

# KIC 005128931

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005128931-01	OBS	No	0.505298	131.562344	18.0	3.474	10.9	10.2	3.35	6211	1.52	0.00
005128931-02	OBS	No	33.997504	132.982782	539.0	1.290	12.2	11.5	3.35	6211	7.97	275.41
005128931-04	OBS	No	19.514973	131.733189	237.5	2.393	9.0	8.5	3.35	6211	5.85	577.33
005128931-05	OBS	No	37.145662	150.819517	361.3	2.204	13.8	7.8	3.35	6211	6.62	244.74
005128931-06	OBS	No	14.771871	140.019102	274.0	2.387	9.8	10.9	3.35	6211	6.47	836.89
005128931-07	OBS	No	28.583983	145.877110	490.1	0.960	9.2	9.5	3.35	6211	8.32	347.07
005128931-08	OBS	No	23.561503	140.282998	279.1	2.825	10.4	9.2	3.35	6211	6.30	449.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005128931-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
005128931-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
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005128931-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005128931-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005128931-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

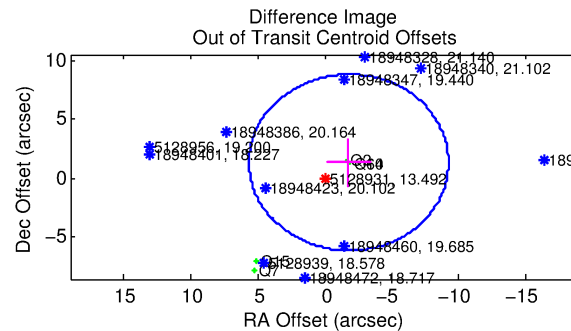
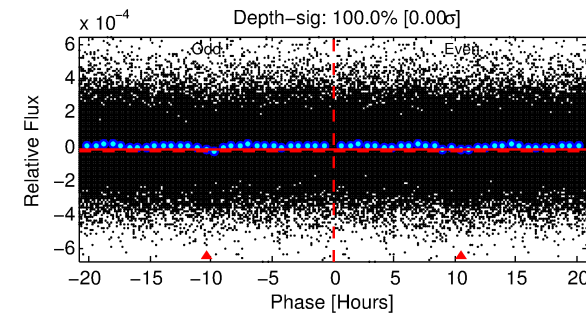
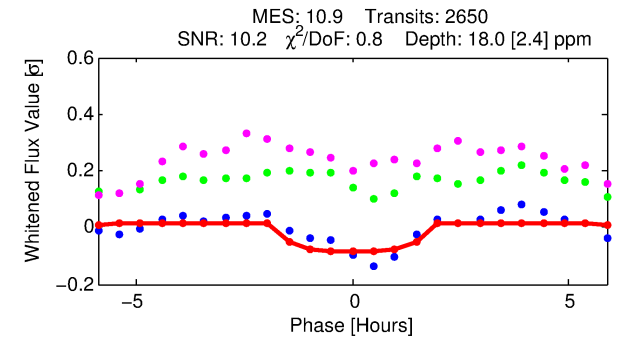
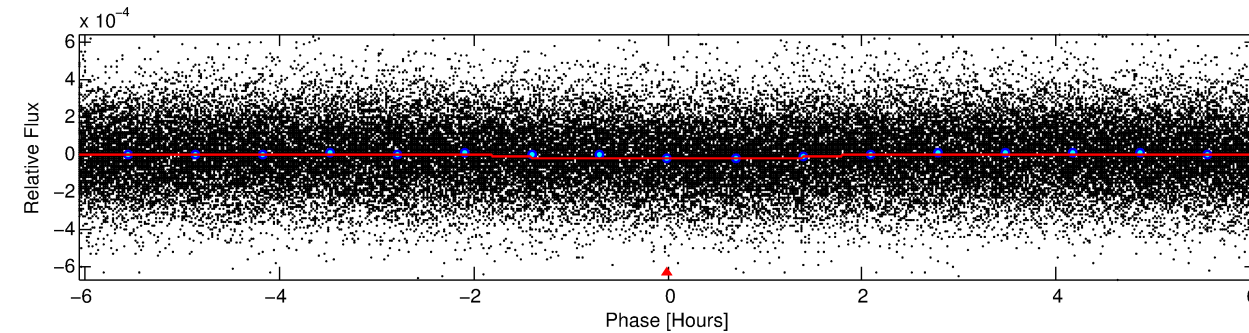
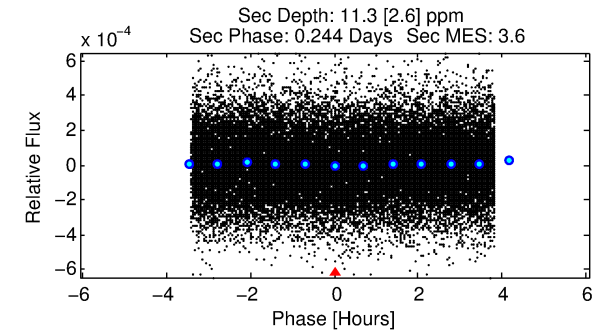
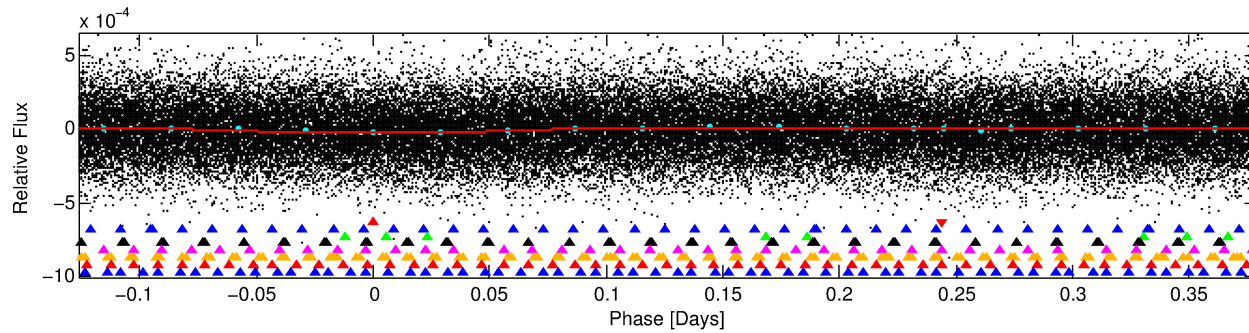
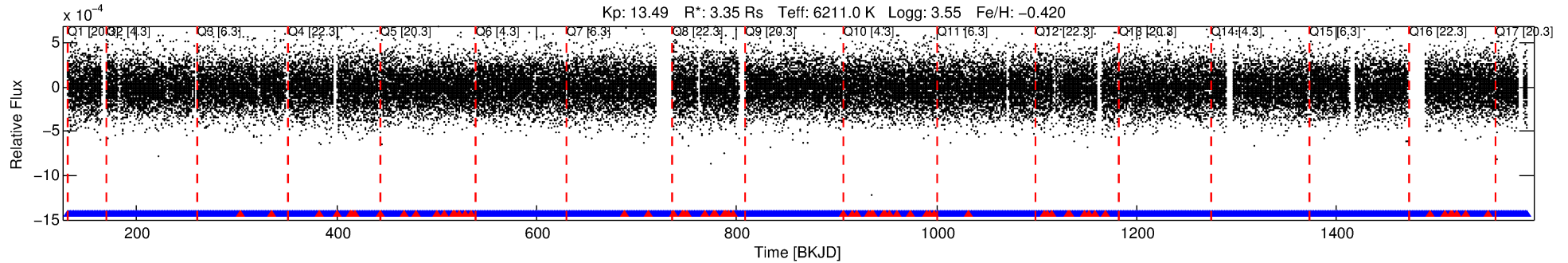
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005128931-01

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 1 of 8 Period: 0.505 d



## DV Fit Results:

Period = 0.50530 [0.00001] d  
Epoch = 131.5623 [0.0034] BKJD  
Rp/R\* = 0.0042 [0.0020]  
a/R\* = 1.16 [0.72]  
b = 0.70 [1.85]  
Seff = N/A  
Teq = N/A  
Rp = 1.52 [0.96] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

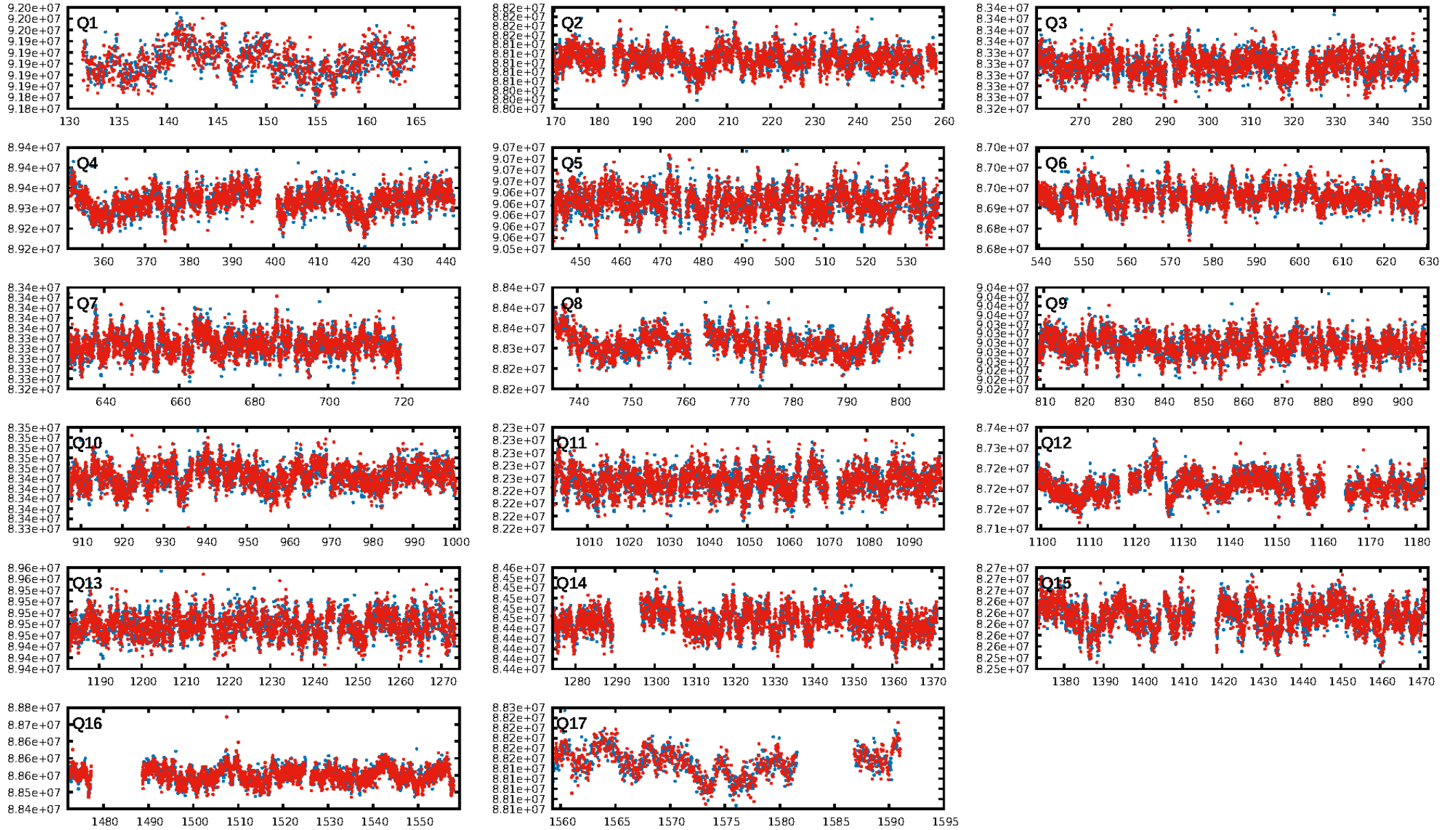
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [81.23σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.23e-11**  
RollingBand-fgt: 0.97 [2464/2530]  
**GhostDiagnostic-chr: -0.4365**  
Centroid-sig: 0.0%  
**Centroid-so: 6.008 arcsec [5.93σ]**  
OotOffset-rm: 2.256 arcsec [0.91σ]  
OotOffset-st: 4/2/0/0 [6]  
KicOffset-rm: 2.164 arcsec [1.20σ]  
KicOffset-st: 4/2/0/0 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 1.00 [17/17]

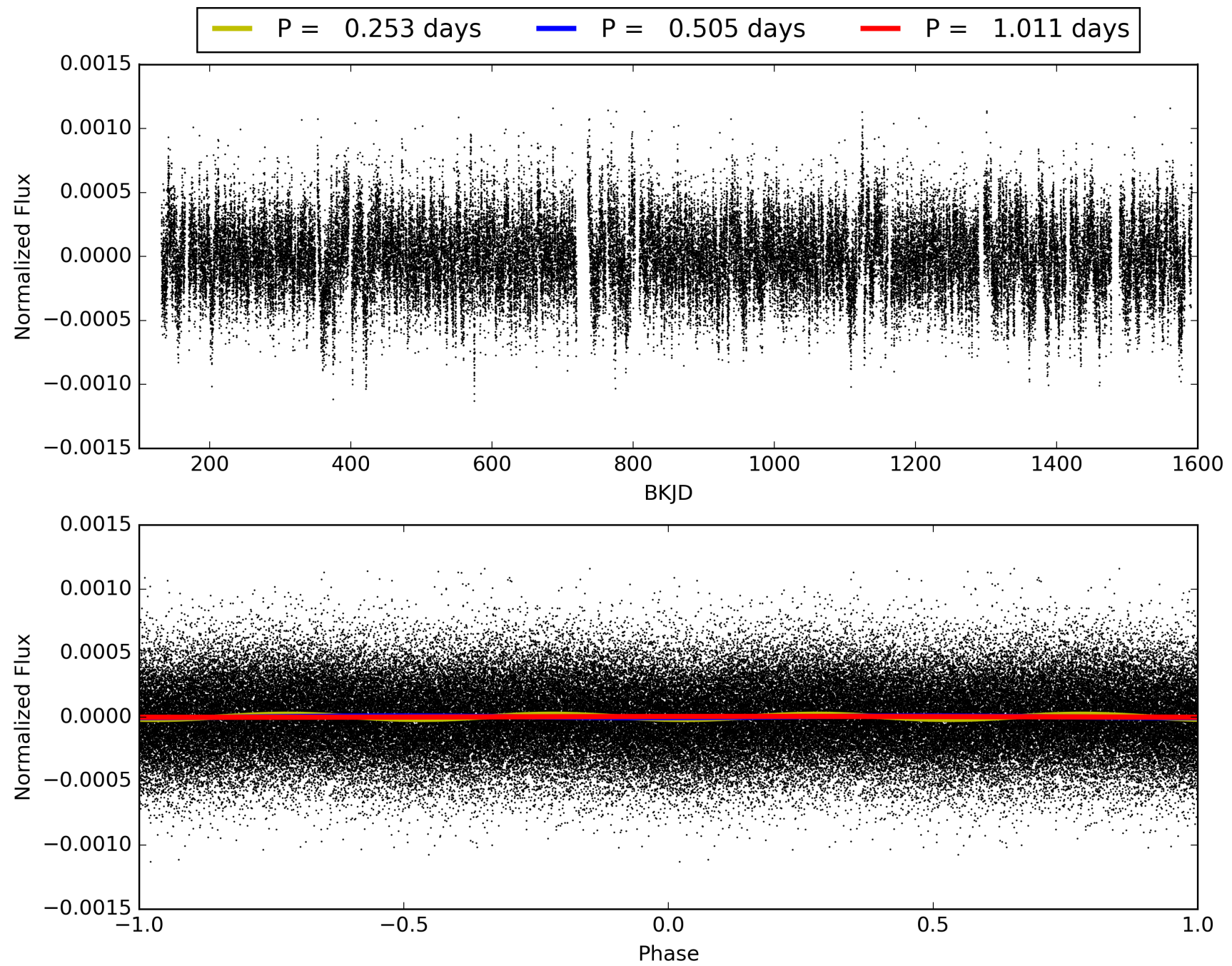
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:00:37 Z

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

# TCE 005128931-01, PDC Light Curves



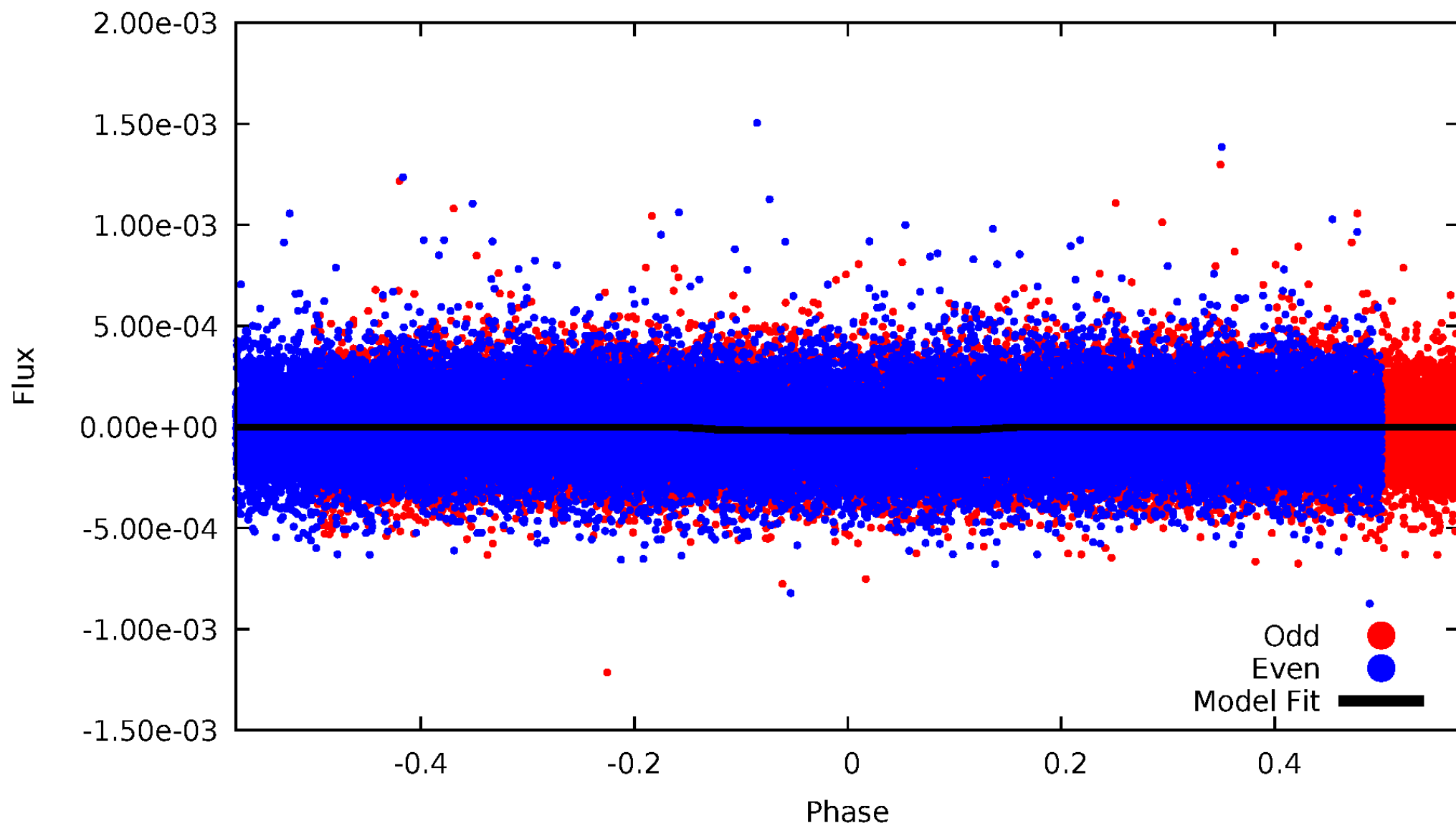
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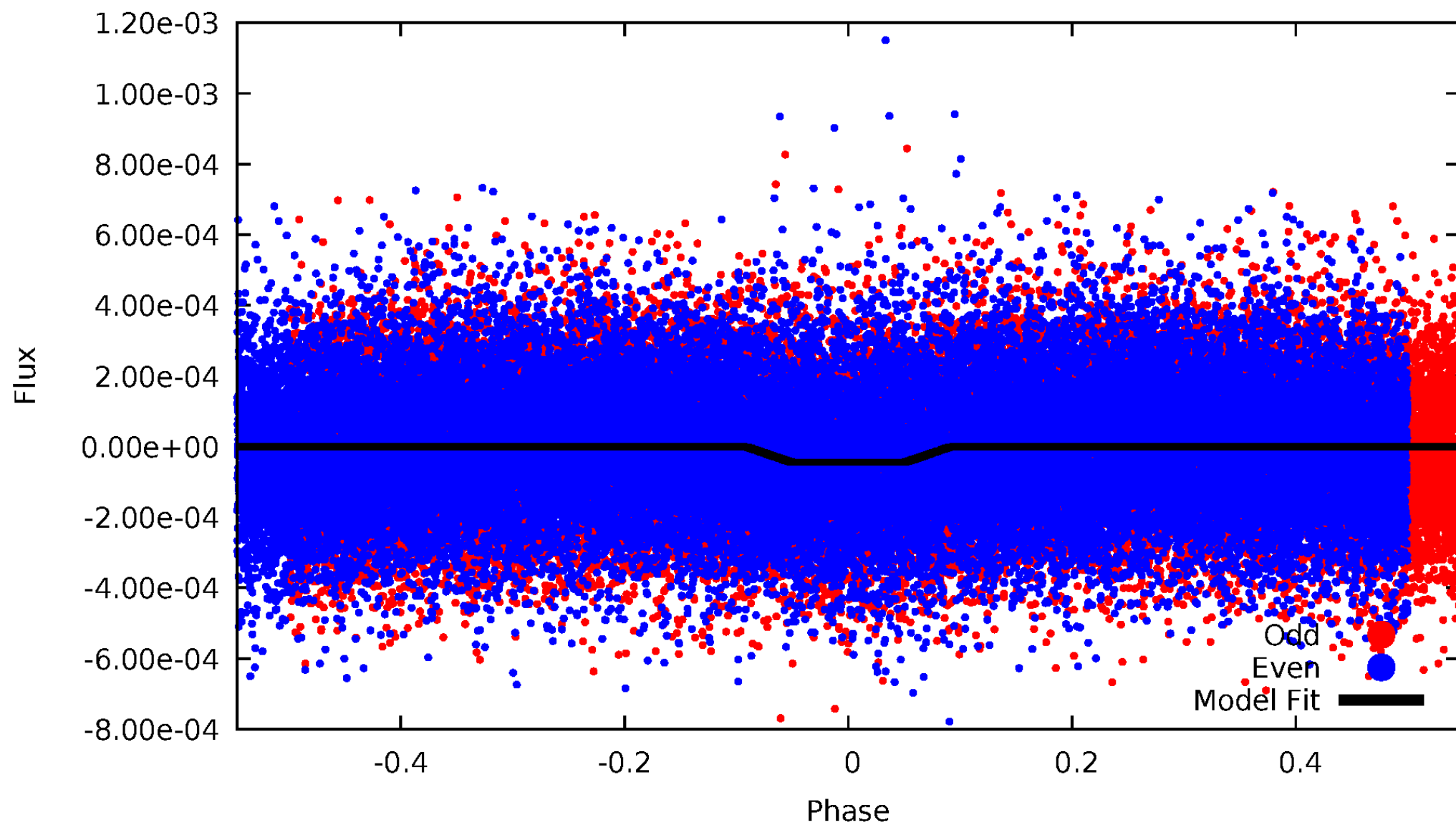
# DV Odd/Even

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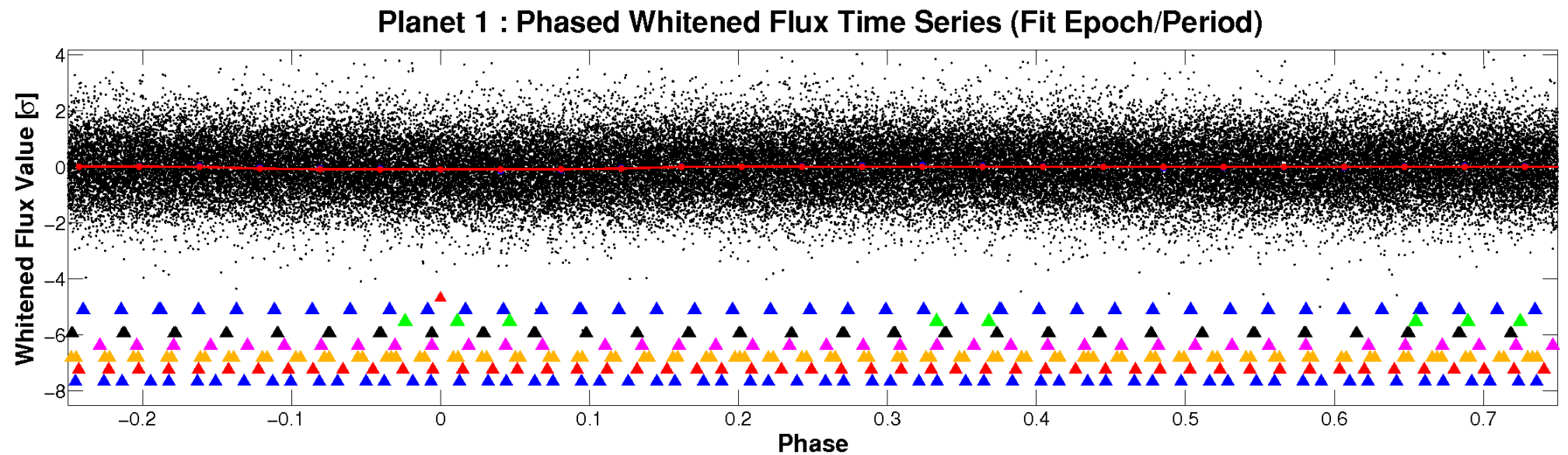
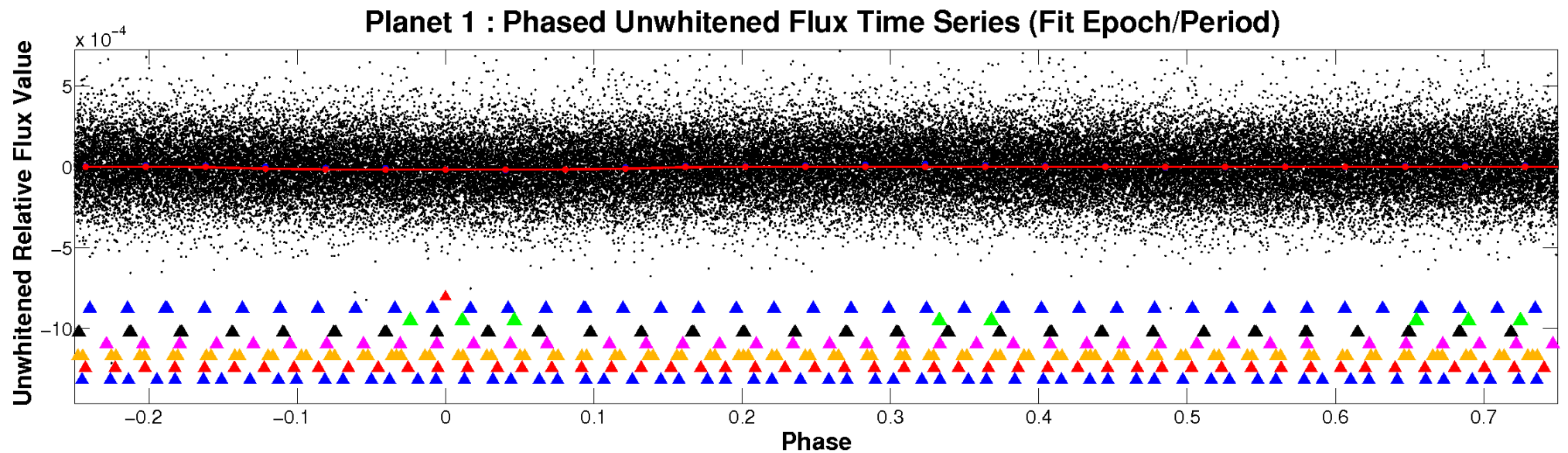


# ALT Odd/Even

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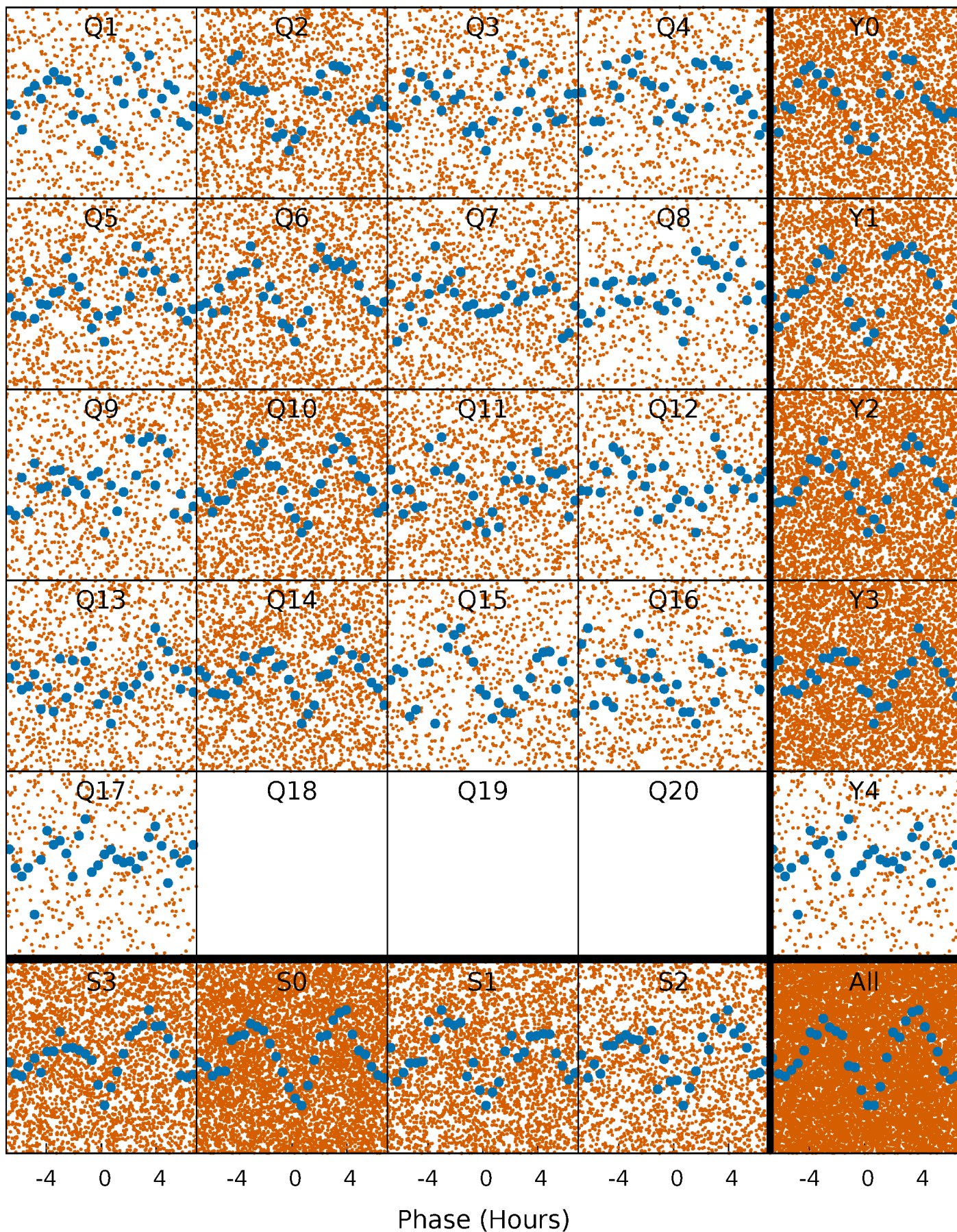


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

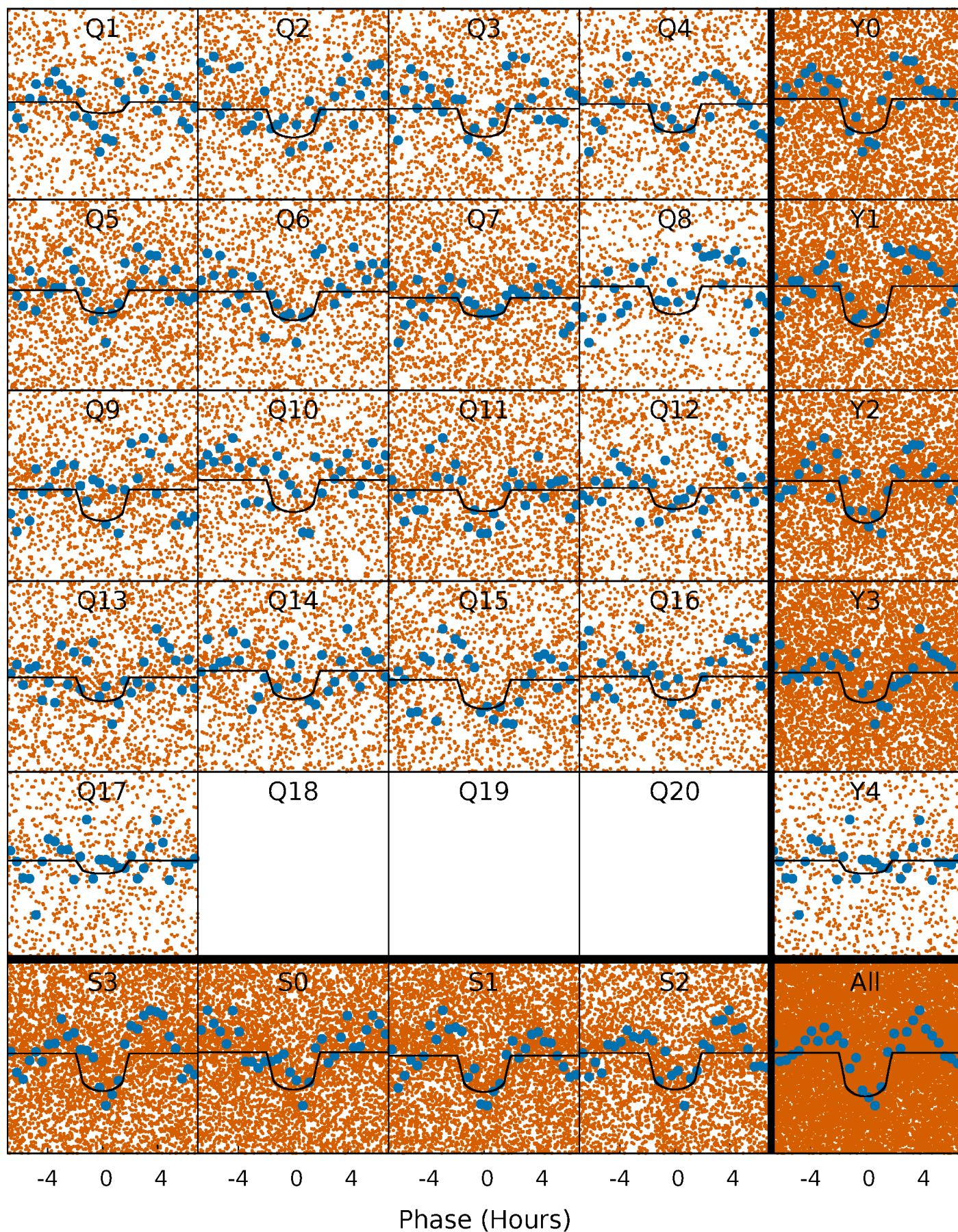
TCE 005128931-01 P= 0.505298 Days  $T_0=131.562344$  (BKJD)





# DV Quarter-Phased Transit Curves

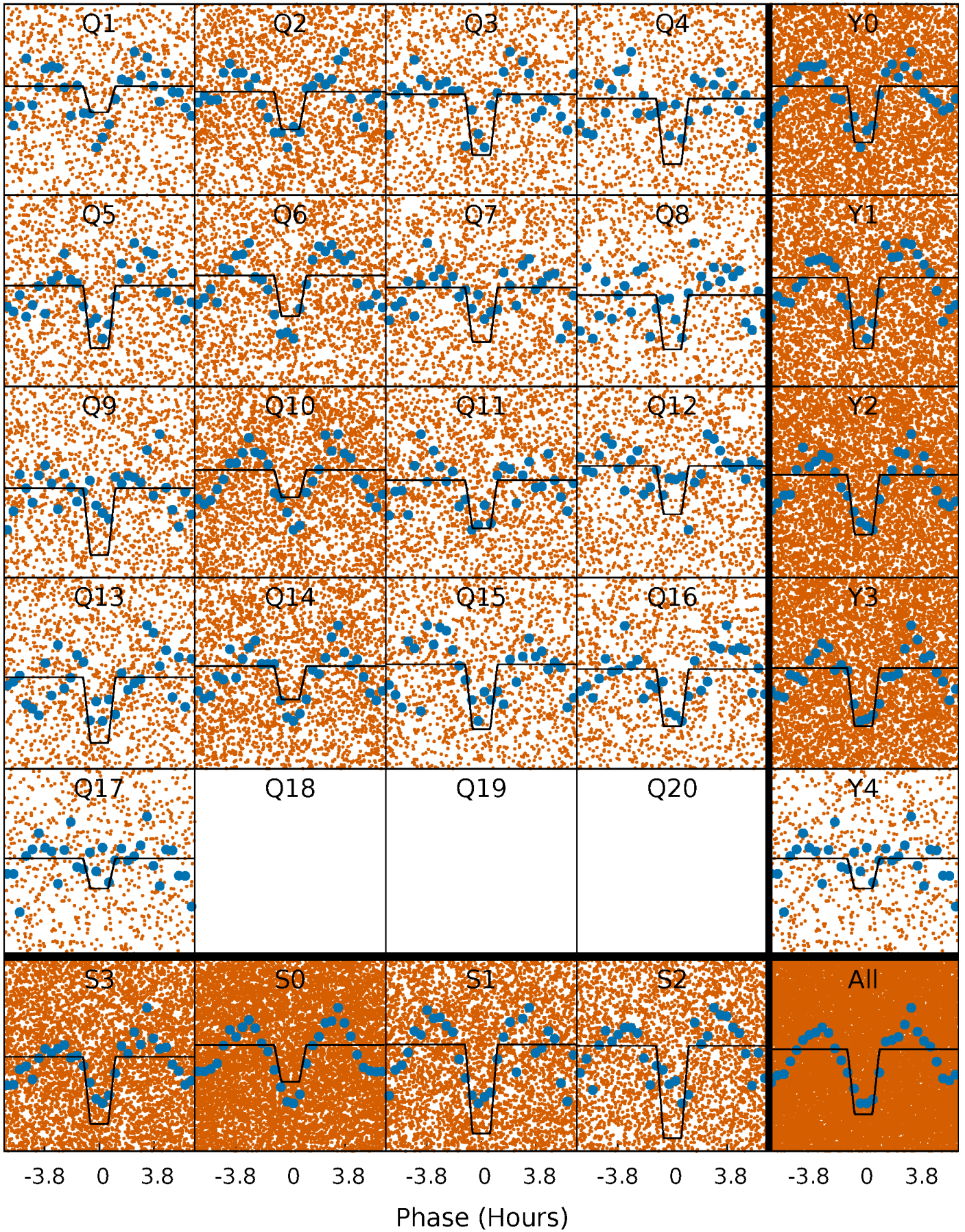
TCE 005128931-01 P= 0.505298 Days  $T_0=131.562344$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

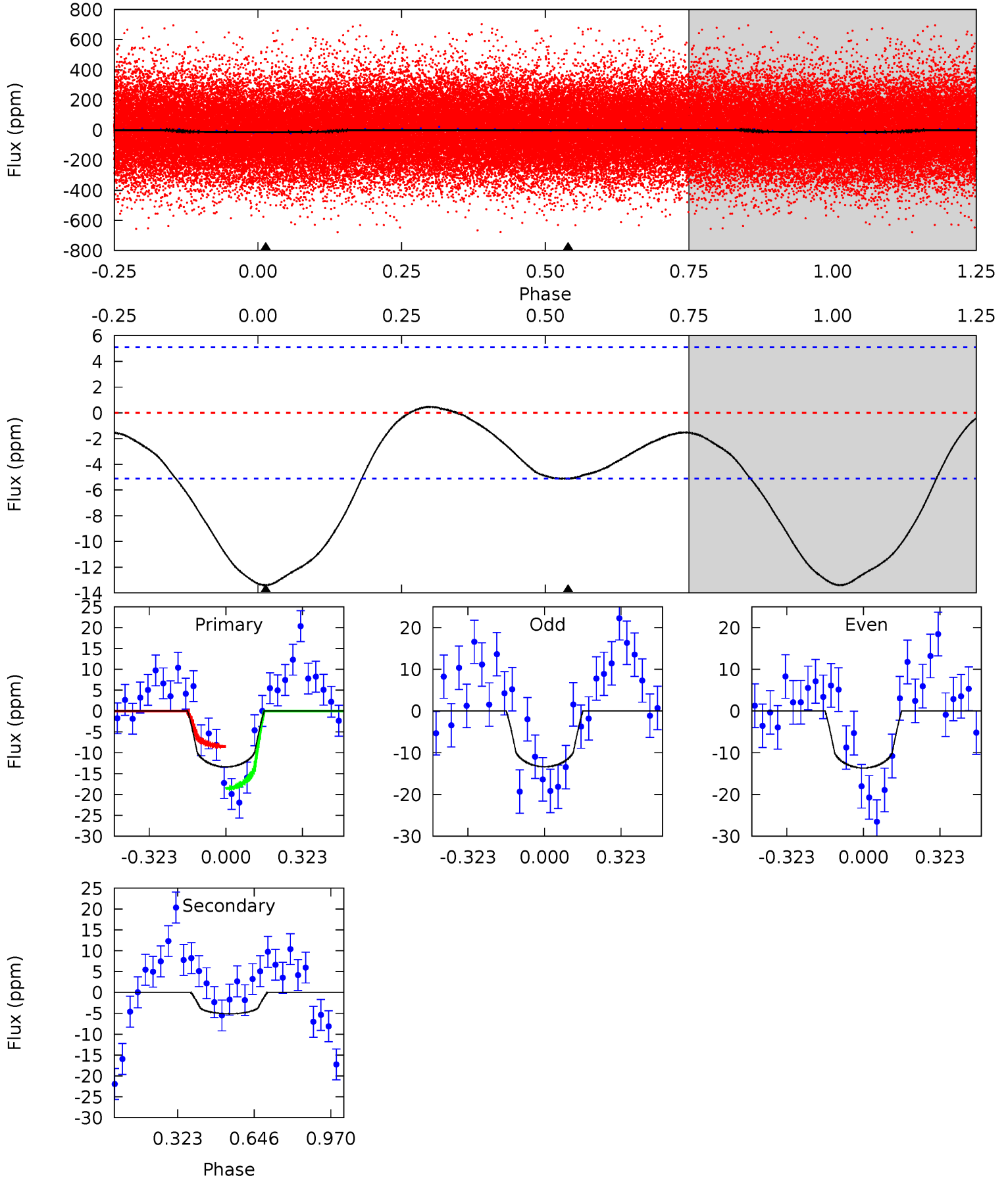
TCE 005128931-01 P= 0.505311 Days  $T_0=131.559666$  (BKJD)



# DV Model-Shift Uniqueness Test

005128931-01, P = 0.505298 Days, E = 131.057046 Days

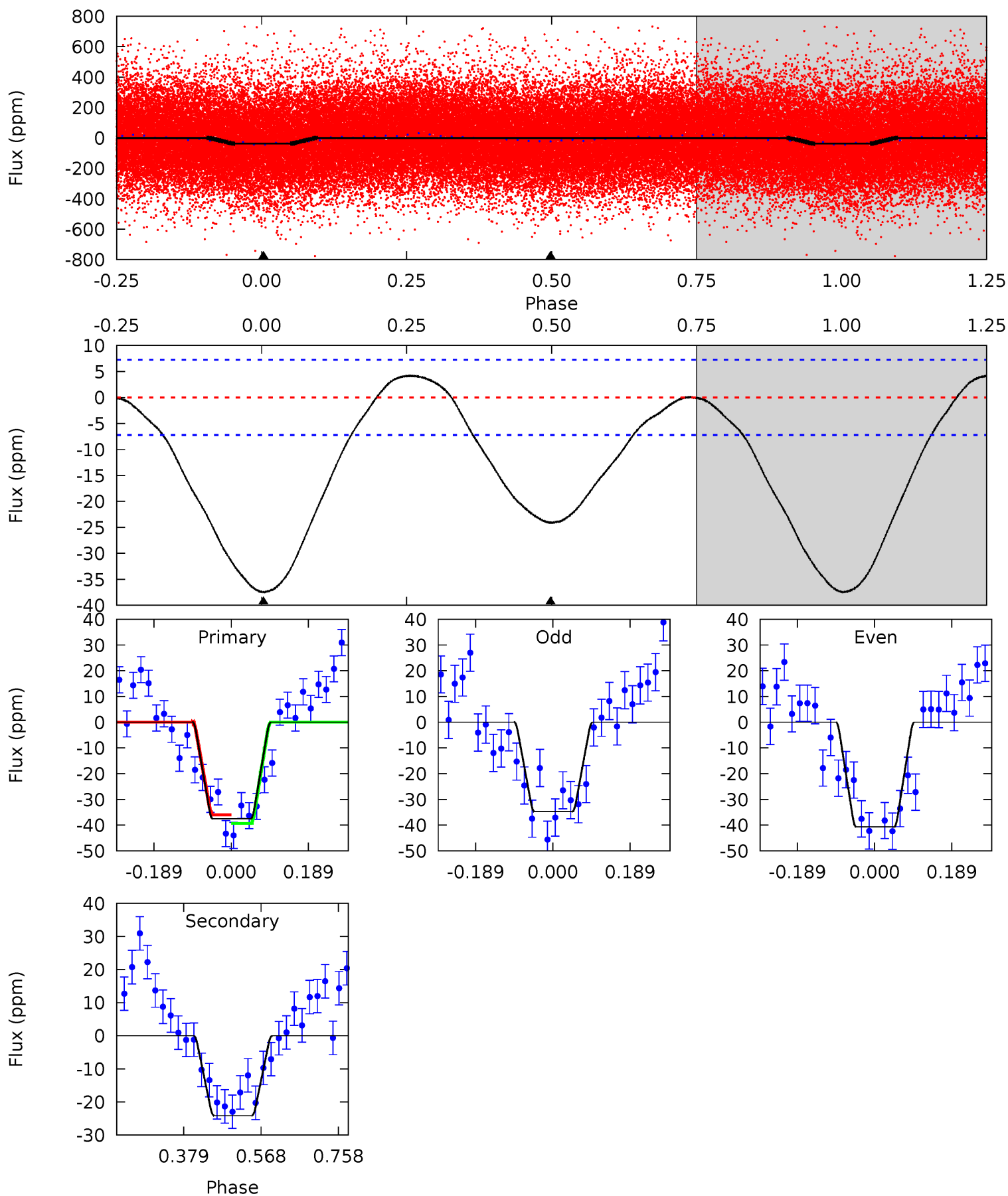
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	4.32	0	0	4.31	0.99	0.79	11.3	11.3	4.32	4.32	0.13	0.91	0.03	4.29



# Alt Model-Shift Uniqueness Test

005128931-01, P = 0.505311 Days, E = 131.054355 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
23.0	14.8	0	0	4.43	1.31	1.61	23.0	23.0	14.8	14.8	1.84	0.93	0.10	1.01





### Stellar Parameters For KIC 005128931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-5\pm 1$	$1.47^{+0.68}_{-0.73}$	$5838^{+373}_{-571}$	$-3434^{+8940}_{-1064}$	$0.256^{+0.712}_{-0.142}$
Alt.	$-24\pm 2$	$2.28^{+0.82}_{-0.78}$	$5834^{+369}_{-589}$	$4416^{+1374}_{-7522}$	$0.517^{+0.638}_{-0.237}$

$T_{max}$  = 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

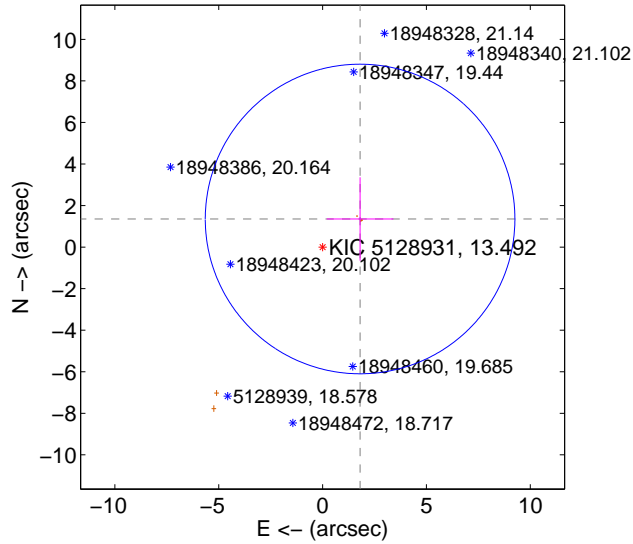
Supplemental centroid analysis for 005128931-01. Kepler magnitude: 13.49. Transit SNR 10.19

There are 0 quarters with good PRF difference image offsets

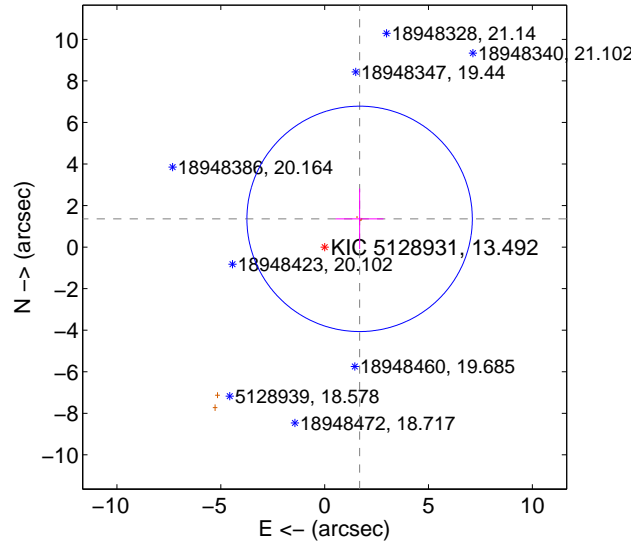
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.256 \pm 2.484$	0.91	$-1.805 \pm 1.603$	$1.353 \pm 2.005$
PRF-fit source offset from KIC position	$2.164 \pm 1.808$	1.20	$-1.683 \pm 1.150$	$1.359 \pm 1.457$
photometric centroid source offset	$6.01 \pm 1.01$	5.93	$4.16 \pm 1.02$	$-4.33 \pm 1.00$

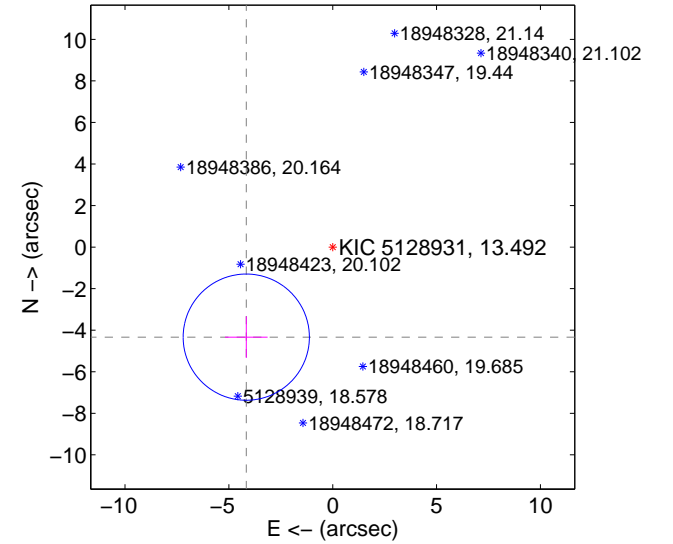
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

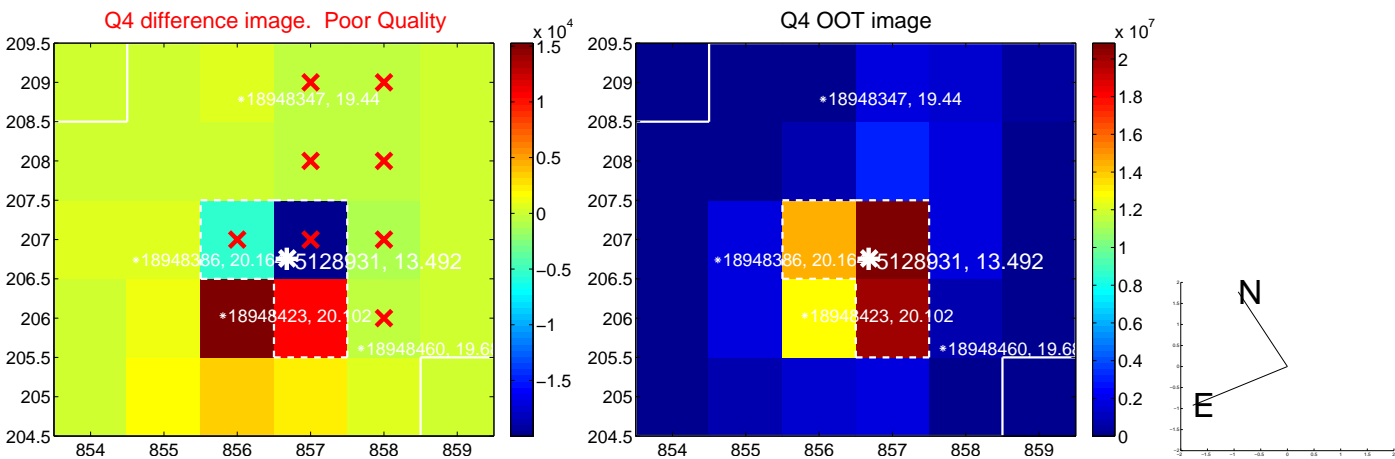
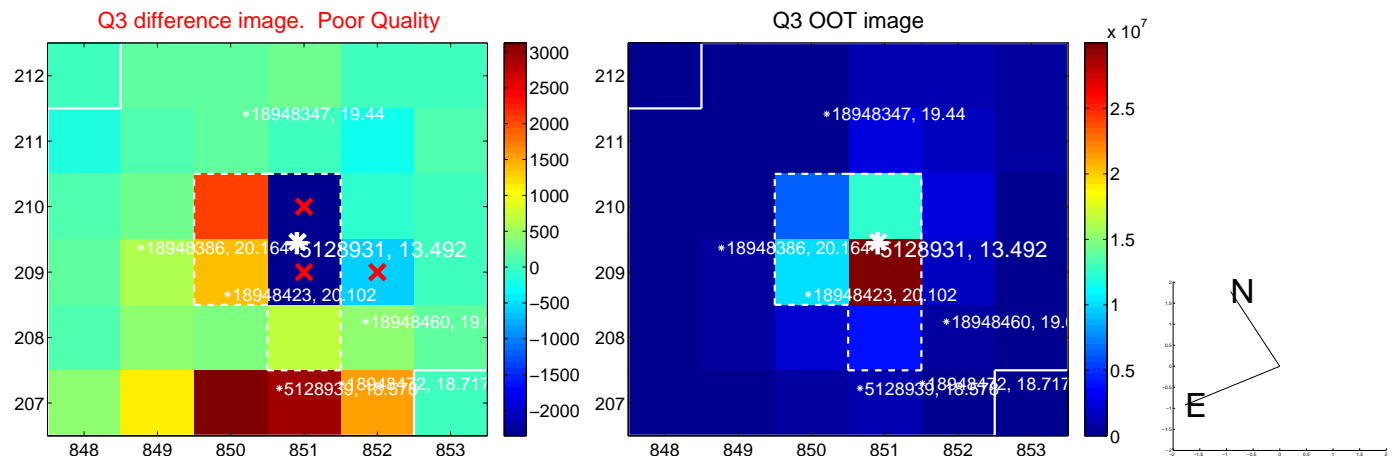
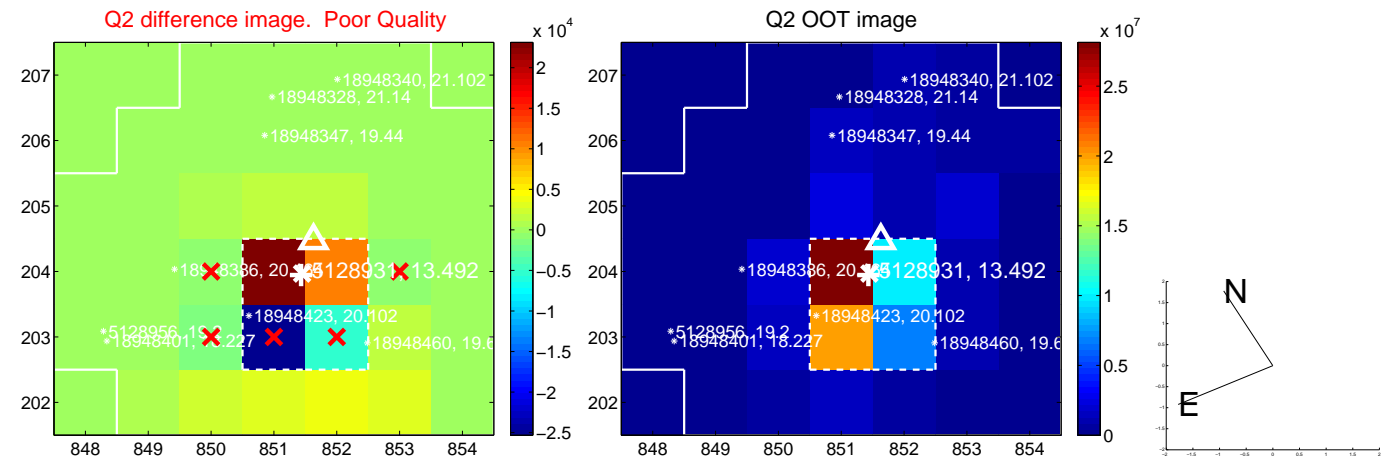
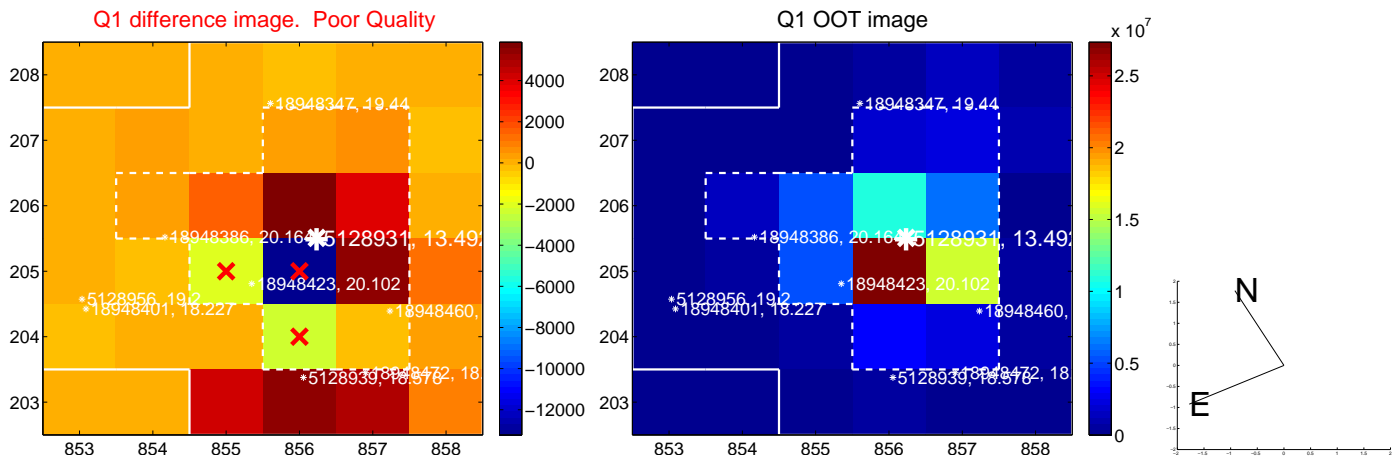


offset from photometric centroids

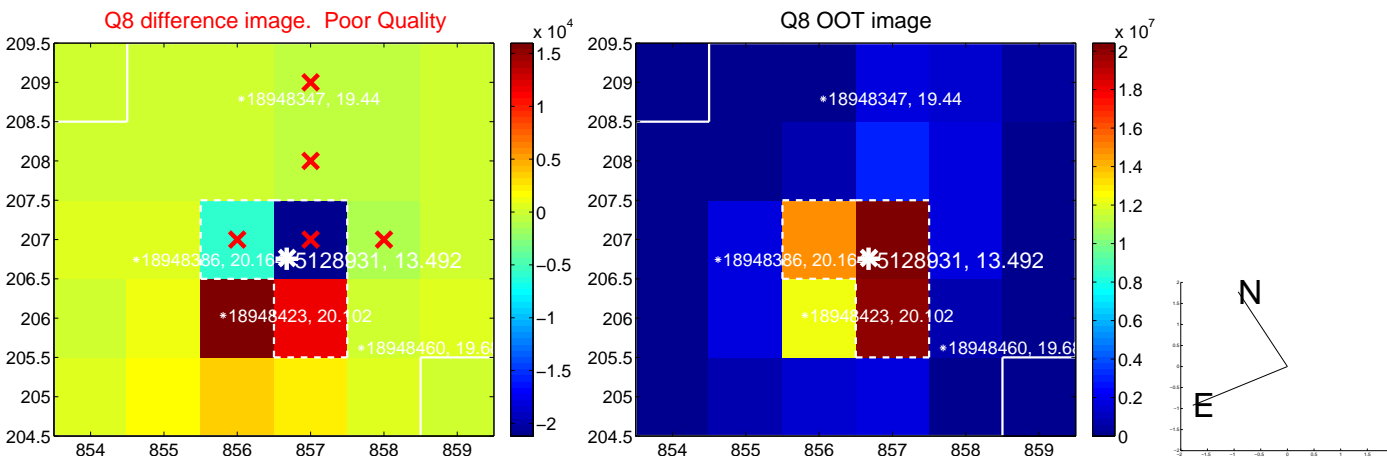
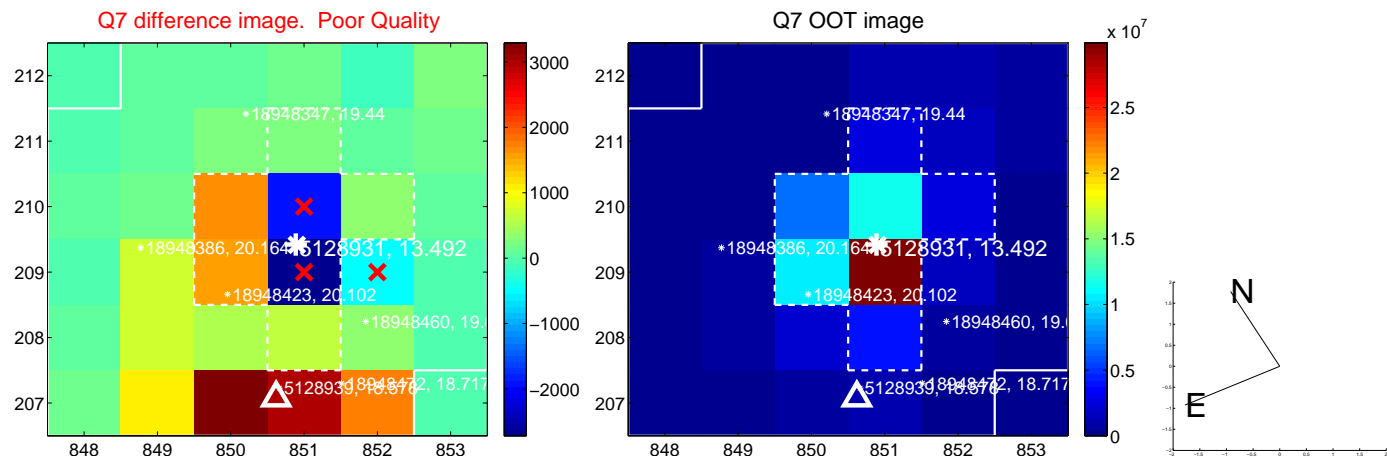
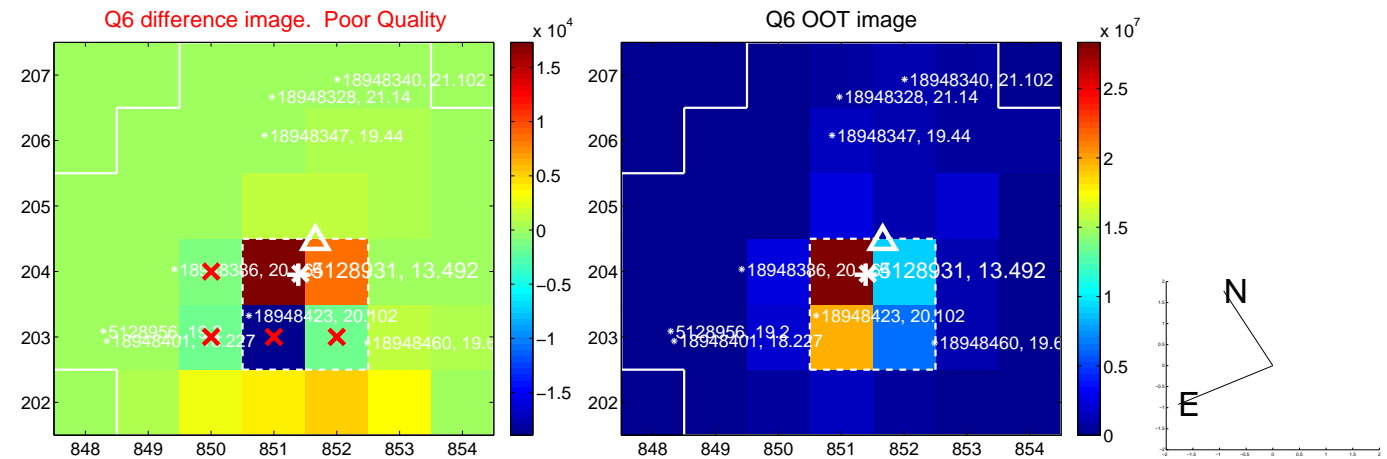
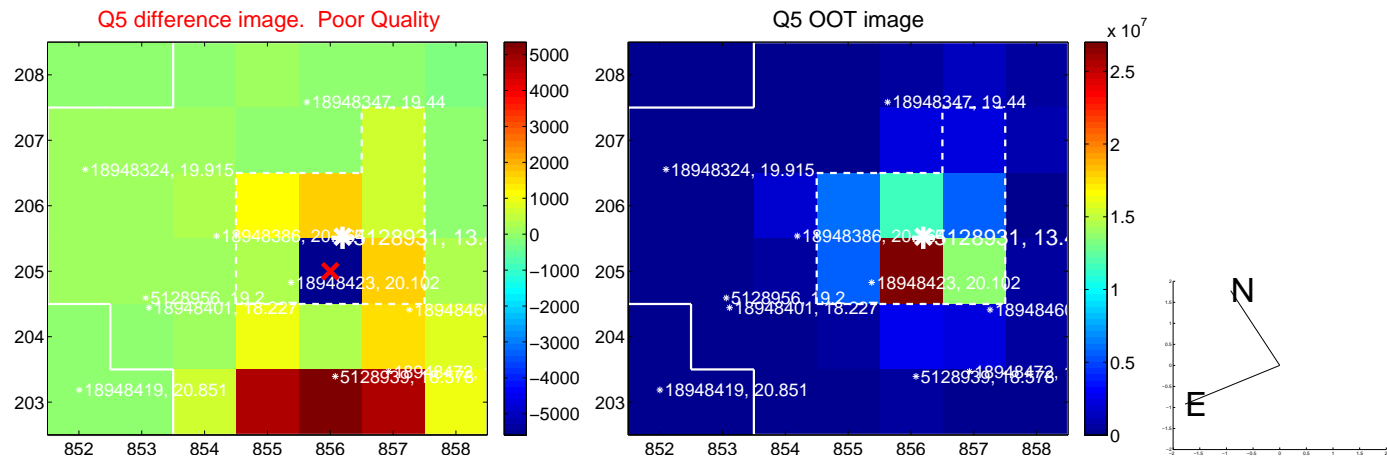


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

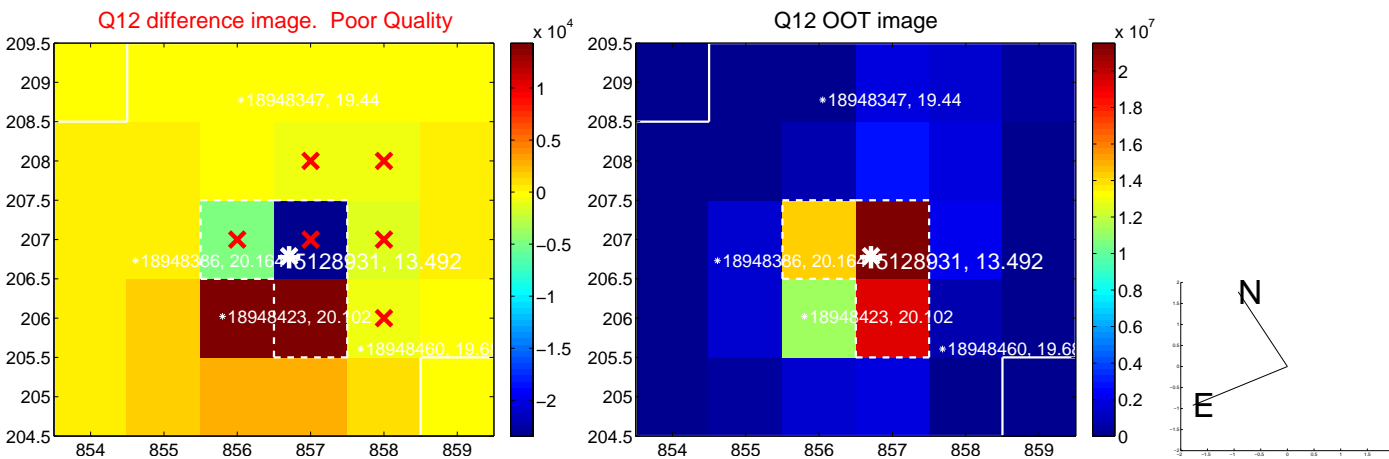
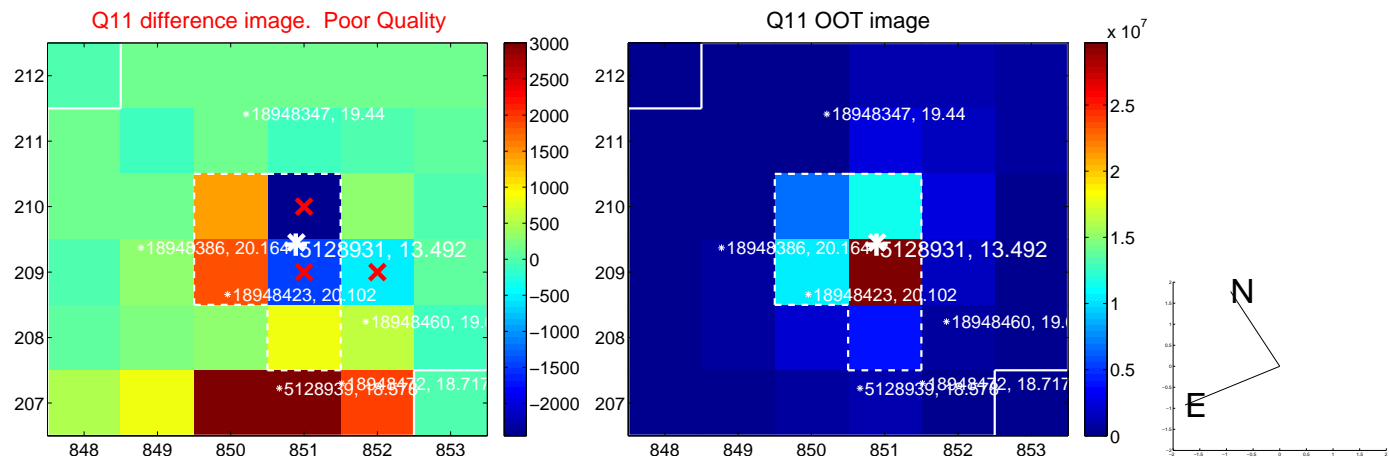
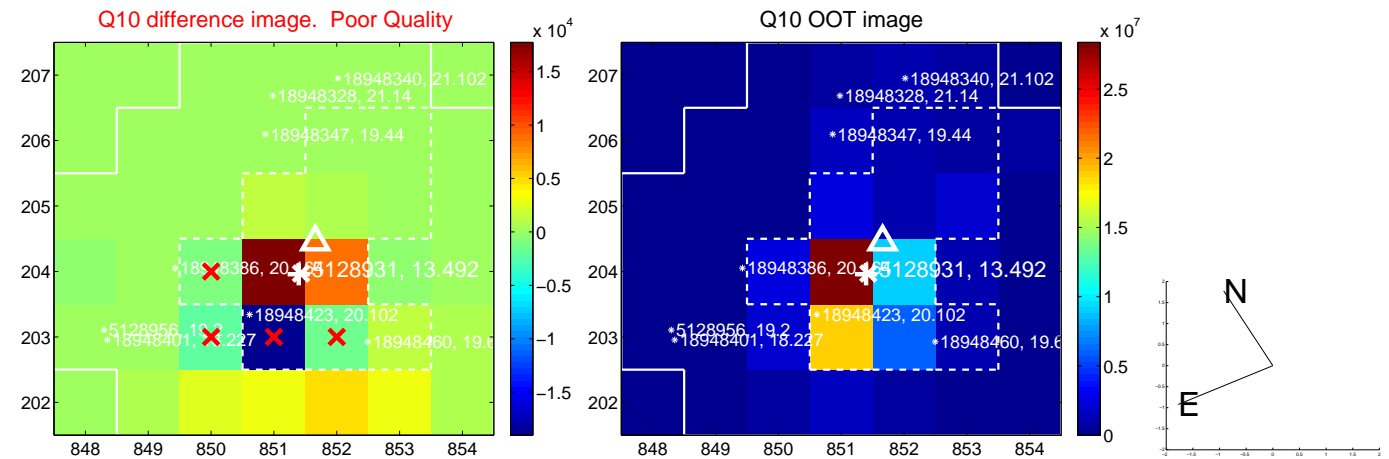
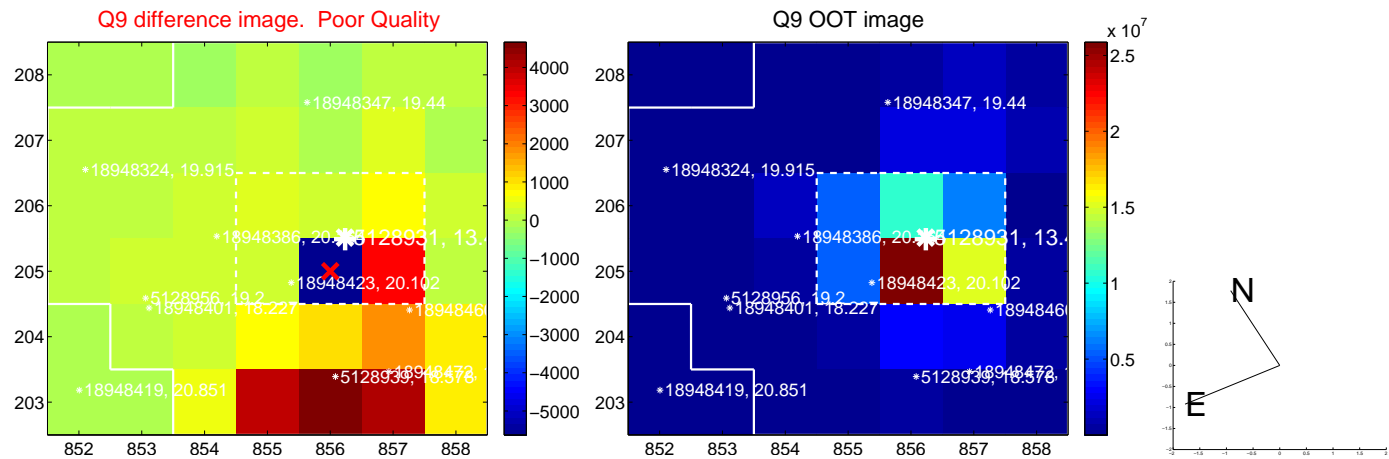


