

# KIC 005286045

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005286045-01	OBS	No	0.503876	131.616885	20.3	3.610	9.4	7.2	1.21	6847	0.56	16483.05
005286045-02	OBS	No	24.776117	155.043494	650.0	1.006	13.2	14.9	1.21	6847	3.46	91.50
005286045-03	OBS	No	13.997211	140.388169	165.4	4.129	10.8	6.6	1.21	6847	1.58	195.92
005286045-04	OBS	No	14.093368	132.666482	263.2	1.475	9.9	6.8	1.21	6847	2.28	194.14
005286045-05	OBS	No	11.428347	136.664083	182.8	1.724	8.5	5.7	1.21	6847	1.77	256.74
005286045-06	OBS	No	28.466030	146.235729	386.6	2.095	10.9	11.4	1.21	6847	2.44	76.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005286045-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS
005286045-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005286045-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

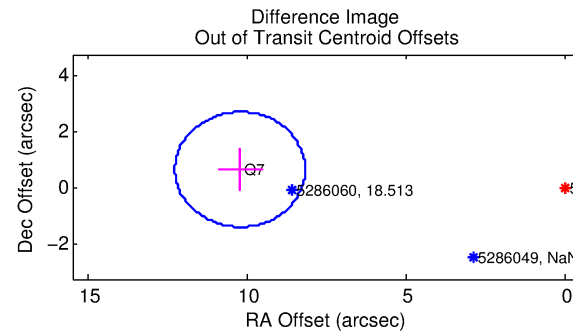
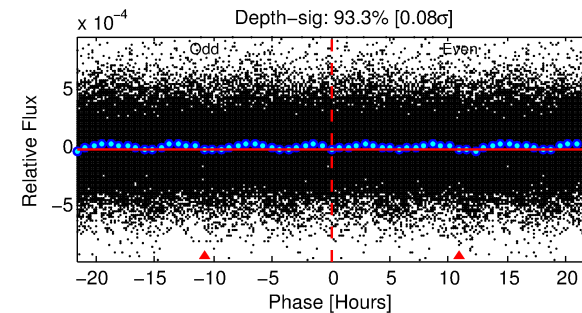
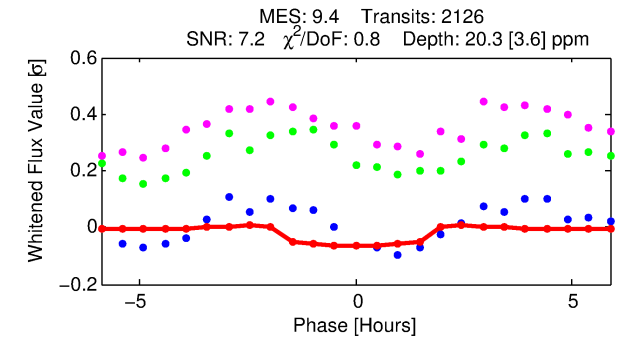
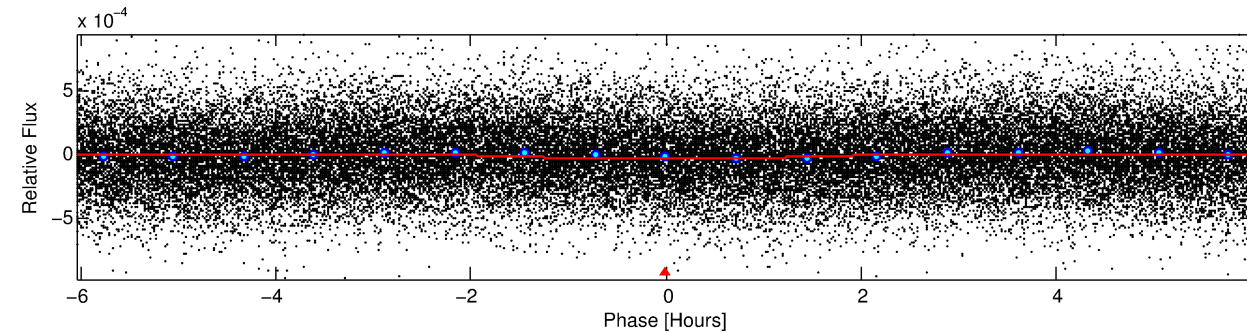
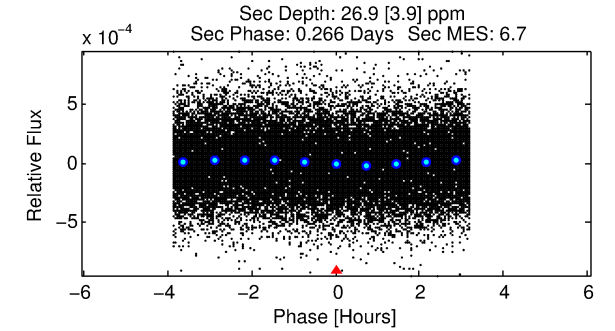
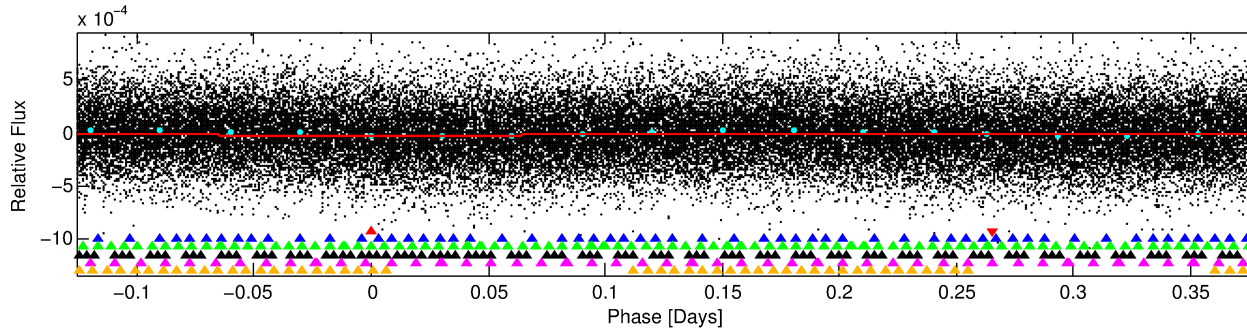
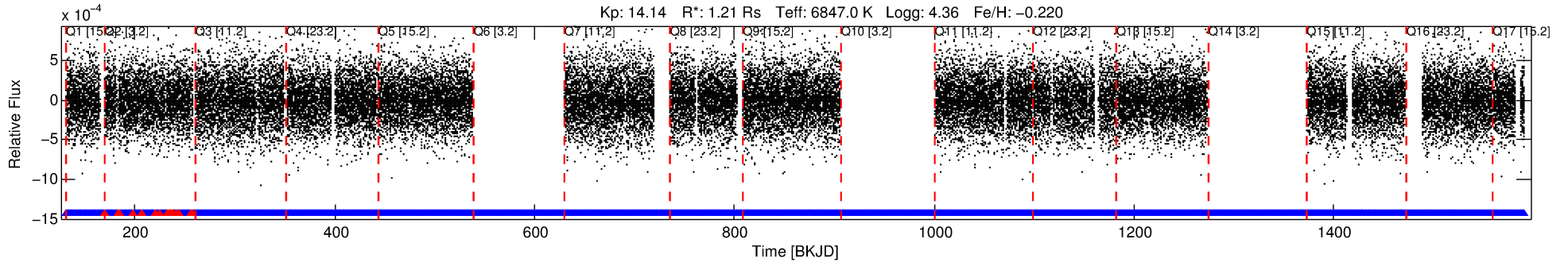
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005286045-01

No Significant Match Found

# DV One-Page Summary

KIC: 5286045 Candidate: 1 of 6 Period: 0.504 d



## DV Fit Results:

Period = 0.50388 [0.00001] d  
Epoch = 131.6169 [0.0050] BKJD  
Rp/R\* = 0.0042 [0.0042]  
a/R\* = 1.21 [2.18]  
b = 0.40 [11.98]  
Seff = 16483.05 [6227.90]  
Teq = 2889 [273] K  
Rp = 0.56 [0.58] Re  
a = 0.0133 [0.0032] AU  
Ag = 8.28 [16.86] [0.43σ]  
Teff = 7578 [3815] K [1.23σ]

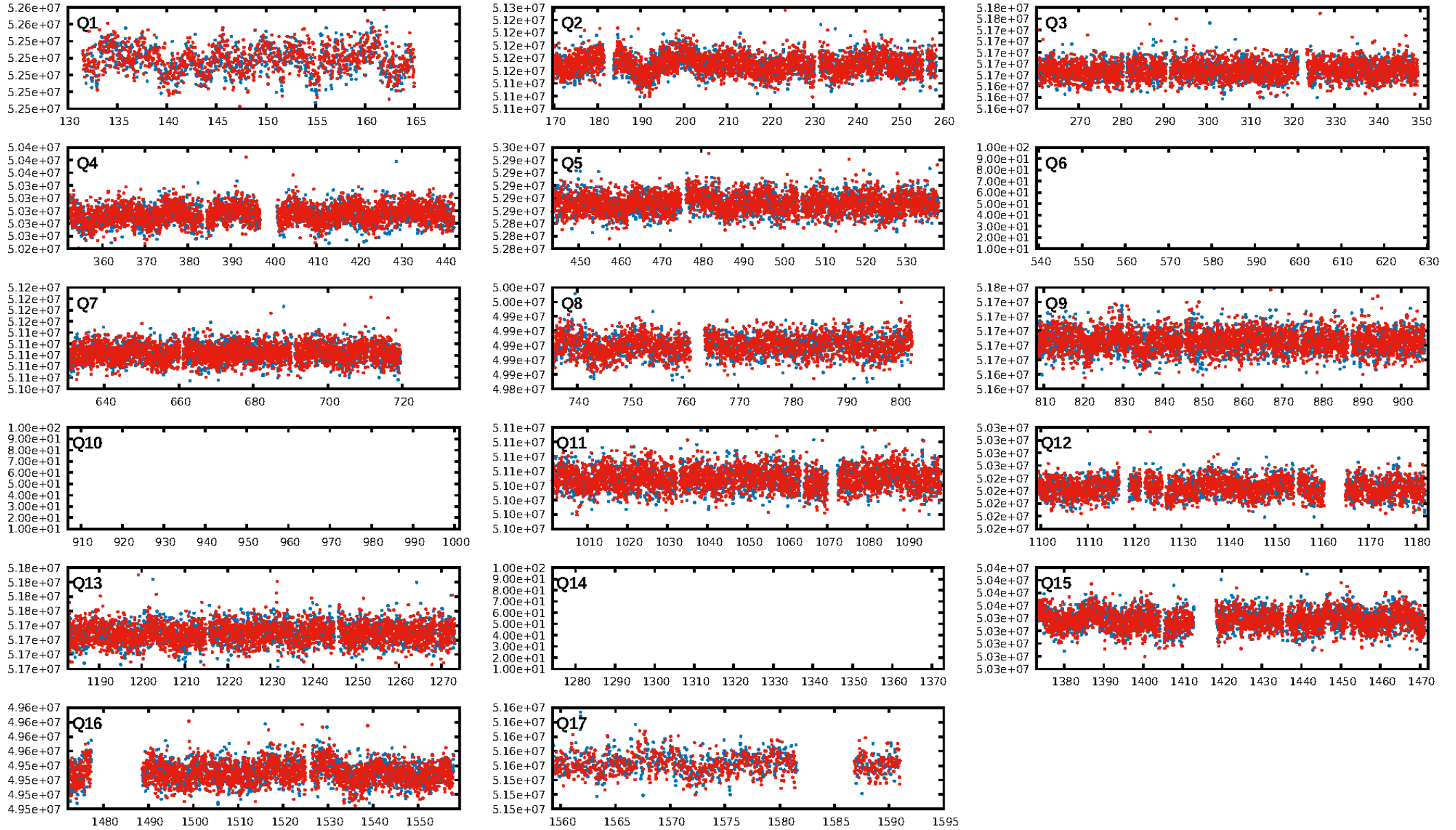
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [65.53σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: 1.39e-17  
RollingBand-fgt: 0.99 [1988/2006]  
GhostDiagnostic-chr: -5.282  
Centroid-sig: N/A  
Centroid-so: 1.192 arcsec [1.20σ]  
OotOffset-rm: 10.248 arcsec [15.02σ]  
KicOffset-rm: 9.449 arcsec [13.84σ]  
OotOffset-st: 0/1/0/0 [1]  
KicOffset-st: 0/1/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [14/14]

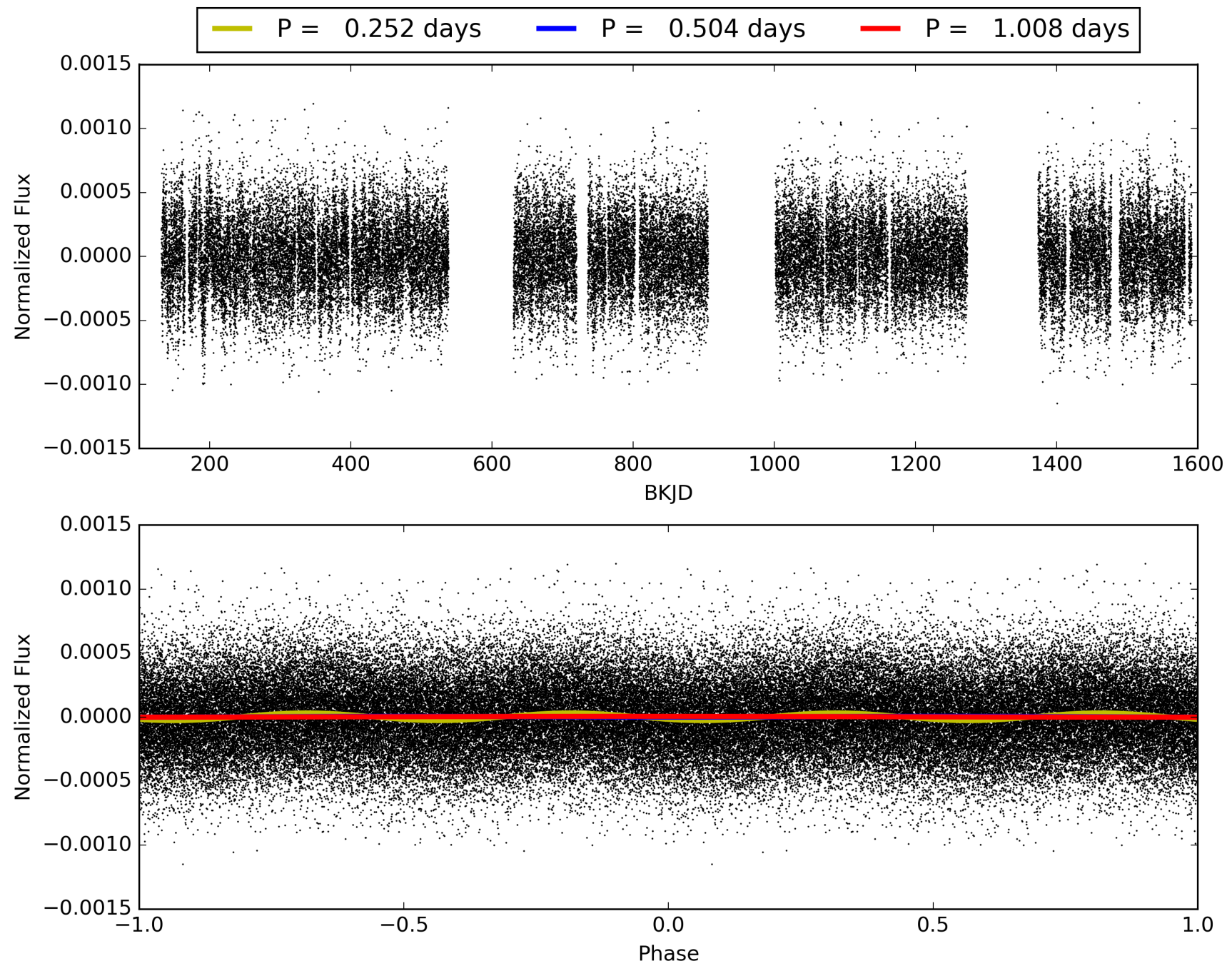
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005286045-01, PDC Light Curves



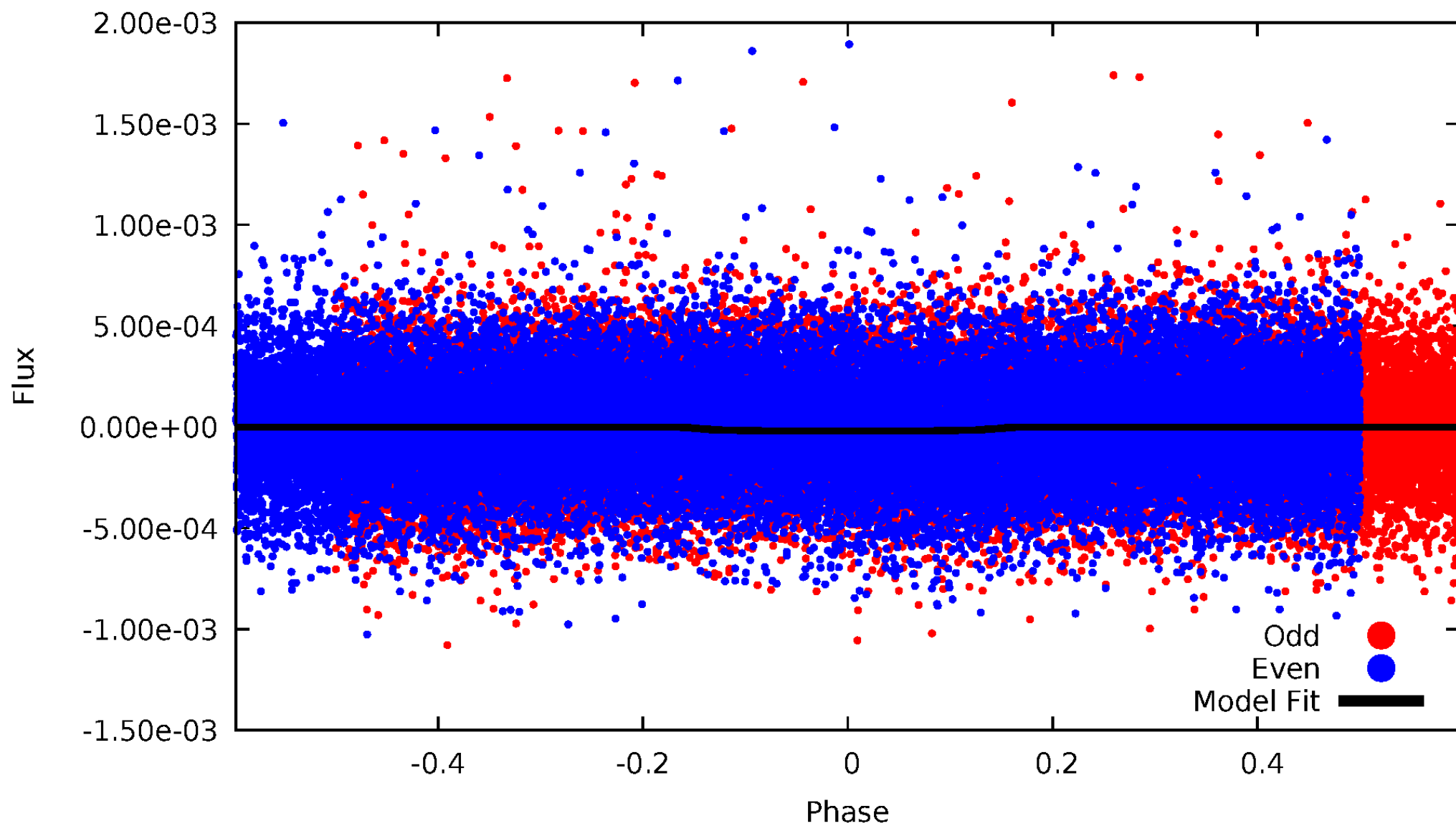
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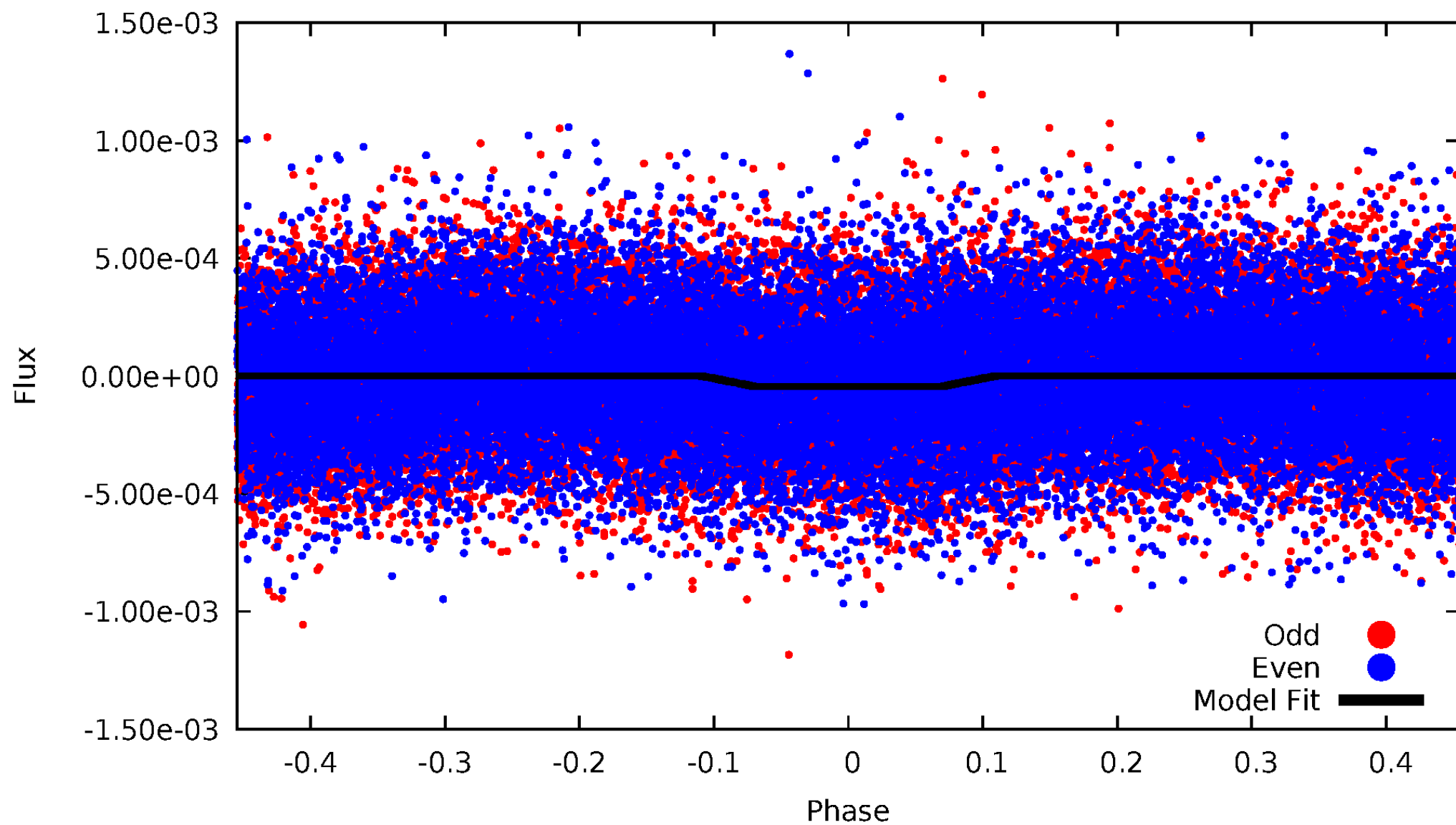
# DV Odd/Even

TCE 005286045-01



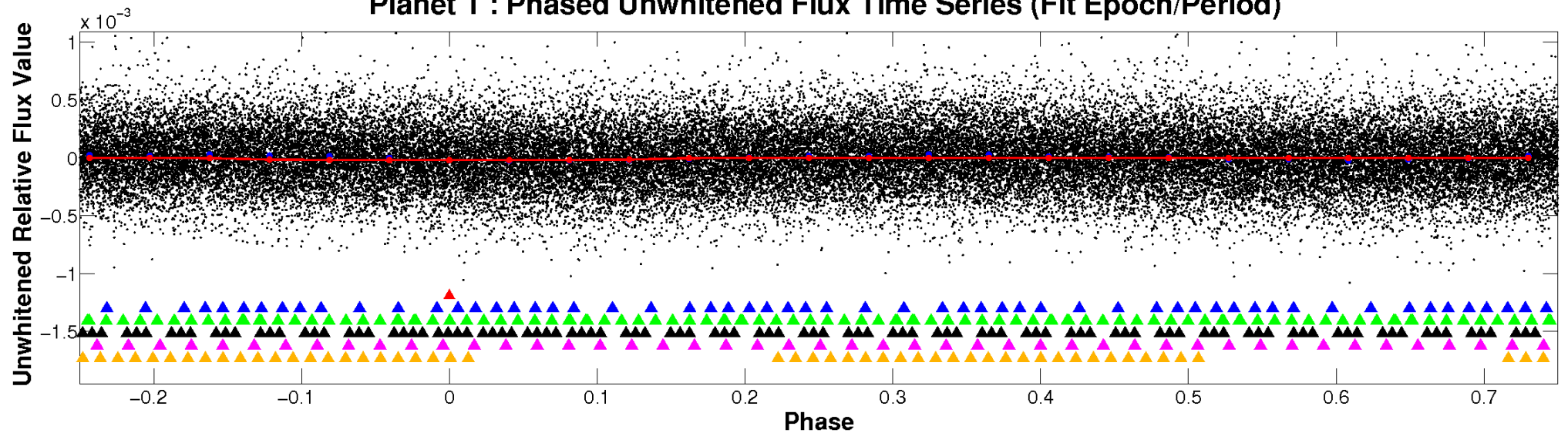
# ALT Odd/Even

TCE 005286045-01

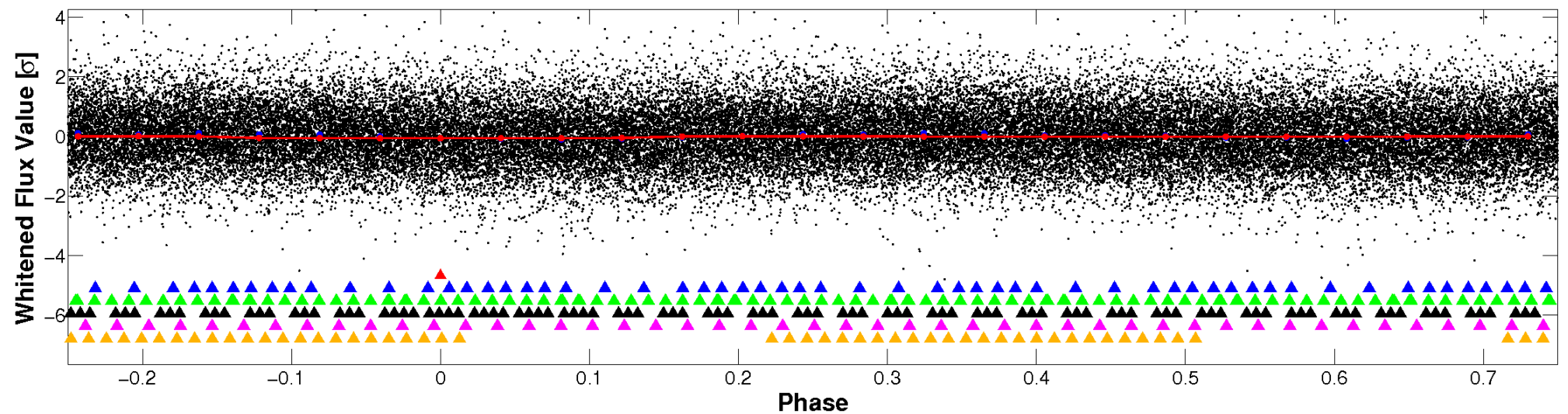


# Non-Whitened Vs. Whitened Light Curve

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

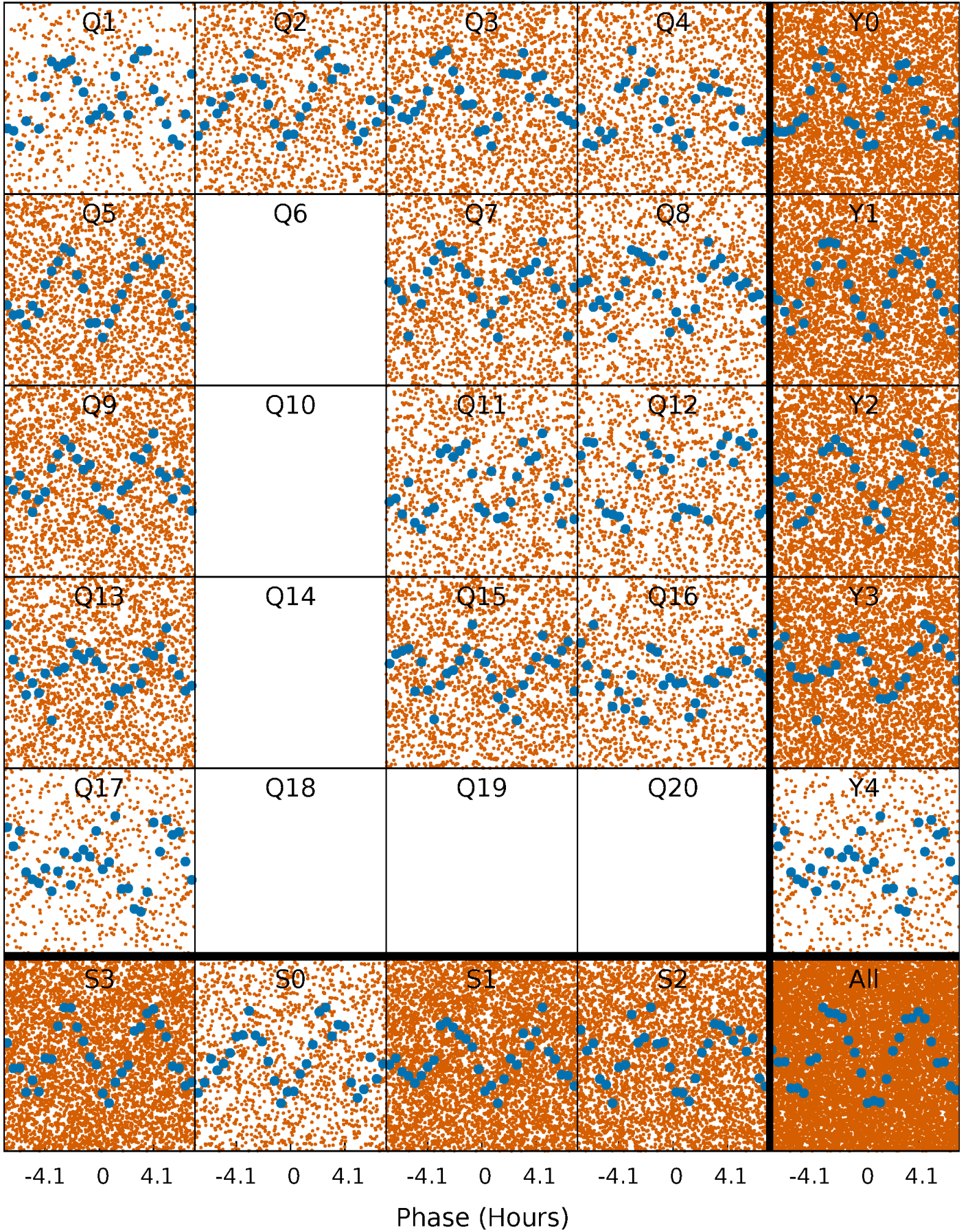


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

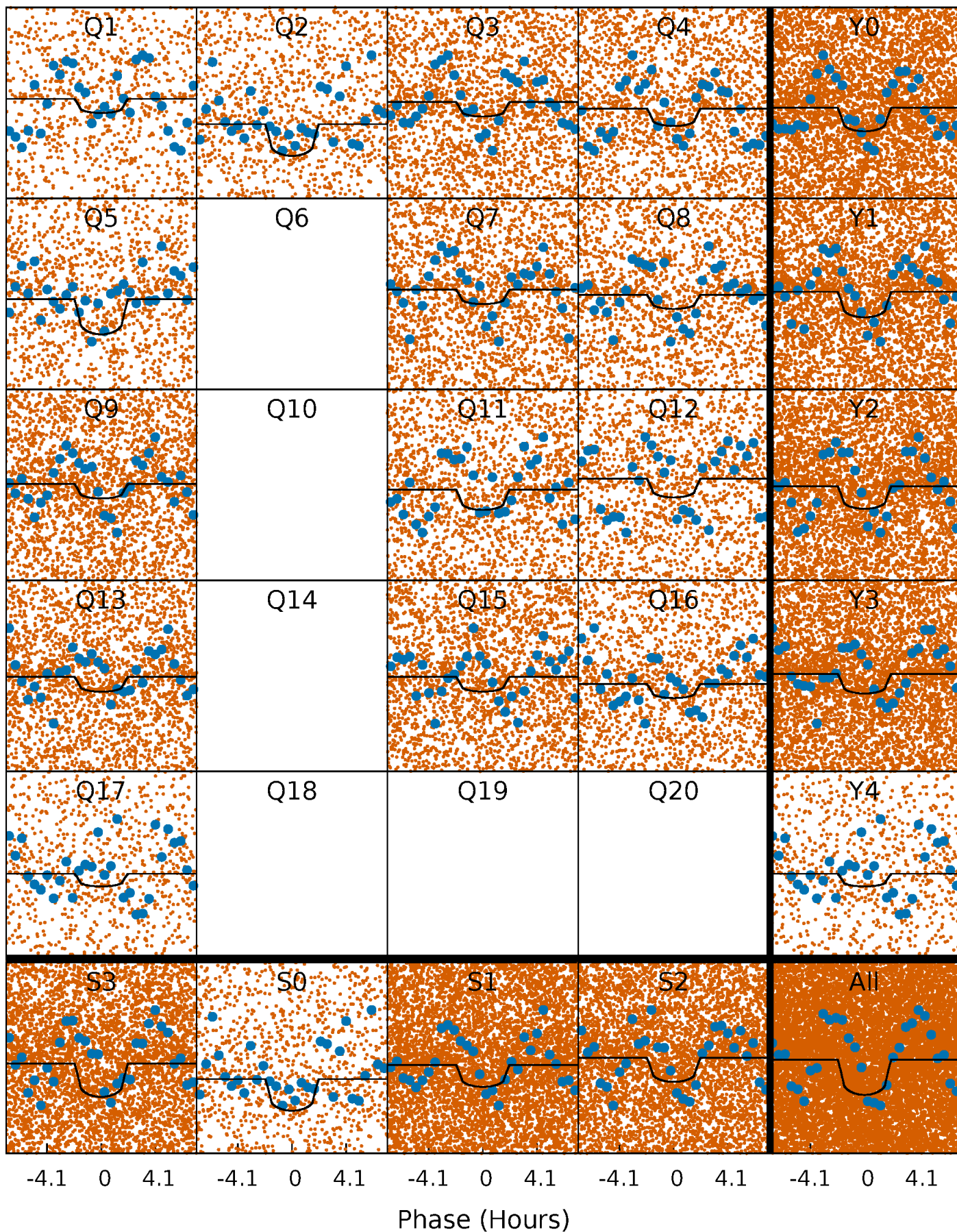
TCE 005286045-01   P= 0.503876 Days    $T_0=131.616884$  (BKJD)





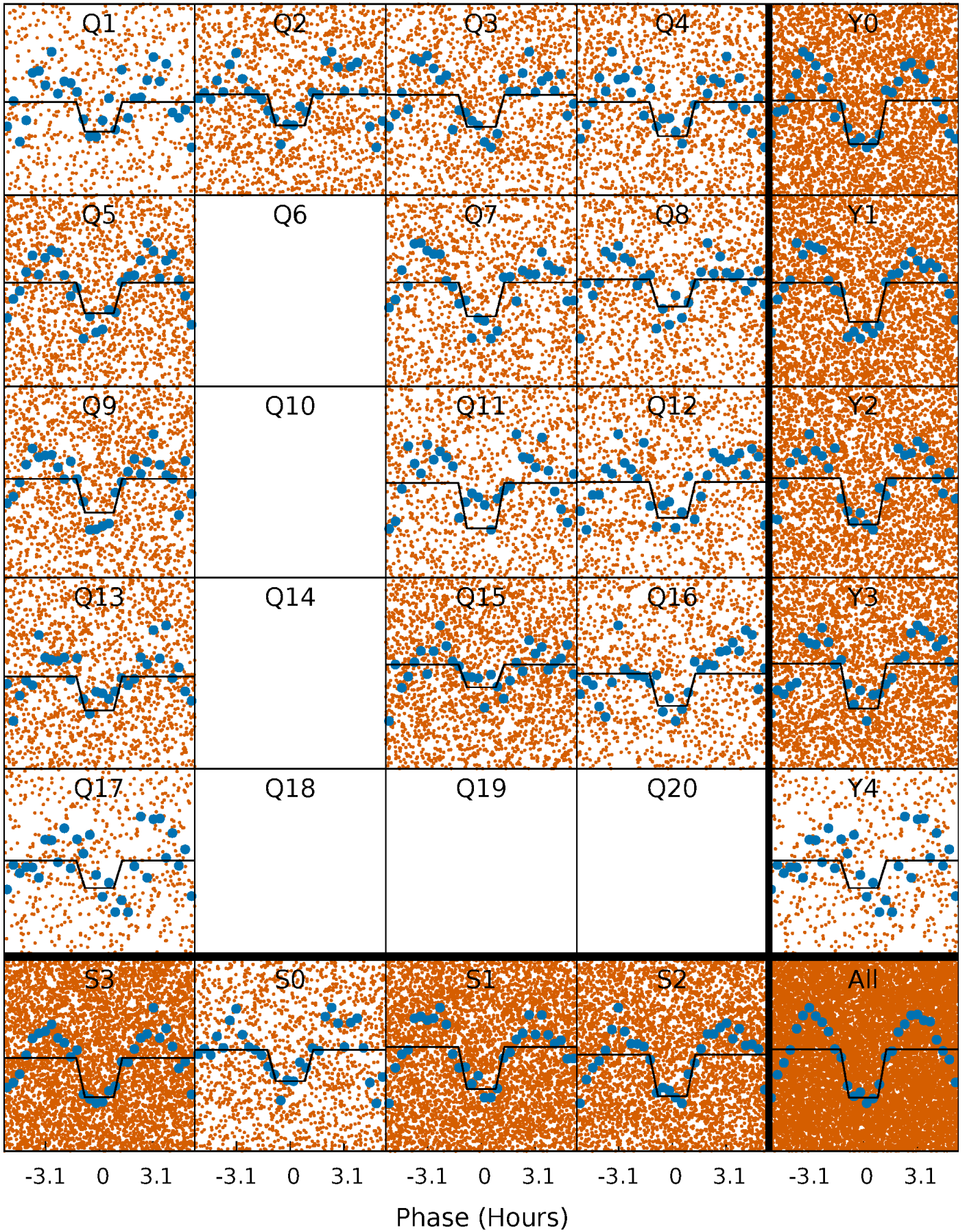
# DV Quarter-Phased Transit Curves

TCE 005286045-01 P= 0.503876 Days  $T_0=131.616884$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005286045-01 P= 0.503903 Days  $T_0=131.614148$  (BKJD)

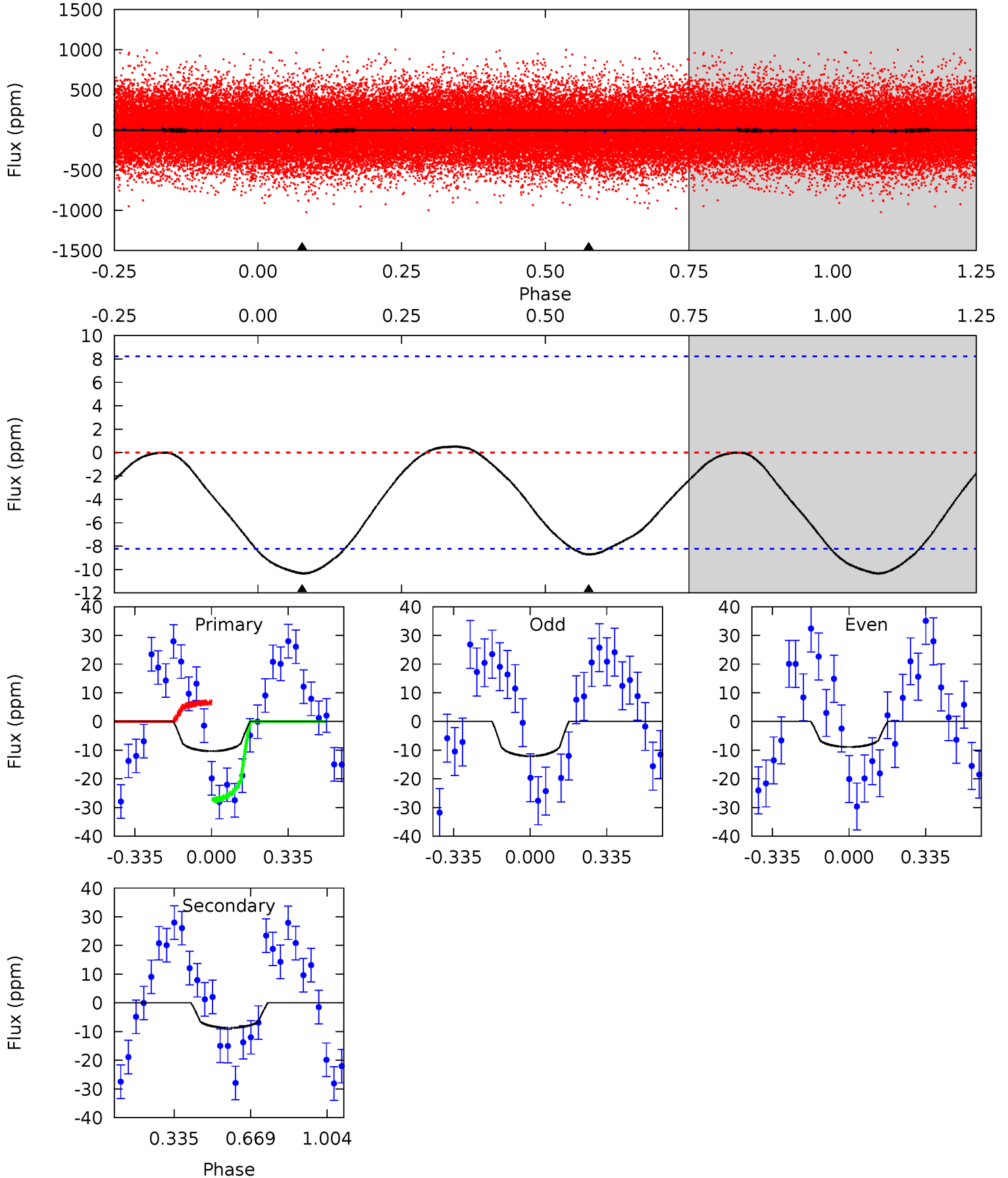




# DV Model-Shift Uniqueness Test

005286045-01, P = 0.503876 Days, E = 131.113008 Days

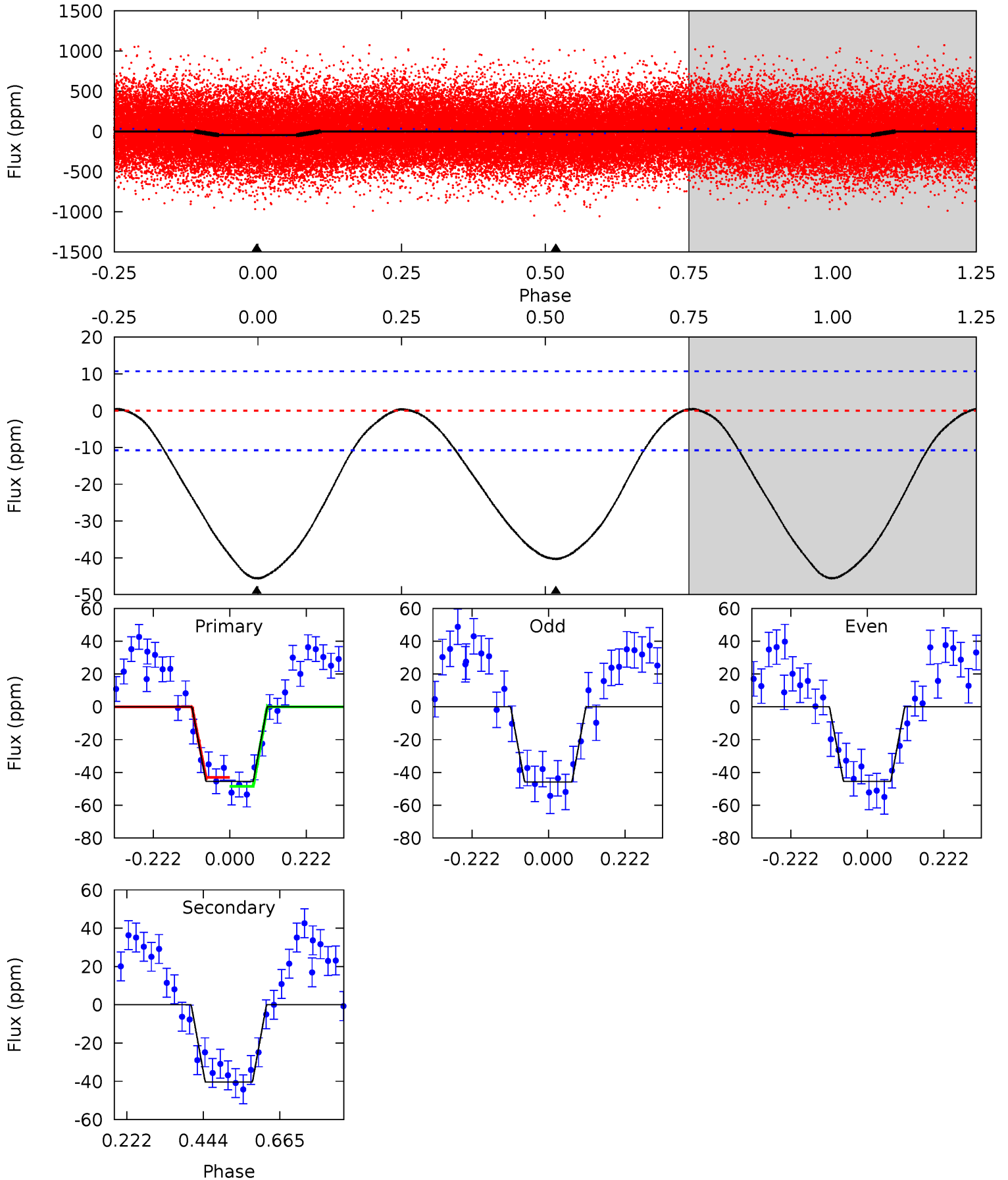
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.42	4.56	0	0	4.30	0.96	0.15	5.42	5.42	4.56	4.56	0.83	0.99	0.05	5.50



# Alt Model-Shift Uniqueness Test

005286045-01, P = 0.503903 Days, E = 131.110245 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
18.6	16.5	0	0	4.39	1.22	0.29	18.6	18.6	16.5	16.5	0.09	1.04	0.01	1.09





### Stellar Parameters For KIC 005286045

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6847^{+167}_{-286}$	$4.358^{+0.060}_{-0.180}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.357}_{-0.127}$	$1.239^{+0.178}_{-0.160}$	$0.977^{+0.256}_{-0.465}$
	+2%/-4%	+1%/-4%	+114%/-136%	+29%/-10%	+14%/-13%	+26%/-48%
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 005286045-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-9 \pm 2$	$0.69^{+0.56}_{-0.44}$	$4083^{+251}_{-210}$	$4965^{+3534}_{-1404}$	$1.694^{+9.821}_{-1.176}$
Alt.	$-40 \pm 2$	$0.96^{+0.57}_{-0.47}$	$4087^{+259}_{-211}$	$6322^{+3502}_{-1394}$	$4.102^{+11.650}_{-2.471}$

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

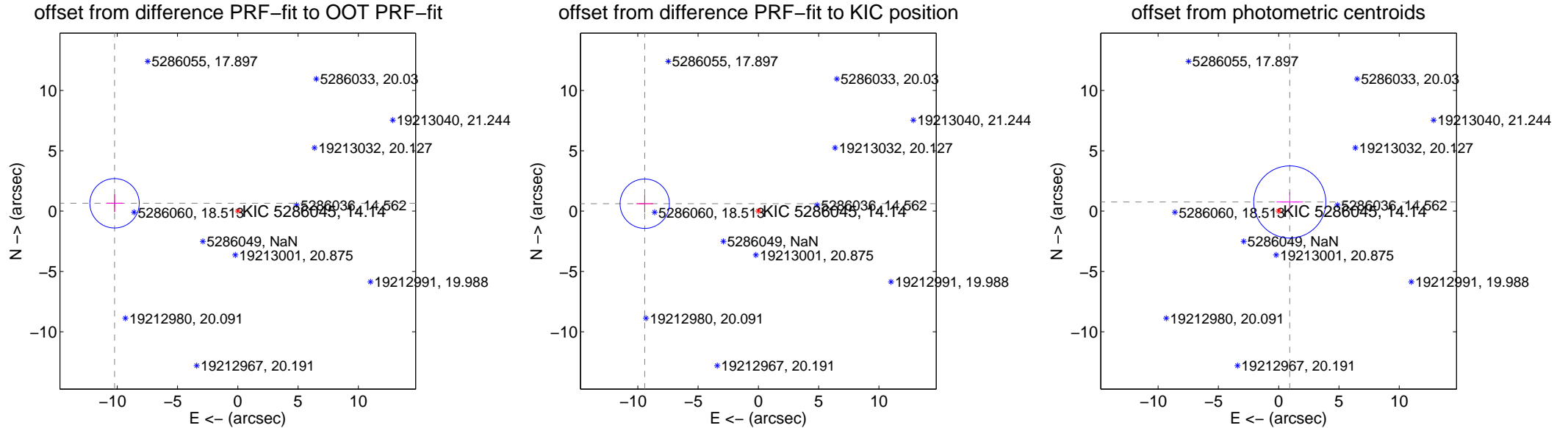
## DV Centroid Data

Supplemental centroid analysis for 005286045-01. Kepler magnitude: 14.14. Transit SNR 7.15

There are 0 quarters with good PRF difference image offsets

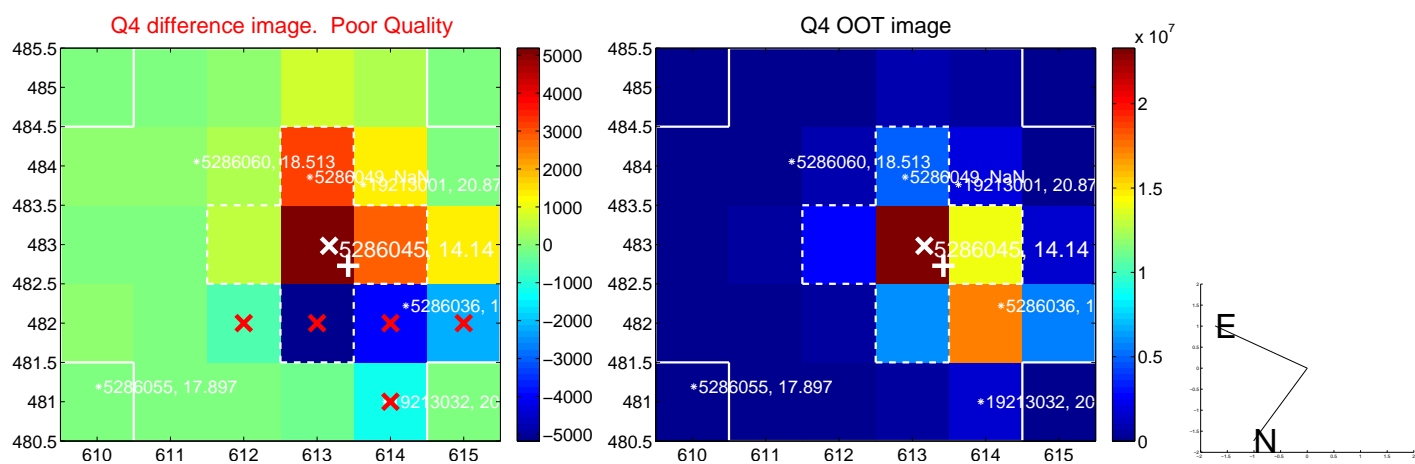
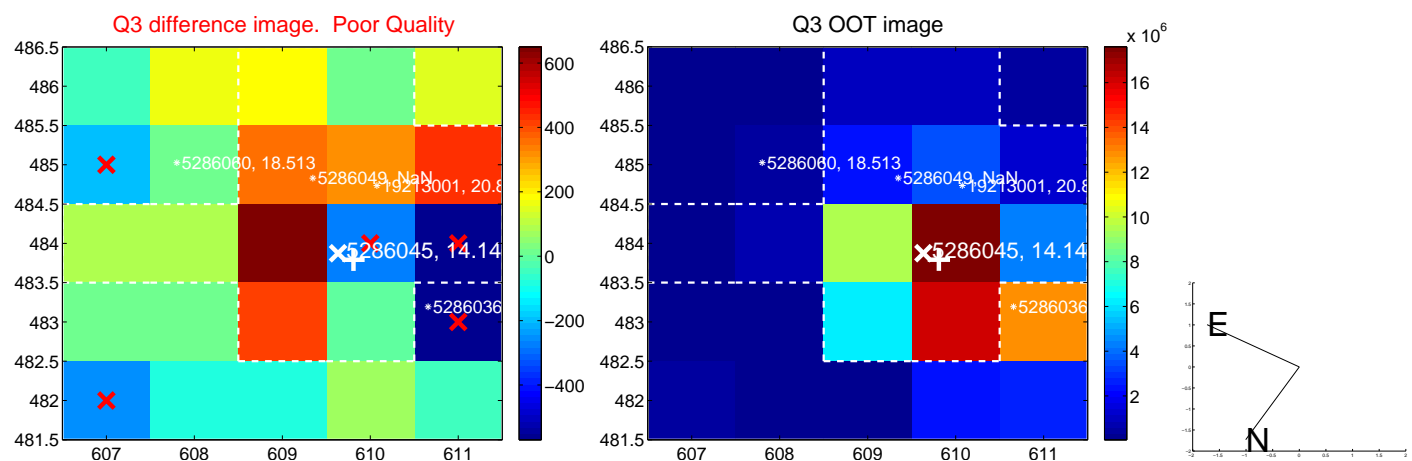
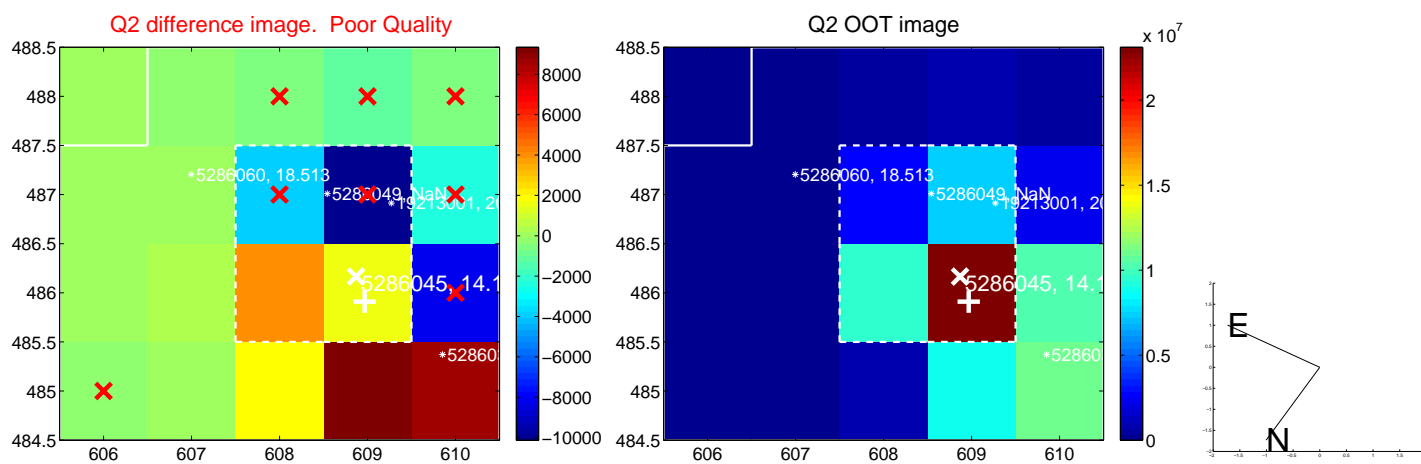
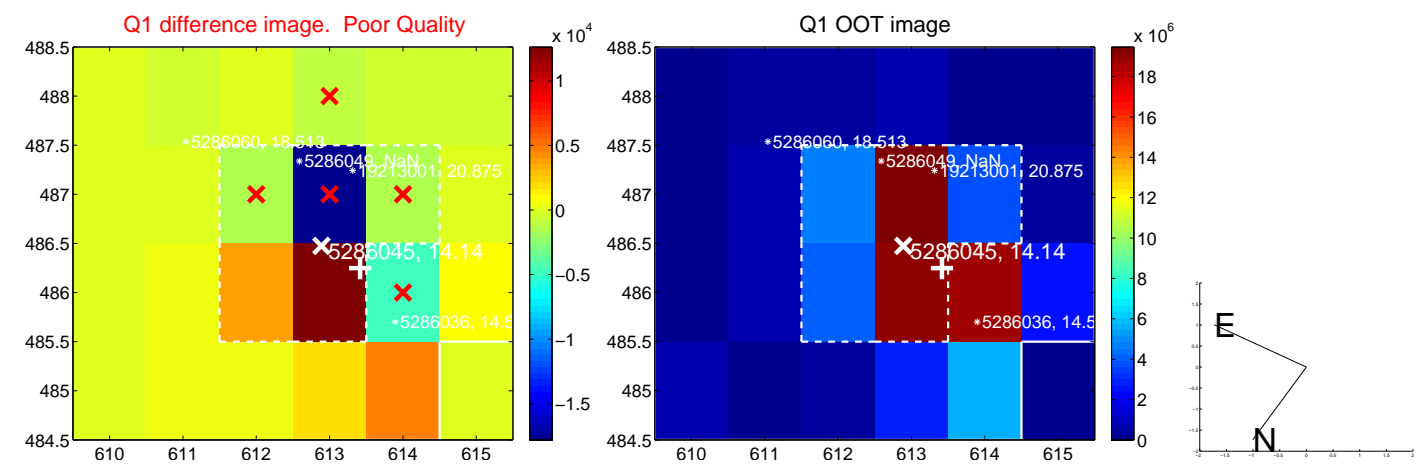
The direct PRF centroid is offset from the target star catalog position by about 0.80 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	10.248 $\pm$ 0.682	15.02	10.228 $\pm$ 0.682	0.650 $\pm$ 0.727
PRF-fit source offset from KIC position	9.449 $\pm$ 0.683	13.84	9.429 $\pm$ 0.682	0.616 $\pm$ 0.727
photometric centroid source offset	1.19 $\pm$ 1.00	1.20	-0.92 $\pm$ 1.10	0.76 $\pm$ 0.83

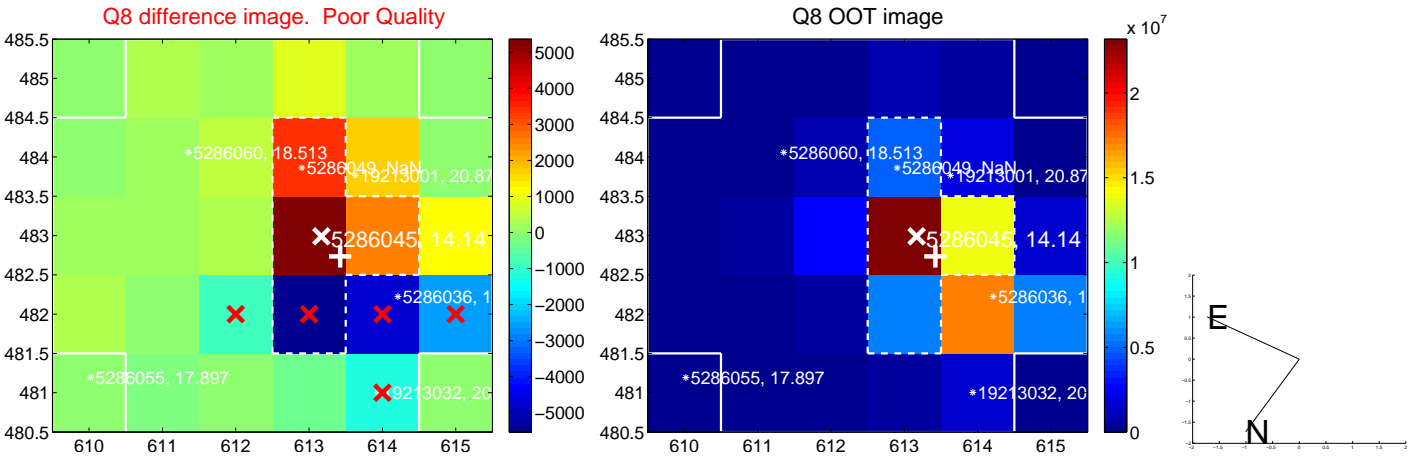
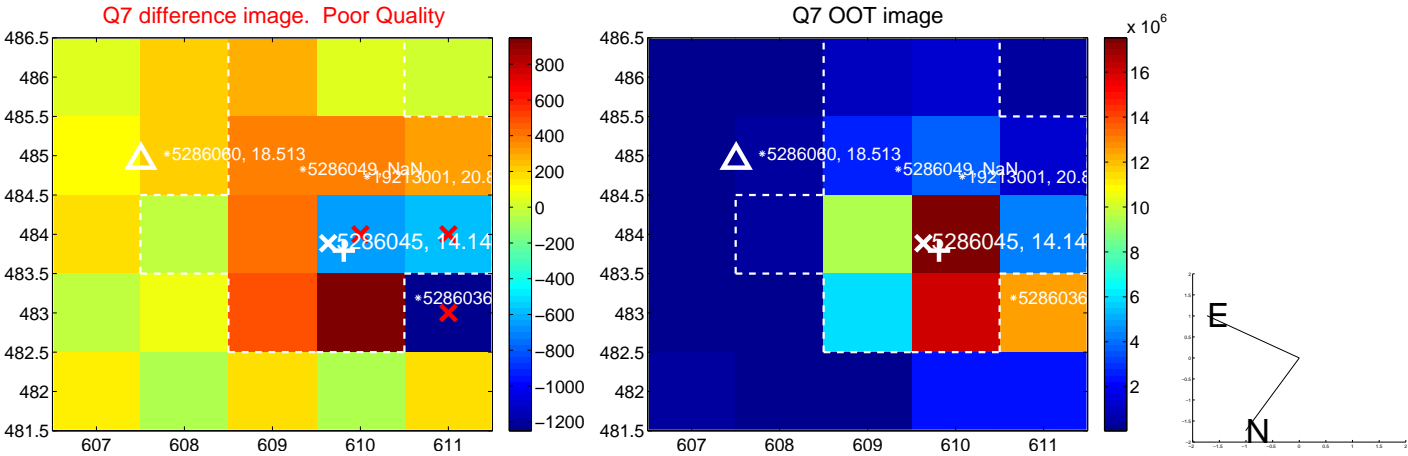
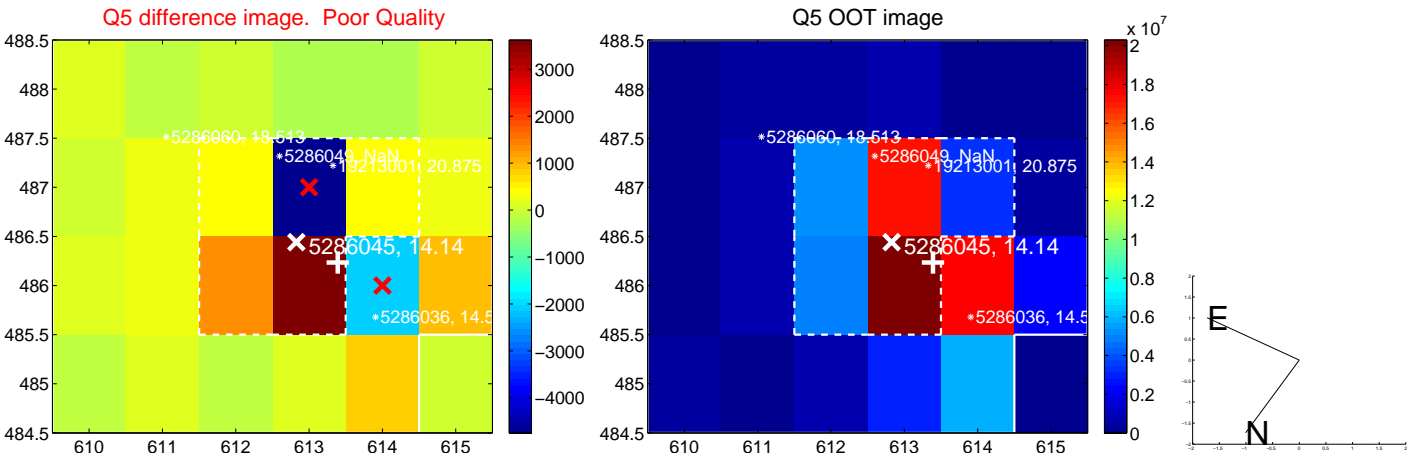


