

# KIC 009954225

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009954225-01	OBS	5742.01	1.340494	132.219327	537646.6	2.500	2691.7	-1.0	1.22	6332	41.48	3820.20
009954225-02	OBS	No	1.340381	131.630888	36.8	1.869	193.1	0.1	1.22	6332	0.81	3820.63
009954225-03	OBS	No	28.147794	140.814121	4175.8	1.500	27.1	-1.0	1.22	6332	7.96	65.94
009954225-04	OBS	No	22.706568	134.935995	5735.1	1.500	29.2	-1.0	1.22	6332	9.34	87.81
009954225-05	OBS	No	42.845689	162.879751	5497.0	1.500	31.0	-1.0	1.22	6332	9.14	37.66
009954225-06	OBS	No	10.550603	133.107869	6571.4	1.500	30.7	-1.0	1.22	6332	9.99	244.01

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009954225-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—CENT_NOFITS—HALO_GHOST
009954225-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
009954225-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
009954225-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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.

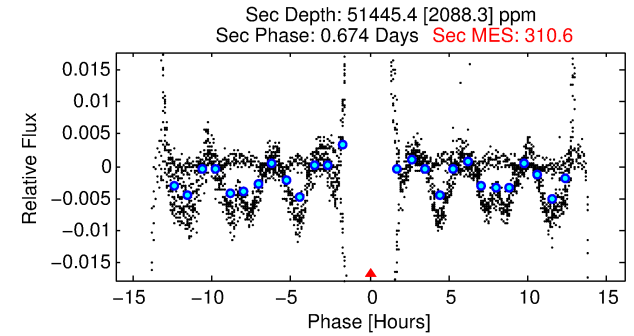
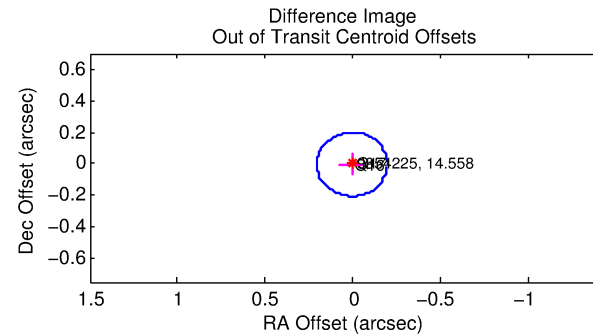
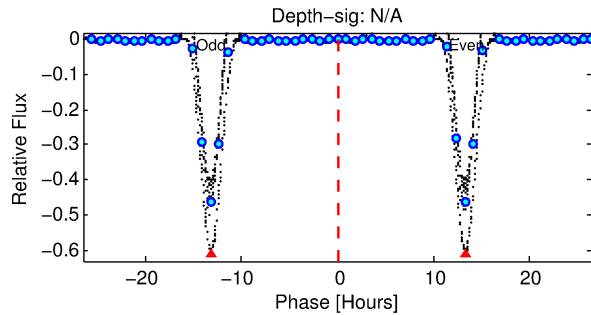
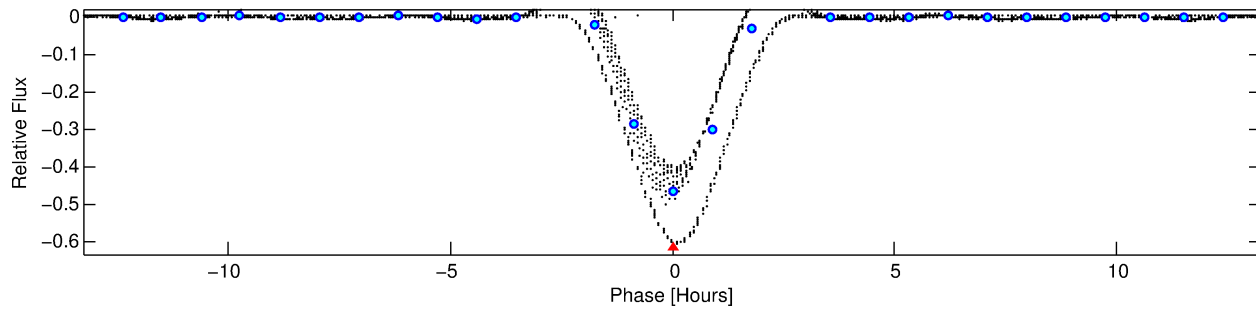
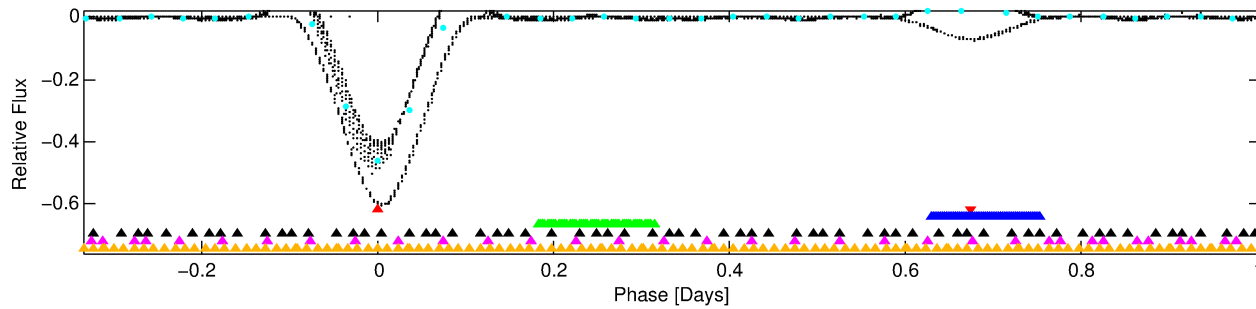
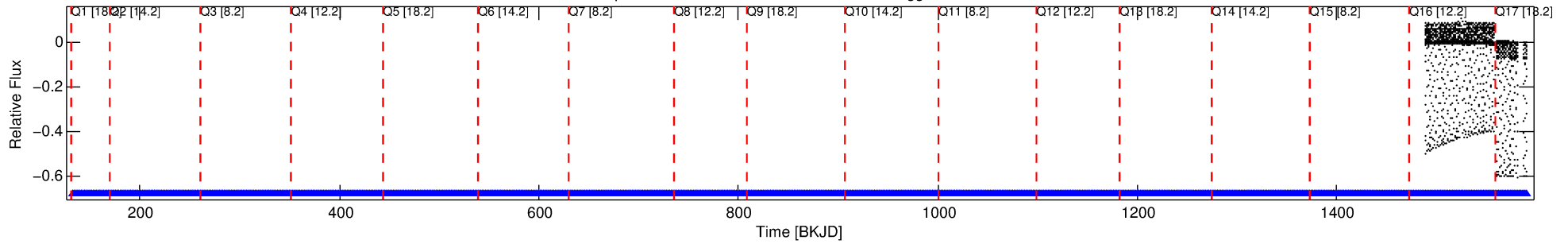
## Ephemeris Match Information For 009954225-01

No Significant Match Found

# DV One-Page Summary

KIC: 9954225 Candidate: 1 of 6 Period: 1.340 d  
KOI: K05742 Corr: No Ephemeris Match

Kp: 14.56 R\*: 1.22 Rs Teff: 6332.0 K Logg: 4.26 Fe/H: -0.420



## TPS TCE Results:

Period = 1.34049 d  
Epoch = 132.2193 BKJD

DV fit results are unavailable

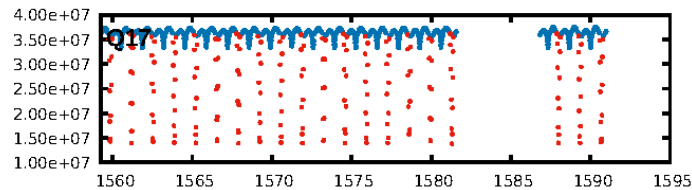
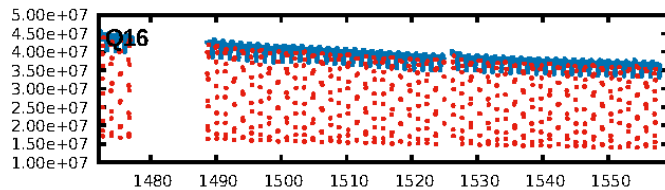
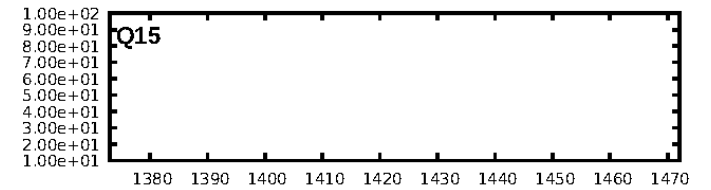
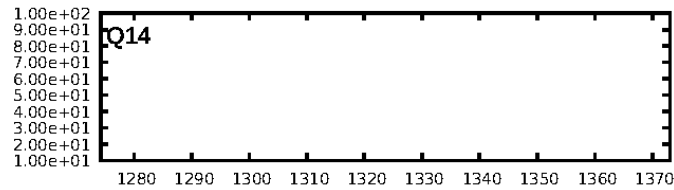
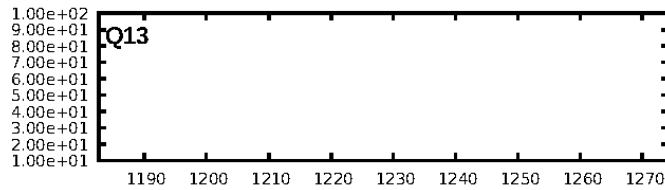
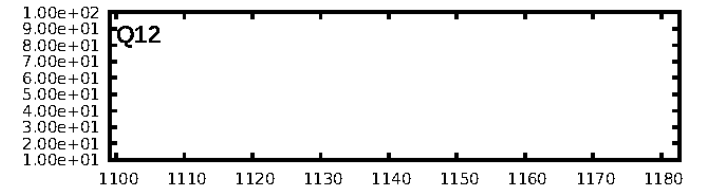
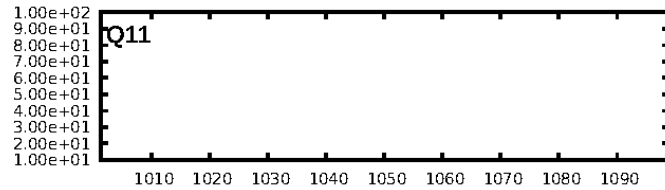
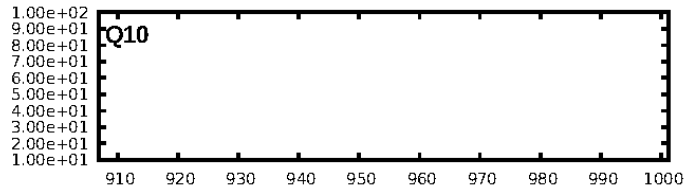
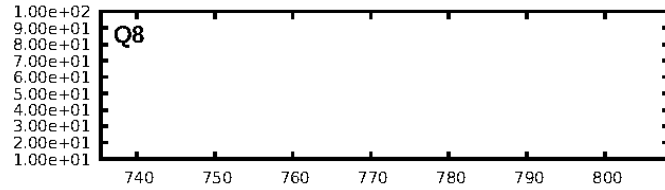
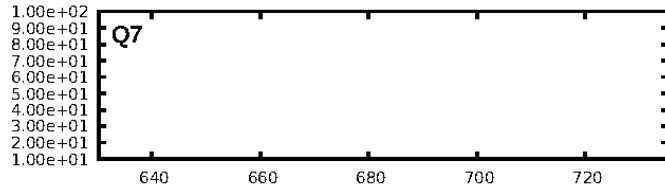
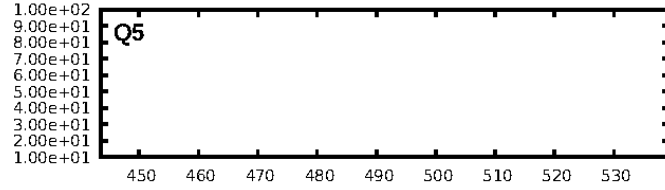
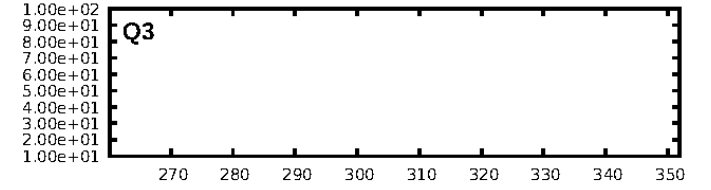
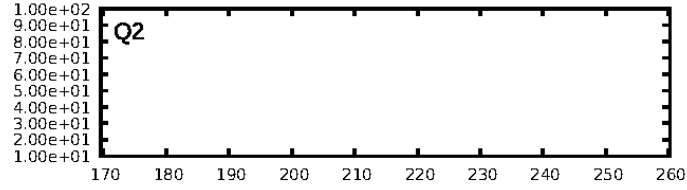
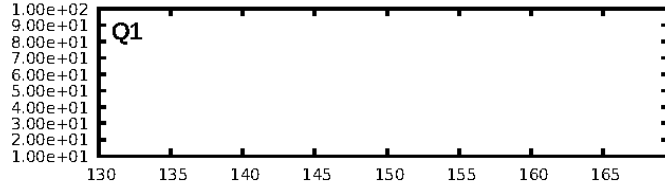
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [75.82 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [52/52]  
GhostDiagnostic-chr: -0.005688  
Centroid-sig: N/A  
Centroid-so: 0.358 arcsec [277.55 $\sigma$ ]  
OotOffset-rm: 0.006 arcsec [0.10 $\sigma$ ]  
KicOffset-rm: 0.280 arcsec [2.70 $\sigma$ ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [2/2]

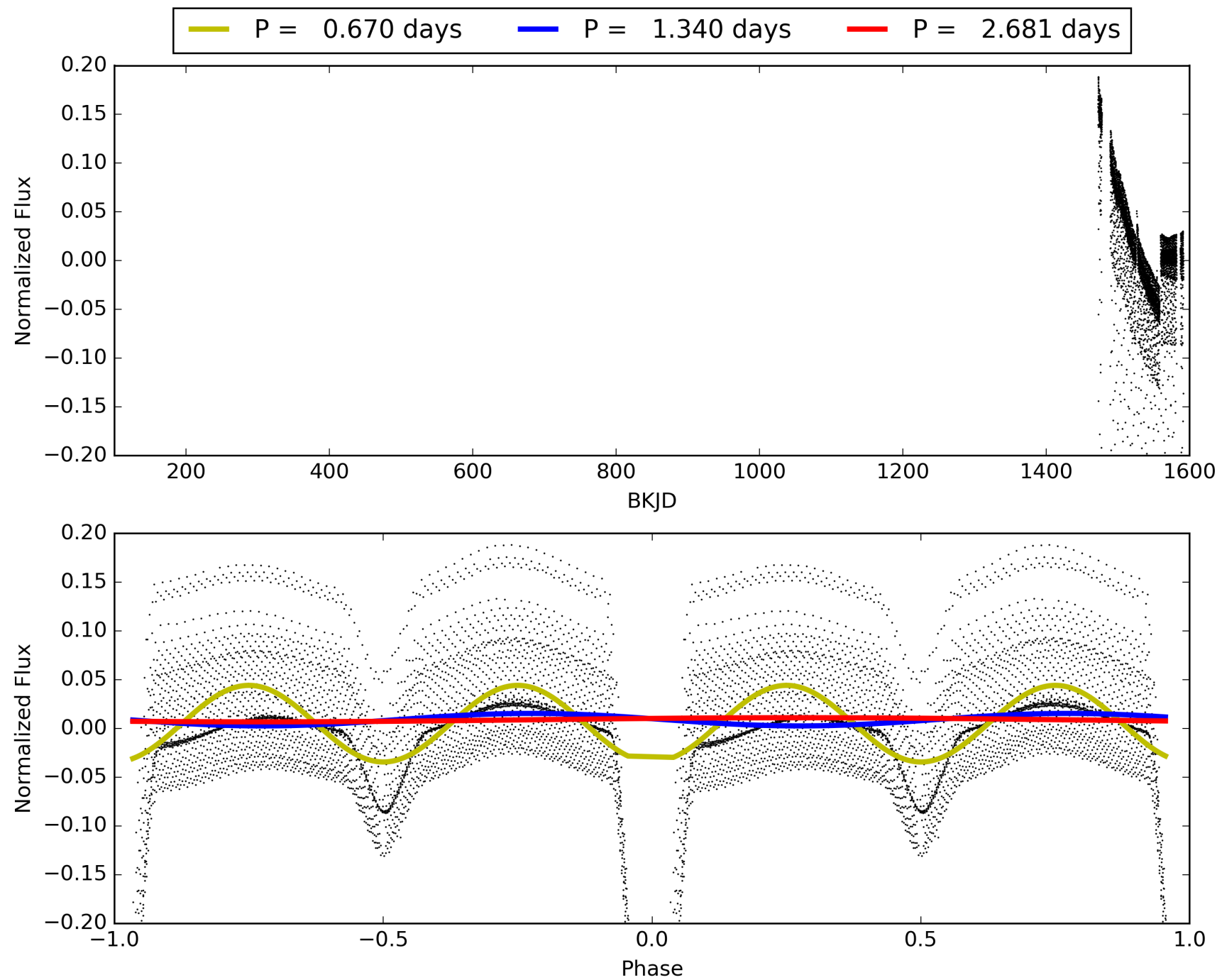
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009954225-01, PDC Light Curves



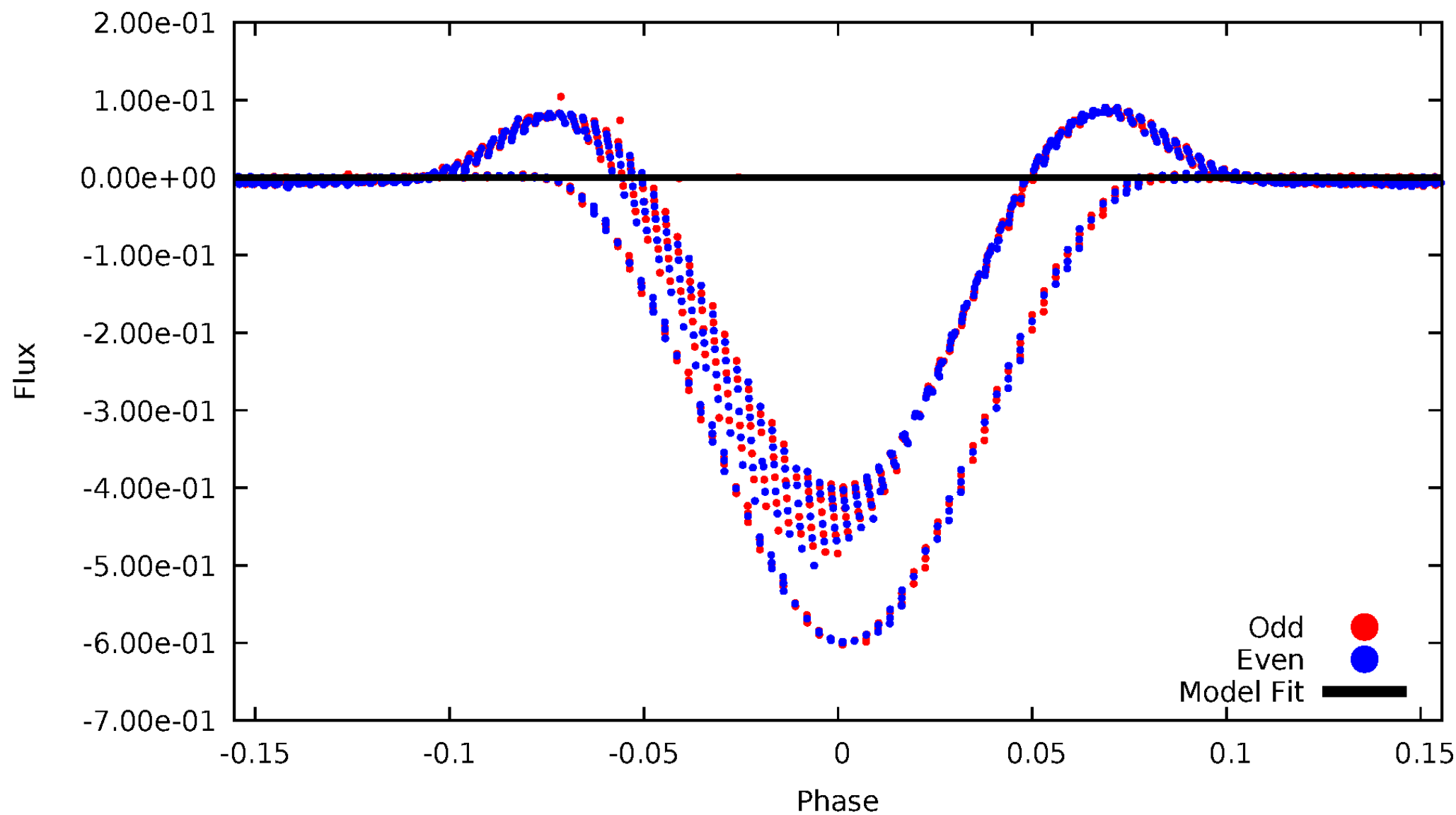
TCE 009954225-01





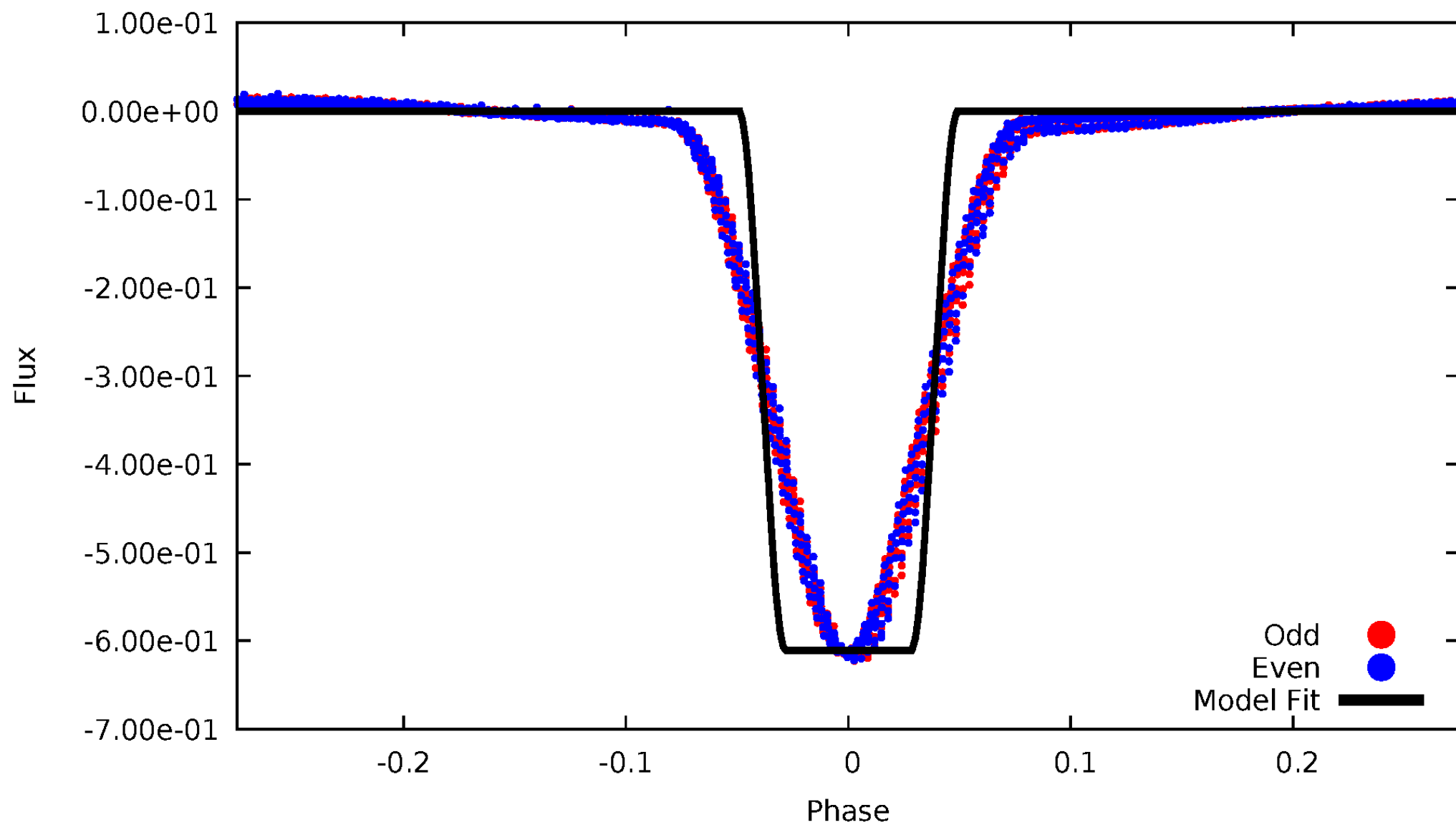
# DV Odd/Even

TCE 009954225-01



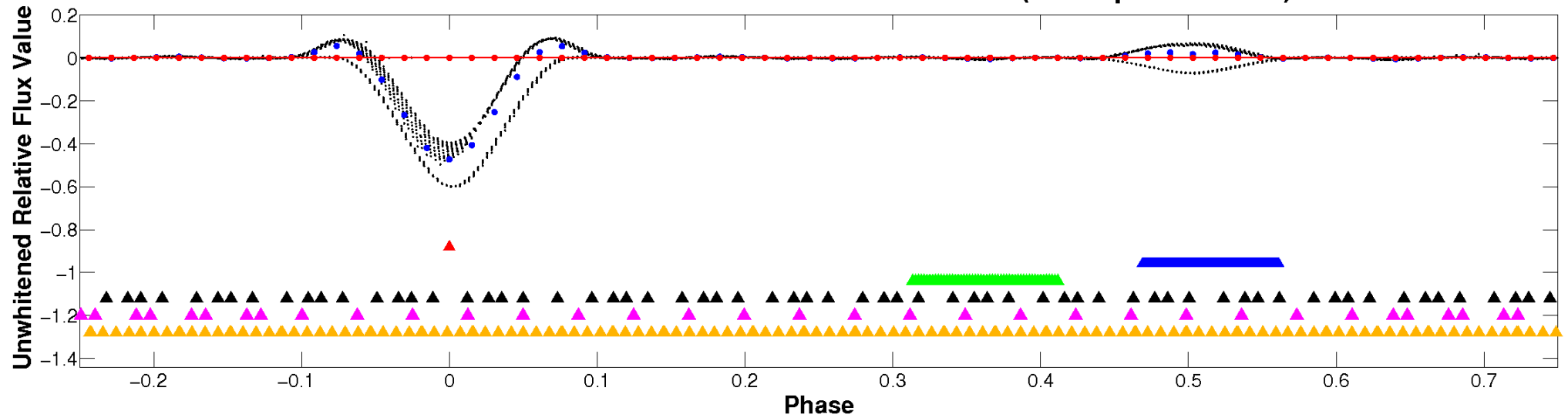
# ALT Odd/Even

TCE 009954225-01



# Non-Whitened Vs. Whitened Light Curve

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

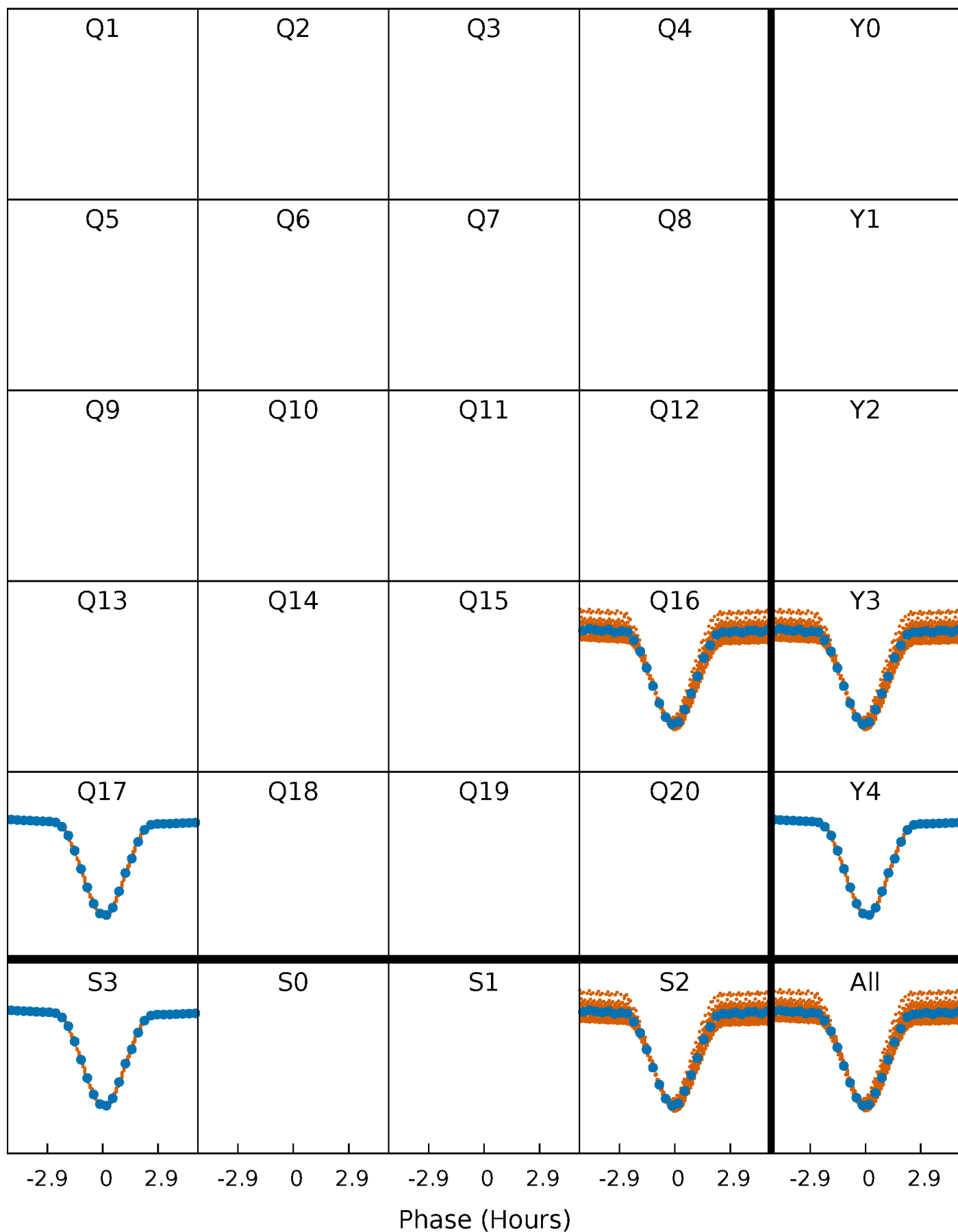


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



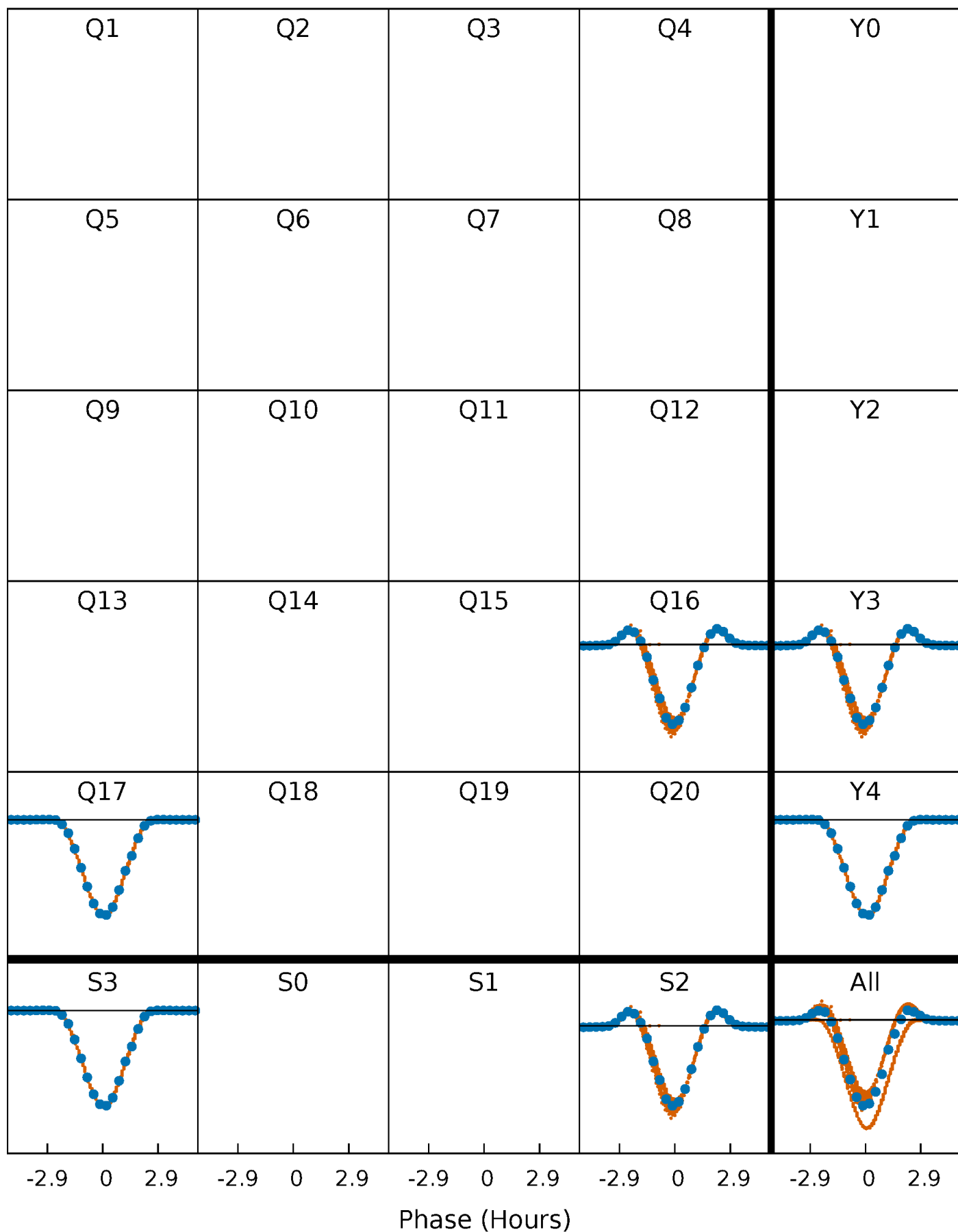
# PDC Quarter-Phased Transit Curves

TCE 009954225-01   P= 1.340494 Days    $T_0=132.219327$  (BKJD)



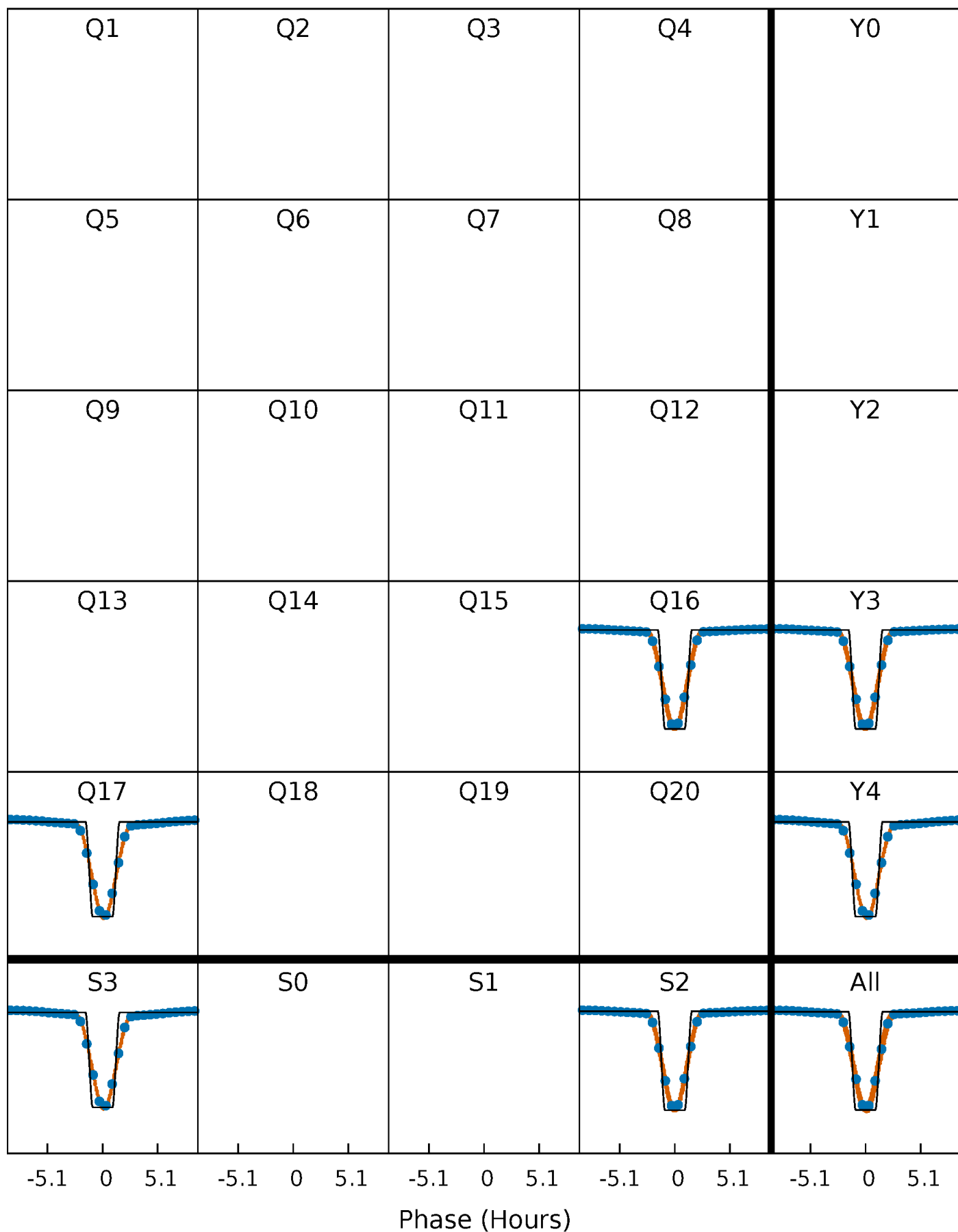
# DV Quarter-Phased Transit Curves

TCE 009954225-01   P= 1.340494 Days    $T_0=132.219327$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

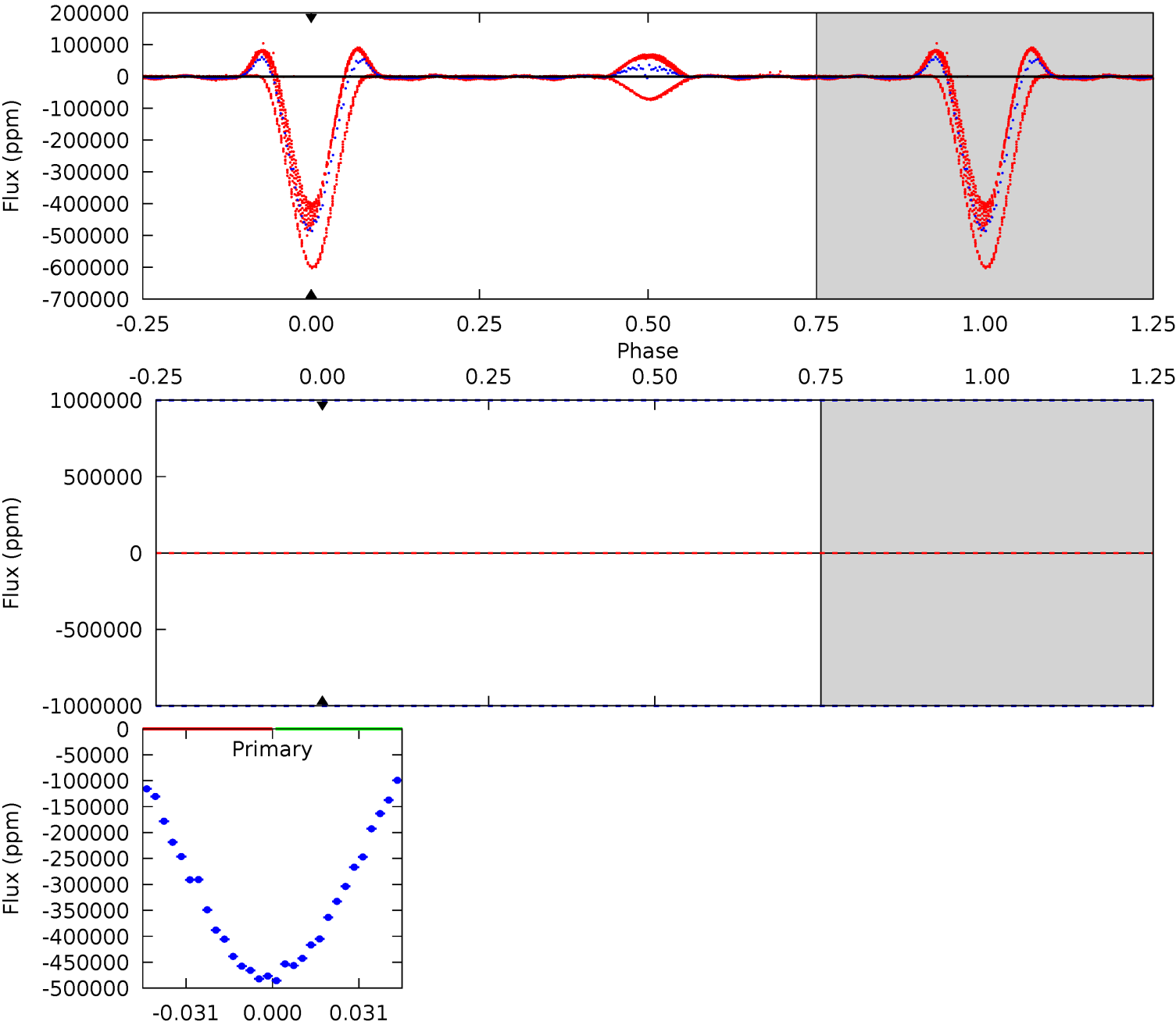
TCE 009954225-01 P= 1.340494 Days  $T_0=132.217328$  (BKJD)



DV Model-Shift Uniqueness Test

009954225-01, P = 1.340494 Days, E = 132.219327 Days

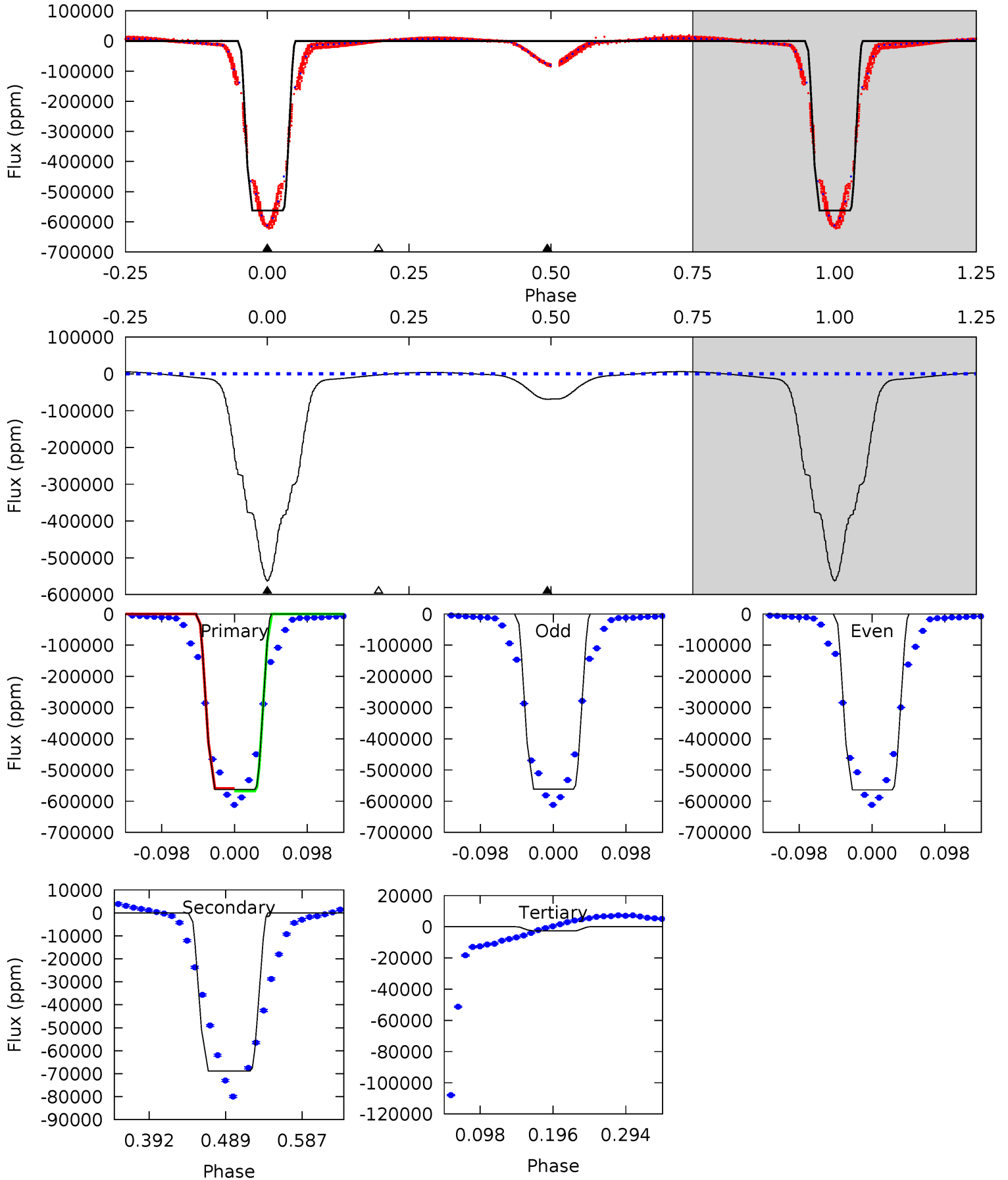
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009954225-01, P = 1.340494 Days, E = 132.217328 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
1488	182.1	7.14	0	4.57	1.66	15.8	1481	1488	175.0	182.1	3.13	1.00	0.01	11.1





### Stellar Parameters For KIC 009954225

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6332^{+199}_{-244}$	$4.260^{+0.180}_{-0.180}$	$-0.420^{+0.300}_{-0.300}$	$1.222^{+0.339}_{-0.277}$	$0.991^{+0.156}_{-0.114}$	$0.765^{+0.707}_{-0.363}$
	+3%/-4%	+4%/-4%	+71%/-71%	+28%/-23%	+16%/-12%	+92%/-47%
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 009954225-01 / KOI 5742.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$41.54^{+15.44}_{-13.90}$	$2793^{+218}_{-194}$	$-3197^{+9791}_{-3219}$	$-0.102^{+21.254}_{-17.675}$
Alt.	$-68844 \pm 378$	$104.56^{+22.88}_{-19.06}$	$2814^{+199}_{-200}$	$3947^{+229}_{-238}$	$2.143^{+1.018}_{-0.689}$

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

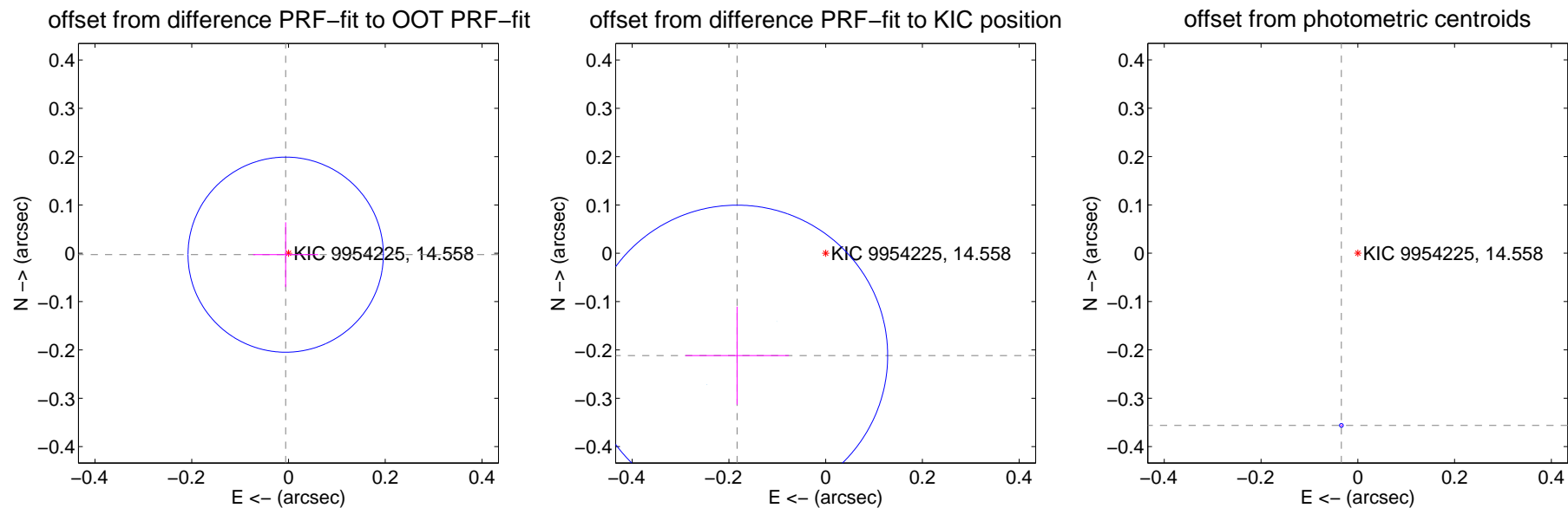
## DV Centroid Data

Supplemental centroid analysis for 009954225-01. Kepler magnitude: 14.56. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.006 \pm 0.067$	0.10	$0.006 \pm 0.067$	$-0.003 \pm 0.067$
PRF-fit source offset from KIC position	$0.280 \pm 0.104$	2.70	$0.183 \pm 0.107$	$-0.212 \pm 0.101$
photometric centroid source offset	$0.36 \pm 0.00$	277.55	$0.03 \pm 0.00$	$-0.36 \pm 0.00$



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.