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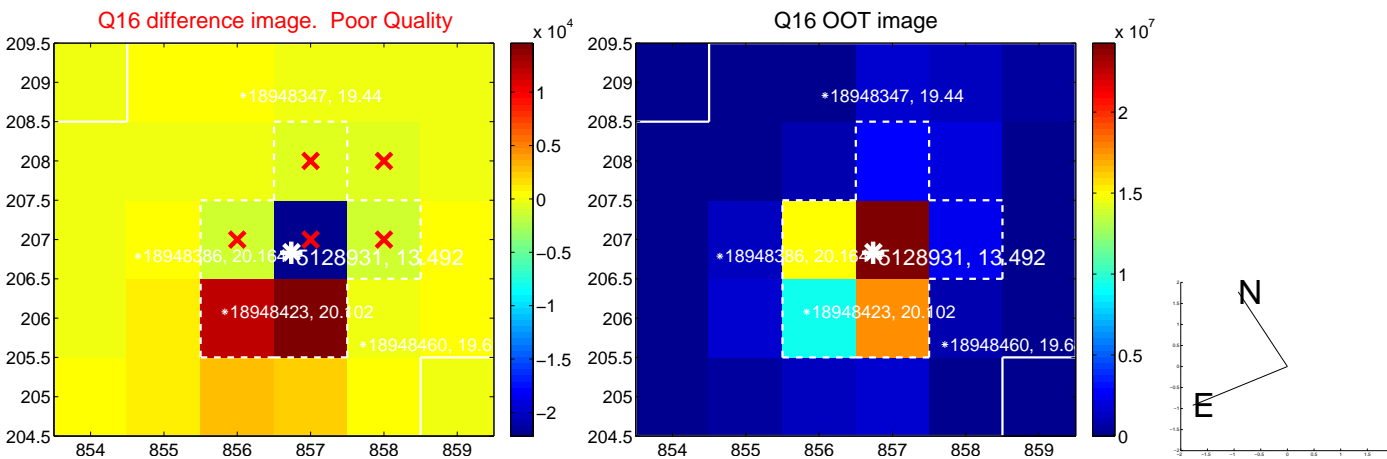
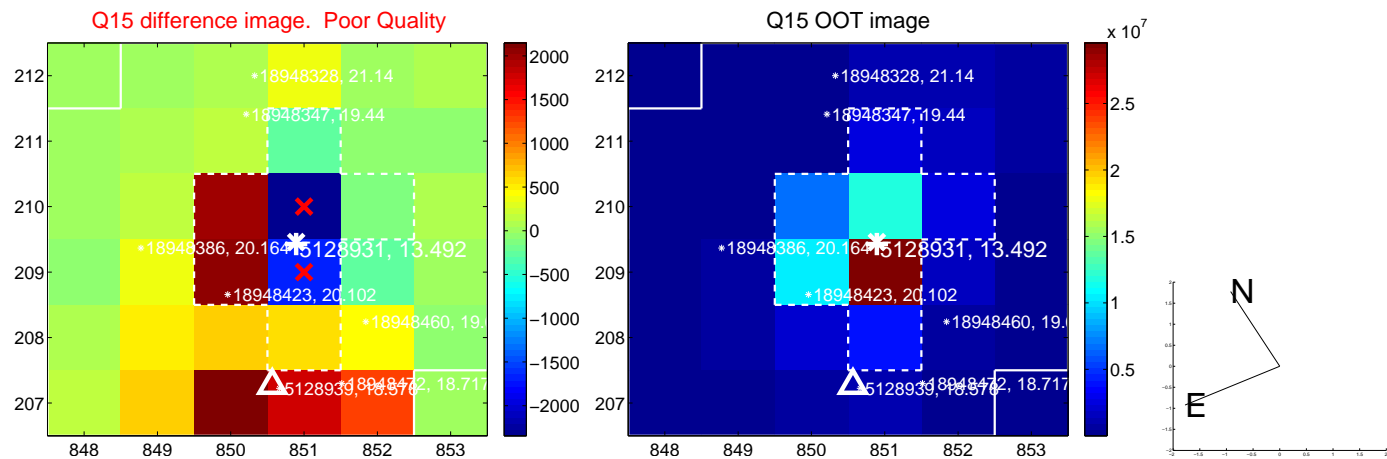
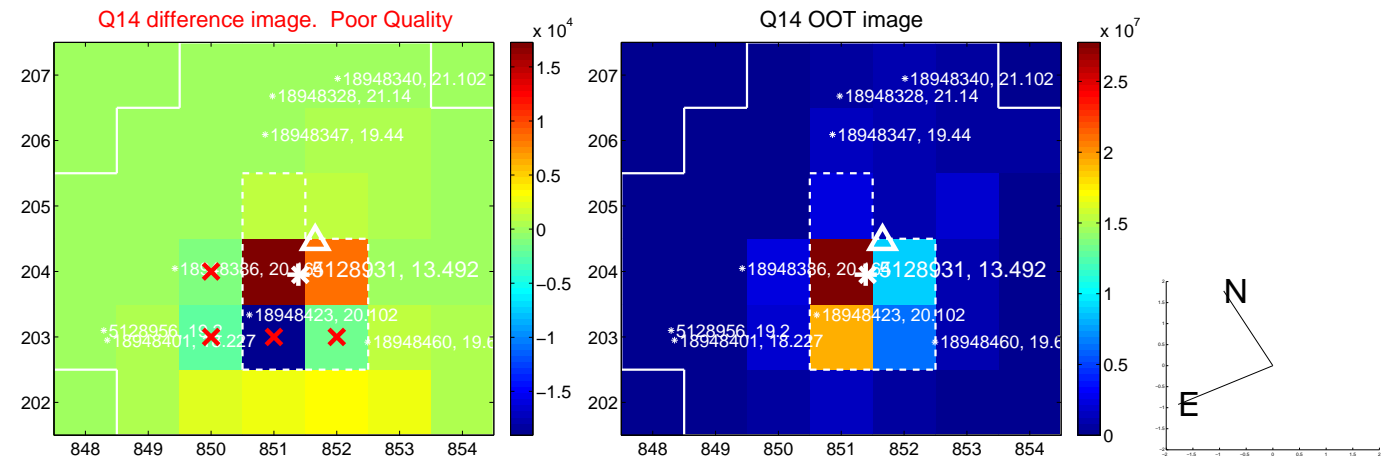
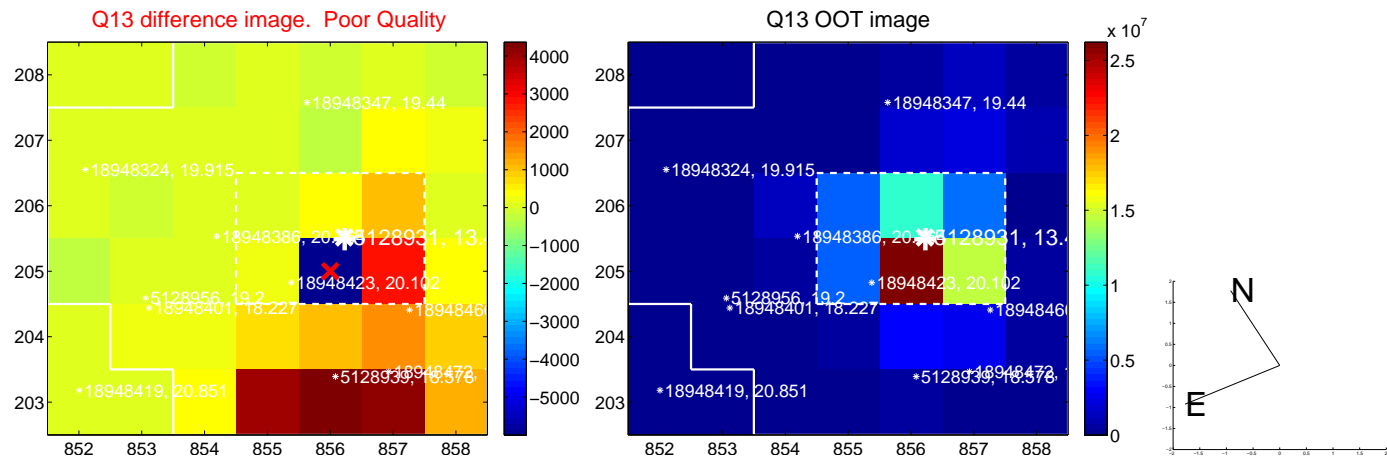




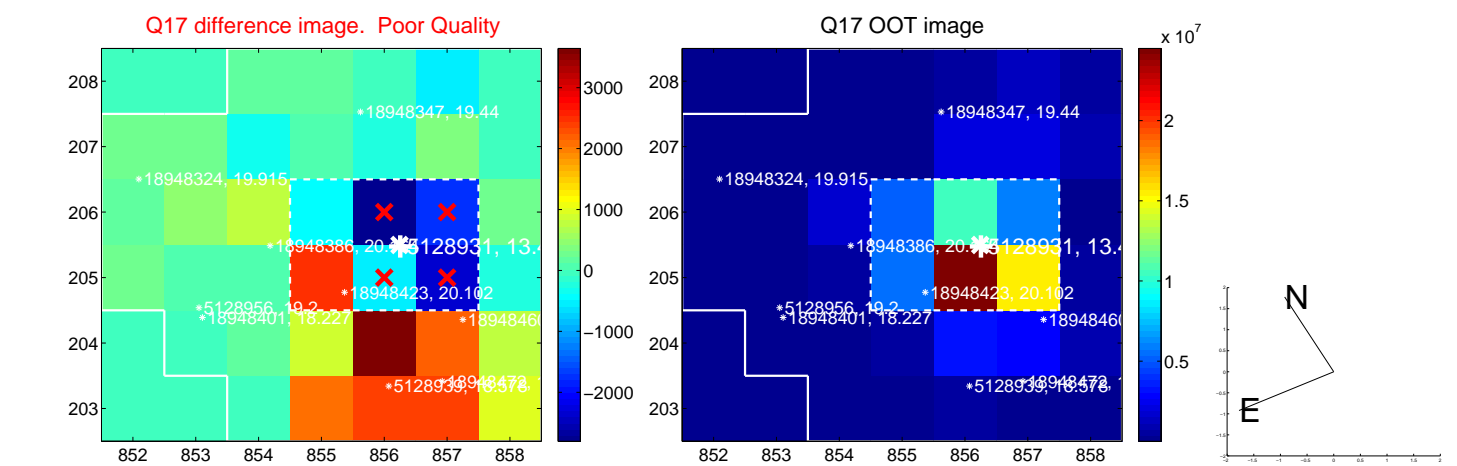
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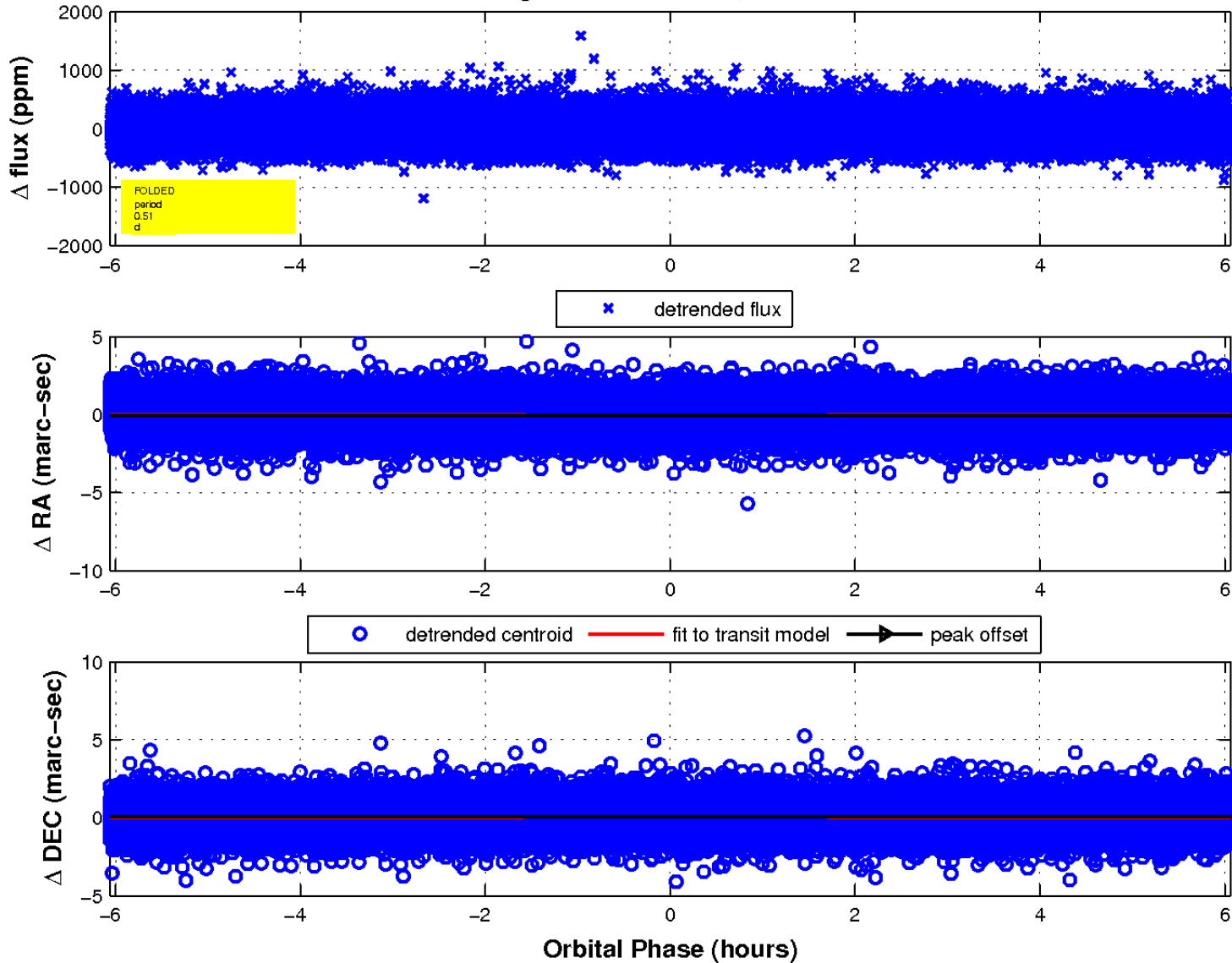
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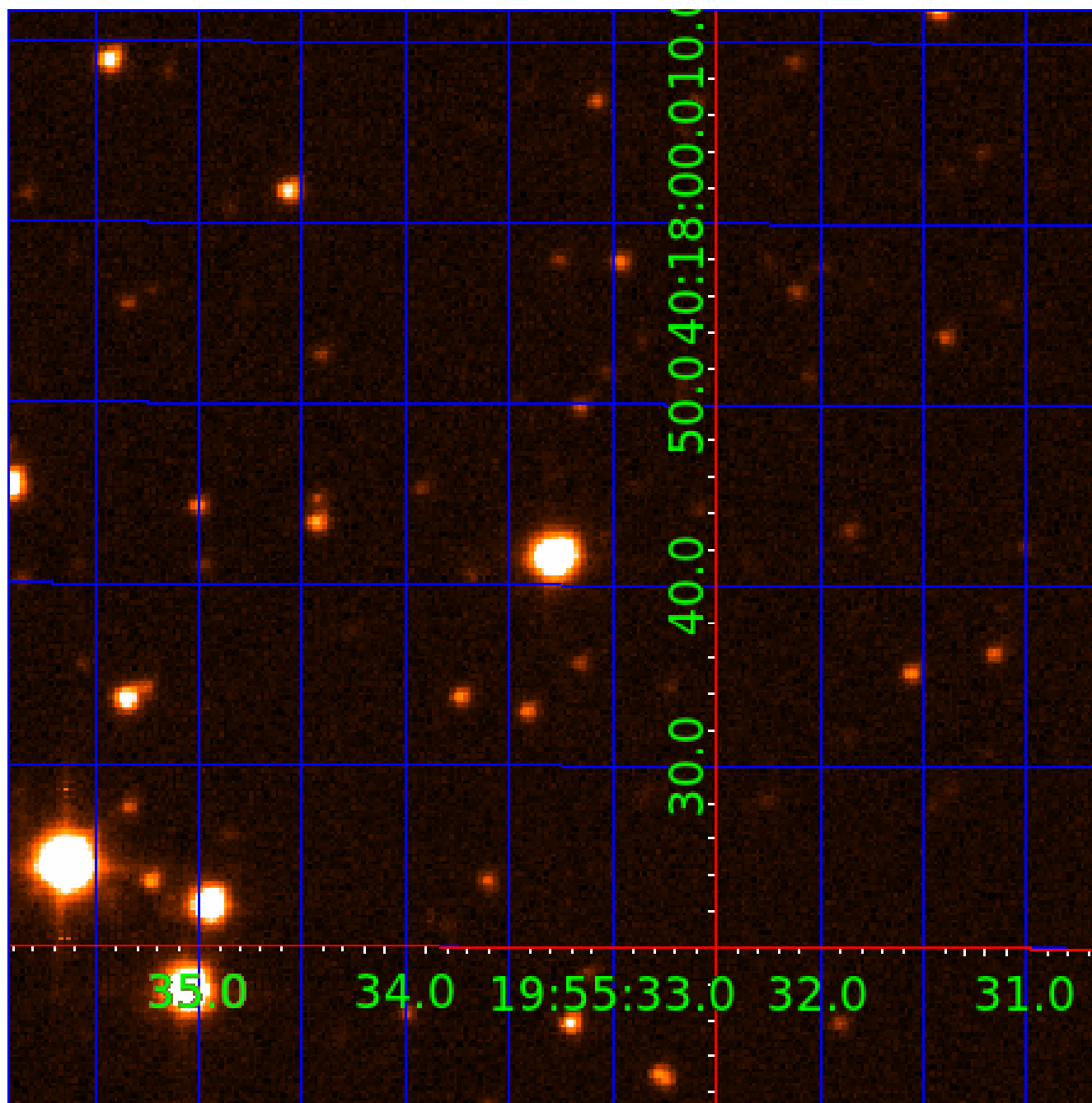


fluxWeightedCentroids, Planet 1 of 8



UKIRT Image

Declination





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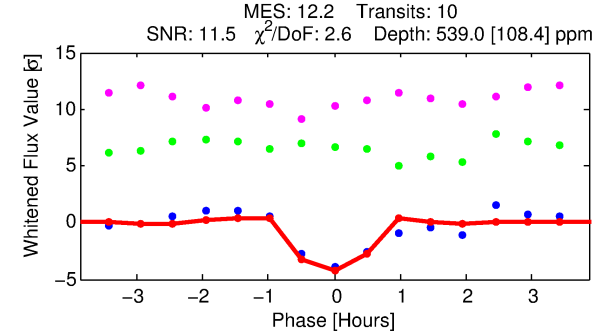
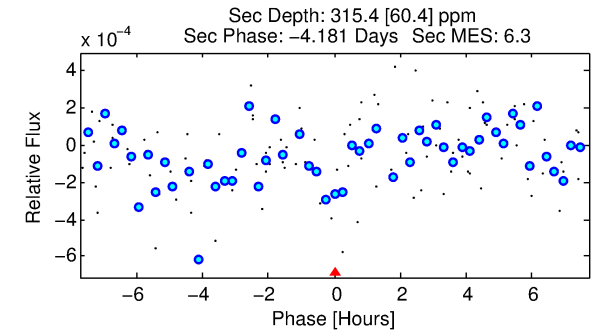
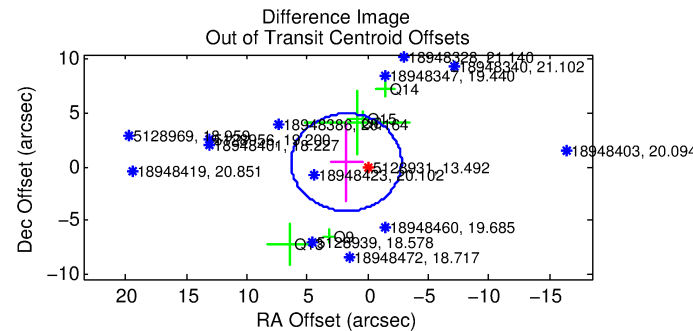
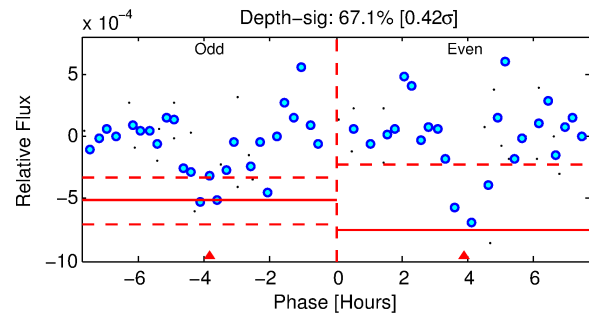
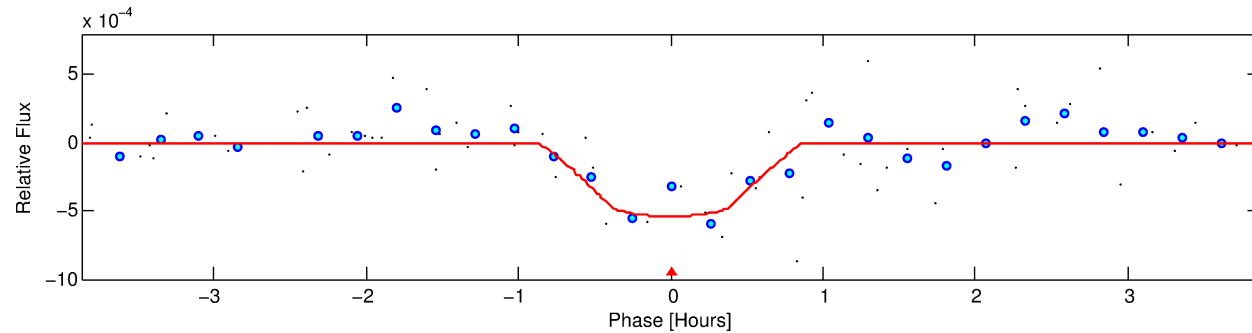
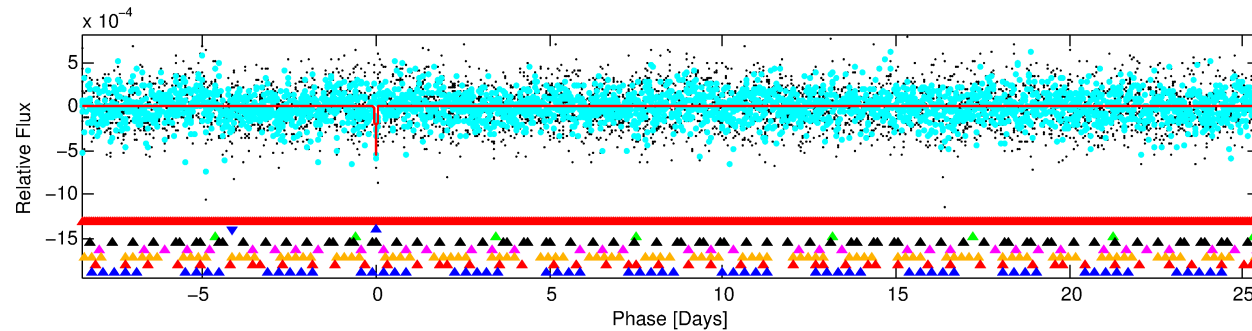
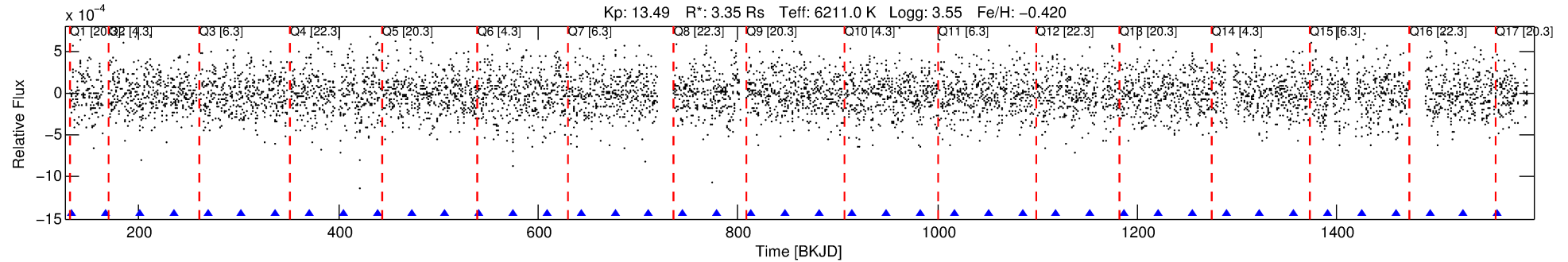
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005128931-02

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 2 of 8 Period: 33.998 d



## DV Fit Results:

Period = 33.99750 [0.00031] d  
Epoch = 132.9828 [0.0075] BKJD  
Rp/R\* = 0.0218 [0.0223]  
a/R\* = 190.05 [1015.49]  
b = 0.39 [11.53]  
Seff = 275.41 [170.42]  
Teq = 1039 [161] K  
Rp = 7.97 [8.82] Re  
a = 0.2334 [0.0902] AU  
Ag = 148.62 [319.25] [0.46 $\sigma$ ]  
Teffp = 5608 [2893] K [1.58 $\sigma$ ]

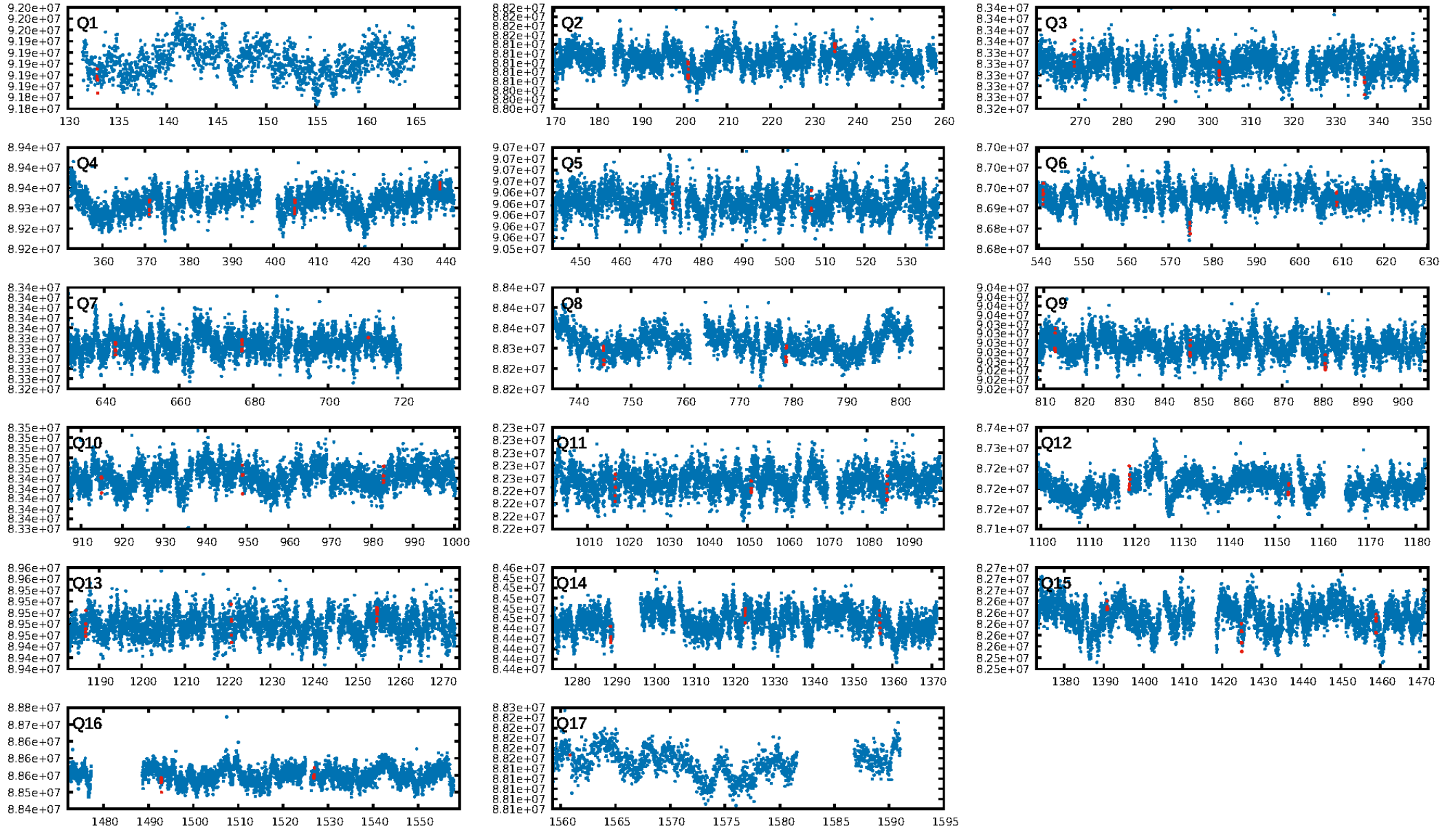
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [80.82 $\sigma$ ]  
LongPeriod-sig: 100.0% [29.59 $\sigma$ ]  
ModelChiSquare2-sig: 30.4%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: 2.11e-14  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: -1.81  
Centroid-sig: 30.8%  
Centroid-so: 0.709 arcsec [1.55 $\sigma$ ]  
OotOffset-rm: 1.832 arcsec [1.21 $\sigma$ ]  
KicOffset-rm: 1.868 arcsec [1.24 $\sigma$ ]  
OotOffset-st: 1/1/1/2 [5]  
KicOffset-st: 1/1/1/2 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.00 [0/16]

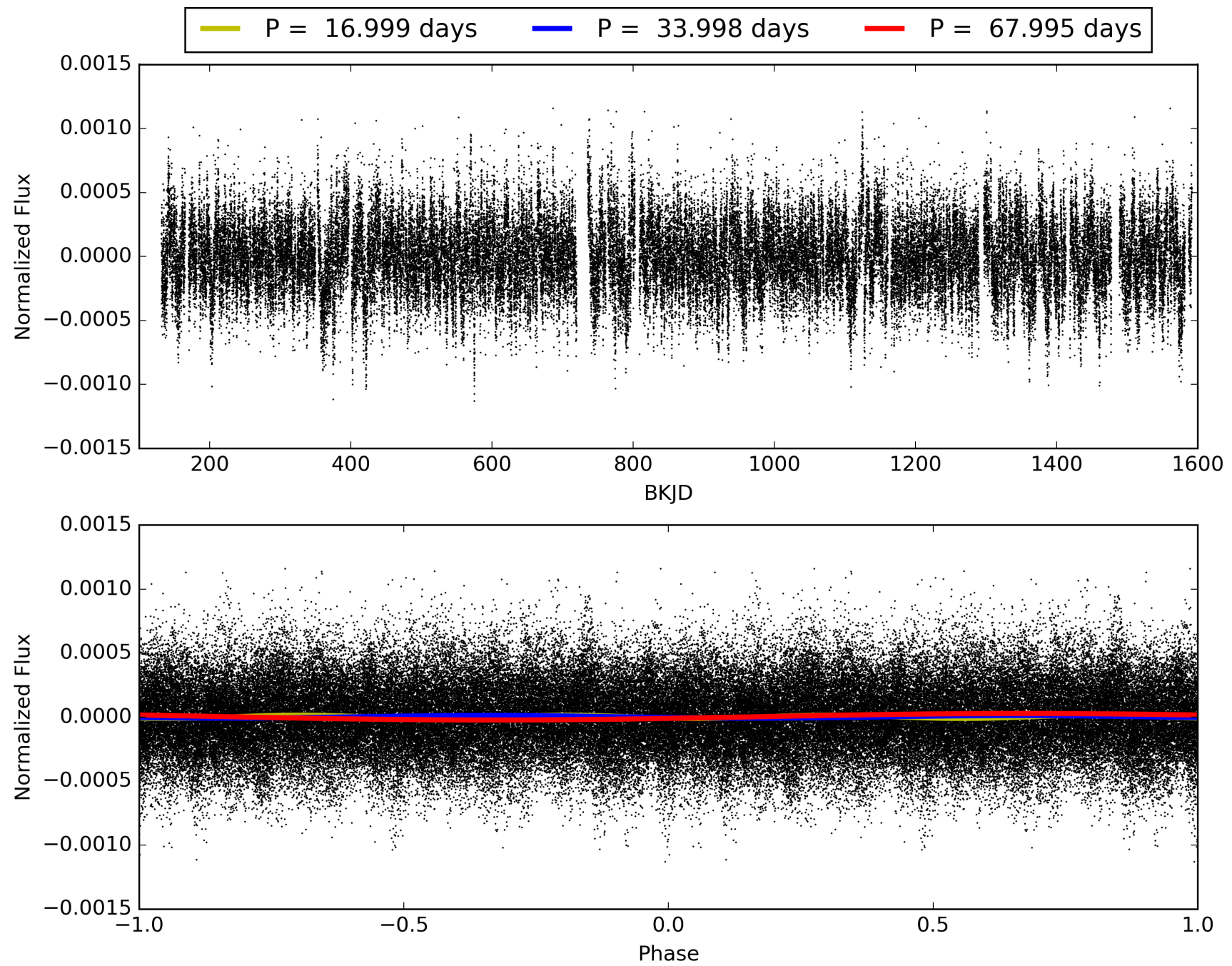
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:00:48 Z

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

# TCE 005128931-02, PDC Light Curves

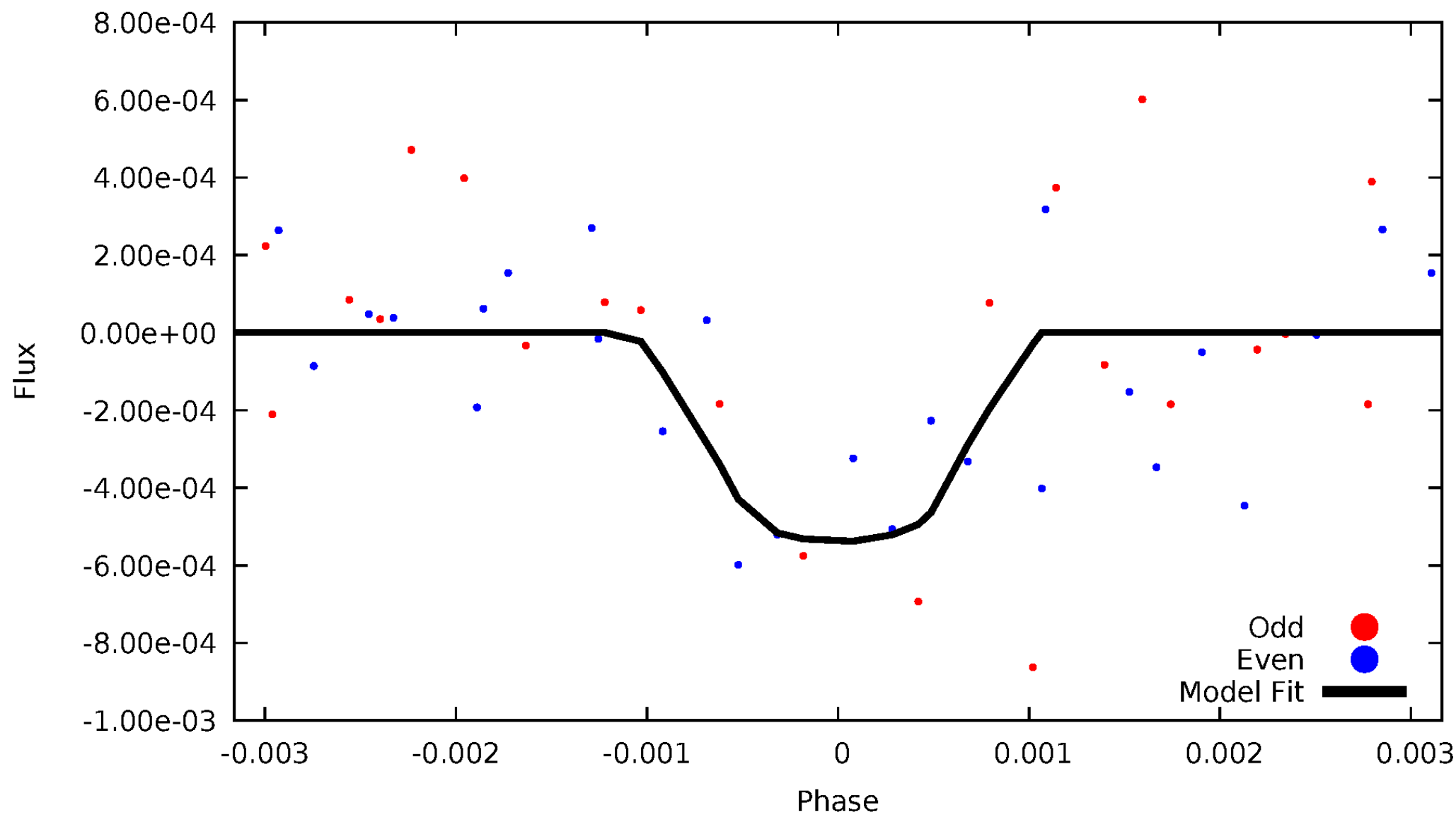


TCE 005128931-02



# DV Odd/Even

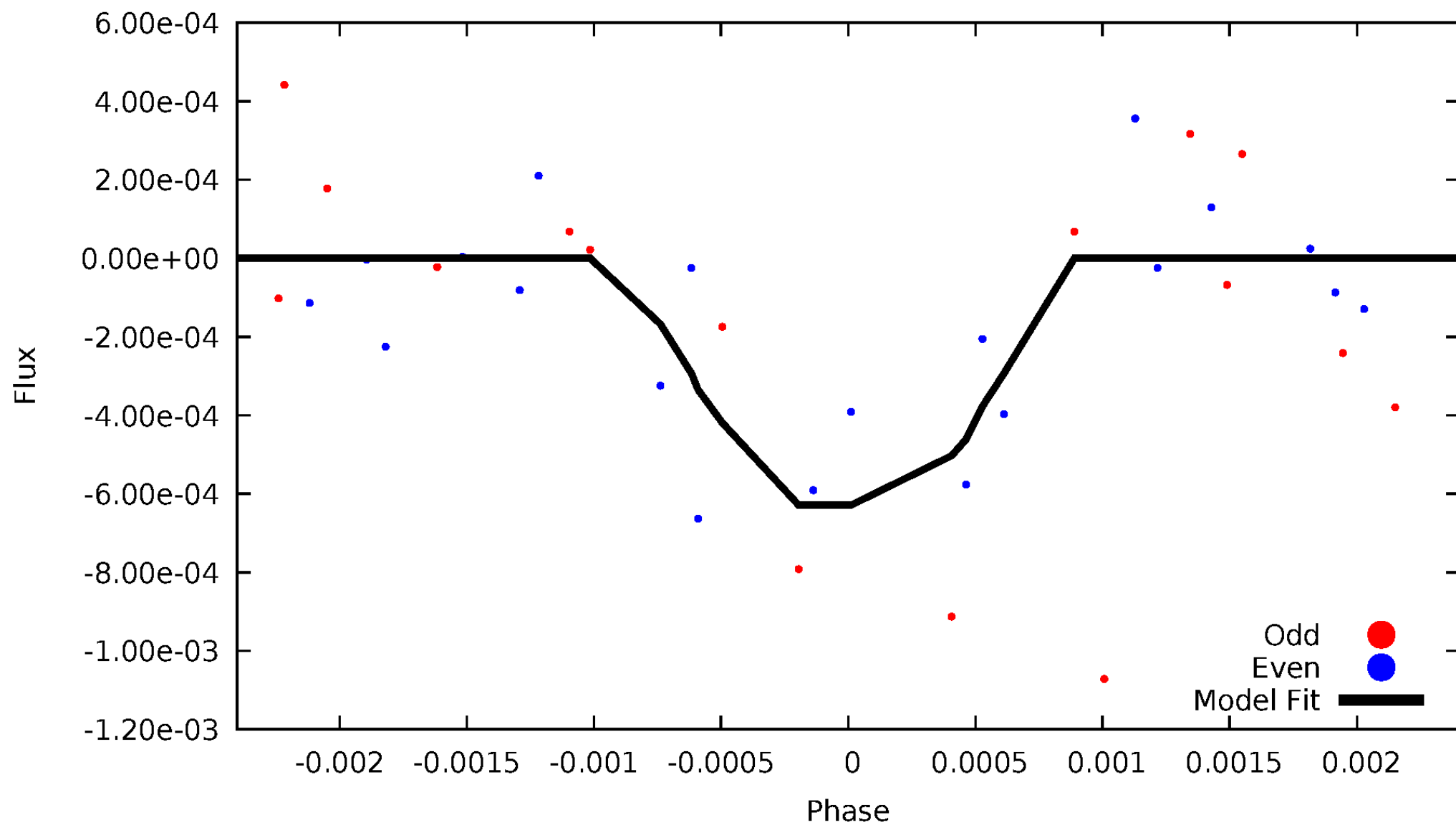
TCE 005128931-02





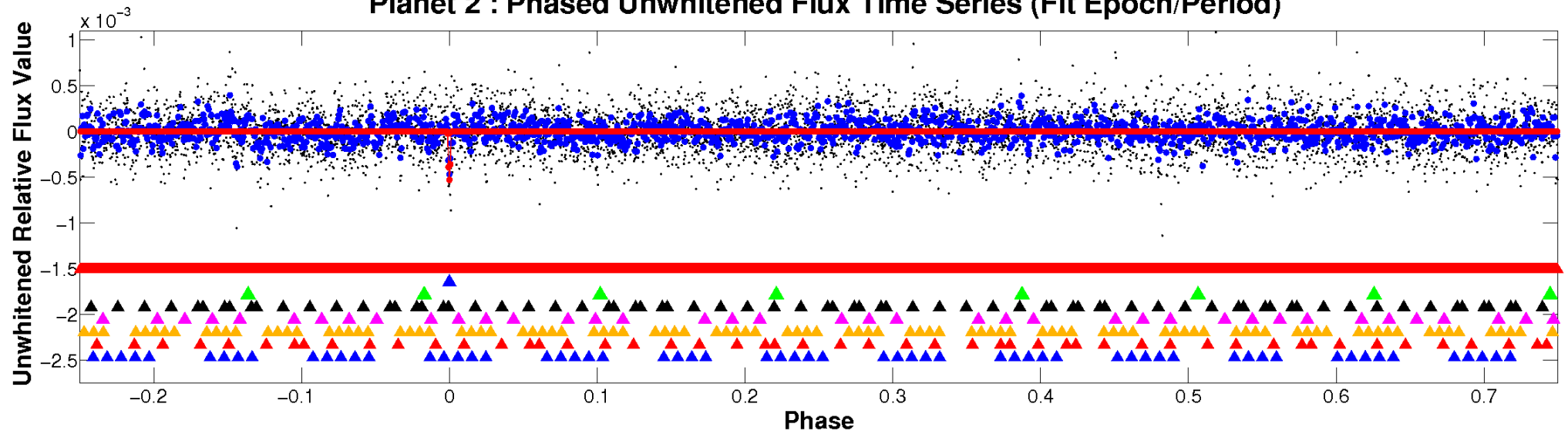
# ALT Odd/Even

TCE 005128931-02

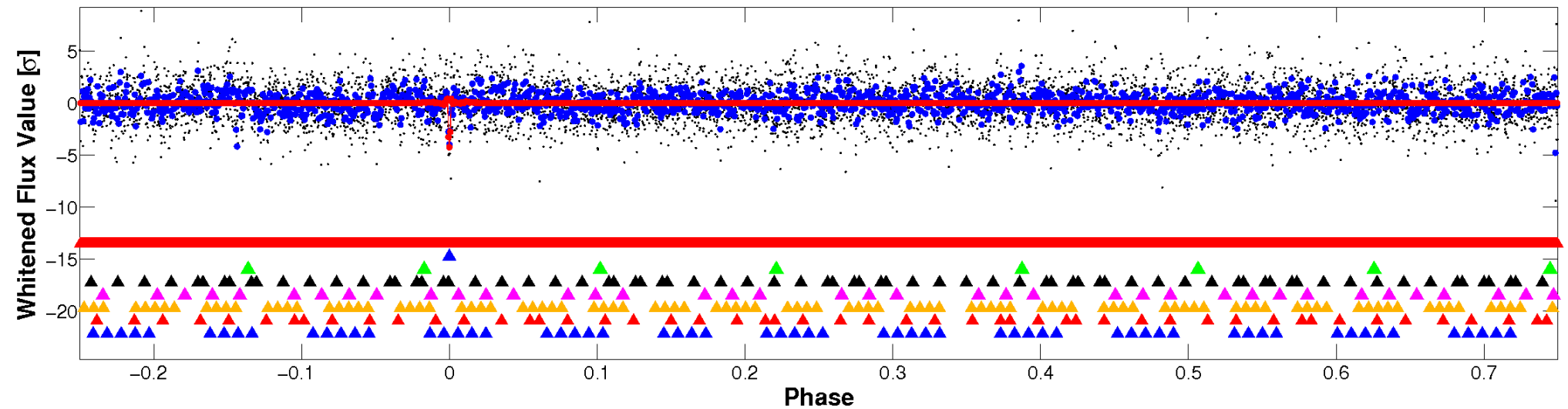


# Non-Whitened Vs. Whitened Light Curve

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

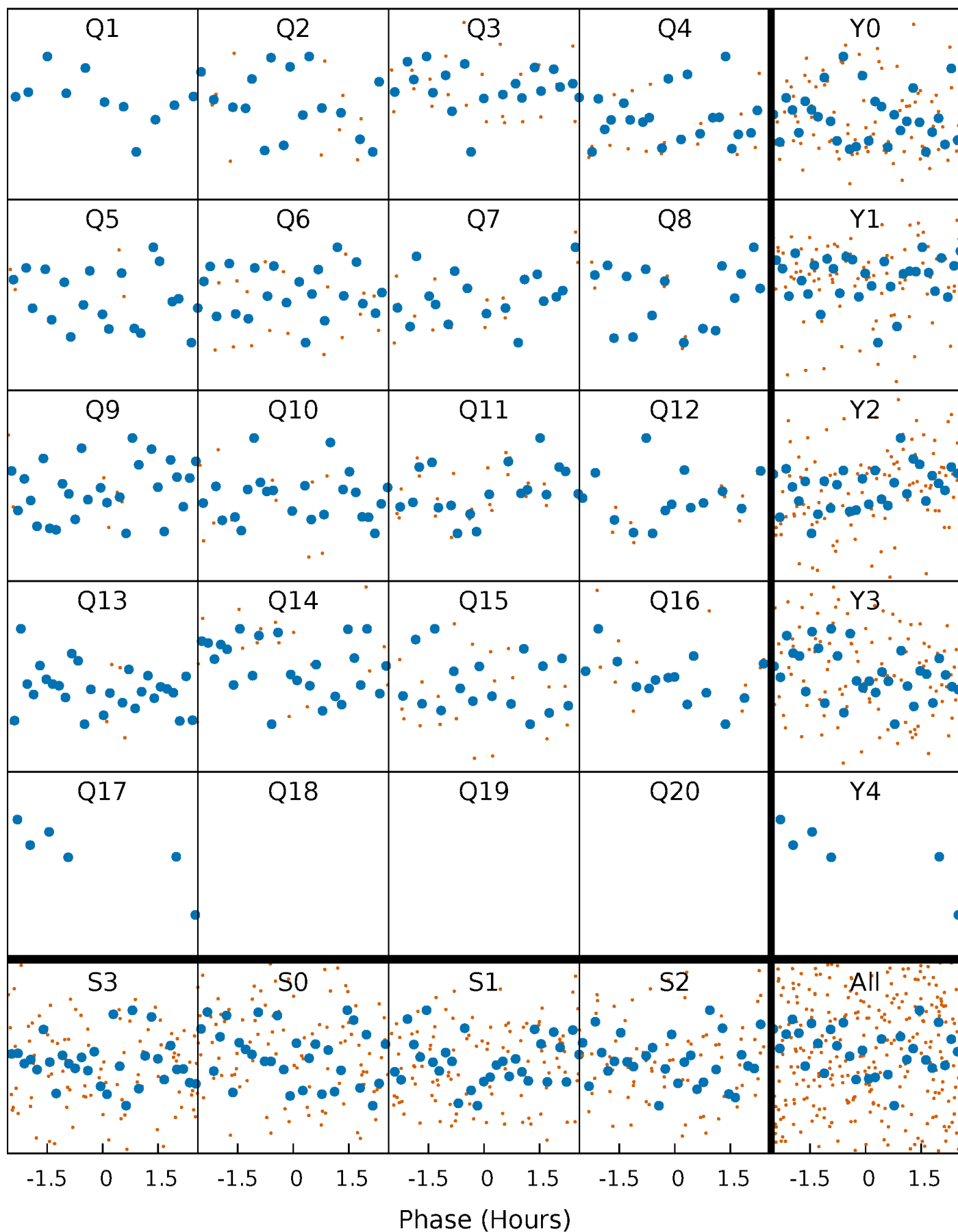


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



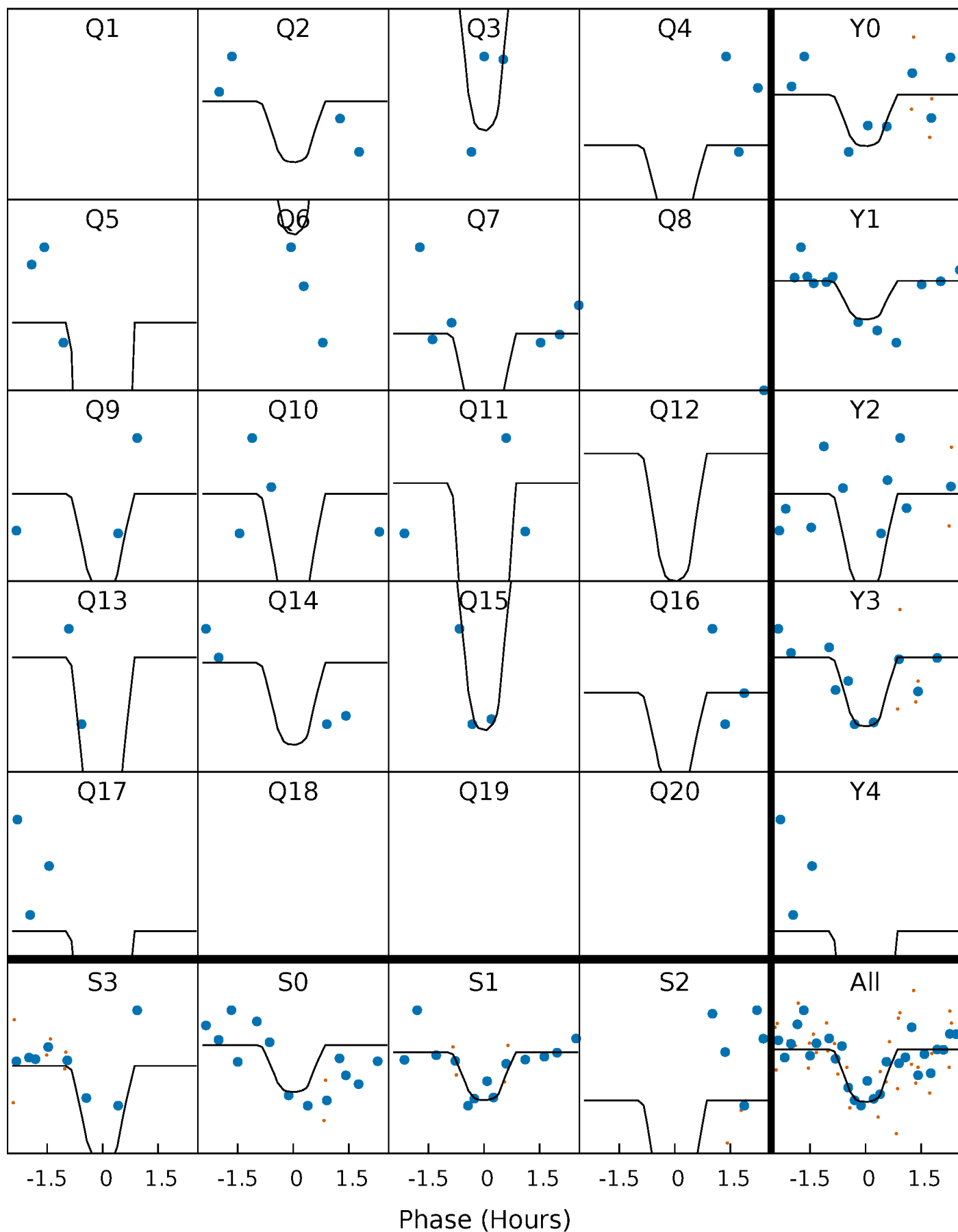
# PDC Quarter-Phased Transit Curves

TCE 005128931-02   P= 33.997504 Days    $T_0=132.982782$  (BKJD)



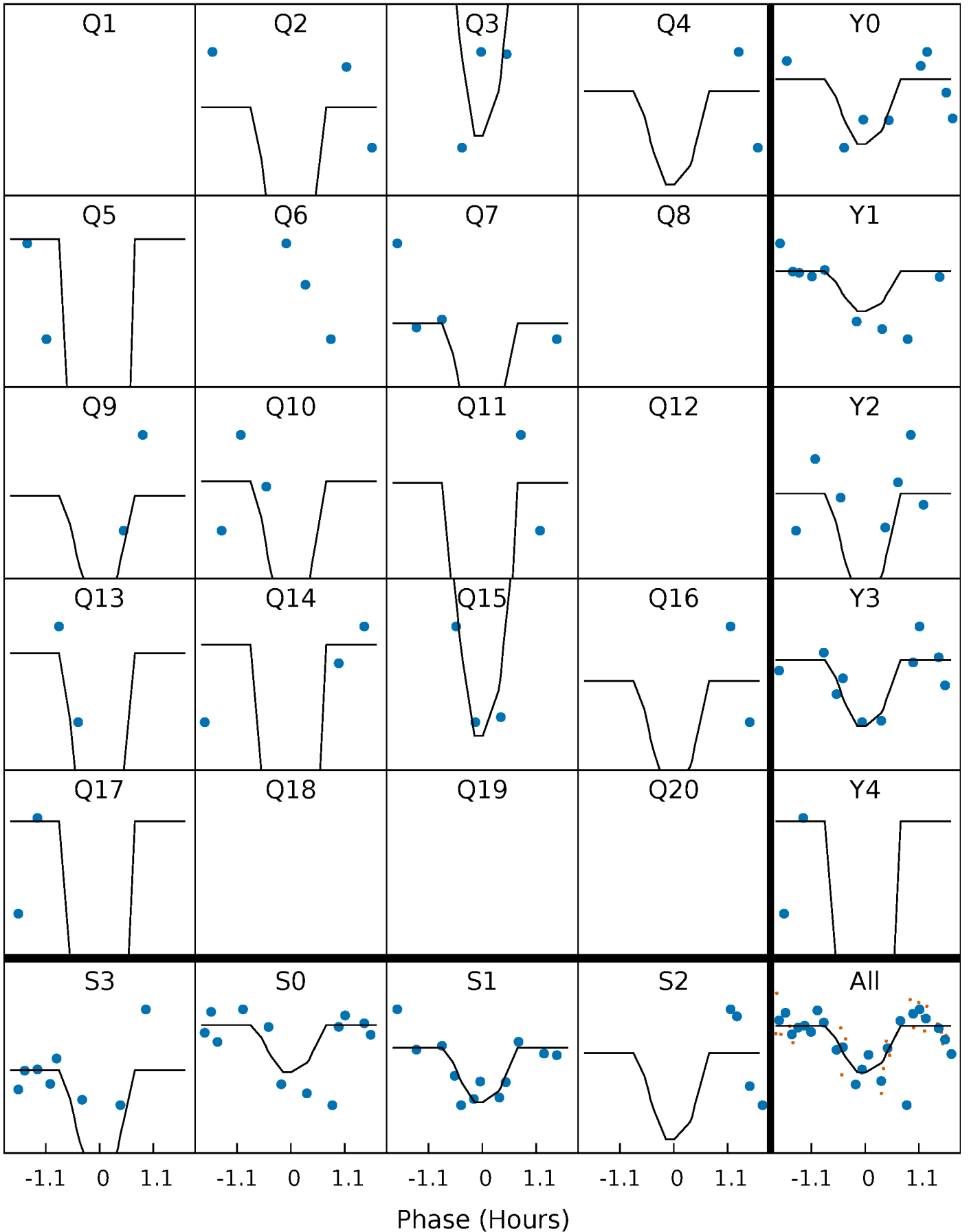
# DV Quarter-Phased Transit Curves

TCE 005128931-02   P= 33.997504 Days    $T_0=132.982782$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

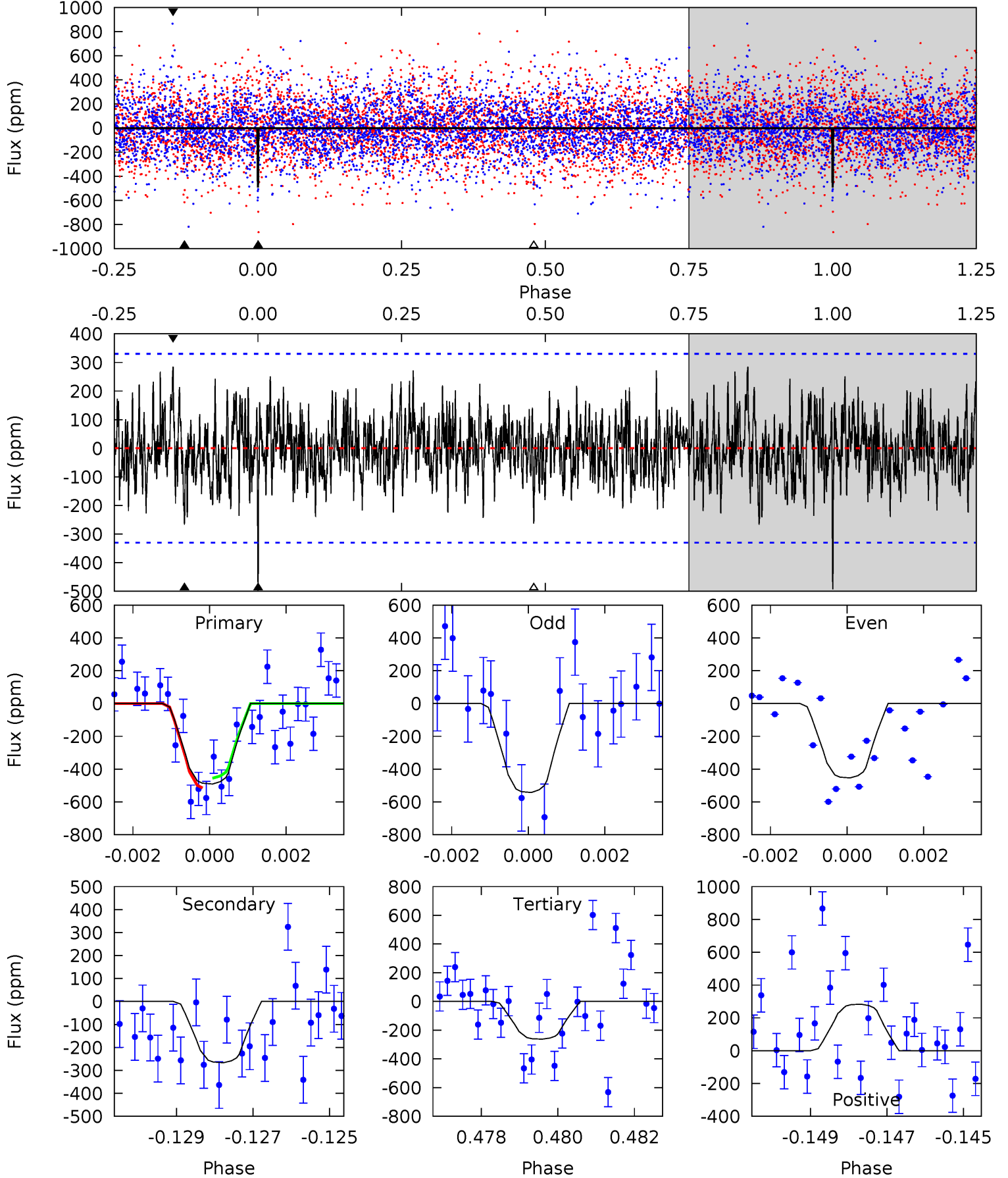
TCE 005128931-02 P= 33.997242 Days  $T_0=132.986672$  (BKJD)



# DV Model-Shift Uniqueness Test

005128931-02, P = 33.997504 Days, E = 98.985278 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
7.93	4.30	4.23	4.57	5.33	3.09	1.42	3.69	3.36	0.07	-0.27	0.66	1.06	0.37	0.45

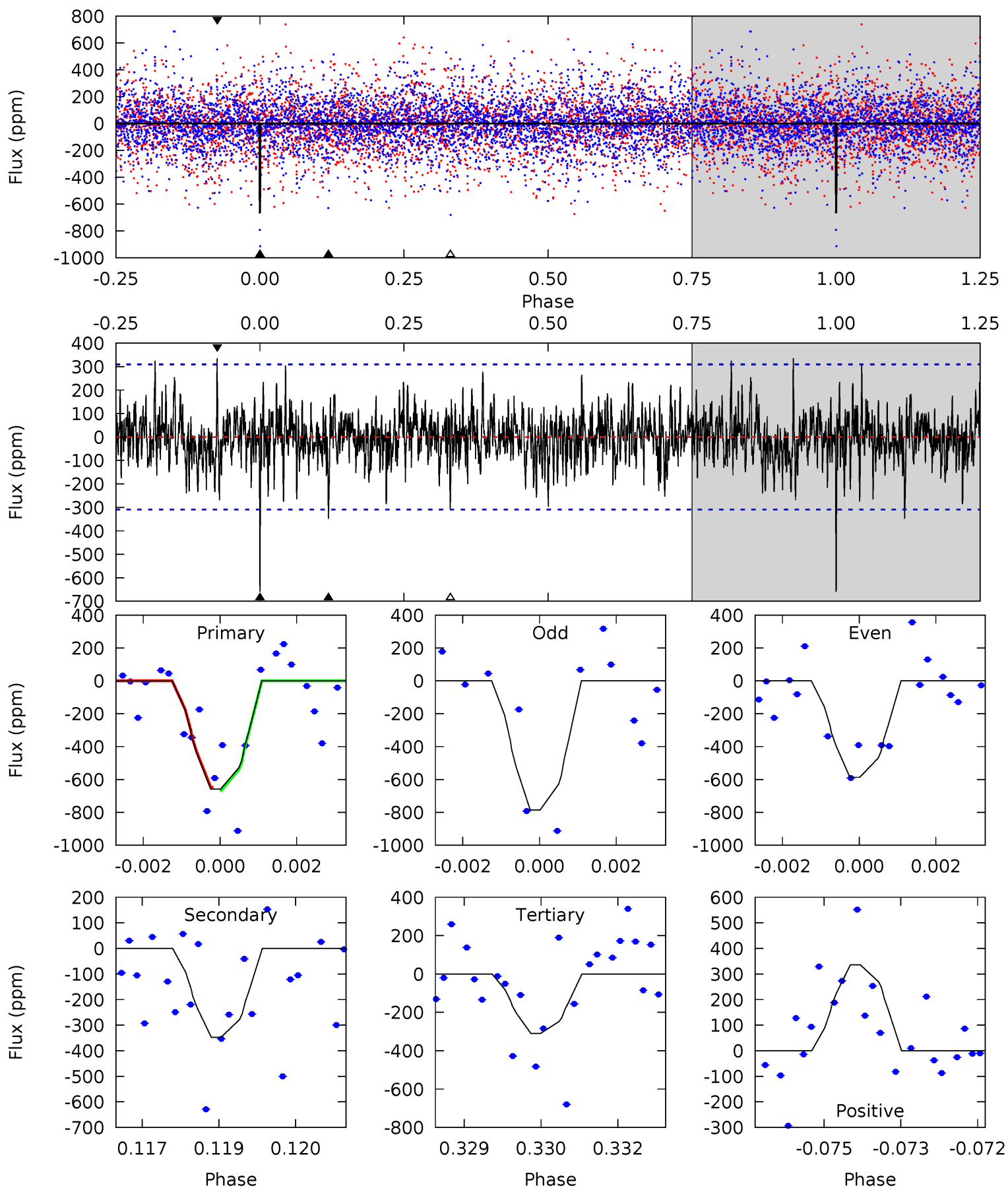




# Alt Model-Shift Uniqueness Test

005128931-02, P = 33.997242 Days, E = 98.989430 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
11.4	6.03	5.37	5.83	5.36	3.15	1.46	6.06	5.60	0.66	0.20	1.57	1.09	0.34	0.23



### Stellar Parameters For KIC 005128931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-267 \pm 62$	$8.96^{+7.91}_{-5.56}$	$1431^{+95}_{-129}$	$4985^{+3086}_{-1043}$	$104^{+620}_{-77}$
Alt.	$-348 \pm 58$	$9.96^{+7.56}_{-6.00}$	$1431^{+89}_{-134}$	$5031^{+3110}_{-962}$	$105^{+549}_{-71}$

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

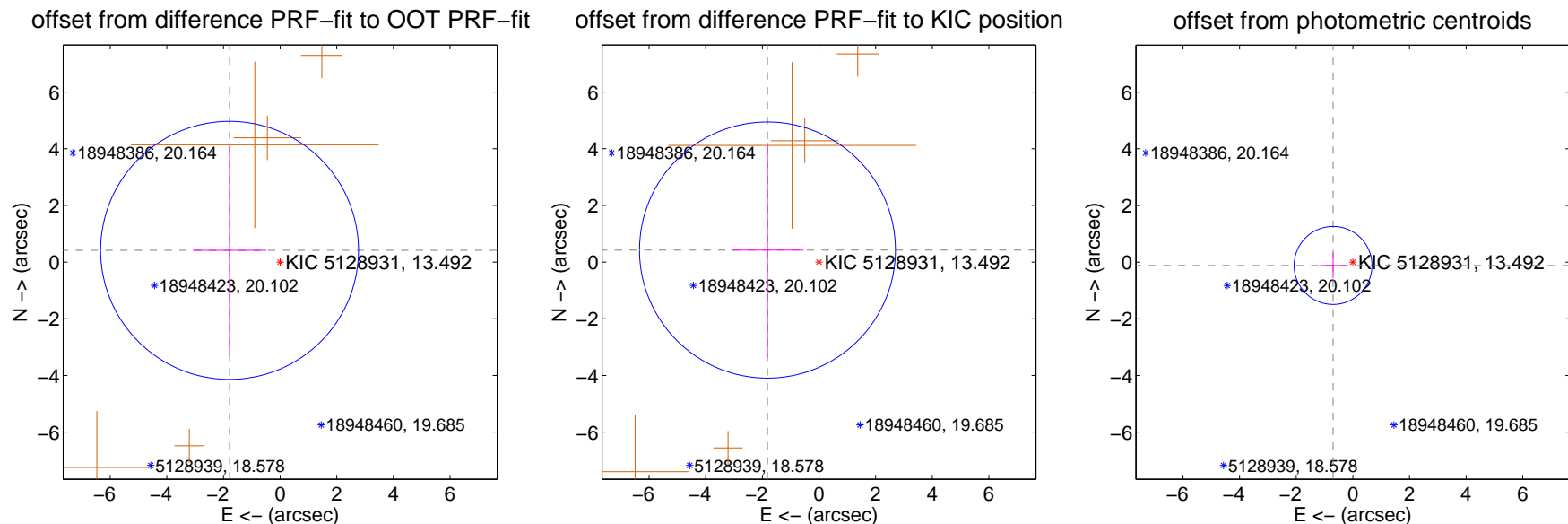
## DV Centroid Data

Supplemental centroid analysis for 005128931-02. Kepler magnitude: 13.49. Transit SNR 11.49

There are 0 quarters with good PRF difference image offsets

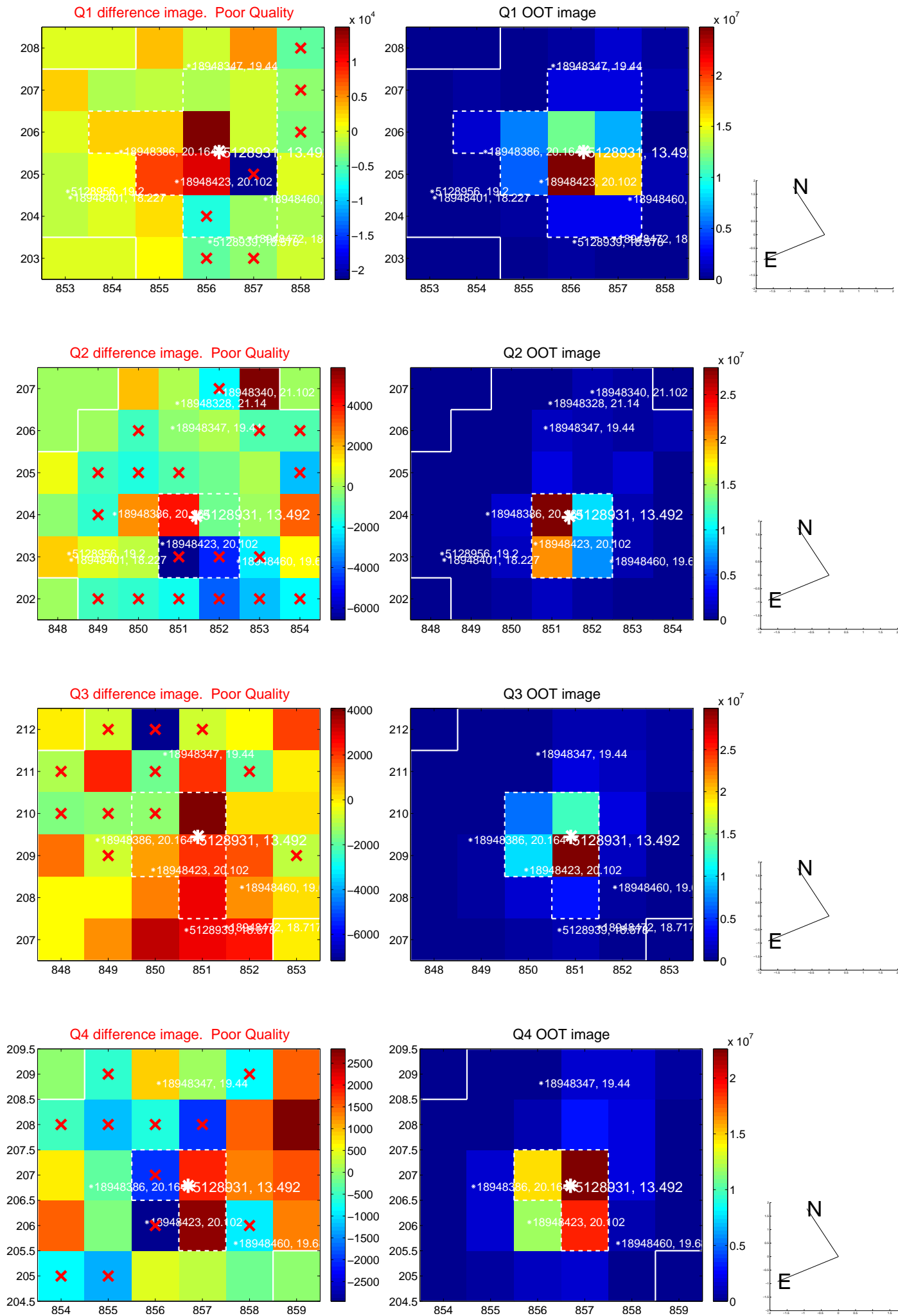
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.832 \pm 1.518$	1.21	$1.785 \pm 1.299$	$0.414 \pm 3.710$
PRF-fit source offset from KIC position	$1.868 \pm 1.506$	1.24	$1.819 \pm 1.271$	$0.424 \pm 3.780$
photometric centroid source offset	$0.71 \pm 0.46$	1.55	$0.70 \pm 0.46$	$-0.12 \pm 0.45$

