

# KIC 009049697

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009049697-01	OBS	5607.01	1.327473	131.580786	114.9	3.706	13.0	13.8	0.61	4137	0.80	245.37
009049697-02	OBS	No	288.404994	264.996546	383.4	4.736	9.5	3.1	0.61	4137	1.39	0.19
009049697-03	OBS	No	288.344821	265.908183	536.3	16.370	9.1	4.8	0.61	4137	1.53	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009049697-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH
009049697-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009049697-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—SAME_NTL_PERIOD—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 009049697-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009049697-01	9049697	3799.01	9049673	1:1	19.4	-4	1	15.82	15.16	61.92	Direct-PRF	0	0.15	0.21

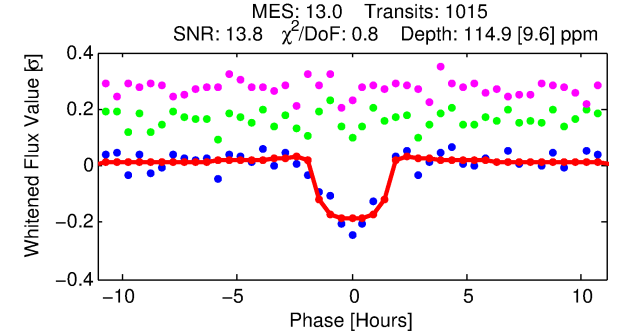
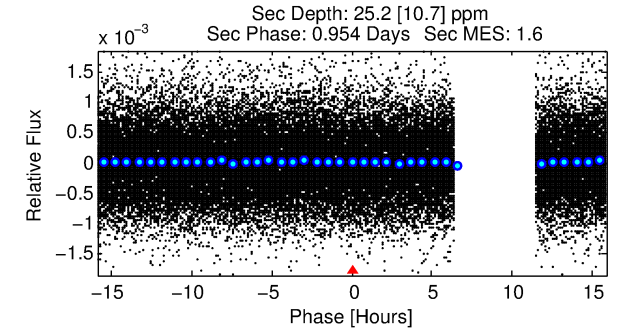
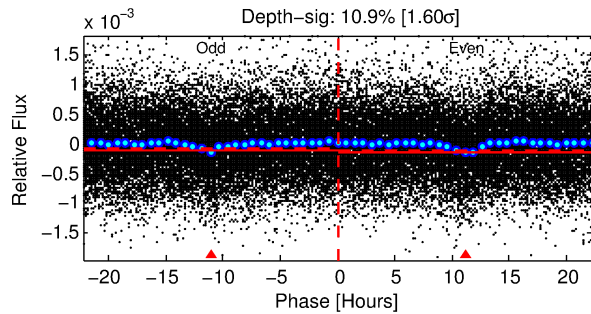
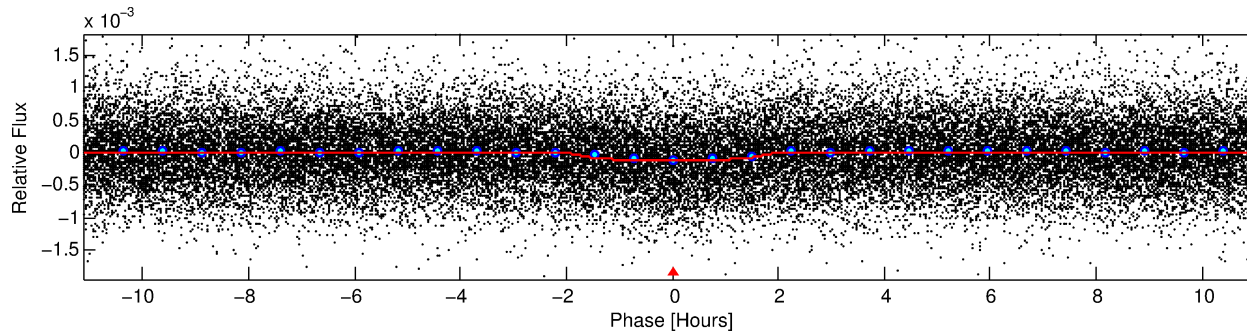
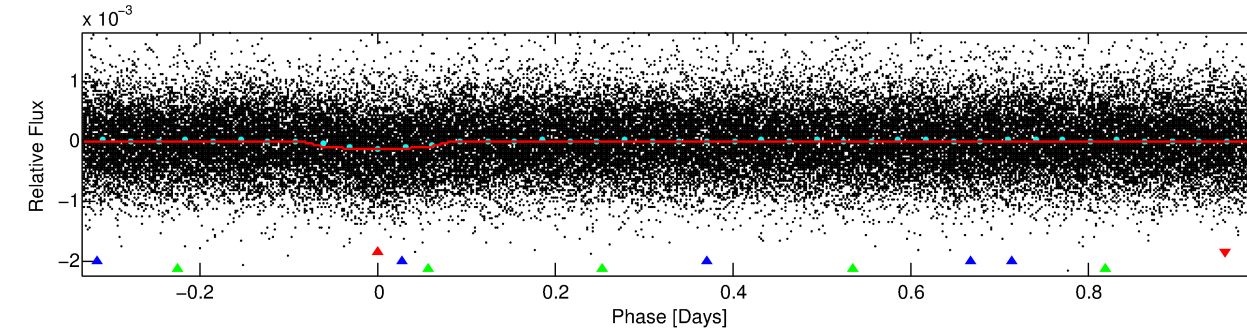
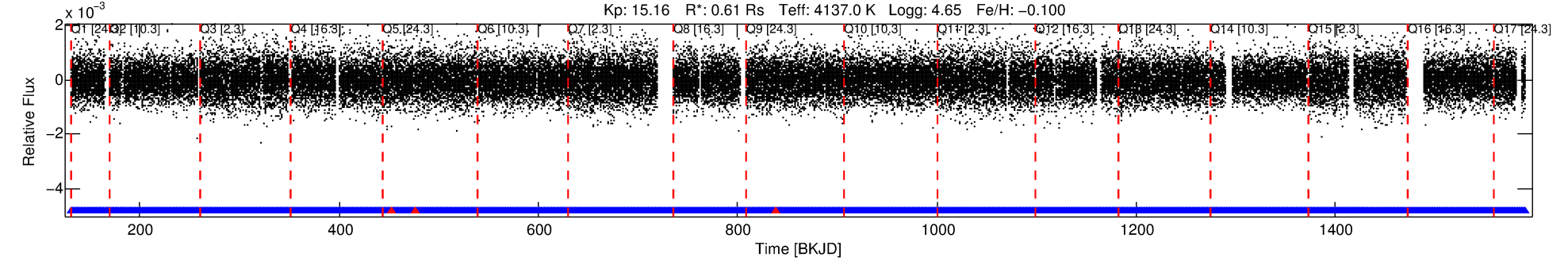
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 9049697 Candidate: 1 of 3 Period: 1.327 d

KOI: K05607.01 Corr: 0.895

Kp: 15.16 R\*: 0.61 Rs Teff: 4137.0 K Logg: 4.65 Fe/H: -0.100



## DV Fit Results:

Period = 1.32747 [0.00001] d  
Epoch = 131.5808 [0.0029] BKJD  
Rp/R\* = 0.0119 [0.0049]  
a/R\* = 1.57 [1.59]  
b = 0.90 [0.36]  
Seff = 245.37 [42.27]  
Teq = 1009 [43] K  
Rp = 0.79 [0.34] Re  
a = 0.0199 [0.0016] AU  
Ag = 8.73 [8.11] [0.95σ]  
Teffp = 2682 [625] K [2.67σ]

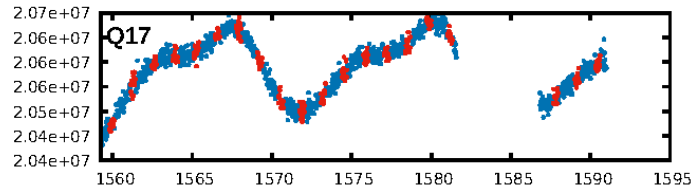
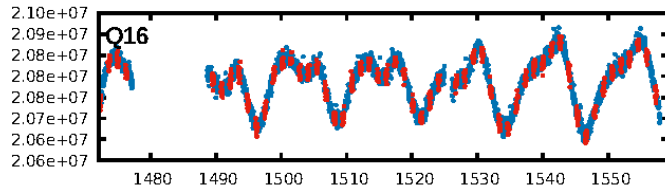
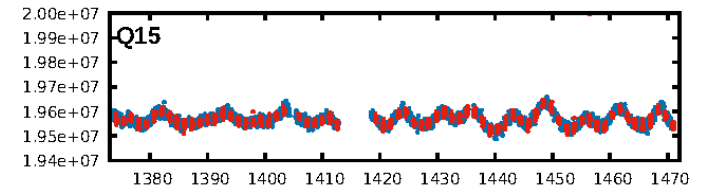
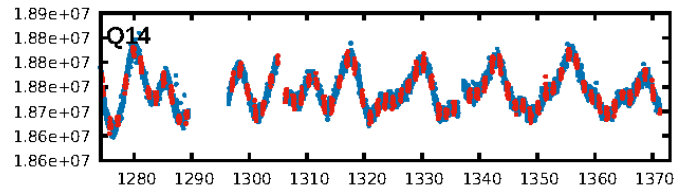
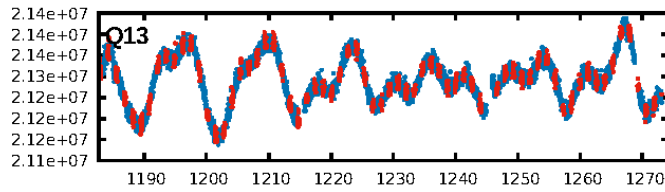
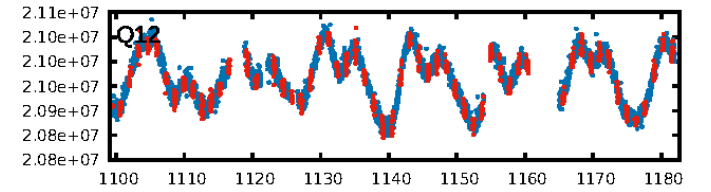
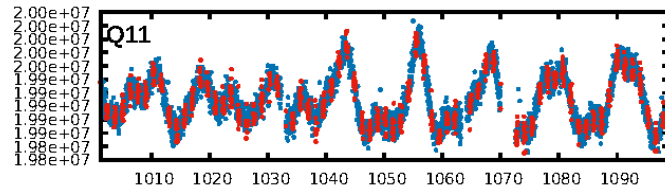
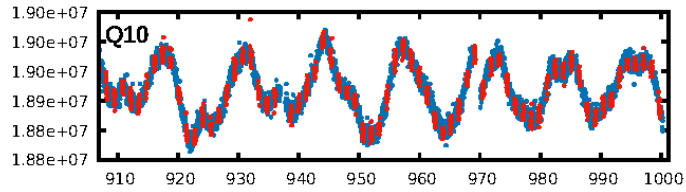
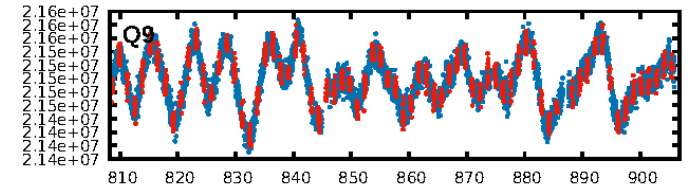
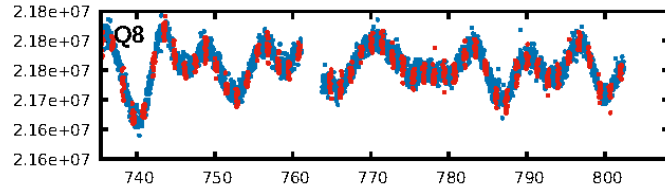
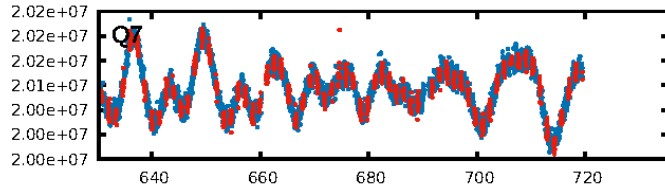
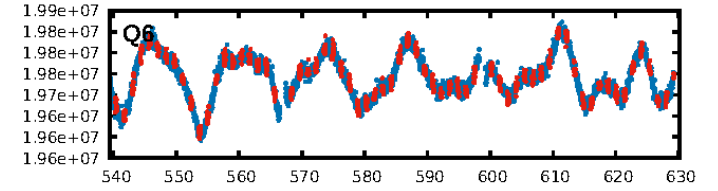
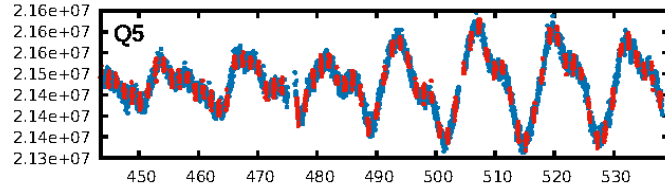
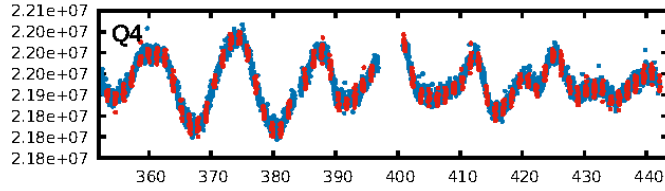
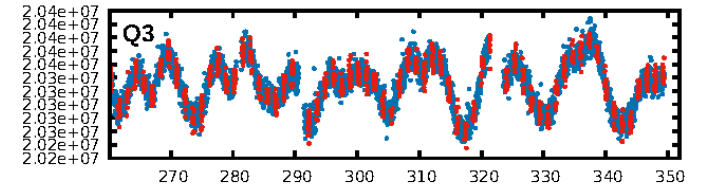
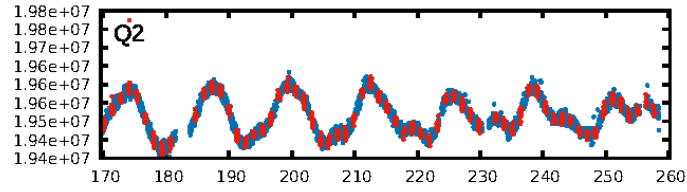
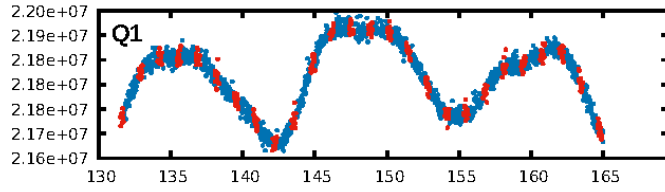
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [410.40σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.86e-33  
RollingBand-fgt: 1.00 [966/969]  
GhostDiagnostic-chr: -0.3908  
Centroid-sig: 0.0%  
Centroid-so: 11.469 arcsec [13.81σ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [17/17]

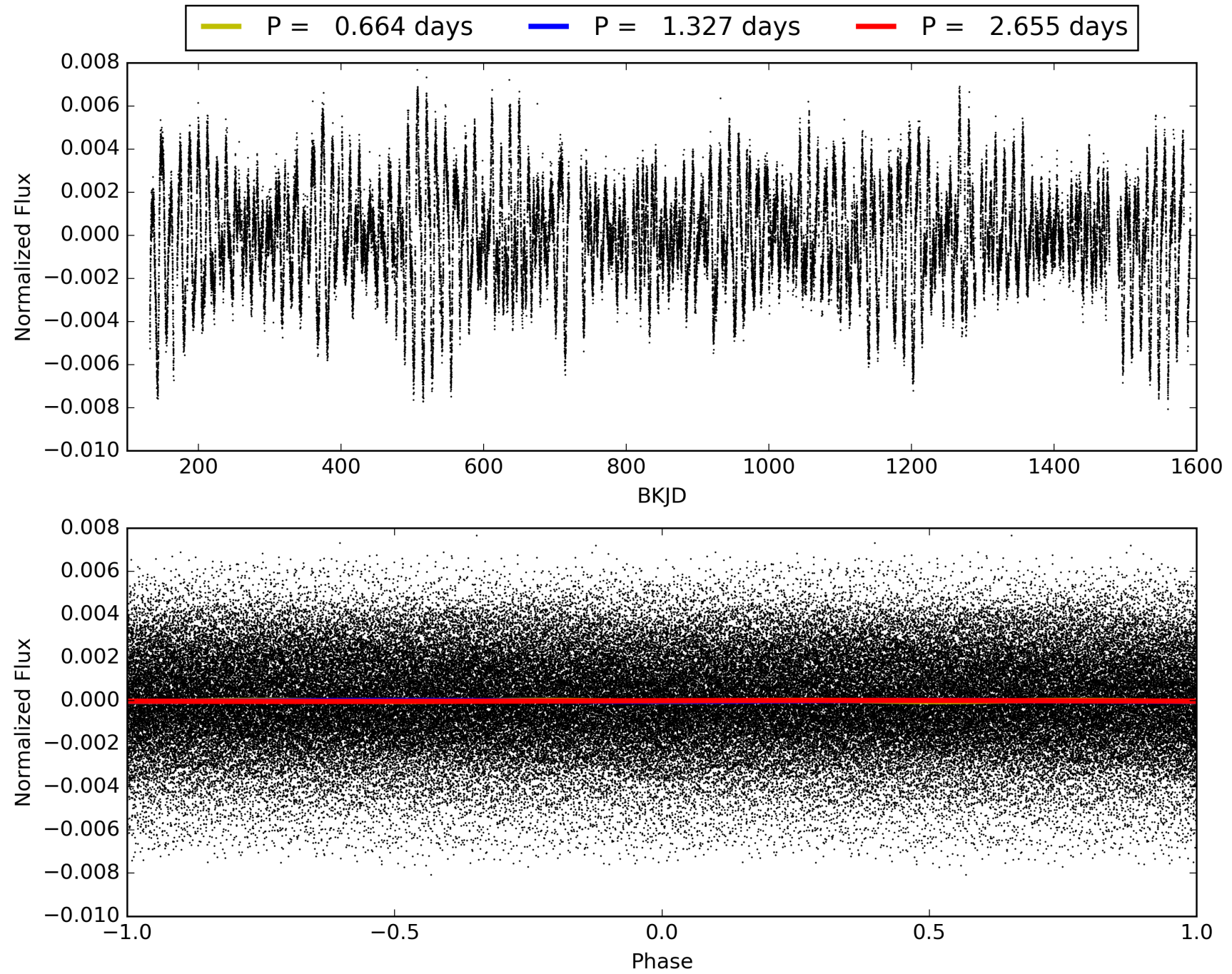
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:02:49 Z

