

# KIC 005989921

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005989921-01	OBS	No	0.597713	131.683993	5.9	4.387	8.3	3.0	1.94	6583	0.47	26084.78
005989921-02	OBS	No	11.732653	142.738402	67.7	5.849	10.7	6.8	1.94	6583	1.62	492.62
005989921-03	OBS	No	14.116147	131.740411	319.5	1.454	12.4	13.0	1.94	6583	4.00	384.97
005989921-04	OBS	No	5.791073	131.605569	143.7	2.078	11.0	12.0	1.94	6583	2.48	1262.89
005989921-05	OBS	No	22.241919	139.123933	337.0	1.072	11.3	13.6	1.94	6583	3.60	209.97
005989921-06	OBS	No	12.829749	135.098981	431.7	0.700	10.9	12.3	1.94	6583	4.35	437.27
005989921-07	OBS	No	13.303210	143.085521	229.7	1.624	7.2	9.1	1.94	6583	3.36	416.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005989921-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
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005989921-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005989921-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS— HALO_GHOST
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**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

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

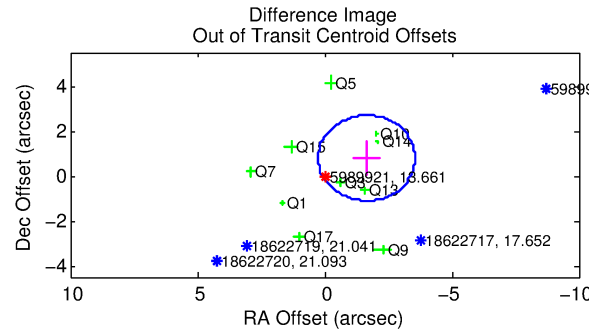
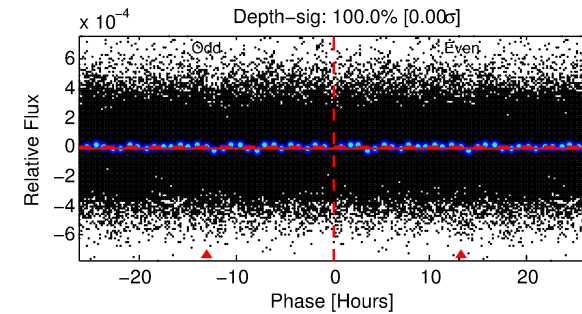
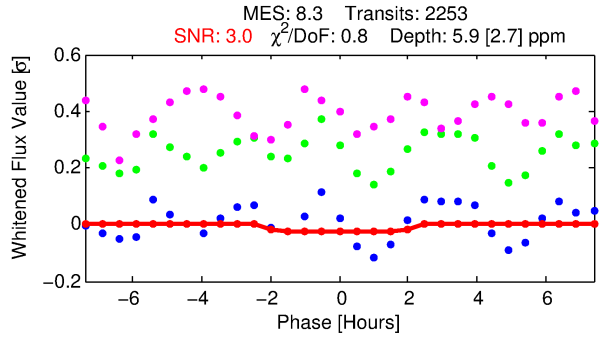
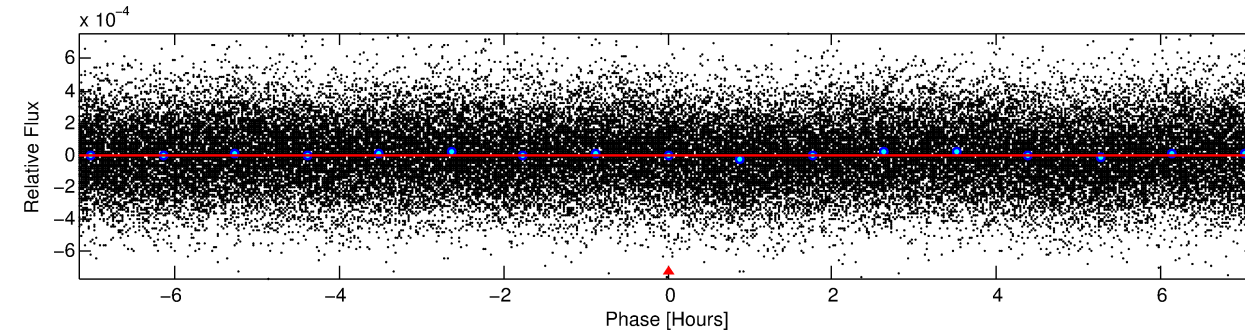
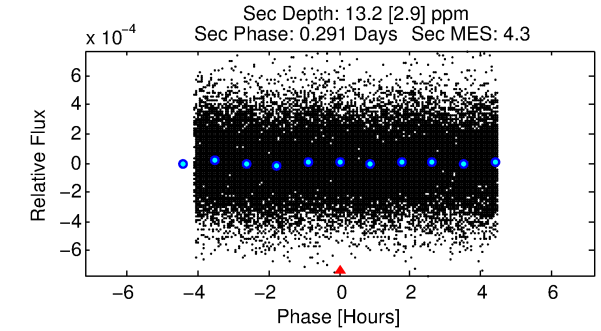
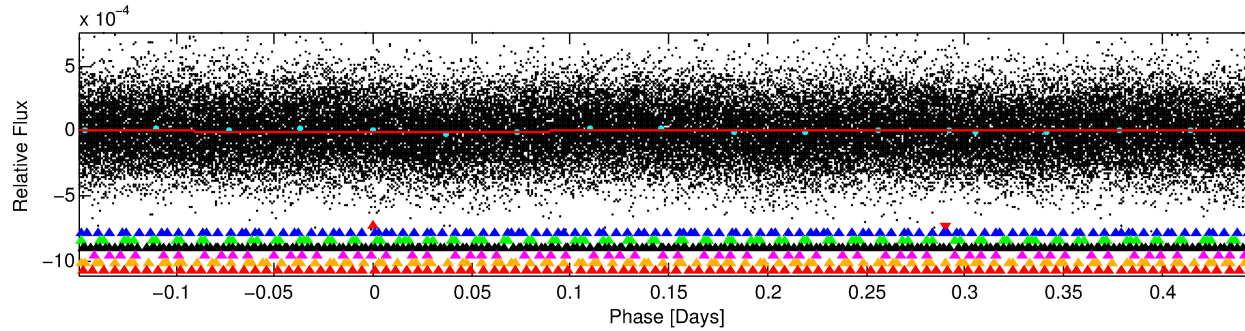
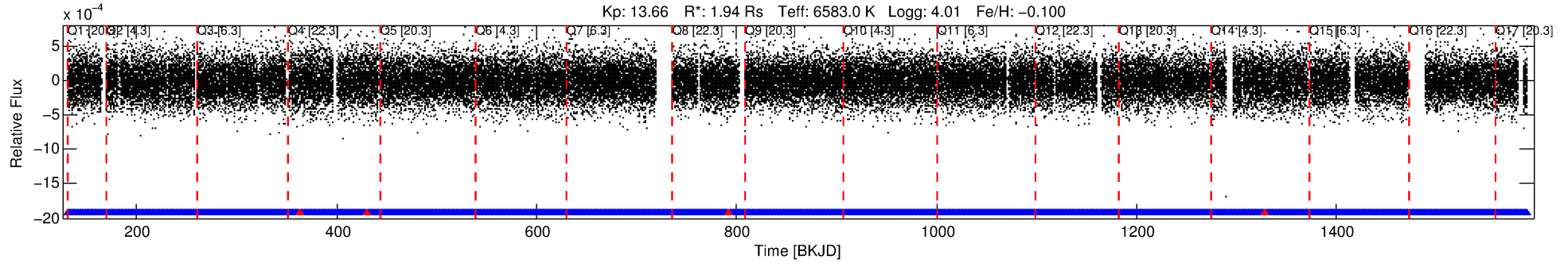
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005989921-01

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 1 of 7 Period: 0.598 d



## DV Fit Results:

Period = 0.59771 [0.00004] d  
Epoch = 131.6840 [0.0143] BKJD  
Rp/R\* = 0.0022 [0.0068]  
a/R\* = 1.21 [6.32]  
b = 0.22 [70.60]  
Seff = 26084.78 [13725.02]  
Teq = 3241 [426] K  
Rp = 0.47 [1.44] Re  
a = 0.0155 [0.0051] AU  
Ag = 7.79 [47.36] [0.14σ]  
Teffp = 8371 [12679] K [0.40σ]

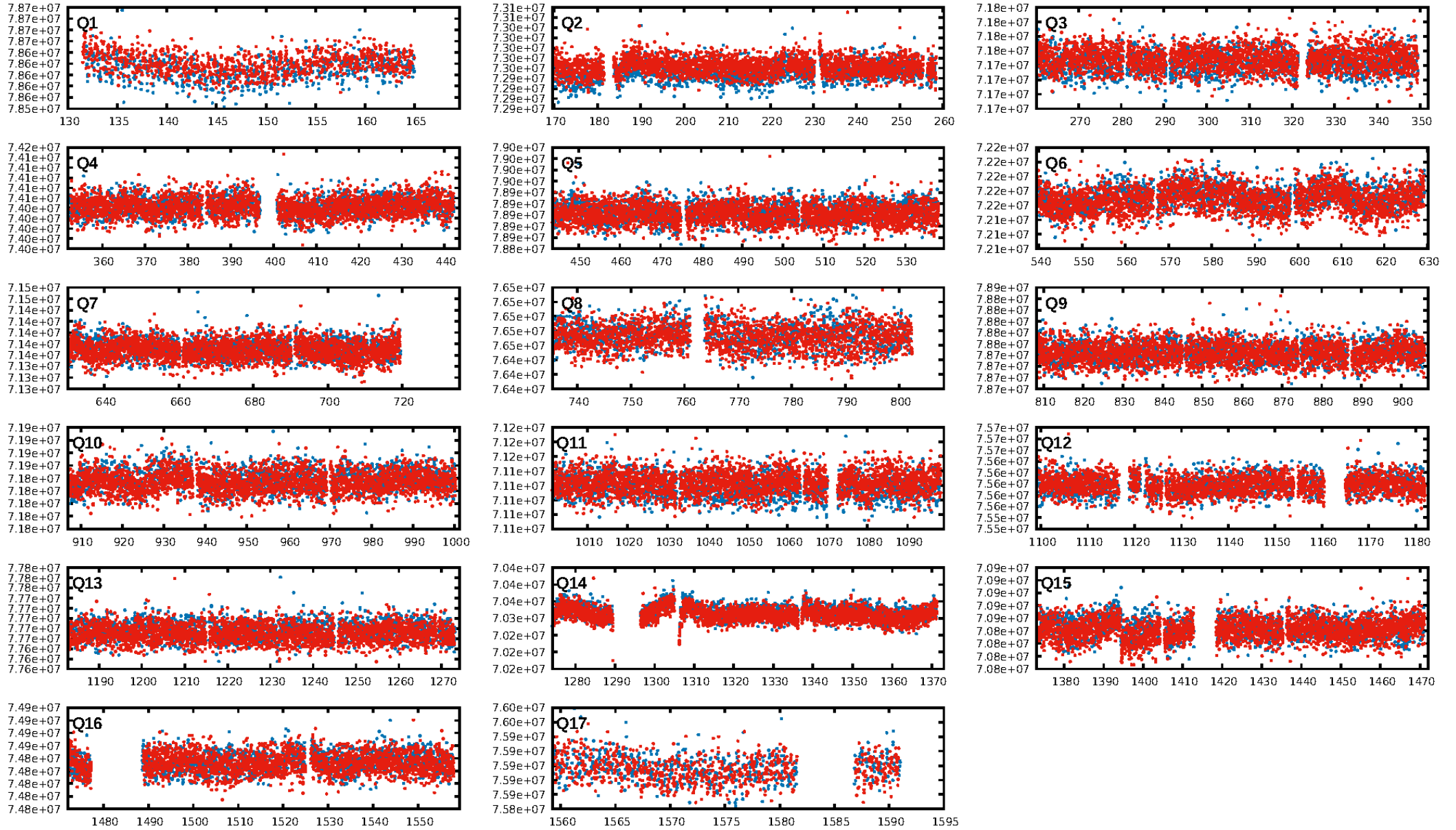
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [25.68σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 3.27e-11**  
RollingBand-fgt: 1.00 [2149/2153]  
GhostDiagnostic-chr: 1.341  
Centroid-sig: 9.0%  
Centroid-so: 4.230 arcsec [1.30σ]  
OotOffset-rm: 1.830 arcsec [2.88σ]  
**KicOffset-rm: 2.063 arcsec [3.69σ]**  
OotOffset-st: 2/3/0/5 [10]  
KicOffset-st: 2/3/0/5 [10]  
DiffImageQuality-fgm: 0.30 [3/10]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:31 Z

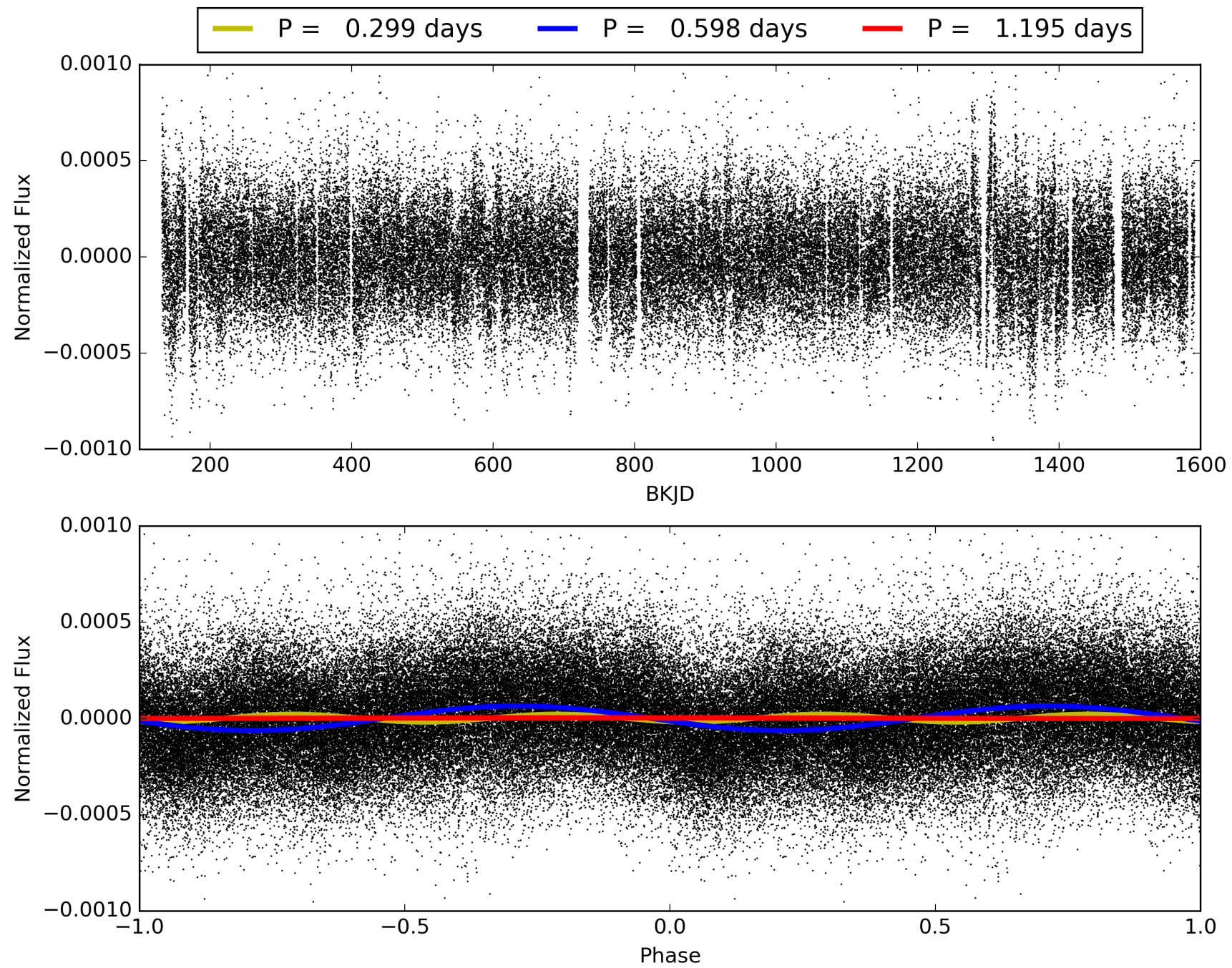
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005989921-01, PDC Light Curves





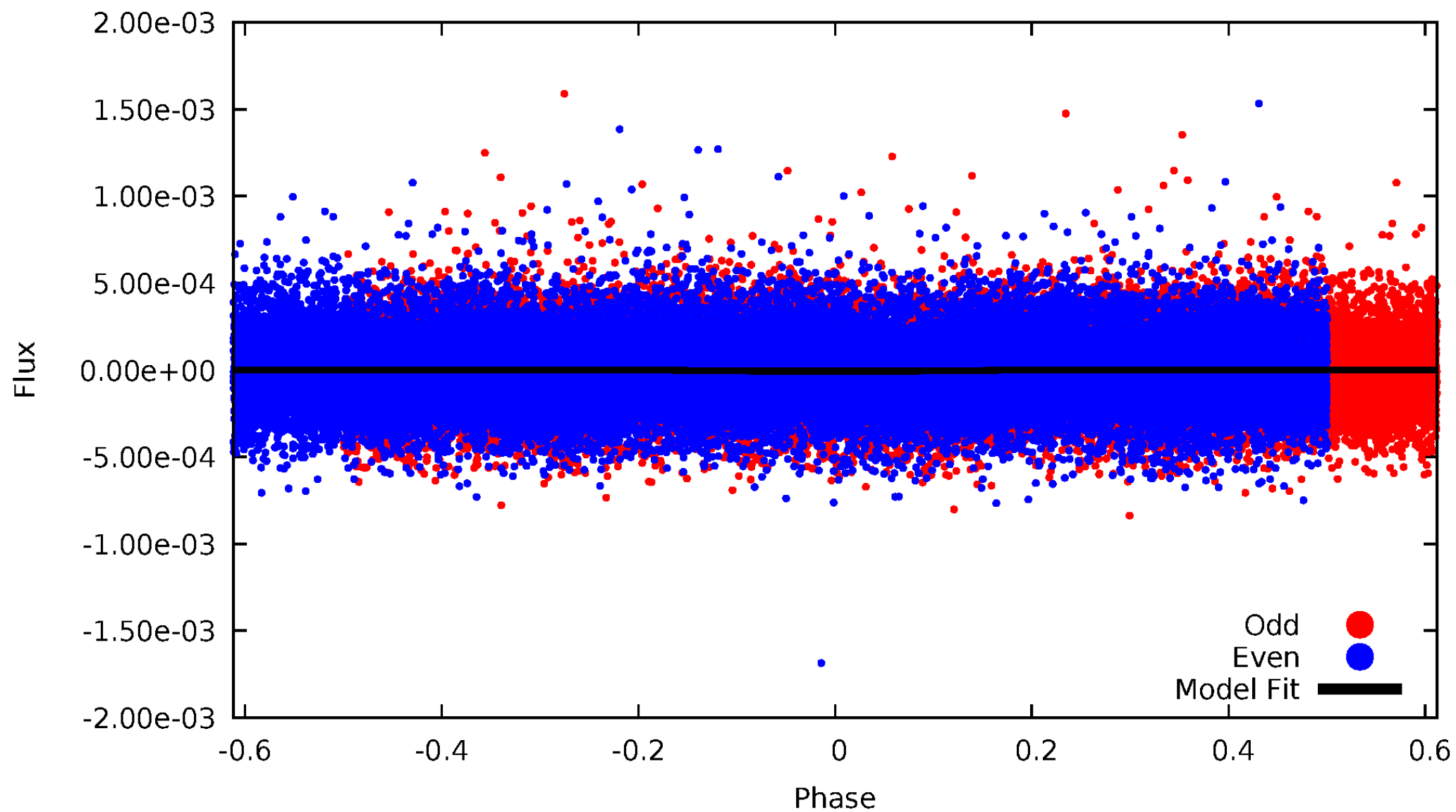
TCE 005989921-01





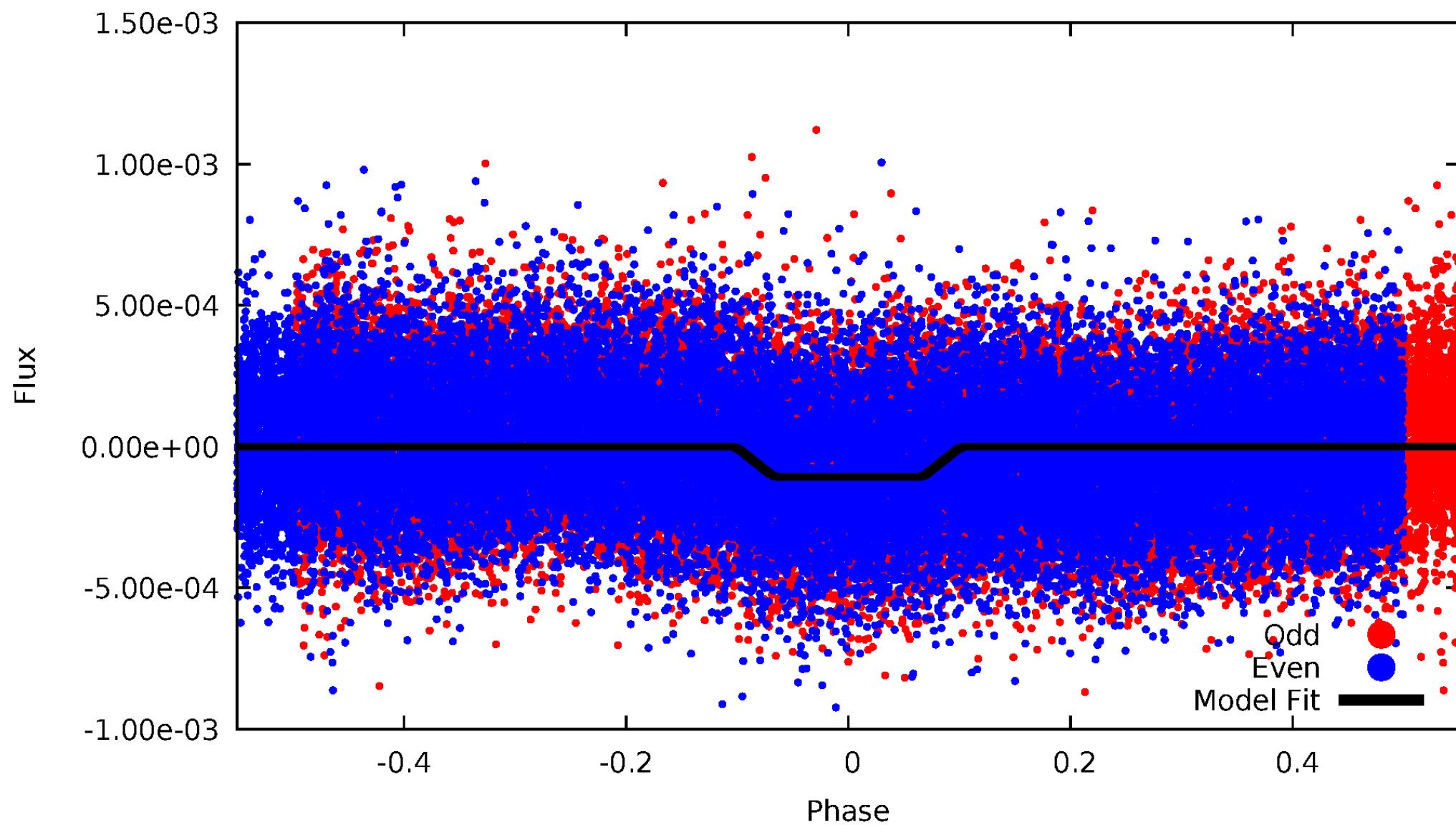
# DV Odd/Even

TCE 005989921-01



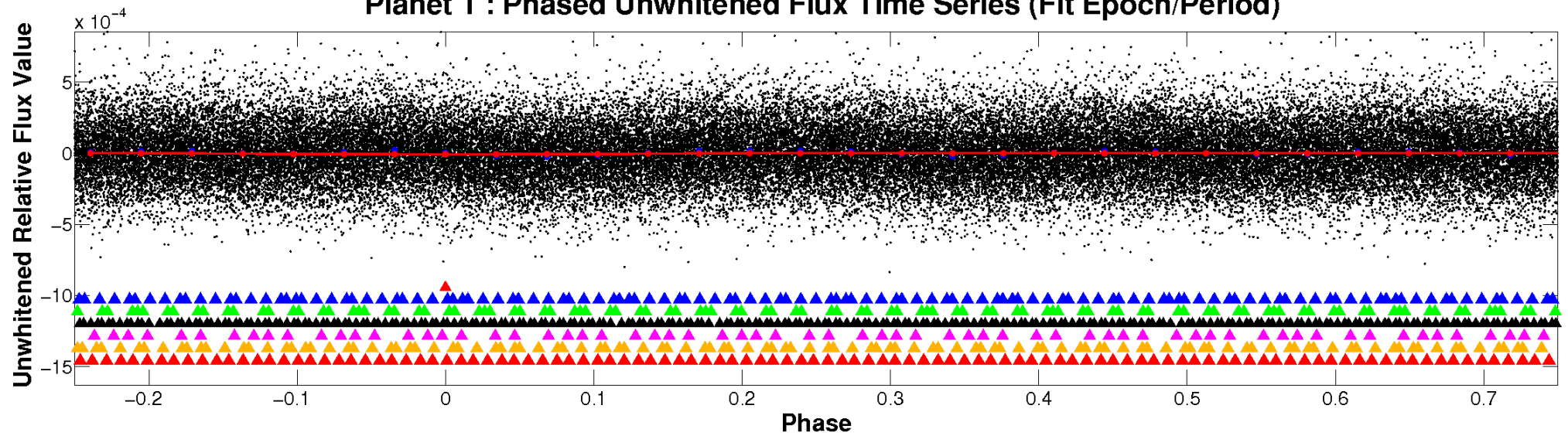
# ALT Odd/Even

TCE 005989921-01

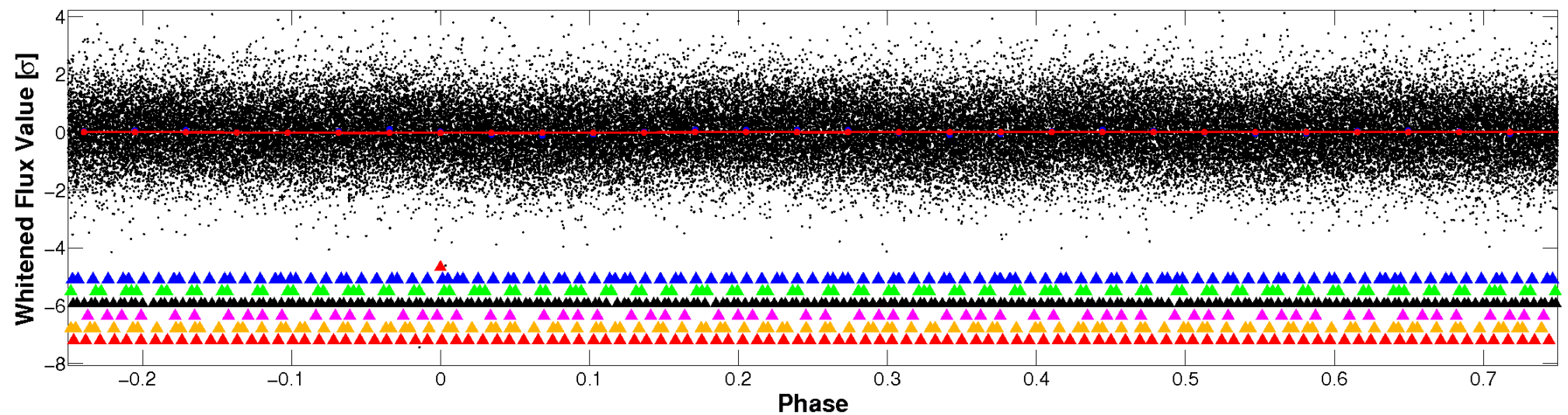


# Non-Whitened Vs. Whitened Light Curve

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



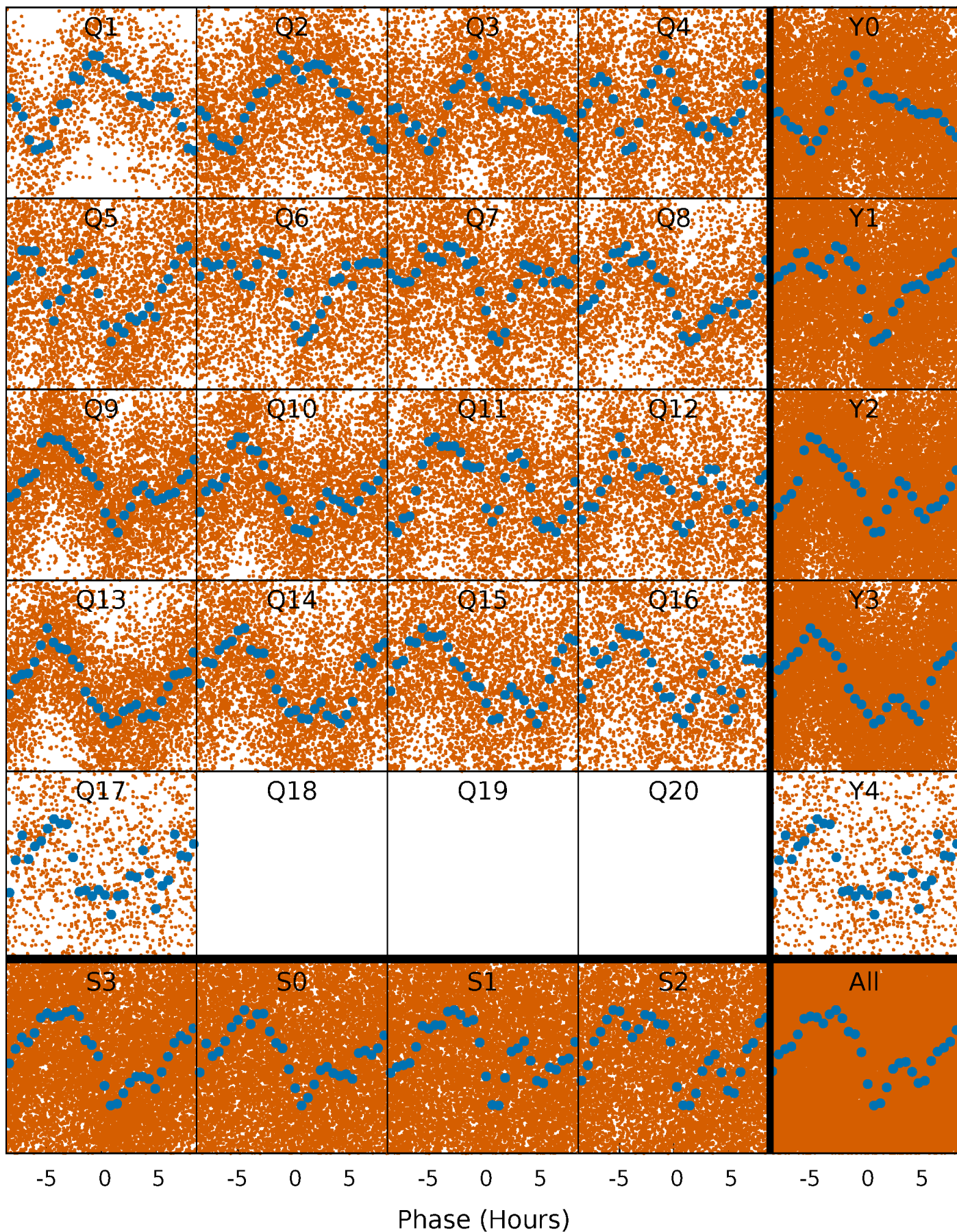
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

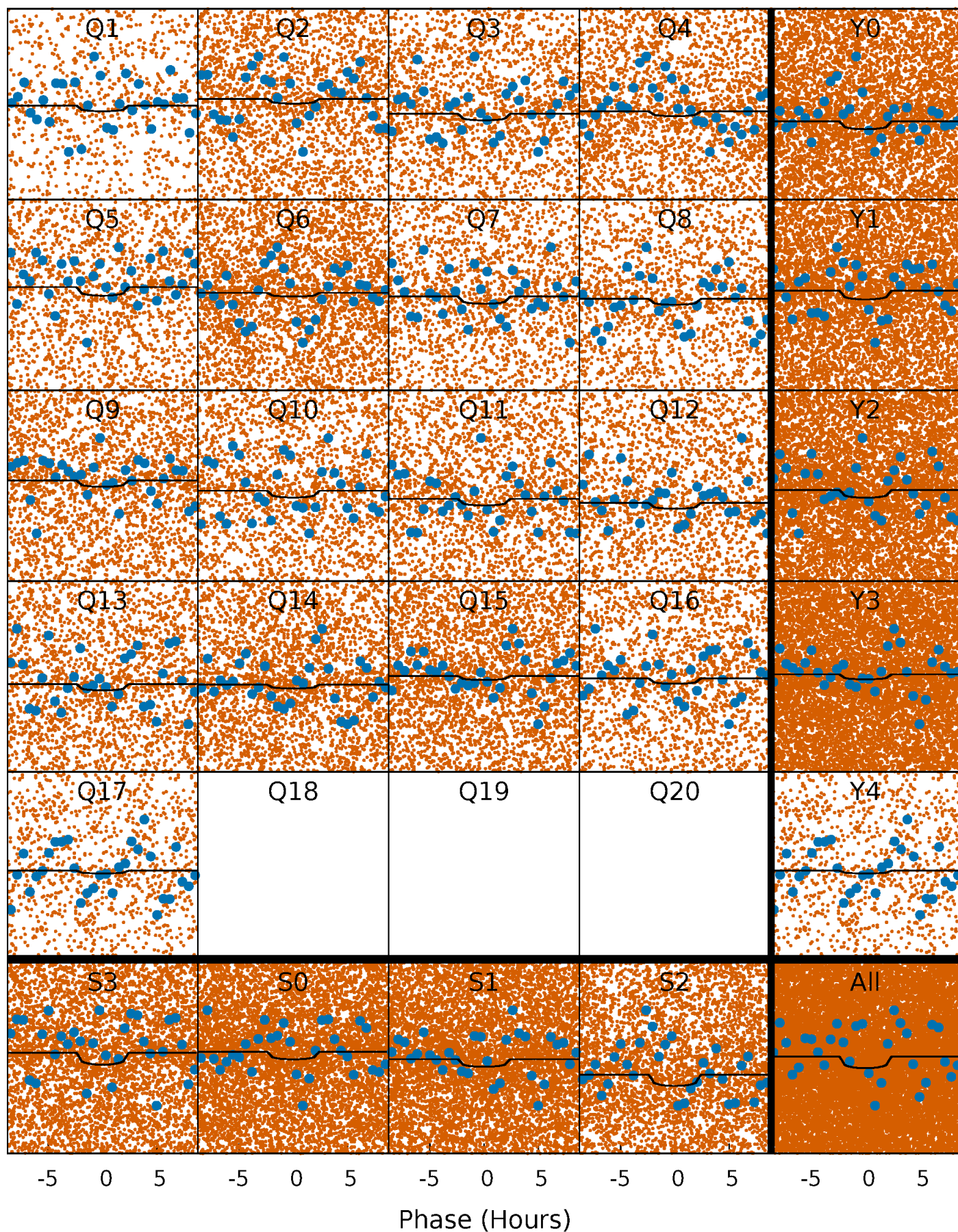
TCE 005989921-01 P= 0.597713 Days  $T_0=131.683993$  (BKJD)





# DV Quarter-Phased Transit Curves

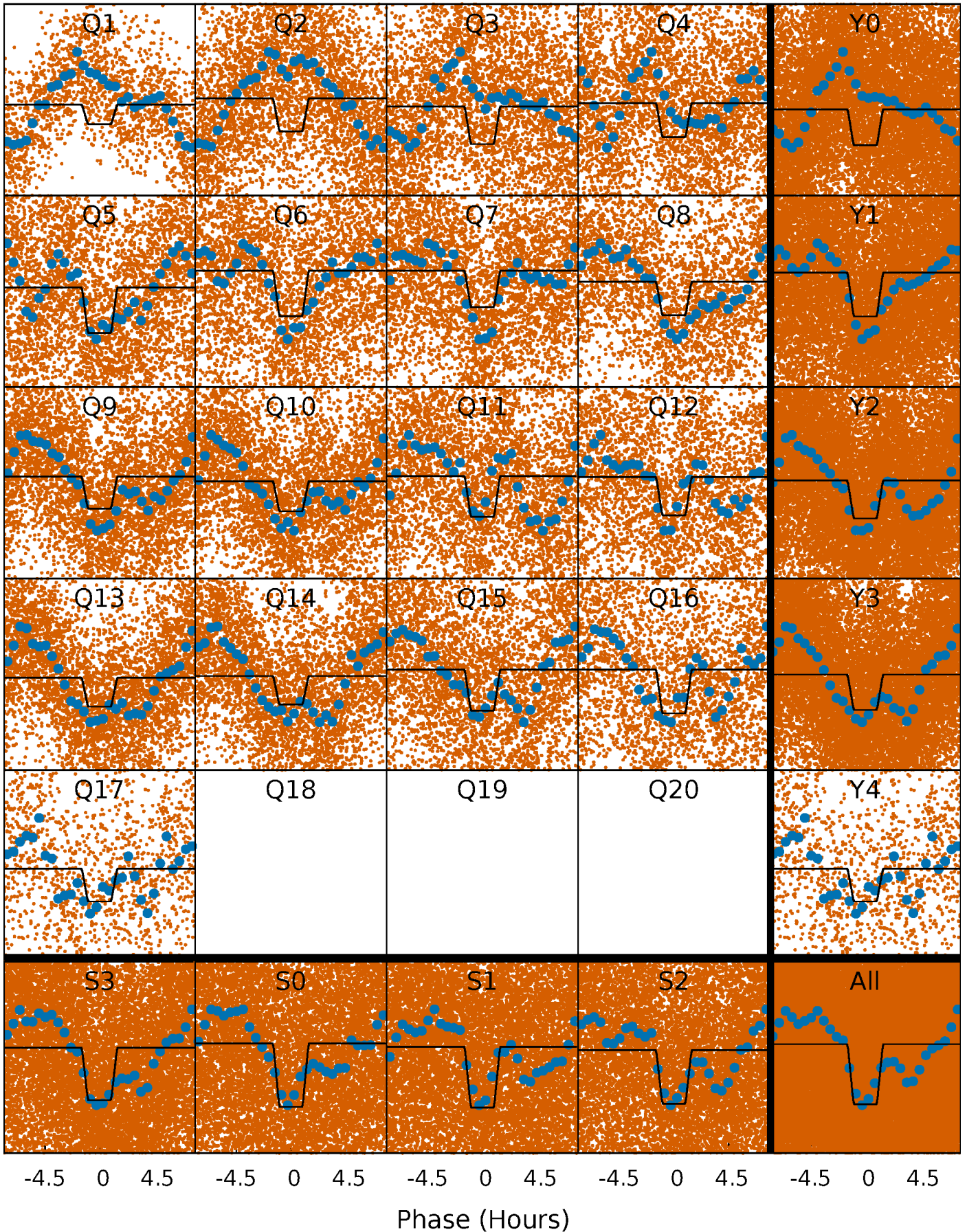
TCE 005989921-01 P= 0.597713 Days  $T_0=131.683993$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005989921-01 P= 0.597718 Days  $T_0=131.733083$  (BKJD)

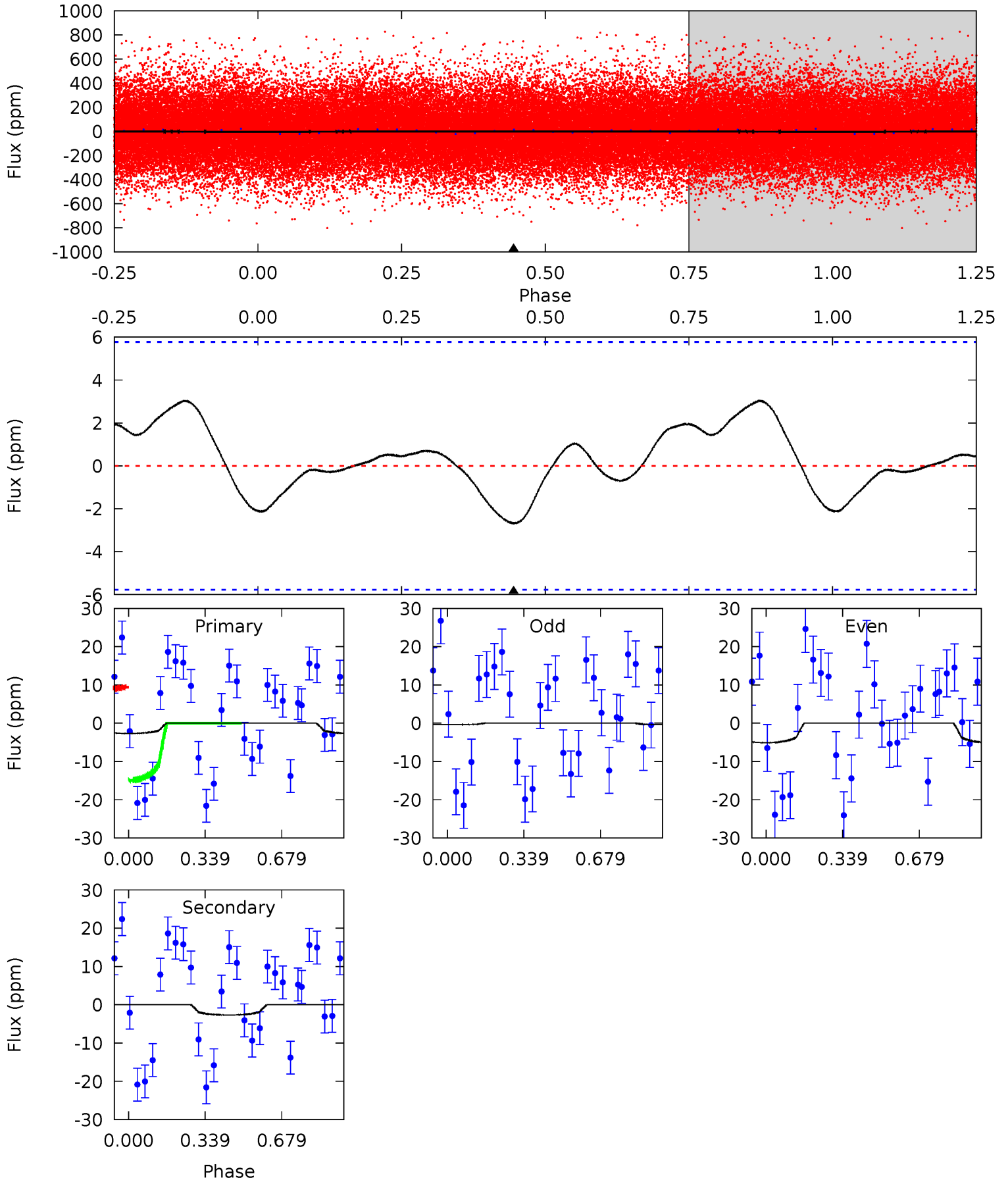




# DV Model-Shift Uniqueness Test

005989921-01, P = 0.597713 Days, E = 131.086280 Days

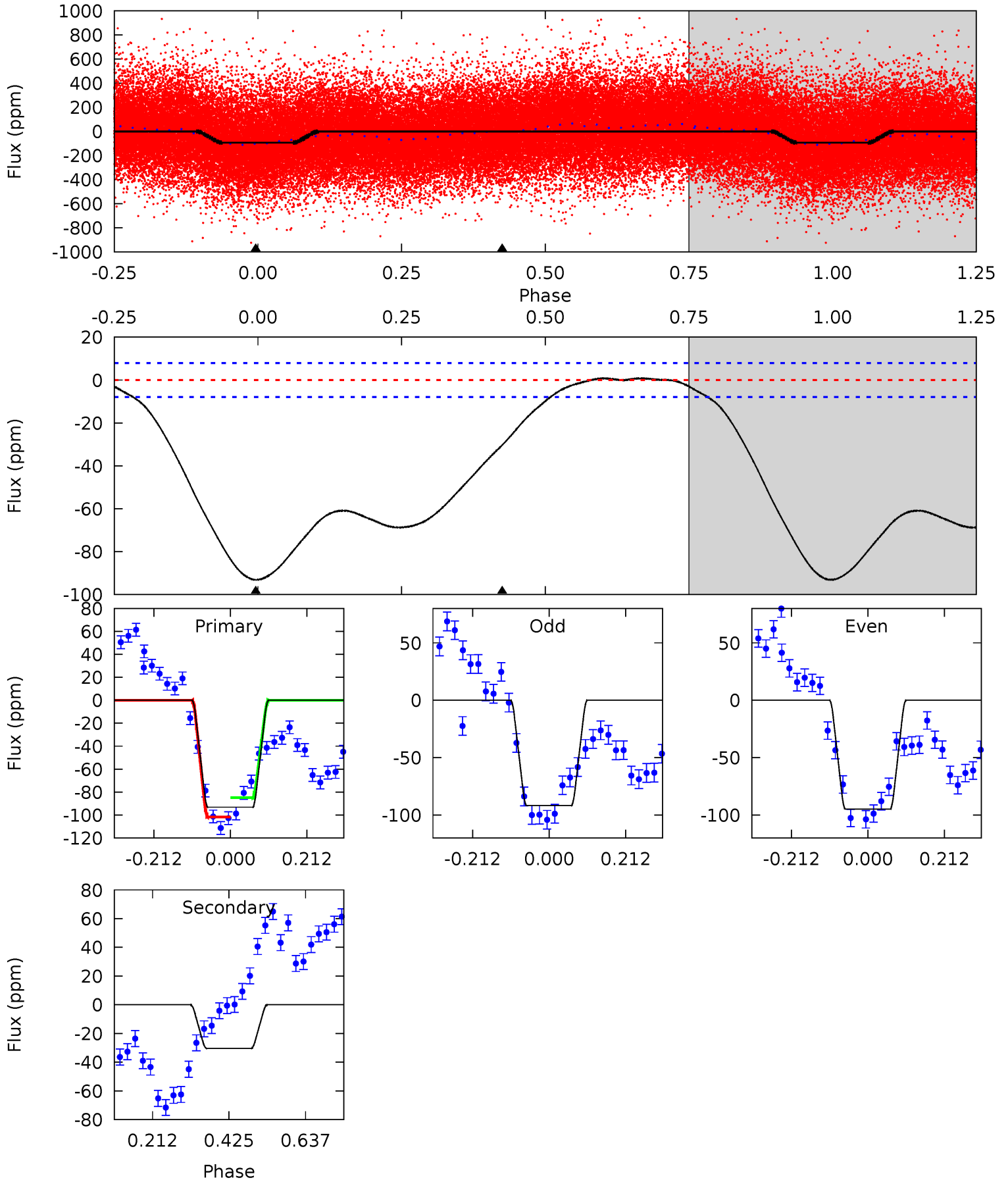
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.00	2.00	0	0	4.30	0.96	1.31	2.00	2.00	2.00	2.00	1.77	0.53	0.53	2.08



# Alt Model-Shift Uniqueness Test

005989921-01, P = 0.597718 Days, E = 131.135365 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
51.9	16.9	0	0	4.40	1.25	5.91	51.9	51.9	16.9	16.9	0.90	0.88	0.01	4.69



### Stellar Parameters For KIC 005989921

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3 \pm 1$	$1.13^{+1.24}_{-0.79}$	$4462^{+371}_{-400}$	$-2979^{+9187}_{-938}$	$0.243^{+2.831}_{-0.192}$
Alt.	$-30 \pm 2$	$2.11^{+1.49}_{-1.18}$	$4452^{+374}_{-443}$	$4448^{+2388}_{-2215}$	$0.911^{+3.677}_{-0.605}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



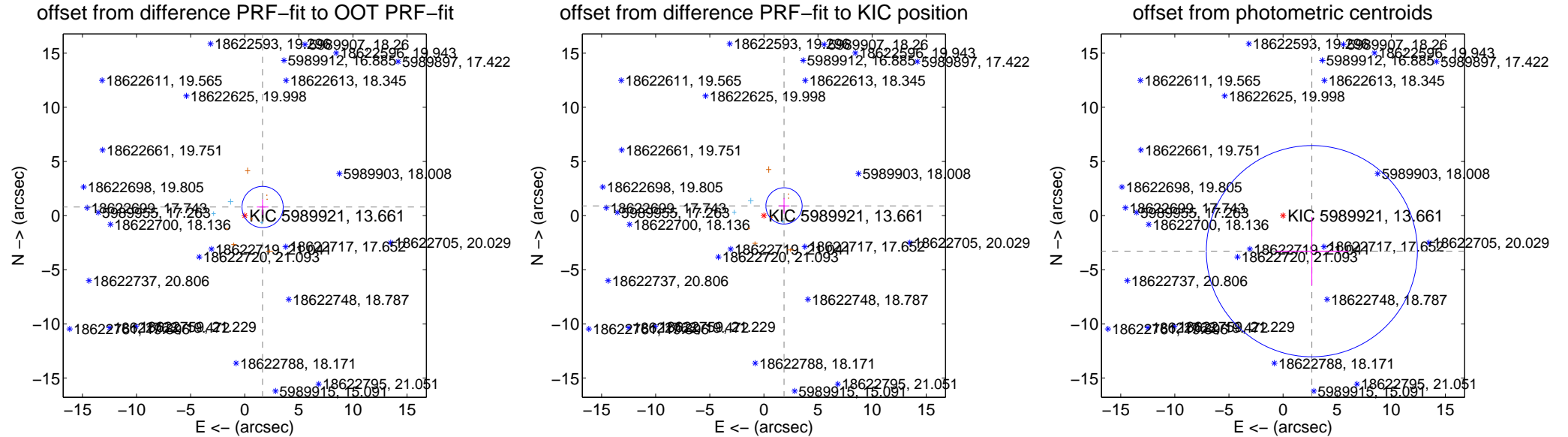
## DV Centroid Data

Supplemental centroid analysis for 005989921-01. Kepler magnitude: 13.66. Transit SNR 2.99

There are 3 quarters with good PRF difference image offsets

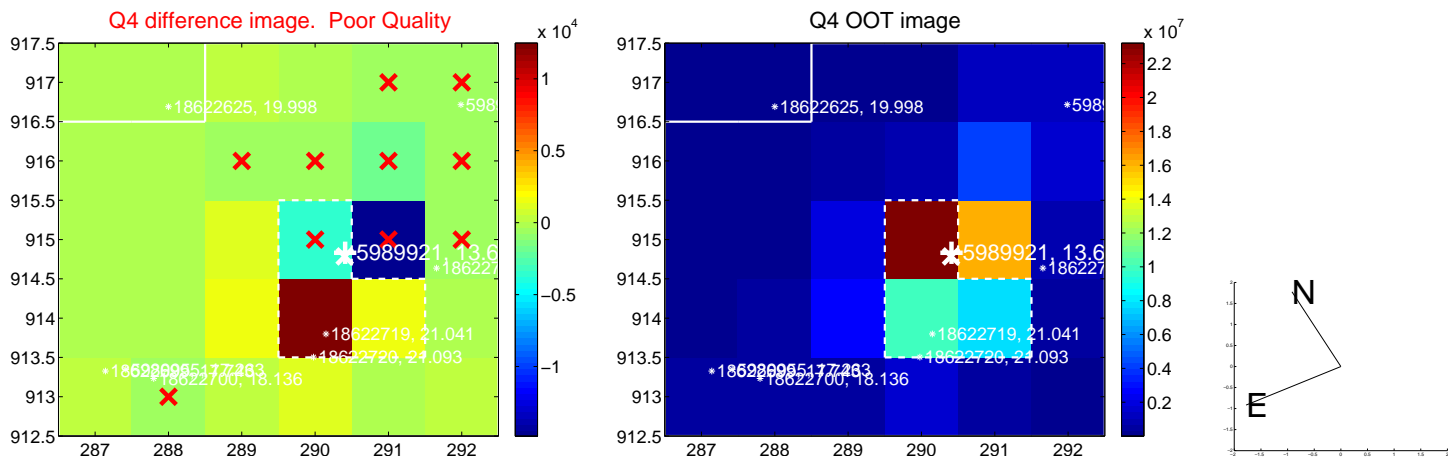
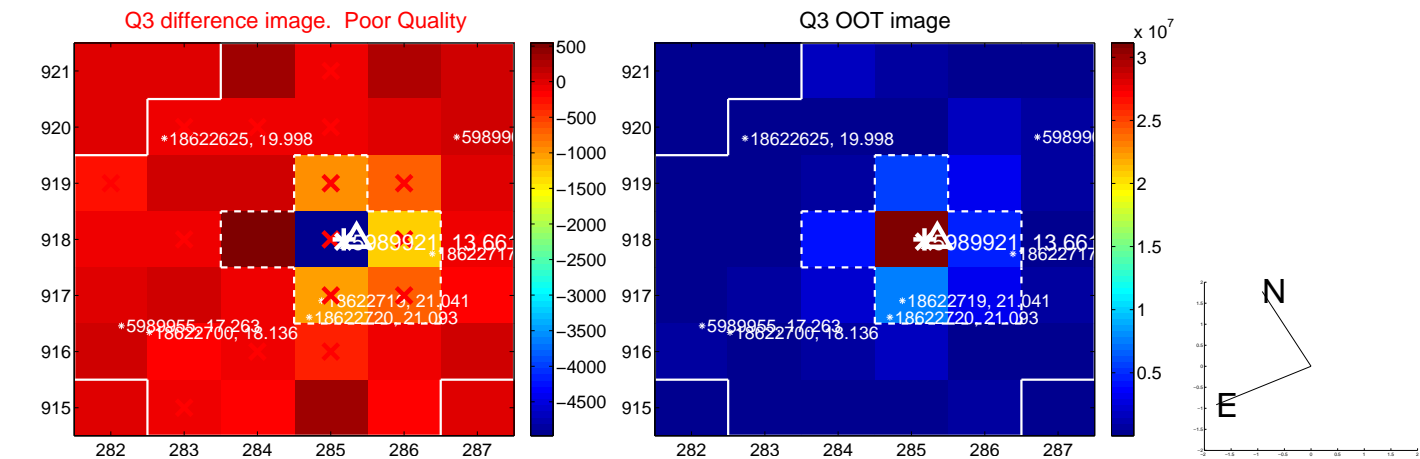
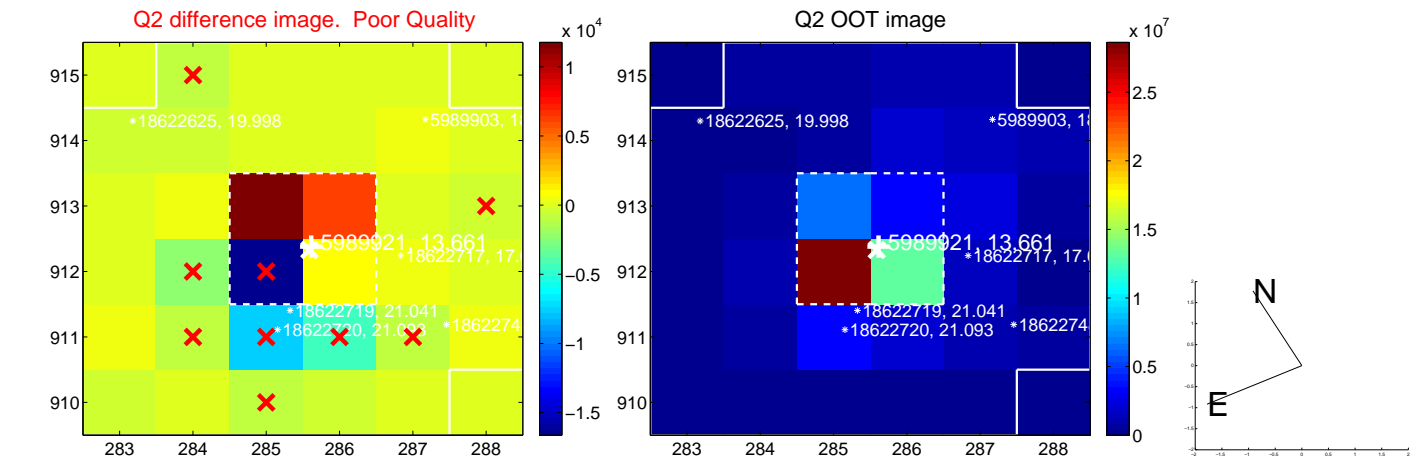
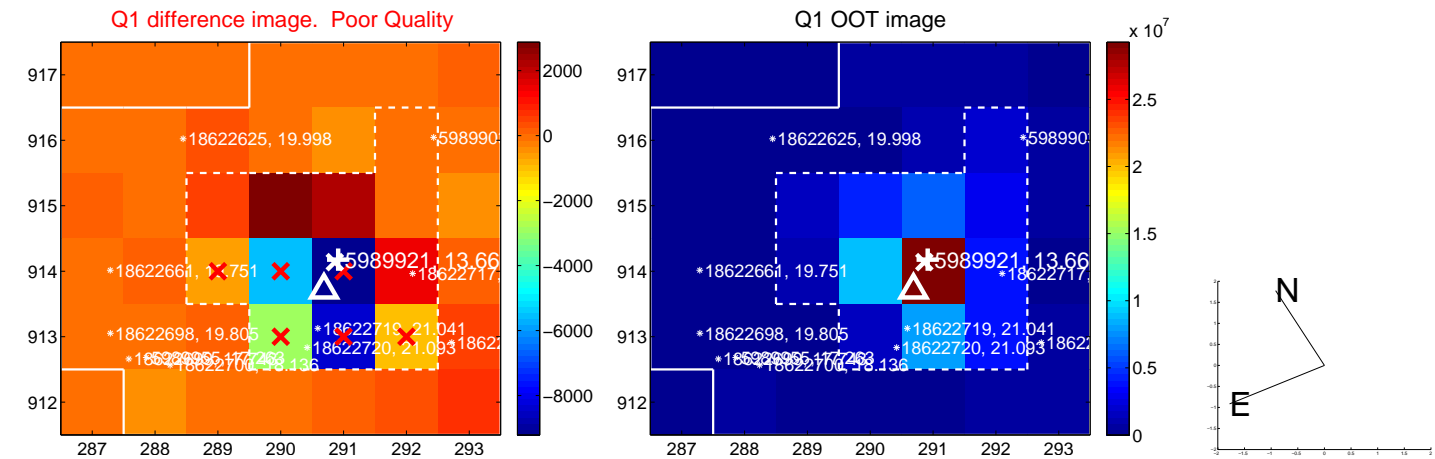
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.830 \pm 0.634$	2.88	$-1.650 \pm 0.536$	$0.792 \pm 0.713$
PRF-fit source offset from KIC position	<b><math>2.063 \pm 0.559</math></b>	<b>3.69</b>	$-1.860 \pm 0.499$	$0.893 \pm 0.723$
photometric centroid source offset	$4.23 \pm 3.25$	1.30	$-2.66 \pm 3.38$	$-3.29 \pm 3.16$

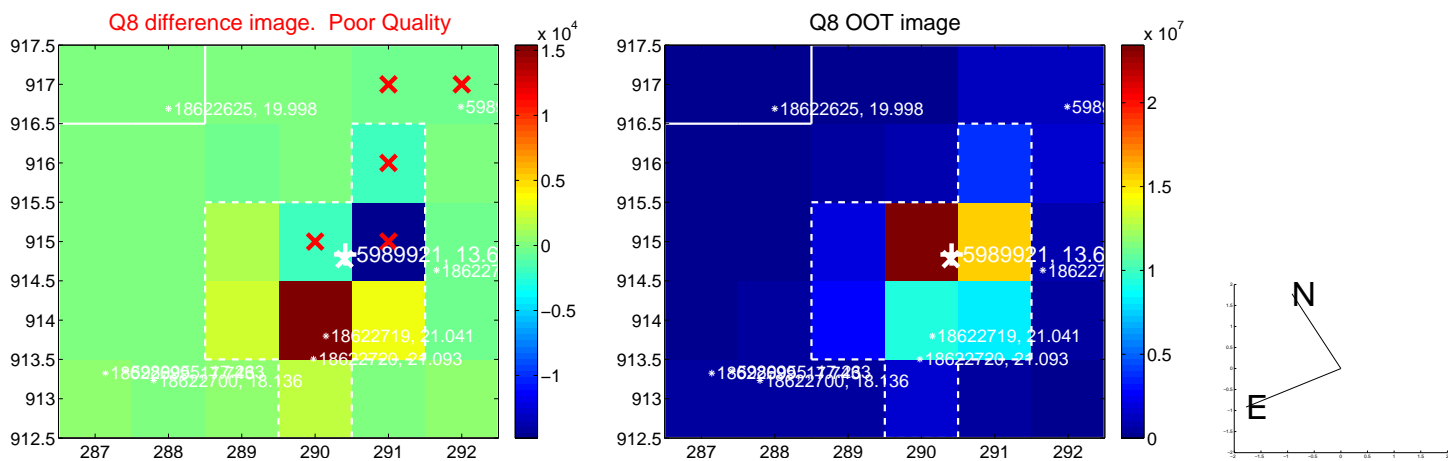
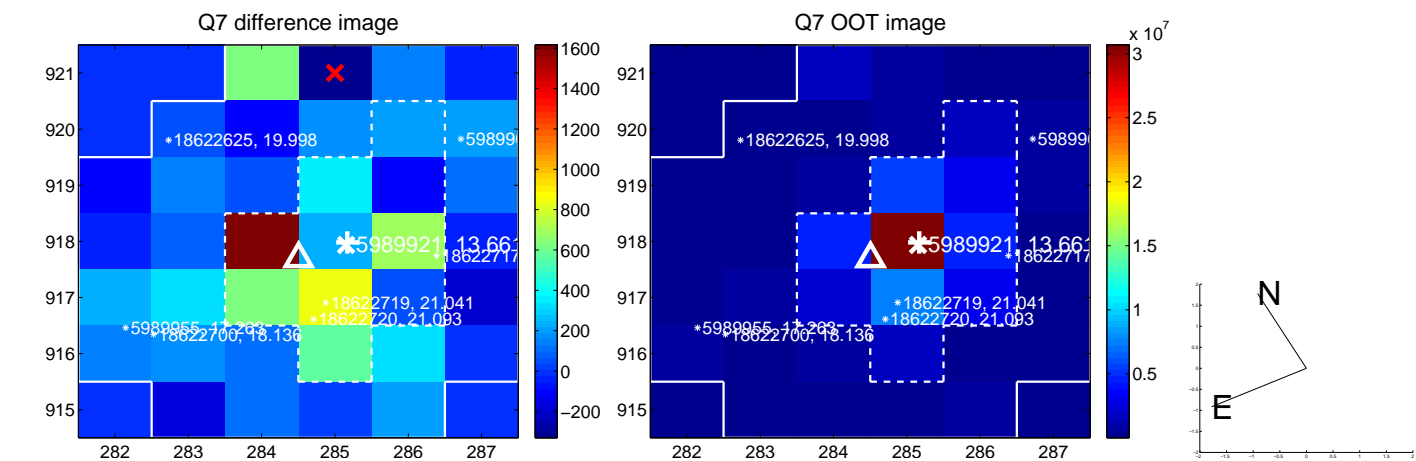
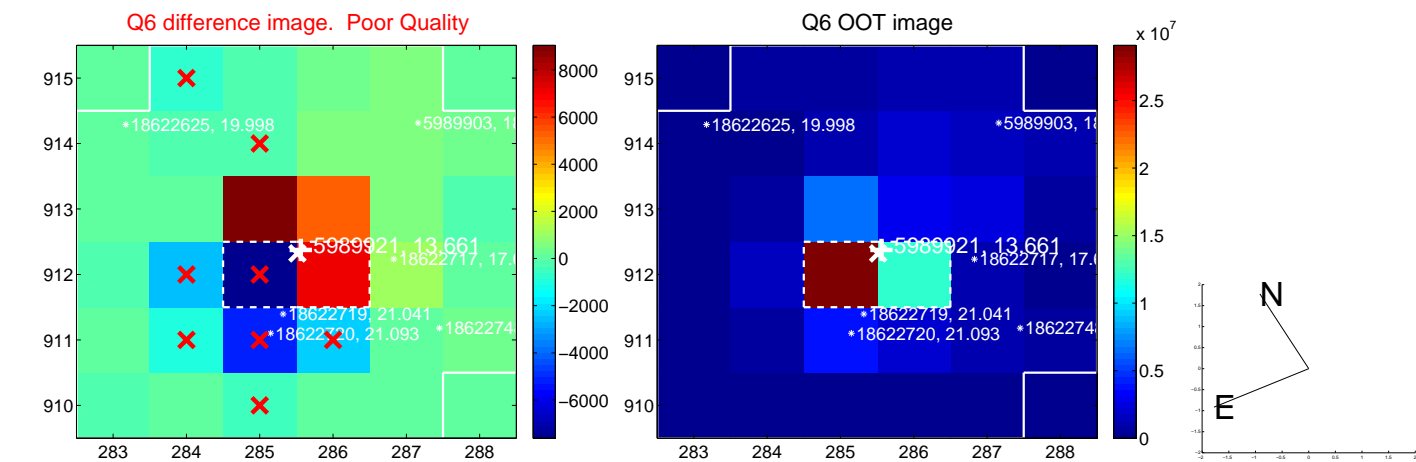
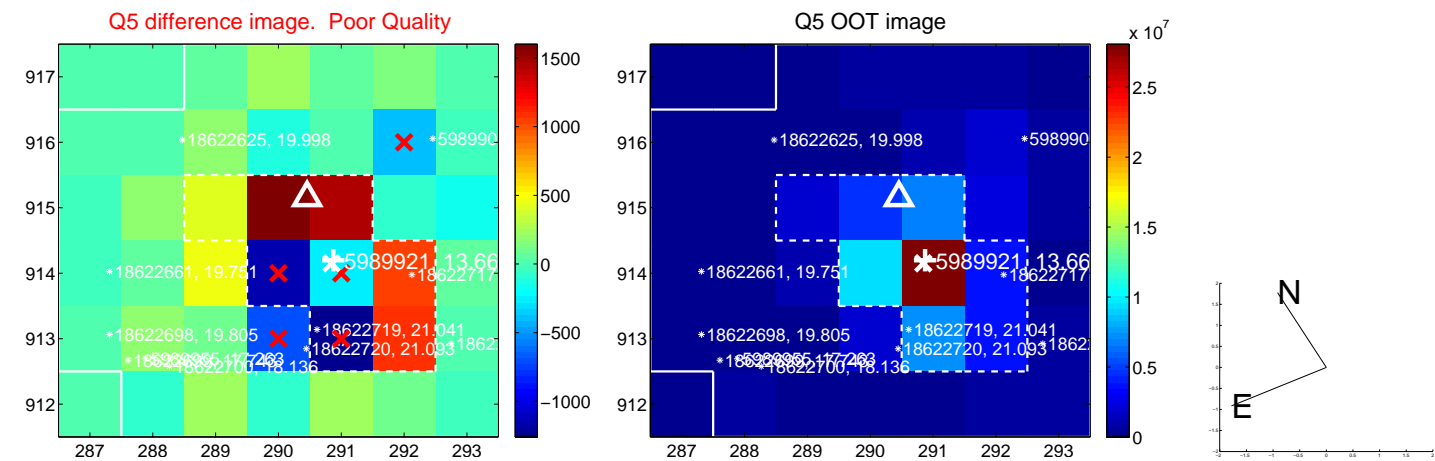


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

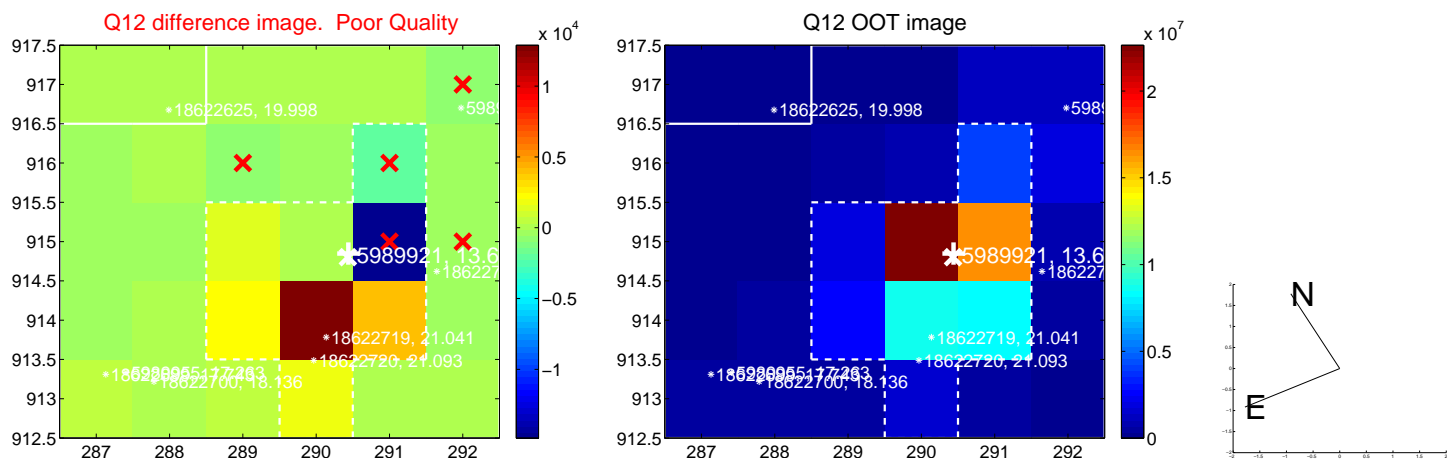
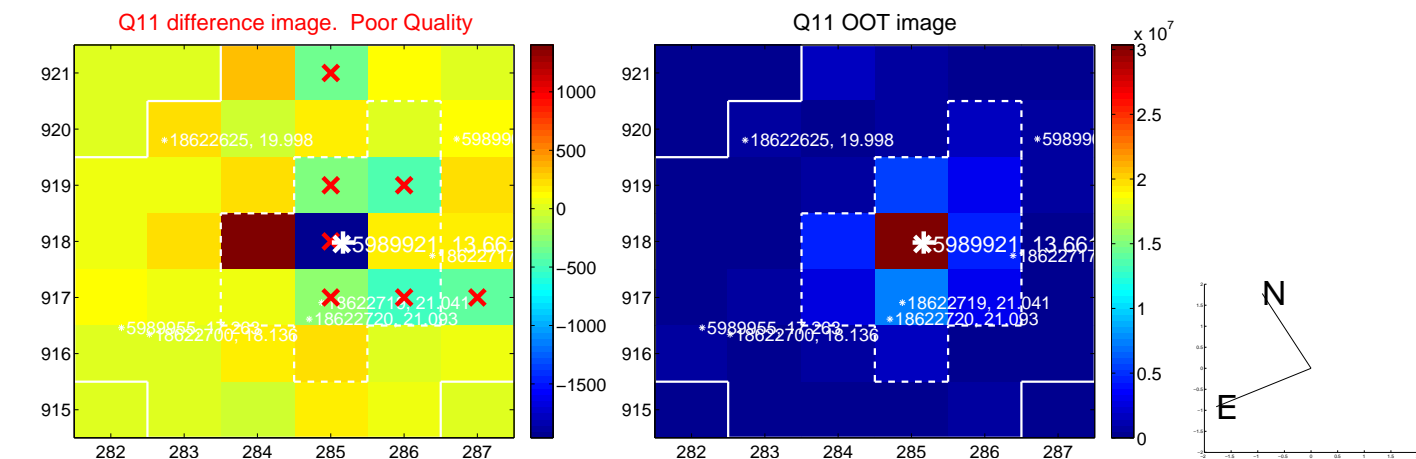
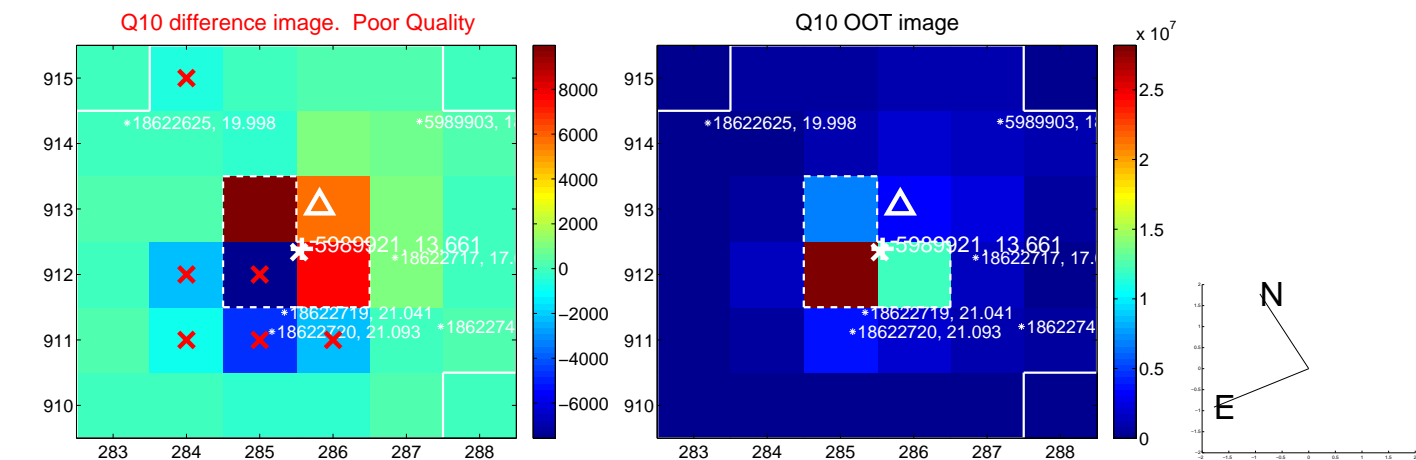
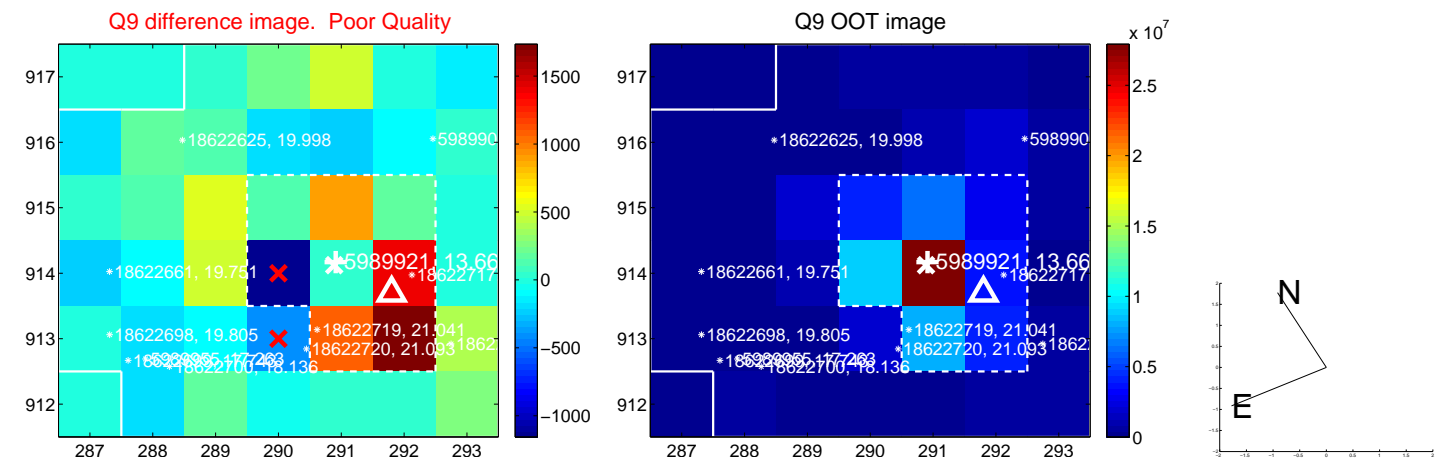


