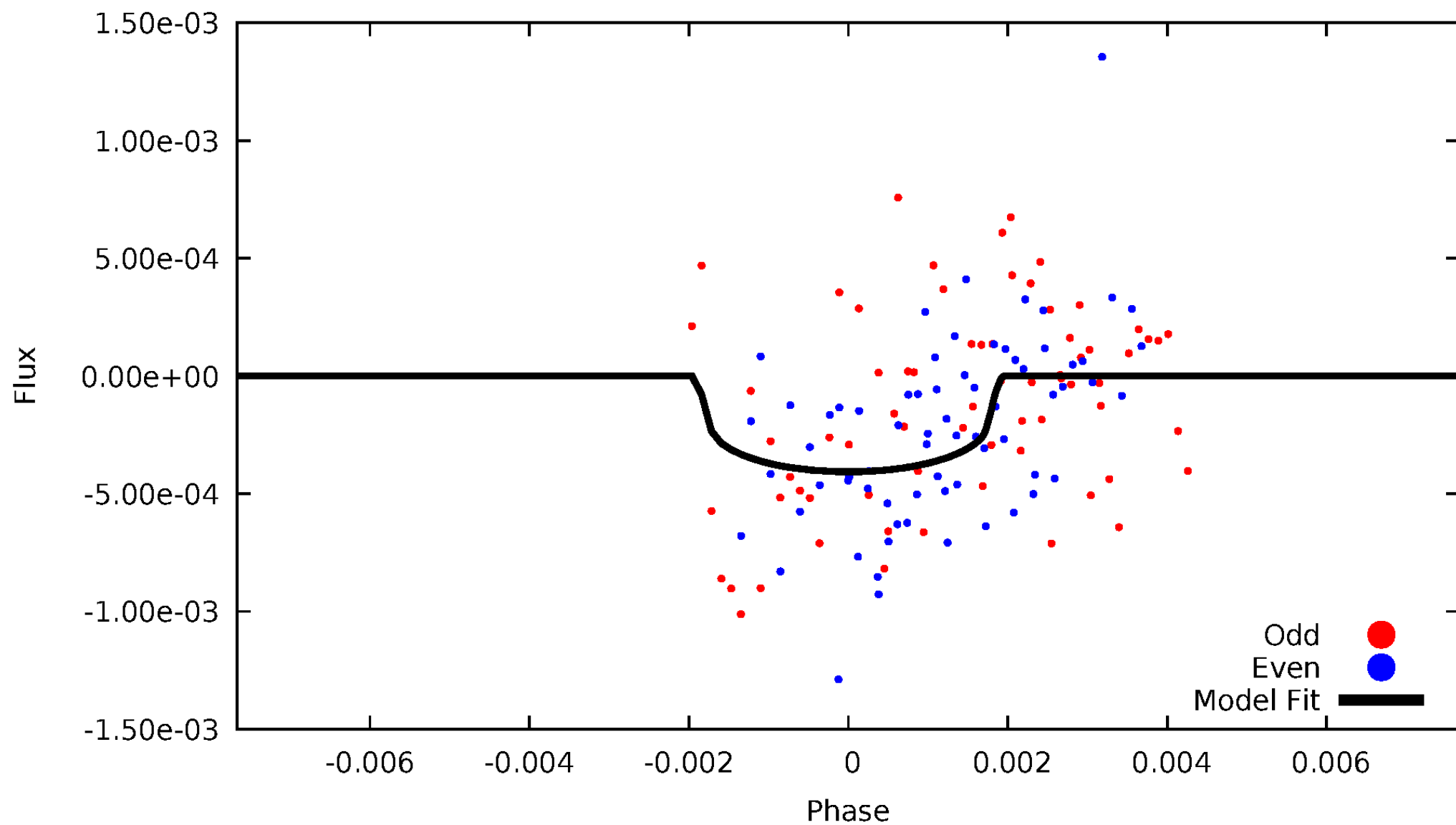


TCE 009305136-04



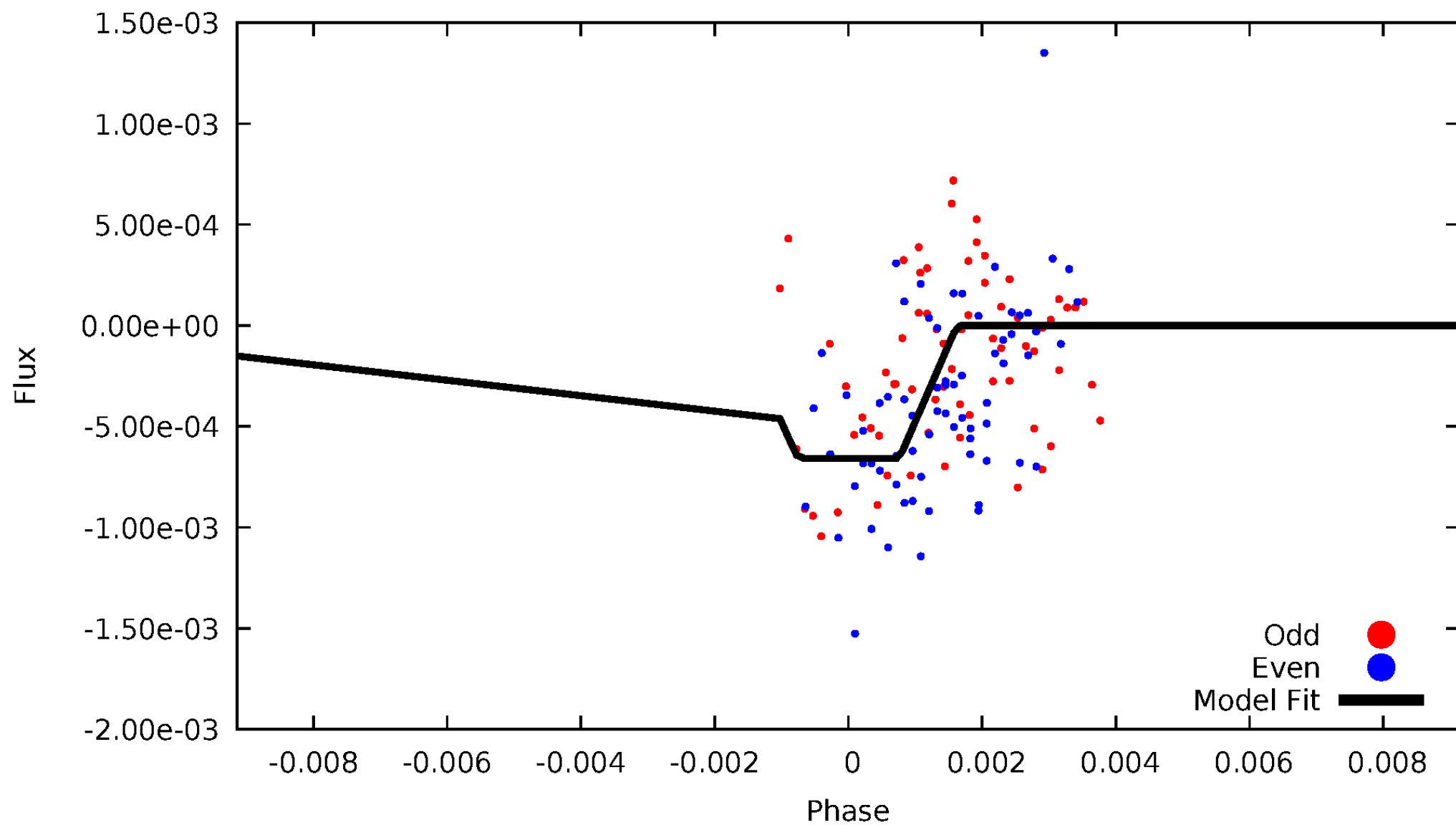
# DV Odd/Even

TCE 009305136-04



# ALT Odd/Even

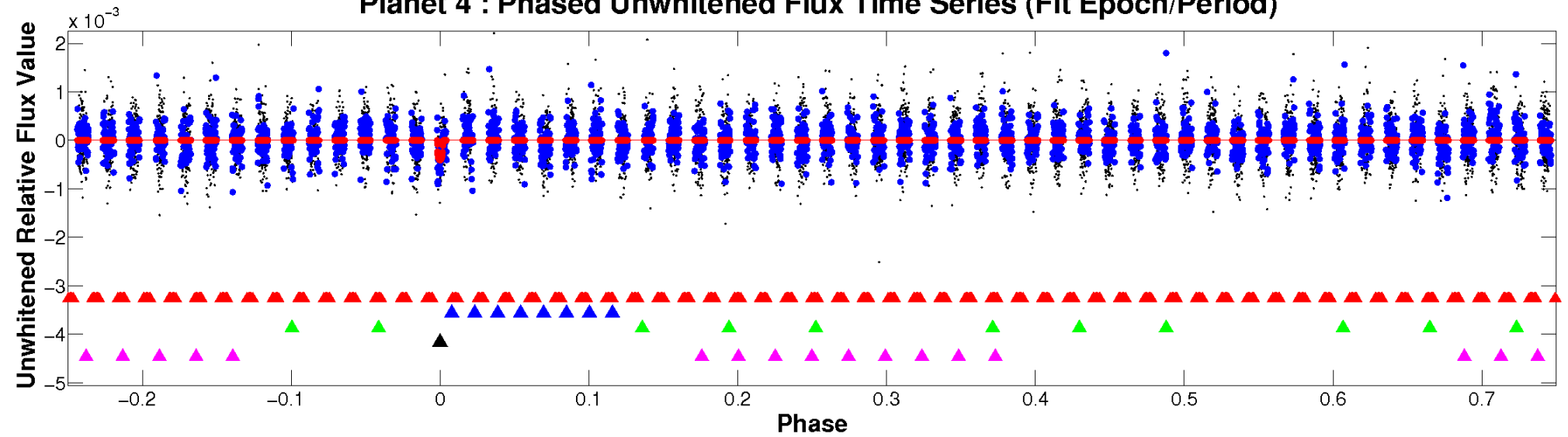
TCE 009305136-04



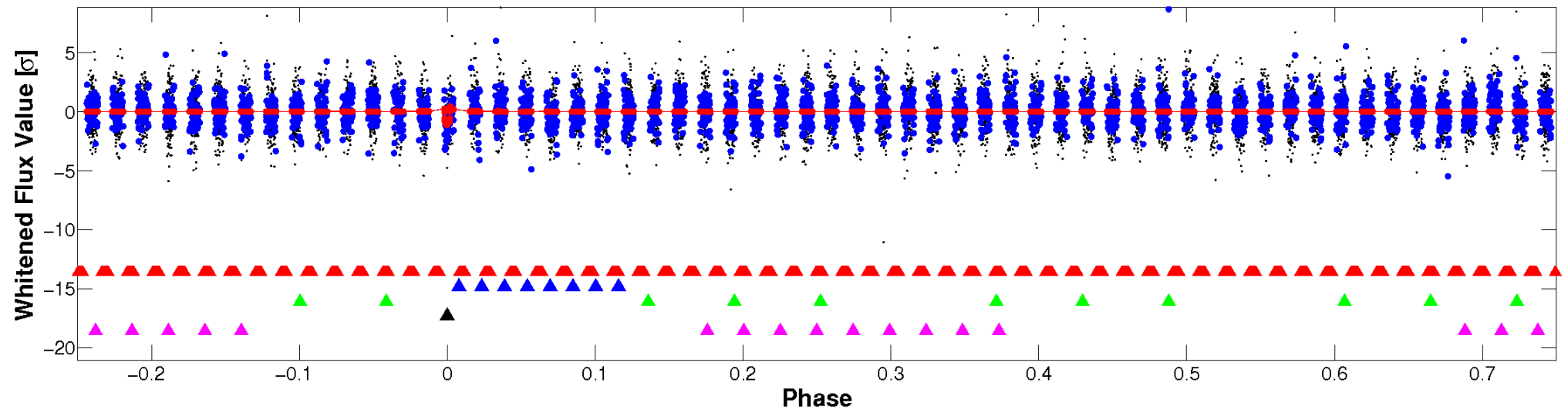


# Non-Whitened Vs. Whitened Light Curve

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

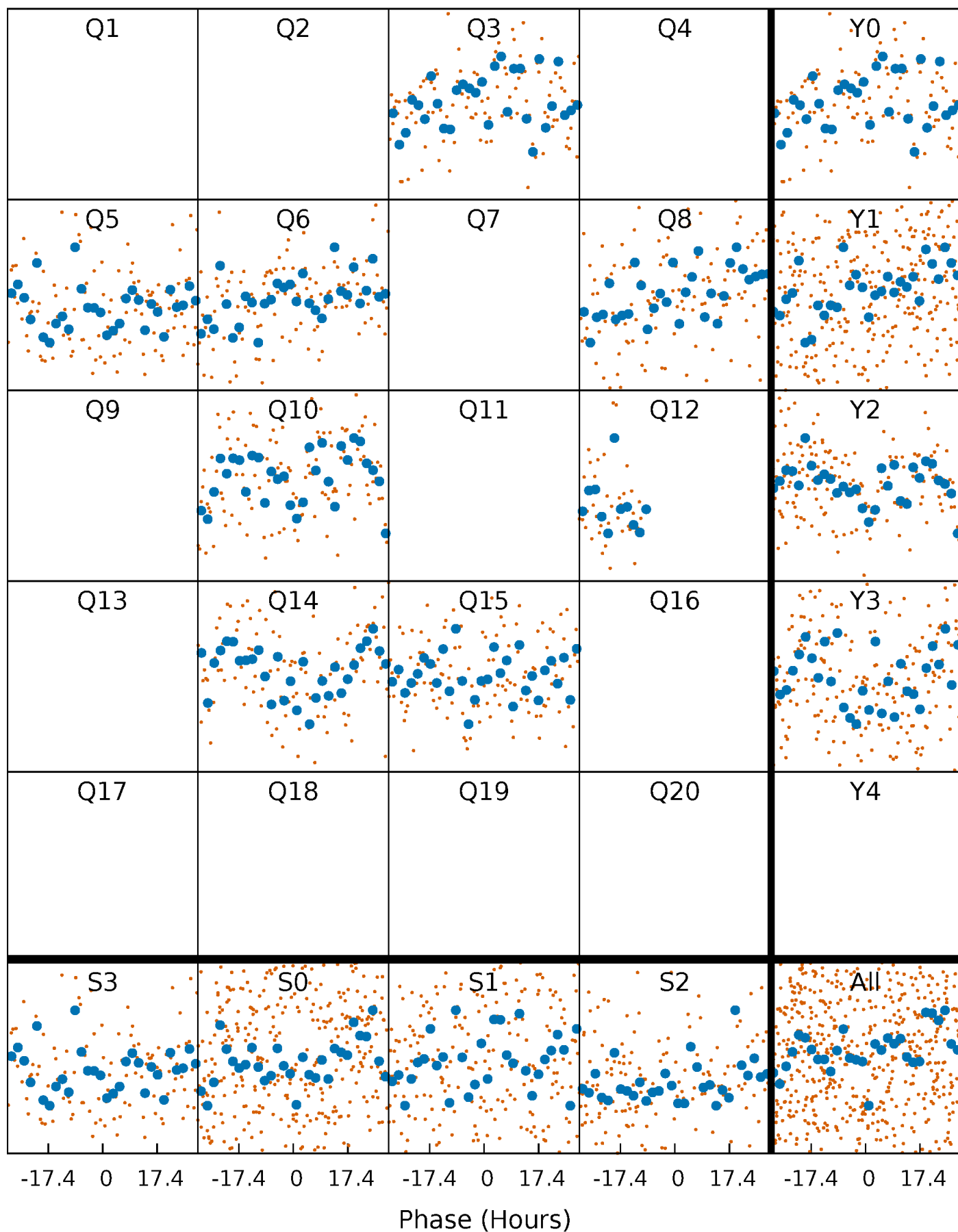


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



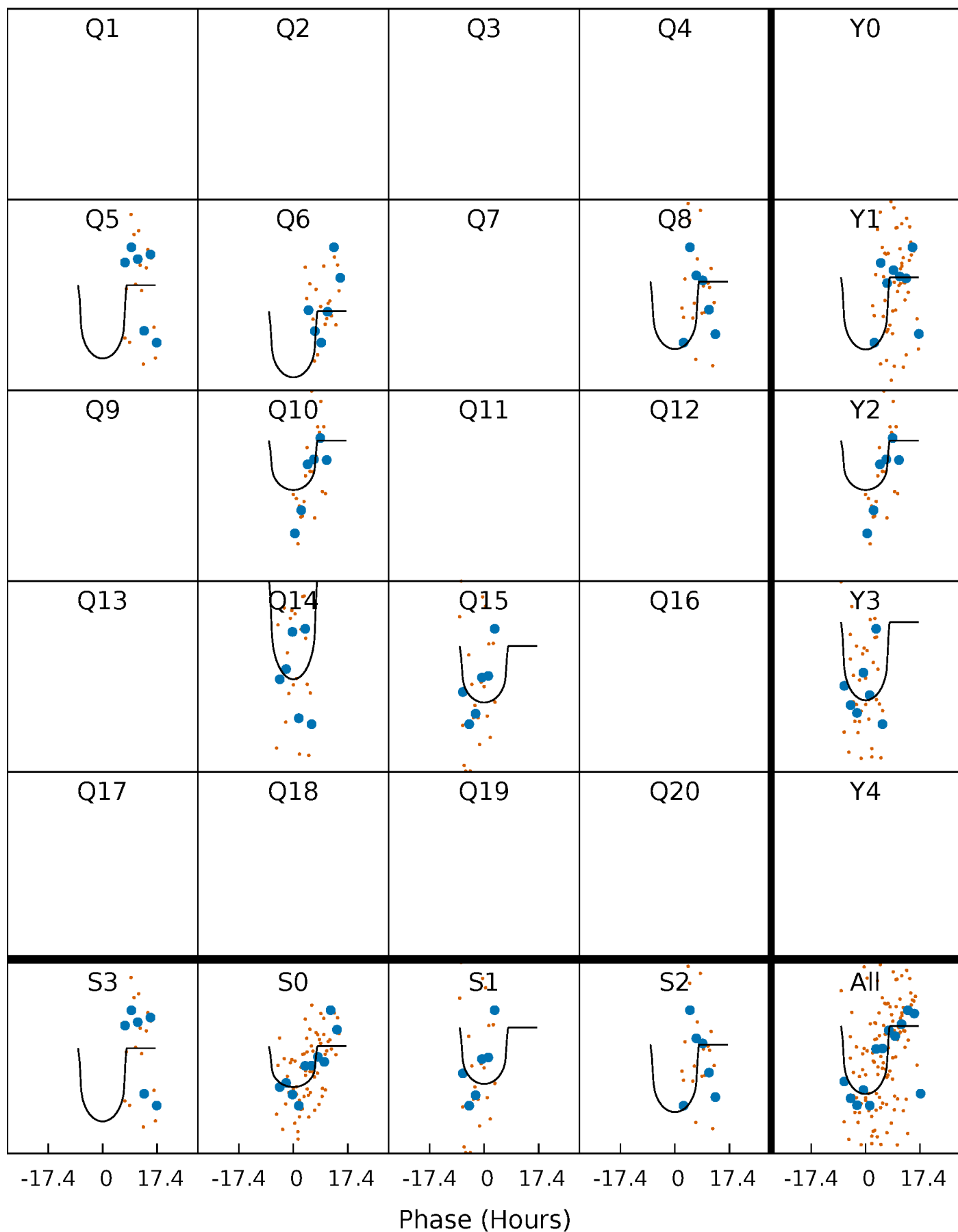
# PDC Quarter-Phased Transit Curves

TCE 009305136-04   P=165.776208 Days    $T_0=288.185175$  (BKJD)



