

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

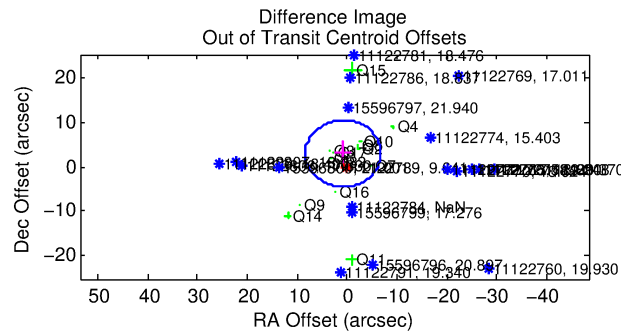
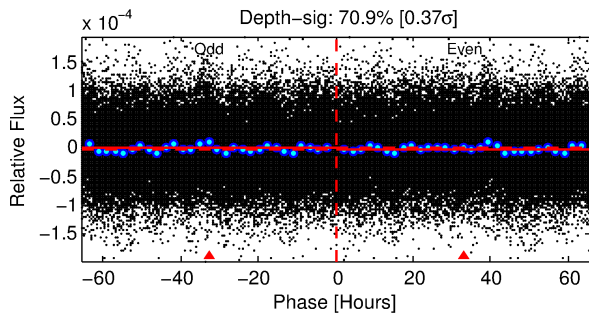
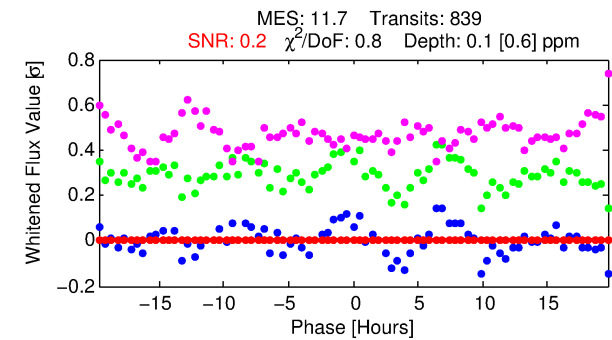
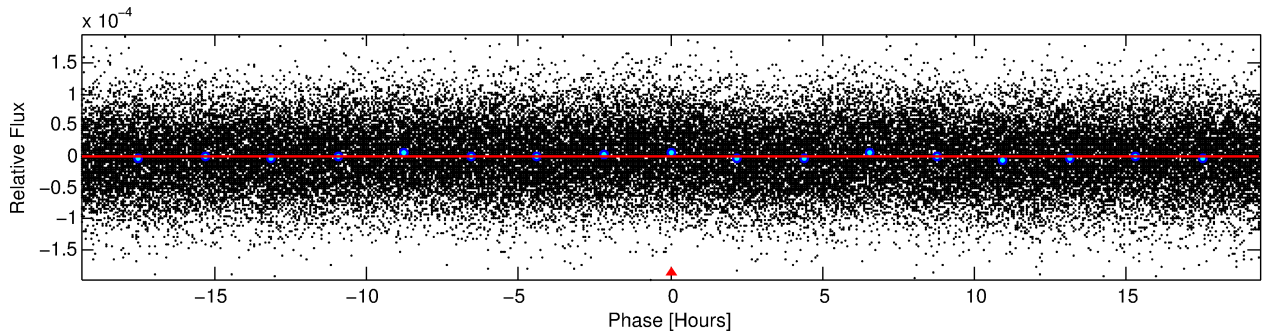
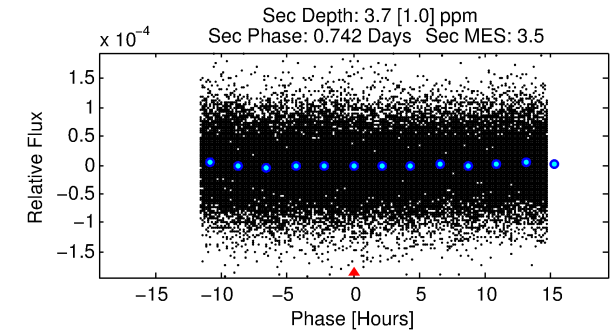
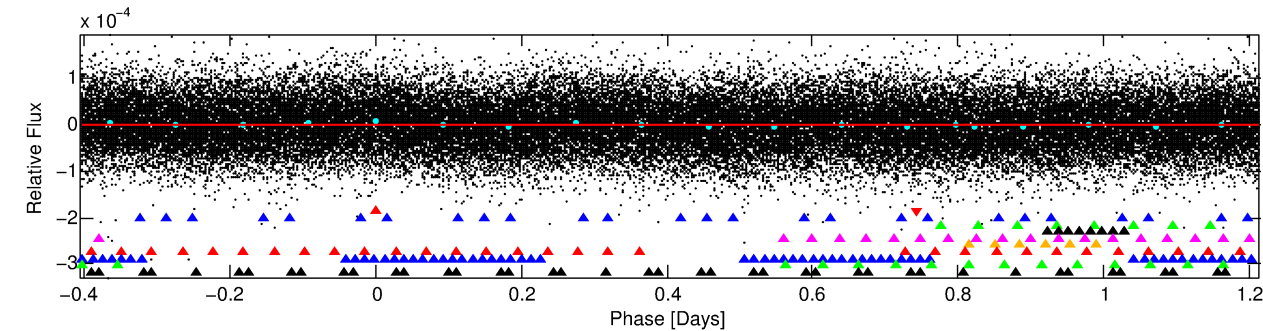
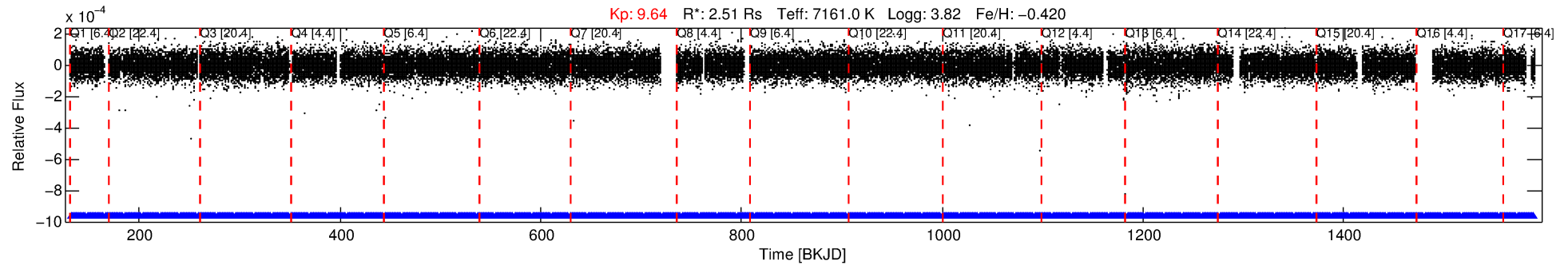
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-01

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 1 of 10 Period: 1.619 d



## DV Fit Results:

Period = 1.61908 [0.00108] d  
Epoch = 132.2487 [0.2766] BKJD  
Rp/R\* = 0.0004 [0.0009]  
a/R\* = 1.16 [1.44]  
b = 0.70 [3.63]  
Seff = 15432.77 [11088.09]  
Teff = 2842 [510] K  
Rp = 0.10 [0.25] Re  
a = 0.0310 [0.0136] AU  
Ag = 191.99 [939.92] [0.20σ]  
Teffp = 16357 [19818] K [0.68σ]

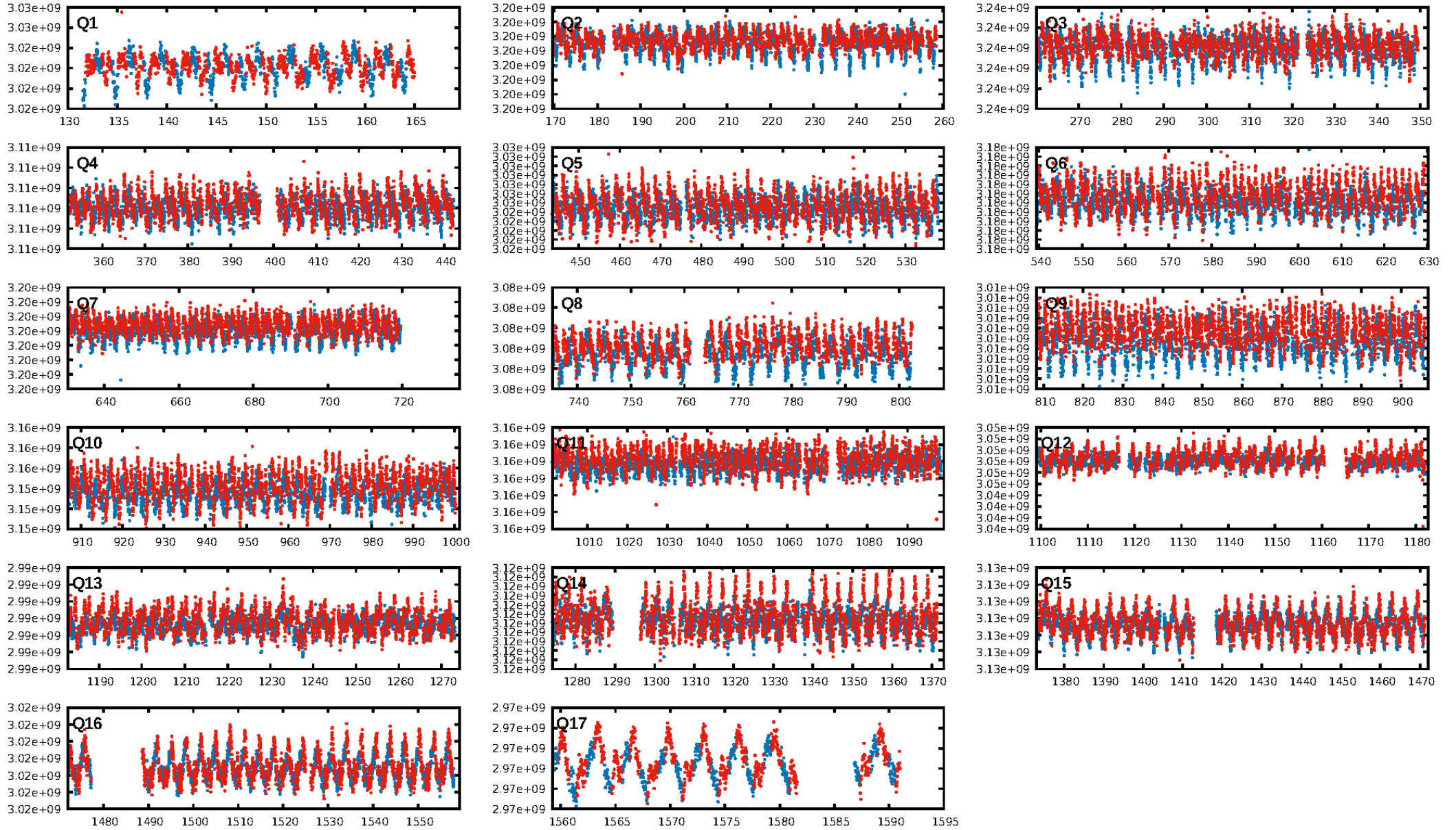
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [48.36σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 4.16e-11**  
RollingBand-fgt: 1.00 [801/801]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 3.083 arcsec [1.22σ]  
KicOffset-rm: 3.413 arcsec [1.21σ]  
OotOffset-st: 4/4/3/2 [13]  
KicOffset-st: 4/4/3/2 [13]  
DiffImageQuality-fgm: 0.08 [1/13]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:17 Z

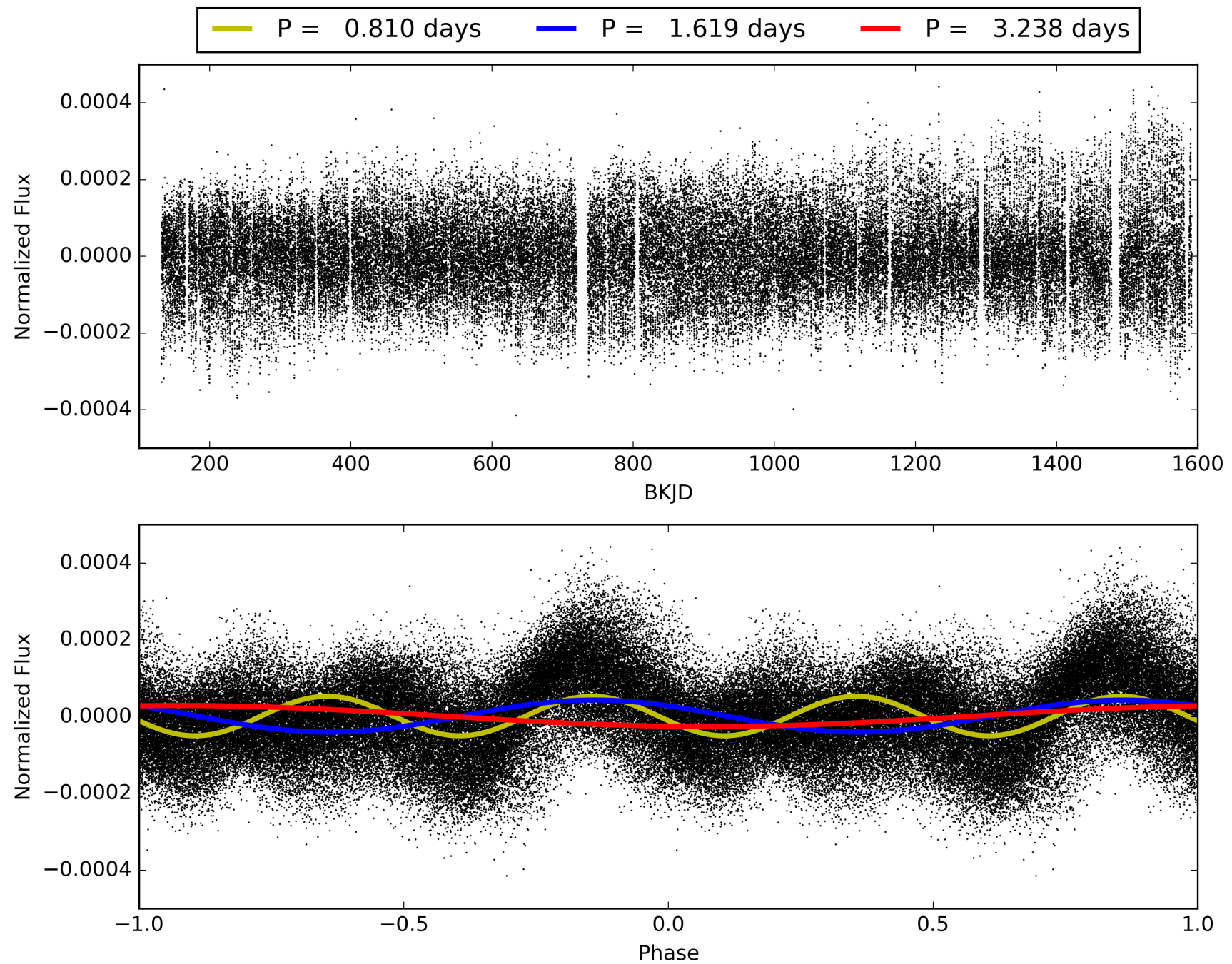
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011122789-01, PDC Light Curves



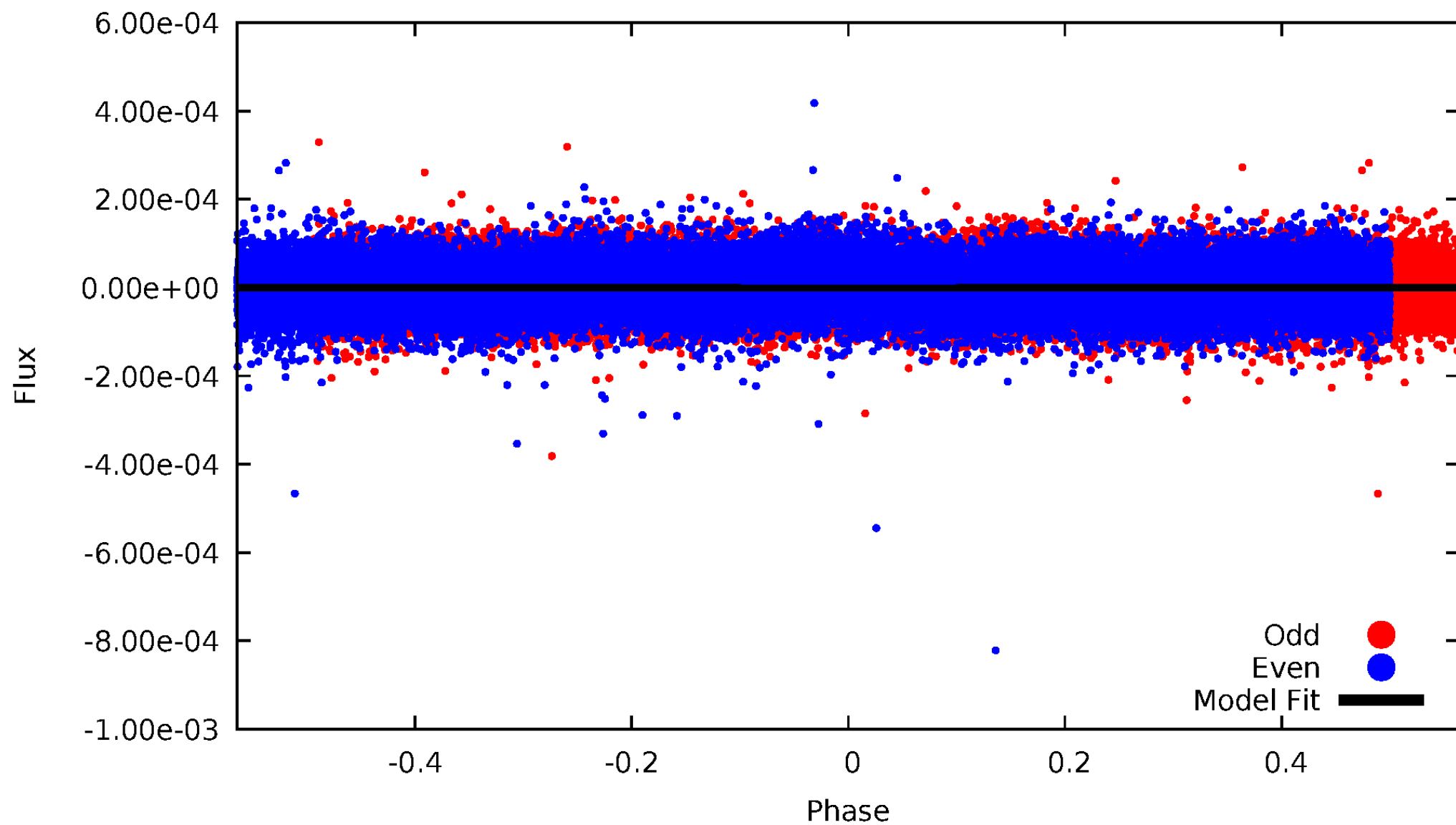


TCE 011122789-01



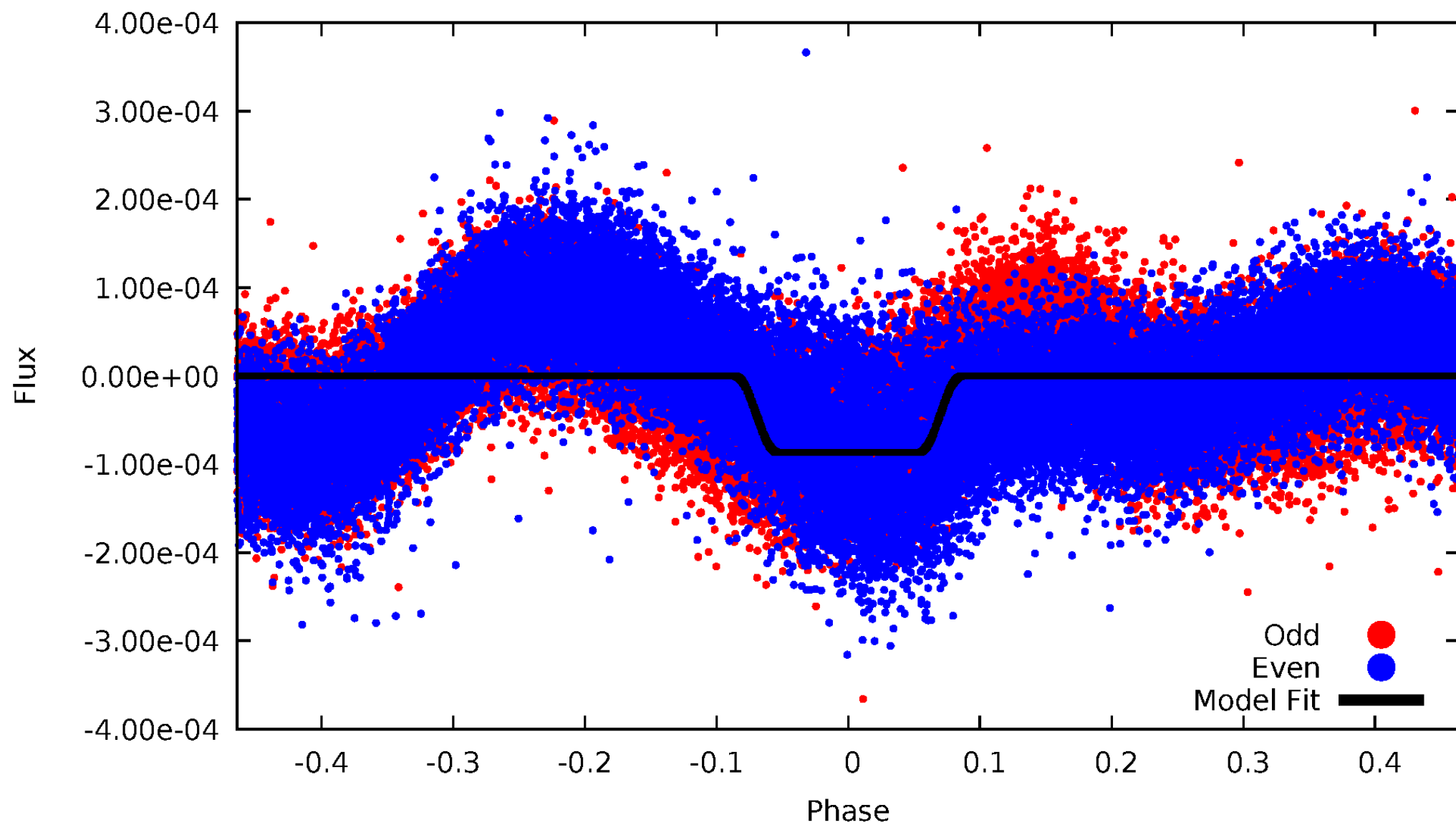
# DV Odd/Even

TCE 011122789-01



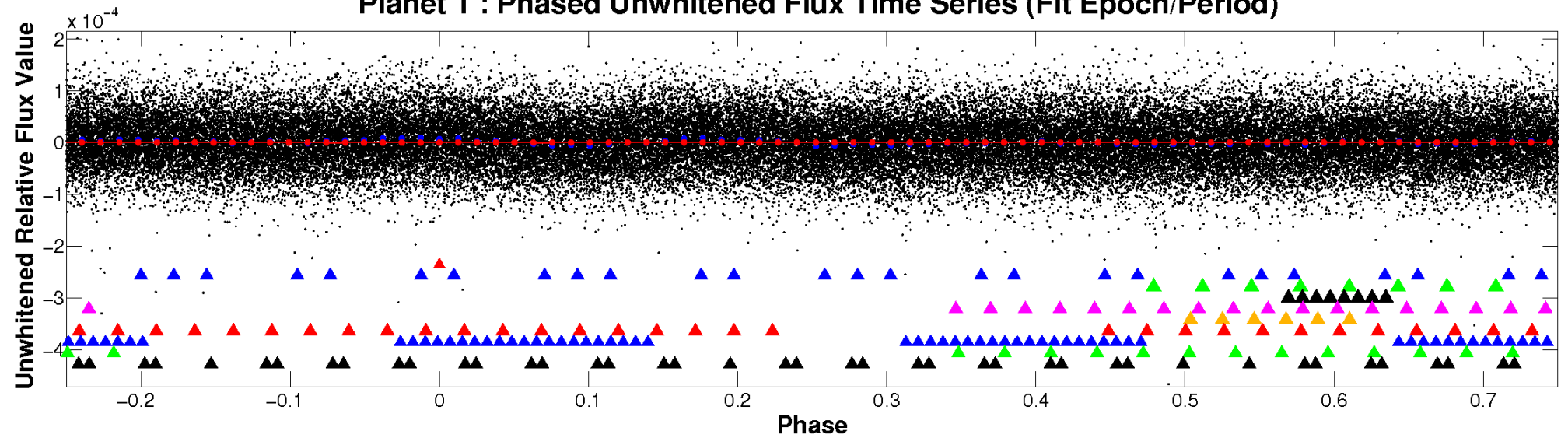
# ALT Odd/Even

TCE 011122789-01

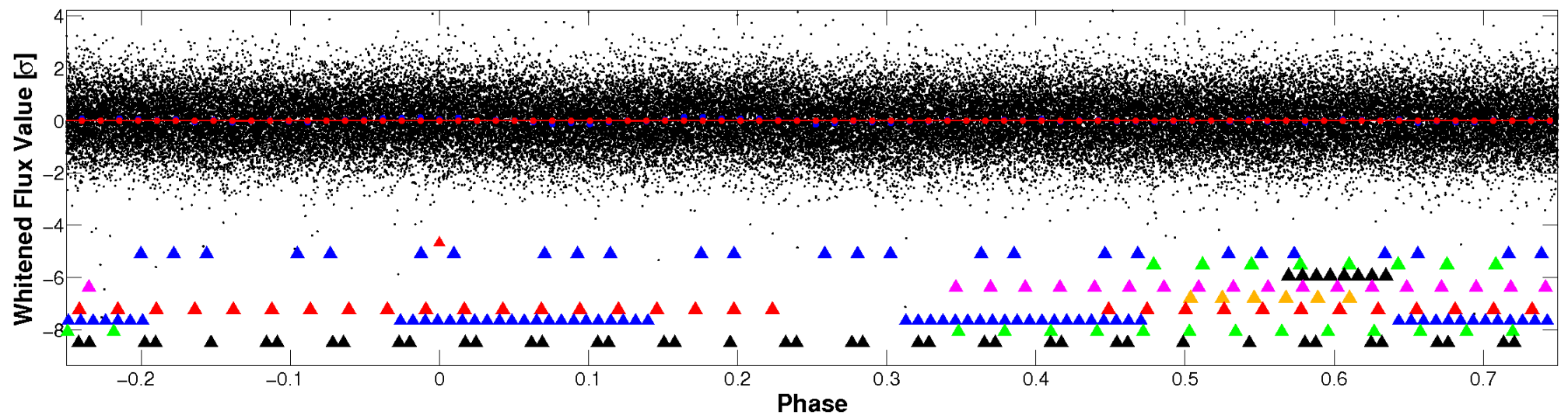


# Non-Whitened Vs. Whitened Light Curve

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



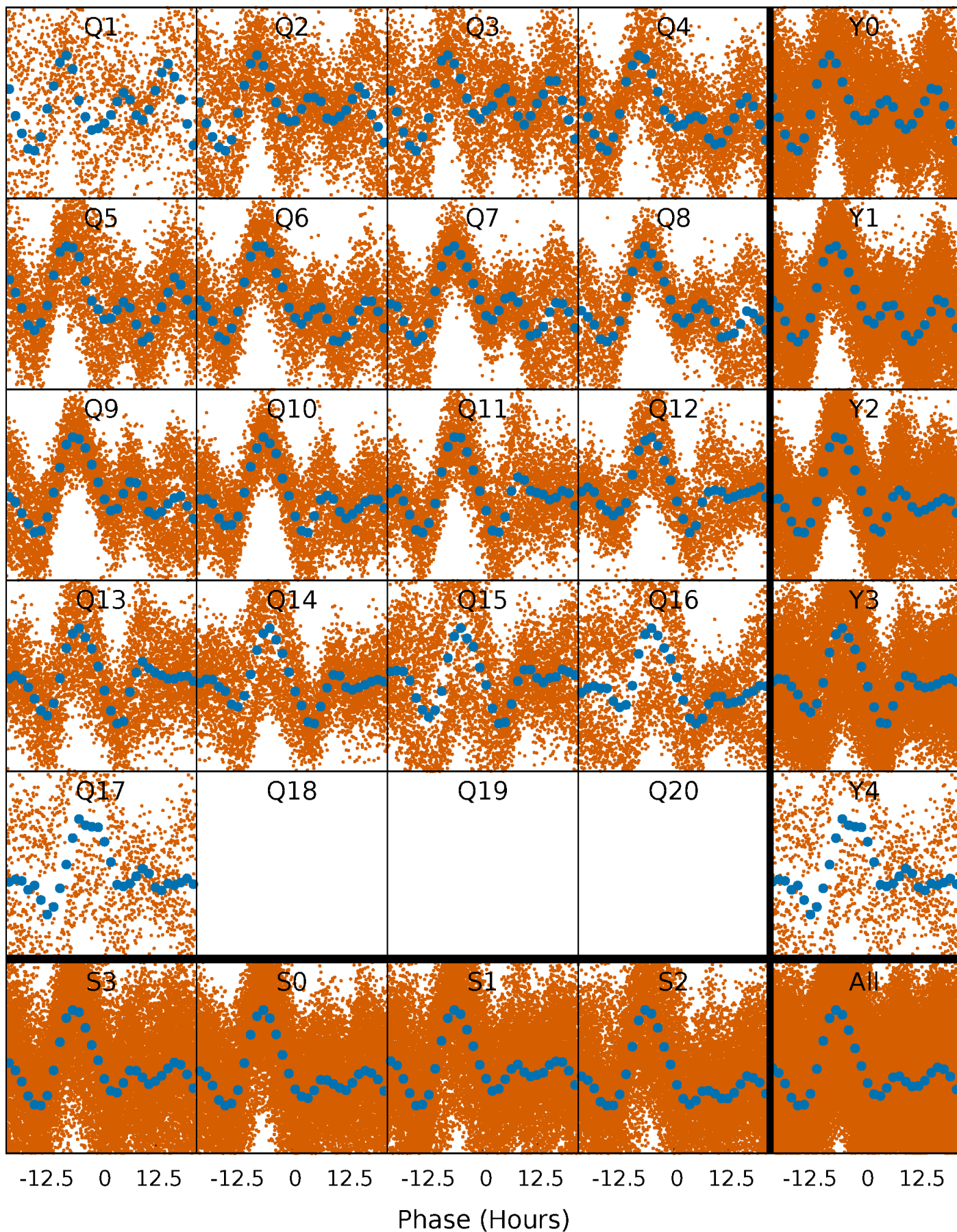
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

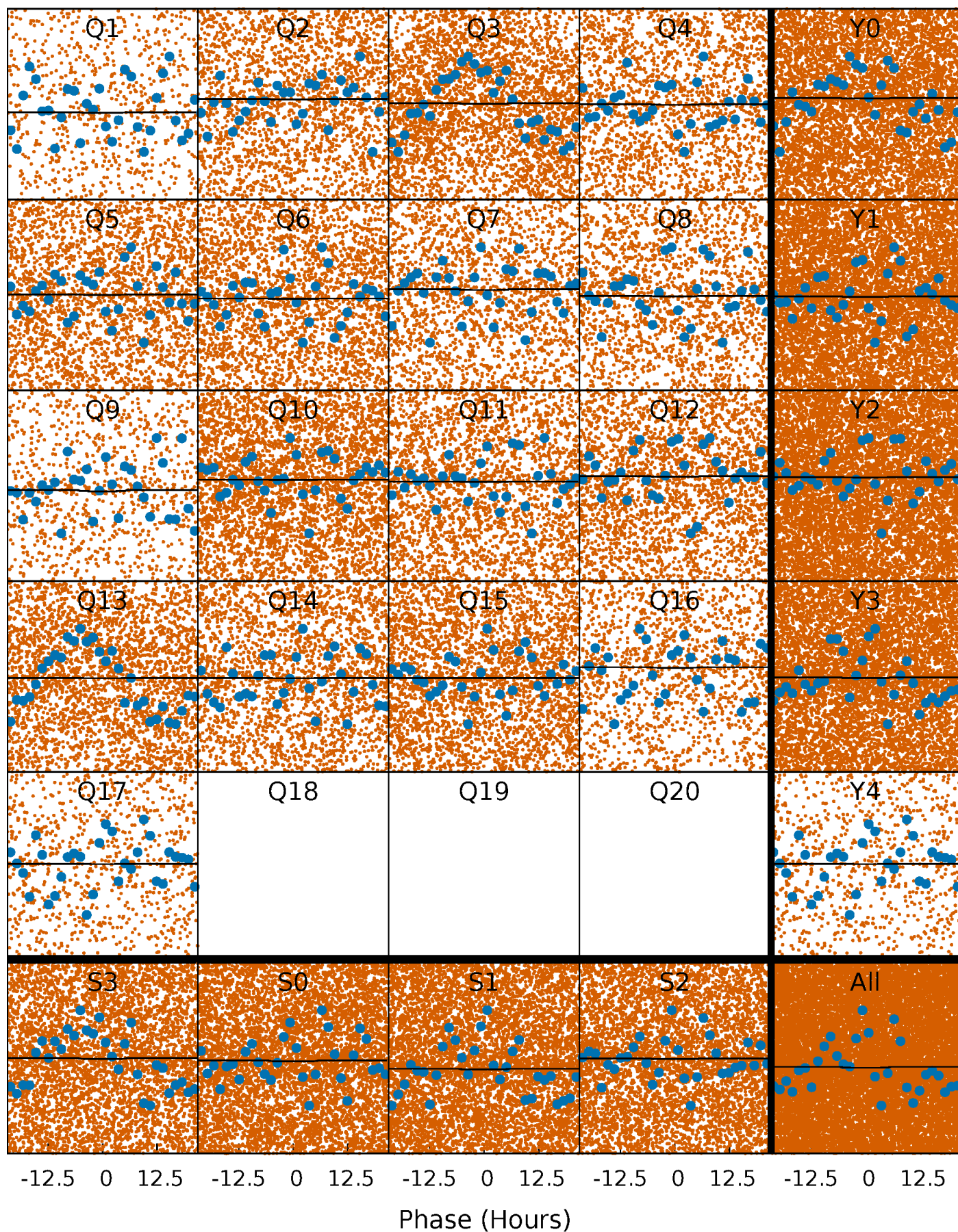
TCE 011122789-01 P= 1.619082 Days  $T_0=132.248682$  (BKJD)





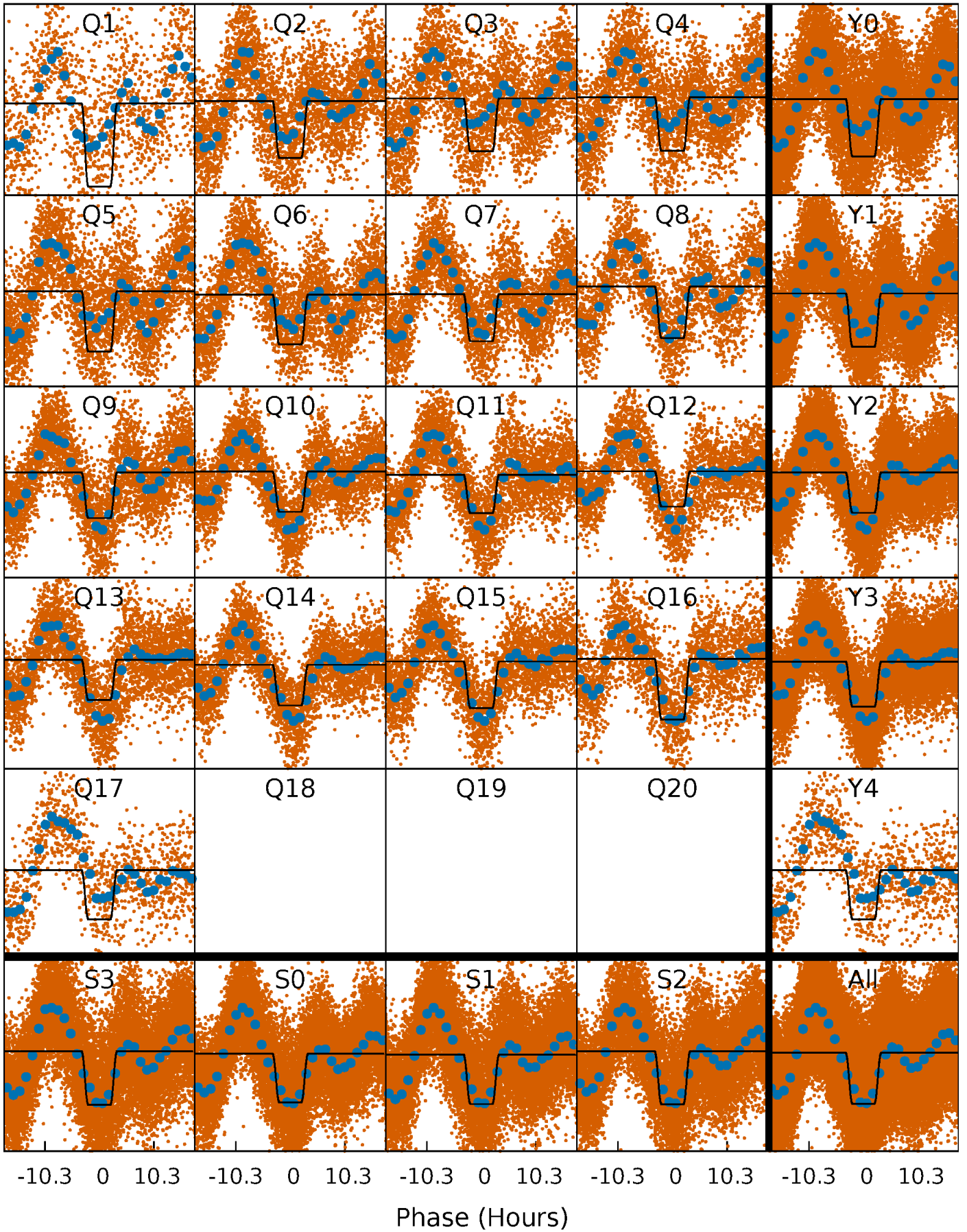
# DV Quarter-Phased Transit Curves

TCE 011122789-01 P= 1.619082 Days  $T_0=132.248682$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011122789-01 P= 1.619276 Days  $T_0=132.249297$  (BKJD)

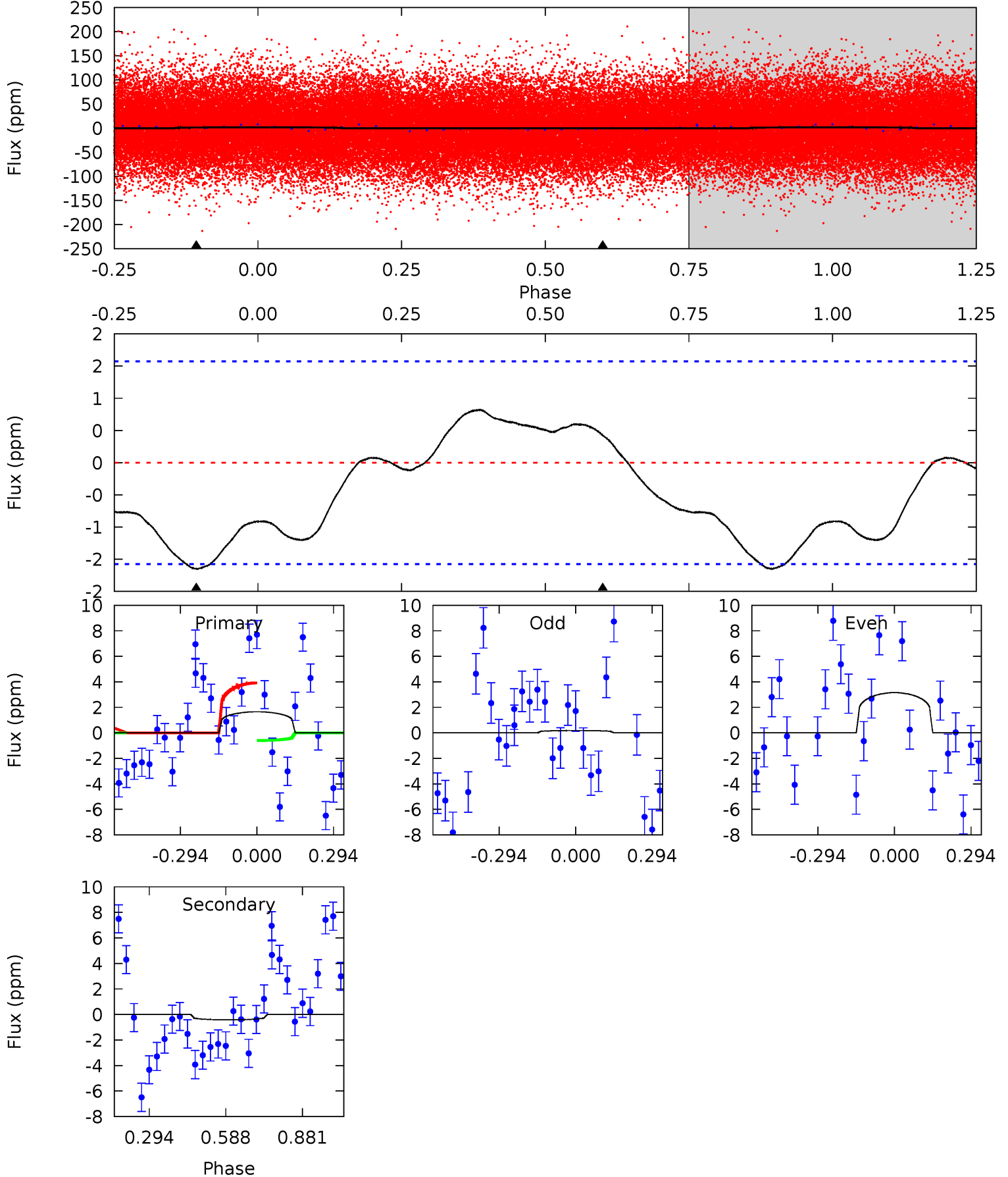




# DV Model-Shift Uniqueness Test

011122789-01, P = 1.619082 Days, E = 130.629600 Days

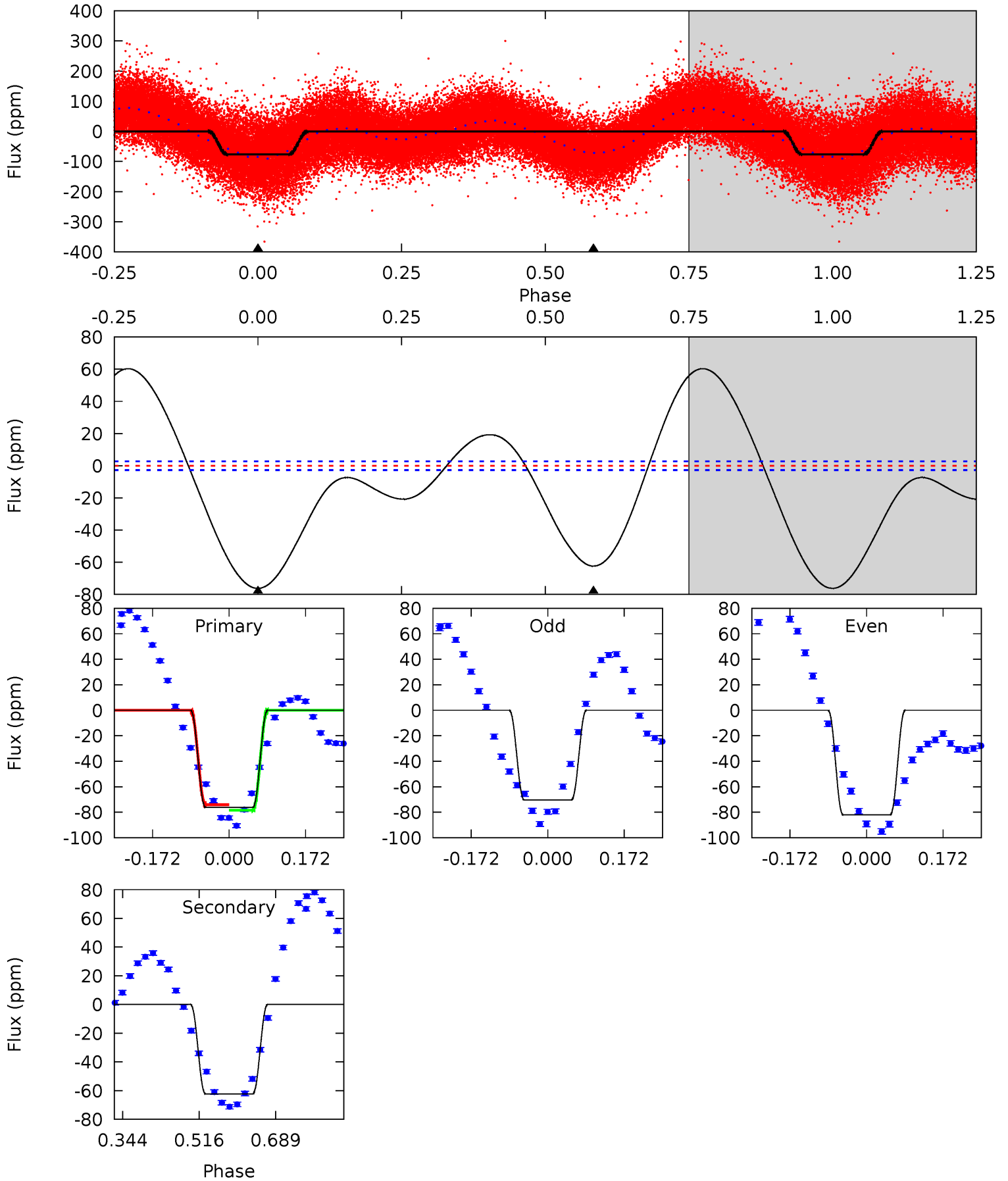
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.54	-1.16	0	0	4.33	1.05	0.20	4.54	4.54	-1.16	-1.16	4.09	2.38	0.33	4.56



# Alt Model-Shift Uniqueness Test

011122789-01, P = 1.619276 Days, E = 130.630021 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
125.7	102.9	0	0	4.45	1.37	46.9	125.7	125.7	102.9	102.9	9.45	1.02	0.44	3.40



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 0$	$0.19^{+0.19}_{-0.12}$	$3880^{+267}_{-427}$	$-6203^{+2049}_{-5753}$	$-4.746^{+4.239}_{-32.726}$
Alt.	$-62 \pm 1$	$2.35^{+0.51}_{-0.56}$	$3858^{+265}_{-468}$	$6446^{+400}_{-348}$	$5.950^{+3.714}_{-1.738}$

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



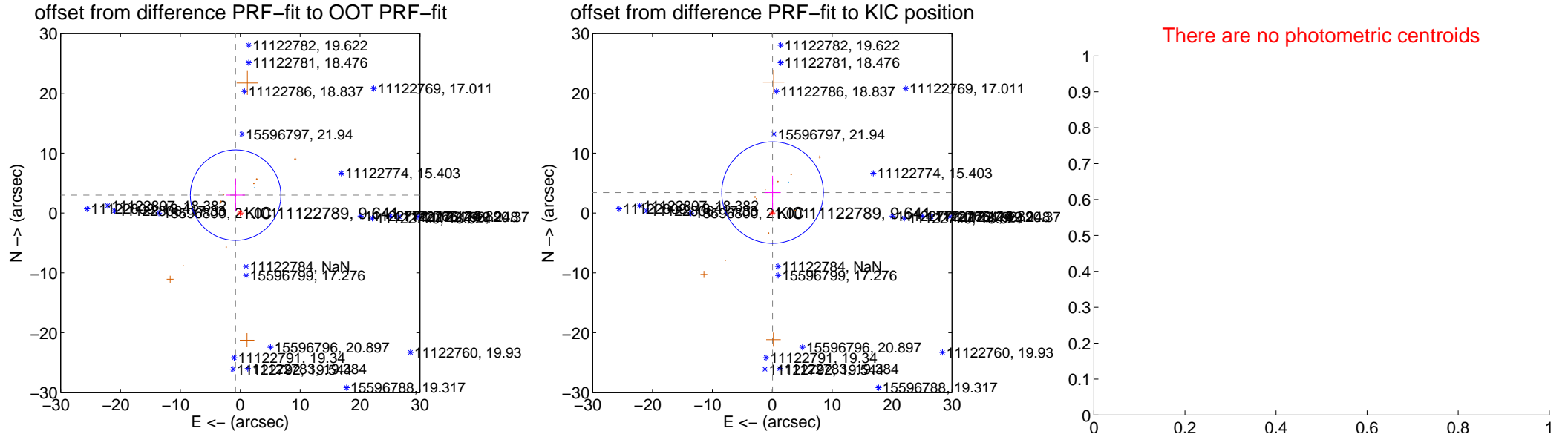
## DV Centroid Data

Supplemental centroid analysis for 011122789-01. **Kepler magnitude: 9.64.** Transit SNR 0.22

**There are 1 quarters with good PRF difference image offsets**

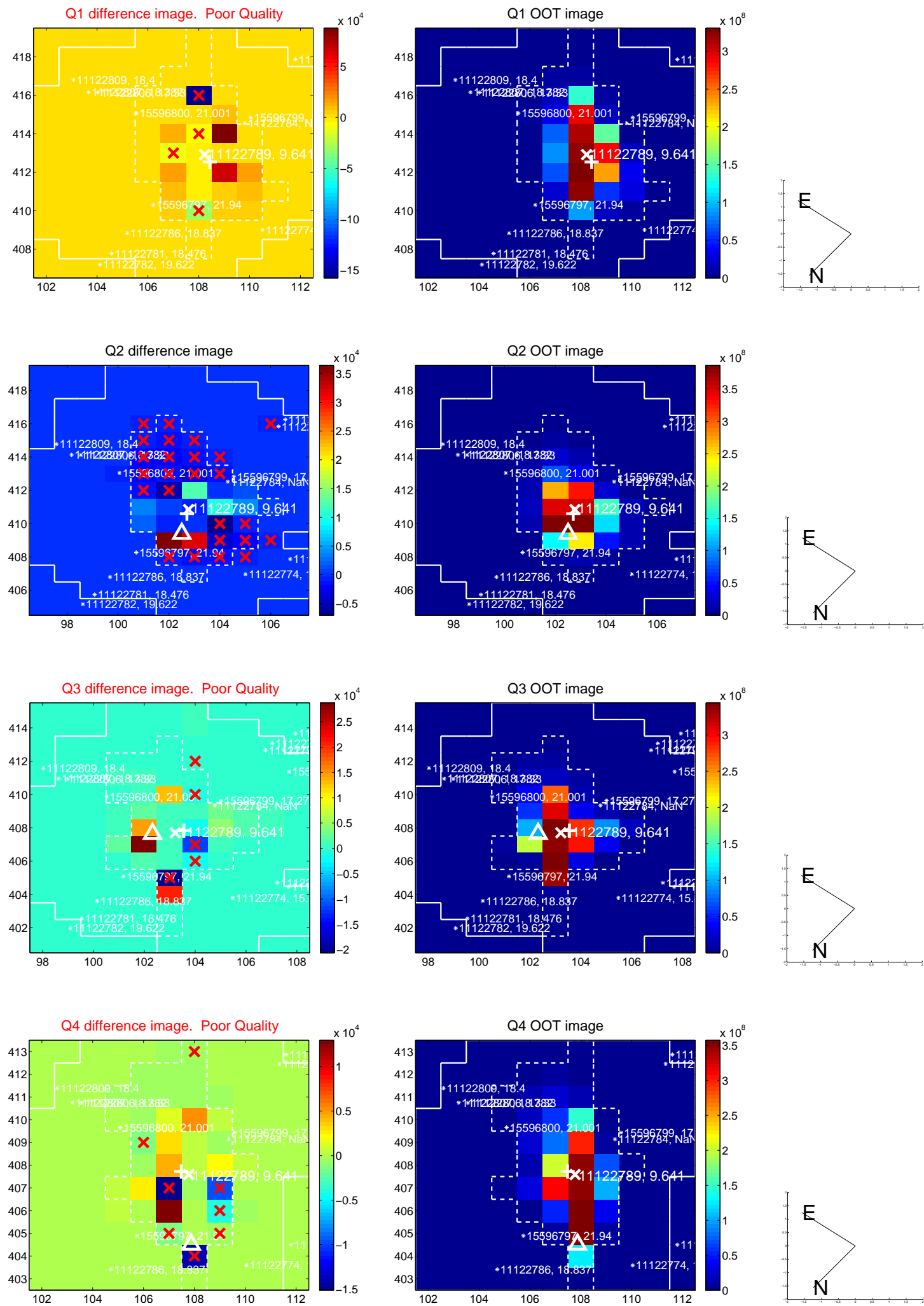
The direct PRF centroid is offset from the target star catalog position by about 1.79 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.083 \pm 2.518$	1.22	$0.781 \pm 1.551$	$2.983 \pm 2.755$
PRF-fit source offset from KIC position	$3.413 \pm 2.828$	1.21	$-0.050 \pm 1.352$	$3.413 \pm 2.817$
photometric centroid source offset	—	—	—	—

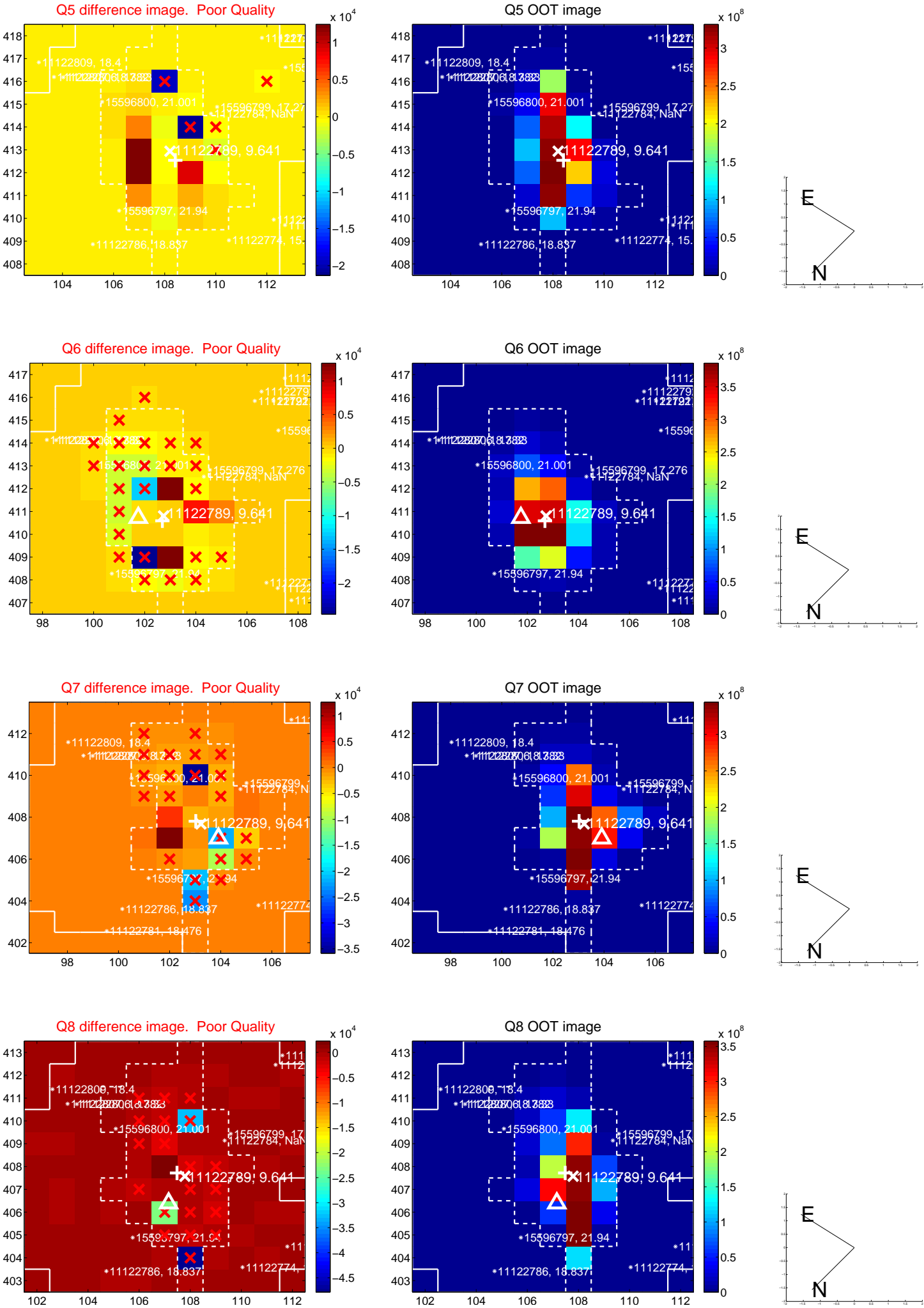


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

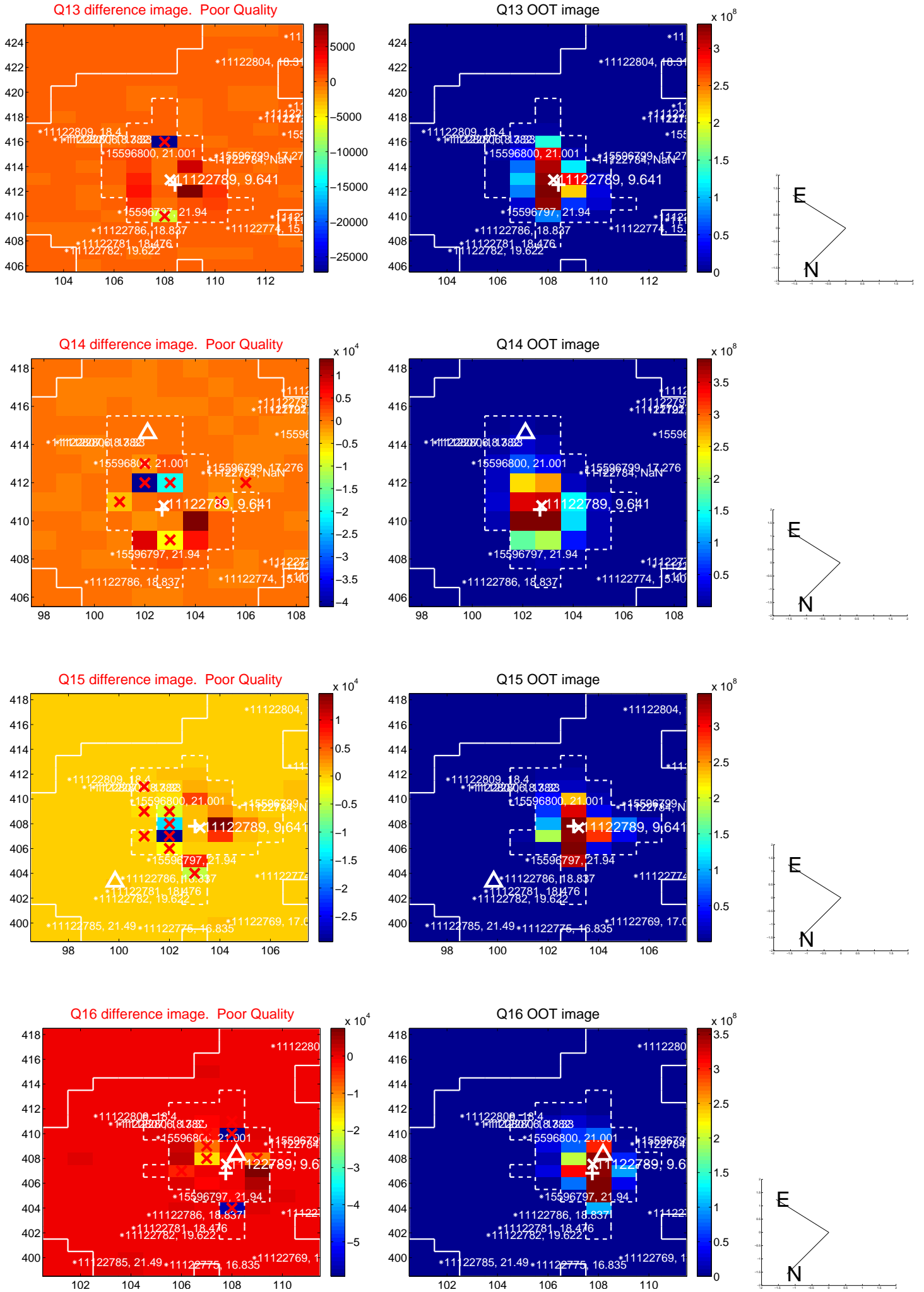


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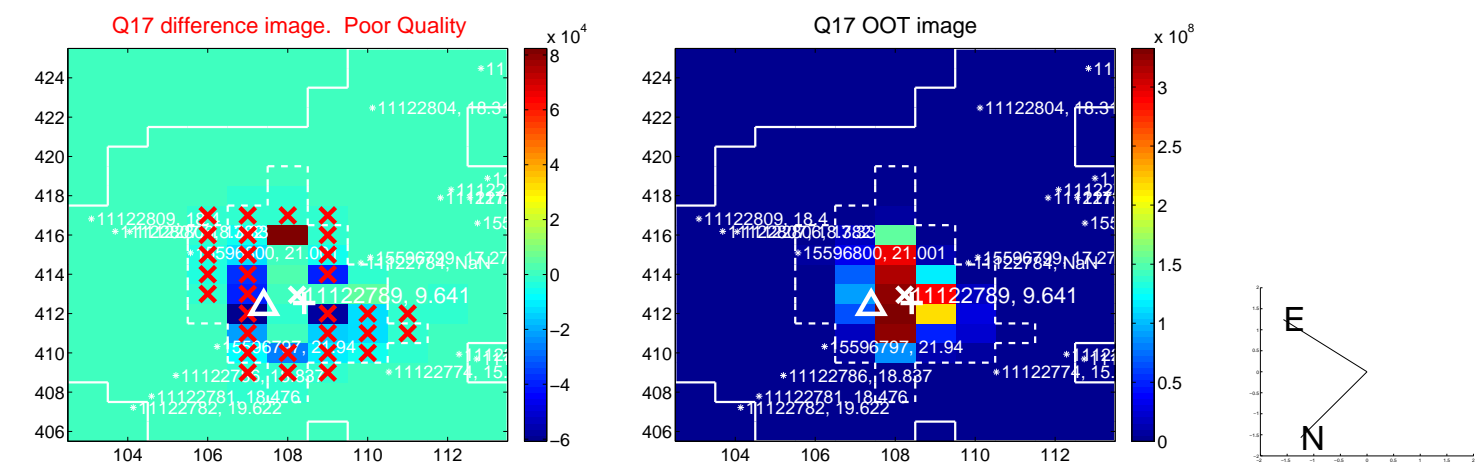


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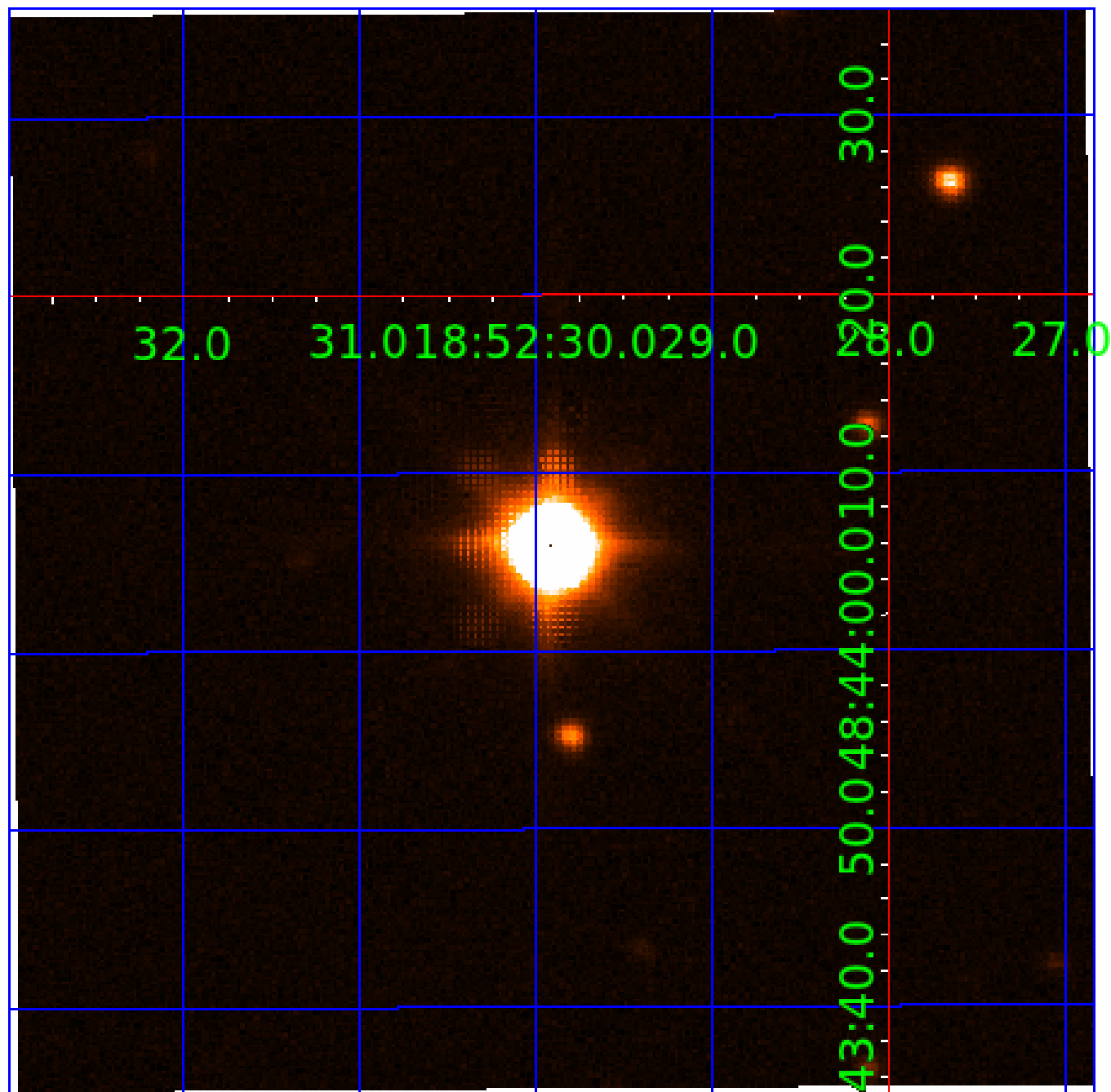
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folded centroid time series figure for this object.

UKIRT Image

Declination



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011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
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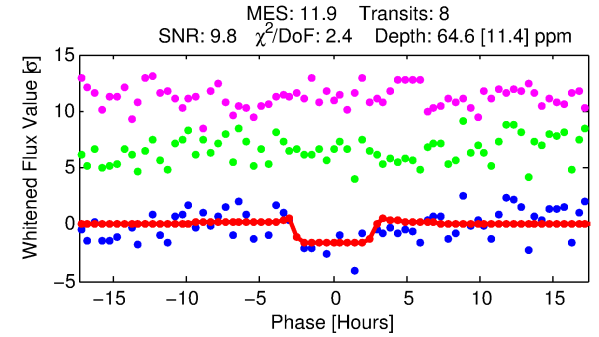
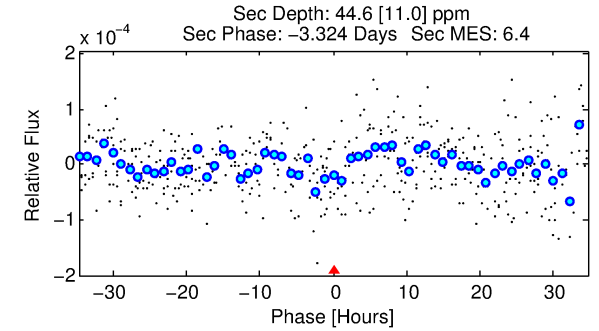
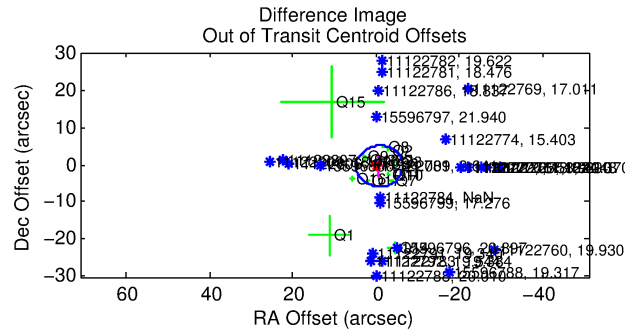
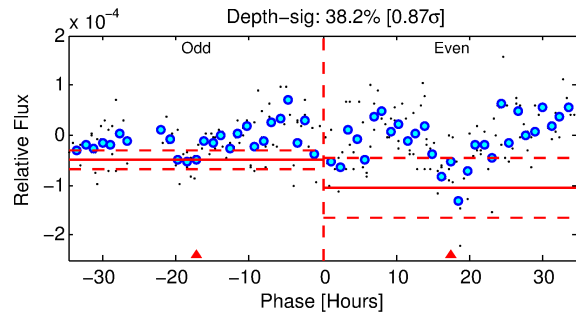
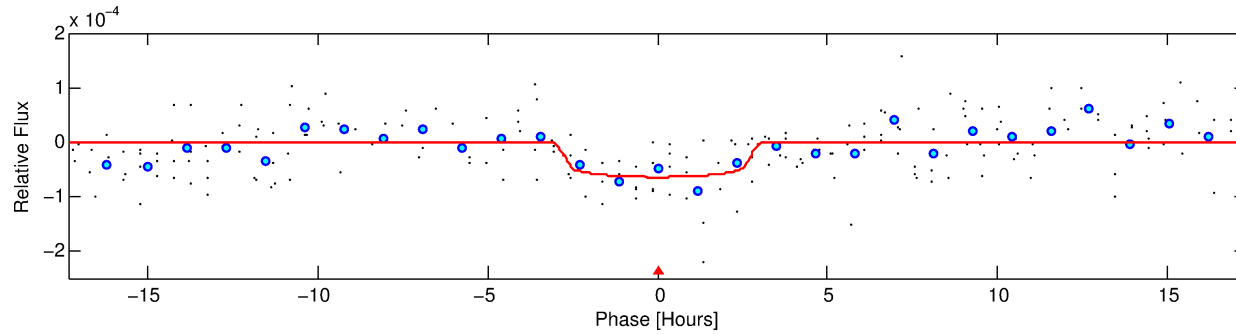
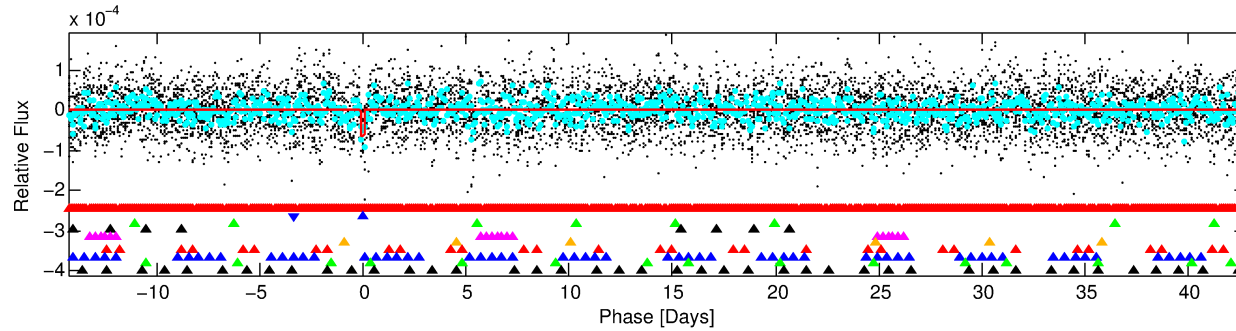
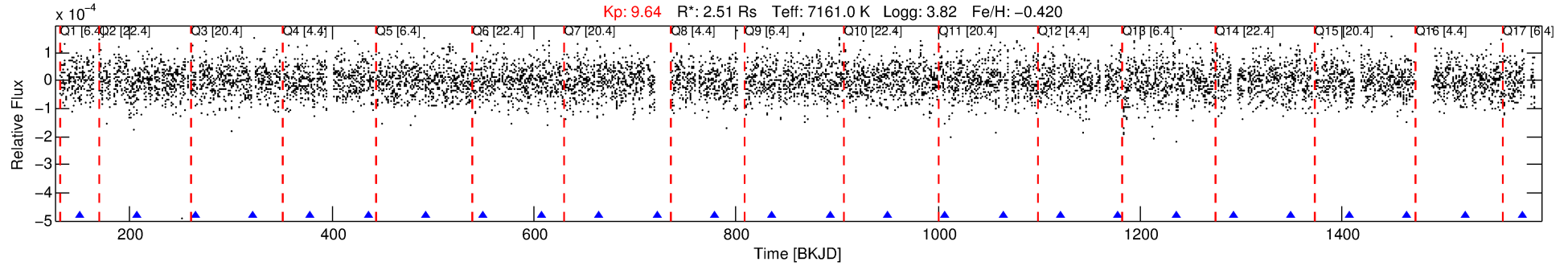
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-02

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 2 of 10 Period: 57.106 d



## DV Fit Results:

Period = 57.10618 [0.00108] d  
Epoch = 150.5484 [0.0168] BKJD  
 $R_p/R^* = 0.0085$  [0.0074]  
 $a/R^* = 35.61$  [184.54]  
 $b = 0.89$  [1.19]  
 $\text{Seff} = 133.42$  [95.86]  
 $\text{Teq} = 867$  [156] K  
 $R_p = 2.34$  [2.29]  $R_e$   
 $a = 0.3338$  [0.1466] AU  
 $\text{Ag} = 498.54$  [941.97] [0.53 $\sigma$ ]  
 $\text{Teffp} = 6331$  [2782] K [1.96 $\sigma$ ]

## DV Diagnostic Results:

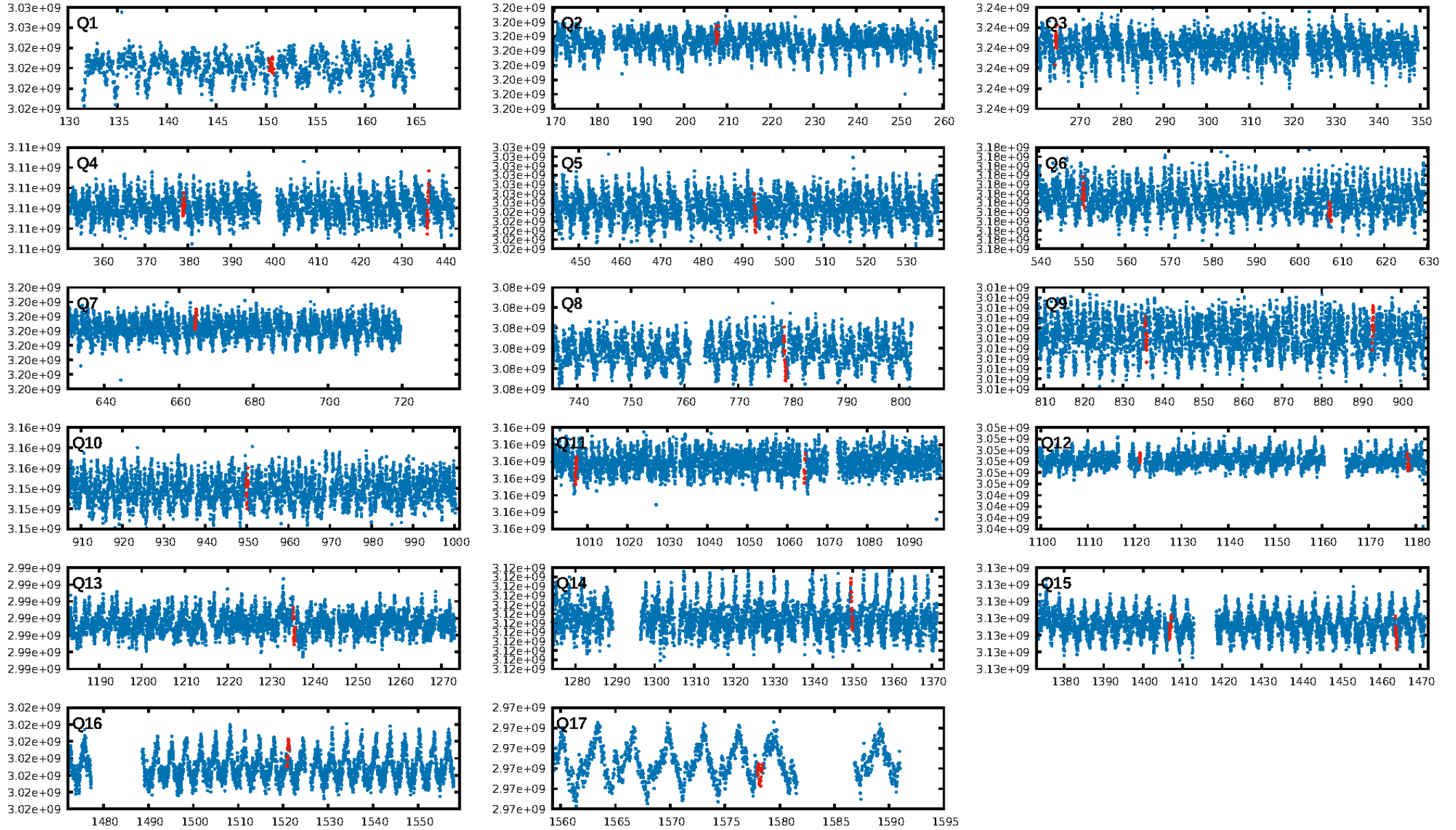
ShortPeriod-sig: 100.0% [35.21 $\sigma$ ]  
LongPeriod-sig: 100.0% [45.22 $\sigma$ ]  
ModelChiSquare2-sig: 0.9%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 8.27e-12**  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 2.8%  
Centroid-so: 1.888 arcsec [1.80 $\sigma$ ]  
OotOffset-rm: 0.796 arcsec [0.43 $\sigma$ ]  
OotOffset-st: 3/4/2/4 [13]  
KicOffset-rm: 2.443 arcsec [1.57 $\sigma$ ]  
KicOffset-st: 3/4/2/4 [13]  
DiffImageQuality-fgm: 0.08 [1/13]  
DiffImageOverlap-fno: 0.19 [3/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:28 Z

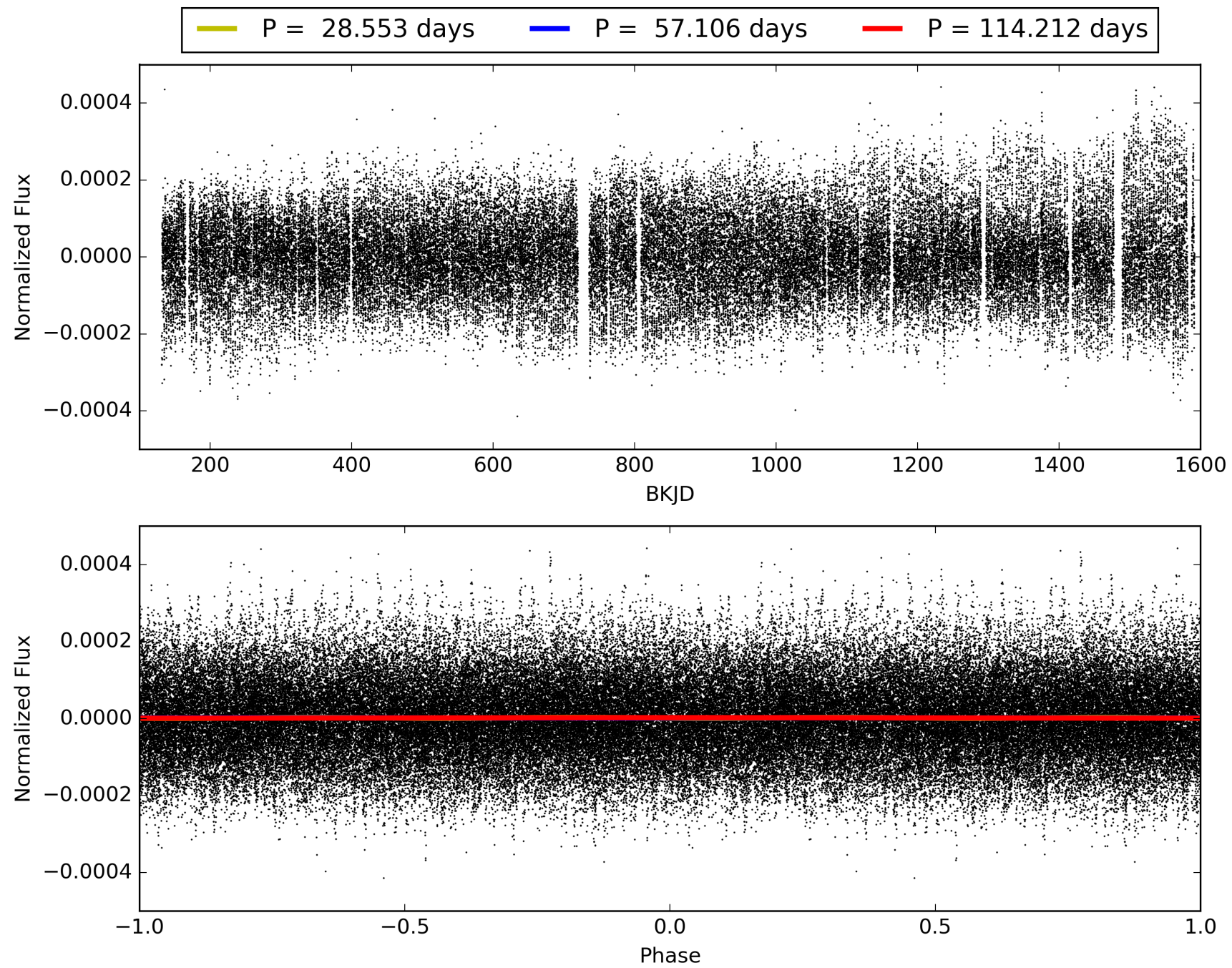
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011122789-02, PDC Light Curves

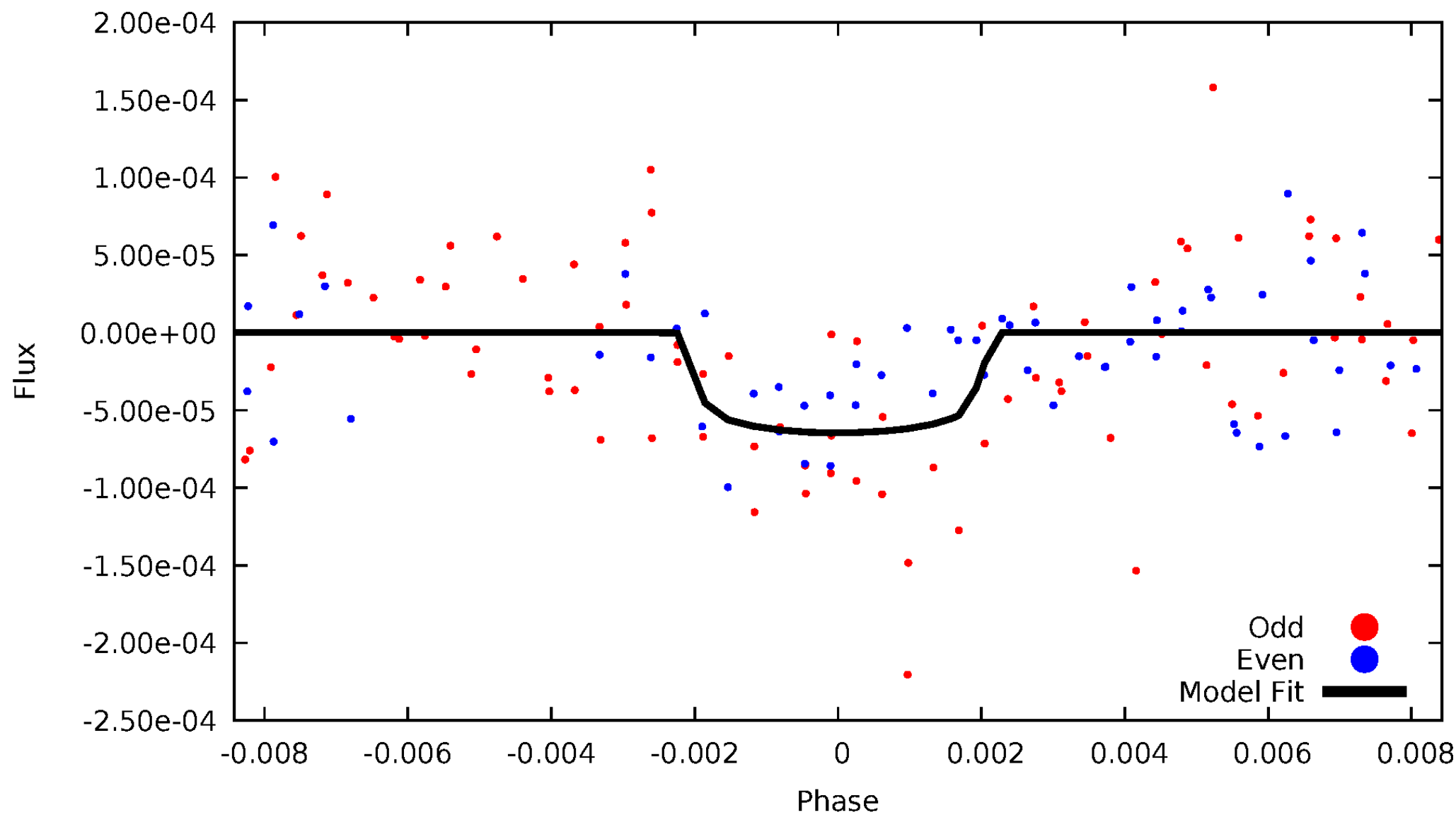


# TCE 011122789-02



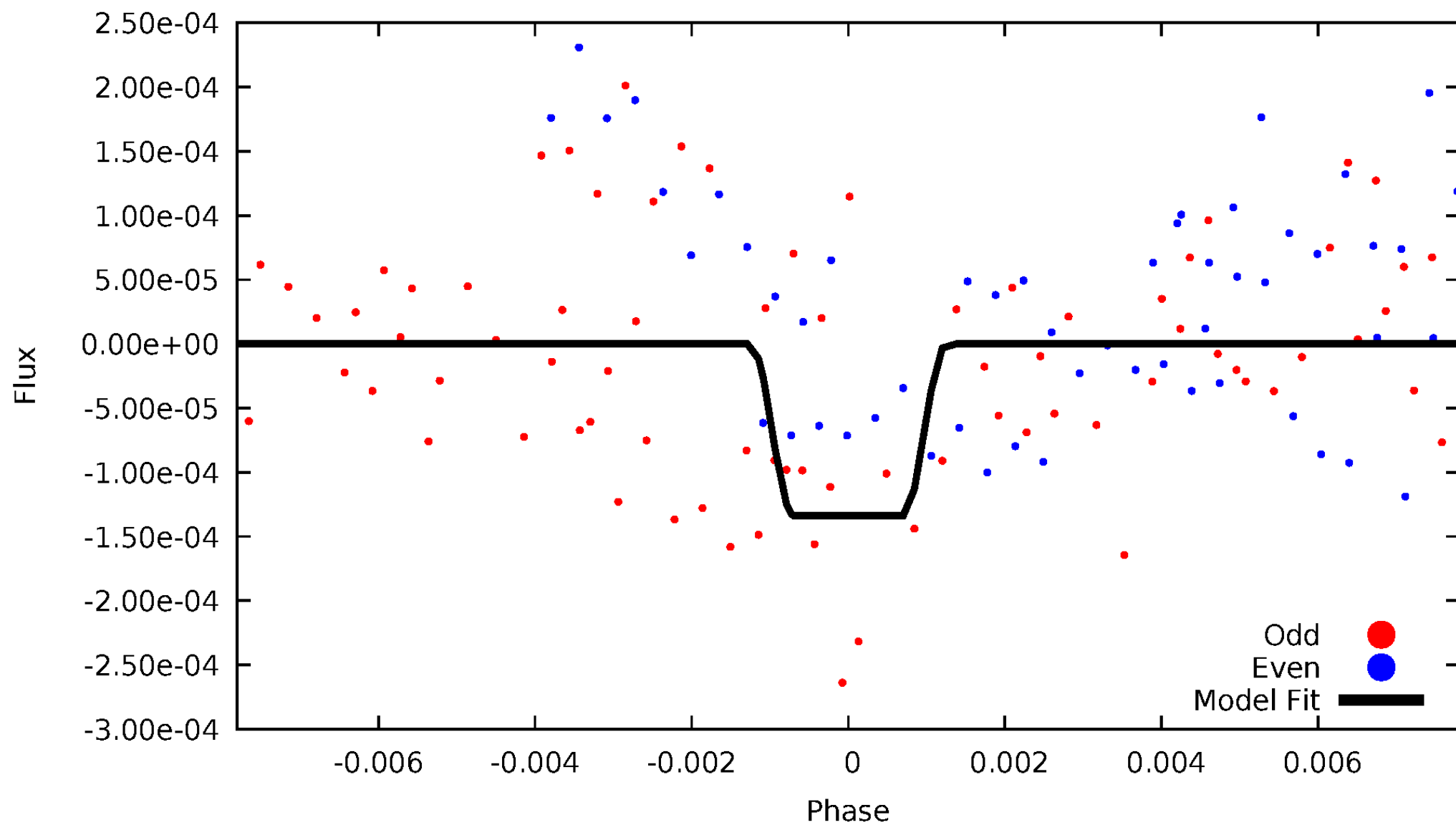
# DV Odd/Even

TCE 011122789-02



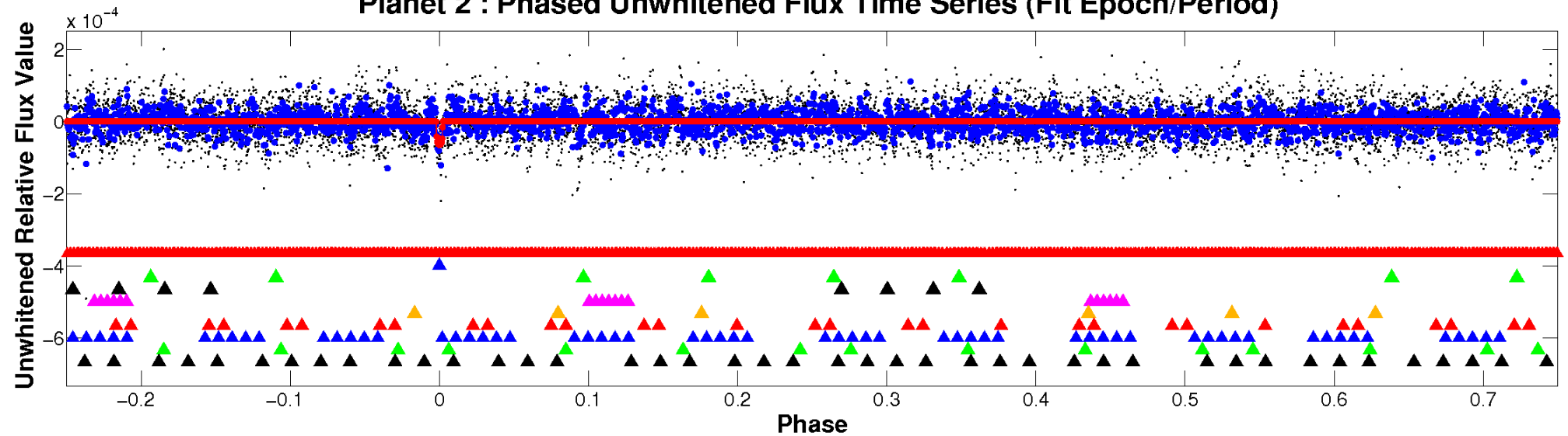
# ALT Odd/Even

TCE 011122789-02

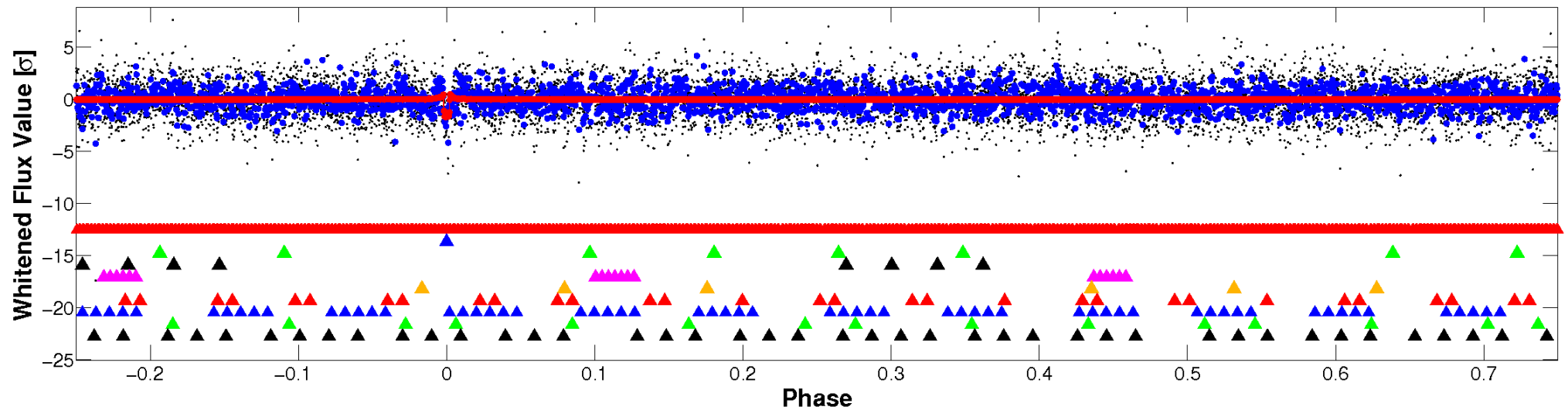


# Non-Whitened Vs. Whitened Light Curve

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

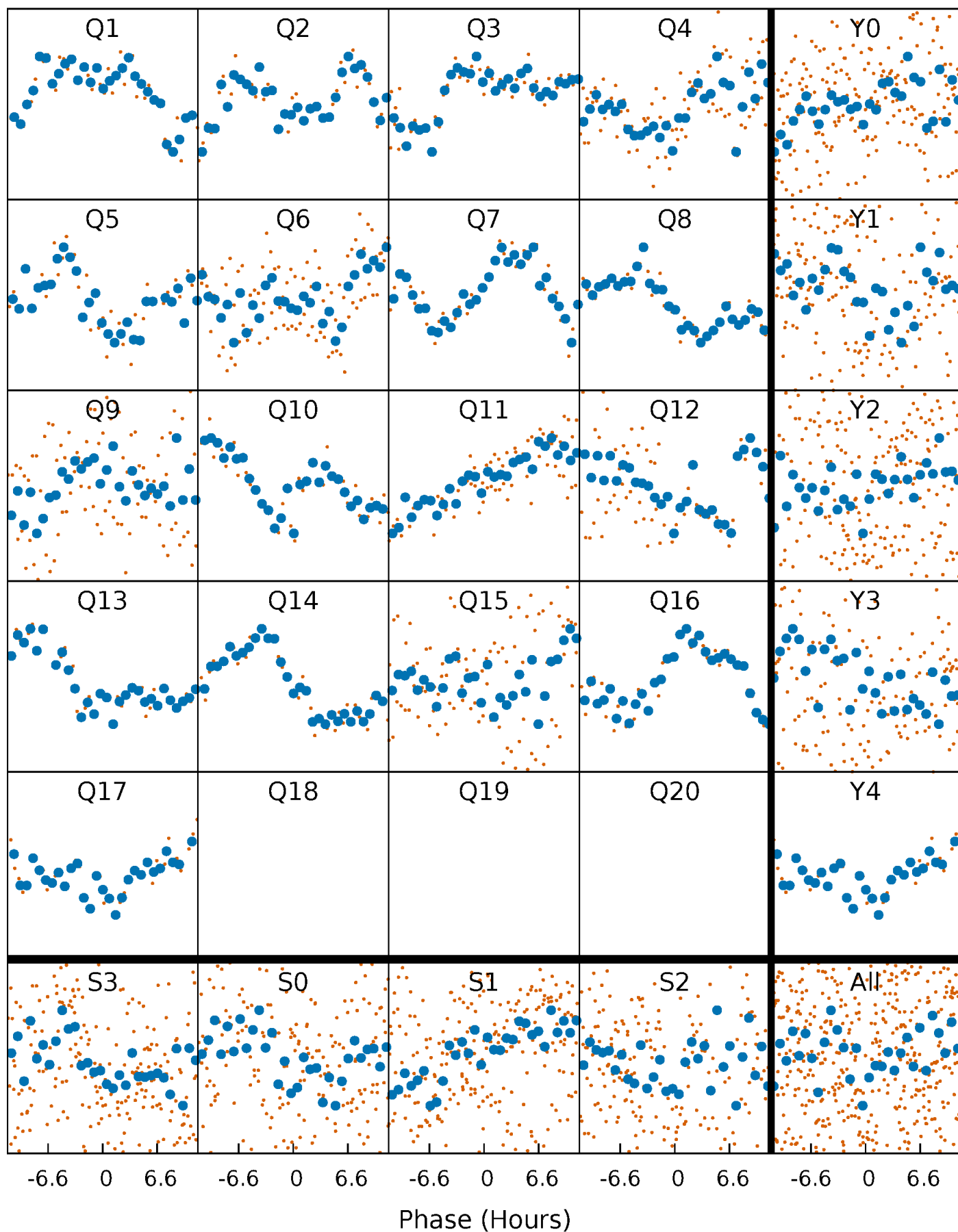


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

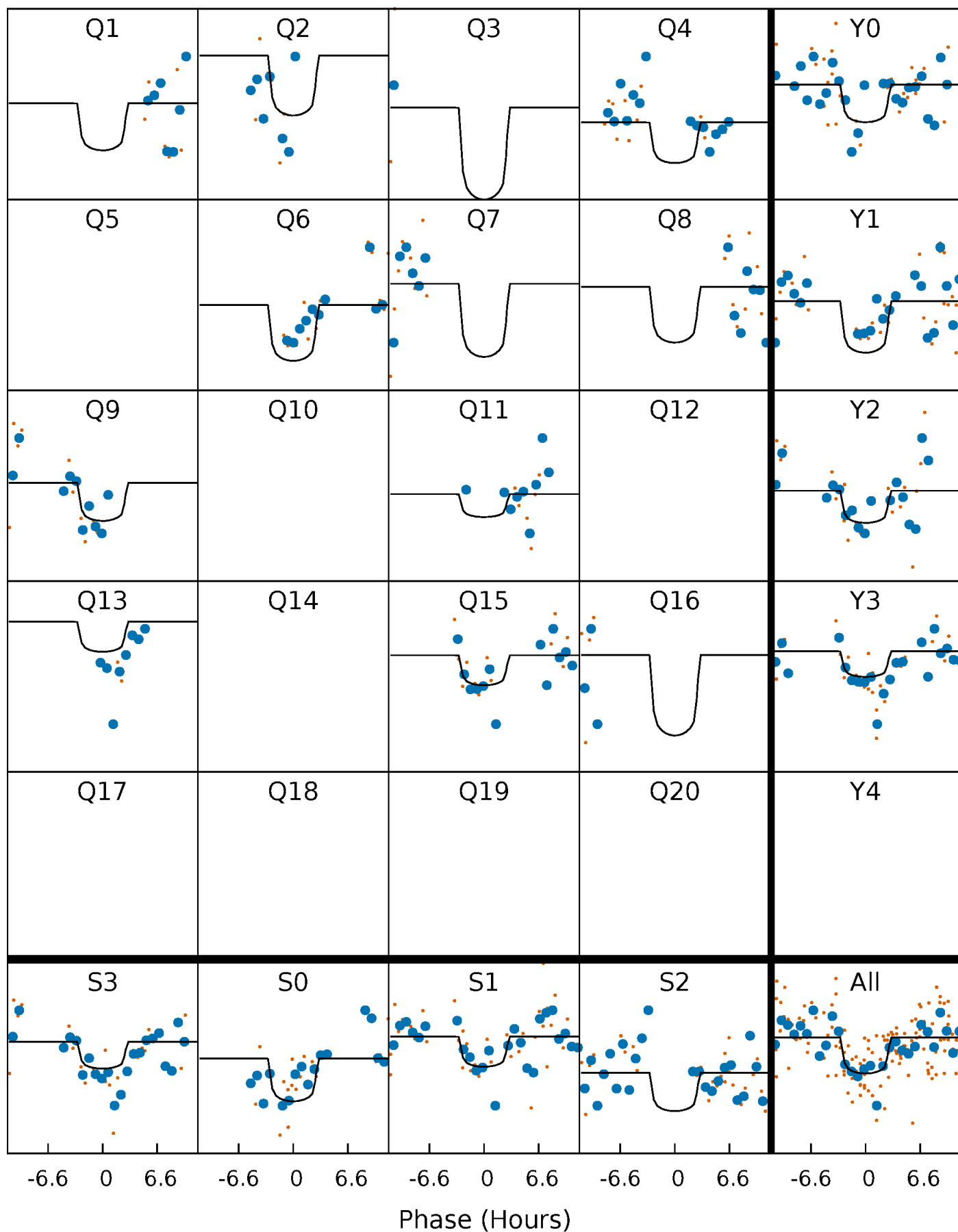
TCE 011122789-02 P= 57.106183 Days  $T_0=150.548374$  (BKJD)