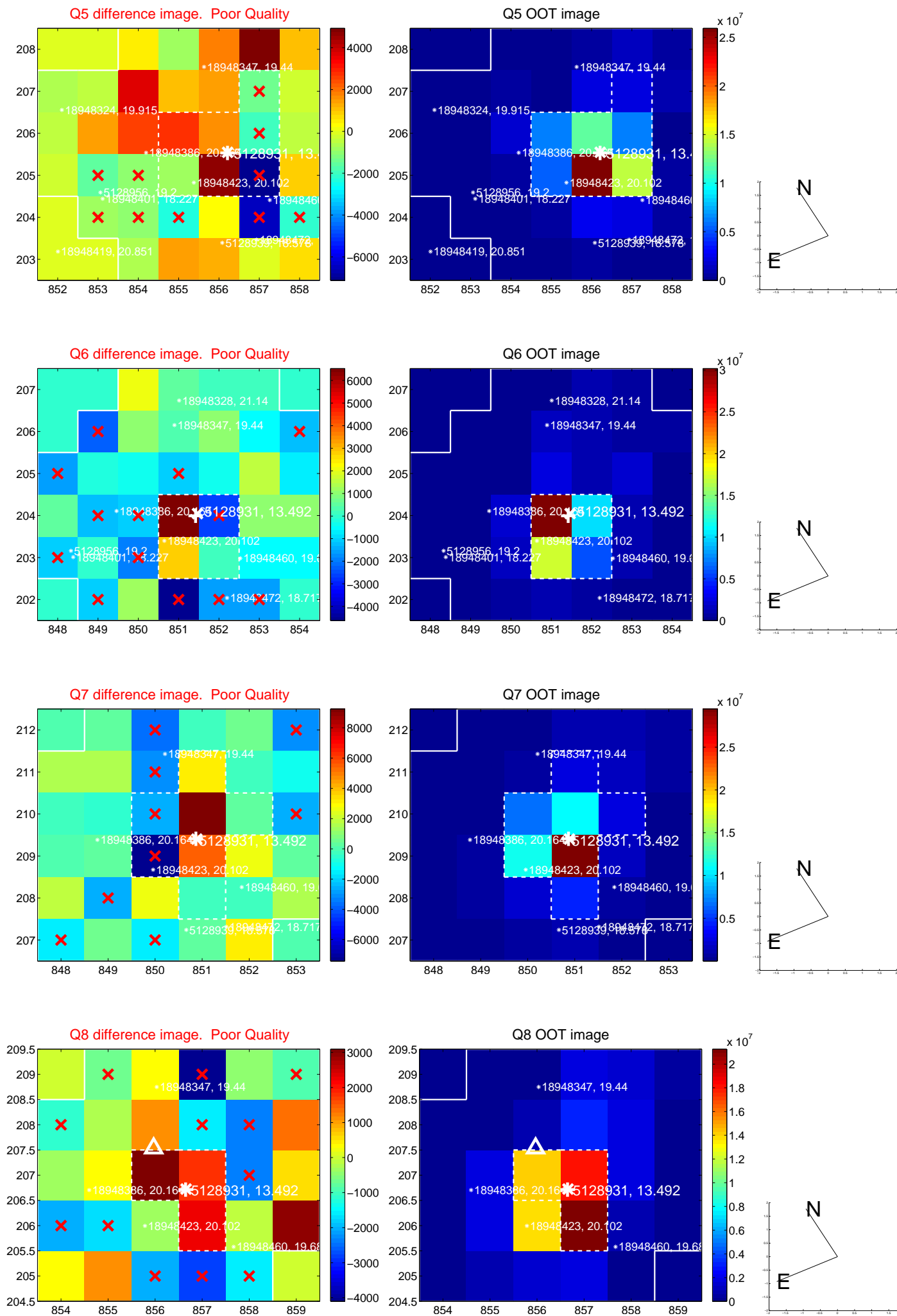


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

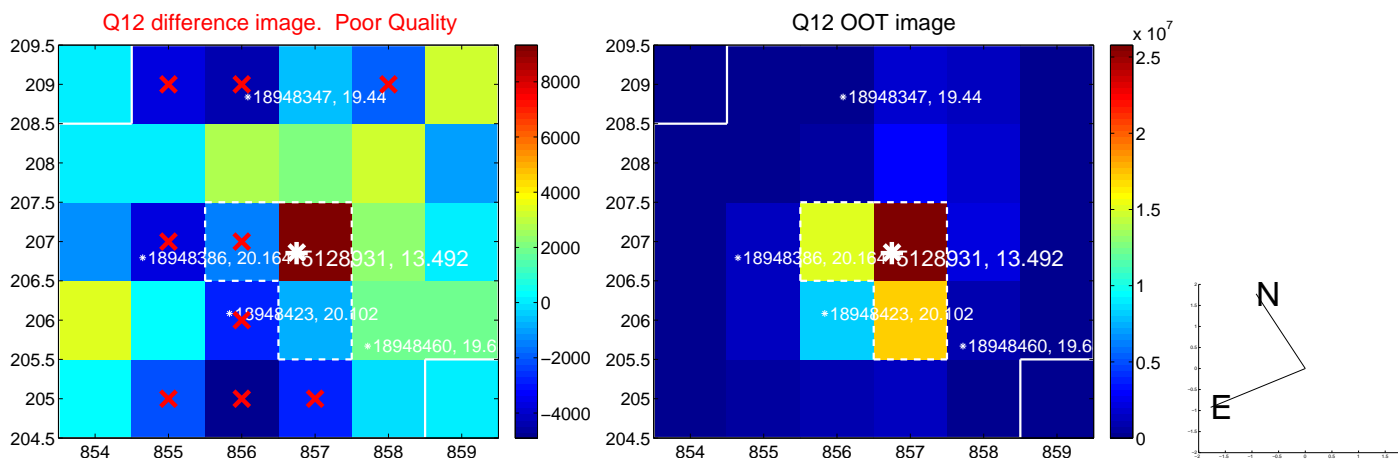
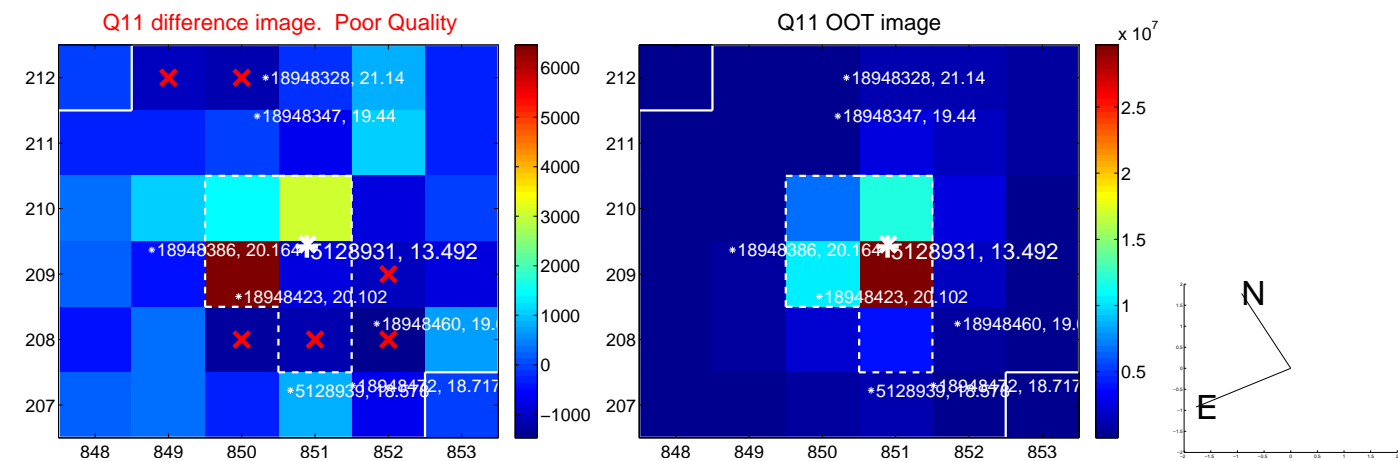
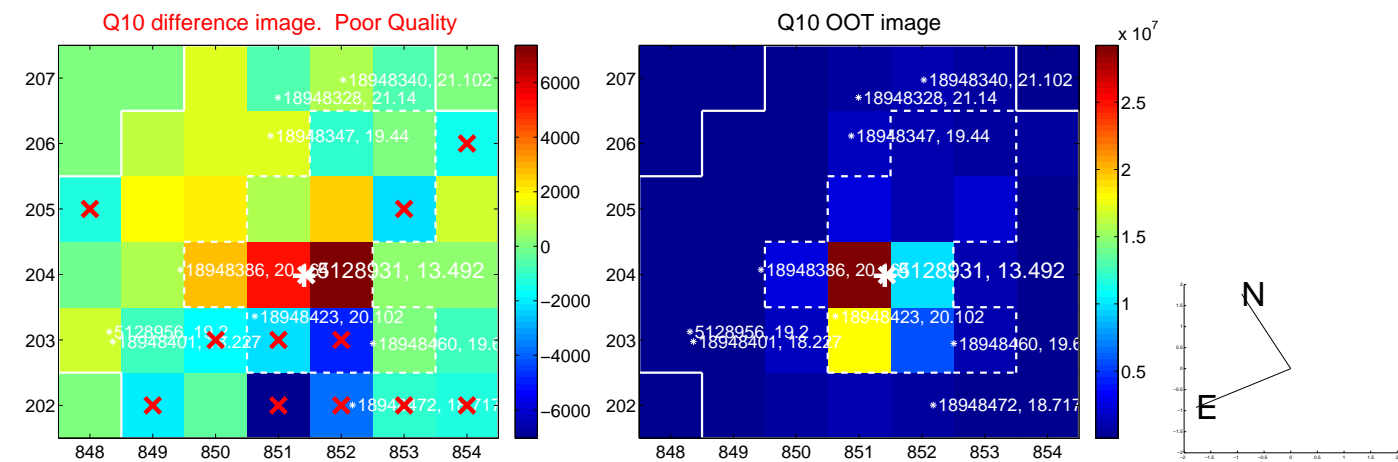
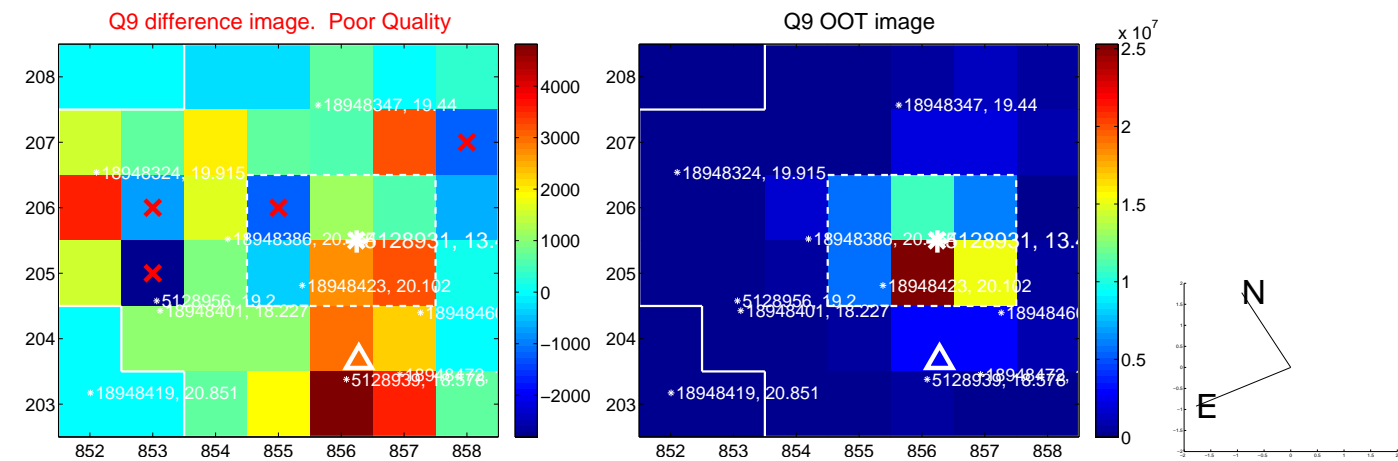
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

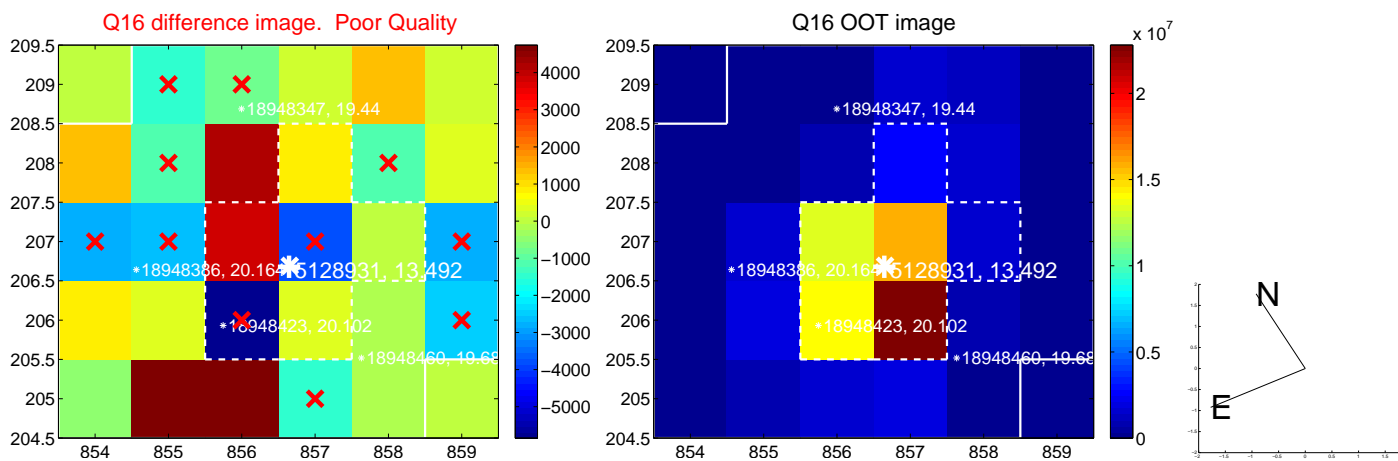
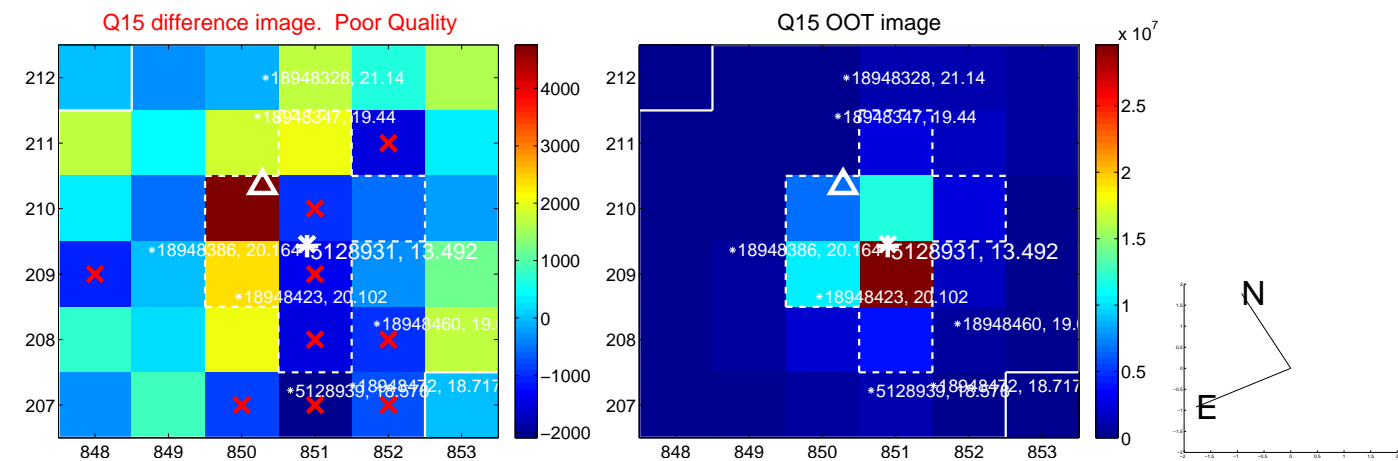
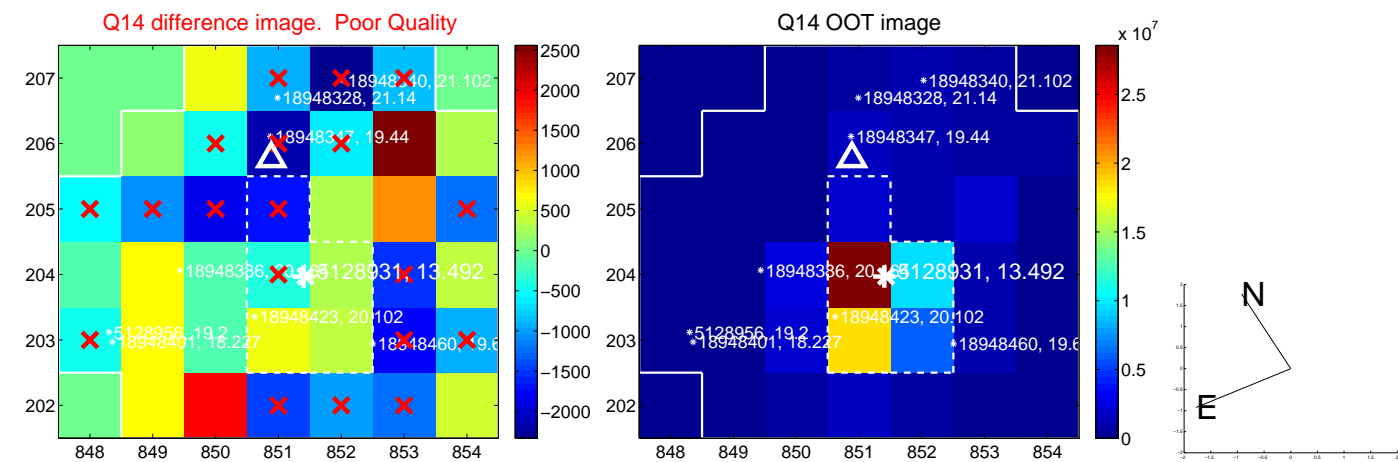
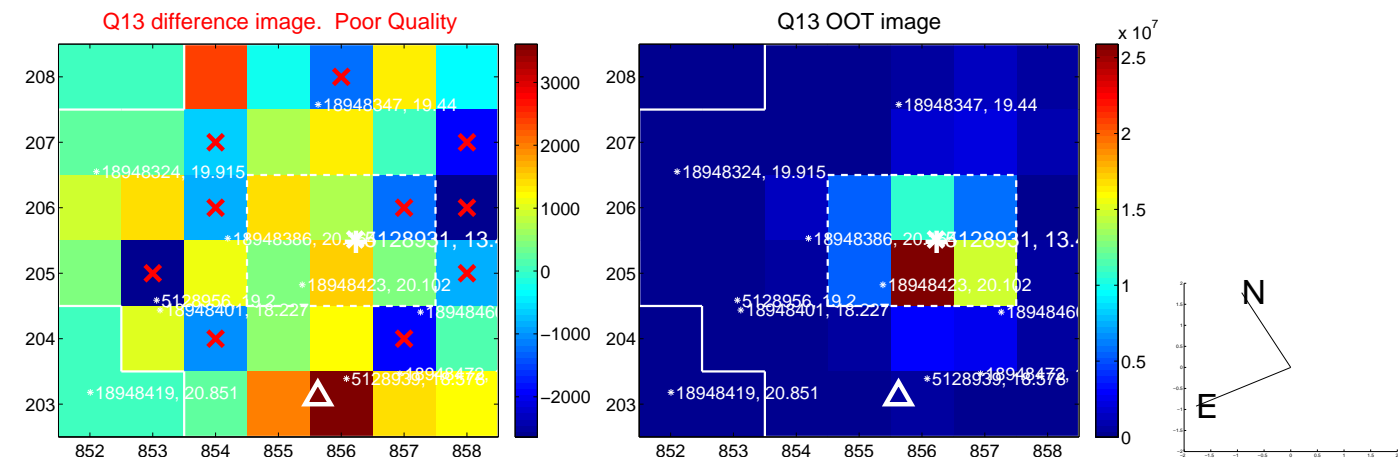


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

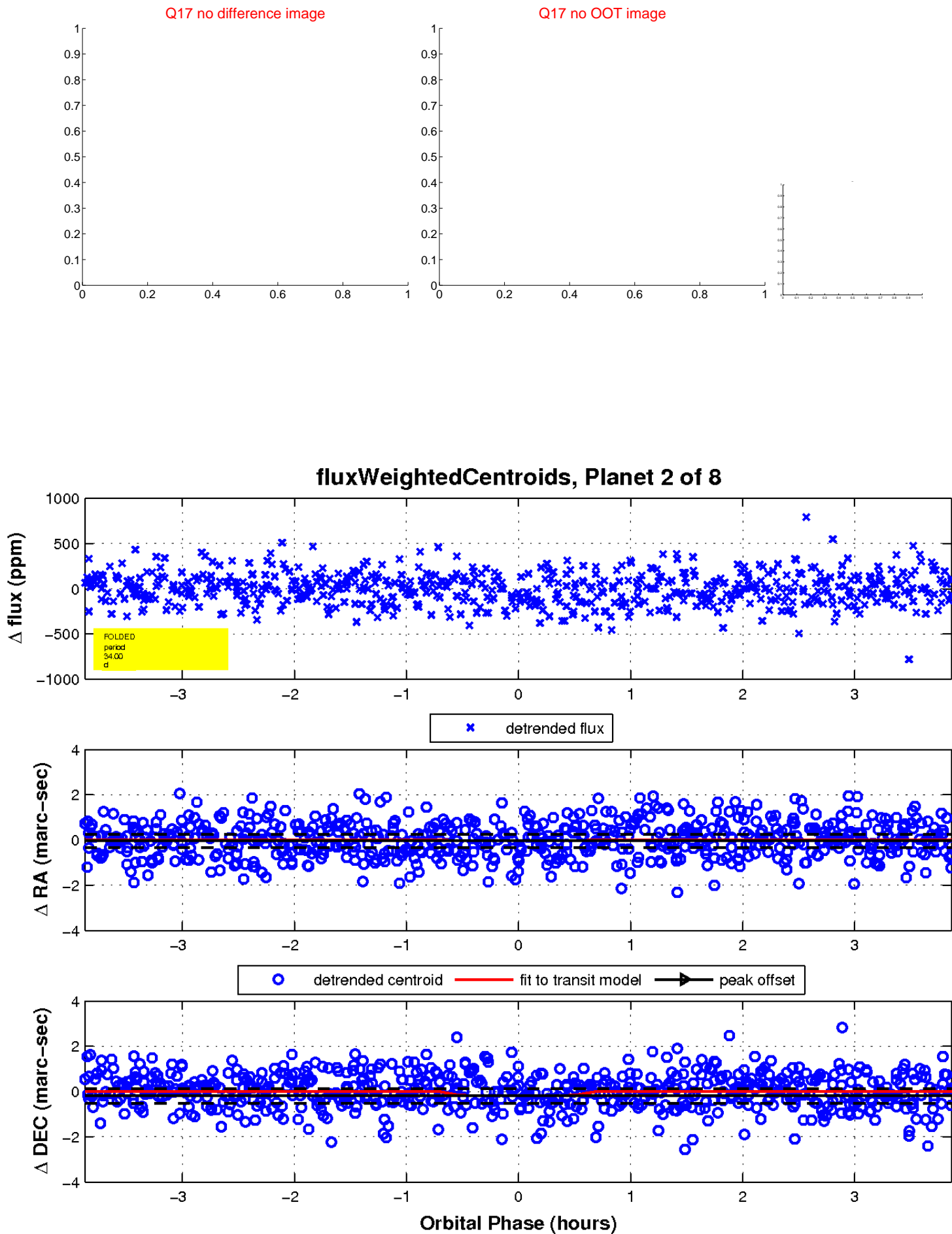




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

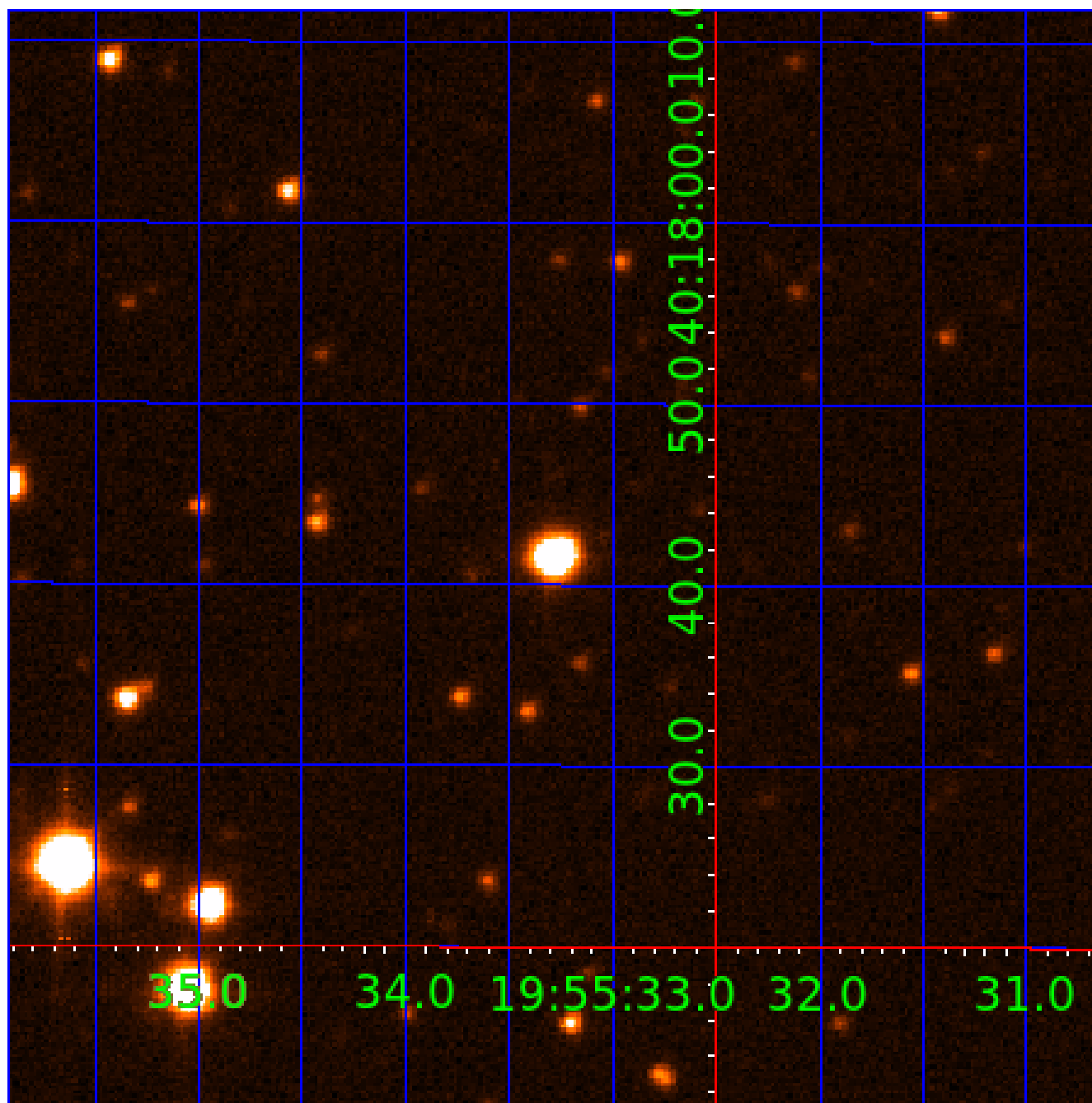


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005128931

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005128931-01	OBS	No	0.505298	131.562344	18.0	3.474	10.9	10.2	3.35	6211	1.52	0.00
005128931-02	OBS	No	33.997504	132.982782	539.0	1.290	12.2	11.5	3.35	6211	7.97	275.41
005128931-04	OBS	No	19.514973	131.733189	237.5	2.393	9.0	8.5	3.35	6211	5.85	577.33
005128931-05	OBS	No	37.145662	150.819517	361.3	2.204	13.8	7.8	3.35	6211	6.62	244.74
005128931-06	OBS	No	14.771871	140.019102	274.0	2.387	9.8	10.9	3.35	6211	6.47	836.89
005128931-07	OBS	No	28.583983	145.877110	490.1	0.960	9.2	9.5	3.35	6211	8.32	347.07
005128931-08	OBS	No	23.561503	140.282998	279.1	2.825	10.4	9.2	3.35	6211	6.30	449.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005128931-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
005128931-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005128931-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005128931-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

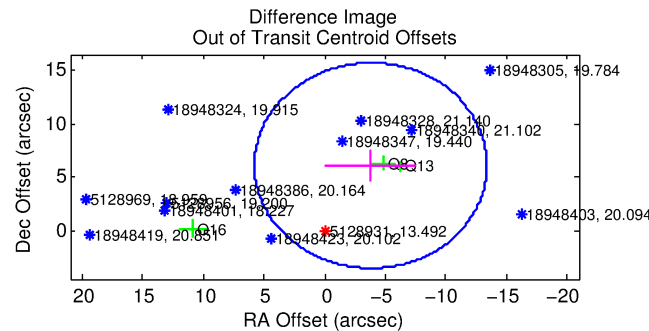
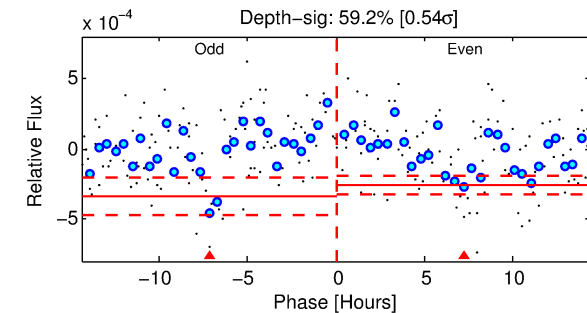
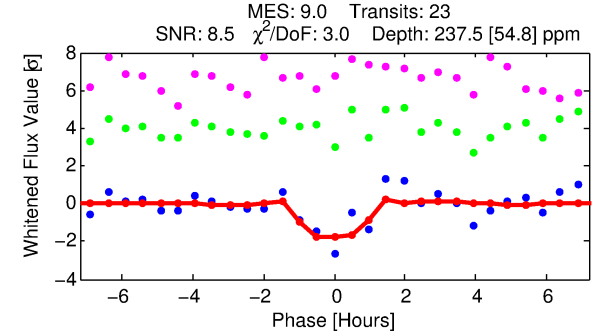
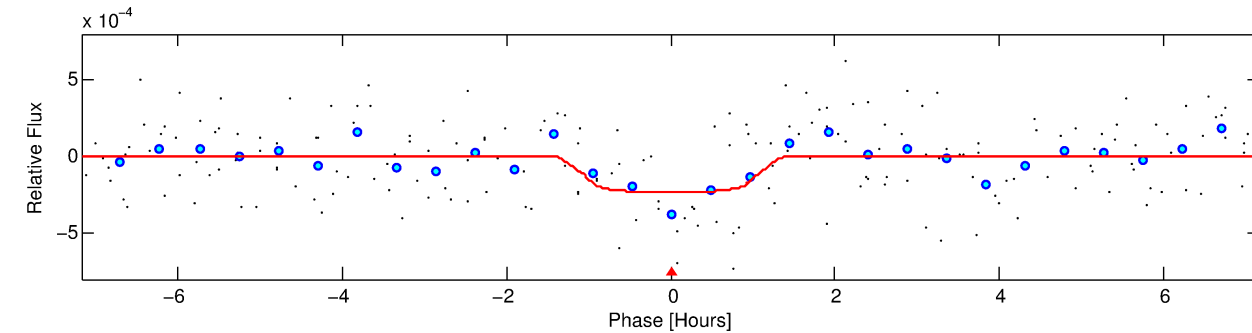
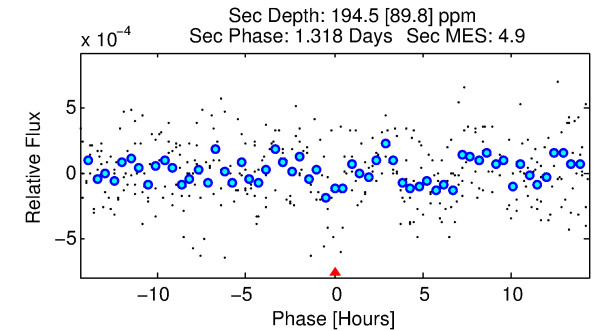
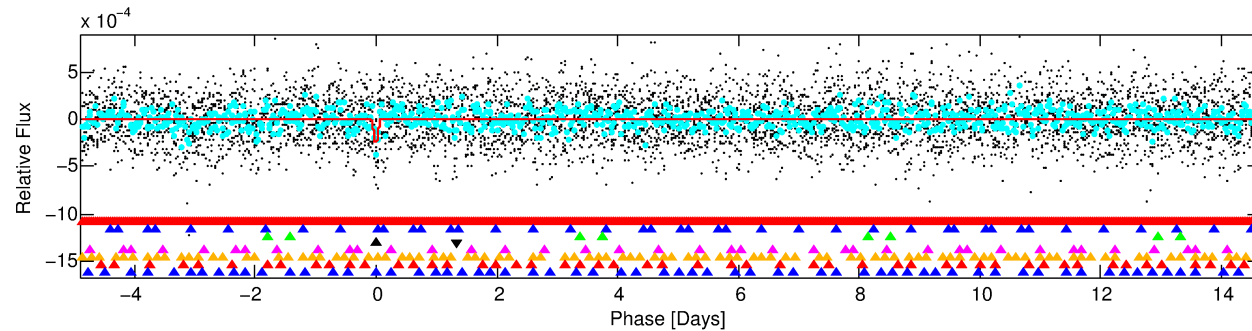
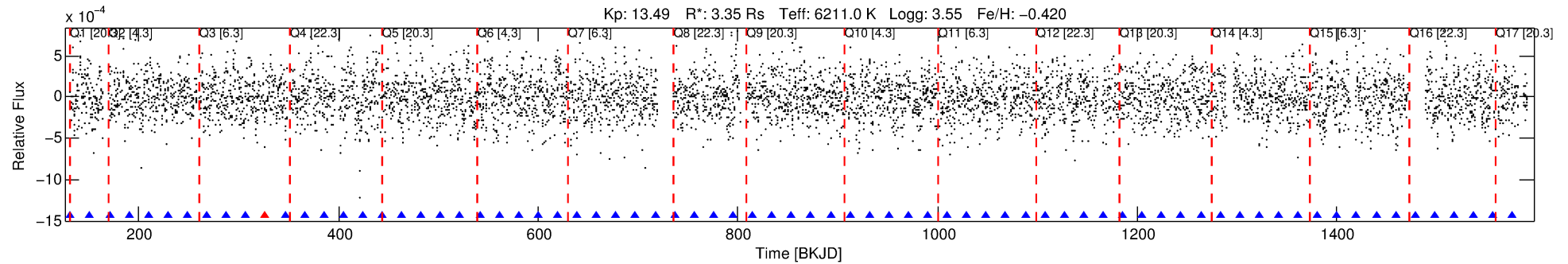
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005128931-04

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 4 of 8 Period: 19.515 d



## DV Fit Results:

Period = 19.51497 [0.00026] d  
Epoch = 131.7332 [0.0098] BKJD  
Rp/R\* = 0.0160 [0.0241]  
a/R\* = 34.99 [288.55]  
b = 0.85 [2.78]  
Seff = 577.33 [357.23]  
Teff = 1250 [193] K  
Rp = 5.85 [9.14] Re  
a = 0.1612 [0.0623] AU  
Ag = 81.32 [252.75] [0.32σ]  
Teffp = 5803 [4426] K [1.03σ]

## DV Diagnostic Results:

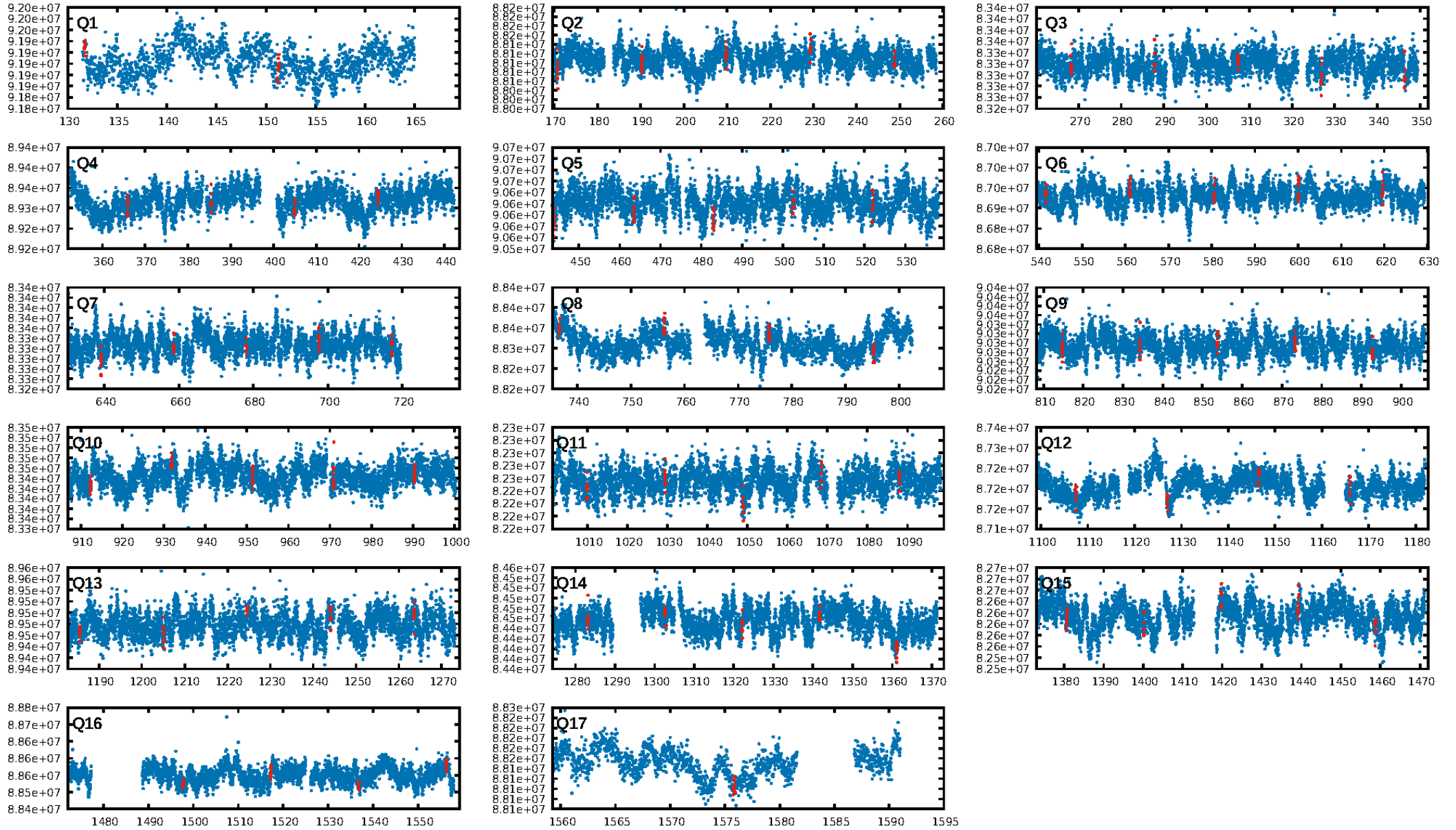
ShortPeriod-sig: 100.0% [33.68σ]  
LongPeriod-sig: 100.0% [26.23σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 98.0%  
Bootstrap-pfa: 1.67e-08  
RollingBand-fgt: 0.96 [22/23]  
GhostDiagnostic-chr: 1.121  
Centroid-sig: 11.0%  
Centroid-so: 0.653 arcsec [1.17σ]  
OotOffset-rm: 7.193 arcsec [2.25σ]  
KicOffset-rm: 7.102 arcsec [2.20σ]  
OotOffset-st: 0/0/2/1 [3]  
KicOffset-st: 0/0/2/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:00:55 Z

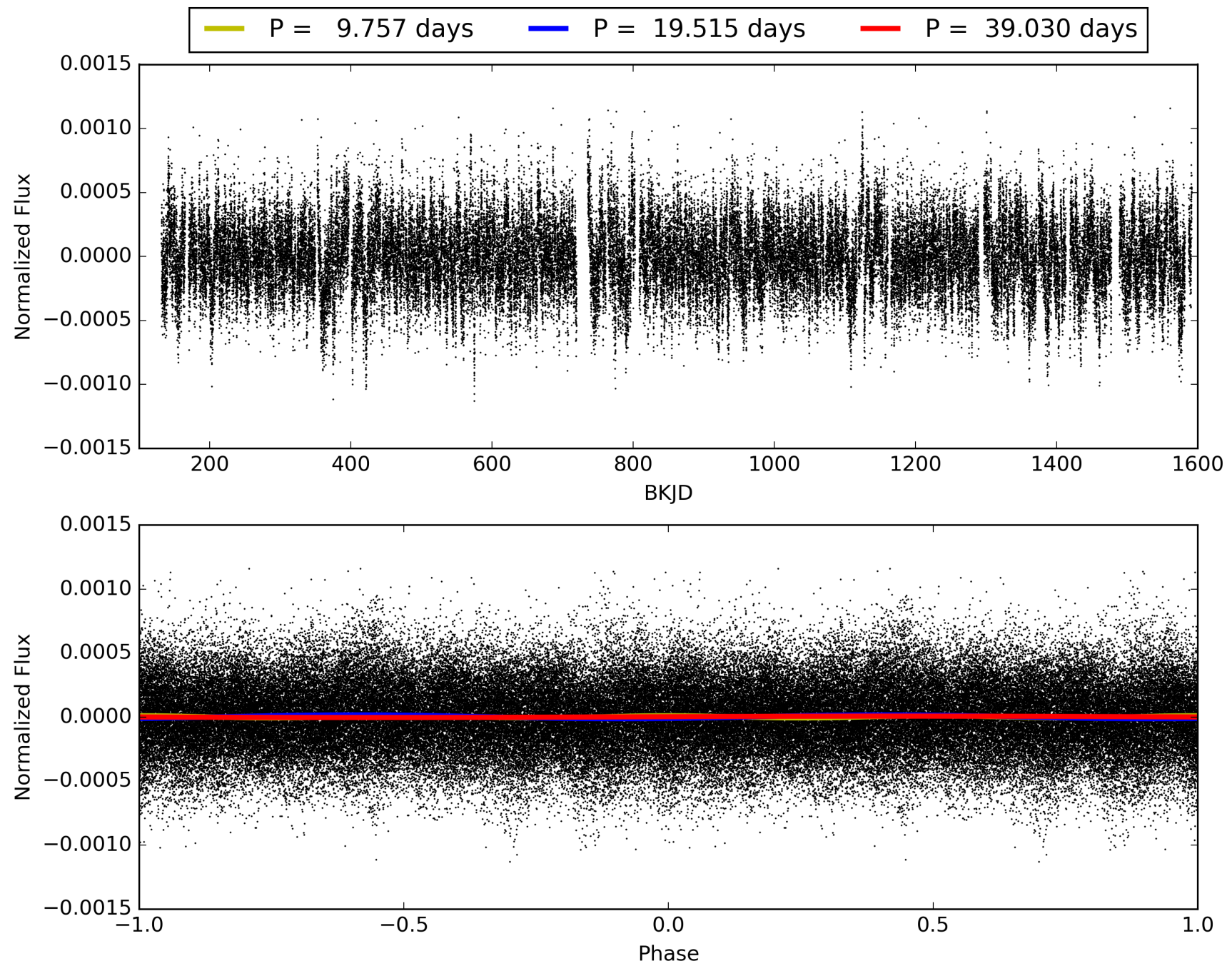
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005128931-04, PDC Light Curves

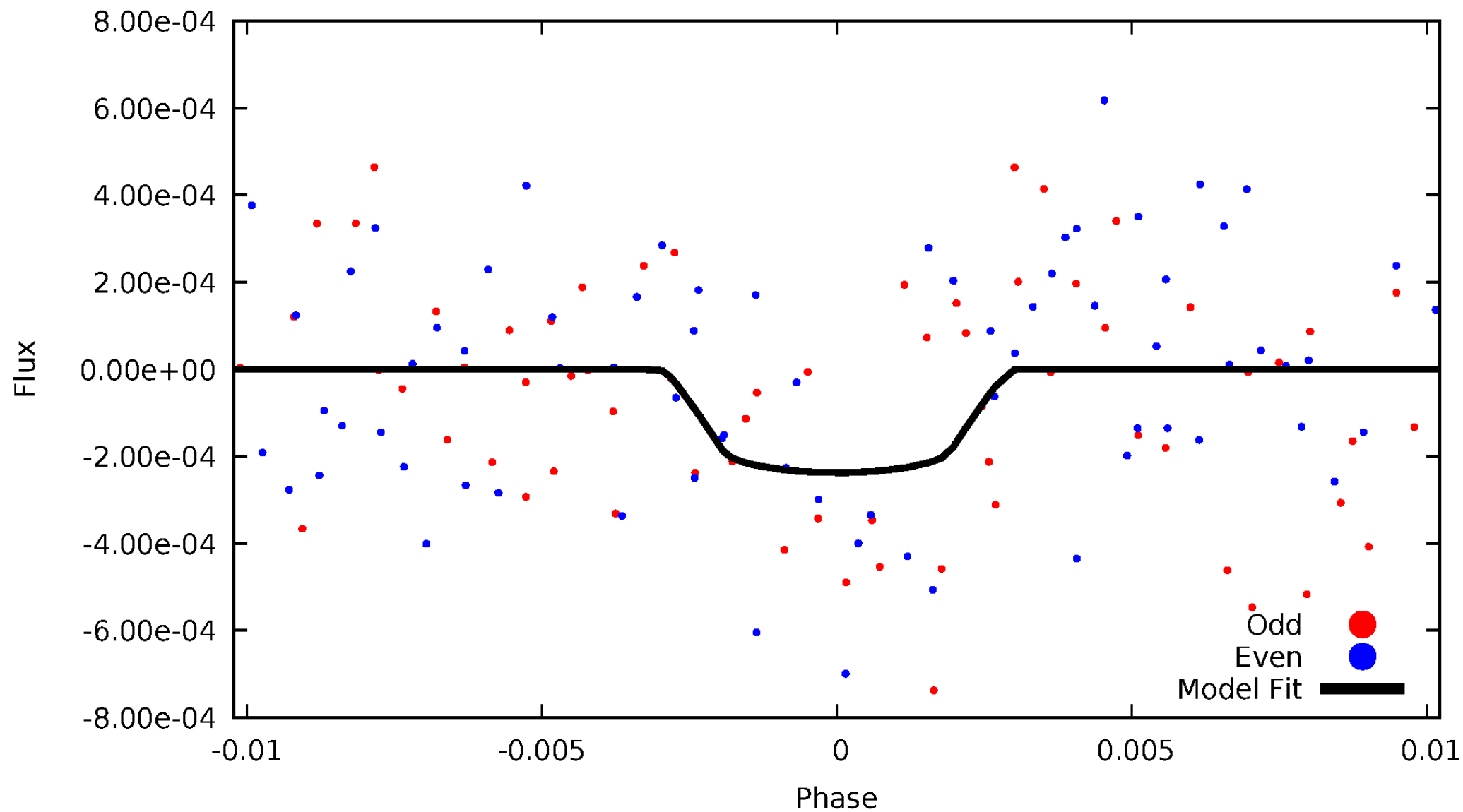


TCE 005128931-04



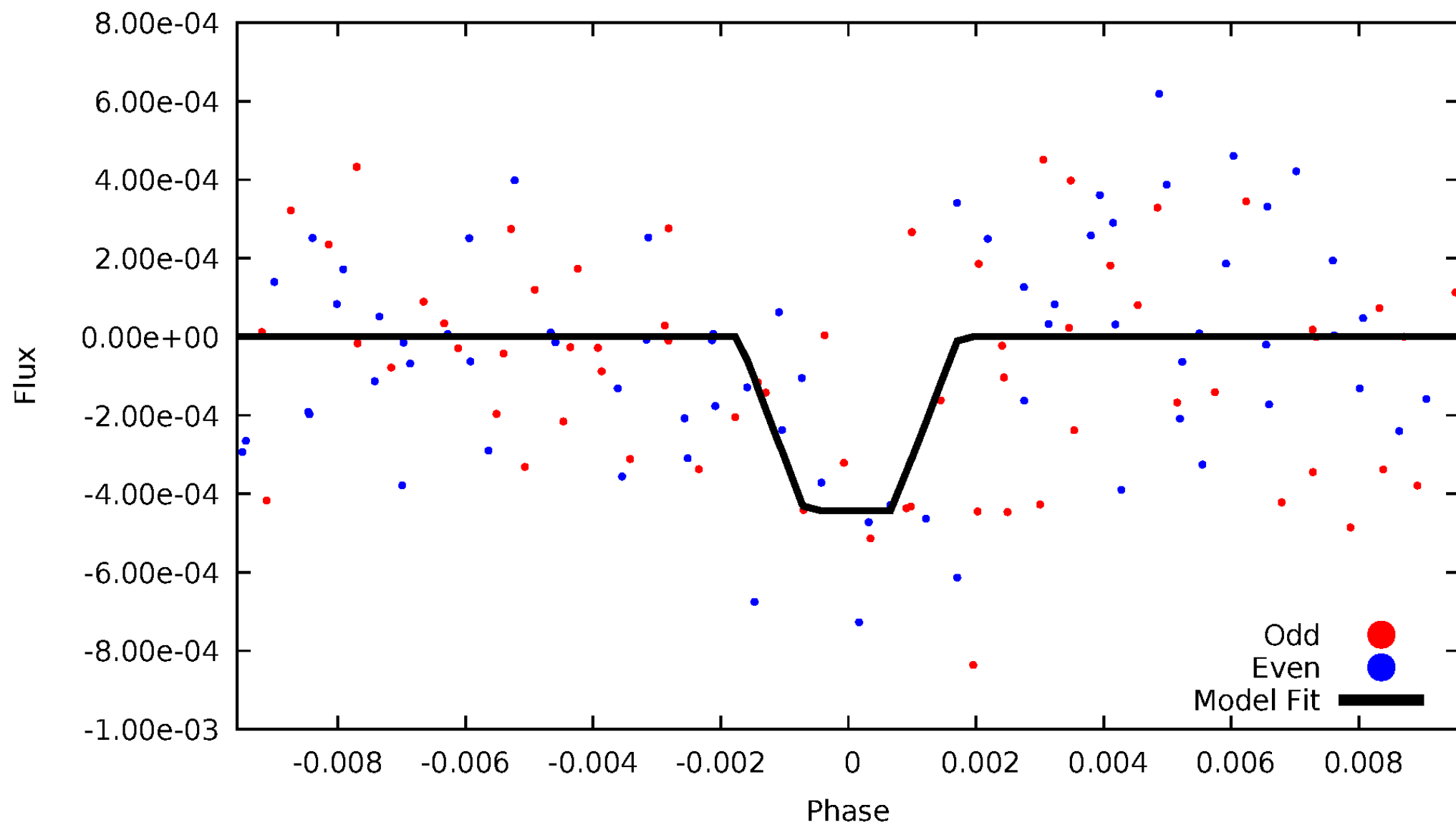
# DV Odd/Even

TCE 005128931-04



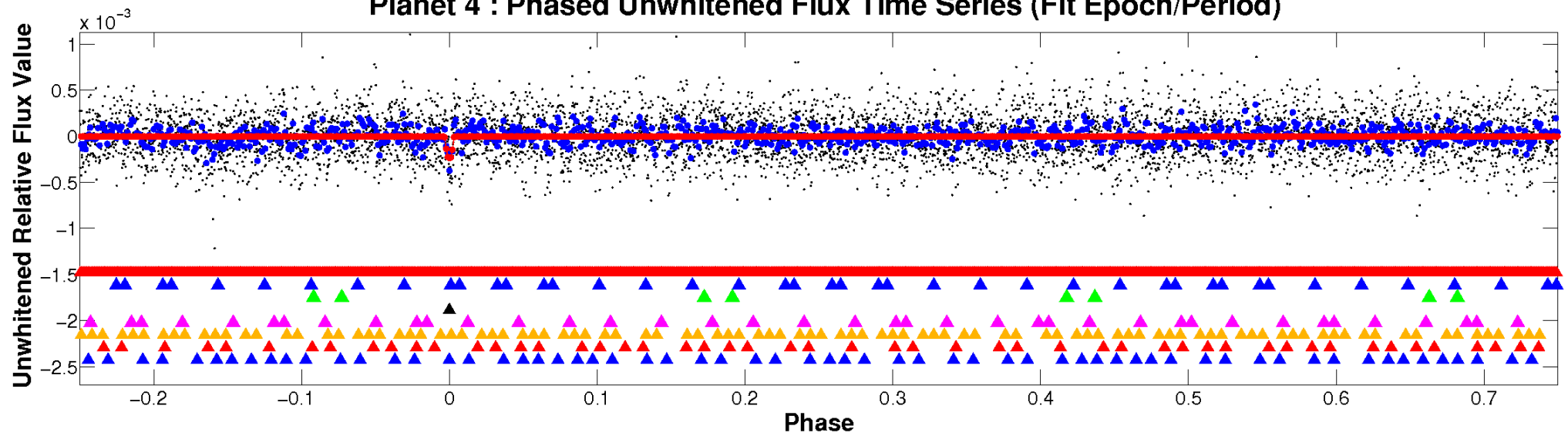
# ALT Odd/Even

TCE 005128931-04

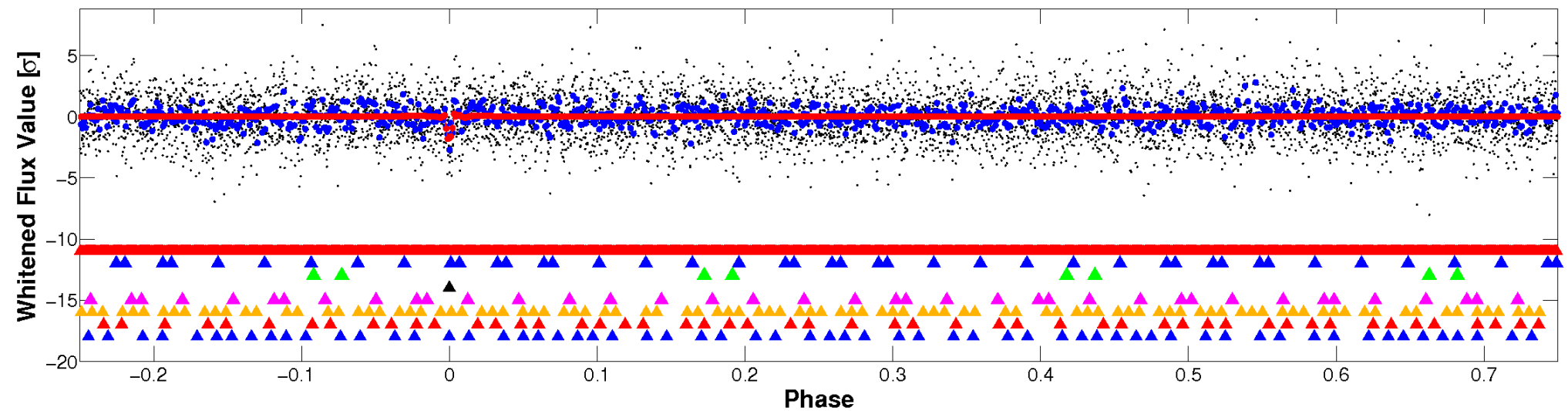


# Non-Whitened Vs. Whitened Light Curve

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



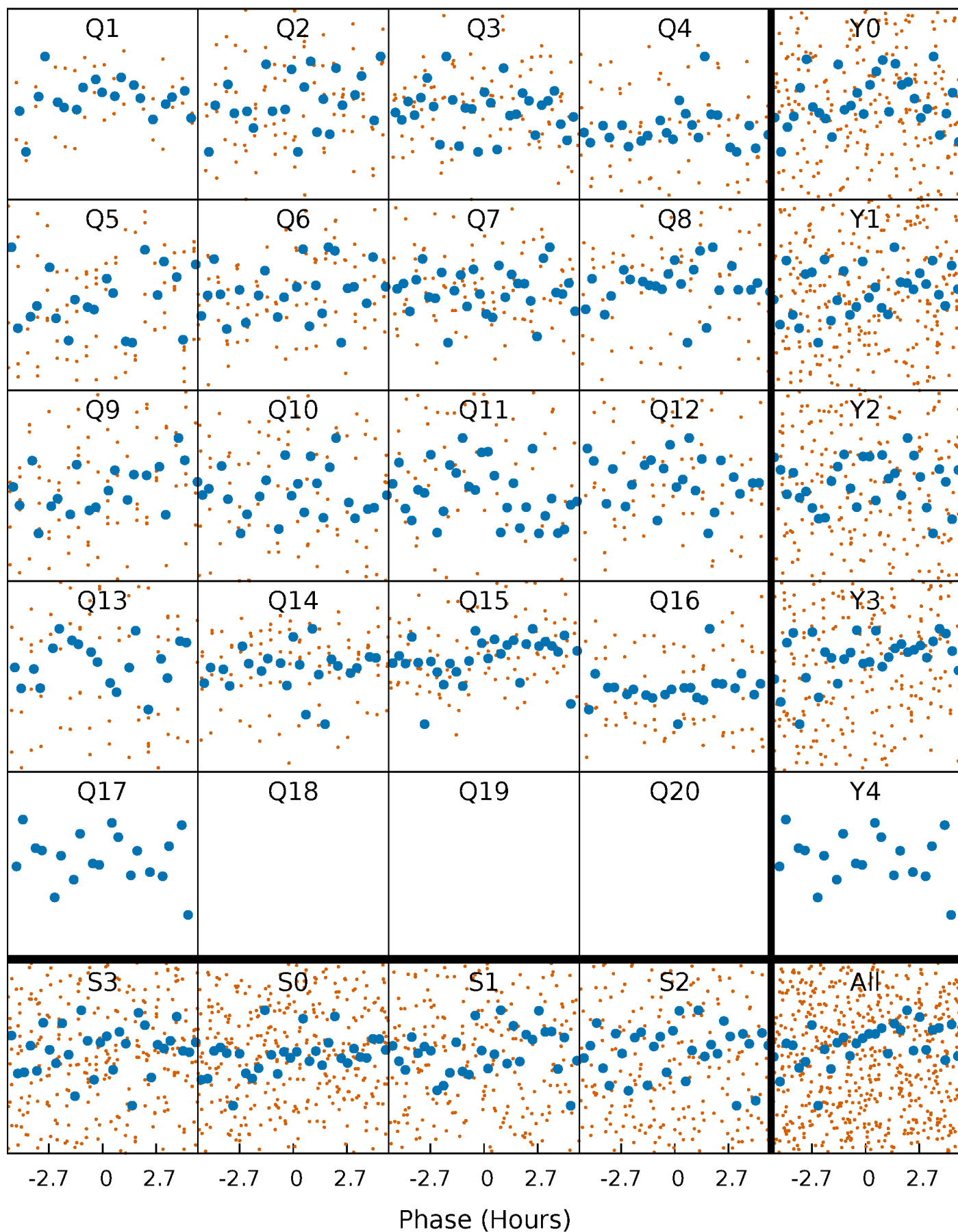
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





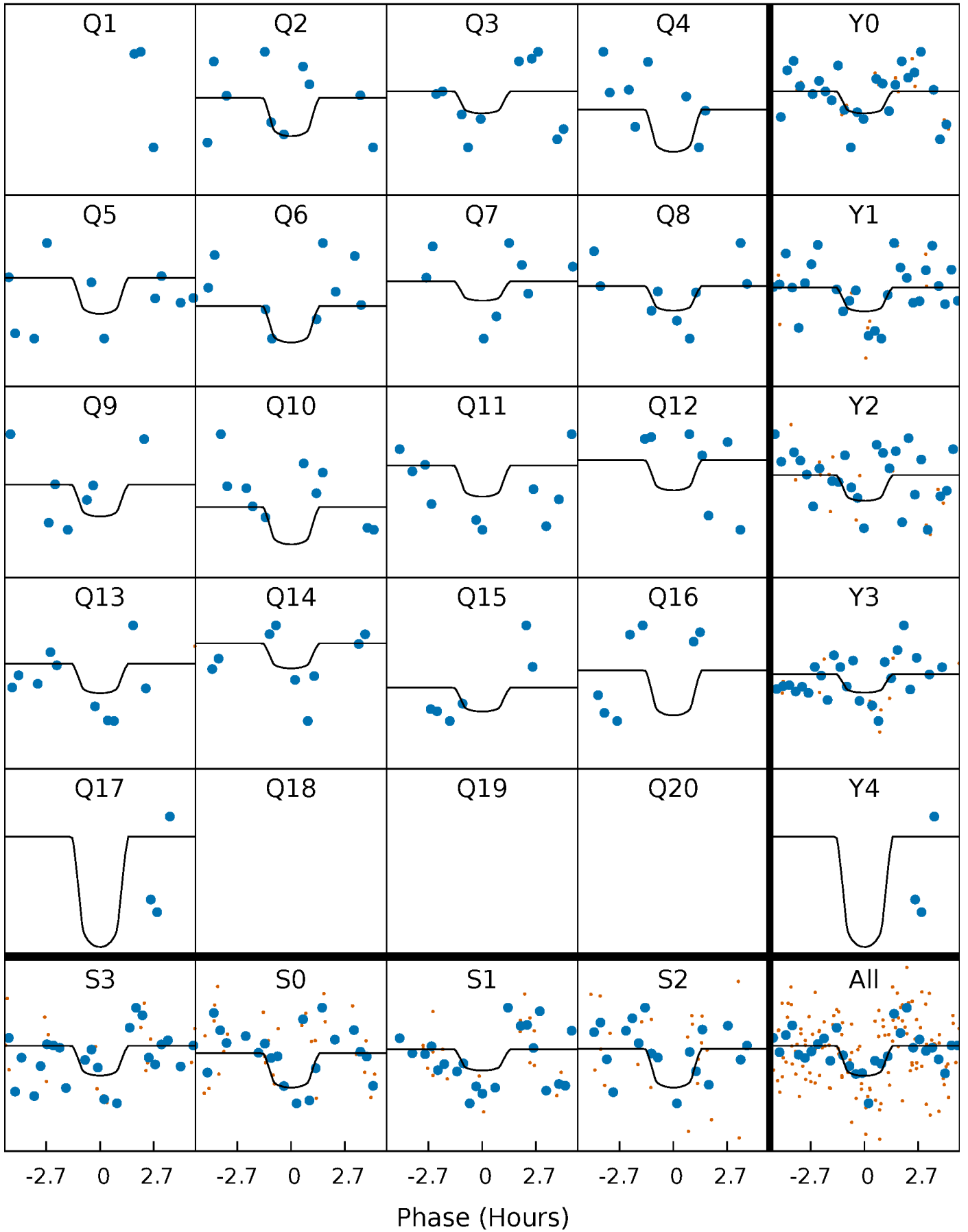
# PDC Quarter-Phased Transit Curves

TCE 005128931-04   P= 19.514973 Days    $T_0=131.733189$  (BKJD)



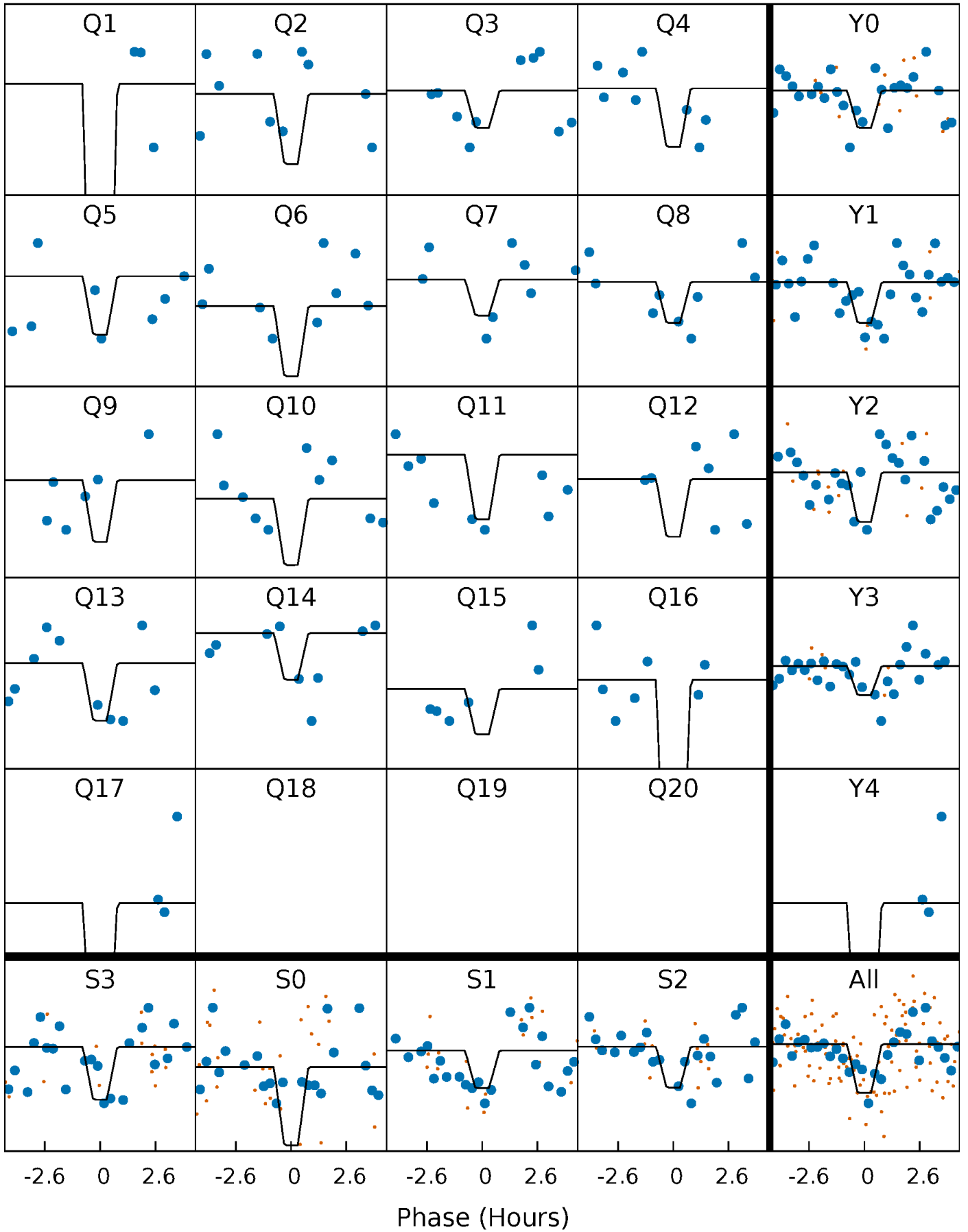
# DV Quarter-Phased Transit Curves

TCE 005128931-04 P= 19.514973 Days  $T_0=131.733189$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

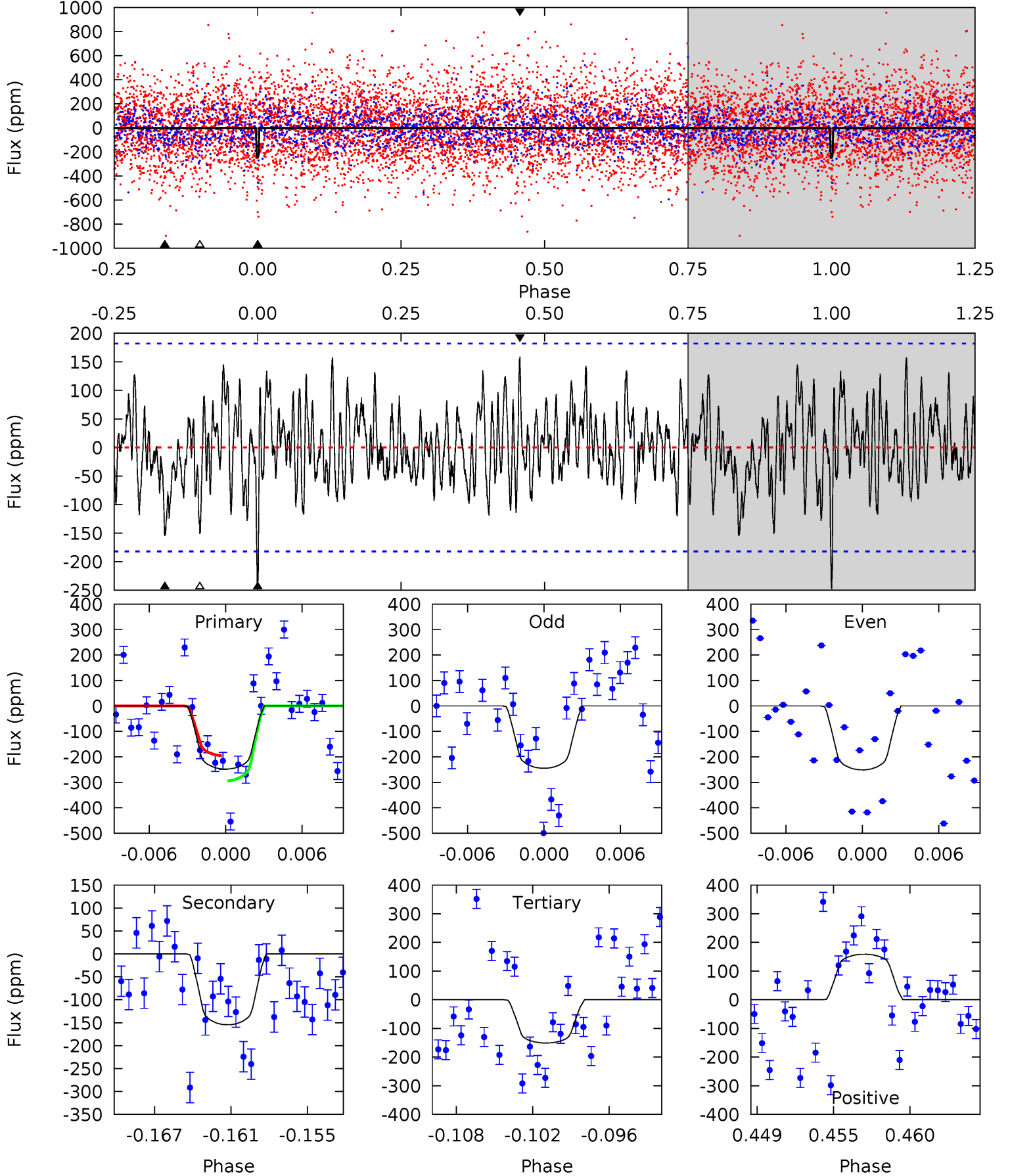
TCE 005128931-04 P= 19.514817 Days  $T_0=131.736871$  (BKJD)



# DV Model-Shift Uniqueness Test

005128931-04, P = 19.514973 Days, E = 131.733189 Days

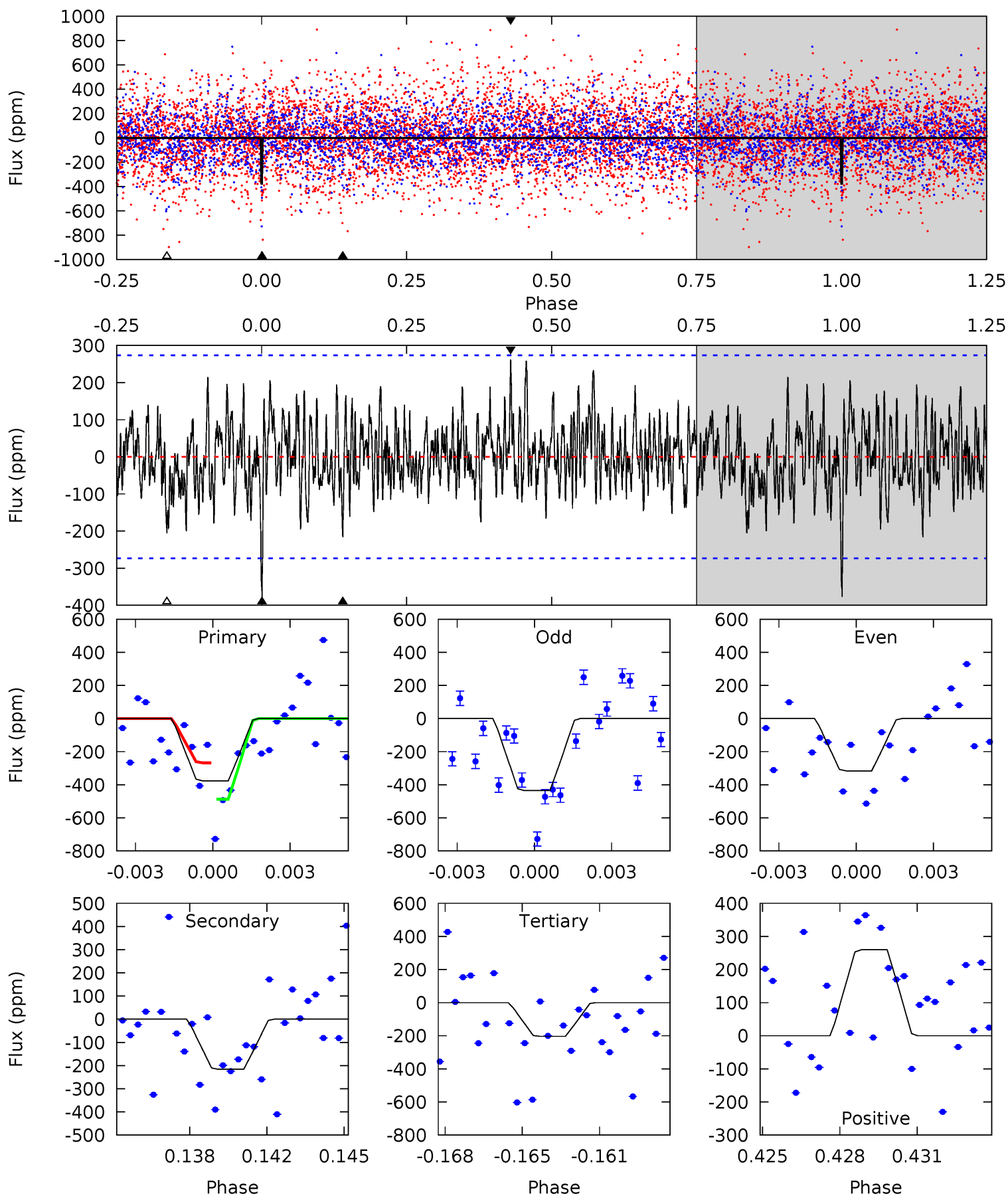
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.98	4.35	4.25	4.47	5.12	2.75	1.55	2.73	2.51	0.10	-0.12	0.09	0.83	0.39	1.39



# Alt Model-Shift Uniqueness Test

005128931-04, P = 19.514817 Days, E = 131.736871 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
7.21	4.14	3.91	4.98	5.24	2.94	1.46	3.31	2.23	0.23	-0.84	1.14	0.95	0.41	2.10



### Stellar Parameters For KIC 005128931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-155 \pm 36$	$7.69^{+7.79}_{-5.21}$	$1721^{+109}_{-182}$	$4613^{+3324}_{-969}$	$36^{+305}_{-27}$
Alt.	$-216 \pm 52$	$9.25^{+7.60}_{-6.24}$	$1725^{+103}_{-177}$	$4702^{+3355}_{-918}$	$34^{+297}_{-24}$