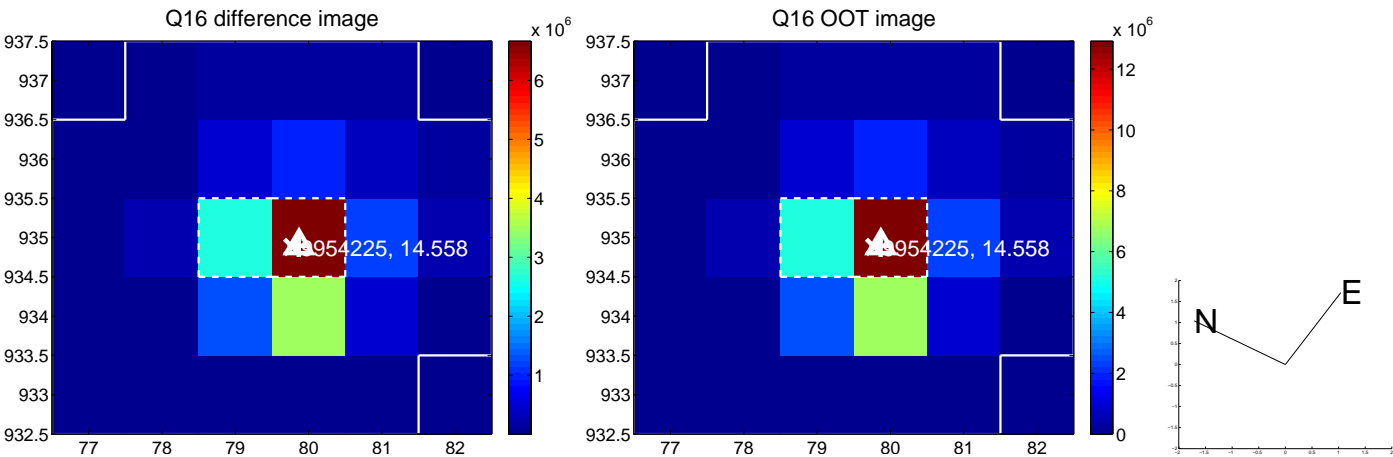
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



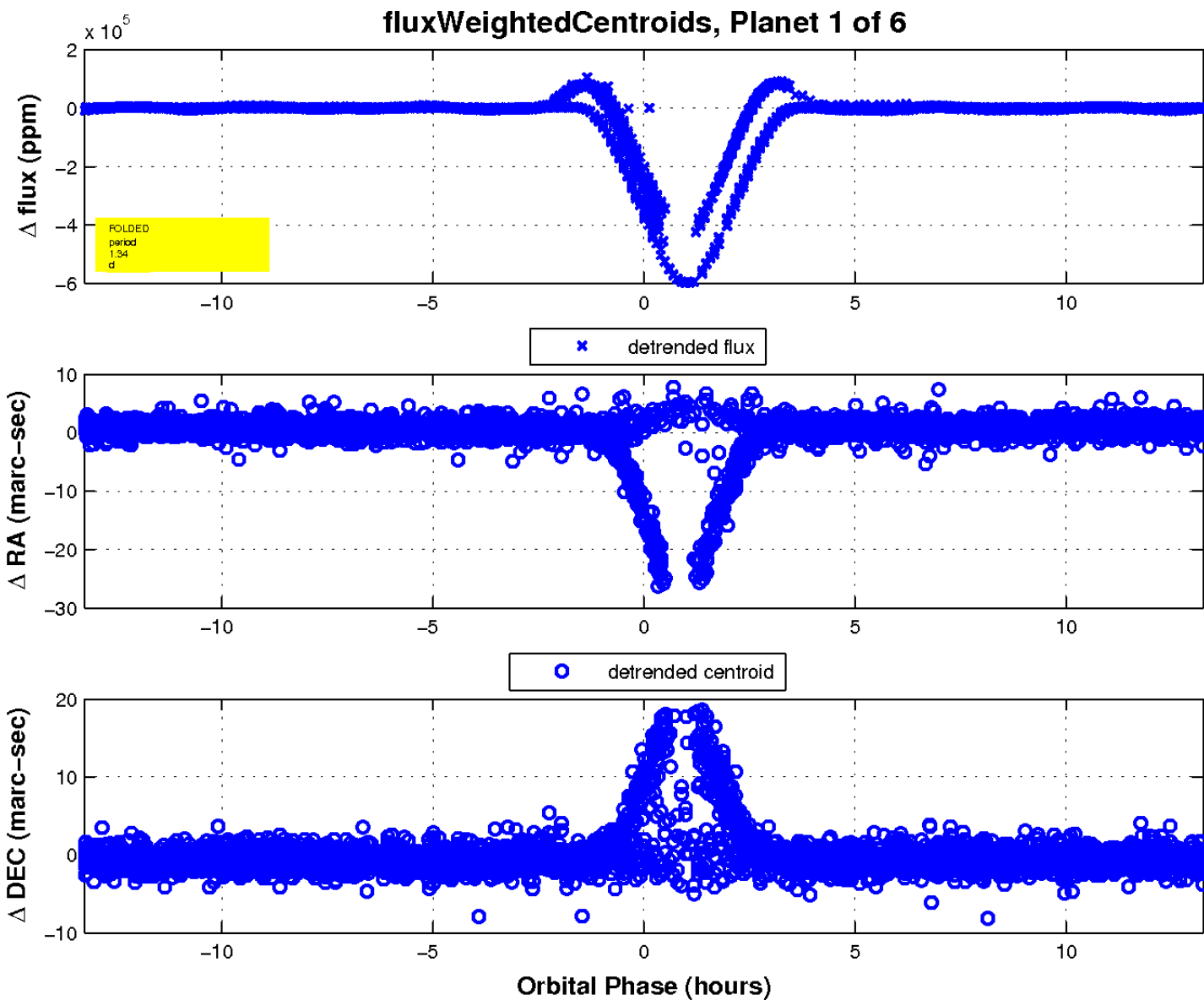
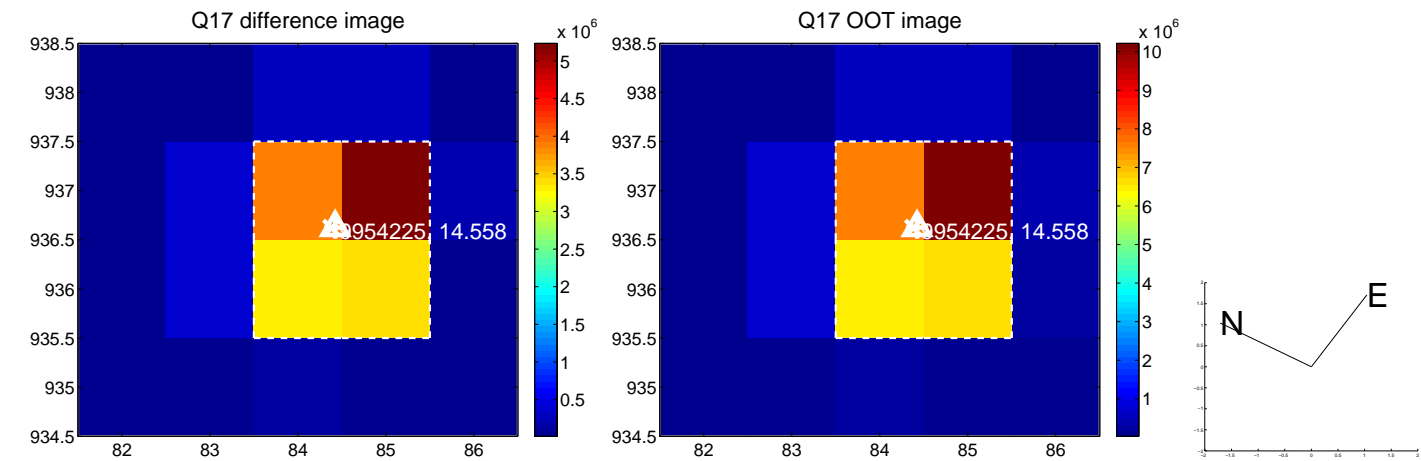
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

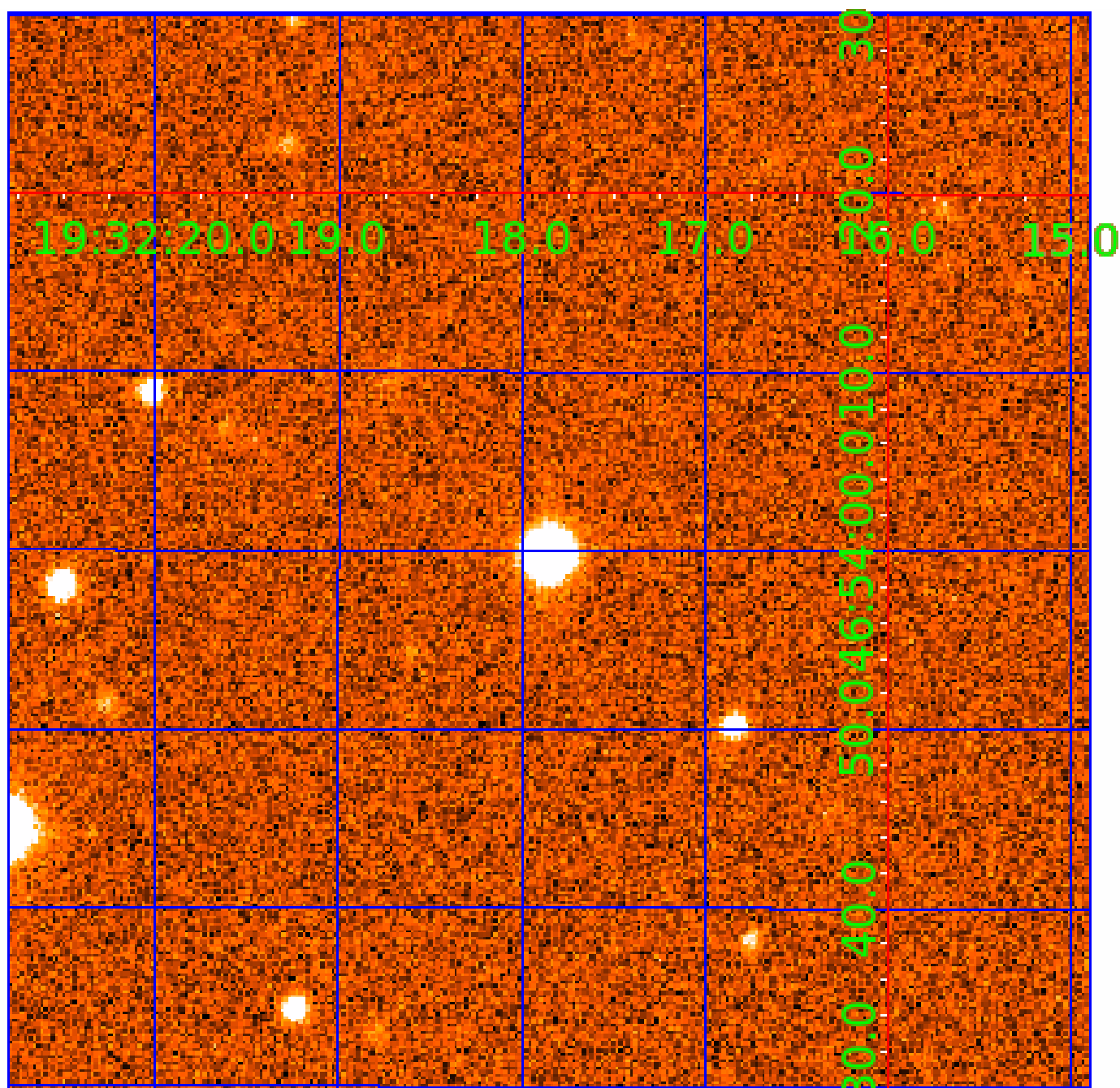


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009954225

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009954225-01	OBS	5742.01	1.340494	132.219327	537646.6	2.500	2691.7	-1.0	1.22	6332	41.48	3820.20
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TCE	Run Type	Disp	Score	N	S	C	E	Comments
009954225-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—CENT_NOFITS—HALO_GHOST
009954225-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
009954225-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
009954225-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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.

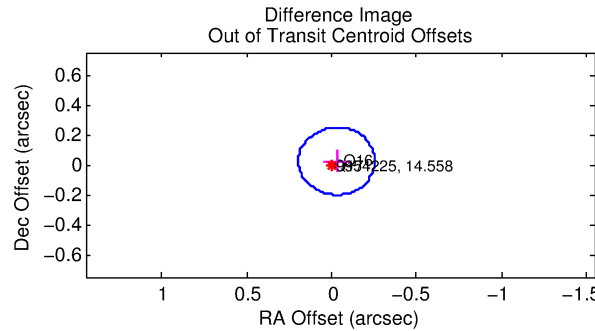
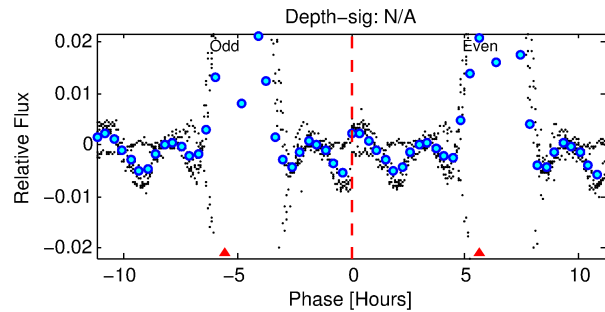
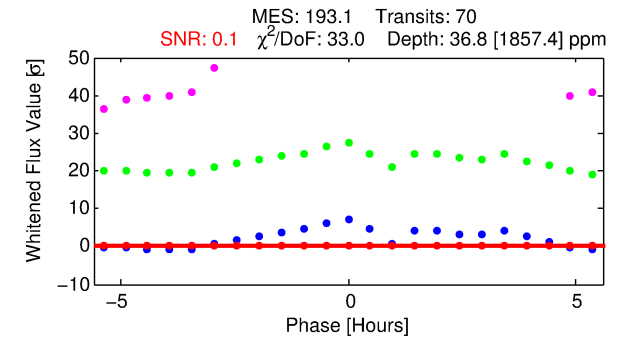
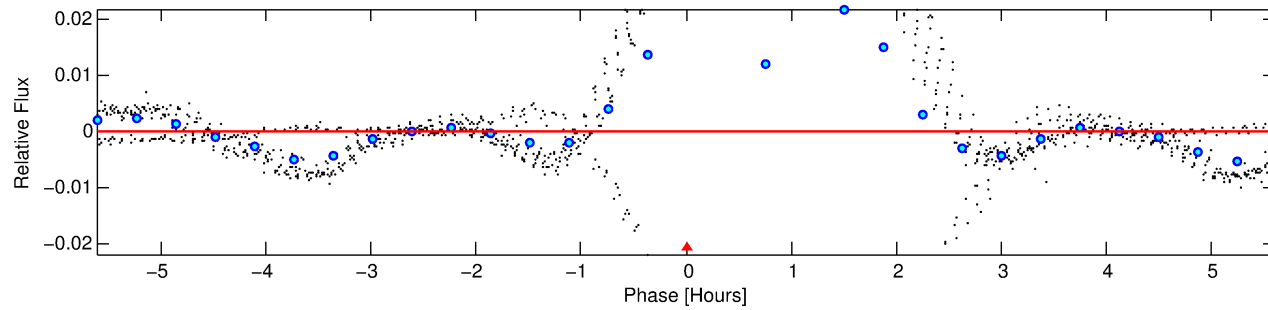
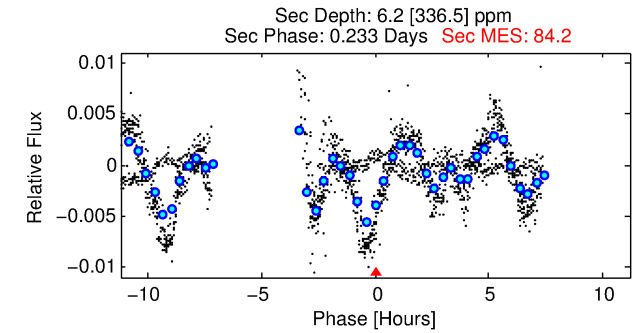
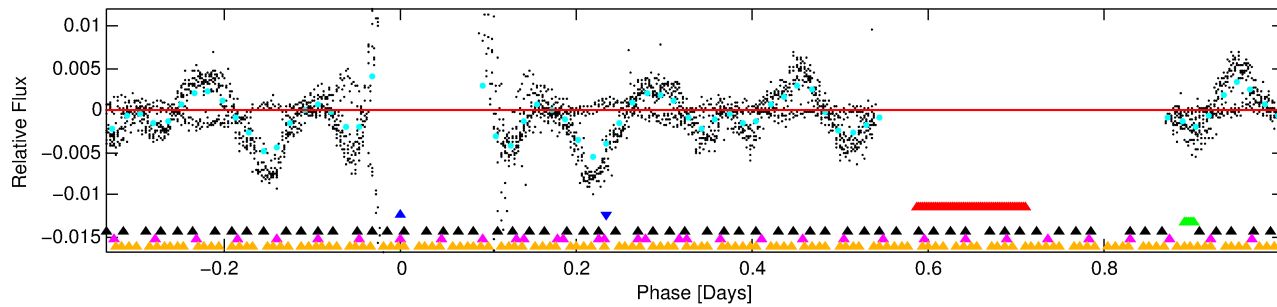
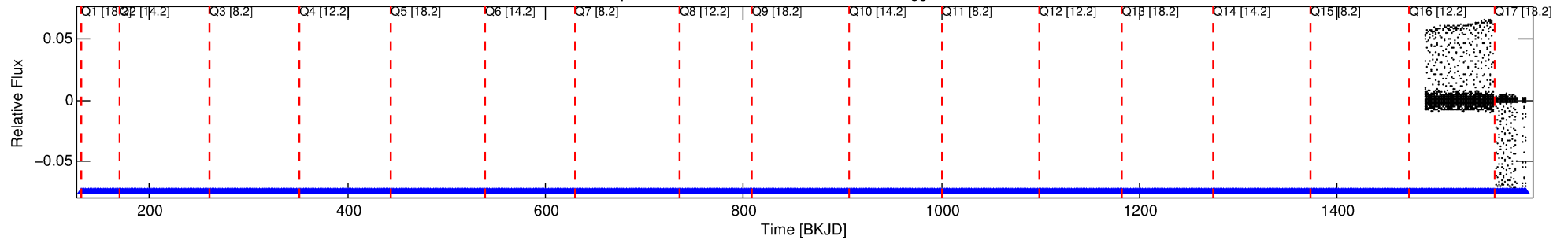
## Ephemeris Match Information For 009954225-02

No Significant Match Found

# DV One-Page Summary

KIC: 9954225 Candidate: 2 of 6 Period: 1.340 d  
KOI: K05742 Corr: No Ephemeris Match

Kp: 14.56 R\*: 1.22 Rs Teff: 6332.0 K Logg: 4.26 Fe/H: -0.420



## DV Fit Results:

Period = 1.34038 [0.00342] d  
Epoch = 131.6309 [0.6847] BKJD  
Rp/R\* = 0.0060 [0.3538]  
a/R\* = 3.75 [1017.04]  
b = 0.75 [170.01]  
Seff = 3820.63 [1400.25]  
Teq = 2005 [184] K  
Rp = 0.81 [47.18] Re  
a = 0.0237 [0.0055] AU  
Ag = 2.95 [380.76] [0.01σ]  
Teffp = 4063 [130991] K [0.02σ]

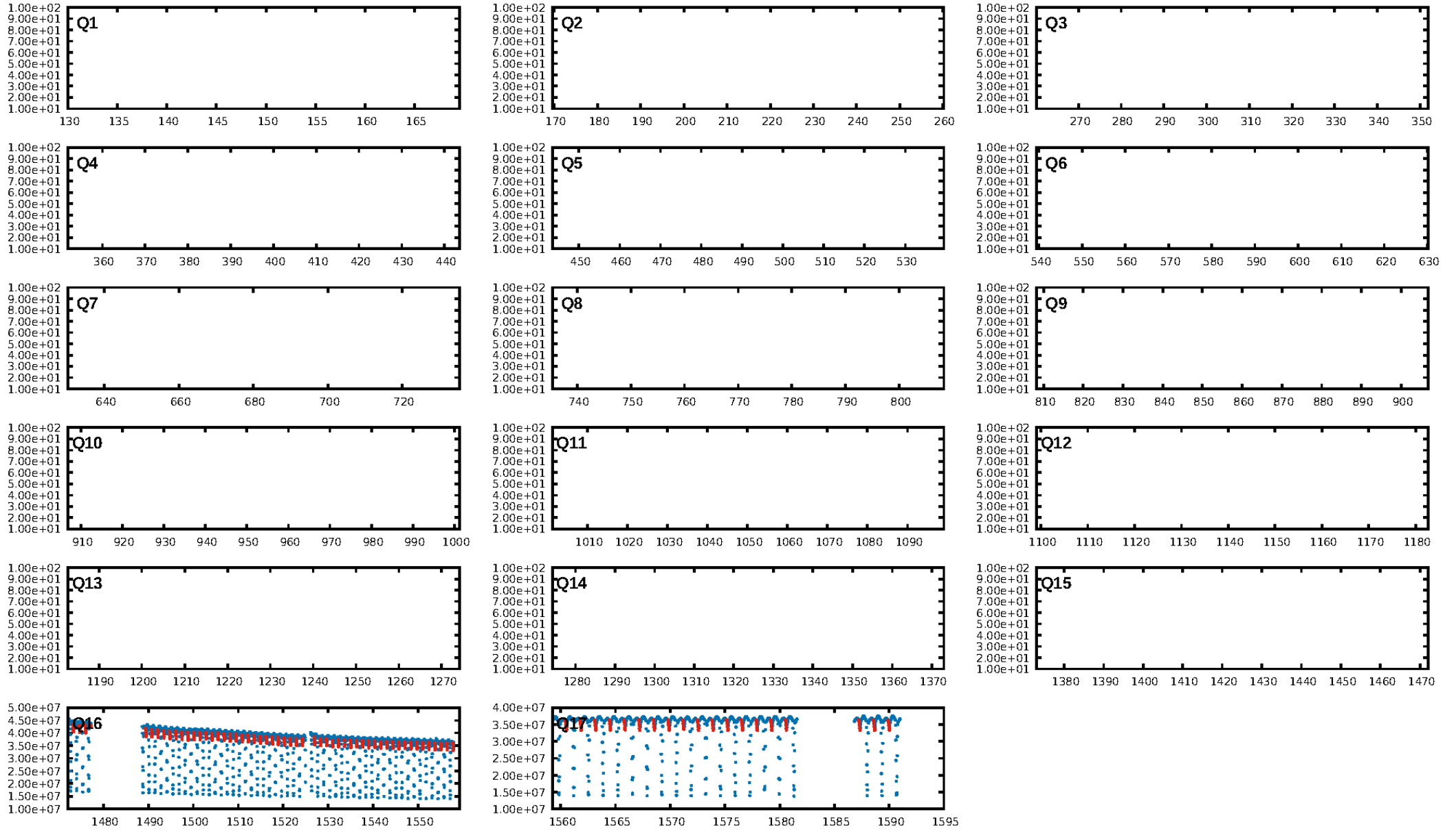
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 4.60e-158  
RollingBand-fgt: 1.00 [51/51]  
GhostDiagnostic-chr: 0.3384  
Centroid-sig: N/A  
Centroid-so: 62.175 arcsec [7.17σ]  
OotOffset-rm: 0.037 arcsec [0.49σ]  
KicOffset-rm: 0.265 arcsec [3.40σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
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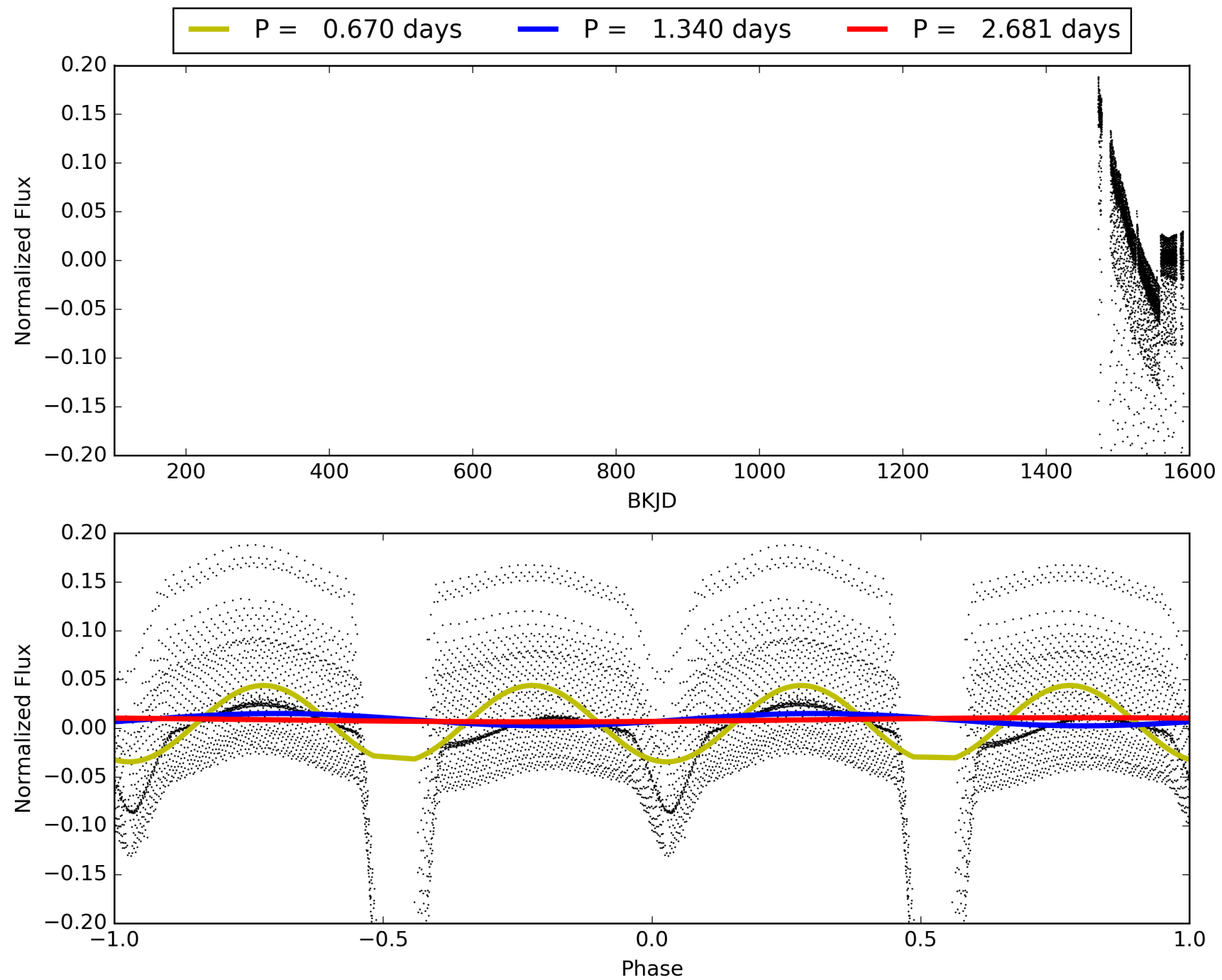
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:35:51 Z

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

# TCE 009954225-02, PDC Light Curves

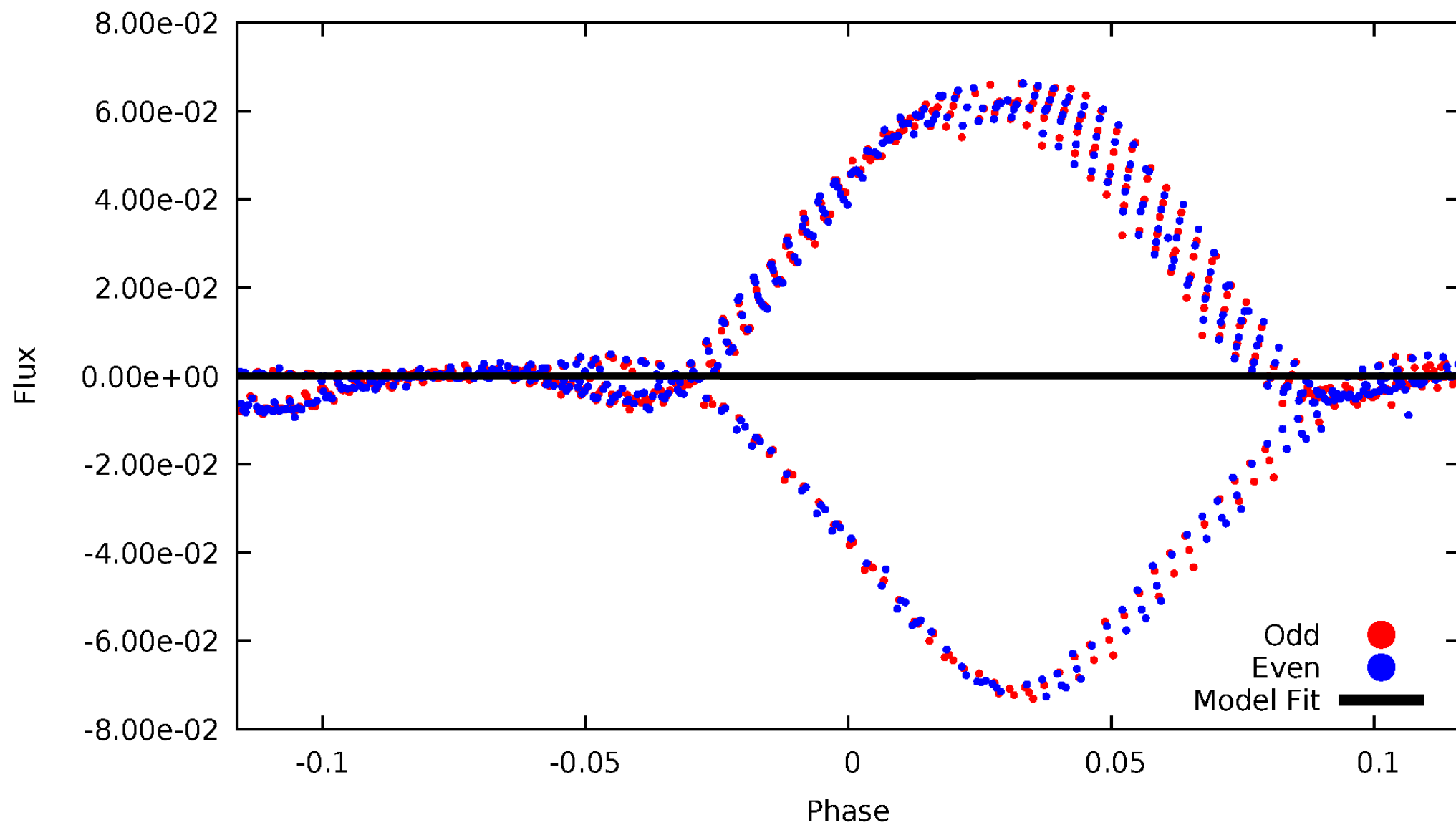


TCE 009954225-02



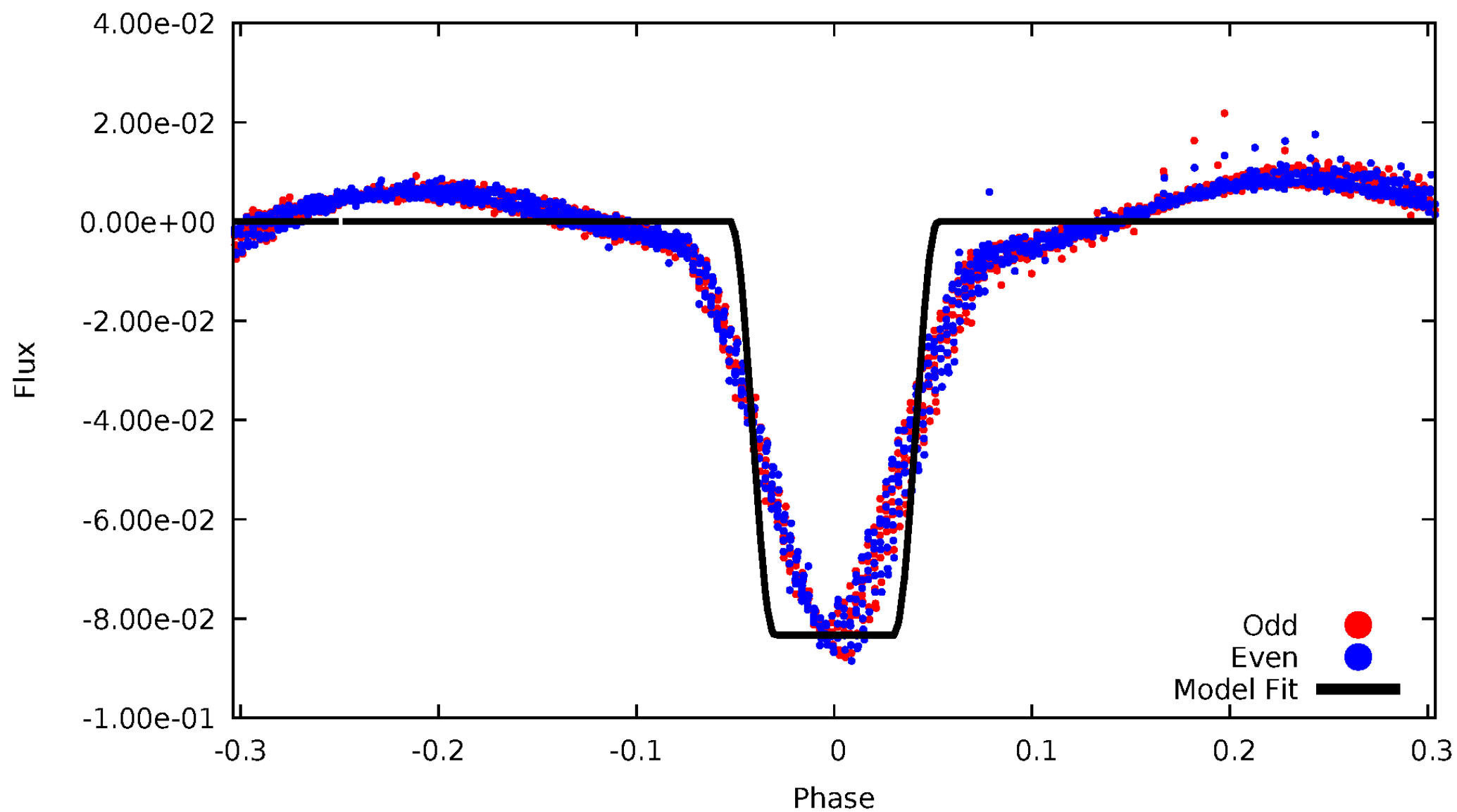
# DV Odd/Even

TCE 009954225-02



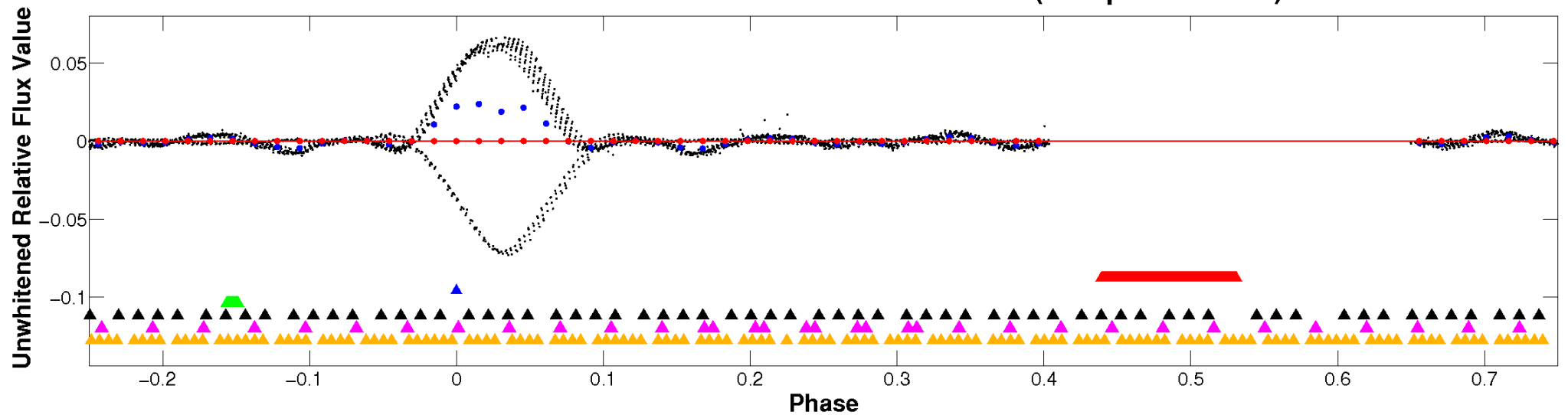
# ALT Odd/Even

TCE 009954225-02

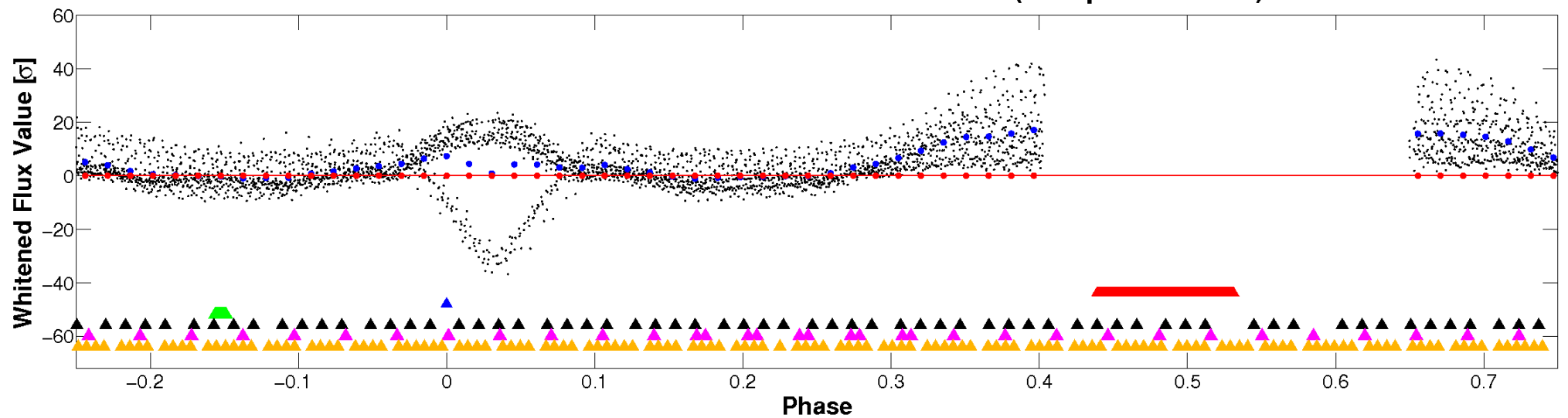


# Non-Whitened Vs. Whitened Light Curve

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

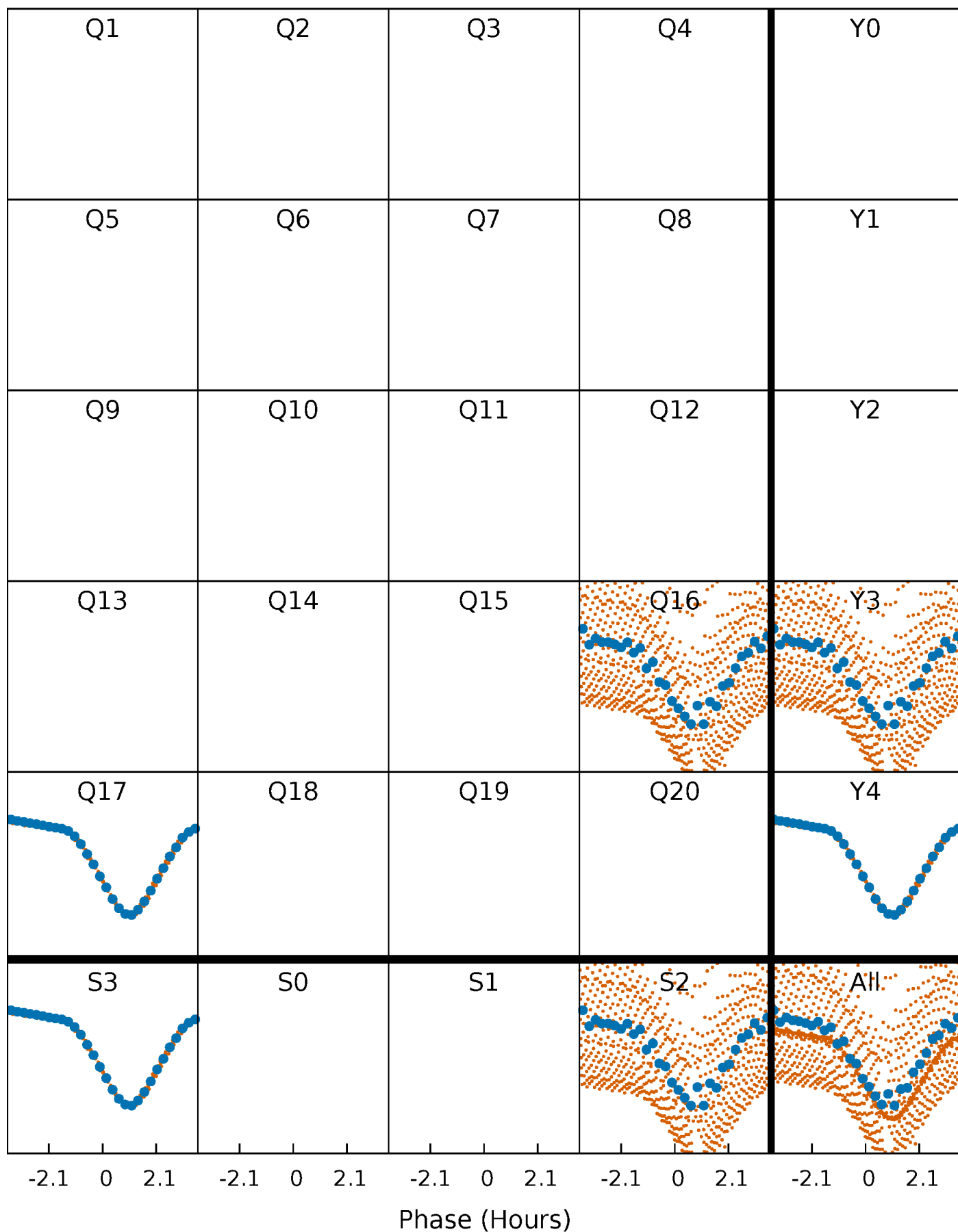


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

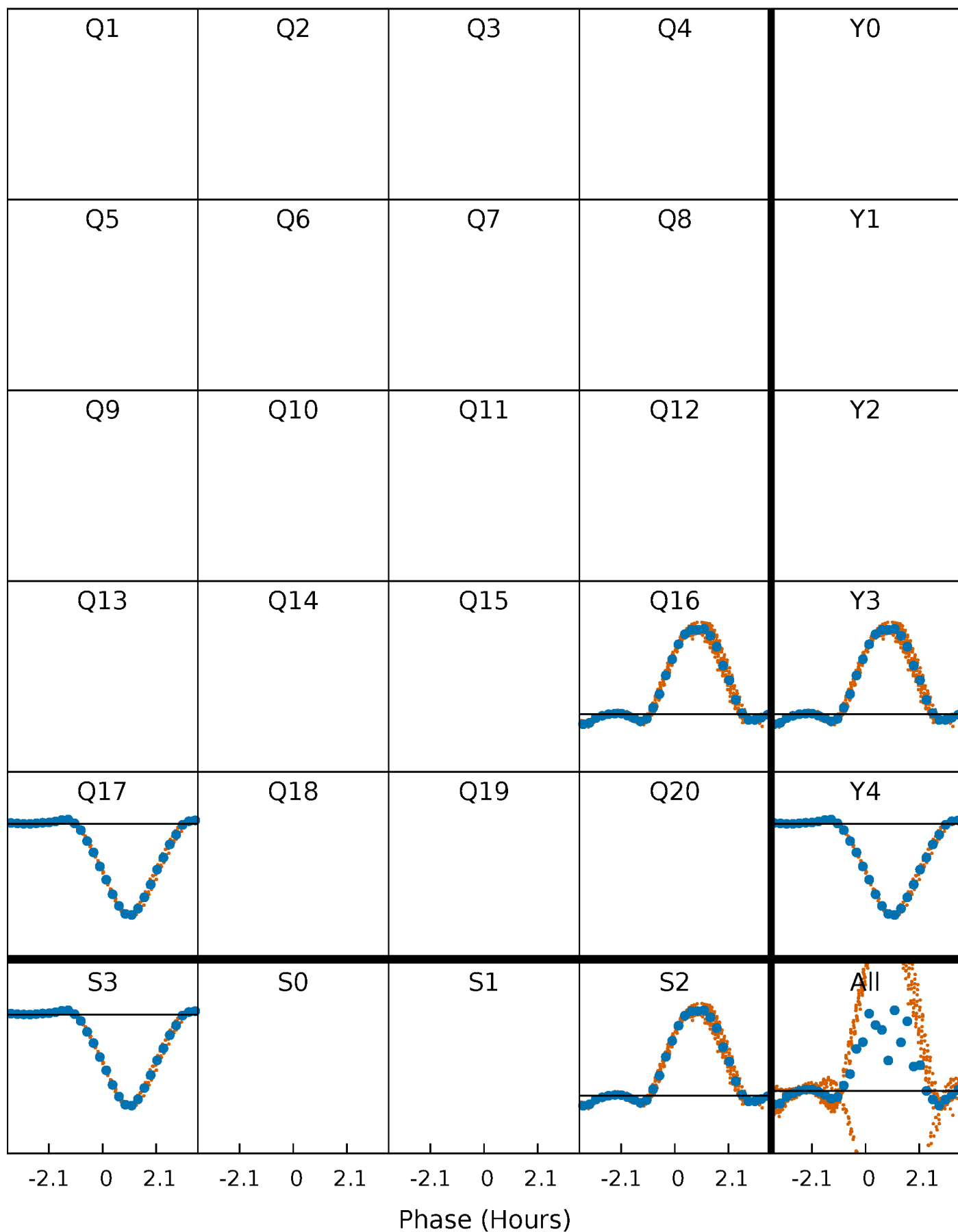
TCE 009954225-02   P= 1.340381 Days    $T_0=131.630888$  (BKJD)