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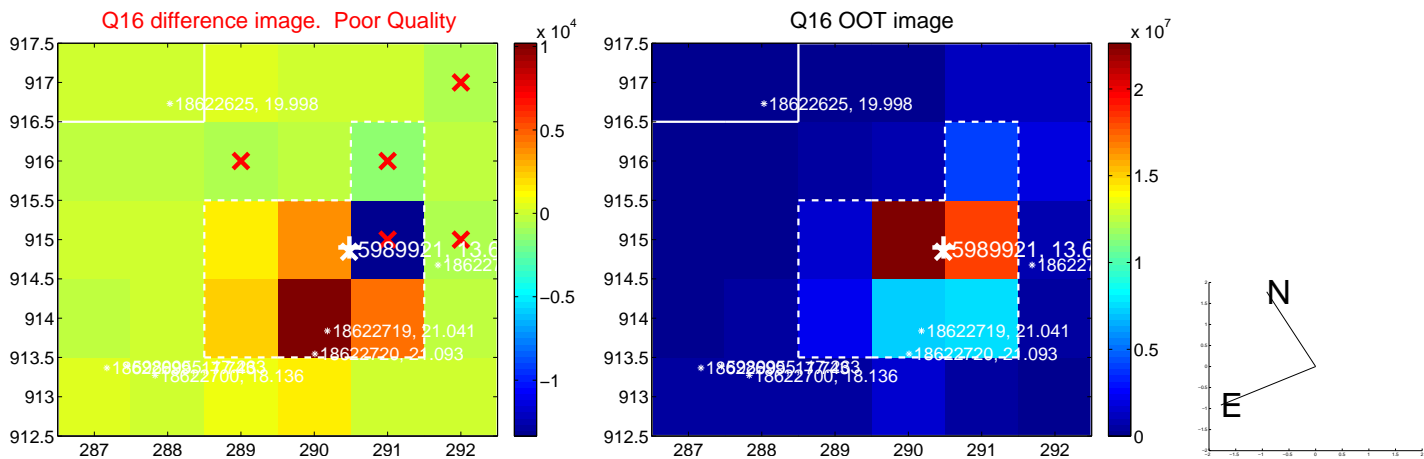
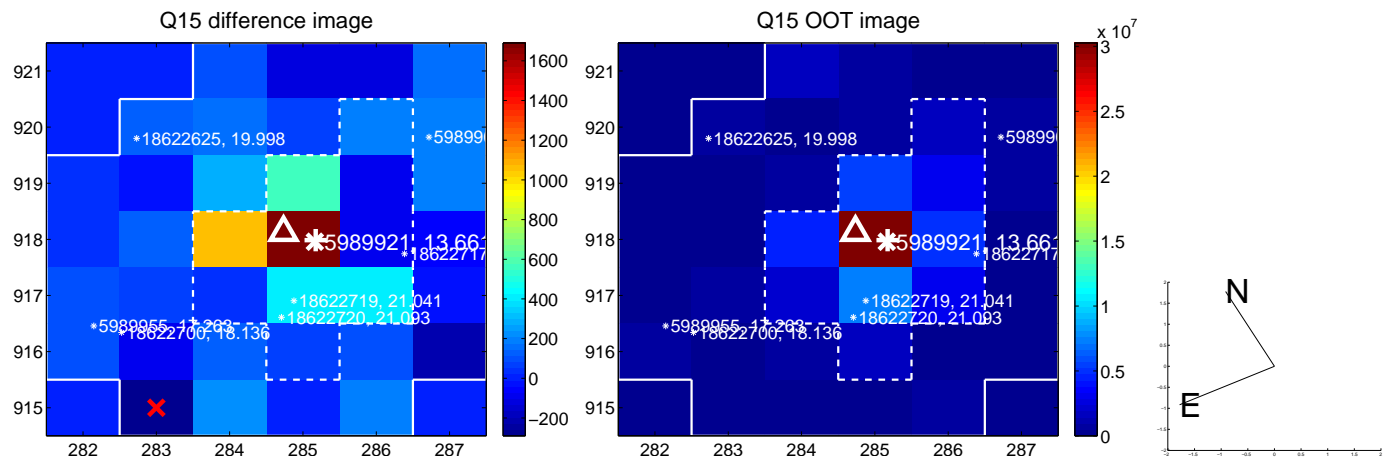
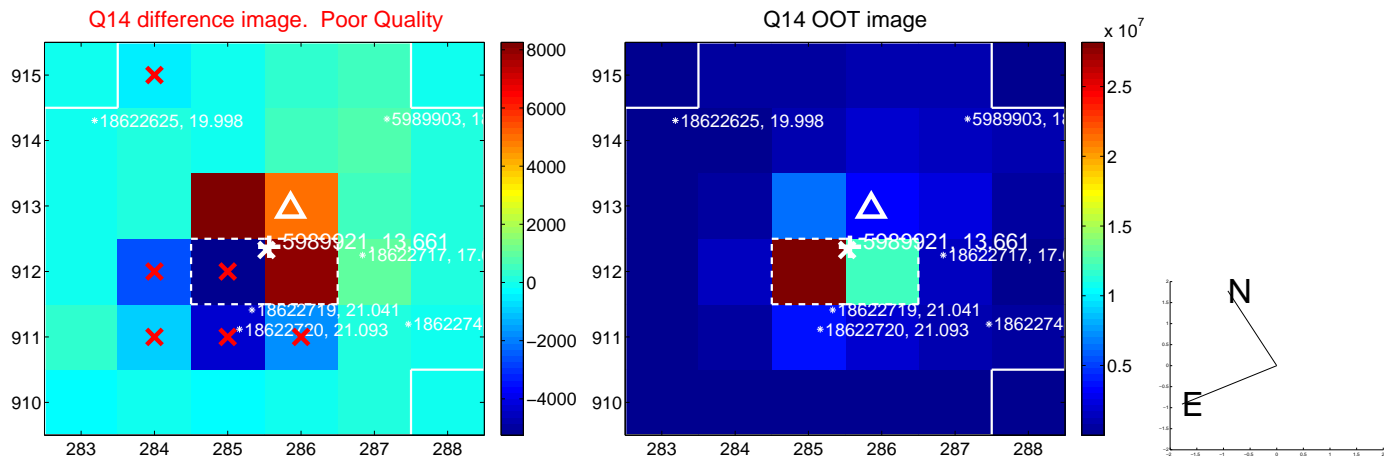
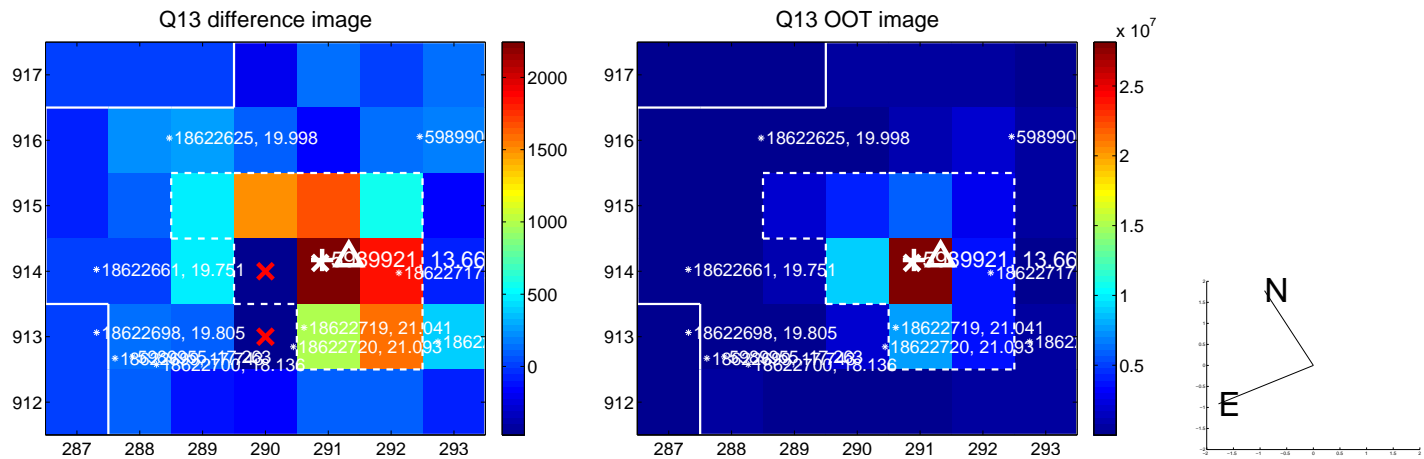




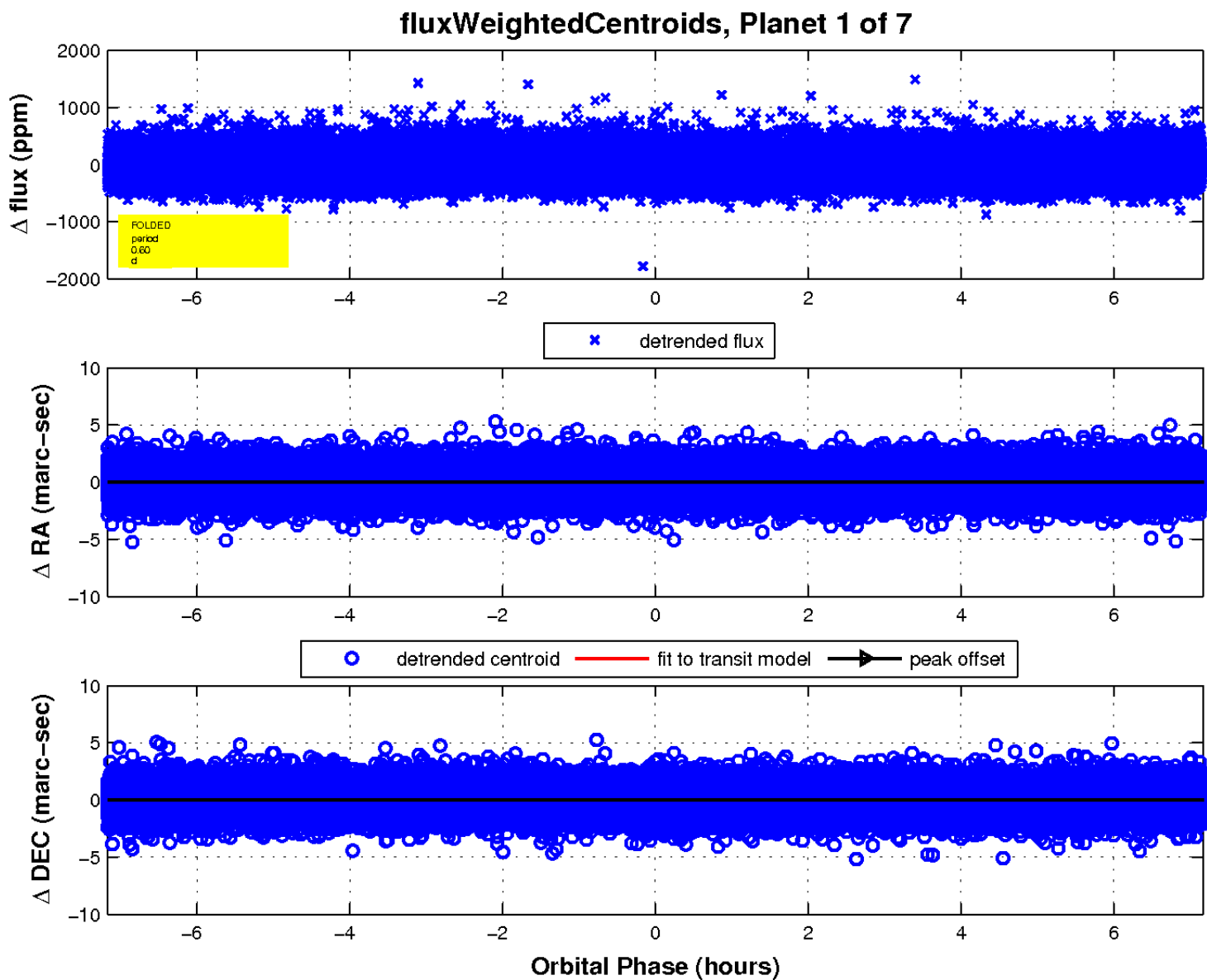
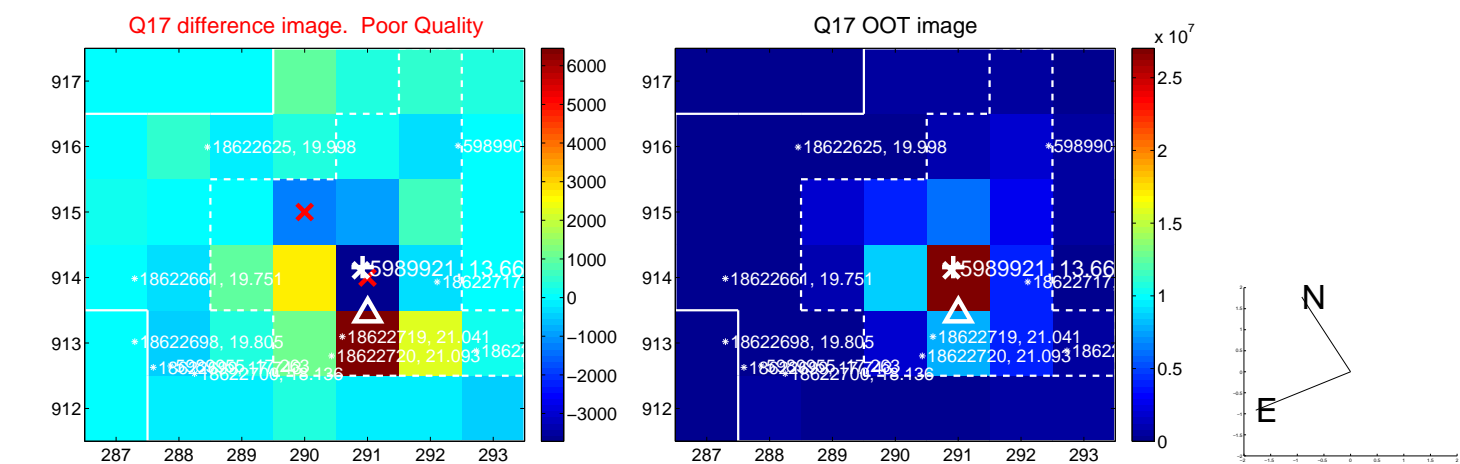
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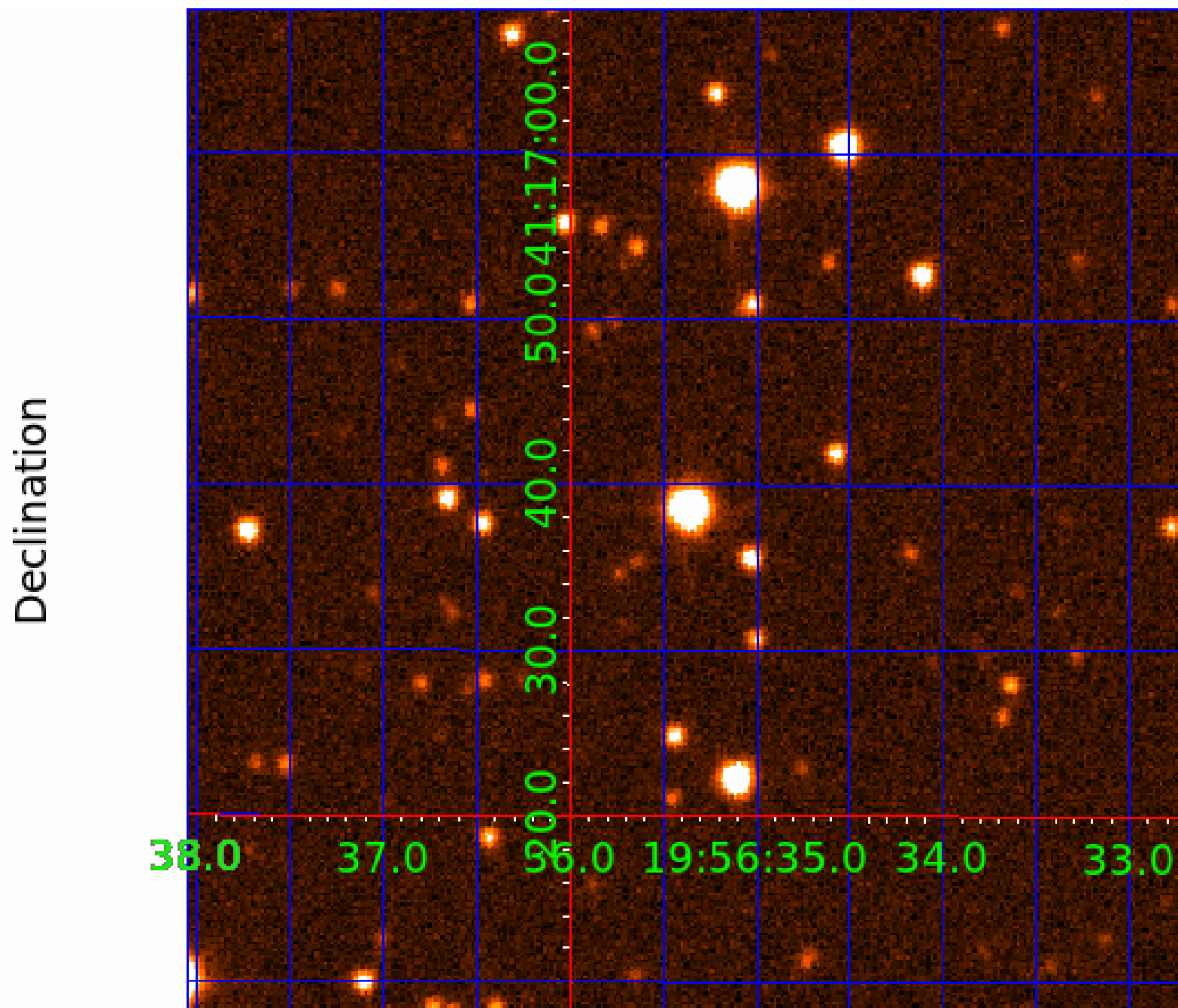
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UKIRT Image



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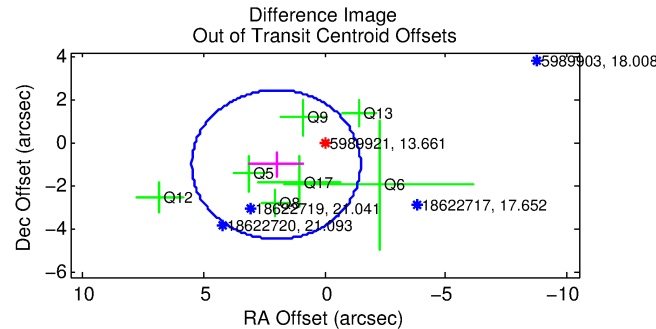
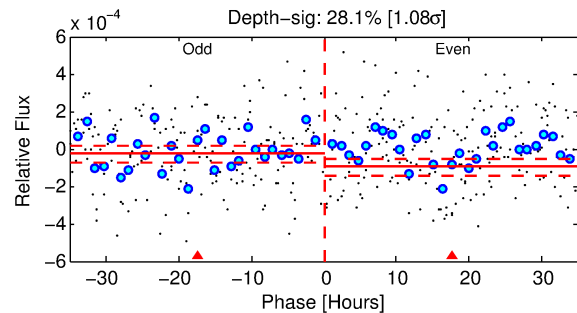
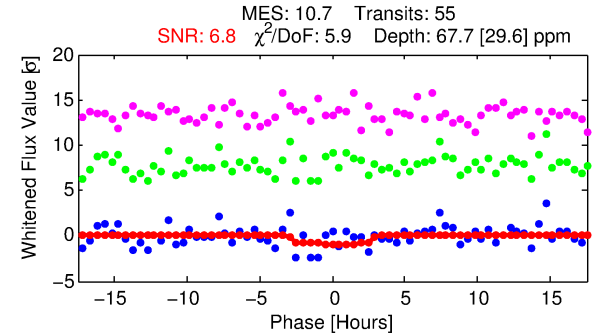
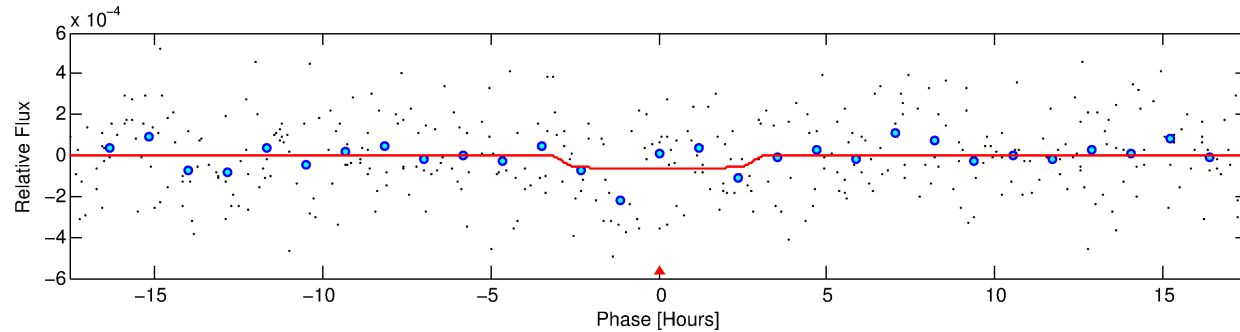
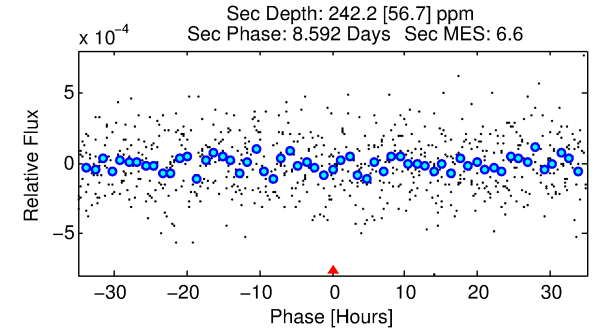
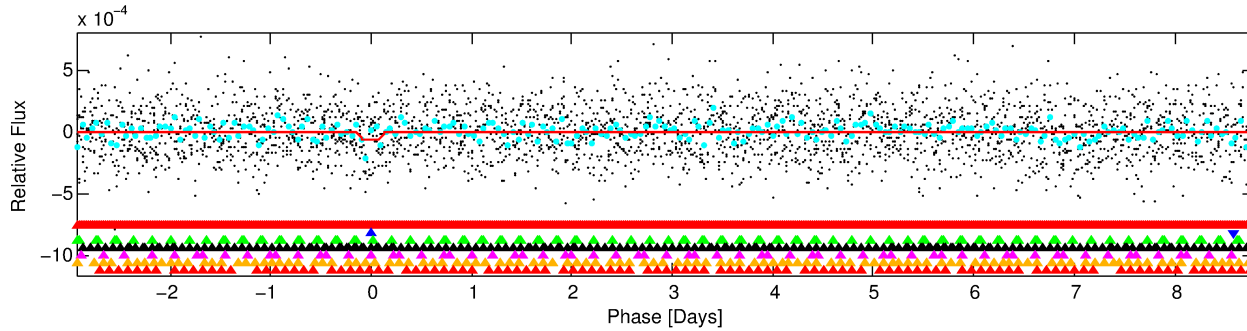
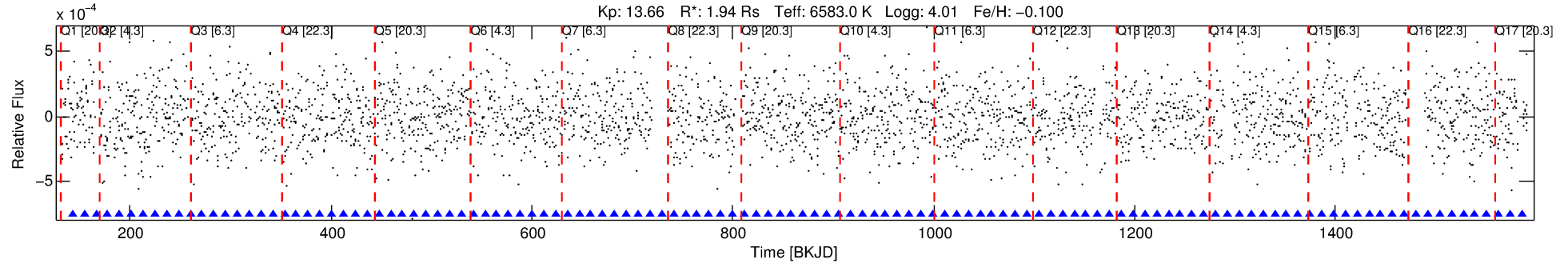
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005989921-02

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 2 of 7 Period: 11.733 d



## DV Fit Results:

Period = 11.73265 [0.00059] d  
Epoch = 142.7384 [0.0366] BKJD  
Rp/R\* = 0.0077 [0.0276]  
a/R\* = 14.68 [283.08]  
b = 0.32 [55.50]  
Seff = 492.62 [259.20]  
Teq = 1201 [158] K  
Rp = 1.62 [5.86] Re  
a = 0.1131 [0.0368] AU  
Ag = 651.66 [4718.38] [0.14σ]  
Teff = 9384 [16948] K [0.48σ]

## DV Diagnostic Results:

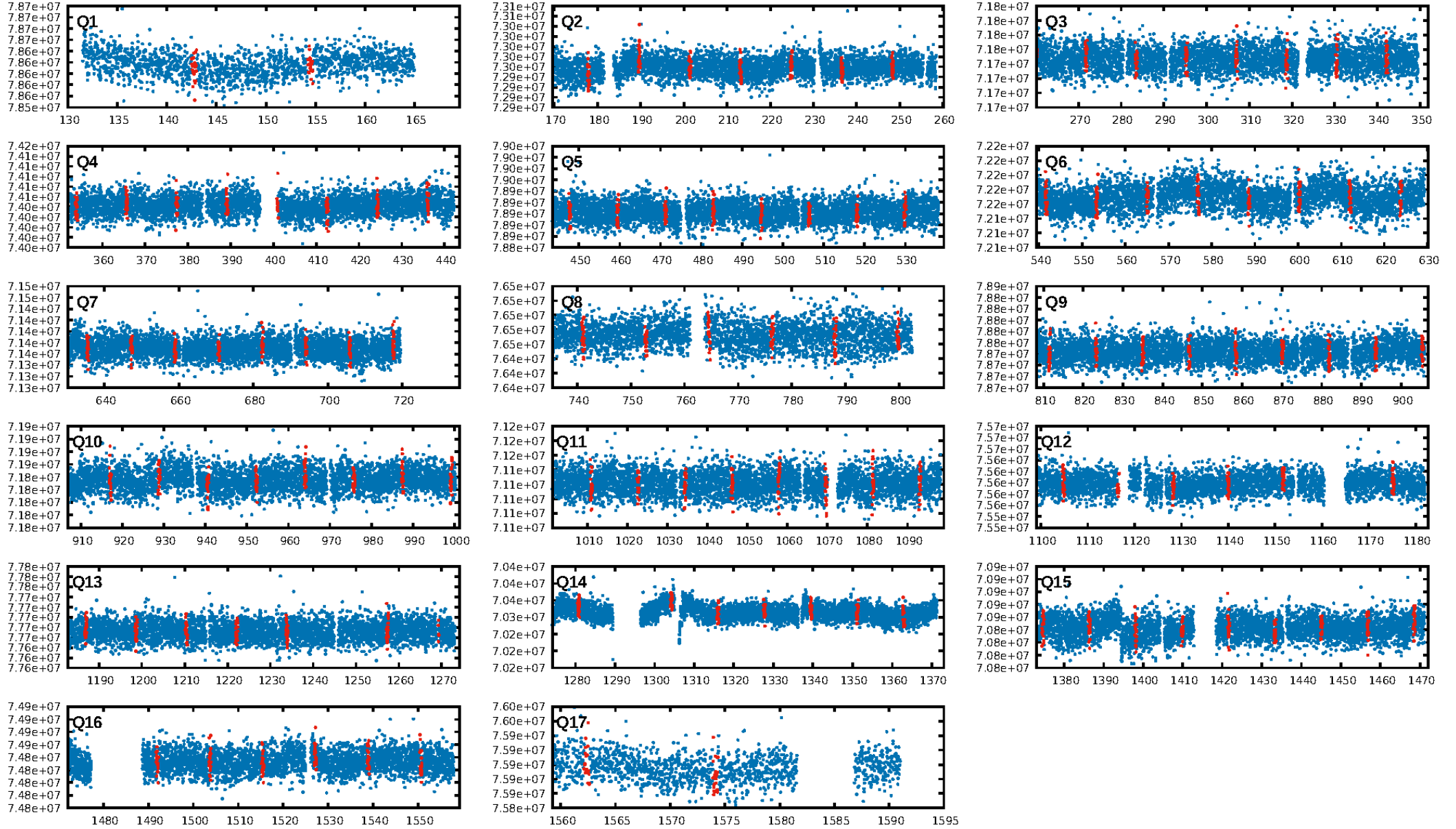
ShortPeriod-sig: 100.0% [22.97σ]  
LongPeriod-sig: 100.0% [4.47σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.79e-10  
RollingBand-fgt: 1.00 [53/53]  
GhostDiagnostic-chr: 0.8136  
Centroid-sig: 46.5%  
Centroid-so: 1.211 arcsec [1.05σ]  
OotOffset-rm: 2.239 arcsec [1.93σ]  
KicOffset-rm: 2.035 arcsec [1.99σ]  
OotOffset-st: 1/0/2/4 [7]  
KicOffset-st: 1/0/2/4 [7]  
DiffImageQuality-fgm: 0.29 [2/7]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:42 Z

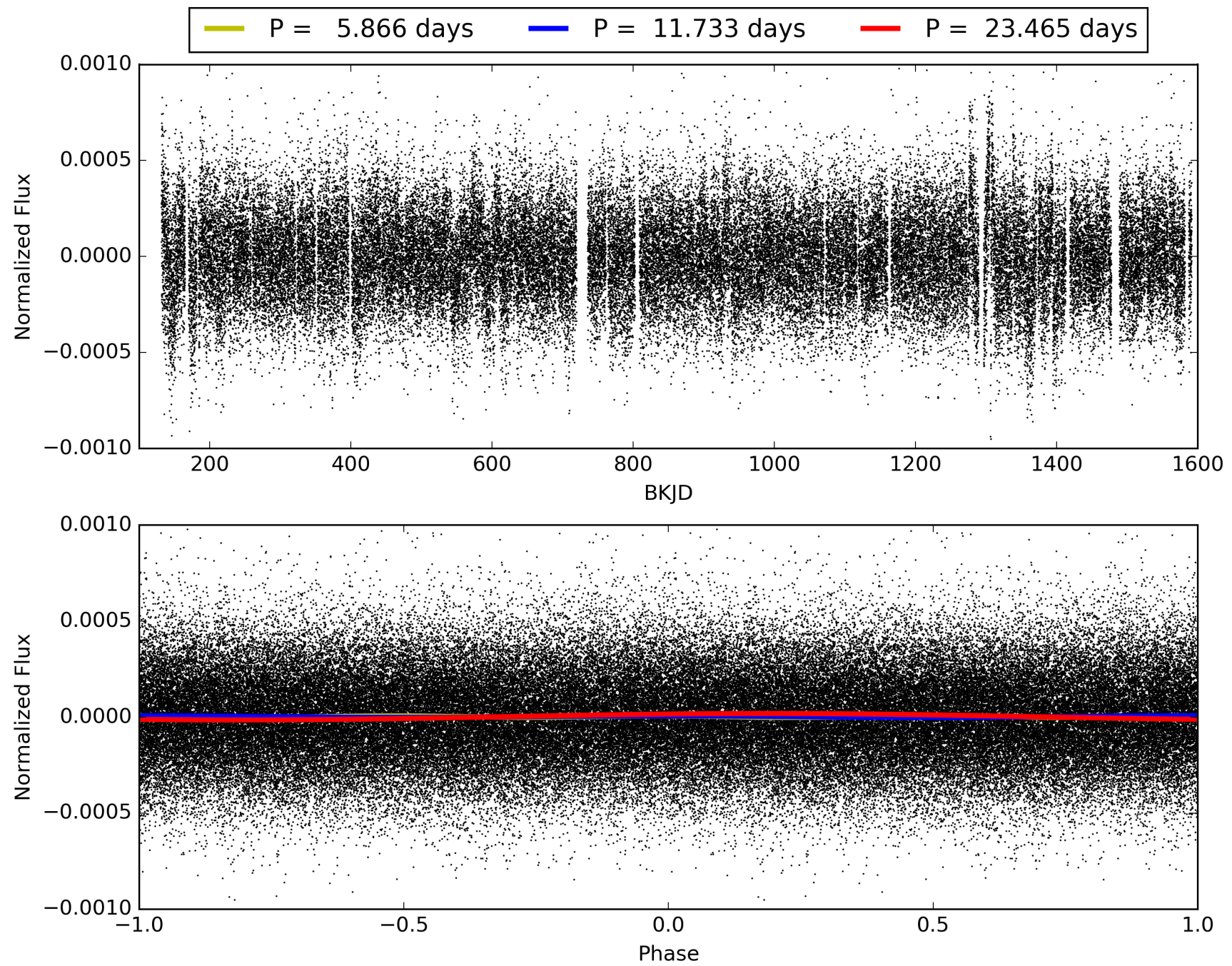
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005989921-02, PDC Light Curves

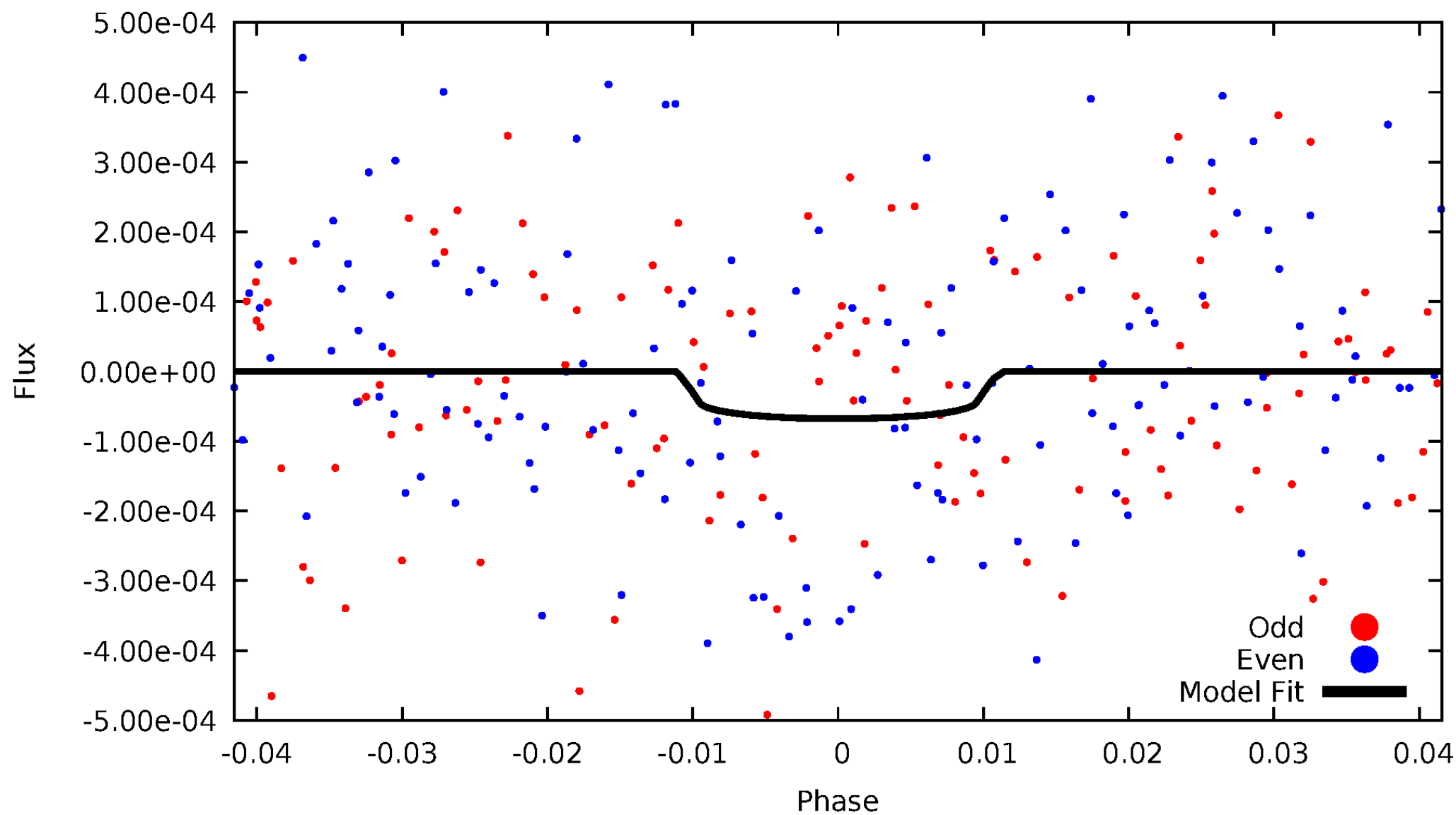


TCE 005989921-02



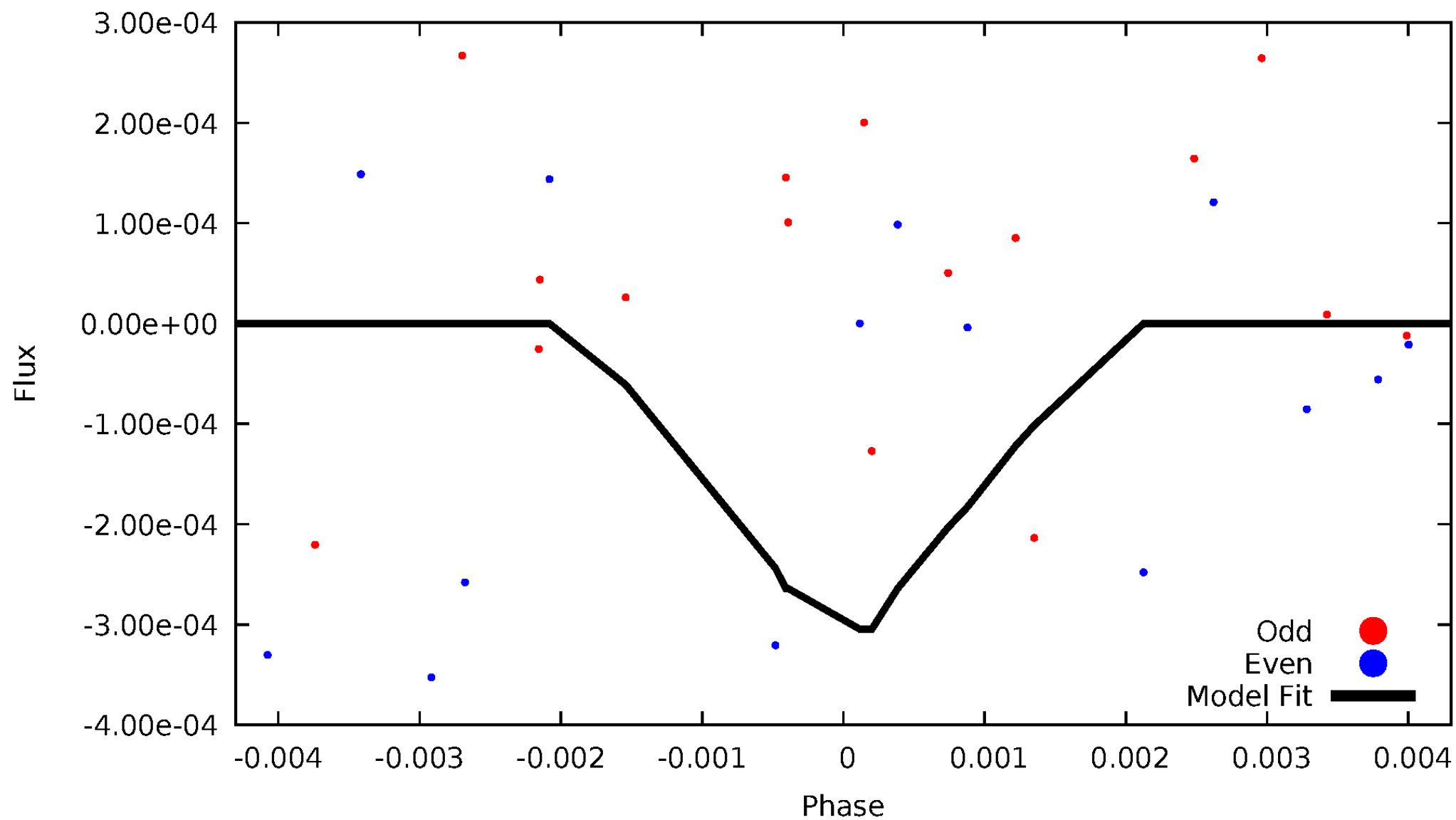
# DV Odd/Even

TCE 005989921-02



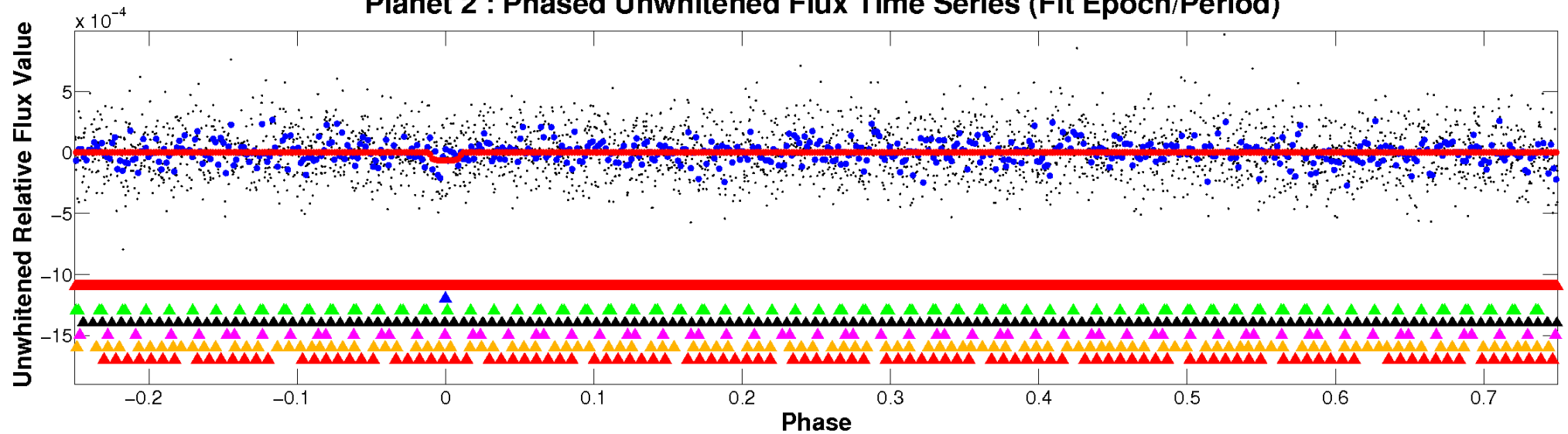
# ALT Odd/Even

TCE 005989921-02

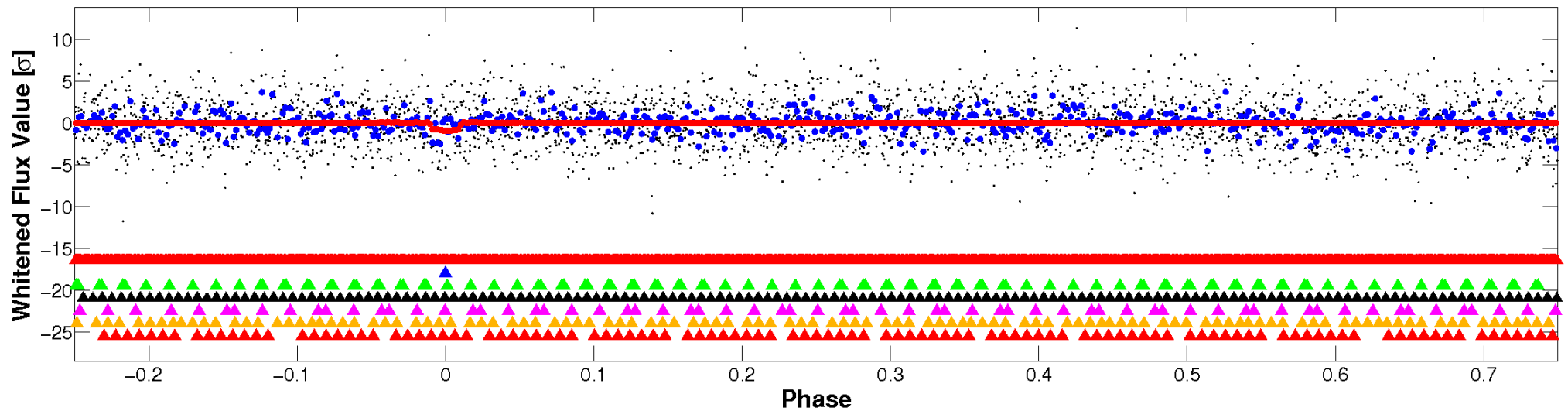


# Non-Whitened Vs. Whitened Light Curve

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



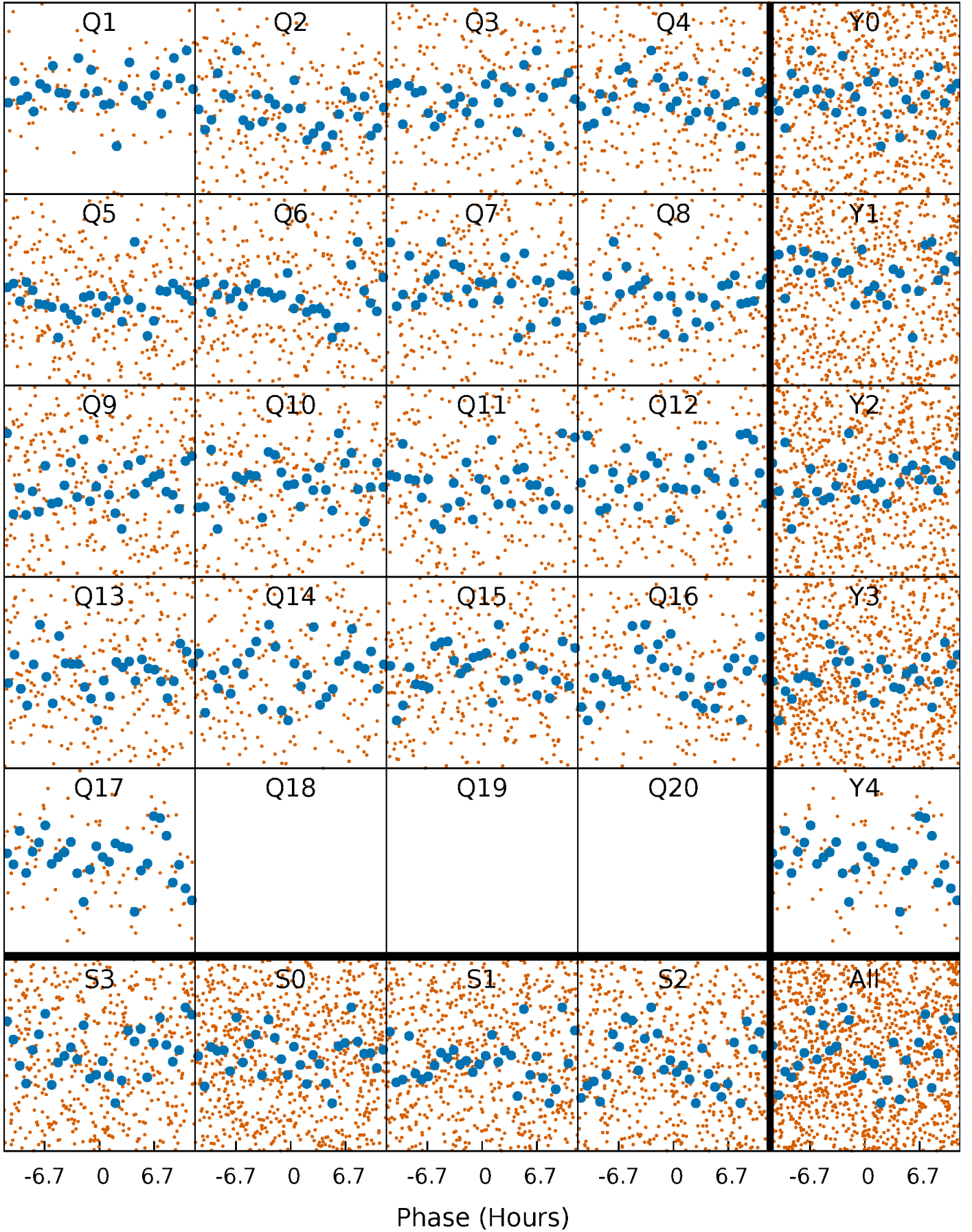
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

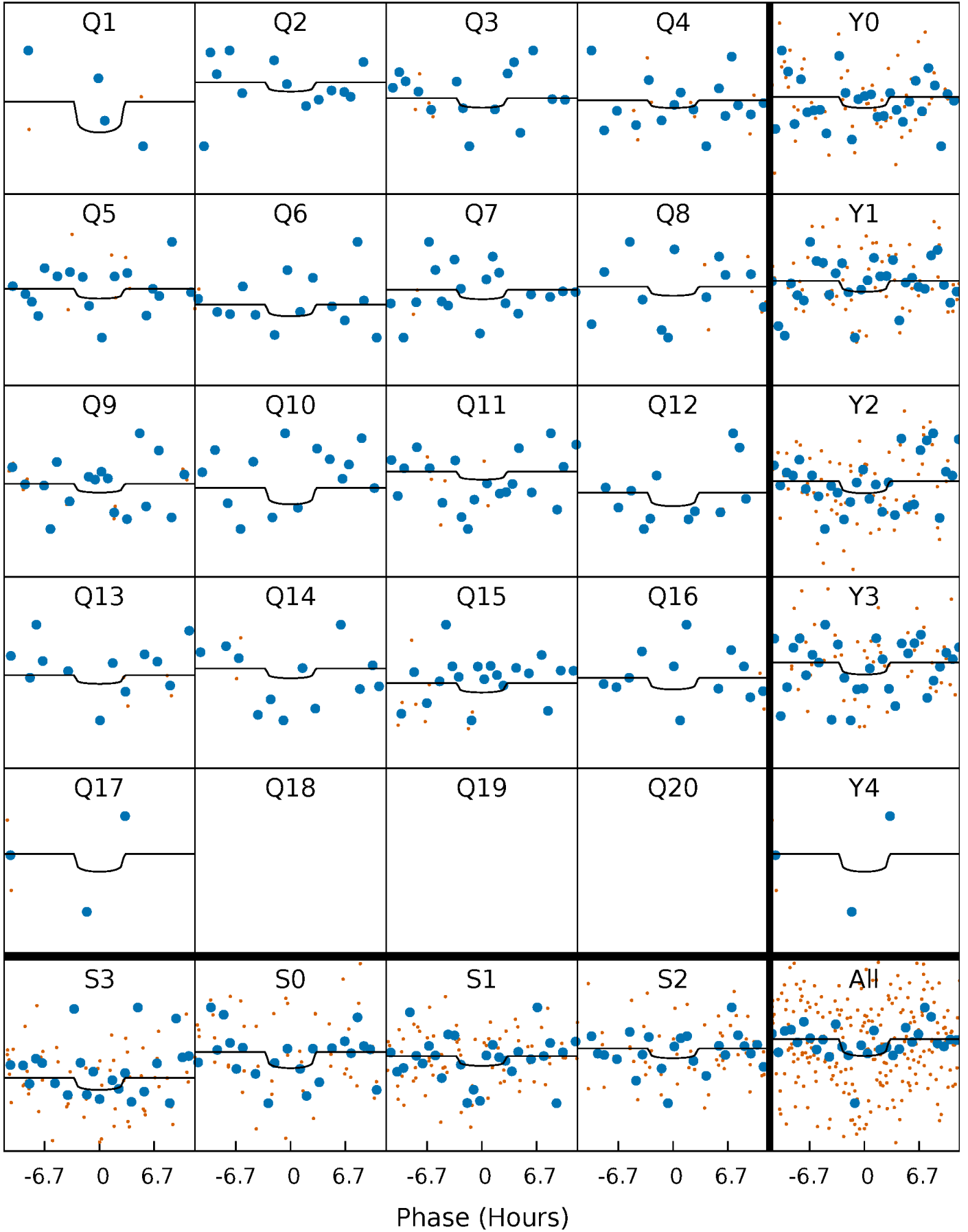
TCE 005989921-02   P= 11.732653 Days    $T_0=142.738402$  (BKJD)





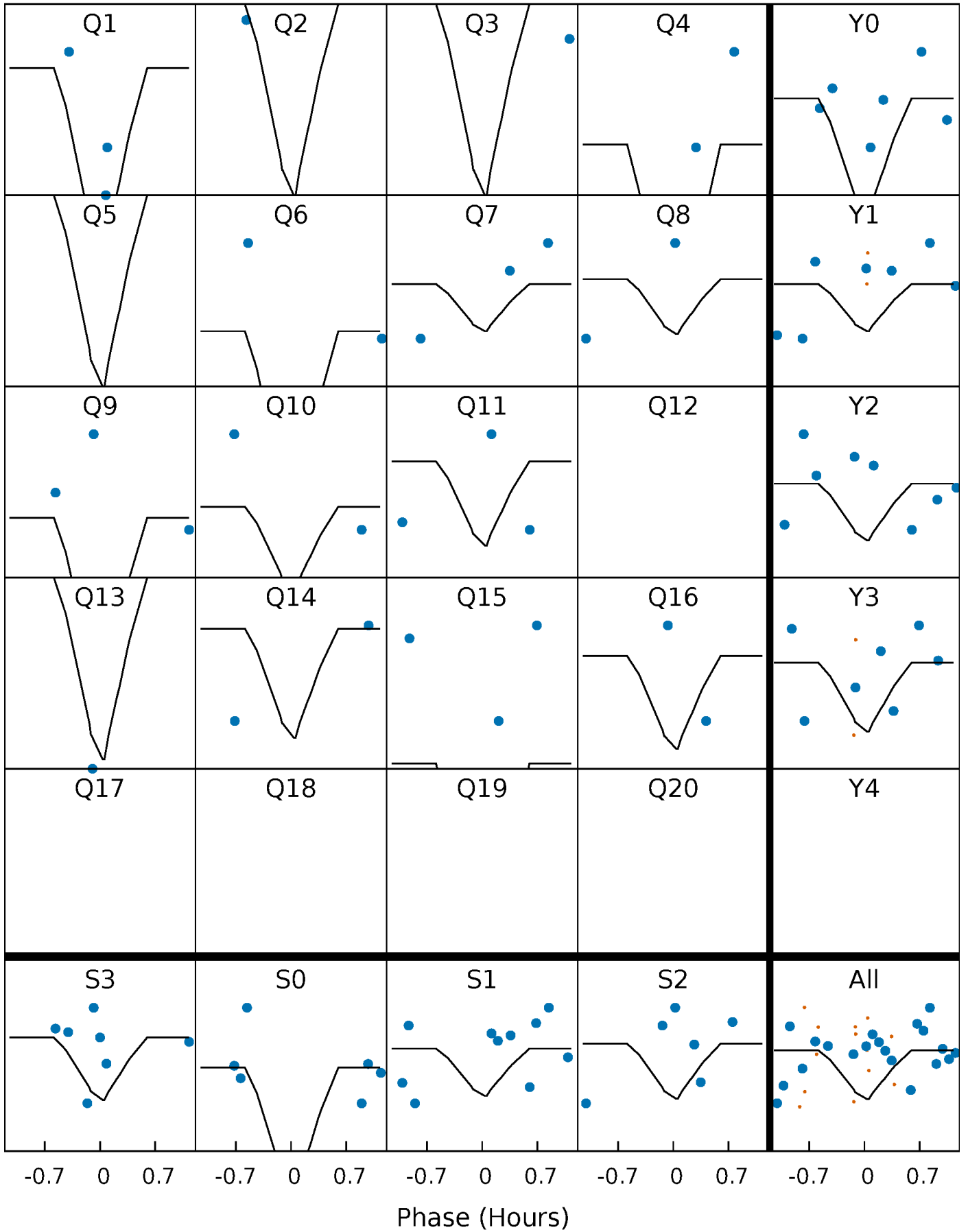
# DV Quarter-Phased Transit Curves

TCE 005989921-02   P= 11.732653 Days    $T_0=142.738402$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

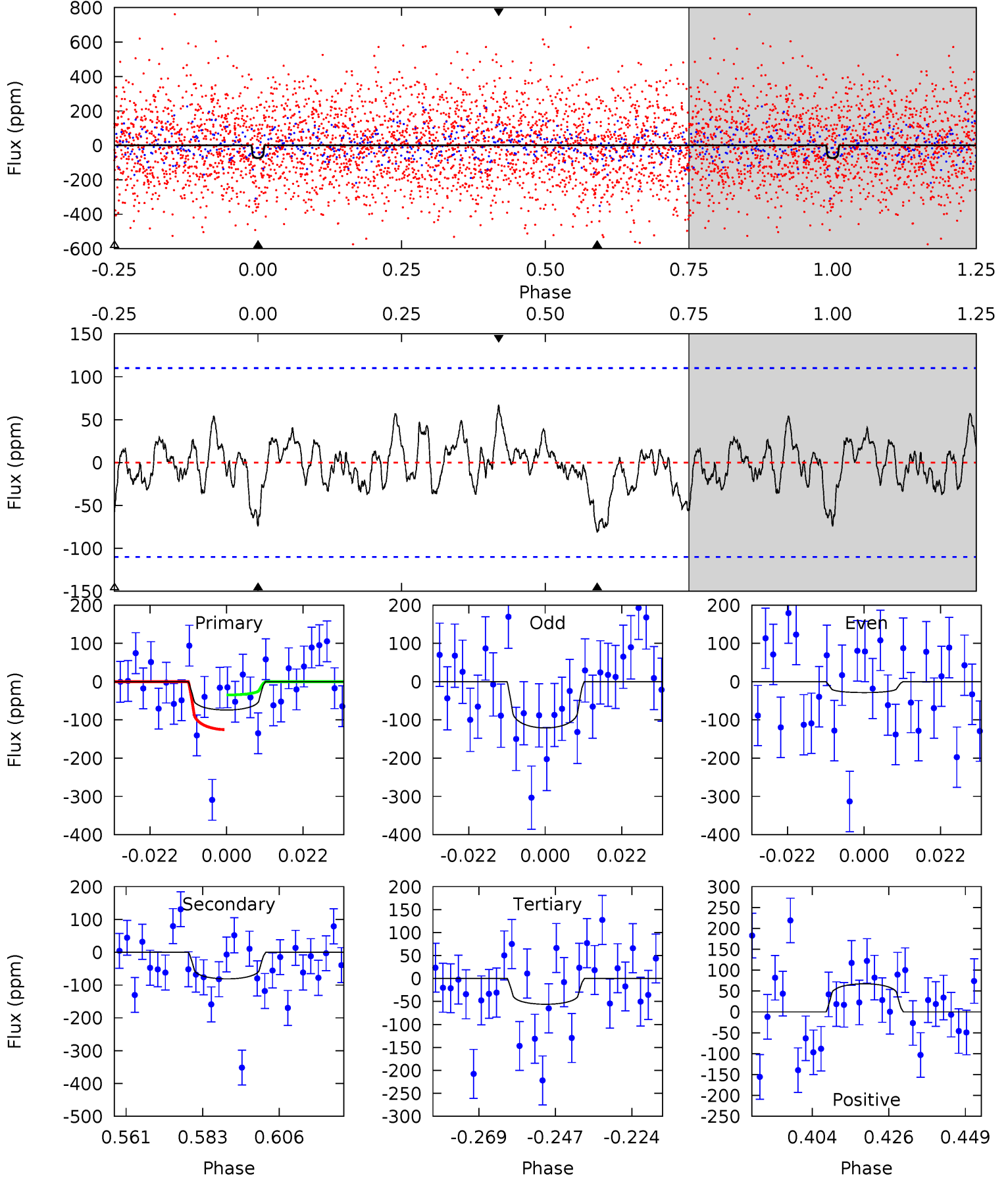
TCE 005989921-02   P= 11.732615 Days    $T_0=142.748581$  (BKJD)



# DV Model-Shift Uniqueness Test

005989921-02, P = 11.732653 Days, E = 131.005749 Days

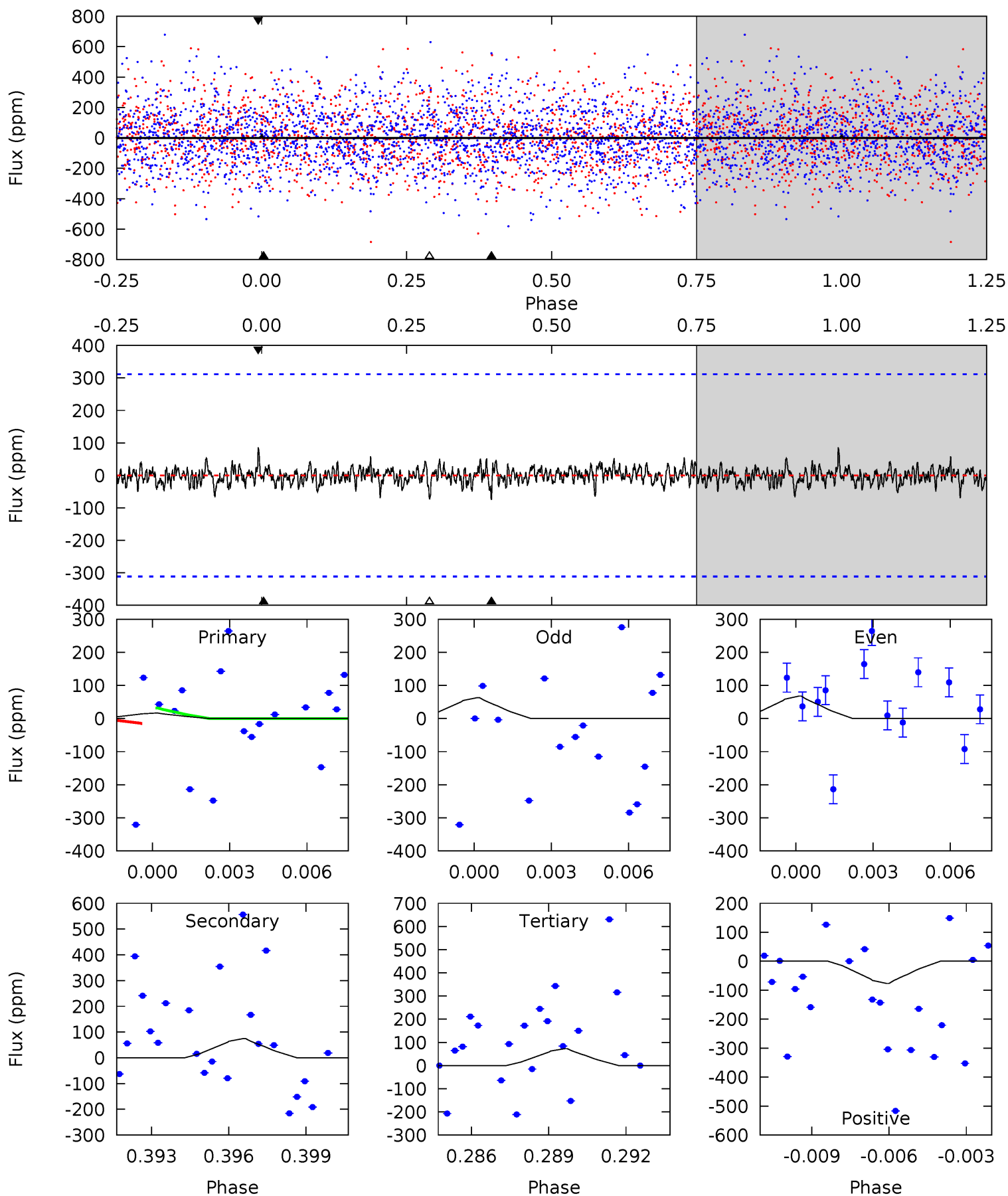
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.28	3.60	2.48	2.98	4.87	2.28	0.98	0.80	0.30	1.11	0.62	2.04	1.61	0.45	2.00



# Alt Model-Shift Uniqueness Test

005989921-02, P = 11.732615 Days, E = 131.015966 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
0.28	1.26	1.23	1.30	5.26	2.98	0.35	-0.95	-1.02	0.04	-0.03	0.04	1.00	0.54	0.13



### Stellar Parameters For KIC 005989921

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-81 \pm 23$	$4.45^{+4.58}_{-3.29}$	$1655^{+133}_{-140}$	$4390^{+3604}_{-959}$	$28^{+367}_{-21}$
Alt.	$-75 \pm 59$	$5.17^{+4.95}_{-3.27}$	$1657^{+142}_{-163}$	$3899^{+2103}_{-1089}$	$15^{+106}_{-13}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

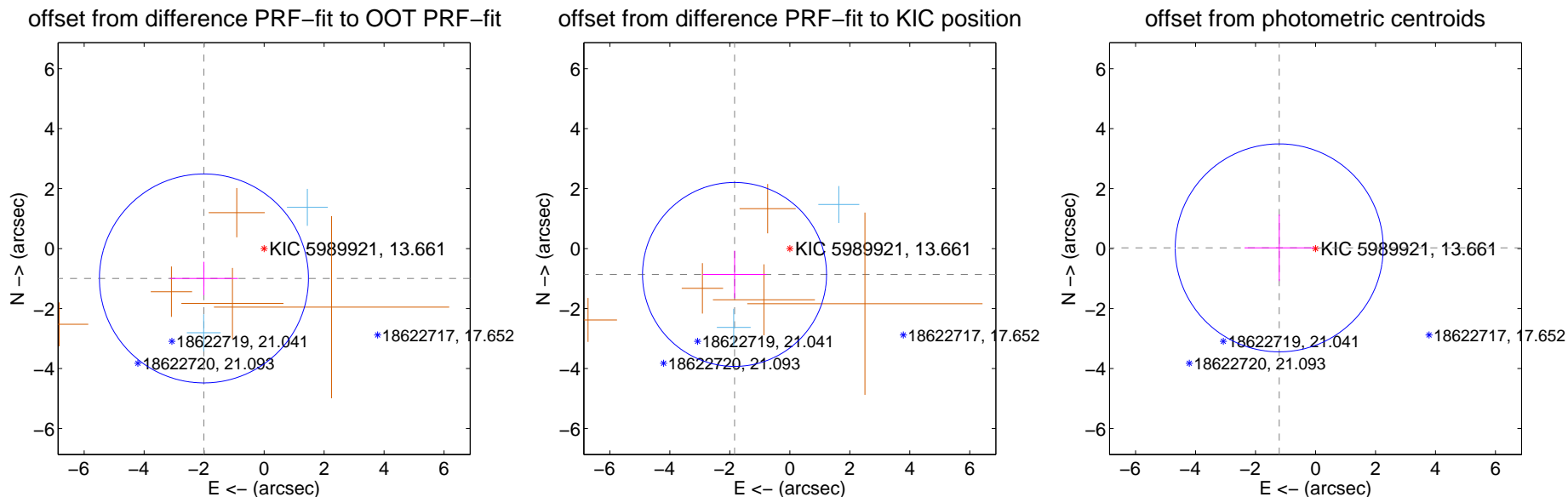
## DV Centroid Data

Supplemental centroid analysis for 005989921-02. Kepler magnitude: 13.66. Transit SNR 6.79

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

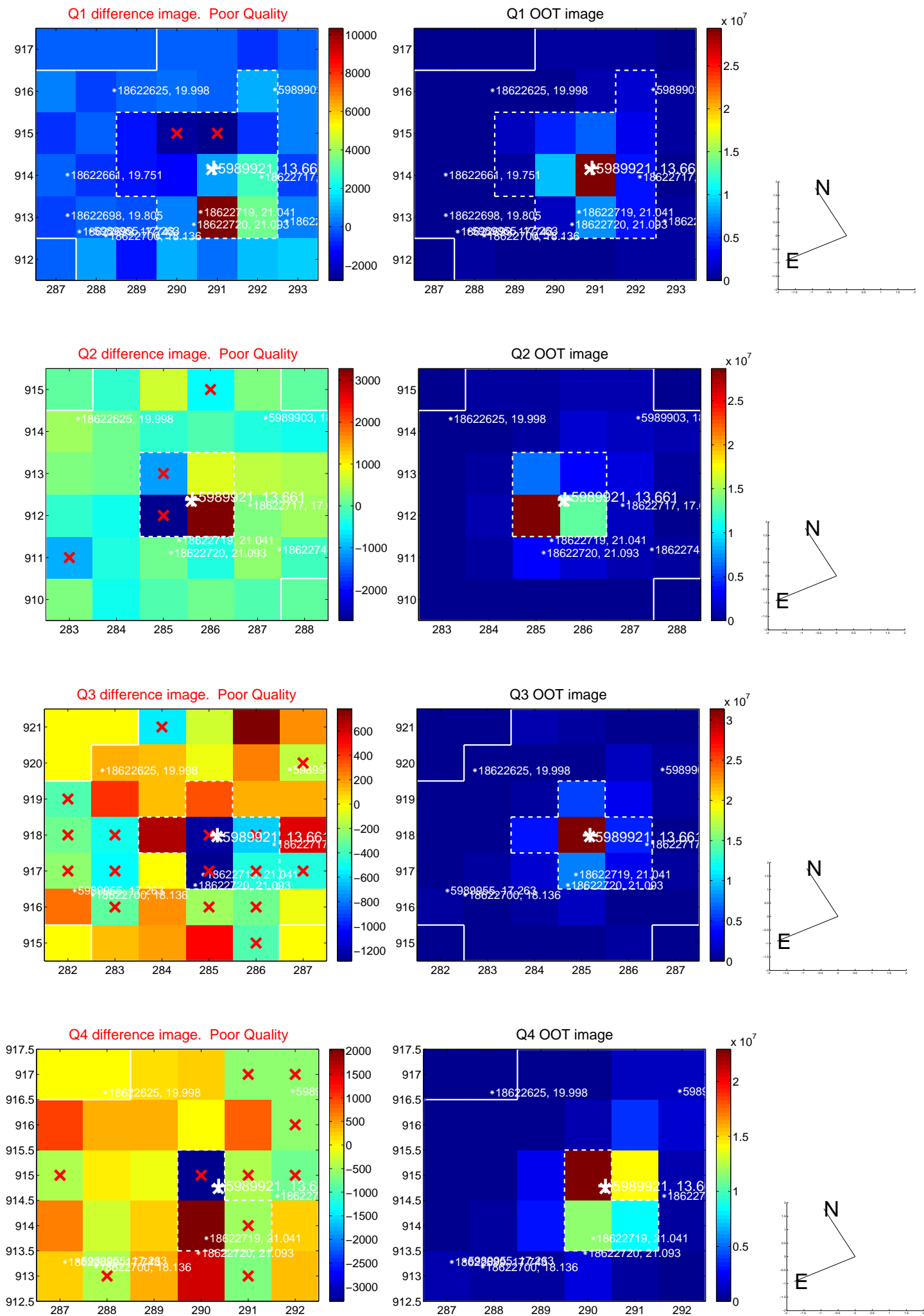
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.239 \pm 1.161$	1.93	$2.006 \pm 1.133$	$-0.996 \pm 0.556$
PRF-fit source offset from KIC position	$2.035 \pm 1.022$	1.99	$1.843 \pm 1.066$	$-0.862 \pm 0.794$
photometric centroid source offset	$1.21 \pm 1.16$	1.05	$1.21 \pm 1.16$	$0.02 \pm 1.11$