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



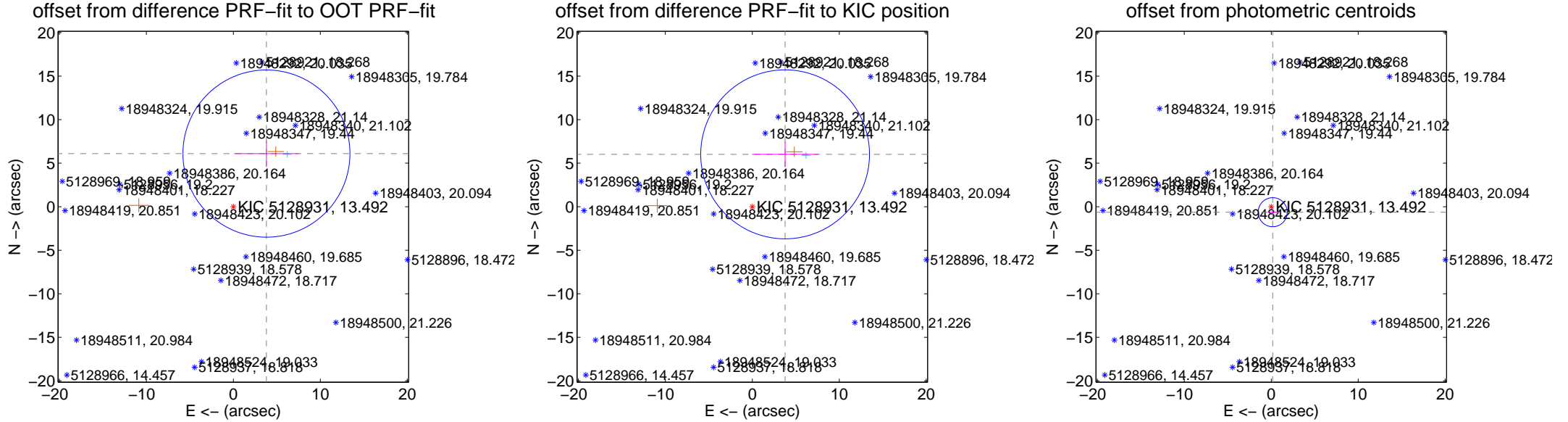
## DV Centroid Data

Supplemental centroid analysis for 005128931-04. Kepler magnitude: 13.49. Transit SNR 8.51

There are 1 quarters with good PRF difference image offsets

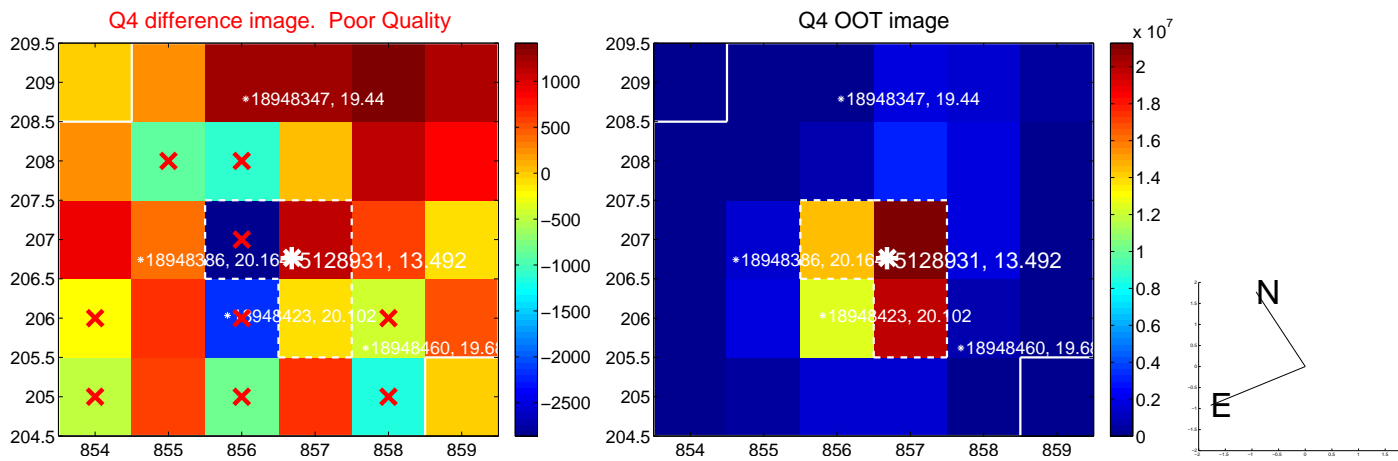
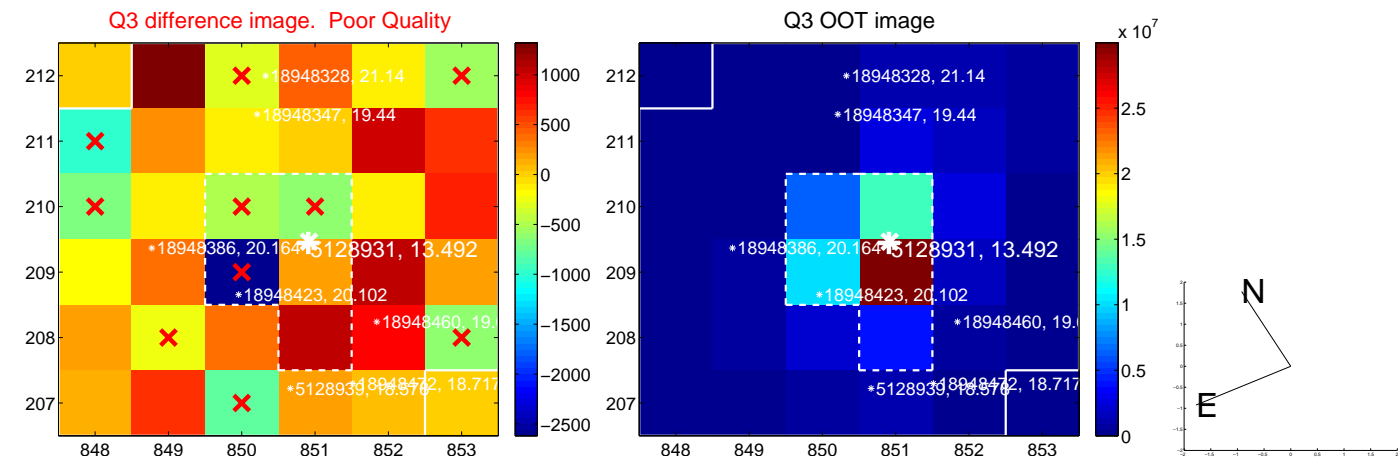
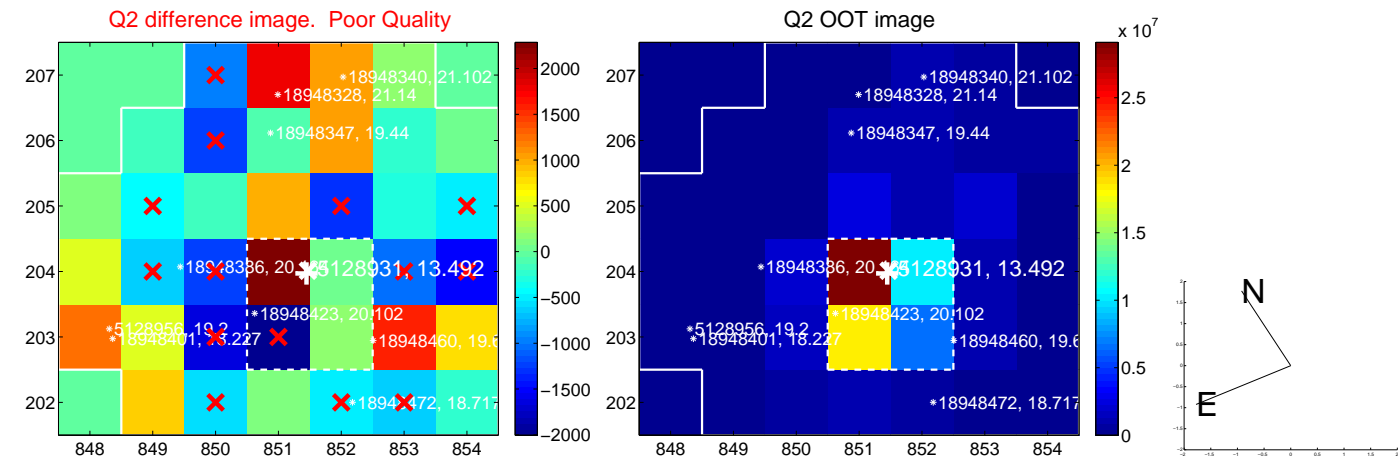
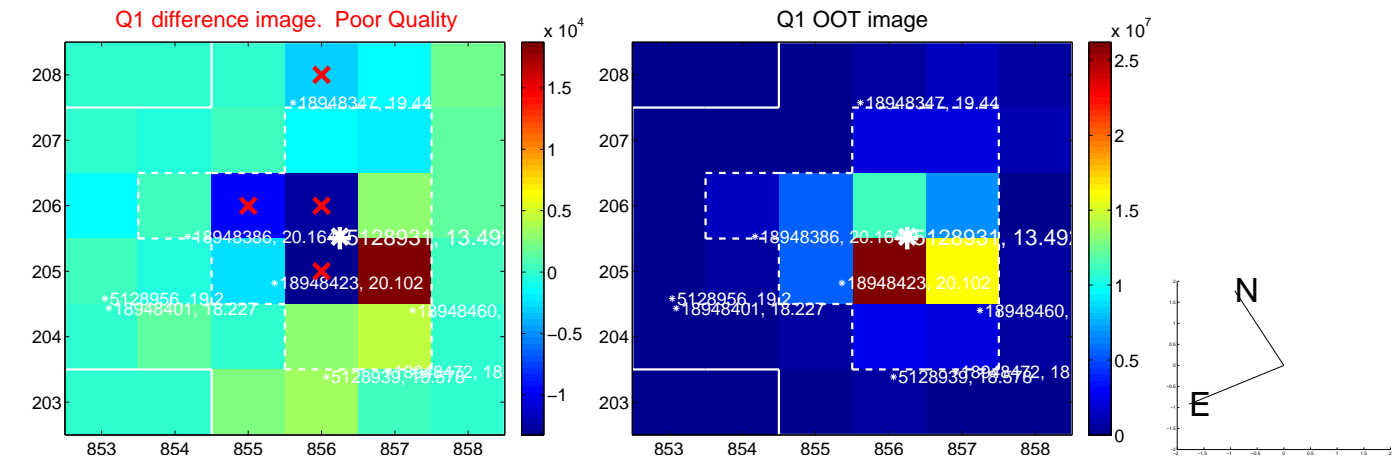
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.193 \pm 3.201$	2.25	$-3.805 \pm 3.725$	$6.104 \pm 1.458$
PRF-fit source offset from KIC position	$7.102 \pm 3.234$	2.20	$-3.773 \pm 3.807$	$6.017 \pm 1.440$
photometric centroid source offset	$0.65 \pm 0.56$	1.17	$-0.17 \pm 0.56$	$-0.63 \pm 0.56$

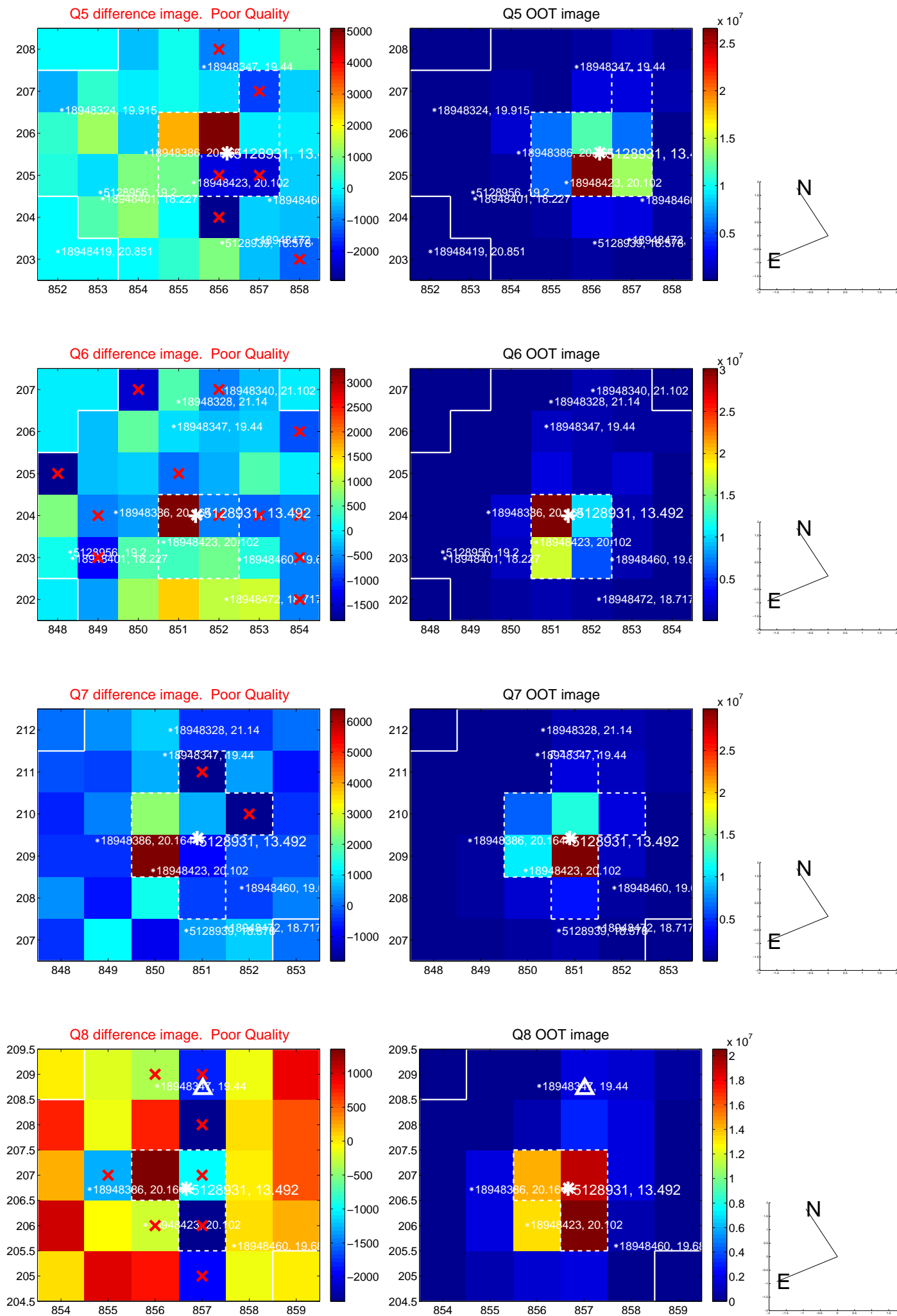


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

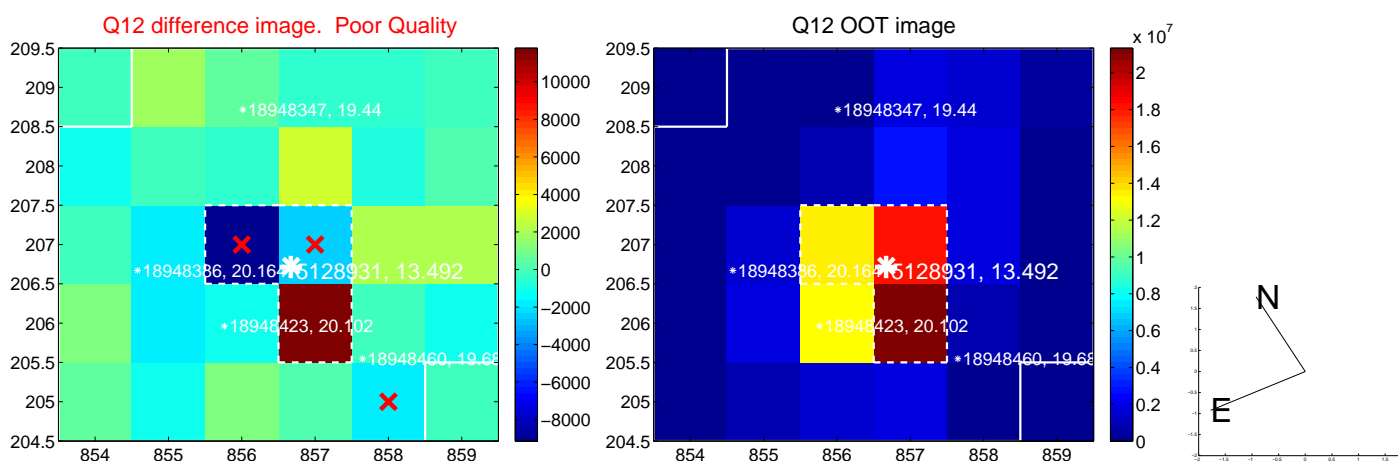
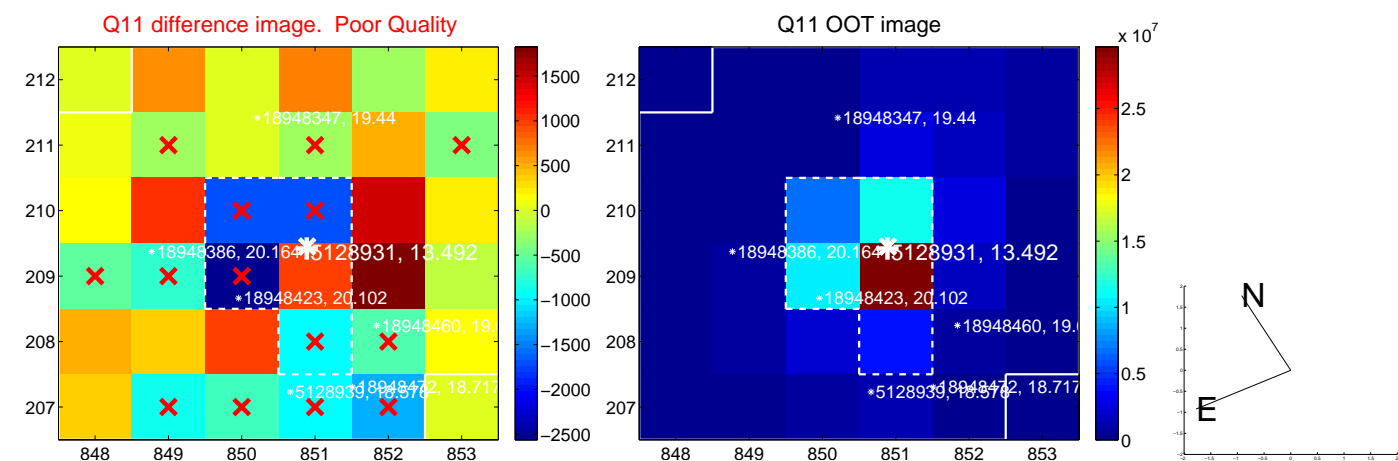
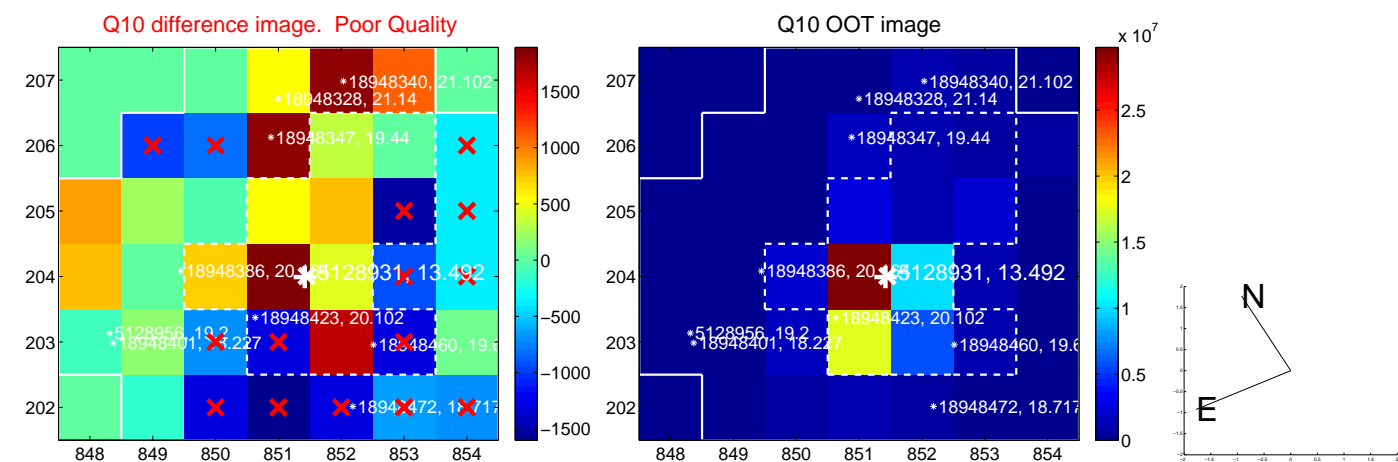
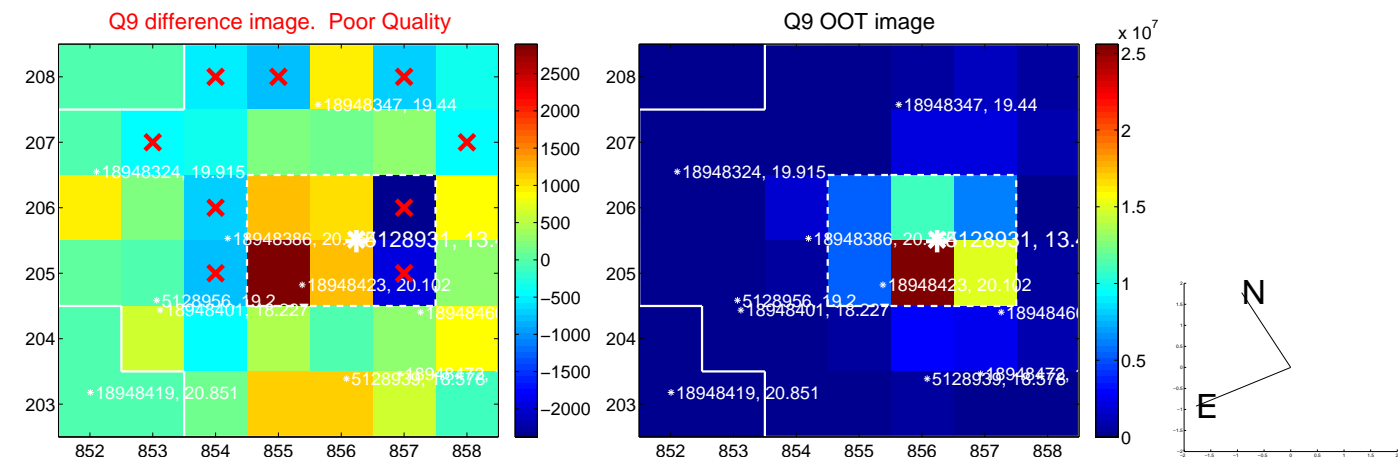
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



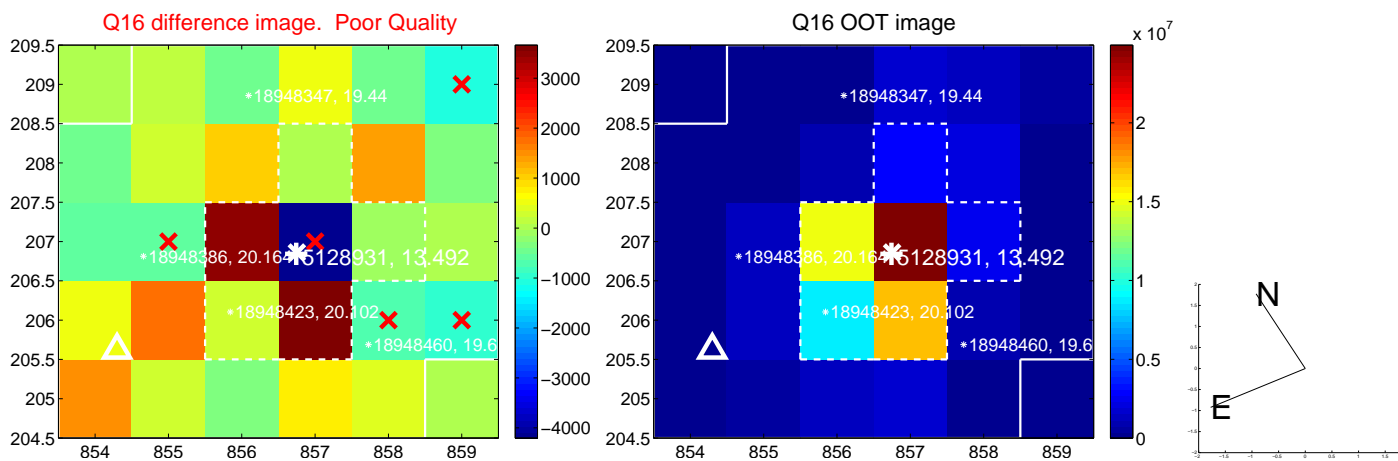
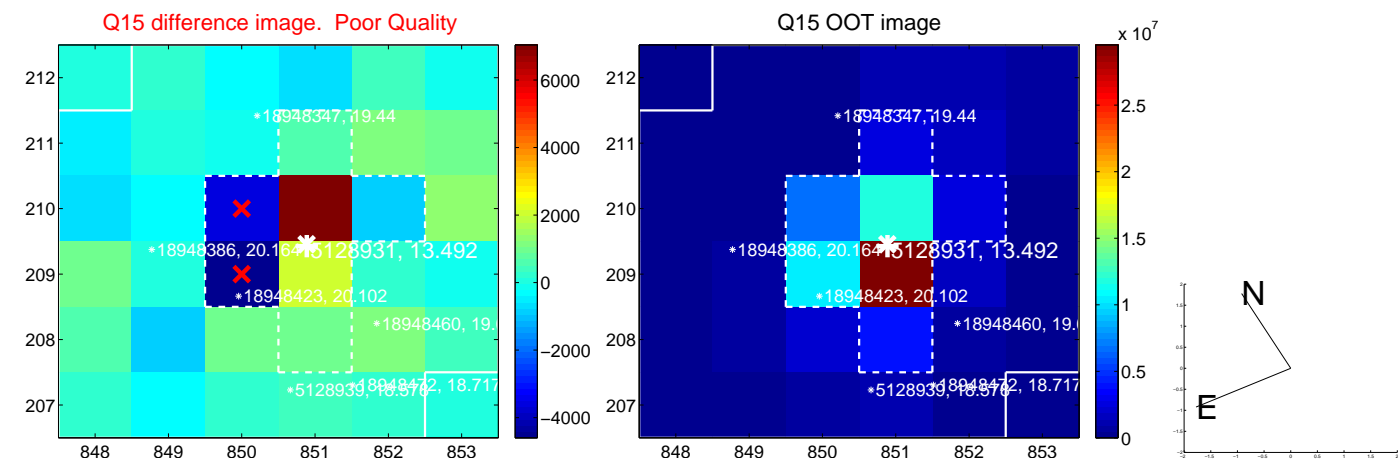
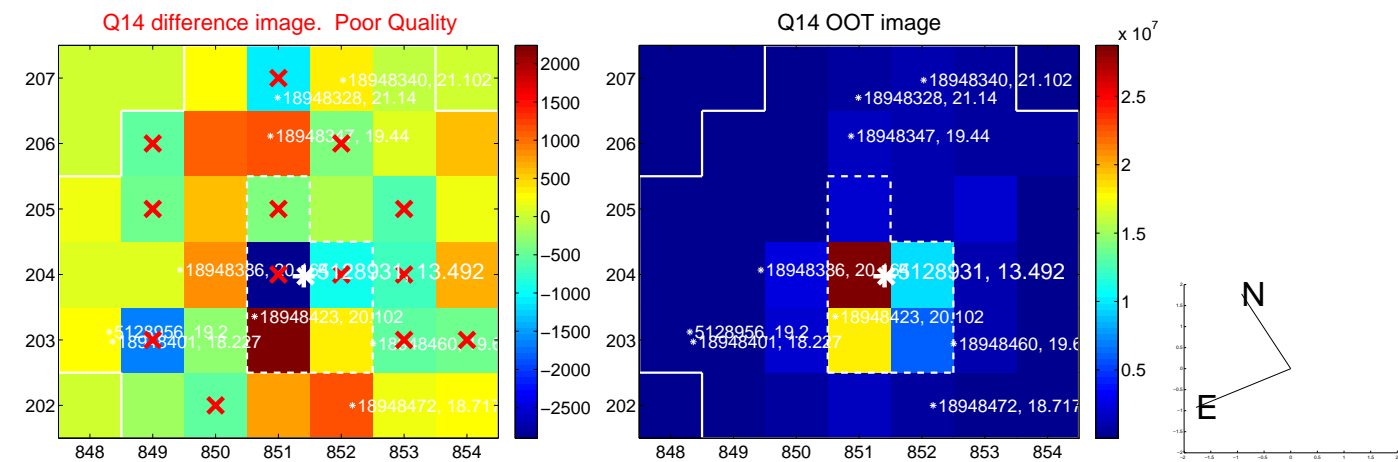
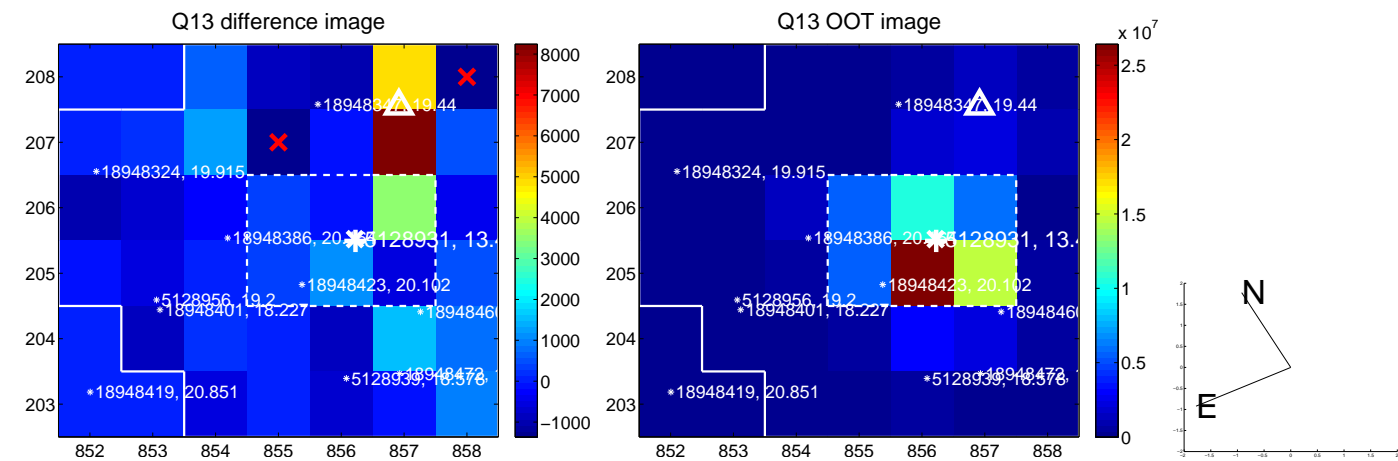
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



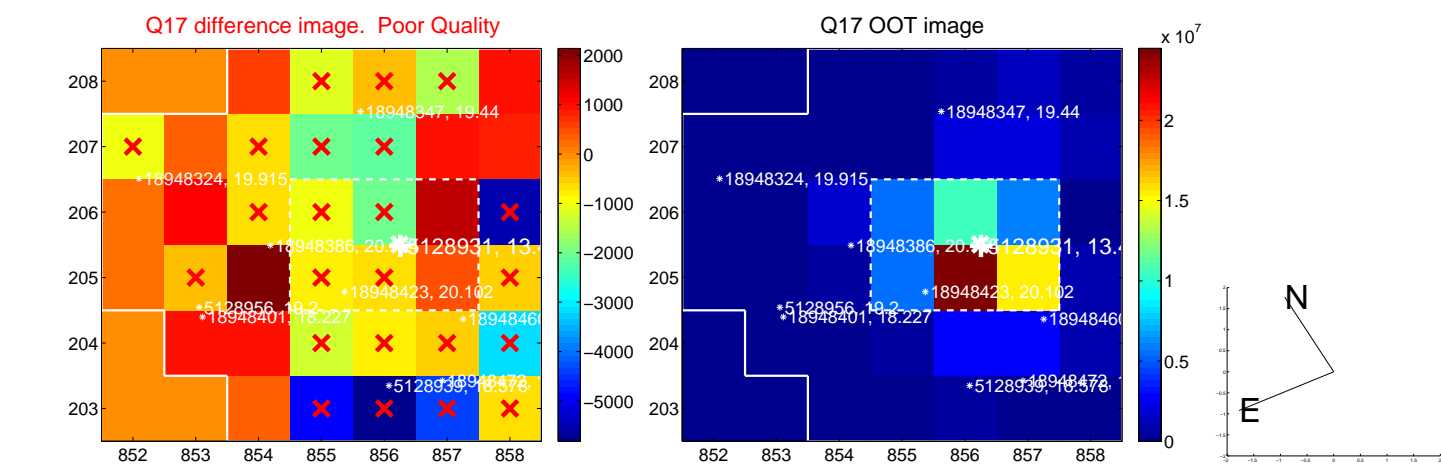
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



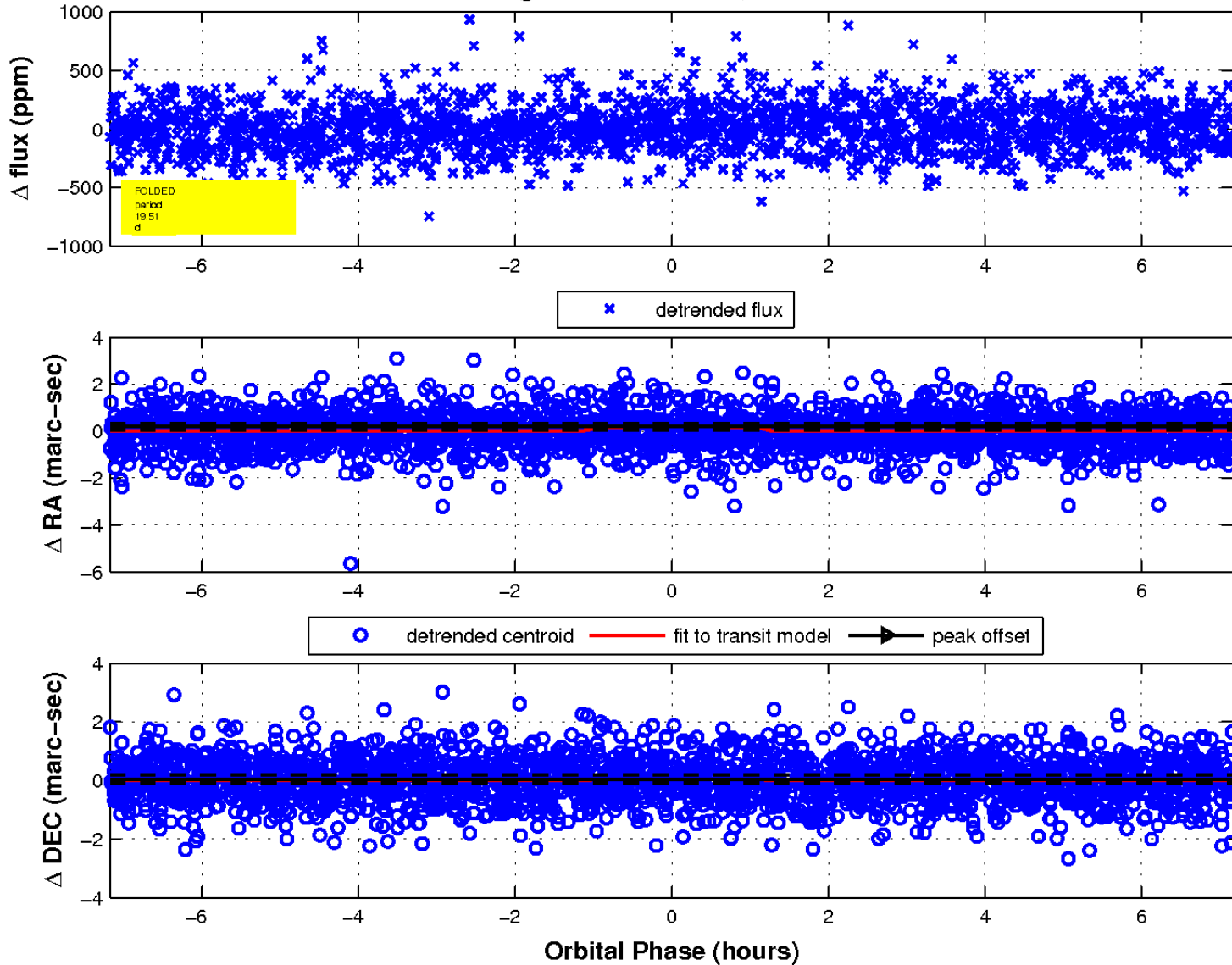
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



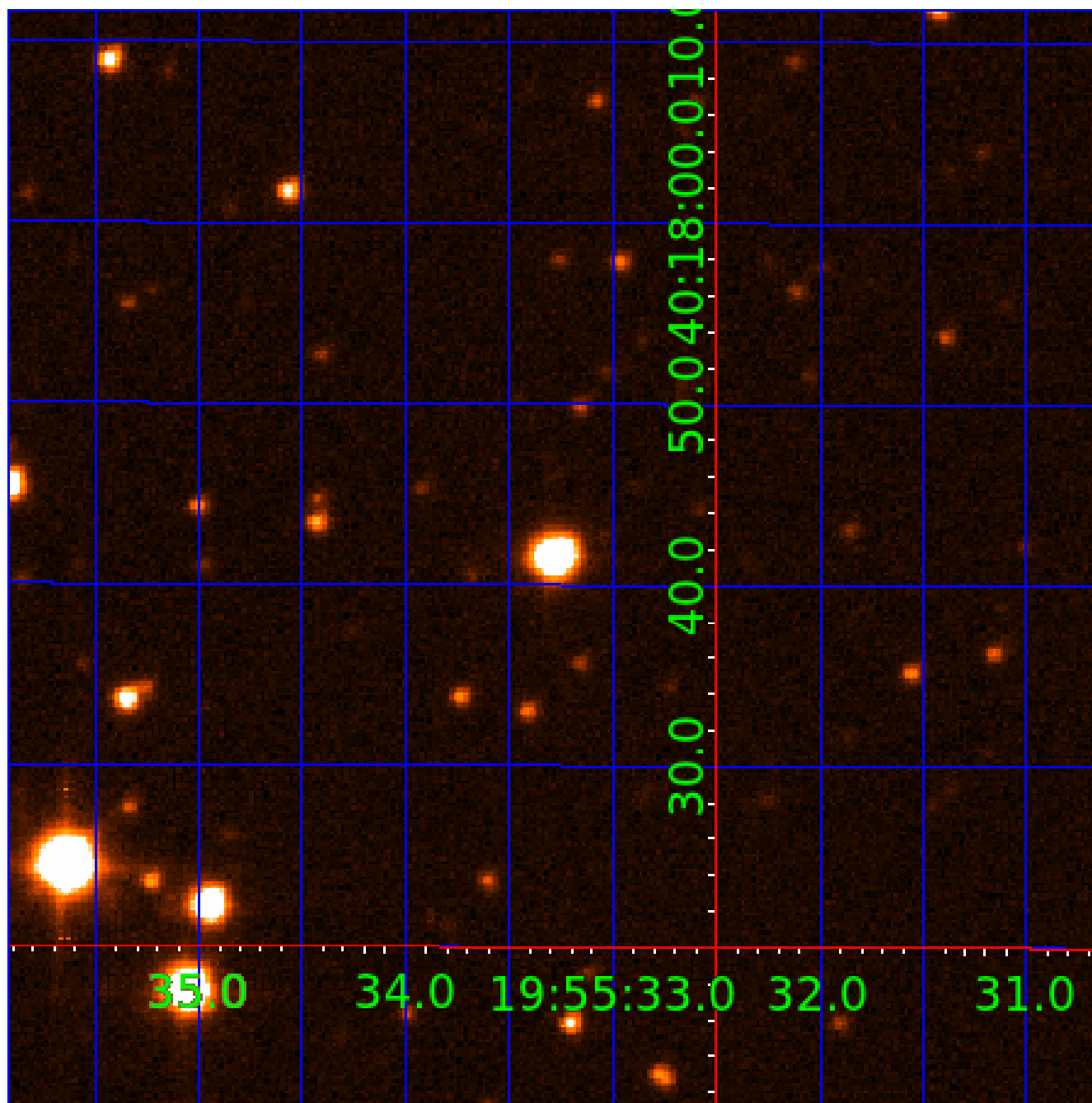
fluxWeightedCentroids, Planet 4 of 8





UKIRT Image

Declination



# KIC 005128931

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005128931-01	OBS	No	0.505298	131.562344	18.0	3.474	10.9	10.2	3.35	6211	1.52	0.00
005128931-02	OBS	No	33.997504	132.982782	539.0	1.290	12.2	11.5	3.35	6211	7.97	275.41
005128931-04	OBS	No	19.514973	131.733189	237.5	2.393	9.0	8.5	3.35	6211	5.85	577.33
005128931-05	OBS	No	37.145662	150.819517	361.3	2.204	13.8	7.8	3.35	6211	6.62	244.74
005128931-06	OBS	No	14.771871	140.019102	274.0	2.387	9.8	10.9	3.35	6211	6.47	836.89
005128931-07	OBS	No	28.583983	145.877110	490.1	0.960	9.2	9.5	3.35	6211	8.32	347.07
005128931-08	OBS	No	23.561503	140.282998	279.1	2.825	10.4	9.2	3.35	6211	6.30	449.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005128931-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
005128931-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005128931-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005128931-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

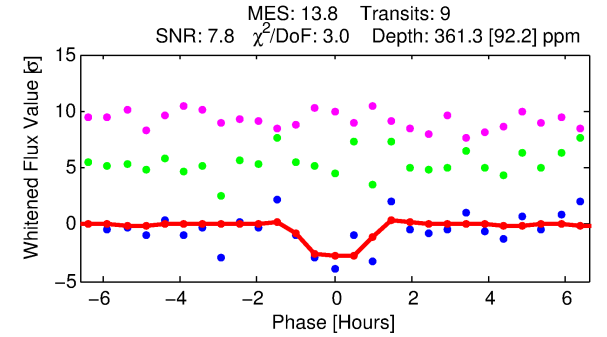
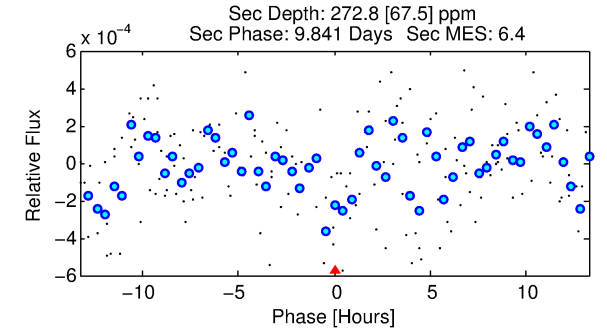
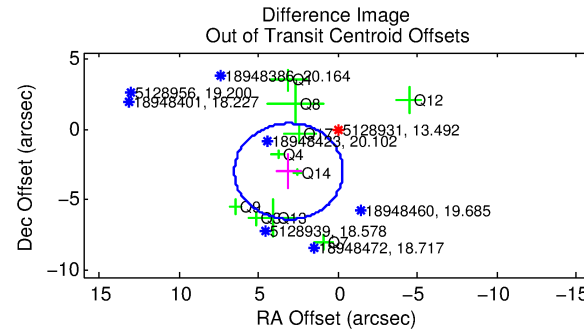
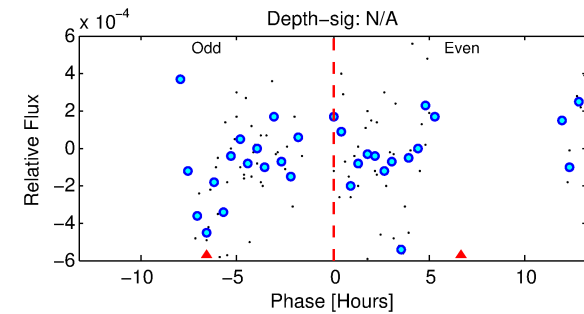
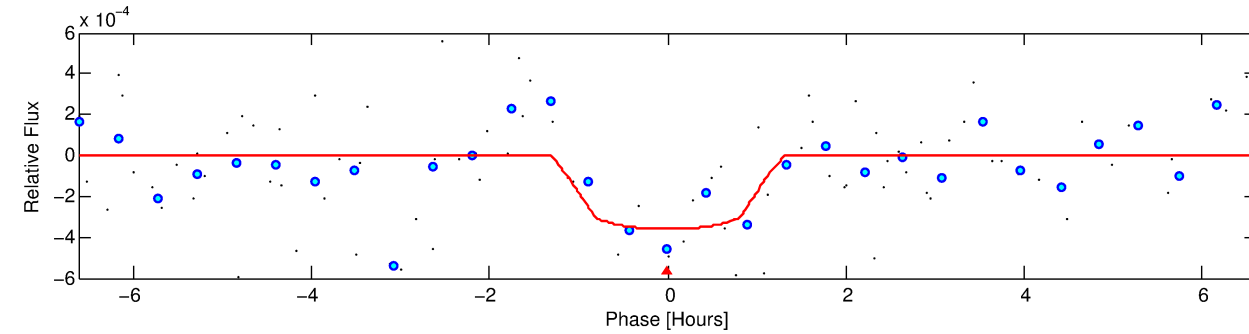
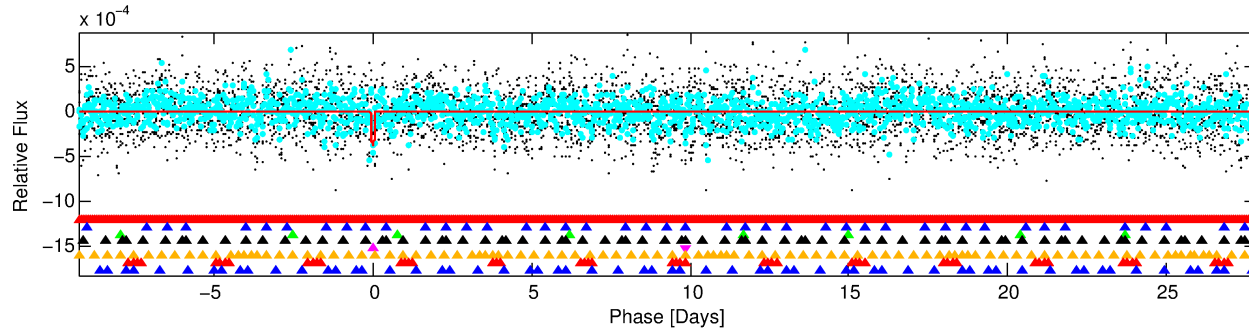
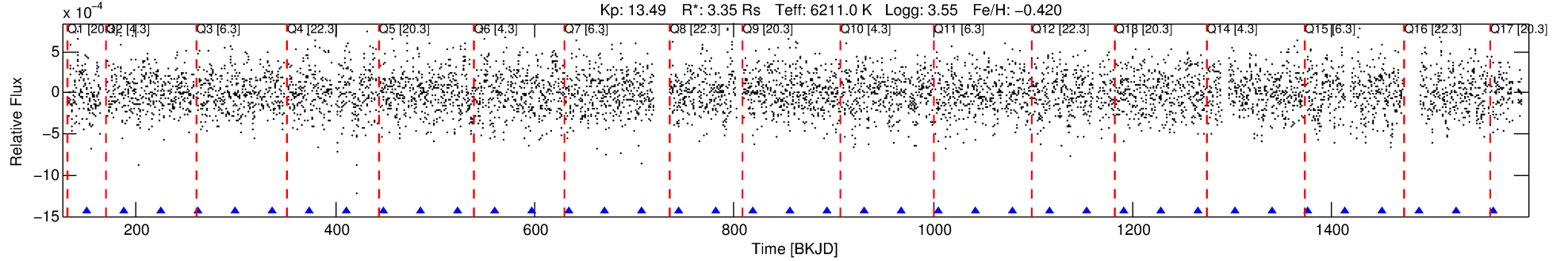
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005128931-05

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 5 of 8 Period: 37.146 d



## DV Fit Results:

Period = 37.14566 [0.00161] d  
Epoch = 150.8195 [0.0453] BKJD  
Rp/R\* = 0.0181 [0.0415]  
a/R\* = 110.77 [1297.96]  
b = 0.54 [15.43]  
Seff = 244.74 [151.44]  
Teq = 1009 [156] K  
Rp = 6.62 [15.44] Re  
a = 0.2476 [0.0957] AU  
Ag = 209.62 [971.23] [0.21 $\sigma$ ]  
Teffp = 5933 [6816] K [0.72 $\sigma$ ]

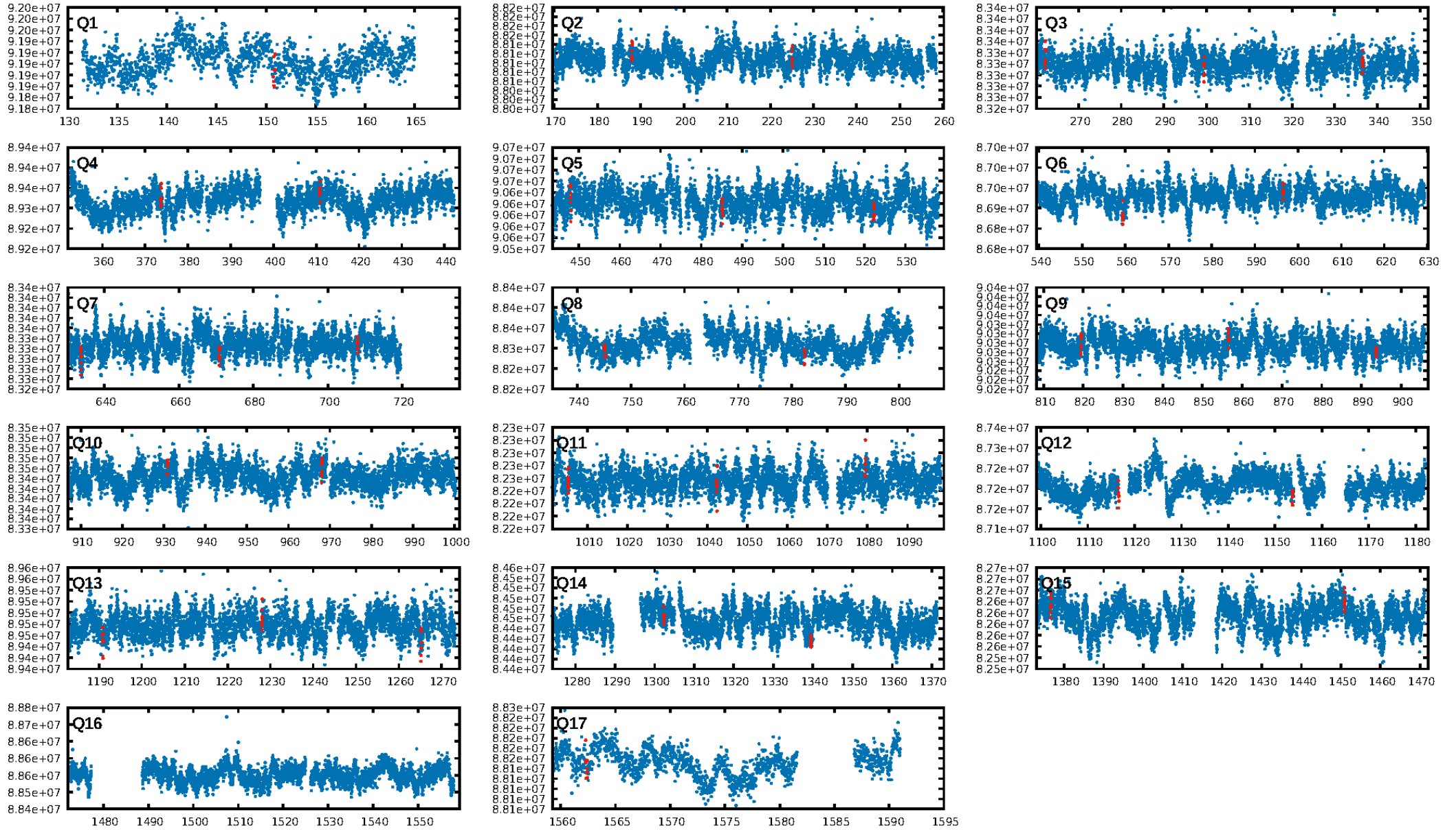
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [29.59 $\sigma$ ]  
LongPeriod-sig: 100.0% [368.35 $\sigma$ ]  
ModelChiSquare2-sig: 1.0%  
ModelChiSquareGof-sig: 99.4%  
Bootstrap-pfa: 1.90e-15  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 0.5903  
Centroid-sig: 91.1%  
Centroid-so: 0.820 arcsec [1.49 $\sigma$ ]  
OotOffset-rm: 4.283 arcsec [3.76 $\sigma$ ]  
KicOffset-rm: 4.203 arcsec [3.17 $\sigma$ ]  
OotOffset-st: 1/2/3/4 [10]  
KicOffset-st: 1/2/3/4 [10]  
DiffImageQuality-fgm: 0.10 [1/10]  
DiffImageOverlap-fno: 0.00 [0/16]

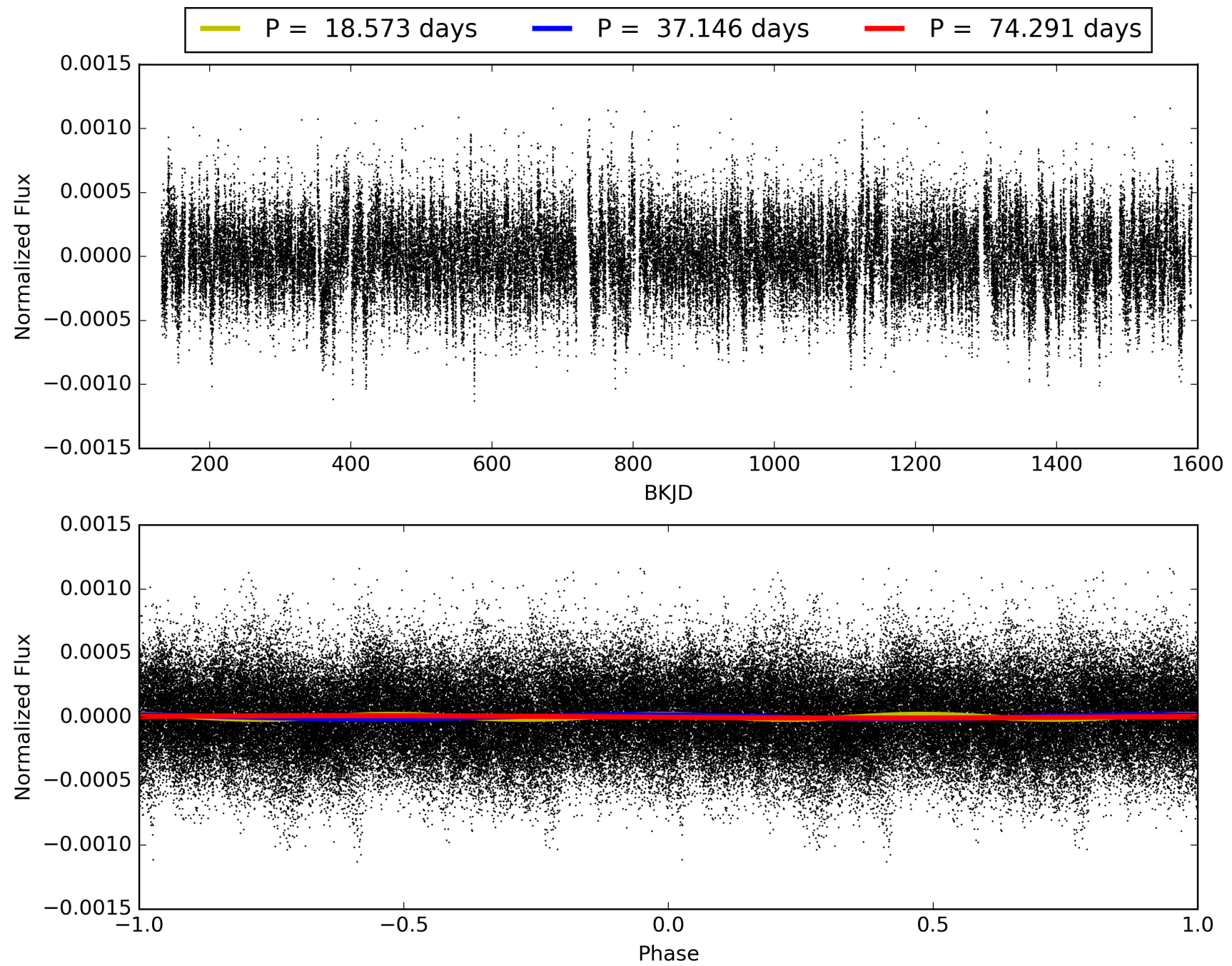
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:00:58 Z

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

# TCE 005128931-05, PDC Light Curves

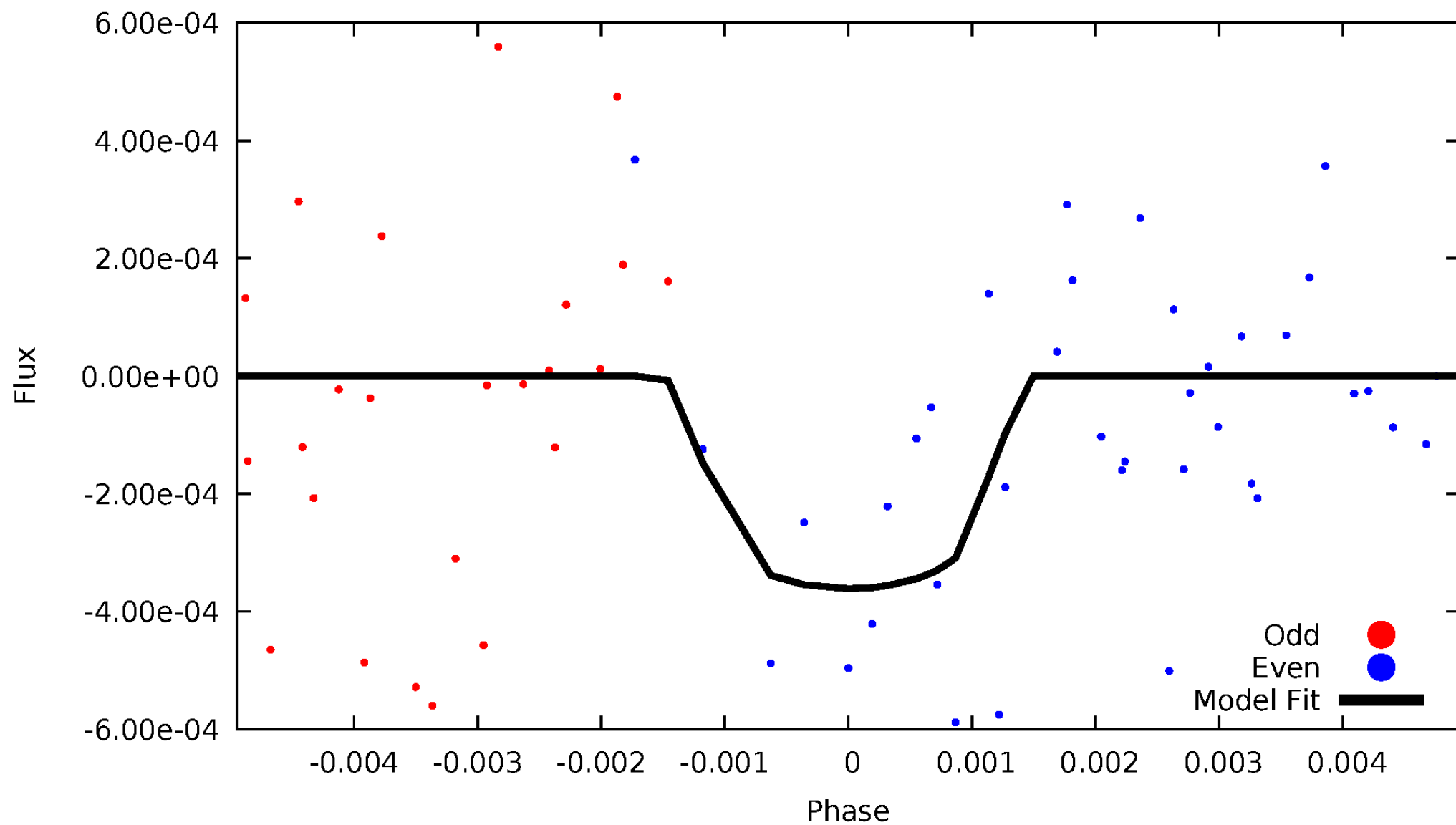


TCE 005128931-05



# DV Odd/Even

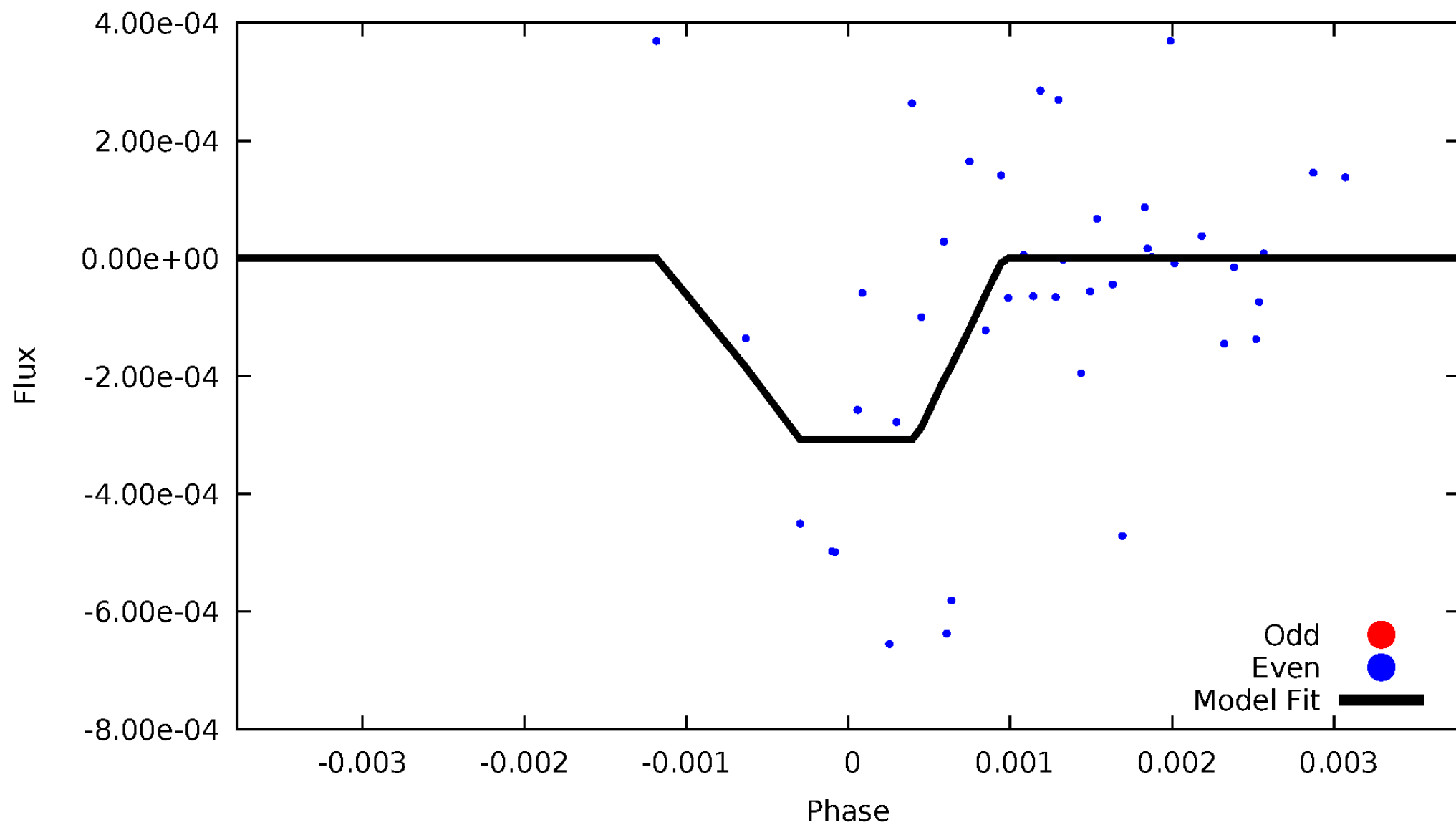
TCE 005128931-05





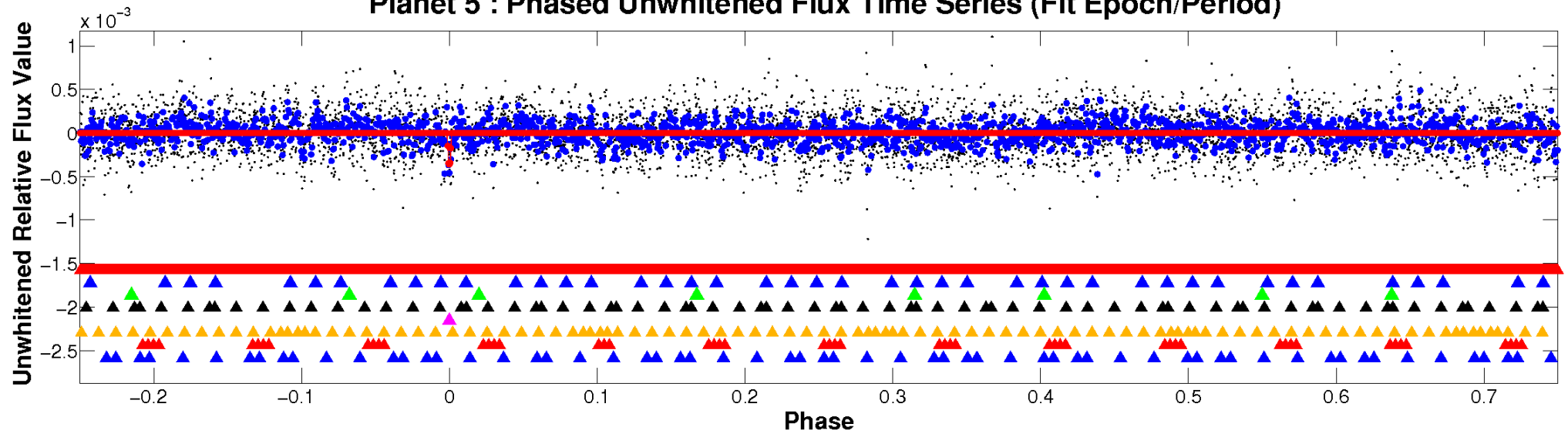
# ALT Odd/Even

TCE 005128931-05

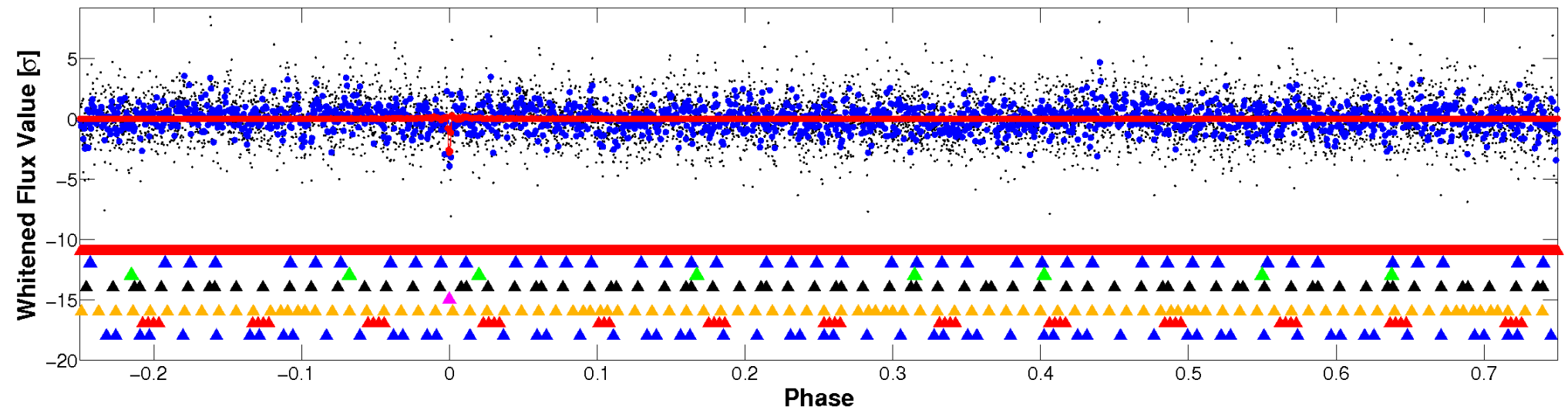


# Non-Whitened Vs. Whitened Light Curve

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

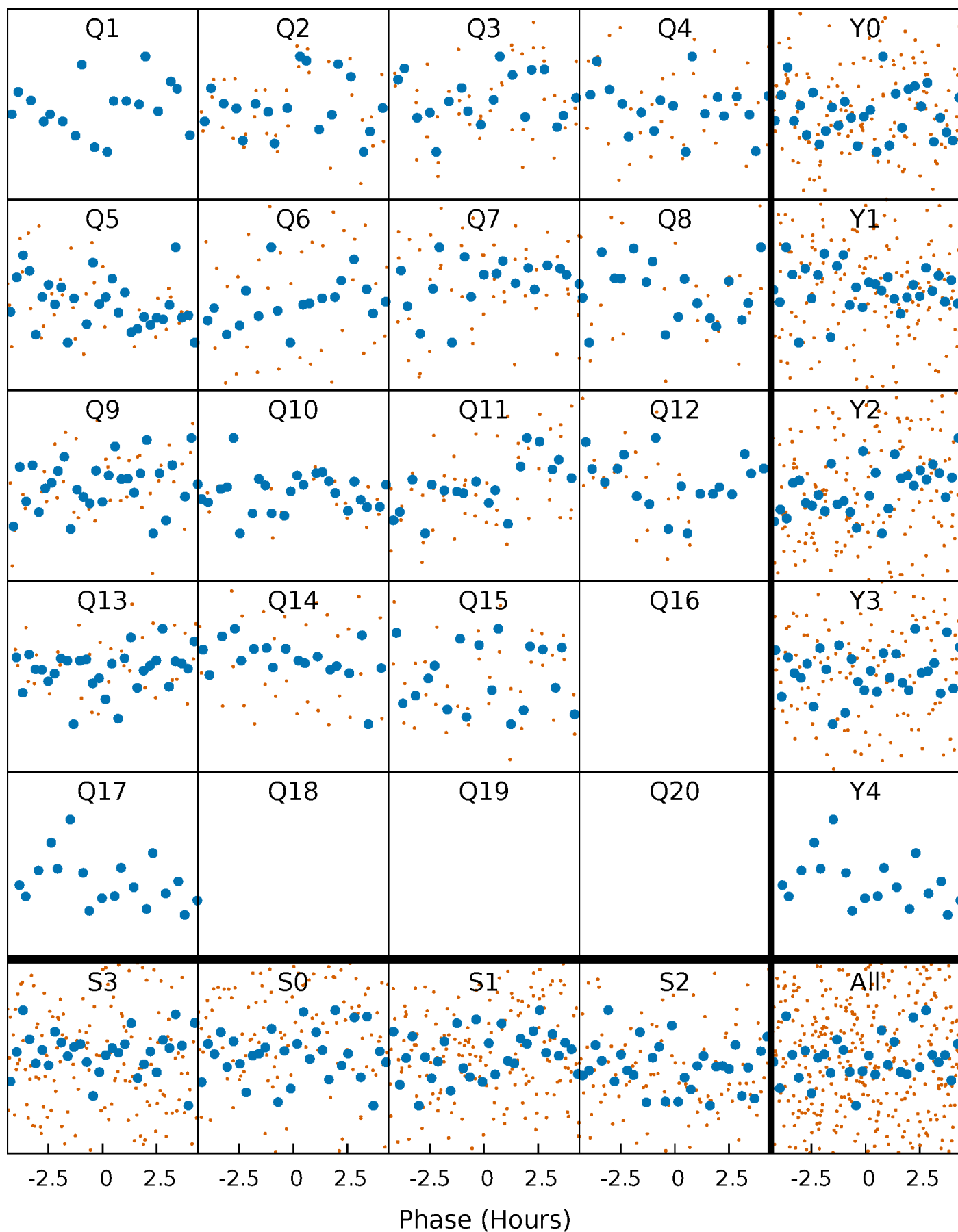


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



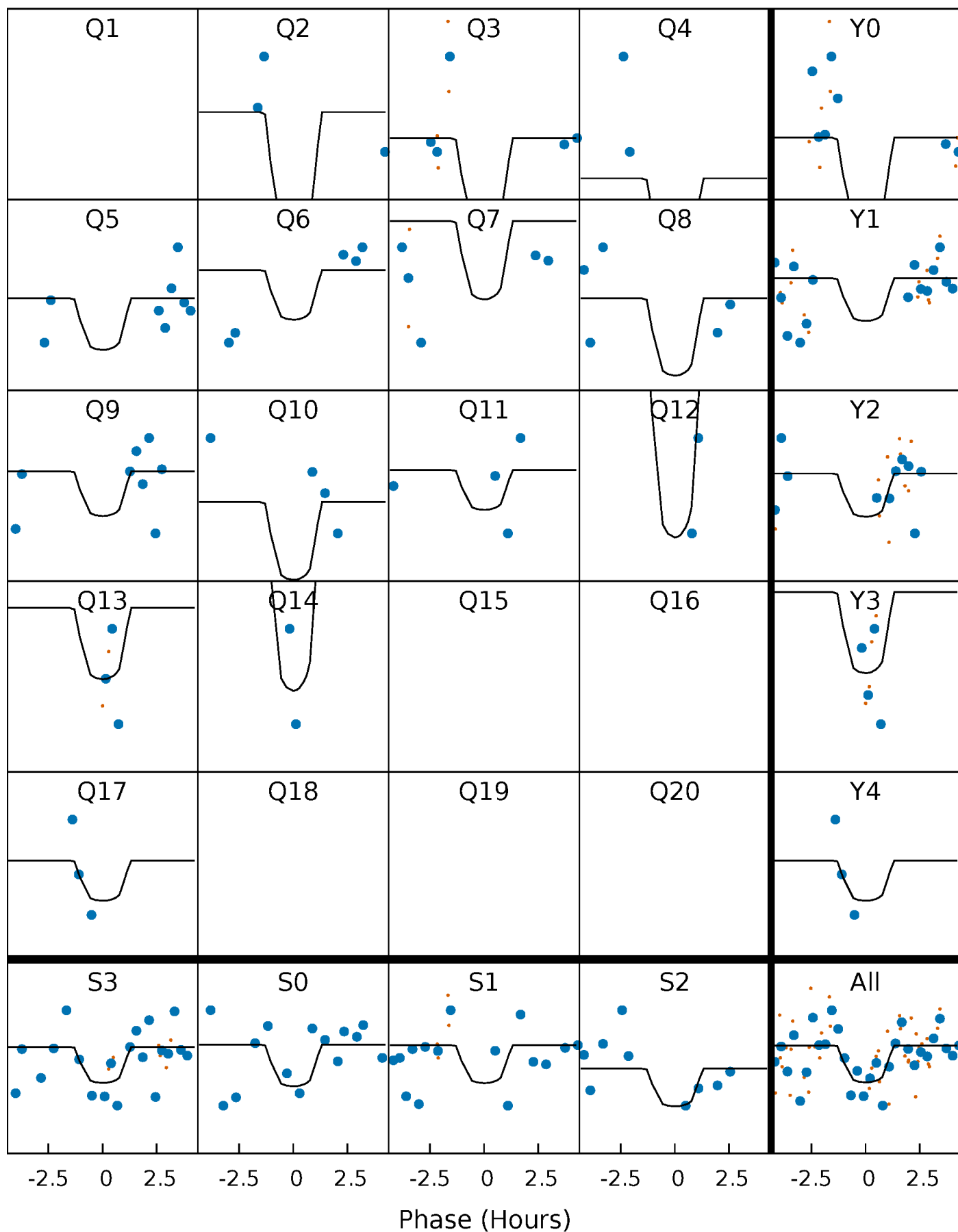
# PDC Quarter-Phased Transit Curves

TCE 005128931-05   P= 37.145662 Days    $T_0=150.819517$  (BKJD)