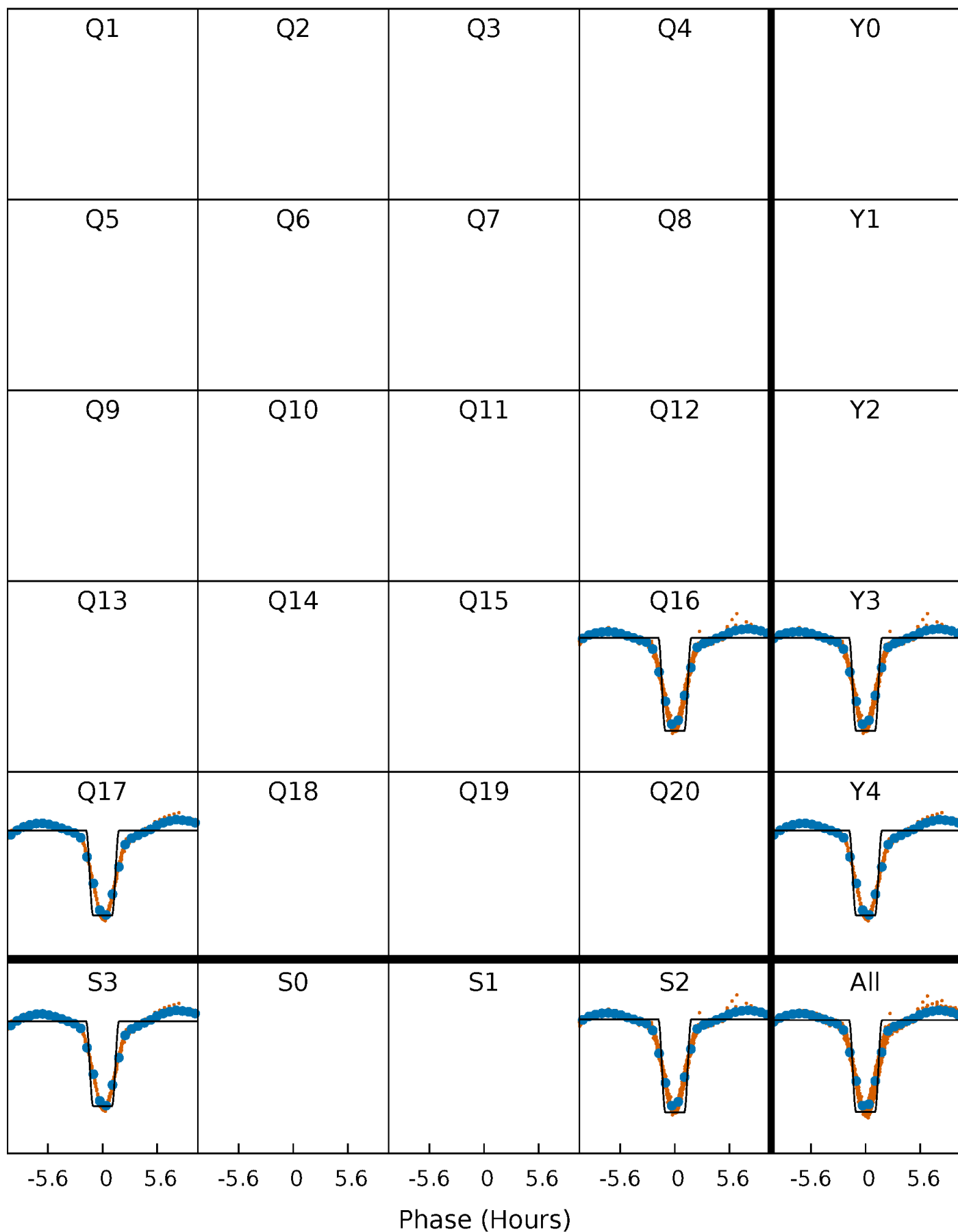
# DV Quarter-Phased Transit Curves

TCE 009954225-02   P= 1.340381 Days    $T_0=131.630888$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

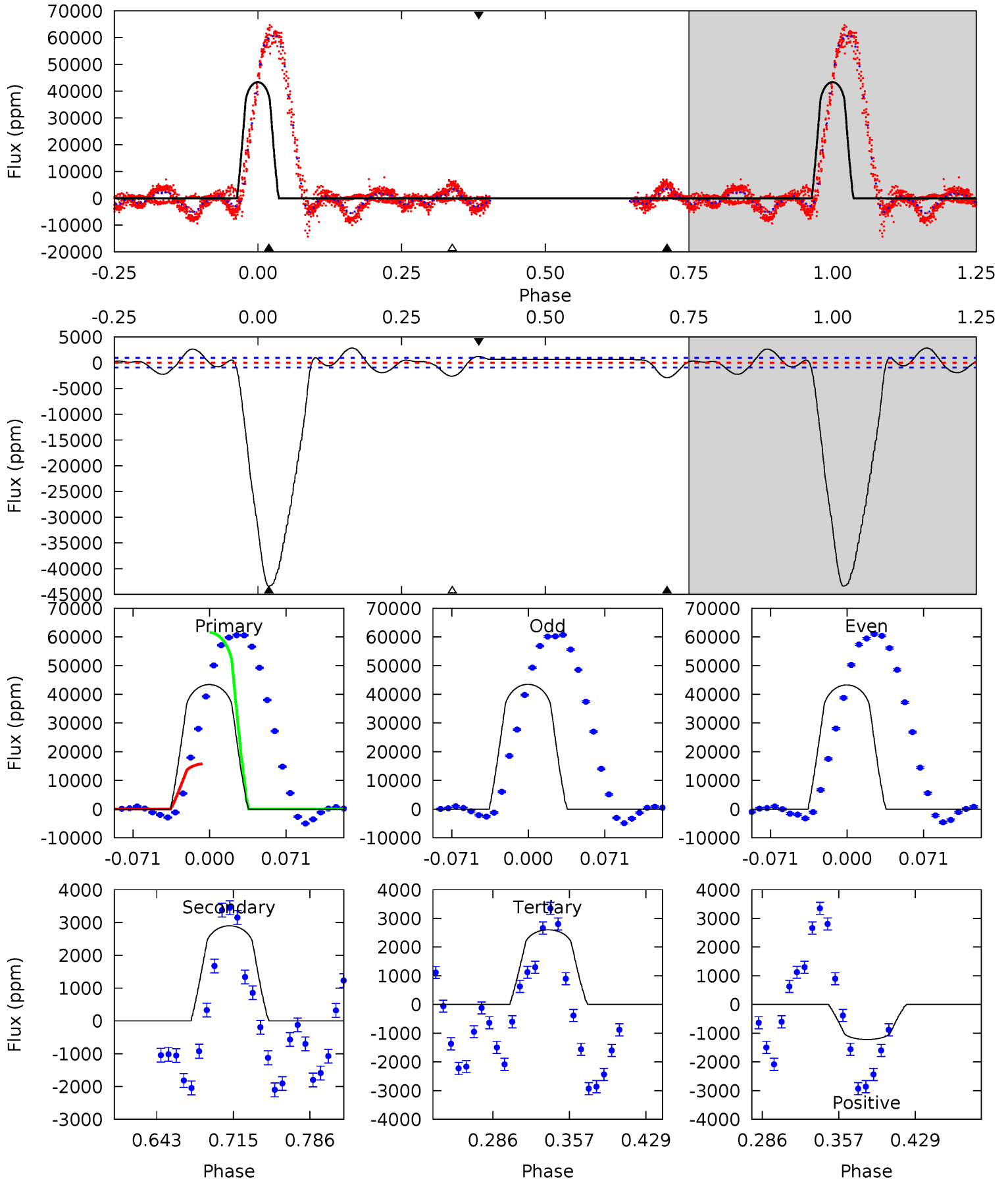
TCE 009954225-02   P= 1.340444 Days    $T_0=131.601475$  (BKJD)



# DV Model-Shift Uniqueness Test

009954225-02, P = 1.340381 Days, E = 131.630888 Days

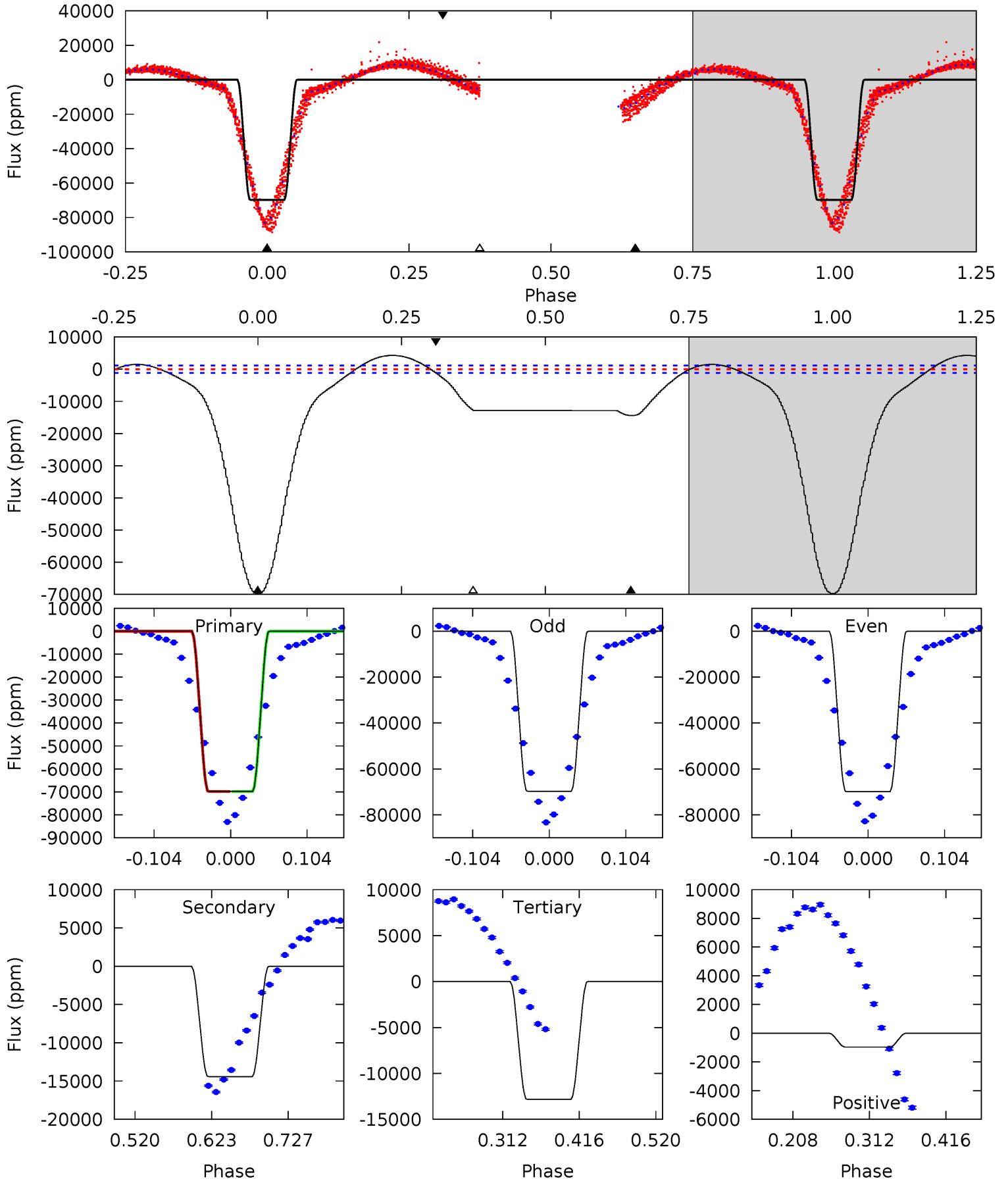
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
215.2	14.4	12.9	6.05	4.63	1.80	6.82	202.3	209.1	1.47	8.32	0.51	0.48	0.06	0



# Alt Model-Shift Uniqueness Test

009954225-02, P = 1.340444 Days, E = 131.601475 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
275.7	56.9	50.7	-3.82	4.56	1.63	16.4	225.1	279.5	6.28	60.8	0.35	1.00	0.06	0.01



### Stellar Parameters For KIC 009954225

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6332^{+199}_{-244}$	$4.260^{+0.180}_{-0.180}$	$-0.420^{+0.300}_{-0.300}$	$1.222^{+0.339}_{-0.277}$	$0.991^{+0.156}_{-0.114}$	$0.765^{+0.707}_{-0.363}$
	+3%/-4%	+4%/-4%	+71%/-71%	+28%/-23%	+16%/-12%	+92%/-47%
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 009954225-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2898 \pm 202$	$32.96^{+33.85}_{-24.08}$	$2803^{+208}_{-194}$	$3207^{+2371}_{-5772}$	$0.818^{+10.754}_{-0.610}$
Alt.	$-14415 \pm 253$	$51.18^{+43.19}_{-34.25}$	$2799^{+211}_{-187}$	$3780^{+2303}_{-970}$	$1.804^{+13.810}_{-1.287}$

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

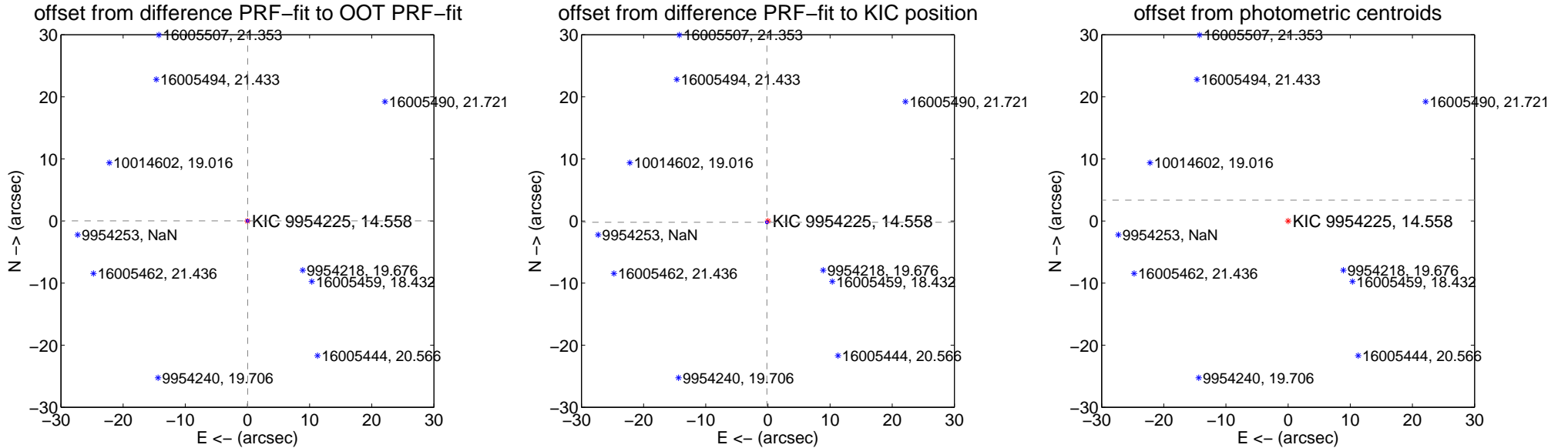
## DV Centroid Data

Supplemental centroid analysis for 009954225-02. Kepler magnitude: 14.56. Transit SNR 0.15

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.037 \pm 0.075$	0.49	$-0.029 \pm 0.073$	$0.023 \pm 0.069$
PRF-fit source offset from KIC position	$0.265 \pm 0.078$	3.40	$0.165 \pm 0.076$	$-0.208 \pm 0.079$
photometric centroid source offset	$62.17 \pm 8.67$	7.17	$-62.08 \pm 8.66$	$3.36 \pm 9.92$



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.

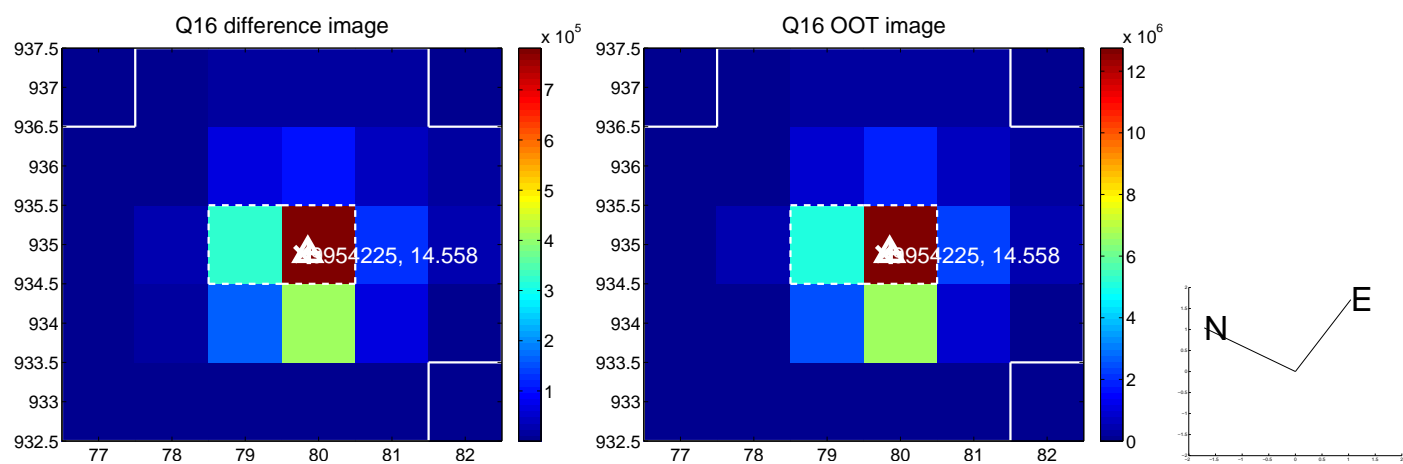
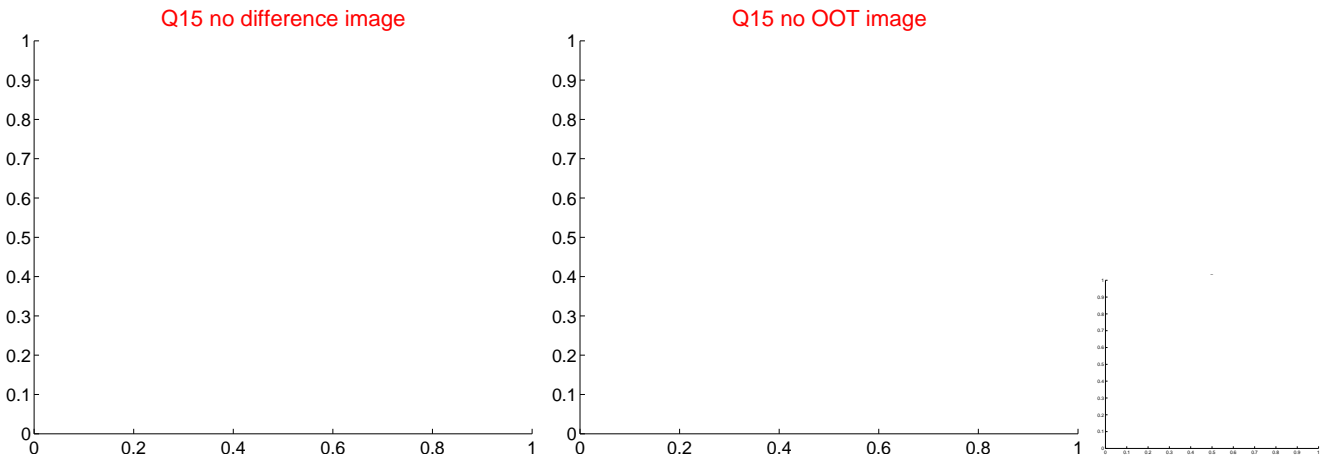
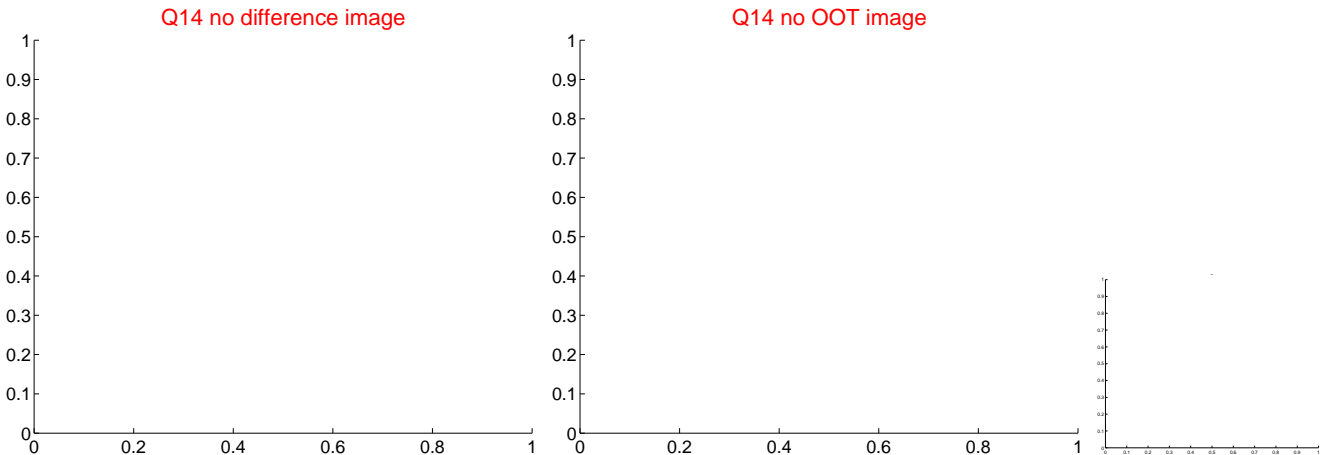
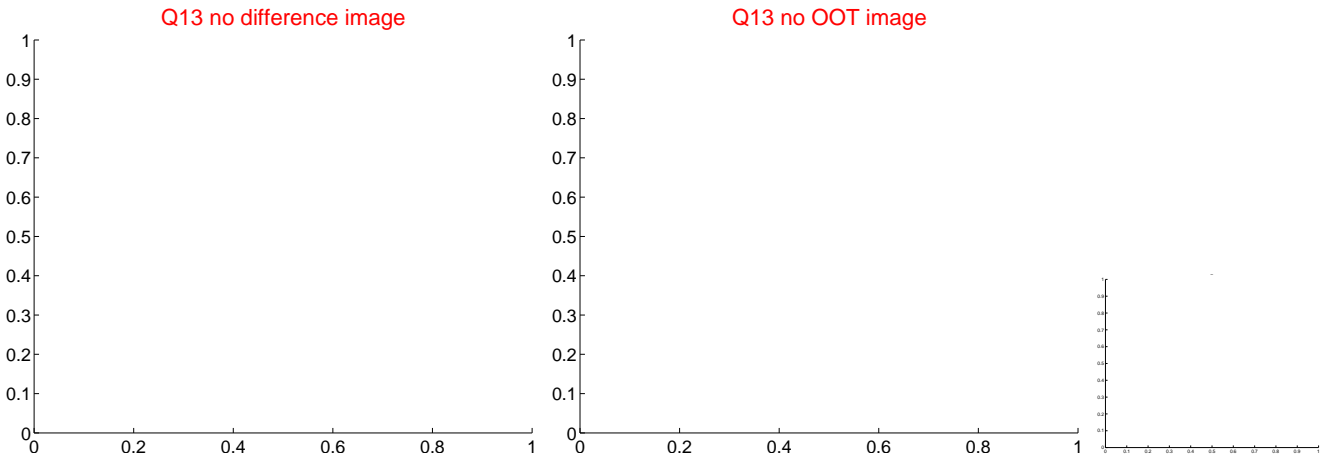




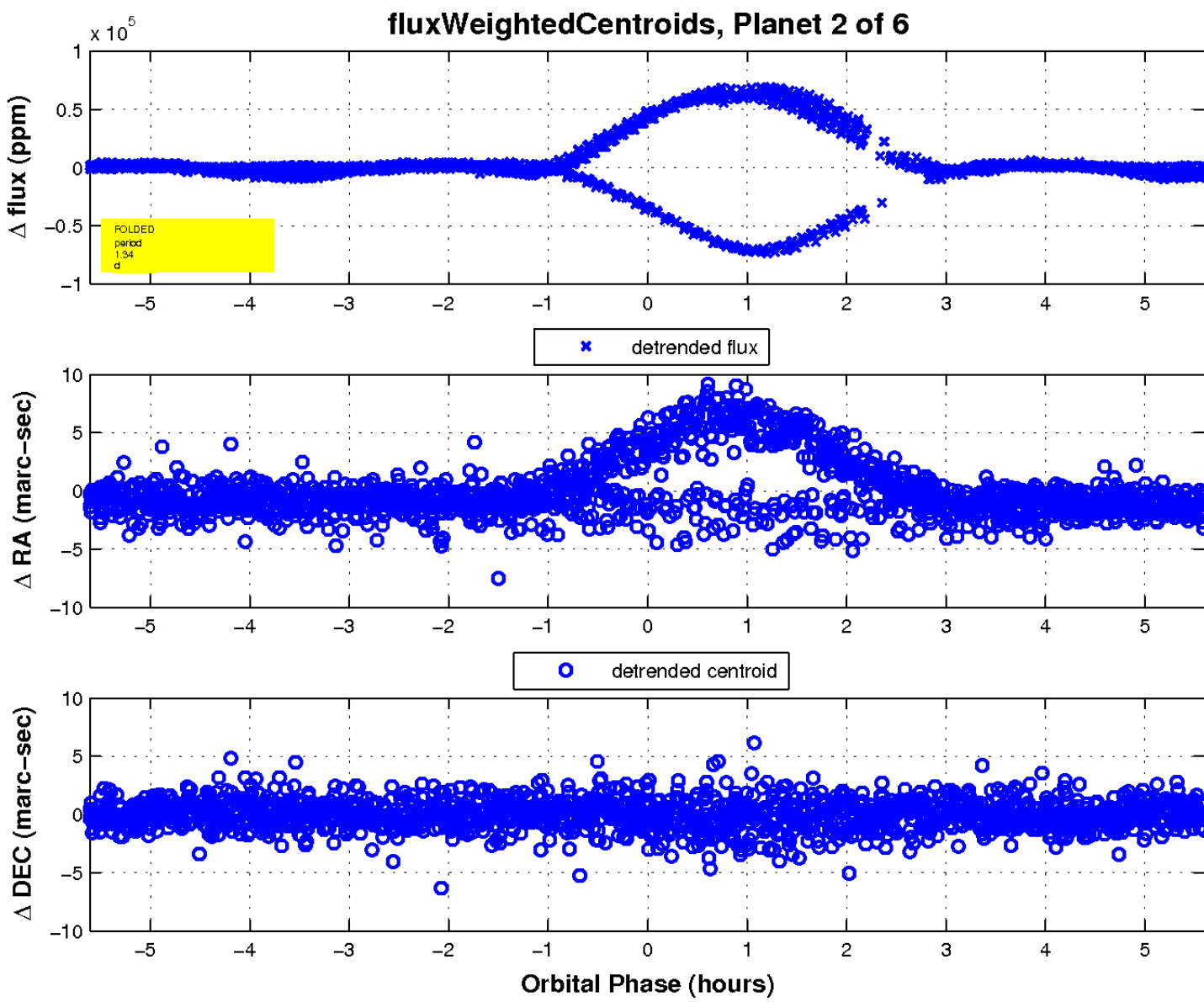
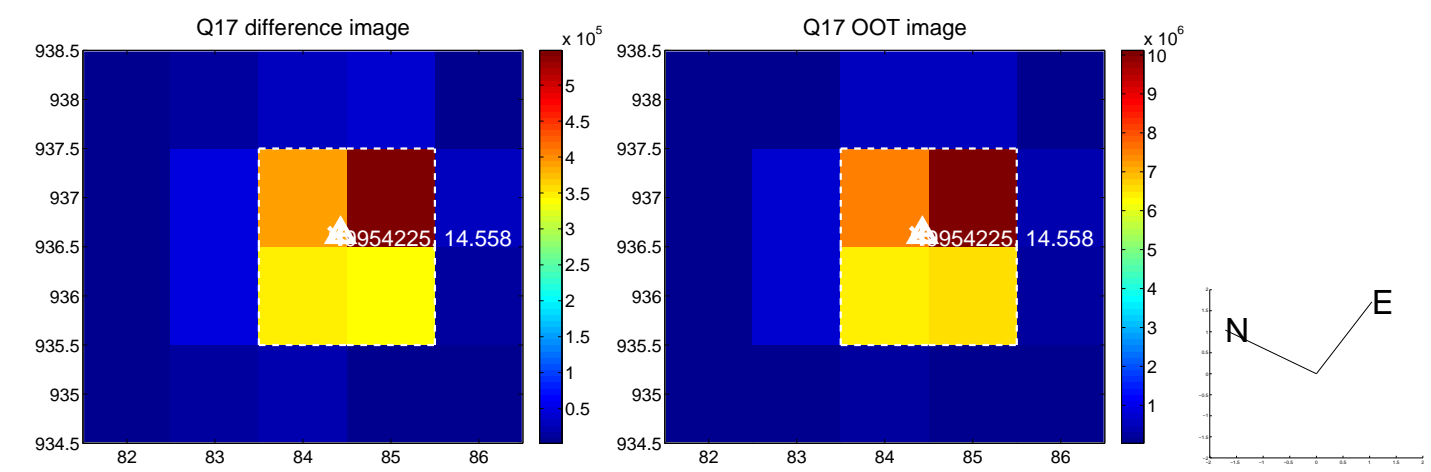
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

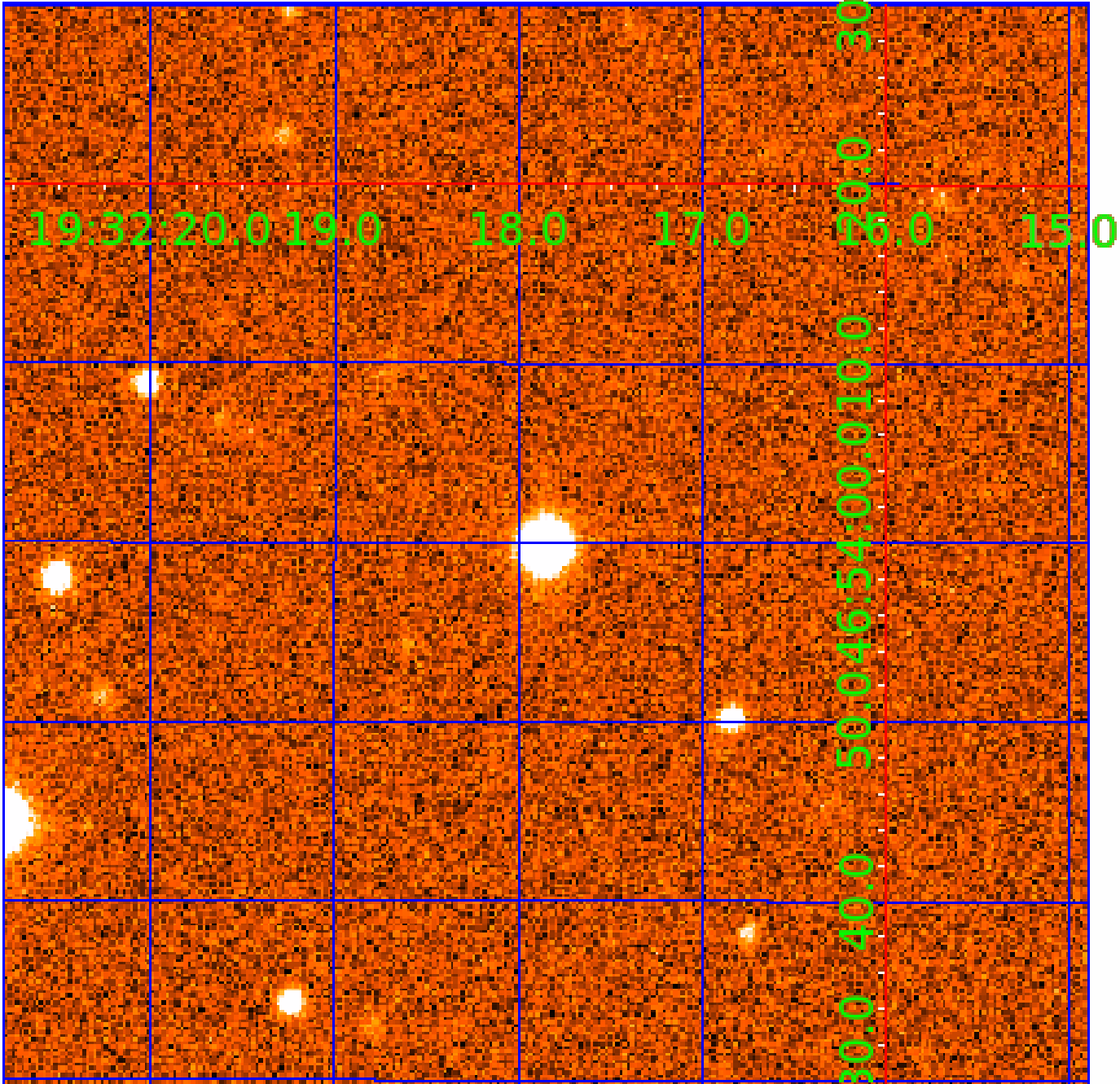


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009954225

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009954225-01	OBS	5742.01	1.340494	132.219327	537646.6	2.500	2691.7	-1.0	1.22	6332	41.48	3820.20
009954225-02	OBS	No	1.340381	131.630888	36.8	1.869	193.1	0.1	1.22	6332	0.81	3820.63
009954225-03	OBS	No	28.147794	140.814121	4175.8	1.500	27.1	-1.0	1.22	6332	7.96	65.94
009954225-04	OBS	No	22.706568	134.935995	5735.1	1.500	29.2	-1.0	1.22	6332	9.34	87.81
009954225-05	OBS	No	42.845689	162.879751	5497.0	1.500	31.0	-1.0	1.22	6332	9.14	37.66
009954225-06	OBS	No	10.550603	133.107869	6571.4	1.500	30.7	-1.0	1.22	6332	9.99	244.01

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009954225-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—CENT_NOFITS—HALO_GHOST
009954225-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
009954225-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
009954225-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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 009954225-03

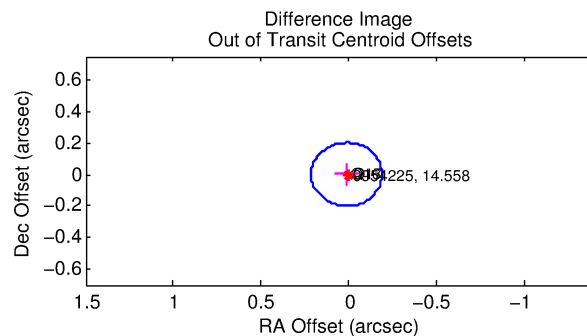
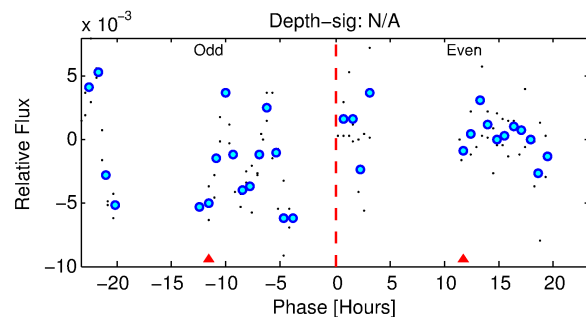
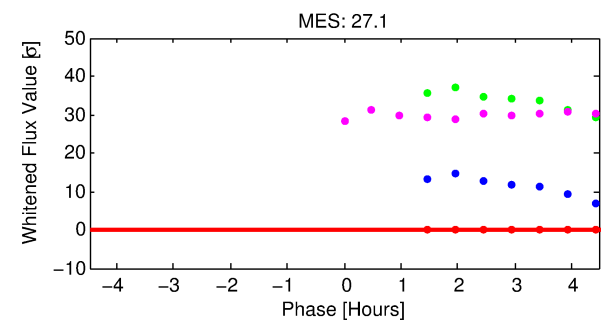
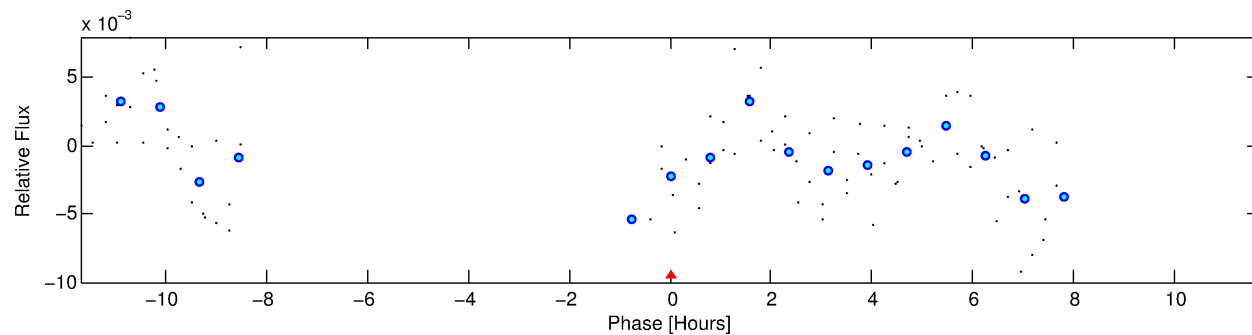
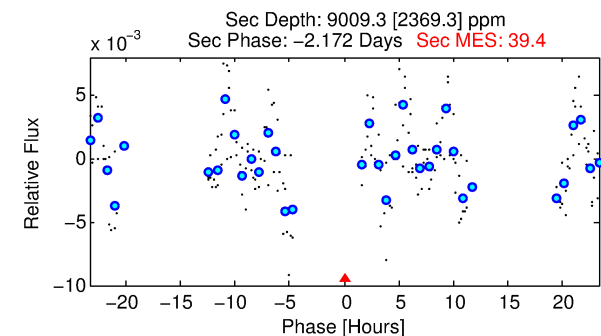
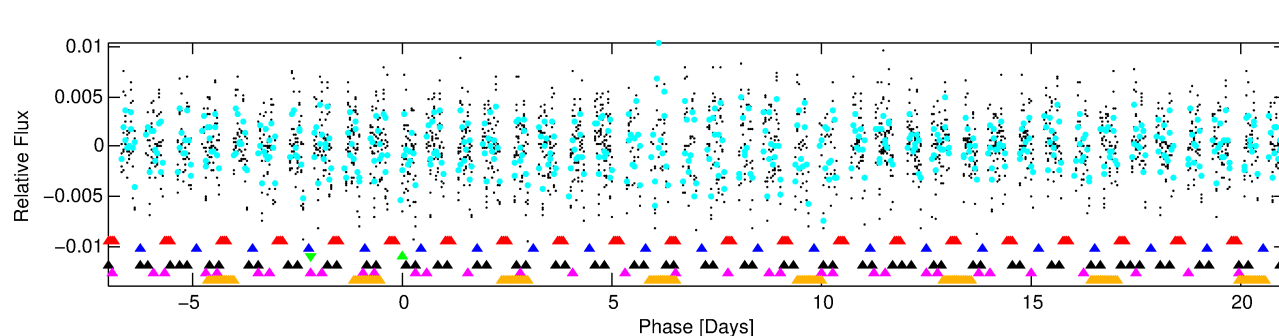
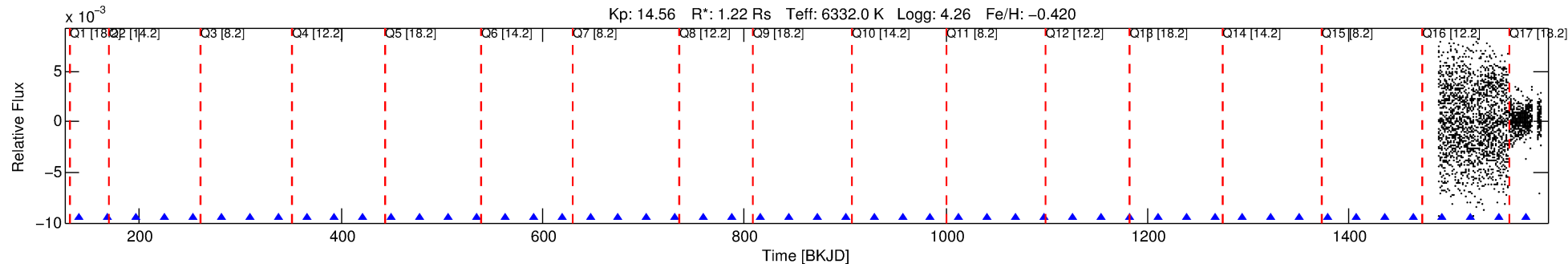
No Significant Match Found

# DV One-Page Summary

KIC: 9954225 Candidate: 3 of 6 Period: 28.148 d

KOI: K05742 Corr: No Ephemeris Match

Kp: 14.56 R\*: 1.22 Rs Teff: 6332.0 K Logg: 4.26 Fe/H: -0.420



## TPS TCE Results:

Period = 28.14779 d  
Epoch = 140.8141 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

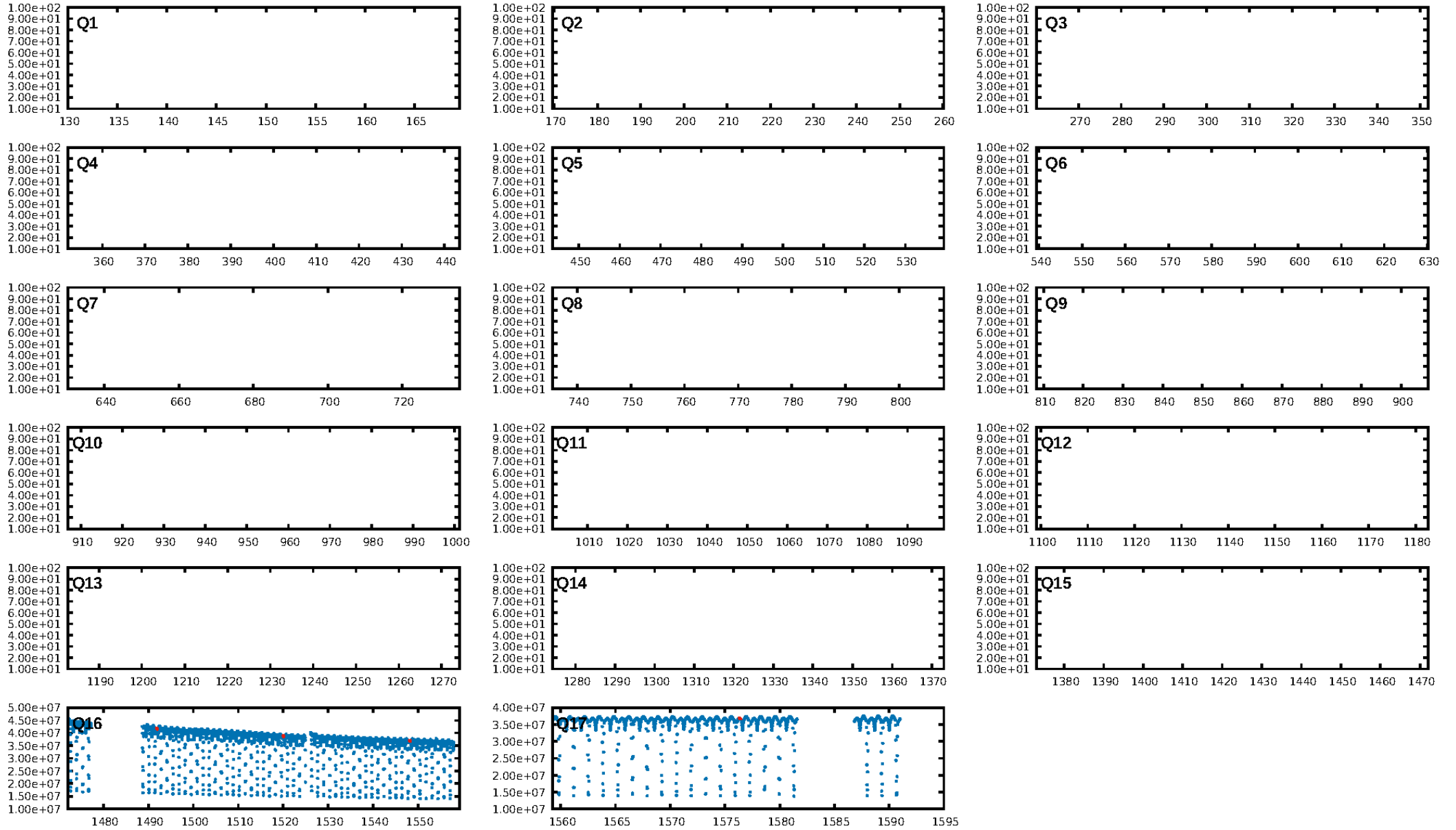
ShortPeriod-sig: 100.0% [61.56σ]  
LongPeriod-sig: 100.0% [166.29σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.30e-08  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.317