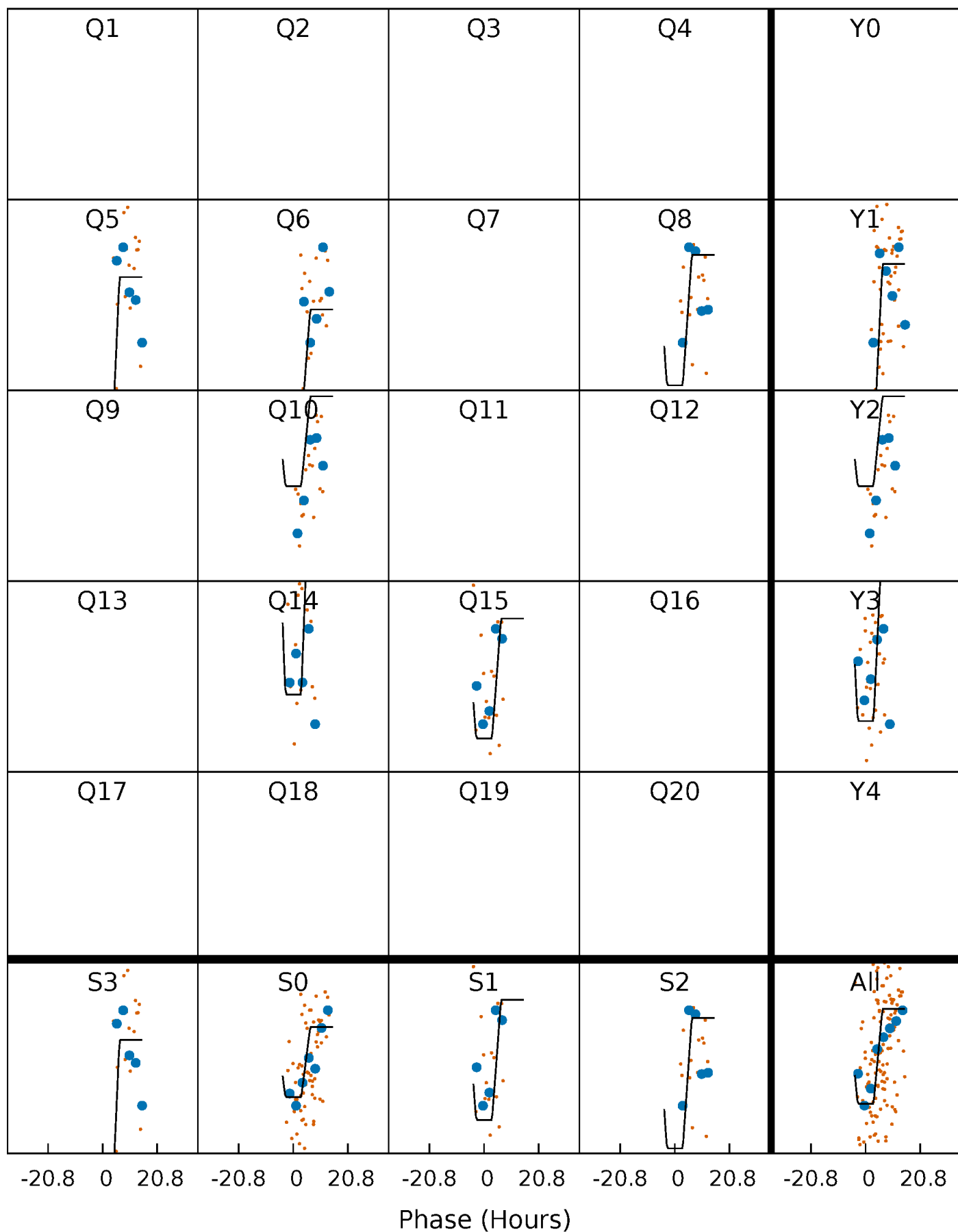
# DV Quarter-Phased Transit Curves

TCE 009305136-04 P=165.776208 Days  $T_0=288.185175$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

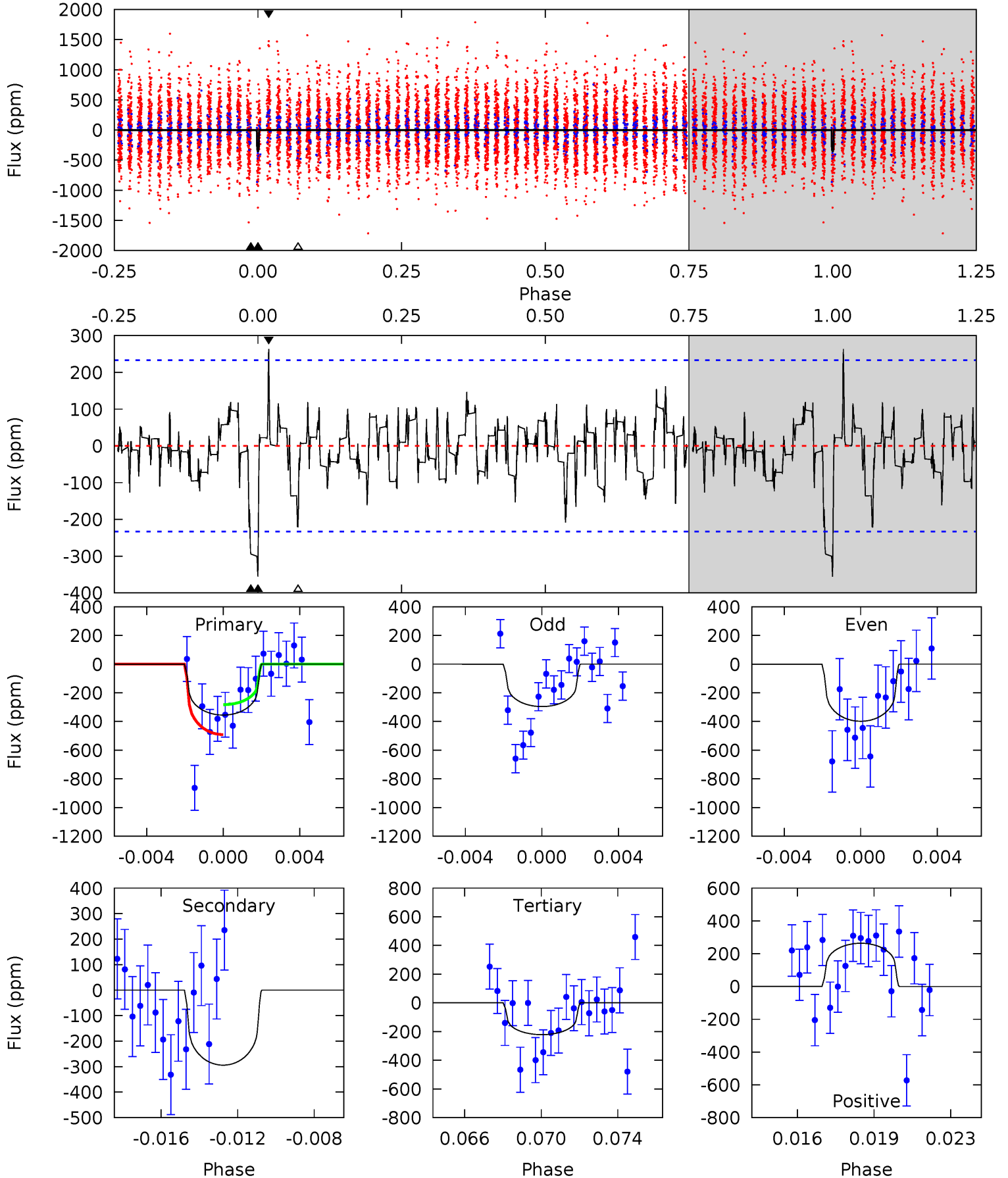
TCE 009305136-04 P=165.736605 Days  $T_0=288.306206$  (BKJD)



# DV Model-Shift Uniqueness Test

009305136-04, P = 165.776208 Days, E = 122.408967 Days

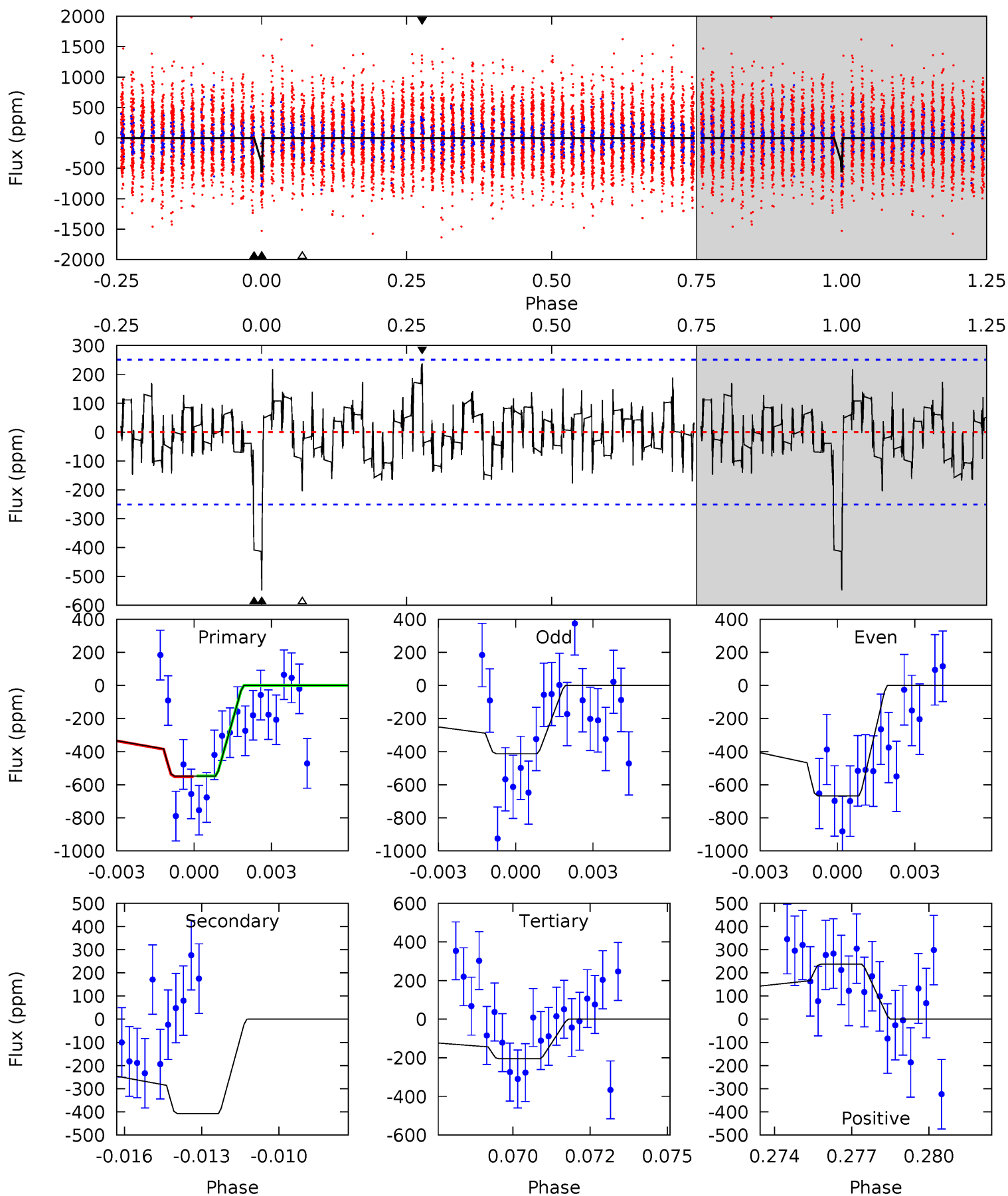
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.94	6.57	4.95	5.89	5.21	2.89	1.49	2.99	2.05	1.62	0.69	1.13	0.86	0.43	2.15



# Alt Model-Shift Uniqueness Test

009305136-04, P = 165.736605 Days, E = 122.569601 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
11.5	8.58	4.31	4.99	5.28	3.01	1.46	7.22	6.54	4.27	3.60	2.68	1.02	0.30	0.03





### Stellar Parameters For KIC 009305136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5017^{+166}_{-166}$	$4.652^{+0.030}_{-0.070}$	$-0.380^{+0.300}_{-0.300}$	$0.668^{+0.086}_{-0.050}$	$0.739^{+0.071}_{-0.078}$	$3.493^{+0.490}_{-0.866}$
	+3%/-3%	+1%/-2%	+79%/-79%	+13%/-7%	+10%/-11%	+14%/-25%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009305136-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-294 \pm 45$	$1.59^{+0.69}_{-0.73}$	$350^{+15}_{-13}$	$4605^{+1397}_{-650}$	$18205^{+42103}_{-9750}$
Alt.	$-408 \pm 48$	$1.91^{+0.72}_{-0.76}$	$350^{+14}_{-13}$	$4583^{+1080}_{-585}$	$17921^{+31470}_{-8889}$

$T_{\text{max}}$  = 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

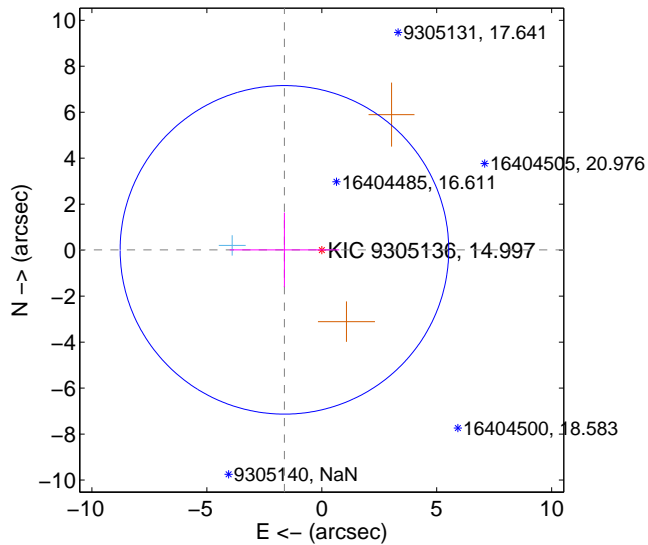
Supplemental centroid analysis for 009305136-04. Kepler magnitude: 15.00. Transit SNR 8.58

There are 1 quarters with good PRF difference image offsets

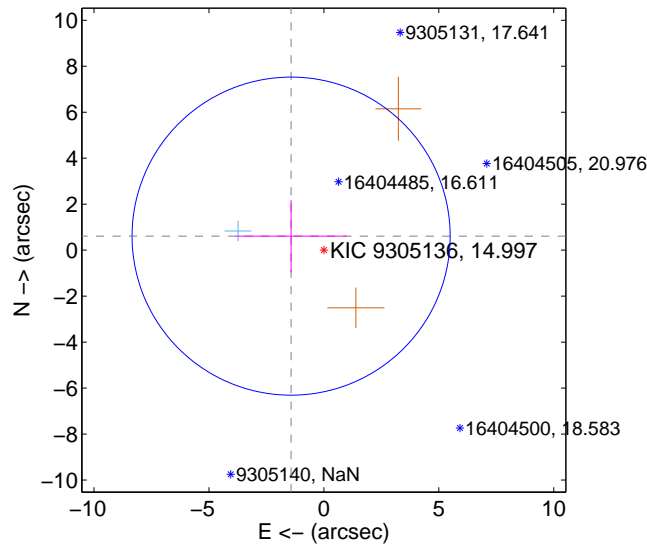
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.625 \pm 2.382$	0.68	$1.624 \pm 2.382$	$0.014 \pm 1.622$
PRF-fit source offset from KIC position	$1.550 \pm 2.306$	0.67	$1.425 \pm 2.417$	$0.611 \pm 1.562$
photometric centroid source offset	$0.47 \pm 1.26$	0.38	$0.46 \pm 1.26$	$-0.11 \pm 1.21$

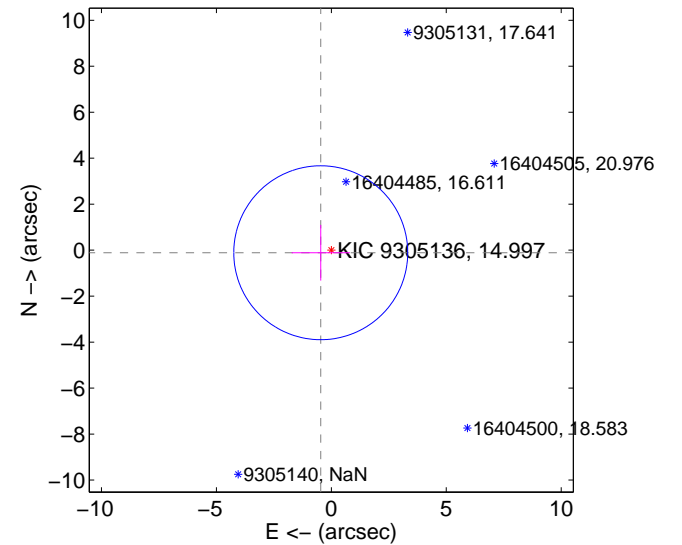
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



