

# KIC 009490506

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009490506-01	OBS	No	0.581598	131.711704	13.3	4.403	10.1	7.1	1.22	6559	0.46	11512.76
009490506-02	OBS	No	9.545196	134.454944	1034.9	2.000	15.2	-1.0	1.22	6559	3.95	276.03
009490506-03	OBS	No	4.188768	135.553388	181.2	1.055	15.1	14.4	1.22	6559	1.92	827.74
009490506-04	OBS	No	4.958190	133.993423	219.2	1.641	15.1	19.2	1.22	6559	1.96	661.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009490506-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_MEAS
009490506-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_NOFITS
009490506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009490506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV

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

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

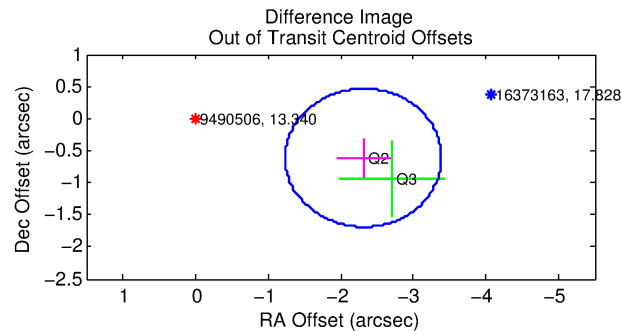
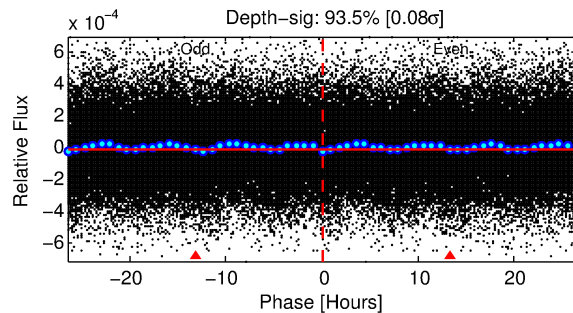
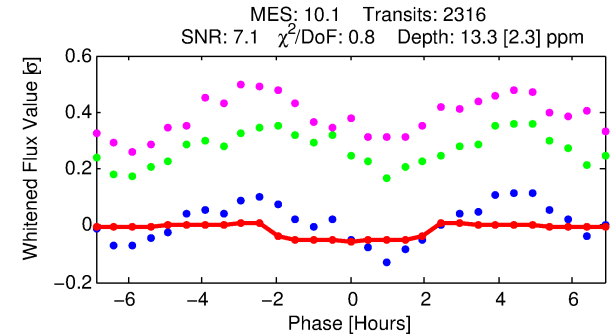
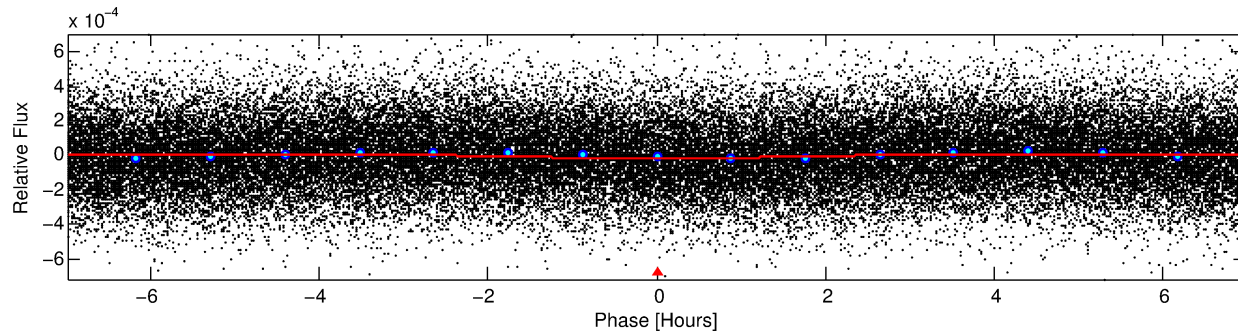
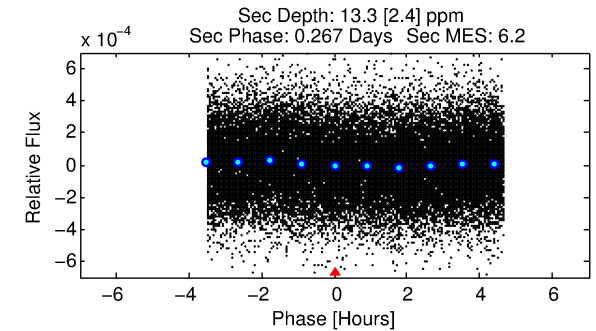
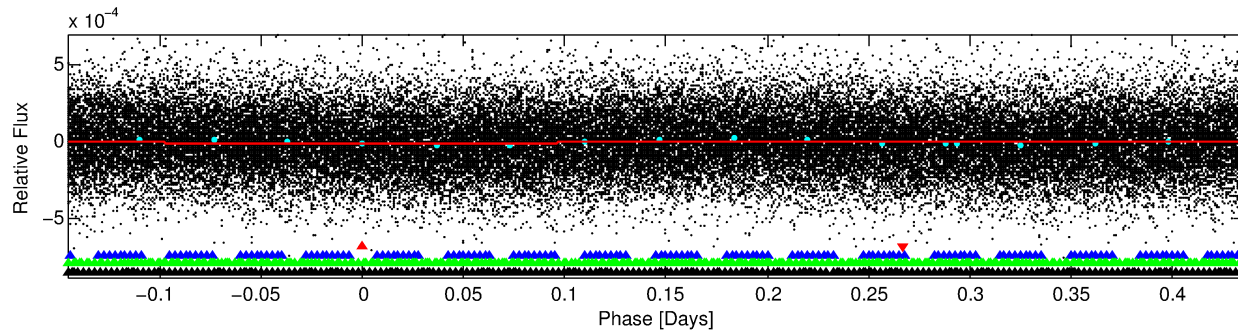
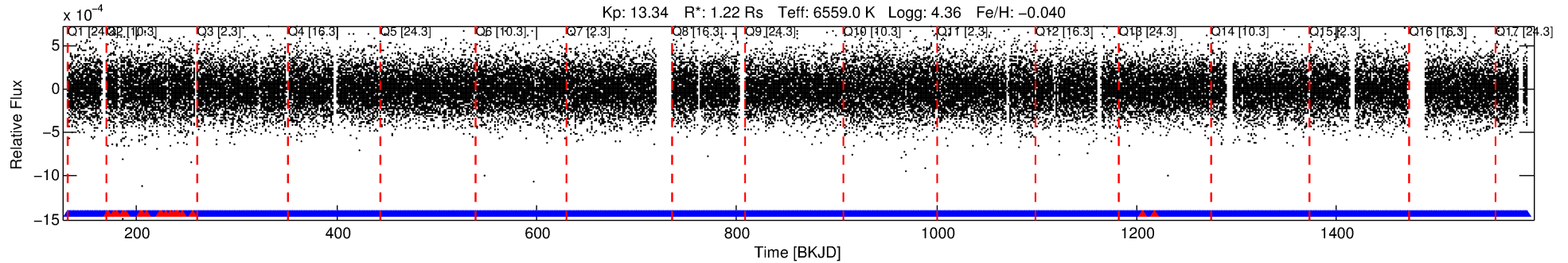
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009490506-01

No Significant Match Found

# DV One-Page Summary

KIC: 9490506 Candidate: 1 of 4 Period: 0.582 d



## DV Fit Results:

Period = 0.58160 [0.00002] d  
Epoch = 131.7117 [0.0057] BKJD  
Rp/R\* = 0.0035 [0.0030]  
a/R\* = 1.14 [1.22]  
b = 0.57 [5.63]  
Seff = 11512.76 [4828.09]  
Teq = 2641 [277] K  
Rp = 0.46 [0.42] Re  
a = 0.0146 [0.0040] AU  
Ag = 7.31 [12.89] [0.49σ]  
Teffp = 6715 [2892] K [1.40σ]

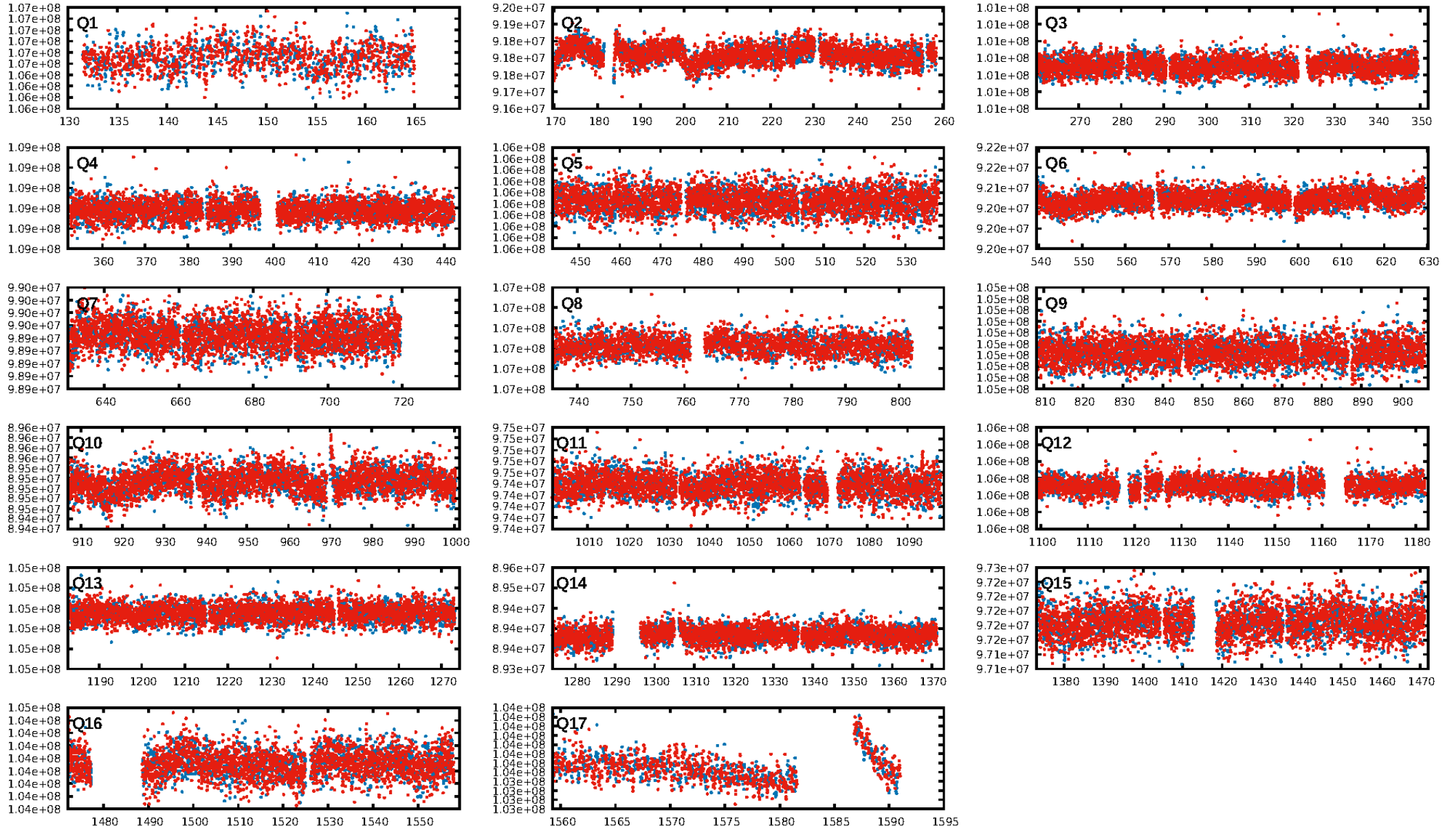
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [19.12σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.70e-02**  
RollingBand-fgt: 0.99 [2192/2211]  
GhostDiagnostic-chr: 3.101  
Centroid-sig: 12.6%  
Centroid-so: 2.081 arcsec [1.50σ]  
**OotOffset-rm: 2.391 arcsec [6.67σ]**  
**KicOffset-rm: 2.728 arcsec [7.54σ]**  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:01:02 Z

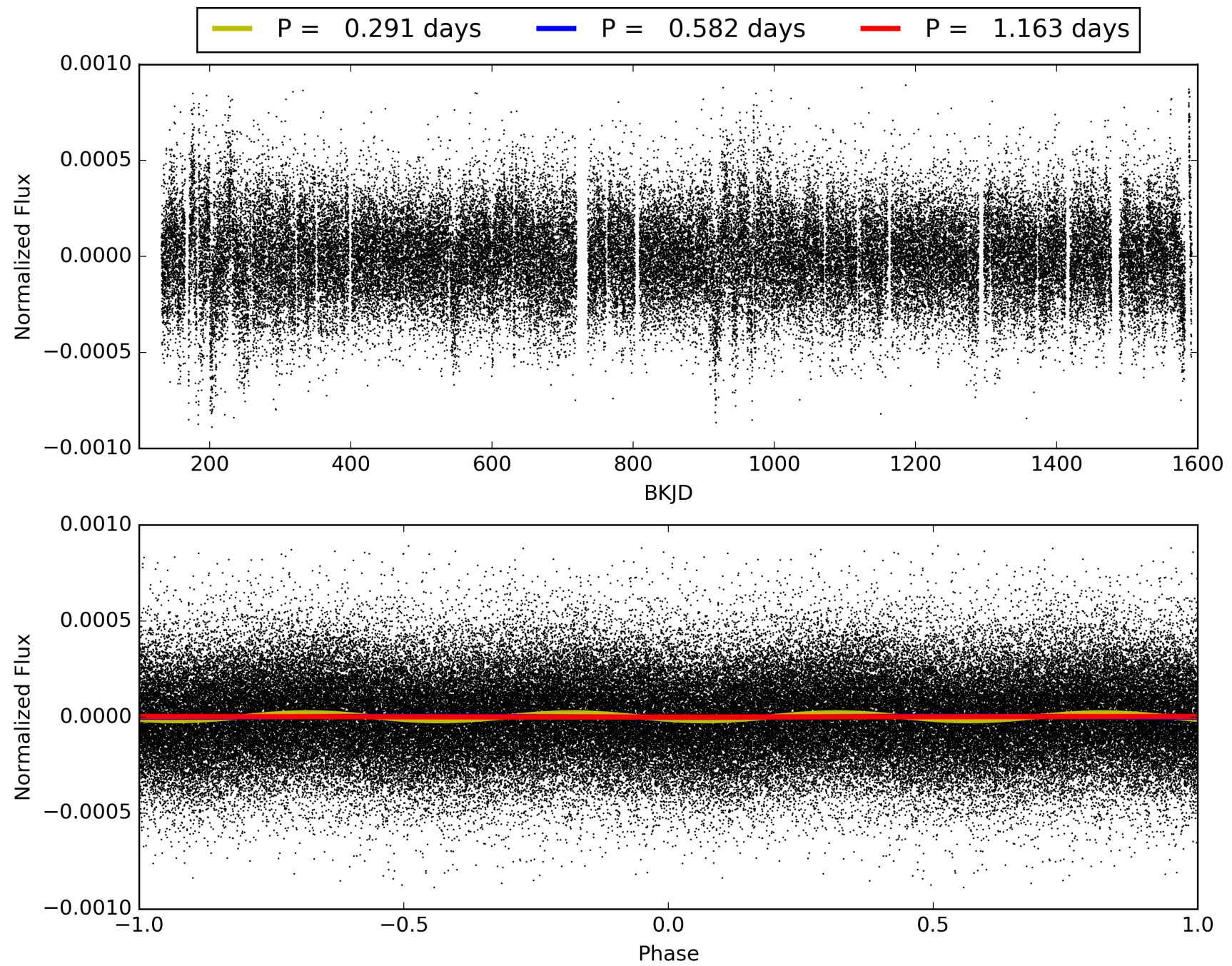
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009490506-01, PDC Light Curves





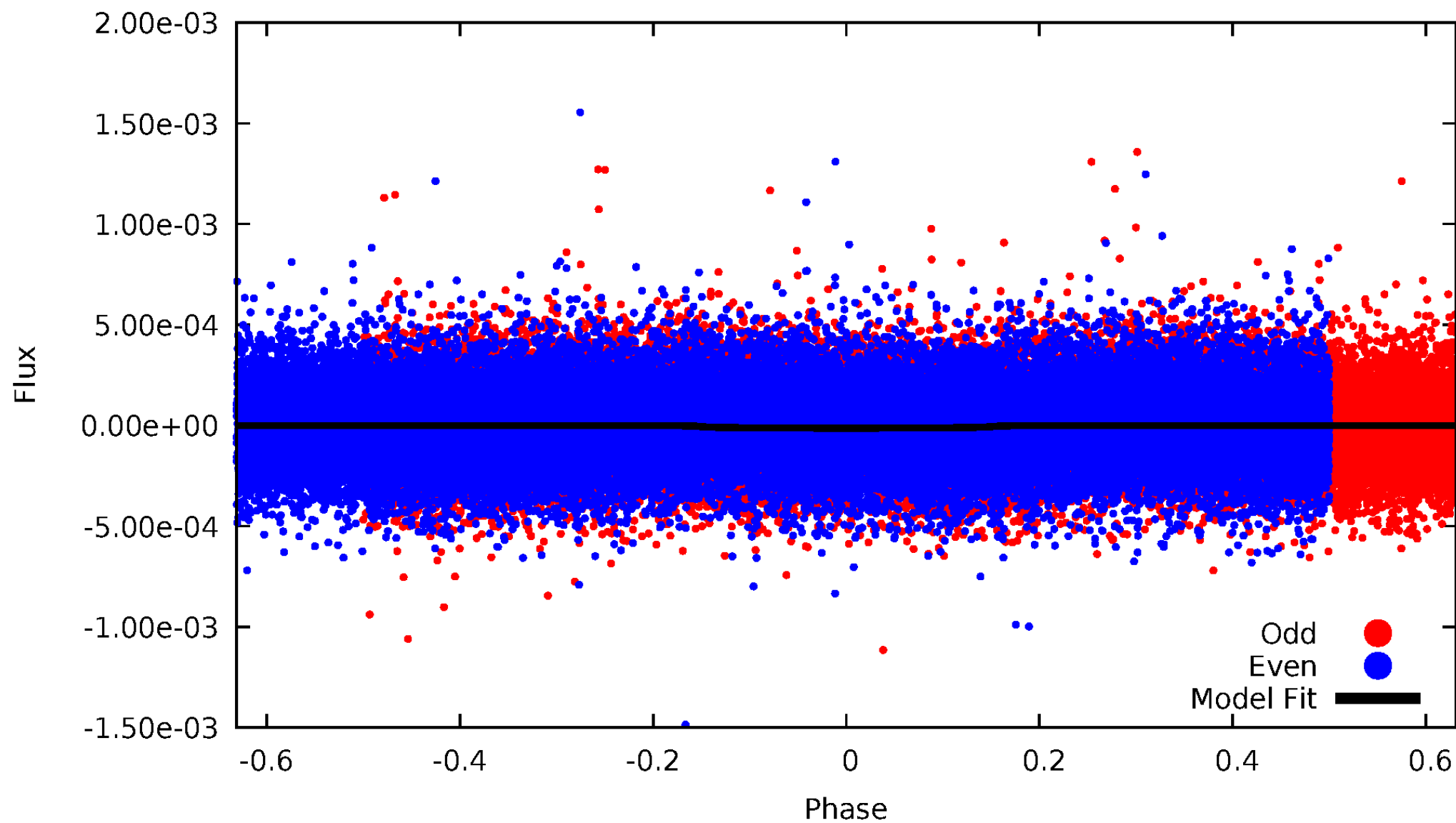
TCE 009490506-01





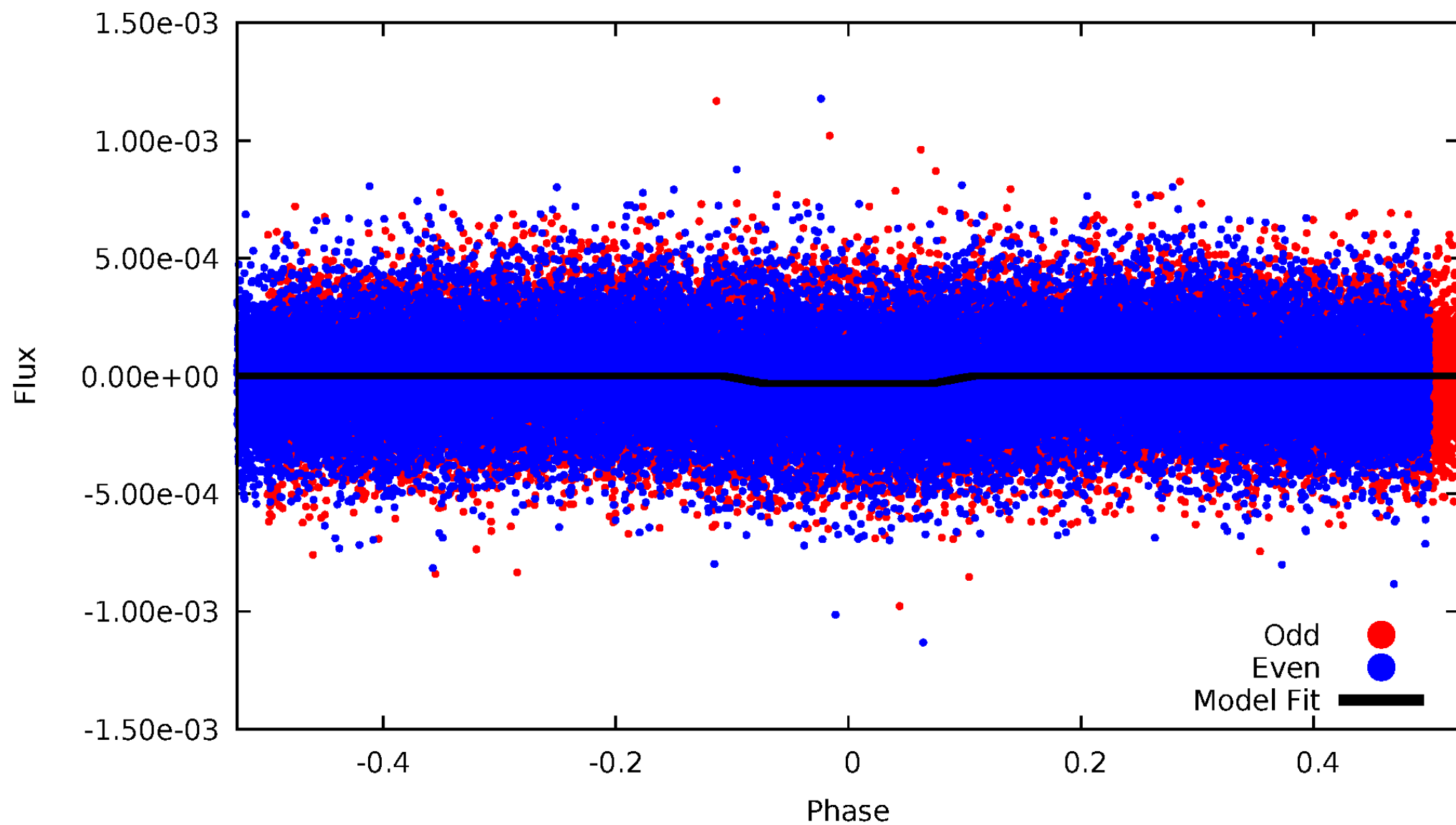
# DV Odd/Even

TCE 009490506-01

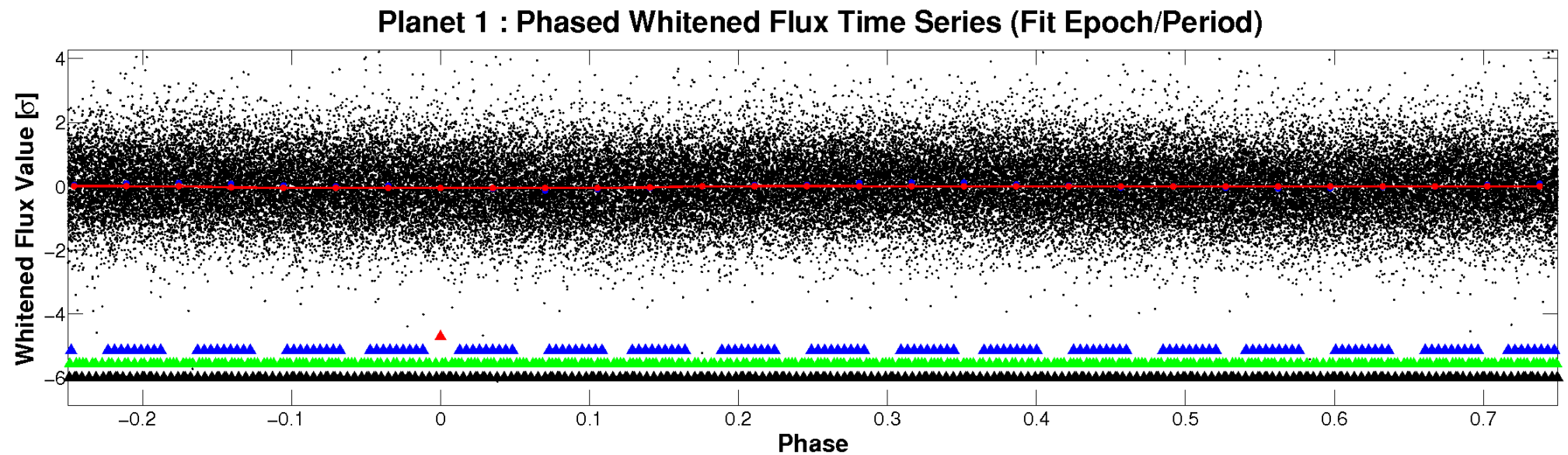
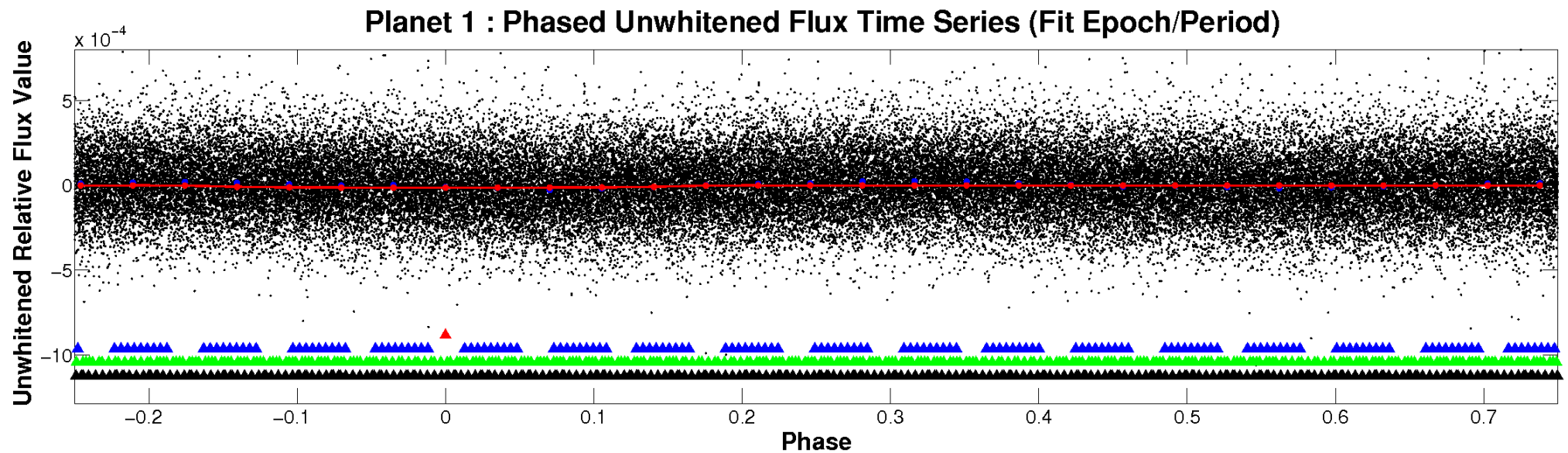


# ALT Odd/Even

TCE 009490506-01



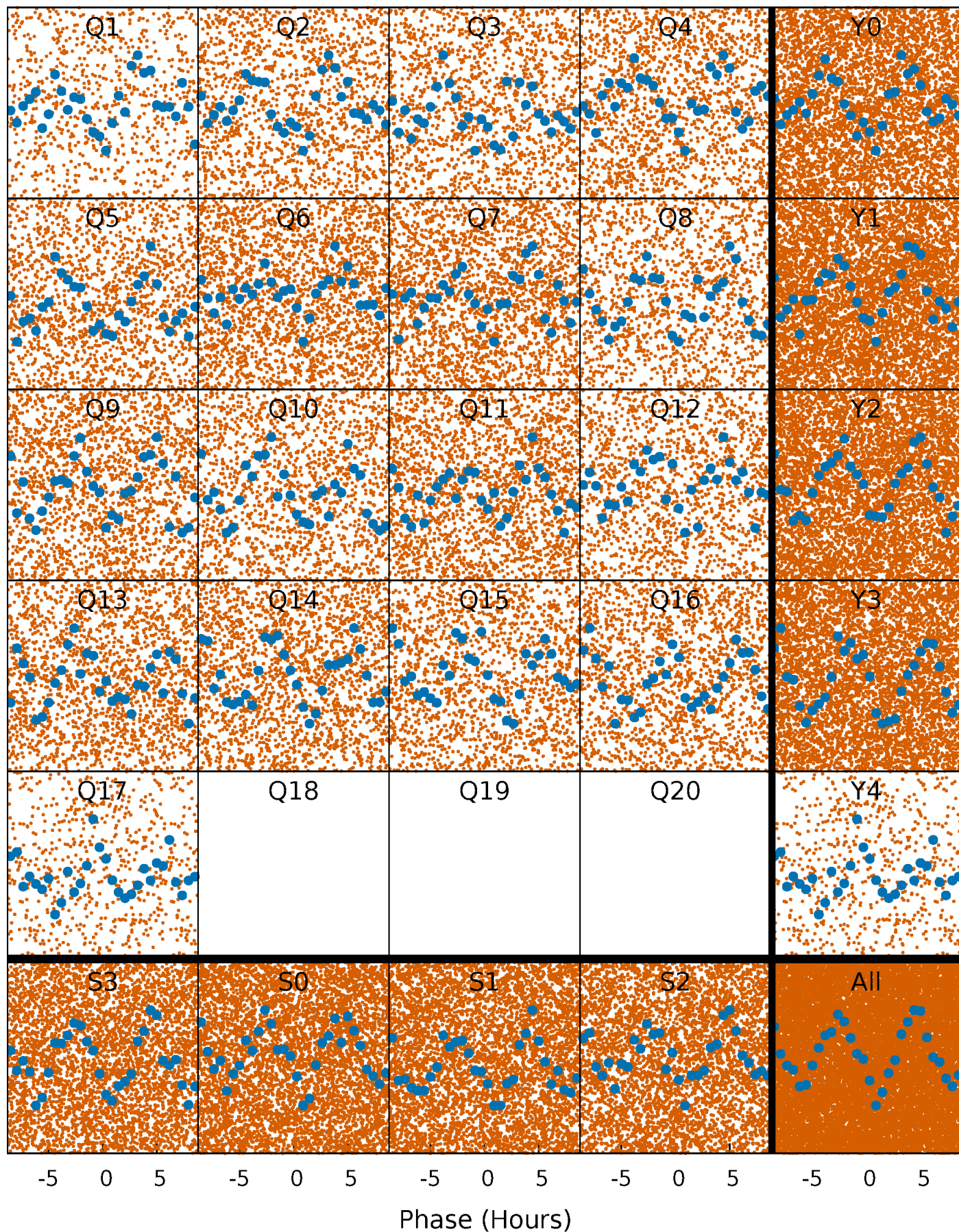
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

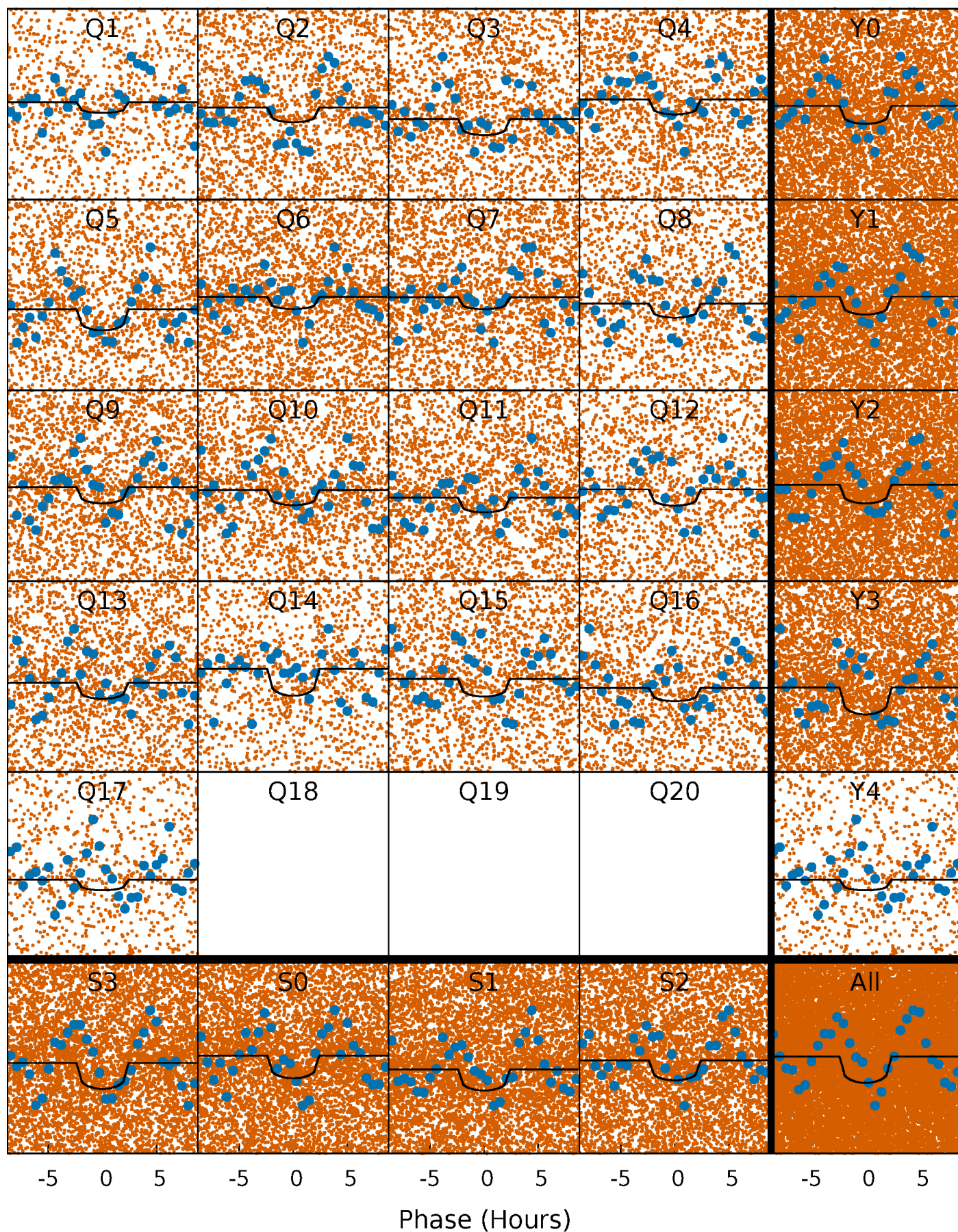
TCE 009490506-01 P= 0.581598 Days  $T_0=131.711704$  (BKJD)