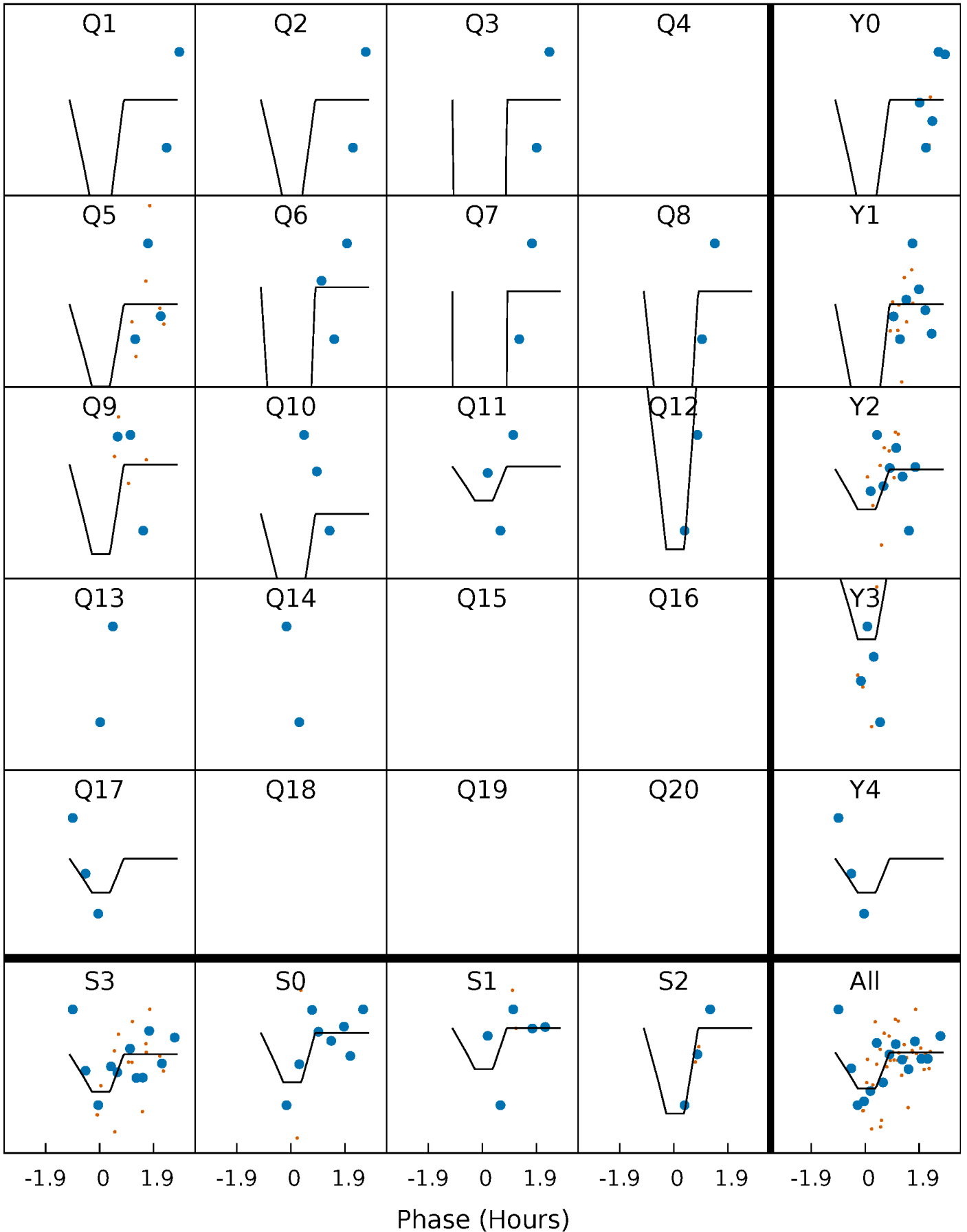
# DV Quarter-Phased Transit Curves

TCE 005128931-05   P= 37.145662 Days    $T_0=150.819517$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

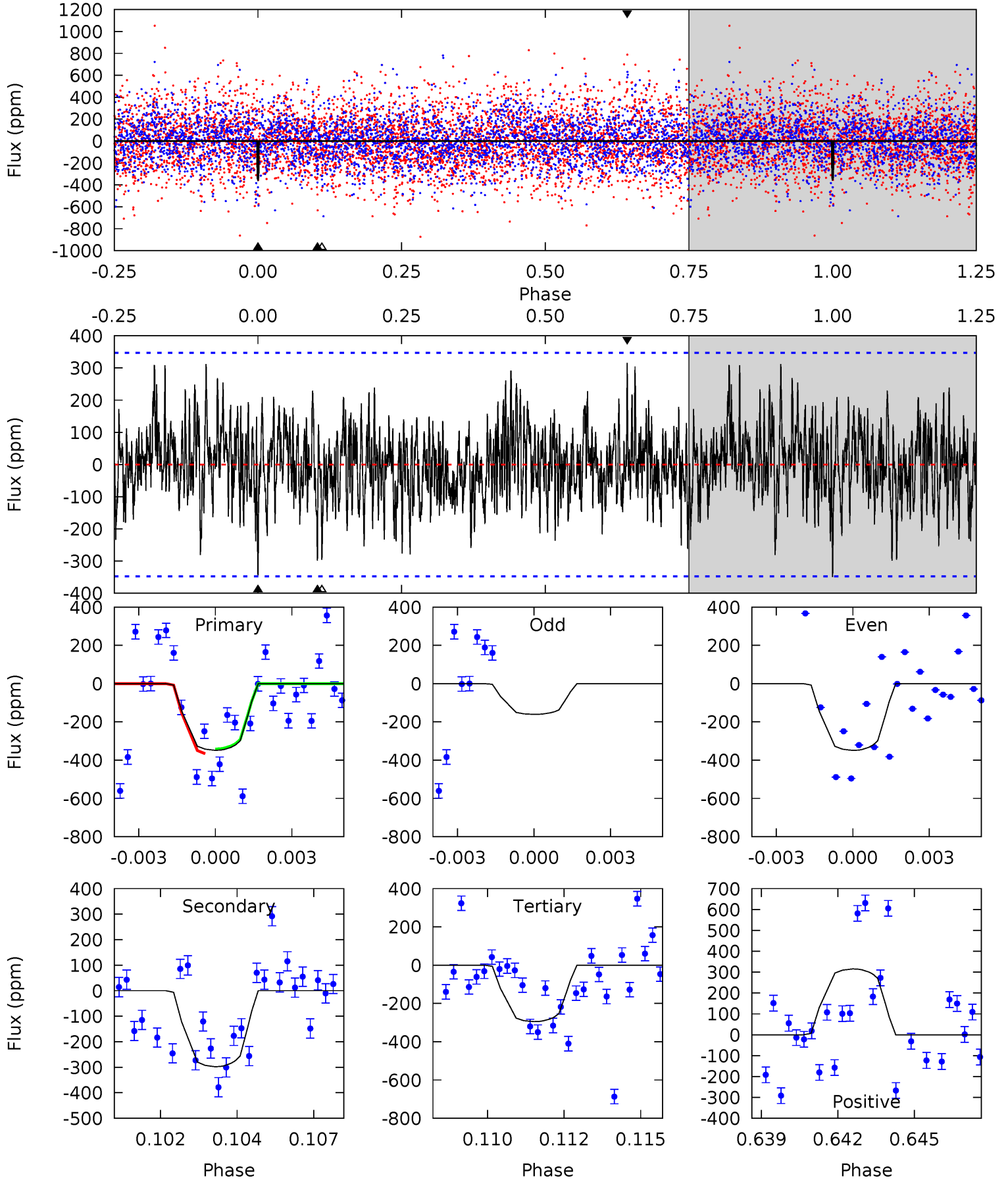
TCE 005128931-05 P= 37.142670 Days  $T_0=150.913008$  (BKJD)



# DV Model-Shift Uniqueness Test

005128931-05, P = 37.145662 Days, E = 113.673855 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.30	4.53	4.48	4.79	5.27	3.00	1.44	0.82	0.51	0.05	-0.26	2.01	0.99	0.47	0.14

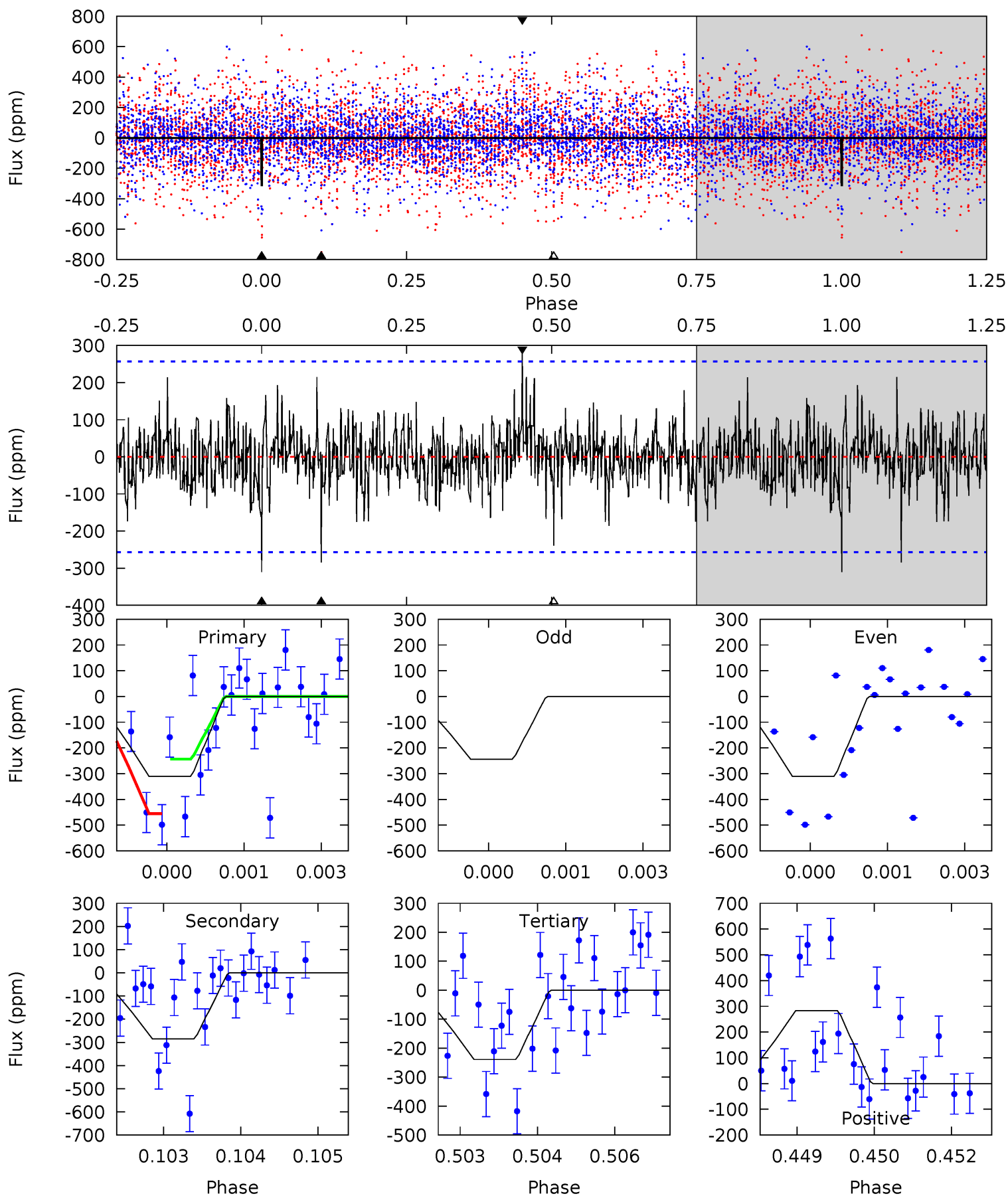




# Alt Model-Shift Uniqueness Test

005128931-05,  $P = 37.142670$  Days,  $E = 113.770338$  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
6.53	5.98	5.03	5.96	5.41	3.22	1.26	1.50	0.57	0.95	0.02	0.97	0.94	0.48	1.55



### Stellar Parameters For KIC 005128931

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-298 \pm 66$	$11.92^{+11.90}_{-8.18}$	$1397^{+81}_{-142}$	$4536^{+3431}_{-986}$	$74^{+616}_{-56}$
Alt.	$-284 \pm 48$	$12.33^{+12.50}_{-8.17}$	$1387^{+96}_{-142}$	$4432^{+3003}_{-922}$	$65^{+467}_{-50}$

$T_{\text{max}}$  = 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

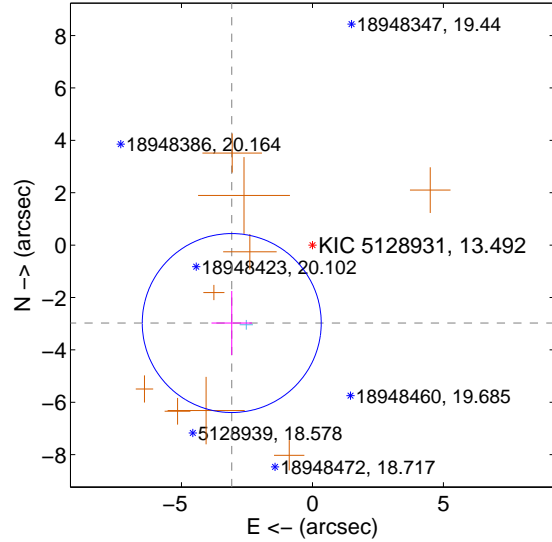
Supplemental centroid analysis for 005128931-05. Kepler magnitude: 13.49. Transit SNR 7.83

There are 1 quarters with good PRF difference image offsets

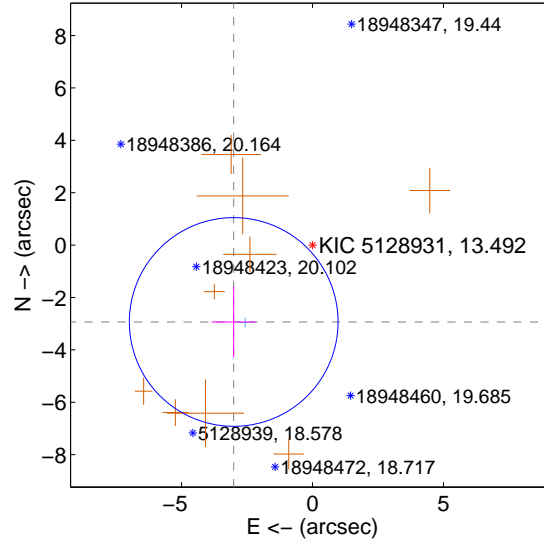
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.283 \pm 1.139$	<b>3.76</b>	$3.081 \pm 0.772$	$-2.976 \pm 1.225$
PRF-fit source offset from KIC position	$4.203 \pm 1.328$	<b>3.17</b>	$3.009 \pm 0.847$	$-2.935 \pm 1.352$
photometric centroid source offset	$0.82 \pm 0.55$	1.49	$0.72 \pm 0.55$	$-0.39 \pm 0.54$

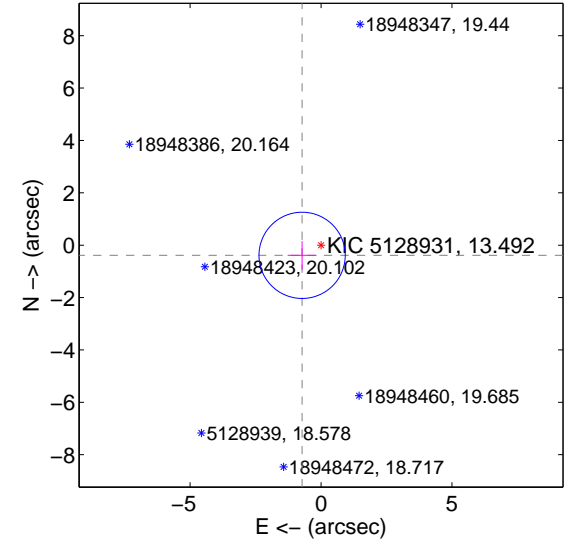
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

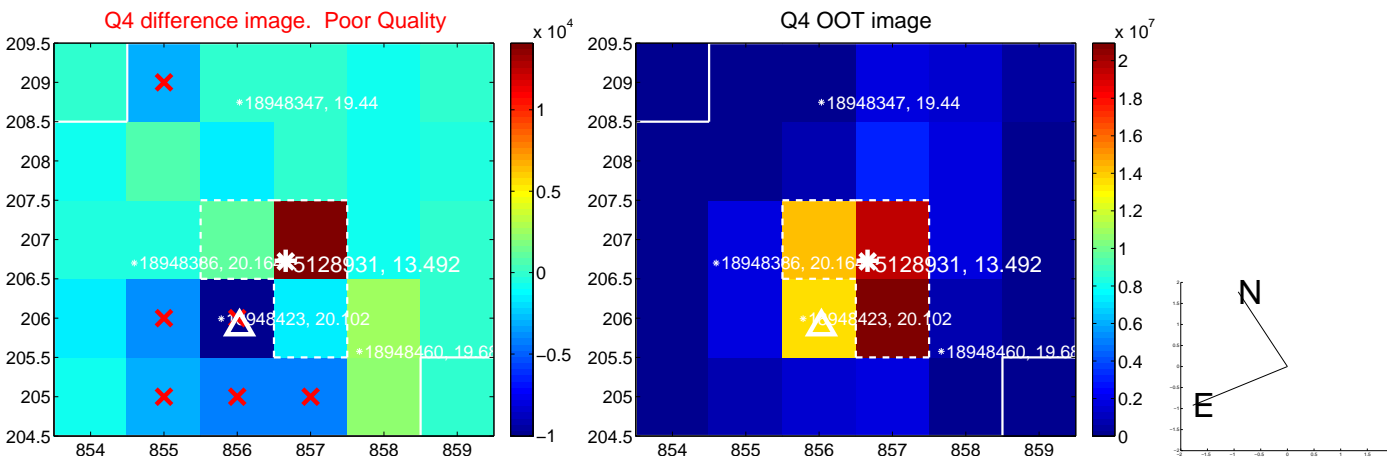
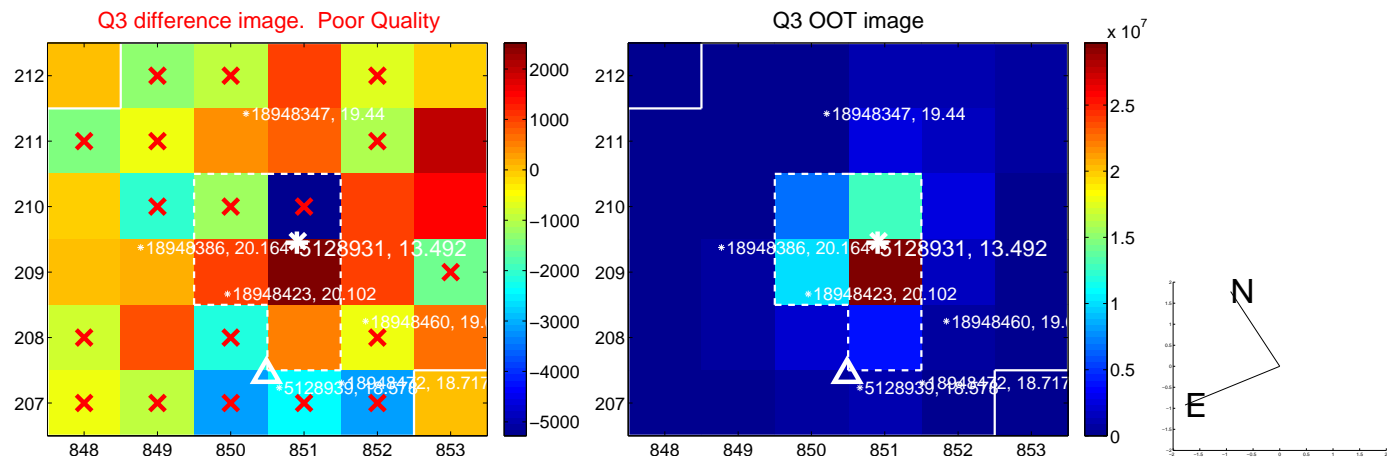
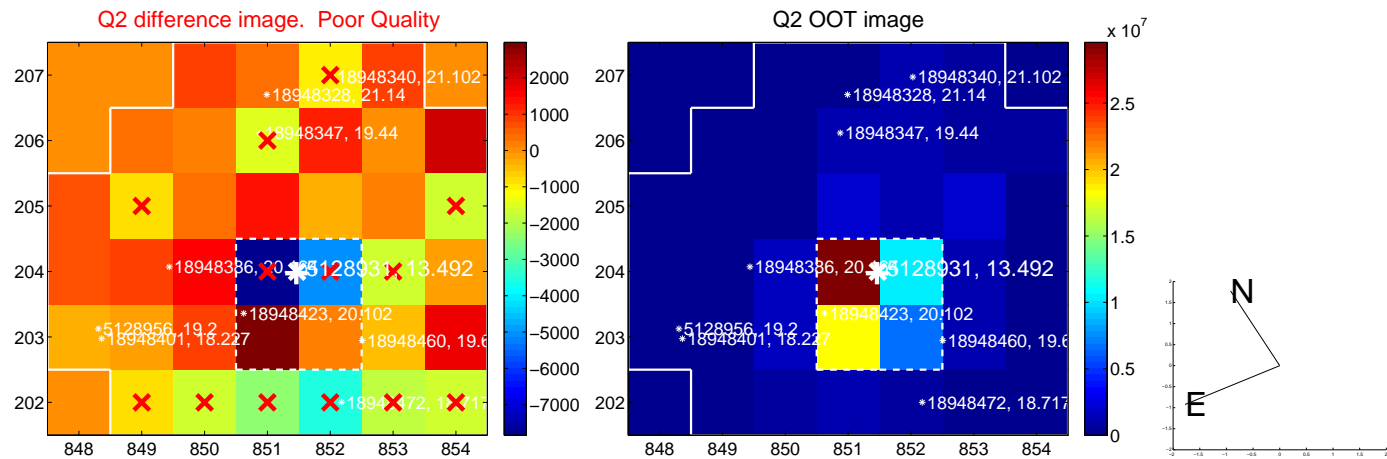
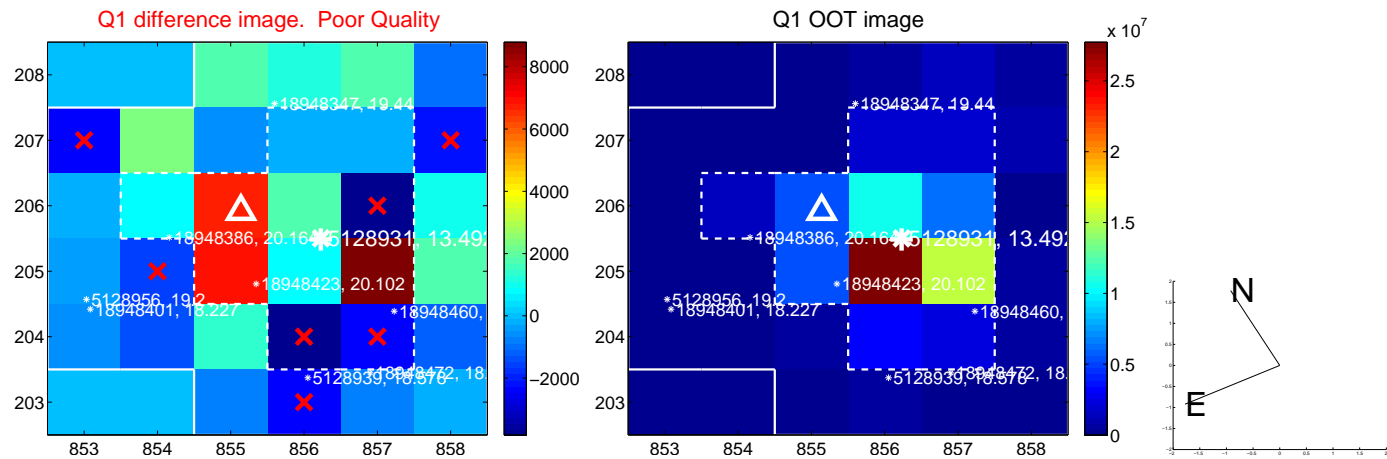


offset from photometric centroids

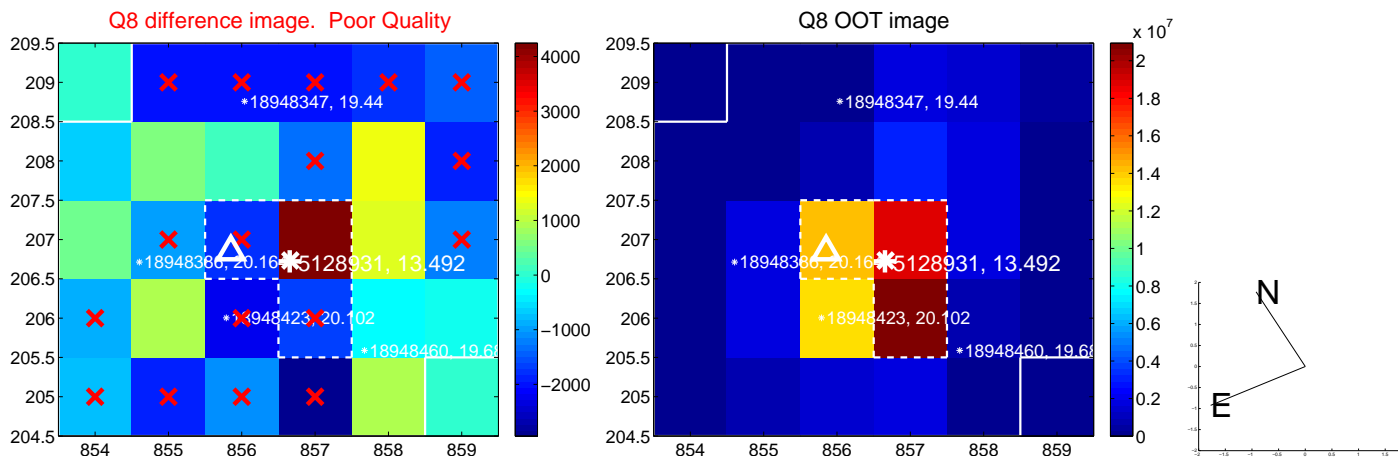
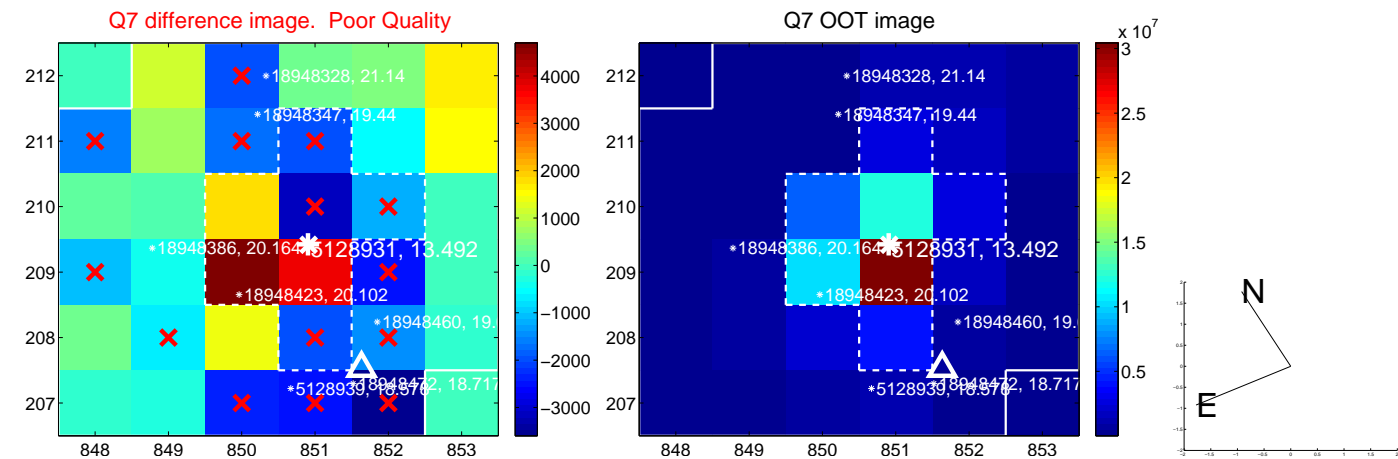
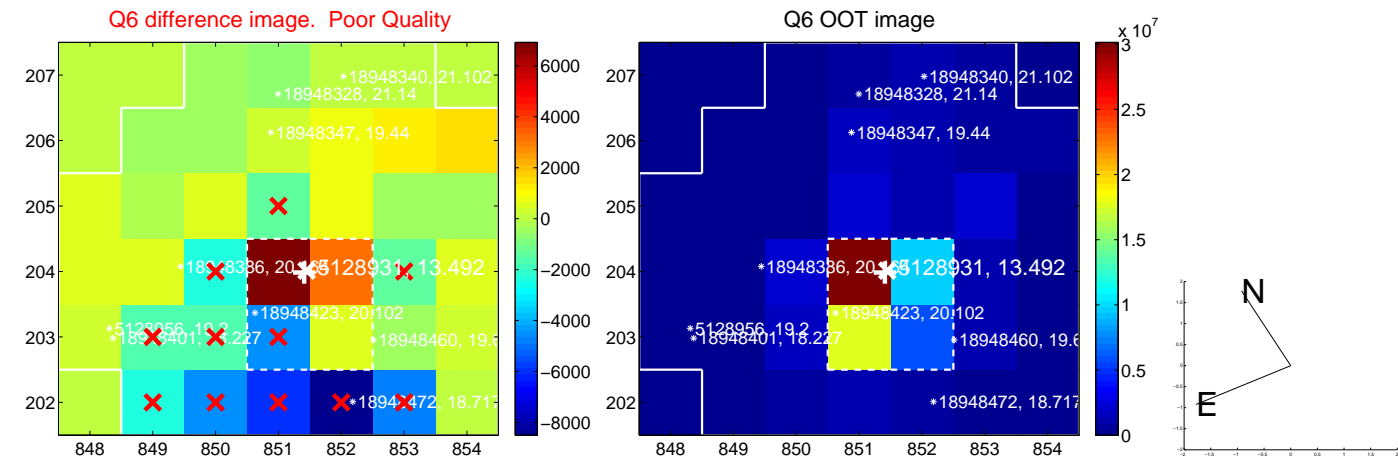
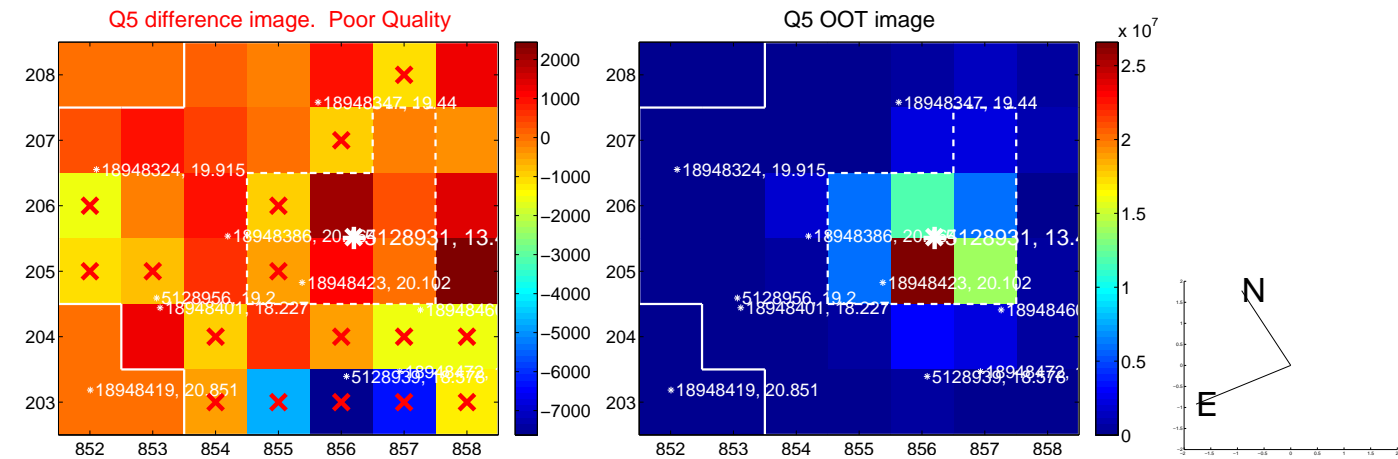


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

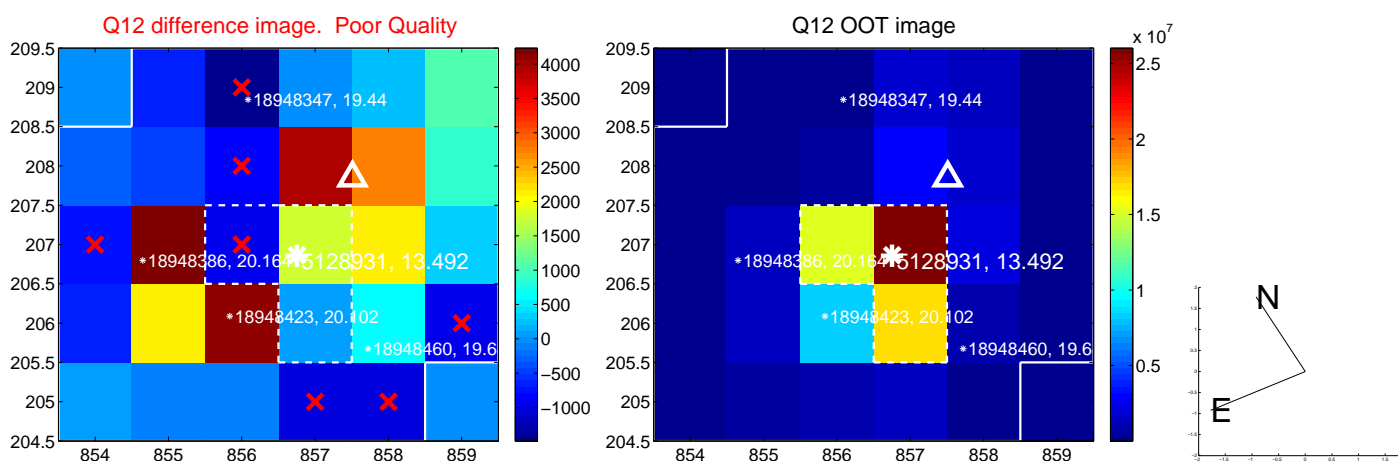
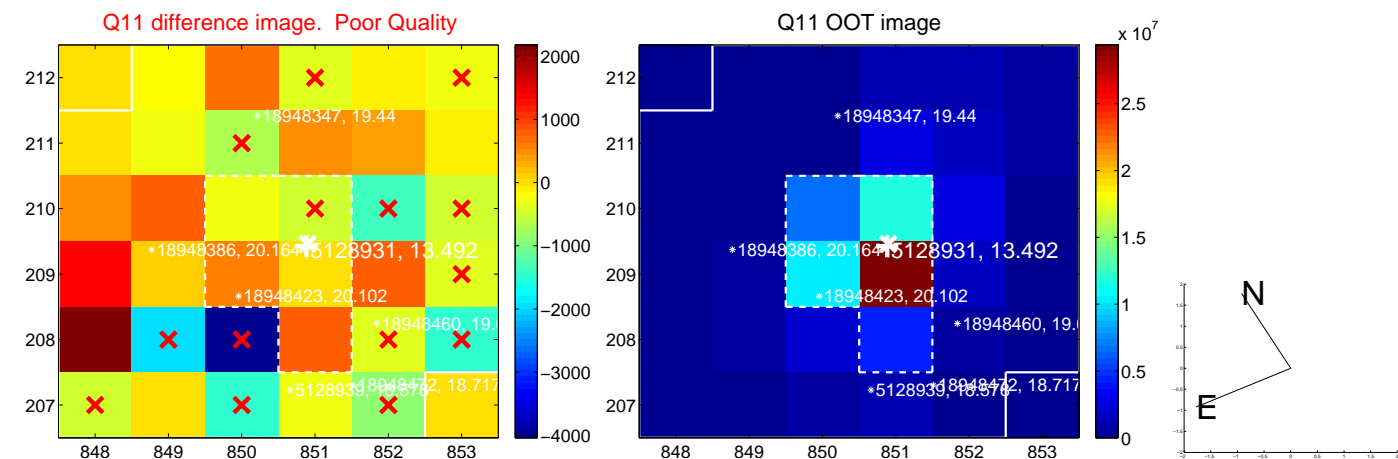
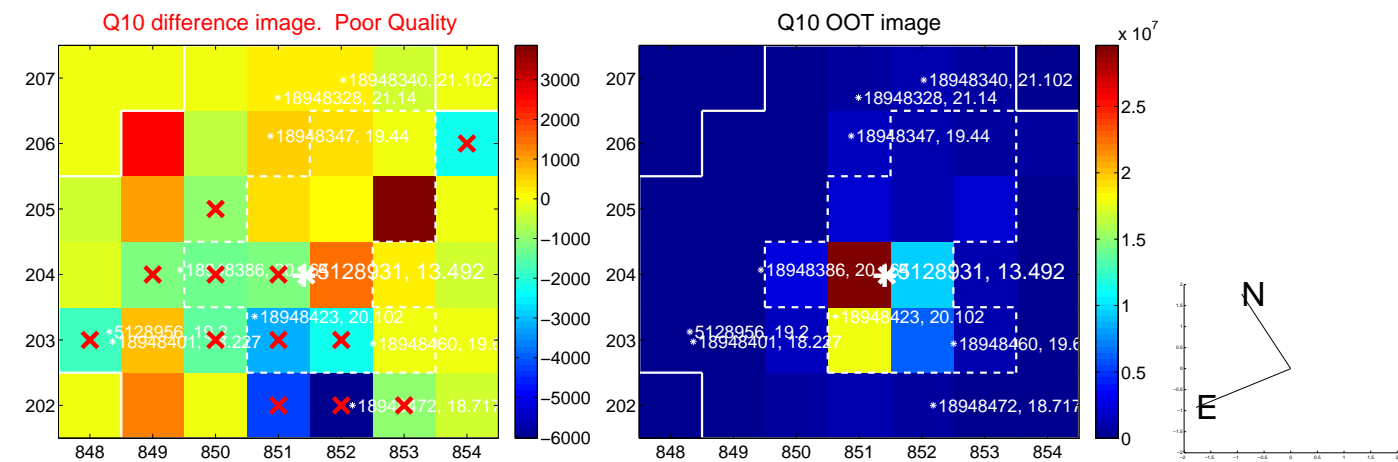
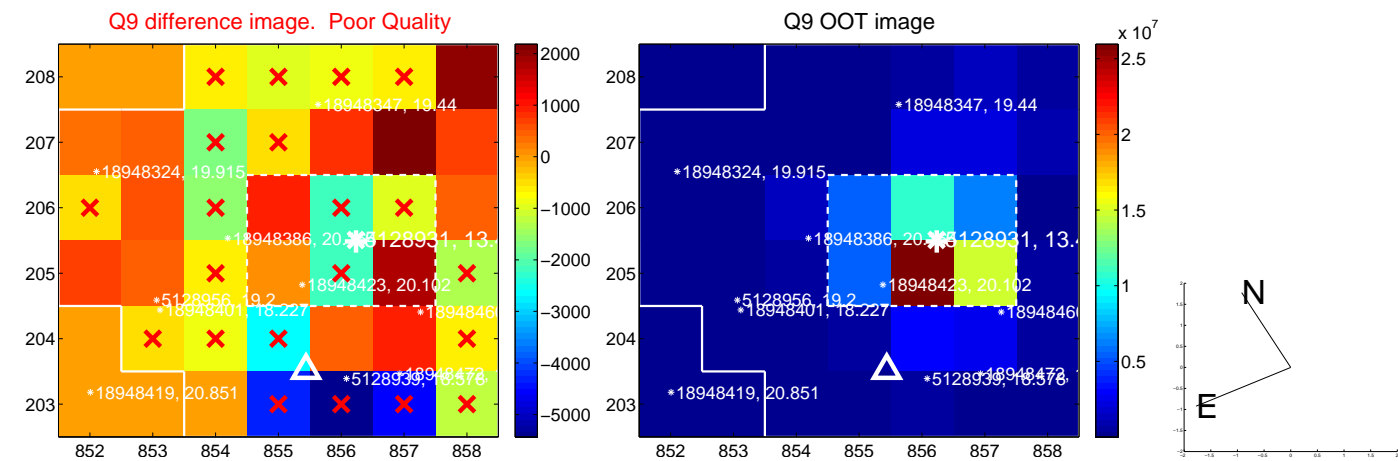
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

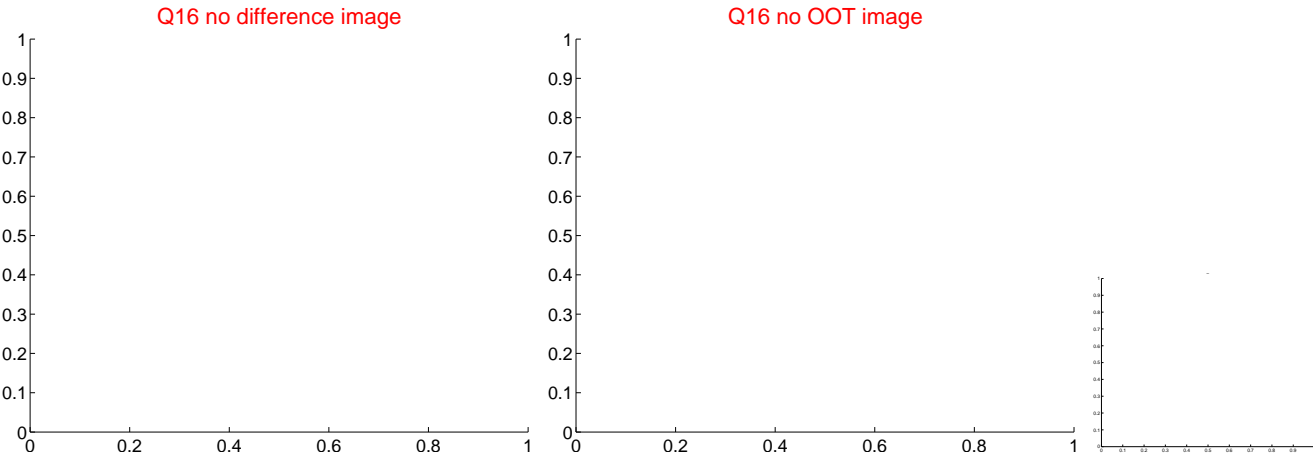
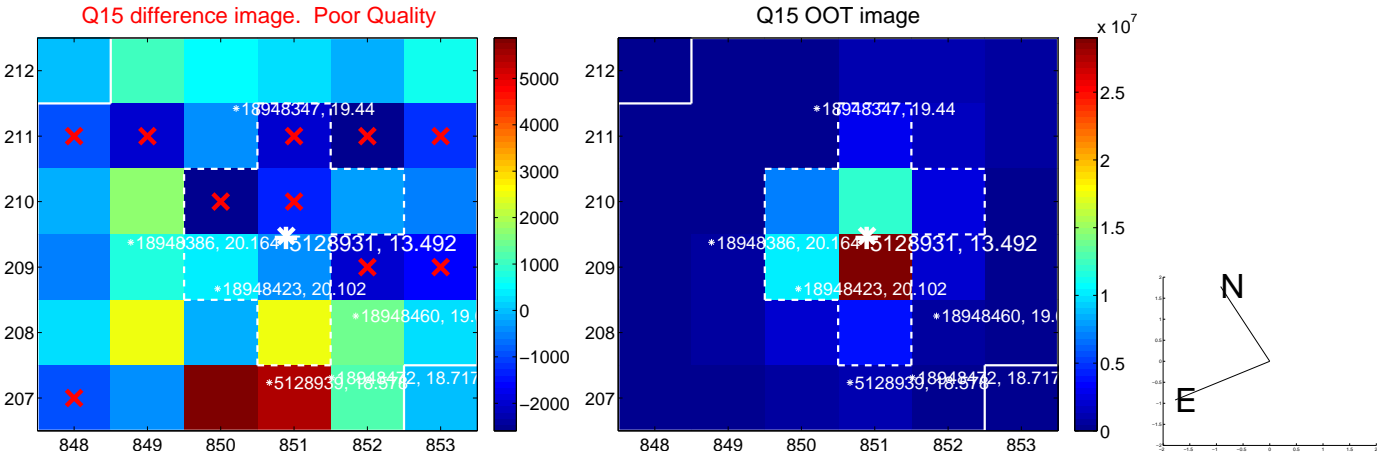
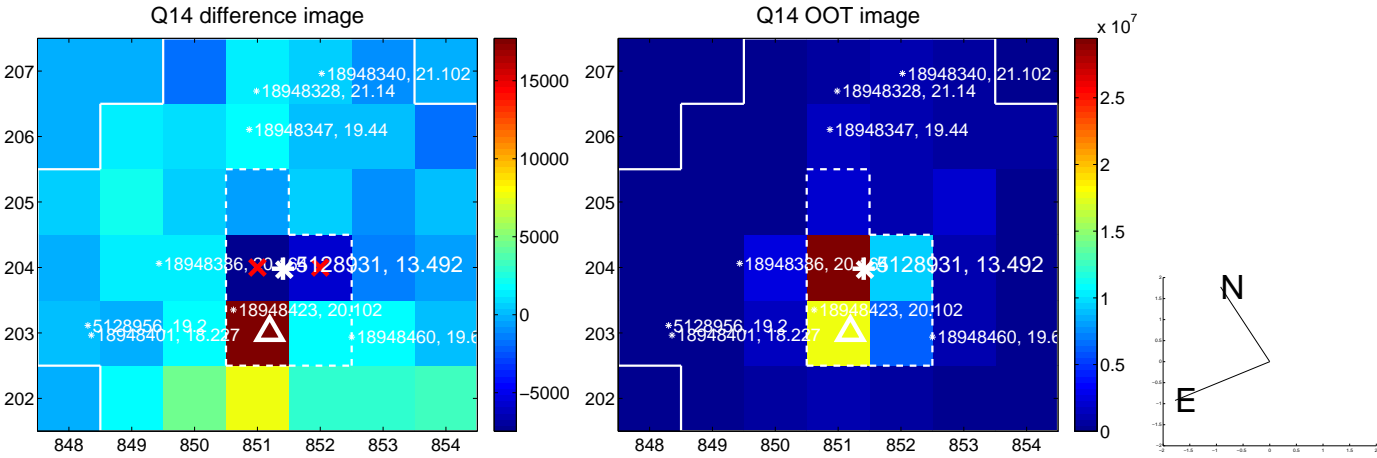
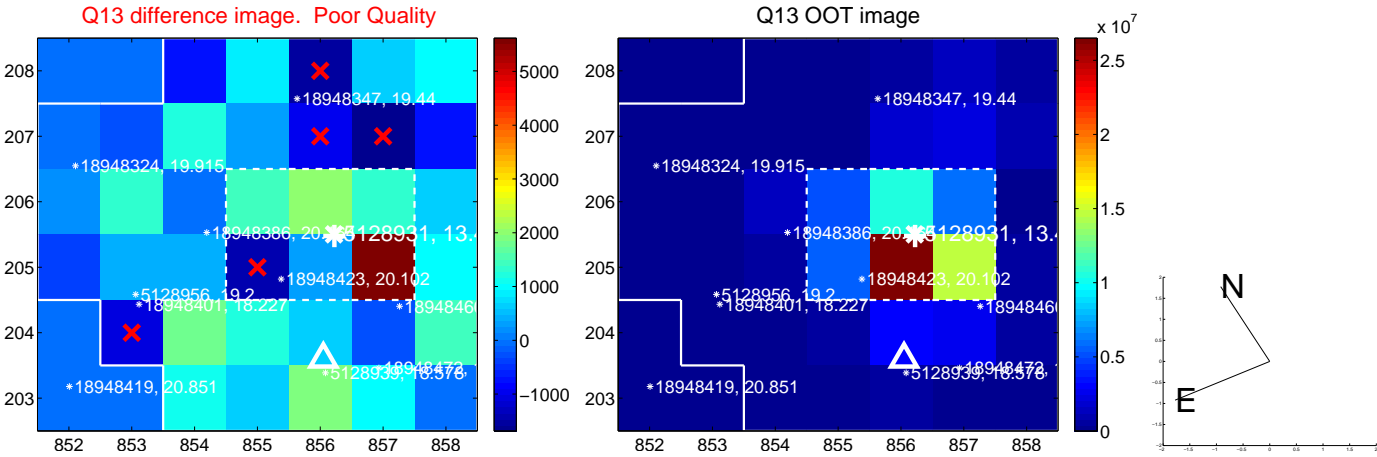


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

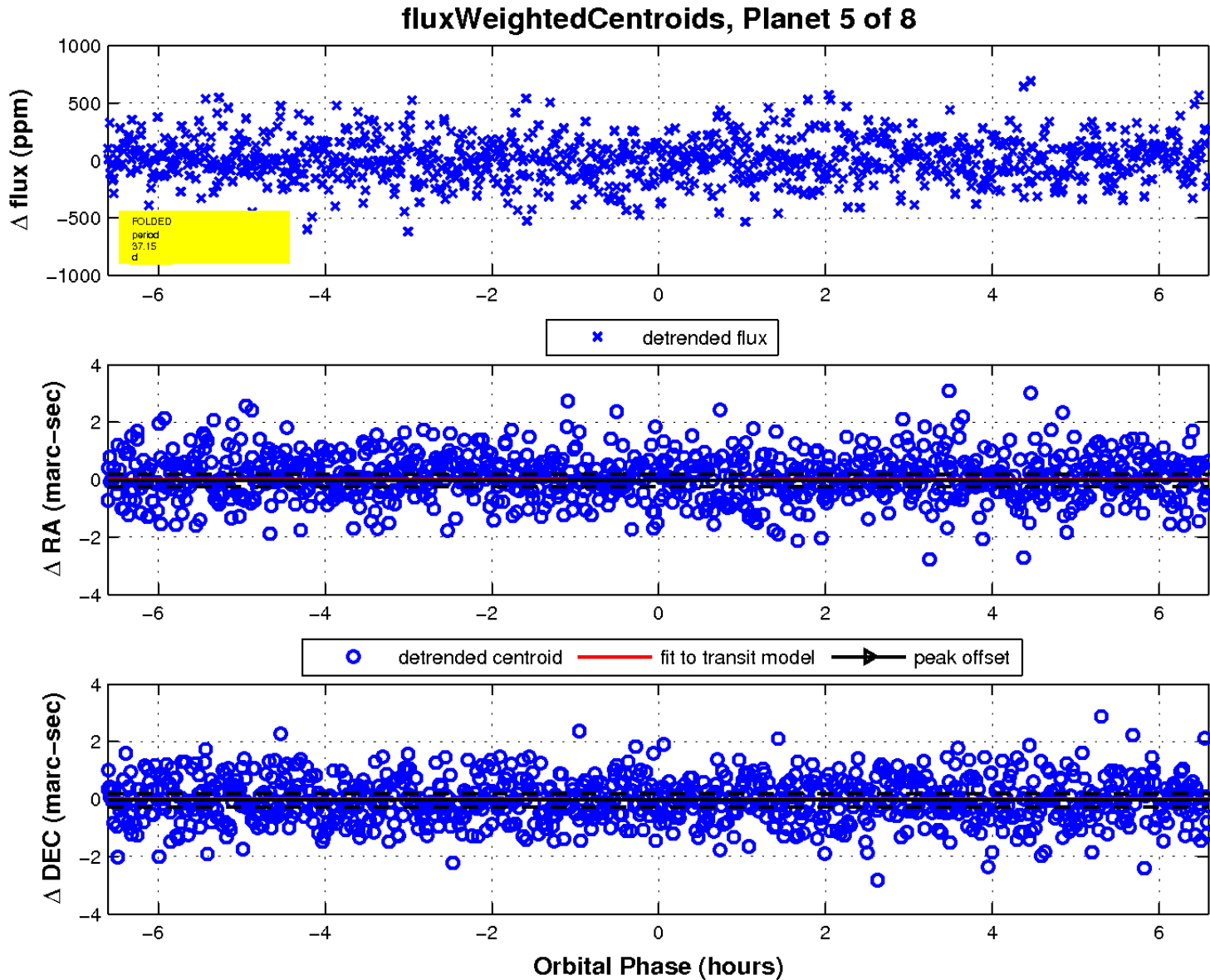
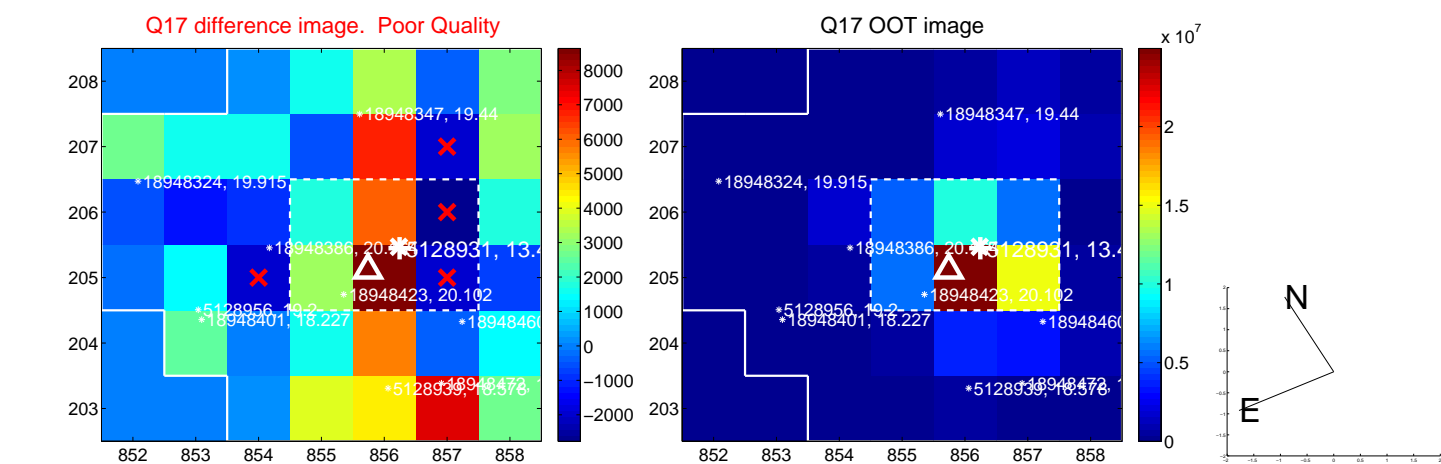




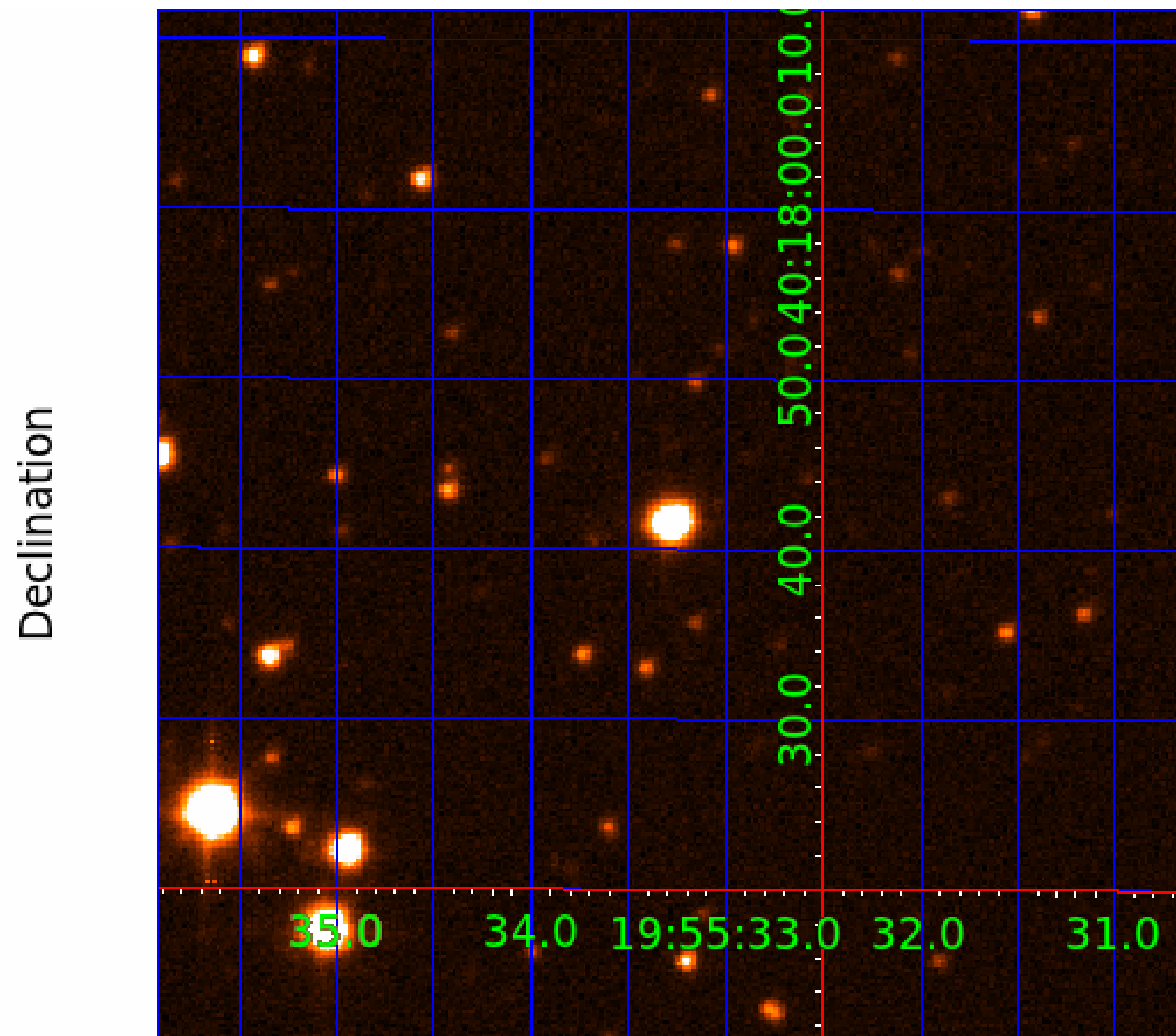
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005128931

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005128931-01	OBS	No	0.505298	131.562344	18.0	3.474	10.9	10.2	3.35	6211	1.52	0.00
005128931-02	OBS	No	33.997504	132.982782	539.0	1.290	12.2	11.5	3.35	6211	7.97	275.41
005128931-04	OBS	No	19.514973	131.733189	237.5	2.393	9.0	8.5	3.35	6211	5.85	577.33
005128931-05	OBS	No	37.145662	150.819517	361.3	2.204	13.8	7.8	3.35	6211	6.62	244.74
005128931-06	OBS	No	14.771871	140.019102	274.0	2.387	9.8	10.9	3.35	6211	6.47	836.89
005128931-07	OBS	No	28.583983	145.877110	490.1	0.960	9.2	9.5	3.35	6211	8.32	347.07
005128931-08	OBS	No	23.561503	140.282998	279.1	2.825	10.4	9.2	3.35	6211	6.30	449.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005128931-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
005128931-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005128931-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005128931-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

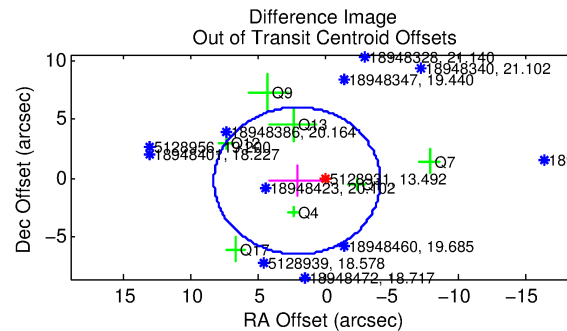
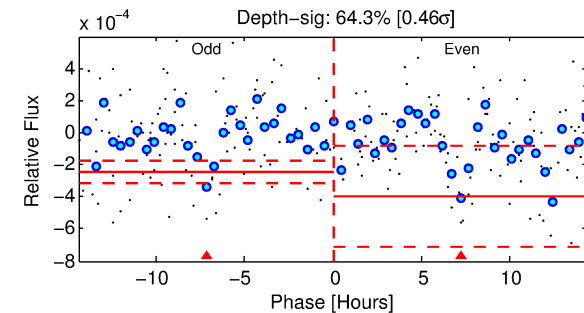
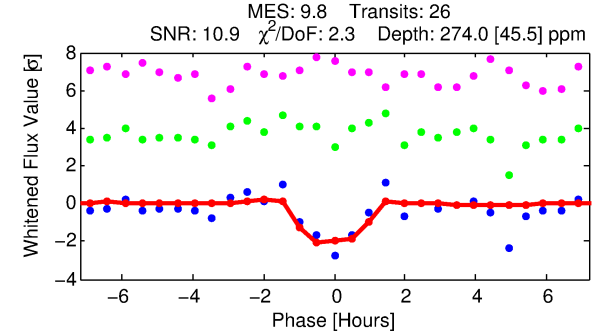
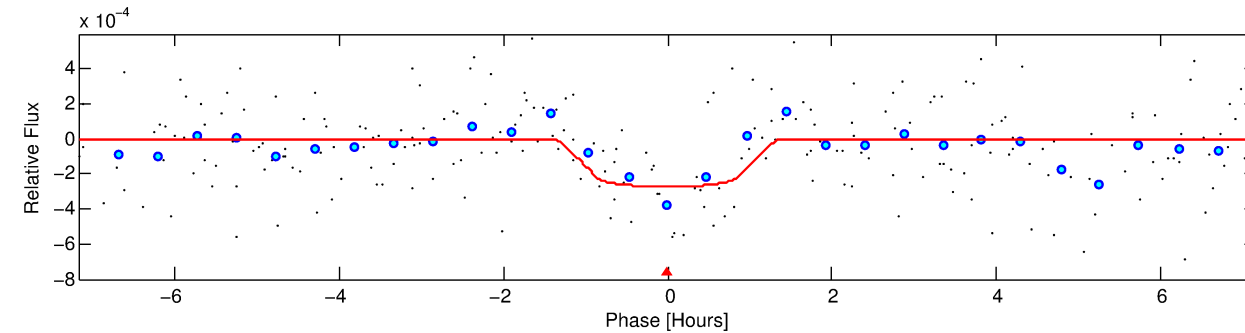
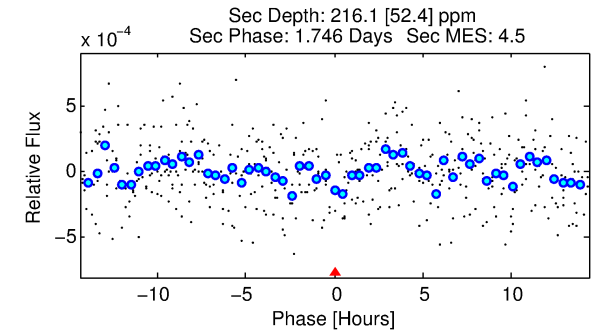
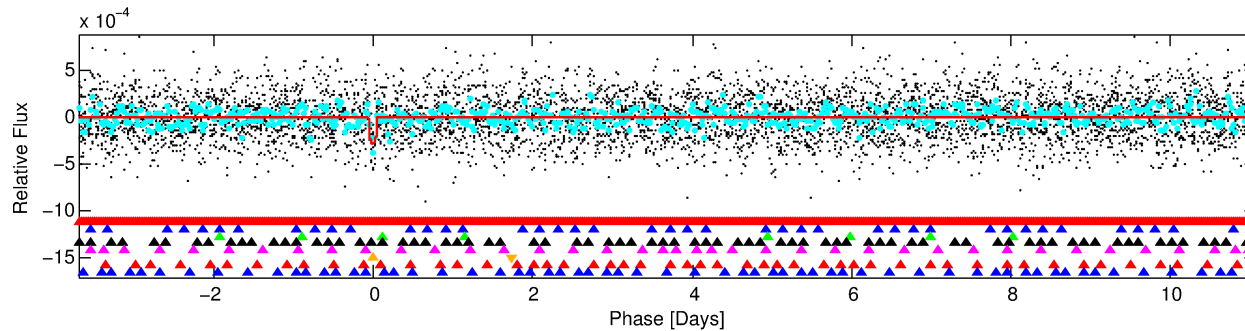
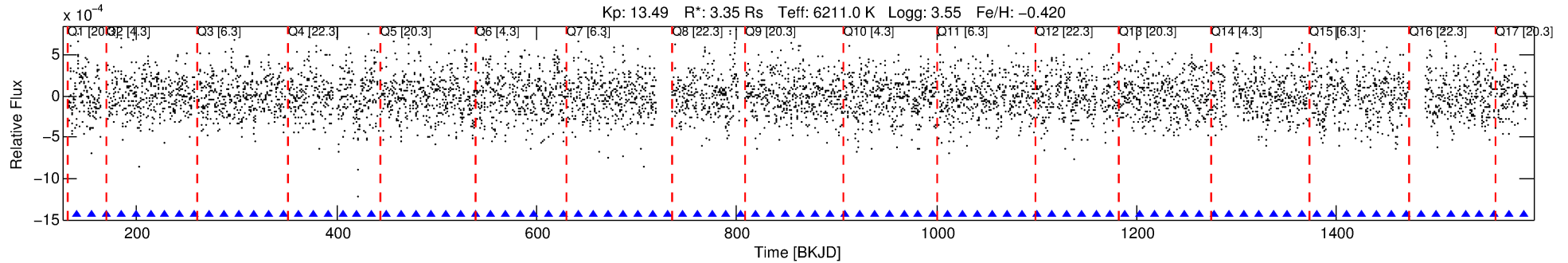
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005128931-06

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 6 of 8 Period: 14.772 d



## DV Fit Results:

Period = 14.77187 [0.00013] d  
Epoch = 140.0191 [0.0069] BKJD  
Rp/R\* = 0.0177 [0.0116]  
a/R\* = 23.04 [81.73]  
b = 0.89 [0.81]  
Seff = 836.89 [517.84]  
Teq = 1371 [212] K  
Rp = 6.47 [5.01] Re  
a = 0.1339 [0.0518] AU  
Ag = 50.83 [74.29] [0.67σ]  
Teffp = 5662 [1890] K [2.26σ]

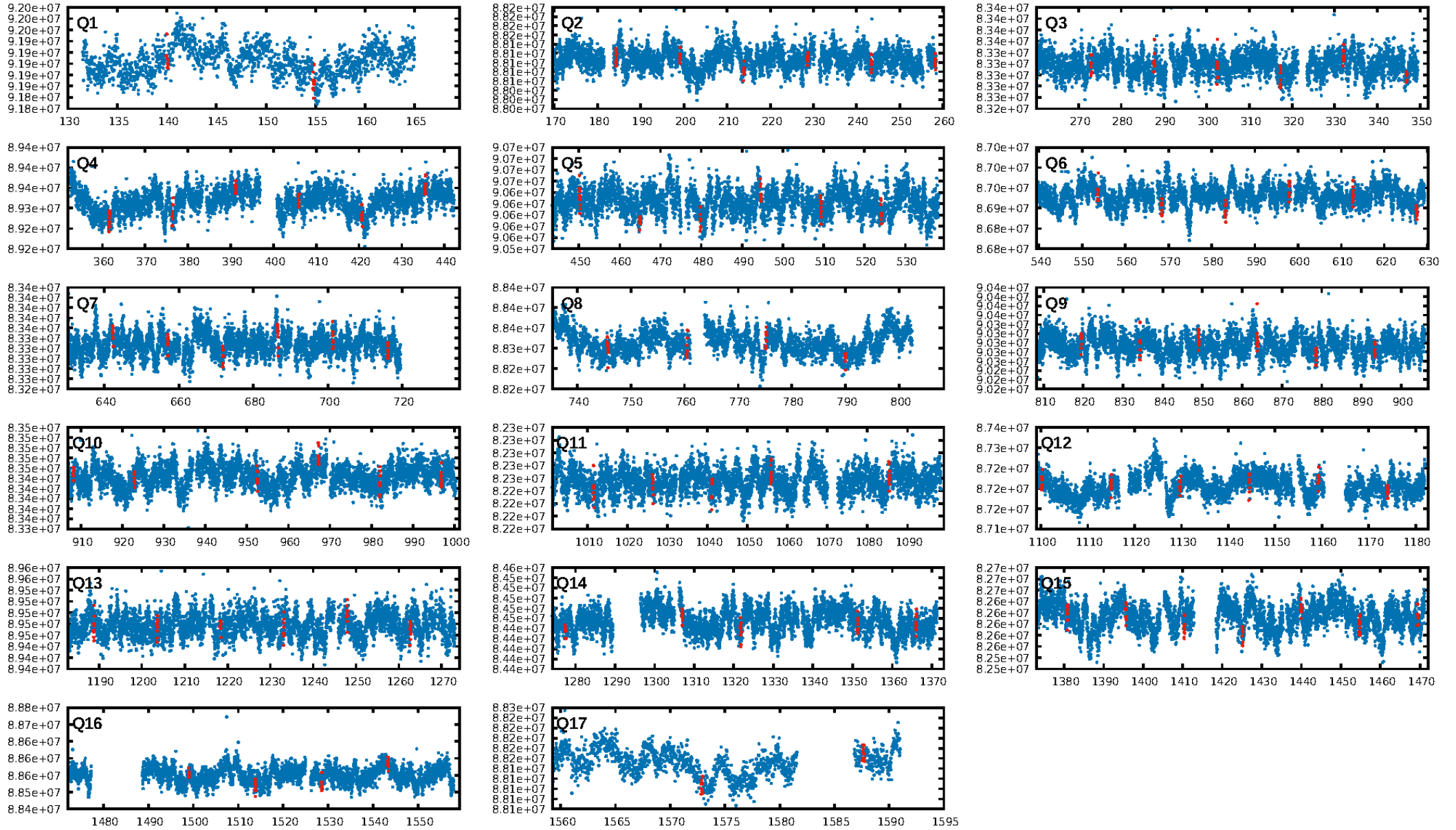
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [81.23σ]  
LongPeriod-sig: 100.0% [33.68σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.07e-10  
RollingBand-fgt: 1.00 [25/25]  
GhostDiagnostic-chr: 0.3973  
Centroid-sig: 3.3%  
Centroid-so: 0.630 arcsec [1.42σ]  
OotOffset-rm: 2.065 arcsec [1.00σ]  
OotOffset-st: 0/1/2/4 [7]  
KicOffset-rm: 2.067 arcsec [1.00σ]  
KicOffset-st: 0/1/2/4 [7]  
DiffImageQuality-fgm: 0.00 [0/7]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:01:01 Z

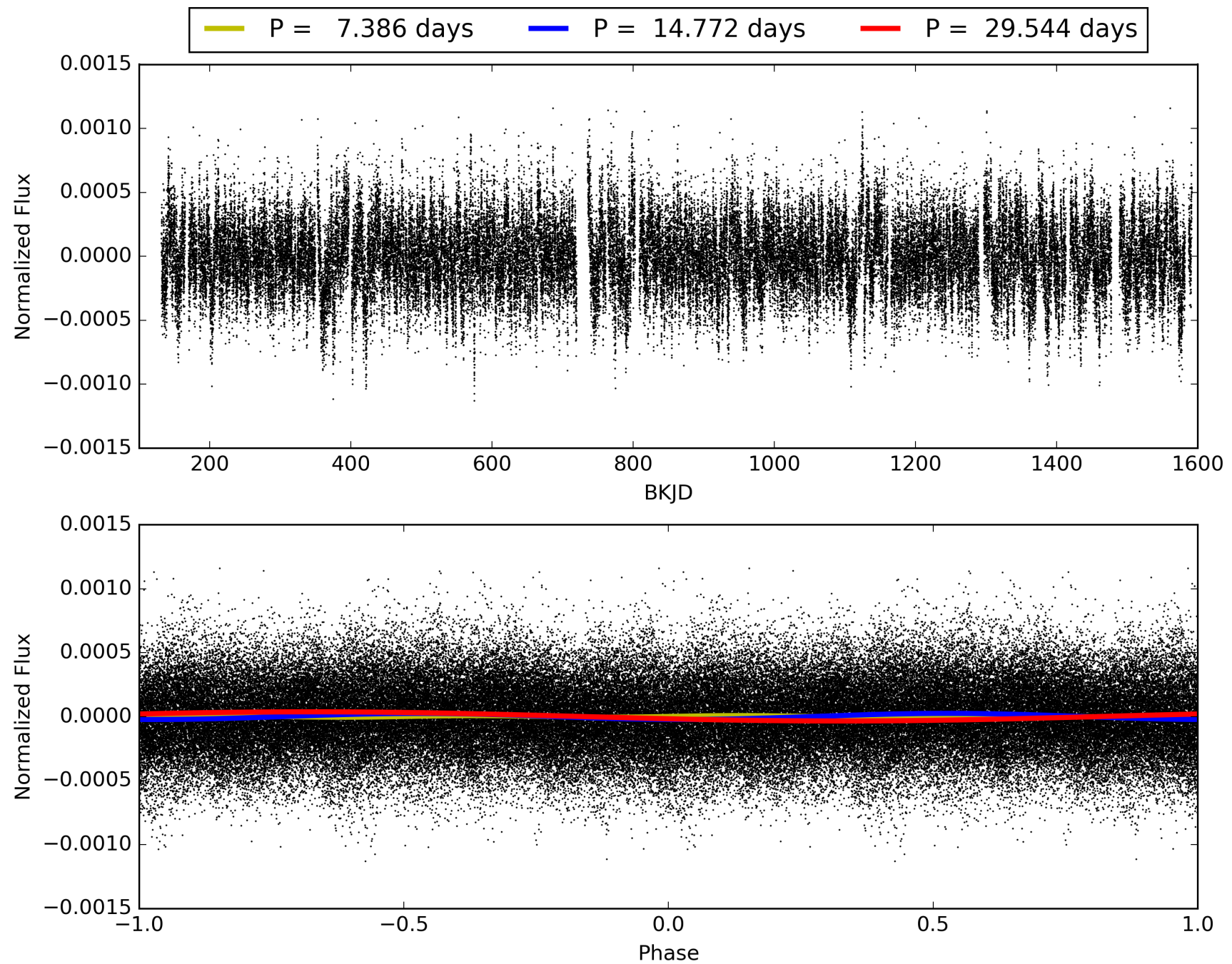
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005128931-06, PDC Light Curves