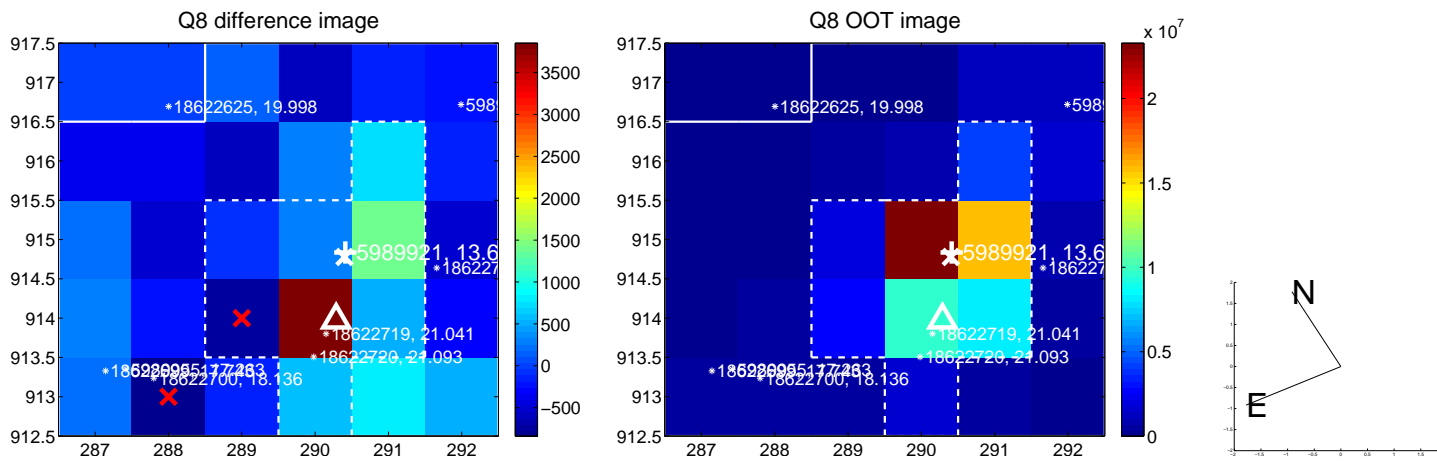
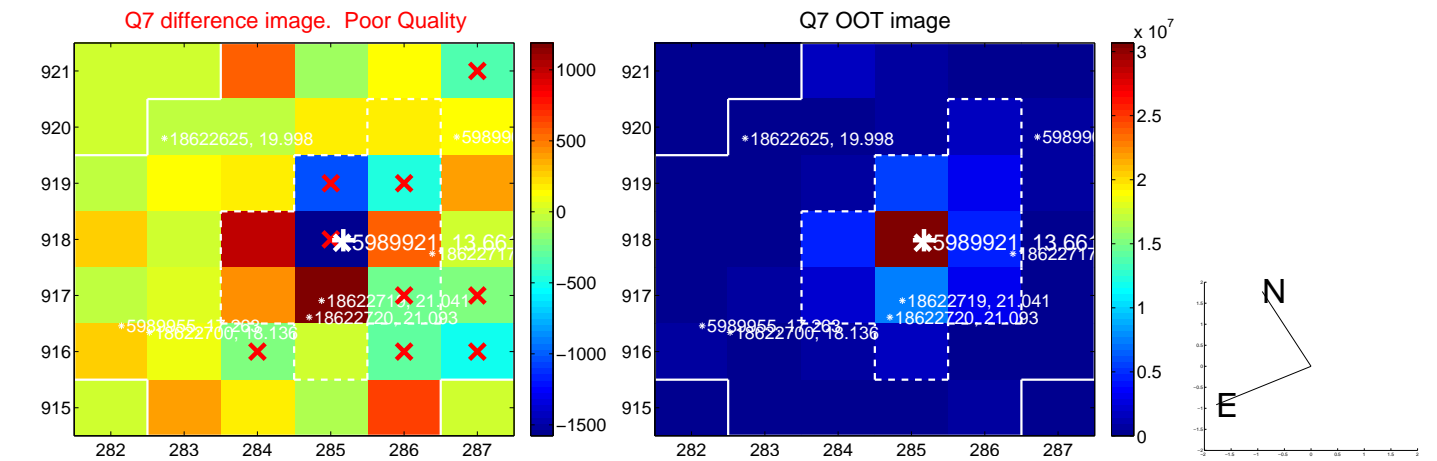
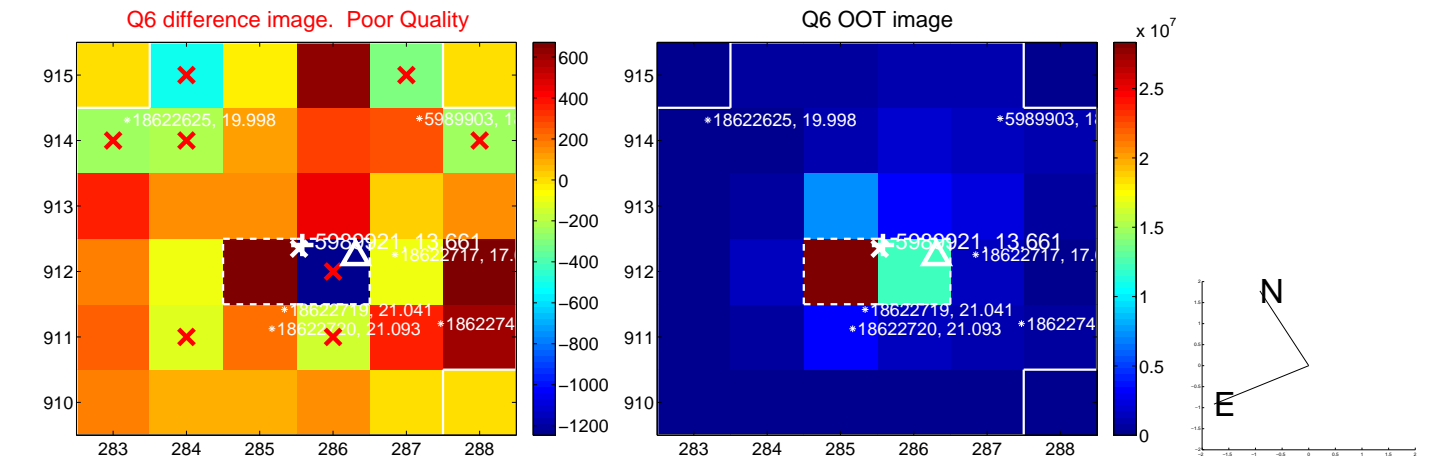
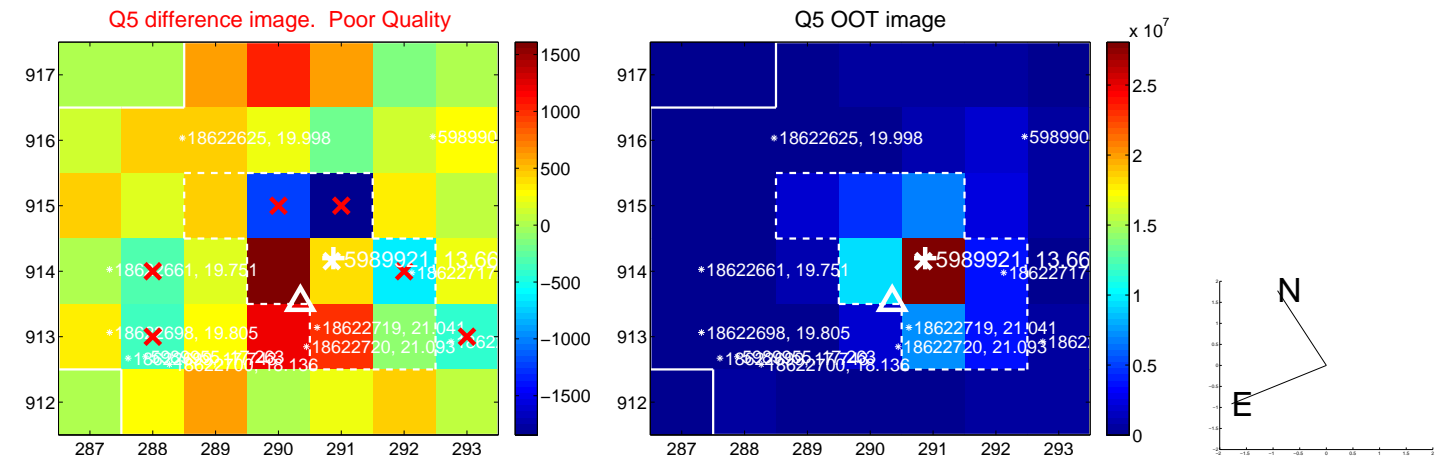
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



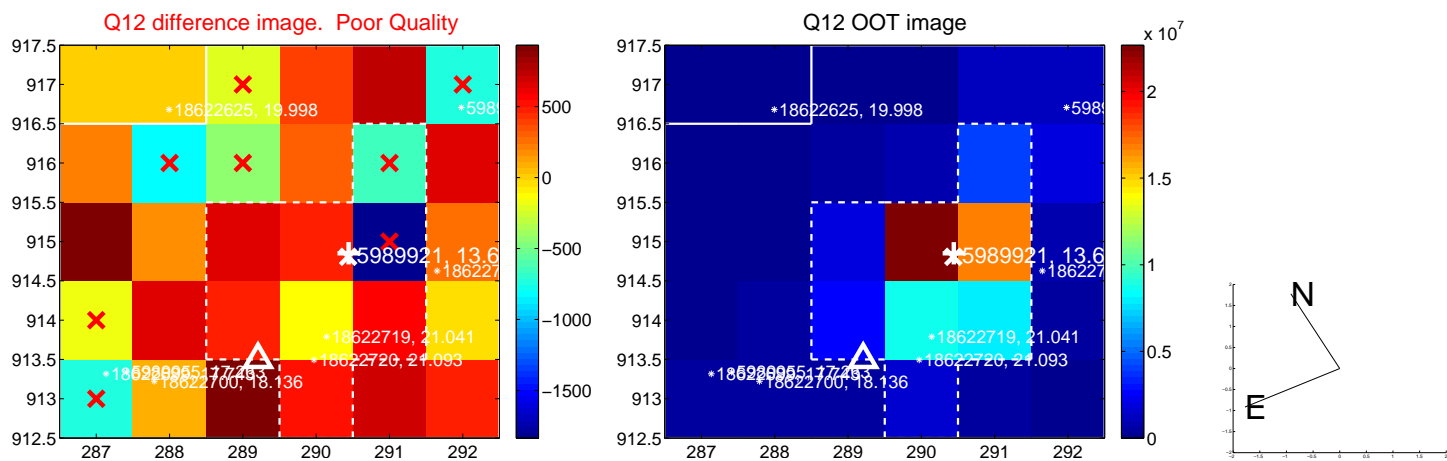
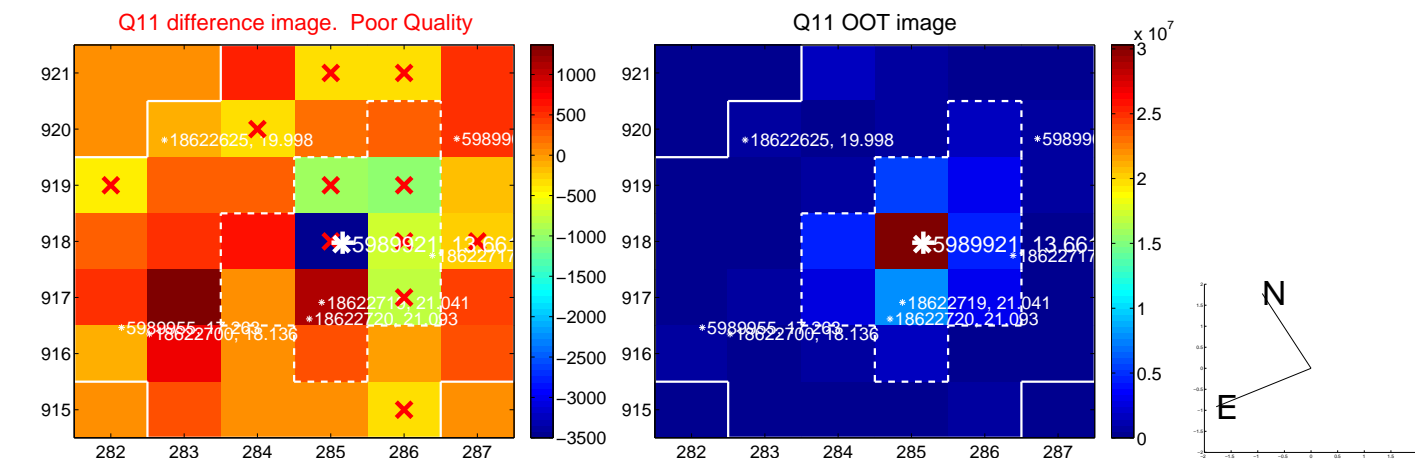
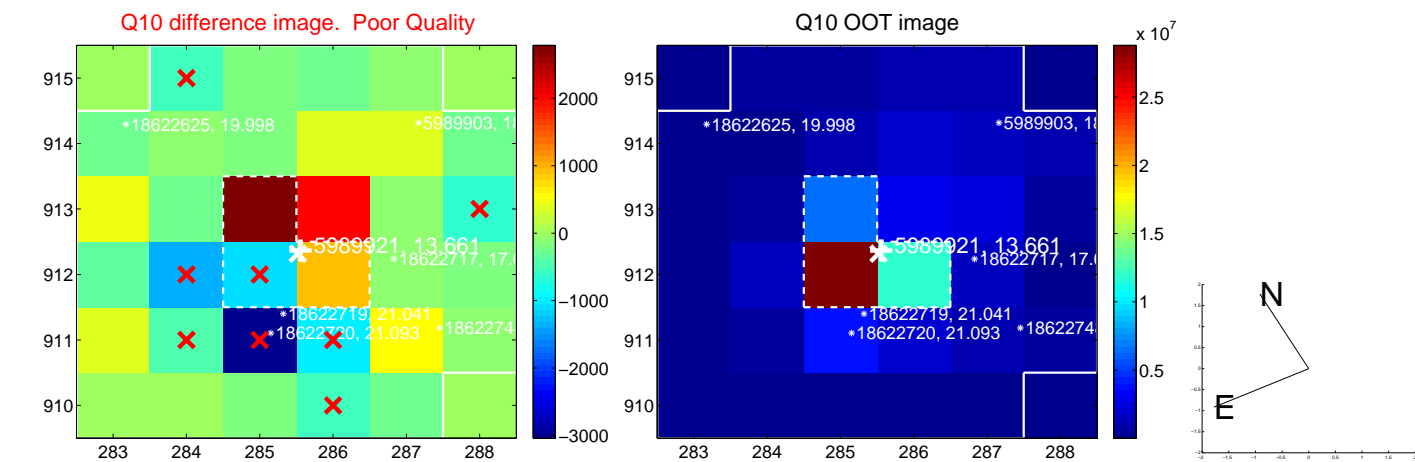
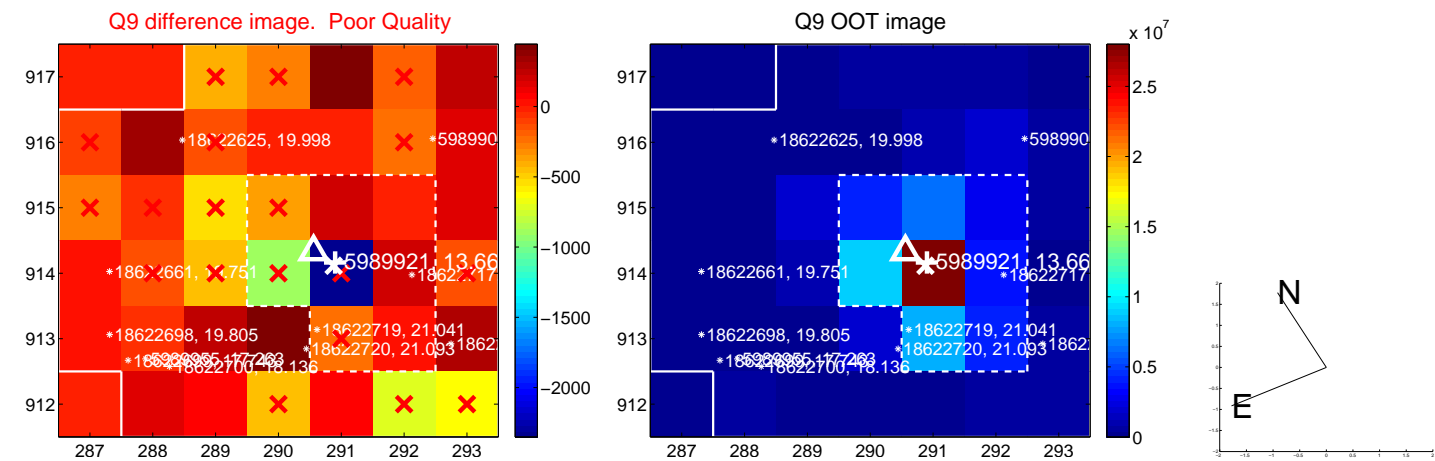
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



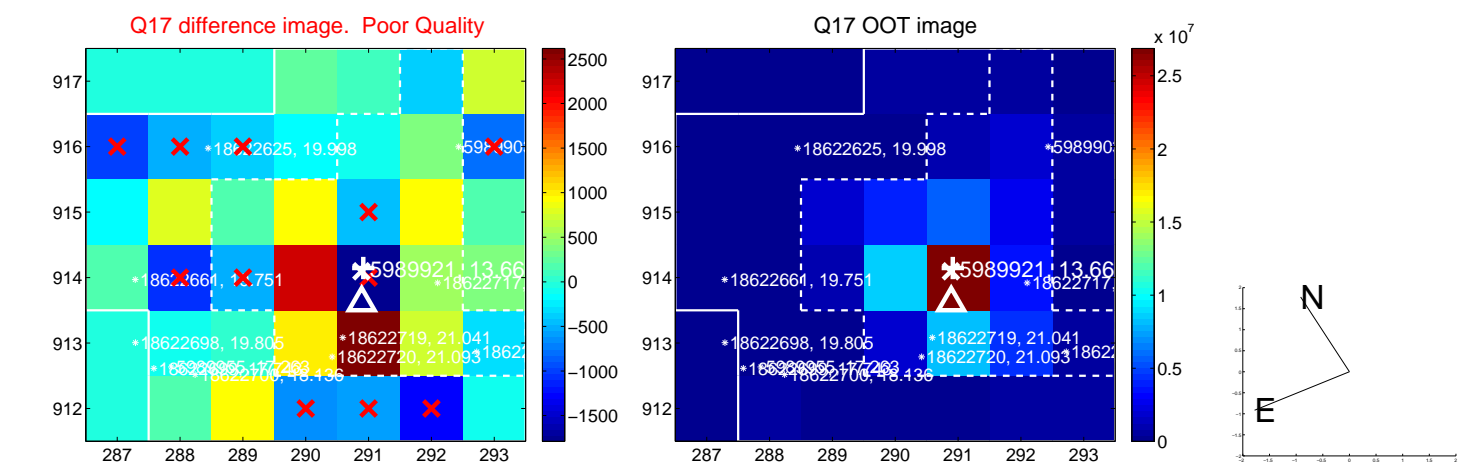
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



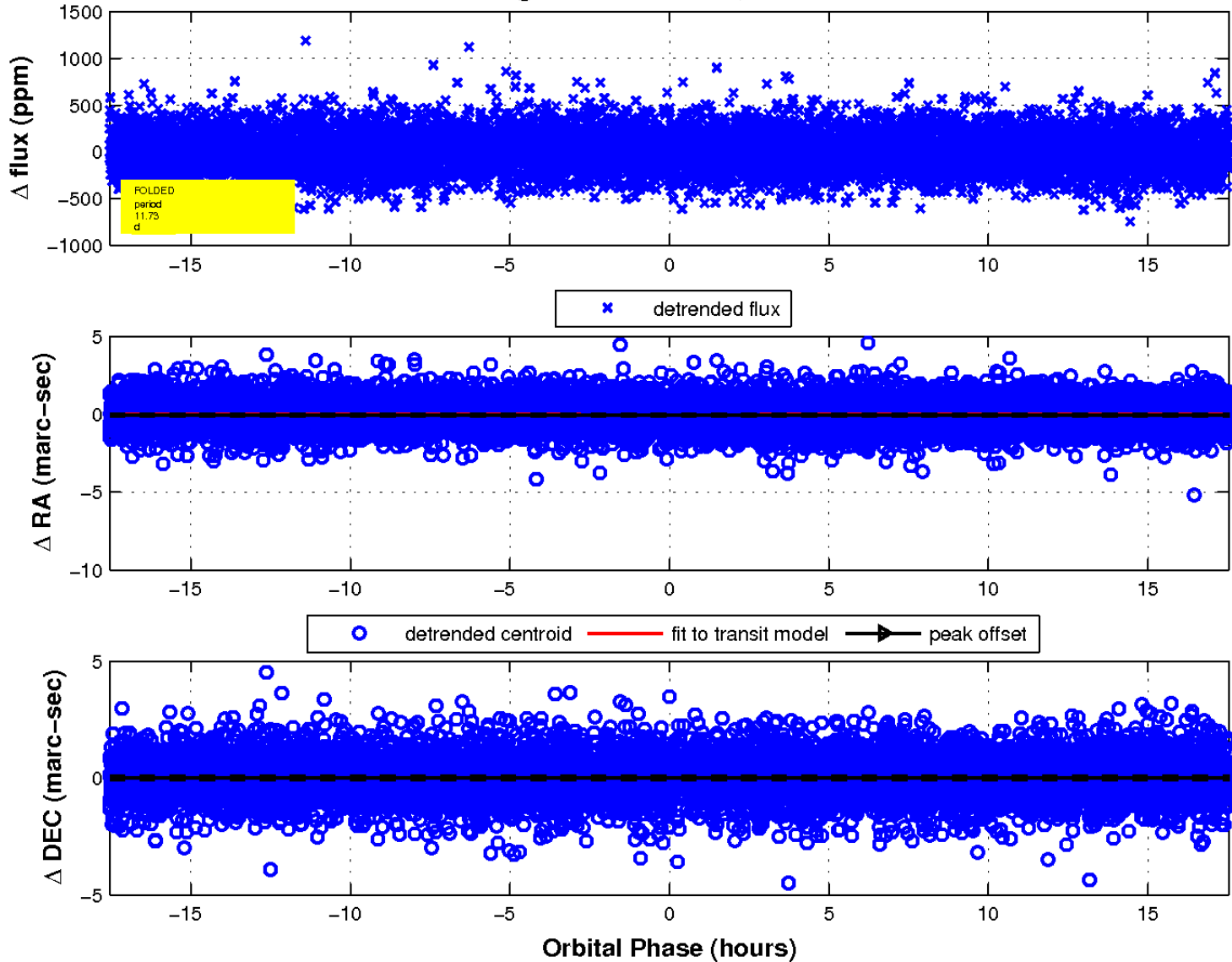




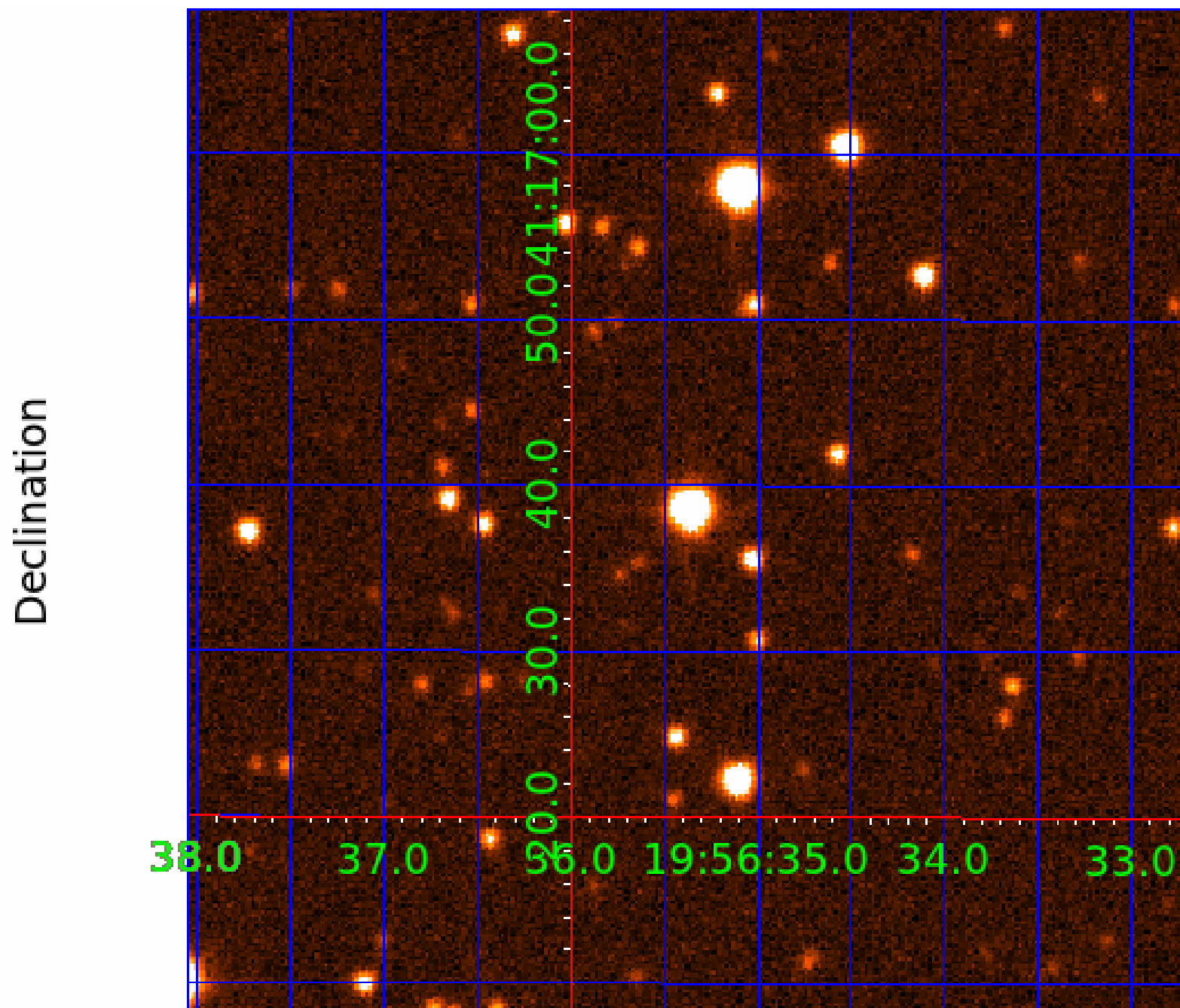
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 7



UKIRT Image



# KIC 005989921

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005989921-01	OBS	No	0.597713	131.683993	5.9	4.387	8.3	3.0	1.94	6583	0.47	26084.78
005989921-02	OBS	No	11.732653	142.738402	67.7	5.849	10.7	6.8	1.94	6583	1.62	492.62
005989921-03	OBS	No	14.116147	131.740411	319.5	1.454	12.4	13.0	1.94	6583	4.00	384.97
005989921-04	OBS	No	5.791073	131.605569	143.7	2.078	11.0	12.0	1.94	6583	2.48	1262.89
005989921-05	OBS	No	22.241919	139.123933	337.0	1.072	11.3	13.6	1.94	6583	3.60	209.97
005989921-06	OBS	No	12.829749	135.098981	431.7	0.700	10.9	12.3	1.94	6583	4.35	437.27
005989921-07	OBS	No	13.303210	143.085521	229.7	1.624	7.2	9.1	1.94	6583	3.36	416.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005989921-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
005989921-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005989921-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005989921-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS— HALO_GHOST
005989921-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV

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

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

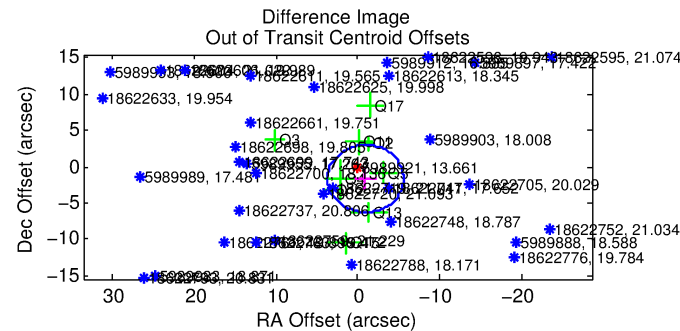
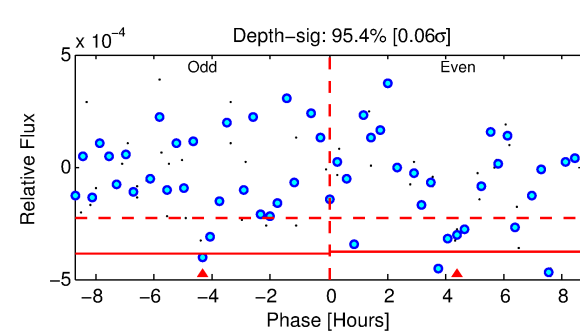
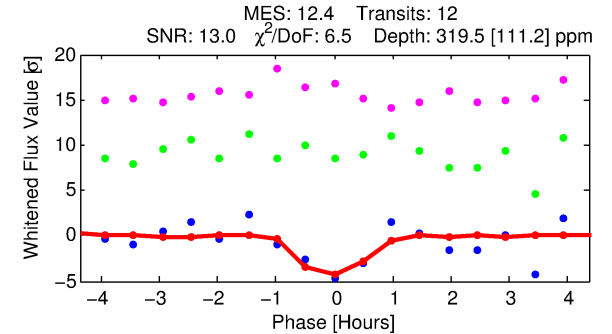
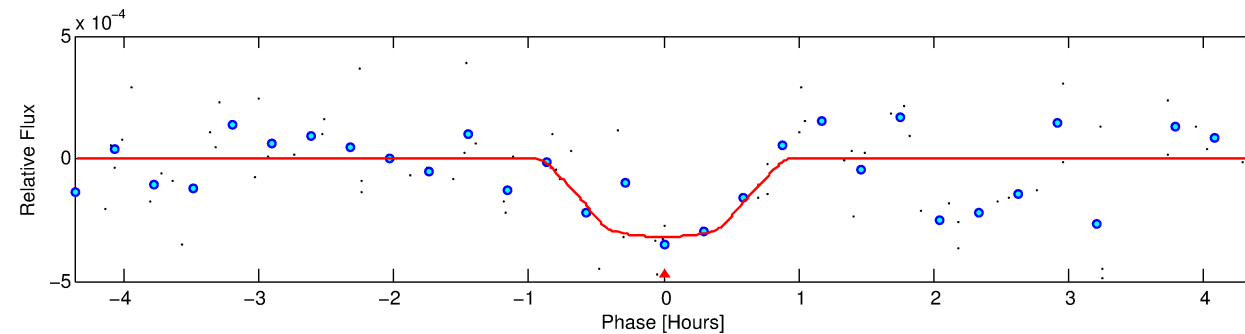
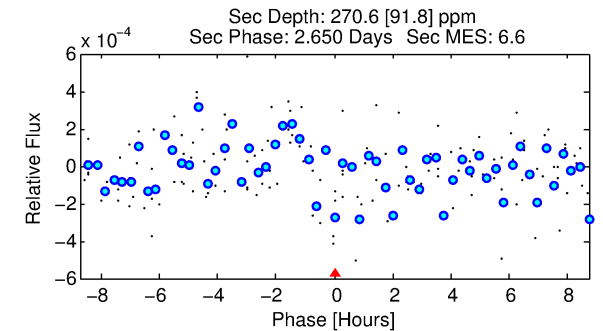
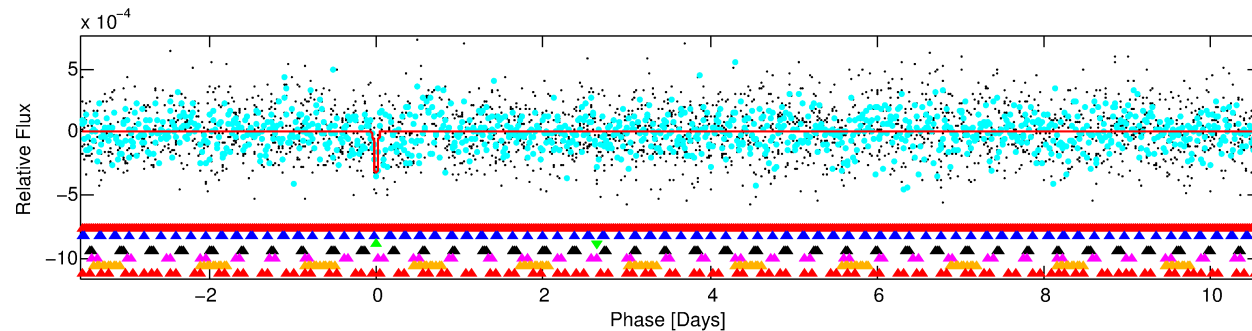
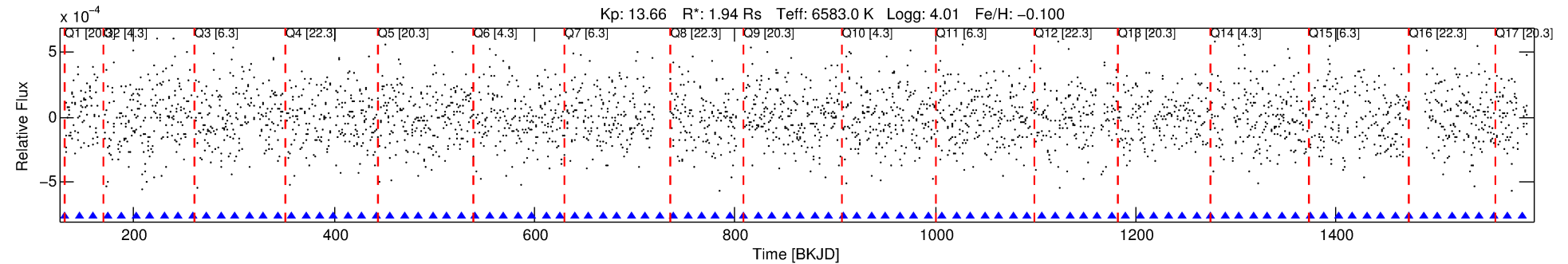
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005989921-03

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 3 of 7 Period: 14.116 d



## DV Fit Results:

Period = 14.11615 [0.00020] d  
Epoch = 131.7404 [0.0099] BKJD  
Rp/R\* = 0.0190 [0.0704]  
a/R\* = 37.70 [799.72]  
b = 0.88 [5.37]  
Seff = 384.97 [202.56]  
Teq = 1129 [149] K  
Rp = 4.00 [14.93] Re  
a = 0.1279 [0.0417] AU  
Ag = 152.14 [1134.25] [0.13σ]  
Teff = 6133 [11406] K [0.44σ]

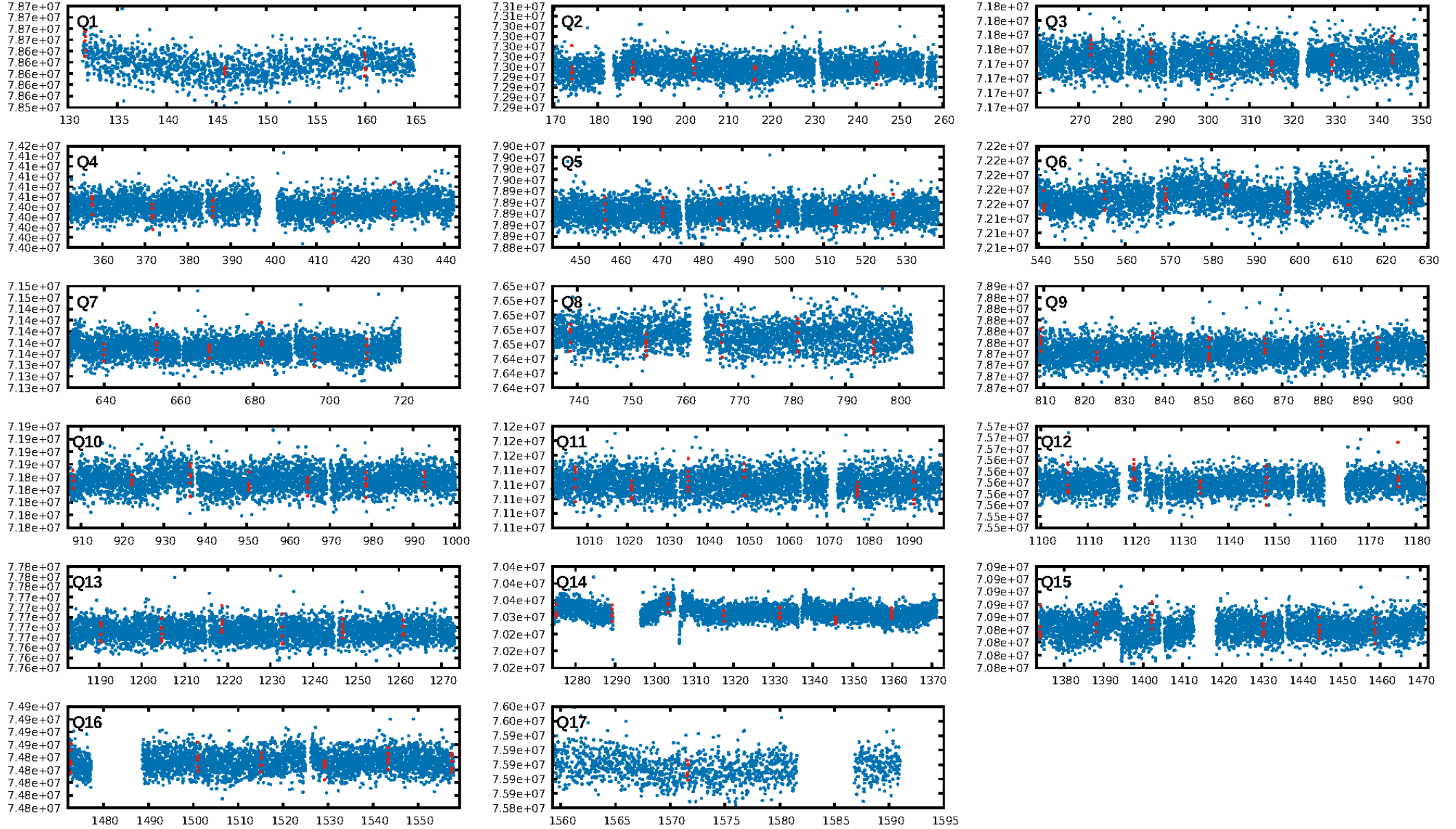
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.95σ]  
LongPeriod-sig: 100.0% [107.95σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 58.2%  
Bootstrap-pfa: 3.16e-13  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: 0.6325  
Centroid-sig: 0.0%  
Centroid-so: 1.365 arcsec [2.62σ]  
OotOffset-rm: 1.868 arcsec [1.21σ]  
OotOffset-st: 1/3/2/3 [9]  
KicOffset-rm: 1.839 arcsec [1.16σ]  
KicOffset-st: 1/3/2/3 [9]  
DiffImageQuality-fgm: 0.00 [0/9]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:46 Z

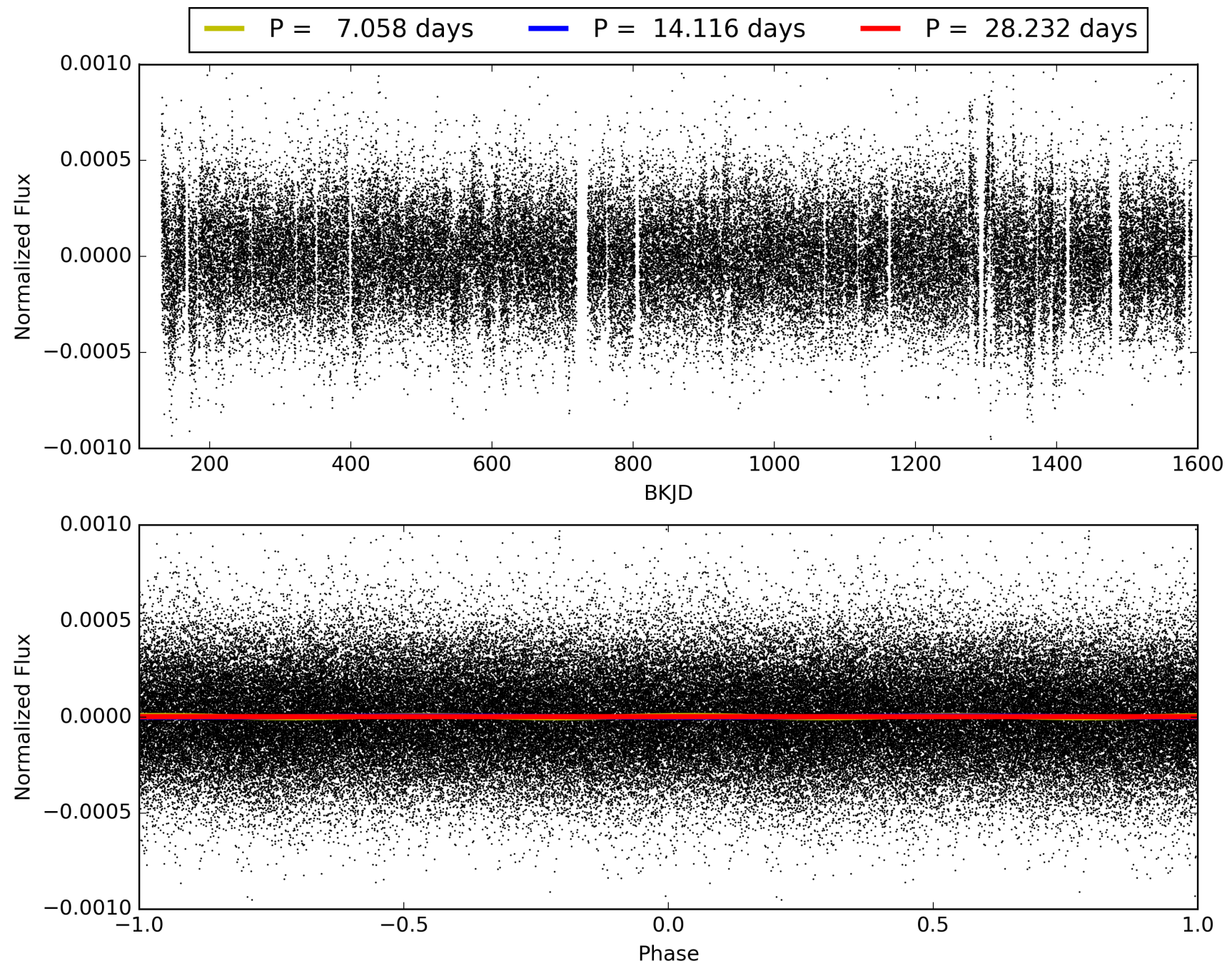
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005989921-03, PDC Light Curves



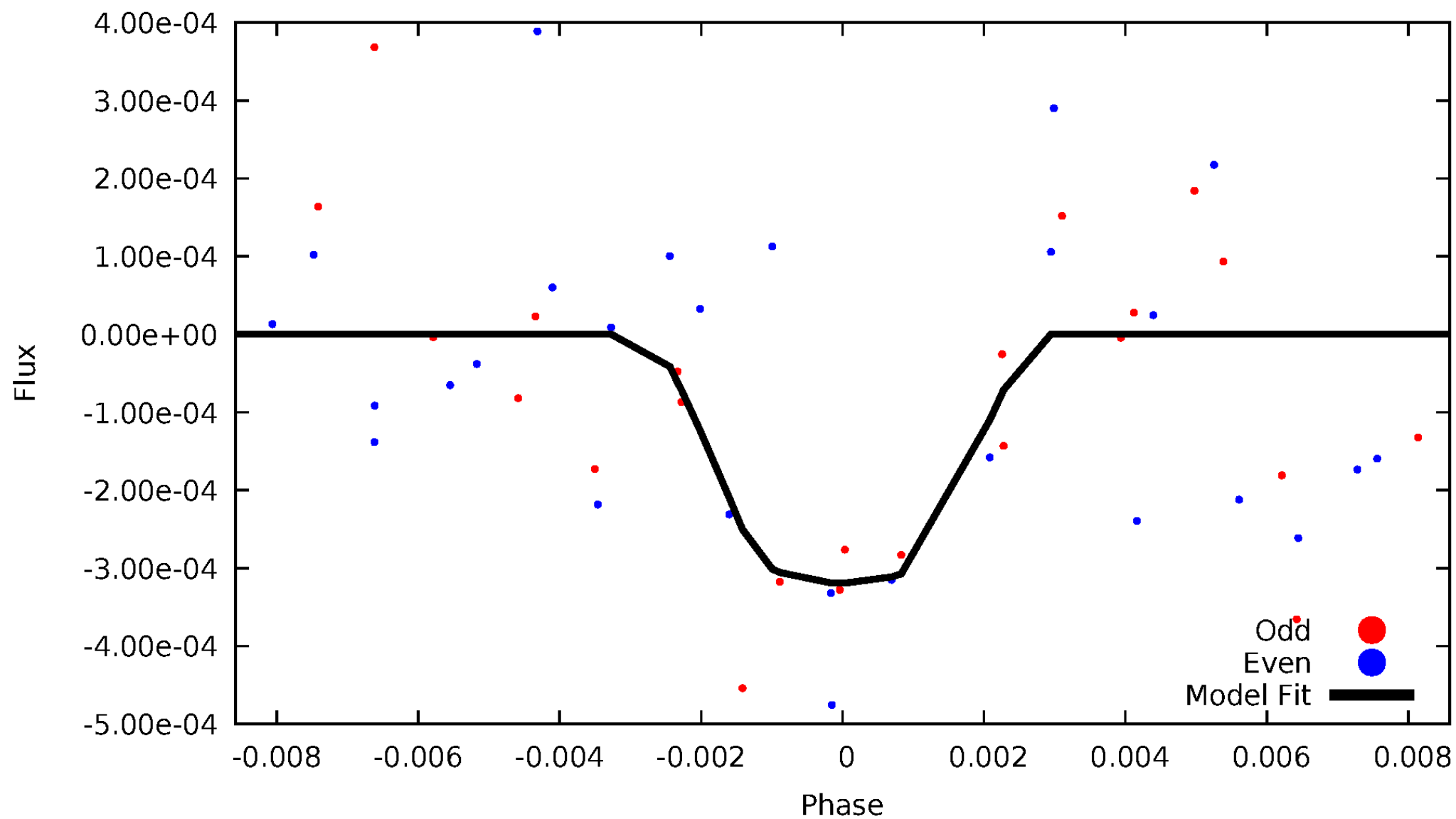


TCE 005989921-03



# DV Odd/Even

TCE 005989921-03



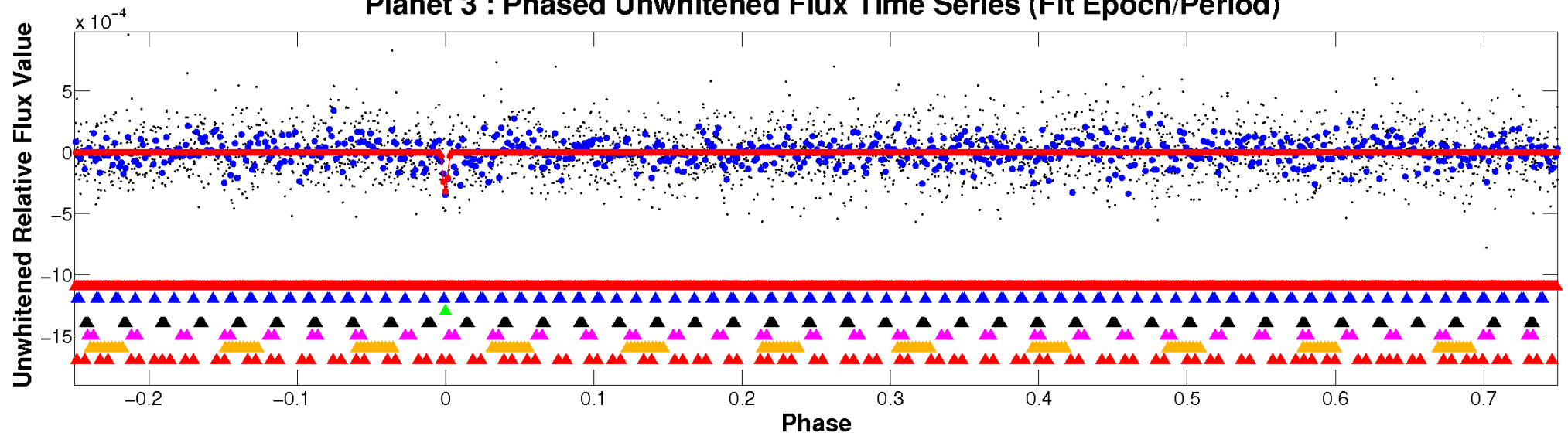


ALT Odd/Even

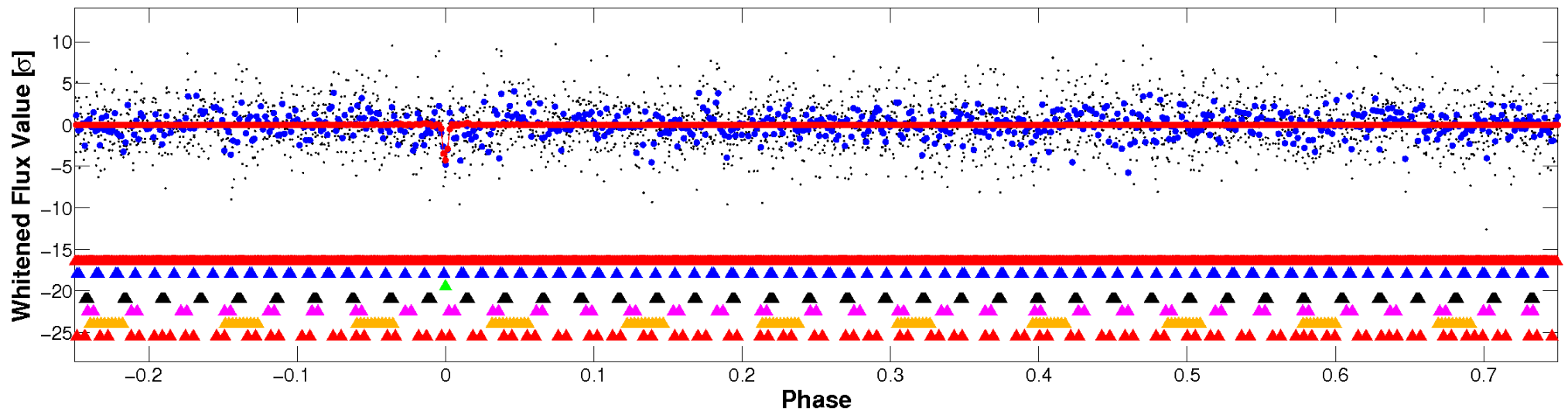
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

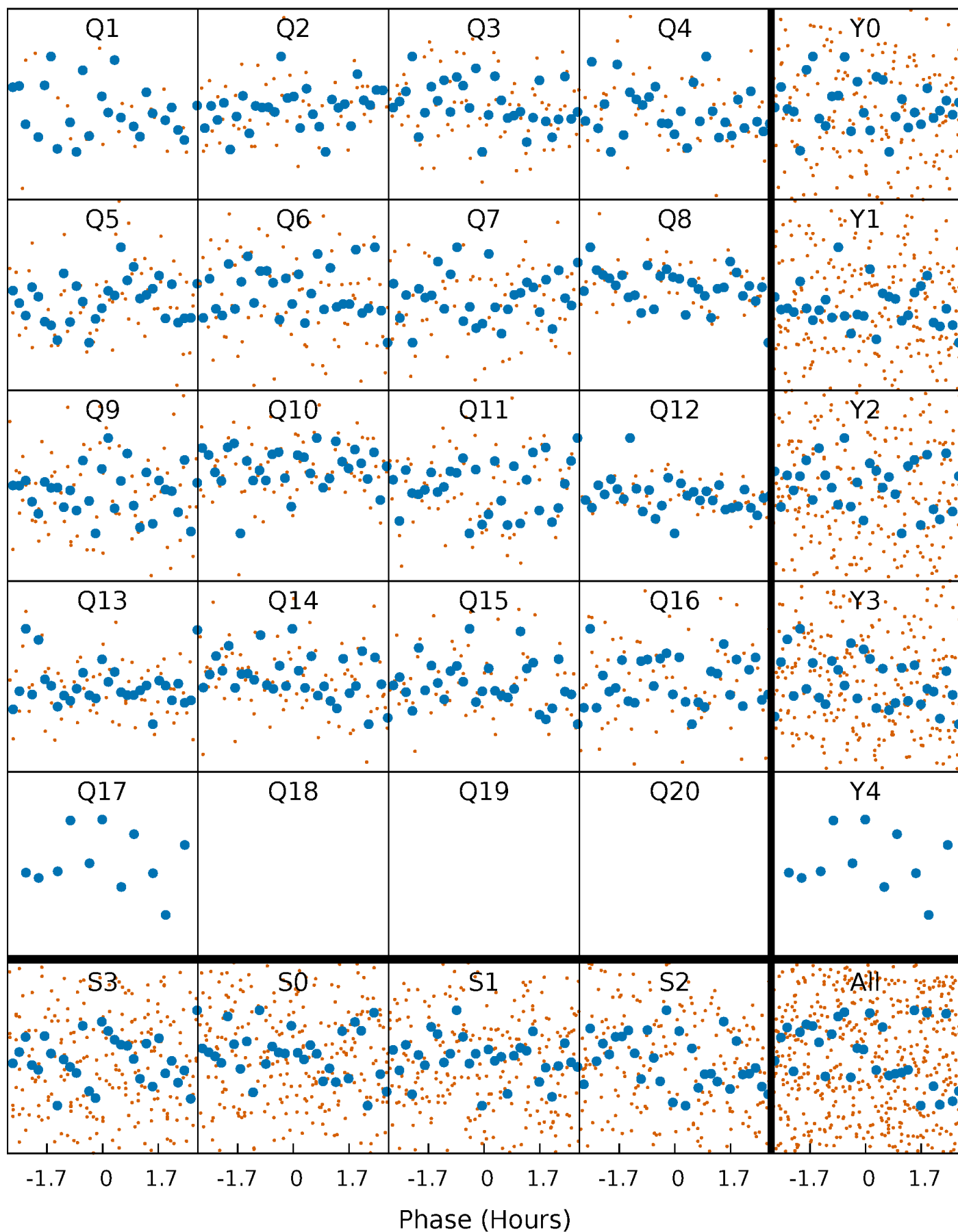


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

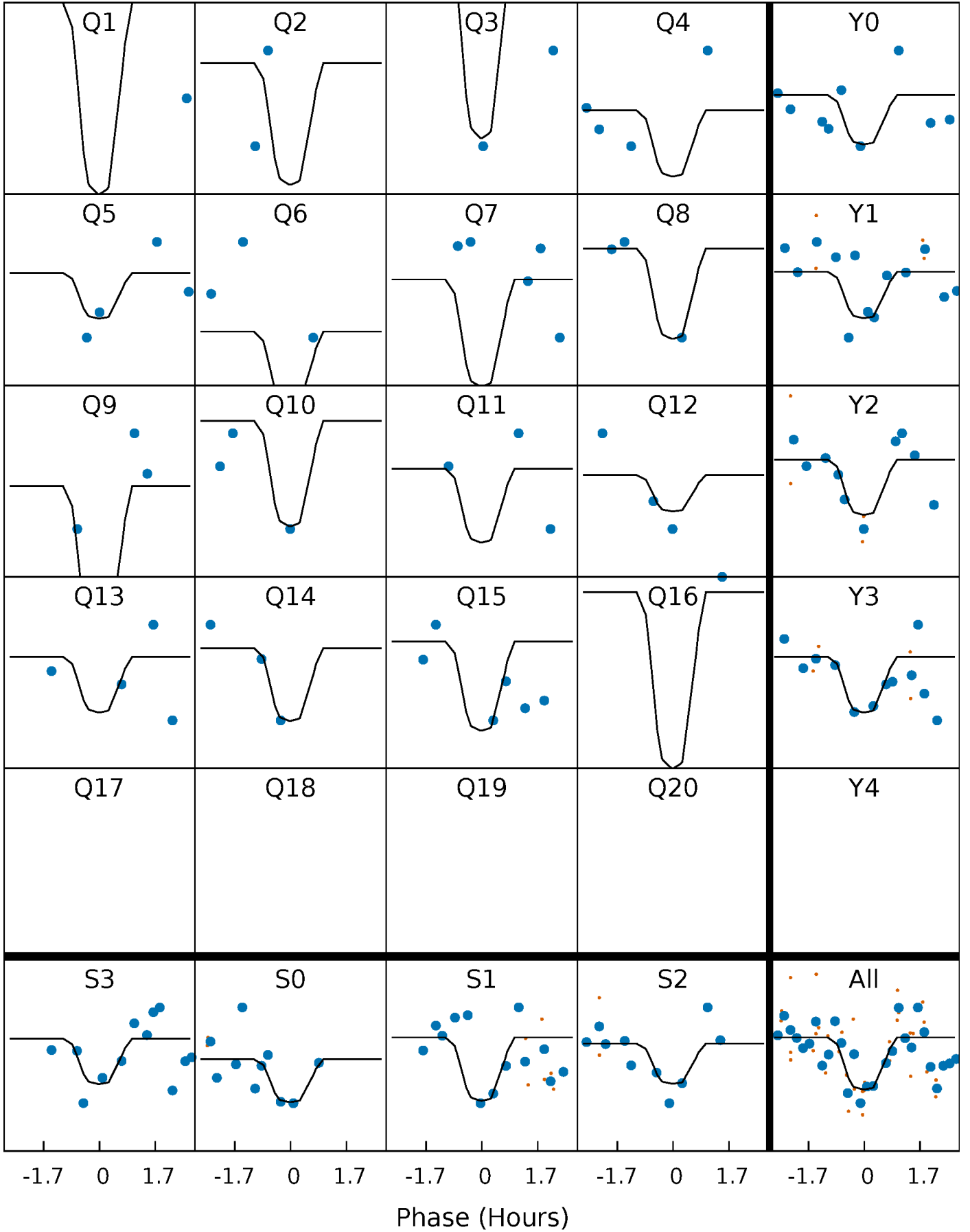
TCE 005989921-03 P= 14.116147 Days  $T_0=131.740411$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 005989921-03   P= 14.116147 Days    $T_0=131.740411$  (BKJD)

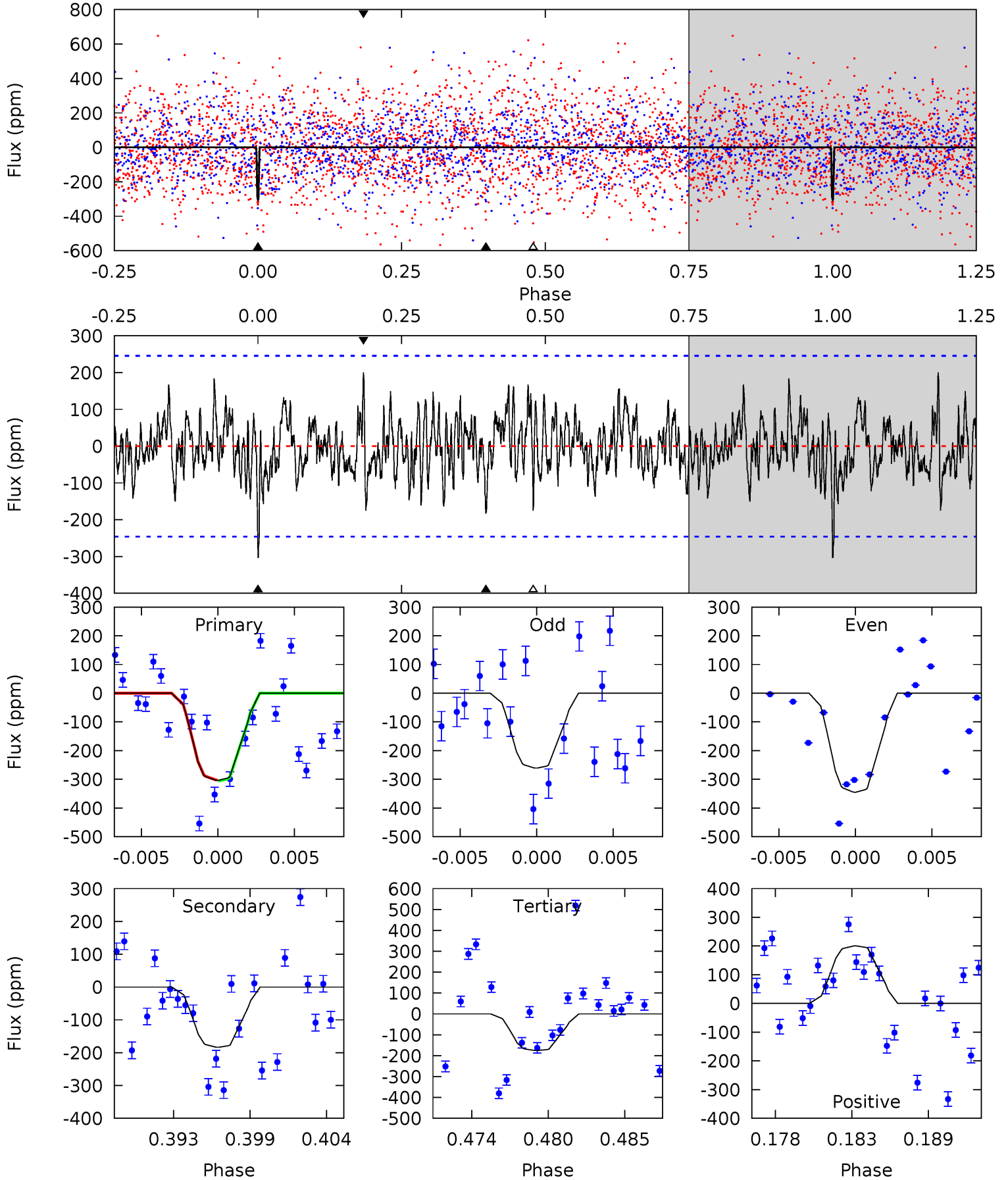


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005989921-03, P = 14.116147 Days, E = 131.740411 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.35	3.84	3.67	4.19	5.14	2.78	1.34	2.68	2.16	0.17	-0.36	0.87	0.81	0.40	0.04



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005989921

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-183 \pm 48$	$11.19^{+11.05}_{-7.79}$	$1564^{+124}_{-149}$	$3666^{+2147}_{-755}$	$13^{+129}_{-9}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

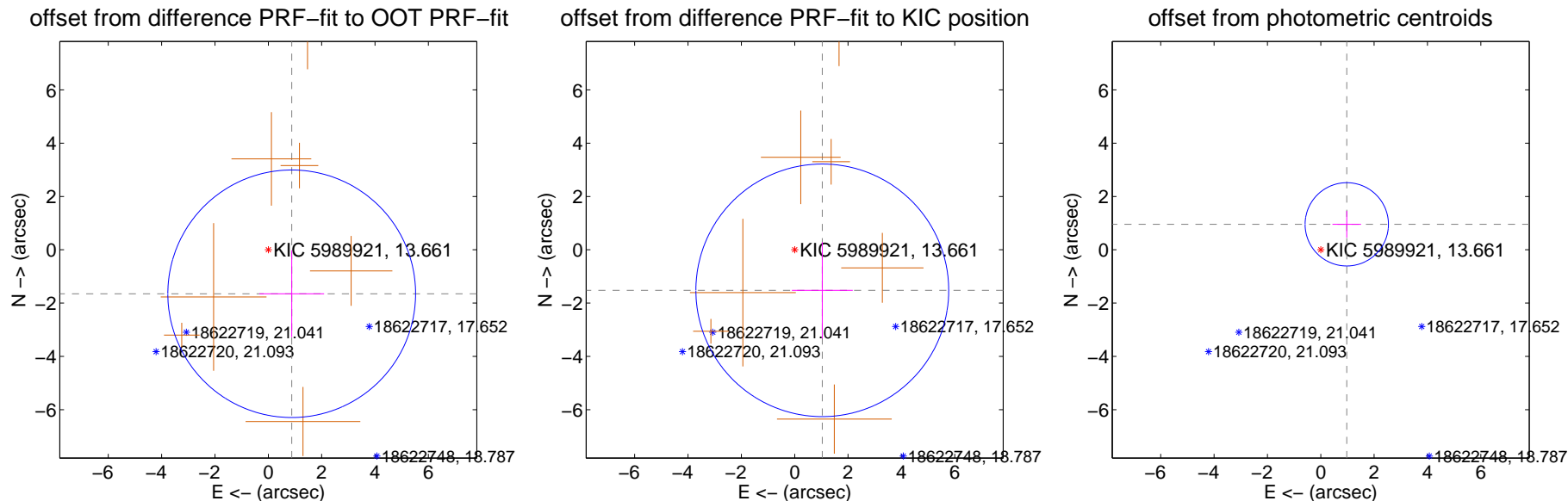
## DV Centroid Data

Supplemental centroid analysis for 005989921-03. Kepler magnitude: 13.66. Transit SNR 13.00

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

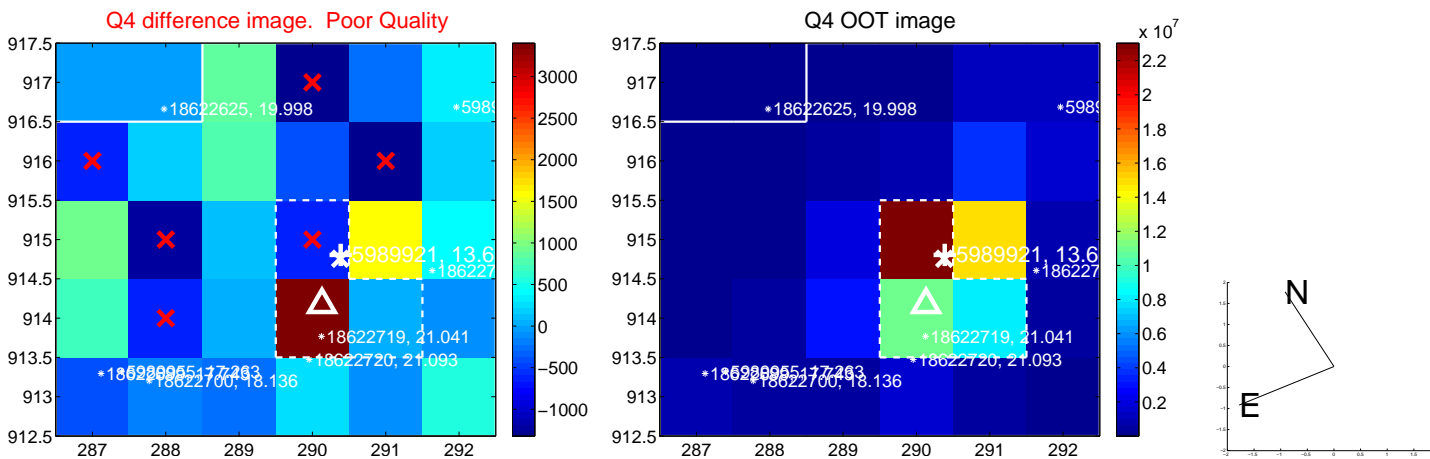
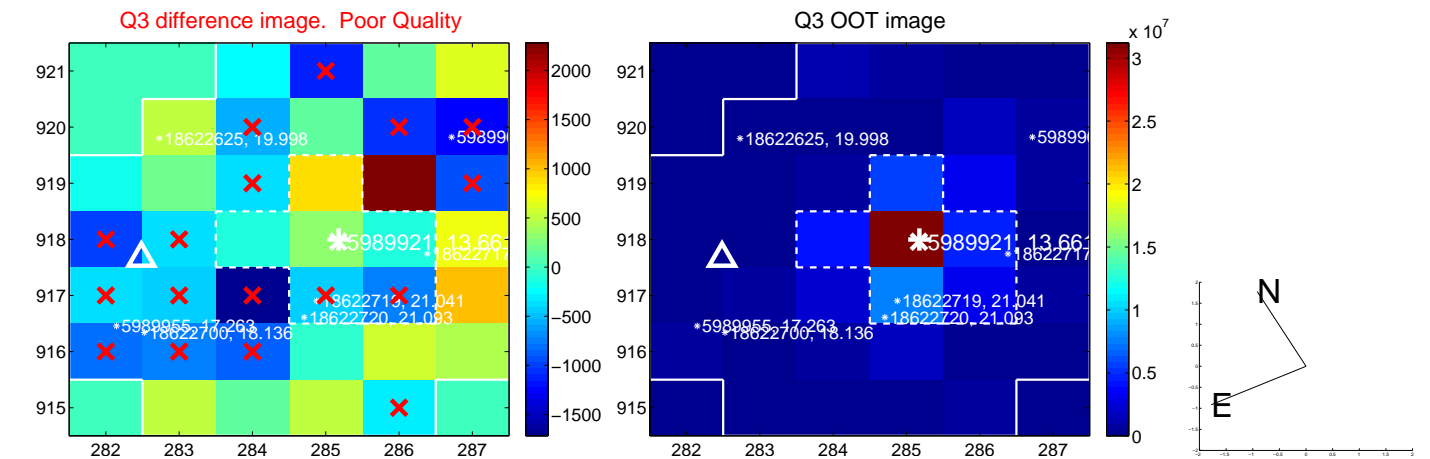
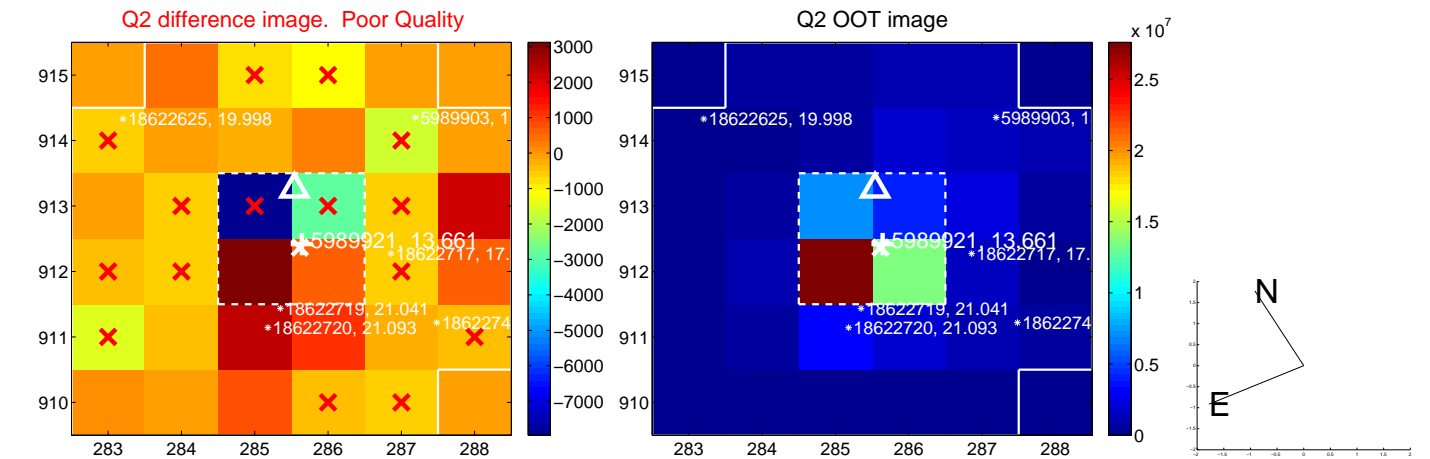
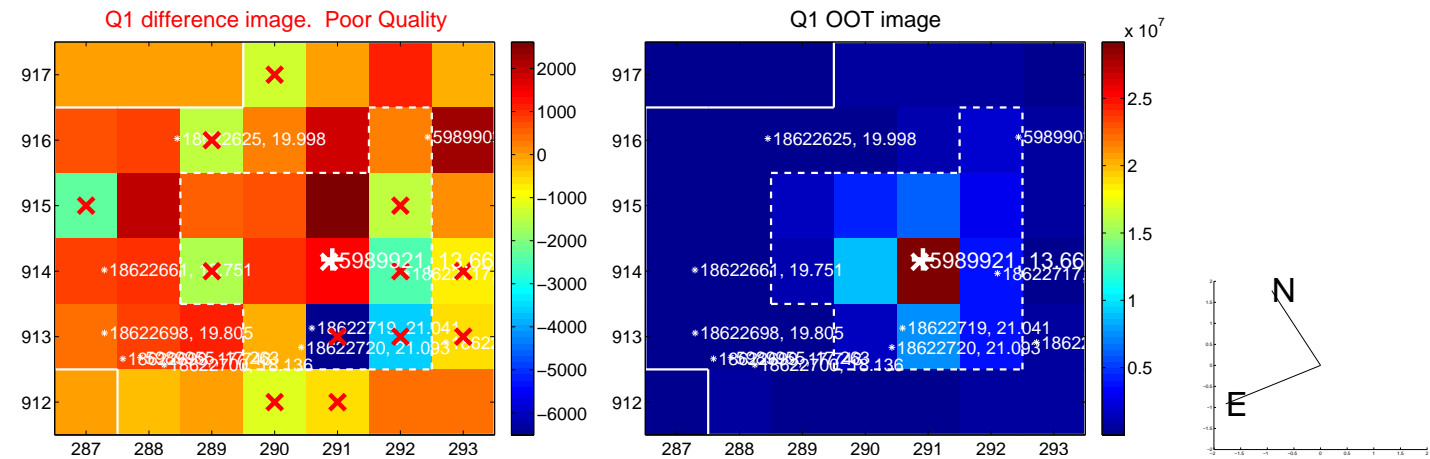
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.868 \pm 1.548$	1.21	$-0.877 \pm 1.214$	$-1.650 \pm 1.630$
PRF-fit source offset from KIC position	$1.839 \pm 1.580$	1.16	$-1.034 \pm 1.141$	$-1.520 \pm 1.810$
photometric centroid source offset	$1.36 \pm 0.52$	2.62	$-0.97 \pm 0.54$	$0.96 \pm 0.50$