# DV Quarter-Phased Transit Curves

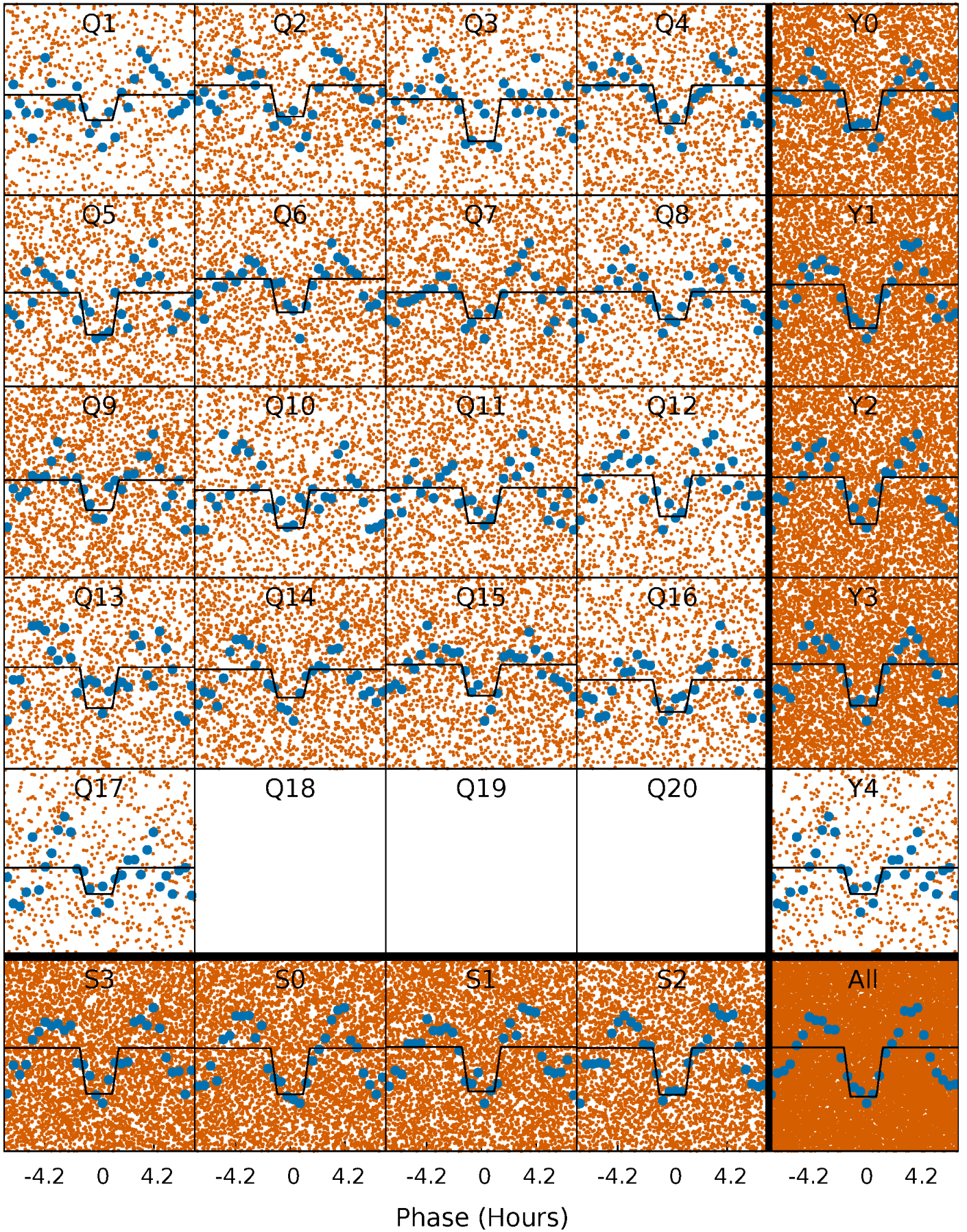
TCE 009490506-01 P= 0.581598 Days  $T_0=131.711704$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009490506-01 P= 0.581636 Days  $T_0=131.703302$  (BKJD)

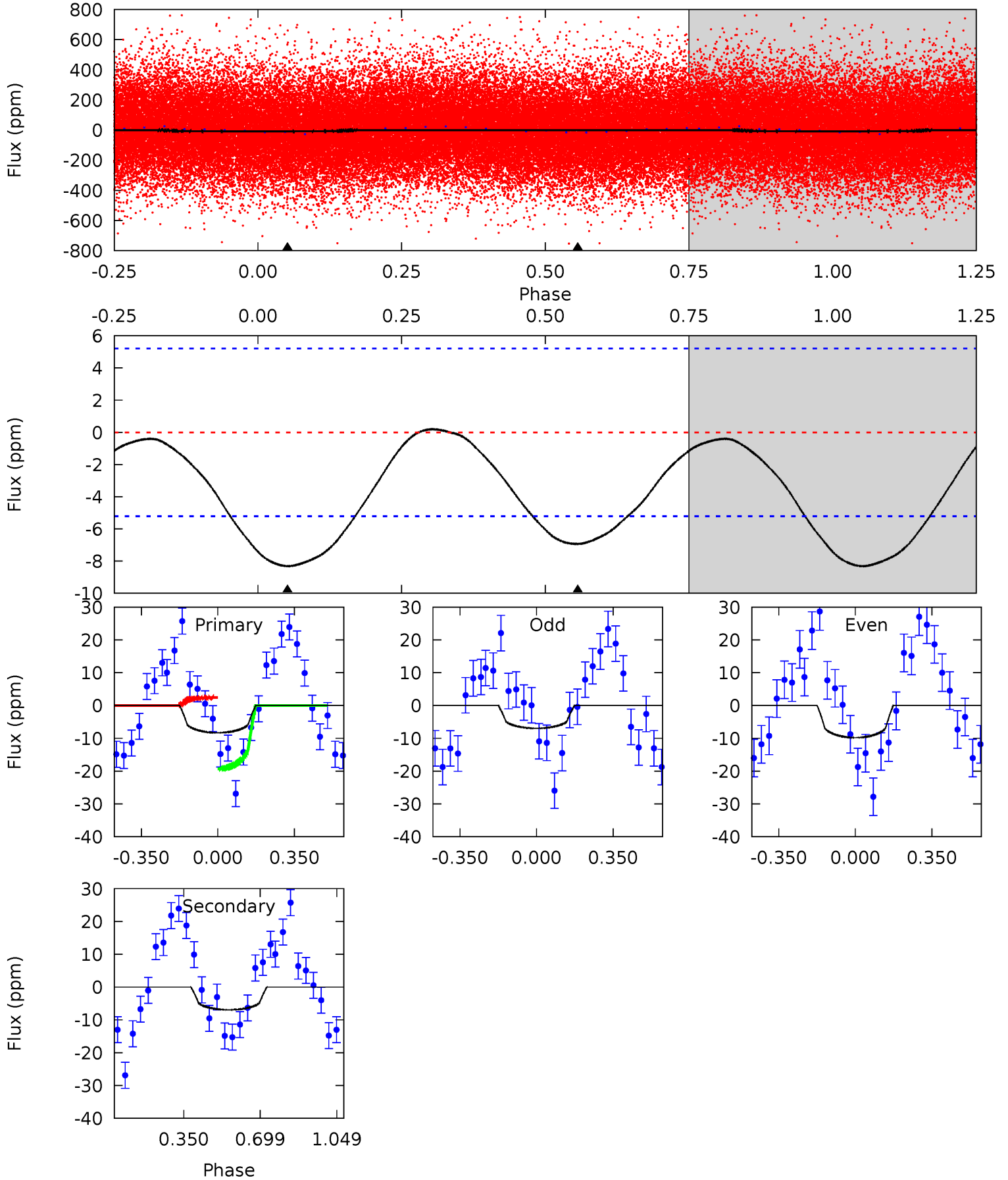




# DV Model-Shift Uniqueness Test

009490506-01, P = 0.581598 Days, E = 131.130106 Days

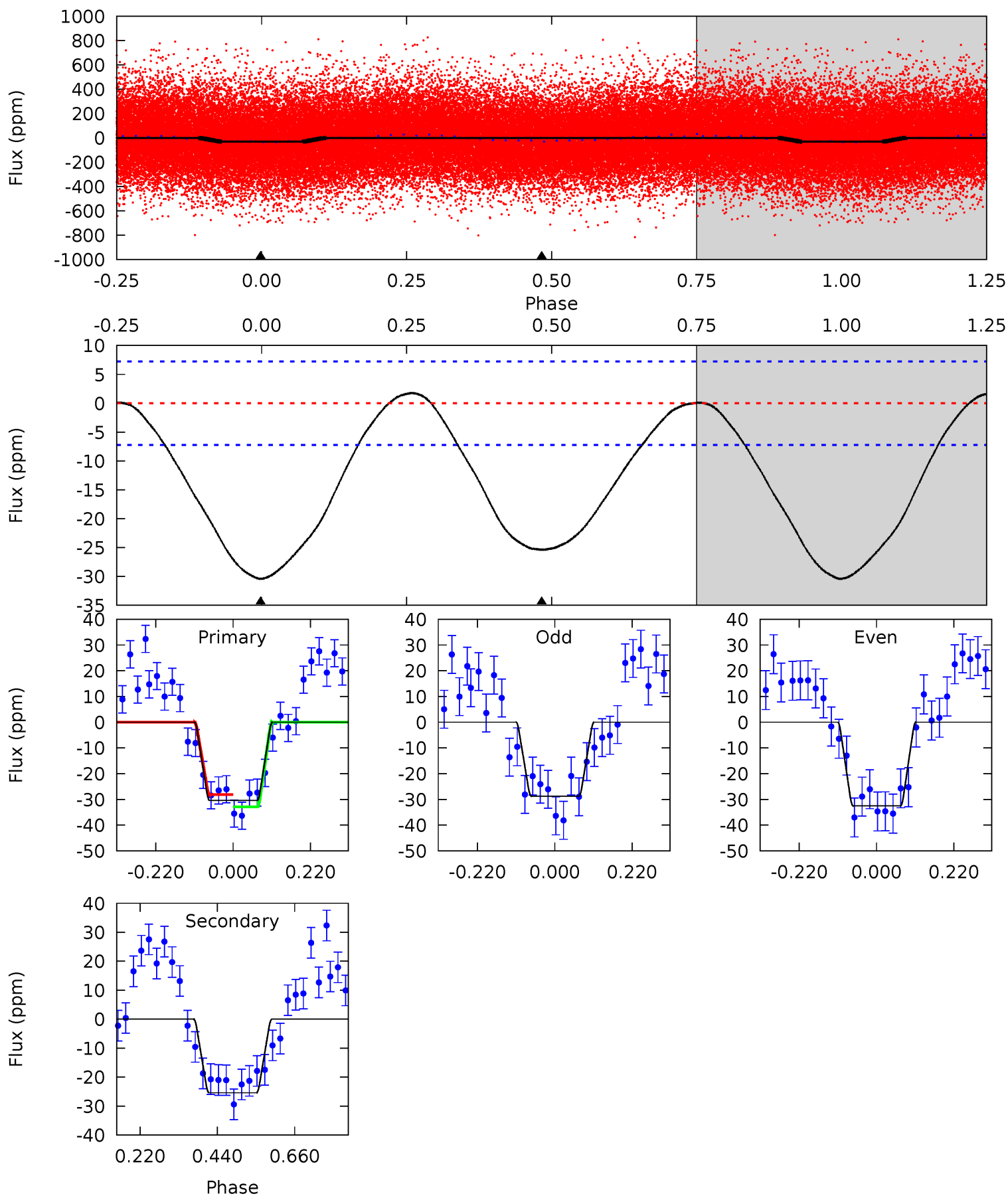
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.85	5.72	0	0	4.29	0.94	0.24	6.85	6.85	5.72	5.72	1.17	0.88	0.02	6.88



# Alt Model-Shift Uniqueness Test

009490506-01, P = 0.581636 Days, E = 131.121666 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.5	15.5	0	0	4.40	1.23	0.55	18.5	18.5	15.5	15.5	1.13	1.05	0.06	1.45



### Stellar Parameters For KIC 009490506

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6559^{+148}_{-214}$	$4.357^{+0.067}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.218^{+0.404}_{-0.144}$	$1.235^{+0.181}_{-0.181}$	$0.963^{+0.289}_{-0.522}$
	+2%/-3%	+2%/-5%	+625%/-750%	+33%/-12%	+15%/-15%	+30%/-54%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009490506-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-7 \pm 1$	$0.56^{+0.39}_{-0.34}$	$3750^{+281}_{-192}$	$5116^{+3689}_{-1160}$	$2.559^{+12.709}_{-1.706}$
Alt.	$-25 \pm 2$	$0.80^{+0.40}_{-0.37}$	$3750^{+248}_{-177}$	$5994^{+2564}_{-1069}$	$4.514^{+11.105}_{-2.471}$

$T_{\text{max}}$  = 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

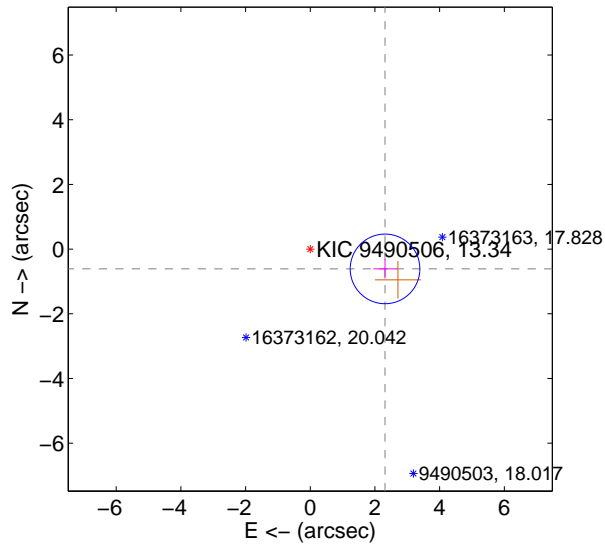
Supplemental centroid analysis for 009490506-01. Kepler magnitude: 13.34. Transit SNR 7.11

There are 1 quarters with good PRF difference image offsets

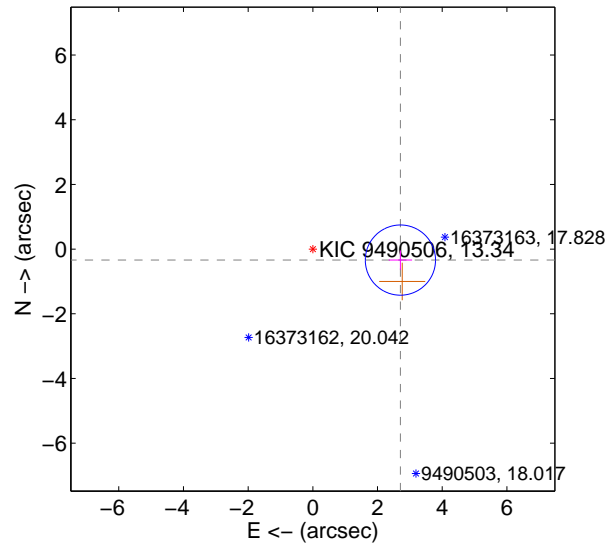
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.391 \pm 0.359$	6.67	$-2.312 \pm 0.363$	$-0.612 \pm 0.299$
PRF-fit source offset from KIC position	$2.728 \pm 0.362$	7.54	$-2.707 \pm 0.363$	$-0.340 \pm 0.299$
photometric centroid source offset	$2.08 \pm 1.38$	1.50	$-2.05 \pm 1.38$	$-0.36 \pm 1.40$

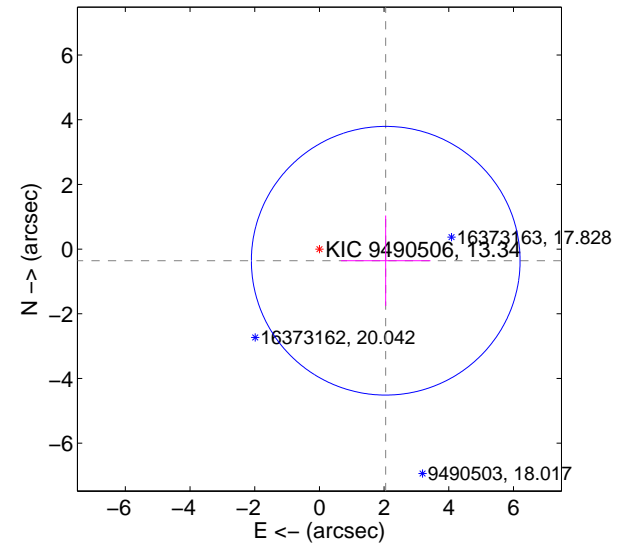
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

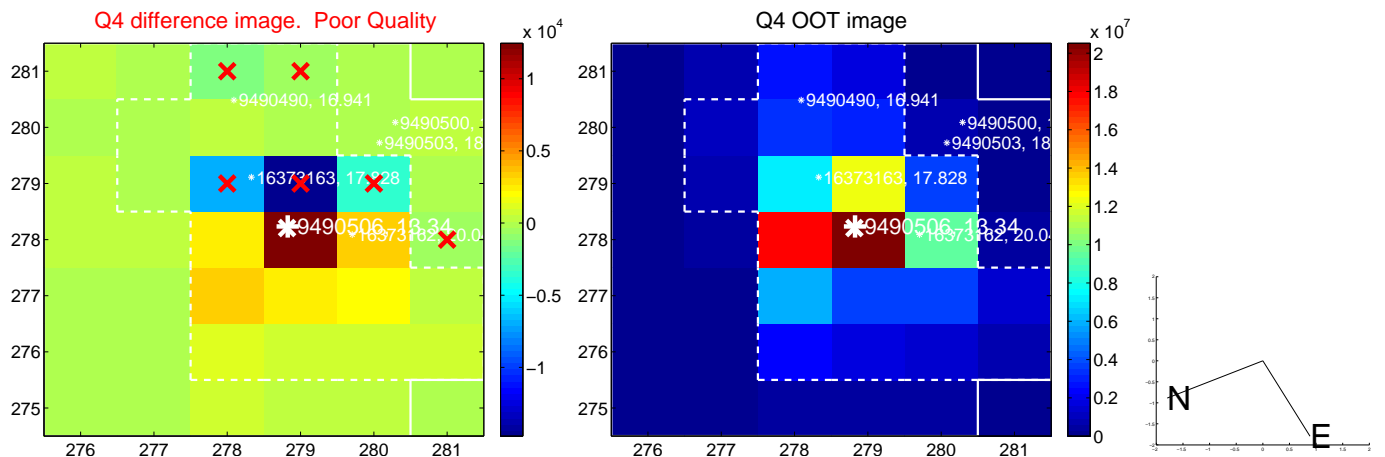
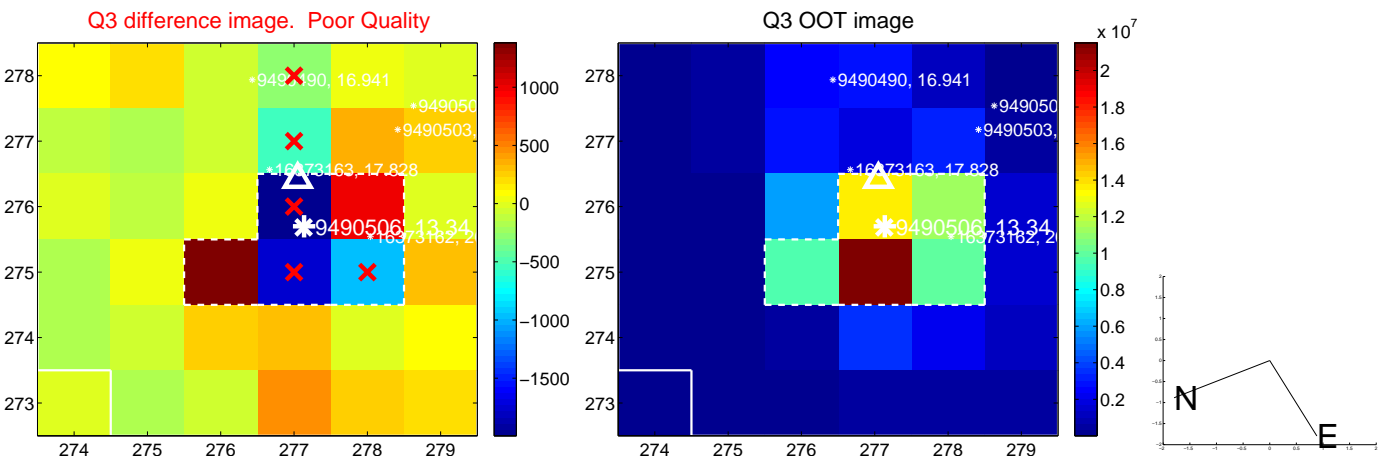
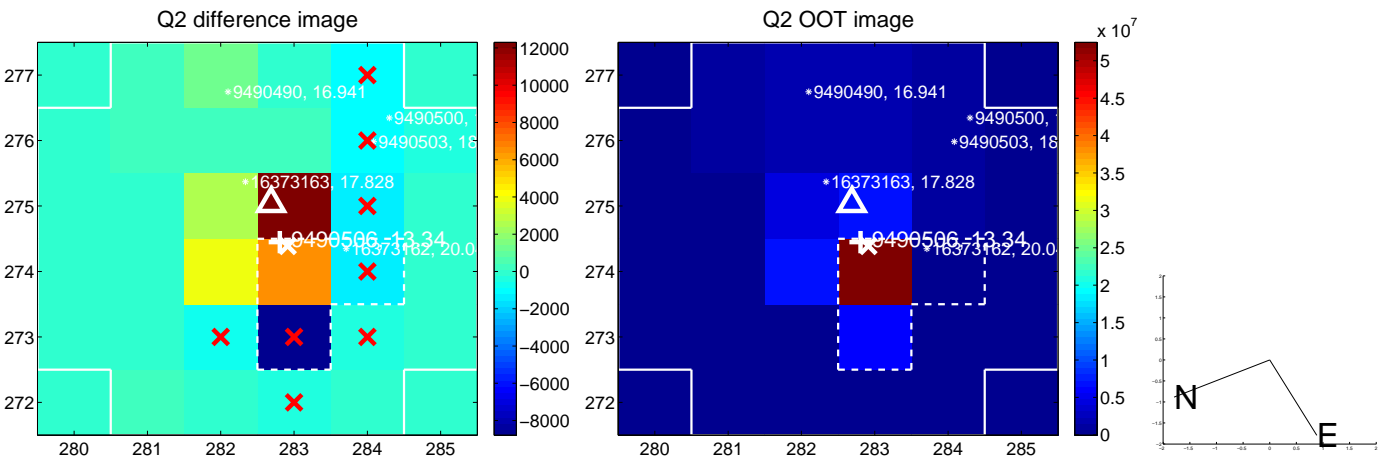
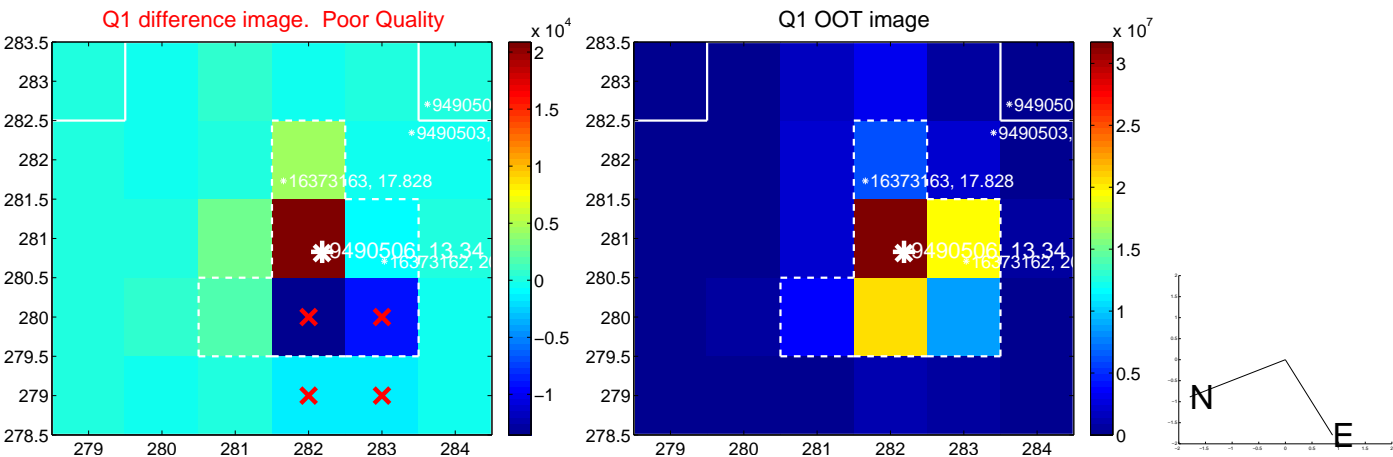


offset from photometric centroids

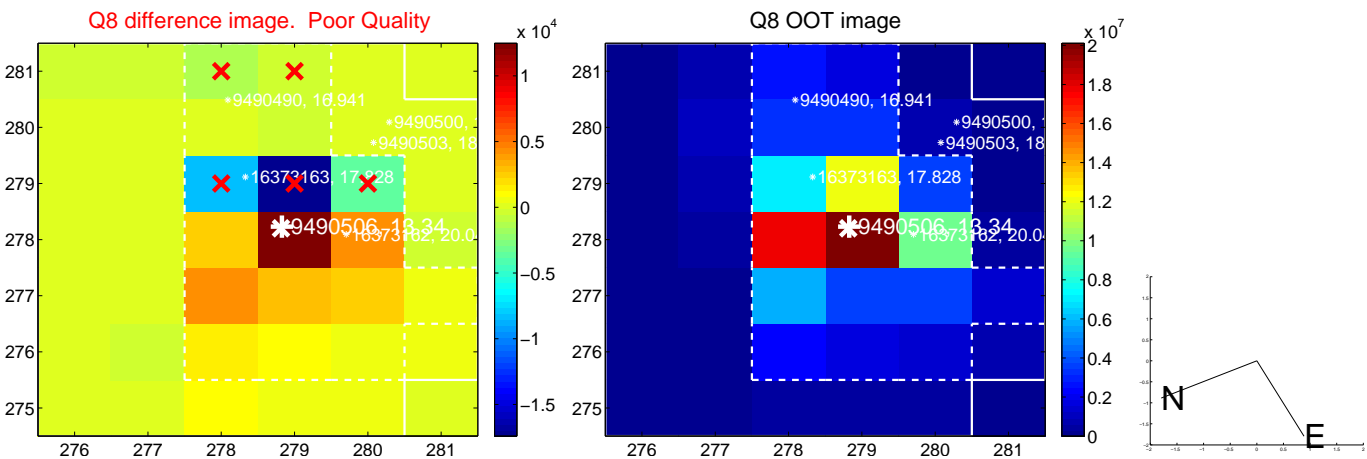
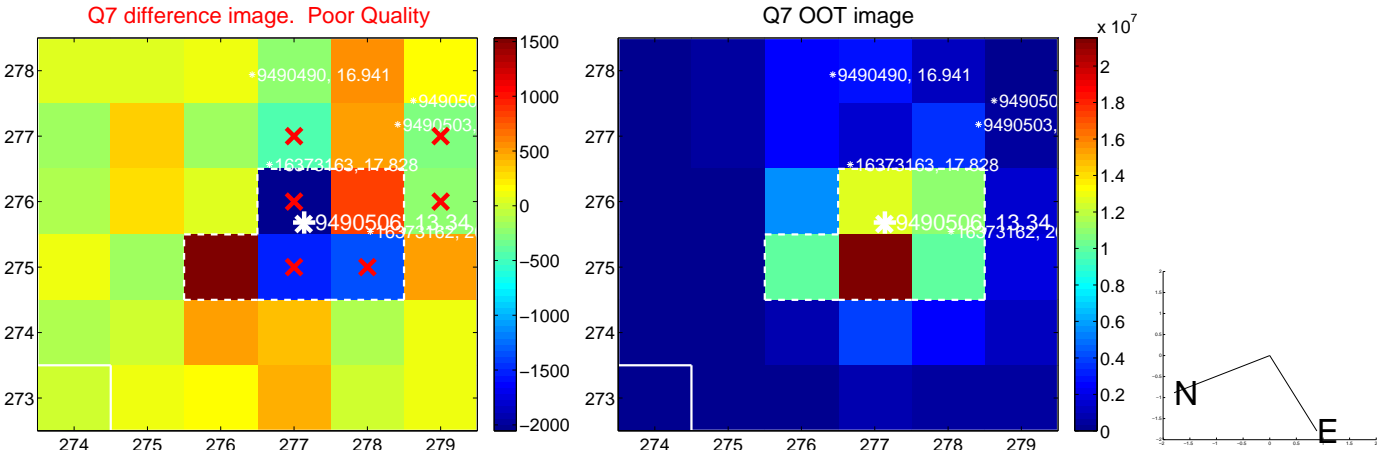
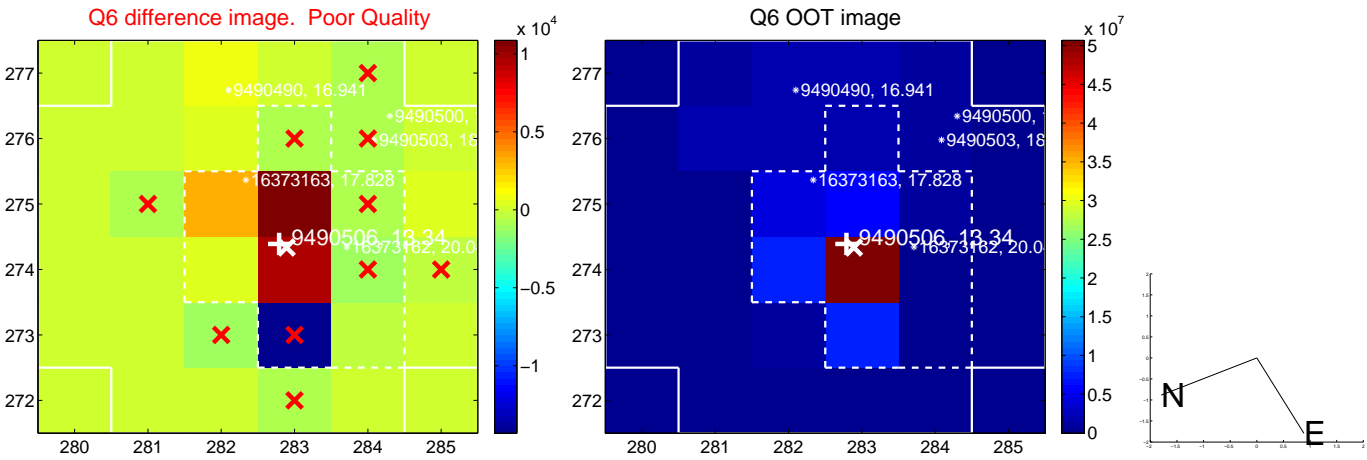
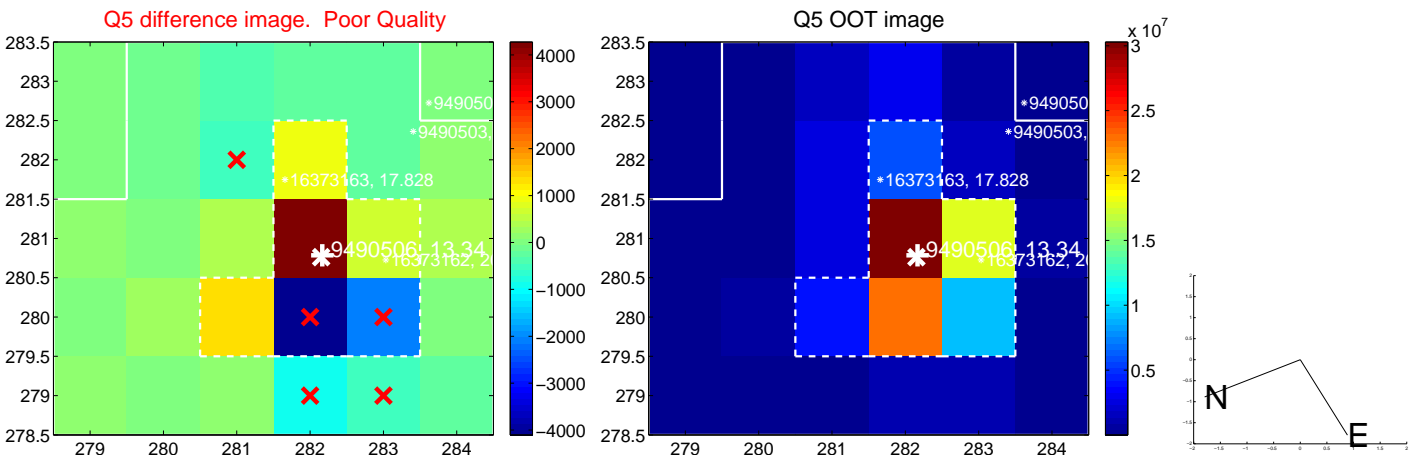