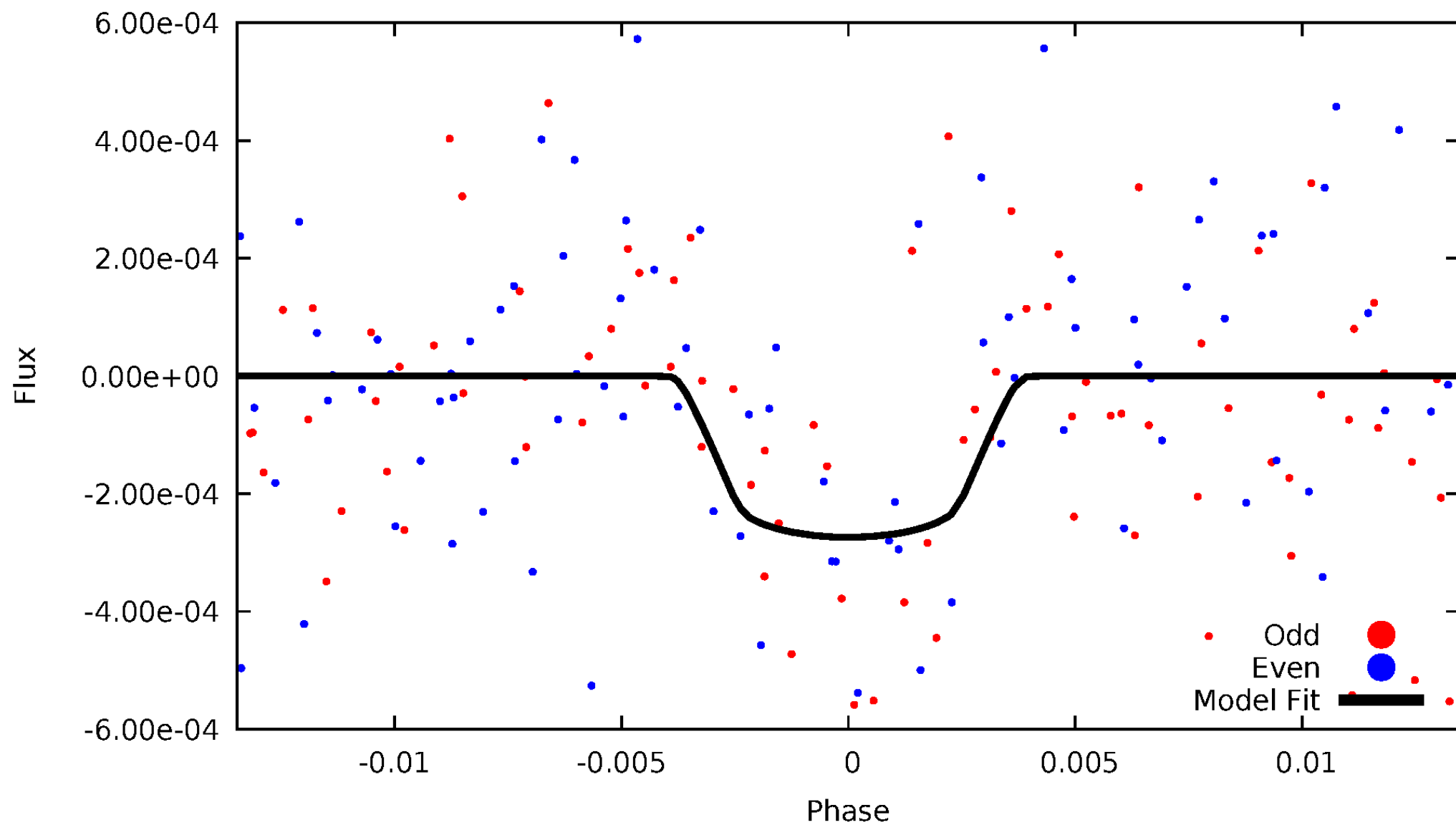


TCE 005128931-06



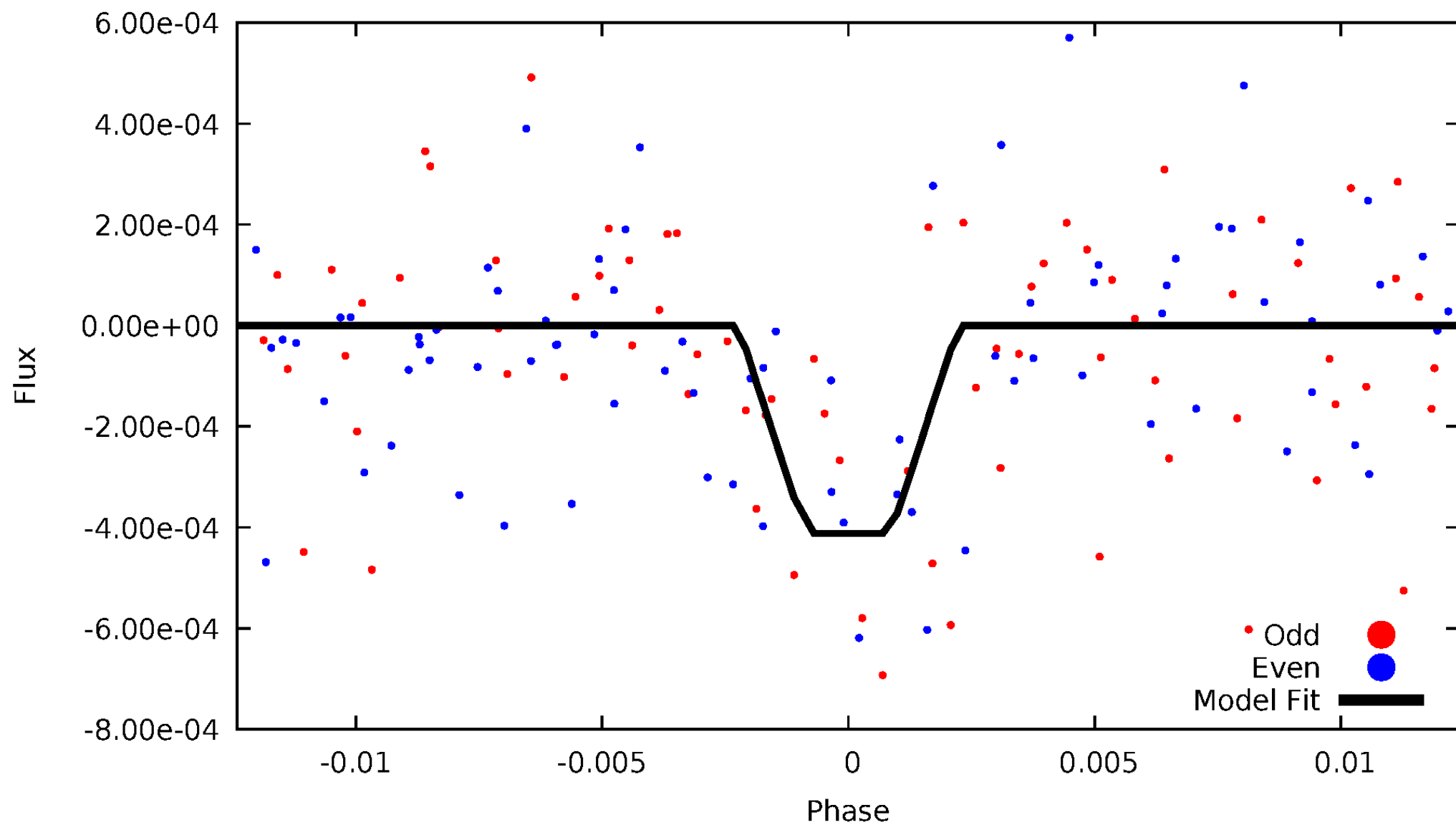
# DV Odd/Even

TCE 005128931-06



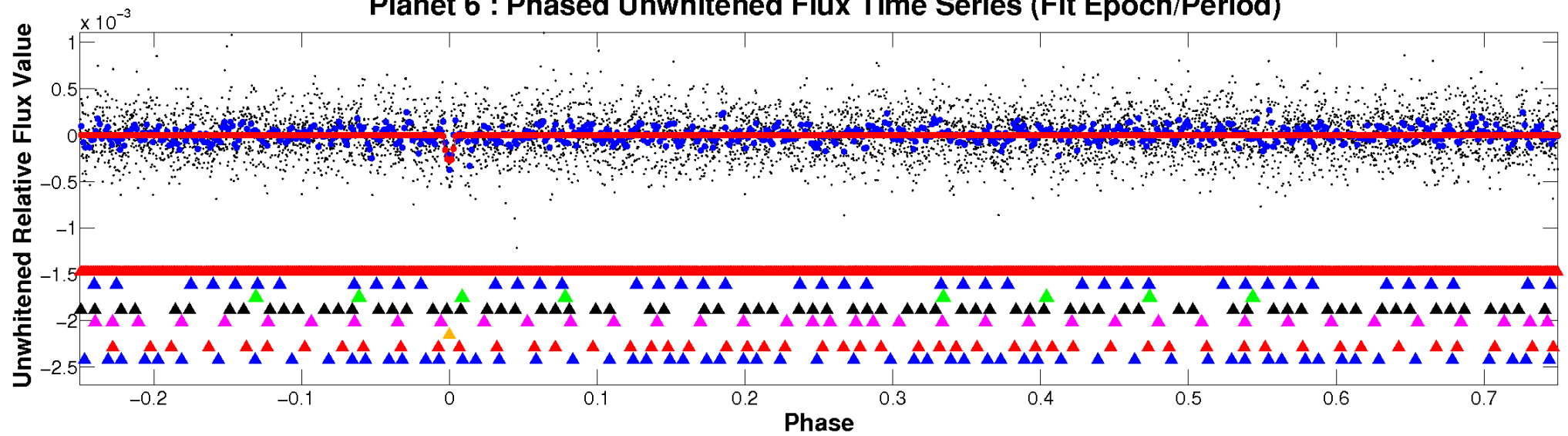
# ALT Odd/Even

TCE 005128931-06

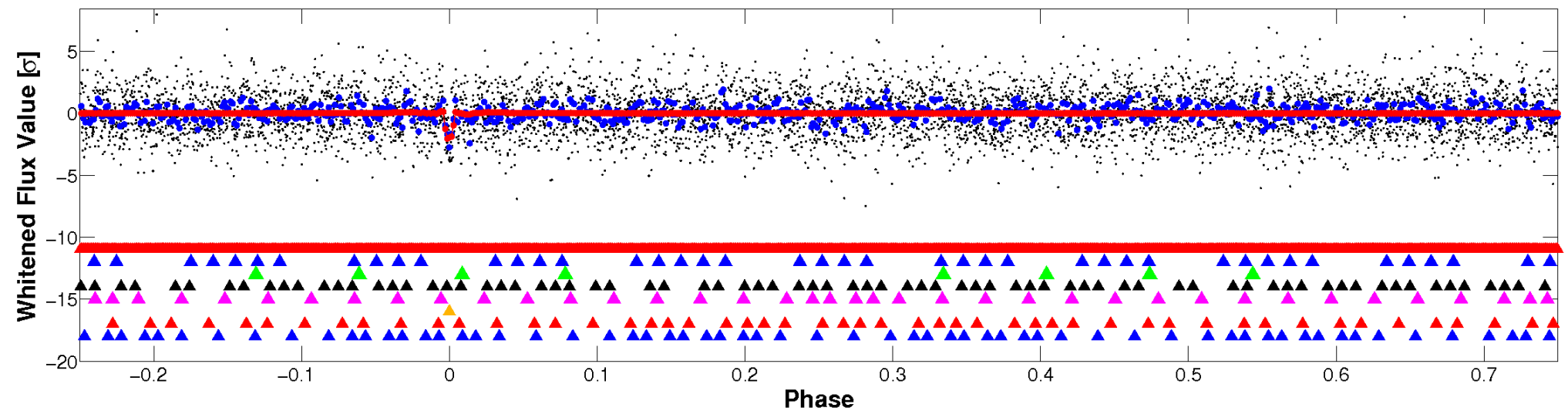


# Non-Whitened Vs. Whitened Light Curve

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

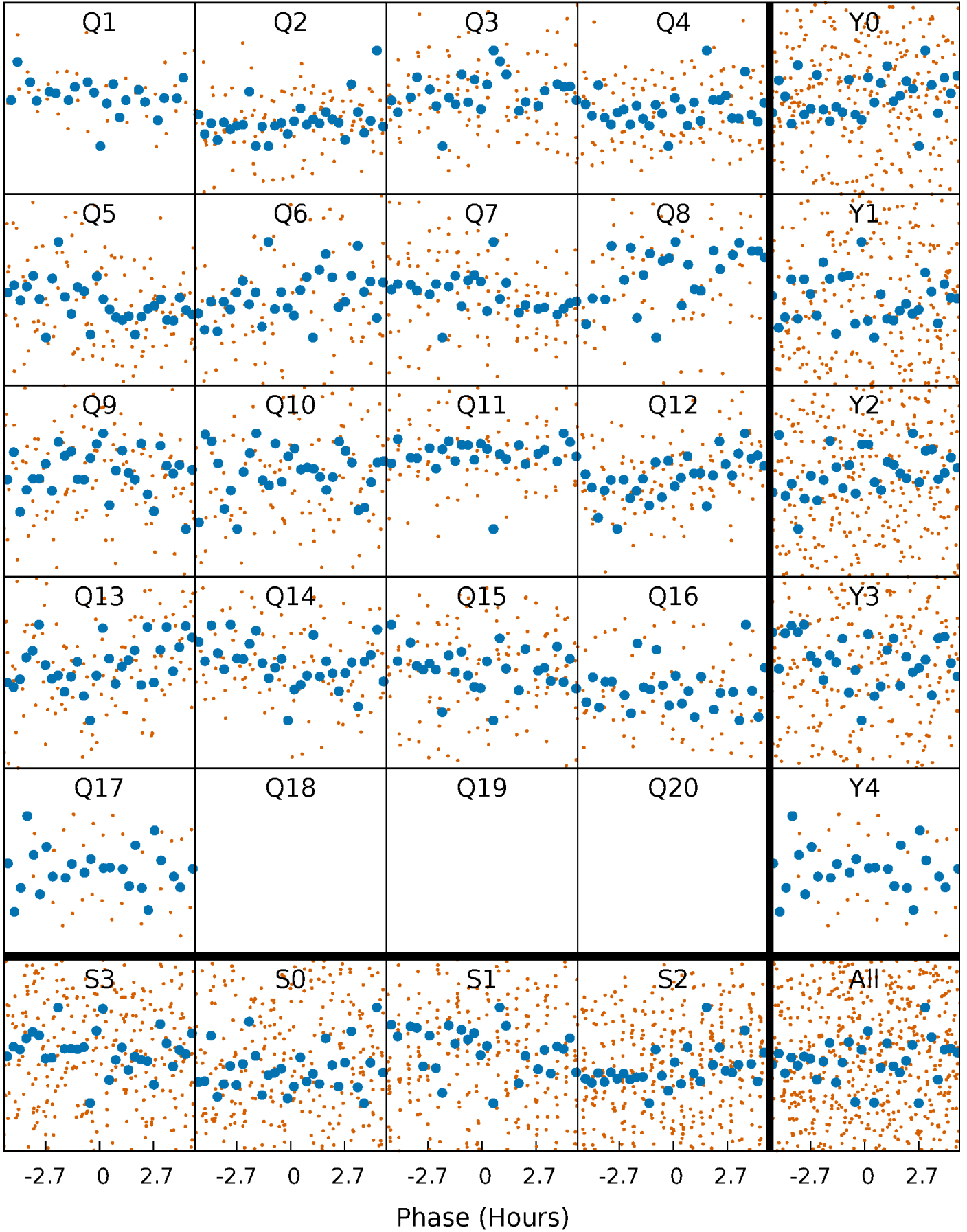


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



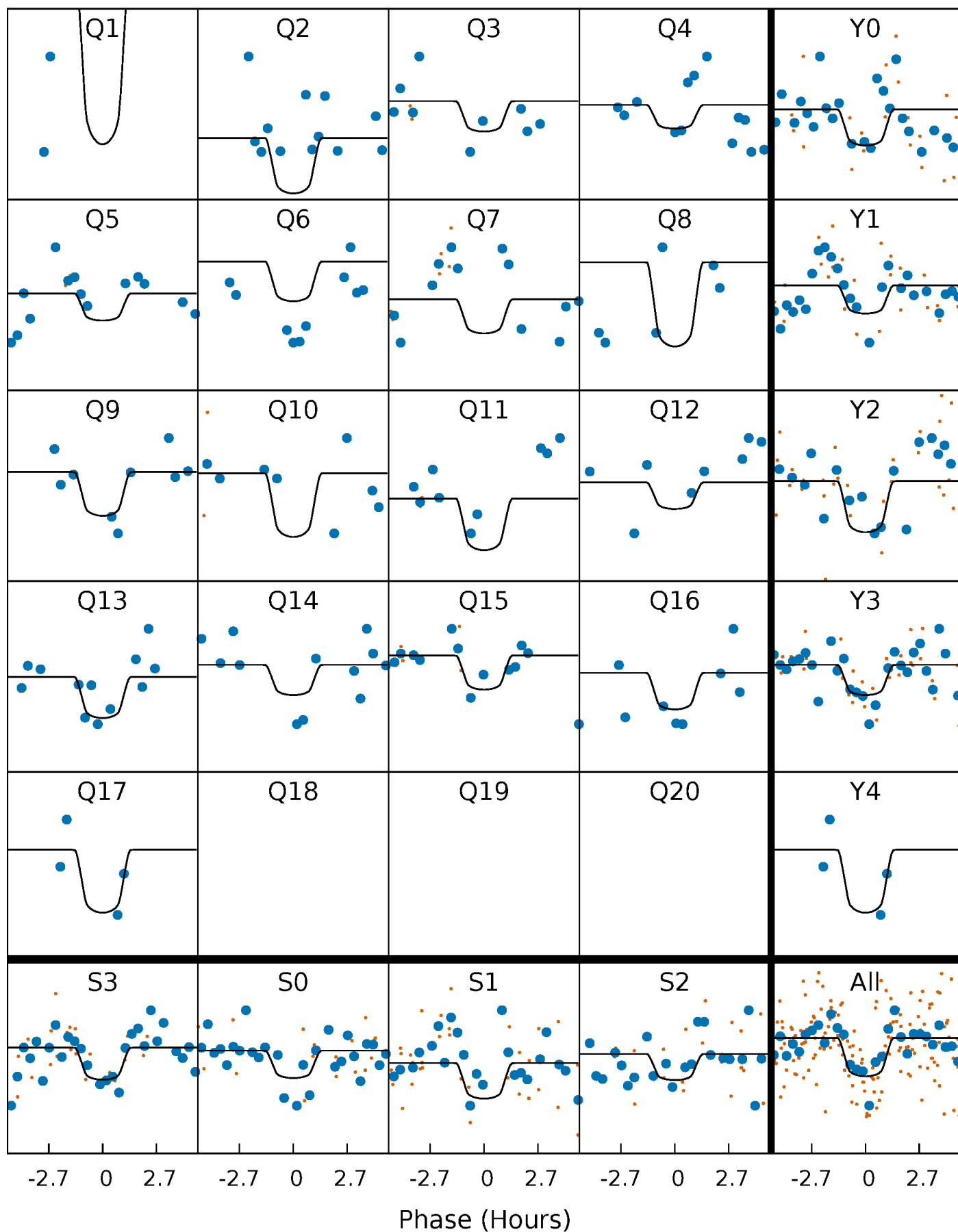
# PDC Quarter-Phased Transit Curves

TCE 005128931-06 P= 14.771871 Days  $T_0=140.019103$  (BKJD)



# DV Quarter-Phased Transit Curves

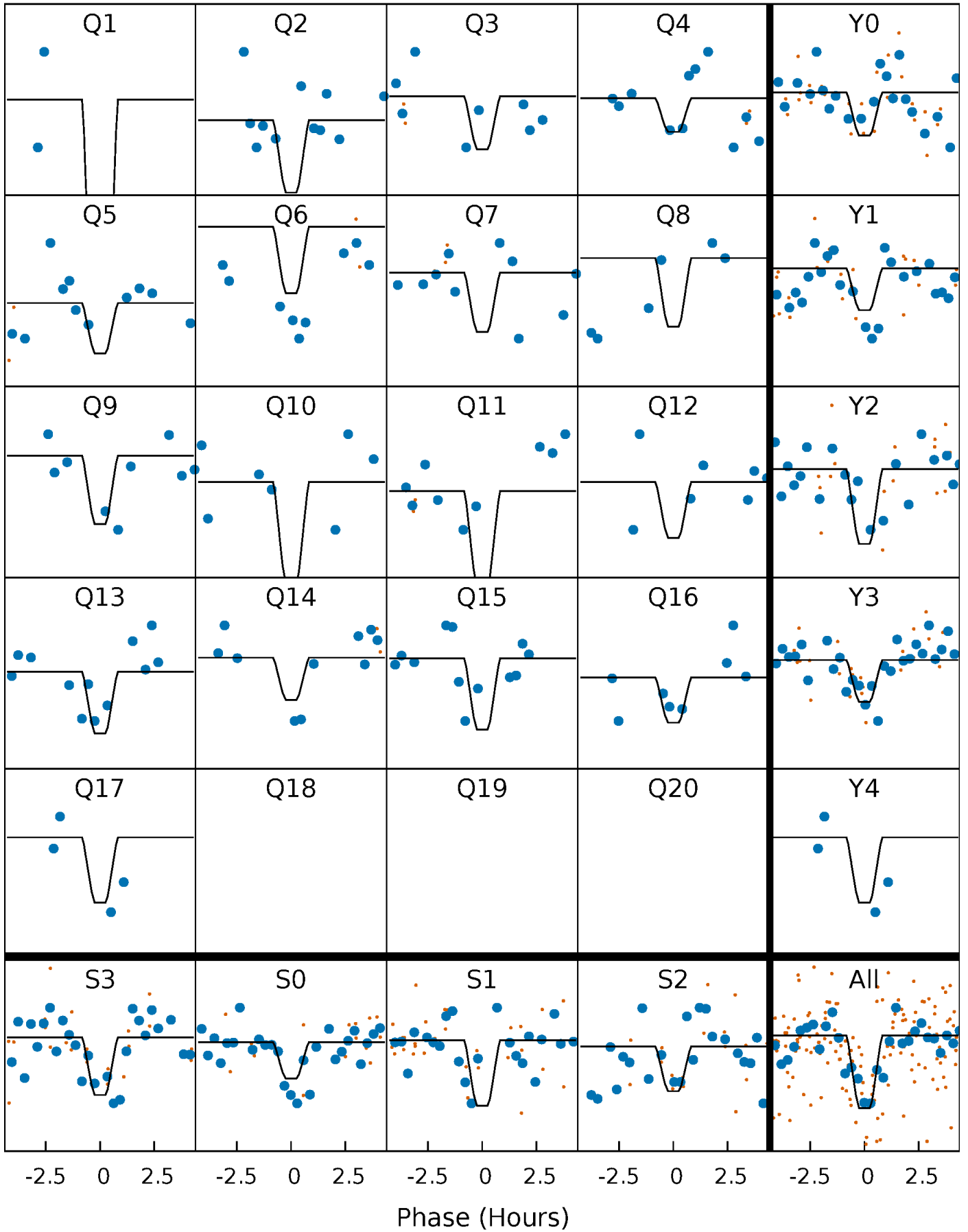
TCE 005128931-06 P= 14.771871 Days  $T_0=140.019103$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

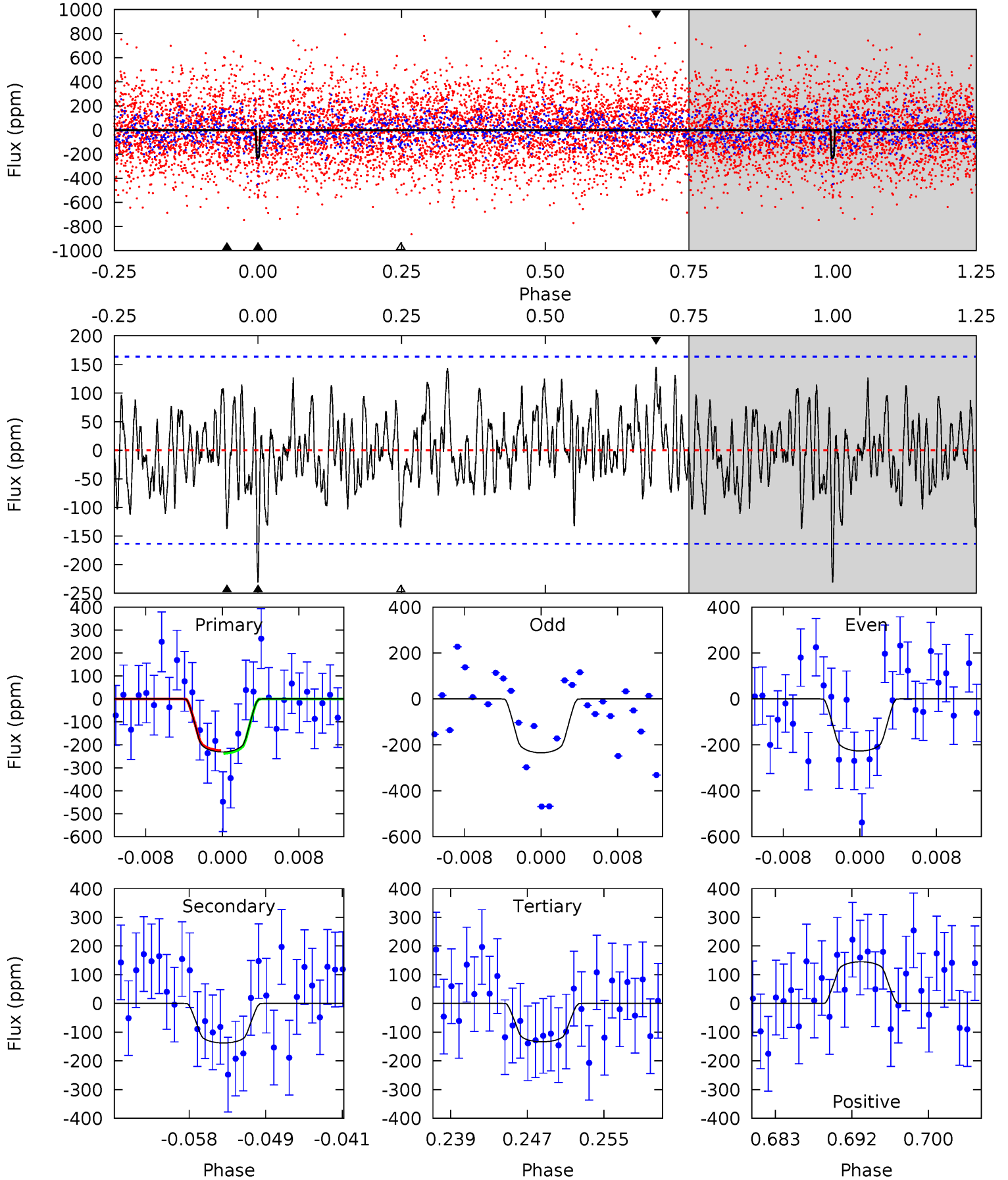
TCE 005128931-06 P= 14.771911 Days  $T_0=140.015735$  (BKJD)



# DV Model-Shift Uniqueness Test

005128931-06,  $P = 14.771871$  Days,  $E = 125.247232$  Days

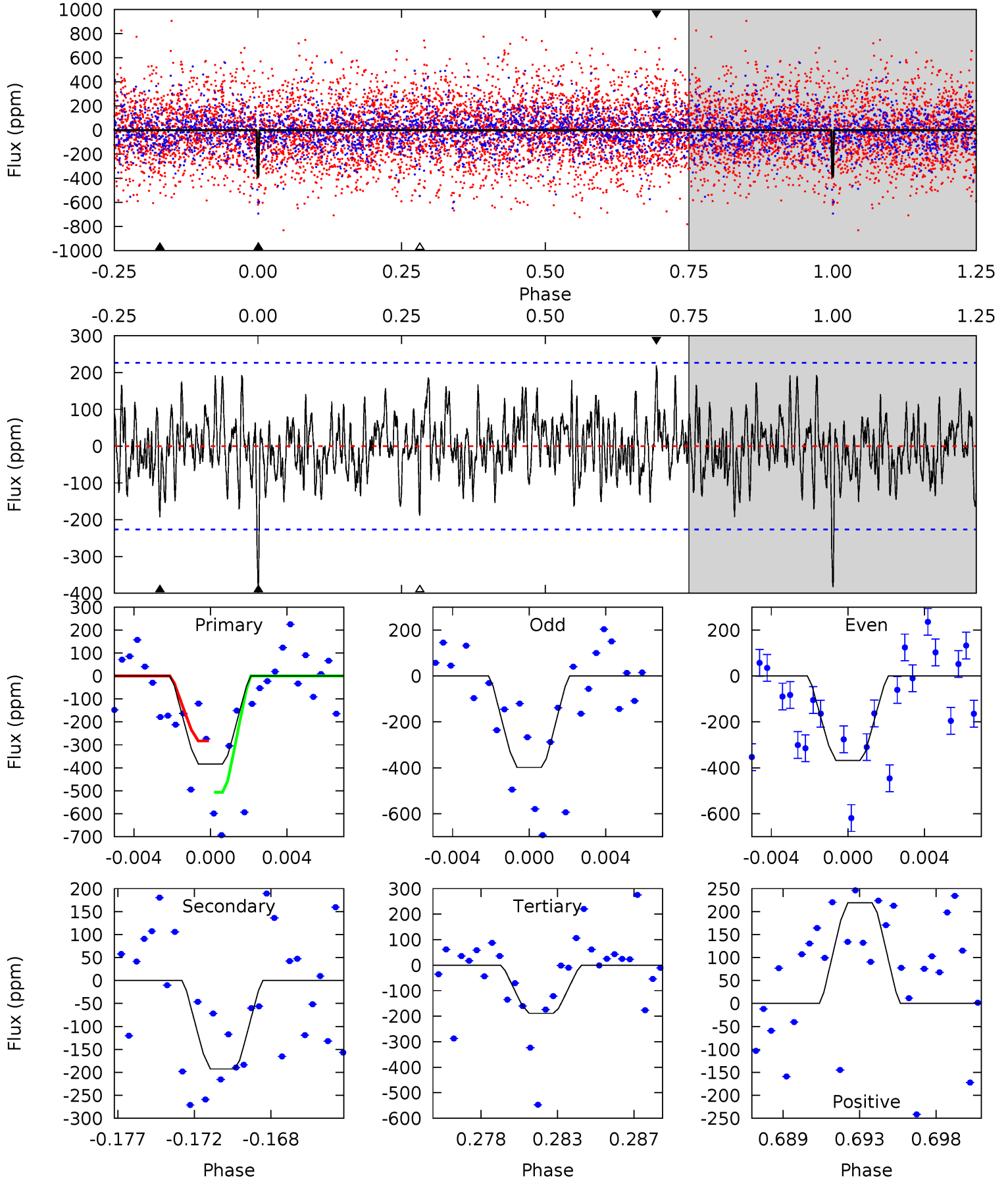
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.16	4.27	4.14	4.50	5.06	2.64	1.60	3.02	2.66	0.13	-0.23	0.12	0.76	0.39	0.19



# Alt Model-Shift Uniqueness Test

005128931-06,  $P = 14.771911$  Days,  $E = 125.243824$  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
8.76	4.40	4.32	5.01	5.18	2.85	1.55	4.45	3.75	0.09	-0.61	0.35	1.33	0.36	2.55



### Stellar Parameters For KIC 005128931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-138 \pm 32$	$6.42^{+4.20}_{-3.61}$	$1890^{+130}_{-202}$	$4941^{+2599}_{-856}$	$32^{+140}_{-20}$
Alt.	$-192 \pm 44$	$7.39^{+4.25}_{-3.94}$	$1886^{+122}_{-195}$	$4995^{+2179}_{-781}$	$33^{+119}_{-20}$

$T_{max}$  = 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

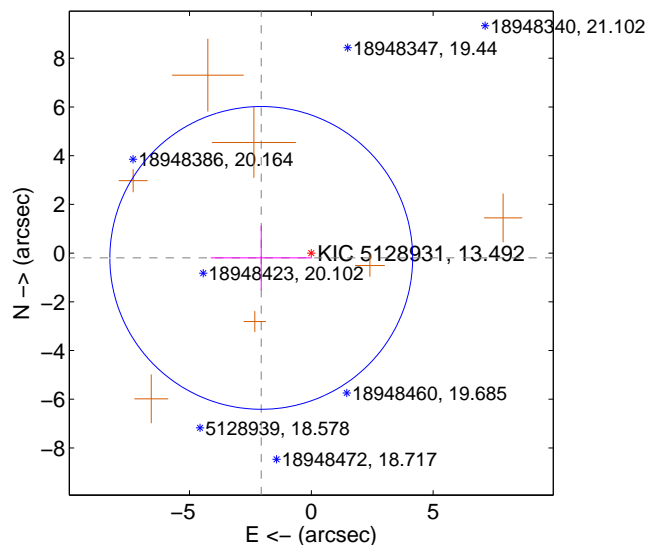
Supplemental centroid analysis for 005128931-06. Kepler magnitude: 13.49. Transit SNR 10.86

There are 0 quarters with good PRF difference image offsets

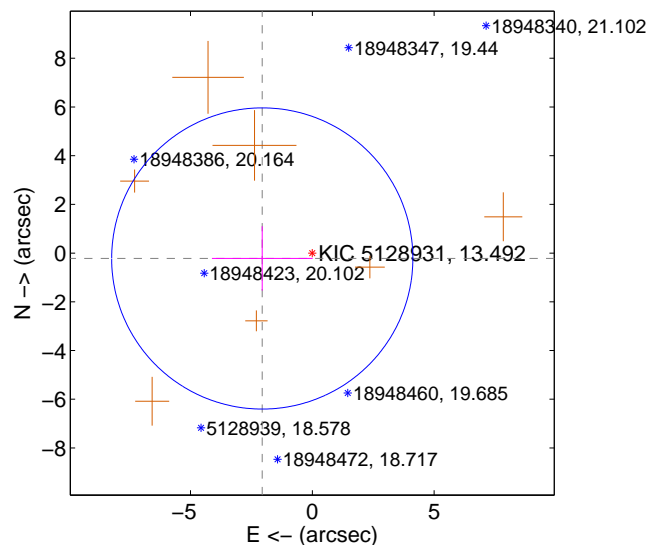
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.065 \pm 2.072$	1.00	$2.055 \pm 2.077$	$-0.197 \pm 1.324$
PRF-fit source offset from KIC position	$2.067 \pm 2.061$	1.00	$2.055 \pm 2.068$	$-0.221 \pm 1.321$
photometric centroid source offset	$0.63 \pm 0.44$	1.42	$-0.17 \pm 0.45$	$-0.61 \pm 0.44$

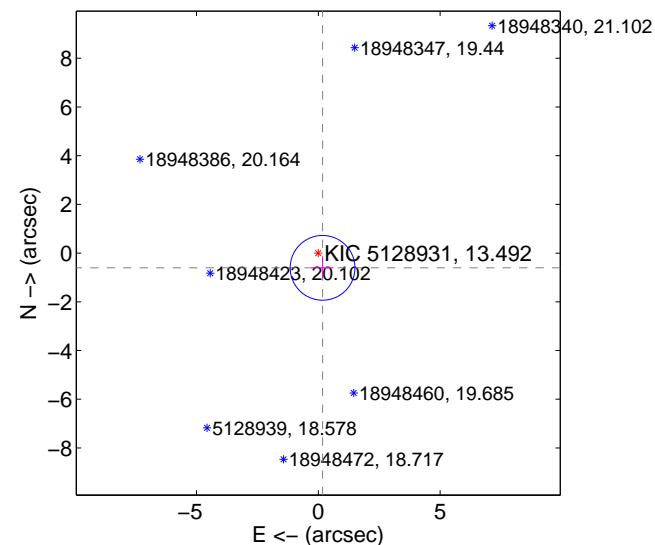
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

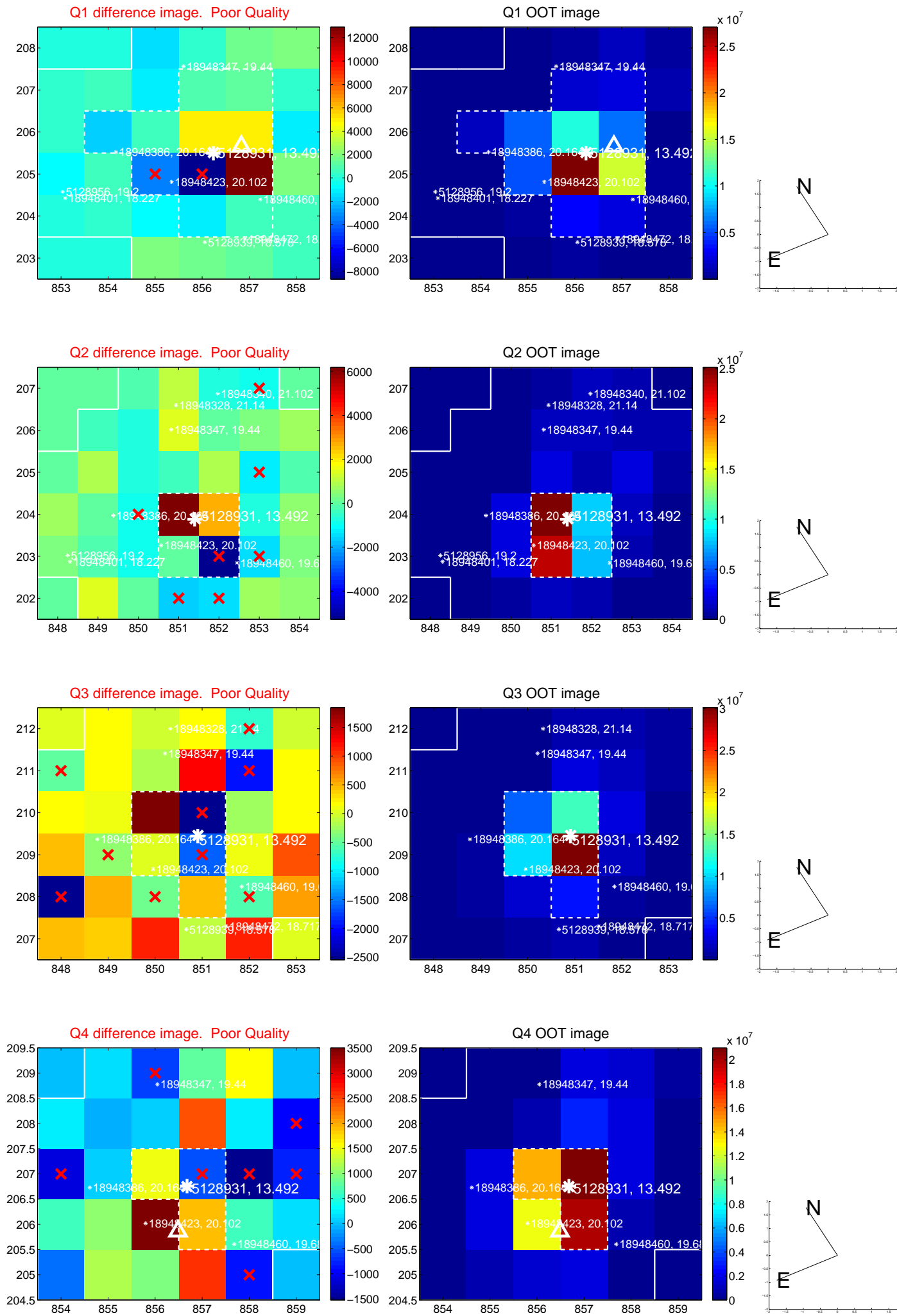


offset from photometric centroids

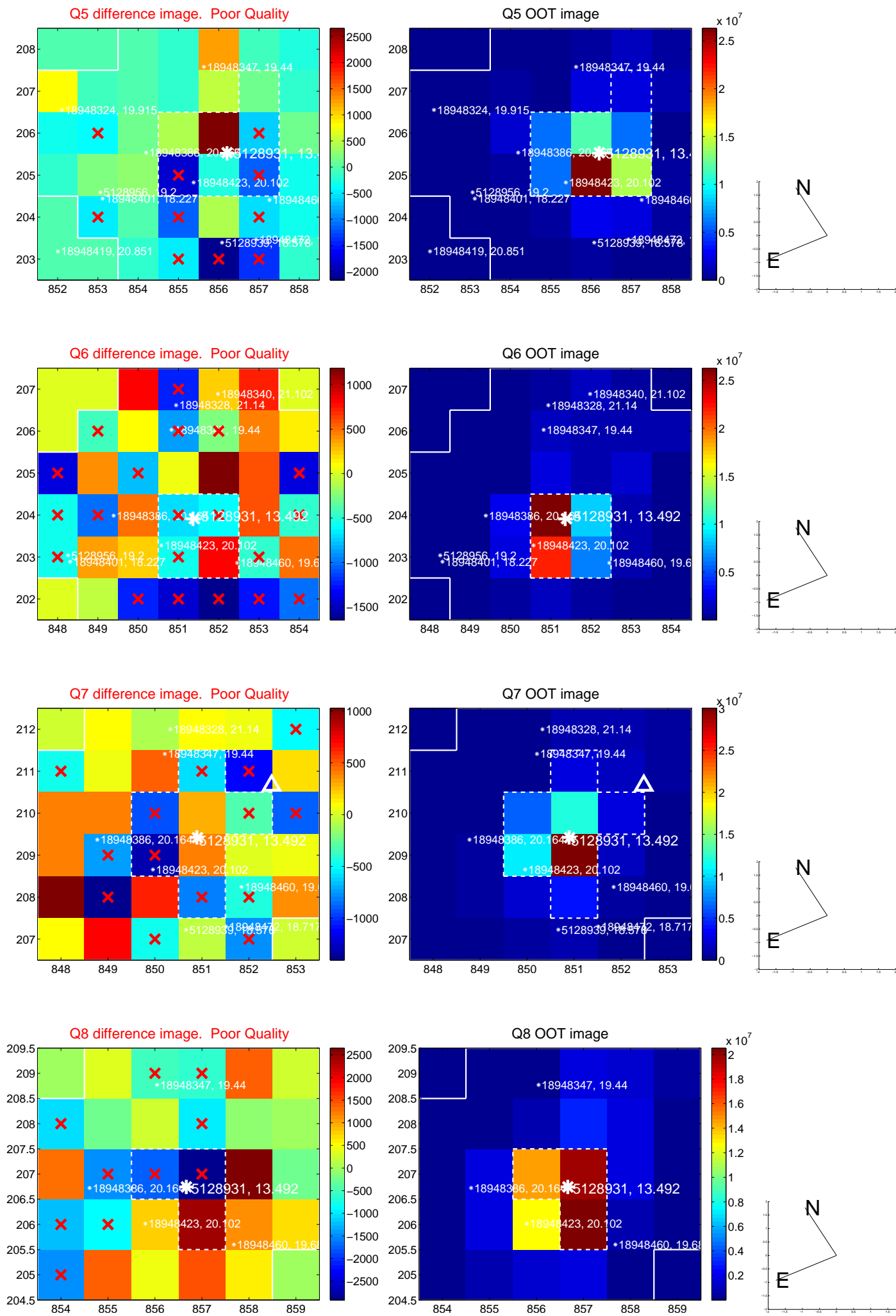


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

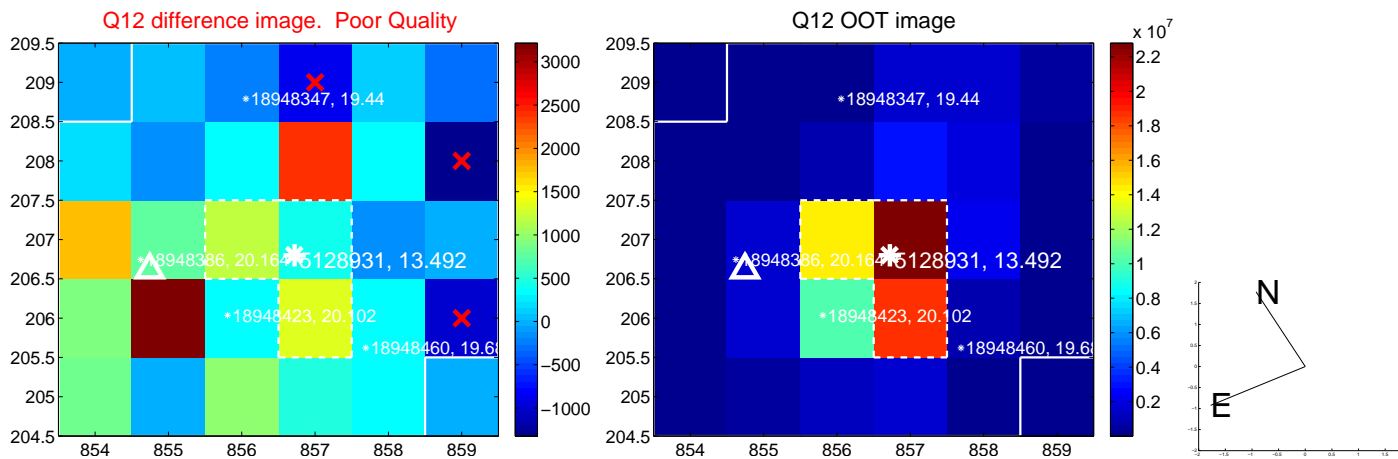
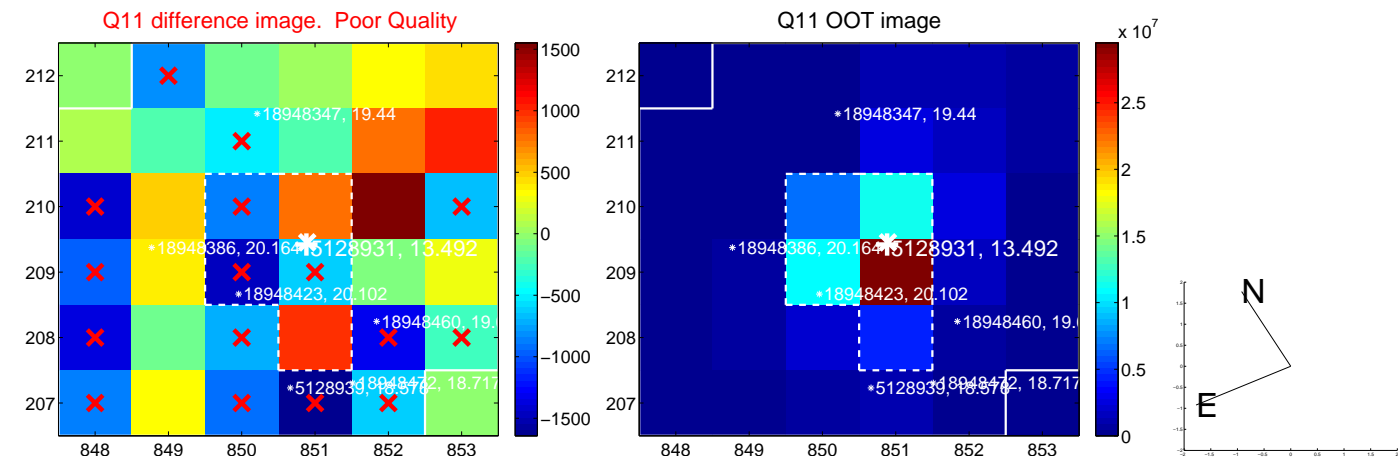
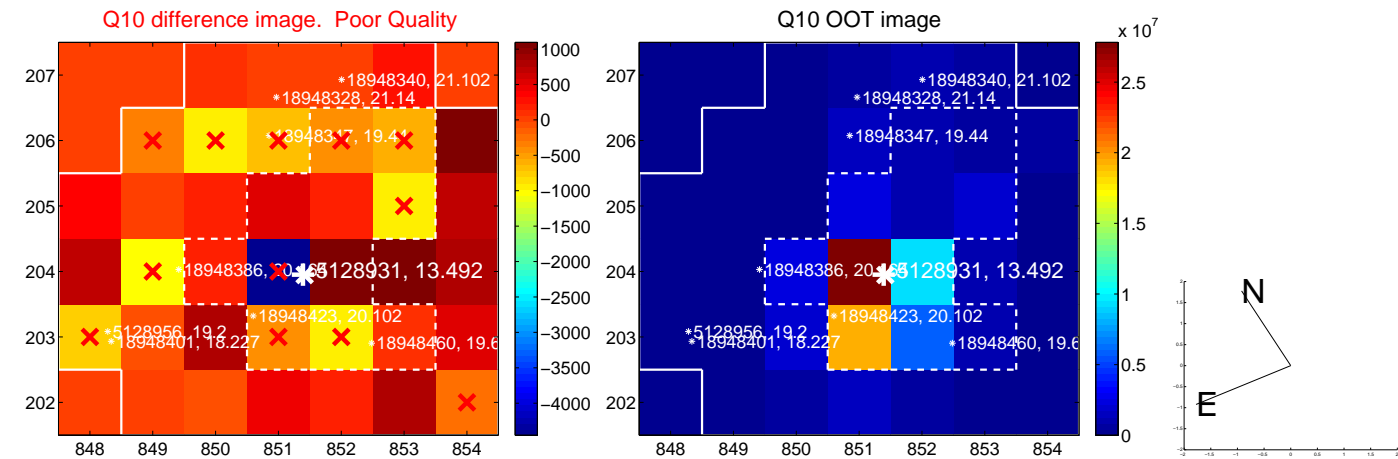
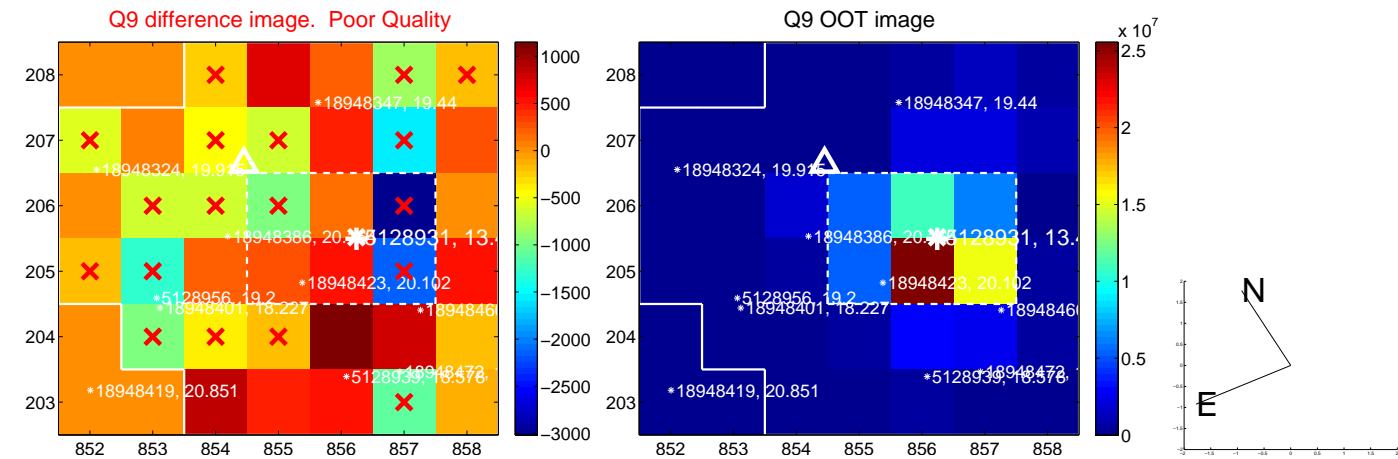


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

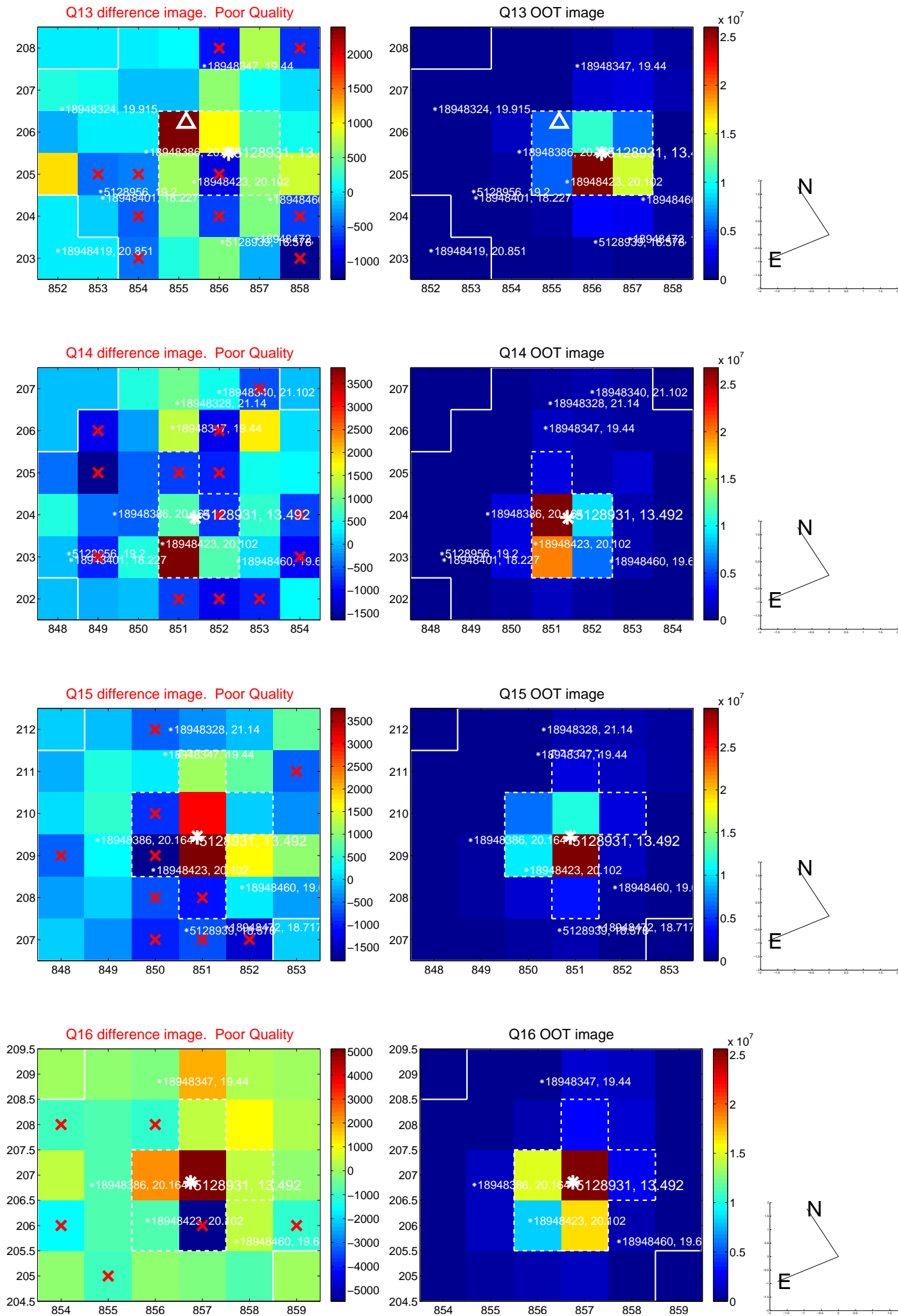




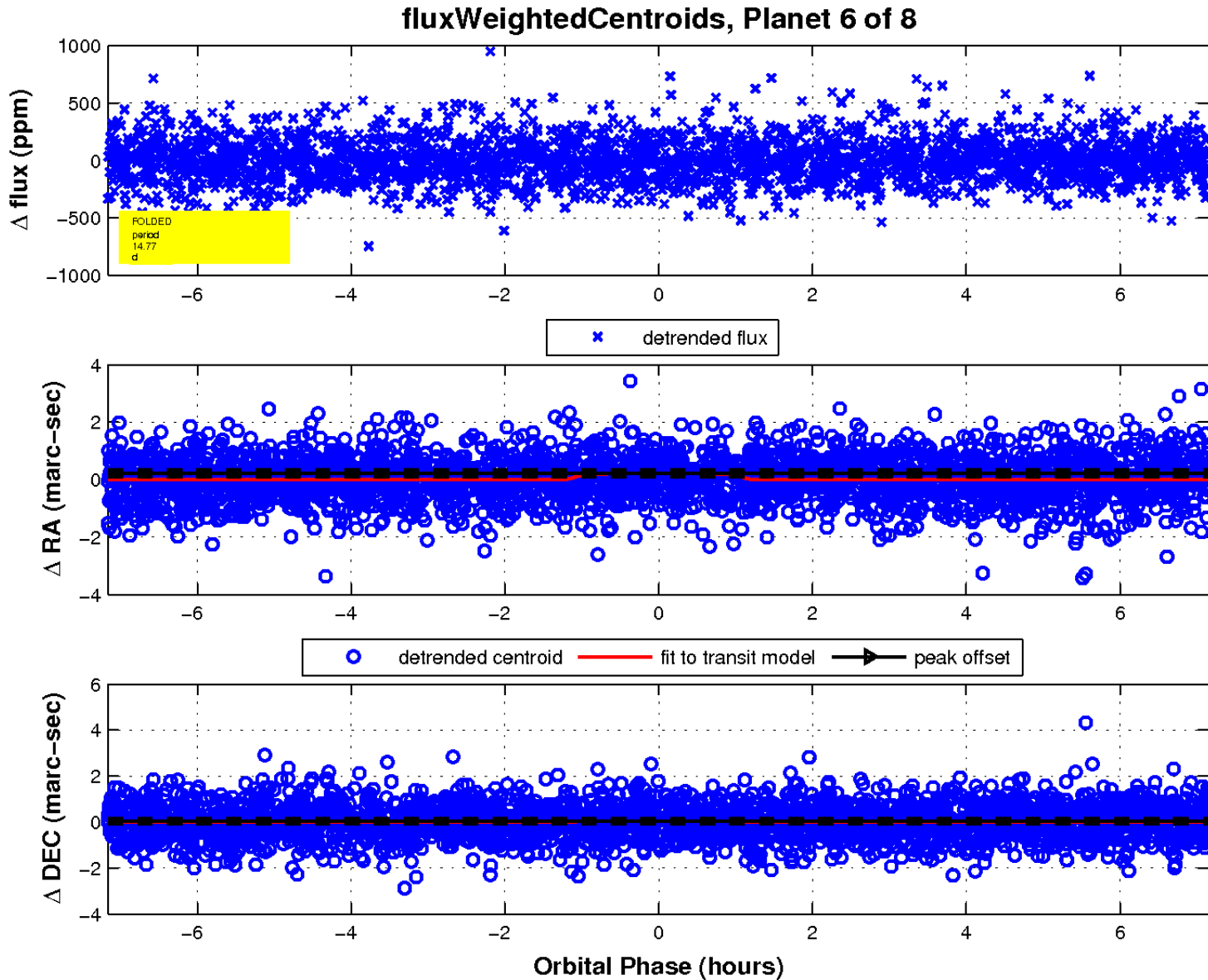
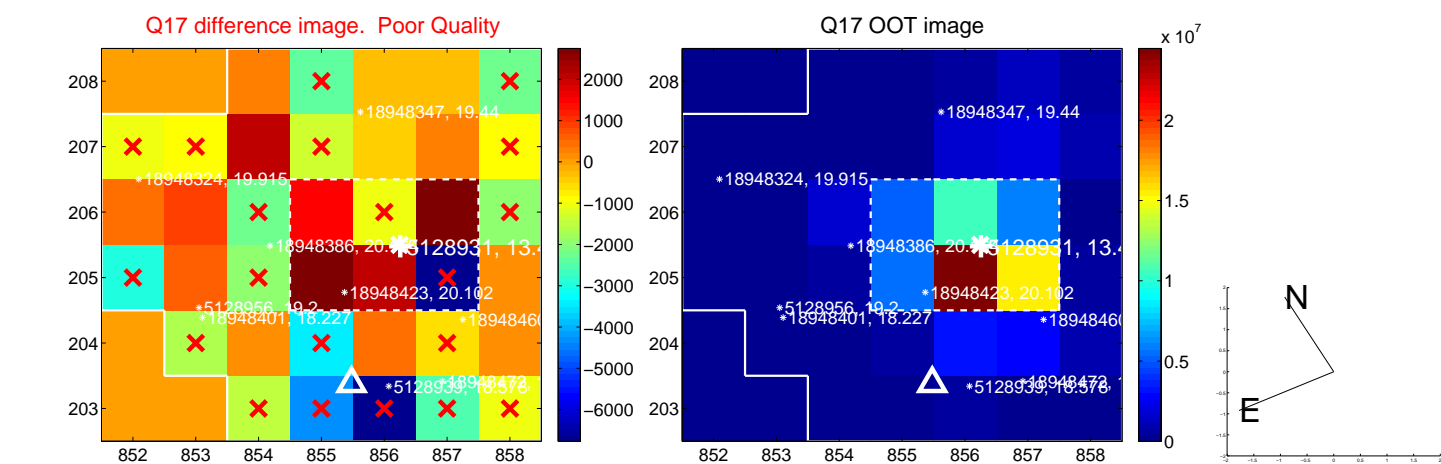
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



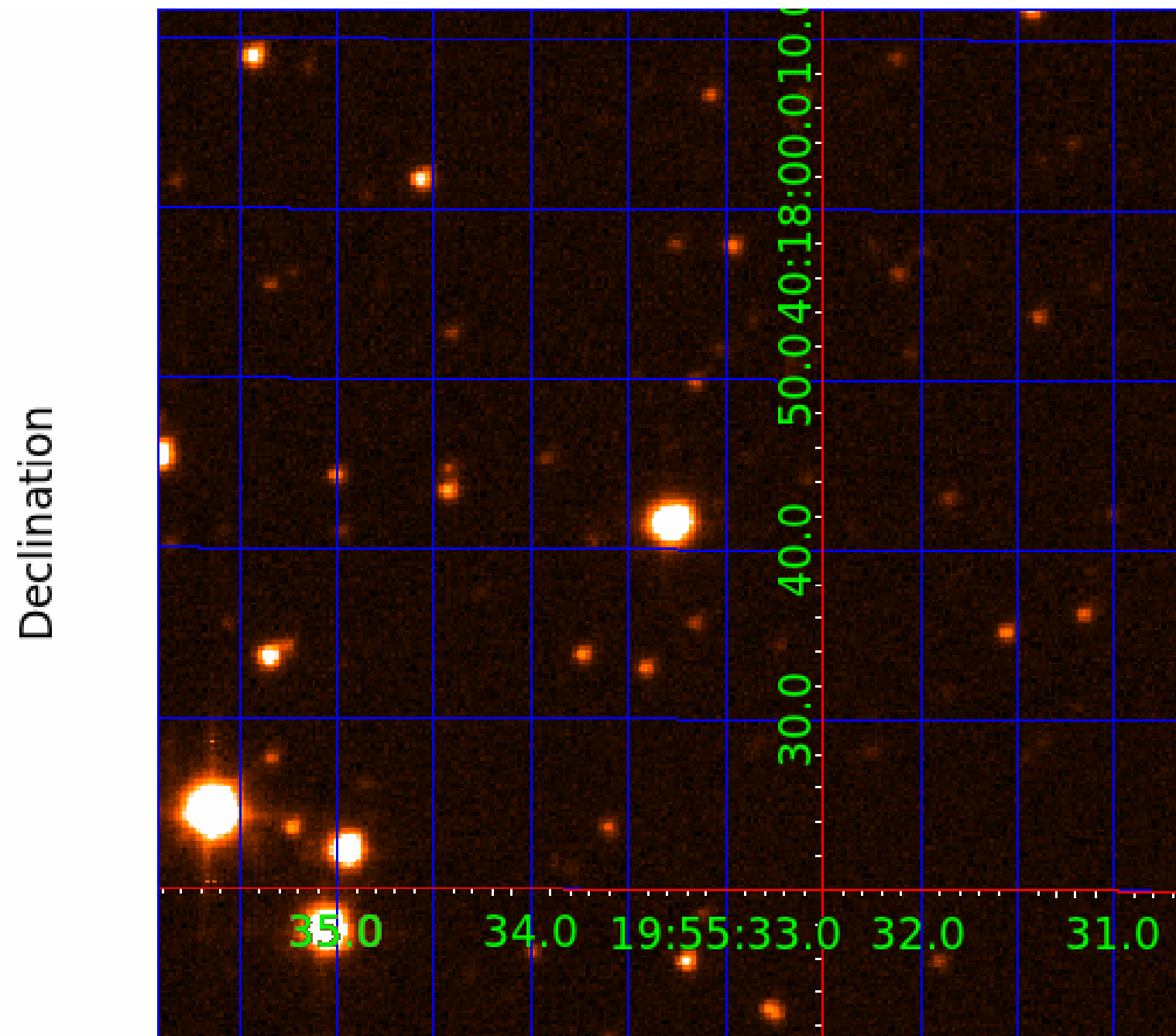
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005128931

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005128931-01	OBS	No	0.505298	131.562344	18.0	3.474	10.9	10.2	3.35	6211	1.52	0.00
005128931-02	OBS	No	33.997504	132.982782	539.0	1.290	12.2	11.5	3.35	6211	7.97	275.41
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005128931-05	OBS	No	37.145662	150.819517	361.3	2.204	13.8	7.8	3.35	6211	6.62	244.74
005128931-06	OBS	No	14.771871	140.019102	274.0	2.387	9.8	10.9	3.35	6211	6.47	836.89
005128931-07	OBS	No	28.583983	145.877110	490.1	0.960	9.2	9.5	3.35	6211	8.32	347.07
005128931-08	OBS	No	23.561503	140.282998	279.1	2.825	10.4	9.2	3.35	6211	6.30	449.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005128931-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
005128931-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005128931-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005128931-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

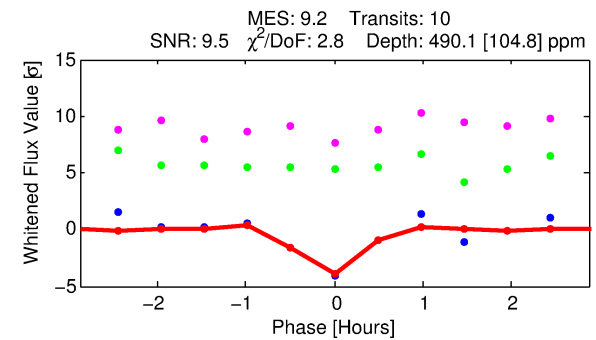
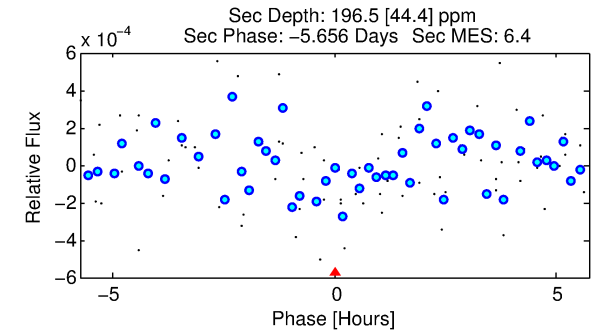
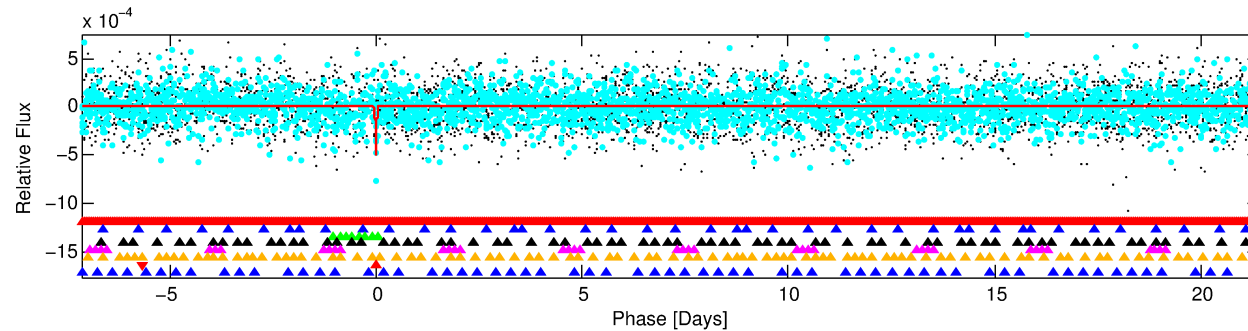
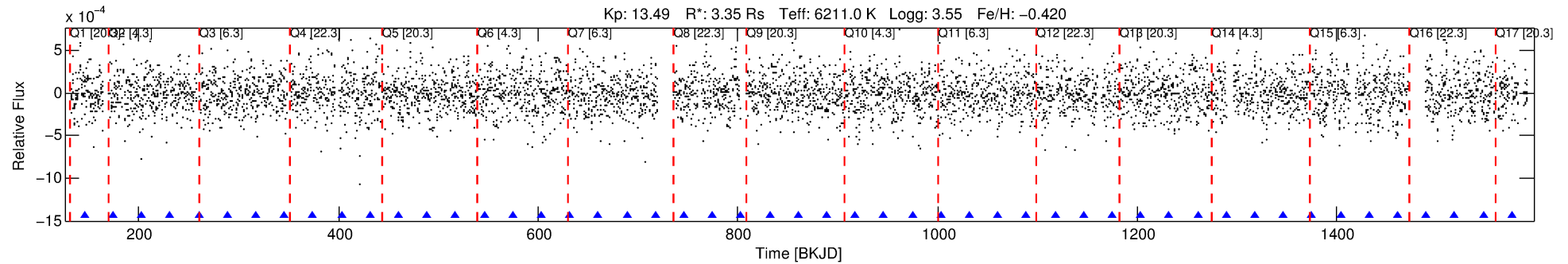
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005128931-07

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 7 of 8 Period: 28.584 d

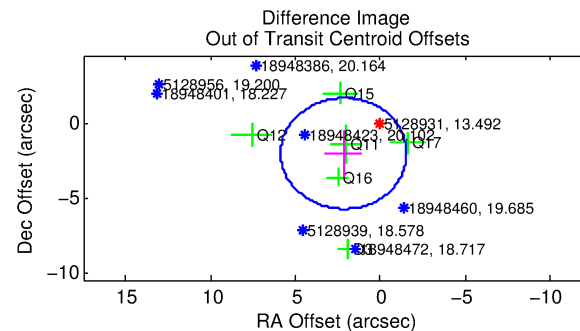
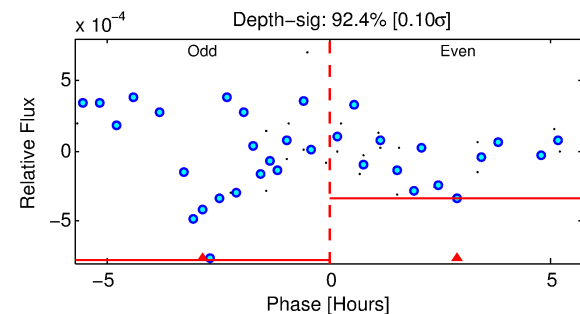
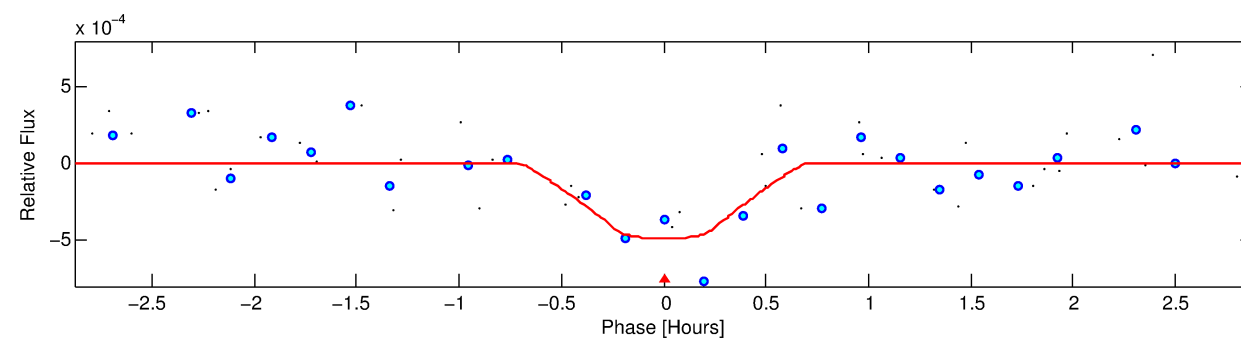


## DV Fit Results:

Period = 28.58398 [0.00022] d  
Epoch = 145.8771 [0.0080] BKJD  
Rp/R\* = 0.0227 [0.0443]  
a/R\* = 141.82 [1491.24]  
b = 0.81 [4.50]  
Seff = 347.07 [214.76]  
Teq = 1101 [170] K  
Rp = 8.32 [16.59] Re  
a = 0.2079 [0.0804] AU  
Ag = 67.42 [266.51] [0.25σ]  
Teffp = 4876 [4764] K [0.79σ]

## DV Diagnostic Results:

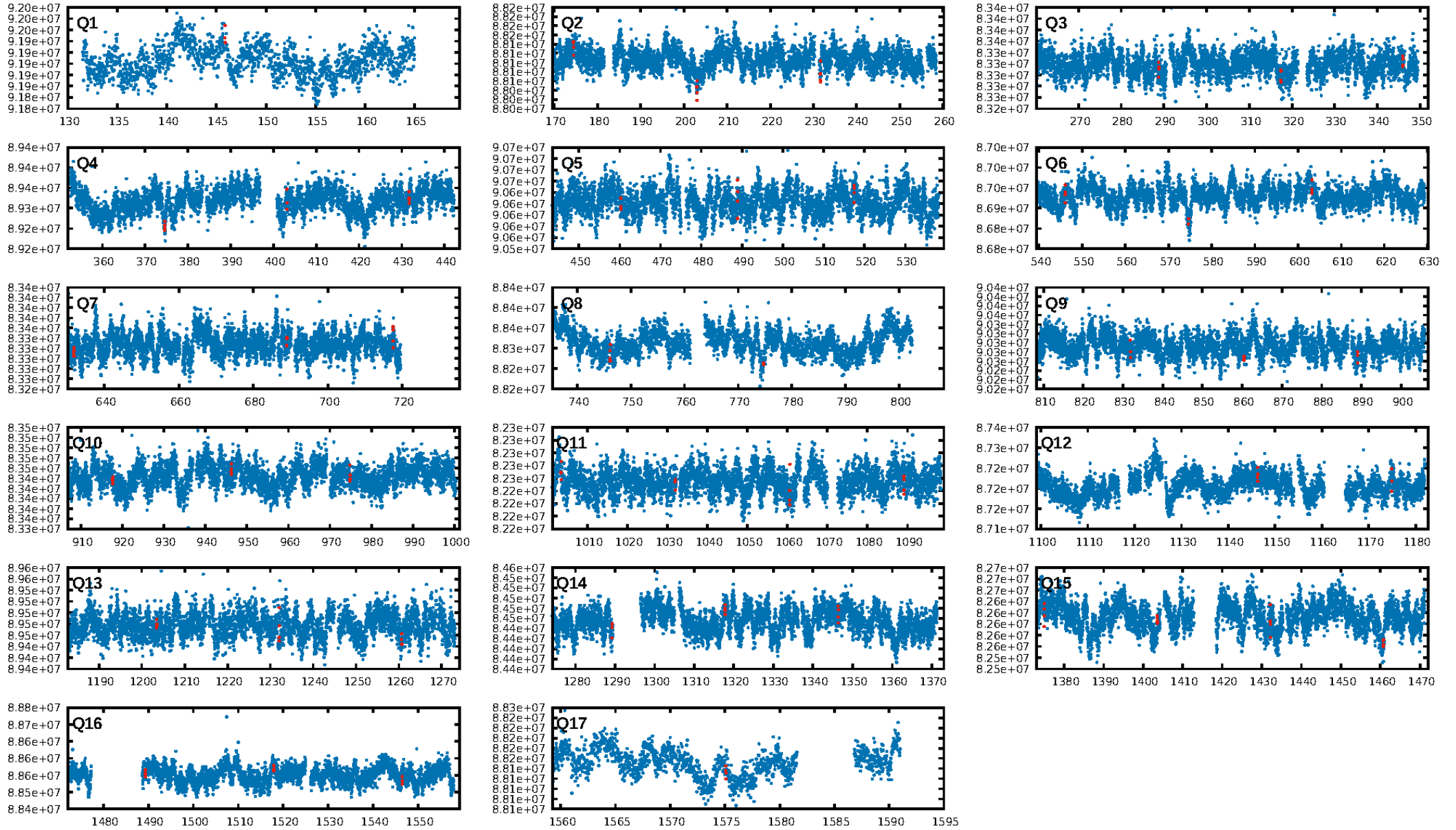
ShortPeriod-sig: 100.0% [40.40σ]  
LongPeriod-sig: 100.0% [80.82σ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 18.4%  
Bootstrap-pfa: 7.00e-08  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: -1.85  
Centroid-sig: 17.0%  
Centroid-so: 0.974 arcsec [1.76σ]  
OotOffset-rm: 2.972 arcsec [2.41σ]  
KicOffset-rm: 3.039 arcsec [2.67σ]  
OotOffset-st: 0/3/2/1 [6]  
KicOffset-st: 0/3/2/1 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.00 [0/17]