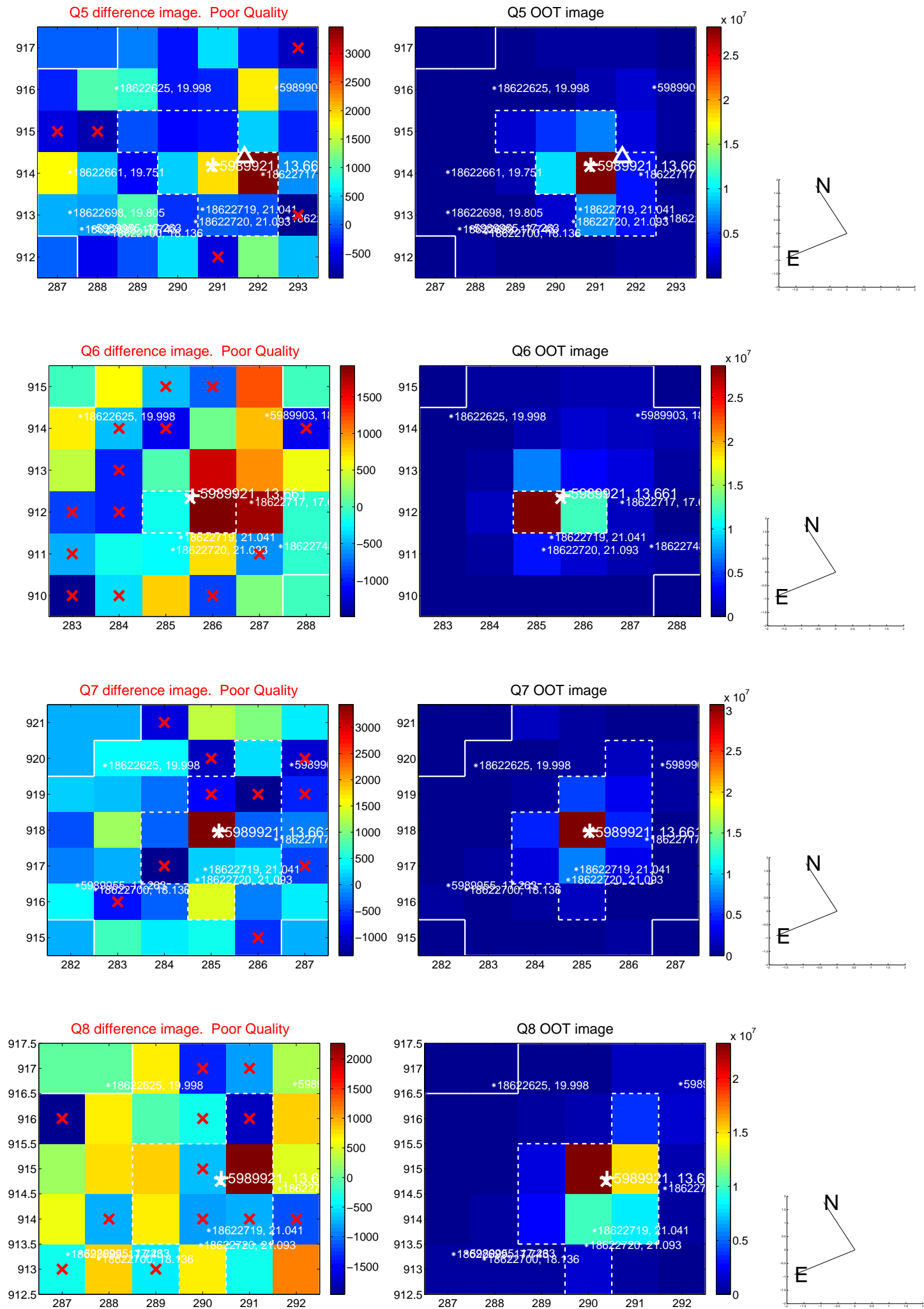
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



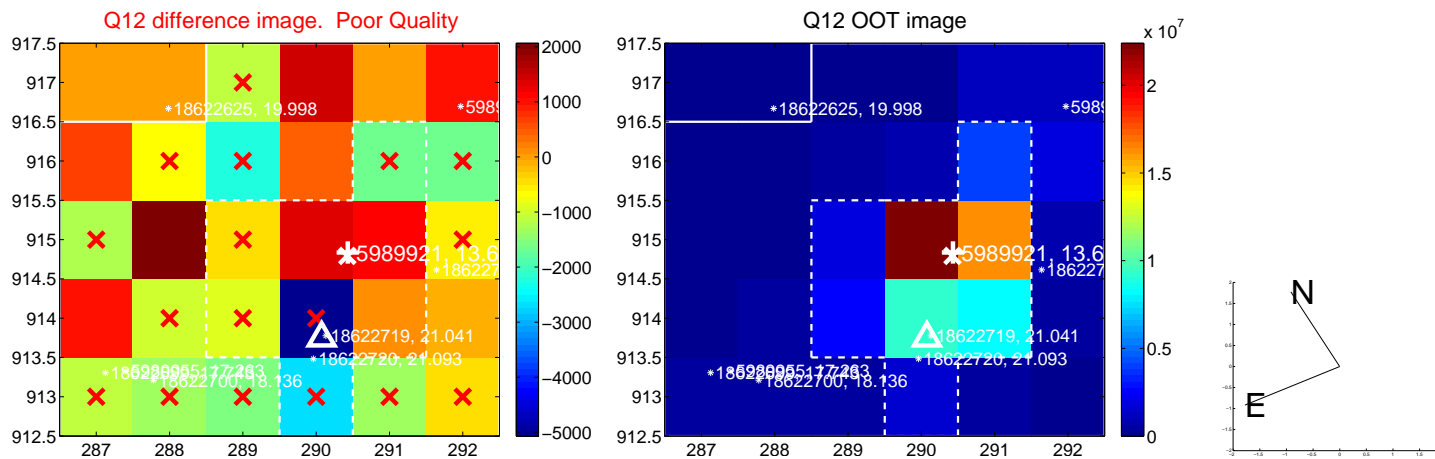
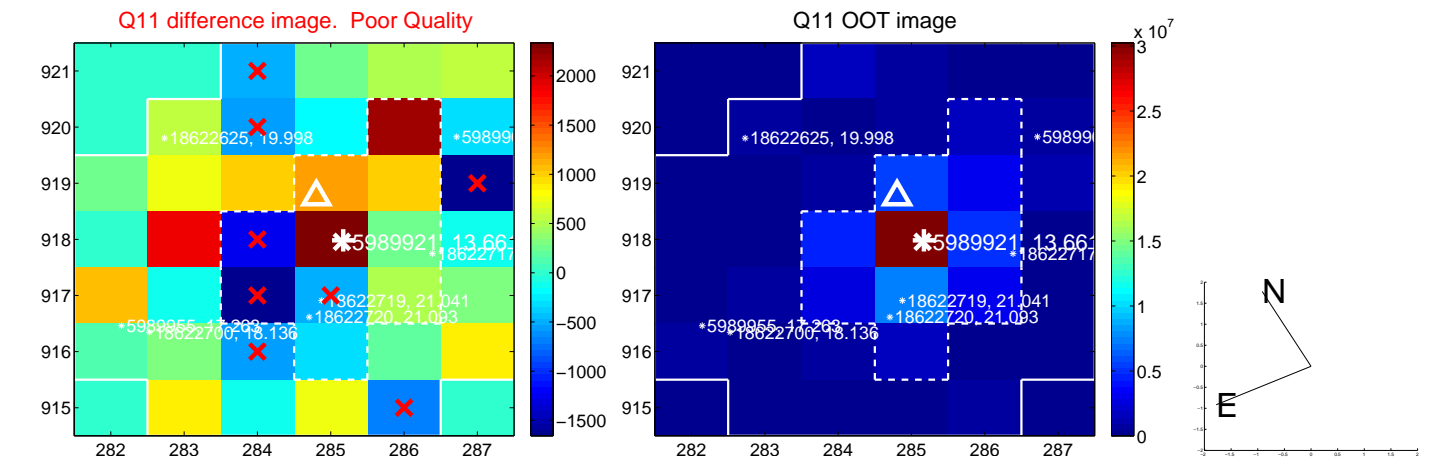
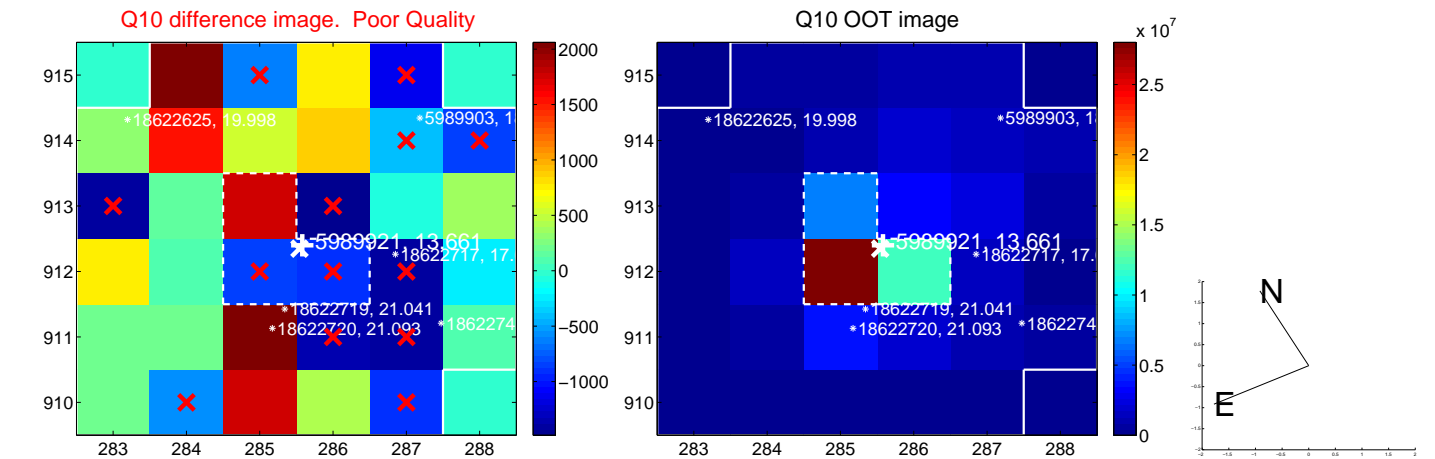
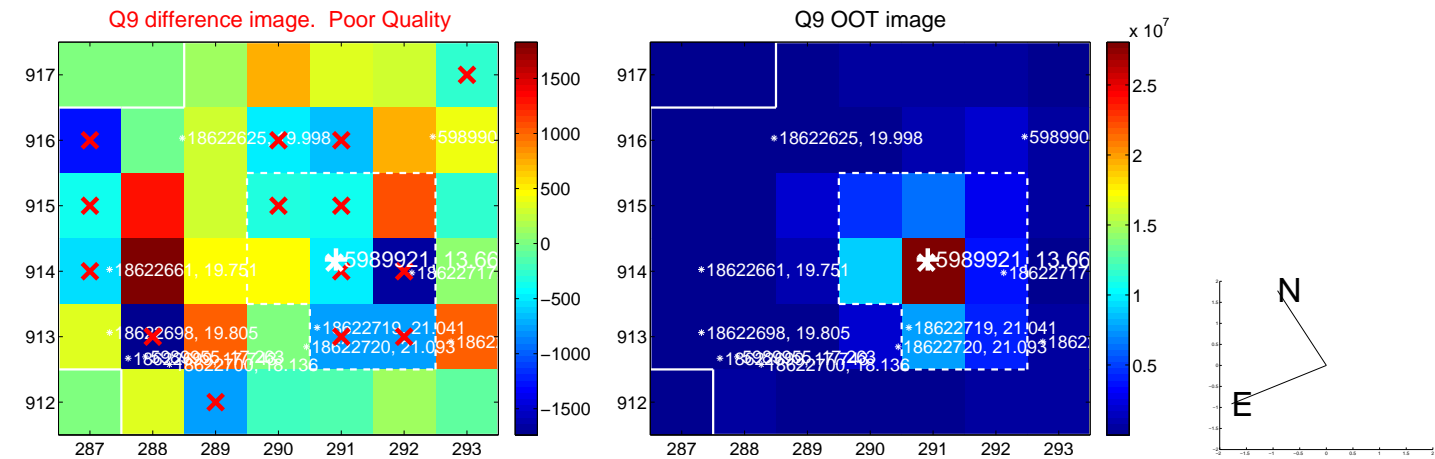
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



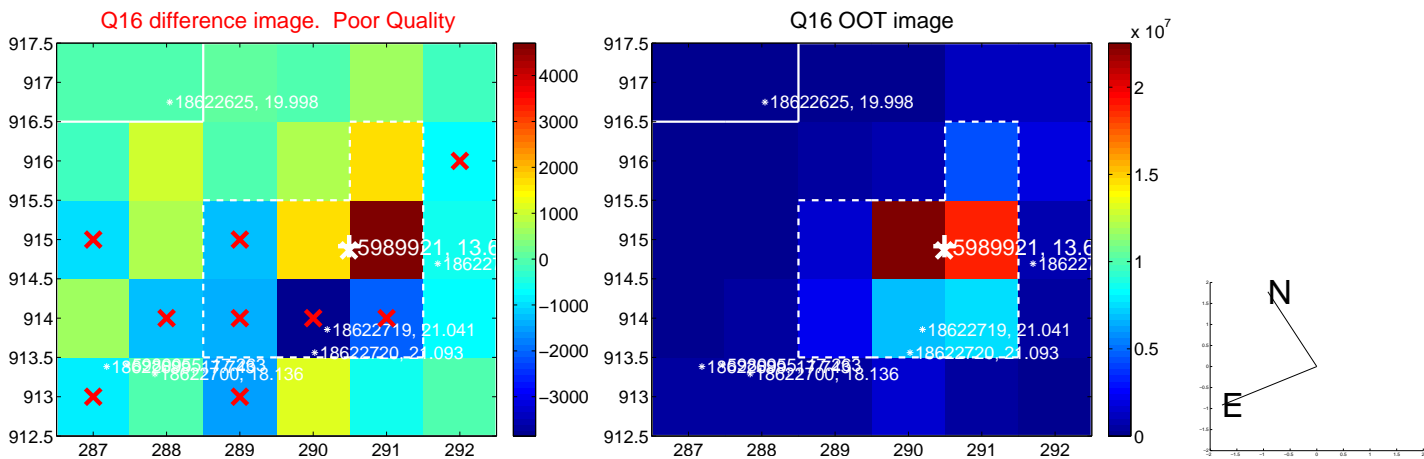
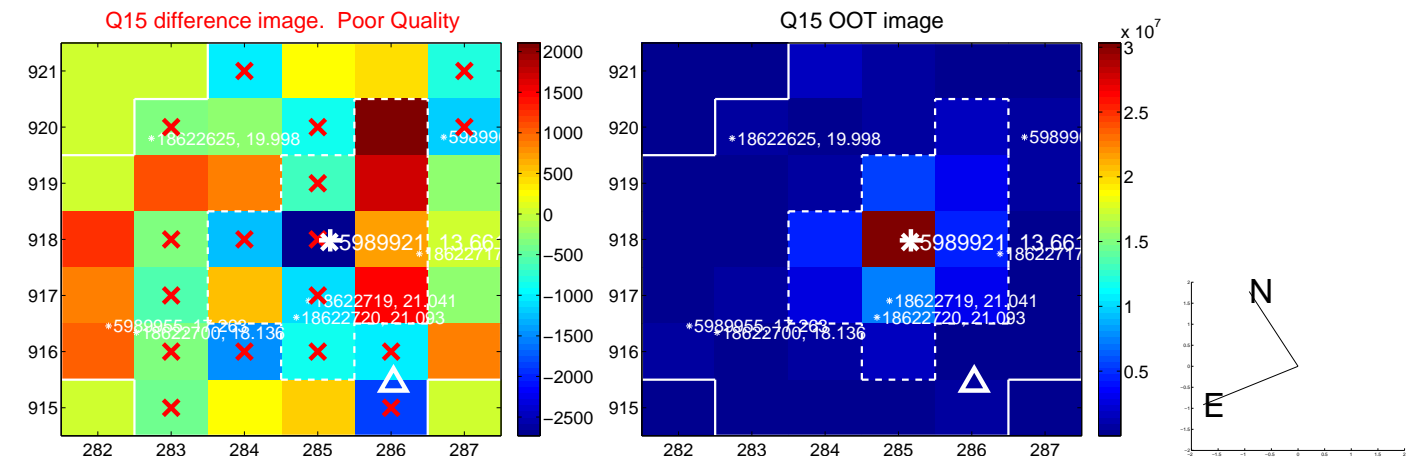
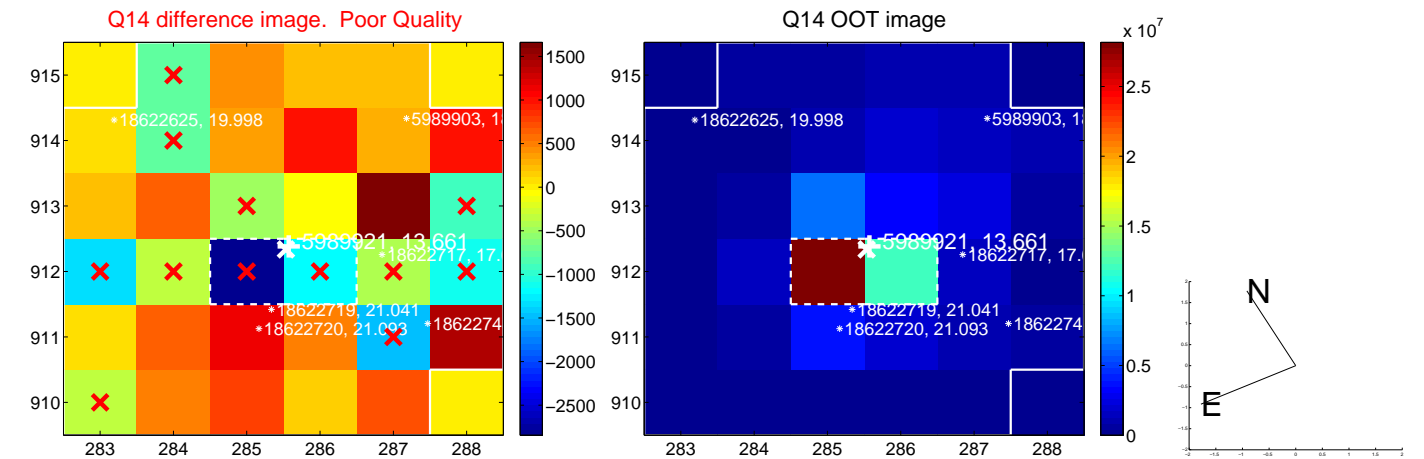
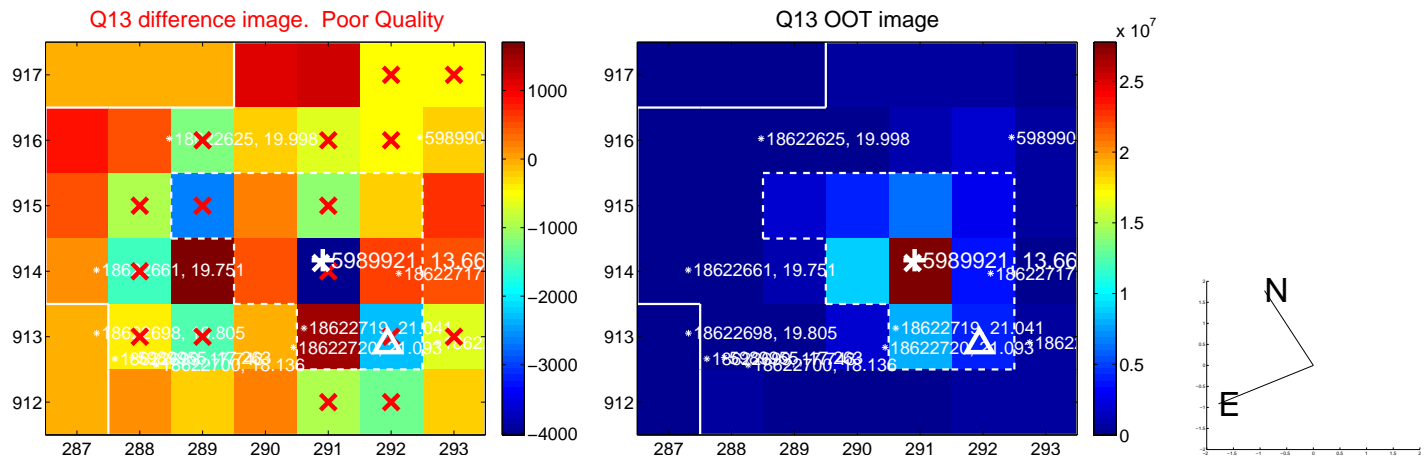
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



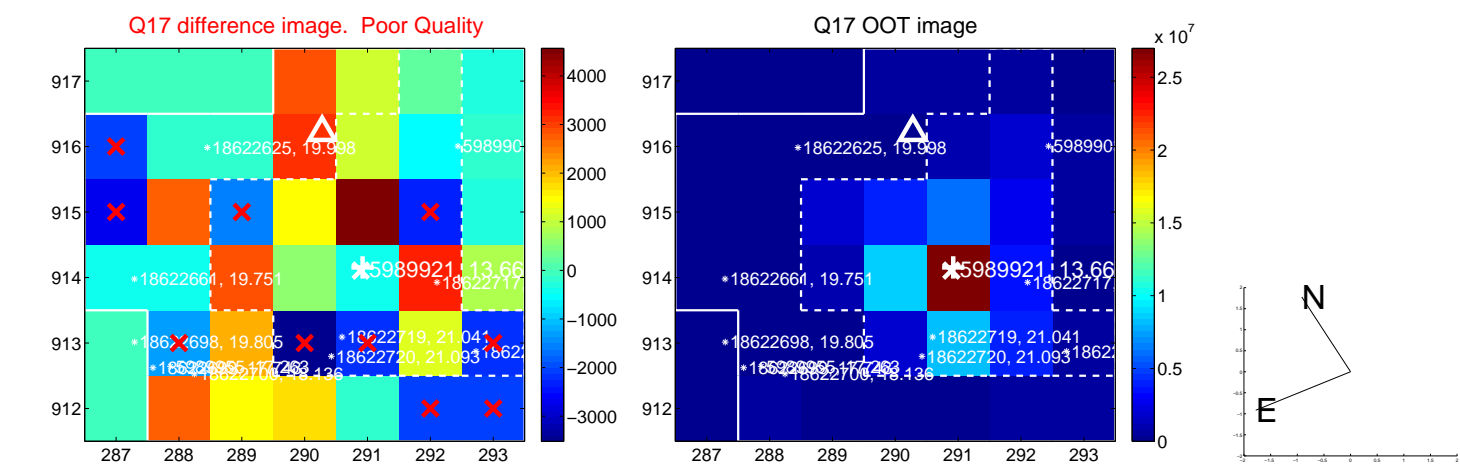
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



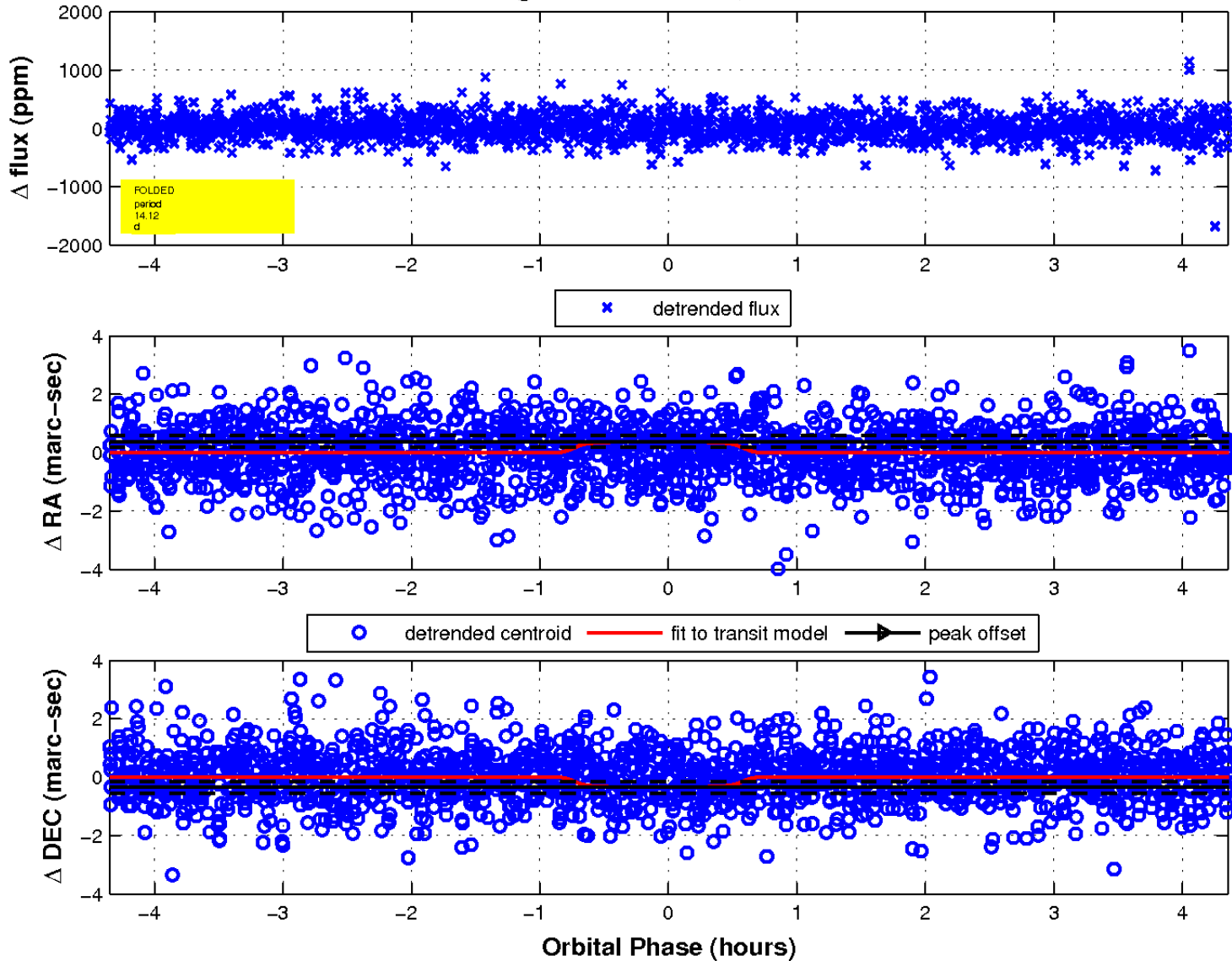
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



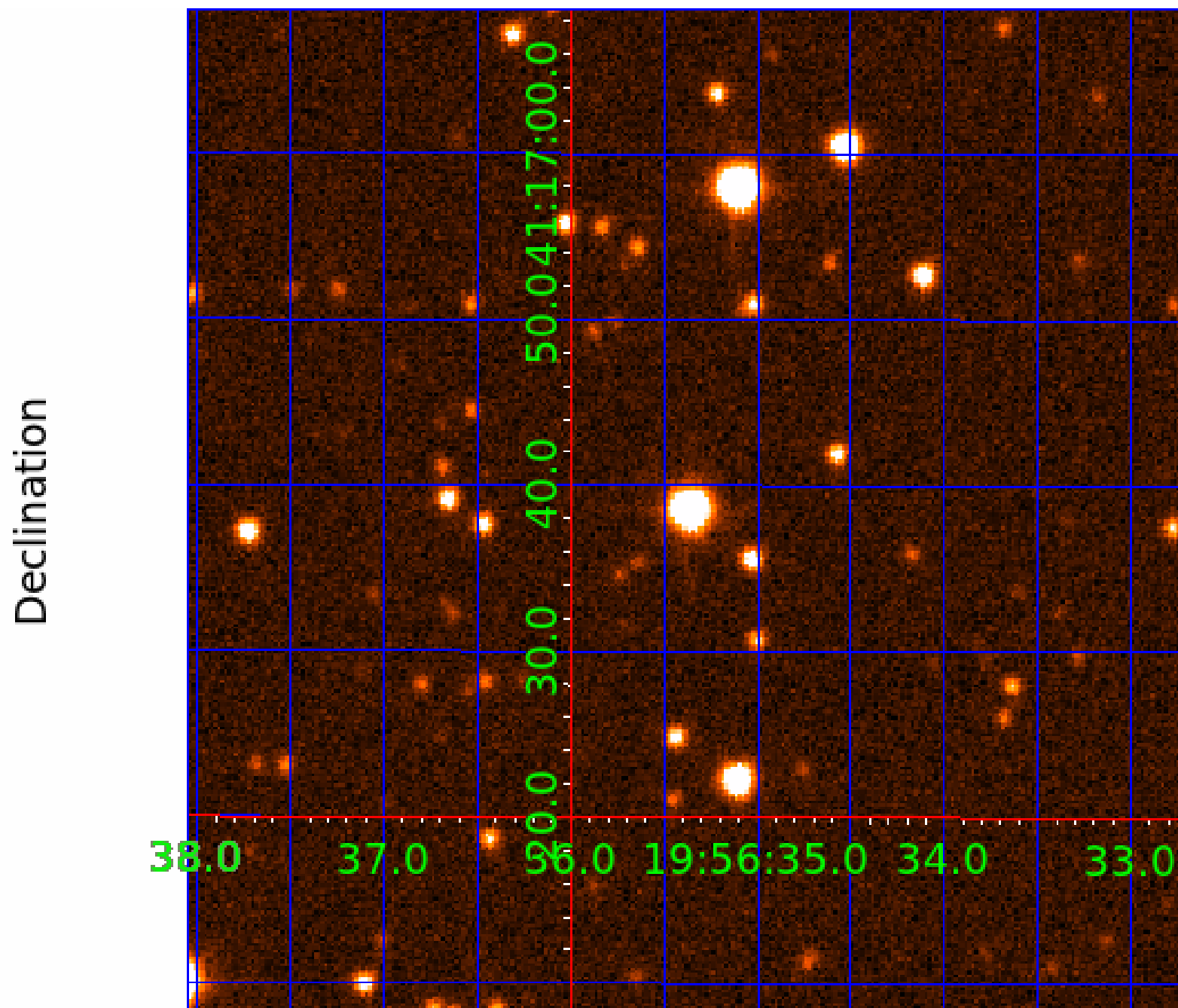
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 3 of 7



UKIRT Image





# KIC 005989921

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005989921-01	OBS	No	0.597713	131.683993	5.9	4.387	8.3	3.0	1.94	6583	0.47	26084.78
005989921-02	OBS	No	11.732653	142.738402	67.7	5.849	10.7	6.8	1.94	6583	1.62	492.62
005989921-03	OBS	No	14.116147	131.740411	319.5	1.454	12.4	13.0	1.94	6583	4.00	384.97
005989921-04	OBS	No	5.791073	131.605569	143.7	2.078	11.0	12.0	1.94	6583	2.48	1262.89
005989921-05	OBS	No	22.241919	139.123933	337.0	1.072	11.3	13.6	1.94	6583	3.60	209.97
005989921-06	OBS	No	12.829749	135.098981	431.7	0.700	10.9	12.3	1.94	6583	4.35	437.27
005989921-07	OBS	No	13.303210	143.085521	229.7	1.624	7.2	9.1	1.94	6583	3.36	416.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005989921-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
005989921-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005989921-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005989921-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS— HALO_GHOST
005989921-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV

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

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

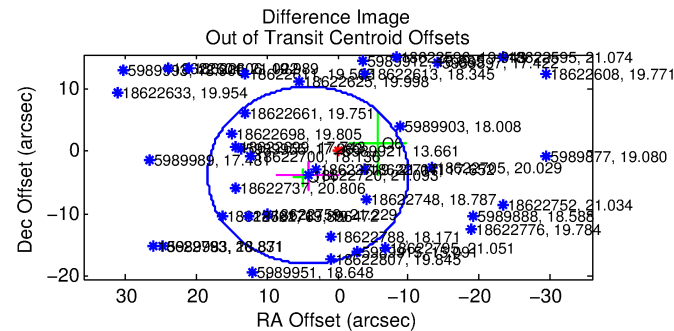
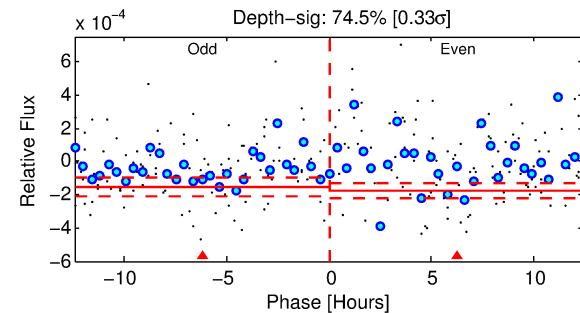
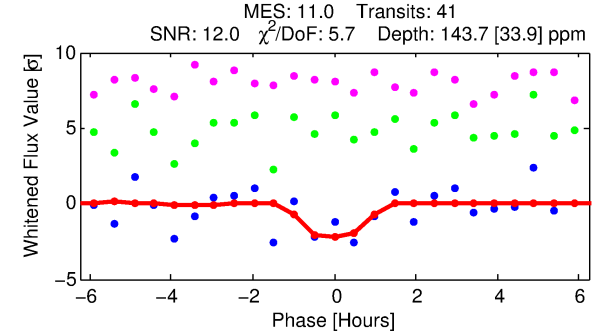
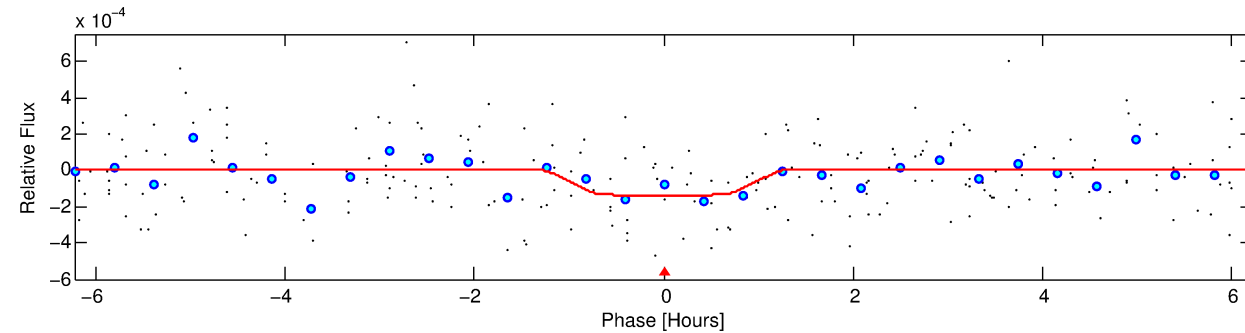
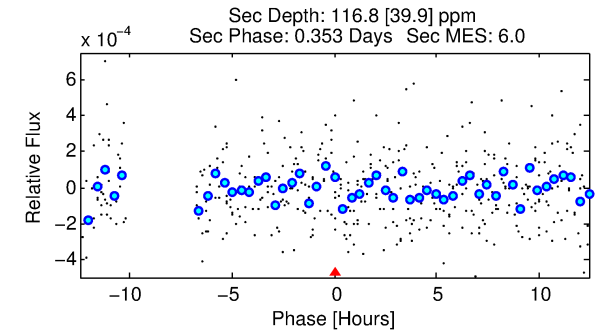
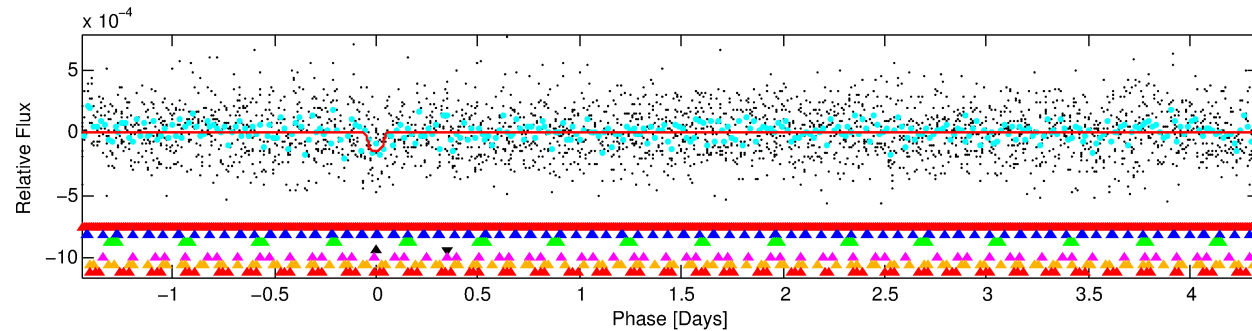
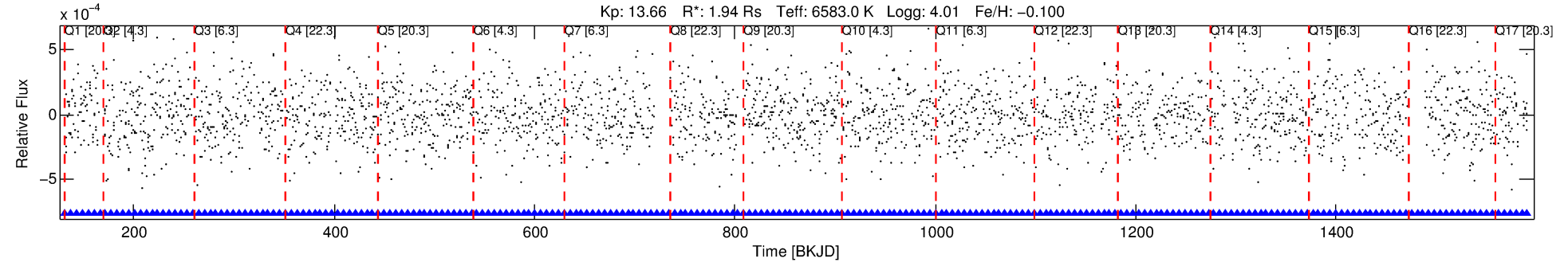
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005989921-04

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 4 of 7 Period: 5.791 d



## DV Fit Results:

Period = 5.79107 [0.00007] d  
Epoch = 131.6056 [0.0097] BKJD  
Rp/R\* = 0.0118 [0.0172]  
a/R\* = 15.75 [124.70]  
b = 0.69 [6.13]  
Seff = 1262.89 [664.49]  
Teq = 1520 [200] K  
Rp = 2.48 [3.74] Re  
a = 0.0706 [0.0230] AU  
Ag = 52.07 [156.11] [0.33σ]  
Teffp = 6313 [4668] K [1.03σ]

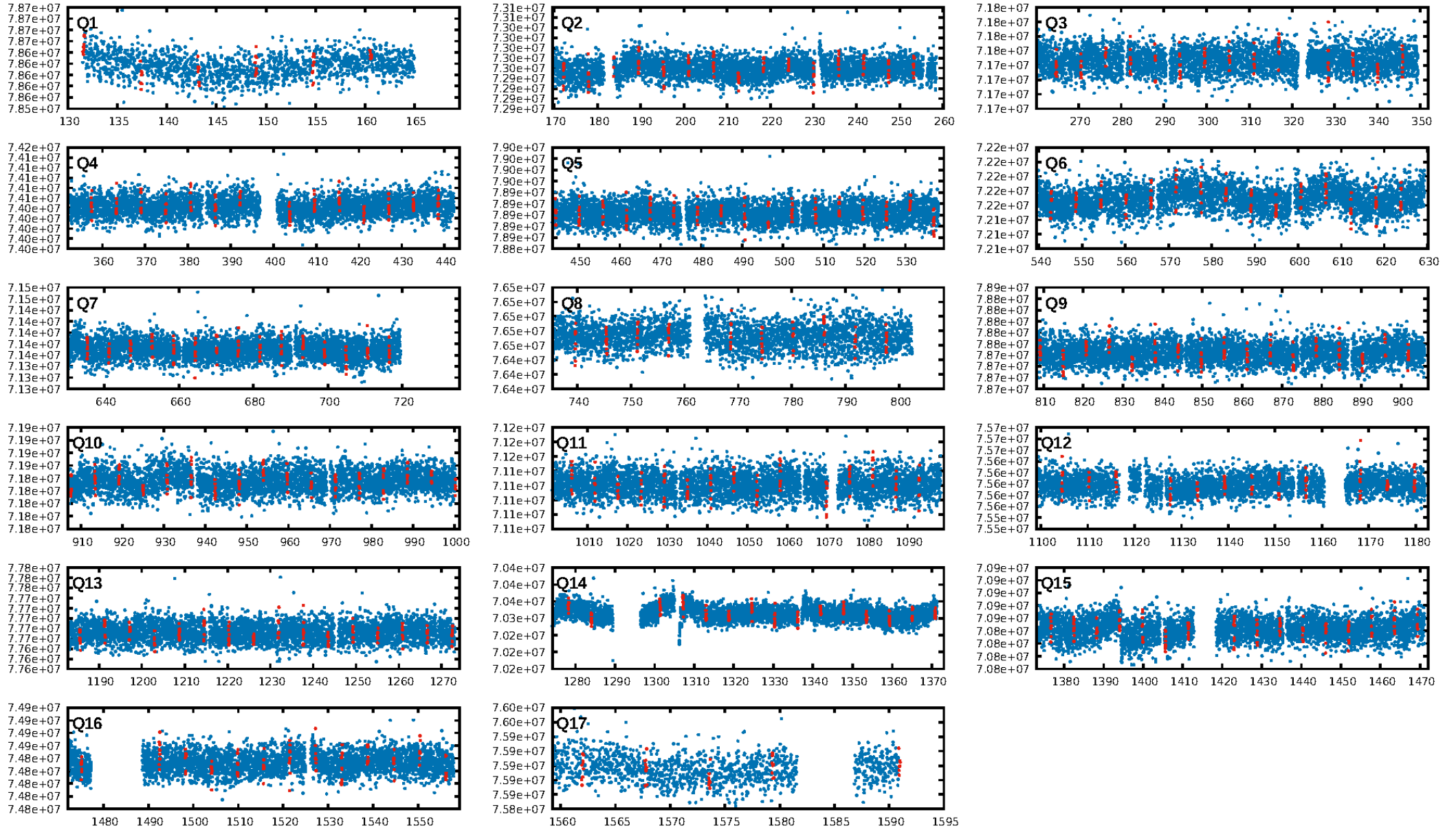
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.68σ]  
LongPeriod-sig: 100.0% [22.97σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 55.9%  
Bootstrap-pfa: 1.31e-11  
RollingBand-fgt: 1.00 [39/39]  
GhostDiagnostic-chr: 0.1488  
Centroid-sig: 0.2%  
Centroid-so: 1.831 arcsec [2.95σ]  
OotOffset-rm: 5.702 arcsec [1.21σ]  
KicOffset-rm: 5.478 arcsec [1.64σ]  
OotOffset-st: 2/0/0/0 [2]  
KicOffset-st: 2/0/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/17]

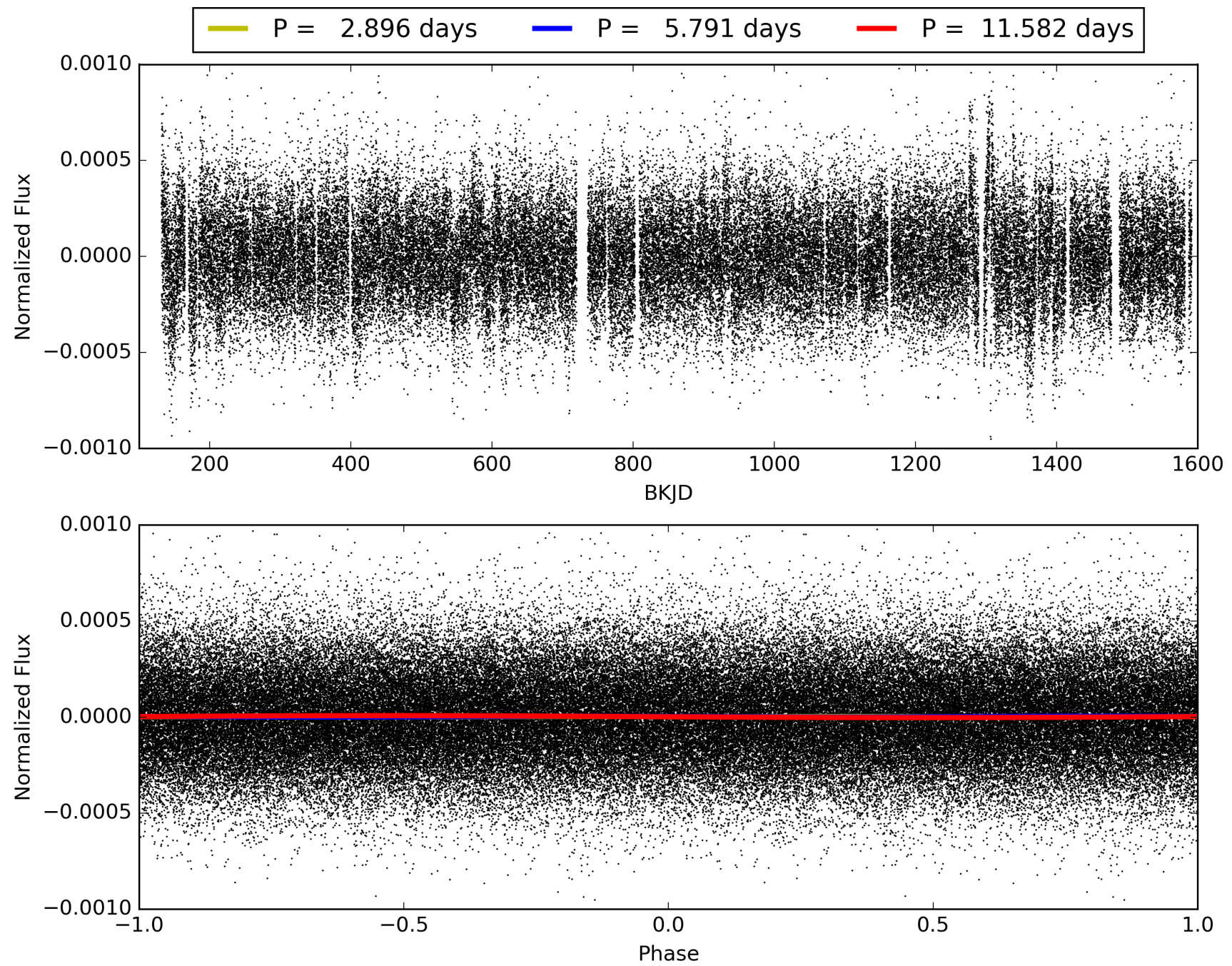
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:49 Z

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

# TCE 005989921-04, PDC Light Curves

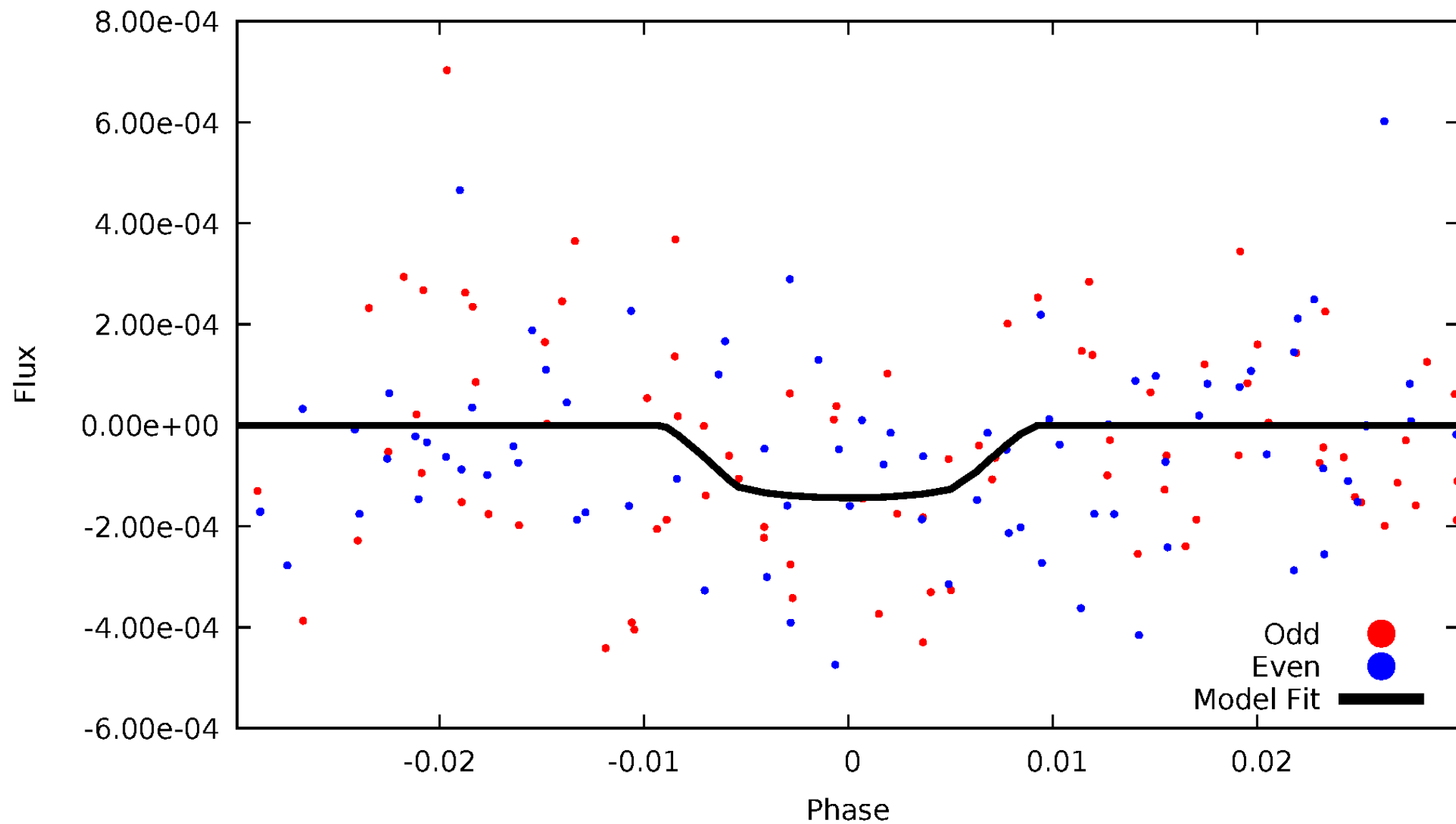


TCE 005989921-04



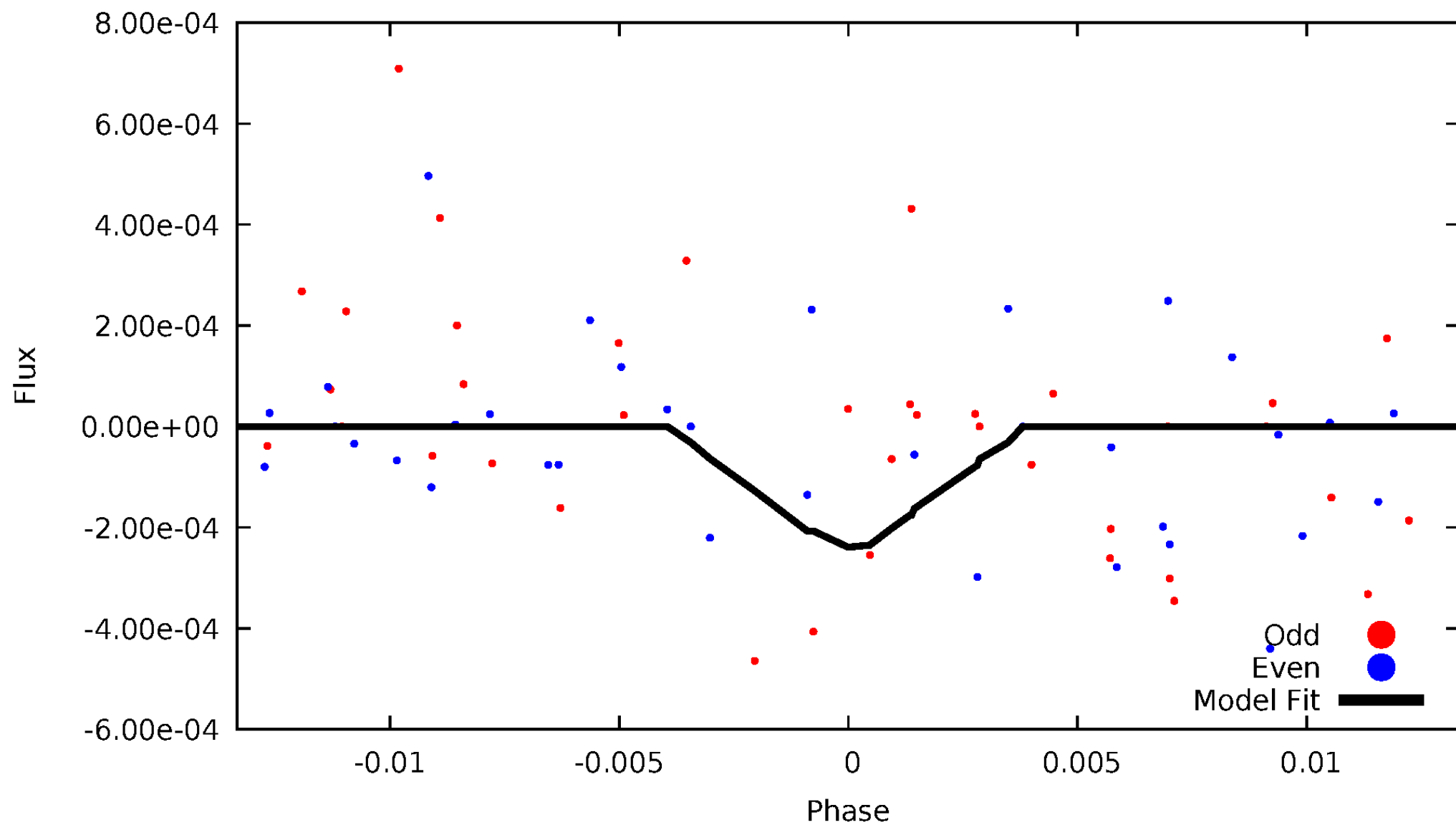
# DV Odd/Even

TCE 005989921-04



# ALT Odd/Even

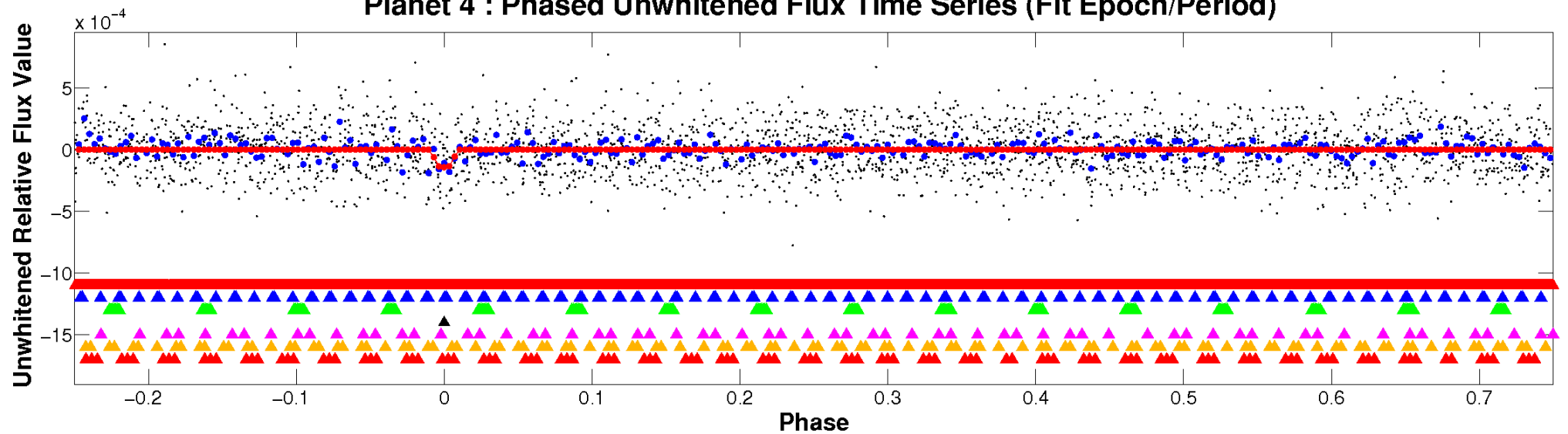
TCE 005989921-04



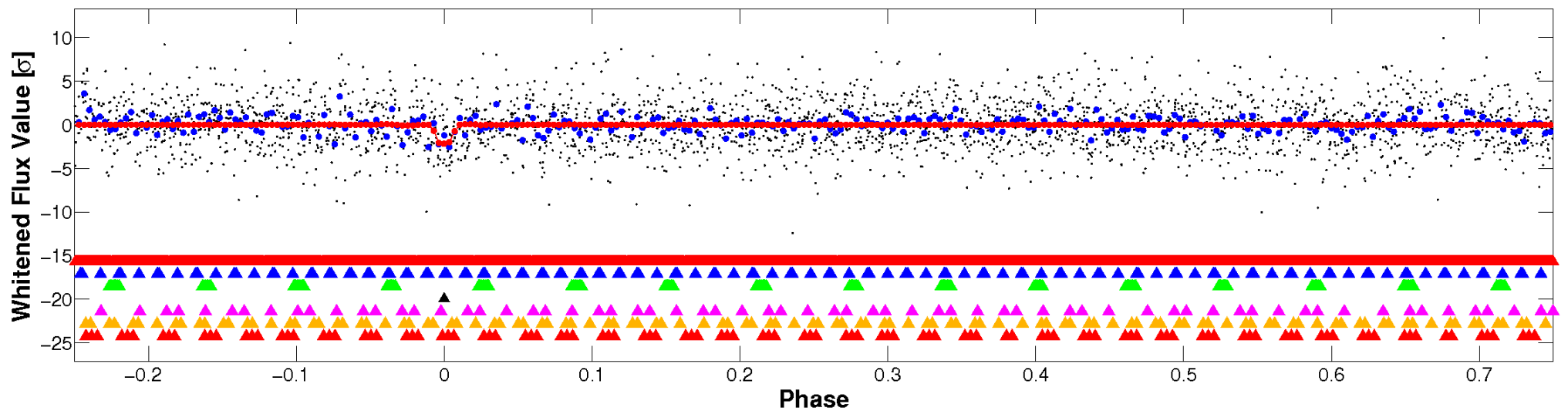


# Non-Whitened Vs. Whitened Light Curve

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

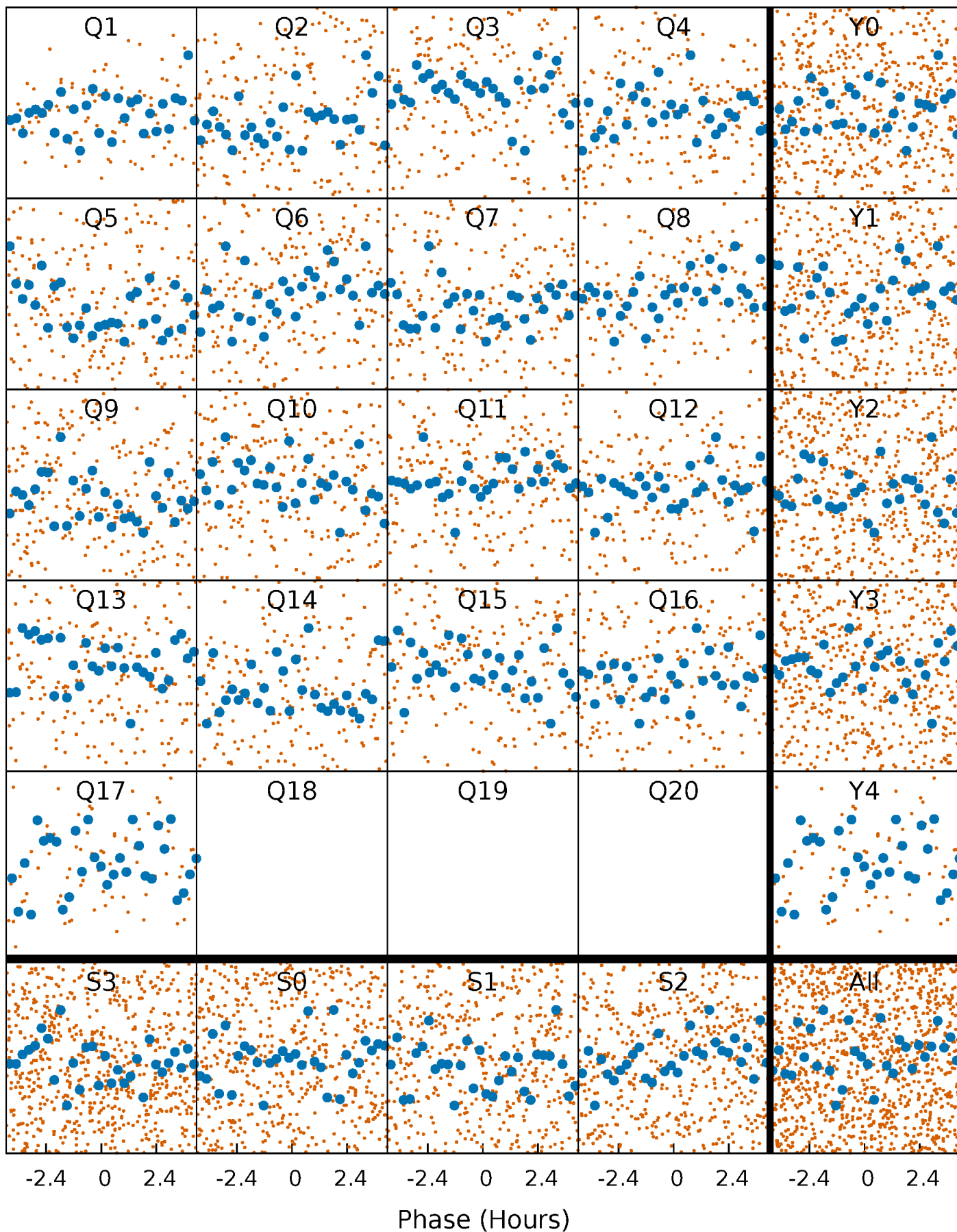


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



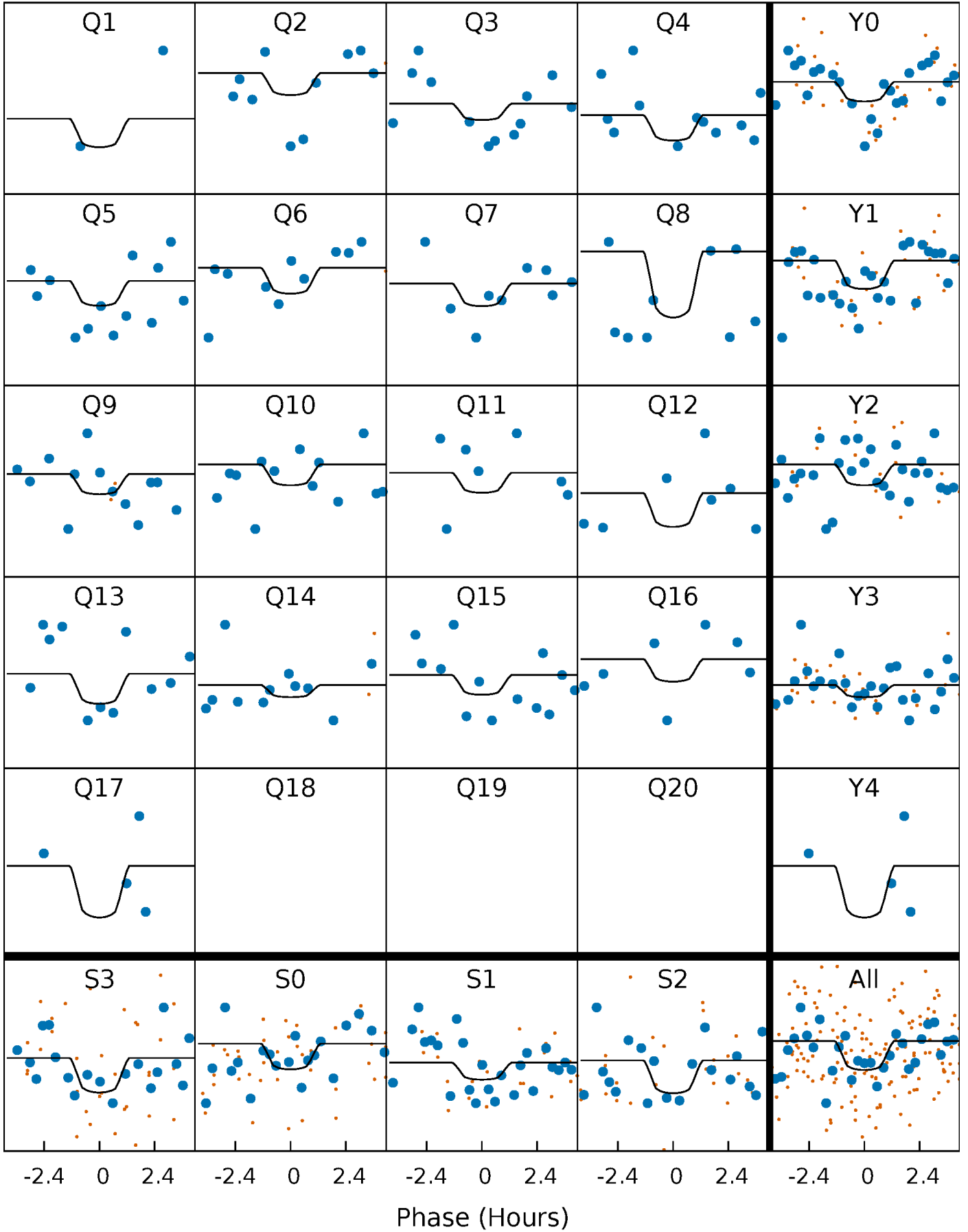
# PDC Quarter-Phased Transit Curves

TCE 005989921-04     $P = 5.791073$  Days     $T_0 = 131.605569$  (BKJD)



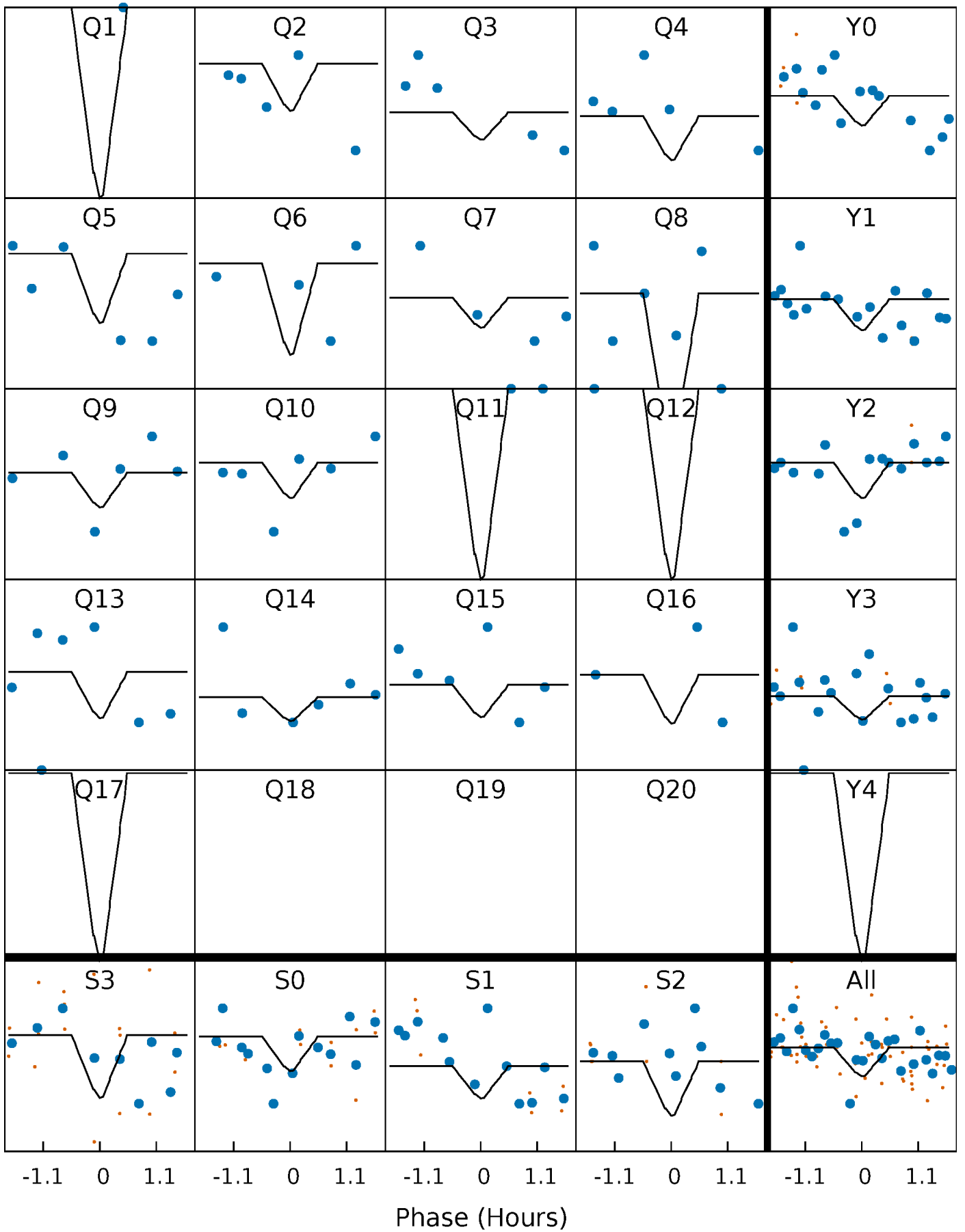
# DV Quarter-Phased Transit Curves

TCE 005989921-04   P= 5.791073 Days    $T_0=131.605569$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

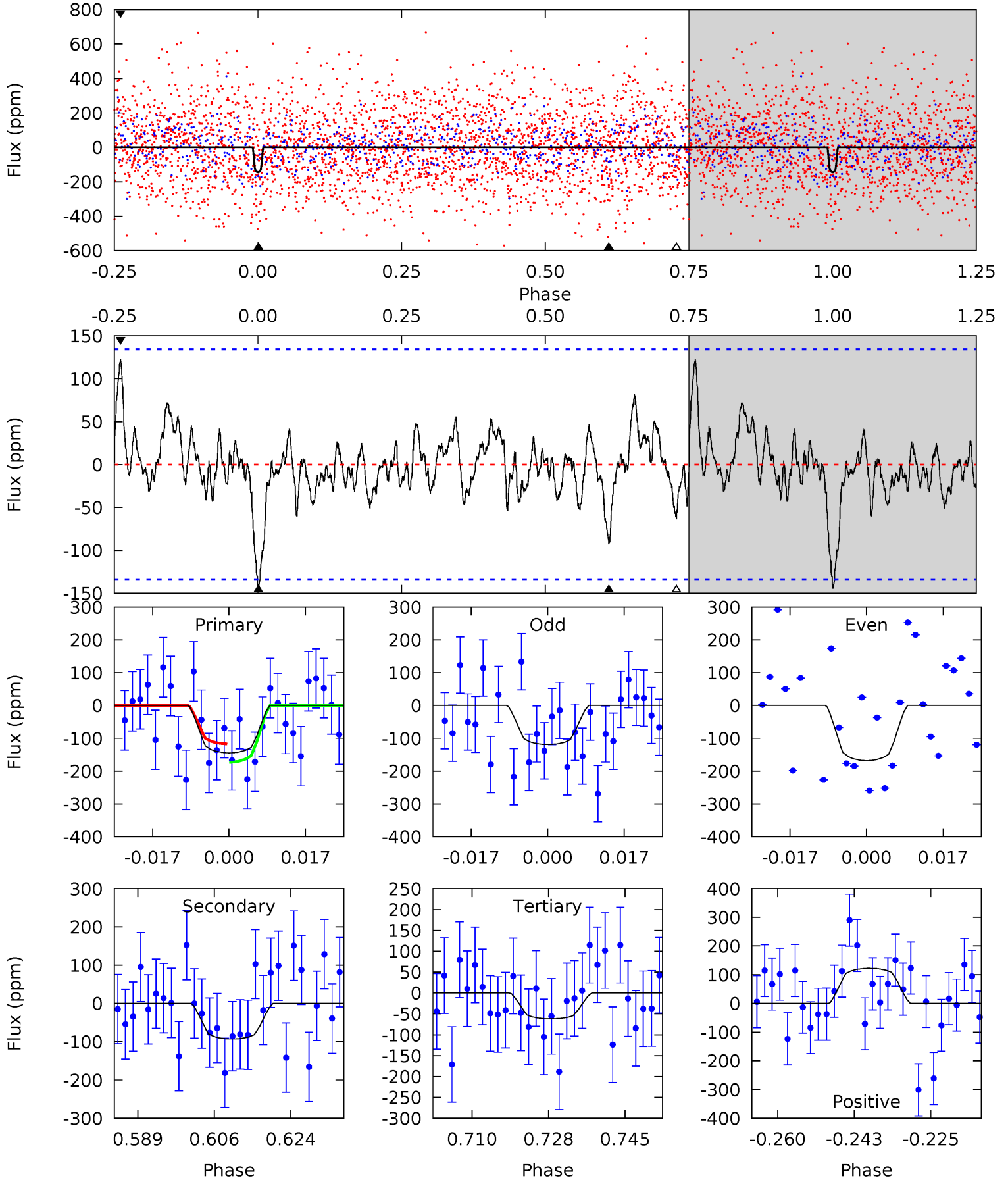
TCE 005989921-04   P= 5.791074 Days    $T_0=131.548569$  (BKJD)