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

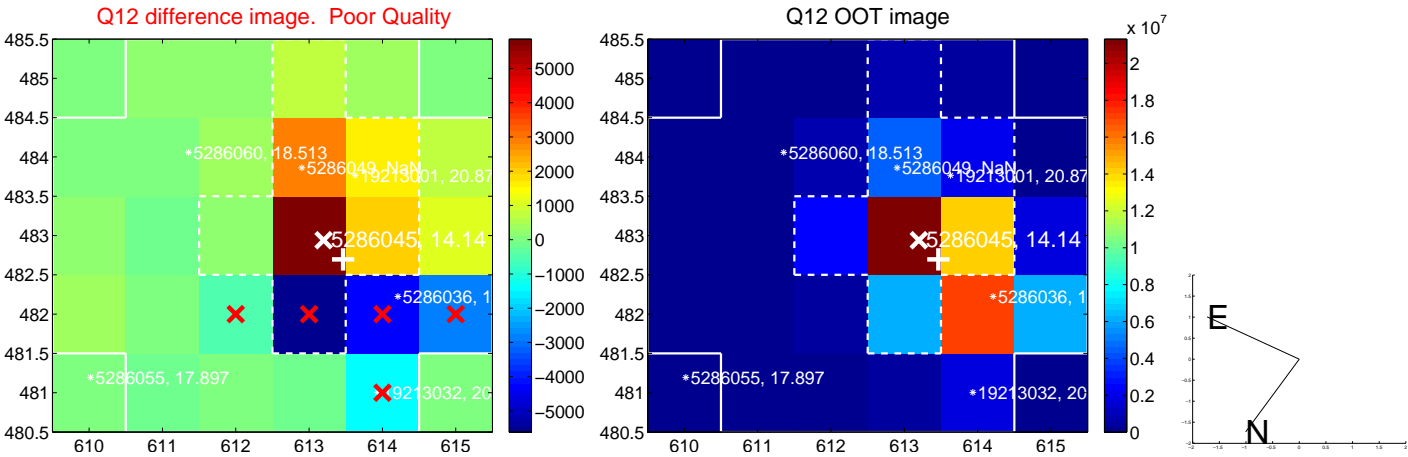
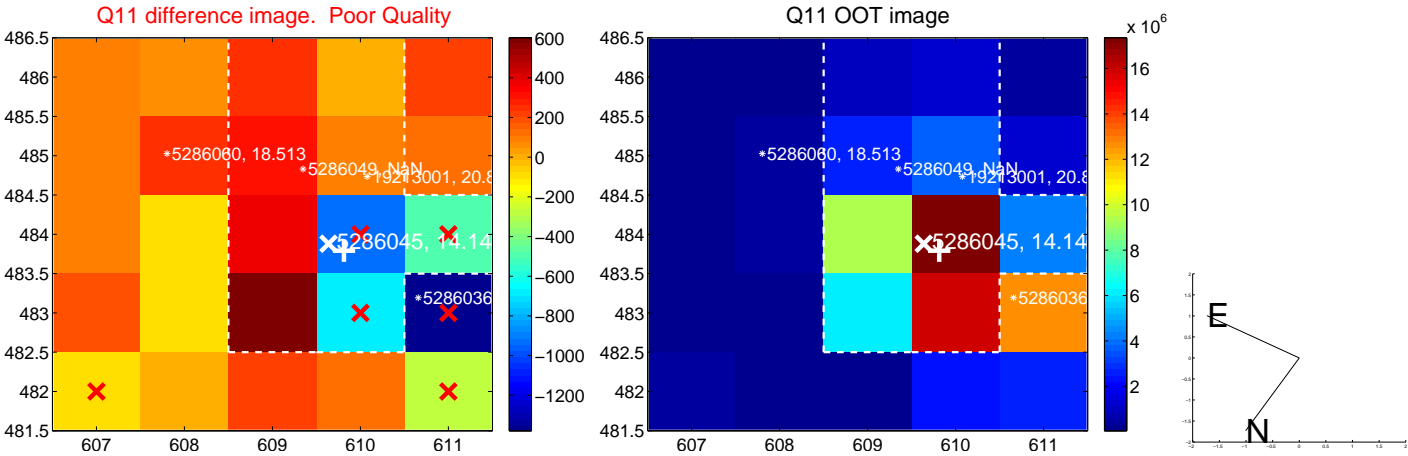
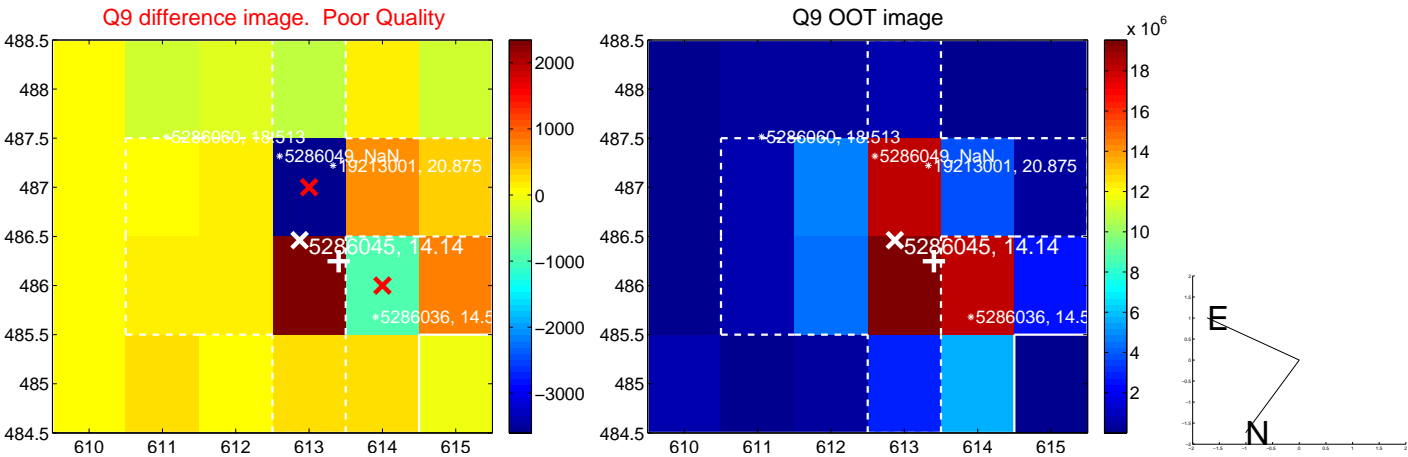


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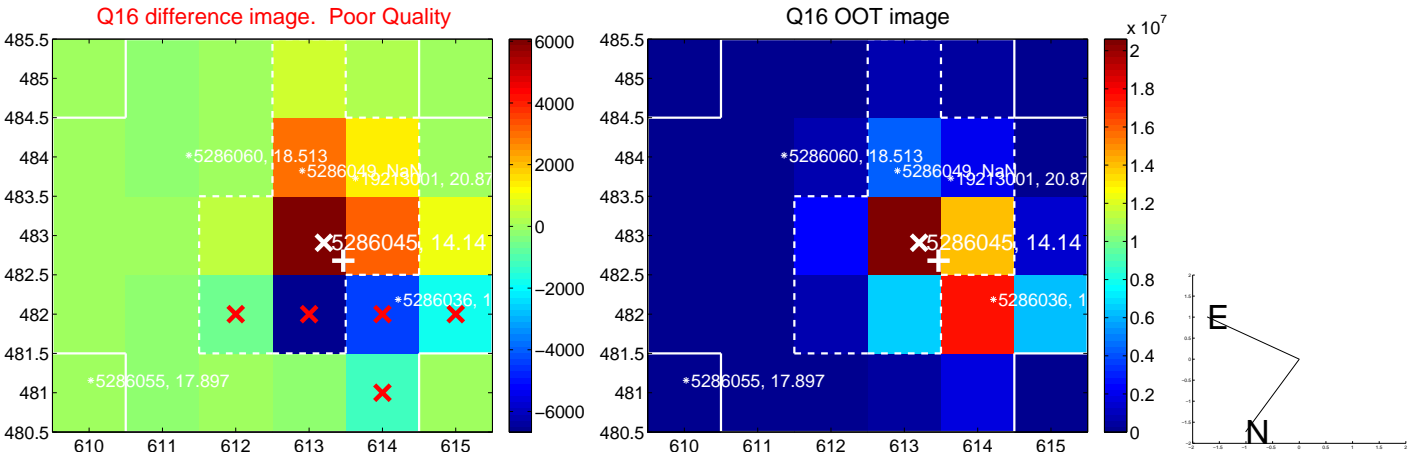
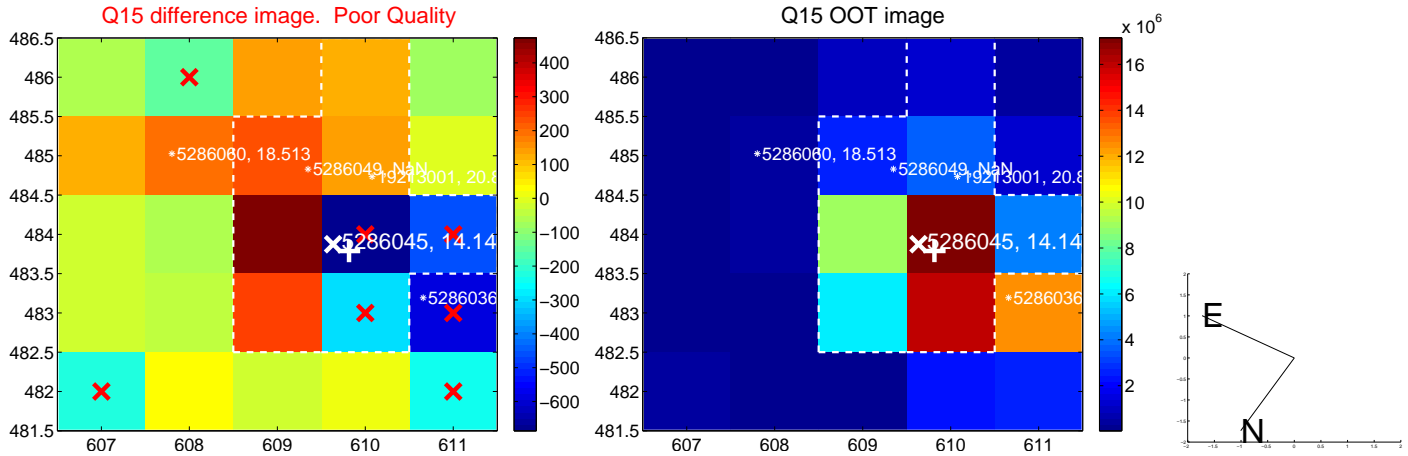
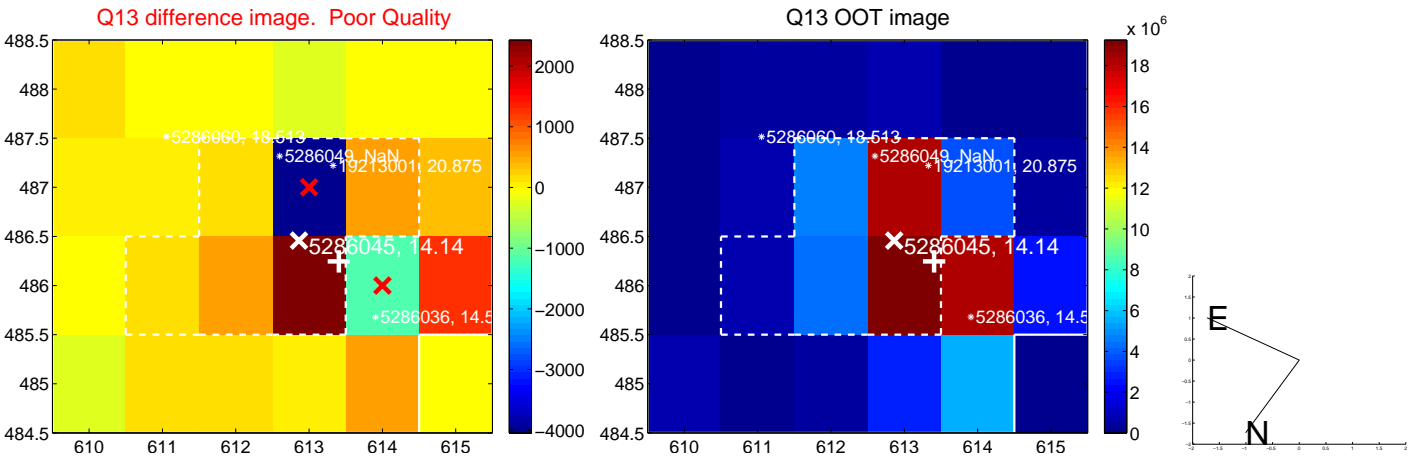




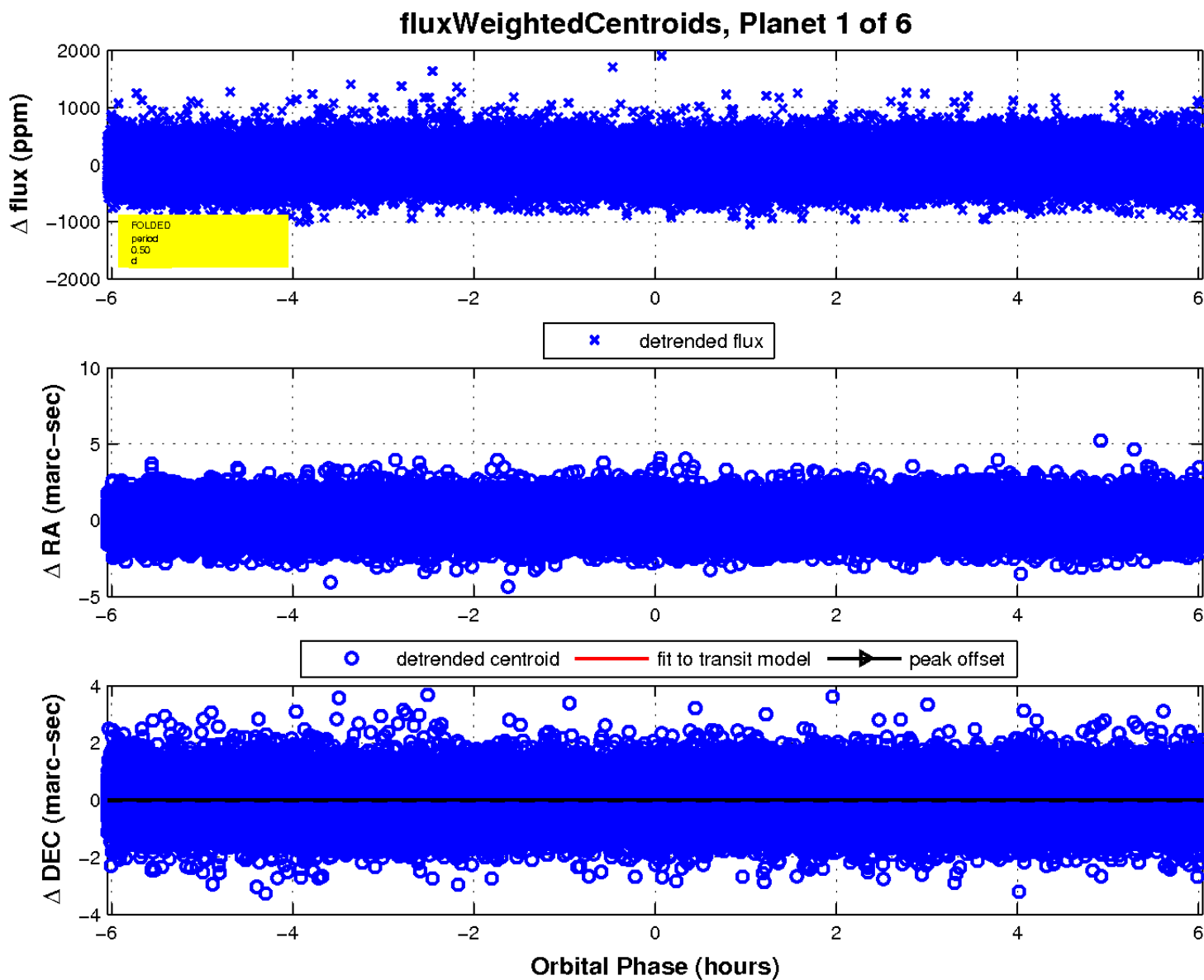
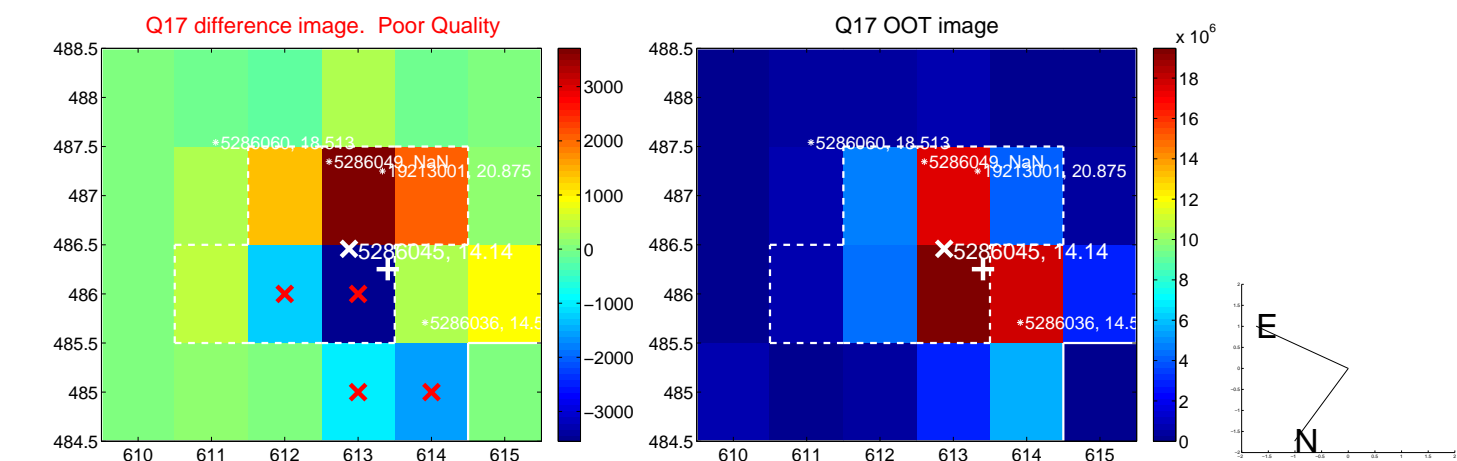
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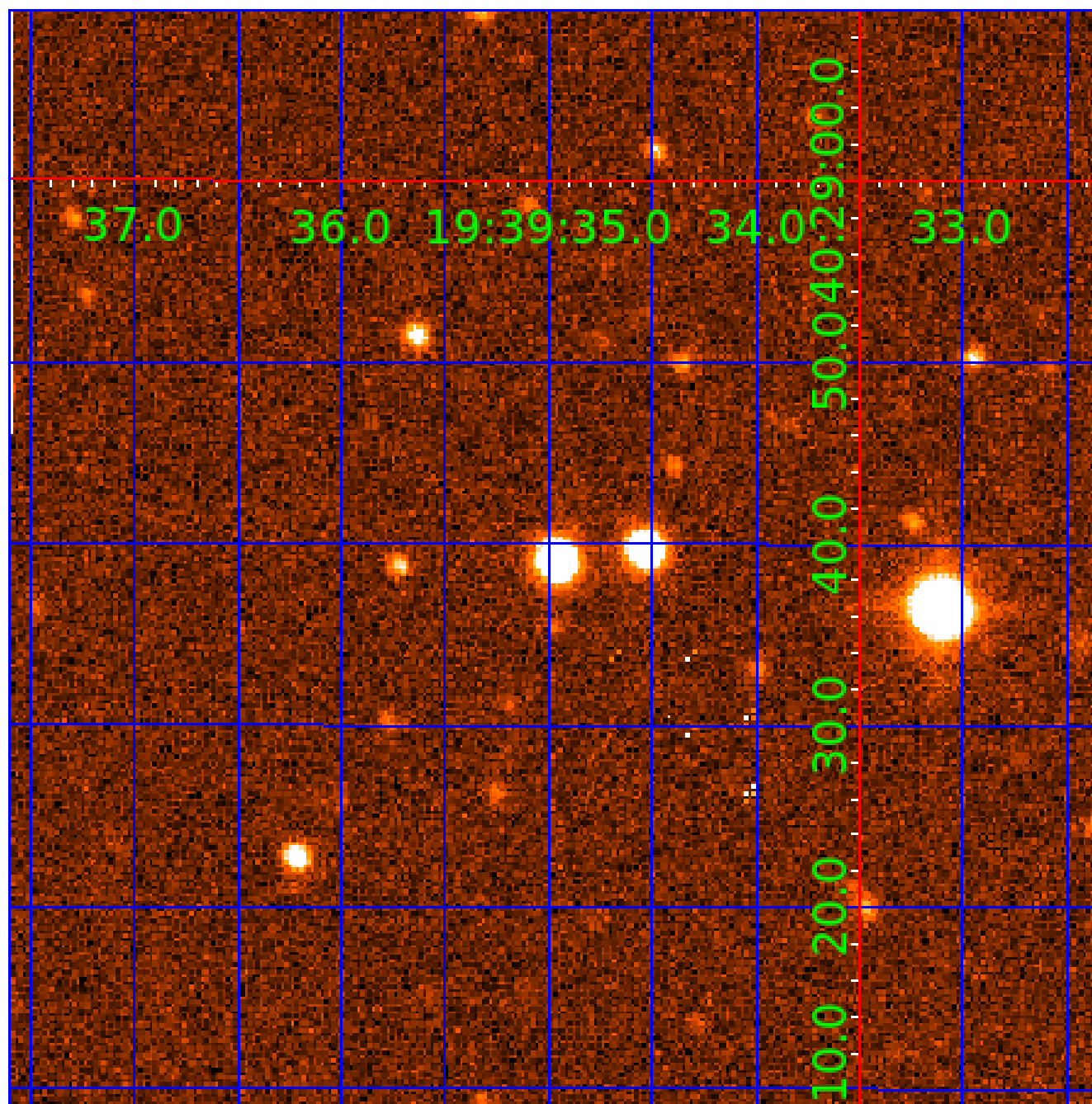


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UKIRT Image

Declination





# KIC 005286045

## 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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005286045-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005286045-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
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005286045-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

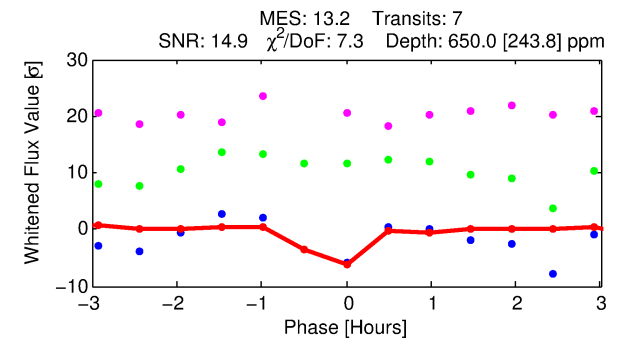
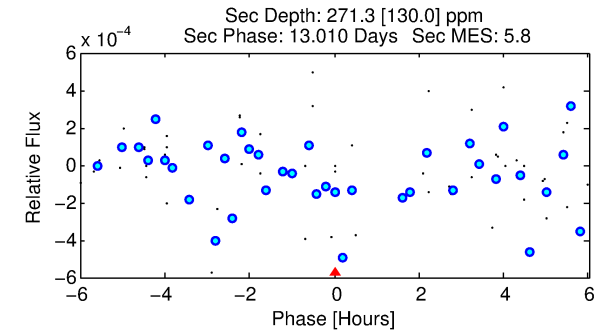
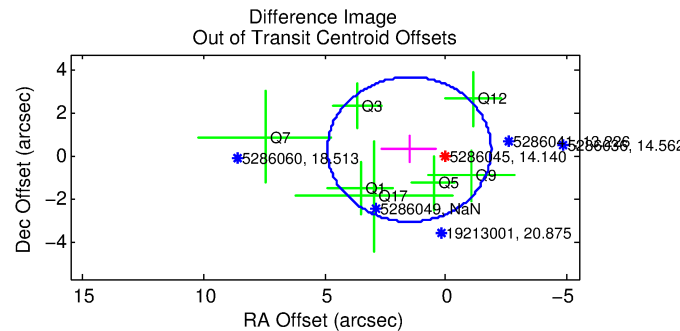
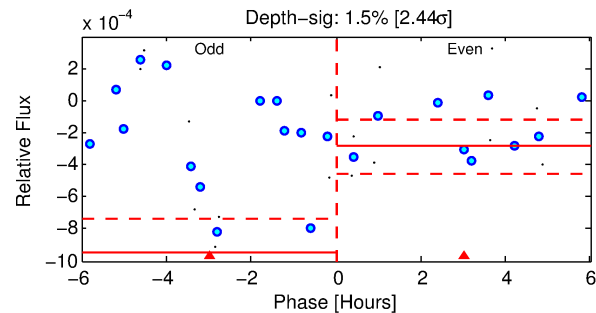
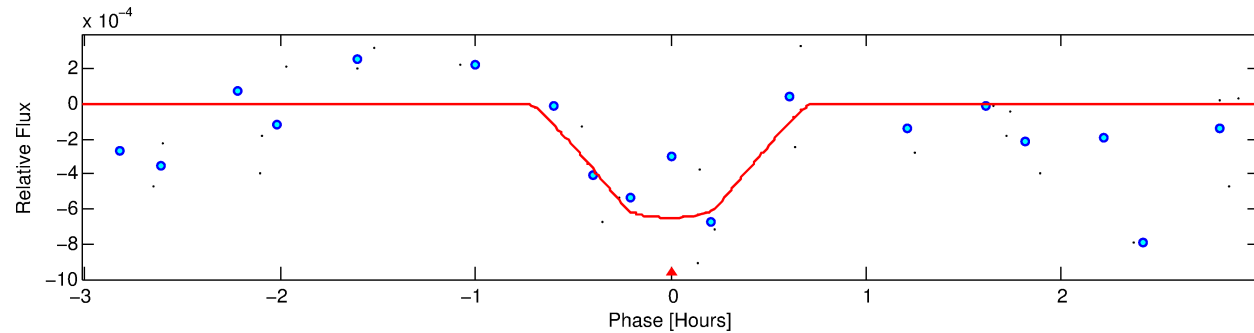
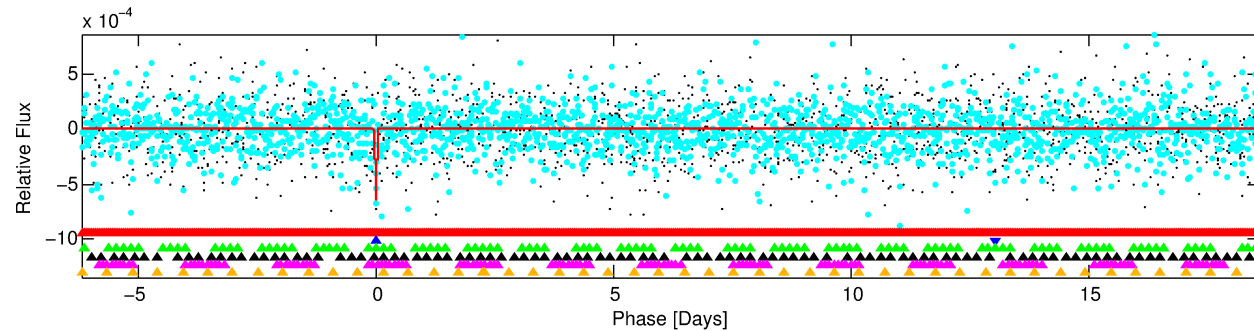
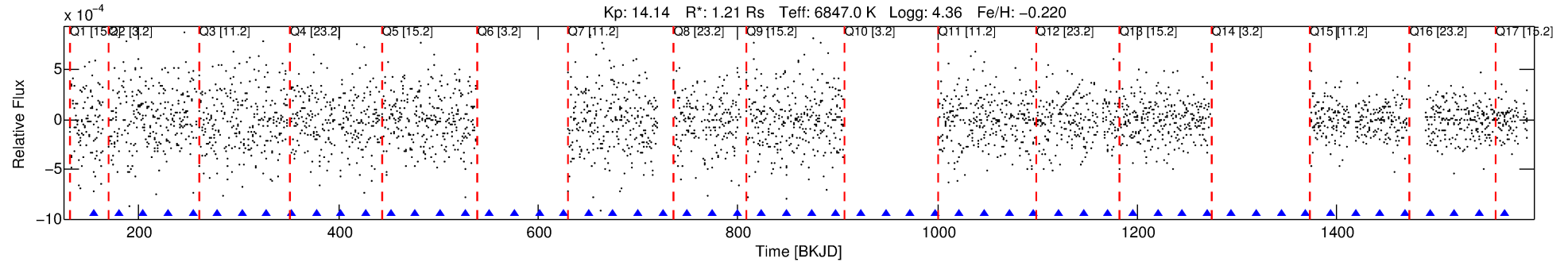
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005286045-02

No Significant Match Found

# DV One-Page Summary

KIC: 5286045 Candidate: 2 of 6 Period: 24.776 d



## DV Fit Results:

Period = 24.77612 [0.00021] d  
Epoch = 155.0435 [0.0067] BKJD  
Rp/R\* = 0.0261 [0.0527]  
a/R\* = 117.63 [1326.11]  
b = 0.81 [4.73]  
Seff = 91.50 [34.57]  
Teq = 789 [74] K  
Rp = 3.46 [7.05] Re  
a = 0.1779 [0.0427] AU  
Ag = 395.18 [1610.77] [0.24 $\sigma$ ]  
Teffp = 5437 [5525] K [0.84 $\sigma$ ]

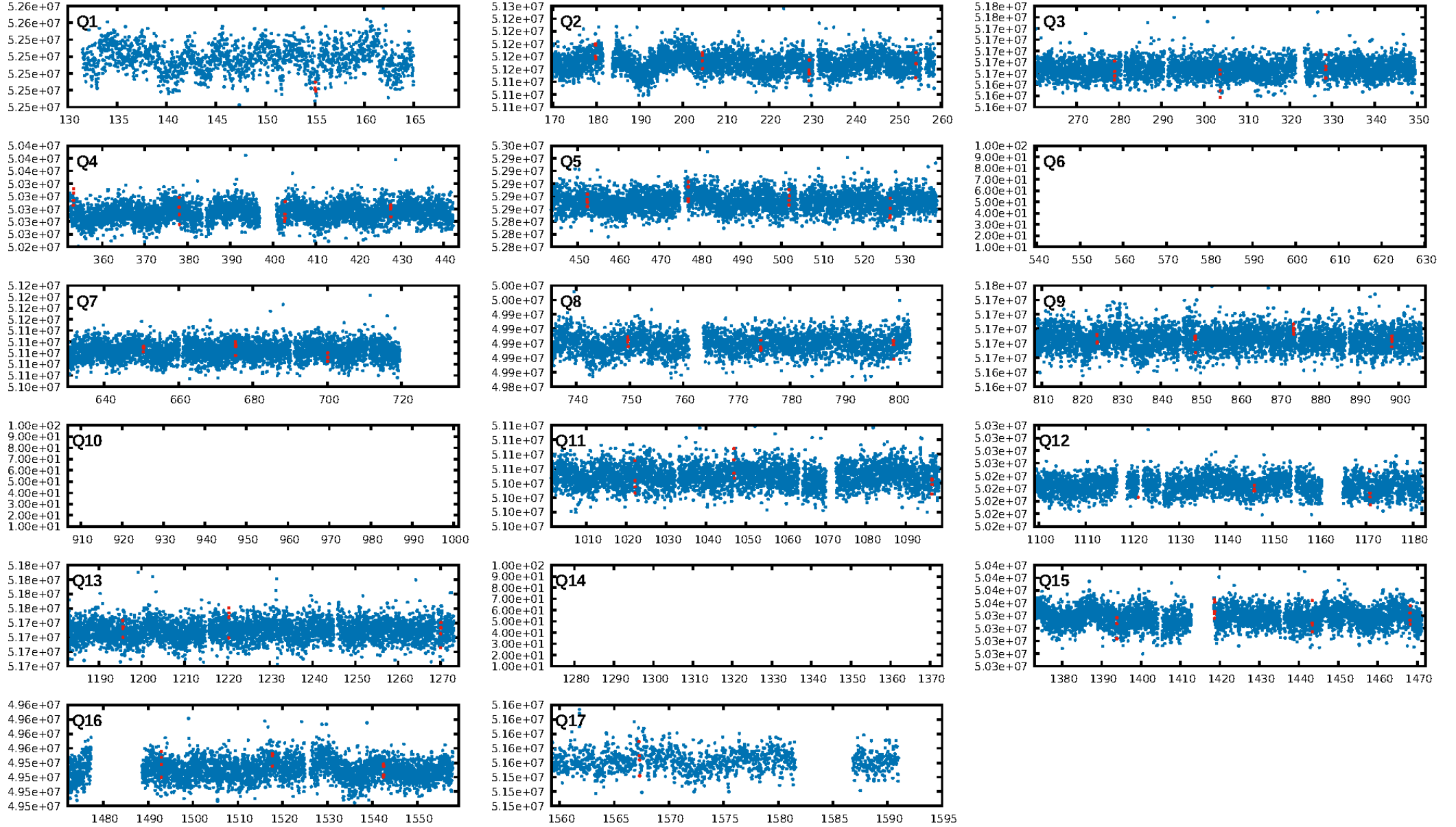
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [143.64 $\sigma$ ]  
LongPeriod-sig: 100.0% [38.10 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 1.1%  
Bootstrap-pfa: 1.92e-21  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 0.404  
Centroid-sig: N/A  
Centroid-so: 1.976 arcsec [4.17 $\sigma$ ]  
OotOffset-rm: 1.534 arcsec [1.36 $\sigma$ ]  
KicOffset-rm: 0.327 arcsec [0.30 $\sigma$ ]  
OotOffset-st: 0/2/1/4 [7]  
KicOffset-st: 0/2/1/4 [7]  
DiffImageQuality-fgm: 0.14 [1/7]  
DiffImageOverlap-fno: 0.00 [0/14]

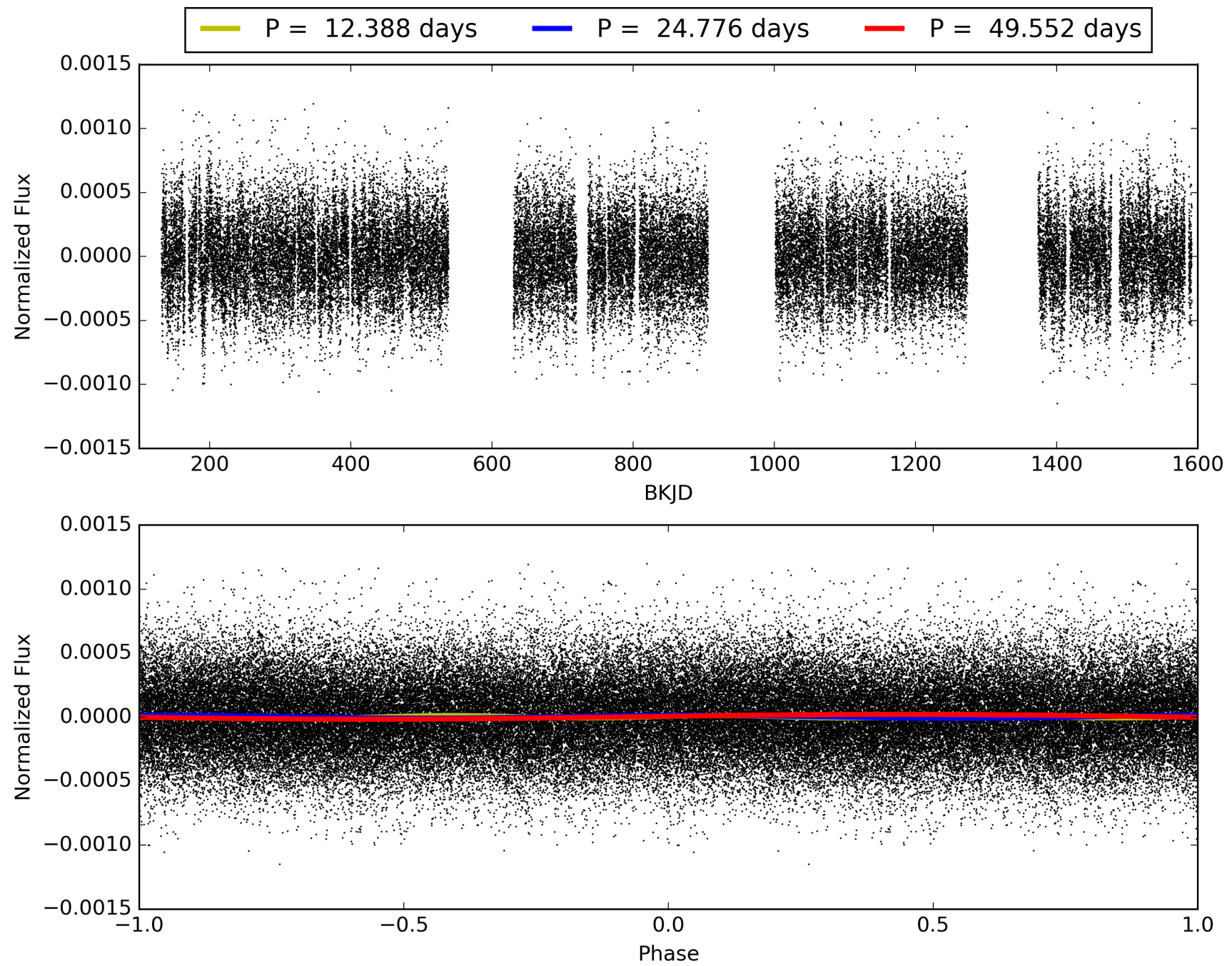
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:26:44 Z

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

# TCE 005286045-02, PDC Light Curves

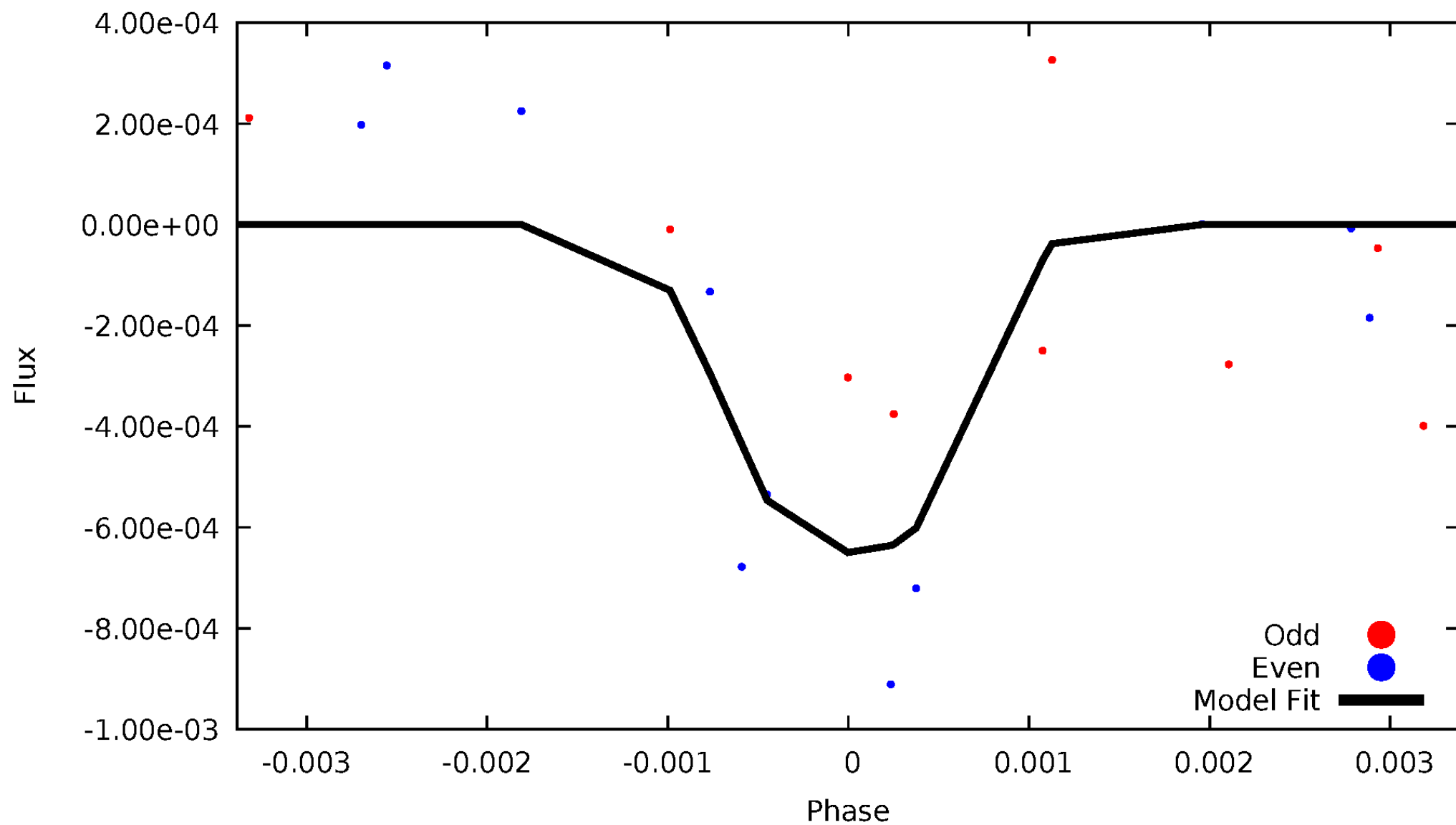


TCE 005286045-02



# DV Odd/Even

TCE 005286045-02





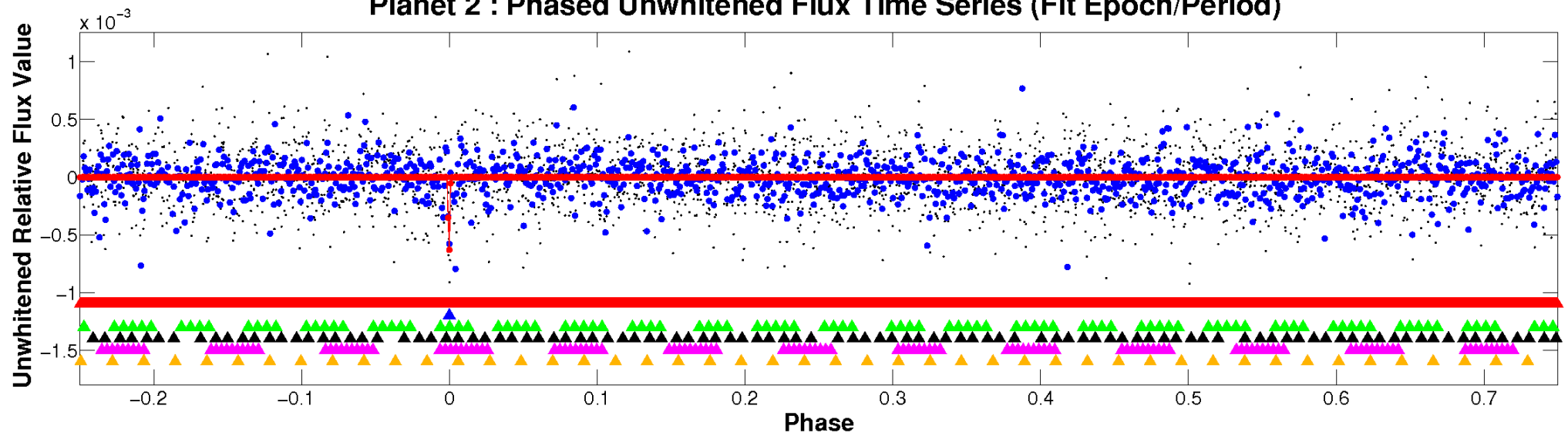


ALT Odd/Even

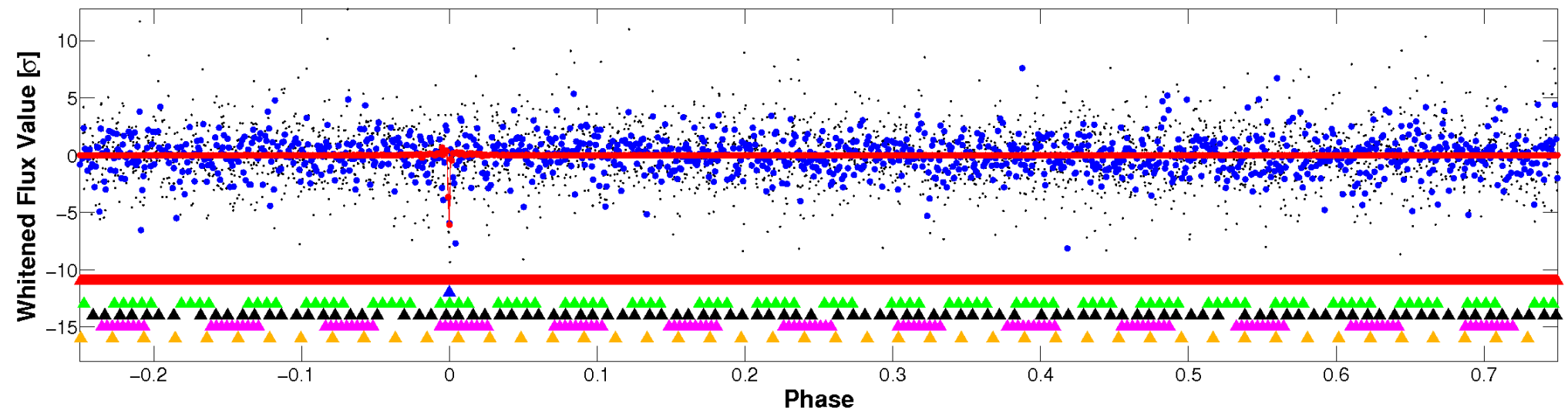
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

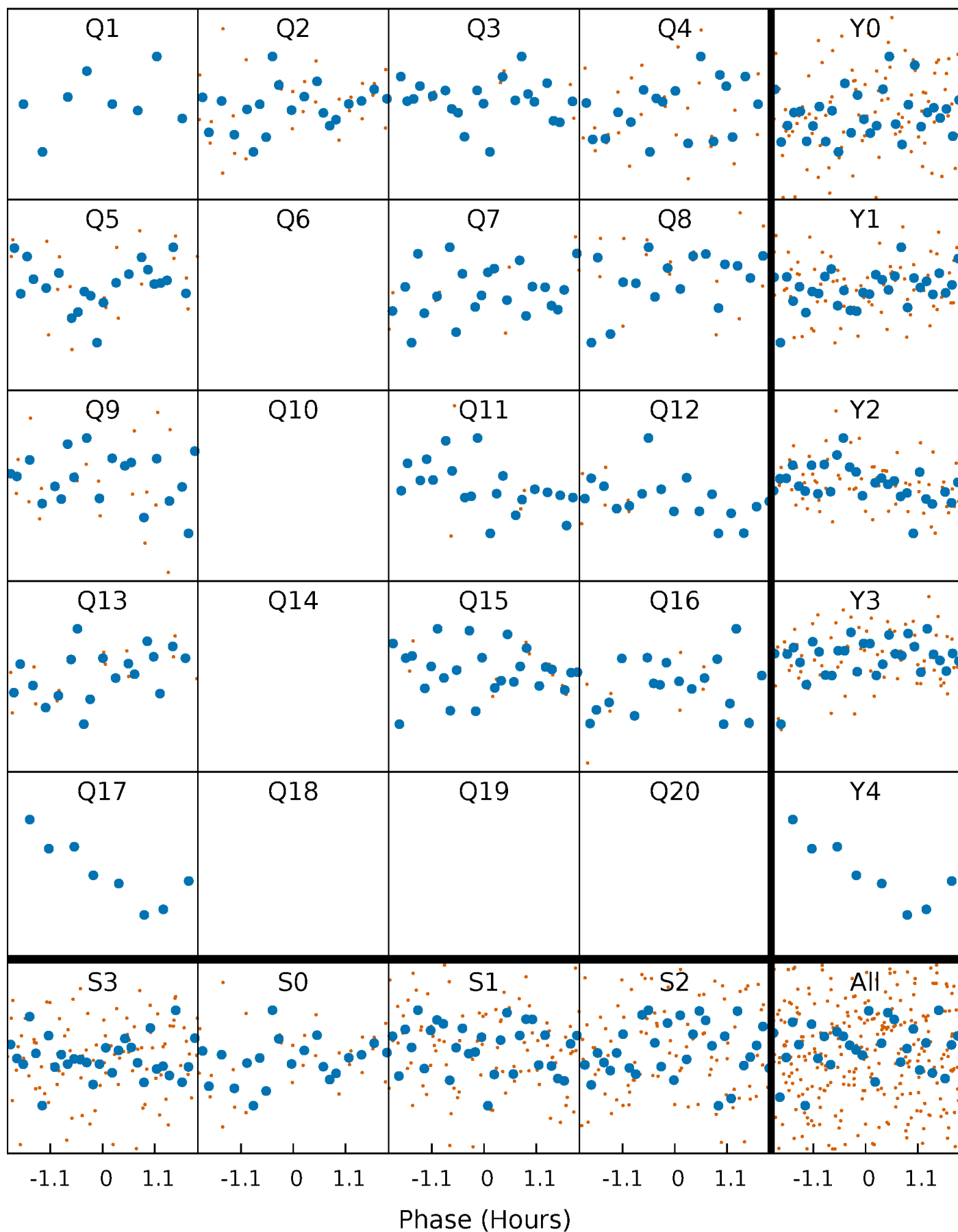


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



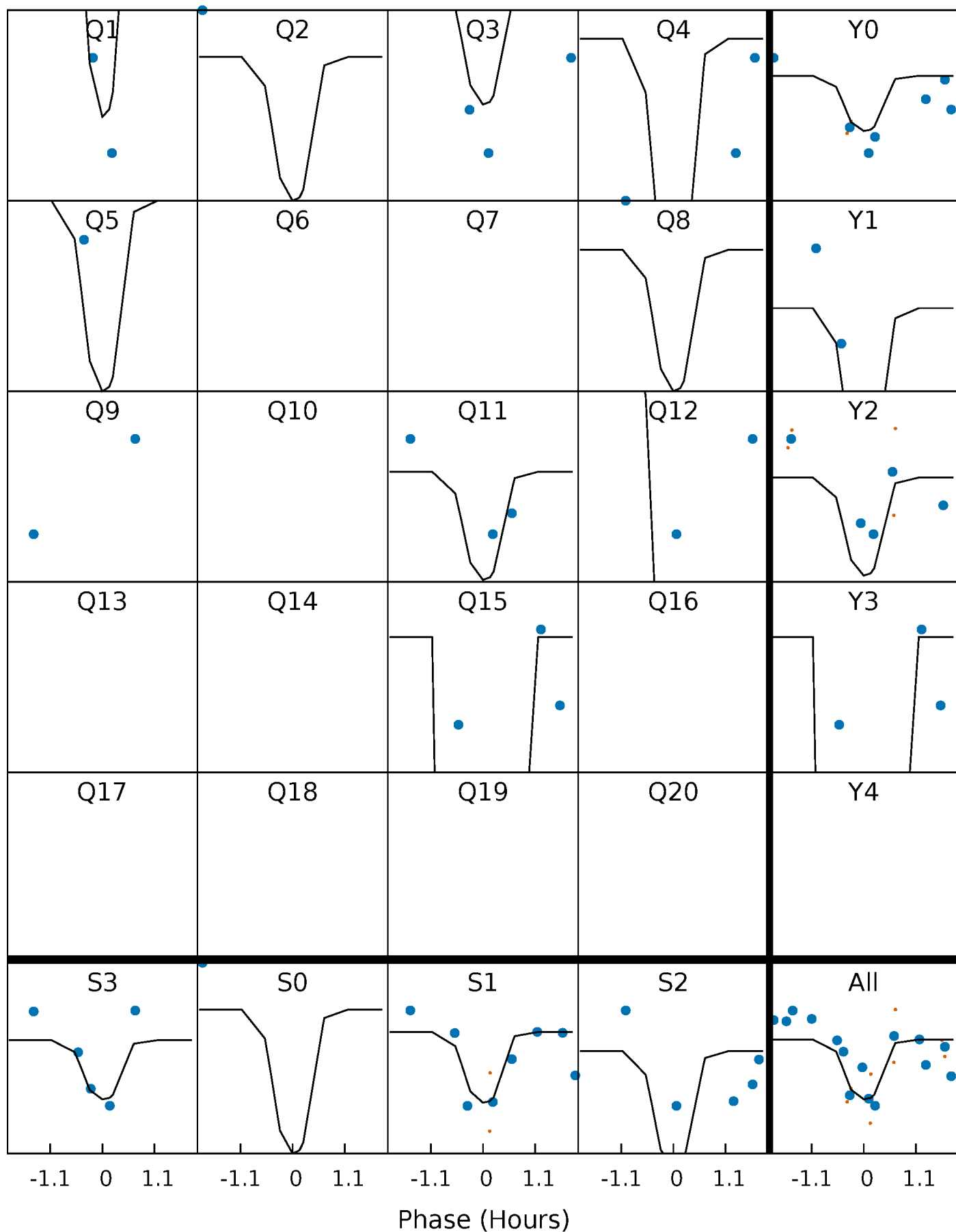
# PDC Quarter-Phased Transit Curves

TCE 005286045-02   P= 24.776117 Days    $T_0=155.043494$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005286045-02   P= 24.776117 Days    $T_0=155.043494$  (BKJD)

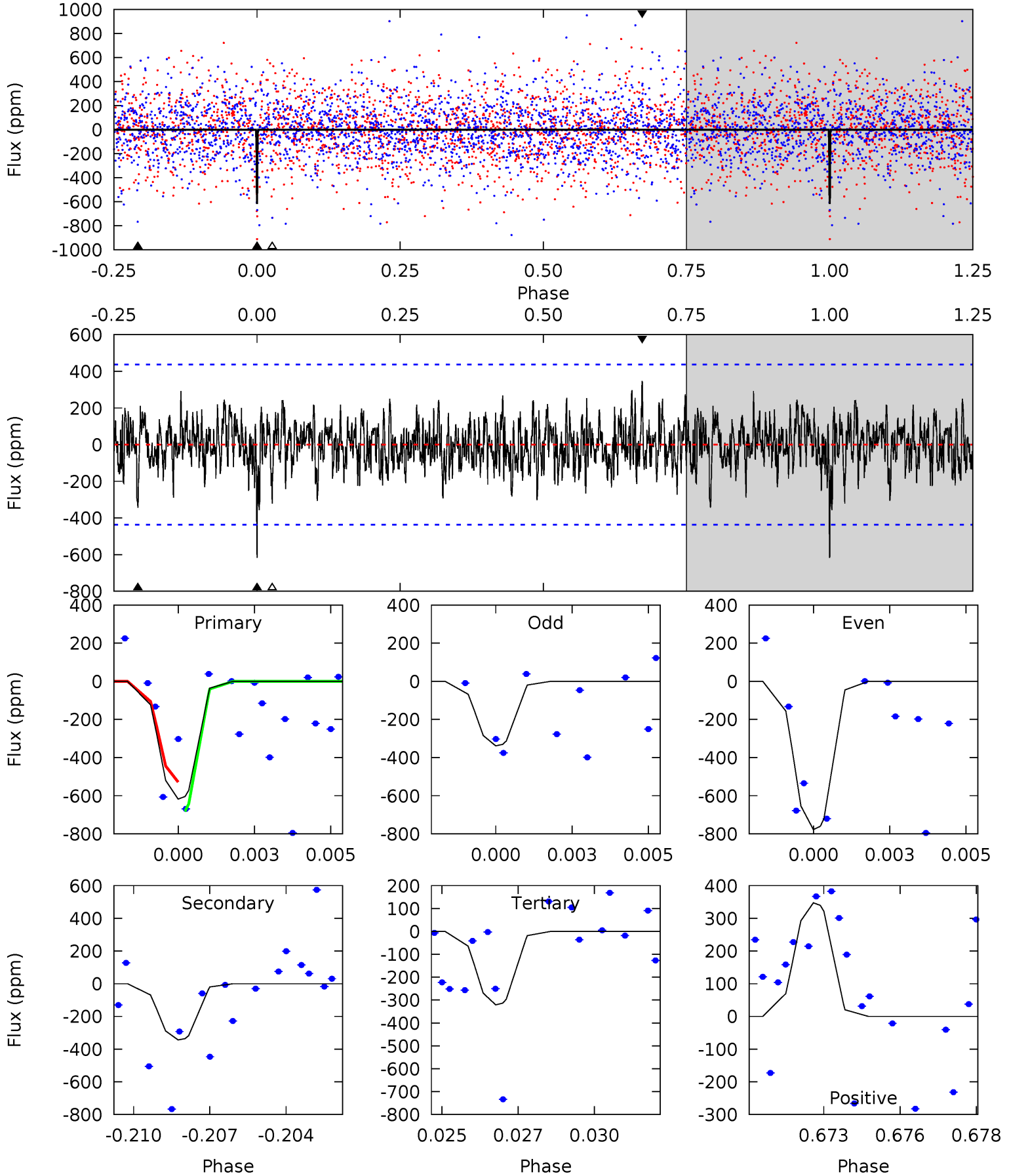


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005286045-02, P = 24.776117 Days, E = 130.267377 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.45	4.15	3.87	4.19	5.27	3.00	1.24	3.58	3.26	0.28	-0.04	2.64	0.97	0.36	0.89





## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005286045

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6847^{+167}_{-286}$	$4.358^{+0.060}_{-0.180}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.357}_{-0.127}$	$1.239^{+0.178}_{-0.160}$	$0.977^{+0.256}_{-0.465}$
	+2%/-4%	+1%/-4%	+114%/-136%	+29%/-10%	+14%/-13%	+26%/-48%
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 005286045-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-344 \pm 83$	$6.41^{+5.96}_{-4.32}$	$1120^{+71}_{-63}$	$4485^{+3063}_{-918}$	$147^{+1234}_{-109}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = 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

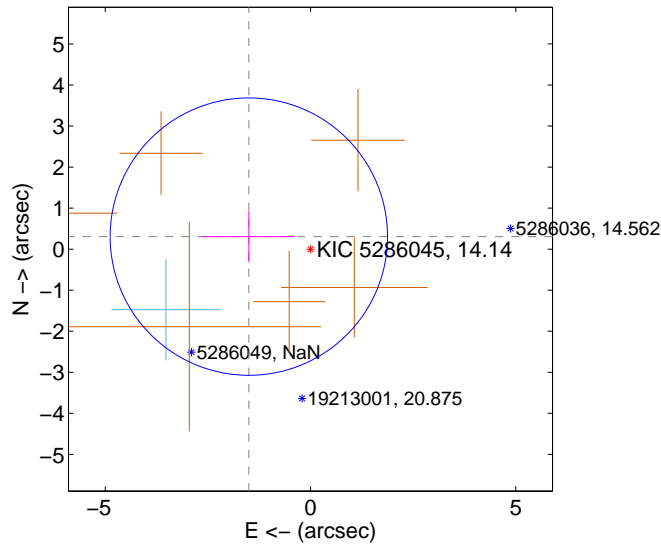
Supplemental centroid analysis for 005286045-02. Kepler magnitude: 14.14. Transit SNR 14.92

There are 1 quarters with good PRF difference image offsets

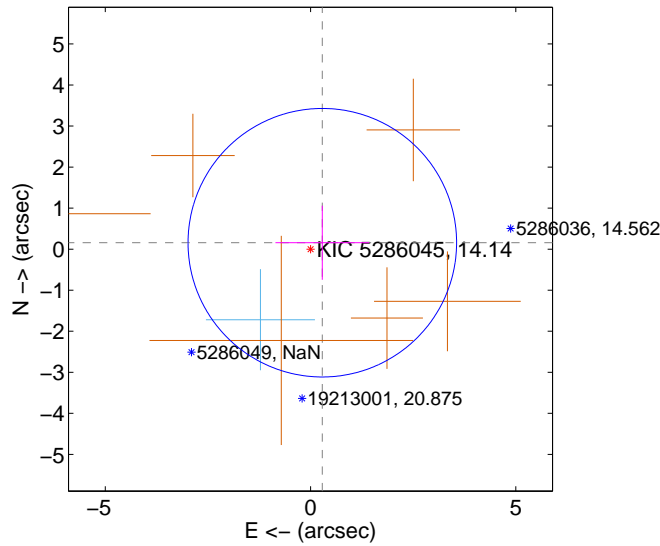
The OOT PRF centroid is offset from the target star catalog position by about 2.26 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.534 \pm 1.126$	1.36	$1.503 \pm 1.124$	$0.306 \pm 0.623$
PRF-fit source offset from KIC position	$0.327 \pm 1.090$	0.30	$-0.287 \pm 1.141$	$0.157 \pm 0.903$
photometric centroid source offset	$1.98 \pm 0.47$	4.17	$-1.96 \pm 0.48$	$0.29 \pm 0.35$

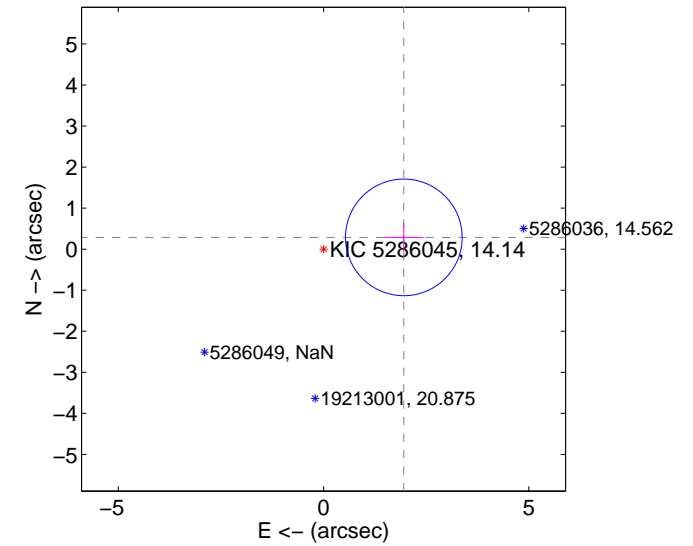
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

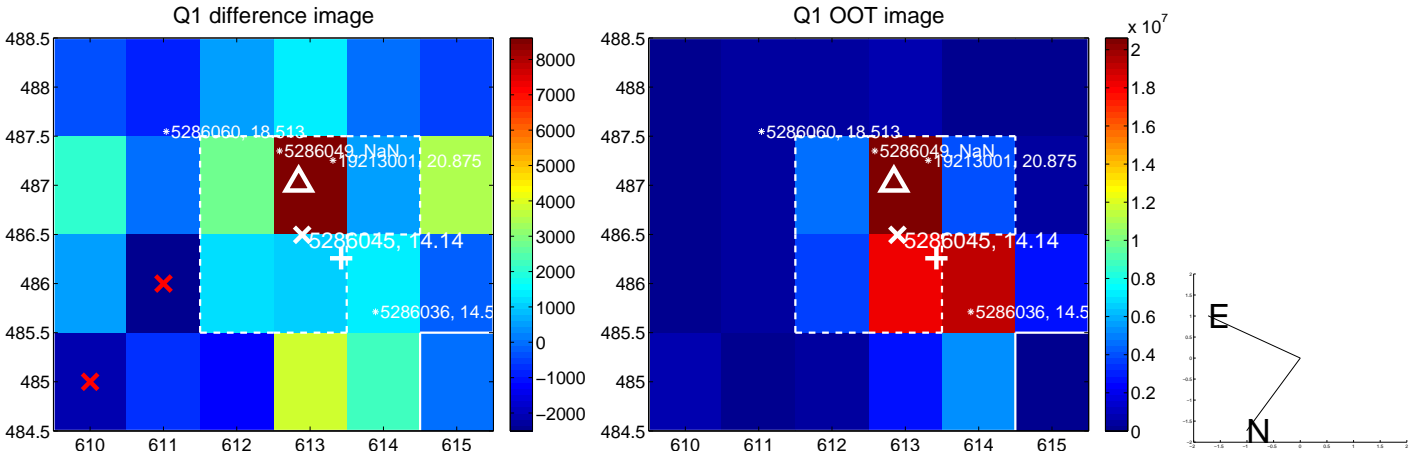


offset from photometric centroids

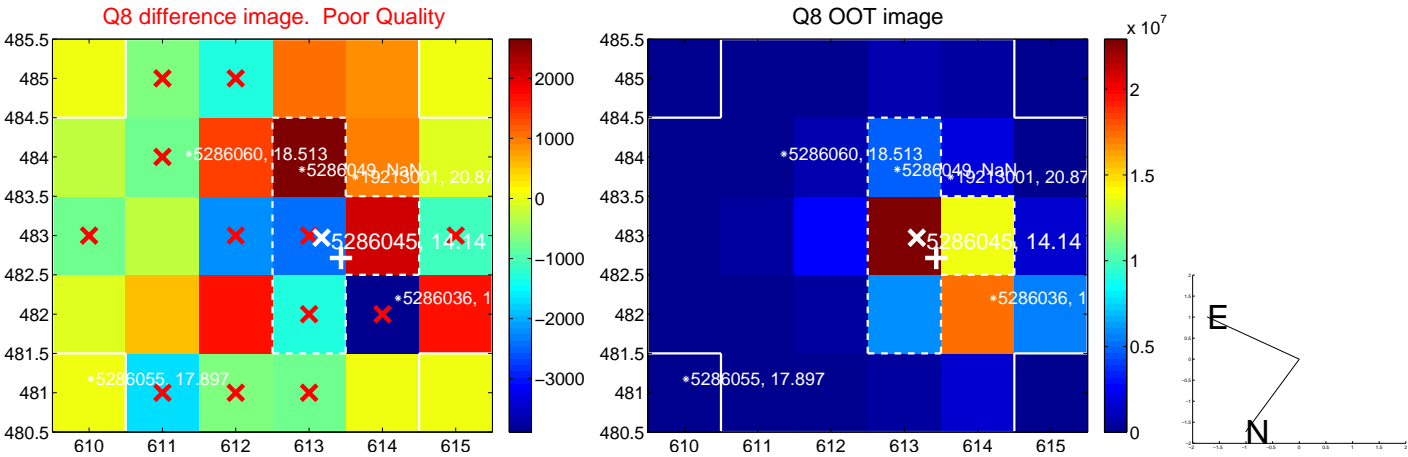
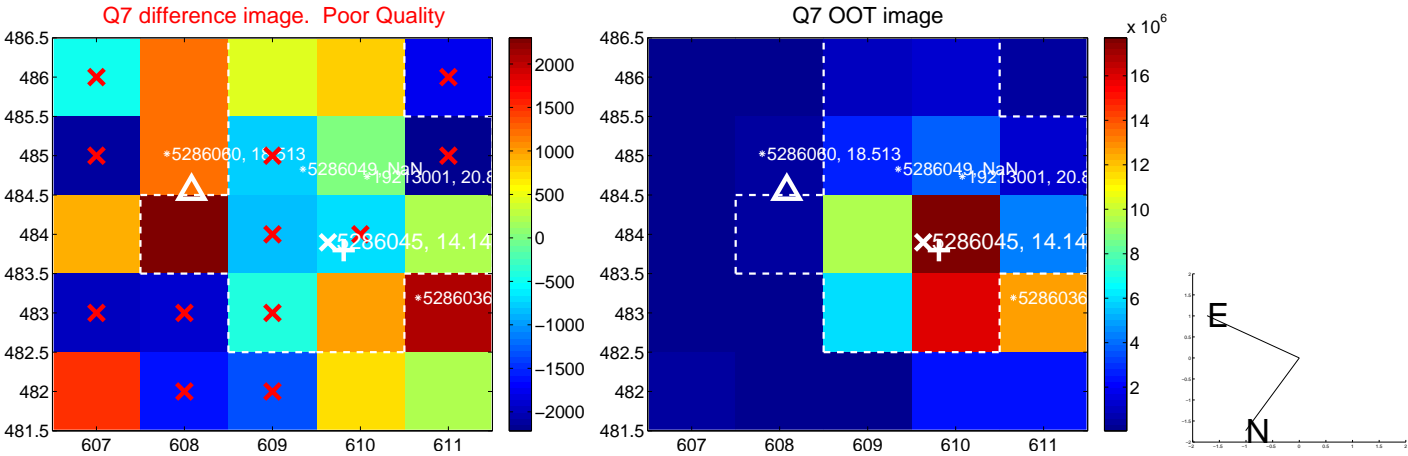
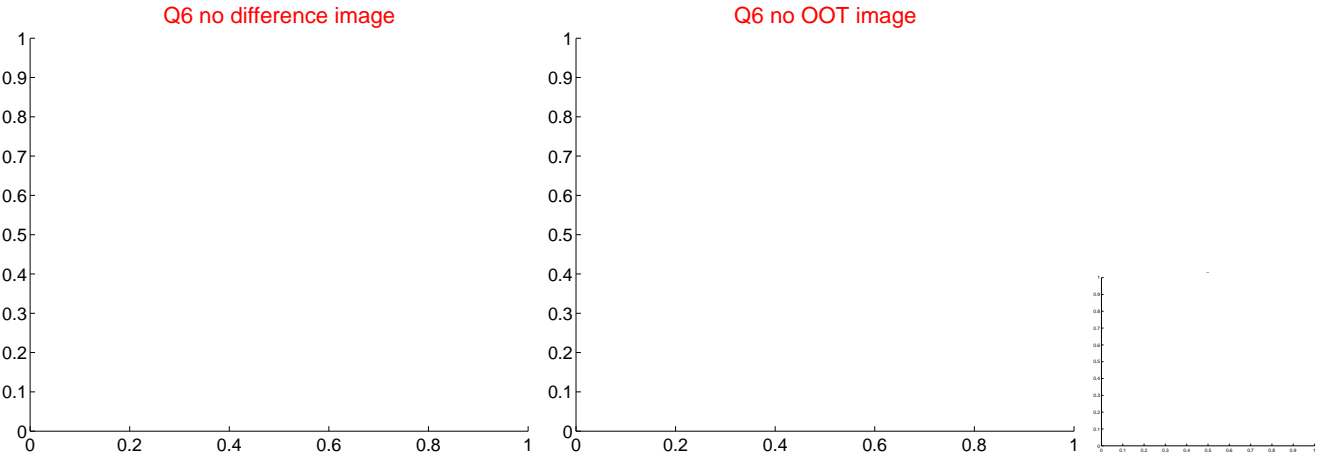
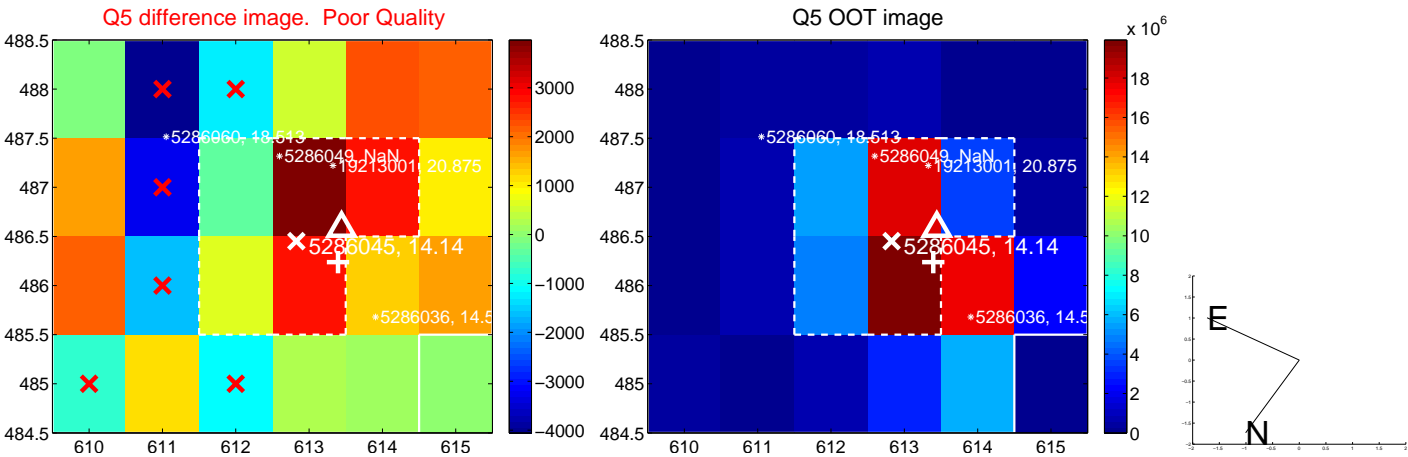