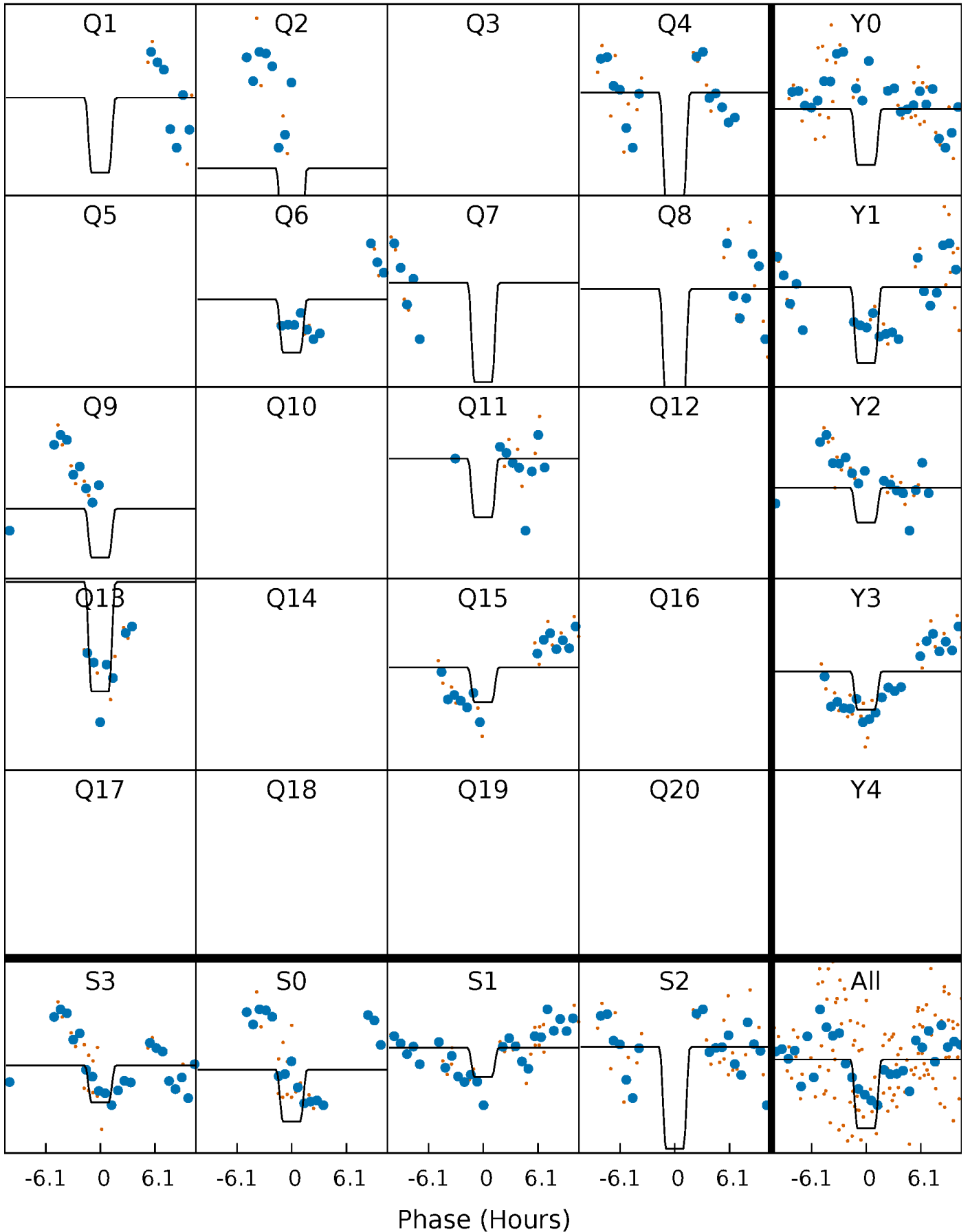
# DV Quarter-Phased Transit Curves

TCE 011122789-02 P= 57.106183 Days  $T_0=150.548374$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

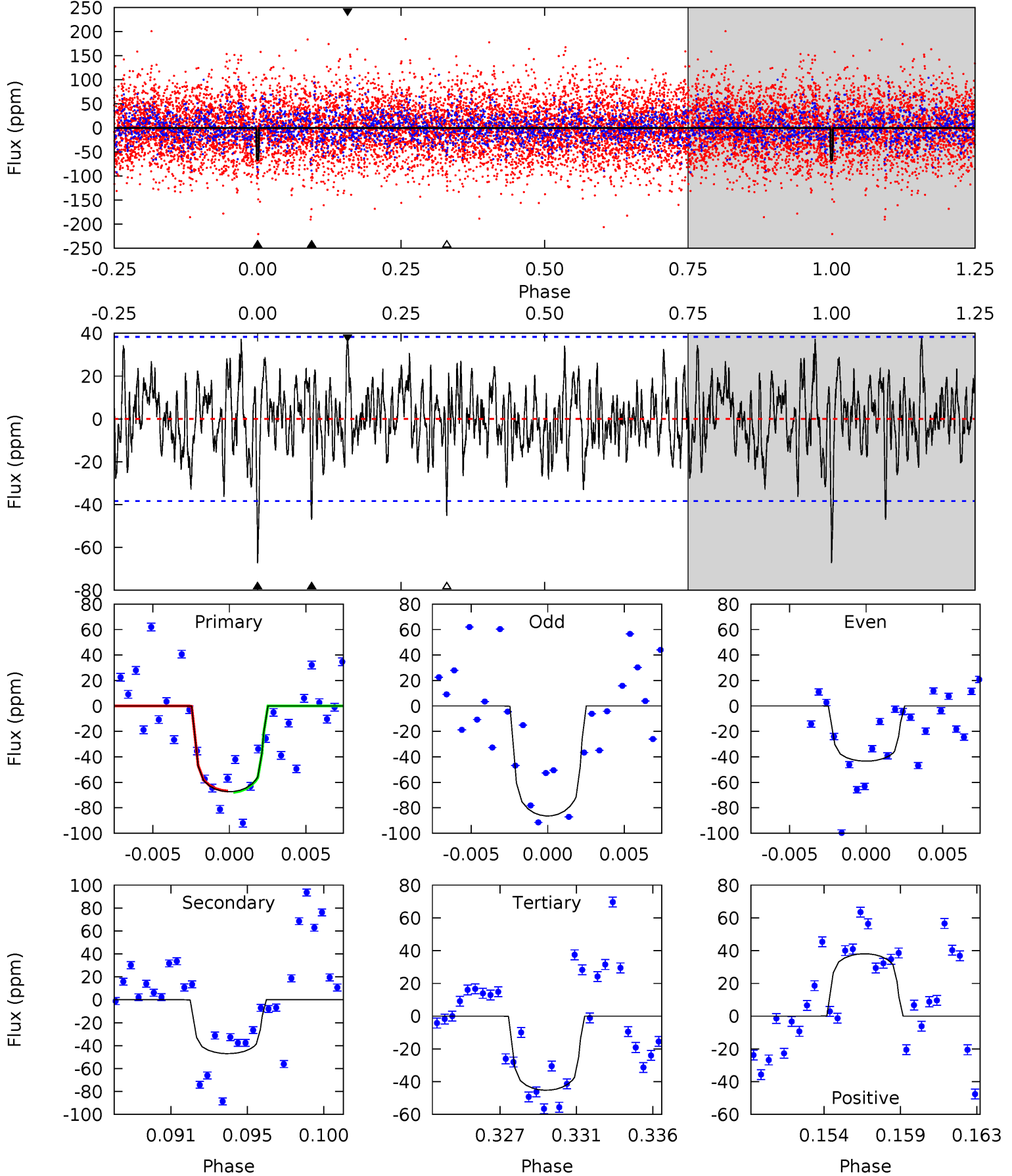
TCE 011122789-02 P= 57.109198 Days  $T_0=150.539208$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-02, P = 57.106183 Days, E = 93.442191 Days

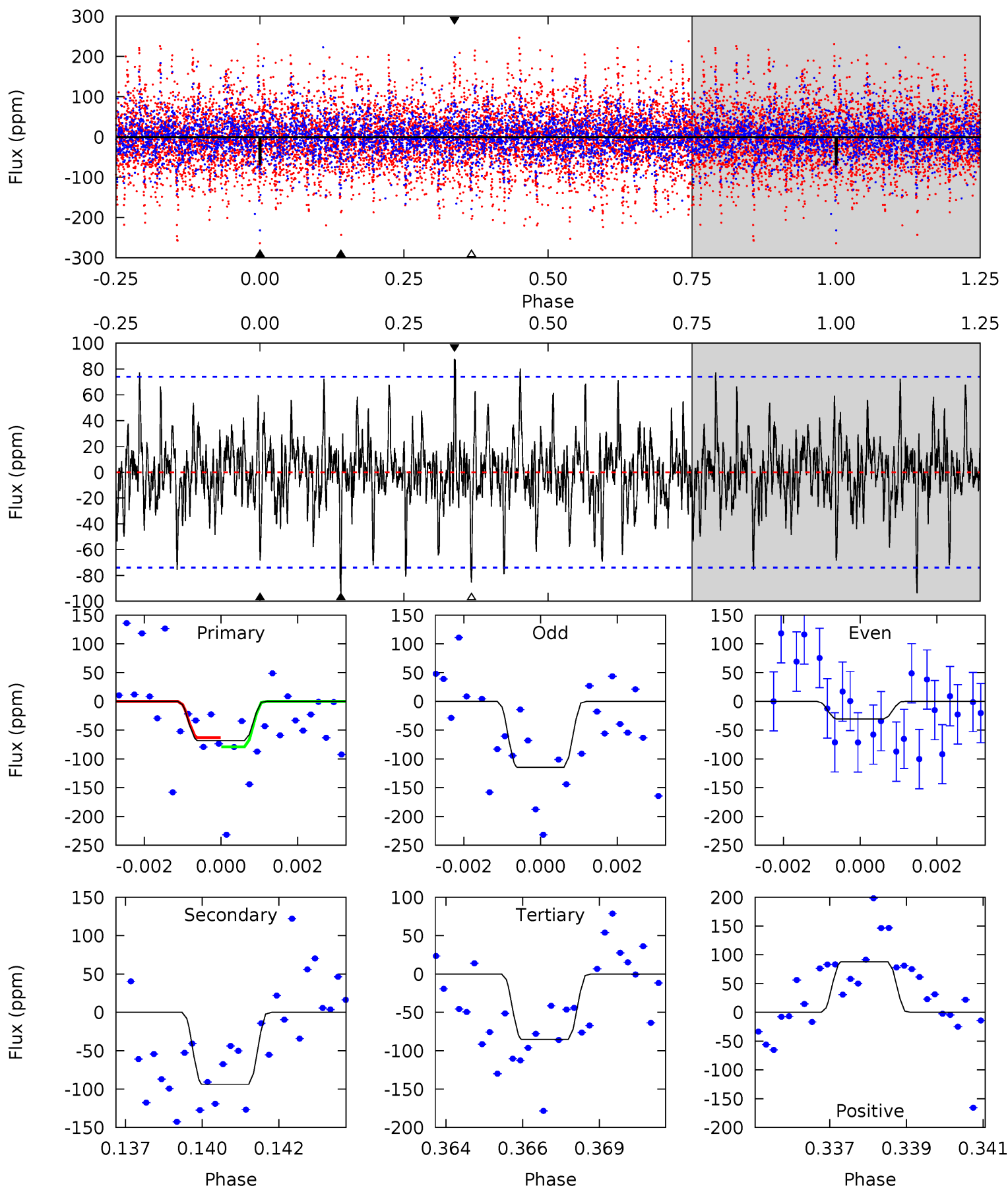
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.09	6.34	6.11	5.14	5.18	2.84	1.73	2.98	3.95	0.24	1.21	2.89	0.88	0.36	0.07



# Alt Model-Shift Uniqueness Test

011122789-02, P = 57.109198 Days, E = 93.430010 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
4.89	6.72	6.10	6.30	5.30	3.05	1.66	-1.21	-1.41	0.62	0.42	2.92	0.84	0.48	0.53



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-47 \pm 7$	$2.30^{+1.87}_{-1.45}$	$1176^{+80}_{-142}$	$6005^{+4810}_{-1280}$	$530^{+3435}_{-363}$
Alt.	$-94 \pm 14$	$2.89^{+2.09}_{-1.63}$	$1169^{+82}_{-131}$	$6344^{+4340}_{-1265}$	$677^{+3056}_{-441}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

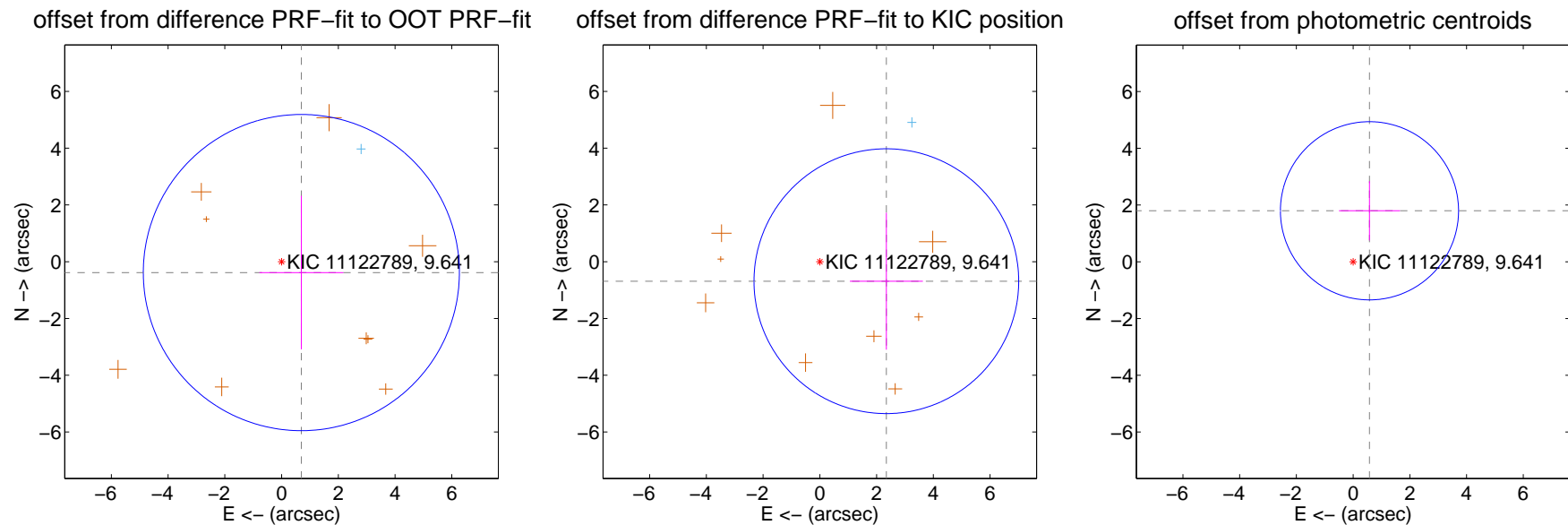
## DV Centroid Data

Supplemental centroid analysis for 011122789-02. **Kepler magnitude: 9.64.** Transit SNR 9.76

**There are 1 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 1.82 arcsec

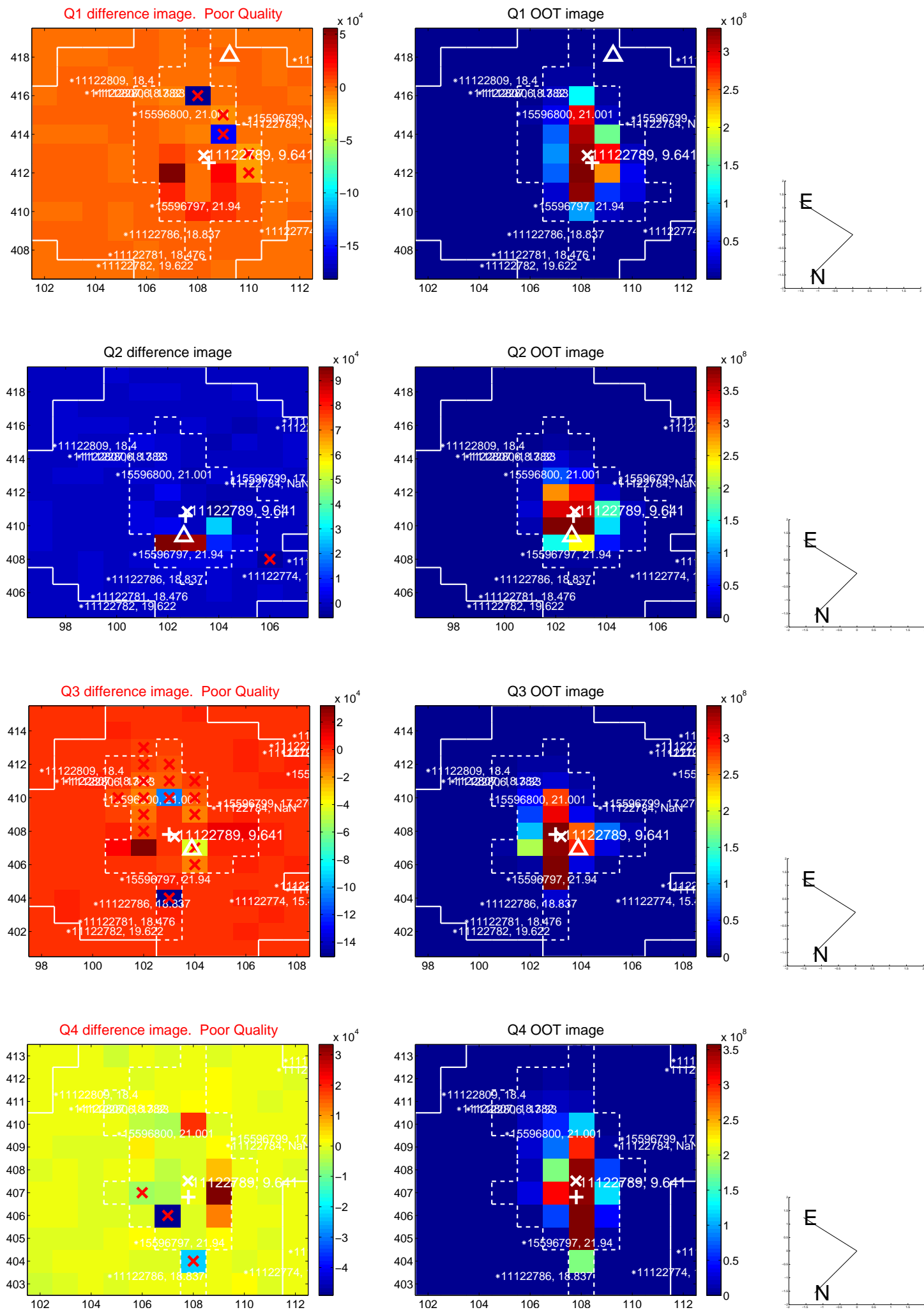
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.796 \pm 1.857$	0.43	$-0.697 \pm 1.481$	$-0.383 \pm 2.708$
PRF-fit source offset from KIC position	$2.443 \pm 1.555$	1.57	$-2.344 \pm 1.287$	$-0.687 \pm 2.414$
photometric centroid source offset	$1.89 \pm 1.05$	1.80	$-0.58 \pm 1.07$	$1.80 \pm 1.04$



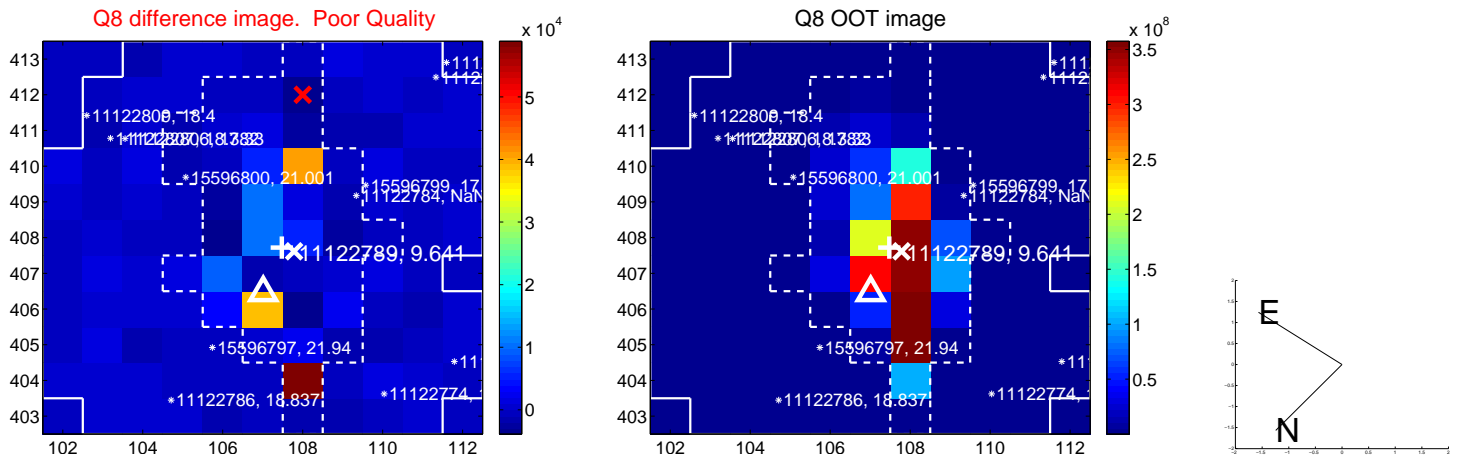
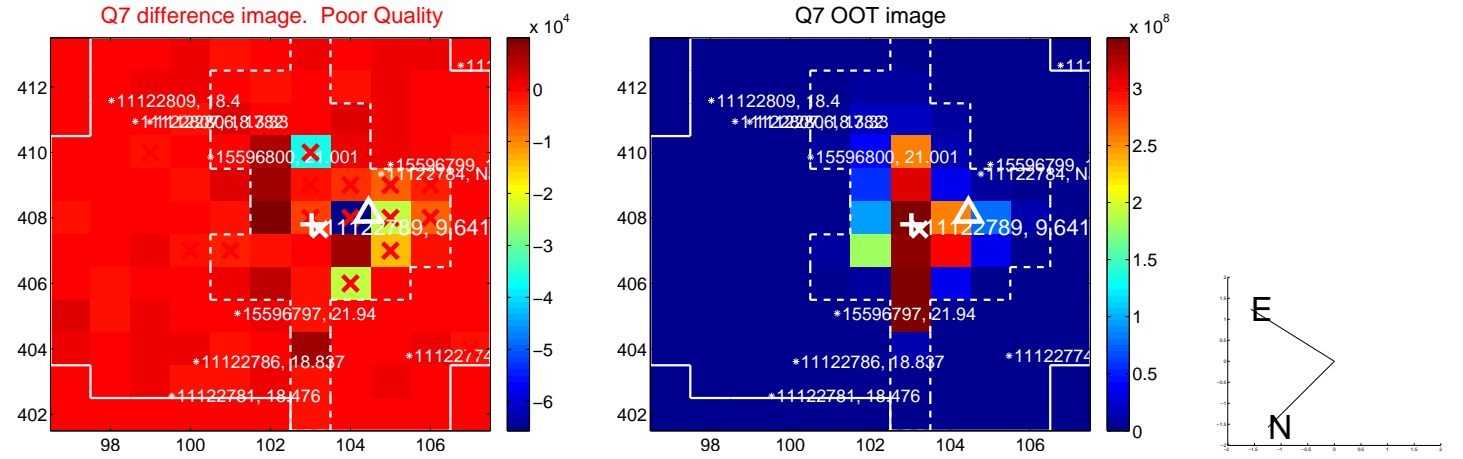
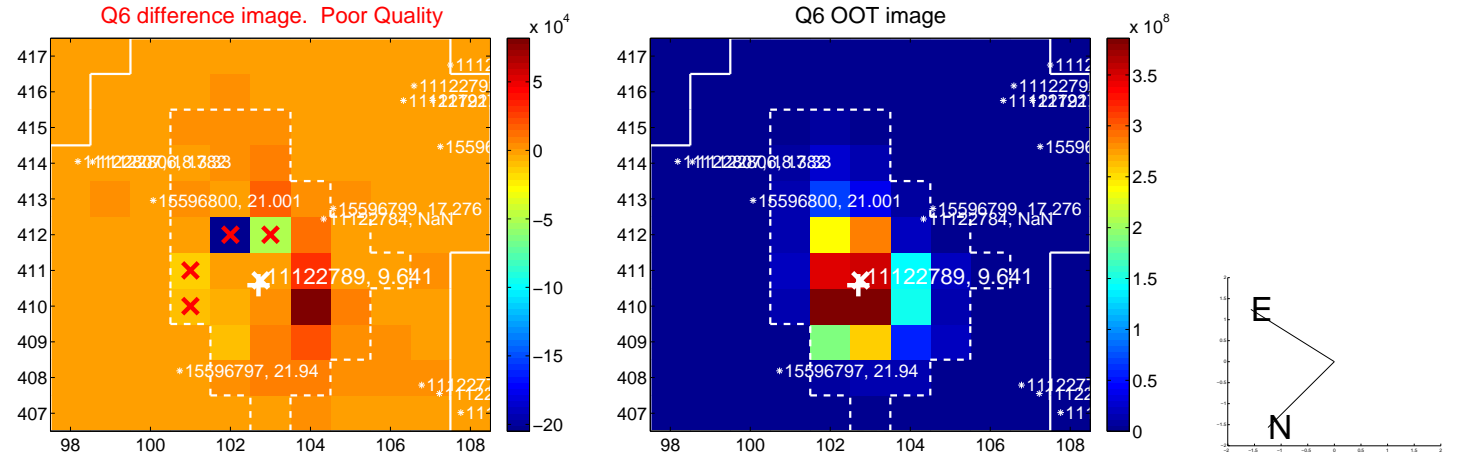
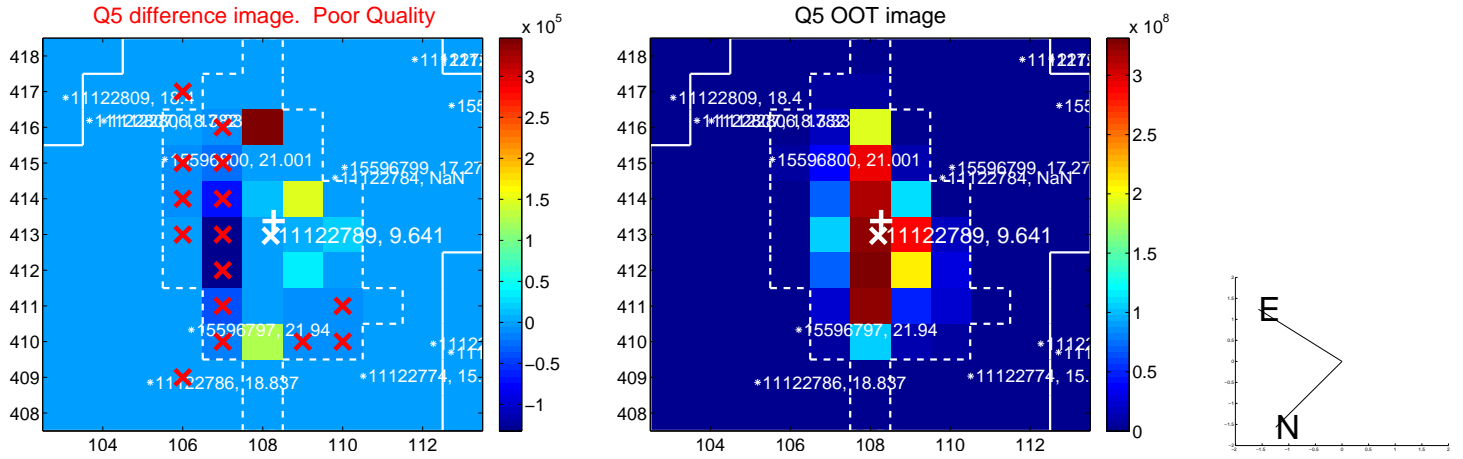
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



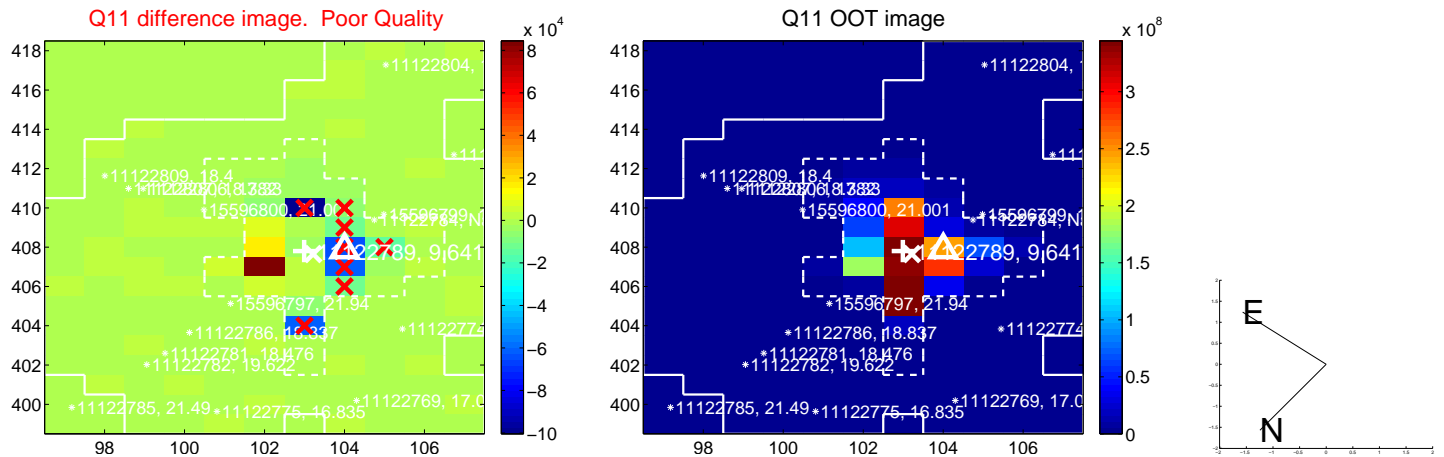
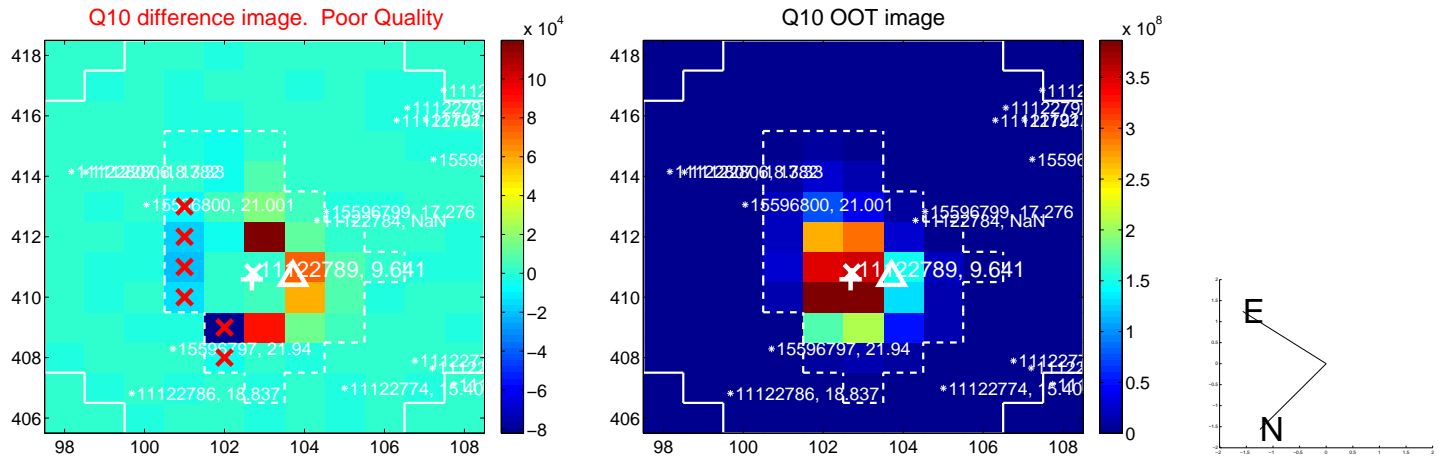
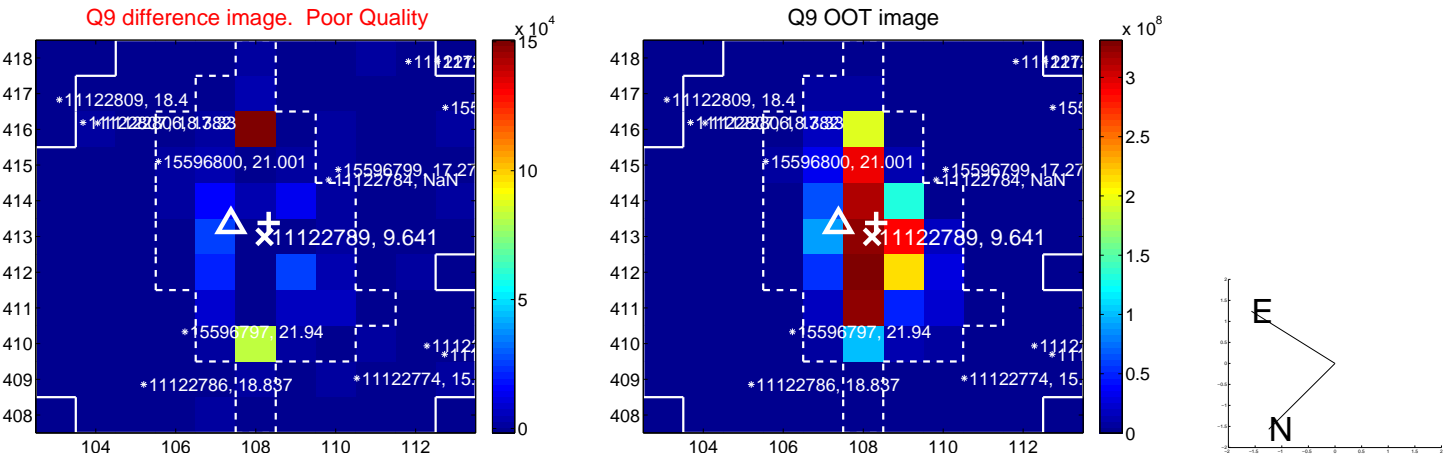
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



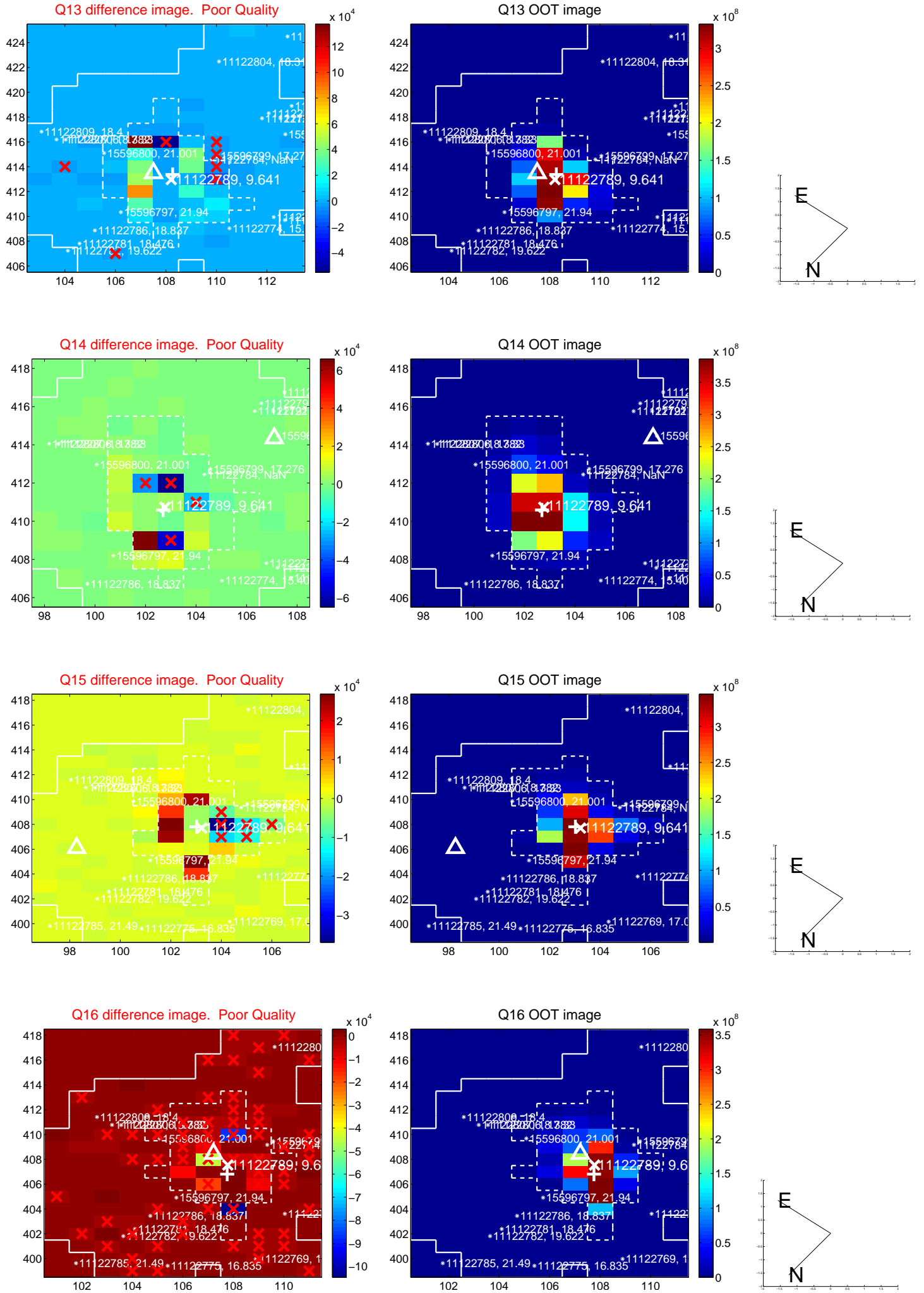
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



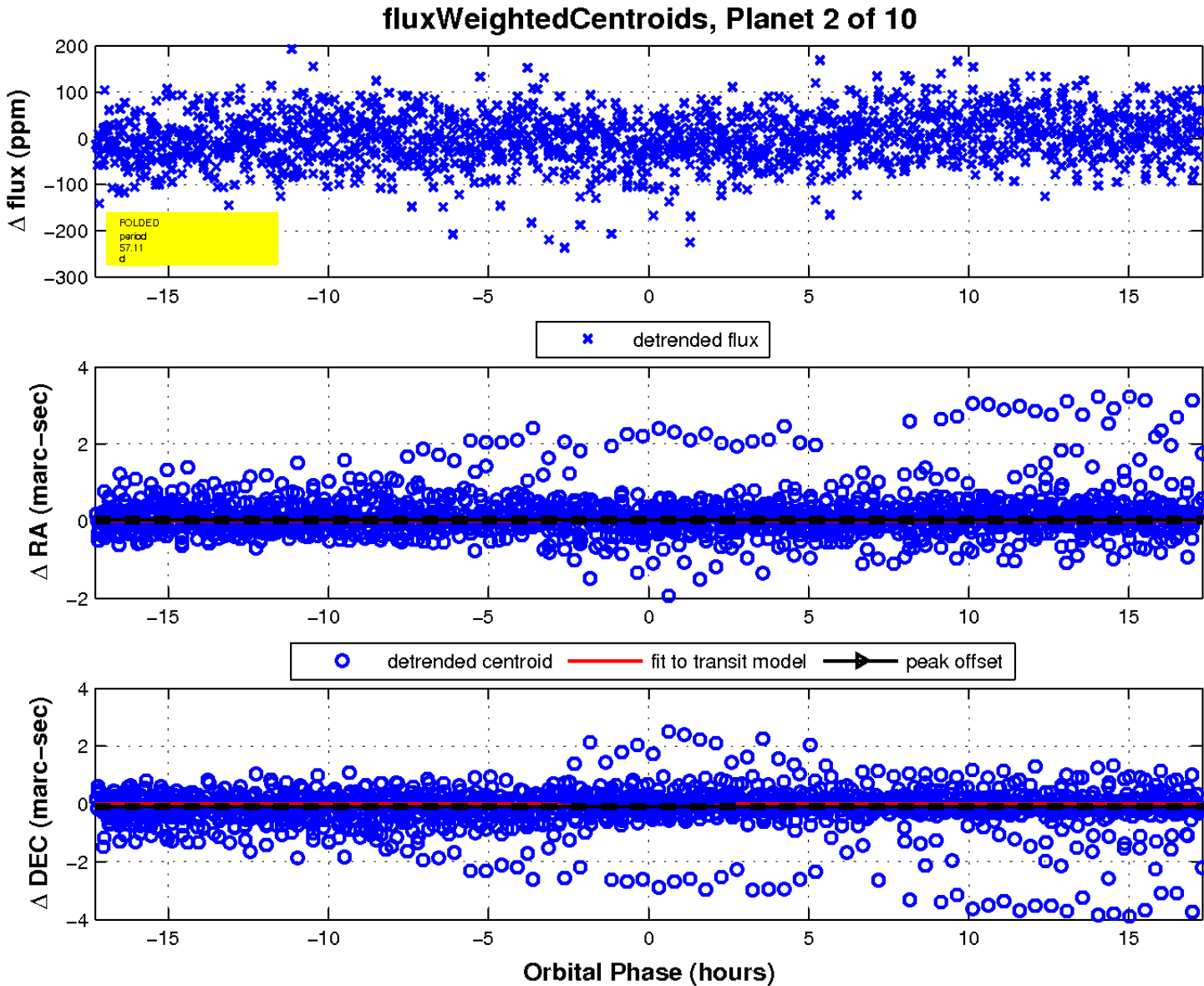
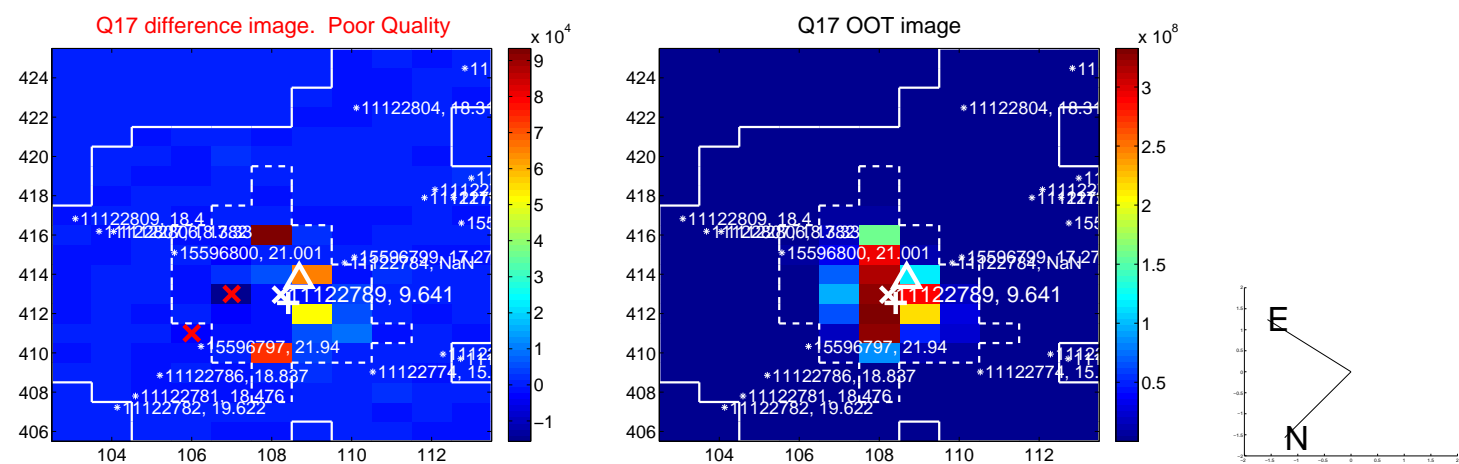
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

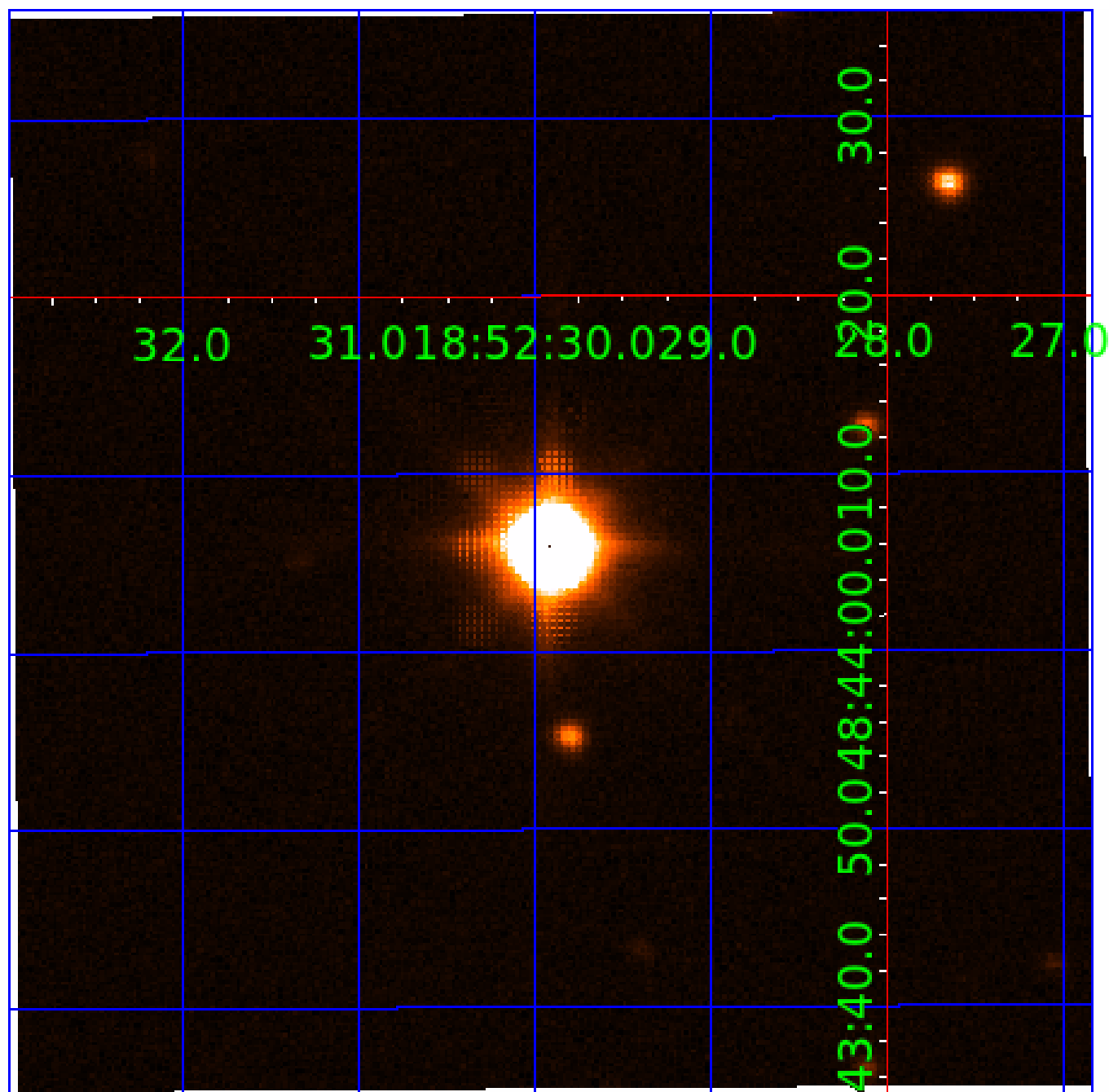


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

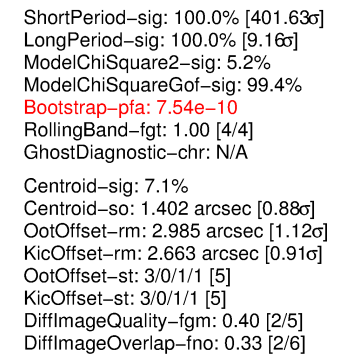
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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.

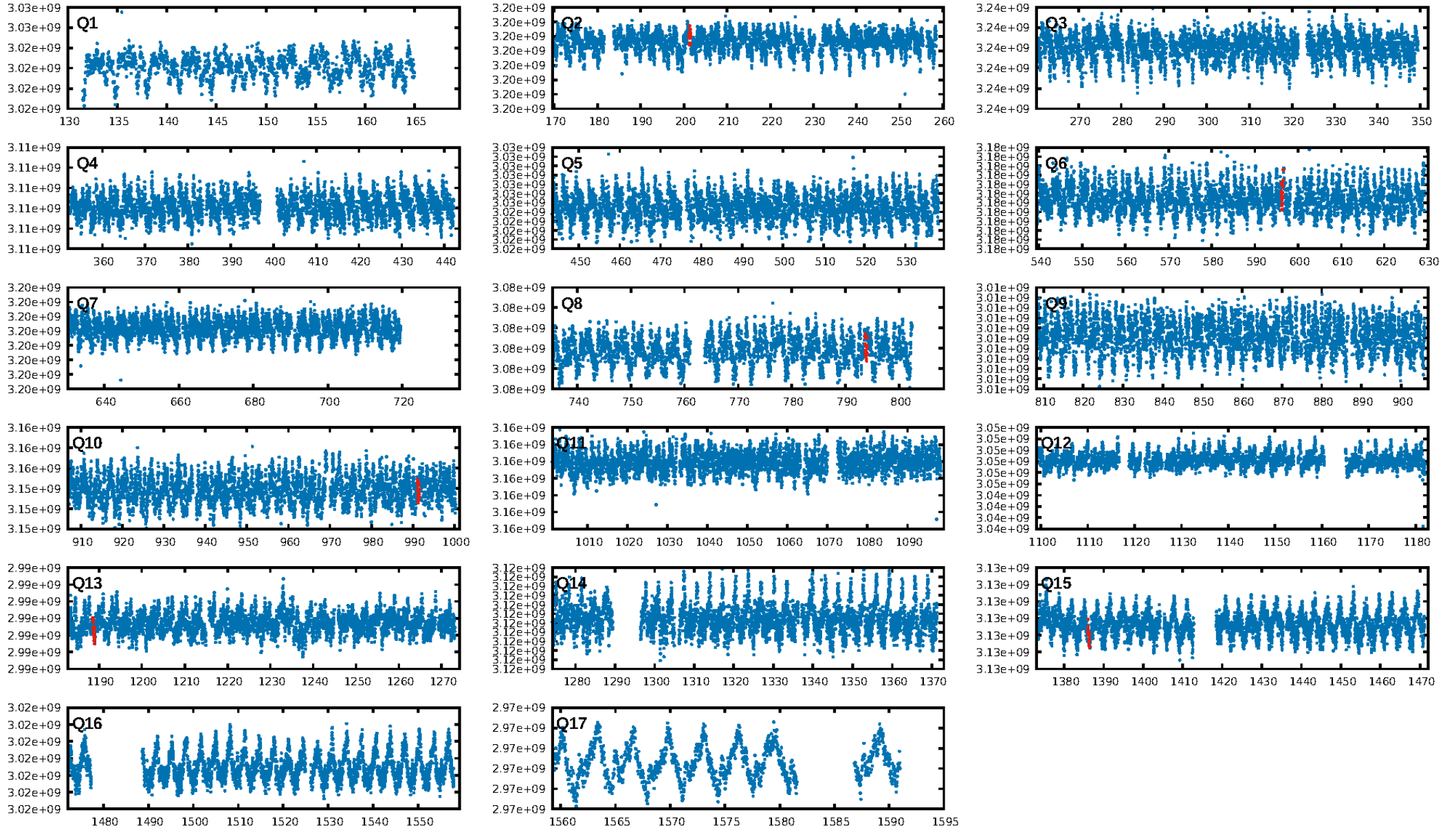
Ephemeris Match Information For 011122789-03

No Significant Match Found

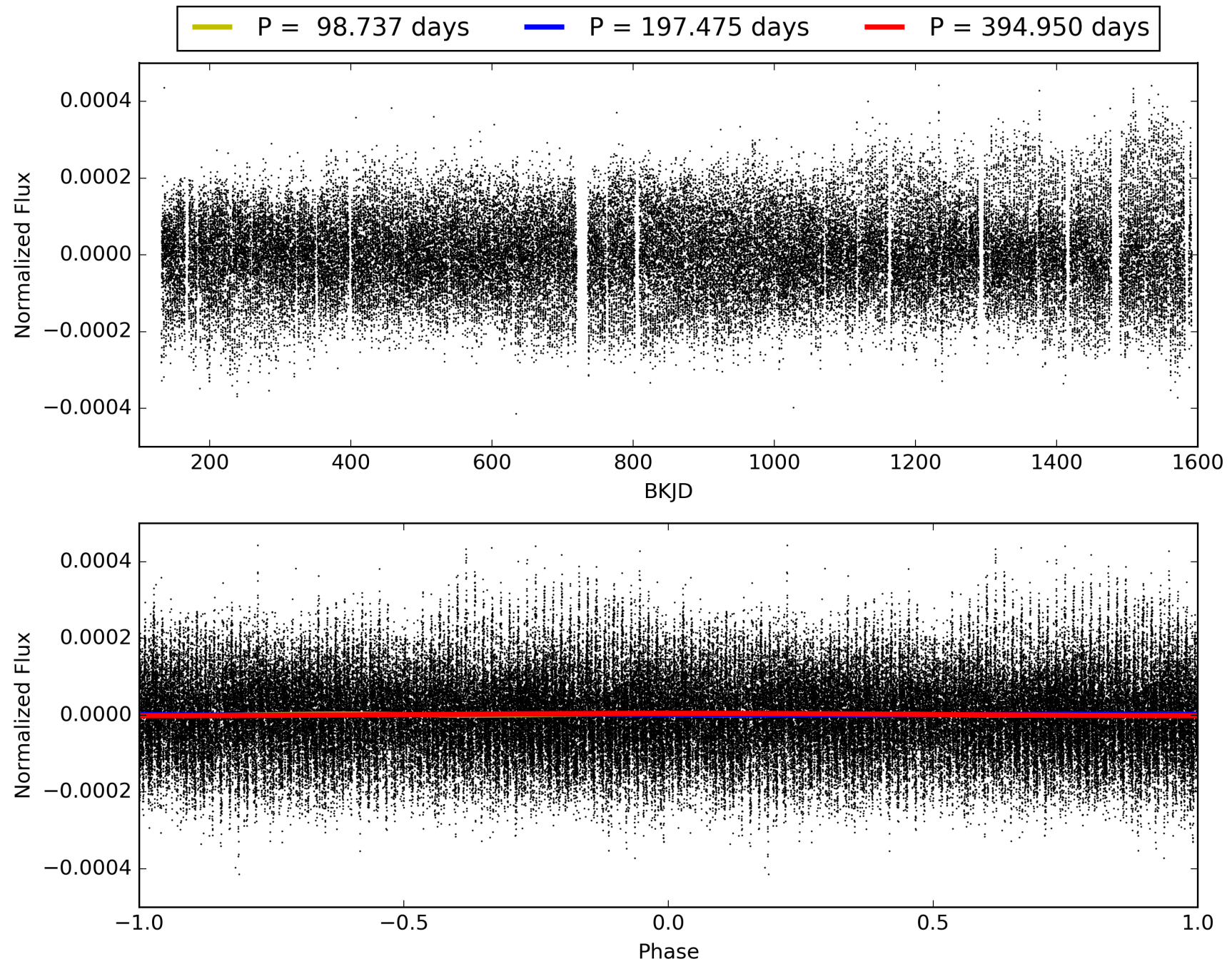
KIC: 11122789    Candidate: 3 of 10    Period: 197.475 d



# TCE 011122789-03, PDC Light Curves

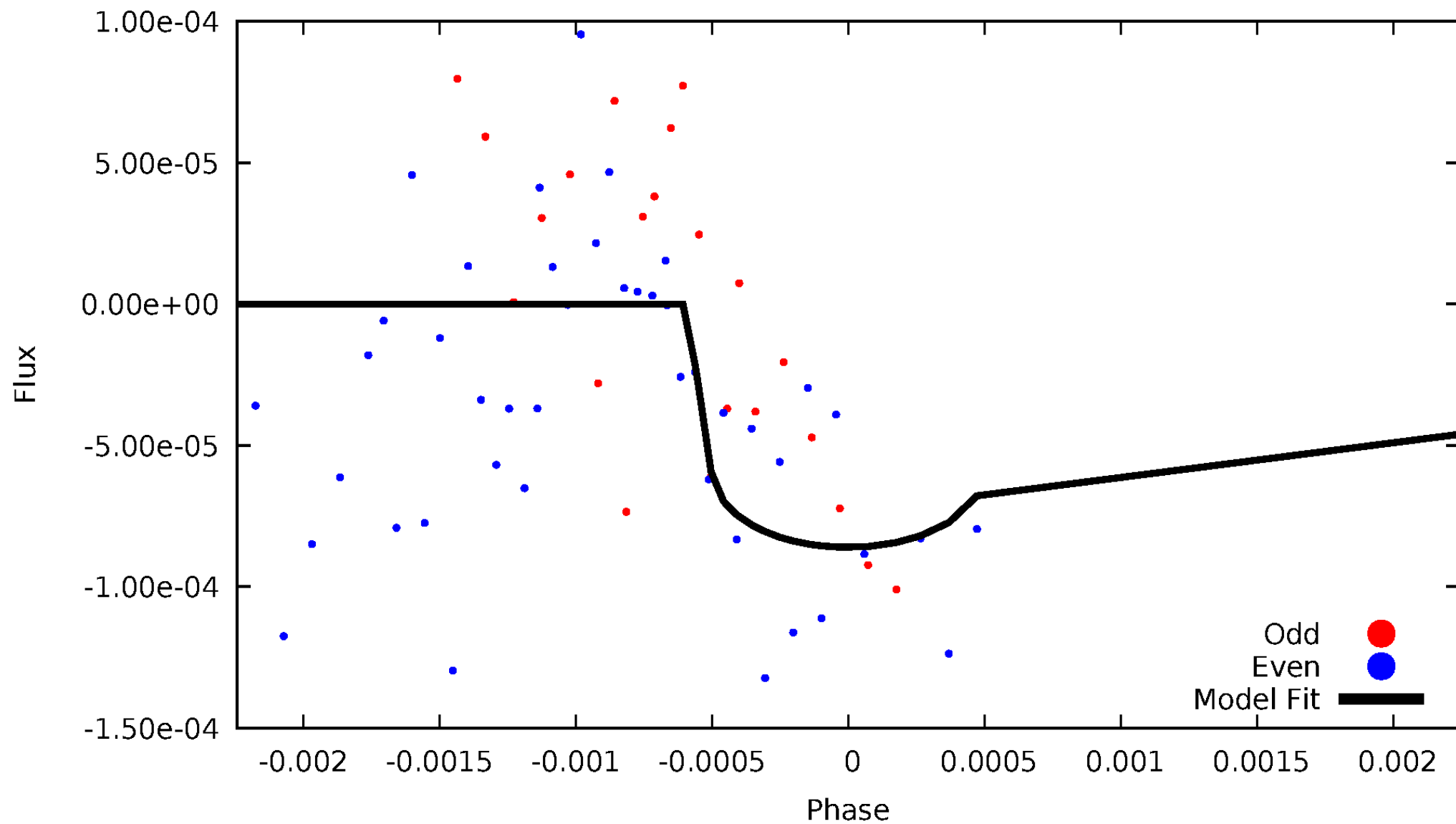


TCE 011122789-03



# DV Odd/Even

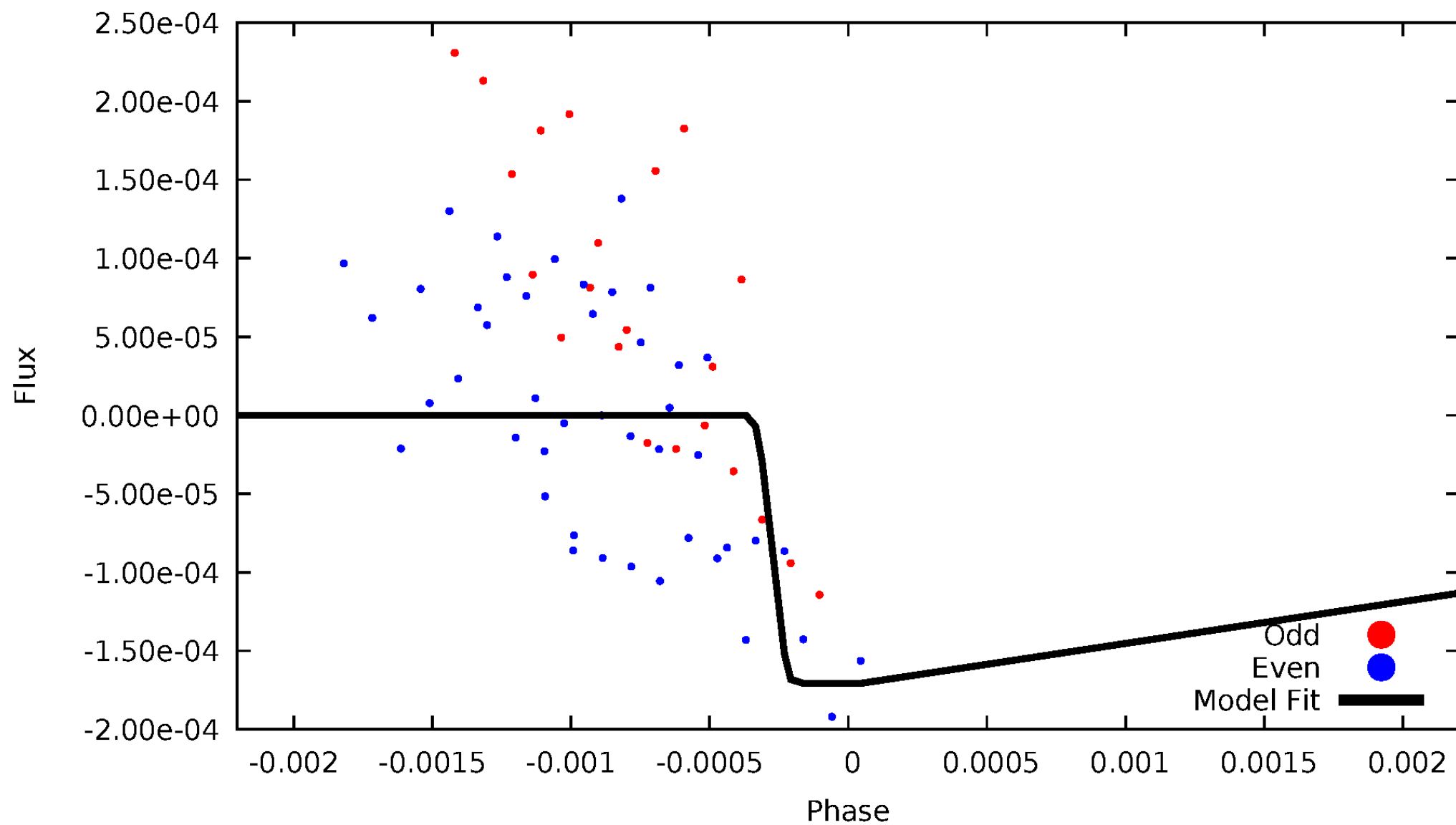
TCE 011122789-03





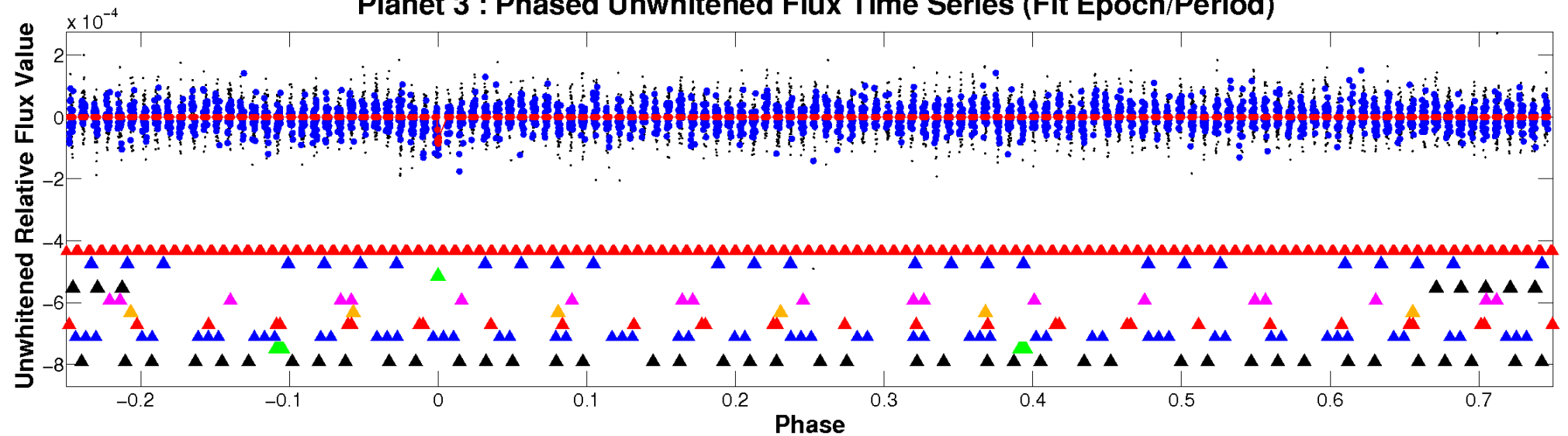
# ALT Odd/Even

TCE 011122789-03

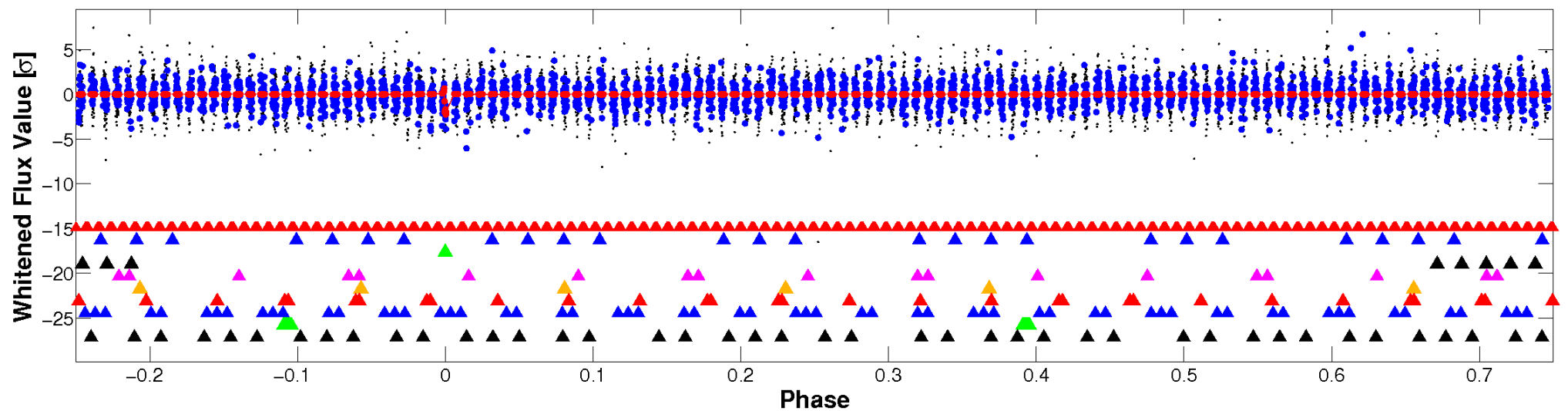


# Non-Whitened Vs. Whitened Light Curve

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

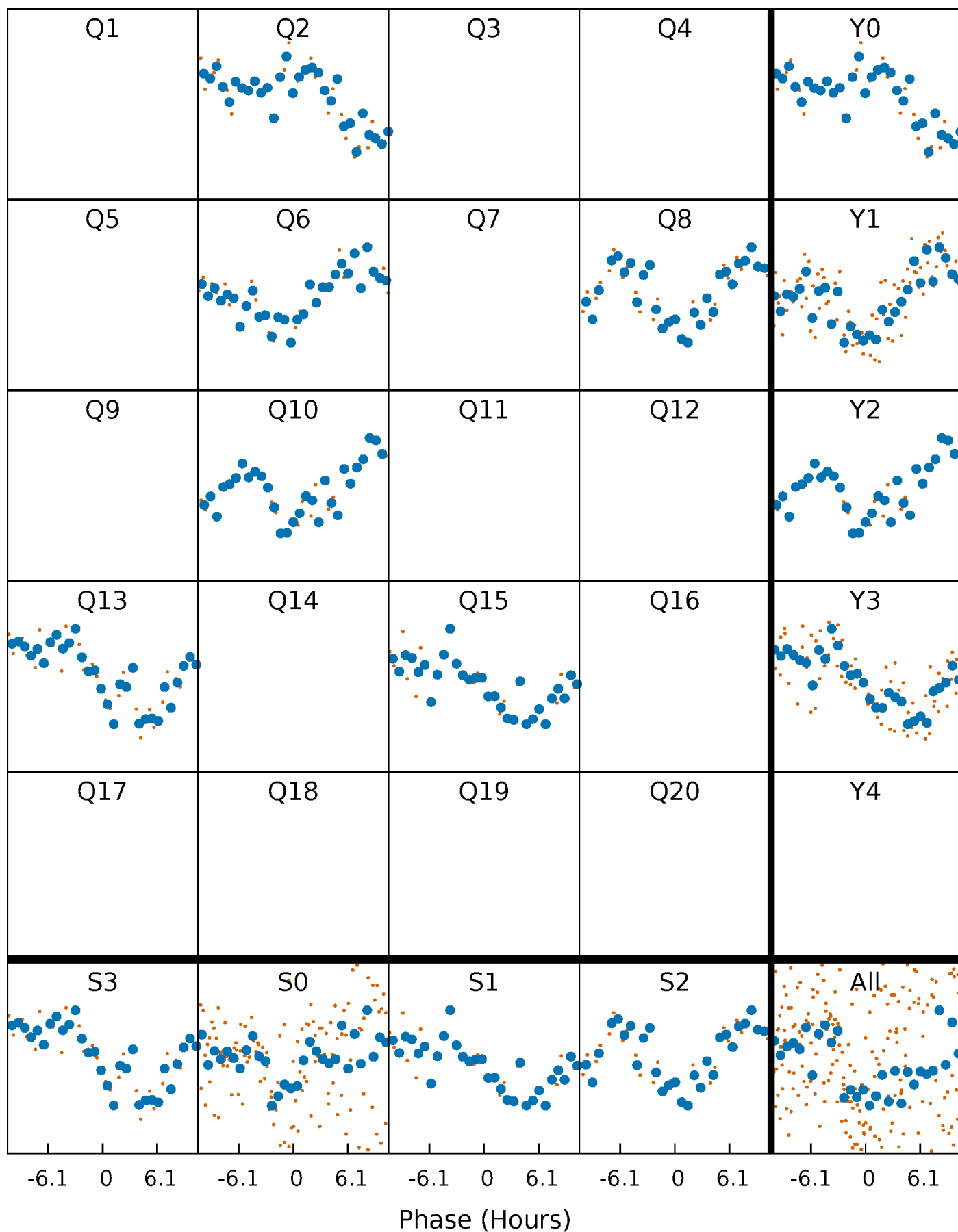


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



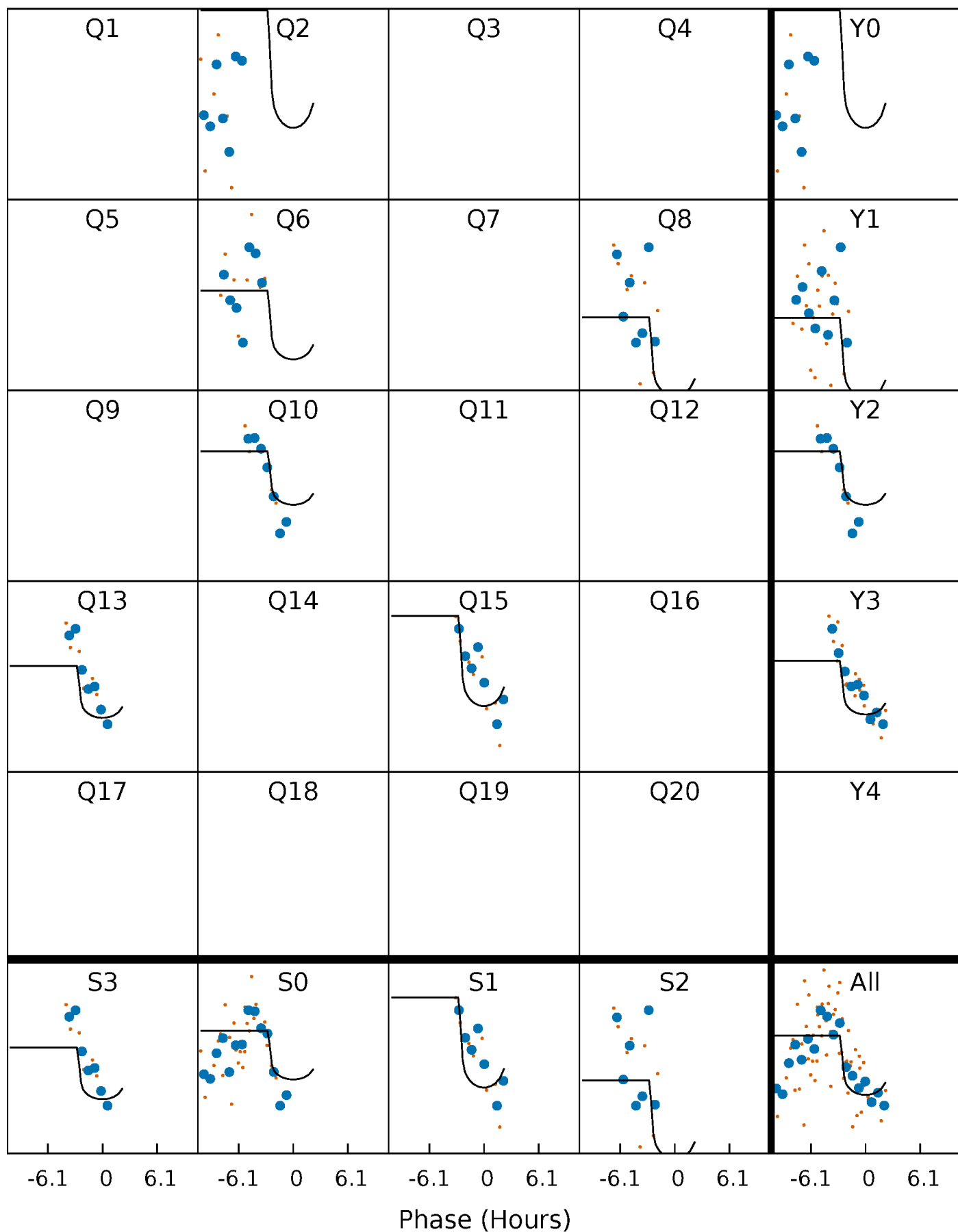
# PDC Quarter-Phased Transit Curves

TCE 011122789-03   P=197.474892 Days    $T_0=201.397186$  (BKJD)



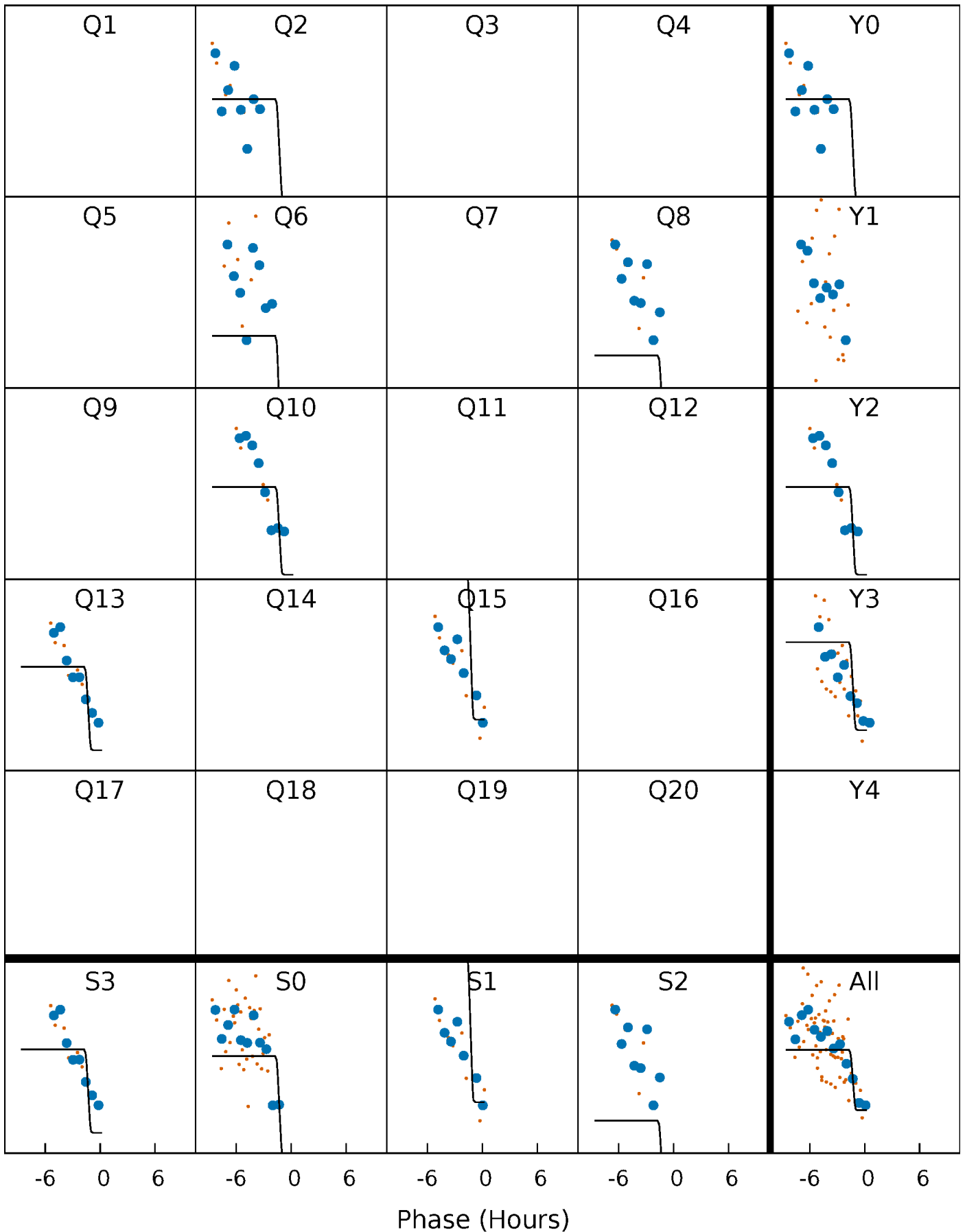
# DV Quarter-Phased Transit Curves

TCE 011122789-03 P=197.474892 Days  $T_0=201.397186$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

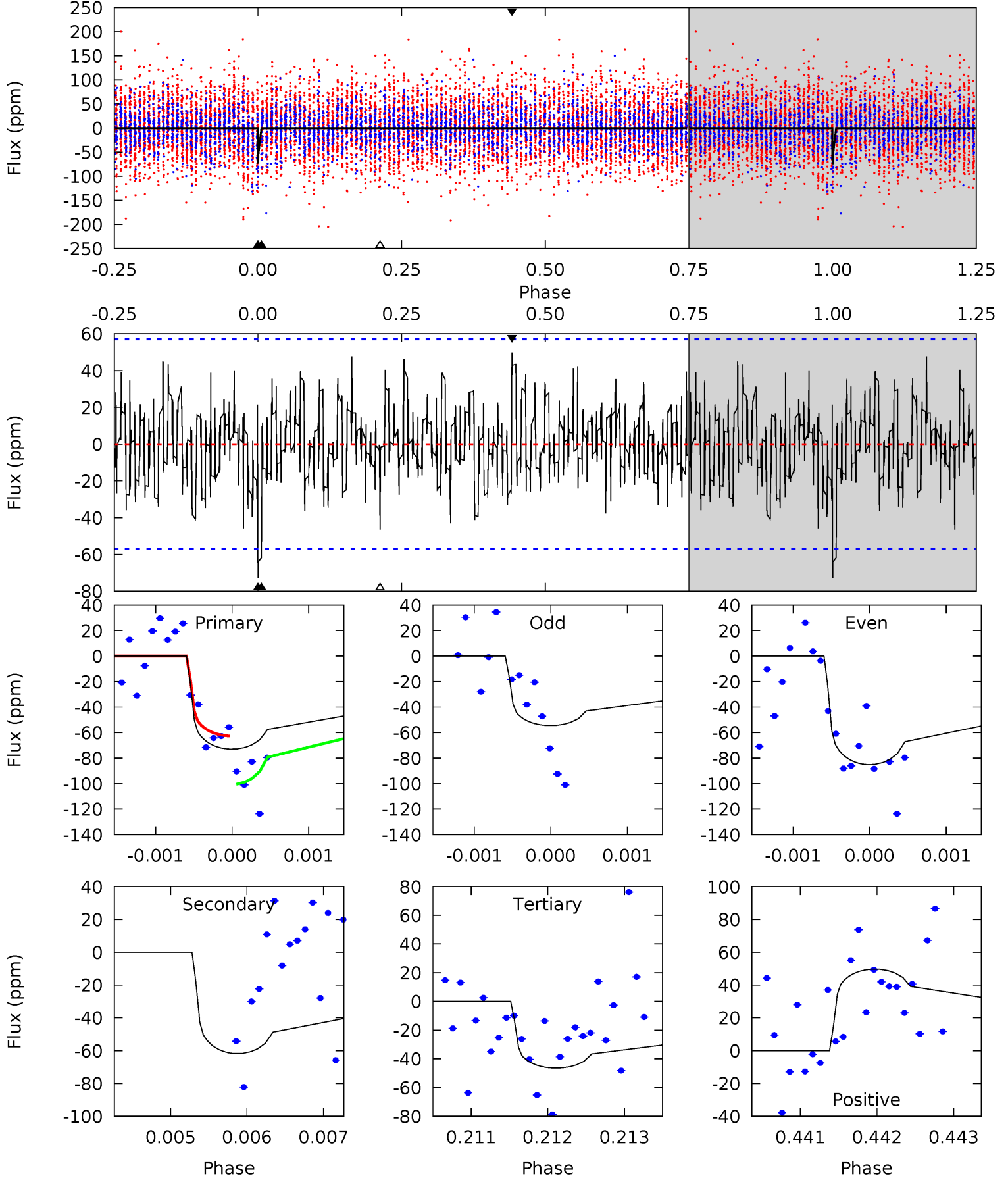
TCE 011122789-03 P=197.504069 Days  $T_0=201.306637$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-03, P = 197.474892 Days, E = 3.922294 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
6.96	5.90	4.43	4.74	5.45	3.28	1.48	2.53	2.22	1.47	1.15	1.47	1.06	0.41	1.52

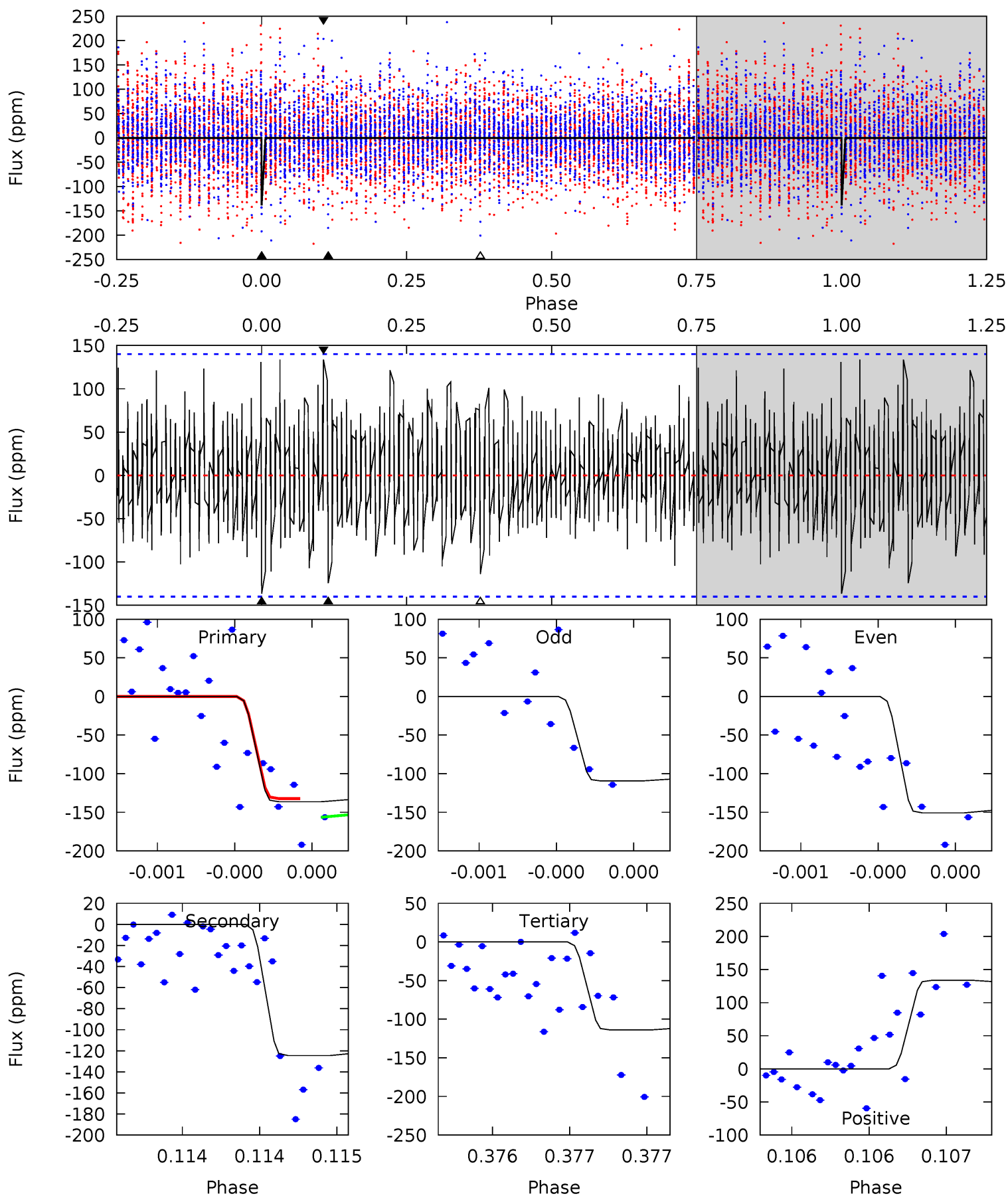




# Alt Model-Shift Uniqueness Test

011122789-03, P = 197.504069 Days, E = 3.802568 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
5.48	5.00	4.57	5.37	5.62	3.55	1.37	0.91	0.11	0.43	-0.37	0.90	0	0.49	0.67



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-62 \pm 10$	$2.35^{+1.78}_{-1.39}$	$778^{+57}_{-90}$	$6356^{+4355}_{-1257}$	$3641^{+17807}_{-2506}$
Alt.	$-125 \pm 25$	$3.30^{+1.71}_{-1.55}$	$781^{+51}_{-91}$	$6478^{+2941}_{-1145}$	$3576^{+9843}_{-2015}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

## DV Centroid Data

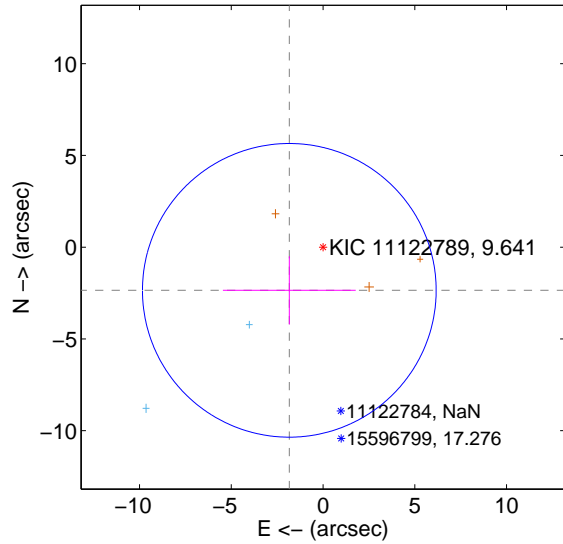
Supplemental centroid analysis for 011122789-03. **Kepler magnitude: 9.64.** Transit SNR 9.45

**There are 2 quarters with good PRF difference image offsets**

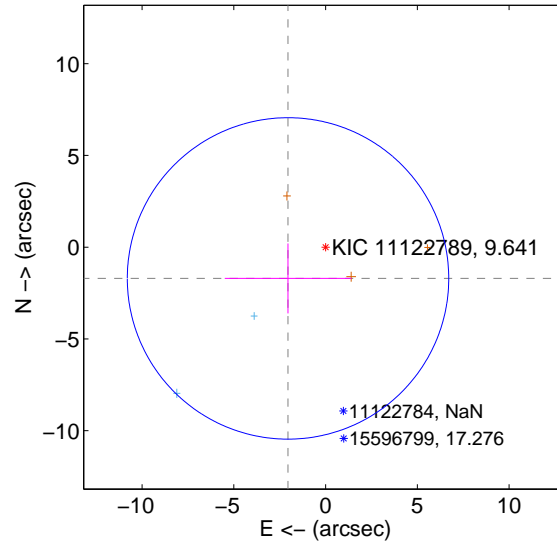
The direct PRF centroid is offset from the target star catalog position by about 1.74 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.985 \pm 2.668$	1.12	$1.838 \pm 3.622$	$-2.352 \pm 1.858$
PRF-fit source offset from KIC position	$2.663 \pm 2.920$	0.91	$2.047 \pm 3.450$	$-1.703 \pm 1.909$
photometric centroid source offset	$1.40 \pm 1.59$	0.88	$0.19 \pm 1.71$	$-1.39 \pm 1.59$