Centroid-sig: N/A  
Centroid-so: 0.390 arcsec [3.62σ]  
OotOffset-rm: 0.014 arcsec [0.21σ]  
KicOffset-rm: 0.322 arcsec [3.52σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/2]

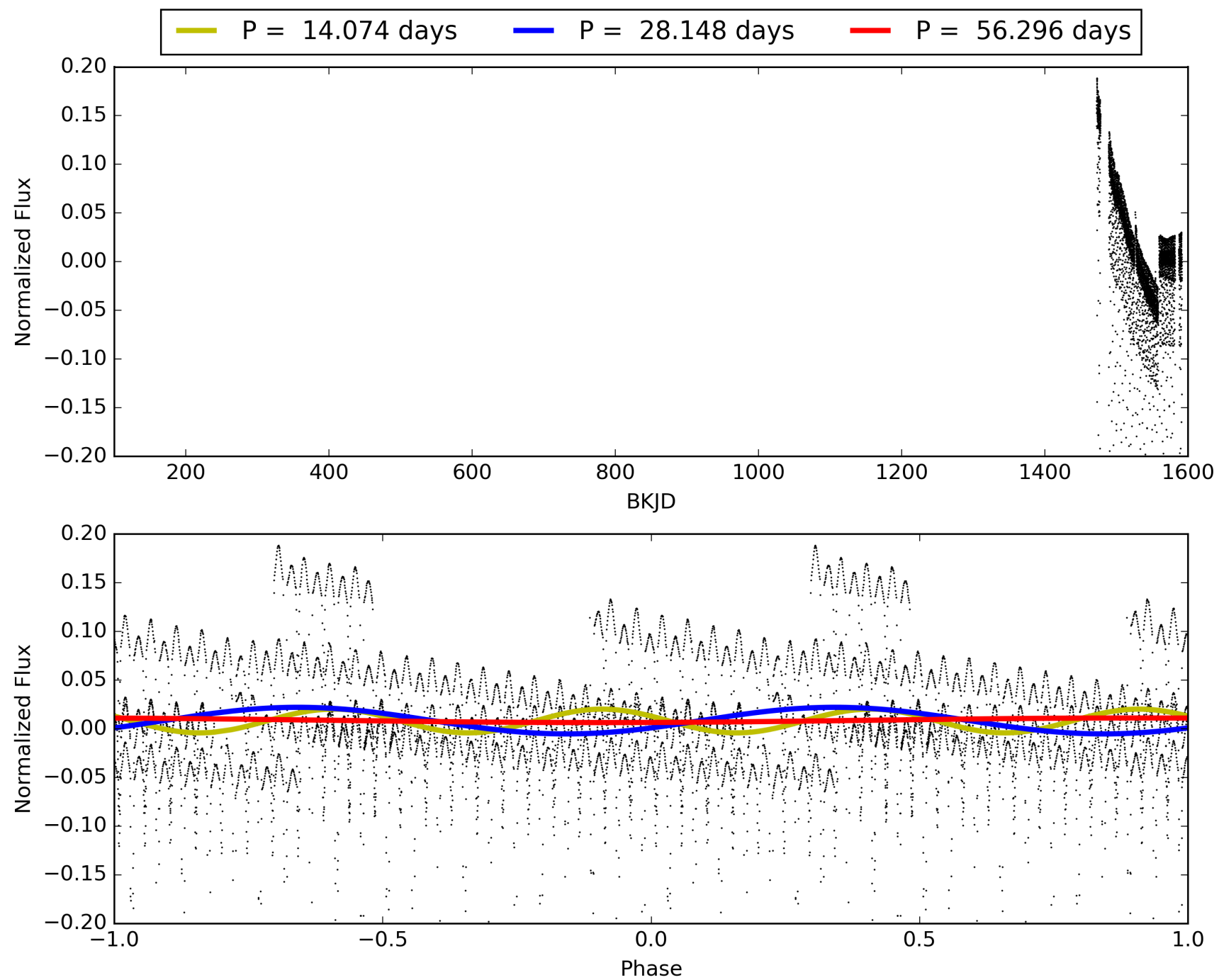
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:35:54 Z

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

# TCE 009954225-03, PDC Light Curves



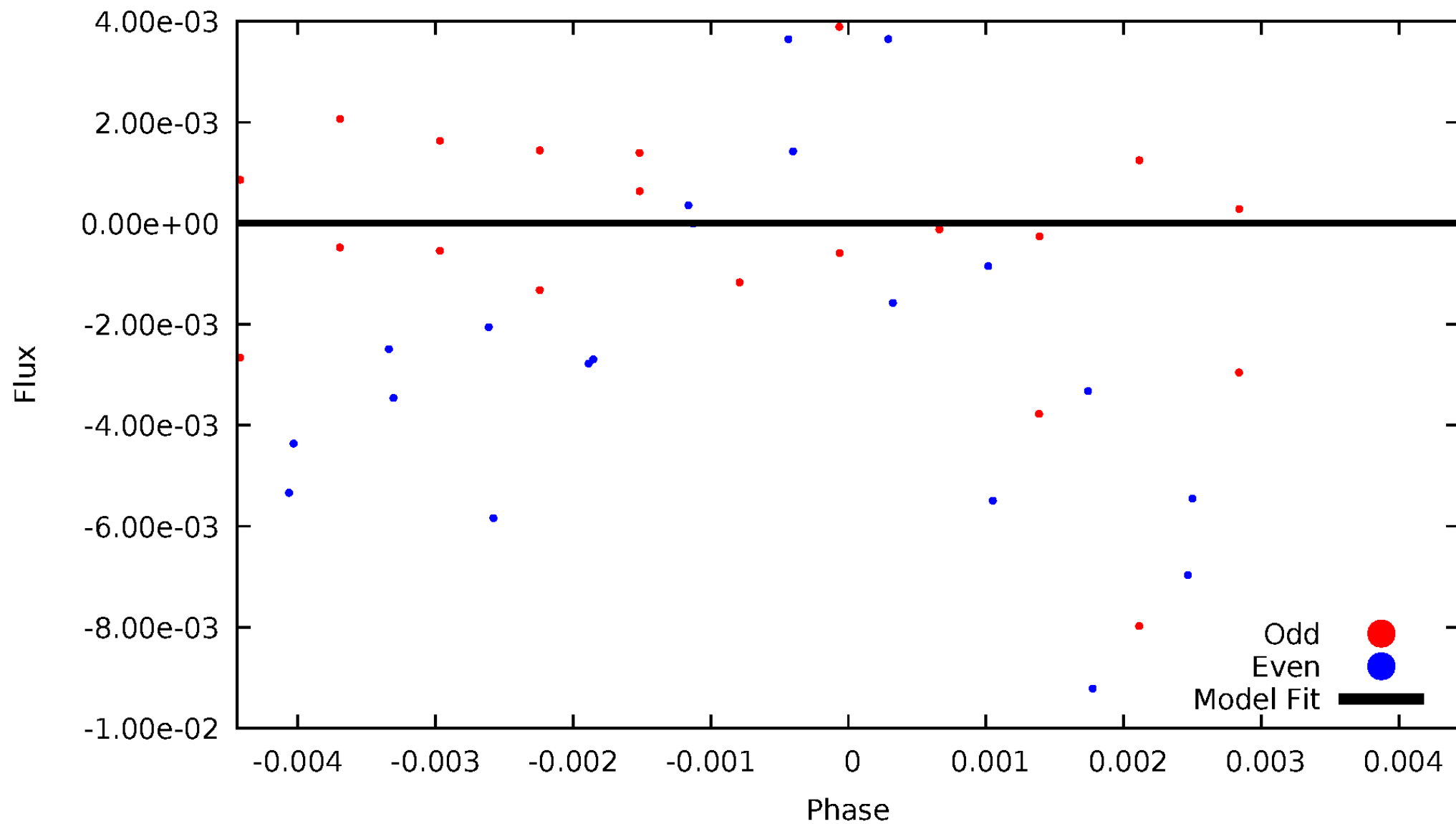
TCE 009954225-03





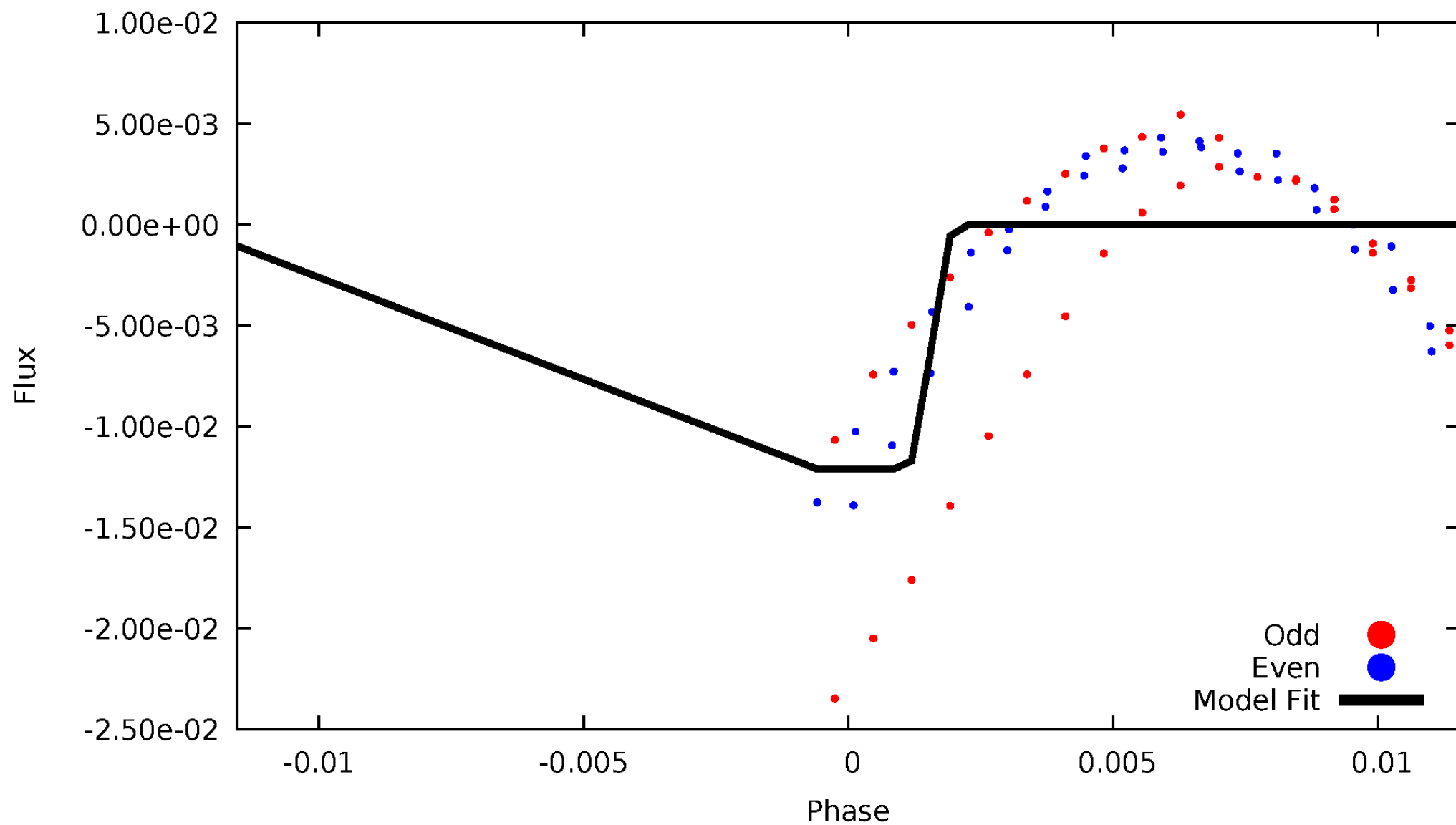
# DV Odd/Even

TCE 009954225-03



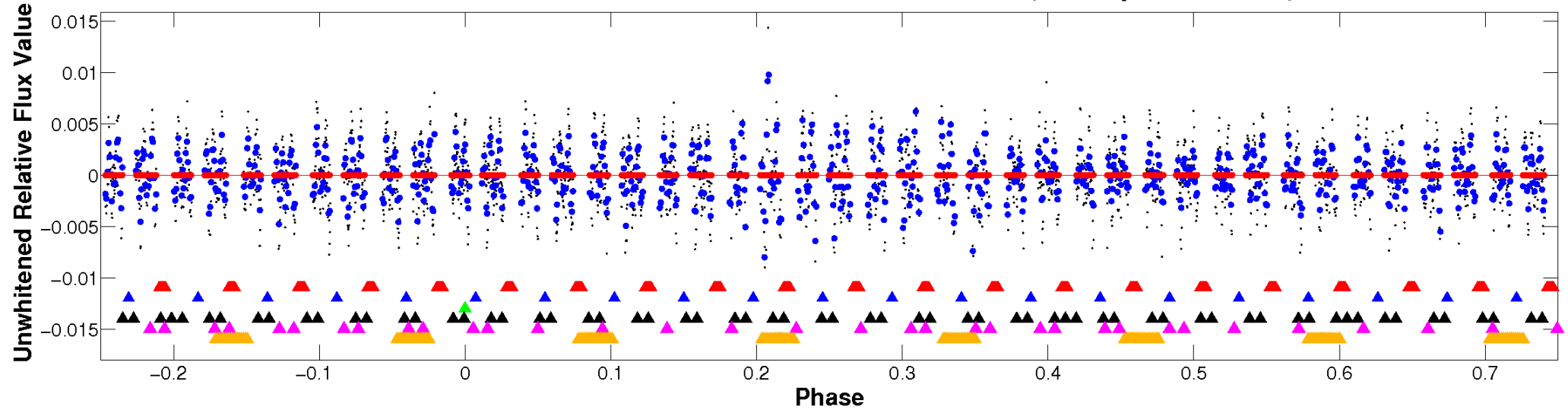
# ALT Odd/Even

TCE 009954225-03

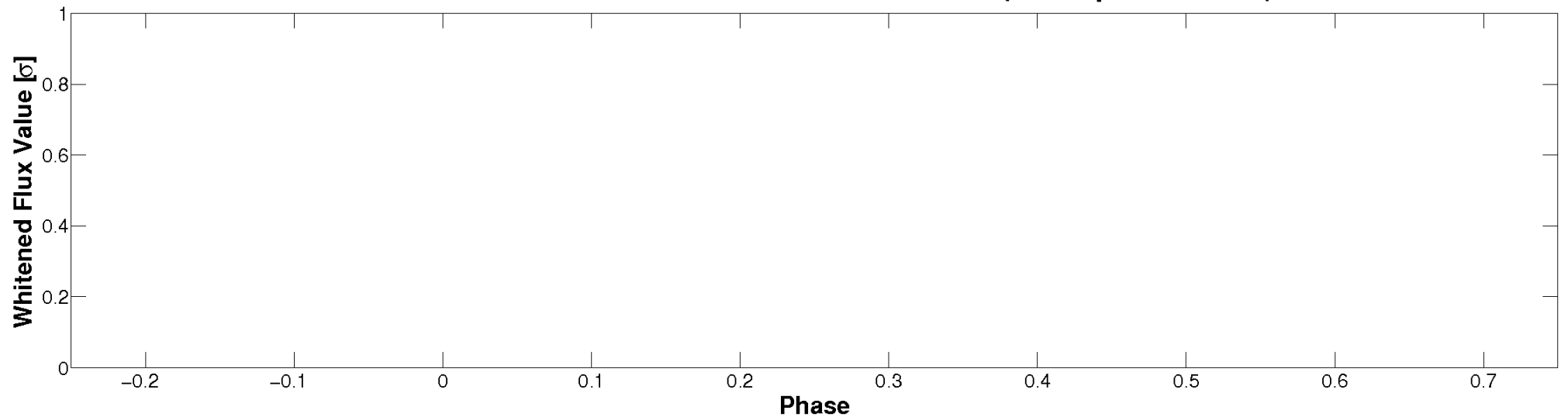


# Non-Whitened Vs. Whitened Light Curve

**Planet 3 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

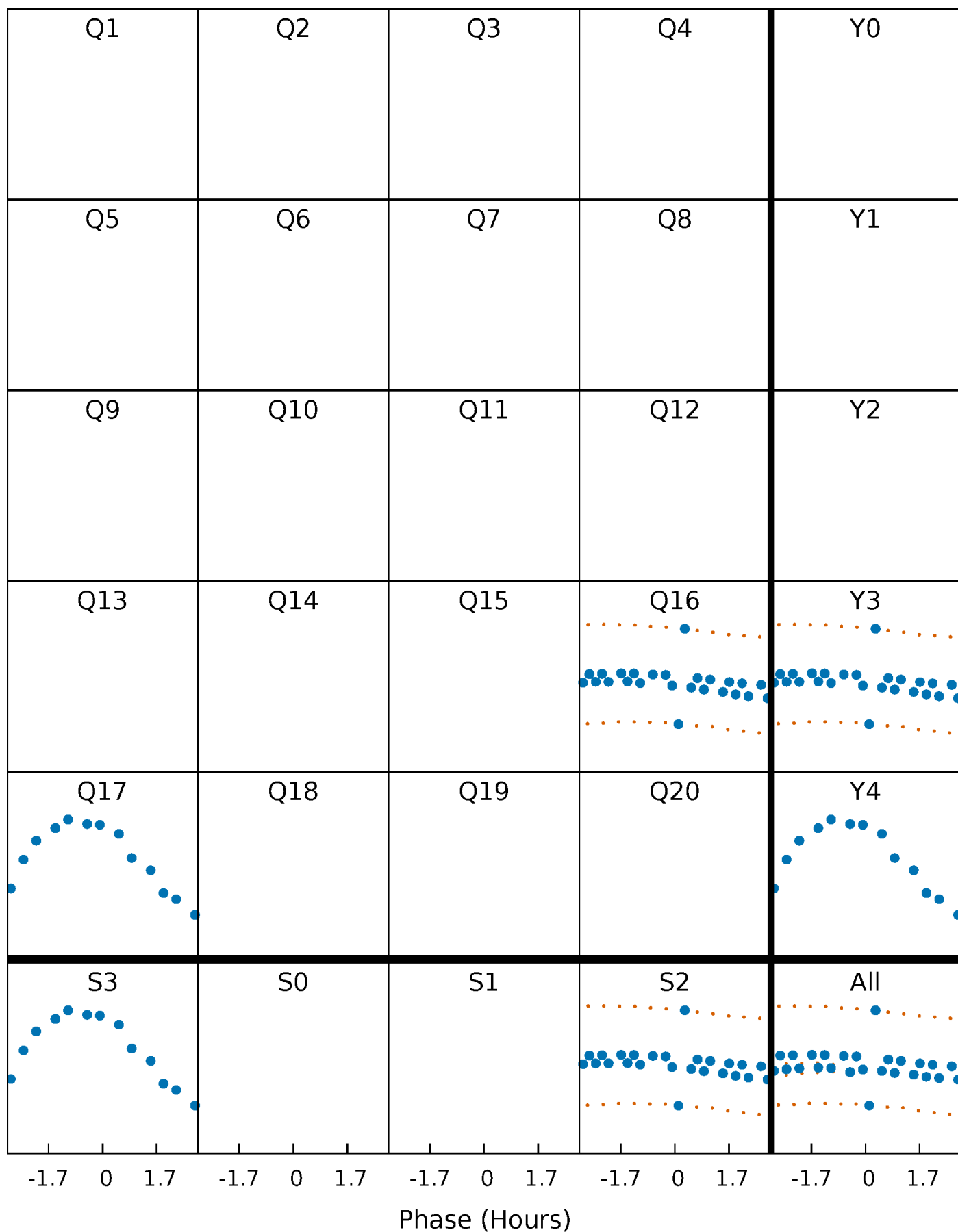


**Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



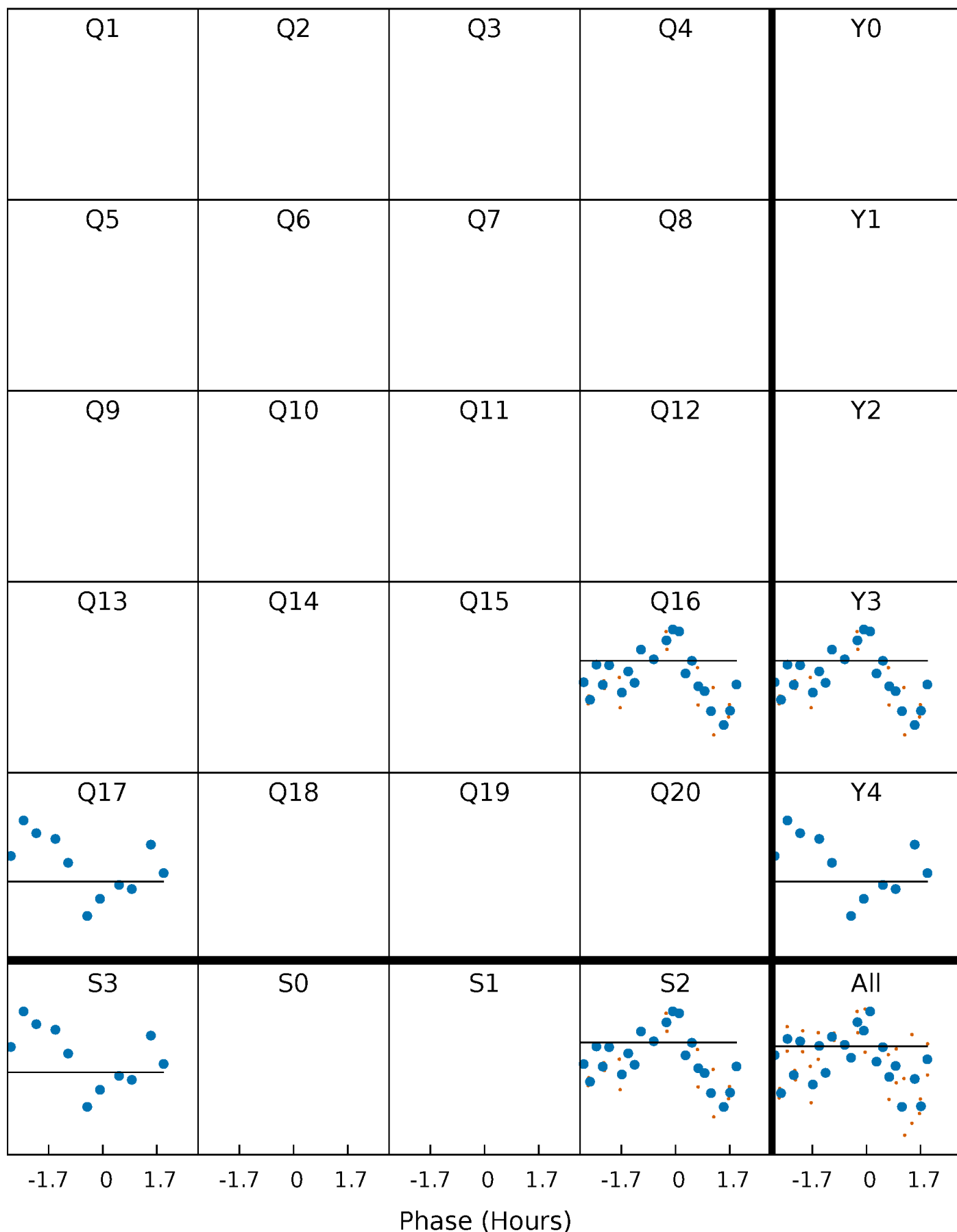
# PDC Quarter-Phased Transit Curves

TCE 009954225-03 P= 28.147794 Days  $T_0=140.814121$  (BKJD)



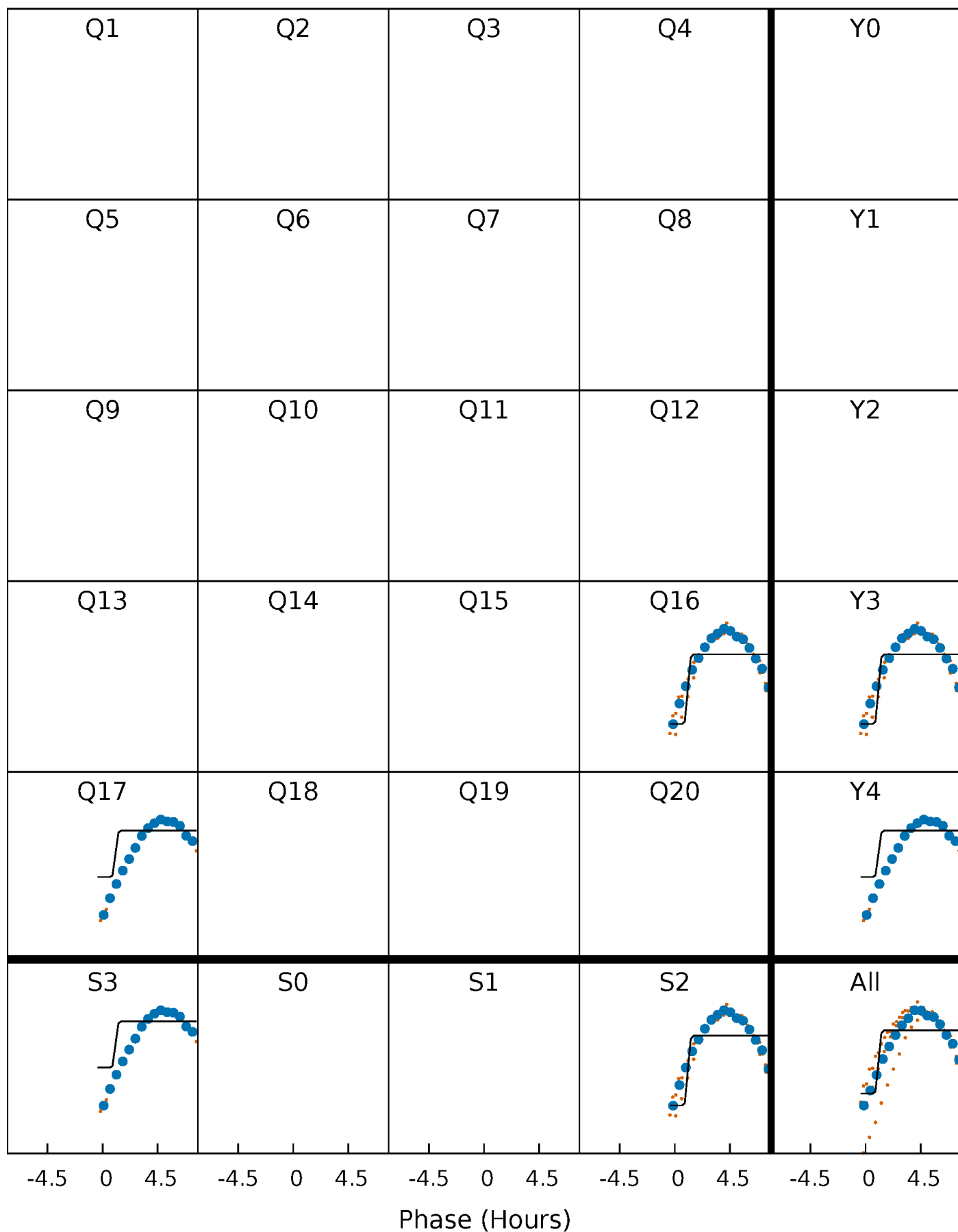
# DV Quarter-Phased Transit Curves

TCE 009954225-03 P= 28.147794 Days  $T_0=140.814121$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

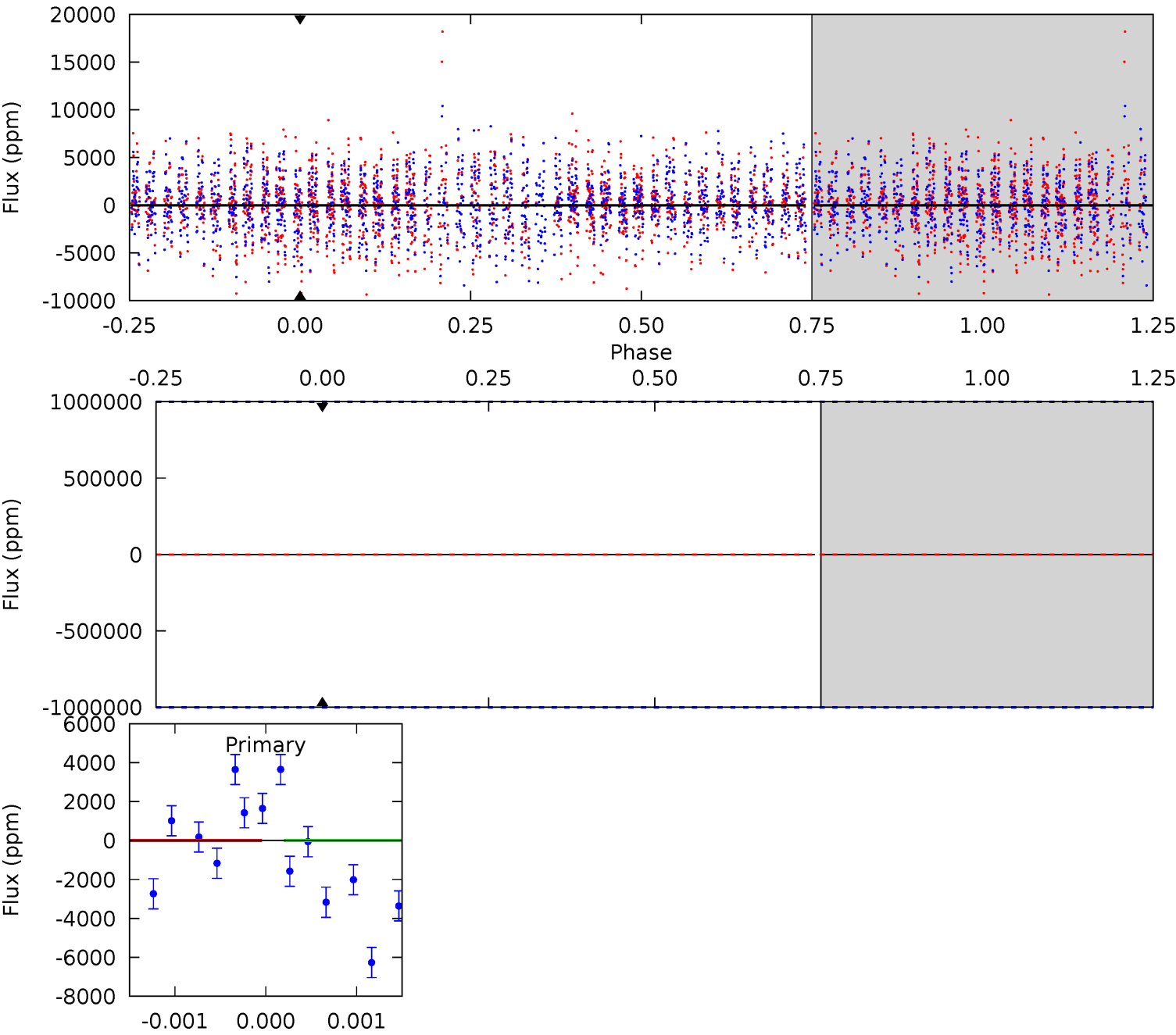
TCE 009954225-03 P= 28.147794 Days  $T_0=140.574274$  (BKJD)



# DV Model-Shift Uniqueness Test

009954225-03, P = 28.147794 Days, E = 140.814121 Days

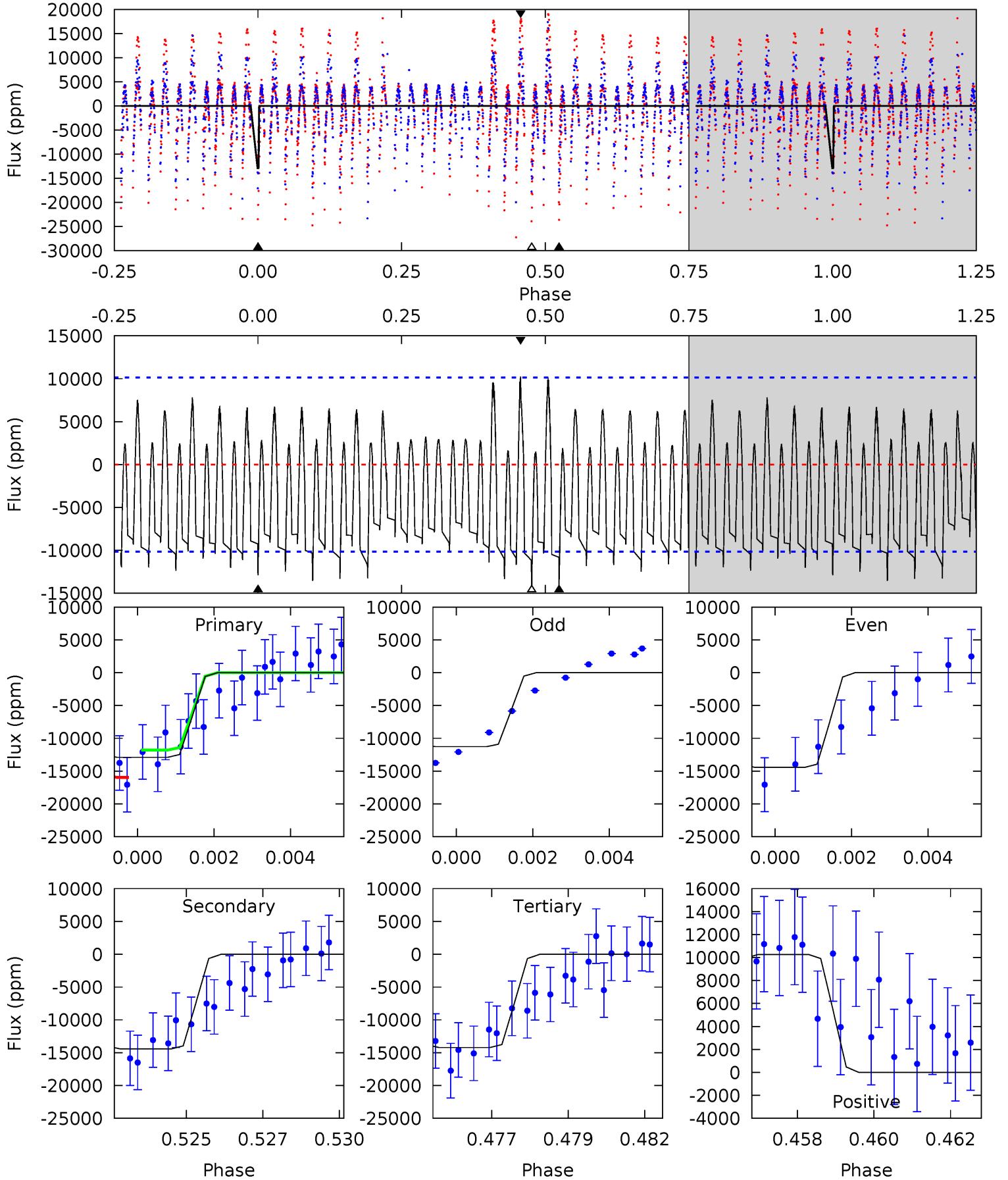
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009954225-03, P = 28.147794 Days, E = 140.574274 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
6.75	7.56	7.45	5.37	5.31	3.06	2.67	-0.69	1.38	0.11	2.19	0.83	1.13	0.42	0.60





### Stellar Parameters For KIC 009954225

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6332^{+199}_{-244}$	$4.260^{+0.180}_{-0.180}$	$-0.420^{+0.300}_{-0.300}$	$1.222^{+0.339}_{-0.277}$	$0.991^{+0.156}_{-0.114}$	$0.765^{+0.707}_{-0.363}$
	+3%/-4%	+4%/-4%	+71%/-71%	+28%/-23%	+16%/-12%	+92%/-47%
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 009954225-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$13.35^{+12.65}_{-9.26}$	$1014^{+75}_{-73}$	$2628^{+16097}_{-20581}$	$6.212^{+18619.043}_{-16690.833}$
Alt.	$-14435 \pm 1909$	$16.92^{+12.69}_{-10.25}$	$1011^{+74}_{-66}$	$6159^{+4580}_{-1393}$	$914^{+5169}_{-624}$

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

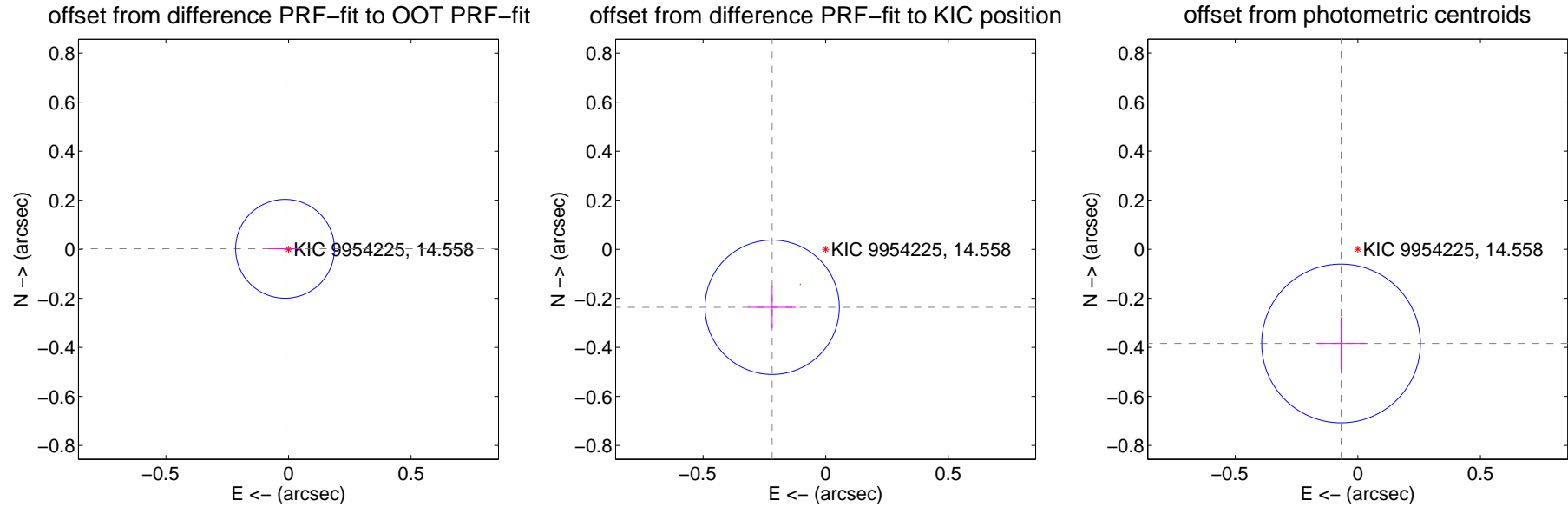
## DV Centroid Data

Supplemental centroid analysis for 009954225-03. Kepler magnitude: 14.56. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.014 \pm 0.067$	0.21	$0.014 \pm 0.067$	$0.002 \pm 0.067$
PRF-fit source offset from KIC position	$0.322 \pm 0.091$	3.52	$0.218 \pm 0.098$	$-0.236 \pm 0.085$
photometric centroid source offset	$0.39 \pm 0.11$	3.62	$0.07 \pm 0.10$	$-0.38 \pm 0.11$



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.



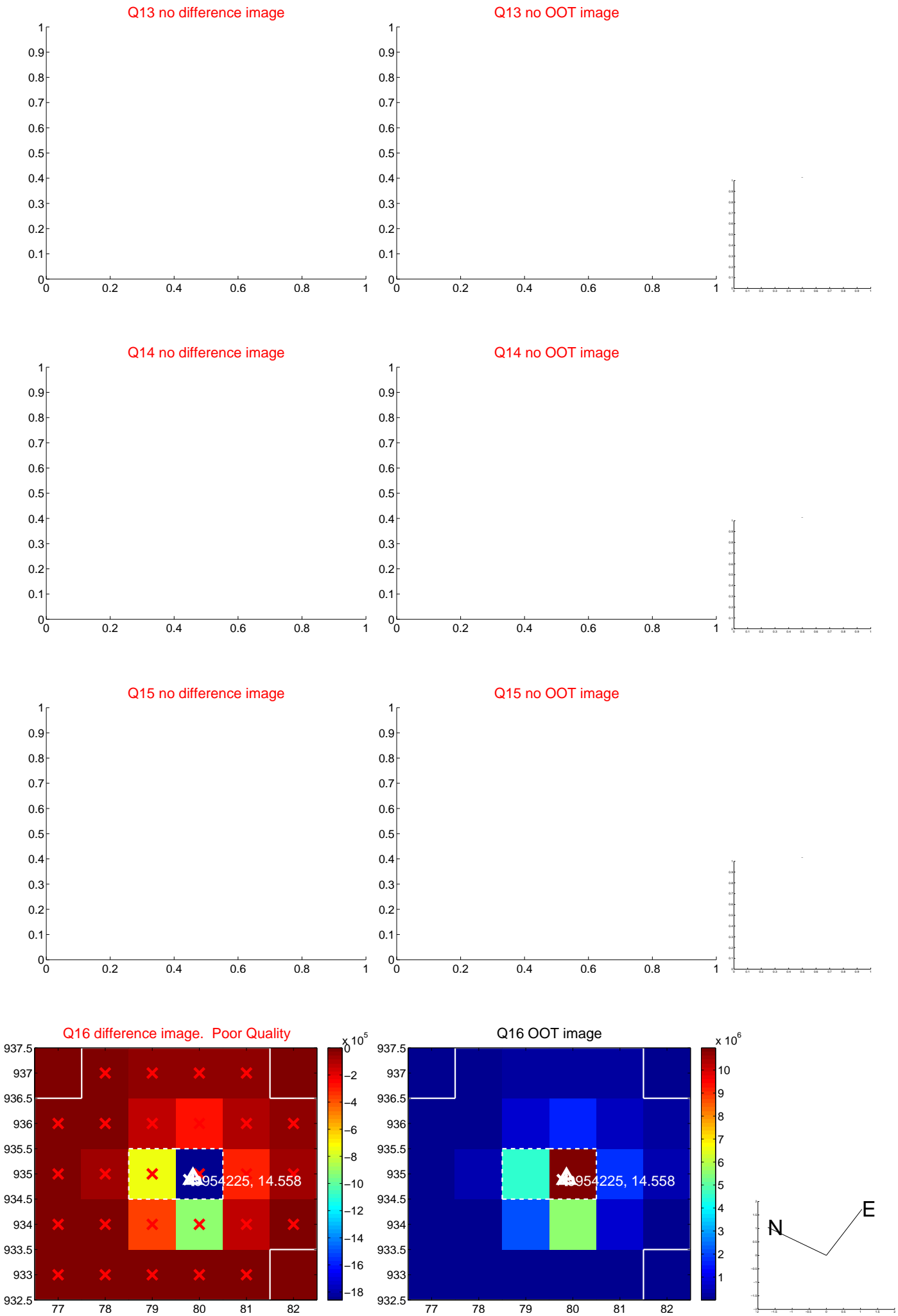
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



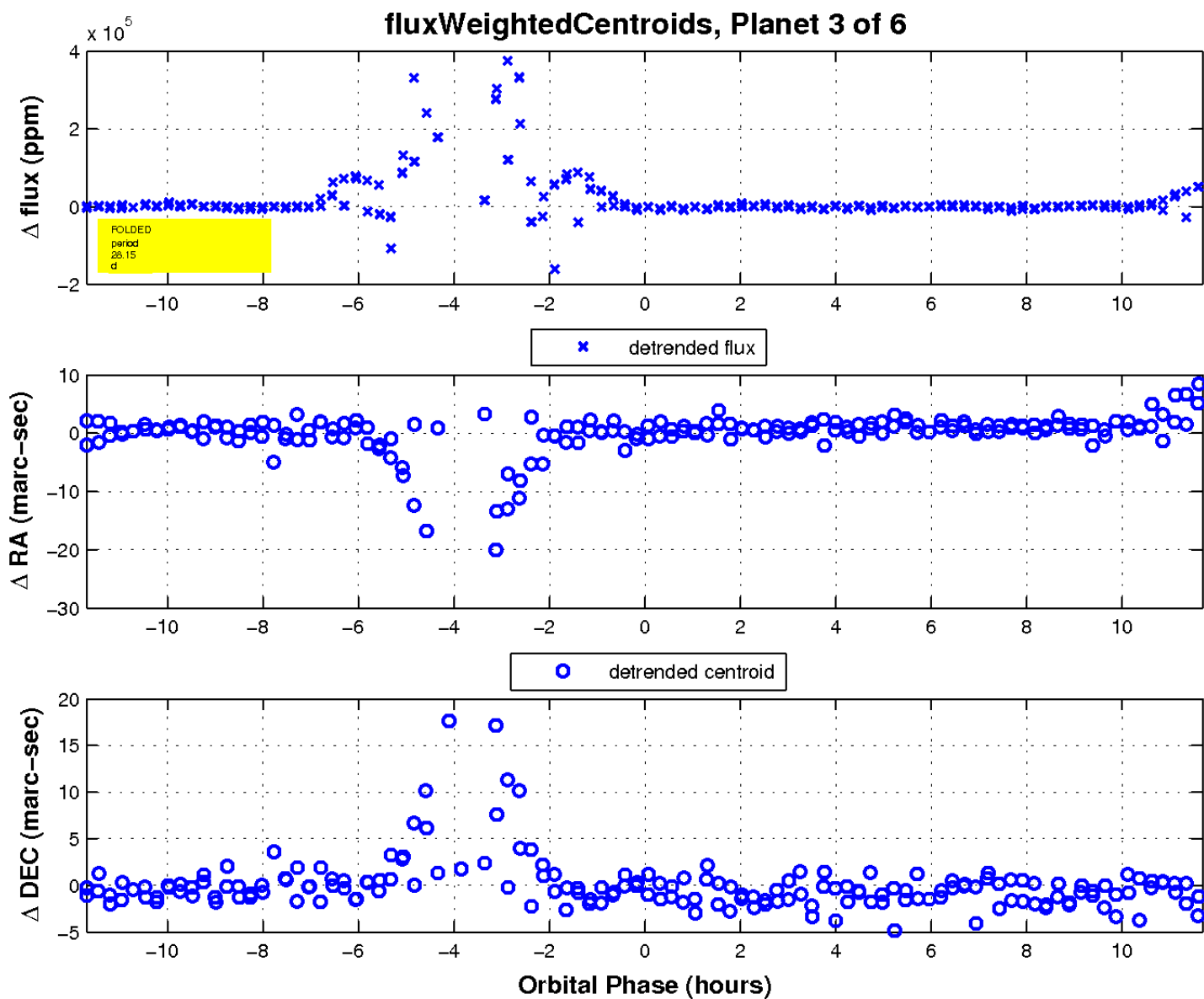
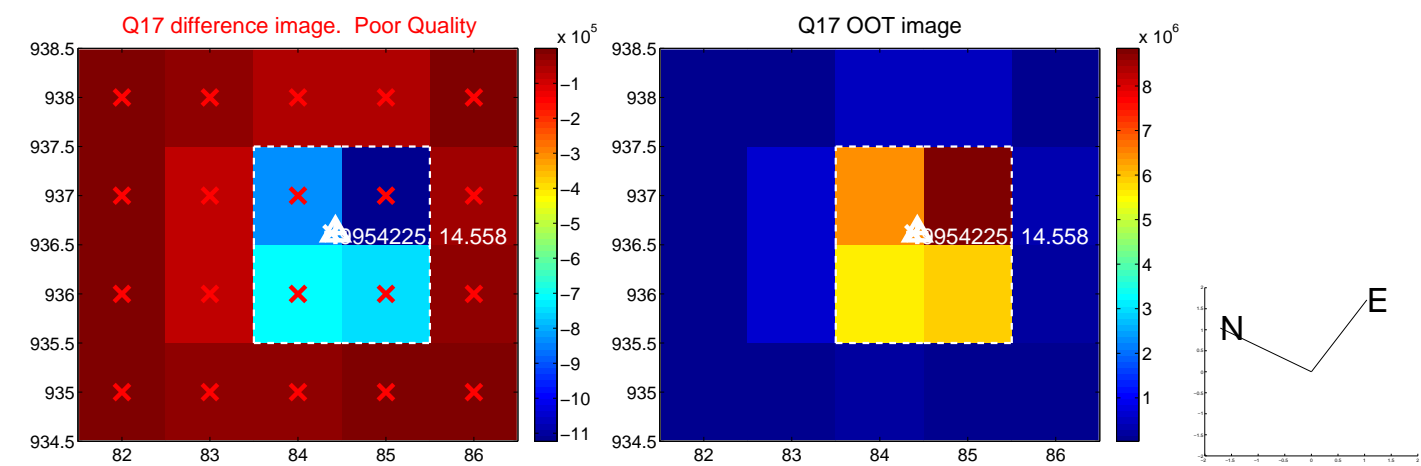
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