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

# TCE 009049697-01, PDC Light Curves



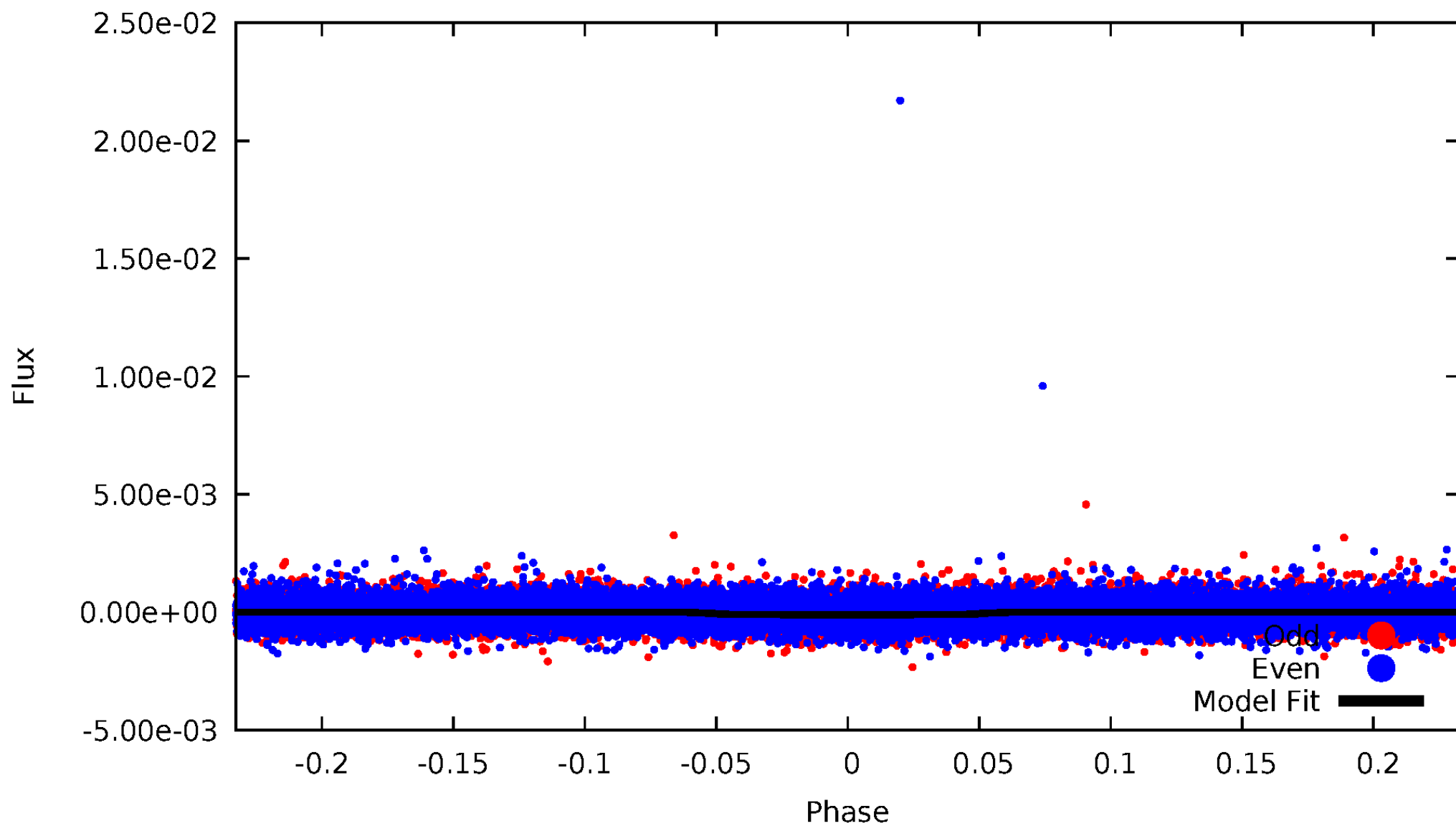
TCE 009049697-01





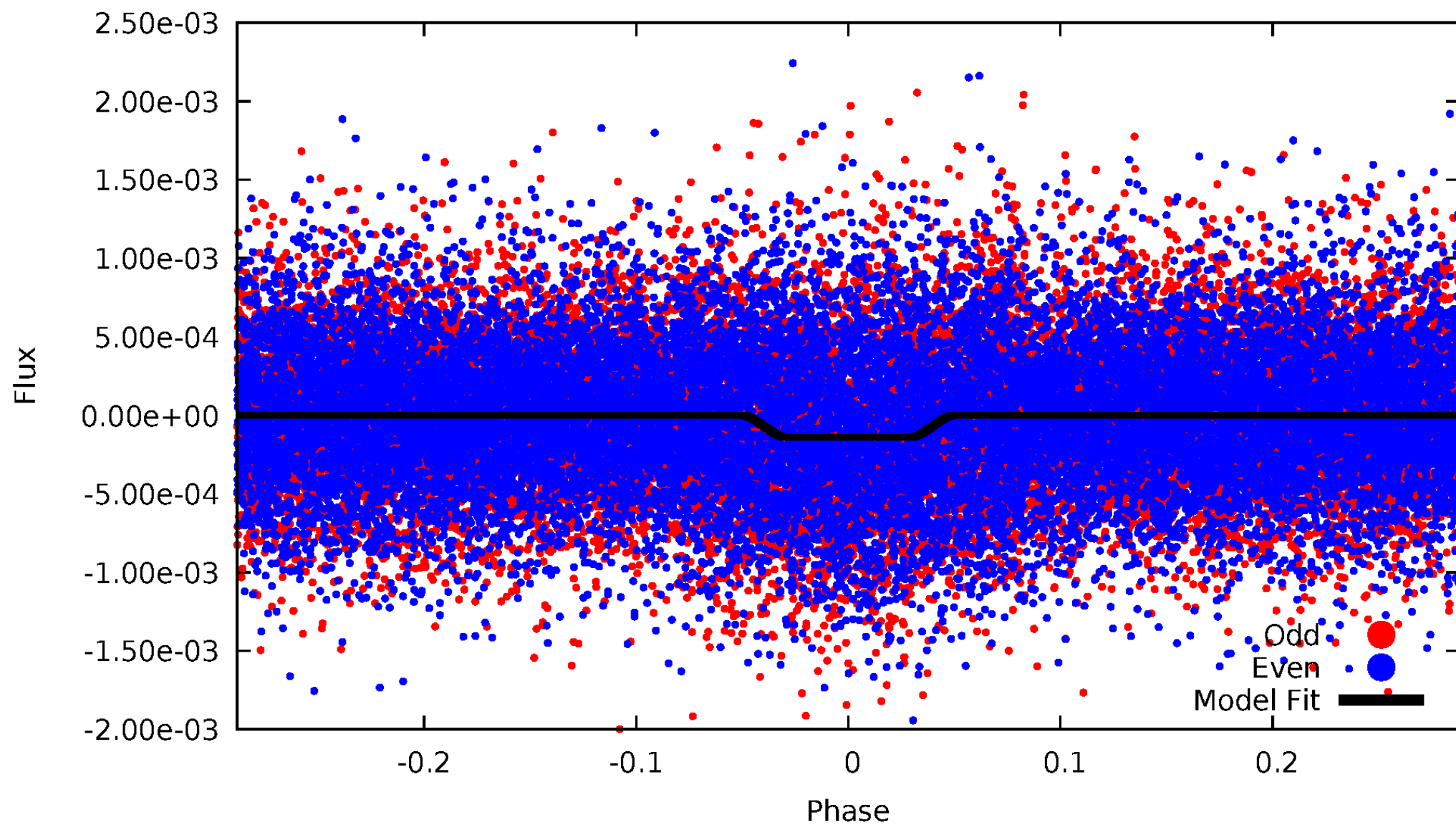
# DV Odd/Even

TCE 009049697-01



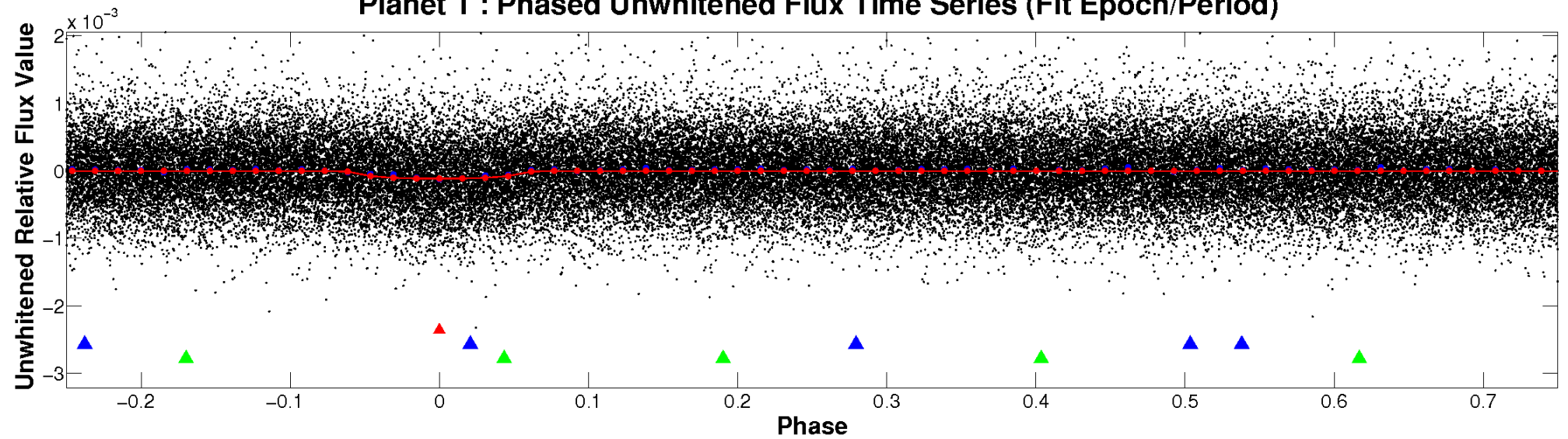
# ALT Odd/Even

TCE 009049697-01

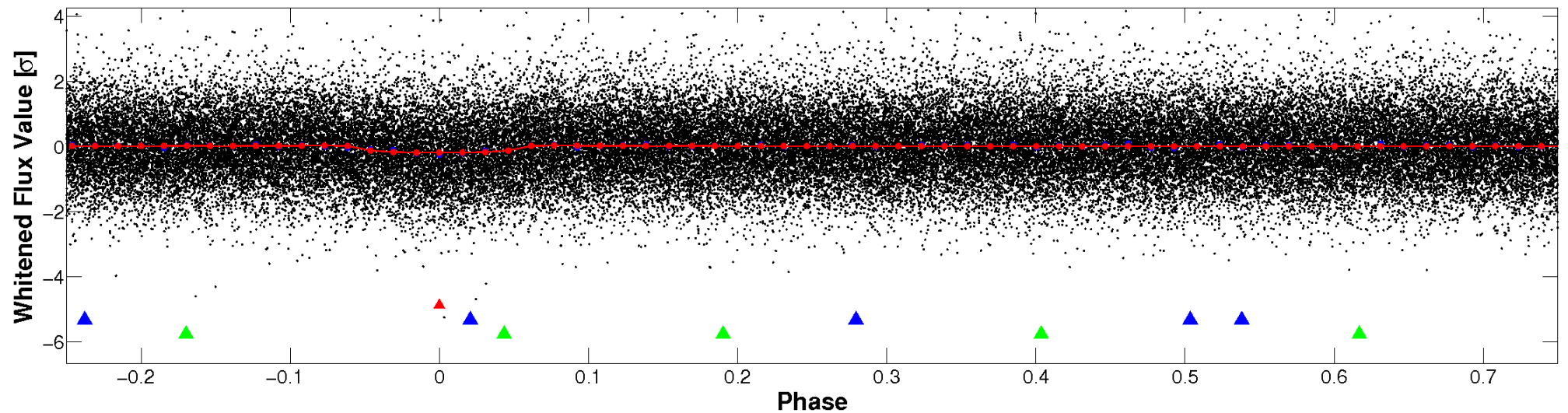


# Non-Whitened Vs. Whitened Light Curve

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

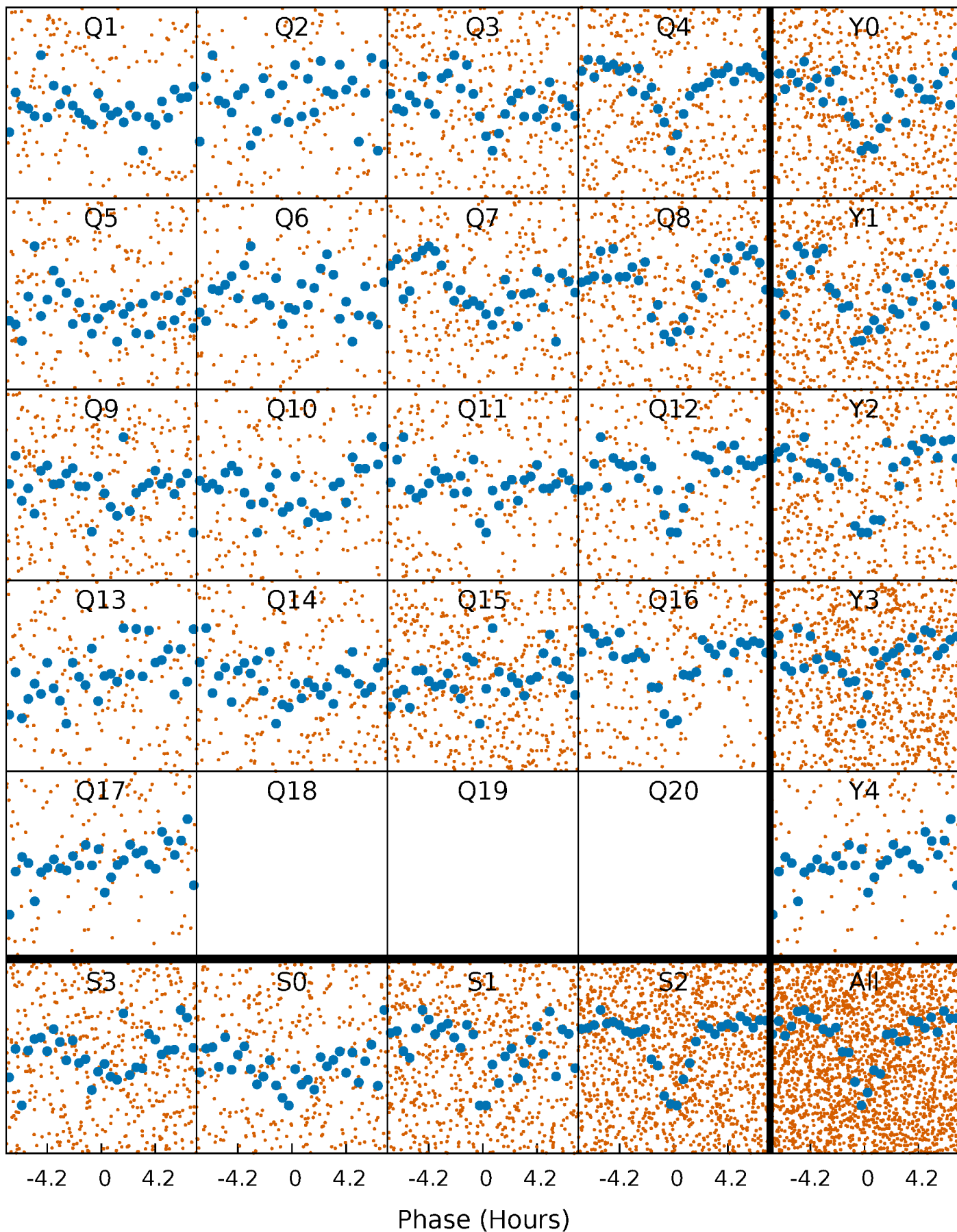


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

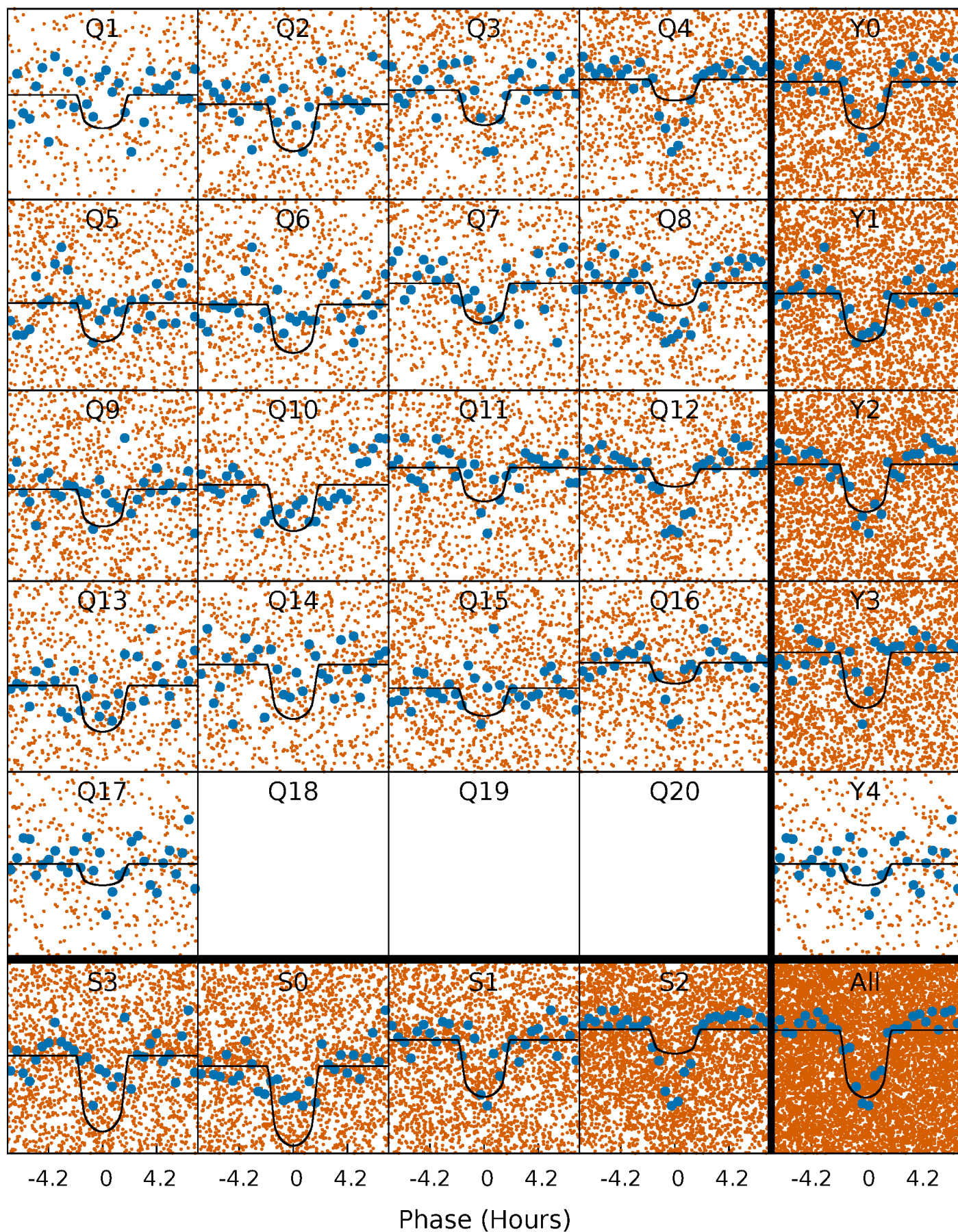
TCE 009049697-01 P= 1.327473 Days  $T_0=131.580786$  (BKJD)





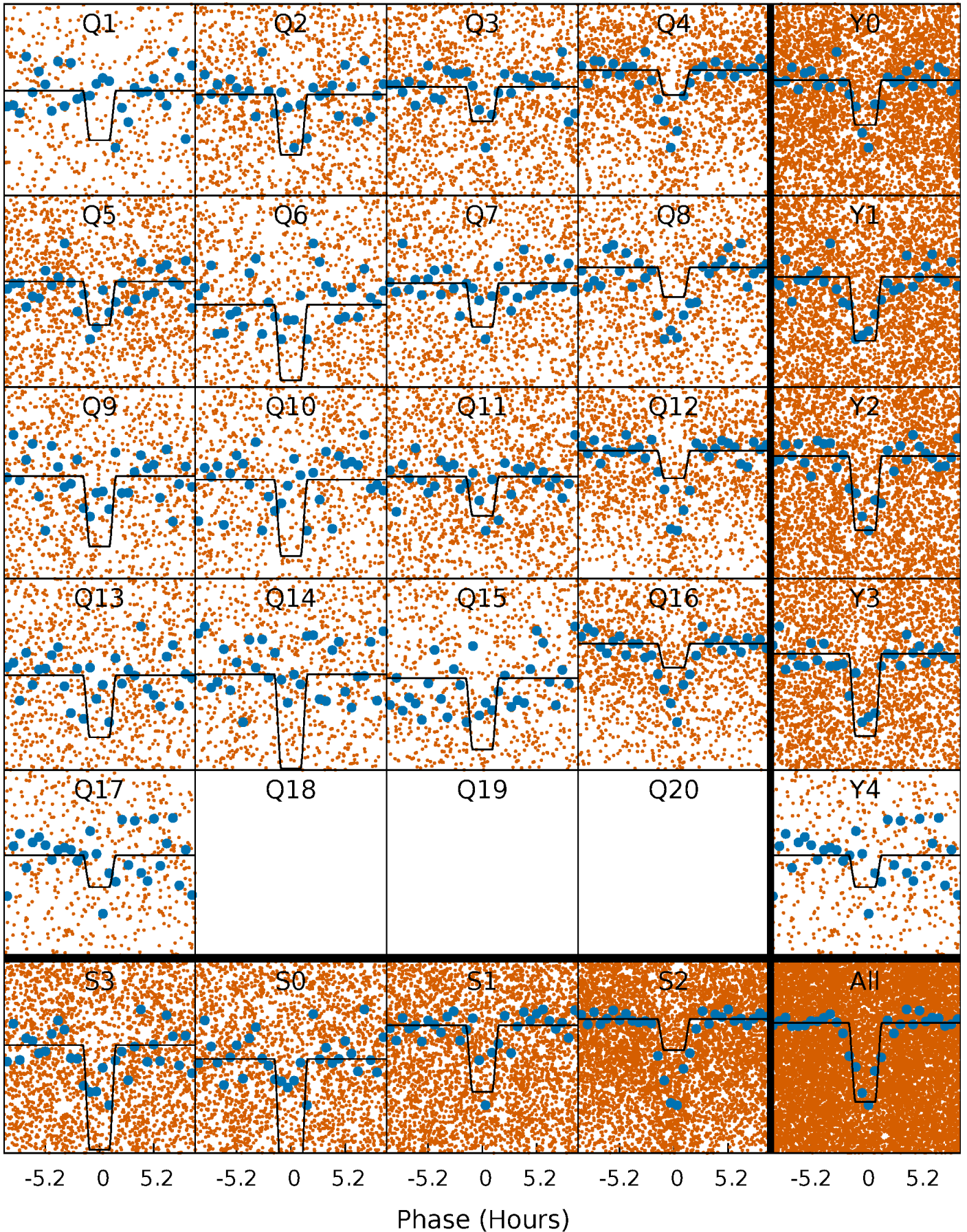
# DV Quarter-Phased Transit Curves

TCE 009049697-01 P= 1.327473 Days  $T_0=131.580786$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009049697-01   P= 1.327452 Days    $T_0=131.592298$  (BKJD)

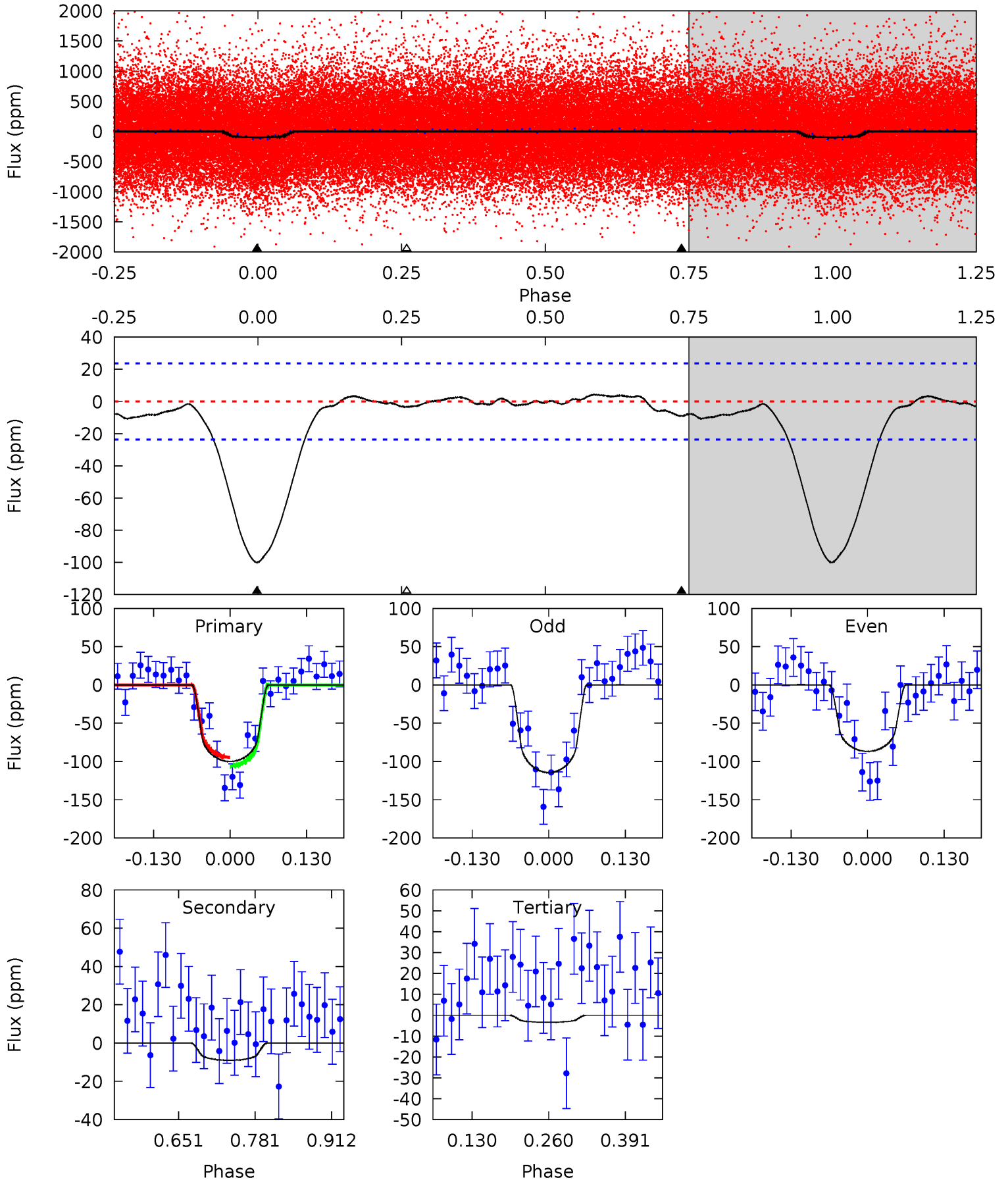




# DV Model-Shift Uniqueness Test

009049697-01, P = 1.327473 Days, E = 130.253313 Days

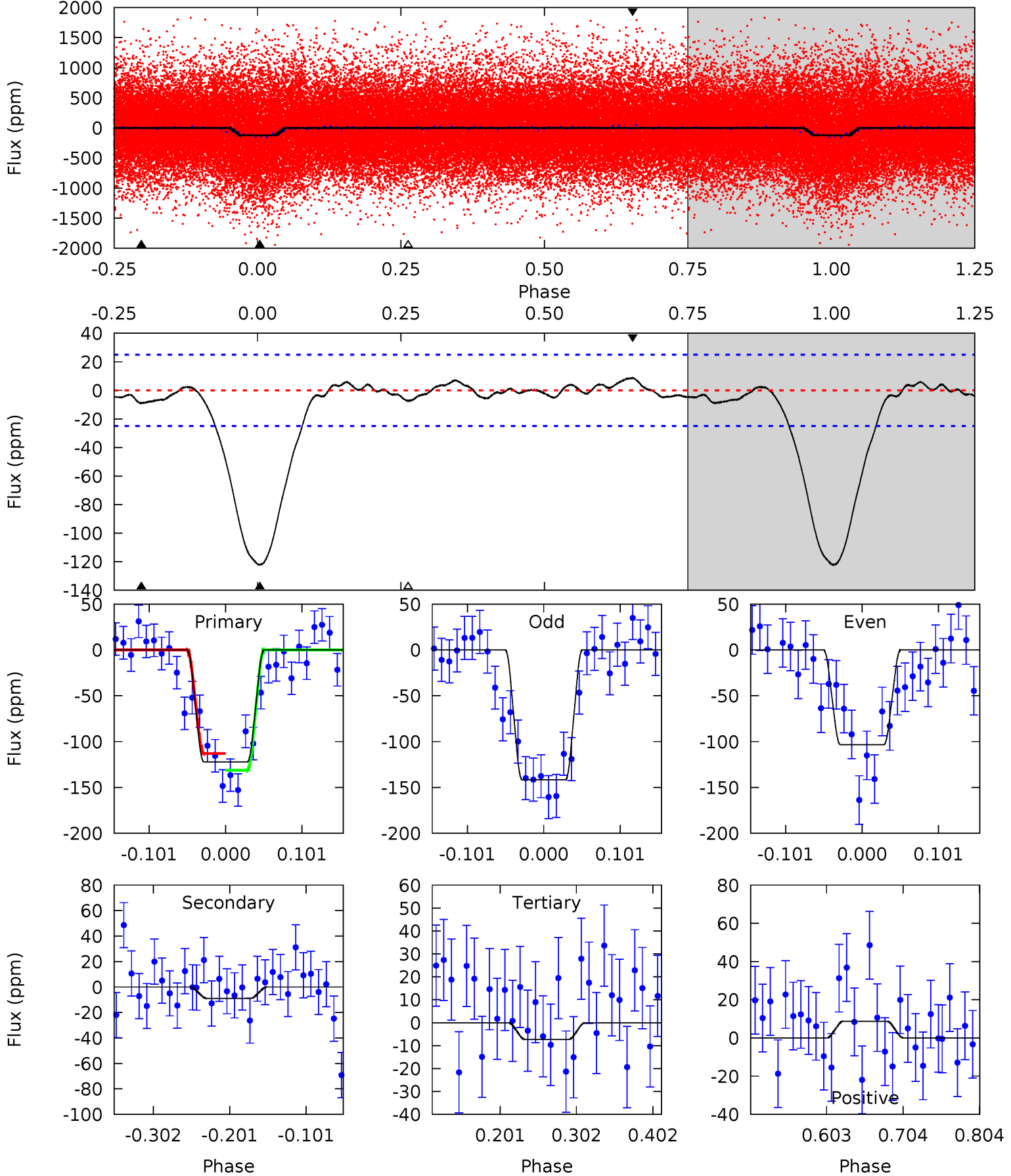
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	1.72	0.65	0	4.51	1.51	0.37	18.4	19.0	1.07	1.72	2.65	1.09	0.04	1.11



# Alt Model-Shift Uniqueness Test

009049697-01, P = 1.327452 Days, E = 130.264846 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
22.3	1.62	1.33	1.59	4.56	1.64	0.68	21.0	20.7	0.29	0.03	3.52	1.06	0.07	1.69





### Stellar Parameters For KIC 009049697

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4137^{+124}_{-137}$	$4.646^{+0.056}_{-0.021}$	$-0.100^{+0.300}_{-0.300}$	$0.610^{+0.039}_{-0.063}$	$0.601^{+0.060}_{-0.060}$	$3.728^{+0.938}_{-0.367}$
	+3%/-3%	+1%/-0%	+300%/-300%	+6%/-10%	+10%/-10%	+25%/-10%
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 009049697-01 / KOI 5607.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-9 \pm 5$	$0.79^{+0.32}_{-0.35}$	$1399^{+50}_{-50}$	$2637^{+549}_{-405}$	$2.897^{+7.330}_{-1.941}$
Alt.	$-9 \pm 5$	$0.79^{+0.32}_{-0.30}$	$1398^{+47}_{-52}$	$2631^{+482}_{-440}$	$2.880^{+6.263}_{-1.976}$

$T_{max}$  = 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 009049697-01. Kepler magnitude: 15.16. Transit SNR 13.81

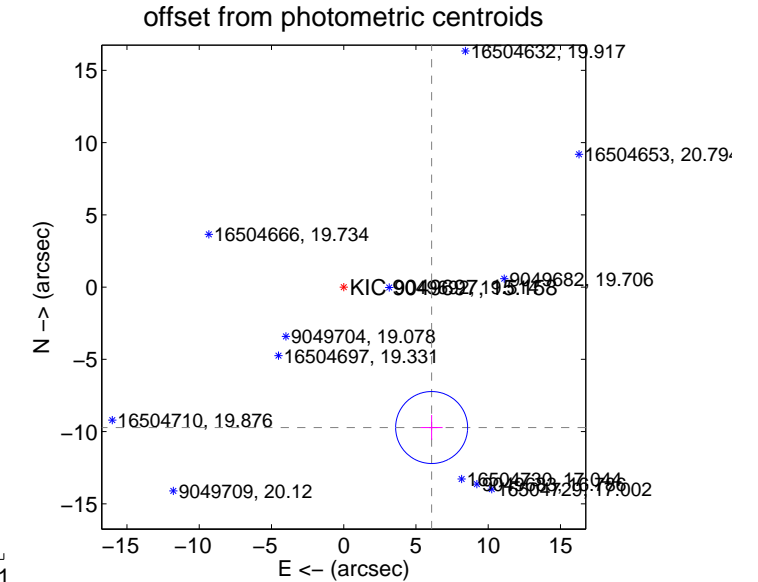
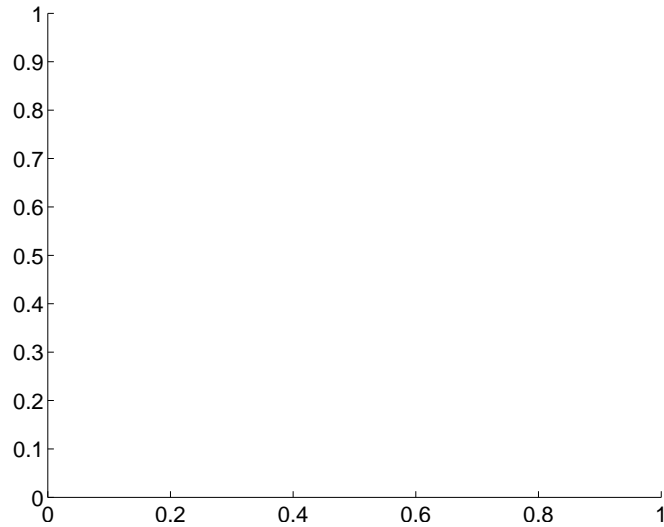
There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$11.47 \pm 0.83$	13.81	$-6.09 \pm 0.76$	$-9.72 \pm 0.86$