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

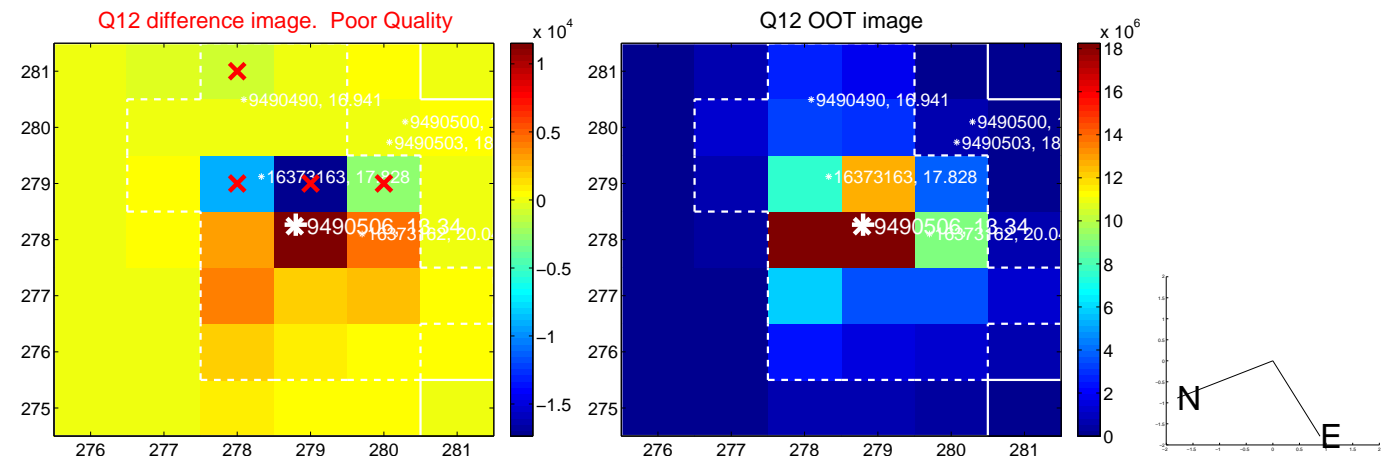
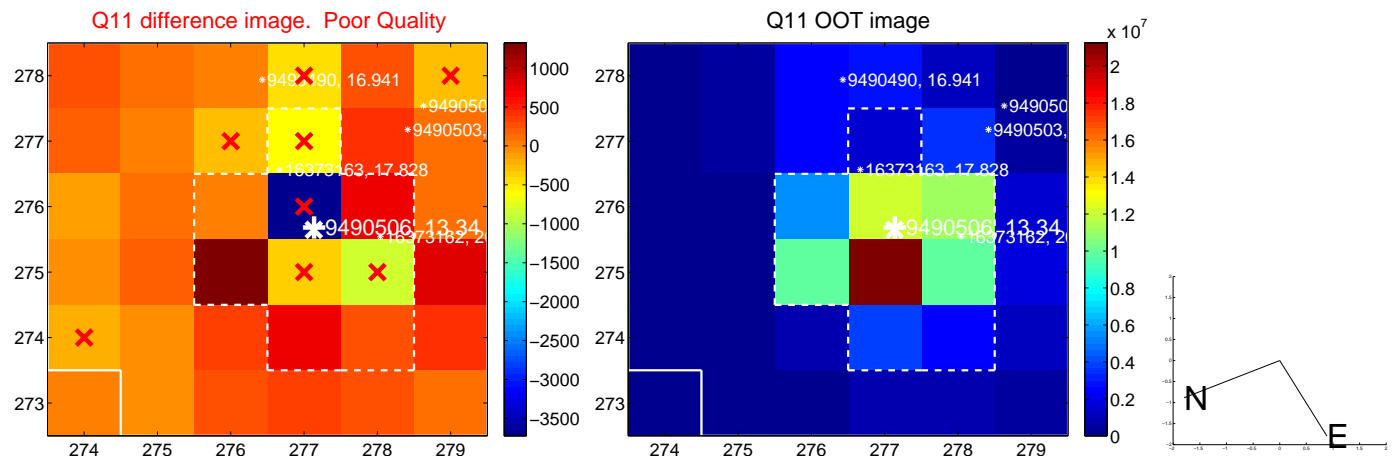
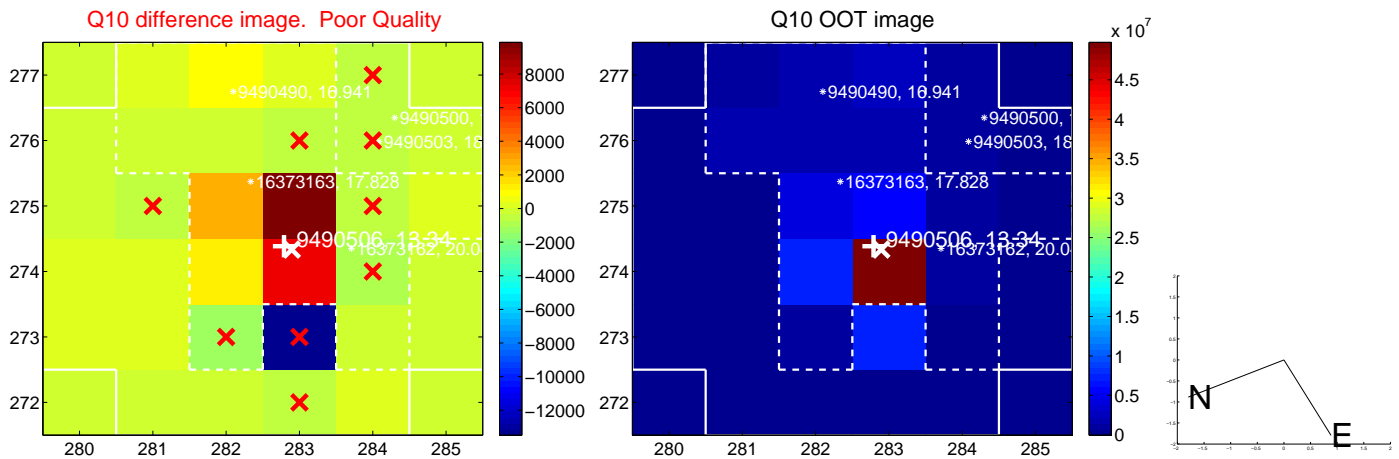
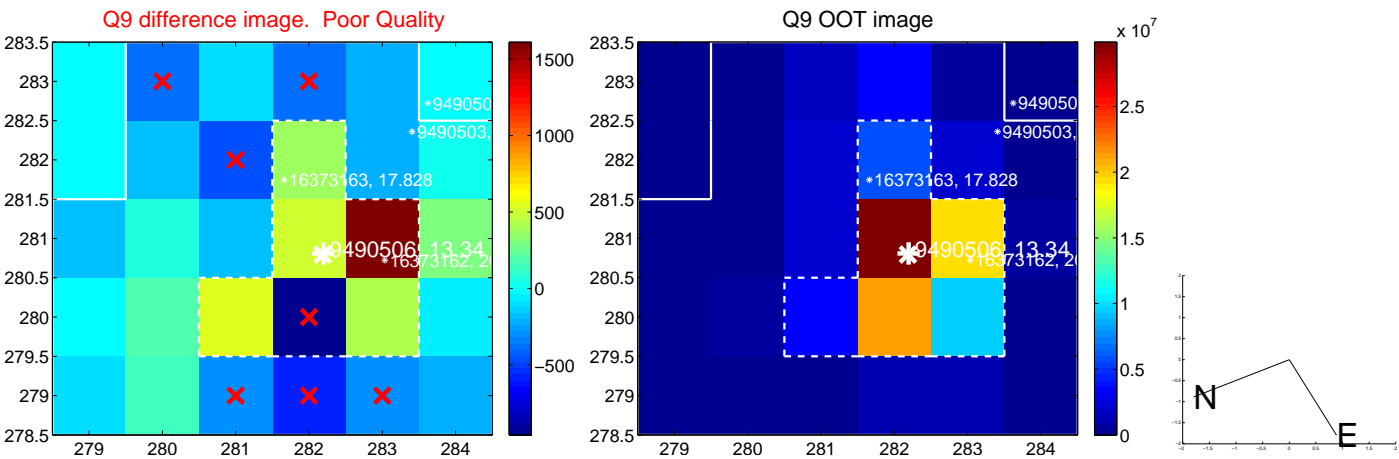


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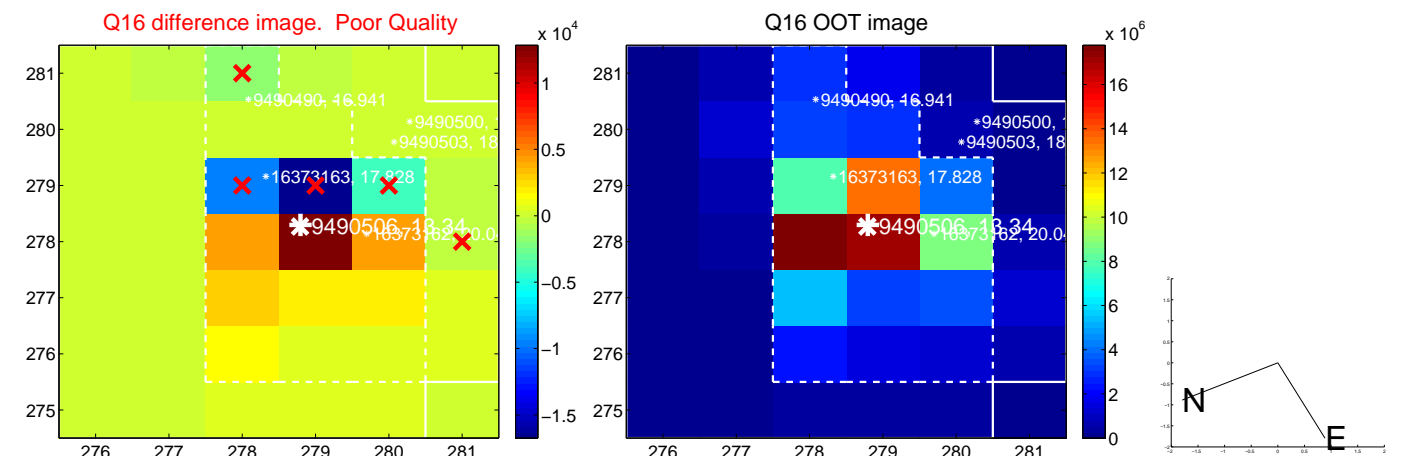
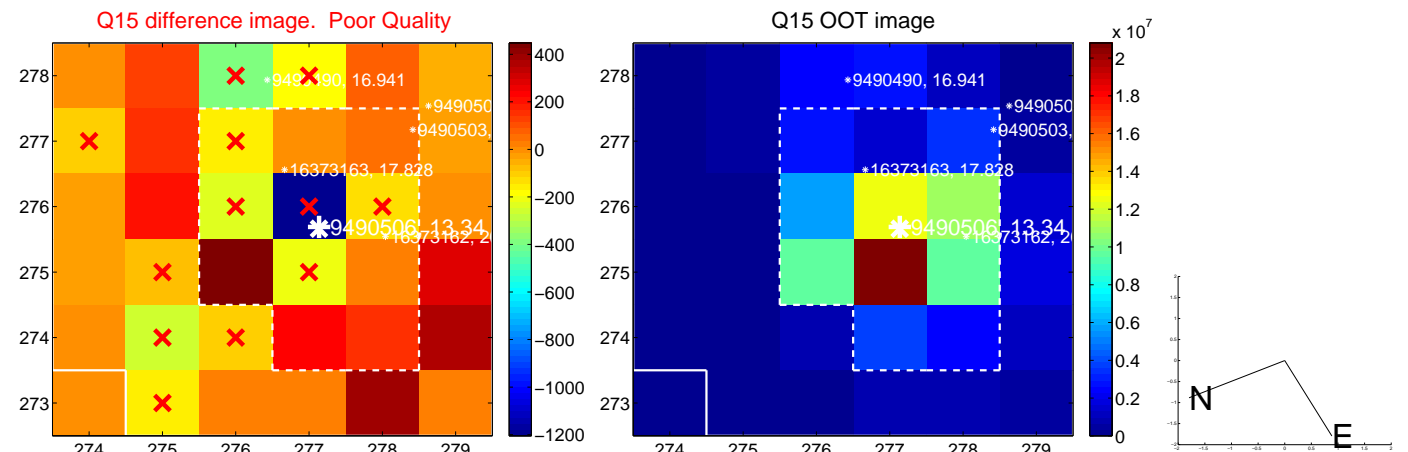
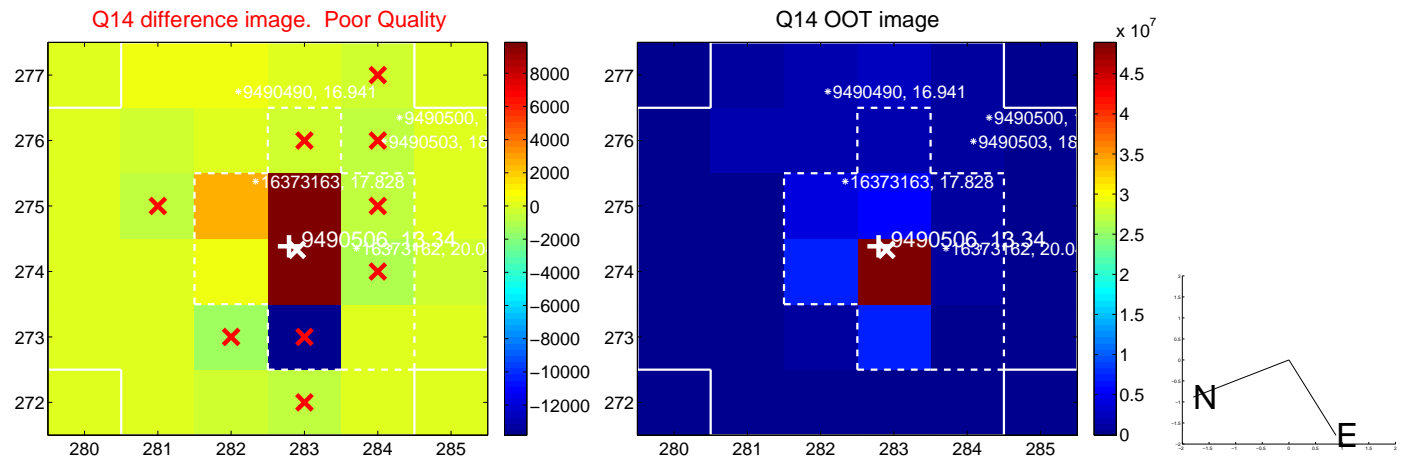
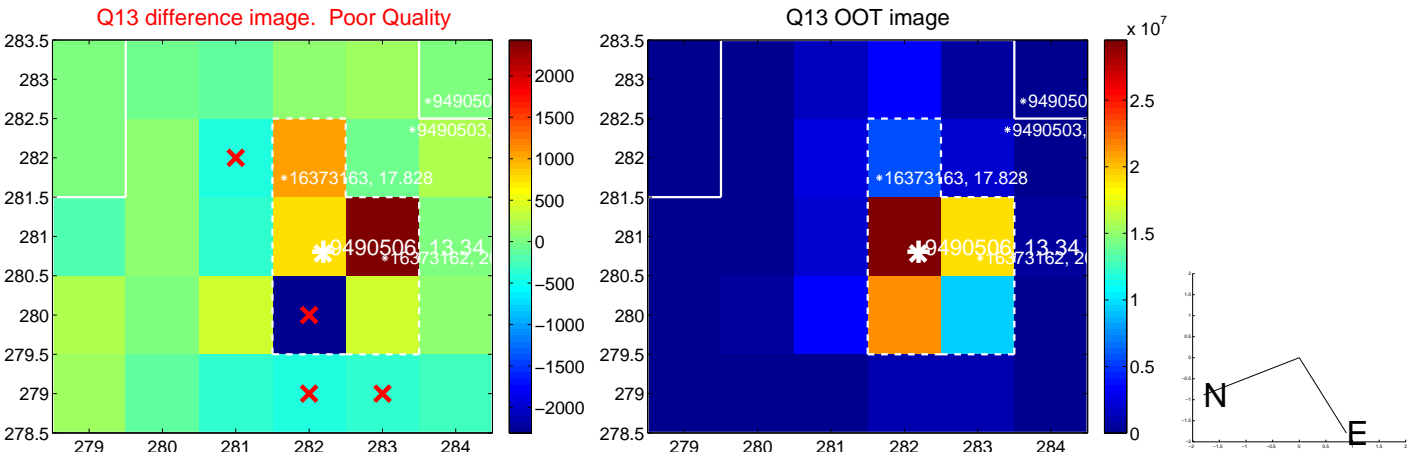




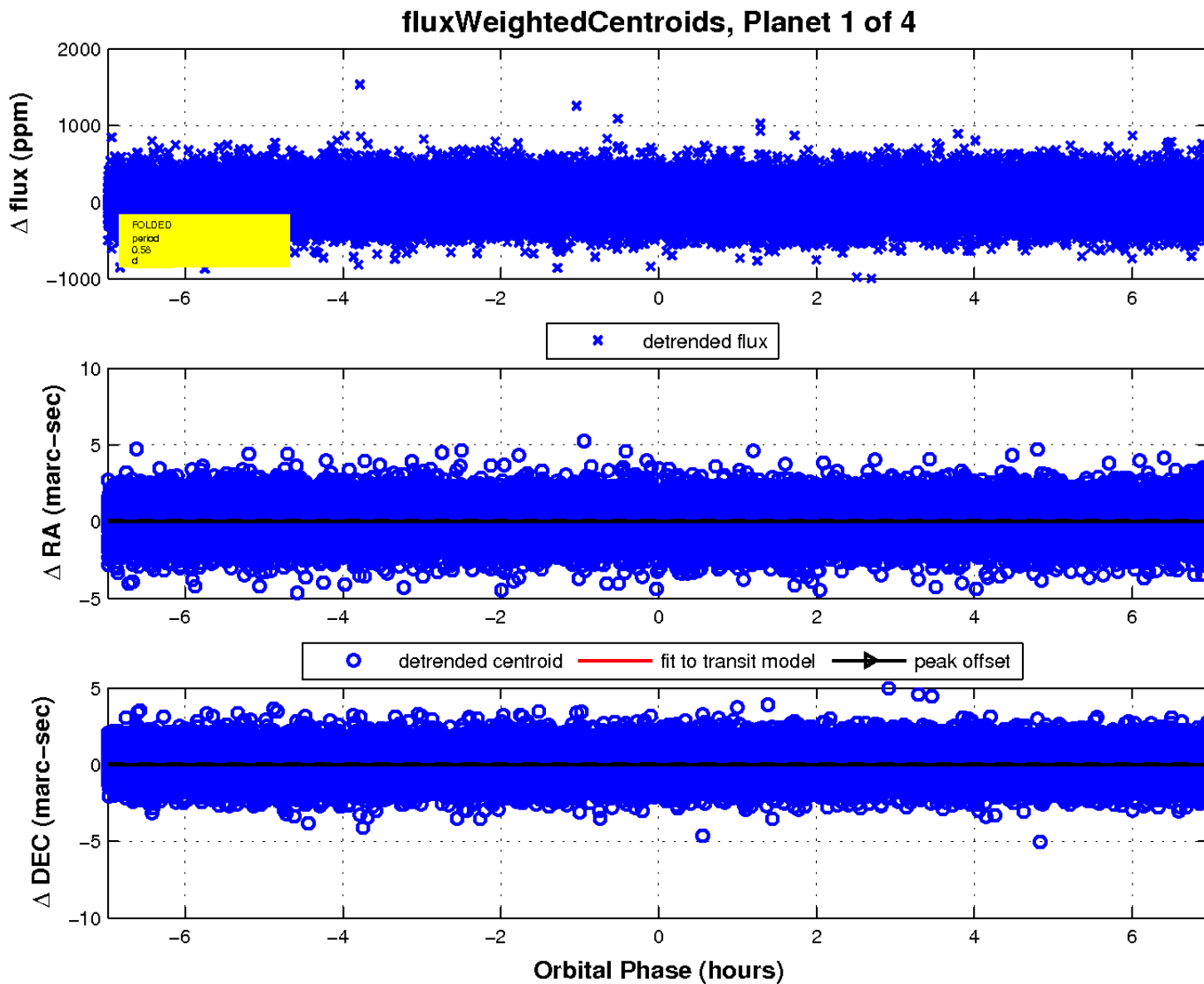
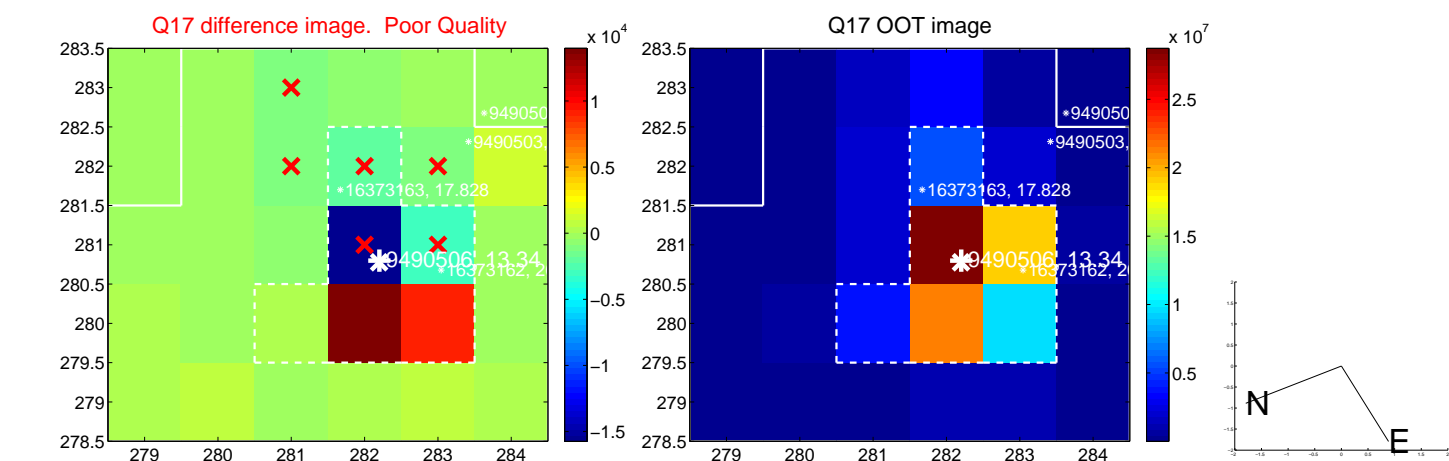
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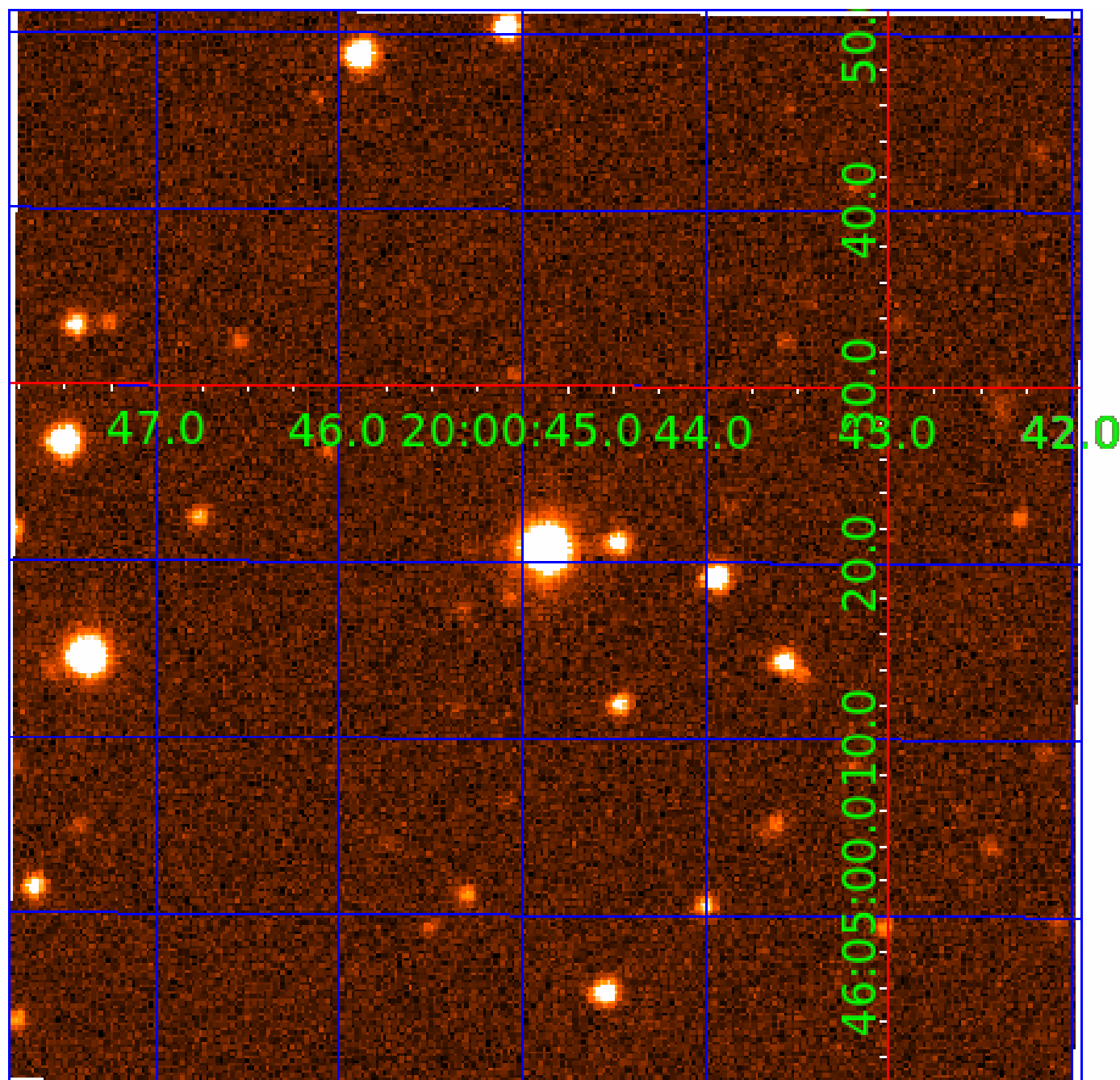


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009490506

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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009490506-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_NOFITS
009490506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009490506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV

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

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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.

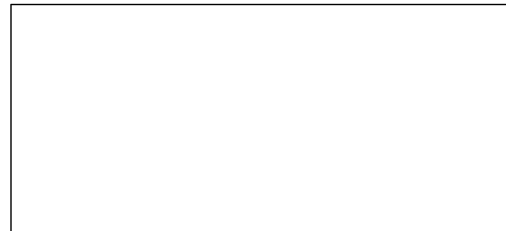
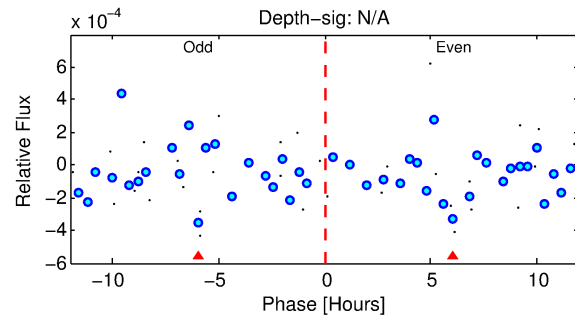
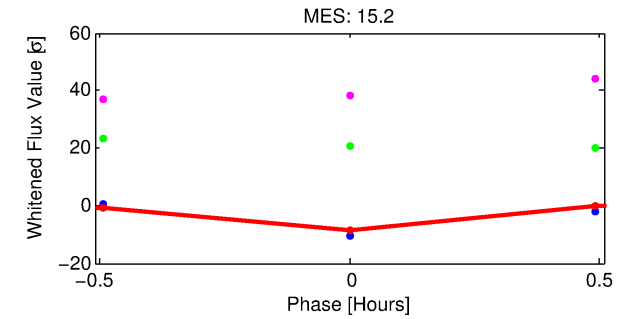
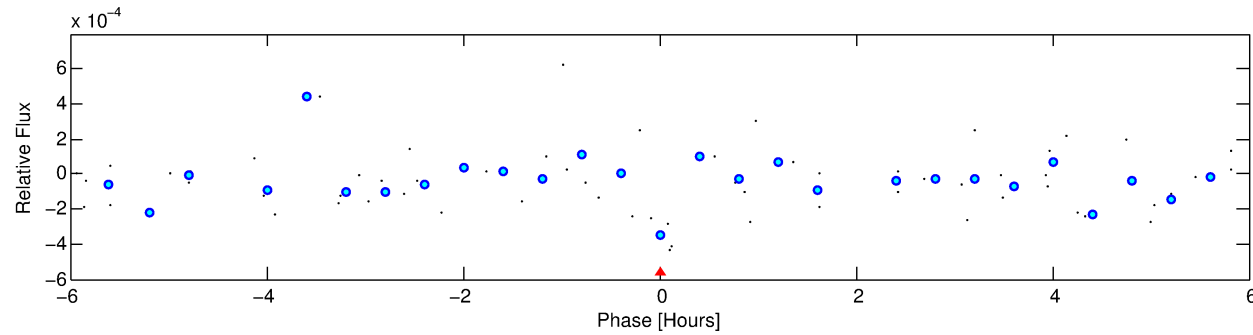
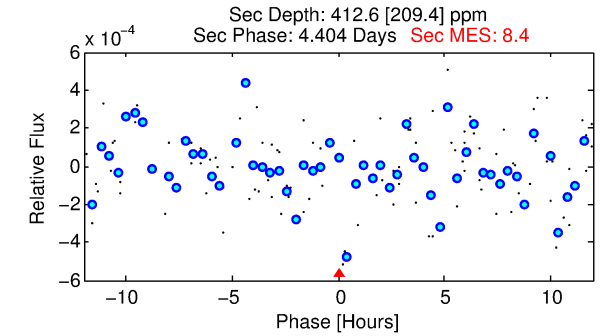
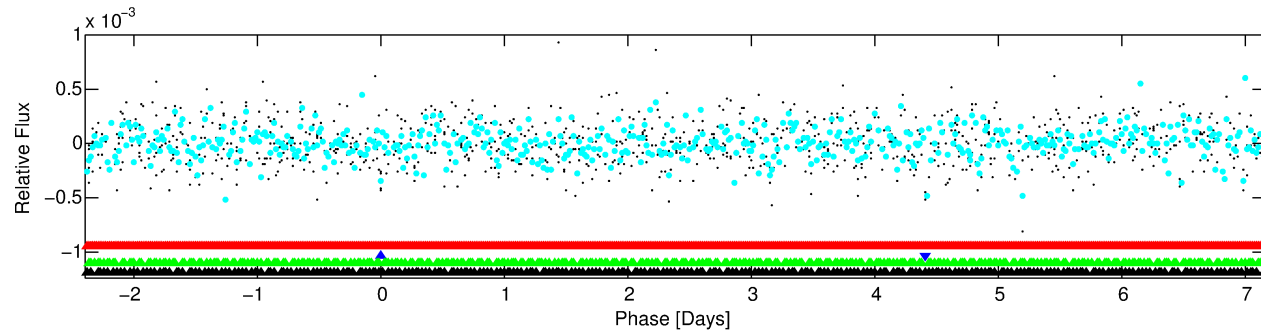
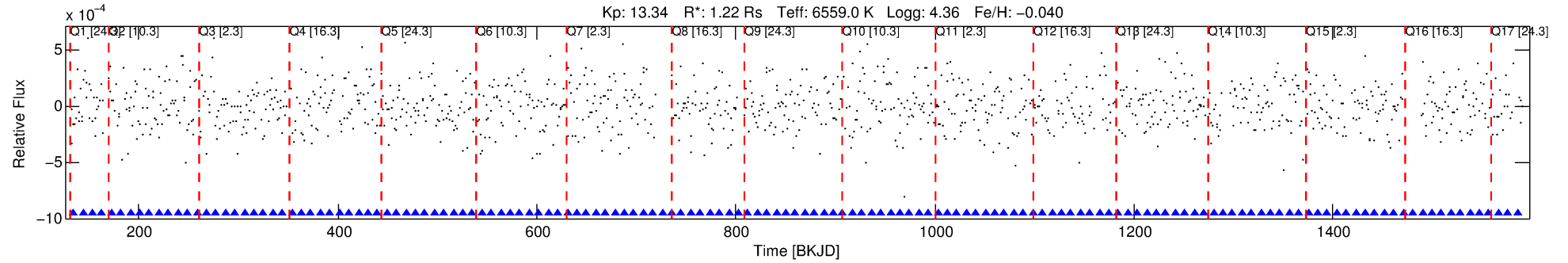
Ephemeris Match Information For 009490506-02

No Significant Match Found



# DV One-Page Summary

KIC: 9490506 Candidate: 2 of 4 Period: 9.545 d



## TPS TCE Results:

Period = 9.54520 d  
Epoch = 134.4549 BKJD

DV fit results are unavailable

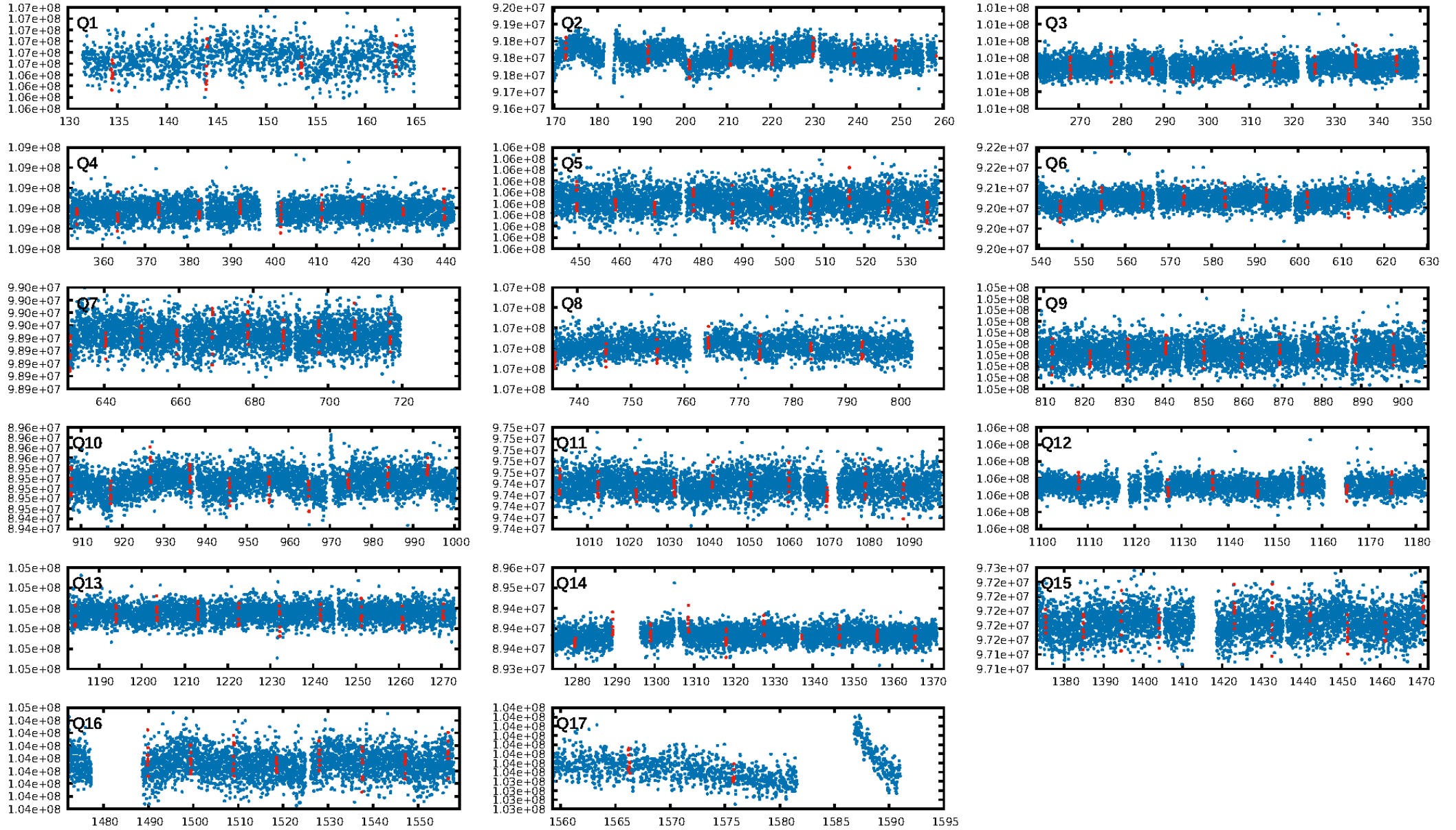
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [42.55σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 6.21e-07**  
RollingBand-fgt: N/A  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: N/A

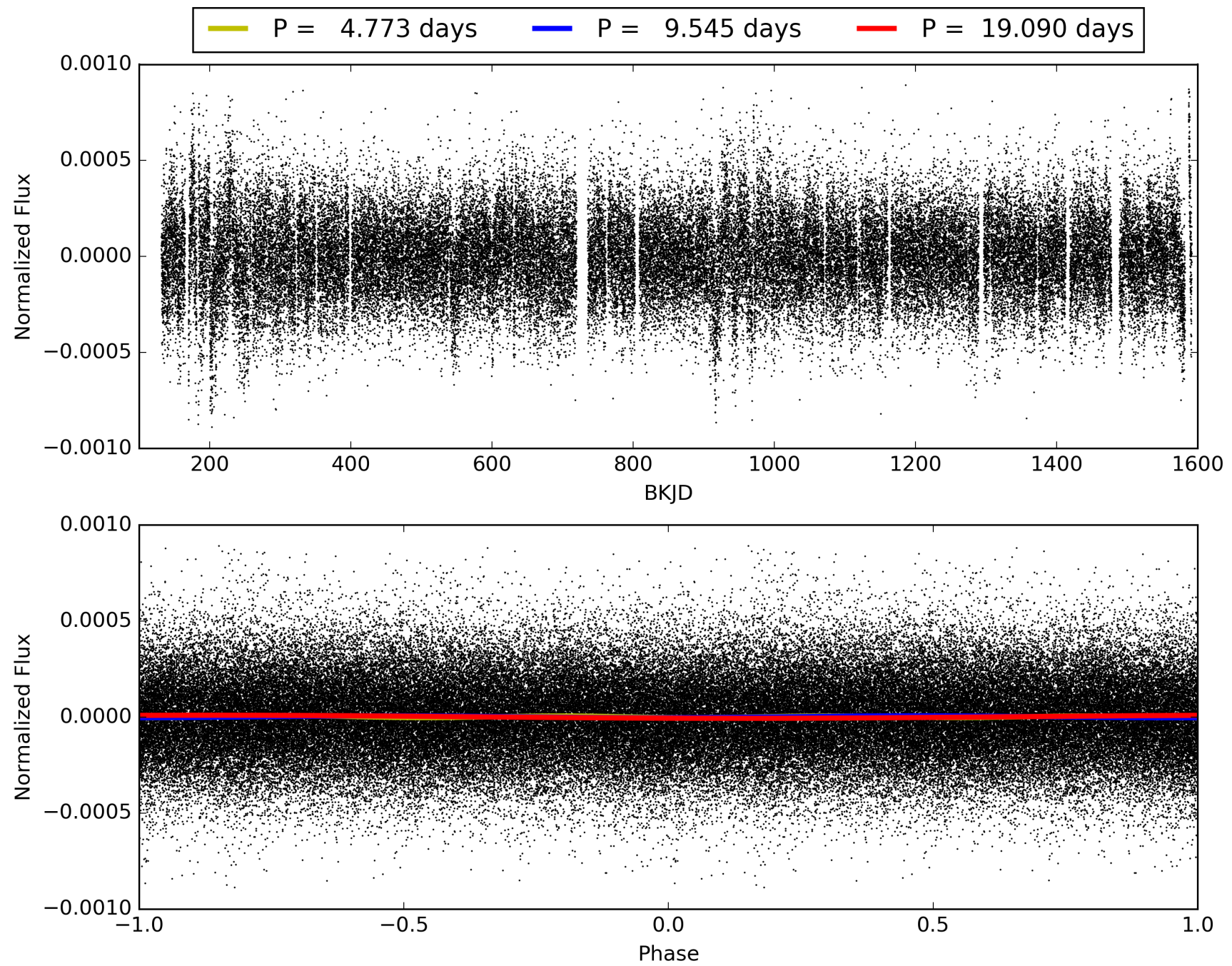
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:01:13 Z