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

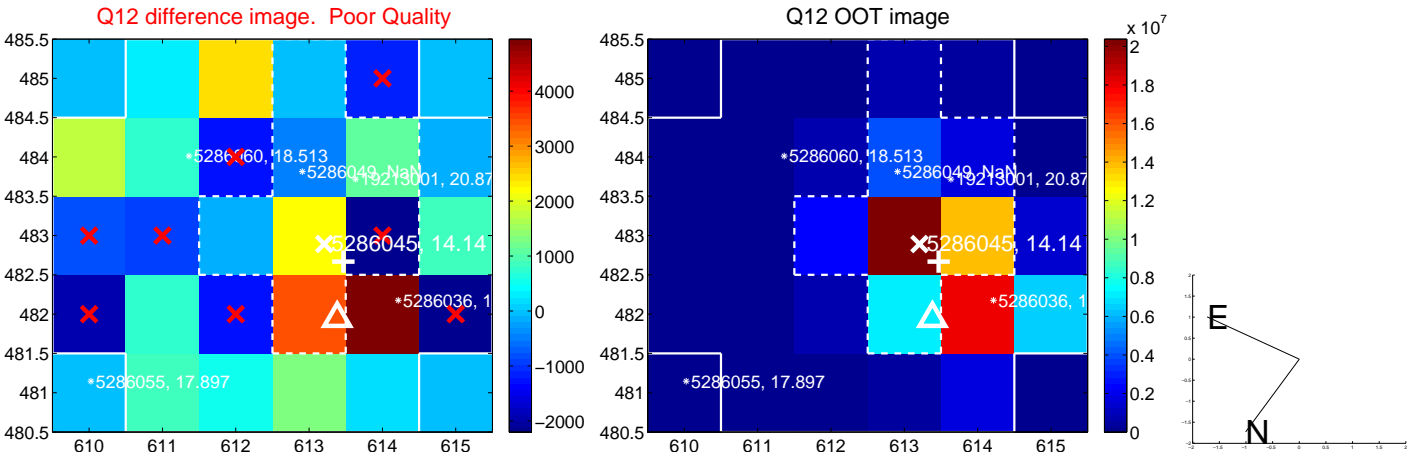
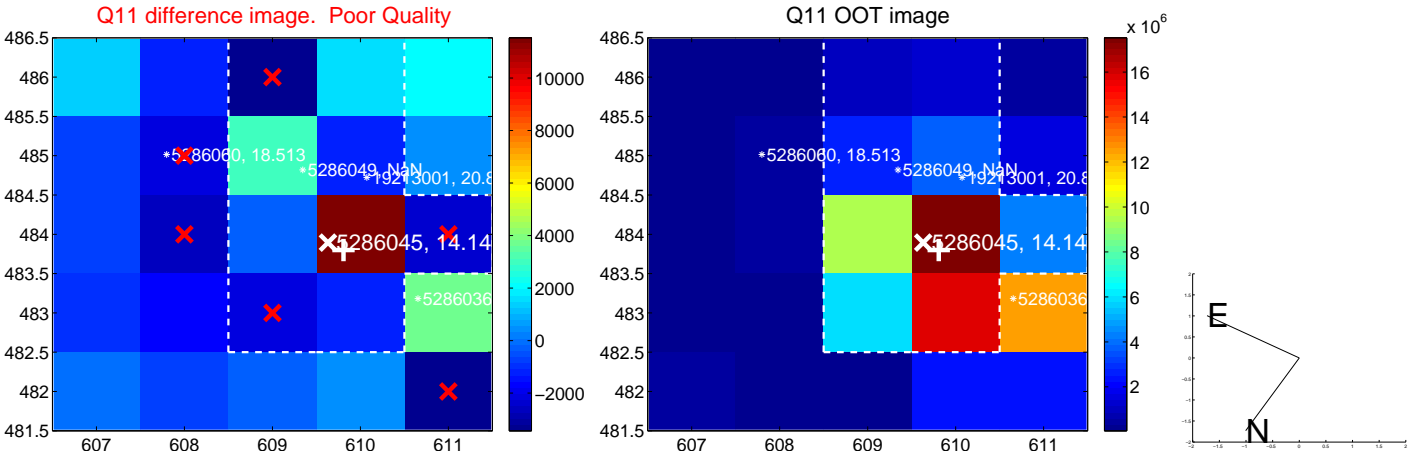
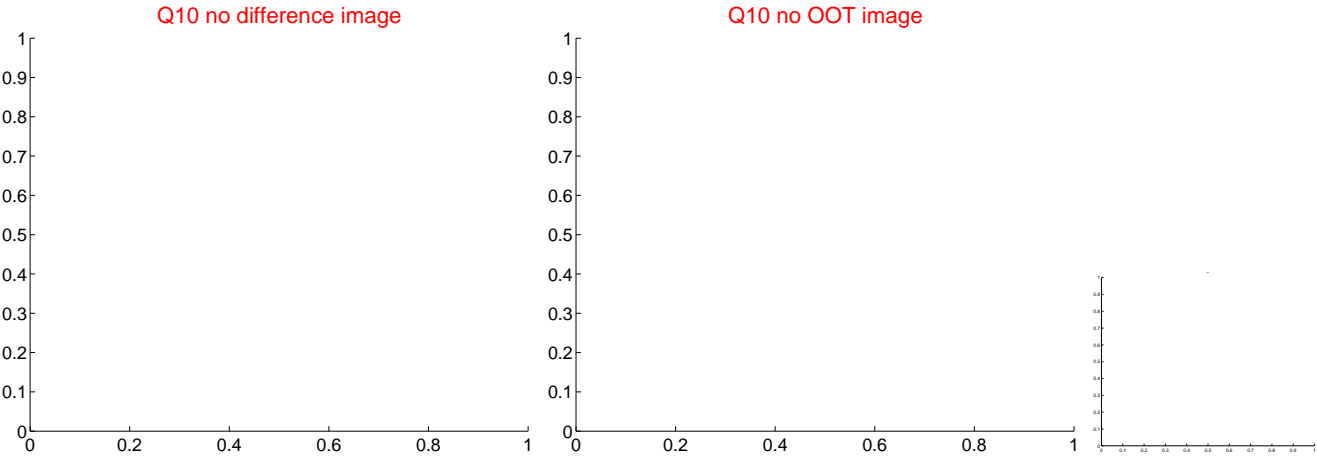
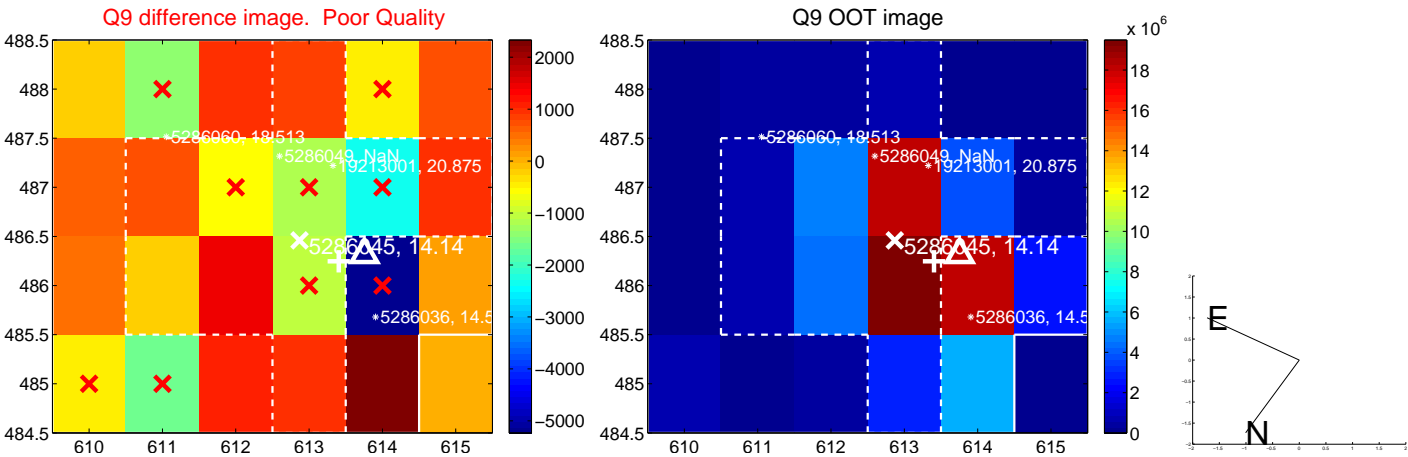
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

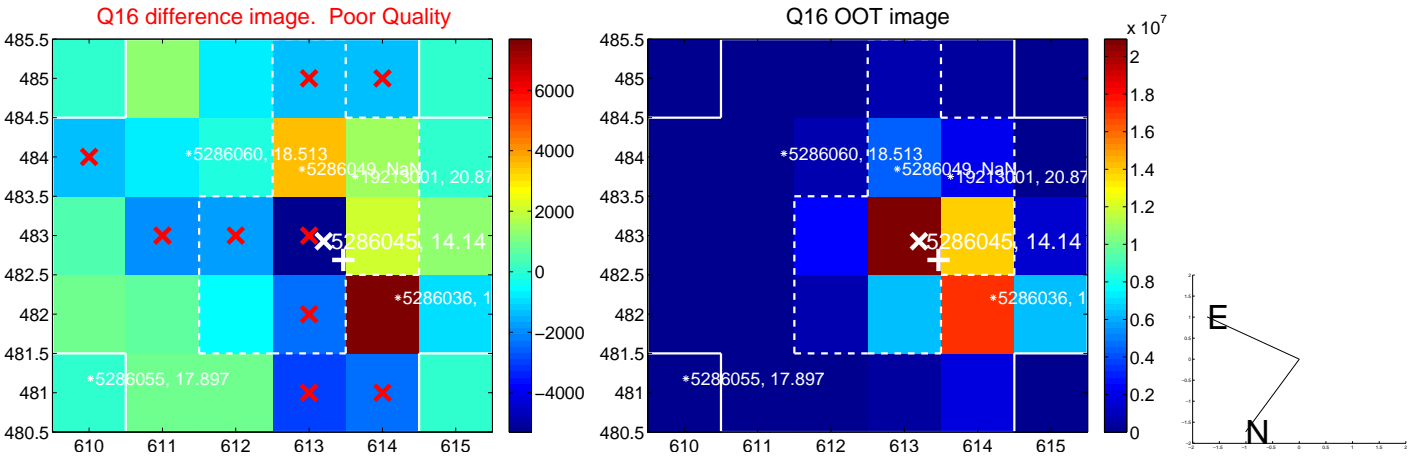
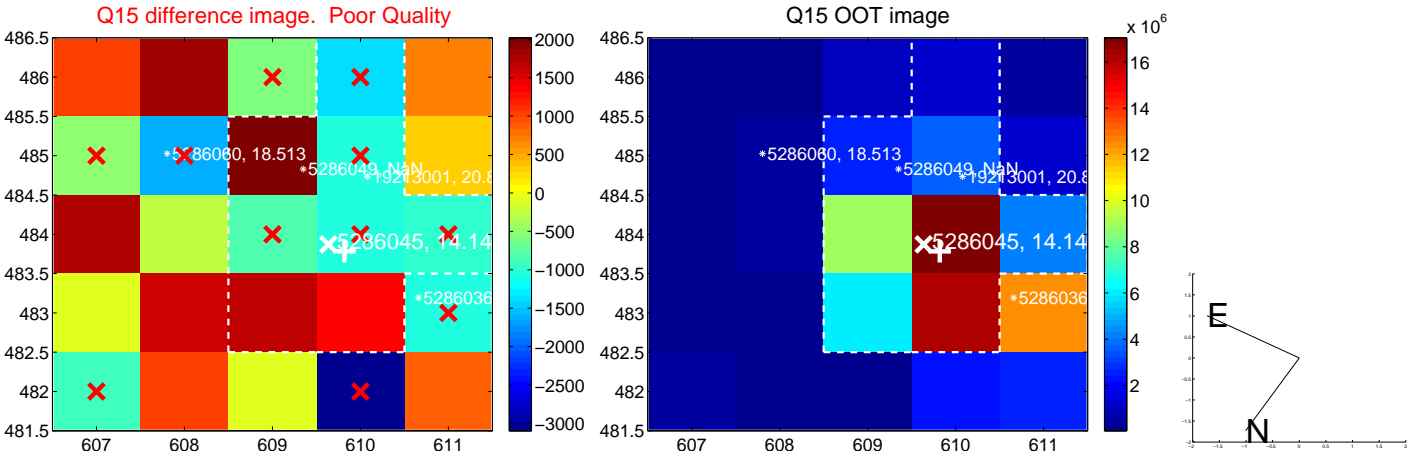
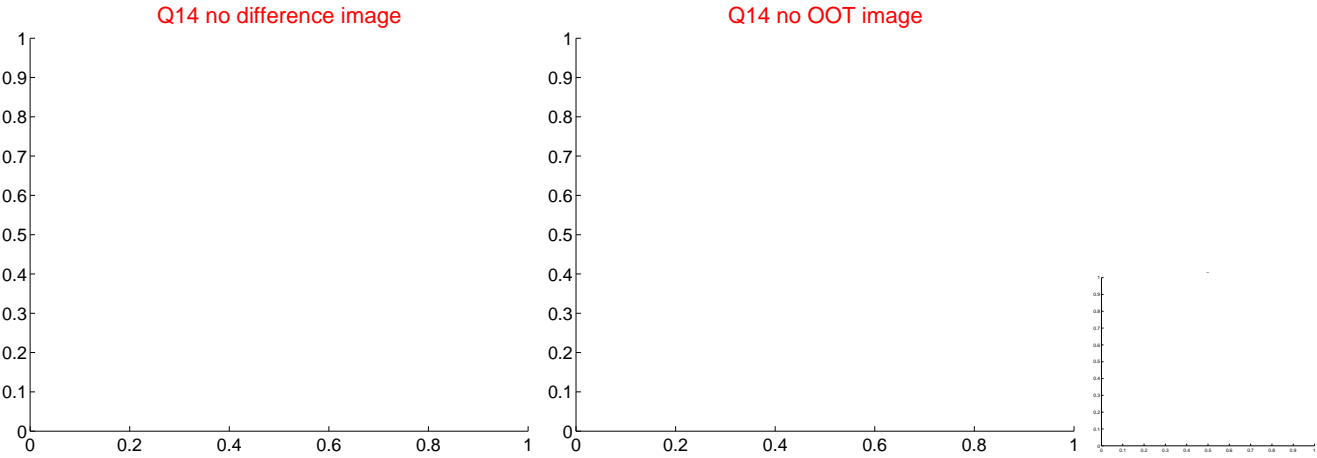
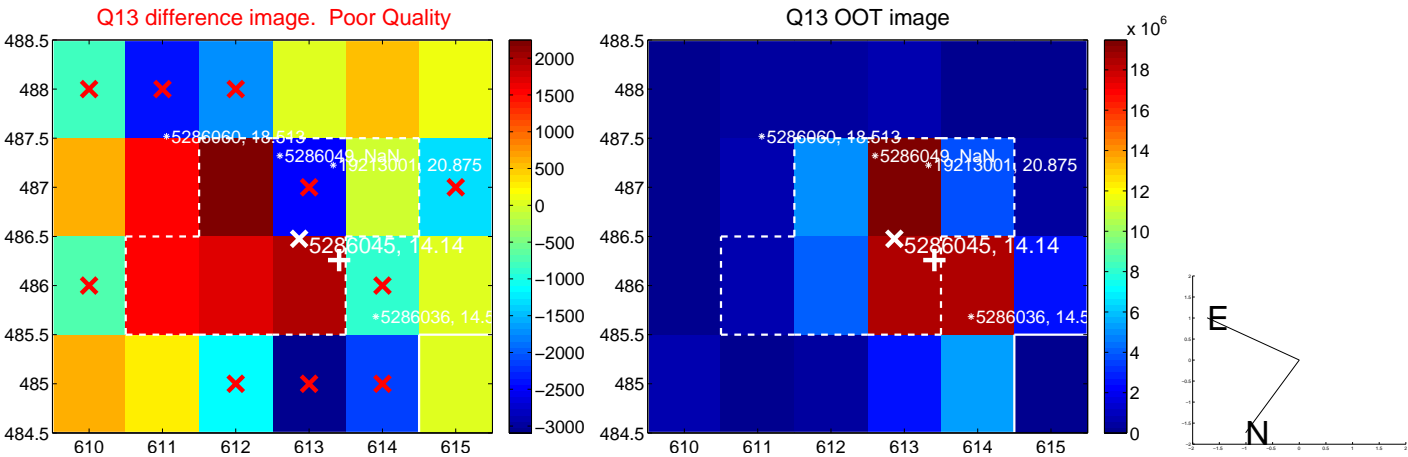


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

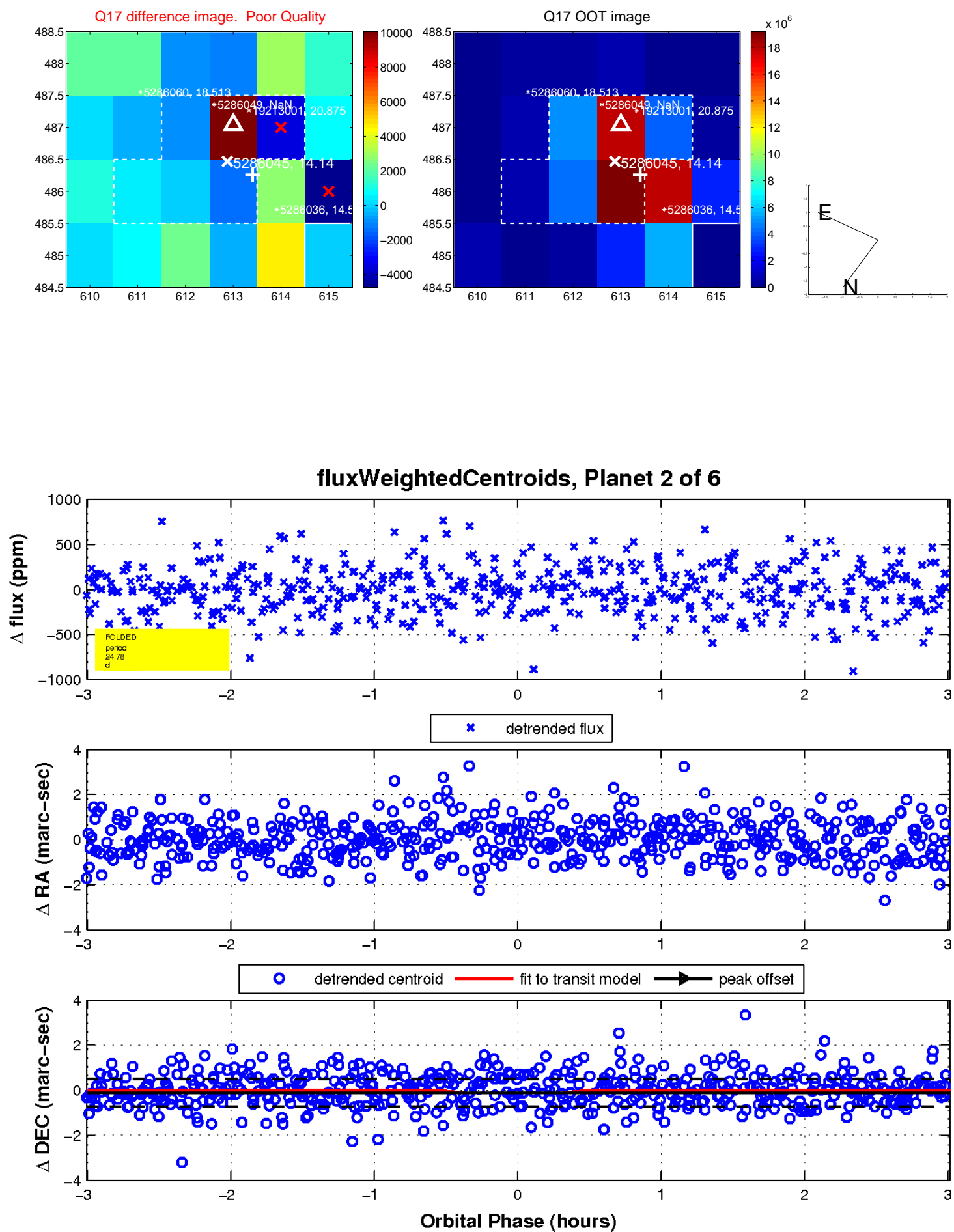




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

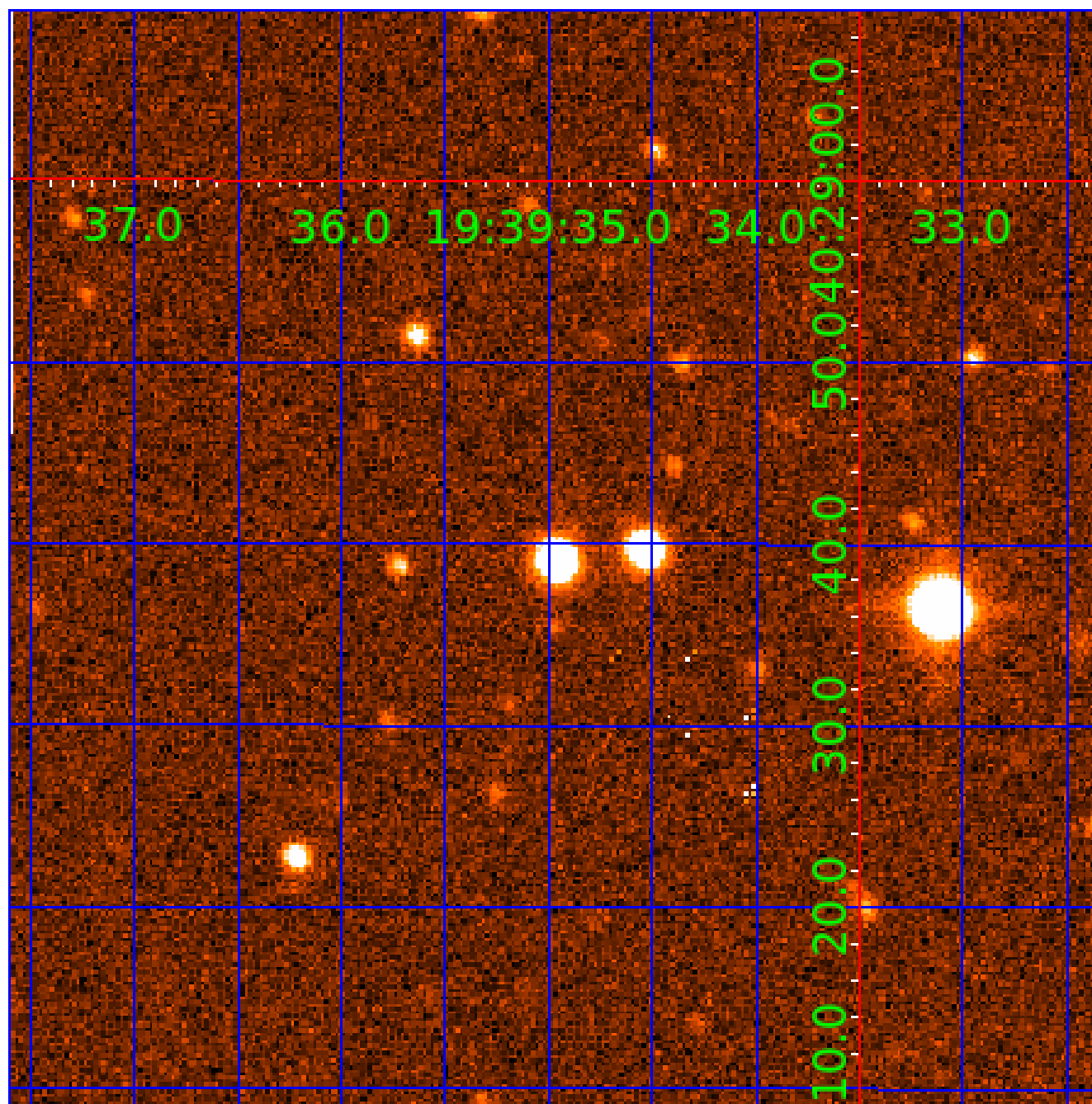


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005286045

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005286045-01	OBS	No	0.503876	131.616885	20.3	3.610	9.4	7.2	1.21	6847	0.56	16483.05
005286045-02	OBS	No	24.776117	155.043494	650.0	1.006	13.2	14.9	1.21	6847	3.46	91.50
005286045-03	OBS	No	13.997211	140.388169	165.4	4.129	10.8	6.6	1.21	6847	1.58	195.92
005286045-04	OBS	No	14.093368	132.666482	263.2	1.475	9.9	6.8	1.21	6847	2.28	194.14
005286045-05	OBS	No	11.428347	136.664083	182.8	1.724	8.5	5.7	1.21	6847	1.77	256.74
005286045-06	OBS	No	28.466030	146.235729	386.6	2.095	10.9	11.4	1.21	6847	2.44	76.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005286045-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS
005286045-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005286045-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

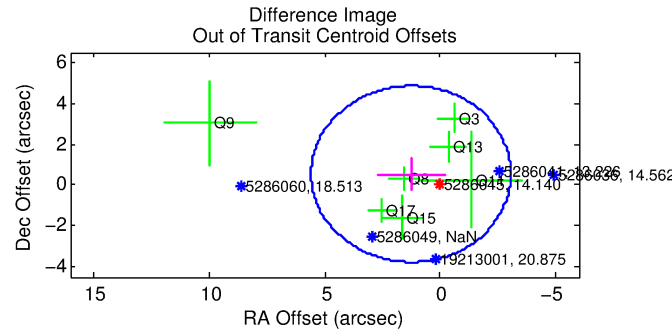
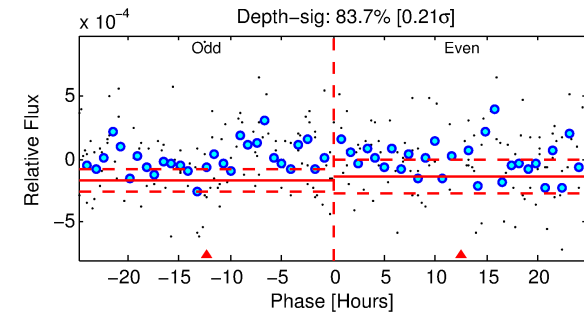
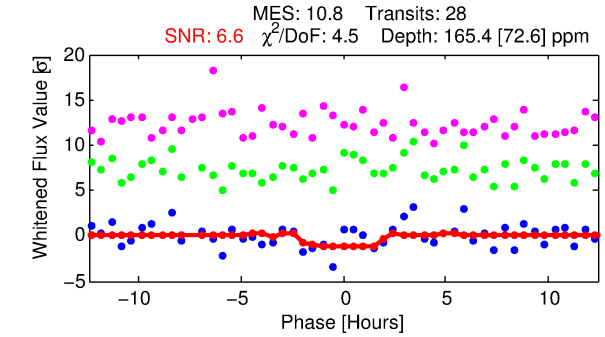
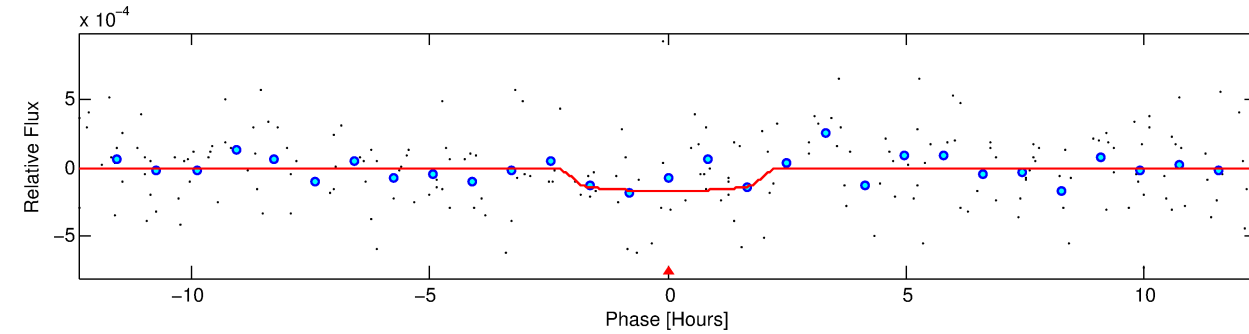
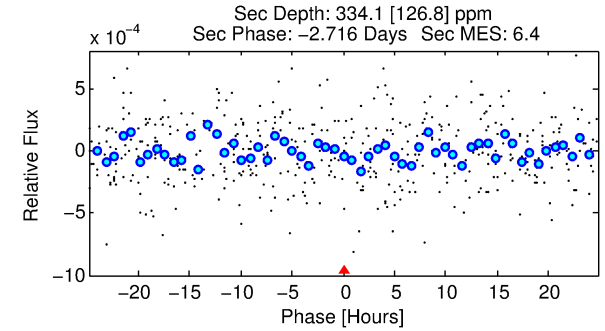
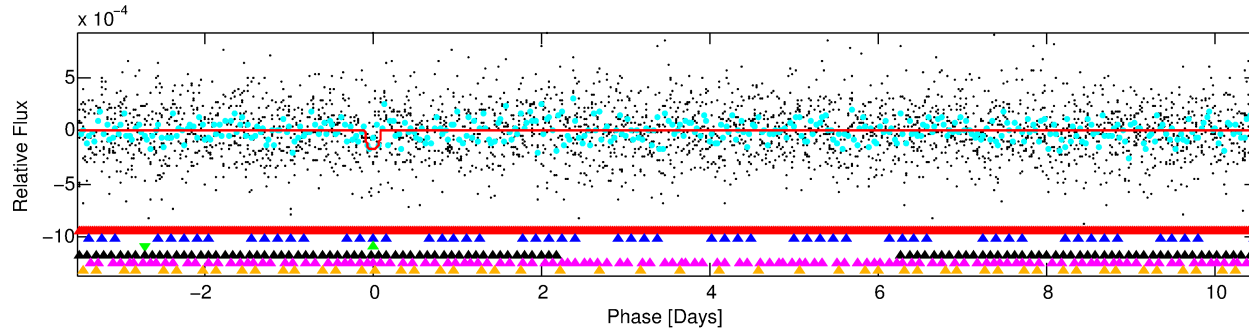
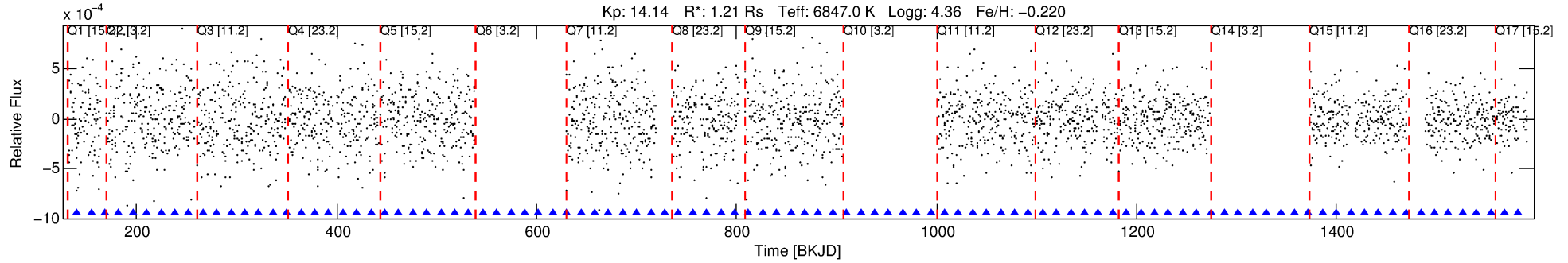
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005286045-03

No Significant Match Found

# DV One-Page Summary

KIC: 5286045 Candidate: 3 of 6 Period: 13.997 d



## DV Fit Results:

Period = 13.99721 [0.00046] d  
Epoch = 140.3882 [0.0247] BKJD  
Rp/R\* = 0.0119 [0.0561]  
a/R\* = 25.96 [681.73]  
b = 0.14 [185.75]  
Seff = 195.92 [74.03]  
Teq = 954 [90] K  
Rp = 1.58 [7.44] Re  
a = 0.1216 [0.0292] AU  
Ag = 1092.62 [10303.11] [0.11σ]  
Teffp = 8480 [19982] K [0.38σ]

## DV Diagnostic Results:

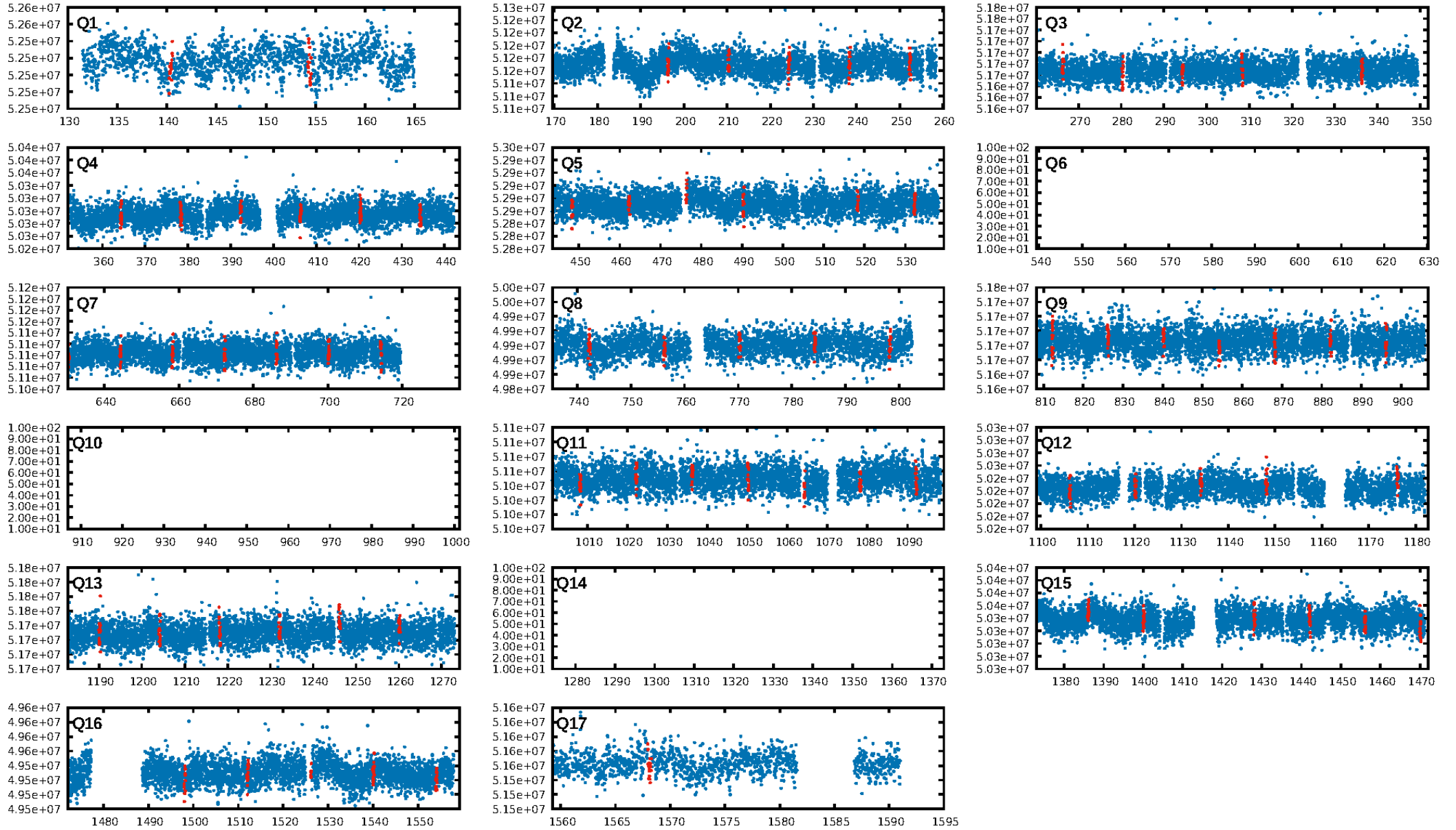
ShortPeriod-sig: 100.0% [13.78σ]  
LongPeriod-sig: 40.1% [0.53σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.17e-14  
RollingBand-fgt: 1.00 [27/27]  
GhostDiagnostic-chr: 0.8853  
Centroid-sig: N/A  
Centroid-so: 2.105 arcsec [2.71σ]  
OotOffset-rm: 1.379 arcsec [0.96σ]  
KicOffset-rm: 0.626 arcsec [0.76σ]  
OotOffset-st: 0/3/1/3 [7]  
KicOffset-st: 0/3/1/3 [7]  
DiffImageQuality-fgm: 0.14 [1/7]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:26:47 Z

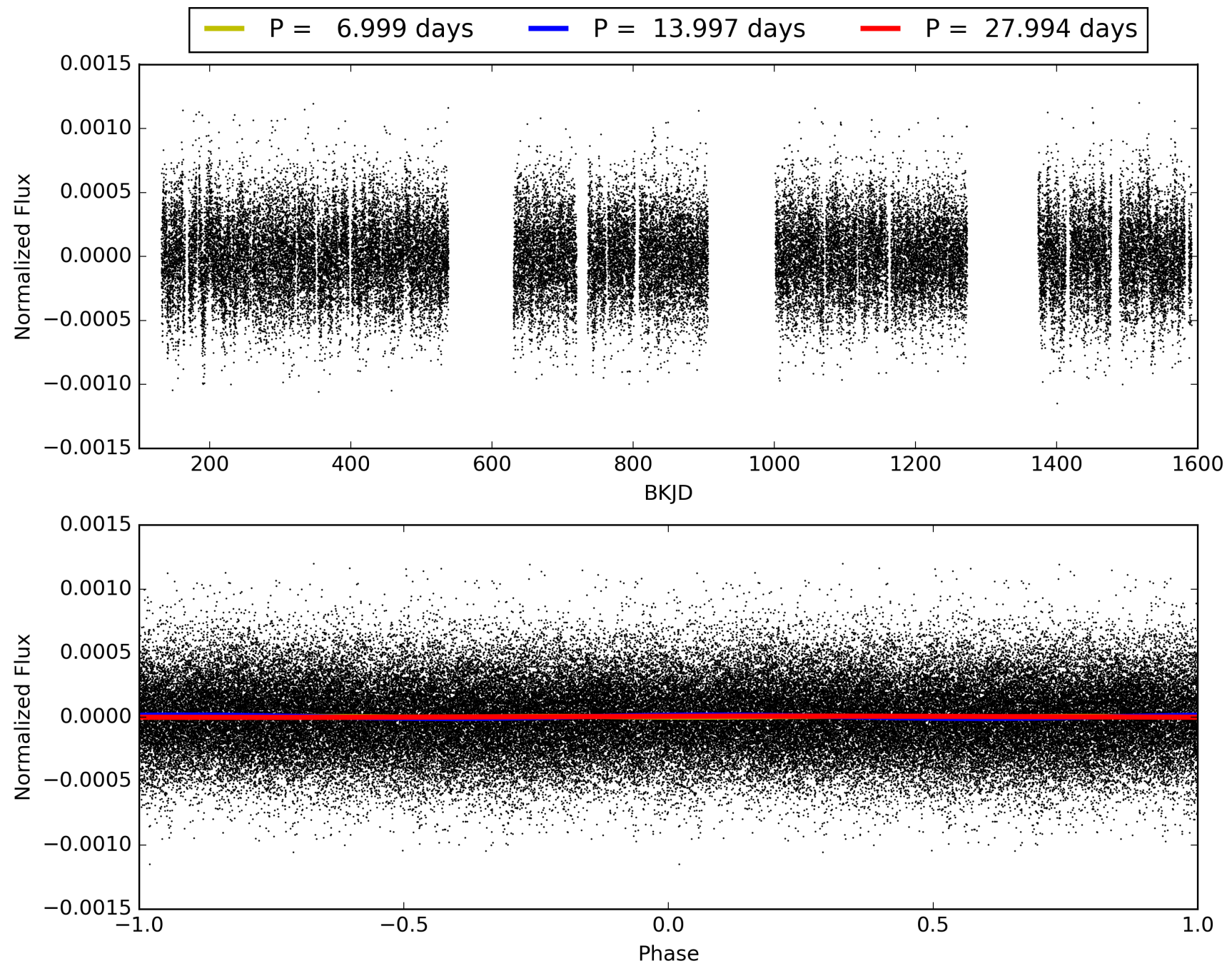
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005286045-03, PDC Light Curves

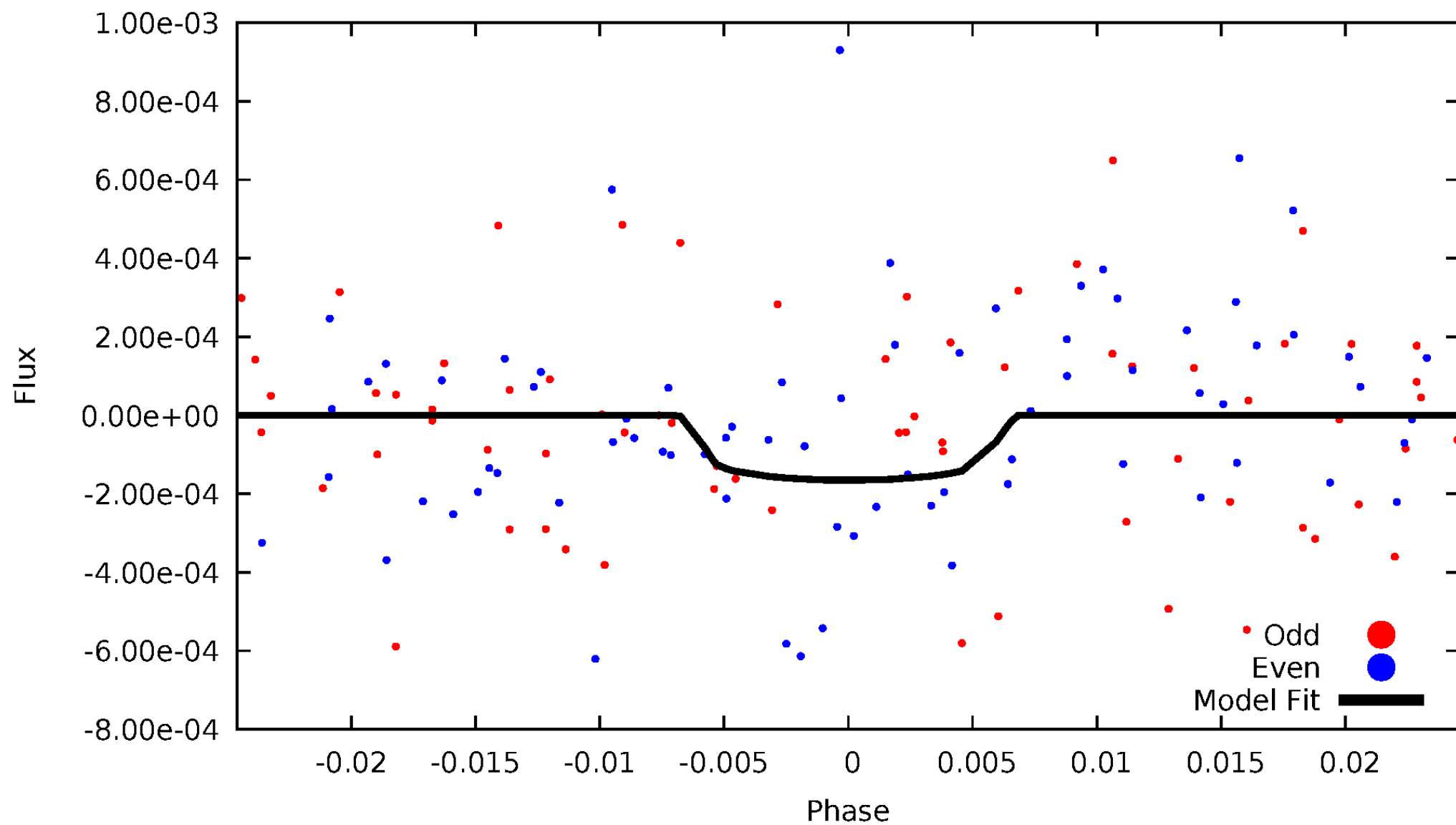


TCE 005286045-03



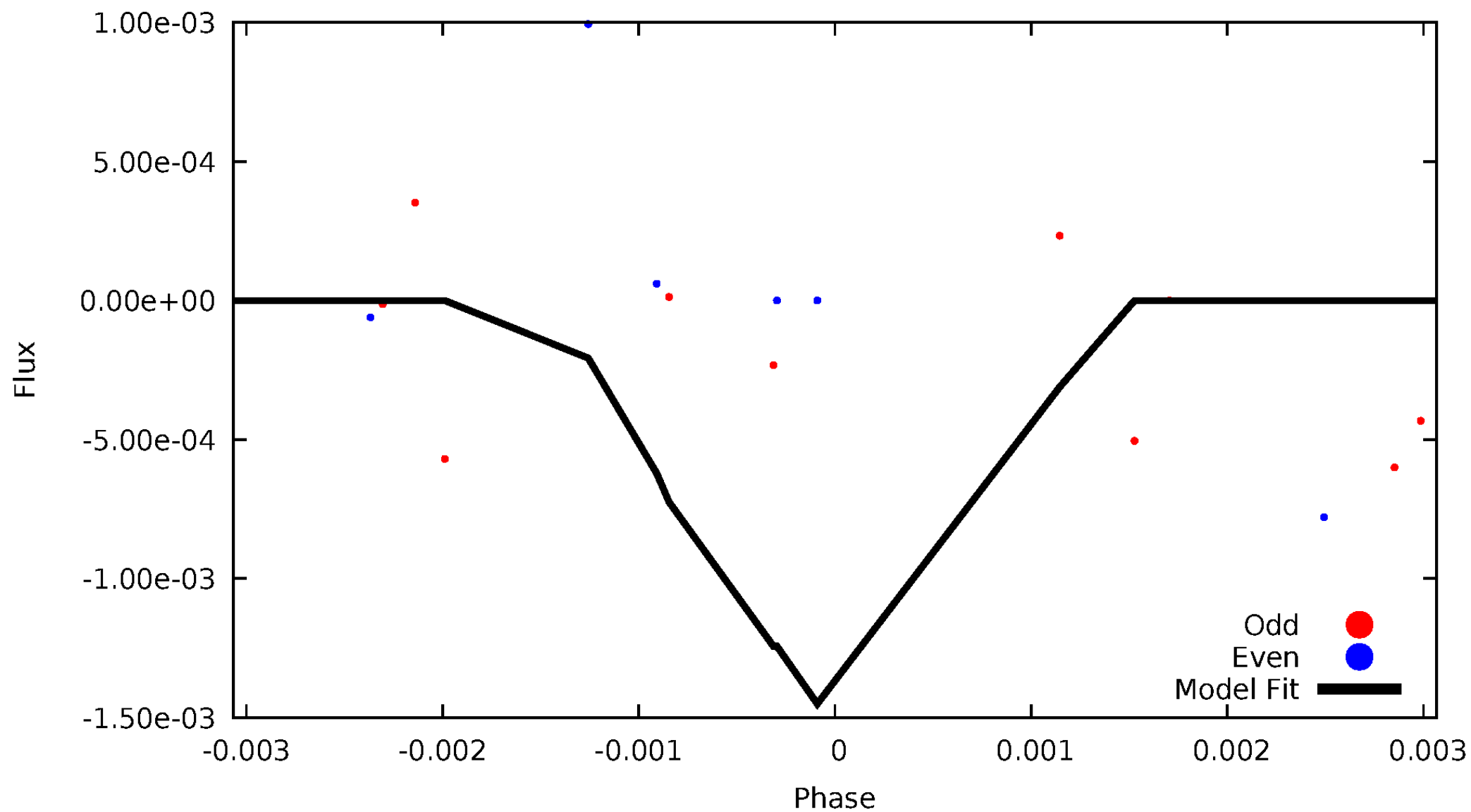
# DV Odd/Even

TCE 005286045-03



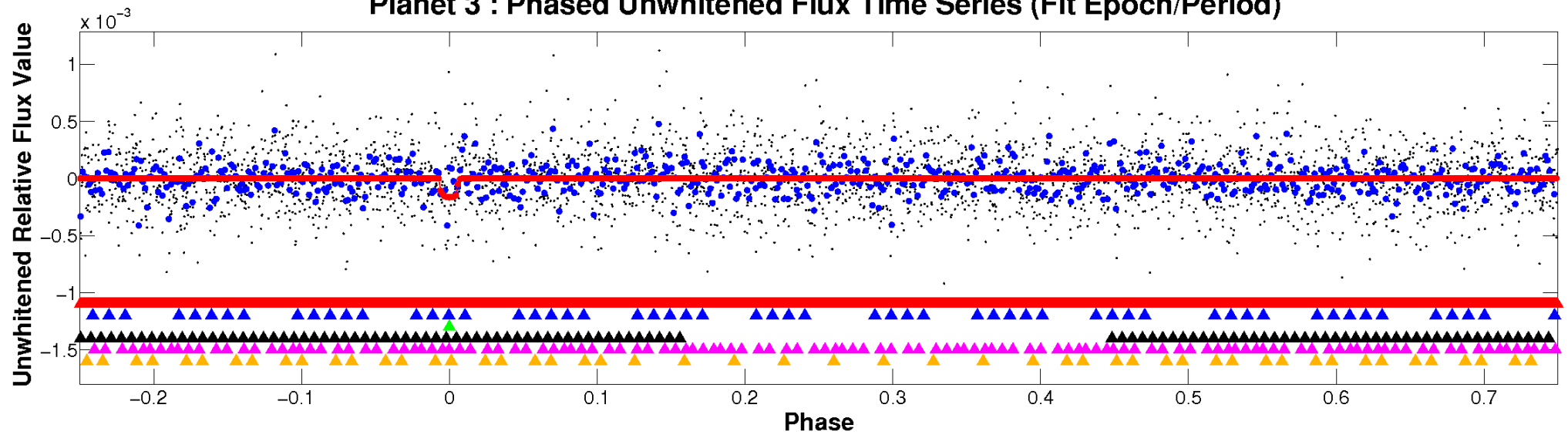
# ALT Odd/Even

TCE 005286045-03

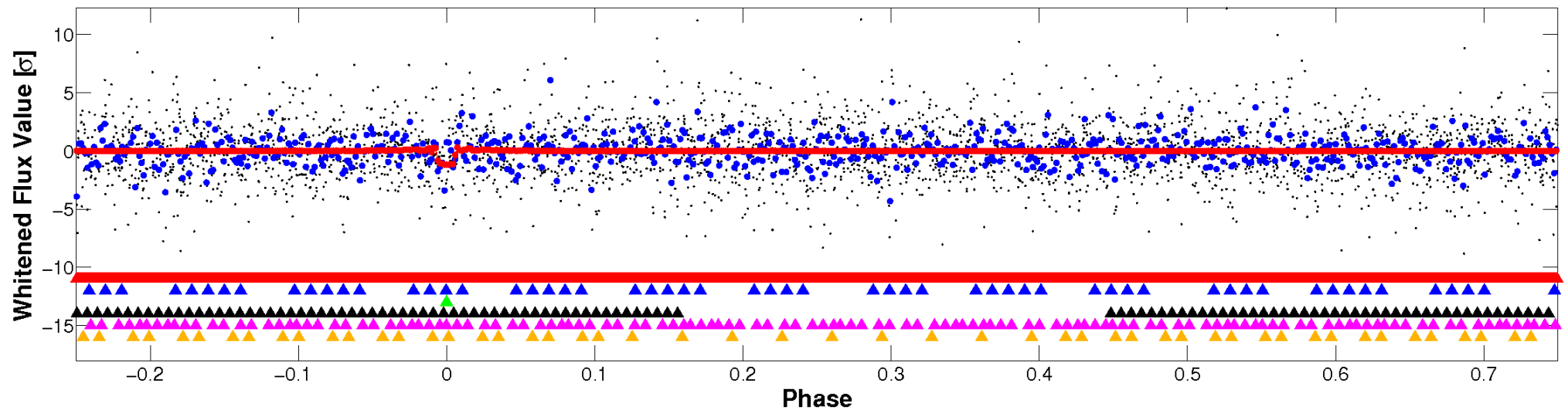


# Non-Whitened Vs. Whitened Light Curve

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

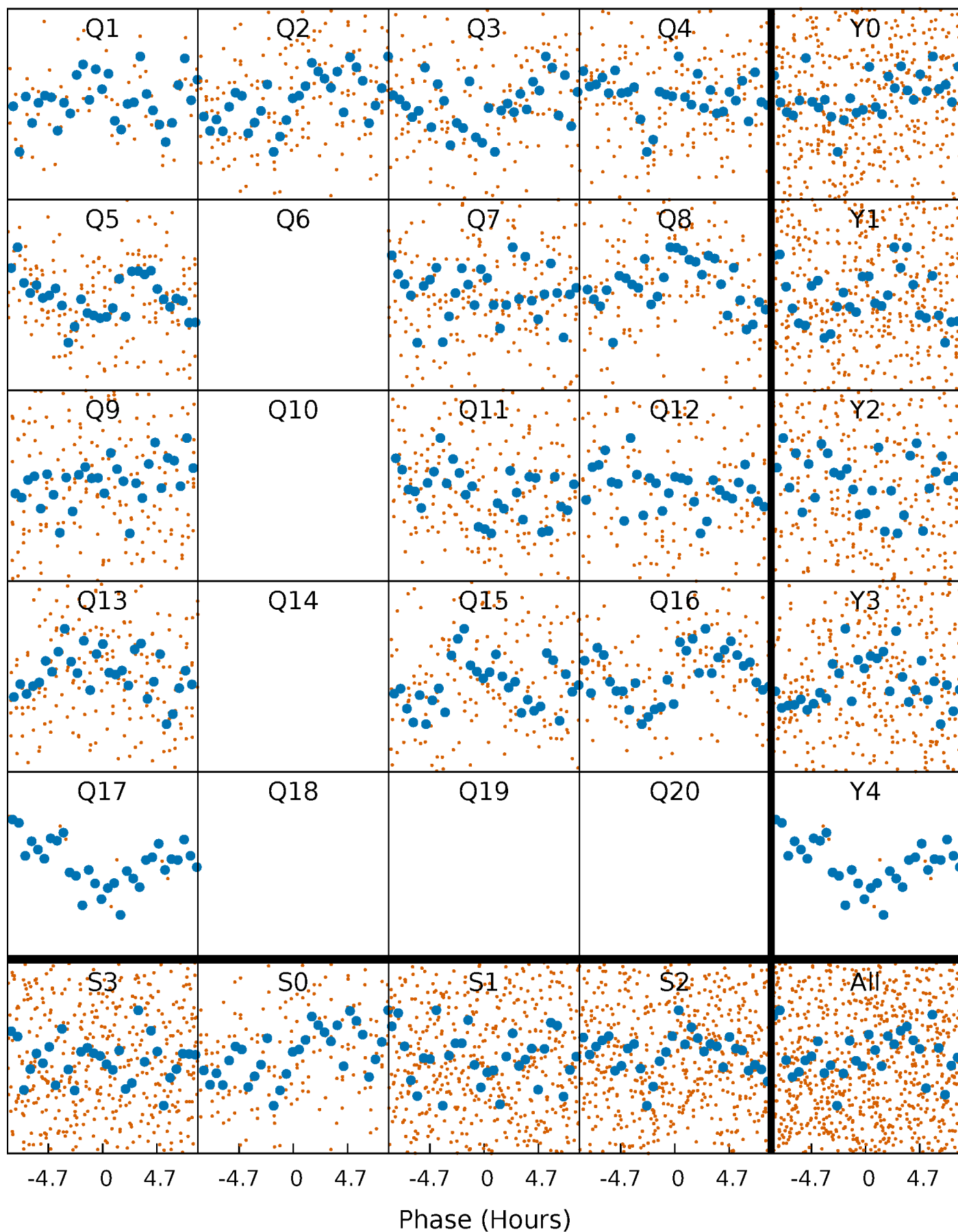


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

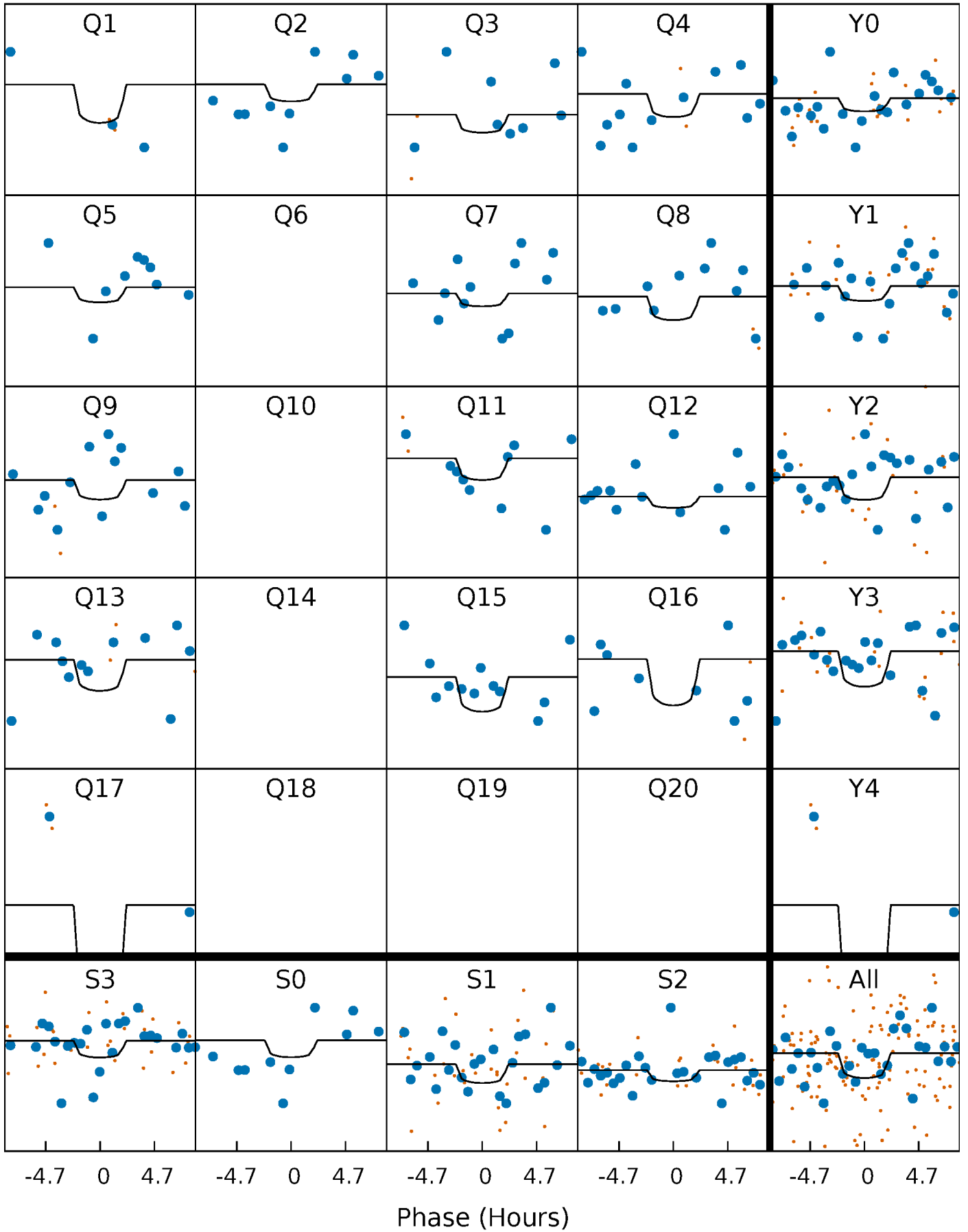
TCE 005286045-03 P= 13.997211 Days  $T_0=140.388169$  (BKJD)





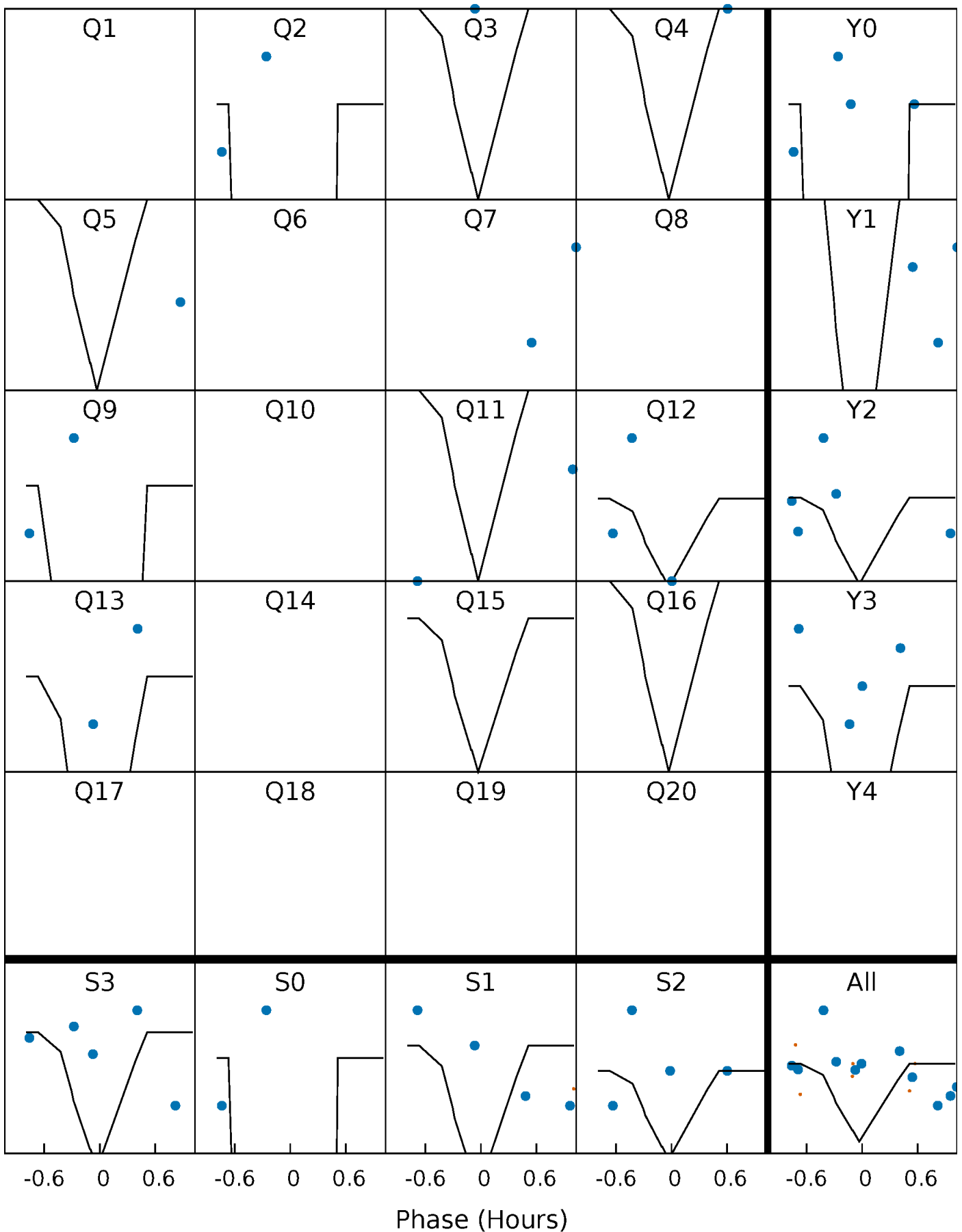
# DV Quarter-Phased Transit Curves

TCE 005286045-03 P= 13.997211 Days  $T_0=140.388169$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