# DV Model-Shift Uniqueness Test

005989921-04, P = 5.791073 Days, E = 131.605569 Days

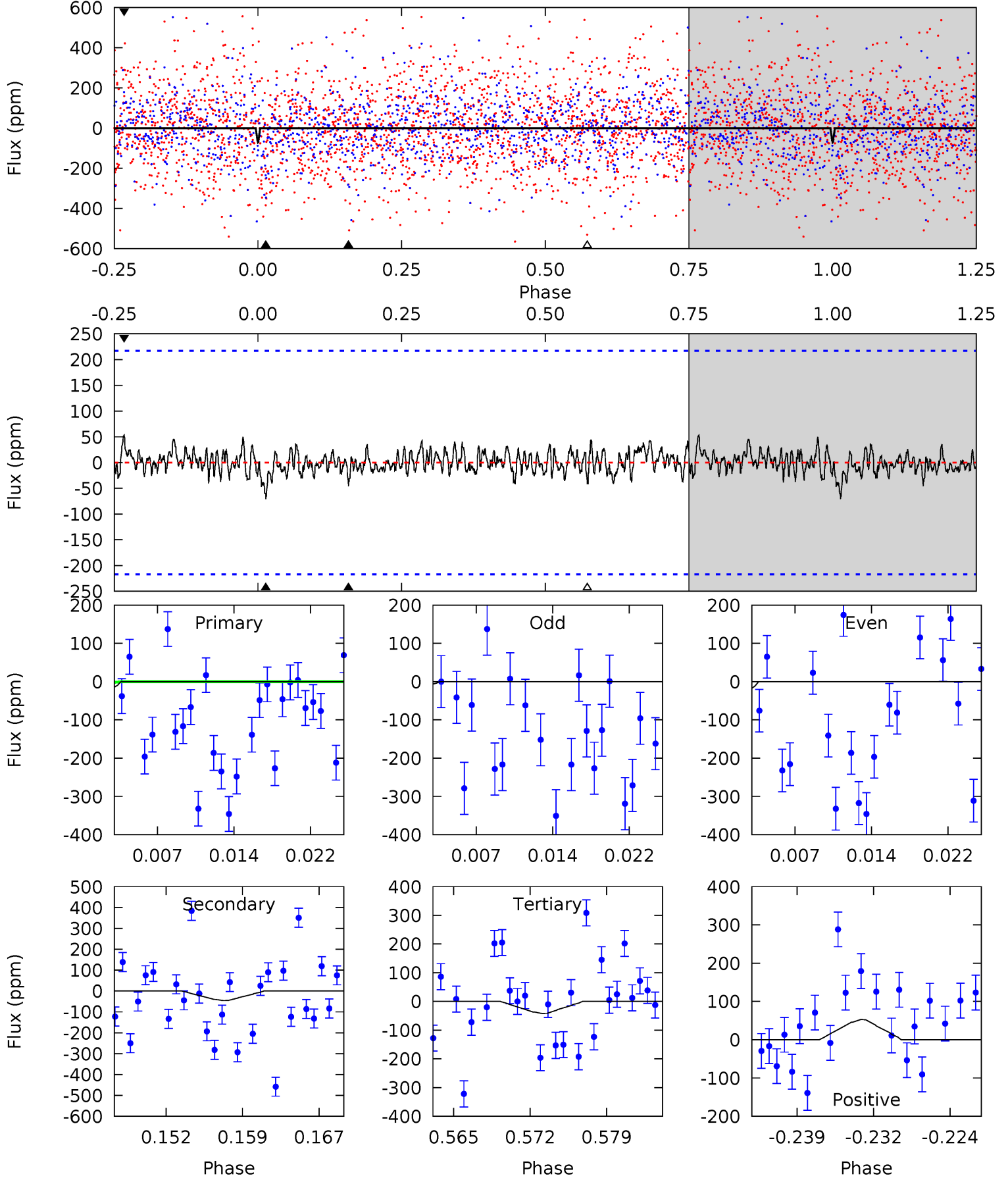
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.30	3.40	2.26	4.48	4.92	2.38	1.03	3.03	0.81	1.13	-1.09	0.90	1.01	0.46	1.02



# Alt Model-Shift Uniqueness Test

005989921-04, P = 5.791074 Days, E = 131.548569 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
1.67	1.08	0.99	1.24	5.09	2.69	0.41	0.68	0.43	0.10	-0.16	0.62	0.68	0.43	1.51



### Stellar Parameters For KIC 005989921

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-93 \pm 27$	$3.32^{+3.32}_{-2.20}$	$2098^{+164}_{-196}$	$5027^{+3773}_{-1177}$	$22^{+165}_{-17}$
Alt.	$-46 \pm 43$	$3.97^{+3.17}_{-2.46}$	$2088^{+173}_{-197}$	$3899^{+1959}_{-1491}$	$6.165^{+41.343}_{-5.704}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



# DV Centroid Data

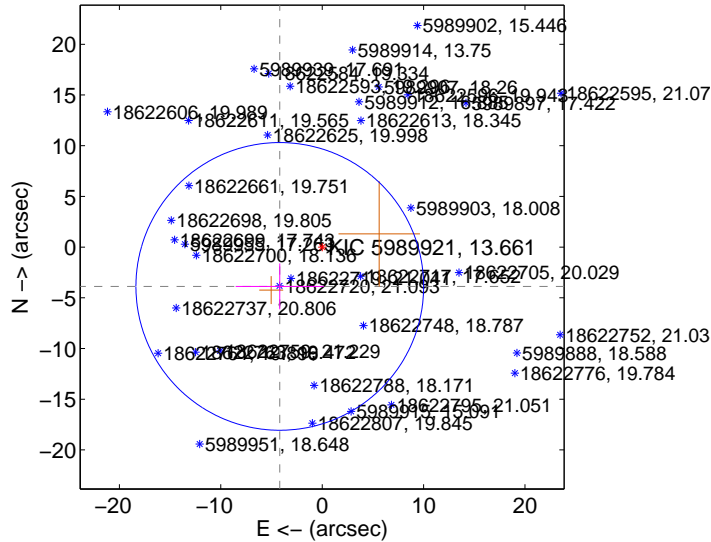
Supplemental centroid analysis for 005989921-04. Kepler magnitude: 13.66. Transit SNR 12.04

There are 0 quarters with good PRF difference image offsets

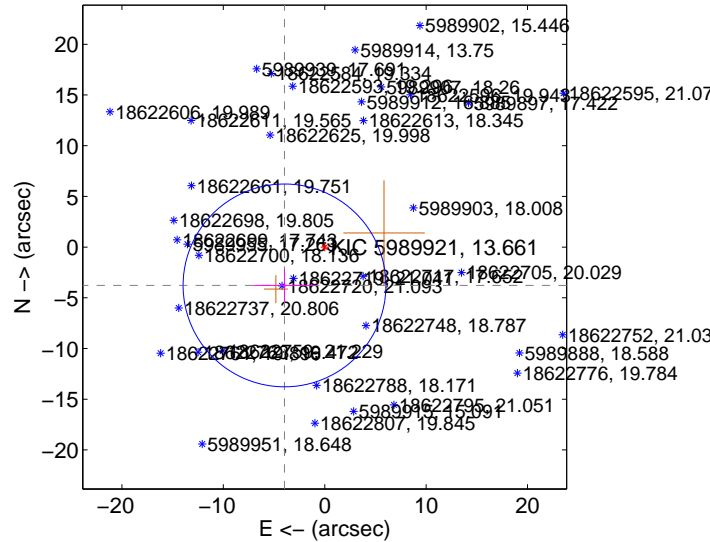
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.702 \pm 4.728$	1.21	$4.181 \pm 4.348$	$-3.877 \pm 2.266$
PRF-fit source offset from KIC position	$5.478 \pm 3.333$	1.64	$3.966 \pm 3.078$	$-3.779 \pm 1.602$
photometric centroid source offset	$1.83 \pm 0.62$	2.95	$1.83 \pm 0.62$	$0.14 \pm 0.58$

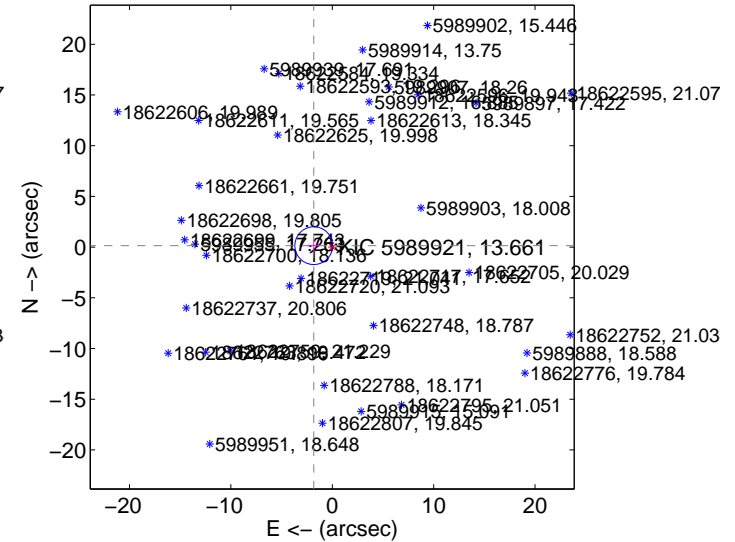
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

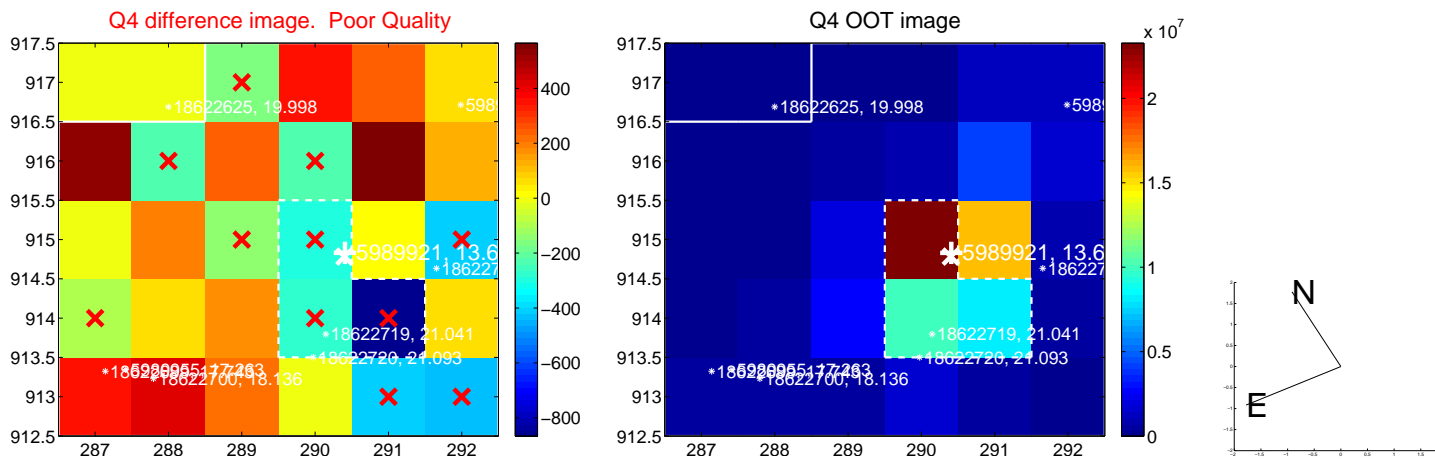
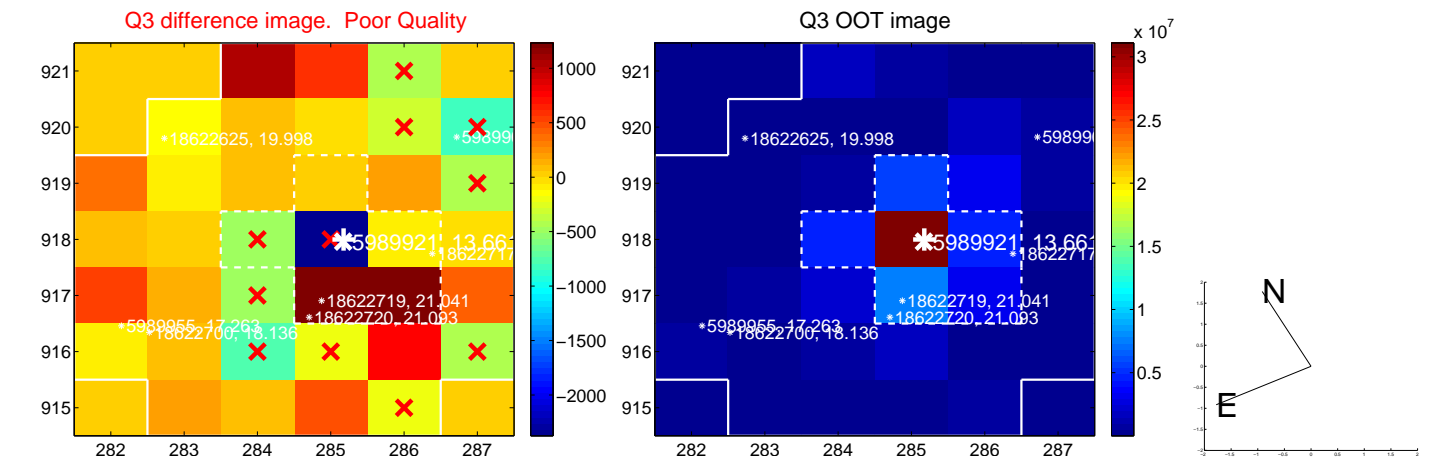
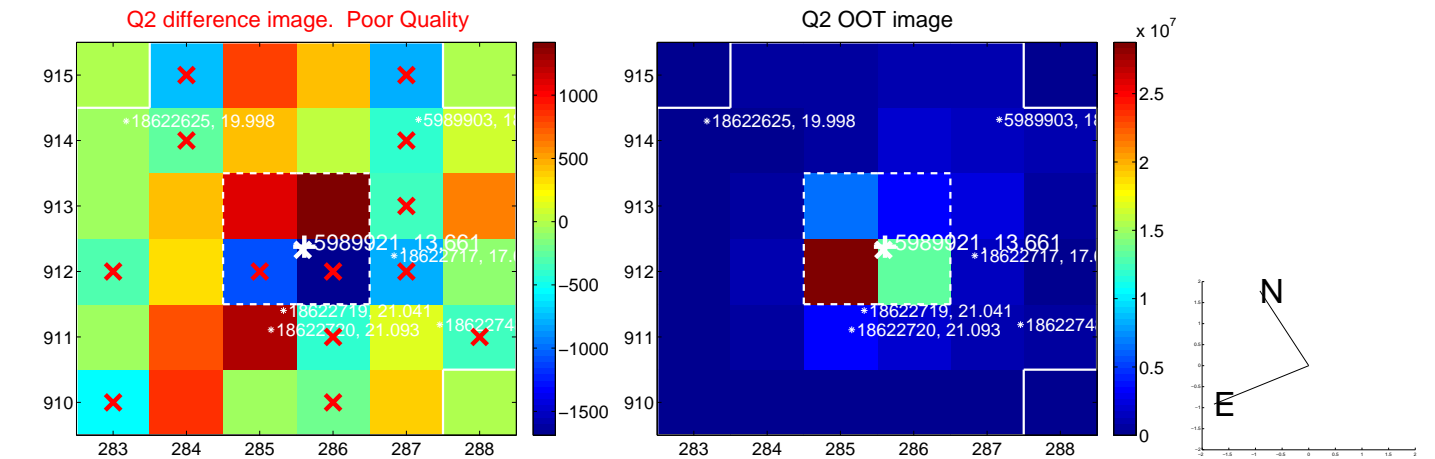
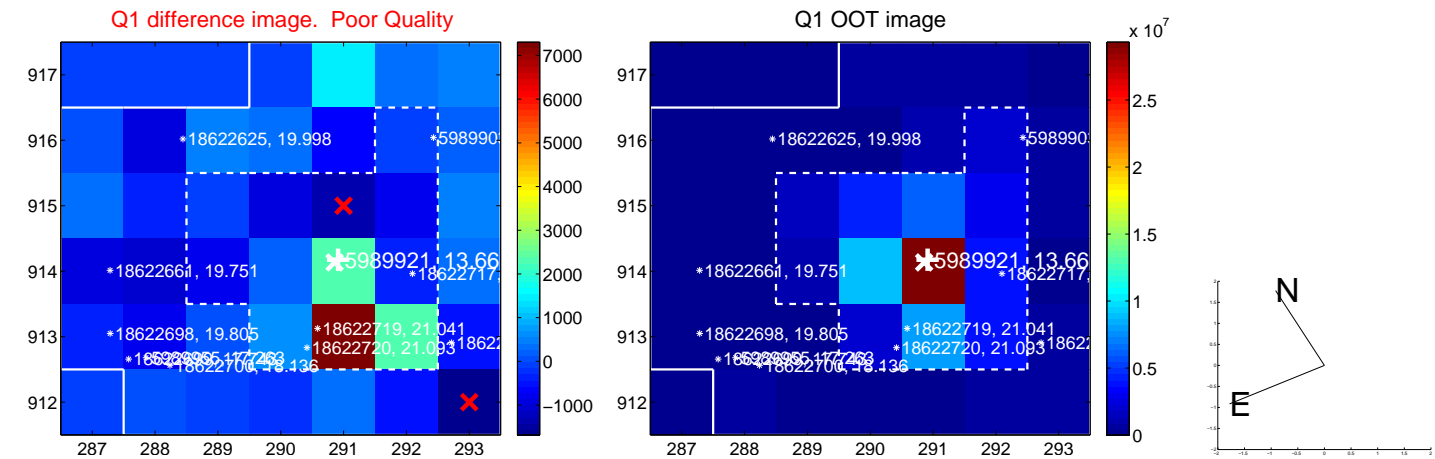


offset from photometric centroids

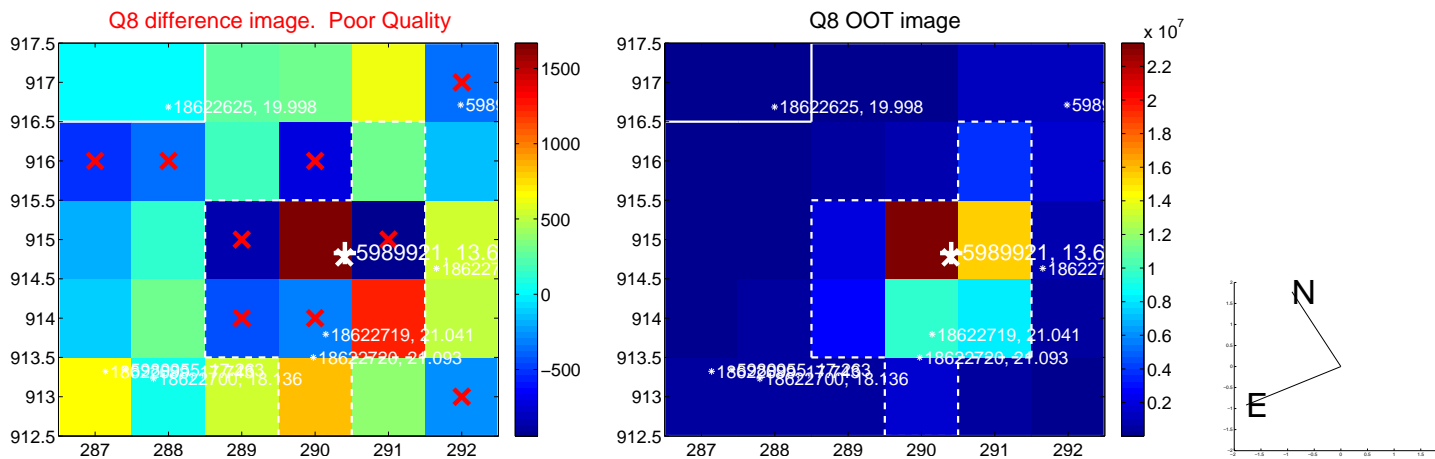
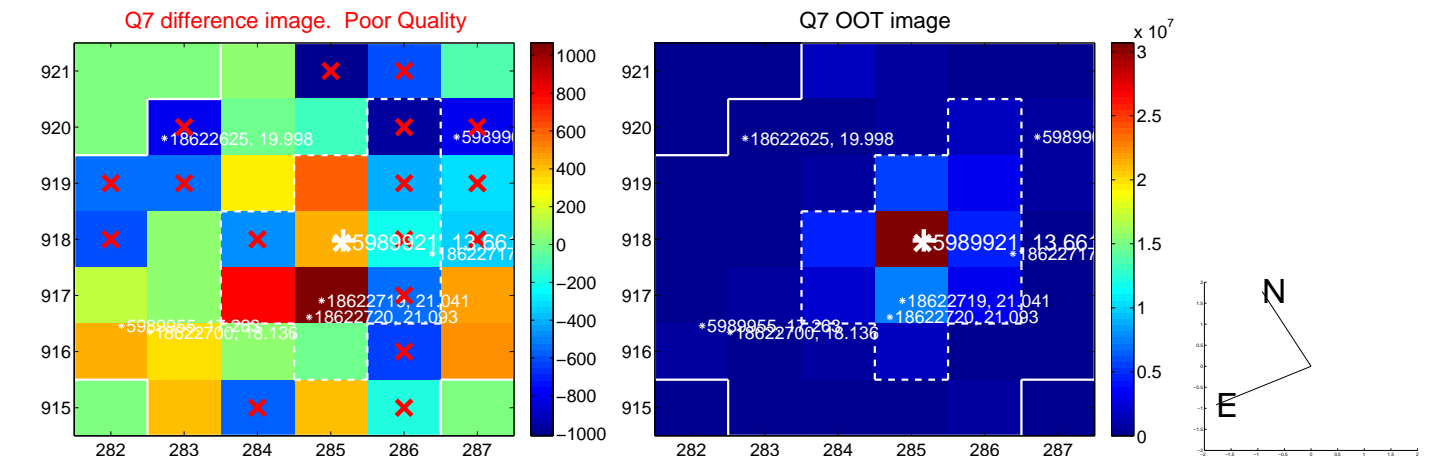
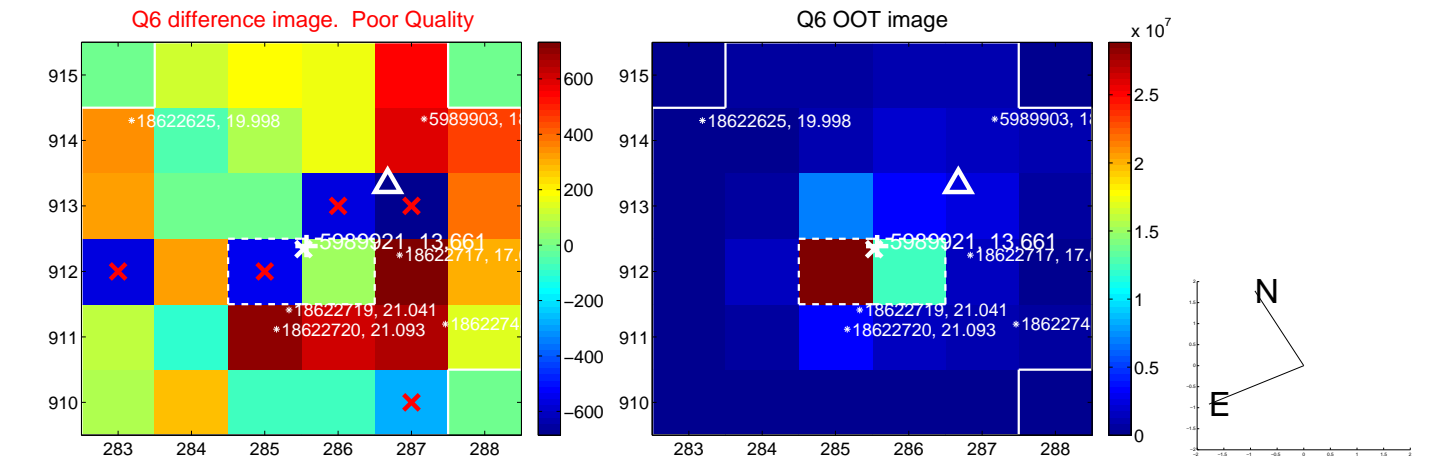
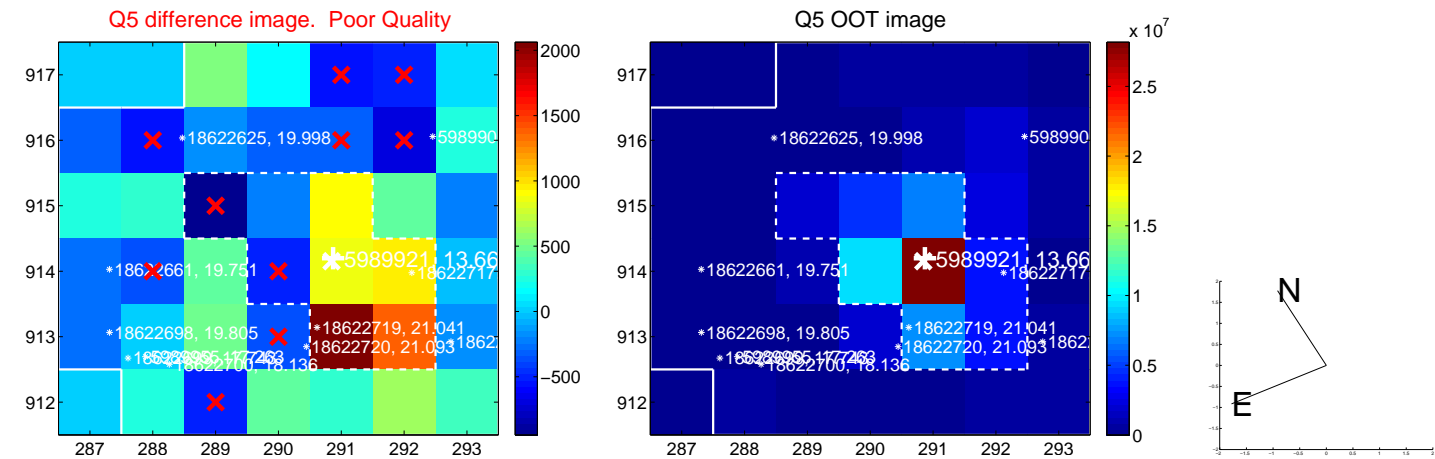


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

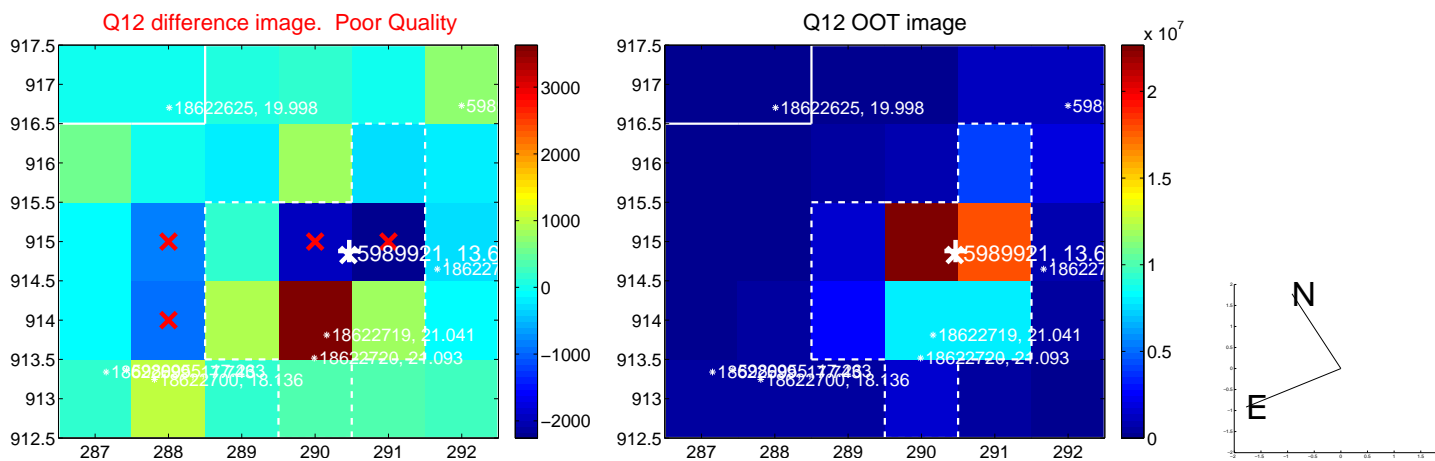
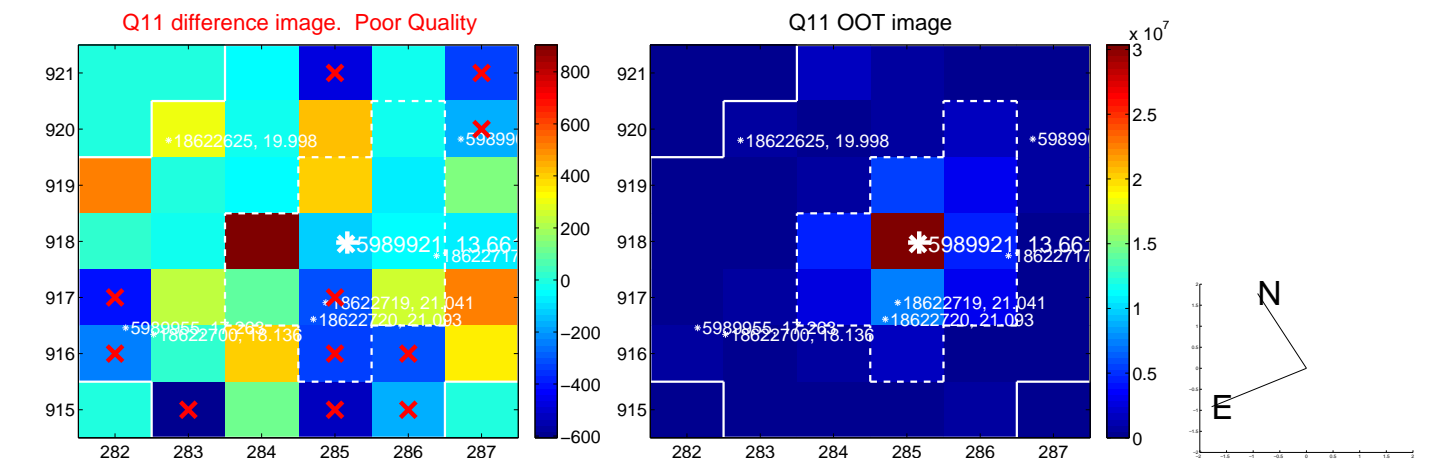
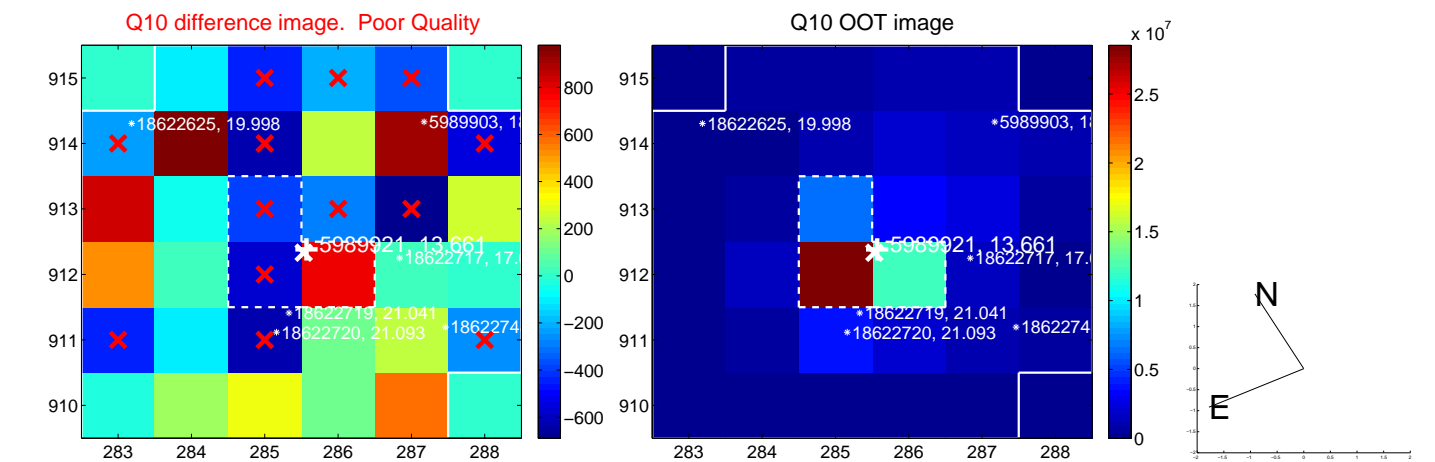
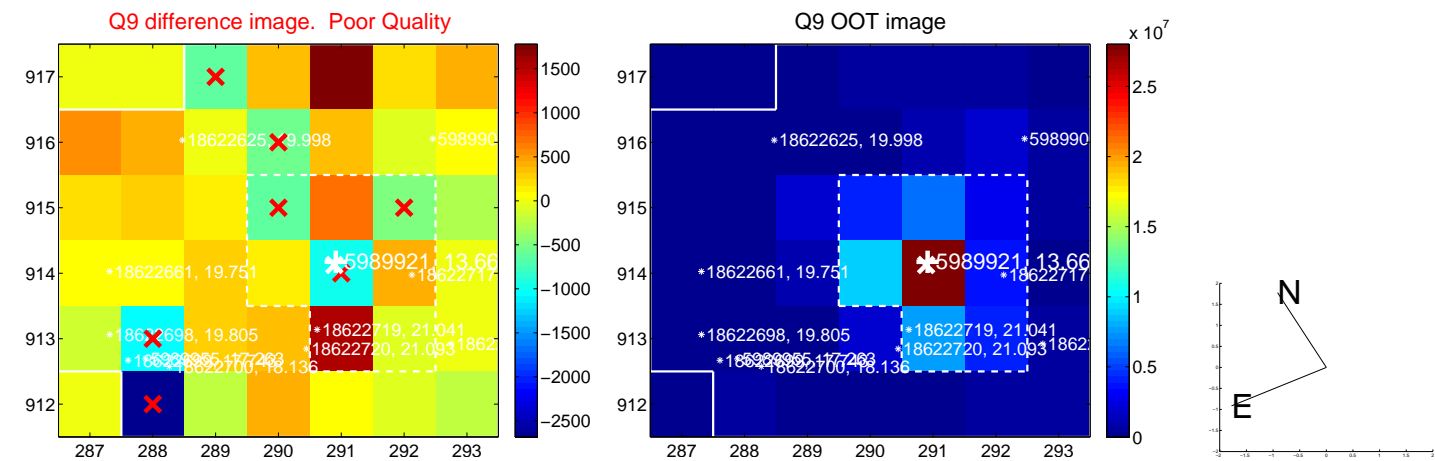
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



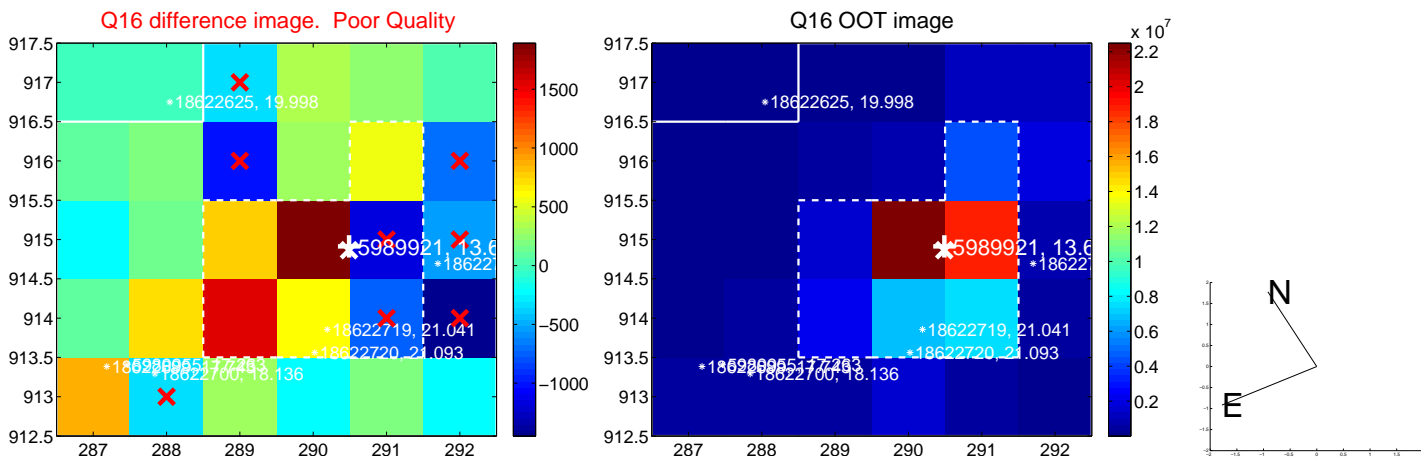
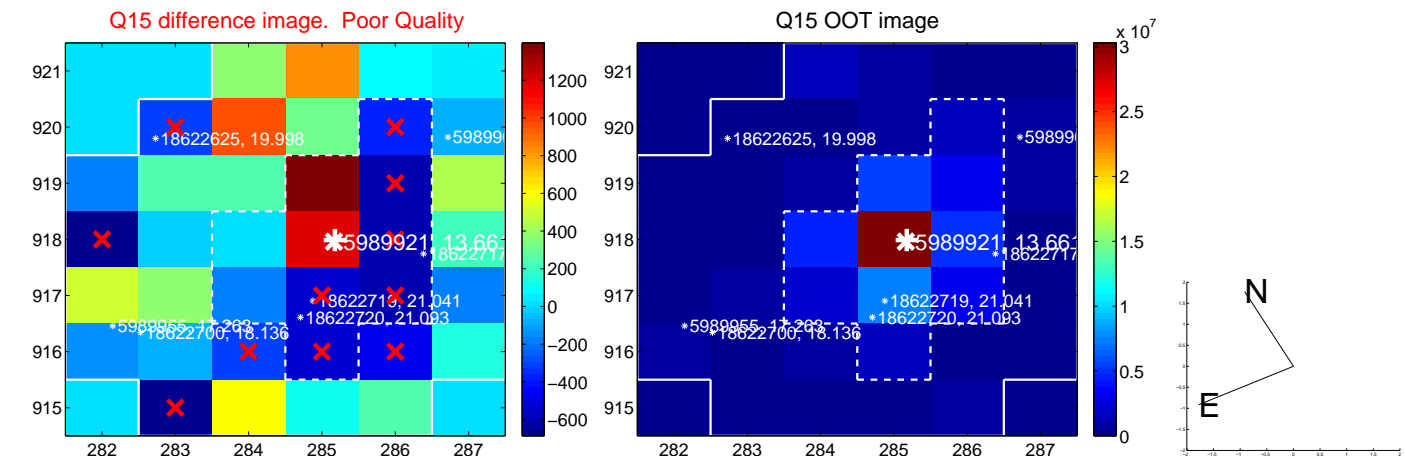
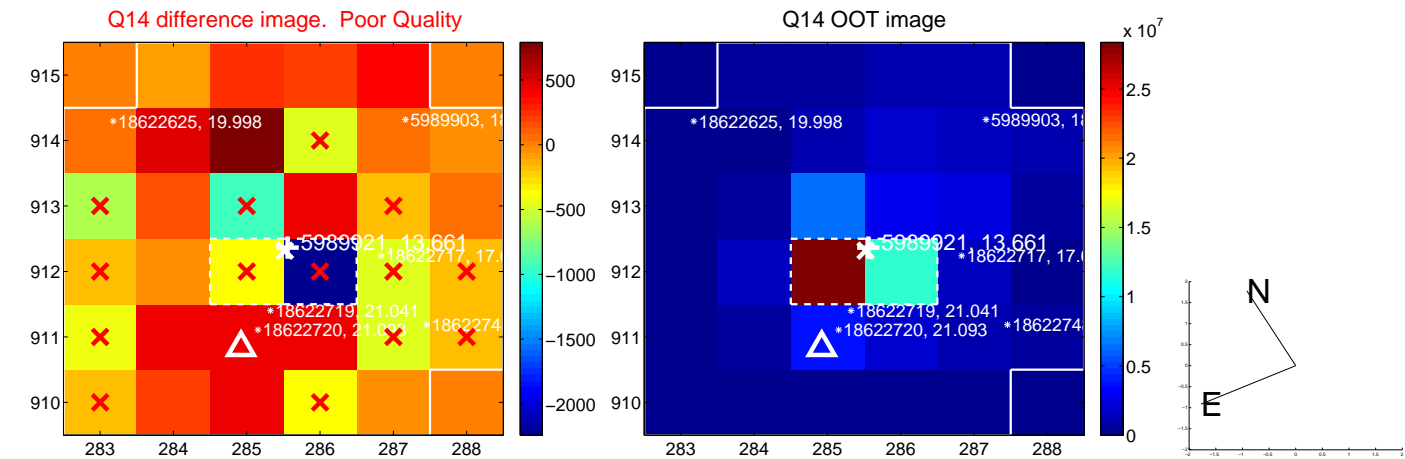
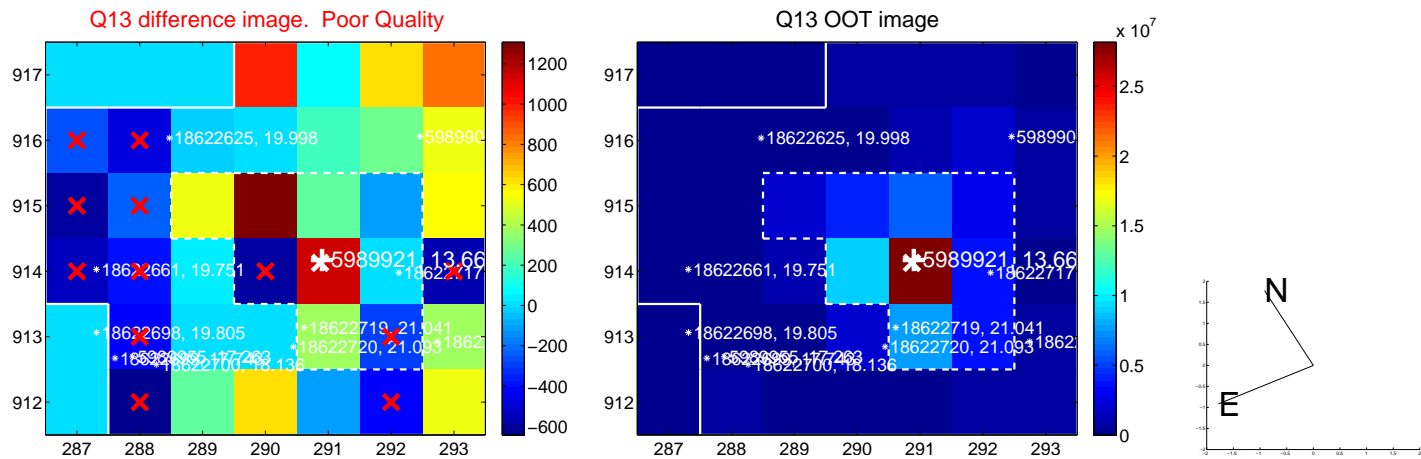
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



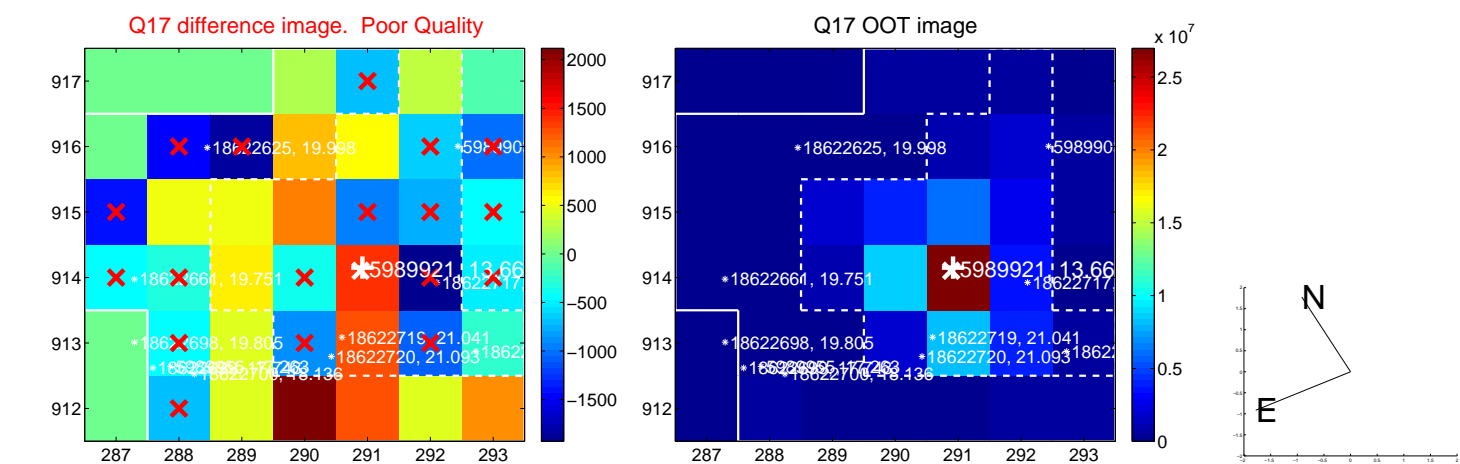
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



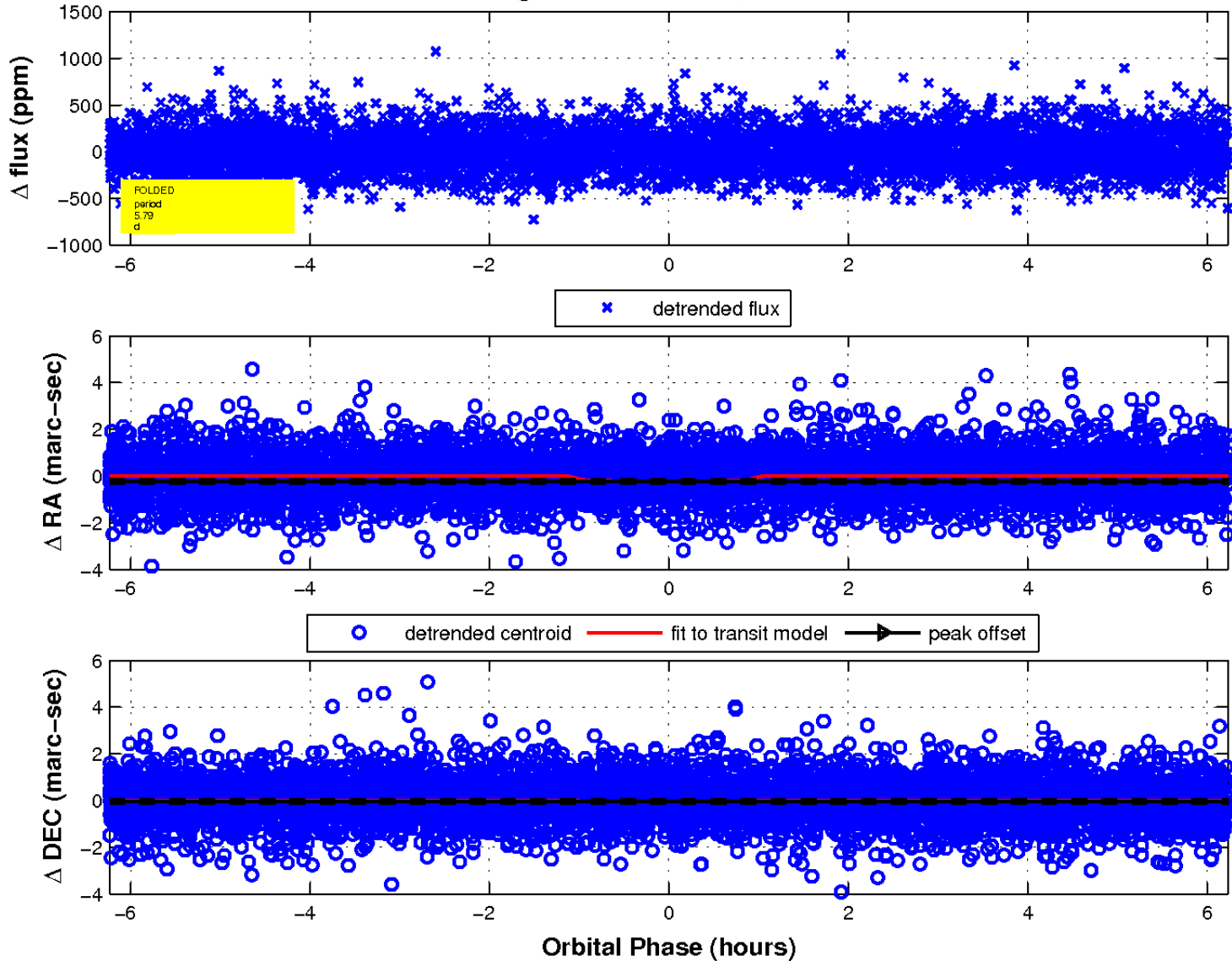
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



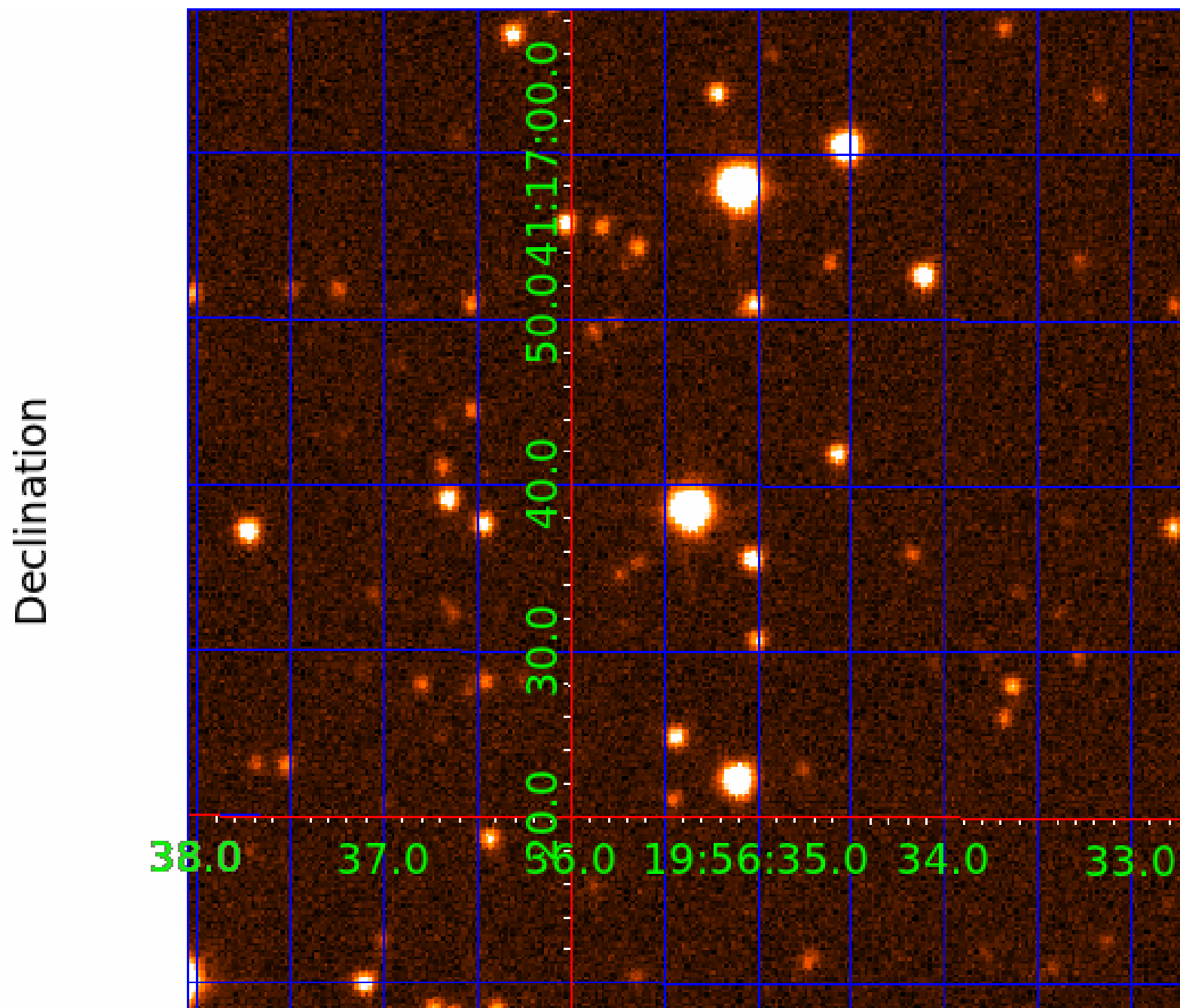
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 4 of 7



UKIRT Image





# KIC 005989921

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005989921-01	OBS	No	0.597713	131.683993	5.9	4.387	8.3	3.0	1.94	6583	0.47	26084.78
005989921-02	OBS	No	11.732653	142.738402	67.7	5.849	10.7	6.8	1.94	6583	1.62	492.62
005989921-03	OBS	No	14.116147	131.740411	319.5	1.454	12.4	13.0	1.94	6583	4.00	384.97
005989921-04	OBS	No	5.791073	131.605569	143.7	2.078	11.0	12.0	1.94	6583	2.48	1262.89
005989921-05	OBS	No	22.241919	139.123933	337.0	1.072	11.3	13.6	1.94	6583	3.60	209.97
005989921-06	OBS	No	12.829749	135.098981	431.7	0.700	10.9	12.3	1.94	6583	4.35	437.27
005989921-07	OBS	No	13.303210	143.085521	229.7	1.624	7.2	9.1	1.94	6583	3.36	416.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005989921-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
005989921-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005989921-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005989921-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS— HALO_GHOST
005989921-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV

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

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

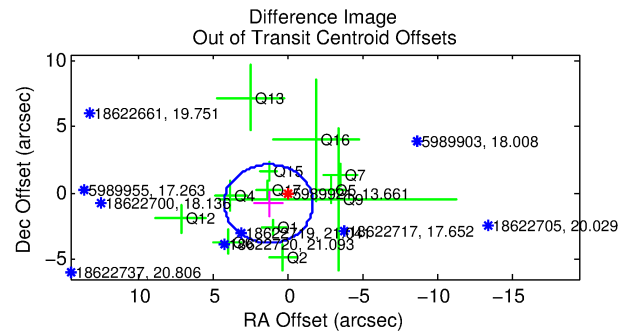
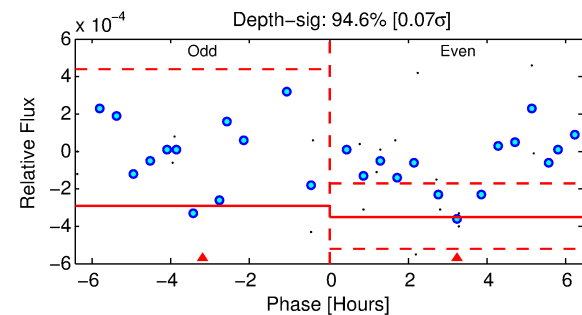
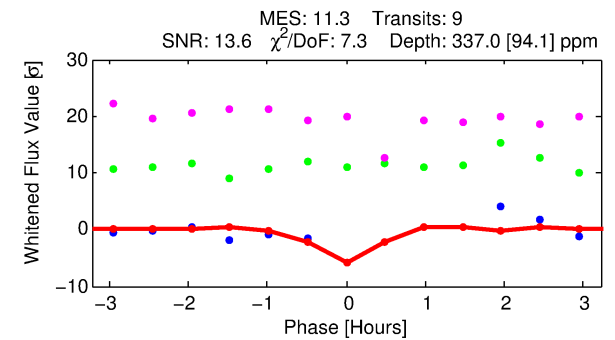
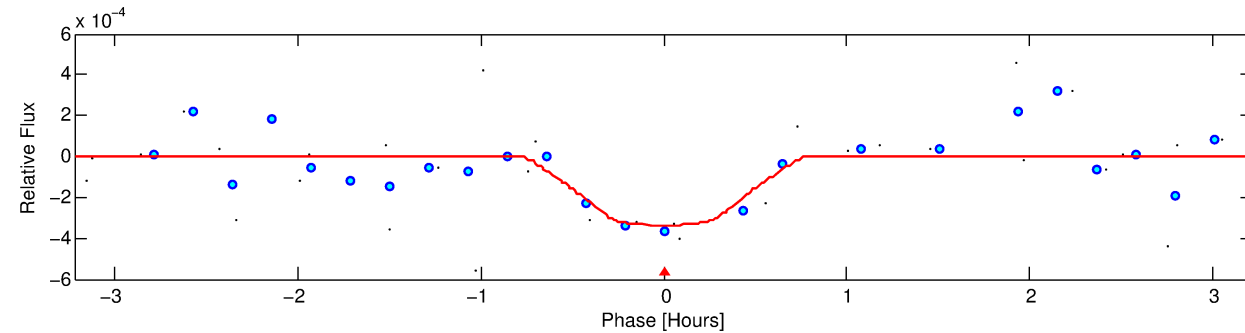
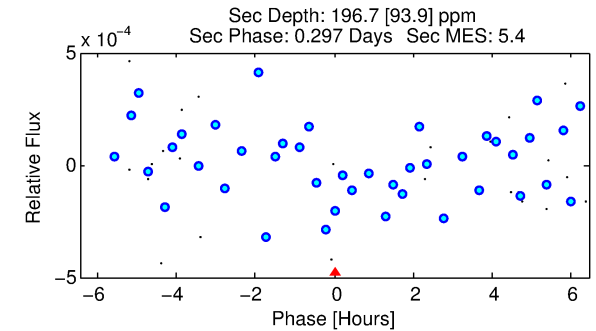
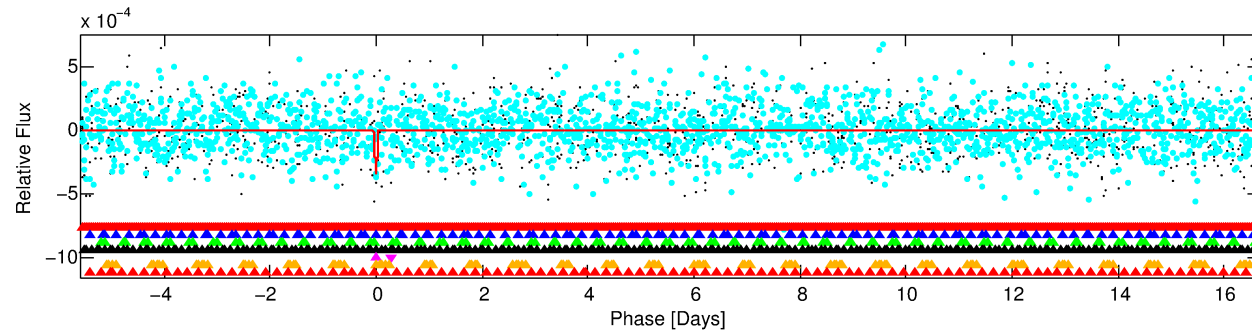
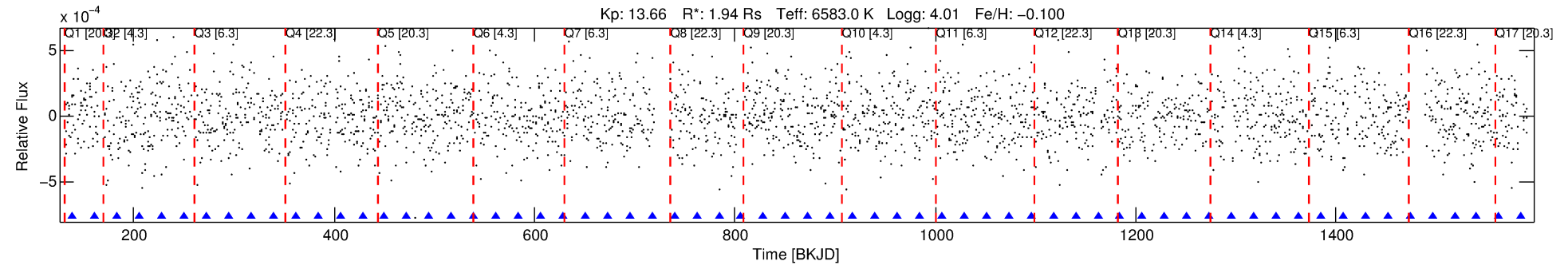
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005989921-05

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 5 of 7 Period: 22.242 d



## DV Fit Results:

Period = 22.24192 [0.00031] d  
Epoch = 139.1239 [0.0122] BKJD  
Rp/R\* = 0.0170 [0.0603]  
a/R\* = 160.64 [3062.65]  
b = 0.08 [234.18]  
Seff = 209.97 [110.48]  
Teq = 971 [128] K  
Rp = 3.60 [12.80] Re  
a = 0.1732 [0.0564] AU  
Ag = 250.66 [1782.42] [0.14 $\sigma$ ]  
Teffp = 5971 [10591] K [0.47 $\sigma$ ]

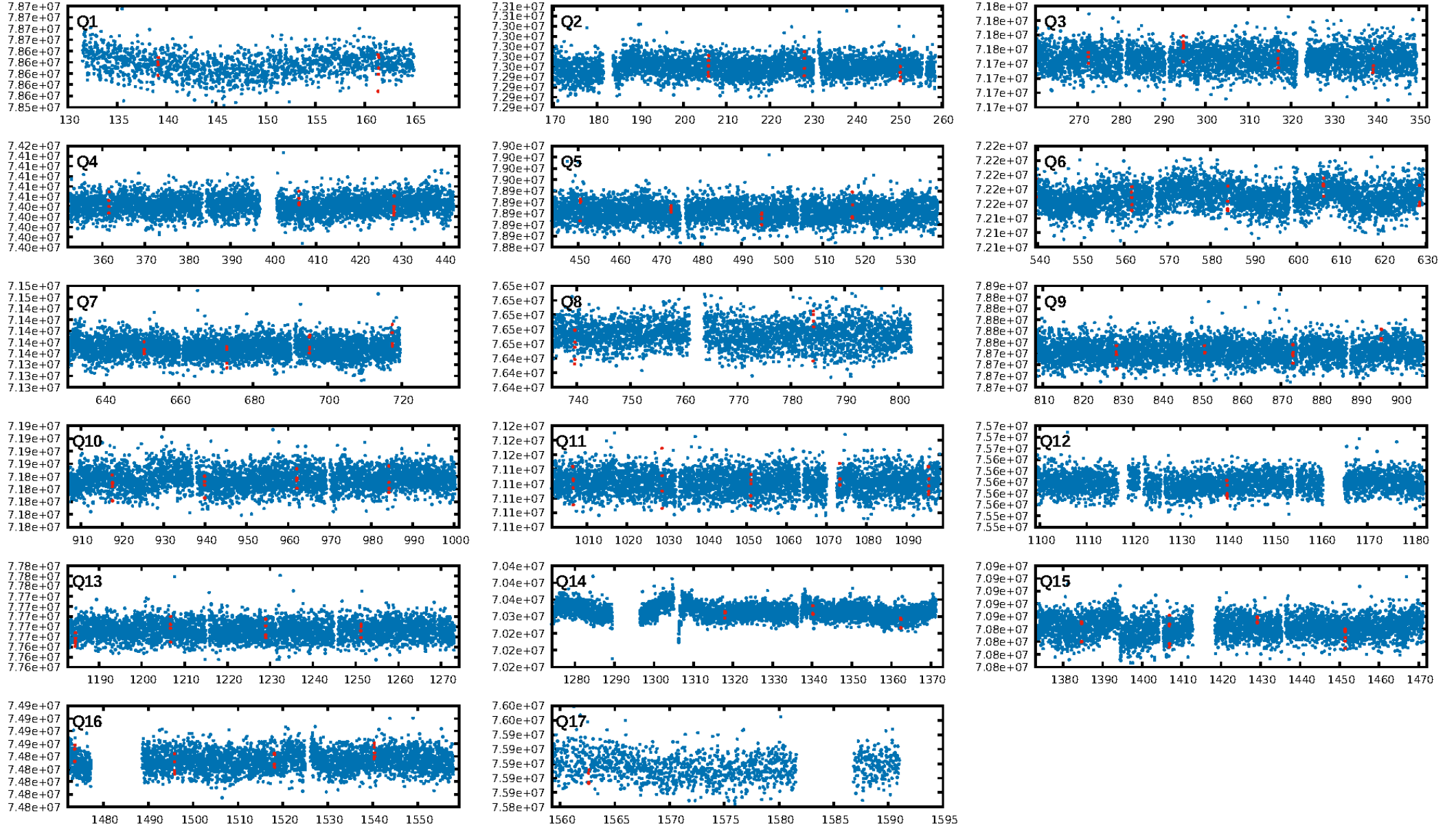
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [107.95 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 31.7%  
Bootstrap-pfa: 4.16e-11  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -2.328  
Centroid-sig: 98.3%  
Centroid-so: 0.170 arcsec [0.23 $\sigma$ ]  
OotOffset-rm: 1.483 arcsec [1.50 $\sigma$ ]  
KicOffset-rm: 1.303 arcsec [1.23 $\sigma$ ]  
OotOffset-st: 2/2/3/5 [12]  
KicOffset-st: 2/2/3/5 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 0.00 [0/17]

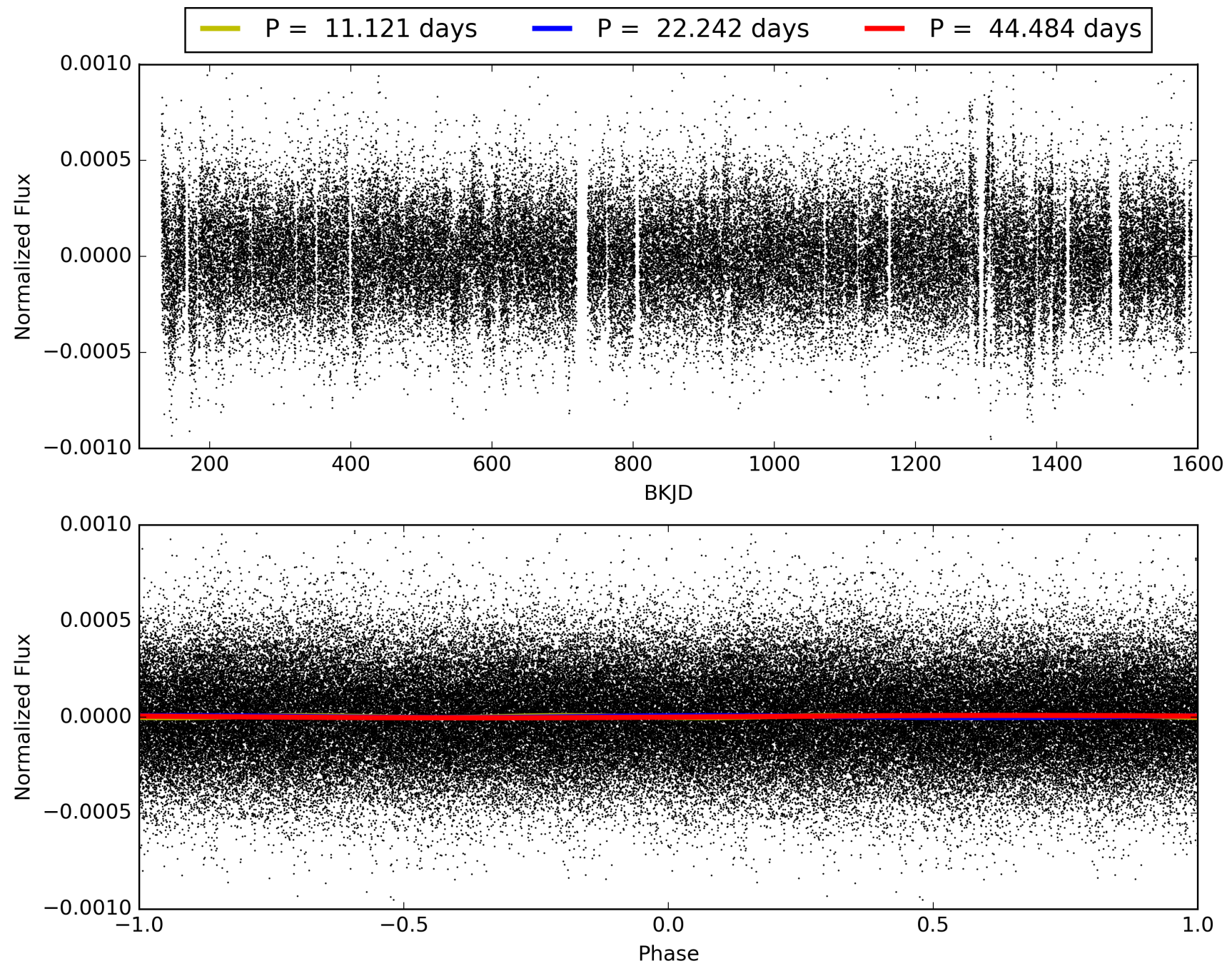
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:52 Z

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

# TCE 005989921-05, PDC Light Curves

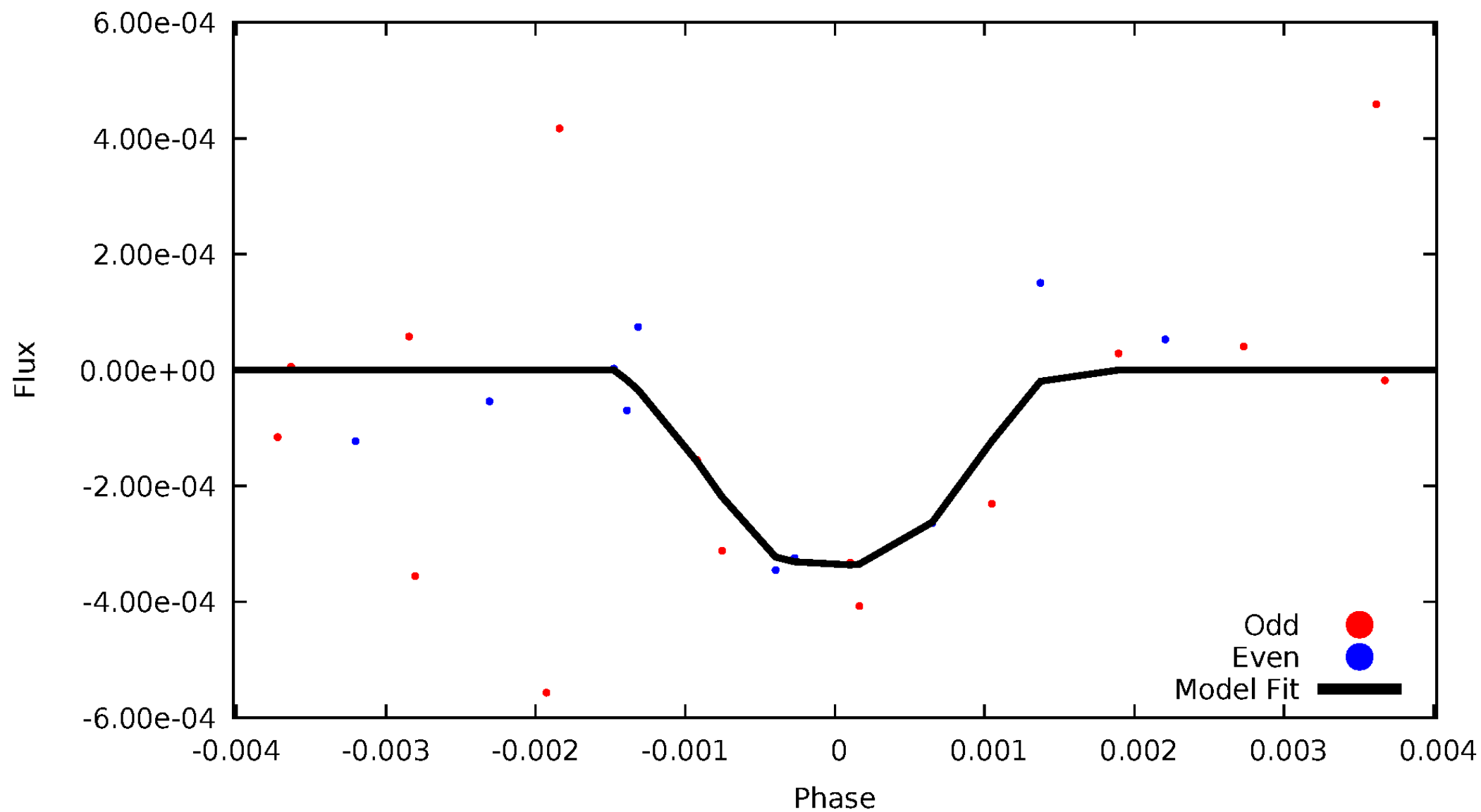


TCE 005989921-05



# DV Odd/Even

TCE 005989921-05





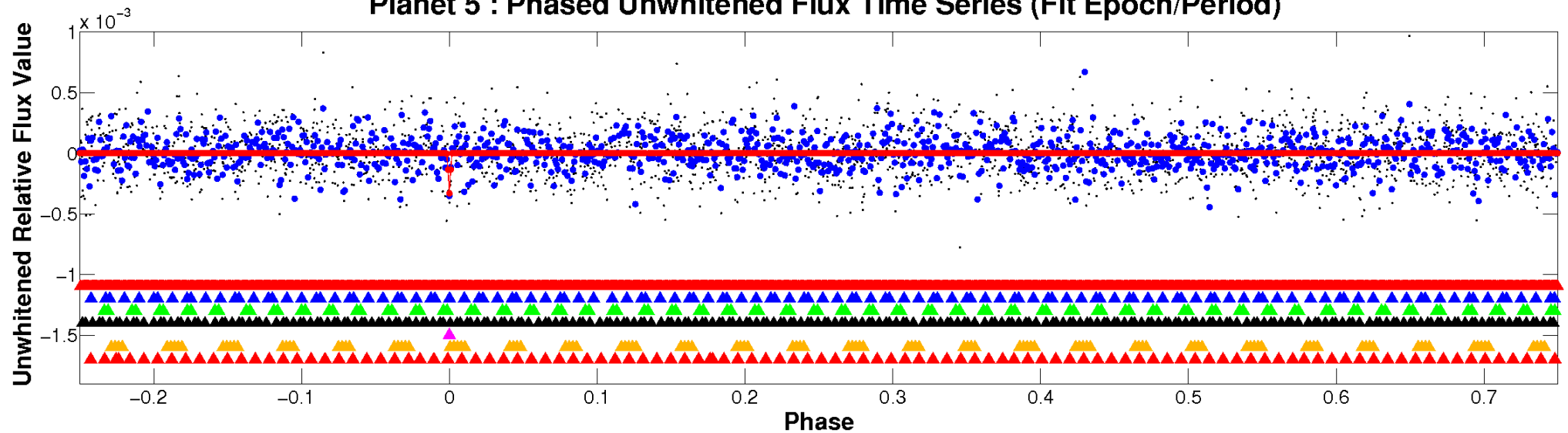
ALT Odd/Even

This plot does not exist for this TCE.