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

# TCE 009490506-02, PDC Light Curves

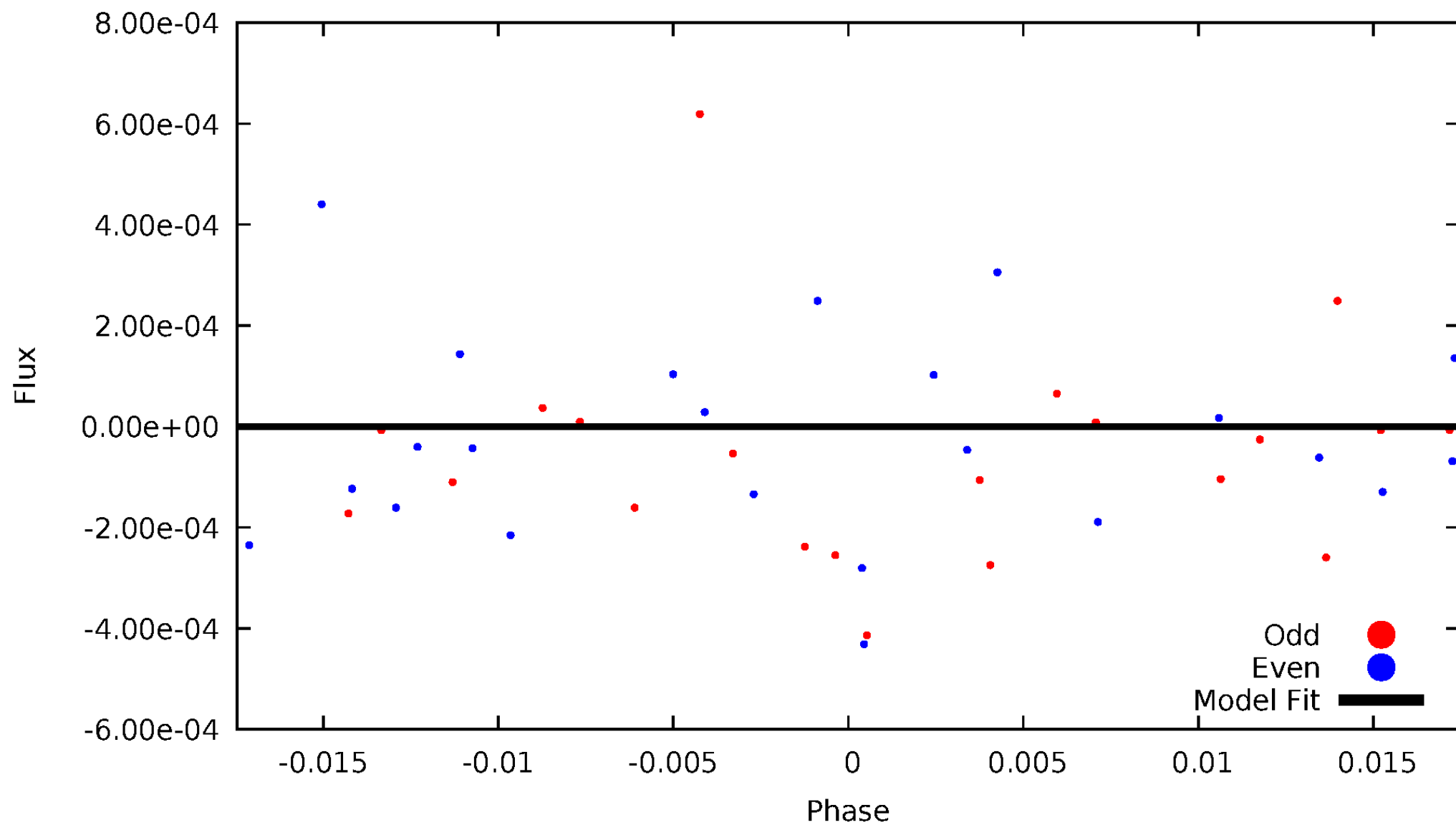


TCE 009490506-02



# DV Odd/Even

TCE 009490506-02





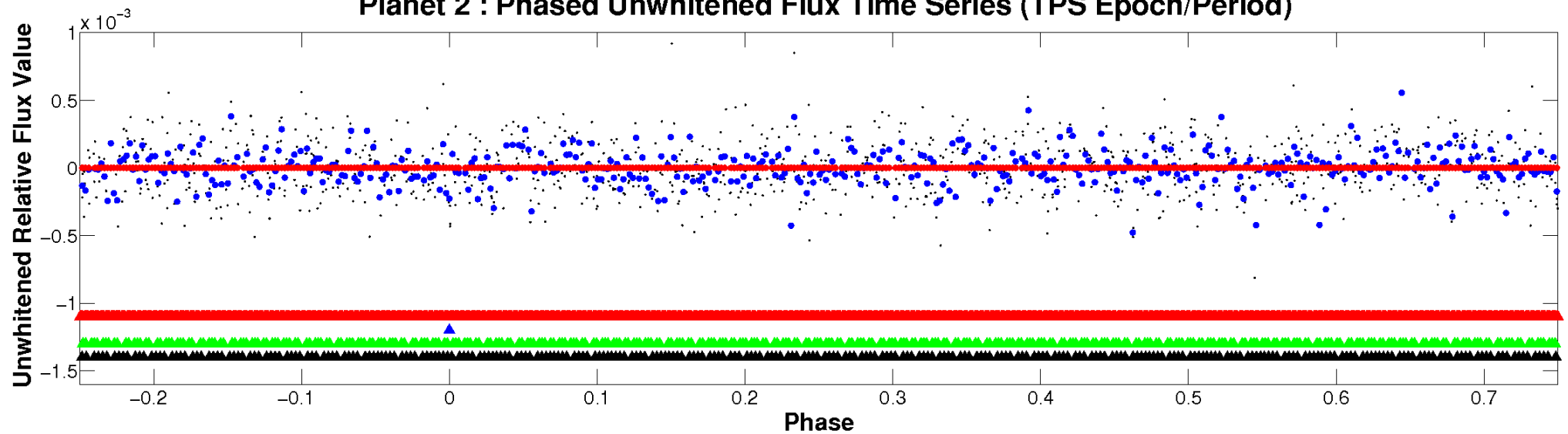


ALT Odd/Even

This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

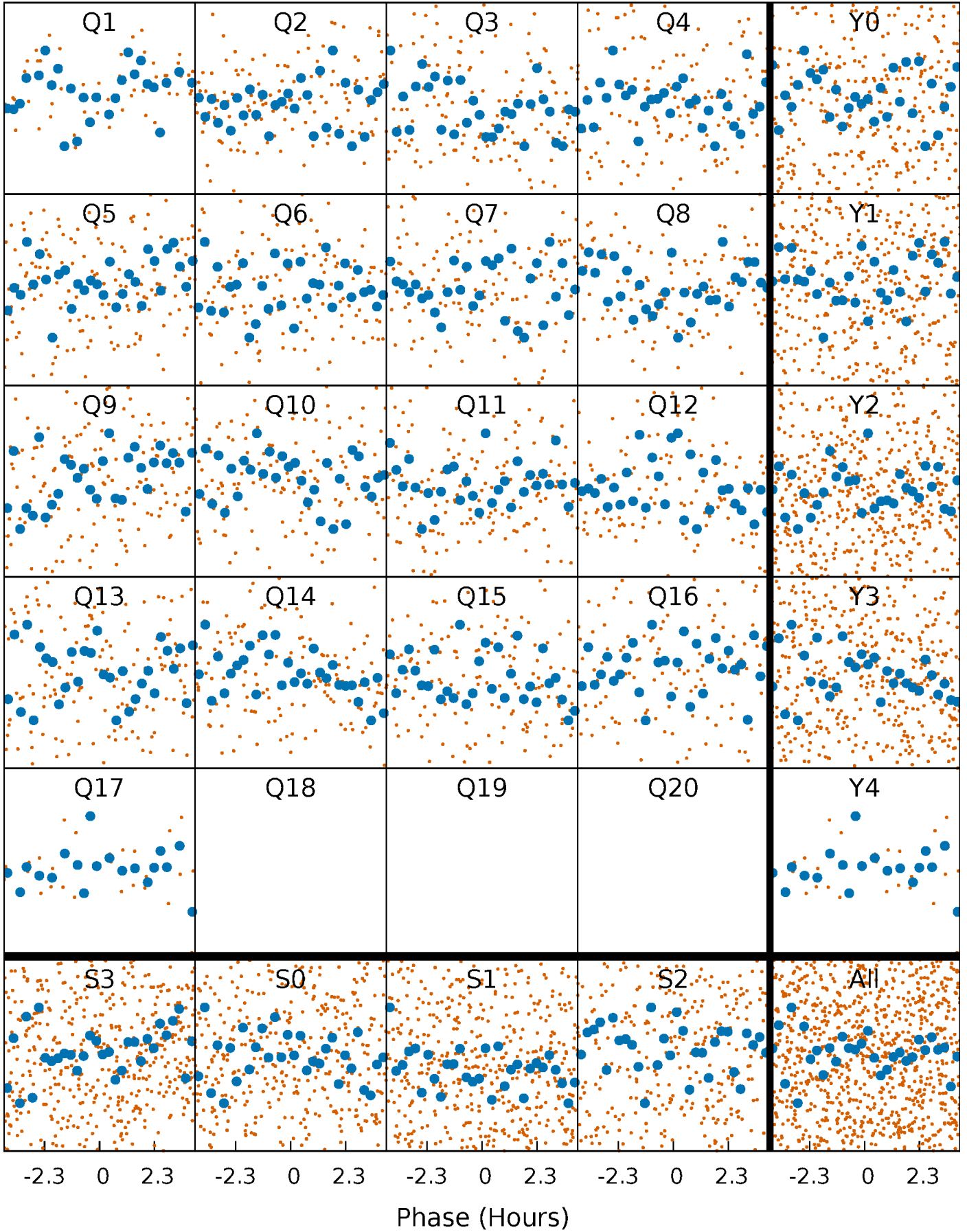


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

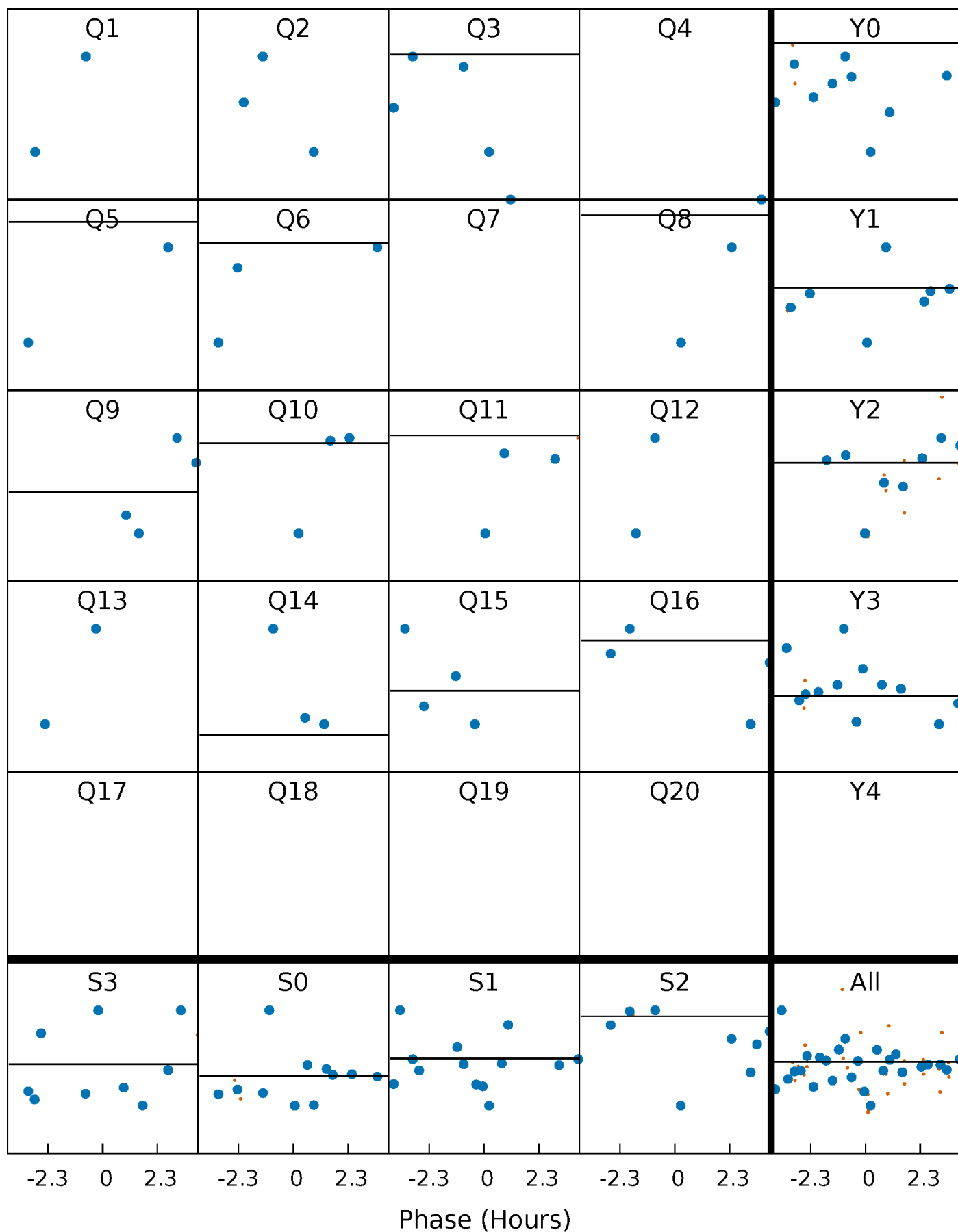
TCE 009490506-02     $P = 9.545196$  Days     $T_0 = 134.454944$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 009490506-02   P= 9.545196 Days    $T_0=134.454944$  (BKJD)

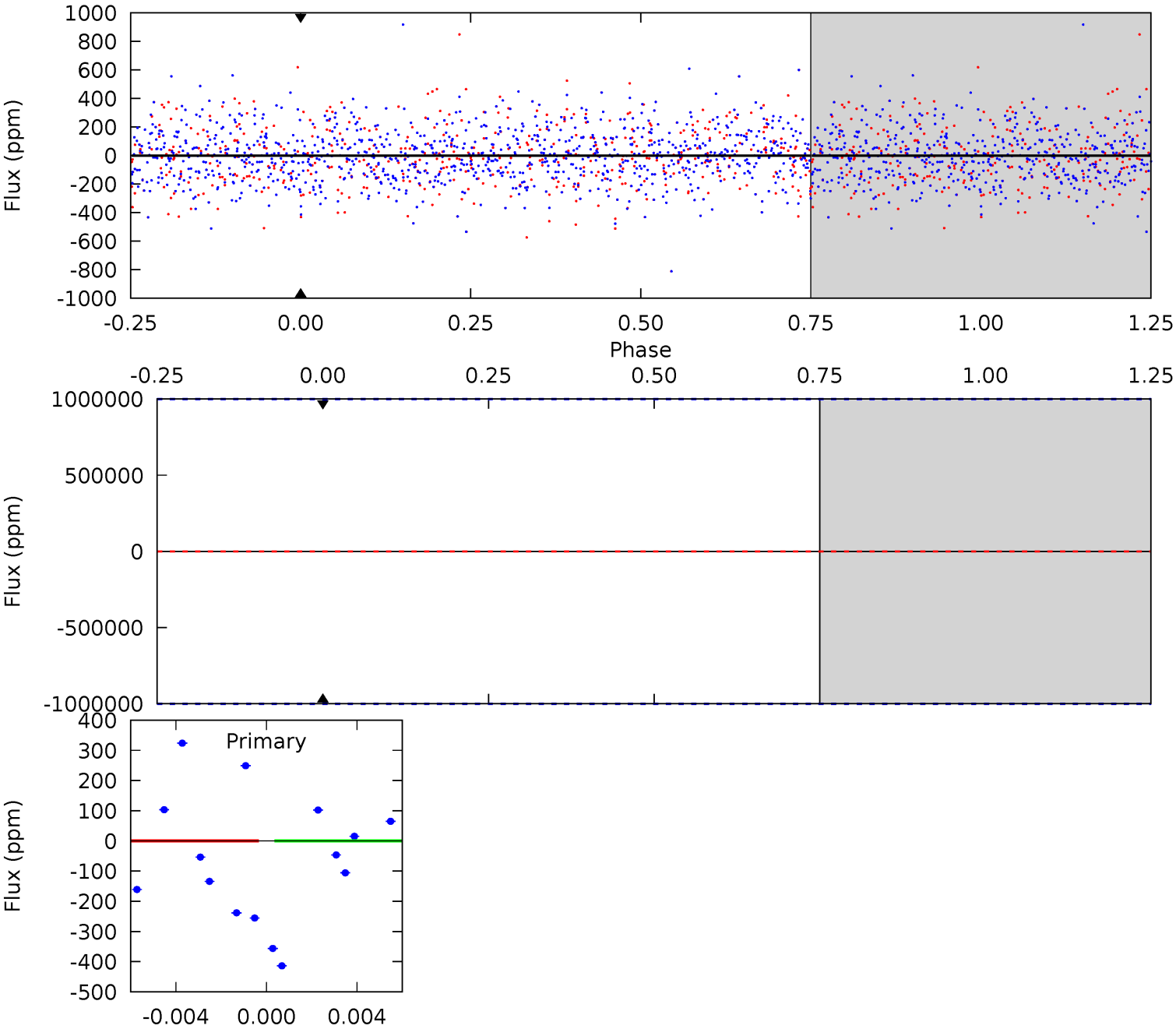


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

009490506-02, P = 9.545196 Days, E = 124.909748 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.



### Stellar Parameters For KIC 009490506

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6559^{+148}_{-214}$	$4.357^{+0.067}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.218^{+0.404}_{-0.144}$	$1.235^{+0.181}_{-0.181}$	$0.963^{+0.289}_{-0.522}$
	+2%/-3%	+2%/-5%	+625%/-750%	+33%/-12%	+15%/-15%	+30%/-54%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009490506-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$11.73^{+11.72}_{-7.83}$	$1478^{+100}_{-72}$	$-4786^{+27637}_{-17360}$	$-50.401^{+5975.376}_{-5378.271}$
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 009490506-02. Kepler magnitude: 13.34. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	—	—	—	—



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.

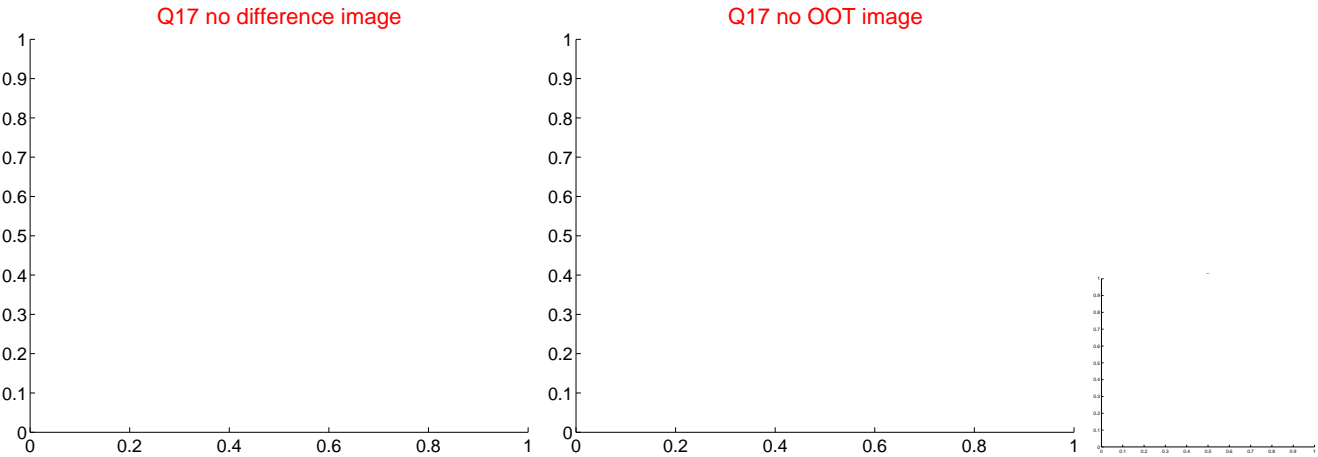




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



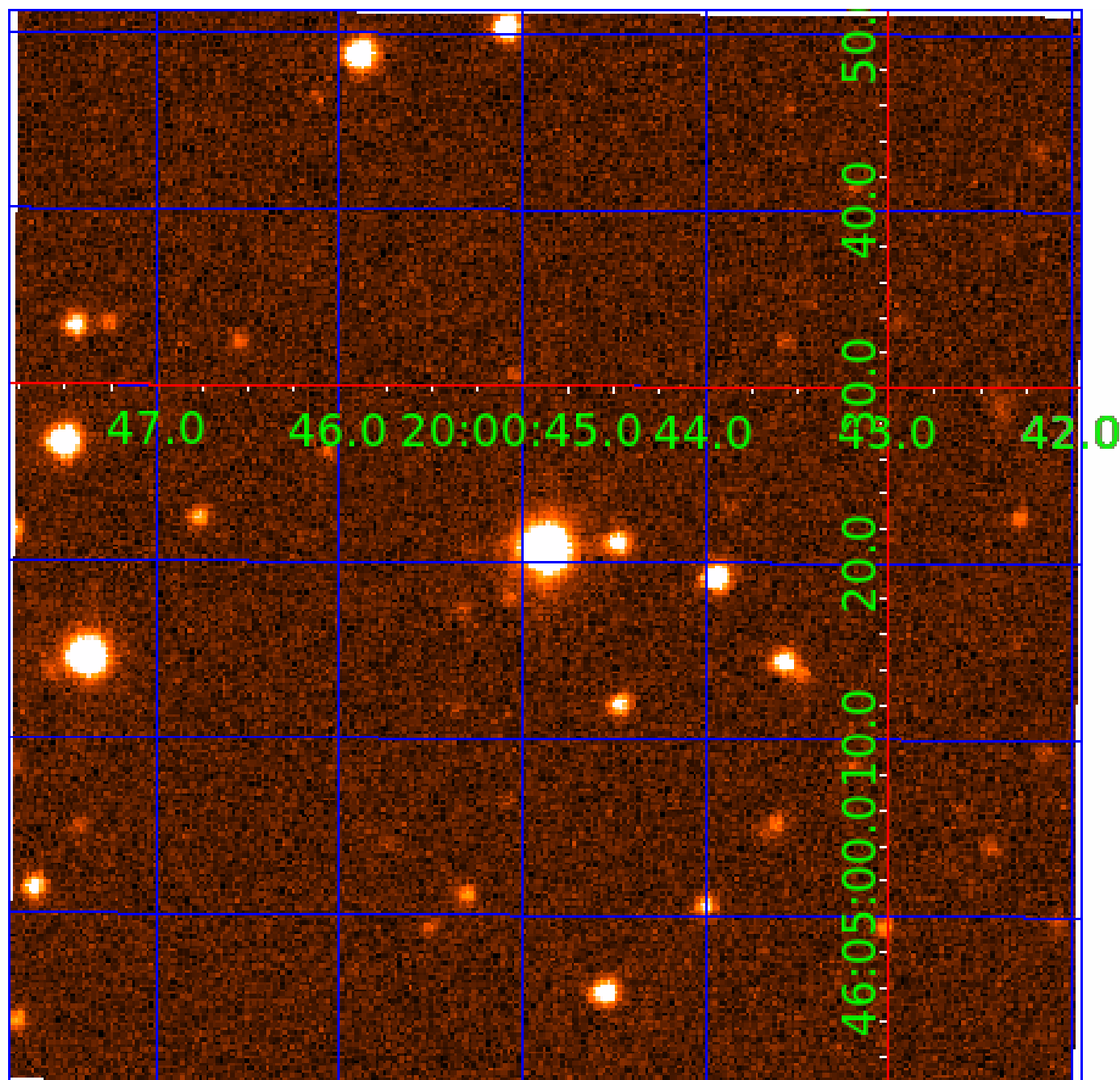
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 009490506

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009490506-01	OBS	No	0.581598	131.711704	13.3	4.403	10.1	7.1	1.22	6559	0.46	11512.76
009490506-02	OBS	No	9.545196	134.454944	1034.9	2.000	15.2	-1.0	1.22	6559	3.95	276.03
009490506-03	OBS	No	4.188768	135.553388	181.2	1.055	15.1	14.4	1.22	6559	1.92	827.74
009490506-04	OBS	No	4.958190	133.993423	219.2	1.641	15.1	19.2	1.22	6559	1.96	661.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009490506-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_MEAS
009490506-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_NOFITS
009490506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009490506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV

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

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

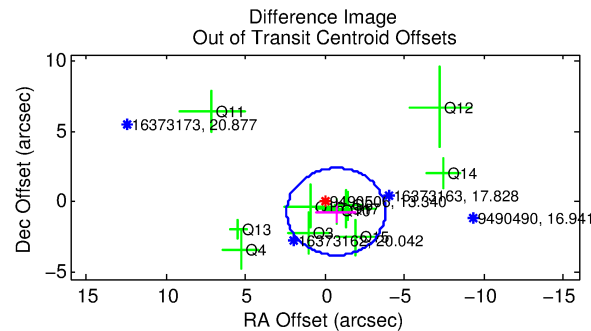
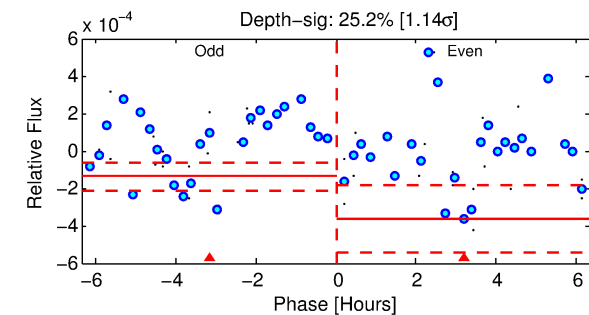
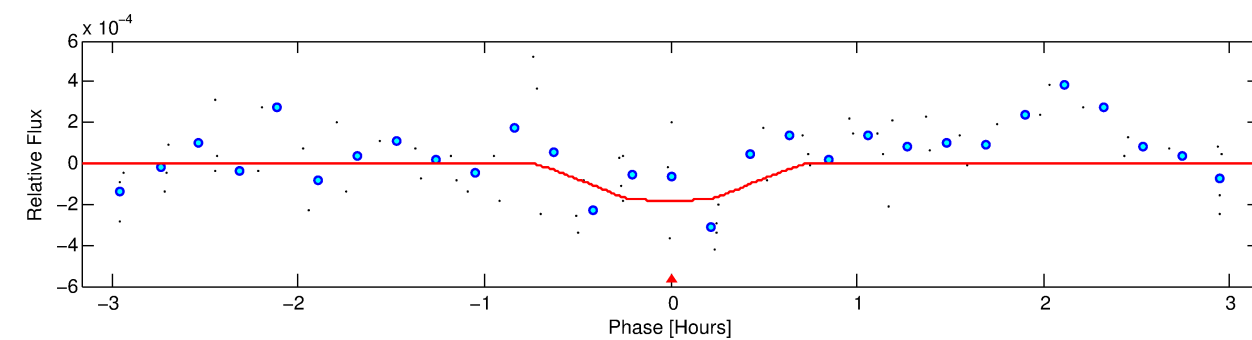
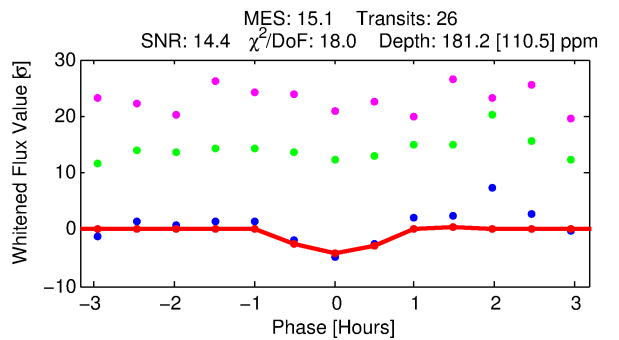
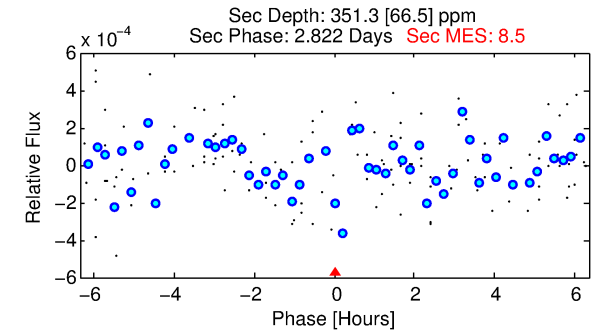
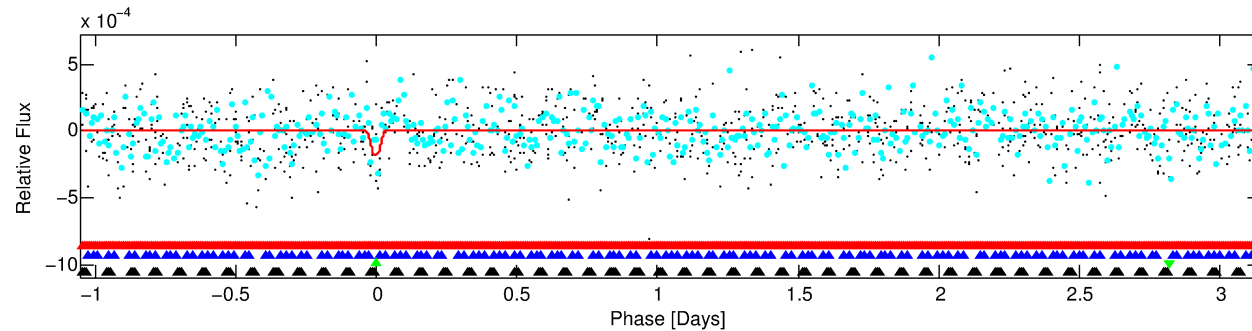
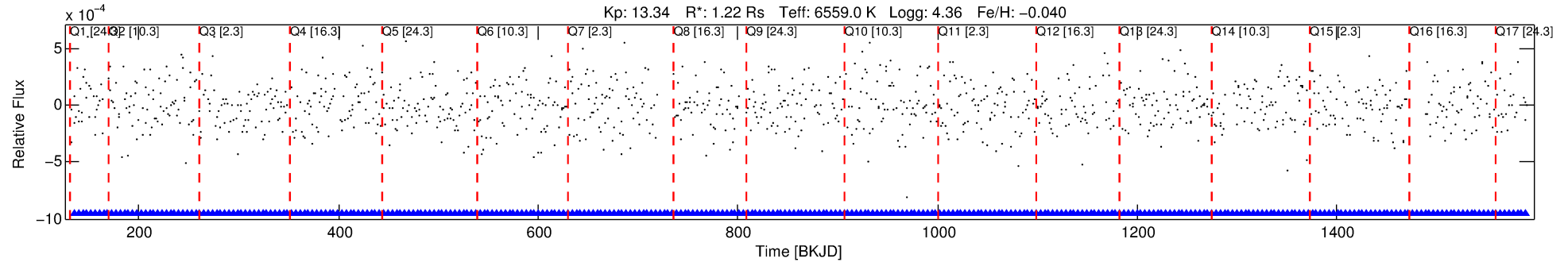
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009490506-03

No Significant Match Found

# DV One-Page Summary

KIC: 9490506 Candidate: 3 of 4 Period: 4.189 d



## DV Fit Results:

Period = 4.18877 [0.00007] d  
Epoch = 135.5534 [0.0100] BKJD  
Rp/R\* = 0.0144 [0.0249]  
a/R\* = 14.58 [130.95]  
b = 0.89 [2.09]  
Seff = 827.74 [347.13]  
Teq = 1368 [143] K  
Rp = 1.92 [3.37] Re  
a = 0.0545 [0.0151] AU  
Ag = 155.78 [541.10] [0.29 $\sigma$ ]  
Teffp = 7471 [6449] K [0.95 $\sigma$ ]

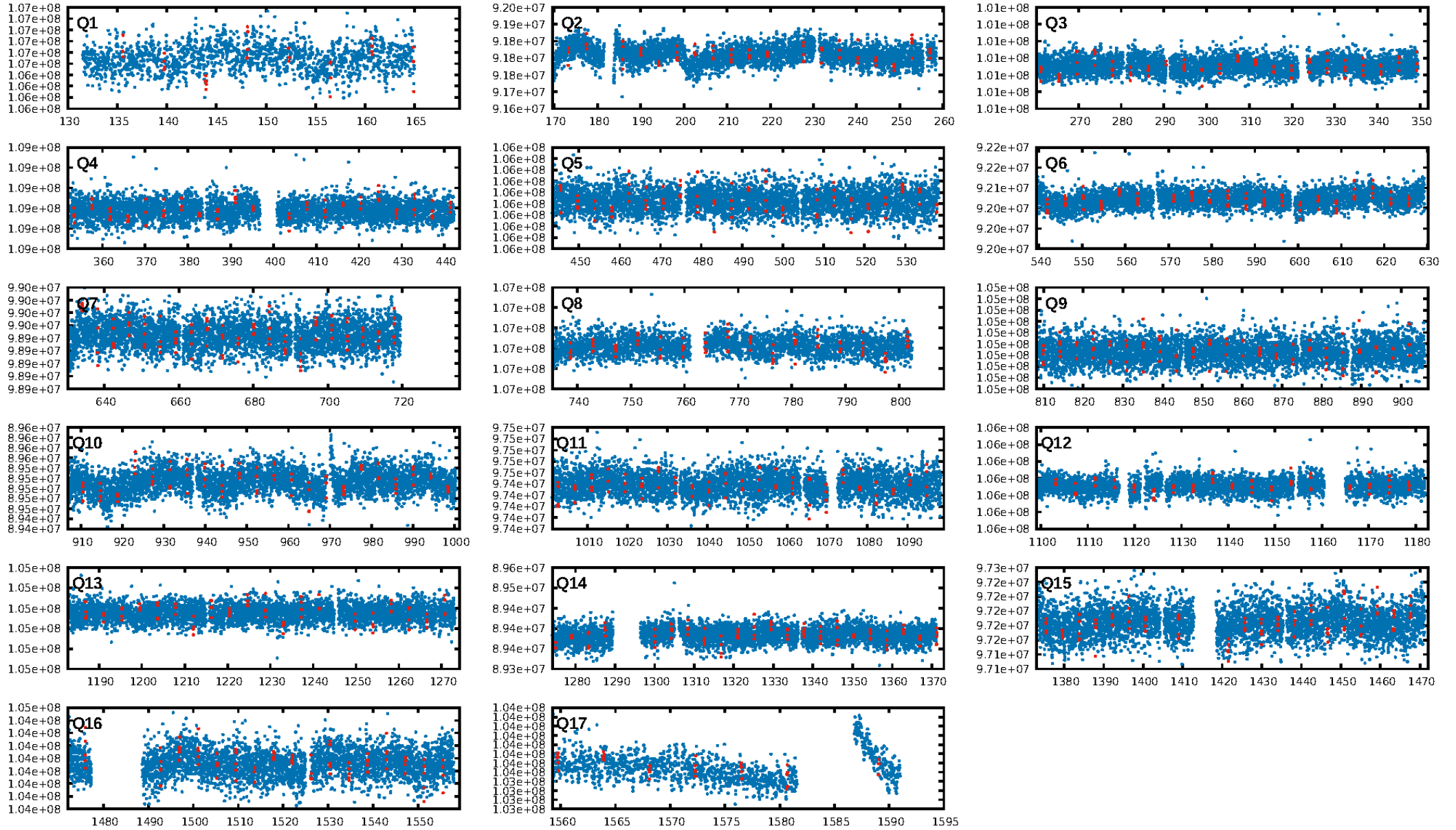
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.12 $\sigma$ ]  
LongPeriod-sig: 100.0% [9.46 $\sigma$ ]  
**ModelChiSquare2-sig: 0.0%**  
**ModelChiSquareGof-sig: 0.0%**  
**Bootstrap-pfa: 1.85e-06**  
RollingBand-fgt: 1.00 [26/26]  
**GhostDiagnostic-chr: -0.5776**  
Centroid-sig: 94.4%  
Centroid-so: 0.053 arcsec [0.09 $\sigma$ ]  
OotOffset-rm: 1.013 arcsec [0.98 $\sigma$ ]  
OotOffset-st: 3/3/3/2 [11]  
KicOffset-rm: 1.185 arcsec [0.97 $\sigma$ ]  
KicOffset-st: 3/3/3/2 [11]  
DiffImageQuality-fgm: 0.00 [0/11]  
DiffImageOverlap-fno: 0.00 [0/17]