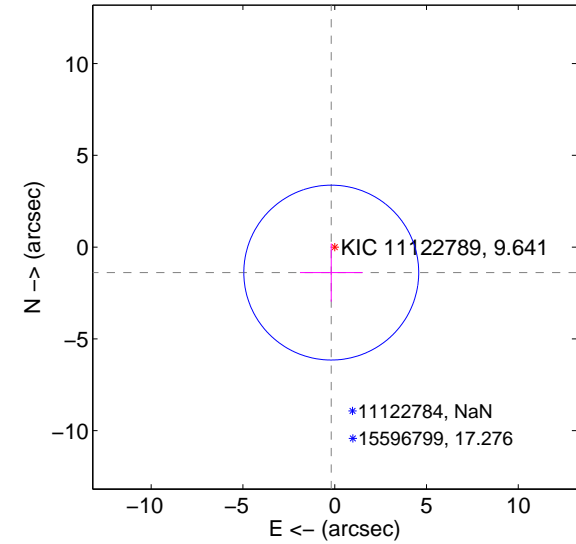
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



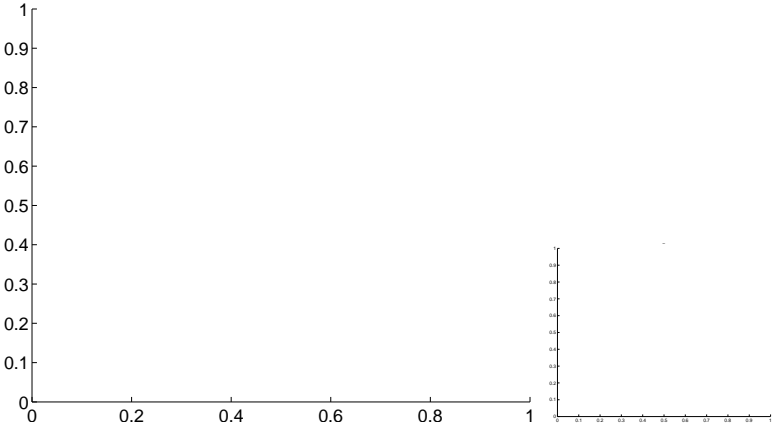
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

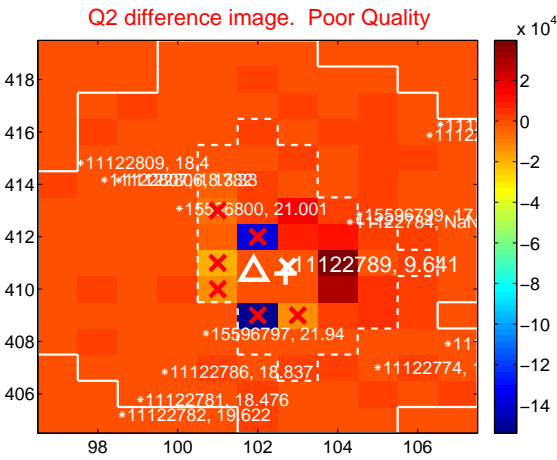
Q1 no difference image



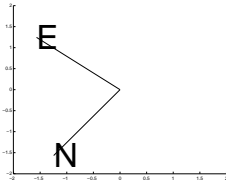
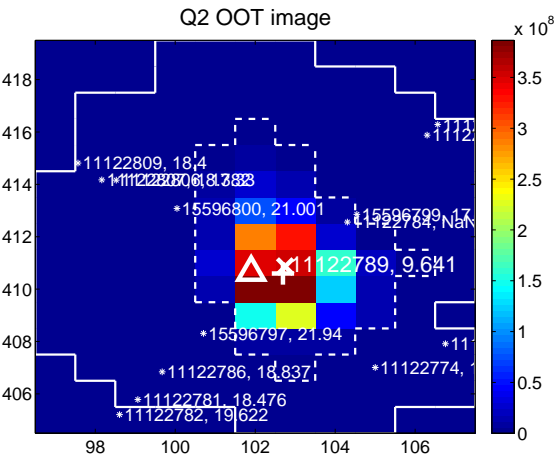
Q1 no OOT image



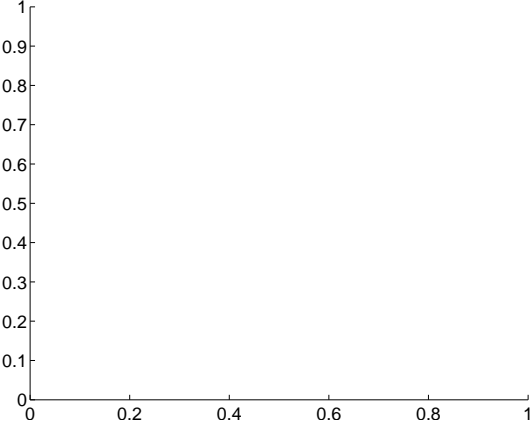
Q2 difference image. Poor Quality



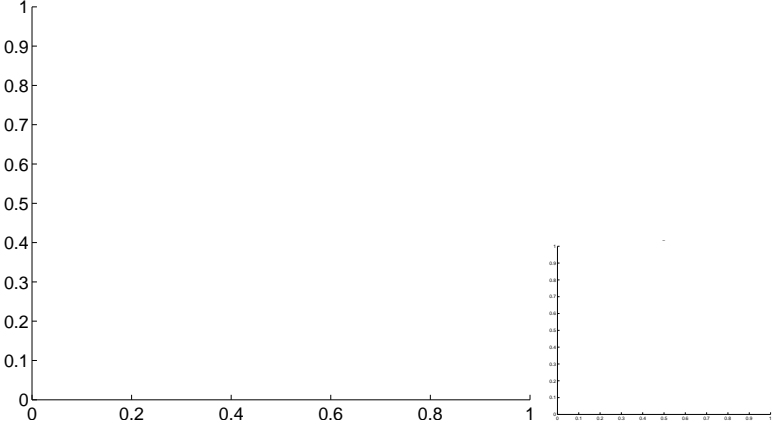
Q2 OOT image



Q3 no difference image



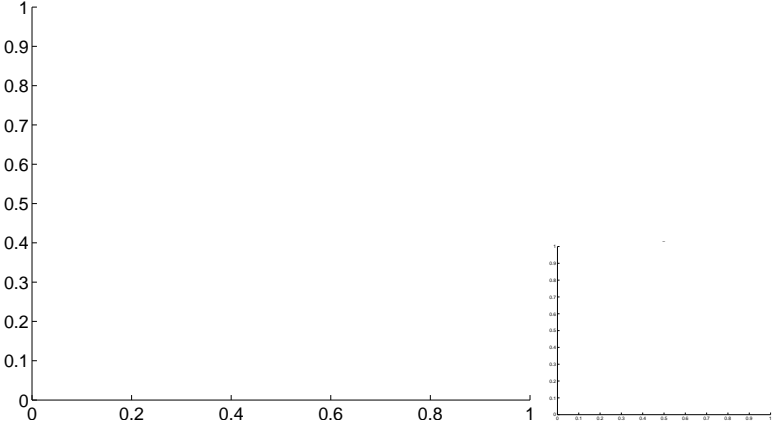
Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

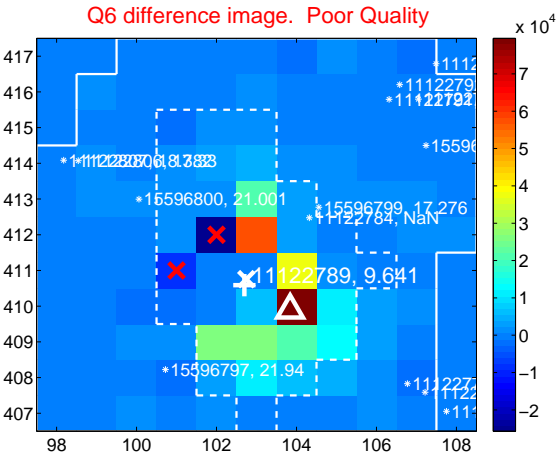
Q5 no difference image



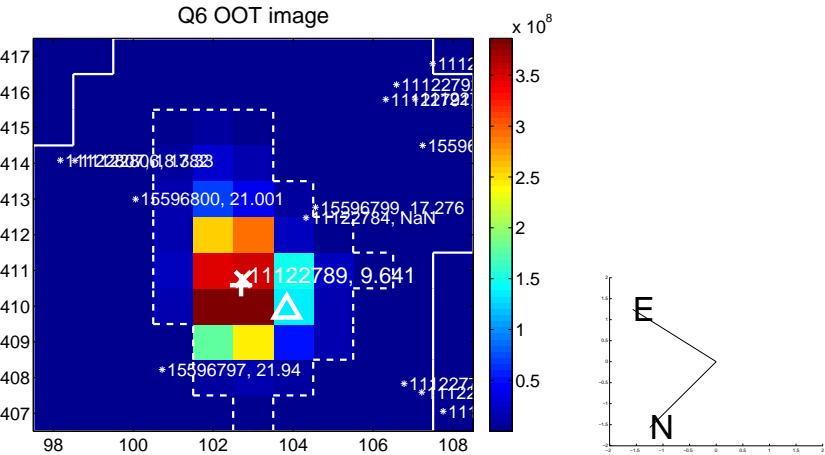
Q5 no OOT image



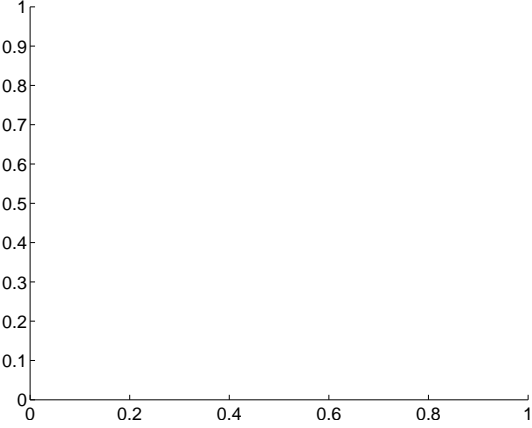
Q6 difference image. Poor Quality



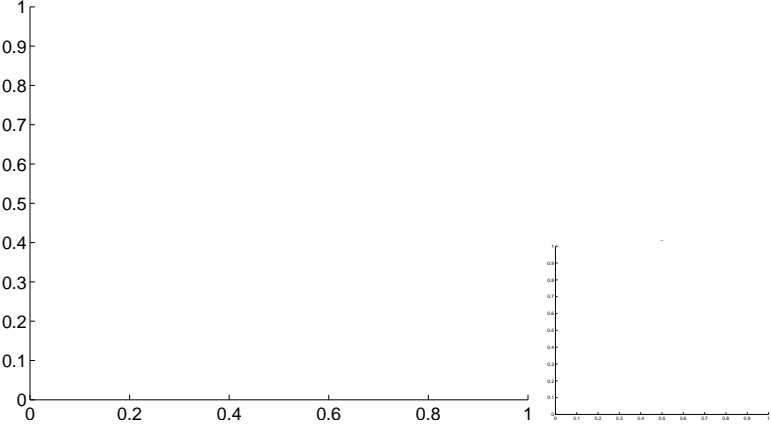
Q6 OOT image



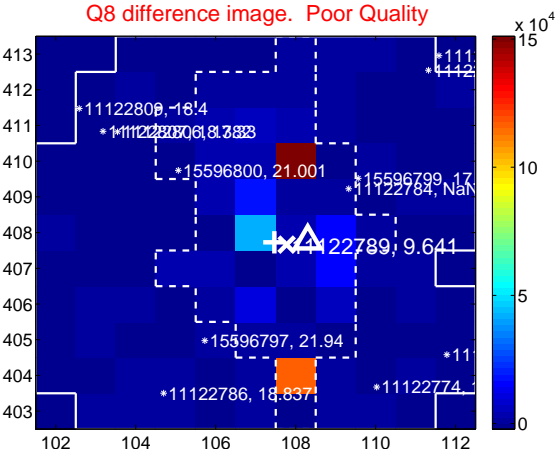
Q7 no difference image



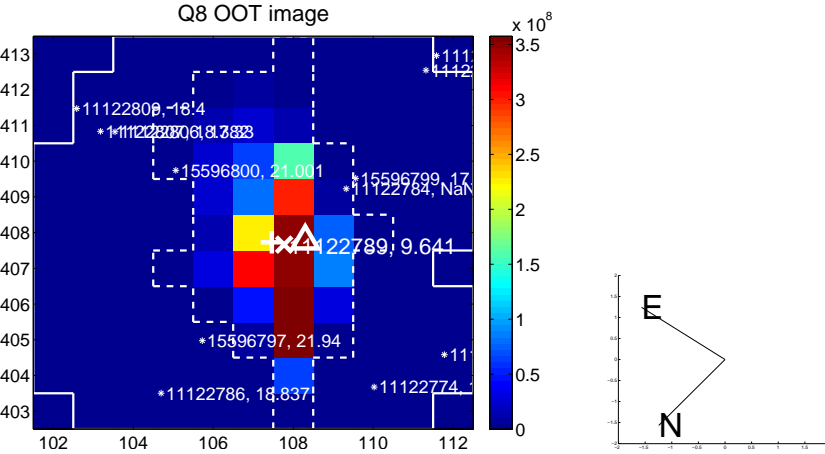
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image

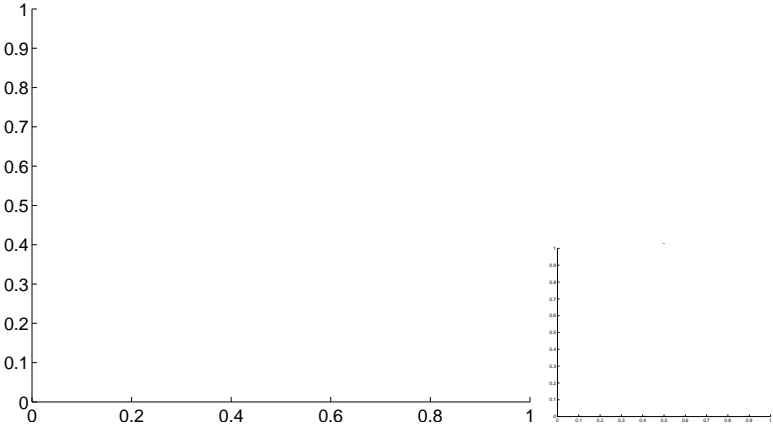


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

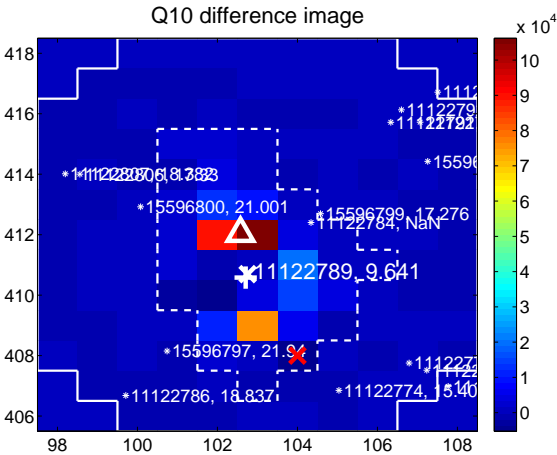
Q9 no difference image



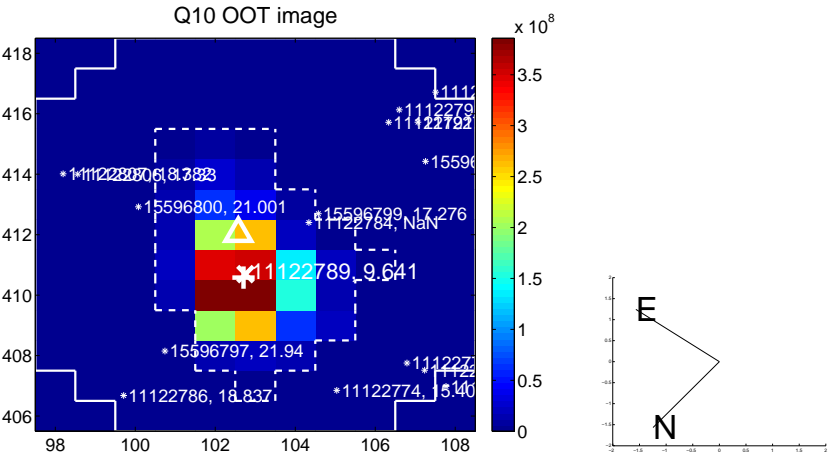
Q9 no OOT image



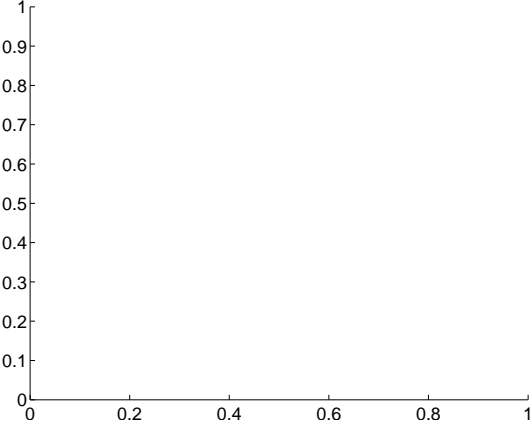
Q10 difference image



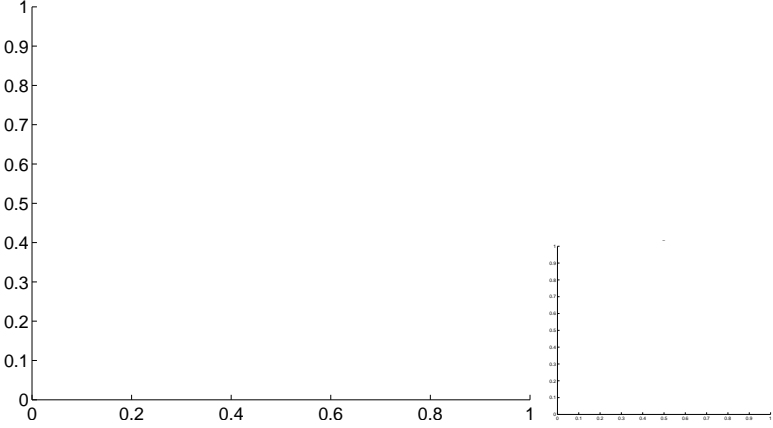
Q10 OOT image



Q11 no difference image



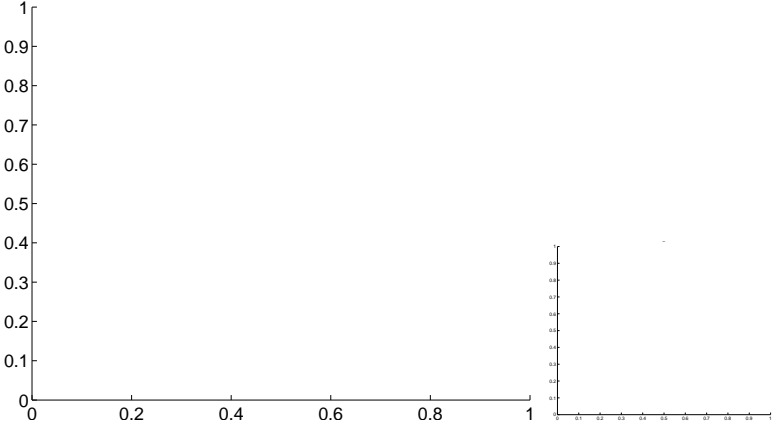
Q11 no OOT image



Q12 no difference image

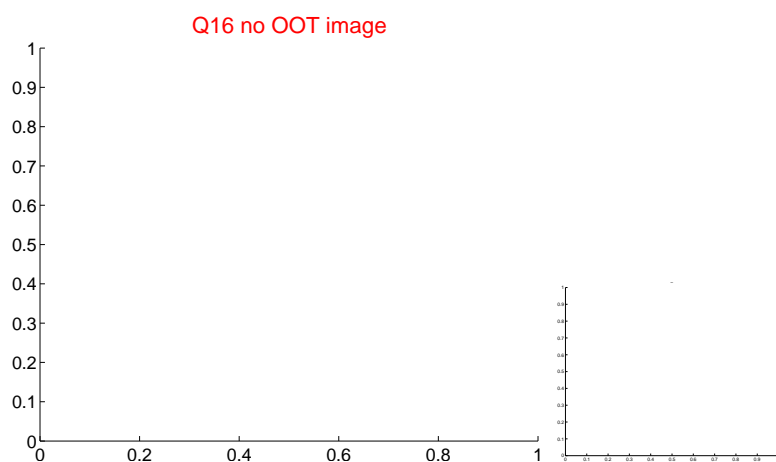
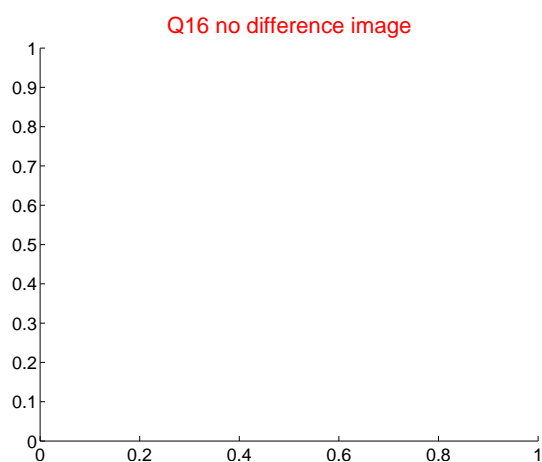
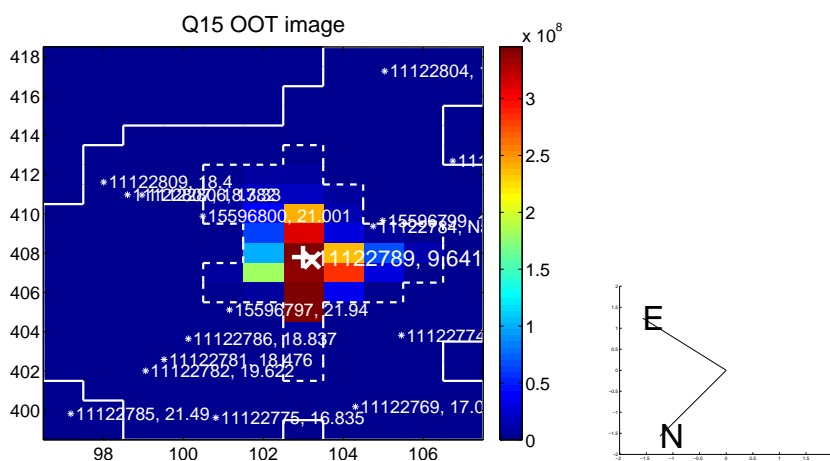
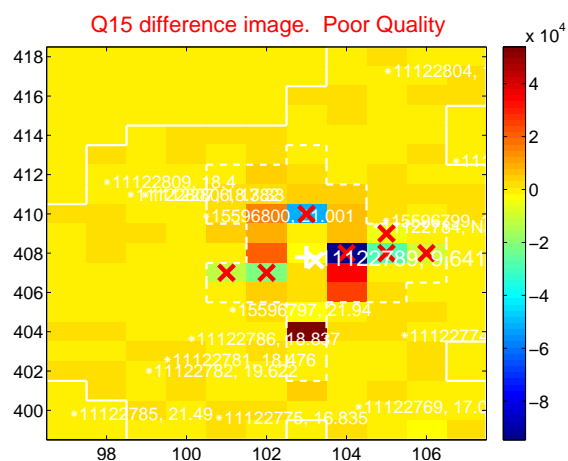
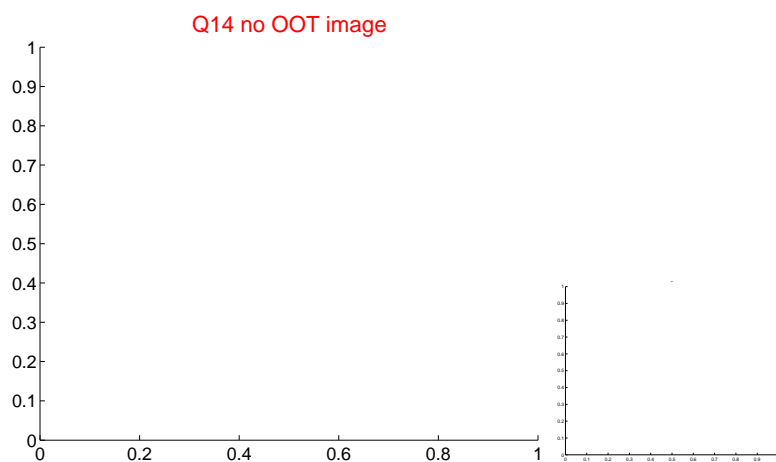
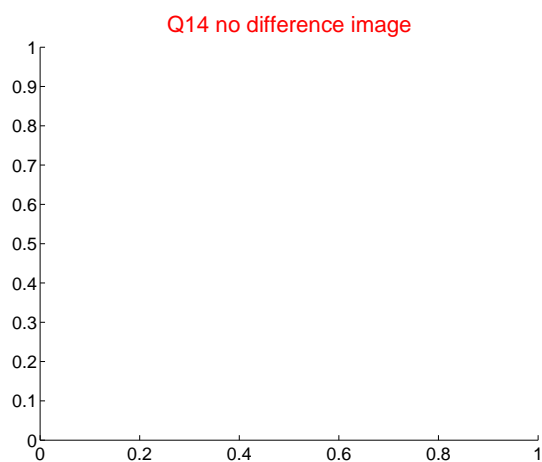
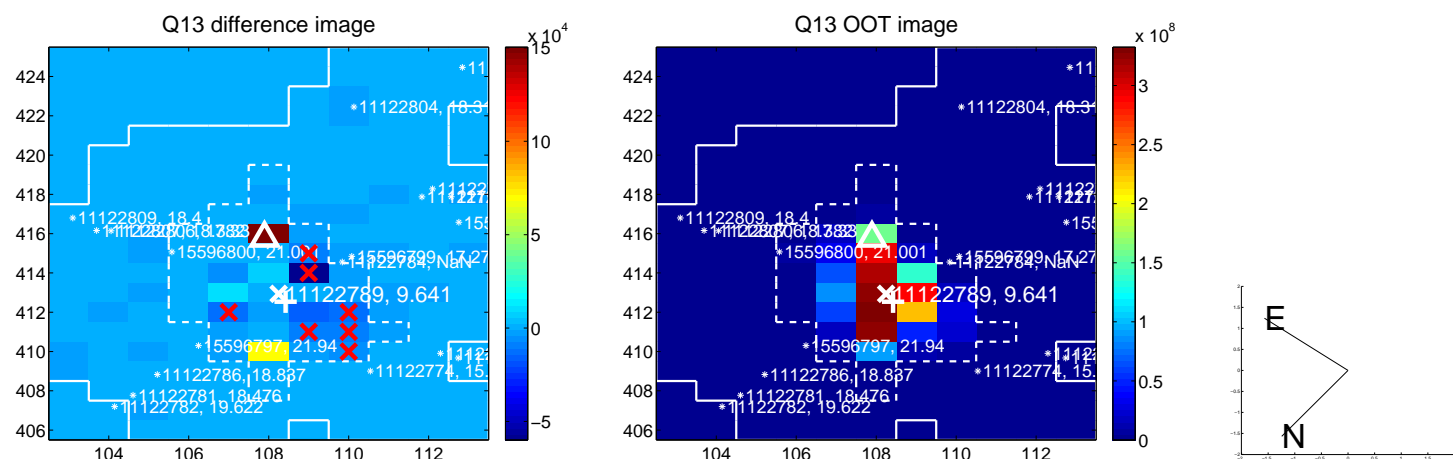


Q12 no OOT image

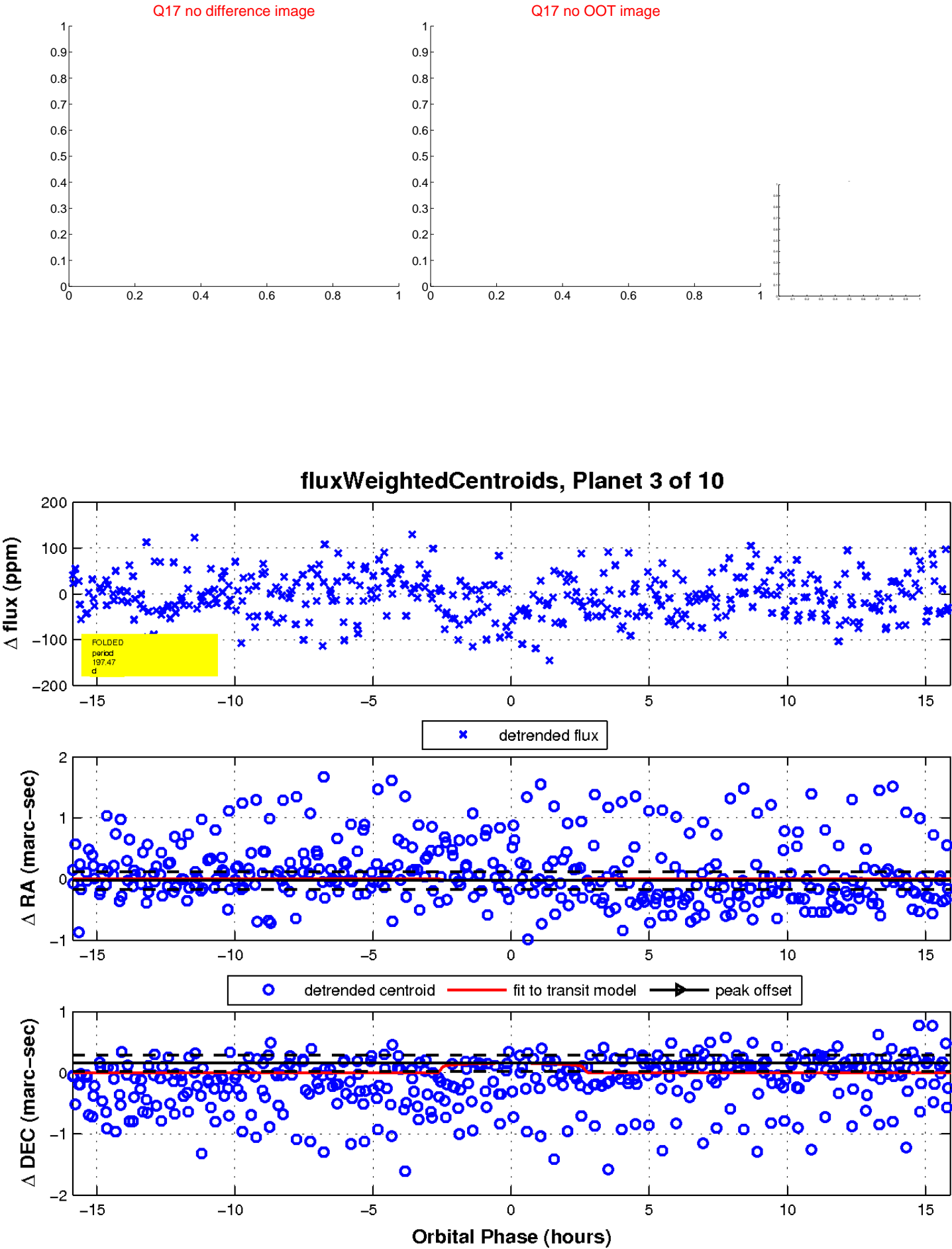




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

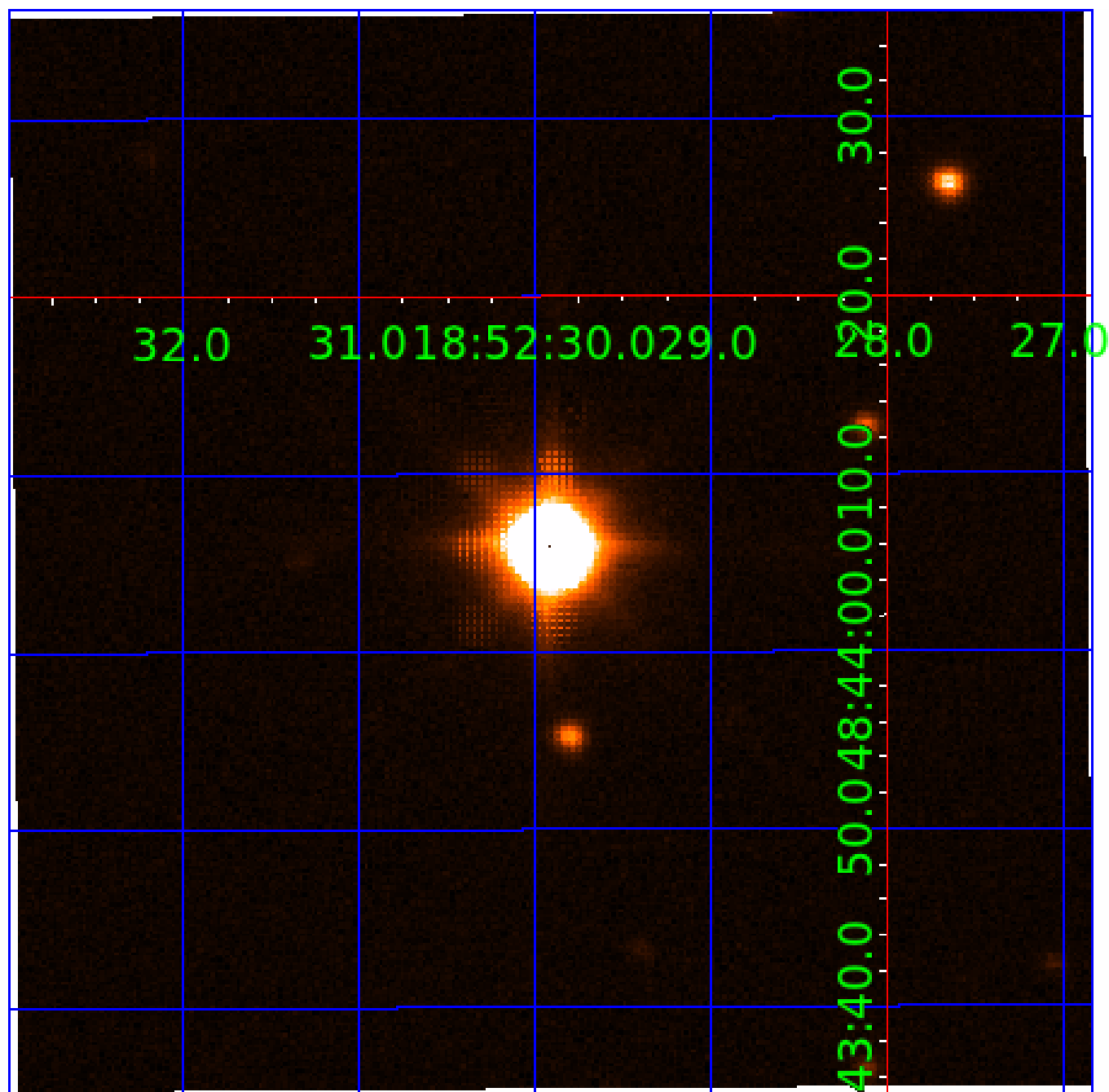


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

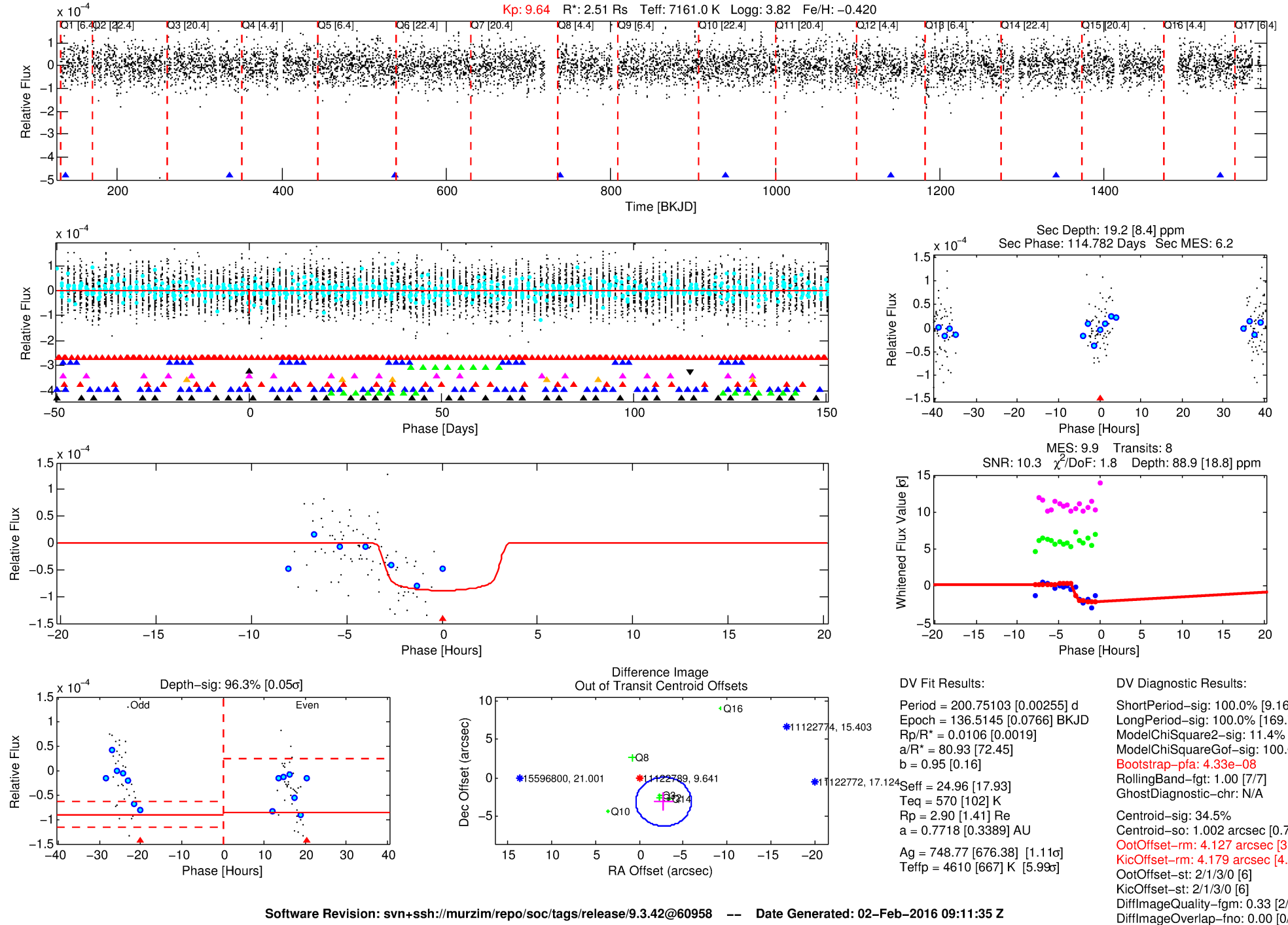
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-04

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 4 of 10 Period: 200.751 d

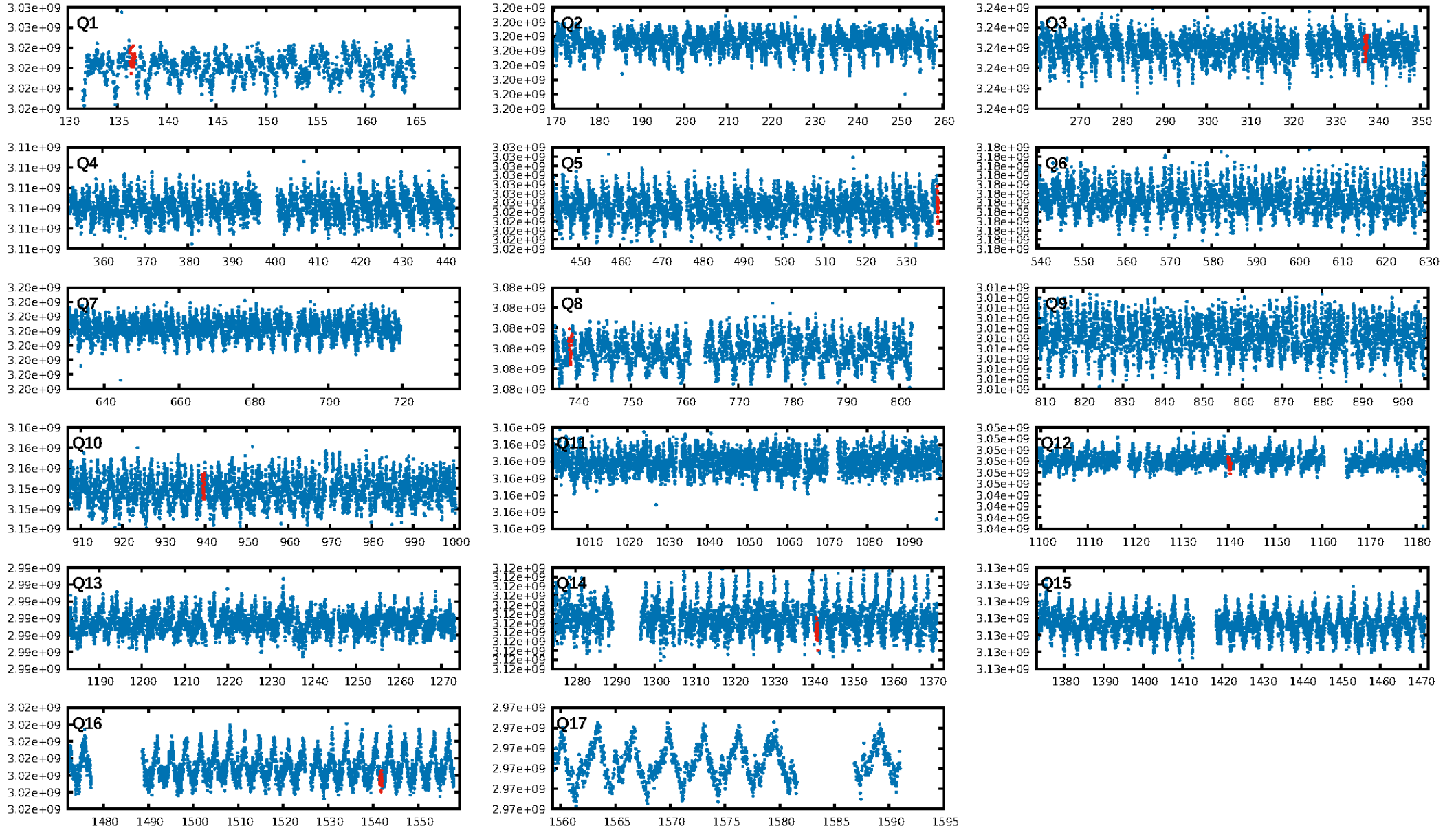


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:35 Z

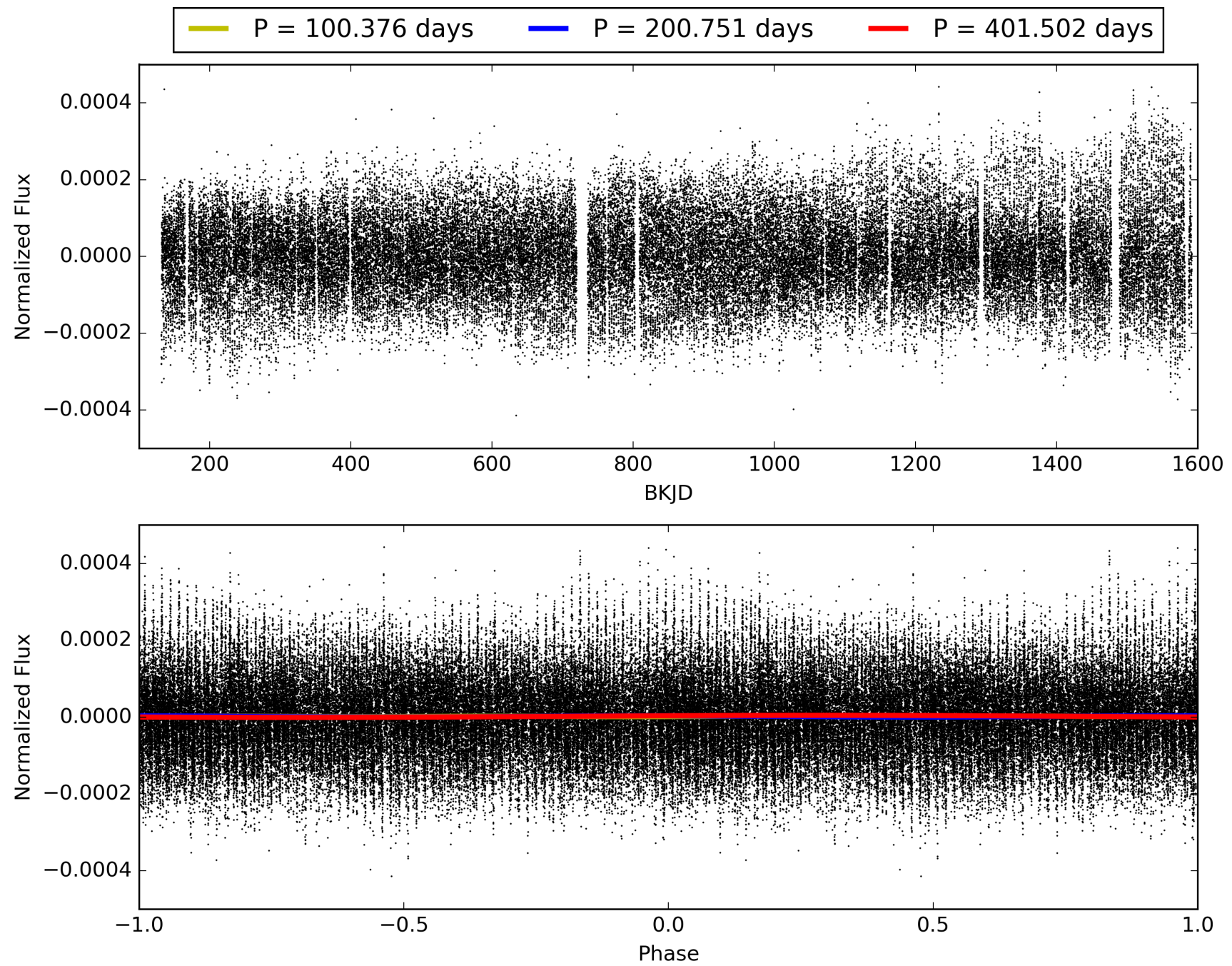
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011122789-04, PDC Light Curves

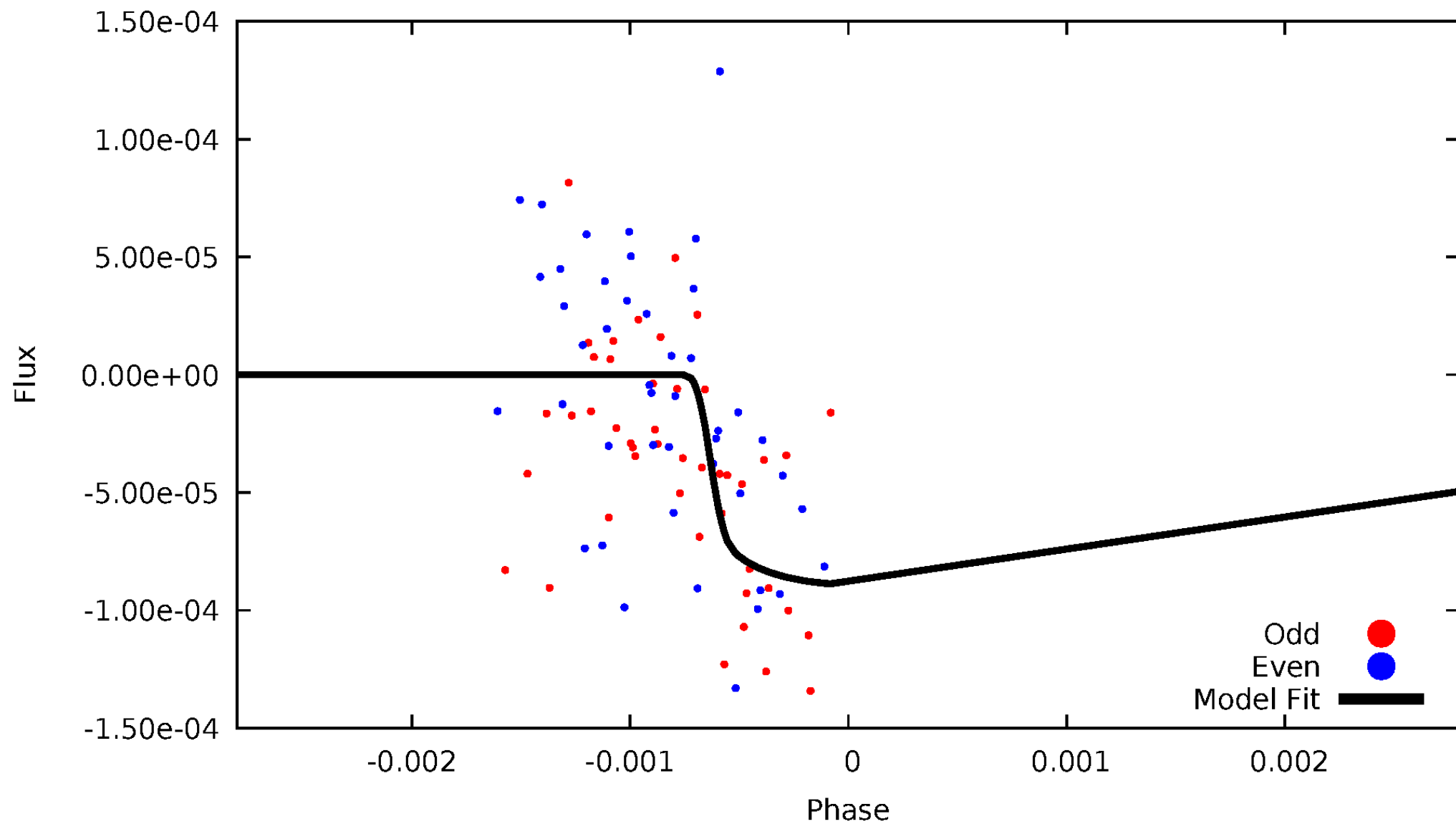


TCE 011122789-04



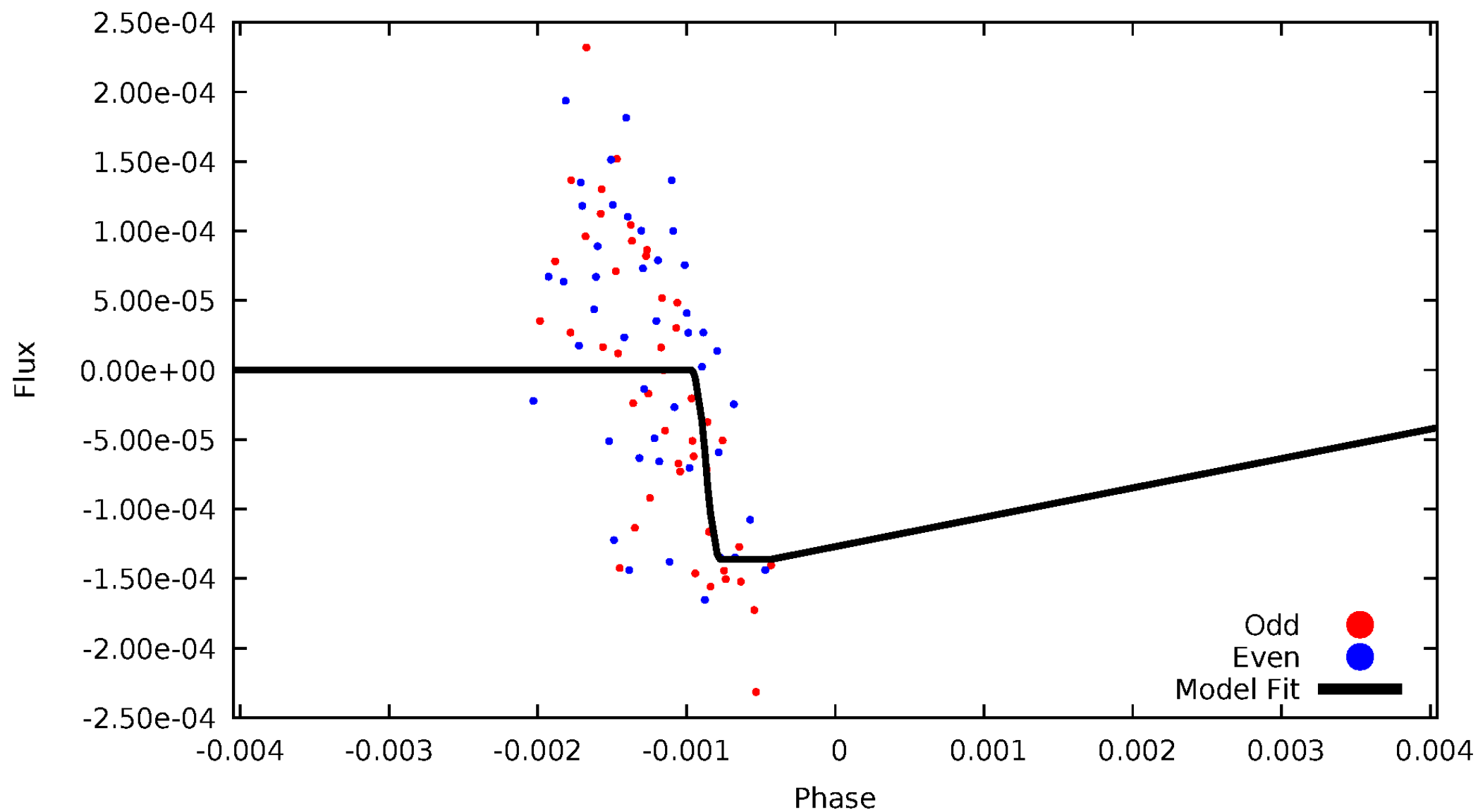
# DV Odd/Even

TCE 011122789-04



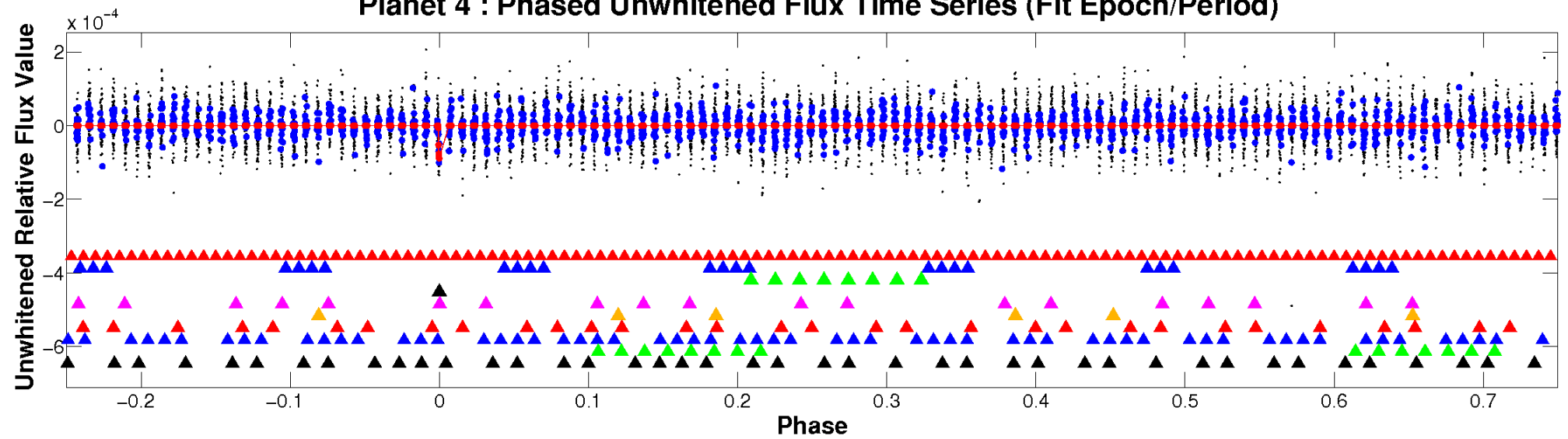
# ALT Odd/Even

TCE 011122789-04

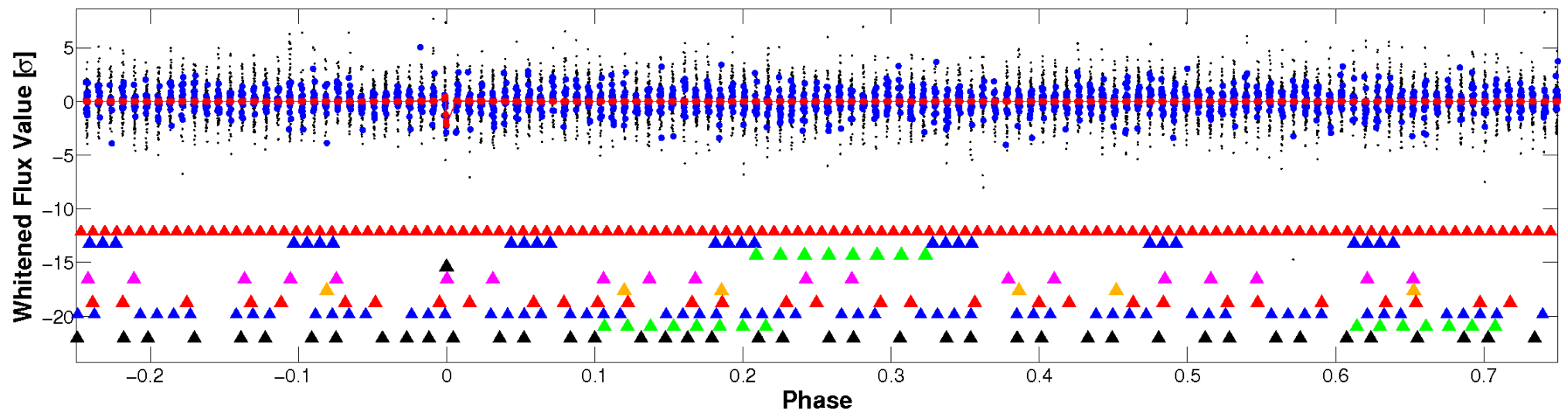


# Non-Whitened Vs. Whitened Light Curve

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

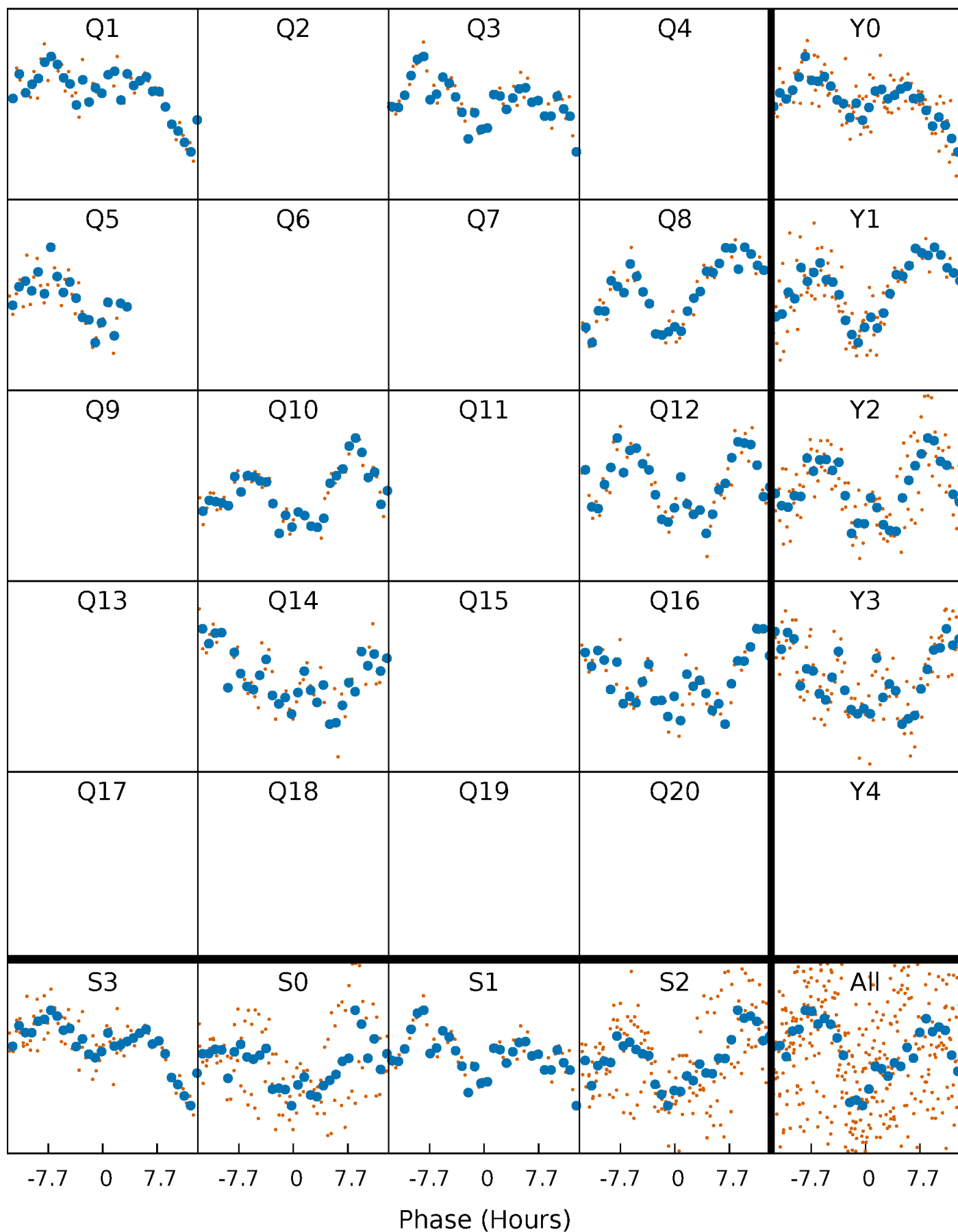


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



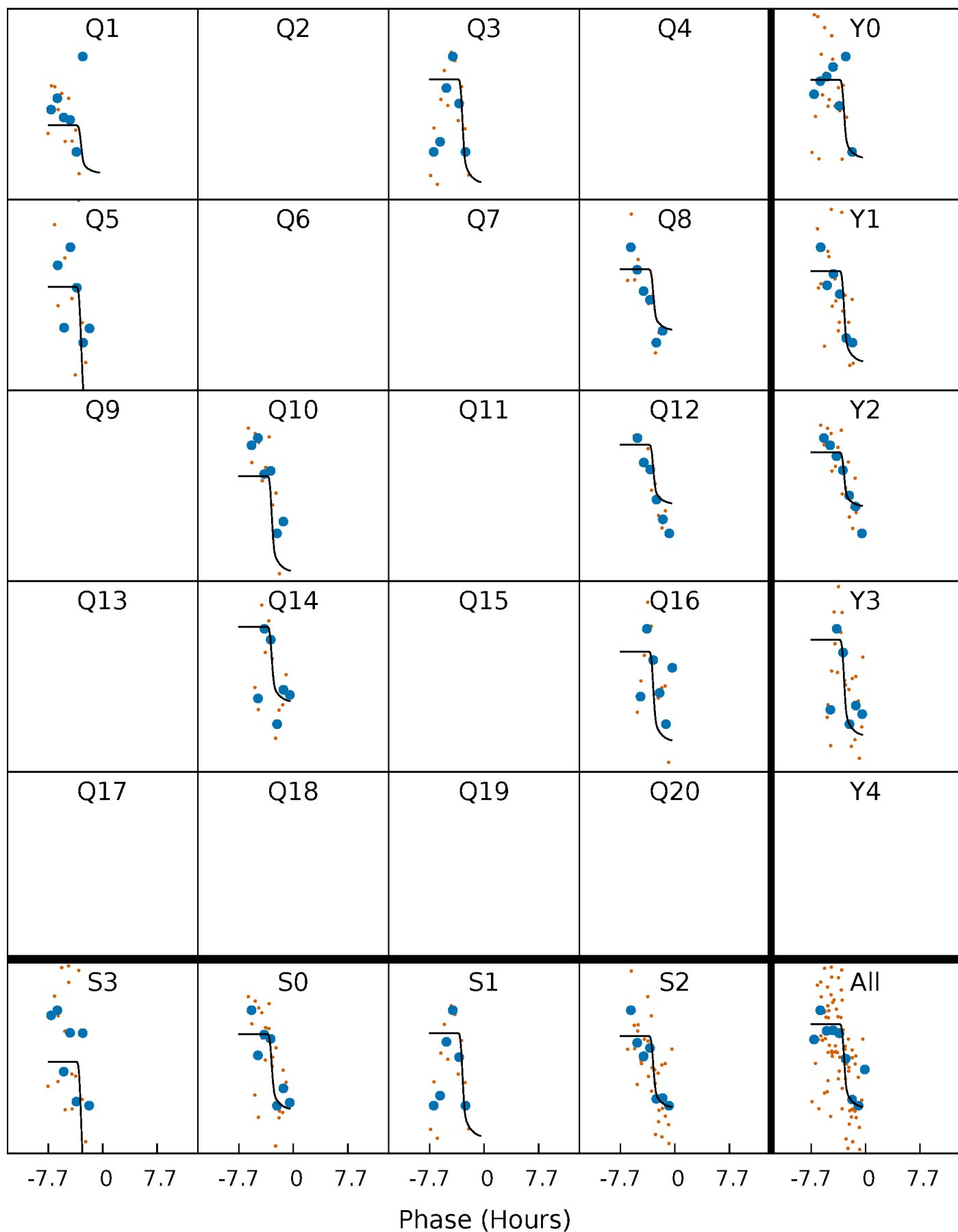
# PDC Quarter-Phased Transit Curves

TCE 011122789-04   P=200.751028 Days    $T_0=136.514514$  (BKJD)



# DV Quarter-Phased Transit Curves

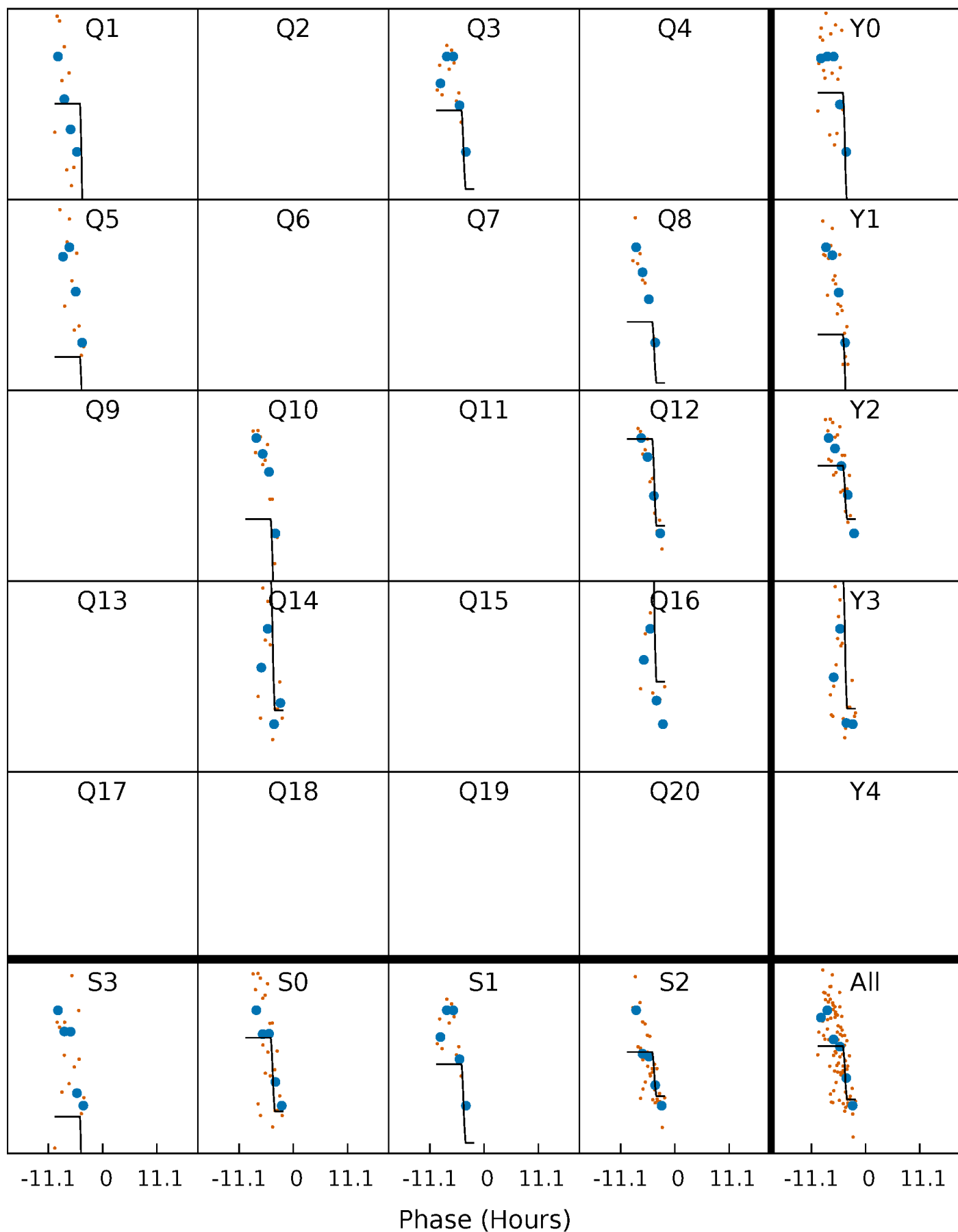
TCE 011122789-04 P=200.751028 Days  $T_0=136.514514$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

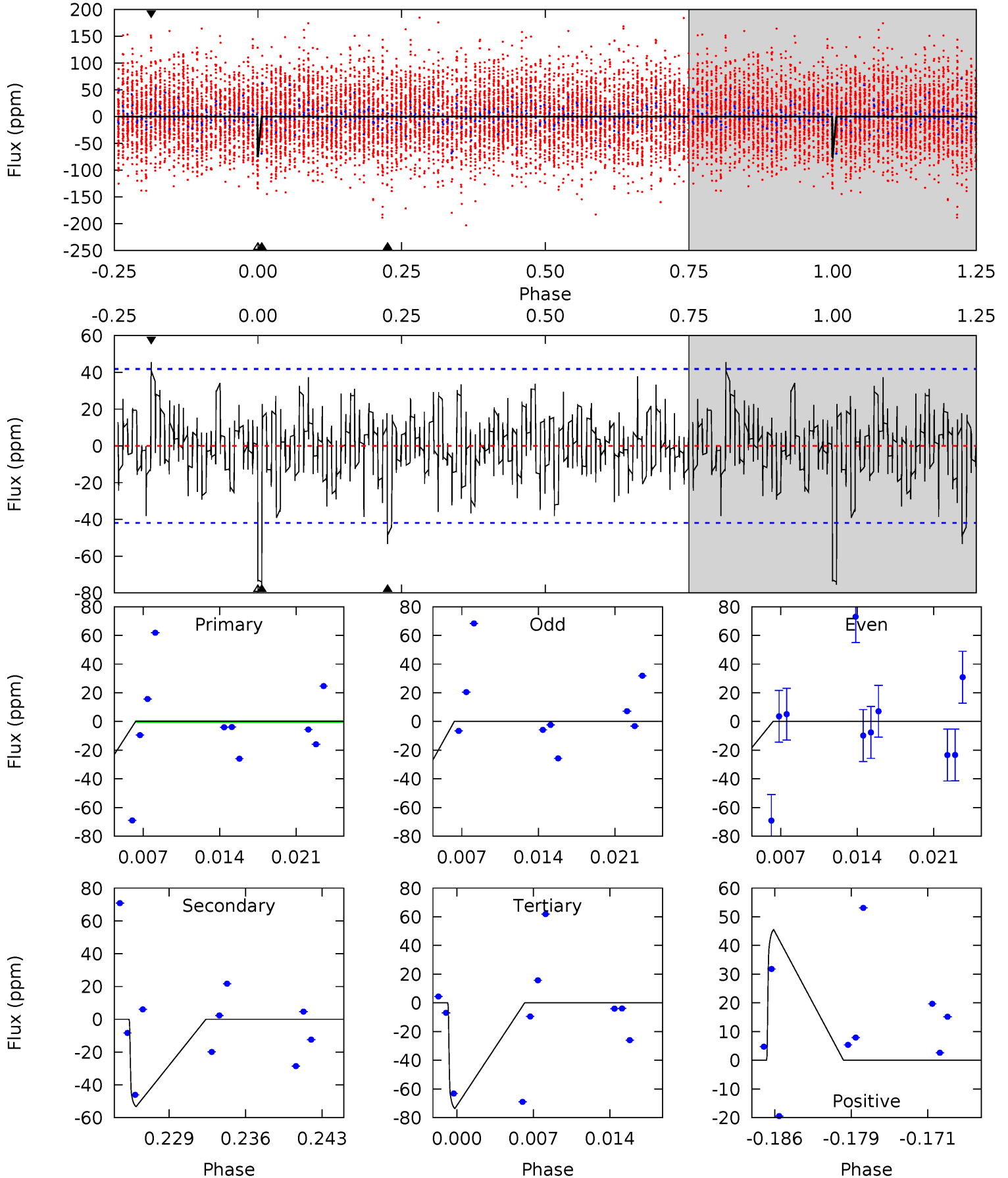
TCE 011122789-04 P=200.748971 Days  $T_0=136.599317$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-04, P = 200.751028 Days, E = 136.514514 Days

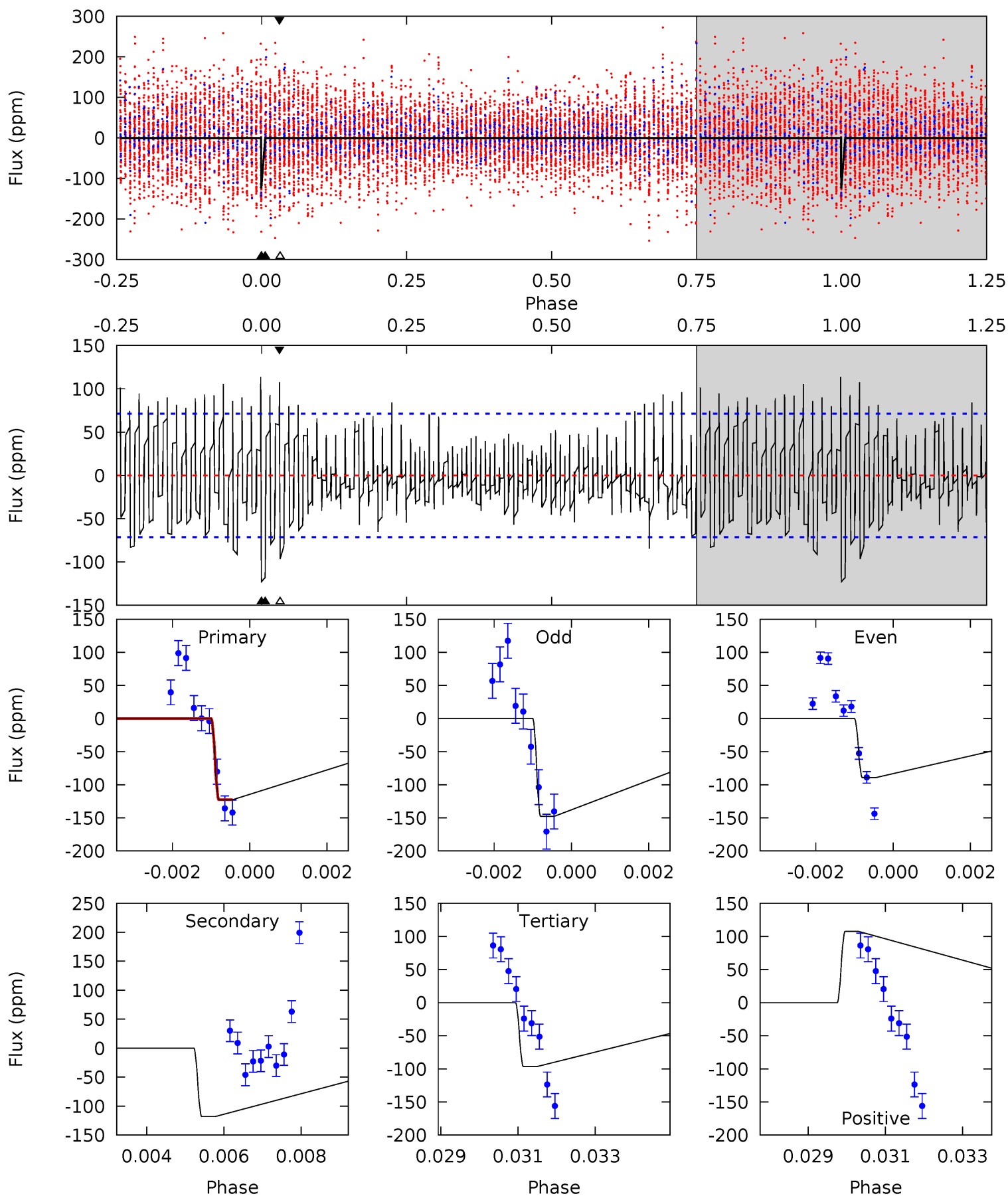
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.18	6.47	8.95	5.54	5.09	2.69	1.59	0.23	3.65	-2.48	0.94	1.68	0	0.38	0



# Alt Model-Shift Uniqueness Test

011122789-04, P = 200.748971 Days, E = 136.599317 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
9.18	8.83	7.22	8.04	5.33	3.10	2.39	1.96	1.13	1.61	0.79	2.19	0	0.48	0



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-53 \pm 8$	$2.68^{+0.69}_{-0.72}$	$772^{+55}_{-92}$	$5849^{+690}_{-479}$	$2379^{+2027}_{-885}$
Alt.	$-118 \pm 13$	$3.00^{+0.75}_{-0.81}$	$776^{+51}_{-86}$	$6831^{+822}_{-552}$	$4320^{+3498}_{-1482}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

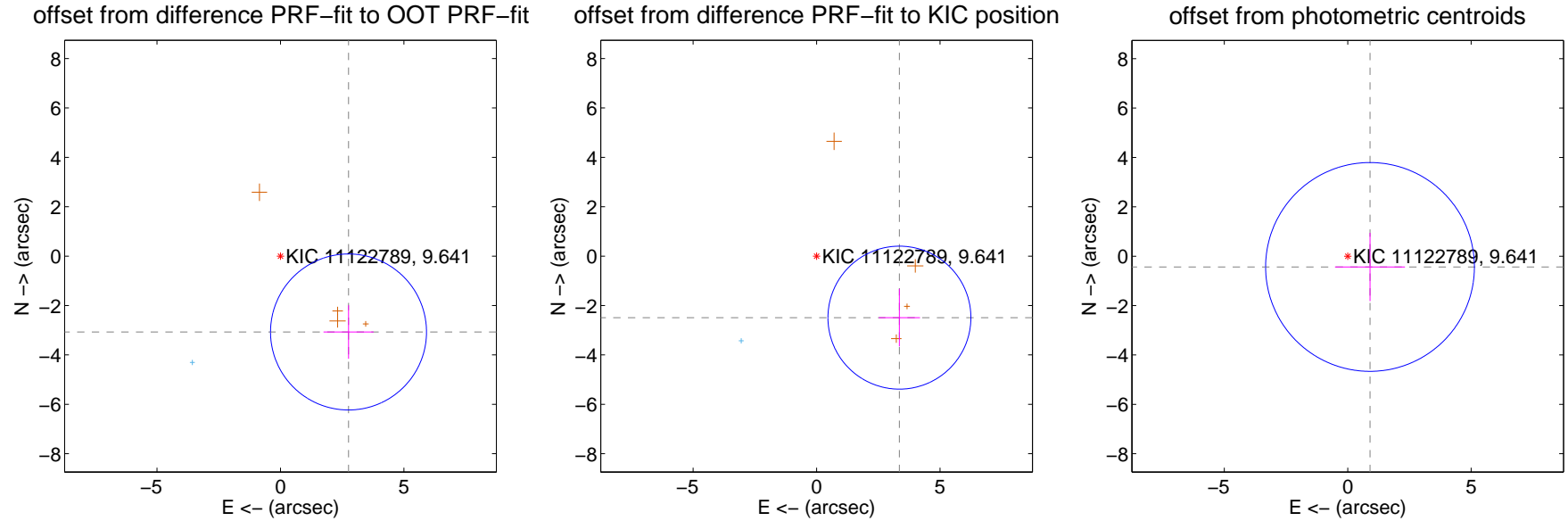
## DV Centroid Data

Supplemental centroid analysis for 011122789-04. **Kepler magnitude: 9.64.** Transit SNR 10.29

**There are 2 quarters with good PRF difference image offsets**

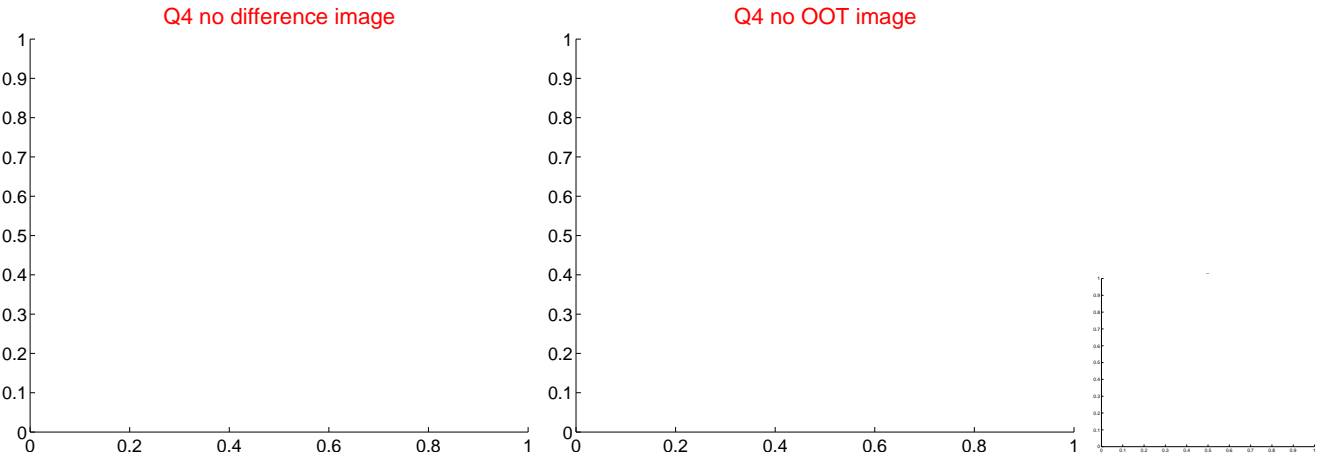
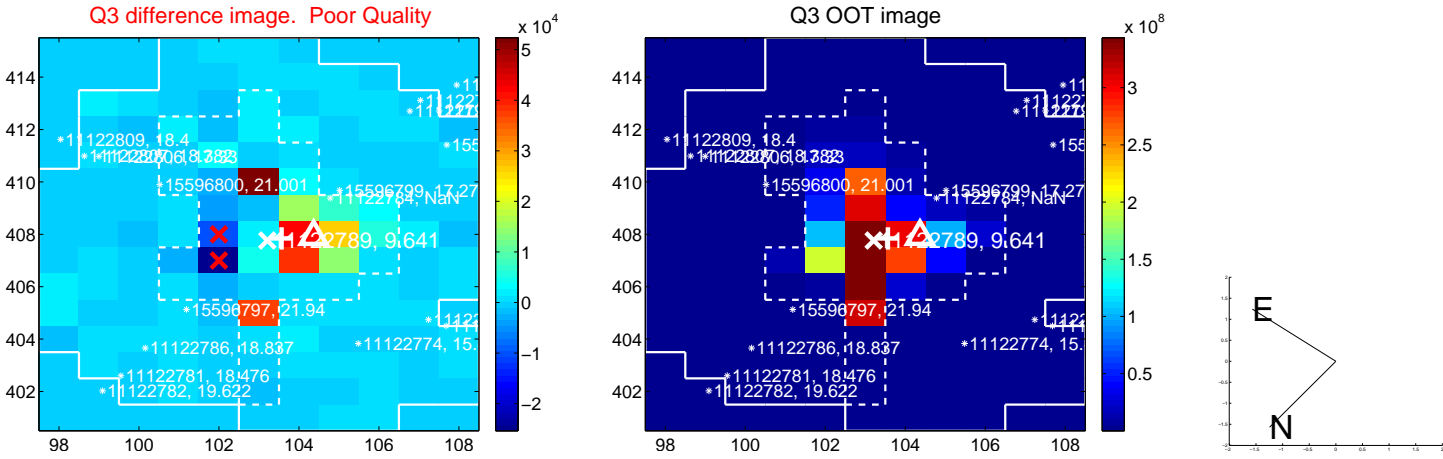
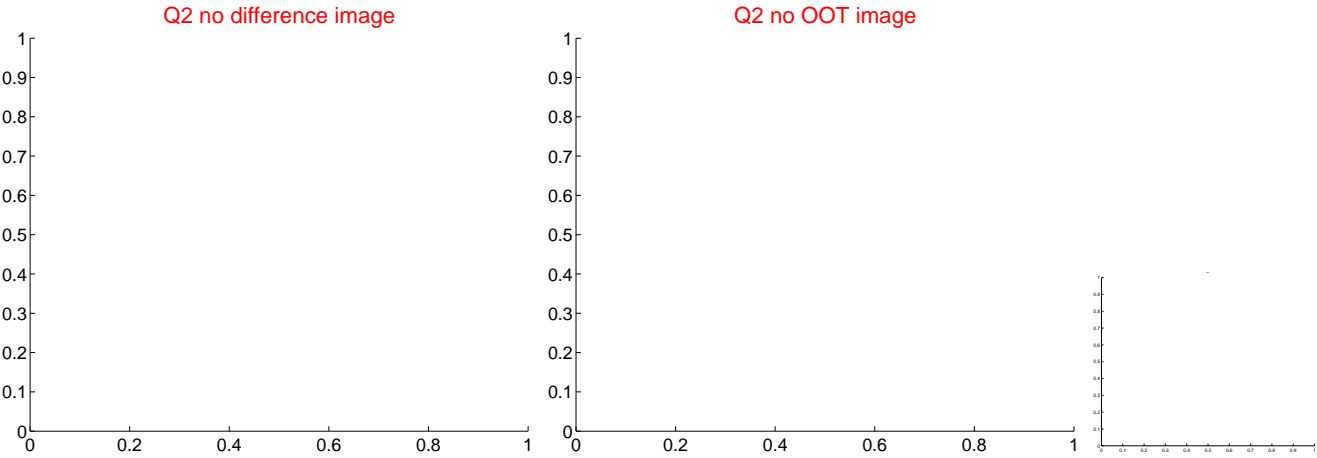
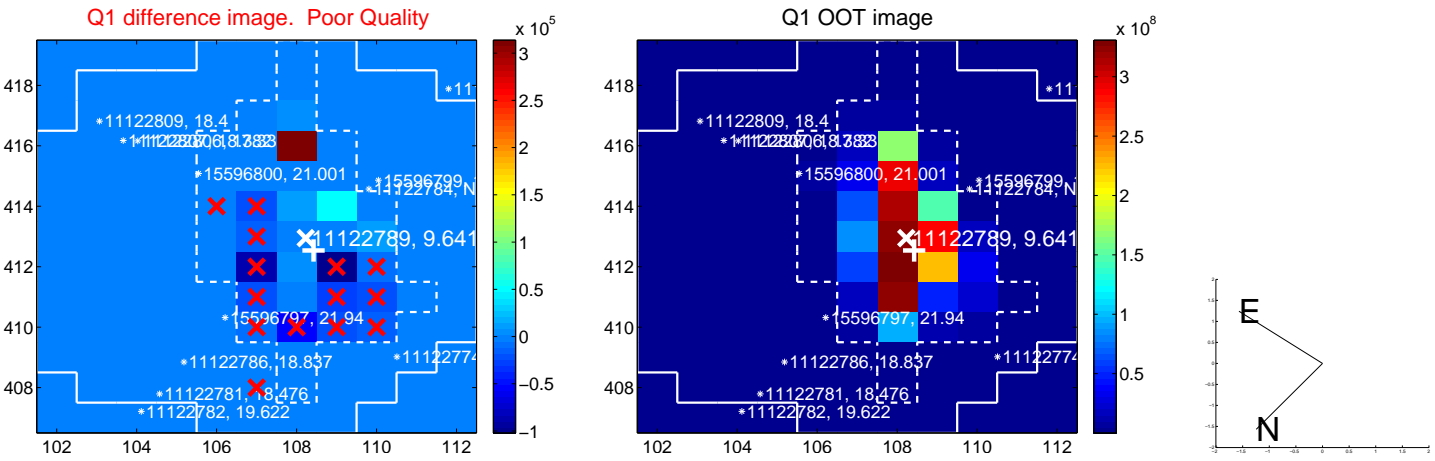
The direct PRF centroid is offset from the target star catalog position by about 1.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.127 \pm 1.053</math></b>	<b>3.92</b>	$-2.756 \pm 1.013$	$-3.071 \pm 1.083$
PRF-fit source offset from KIC position	<b><math>4.179 \pm 0.965</math></b>	<b>4.33</b>	$-3.355 \pm 0.835$	$-2.491 \pm 1.164$
photometric centroid source offset	$1.00 \pm 1.41$	0.71	$-0.90 \pm 1.42$	$-0.44 \pm 1.38$



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

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



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

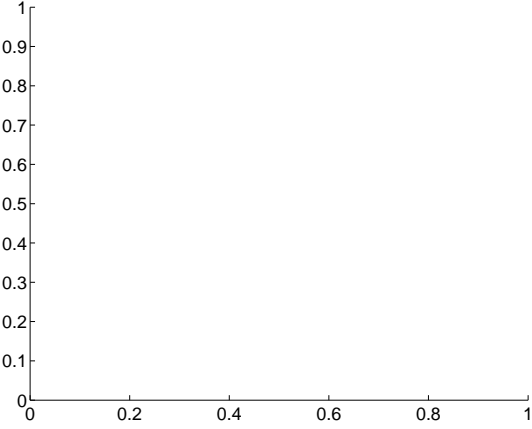
Q5 no difference image



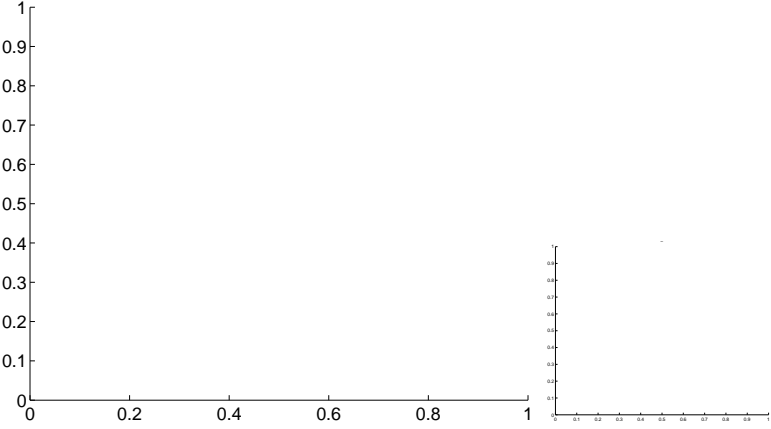
Q5 no OOT image



Q6 no difference image



Q6 no OOT image



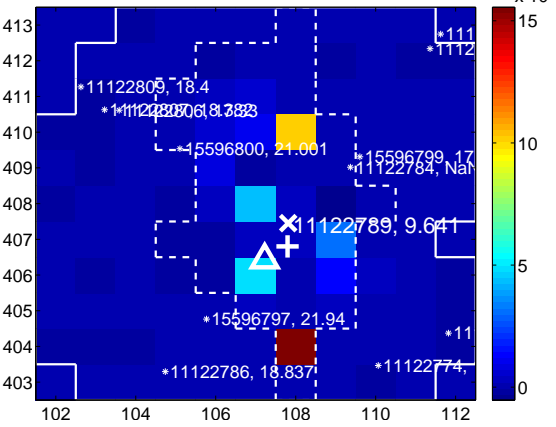
Q7 no difference image



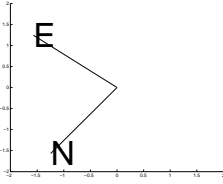
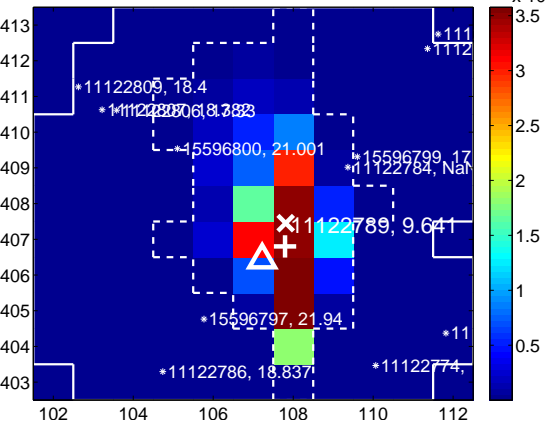
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image