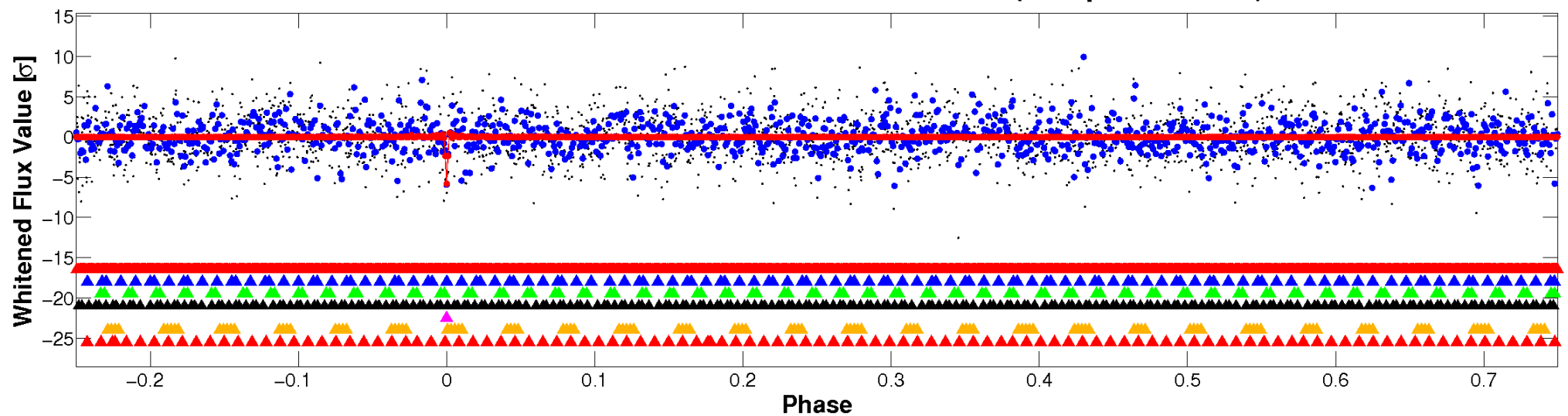


# Non-Whitened Vs. Whitened Light Curve

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

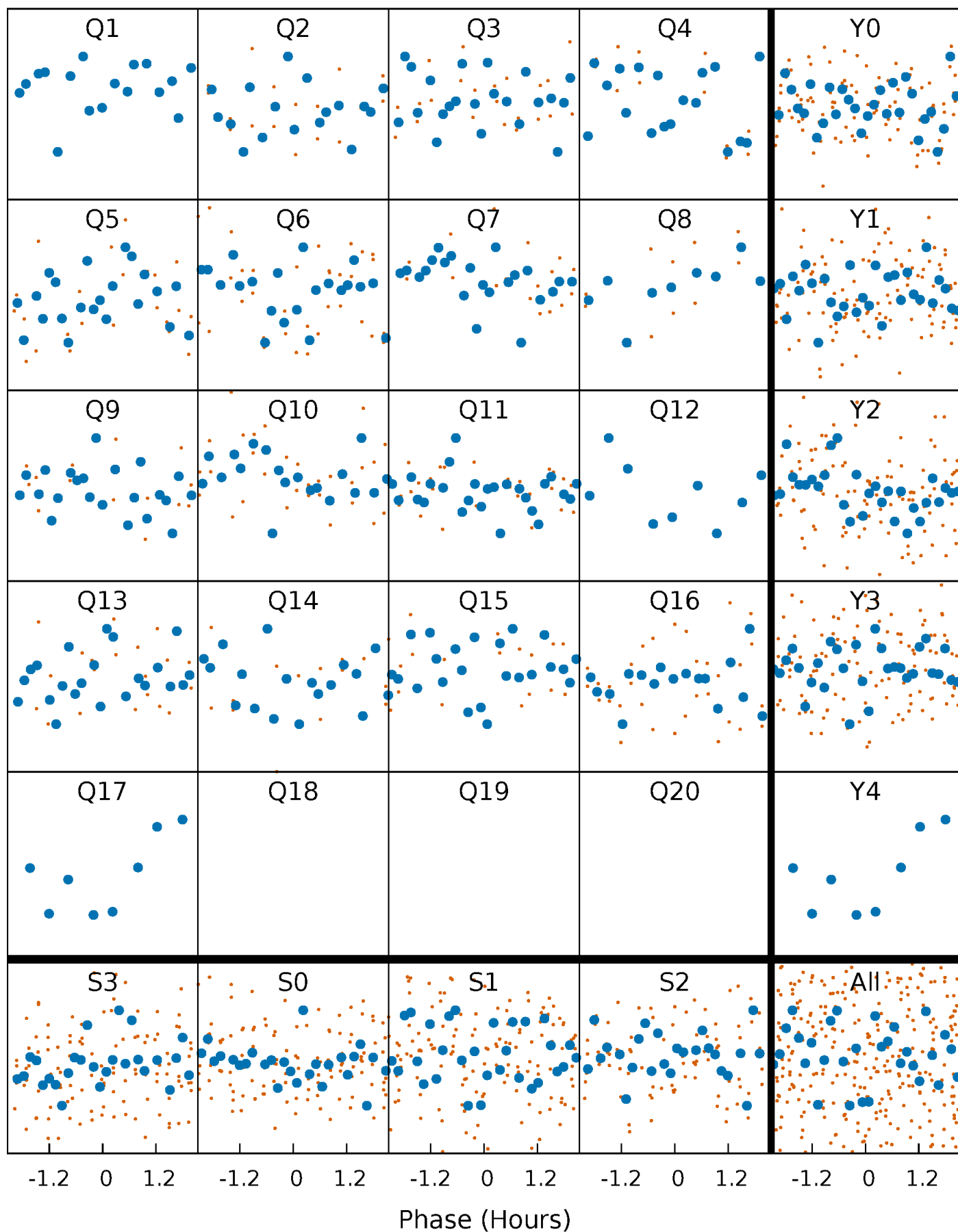


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



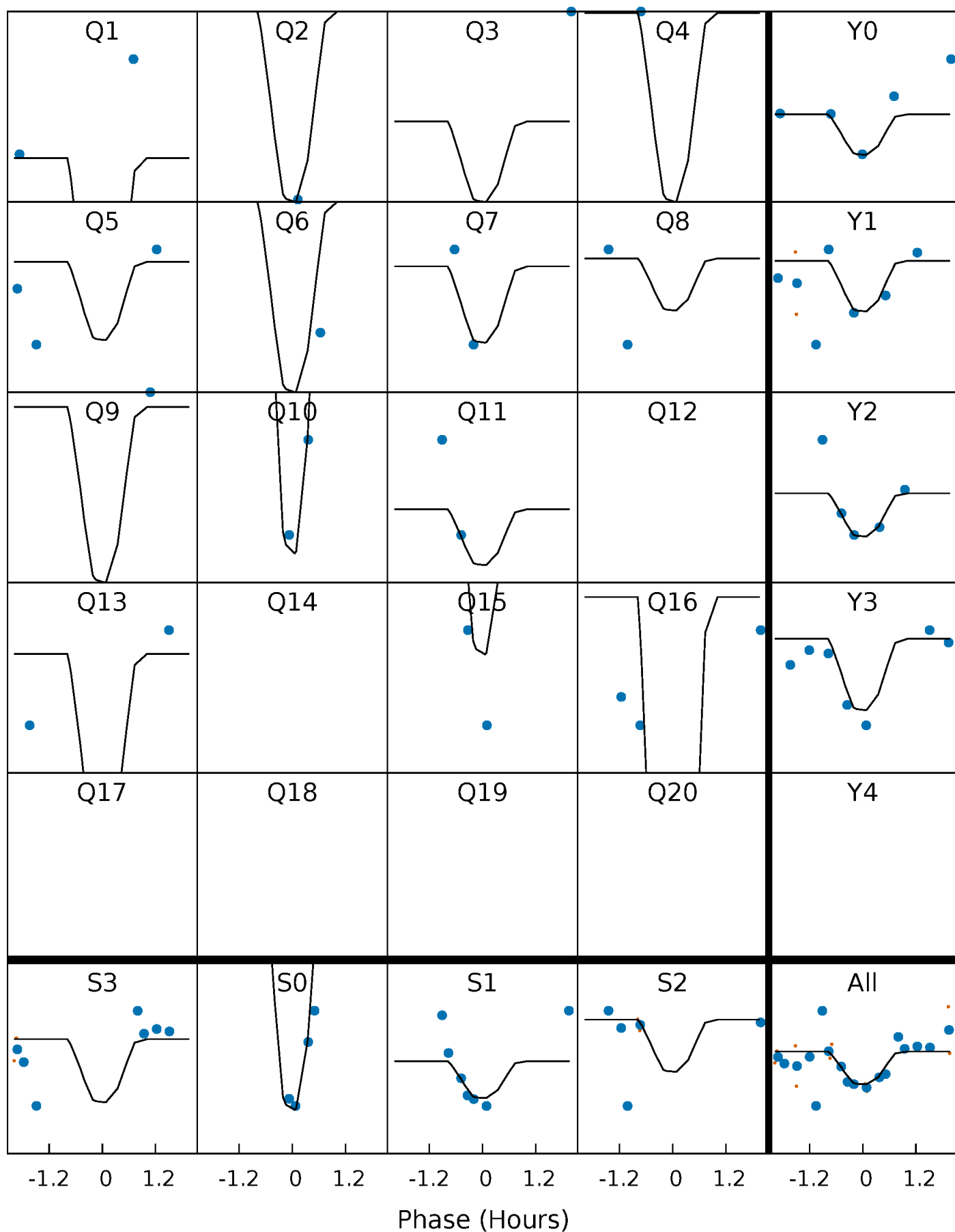
# PDC Quarter-Phased Transit Curves

TCE 005989921-05   P= 22.241919 Days    $T_0=139.123933$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005989921-05   P= 22.241919 Days    $T_0=139.123933$  (BKJD)

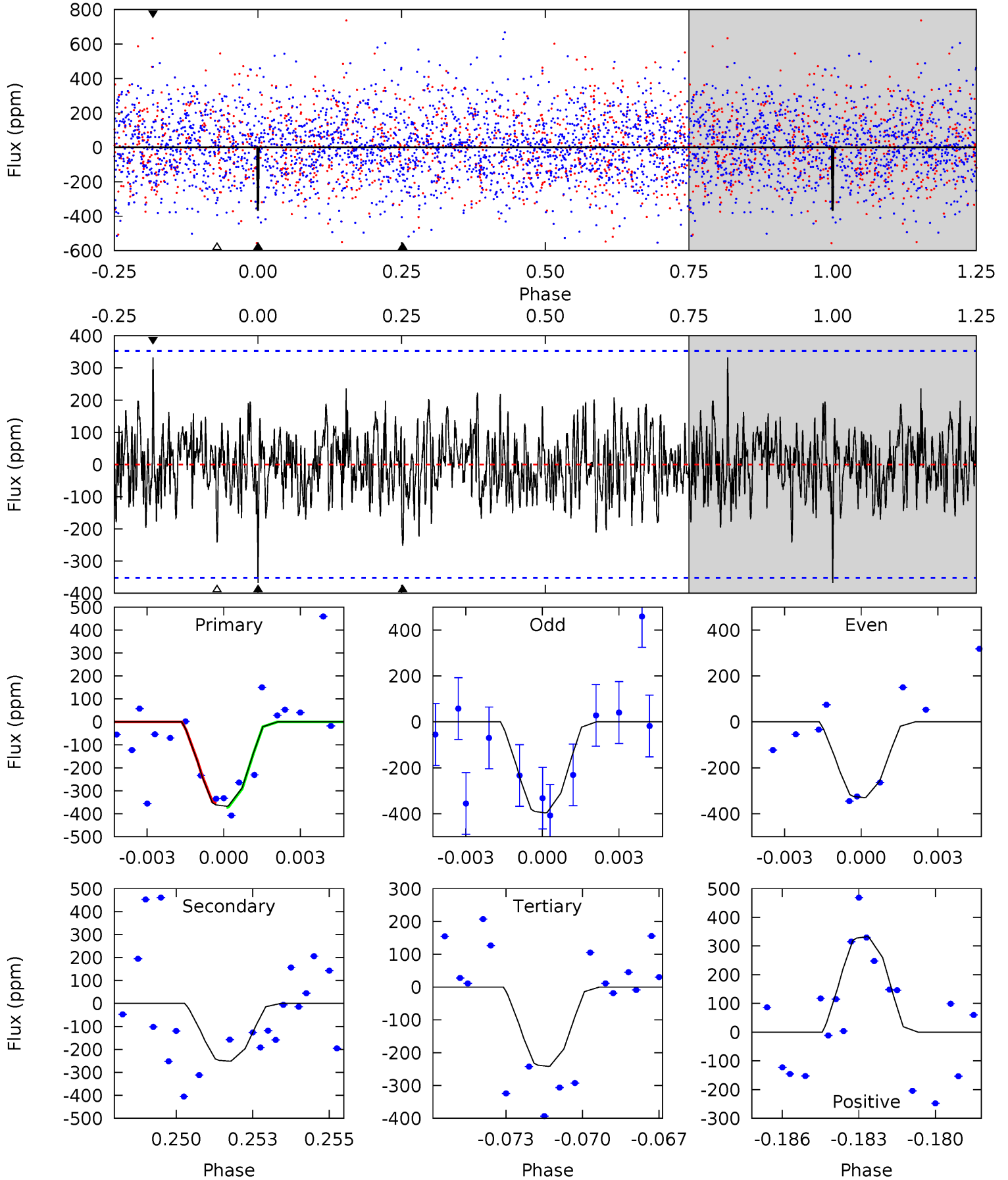


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005989921-05, P = 22.241919 Days, E = 116.882014 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
5.50	3.77	3.62	4.98	5.27	3.00	1.24	1.88	0.52	0.15	-1.21	0.52	1.07	0.48	0.12



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005989921

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-252 \pm 67$	$9.56^{+10.69}_{-6.68}$	$1338^{+107}_{-125}$	$4036^{+3174}_{-828}$	$45^{+450}_{-36}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



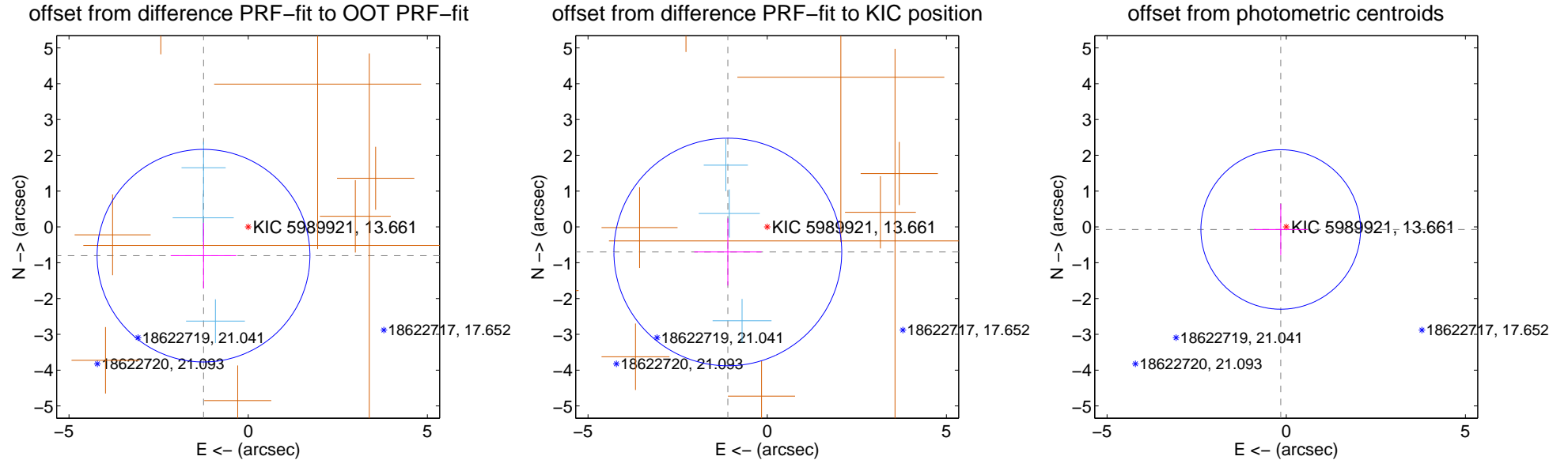
## DV Centroid Data

Supplemental centroid analysis for 005989921-05. Kepler magnitude: 13.66. Transit SNR 13.64

There are 3 quarters with good PRF difference image offsets

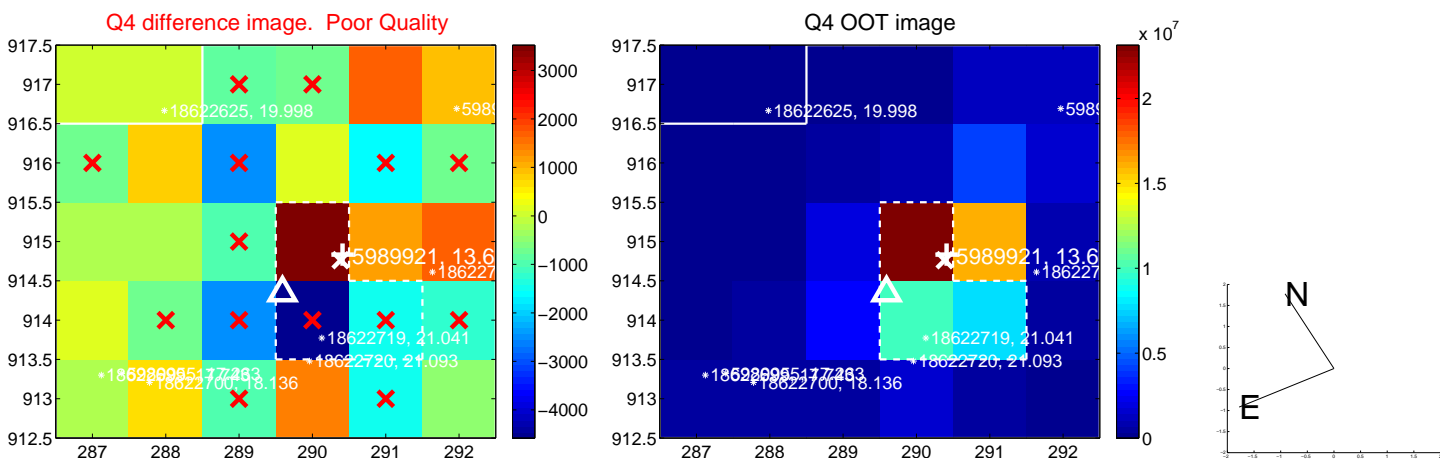
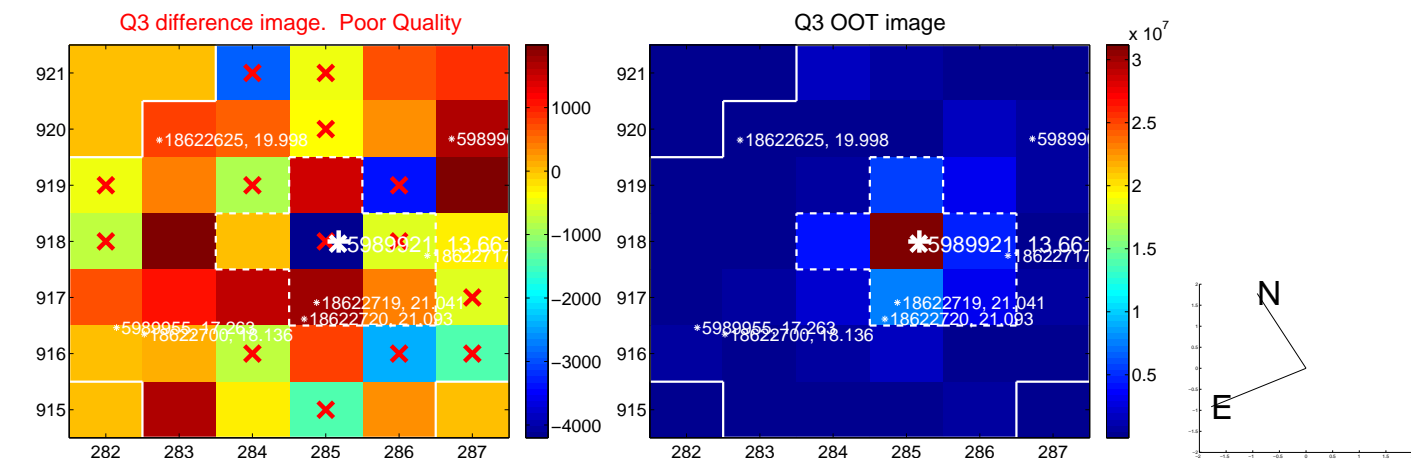
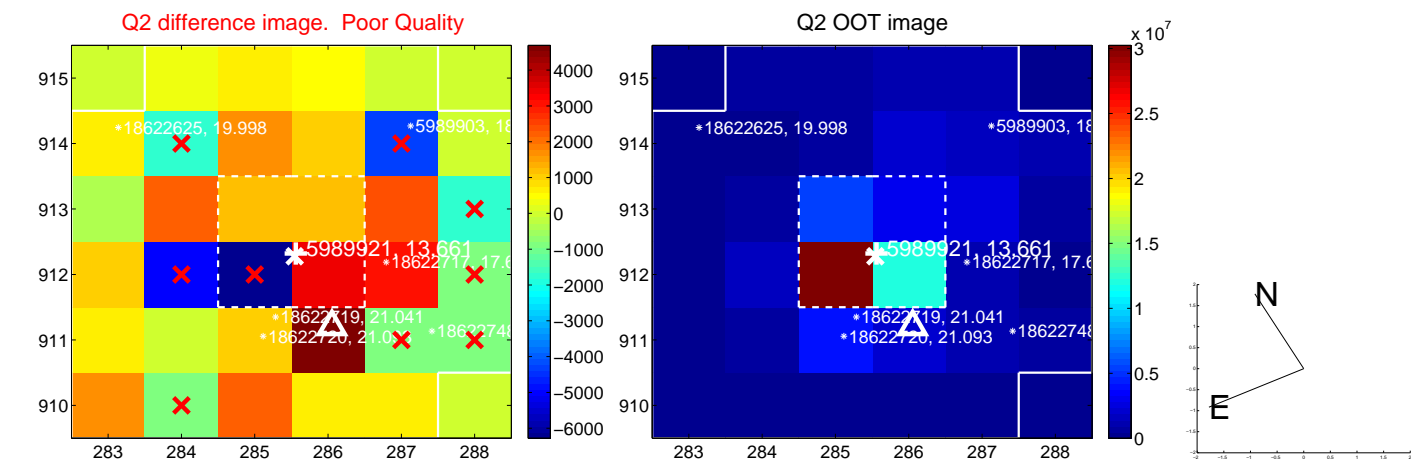
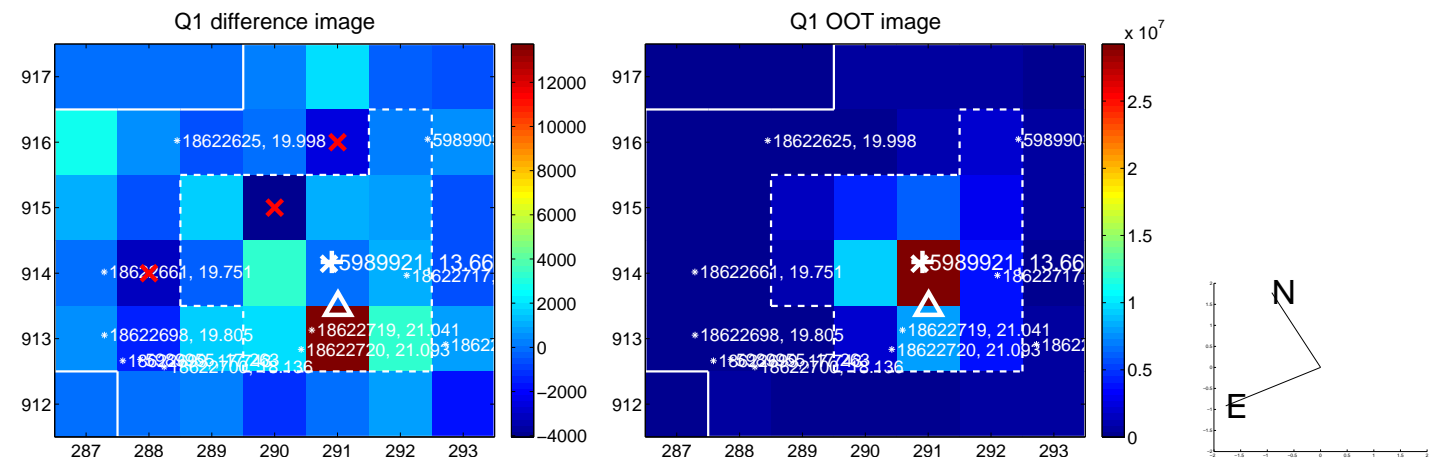
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.483 \pm 0.990$	1.50	$1.246 \pm 0.917$	$-0.803 \pm 0.919$
PRF-fit source offset from KIC position	$1.303 \pm 1.059$	1.23	$1.099 \pm 0.941$	$-0.700 \pm 0.936$
photometric centroid source offset	$0.17 \pm 0.74$	0.23	$0.15 \pm 0.75$	$-0.07 \pm 0.72$

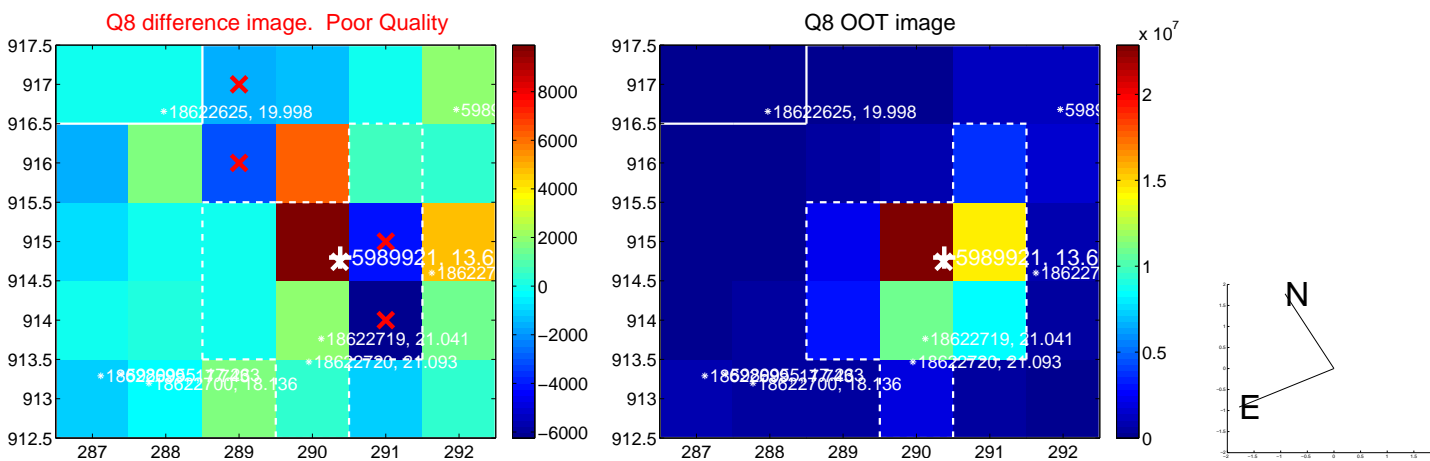
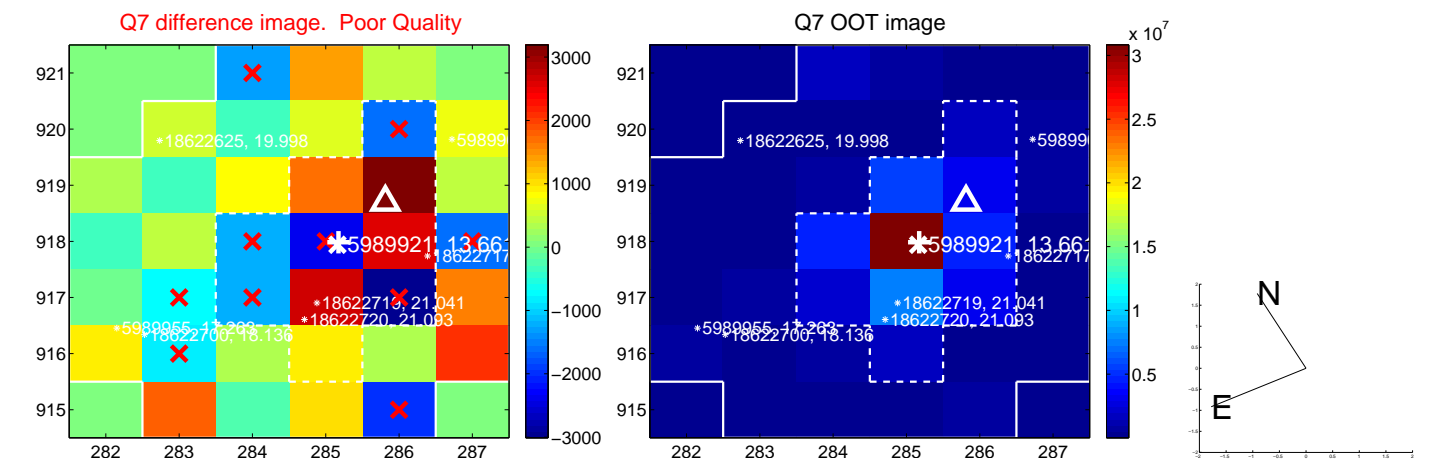
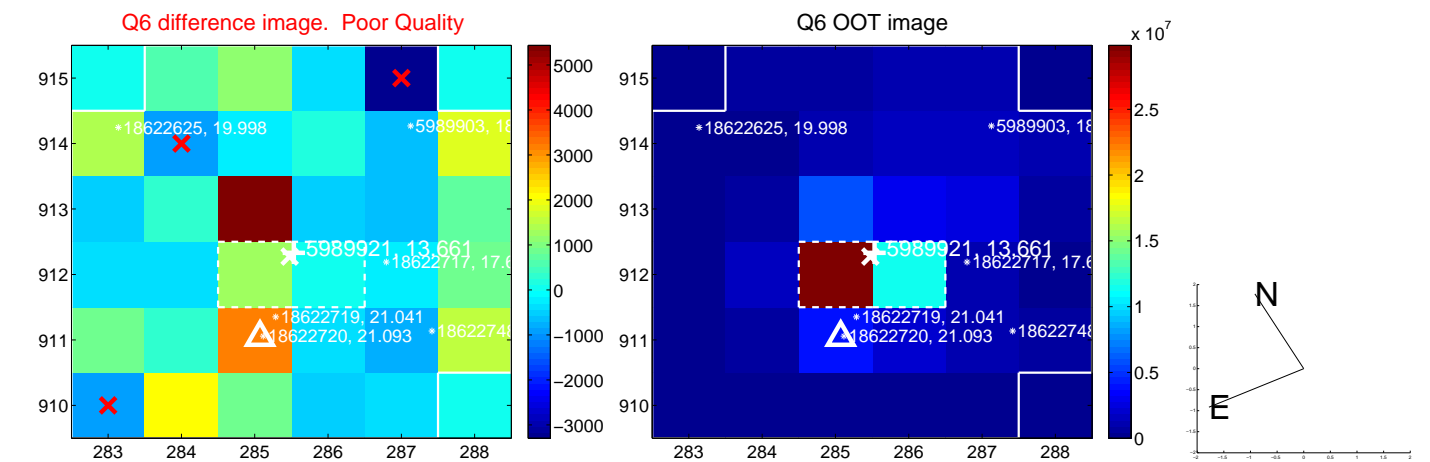
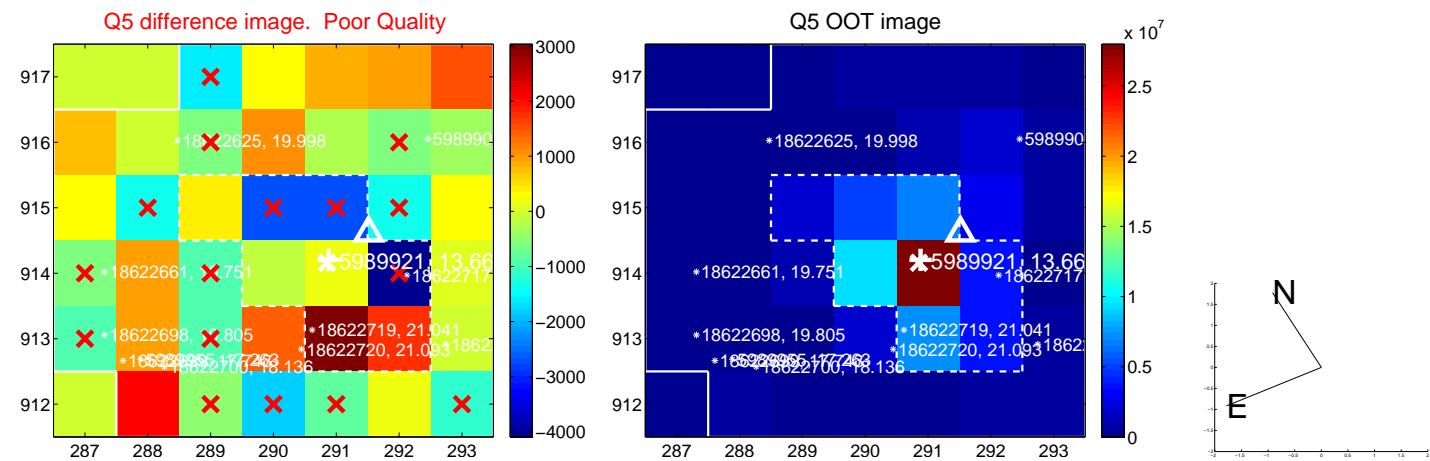


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

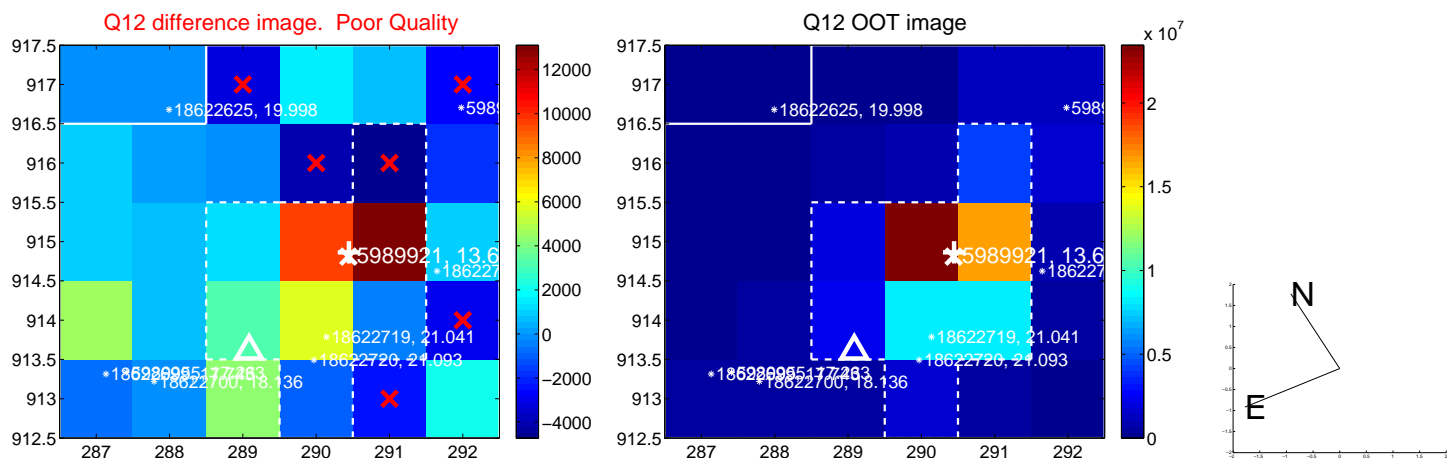
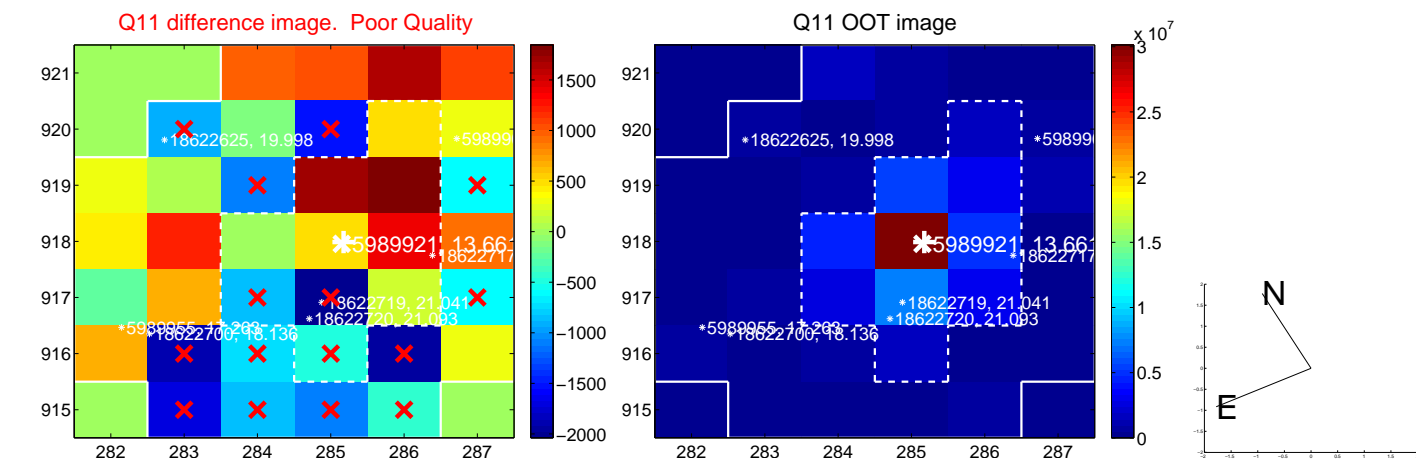
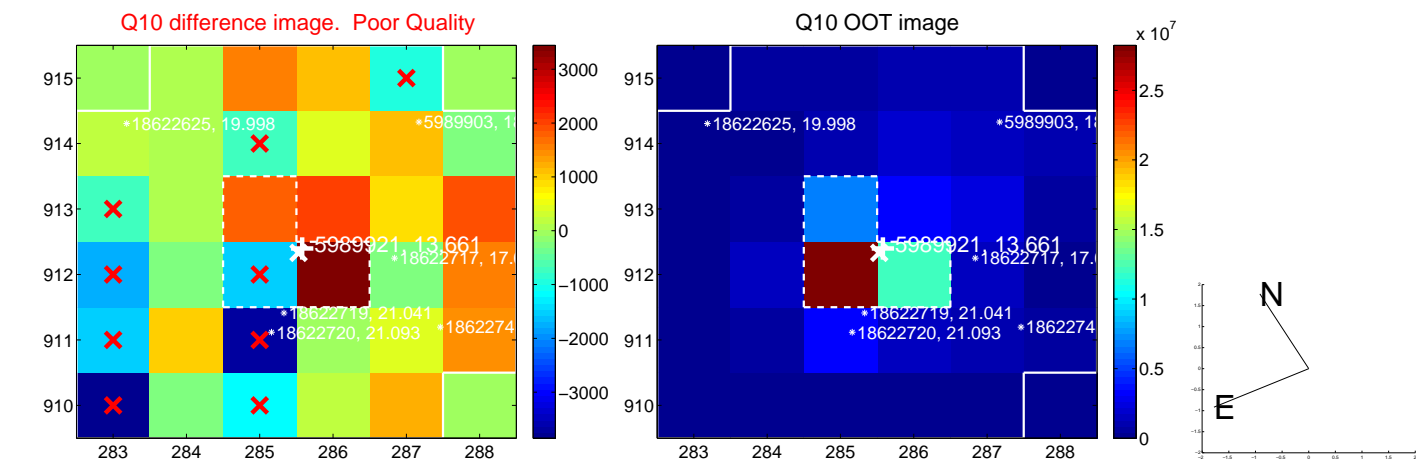
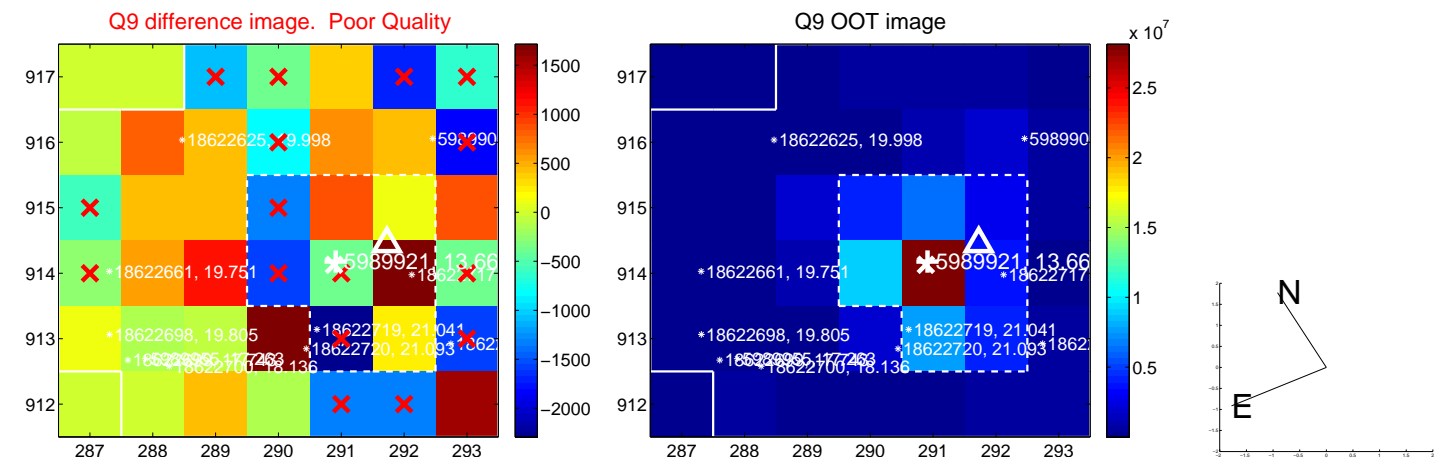
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



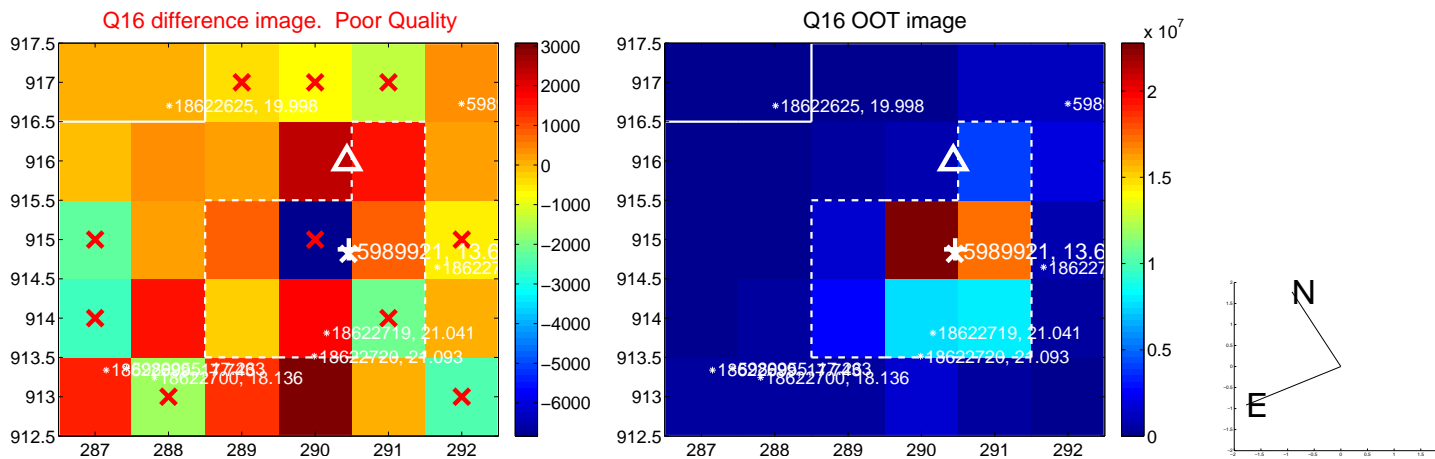
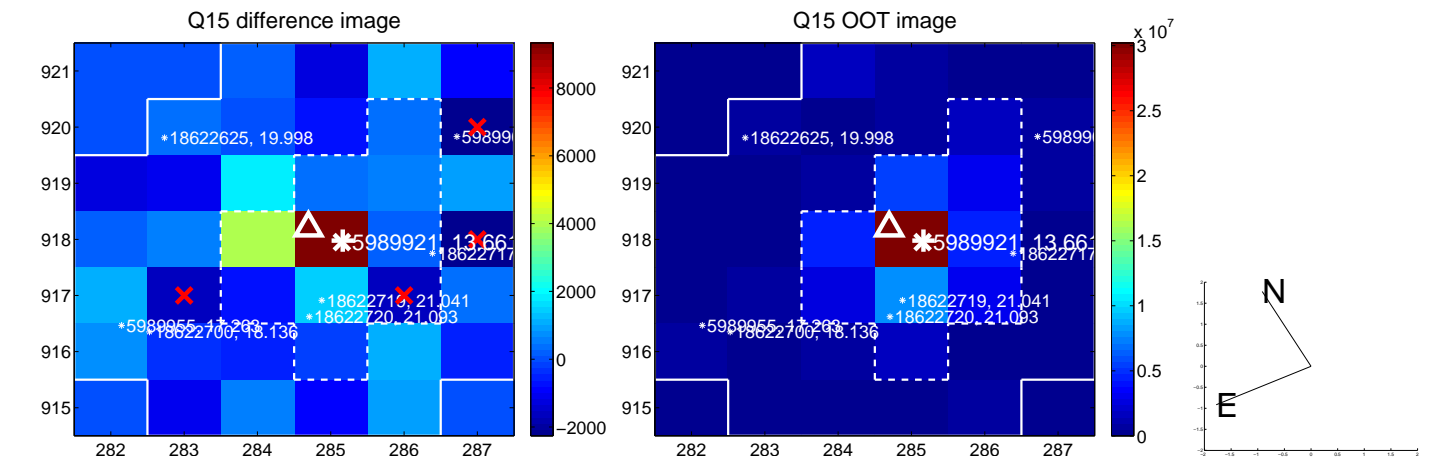
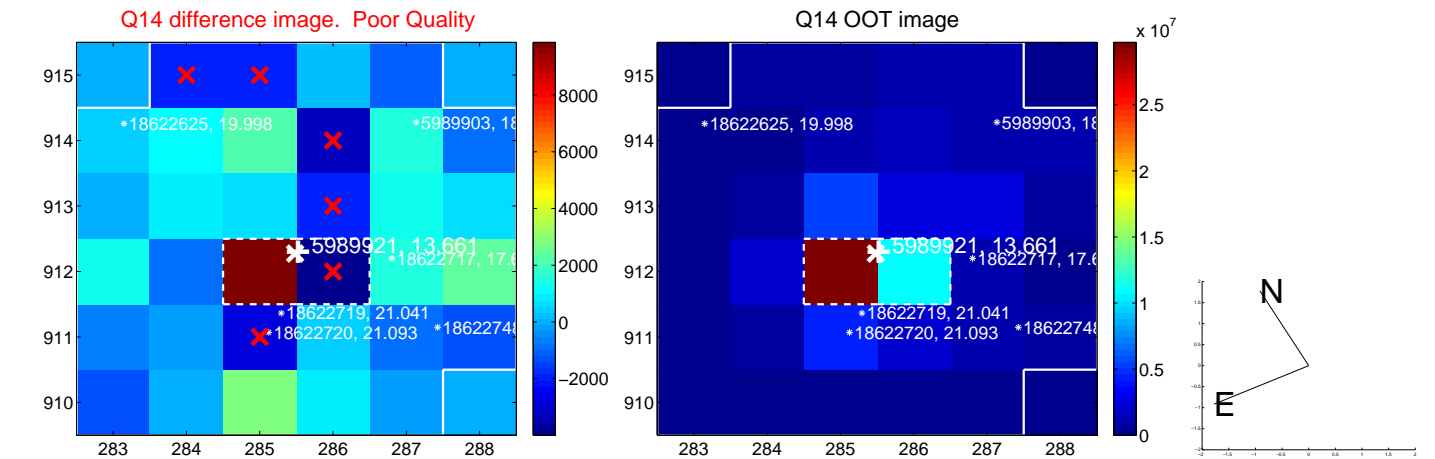
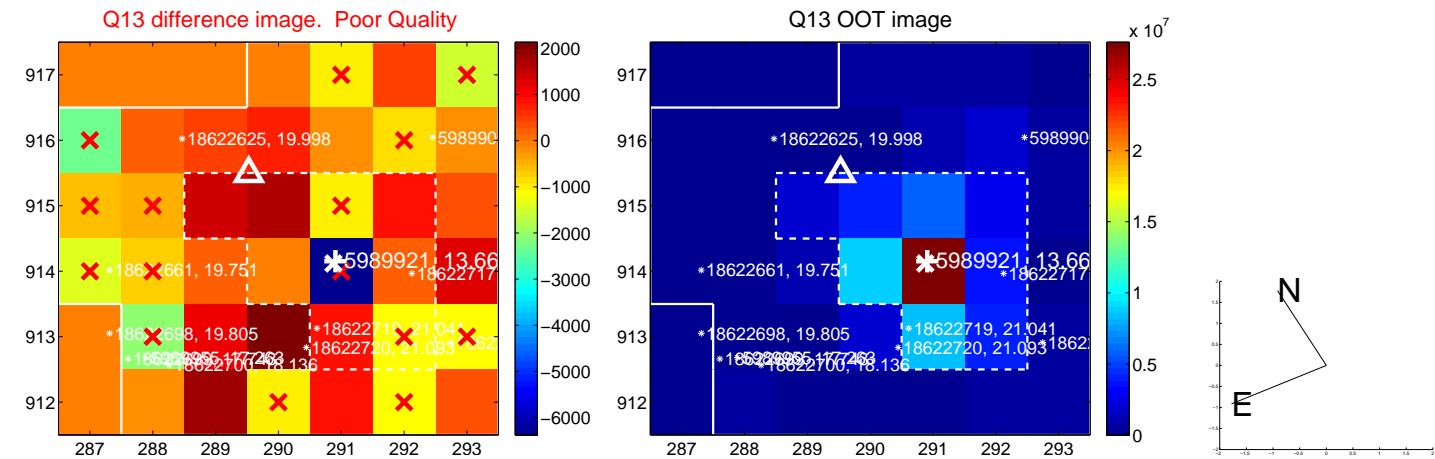
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



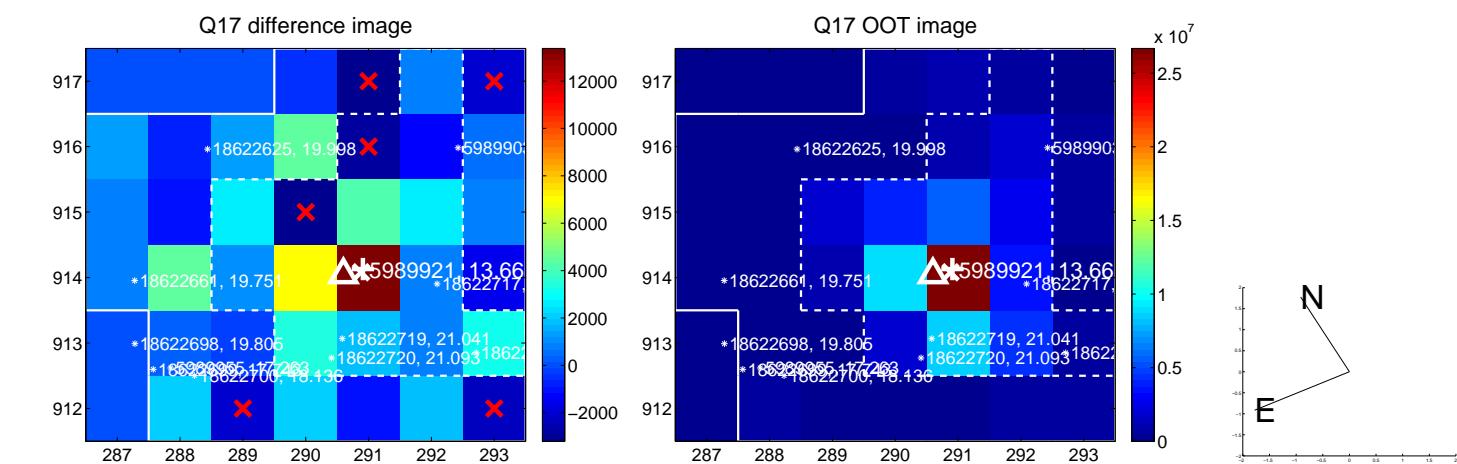
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



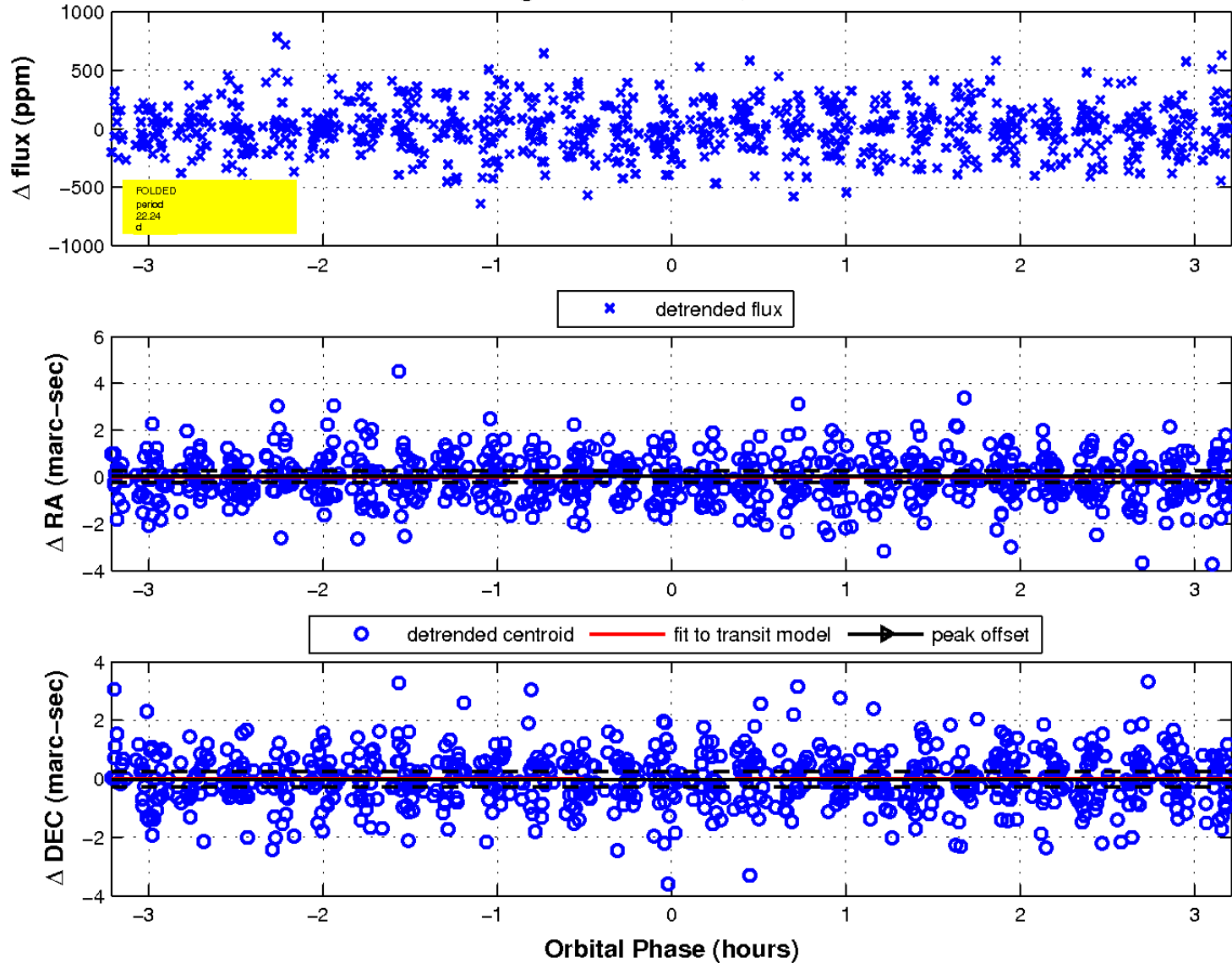
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



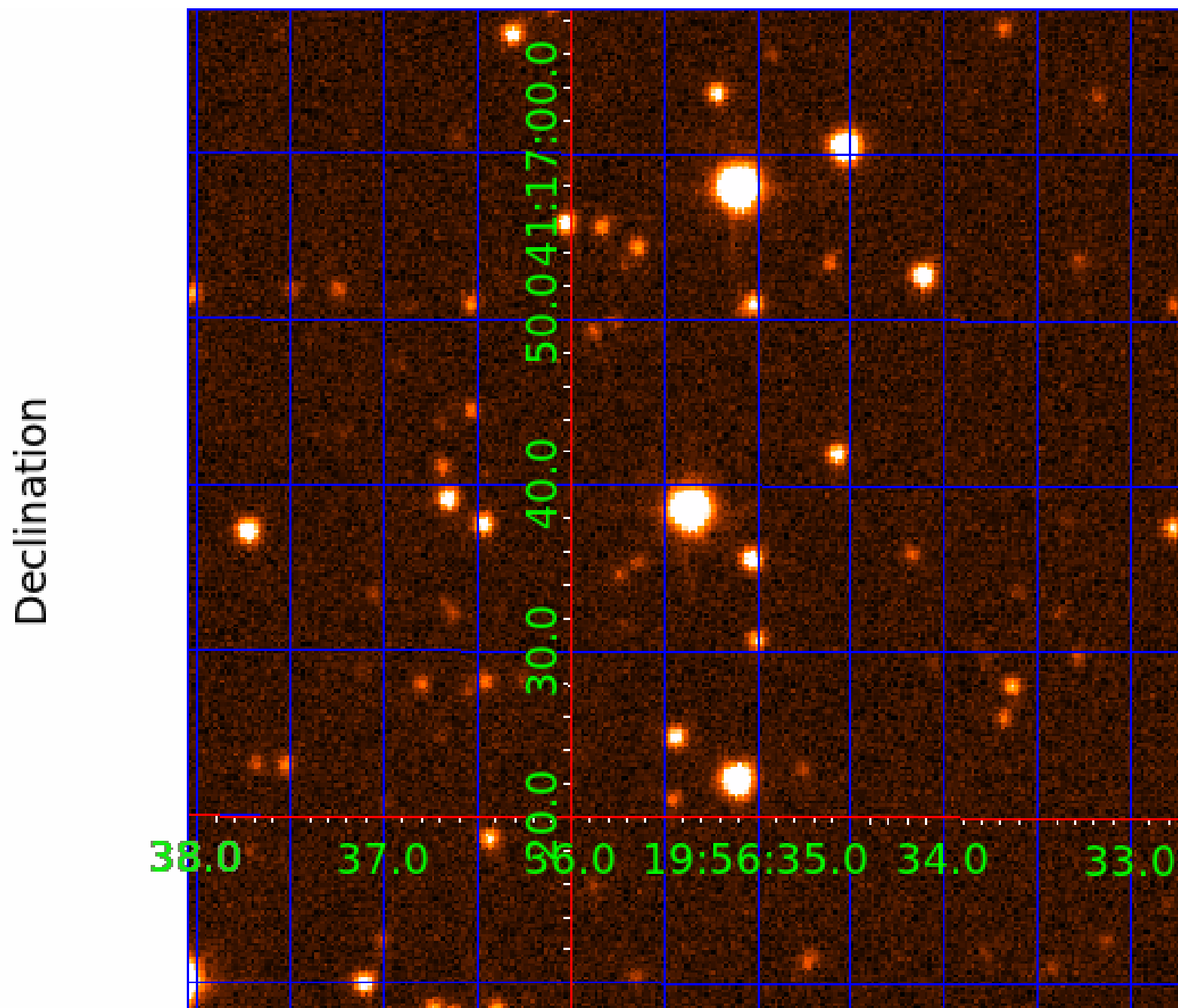
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 5 of 7



UKIRT Image





# KIC 005989921

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005989921-01	OBS	No	0.597713	131.683993	5.9	4.387	8.3	3.0	1.94	6583	0.47	26084.78
005989921-02	OBS	No	11.732653	142.738402	67.7	5.849	10.7	6.8	1.94	6583	1.62	492.62
005989921-03	OBS	No	14.116147	131.740411	319.5	1.454	12.4	13.0	1.94	6583	4.00	384.97
005989921-04	OBS	No	5.791073	131.605569	143.7	2.078	11.0	12.0	1.94	6583	2.48	1262.89
005989921-05	OBS	No	22.241919	139.123933	337.0	1.072	11.3	13.6	1.94	6583	3.60	209.97
005989921-06	OBS	No	12.829749	135.098981	431.7	0.700	10.9	12.3	1.94	6583	4.35	437.27
005989921-07	OBS	No	13.303210	143.085521	229.7	1.624	7.2	9.1	1.94	6583	3.36	416.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005989921-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
005989921-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005989921-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005989921-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS— HALO_GHOST
005989921-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV

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

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

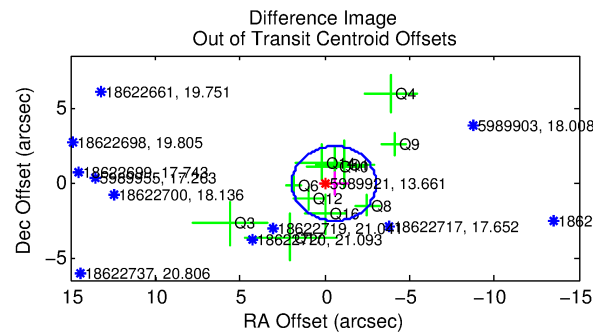
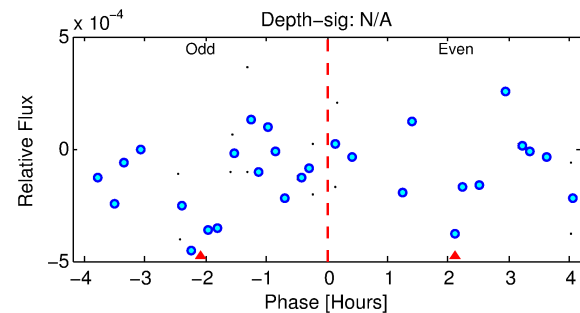
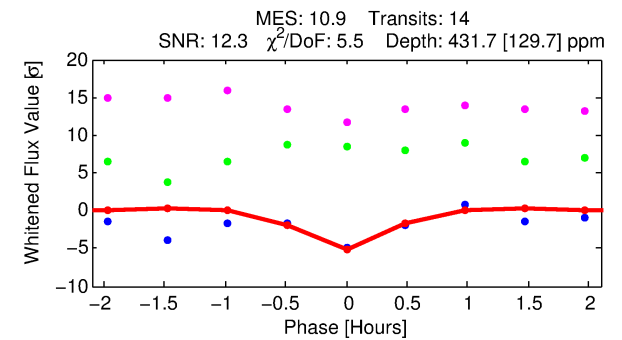
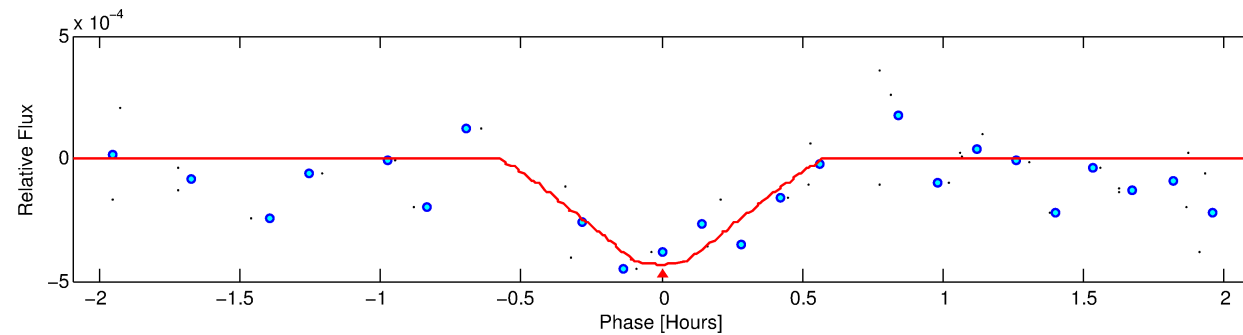
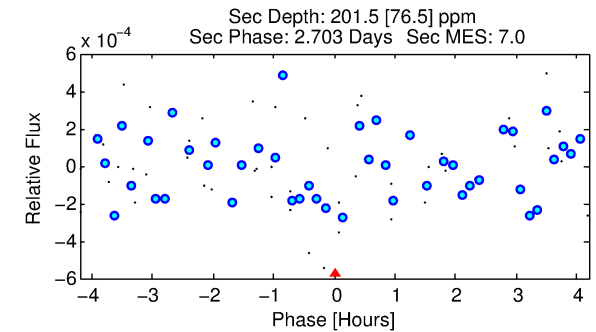
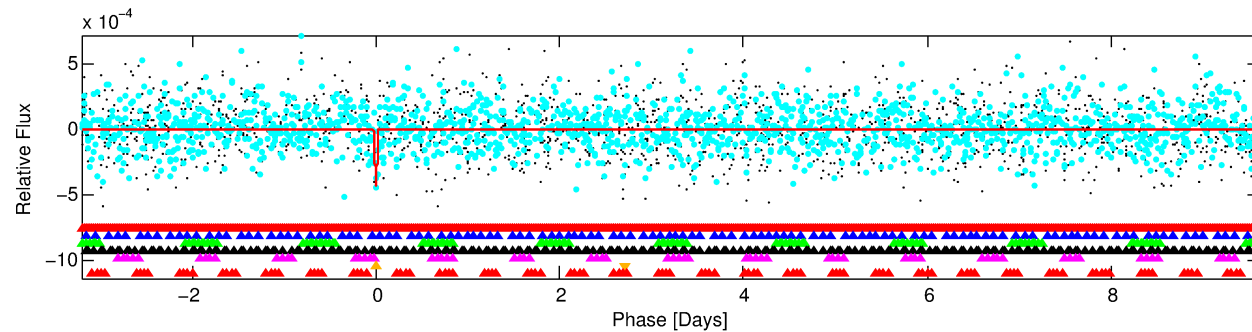
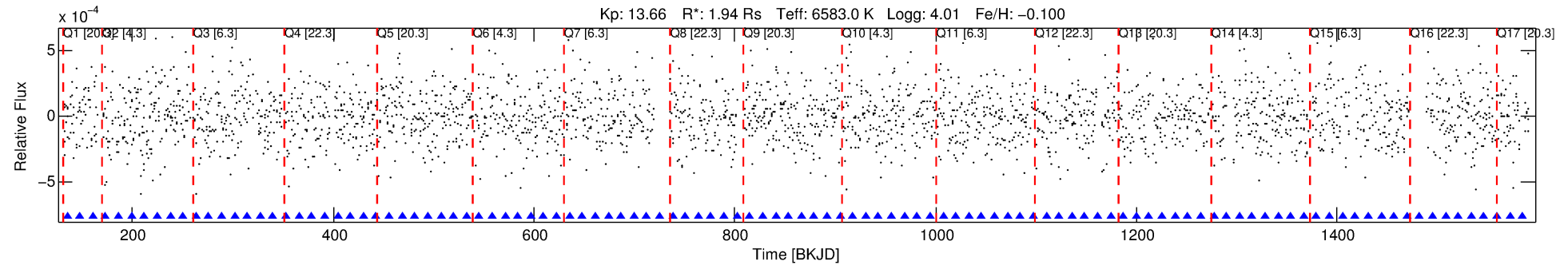
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005989921-06

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 6 of 7 Period: 12.830 d



## DV Fit Results:

Period = 12.82975 [0.00013] d  
Epoch = 135.0990 [0.0065] BKJD  
Rp/R\* = 0.0206 [0.0247]  
a/R\* = 108.38 [663.92]  
b = 0.67 [5.31]  
Seff = 437.27 [230.08]  
Teq = 1166 [153] K  
Rp = 4.35 [5.43] Re  
a = 0.1200 [0.0391] AU  
Ag = 84.46 [209.30] [0.40] $\sigma$   
Teffp = 5465 [3319] K [1.29] $\sigma$

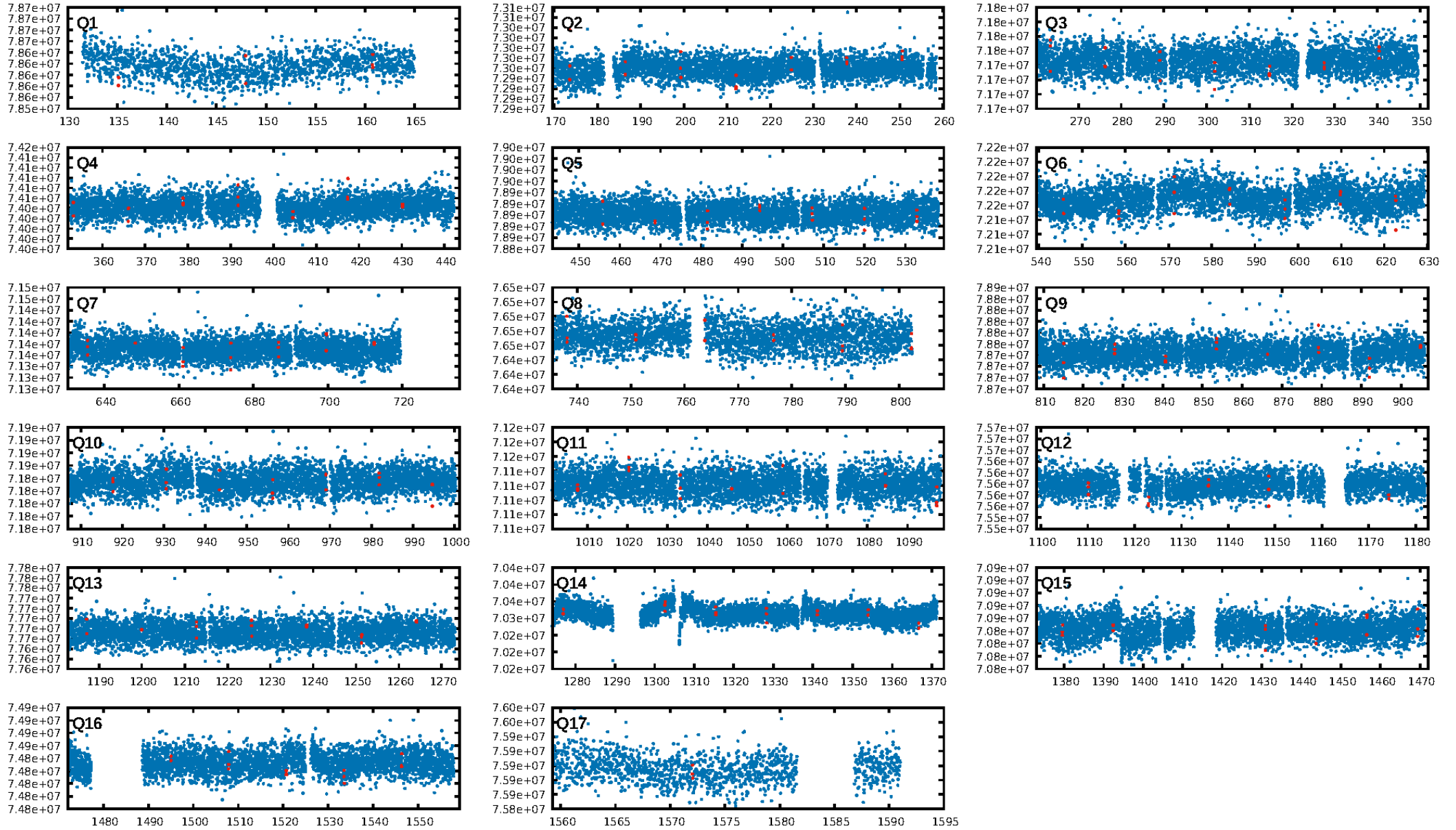
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.47] $\sigma$   
LongPeriod-sig: 100.0% [6.43] $\sigma$   
ModelChiSquare2-sig: 10.4%  
ModelChiSquareGof-sig: 87.0%  
**Bootstrap-pfa: 9.36e-11**  
RollingBand-fgt: 1.00 [14/14]  
GhostDiagnostic-chr: -2.928  
Centroid-sig: 1.6%  
Centroid-so: 1.281 arcsec [2.37] $\sigma$   
OotOffset-rm: 0.556 arcsec [0.67] $\sigma$   
OotOffset-st: 3/1/4/3 [11]  
KicOffset-rm: 0.685 arcsec [0.83] $\sigma$   
KicOffset-st: 3/1/4/3 [11]  
DiffImageQuality-fgm: 0.27 [3/11]  
DiffImageOverlap-fno: 0.00 [0/17]