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

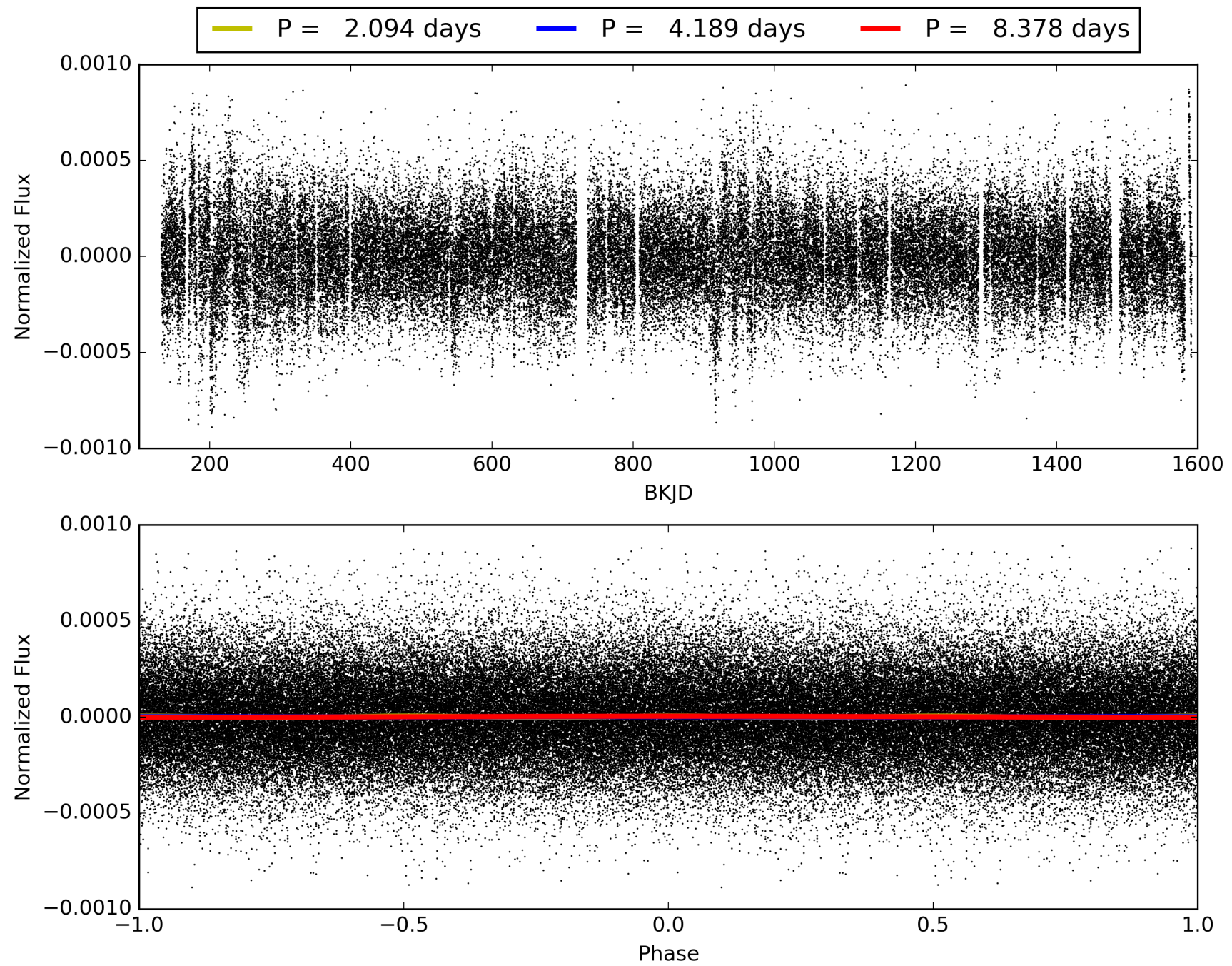
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009490506-03, PDC Light Curves



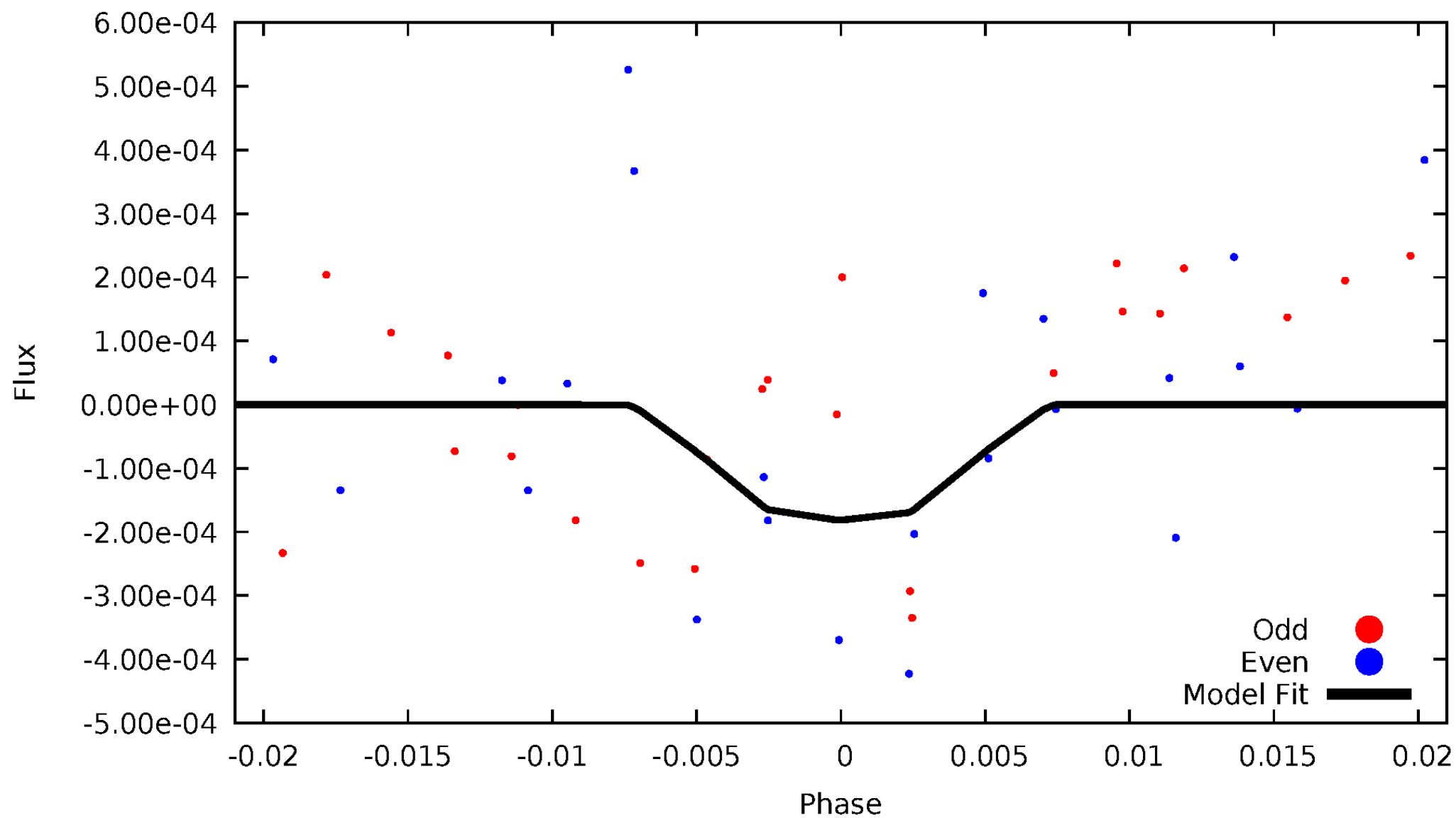


TCE 009490506-03



# DV Odd/Even

TCE 009490506-03



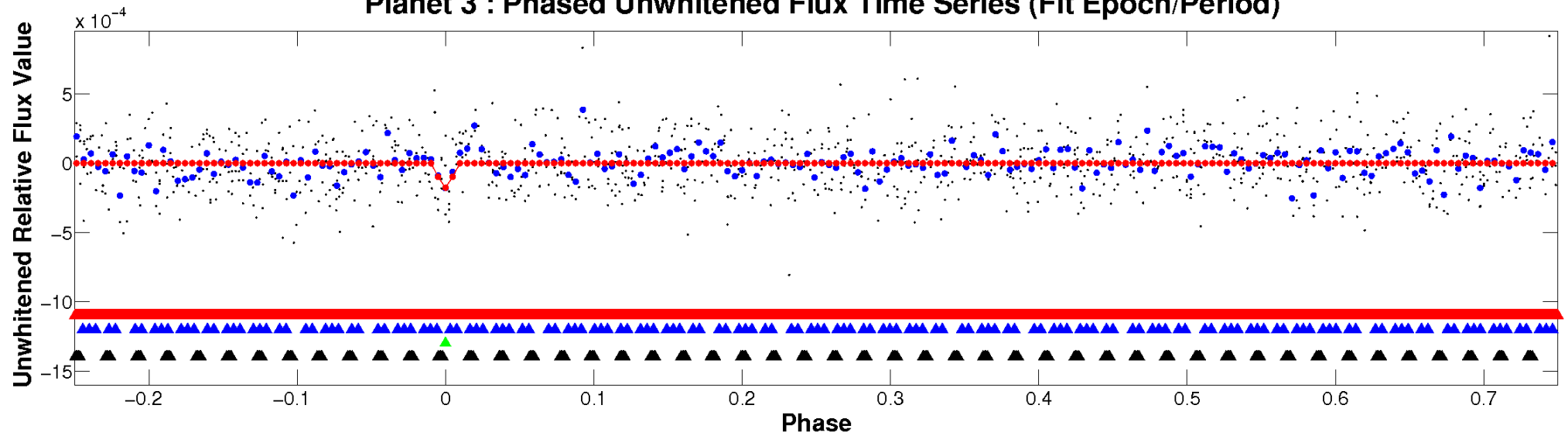


ALT Odd/Even

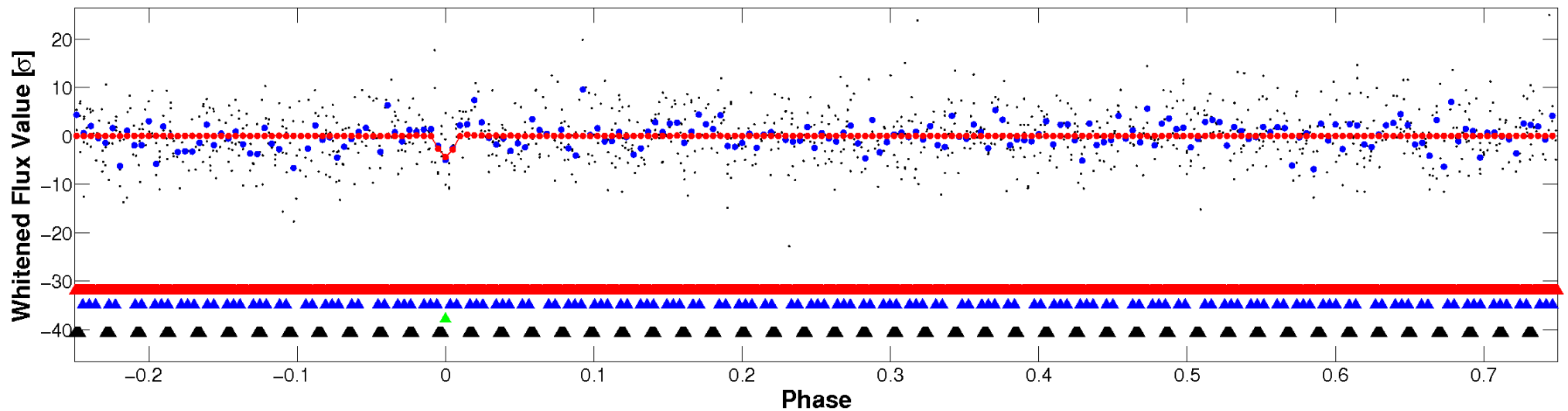
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

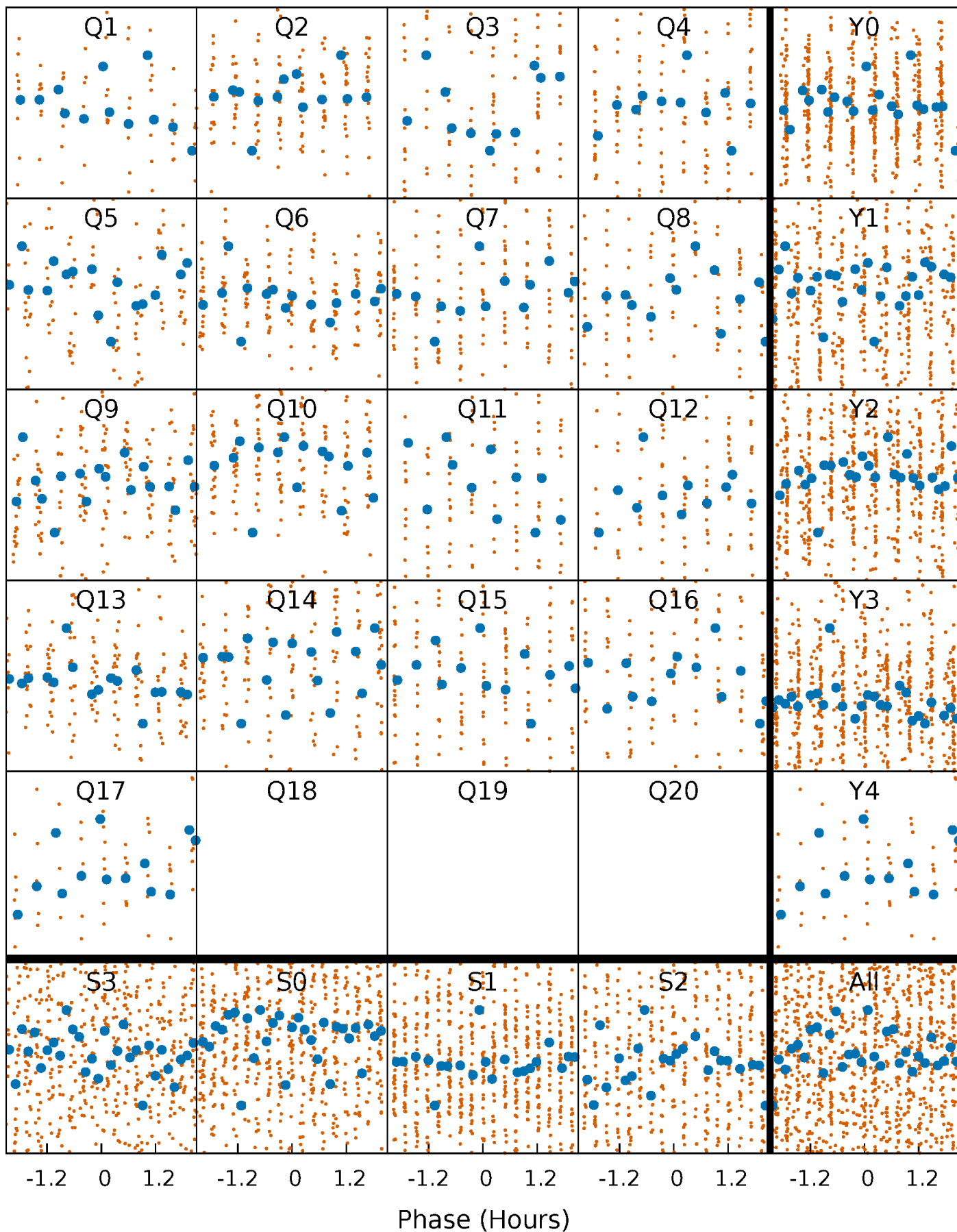


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

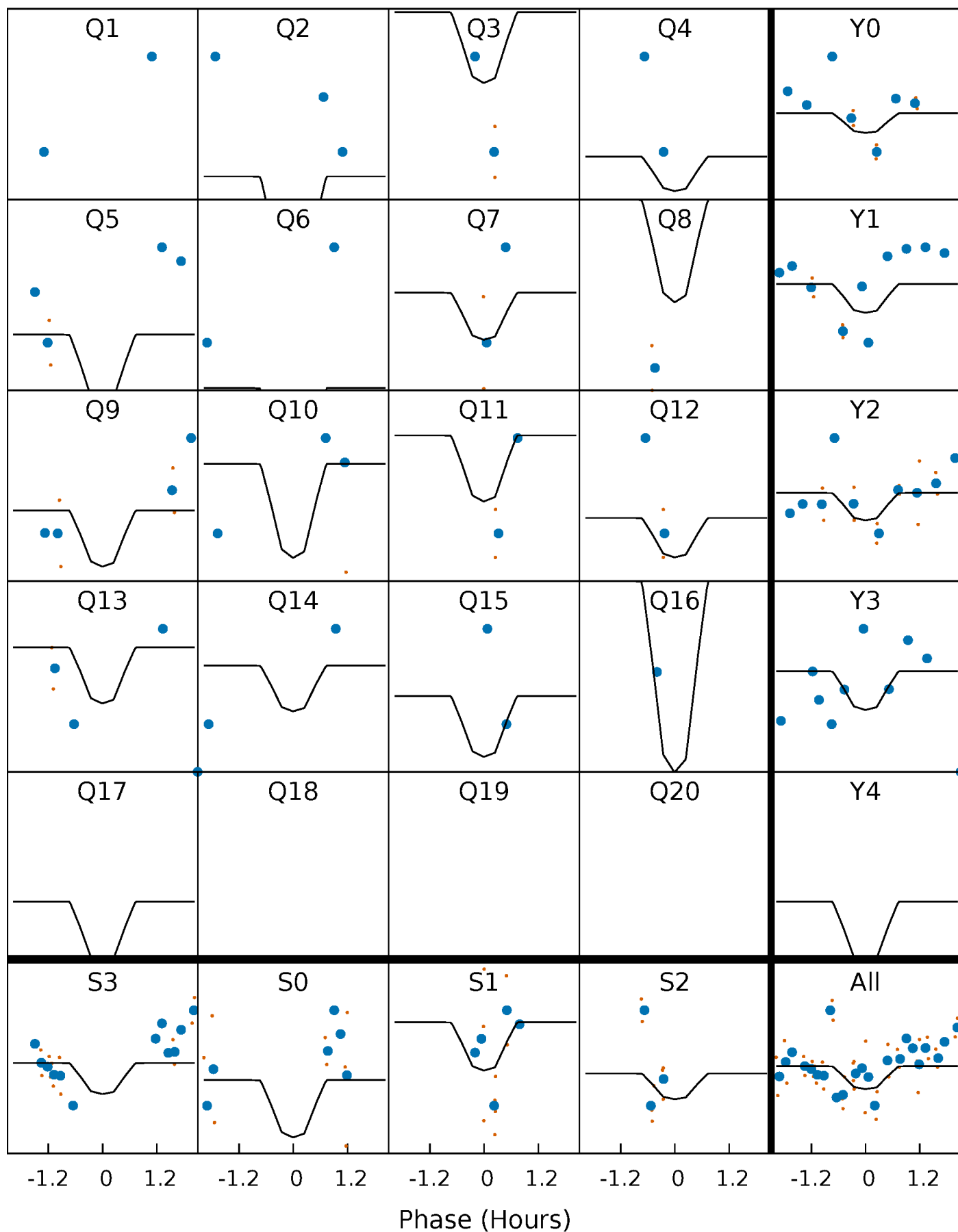
TCE 009490506-03   P= 4.188768 Days    $T_0=135.553388$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 009490506-03 P= 4.188768 Days  $T_0=135.553388$  (BKJD)

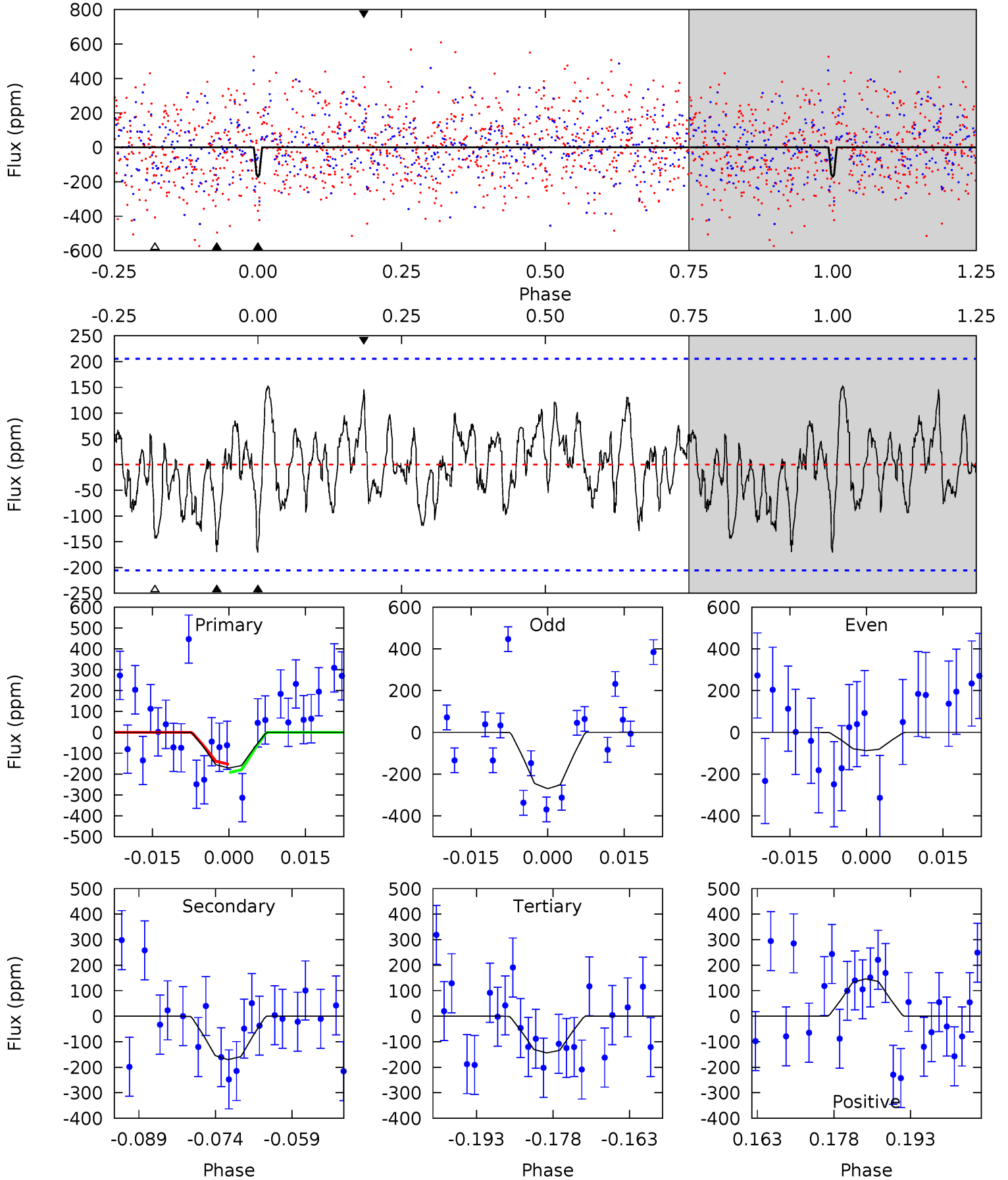


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

009490506-03, P = 4.188768 Days, E = 131.364620 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.11	4.09	3.45	3.51	4.95	2.44	1.35	0.65	0.60	0.63	0.57	2.23	0	0.47	0.48



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 009490506

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6559^{+148}_{-214}$	$4.357^{+0.067}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.218^{+0.404}_{-0.144}$	$1.235^{+0.181}_{-0.181}$	$0.963^{+0.289}_{-0.522}$
	+2%/-3%	+2%/-5%	+625%/-750%	+33%/-12%	+15%/-15%	+30%/-54%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009490506-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-170 \pm 42$	$3.23^{+3.01}_{-2.25}$	$1944^{+139}_{-99}$	$4935^{+4200}_{-1114}$	$26^{+243}_{-19}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

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

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

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

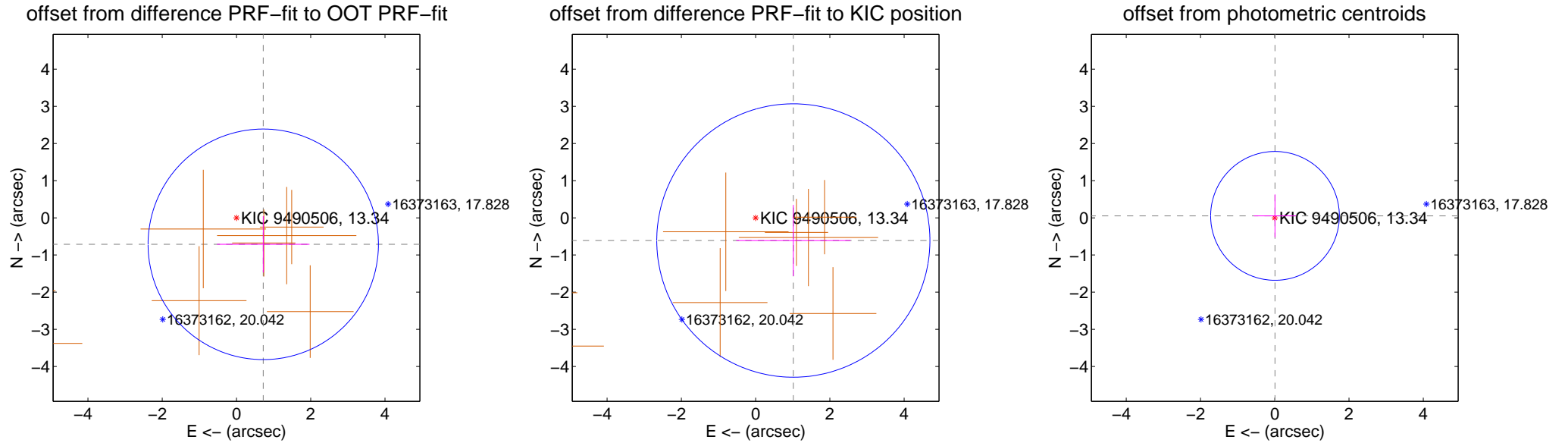
## DV Centroid Data

Supplemental centroid analysis for 009490506-03. Kepler magnitude: 13.34. Transit SNR 14.44

There are 0 quarters with good PRF difference image offsets

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

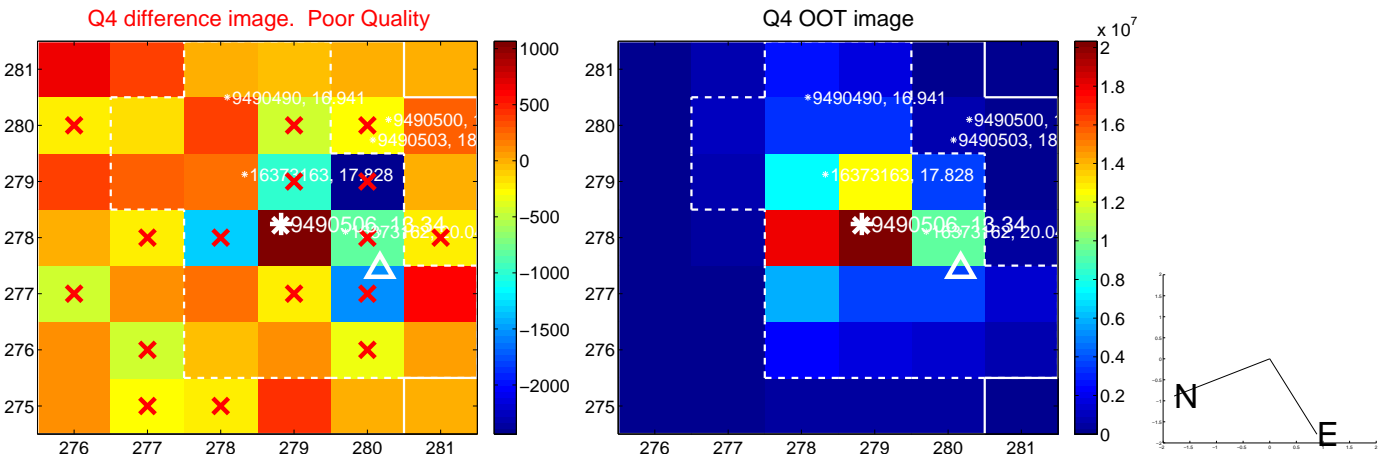
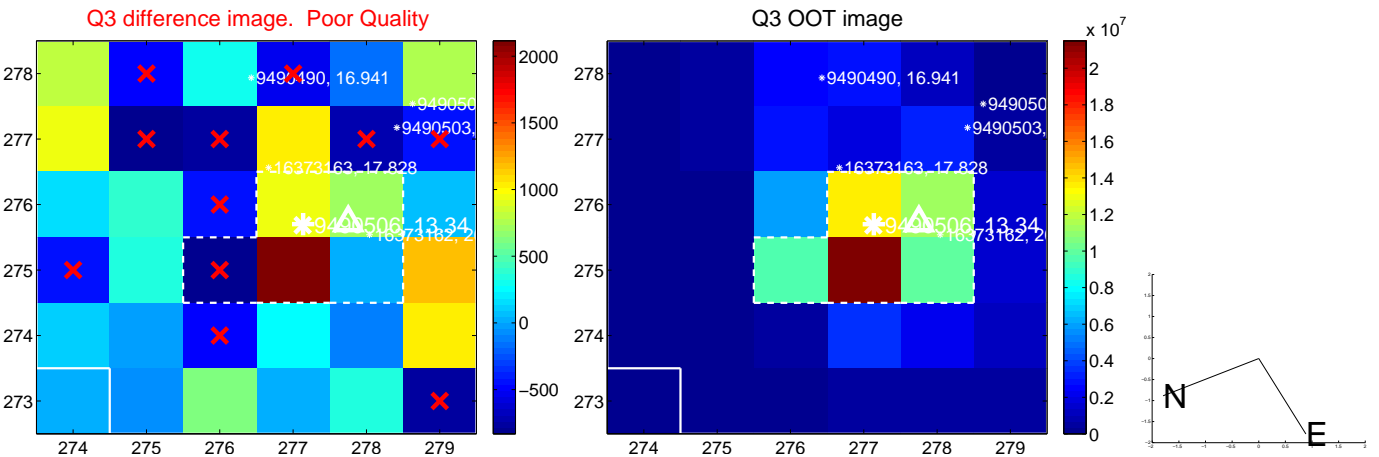
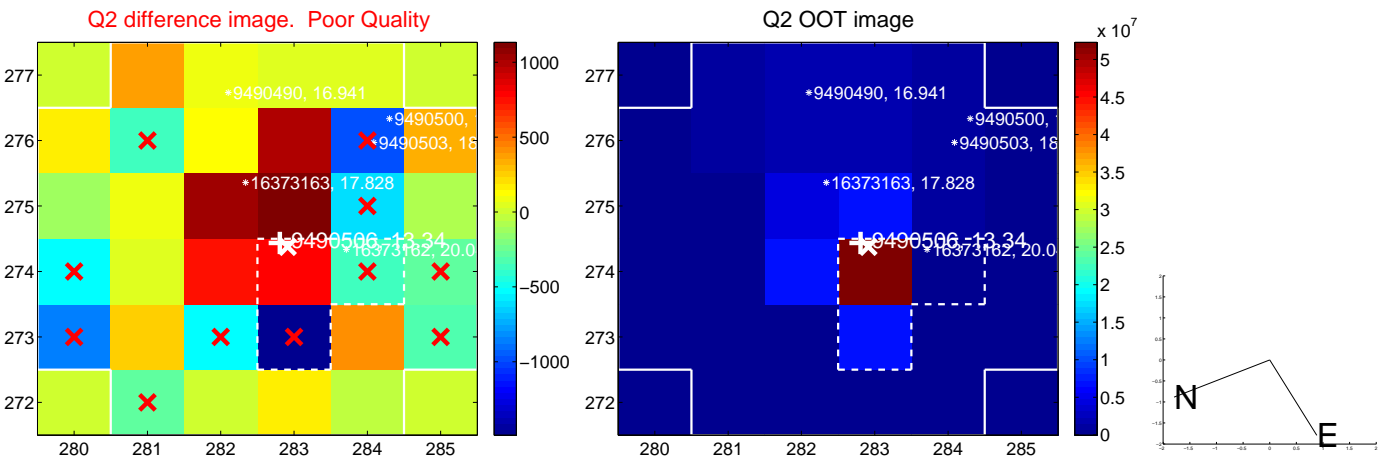
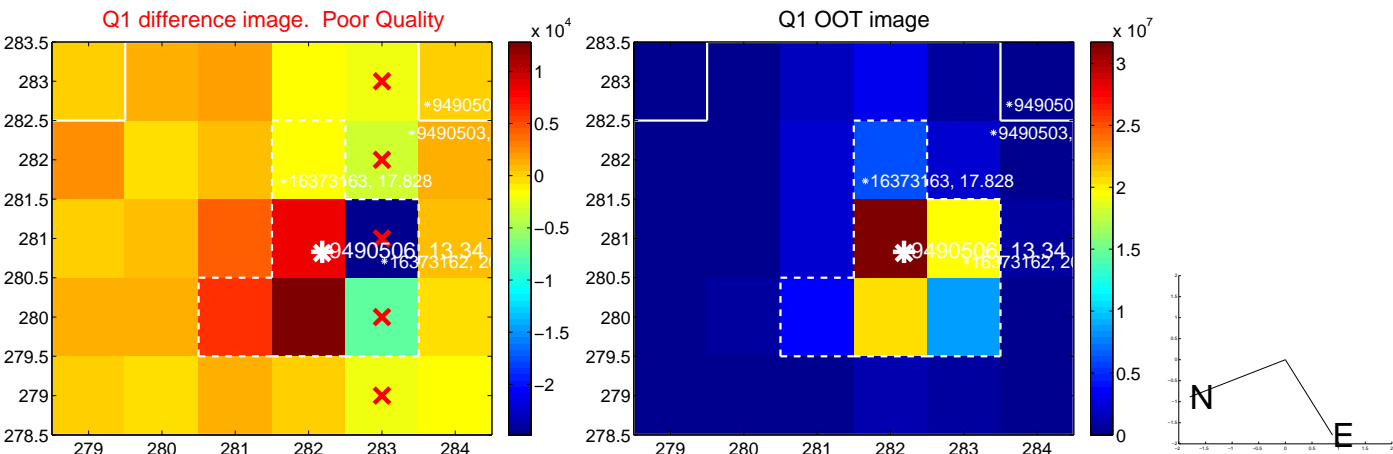
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.013 \pm 1.034$	0.98	$-0.721 \pm 1.245$	$-0.712 \pm 0.758$
PRF-fit source offset from KIC position	$1.185 \pm 1.226$	0.97	$-1.016 \pm 1.539$	$-0.610 \pm 0.957$
photometric centroid source offset	$0.05 \pm 0.58$	0.09	$-0.01 \pm 0.57$	$0.05 \pm 0.58$