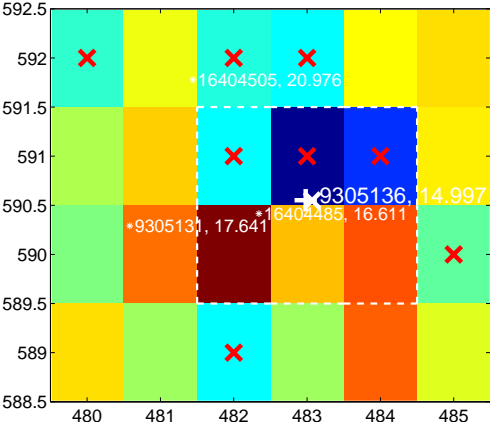
Q2 no difference image



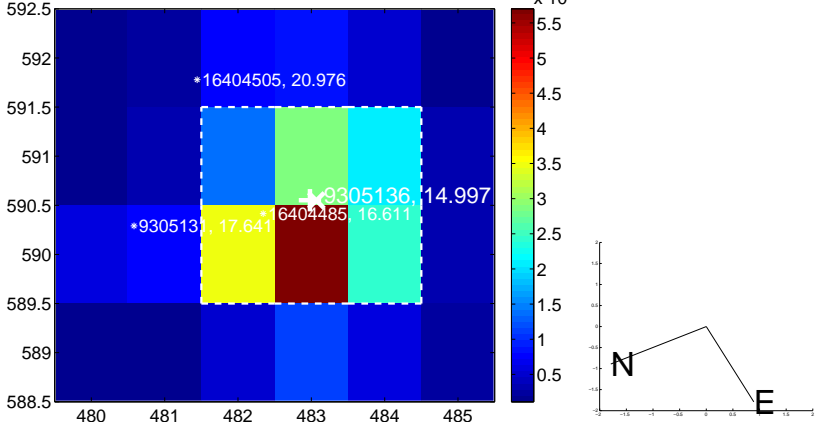
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



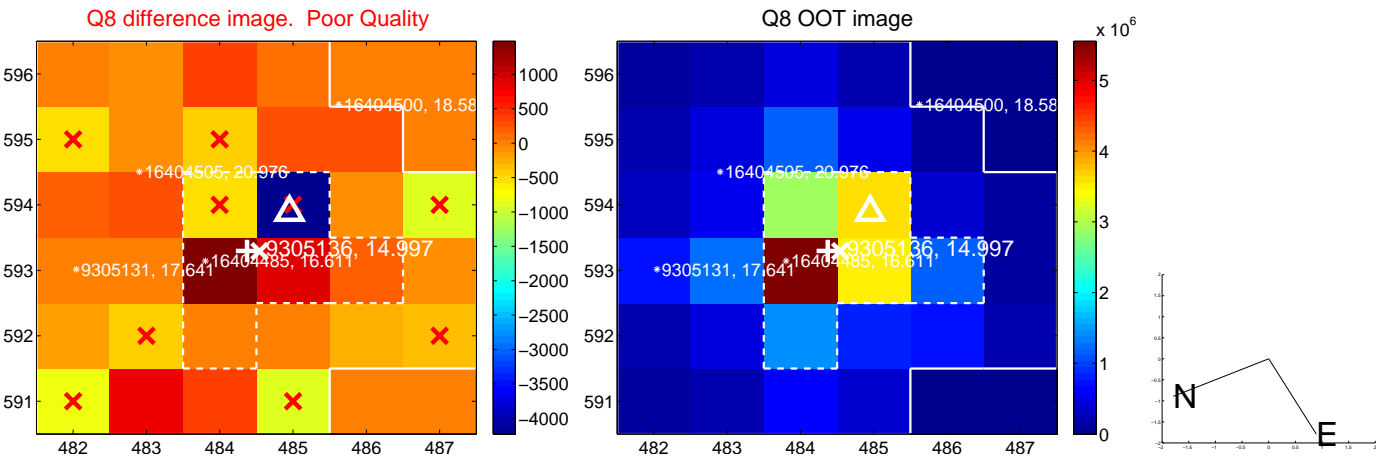
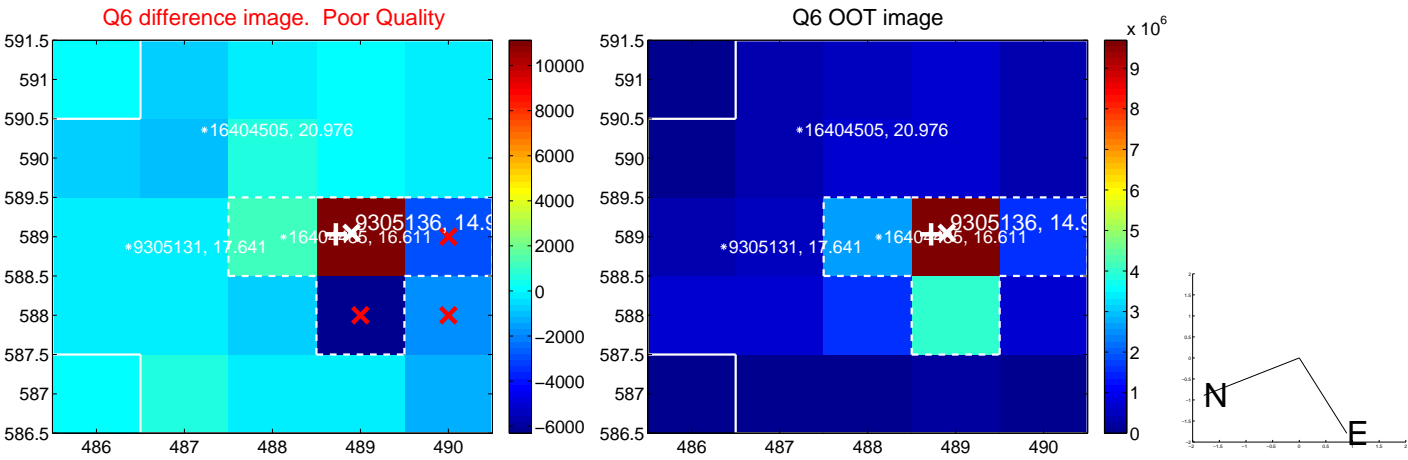
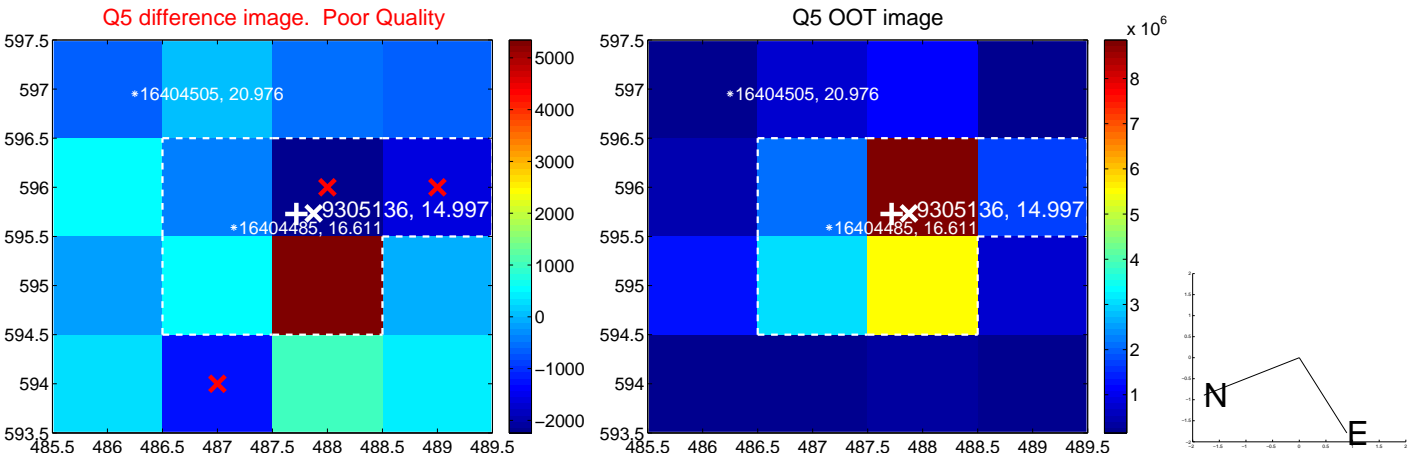
Q4 no difference image



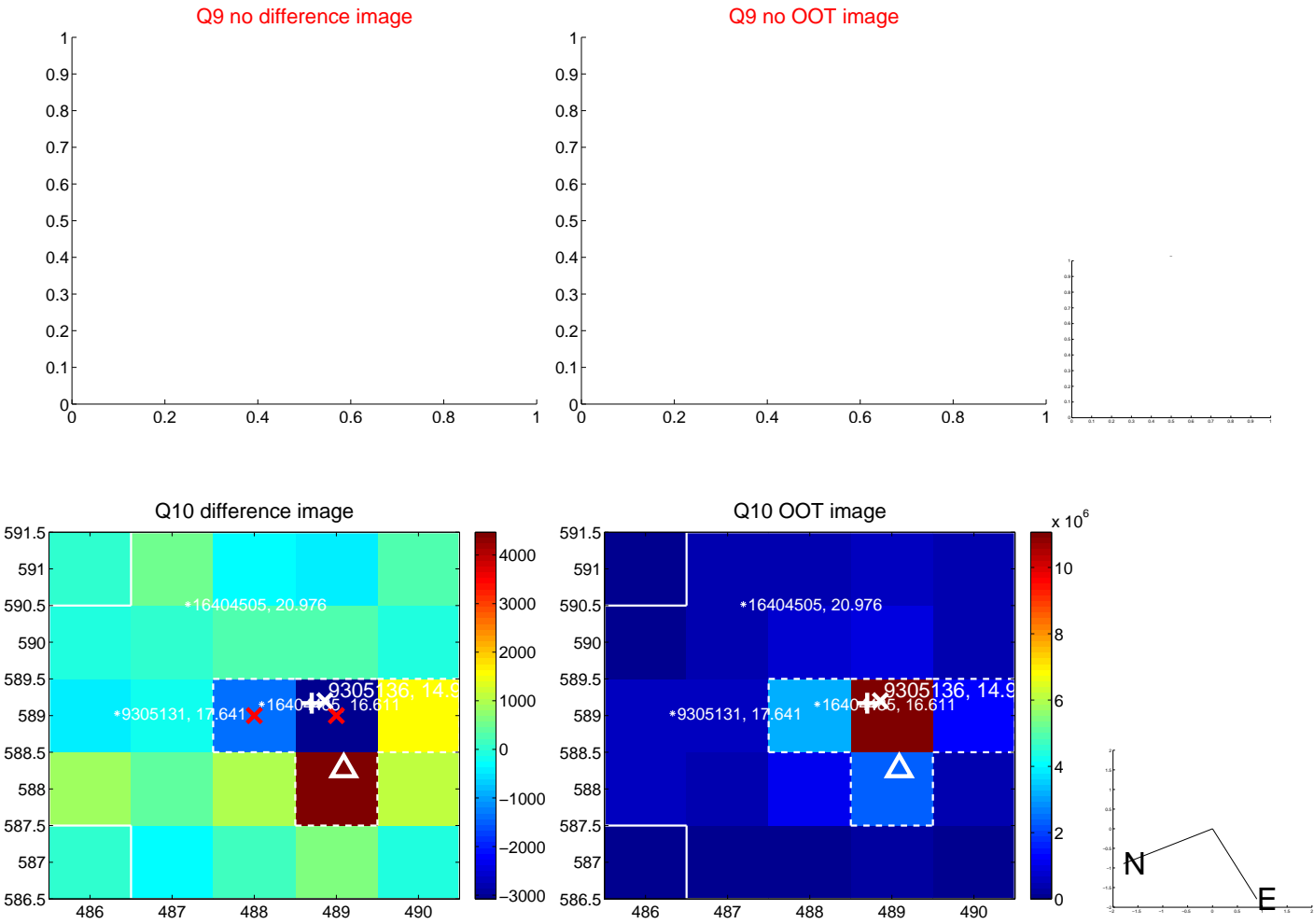
Q4 no OOT image



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



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



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

Q13 no difference image



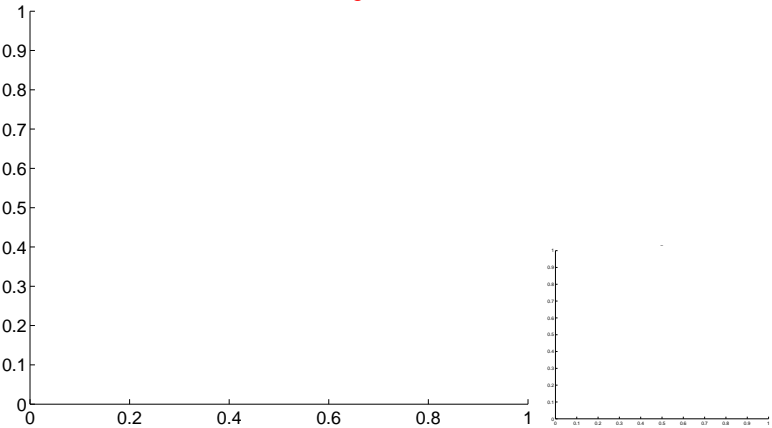
Q13 no OOT image



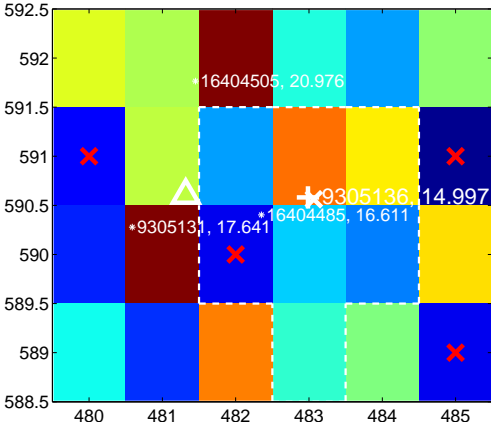
Q14 no difference image



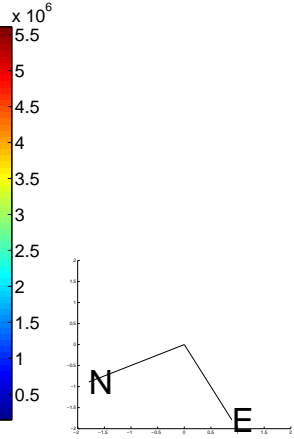
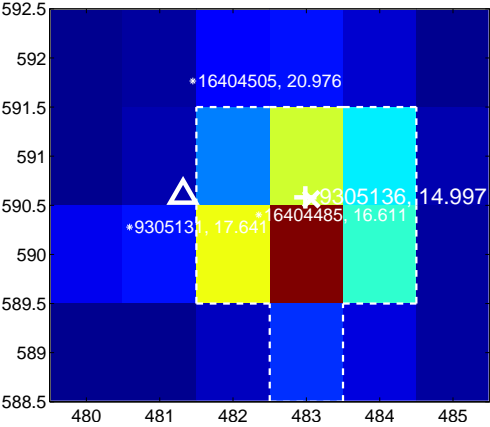
Q14 no OOT image