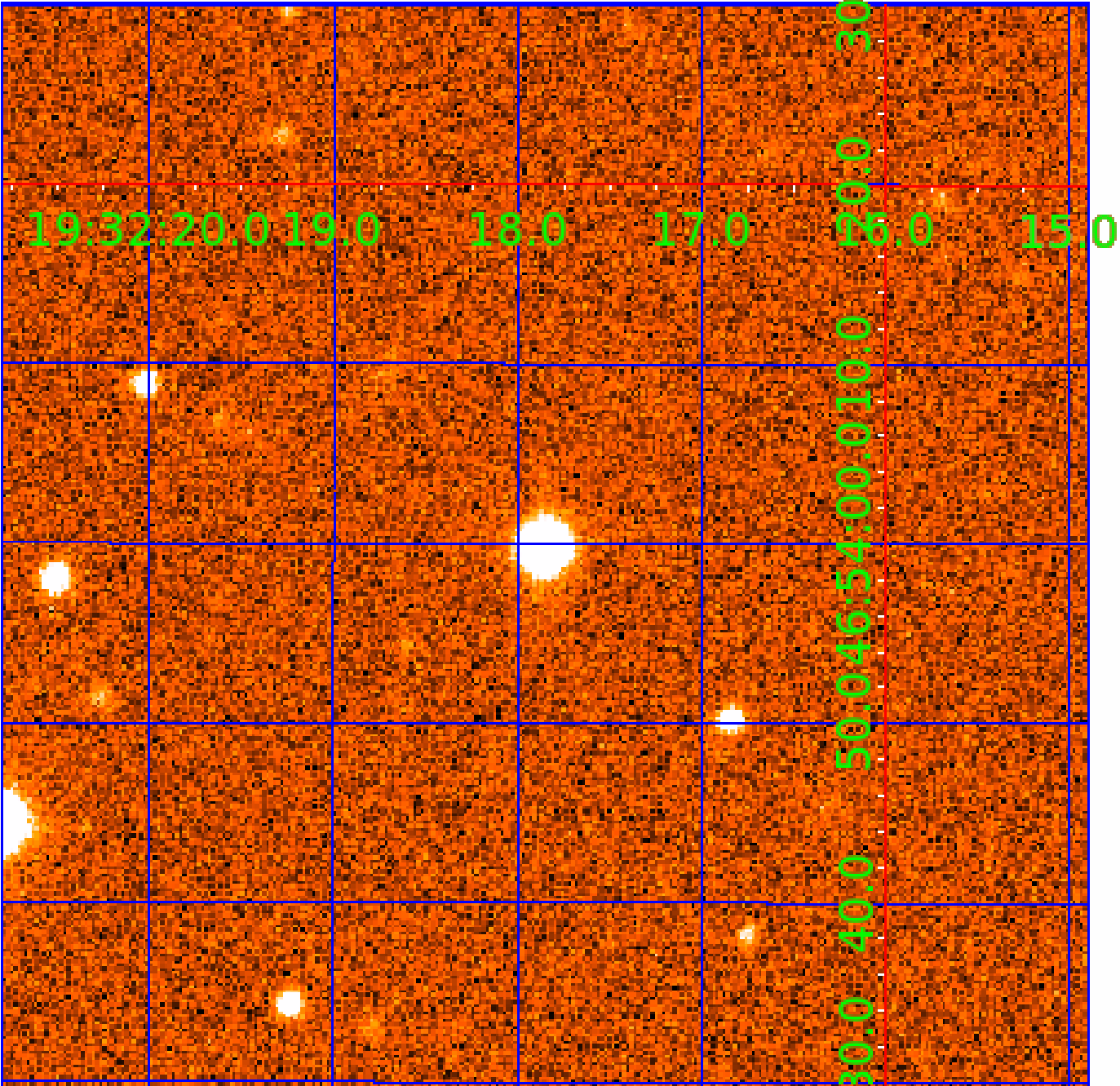


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009954225

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009954225-01	OBS	5742.01	1.340494	132.219327	537646.6	2.500	2691.7	-1.0	1.22	6332	41.48	3820.20
009954225-02	OBS	No	1.340381	131.630888	36.8	1.869	193.1	0.1	1.22	6332	0.81	3820.63
009954225-03	OBS	No	28.147794	140.814121	4175.8	1.500	27.1	-1.0	1.22	6332	7.96	65.94
009954225-04	OBS	No	22.706568	134.935995	5735.1	1.500	29.2	-1.0	1.22	6332	9.34	87.81
009954225-05	OBS	No	42.845689	162.879751	5497.0	1.500	31.0	-1.0	1.22	6332	9.14	37.66
009954225-06	OBS	No	10.550603	133.107869	6571.4	1.500	30.7	-1.0	1.22	6332	9.99	244.01

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009954225-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—CENT_NOFITS—HALO_GHOST
009954225-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
009954225-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
009954225-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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 009954225-04

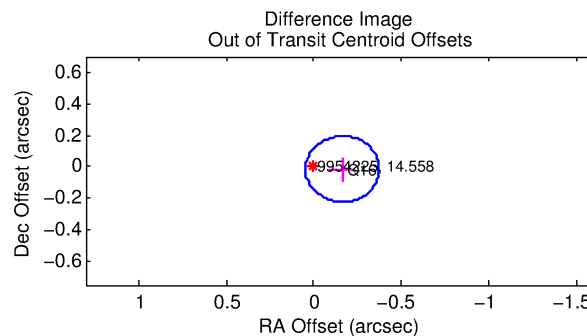
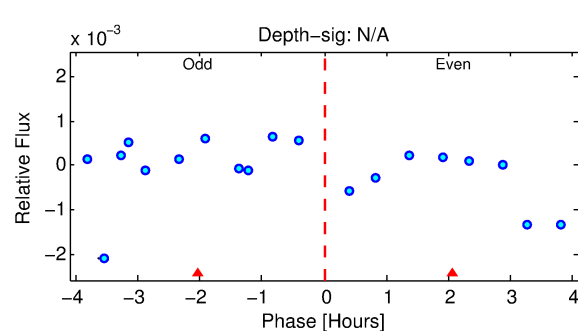
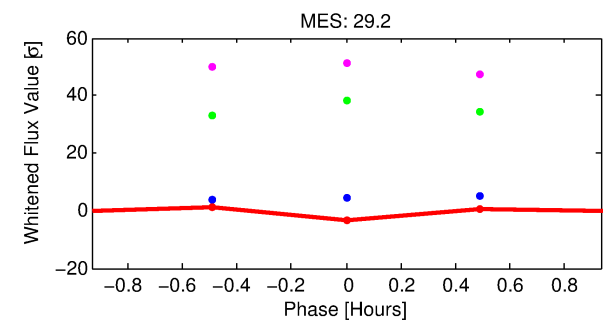
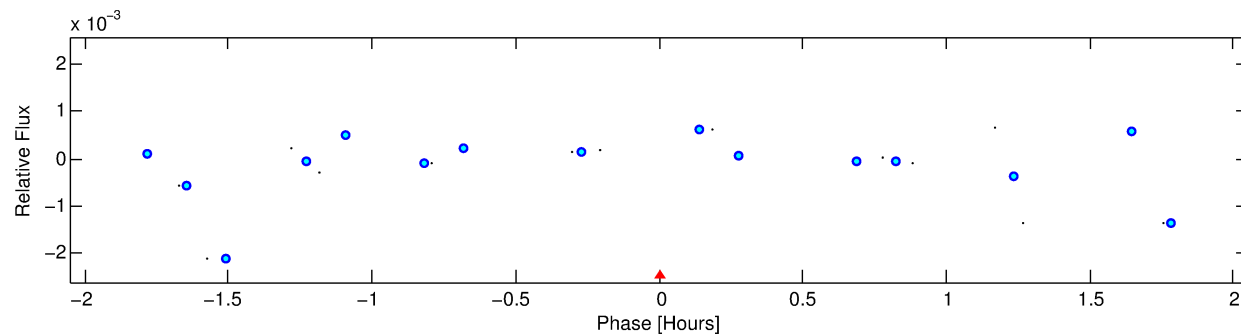
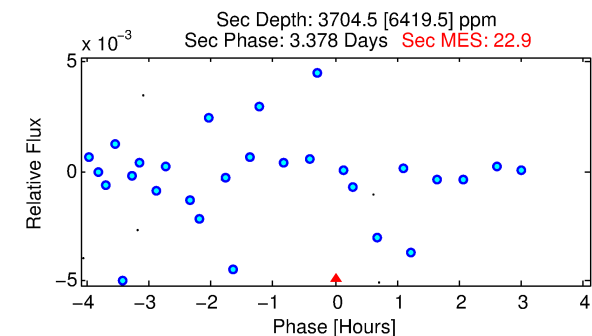
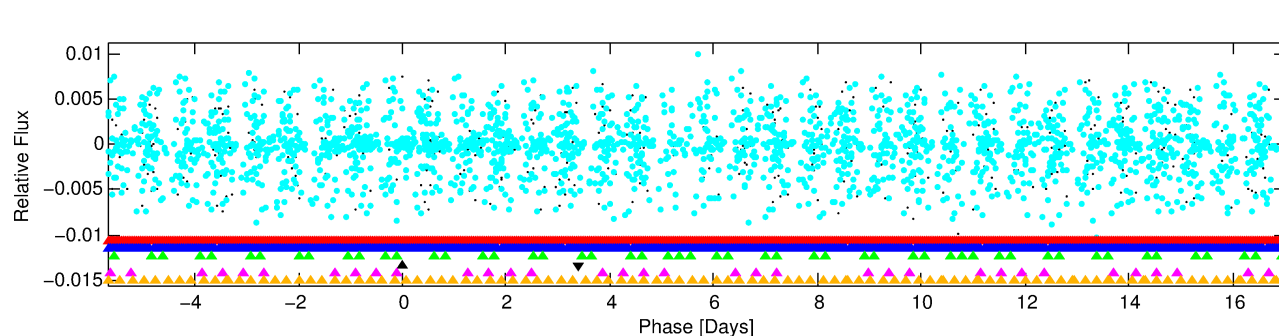
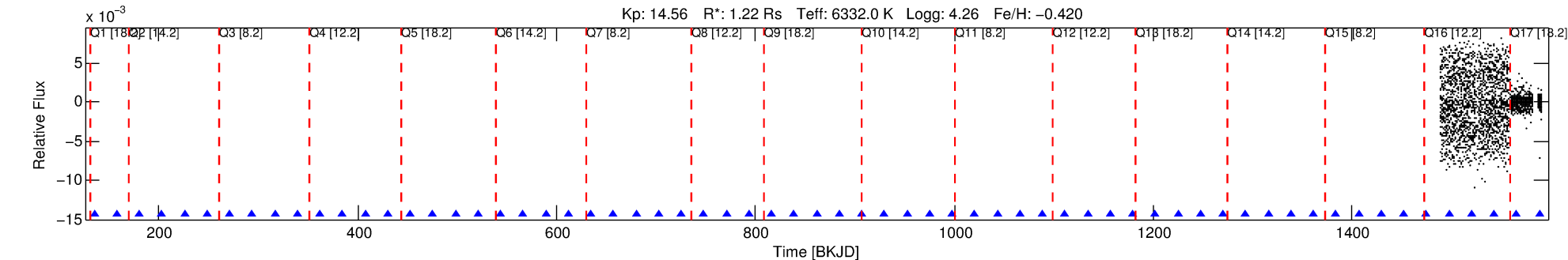
No Significant Match Found

# DV One-Page Summary

KIC: 9954225 Candidate: 4 of 6 Period: 22.707 d

KOI: K05742 Corr: No Ephemeris Match

Kp: 14.56 R\*: 1.22 Rs Teff: 6332.0 K Logg: 4.26 Fe/H: -0.420



## TPS TCE Results:

Period = 22.70657 d  
Epoch = 134.9360 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

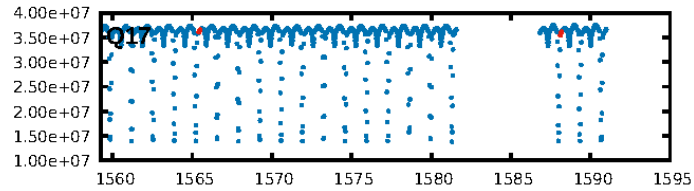
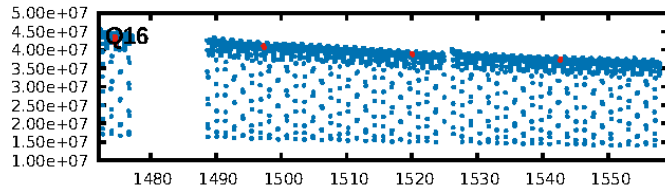
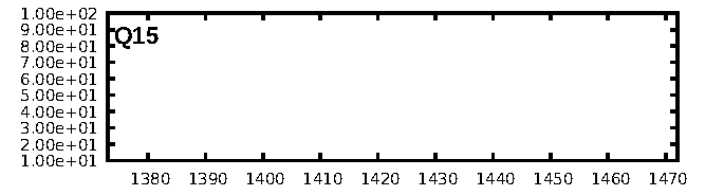
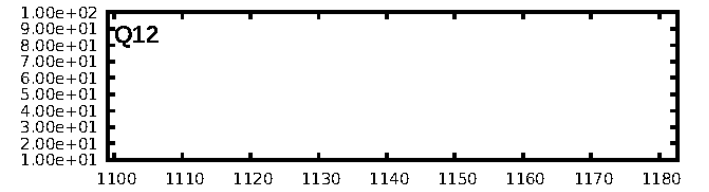
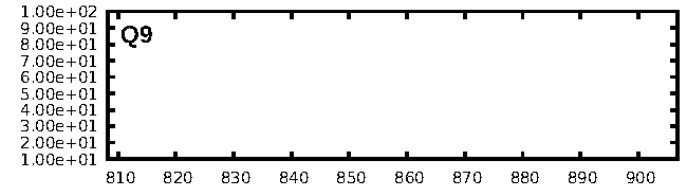
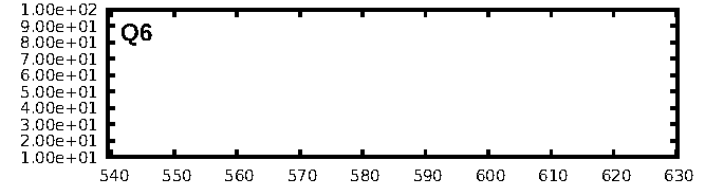
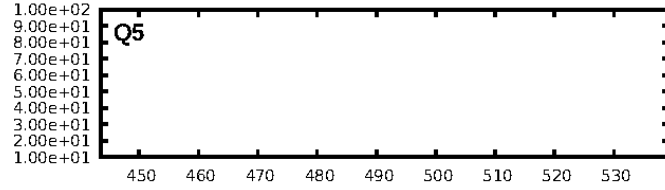
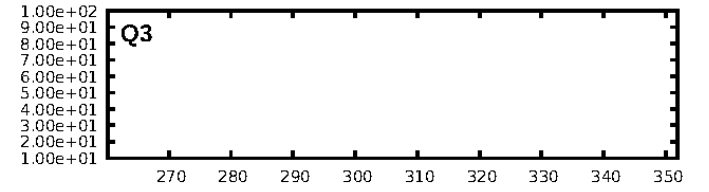
ShortPeriod-sig: 100.0% [137.53σ]  
LongPeriod-sig: 100.0% [61.56σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.67e-09  
RollingBand-fgt: 1.00 [1/1]  
GhostDiagnostic-chr: -30.45

Centroid-sig: N/A  
Centroid-so: 42.101 arcsec [0.45σ]  
OotOffset-rm: 0.163 arcsec [2.33σ]  
KicOffset-rm: 0.285 arcsec [4.02σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/1]

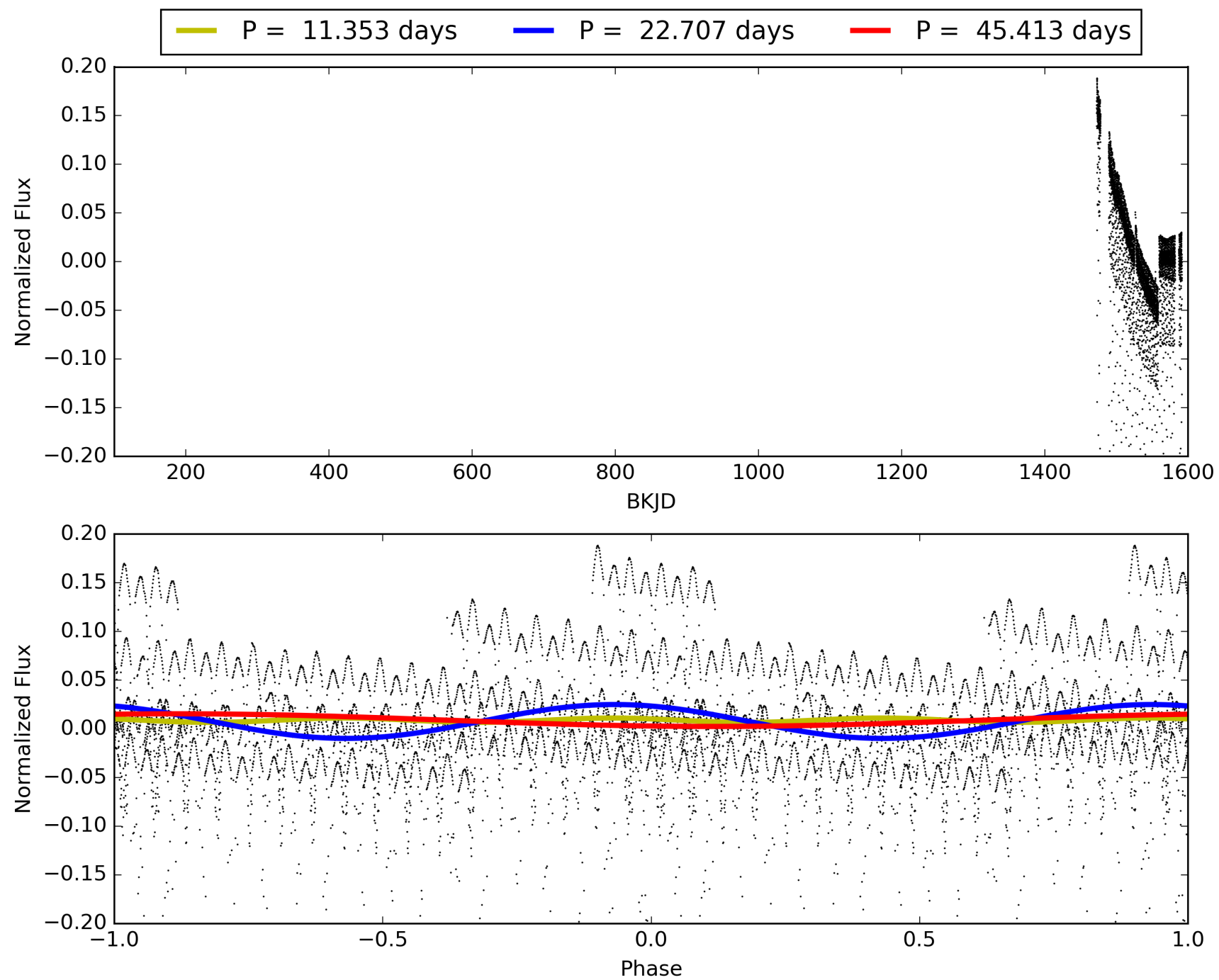
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:35:57 Z

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

# TCE 009954225-04, PDC Light Curves

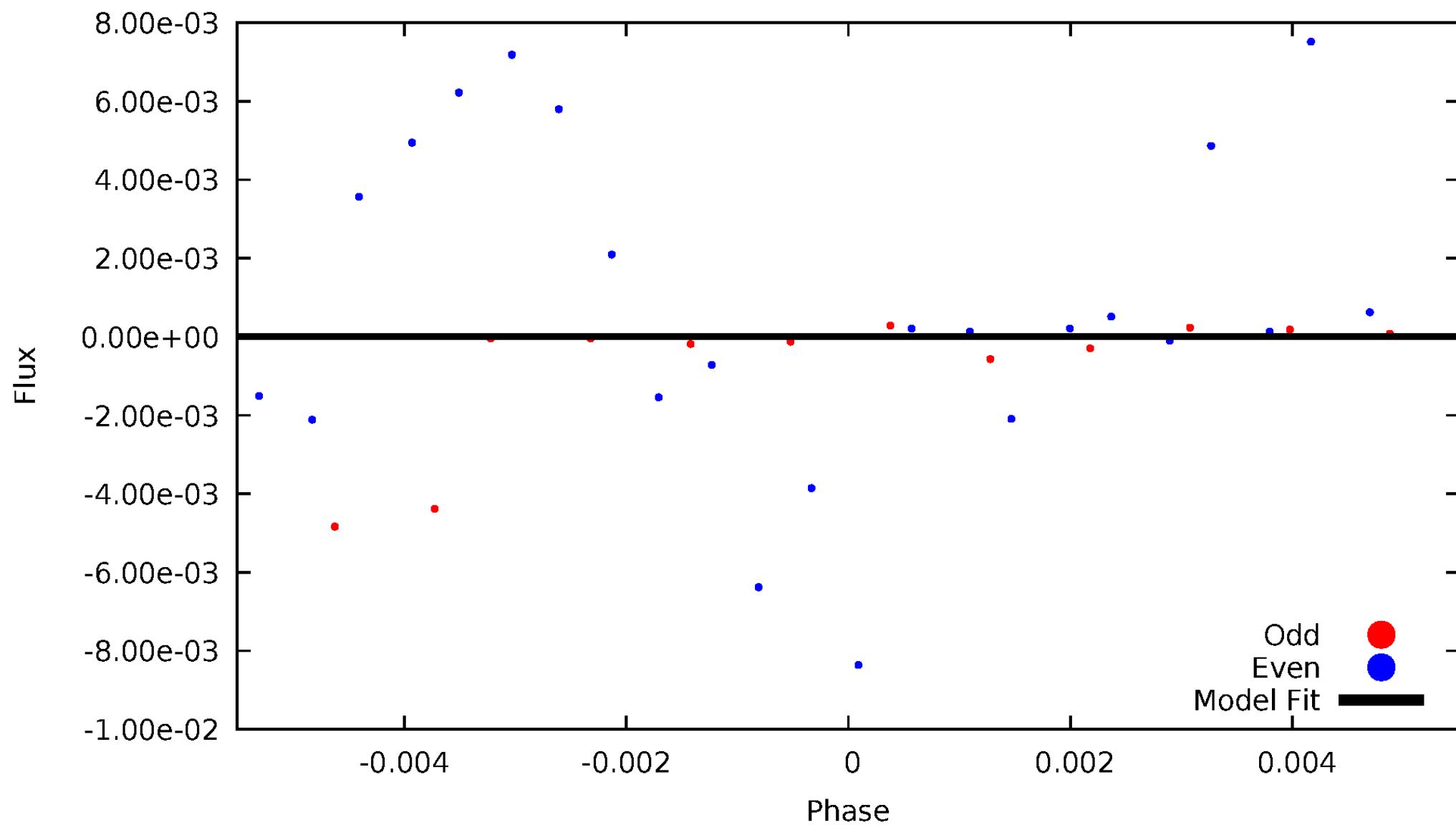


TCE 009954225-04



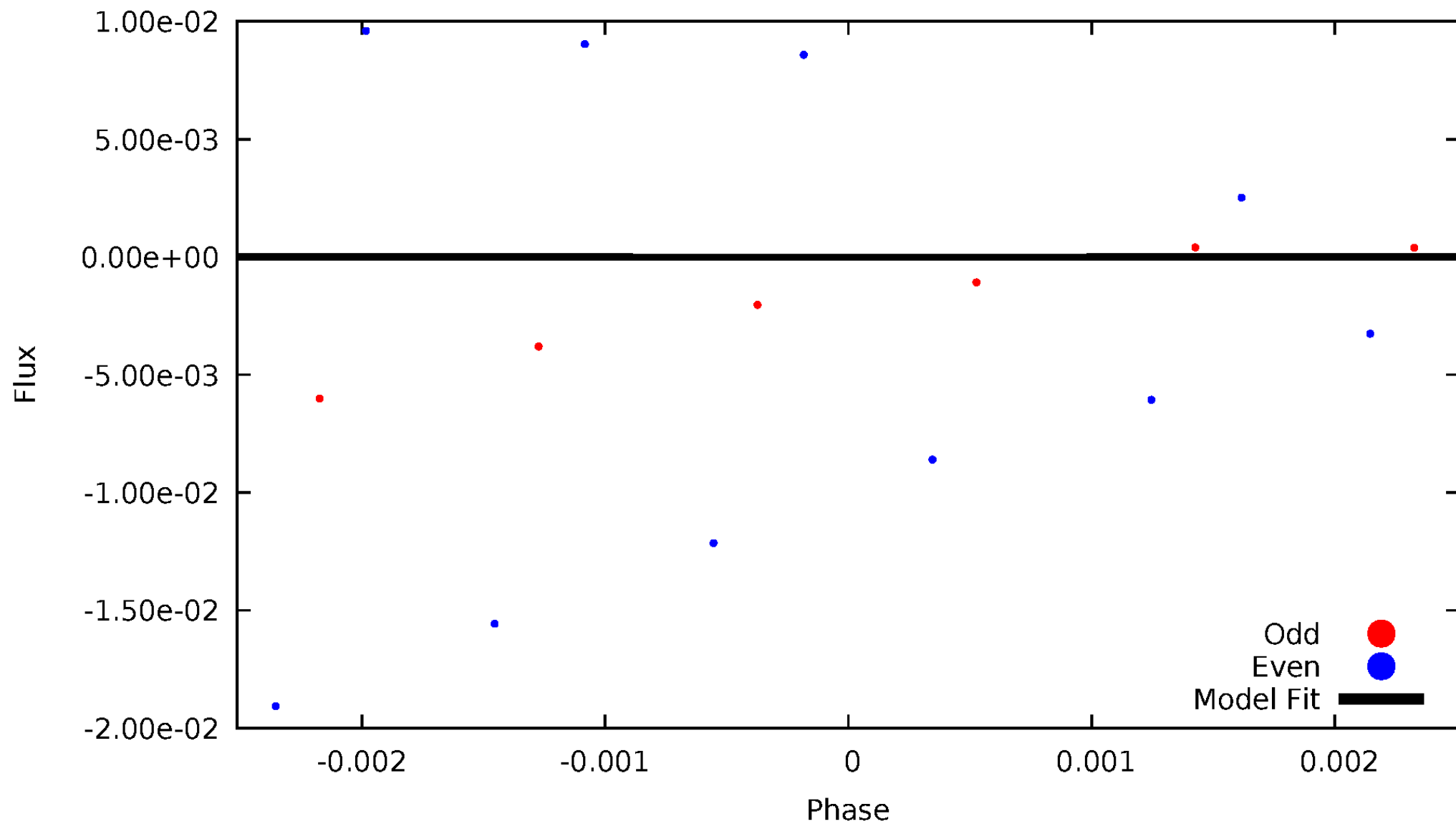
# DV Odd/Even

TCE 009954225-04



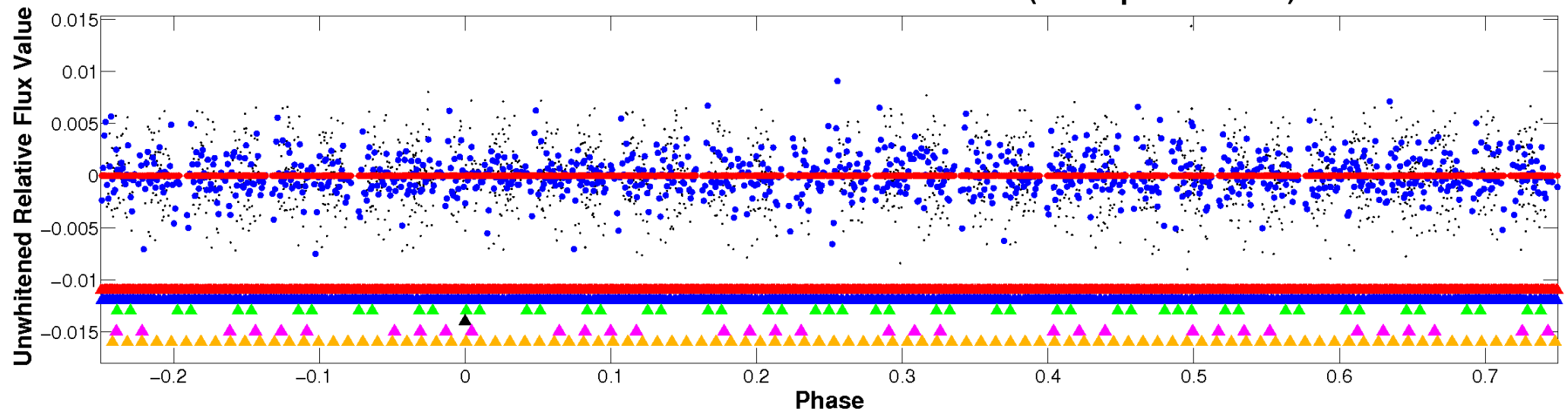
# ALT Odd/Even

TCE 009954225-04

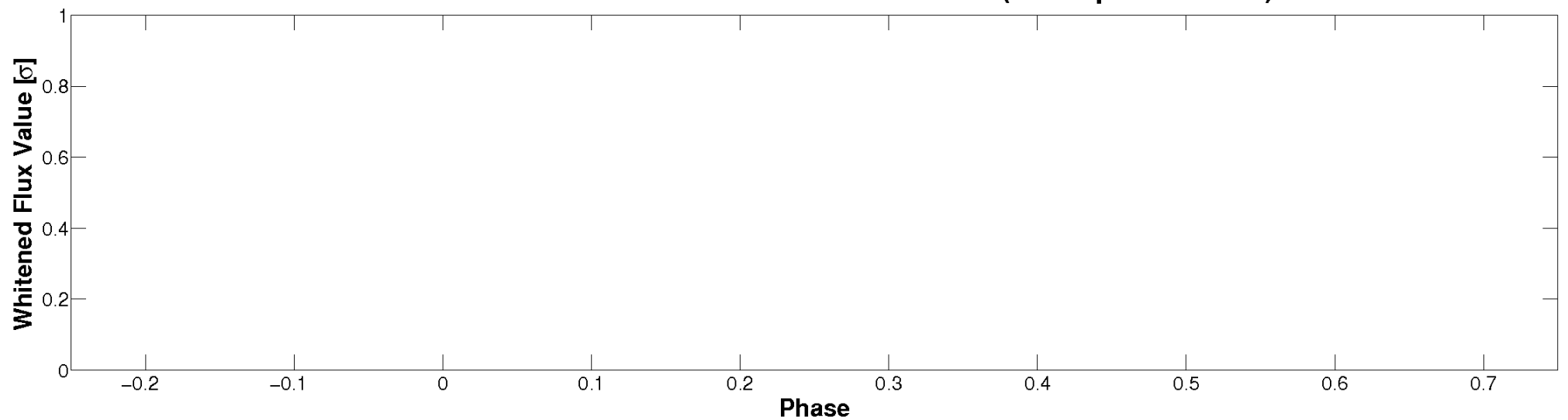


# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

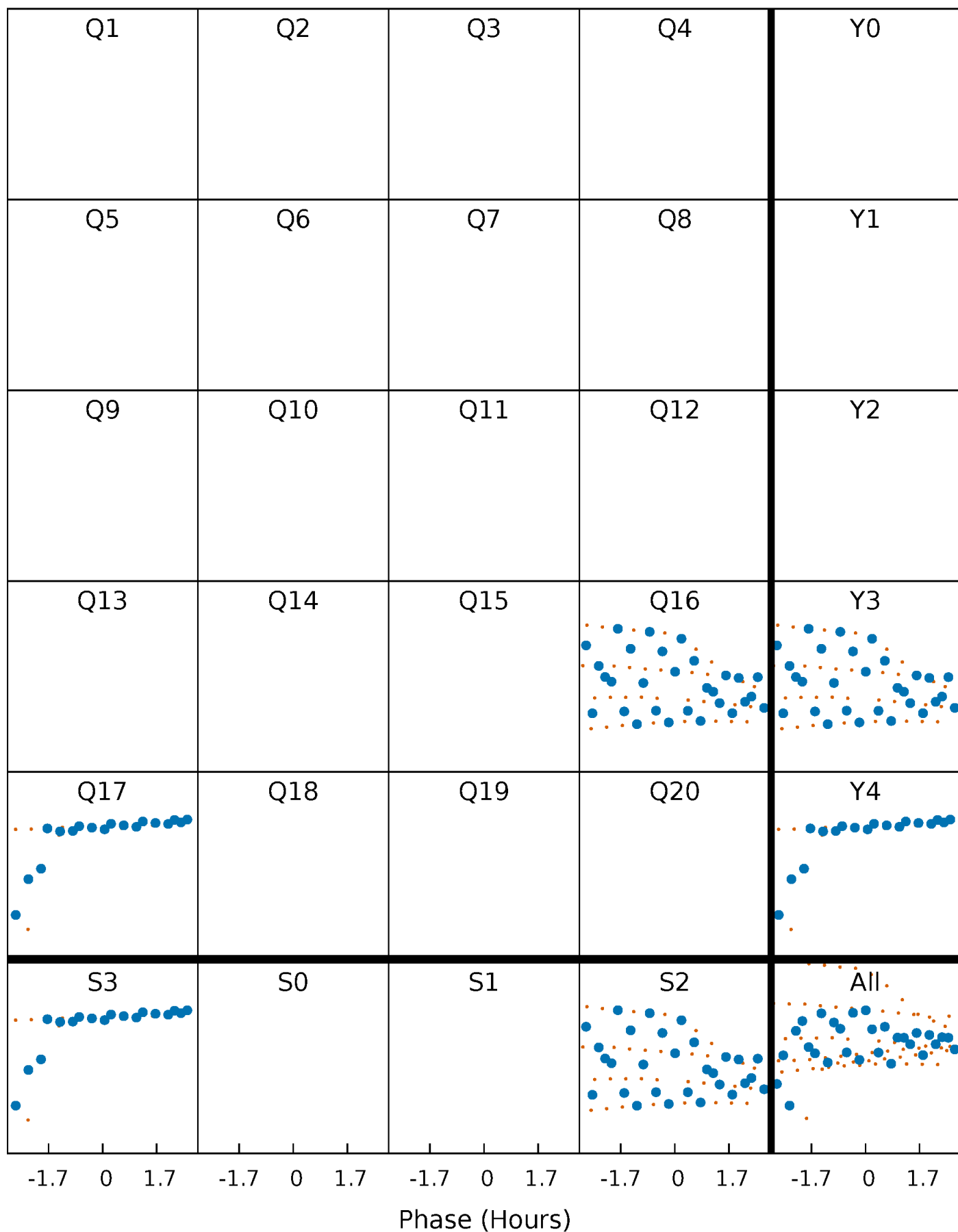


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

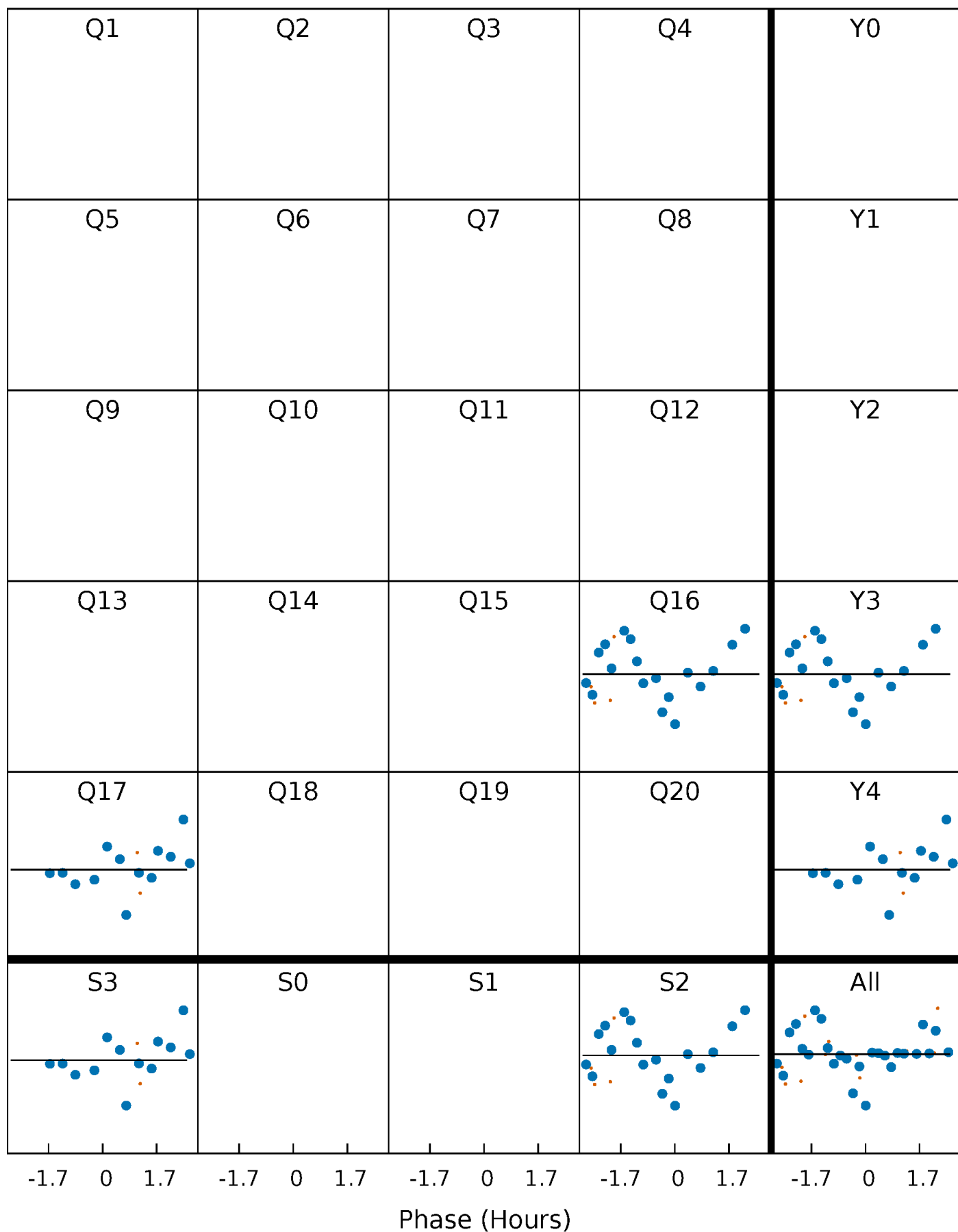
TCE 009954225-04 P= 22.706568 Days  $T_0=134.935995$  (BKJD)





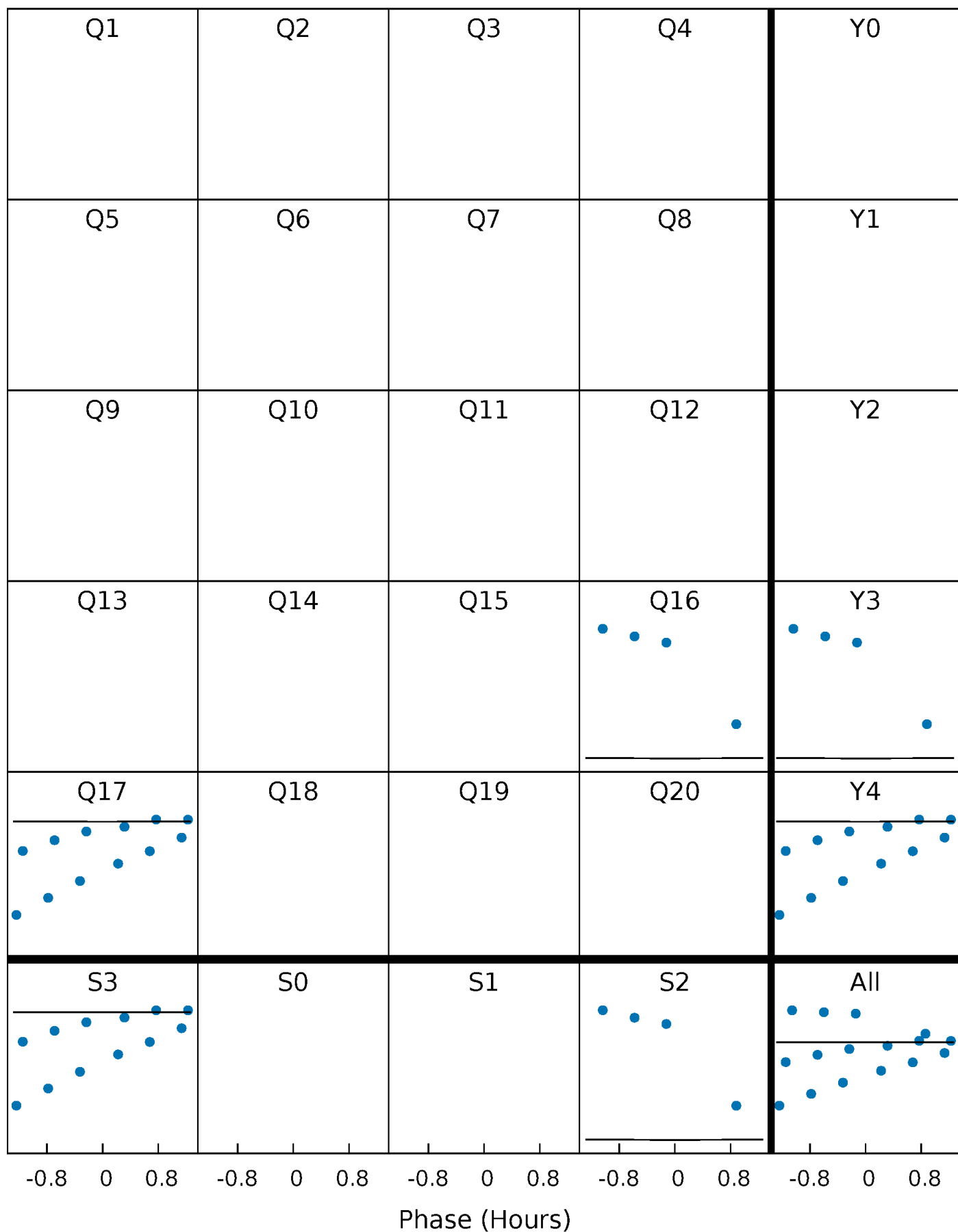
# DV Quarter-Phased Transit Curves

TCE 009954225-04 P= 22.706568 Days  $T_0=134.935995$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

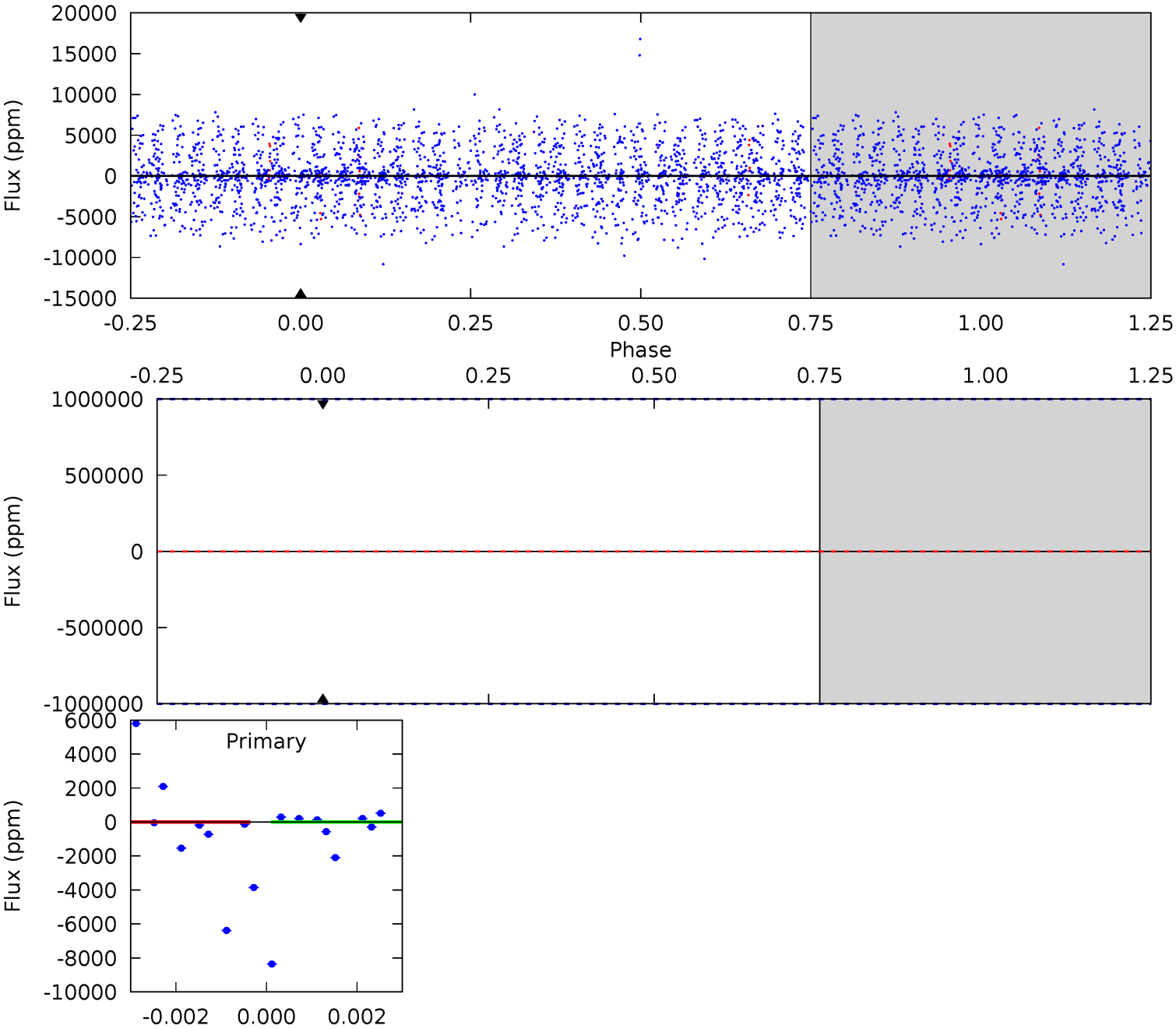
TCE 009954225-04 P= 22.706568 Days  $T_0=135.034803$  (BKJD)