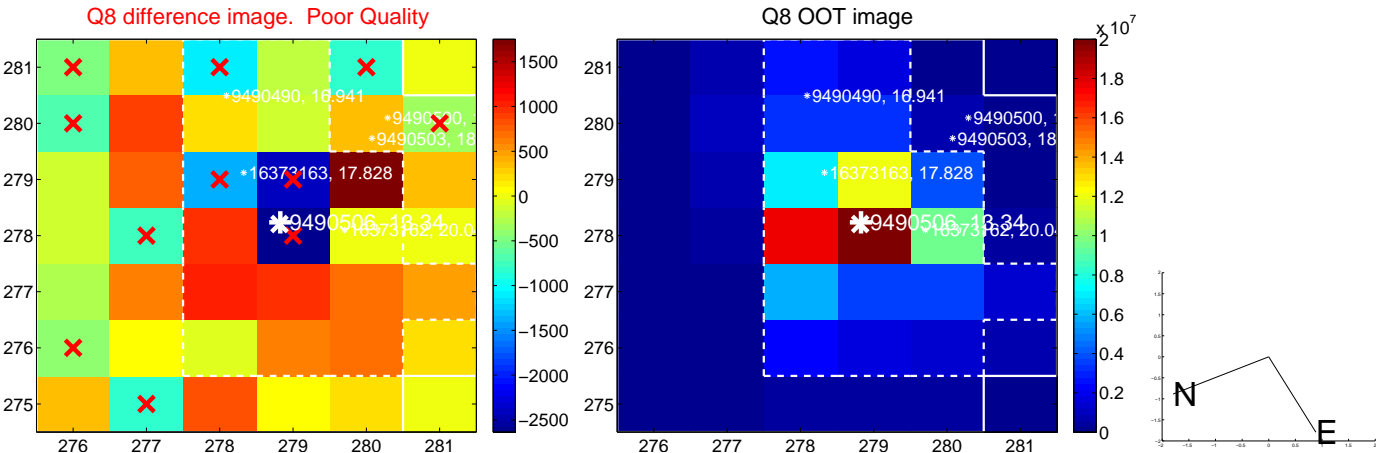
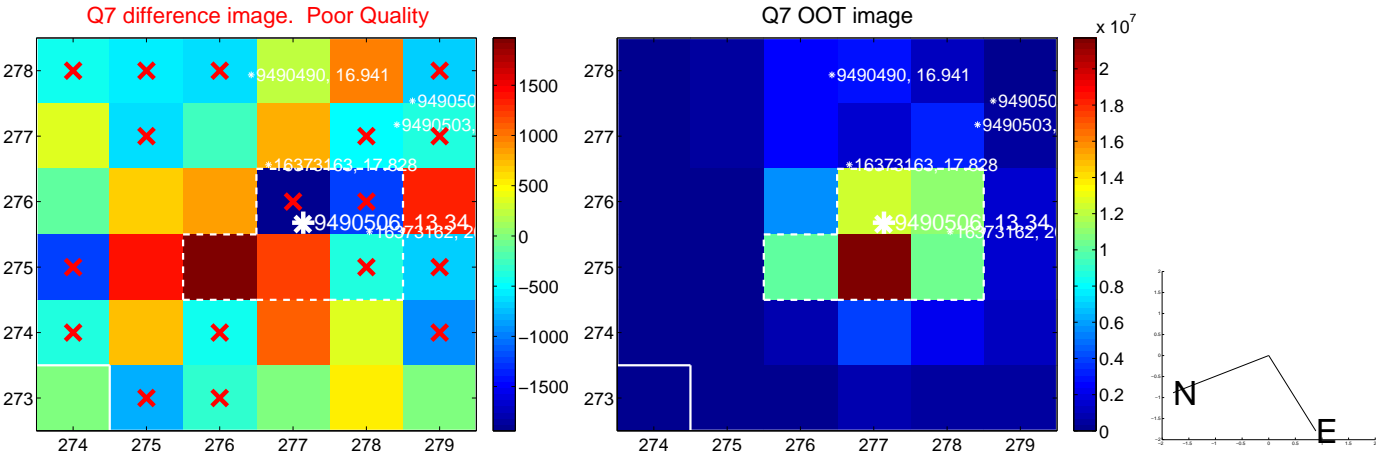
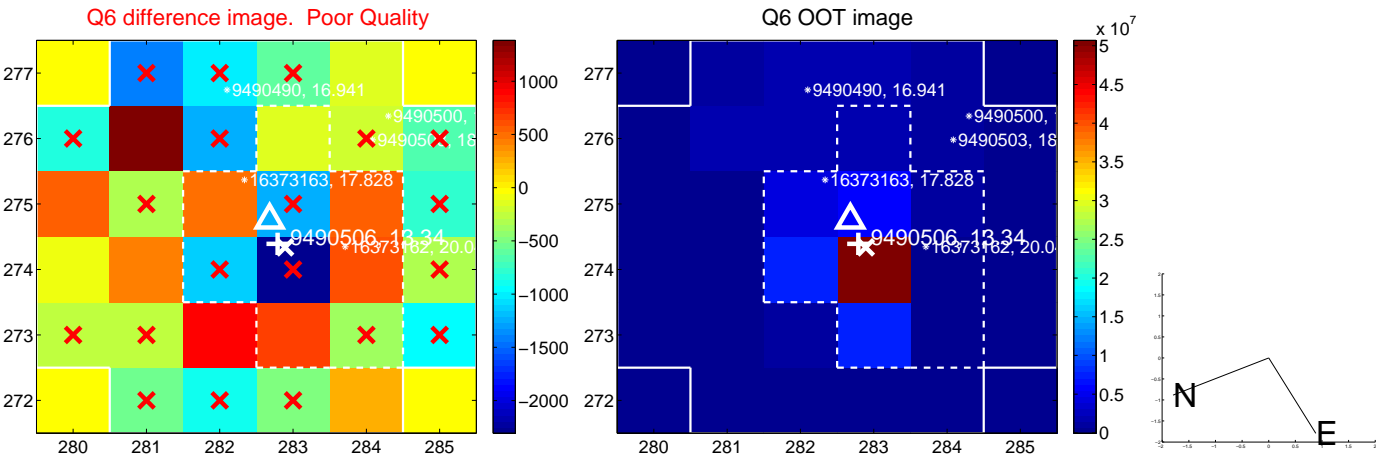
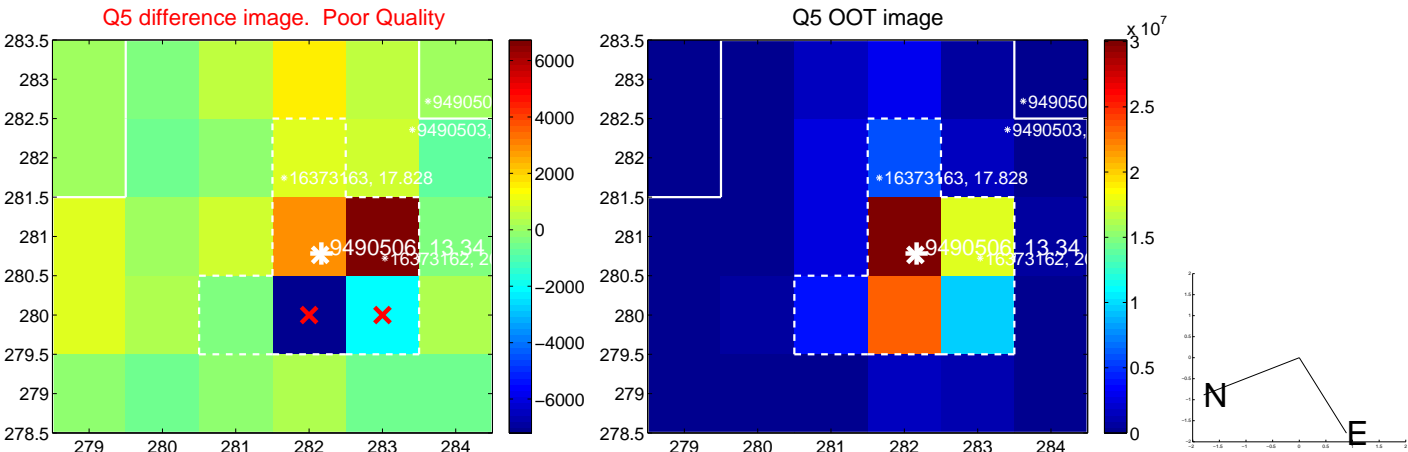
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



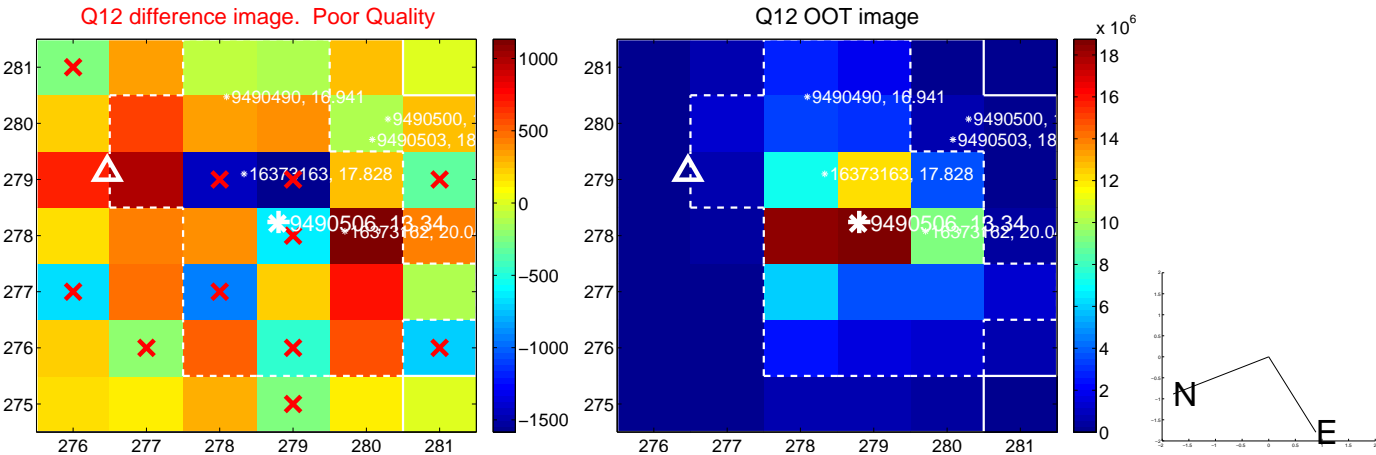
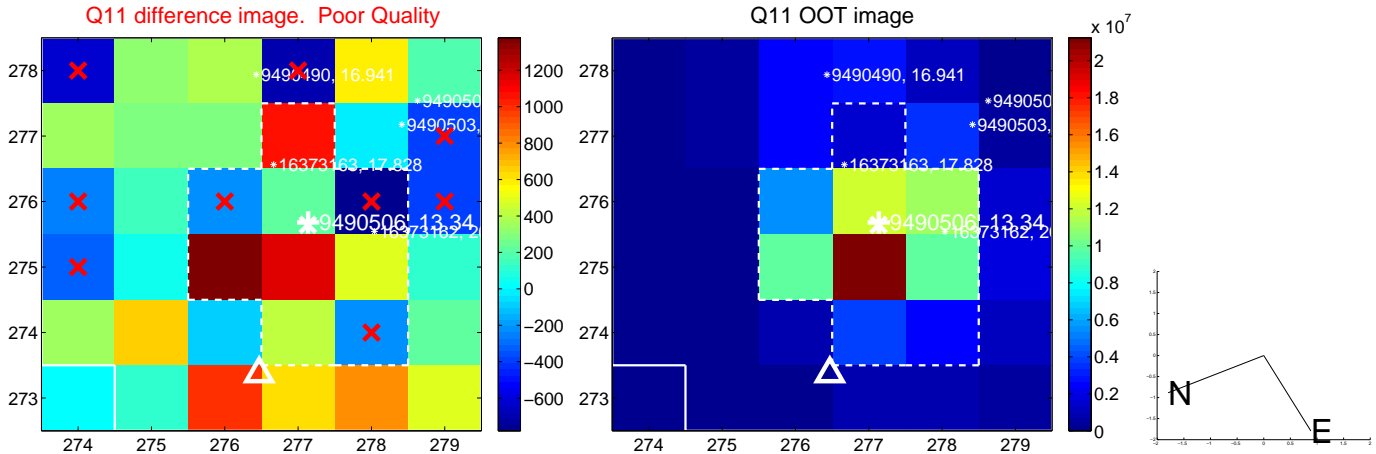
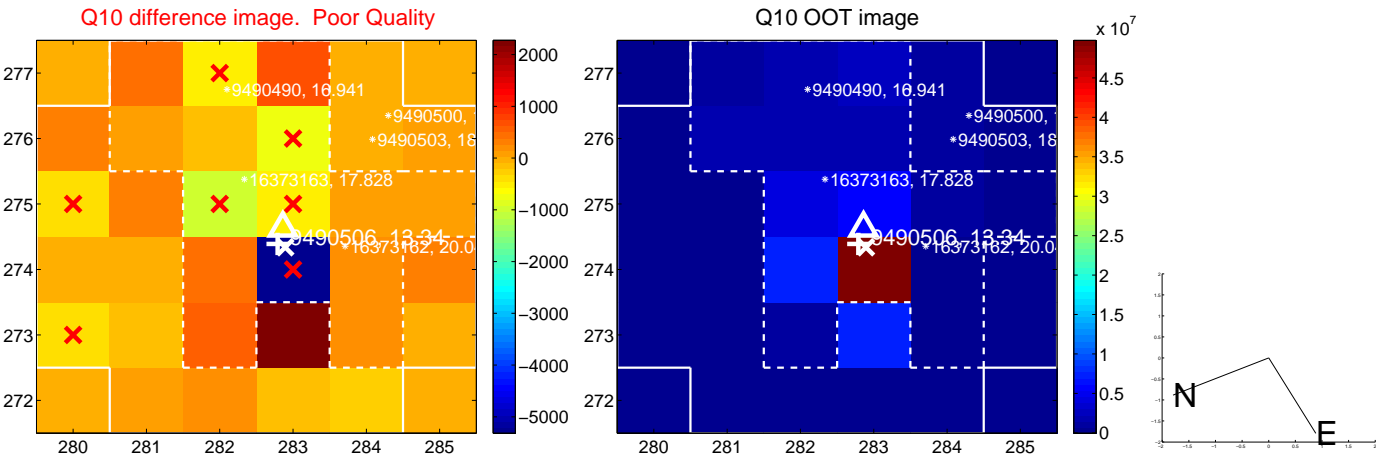
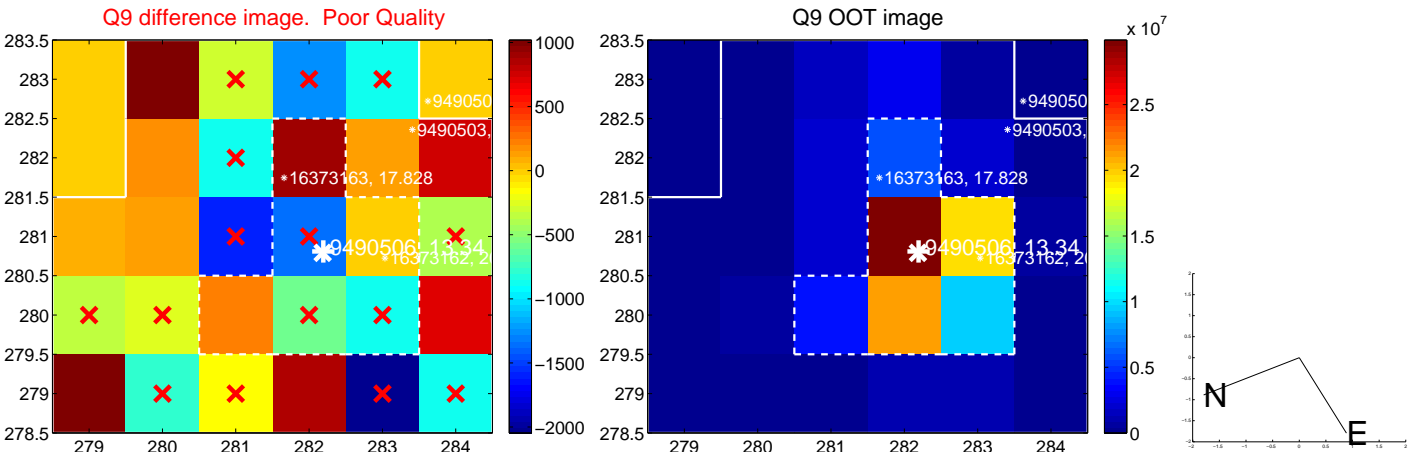
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



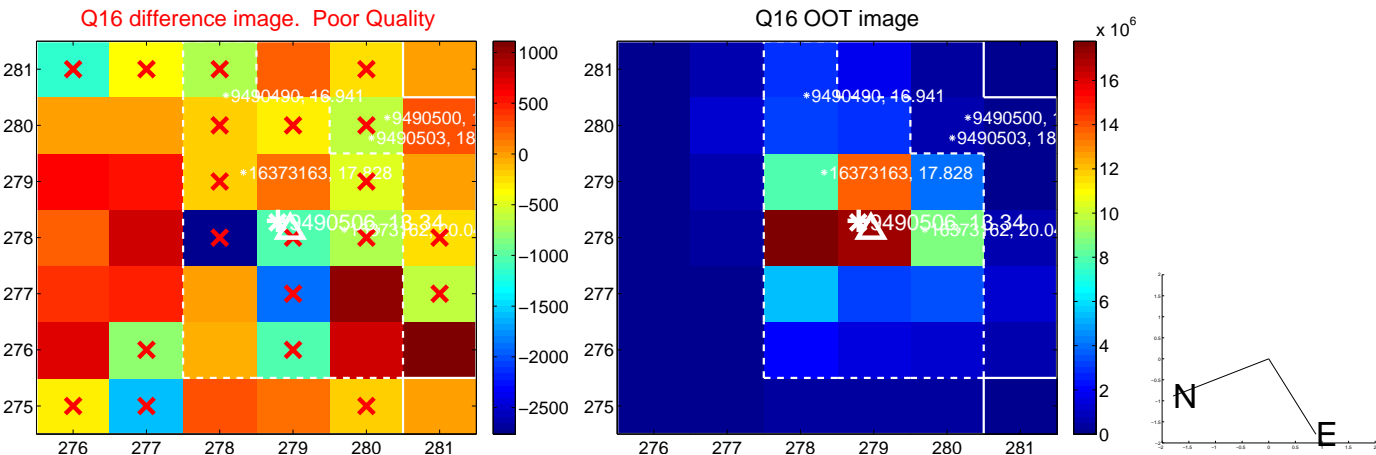
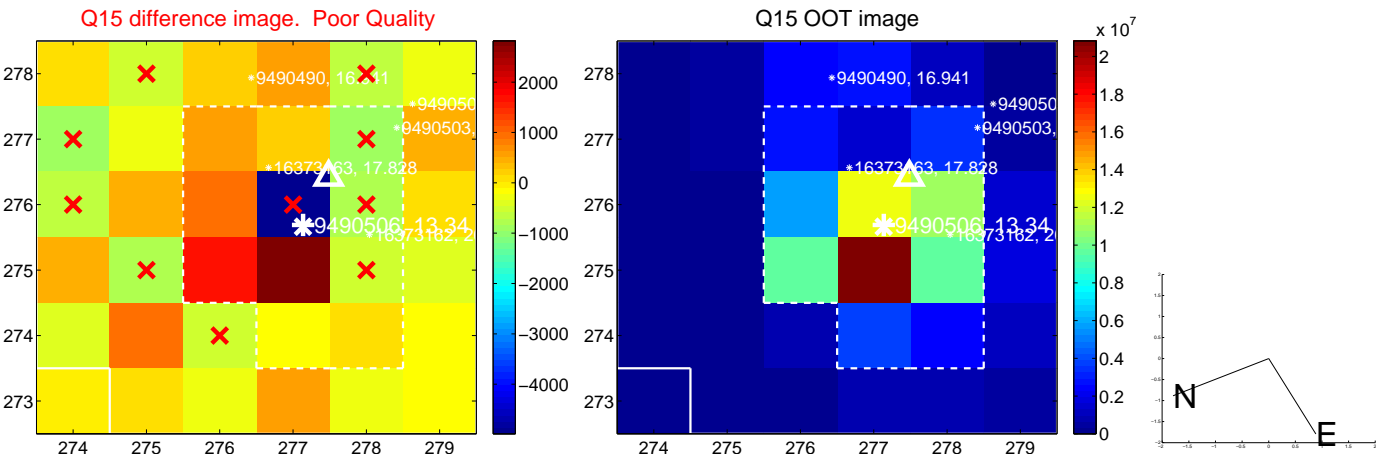
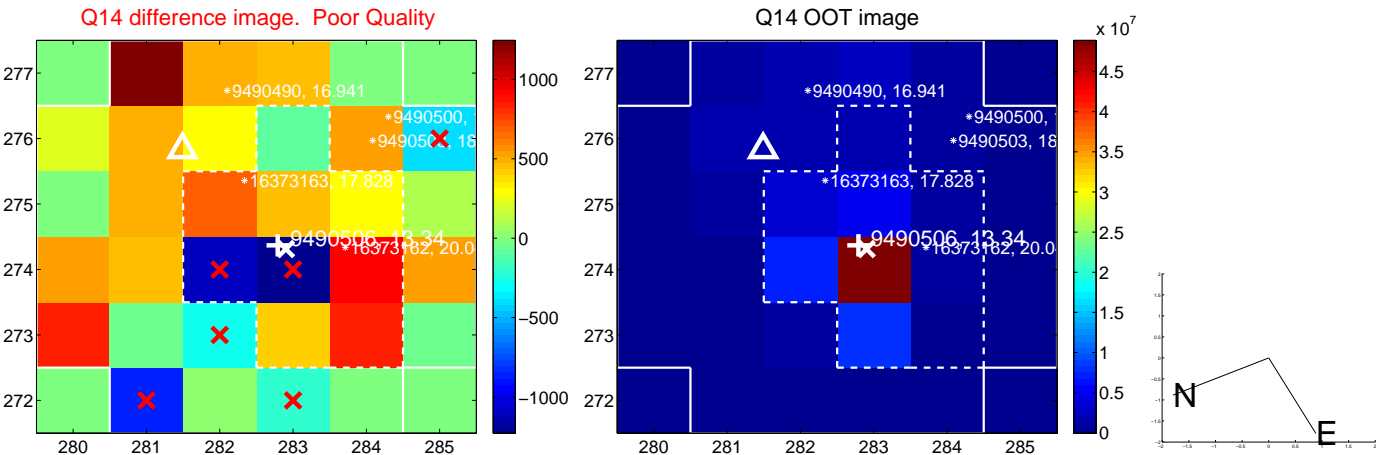
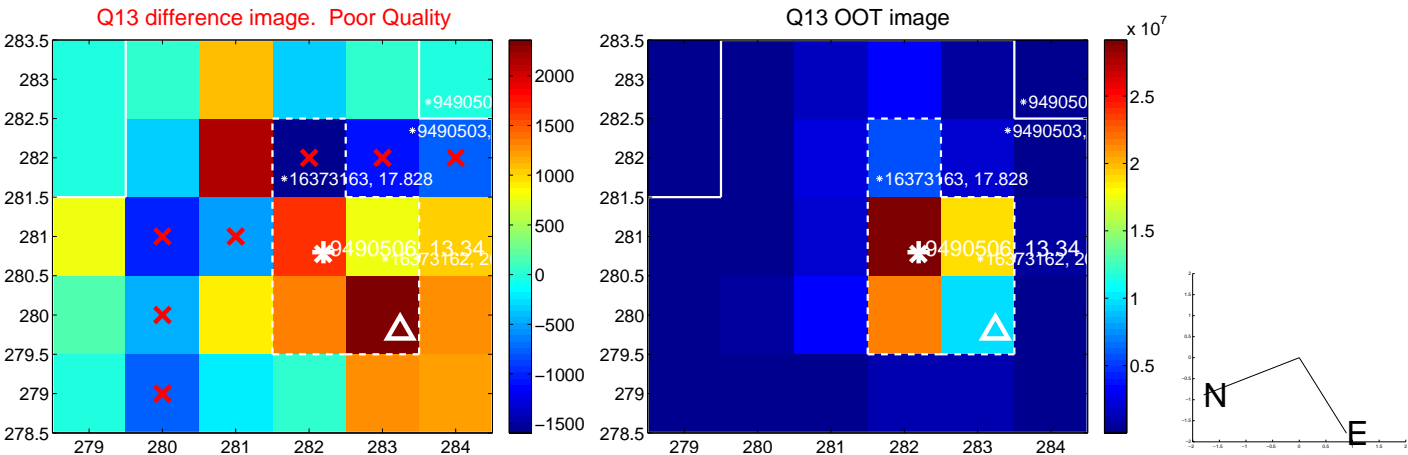
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



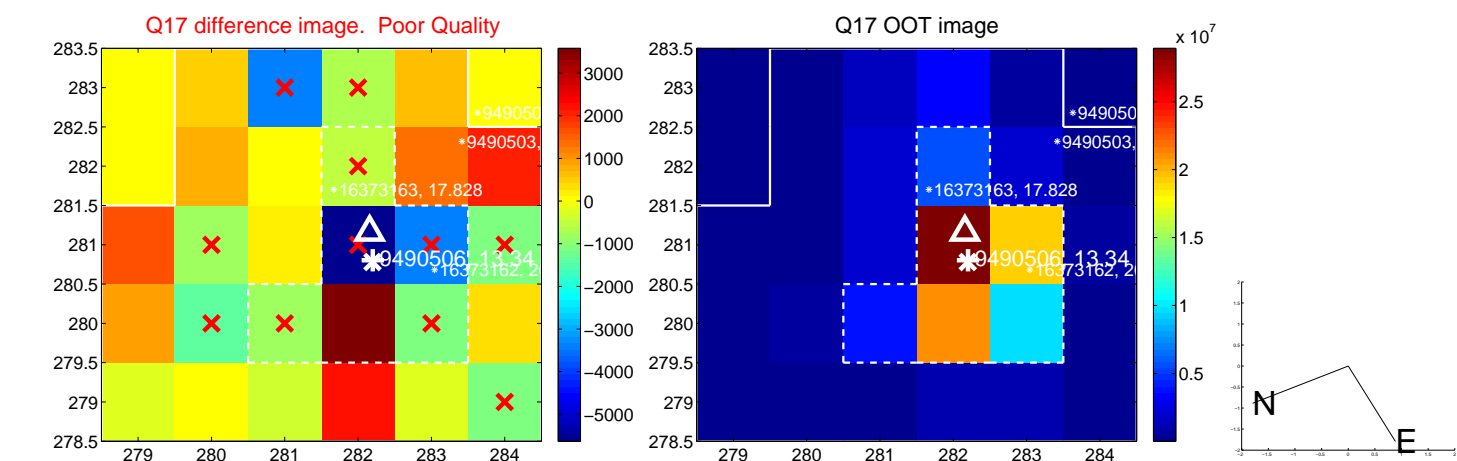
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



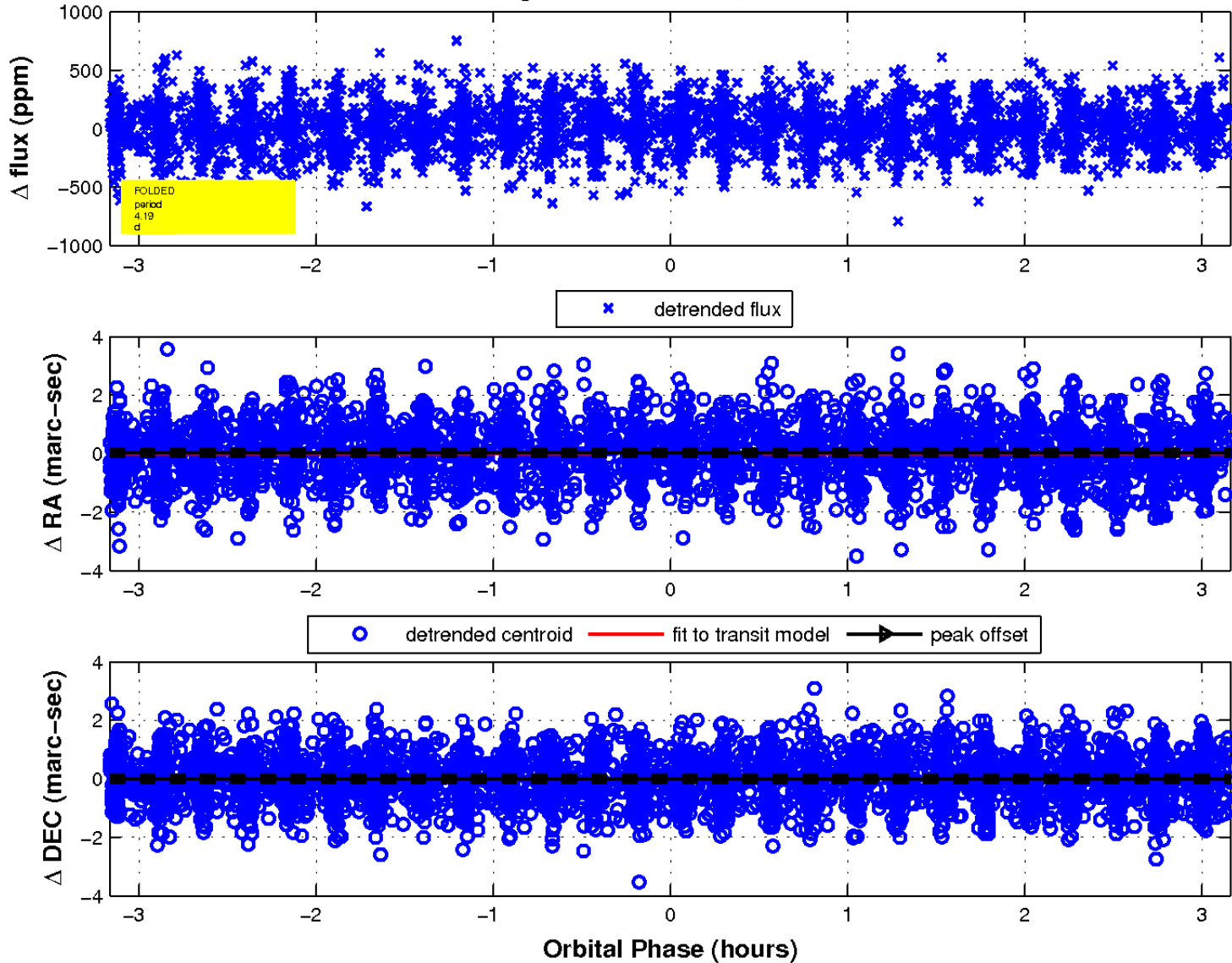
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

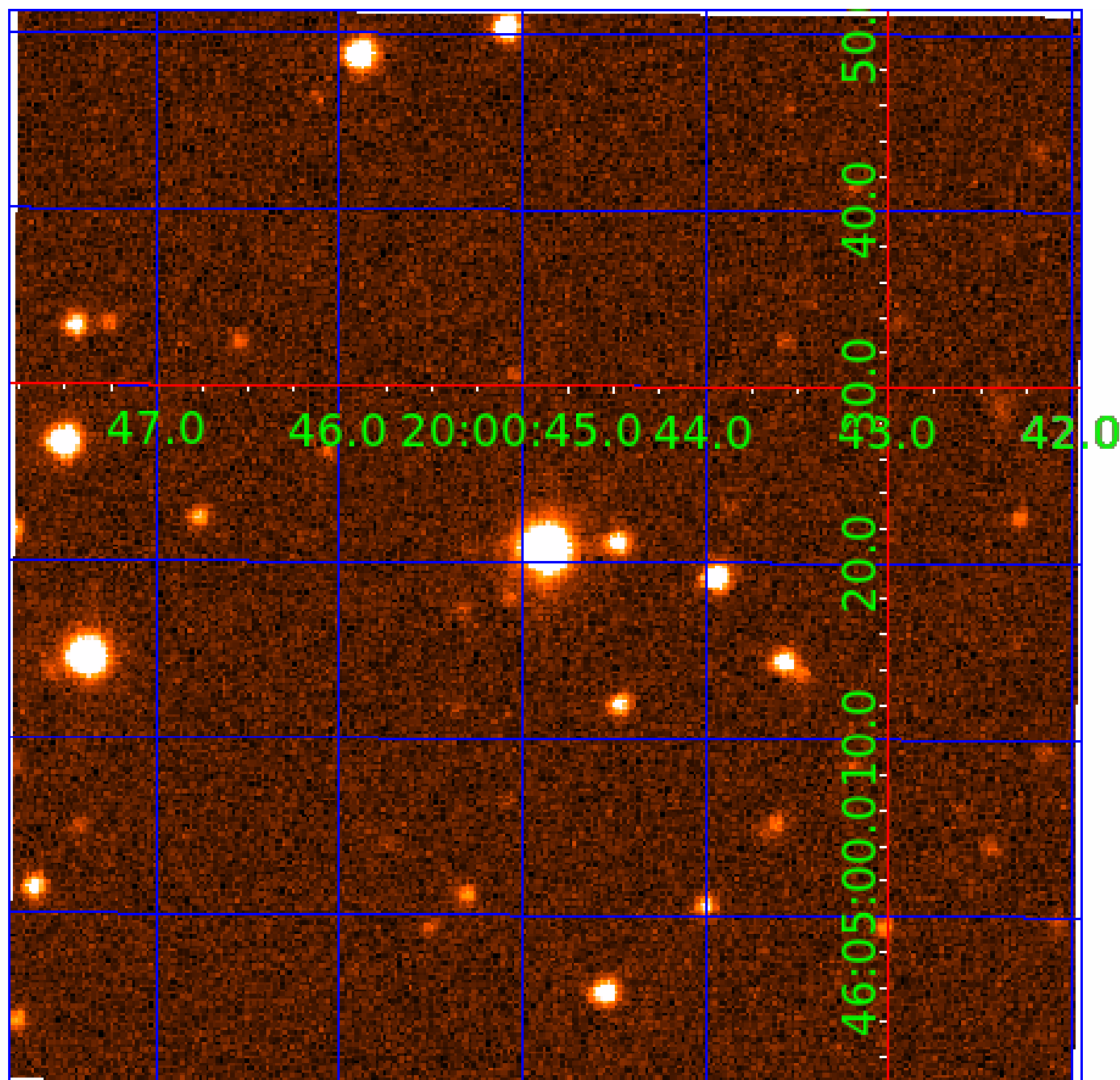


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



# KIC 009490506

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009490506-01	OBS	No	0.581598	131.711704	13.3	4.403	10.1	7.1	1.22	6559	0.46	11512.76
009490506-02	OBS	No	9.545196	134.454944	1034.9	2.000	15.2	-1.0	1.22	6559	3.95	276.03
009490506-03	OBS	No	4.188768	135.553388	181.2	1.055	15.1	14.4	1.22	6559	1.92	827.74
009490506-04	OBS	No	4.958190	133.993423	219.2	1.641	15.1	19.2	1.22	6559	1.96	661.07

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009490506-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_MEAS
009490506-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—NO_FITS—CENT_NOFITS
009490506-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009490506-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV