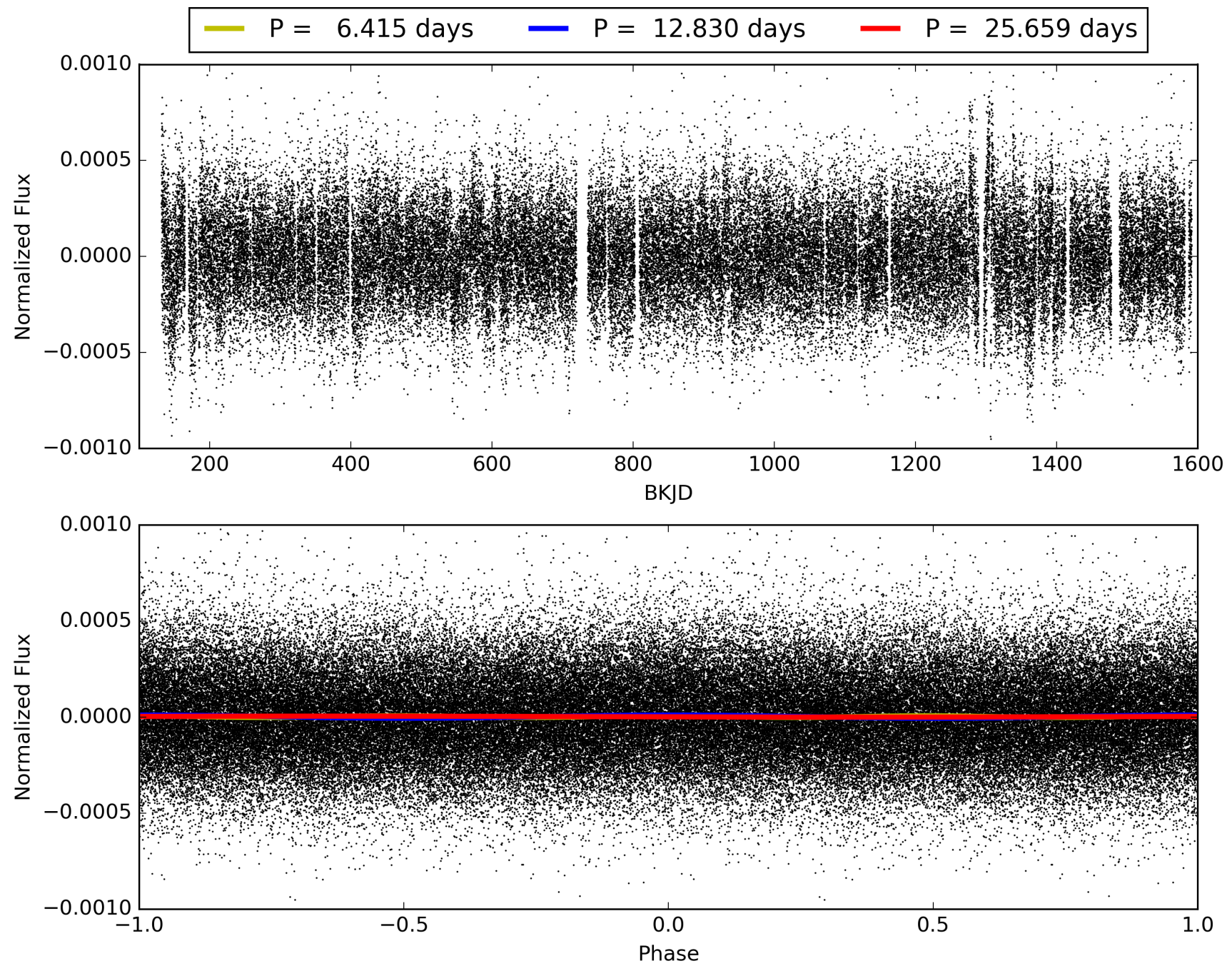
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:55 Z

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

# TCE 005989921-06, PDC Light Curves

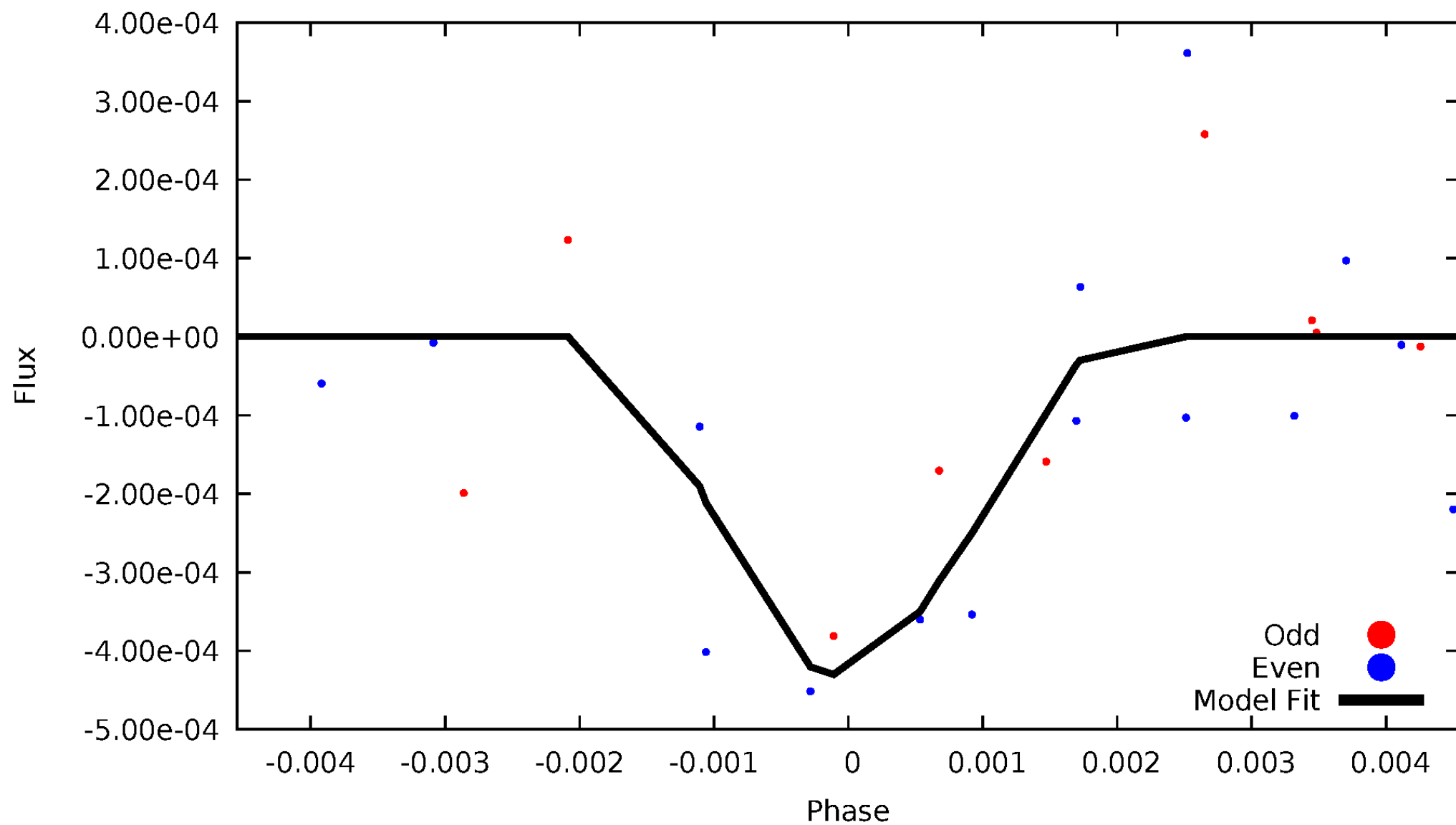


TCE 005989921-06



# DV Odd/Even

TCE 005989921-06





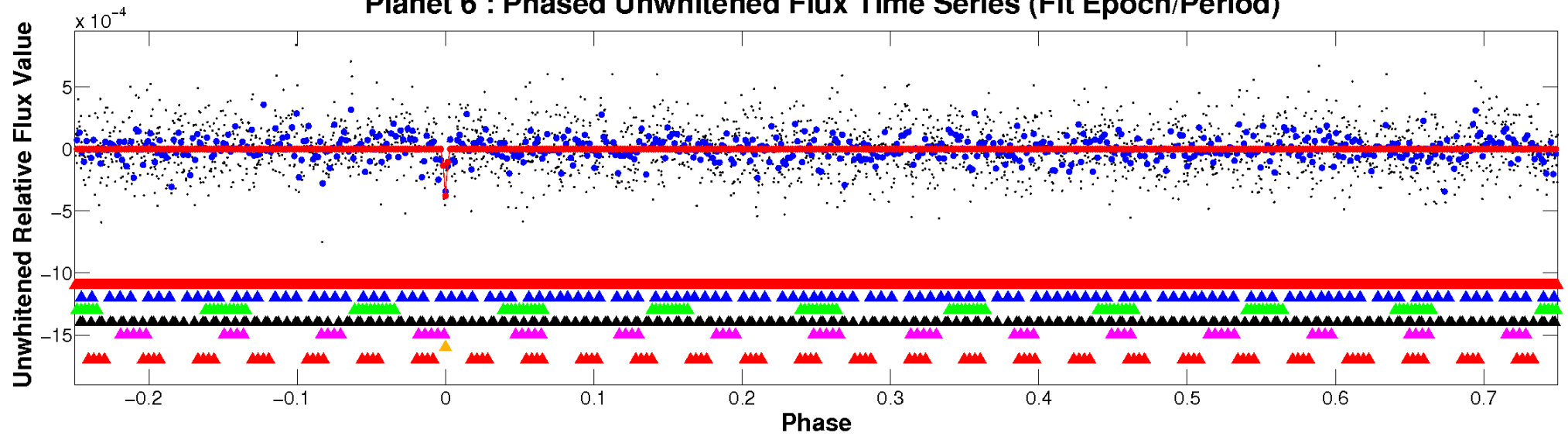
ALT Odd/Even

This plot does not exist for this TCE.

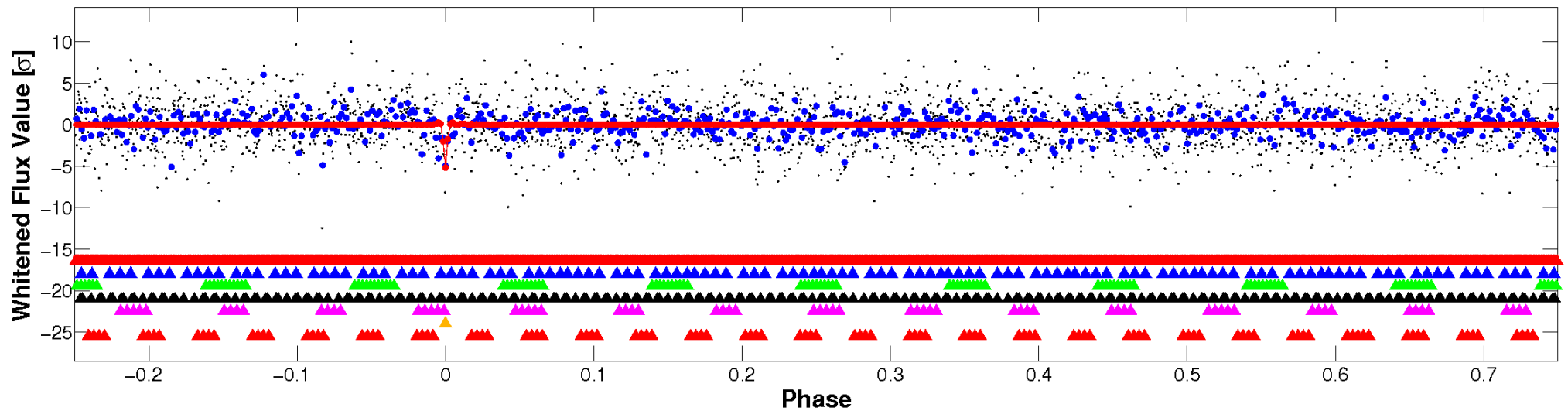


# Non-Whitened Vs. Whitened Light Curve

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

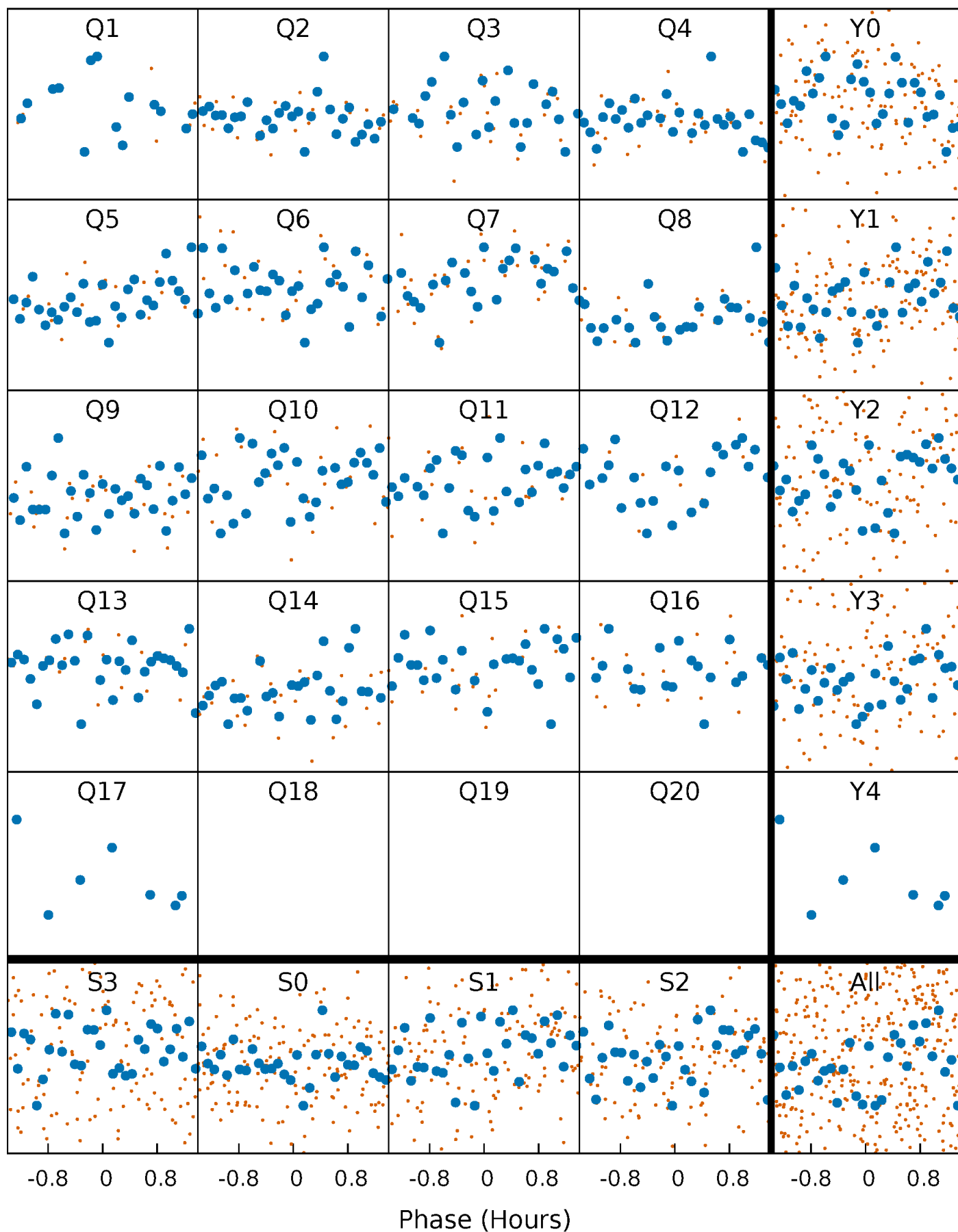


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



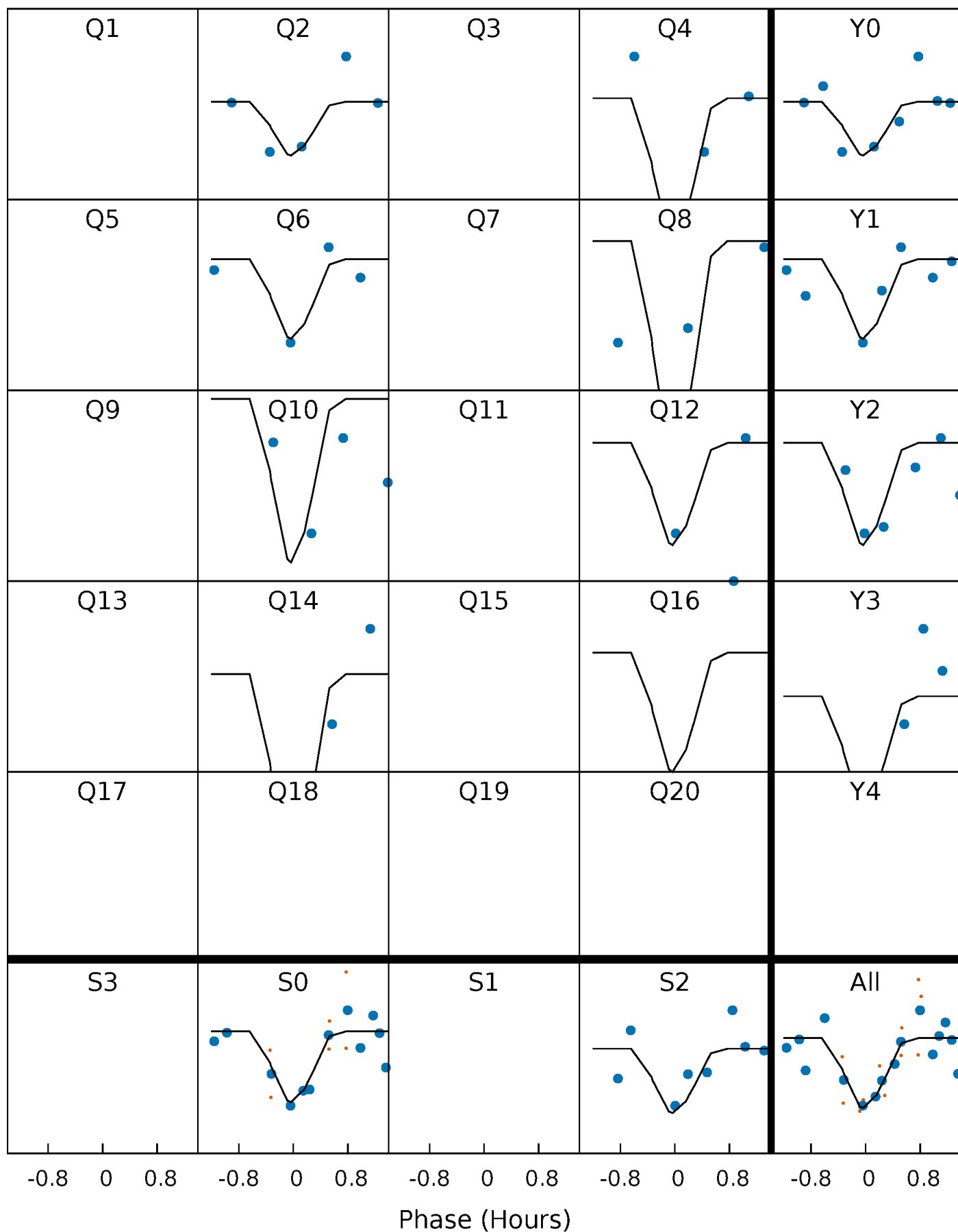
# PDC Quarter-Phased Transit Curves

TCE 005989921-06 P= 12.829749 Days  $T_0=135.098981$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005989921-06 P= 12.829749 Days  $T_0=135.098981$  (BKJD)

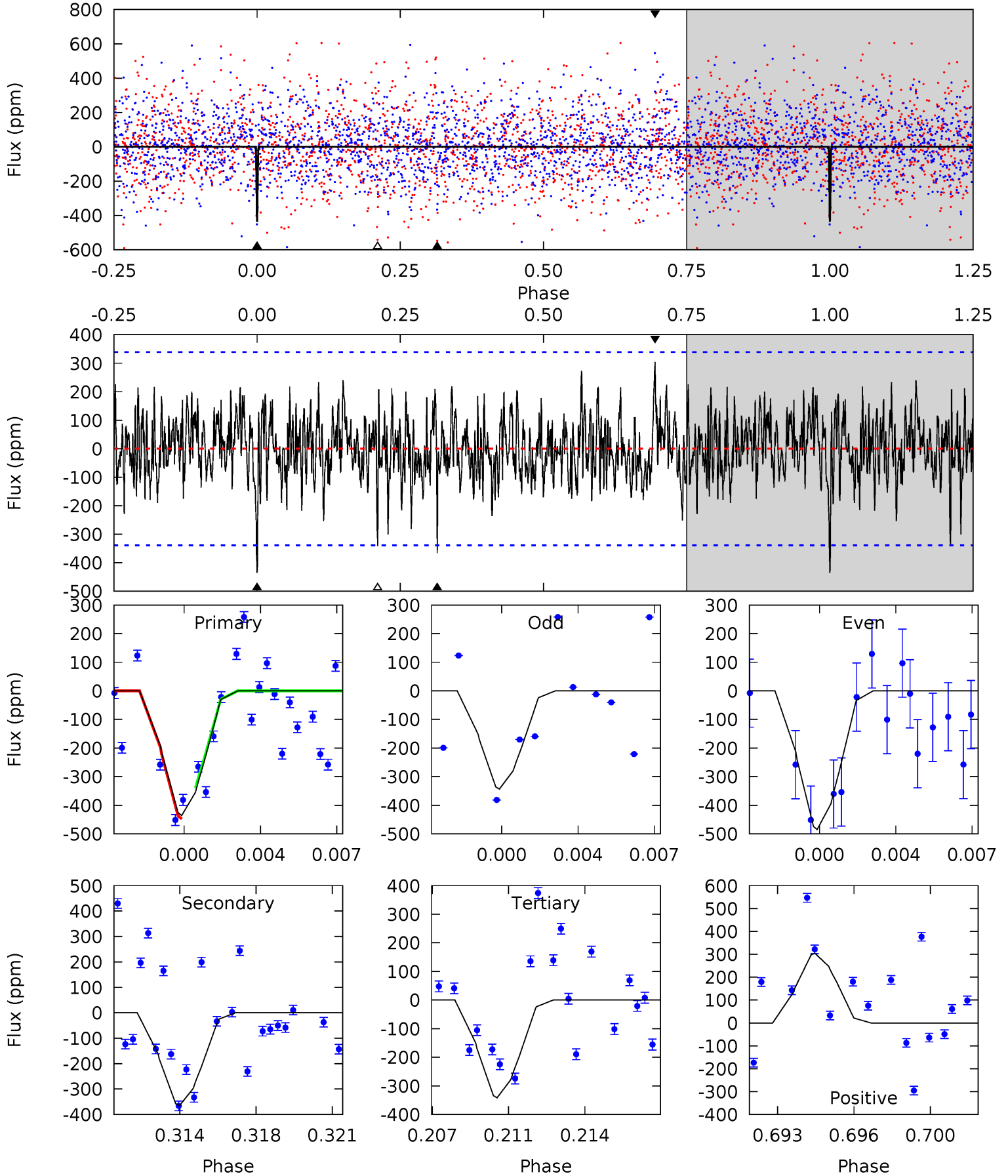


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005989921-06, P = 12.829749 Days, E = 122.269232 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.71	5.63	5.26	4.69	5.22	2.91	1.42	1.45	2.02	0.37	0.94	1.06	1.00	0.41	0.72



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005989921

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-366 \pm 65$	$5.53^{+4.70}_{-3.48}$	$1606^{+133}_{-140}$	$5435^{+4006}_{-1172}$	$91^{+611}_{-64}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



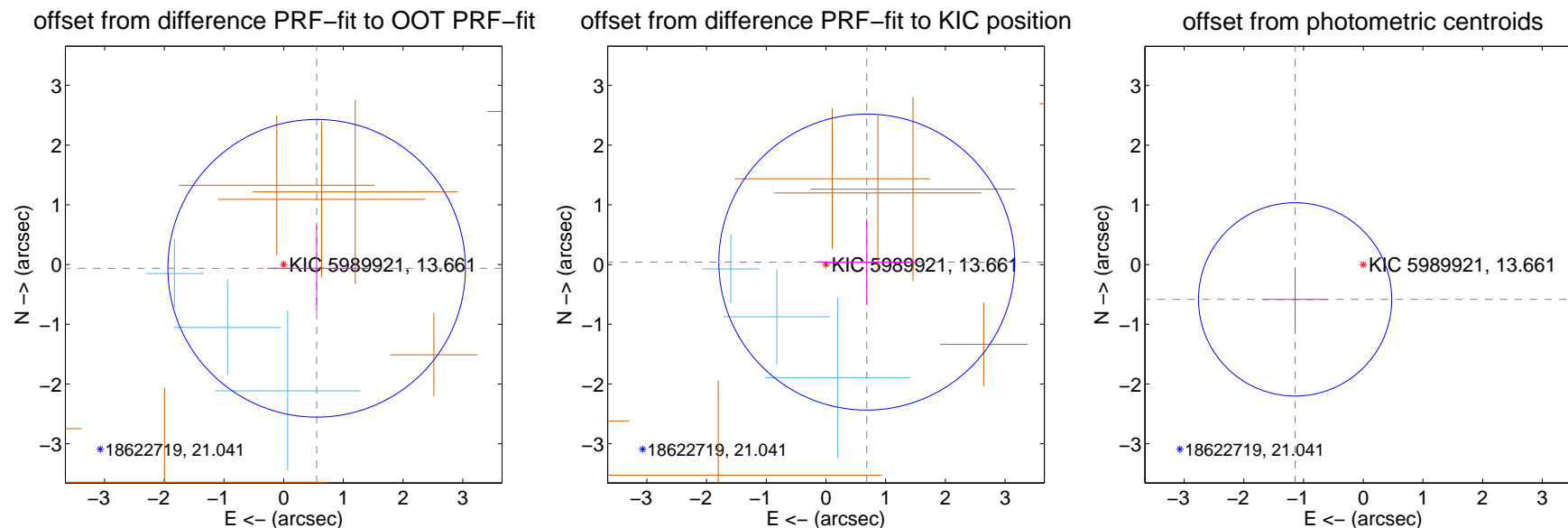
## DV Centroid Data

Supplemental centroid analysis for 005989921-06. Kepler magnitude: 13.66. Transit SNR 12.32

There are 3 quarters with good PRF difference image offsets

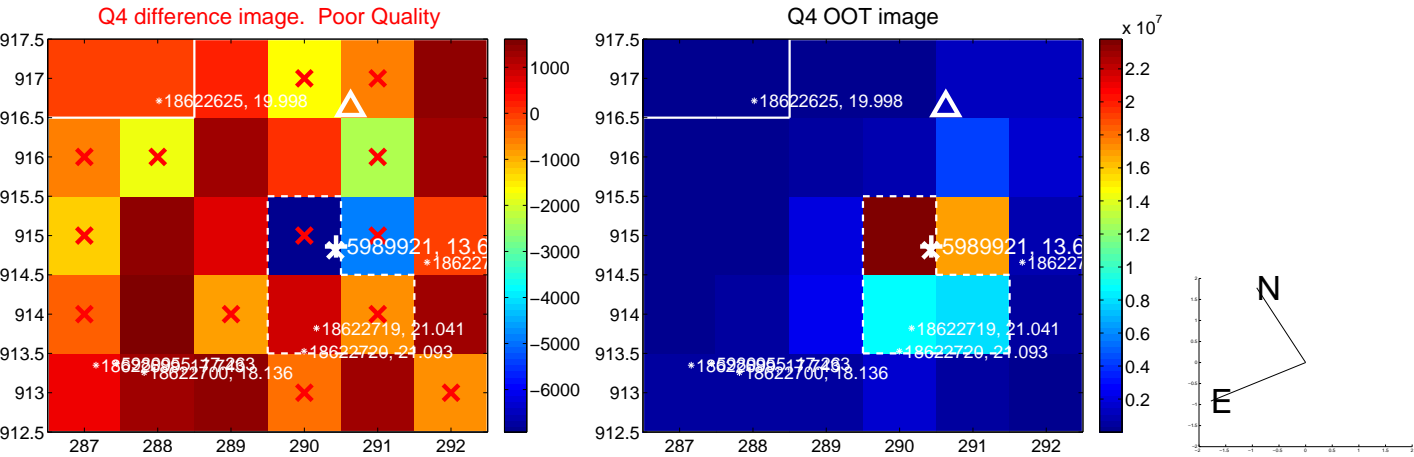
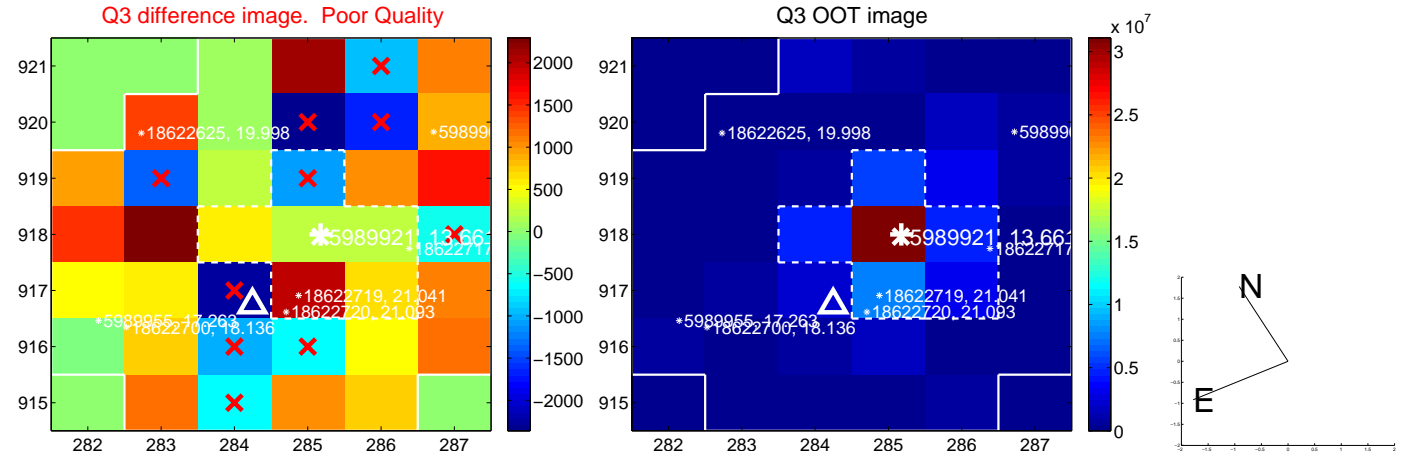
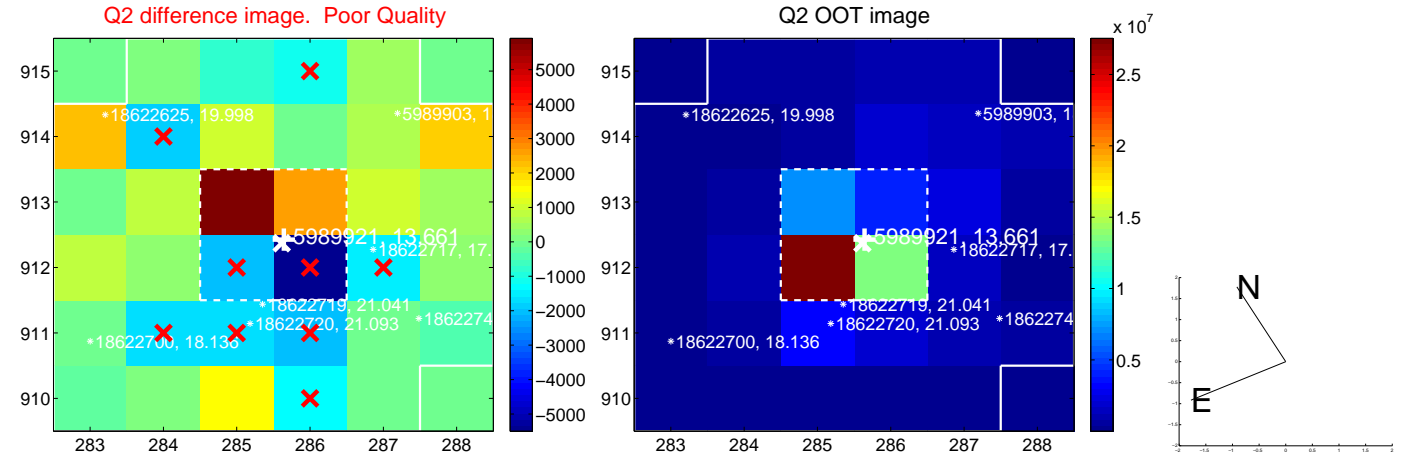
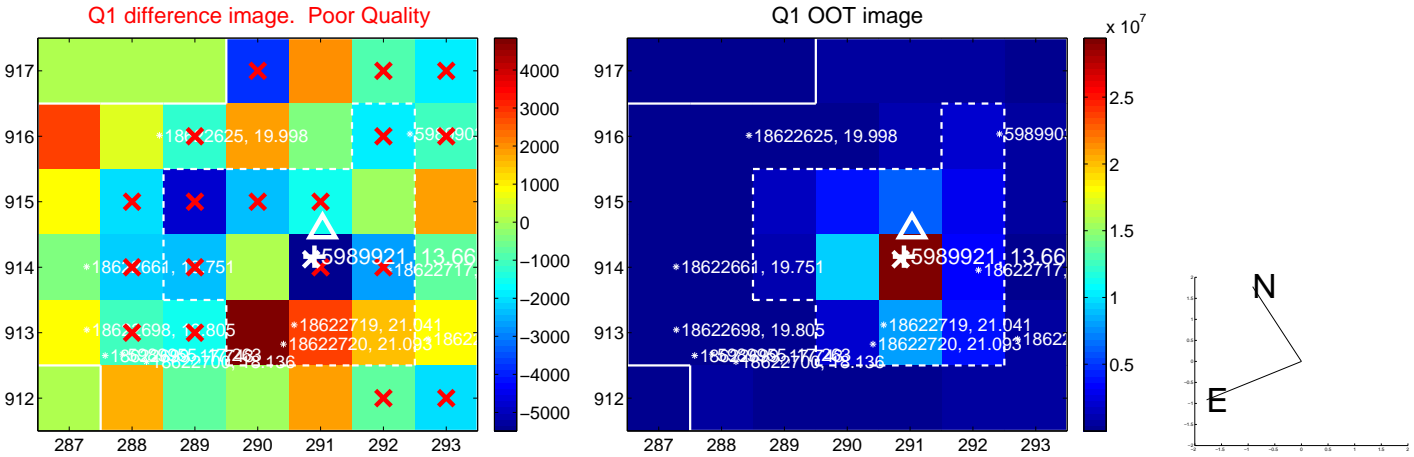
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.556 \pm 0.831$	0.67	$-0.552 \pm 0.832$	$-0.063 \pm 0.721$
PRF-fit source offset from KIC position	$0.685 \pm 0.826$	0.83	$-0.684 \pm 0.826$	$0.041 \pm 0.717$
photometric centroid source offset	$1.28 \pm 0.54$	2.37	$1.14 \pm 0.55$	$-0.58 \pm 0.51$

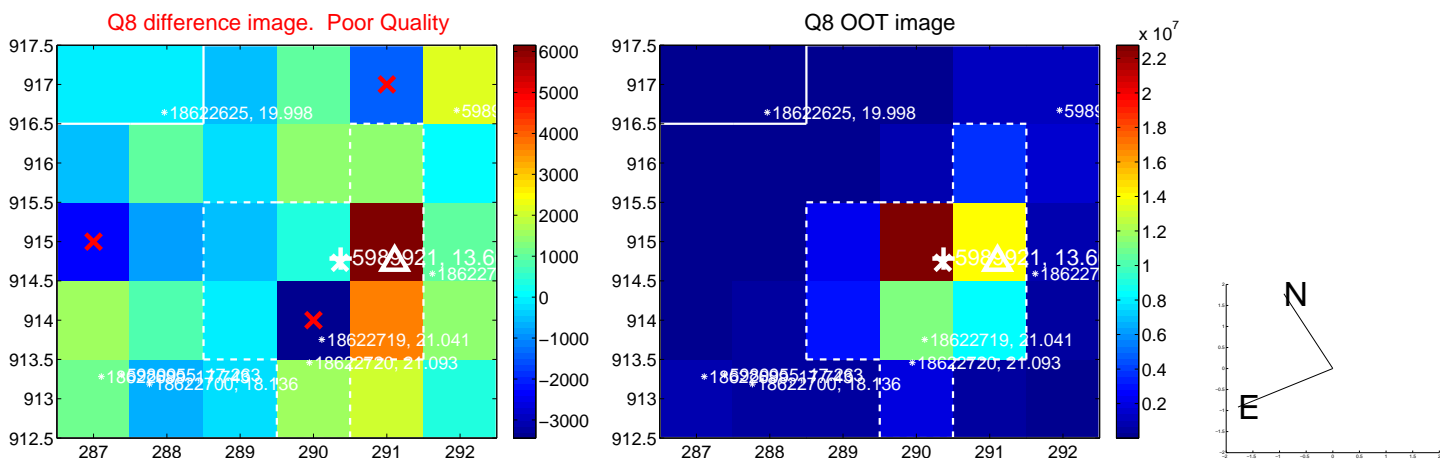
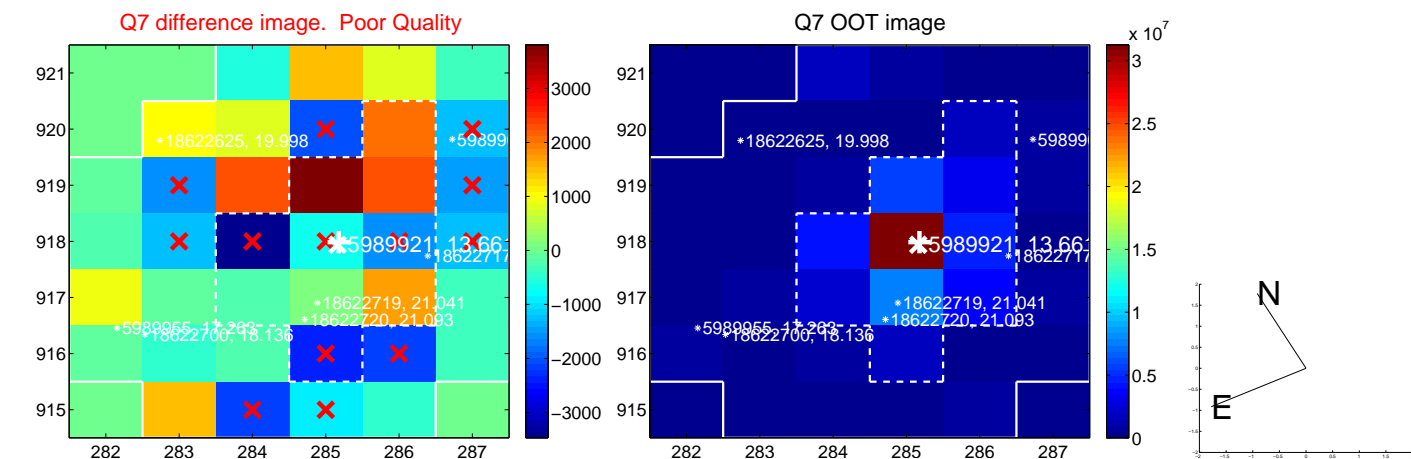
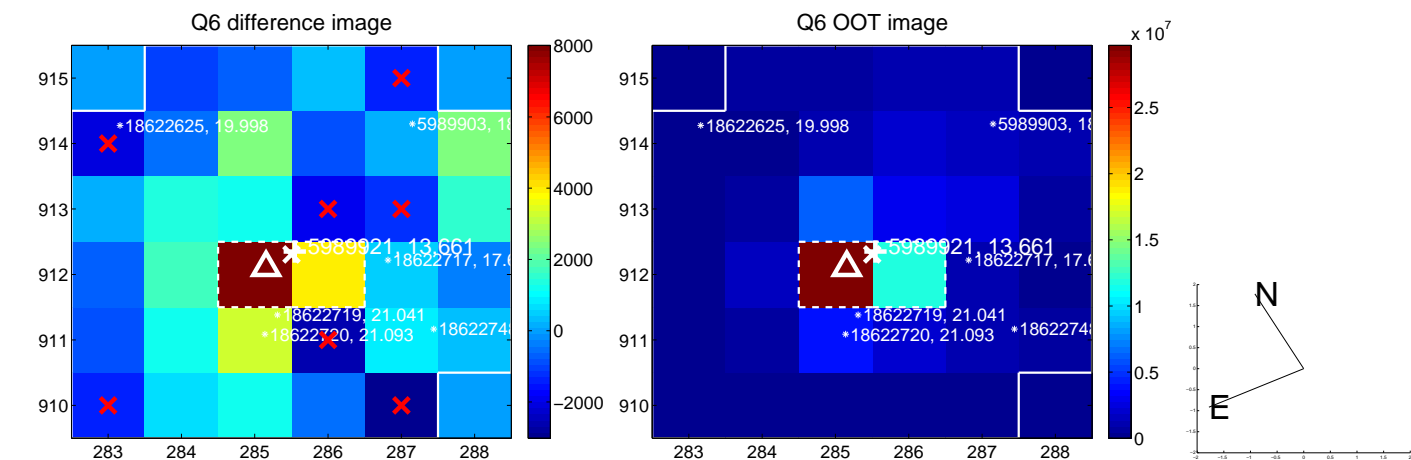
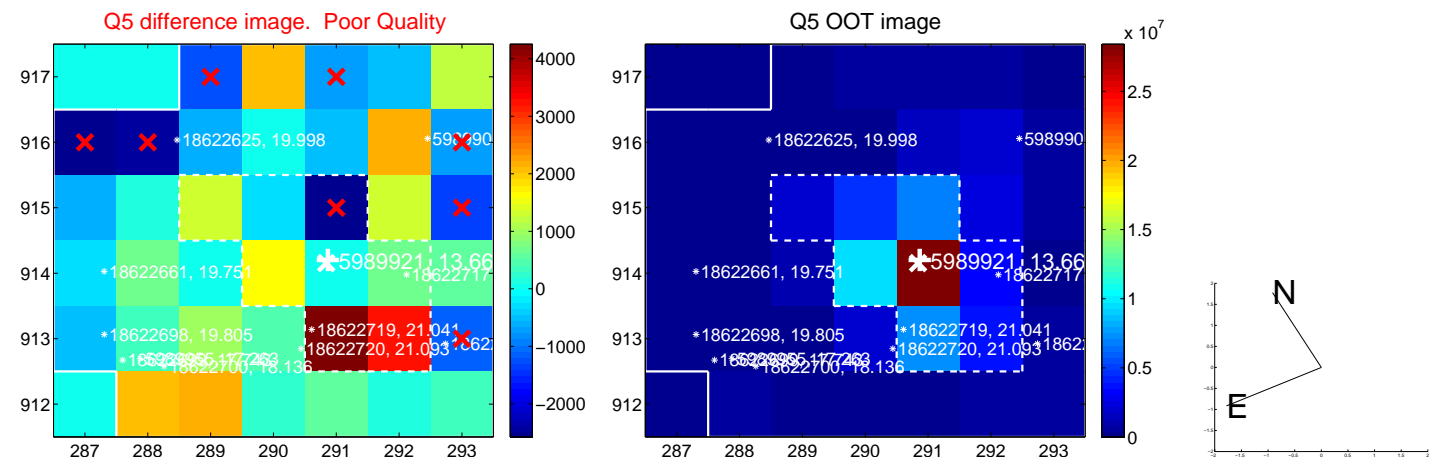


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

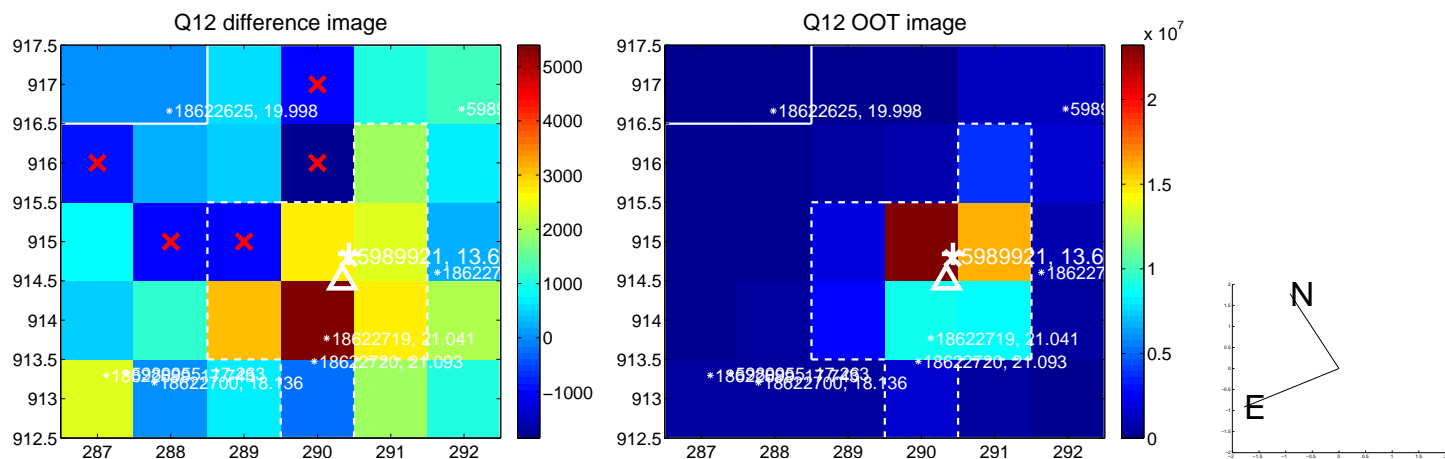
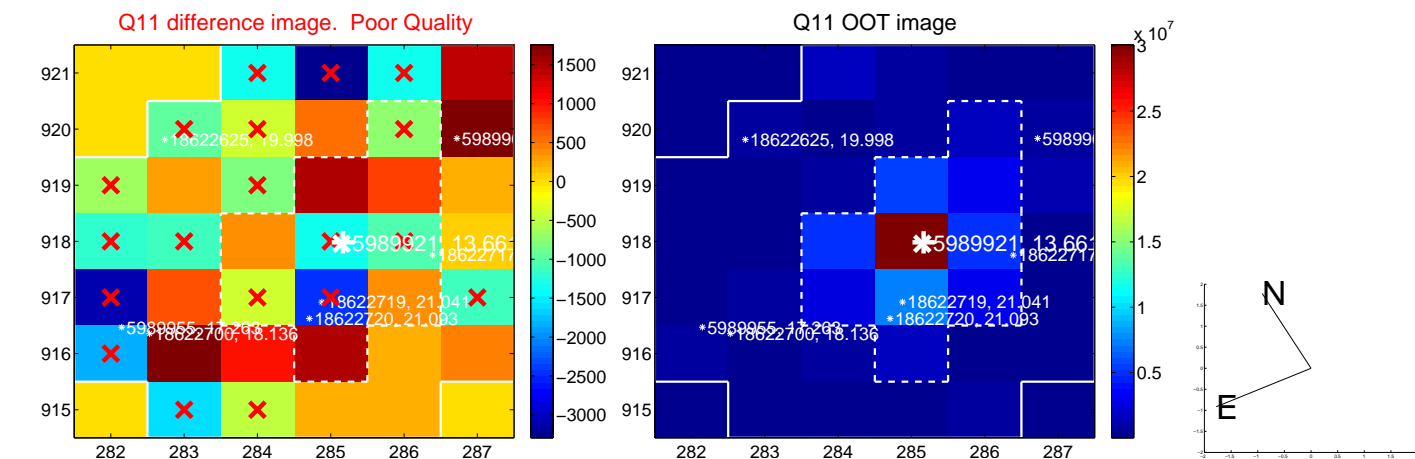
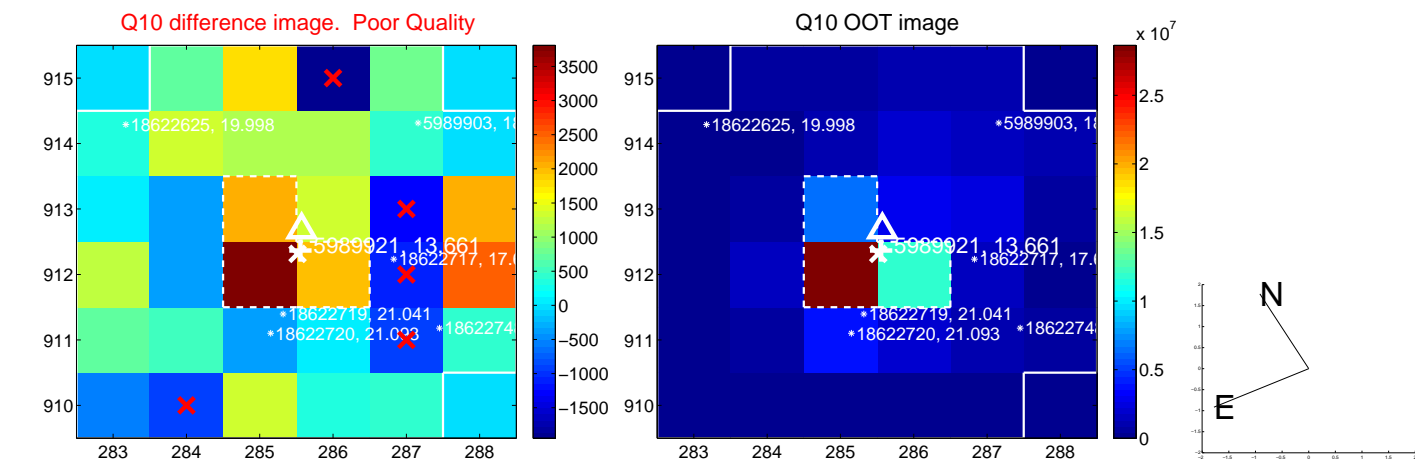
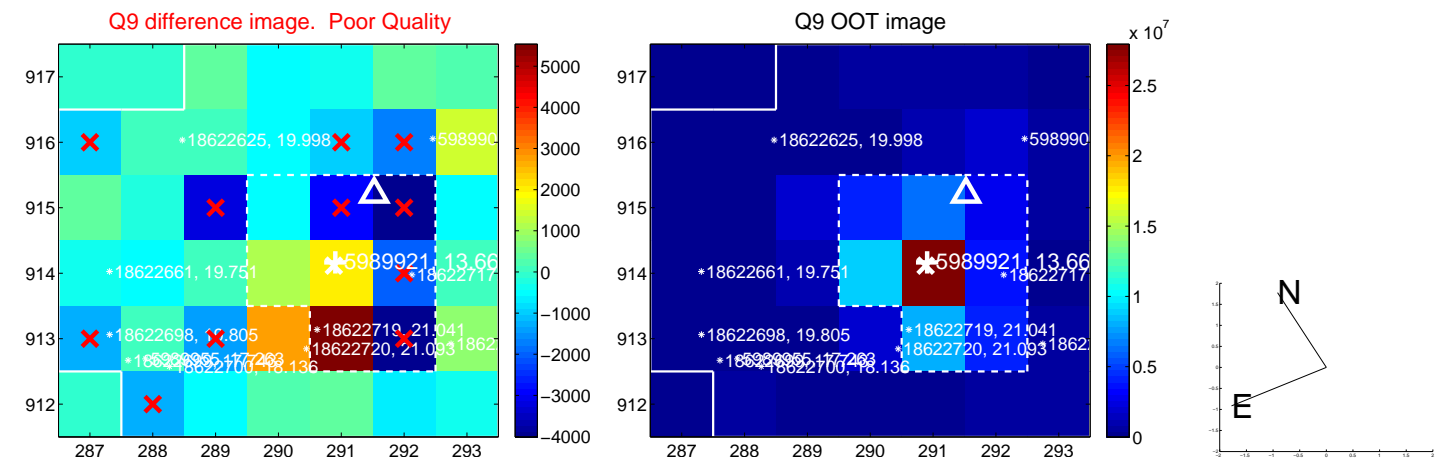
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



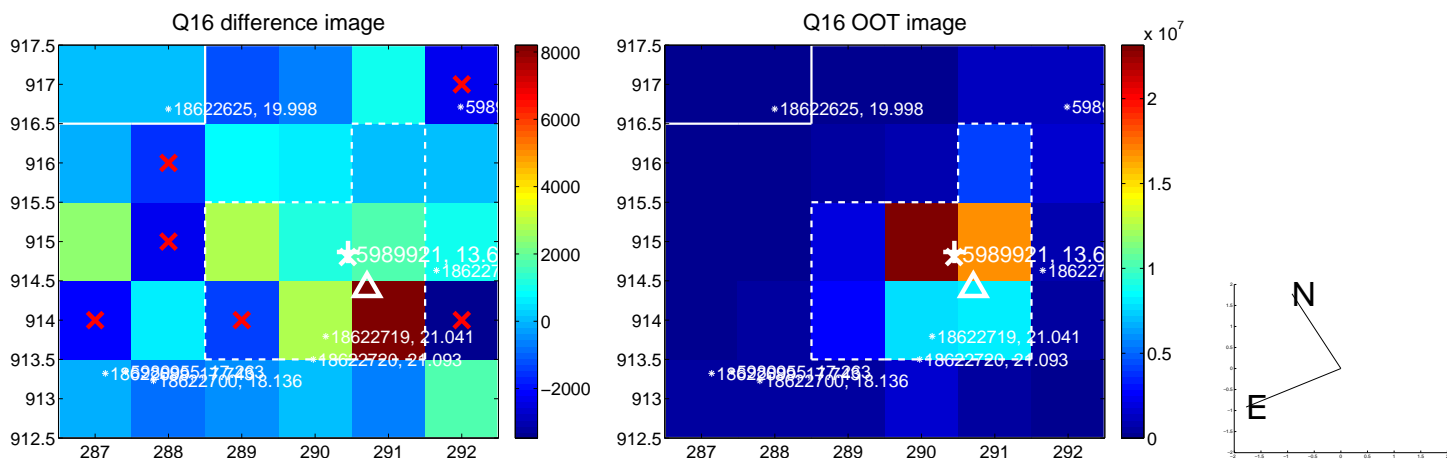
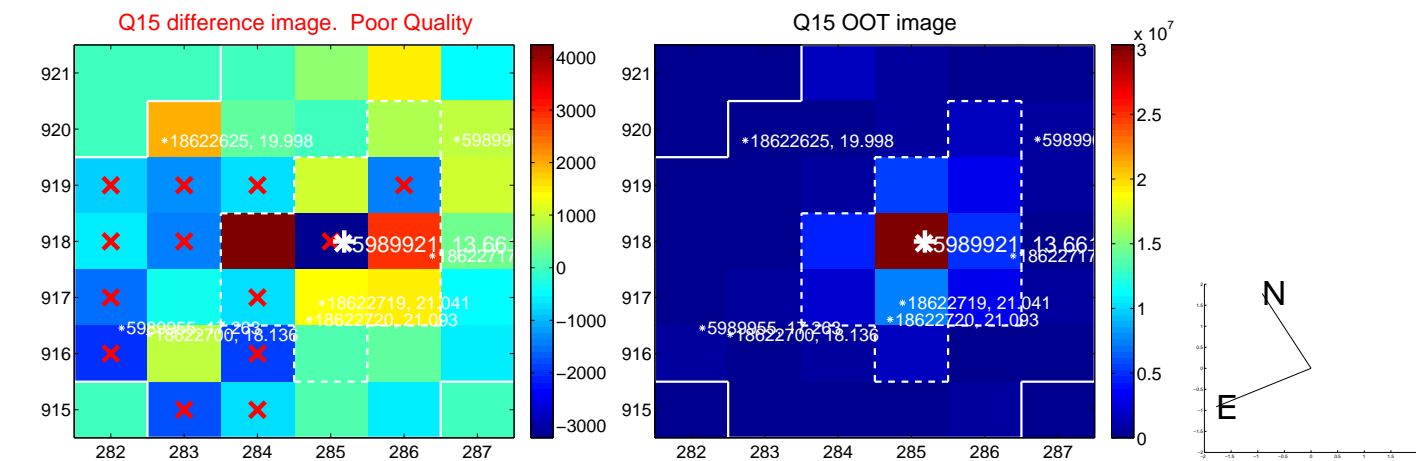
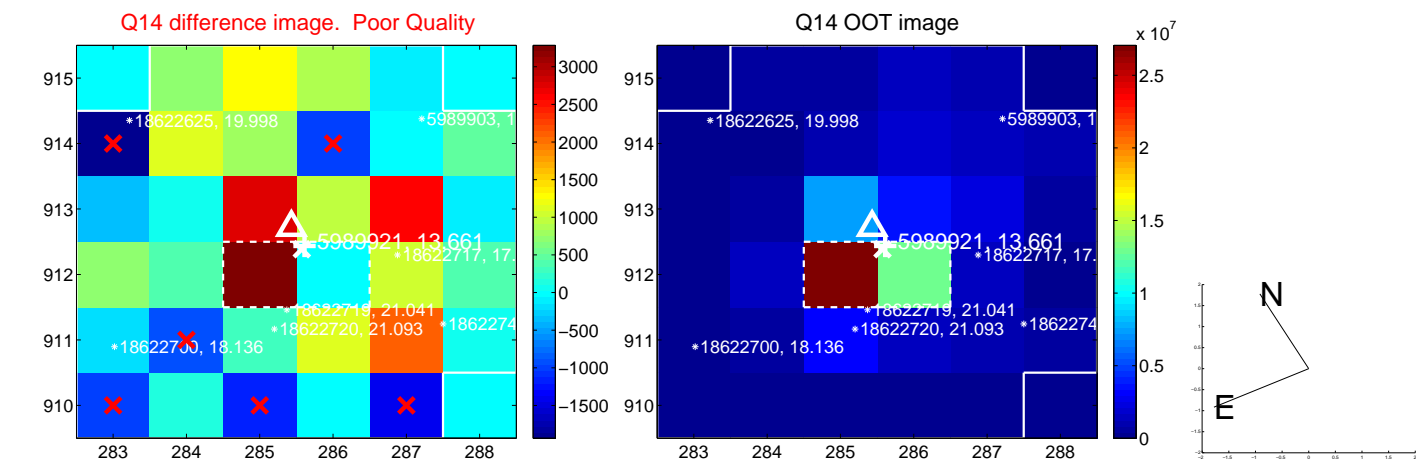
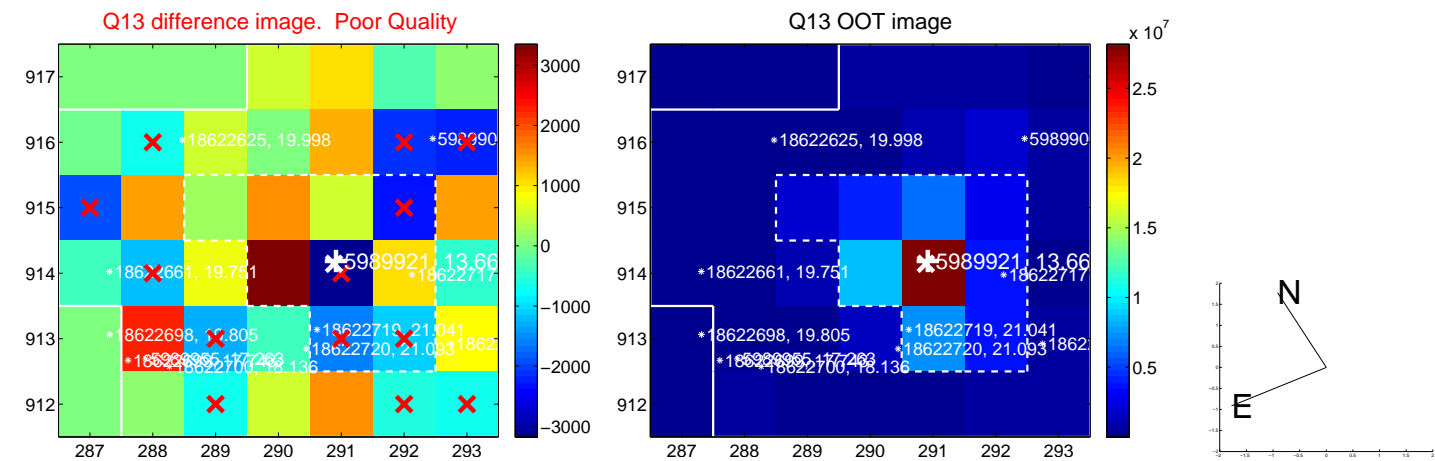
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



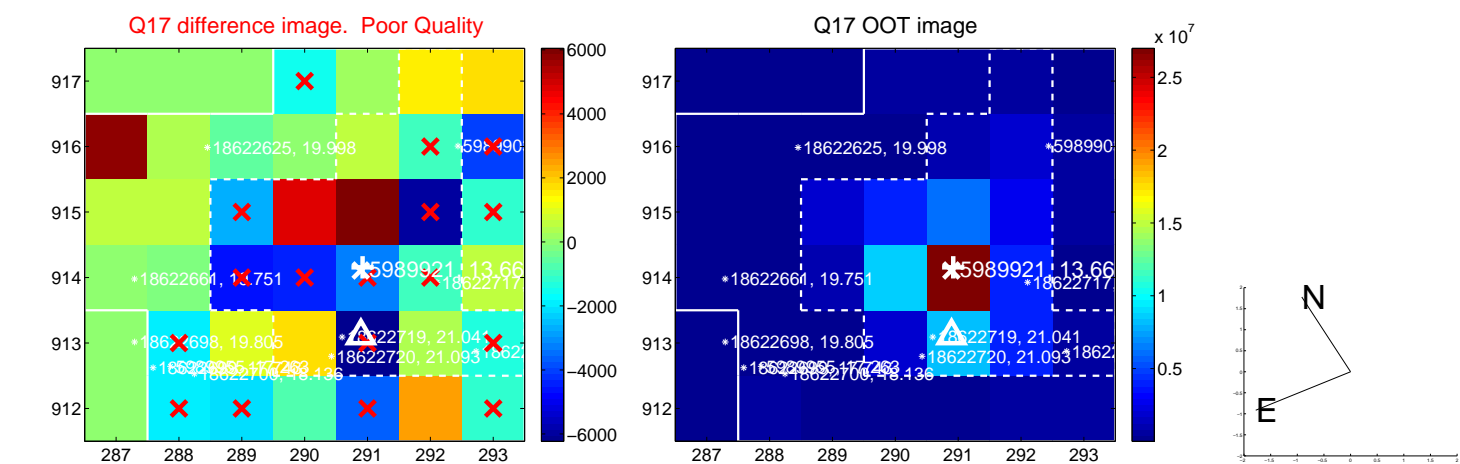
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



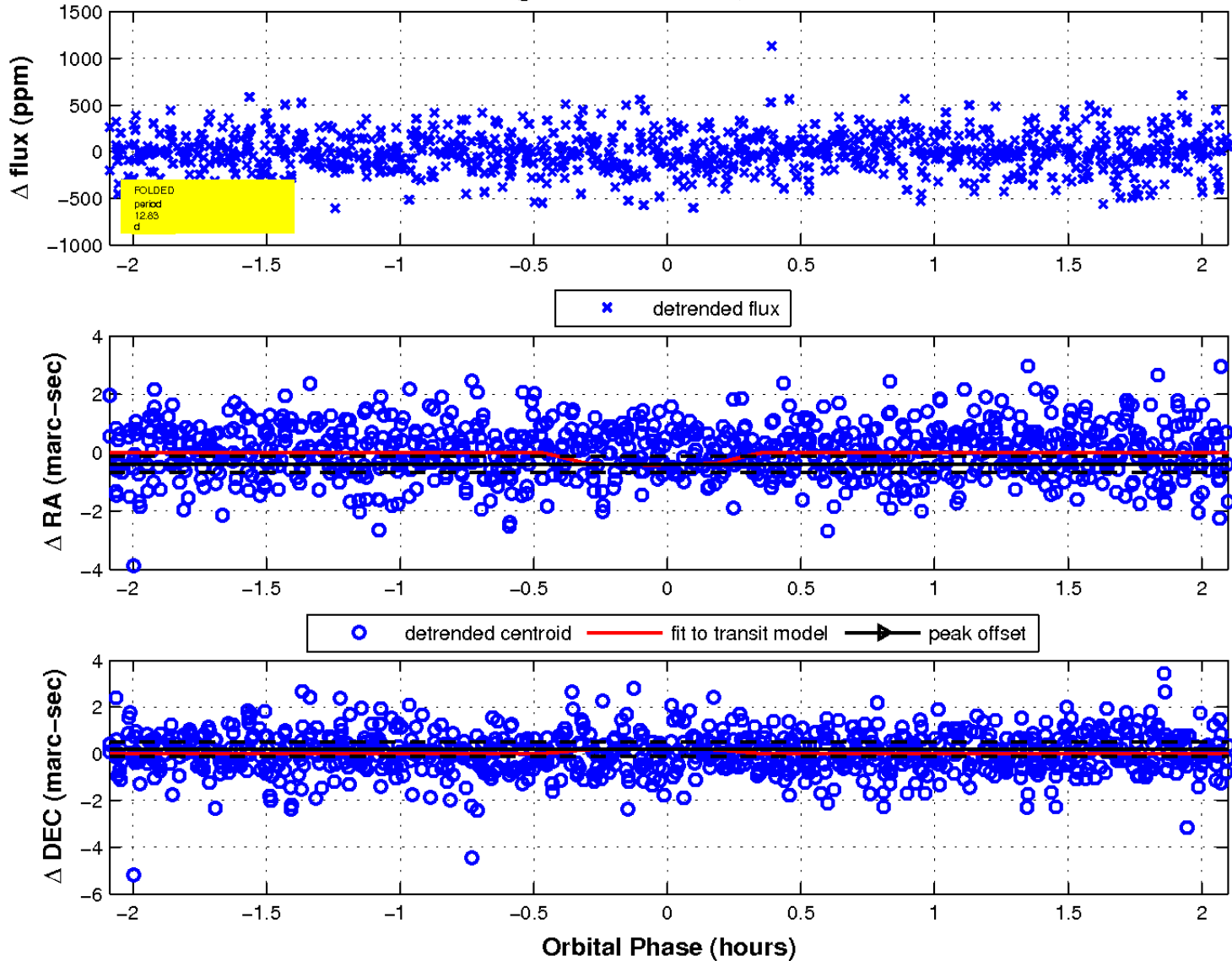
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



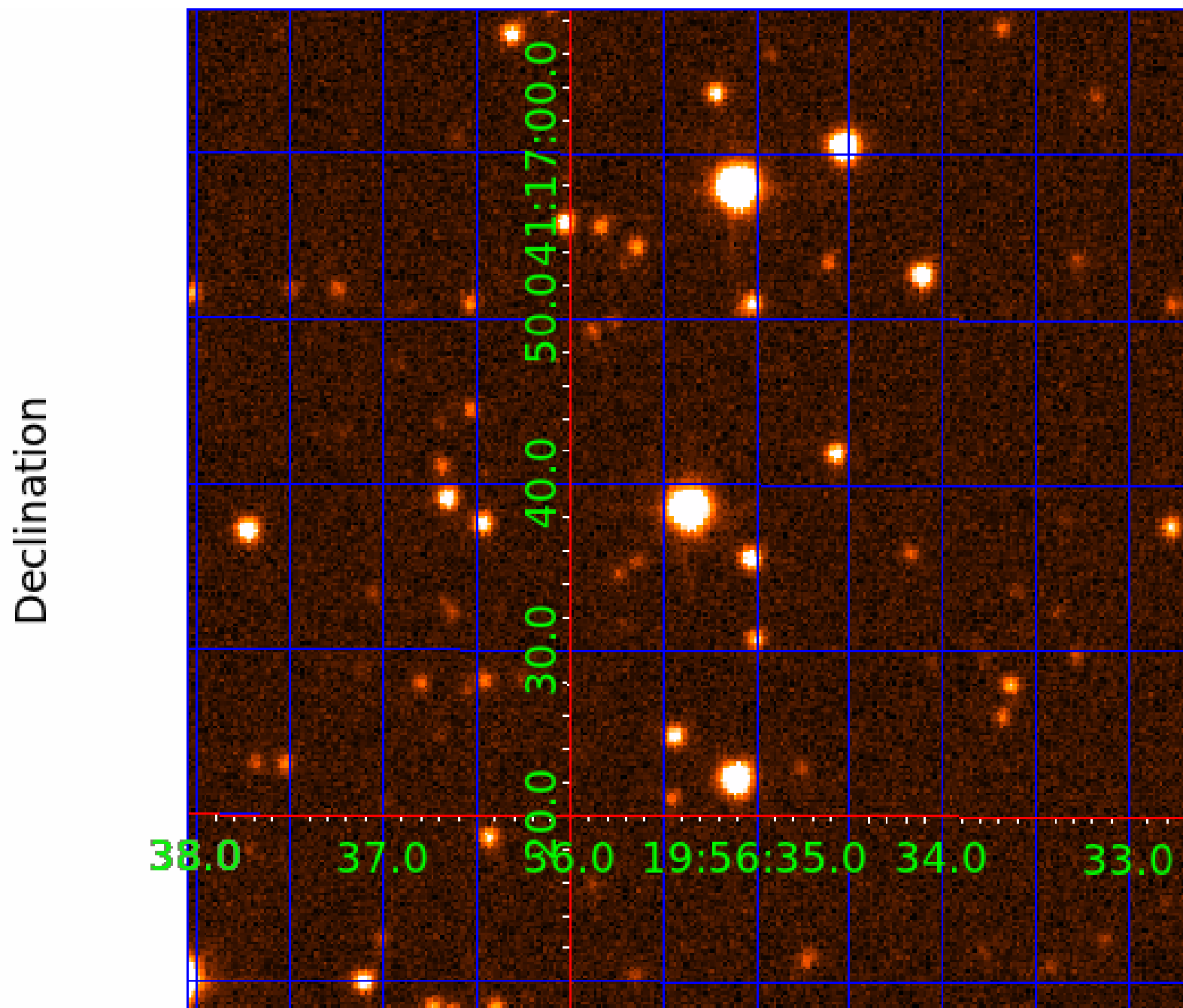
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 6 of 7



UKIRT Image





# KIC 005989921

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005989921-01	OBS	No	0.597713	131.683993	5.9	4.387	8.3	3.0	1.94	6583	0.47	26084.78
005989921-02	OBS	No	11.732653	142.738402	67.7	5.849	10.7	6.8	1.94	6583	1.62	492.62
005989921-03	OBS	No	14.116147	131.740411	319.5	1.454	12.4	13.0	1.94	6583	4.00	384.97
005989921-04	OBS	No	5.791073	131.605569	143.7	2.078	11.0	12.0	1.94	6583	2.48	1262.89
005989921-05	OBS	No	22.241919	139.123933	337.0	1.072	11.3	13.6	1.94	6583	3.60	209.97
005989921-06	OBS	No	12.829749	135.098981	431.7	0.700	10.9	12.3	1.94	6583	4.35	437.27
005989921-07	OBS	No	13.303210	143.085521	229.7	1.624	7.2	9.1	1.94	6583	3.36	416.65

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005989921-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
005989921-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
005989921-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005989921-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS— HALO_GHOST
005989921-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
005989921-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV