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

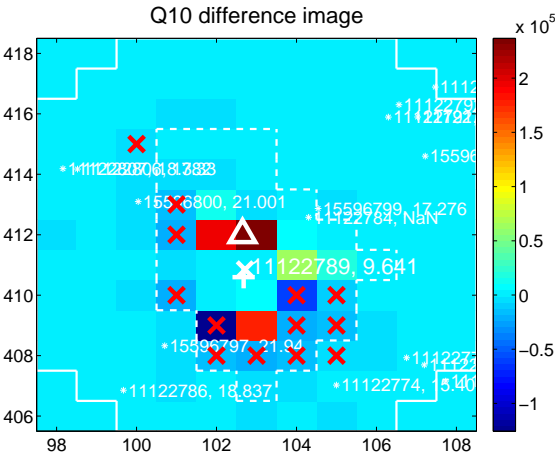
Q9 no difference image



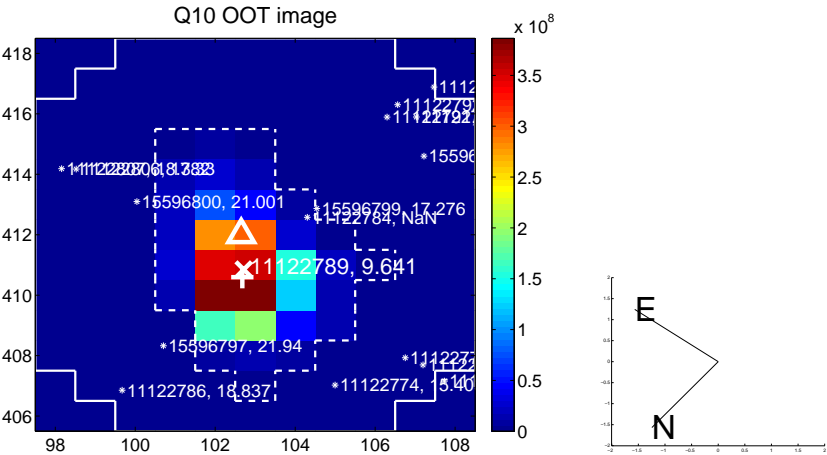
Q9 no OOT image



Q10 difference image



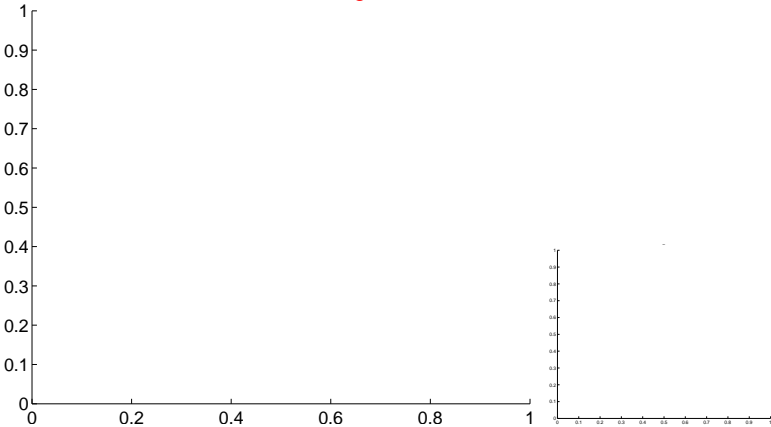
Q10 OOT image



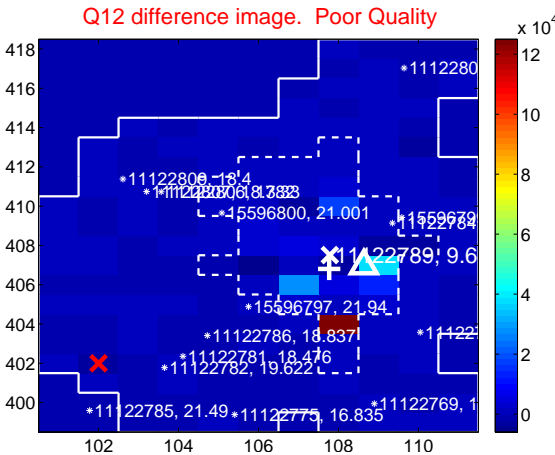
Q11 no difference image



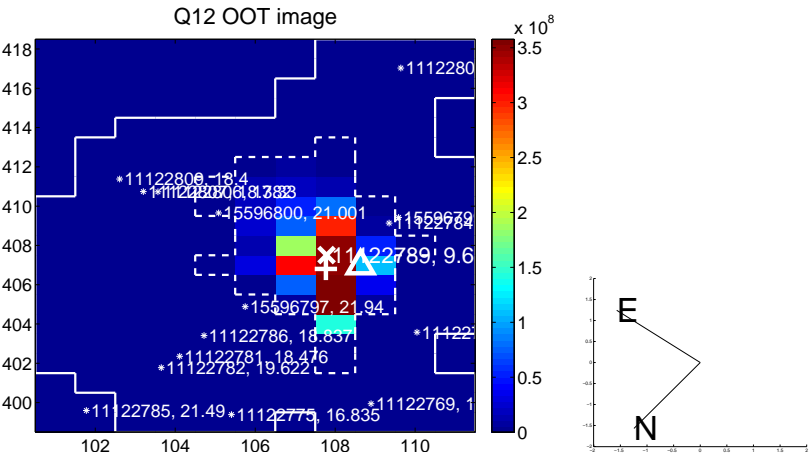
Q11 no OOT image



Q12 difference image. Poor Quality



Q12 OOT image

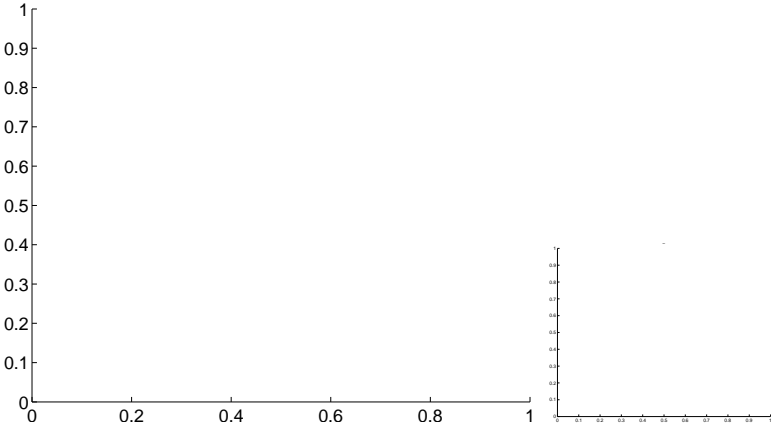


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

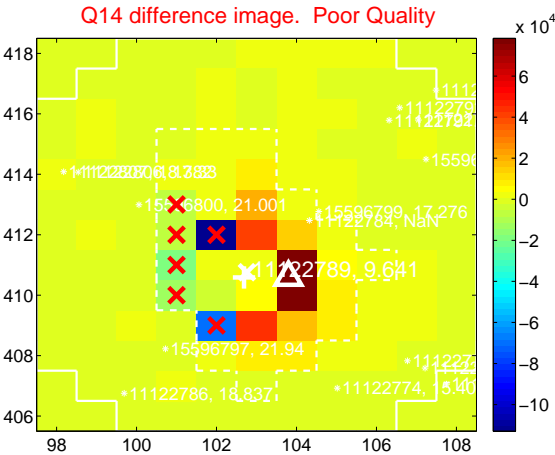
Q13 no difference image



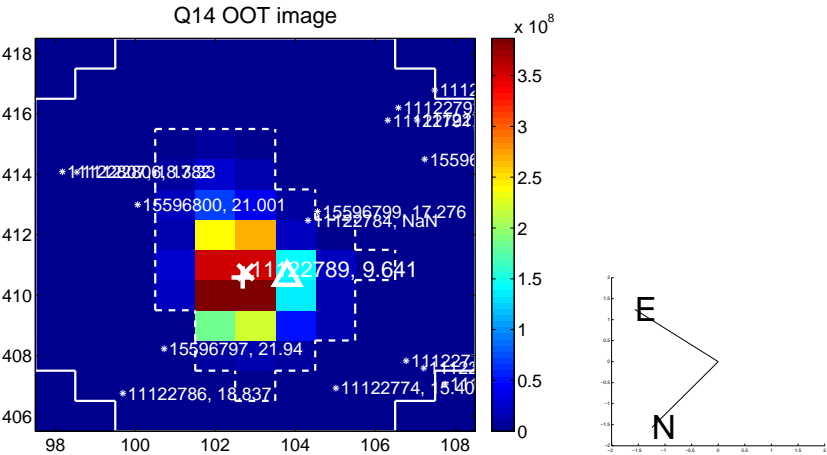
Q13 no OOT image



Q14 difference image. Poor Quality



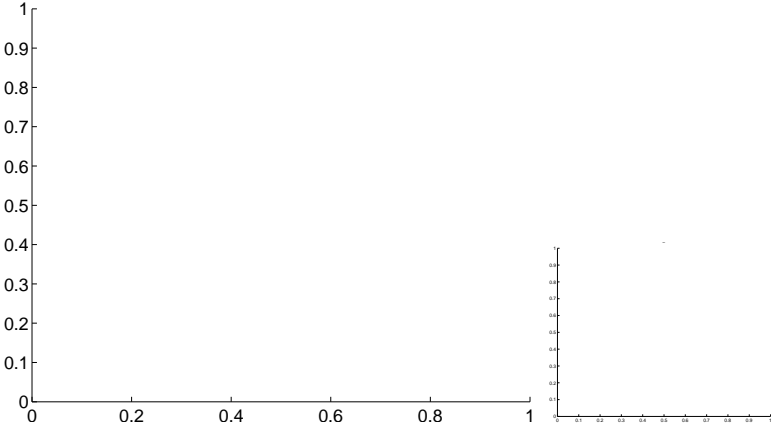
Q14 OOT image



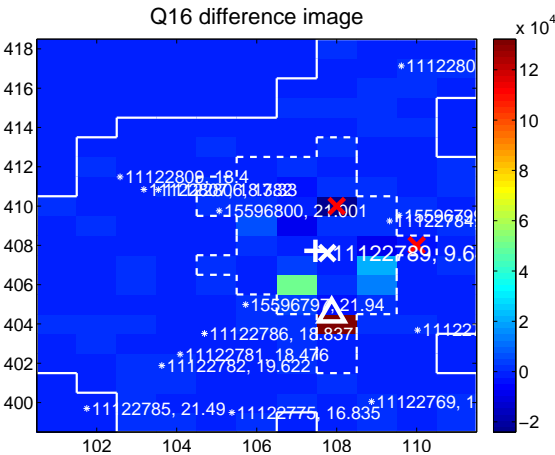
Q15 no difference image



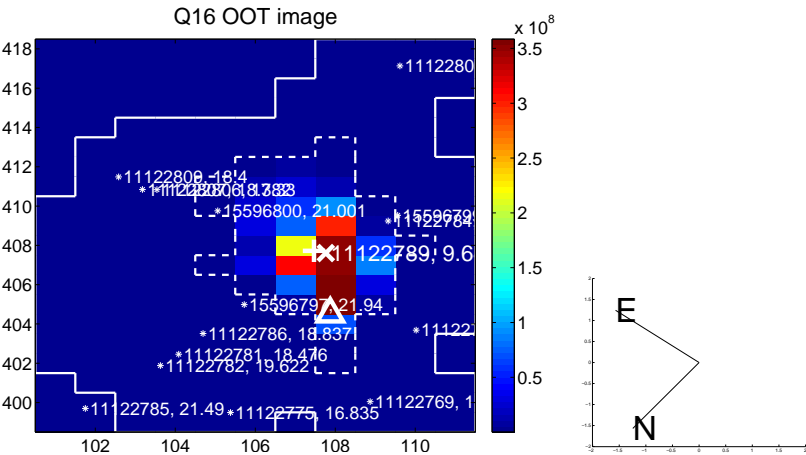
Q15 no OOT image



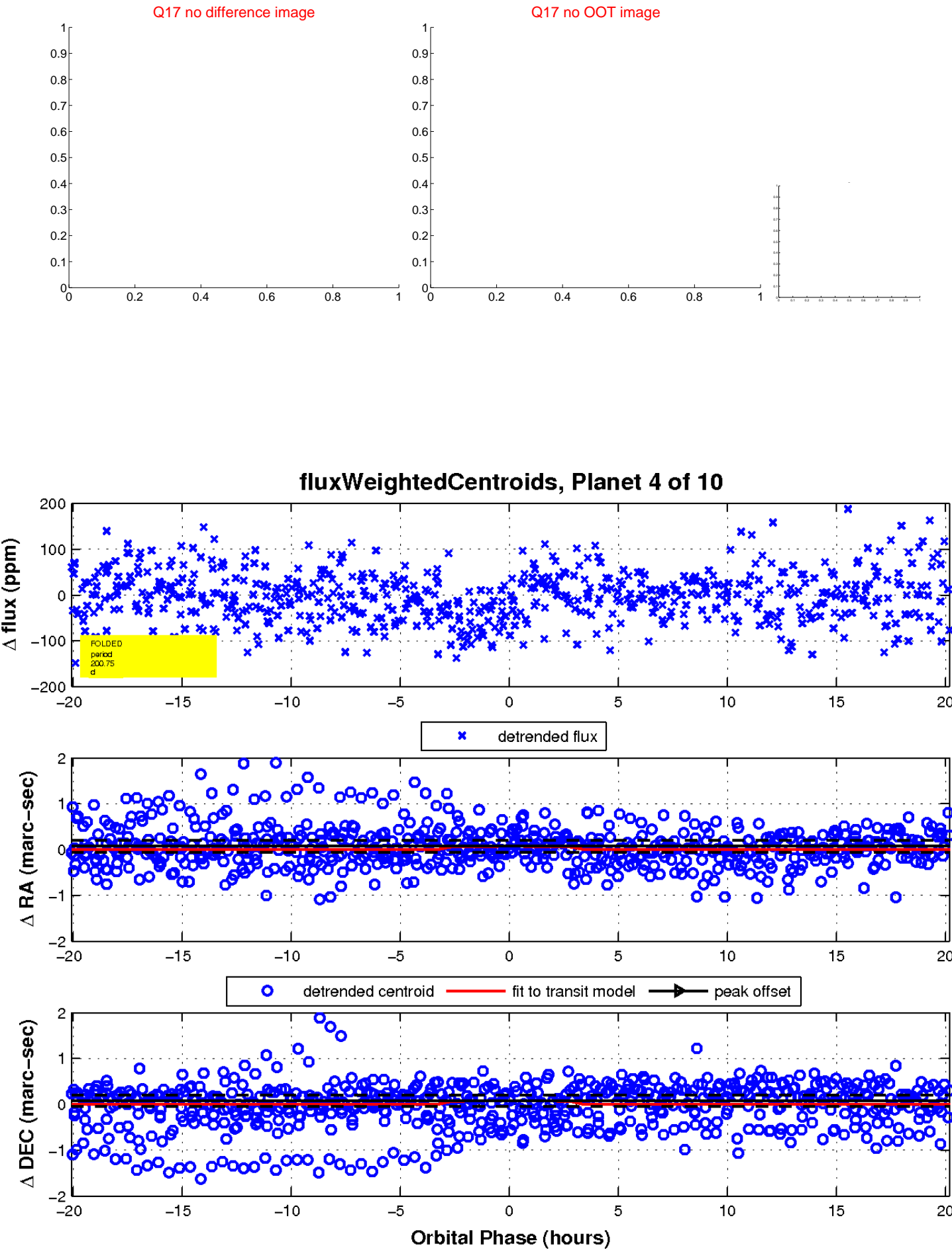
Q16 difference image



Q16 OOT image

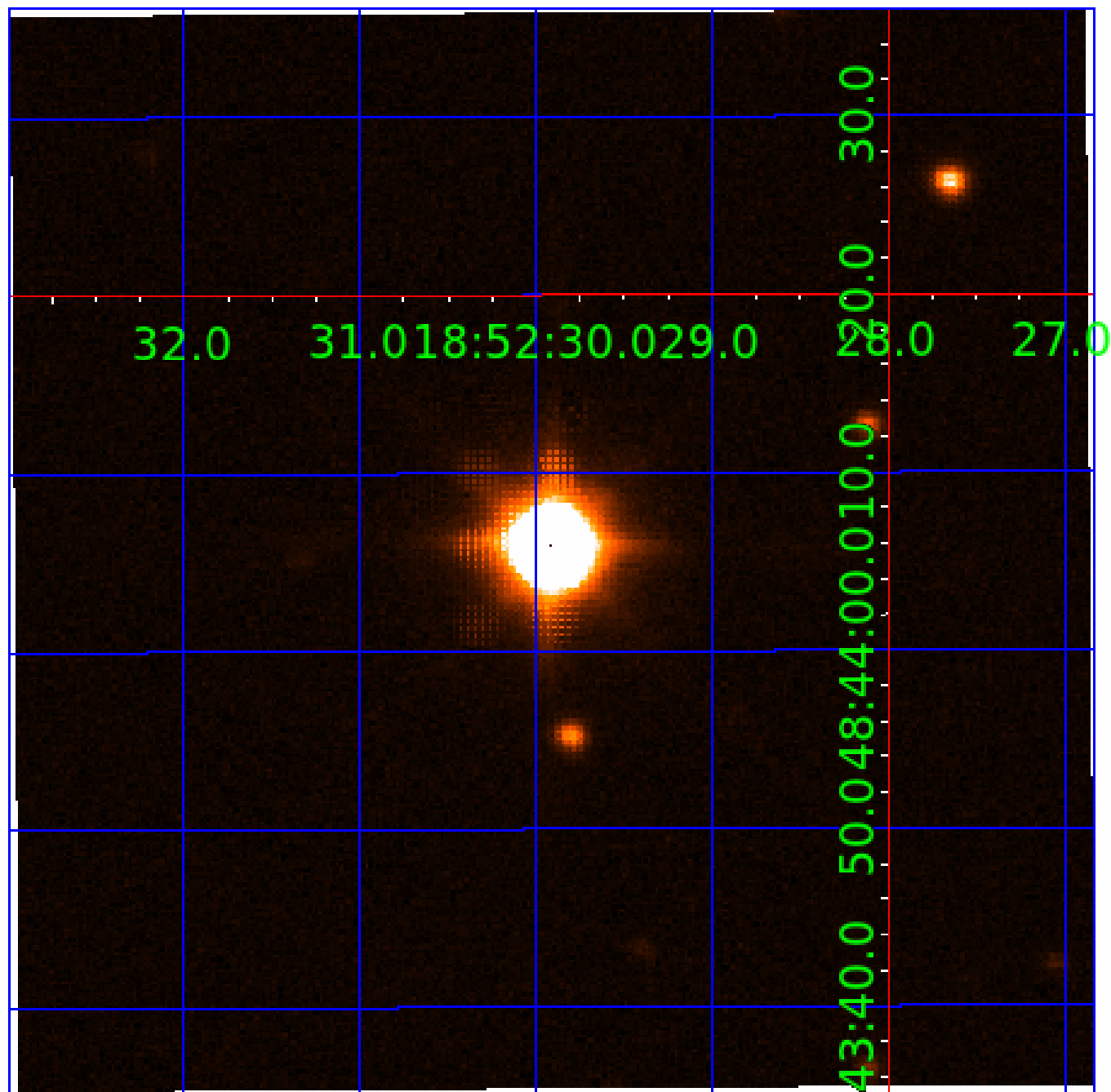


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

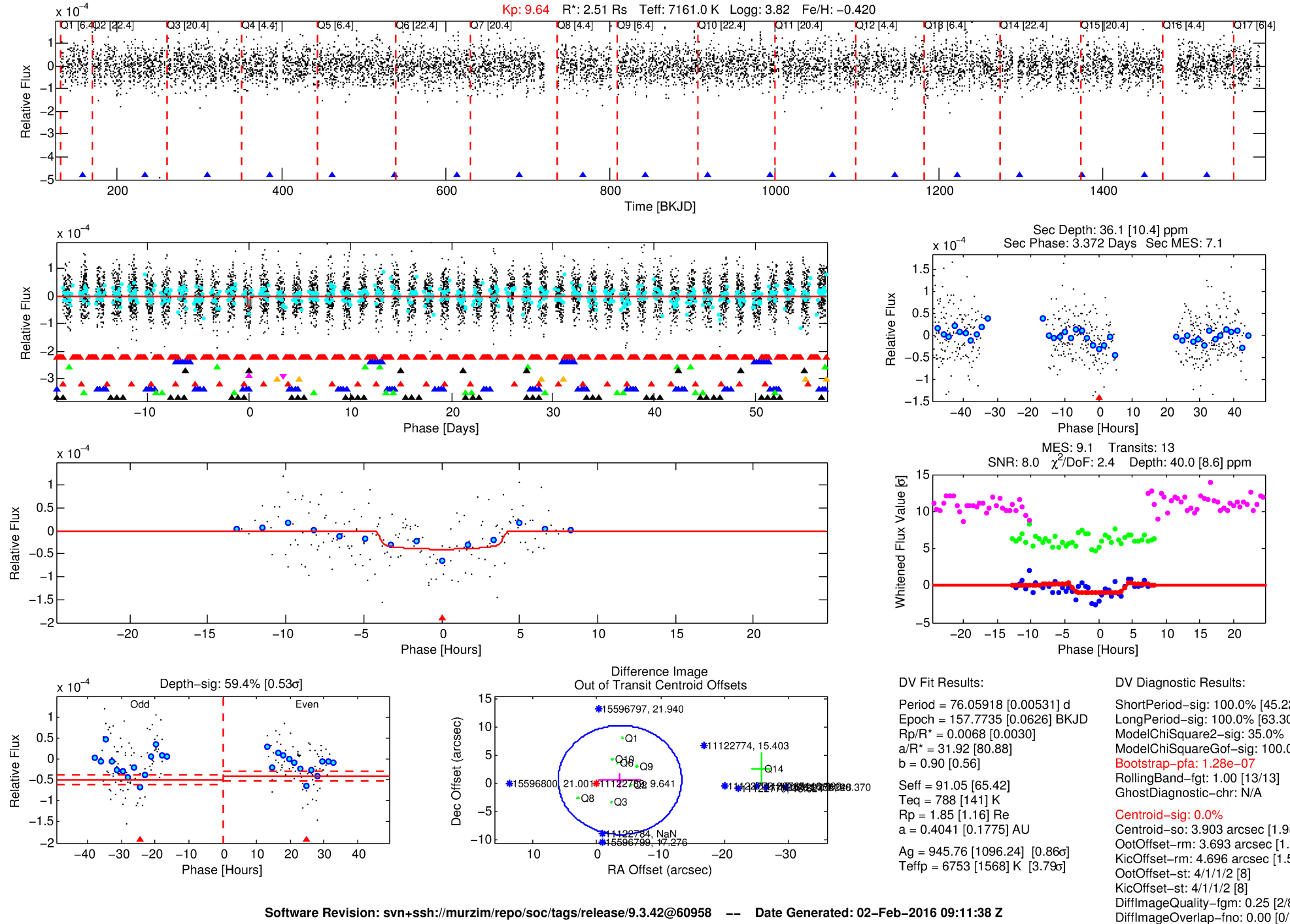
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-05

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 5 of 10 Period: 76.059 d

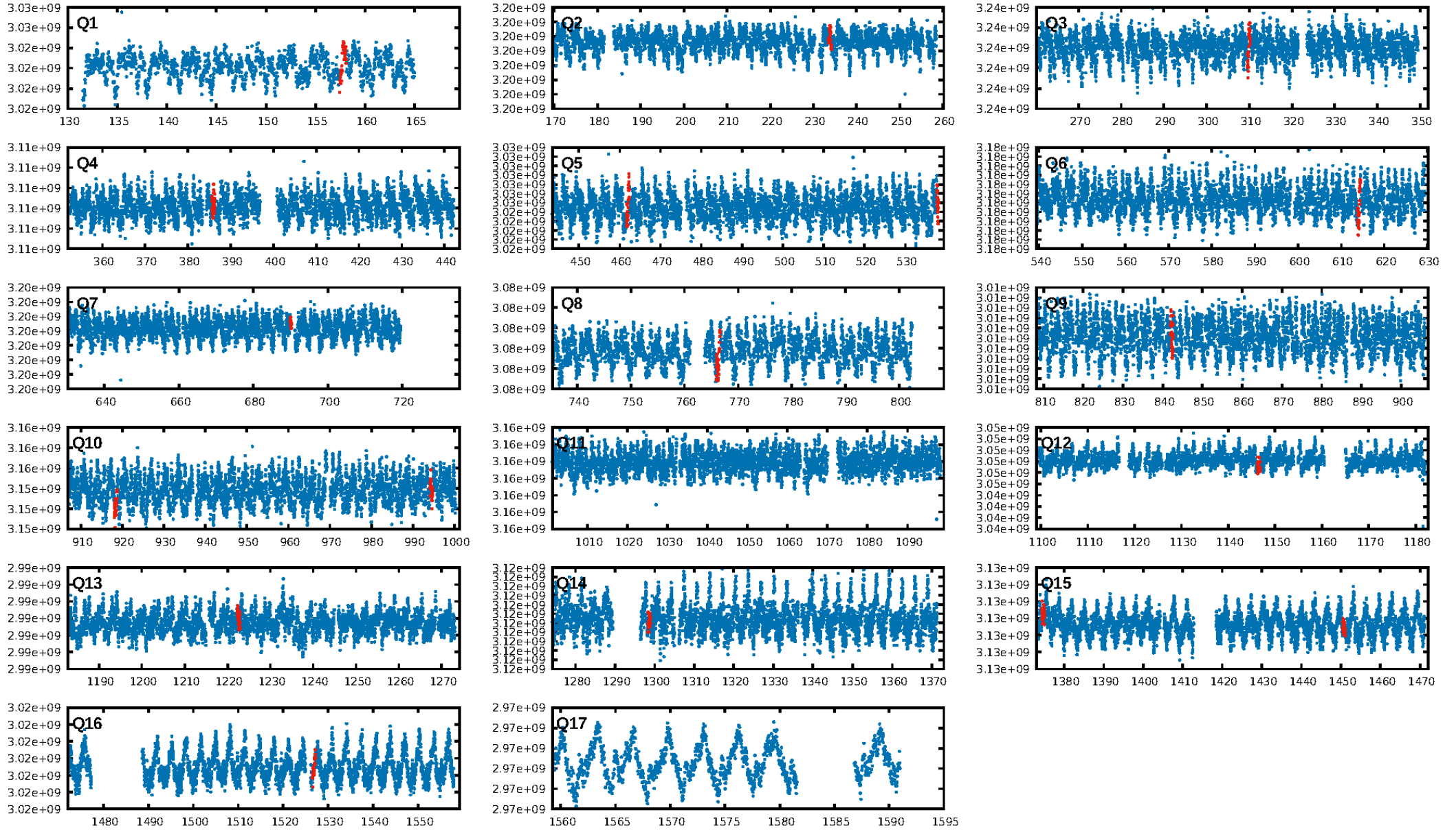


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:38 Z

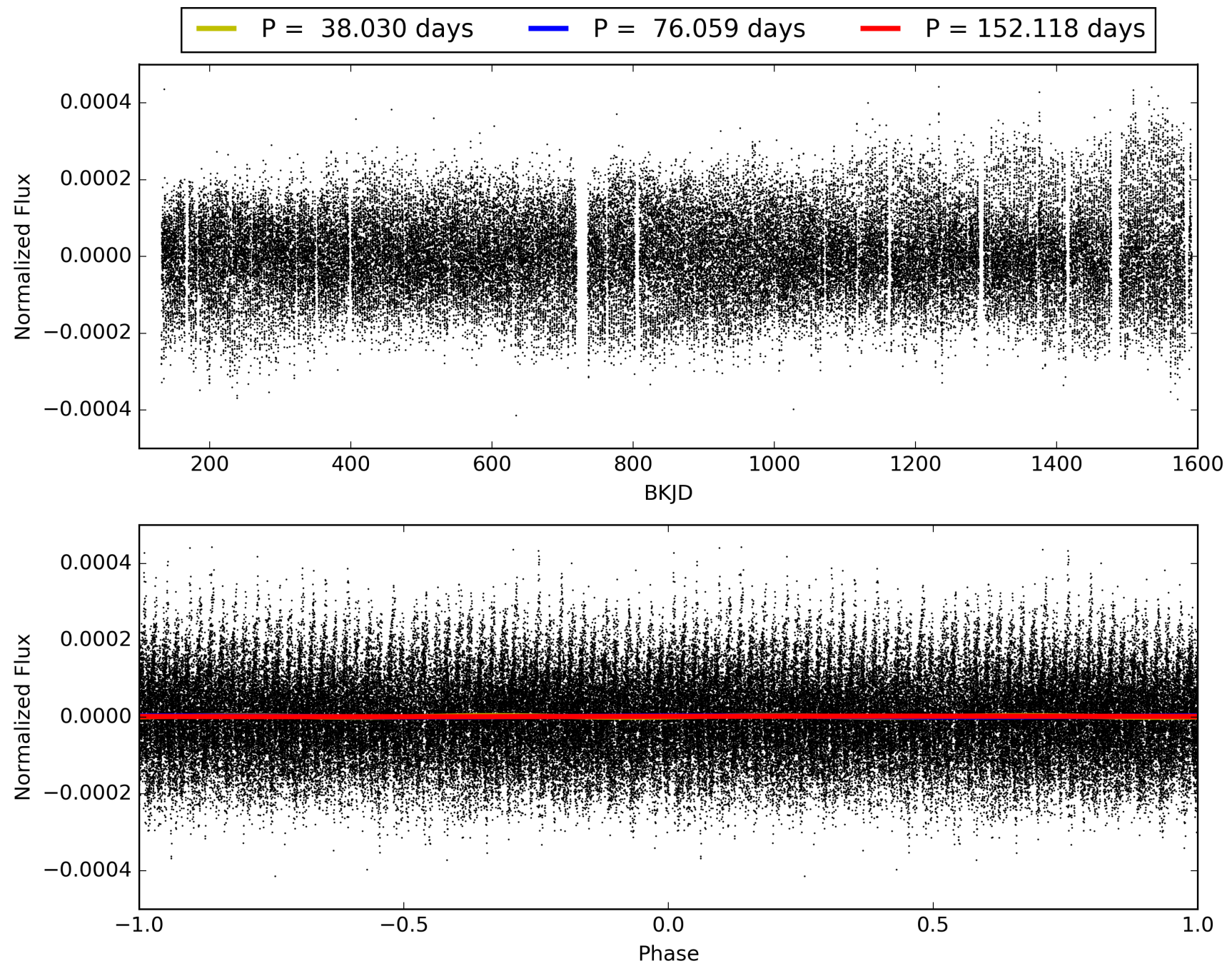
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011122789-05, PDC Light Curves

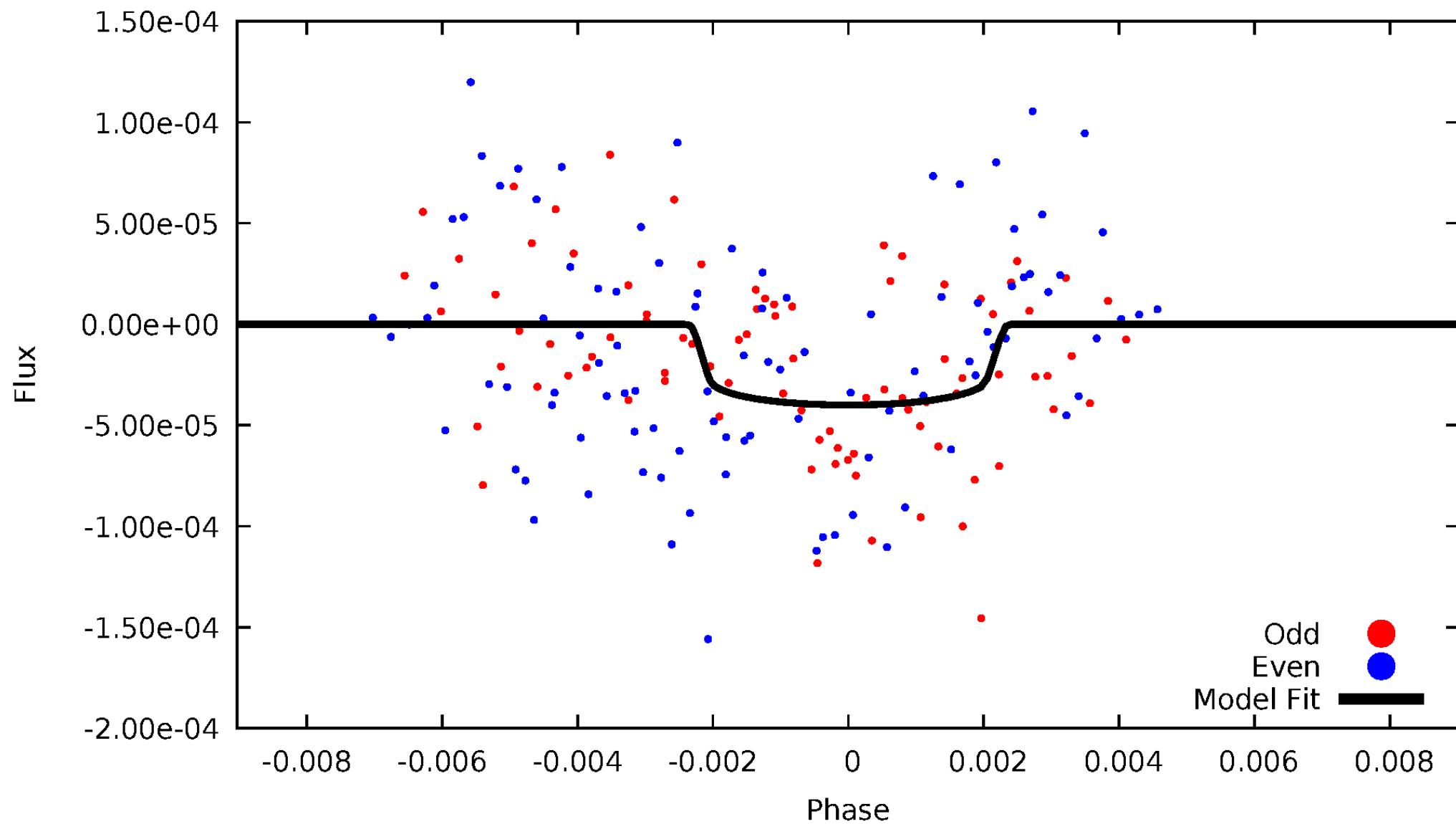


TCE 011122789-05



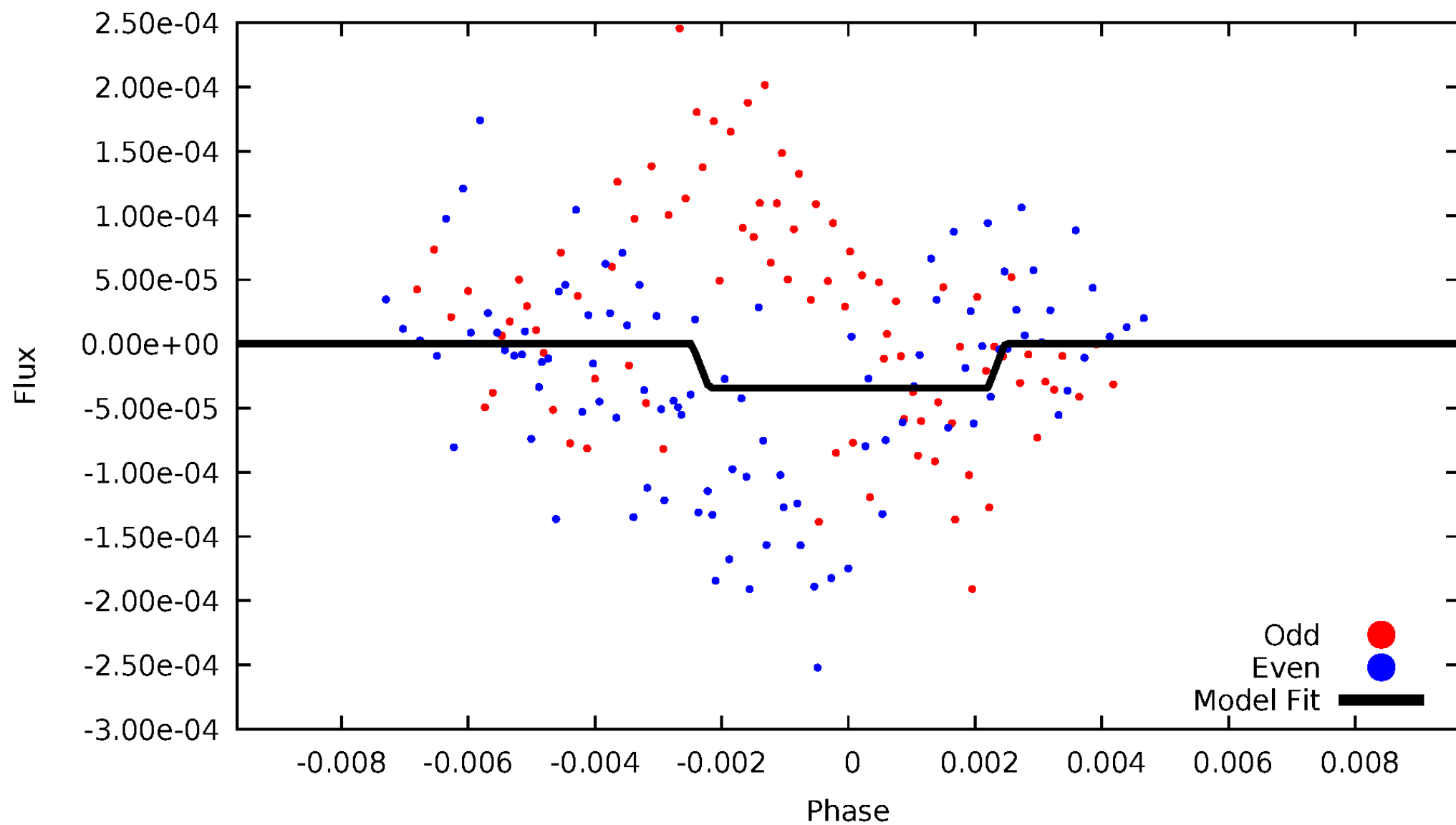
# DV Odd/Even

TCE 011122789-05



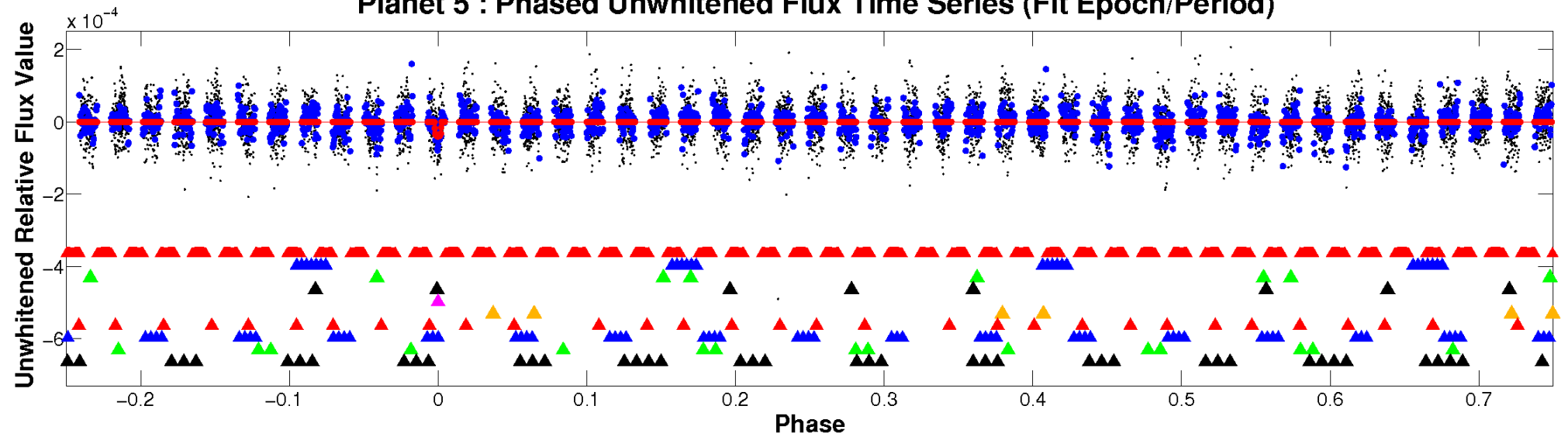
# ALT Odd/Even

TCE 011122789-05

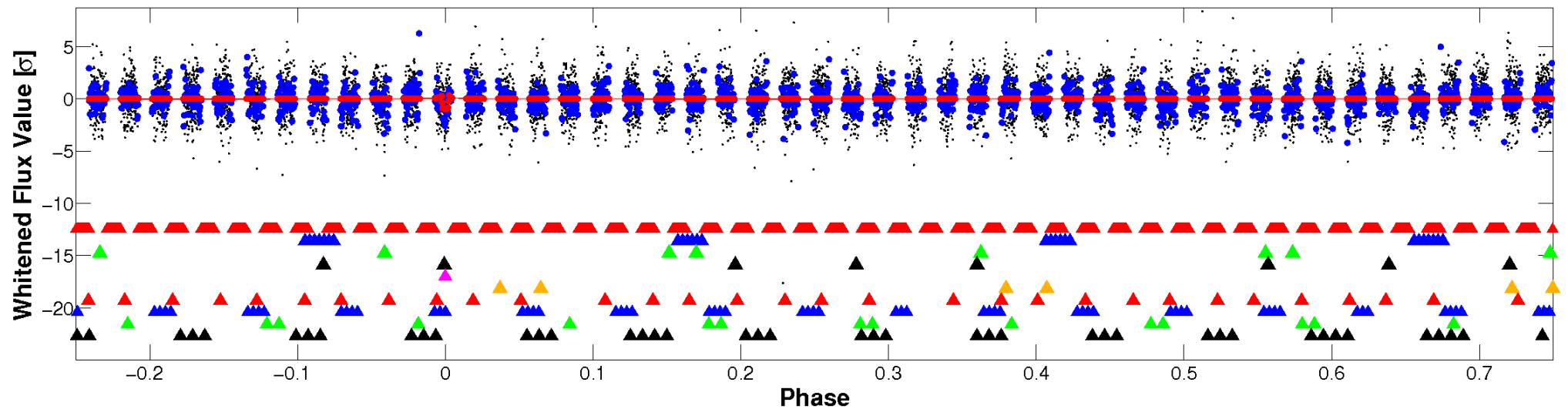


# Non-Whitened Vs. Whitened Light Curve

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

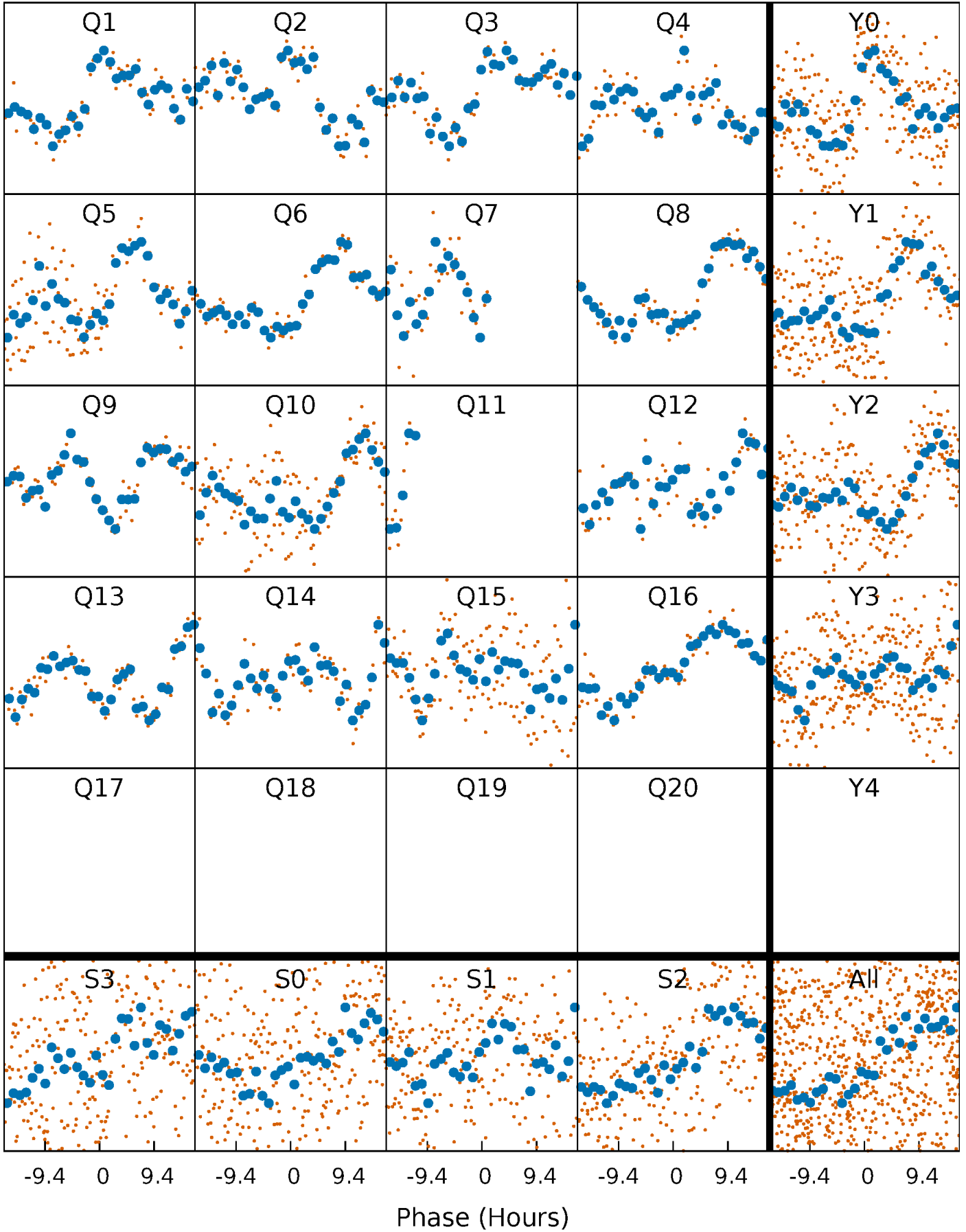


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



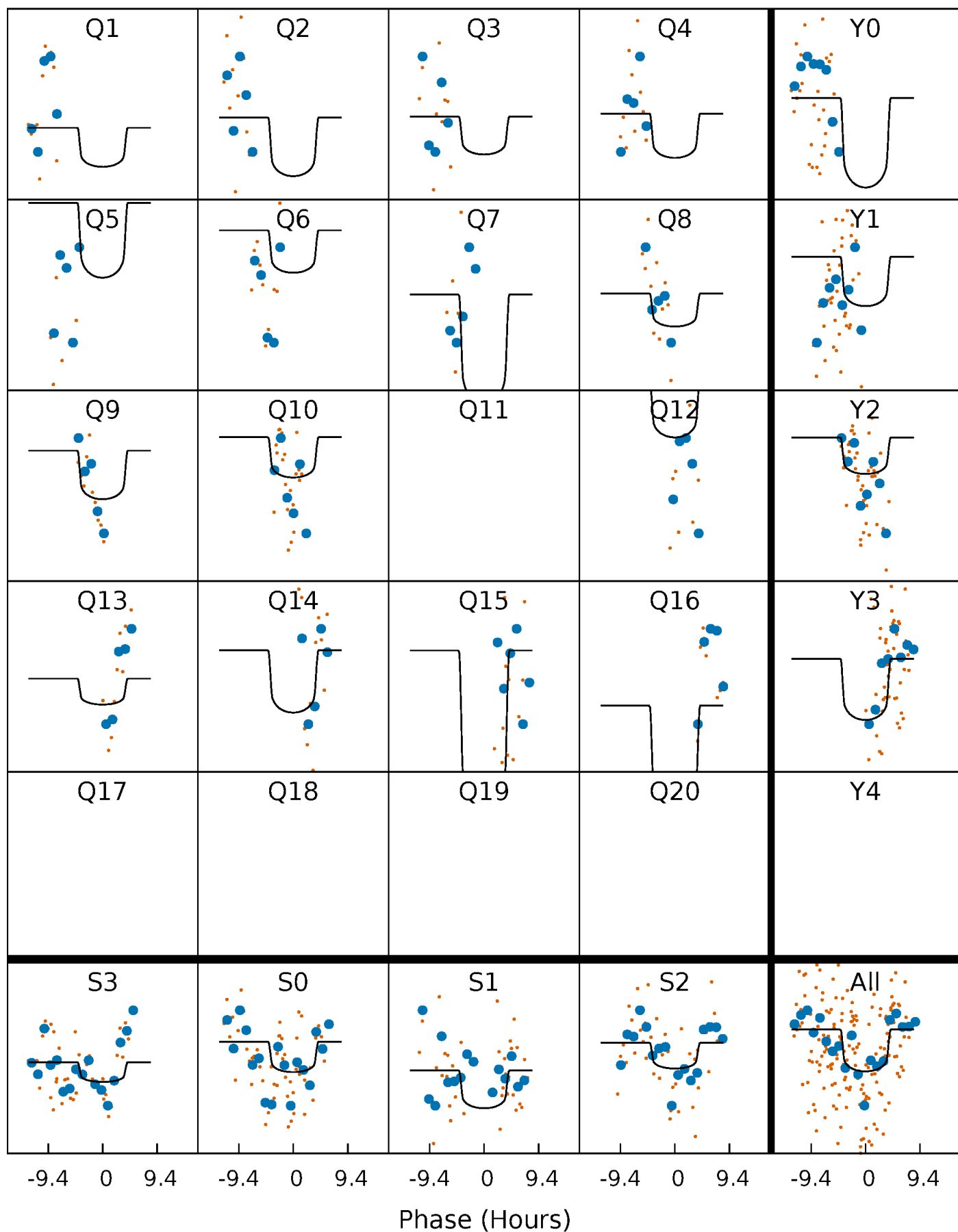
# PDC Quarter-Phased Transit Curves

TCE 011122789-05   P= 76.059182 Days    $T_0=157.773528$  (BKJD)



# DV Quarter-Phased Transit Curves

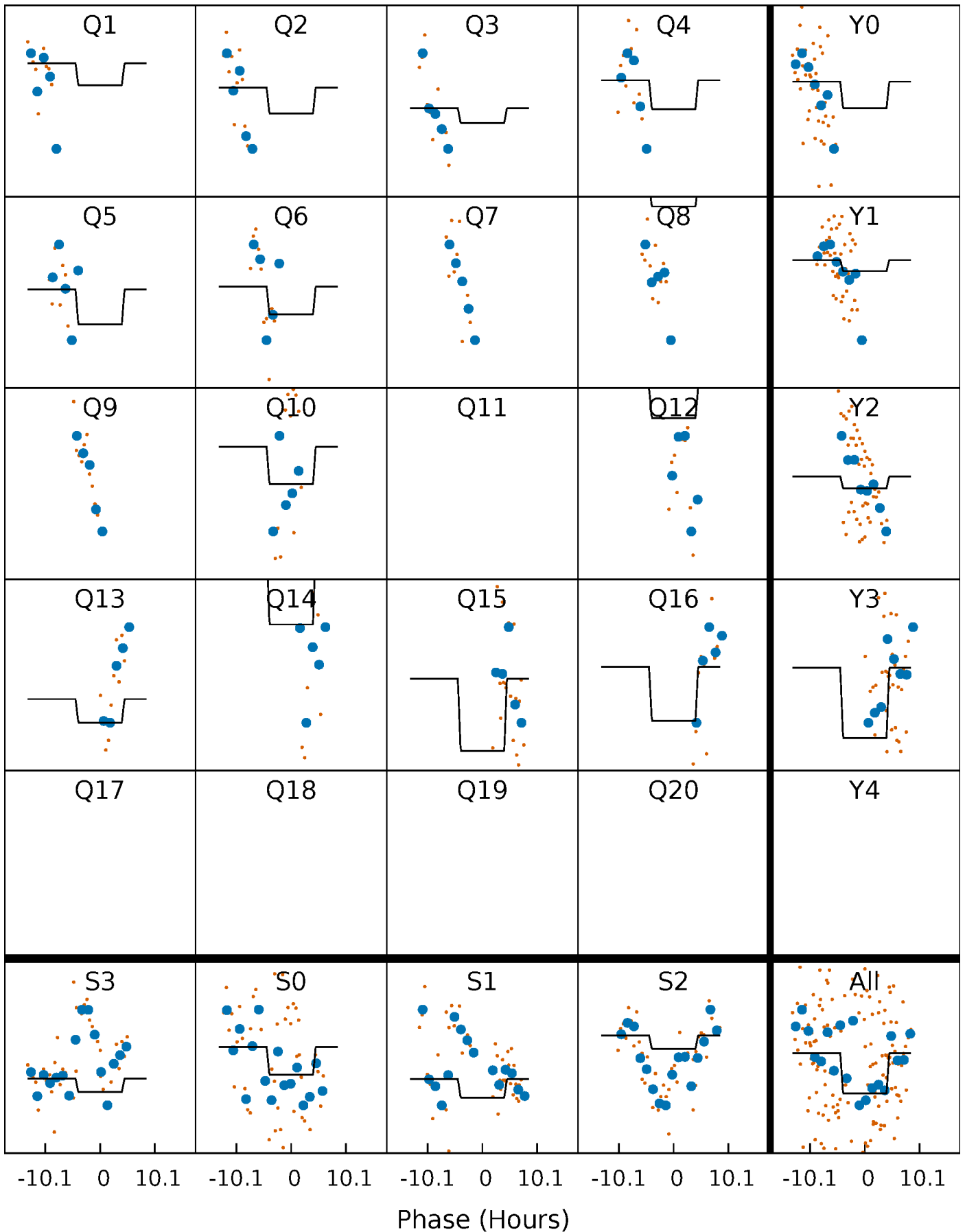
TCE 011122789-05     $P = 76.059182$  Days     $T_0 = 157.773528$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

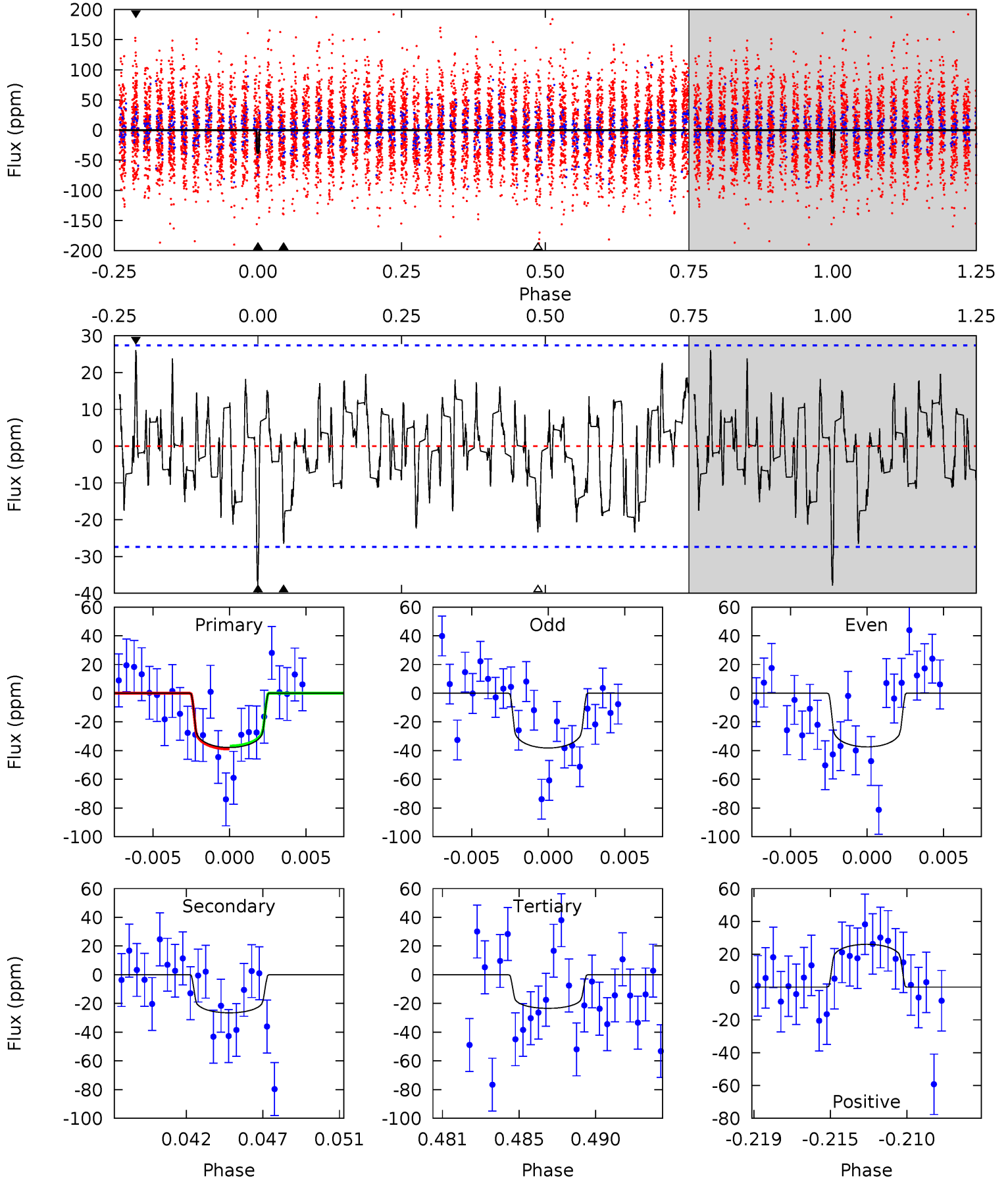
TCE 011122789-05 P= 76.057621 Days  $T_0=157.794235$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-05, P = 76.059182 Days, E = 81.714346 Days

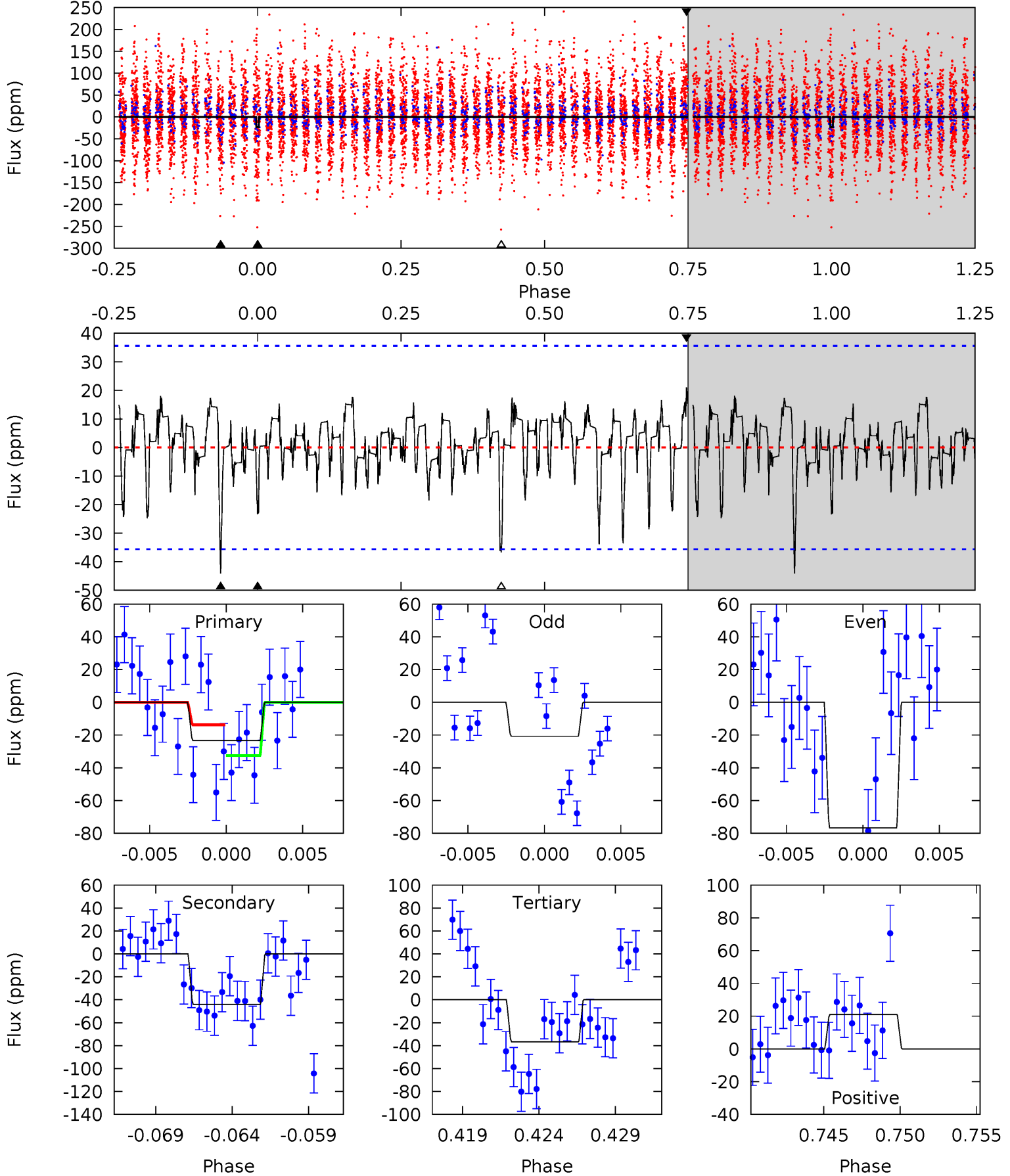
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.15	5.01	4.42	4.92	5.17	2.83	1.76	2.73	2.23	0.59	0.09	0.07	1.04	0.41	0.20



# Alt Model-Shift Uniqueness Test

011122789-05, P = 76.057621 Days, E = 81.736614 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
3.39	6.39	5.31	3.05	5.16	2.81	1.46	-1.92	0.34	1.08	3.34	4.05	0.85	0.32	1.36



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-27 \pm 5$	$1.70^{+0.84}_{-0.76}$	$1069^{+76}_{-114}$	$6153^{+2052}_{-998}$	$810^{+1748}_{-450}$
Alt.	$-44 \pm 7$	$1.43^{+0.83}_{-0.72}$	$1069^{+70}_{-111}$	$7639^{+4373}_{-1494}$	$1834^{+5832}_{-1051}$

$T_{\text{max}}$  = 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

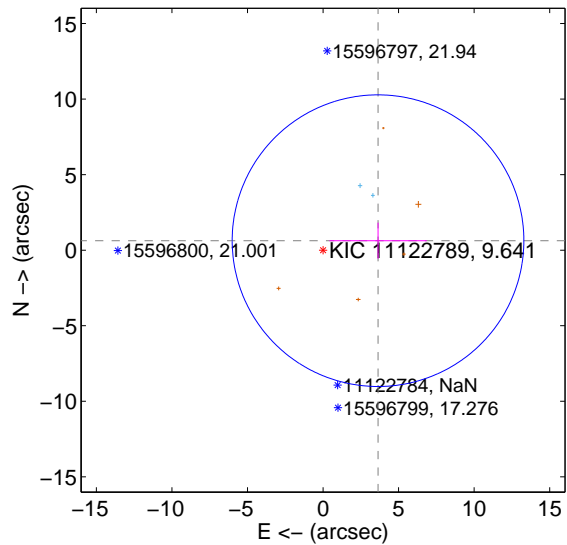
Supplemental centroid analysis for 011122789-05. **Kepler magnitude: 9.64.** Transit SNR 8.04

**There are 2 quarters with good PRF difference image offsets**

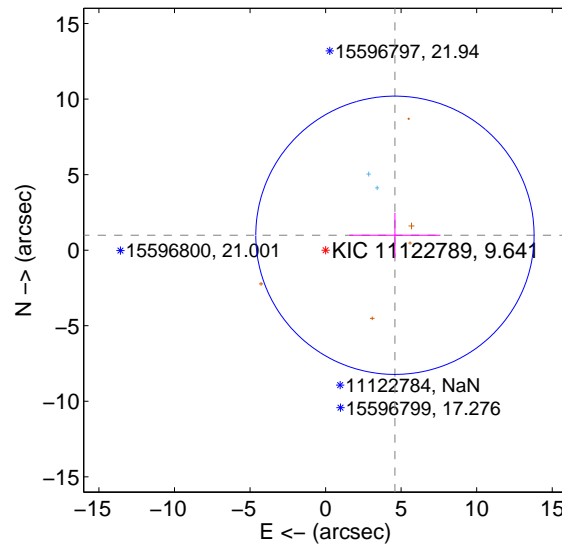
The direct PRF centroid is offset from the target star catalog position by about 1.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.693 \pm 3.217$	1.15	$-3.639 \pm 3.222$	$0.628 \pm 1.192$
PRF-fit source offset from KIC position	$4.696 \pm 3.070$	1.53	$-4.591 \pm 3.015$	$0.987 \pm 1.484$
photometric centroid source offset	$3.90 \pm 2.00$	1.95	$1.78 \pm 2.01$	$-3.47 \pm 1.99$

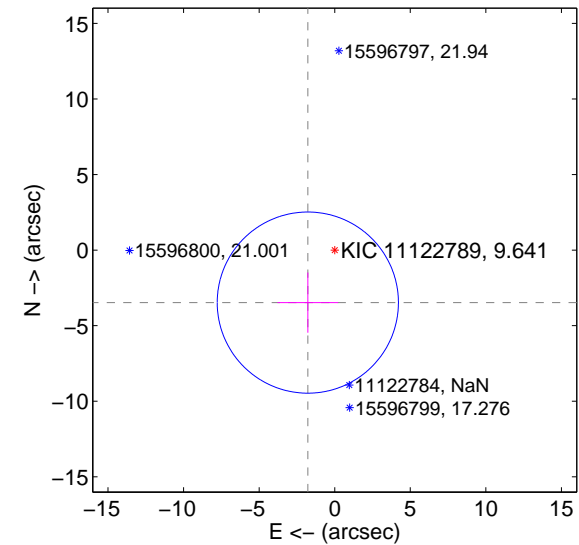
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

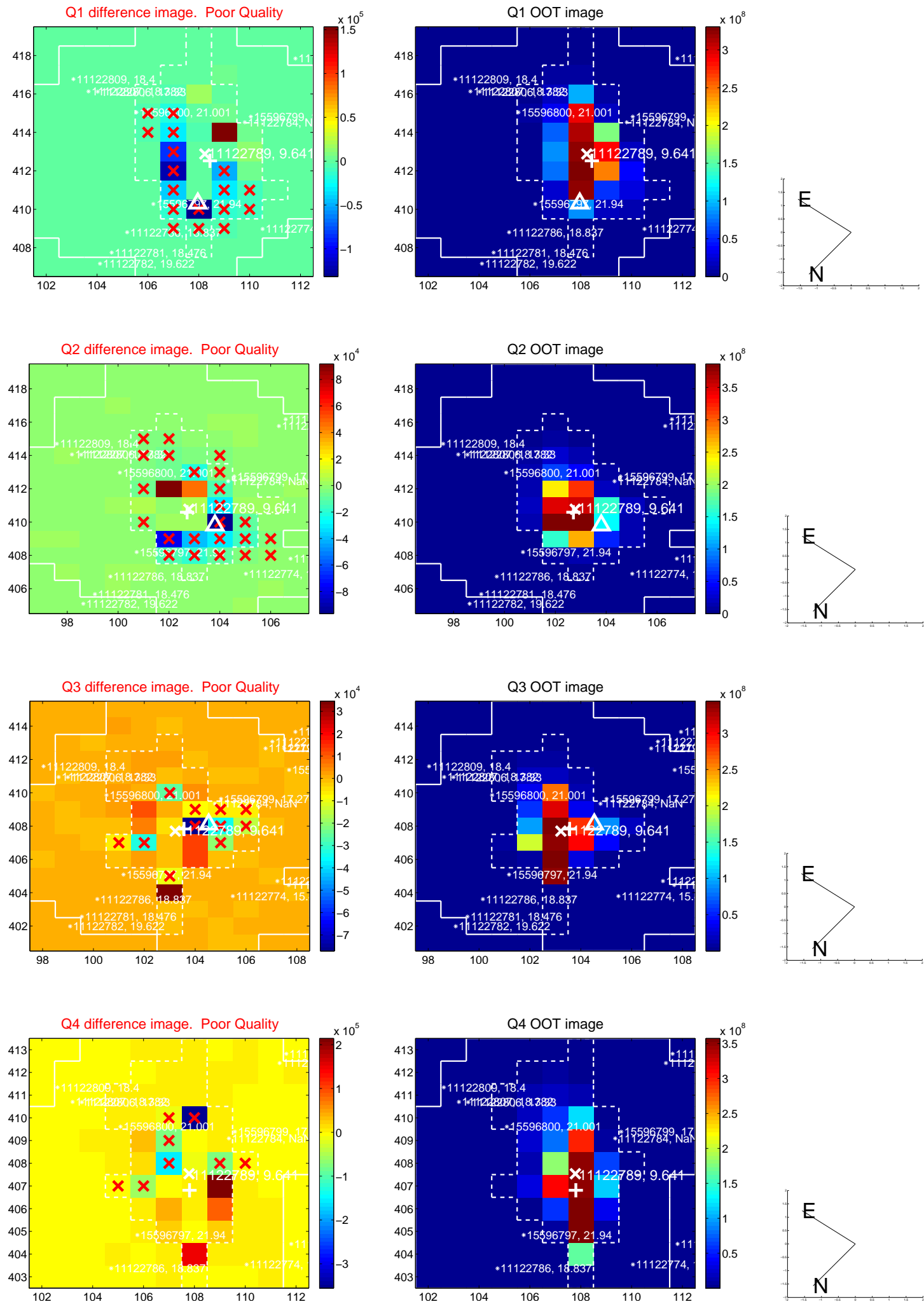


offset from photometric centroids

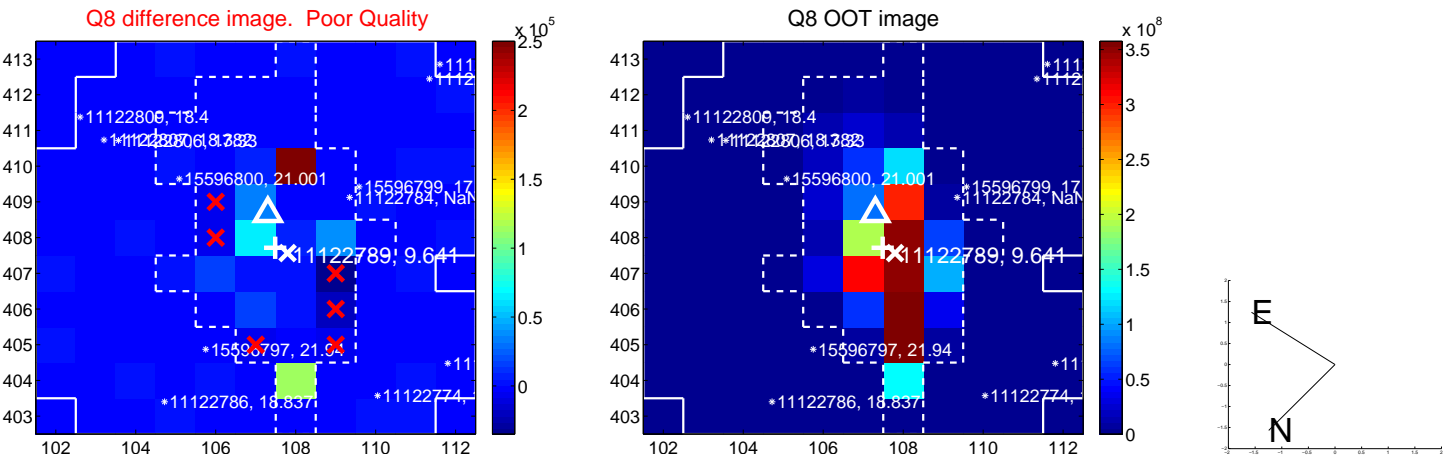
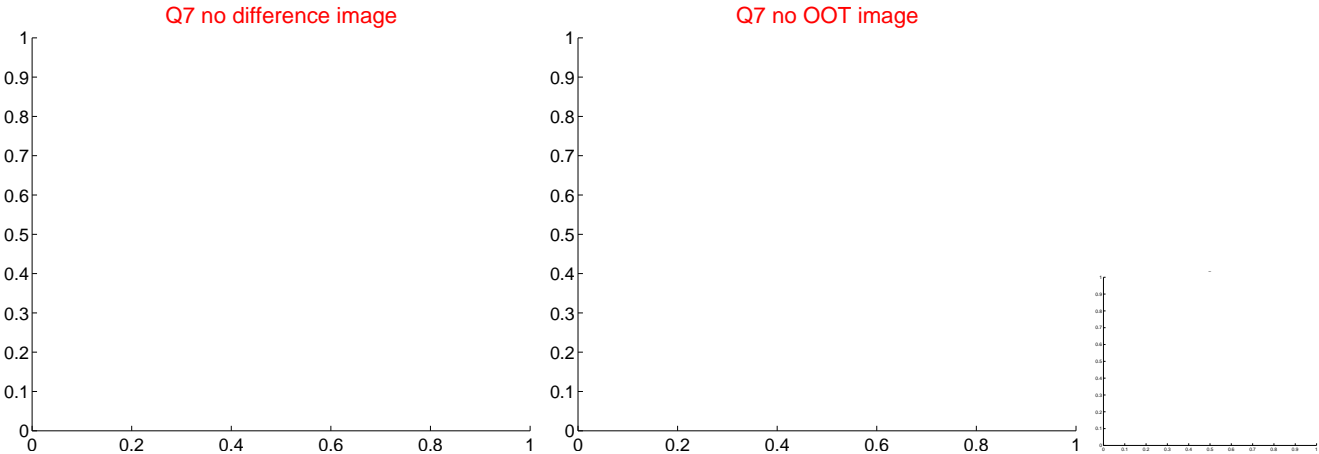
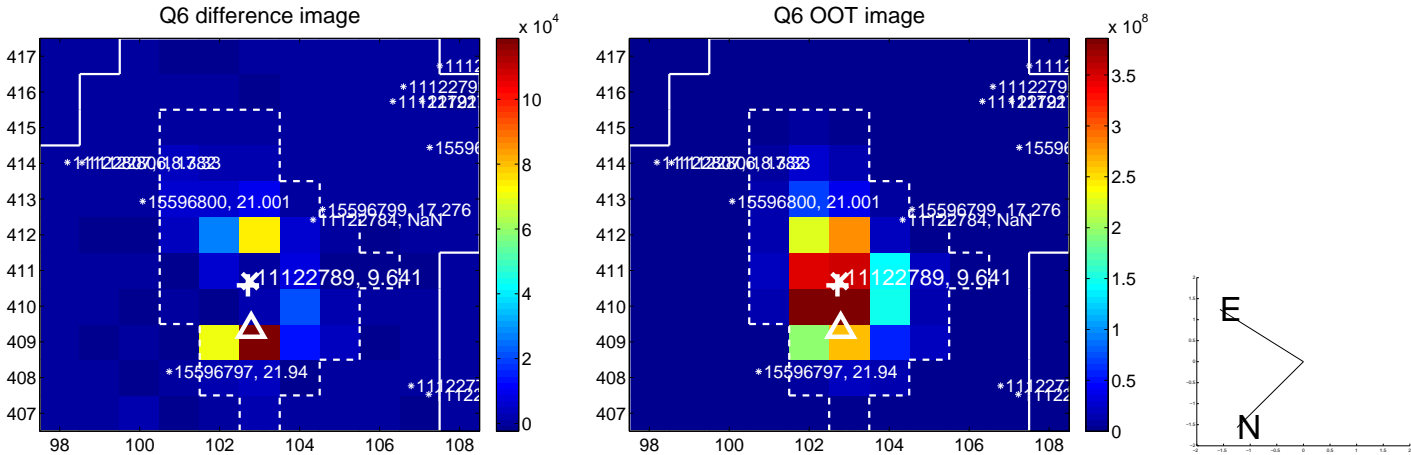
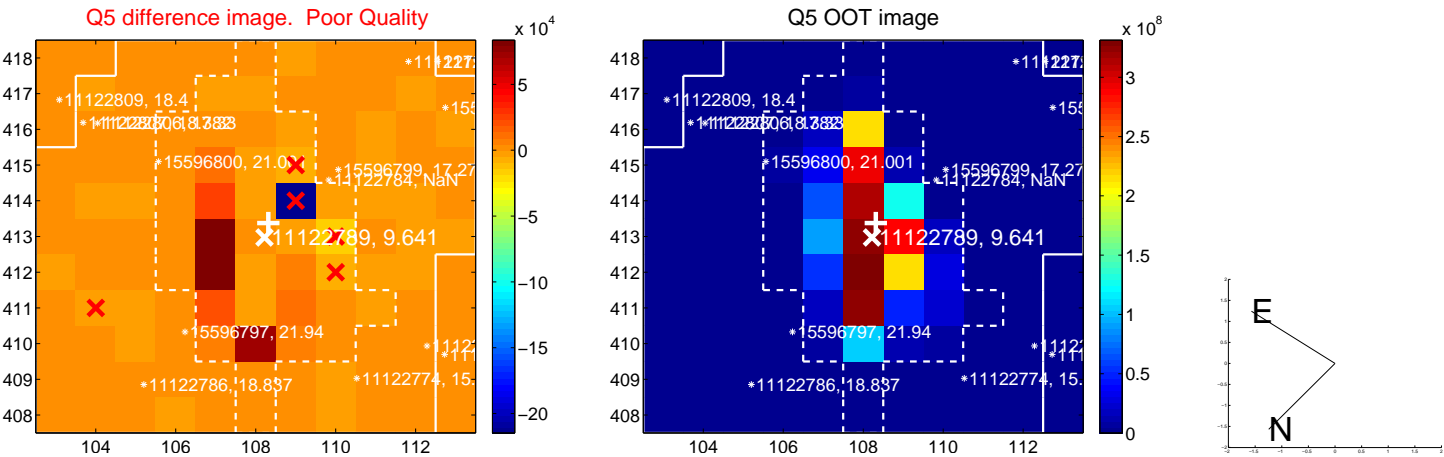


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

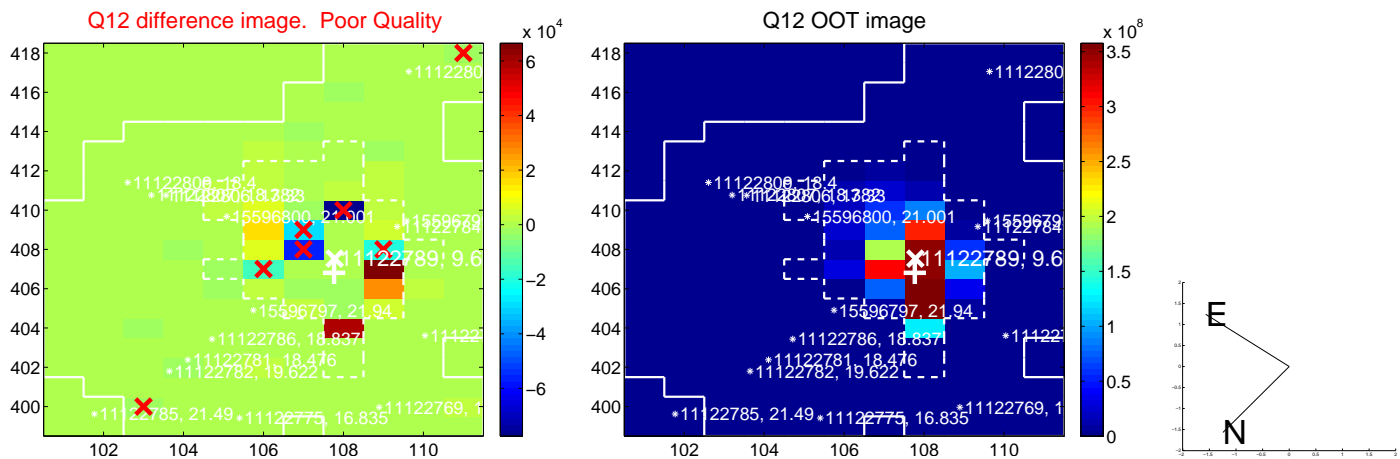
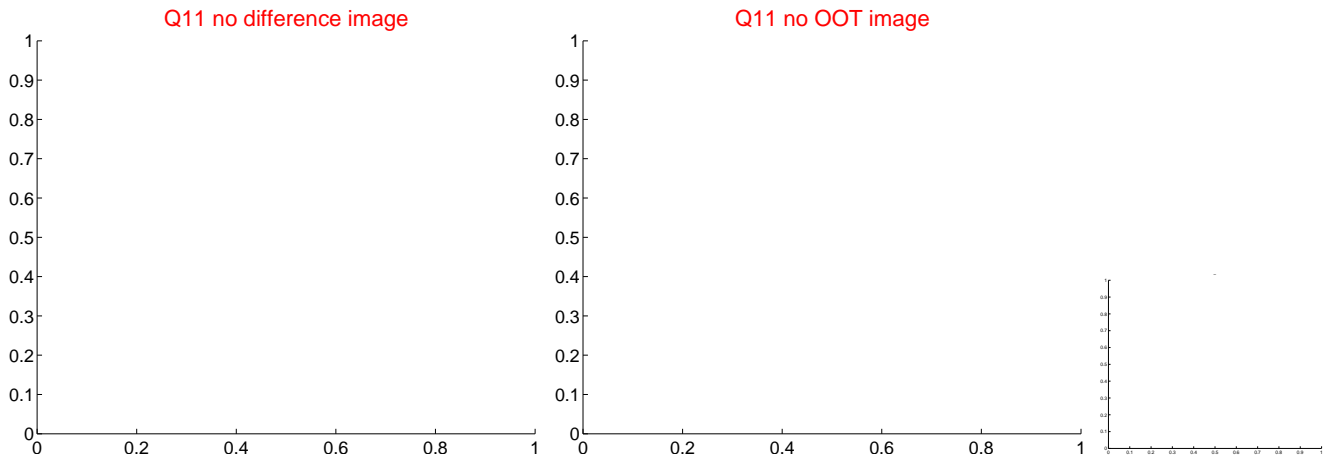
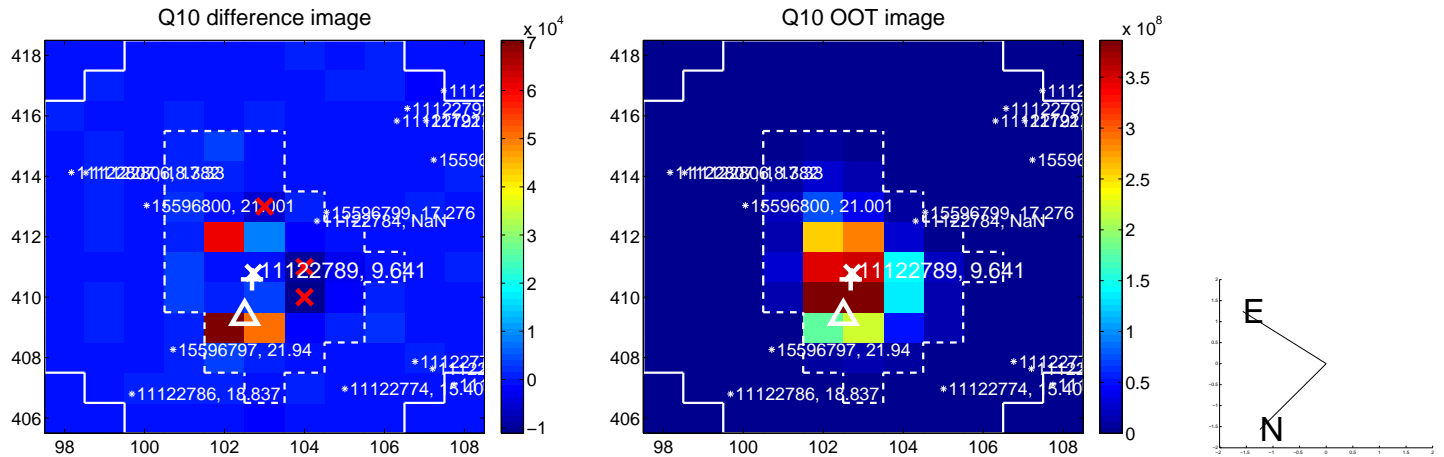
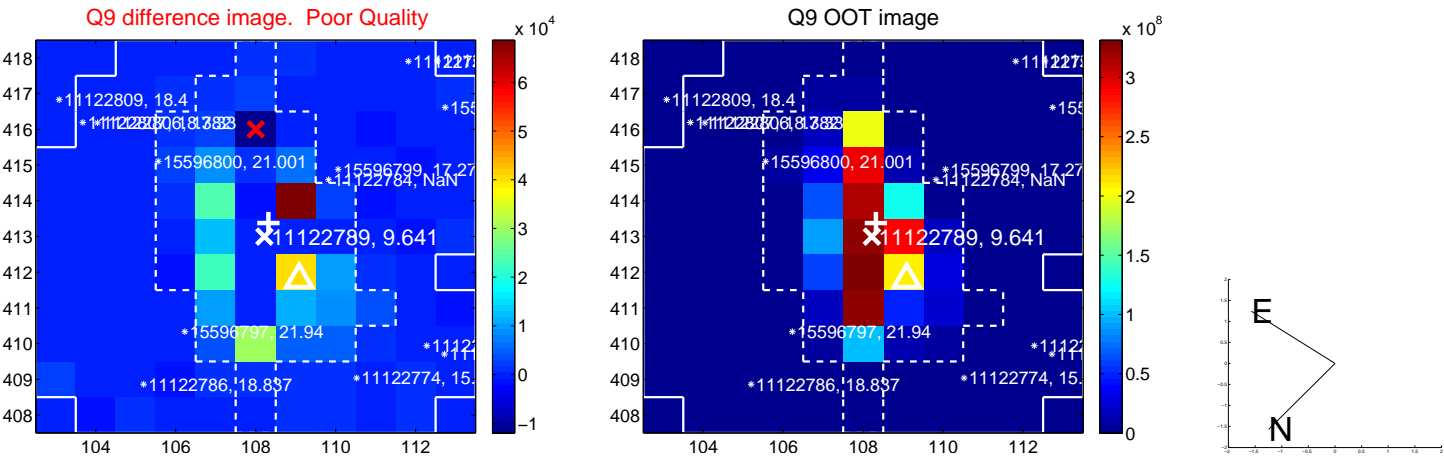
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

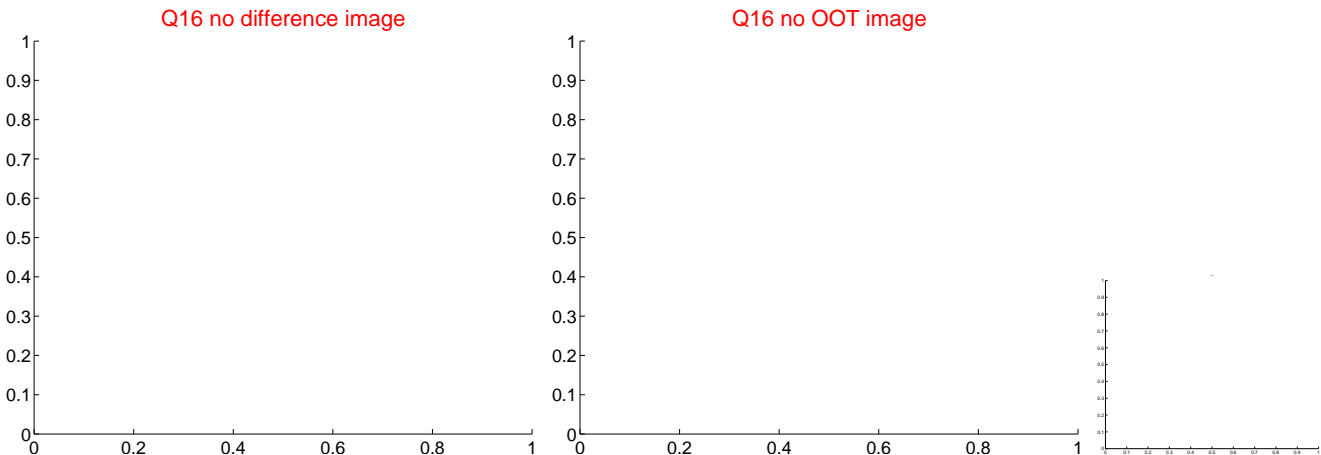
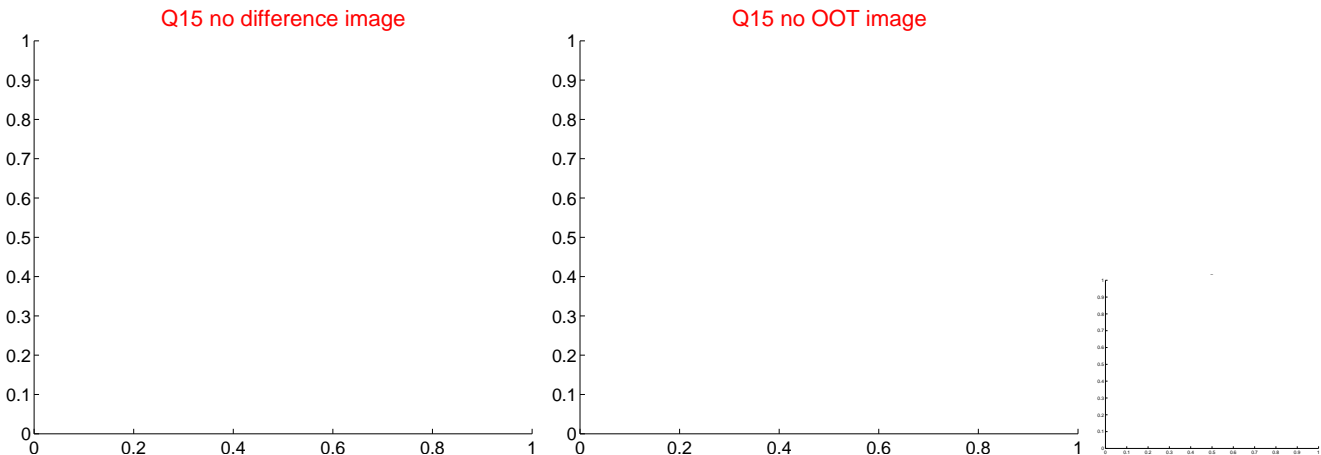
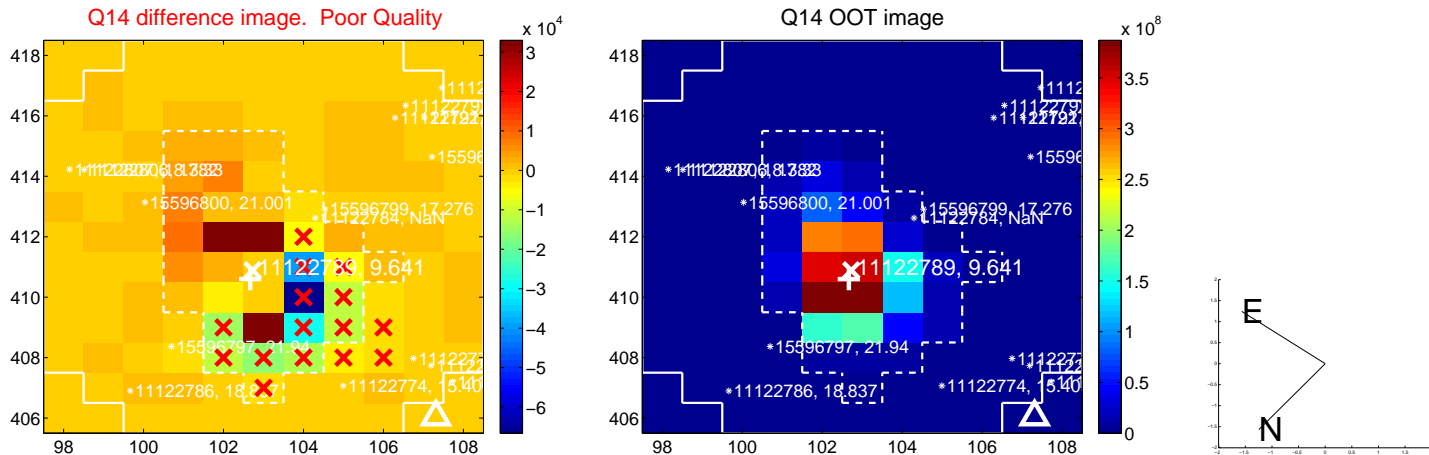
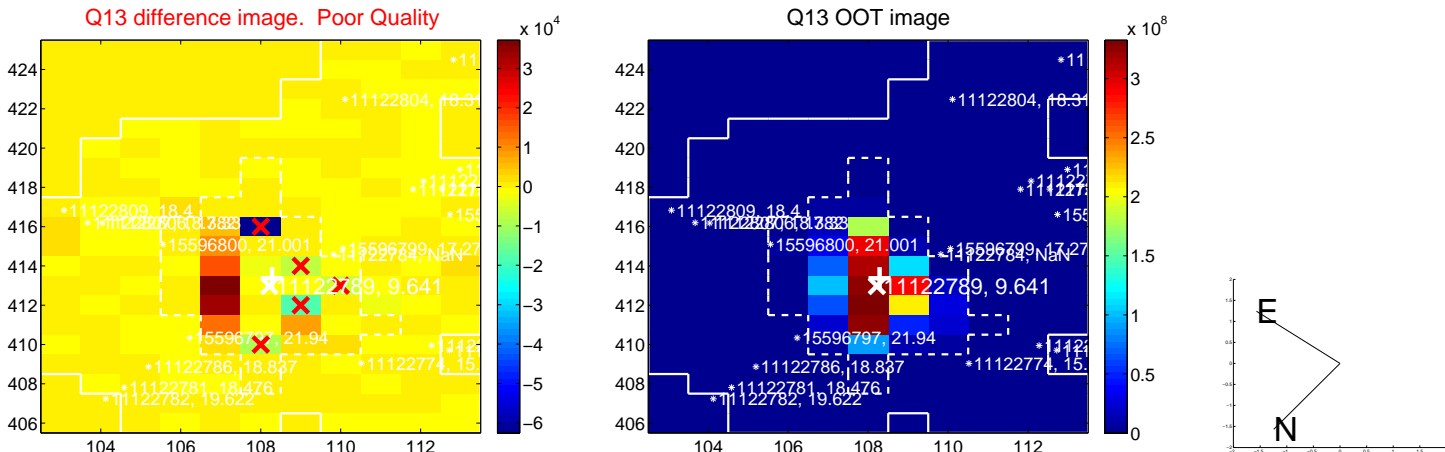