Q15 difference image. Poor Quality



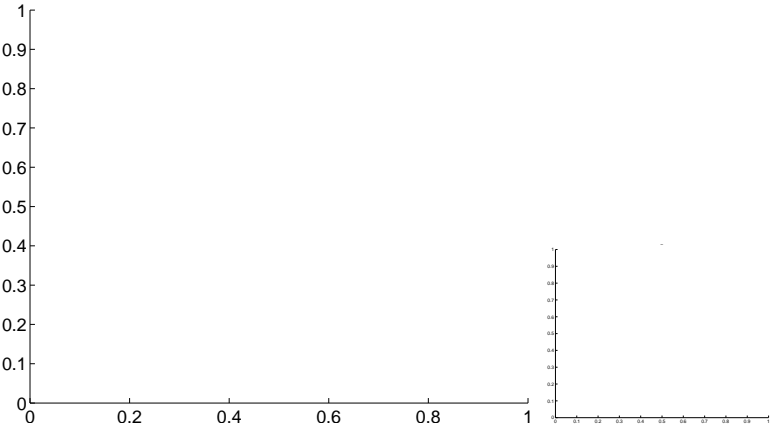
Q15 OOT image



Q16 no difference image

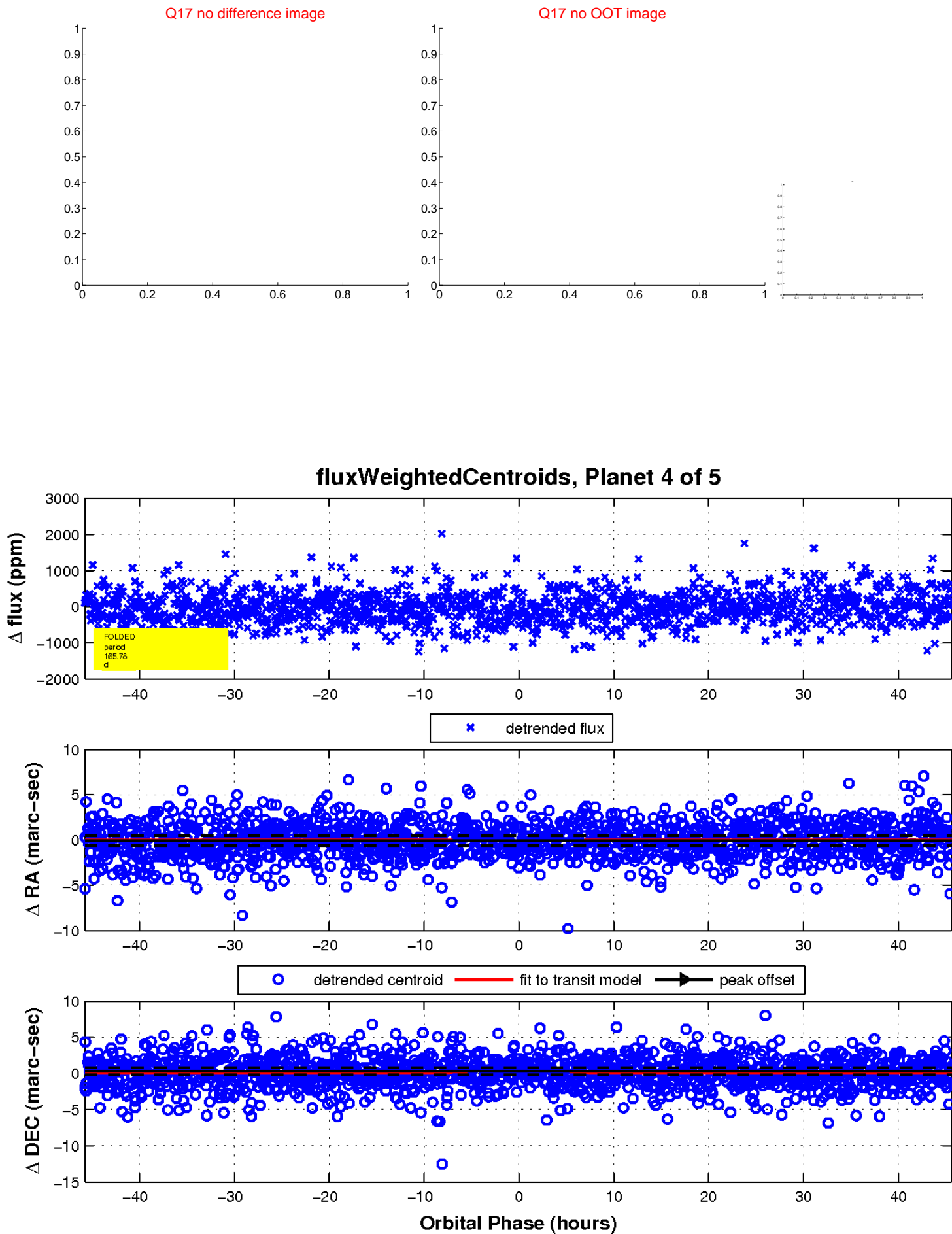


Q16 no OOT image



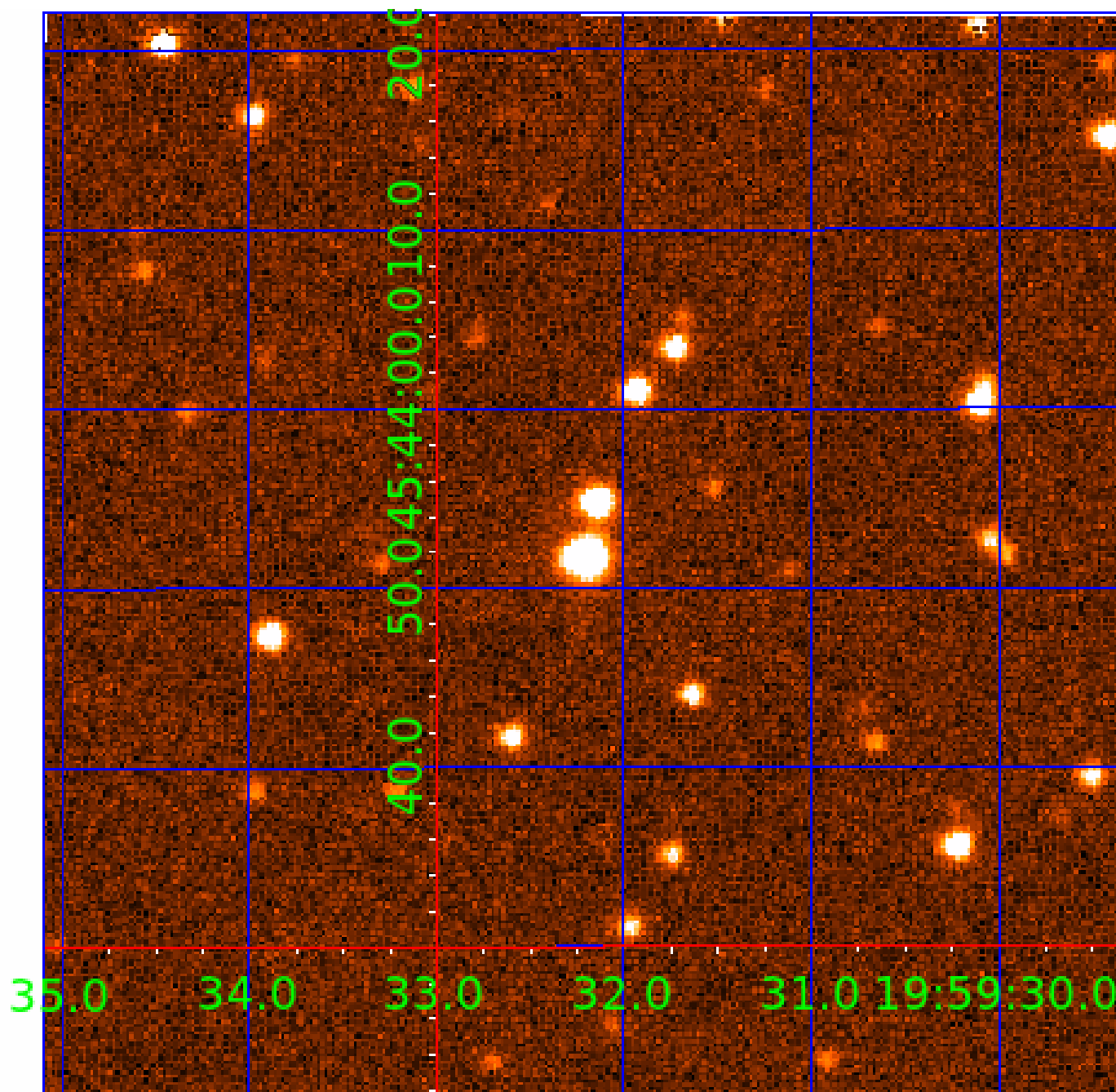


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009305136

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009305136-01	OBS	No	2.856561	133.084044	54.2	18.894	9.6	12.2	0.67	5017	0.49	201.09
009305136-02	OBS	No	168.333018	289.490966	459.5	25.978	13.0	8.5	0.67	5017	1.48	0.88
009305136-03	OBS	No	126.747662	222.993463	489.2	10.773	12.1	8.8	0.67	5017	1.78	1.28
009305136-04	OBS	No	165.776208	288.185175	406.7	15.245	9.5	8.6	0.67	5017	1.50	0.90
009305136-05	OBS	No	84.931002	151.570416	902.2	1.789	8.6	8.9	0.67	5017	2.40	2.18

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009305136-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_KIC_POS—HALO_GHOST
009305136-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009305136-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009305136-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009305136-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

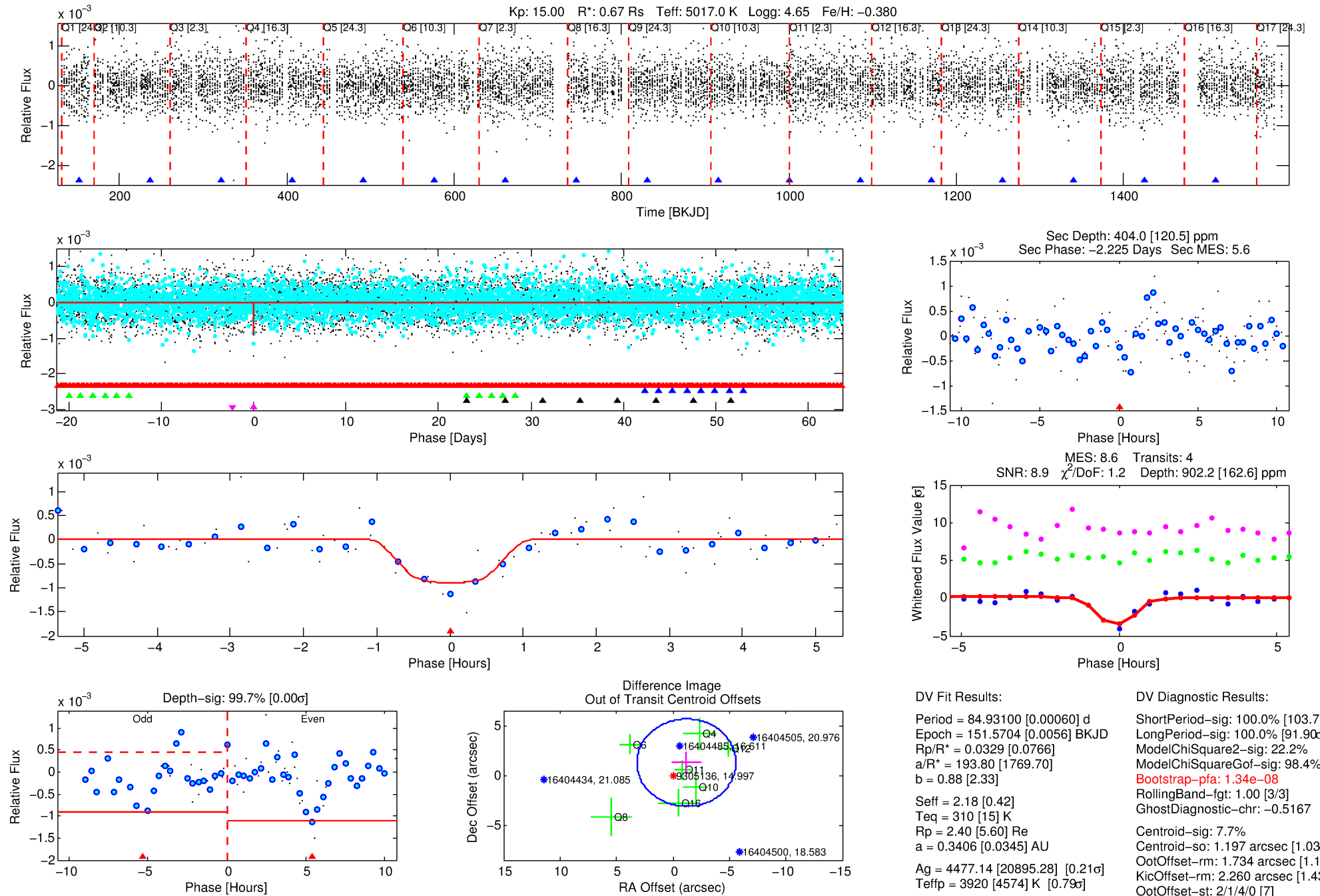
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009305136-05

No Significant Match Found

# DV One-Page Summary

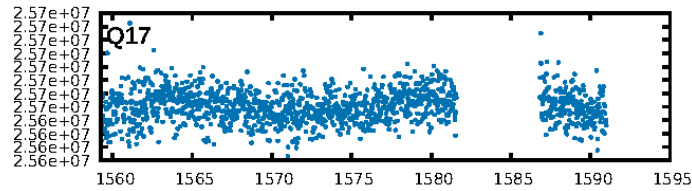
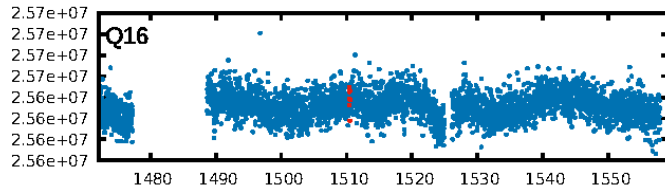
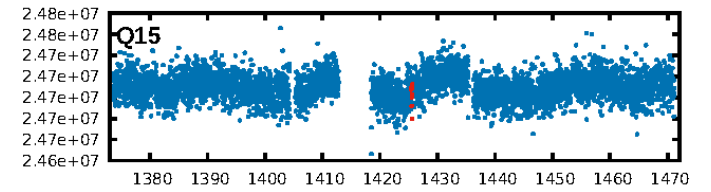
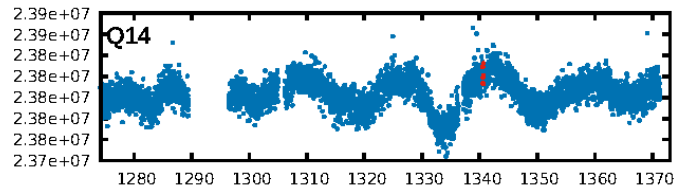
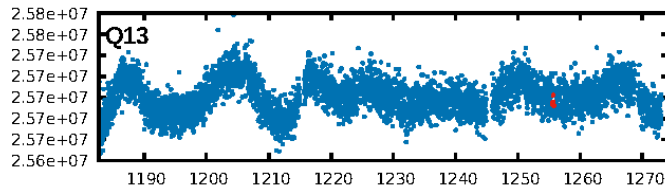
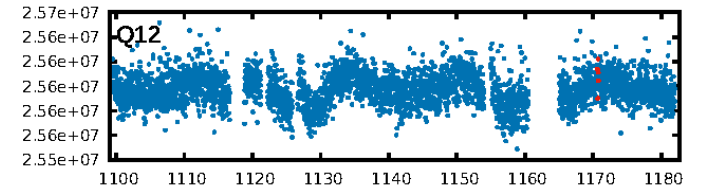
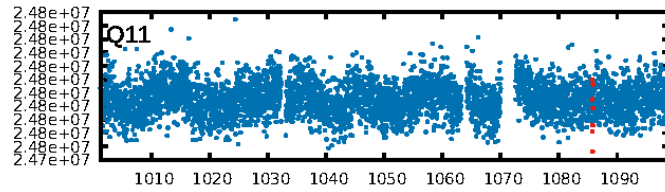
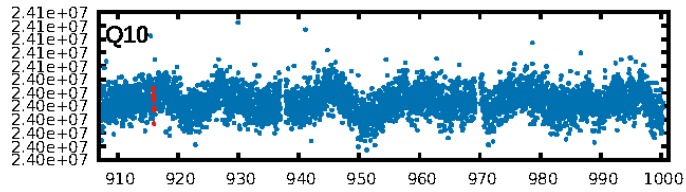
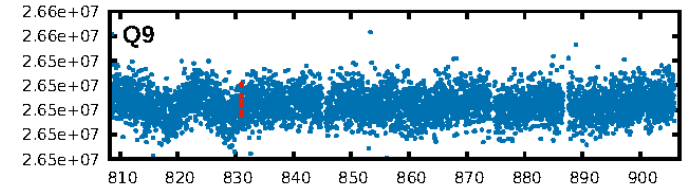
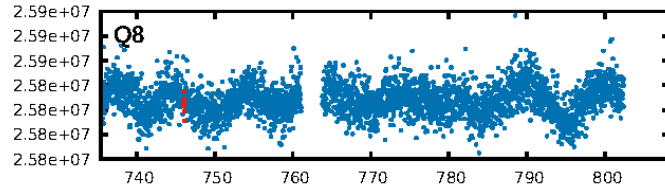
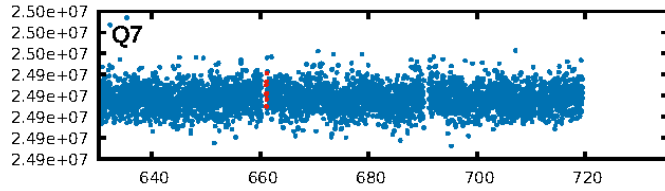
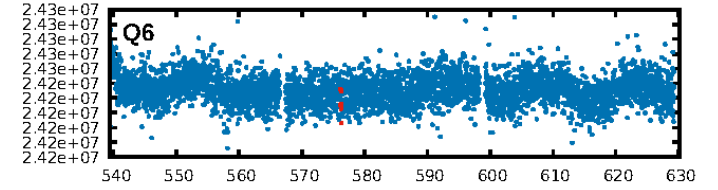
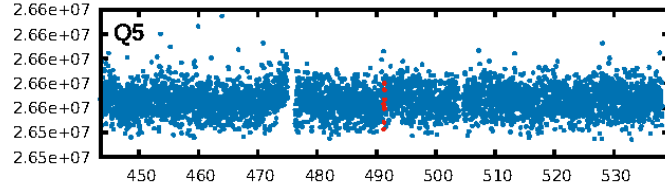
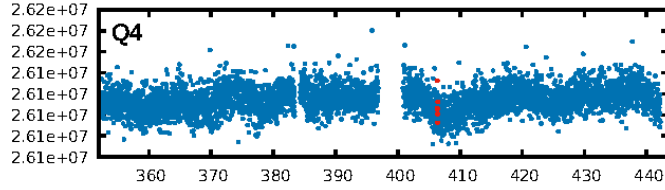
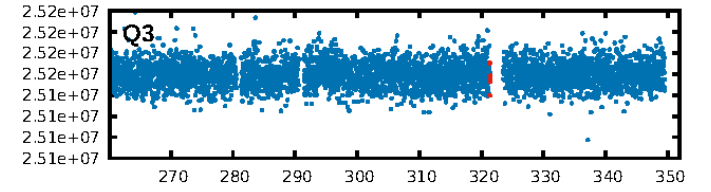
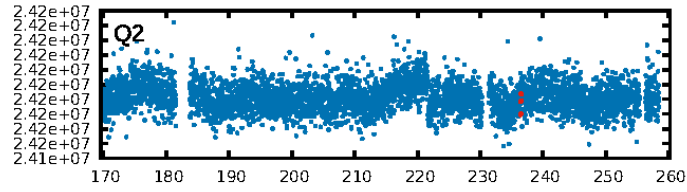
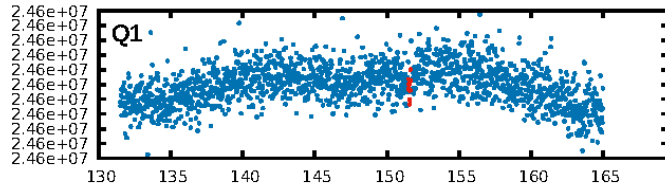
KIC: 9305136 Candidate: 5 of 5 Period: 84.931 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:31:30 Z