# DV Model-Shift Uniqueness Test

009954225-04, P = 22.706568 Days, E = 134.935995 Days

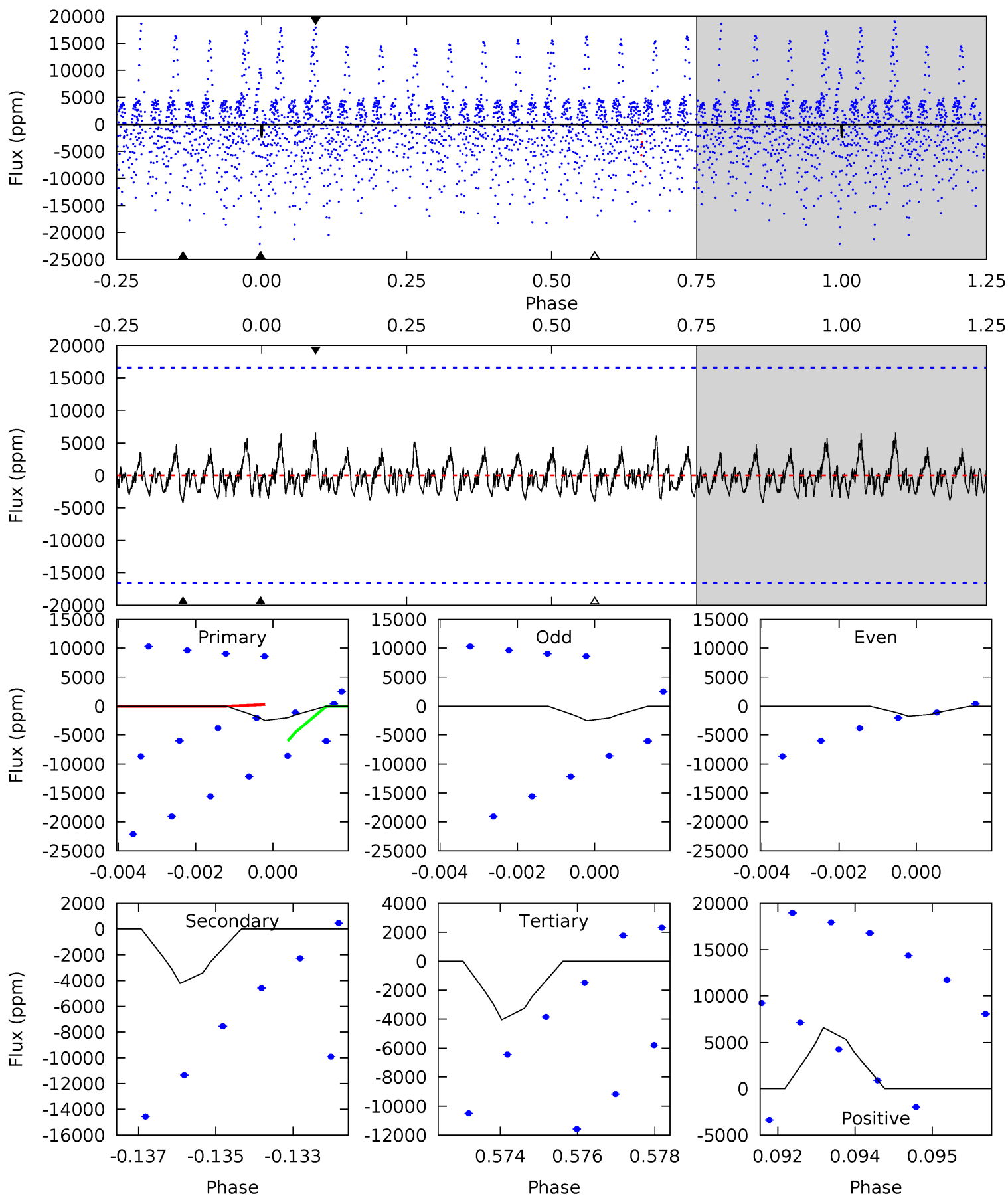
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009954225-04, P = 22.706568 Days, E = 135.034803 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
0.79	1.36	1.30	2.12	5.35	3.12	0.56	-0.51	-1.33	0.06	-0.76	0.12	1.00	0.61	0.94



### Stellar Parameters For KIC 009954225

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6332^{+199}_{-244}$	$4.260^{+0.180}_{-0.180}$	$-0.420^{+0.300}_{-0.300}$	$1.222^{+0.339}_{-0.277}$	$0.991^{+0.156}_{-0.114}$	$0.765^{+0.707}_{-0.363}$
	+3%/-4%	+4%/-4%	+71%/-71%	+28%/-23%	+16%/-12%	+92%/-47%
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 009954225-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$13.17^{+11.16}_{-8.51}$	$1088^{+82}_{-76}$	$-4741^{+22147}_{-13728}$	$-181.252^{+12374.778}_{-13521.479}$
Alt.	$-4218 \pm 3106$	$9.69^{+10.00}_{-6.44}$	$1092^{+88}_{-75}$	$5559^{+5481}_{-1832}$	$449^{+3996}_{-396}$

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

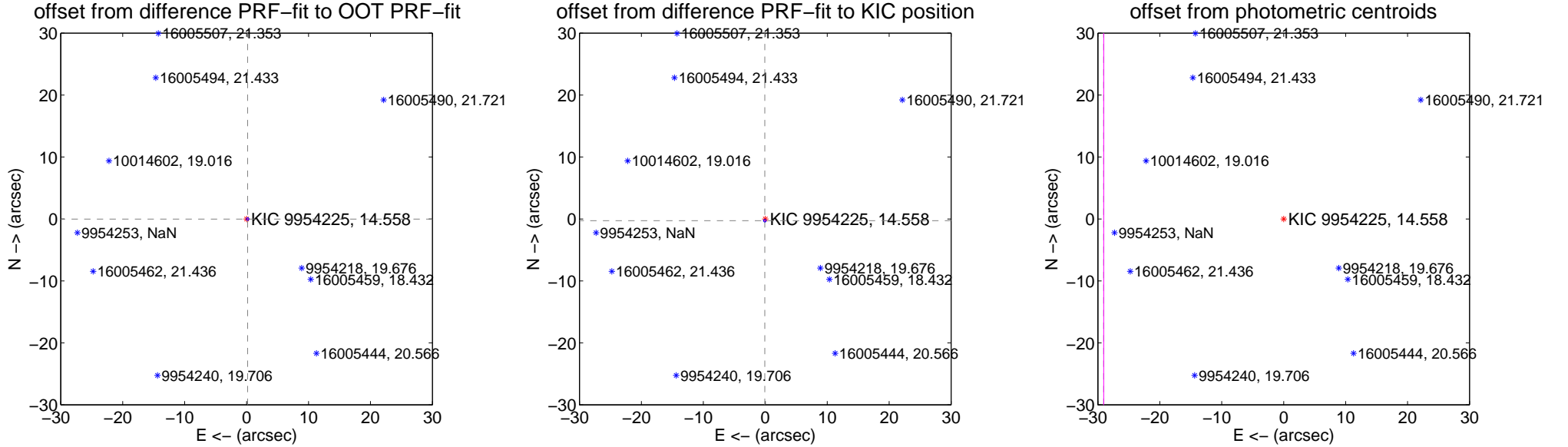
## DV Centroid Data

Supplemental centroid analysis for 009954225-04. Kepler magnitude: 14.56. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.163 \pm 0.070$	2.33	$-0.162 \pm 0.070$	$-0.014 \pm 0.071$
PRF-fit source offset from KIC position	$0.285 \pm 0.071$	4.02	$0.073 \pm 0.070$	$-0.275 \pm 0.071$
photometric centroid source offset	$42.10 \pm 93.32$	0.45	$29.05 \pm 80.05$	$30.47 \pm 103.93$



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.

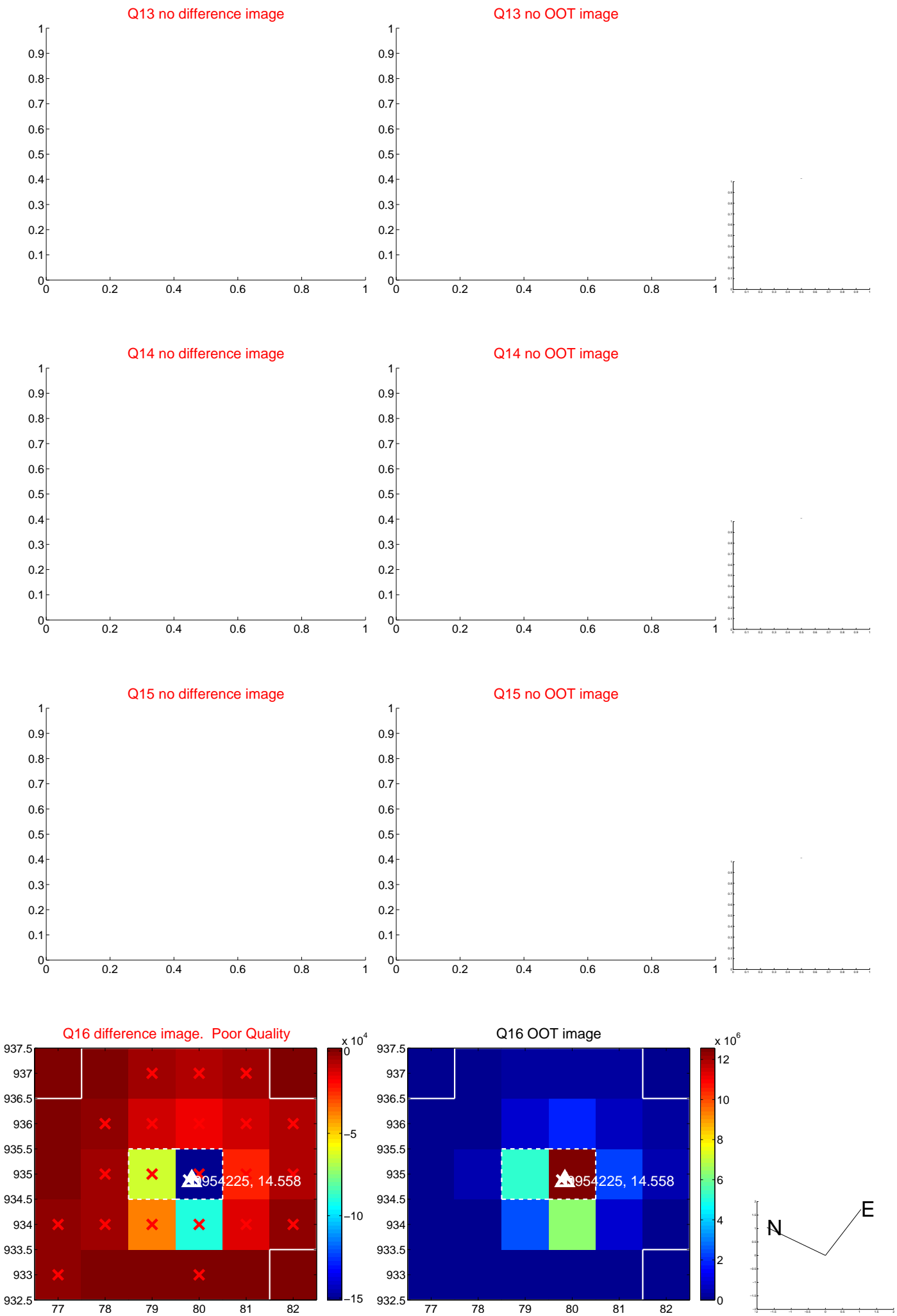




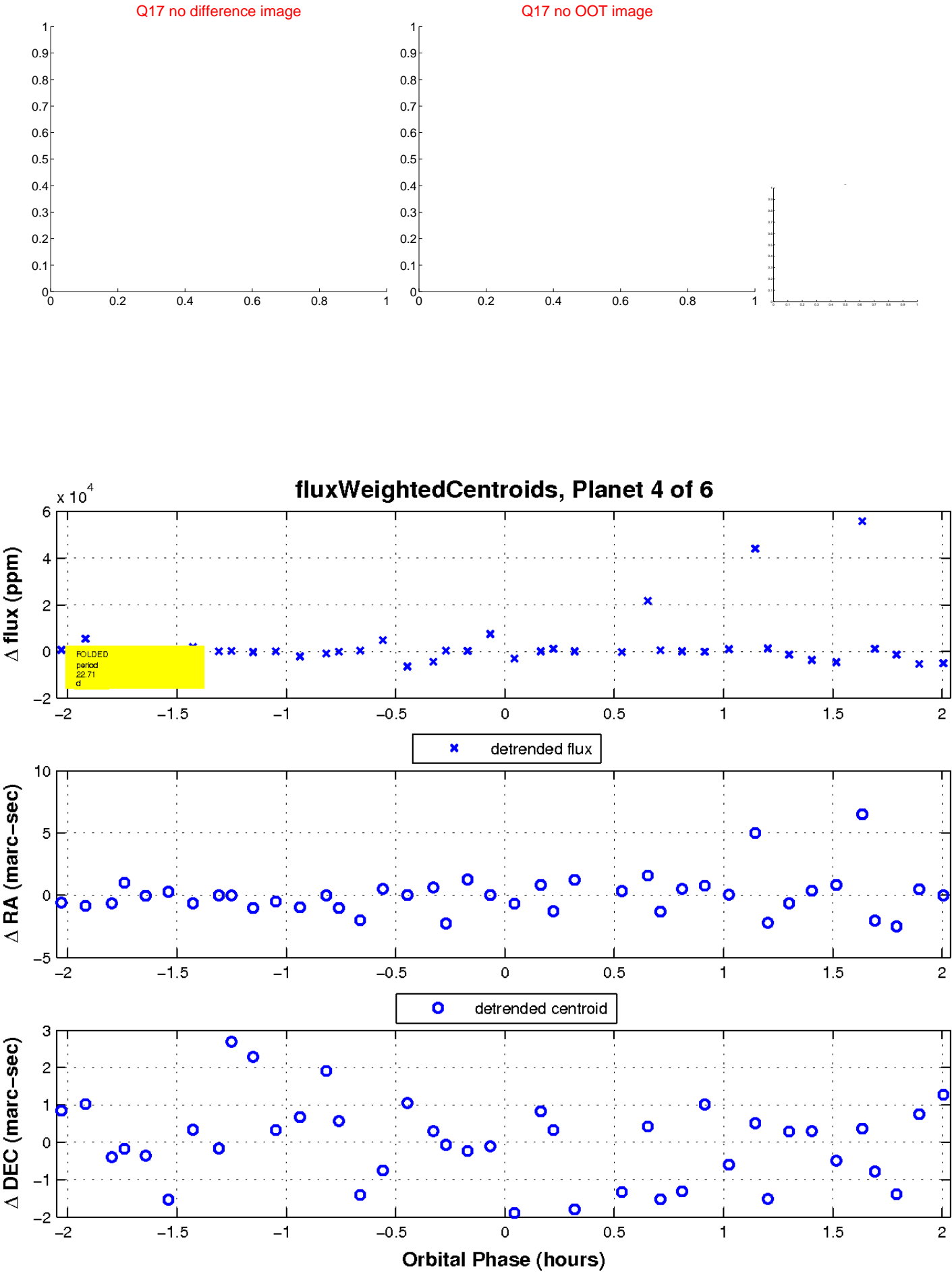
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

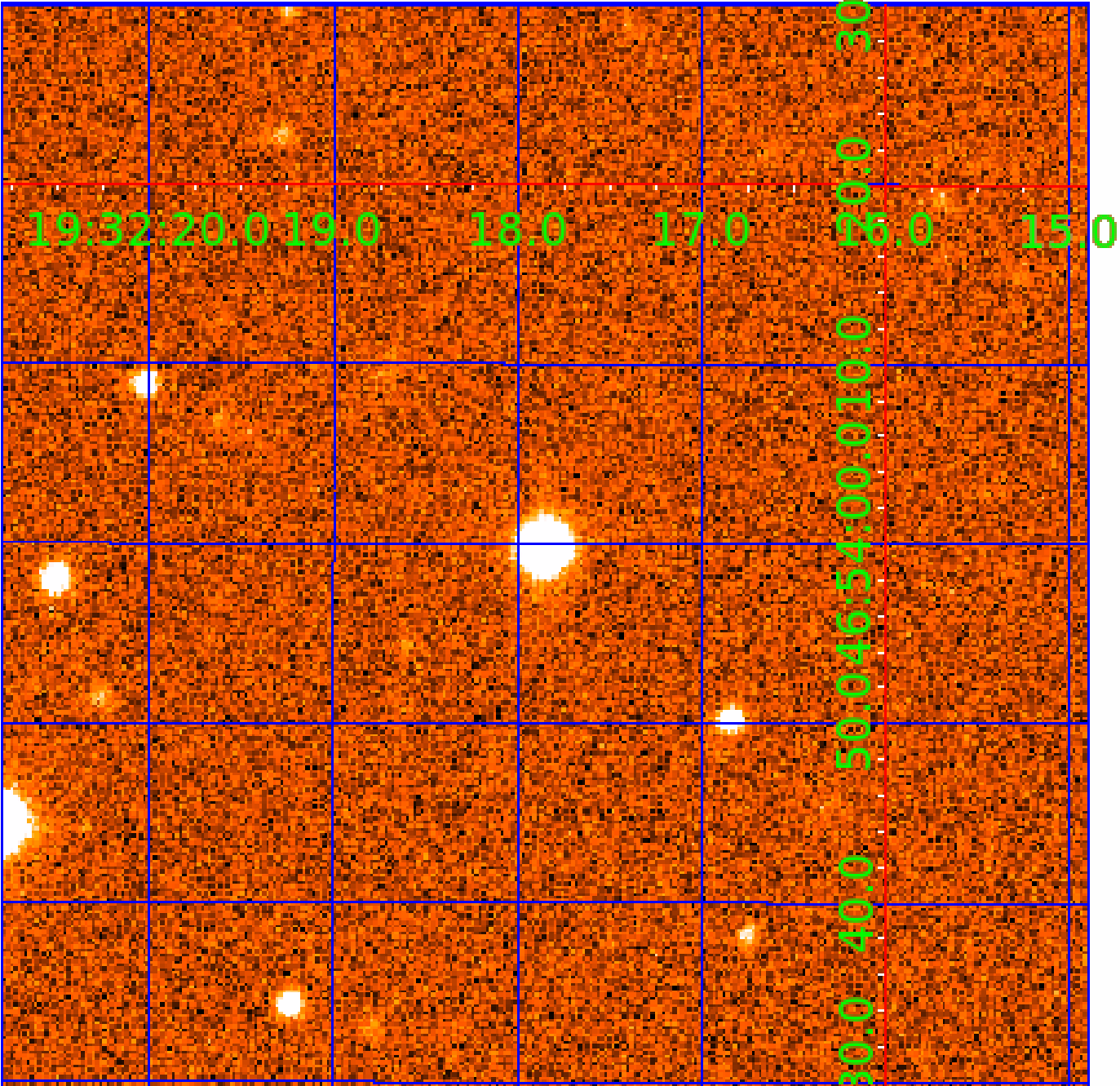


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009954225

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009954225-01	OBS	5742.01	1.340494	132.219327	537646.6	2.500	2691.7	-1.0	1.22	6332	41.48	3820.20
009954225-02	OBS	No	1.340381	131.630888	36.8	1.869	193.1	0.1	1.22	6332	0.81	3820.63
009954225-03	OBS	No	28.147794	140.814121	4175.8	1.500	27.1	-1.0	1.22	6332	7.96	65.94
009954225-04	OBS	No	22.706568	134.935995	5735.1	1.500	29.2	-1.0	1.22	6332	9.34	87.81
009954225-05	OBS	No	42.845689	162.879751	5497.0	1.500	31.0	-1.0	1.22	6332	9.14	37.66
009954225-06	OBS	No	10.550603	133.107869	6571.4	1.500	30.7	-1.0	1.22	6332	9.99	244.01

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009954225-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—CENT_NOFITS—HALO_GHOST
009954225-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
009954225-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
009954225-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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 009954225-05

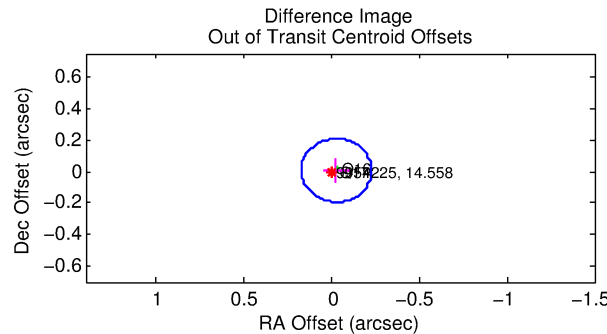
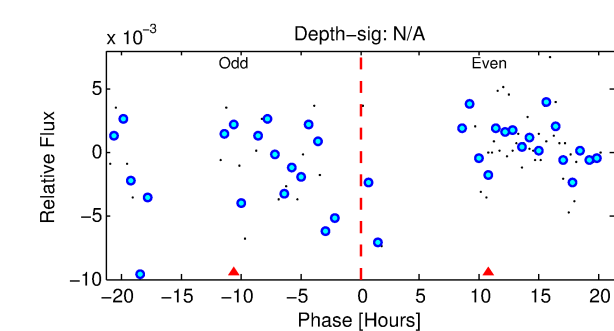
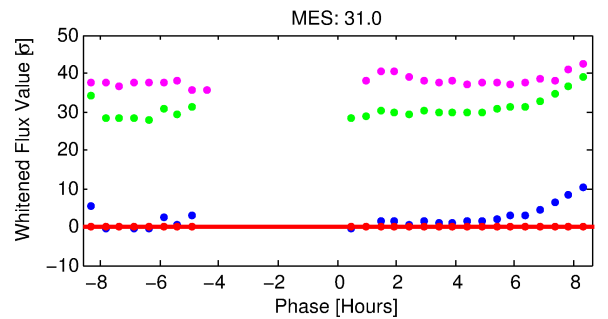
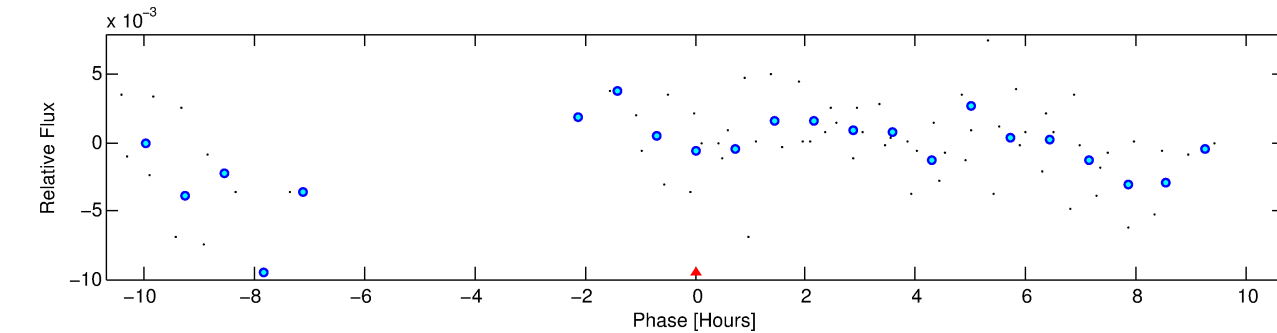
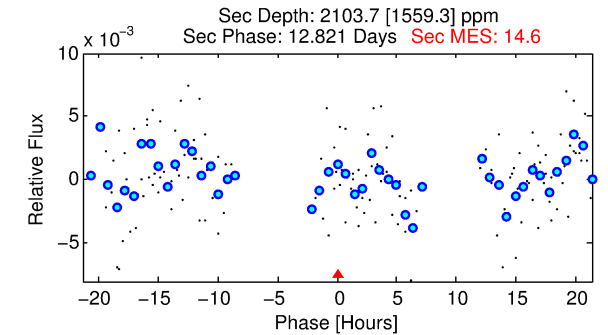
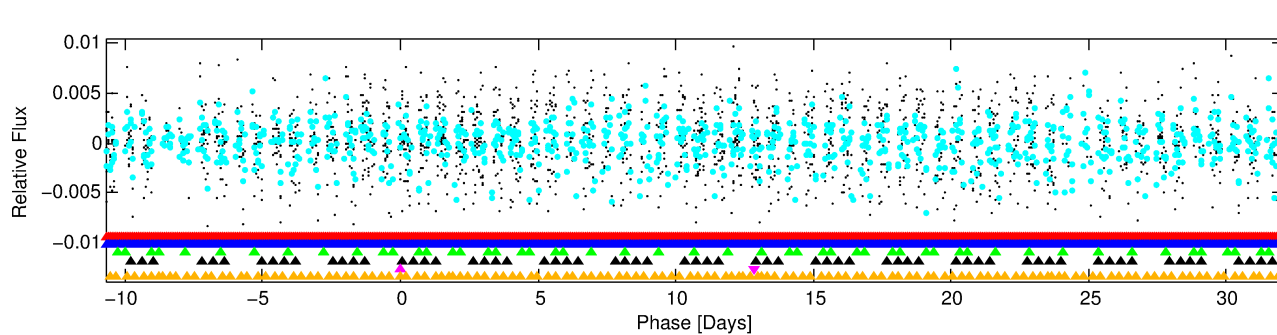
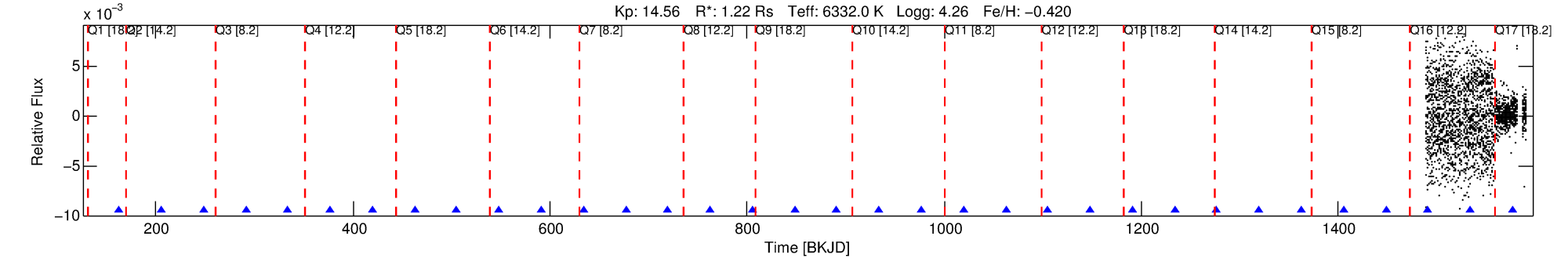
No Significant Match Found

# DV One-Page Summary

KIC: 9954225 Candidate: 5 of 6 Period: 42.846 d

KOI: K05742 Corr: No Ephemeris Match

Kp: 14.56 R\*: 1.22 Rs Teff: 6332.0 K Logg: 4.26 Fe/H: -0.420



## TPS TCE Results:

Period = 42.84569 d  
Epoch = 162.8798 BKJD

DV fit results are unavailable

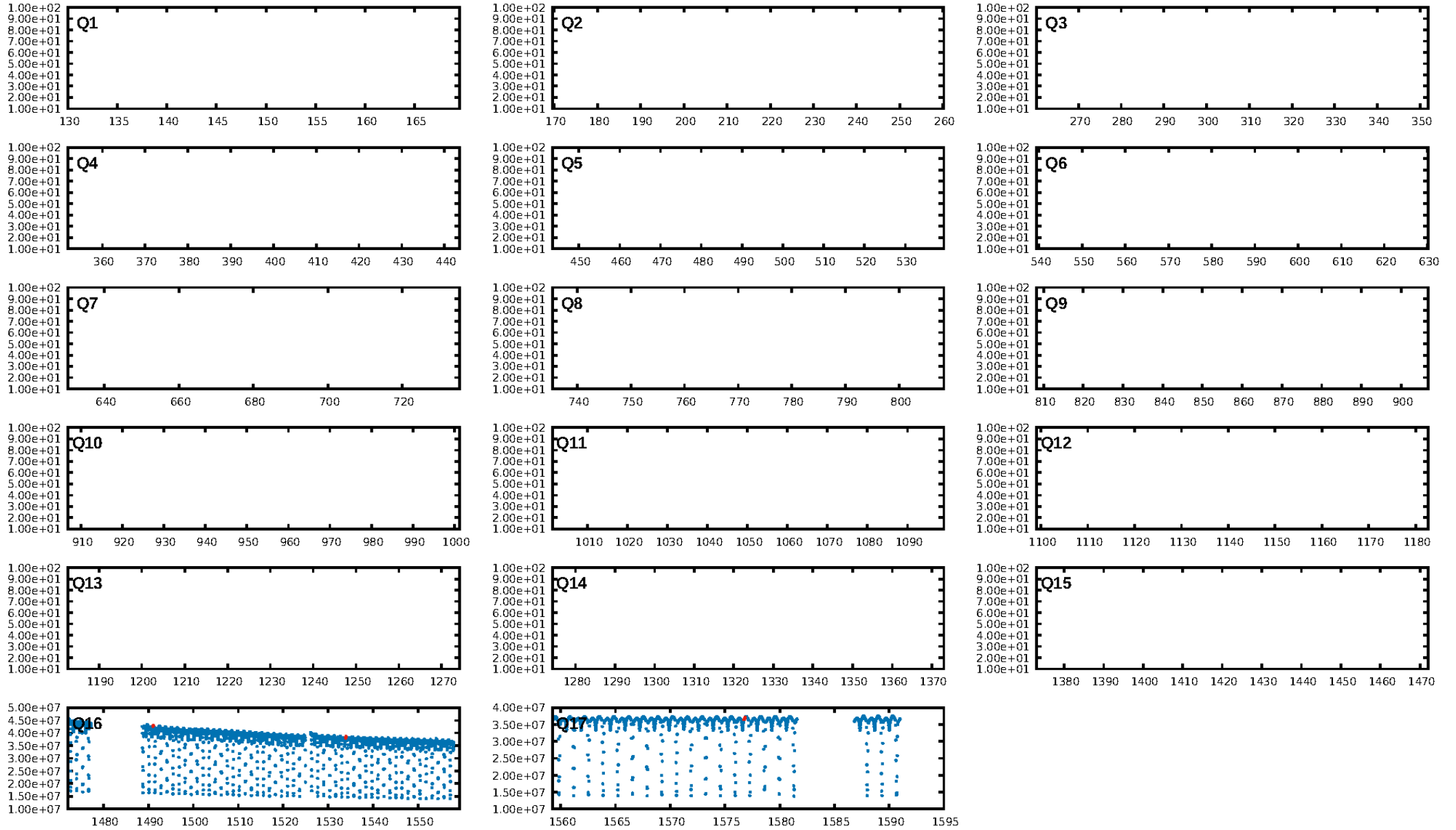
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [166.29σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.18e-07  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -19.28  
Centroid-sig: N/A  
Centroid-so: 0.124 arcsec [0.20σ]  
OotOffset-rm: 0.029 arcsec [0.43σ]  
KicOffset-rm: 0.253 arcsec [2.84σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.00 [0/2]

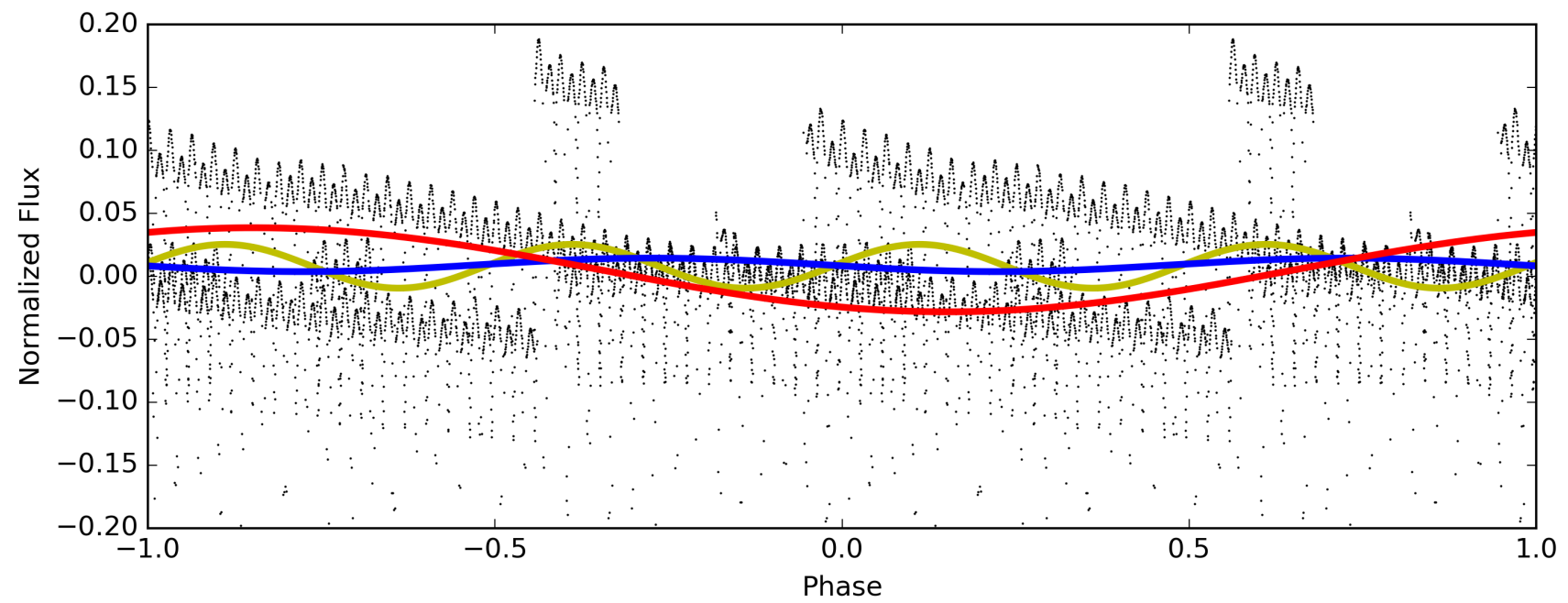
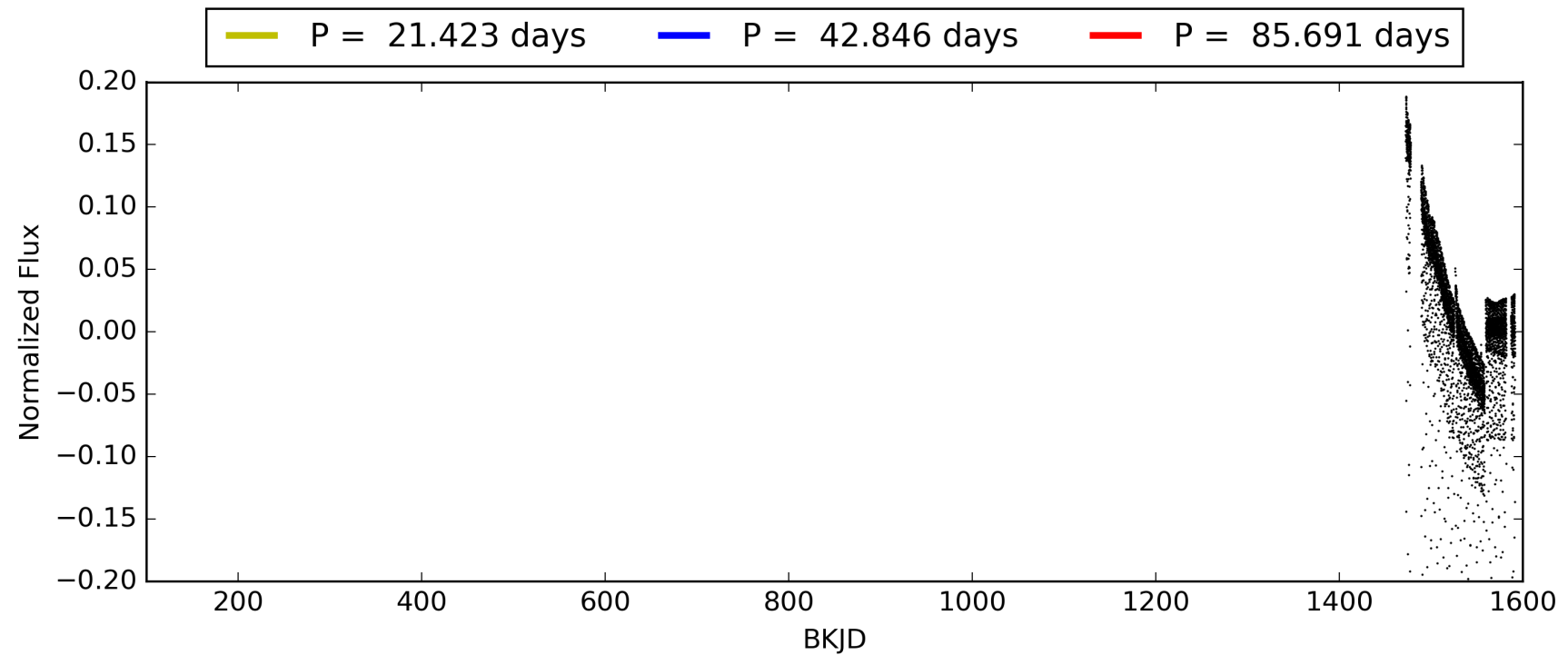
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:35:59 Z

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

# TCE 009954225-05, PDC Light Curves



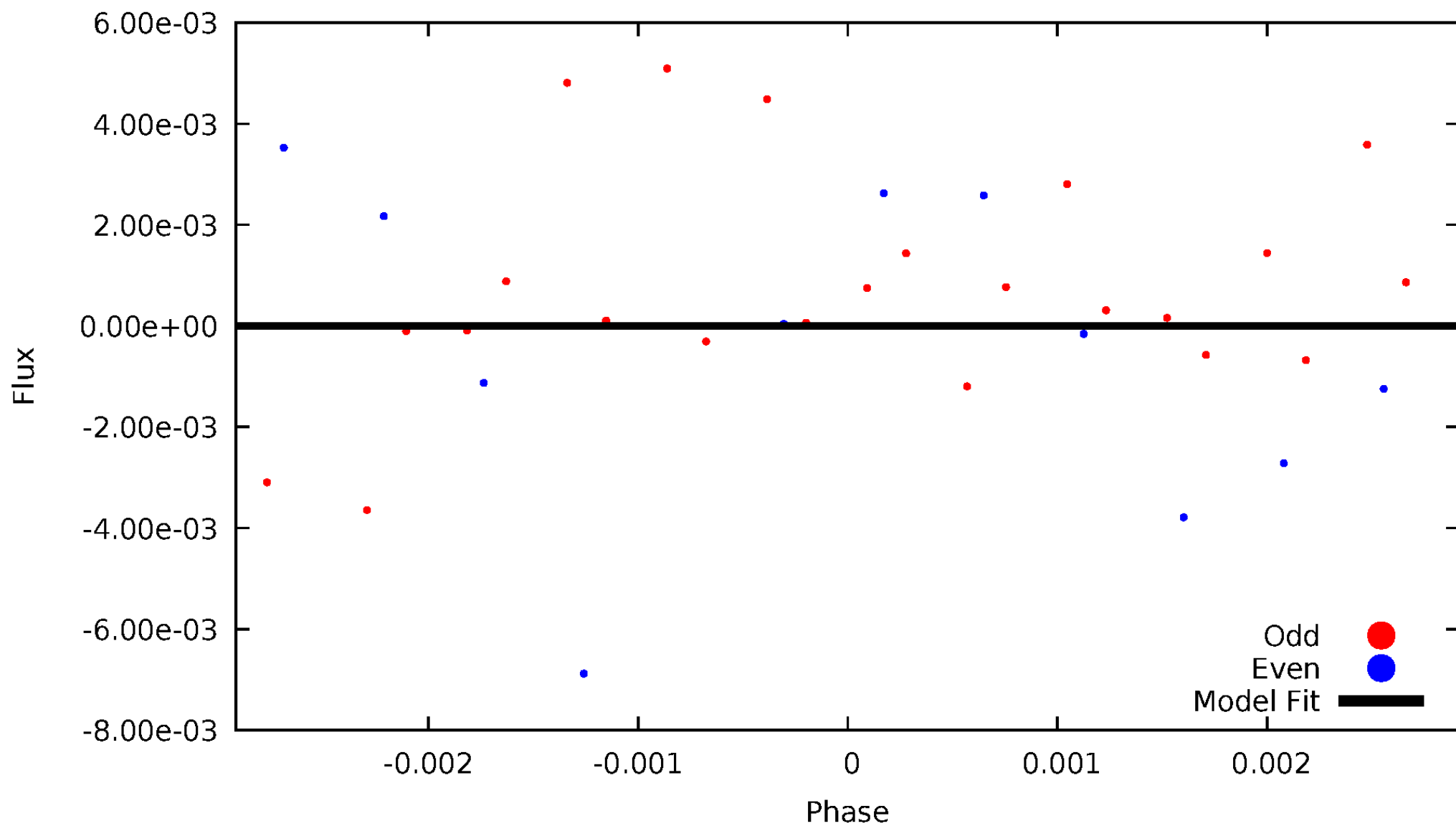
TCE 009954225-05





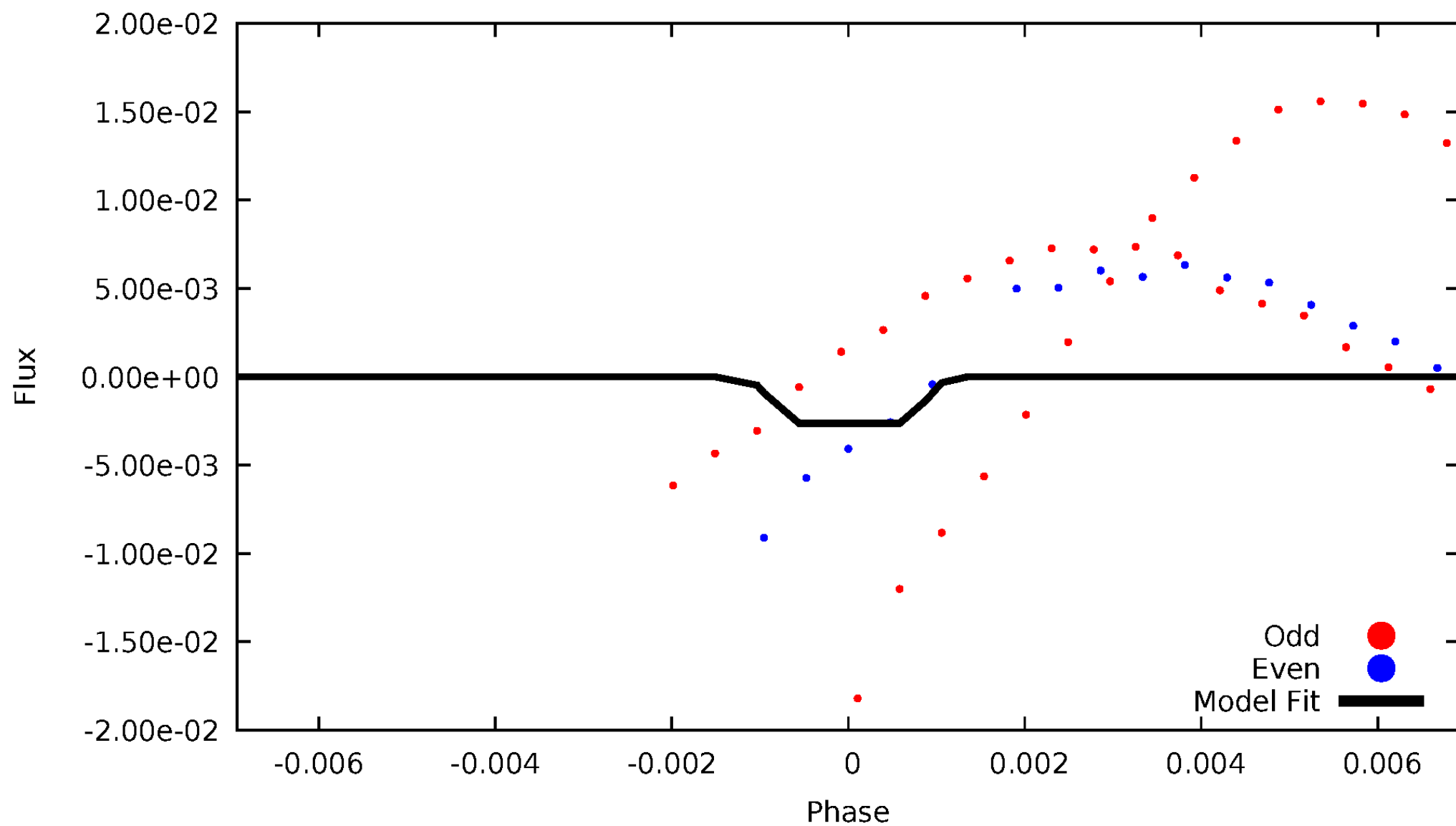
# DV Odd/Even

TCE 009954225-05



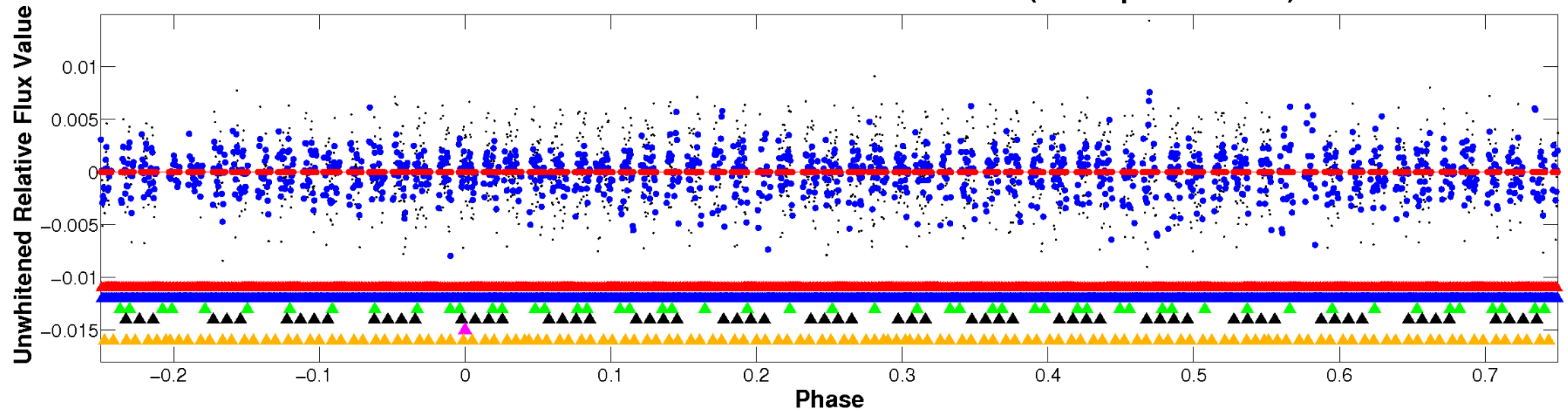
# ALT Odd/Even

TCE 009954225-05



# Non-Whitened Vs. Whitened Light Curve

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

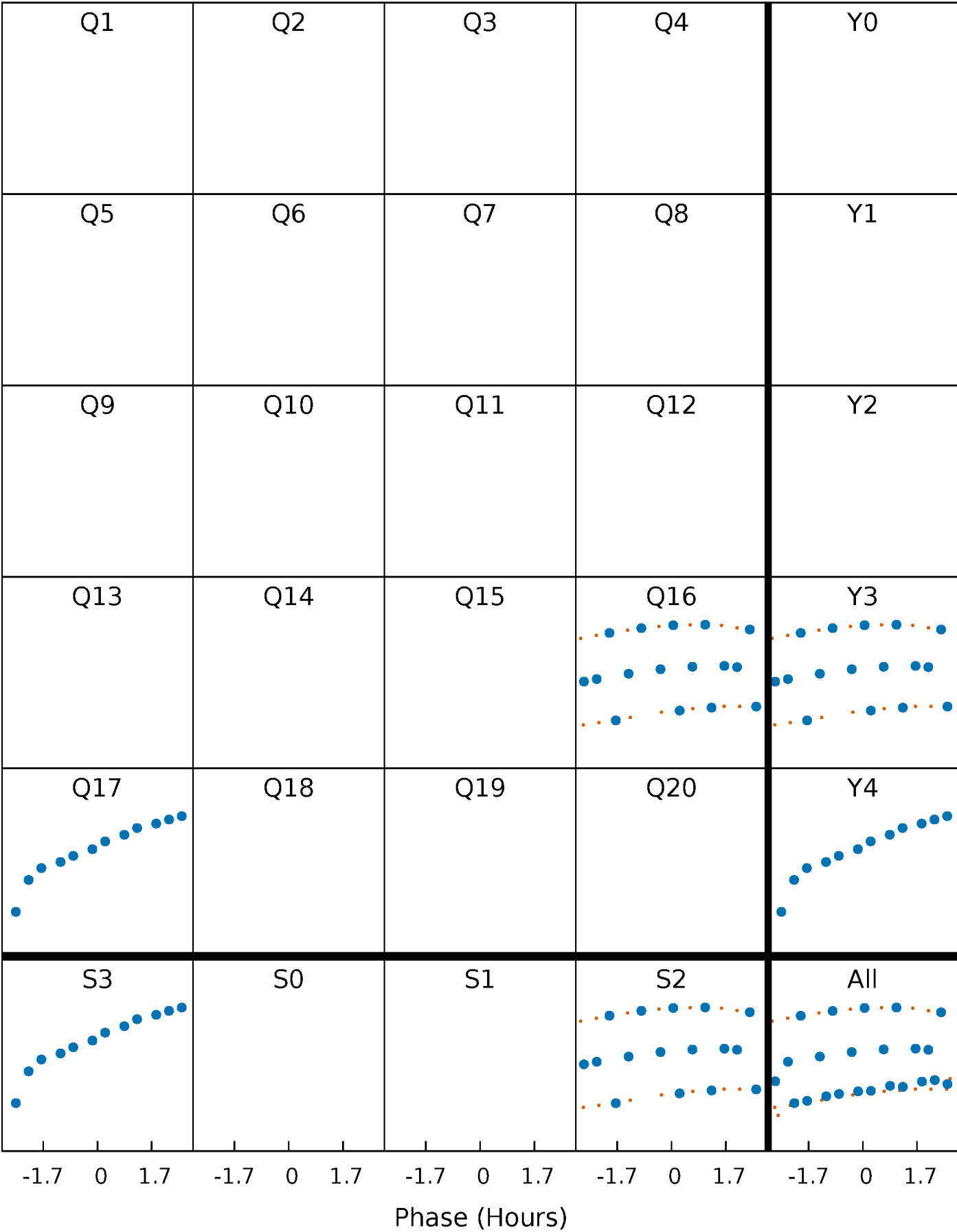


Planet 5 : Phased Whitened Flux Time Series (TPS Epoch/Period)