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:01:04 Z

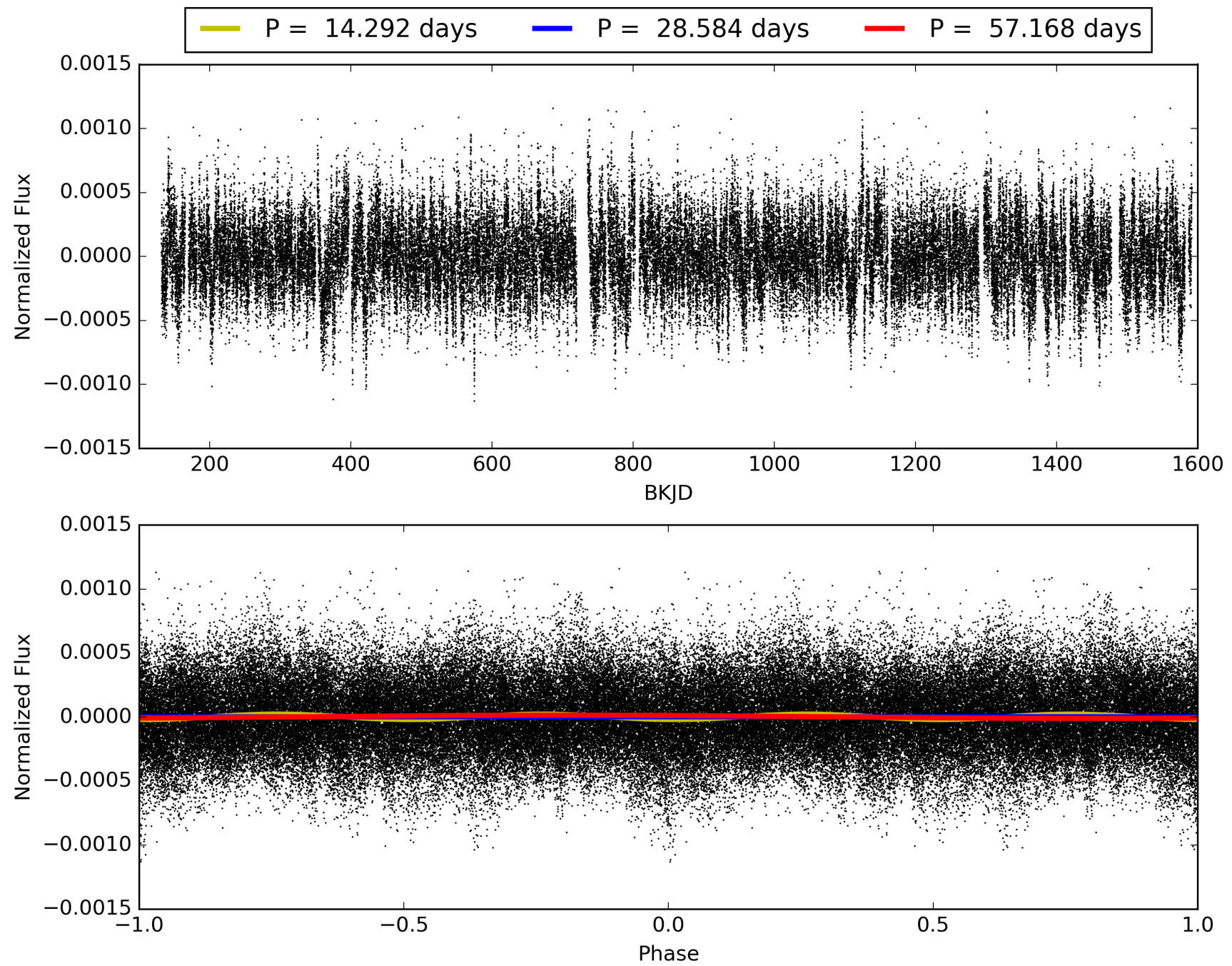
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005128931-07, PDC Light Curves



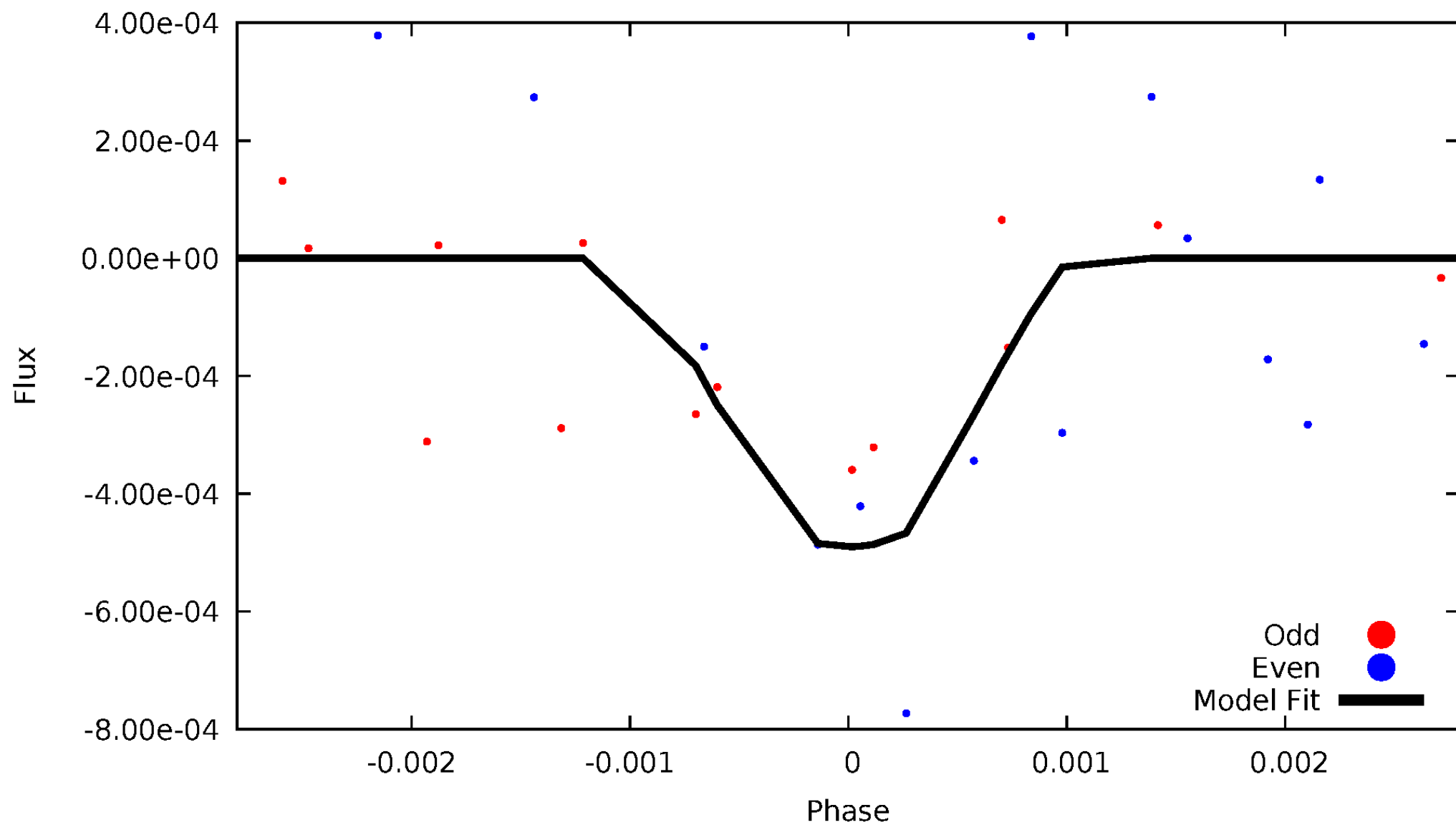


TCE 005128931-07



# DV Odd/Even

TCE 005128931-07



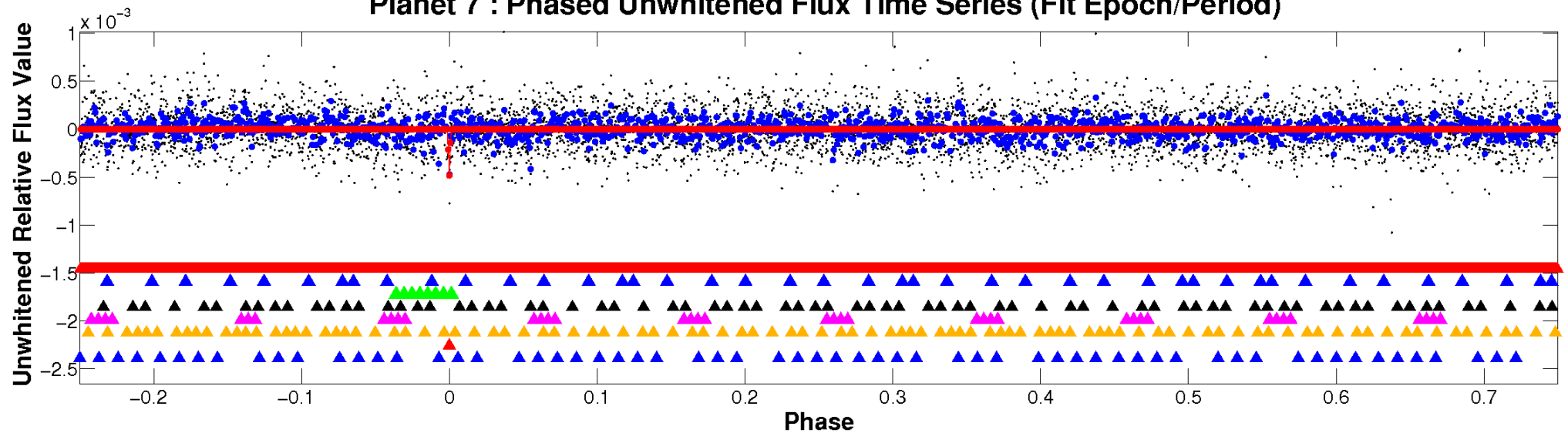


ALT Odd/Even

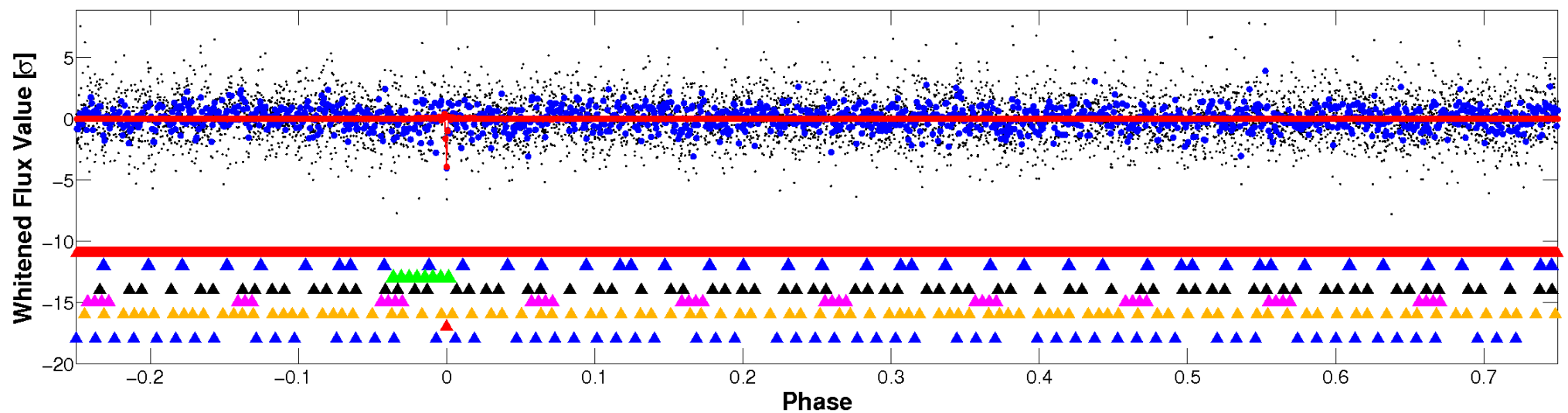
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

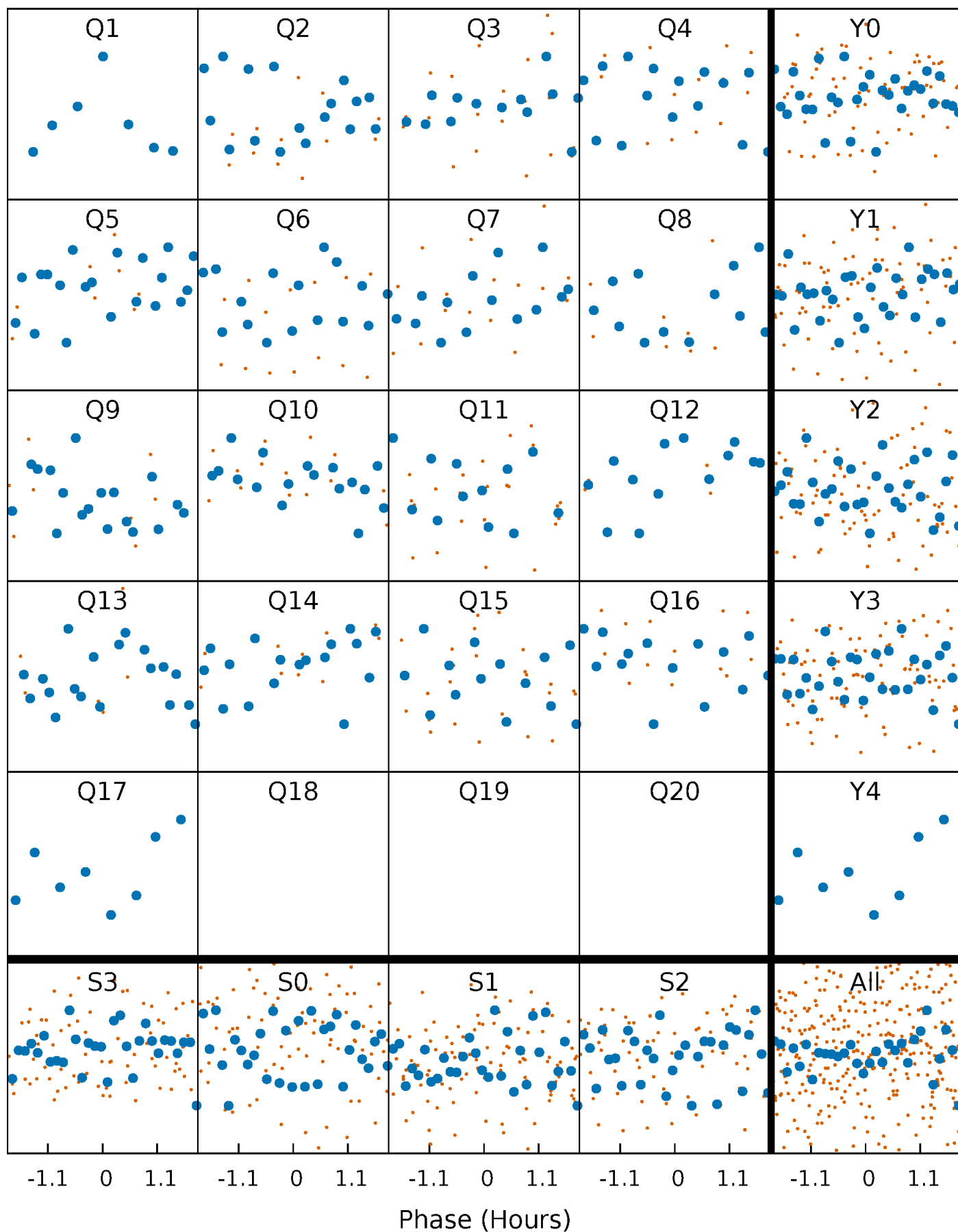


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



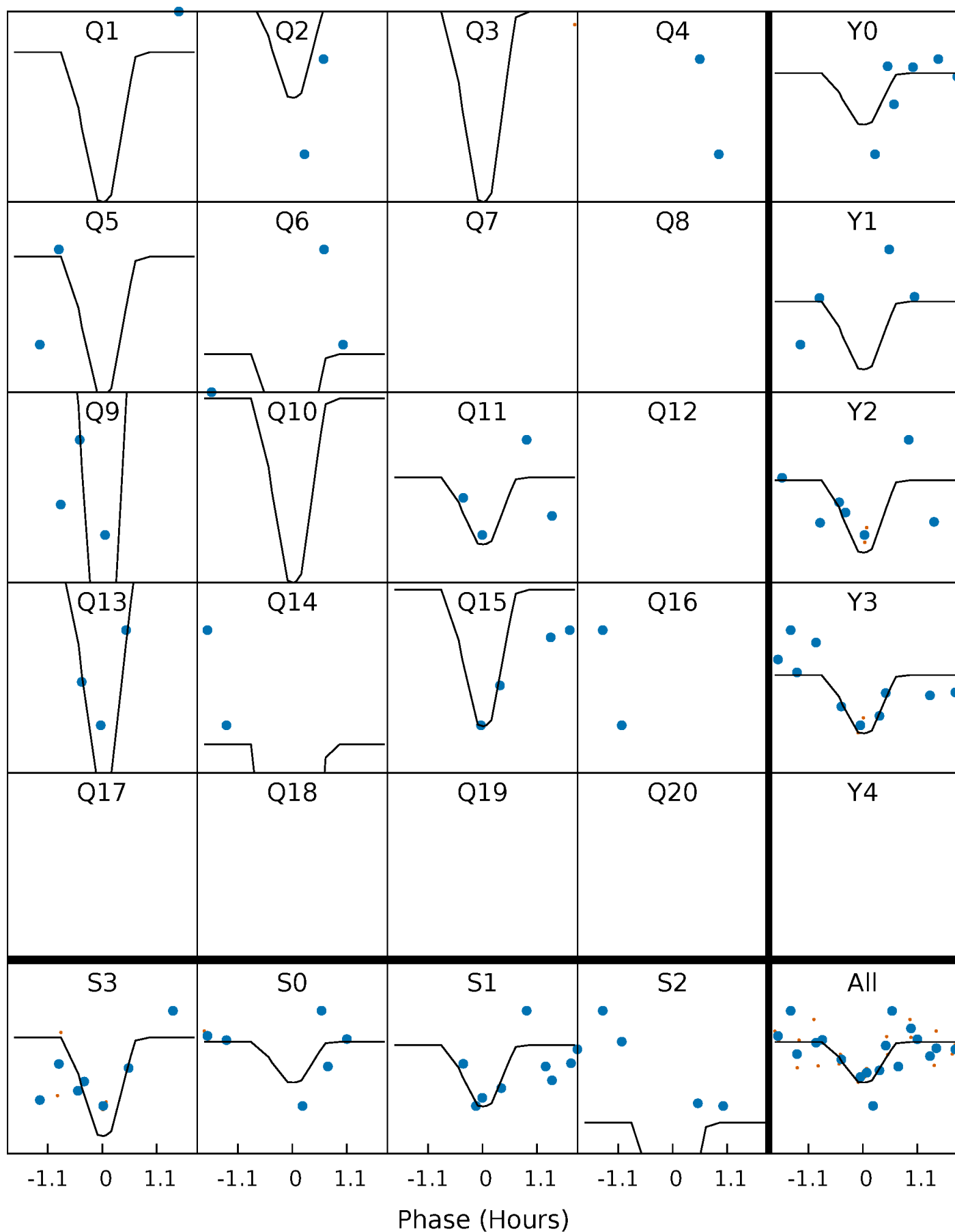
# PDC Quarter-Phased Transit Curves

TCE 005128931-07   P= 28.583983 Days    $T_0=145.877110$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005128931-07 P= 28.583983 Days  $T_0=145.877110$  (BKJD)



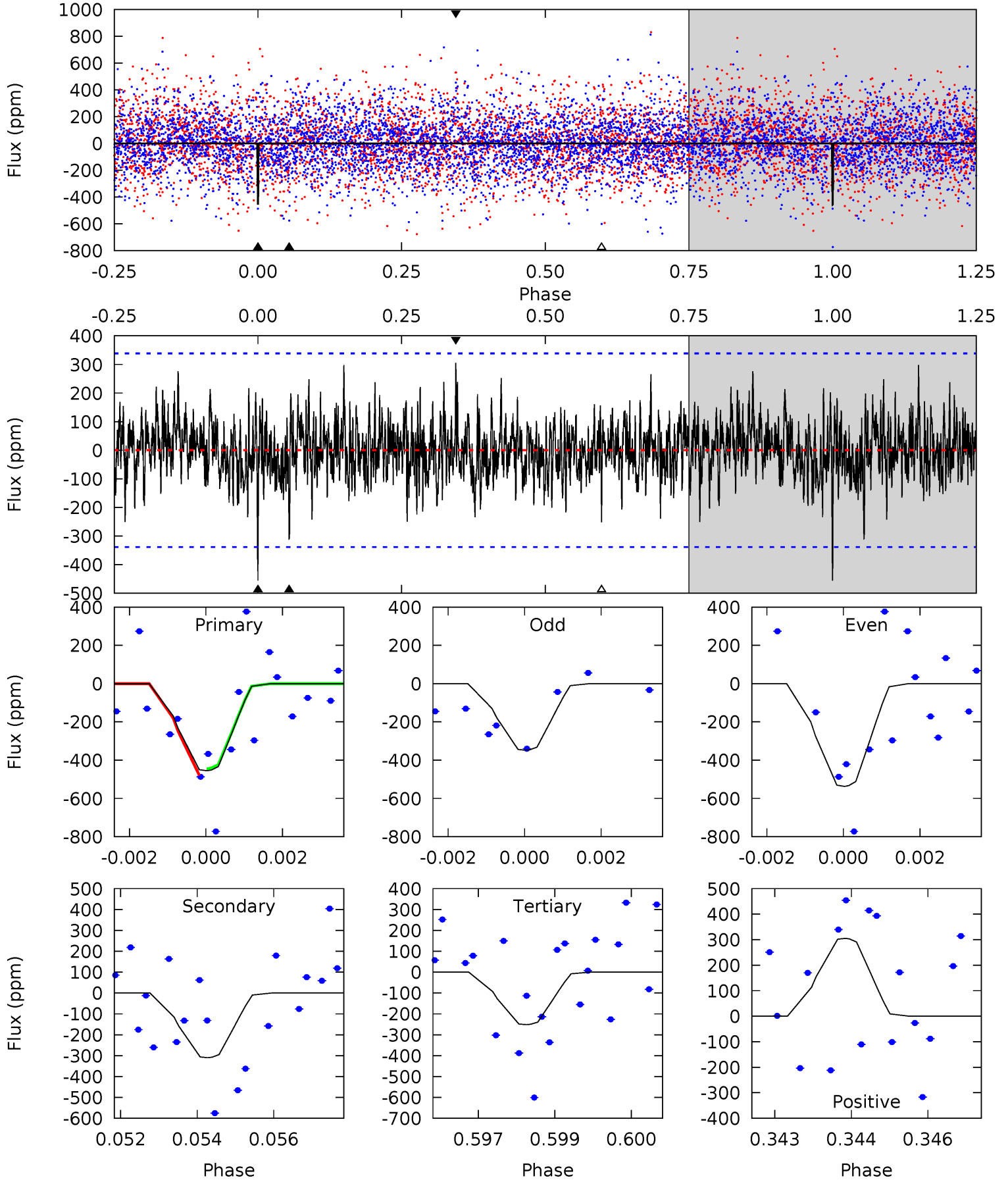


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005128931-07, P = 28.583983 Days, E = 117.293127 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
7.21	4.90	3.98	4.83	5.36	3.15	1.30	3.22	2.38	0.92	0.07	1.56	1.22	0.40	0.22



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005128931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-310 \pm 63$	$14.28^{+12.78}_{-9.71}$	$1513^{+103}_{-152}$	$4300^{+2859}_{-828}$	$35^{+314}_{-25}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

## DV Centroid Data

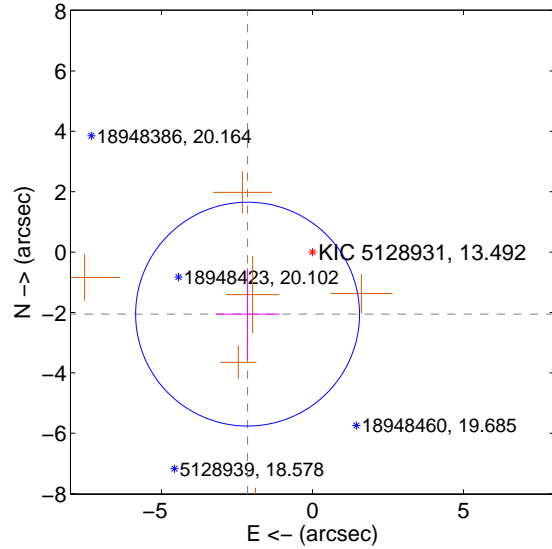
Supplemental centroid analysis for 005128931-07. Kepler magnitude: 13.49. Transit SNR 9.50

There are 0 quarters with good PRF difference image offsets

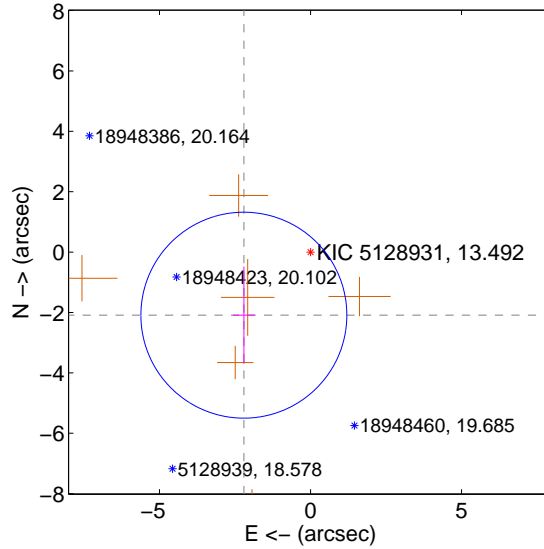
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.972 \pm 1.236$	2.41	$2.148 \pm 1.061$	$-2.054 \pm 1.512$
PRF-fit source offset from KIC position	$3.039 \pm 1.137$	2.67	$2.207 \pm 0.364$	$-2.089 \pm 1.608$
photometric centroid source offset	$0.97 \pm 0.55$	1.76	$0.97 \pm 0.55$	$-0.03 \pm 0.55$

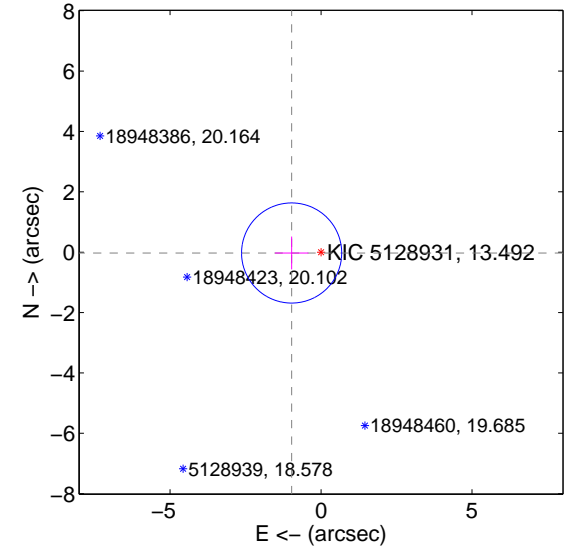
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

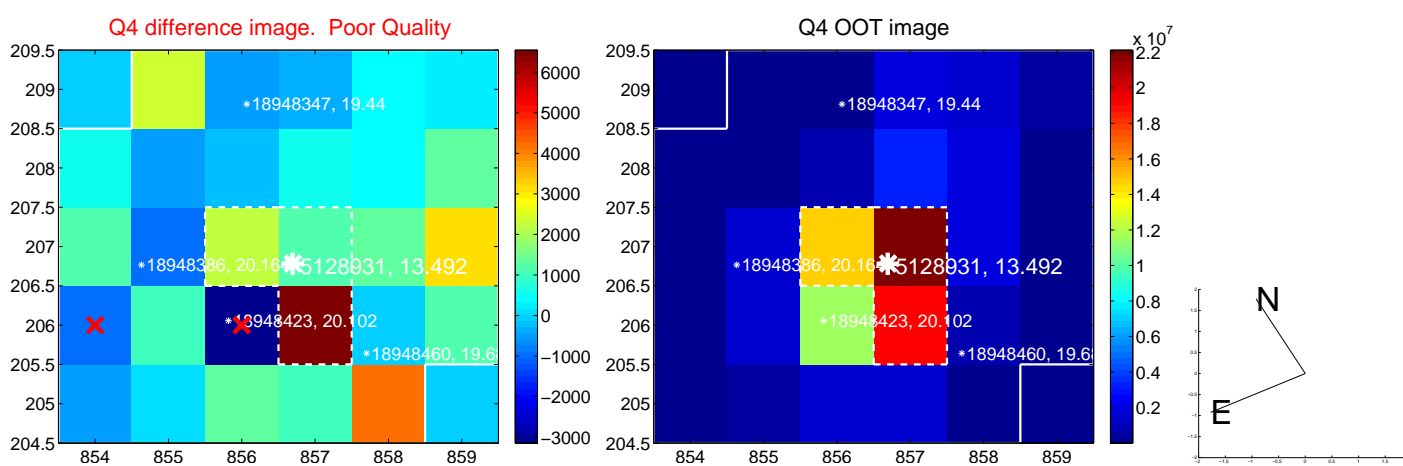
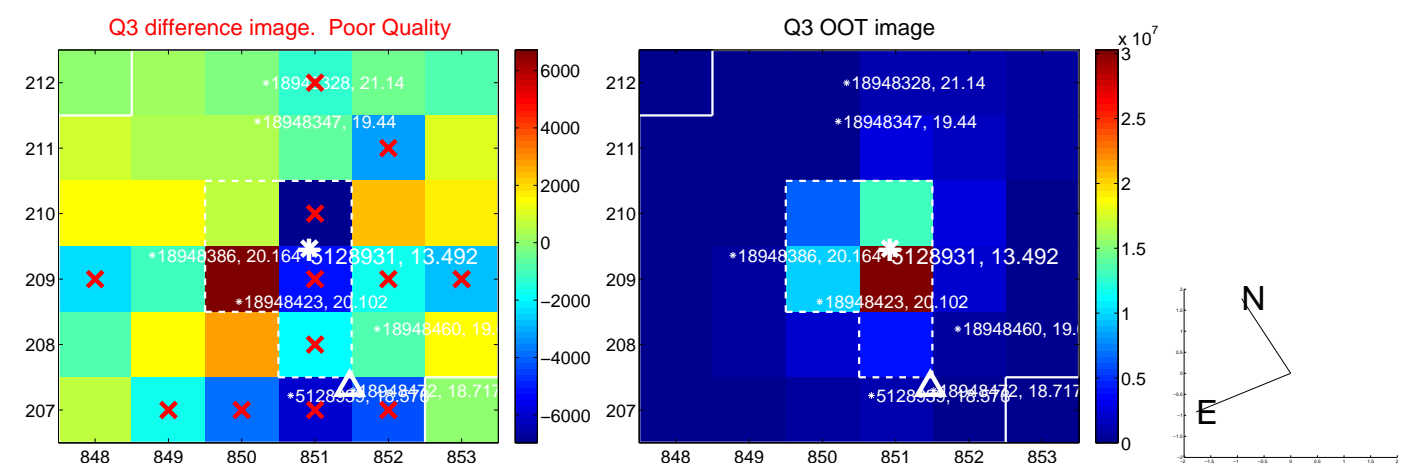
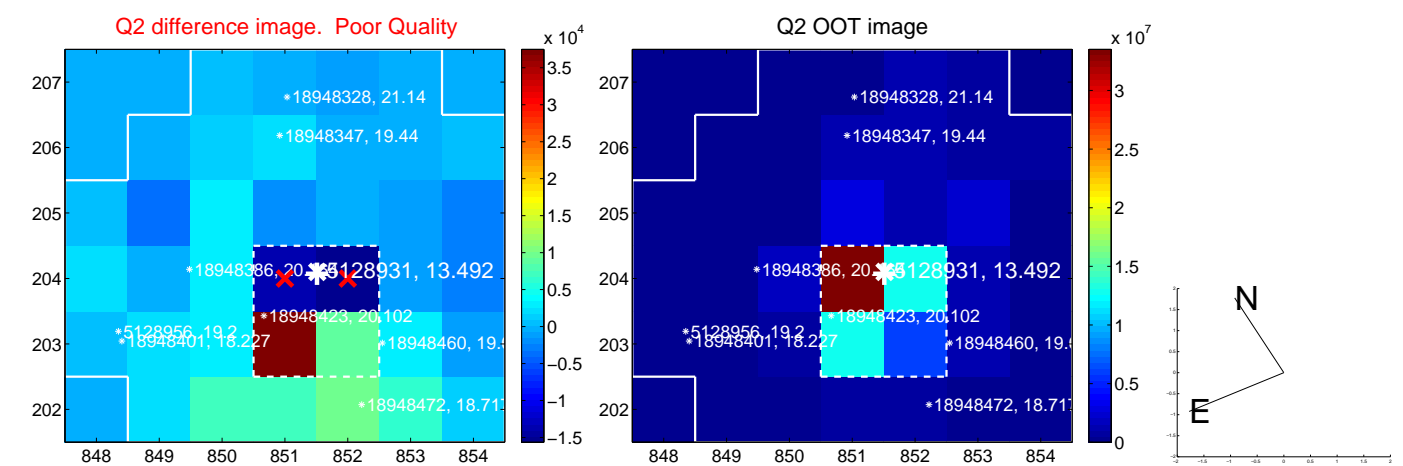
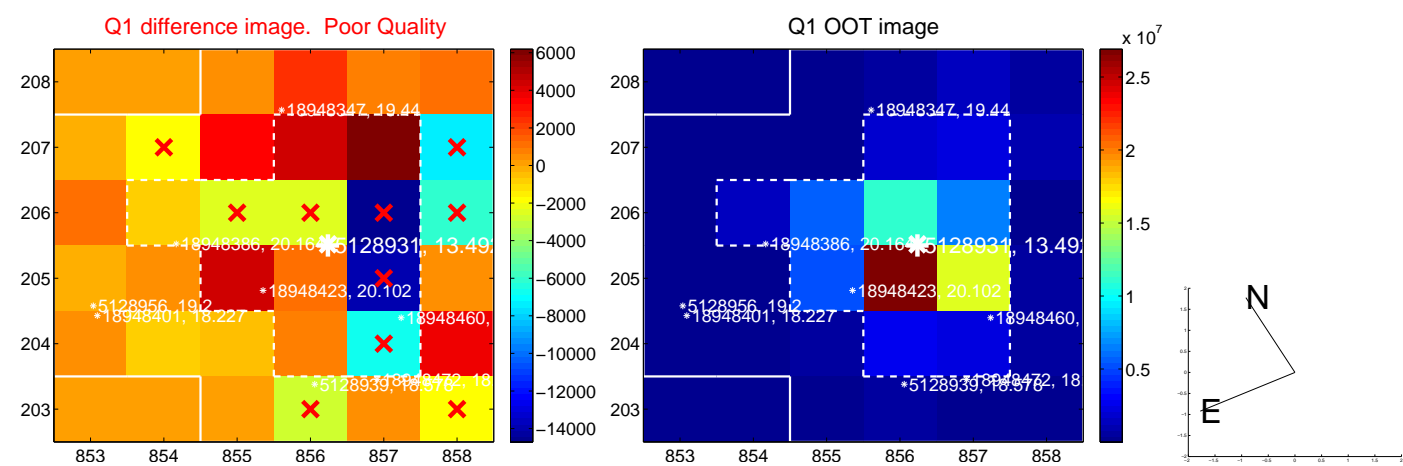


offset from photometric centroids

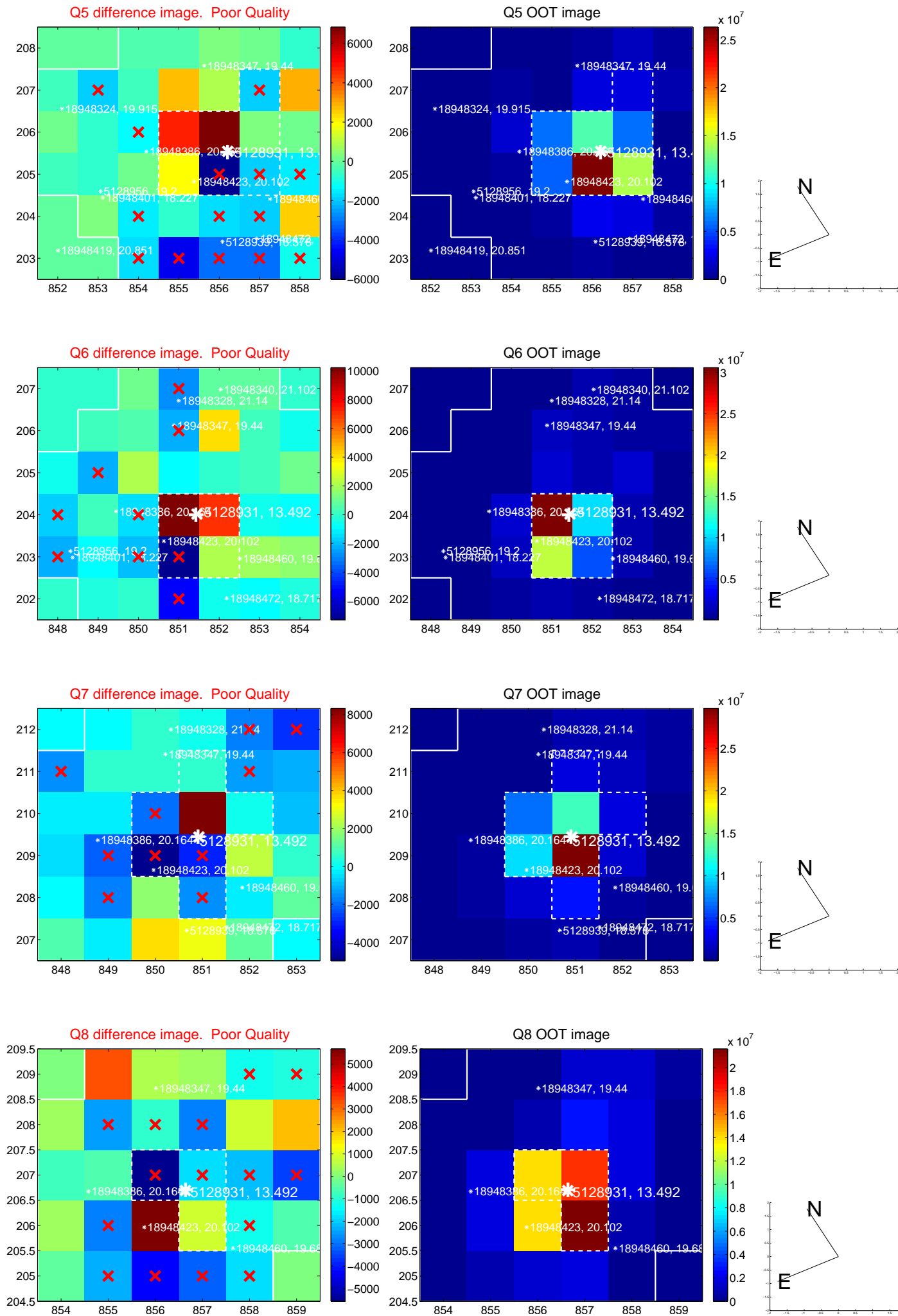


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

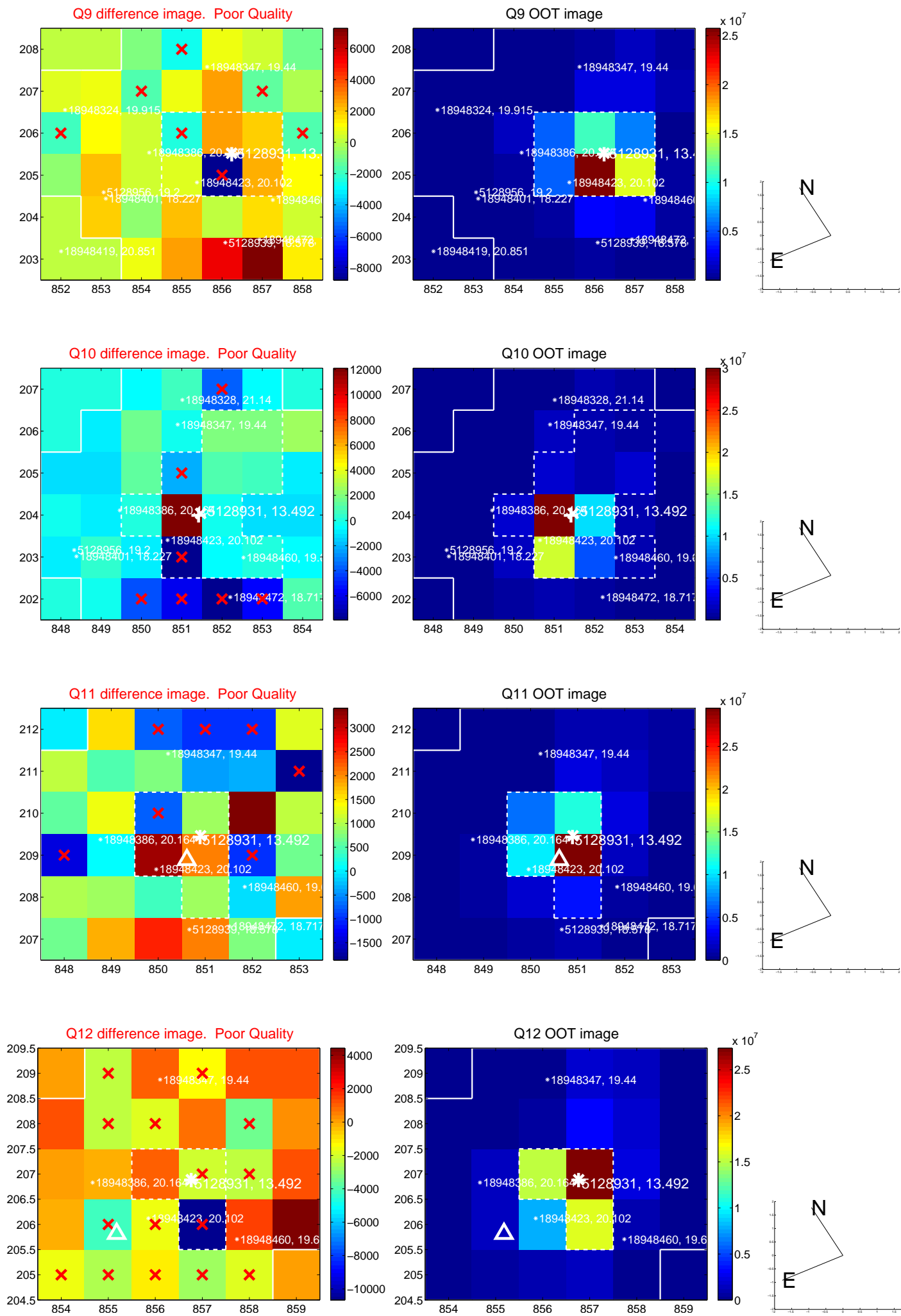


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

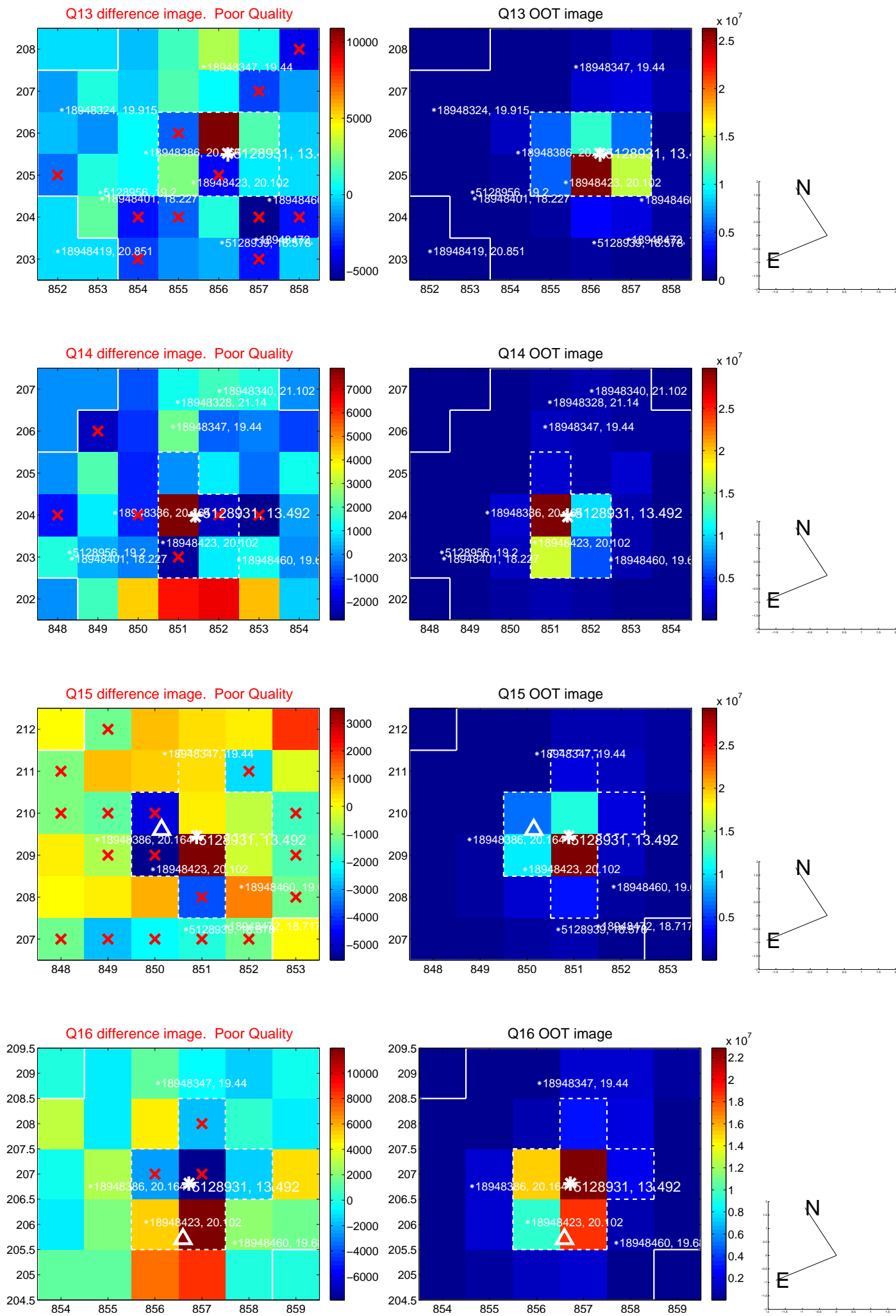




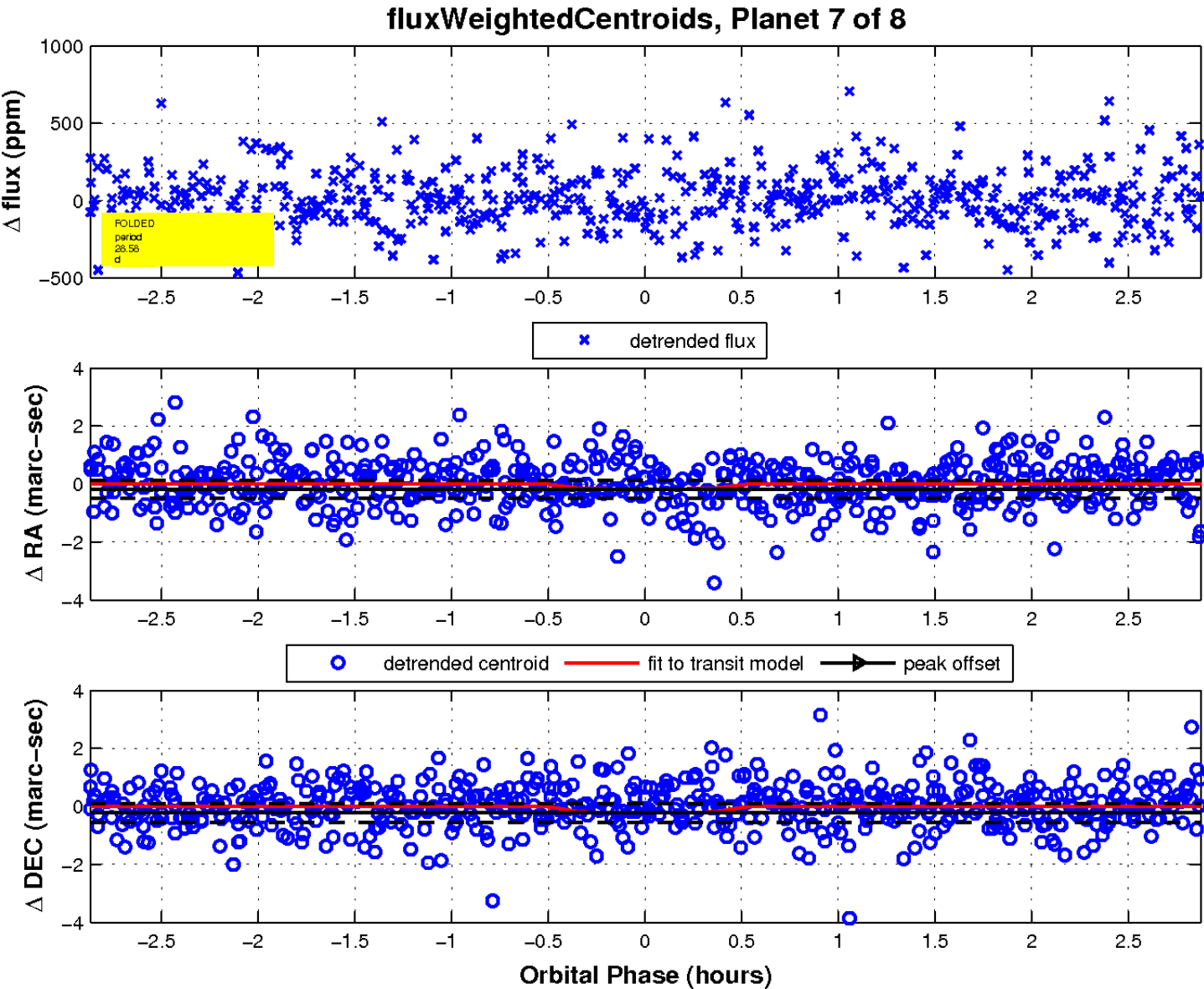
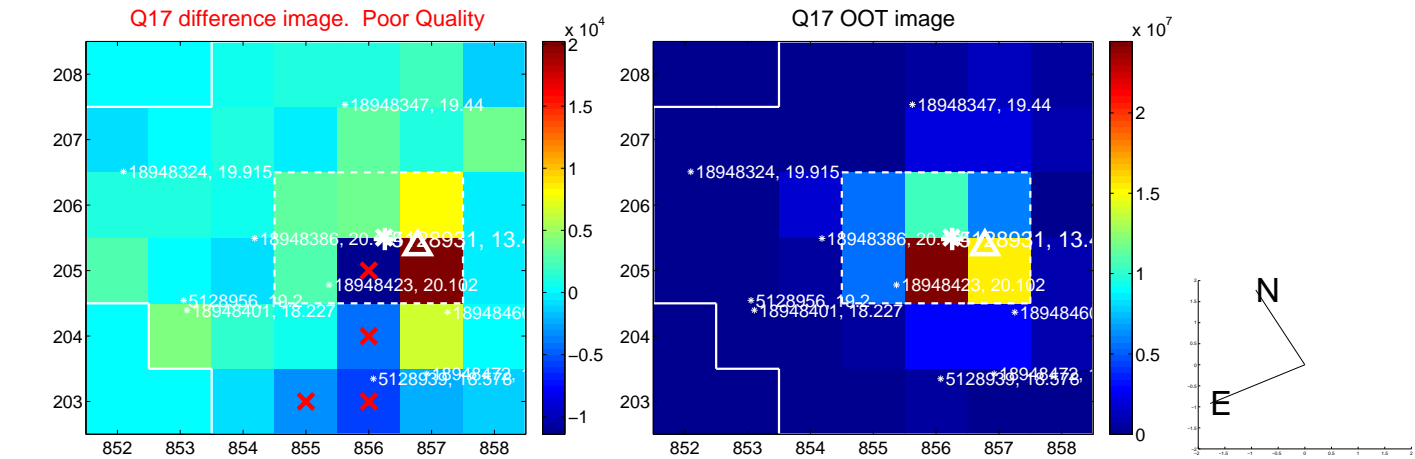
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



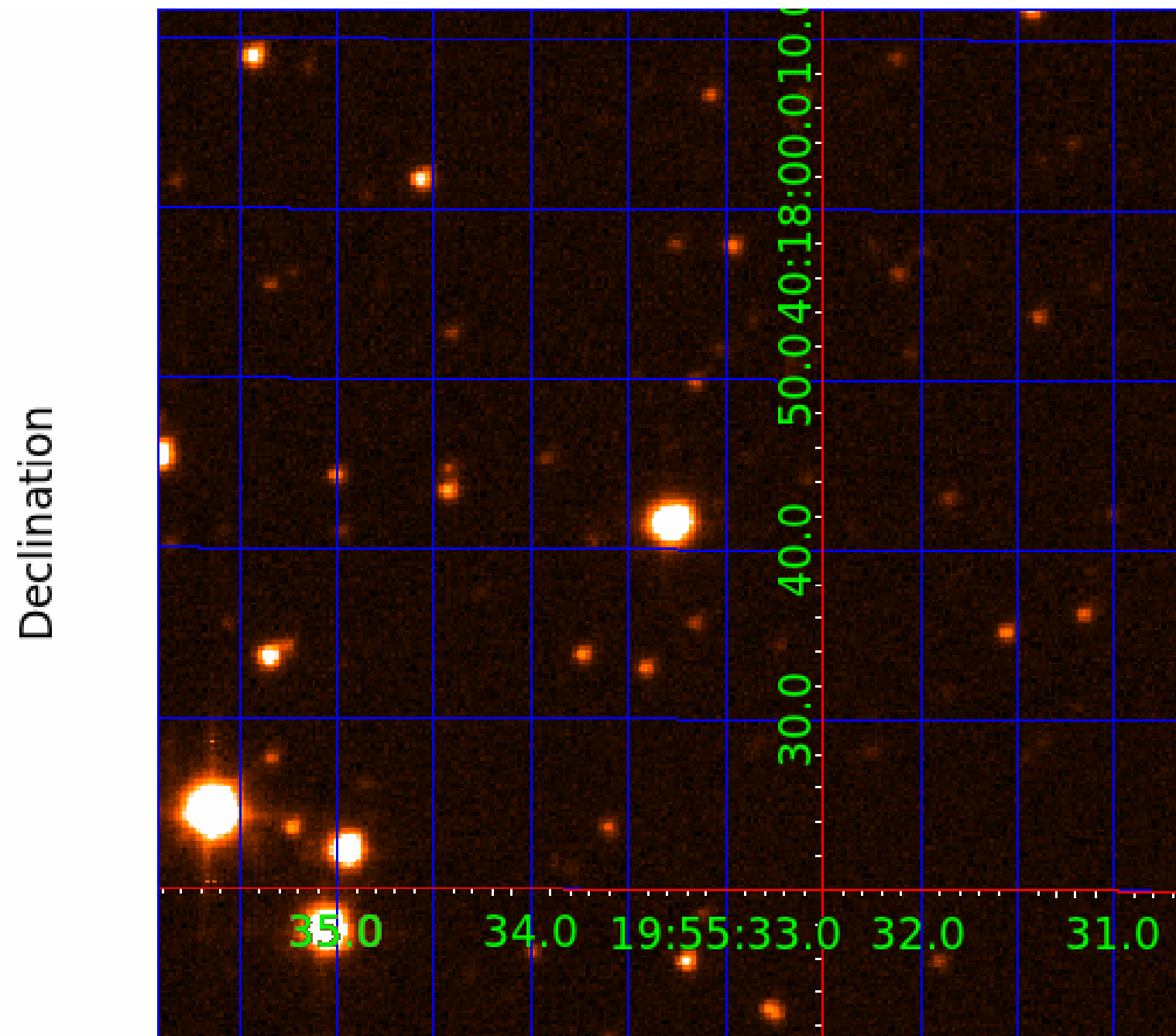
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005128931

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005128931-01	OBS	No	0.505298	131.562344	18.0	3.474	10.9	10.2	3.35	6211	1.52	0.00
005128931-02	OBS	No	33.997504	132.982782	539.0	1.290	12.2	11.5	3.35	6211	7.97	275.41
005128931-04	OBS	No	19.514973	131.733189	237.5	2.393	9.0	8.5	3.35	6211	5.85	577.33
005128931-05	OBS	No	37.145662	150.819517	361.3	2.204	13.8	7.8	3.35	6211	6.62	244.74
005128931-06	OBS	No	14.771871	140.019102	274.0	2.387	9.8	10.9	3.35	6211	6.47	836.89
005128931-07	OBS	No	28.583983	145.877110	490.1	0.960	9.2	9.5	3.35	6211	8.32	347.07
005128931-08	OBS	No	23.561503	140.282998	279.1	2.825	10.4	9.2	3.35	6211	6.30	449.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005128931-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
005128931-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005128931-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
005128931-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
005128931-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

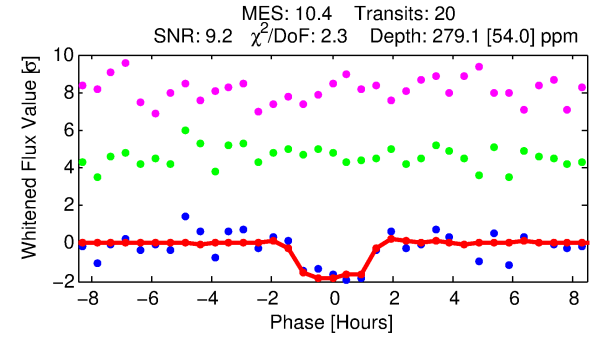
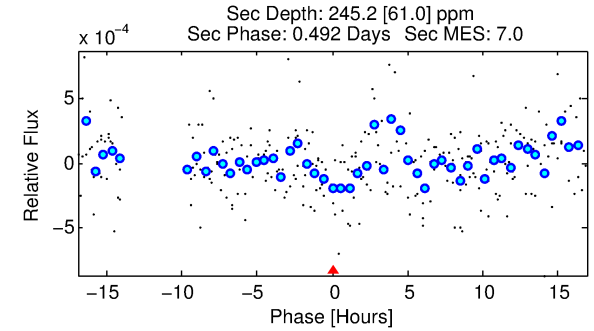
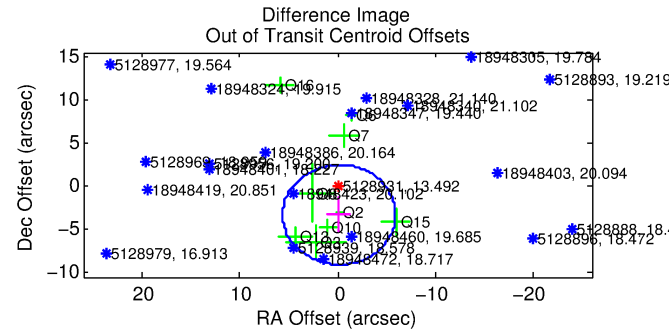
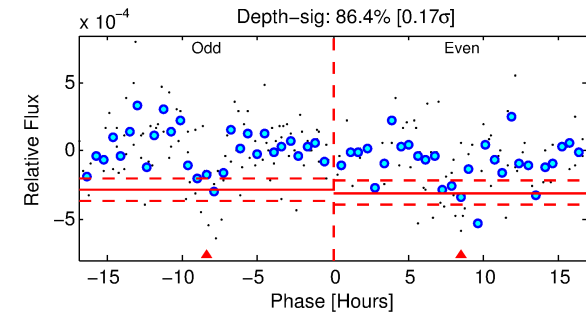
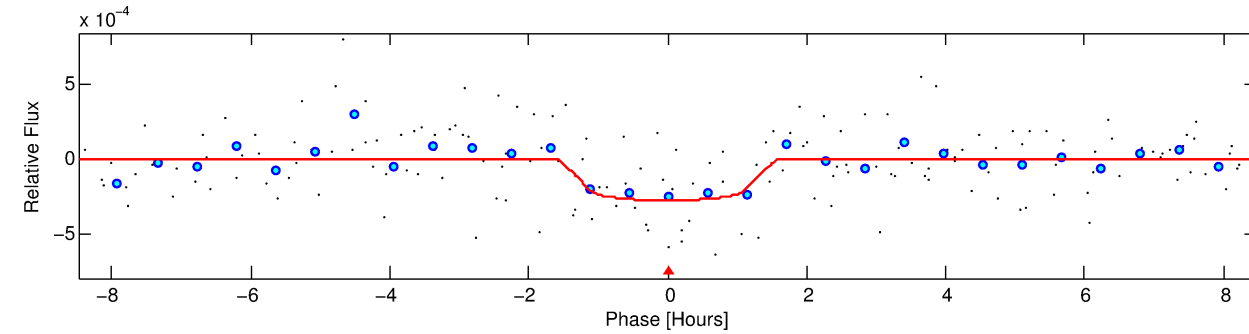
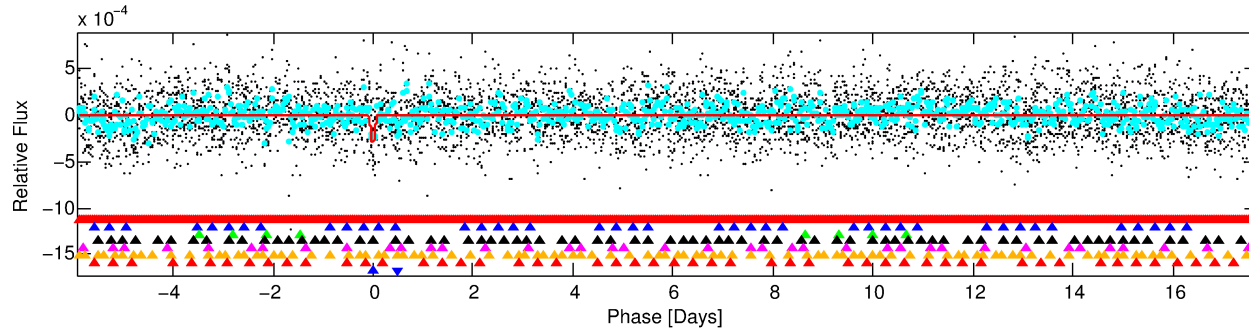
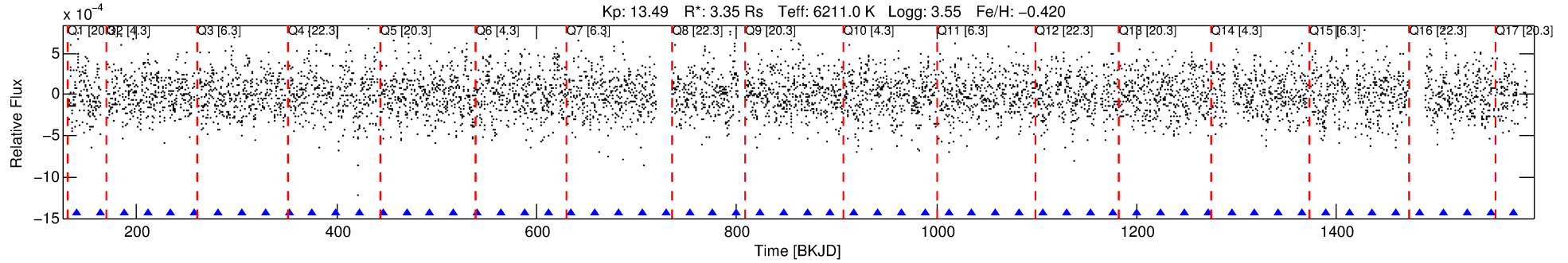
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005128931-08

No Significant Match Found

# DV One-Page Summary

KIC: 5128931 Candidate: 8 of 8 Period: 23.562 d



## DV Fit Results:

Period = 23.56150 [0.00033] d  
Epoch = 140.2830 [0.0116] BKJD  
Rp/R\* = 0.0172 [0.0205]  
a/R\* = 37.06 [238.29]  
b = 0.83 [2.37]  
Seff = 449.07 [277.87]  
Teq = 1174 [182] K  
Rp = 6.30 [7.95] Re  
a = 0.1828 [0.0707] AU  
Ag = 113.66 [281.14] [0.40 $\sigma$ ]  
Teffp = 5926 [3557] K [1.33 $\sigma$ ]

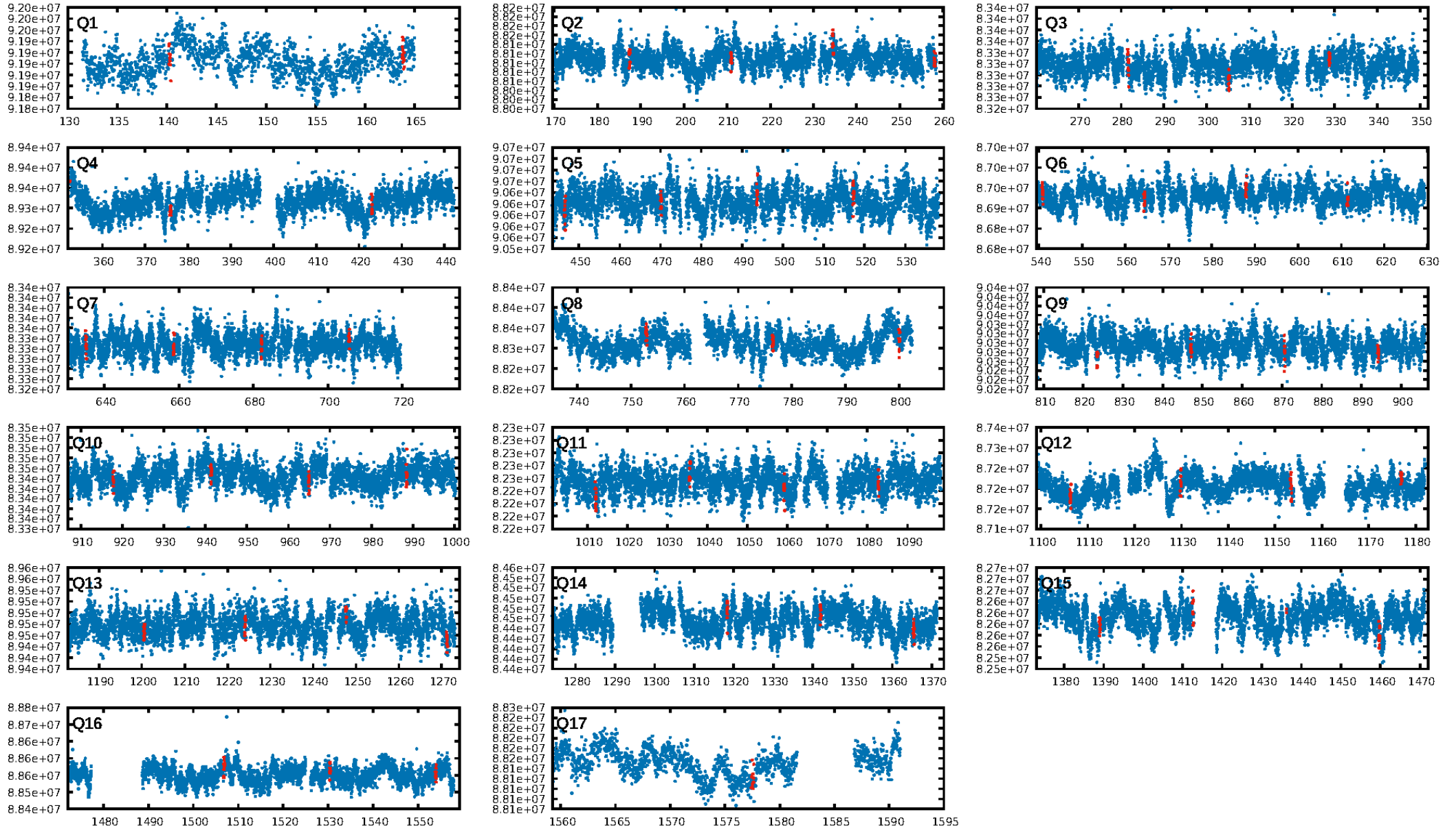
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [26.23 $\sigma$ ]  
LongPeriod-sig: 100.0% [40.40 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.23e-11  
RollingBand-fgt: 1.00 [19/19]  
GhostDiagnostic-chr: -4.427  
Centroid-sig: 2.9%  
Centroid-so: 0.677 arcsec [1.34 $\sigma$ ]  
OotOffset-rm: 3.309 arcsec [1.72 $\sigma$ ]  
KicOffset-rm: 3.337 arcsec [1.57 $\sigma$ ]  
OotOffset-st: 3/3/2/1 [9]  
KicOffset-st: 3/3/2/1 [9]  
DiffImageQuality-fgm: 0.00 [0/9]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:01:07 Z

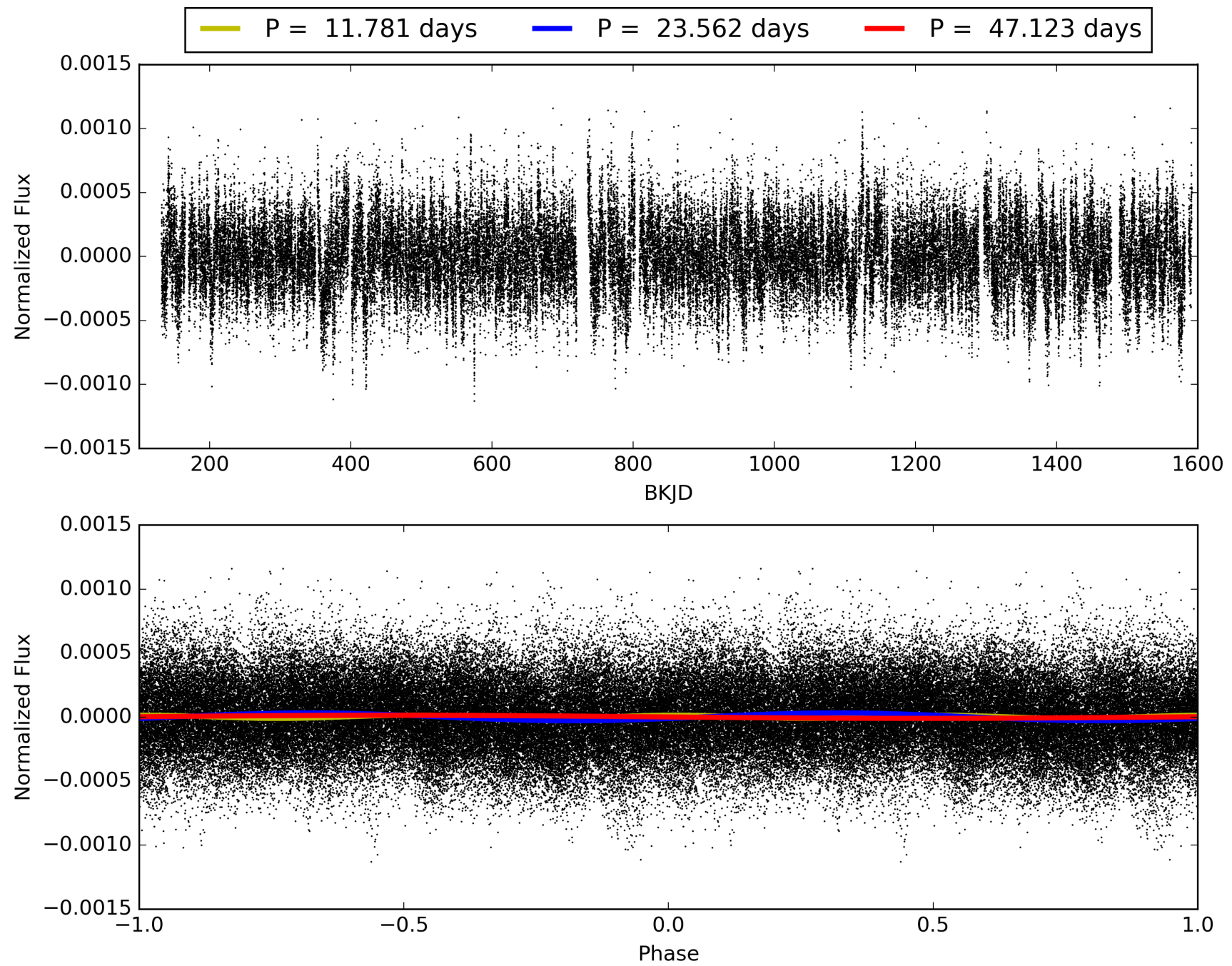
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005128931-08, PDC Light Curves