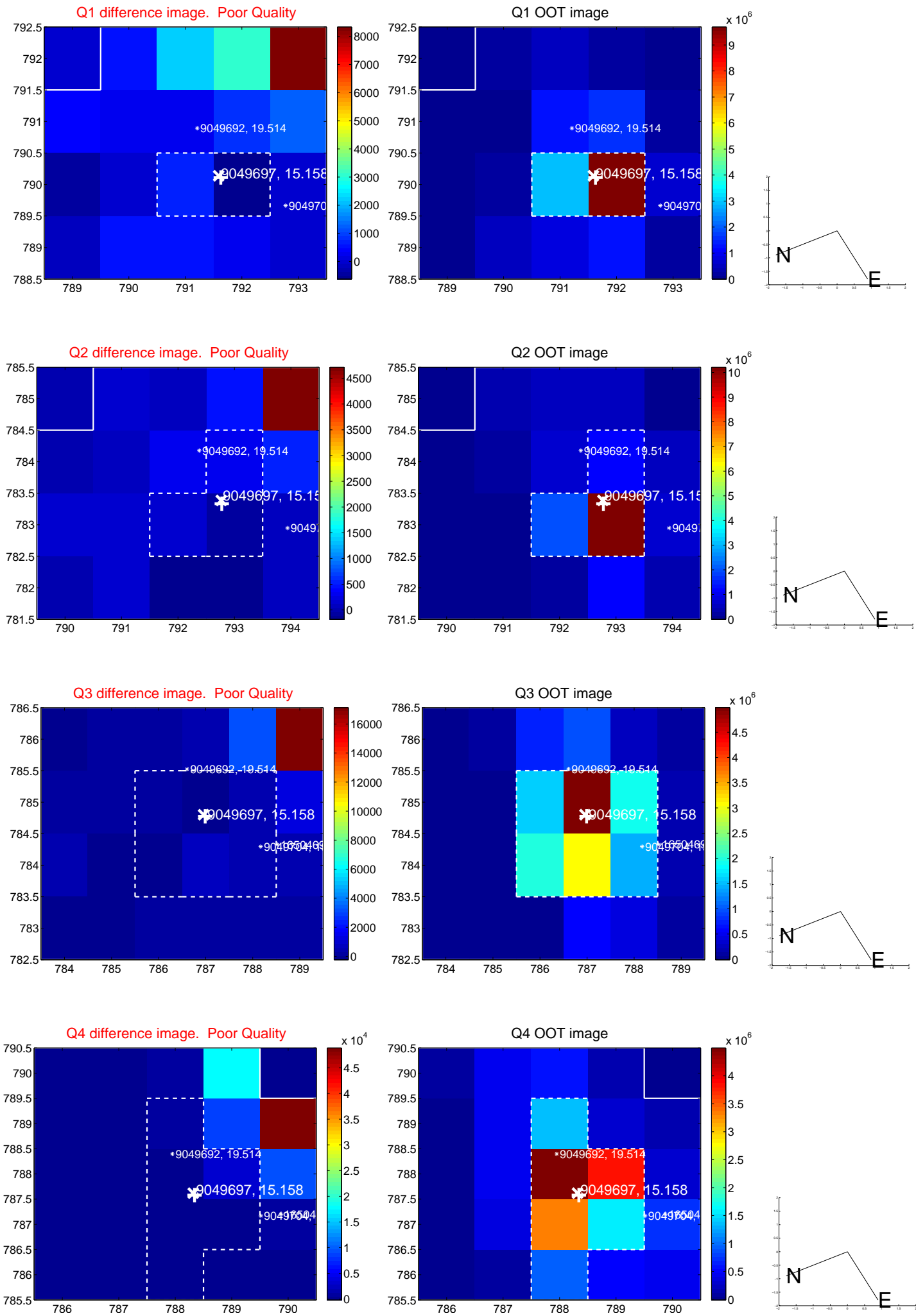
There is no PRF-fit offset from OOT-fit

There is no PRF-fit offset from KIC

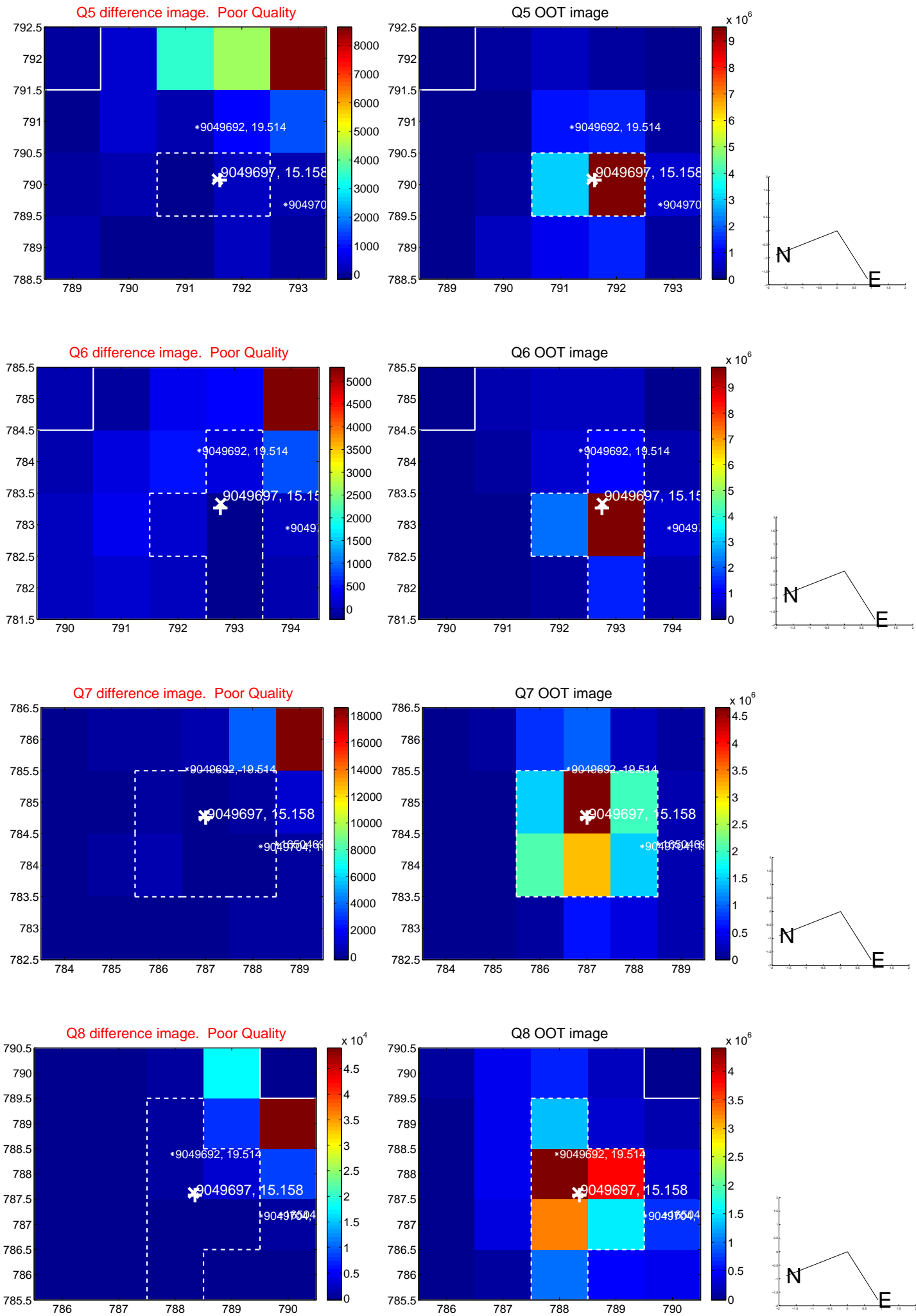


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

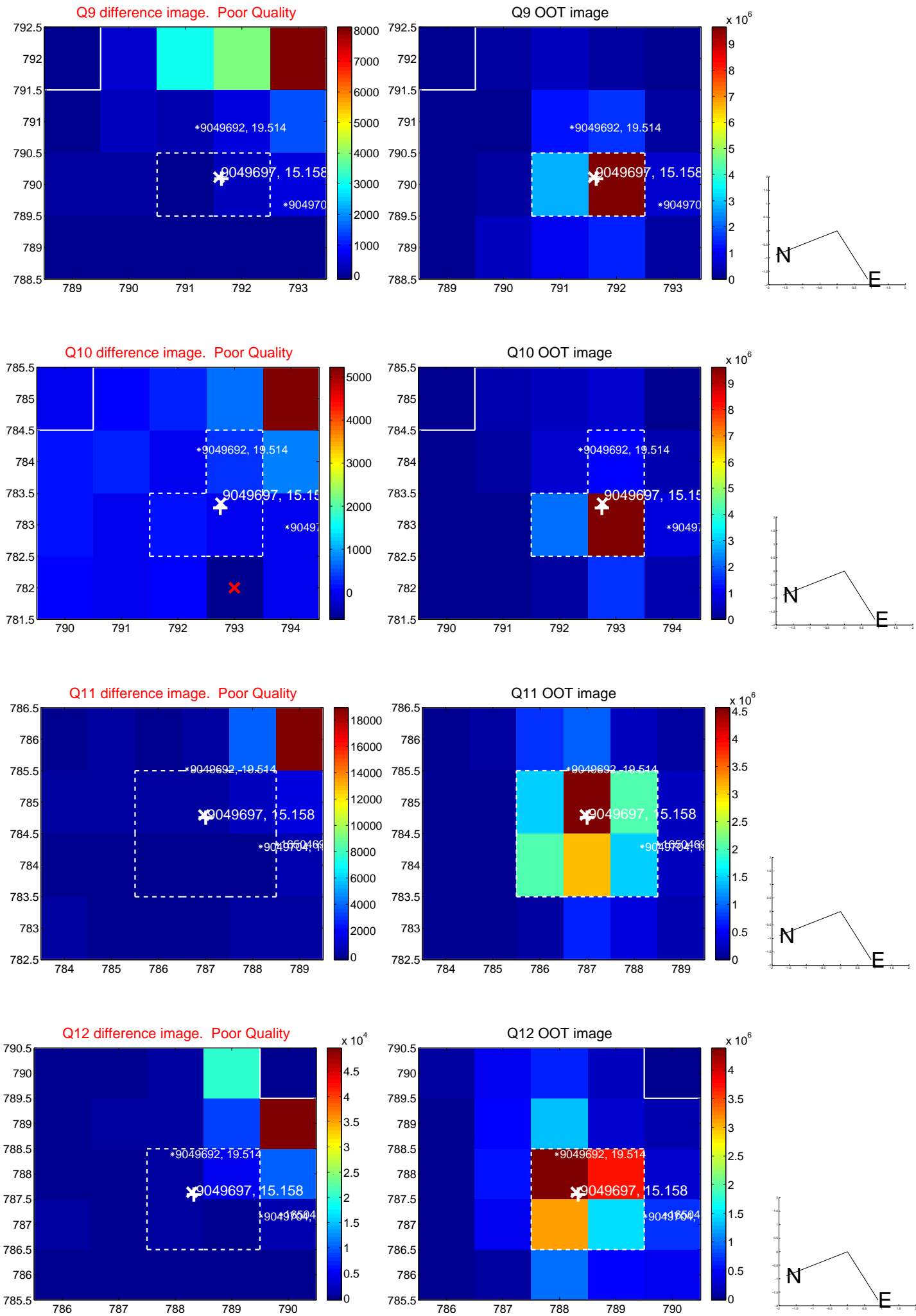


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

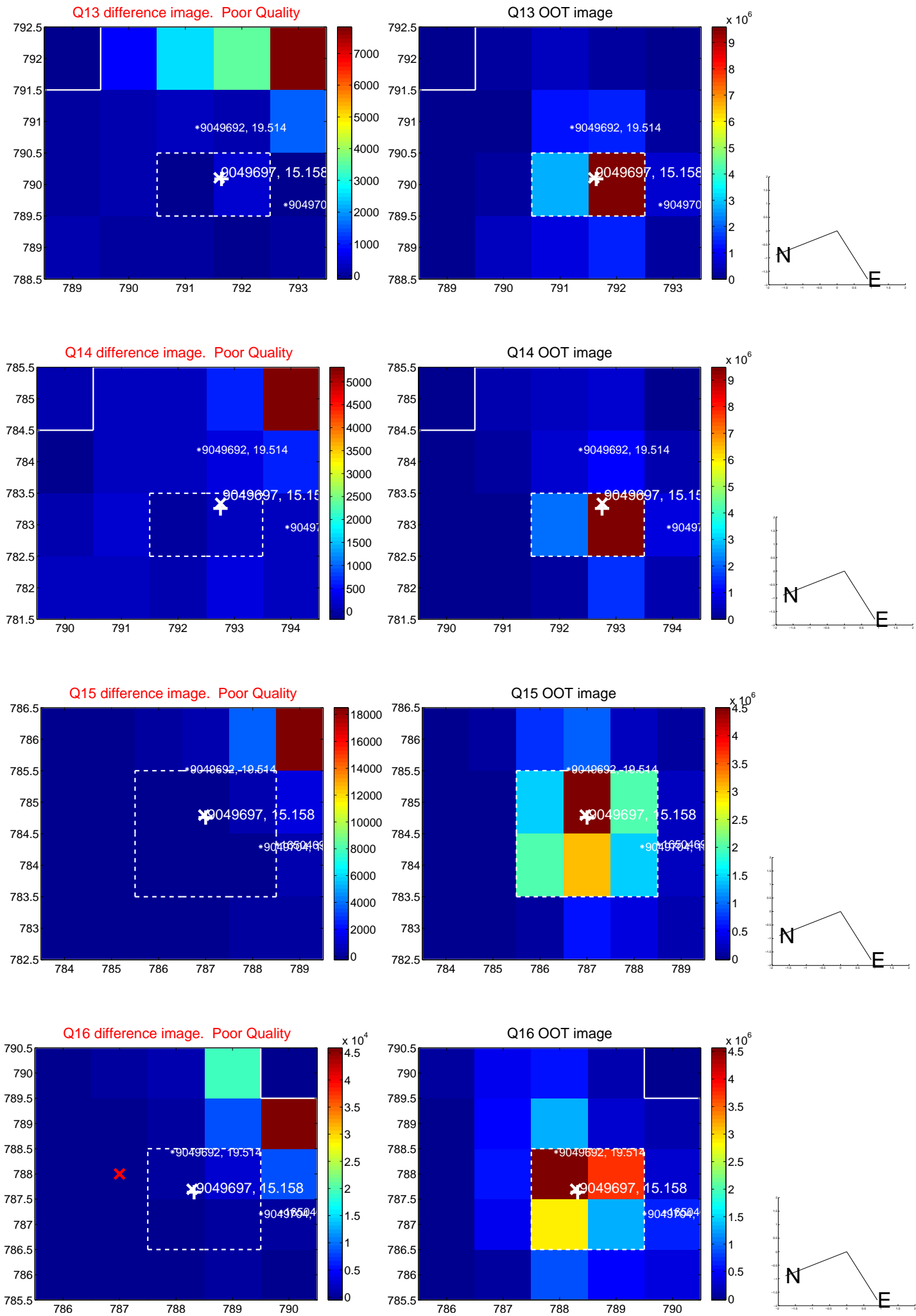




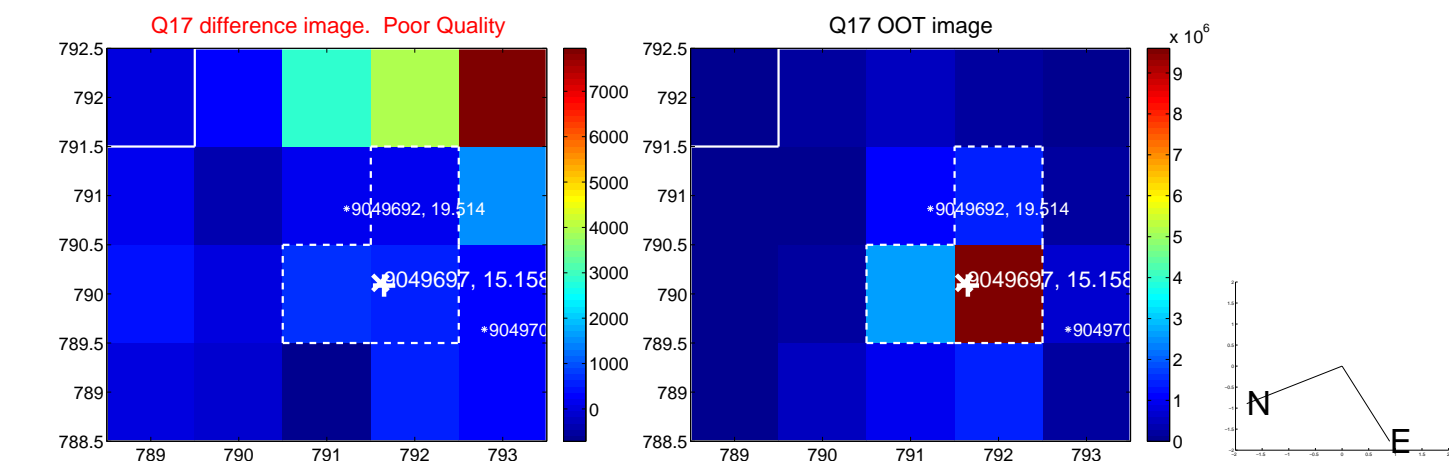
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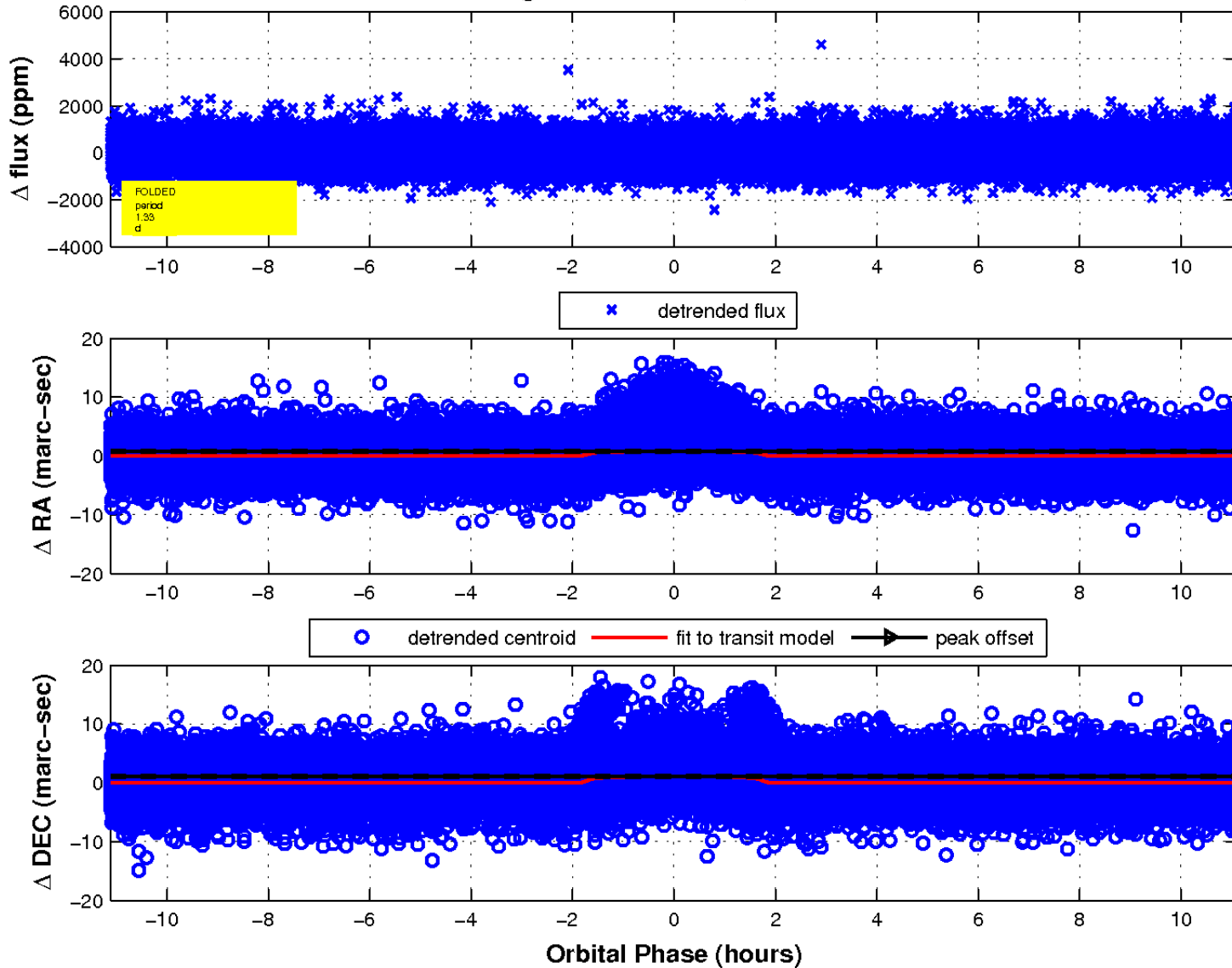
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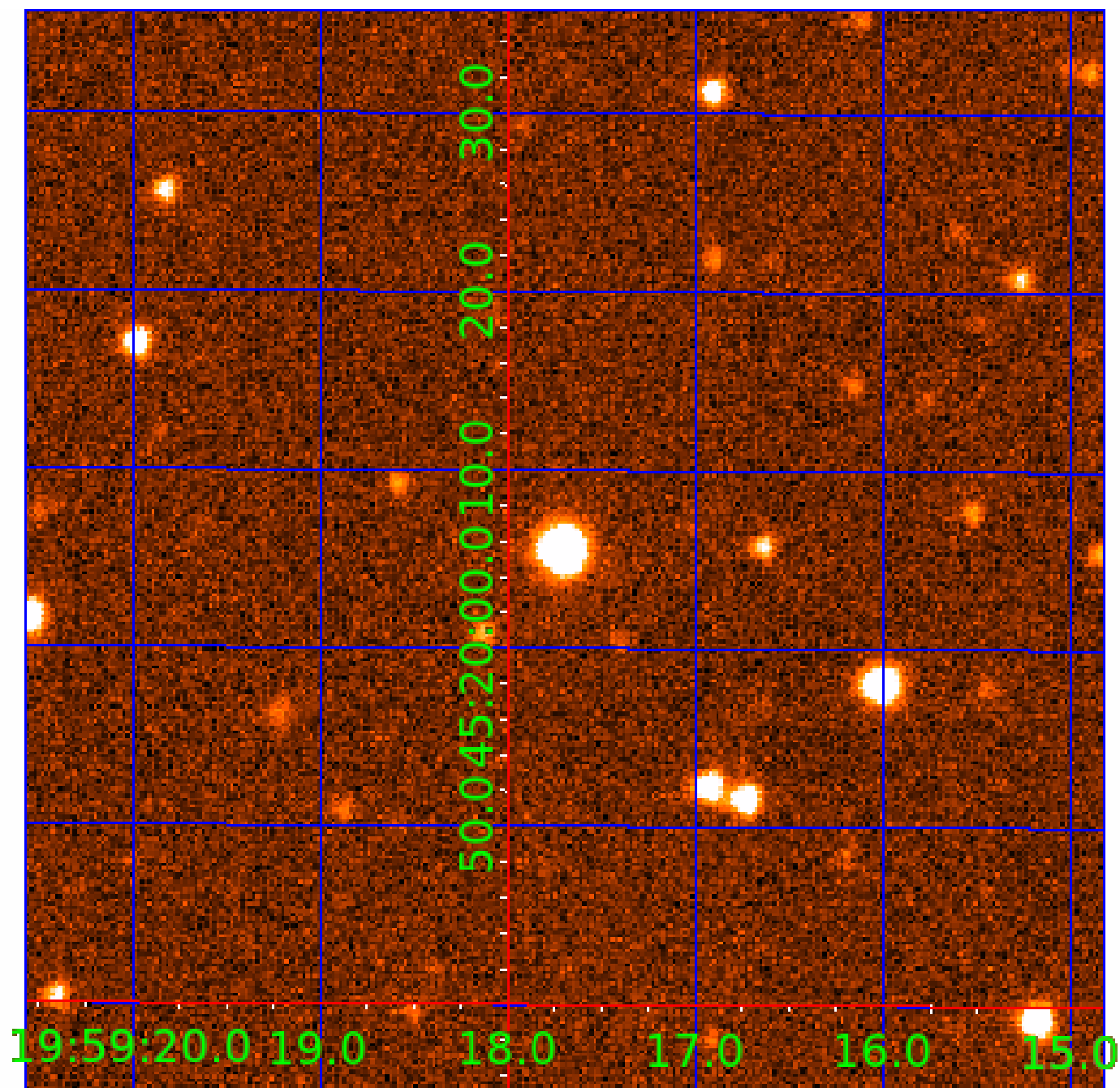


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 009049697

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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009049697-02	OBS	No	288.404994	264.996546	383.4	4.736	9.5	3.1	0.61	4137	1.39	0.19
009049697-03	OBS	No	288.344821	265.908183	536.3	16.370	9.1	4.8	0.61	4137	1.53	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009049697-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH
009049697-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009049697-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—SAME_NTL_PERIOD—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.

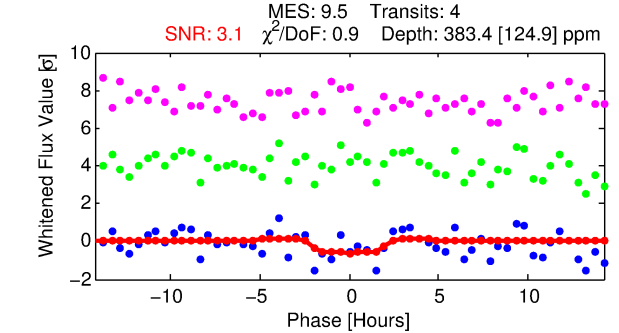
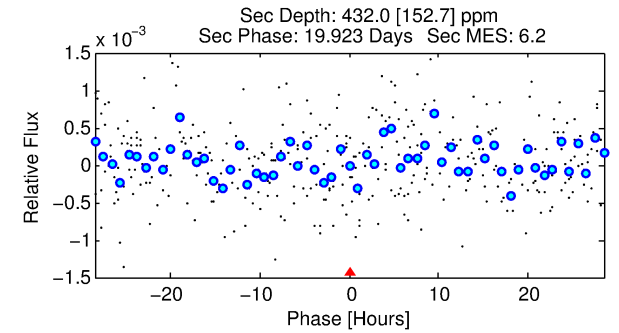
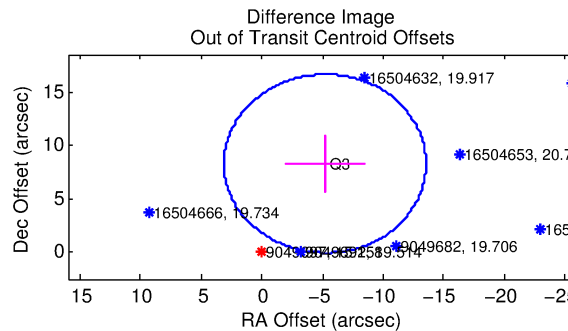
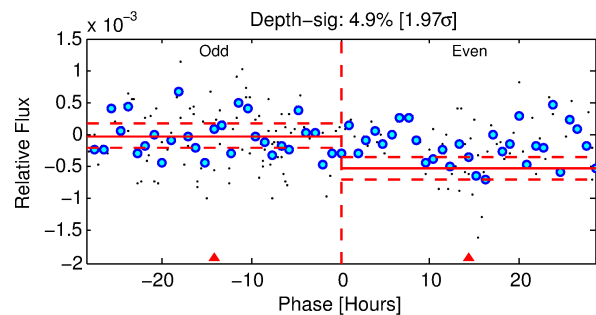
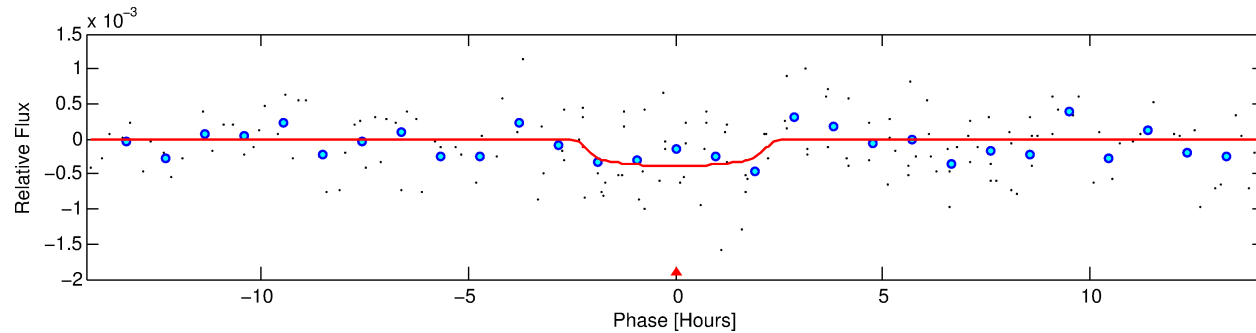
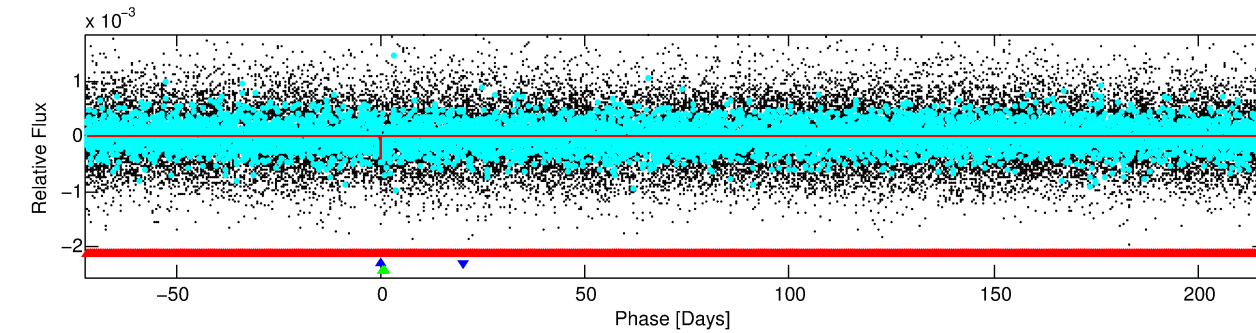
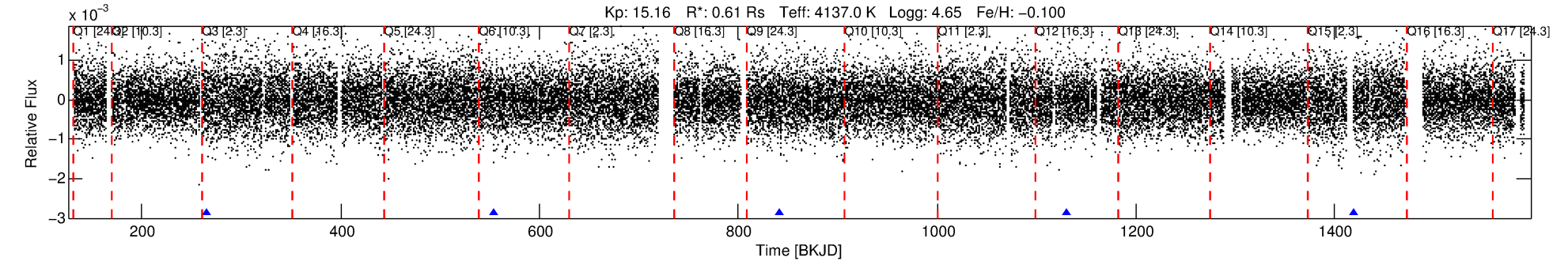
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009049697-02