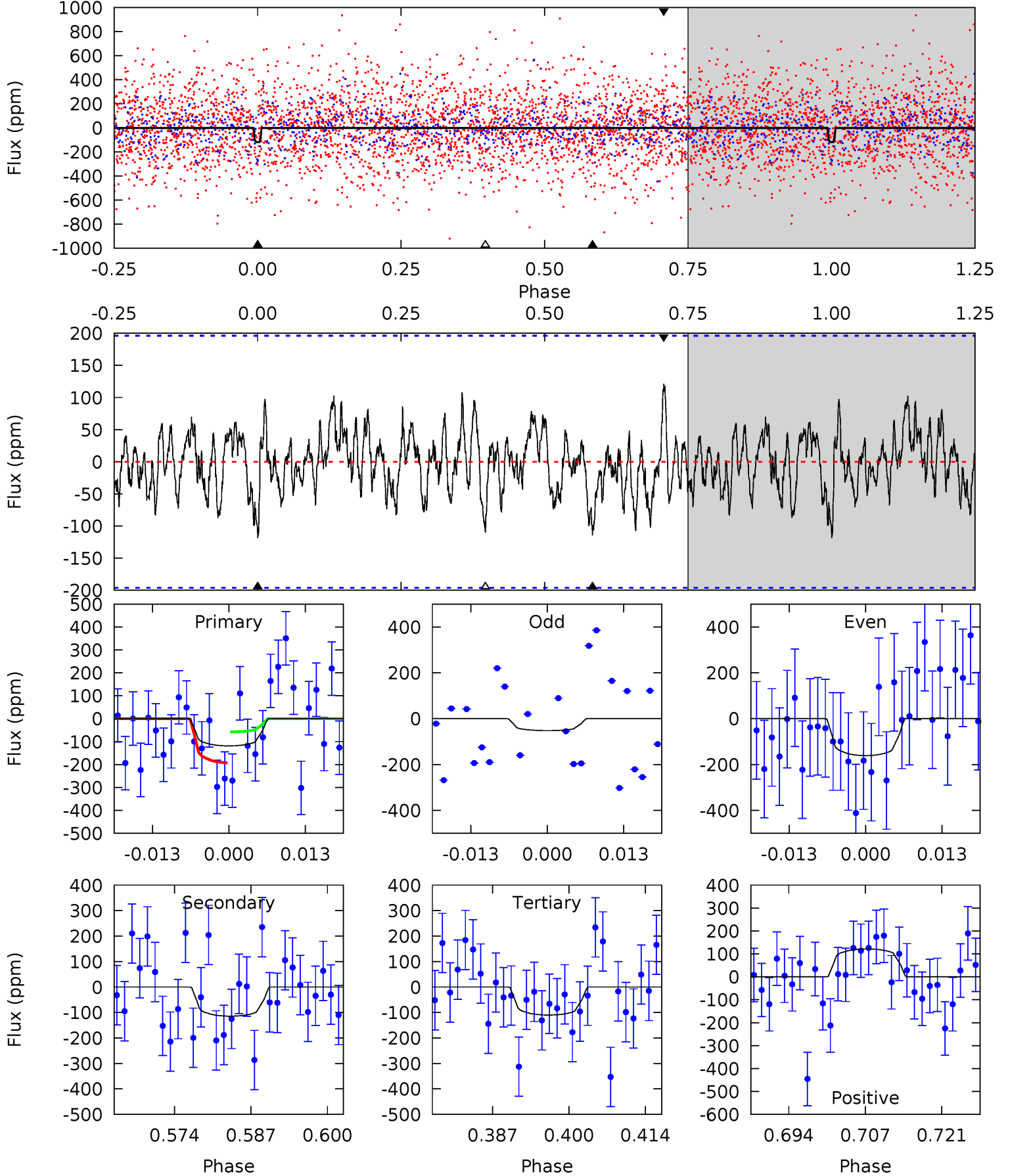
TCE 005286045-03 P= 14.003125 Days  $T_0=140.188263$  (BKJD)



# DV Model-Shift Uniqueness Test

005286045-03, P = 13.997211 Days, E = 126.390958 Days

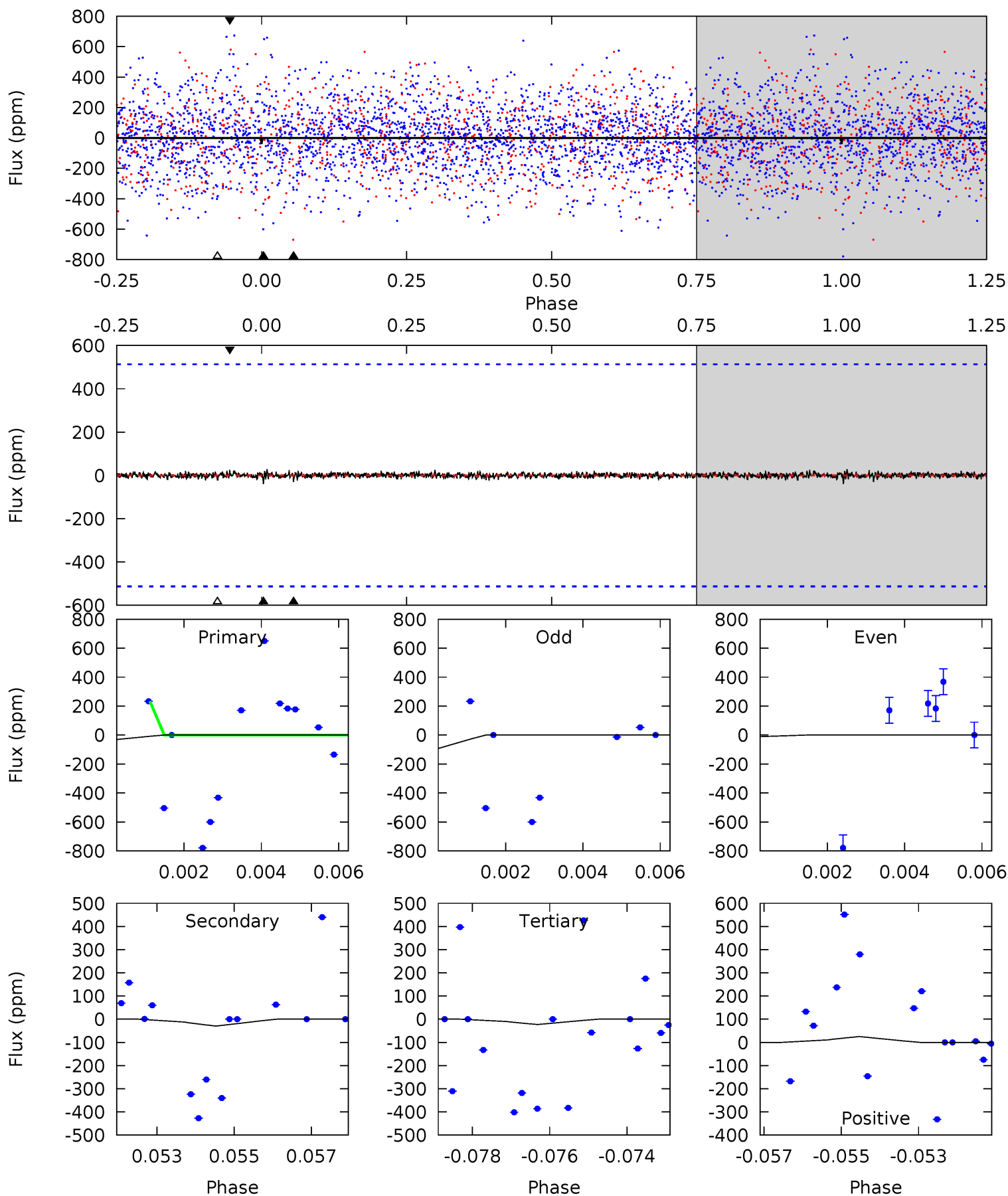
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.00	2.90	2.79	3.08	4.97	2.47	1.02	0.21	-0.07	0.11	-0.18	1.37	2.13	0.51	1.72



# Alt Model-Shift Uniqueness Test

005286045-03, P = 14.003125 Days, E = 126.185138 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
0.41	0.31	0.24	0.26	5.32	3.08	0.07	0.17	0.15	0.07	0.05	0.60	0	0.42	1.28



### Stellar Parameters For KIC 005286045

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6847^{+167}_{-286}$	$4.358^{+0.060}_{-0.180}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.357}_{-0.127}$	$1.239^{+0.178}_{-0.160}$	$0.977^{+0.256}_{-0.465}$
	+2%/-4%	+1%/-4%	+114%/-136%	+29%/-10%	+14%/-13%	+26%/-48%
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 005286045-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-114 \pm 39$	$5.53^{+6.54}_{-3.72}$	$1355^{+89}_{-75}$	$3846^{+2234}_{-871}$	$28^{+237}_{-23}$
Alt.	$-30 \pm 96$	$7.50^{+6.70}_{-5.18}$	$1349^{+82}_{-67}$	$2726^{+1462}_{-5970}$	$3.194^{+41.417}_{-12.548}$

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

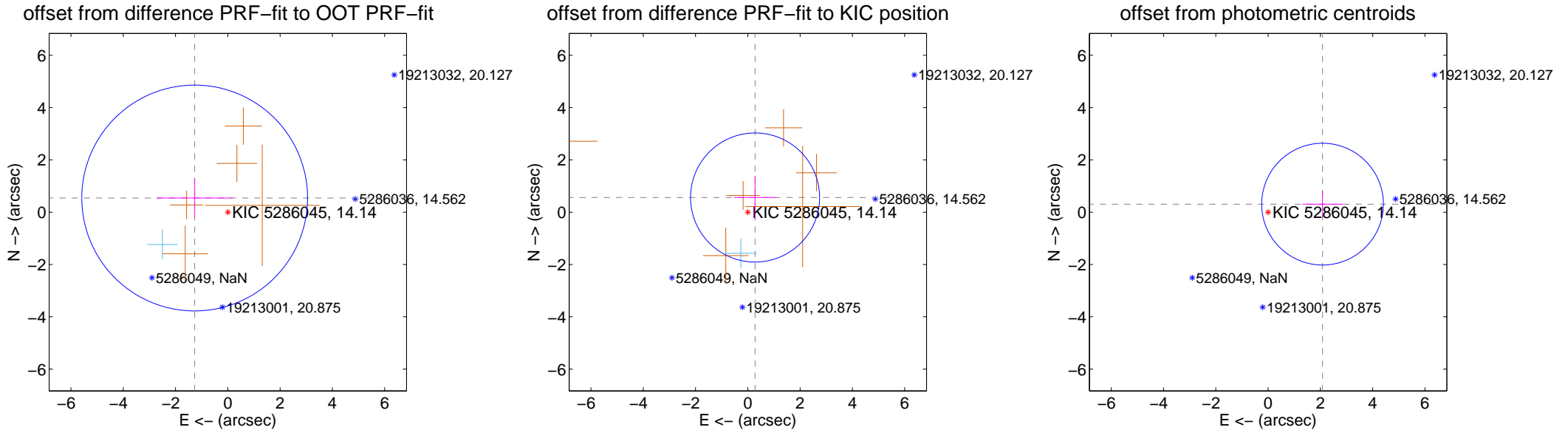
## DV Centroid Data

Supplemental centroid analysis for 005286045-03. Kepler magnitude: 14.14. Transit SNR 6.63

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 2.26 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

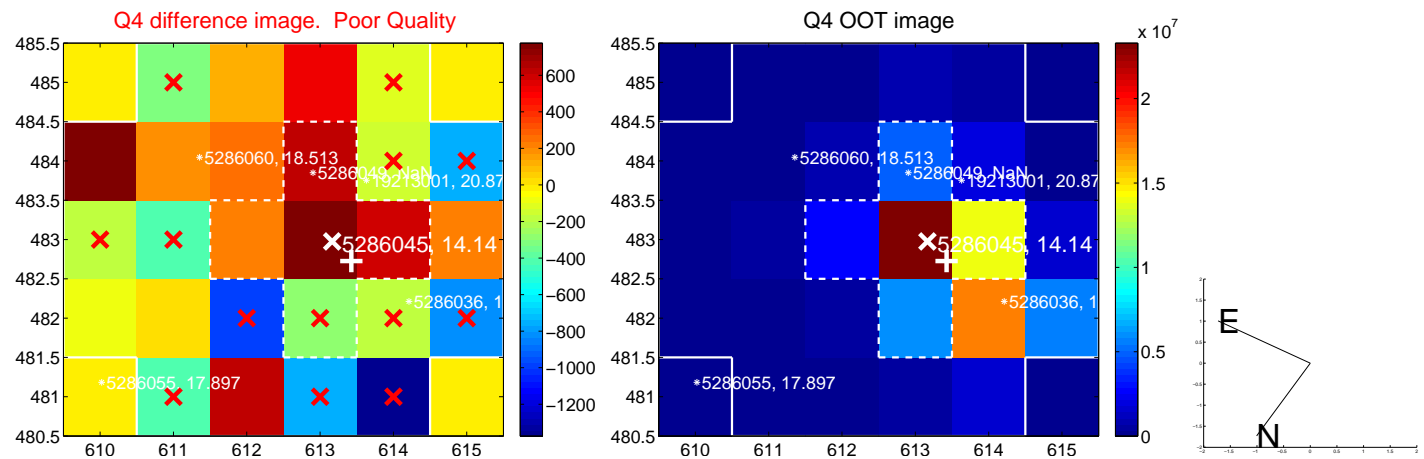
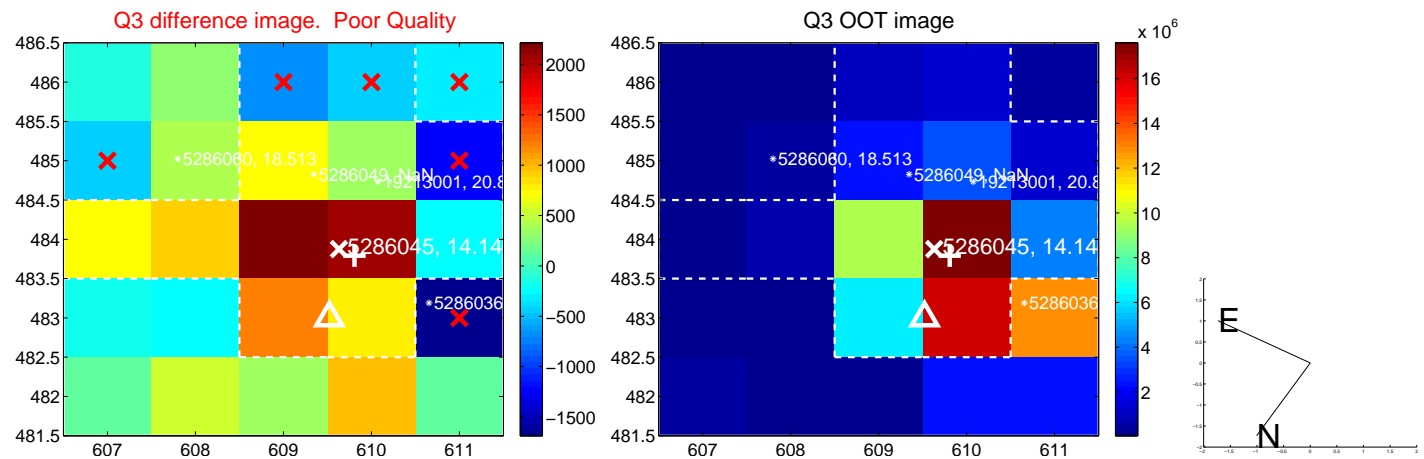
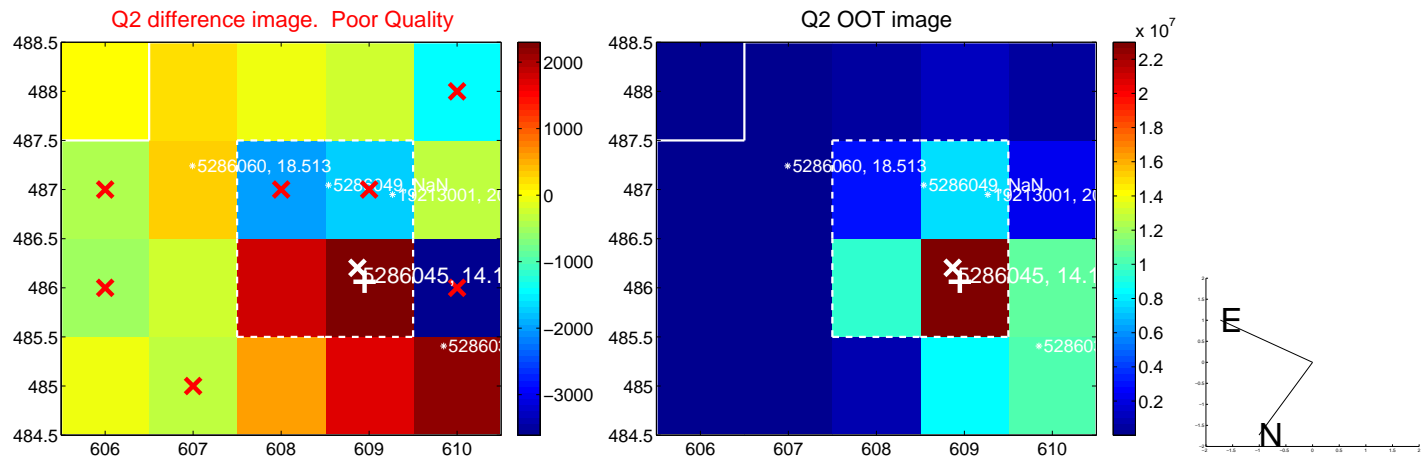
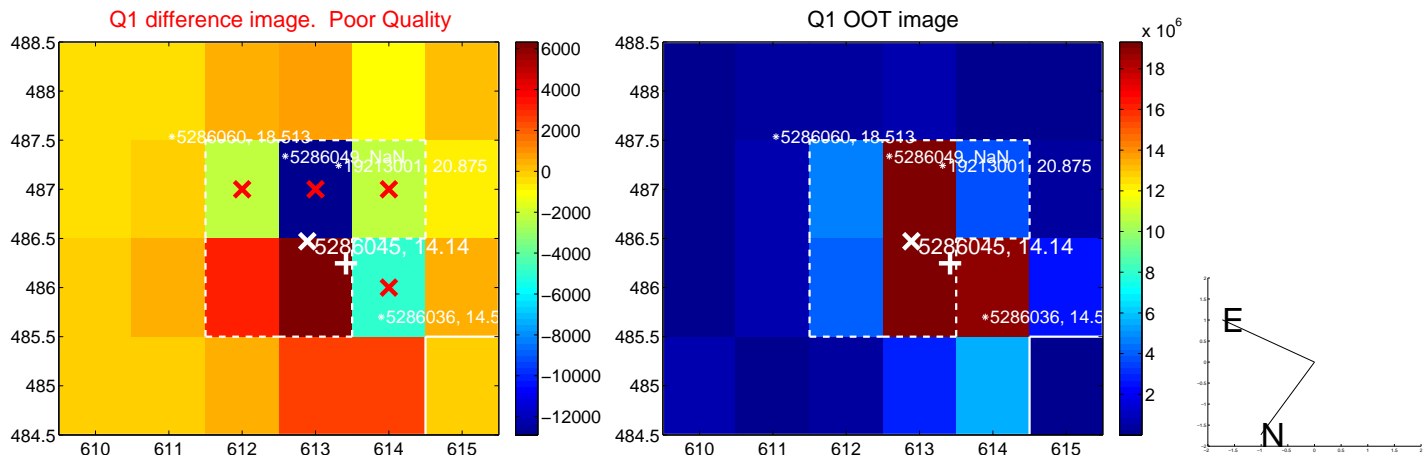
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.379 \pm 1.439$	0.96	$1.268 \pm 1.453$	$0.542 \pm 0.740$
PRF-fit source offset from KIC position	$0.626 \pm 0.823$	0.76	$-0.277 \pm 0.801$	$0.561 \pm 0.828$
photometric centroid source offset	$2.10 \pm 0.78$	2.71	$-2.08 \pm 0.78$	$0.31 \pm 0.52$



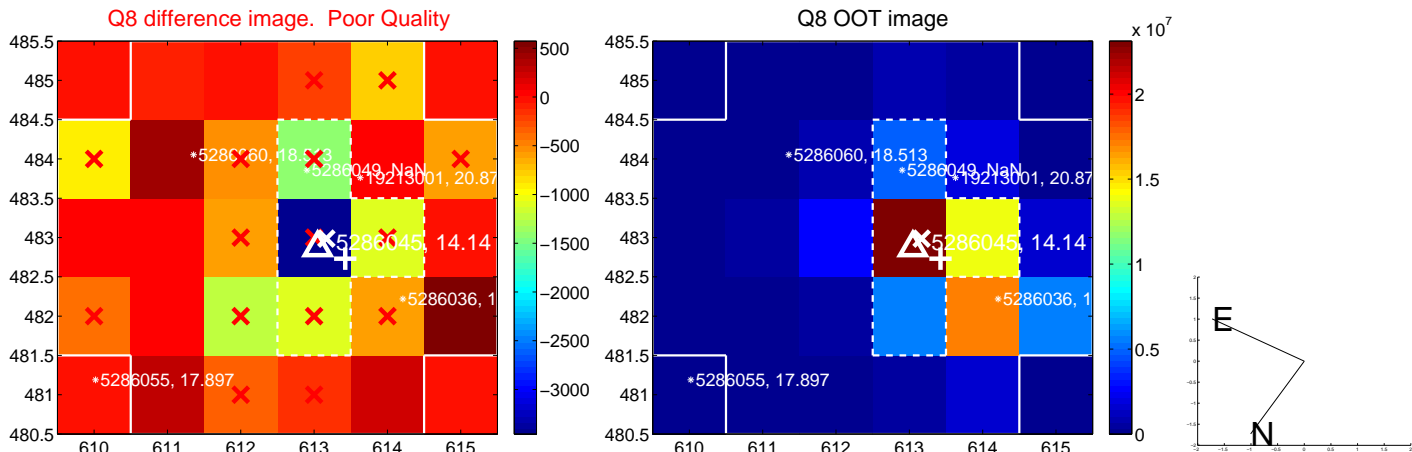
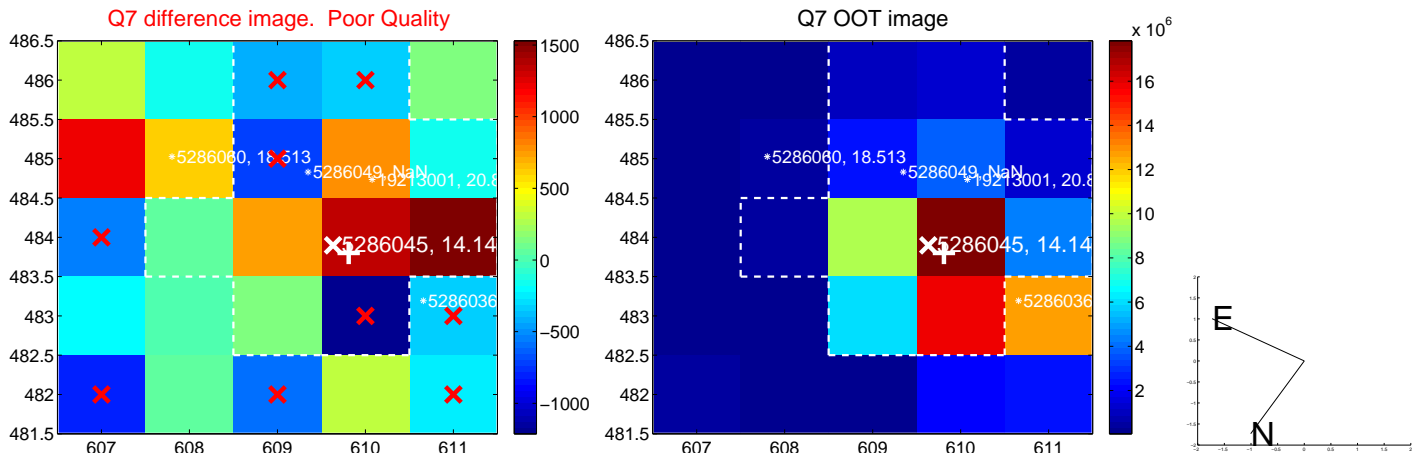
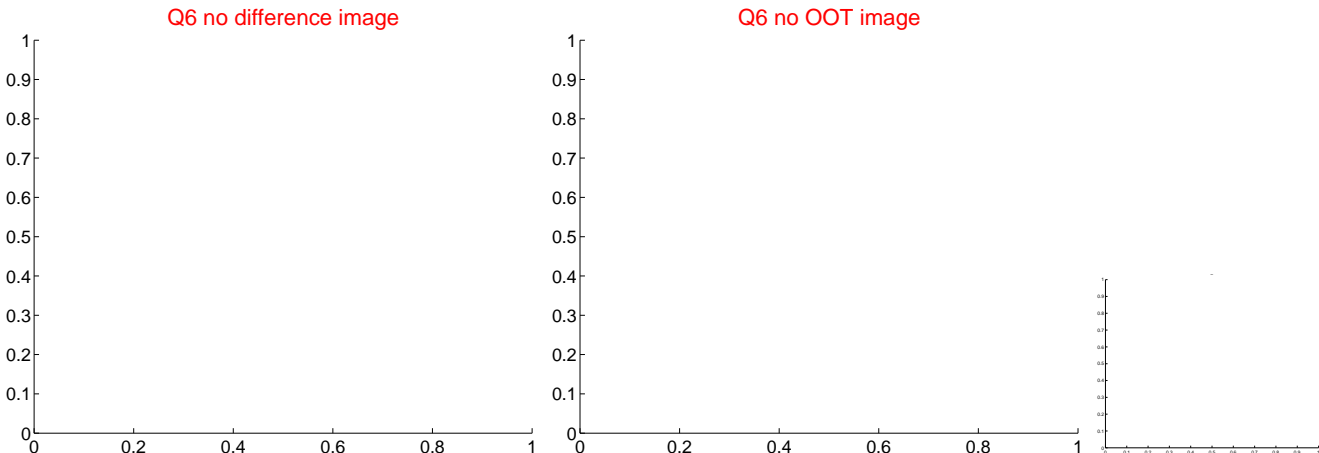
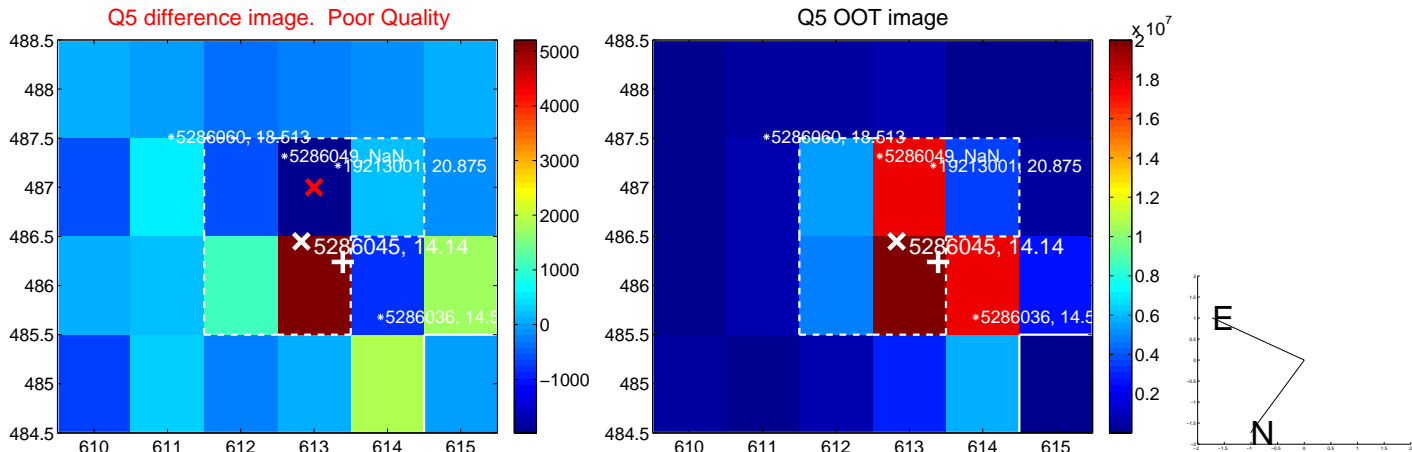
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



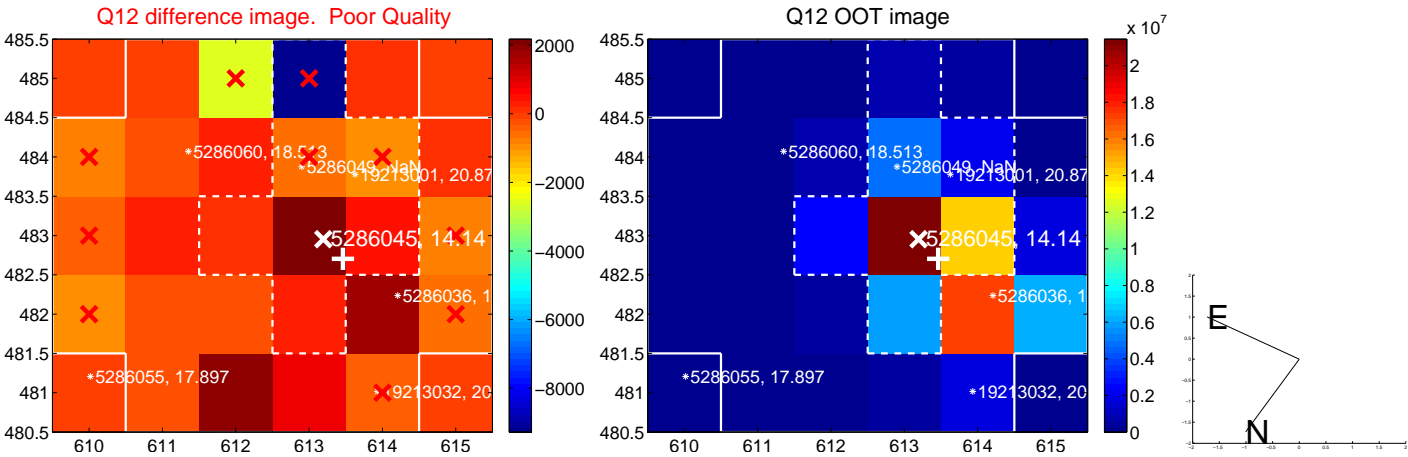
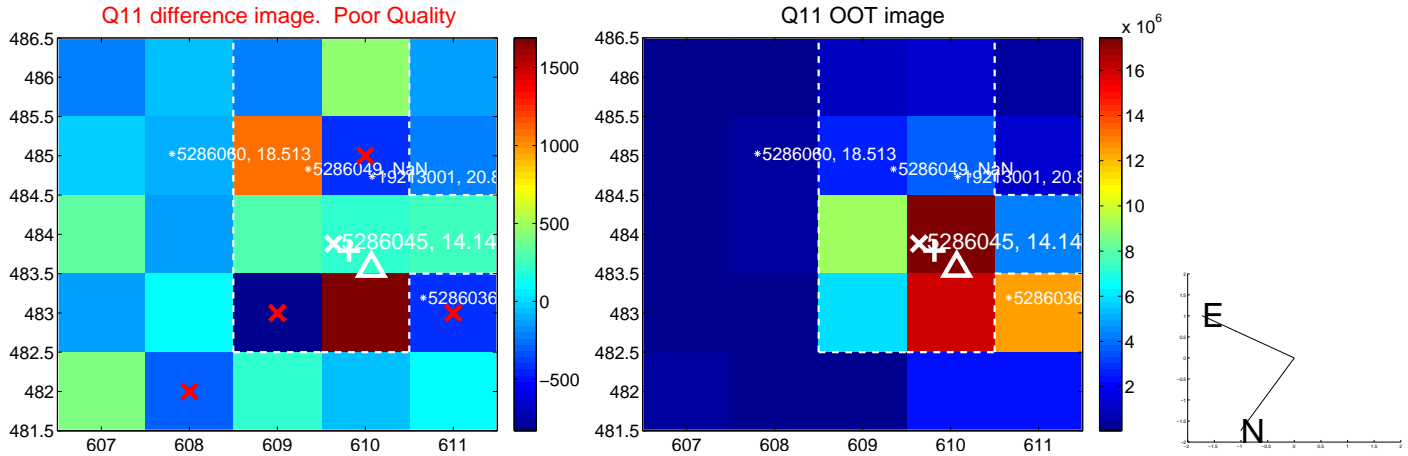
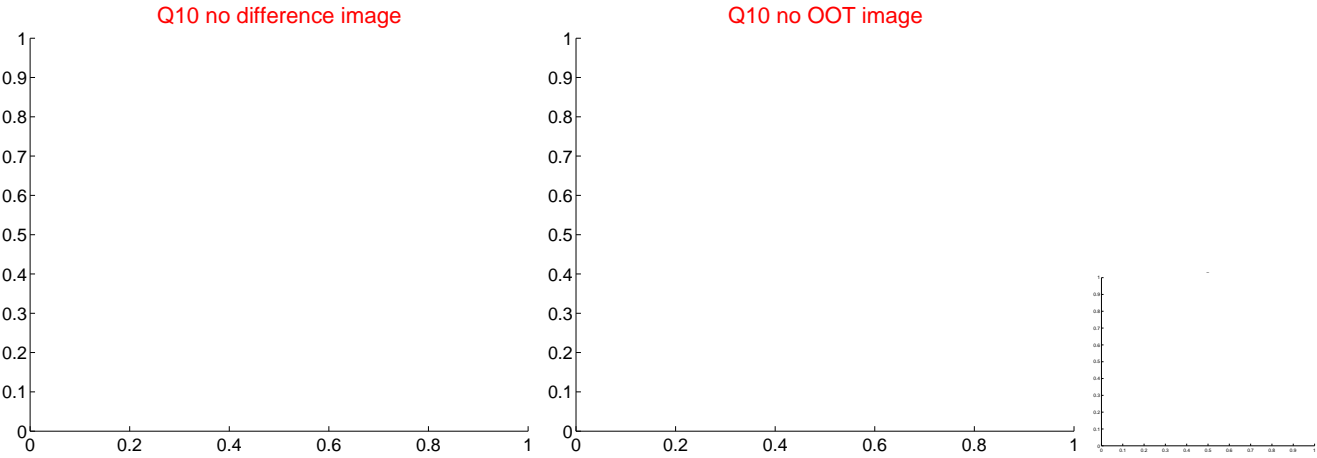
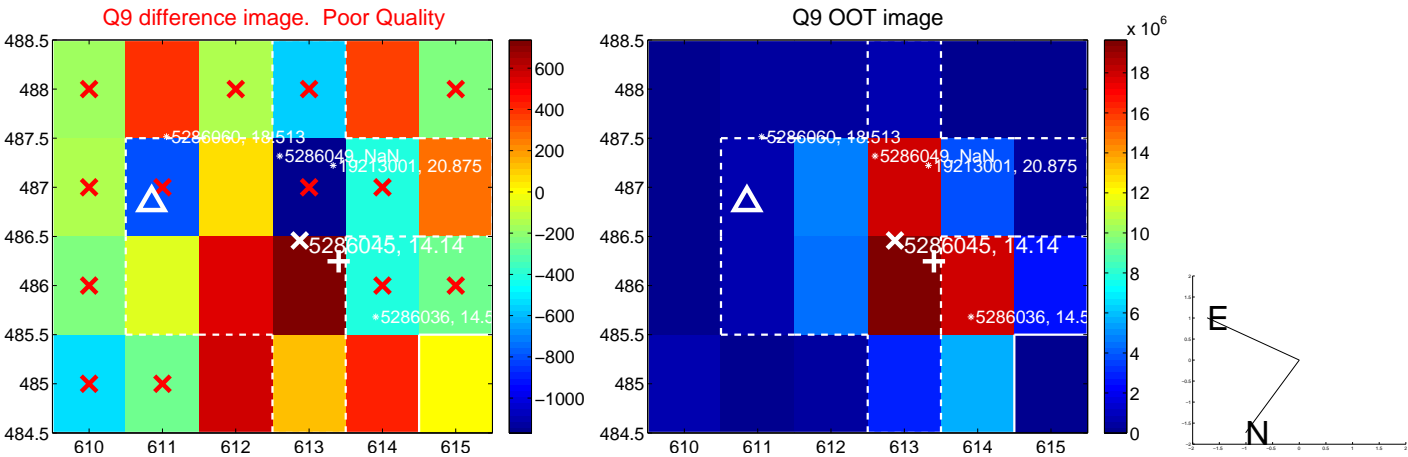
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



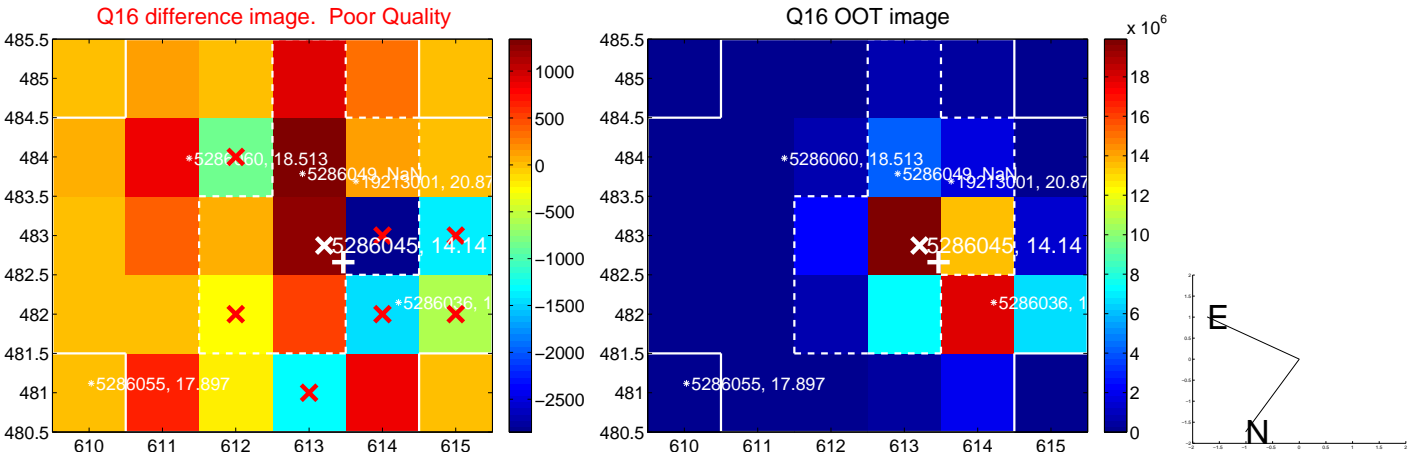
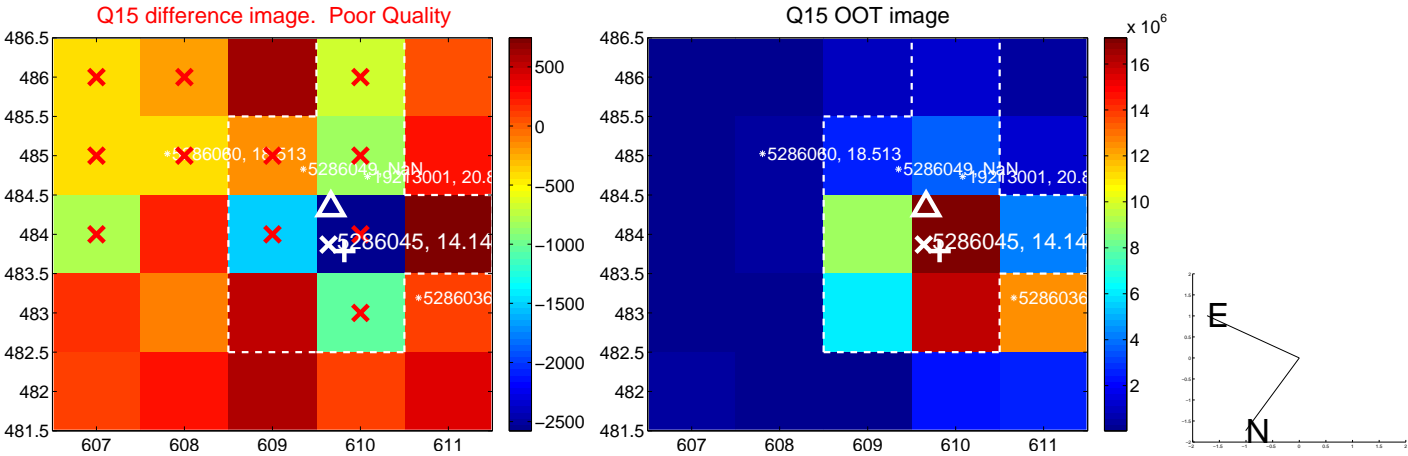
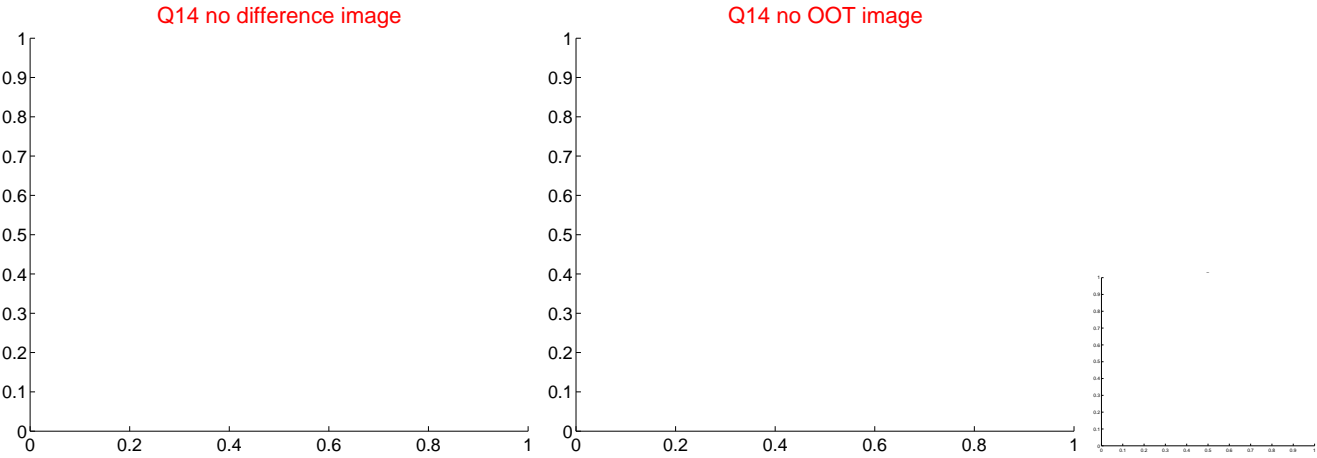
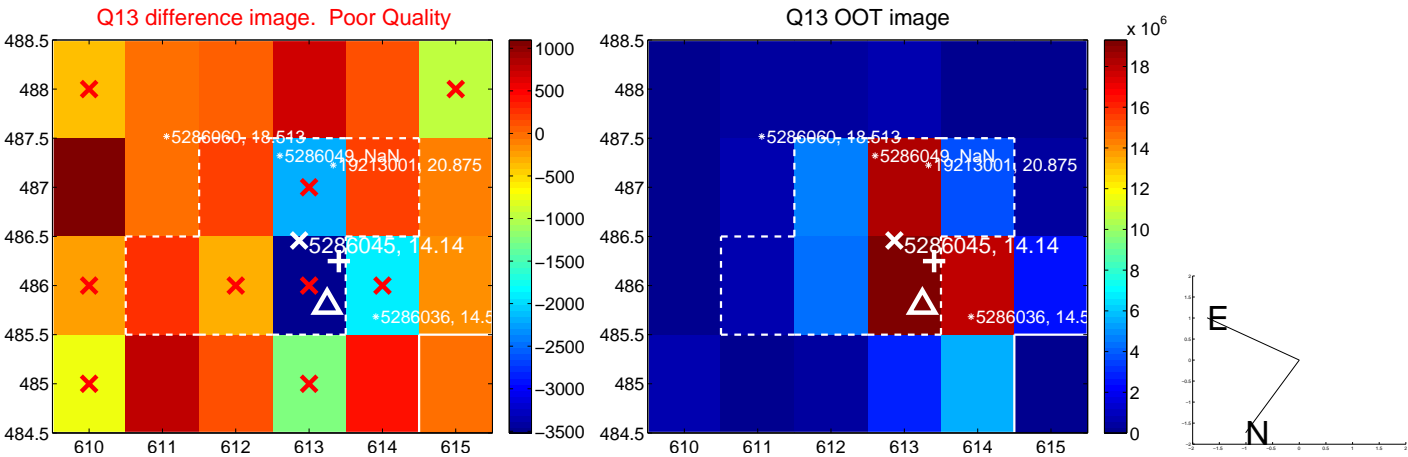
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



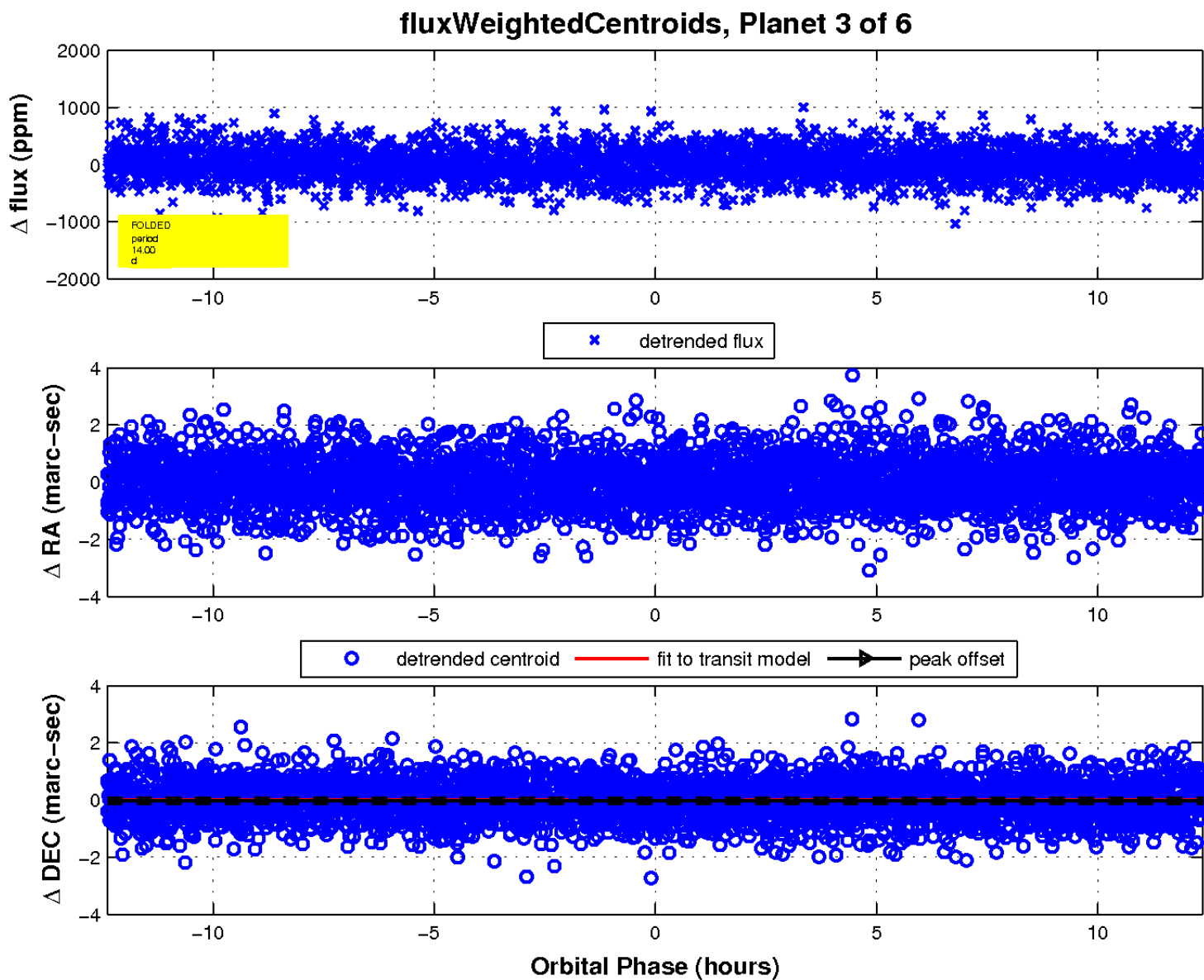
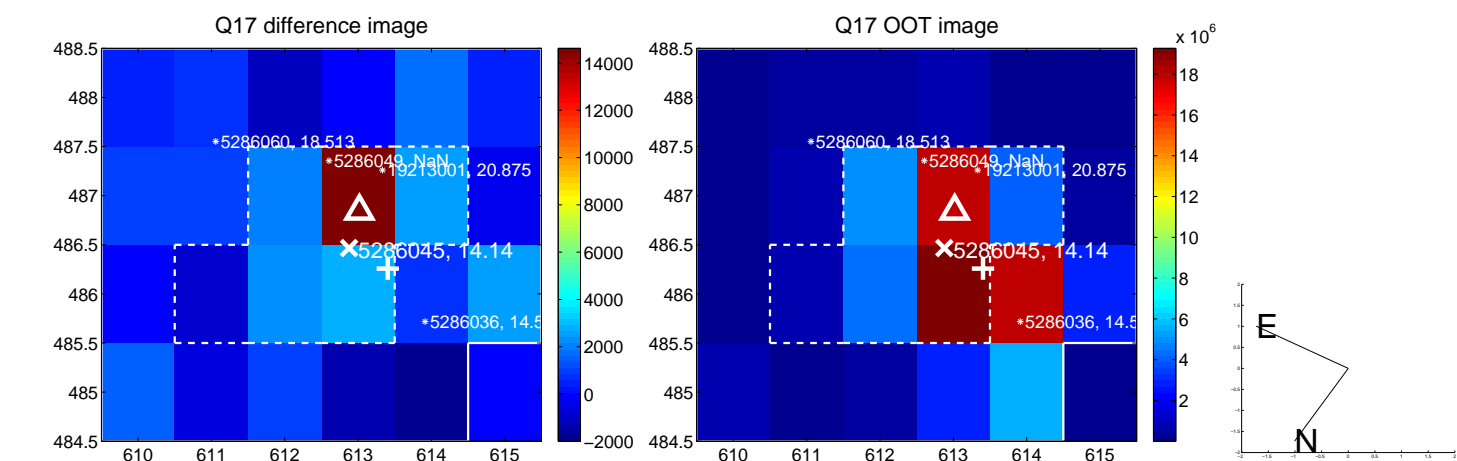
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

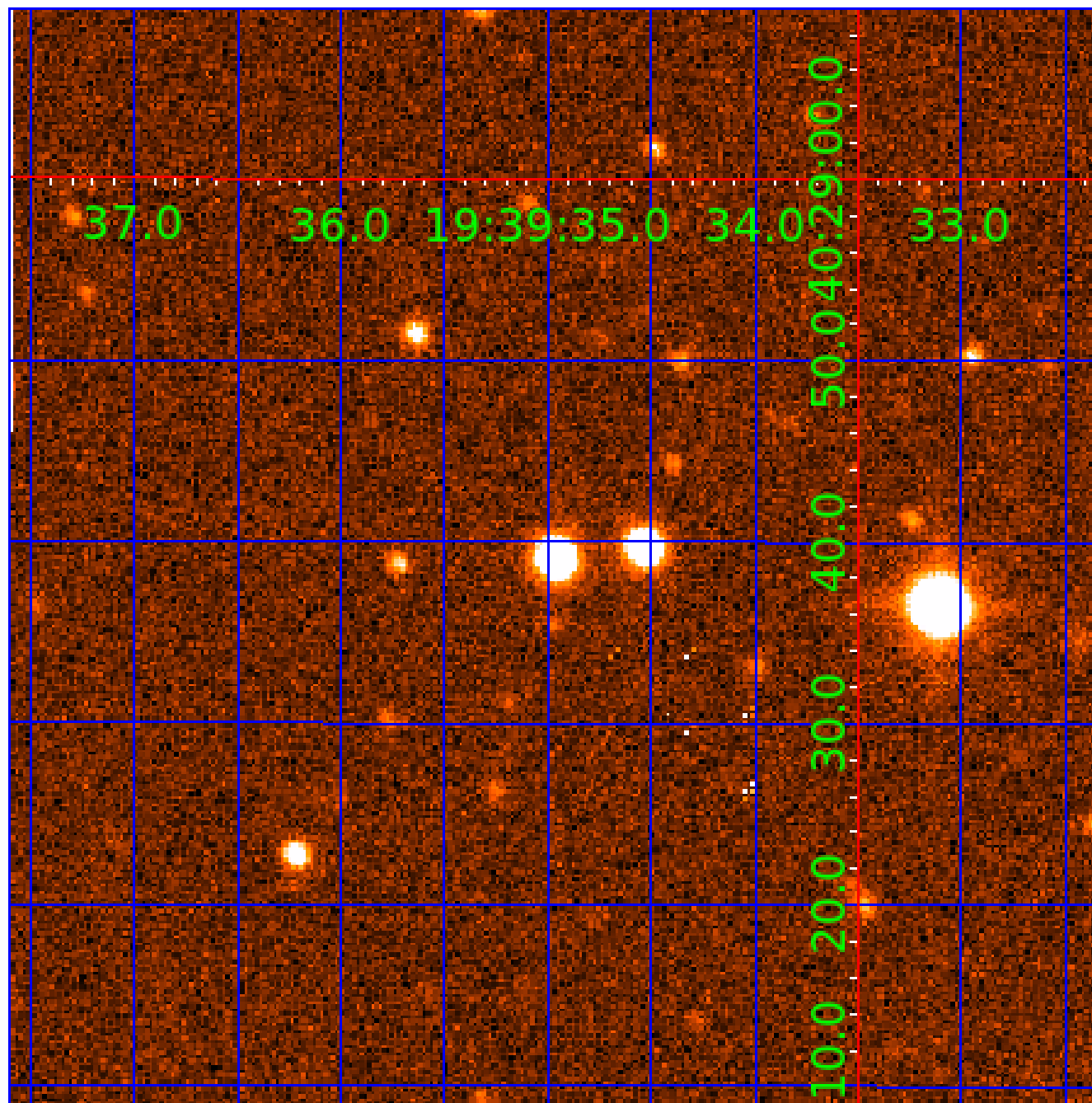


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005286045

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005286045-01	OBS	No	0.503876	131.616885	20.3	3.610	9.4	7.2	1.21	6847	0.56	16483.05
005286045-02	OBS	No	24.776117	155.043494	650.0	1.006	13.2	14.9	1.21	6847	3.46	91.50
005286045-03	OBS	No	13.997211	140.388169	165.4	4.129	10.8	6.6	1.21	6847	1.58	195.92
005286045-04	OBS	No	14.093368	132.666482	263.2	1.475	9.9	6.8	1.21	6847	2.28	194.14
005286045-05	OBS	No	11.428347	136.664083	182.8	1.724	8.5	5.7	1.21	6847	1.77	256.74
005286045-06	OBS	No	28.466030	146.235729	386.6	2.095	10.9	11.4	1.21	6847	2.44	76.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005286045-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS
005286045-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005286045-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

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

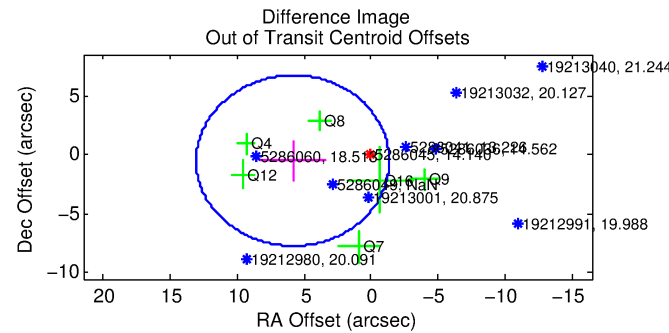
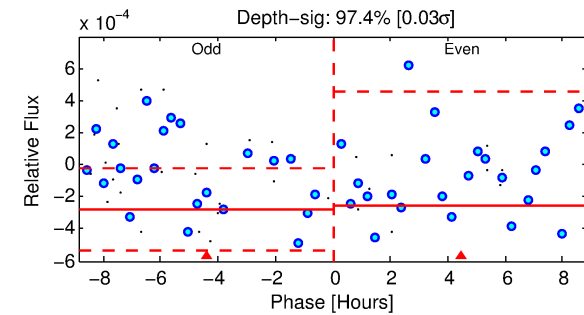
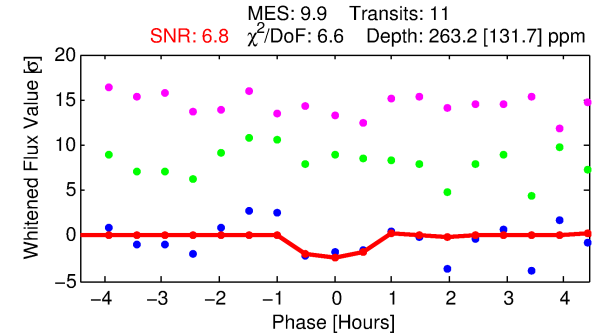
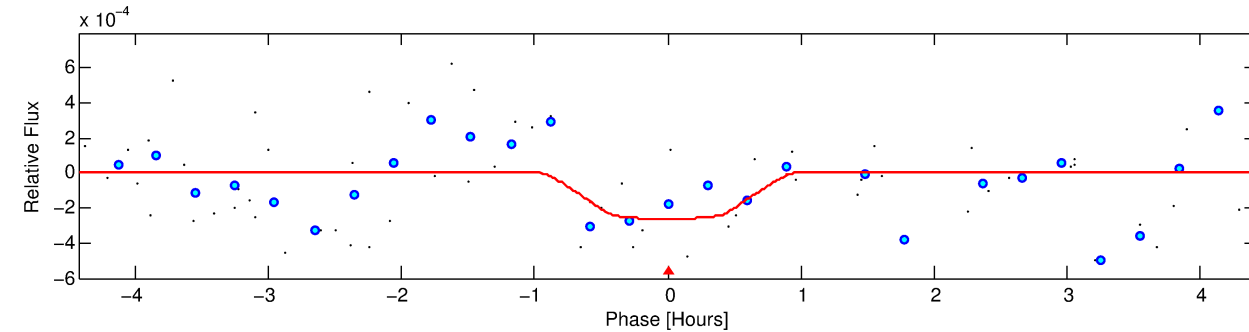
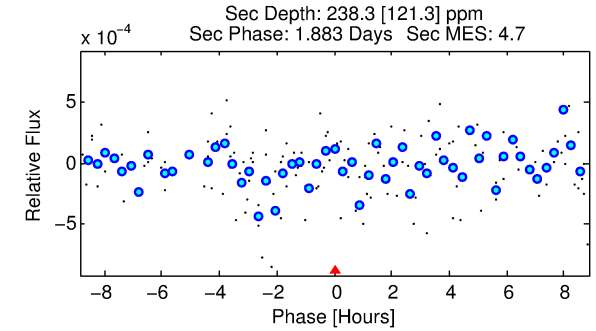
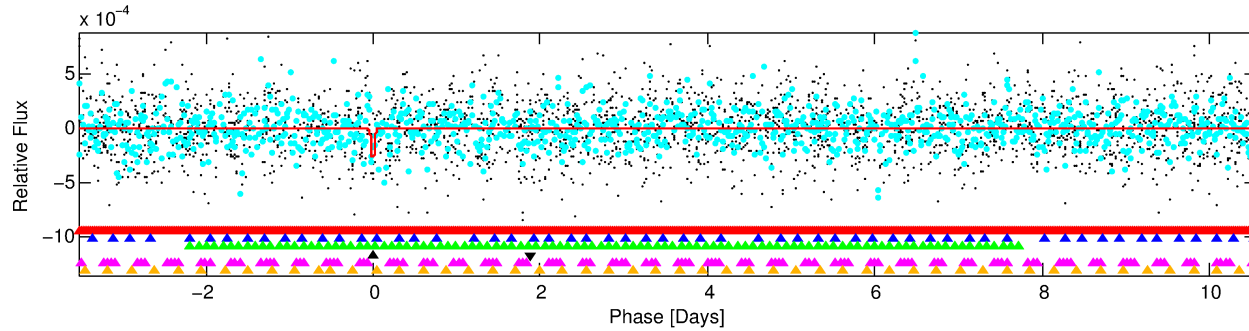
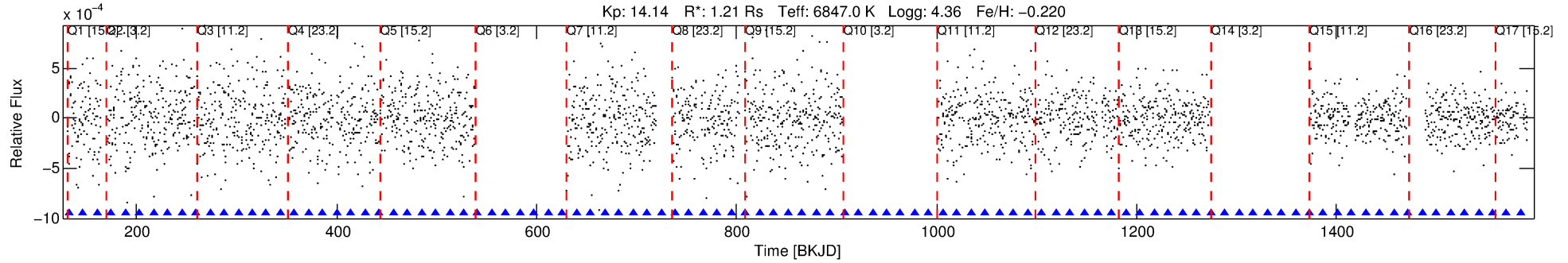
## Ephemeris Match Information For 005286045-04

No Significant Match Found



# DV One-Page Summary

KIC: 5286045 Candidate: 4 of 6 Period: 14.093 d



## DV Fit Results:

Period = 14.09337 [0.00045] d  
Epoch = 132.6665 [0.0228] BKJD  
Rp/R\* = 0.0172 [0.0373]  
a/R\* = 36.19 [467.18]  
b = 0.89 [3.10]  
Seff = 194.14 [73.35]  
Teq = 952 [90] K  
Rp = 2.28 [4.99] Re  
a = 0.1222 [0.0293] AU  
Ag = 377.17 [1653.35] [0.23 $\sigma$ ]  
Teffp = 6485 [7091] K [0.78 $\sigma$ ]

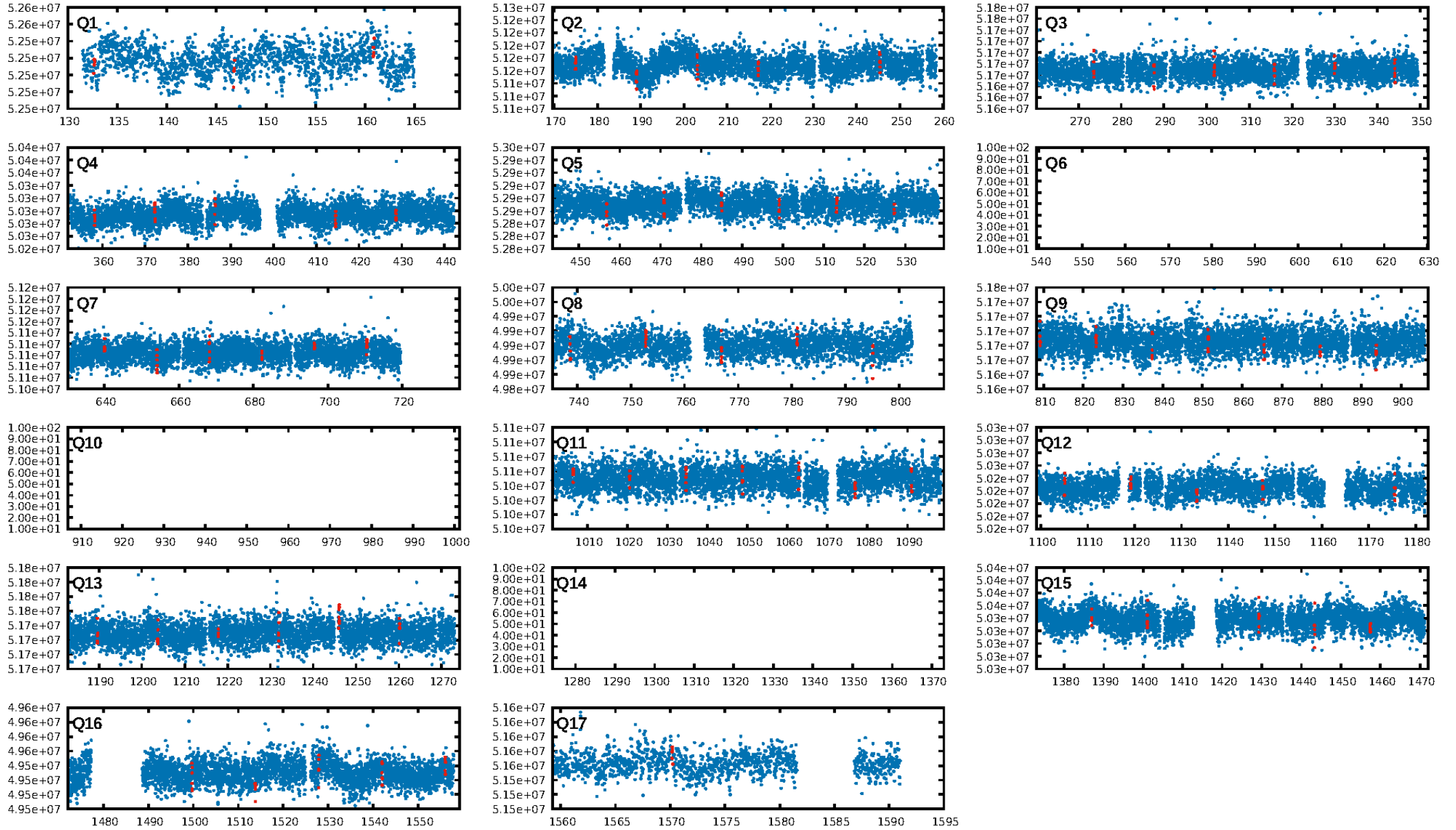
## DV Diagnostic Results:

ShortPeriod-sig: 40.1% [0.53 $\sigma$ ]  
LongPeriod-sig: 100.0% [143.64 $\sigma$ ]  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 51.7%  
Bootstrap-pfa: 3.74e-14  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 1.416  
Centroid-sig: N/A  
Centroid-so: 1.614 arcsec [2.26 $\sigma$ ]  
OotOffset-rm: 5.870 arcsec [2.44 $\sigma$ ]  
KicOffset-rm: 4.482 arcsec [1.75 $\sigma$ ]  
OotOffset-st: 0/1/4/1 [6]  
KicOffset-st: 0/1/4/1 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.00 [0/14]