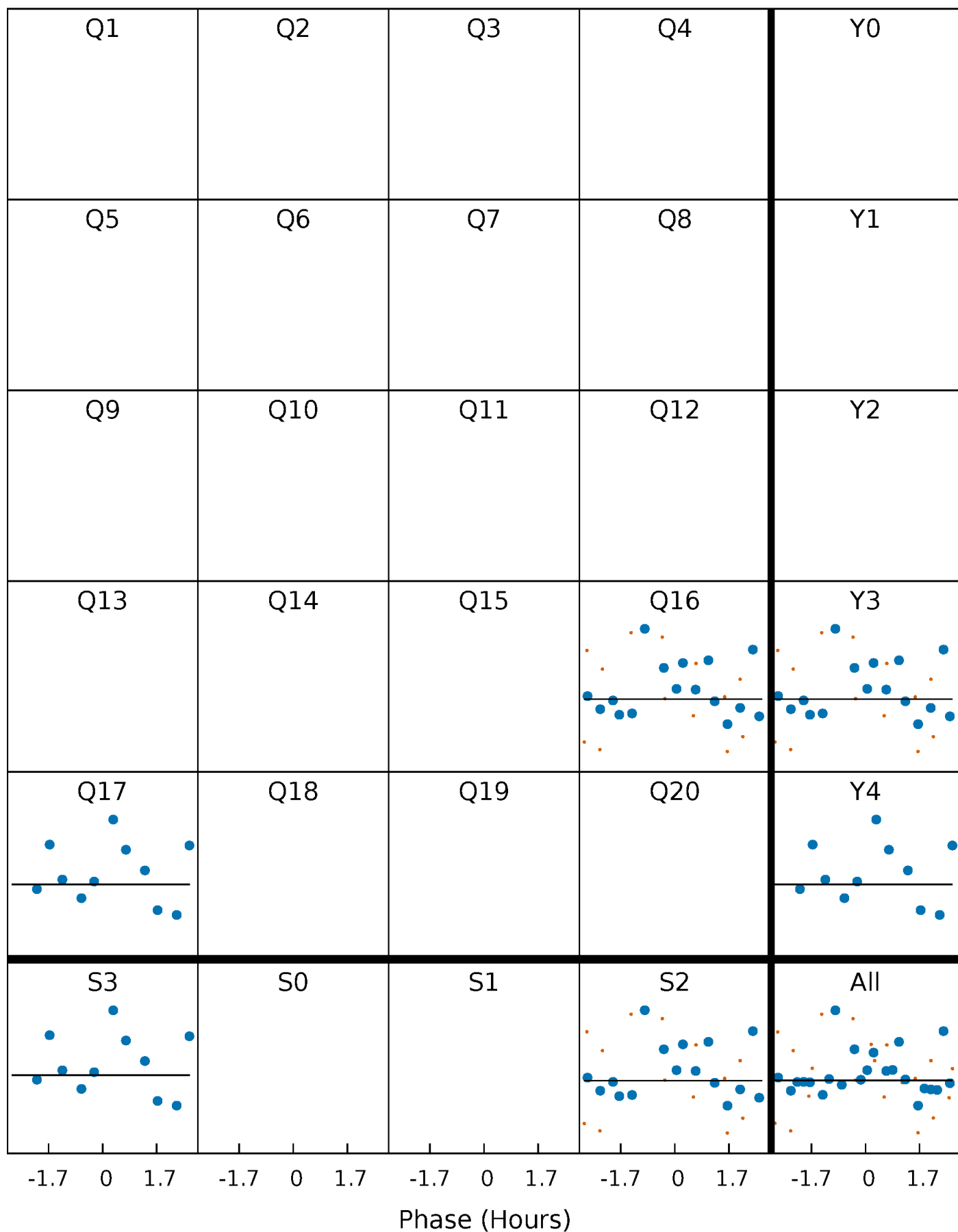
PDC Quarter-Phased Transit Curves

TCE 009954225-05    P= 42.845689 Days    T<sub>0</sub>=162.879751 (BKJD)



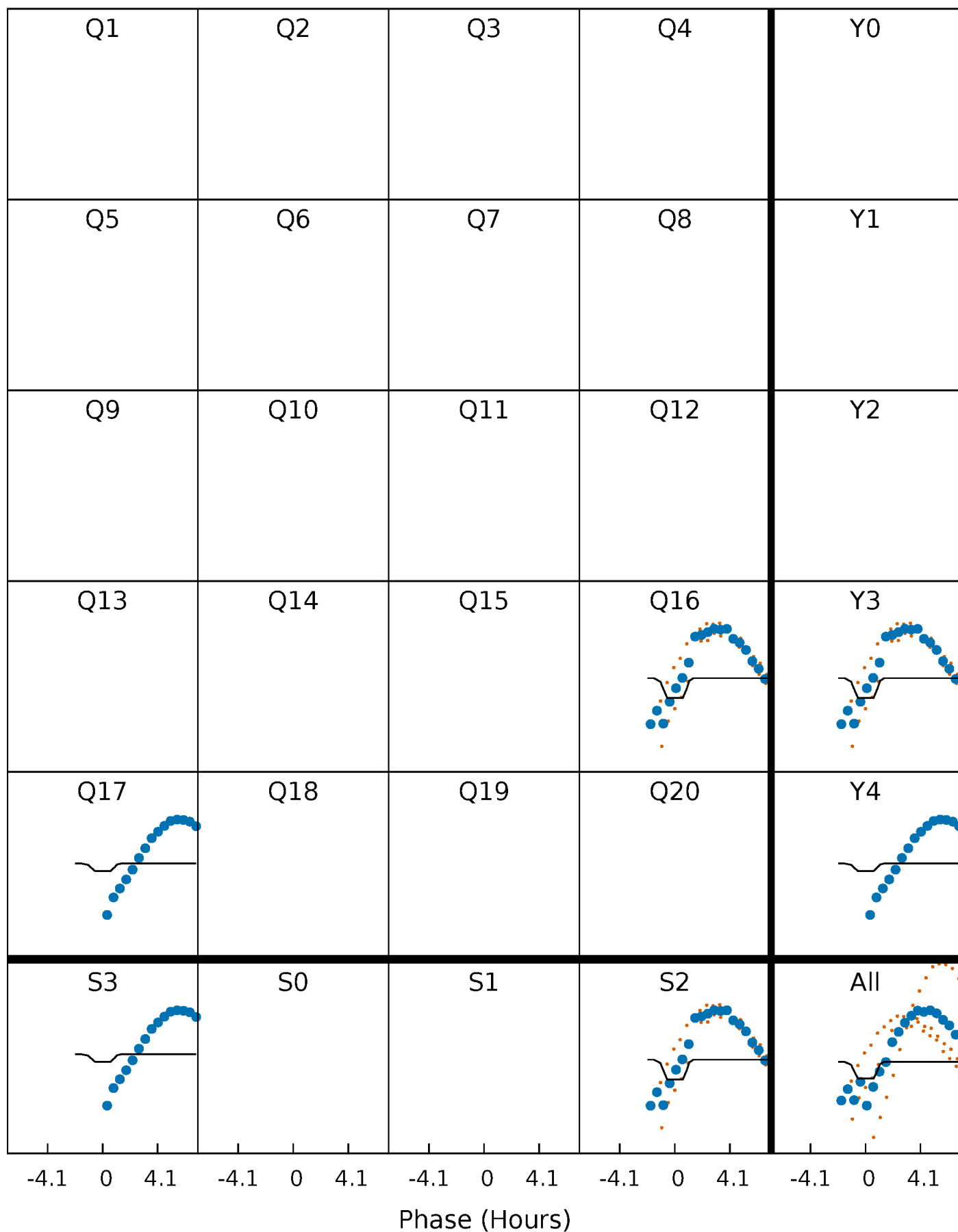
# DV Quarter-Phased Transit Curves

TCE 009954225-05     $P = 42.845689$  Days     $T_0 = 162.879751$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

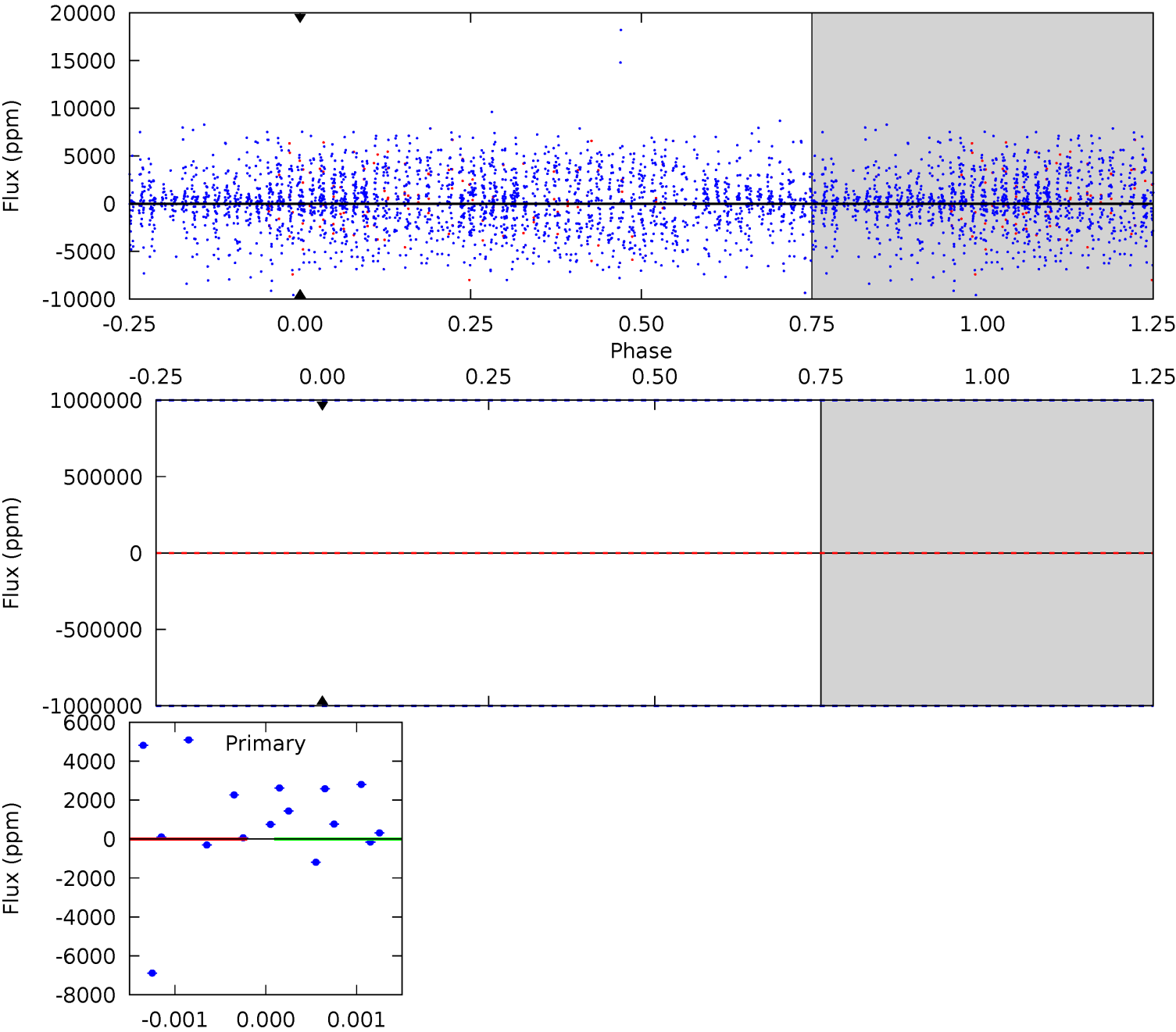
TCE 009954225-05 P= 42.845689 Days  $T_0=162.784986$  (BKJD)



# DV Model-Shift Uniqueness Test

009954225-05, P = 42.845689 Days, E = 162.879751 Days

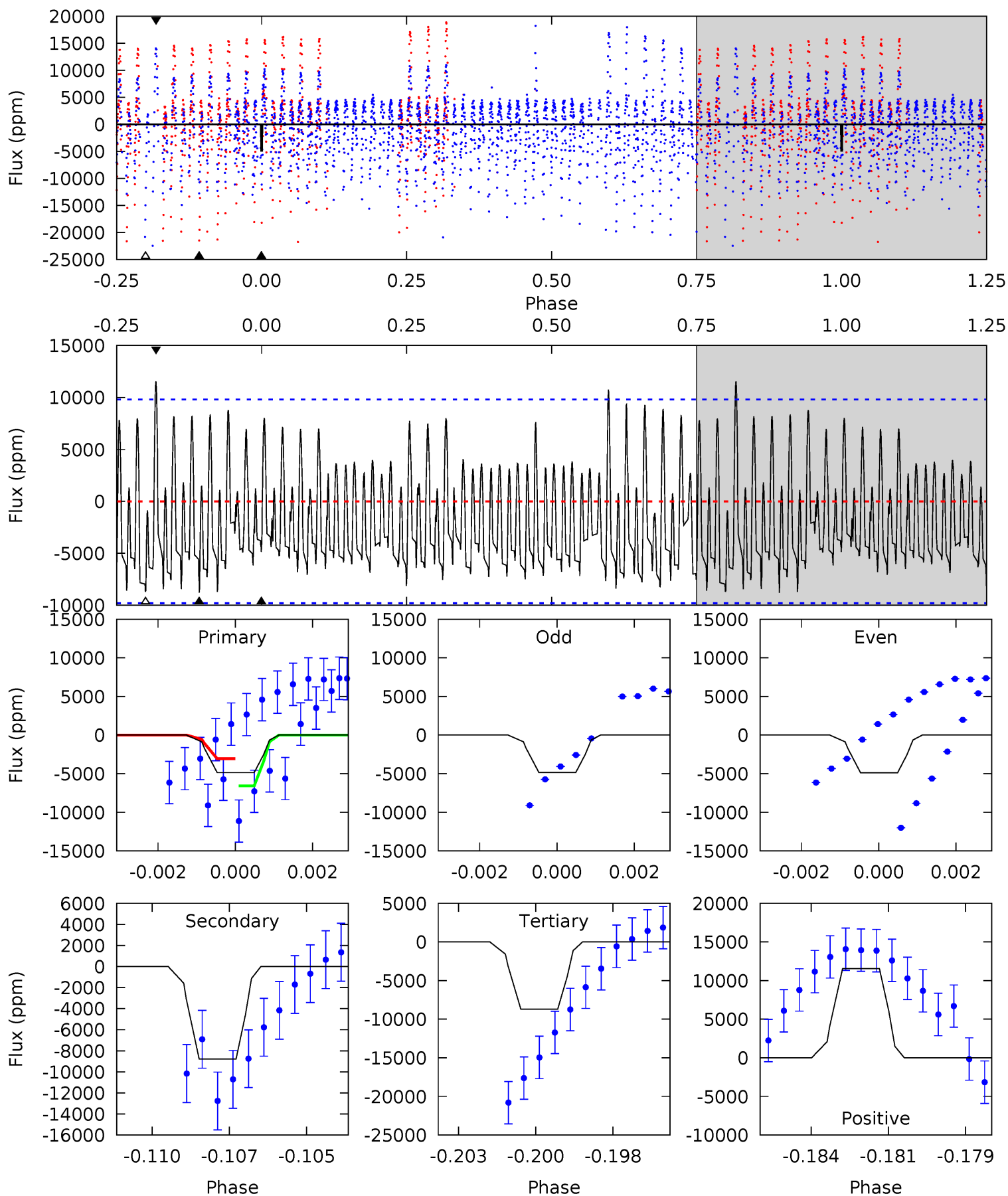
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009954225-05, P = 42.845689 Days, E = 162.784986 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
2.63	4.75	4.70	6.23	5.29	3.04	2.31	-2.07	-3.60	0.04	-1.48	0.01	1.29	0.57	0.93





### Stellar Parameters For KIC 009954225

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6332^{+199}_{-244}$	$4.260^{+0.180}_{-0.180}$	$-0.420^{+0.300}_{-0.300}$	$1.222^{+0.339}_{-0.277}$	$0.991^{+0.156}_{-0.114}$	$0.765^{+0.707}_{-0.363}$
	+3%/-4%	+4%/-4%	+71%/-71%	+28%/-23%	+16%/-12%	+92%/-47%
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 009954225-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$12.96^{+13.30}_{-8.35}$	$882^{+69}_{-60}$	$-3828^{+23377}_{-13419}$	$-128.395^{+34631.439}_{-26717.106}$
Alt.	$-8787 \pm 1852$	$12.34^{+11.16}_{-8.35}$	$883^{+72}_{-60}$	$6372^{+7336}_{-1598}$	$1849^{+16016}_{-1331}$

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

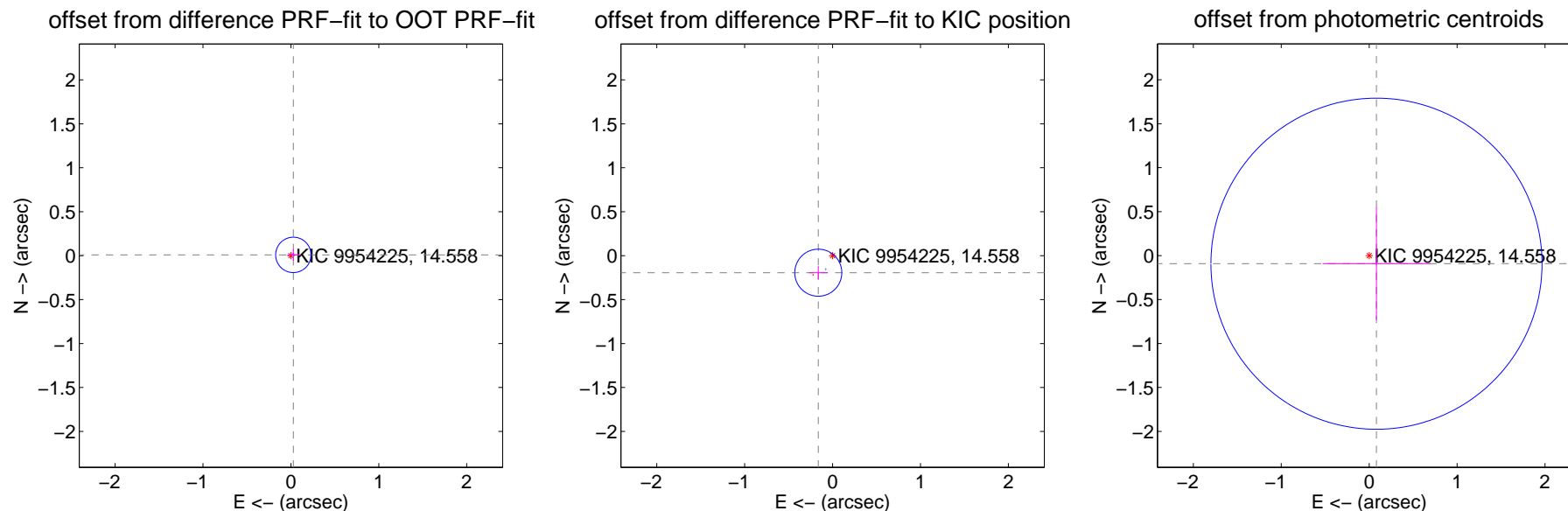
## DV Centroid Data

Supplemental centroid analysis for 009954225-05. Kepler magnitude: 14.56. 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 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.029 \pm 0.067$	0.43	$-0.028 \pm 0.067$	$0.009 \pm 0.067$
PRF-fit source offset from KIC position	$0.253 \pm 0.089$	2.84	$0.163 \pm 0.105$	$-0.194 \pm 0.076$
photometric centroid source offset	$0.12 \pm 0.63$	0.20	$-0.08 \pm 0.61$	$-0.09 \pm 0.64$



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

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



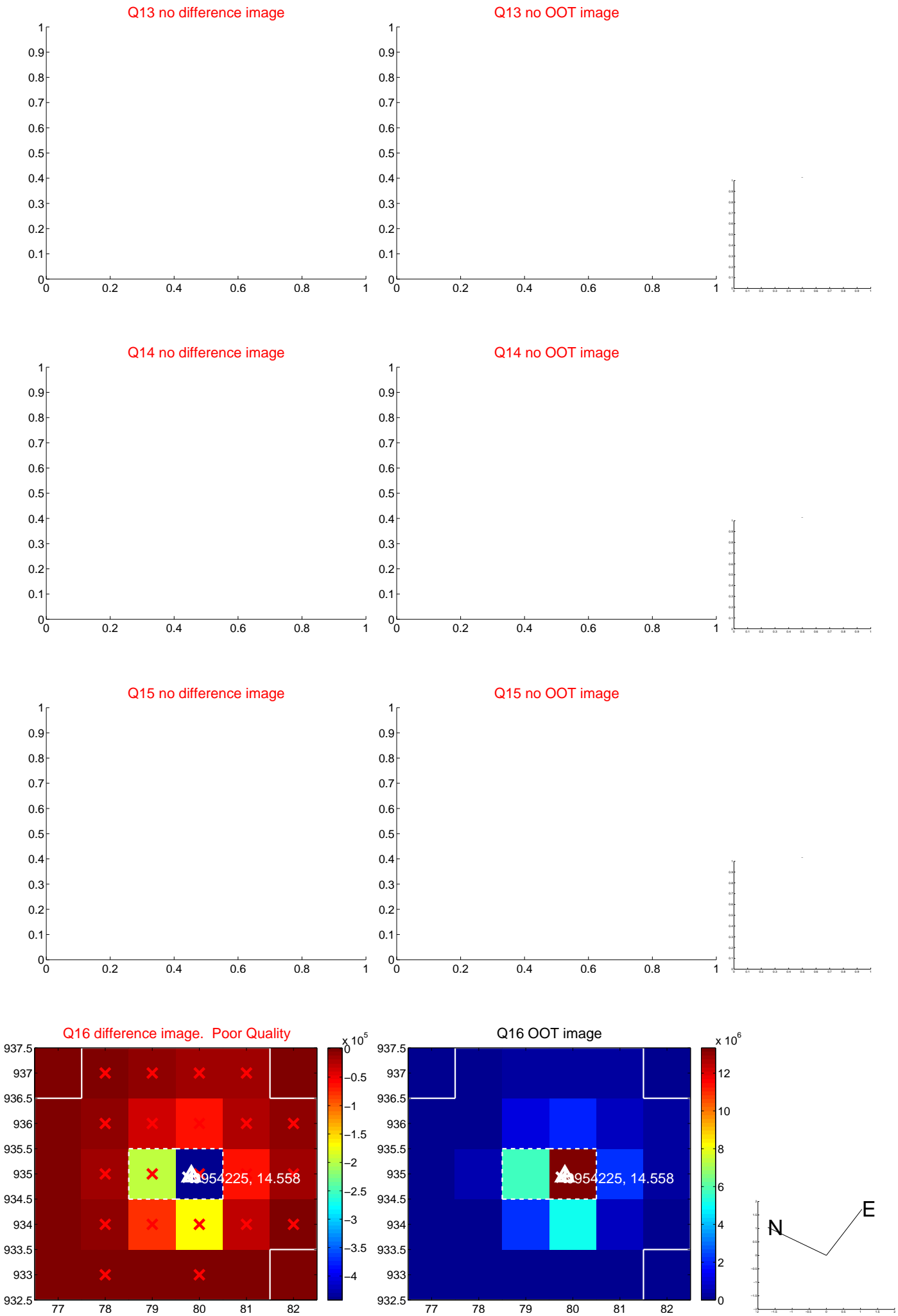
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



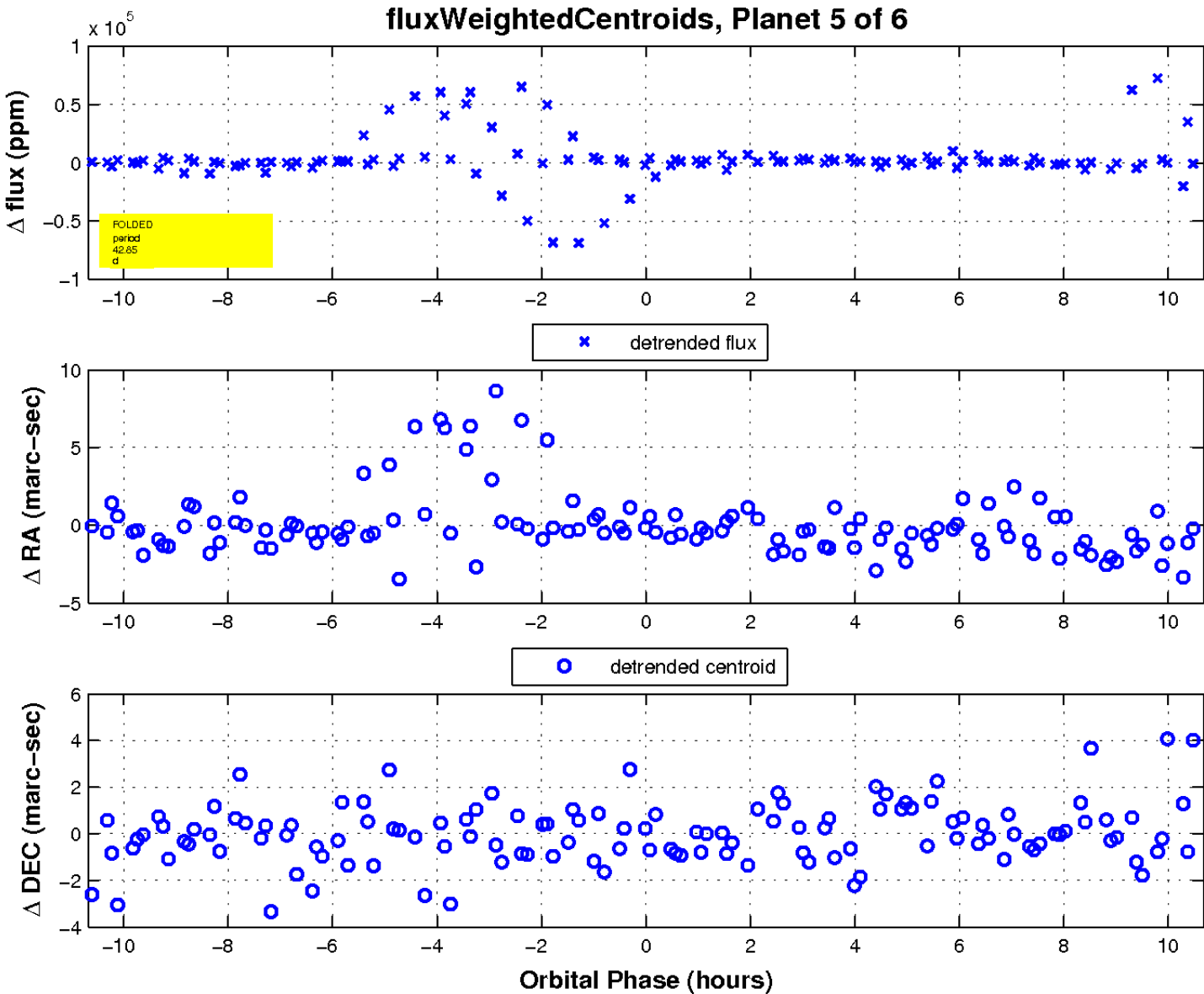
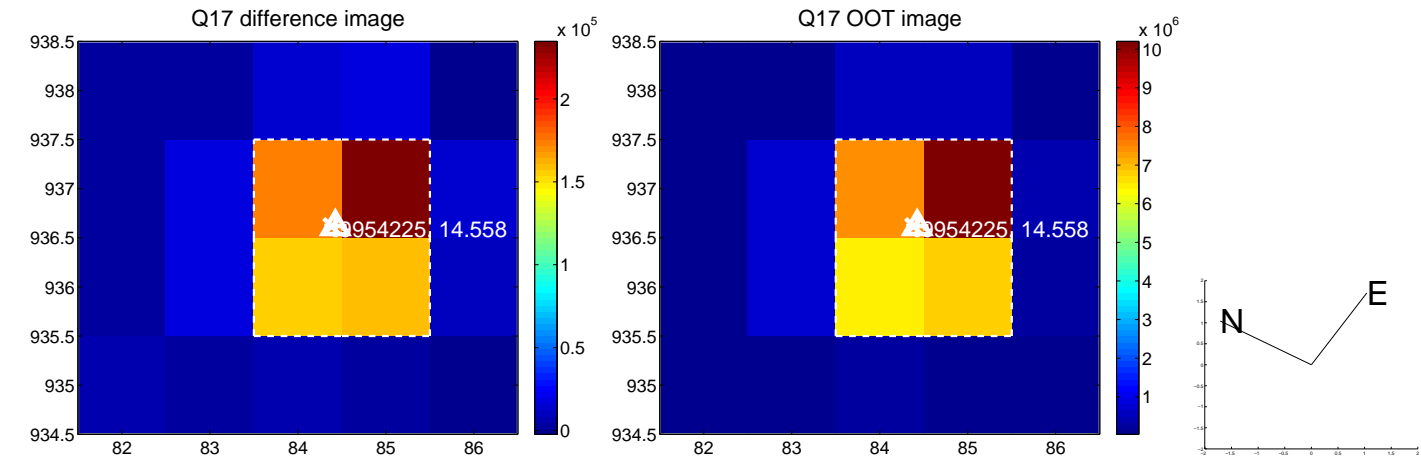
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

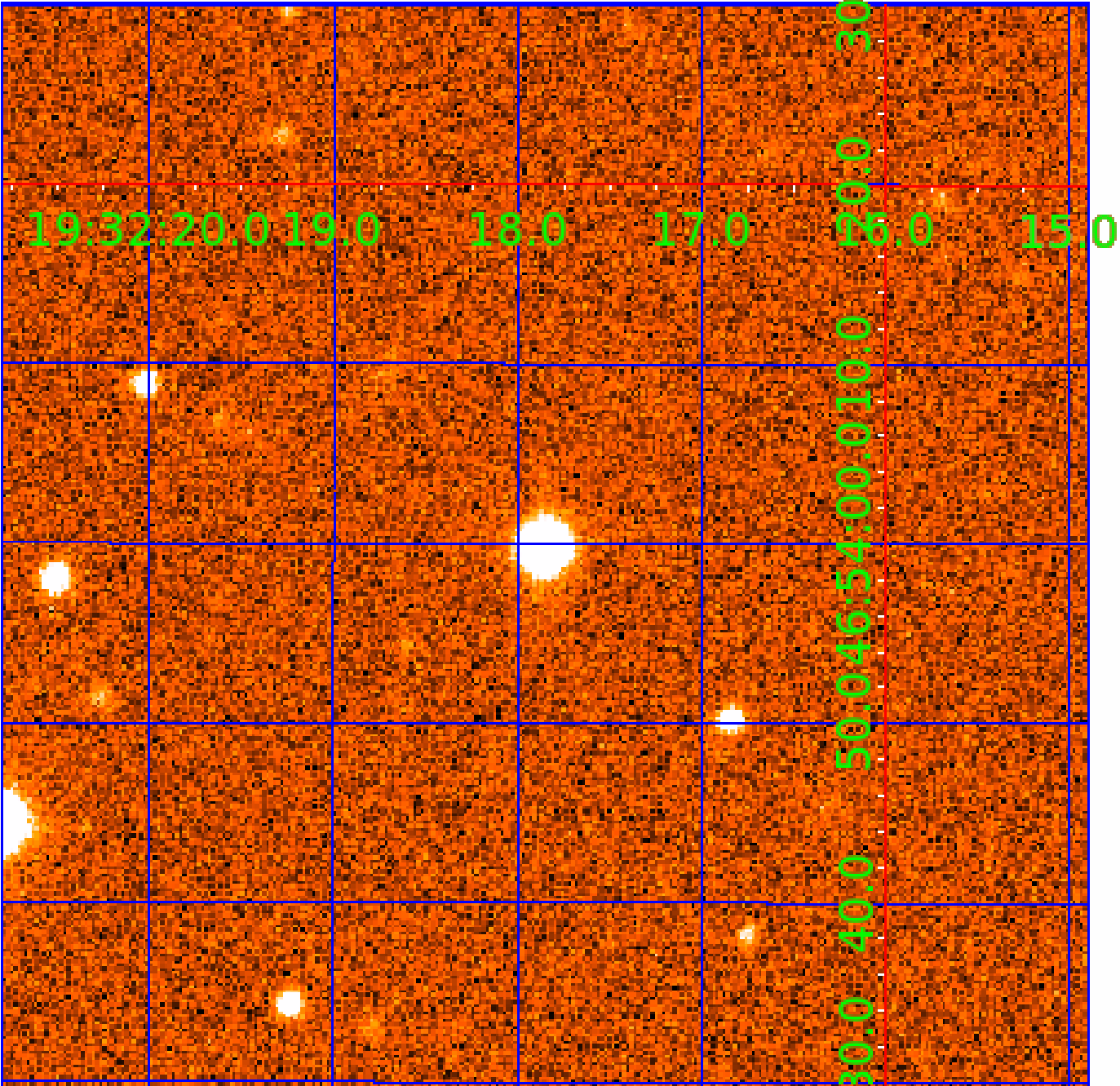


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009954225

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009954225-01	OBS	5742.01	1.340494	132.219327	537646.6	2.500	2691.7	-1.0	1.22	6332	41.48	3820.20
009954225-02	OBS	No	1.340381	131.630888	36.8	1.869	193.1	0.1	1.22	6332	0.81	3820.63
009954225-03	OBS	No	28.147794	140.814121	4175.8	1.500	27.1	-1.0	1.22	6332	7.96	65.94
009954225-04	OBS	No	22.706568	134.935995	5735.1	1.500	29.2	-1.0	1.22	6332	9.34	87.81
009954225-05	OBS	No	42.845689	162.879751	5497.0	1.500	31.0	-1.0	1.22	6332	9.14	37.66
009954225-06	OBS	No	10.550603	133.107869	6571.4	1.500	30.7	-1.0	1.22	6332	9.99	244.01

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009954225-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_ALT—HAS_SEC_TCE—SEASONAL_DEPTH_DV—CENT_NOFITS—HALO_GHOST
009954225-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_FEW_DIFFS
009954225-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD—CENT_NOFITS
009954225-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009954225-06	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

**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 009954225-06

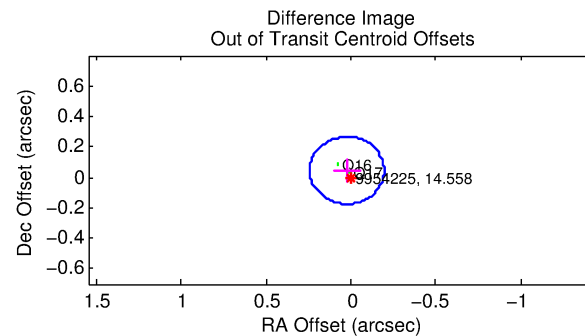
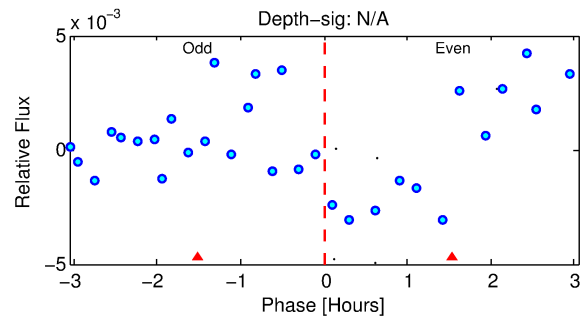
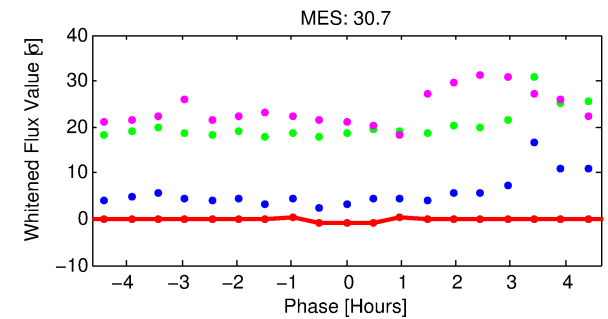
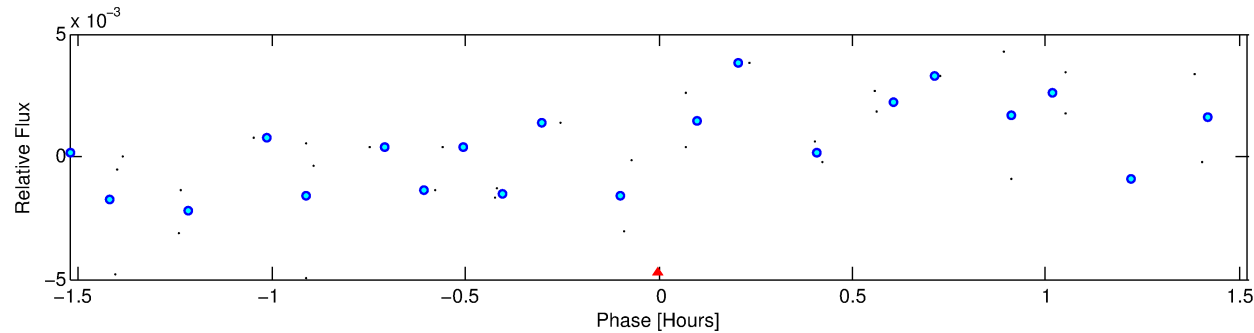
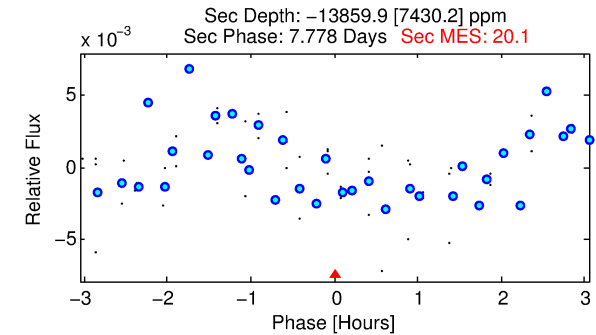
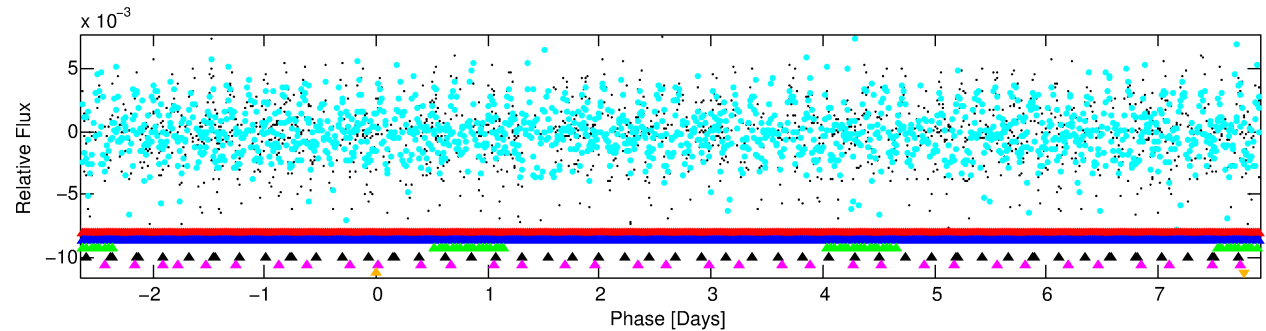
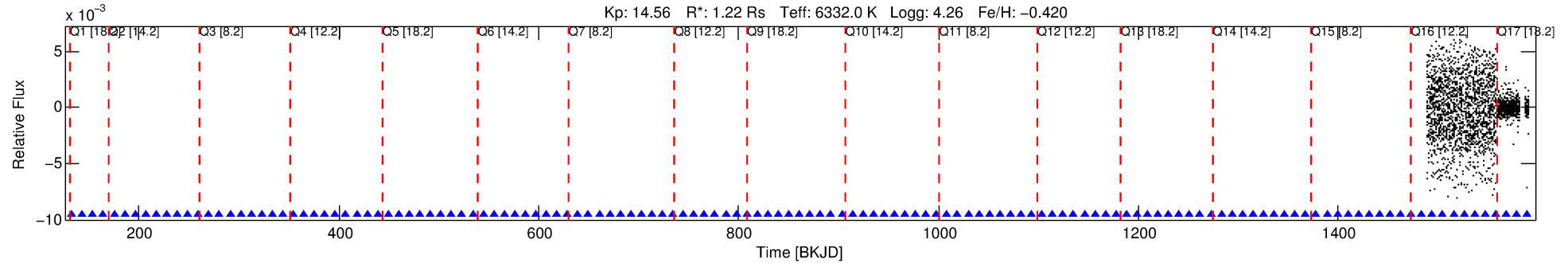
No Significant Match Found

# DV One-Page Summary

KIC: 9954225 Candidate: 6 of 6 Period: 10.551 d

KOI: K05742 Corr: No Ephemeris Match

Kp: 14.56 R\*: 1.22 Rs Teff: 6332.0 K Logg: 4.26 Fe/H: -0.420



## TPS TCE Results:

Period = 10.55060 d

Epoch = 133.1079 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [75.82σ]

LongPeriod-sig: 100.0% [137.53σ]

ModelChiSquare2-sig: N/A

ModelChiSquareGof-sig: N/A

Bootstrap-pfa: 2.54e-15

RollingBand-fgt: 1.00 [4/4]

GhostDiagnostic-chr: 0.9356

Centroid-sig: N/A

Centroid-so: 2.010 arcsec [1.44σ]

OotOffset-rm: 0.053 arcsec [0.72σ]

KicOffset-rm: 0.214 arcsec [1.90σ]

OotOffset-st: 0/0/1/1 [2]

KicOffset-st: 0/0/1/1 [2]