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

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

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

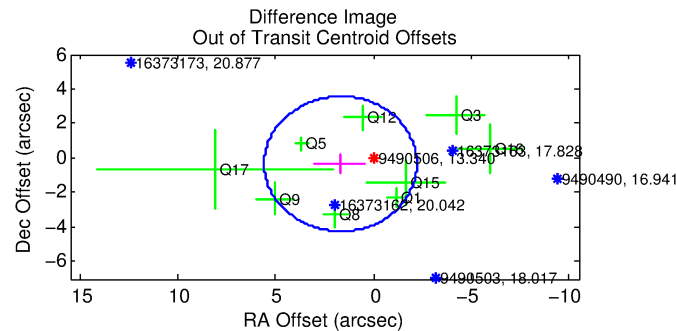
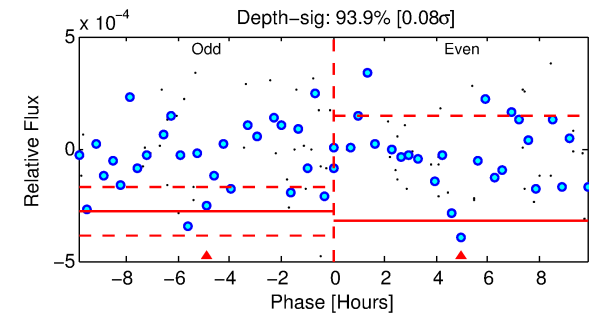
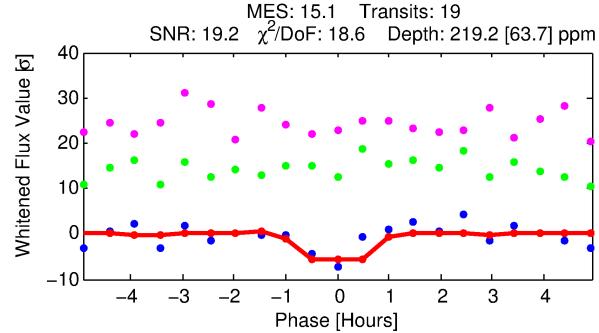
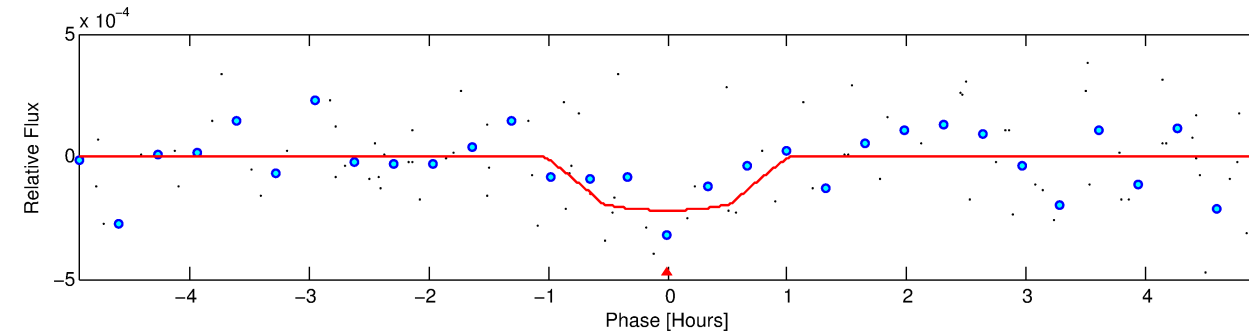
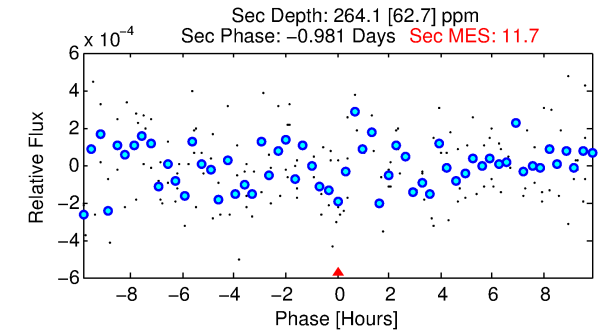
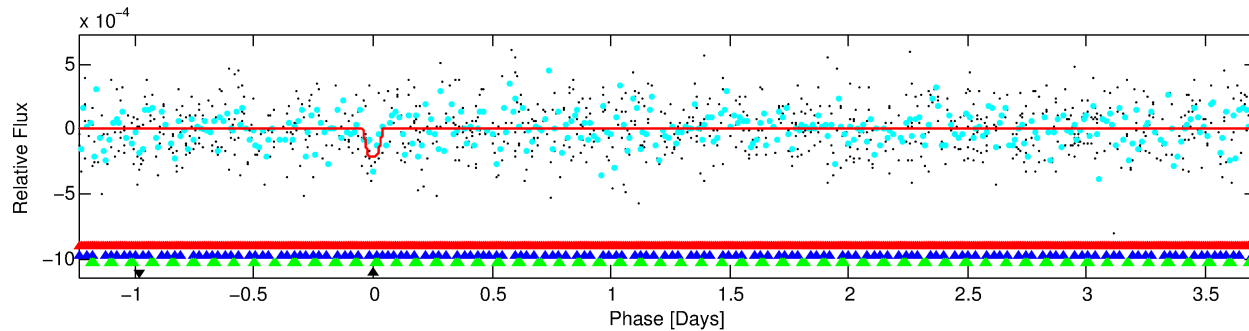
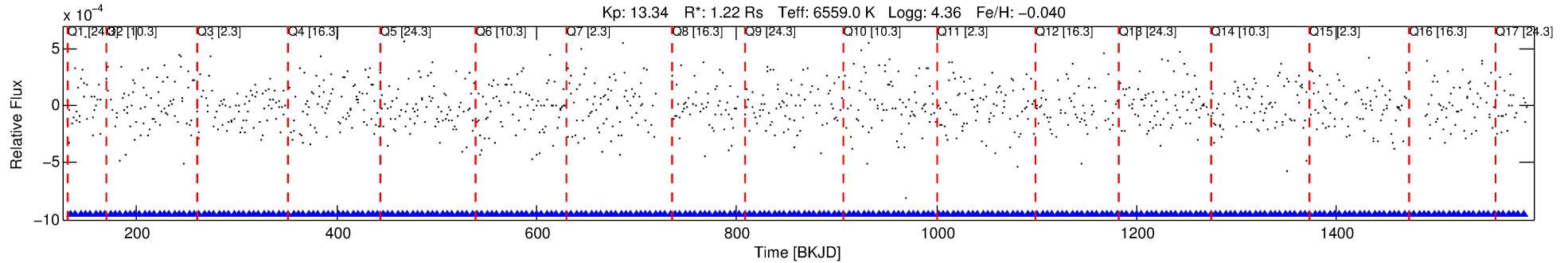
Ephemeris Match Information For 009490506-04

No Significant Match Found



# DV One-Page Summary

KIC: 9490506 Candidate: 4 of 4 Period: 4.958 d



## DV Fit Results:

Period = 4.95819 [0.00006] d  
Epoch = 133.9934 [0.0075] BKJD  
Rp/R\* = 0.0148 [0.0230]  
a/R\* = 15.85 [137.01]  
b = 0.75 [5.18]  
Seff = 661.07 [277.23]  
Teq = 1293 [136] K  
Rp = 1.96 [3.13] Re  
a = 0.0610 [0.0169] AU  
Ag = 140.64 [443.62] [0.31 $\sigma$ ]  
Teffp = 6884 [5390] K [1.04 $\sigma$ ]

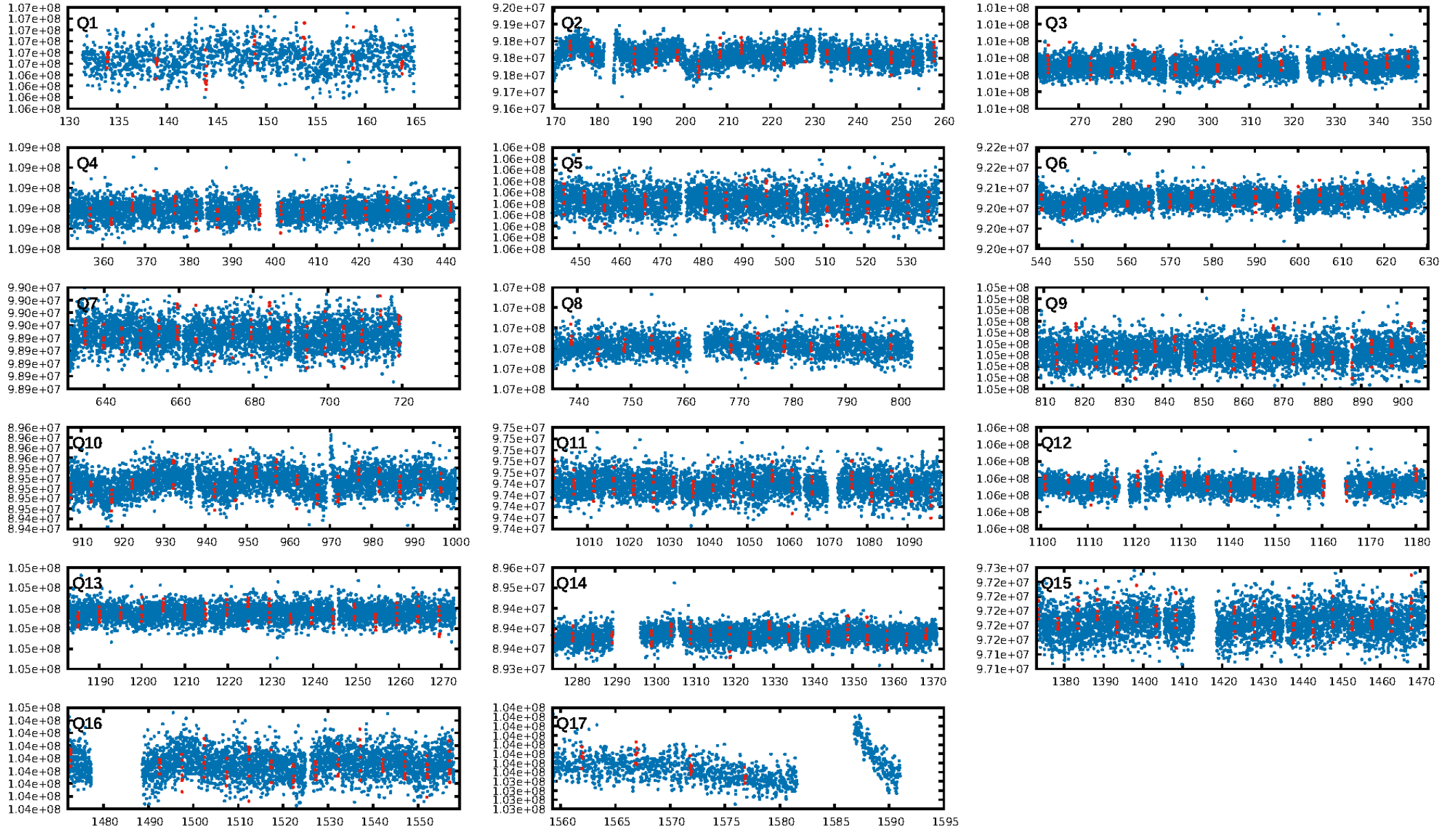
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.46 $\sigma$ ]  
LongPeriod-sig: 100.0% [42.55 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 3.72e-05  
RollingBand-fgt: 1.00 [18/18]  
GhostDiagnostic-chr: 0.7758  
Centroid-sig: 0.9%  
Centroid-so: 0.838 arcsec [2.08 $\sigma$ ]  
OotOffset-rm: 1.726 arcsec [1.33 $\sigma$ ]  
KicOffset-rm: 1.688 arcsec [1.12 $\sigma$ ]  
OotOffset-st: 0/2/3/4 [9]  
KicOffset-st: 0/2/3/4 [9]  
DiffImageQuality-fgm: 0.33 [3/9]  
DiffImageOverlap-fno: 0.00 [0/17]

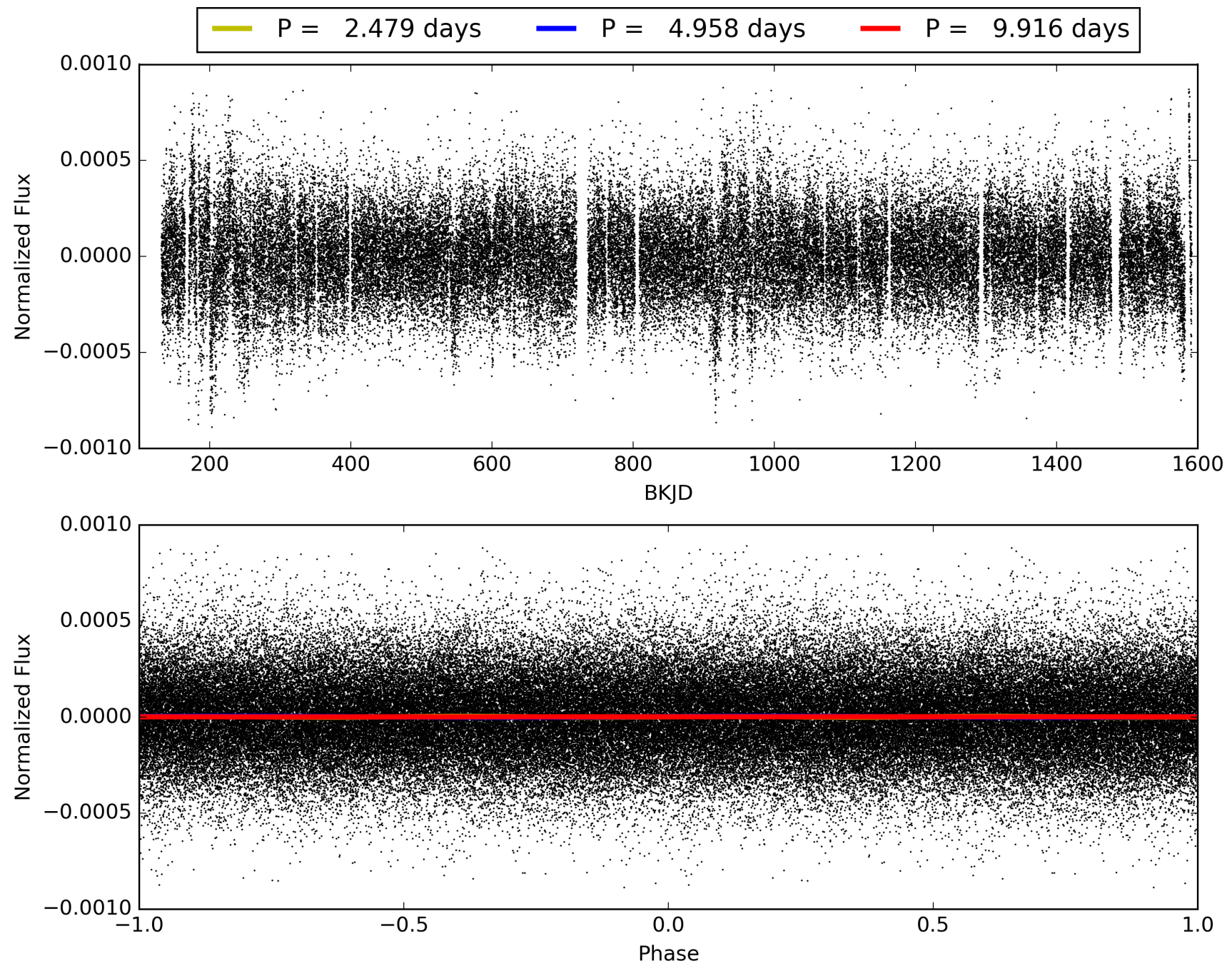
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:01:18 Z

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

# TCE 009490506-04, PDC Light Curves

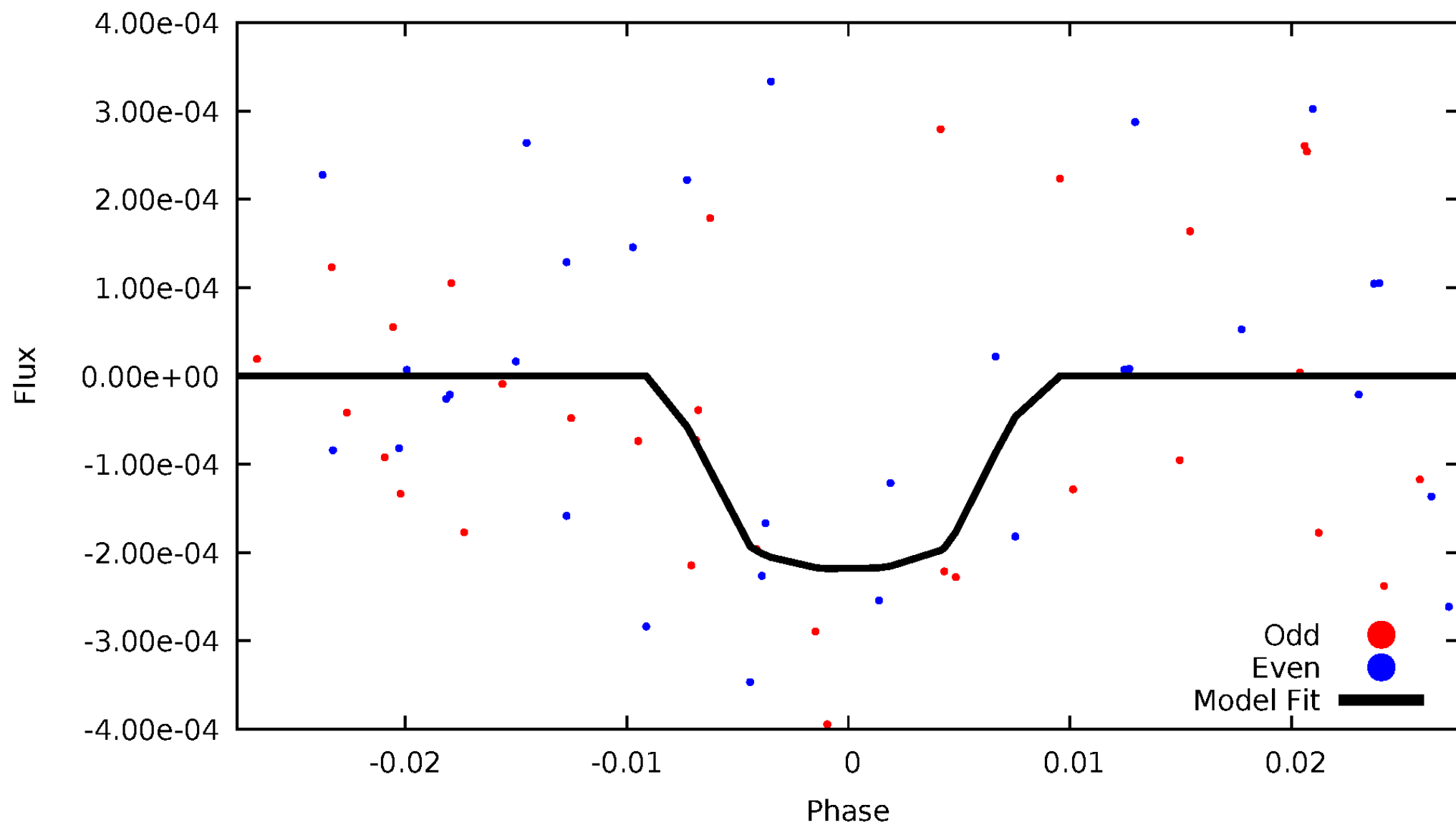


TCE 009490506-04



# DV Odd/Even

TCE 009490506-04



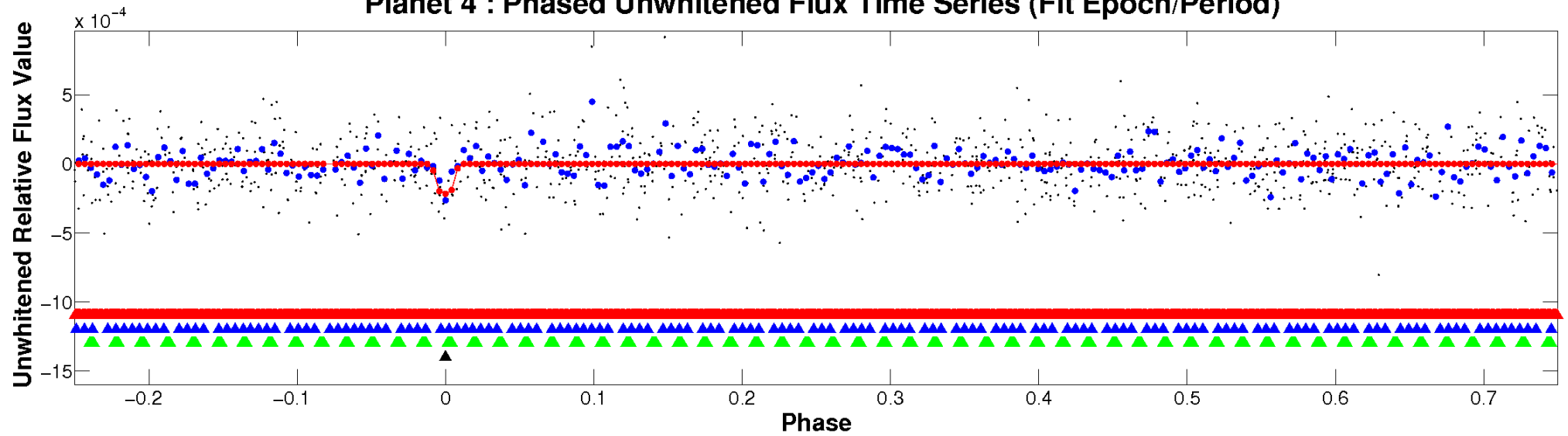


ALT Odd/Even

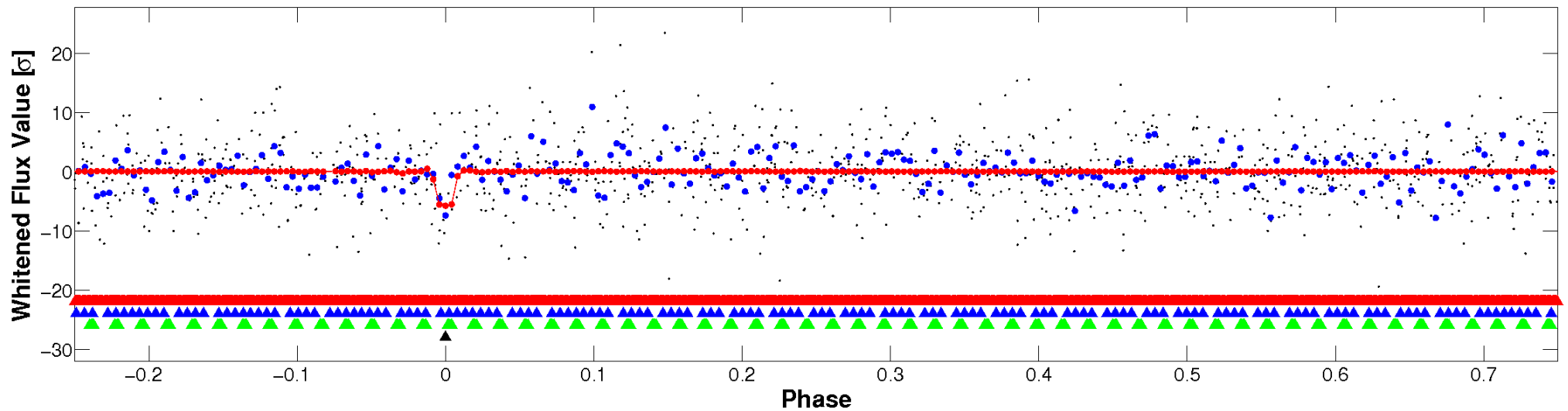
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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



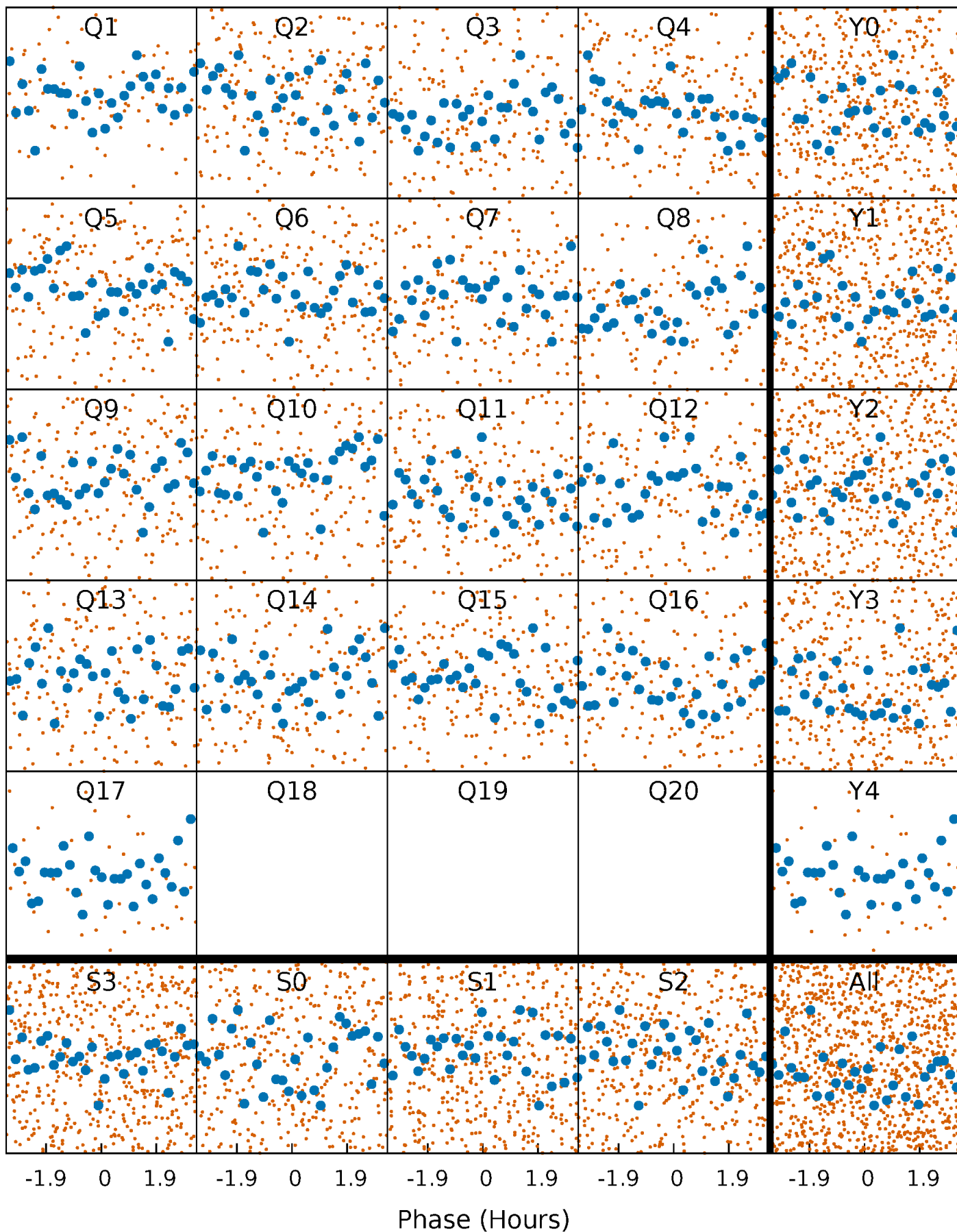
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





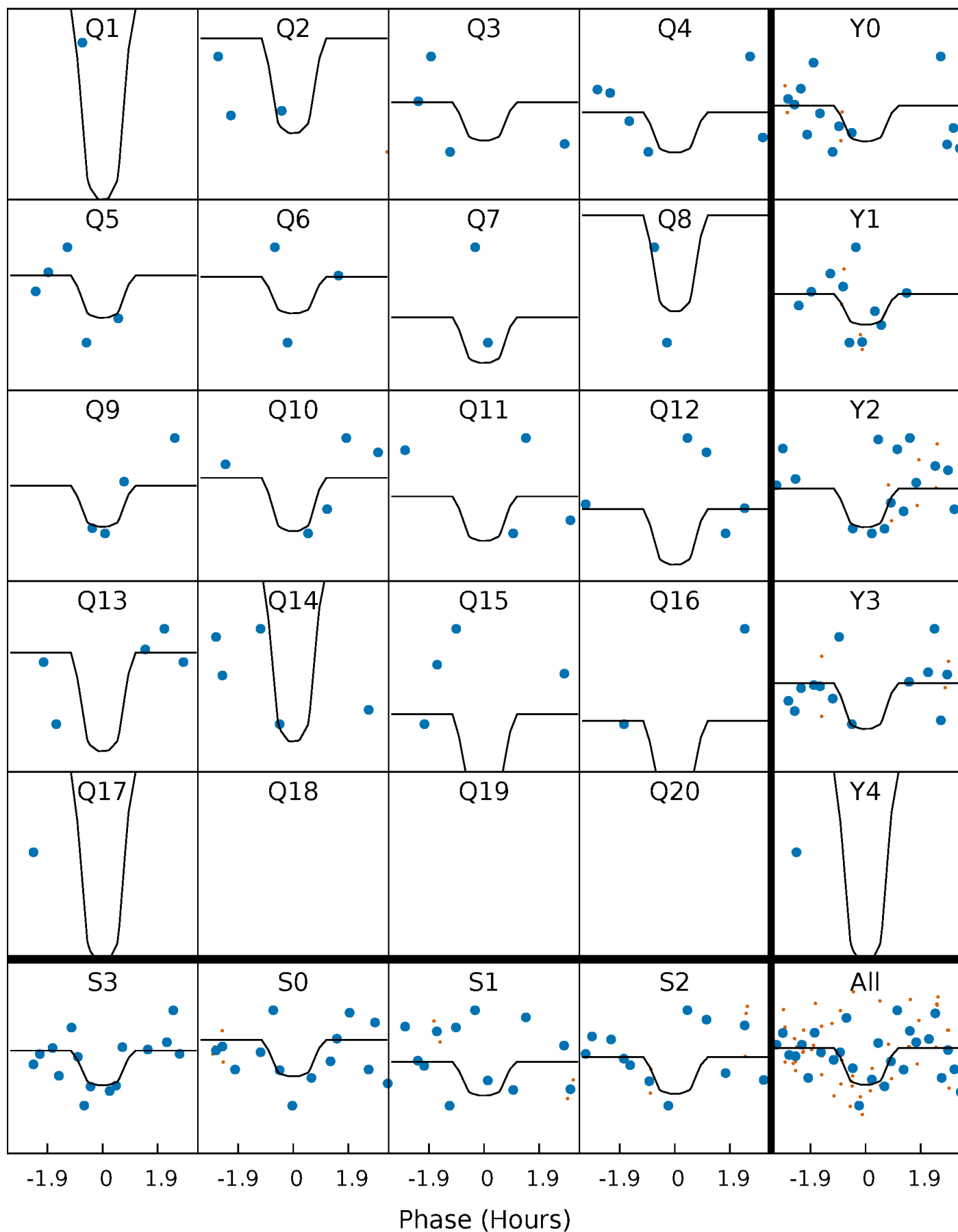
# PDC Quarter-Phased Transit Curves

TCE 009490506-04 P= 4.958190 Days  $T_0=133.993423$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 009490506-04 P= 4.958190 Days  $T_0=133.993423$  (BKJD)

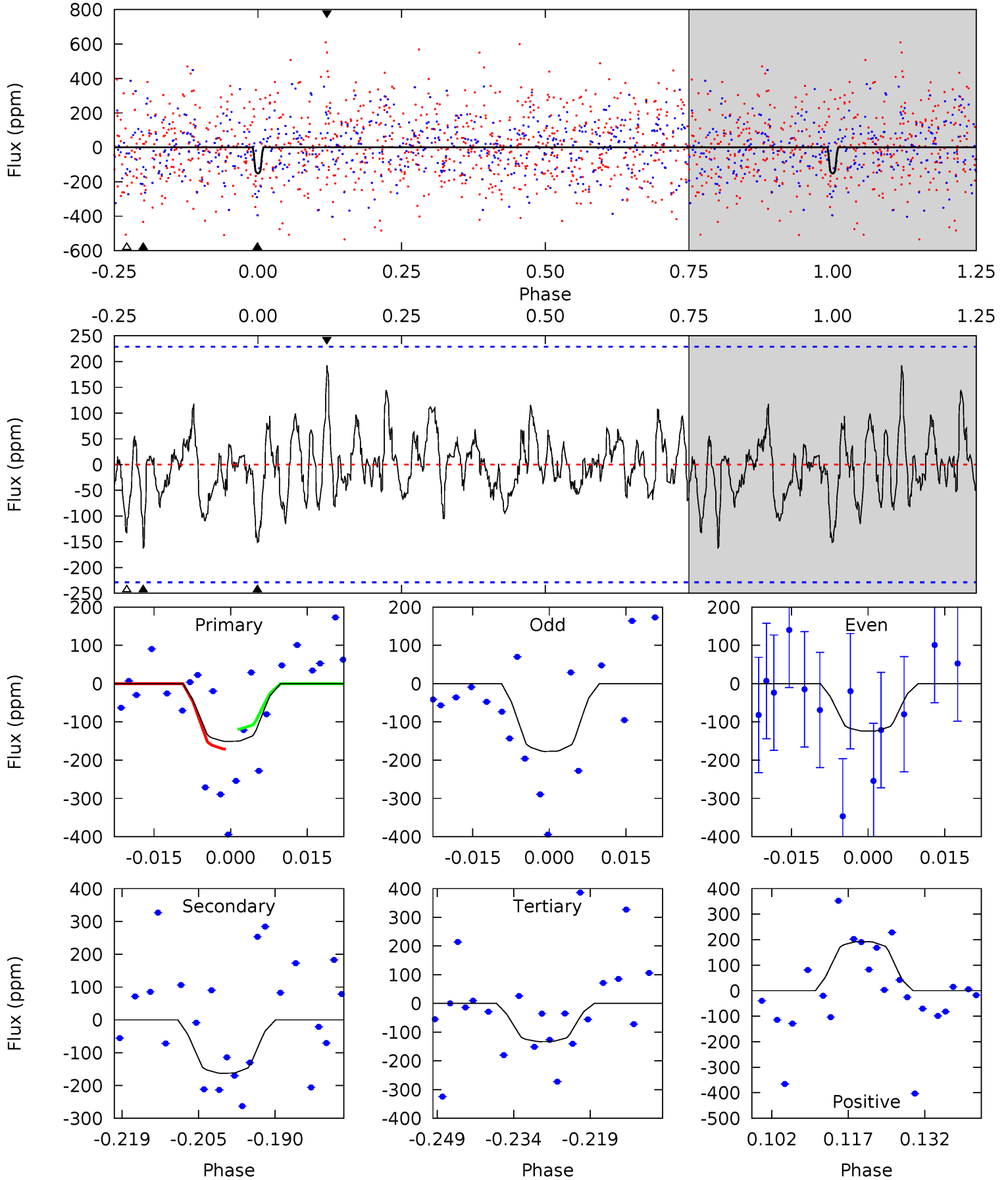


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

009490506-04, P = 4.958190 Days, E = 129.035233 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.27	3.52	2.88	4.17	4.95	2.44	1.11	0.39	-0.90	0.65	-0.65	0.57	0	0.54	0.56



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 009490506

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6559^{+148}_{-214}$	$4.357^{+0.067}_{-0.216}$	$-0.040^{+0.250}_{-0.300}$	$1.218^{+0.404}_{-0.144}$	$1.235^{+0.181}_{-0.181}$	$0.963^{+0.289}_{-0.522}$
	+2%/-3%	+2%/-5%	+625%/-750%	+33%/-12%	+15%/-15%	+30%/-54%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009490506-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-163 \pm 46$	$3.41^{+2.71}_{-2.21}$	$1833^{+144}_{-95}$	$4805^{+3397}_{-996}$	$27^{+223}_{-19}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

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

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

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

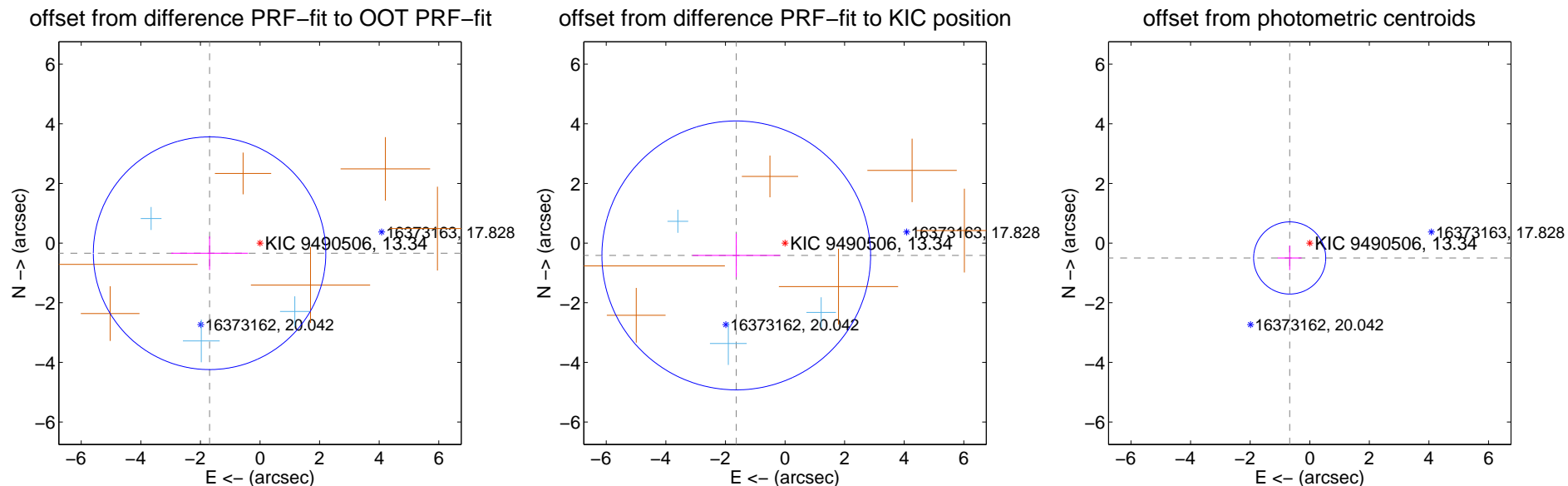
## DV Centroid Data

Supplemental centroid analysis for 009490506-04. Kepler magnitude: 13.34. Transit SNR 19.16