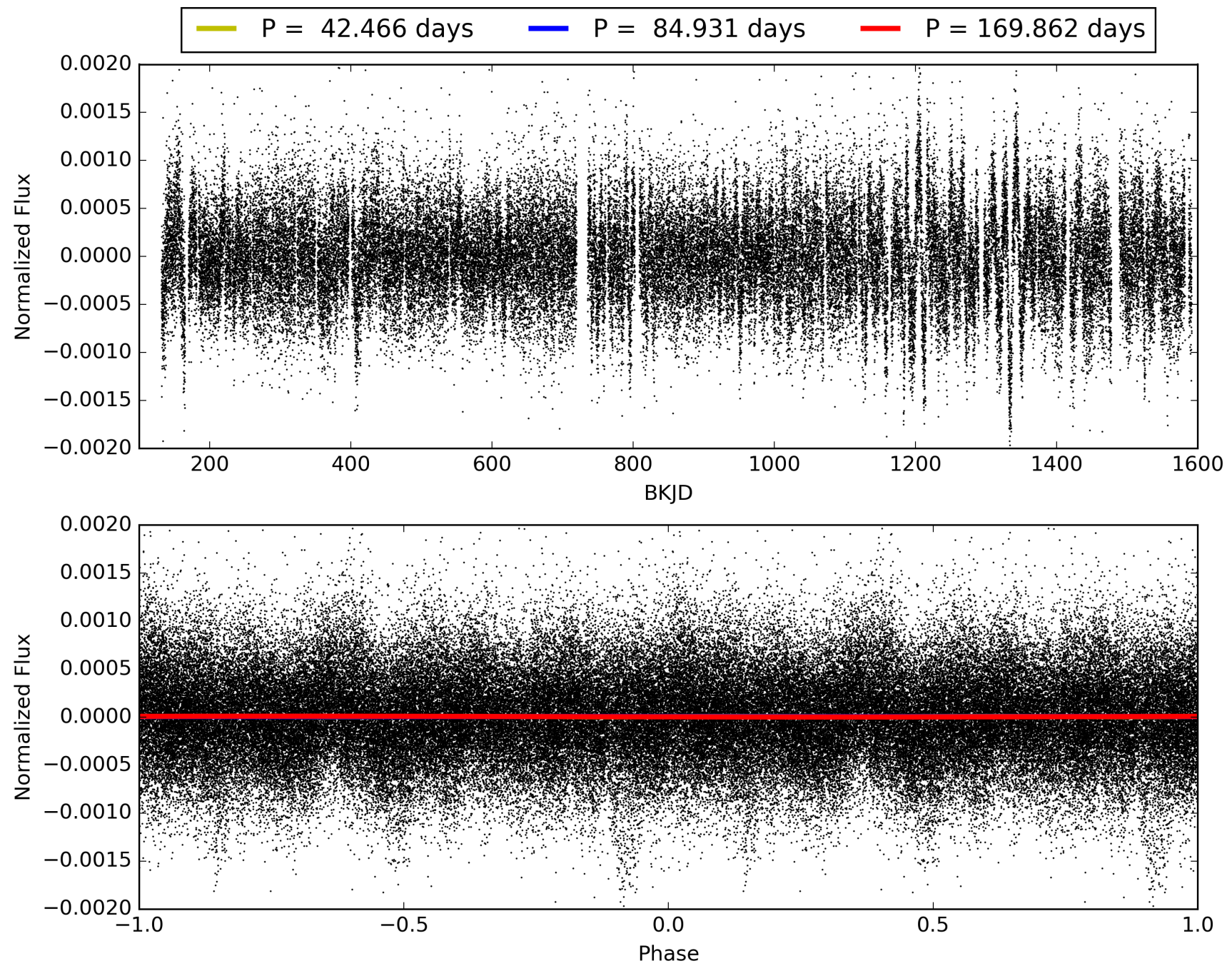
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009305136-05, PDC Light Curves