No Significant Match Found

# DV One-Page Summary

KIC: 9049697 Candidate: 2 of 3 Period: 288.405 d  
KOI: K05607 Corr: No Ephemeris Match



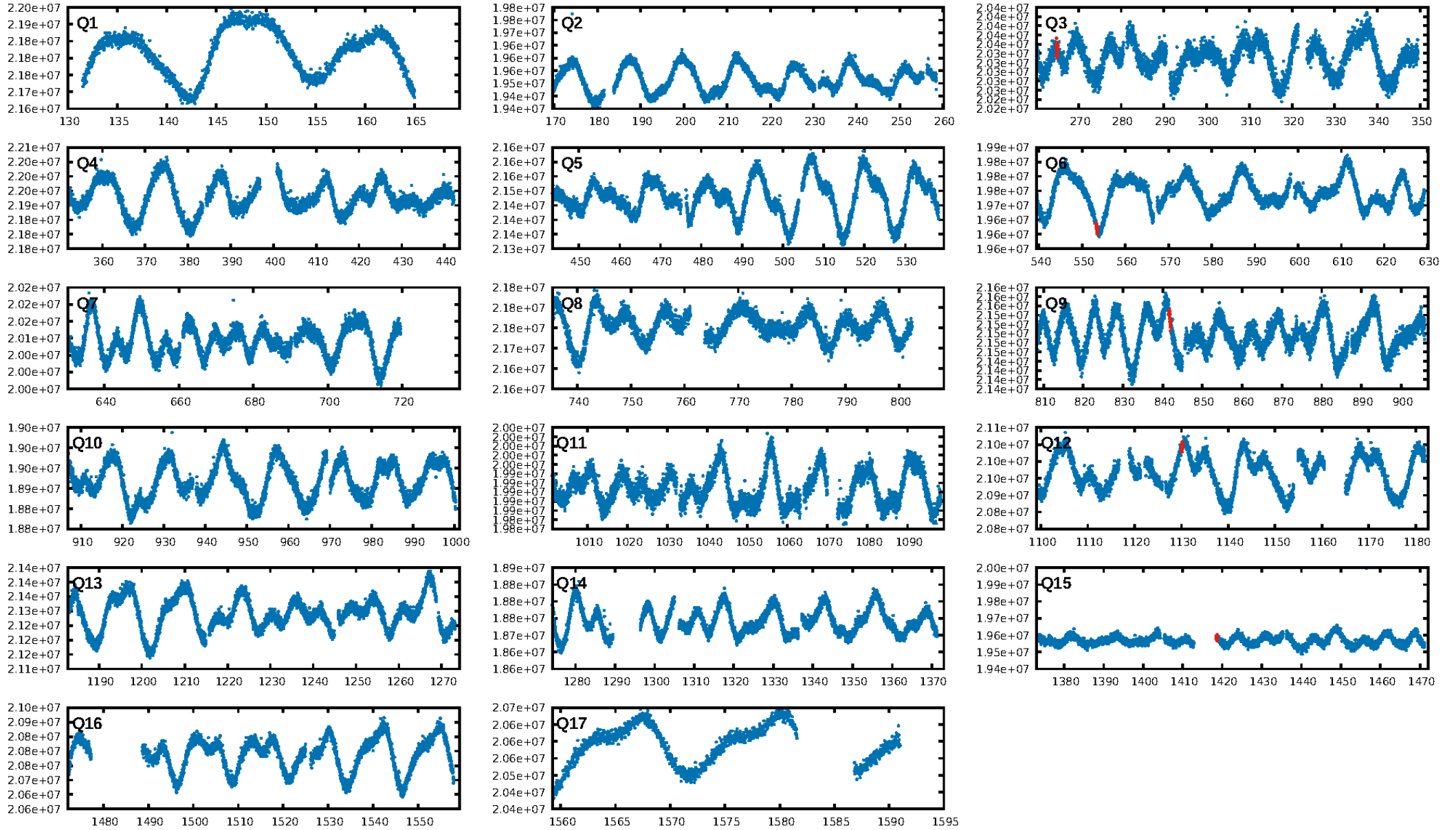
## DV Fit Results:

Period = 288.40499 [0.00897] d  
Epoch = 264.9965 [0.0254] BKJD  
Rp/R\* = 0.0209 [0.0537]  
a/R\* = 258.03 [2612.21]  
b = 0.86 [3.20]  
Seff = 0.19 [0.03]  
Teq = 168 [7] K  
Rp = 1.39 [3.57] Re  
a = 0.7210 [0.0585] AU  
Ag = 63830.71 [328622.42] [0.19 $\sigma$ ]  
Teffp = 4126 [5311] K [0.75 $\sigma$ ]

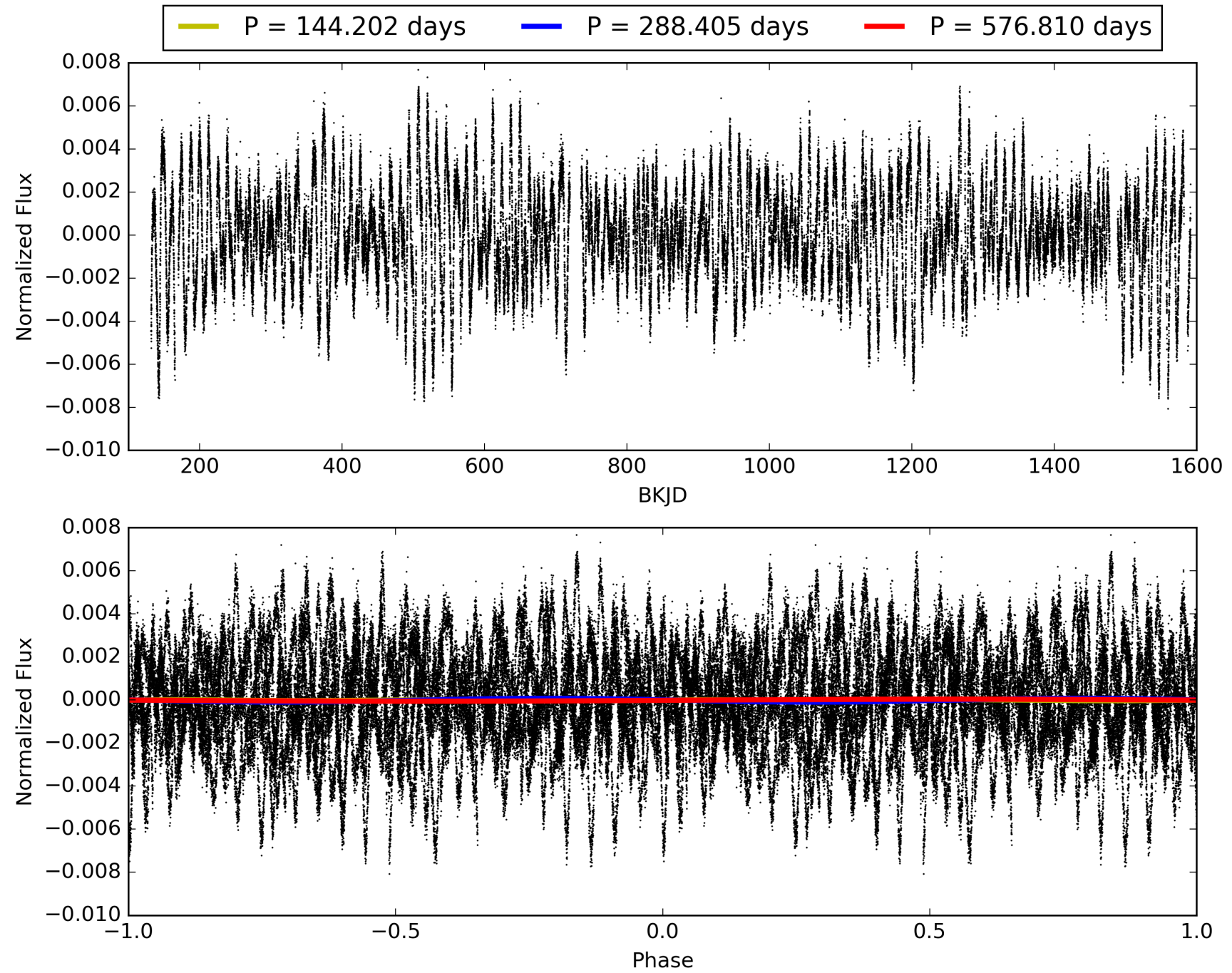
## DV Diagnostic Results:

ShortPeriod-sig: 6.8% [0.08 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.5%  
ModelChiSquareGof-sig: 88.6%  
Bootstrap-pfa: 5.20e-09  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.1468  
Centroid-sig: 92.7%  
Centroid-so: 0.486 arcsec [0.14 $\sigma$ ]  
OotOffset-rm: 9.781 arcsec [3.52 $\sigma$ ]  
KicOffset-rm: 9.622 arcsec [3.47 $\sigma$ ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.33 [1/3]

# TCE 009049697-02, PDC Light Curves

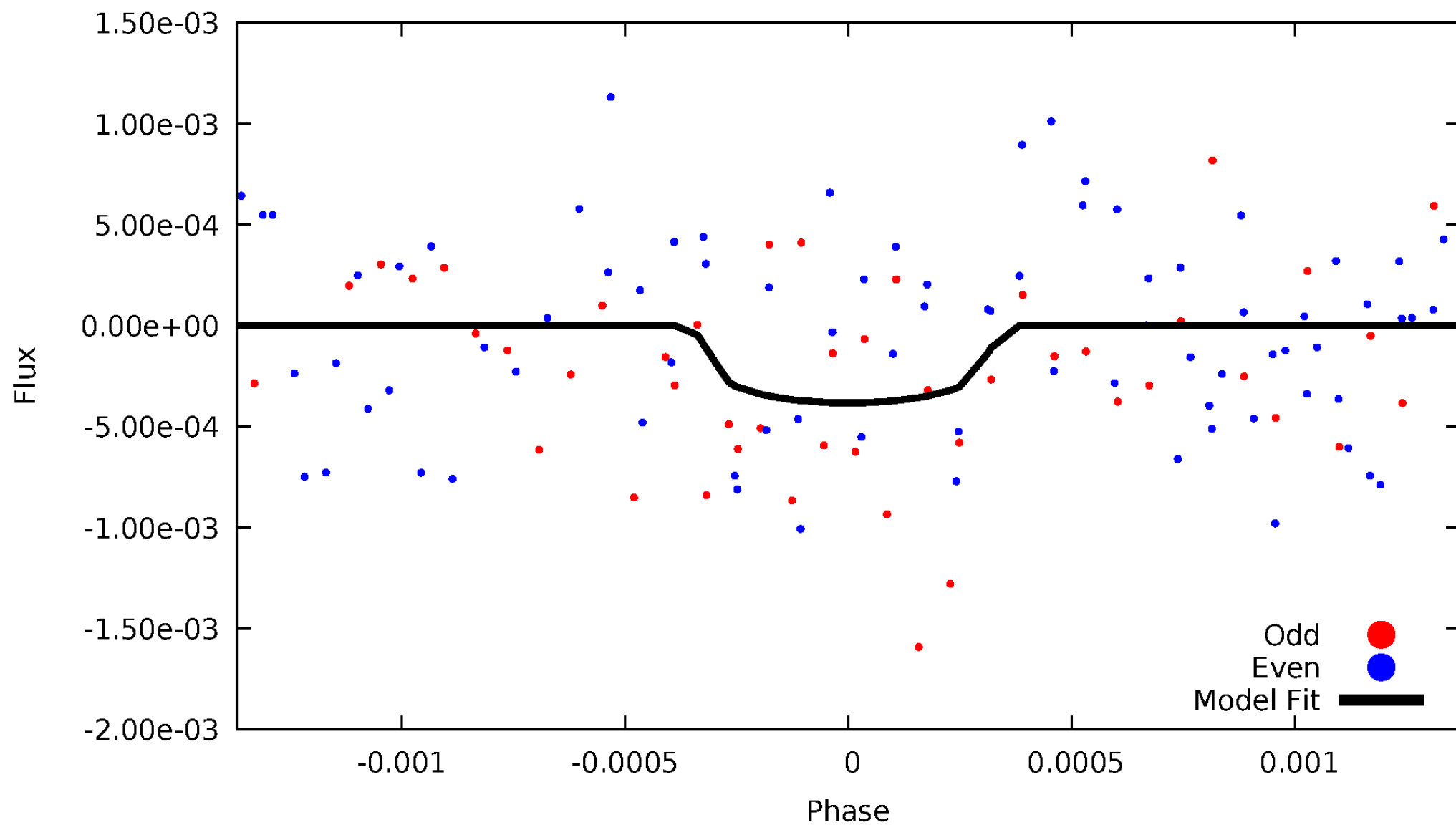


TCE 009049697-02



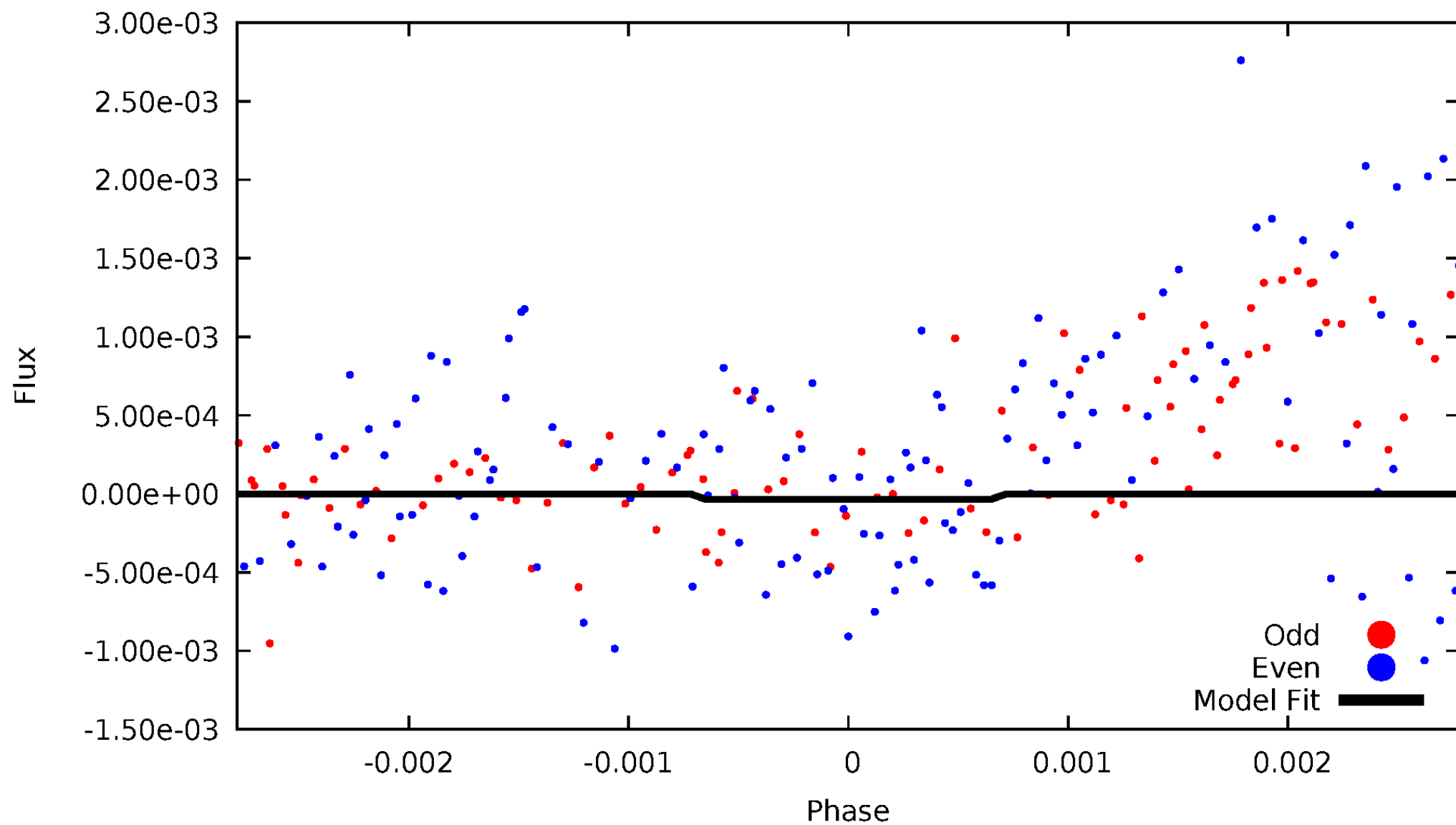
# DV Odd/Even

TCE 009049697-02



# ALT Odd/Even

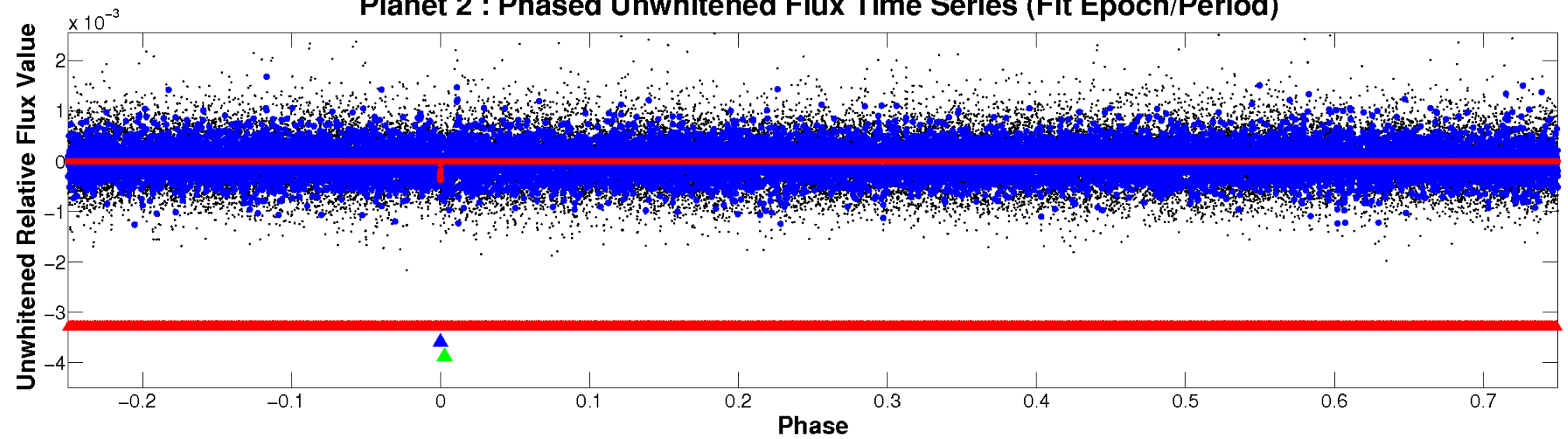
TCE 009049697-02



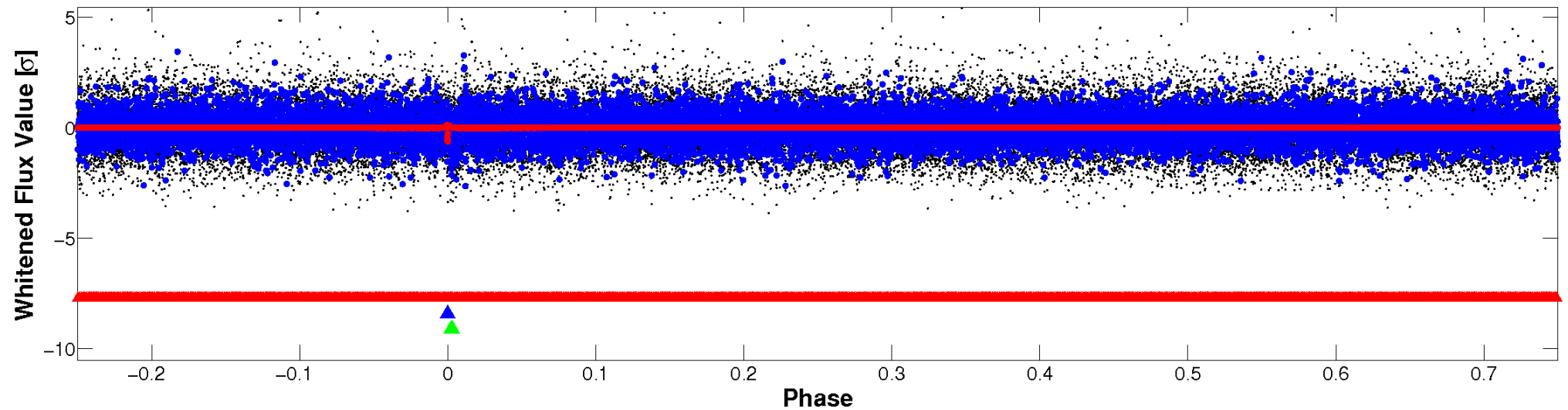


# Non-Whitened Vs. Whitened Light Curve

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

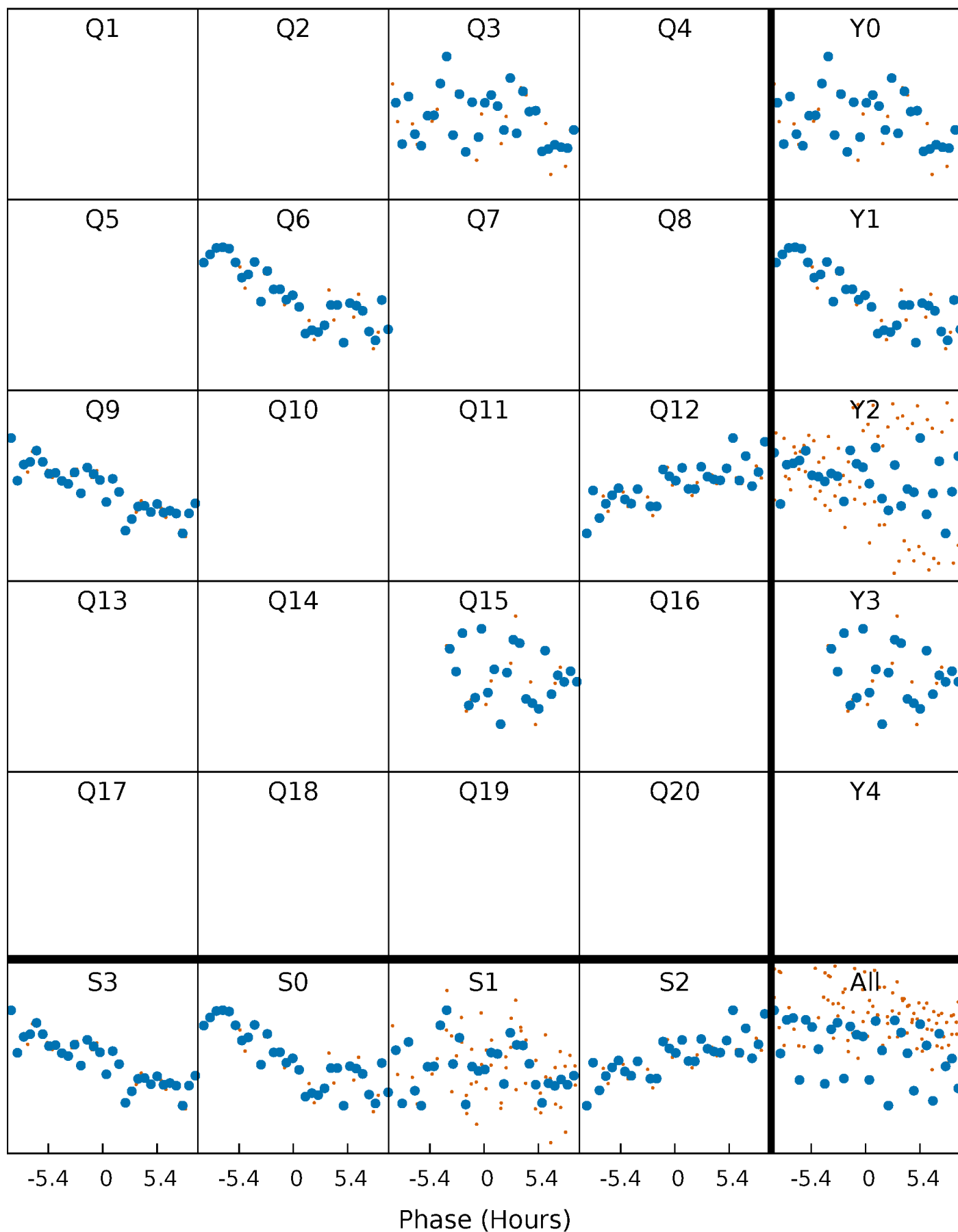


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



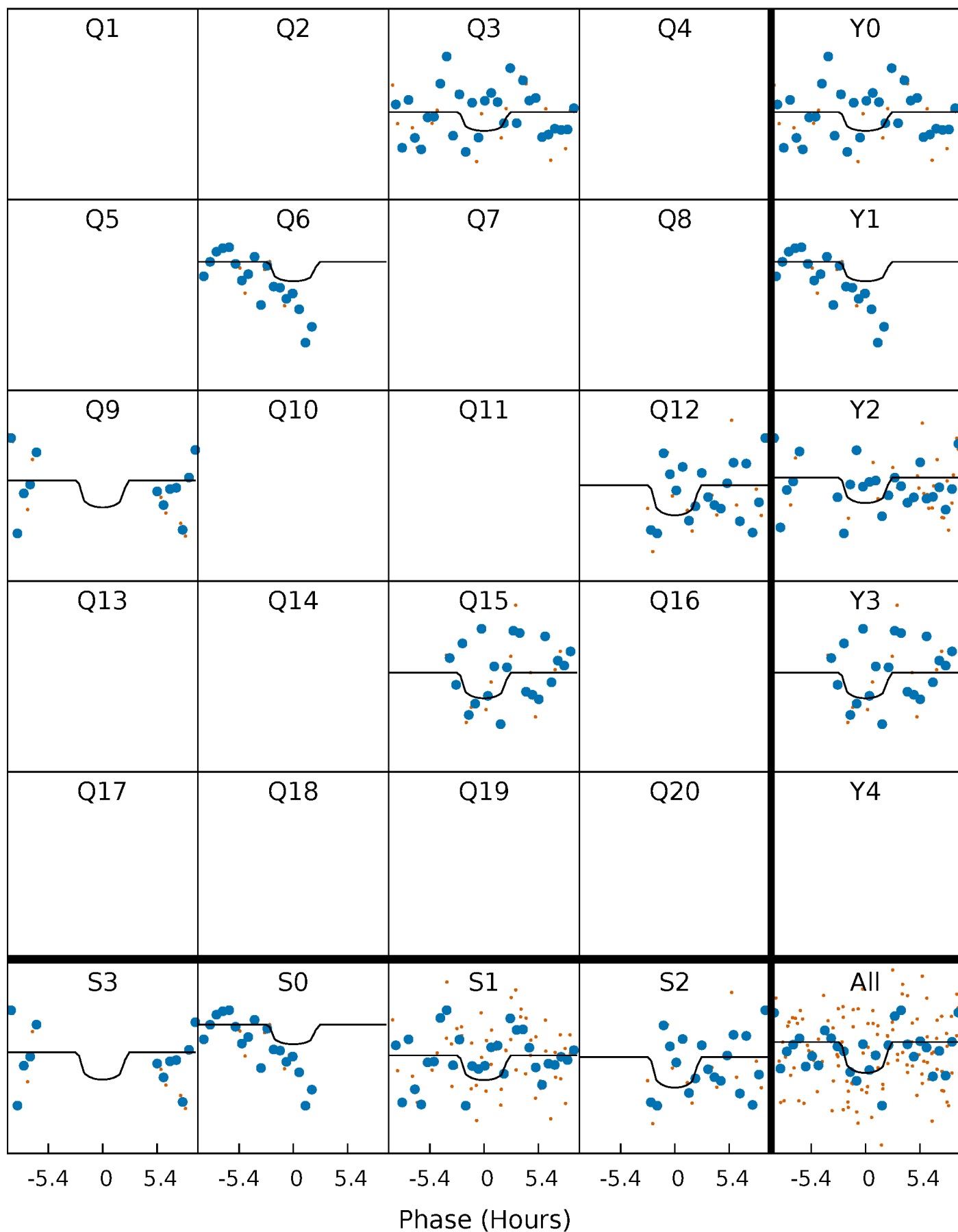
# PDC Quarter-Phased Transit Curves

TCE 009049697-02     $P=288.404994$  Days     $T_0=264.996546$  (BKJD)