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

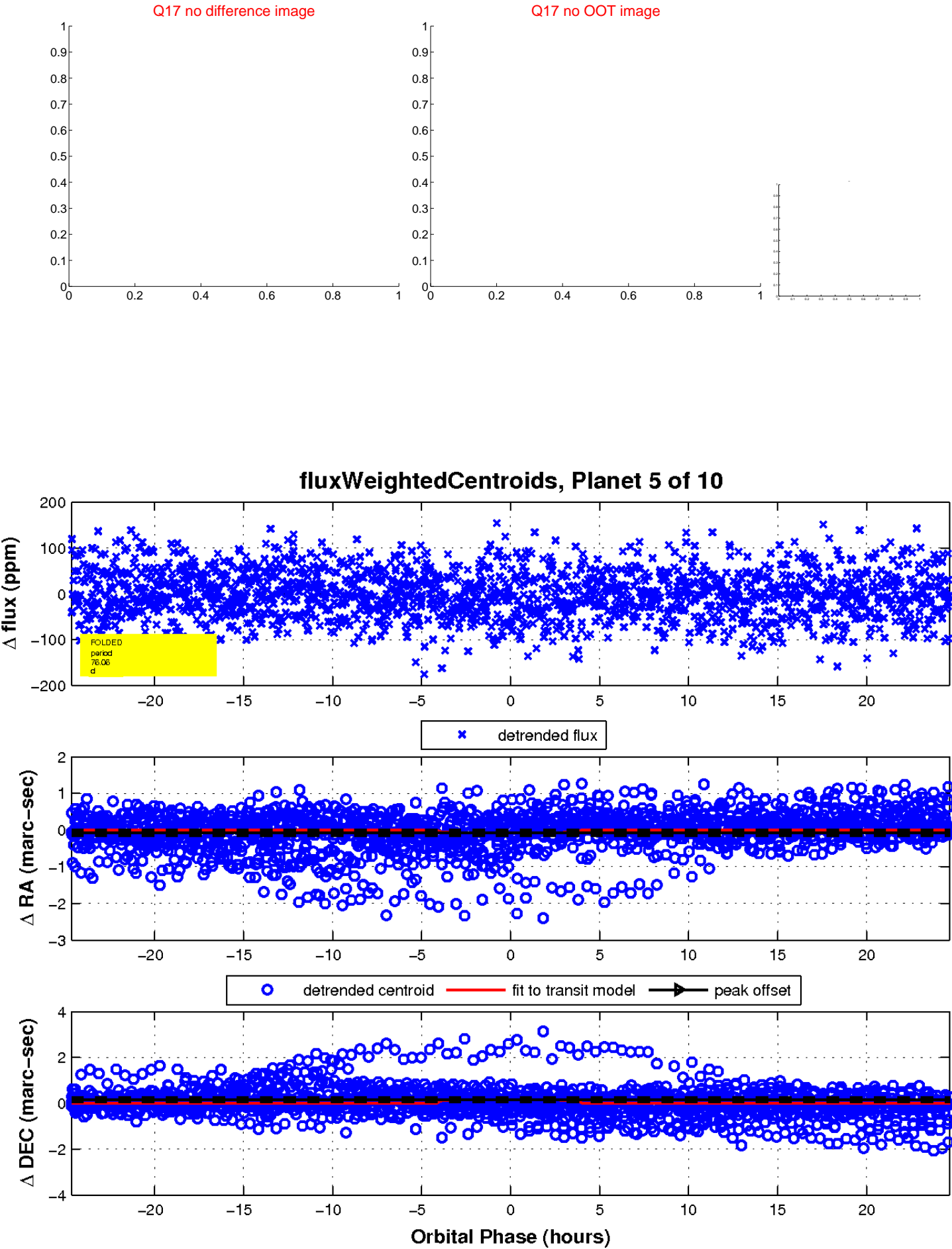




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

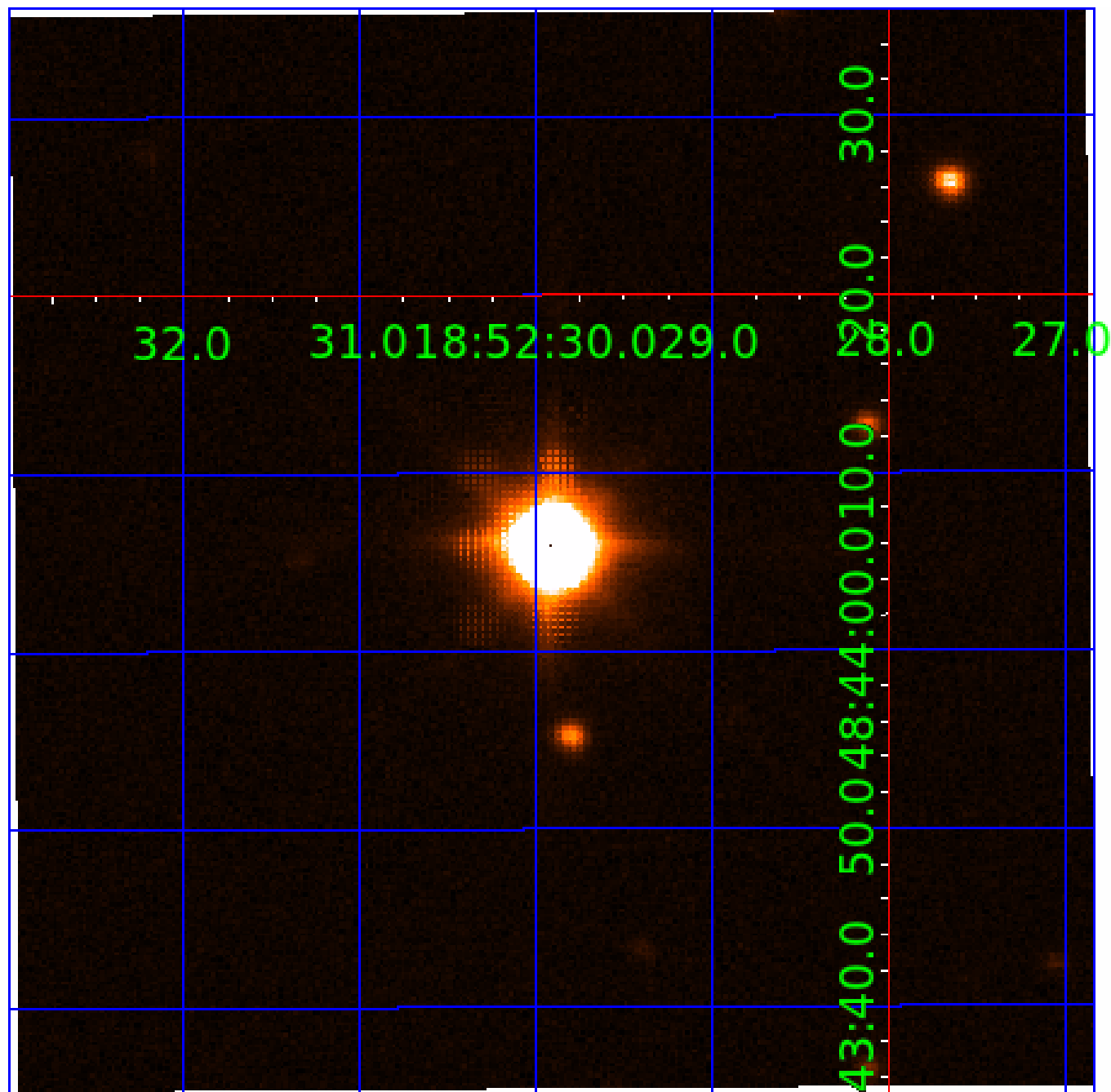


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

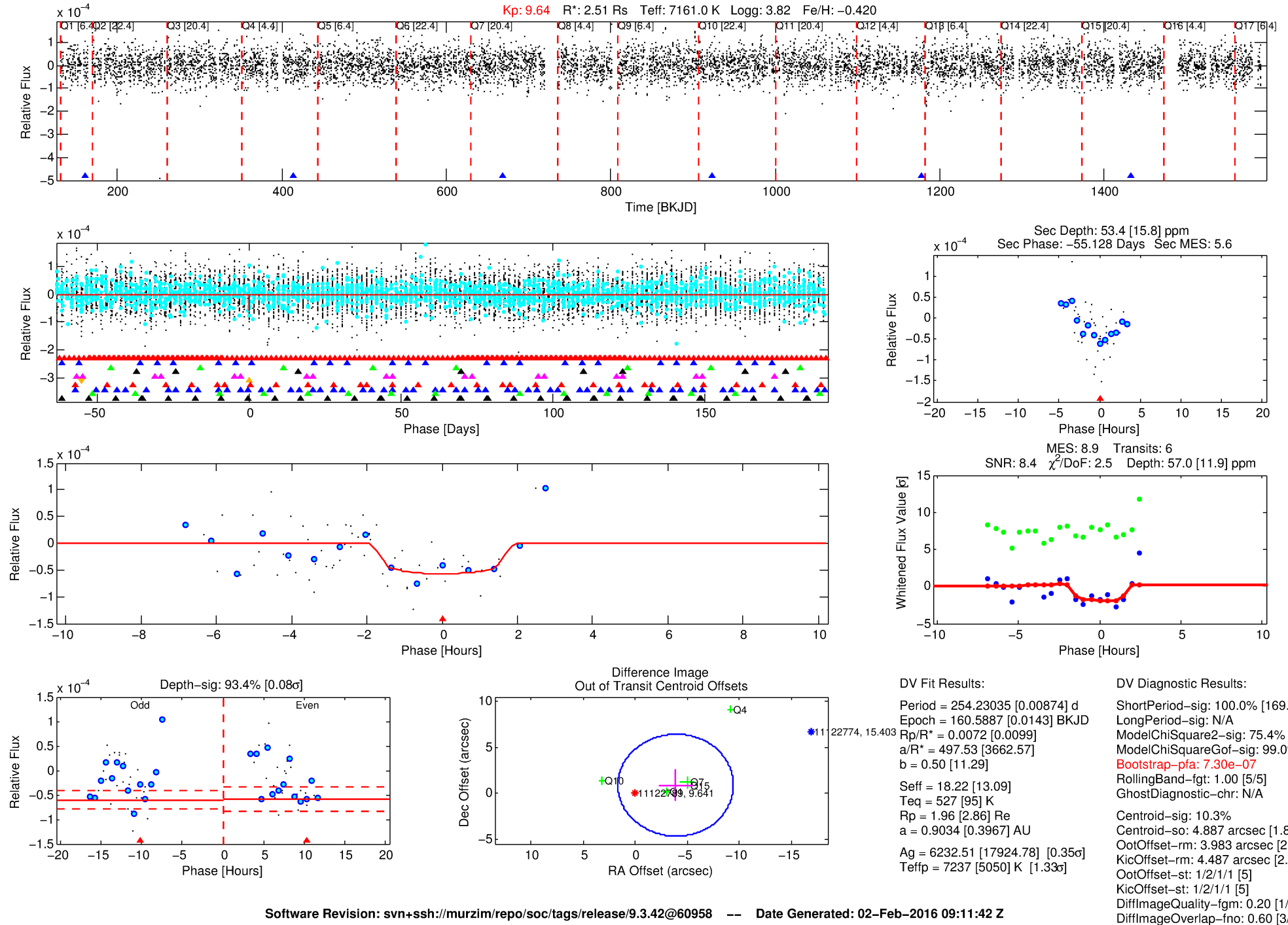
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-06

No Significant Match Found

# DV One-Page Summary

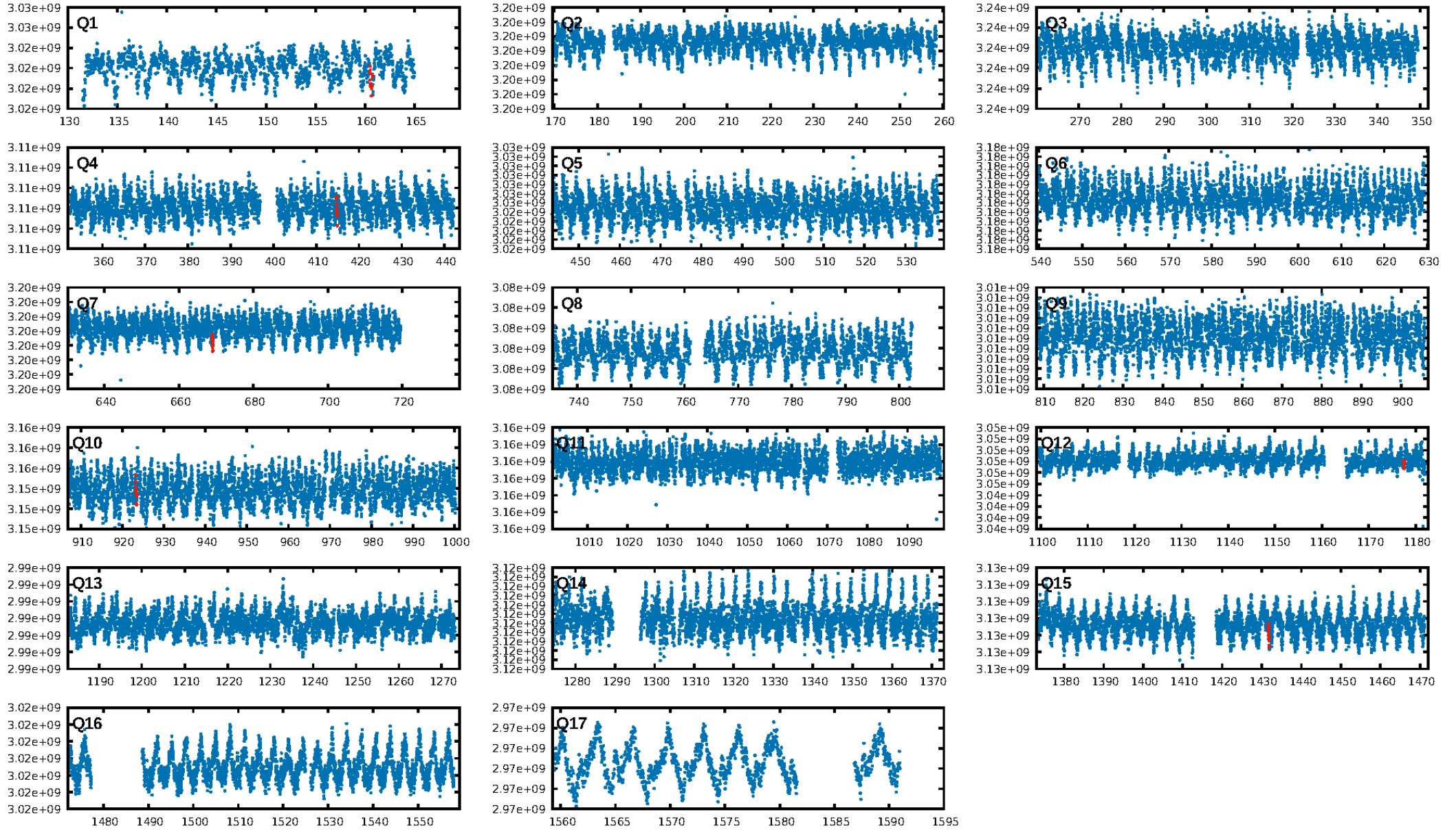
KIC: 11122789 Candidate: 6 of 10 Period: 254.230 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:42 Z

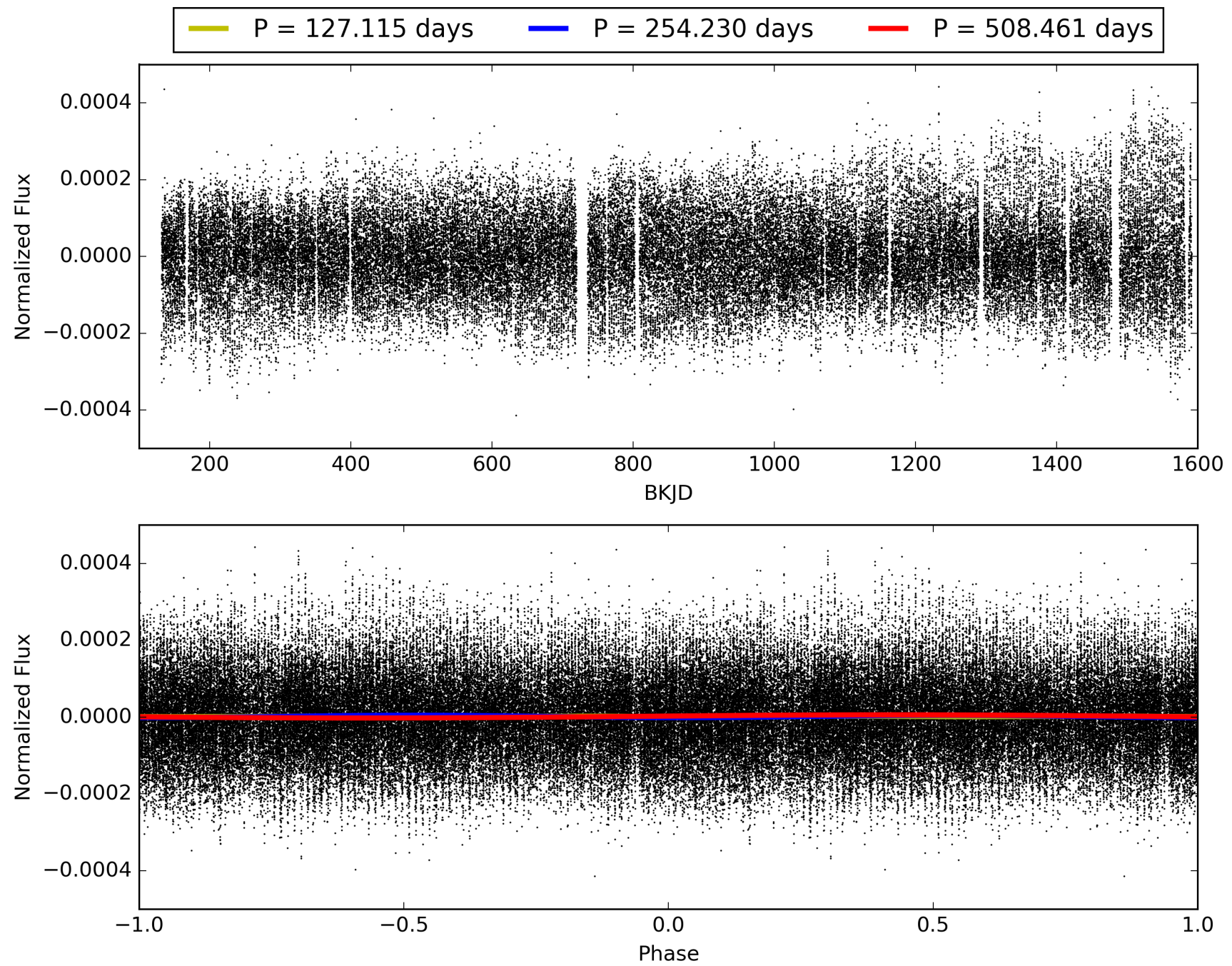
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011122789-06, PDC Light Curves





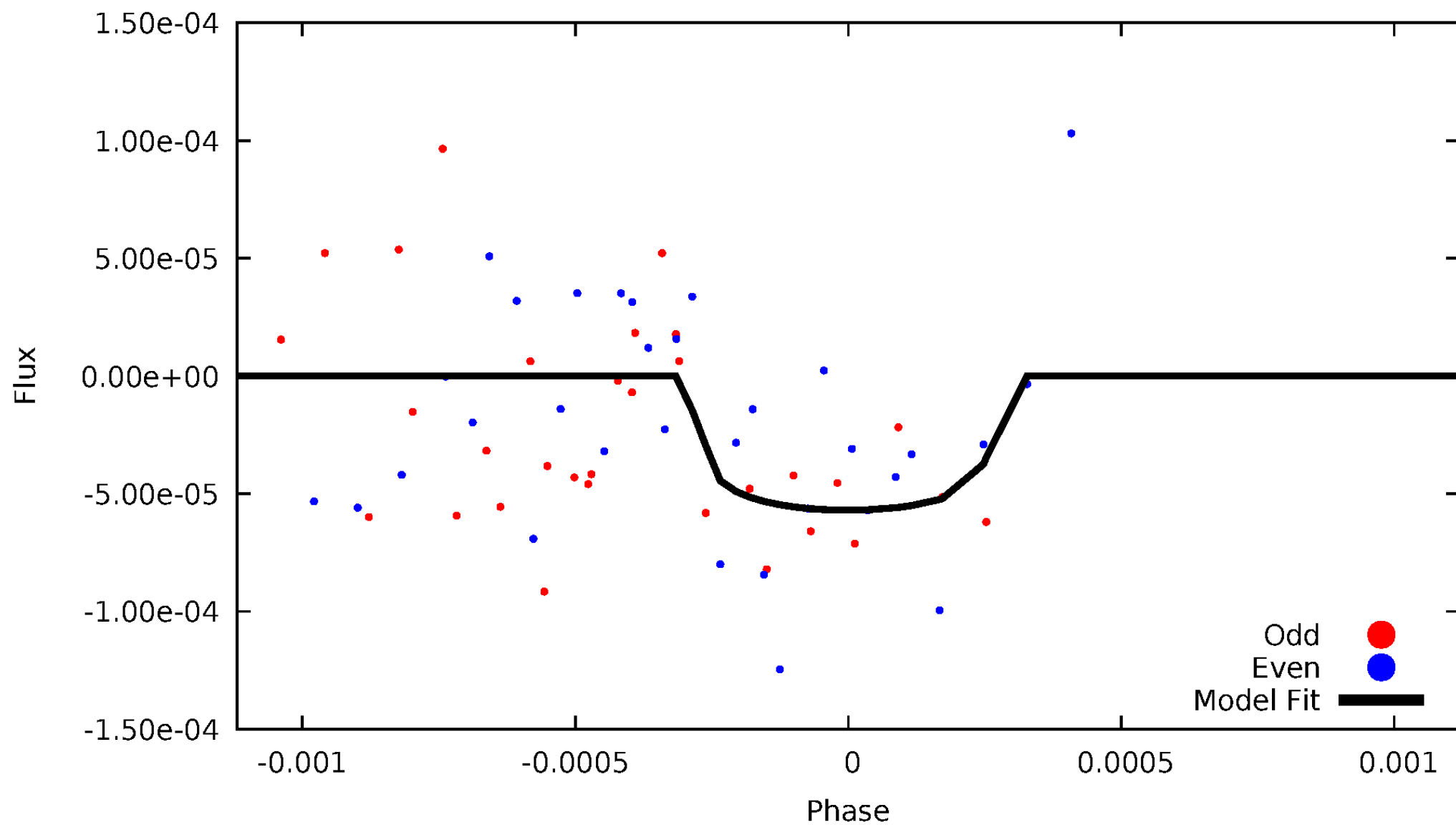
TCE 011122789-06





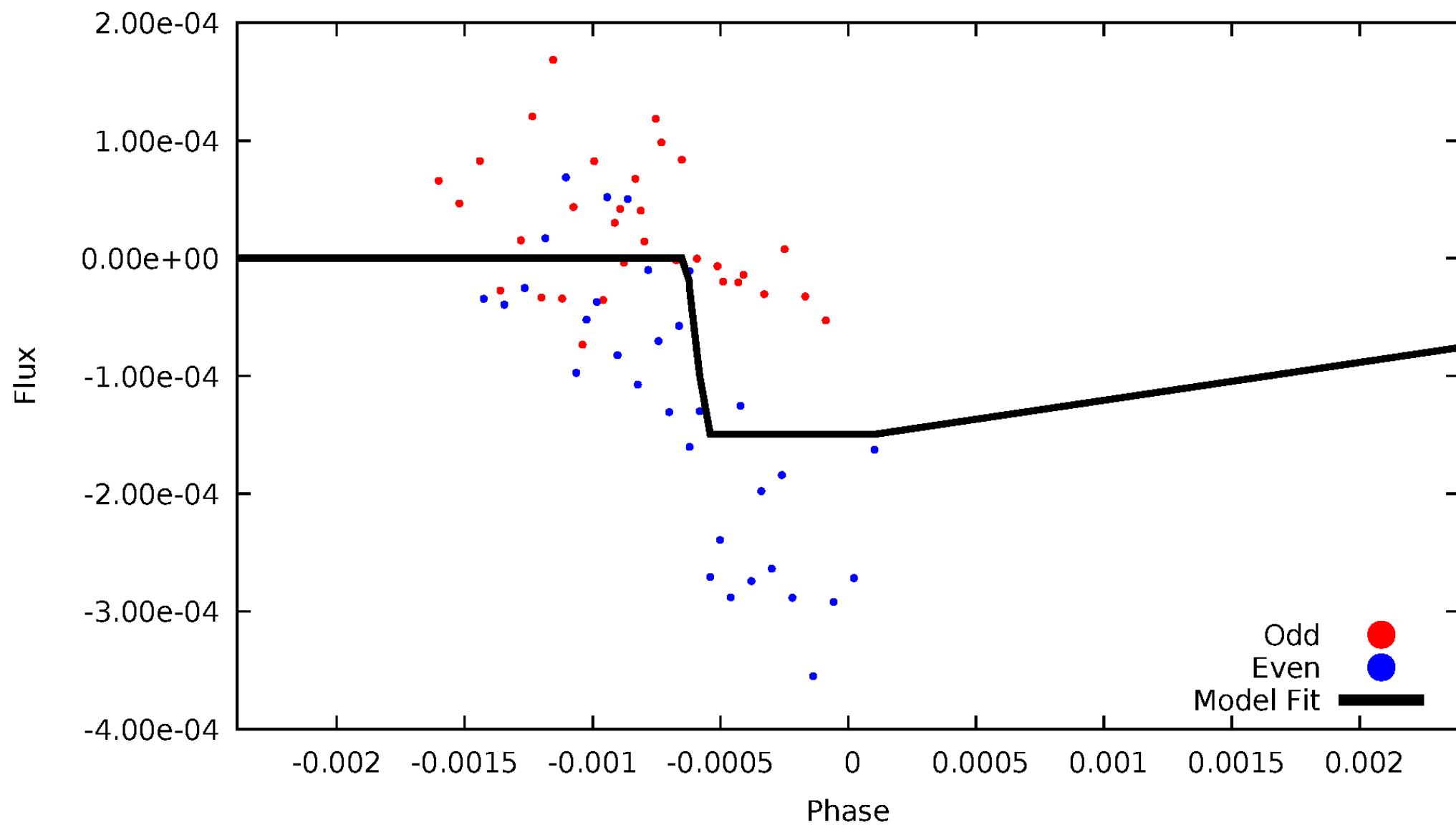
# DV Odd/Even

TCE 011122789-06



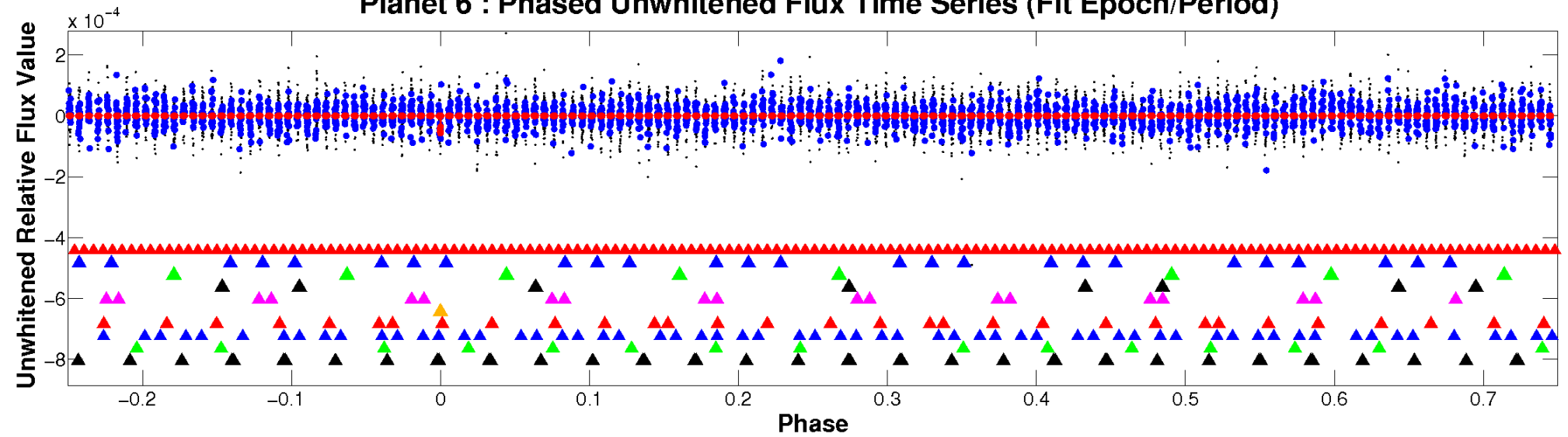
# ALT Odd/Even

TCE 011122789-06

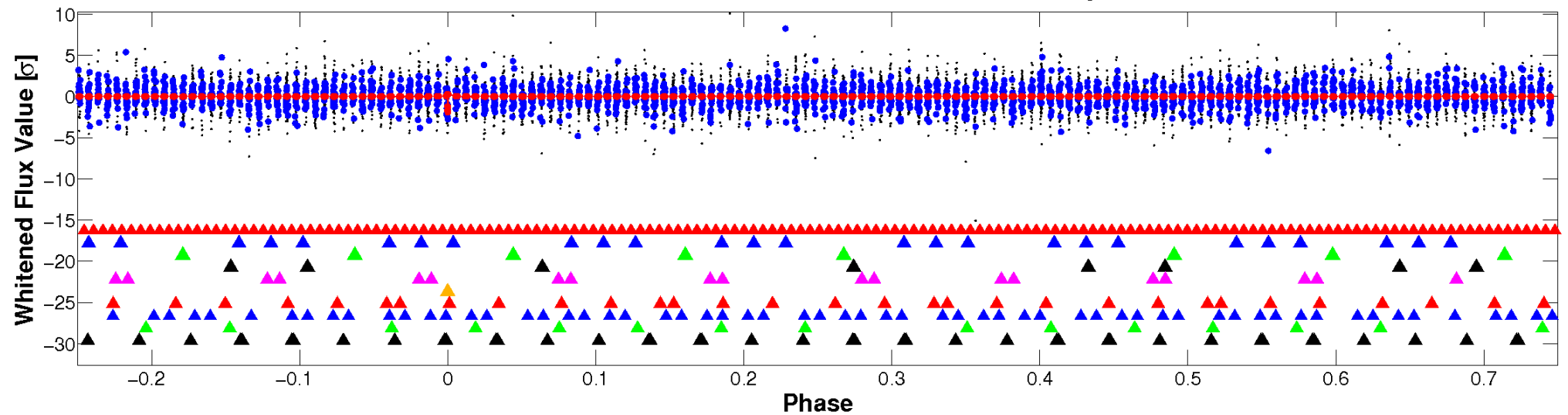


# Non-Whitened Vs. Whitened Light Curve

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

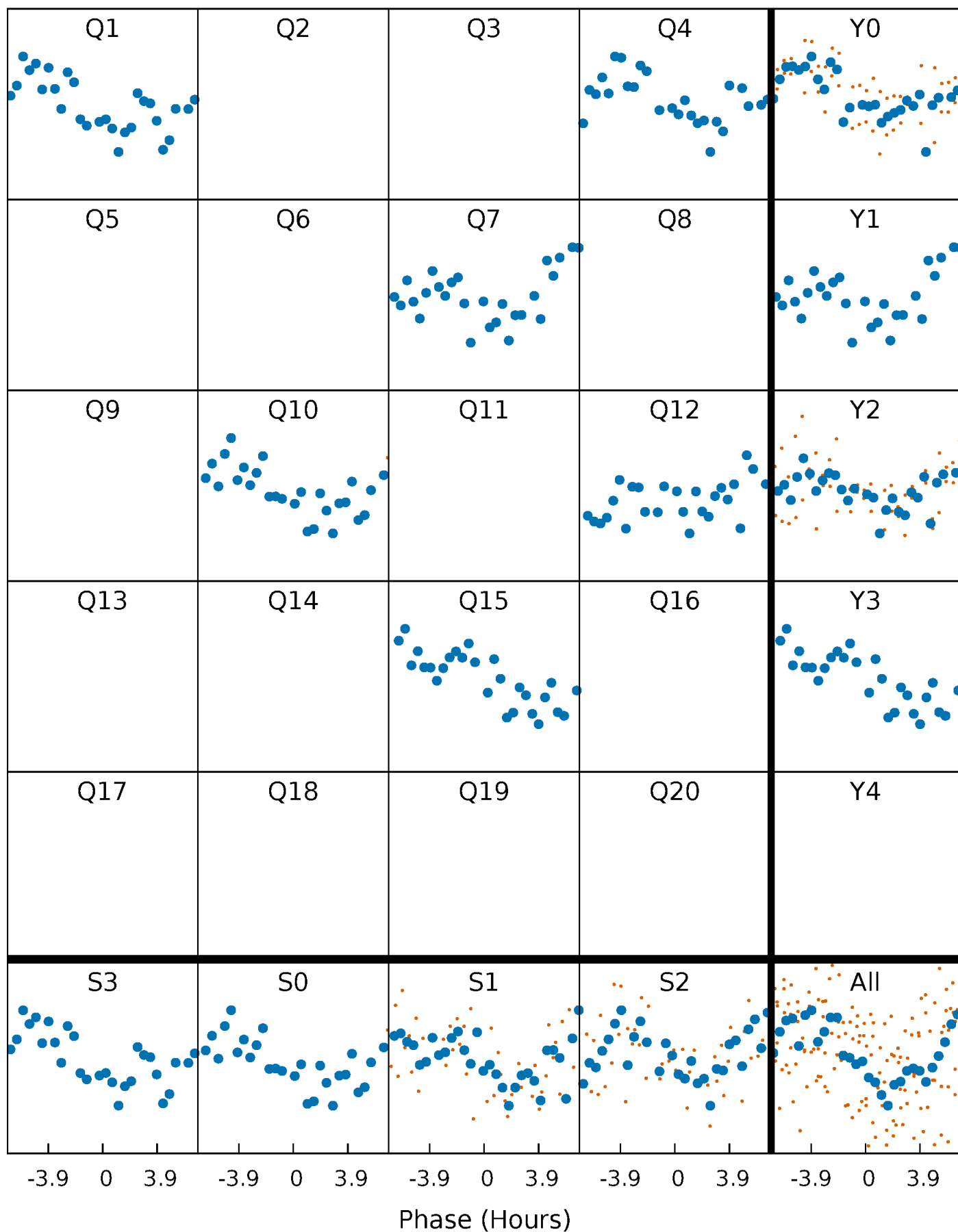


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



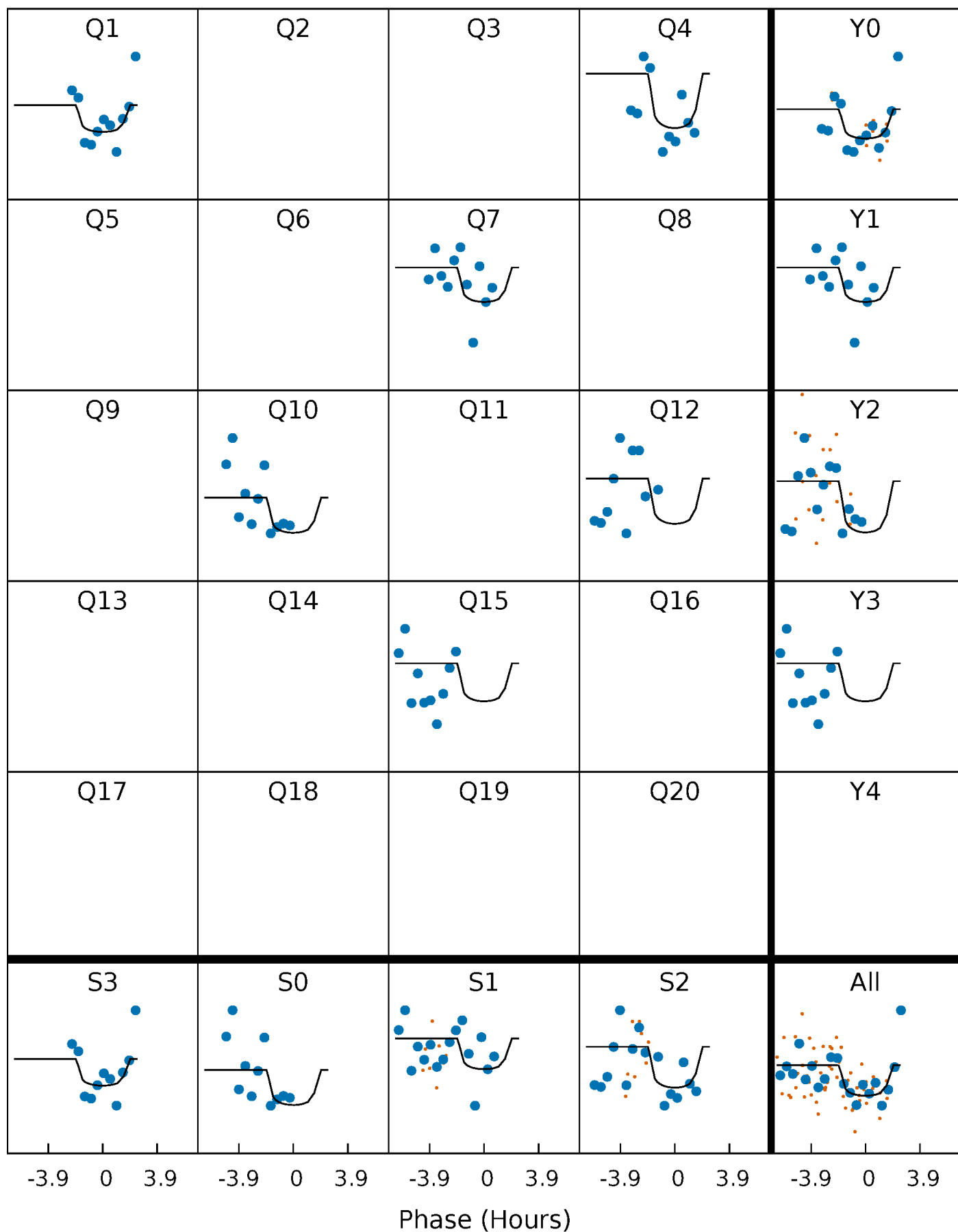
# PDC Quarter-Phased Transit Curves

TCE 011122789-06 P=254.230354 Days  $T_0=160.588659$  (BKJD)



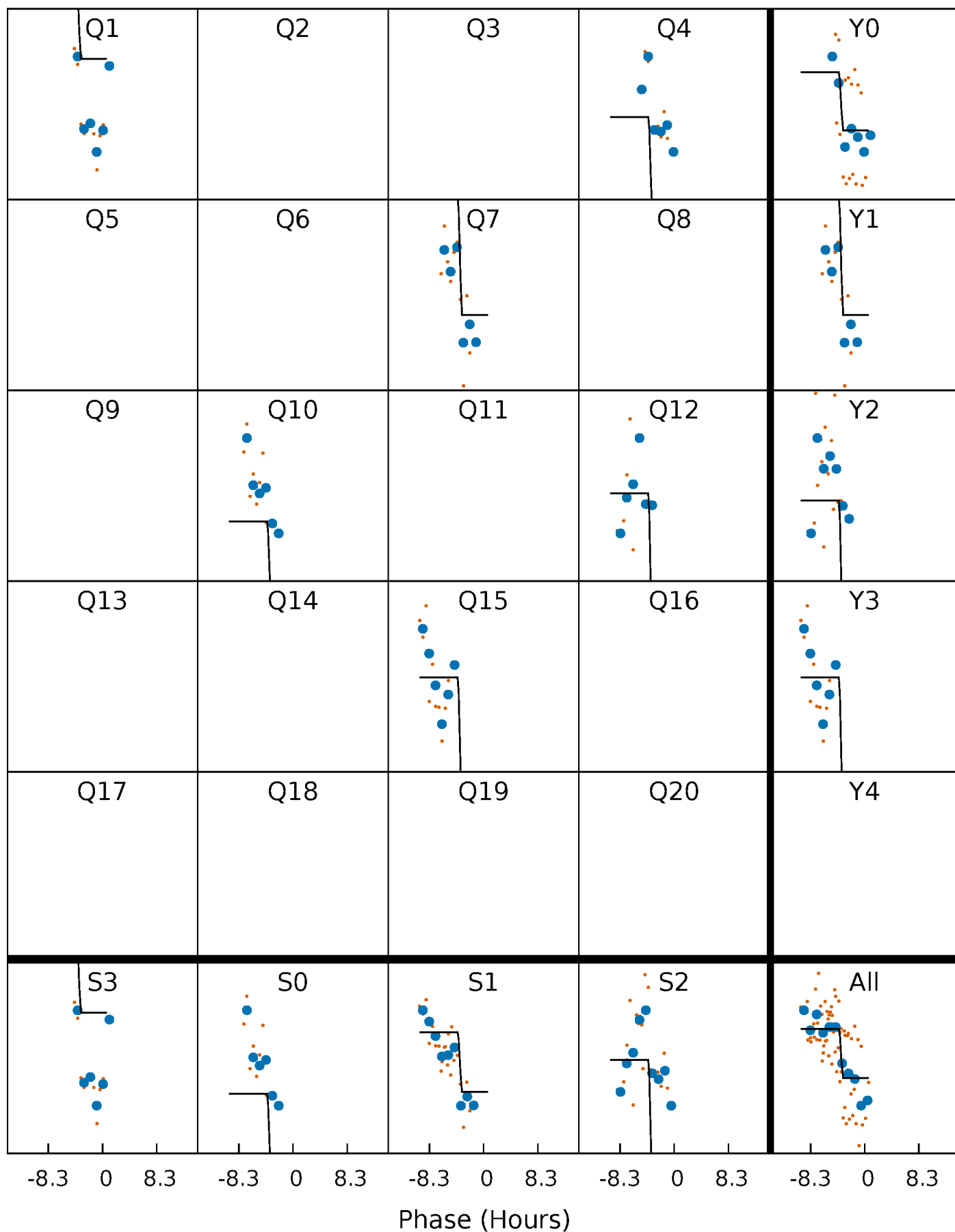
# DV Quarter-Phased Transit Curves

TCE 011122789-06 P=254.230354 Days  $T_0=160.588659$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

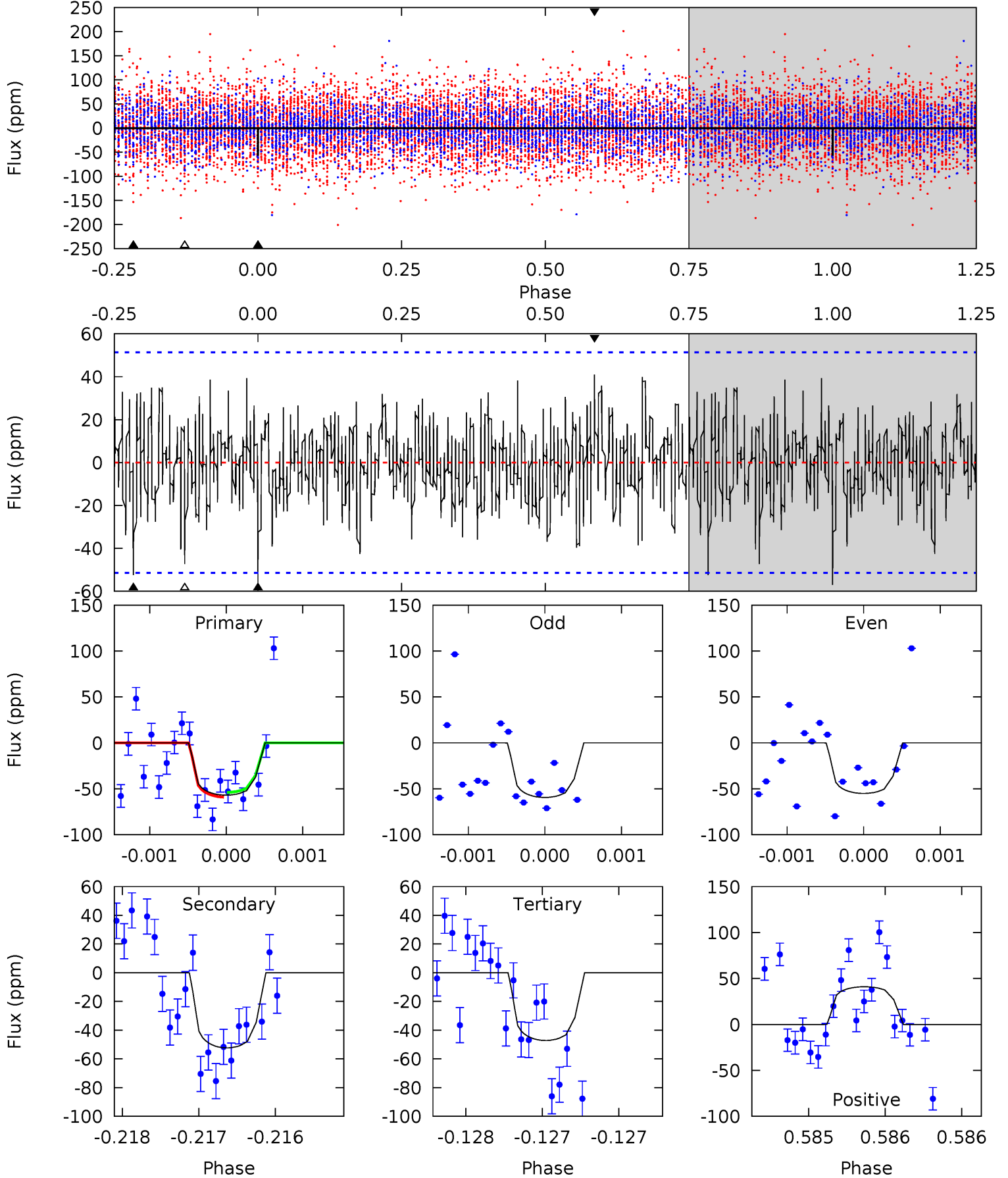
TCE 011122789-06 P=254.239331 Days  $T_0=160.666286$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-06, P = 254.230354 Days, E = 160.588659 Days

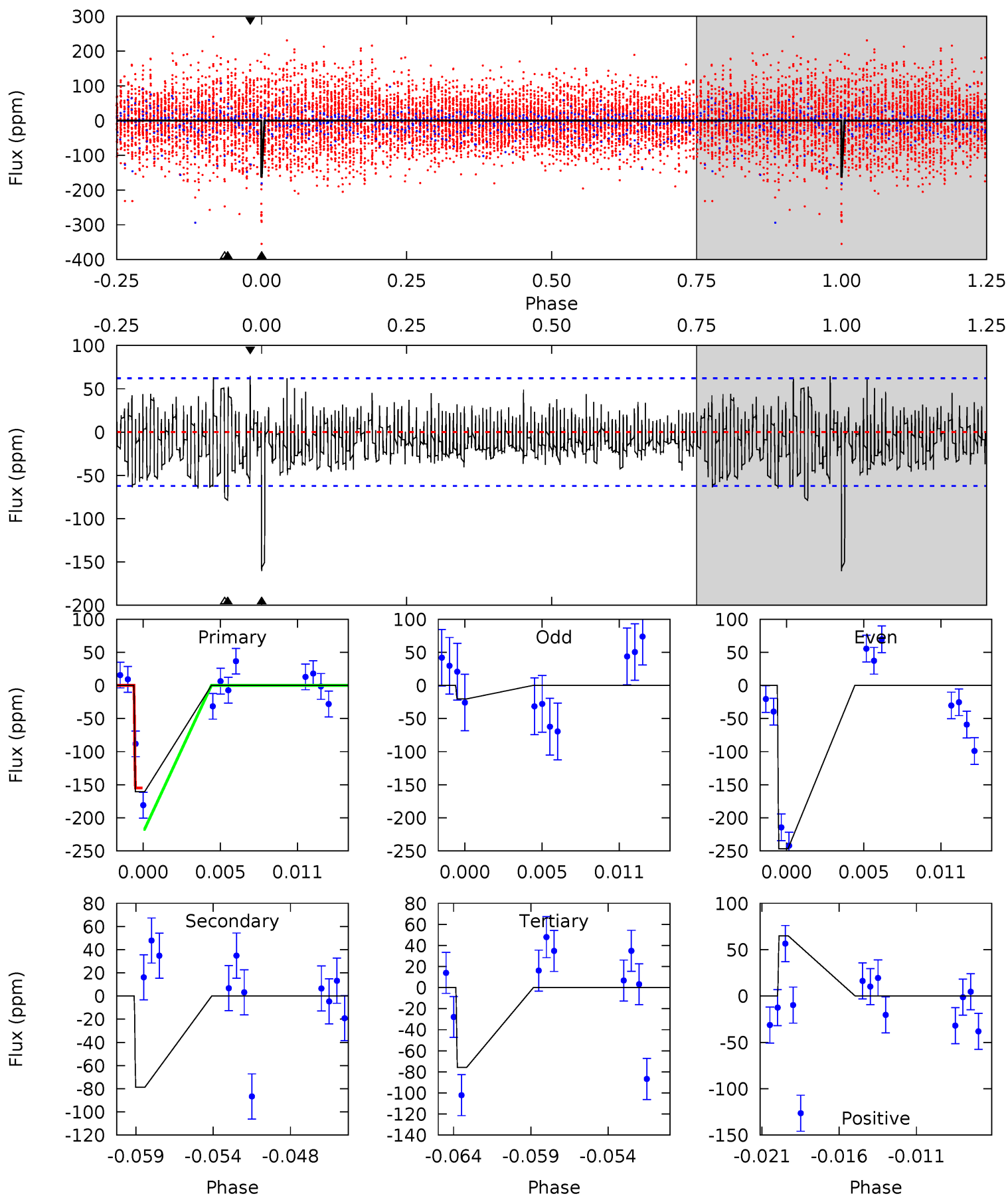
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.12	5.63	5.08	4.41	5.53	3.41	1.55	1.05	1.71	0.56	1.22	0.23	0.99	0.42	0.27



# Alt Model-Shift Uniqueness Test

011122789-06, P = 254.239331 Days, E = 160.666286 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
13.3	6.50	6.27	5.35	5.14	2.78	1.61	7.01	7.92	0.23	1.15	9.11	1.18	0.29	1.42





### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-52 \pm 9$	$2.55^{+2.18}_{-1.63}$	$718^{+49}_{-82}$	$5936^{+5150}_{-1369}$	$3586^{+23718}_{-2563}$
Alt.	$-79 \pm 12$	$3.44^{+2.61}_{-2.07}$	$717^{+52}_{-85}$	$5657^{+3675}_{-1111}$	$2965^{+14952}_{-1979}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

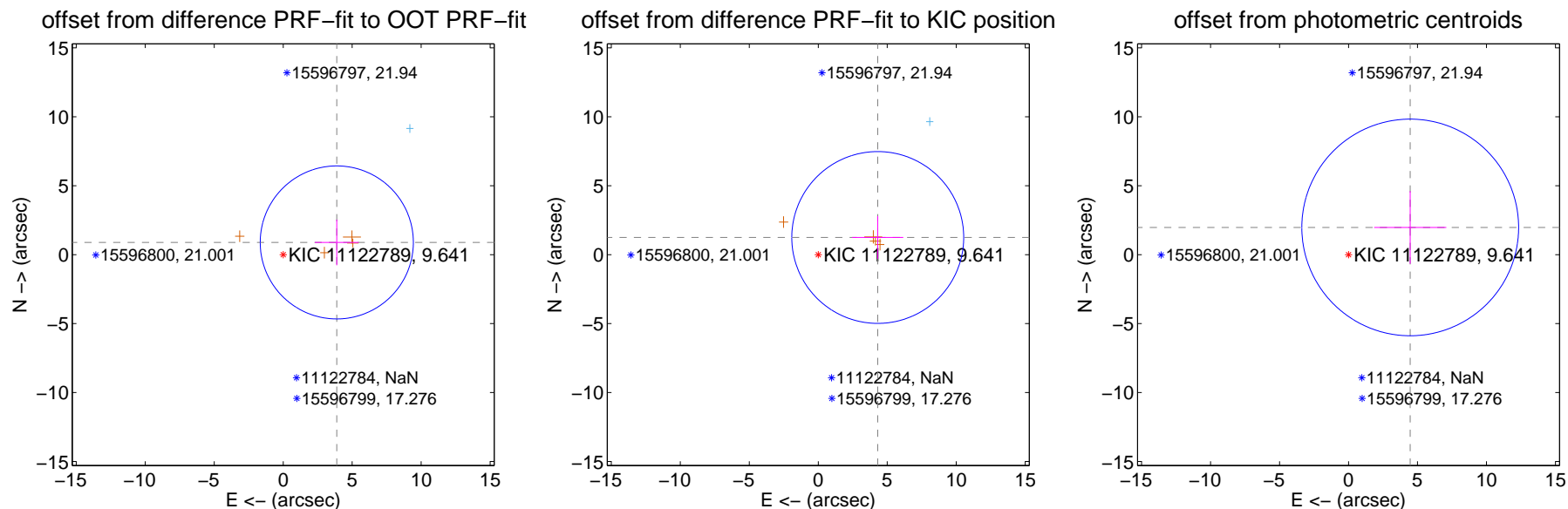
## DV Centroid Data

Supplemental centroid analysis for 011122789-06. **Kepler magnitude: 9.64.** Transit SNR 8.35

**There are 1 quarters with good PRF difference image offsets**

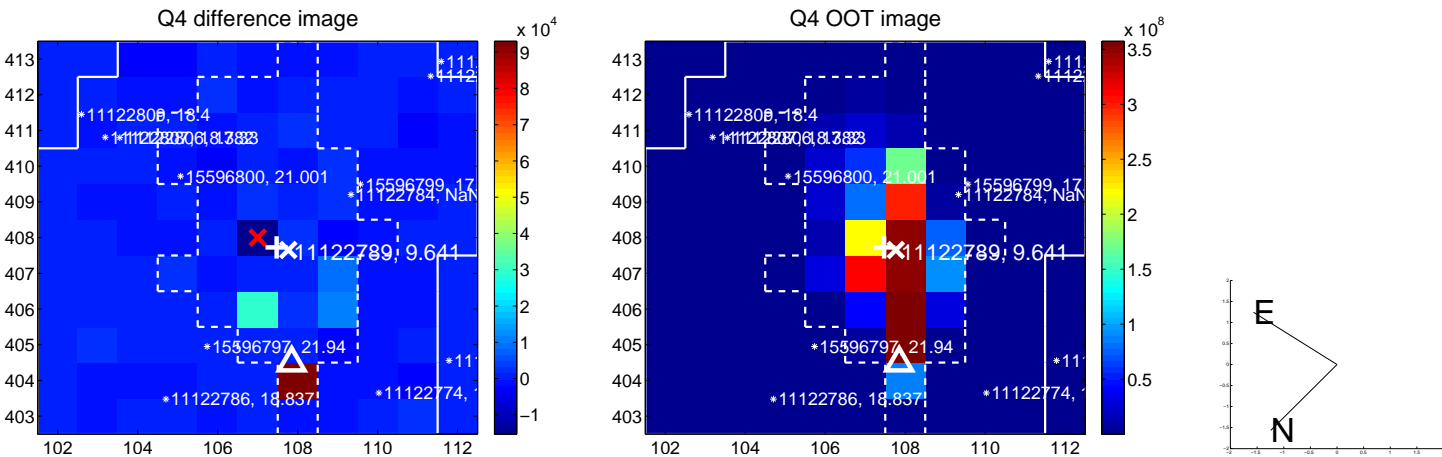
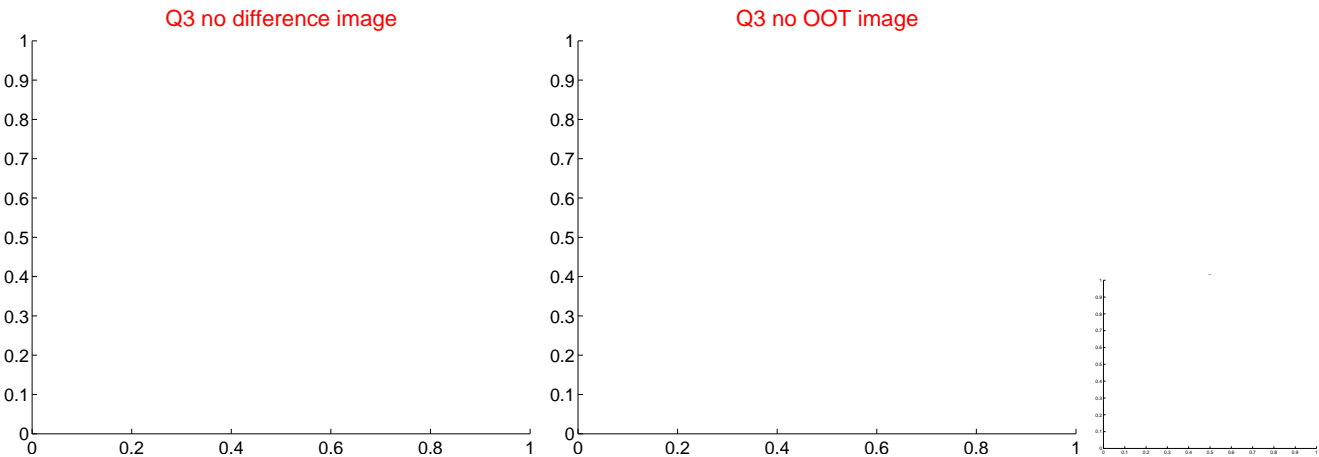
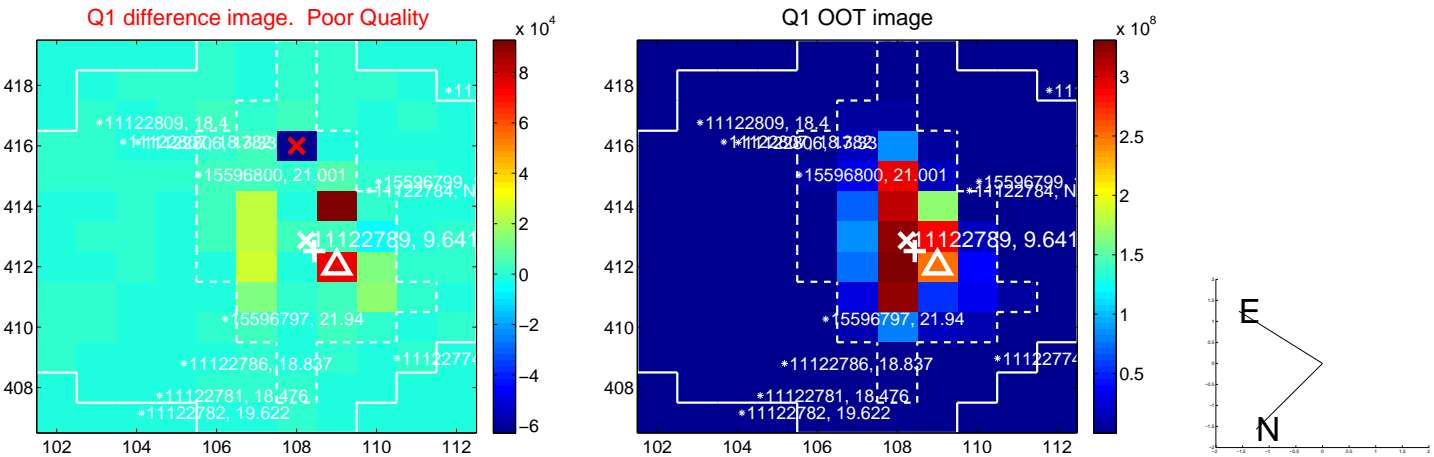
The direct PRF centroid is offset from the target star catalog position by about 0.91 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.983 \pm 1.849$	2.15	$-3.883 \pm 1.590$	$0.887 \pm 1.655$
PRF-fit source offset from KIC position	$4.487 \pm 2.076$	2.16	$-4.311 \pm 1.854$	$1.246 \pm 1.552$
photometric centroid source offset	$4.89 \pm 2.62$	1.87	$-4.47 \pm 2.61$	$1.97 \pm 2.64$



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

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



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

Q5 no difference image



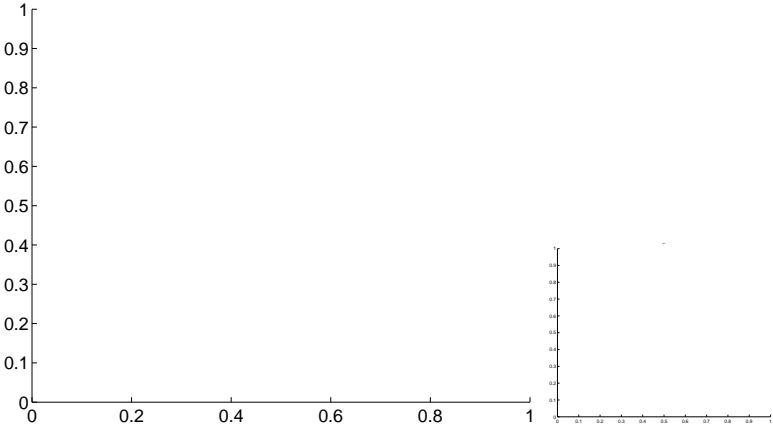
Q5 no OOT image



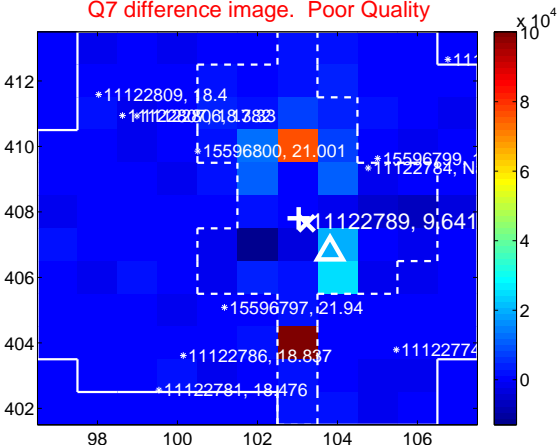
Q6 no difference image



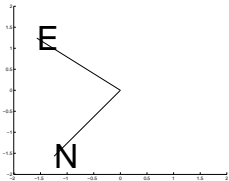
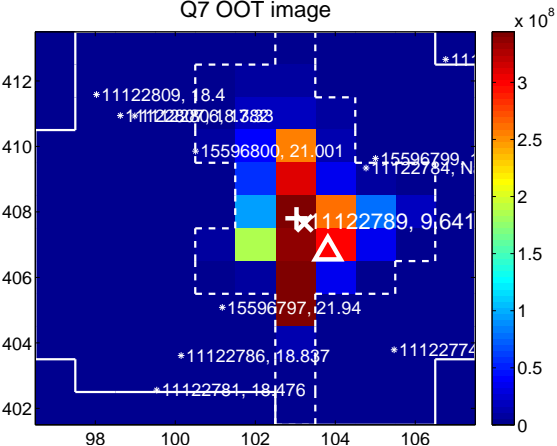
Q6 no OOT image



Q7 difference image. Poor Quality



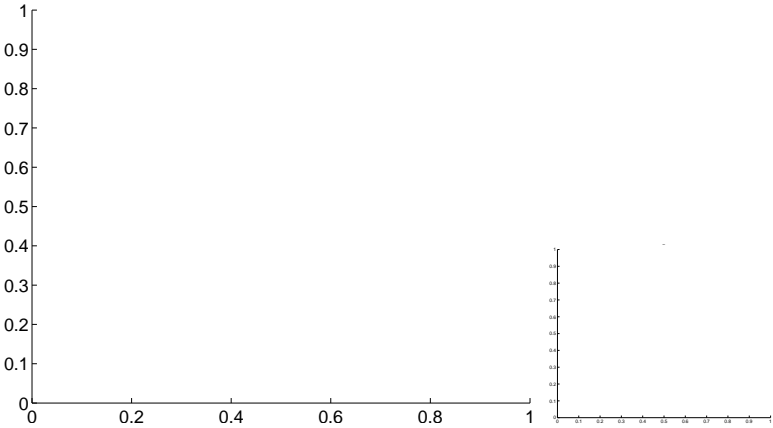
Q7 OOT image



Q8 no difference image



Q8 no OOT image



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

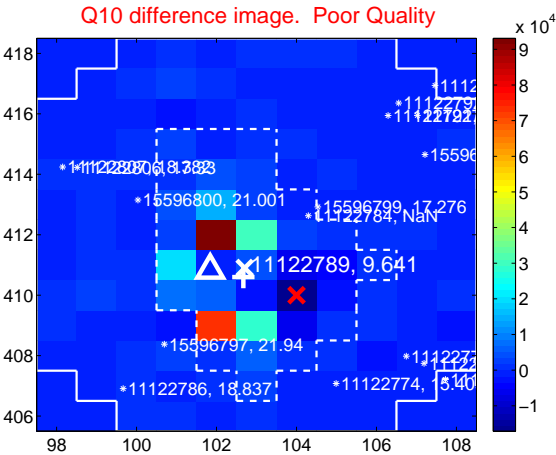
Q9 no difference image



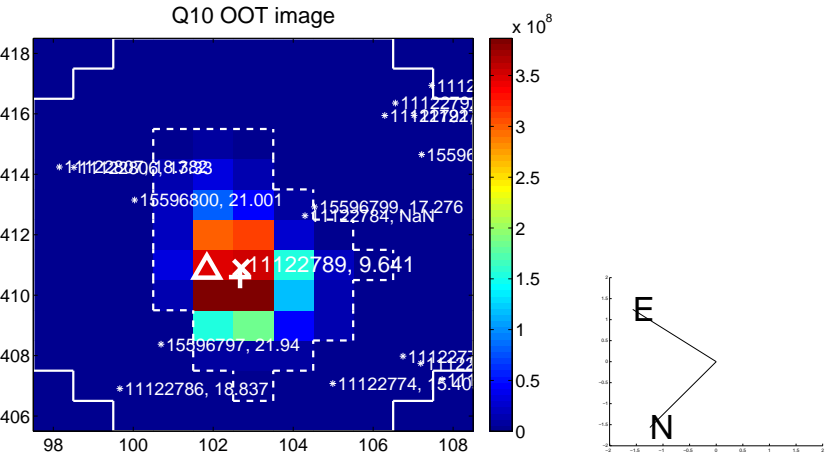
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



Q12 no OOT image



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

Q13 no difference image



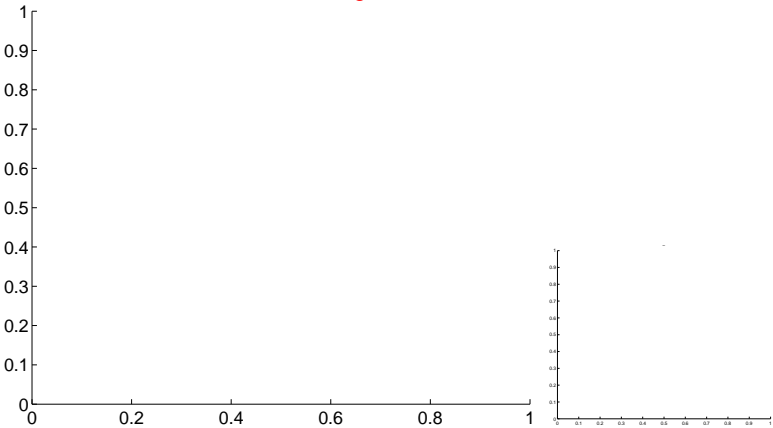
Q13 no OOT image



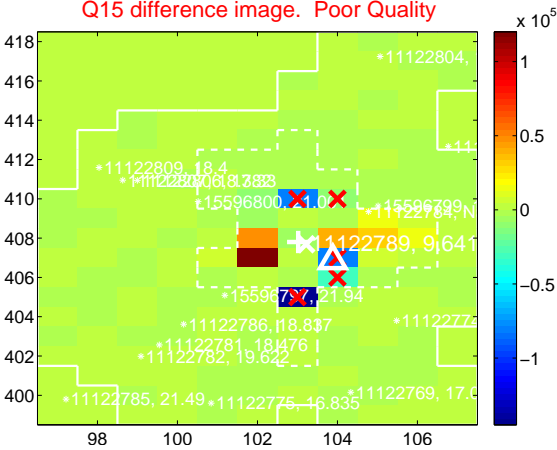
Q14 no difference image



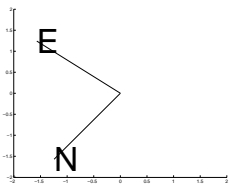
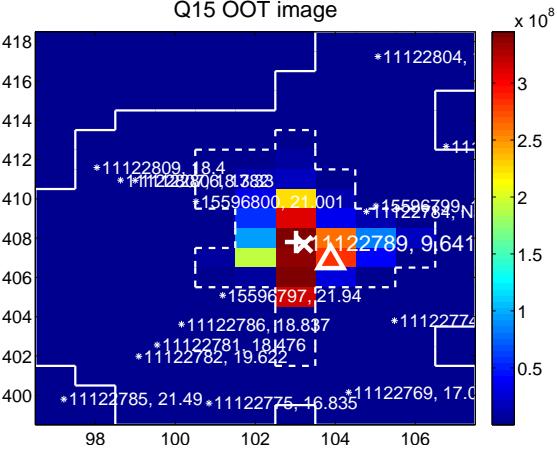
Q14 no OOT image



Q15 difference image. Poor Quality



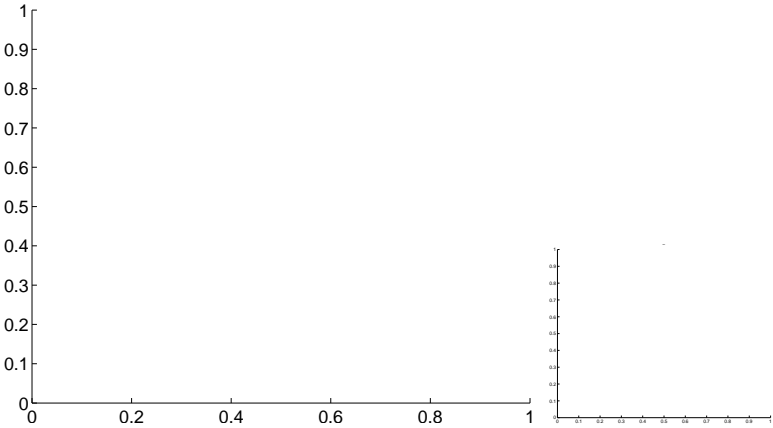
Q15 OOT image



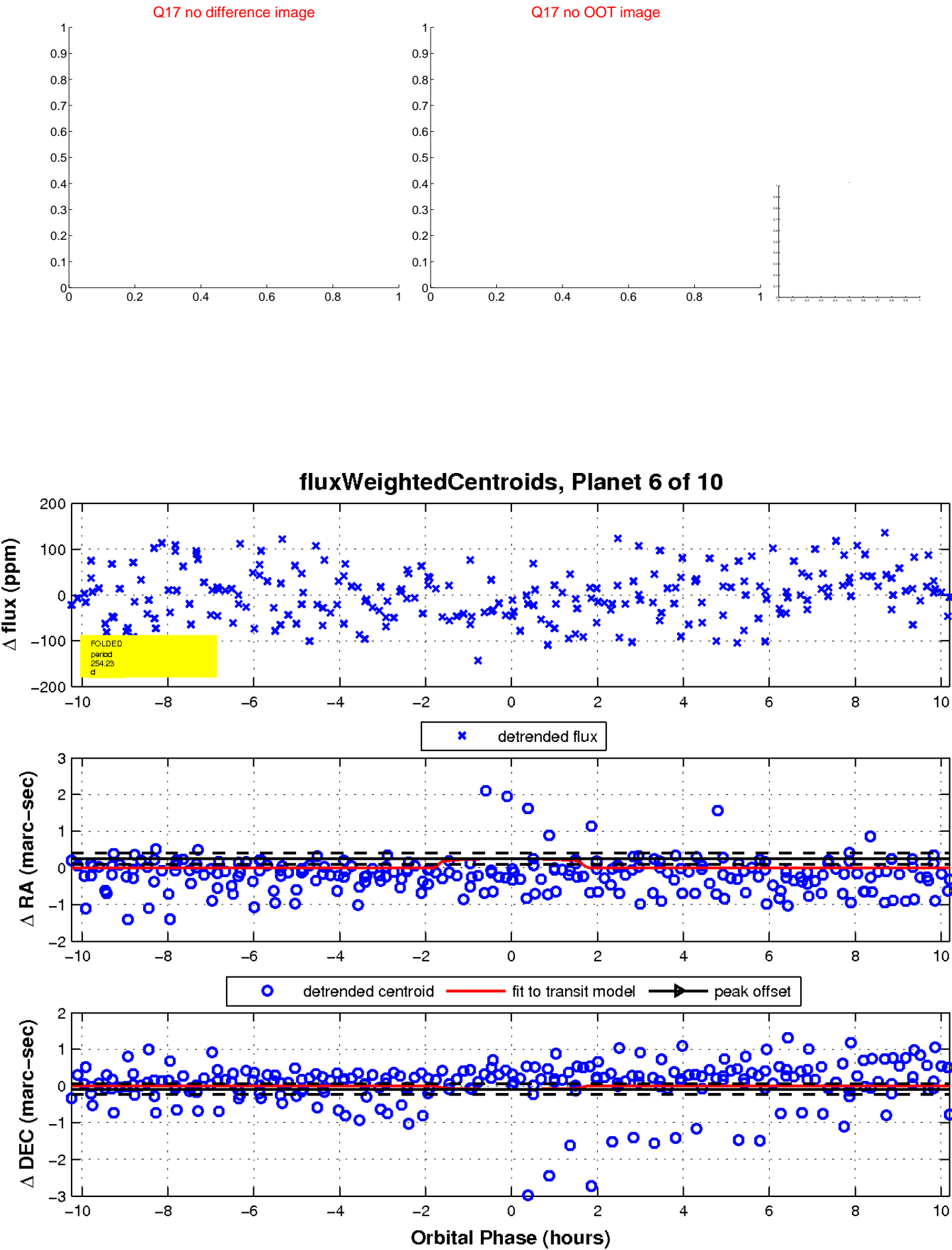
Q16 no difference image



Q16 no OOT image

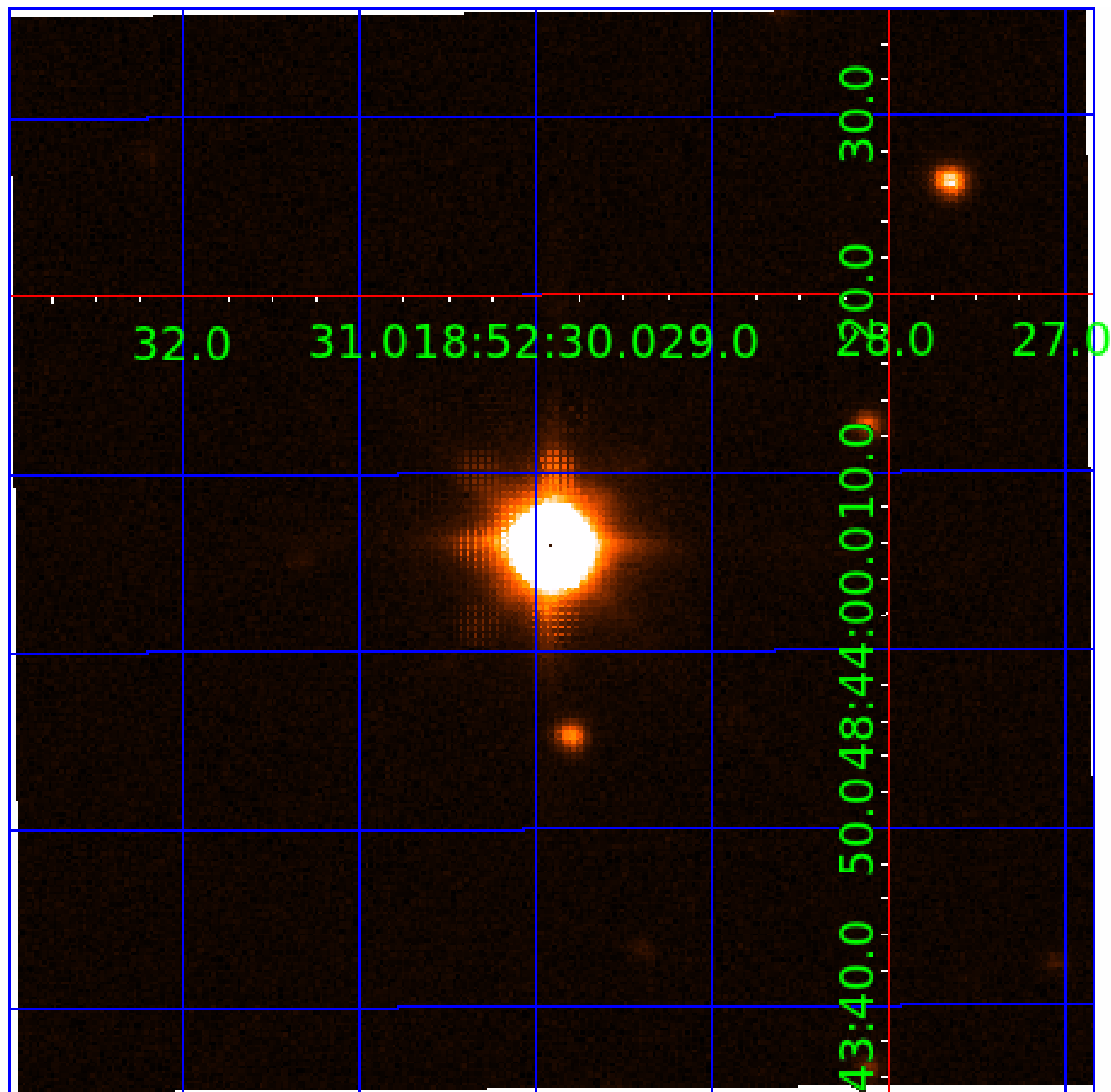


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

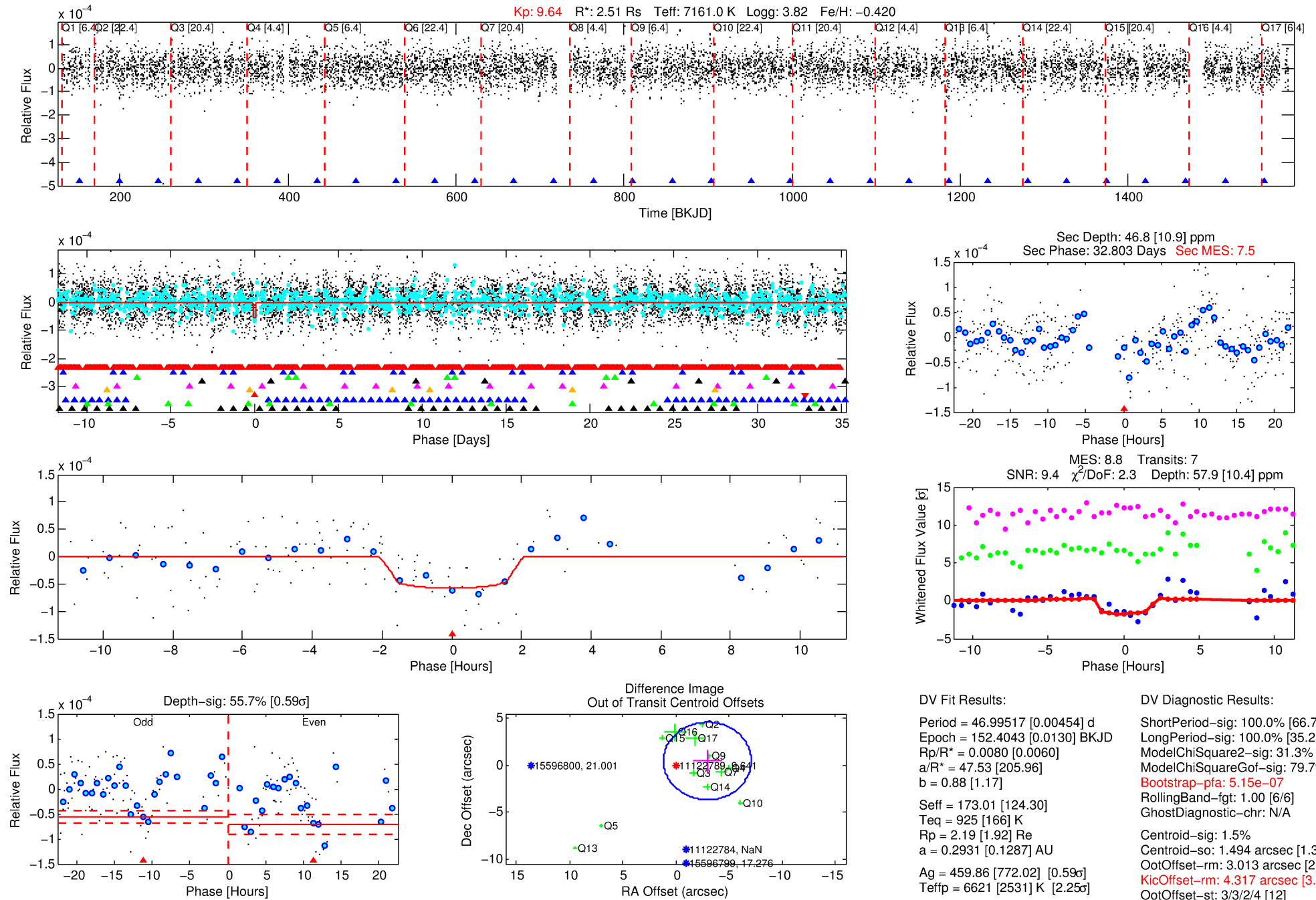
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-07

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 7 of 10 Period: 46.995 d



## DV Fit Results:

Period = 46.99517 [0.00454] d  
Epoch = 152.4043 [0.0130] BKJD  
Rp/R\* = 0.0080 [0.0060]  
a/R\* = 47.53 [205.96]  
b = 0.88 [1.17]  
Seff = 173.01 [124.30]  
Teq = 925 [166] K  
Rp = 2.19 [1.92] Re  
a = 0.2931 [0.1287] AU  
Ag = 459.86 [772.02] [0.59 $\sigma$ ]  
Teff = 6621 [2531] K [2.25 $\sigma$ ]

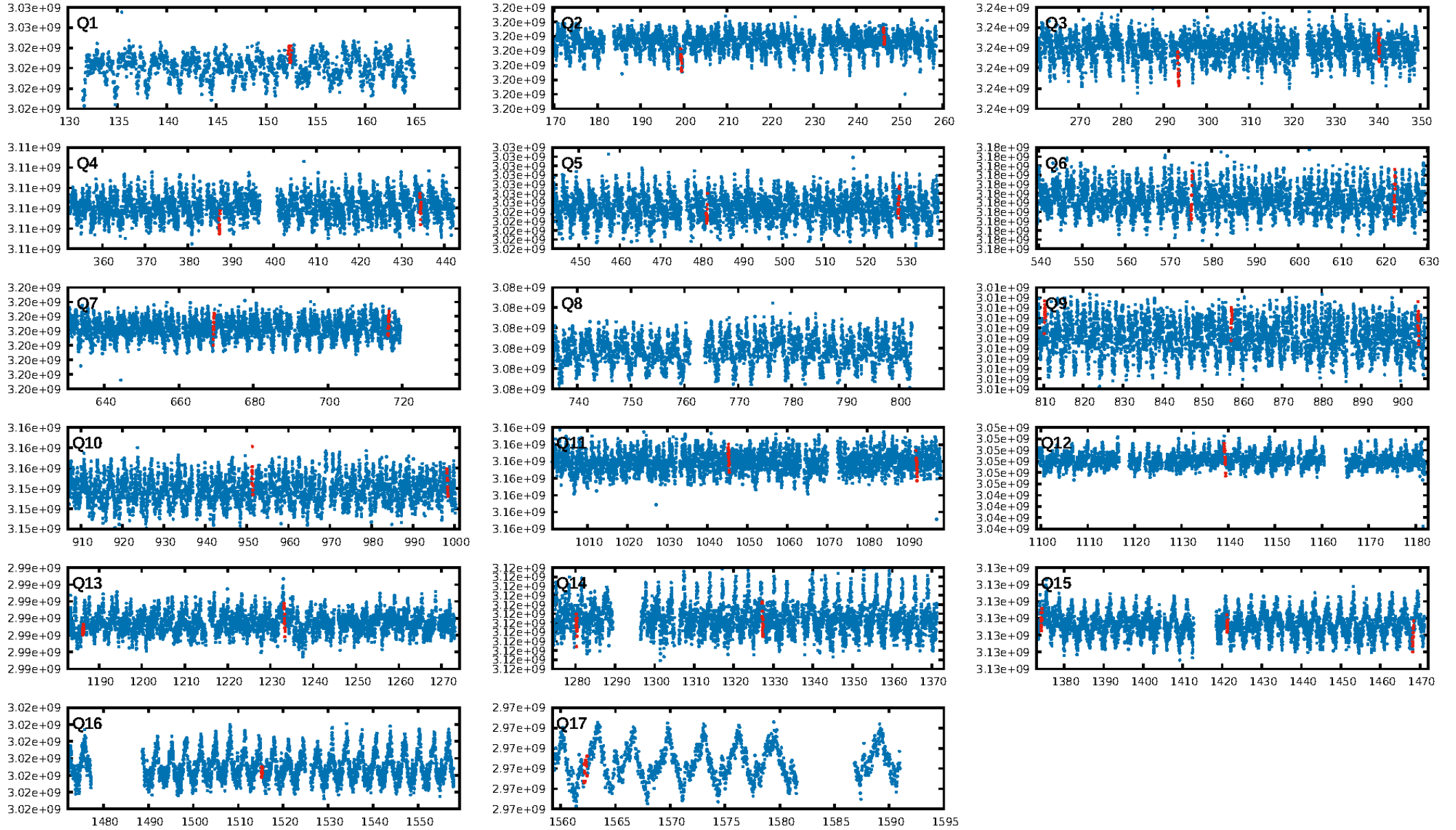
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [66.71 $\sigma$ ]  
LongPeriod-sig: 100.0% [35.21 $\sigma$ ]  
ModelChiSquare2-sig: 31.3%  
ModelChiSquareGof-sig: 79.7%  
**Bootstrap-pfa: 5.15e-07**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 1.5%  
Centroid-so: 1.494 arcsec [1.38 $\sigma$ ]  
OotOffset-rm: 3.013 arcsec [2.19 $\sigma$ ]  
**KicOffset-rm: 4.317 arcsec [3.10 $\sigma$ ]**  
OotOffset-st: 3/3/2/4 [12]  
KicOffset-st: 3/3/2/4 [12]  
DiffImageQuality-fgm: 0.33 [4/12]  
DiffImageOverlap-fno: 0.31 [5/16]

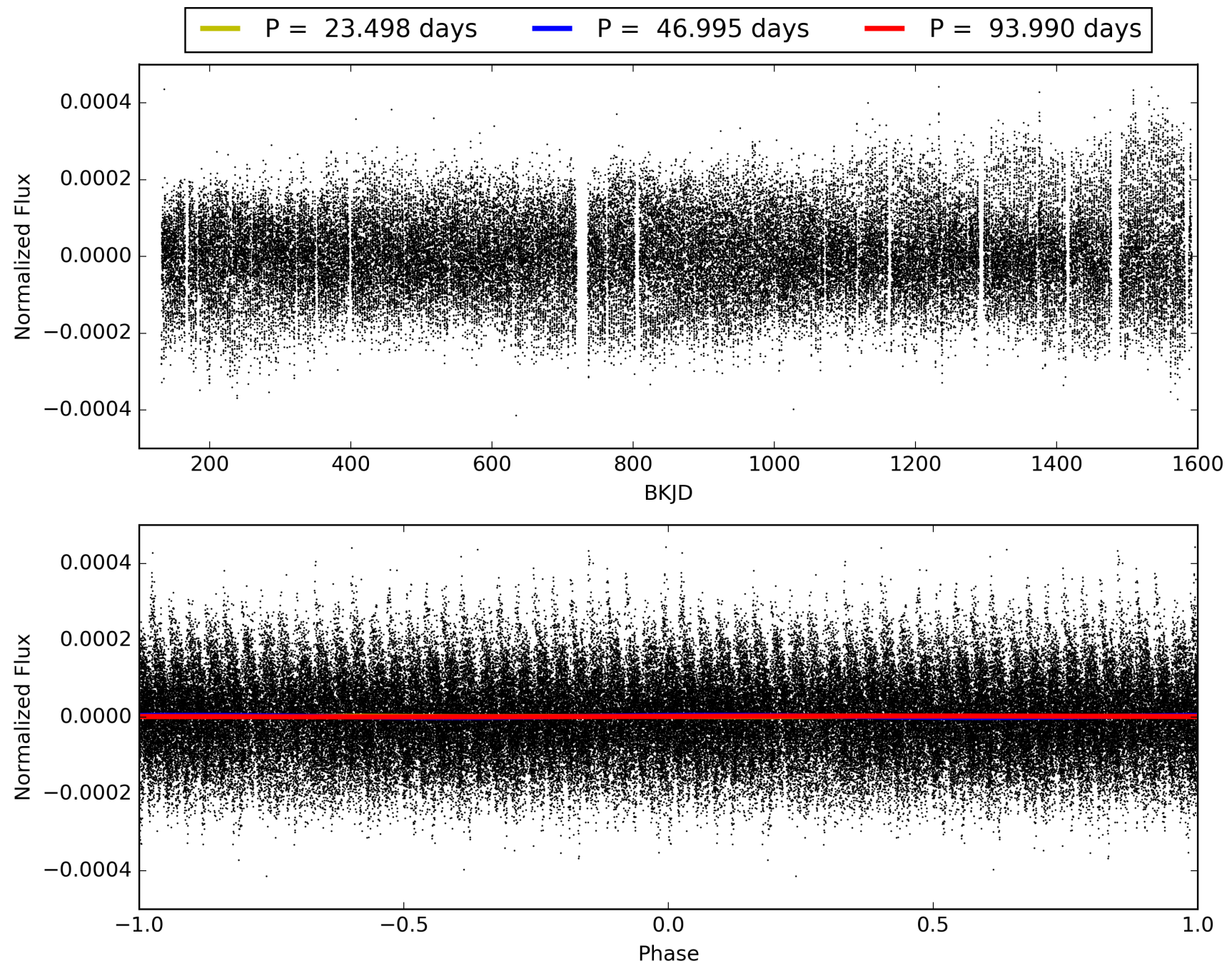
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:45 Z

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

# TCE 011122789-07, PDC Light Curves

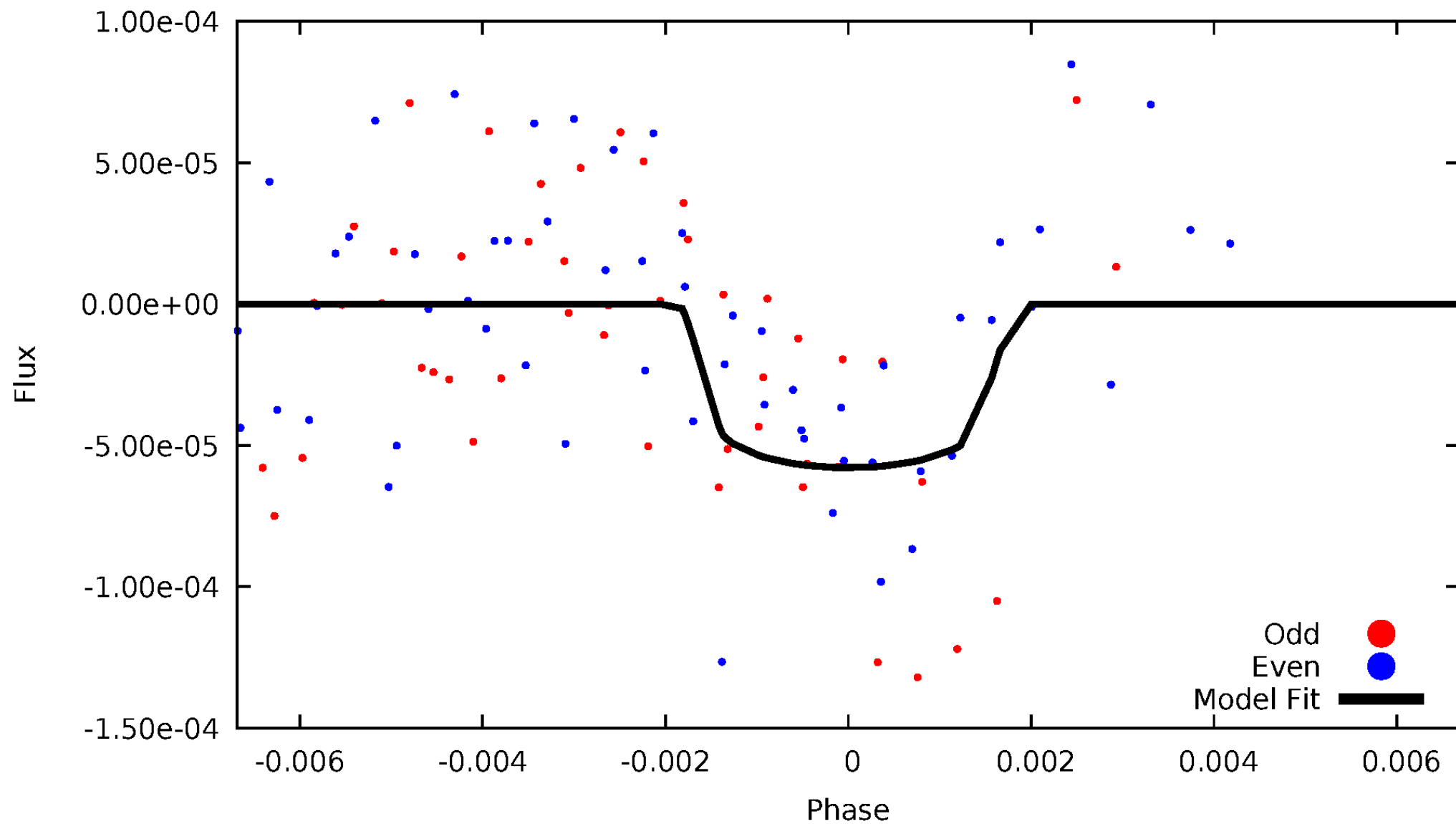


TCE 011122789-07



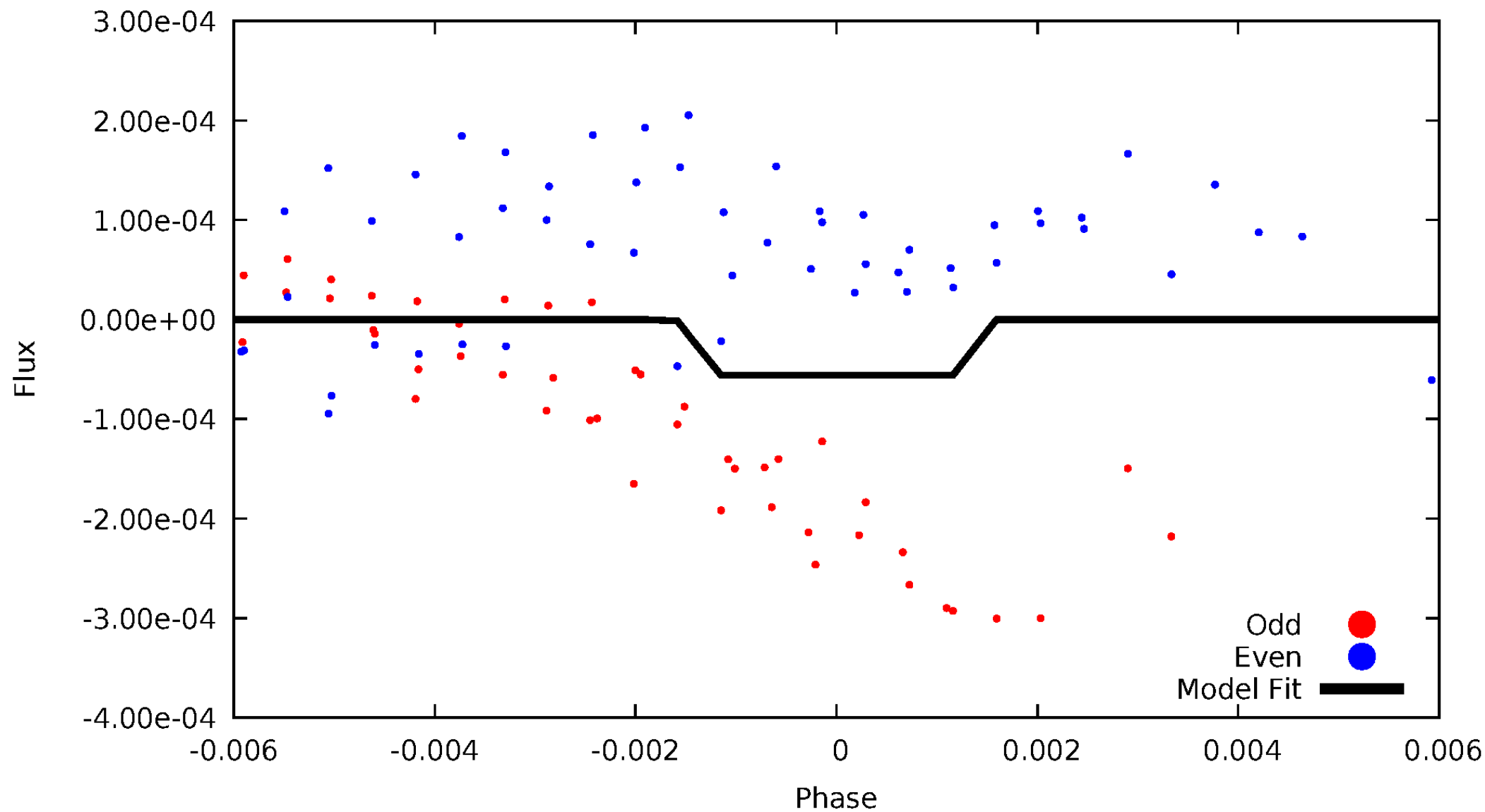
# DV Odd/Even

TCE 011122789-07



# ALT Odd/Even

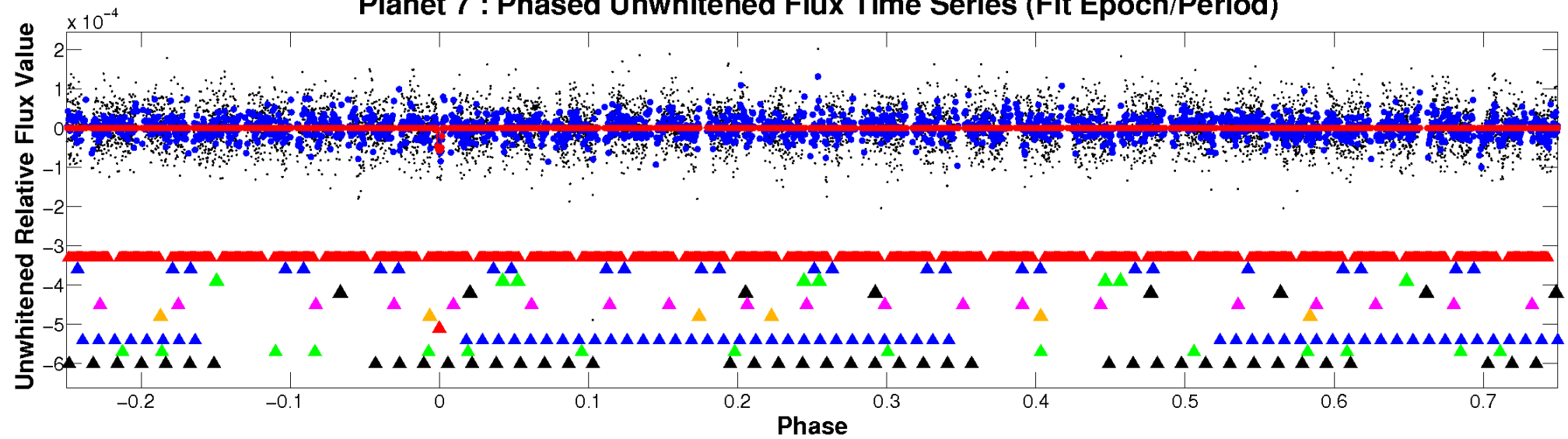
TCE 011122789-07



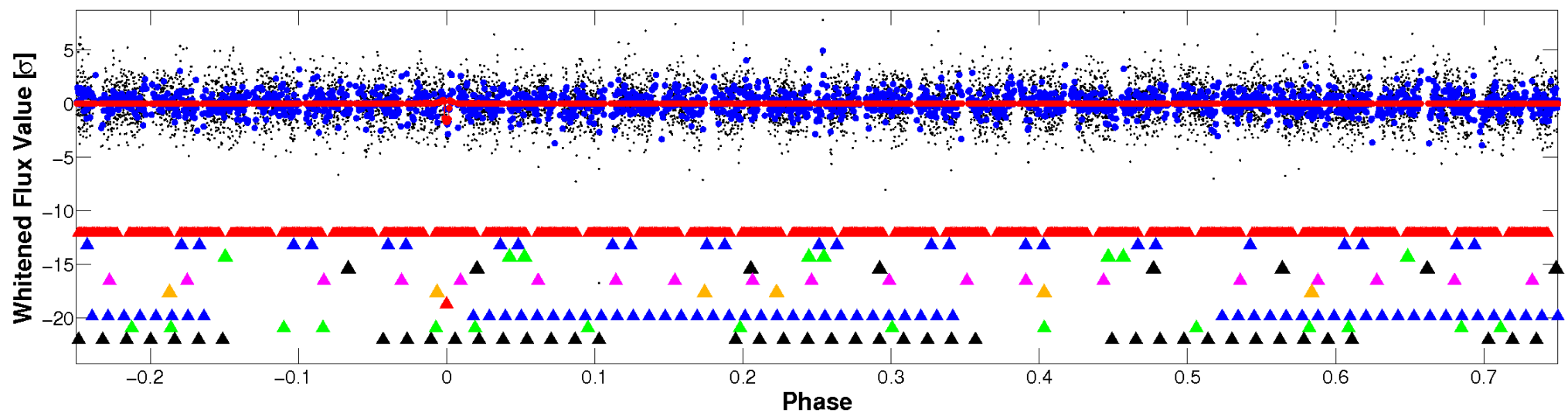


# Non-Whitened Vs. Whitened Light Curve

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



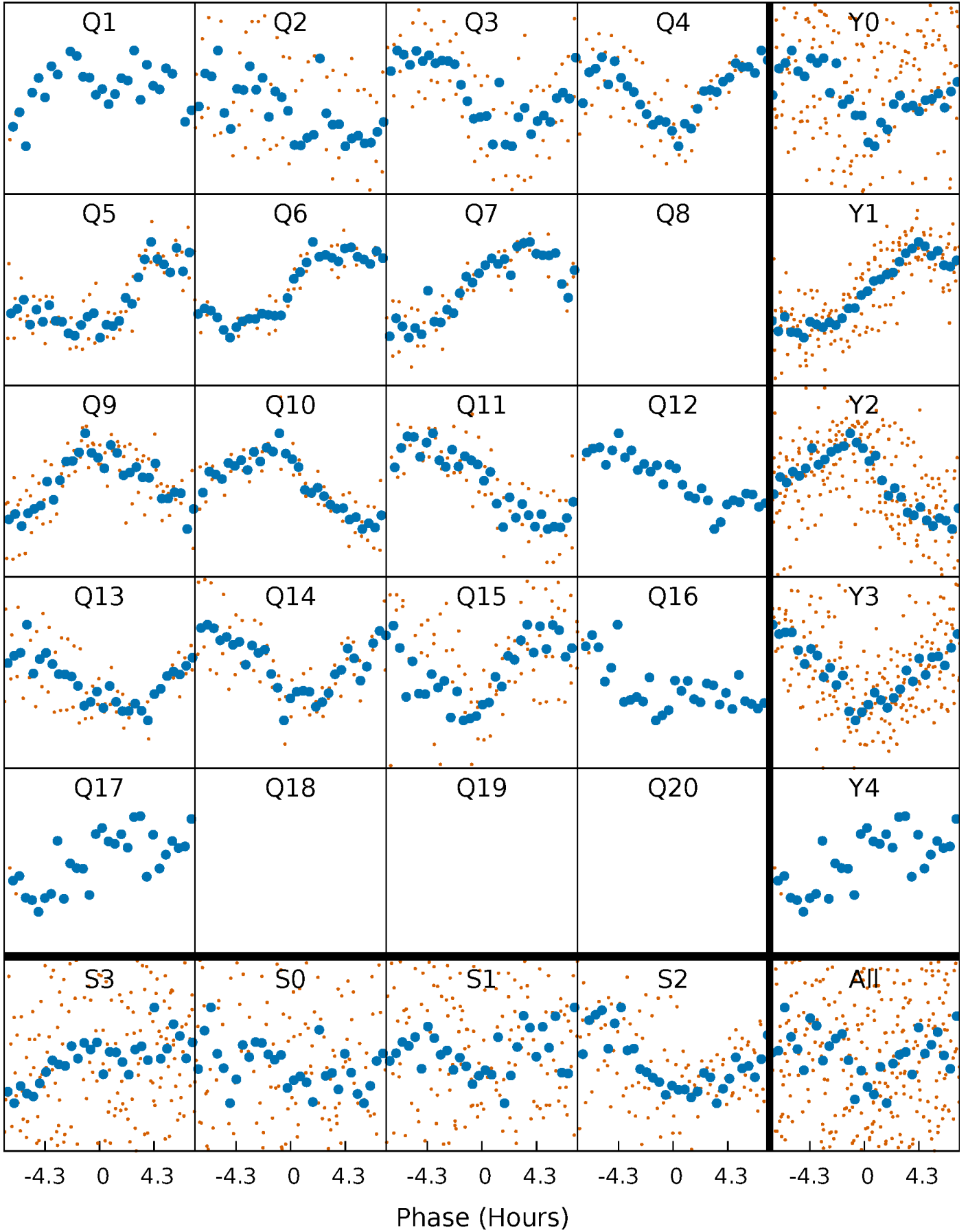
## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)