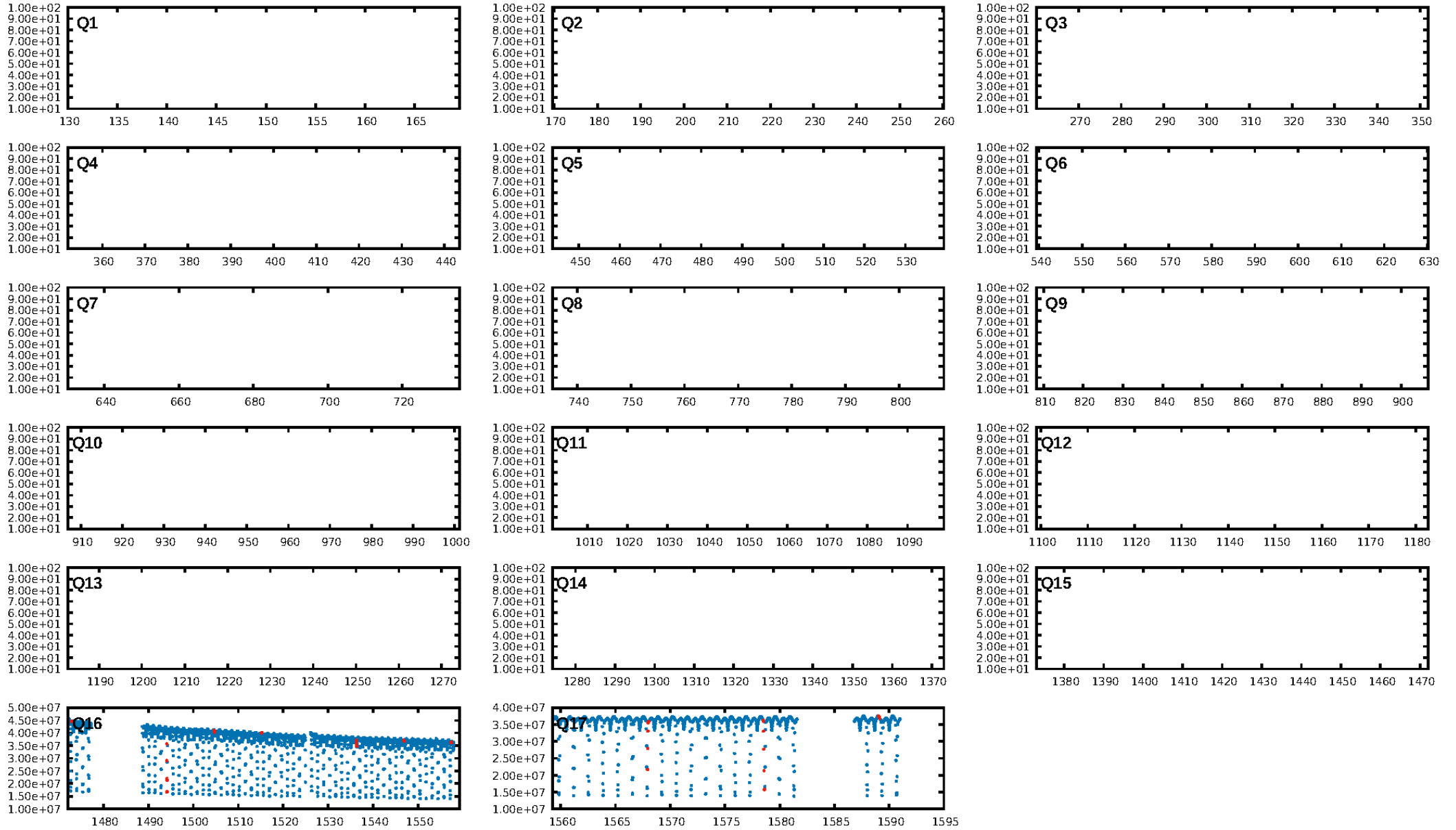
DiffImageQuality-fgm: 0.00 [0/2]

DiffImageOverlap-fno: 0.00 [0/2]

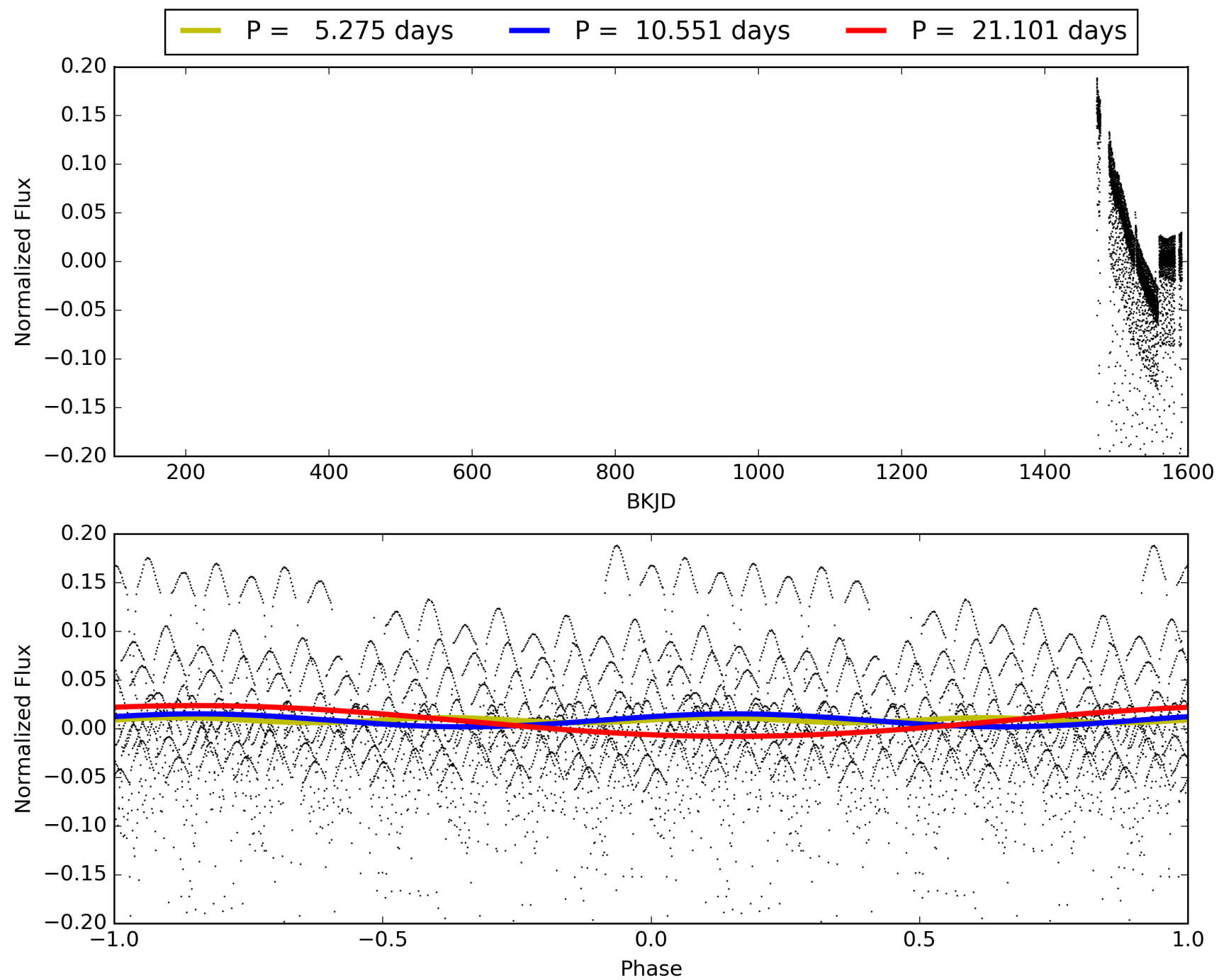
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:36:02 Z

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

# TCE 009954225-06, PDC Light Curves

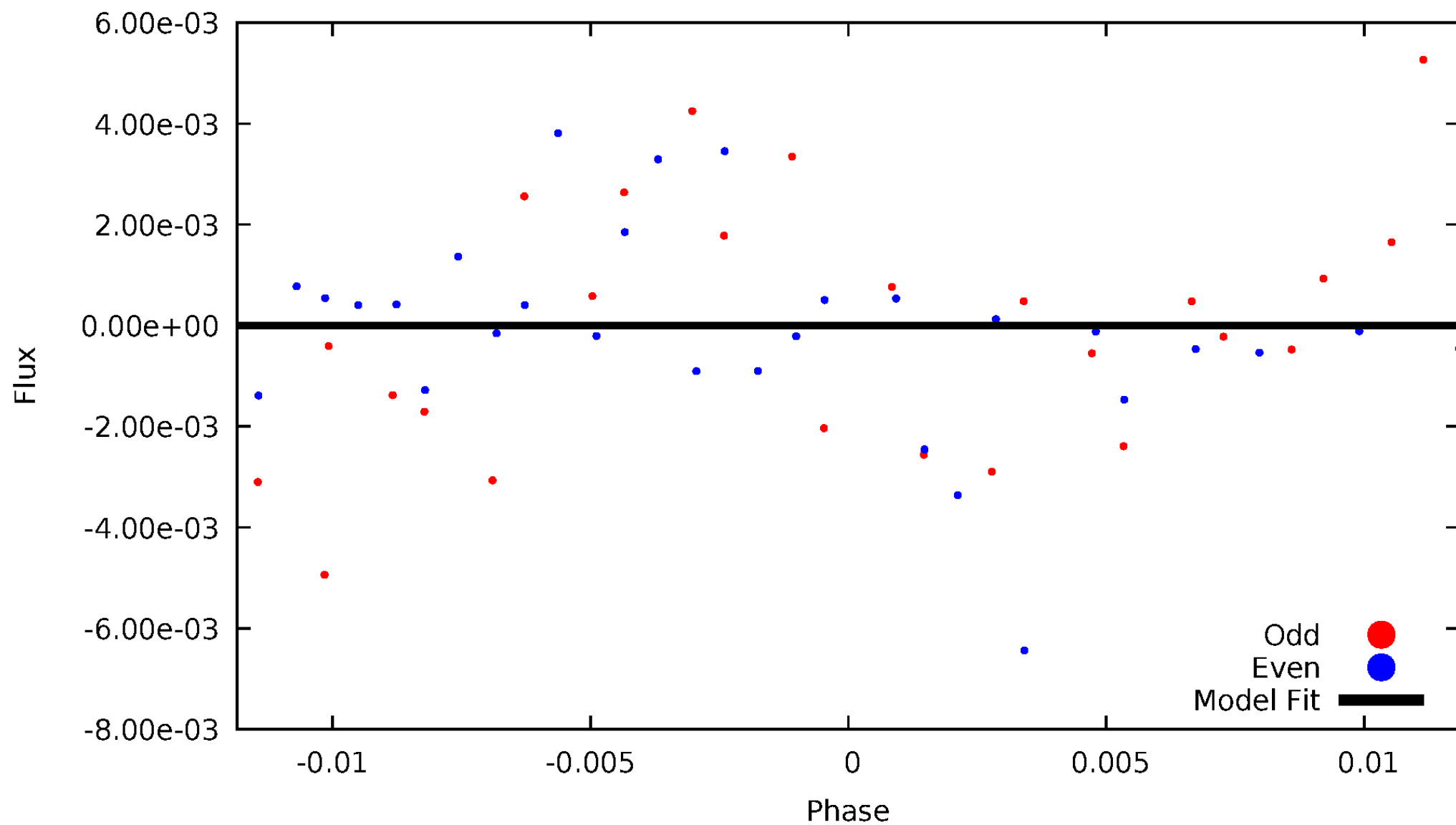


TCE 009954225-06



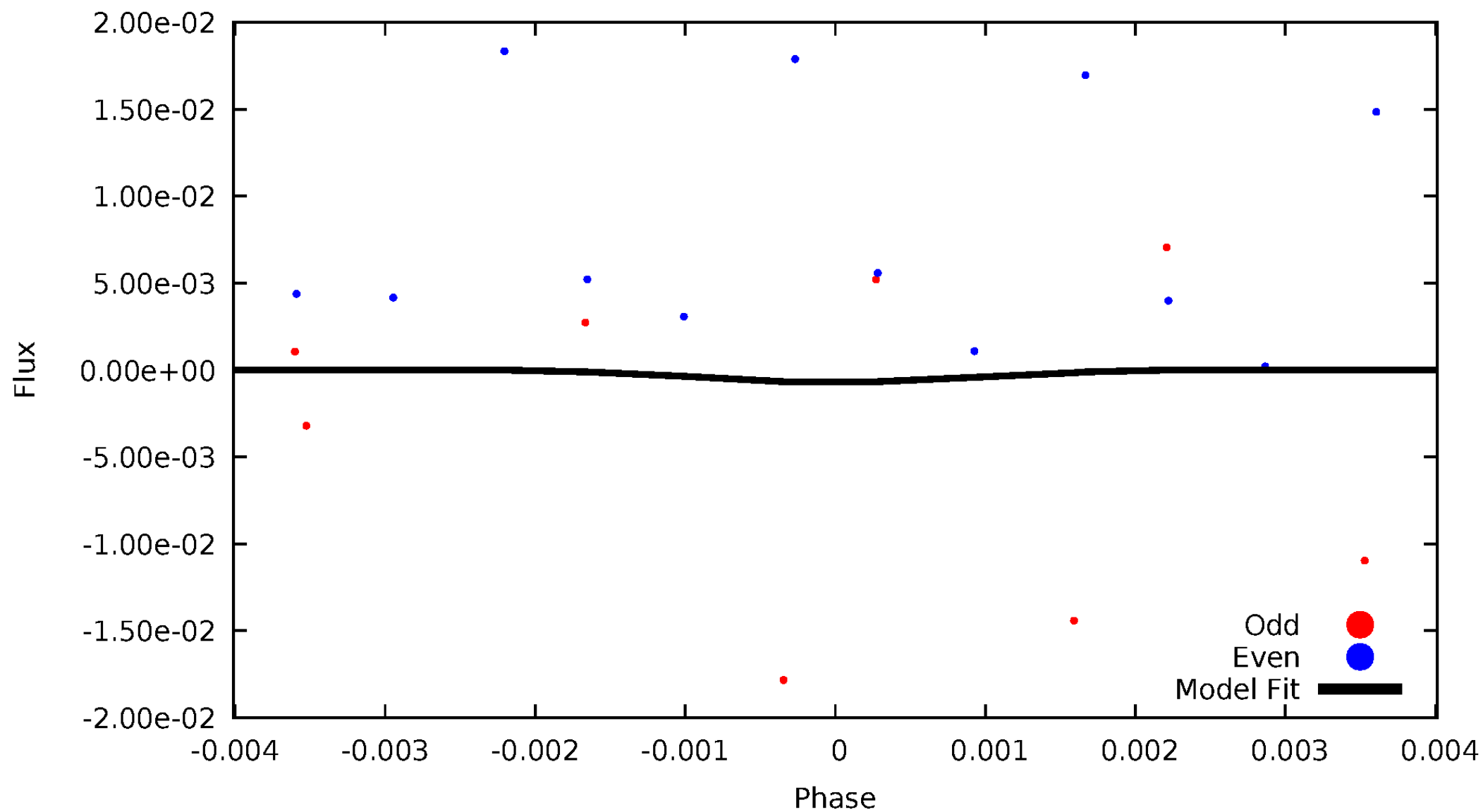
# DV Odd/Even

TCE 009954225-06



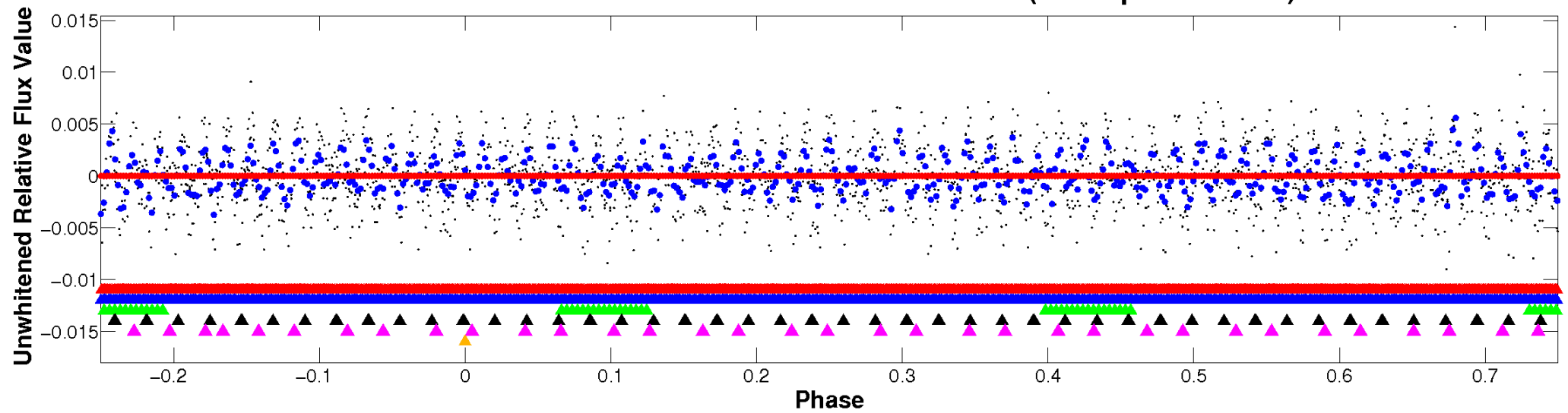
# ALT Odd/Even

TCE 009954225-06

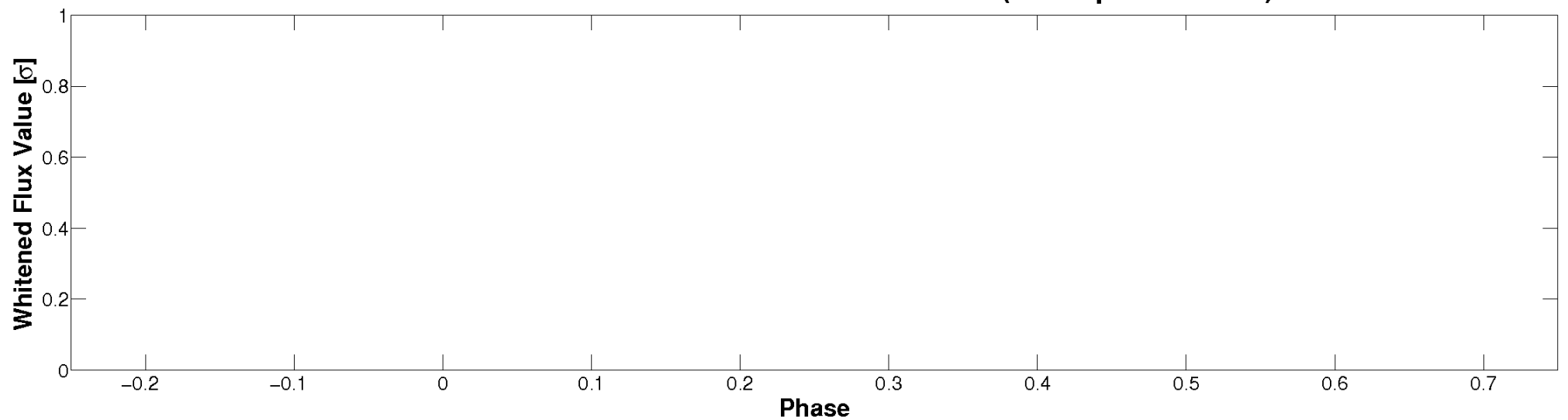


# Non-Whitened Vs. Whitened Light Curve

**Planet 6 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

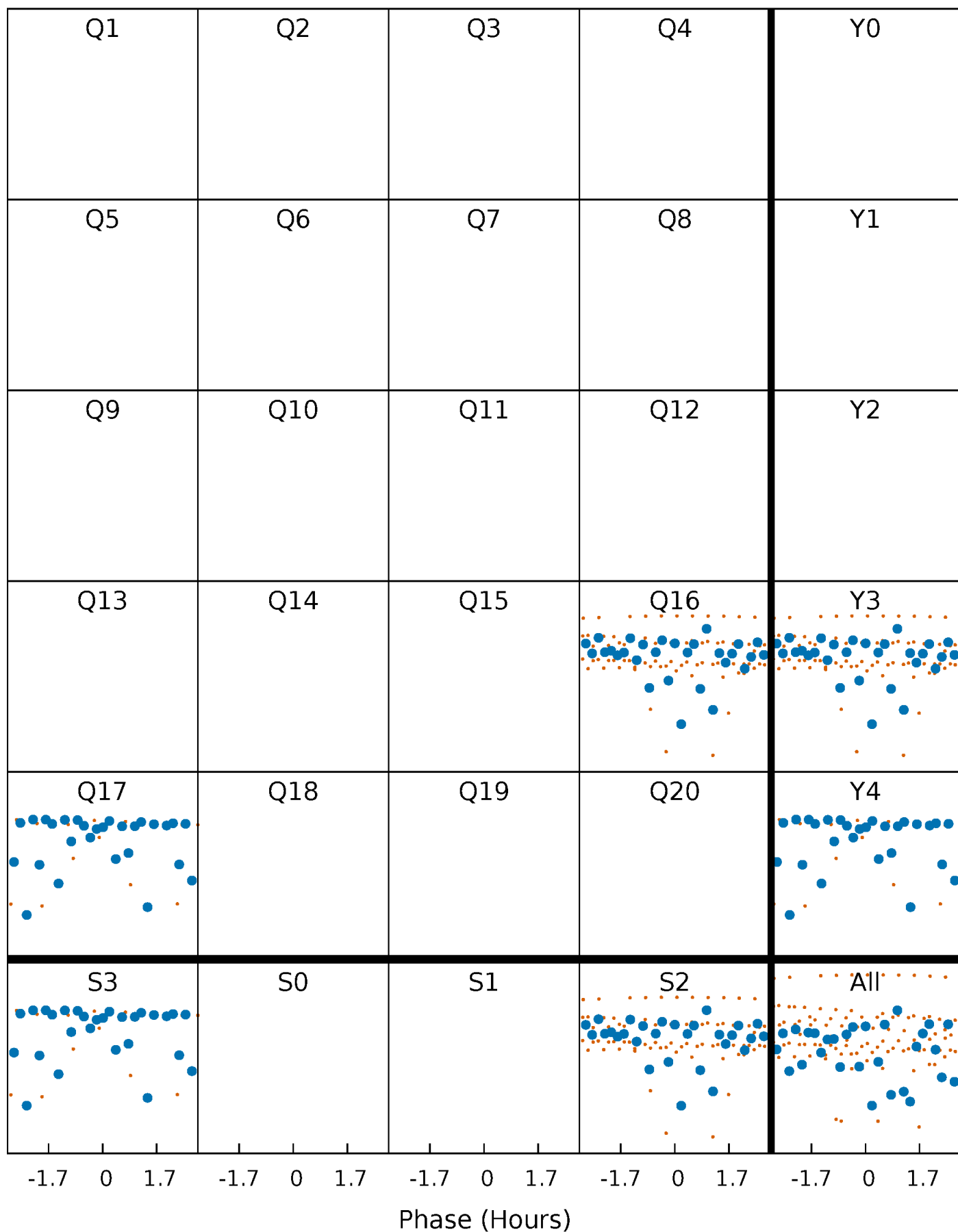


**Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

TCE 009954225-06 P= 10.550603 Days  $T_0=133.107869$  (BKJD)





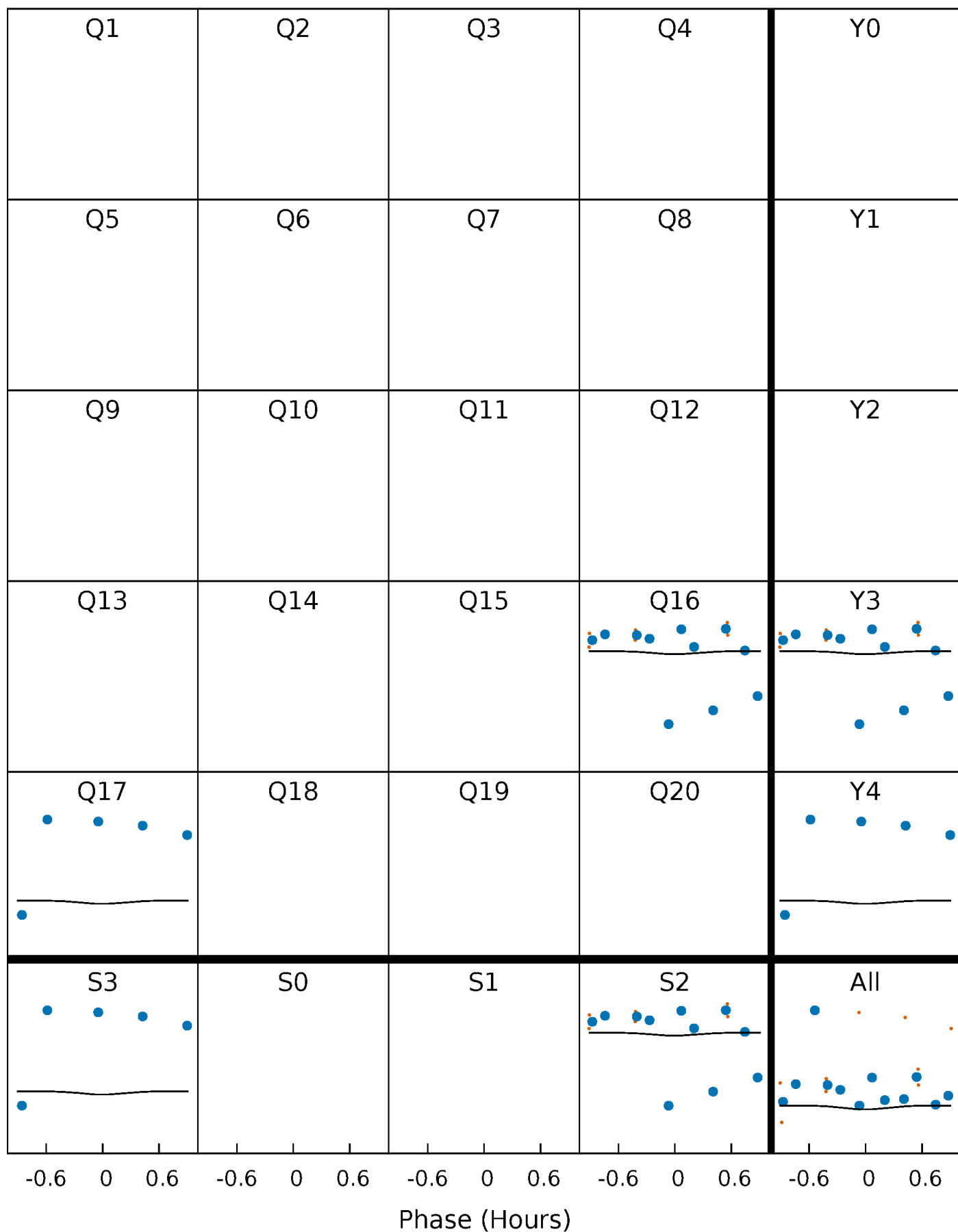
# DV Quarter-Phased Transit Curves

TCE 009954225-06     $P = 10.550603$  Days     $T_0 = 133.107869$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

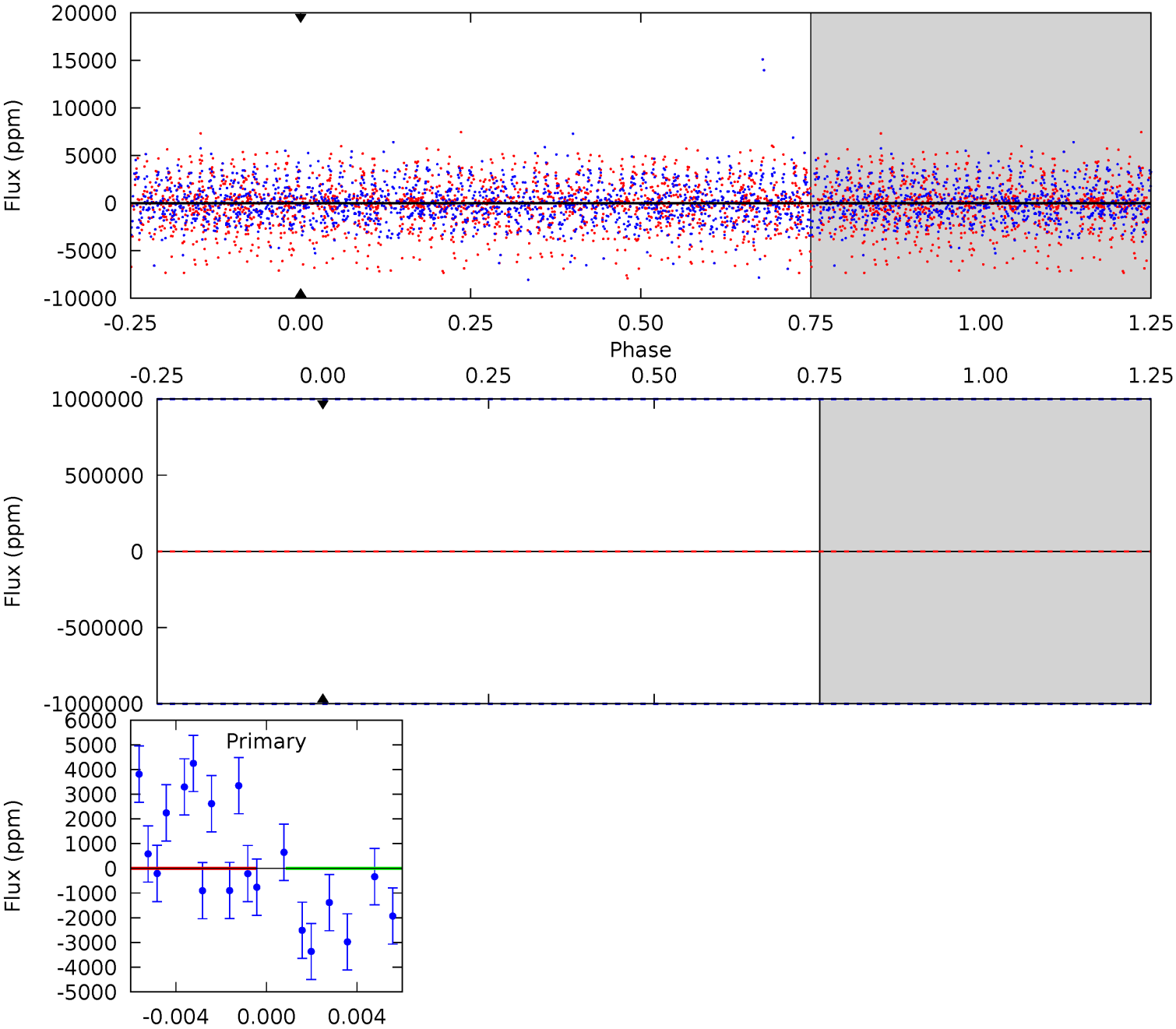
TCE 009954225-06 P= 10.550603 Days  $T_0=133.038715$  (BKJD)



# DV Model-Shift Uniqueness Test

009954225-06, P = 10.550603 Days, E = 133.107869 Days

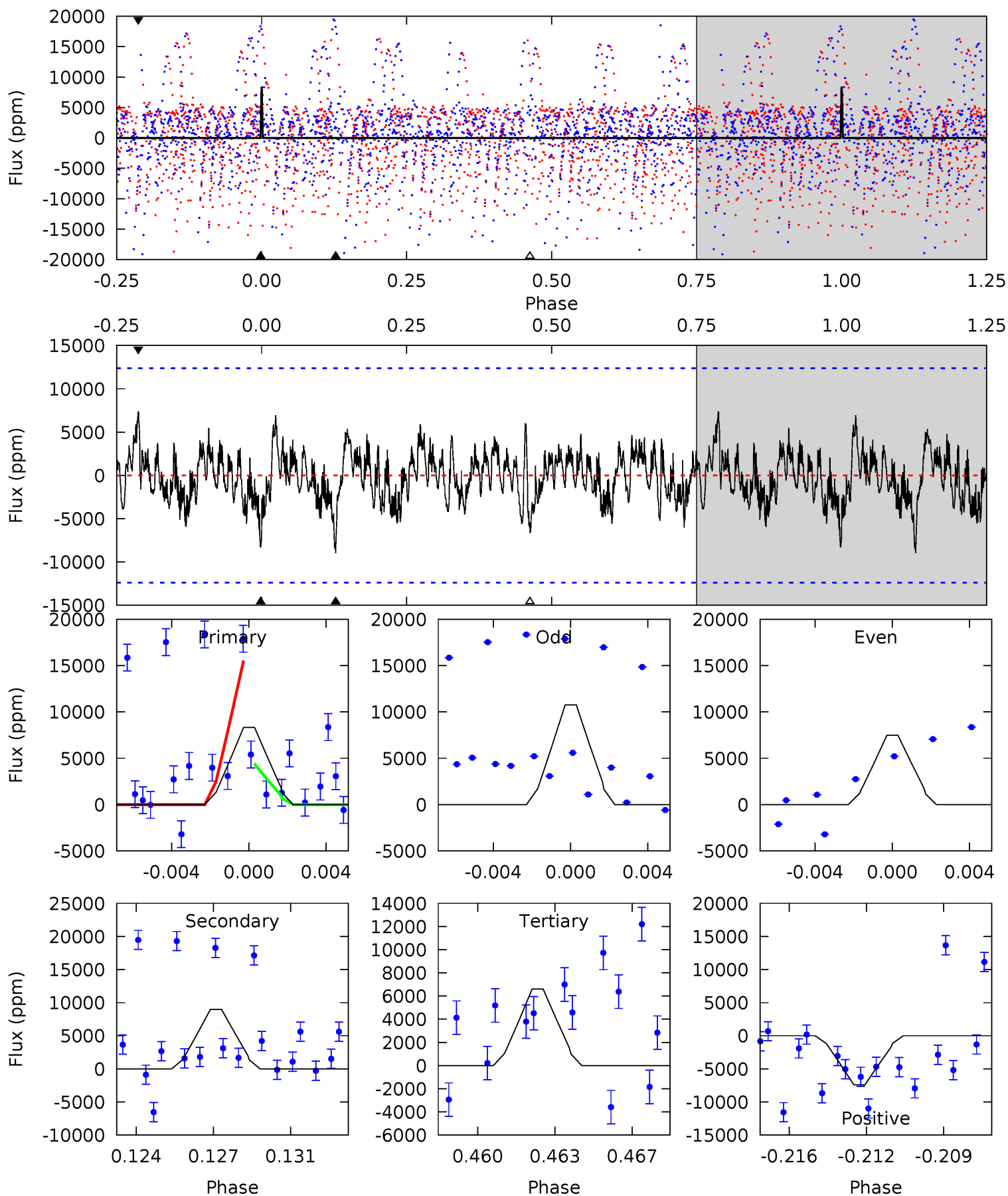
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009954225-06, P = 10.550603 Days, E = 133.038715 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
3.50	3.78	2.77	3.12	5.21	2.89	1.04	0.72	0.38	1.01	0.66	0.68	0.55	0.45	2.16



### Stellar Parameters For KIC 009954225

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6332^{+199}_{-244}$	$4.260^{+0.180}_{-0.180}$	$-0.420^{+0.300}_{-0.300}$	$1.222^{+0.339}_{-0.277}$	$0.991^{+0.156}_{-0.114}$	$0.765^{+0.707}_{-0.363}$
	+3%/-4%	+4%/-4%	+71%/-71%	+28%/-23%	+16%/-12%	+92%/-47%
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 009954225-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$13.77^{+12.19}_{-8.65}$	$1402^{+107}_{-92}$	$-4164^{+20846}_{-12504}$	$-42.582^{+4225.139}_{-4257.818}$
Alt.	$-8981 \pm 2378$	$10.73^{+10.84}_{-7.84}$	$1406^{+108}_{-98}$	$6807^{+12625}_{-1857}$	$364^{+4791}_{-273}$

$T_{\text{max}}$  = 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

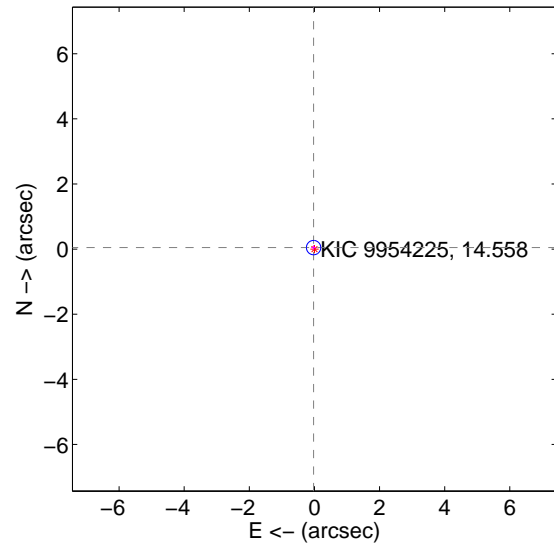
Supplemental centroid analysis for 009954225-06. Kepler magnitude: 14.56. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

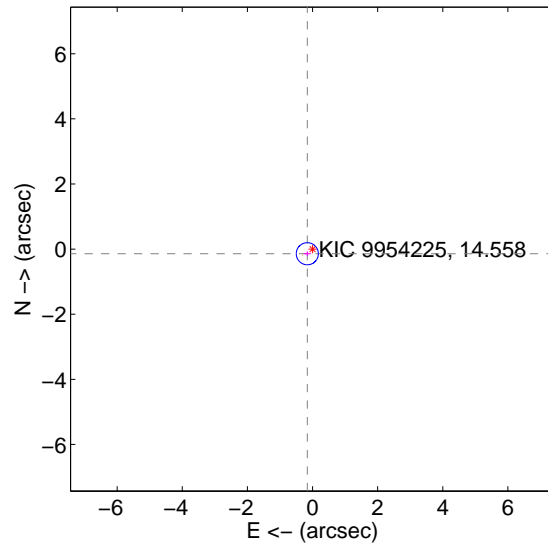
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.053 \pm 0.073$	0.72	$0.026 \pm 0.076$	$0.046 \pm 0.073$
PRF-fit source offset from KIC position	$0.214 \pm 0.113$	1.90	$0.160 \pm 0.117$	$-0.143 \pm 0.073$
photometric centroid source offset	$2.01 \pm 1.39$	1.44	$-2.00 \pm 1.39$	$0.18 \pm 2.02$

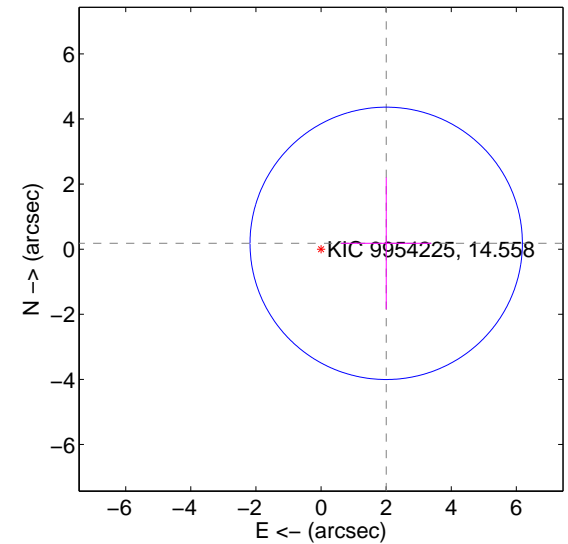
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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

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



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

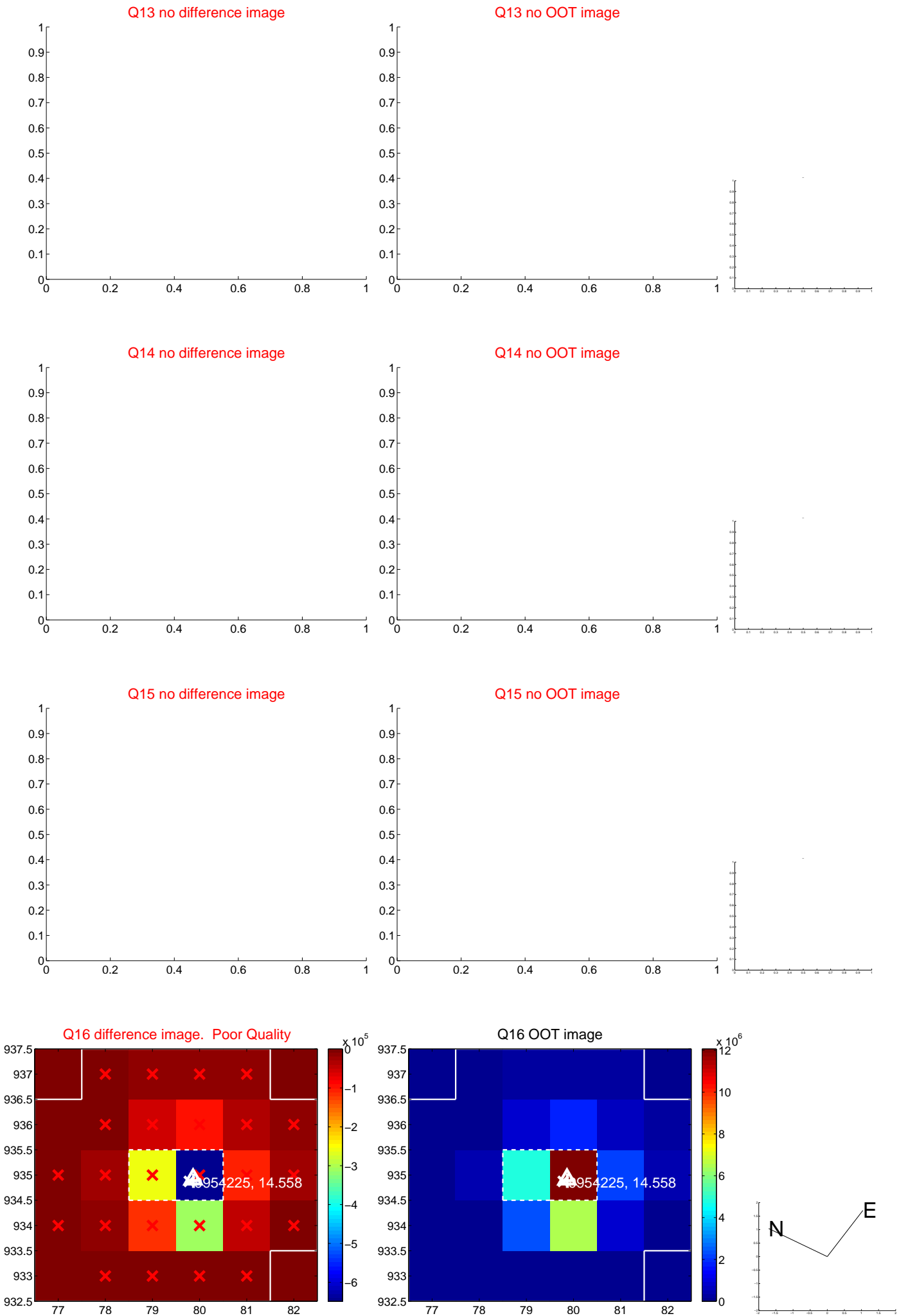




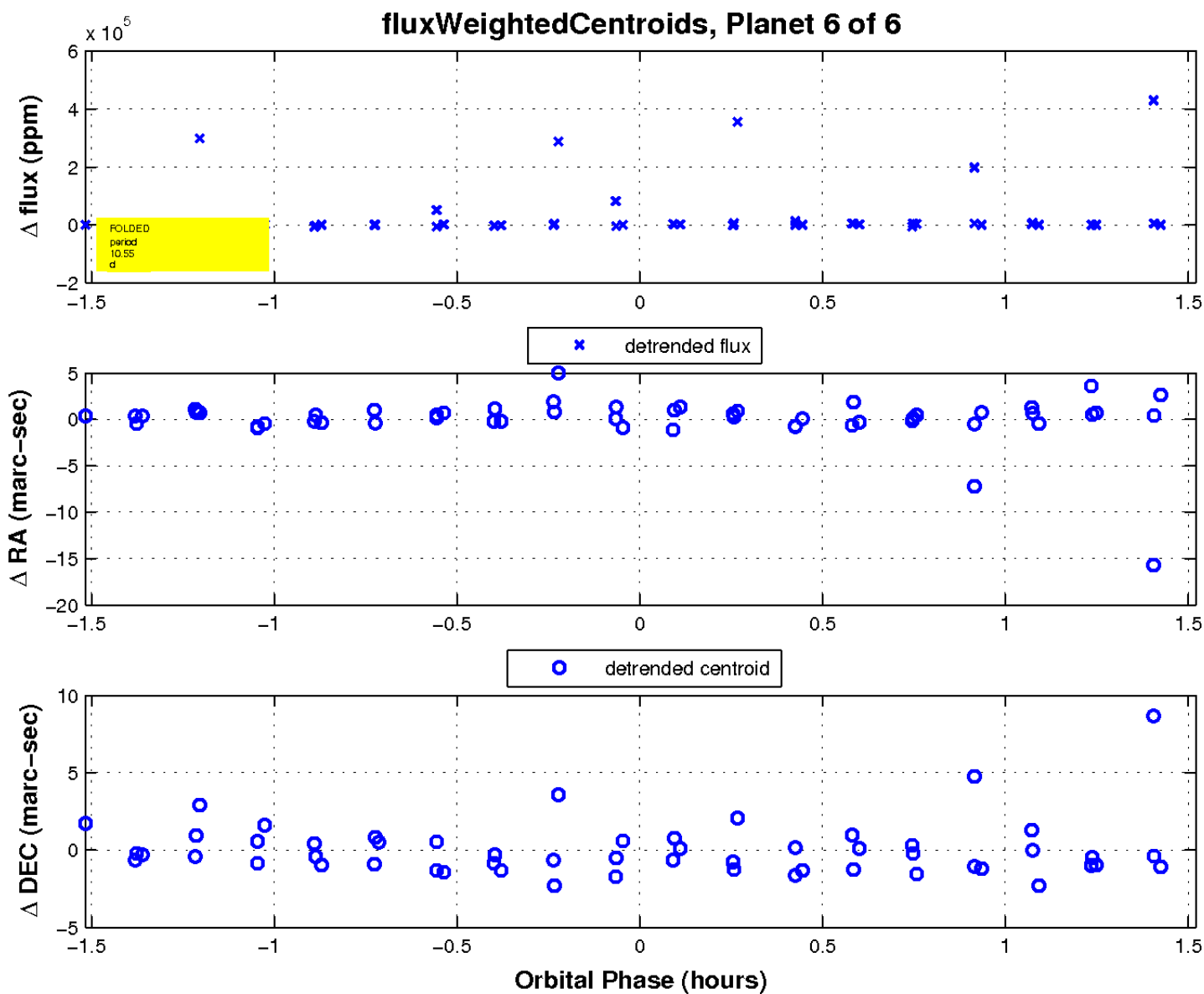
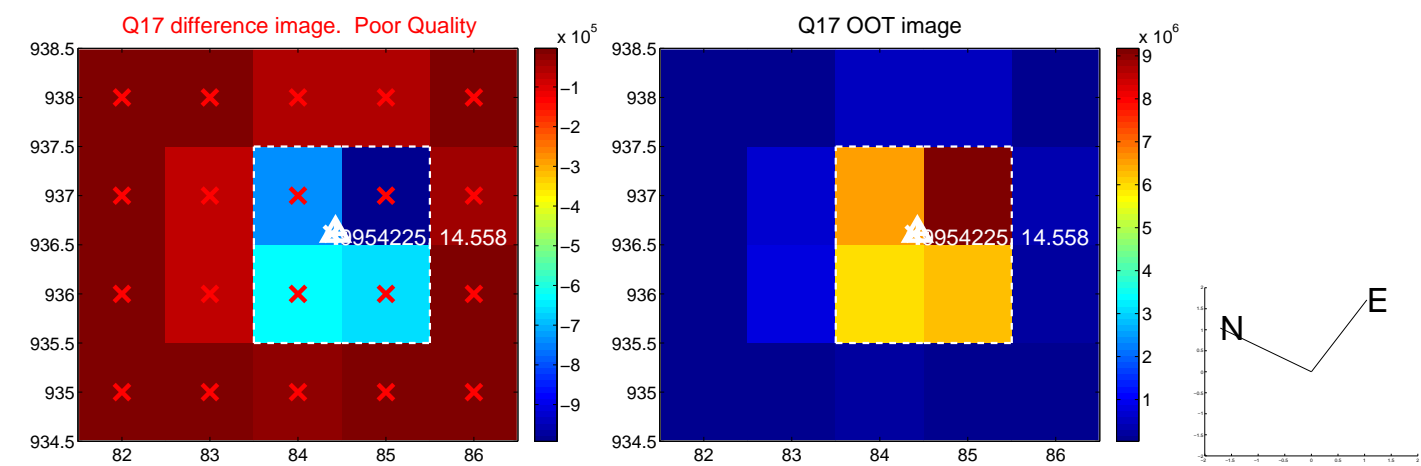
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