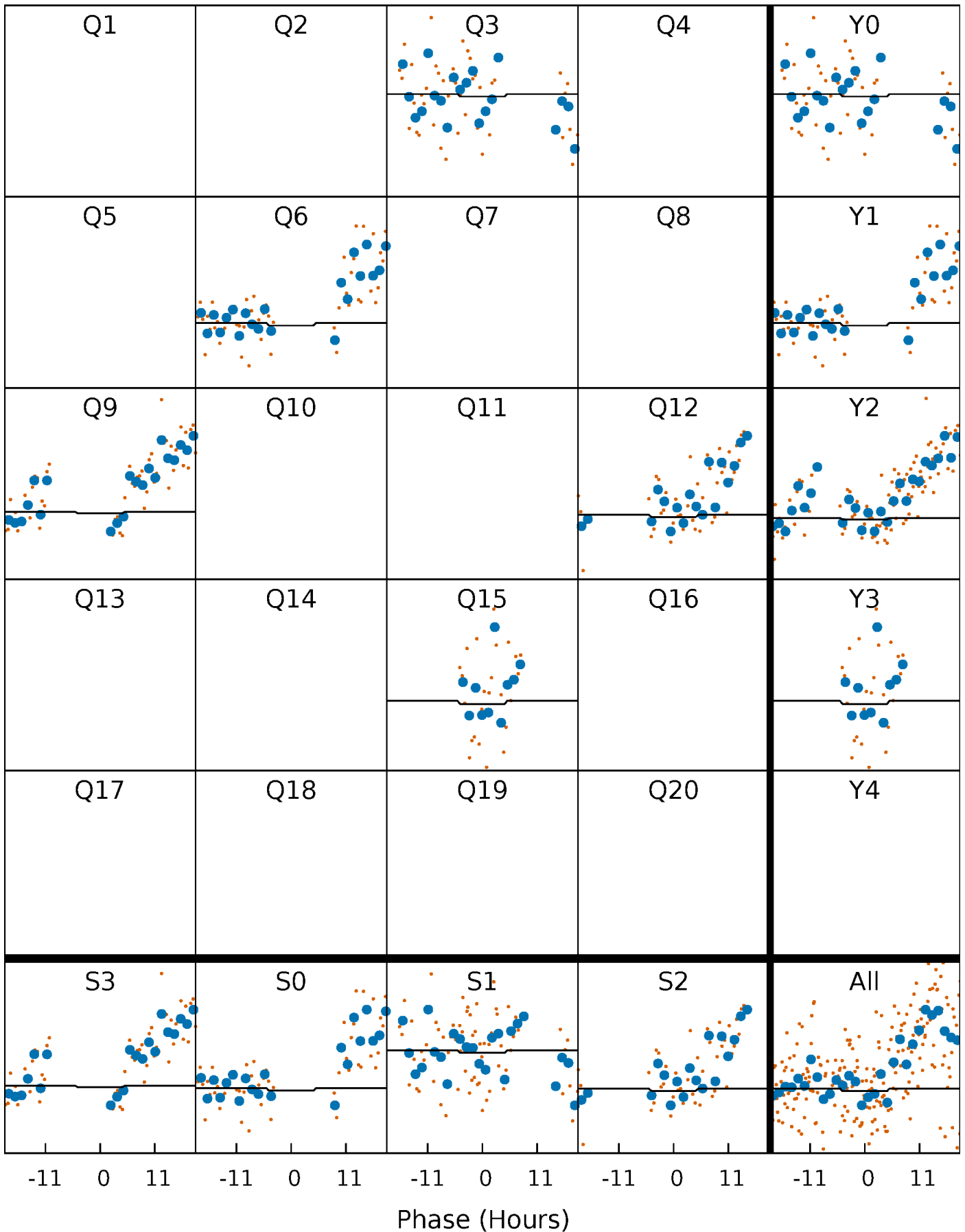
# DV Quarter-Phased Transit Curves

TCE 009049697-02     $P=288.404994$  Days     $T_0=264.996546$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

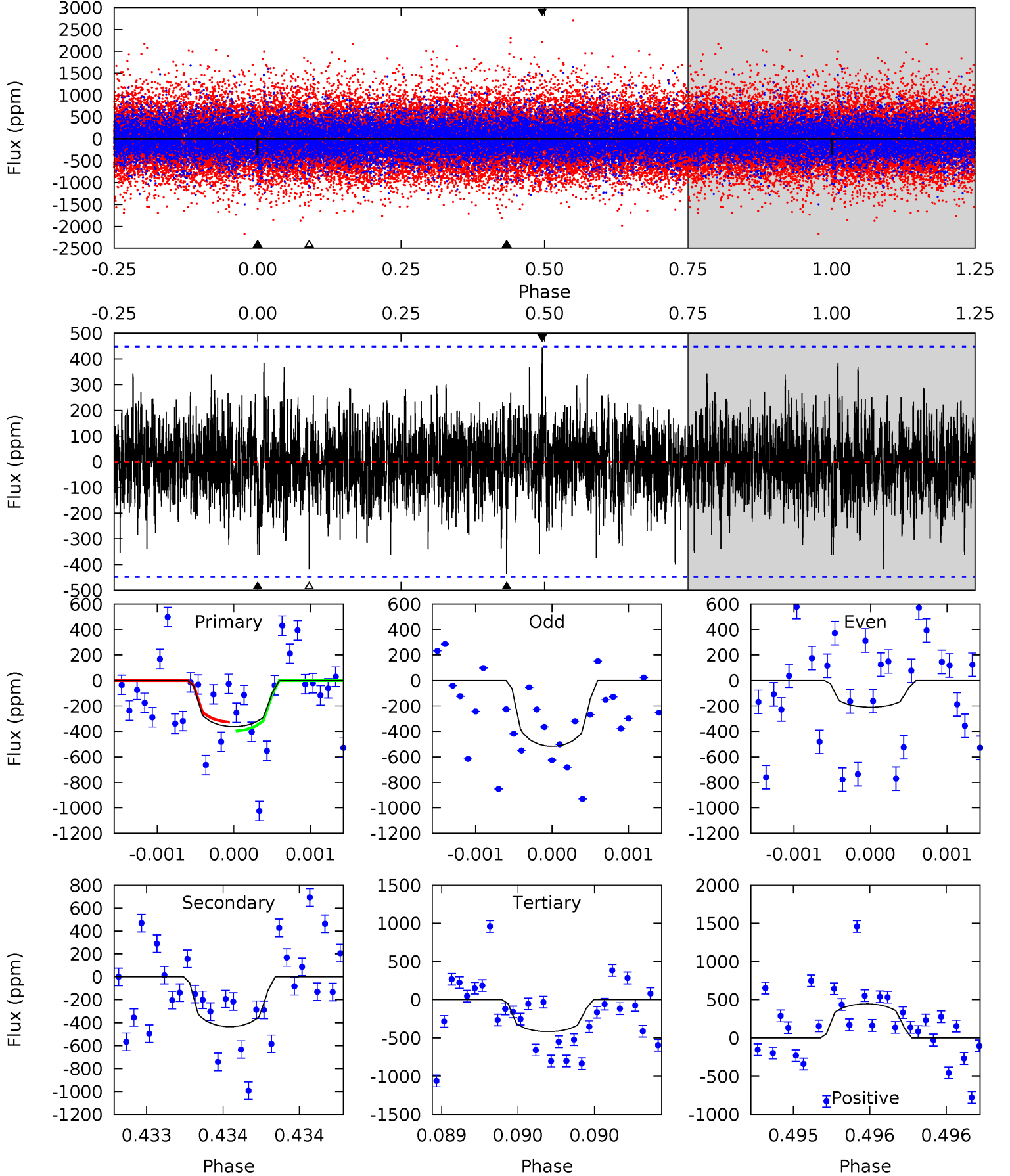
TCE 009049697-02     $P=288.344776$  Days     $T_0=265.272297$  (BKJD)



# DV Model-Shift Uniqueness Test

009049697-02, P = 288.404994 Days, E = 264.996546 Days

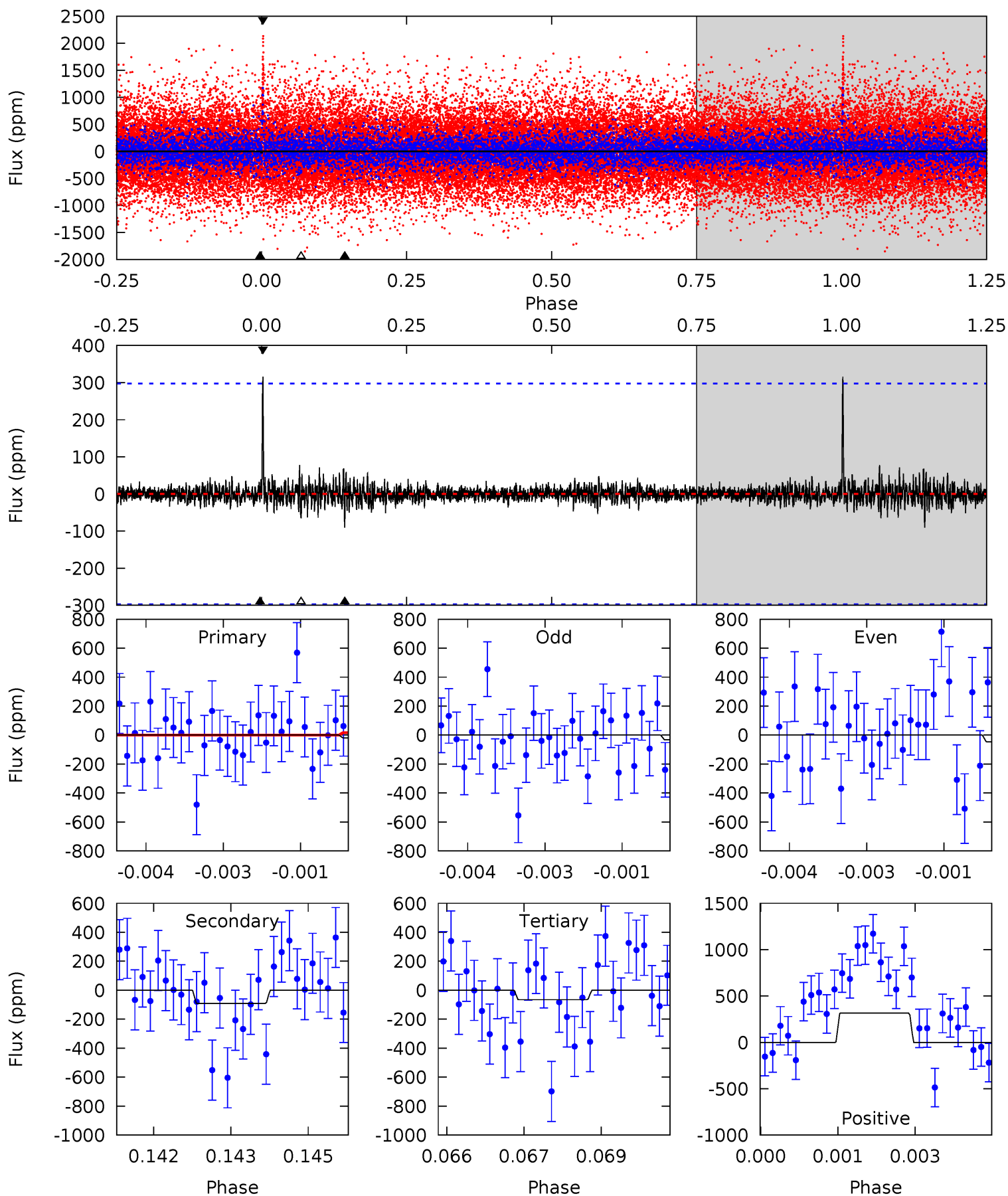
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.46	5.35	5.14	5.49	5.53	3.41	1.31	-0.67	-1.03	0.22	-0.14	1.89	1.75	0.51	0.42



# Alt Model-Shift Uniqueness Test

009049697-02, P = 288.344776 Days, E = 265.272297 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
0.35	1.65	1.18	5.72	5.39	3.19	0.34	-0.83	-5.37	0.47	-4.07	0.12	-5.58	0.78	0.36



### Stellar Parameters For KIC 009049697

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4137^{+124}_{-137}$	$4.646^{+0.056}_{-0.021}$	$-0.100^{+0.300}_{-0.300}$	$0.610^{+0.039}_{-0.063}$	$0.601^{+0.060}_{-0.060}$	$3.728^{+0.938}_{-0.367}$
	+3%/-3%	+1%/-0%	+300%/-300%	+6%/-10%	+10%/-10%	+25%/-10%
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 009049697-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-435 \pm 81$	$2.94^{+2.71}_{-2.01}$	$233^{+8}_{-9}$	$3200^{+1515}_{-548}$	$14772^{+124106}_{-11035}$
Alt.	$-91 \pm 55$	$2.64^{+2.72}_{-1.97}$	$232^{+8}_{-8}$	$2618^{+1210}_{-453}$	$3316^{+42370}_{-2679}$

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



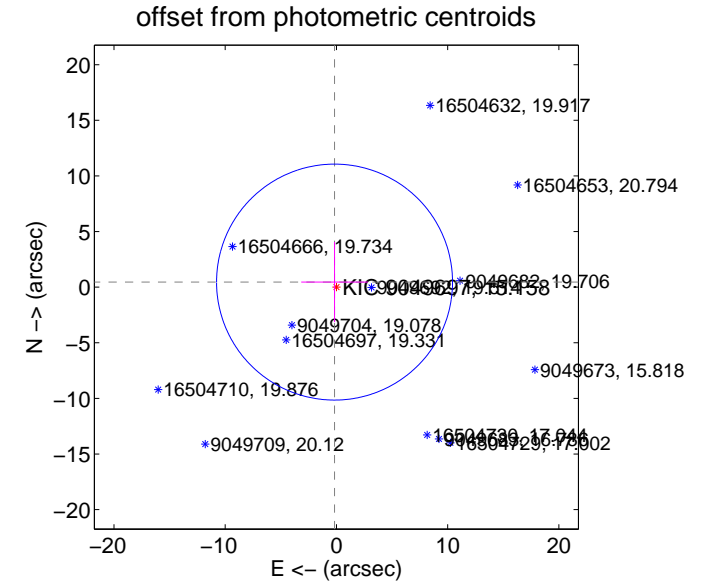
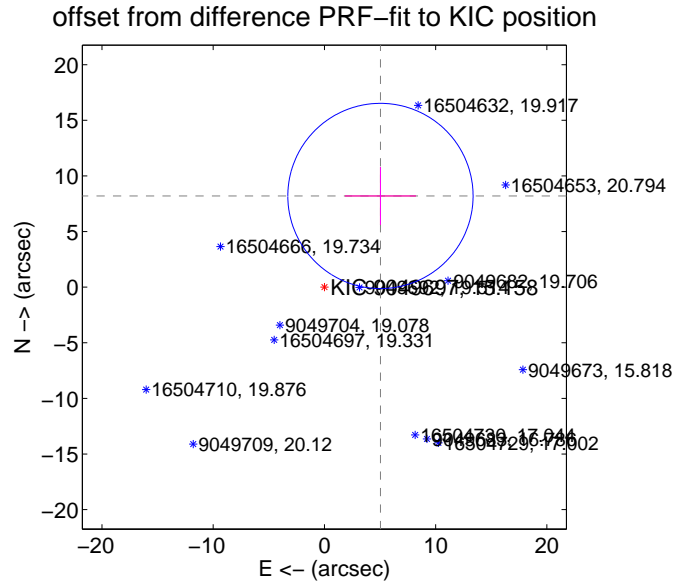
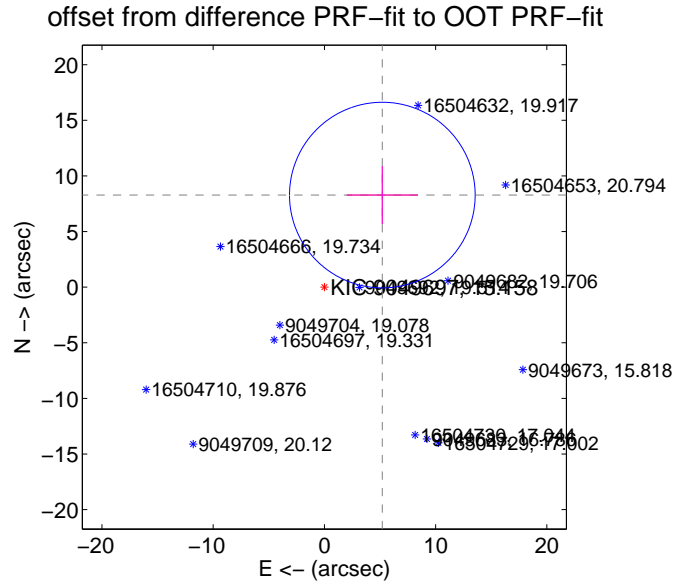
## DV Centroid Data

Supplemental centroid analysis for 009049697-02. Kepler magnitude: 15.16. Transit SNR 3.14

There are 0 quarters with good PRF difference image offsets

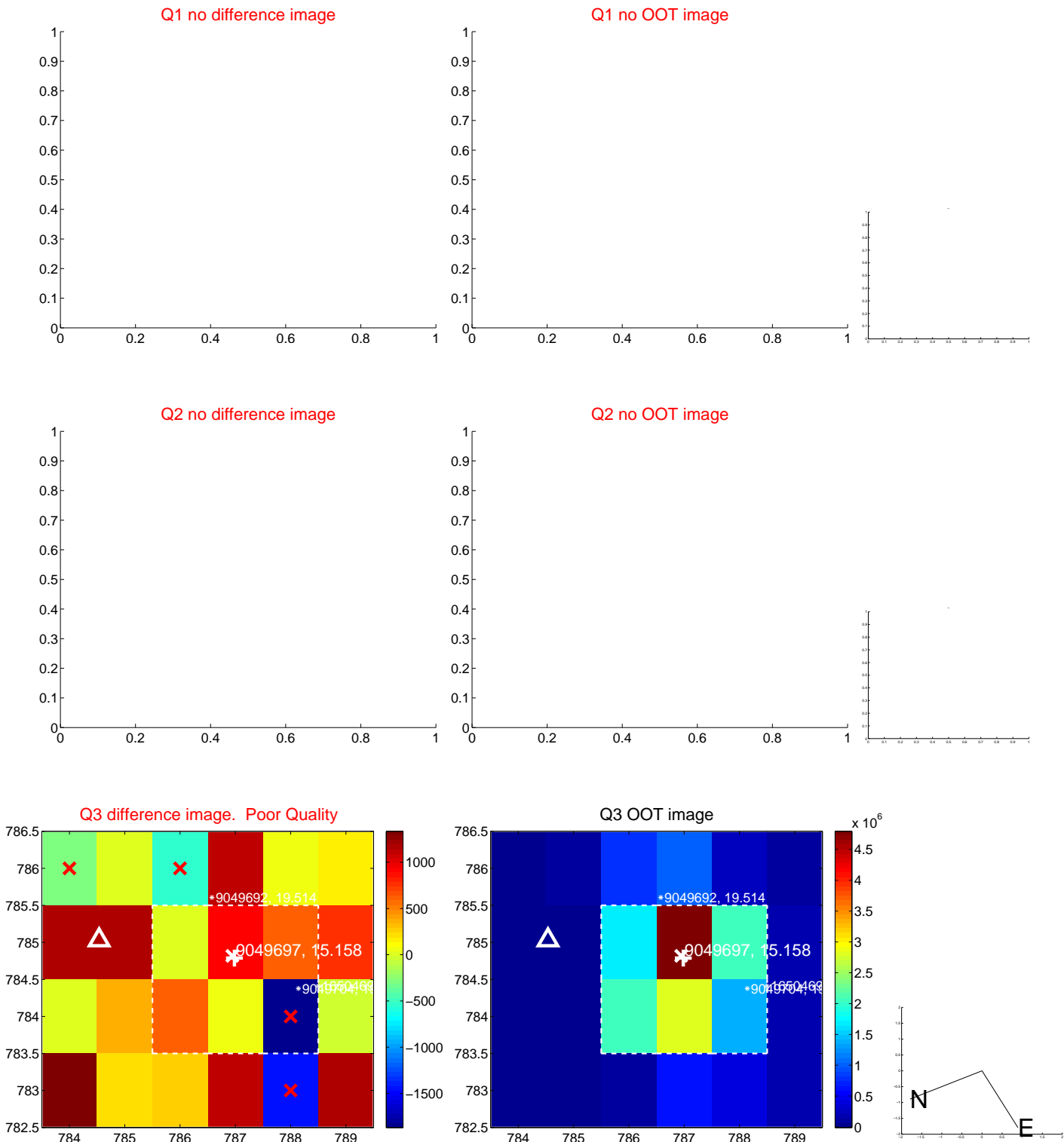
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	9.781 $\pm$ 2.781	3.52	-5.208 $\pm$ 3.197	8.279 $\pm$ 2.599
PRF-fit source offset from KIC position	9.622 $\pm$ 2.775	3.47	-5.037 $\pm$ 3.197	8.199 $\pm$ 2.599
photometric centroid source offset	0.49 $\pm$ 3.54	0.14	0.17 $\pm$ 3.00	0.46 $\pm$ 3.60

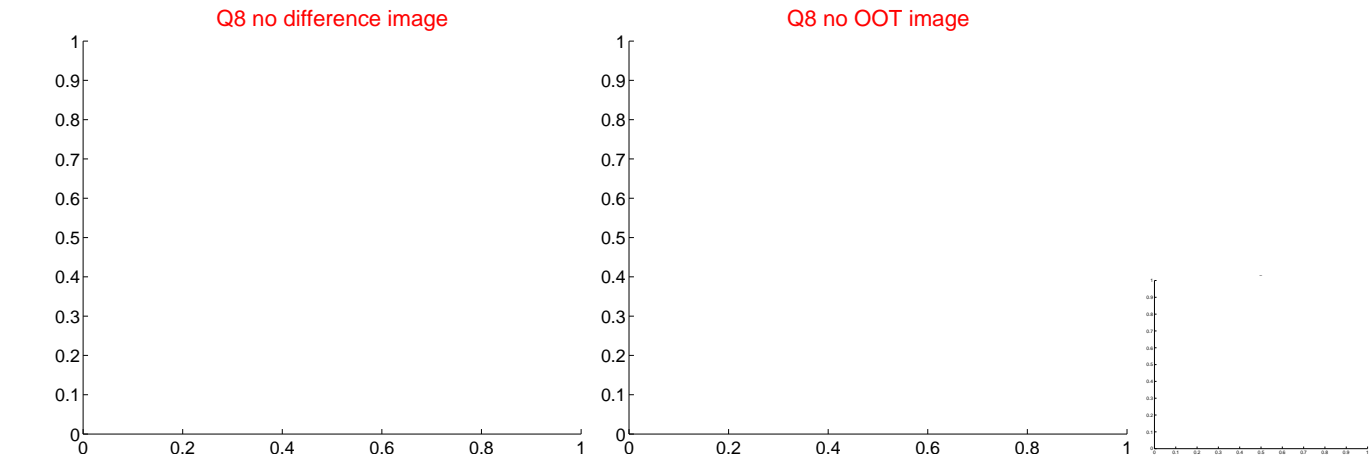
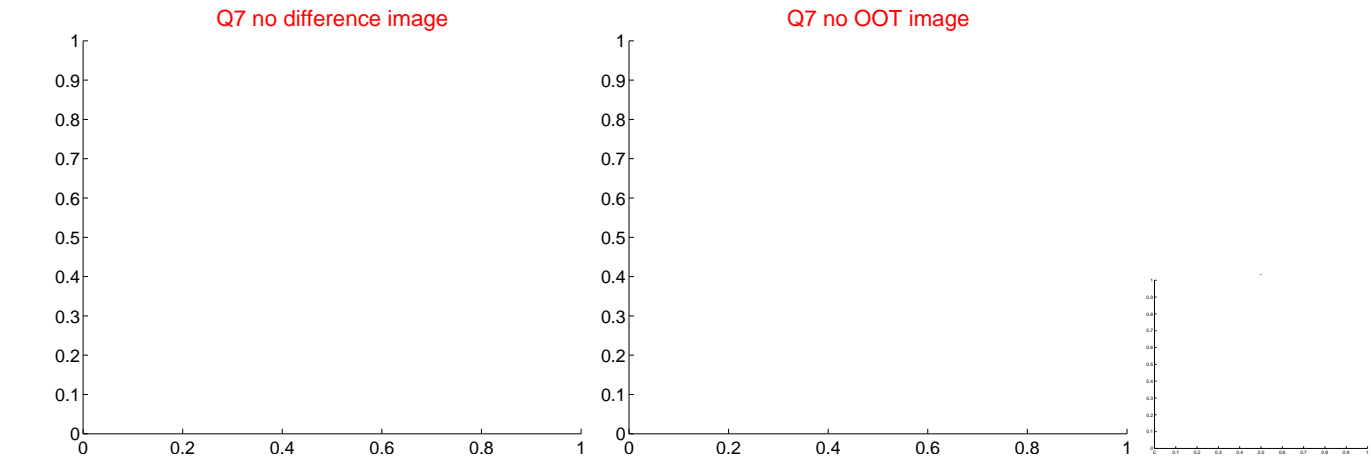
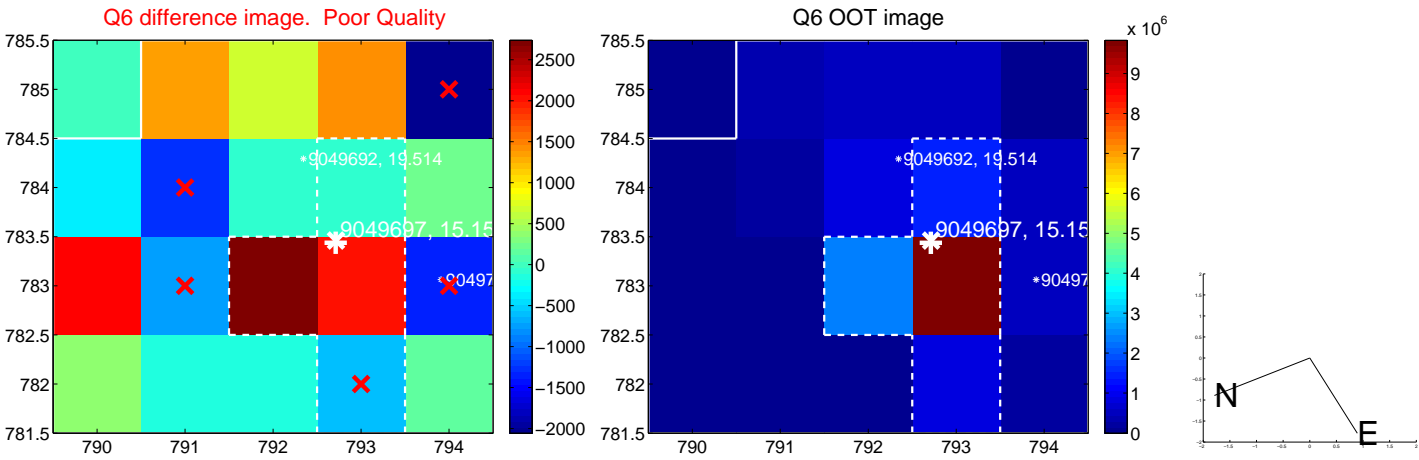
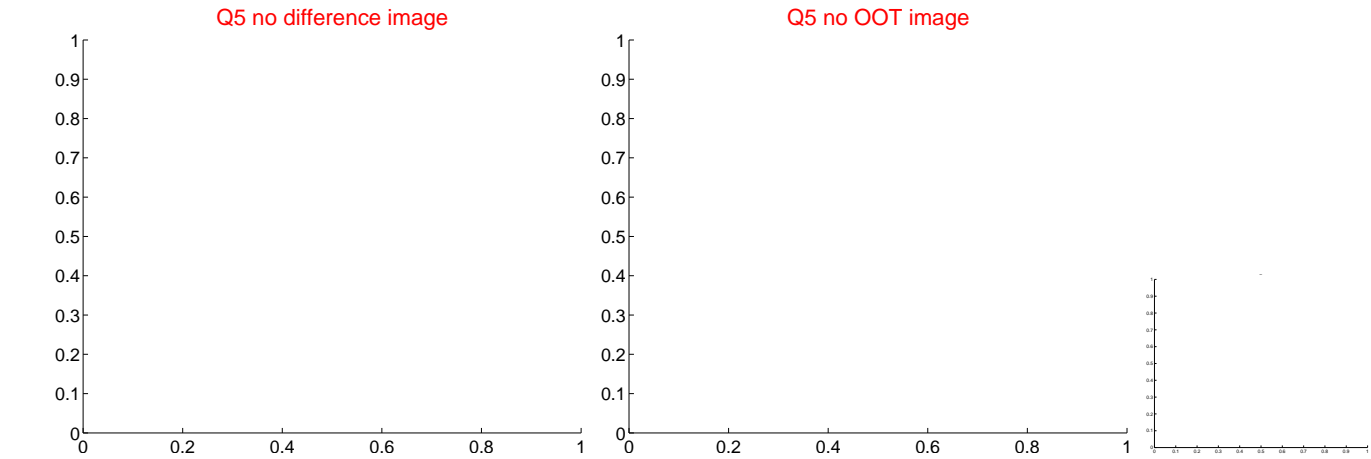