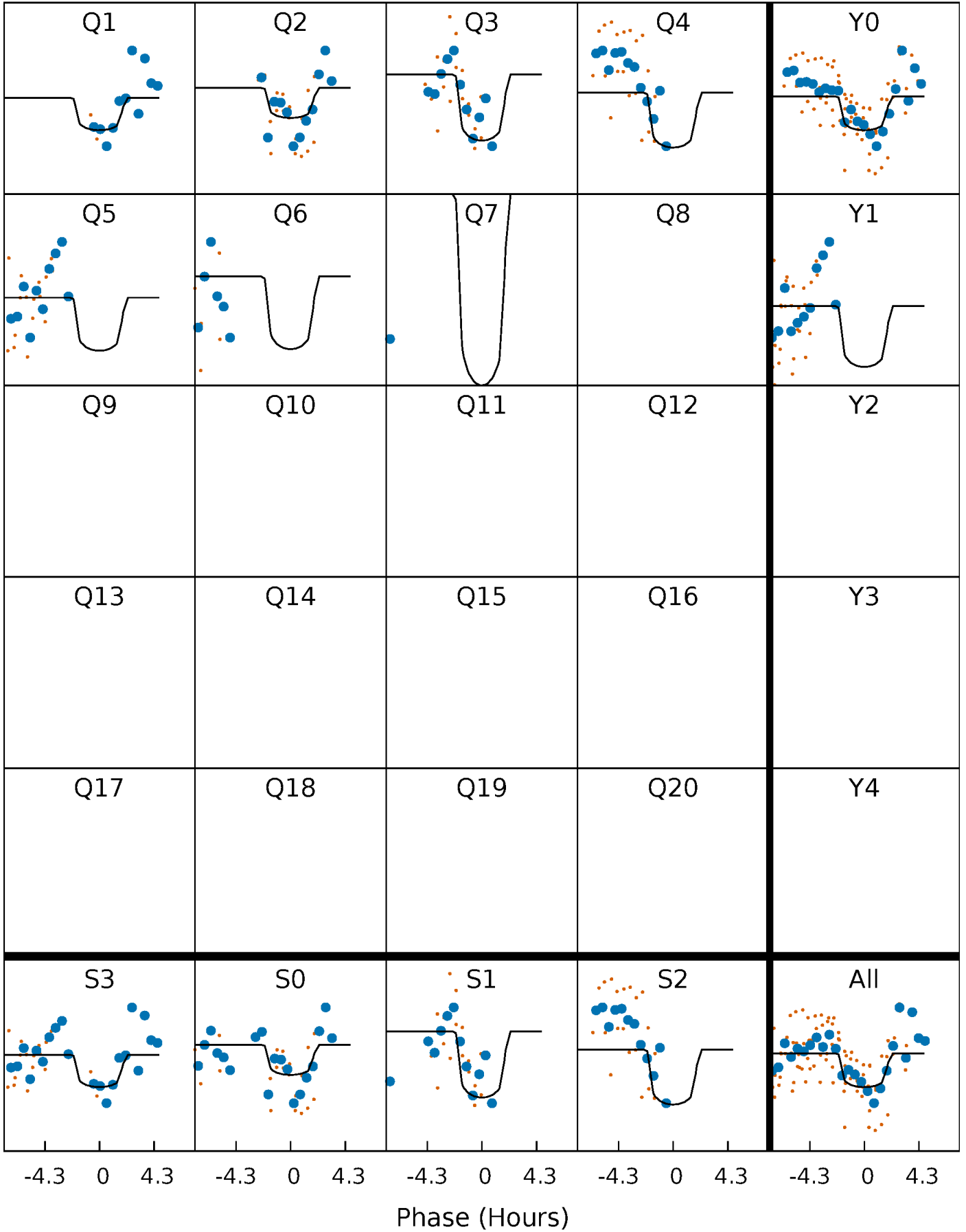
# PDC Quarter-Phased Transit Curves

TCE 011122789-07     $P = 46.995171$  Days     $T_0 = 152.404263$  (BKJD)



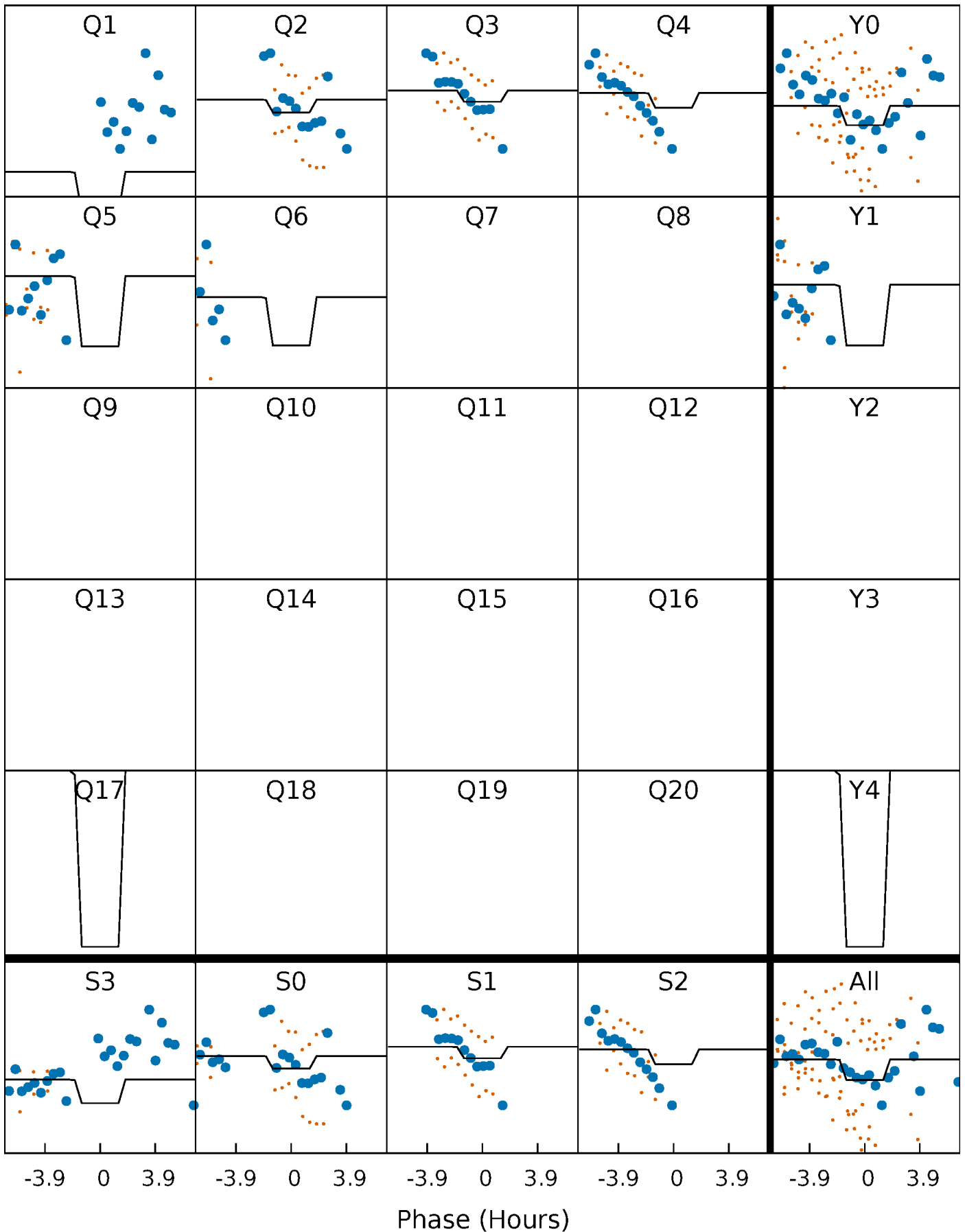
# DV Quarter-Phased Transit Curves

TCE 011122789-07 P= 46.995171 Days  $T_0=152.404263$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

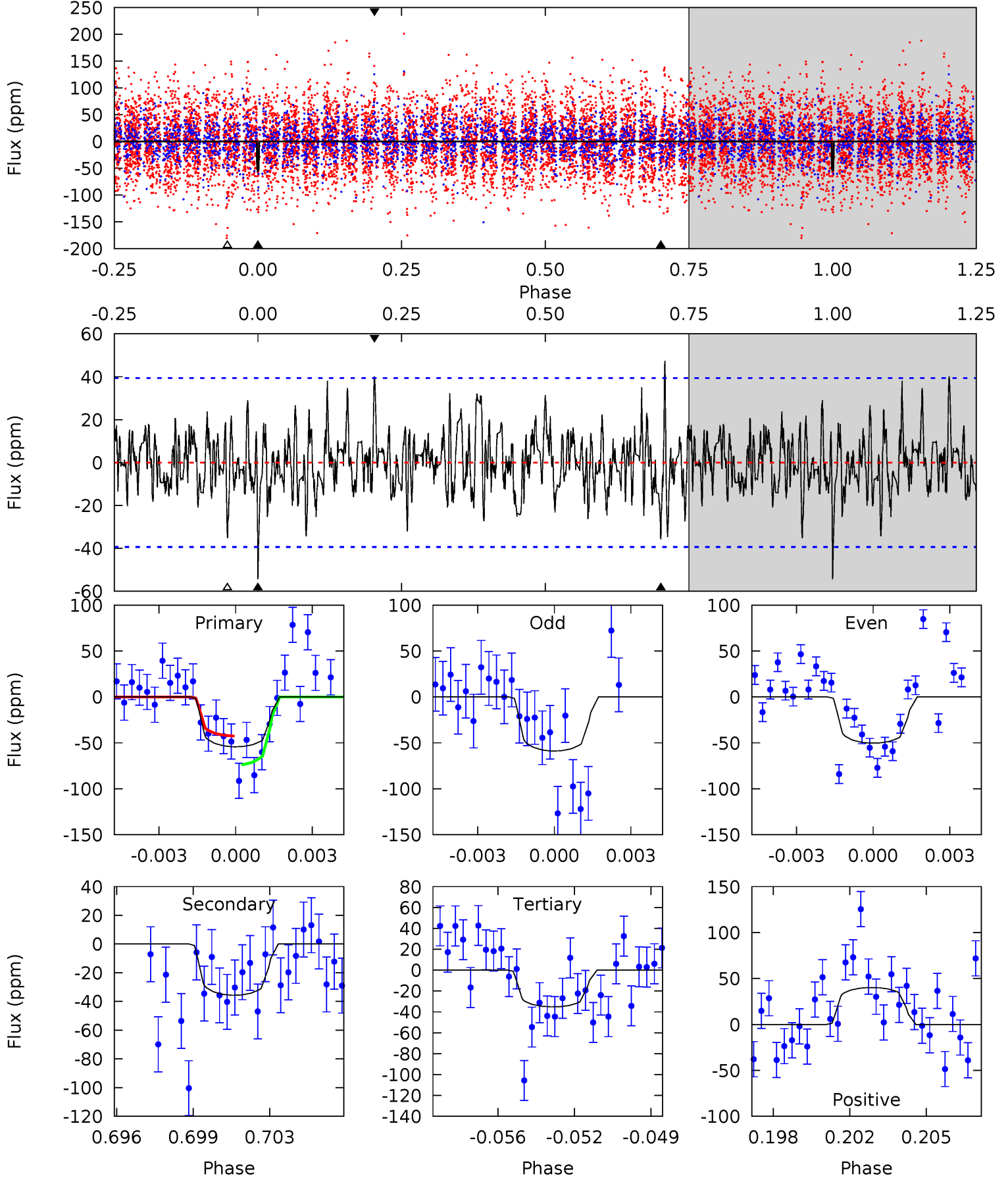
TCE 011122789-07   P= 46.997904 Days    $T_0=152.382502$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-07, P = 46.995171 Days, E = 105.409092 Days

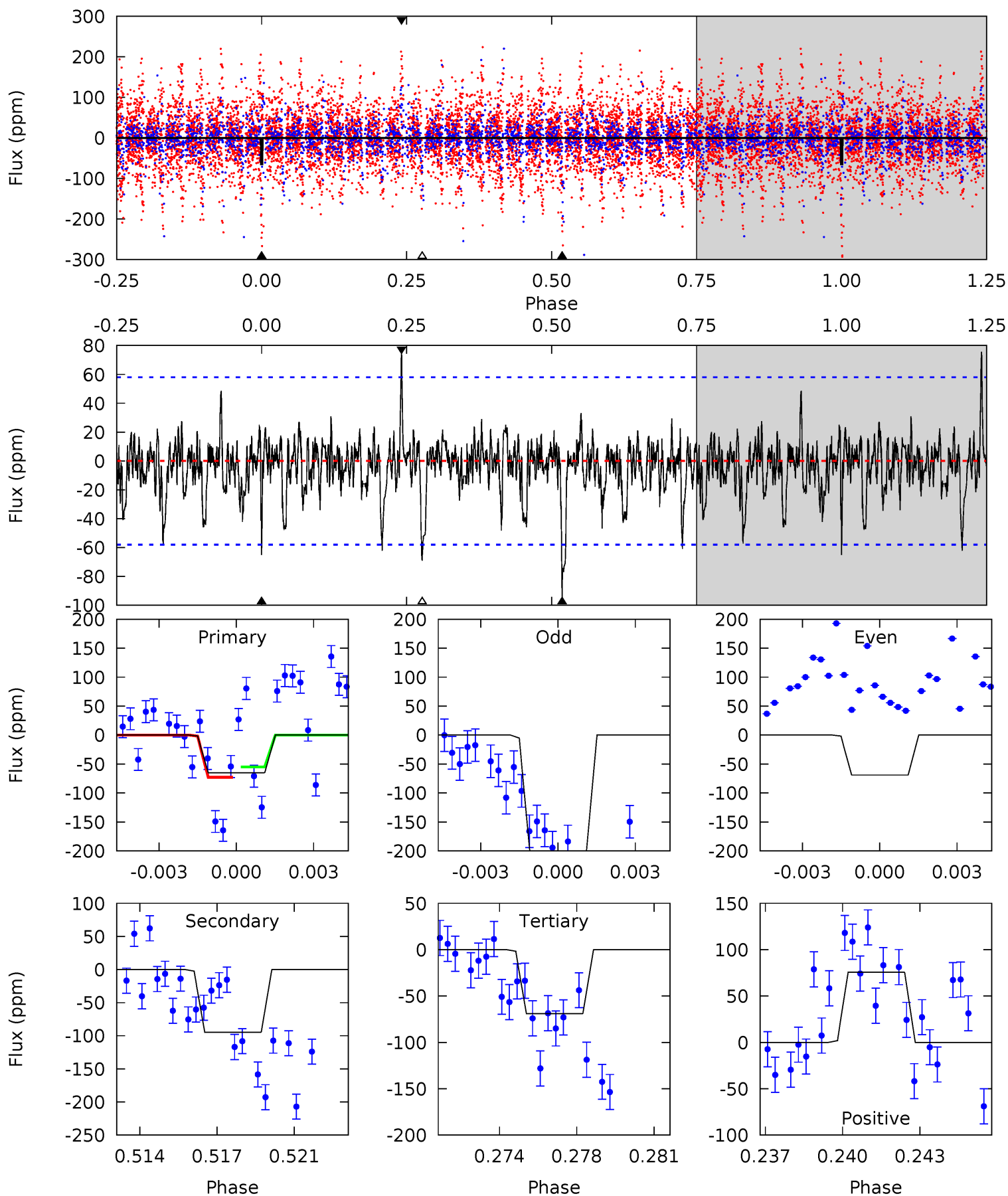
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.20	4.73	4.67	5.33	5.23	2.92	1.59	2.53	1.87	0.07	-0.59	0.57	1.22	0.47	2.00



# Alt Model-Shift Uniqueness Test

011122789-07, P = 46.997904 Days, E = 105.384598 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
5.88	8.57	6.24	6.84	5.24	2.95	1.23	-0.36	-0.96	2.33	1.73	6.35	2.52	0.44	0.80



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-36 \pm 8$	$2.08^{+1.63}_{-1.27}$	$1257^{+89}_{-147}$	$5913^{+4050}_{-1227}$	$360^{+1968}_{-244}$
Alt.	$-95 \pm 11$	$2.02^{+1.40}_{-1.21}$	$1251^{+94}_{-142}$	$7861^{+8098}_{-1903}$	$1088^{+5782}_{-712}$

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

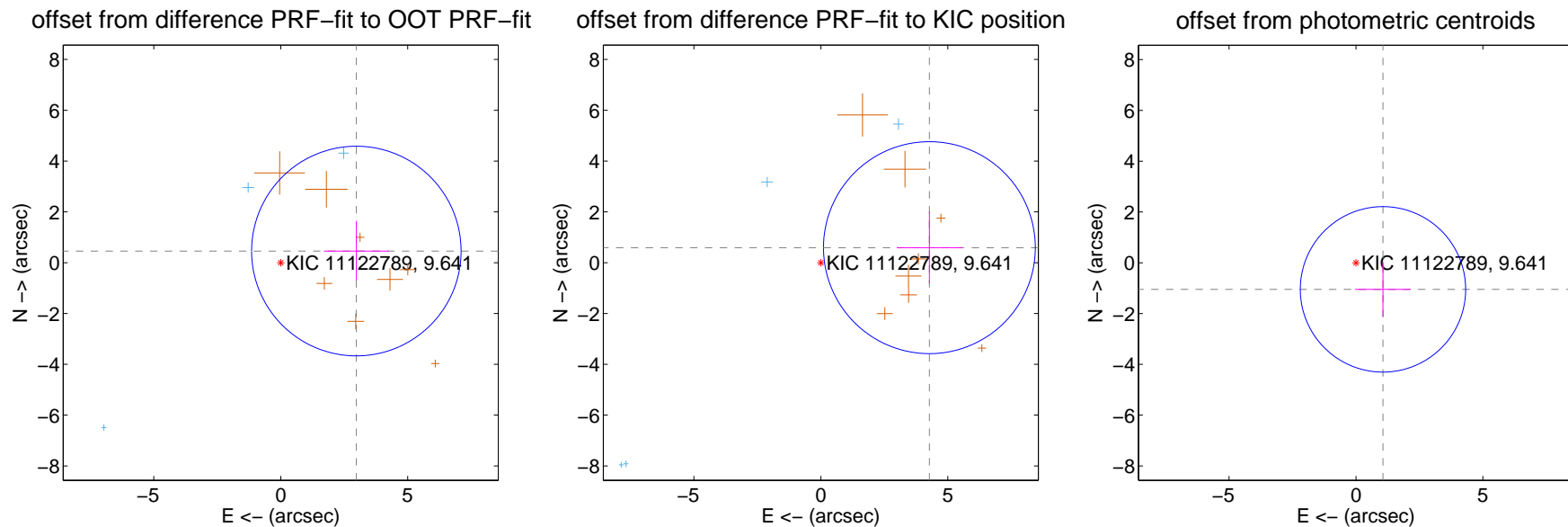
## DV Centroid Data

Supplemental centroid analysis for 011122789-07. **Kepler magnitude: 9.64.** Transit SNR 9.38

There are 4 quarters with good PRF difference image offsets

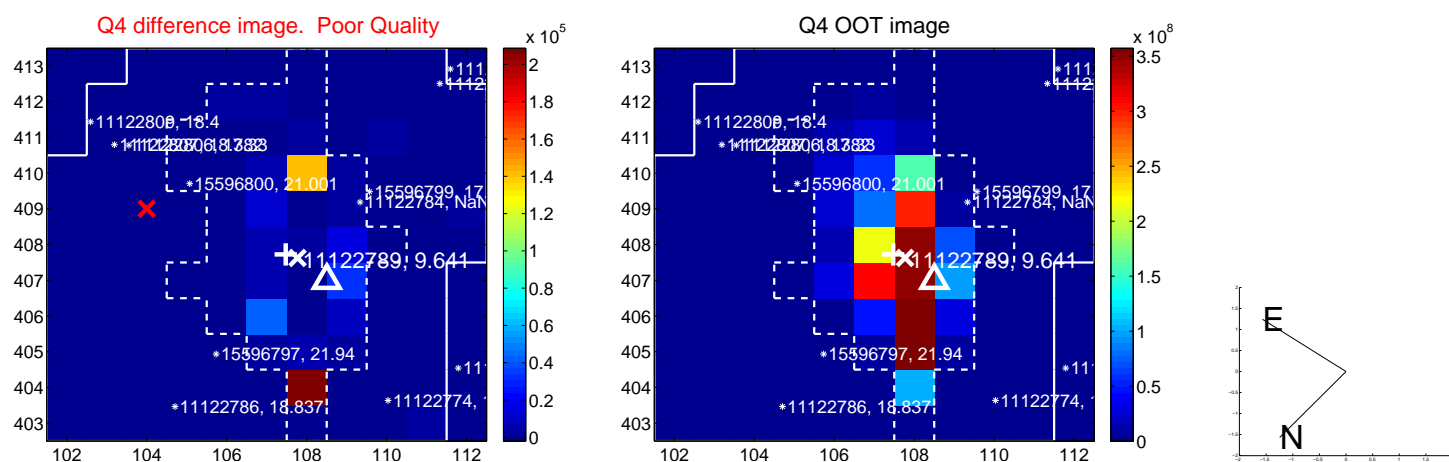
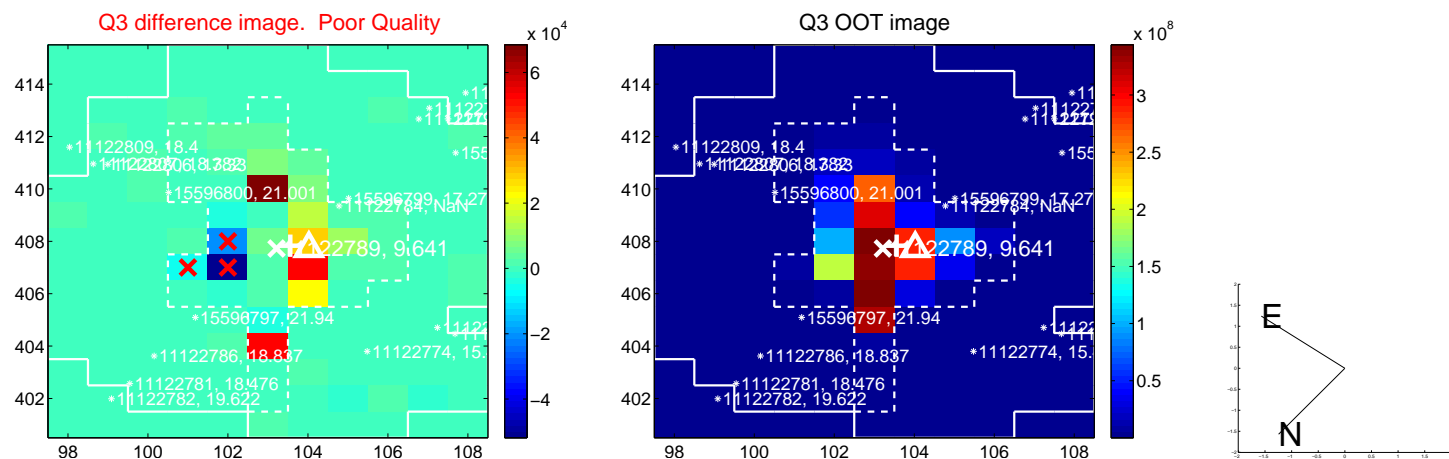
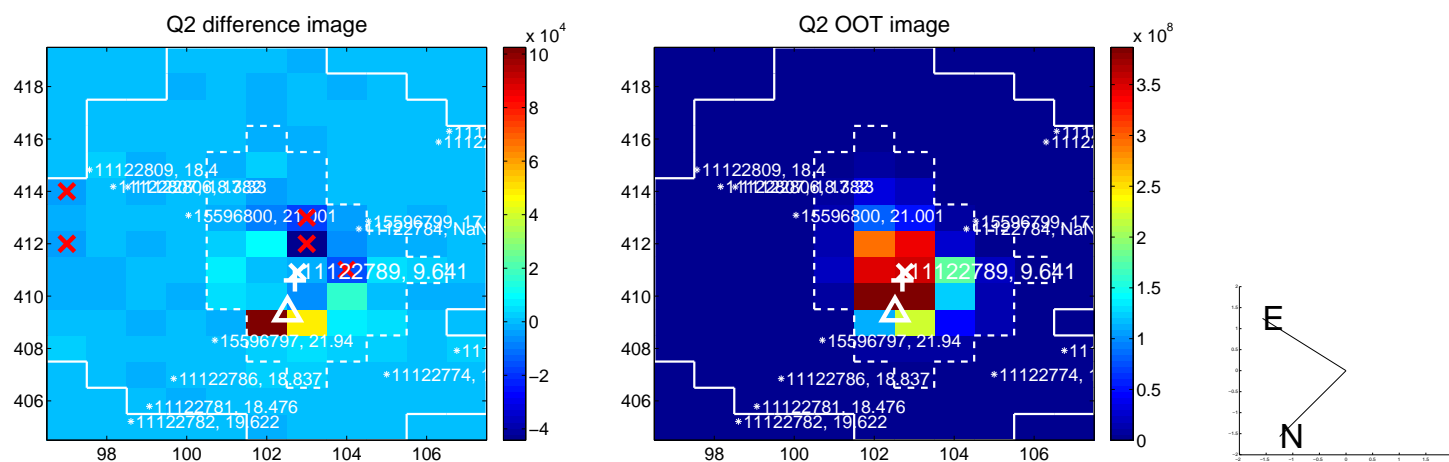
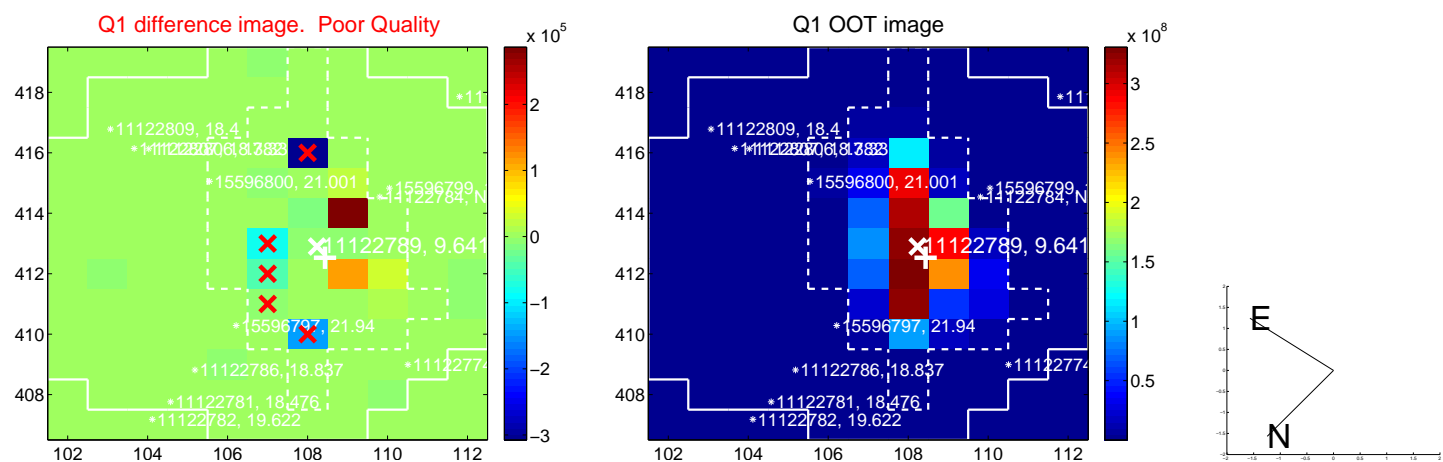
The direct PRF centroid is offset from the target star catalog position by about 1.71 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.013 \pm 1.375$	2.19	$-2.978 \pm 1.279$	$0.458 \pm 1.165$
PRF-fit source offset from KIC position	<b><math>4.317 \pm 1.391</math></b>	<b>3.10</b>	$-4.276 \pm 1.286$	$0.592 \pm 1.418$
photometric centroid source offset	$1.49 \pm 1.09$	1.38	$-1.06 \pm 1.10$	$-1.05 \pm 1.07$



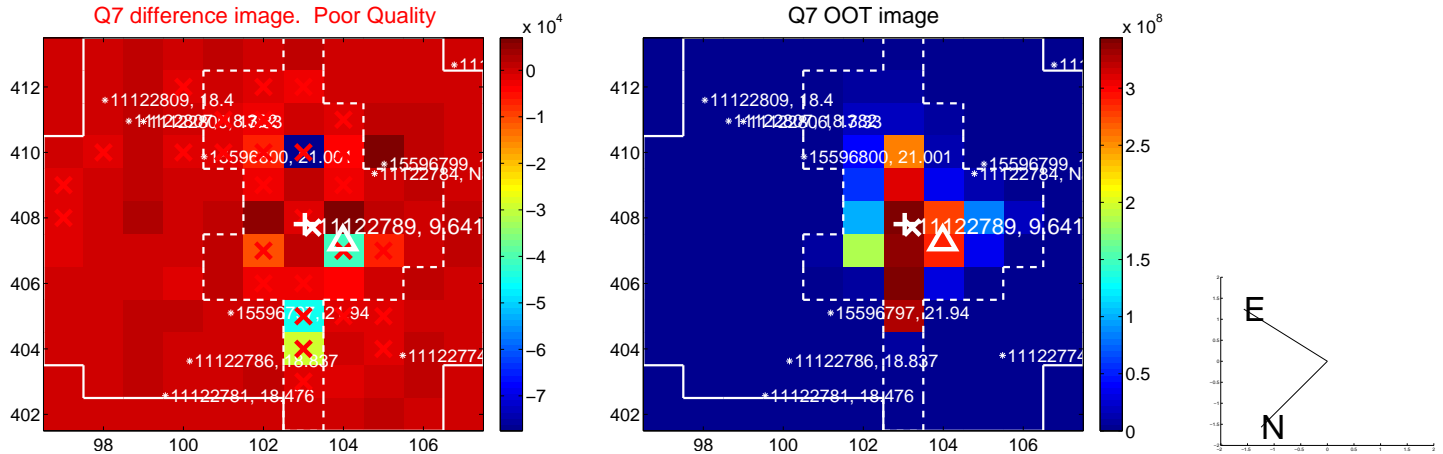
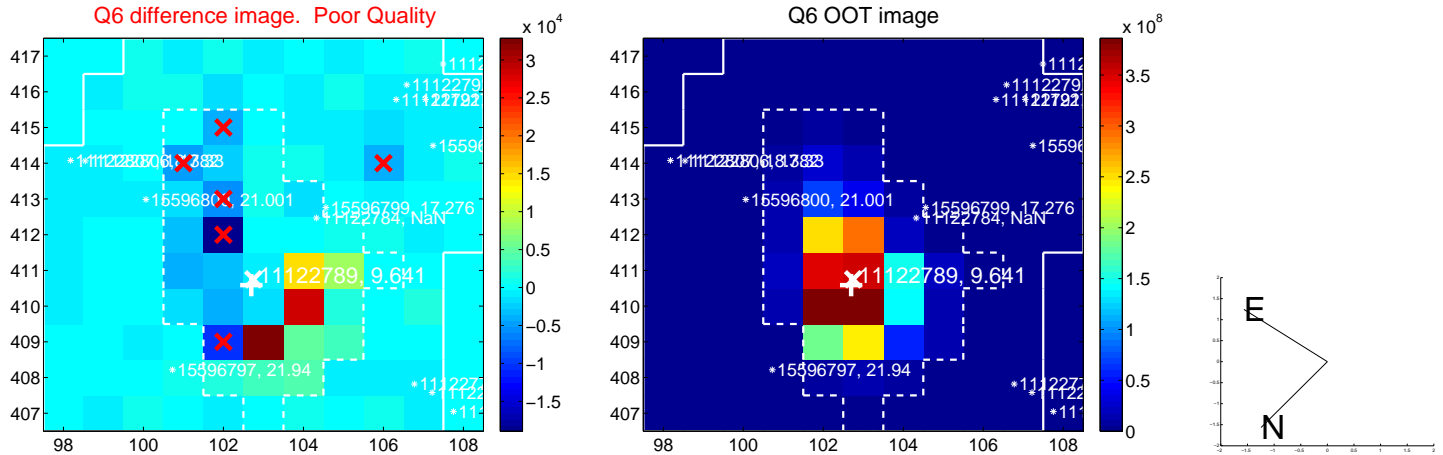
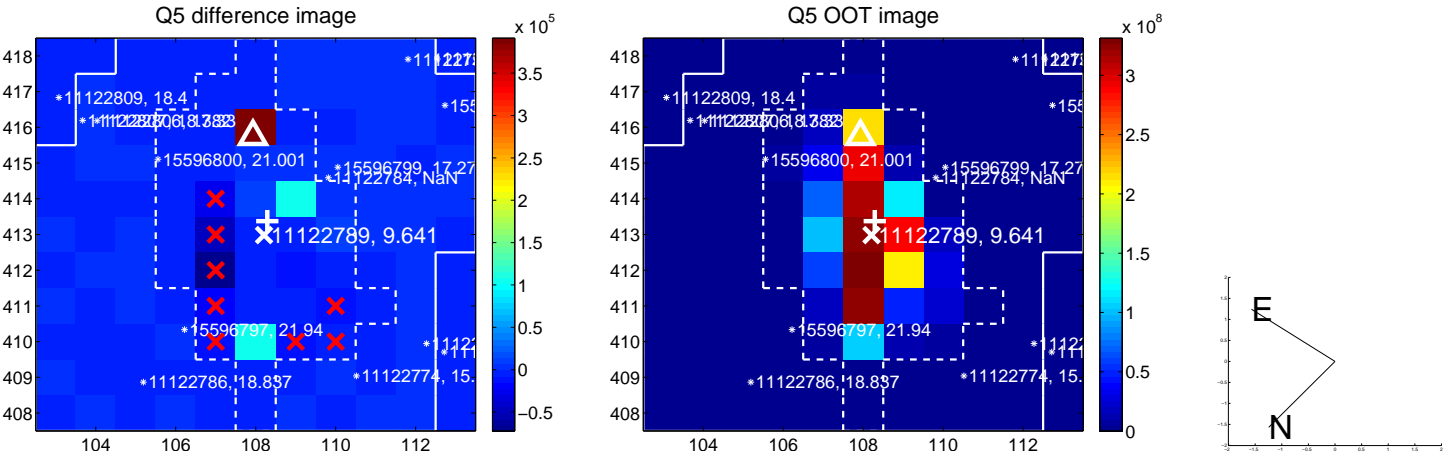
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

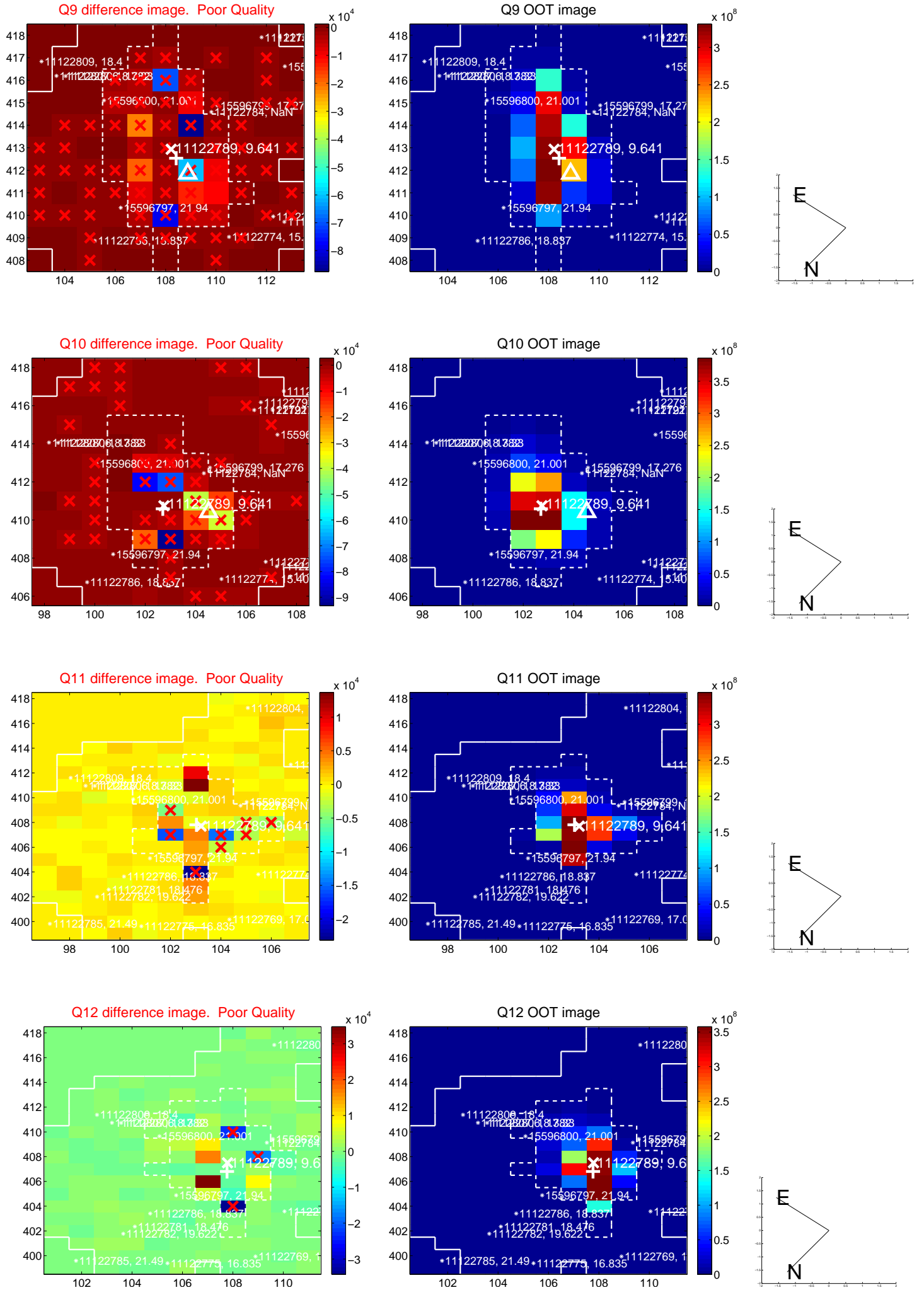




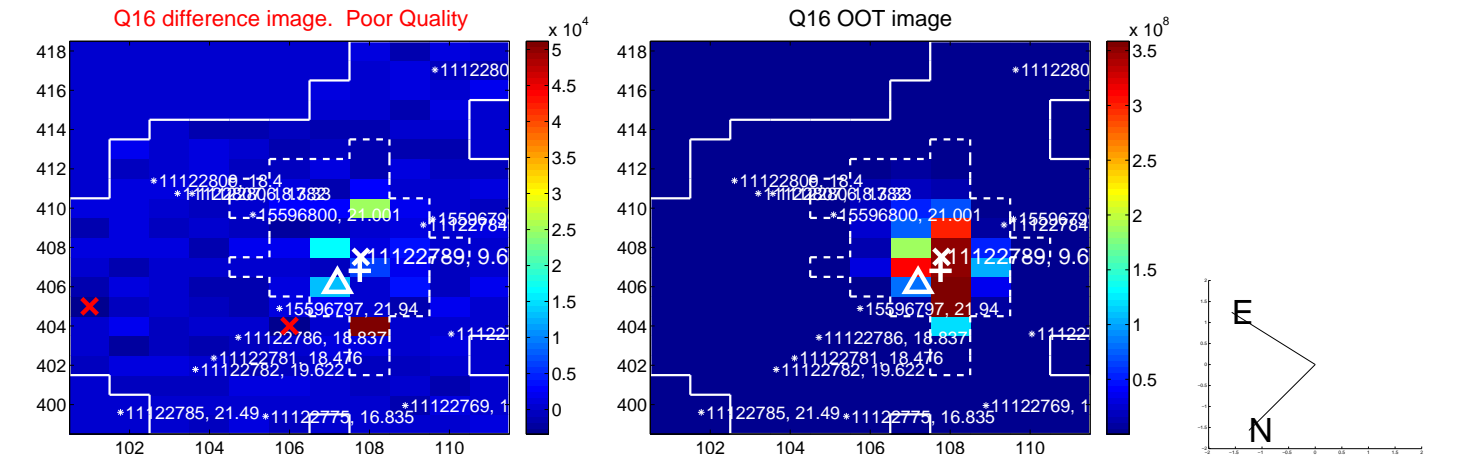
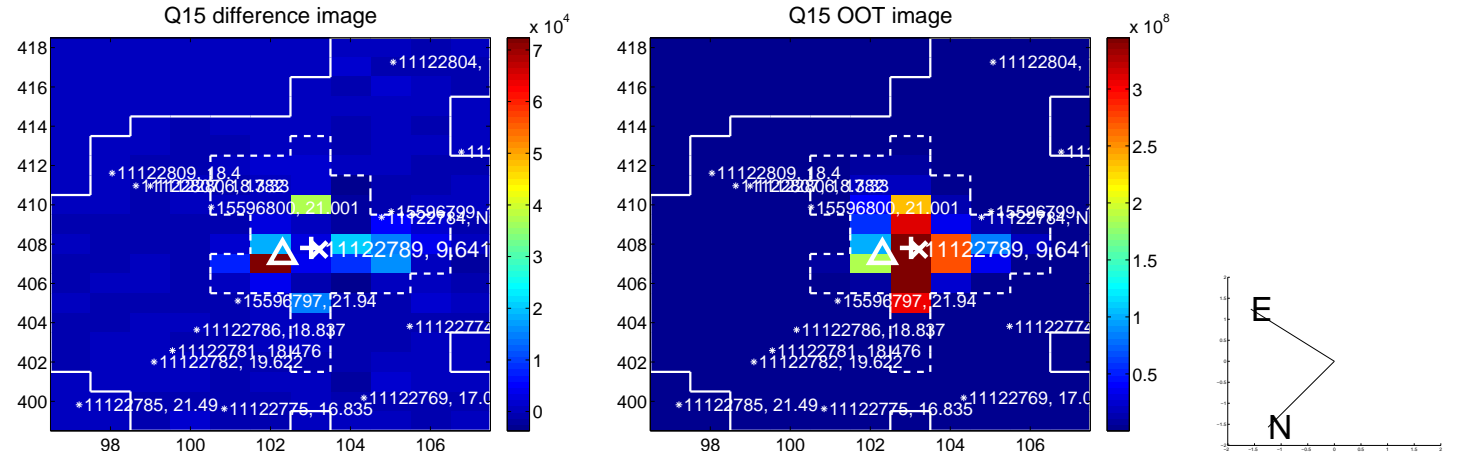
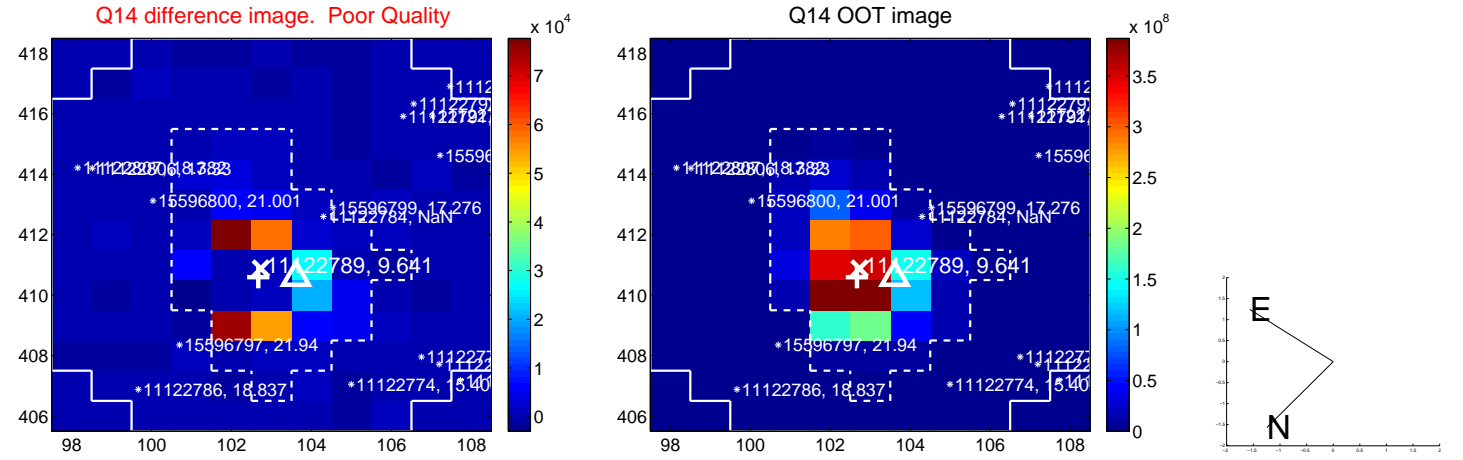
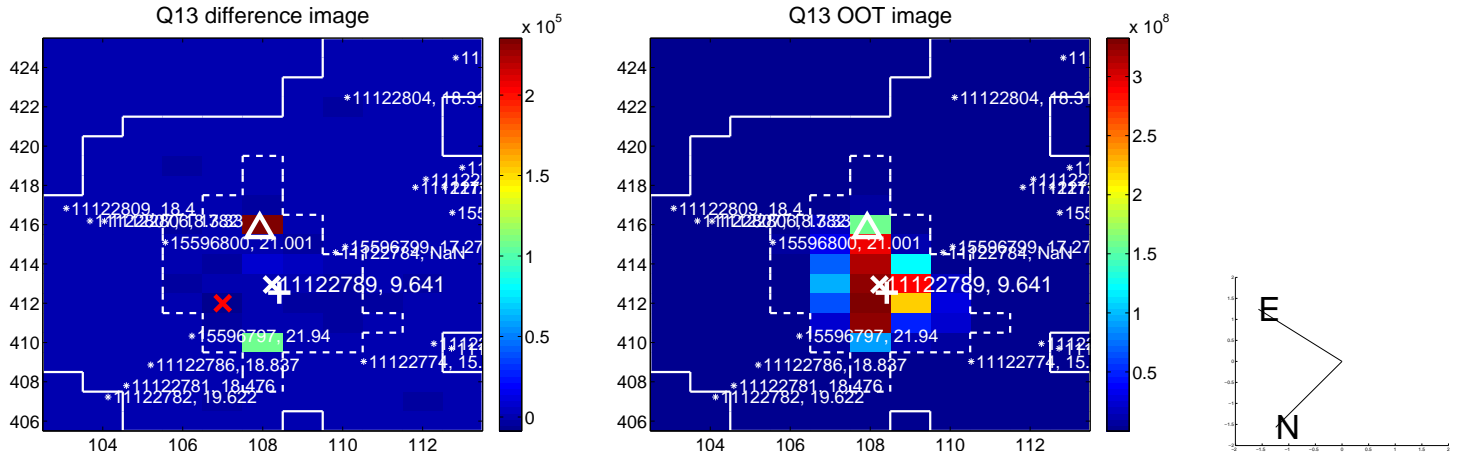
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



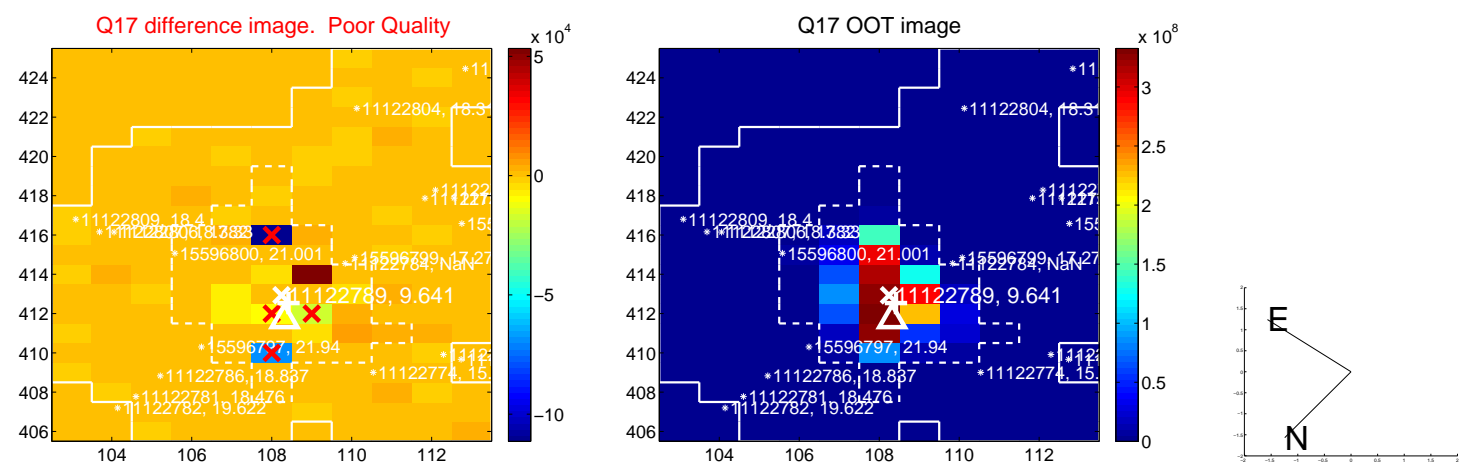
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



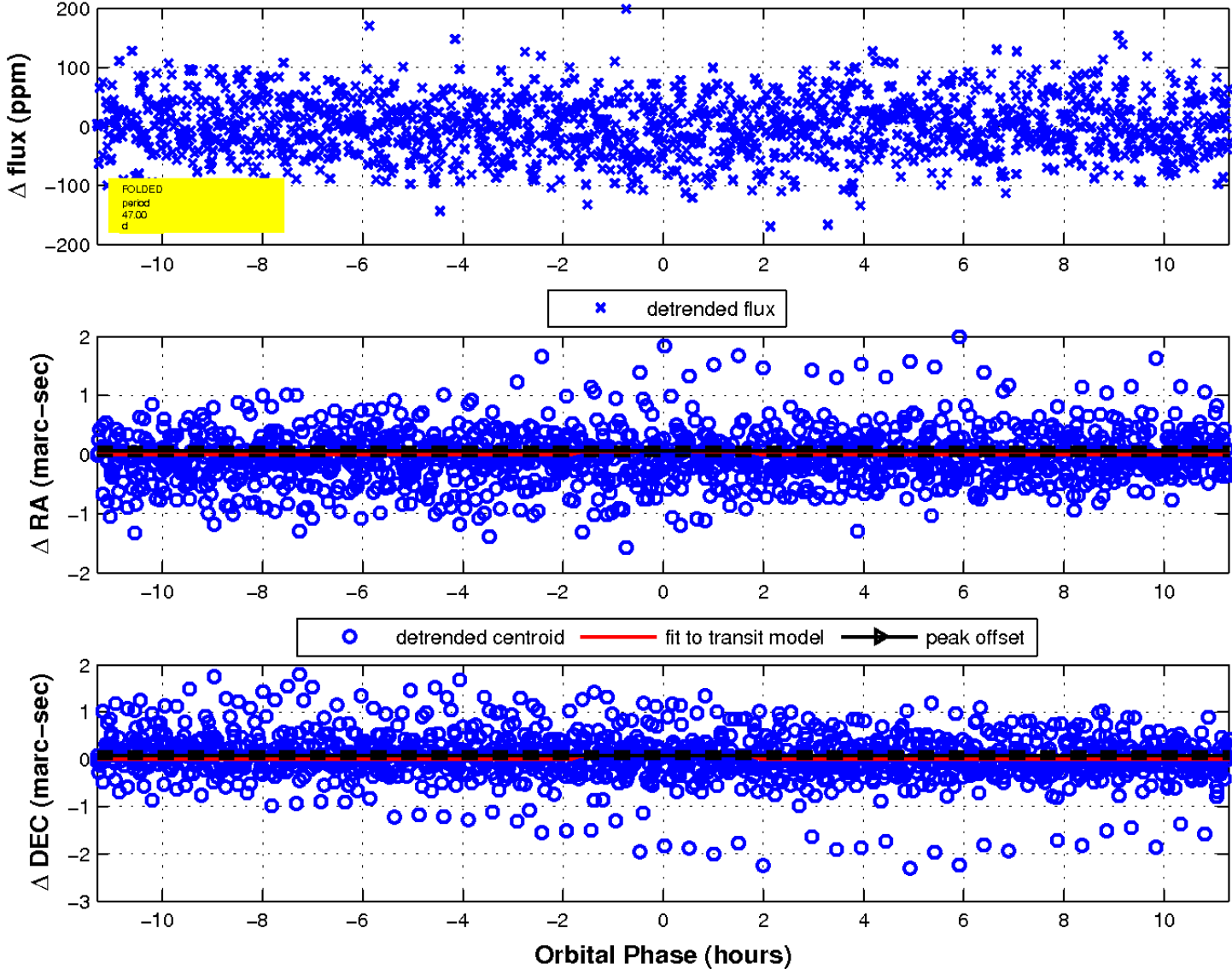
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

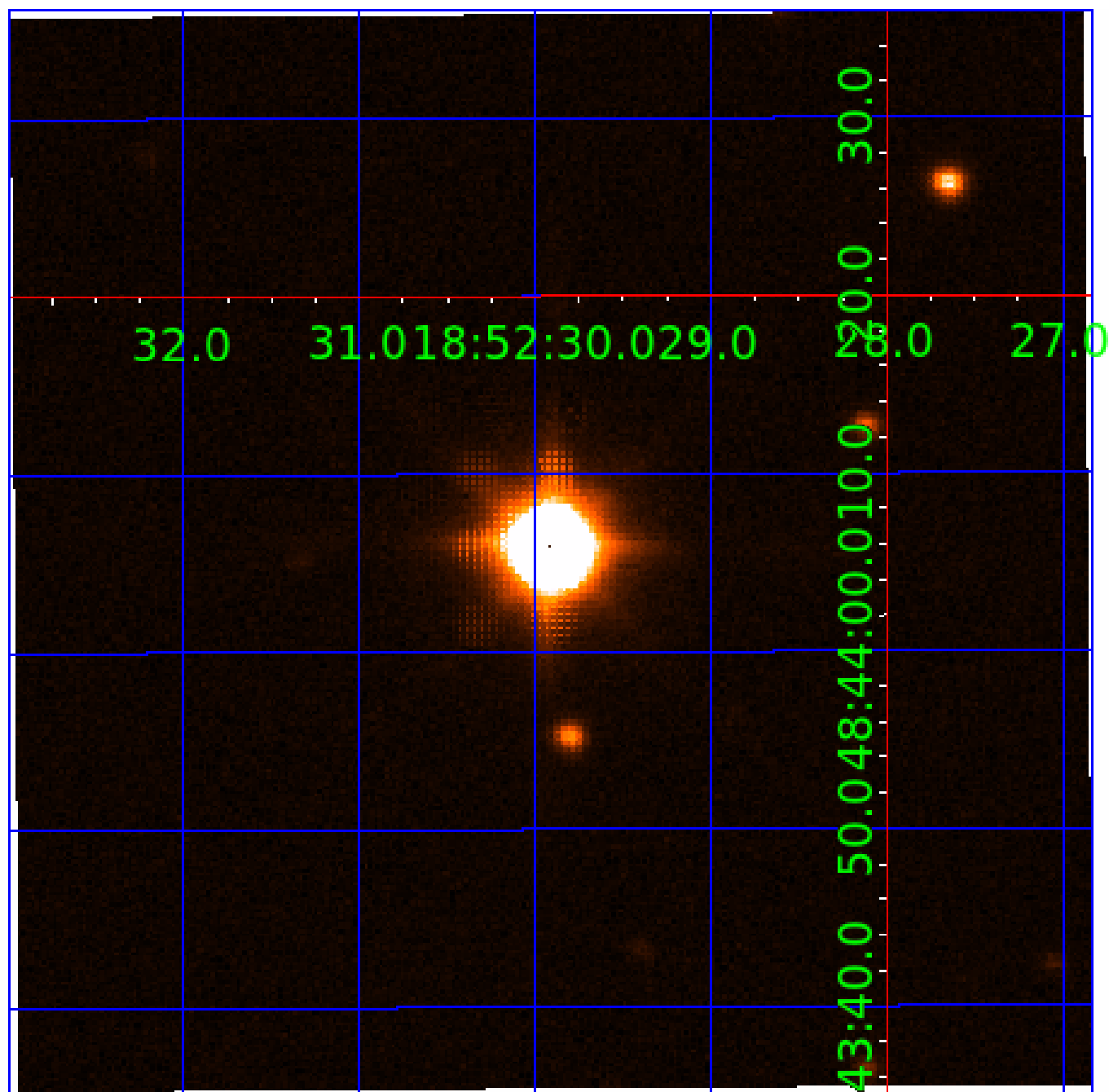


fluxWeightedCentroids, Planet 7 of 10



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

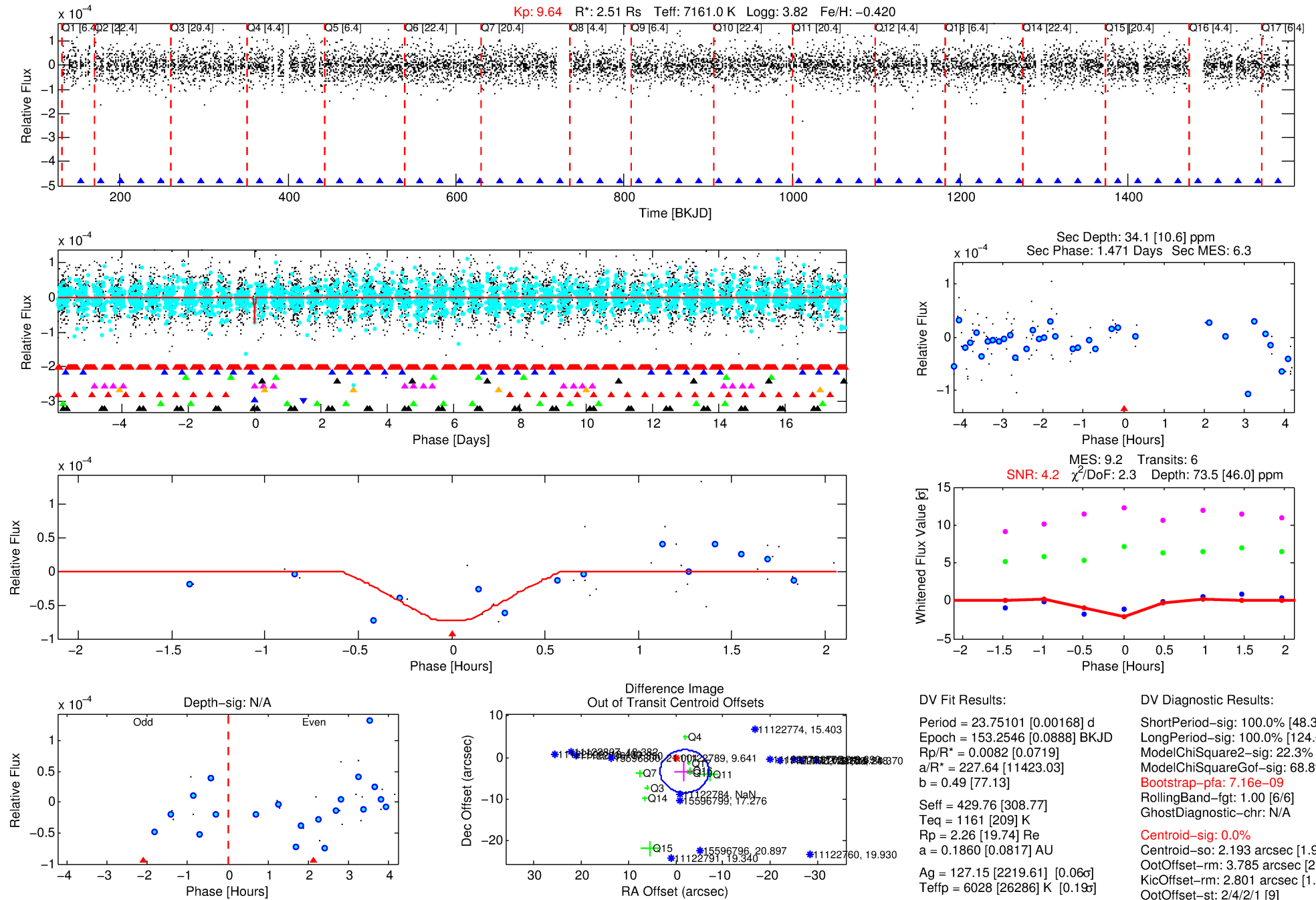
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011122789-08

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 8 of 10 Period: 23.751 d

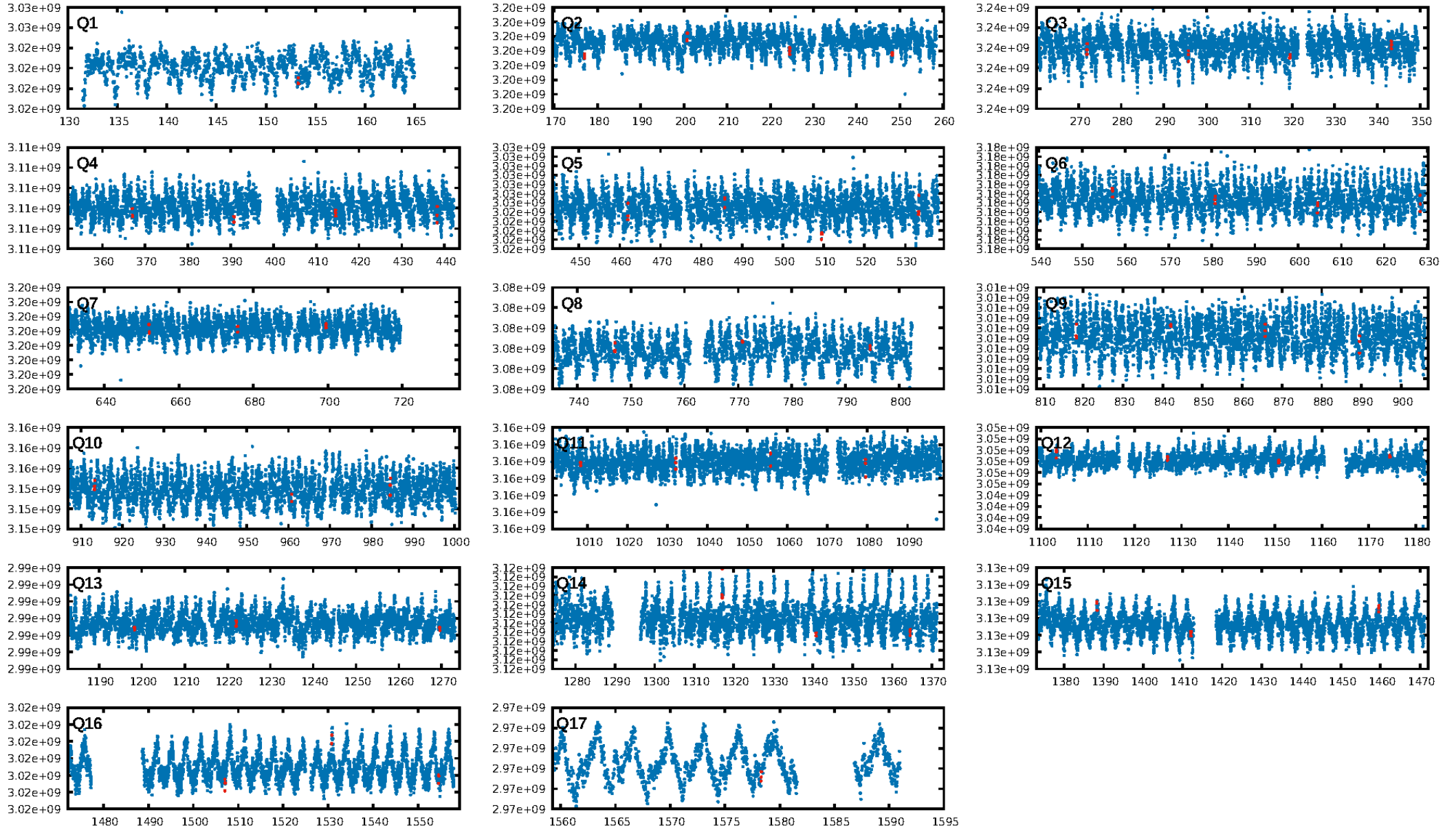


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:49 Z

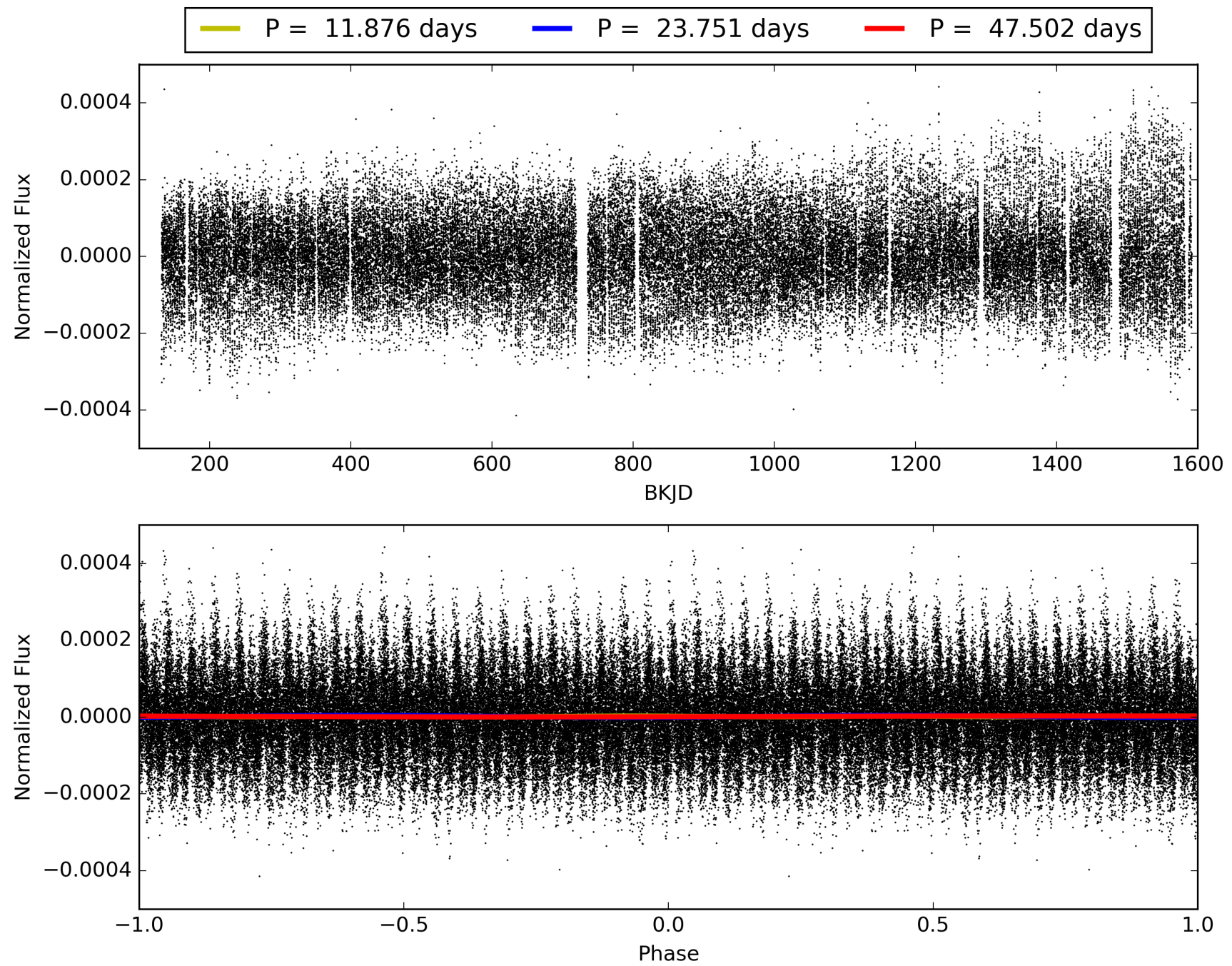
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011122789-08, PDC Light Curves

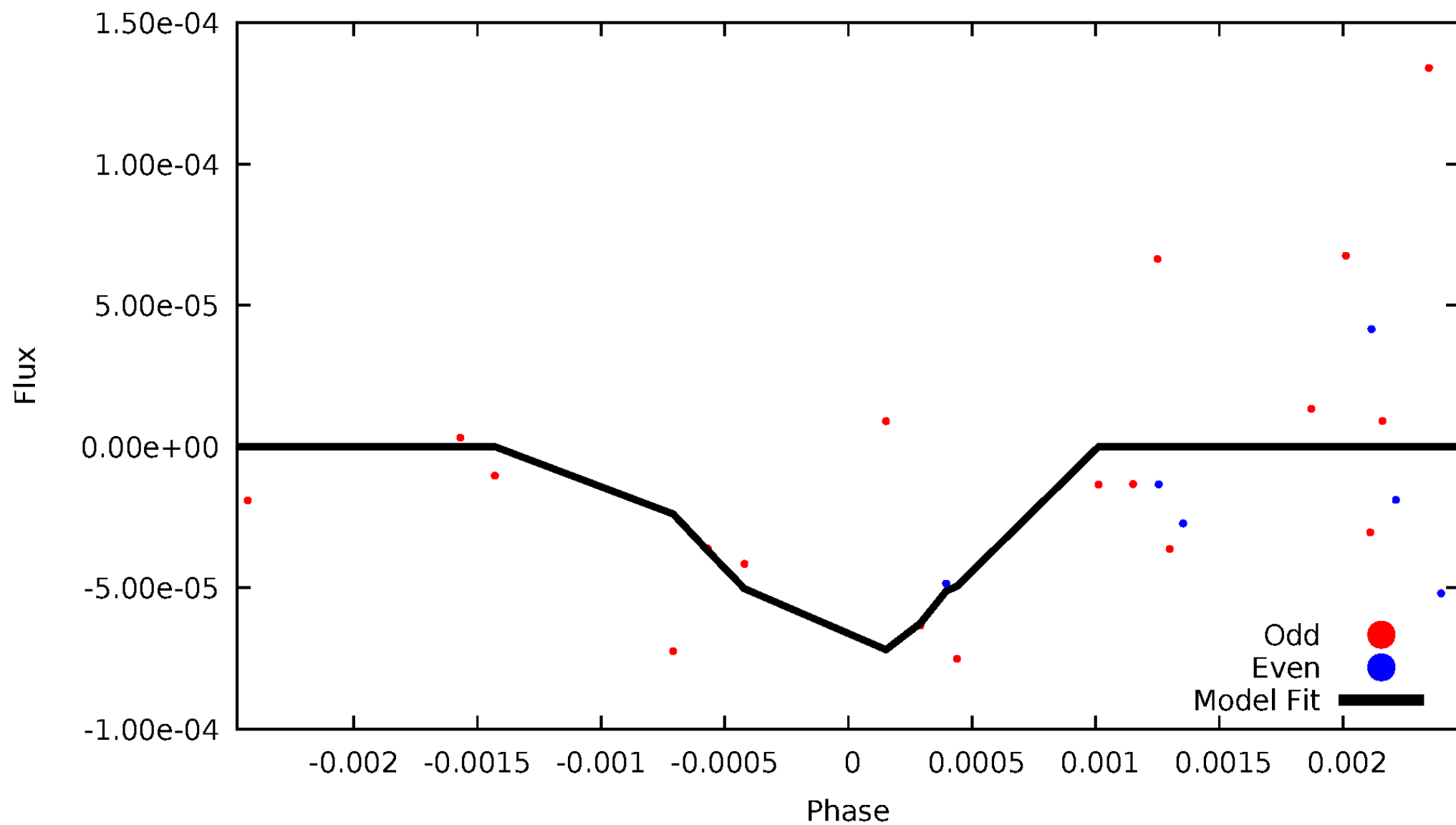


TCE 011122789-08



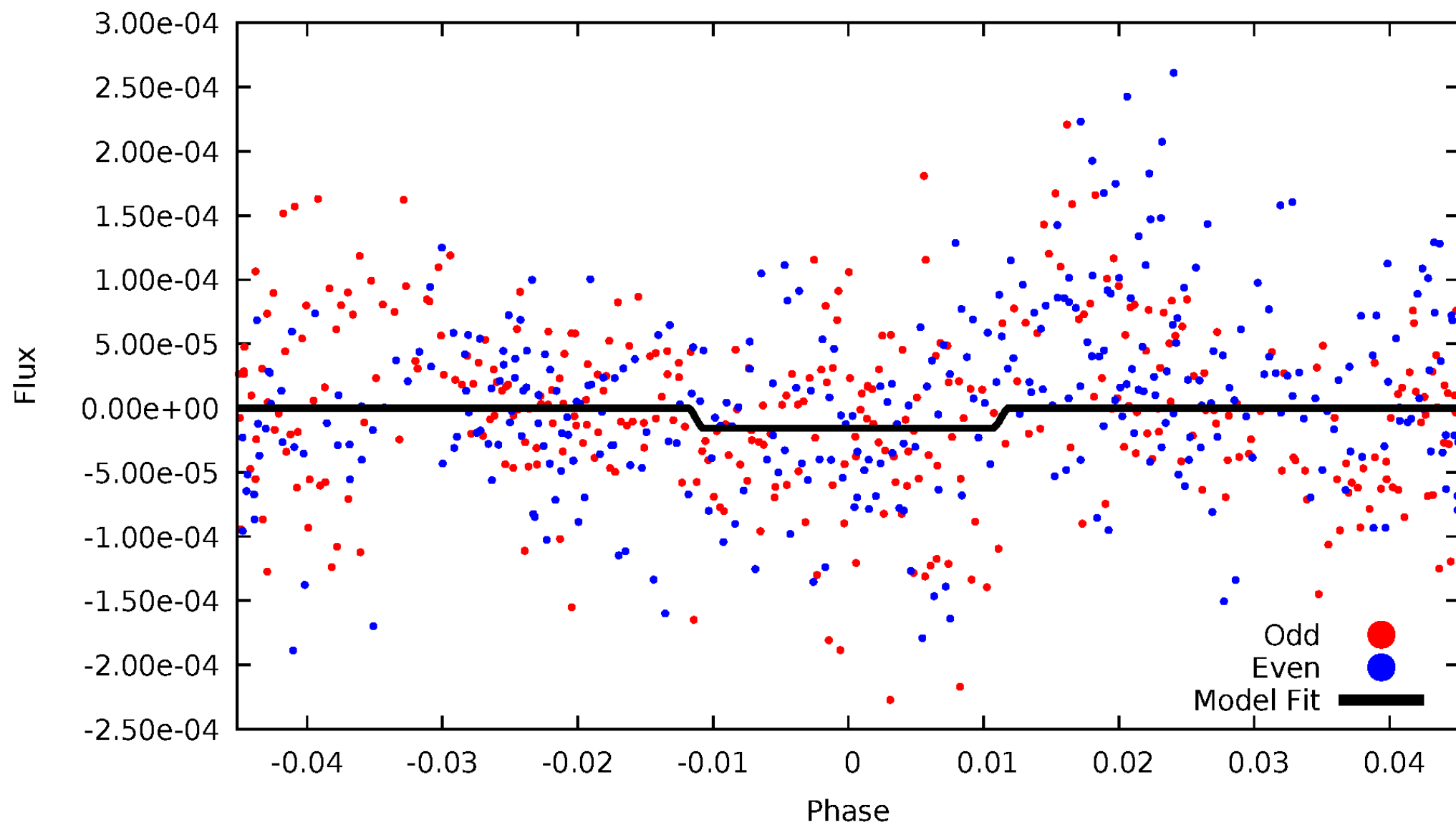
# DV Odd/Even

TCE 011122789-08



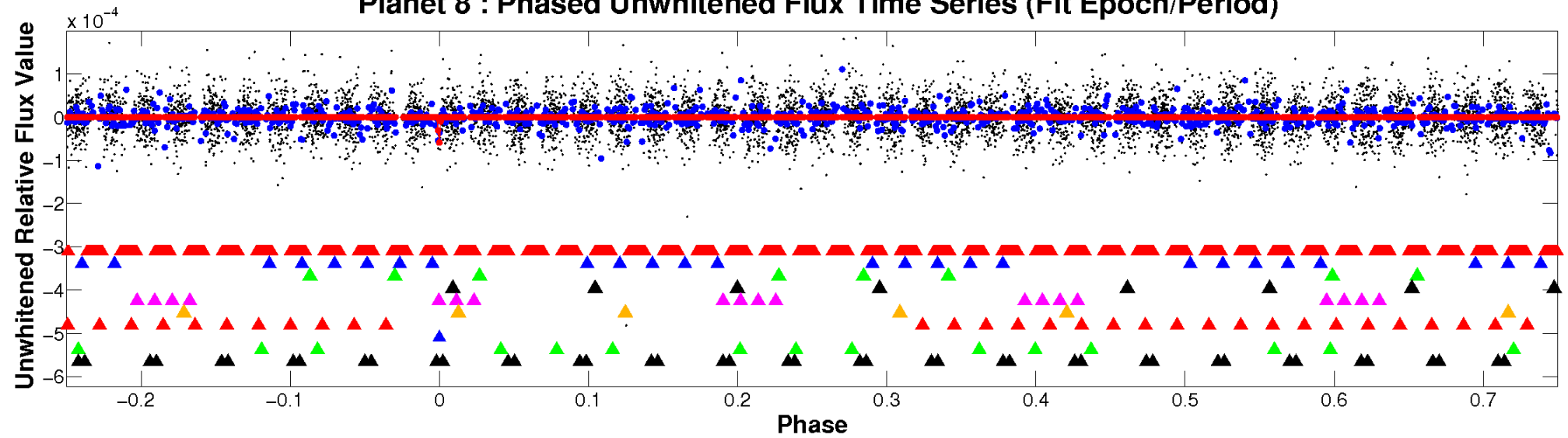
# ALT Odd/Even

TCE 011122789-08

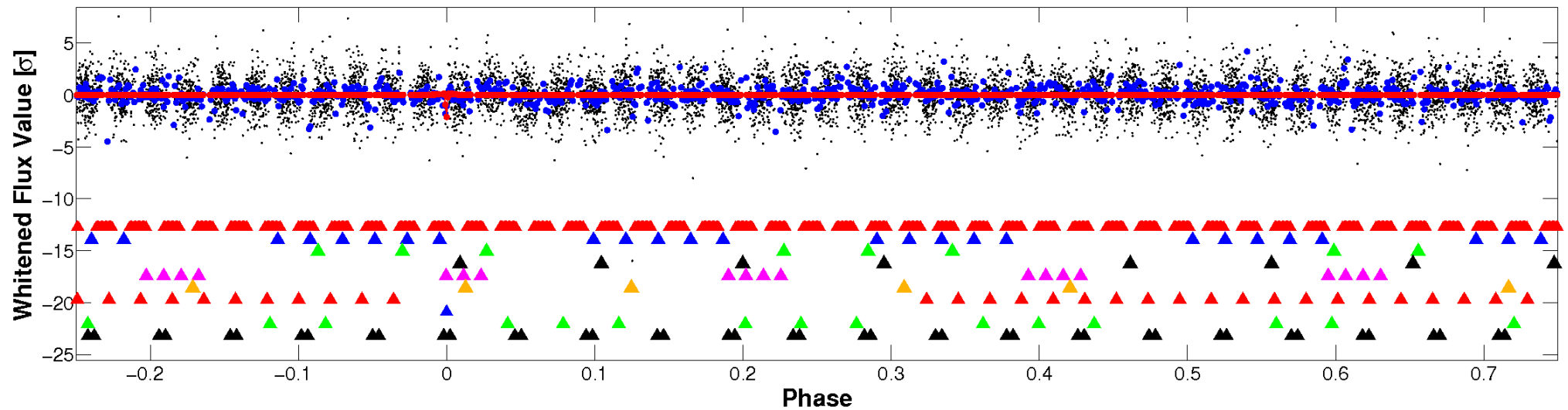


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

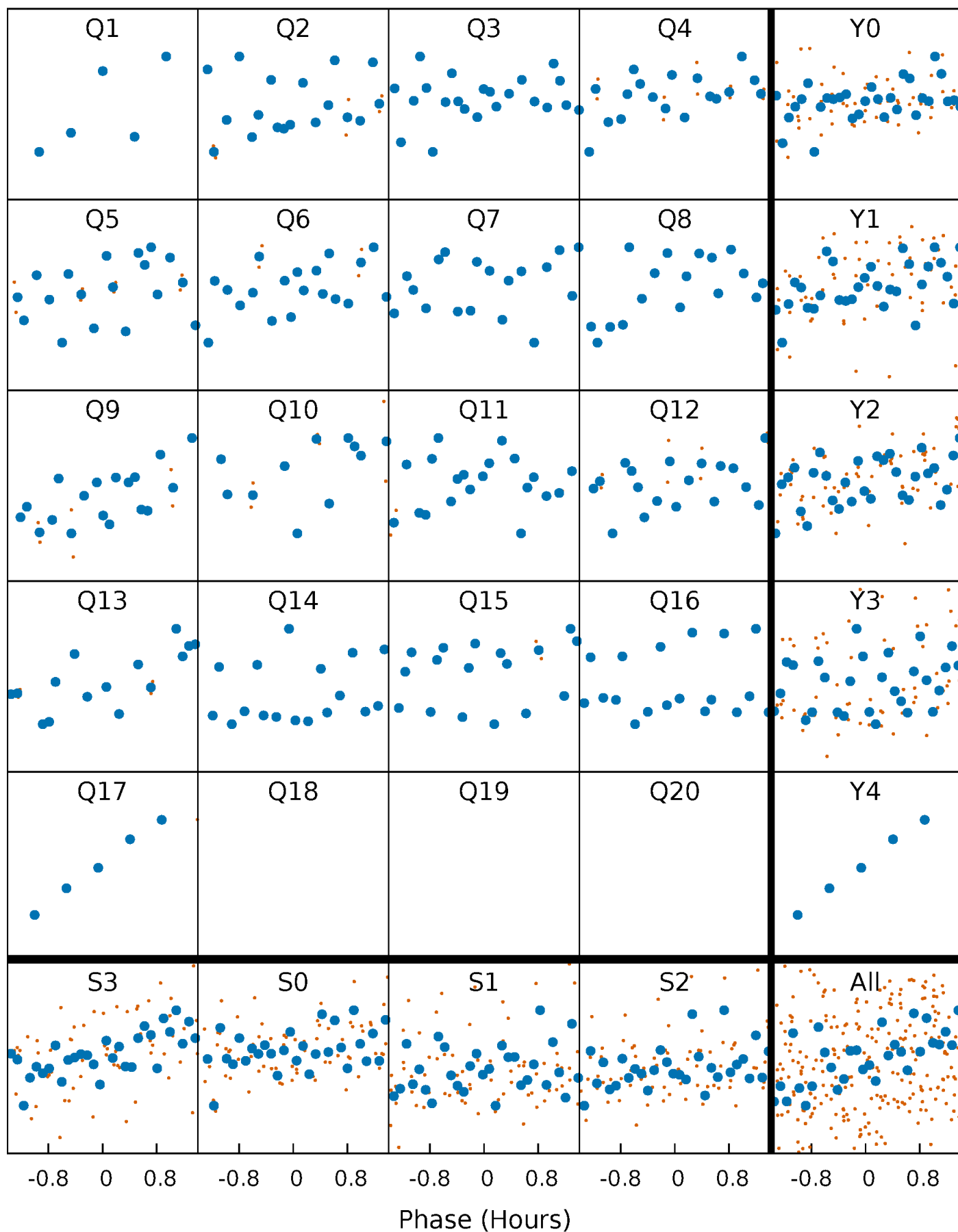


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



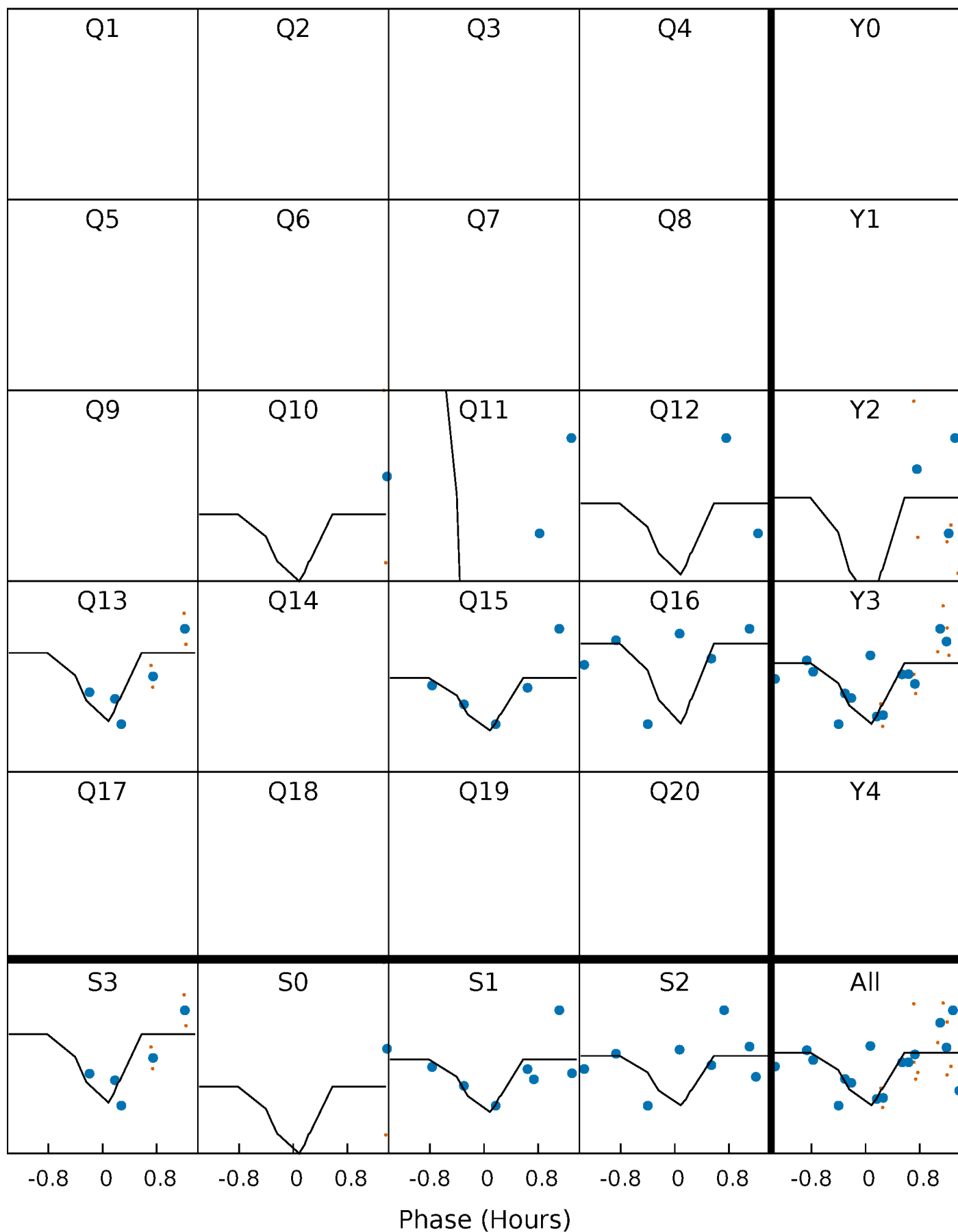
# PDC Quarter-Phased Transit Curves

TCE 011122789-08 P= 23.751009 Days  $T_0=153.254589$  (BKJD)



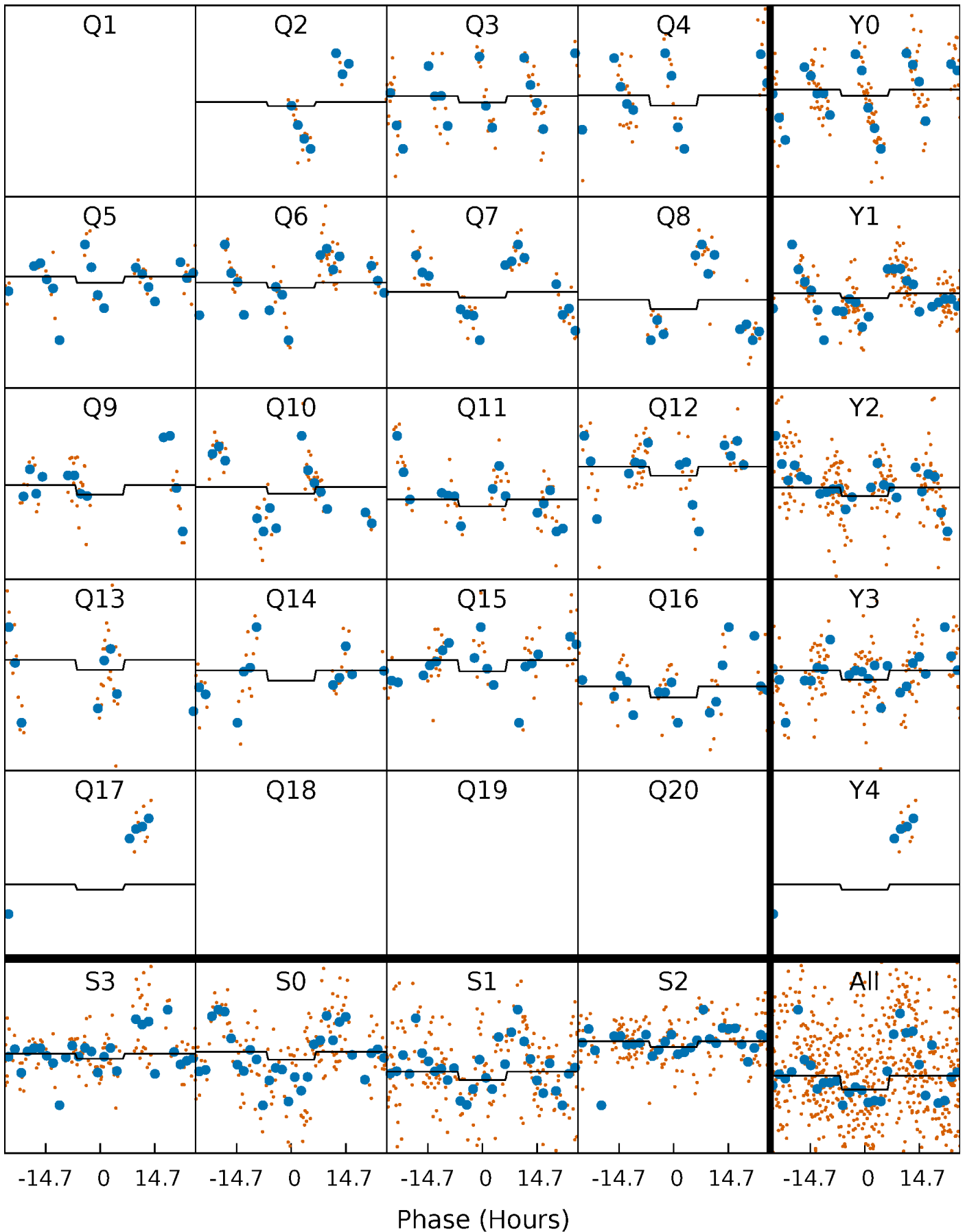
# DV Quarter-Phased Transit Curves

TCE 011122789-08 P= 23.751009 Days  $T_0=153.254589$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011122789-08 P= 23.758916 Days  $T_0=152.900673$  (BKJD)