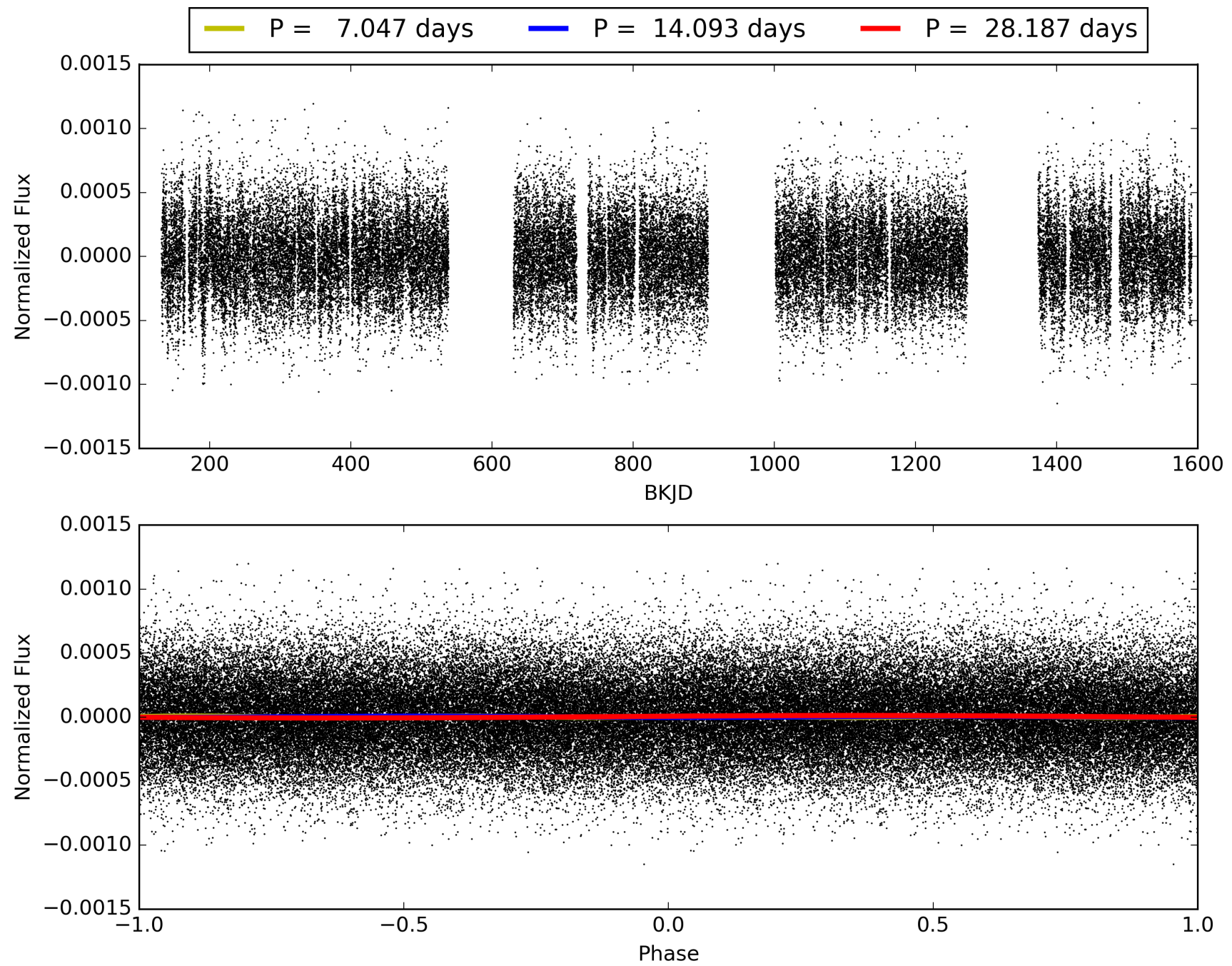
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:26:50 Z

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

# TCE 005286045-04, PDC Light Curves

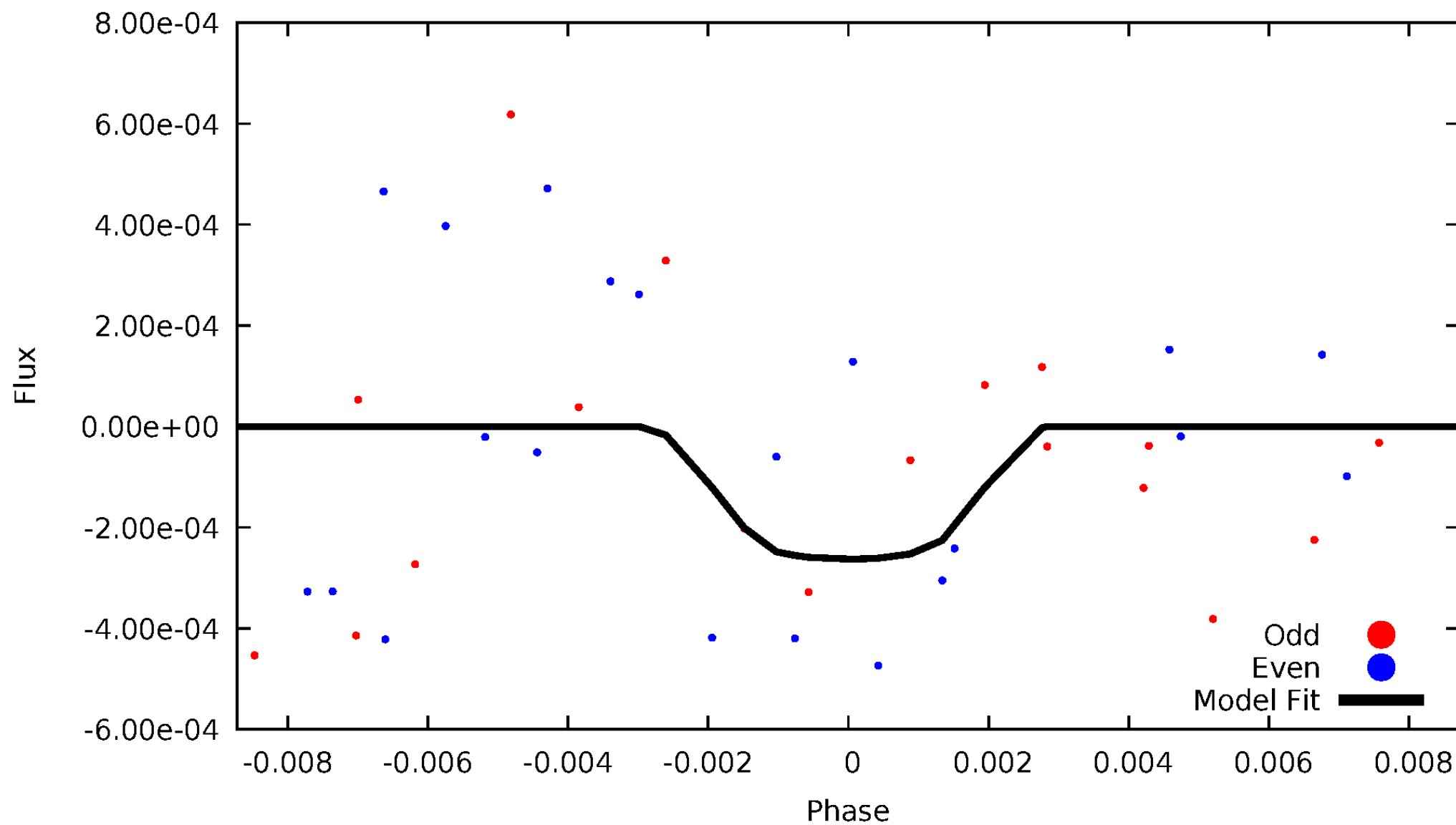


TCE 005286045-04



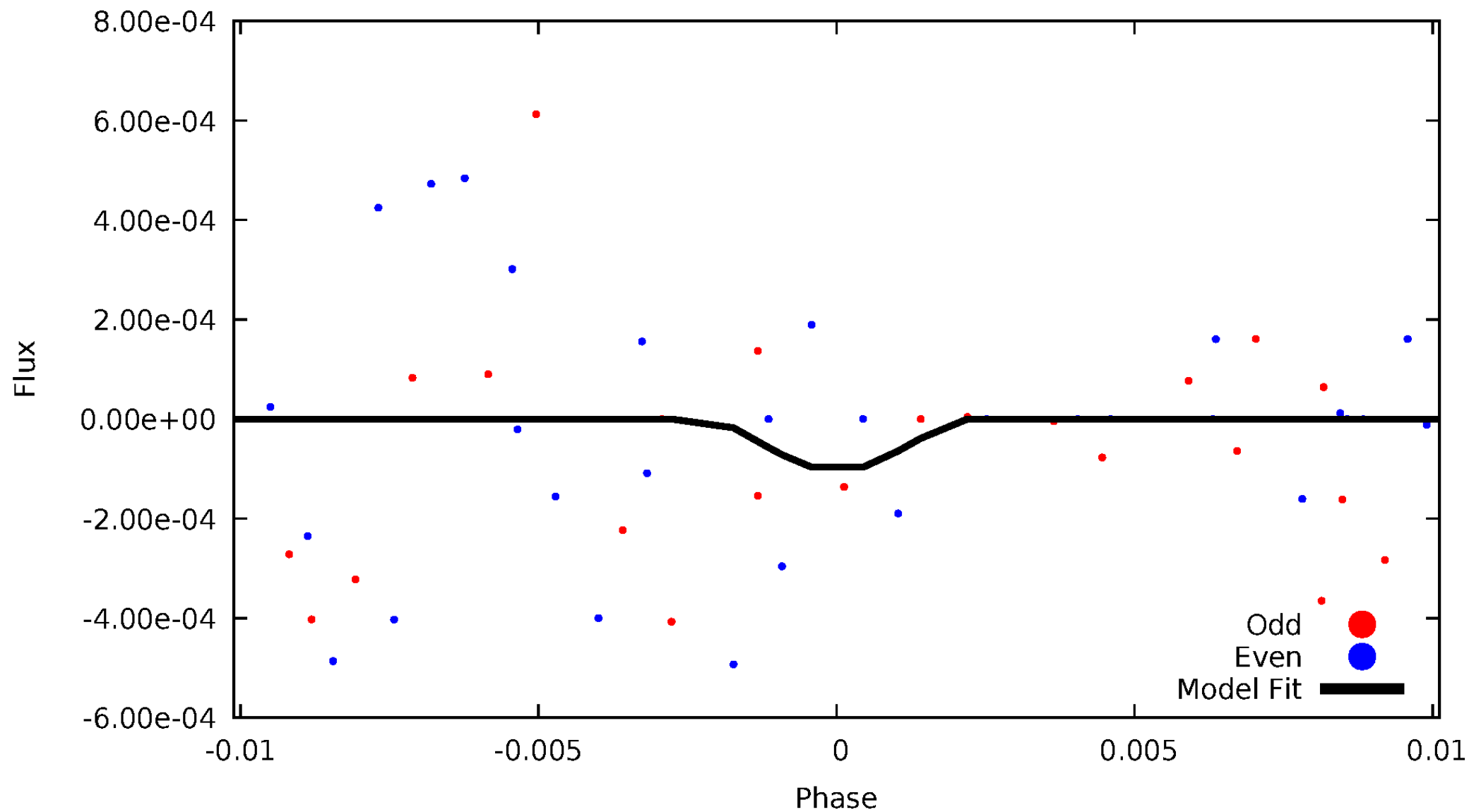
# DV Odd/Even

TCE 005286045-04



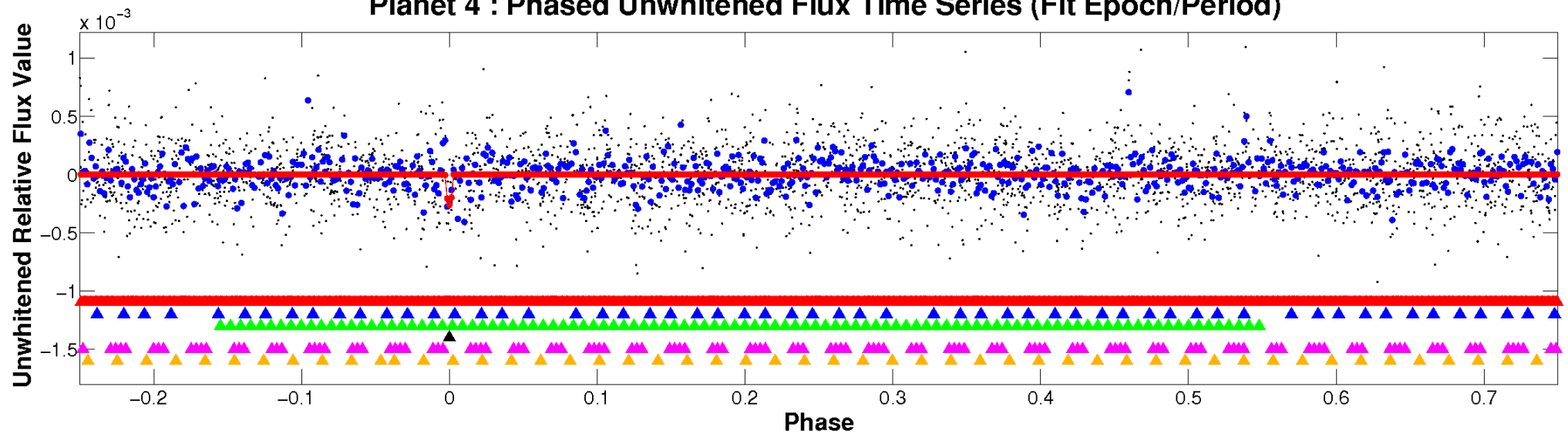
# ALT Odd/Even

TCE 005286045-04

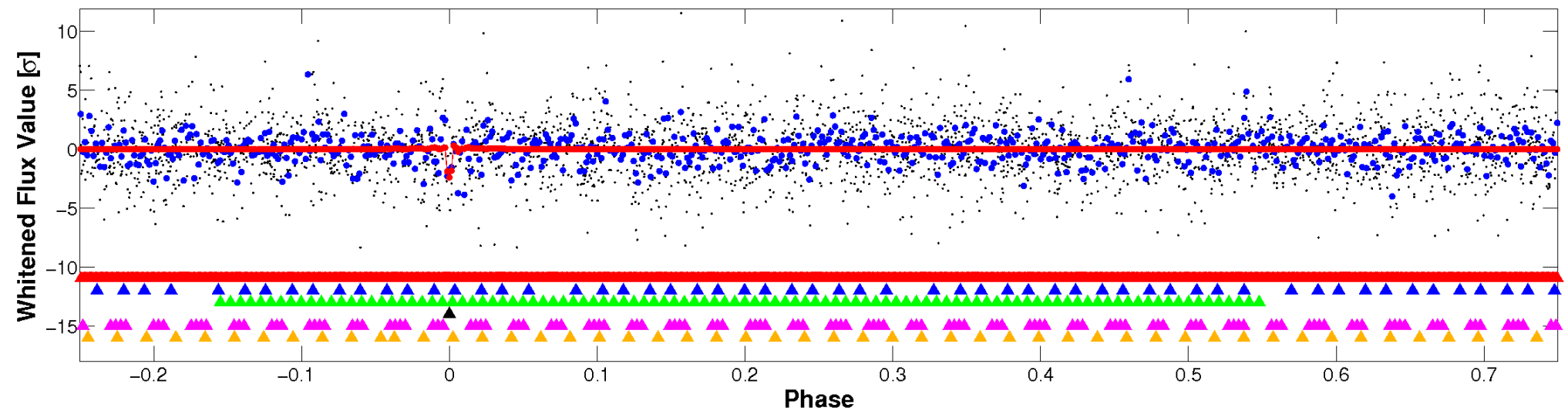


# Non-Whitened Vs. Whitened Light Curve

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

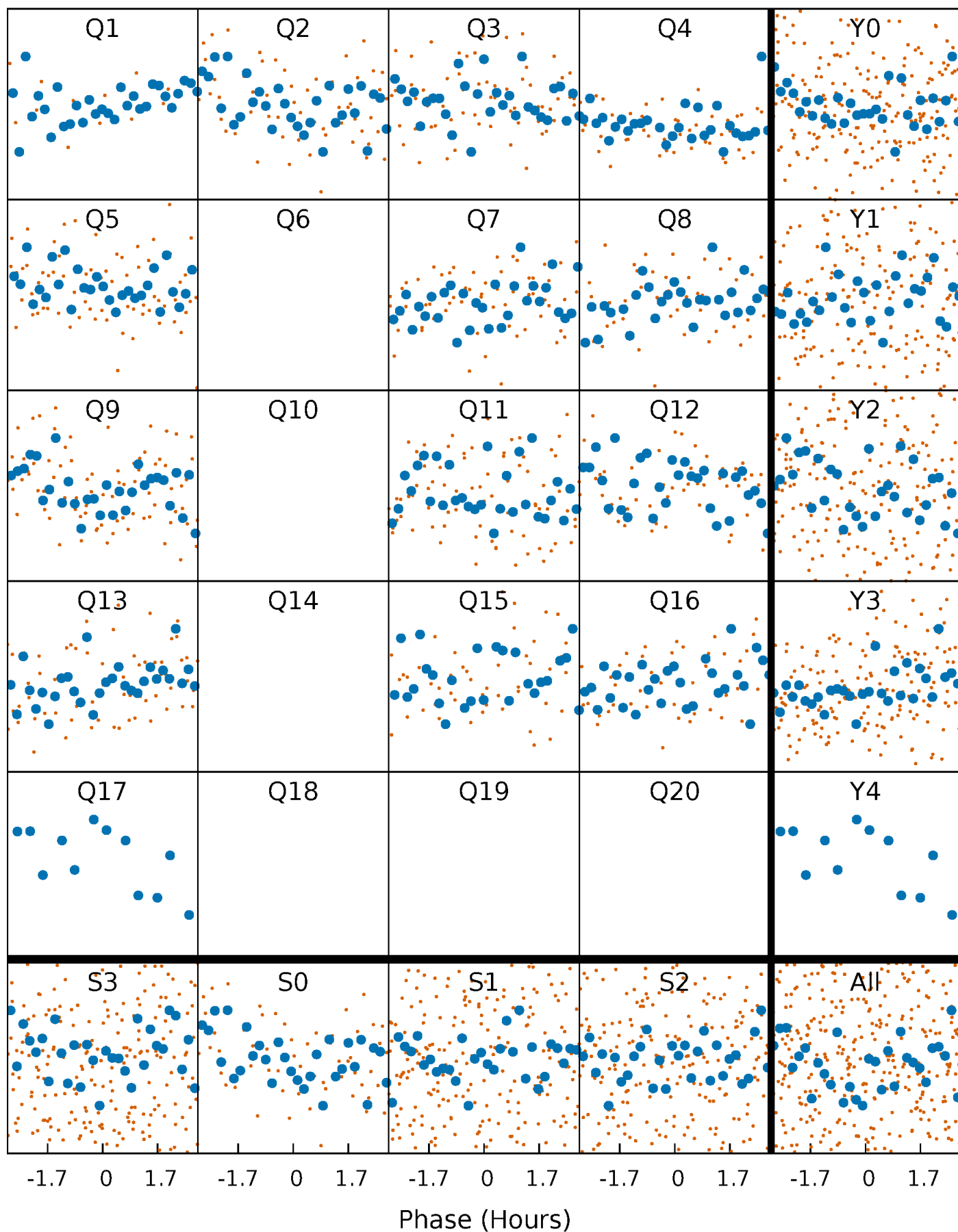


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

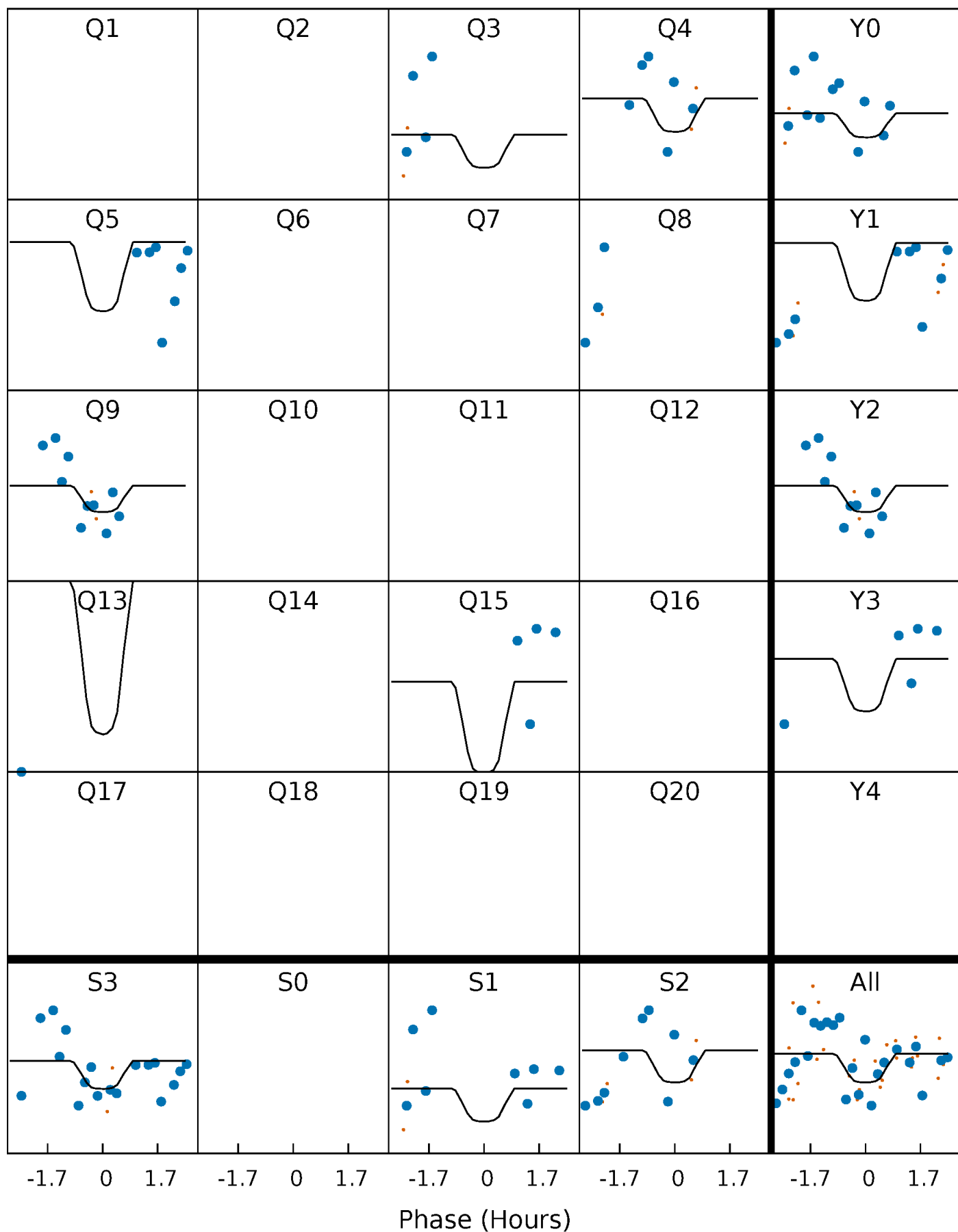
TCE 005286045-04 P= 14.093368 Days  $T_0=132.666482$  (BKJD)





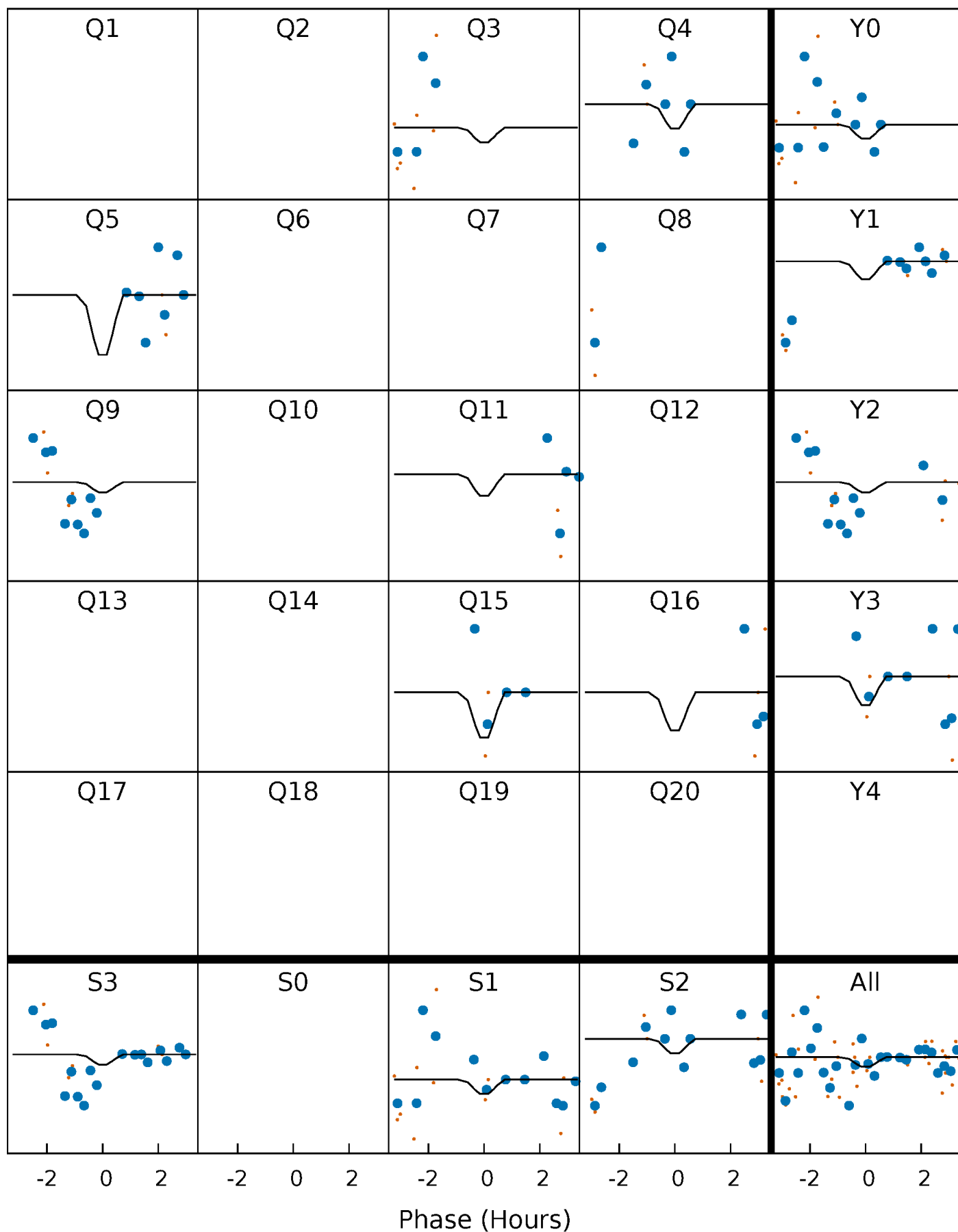
# DV Quarter-Phased Transit Curves

TCE 005286045-04 P= 14.093368 Days  $T_0=132.666482$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

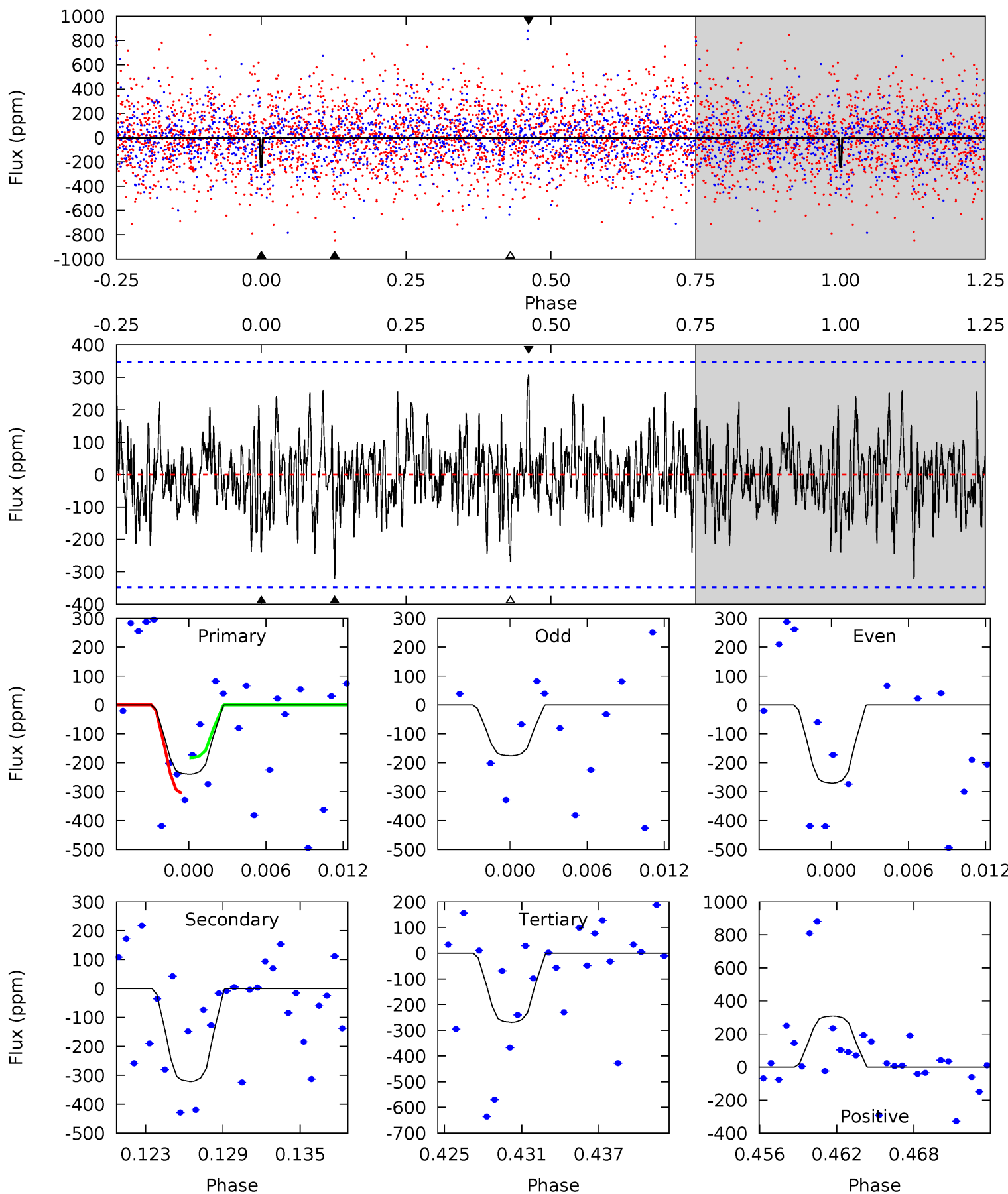
TCE 005286045-04 P= 14.094104 Days  $T_0=132.658595$  (BKJD)



# DV Model-Shift Uniqueness Test

005286045-04, P = 14.093368 Days, E = 118.573114 Days

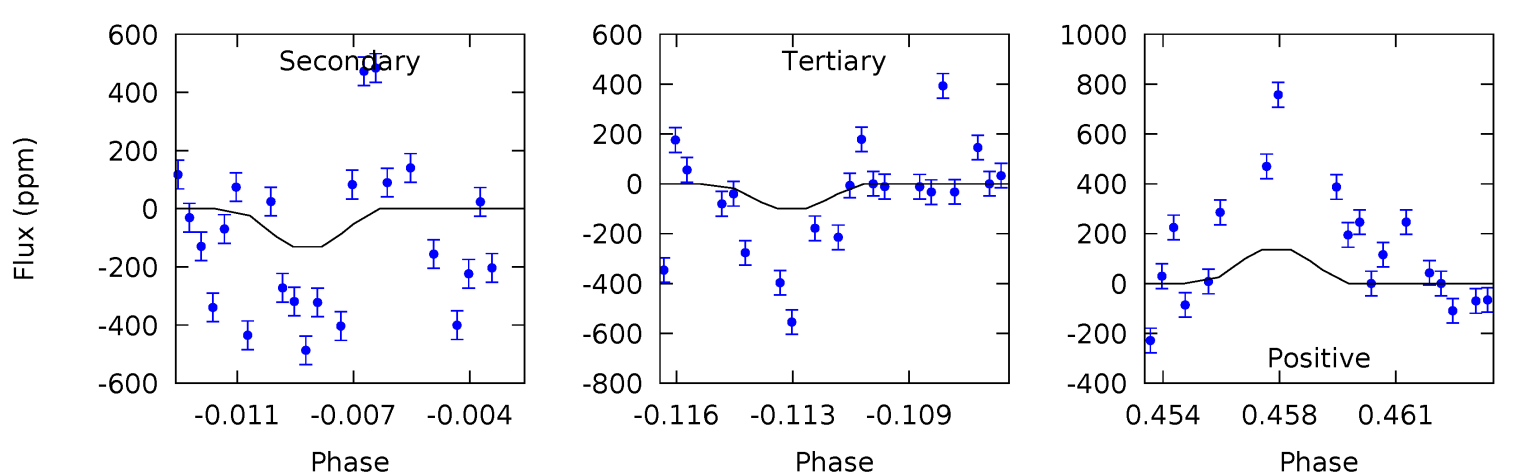
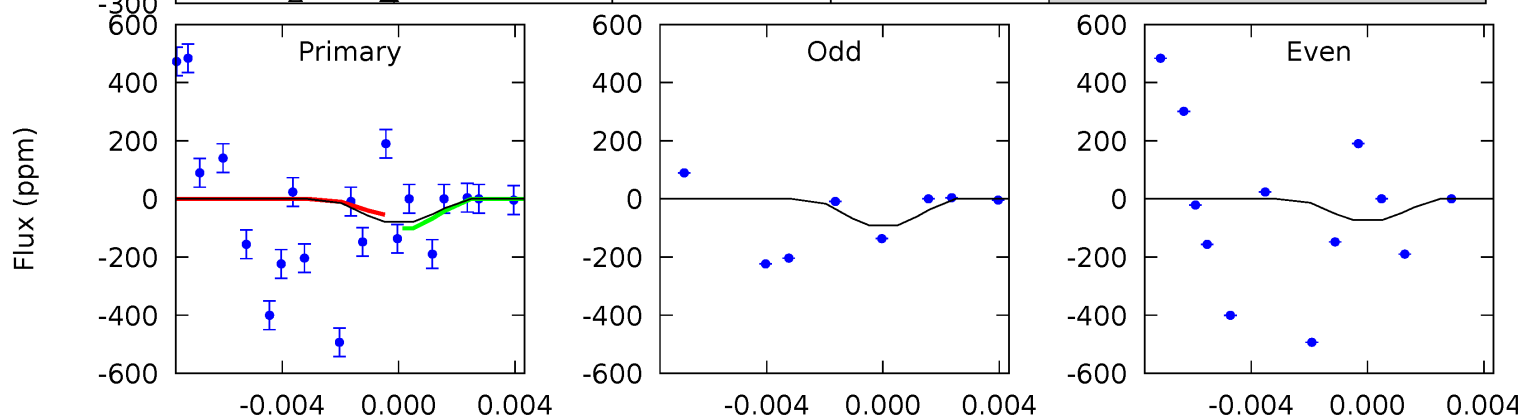
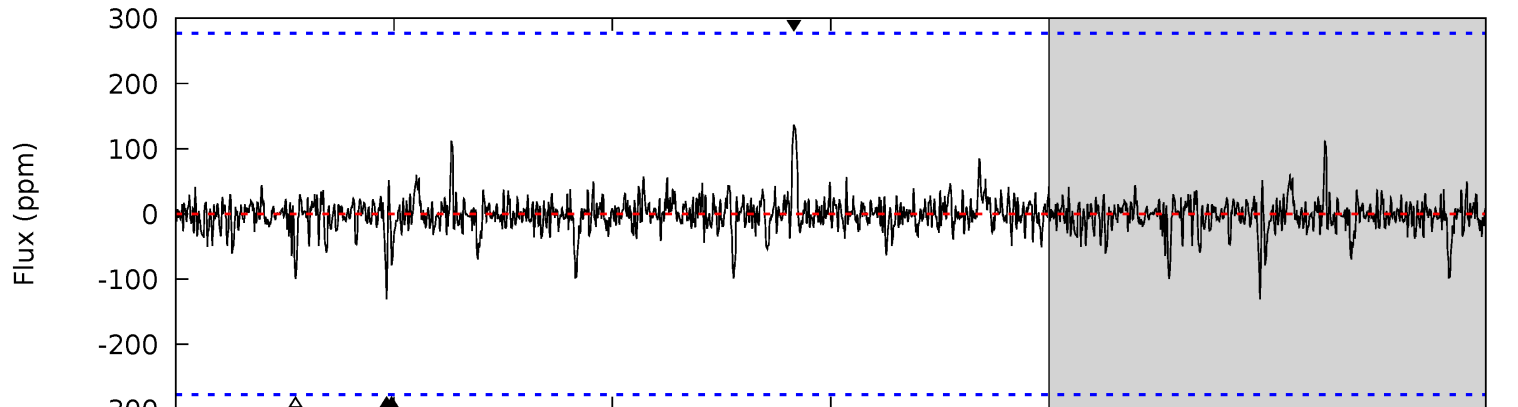
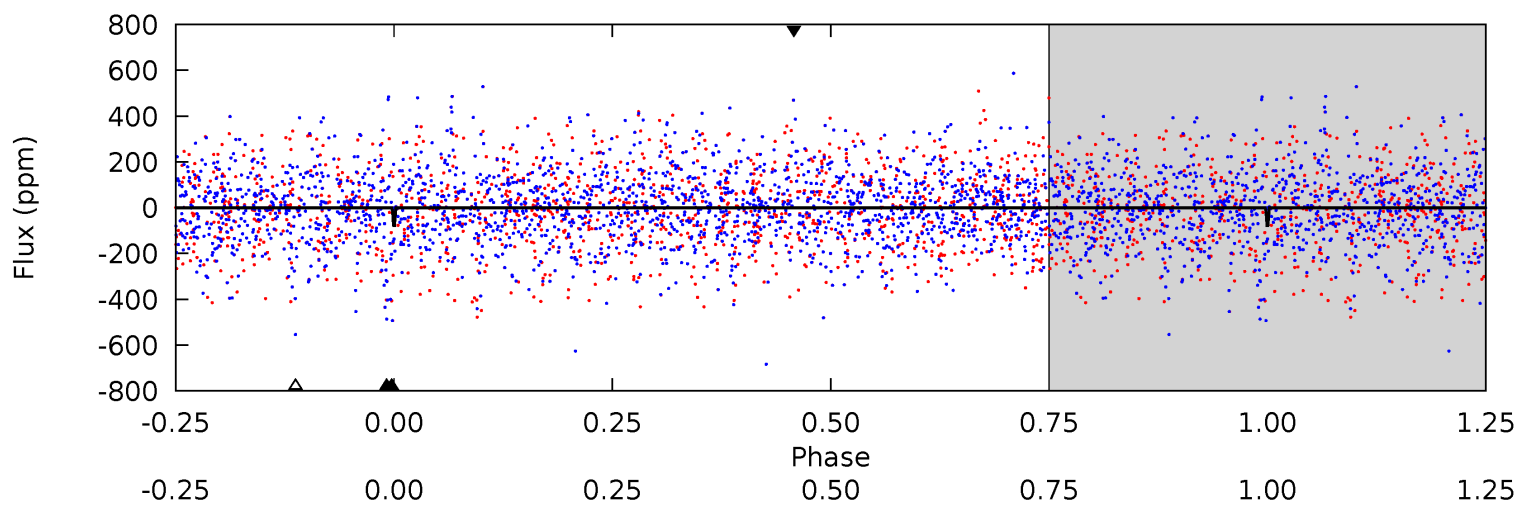
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.54	4.74	3.96	4.55	5.12	2.74	1.30	-0.43	-1.01	0.77	0.19	0.73	0.84	0.49	0.85



# Alt Model-Shift Uniqueness Test

005286045-04, P = 14.094104 Days, E = 118.564491 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
1.48	2.47	1.88	2.57	5.22	2.92	0.41	-0.39	-1.09	0.59	-0.10	0.16	1.00	0.51	0.45



### Stellar Parameters For KIC 005286045

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6847^{+167}_{-286}$	$4.358^{+0.060}_{-0.180}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.357}_{-0.127}$	$1.239^{+0.178}_{-0.160}$	$0.977^{+0.256}_{-0.465}$
	+2%/-4%	+1%/-4%	+114%/-136%	+29%/-10%	+14%/-13%	+26%/-48%
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 005286045-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-322 \pm 68$	$4.54^{+4.31}_{-2.98}$	$1348^{+91}_{-68}$	$5121^{+3854}_{-1194}$	$129^{+890}_{-97}$
Alt.	$-131 \pm 53$	$4.27^{+3.98}_{-2.92}$	$1349^{+88}_{-73}$	$4256^{+2734}_{-919}$	$52^{+435}_{-39}$

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

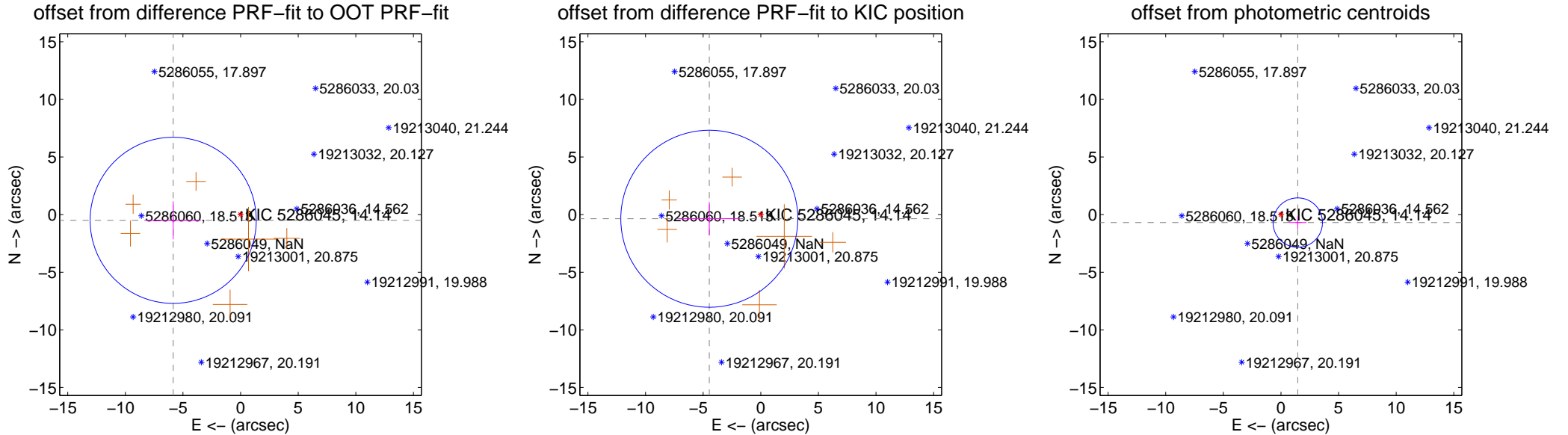
## DV Centroid Data

Supplemental centroid analysis for 005286045-04. Kepler magnitude: 14.14. Transit SNR 6.76

There are 0 quarters with good PRF difference image offsets

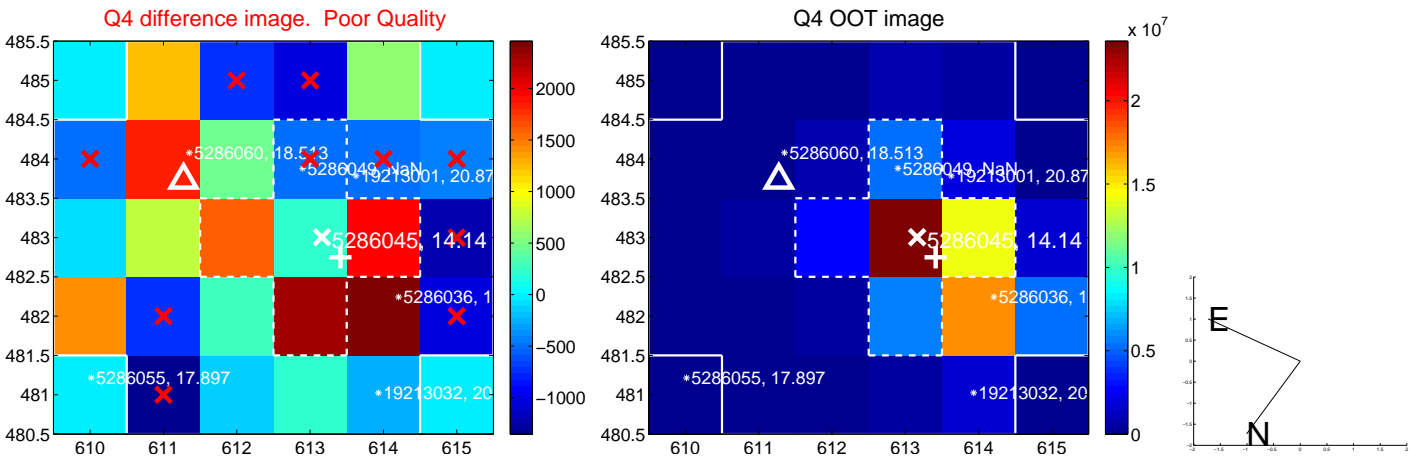
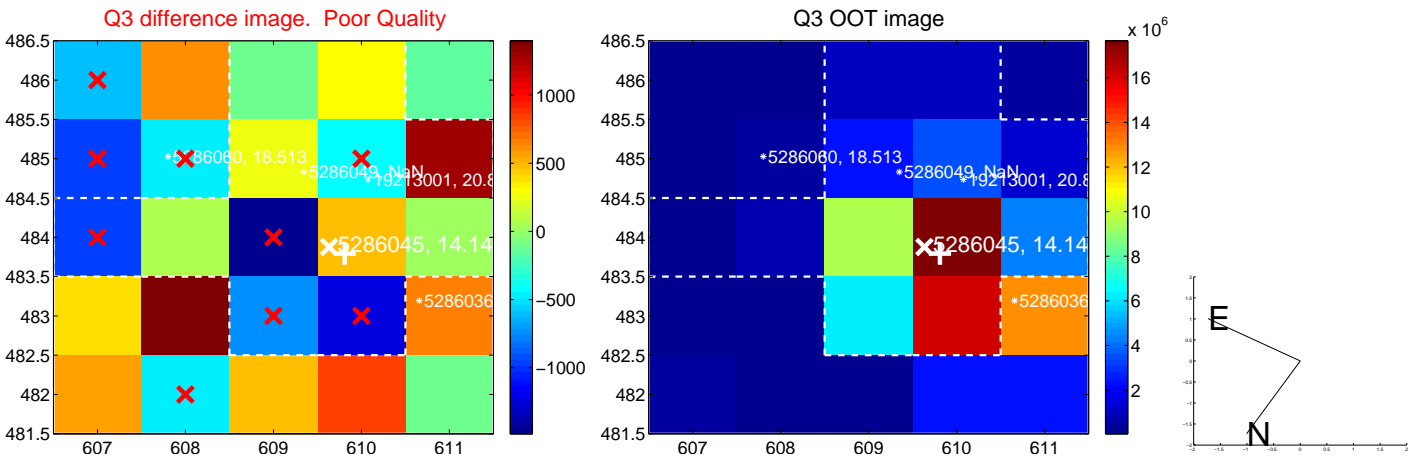
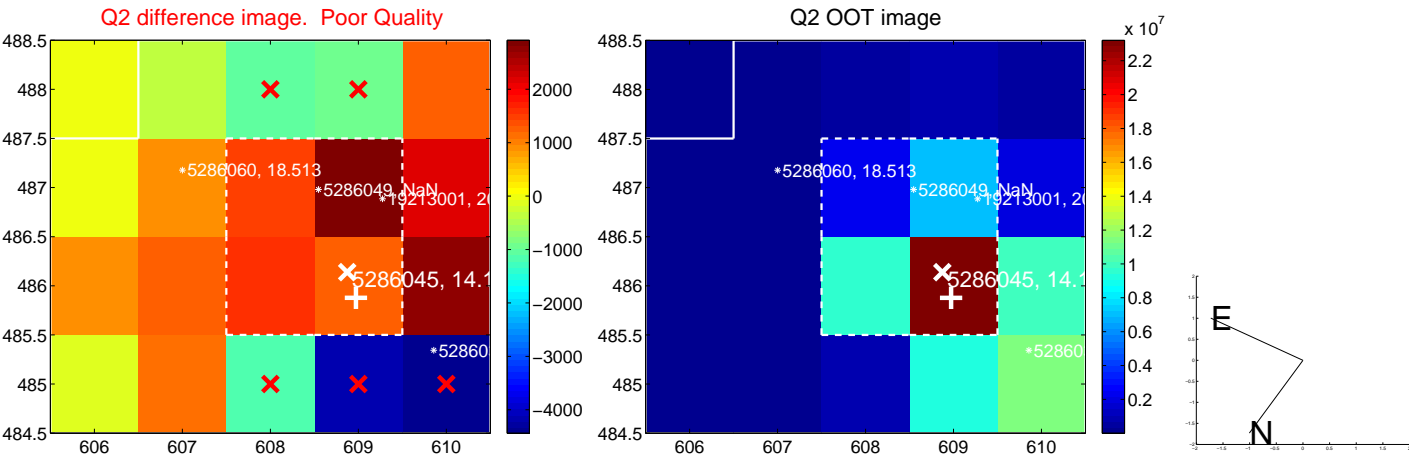
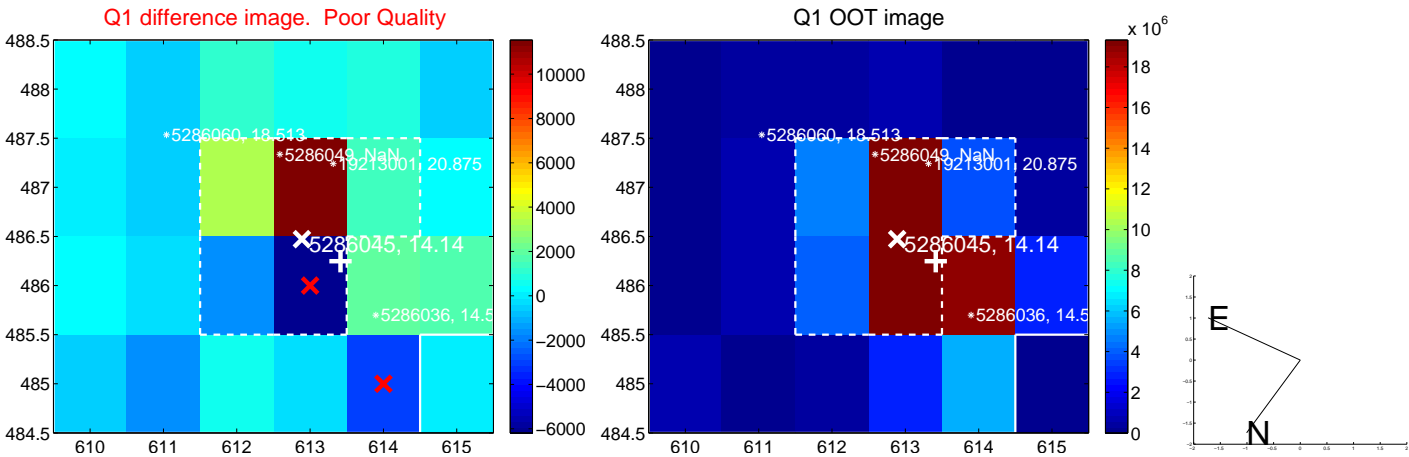
The direct PRF centroid is offset from the target star catalog position by about 1.37 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.870 \pm 2.403$	2.44	$5.850 \pm 2.408$	$-0.493 \pm 1.647$
PRF-fit source offset from KIC position	$4.482 \pm 2.561$	1.75	$4.467 \pm 2.621$	$-0.357 \pm 1.443$
photometric centroid source offset	$1.61 \pm 0.71$	2.26	$-1.46 \pm 0.75$	$-0.69 \pm 0.54$



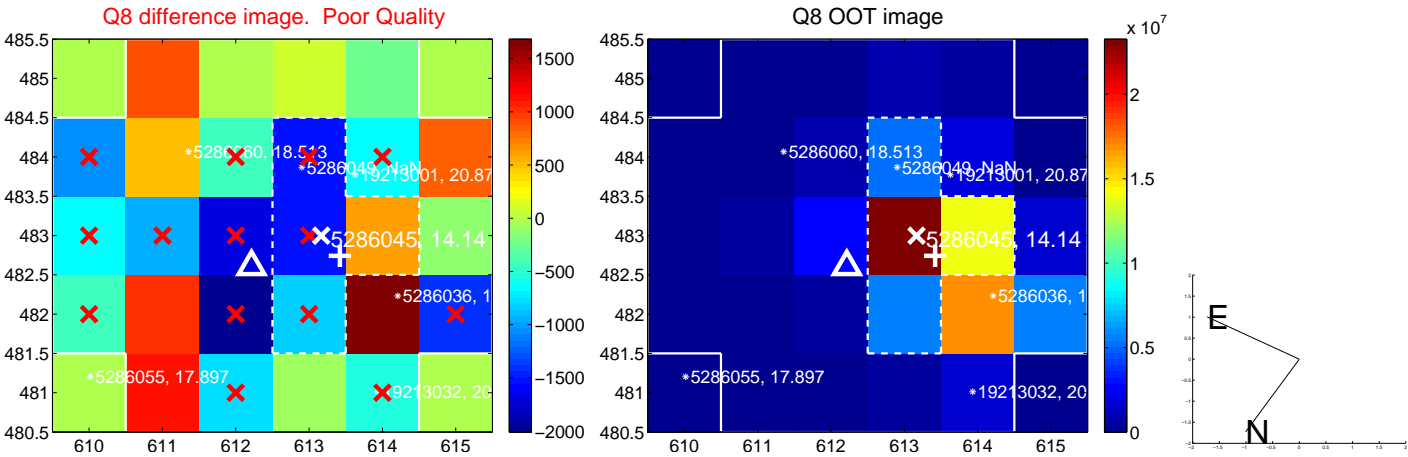
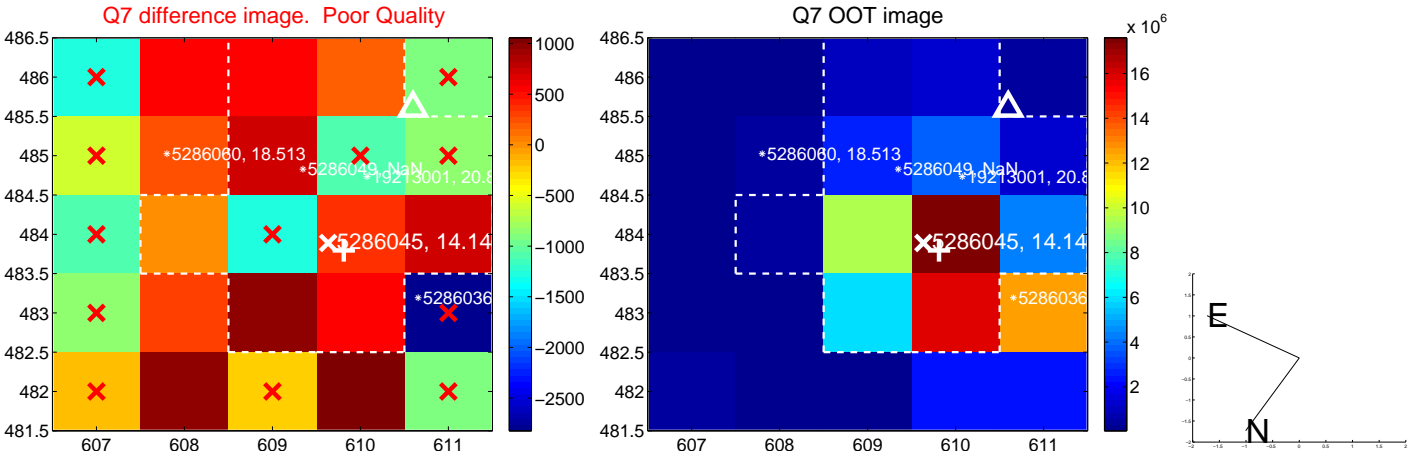
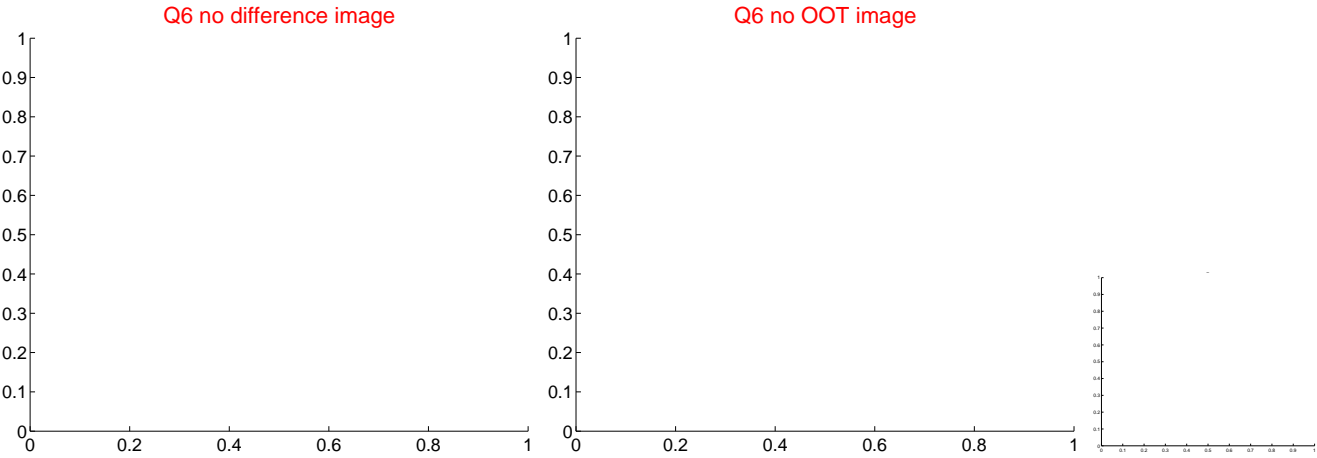
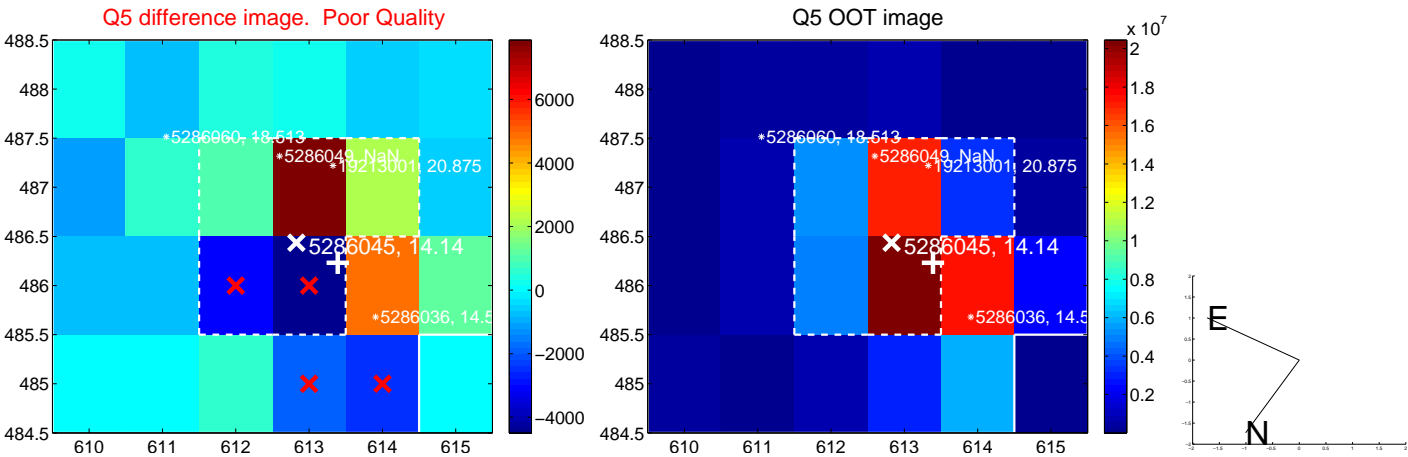
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

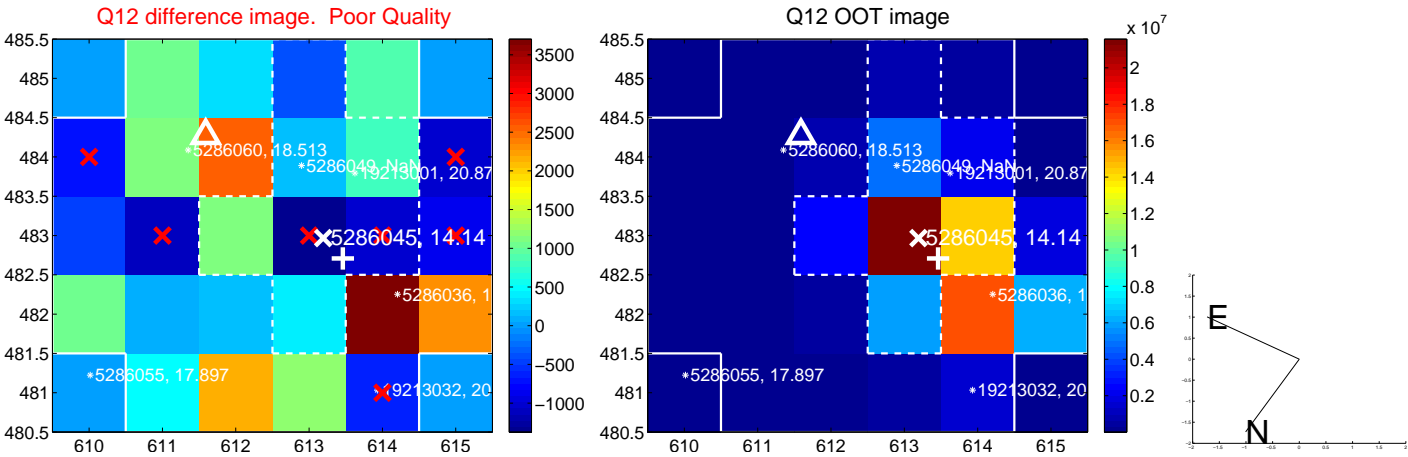
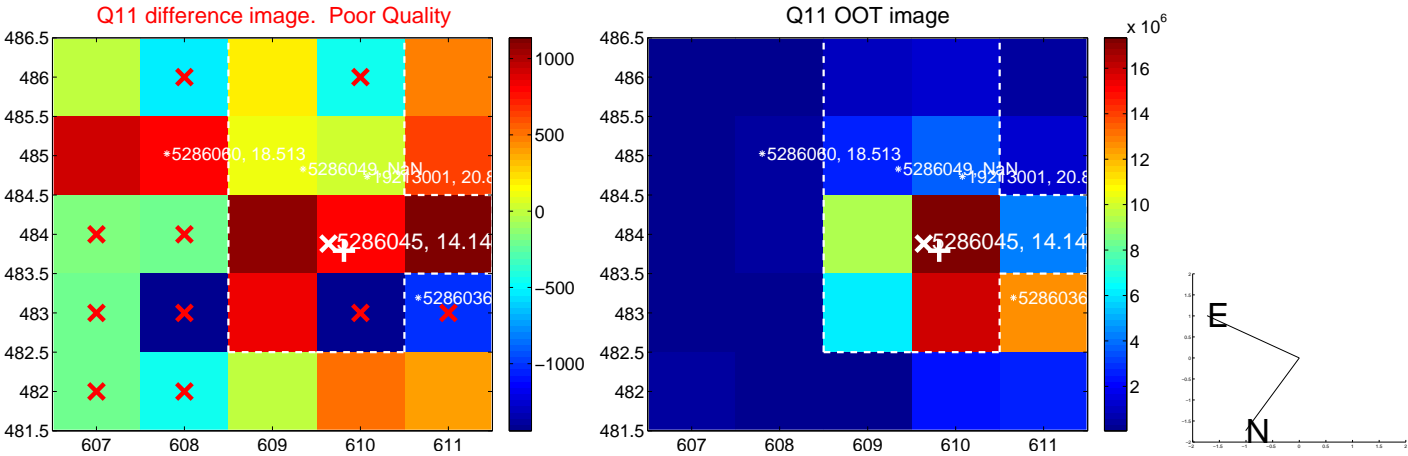
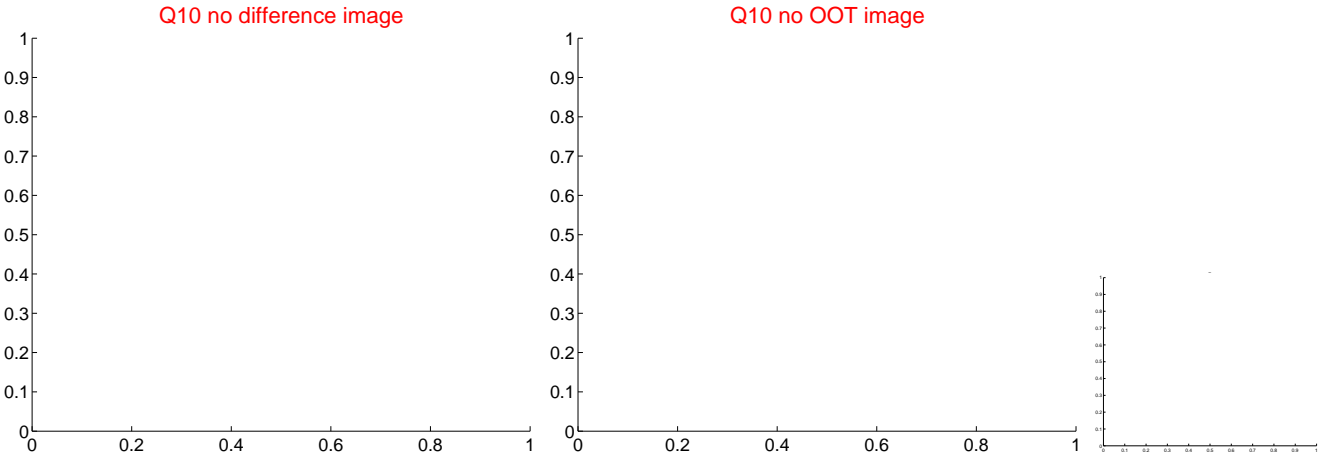
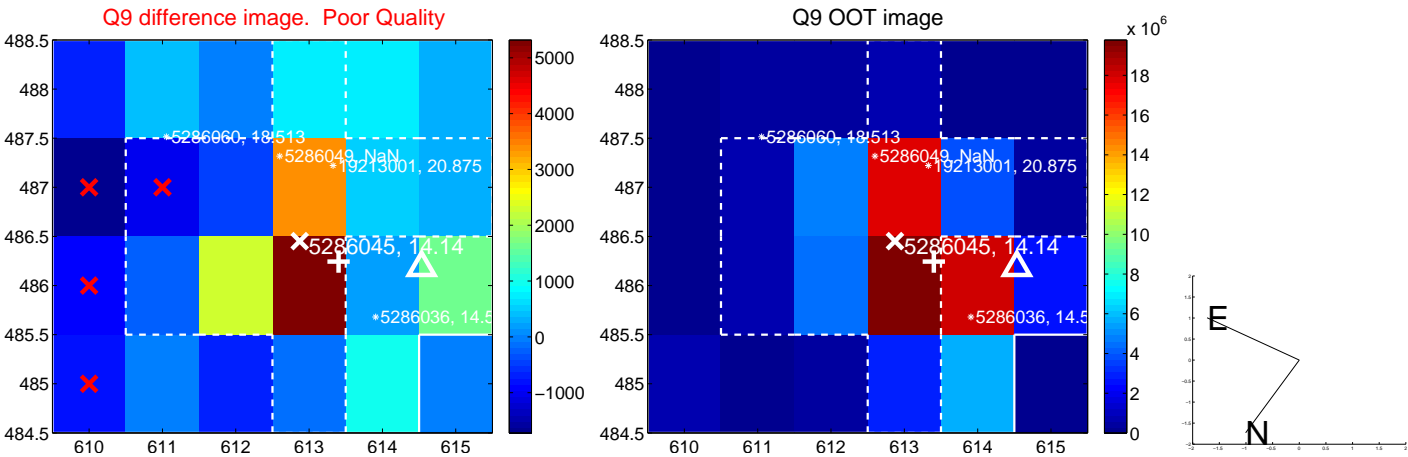