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

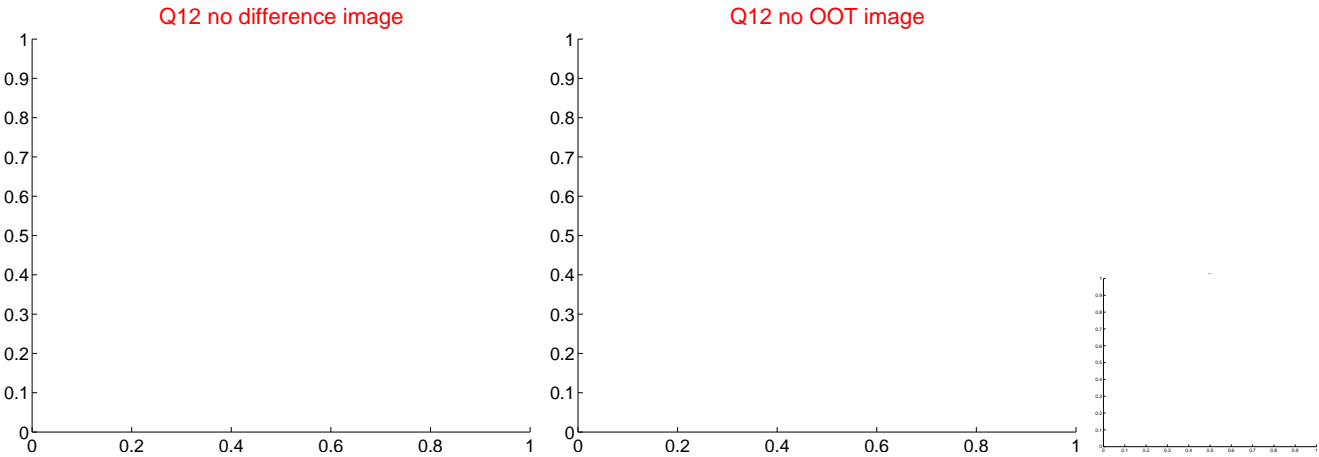
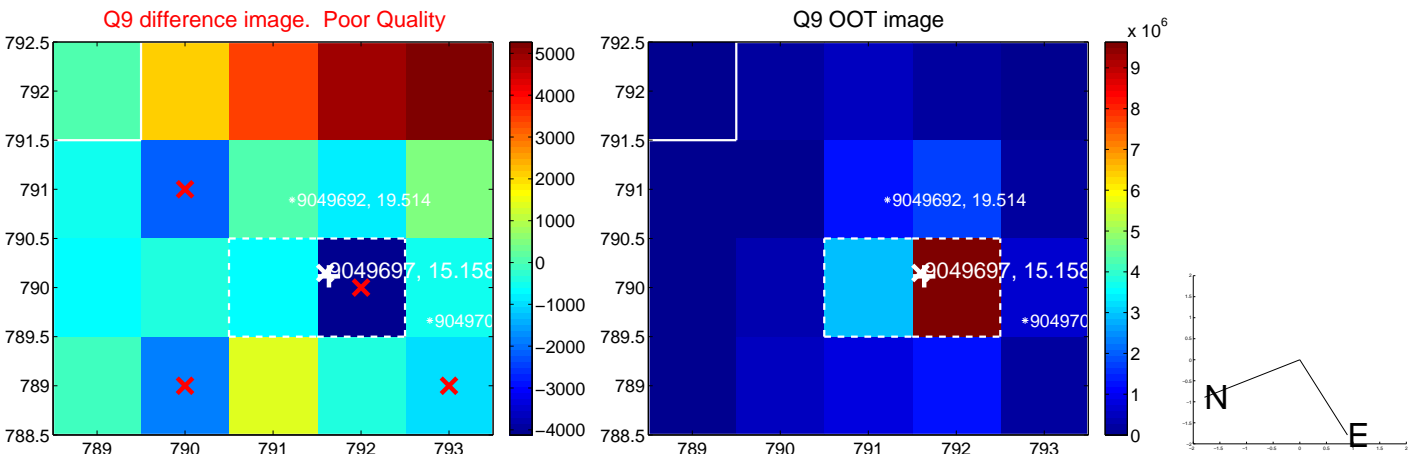
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: 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.

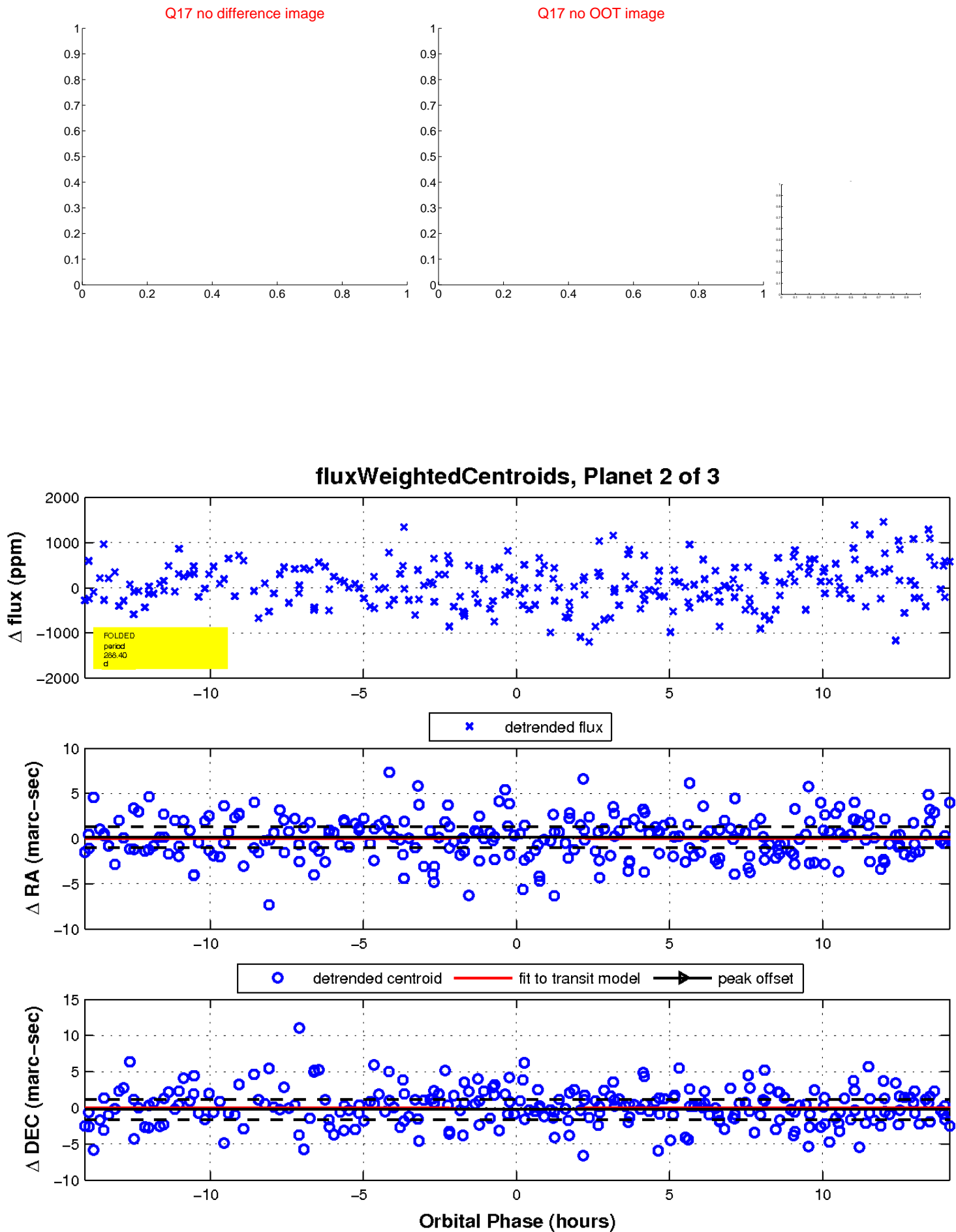


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



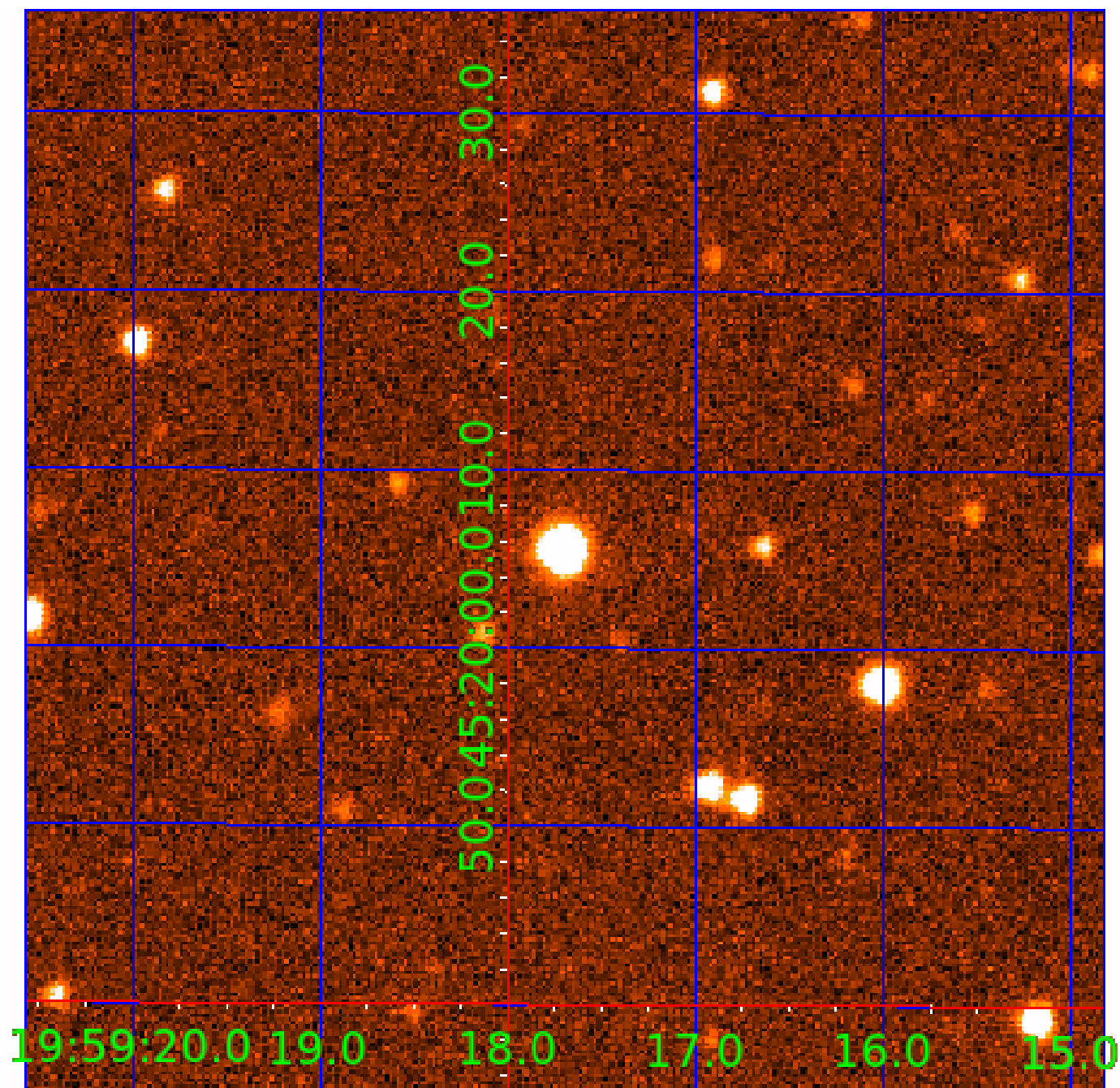


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009049697

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009049697-01	OBS	5607.01	1.327473	131.580786	114.9	3.706	13.0	13.8	0.61	4137	0.80	245.37
009049697-02	OBS	No	288.404994	264.996546	383.4	4.736	9.5	3.1	0.61	4137	1.39	0.19
009049697-03	OBS	No	288.344821	265.908183	536.3	16.370	9.1	4.8	0.61	4137	1.53	0.19

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009049697-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—EPHEM_MATCH
009049697-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009049697-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—SAME_NTL_PERIOD—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 009049697-03

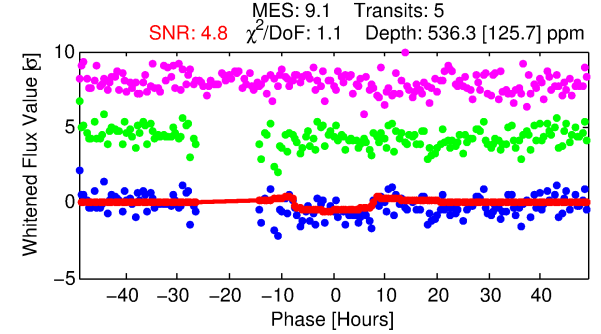
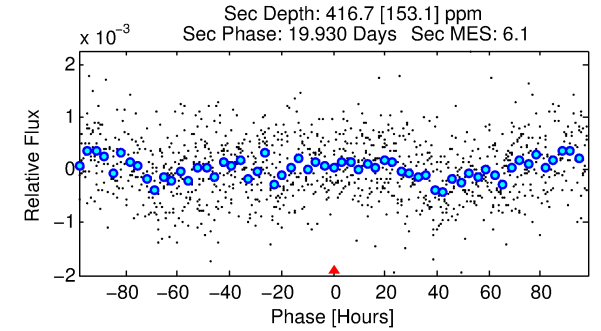
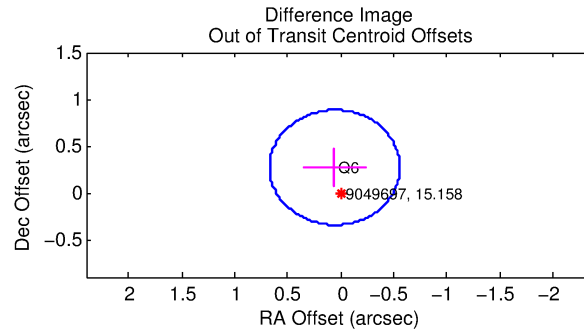
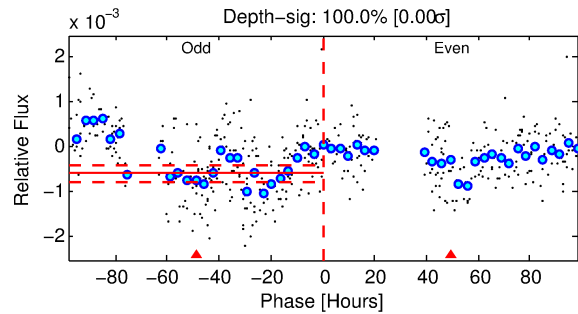
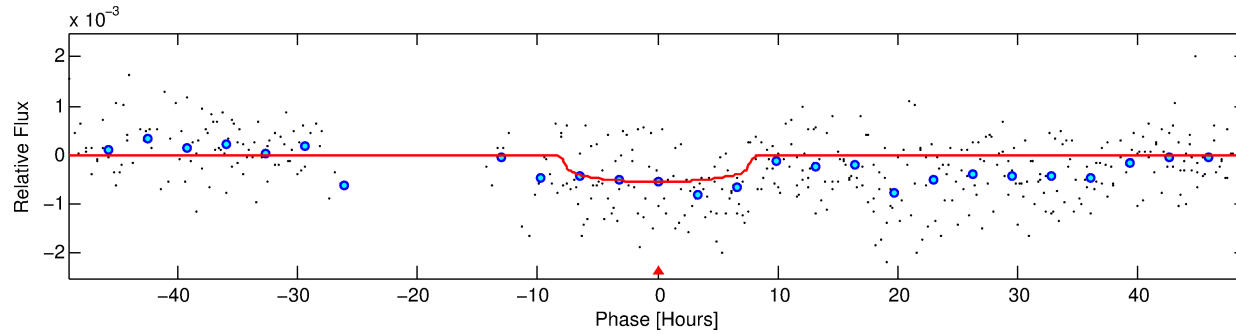
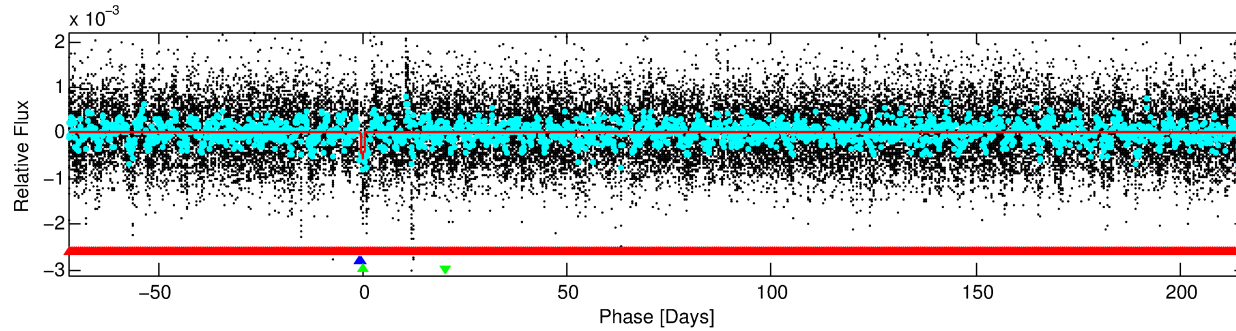
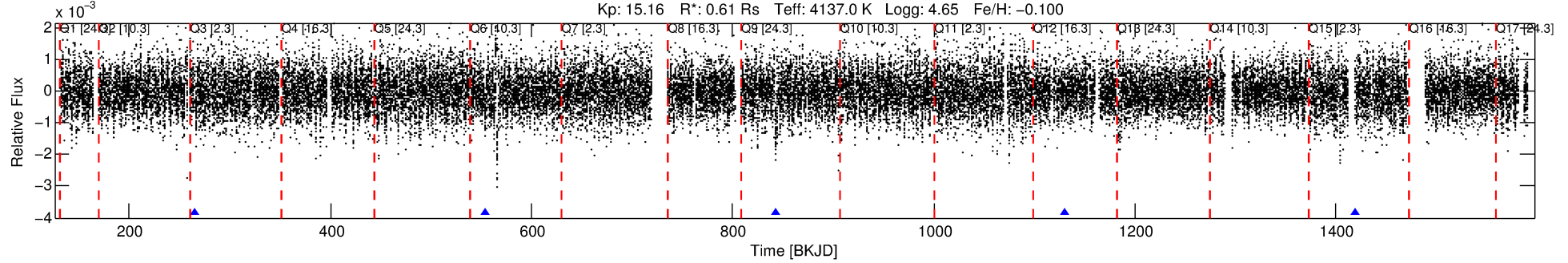
No Significant Match Found

# DV One-Page Summary

KIC: 9049697 Candidate: 3 of 3 Period: 288.345 d

KOI: K05607 Corr: No Ephemeris Match

Kp: 15.16 R\*: 0.61 Rs Teff: 4137.0 K Logg: 4.65 Fe/H: -0.100



## DV Fit Results:

Period = 288.34482 [0.01563] d  
Epoch = 265.9082 [0.0409] BKJD  
Rp/R\* = 0.0230 [0.0108]  
a/R\* = 95.74 [159.22]  
b = 0.74 [1.04]  
Seff = 0.19 [0.03]  
Teq = 168 [7] K  
Rp = 1.53 [0.74] Re  
a = 0.7209 [0.0585] AU  
Ag = 50963.91 [51915.05] [0.98σ]  
Teffp = 3900 [996] K [3.75σ]

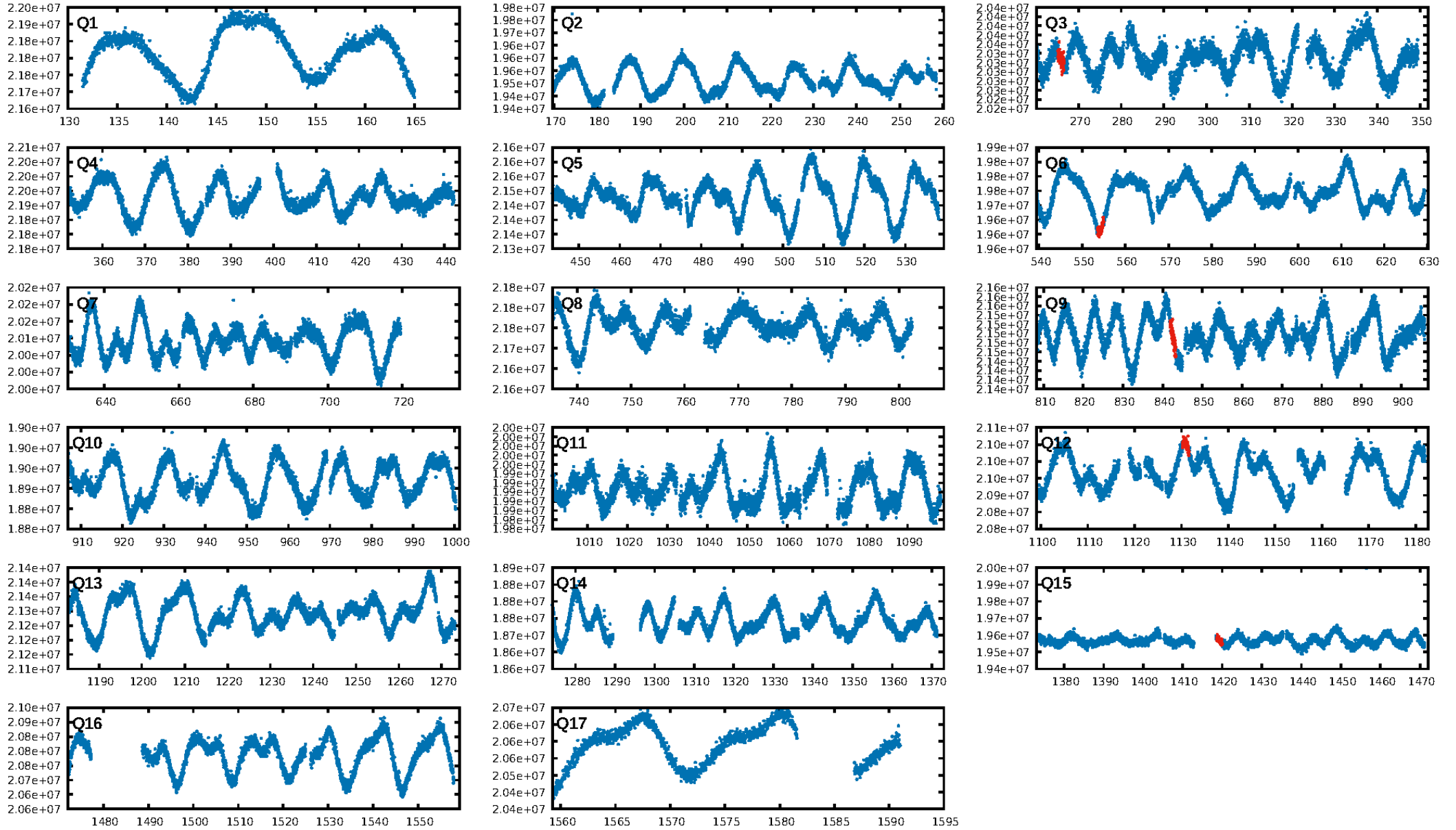
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [410.40σ]  
LongPeriod-sig: 6.8% [0.08σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.37e-08  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.308  
Centroid-sig: 96.5%  
Centroid-so: 0.752 arcsec [0.58σ]  
OotOffset-rm: 0.276 arcsec [1.35σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-rm: 0.350 arcsec [1.63σ]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 0.00 [0/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:03:08 Z