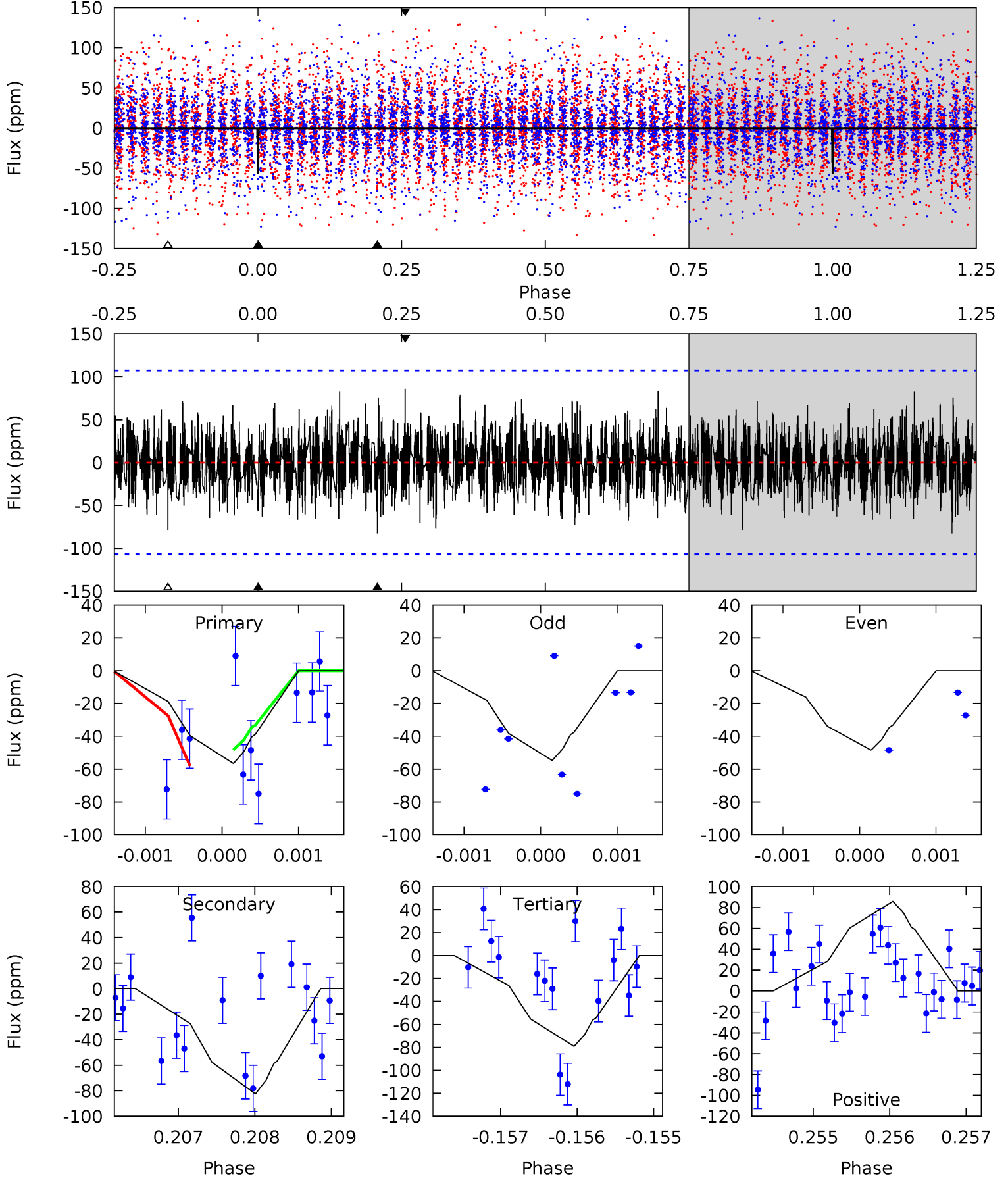




# DV Model-Shift Uniqueness Test

011122789-08, P = 23.751009 Days, E = 129.503580 Days

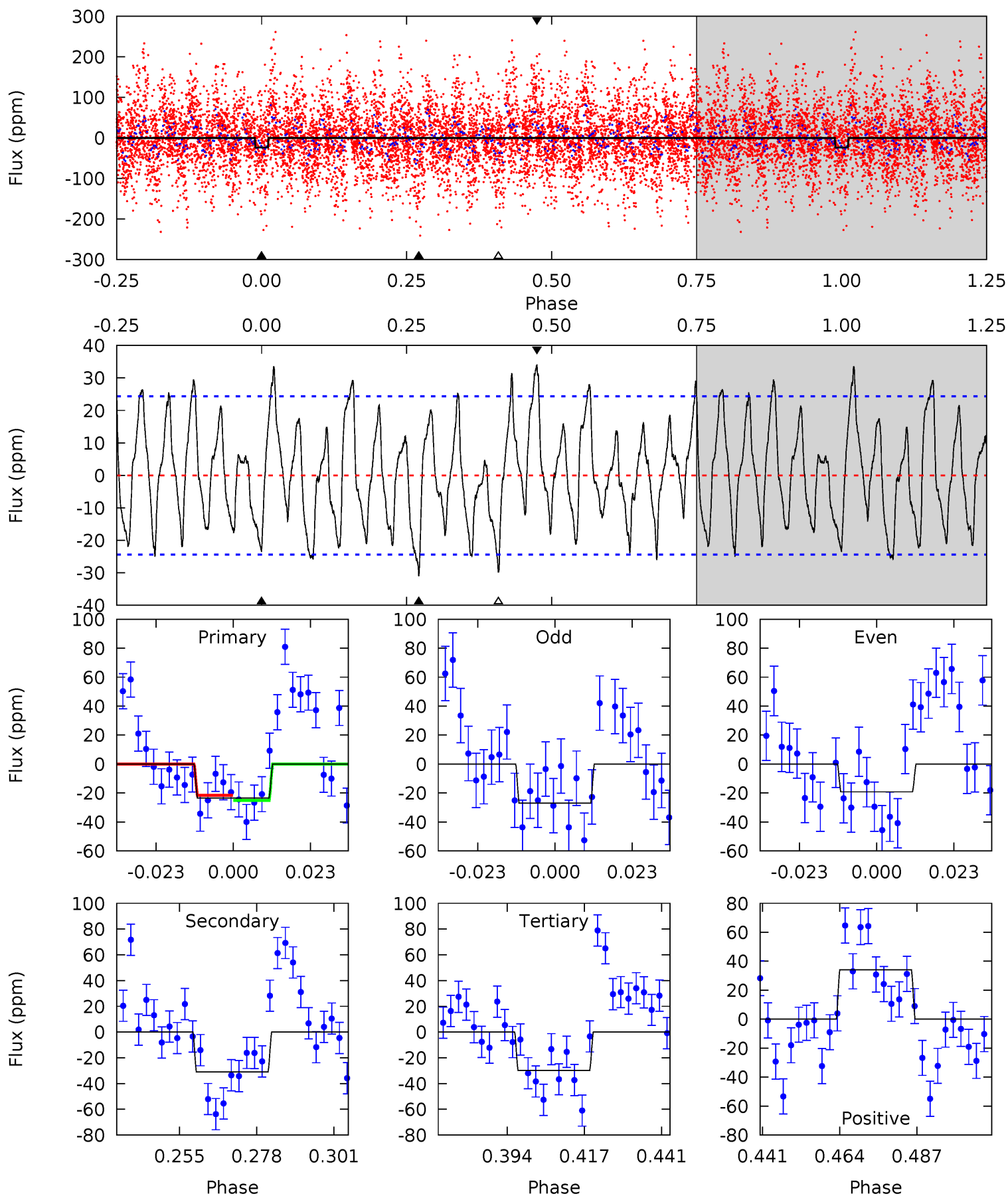
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.88	4.19	4.02	4.37	5.45	3.29	1.15	-1.14	-1.49	0.17	-0.18	0.14	0.78	0.51	0.22



# Alt Model-Shift Uniqueness Test

011122789-08, P = 23.758916 Days, E = 129.141757 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
4.69	6.19	5.96	6.82	4.86	2.27	2.78	-1.27	-2.13	0.23	-0.63	0.76	1.57	0.52	0.35



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-82 \pm 20$	$12.49^{+14.40}_{-8.68}$	$1574^{+108}_{-178}$	$3462^{+1916}_{-734}$	$9.765^{+95.204}_{-7.632}$
Alt.	$-31 \pm 5$	$12.19^{+13.63}_{-8.89}$	$1580^{+112}_{-176}$	$3004^{+1639}_{-634}$	$3.929^{+49.680}_{-3.098}$

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

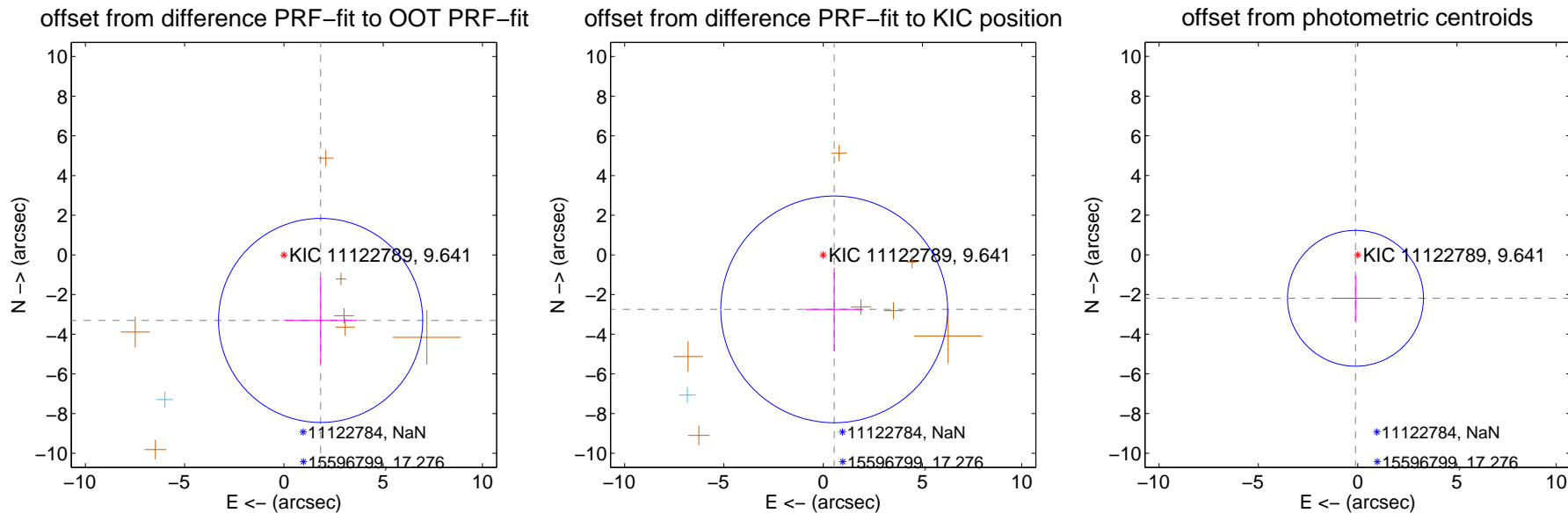
## DV Centroid Data

Supplemental centroid analysis for 011122789-08. **Kepler magnitude: 9.64.** Transit SNR 4.15

**There are 1 quarters with good PRF difference image offsets**

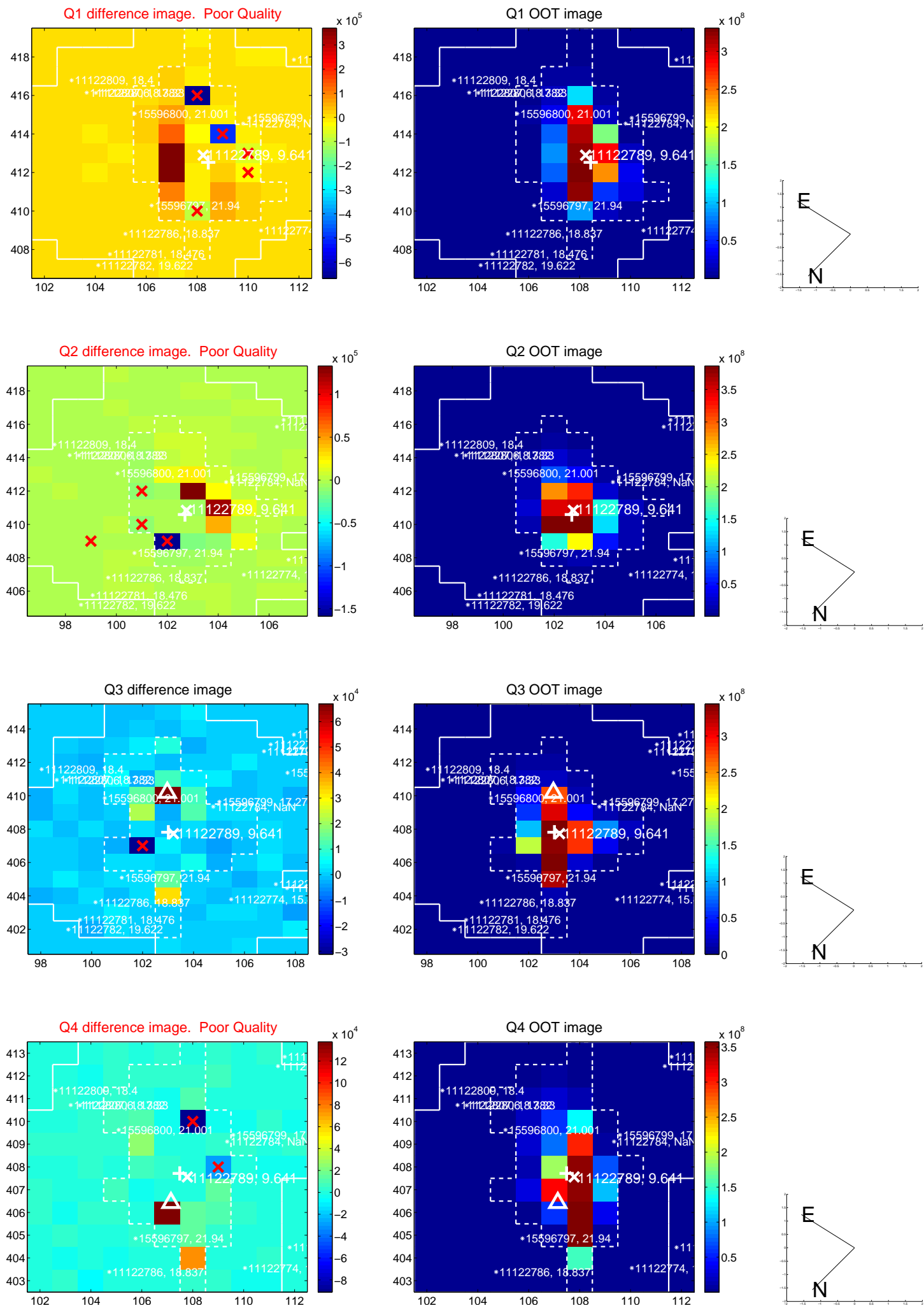
The direct PRF centroid is offset from the target star catalog position by about 1.82 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.785 \pm 1.714$	2.21	$-1.849 \pm 1.862$	$-3.303 \pm 2.174$
PRF-fit source offset from KIC position	$2.801 \pm 1.904$	1.47	$-0.556 \pm 1.470$	$-2.746 \pm 2.086$
photometric centroid source offset	$2.19 \pm 1.14$	1.92	$0.11 \pm 1.18$	$-2.19 \pm 1.14$

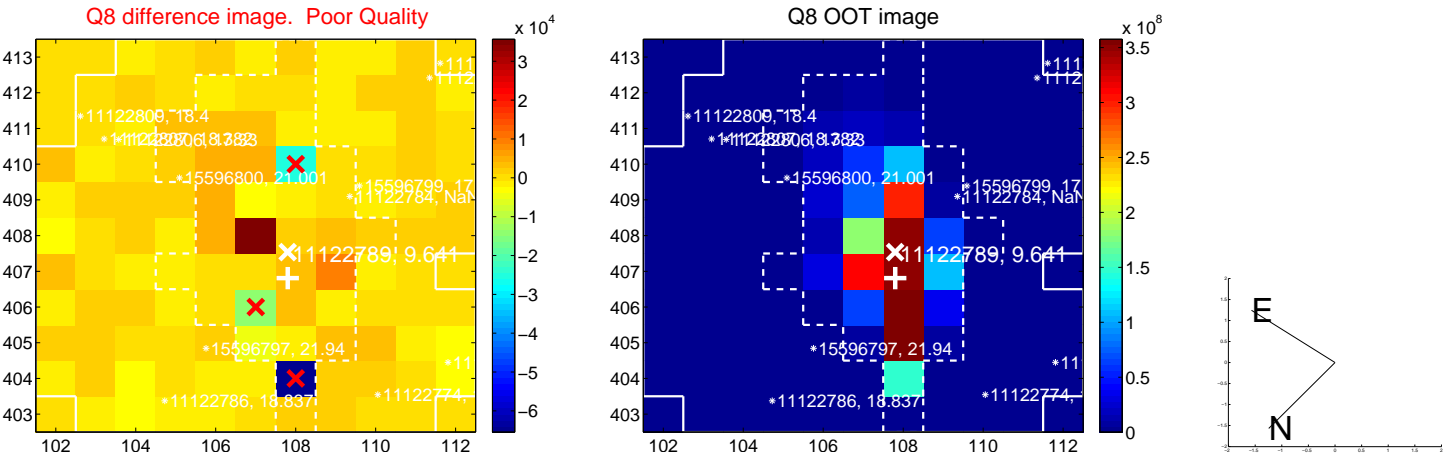
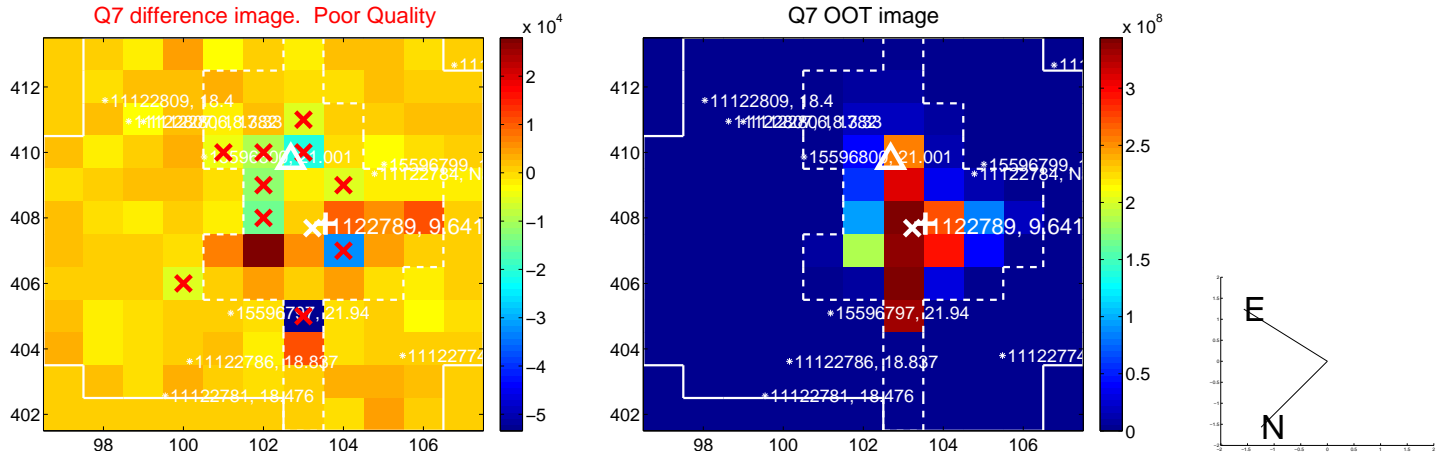
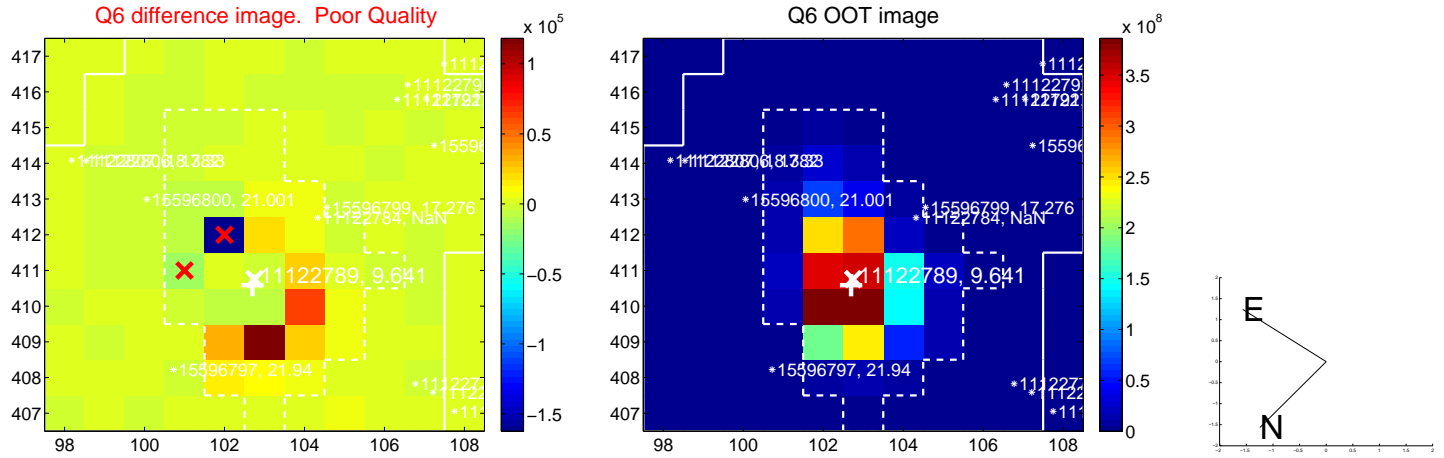
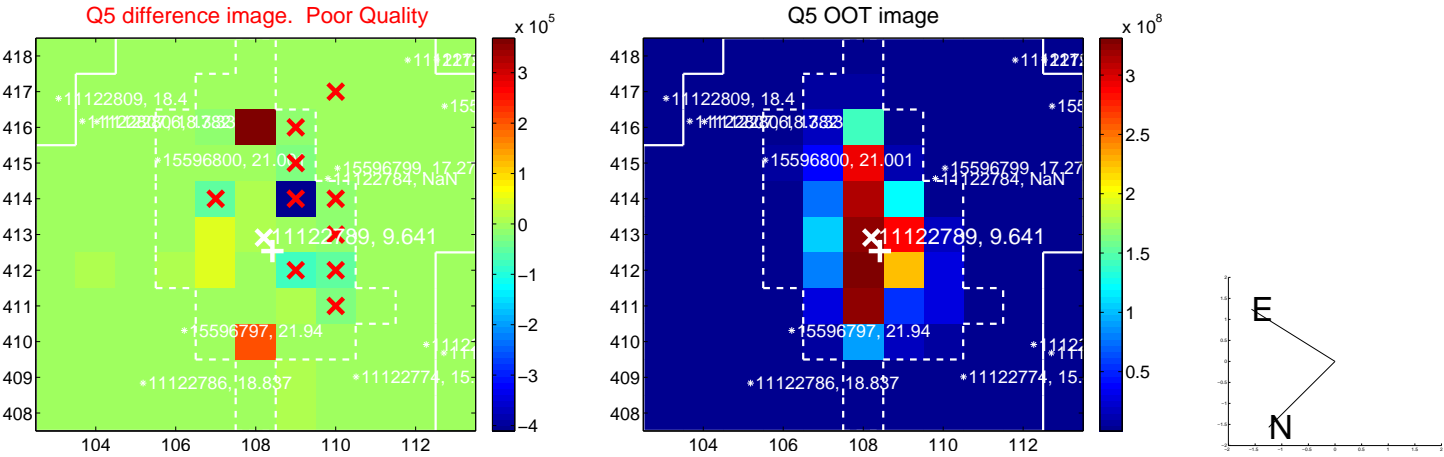


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

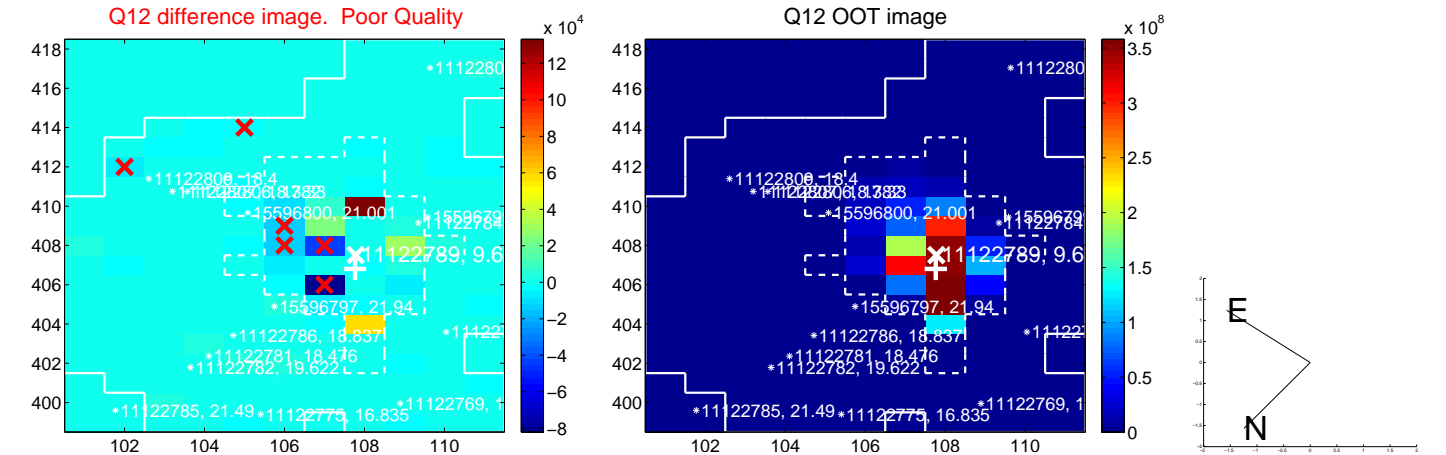
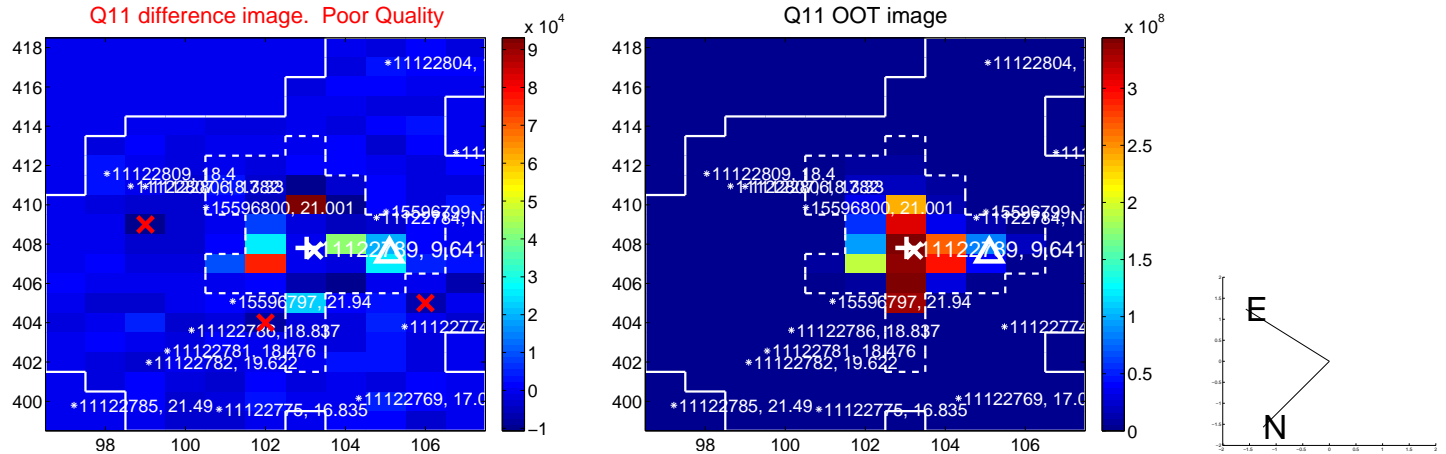
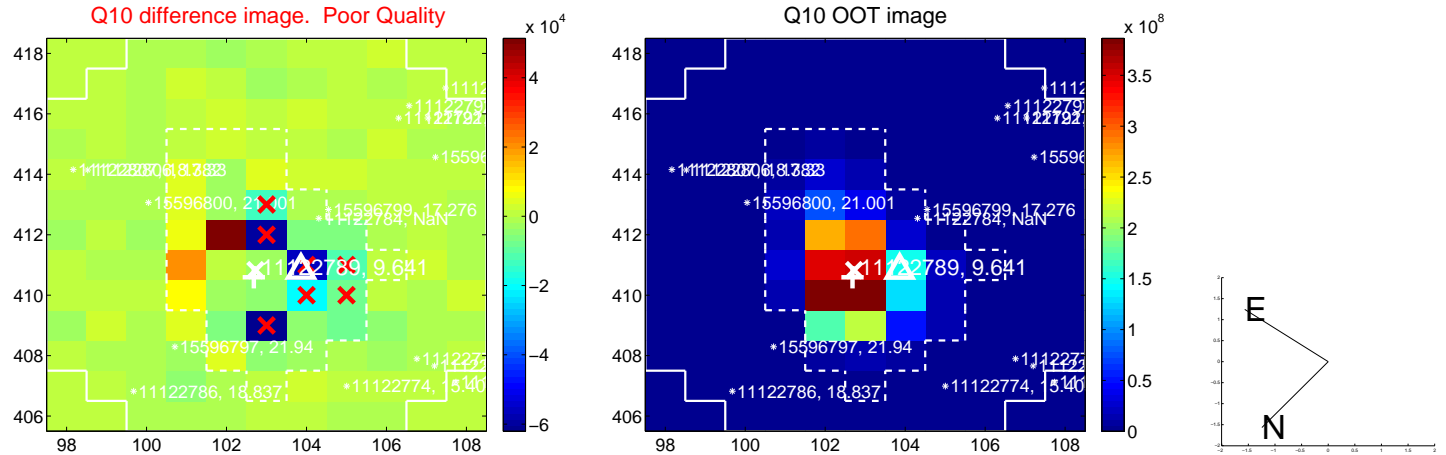
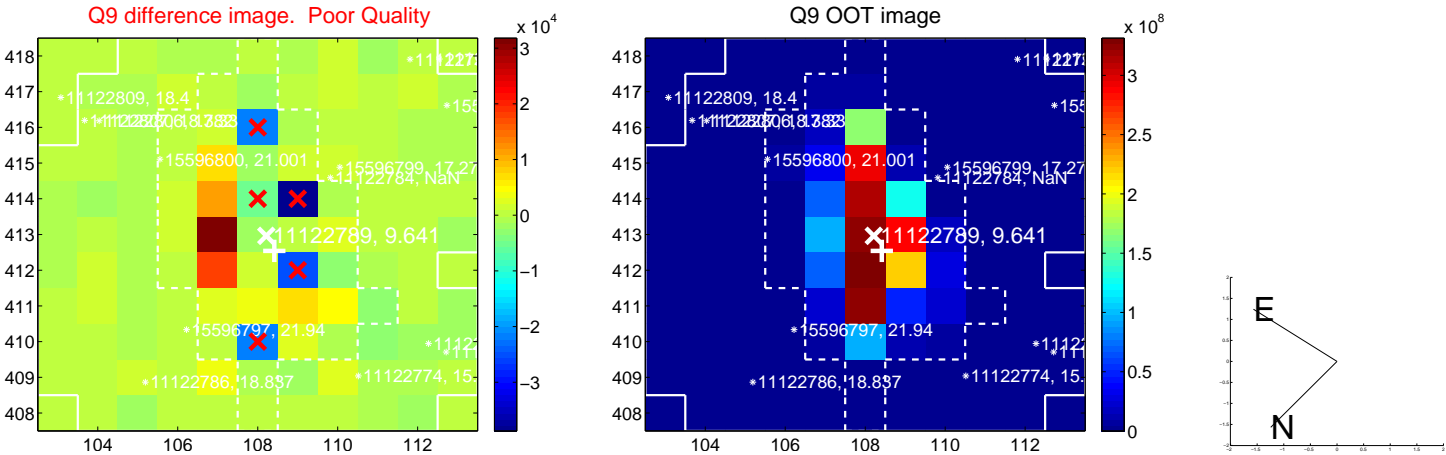
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



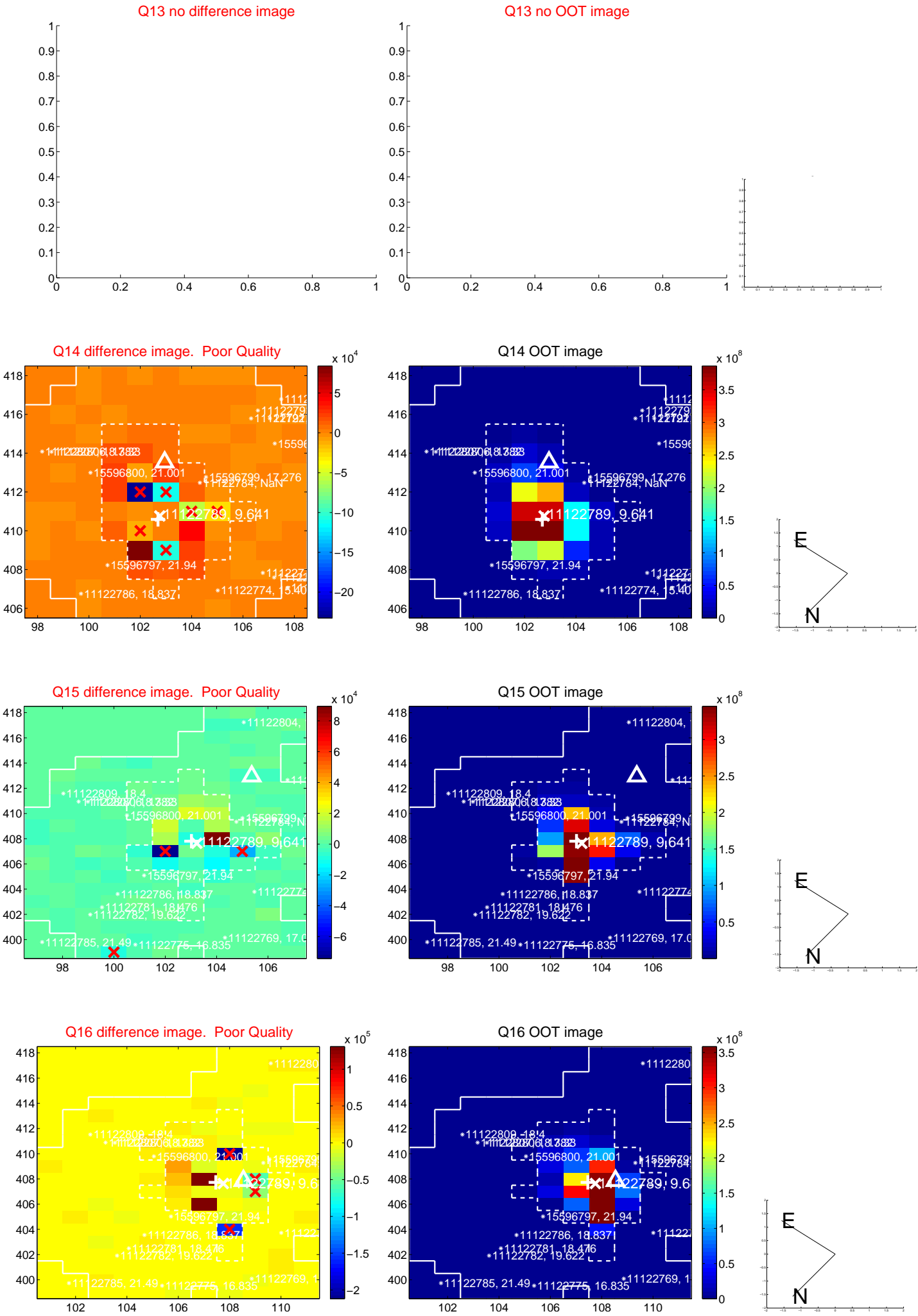
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

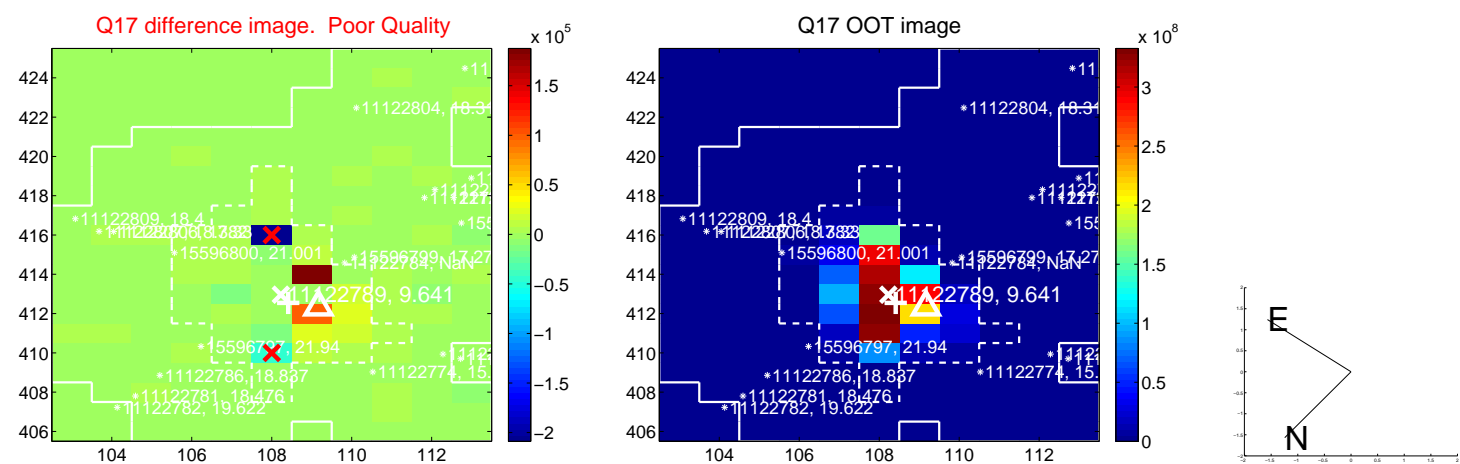


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

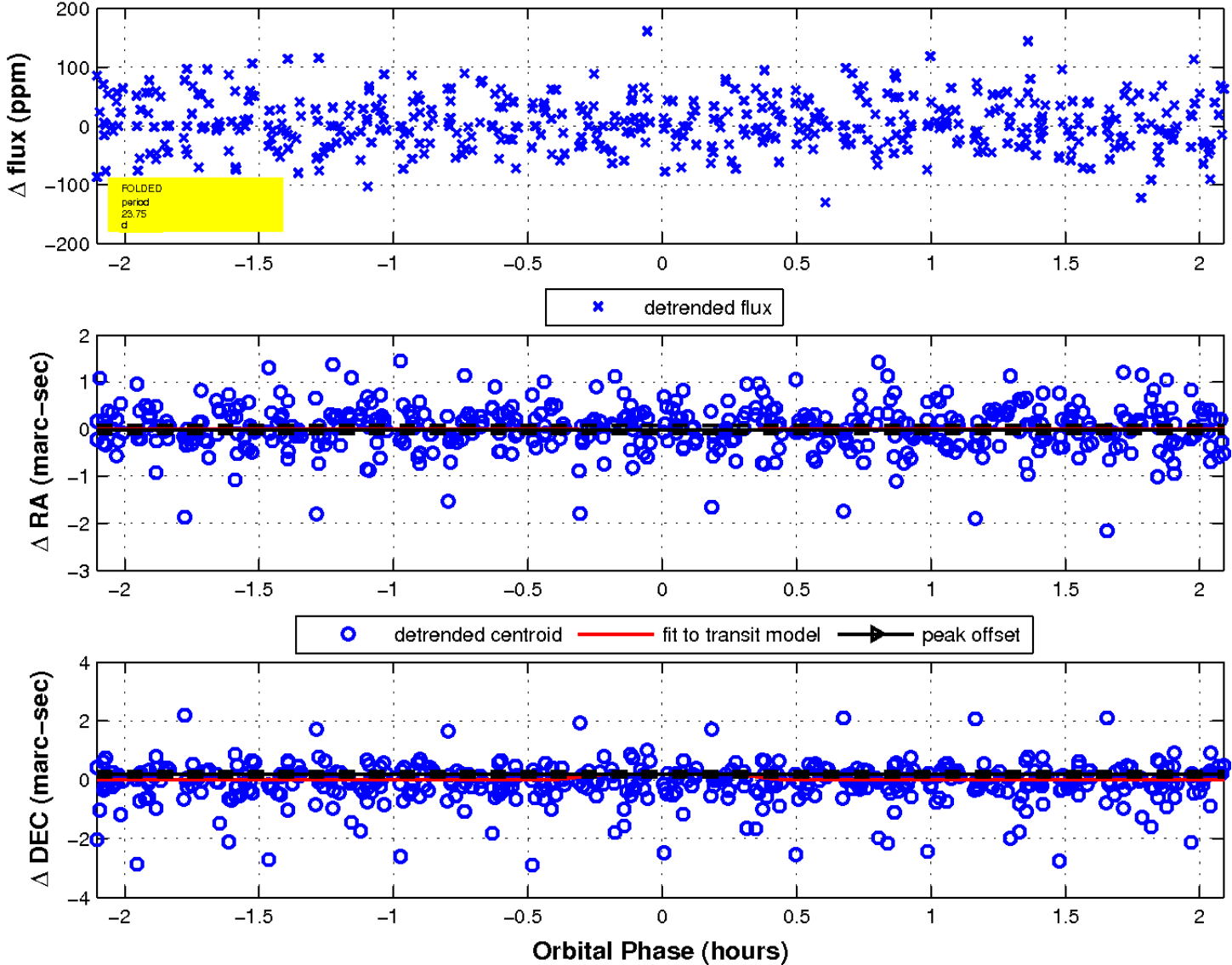




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

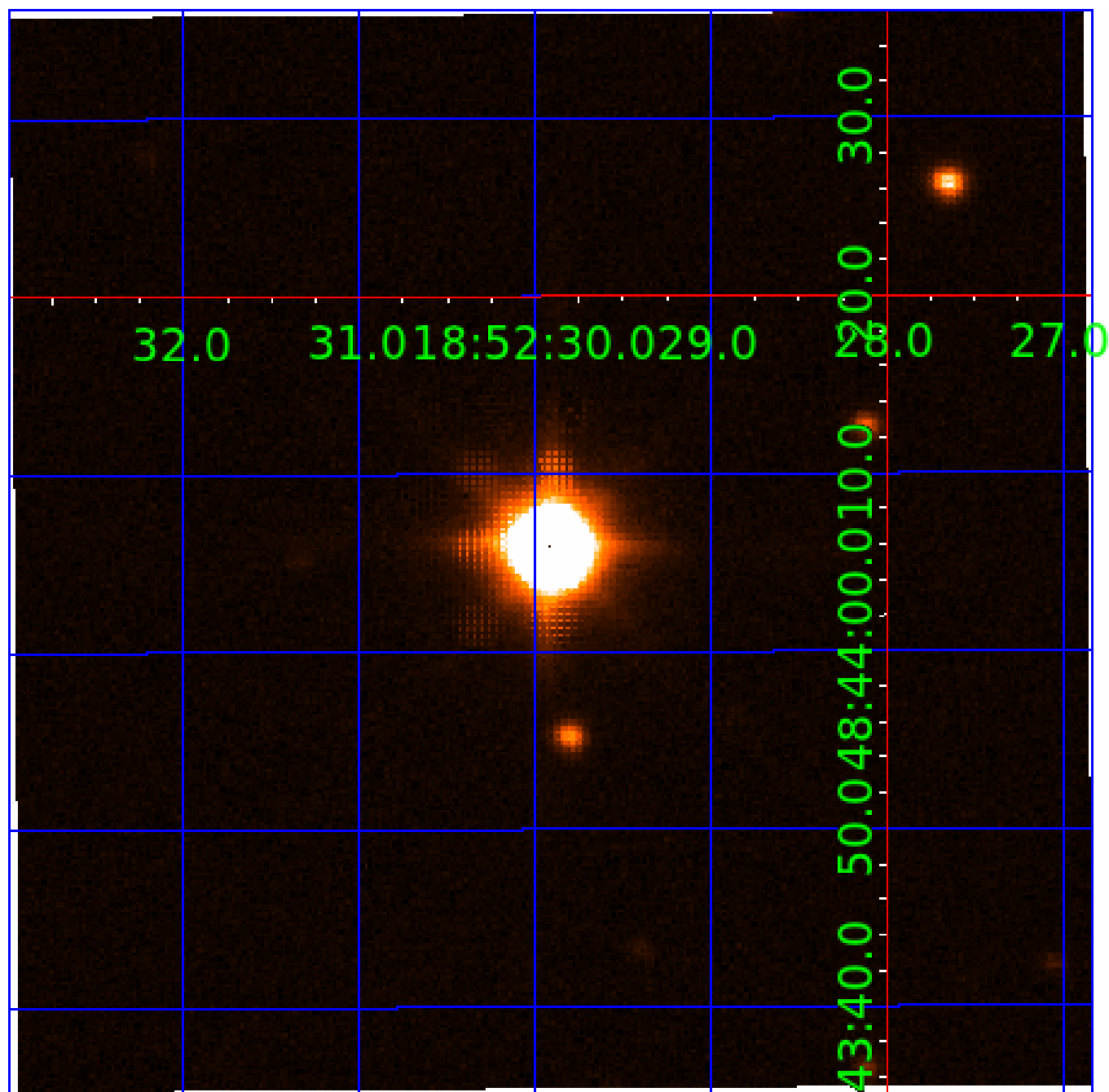


fluxWeightedCentroids, Planet 8 of 10



UKIRT Image

Declination



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011122789-01	OBS	No	1.619082	132.248682	0.1	10.961	11.7	0.2	2.51	7161	0.10	15432.77
011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

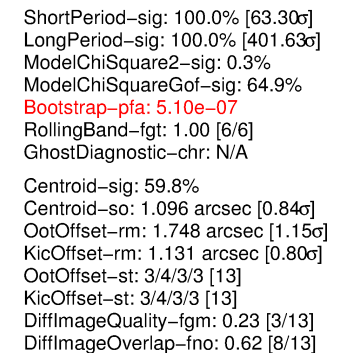
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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.

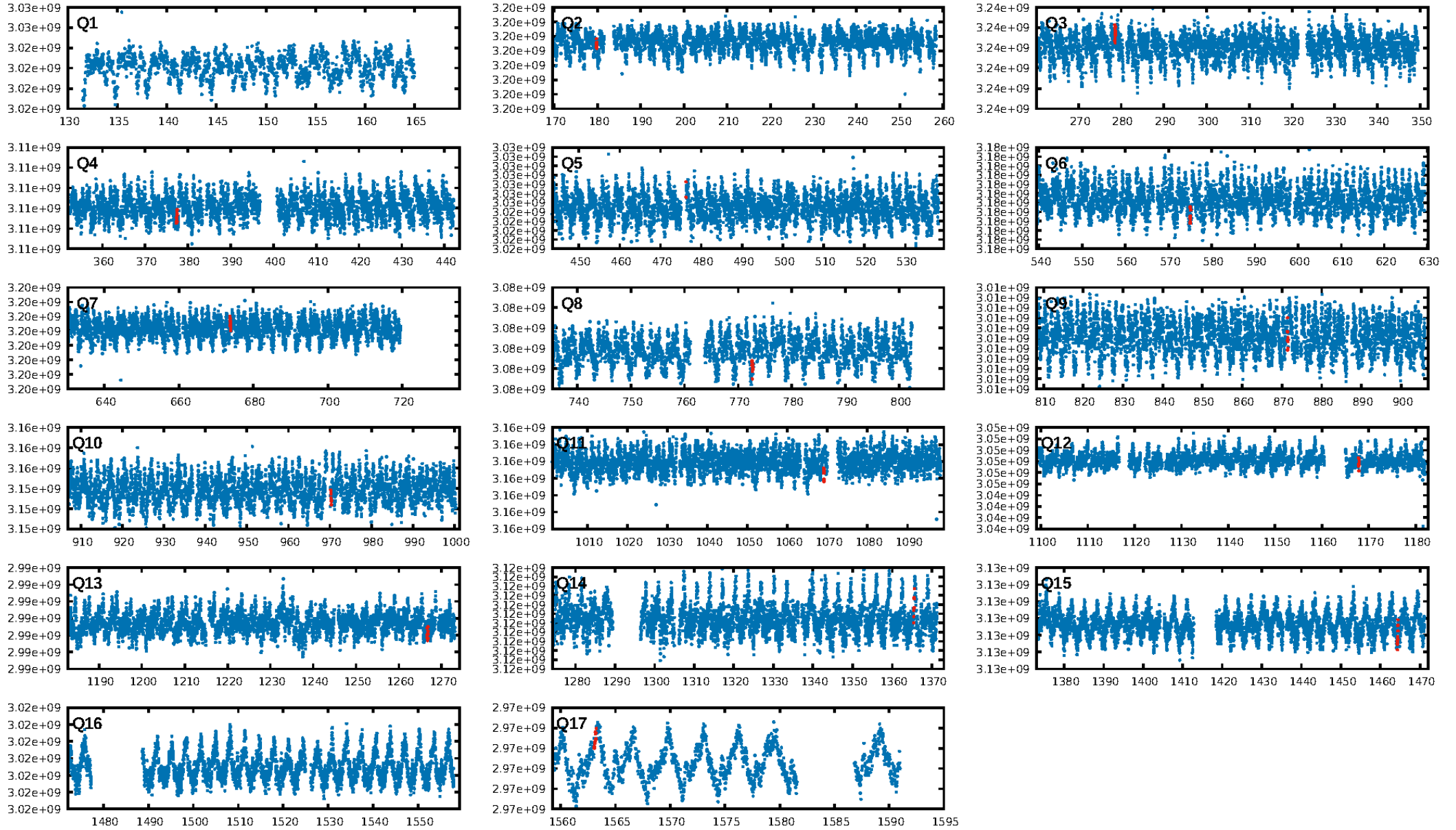
Ephemeris Match Information For 011122789-09

No Significant Match Found

## KIC: 11122789 Candidate: 9 of 10 Period: 98.814 d

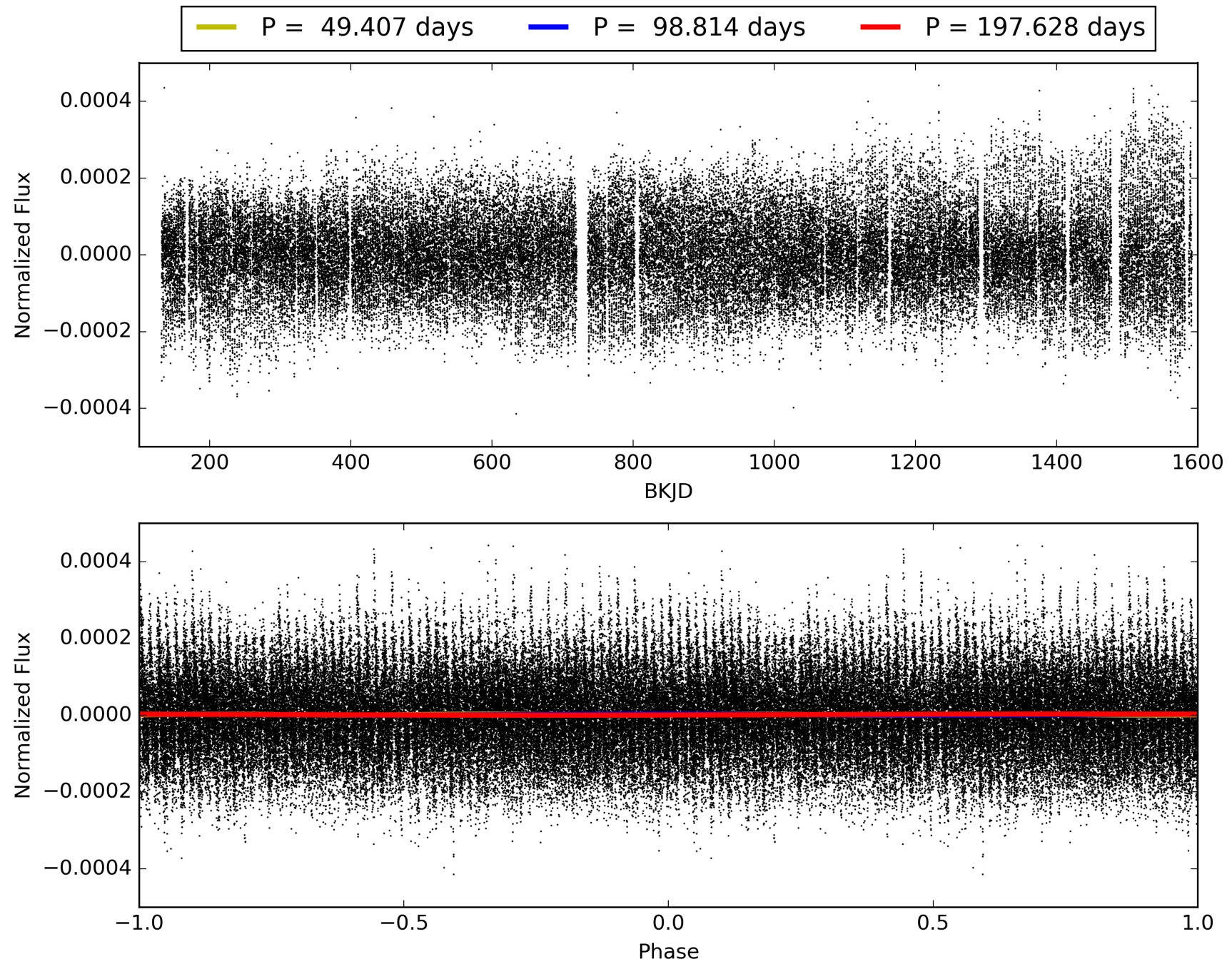


# TCE 011122789-09, PDC Light Curves



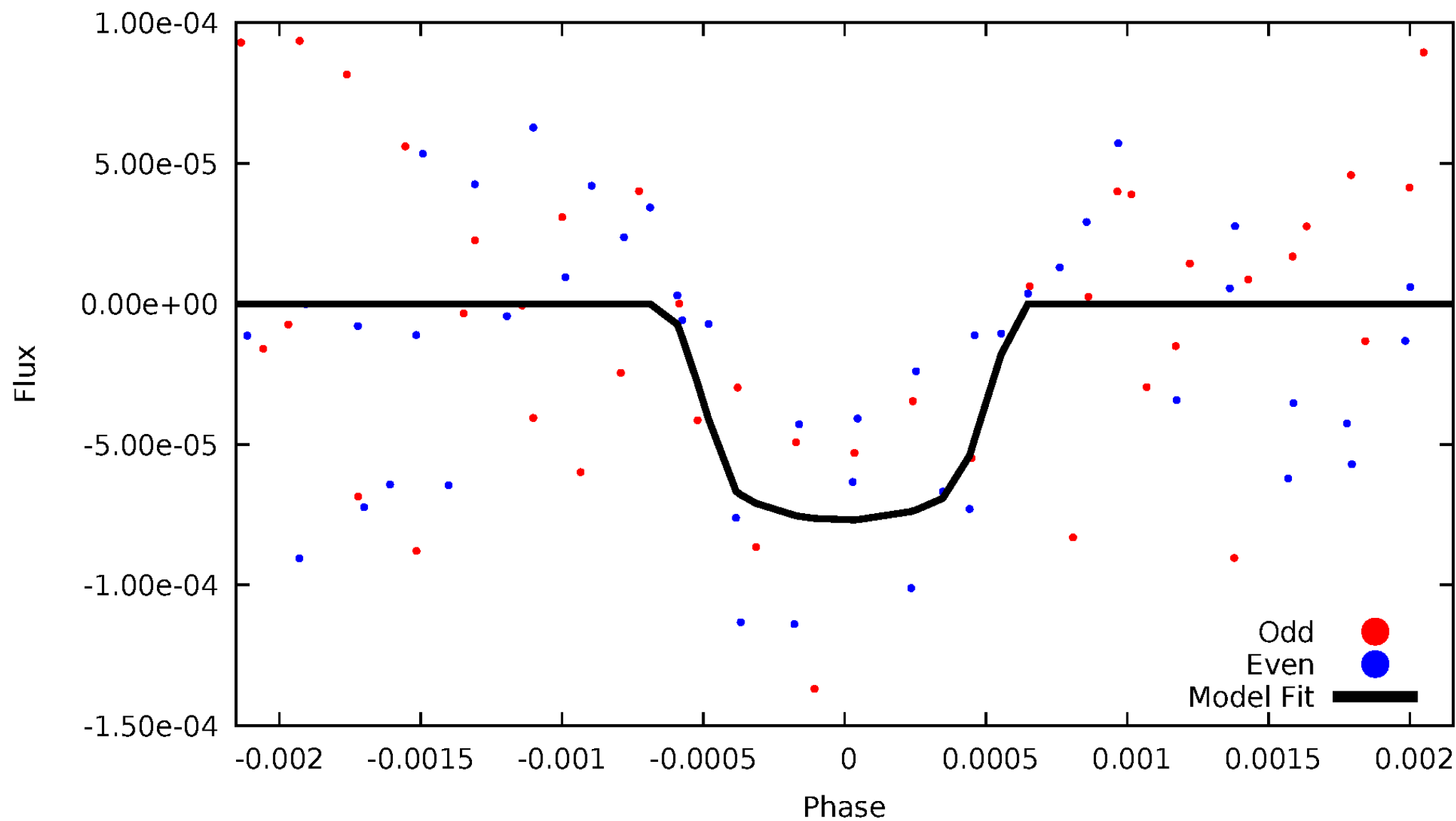


TCE 011122789-09



# DV Odd/Even

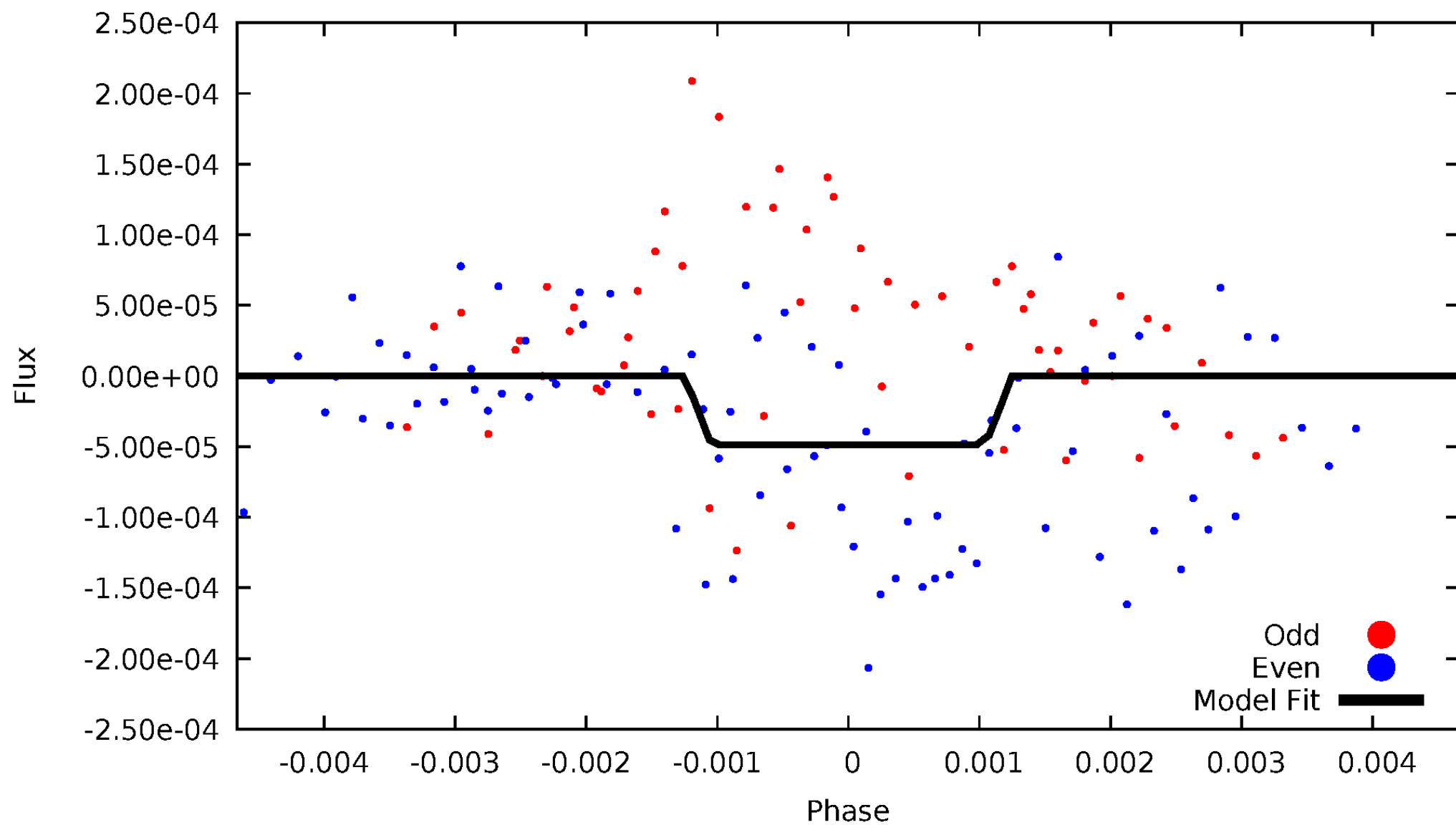
TCE 011122789-09





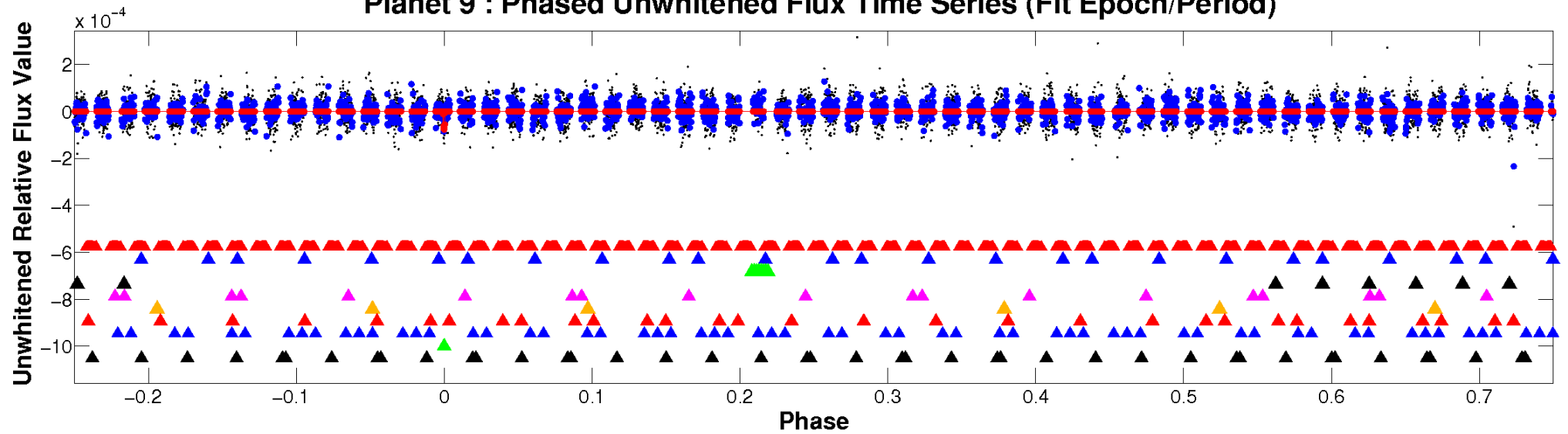
# ALT Odd/Even

TCE 011122789-09

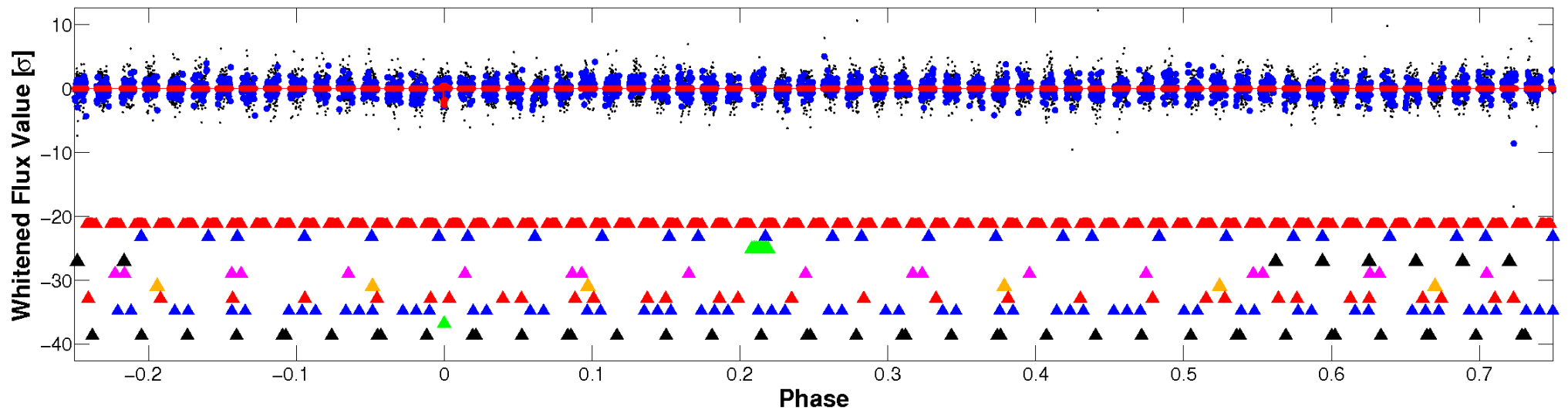


# Non-Whitened Vs. Whitened Light Curve

Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

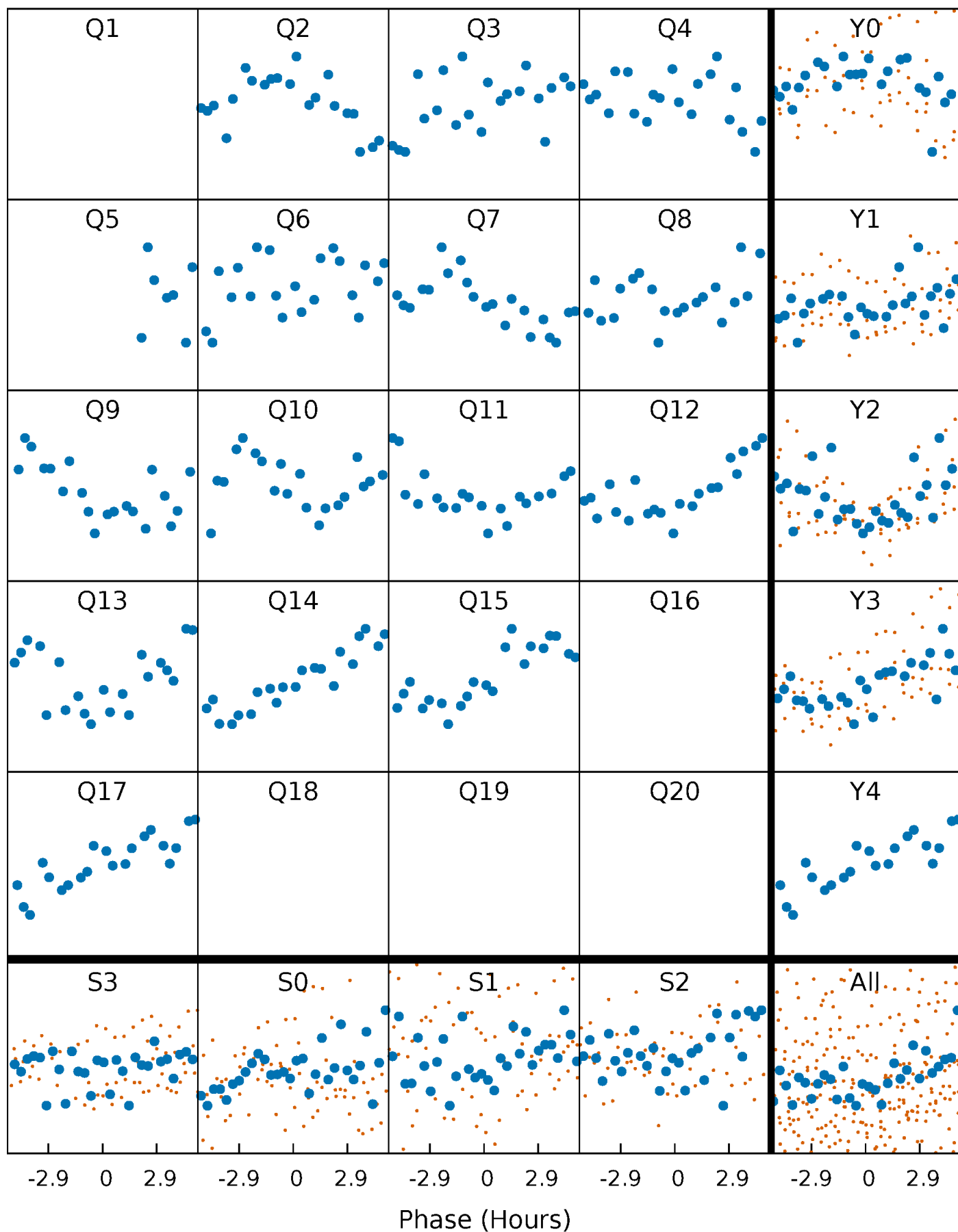


Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



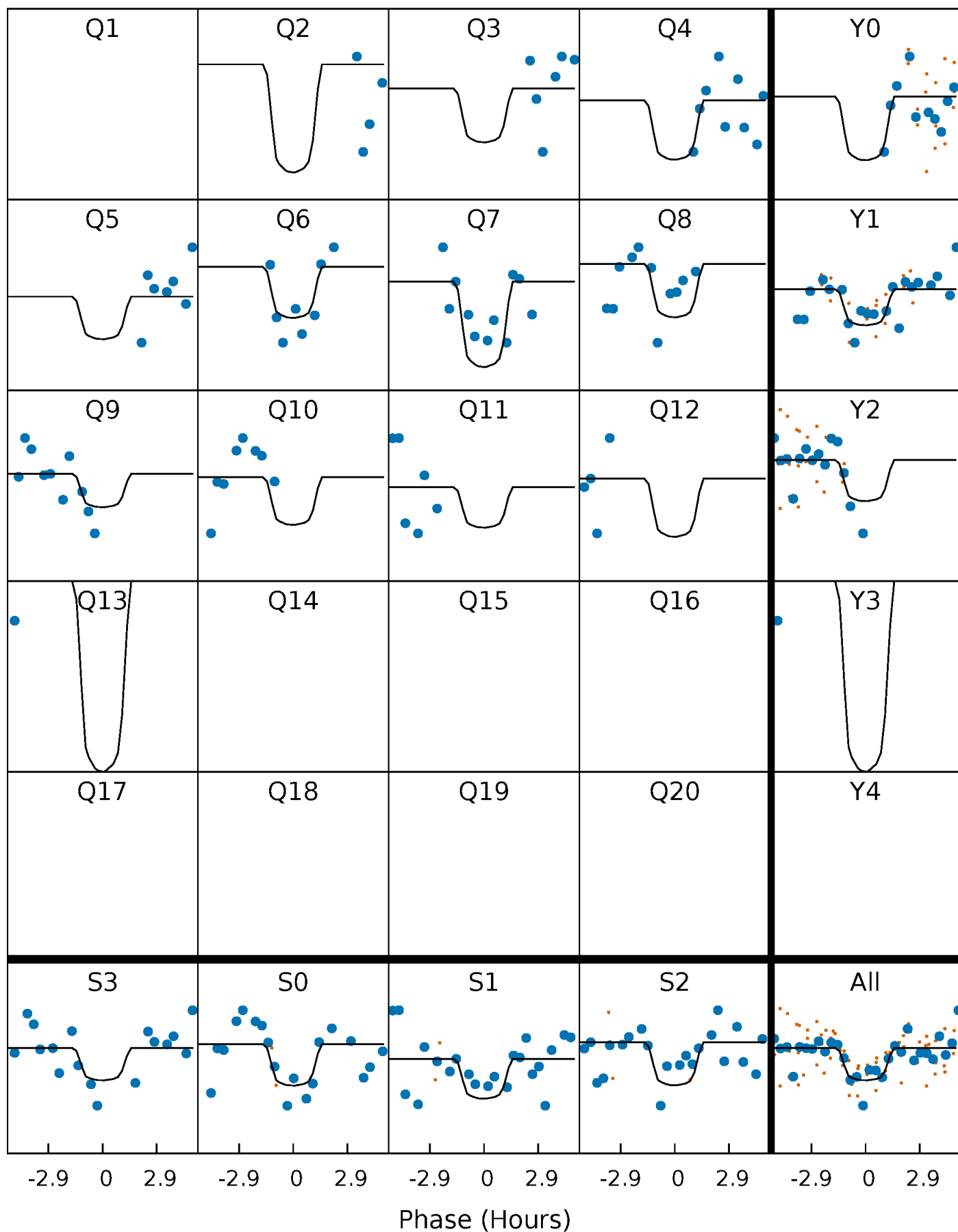
# PDC Quarter-Phased Transit Curves

TCE 011122789-09 P= 98.814123 Days  $T_0=179.765633$  (BKJD)



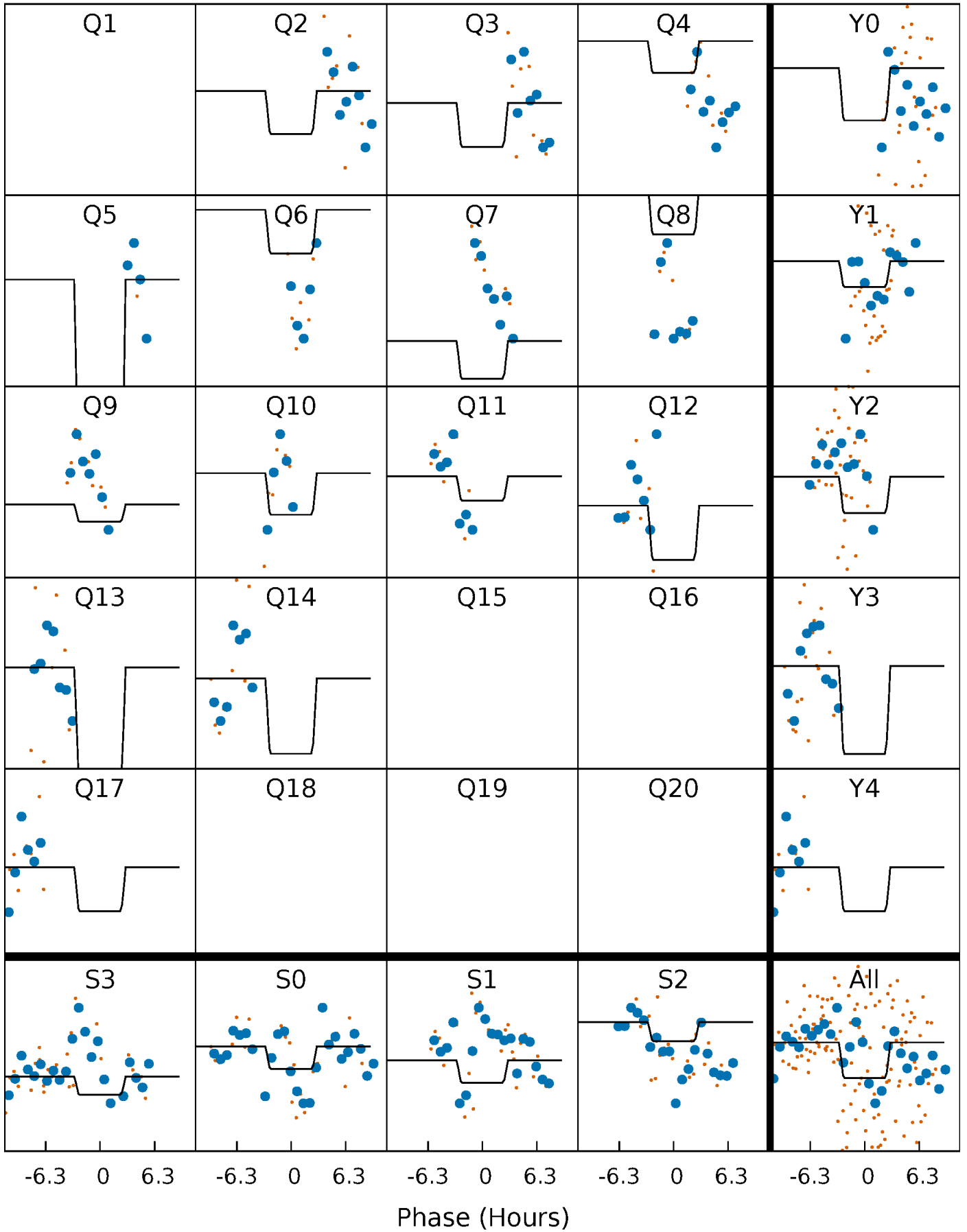
# DV Quarter-Phased Transit Curves

TCE 011122789-09 P= 98.814123 Days  $T_0=179.765633$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

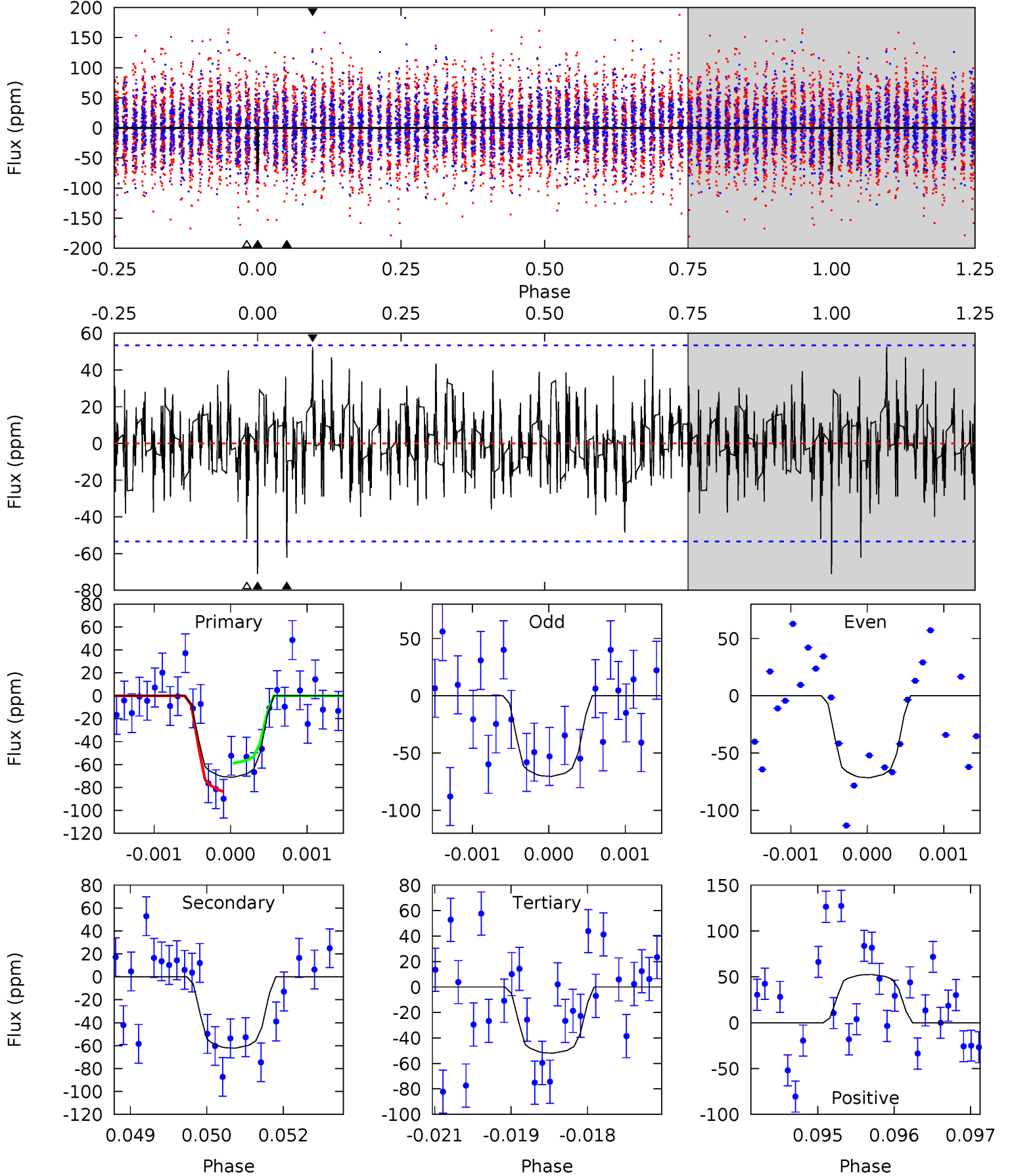
TCE 011122789-09 P= 98.809422 Days  $T_0=179.742383$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-09, P = 98.814123 Days, E = 80.951510 Days

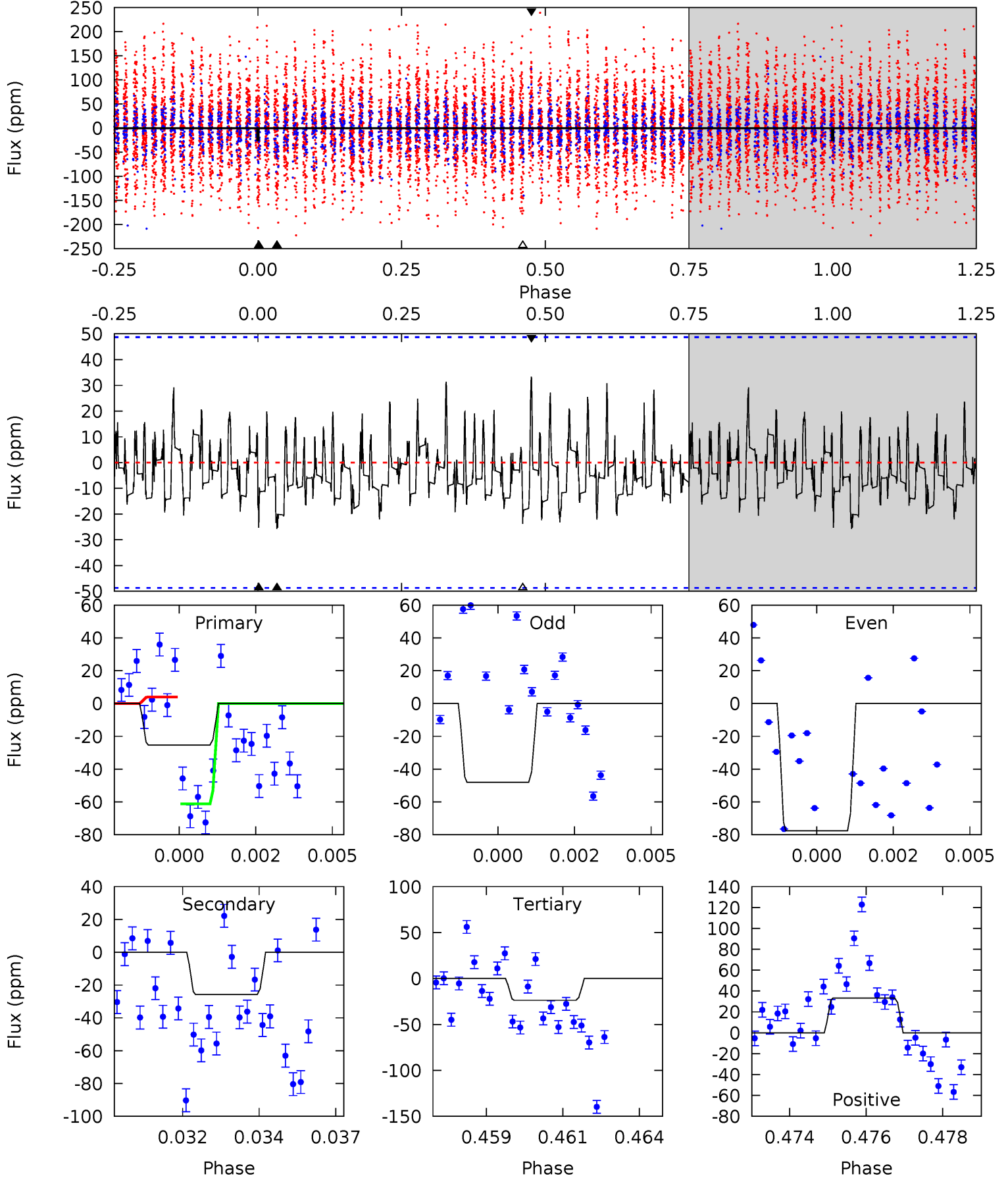
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.22	6.32	5.27	5.33	5.43	3.25	1.50	1.94	1.89	1.05	0.99	0.06	1.06	0.42	1.25



# Alt Model-Shift Uniqueness Test

011122789-09, P = 98.809422 Days, E = 80.932961 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
2.75	2.80	2.58	3.62	5.29	3.03	1.13	0.16	-0.87	0.21	-0.82	1.58	0.87	0.56	3.10



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	-62±10	$2.65^{+2.45}_{-1.63}$	$986^{+68}_{-123}$	$5981^{+5109}_{-1382}$	$1085^{+6585}_{-798}$
Alt.	-26±9	$2.54^{+2.24}_{-1.69}$	$980^{+67}_{-108}$	$4999^{+3649}_{-1059}$	$477^{+3642}_{-352}$

$T_{\text{max}}$  = 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

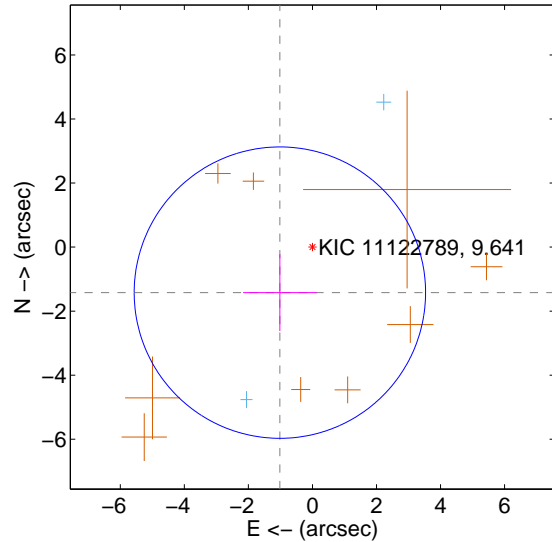
Supplemental centroid analysis for 011122789-09. **Kepler magnitude: 9.64.** Transit SNR 9.80

**There are 3 quarters with good PRF difference image offsets**

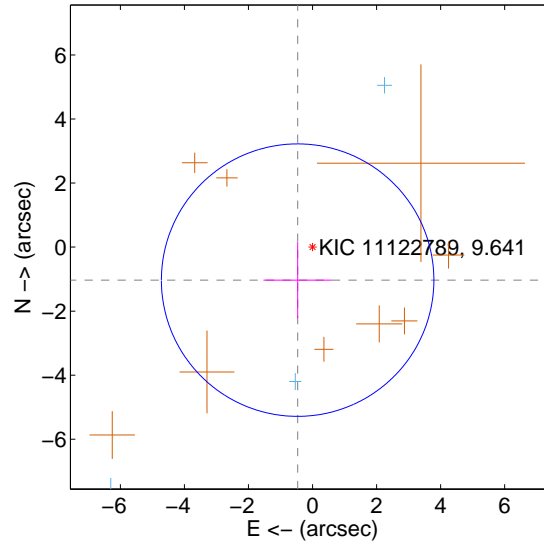
The direct PRF centroid is offset from the target star catalog position by about 1.72 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.748 \pm 1.516$	1.15	$1.016 \pm 1.148$	$-1.422 \pm 1.197$
PRF-fit source offset from KIC position	$1.131 \pm 1.418$	0.80	$0.465 \pm 1.067$	$-1.031 \pm 1.187$
photometric centroid source offset	$1.10 \pm 1.31$	0.84	$0.82 \pm 1.35$	$0.73 \pm 1.27$

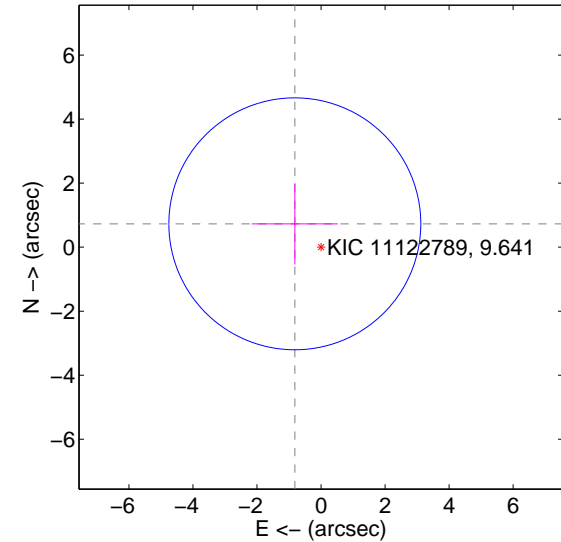
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