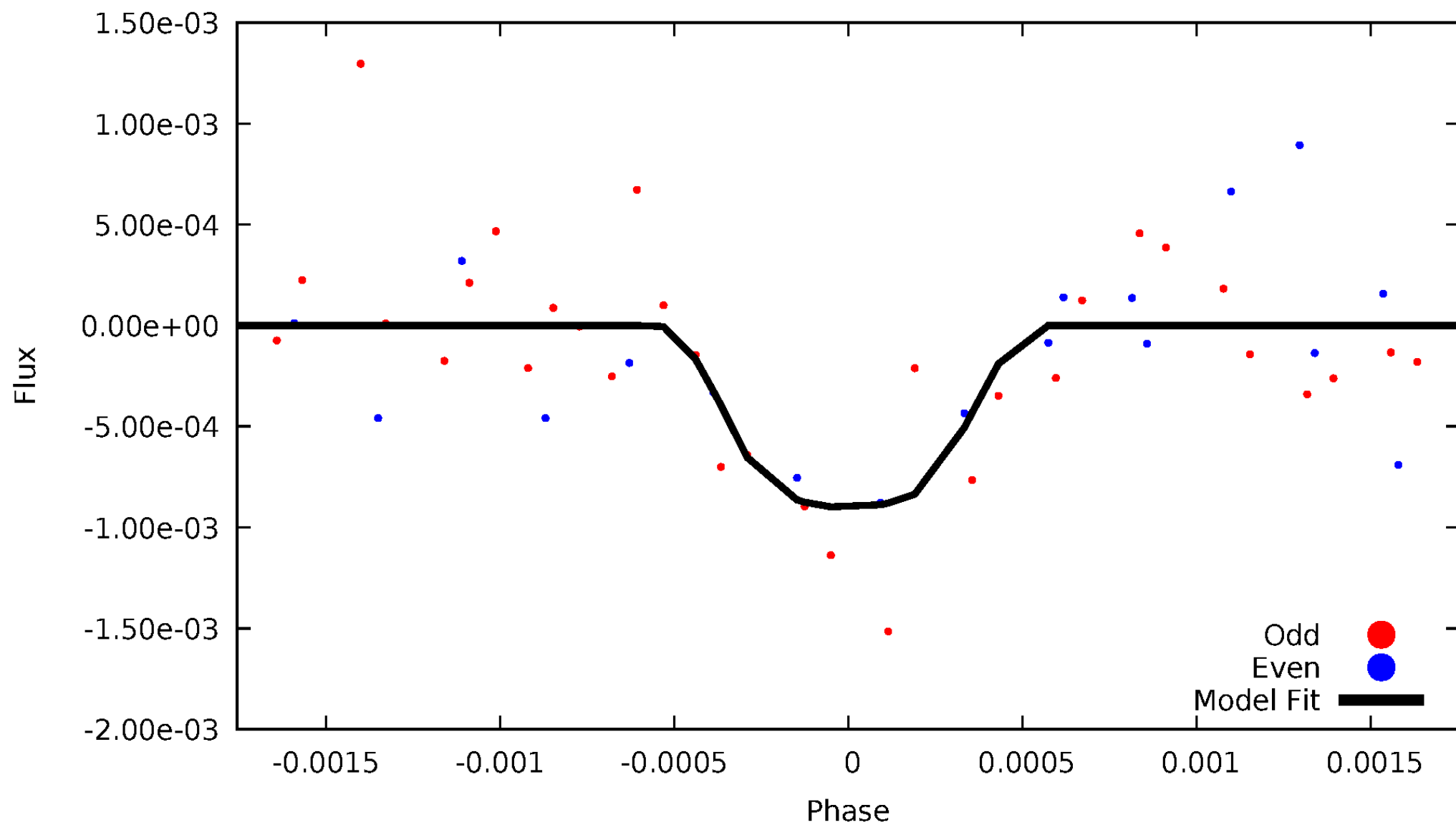


TCE 009305136-05



# DV Odd/Even

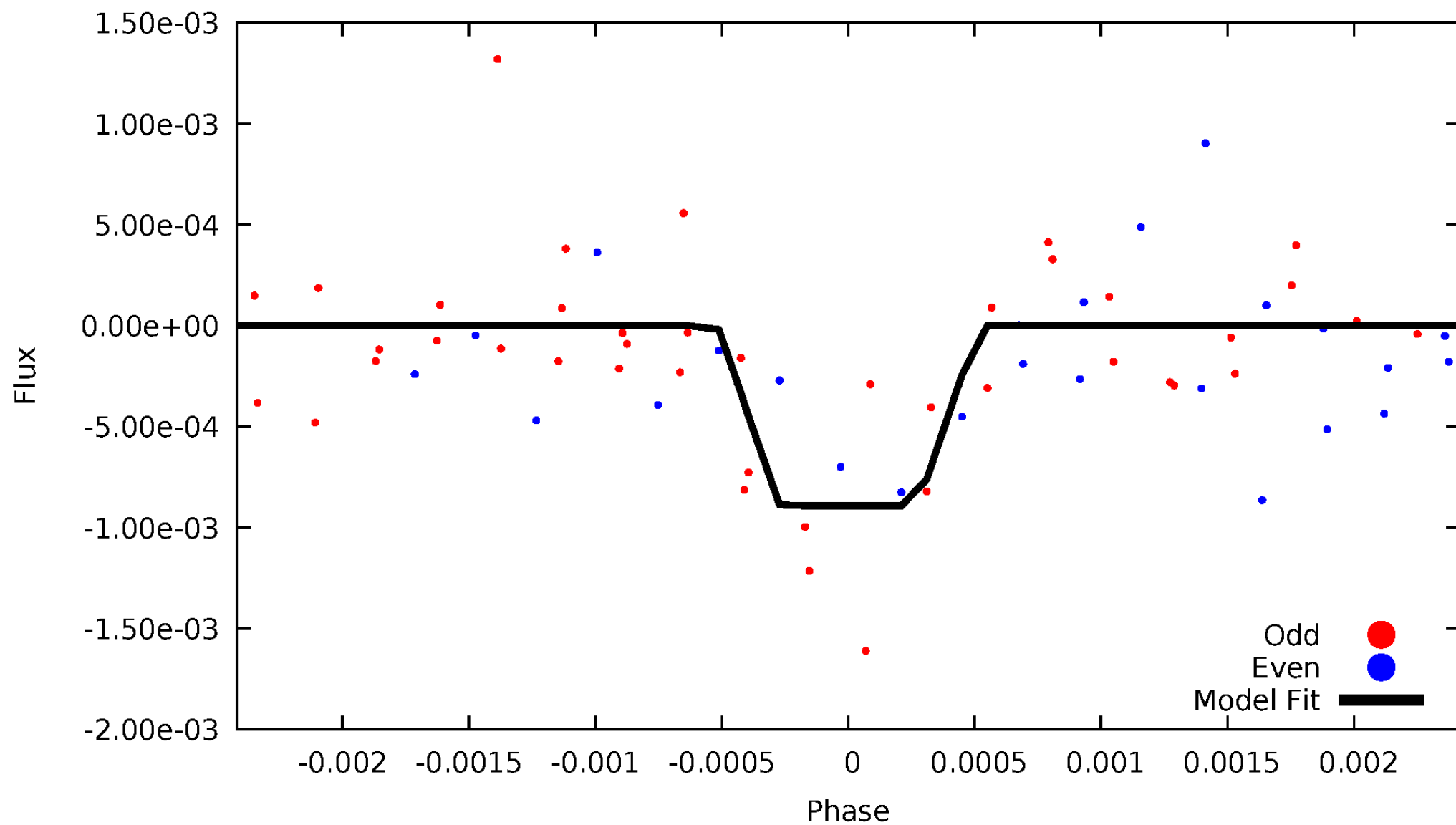
TCE 009305136-05





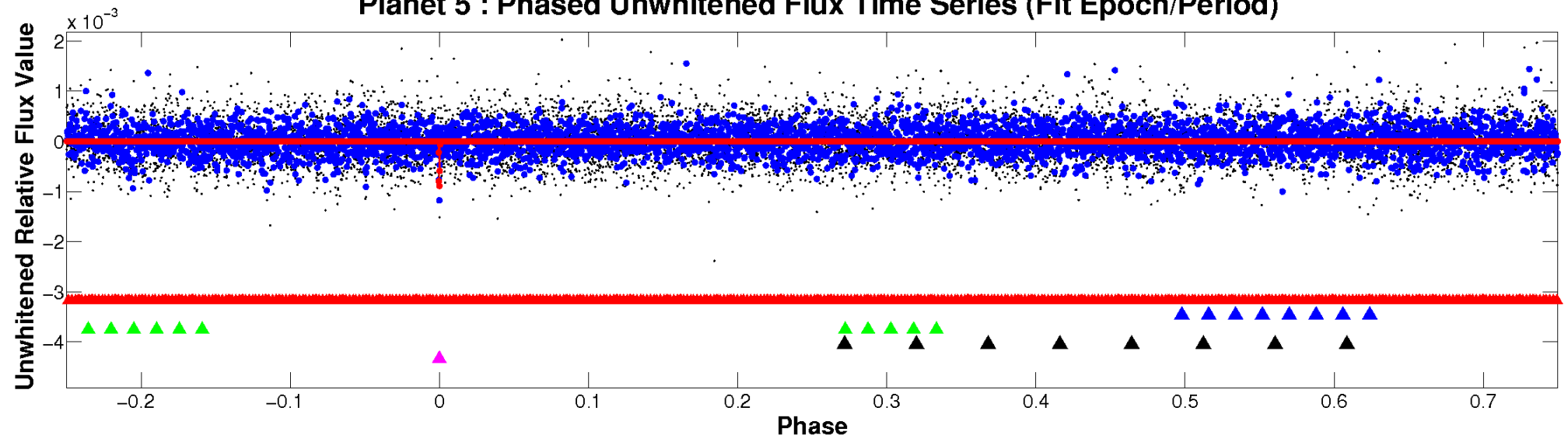
# ALT Odd/Even

TCE 009305136-05

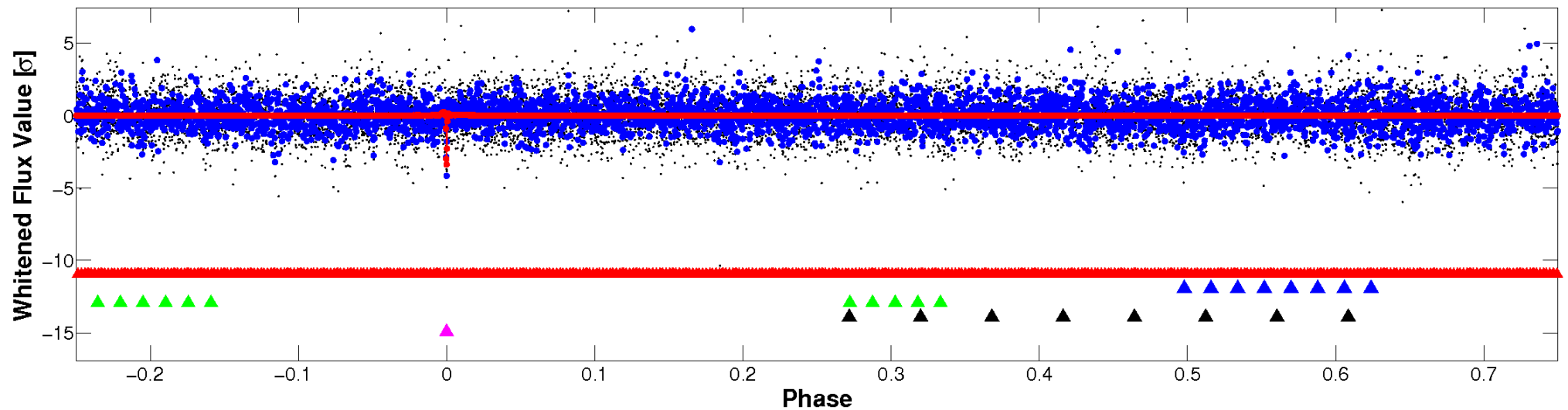


# Non-Whitened Vs. Whitened Light Curve

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

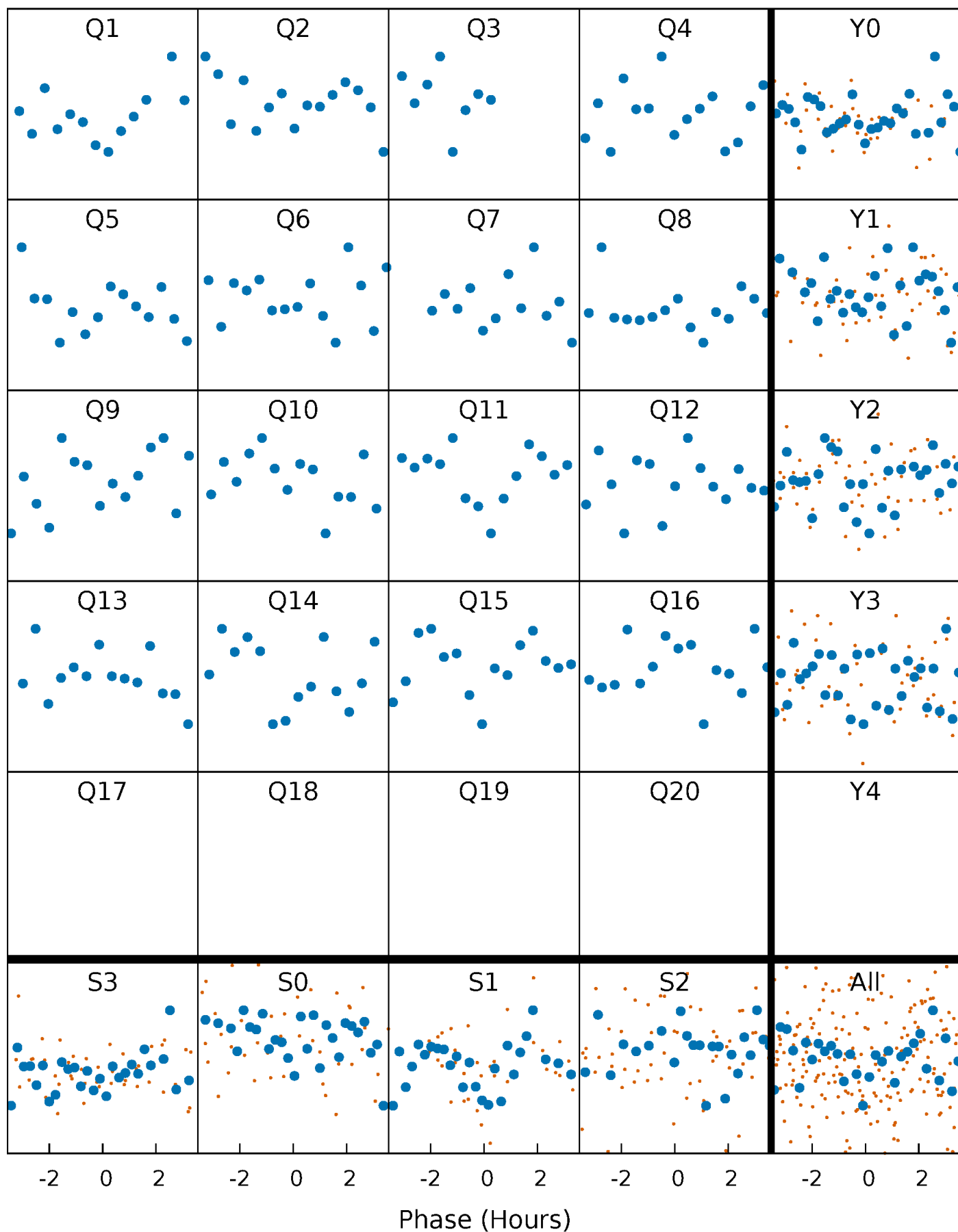


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



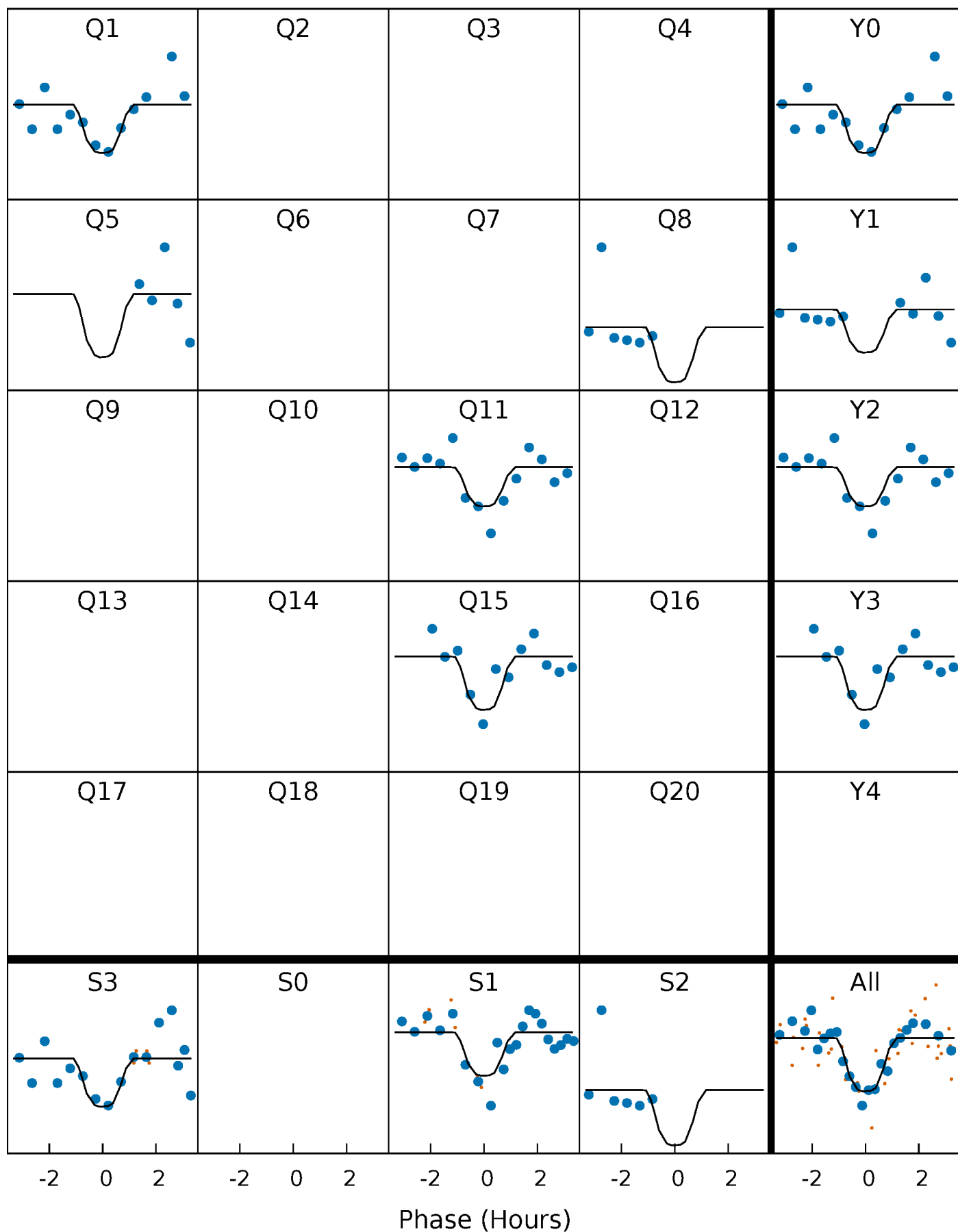
# PDC Quarter-Phased Transit Curves

TCE 009305136-05     $P = 84.931002$  Days     $T_0 = 151.570416$  (BKJD)



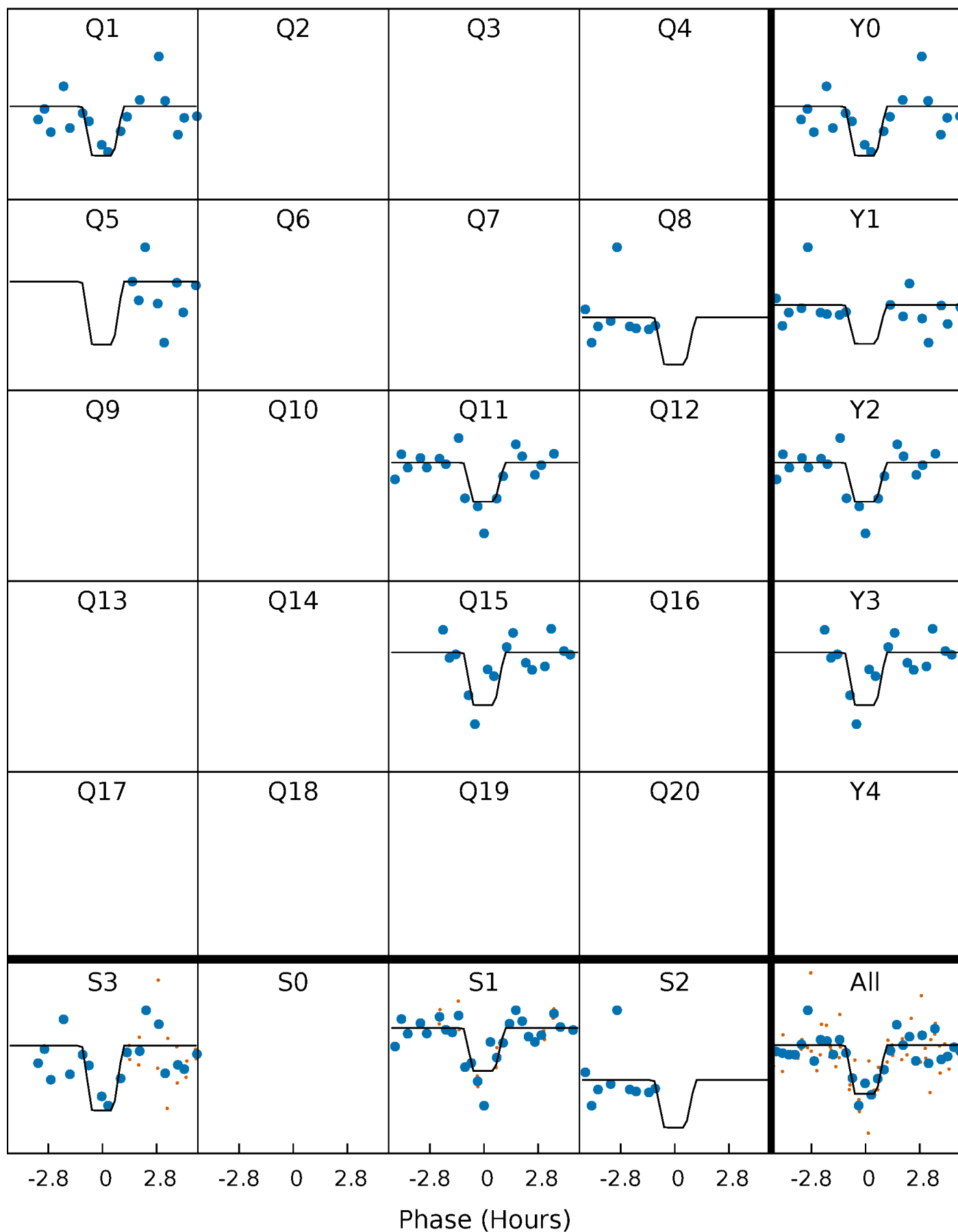
# DV Quarter-Phased Transit Curves

TCE 009305136-05   P= 84.931002 Days    $T_0=151.570416$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

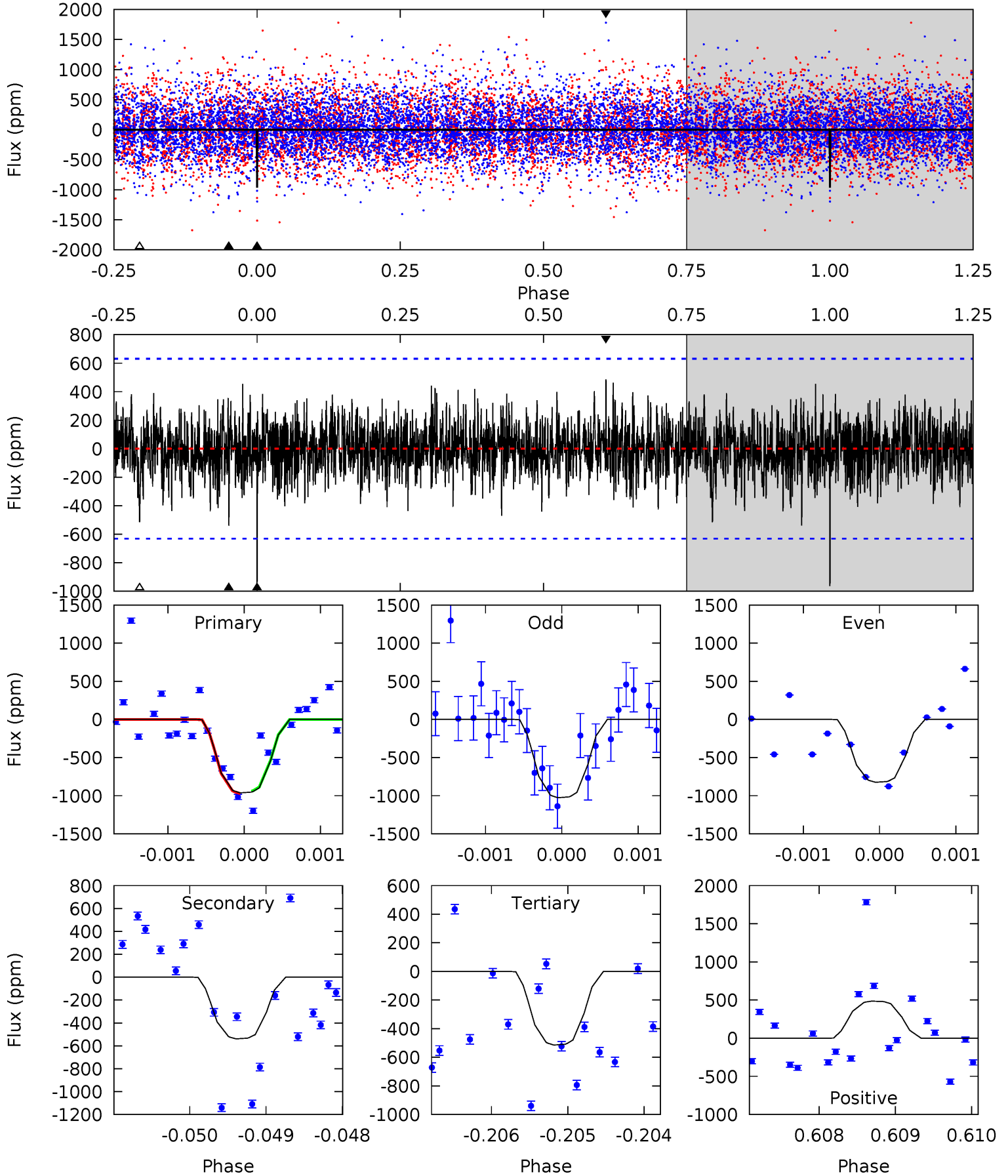
TCE 009305136-05     $P = 84.932254$  Days     $T_0 = 151.560505$  (BKJD)



# DV Model-Shift Uniqueness Test

009305136-05, P = 84.931002 Days, E = 66.639414 Days

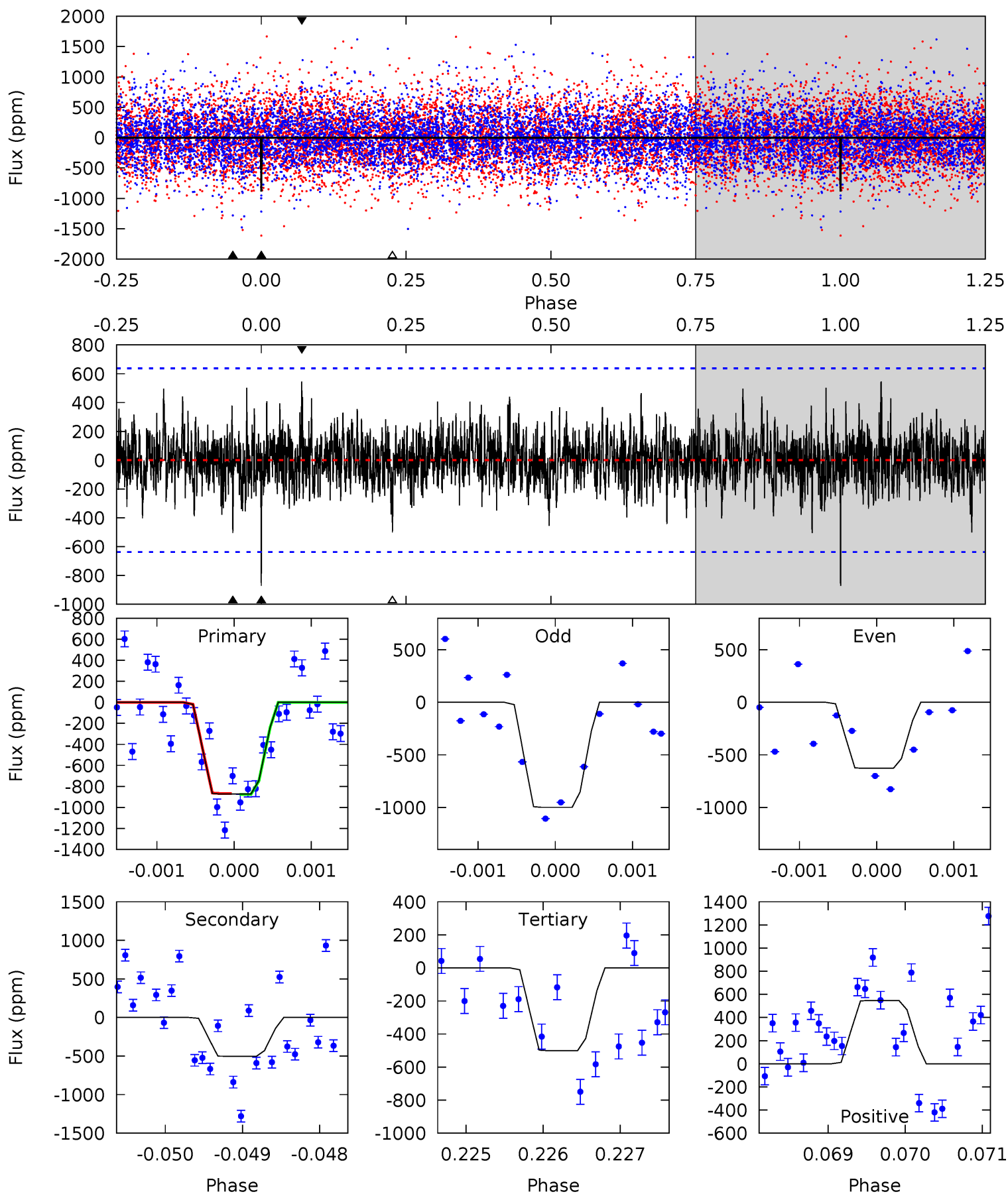
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.33	4.66	4.45	4.21	5.46	3.30	1.24	3.88	4.13	0.21	0.46	0.83	1.16	0.34	0.13



# Alt Model-Shift Uniqueness Test

009305136-05, P = 84.932254 Days, E = 66.628251 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
7.47	4.32	4.29	4.68	5.46	3.30	1.16	3.19	2.79	0.03	-0.37	1.38	1.15	0.39	0.04





### Stellar Parameters For KIC 009305136

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5017^{+166}_{-166}$	$4.652^{+0.030}_{-0.070}$	$-0.380^{+0.300}_{-0.300}$	$0.668^{+0.086}_{-0.050}$	$0.739^{+0.071}_{-0.078}$	$3.493^{+0.490}_{-0.866}$
	+3%/-3%	+1%/-2%	+79%/-79%	+13%/-7%	+10%/-11%	+14%/-25%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009305136-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-539 \pm 116$	$5.10^{+4.47}_{-3.44}$	$437^{+19}_{-16}$	$3390^{+1681}_{-580}$	$1300^{+11439}_{-932}$
Alt.	$-504 \pm 117$	$4.74^{+4.52}_{-3.27}$	$437^{+17}_{-17}$	$3422^{+1881}_{-613}$	$1386^{+13963}_{-1034}$

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

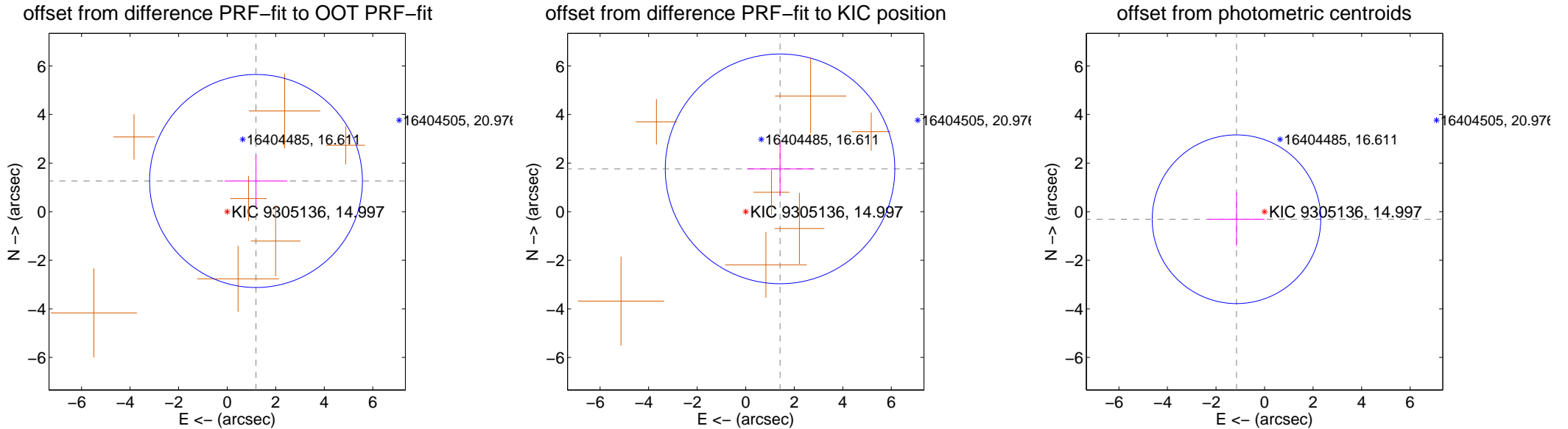
## DV Centroid Data

Supplemental centroid analysis for 009305136-05. Kepler magnitude: 15.00. Transit SNR 8.89