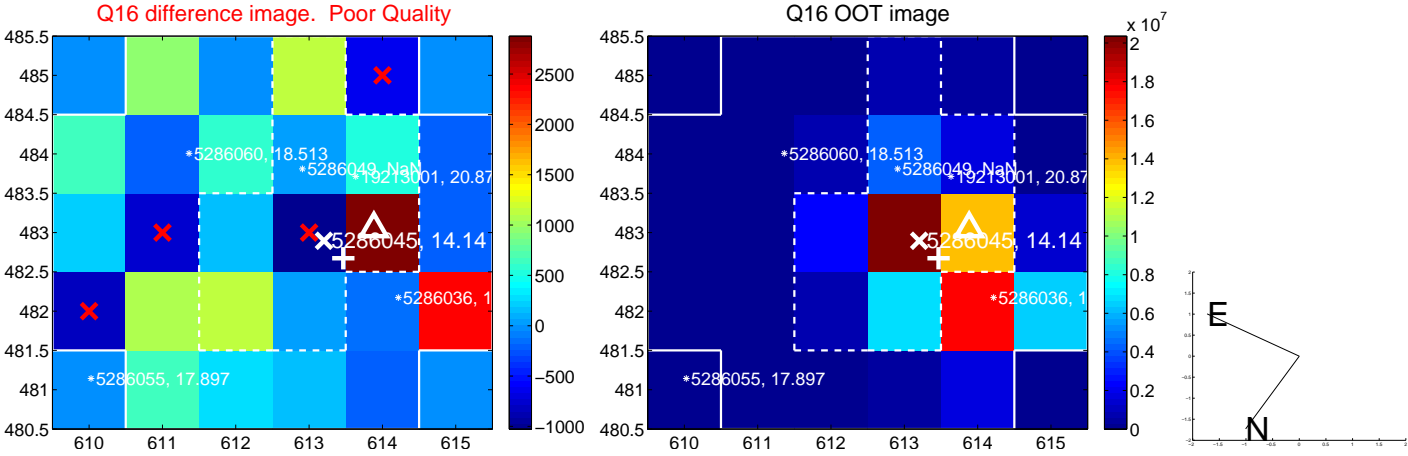
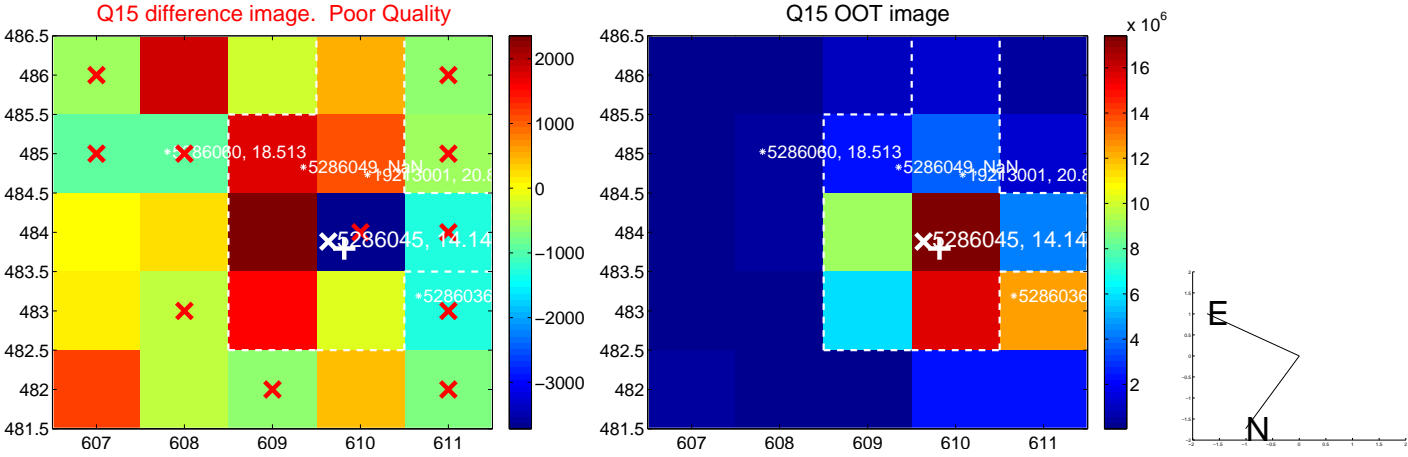
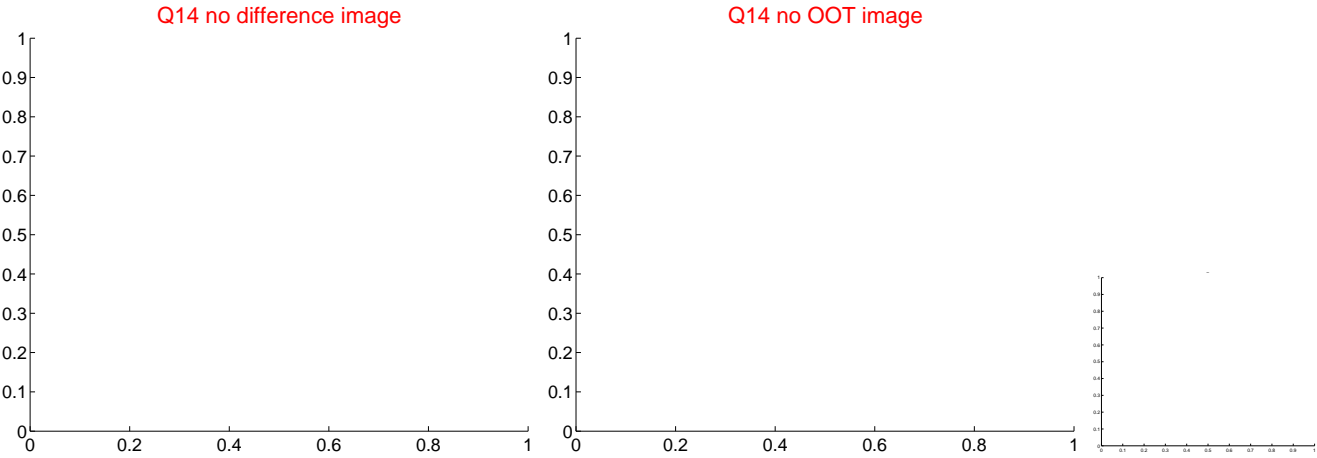
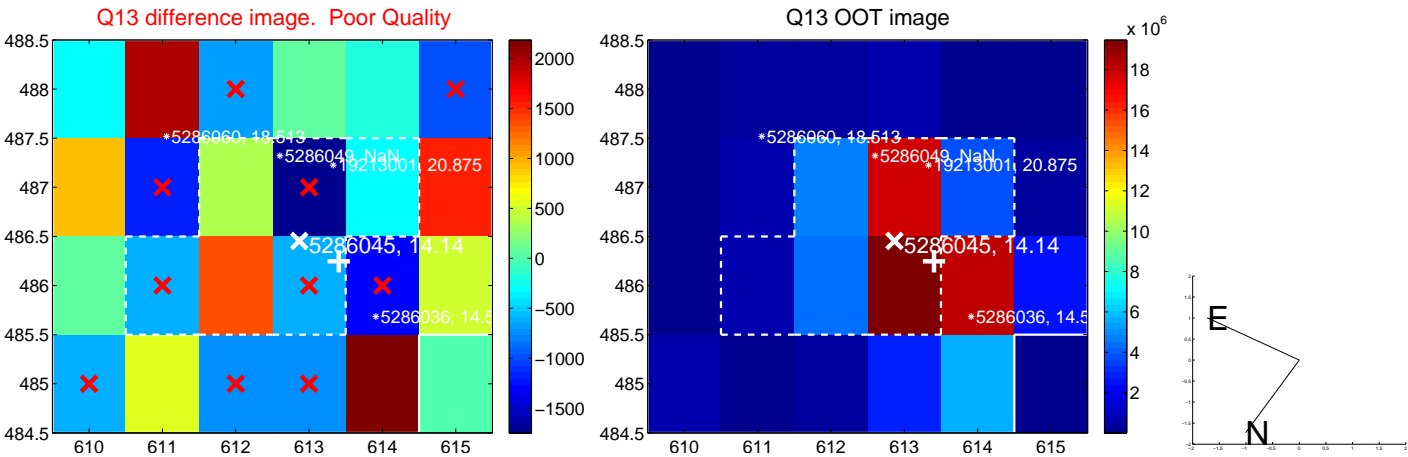
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



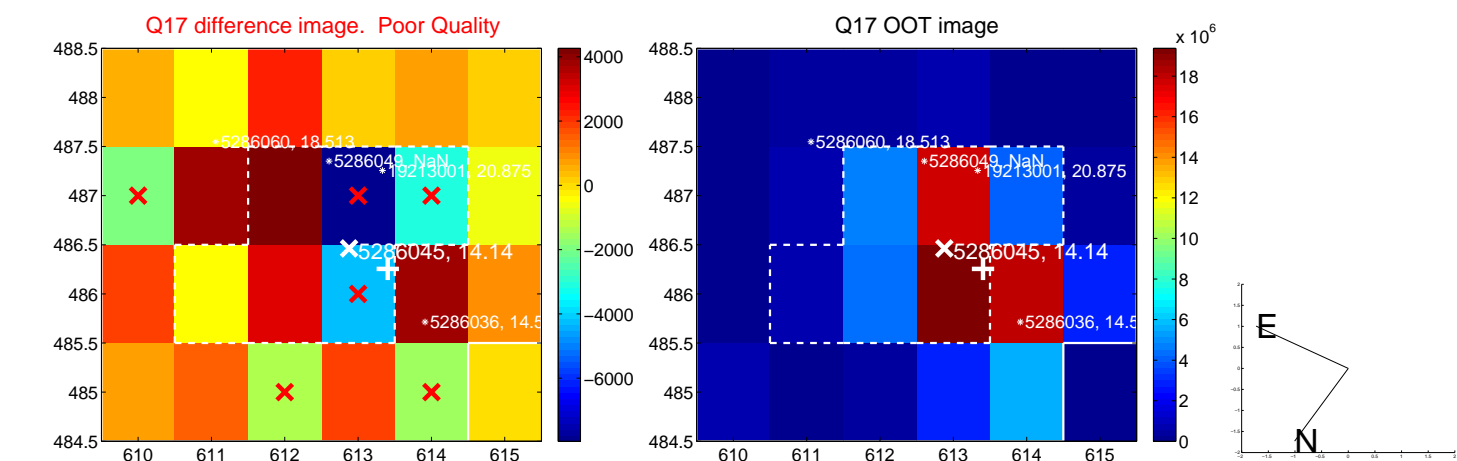
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



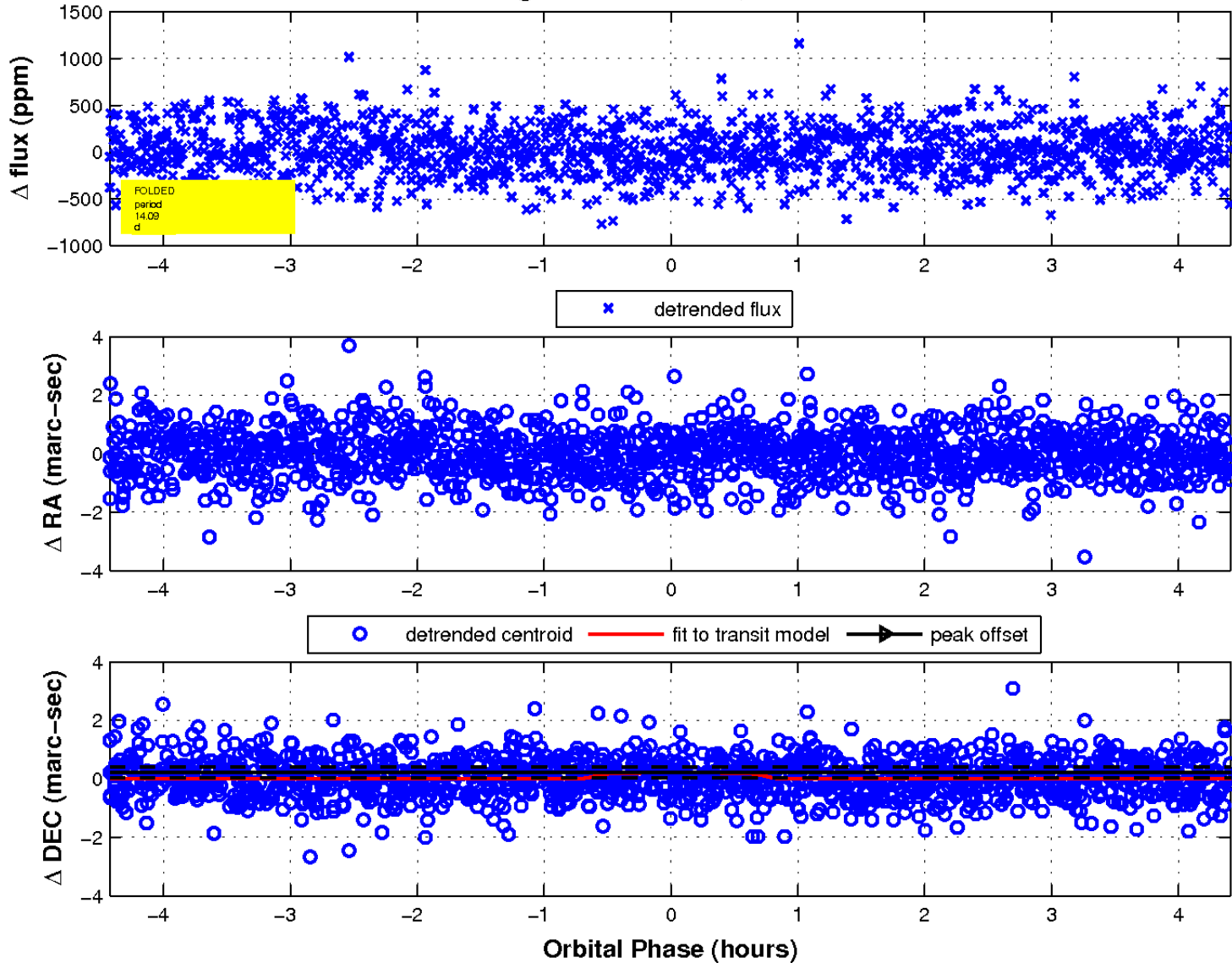
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

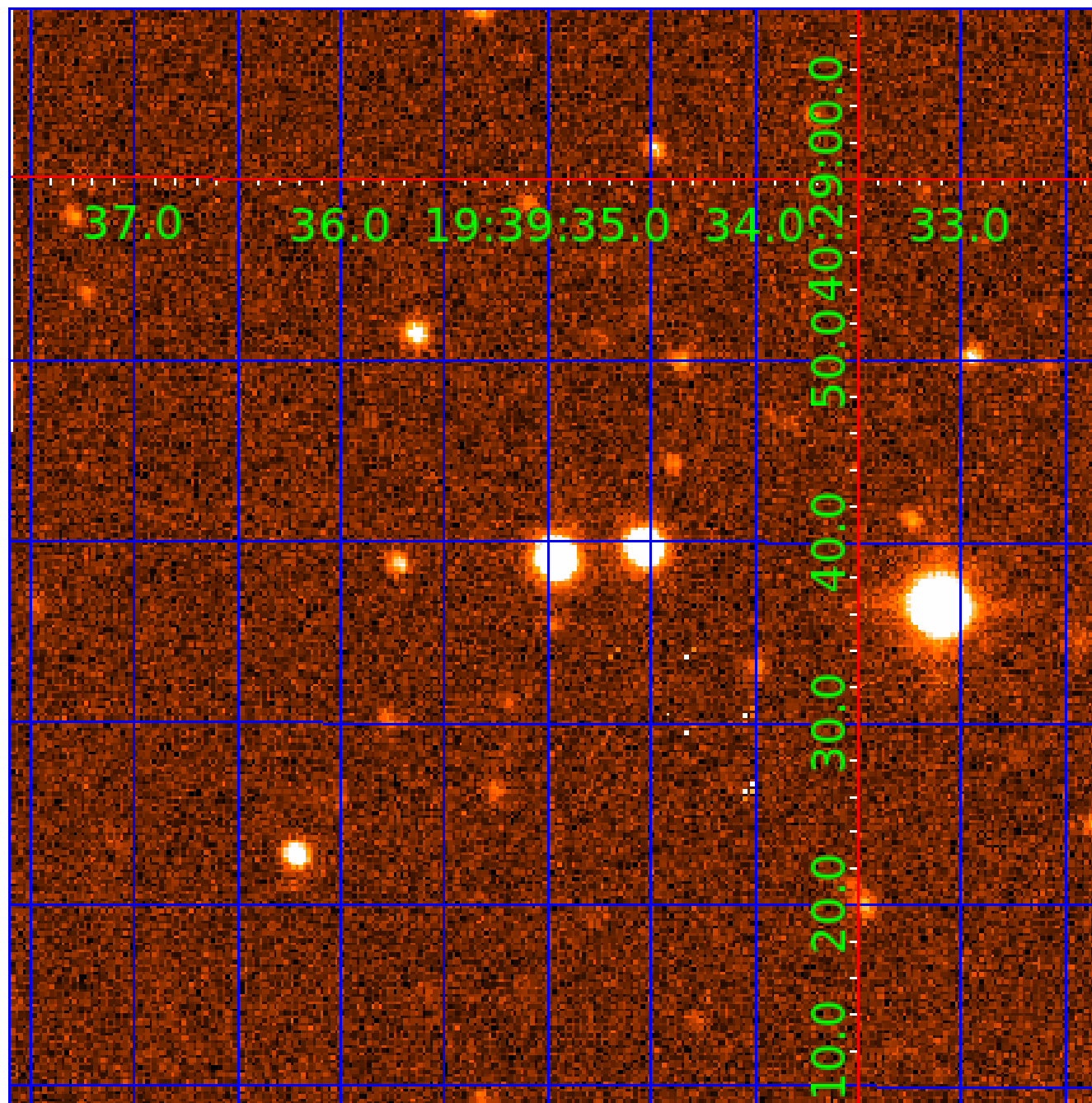


fluxWeightedCentroids, Planet 4 of 6



UKIRT Image

Declination



# KIC 005286045

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005286045-01	OBS	No	0.503876	131.616885	20.3	3.610	9.4	7.2	1.21	6847	0.56	16483.05
005286045-02	OBS	No	24.776117	155.043494	650.0	1.006	13.2	14.9	1.21	6847	3.46	91.50
005286045-03	OBS	No	13.997211	140.388169	165.4	4.129	10.8	6.6	1.21	6847	1.58	195.92
005286045-04	OBS	No	14.093368	132.666482	263.2	1.475	9.9	6.8	1.21	6847	2.28	194.14
005286045-05	OBS	No	11.428347	136.664083	182.8	1.724	8.5	5.7	1.21	6847	1.77	256.74
005286045-06	OBS	No	28.466030	146.235729	386.6	2.095	10.9	11.4	1.21	6847	2.44	76.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005286045-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS
005286045-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005286045-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

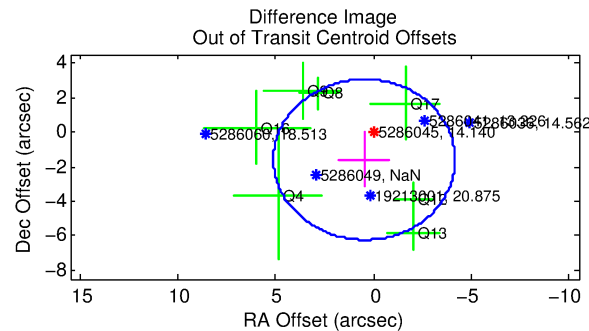
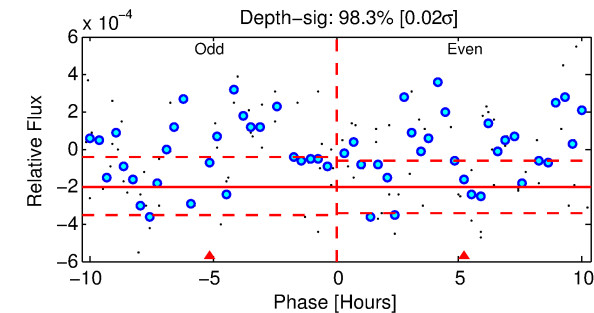
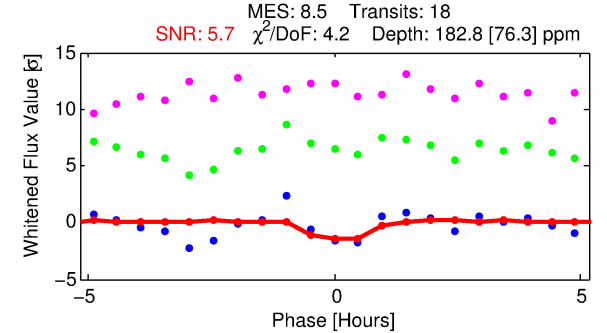
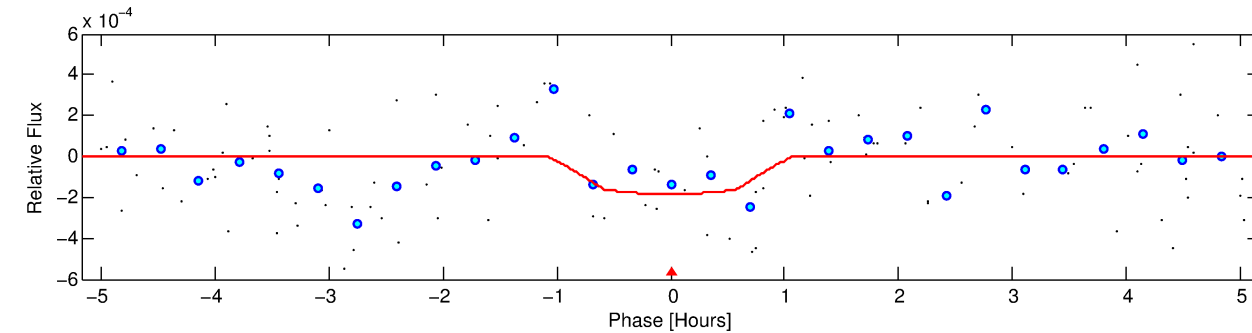
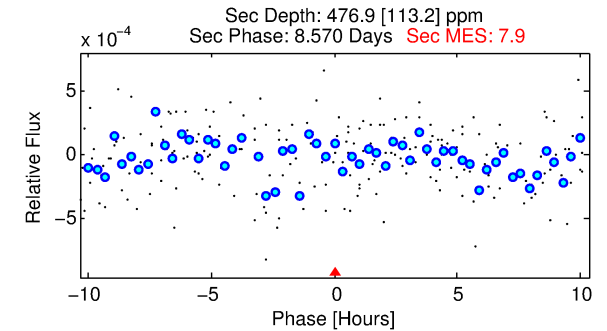
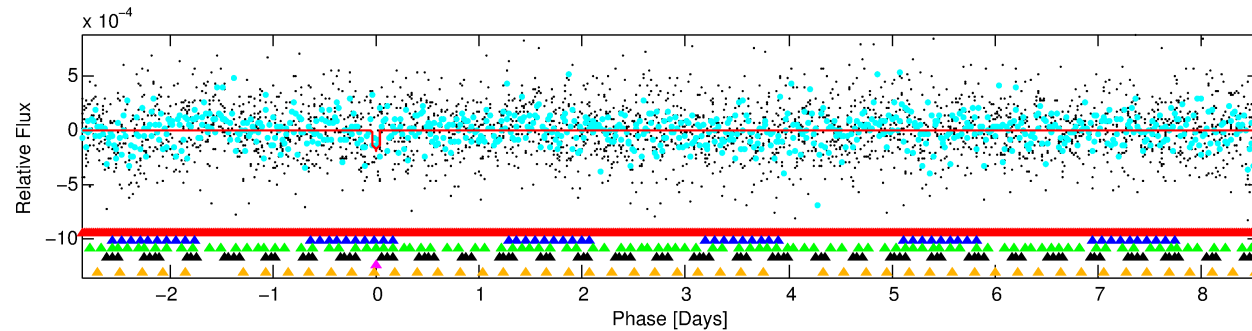
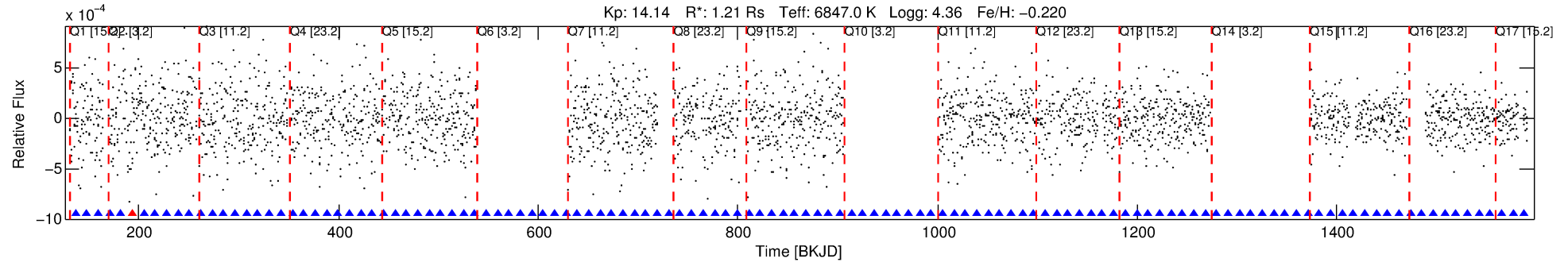
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005286045-05

No Significant Match Found

# DV One-Page Summary

KIC: 5286045 Candidate: 5 of 6 Period: 11.428 d



## DV Fit Results:

Period = 11.42835 [0.00022] d  
Epoch = 136.6641 [0.0159] BKJD  
Rp/R\* = 0.0134 [0.0277]  
a/R\* = 35.52 [422.24]  
b = 0.73 [7.66]  
Seff = 256.74 [97.01]  
Teq = 1021 [96] K  
Rp = 1.77 [3.70] Re  
a = 0.1062 [0.0255] AU  
Ag = 940.49 [3899.67] [0.24 $\sigma$ ]  
Teffp = 8739 [9036] K [0.85 $\sigma$ ]

## DV Diagnostic Results:

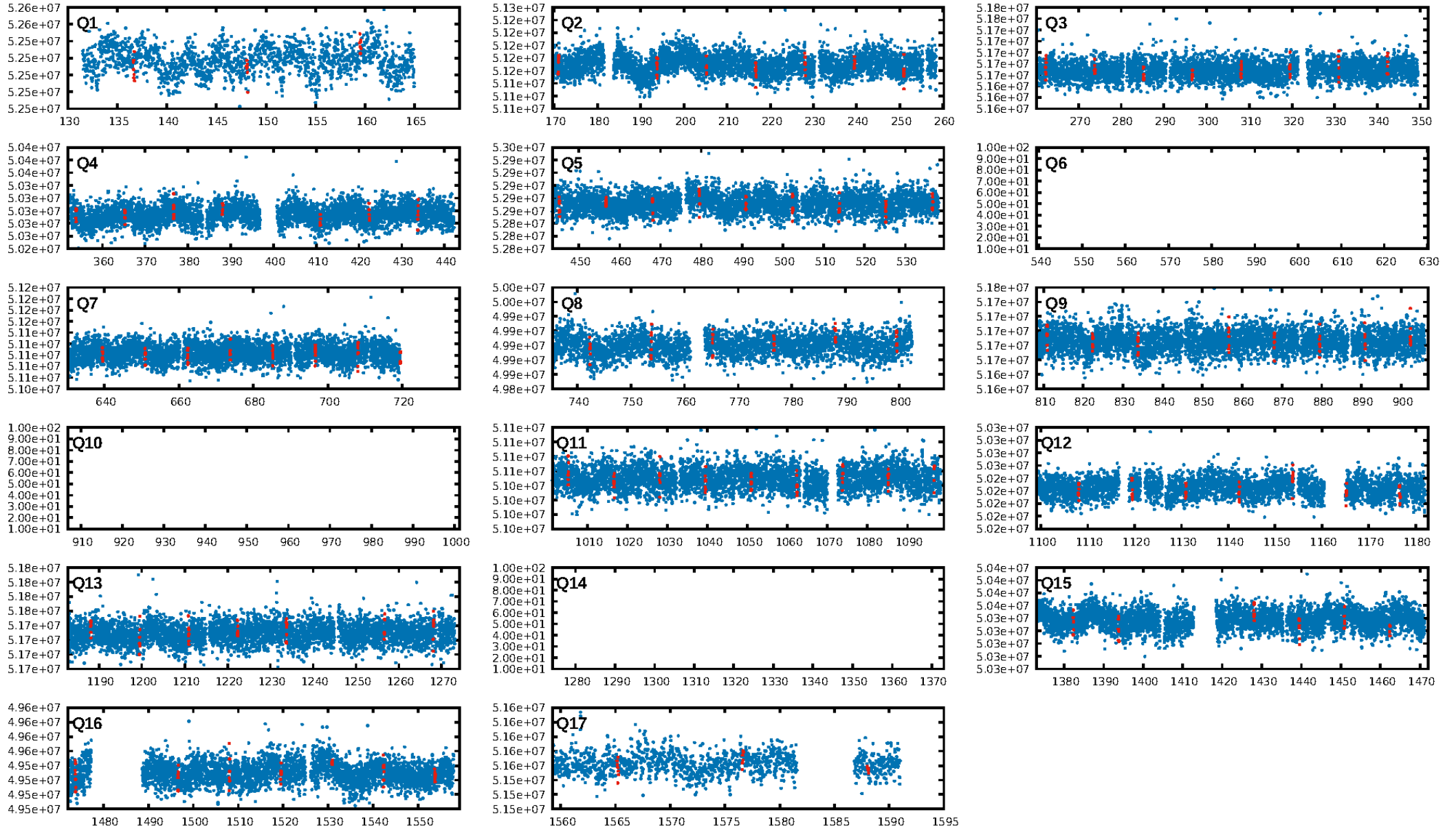
ShortPeriod-sig: 100.0% [65.53 $\sigma$ ]  
LongPeriod-sig: 100.0% [13.78 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 78.5%  
Bootstrap-pfa: 1.18e-11  
RollingBand-fgt: 0.94 [16/17]  
GhostDiagnostic-chr: -3.666  
Centroid-sig: N/A  
Centroid-so: 2.267 arcsec [2.79 $\sigma$ ]  
OotOffset-rm: 1.664 arcsec [1.08 $\sigma$ ]  
KicOffset-rm: 1.945 arcsec [1.27 $\sigma$ ]  
OotOffset-st: 0/0/4/3 [7]  
KicOffset-st: 0/0/4/3 [7]  
DiffImageQuality-fgm: 0.14 [1/7]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:26:53 Z

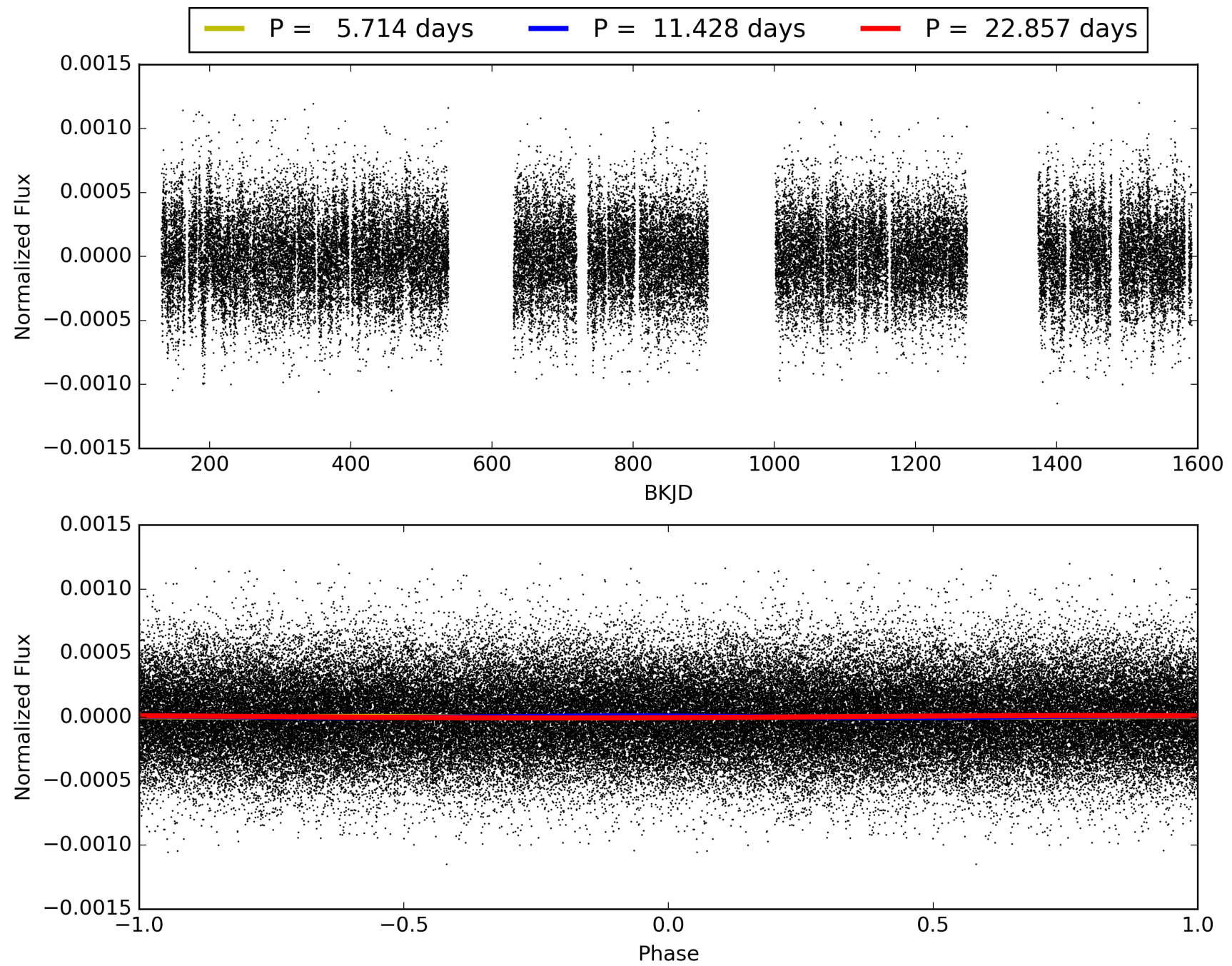
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005286045-05, PDC Light Curves

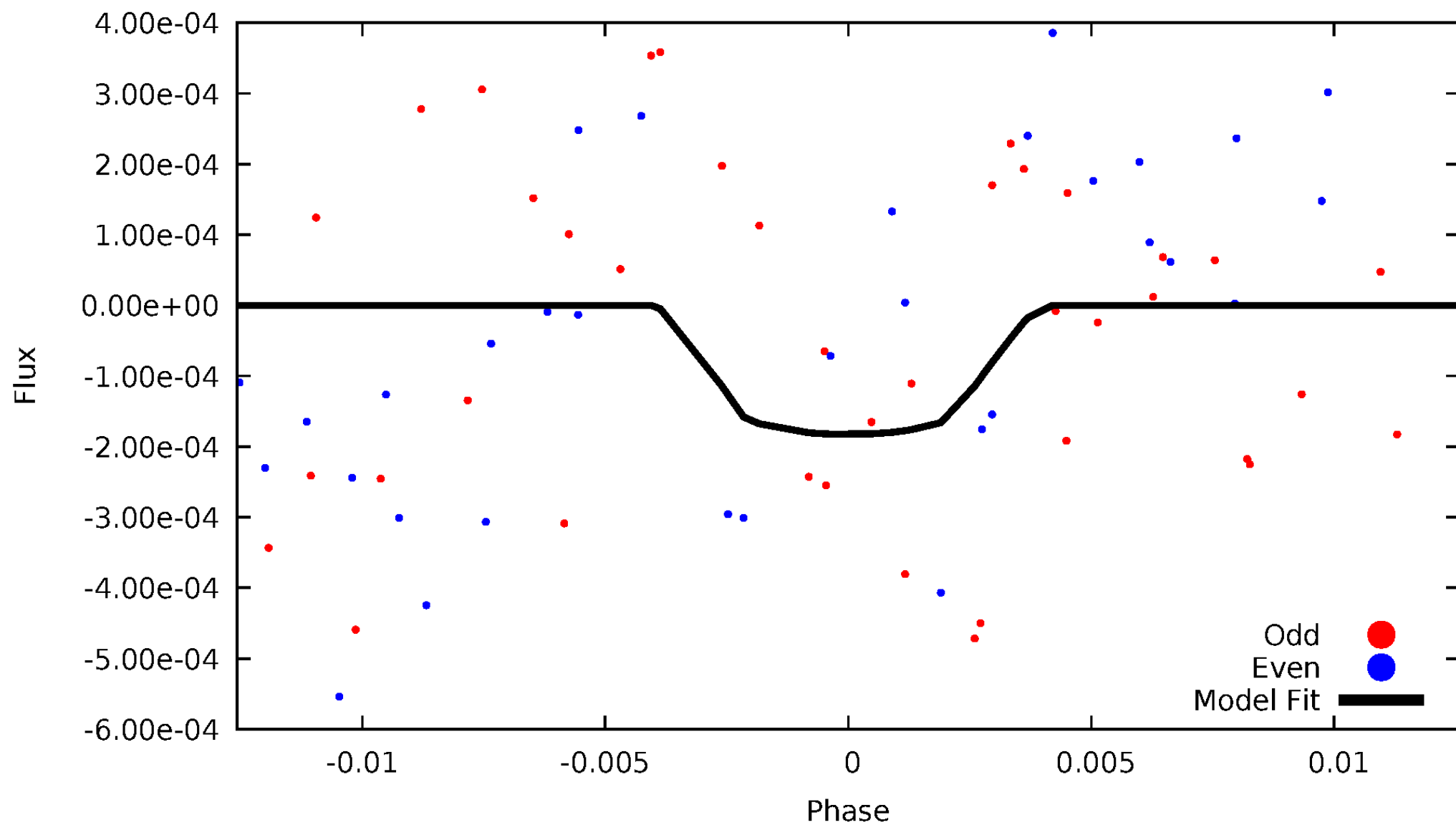


TCE 005286045-05



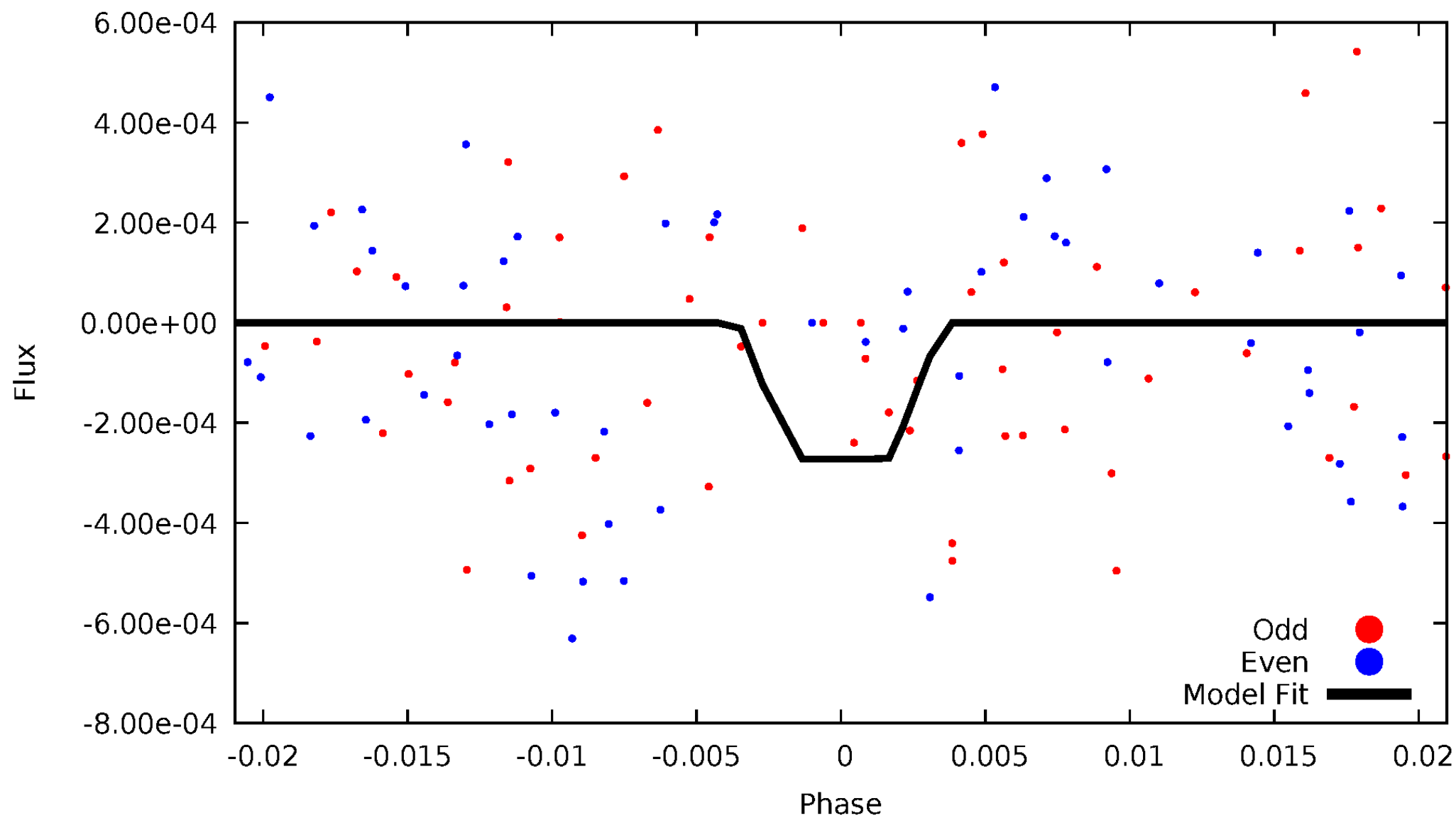
# DV Odd/Even

TCE 005286045-05



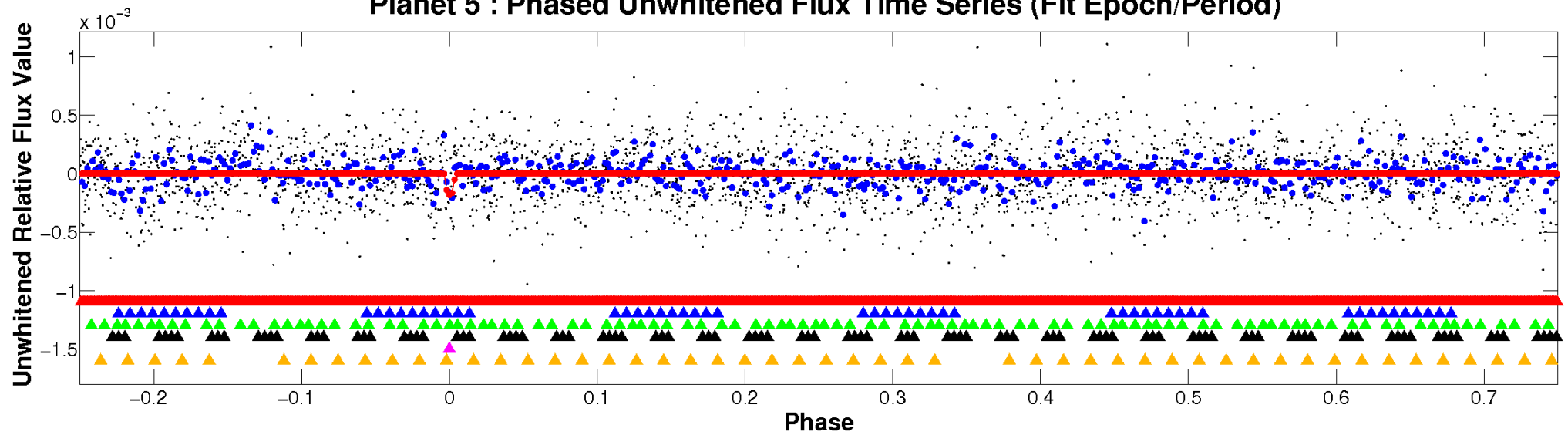
# ALT Odd/Even

TCE 005286045-05

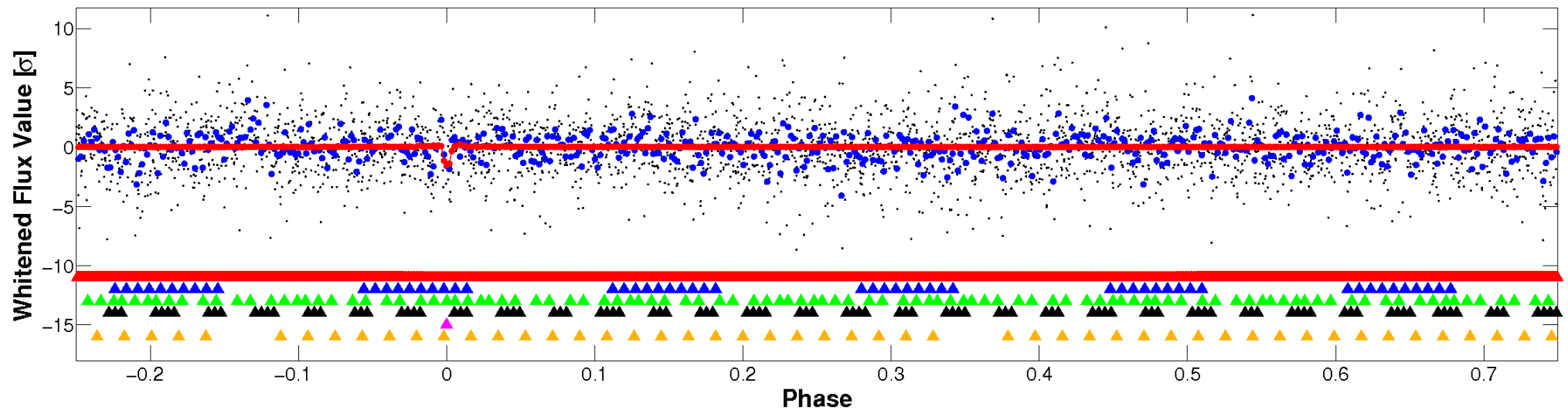


# Non-Whitened Vs. Whitened Light Curve

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

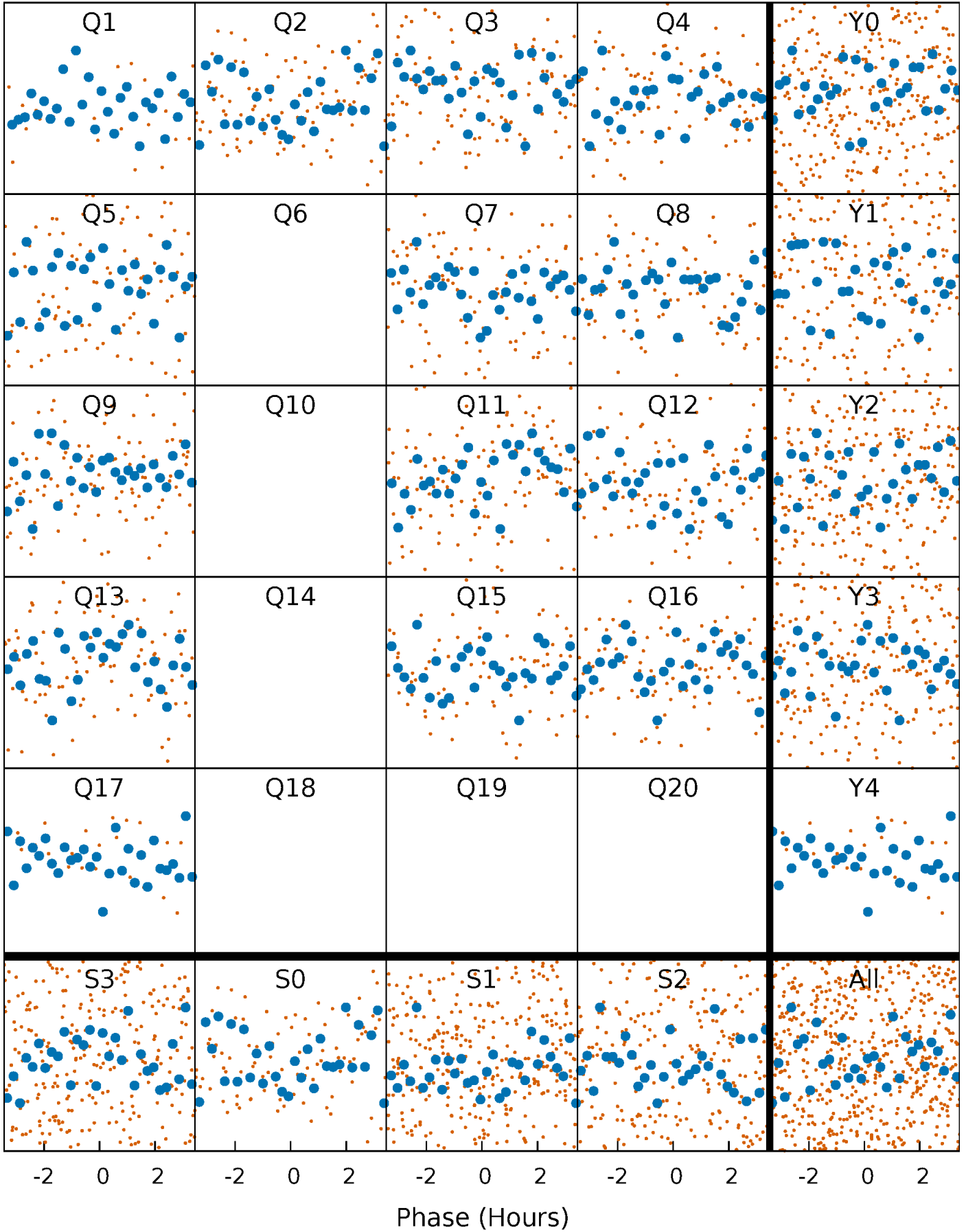


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



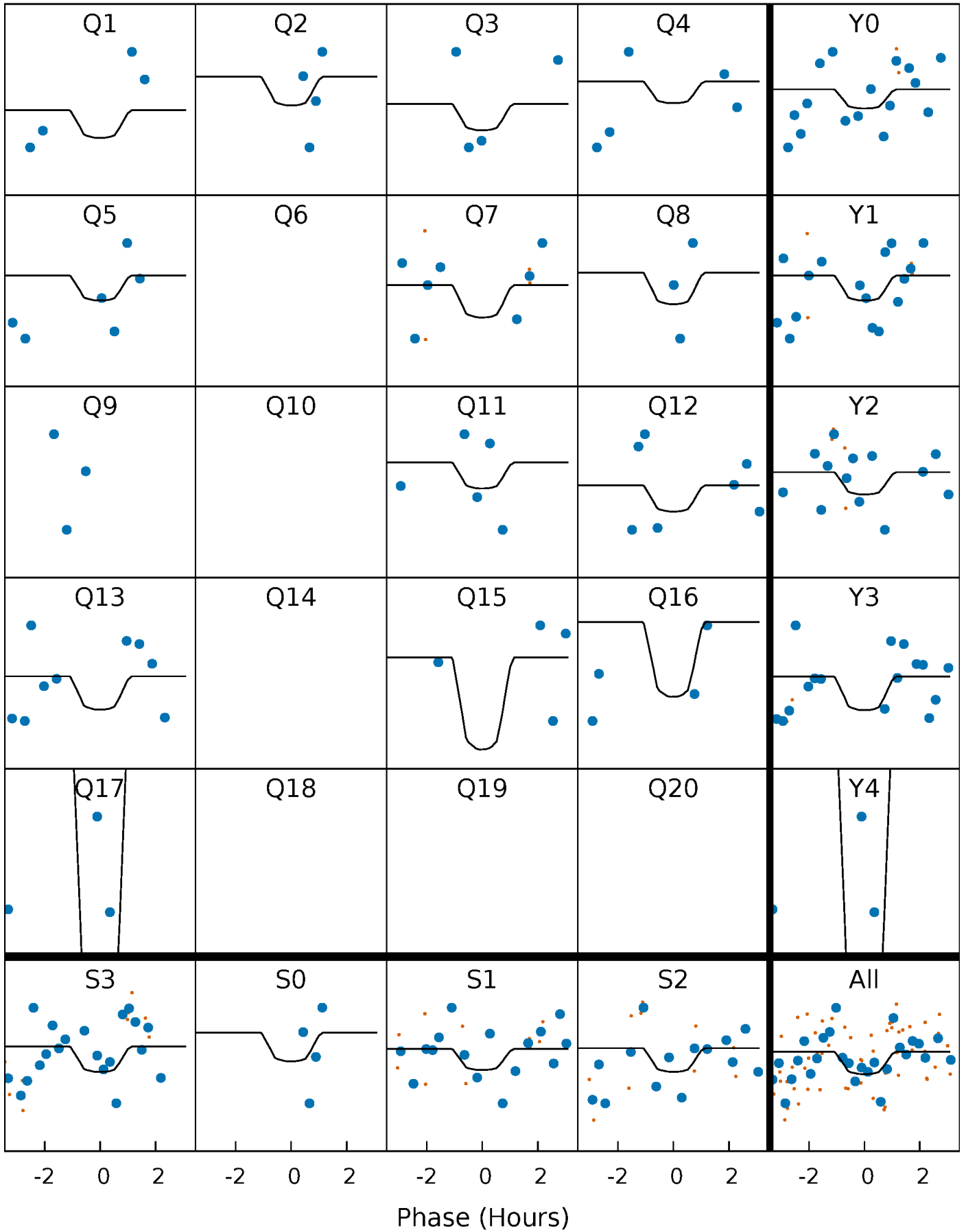
# PDC Quarter-Phased Transit Curves

TCE 005286045-05   P= 11.428347 Days    $T_0=136.664083$  (BKJD)



# DV Quarter-Phased Transit Curves

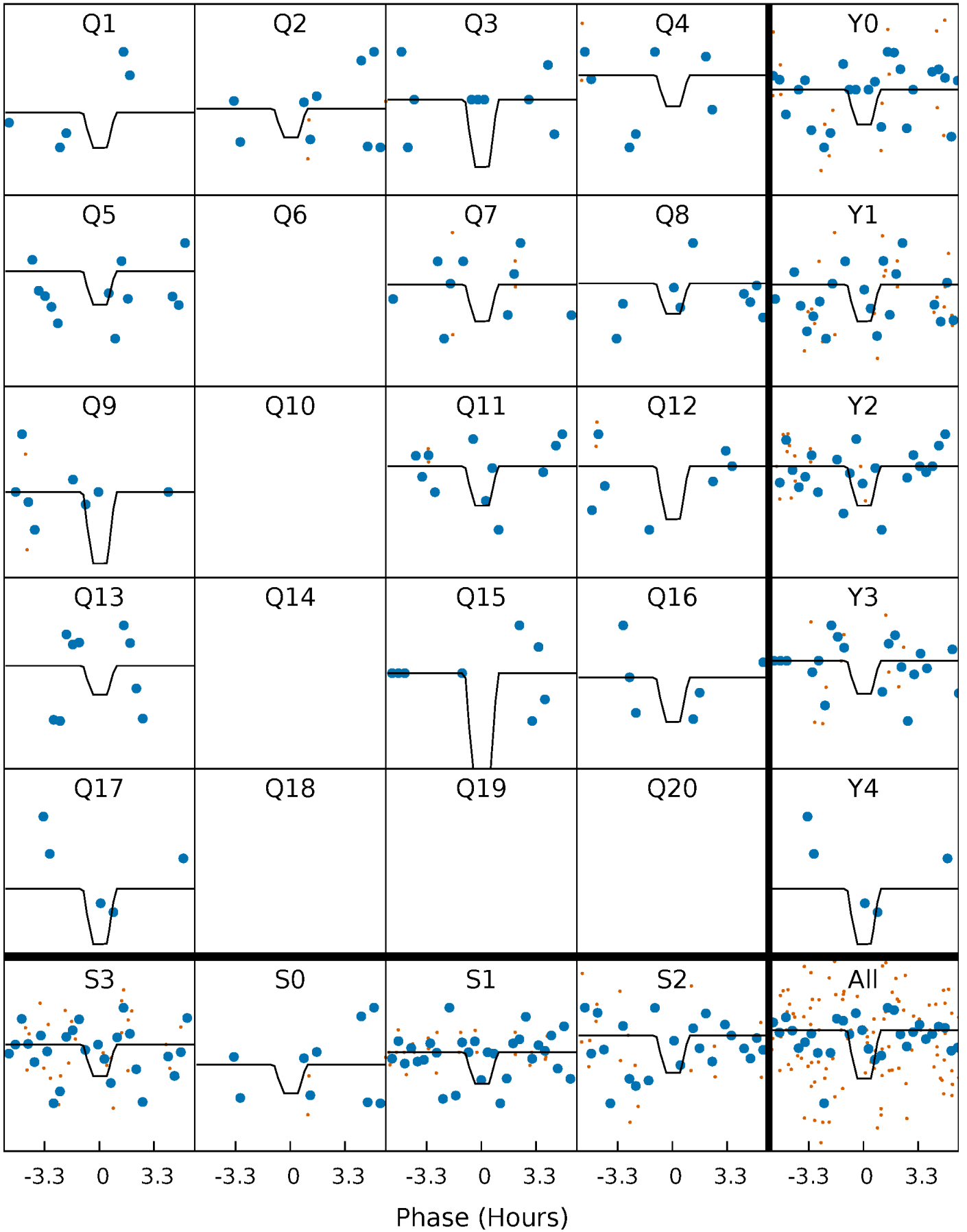
TCE 005286045-05     $P = 11.428347$  Days     $T_0 = 136.664083$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

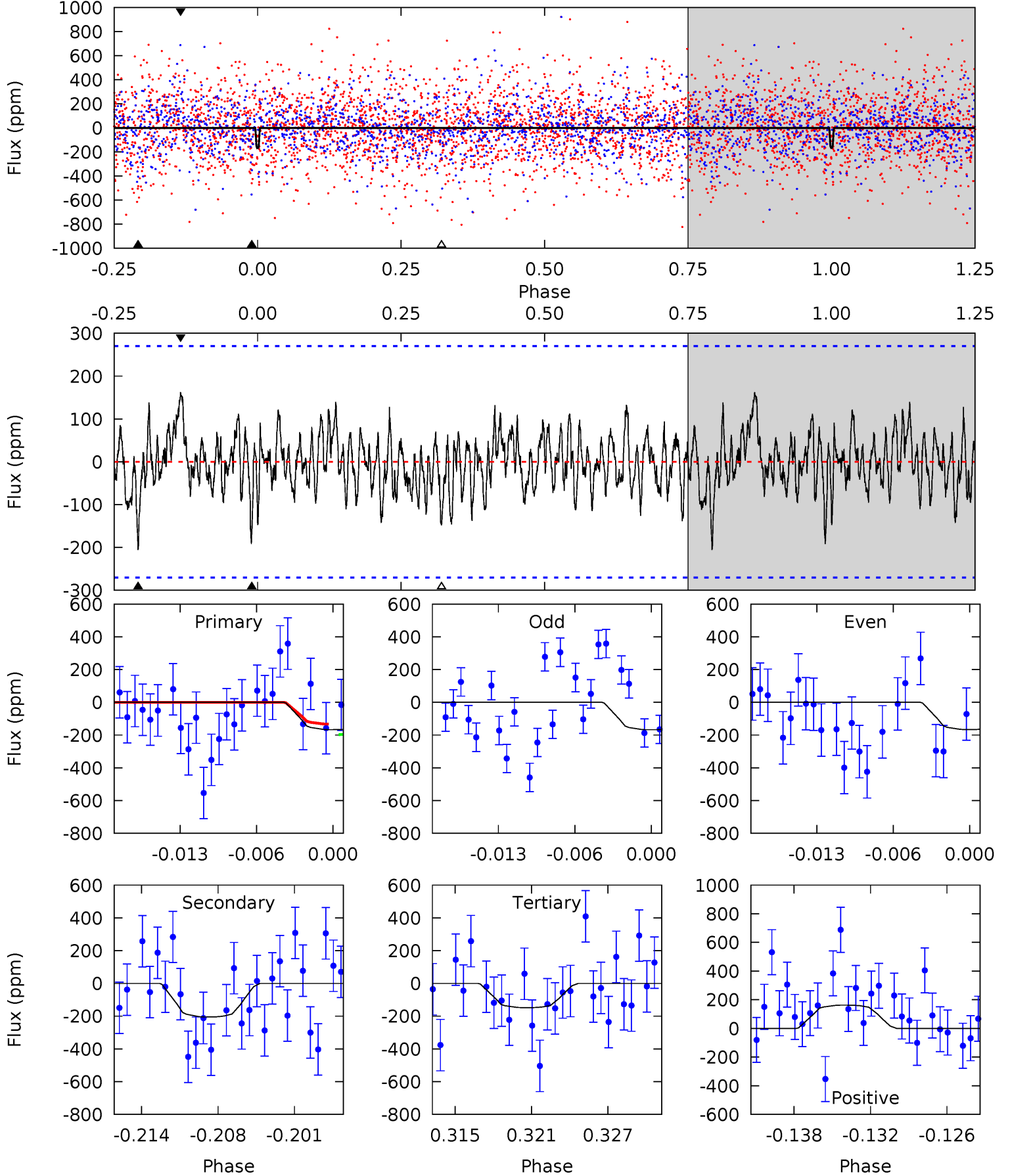
TCE 005286045-05     $P = 11.428328$  Days     $T_0 = 136.651207$  (BKJD)



# DV Model-Shift Uniqueness Test

005286045-05, P = 11.428347 Days, E = 125.235736 Days

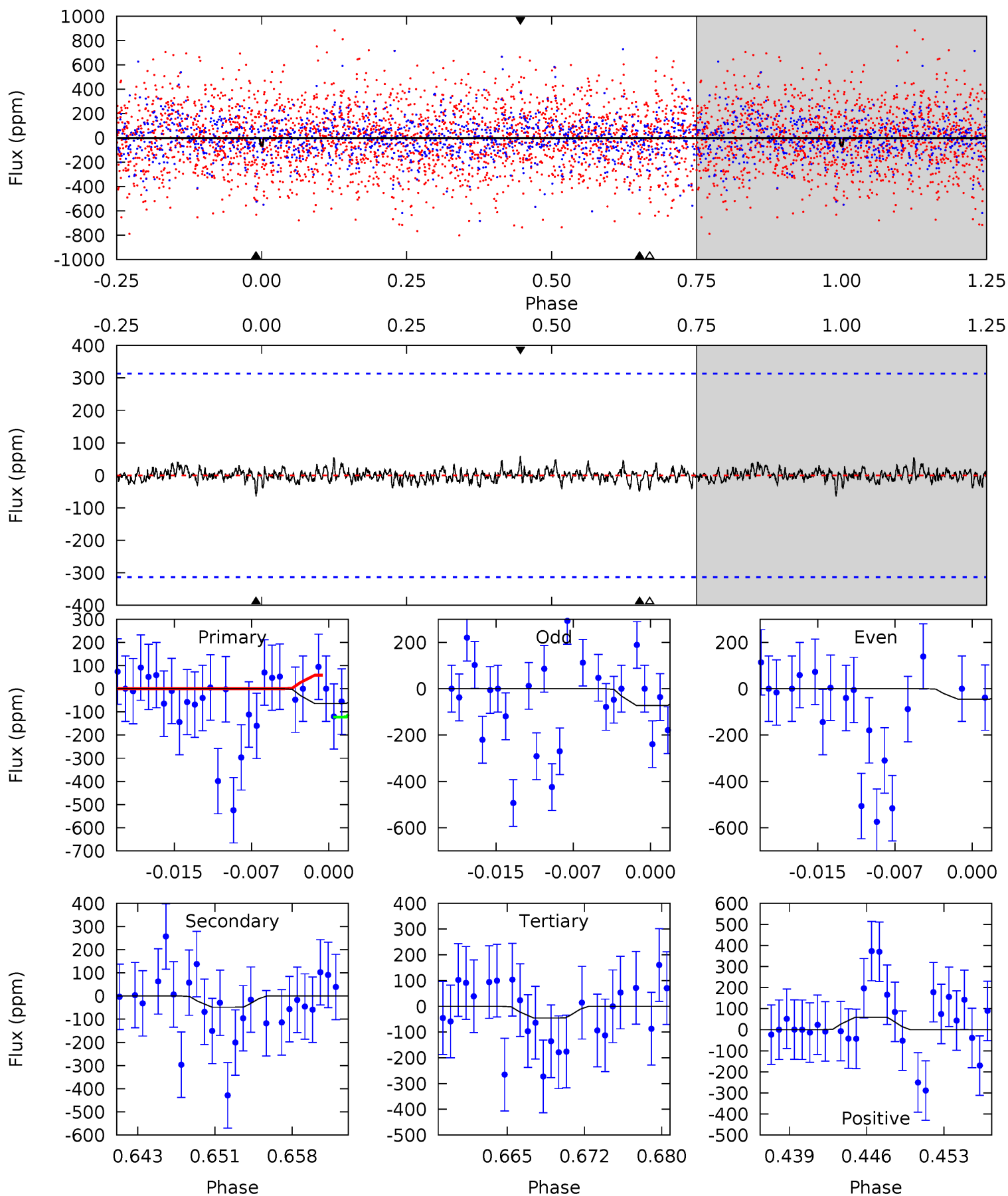
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.17	3.89	2.81	3.08	5.11	2.73	1.05	0.36	0.09	1.08	0.81	0.01	2.03	0.44	0.59



# Alt Model-Shift Uniqueness Test

005286045-05,  $P = 11.428328$  Days,  $E = 125.222879$  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
1.04	0.78	0.74	0.96	5.09	2.68	0.25	0.30	0.08	0.04	-0.18	0.21	1.00	0.48	0.48