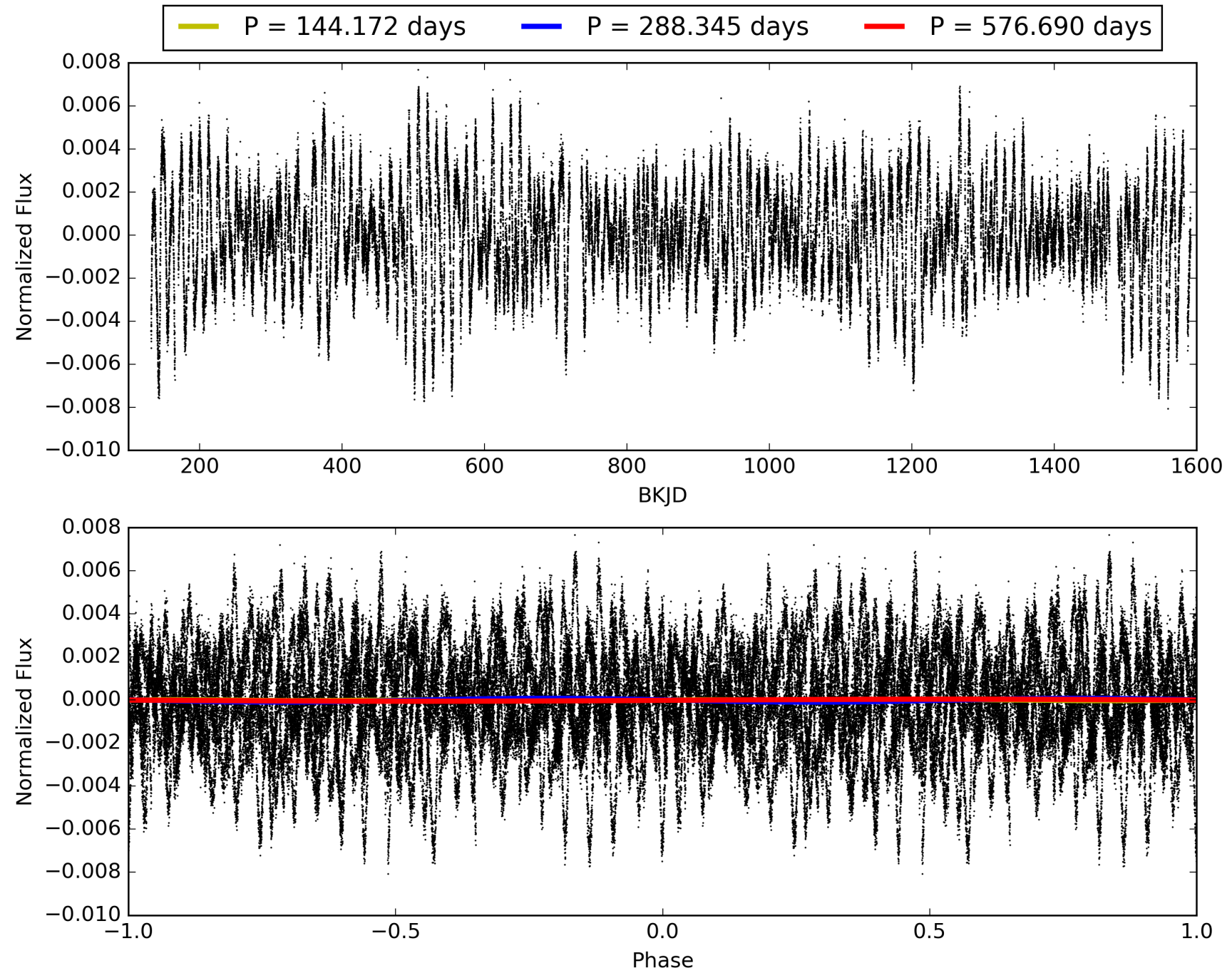
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009049697-03, PDC Light Curves



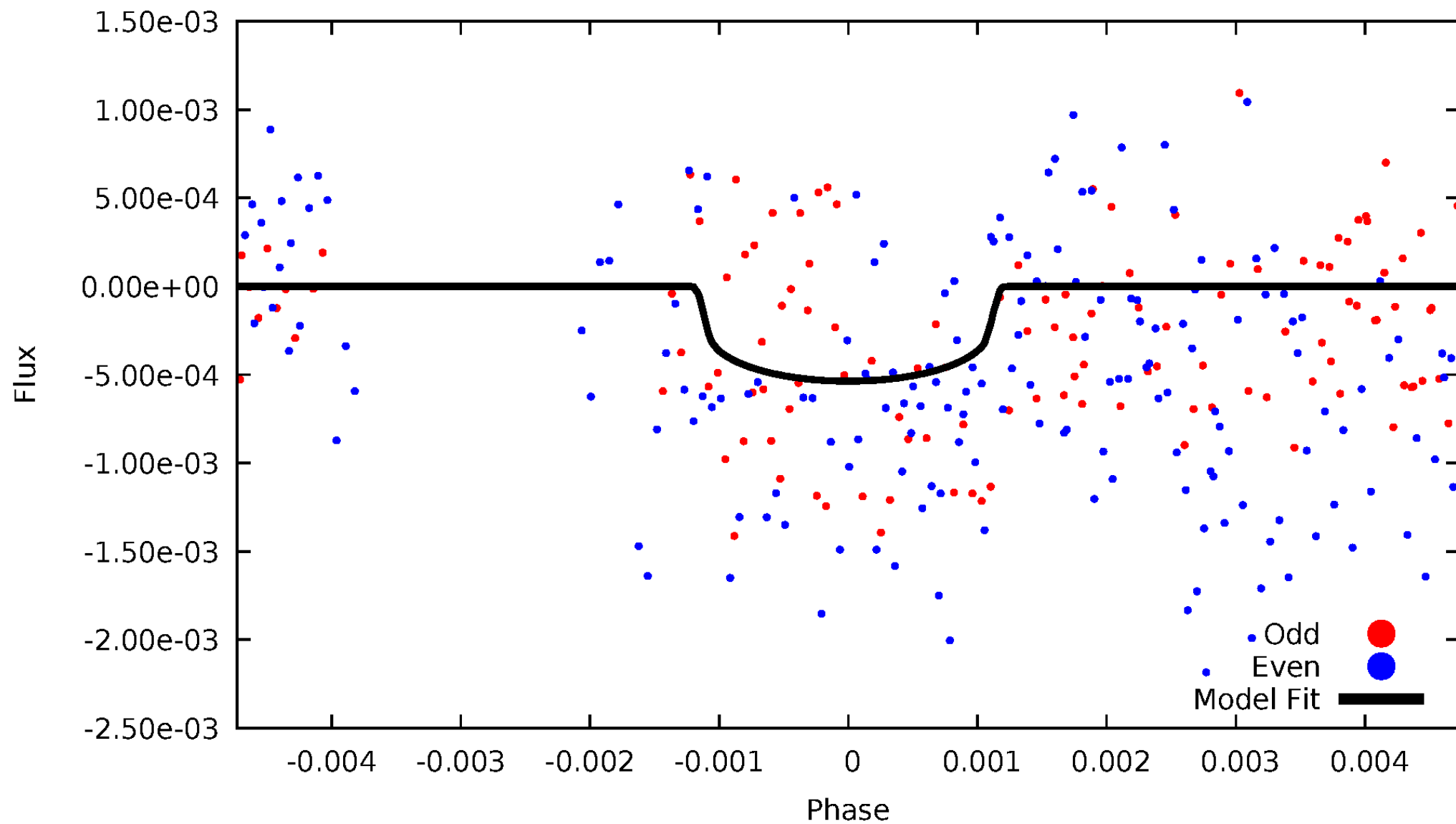


TCE 009049697-03



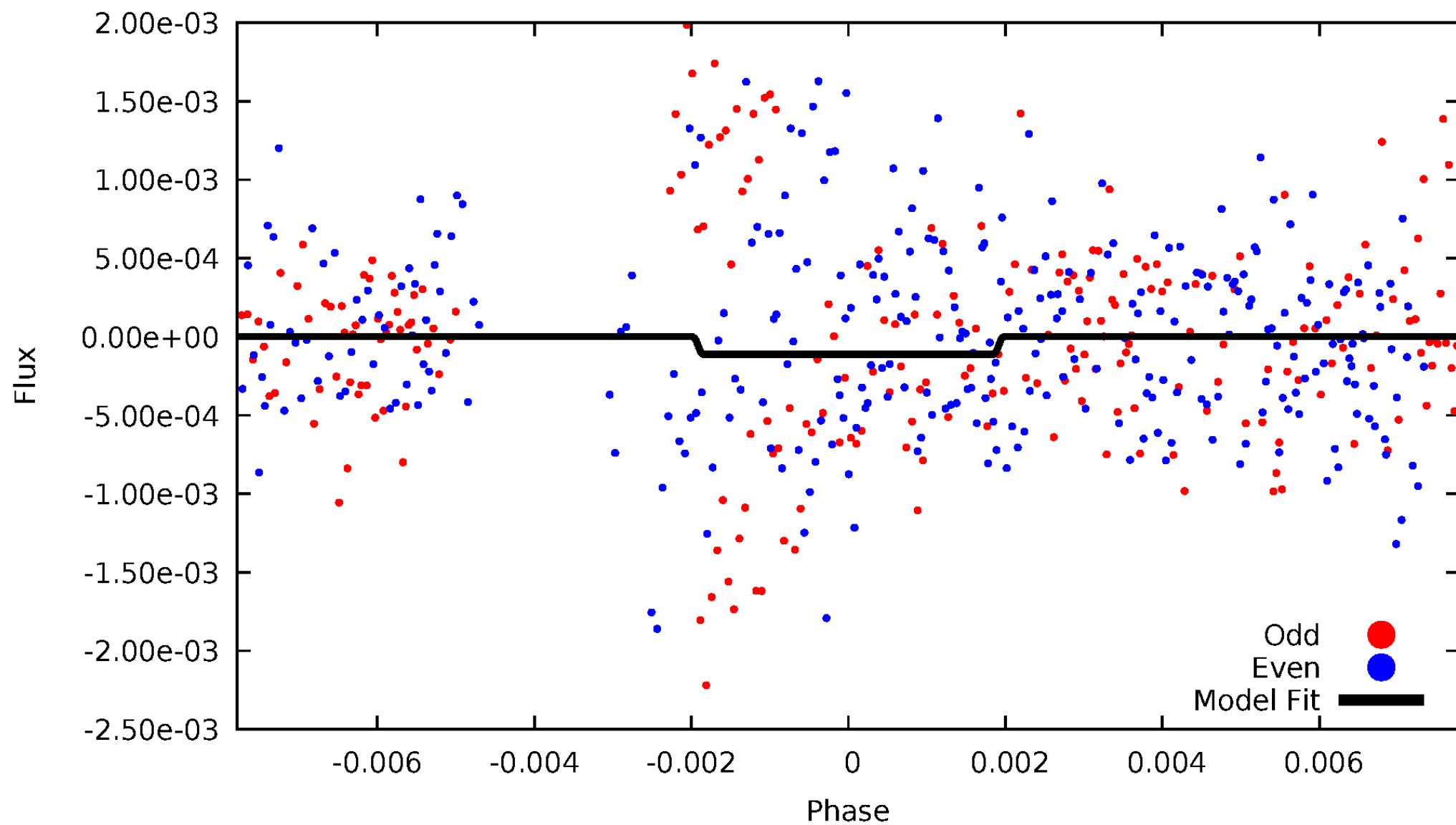
# DV Odd/Even

TCE 009049697-03



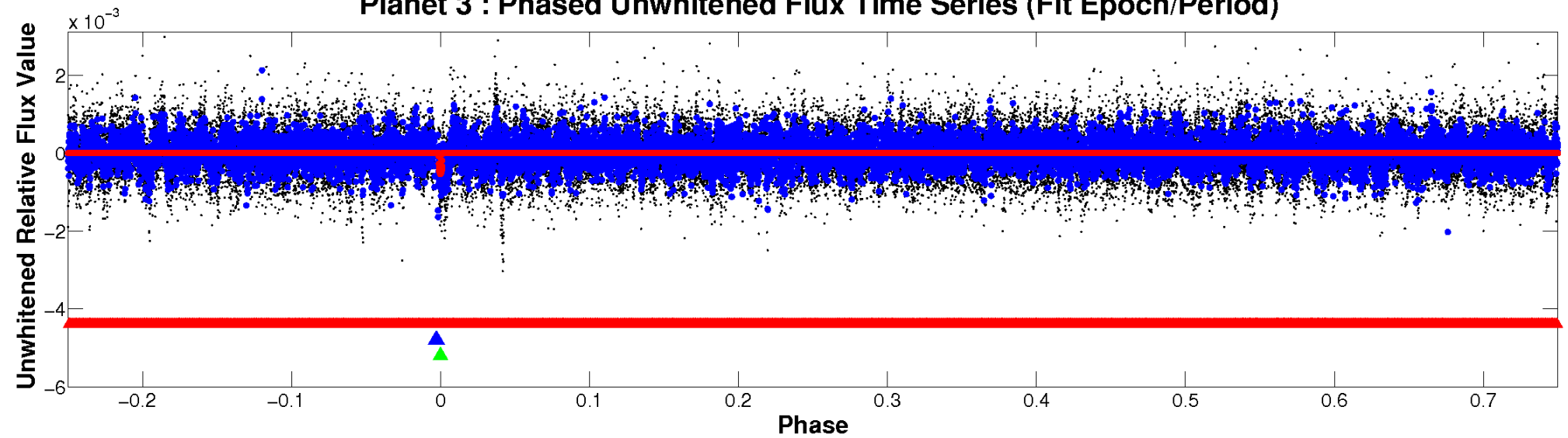
# ALT Odd/Even

TCE 009049697-03

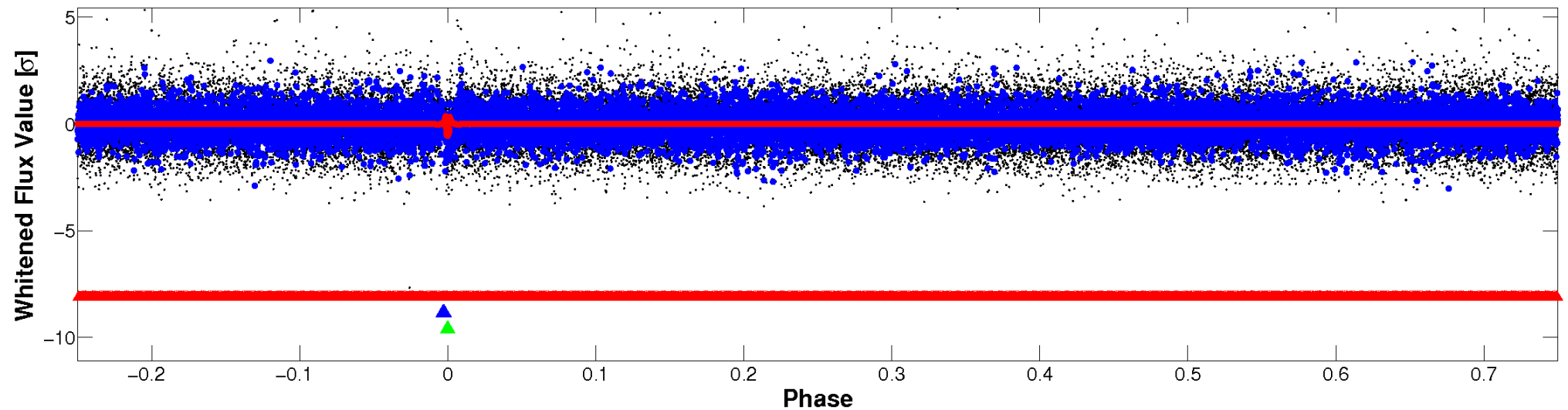


# Non-Whitened Vs. Whitened Light Curve

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

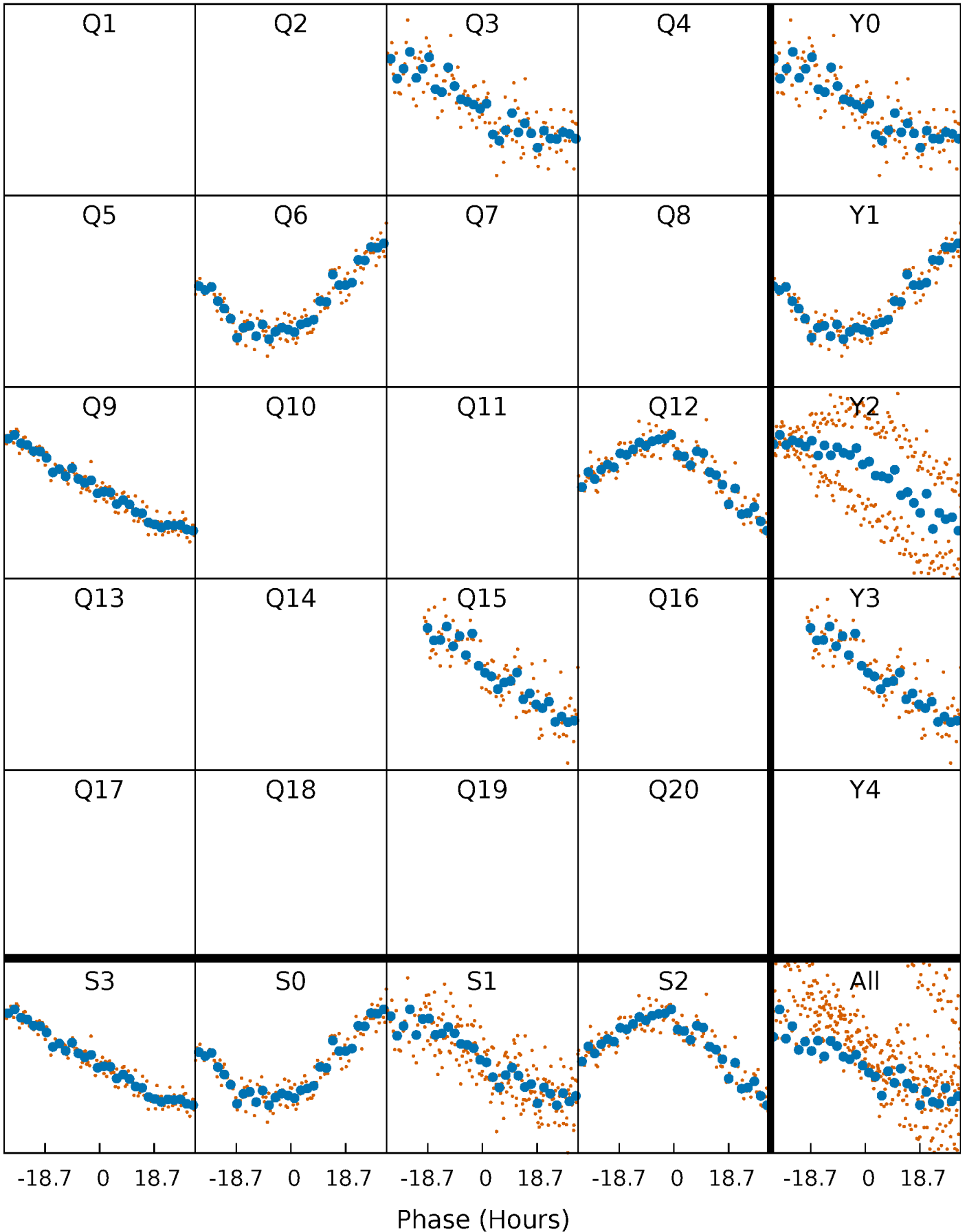


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



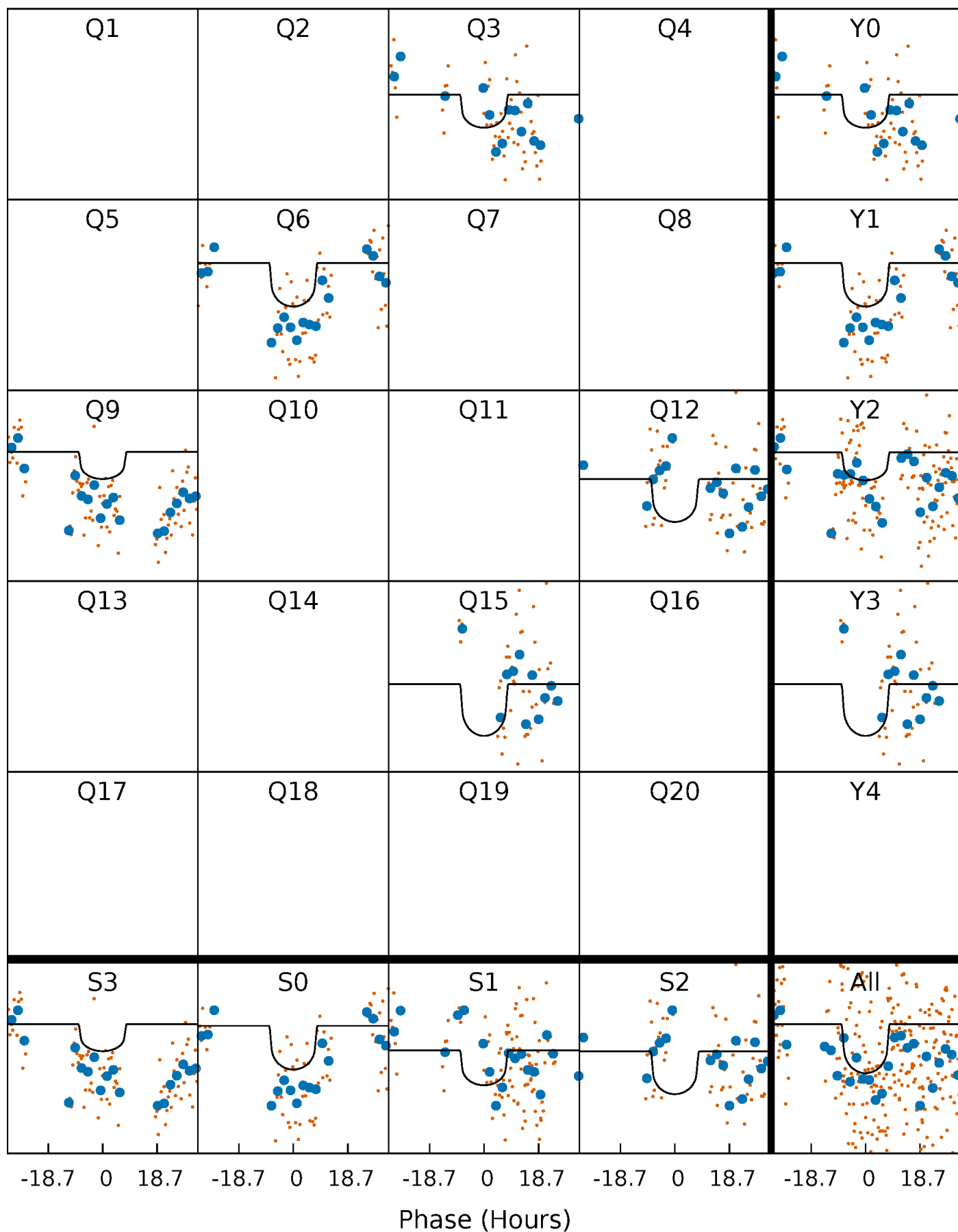
# PDC Quarter-Phased Transit Curves

TCE 009049697-03     $P=288.344821$  Days     $T_0=265.908183$  (BKJD)



# DV Quarter-Phased Transit Curves

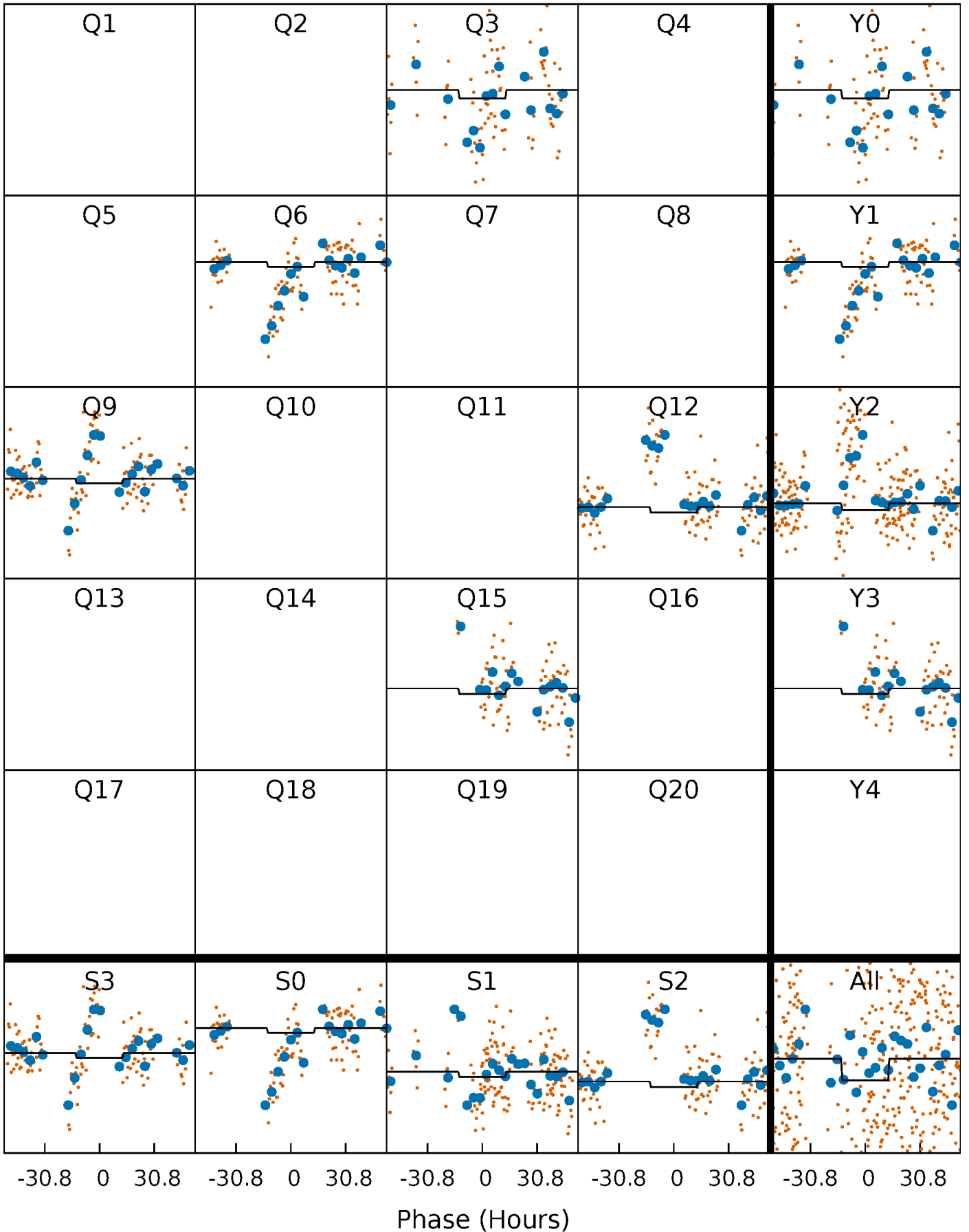
TCE 009049697-03     $P=288.344821$  Days     $T_0=265.908183$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