There are 0 quarters with good PRF difference image offsets

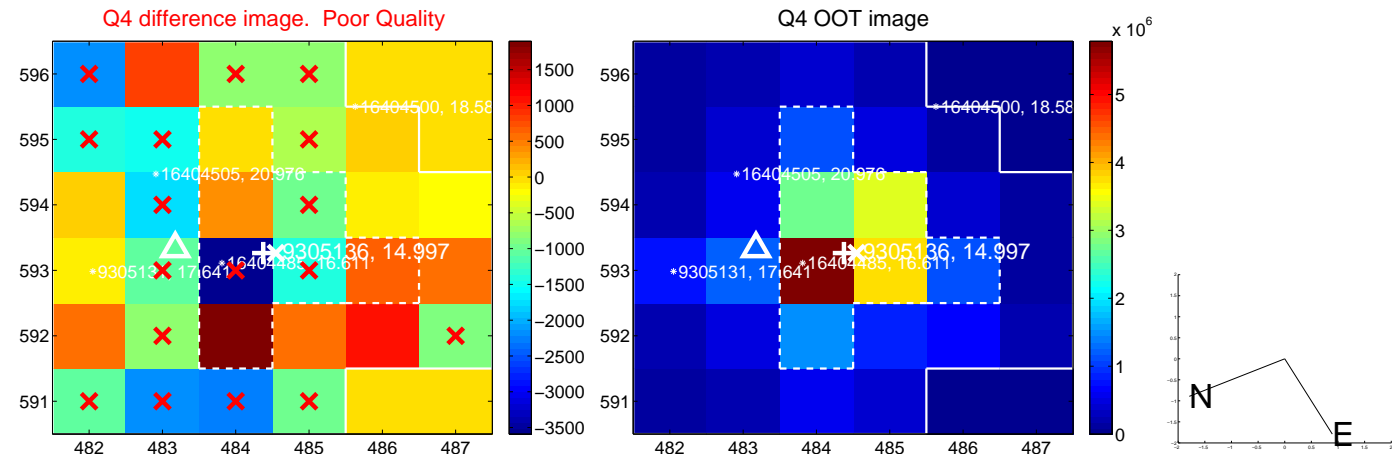
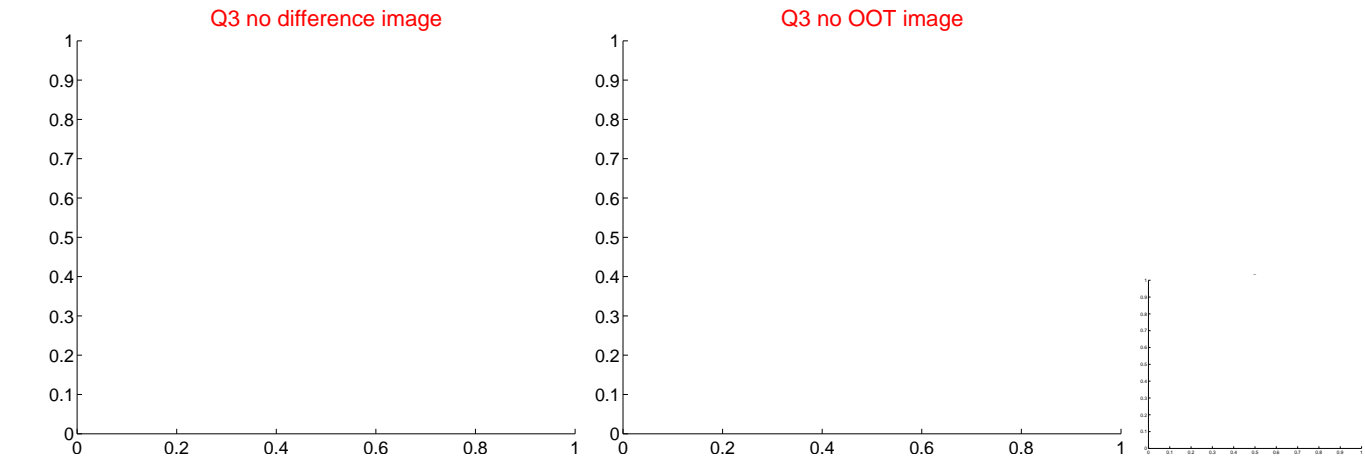
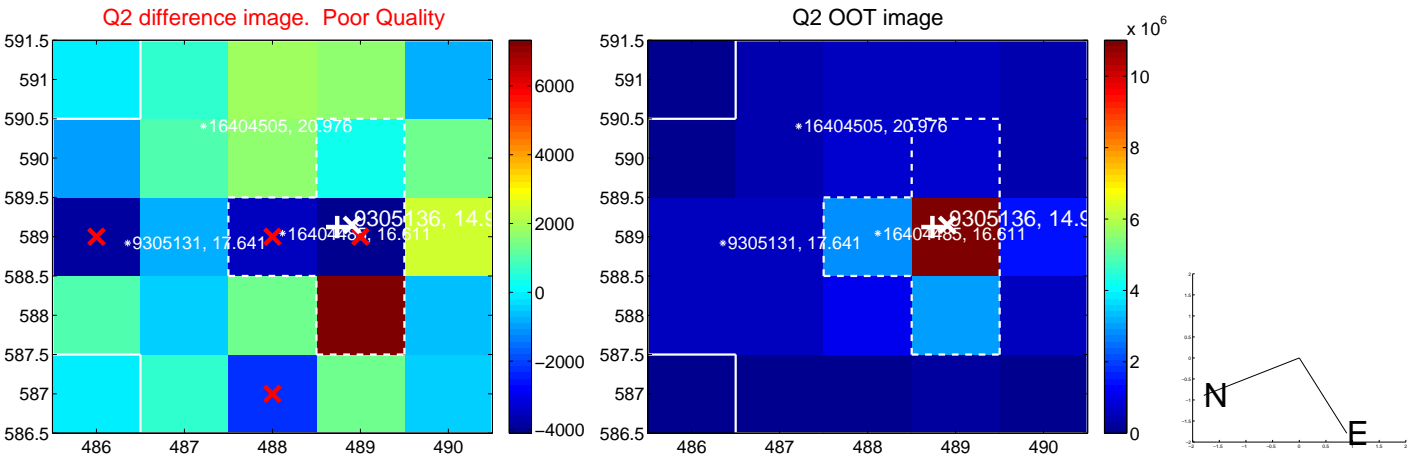
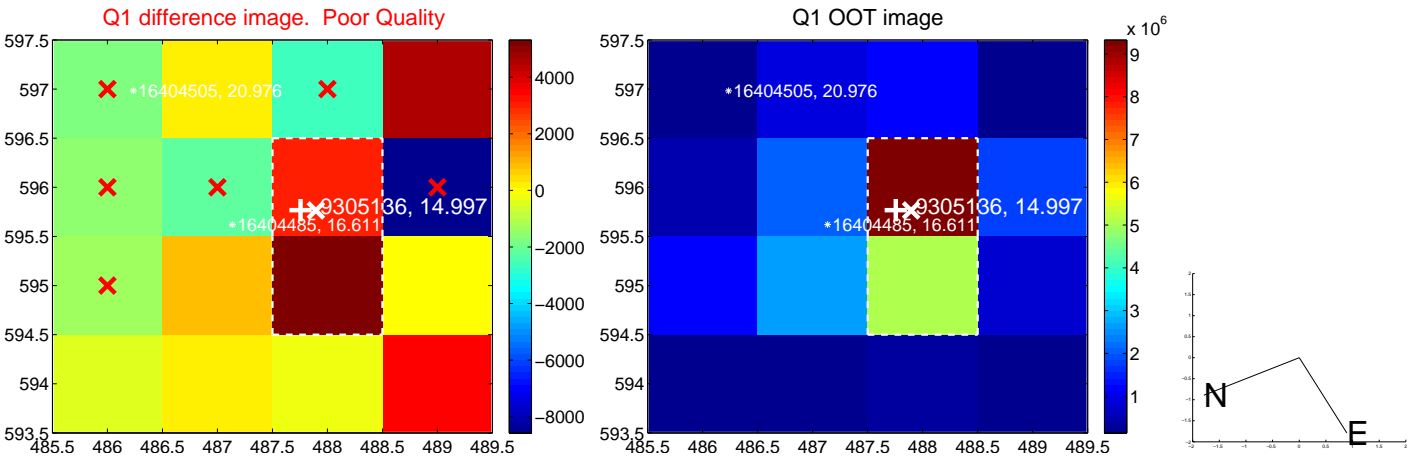
The direct PRF centroid is offset from the target star catalog position by about 0.69 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.734 \pm 1.462$	1.19	$-1.188 \pm 1.286$	$1.263 \pm 1.072$
PRF-fit source offset from KIC position	$2.260 \pm 1.576$	1.43	$-1.415 \pm 1.359$	$1.762 \pm 1.116$
photometric centroid source offset	$1.20 \pm 1.16$	1.03	$1.16 \pm 1.16$	$-0.31 \pm 1.10$

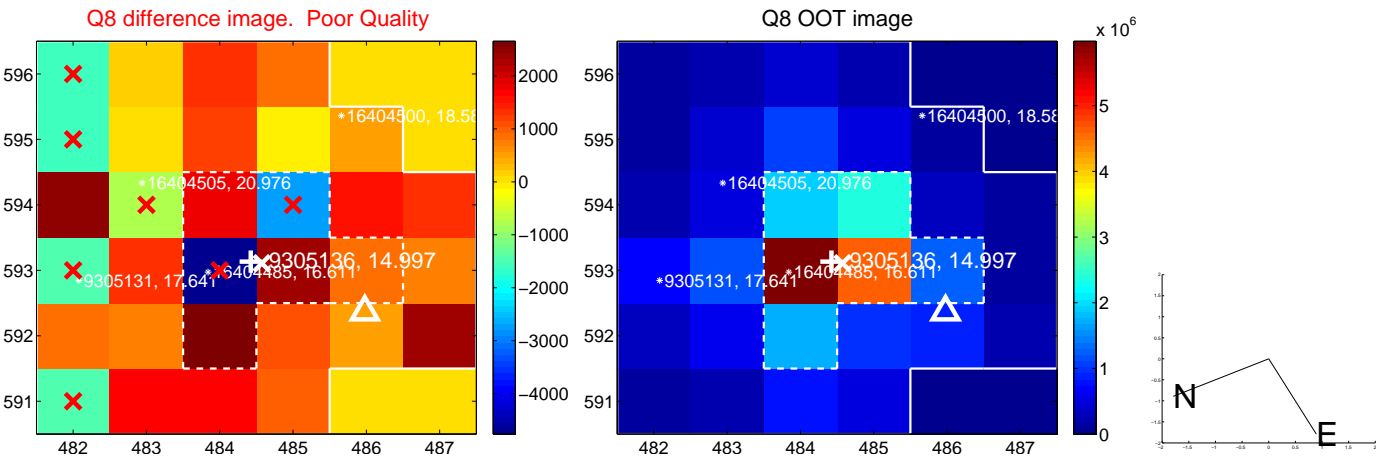
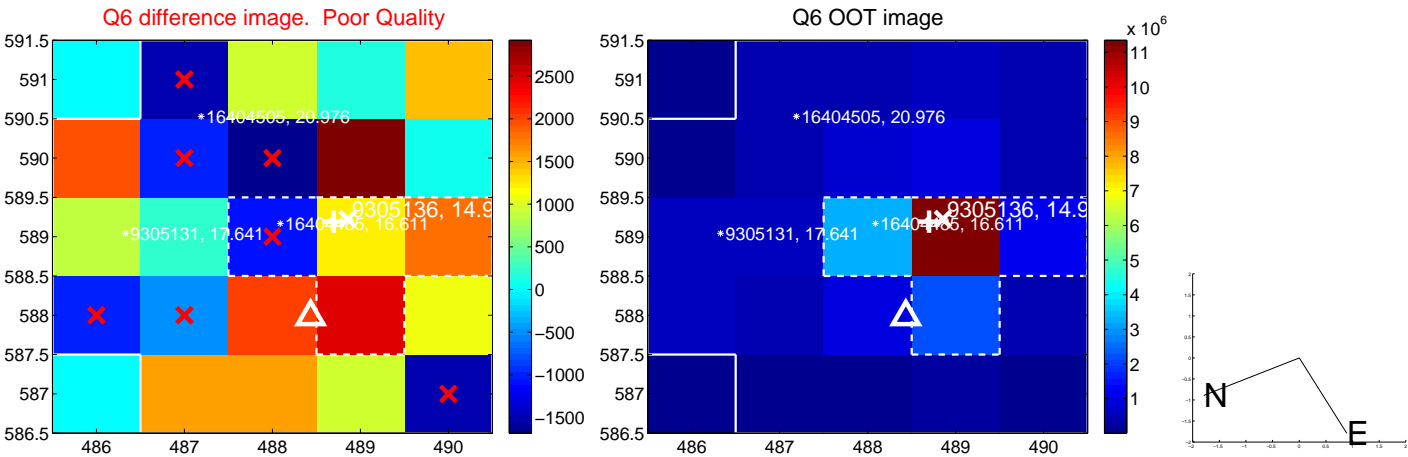
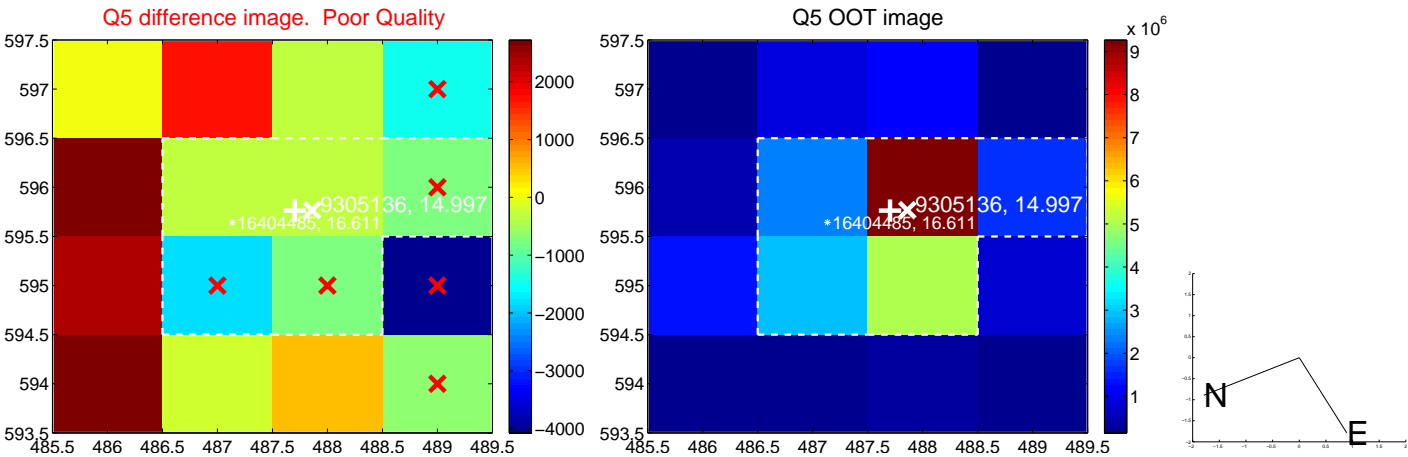