### Stellar Parameters For KIC 005286045

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6847^{+167}_{-286}$	$4.358^{+0.060}_{-0.180}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.357}_{-0.127}$	$1.239^{+0.178}_{-0.160}$	$0.977^{+0.256}_{-0.465}$
	+2%/-4%	+1%/-4%	+114%/-136%	+29%/-10%	+14%/-13%	+26%/-48%
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 005286045-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-205 \pm 53$	$3.42^{+3.14}_{-2.34}$	$1443^{+91}_{-73}$	$5130^{+4428}_{-1090}$	$105^{+929}_{-75}$
Alt.	$-48 \pm 62$	$3.77^{+2.99}_{-2.52}$	$1434^{+93}_{-66}$	$3572^{+2158}_{-6476}$	$15^{+150}_{-19}$

$T_{max}$  = 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

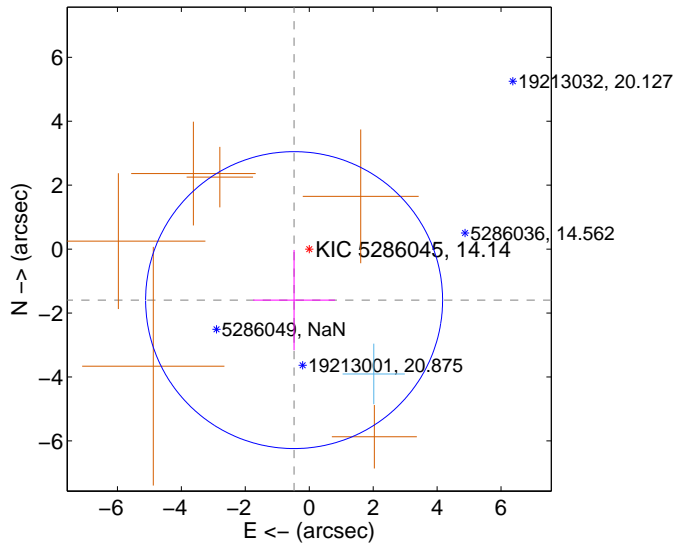
Supplemental centroid analysis for 005286045-05. Kepler magnitude: 14.14. Transit SNR 5.71

There are 1 quarters with good PRF difference image offsets

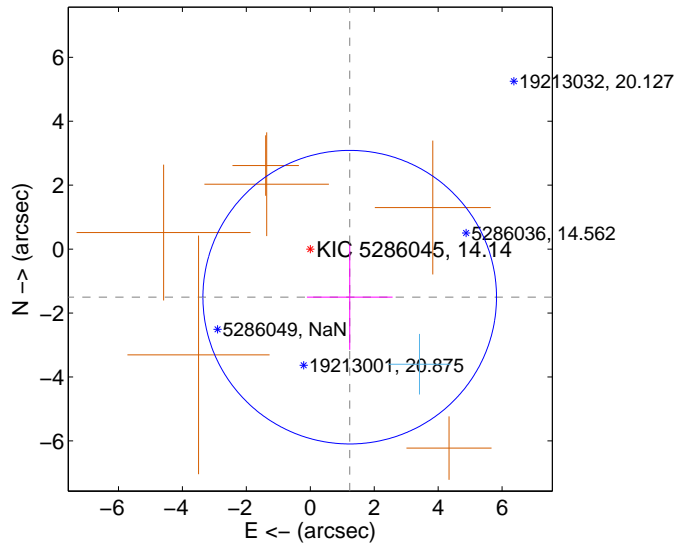
The OOT PRF centroid is offset from the target star catalog position by about 2.25 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.664 \pm 1.548$	1.08	$0.473 \pm 1.280$	$-1.595 \pm 1.569$
PRF-fit source offset from KIC position	$1.945 \pm 1.530$	1.27	$-1.234 \pm 1.340$	$-1.504 \pm 1.646$
photometric centroid source offset	$2.27 \pm 0.81$	2.79	$-2.03 \pm 0.85$	$-1.01 \pm 0.62$

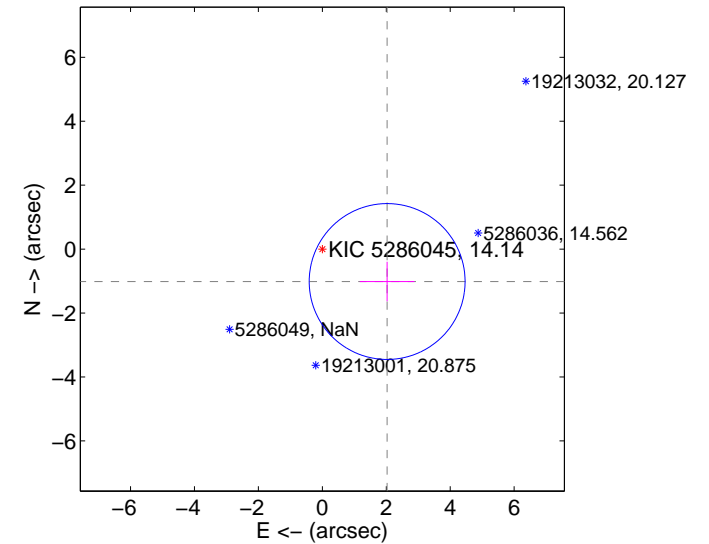
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

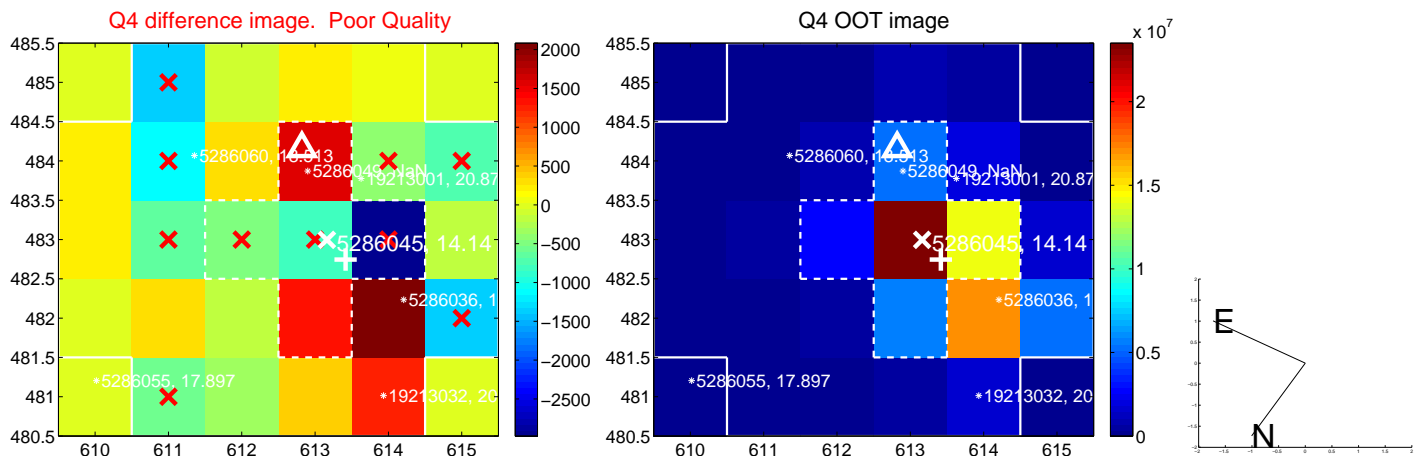
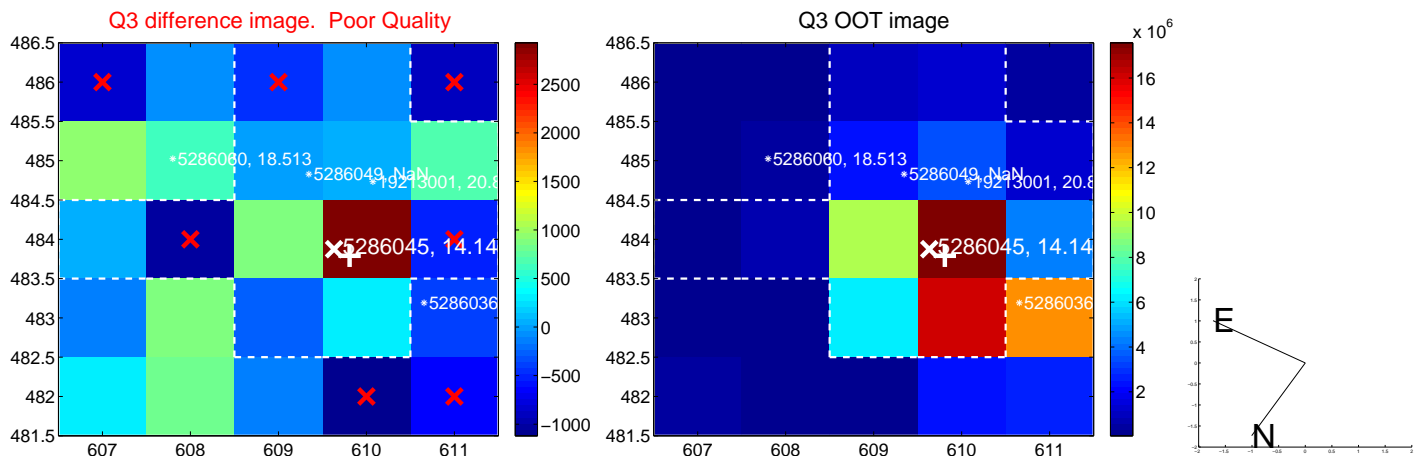
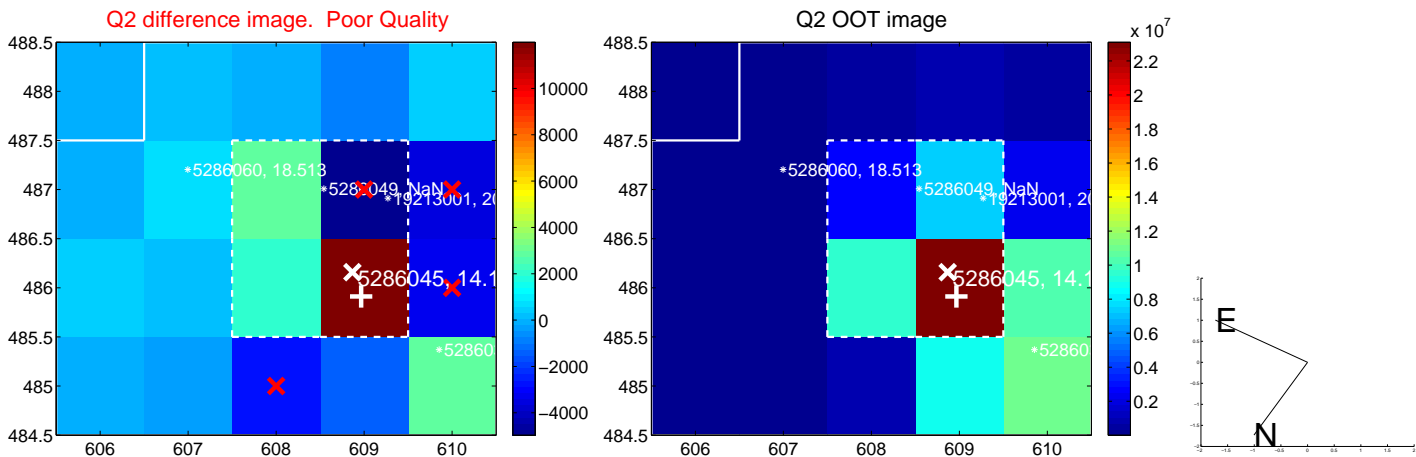
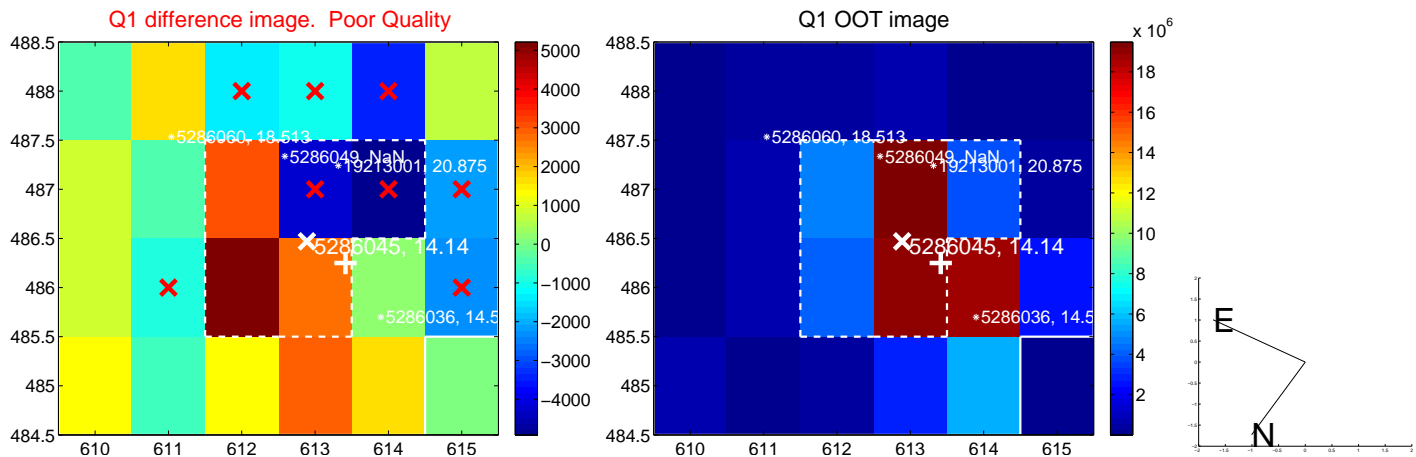


offset from photometric centroids

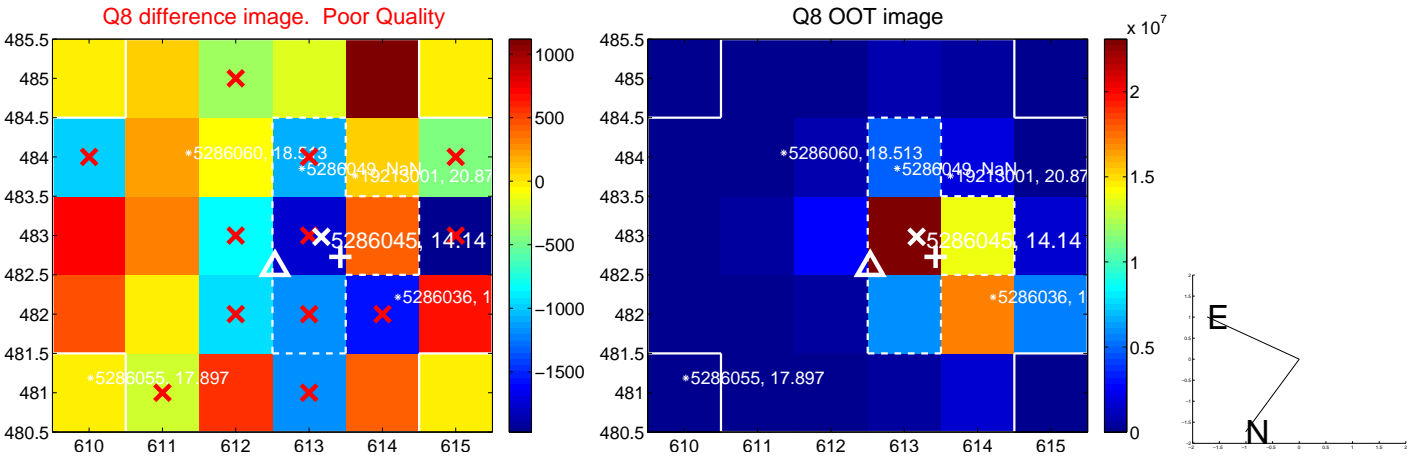
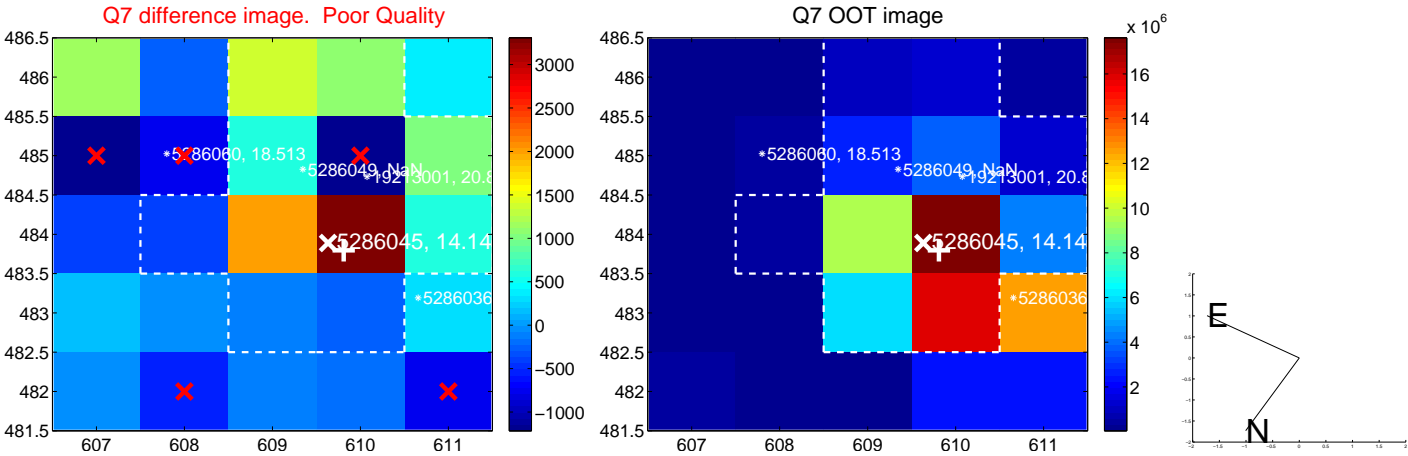
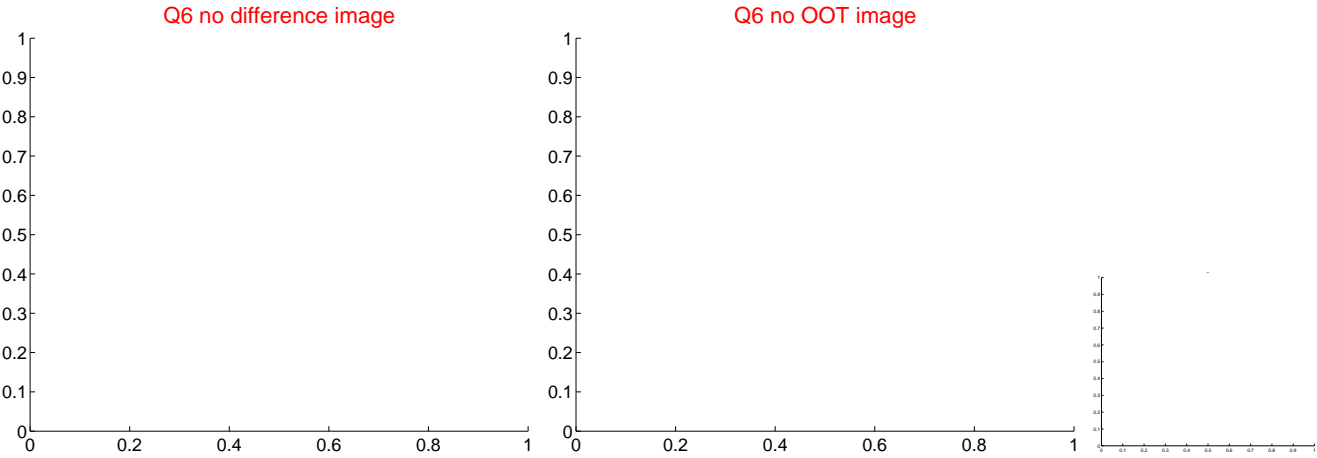
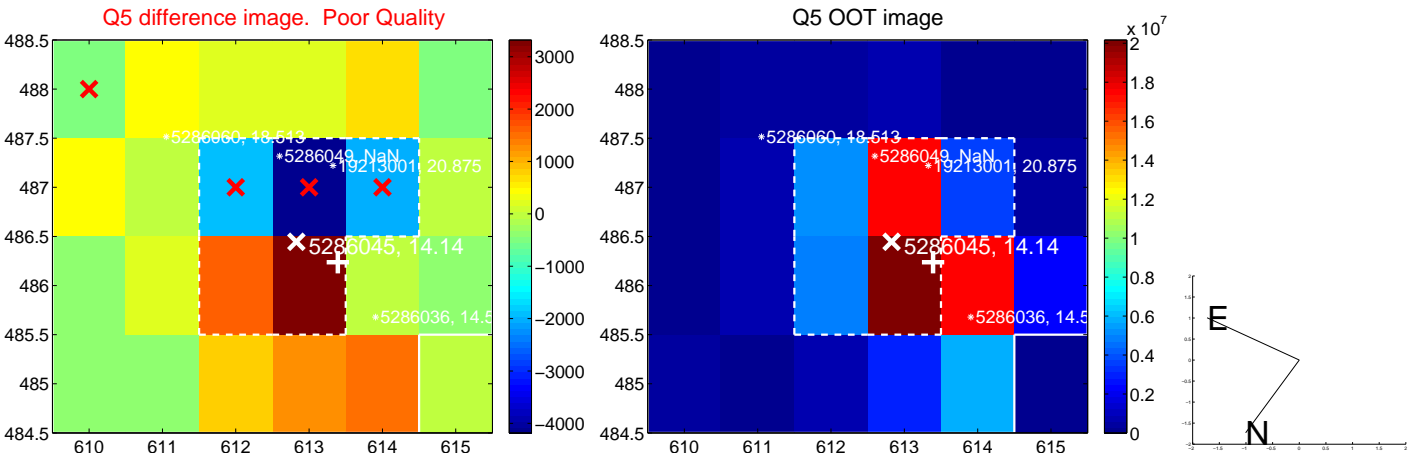


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

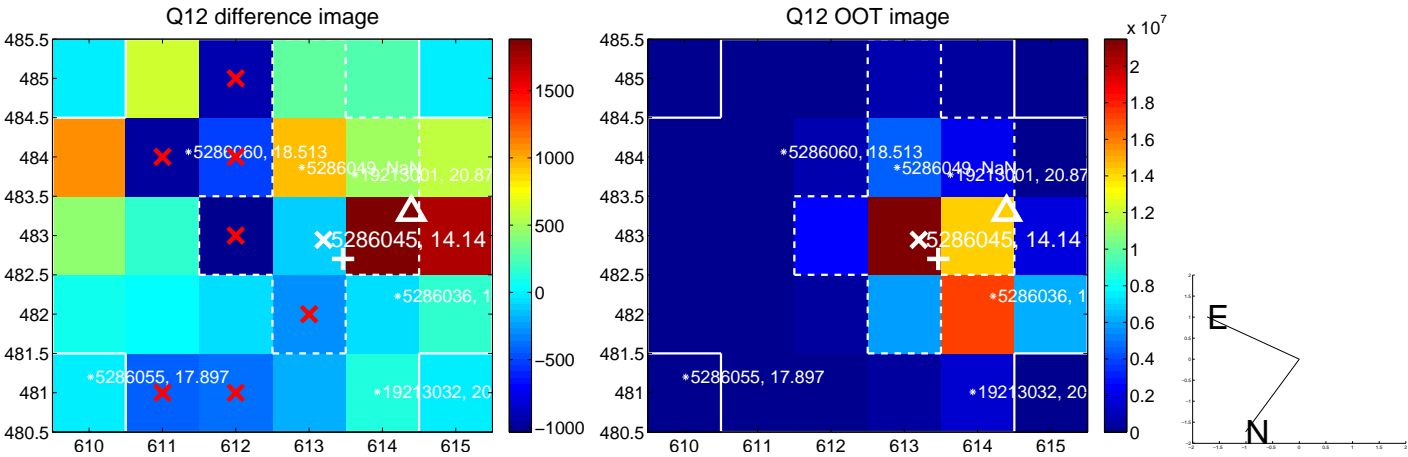
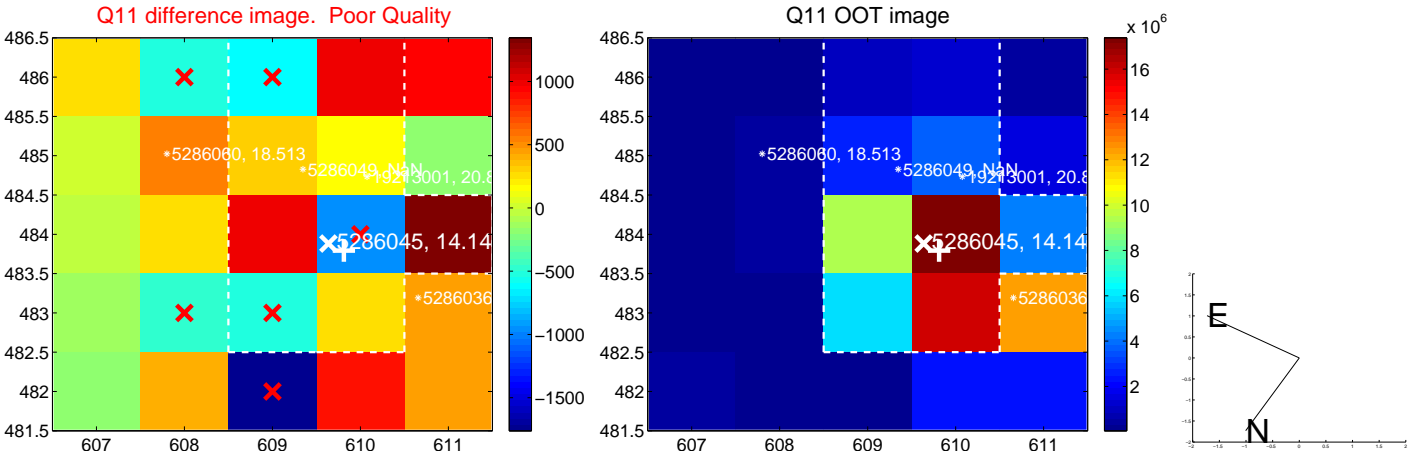
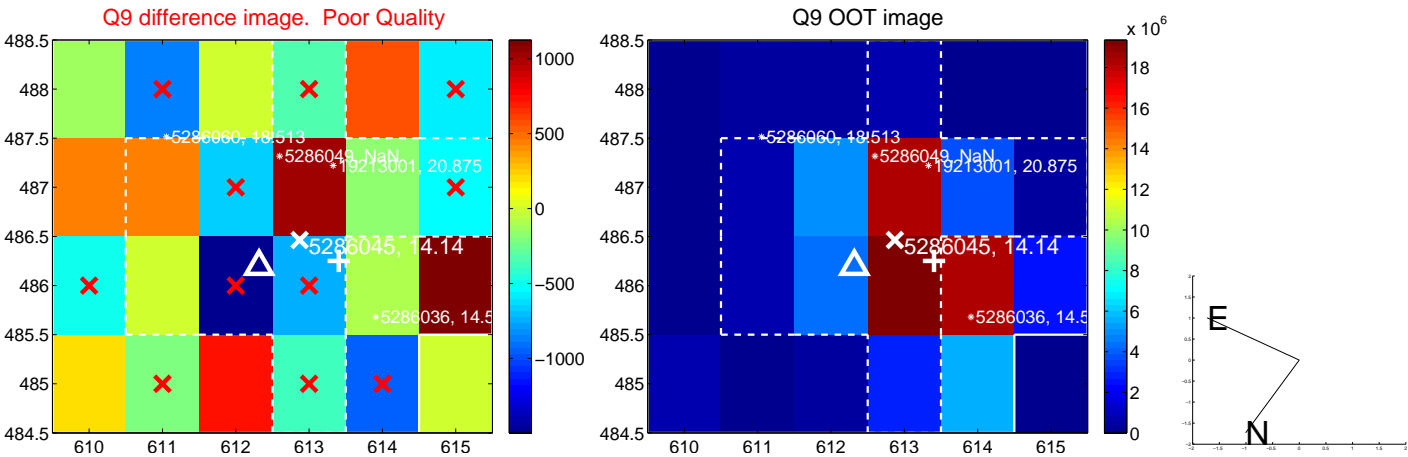


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

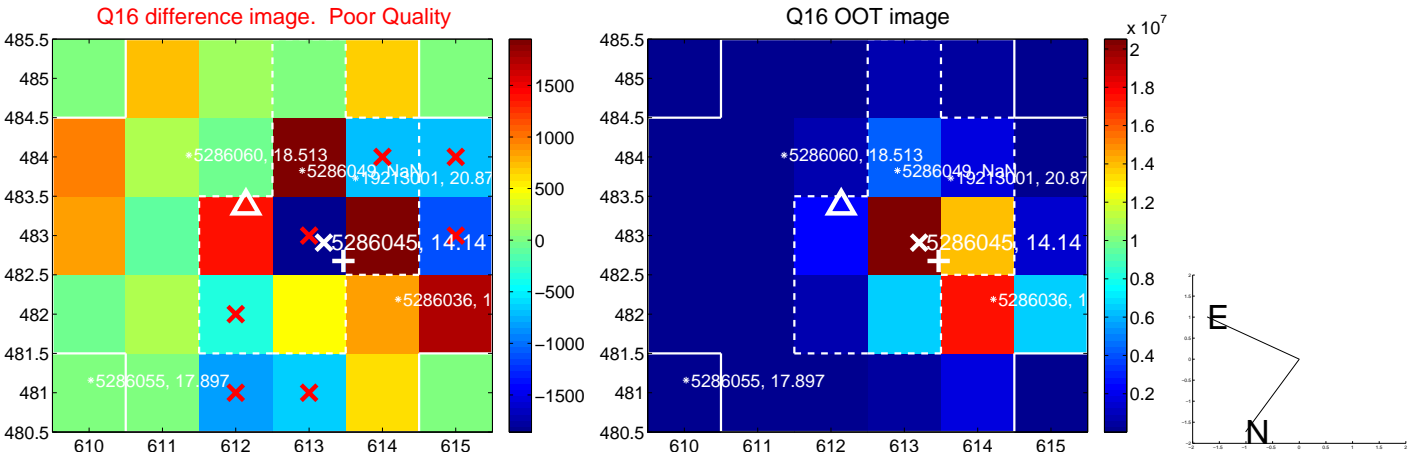
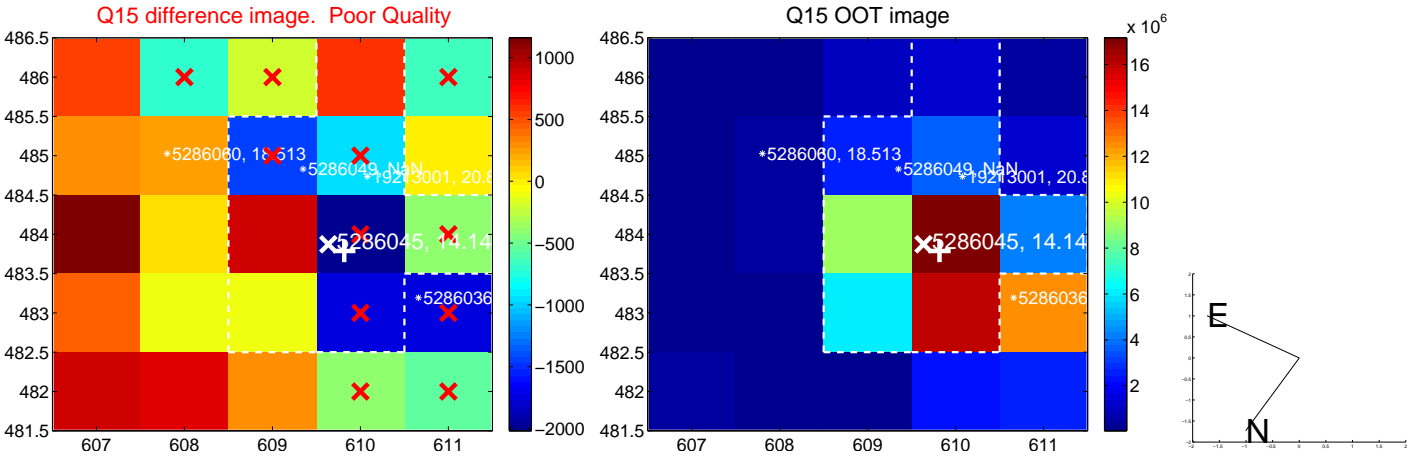
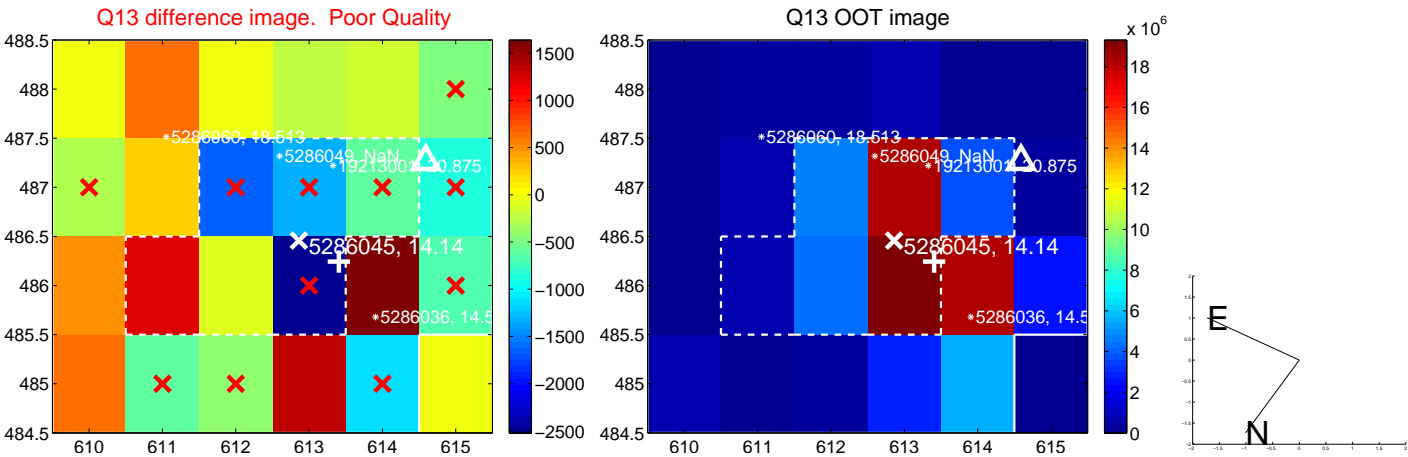




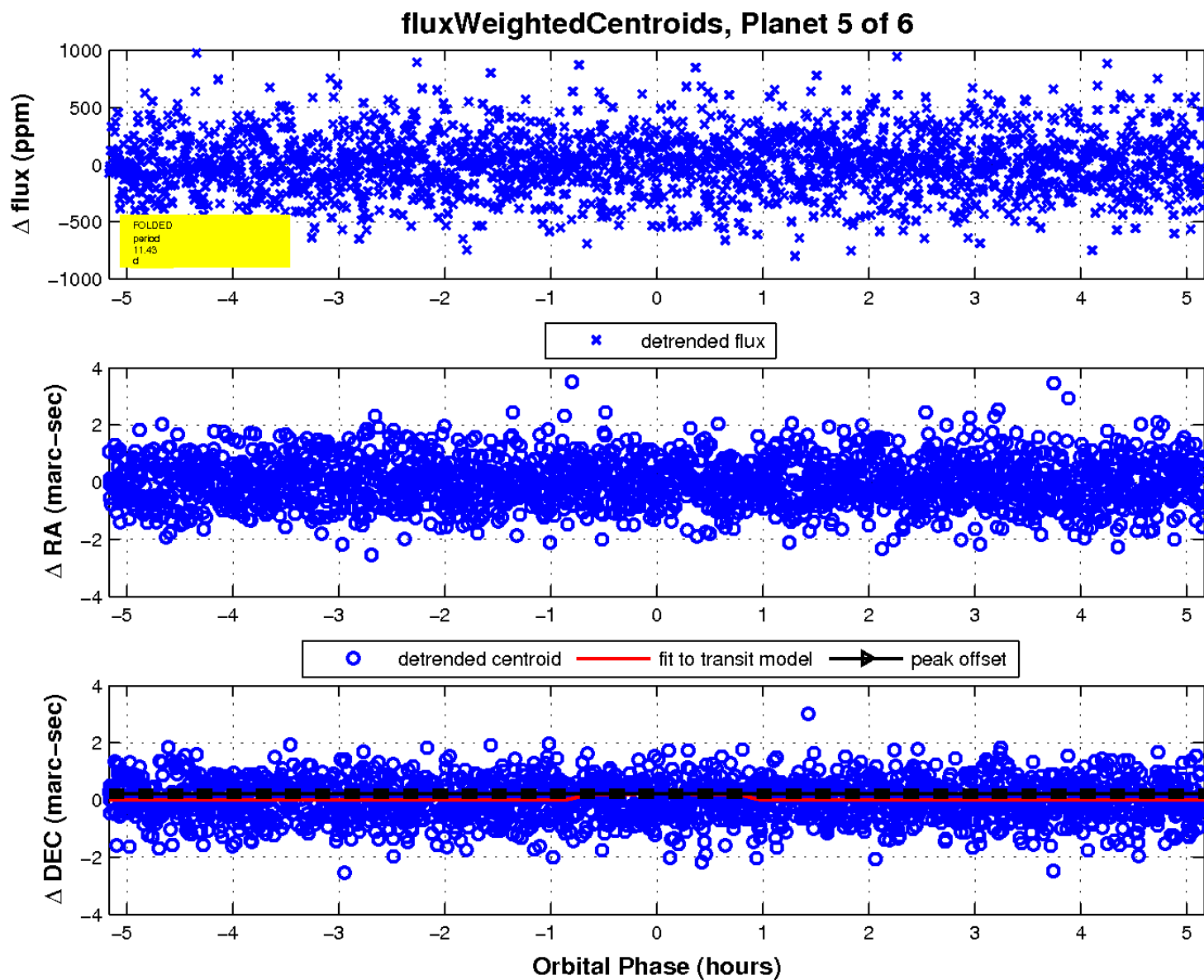
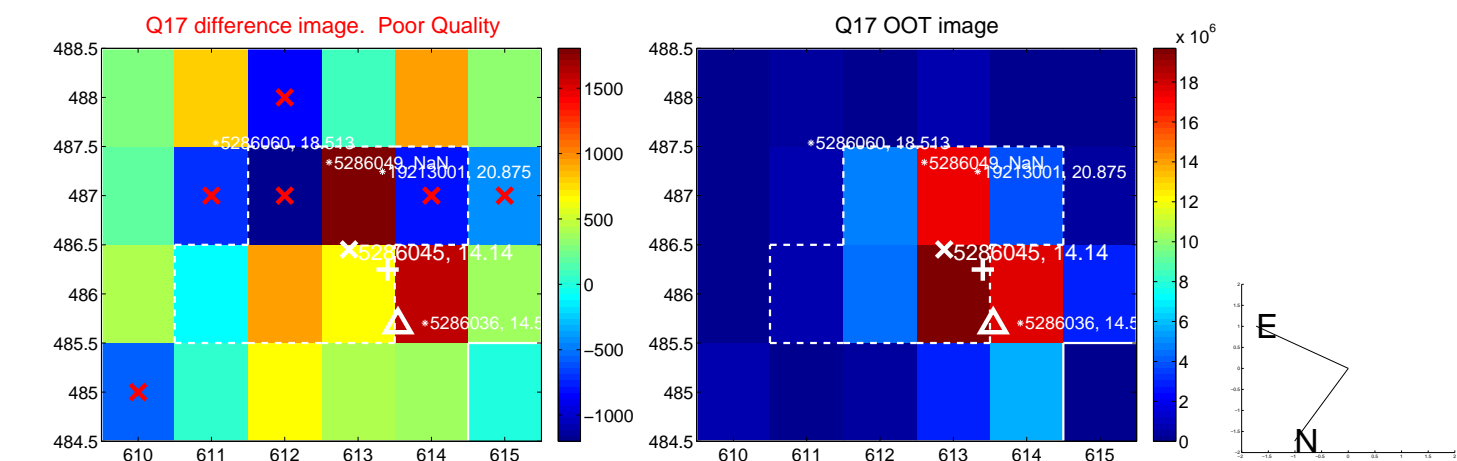
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

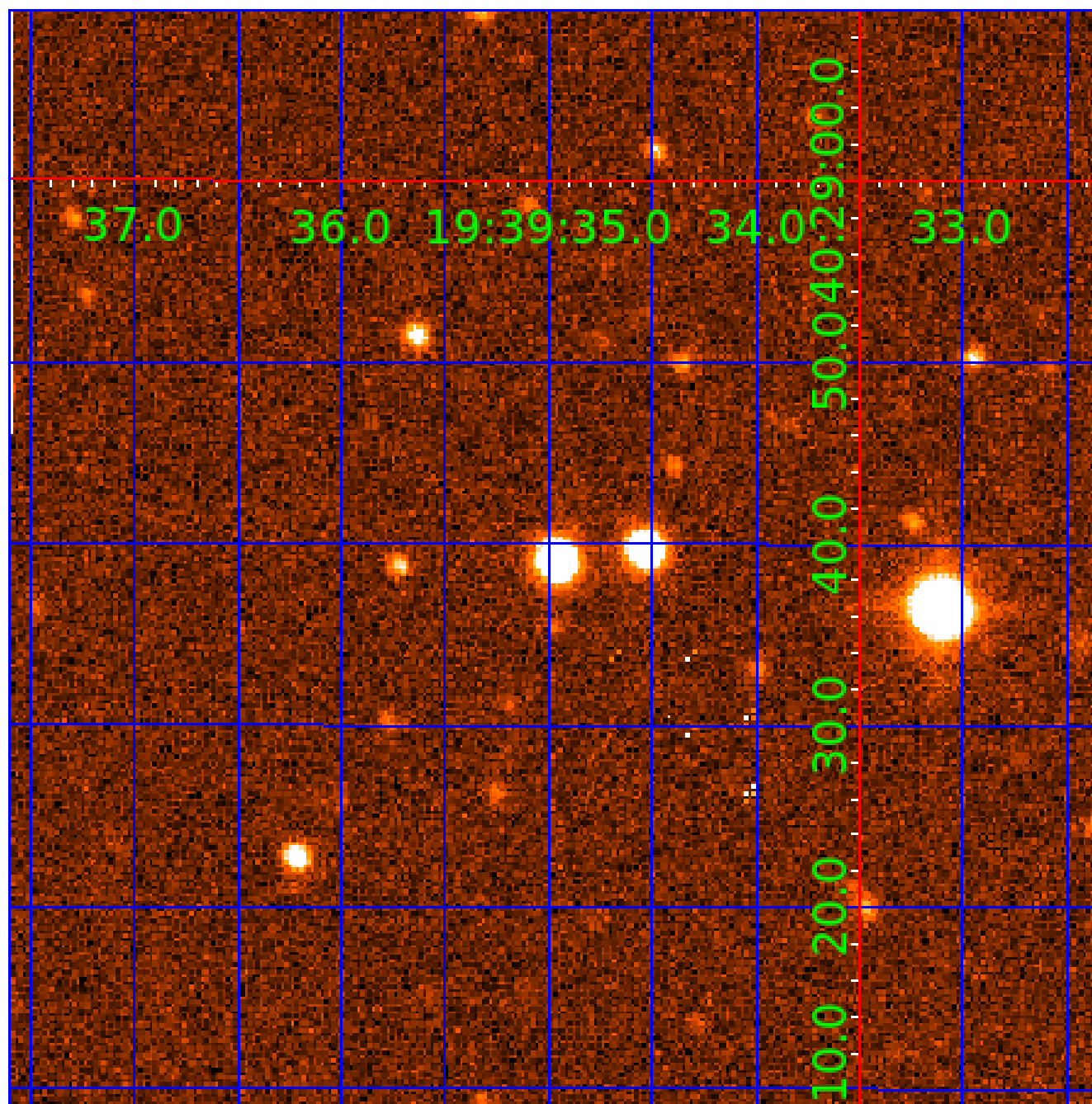


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005286045

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005286045-01	OBS	No	0.503876	131.616885	20.3	3.610	9.4	7.2	1.21	6847	0.56	16483.05
005286045-02	OBS	No	24.776117	155.043494	650.0	1.006	13.2	14.9	1.21	6847	3.46	91.50
005286045-03	OBS	No	13.997211	140.388169	165.4	4.129	10.8	6.6	1.21	6847	1.58	195.92
005286045-04	OBS	No	14.093368	132.666482	263.2	1.475	9.9	6.8	1.21	6847	2.28	194.14
005286045-05	OBS	No	11.428347	136.664083	182.8	1.724	8.5	5.7	1.21	6847	1.77	256.74
005286045-06	OBS	No	28.466030	146.235729	386.6	2.095	10.9	11.4	1.21	6847	2.44	76.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005286045-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS
005286045-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005286045-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005286045-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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

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

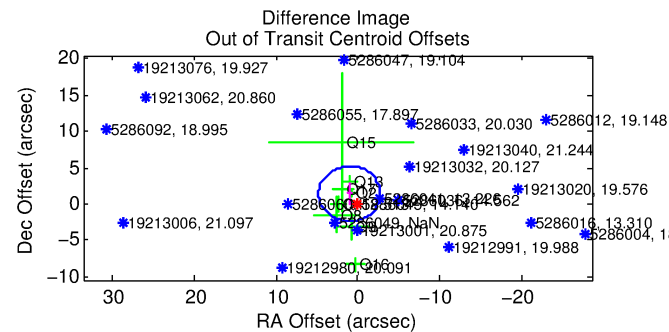
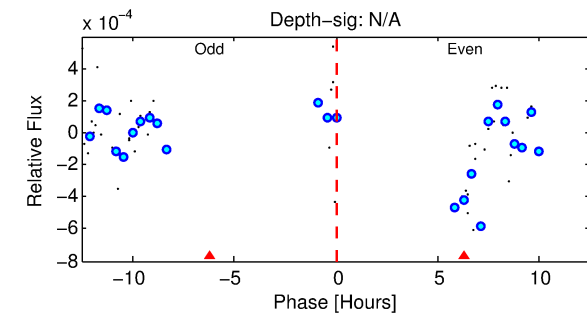
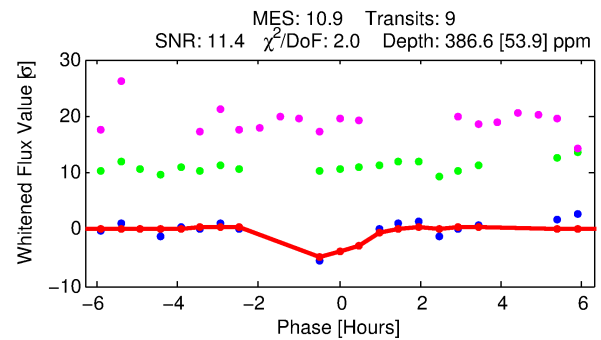
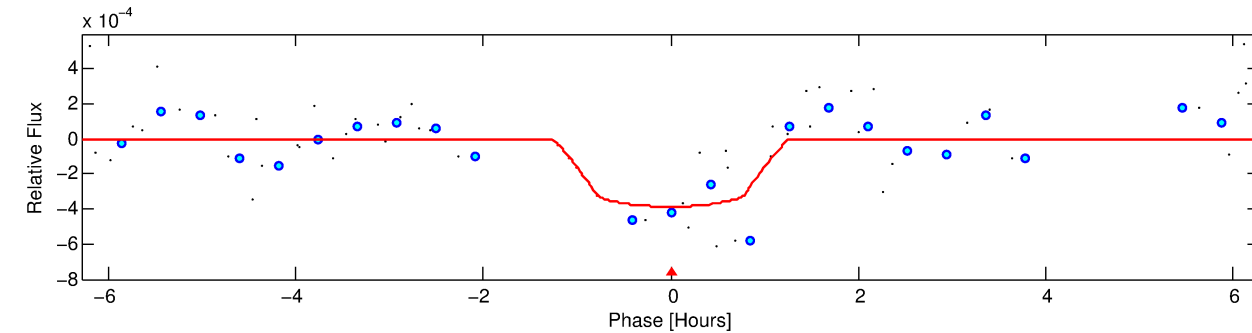
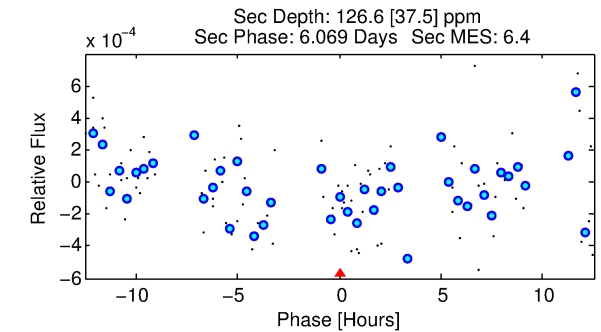
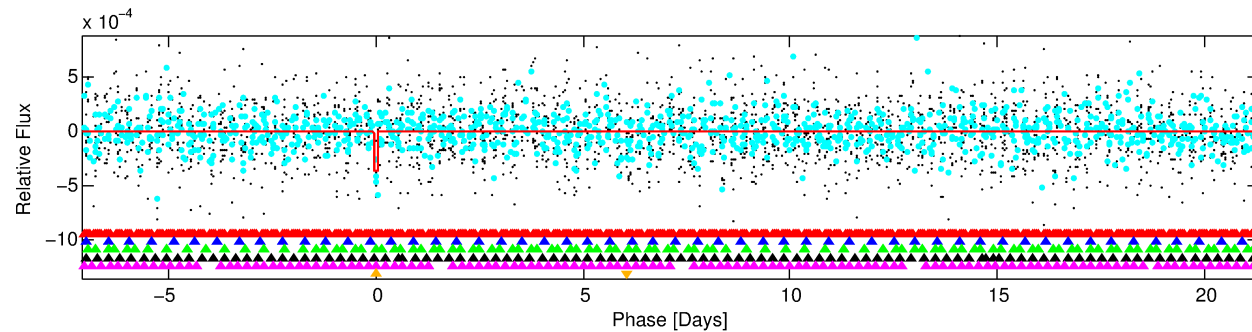
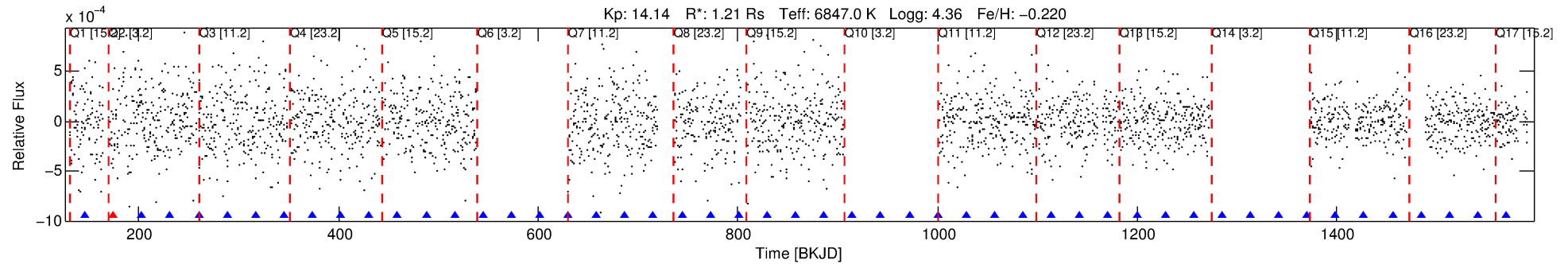
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005286045-06

No Significant Match Found

# DV One-Page Summary

KIC: 5286045 Candidate: 6 of 6 Period: 28.466 d



## DV Fit Results:

Period = 28.46603 [0.00103] d  
Epoch = 146.2357 [0.0206] BKJD  
Rp/R\* = 0.0184 [0.0355]  
a/R\* = 99.34 [1059.44]  
b = 0.35 [27.23]  
Seff = 76.04 [28.73]  
Teff = 753 [71] K  
Rp = 2.44 [4.75] Re  
a = 0.1952 [0.0468] AU  
Ag = 446.30 [1729.61] [0.26 $\sigma$ ]  
Teffp = 5351 [5169] K [0.89 $\sigma$ ]

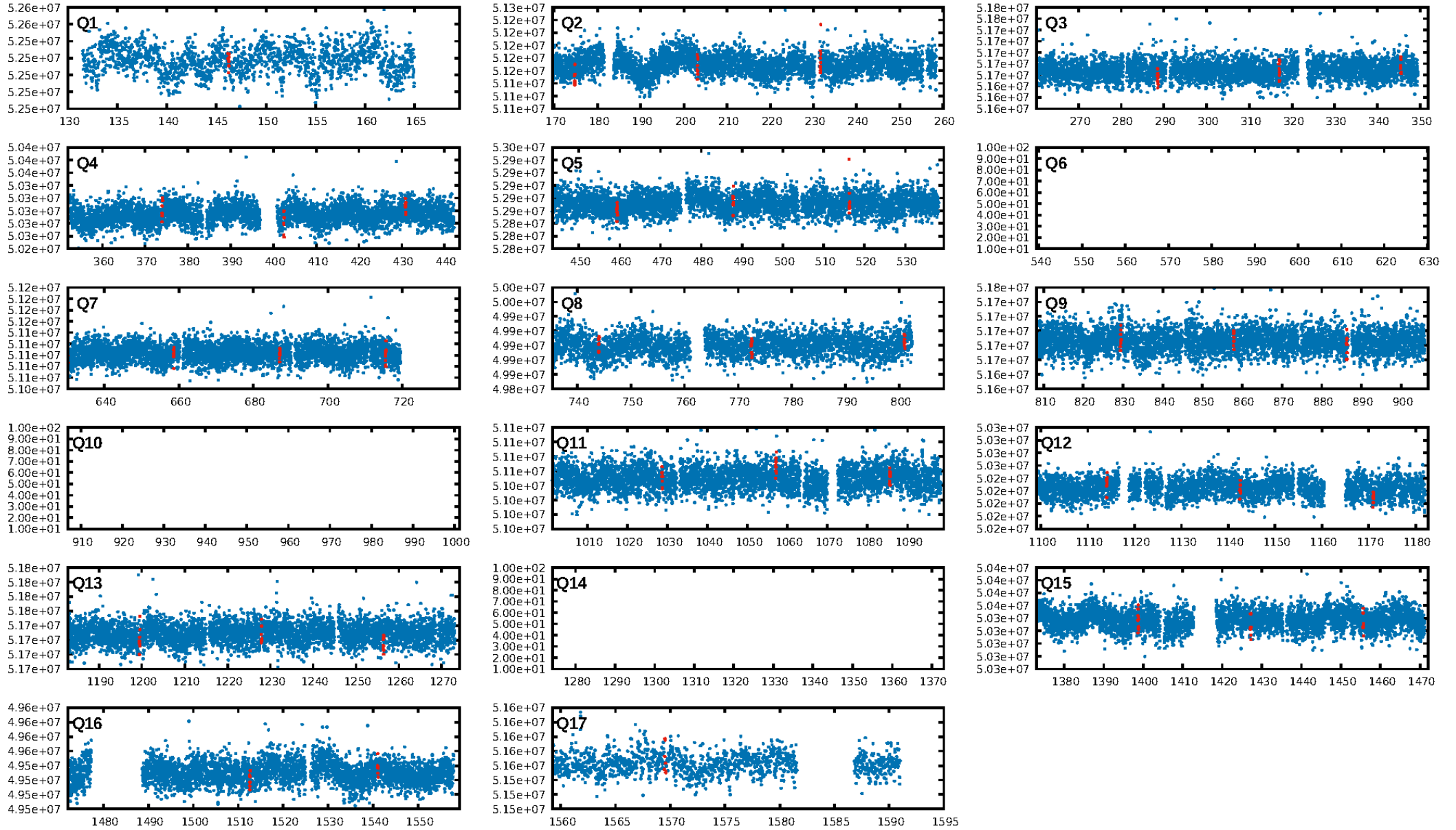
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [38.10 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.81e-14  
RollingBand-fgt: 0.89 [8/9]  
GhostDiagnostic-chr: -0.7851  
Centroid-sig: N/A  
Centroid-so: 1.807 arcsec [3.05 $\sigma$ ]  
OotOffset-rm: 1.748 arcsec [1.39 $\sigma$ ]  
KicOffset-rm: 1.845 arcsec [1.23 $\sigma$ ]  
OotOffset-st: 1/1/3/3 [8]  
KicOffset-st: 1/1/3/3 [8]  
DiffImageQuality-fgm: 0.25 [2/8]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:26:56 Z

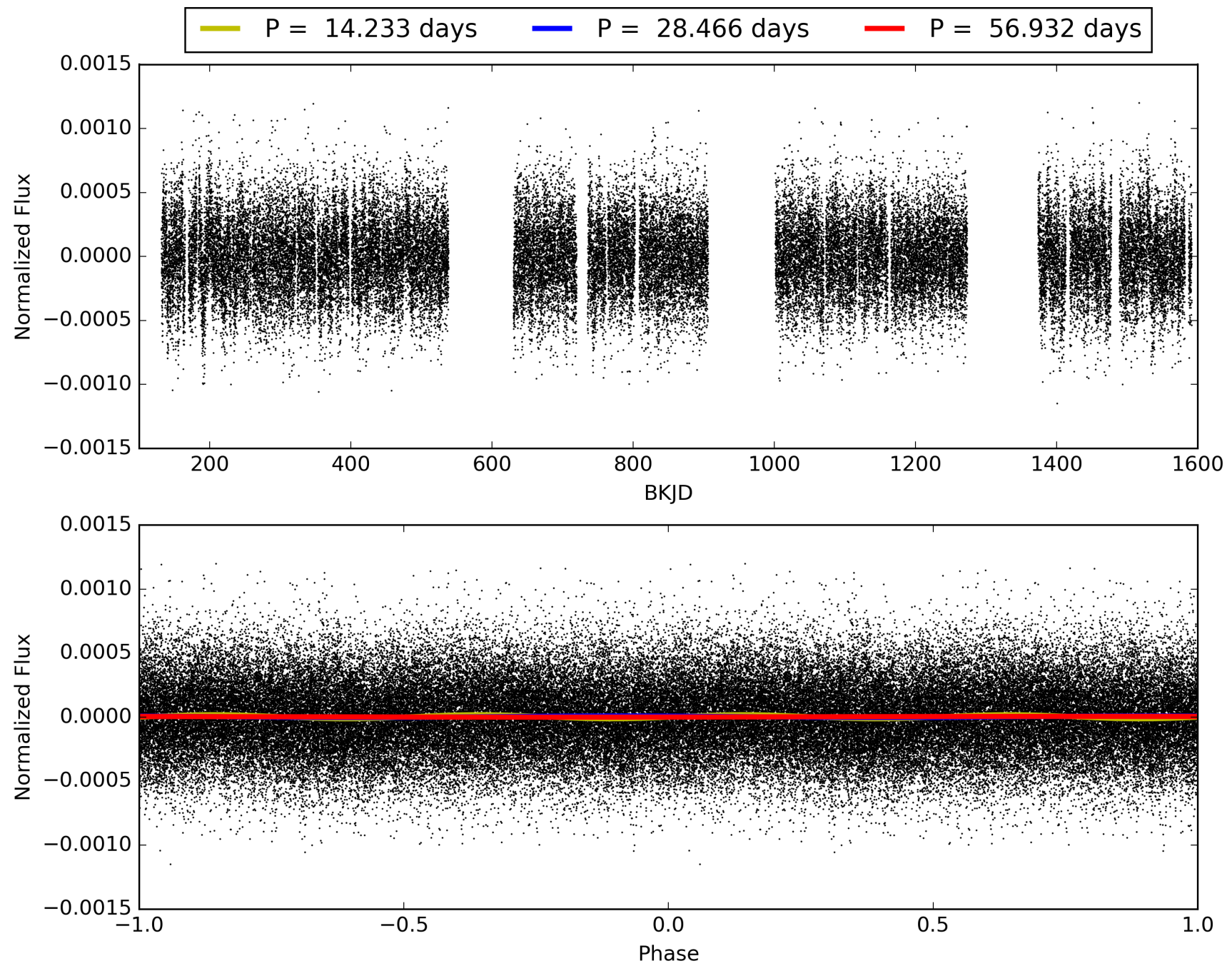
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005286045-06, PDC Light Curves