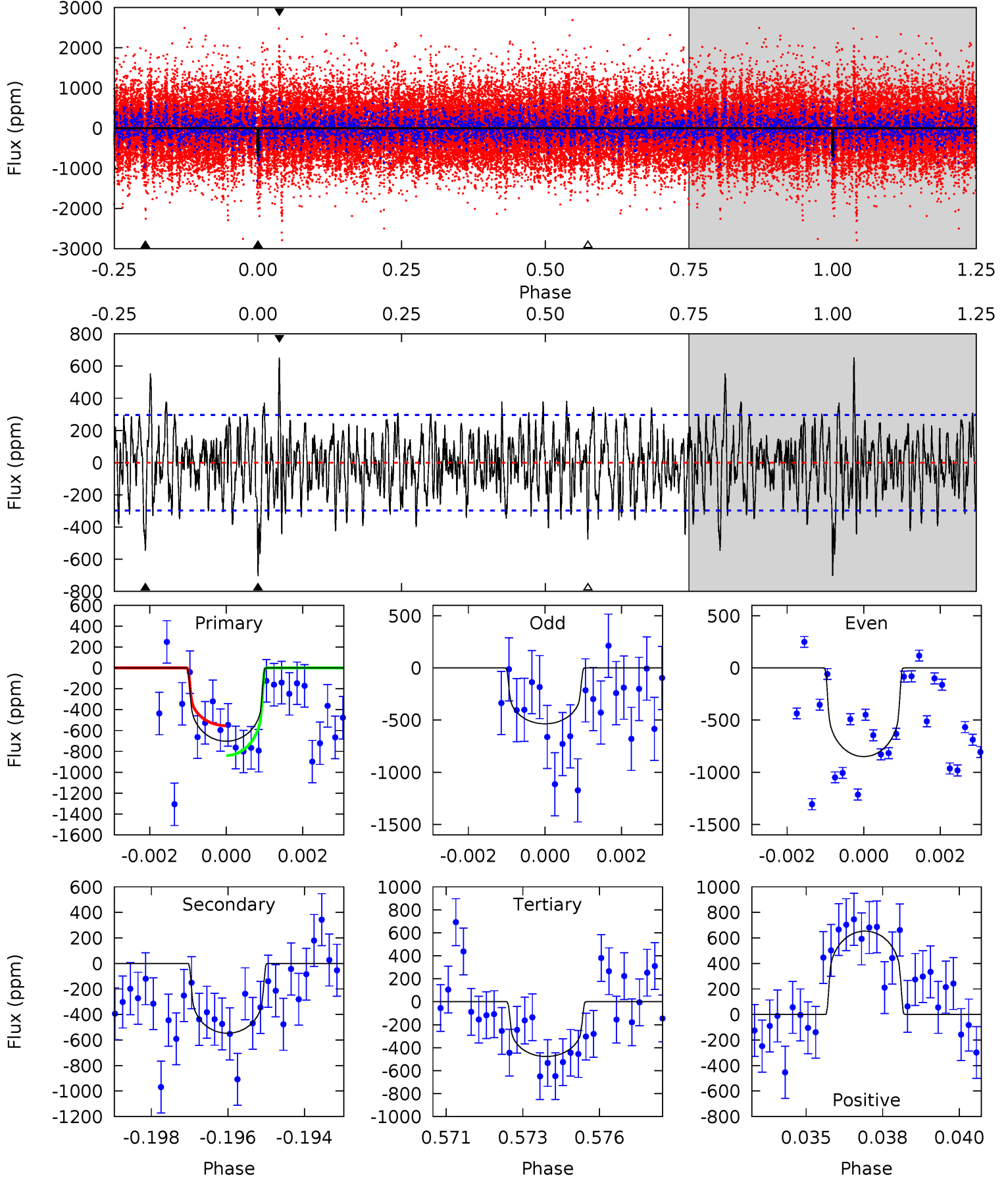
TCE 009049697-03     $P=288.331154$  Days     $T_0=266.189978$  (BKJD)



# DV Model-Shift Uniqueness Test

009049697-03, P = 288.344821 Days, E = 265.908183 Days

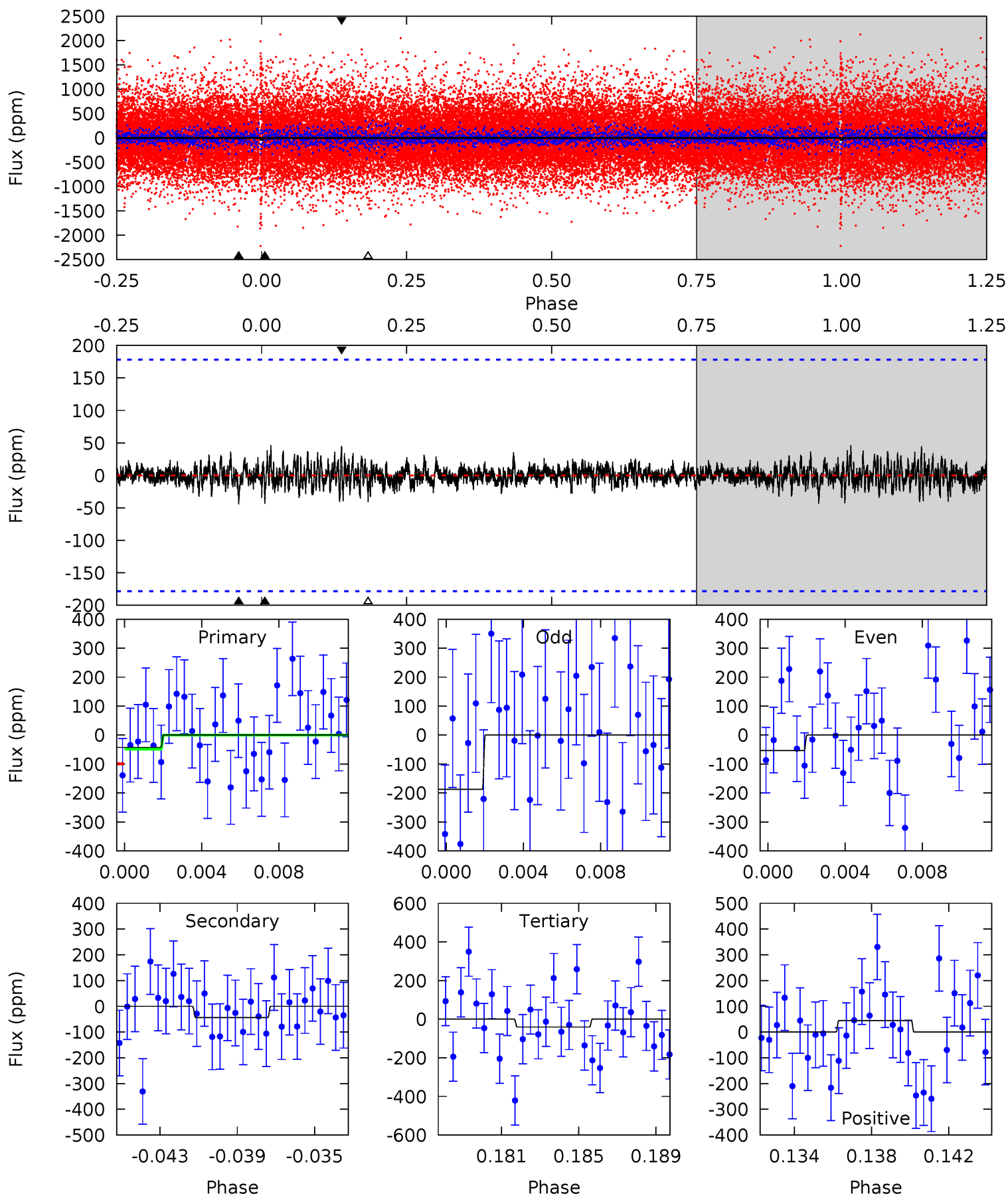
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	9.75	8.51	11.6	5.30	3.04	2.90	4.02	0.88	1.25	-1.89	2.79	0.93	0.48	2.55



# Alt Model-Shift Uniqueness Test

009049697-03, P = 288.331154 Days, E = 266.189978 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.24	1.27	1.19	1.31	5.20	2.88	0.31	0.05	-0.07	0.08	-0.04	1.95	0.20	0.52	0.74



### Stellar Parameters For KIC 009049697

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4137^{+124}_{-137}$	$4.646^{+0.056}_{-0.021}$	$-0.100^{+0.300}_{-0.300}$	$0.610^{+0.039}_{-0.063}$	$0.601^{+0.060}_{-0.060}$	$3.728^{+0.938}_{-0.367}$
	+3%/-3%	+1%/-0%	+300%/-300%	+6%/-10%	+10%/-10%	+25%/-10%
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 009049697-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-547 \pm 56$	$1.52^{+0.72}_{-0.69}$	$233^{+7}_{-9}$	$4152^{+1128}_{-537}$	$69152^{+155652}_{-37989}$
Alt.	$-43 \pm 34$	$0.82^{+0.71}_{-0.51}$	$233^{+8}_{-9}$	$3267^{+1502}_{-782}$	$15823^{+124826}_{-13878}$

$T_{max}$  = 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

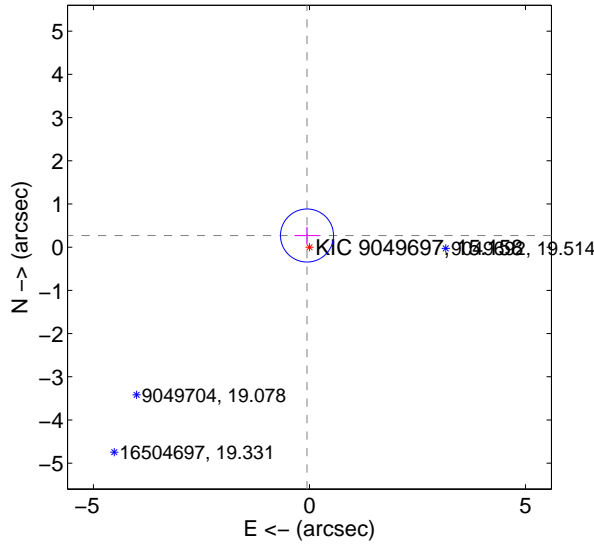
Supplemental centroid analysis for 009049697-03. Kepler magnitude: 15.16. Transit SNR 4.84

There are 1 quarters with good PRF difference image offsets

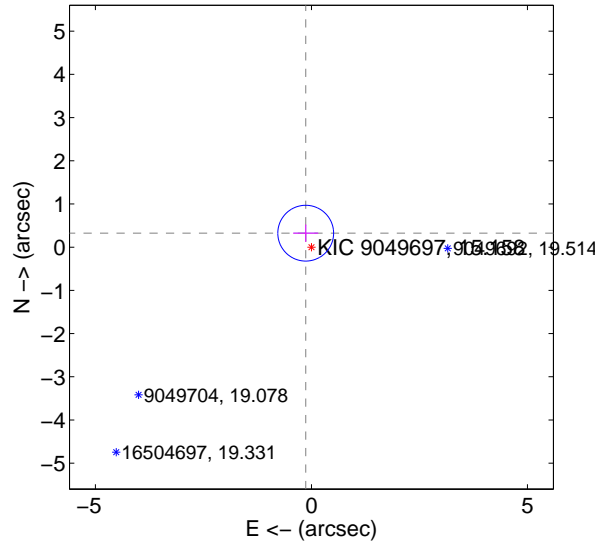
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.276 \pm 0.205$	1.35	$0.056 \pm 0.290$	$0.270 \pm 0.200$
PRF-fit source offset from KIC position	$0.350 \pm 0.215$	1.63	$0.132 \pm 0.290$	$0.324 \pm 0.200$
photometric centroid source offset	$0.75 \pm 1.30$	0.58	$0.65 \pm 1.21$	$-0.38 \pm 1.55$

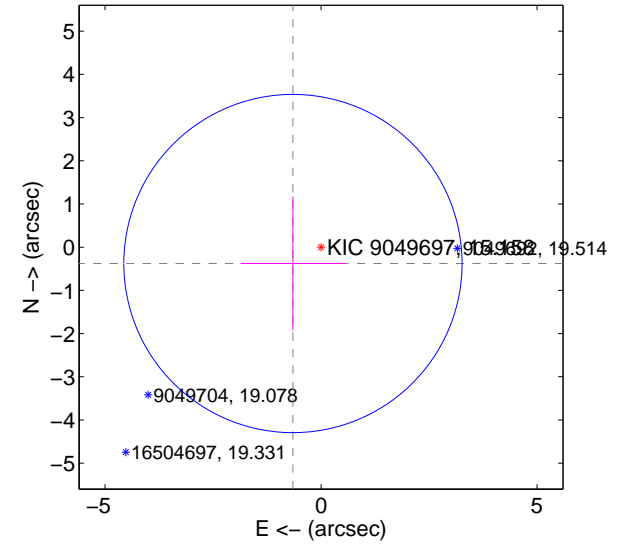
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

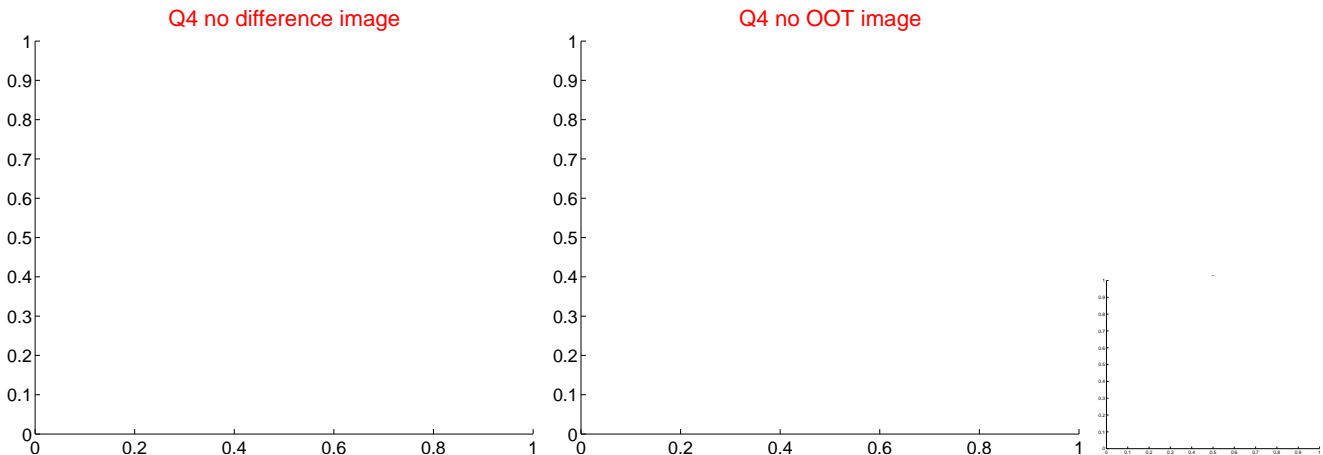
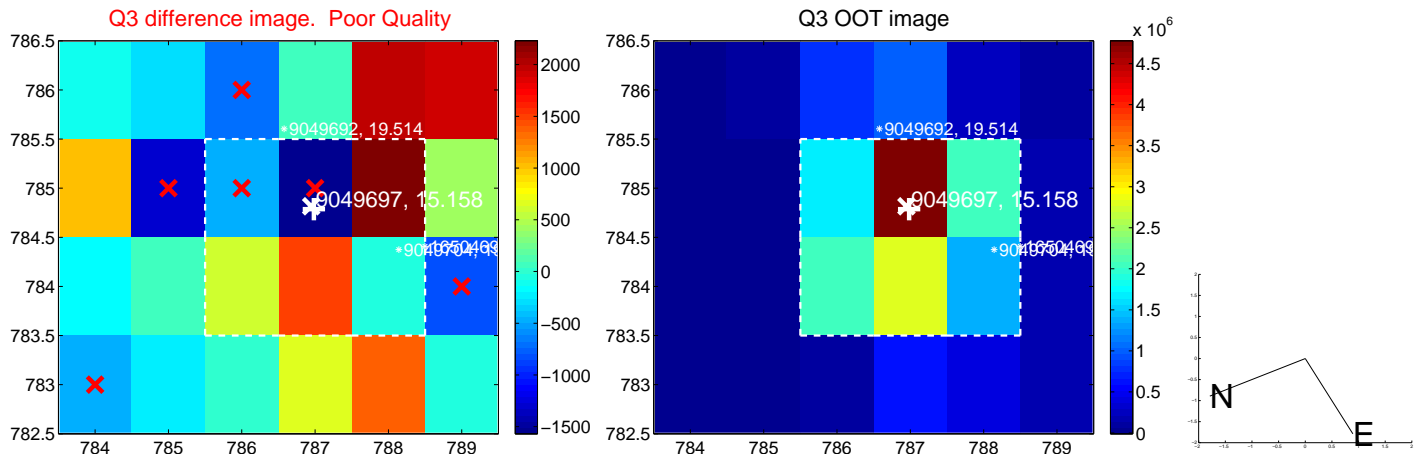
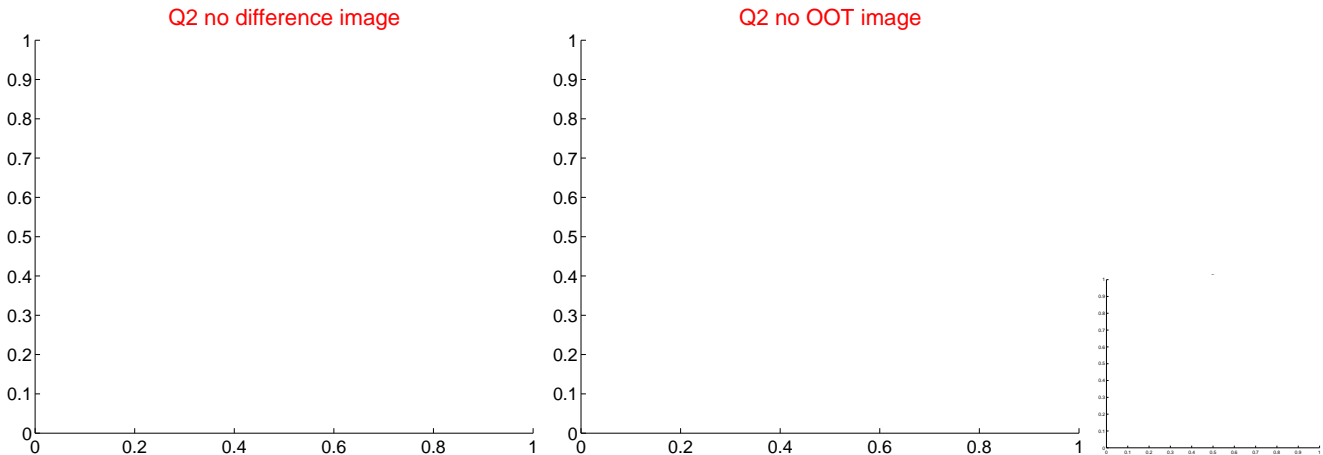
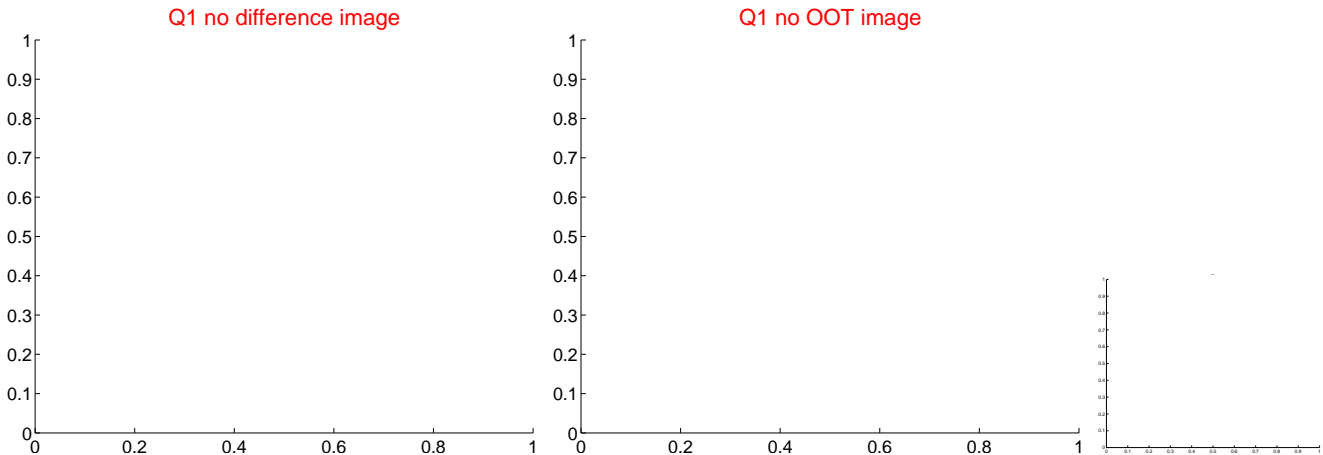


offset from photometric centroids



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.

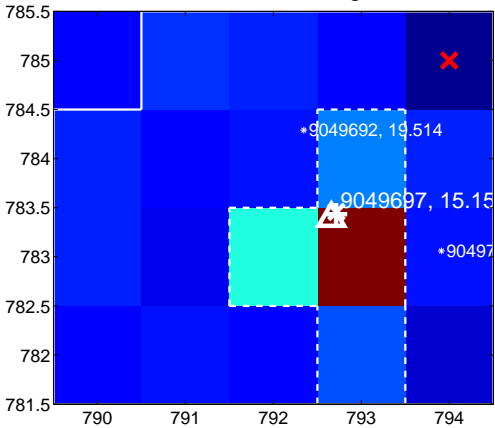
Q5 no difference image



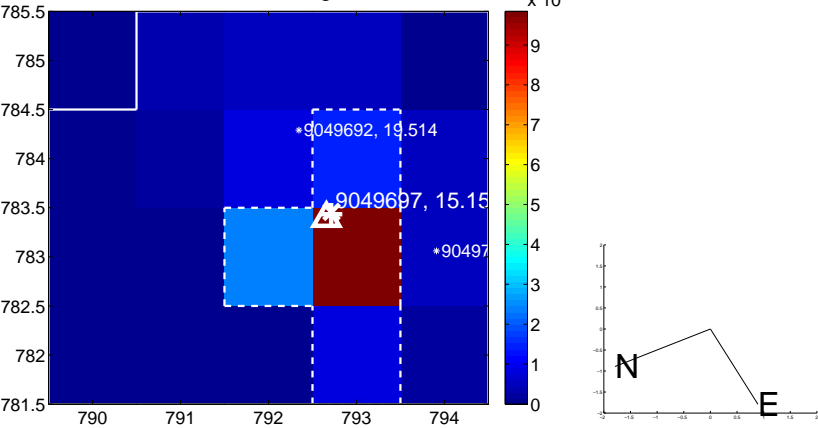
Q5 no OOT image



Q6 difference image



Q6 OOT image



Q7 no difference image



Q7 no OOT image



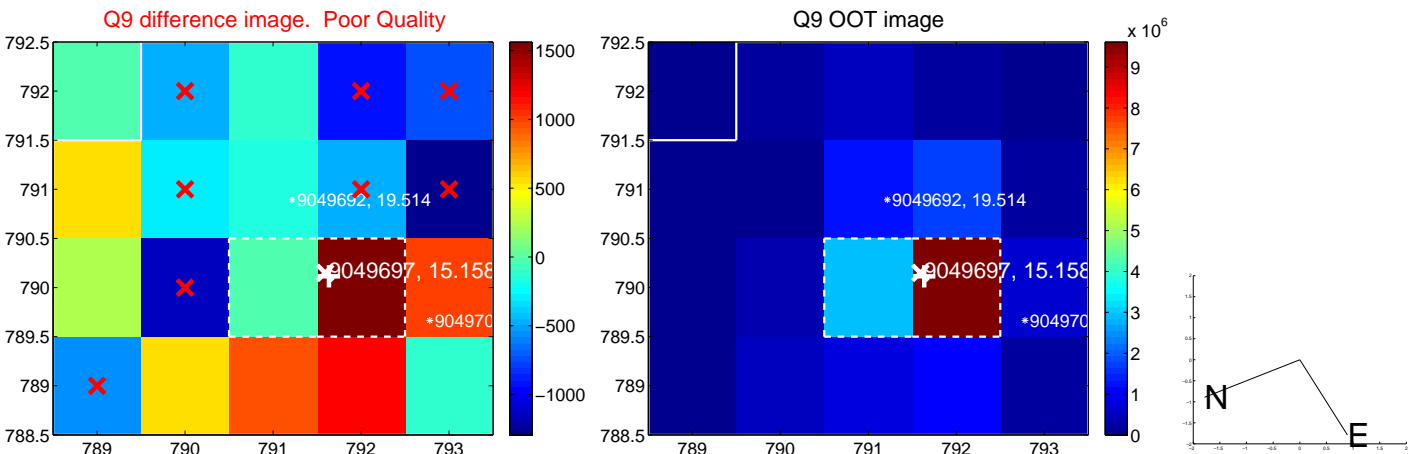
Q8 no difference image



Q8 no OOT image



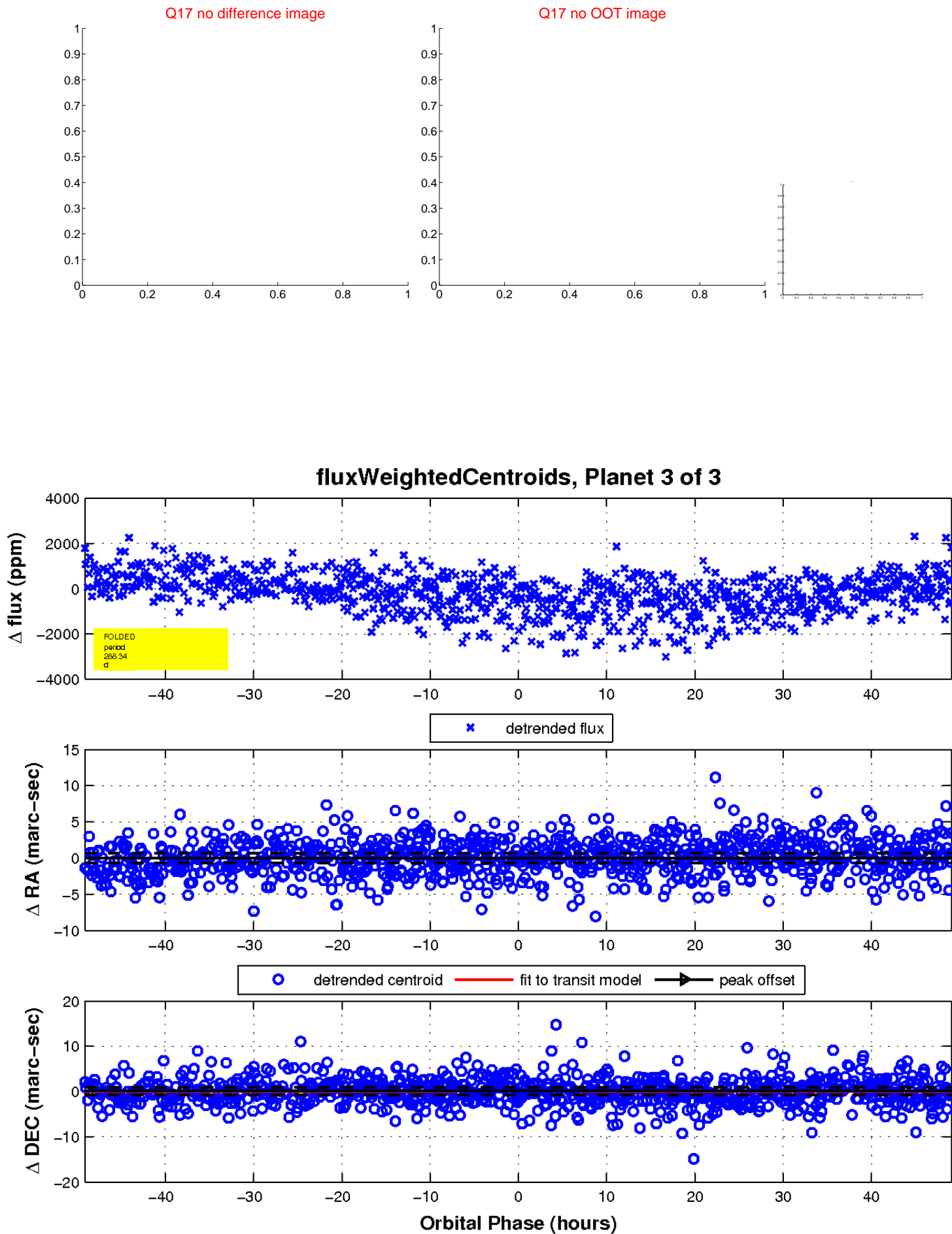
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