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

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

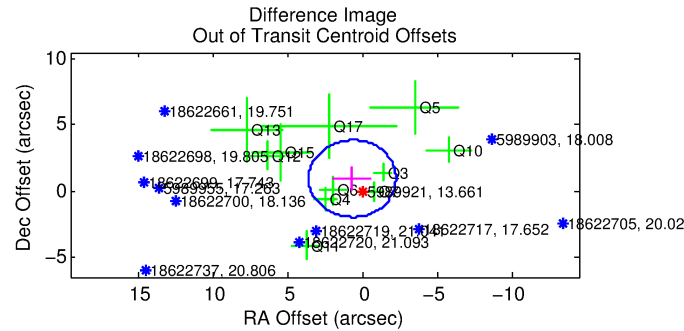
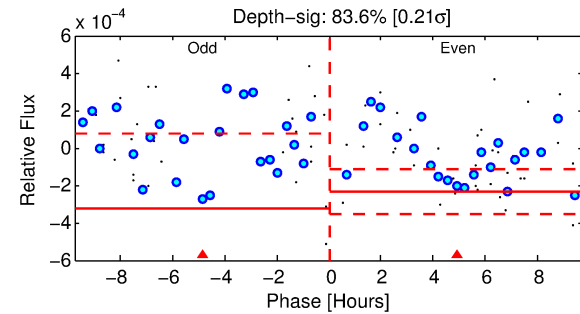
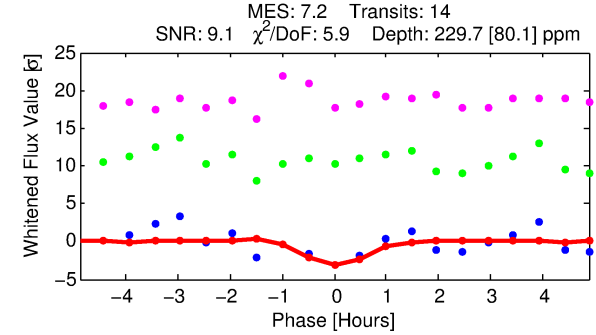
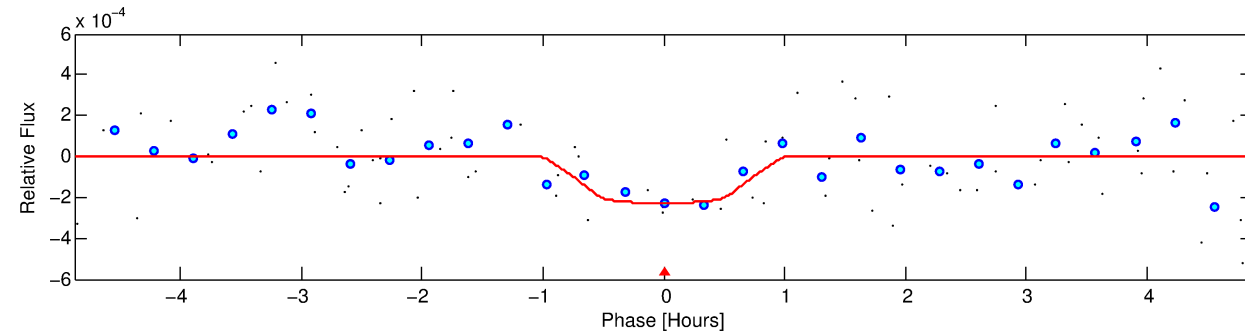
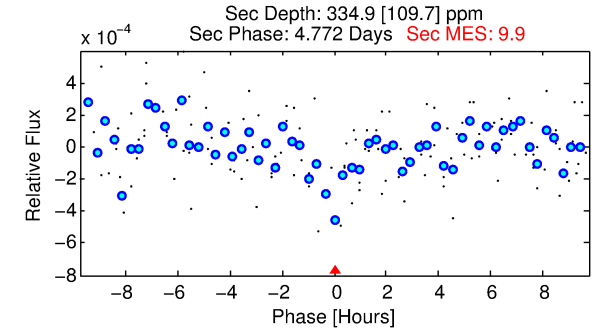
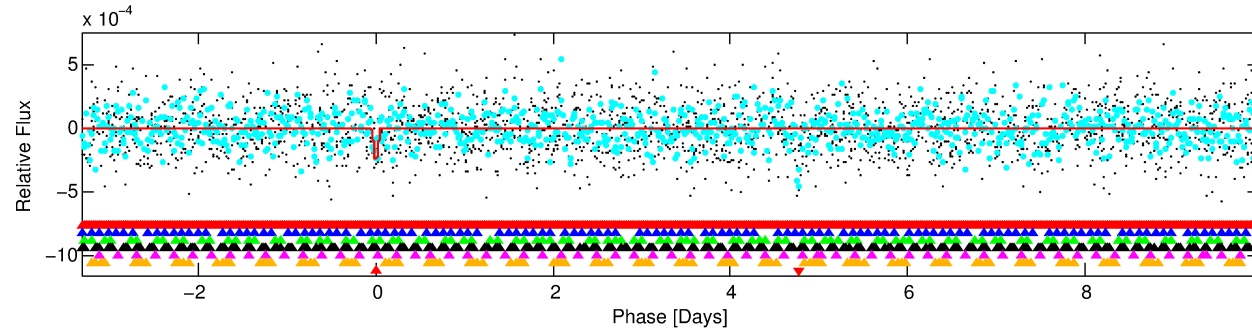
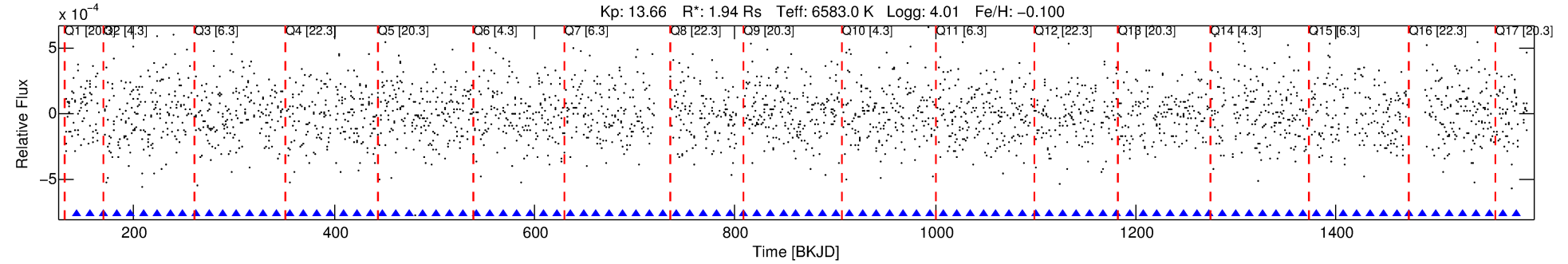
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005989921-07

No Significant Match Found

# DV One-Page Summary

KIC: 5989921 Candidate: 7 of 7 Period: 13.303 d



## DV Fit Results:

Period = 13.30321 [0.00020] d  
Epoch = 143.0855 [0.0129] BKJD  
Rp/R\* = 0.0159 [0.0415]  
a/R\* = 32.93 [490.35]  
b = 0.87 [4.26]  
Seff = 416.65 [219.23]  
Teq = 1152 [152] K  
Rp = 3.36 [8.84] Re  
a = 0.1230 [0.0401] AU  
Ag = 246.97 [1297.40] [0.19 $\sigma$ ]  
Teffp = 7061 [9233] K [0.64 $\sigma$ ]

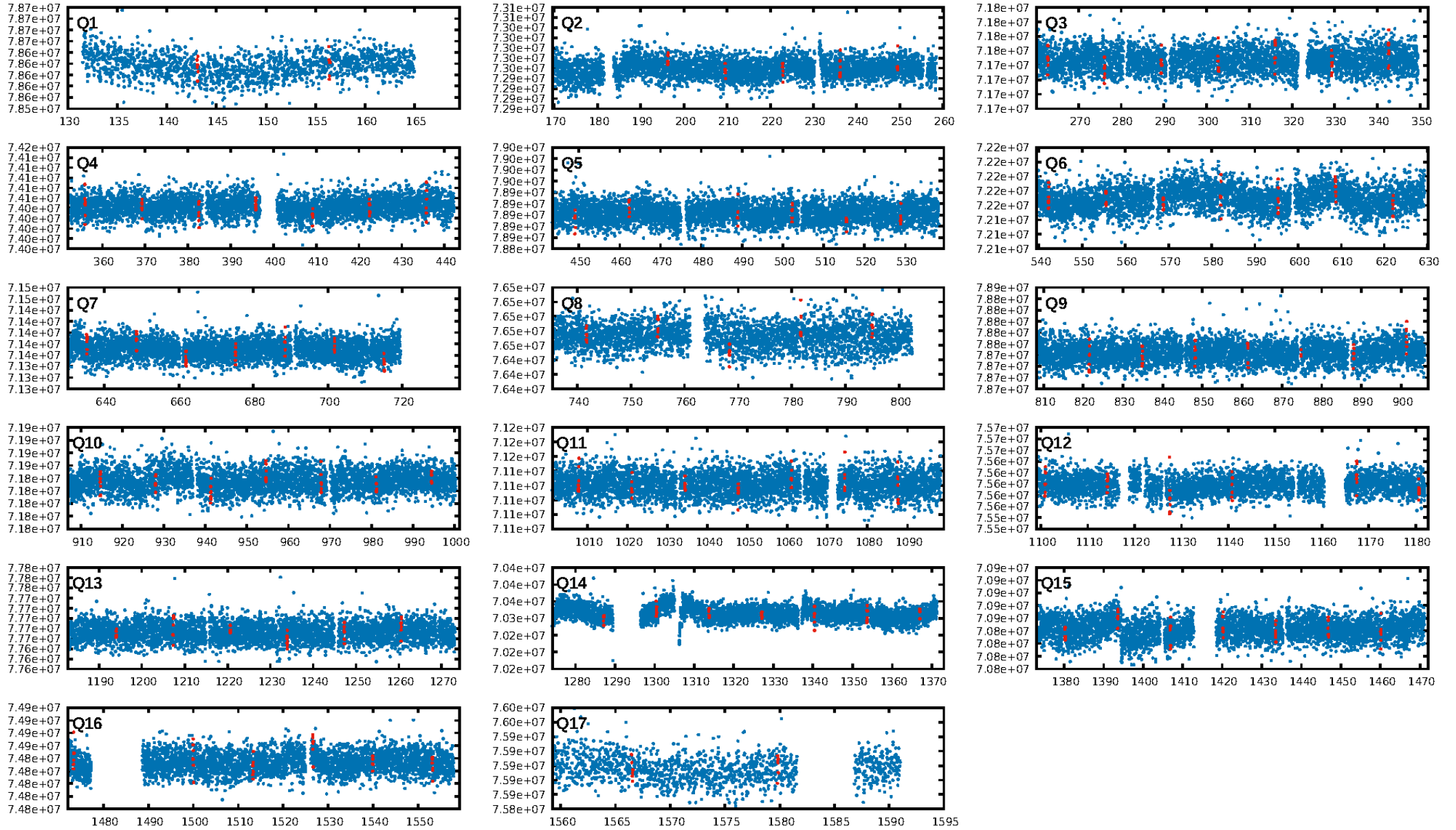
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.43 $\sigma$ ]  
LongPeriod-sig: 100.0% [8.95 $\sigma$ ]  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 99.6%  
**Bootstrap-pfa: 5.79e-05**  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: -1.27  
Centroid-sig: 53.6%  
Centroid-so: 0.506 arcsec [0.80 $\sigma$ ]  
OotOffset-rm: 1.148 arcsec [1.18 $\sigma$ ]  
KicOffset-rm: 1.185 arcsec [1.25 $\sigma$ ]  
OotOffset-st: 2/4/2/3 [11]  
KicOffset-st: 2/4/2/3 [11]  
DiffImageQuality-fgm: 0.09 [1/11]  
DiffImageOverlap-fno: 0.00 [0/17]

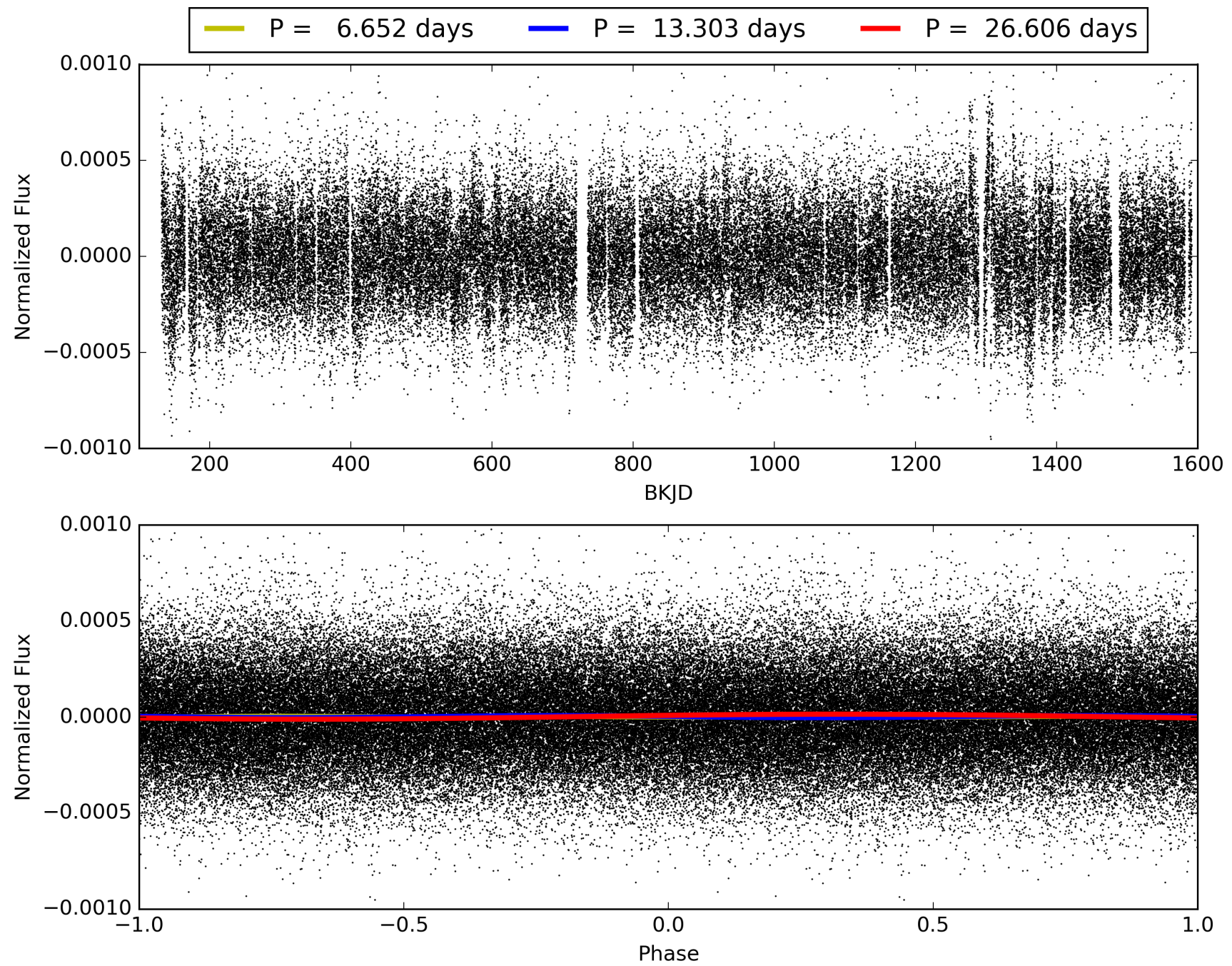
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:05:58 Z

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

# TCE 005989921-07, PDC Light Curves

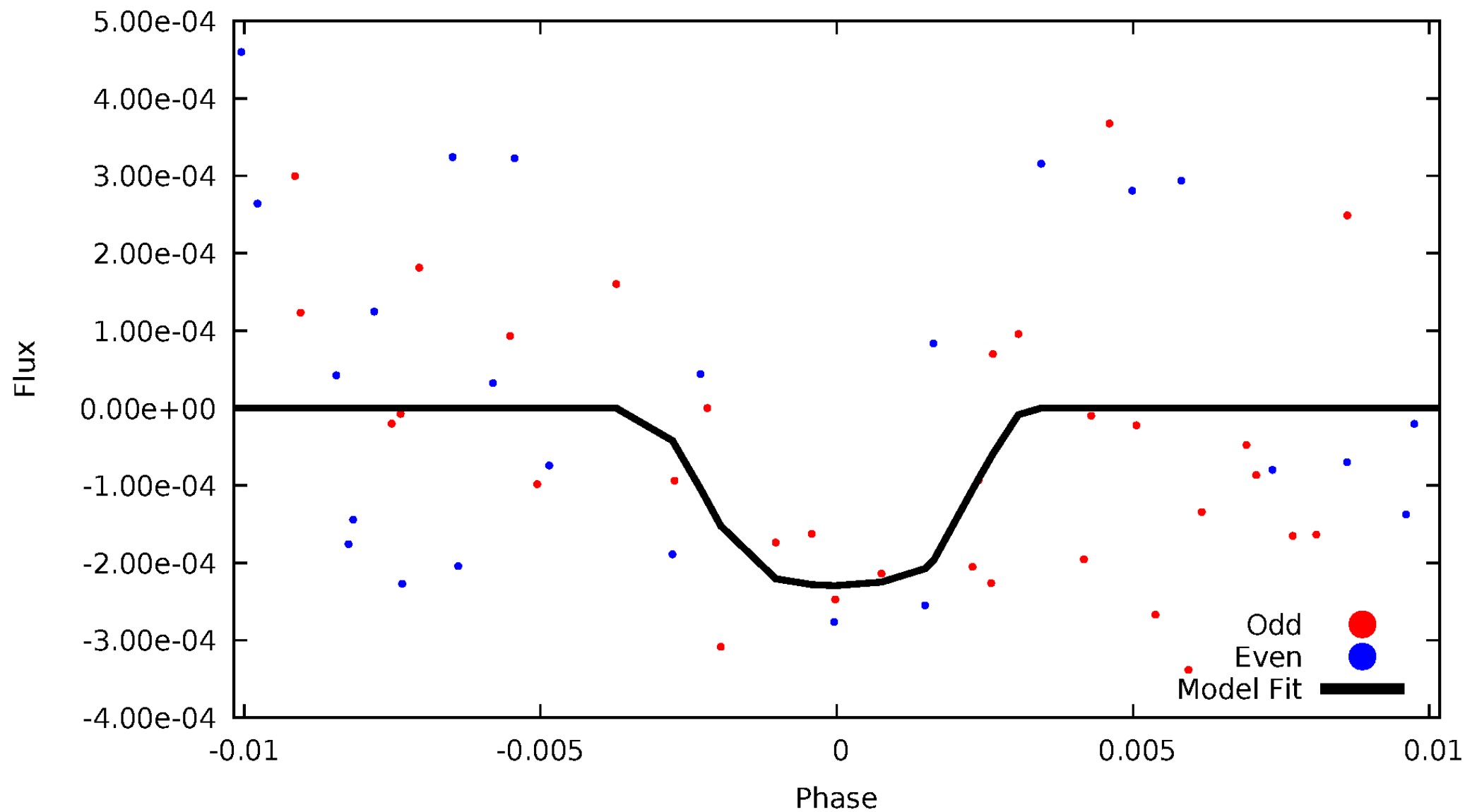


TCE 005989921-07



# DV Odd/Even

TCE 005989921-07





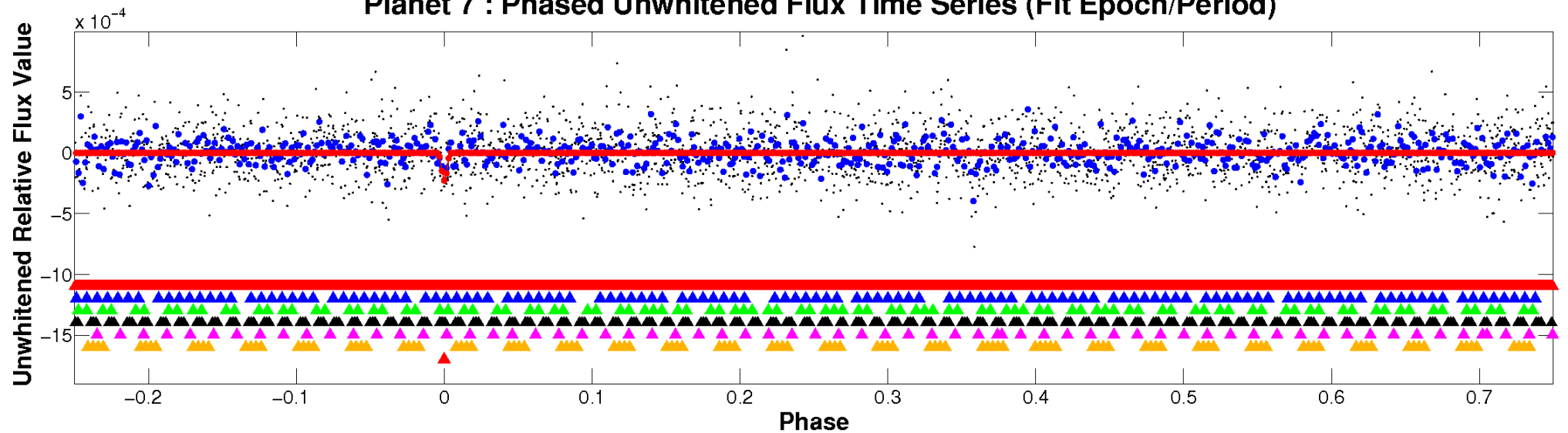
ALT Odd/Even

This plot does not exist for this TCE.

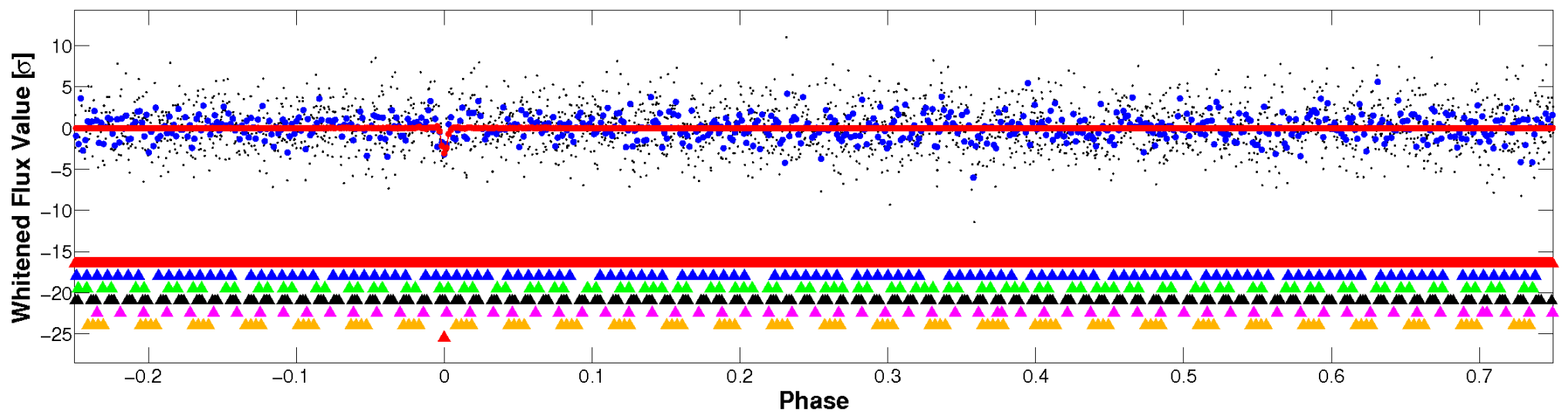


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

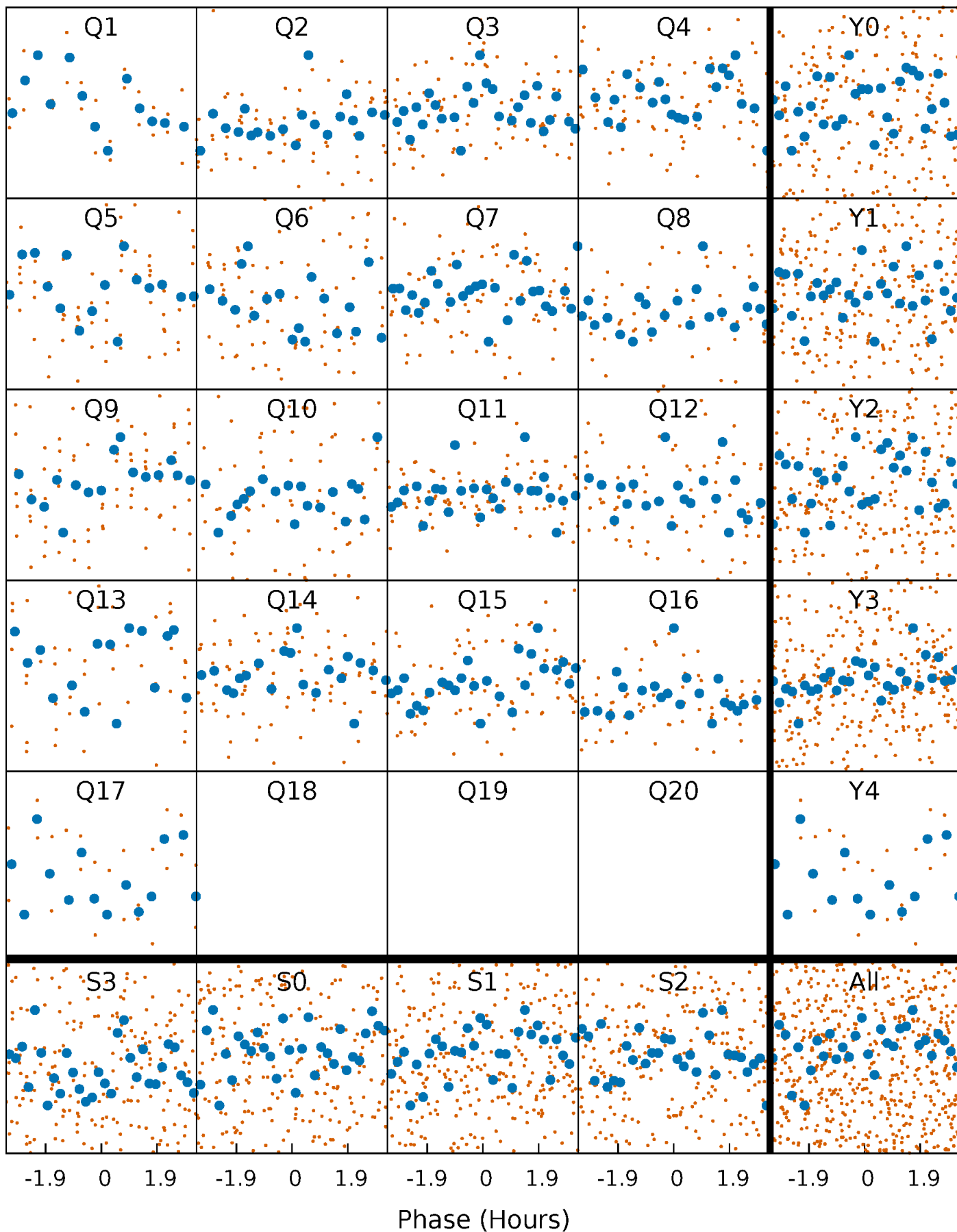


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



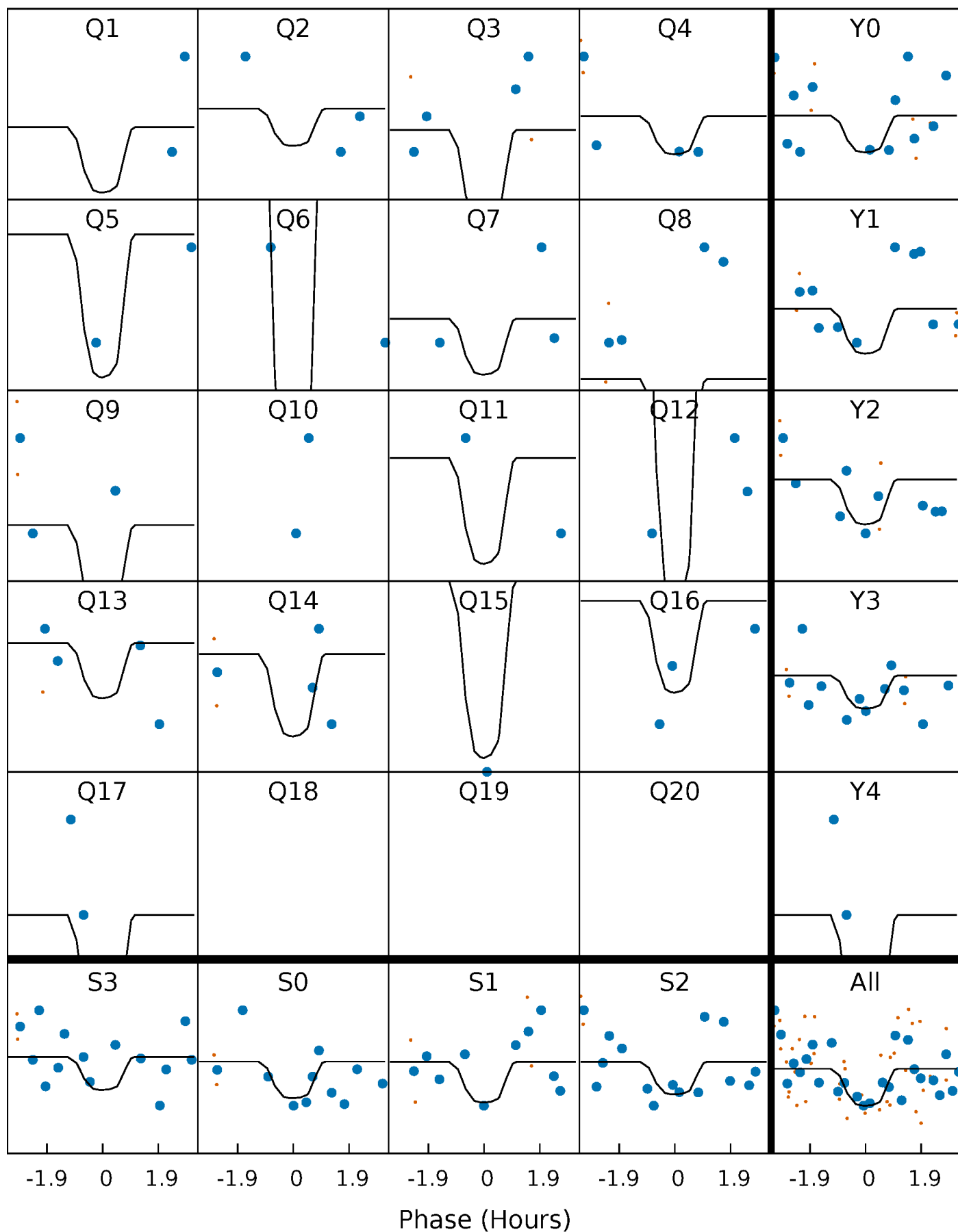
# PDC Quarter-Phased Transit Curves

TCE 005989921-07   P= 13.303210 Days    $T_0=143.085521$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005989921-07   P= 13.303210 Days    $T_0=143.085521$  (BKJD)

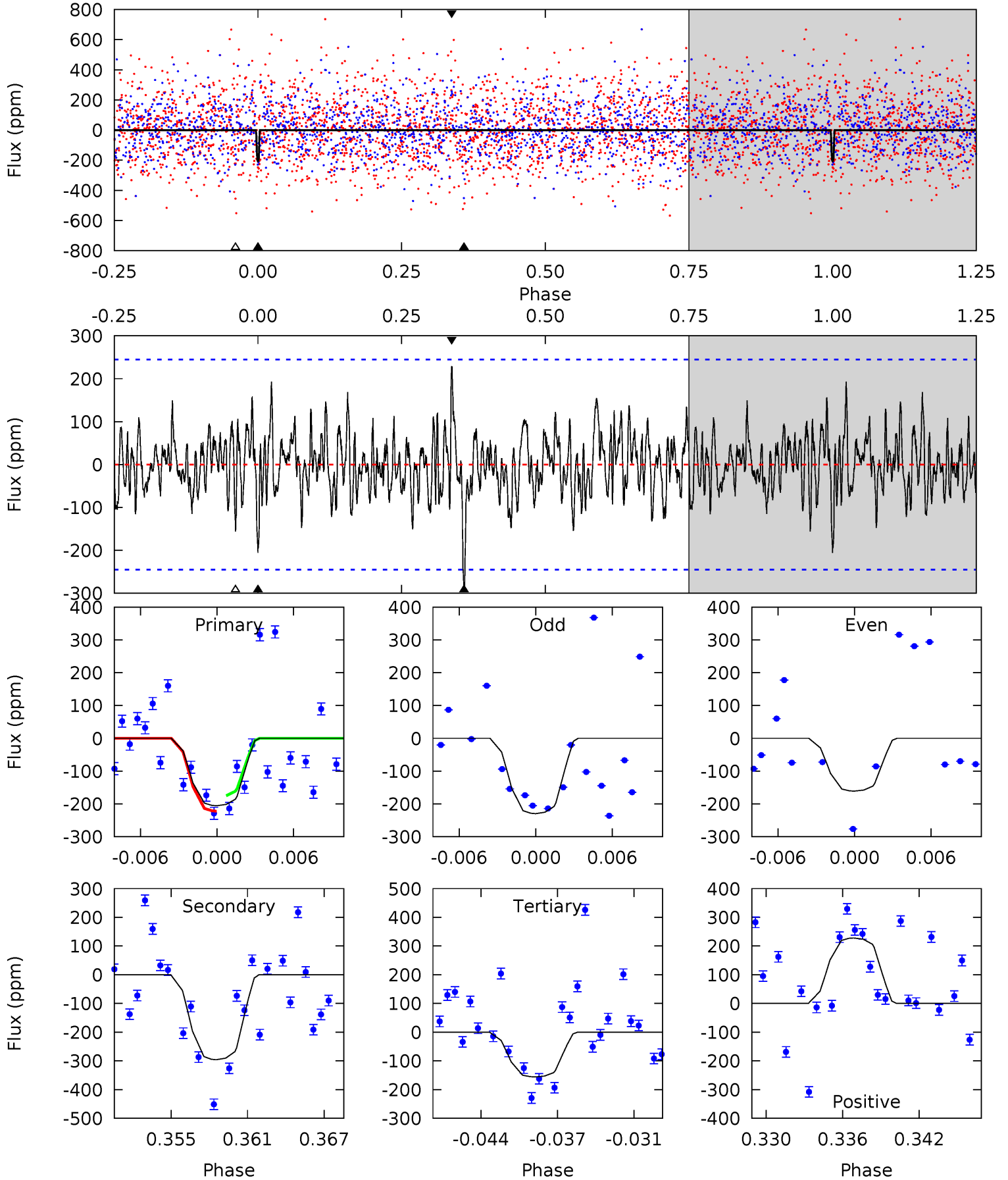


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005989921-07, P = 13.303210 Days, E = 129.782311 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
4.30	6.19	3.26	4.77	5.12	2.74	1.26	1.04	-0.47	2.93	1.42	0.68	1.02	0.44	0.50



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005989921

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6583^{+181}_{-227}$	$4.011^{+0.293}_{-0.158}$	$-0.100^{+0.250}_{-0.300}$	$1.935^{+0.559}_{-0.684}$	$1.405^{+0.193}_{-0.289}$	$0.273^{+0.513}_{-0.128}$
	+3%/-3%	+7%/-4%	+250%/-300%	+29%/-35%	+14%/-21%	+188%/-47%
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 005989921-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-296 \pm 48$	$7.19^{+7.38}_{-4.94}$	$1588^{+116}_{-152}$	$4624^{+3779}_{-979}$	$46^{+411}_{-34}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



## DV Centroid Data

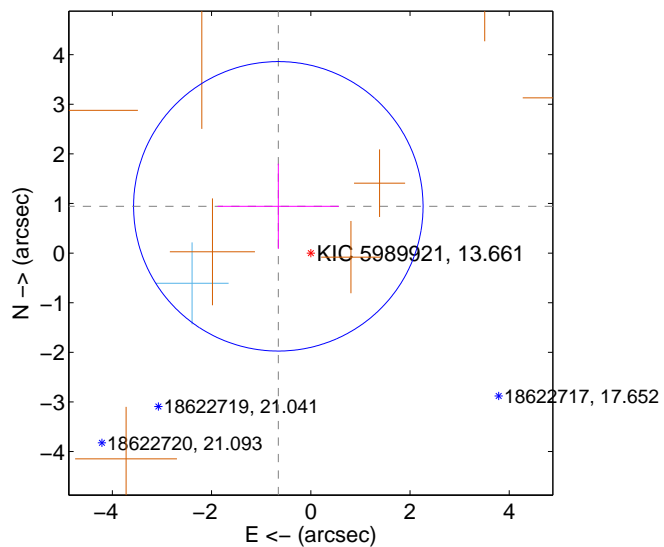
Supplemental centroid analysis for 005989921-07. Kepler magnitude: 13.66. Transit SNR 9.06

There are 1 quarters with good PRF difference image offsets

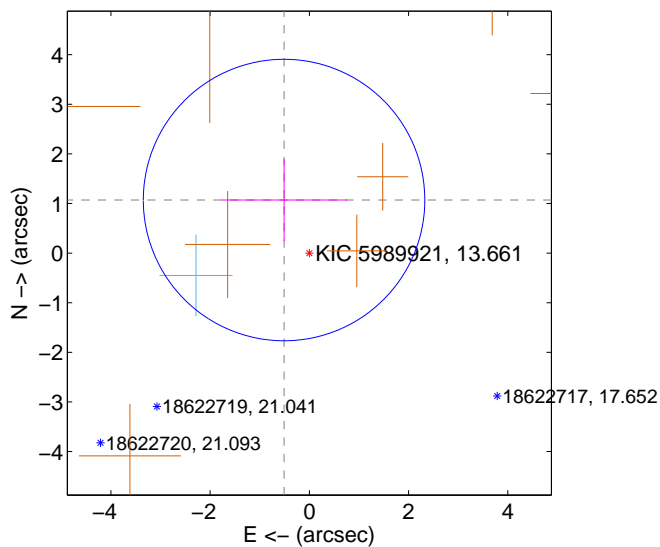
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.148 \pm 0.972$	1.18	$0.654 \pm 1.224$	$0.943 \pm 0.858$
PRF-fit source offset from KIC position	$1.185 \pm 0.945$	1.25	$0.510 \pm 1.268$	$1.070 \pm 0.825$
photometric centroid source offset	$0.51 \pm 0.63$	0.80	$0.01 \pm 0.68$	$-0.51 \pm 0.63$

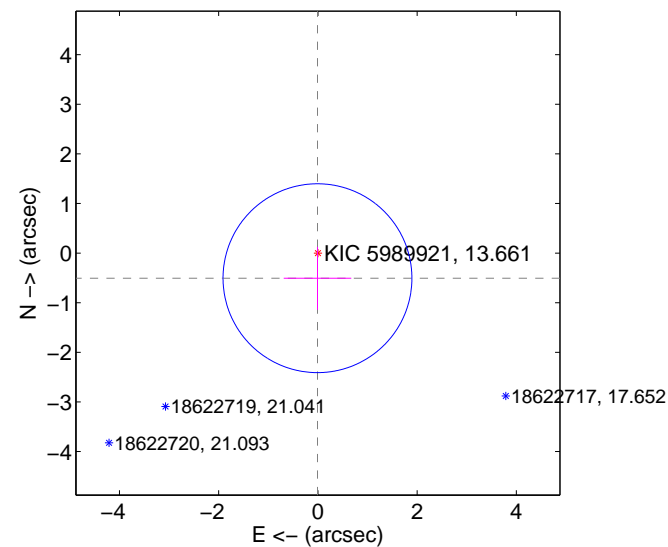
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

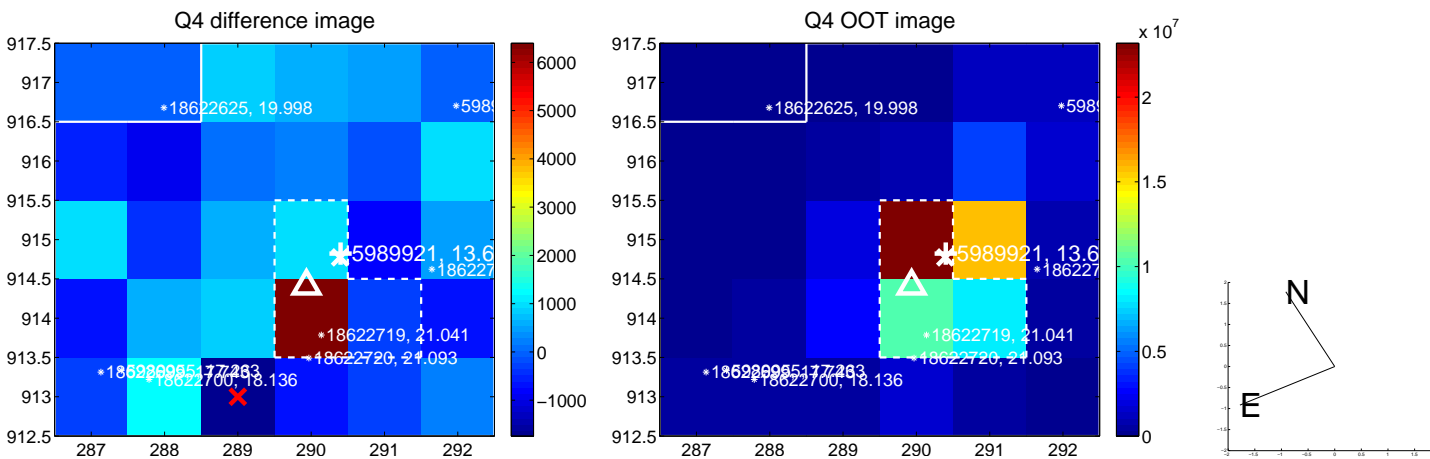
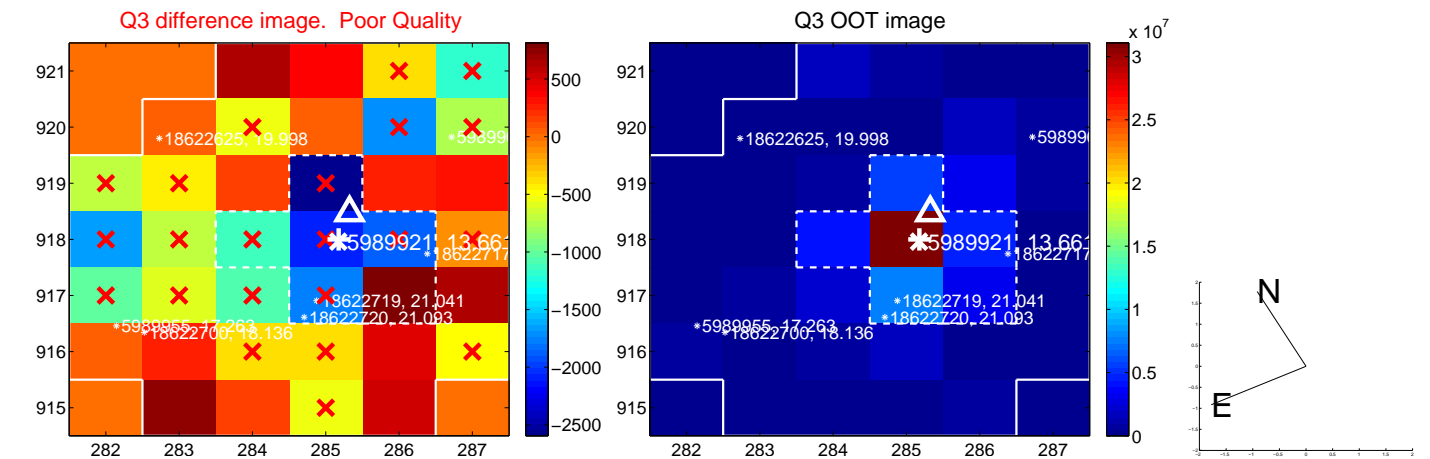
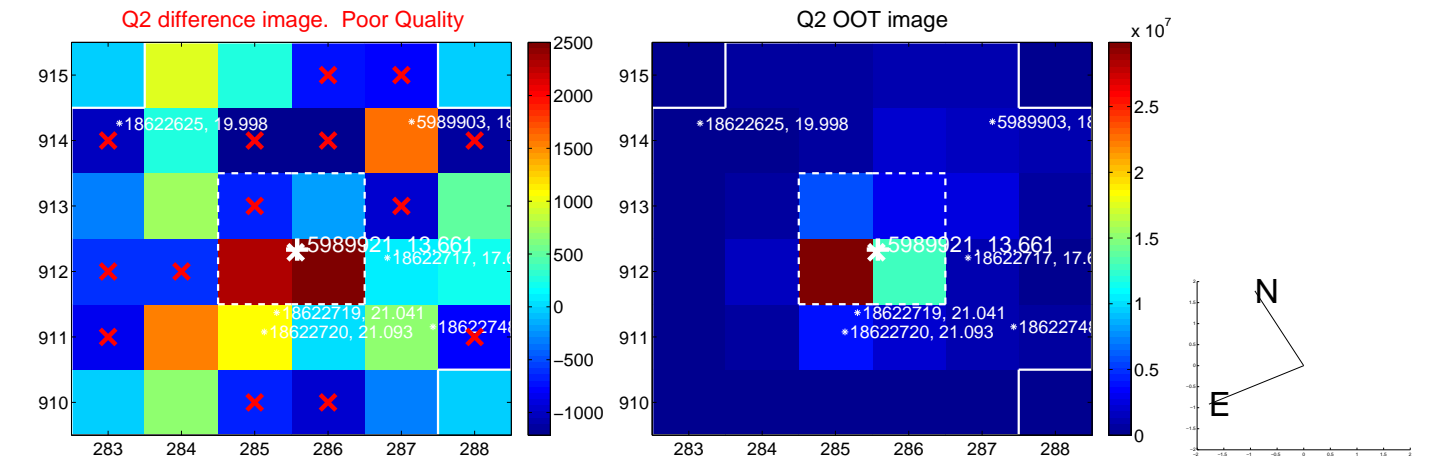
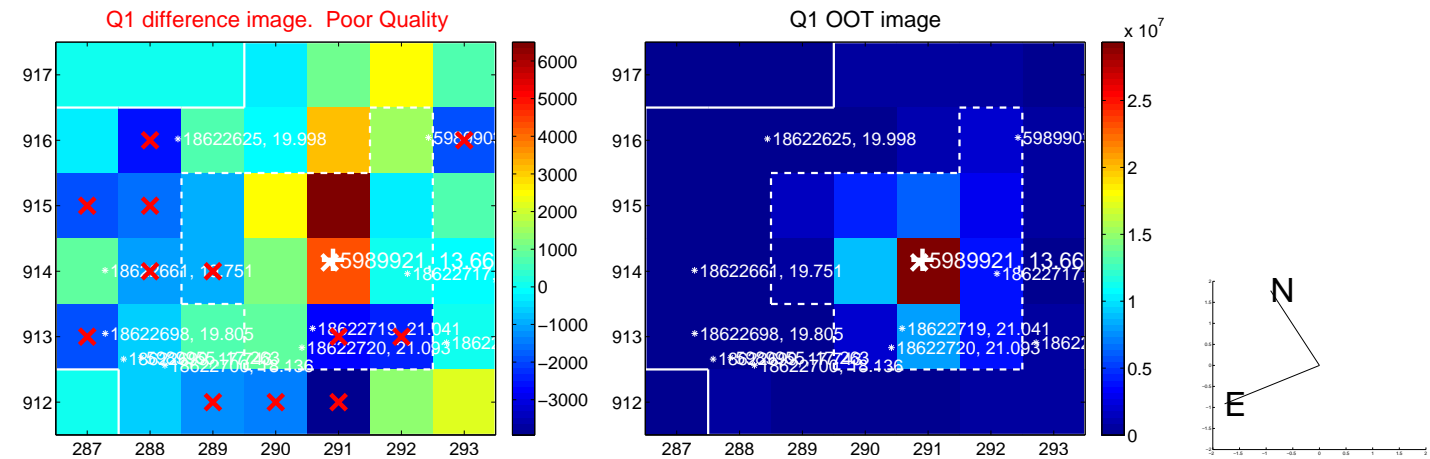


offset from photometric centroids

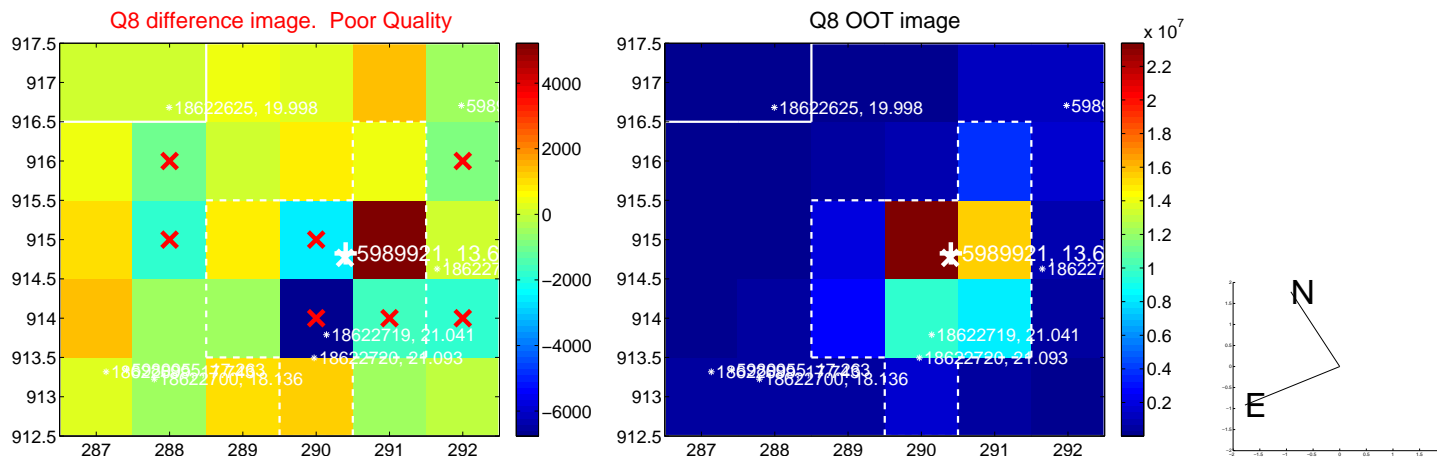
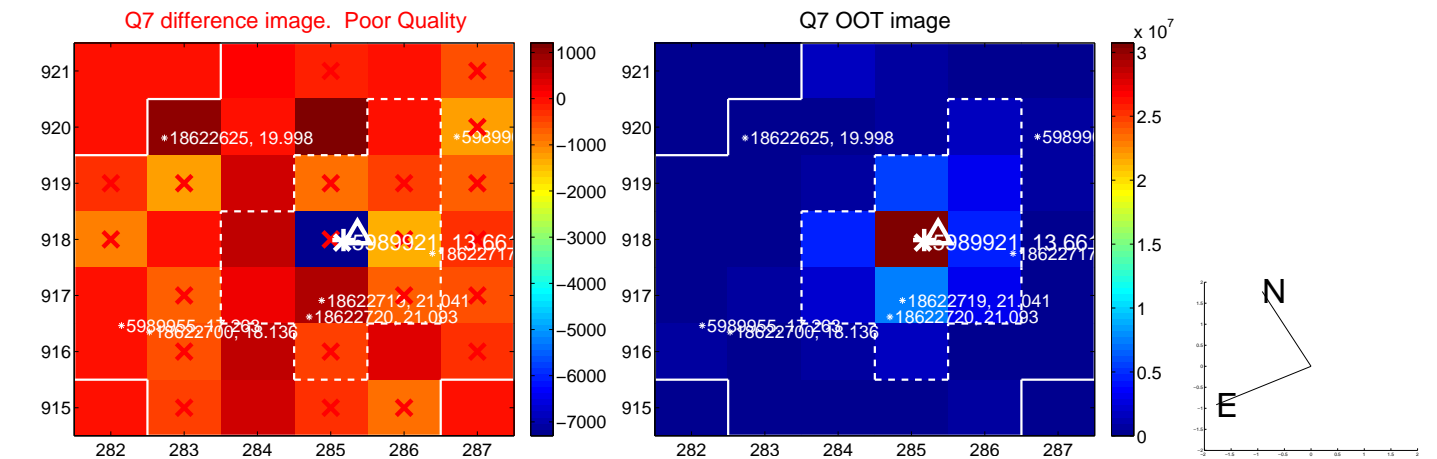
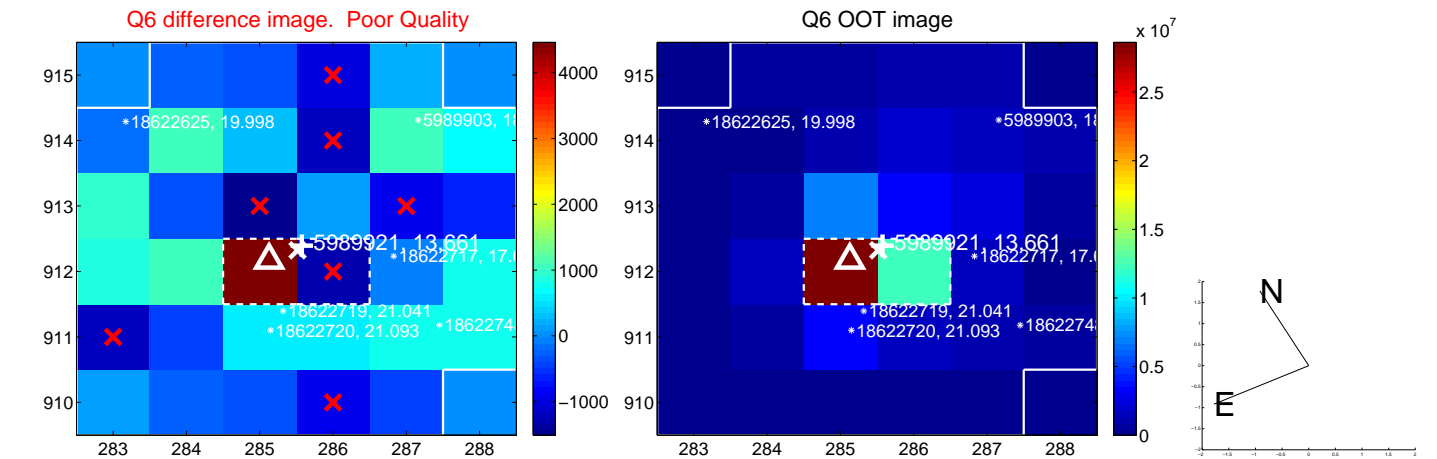
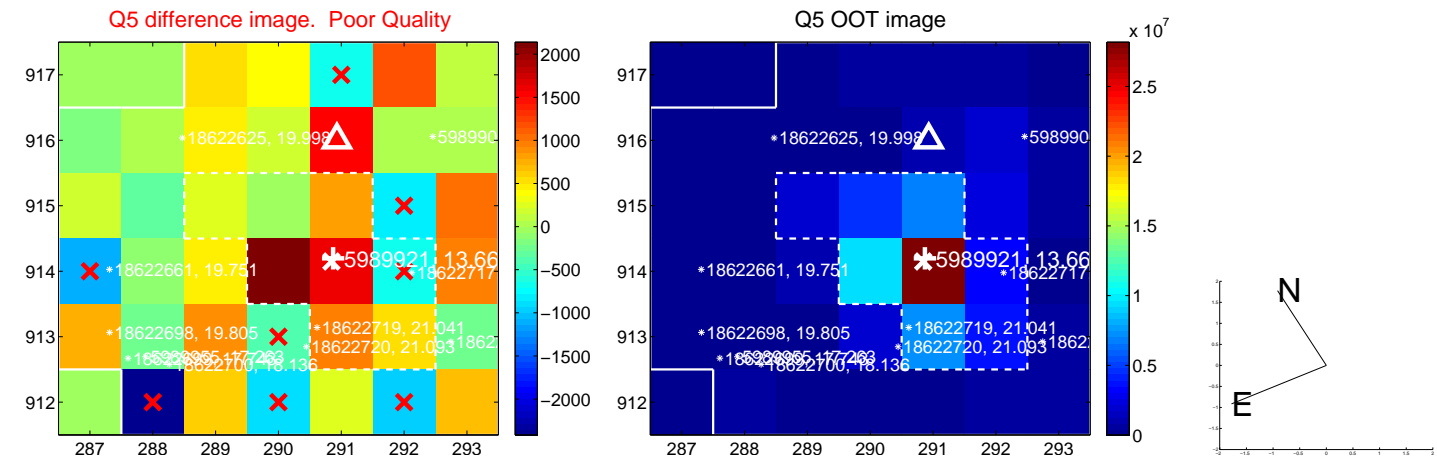


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

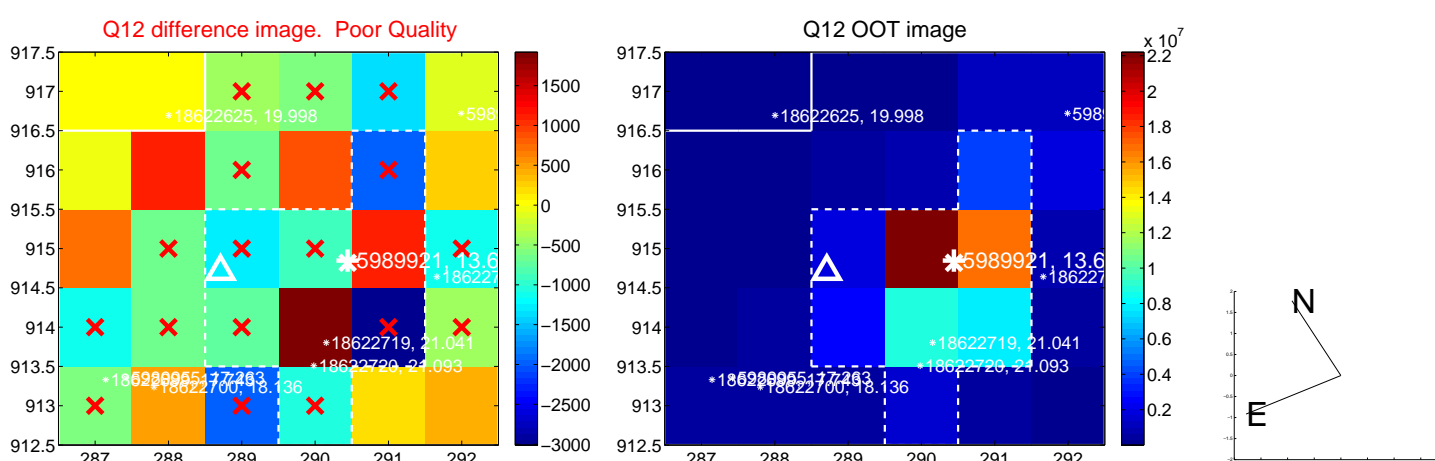
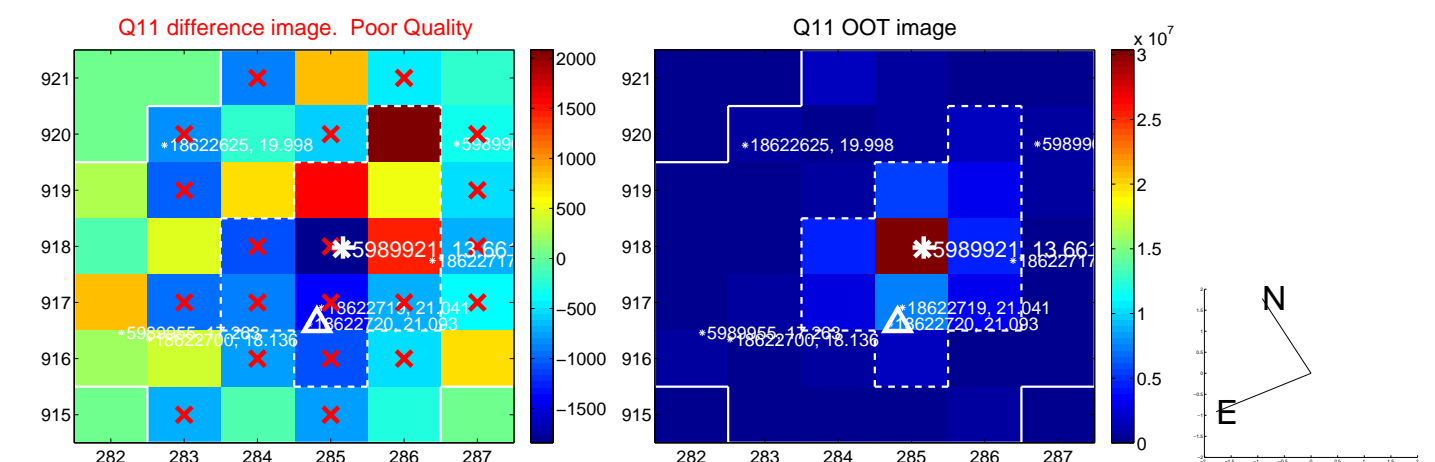
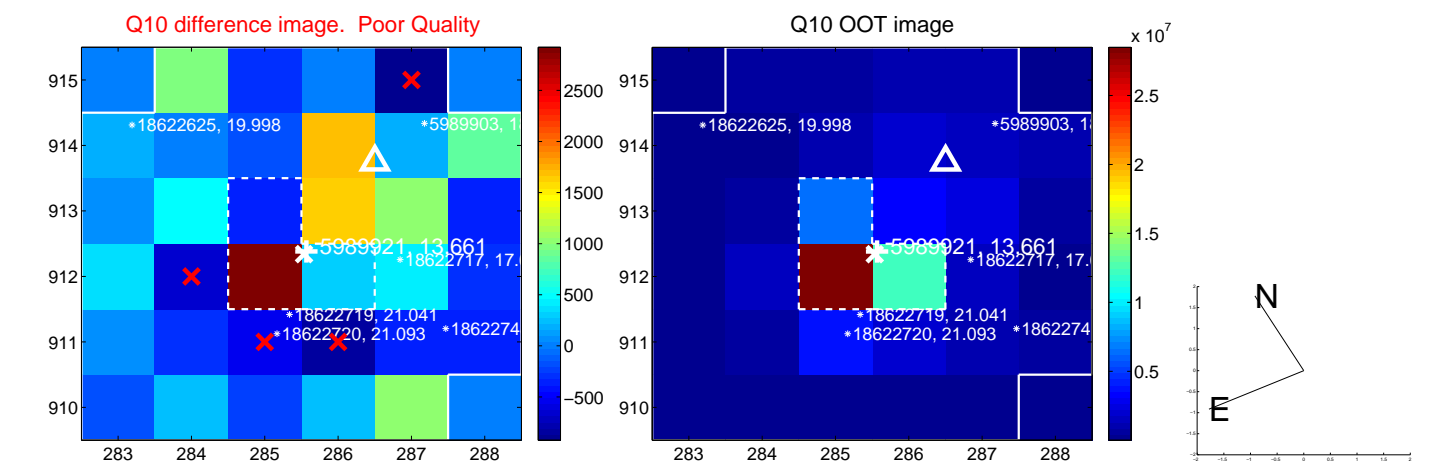
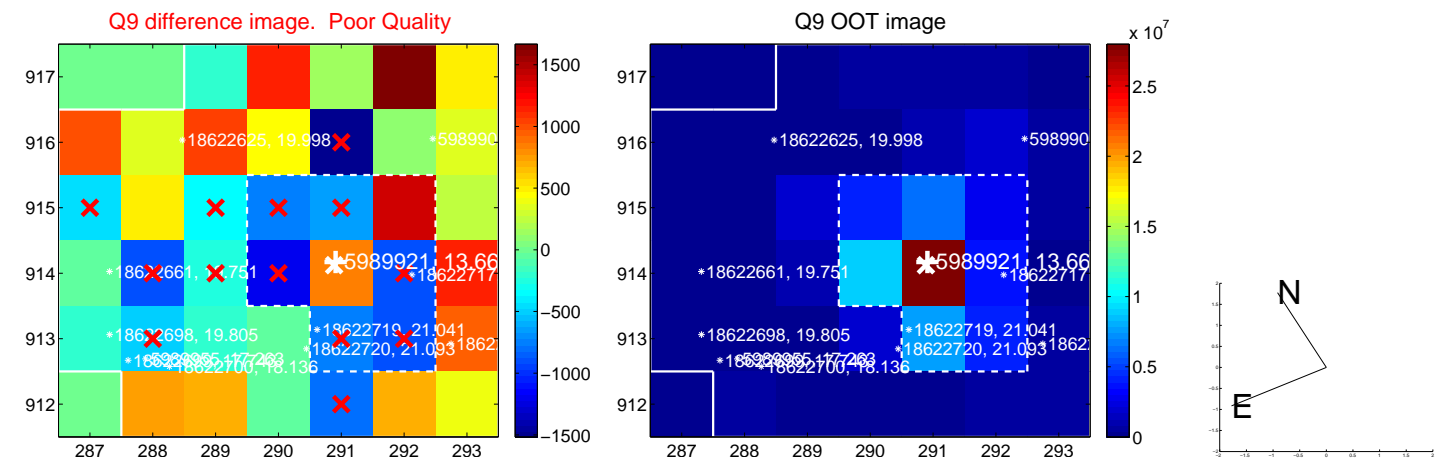
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



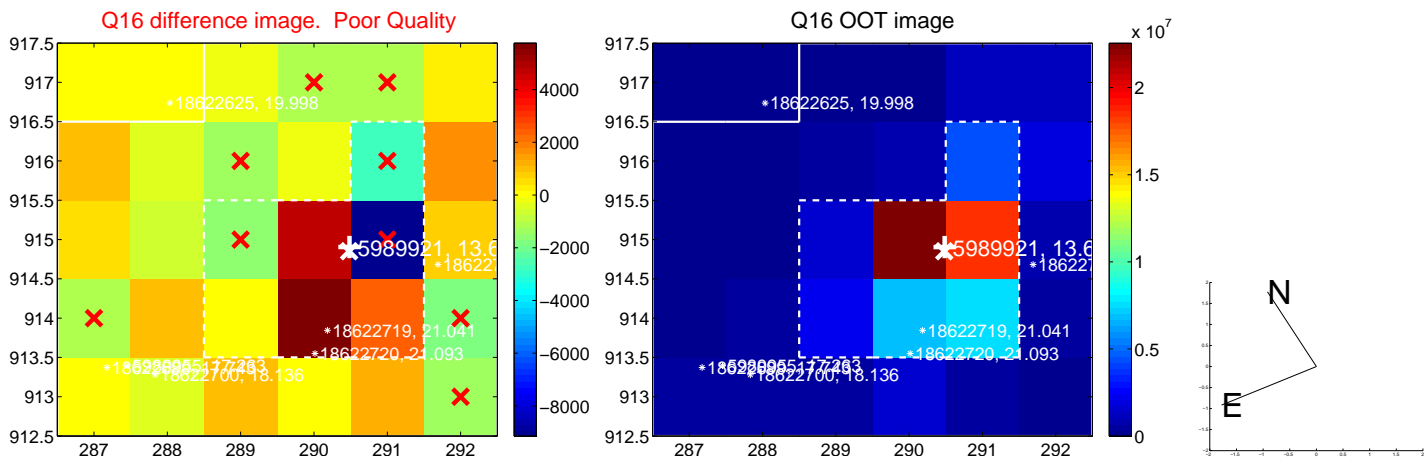
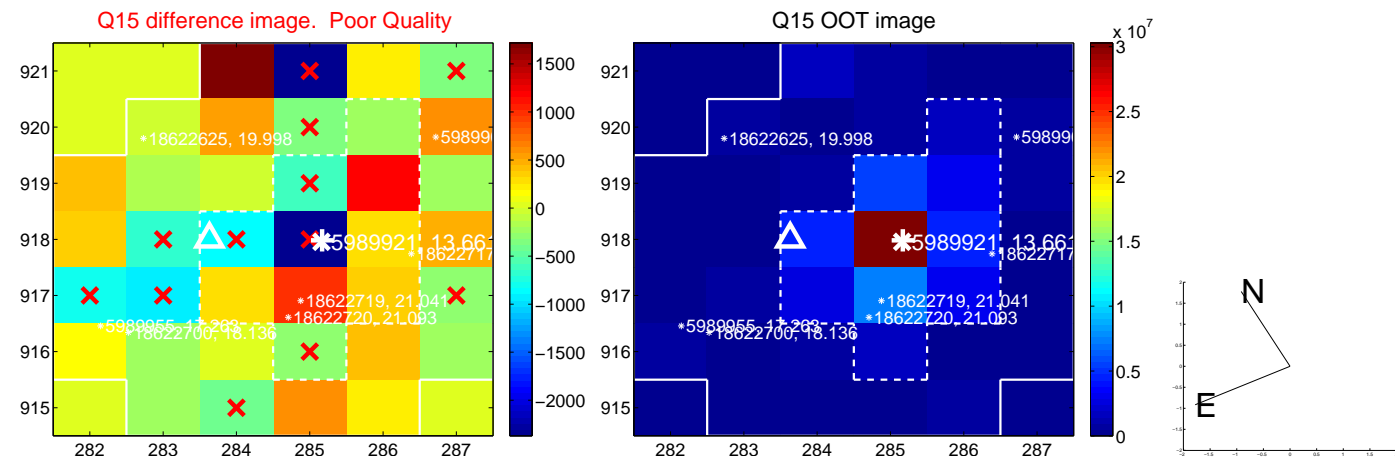
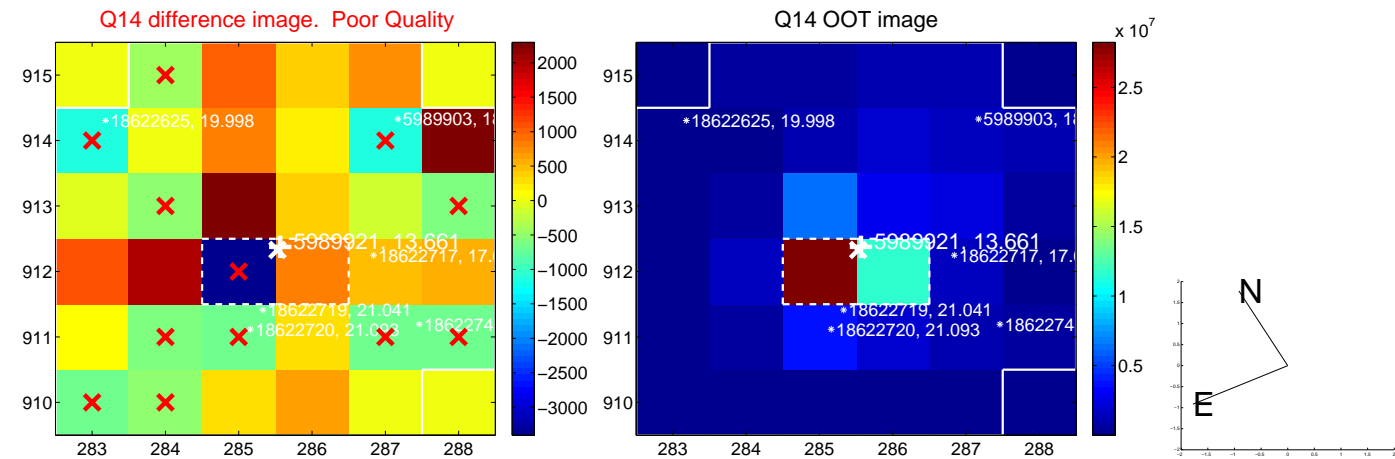
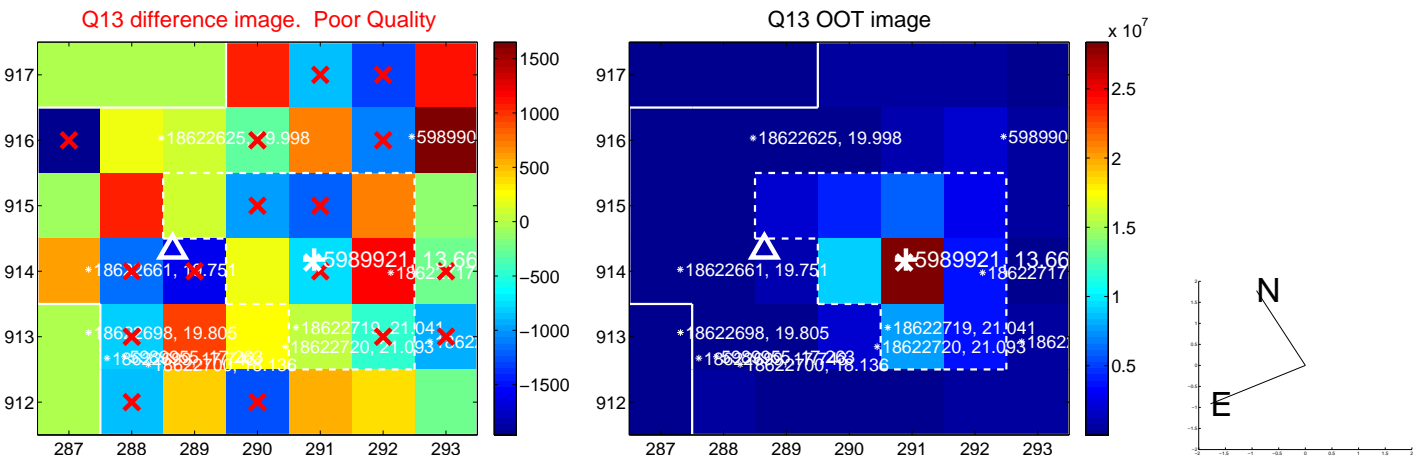
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.





UKIRT Image