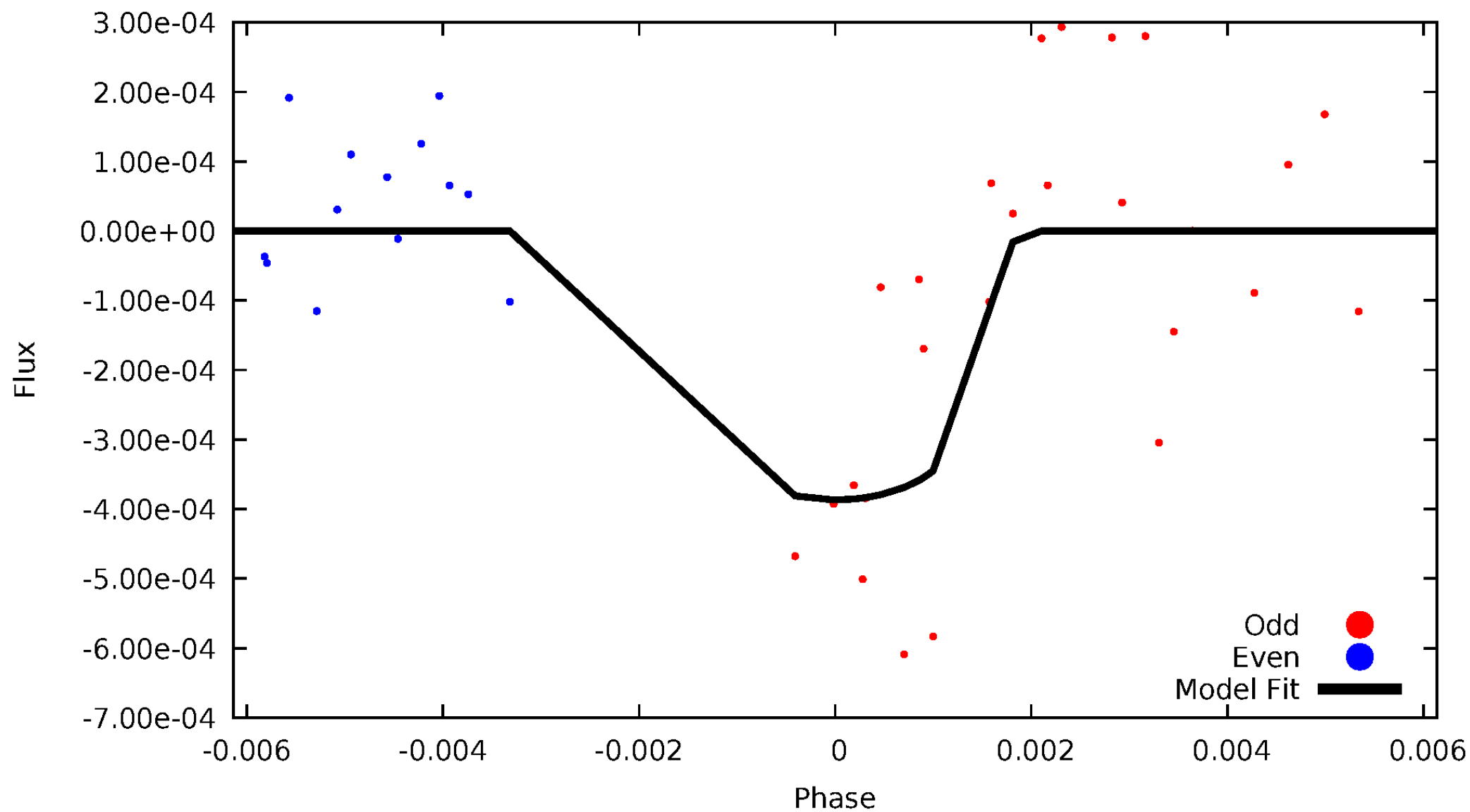
TCE 005286045-06





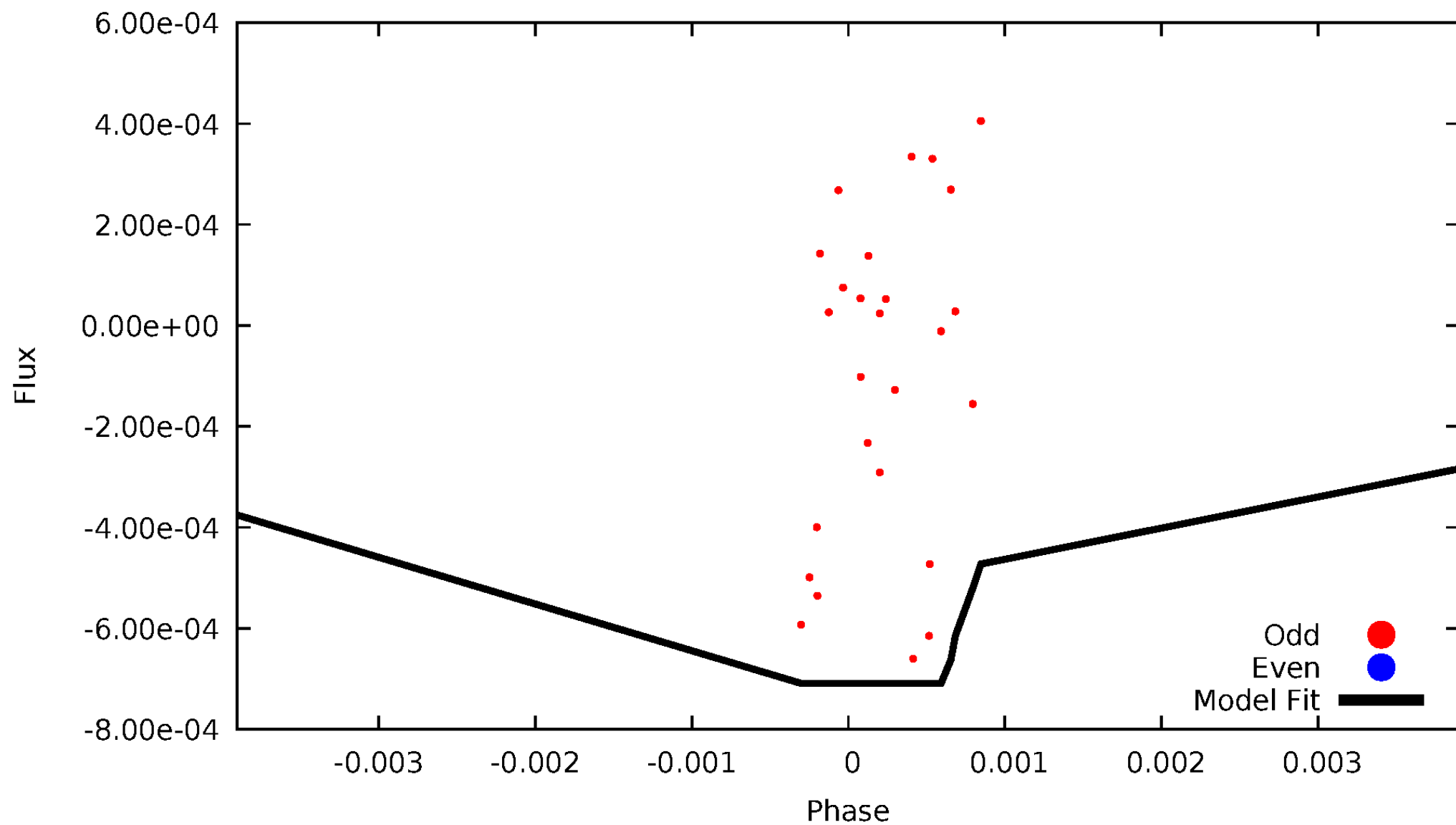
# DV Odd/Even

TCE 005286045-06



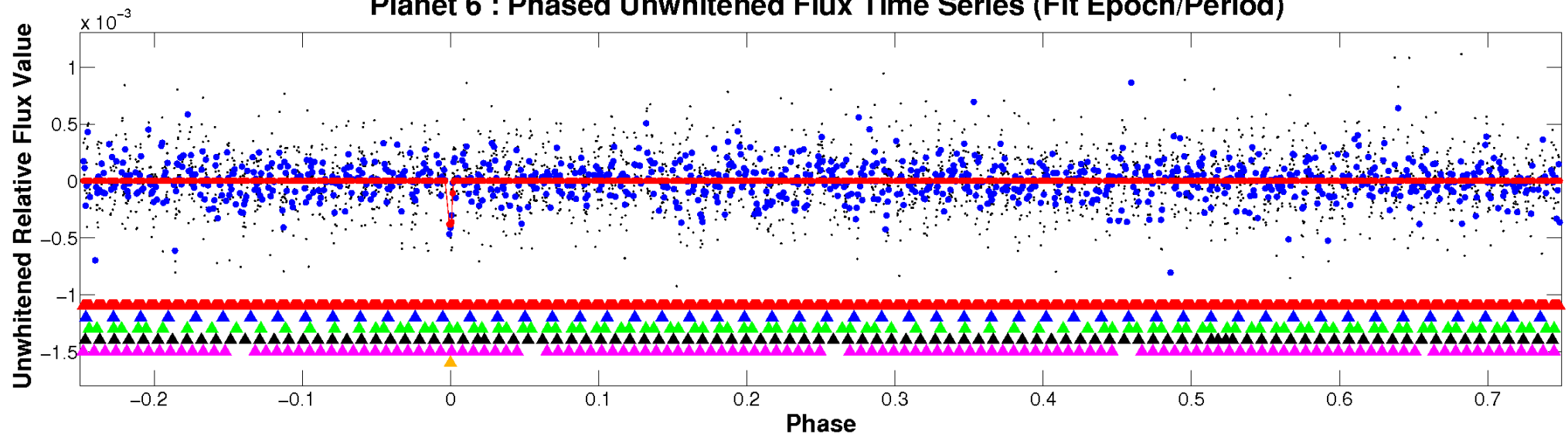
# ALT Odd/Even

TCE 005286045-06

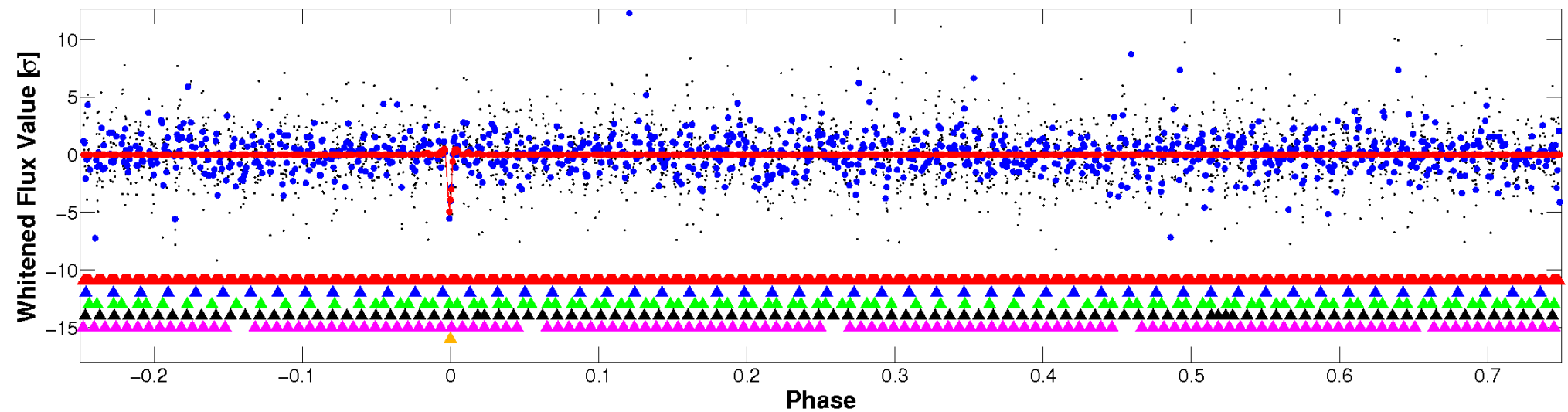


# Non-Whitened Vs. Whitened Light Curve

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

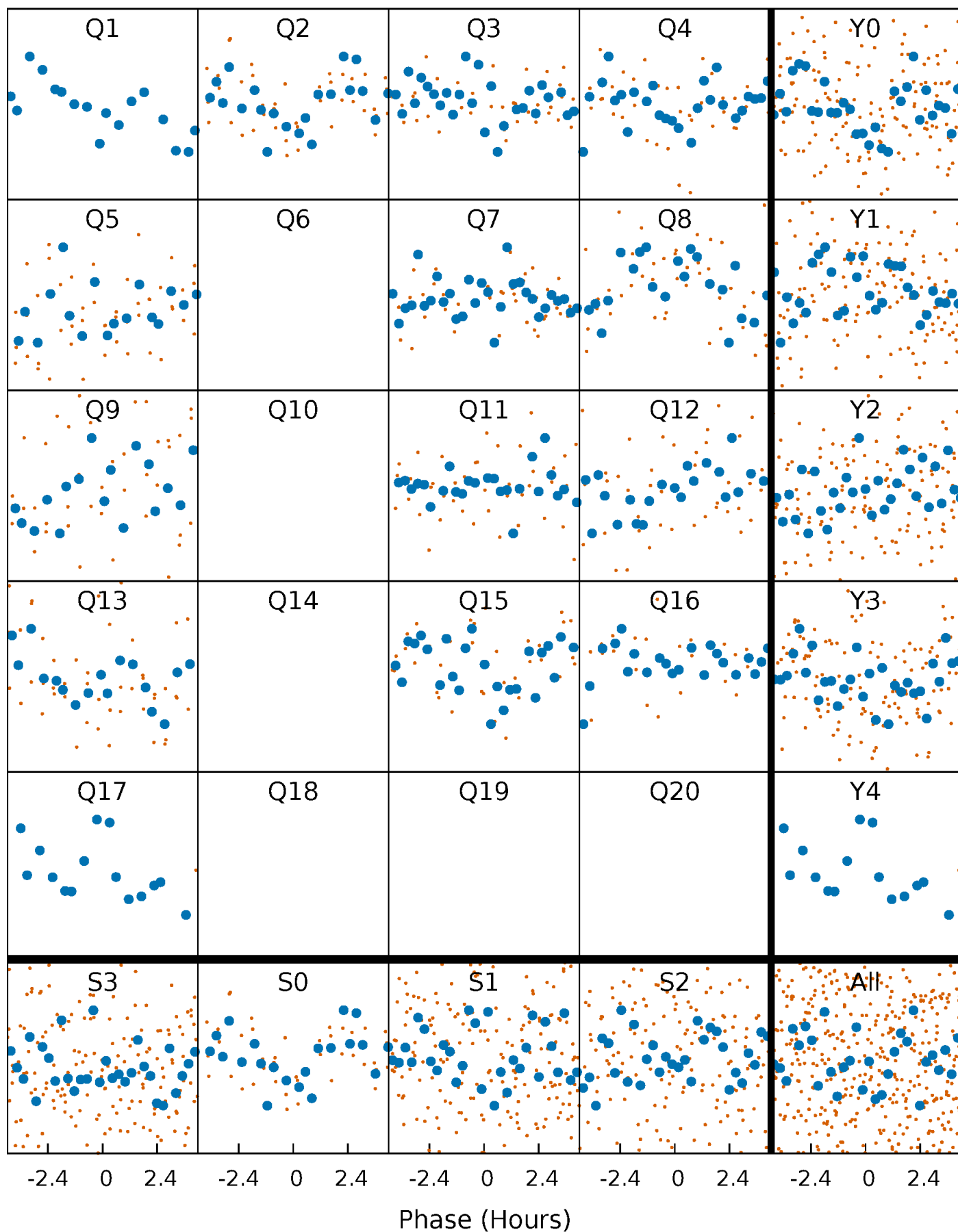


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



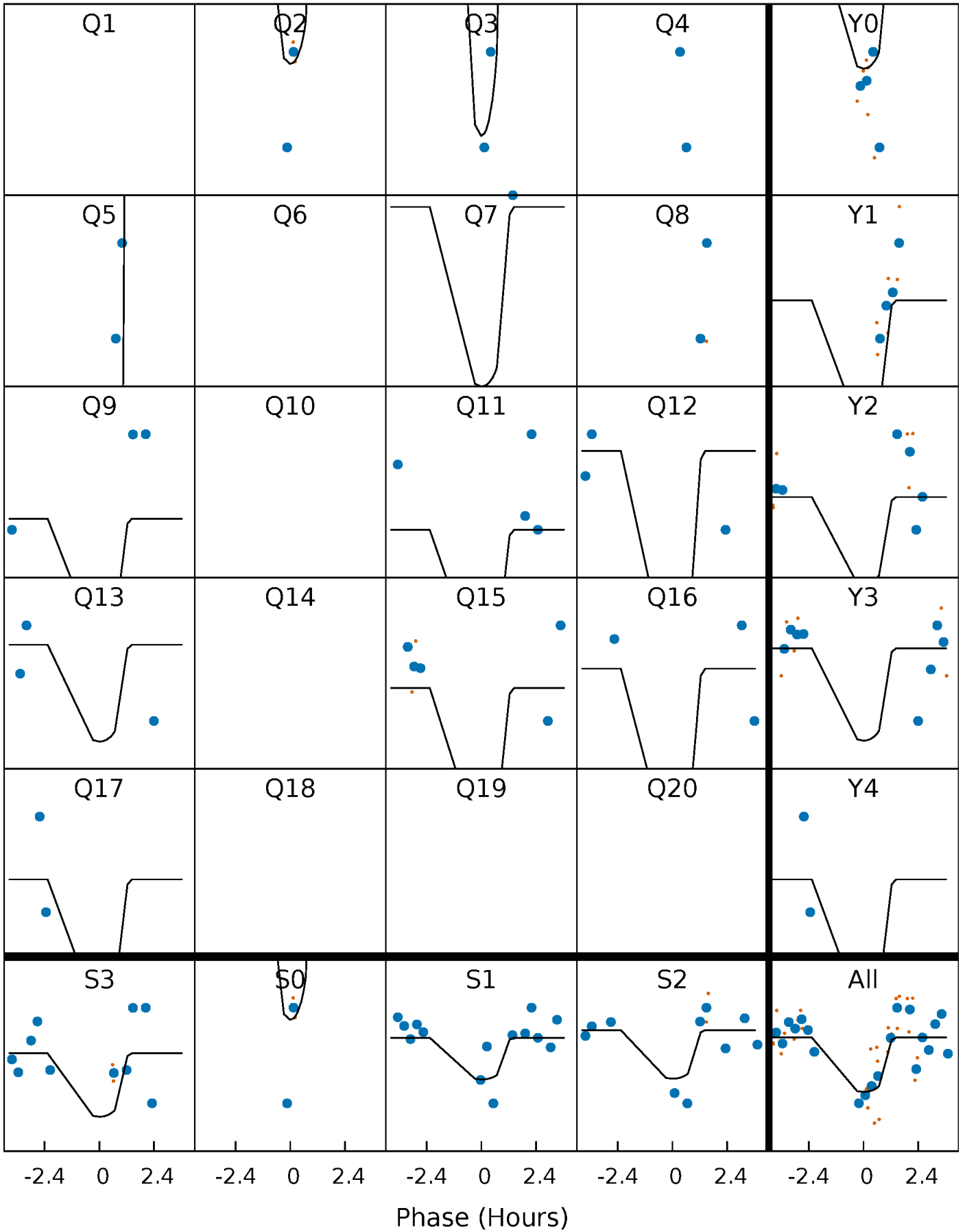
# PDC Quarter-Phased Transit Curves

TCE 005286045-06 P= 28.466030 Days  $T_0=146.235729$  (BKJD)



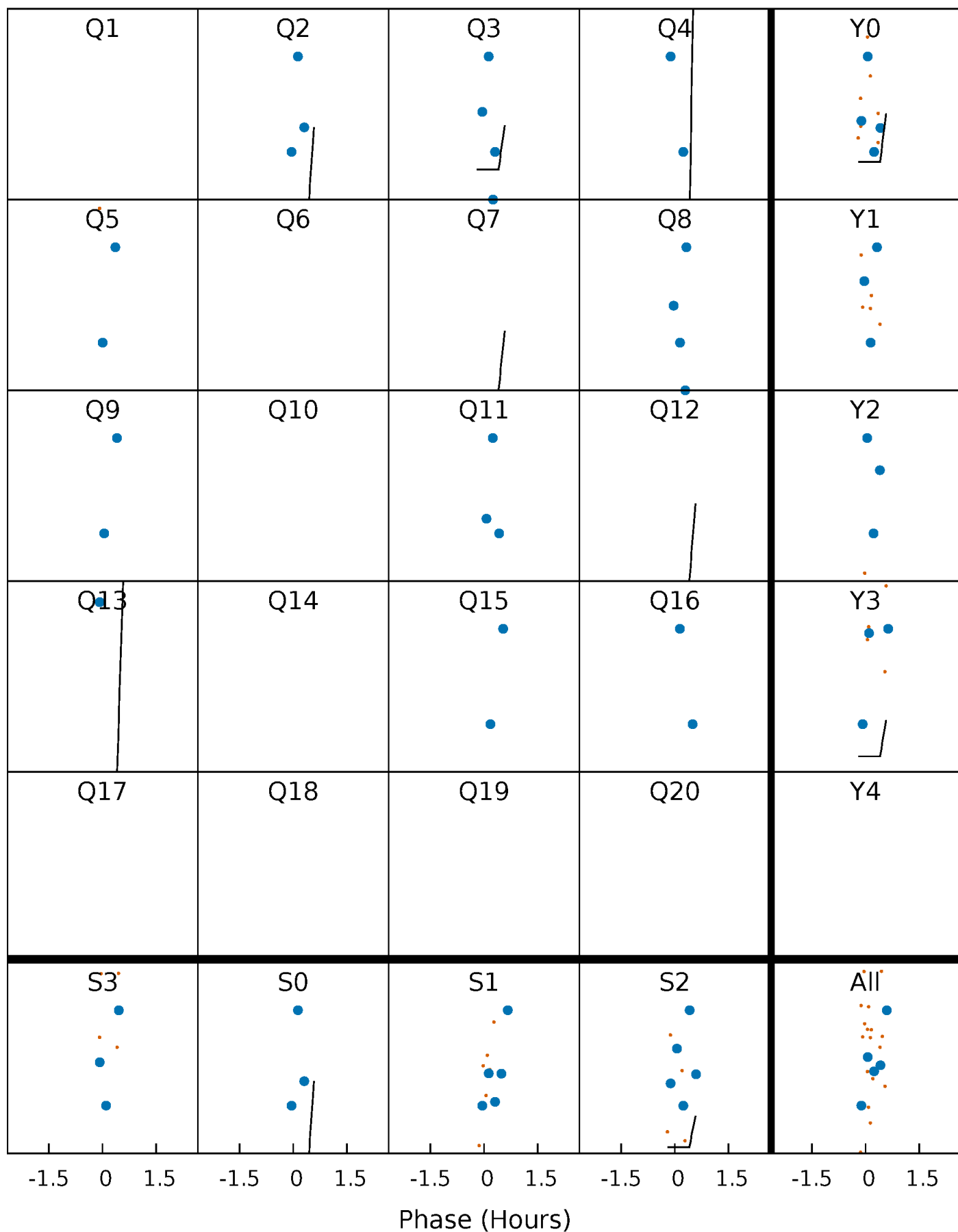
# DV Quarter-Phased Transit Curves

TCE 005286045-06   P= 28.466030 Days    $T_0=146.235729$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

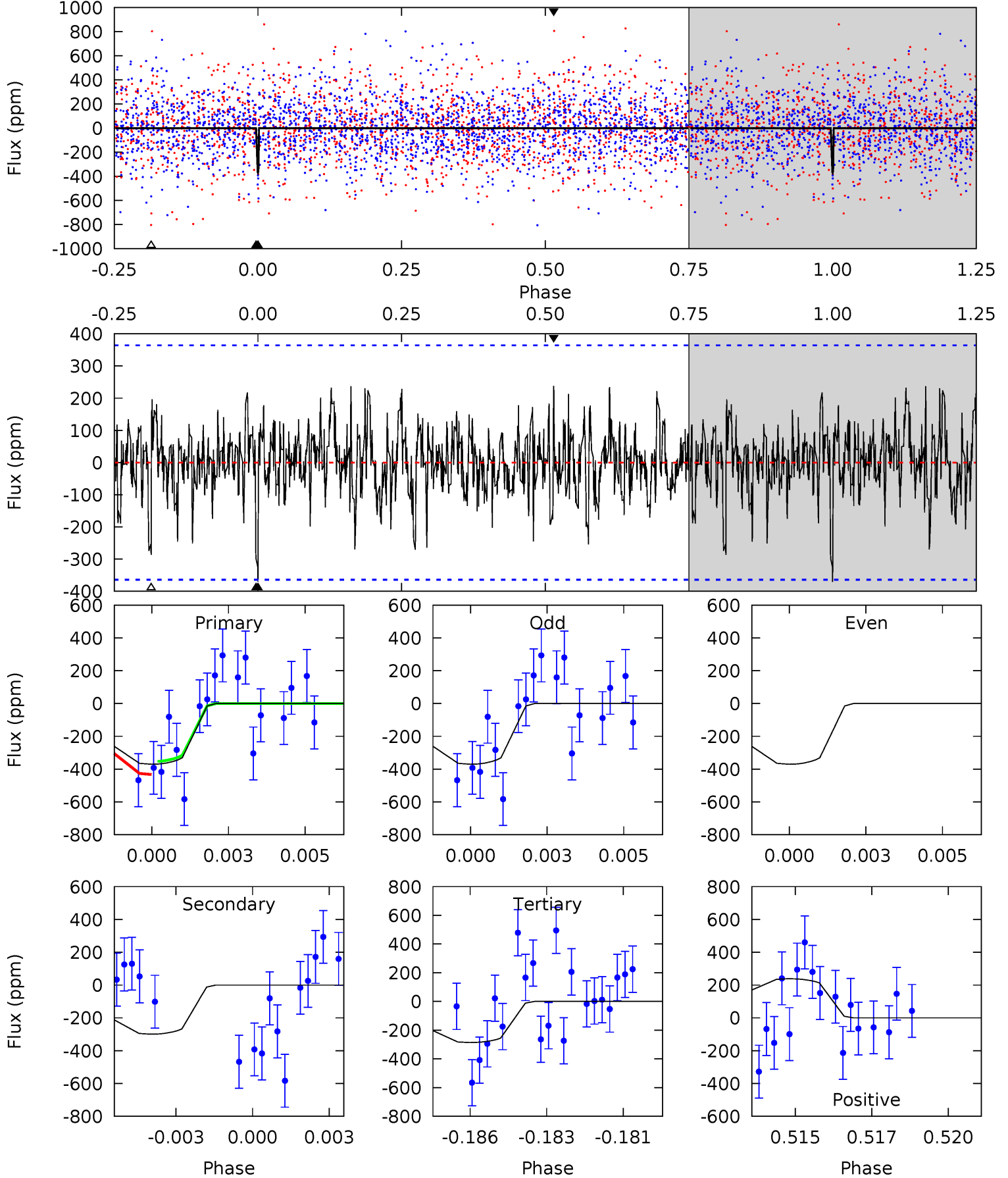
TCE 005286045-06 P= 28.468848 Days  $T_0=146.226974$  (BKJD)



# DV Model-Shift Uniqueness Test

005286045-06, P = 28.466030 Days, E = 117.769699 Days

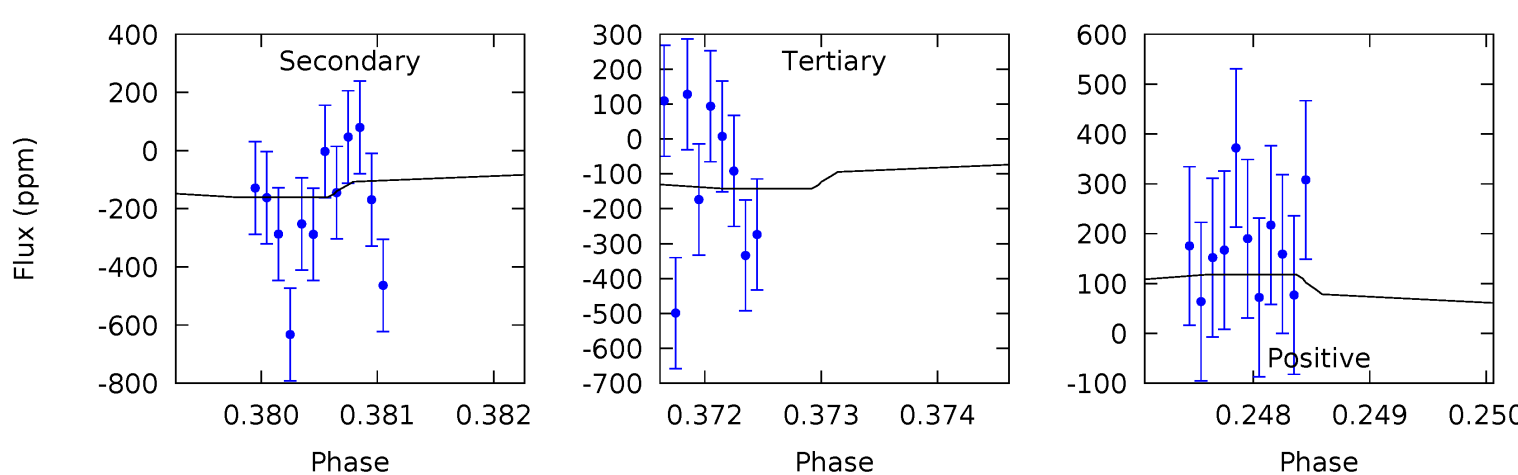
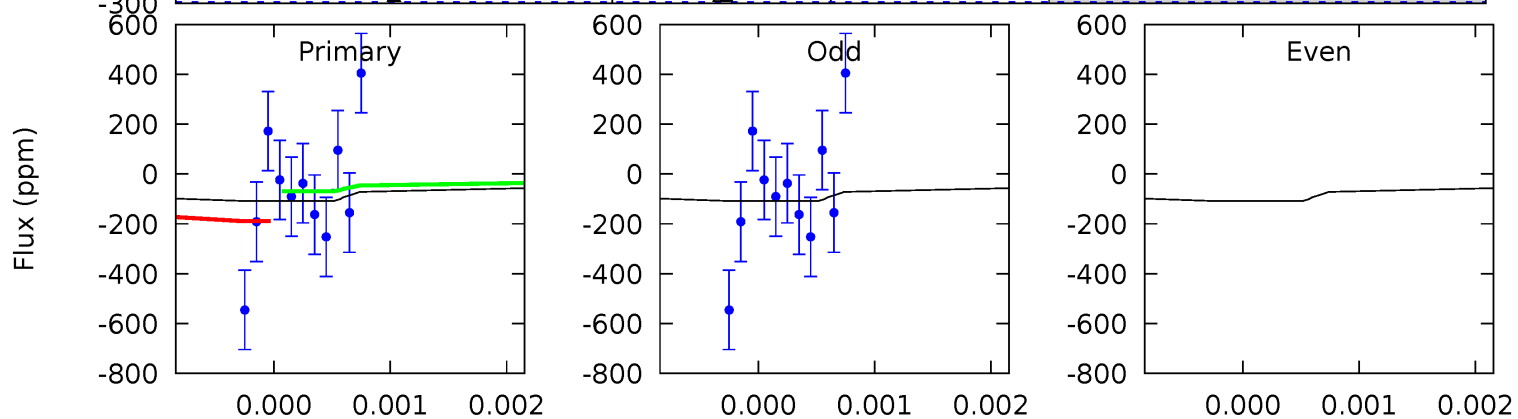
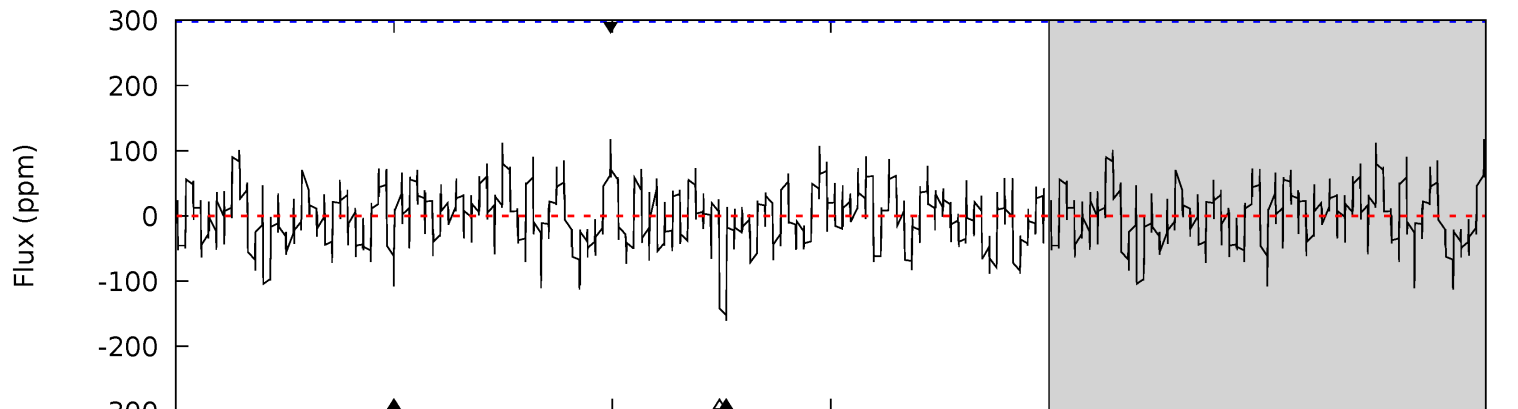
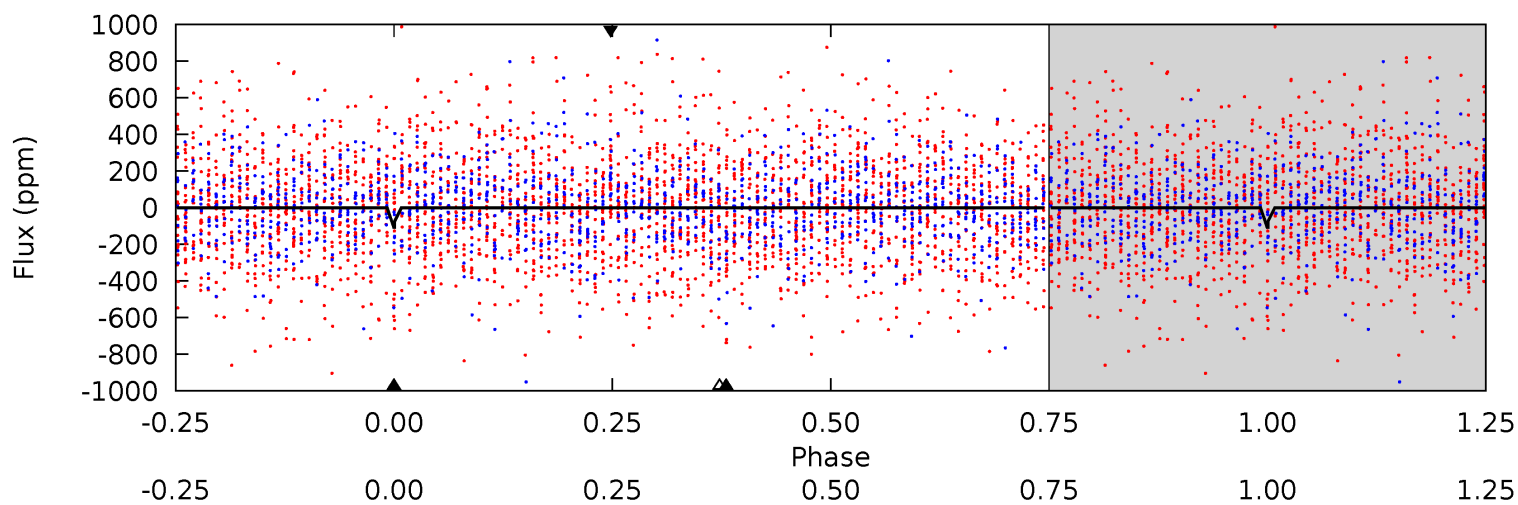
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.38	4.35	4.15	3.46	5.29	3.02	1.17	1.22	1.92	0.19	0.88	0	0.86	0.39	0.32



# Alt Model-Shift Uniqueness Test

005286045-06, P = 28.468848 Days, E = 117.758126 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
1.97	2.92	2.58	2.14	5.43	3.25	0.69	-0.61	-0.17	0.34	0.78	0	-12.2	0.42	1.01





### Stellar Parameters For KIC 005286045

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6847^{+167}_{-286}$	$4.358^{+0.060}_{-0.180}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.357}_{-0.127}$	$1.239^{+0.178}_{-0.160}$	$0.977^{+0.256}_{-0.465}$
	+2%/-4%	+1%/-4%	+114%/-136%	+29%/-10%	+14%/-13%	+26%/-48%
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 005286045-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-299 \pm 69$	$4.61^{+4.52}_{-3.22}$	$1067^{+68}_{-59}$	$4918^{+4794}_{-1132}$	$286^{+2962}_{-215}$
Alt.	$-161 \pm 55$	$5.09^{+4.40}_{-3.59}$	$1065^{+68}_{-57}$	$4161^{+3013}_{-772}$	$120^{+1269}_{-85}$

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

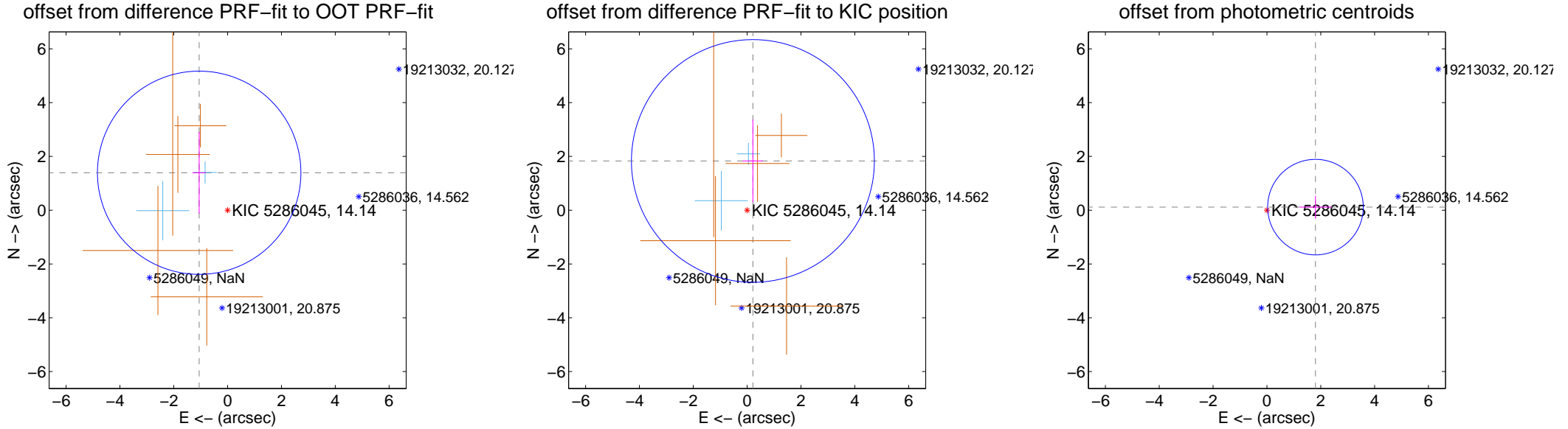
## DV Centroid Data

Supplemental centroid analysis for 005286045-06. Kepler magnitude: 14.14. Transit SNR 11.37

There are 2 quarters with good PRF difference image offsets

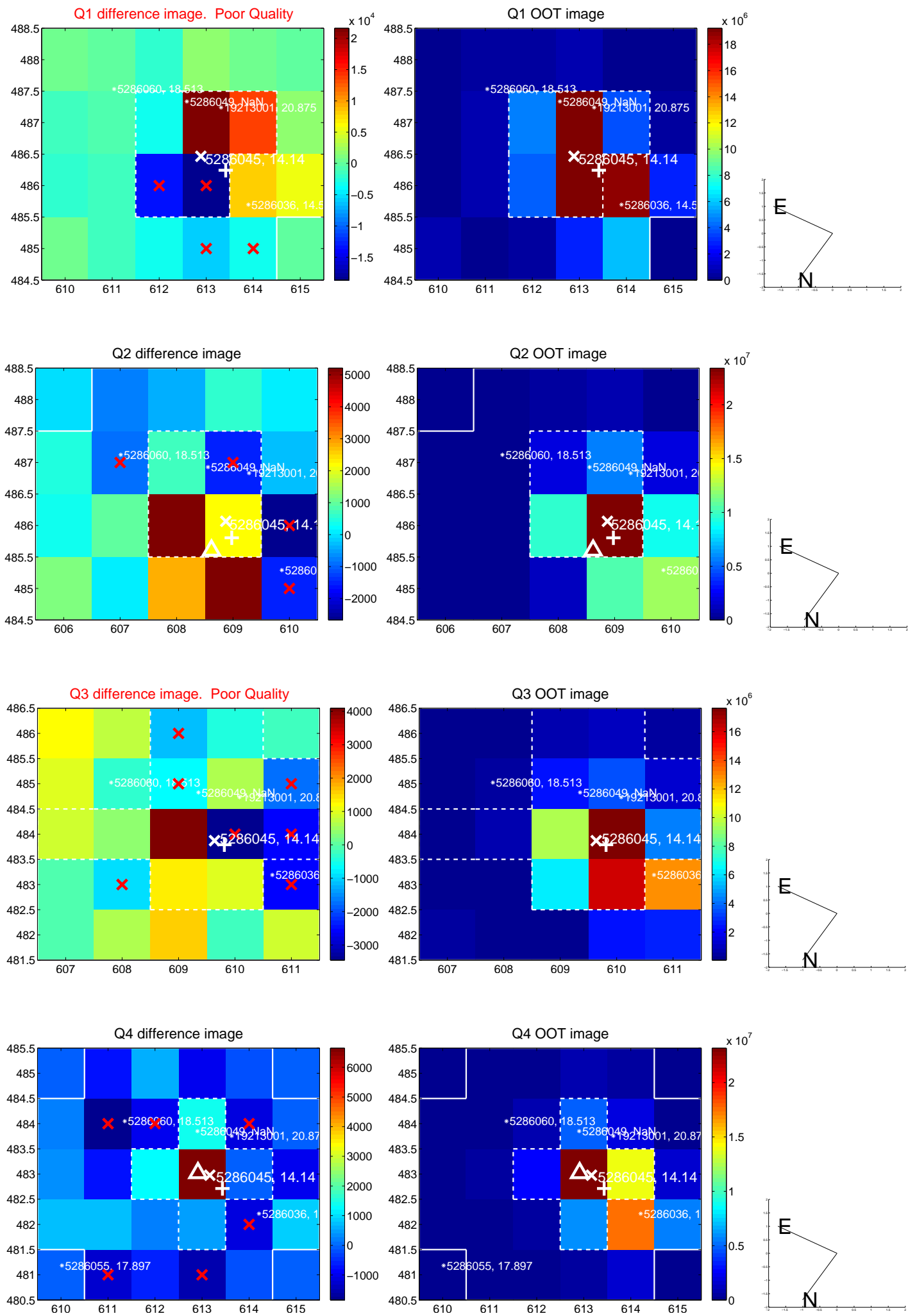
The OOT PRF centroid is offset from the target star catalog position by about 2.26 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.748 \pm 1.260$	1.39	$1.056 \pm 0.250$	$1.393 \pm 1.514$
PRF-fit source offset from KIC position	$1.845 \pm 1.504$	1.23	$-0.215 \pm 0.376$	$1.832 \pm 1.536$
photometric centroid source offset	$1.81 \pm 0.59$	3.05	$-1.80 \pm 0.59$	$0.11 \pm 0.42$

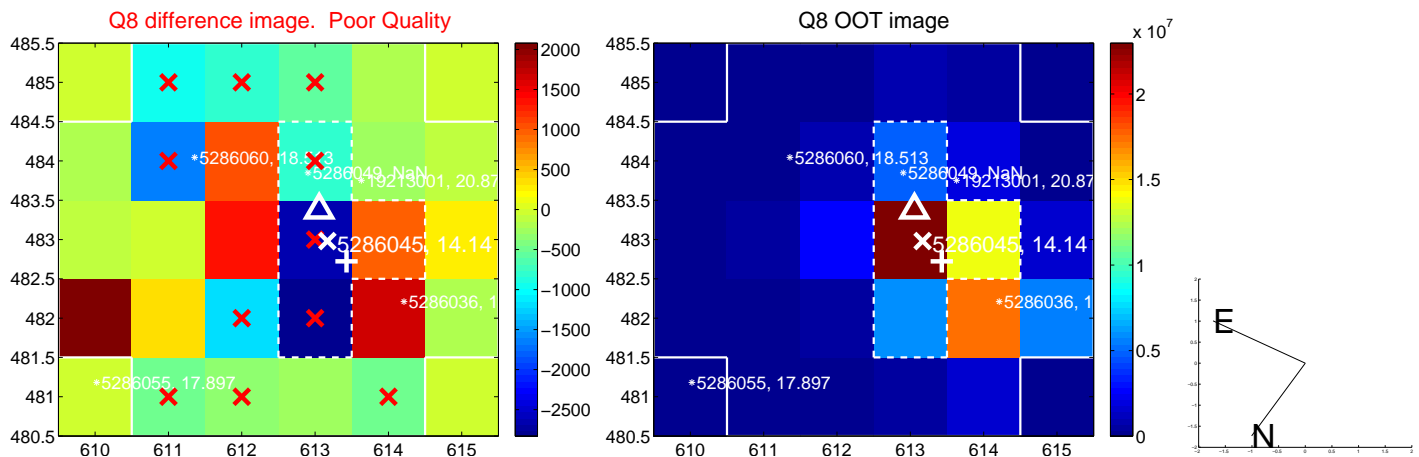
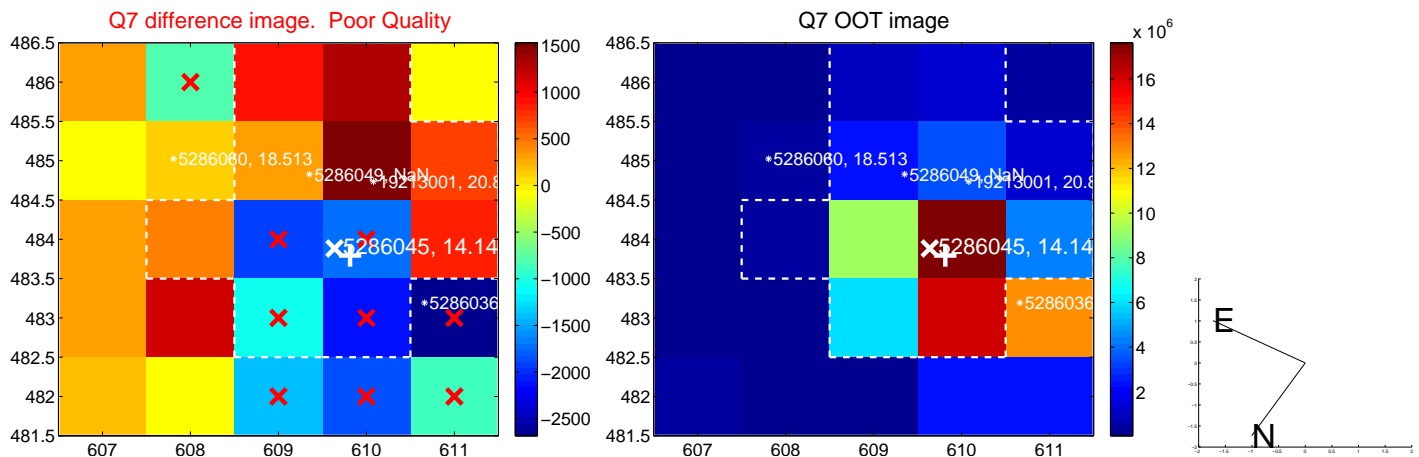
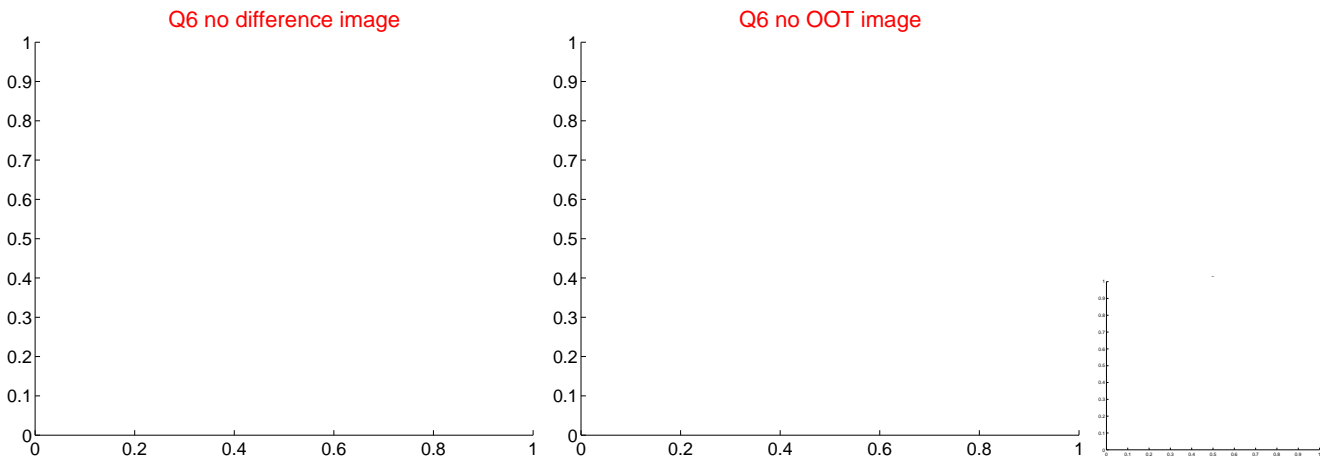
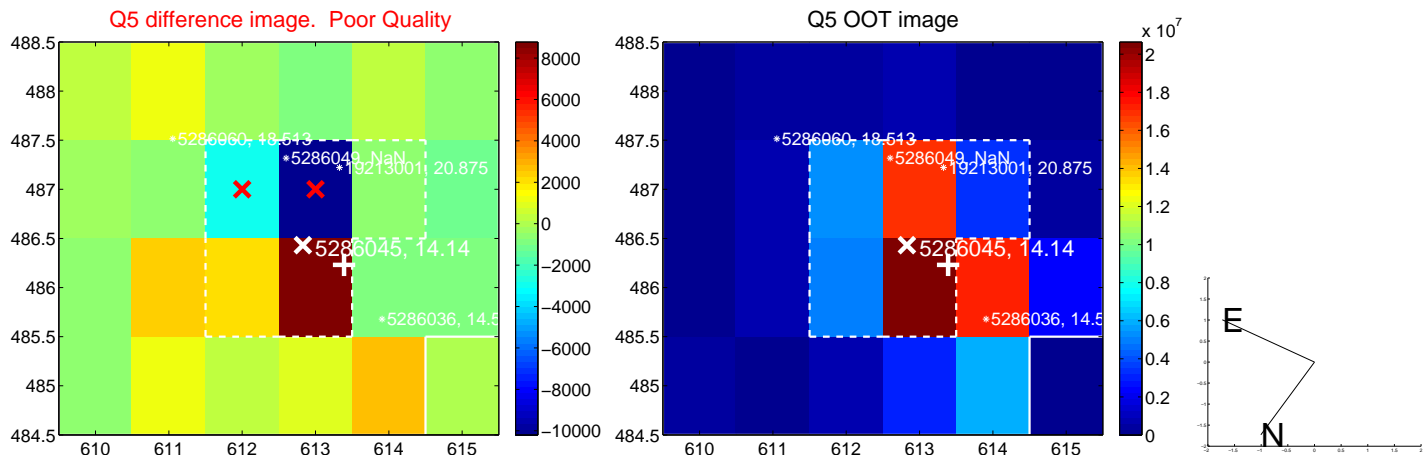


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

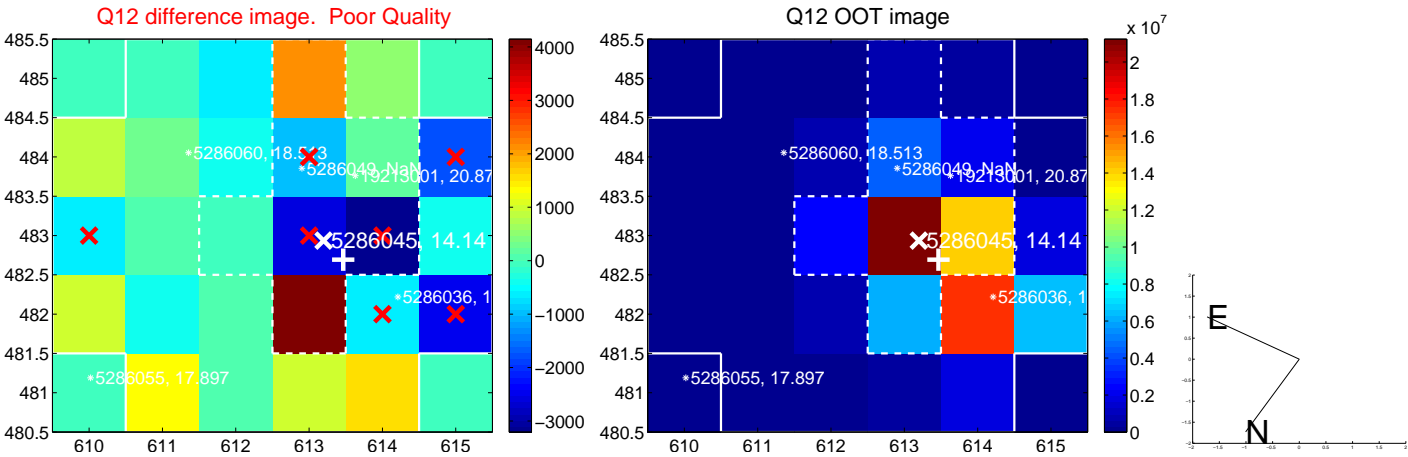
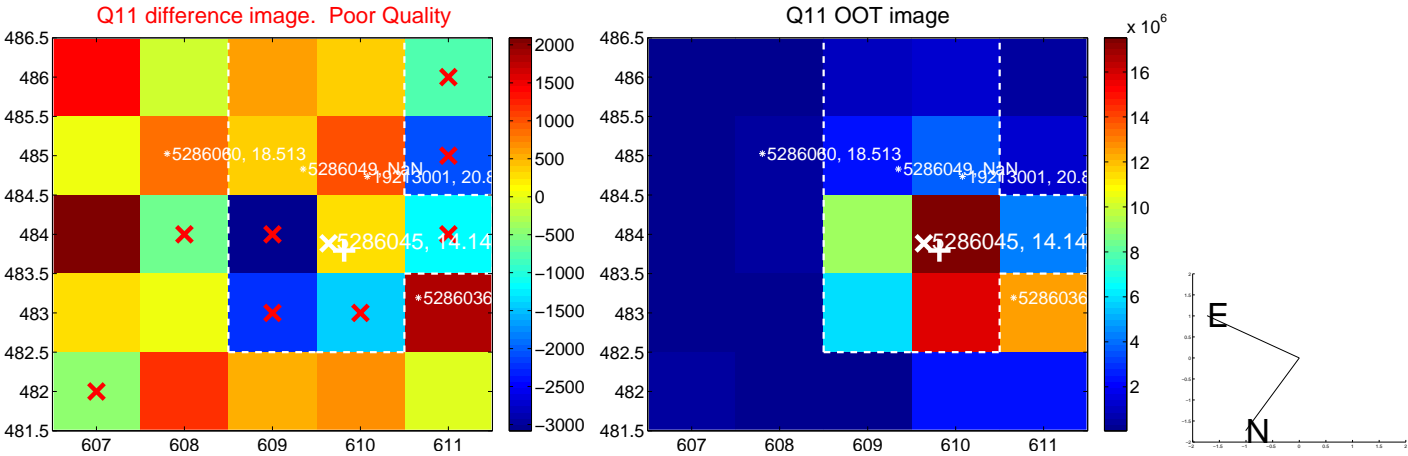
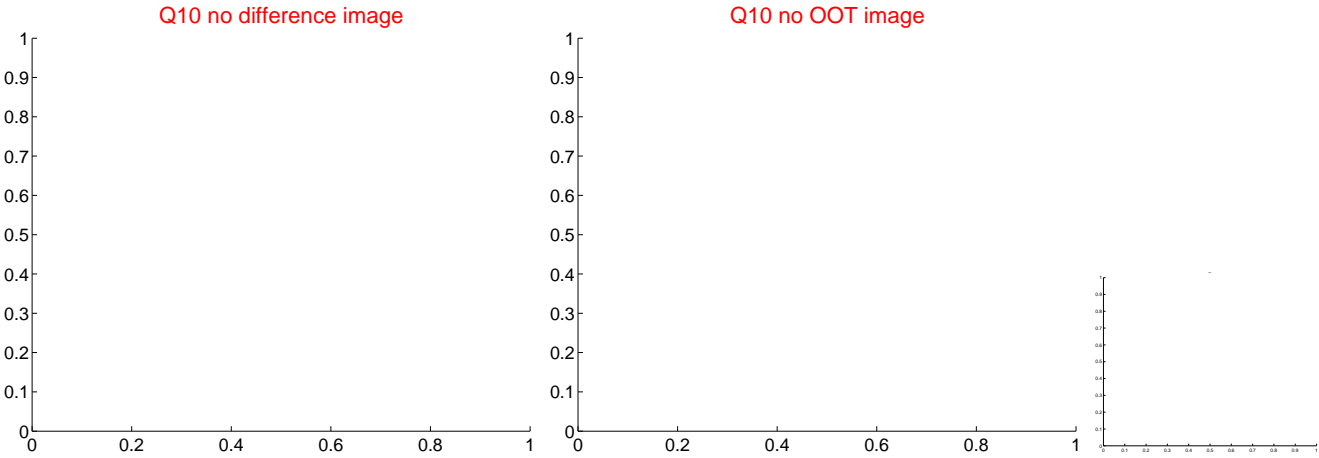
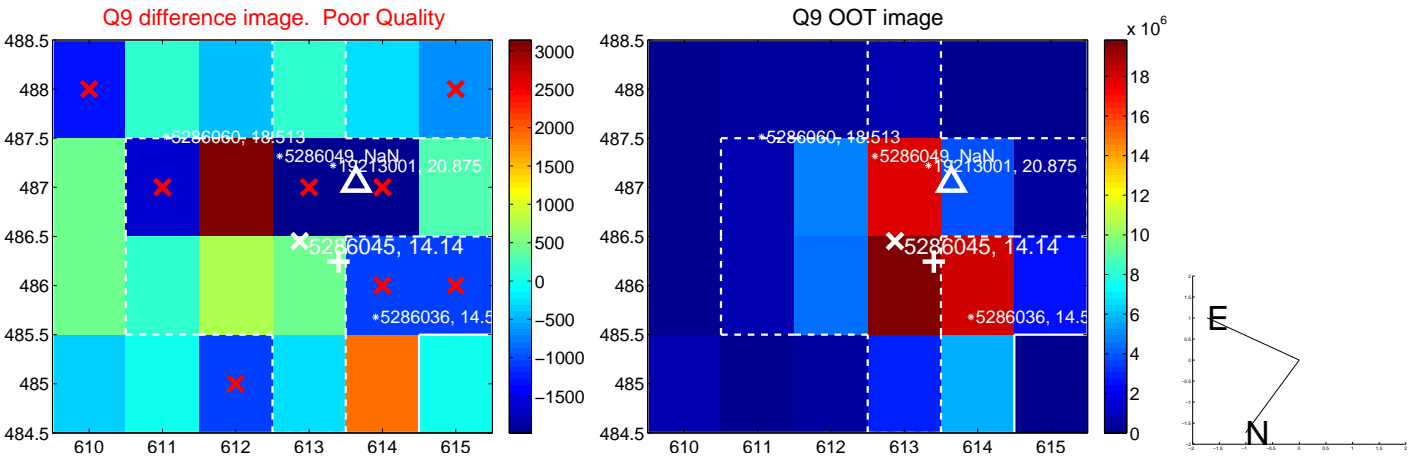
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



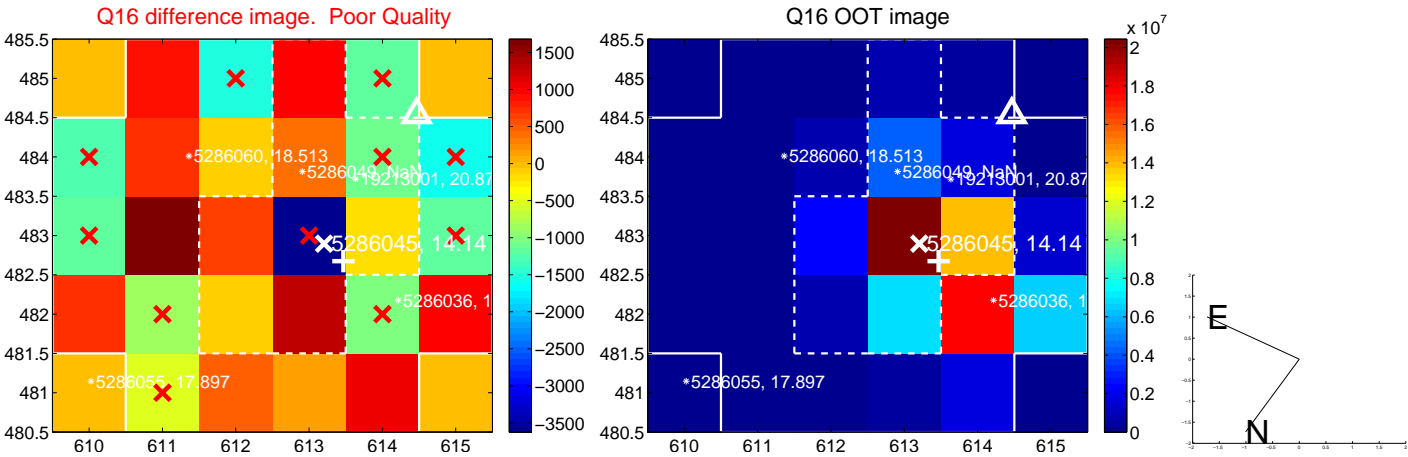
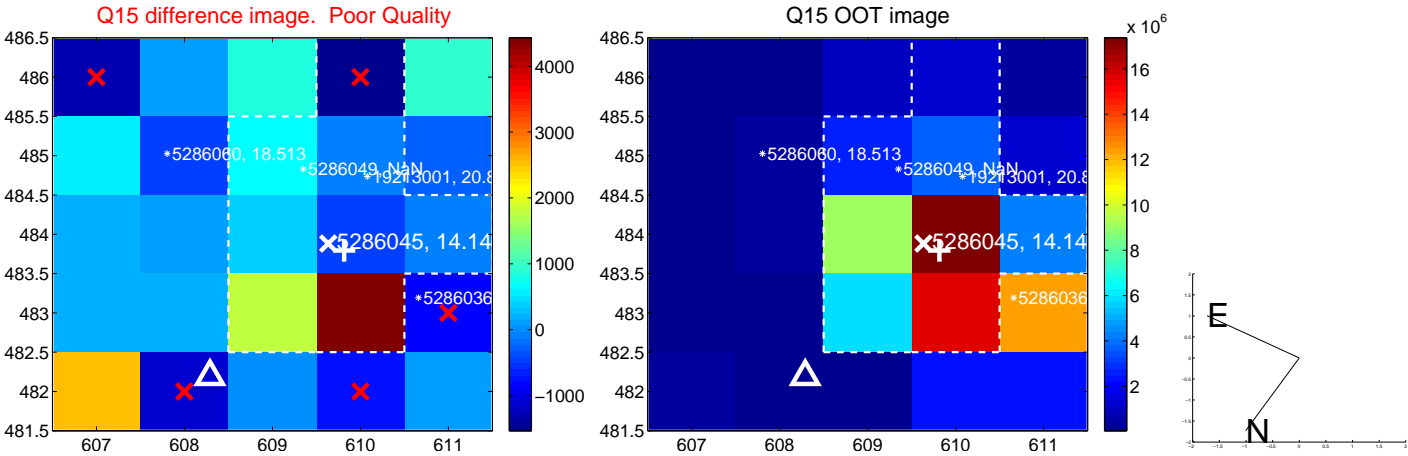
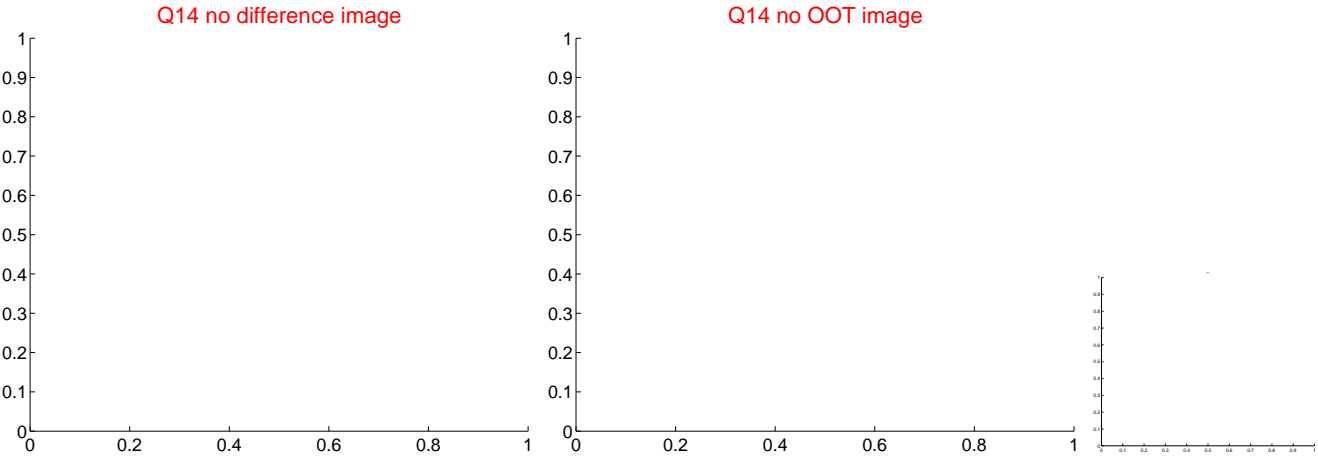
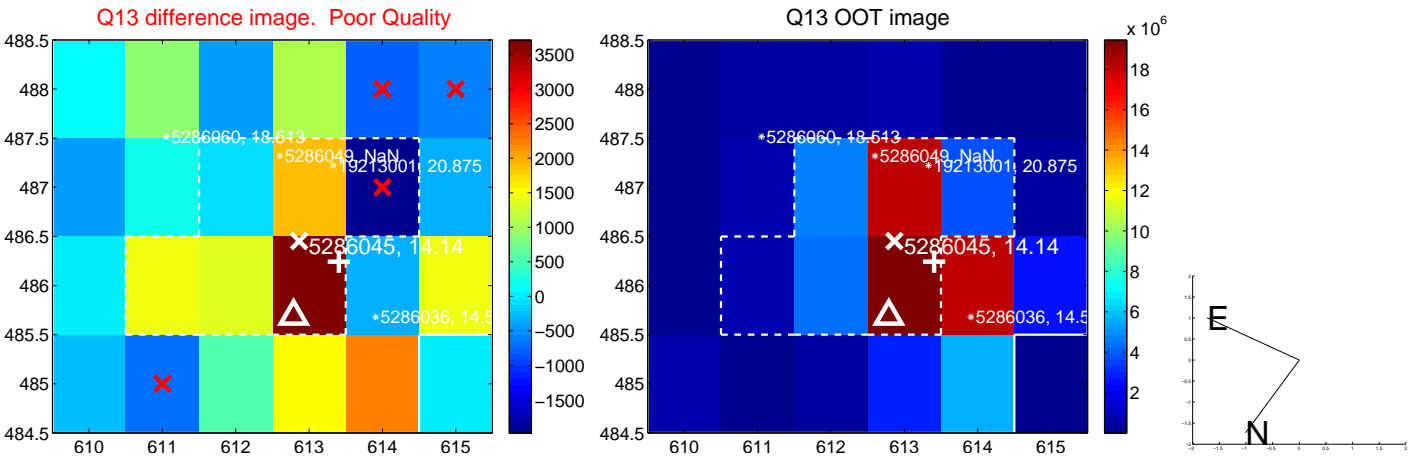
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



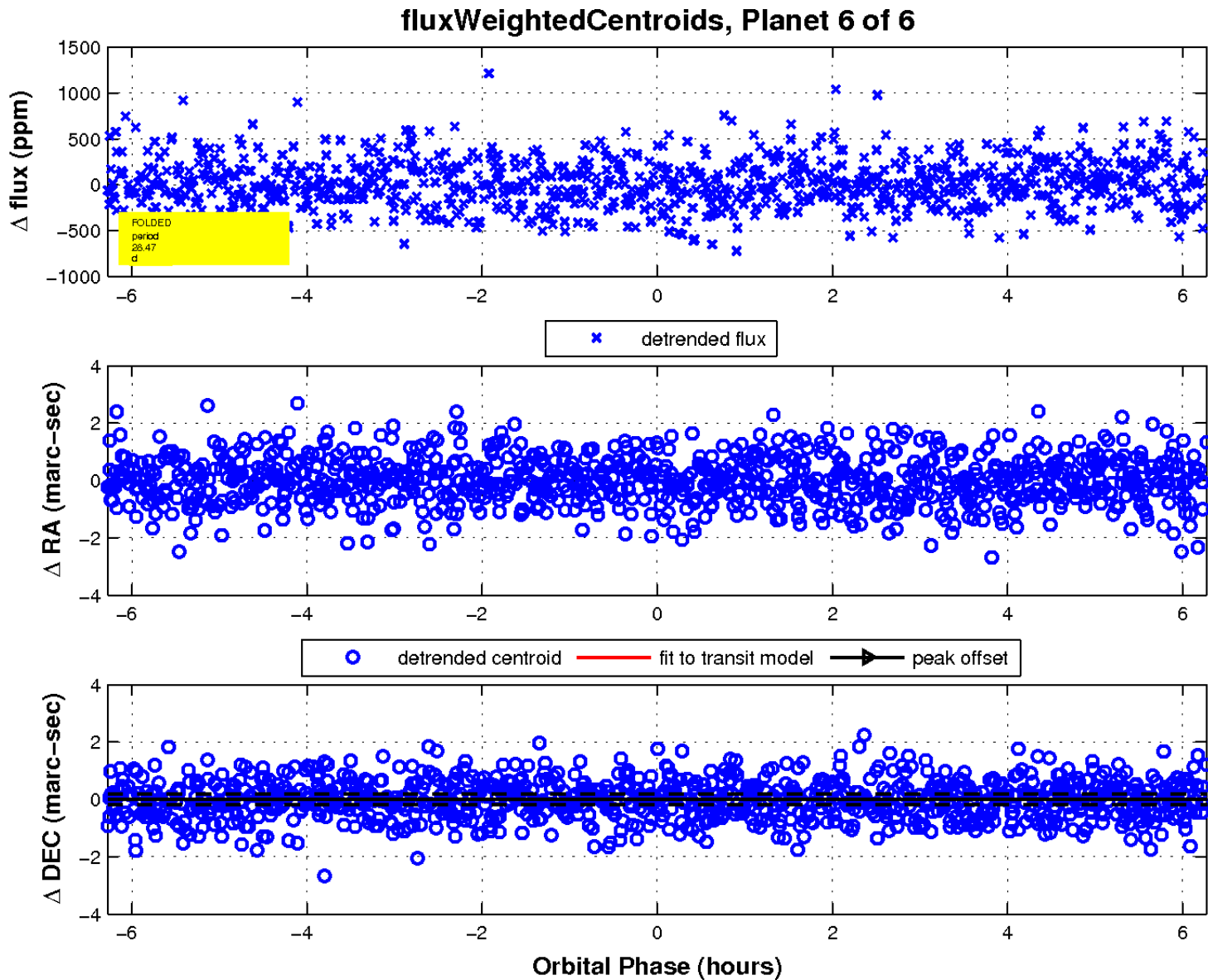
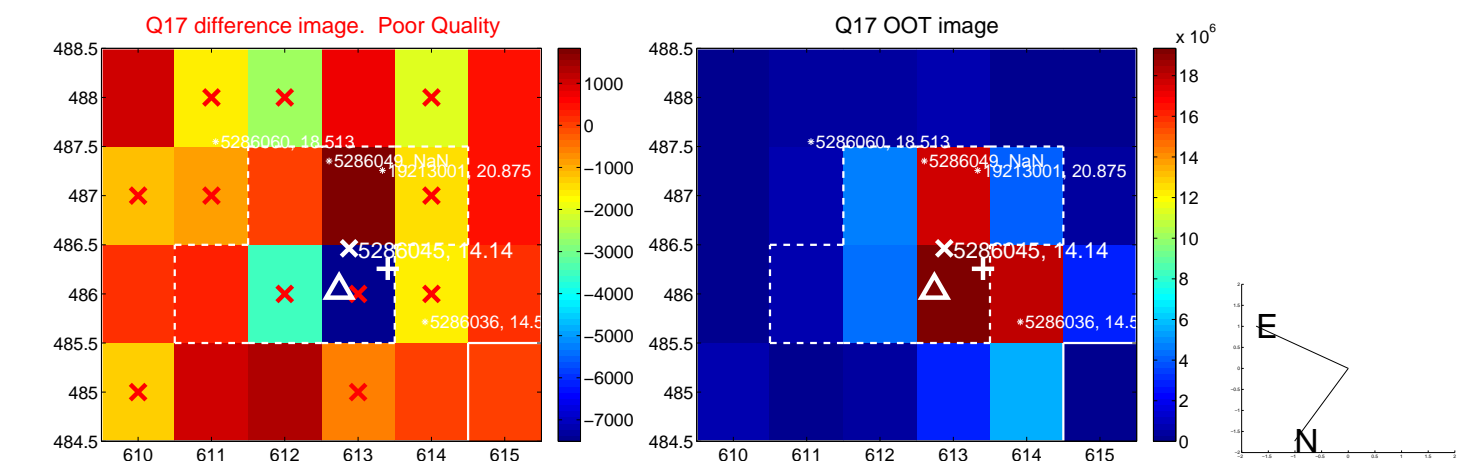
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