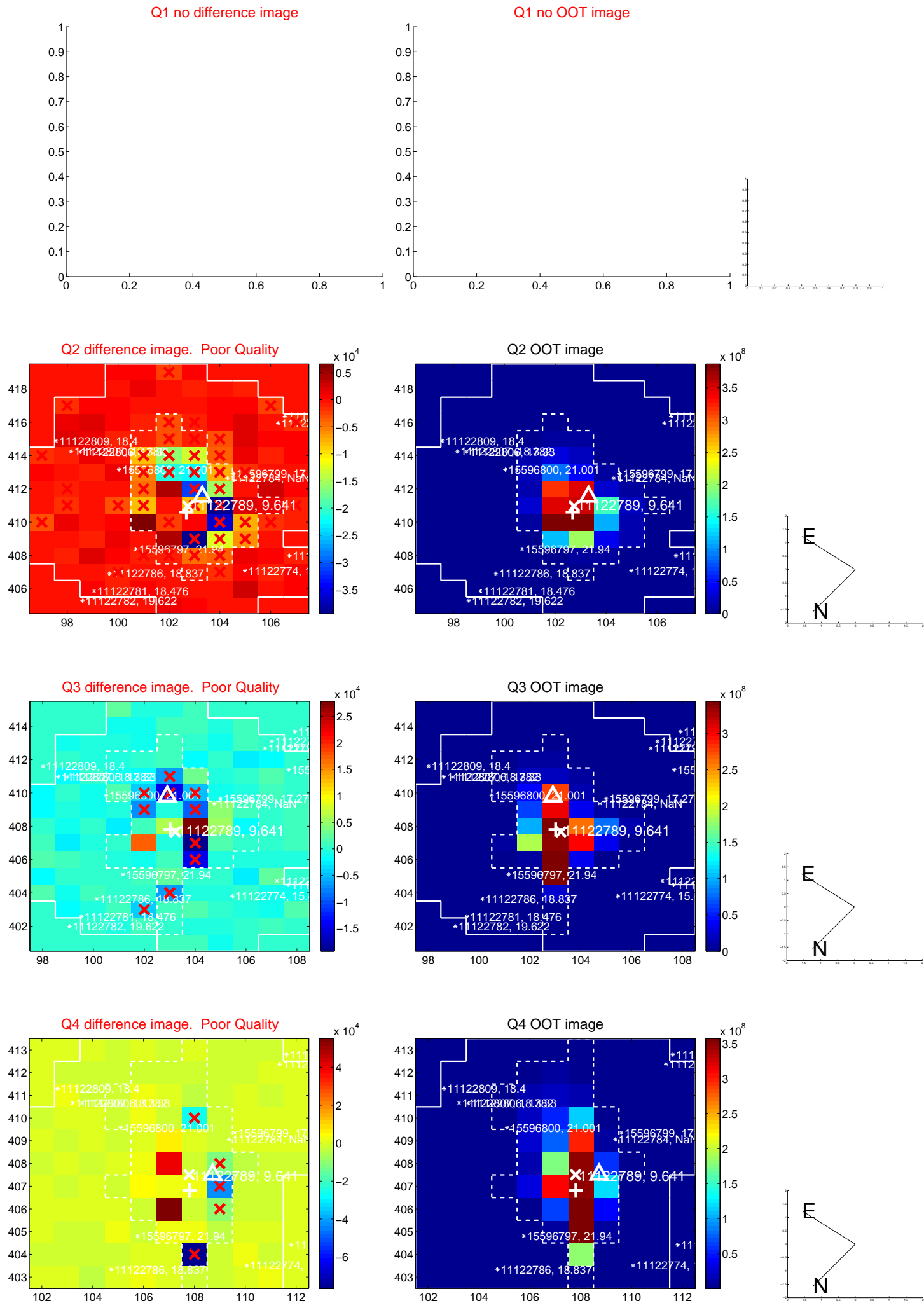


offset from photometric centroids

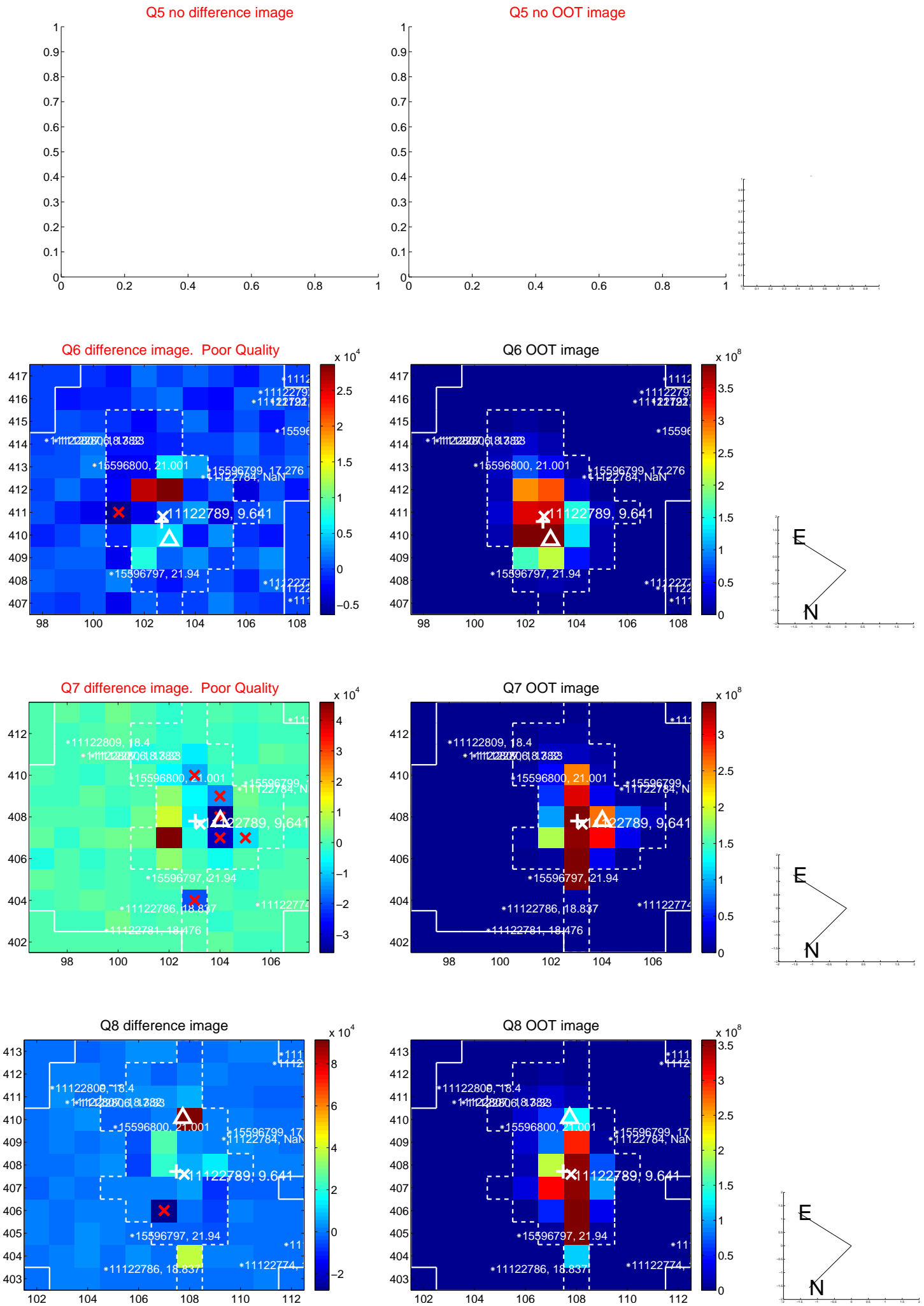


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

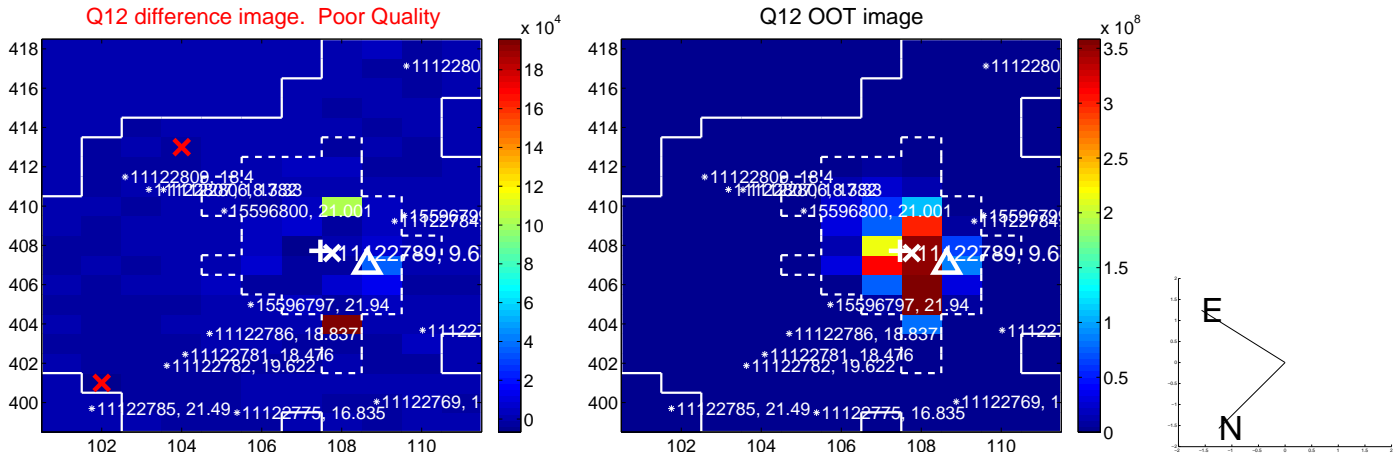
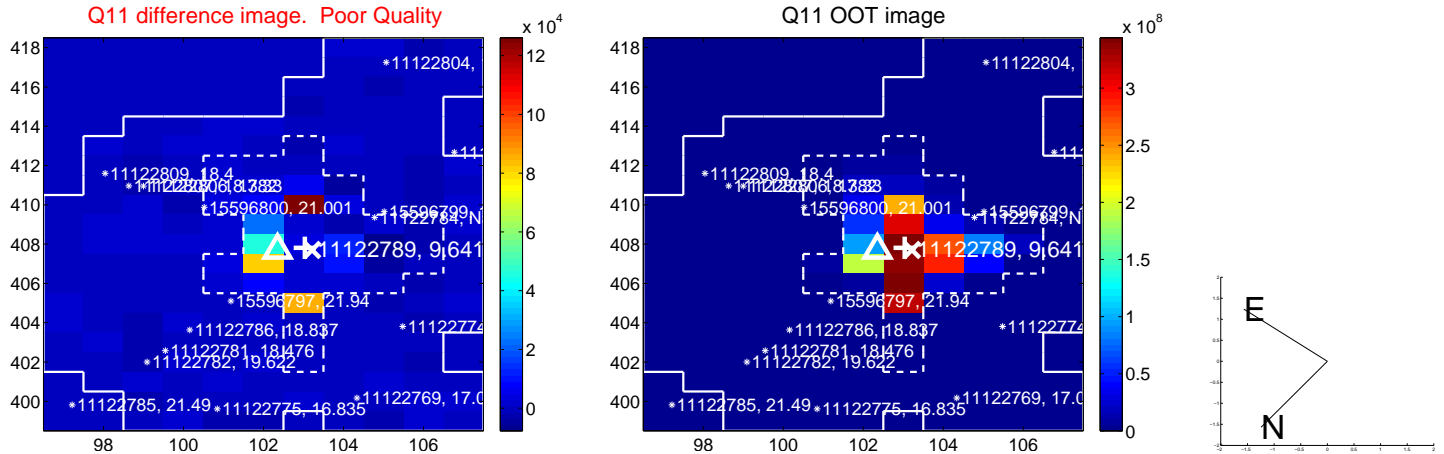
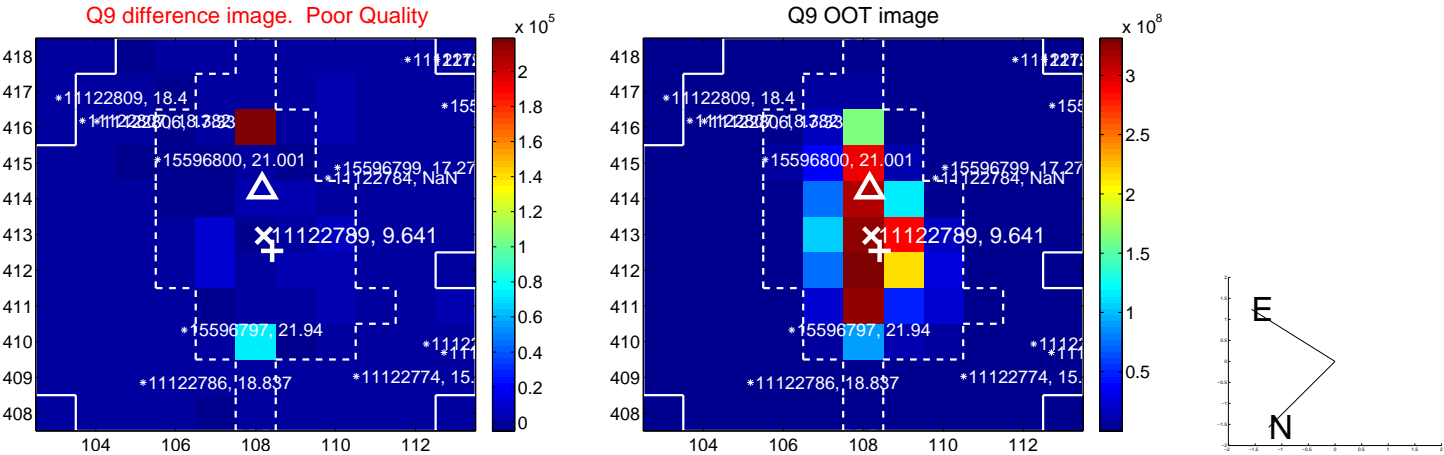
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



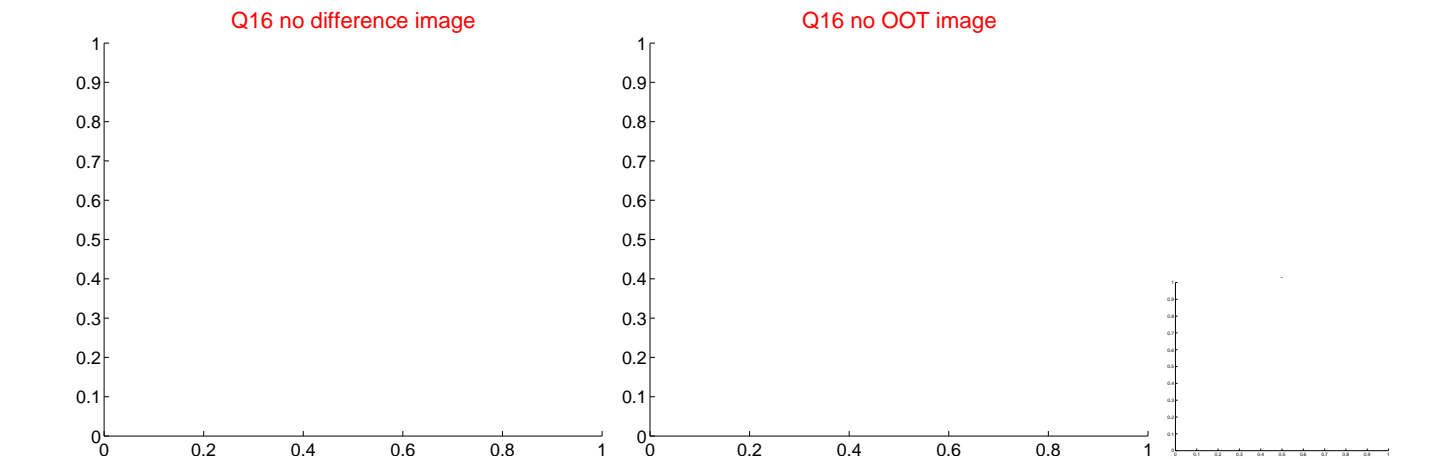
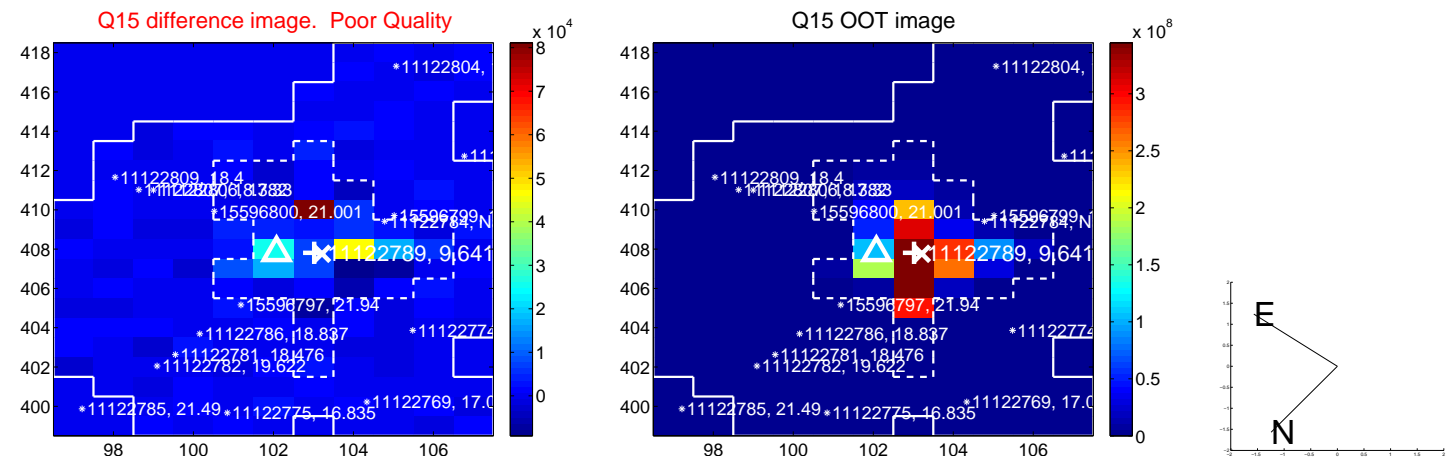
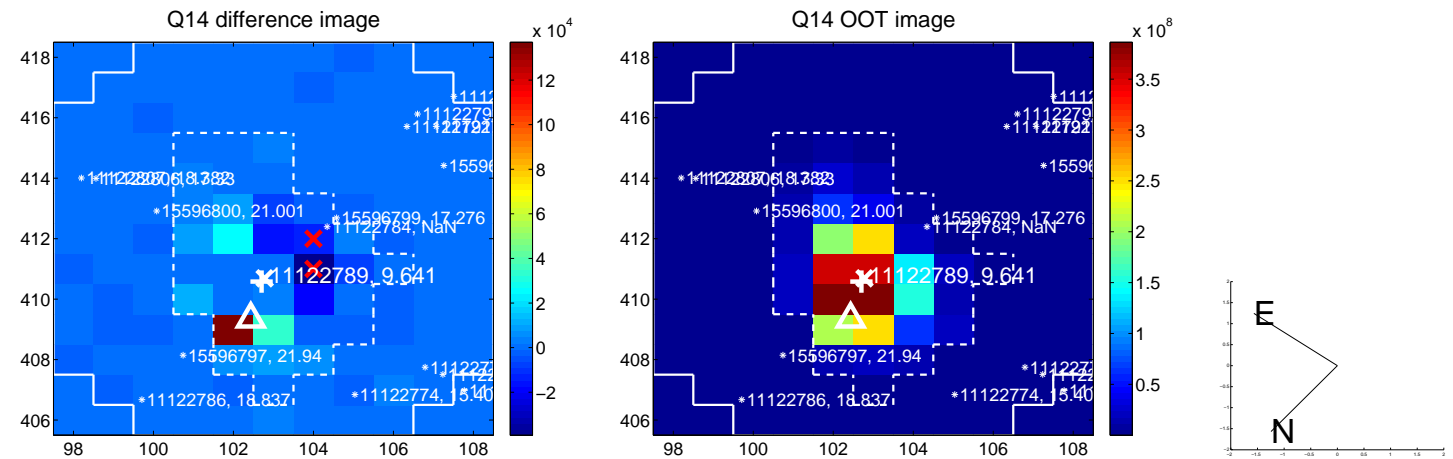
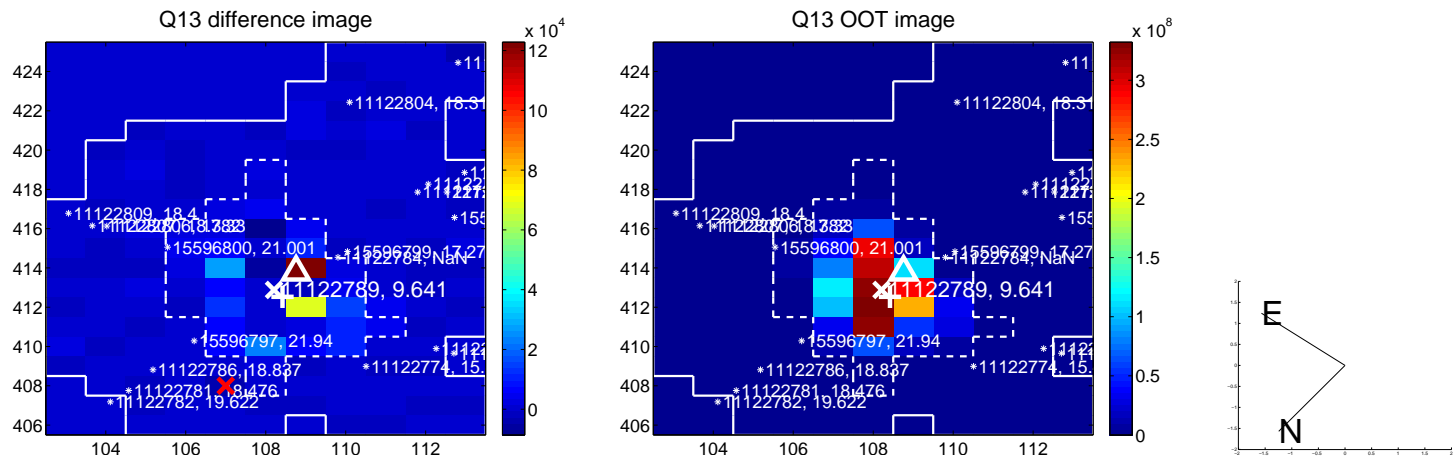
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



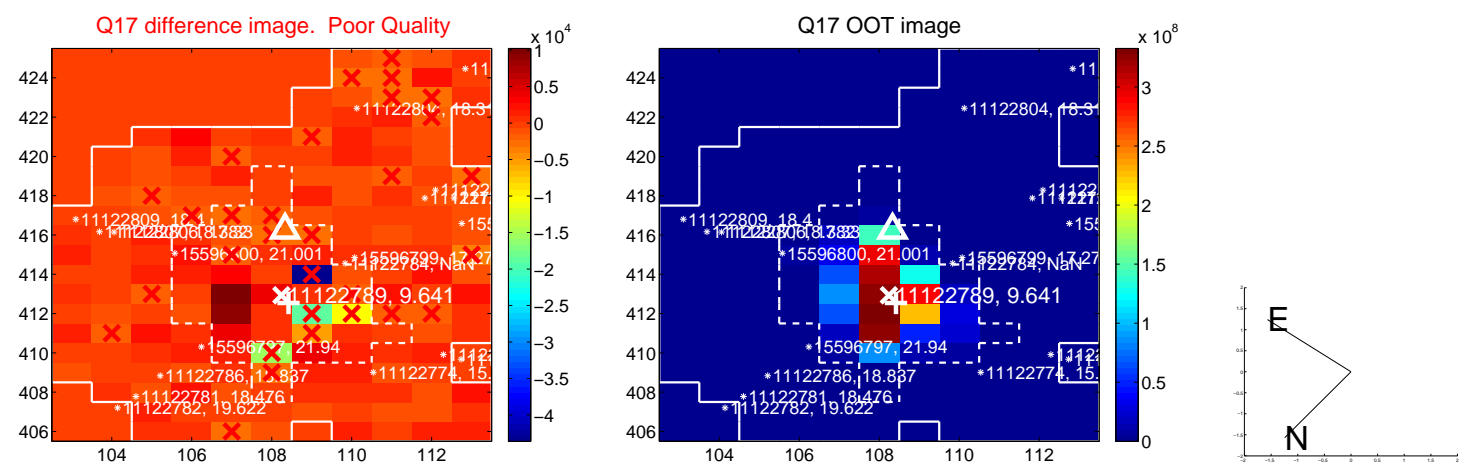
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



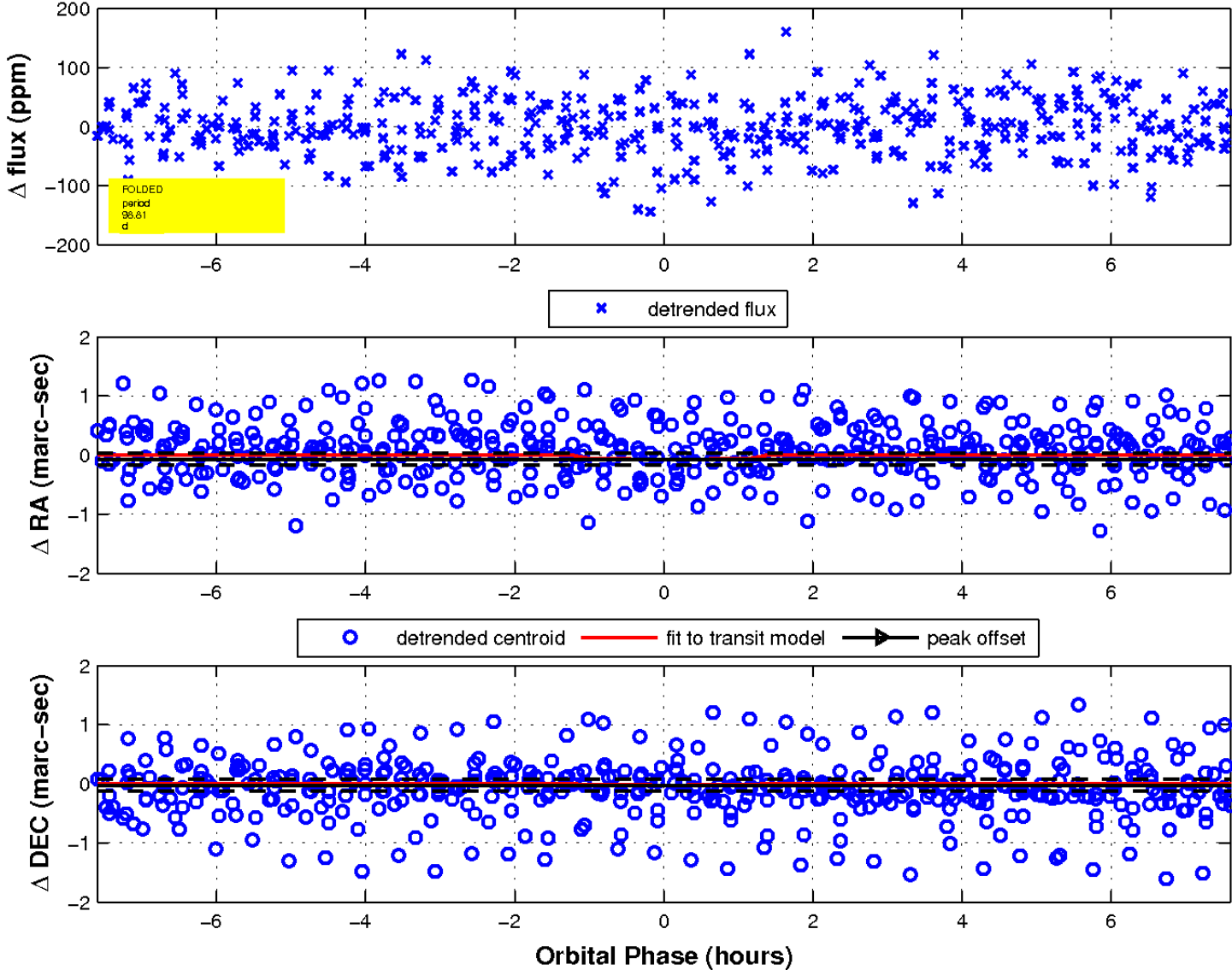
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

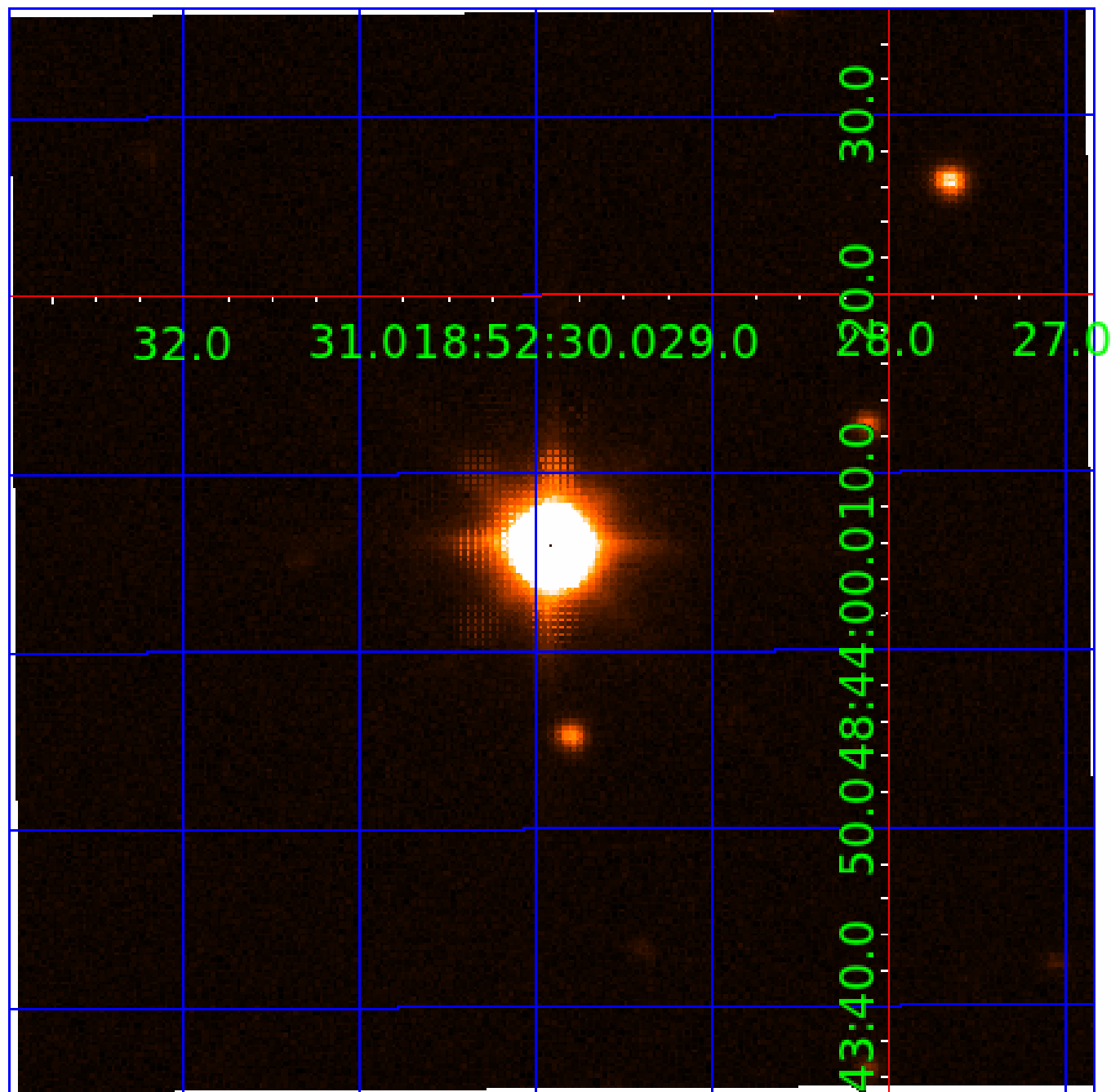


fluxWeightedCentroids, Planet 9 of 10



UKIRT Image

Declination



## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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011122789-02	OBS	No	57.106183	150.548374	64.6	5.769	11.9	9.8	2.51	7161	2.34	133.42
011122789-03	OBS	No	197.474892	201.397186	86.0	5.314	10.8	9.5	2.51	7161	2.50	25.51
011122789-04	OBS	No	200.751028	136.514514	88.9	6.744	9.9	10.3	2.51	7161	2.90	24.96
011122789-05	OBS	No	76.059182	157.773528	40.0	8.241	9.1	8.0	2.51	7161	1.85	91.05
011122789-06	OBS	No	254.230354	160.588659	57.0	3.415	8.9	8.4	2.51	7161	1.96	18.22
011122789-07	OBS	No	46.995171	152.404263	57.9	3.769	8.8	9.4	2.51	7161	2.19	173.01
011122789-08	OBS	No	23.751009	153.254589	73.5	0.704	9.2	4.2	2.51	7161	2.26	429.76
011122789-09	OBS	No	98.814123	179.765633	76.9	2.552	9.1	9.8	2.51	7161	2.53	64.23
011122789-10	OBS	No	35.056130	134.123326	96.4	2.060	10.0	11.4	2.51	7161	2.88	255.73

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011122789-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
011122789-07	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_SATURATED
011122789-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
011122789-10	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

**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.

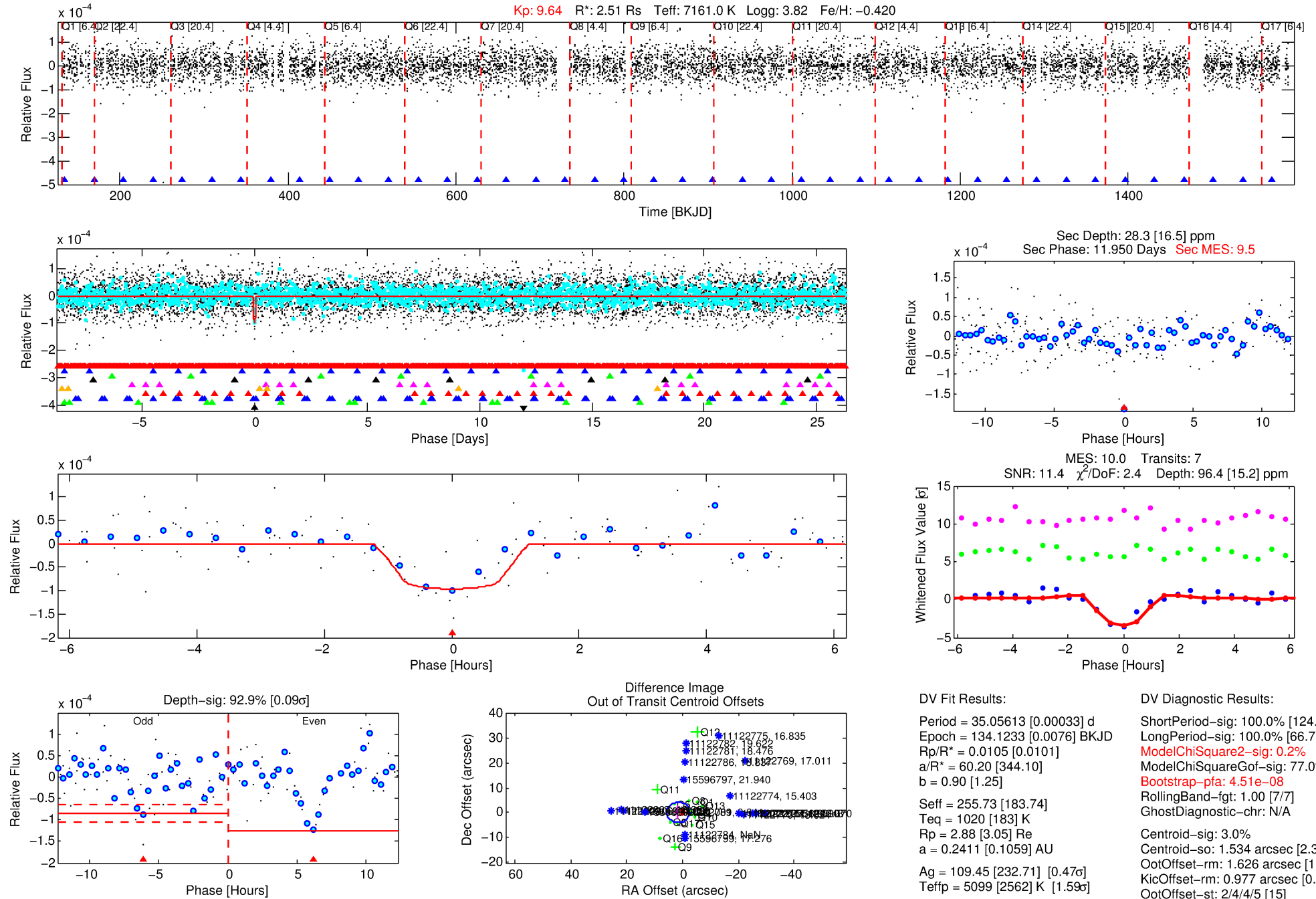


Ephemeris Match Information For 011122789-10

No Significant Match Found

# DV One-Page Summary

KIC: 11122789 Candidate: 10 of 10 Period: 35.056 d



## DV Fit Results:

Period = 35.05613 [0.00033] d  
Epoch = 134.1233 [0.0076] BKJD  
Rp/R\* = 0.0105 [0.0101]  
a/R\* = 60.20 [344.10]  
b = 0.90 [1.25]  
Seff = 255.73 [183.74]  
Teq = 1020 [183] K  
Rp = 2.88 [3.05] Re  
a = 0.2411 [0.1059] AU  
Ag = 109.45 [232.71] [0.47 $\sigma$ ]  
Teff = 5099 [2562] K [1.59 $\sigma$ ]

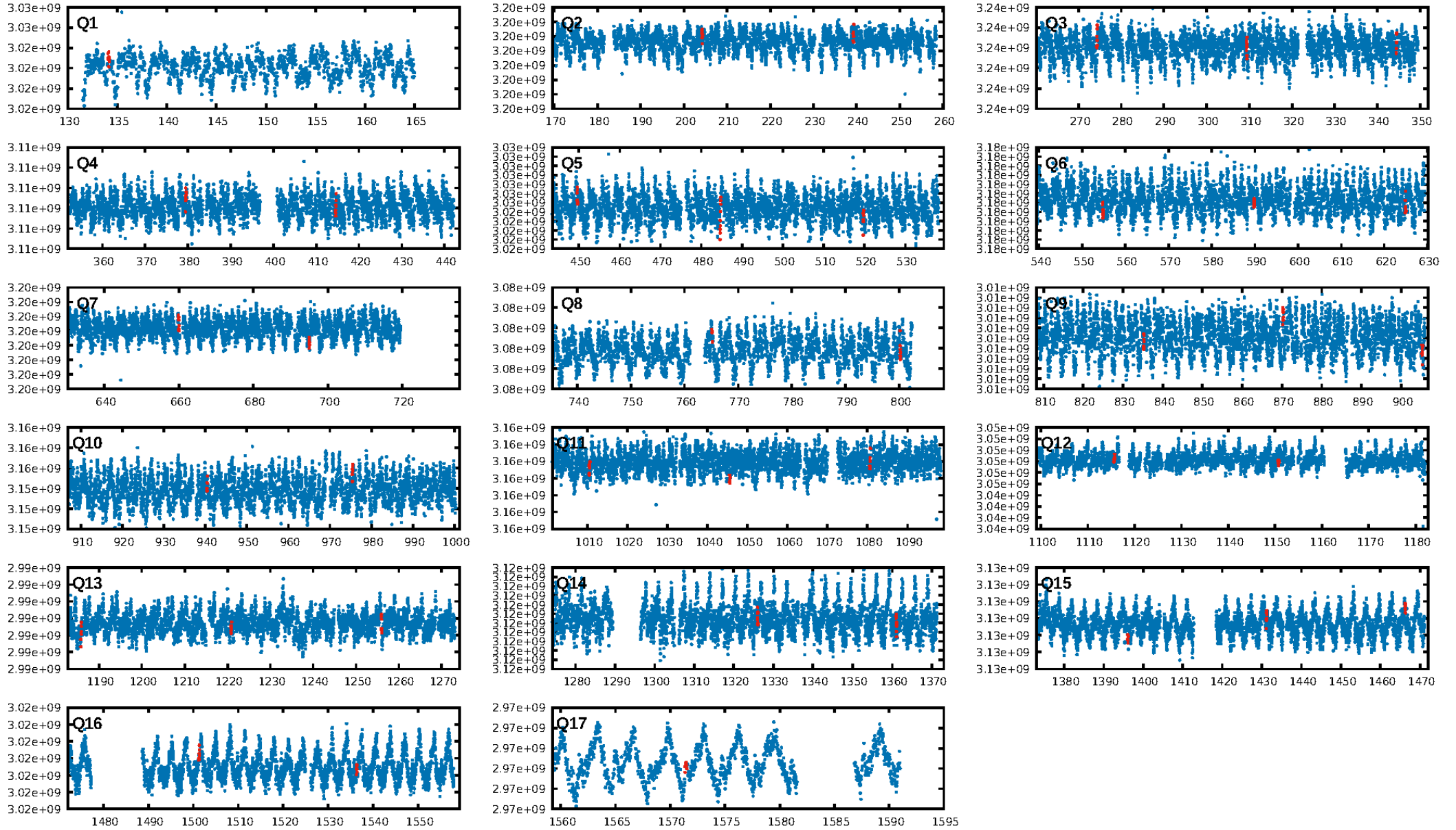
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [124.63 $\sigma$ ]  
LongPeriod-sig: 100.0% [66.71 $\sigma$ ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 77.0%  
Bootstrap-pfa: 4.51e-08  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 3.0%  
Centroid-so: 1.534 arcsec [2.37 $\sigma$ ]  
OotOffset-rm: 1.626 arcsec [1.18 $\sigma$ ]  
KicOffset-rm: 0.977 arcsec [0.37 $\sigma$ ]  
OotOffset-st: 2/4/4/5 [15]  
KicOffset-st: 2/4/4/5 [15]  
DiffImageQuality-fgm: 0.07 [1/15]  
DiffImageOverlap-fno: 0.71 [12/17]

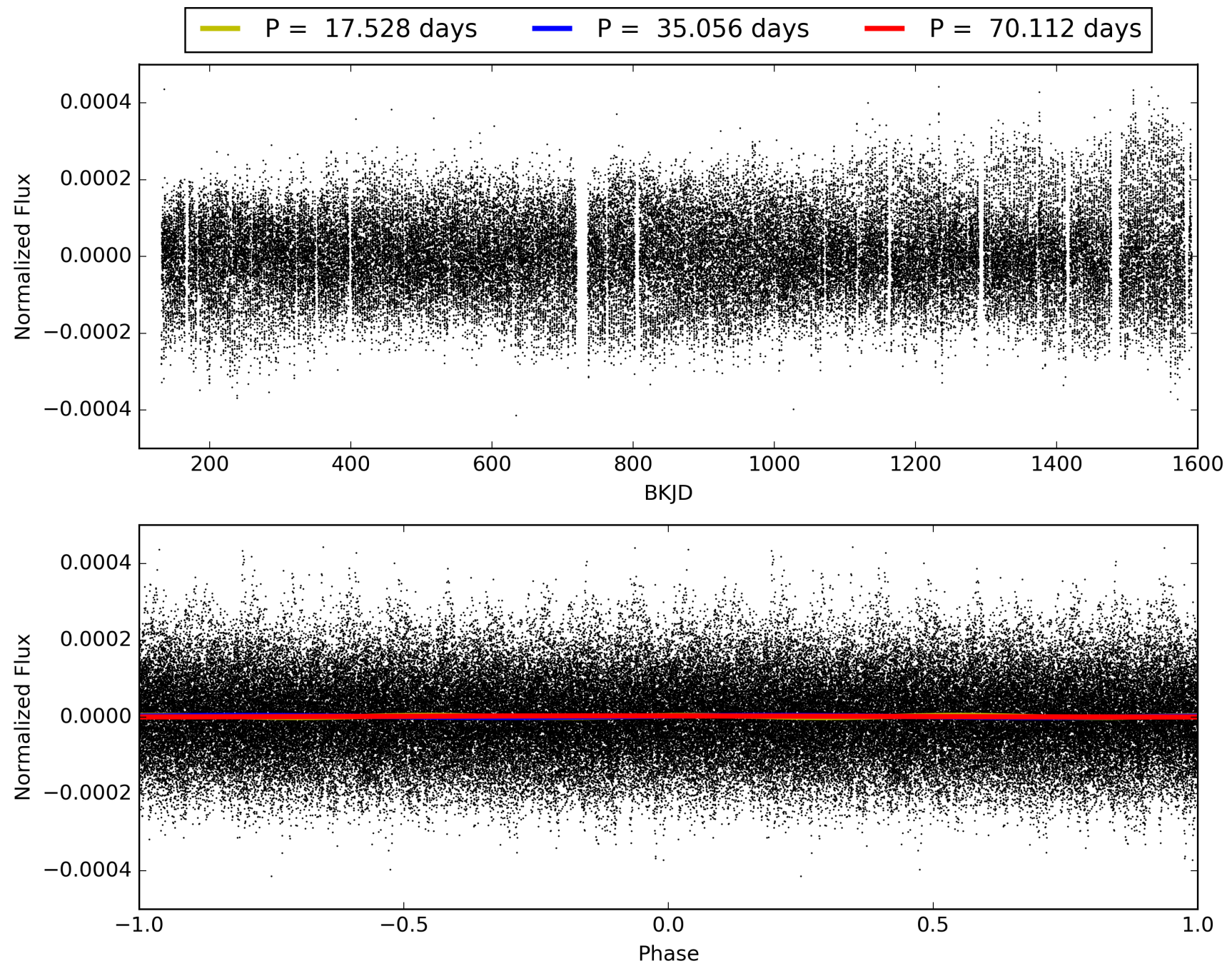
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:11:56 Z

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

# TCE 011122789-10, PDC Light Curves

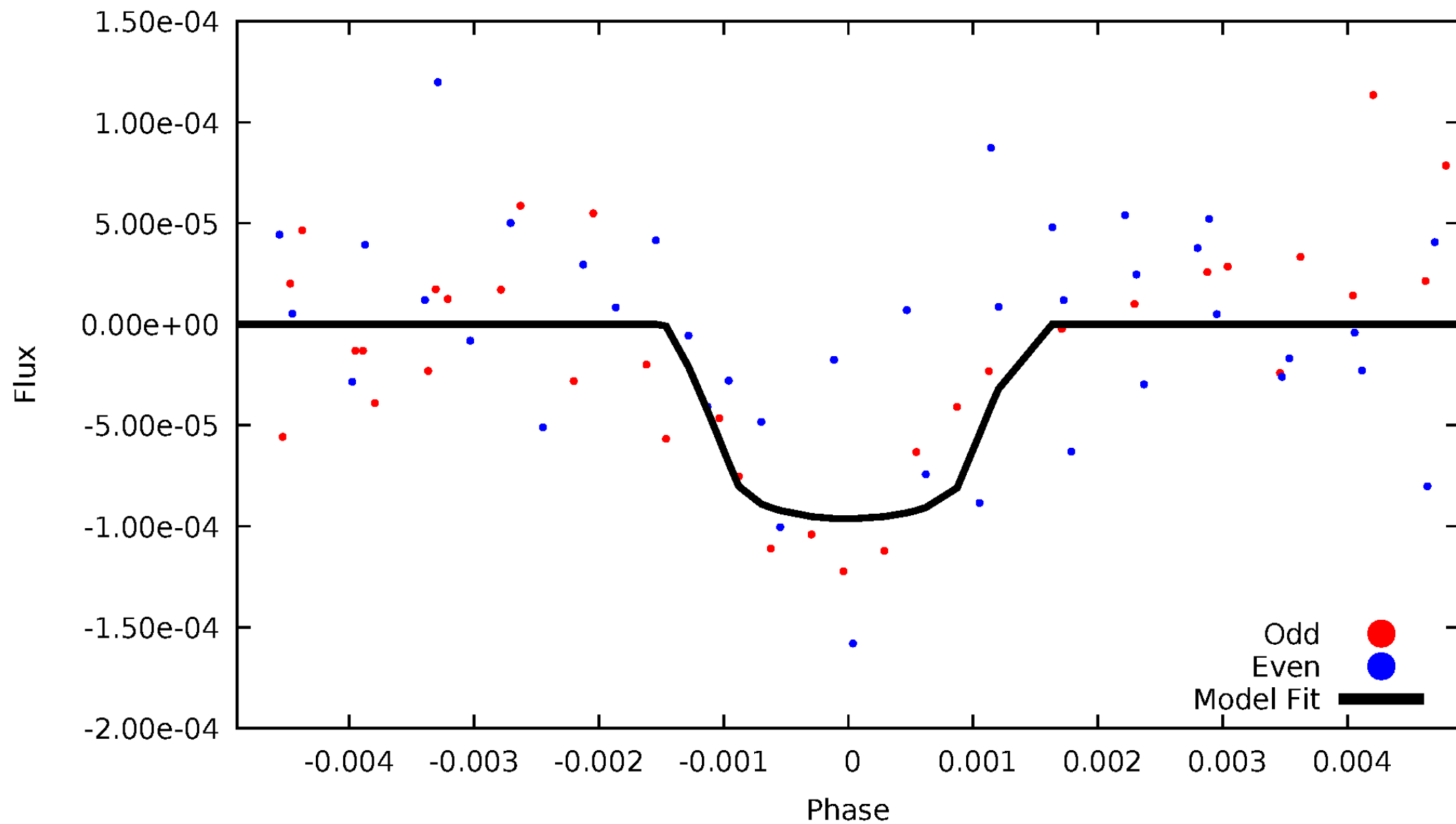


TCE 011122789-10



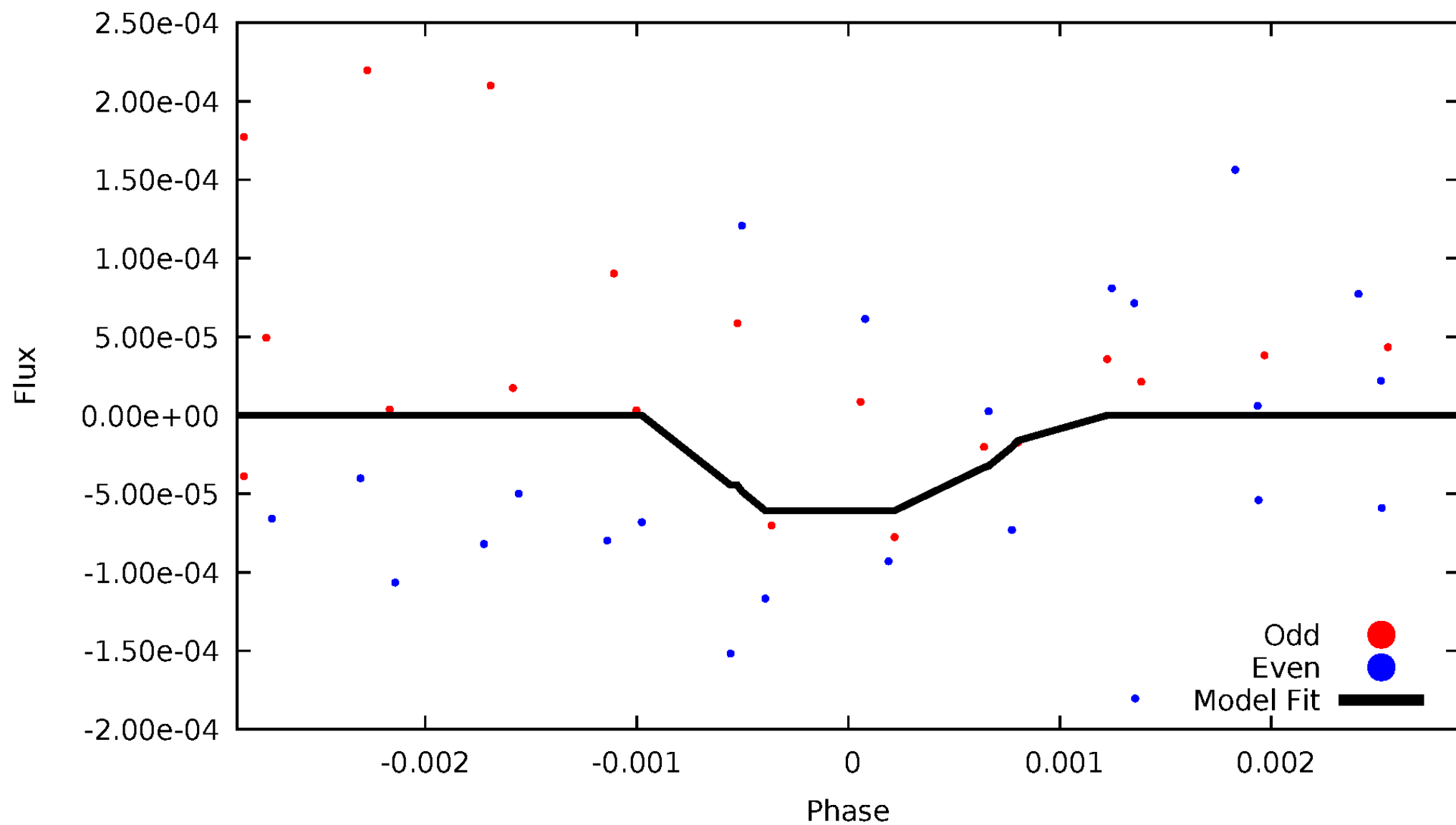
# DV Odd/Even

TCE 011122789-10



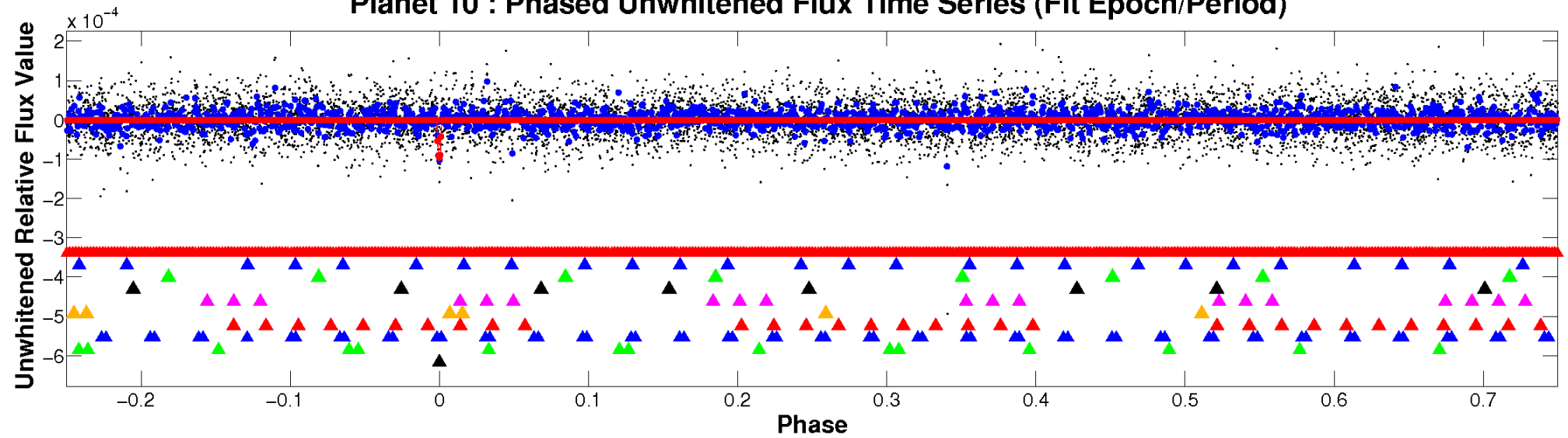
# ALT Odd/Even

TCE 011122789-10

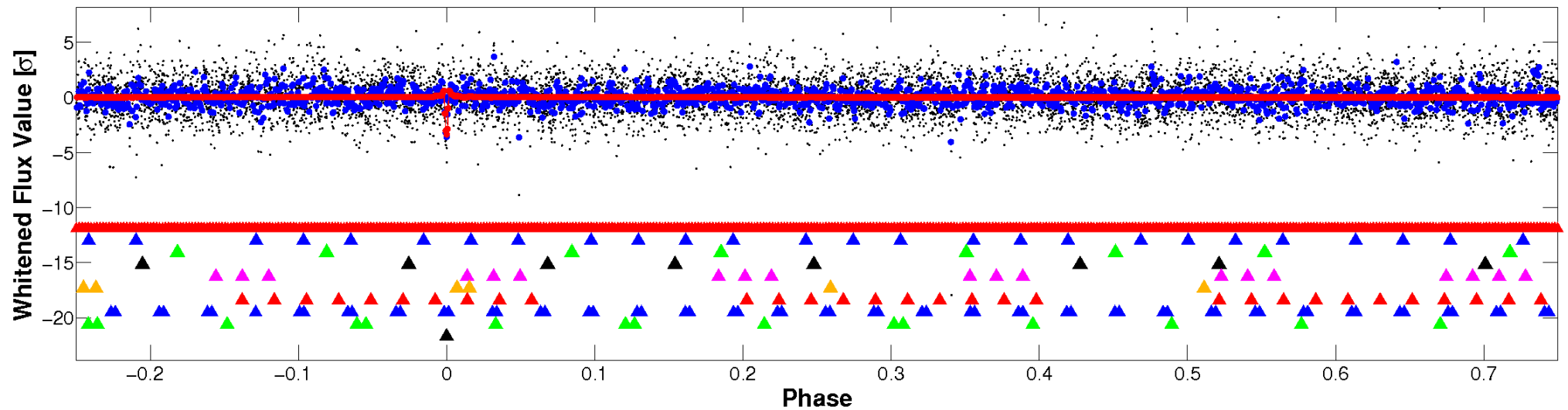


# Non-Whitened Vs. Whitened Light Curve

Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



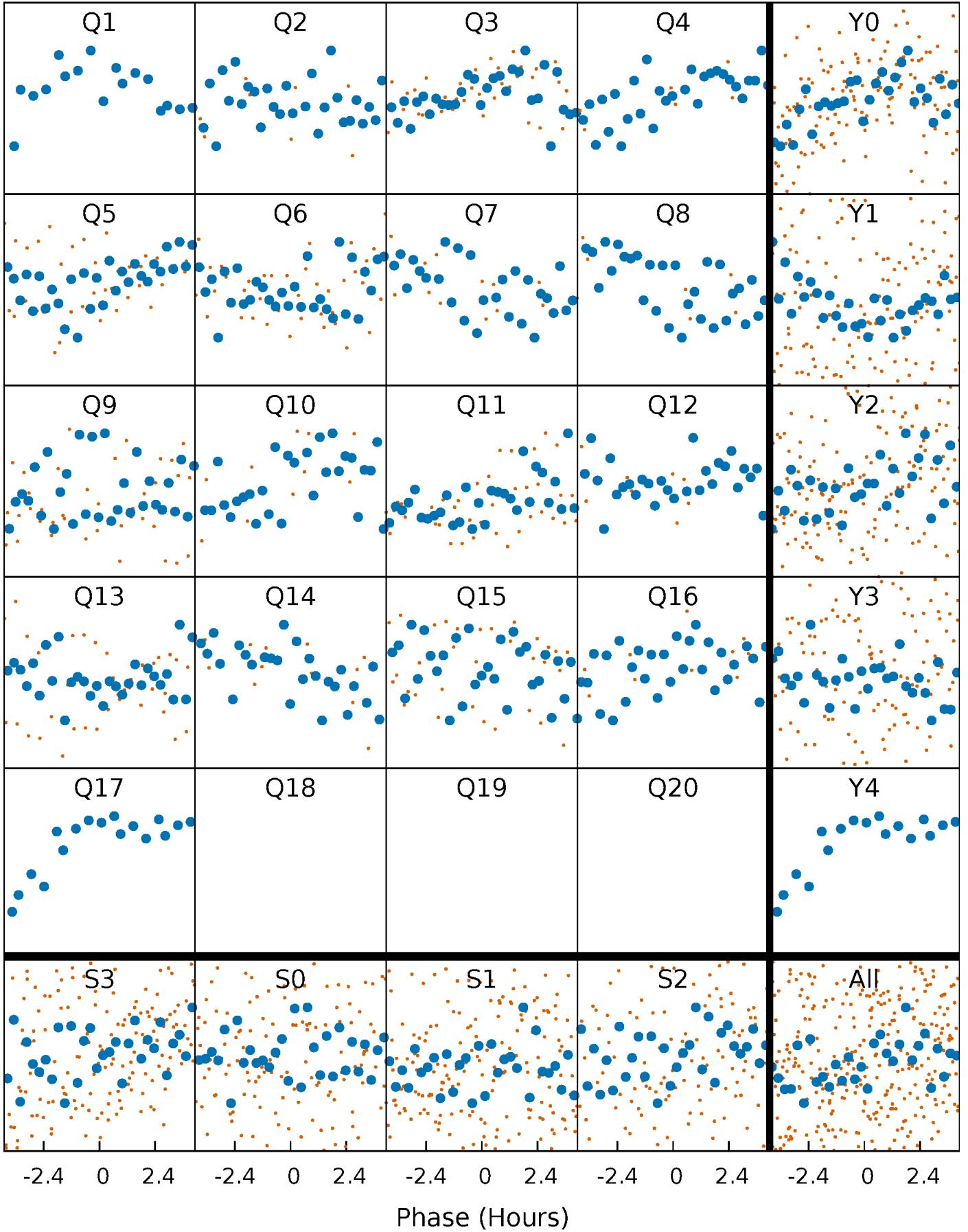
Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

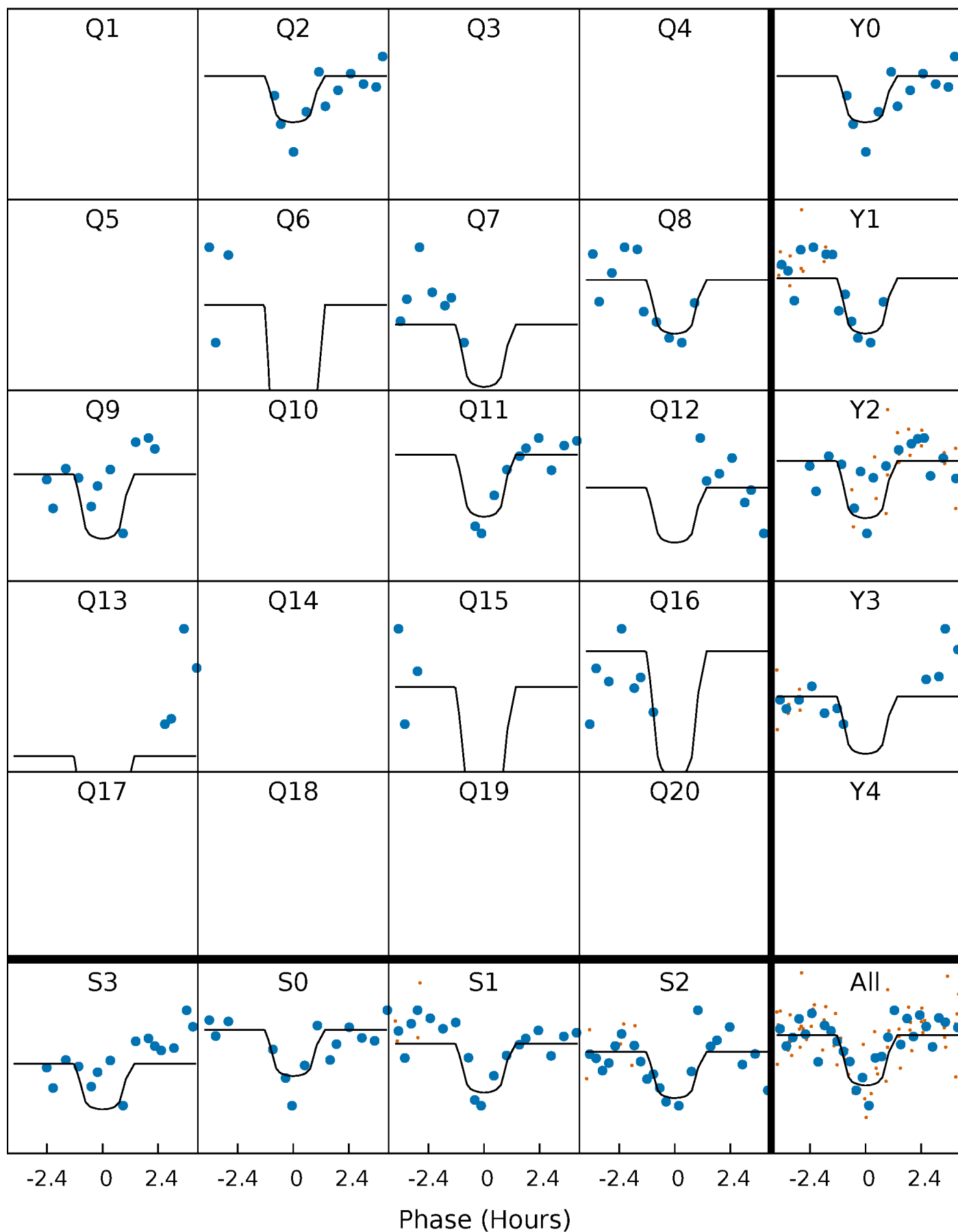
TCE 011122789-10 P= 35.056130 Days  $T_0=134.123326$  (BKJD)





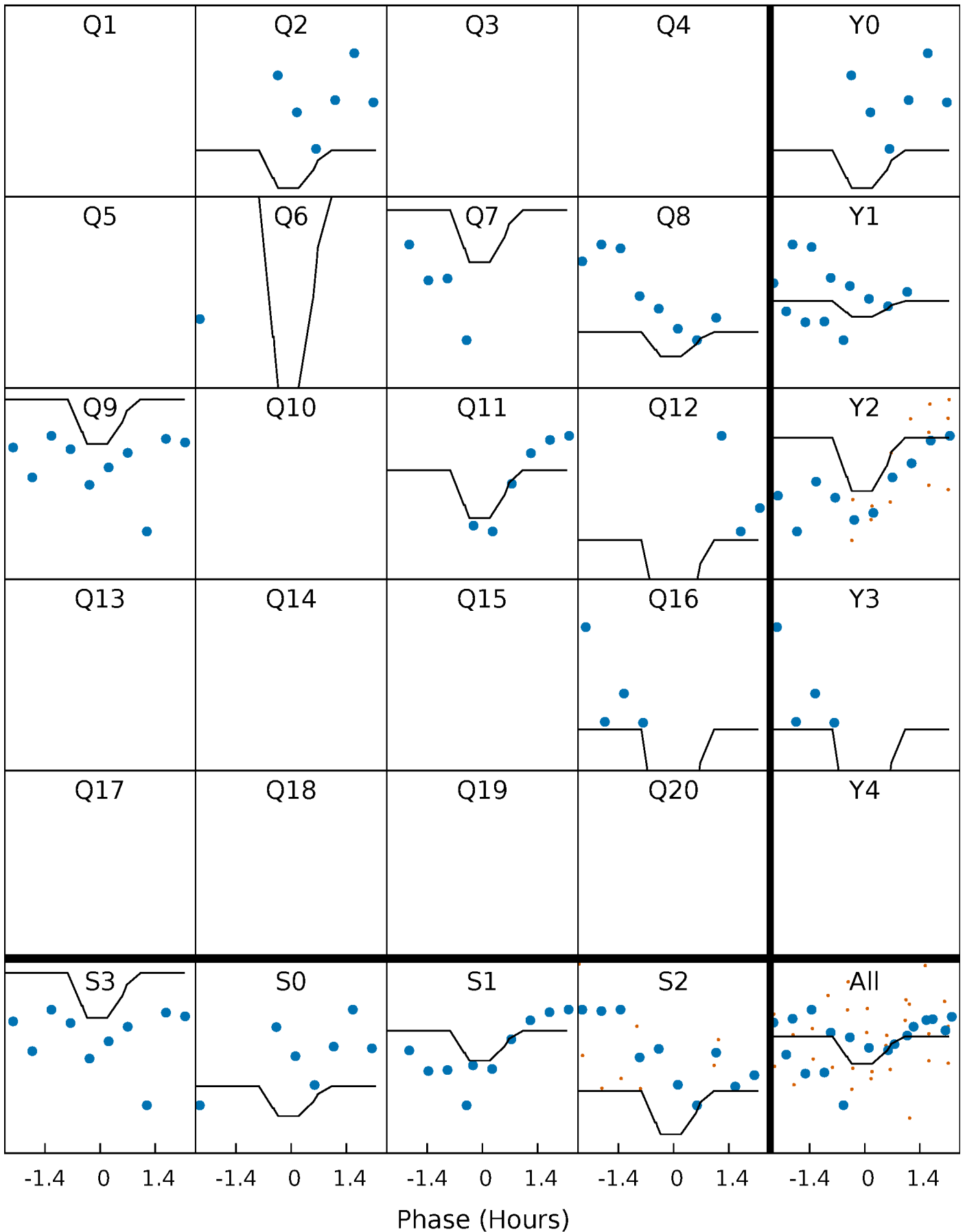
# DV Quarter-Phased Transit Curves

TCE 011122789-10 P= 35.056130 Days  $T_0=134.123326$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

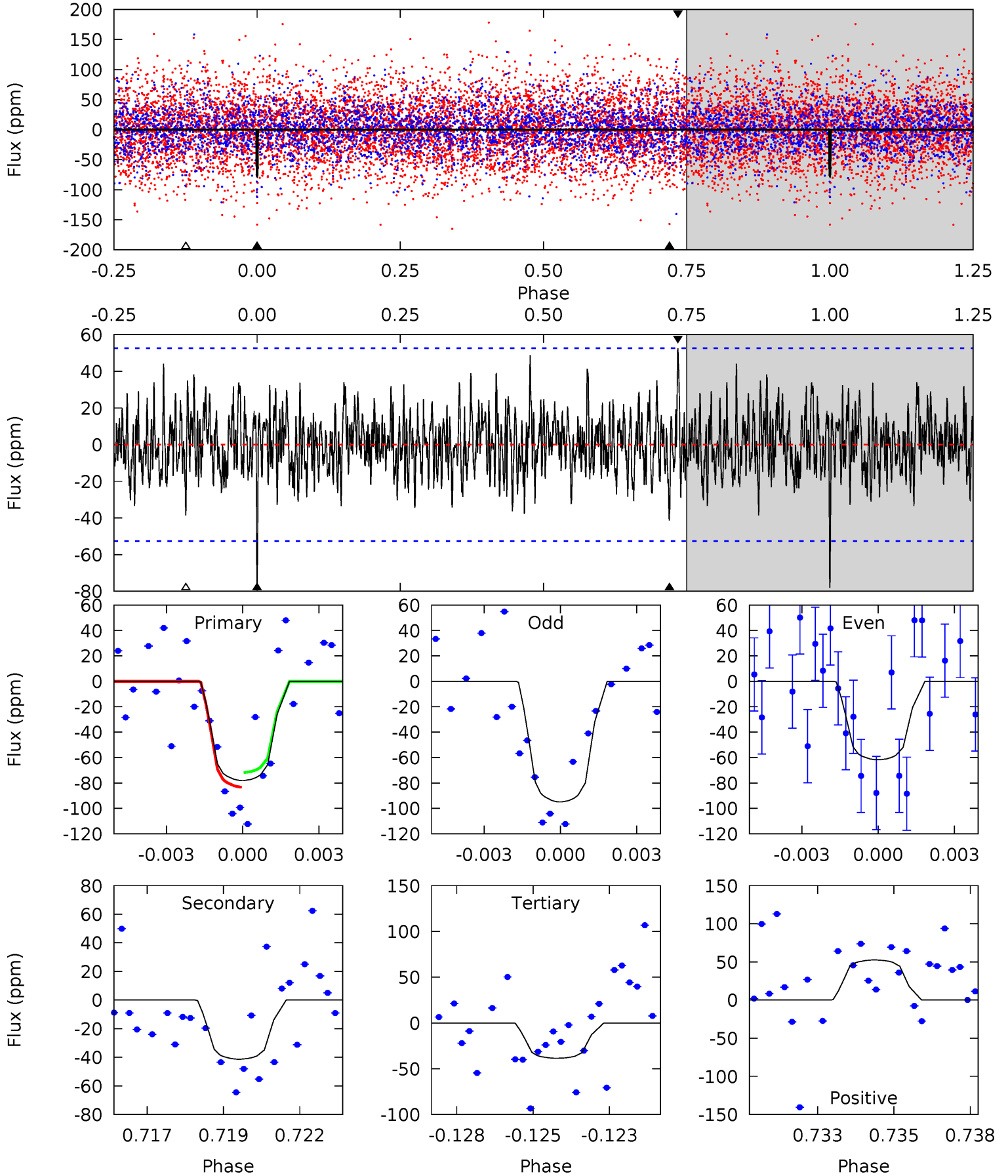
TCE 011122789-10 P= 35.056692 Days  $T_0=134.100268$  (BKJD)



# DV Model-Shift Uniqueness Test

011122789-10, P = 35.056130 Days, E = 99.067196 Days

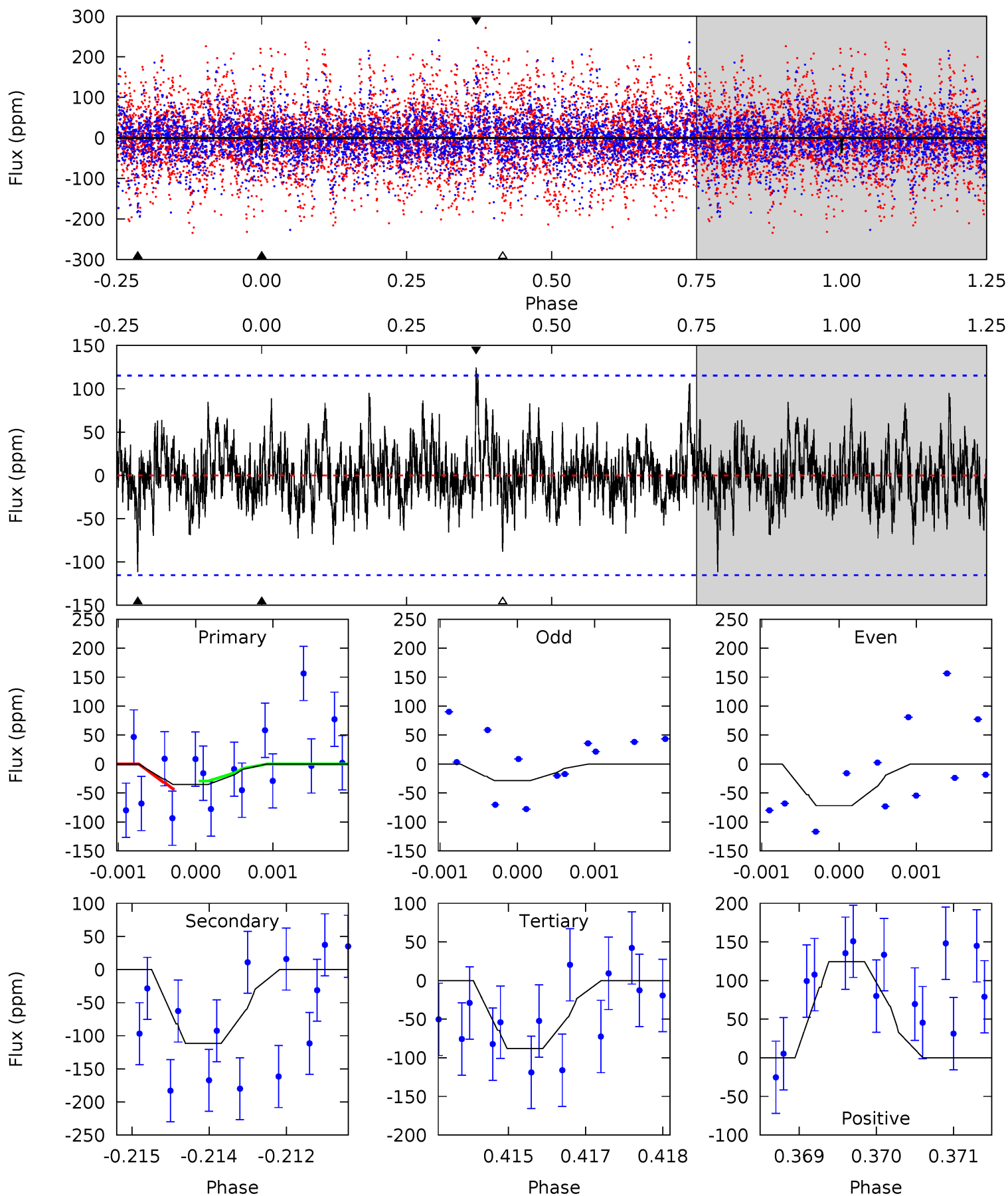
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.82	4.15	3.86	5.27	5.27	3.00	1.40	3.96	2.55	0.28	-1.12	1.68	0.87	0.40	0.57



# Alt Model-Shift Uniqueness Test

011122789-10, P = 35.056692 Days, E = 99.043576 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
1.65	5.24	4.12	5.84	5.40	3.21	1.26	-2.47	-4.19	1.11	-0.60	0.95	0.77	0.53	0.29



### Stellar Parameters For KIC 011122789

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7161^{+172}_{-237}$	$3.820^{+0.416}_{-0.104}$	$-0.420^{+0.300}_{-0.300}$	$2.512^{+0.487}_{-1.136}$	$1.518^{+0.200}_{-0.371}$	$0.135^{+0.498}_{-0.042}$
	+2%/-3%	+11%/-3%	+71%/-71%	+19%/-45%	+13%/-24%	+370%/-31%
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 011122789-10 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-41 \pm 10$	$3.25^{+2.47}_{-2.05}$	$1387^{+91}_{-168}$	$5037^{+3376}_{-965}$	$125^{+807}_{-87}$
Alt.	$-112 \pm 21$	$2.71^{+2.25}_{-1.81}$	$1385^{+90}_{-151}$	$6937^{+7731}_{-1690}$	$461^{+3740}_{-313}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

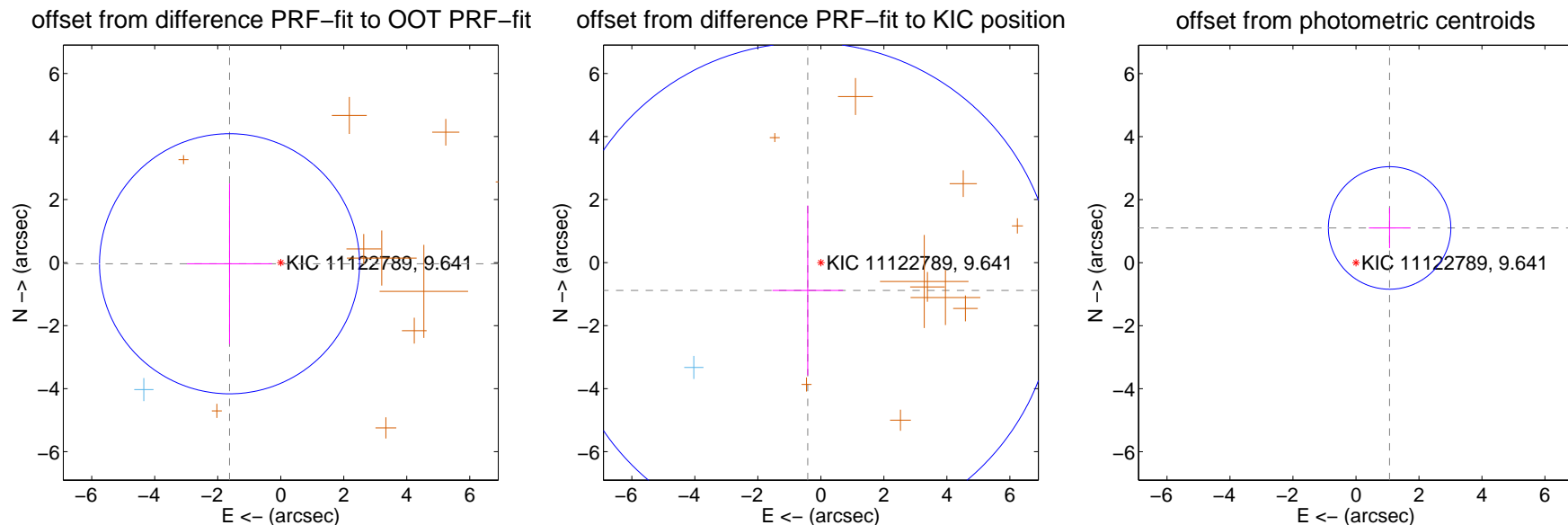
## DV Centroid Data

Supplemental centroid analysis for 011122789-10. **Kepler magnitude: 9.64.** Transit SNR 11.41

**There are 1 quarters with good PRF difference image offsets**

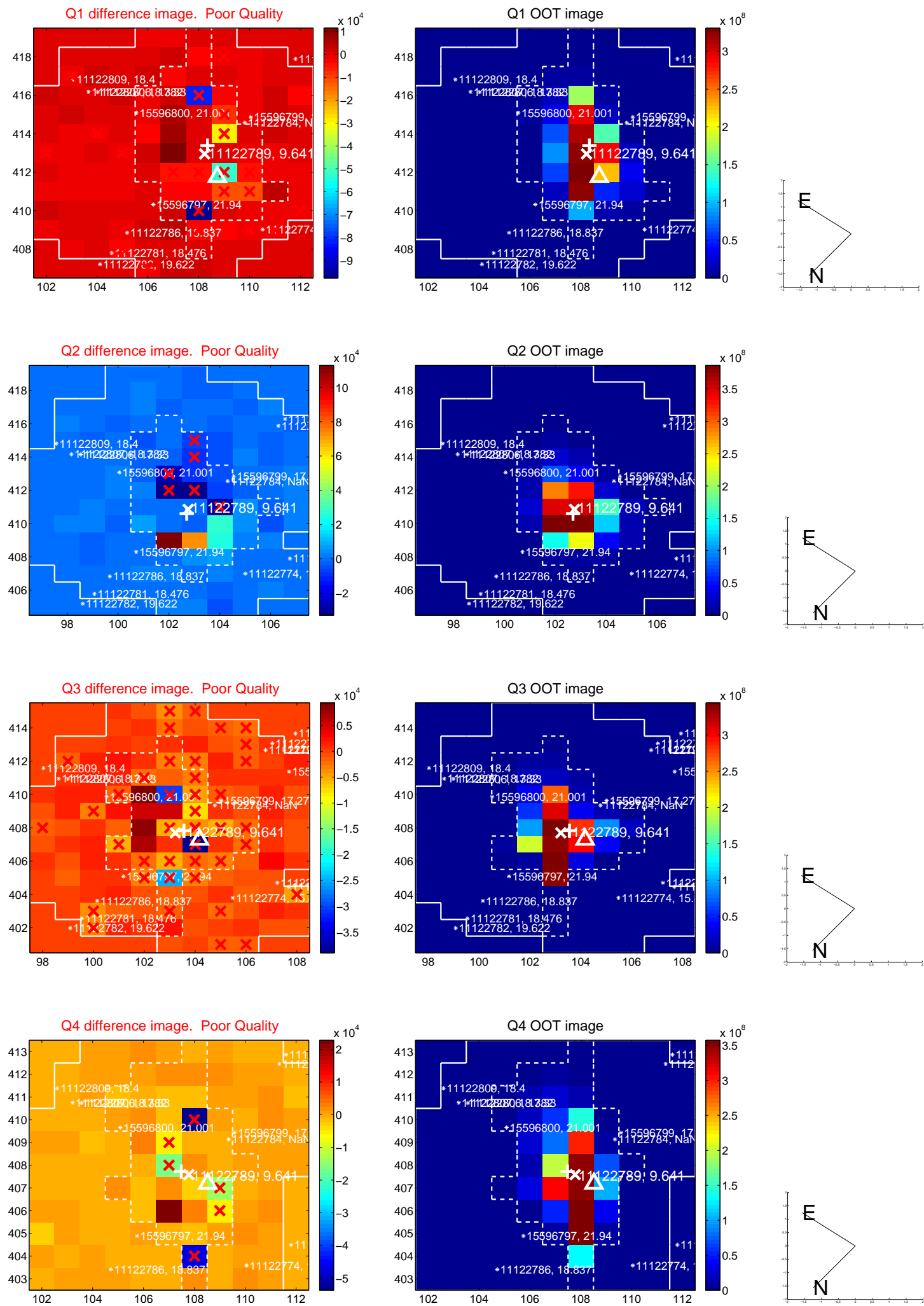
The direct PRF centroid is offset from the target star catalog position by about 1.78 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.626 \pm 1.375$	1.18	$1.626 \pm 1.351$	$-0.037 \pm 2.545$
PRF-fit source offset from KIC position	$0.977 \pm 2.621$	0.37	$0.416 \pm 1.120$	$-0.884 \pm 2.697$
photometric centroid source offset	$1.53 \pm 0.65$	2.37	$-1.07 \pm 0.66$	$1.10 \pm 0.64$

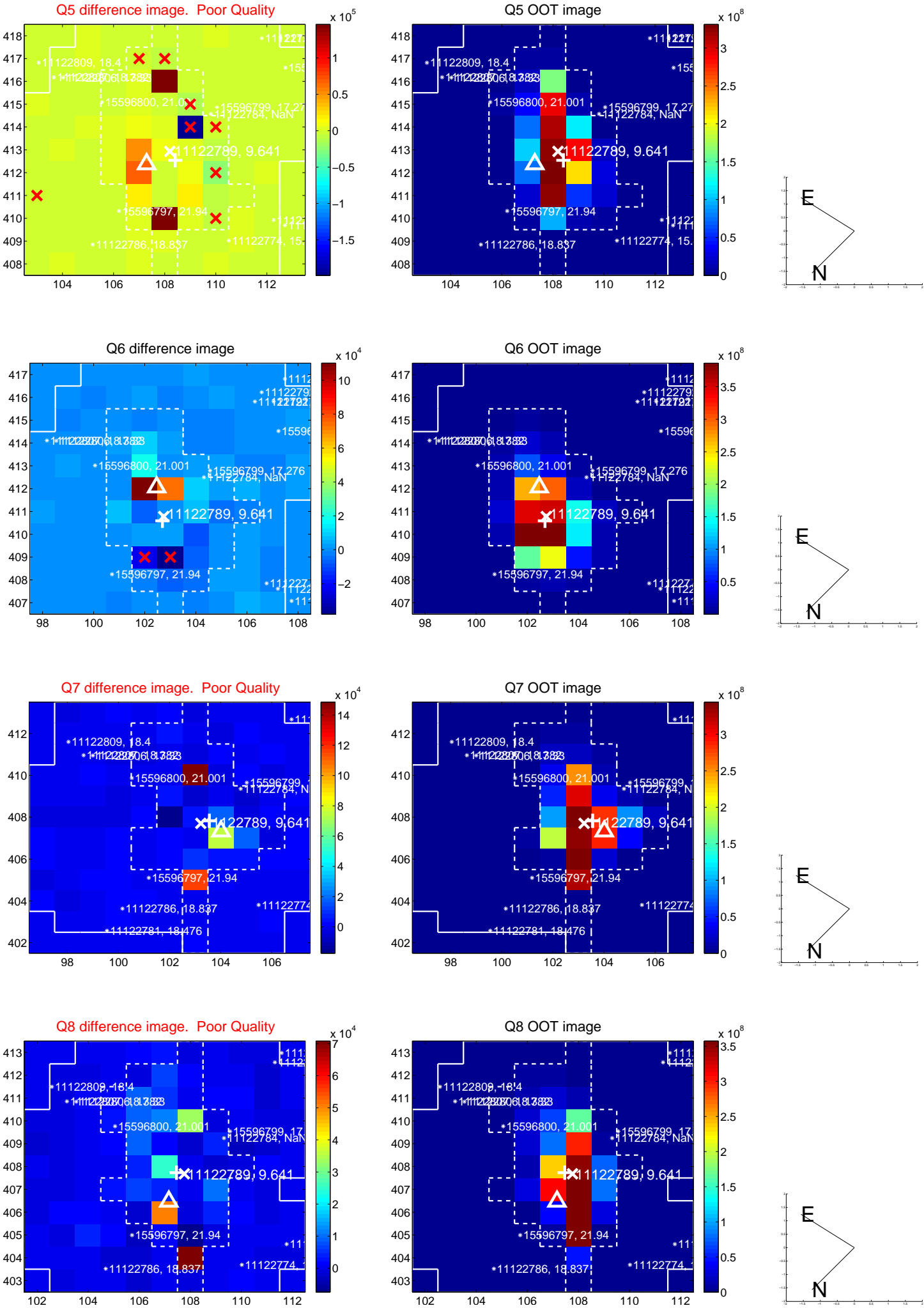


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

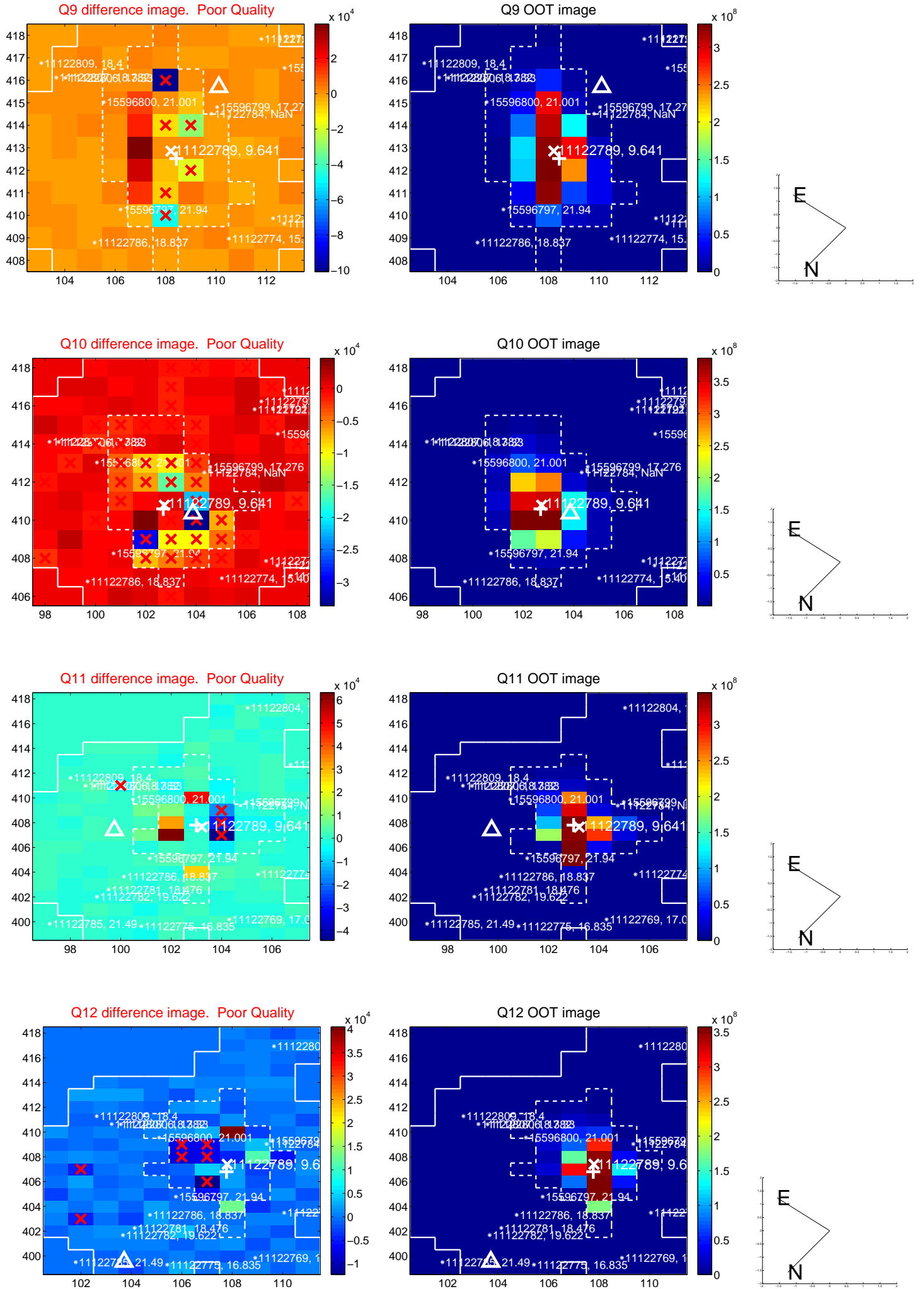


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

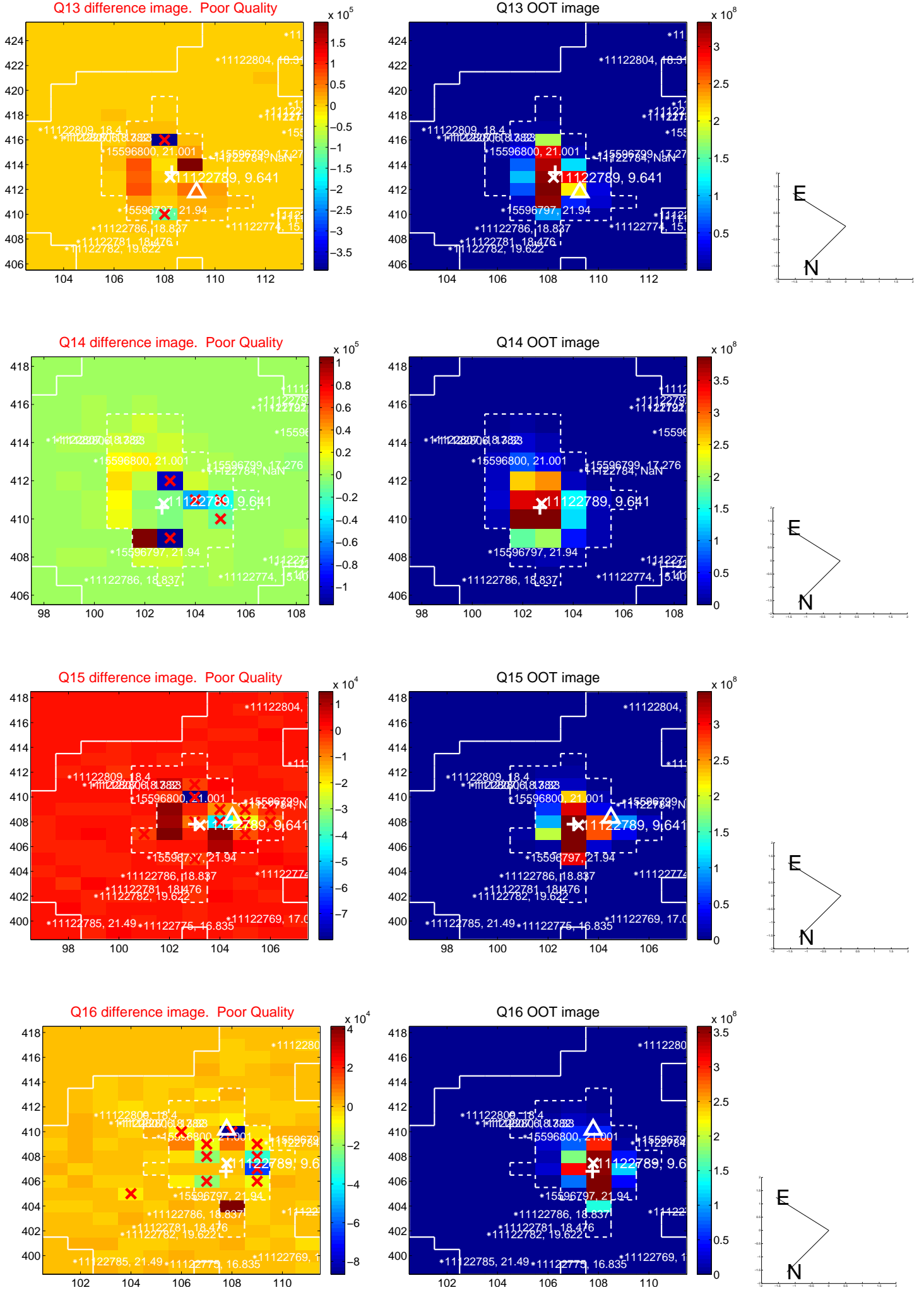




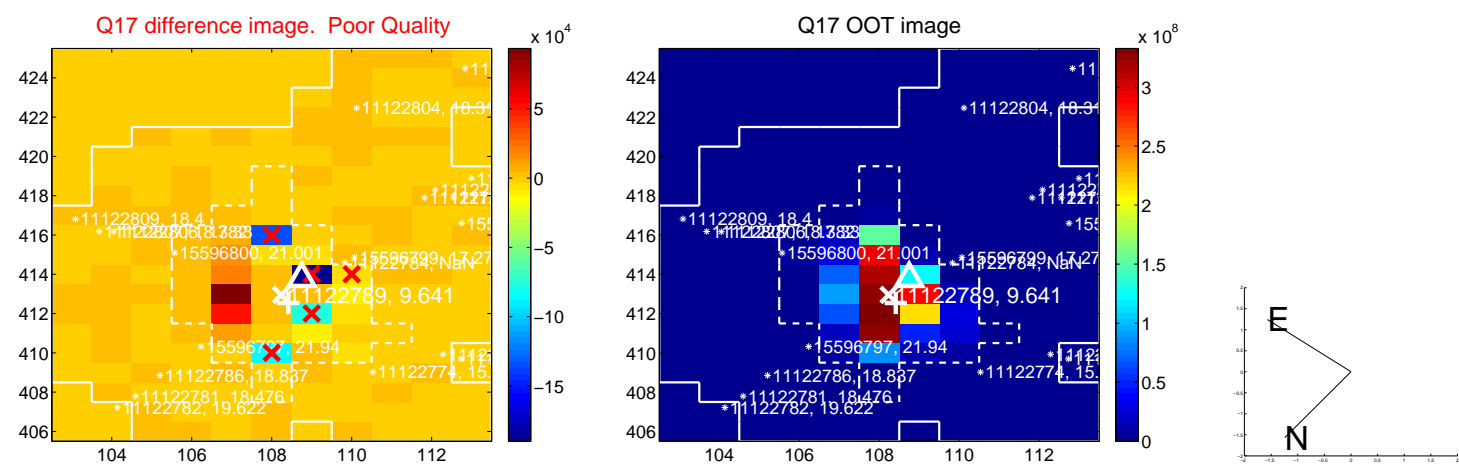
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



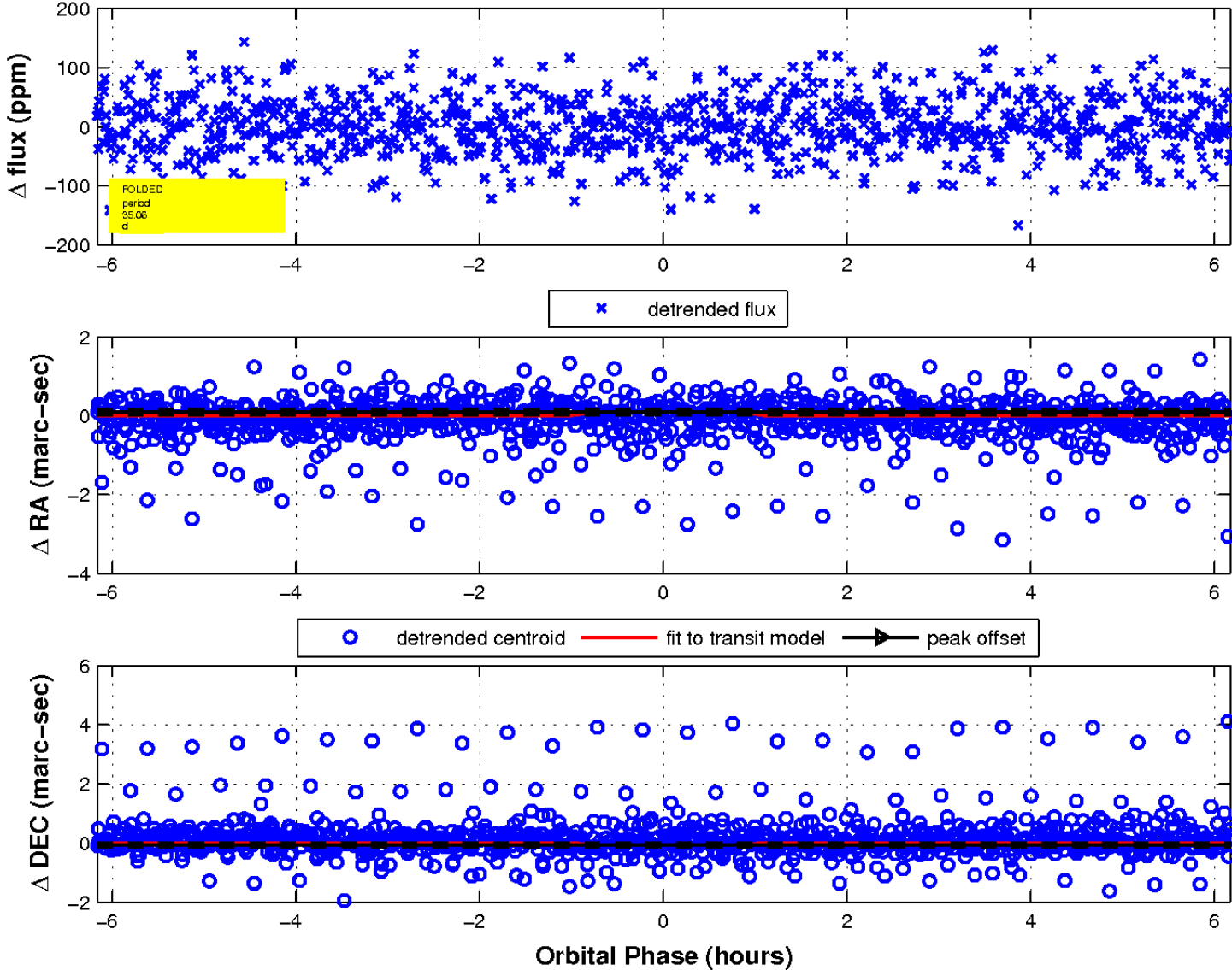
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 10 of 10



UKIRT Image

Declination