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

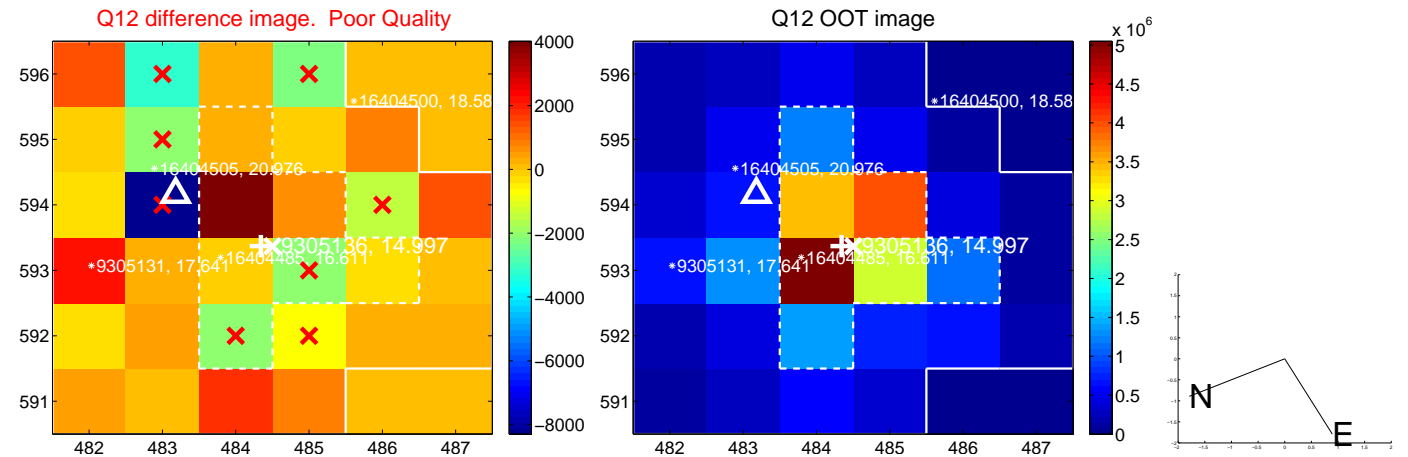
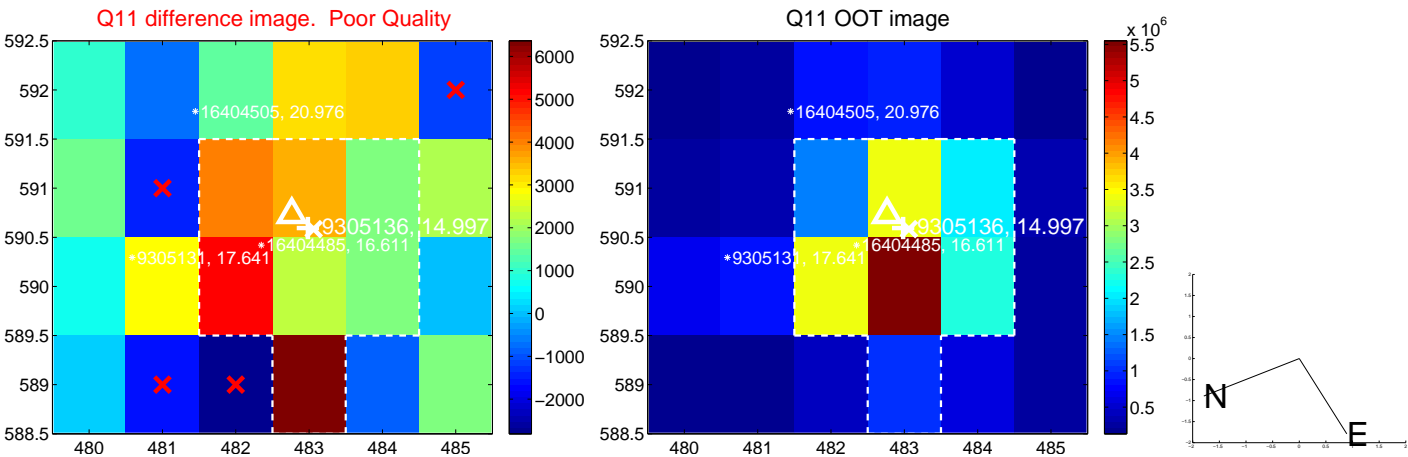
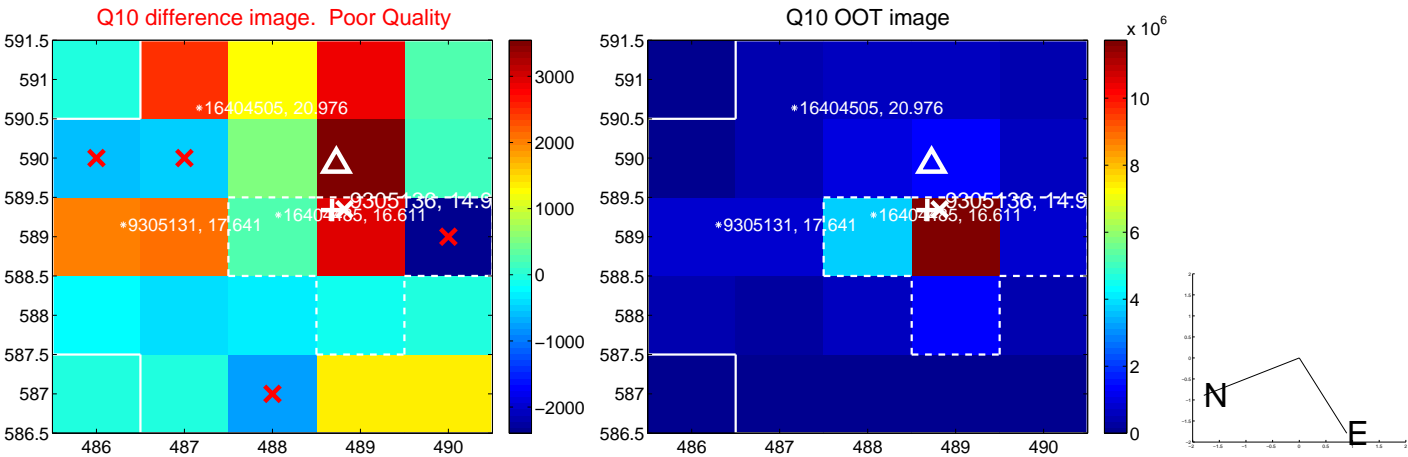
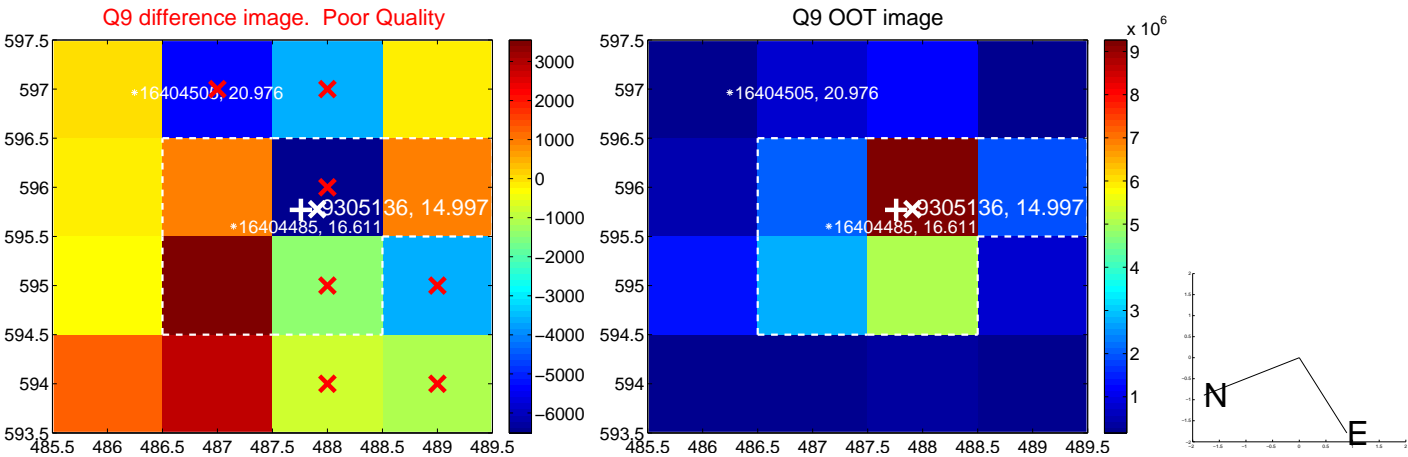
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



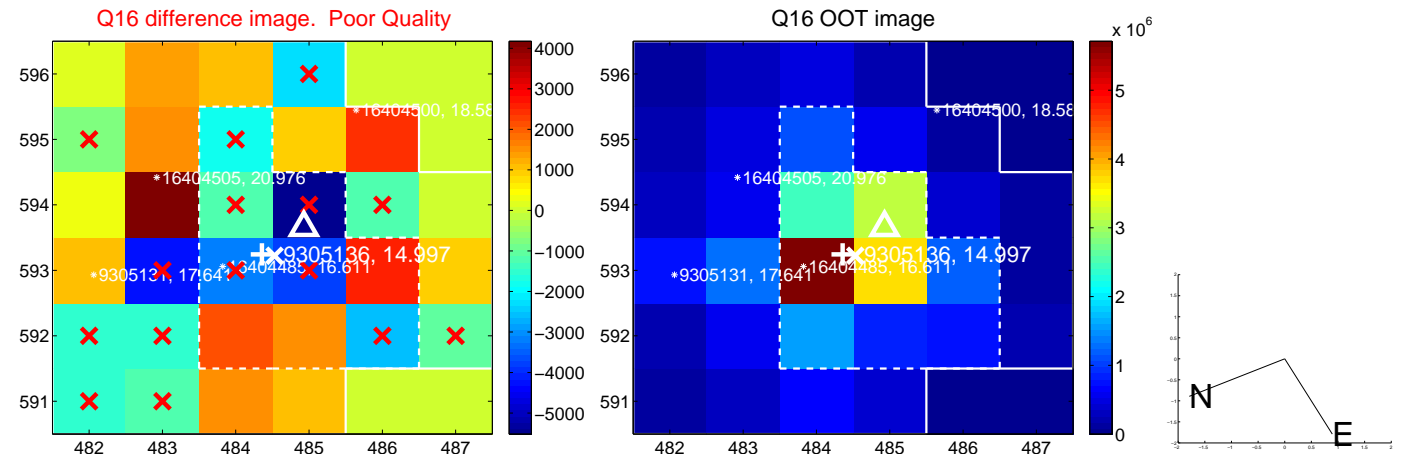
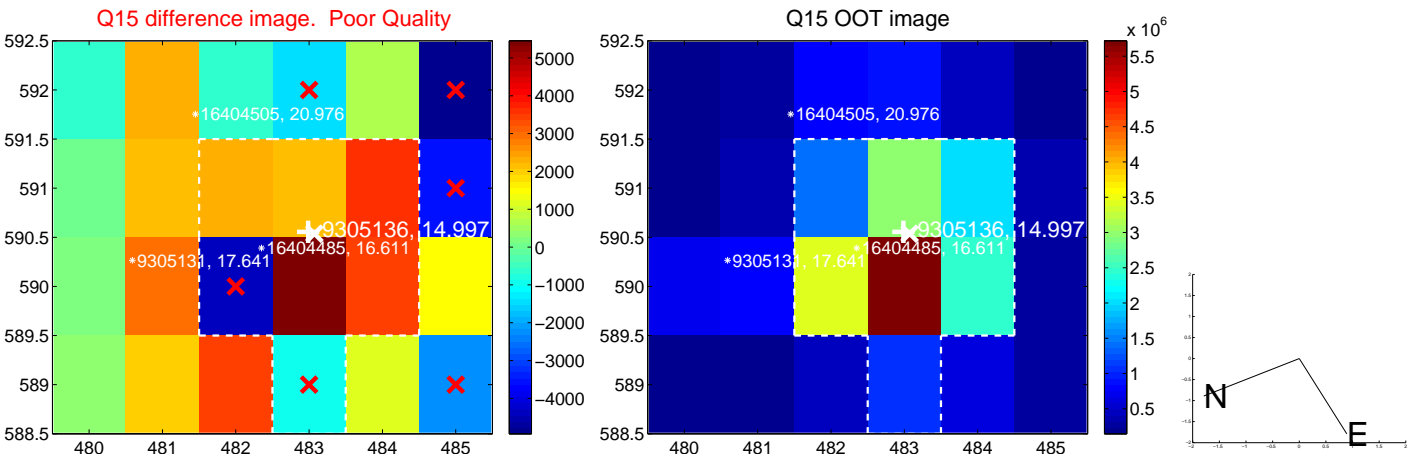
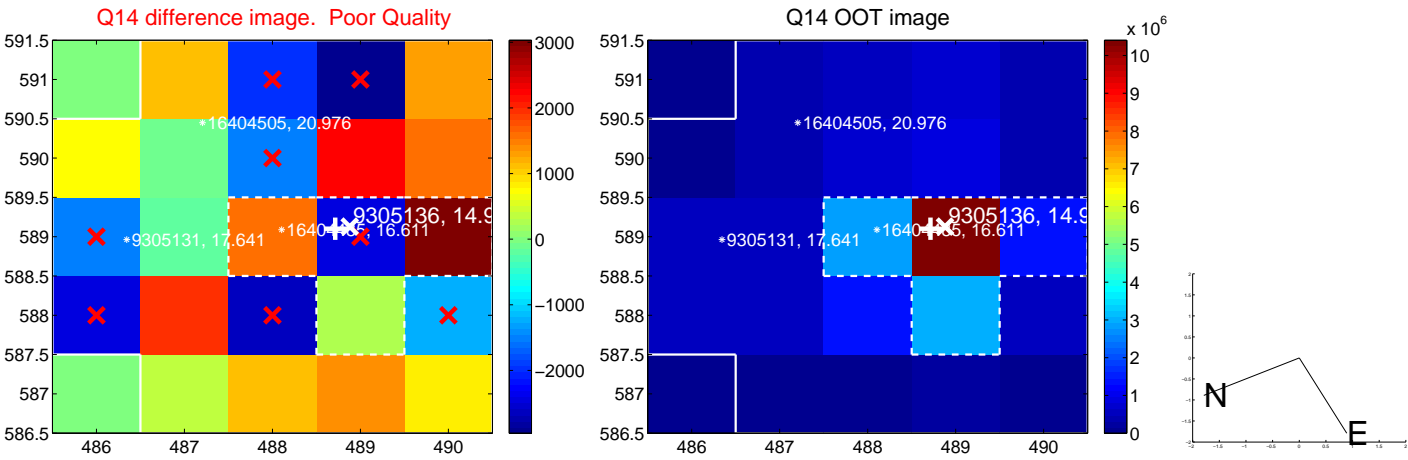
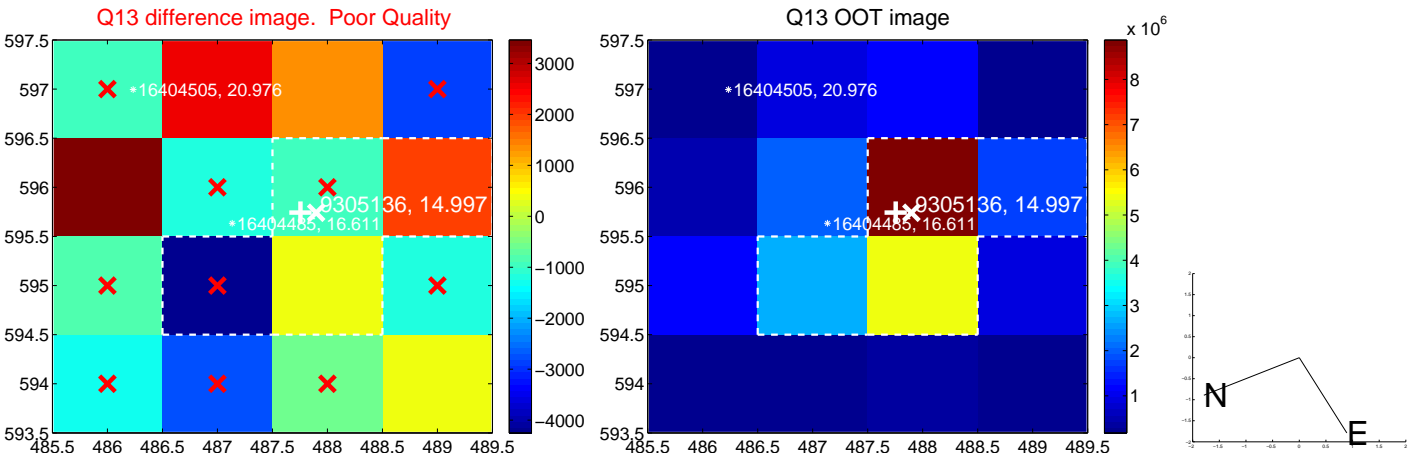
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



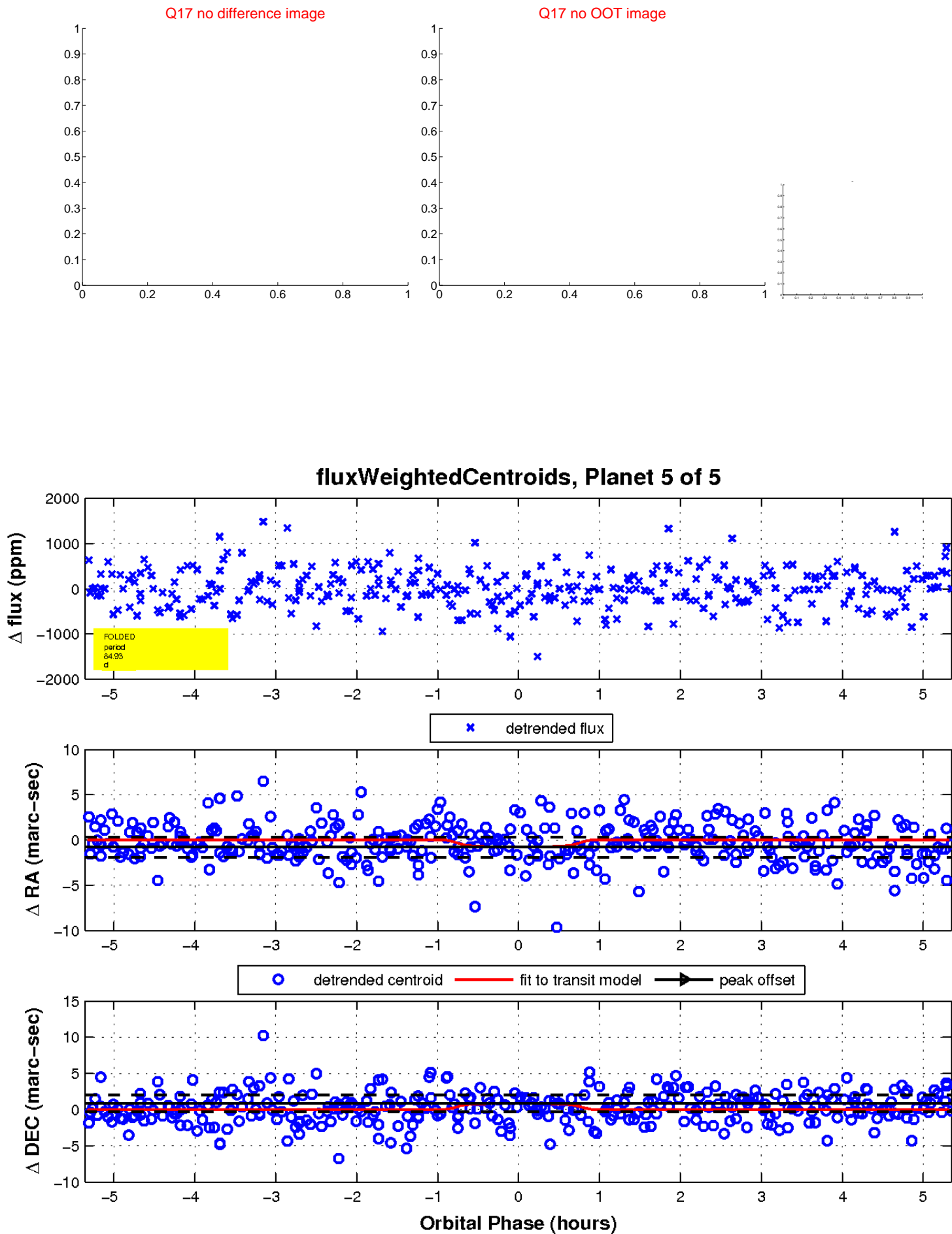
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