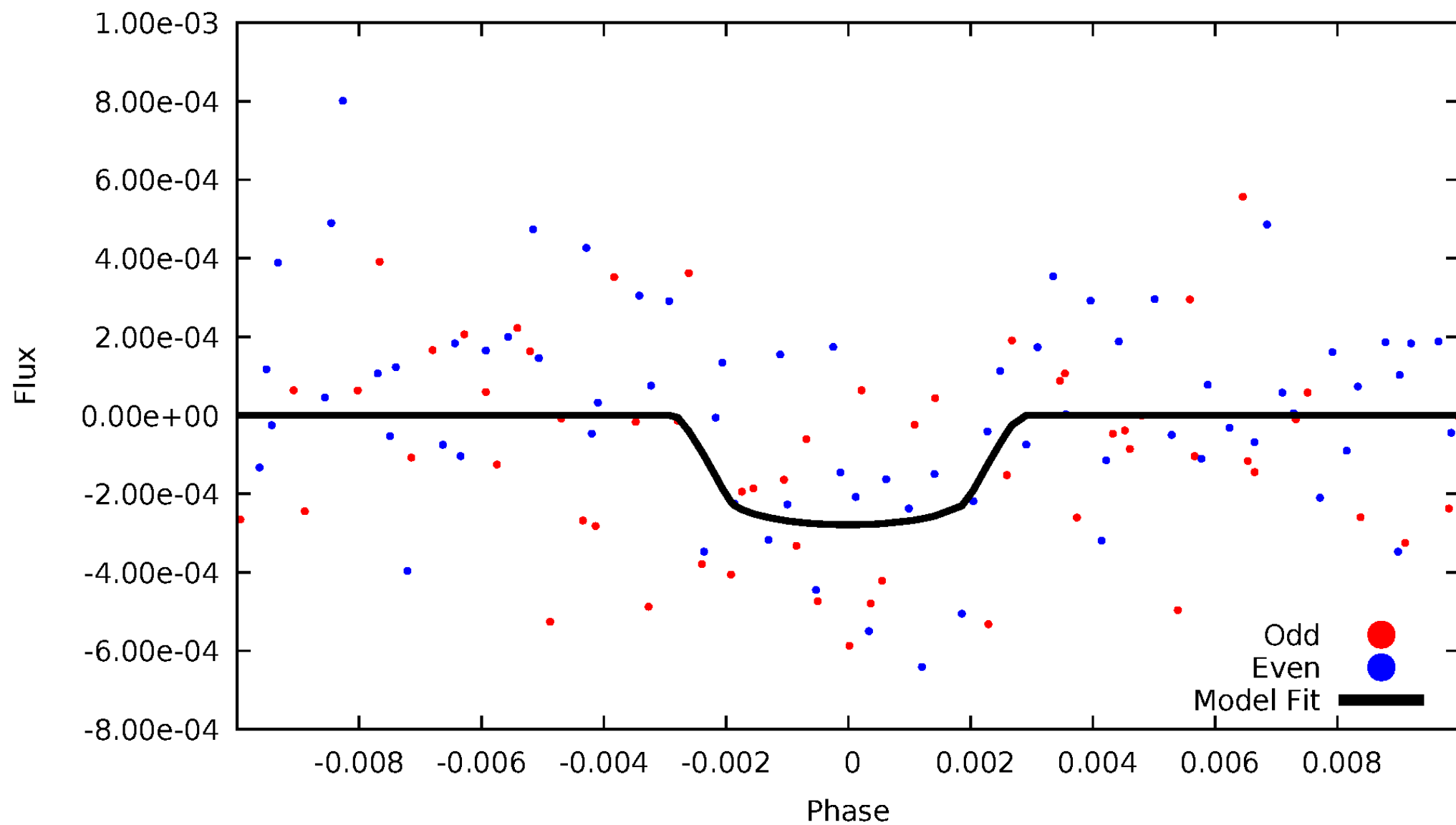


# TCE 005128931-08



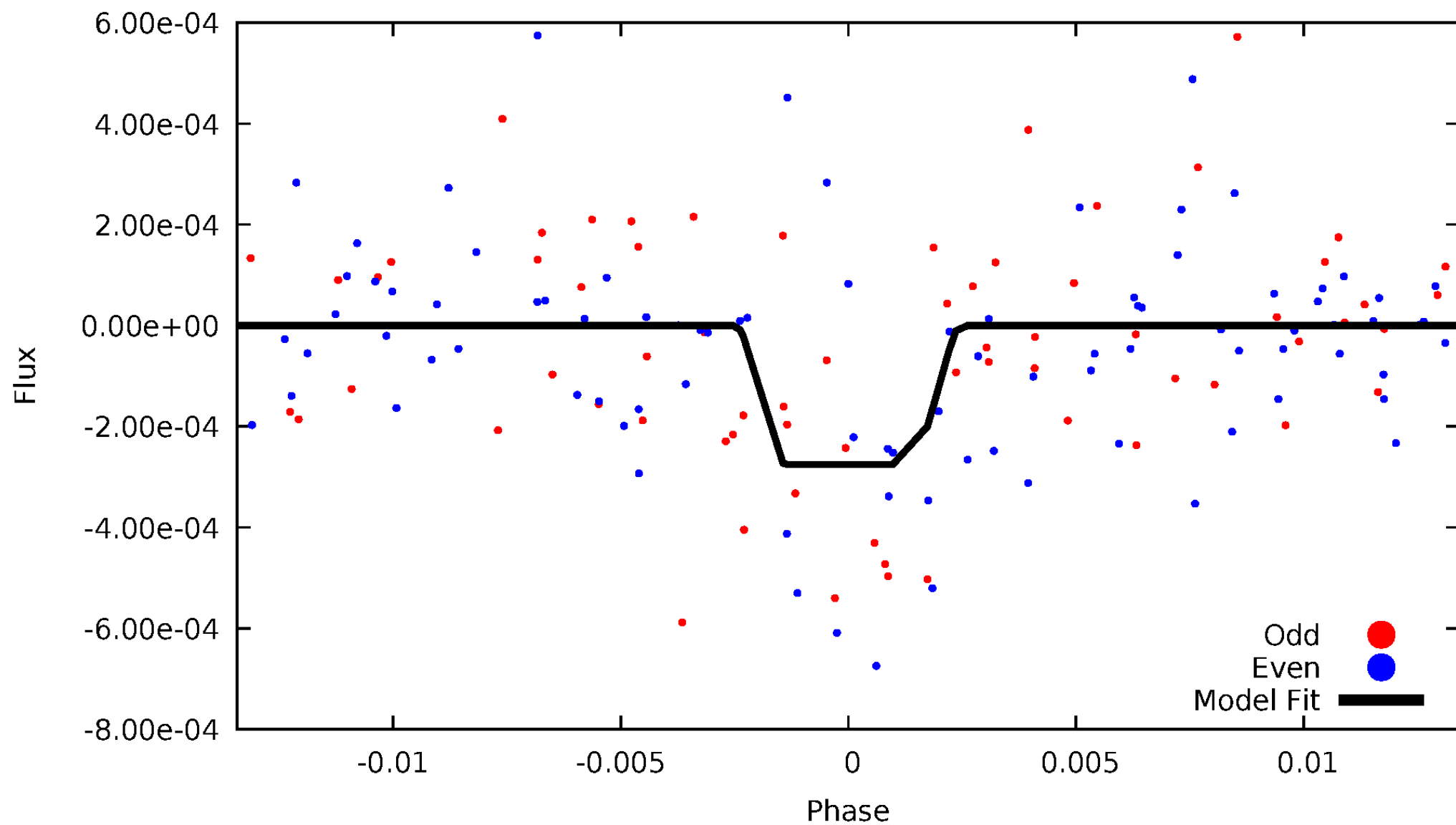
# DV Odd/Even

TCE 005128931-08



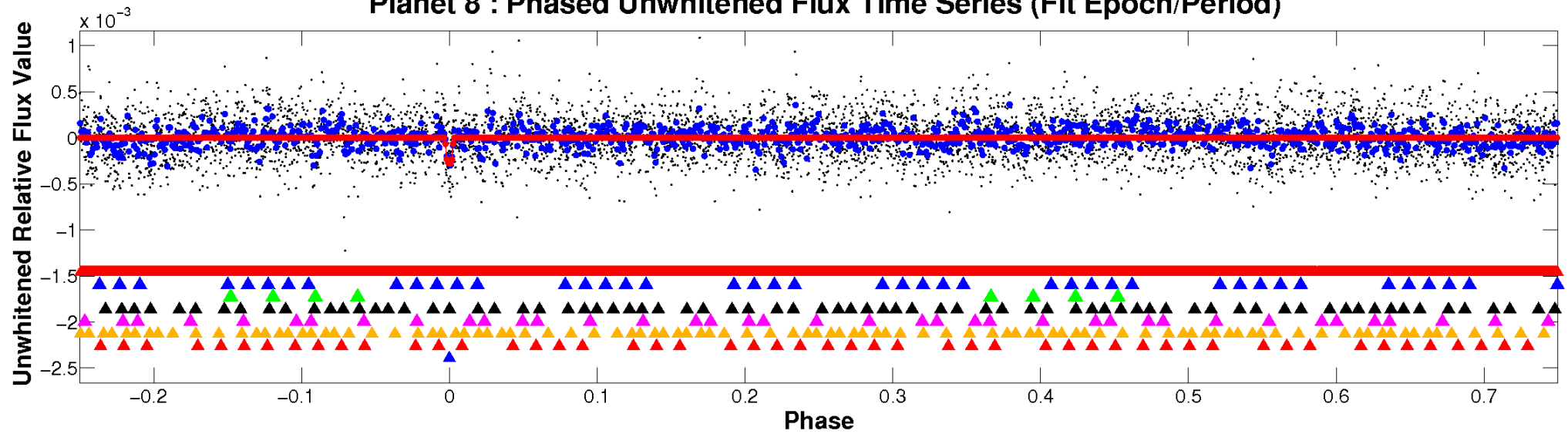
# ALT Odd/Even

TCE 005128931-08

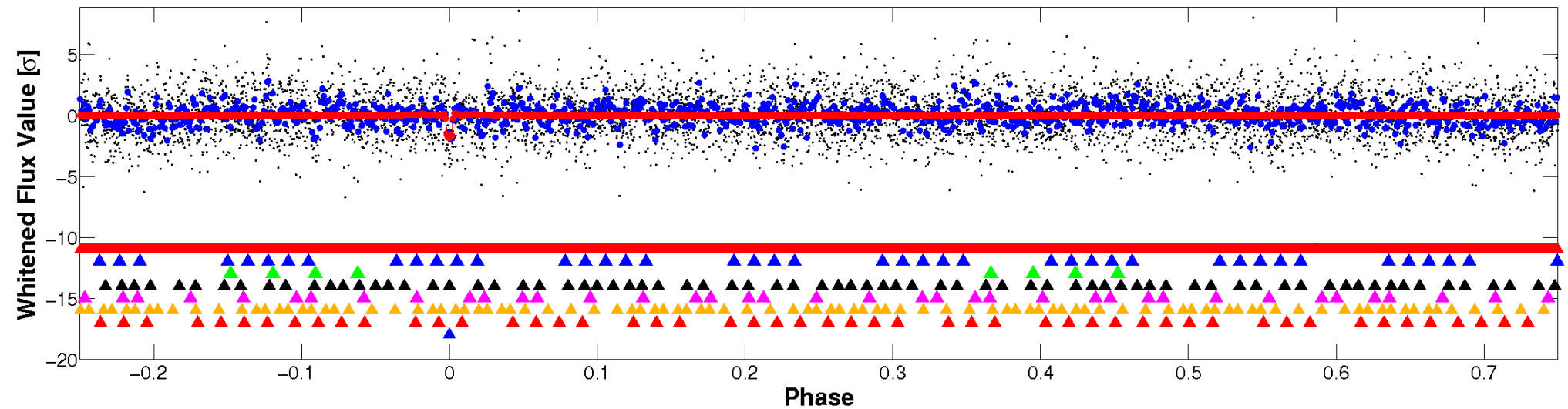


# Non-Whitened Vs. Whitened Light Curve

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

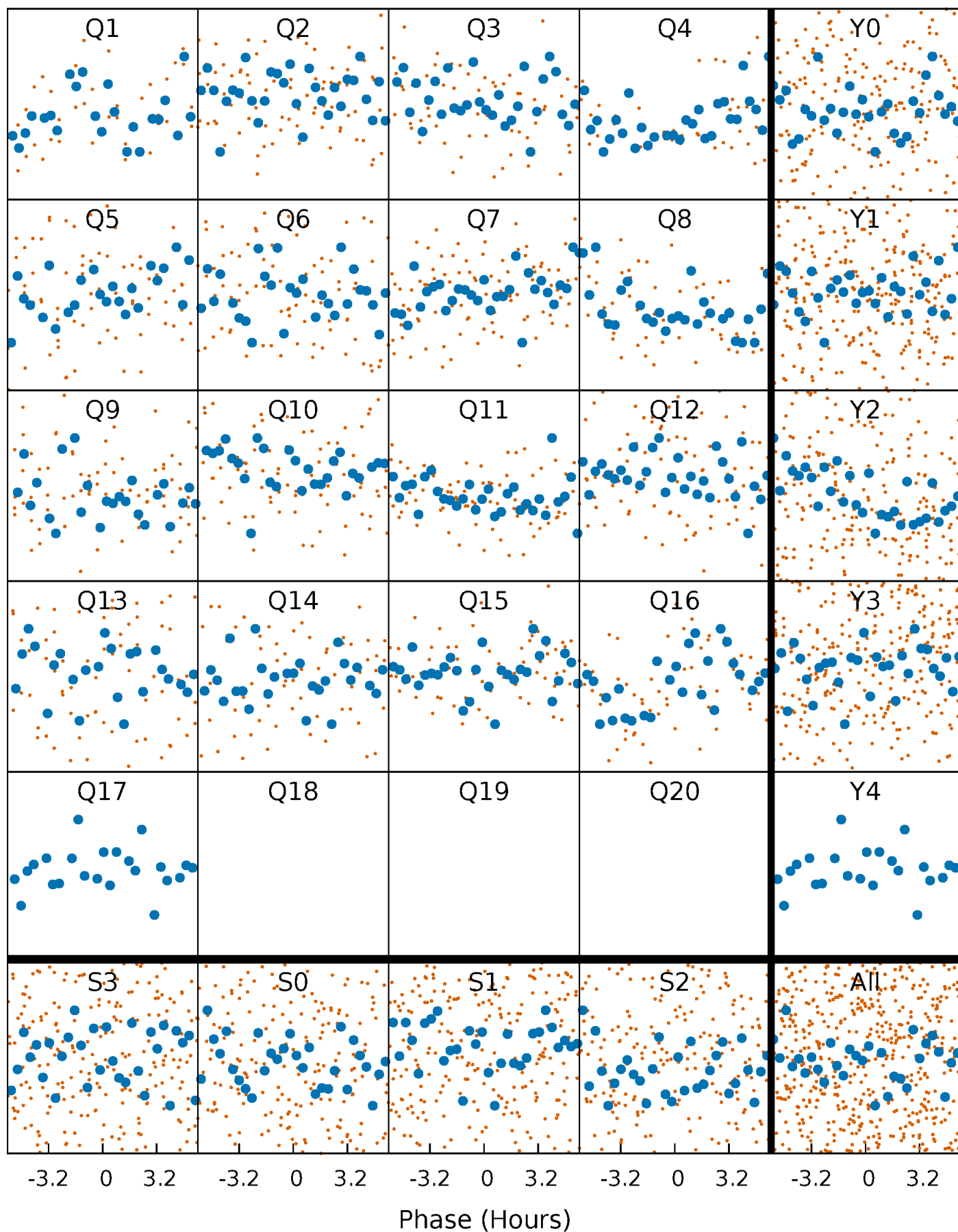


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



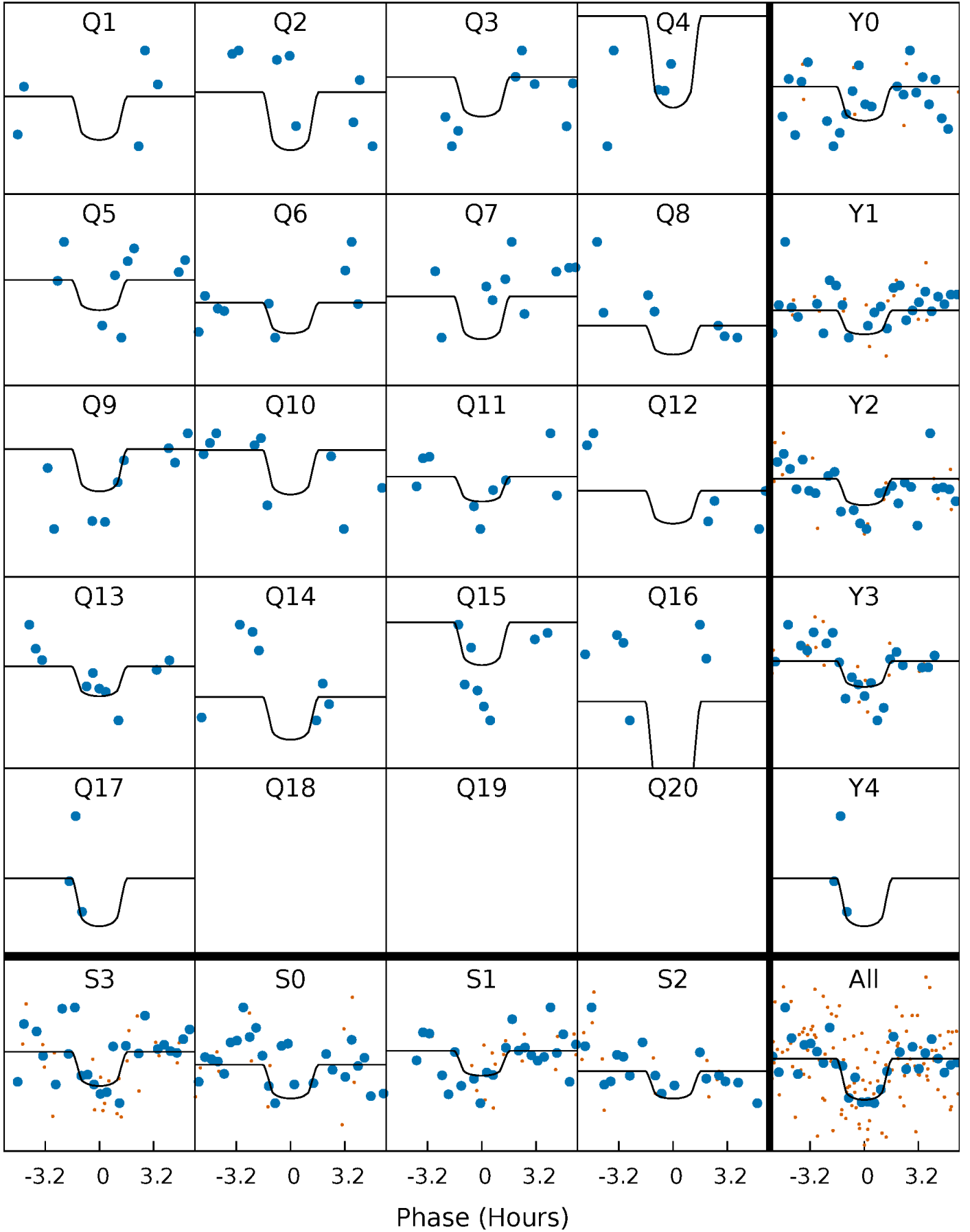
# PDC Quarter-Phased Transit Curves

TCE 005128931-08   P= 23.561503 Days    $T_0=140.282998$  (BKJD)



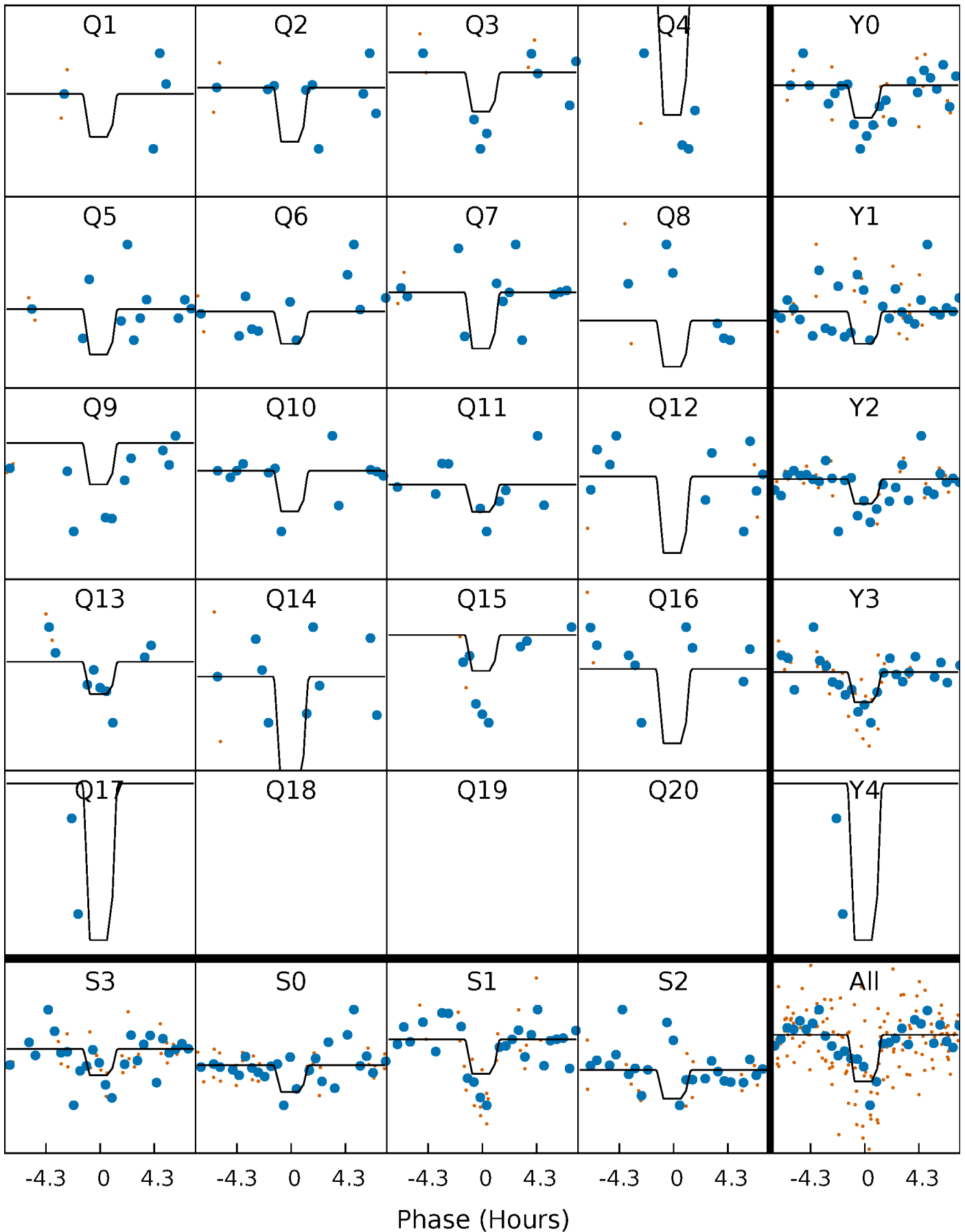
# DV Quarter-Phased Transit Curves

TCE 005128931-08   P= 23.561503 Days    $T_0=140.282998$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005128931-08 P= 23.563214 Days  $T_0=140.201067$  (BKJD)

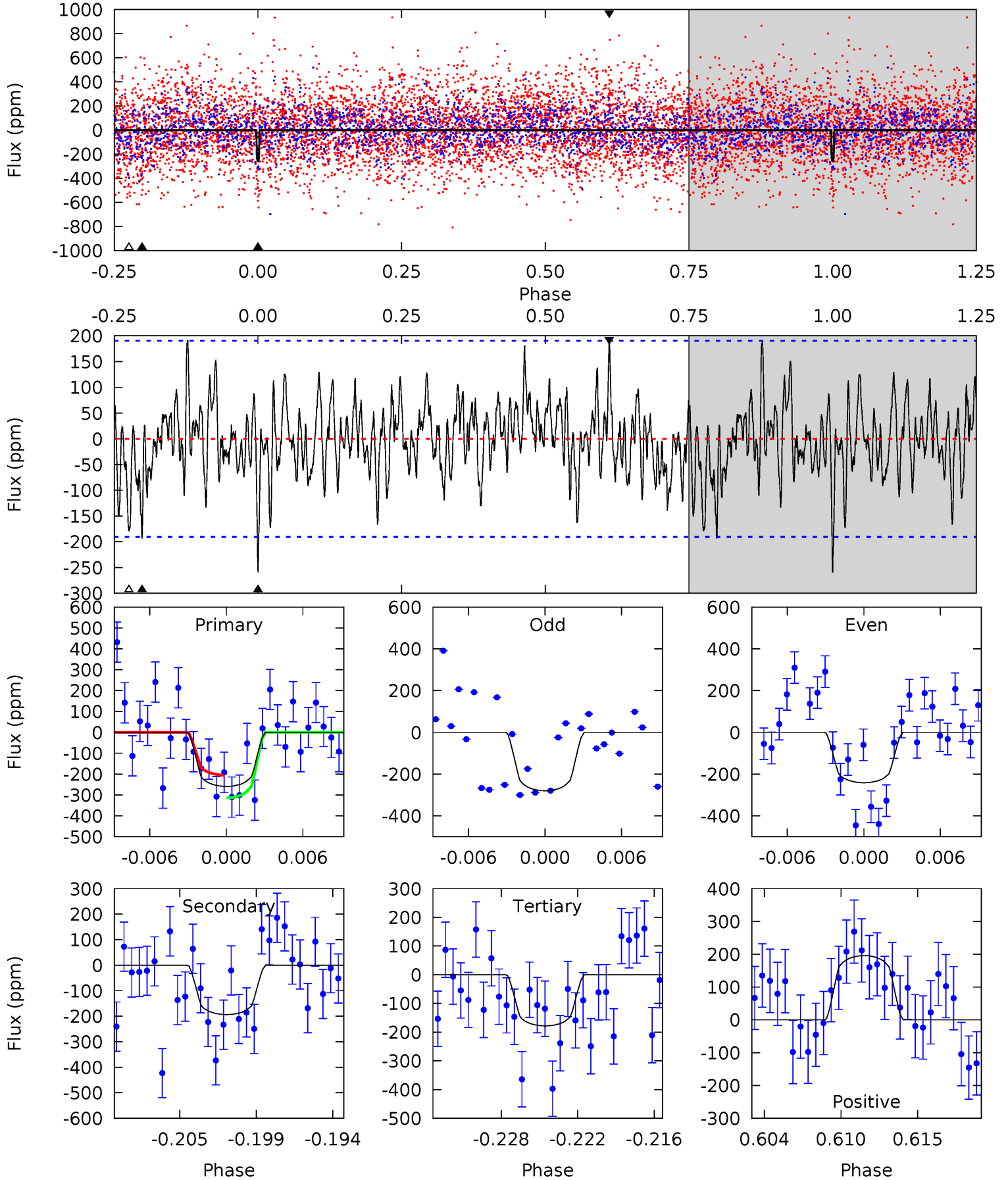




# DV Model-Shift Uniqueness Test

005128931-08, P = 23.561503 Days, E = 116.721495 Days

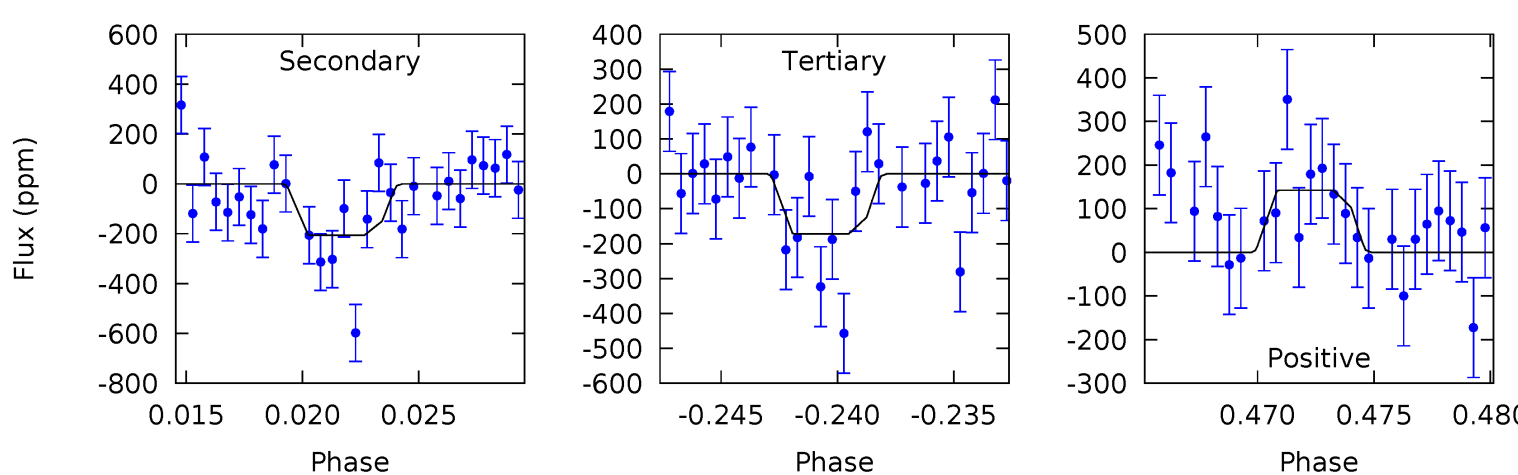
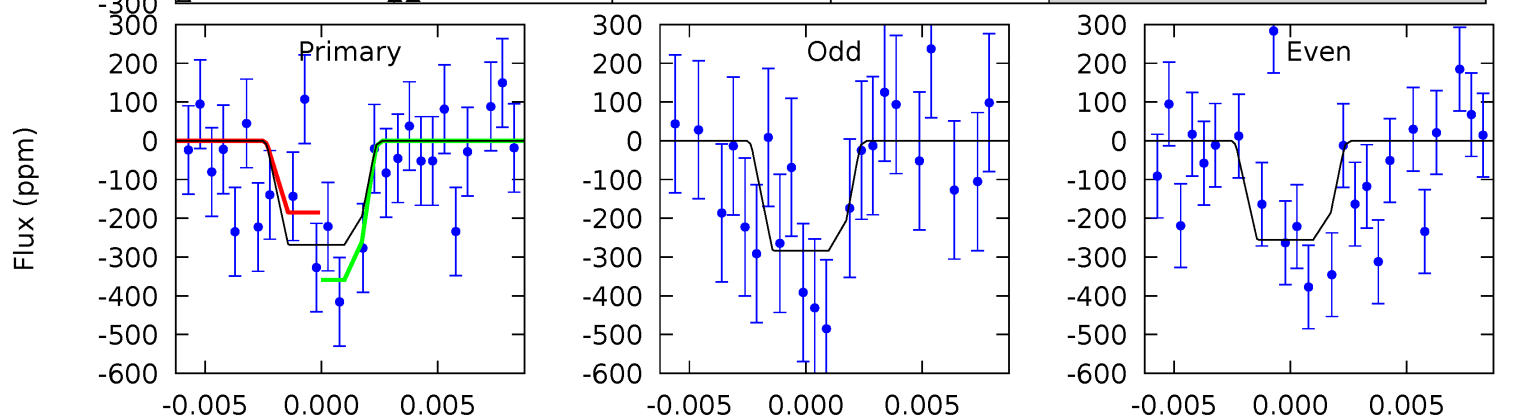
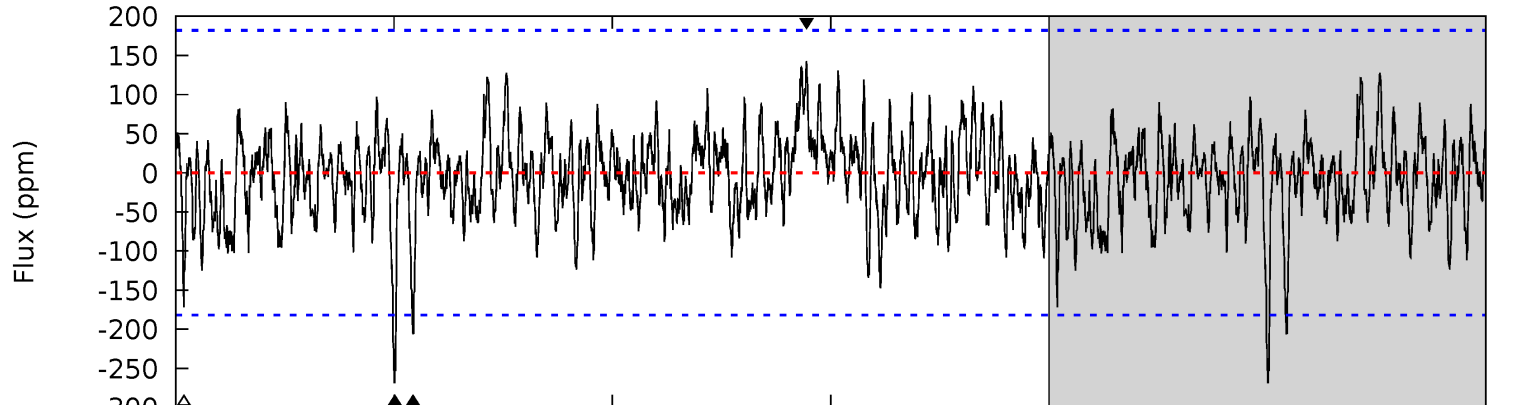
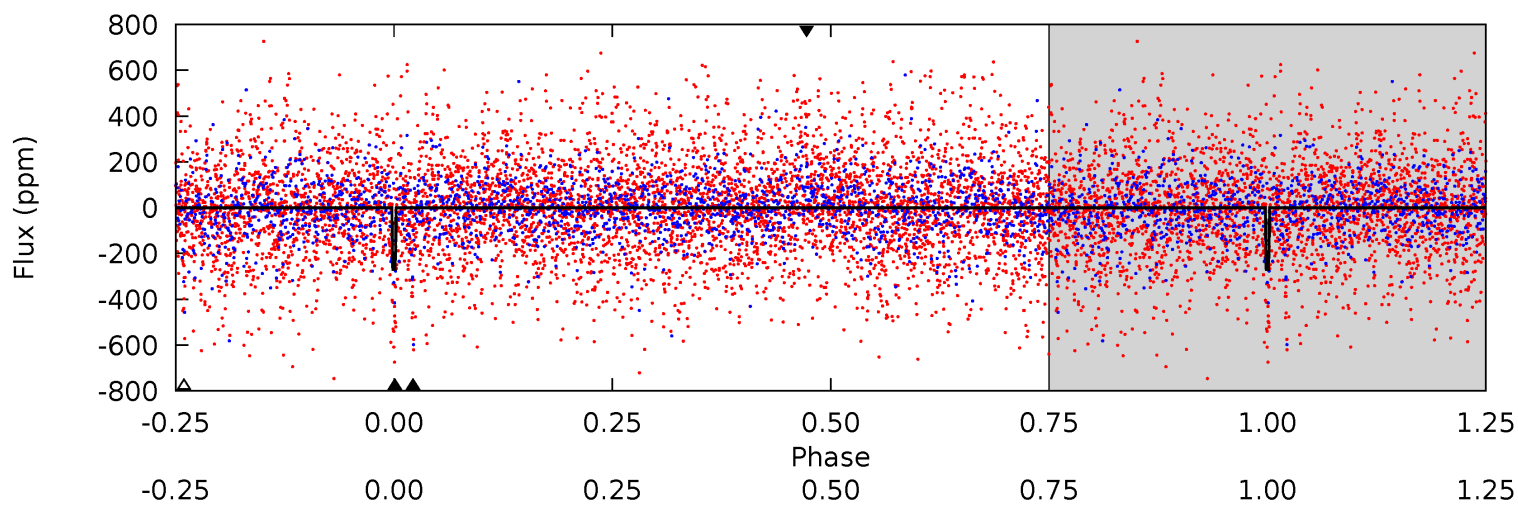
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.99	5.22	4.80	5.28	5.13	2.76	1.63	2.19	1.71	0.42	-0.06	0.52	0.99	0.43	1.47



# Alt Model-Shift Uniqueness Test

005128931-08,  $P = 23.563214$  Days,  $E = 116.637853$  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
7.62	5.85	4.88	4.04	5.16	2.81	1.36	2.74	3.58	0.97	1.81	0.39	0.71	0.35	2.46



### Stellar Parameters For KIC 005128931

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6211^{+186}_{-168}$	$3.553^{+0.352}_{-0.117}$	$-0.420^{+0.400}_{-0.300}$	$3.354^{+0.597}_{-1.392}$	$1.464^{+0.236}_{-0.355}$	$0.055^{+0.147}_{-0.019}$
	+3%/-3%	+10%/-3%	+95%/-71%	+18%/-42%	+16%/-24%	+268%/-35%
Source	PHO1	FLK73	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 005128931-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-194 \pm 37$	$7.71^{+6.69}_{-5.14}$	$1606^{+114}_{-164}$	$4917^{+3415}_{-1008}$	$59^{+430}_{-43}$
Alt.	$-206 \pm 35$	$7.72^{+6.49}_{-5.09}$	$1612^{+111}_{-170}$	$5064^{+3522}_{-1100}$	$64^{+491}_{-46}$

$T_{max}$  = 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

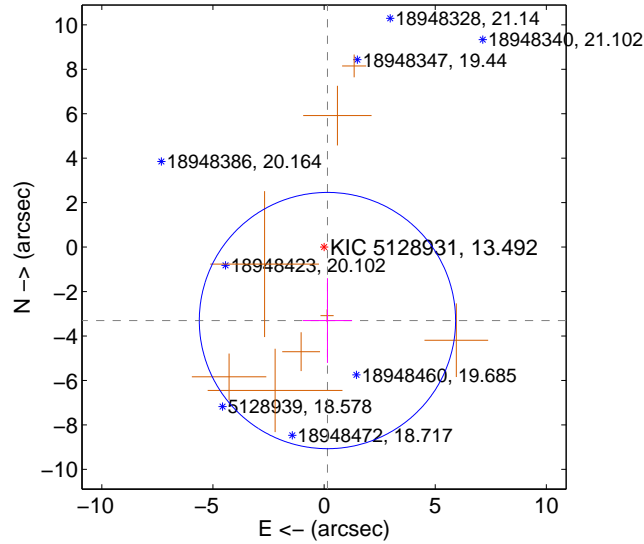
Supplemental centroid analysis for 005128931-08. Kepler magnitude: 13.49. Transit SNR 9.25

There are 0 quarters with good PRF difference image offsets

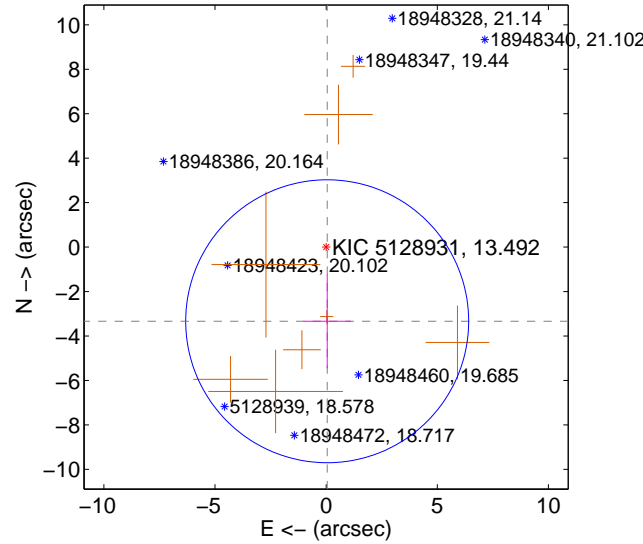
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.309 \pm 1.922$	1.72	$-0.151 \pm 1.107$	$-3.305 \pm 1.906$
PRF-fit source offset from KIC position	$3.337 \pm 2.122$	1.57	$-0.046 \pm 1.067$	$-3.337 \pm 2.117$
photometric centroid source offset	$0.68 \pm 0.51$	1.34	$-0.38 \pm 0.51$	$-0.56 \pm 0.50$

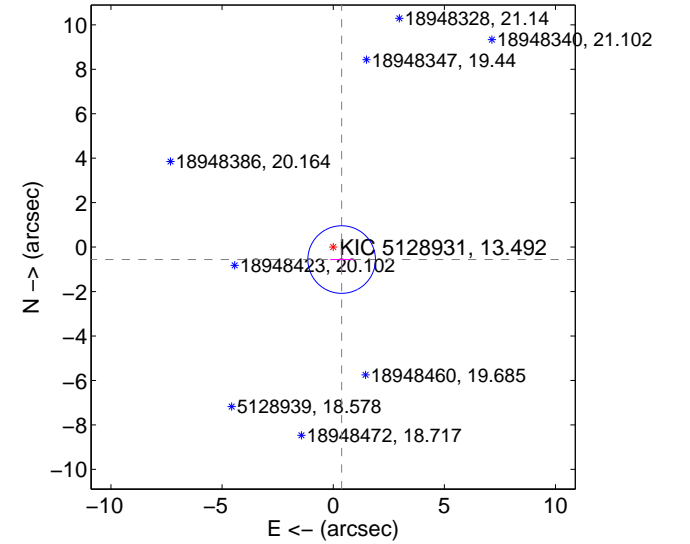
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

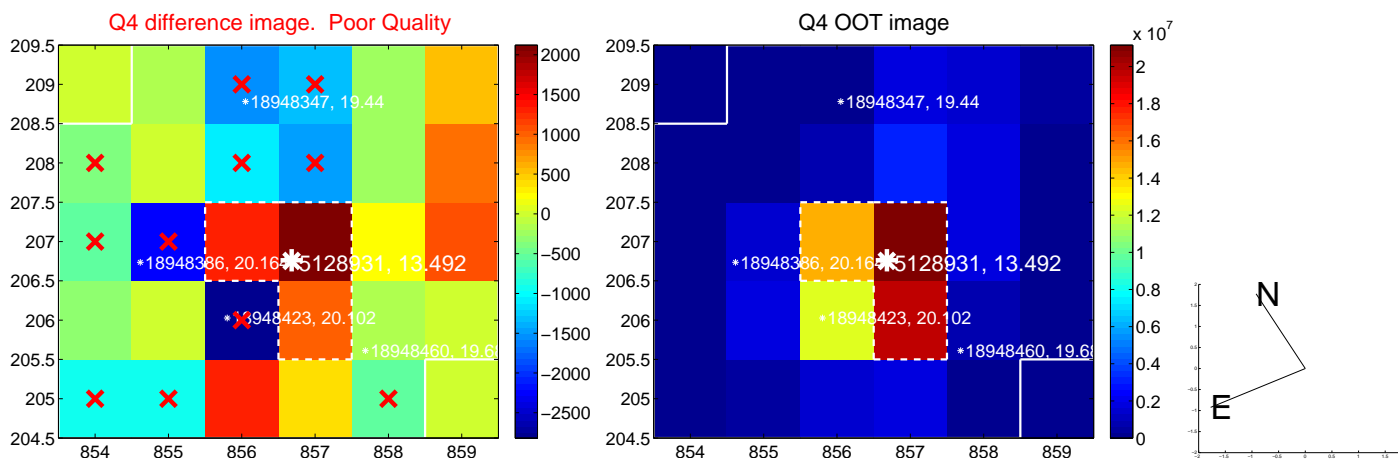
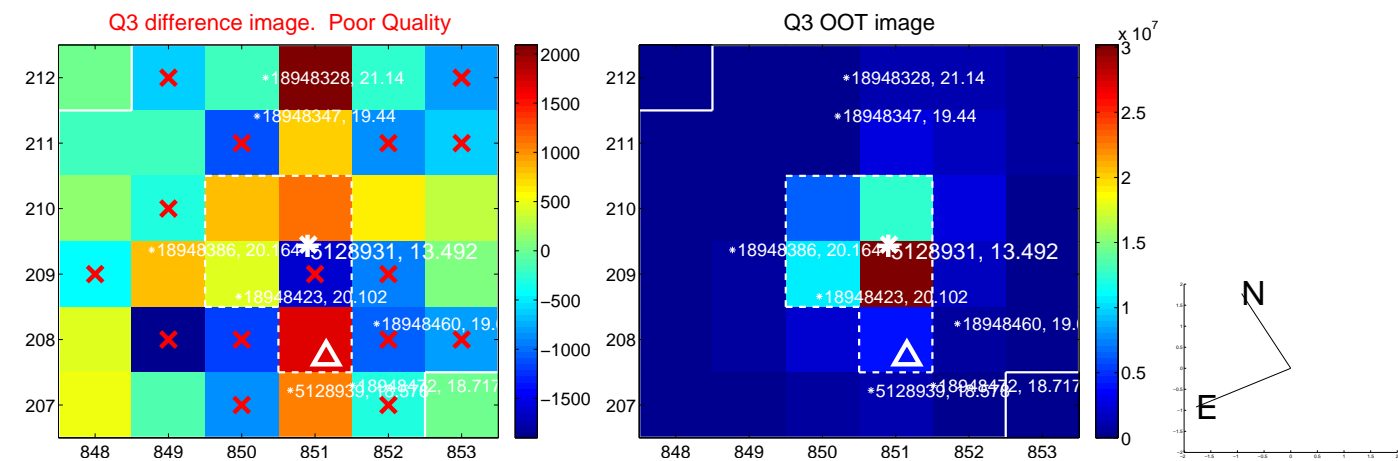
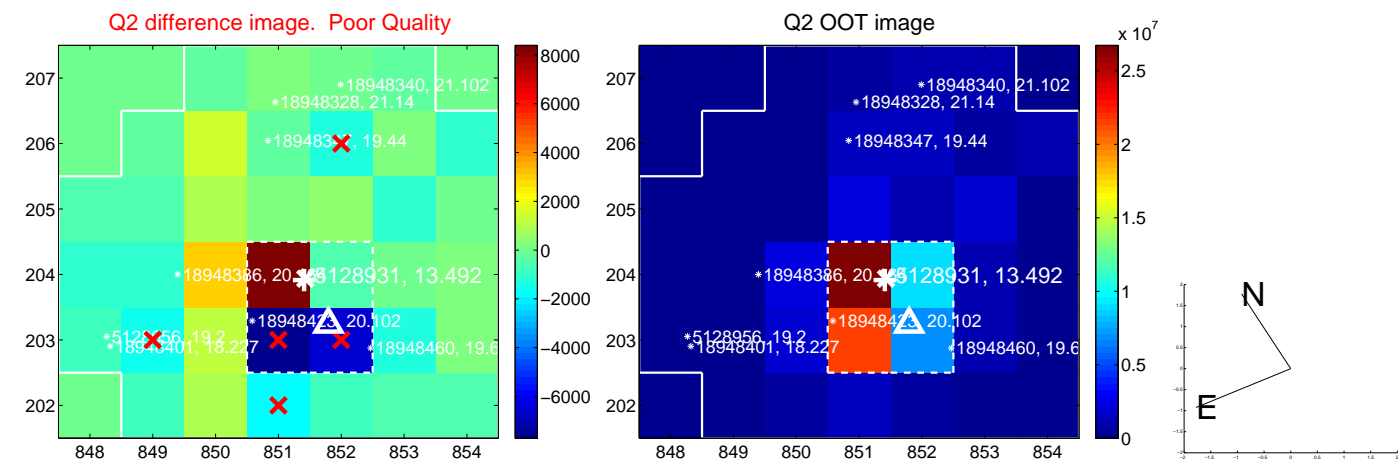
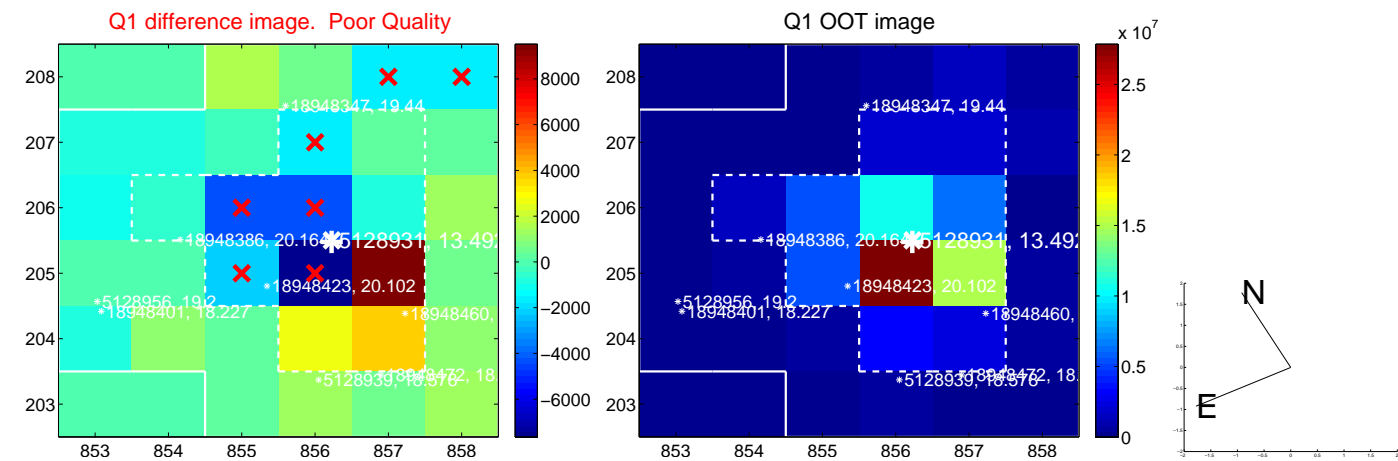


offset from photometric centroids

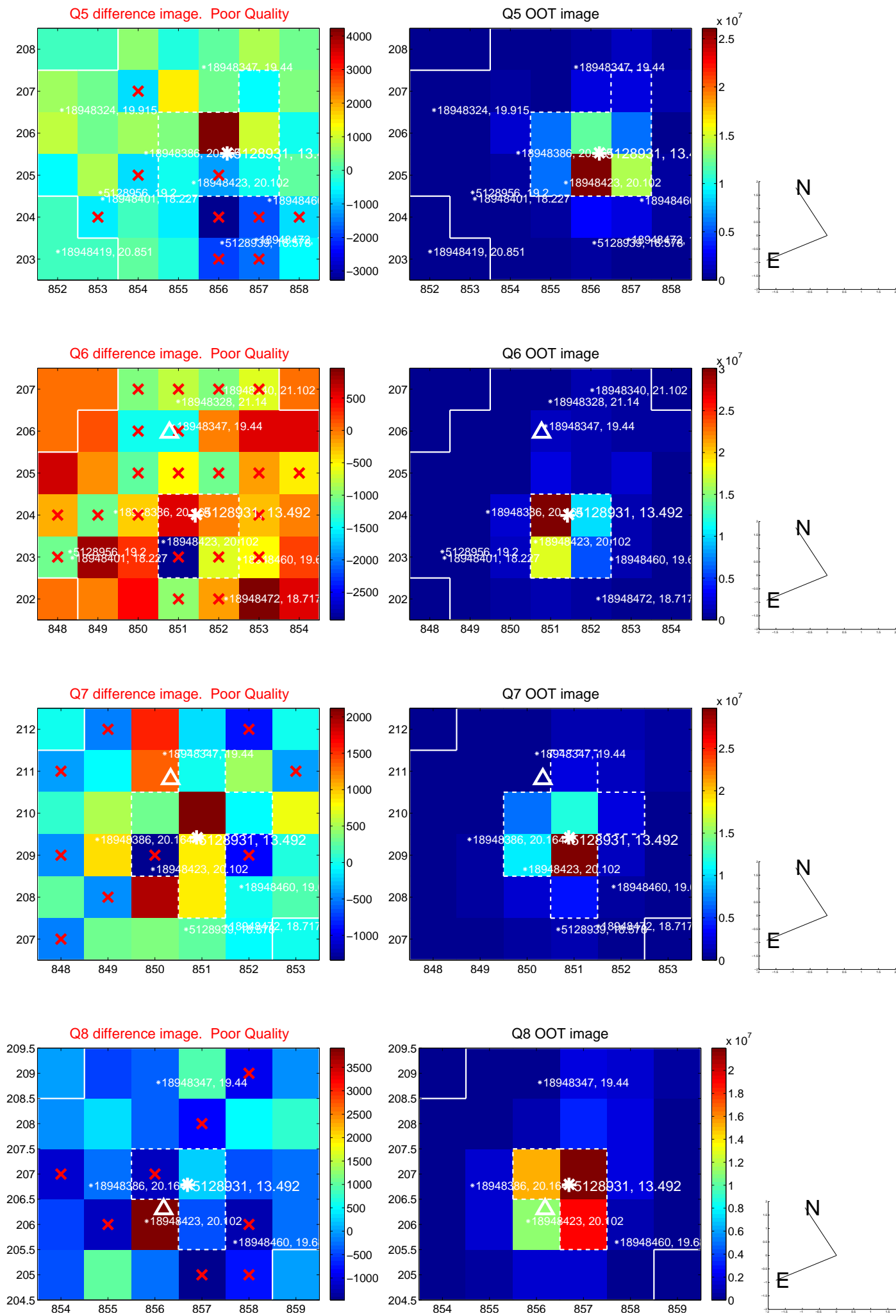


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

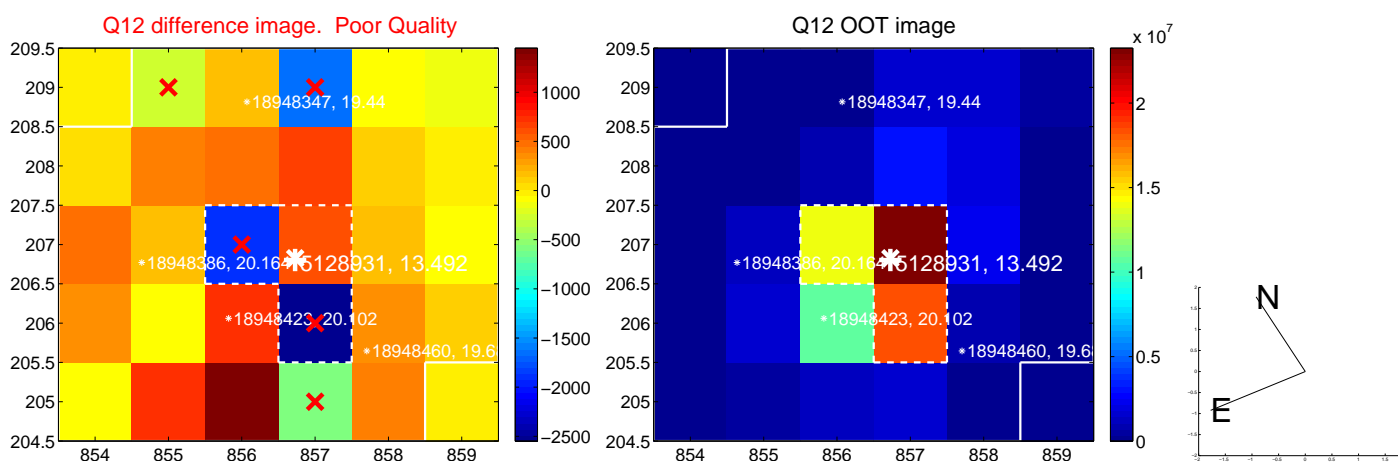
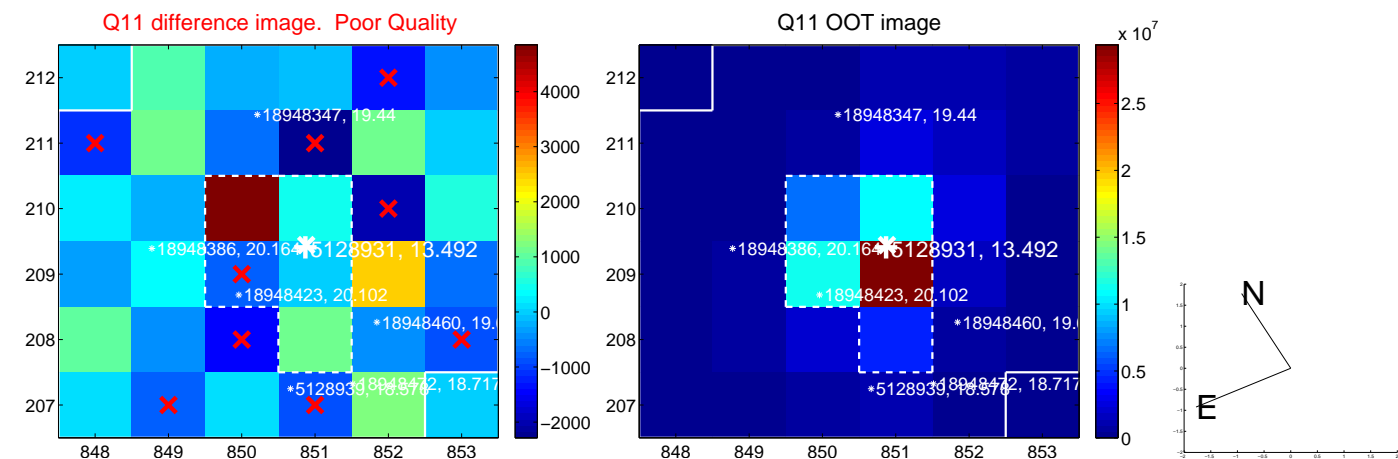
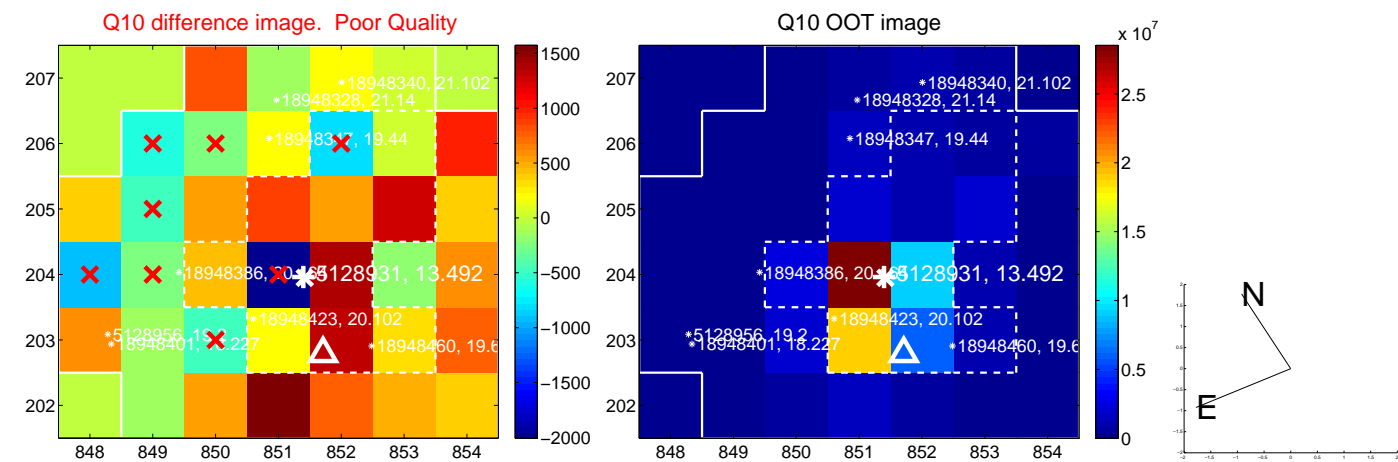
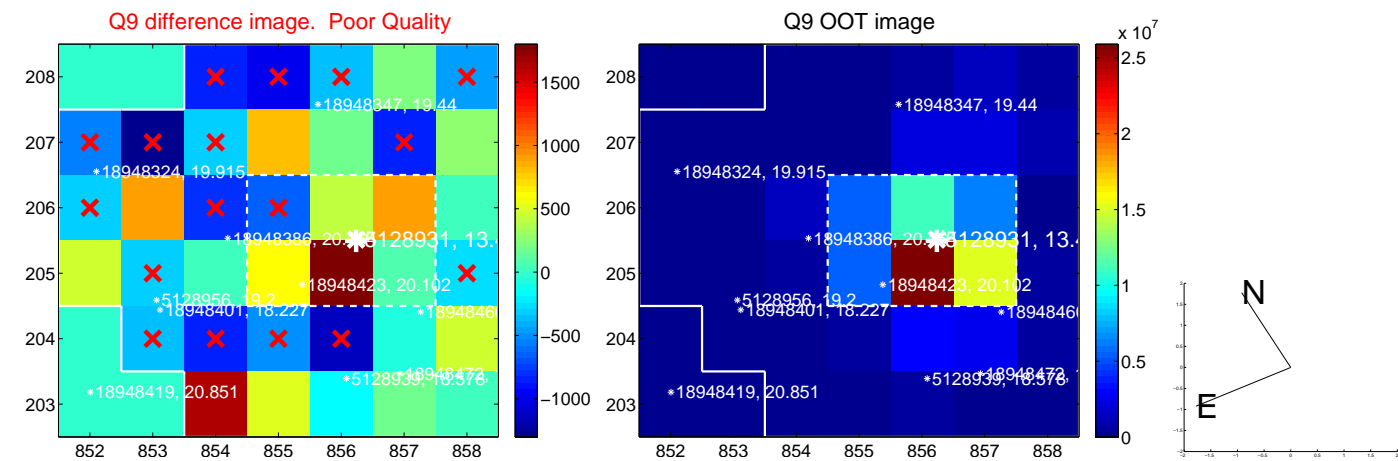
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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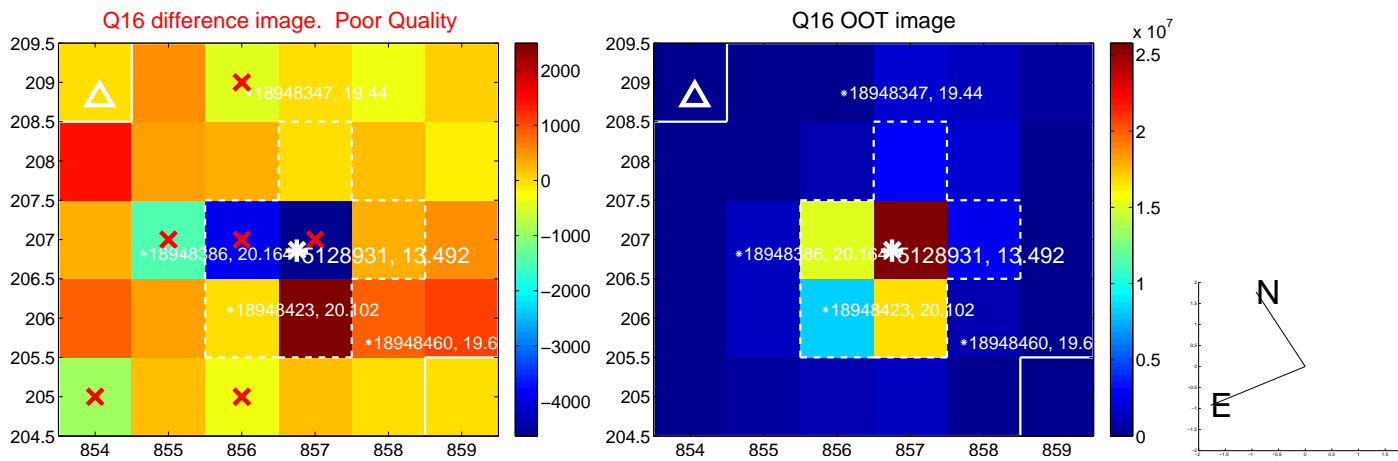
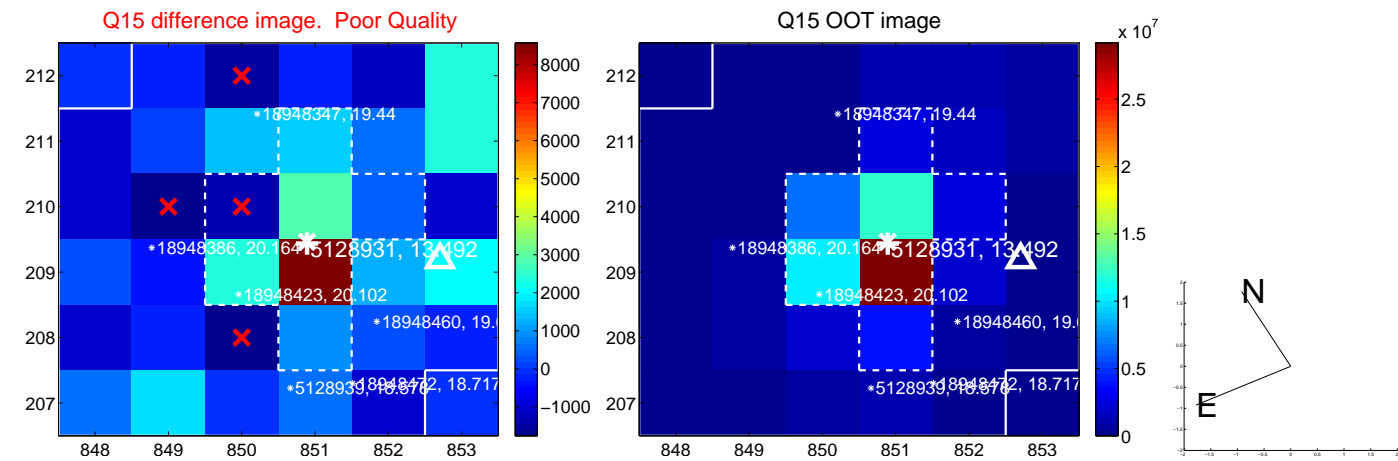
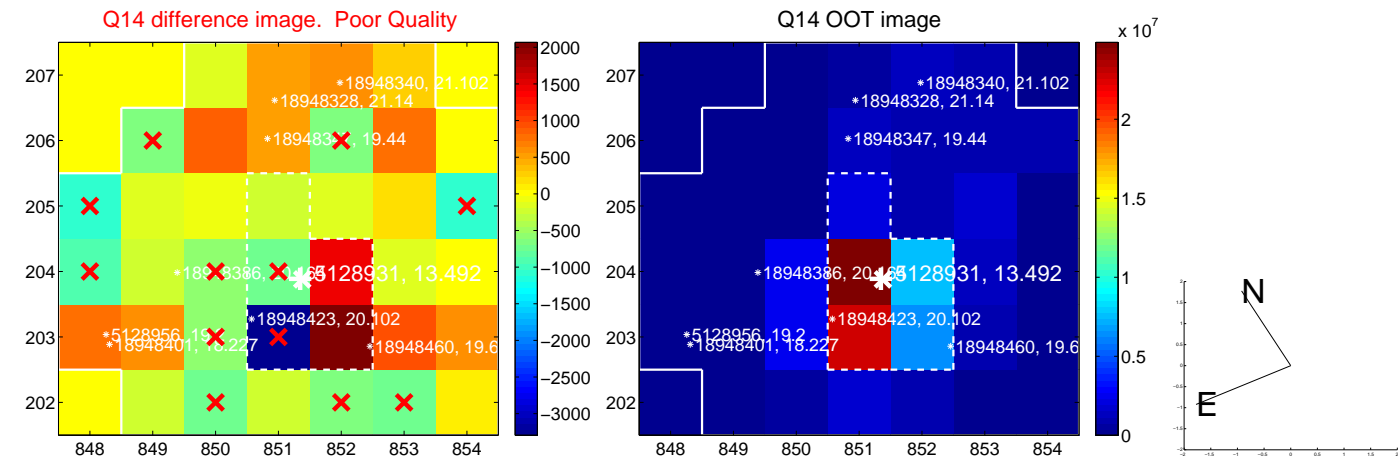
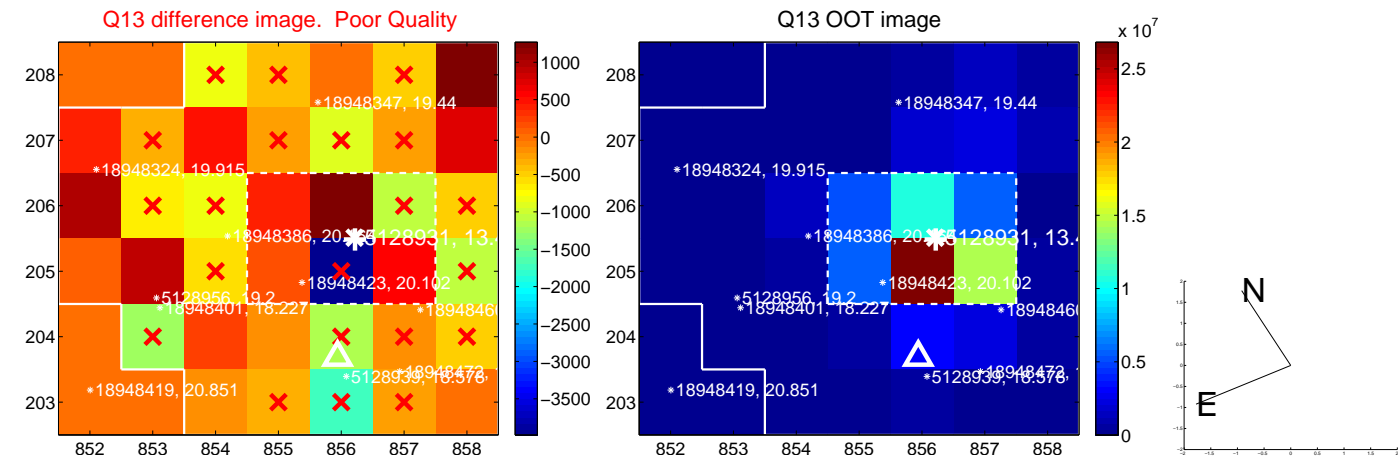


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

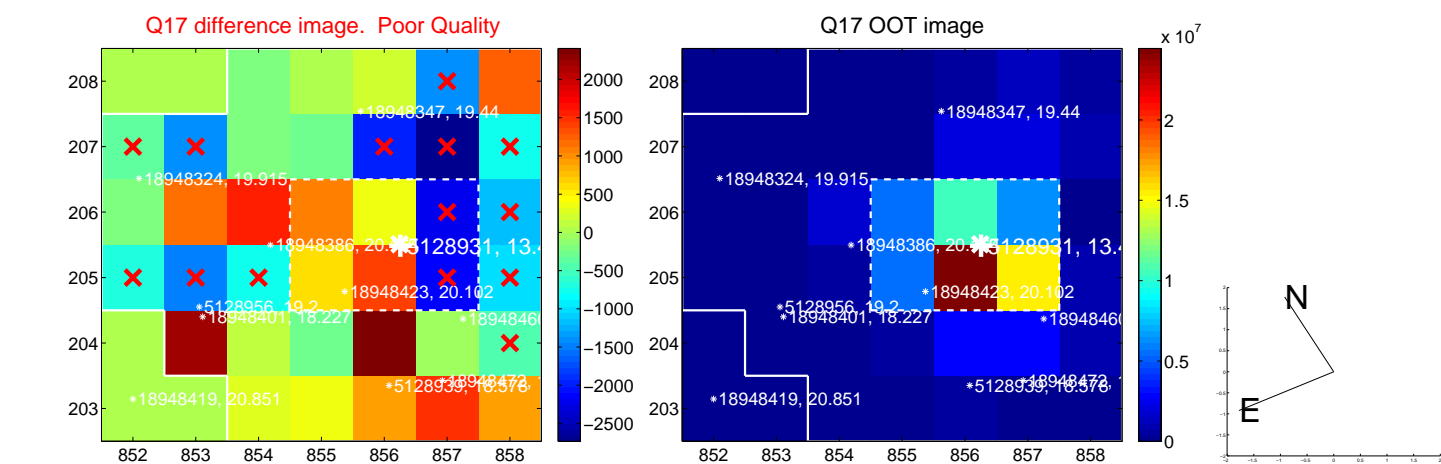




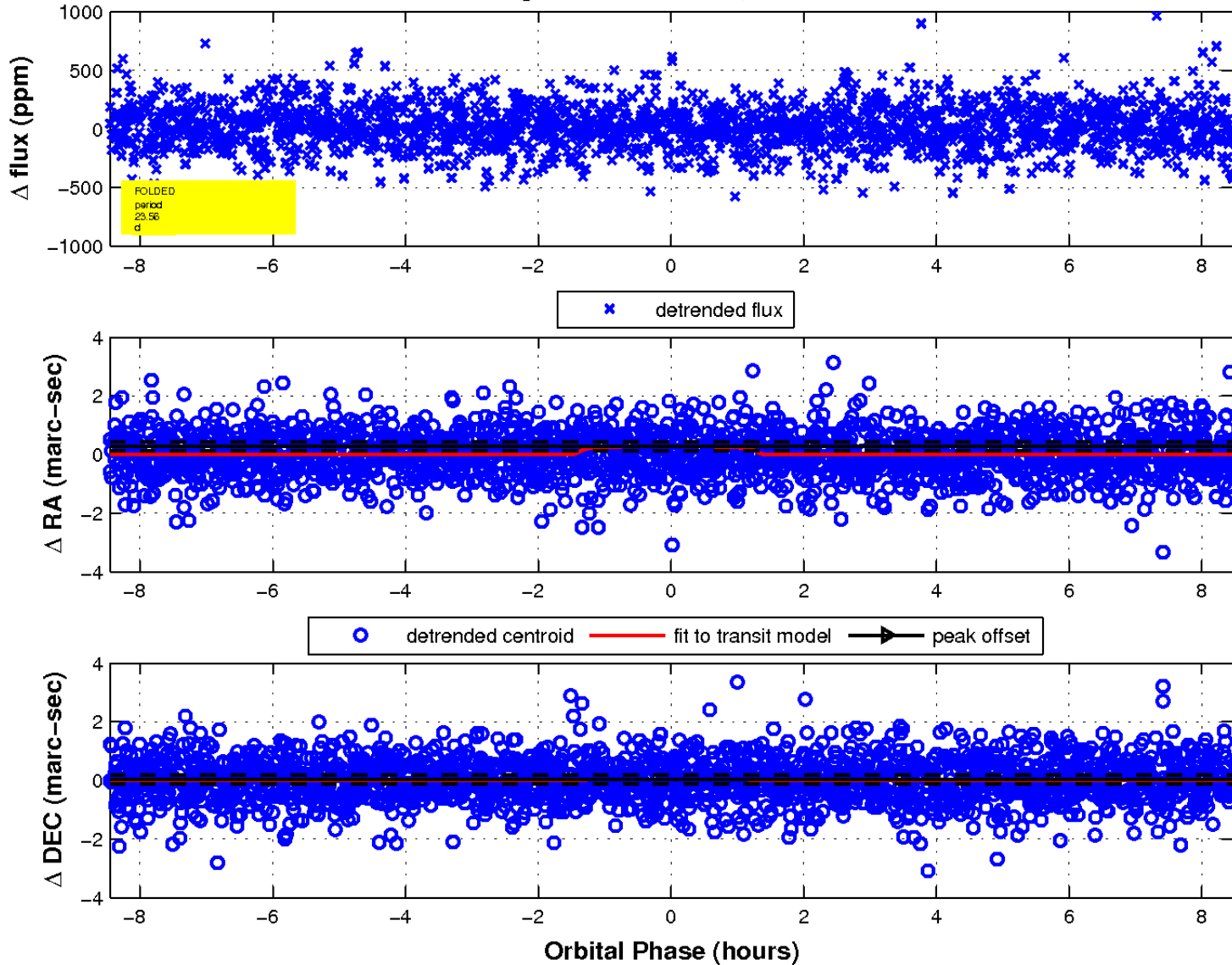
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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fluxWeightedCentroids, Planet 8 of 8



UKIRT Image

Declination