There are 3 quarters with good PRF difference image offsets

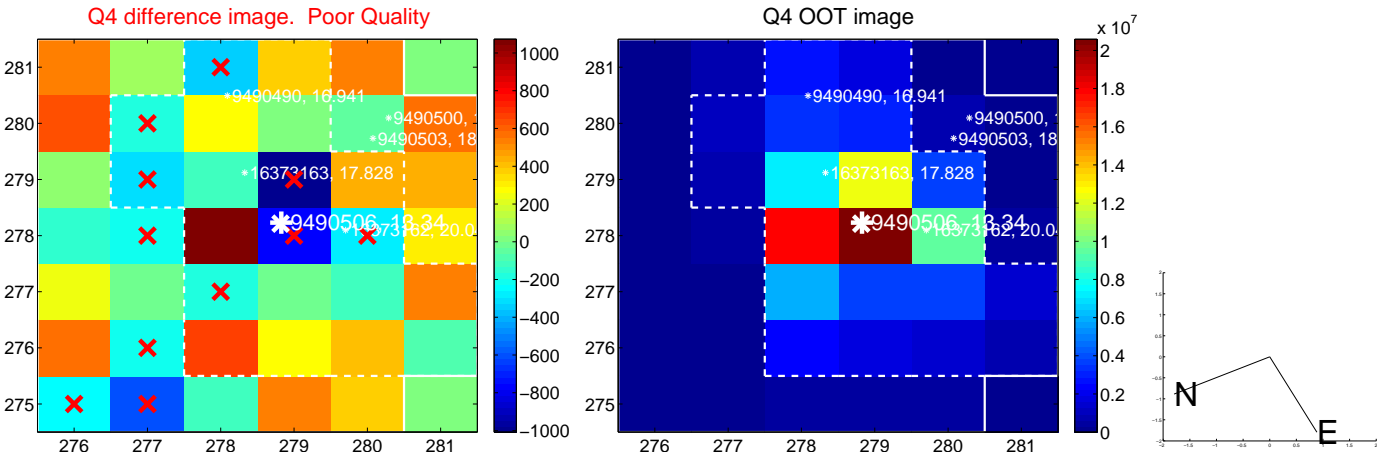
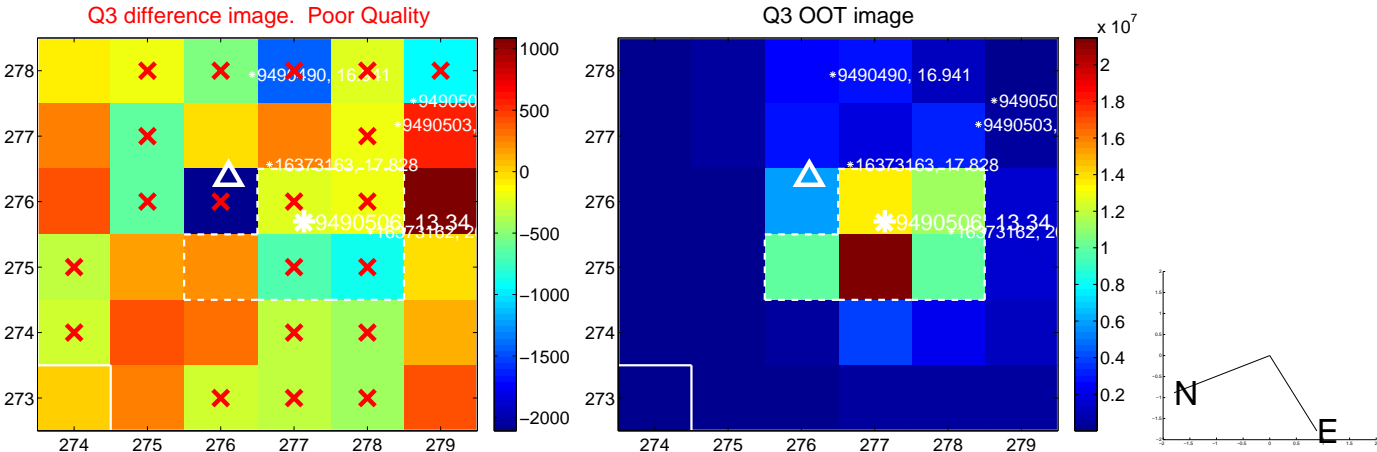
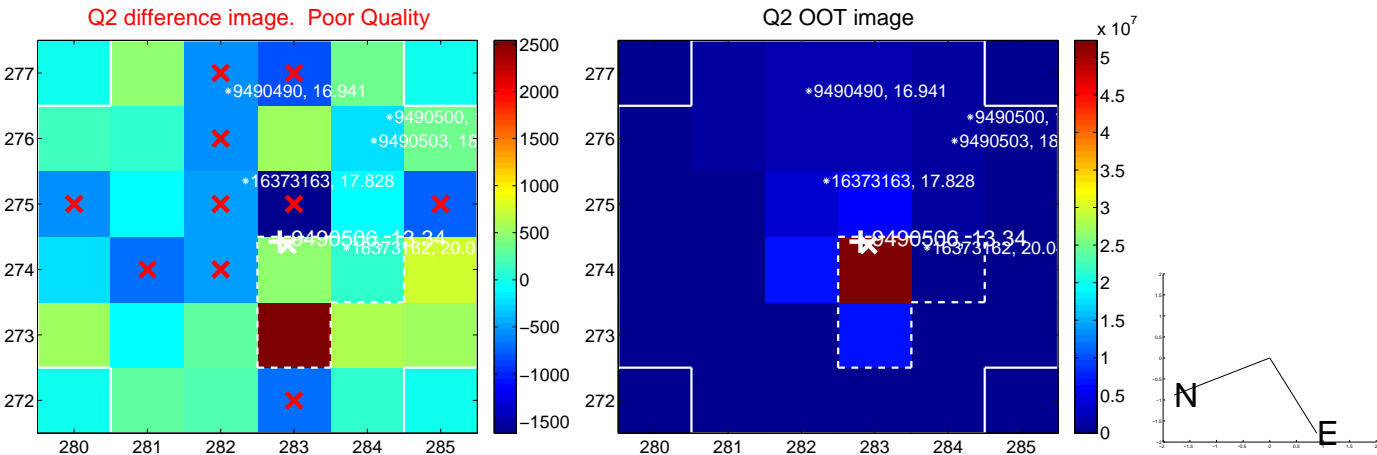
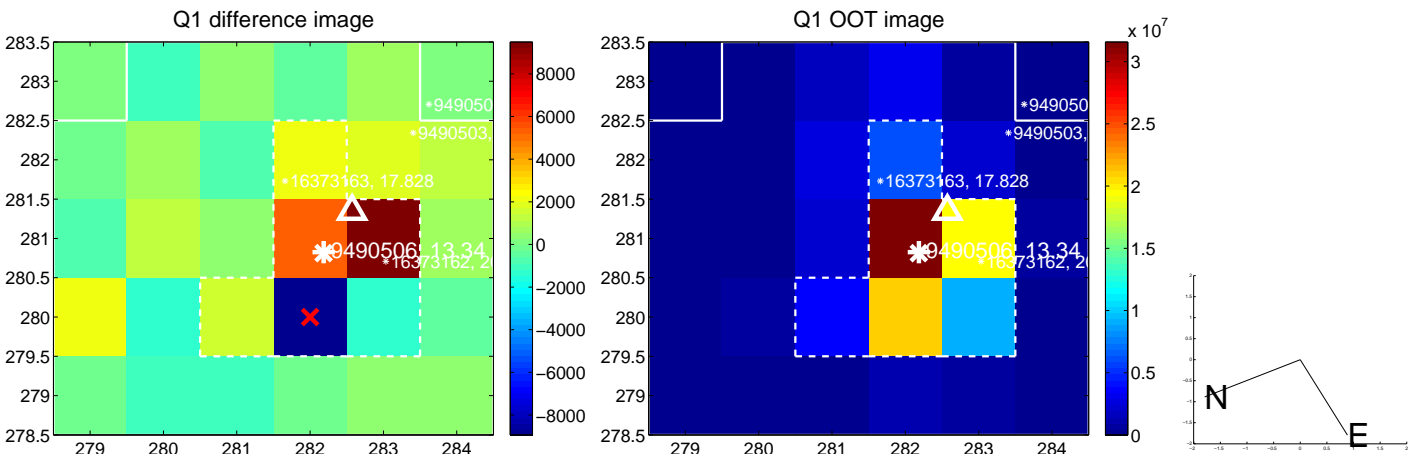
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.726 \pm 1.300$	1.33	$1.692 \pm 1.289$	$-0.340 \pm 0.564$
PRF-fit source offset from KIC position	$1.688 \pm 1.503$	1.12	$1.637 \pm 1.469$	$-0.413 \pm 0.724$
photometric centroid source offset	$0.84 \pm 0.40$	2.08	$0.67 \pm 0.40$	$-0.50 \pm 0.41$



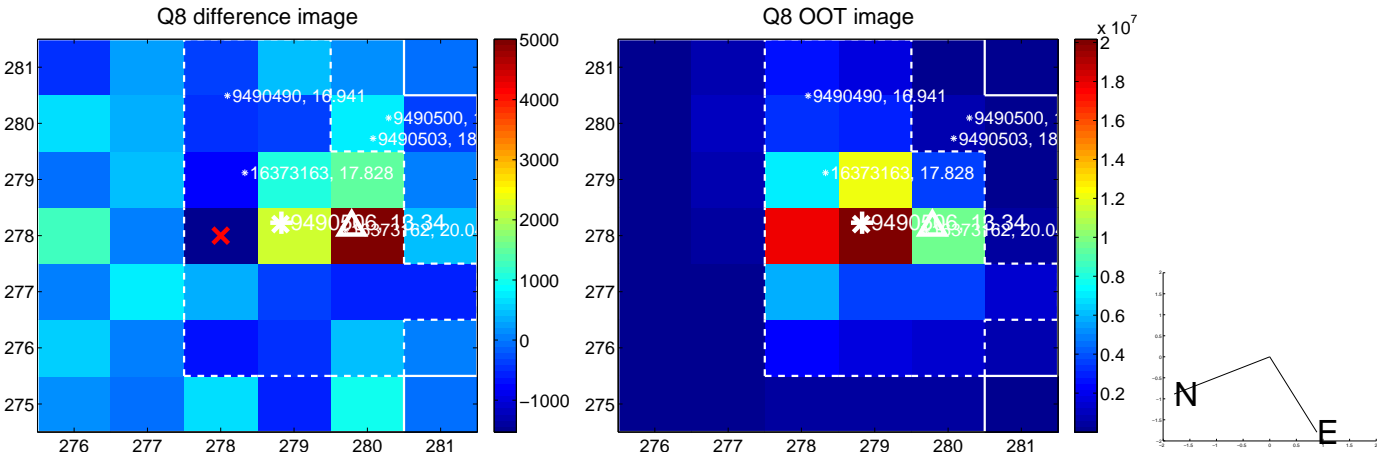
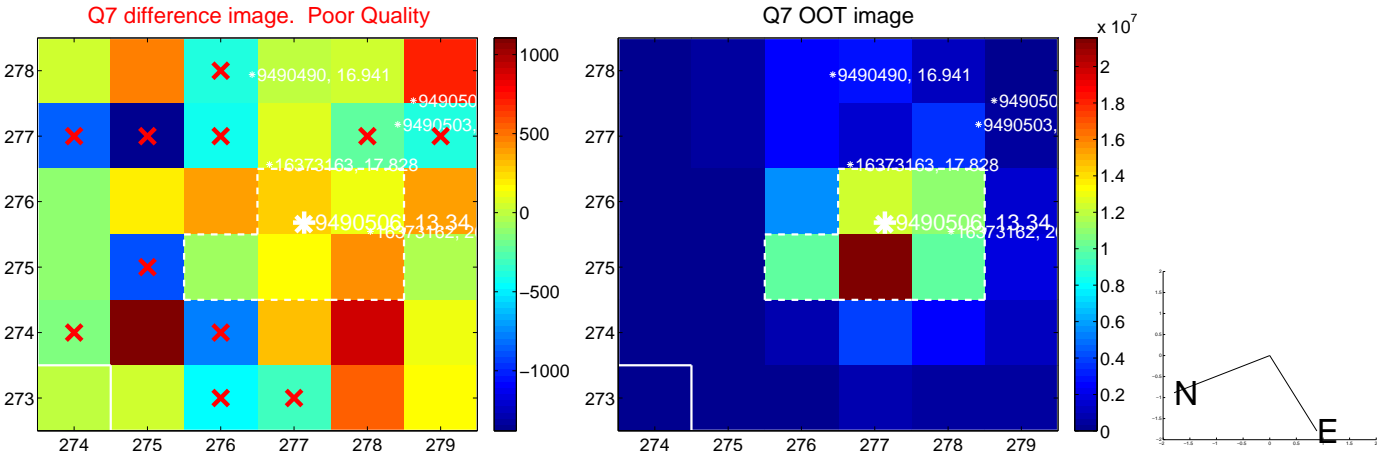
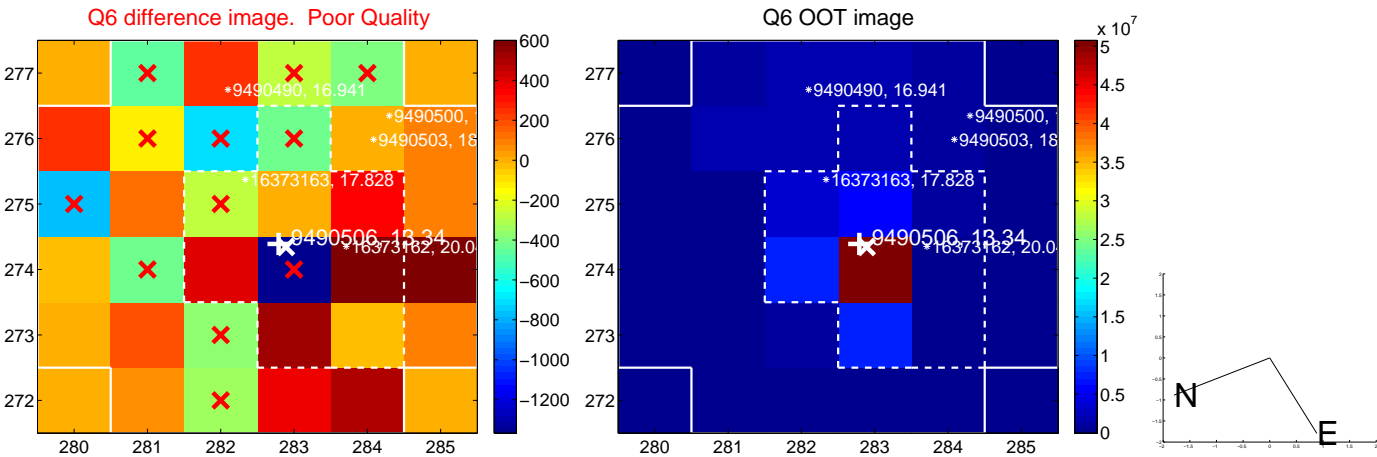
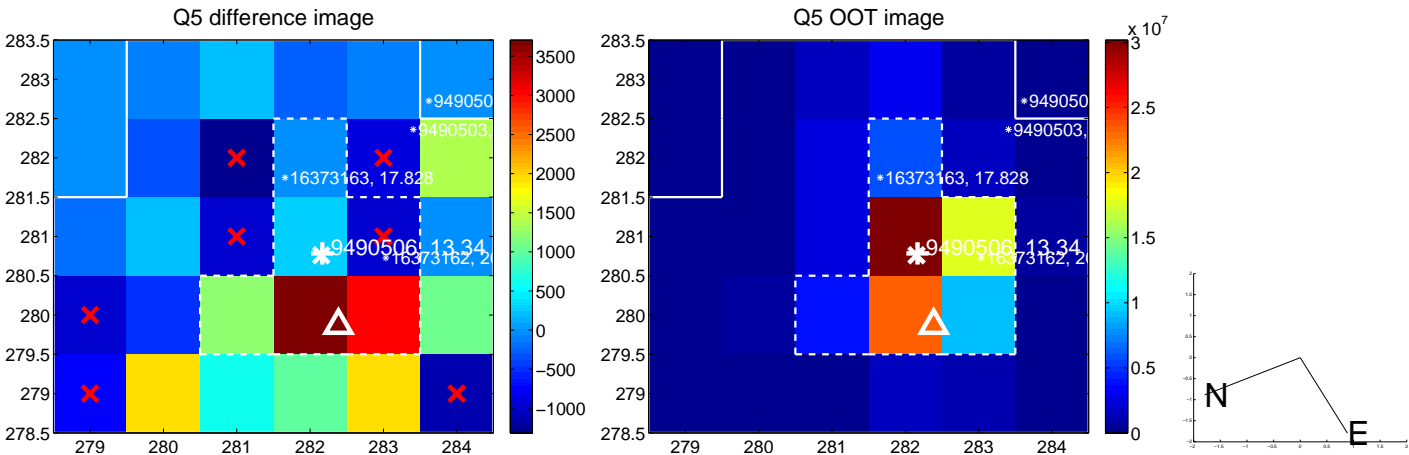
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

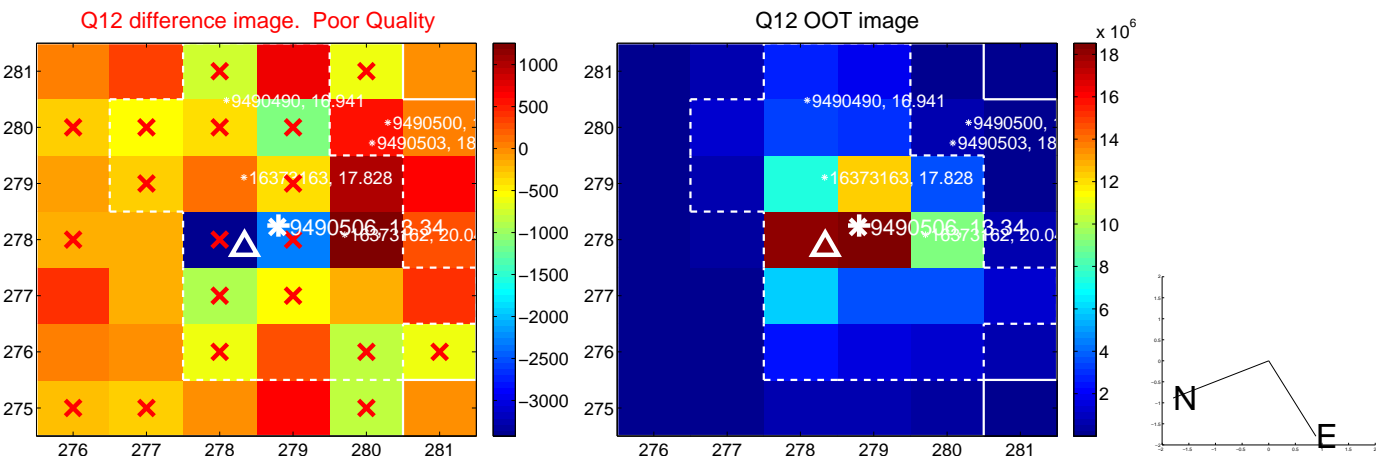
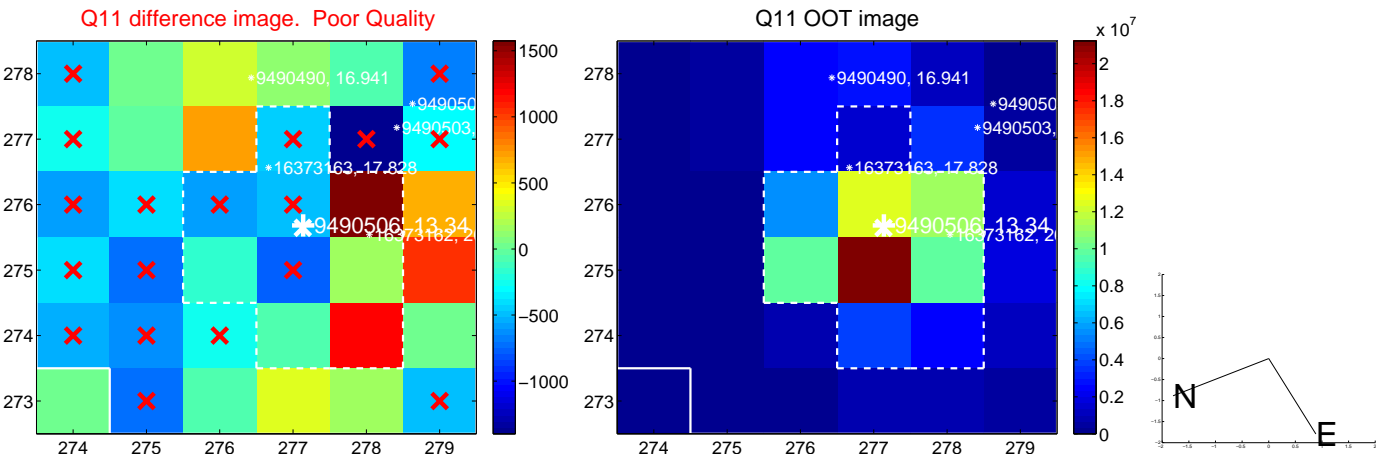
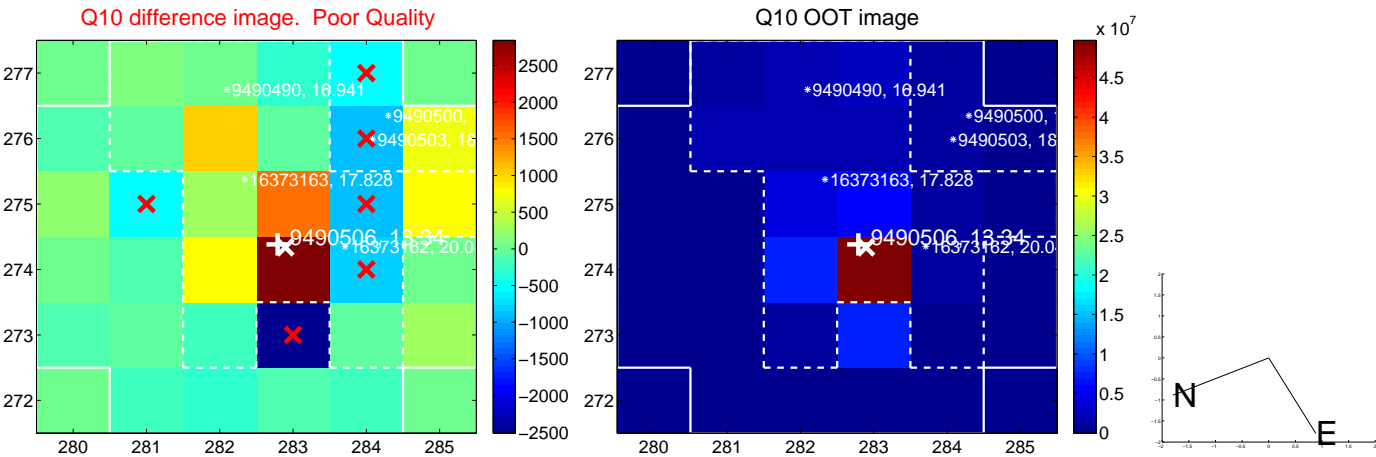
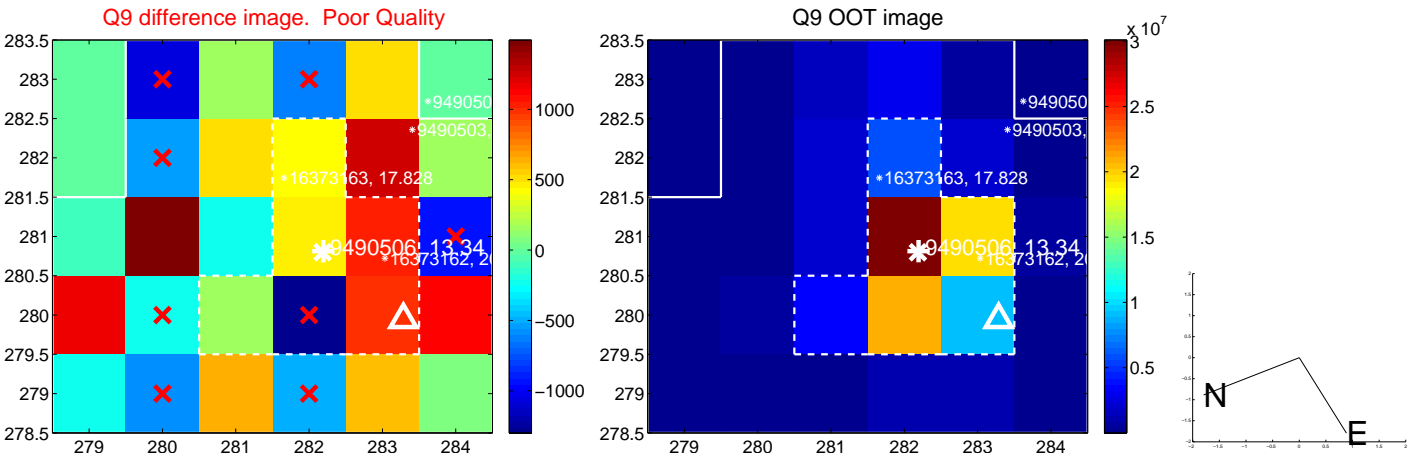




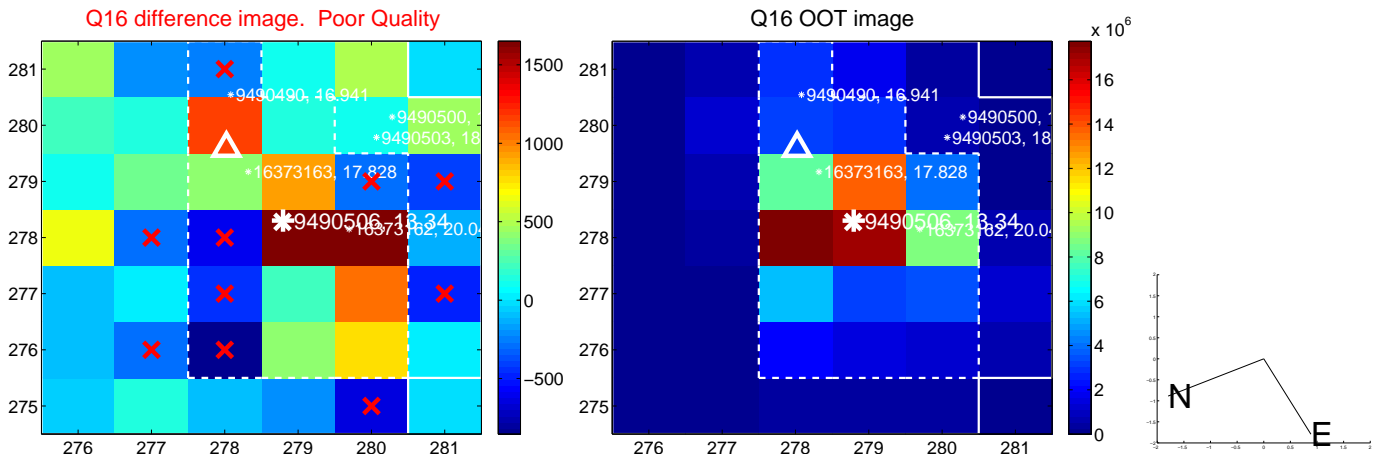
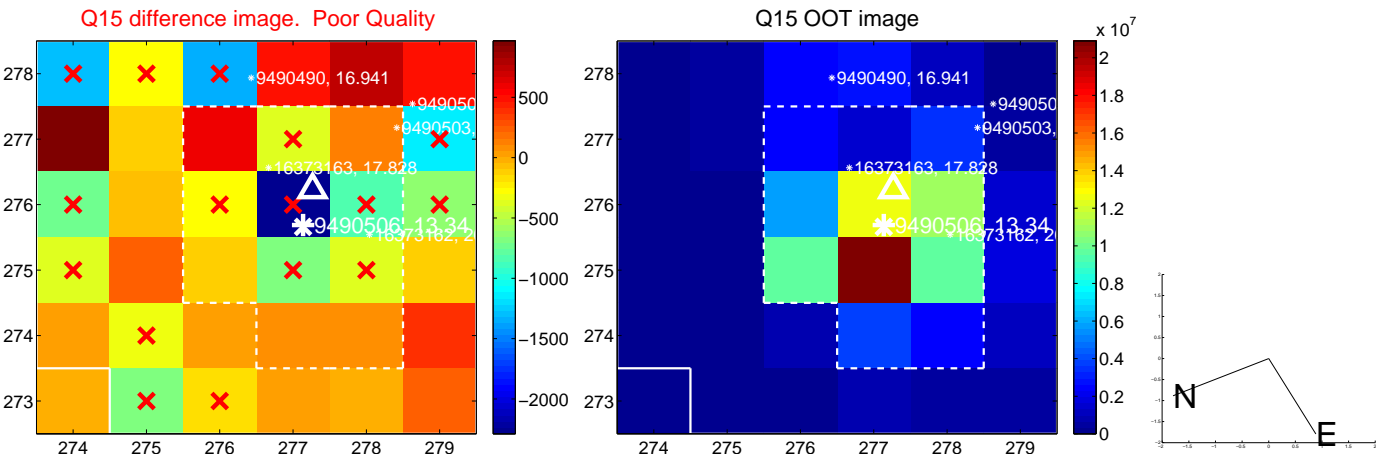
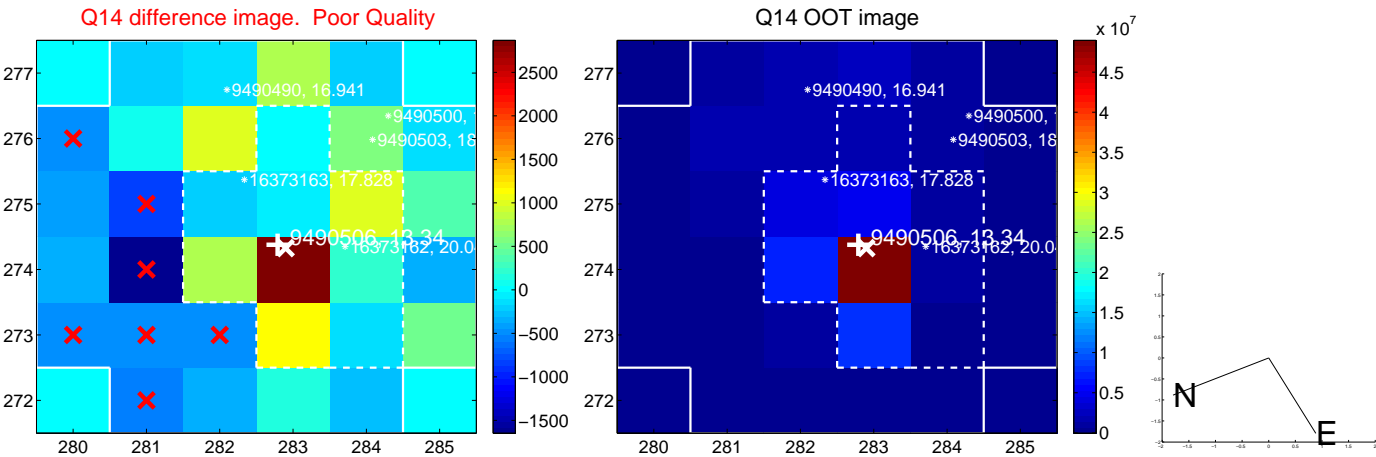
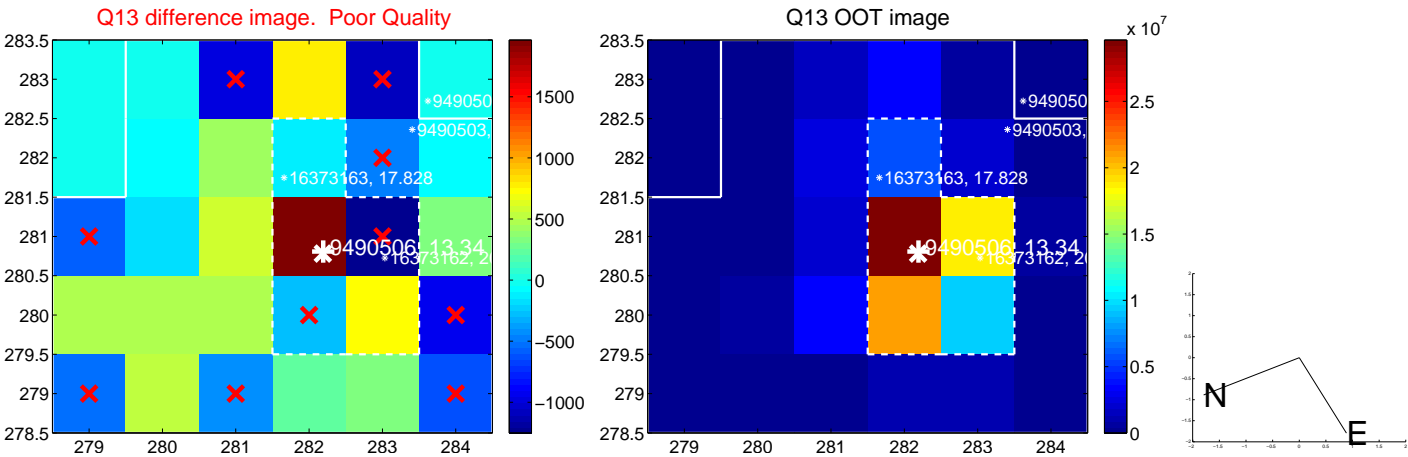
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



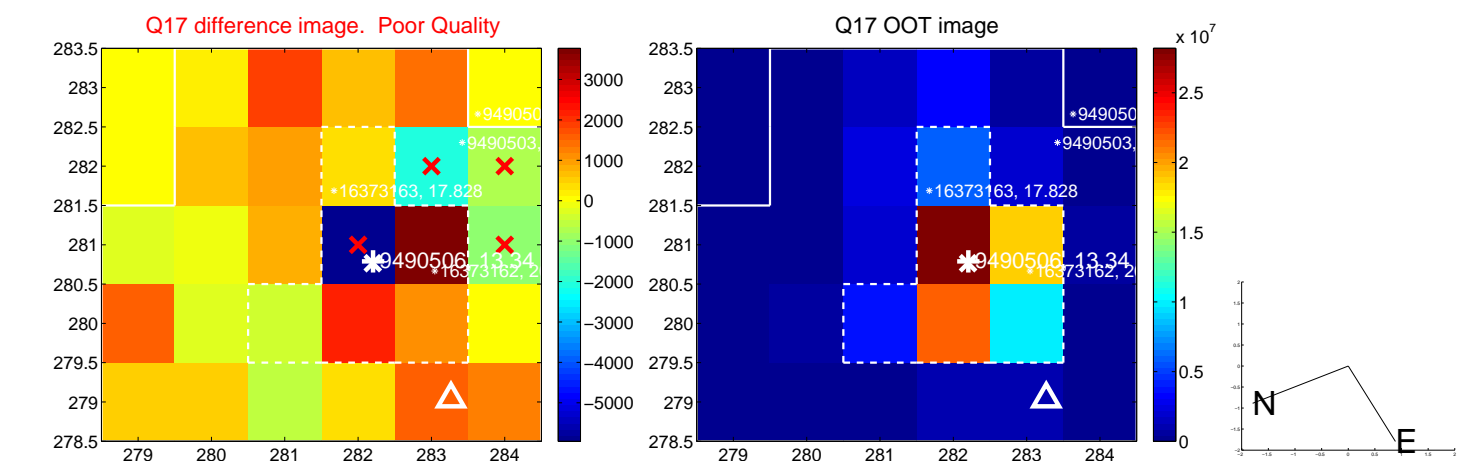
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



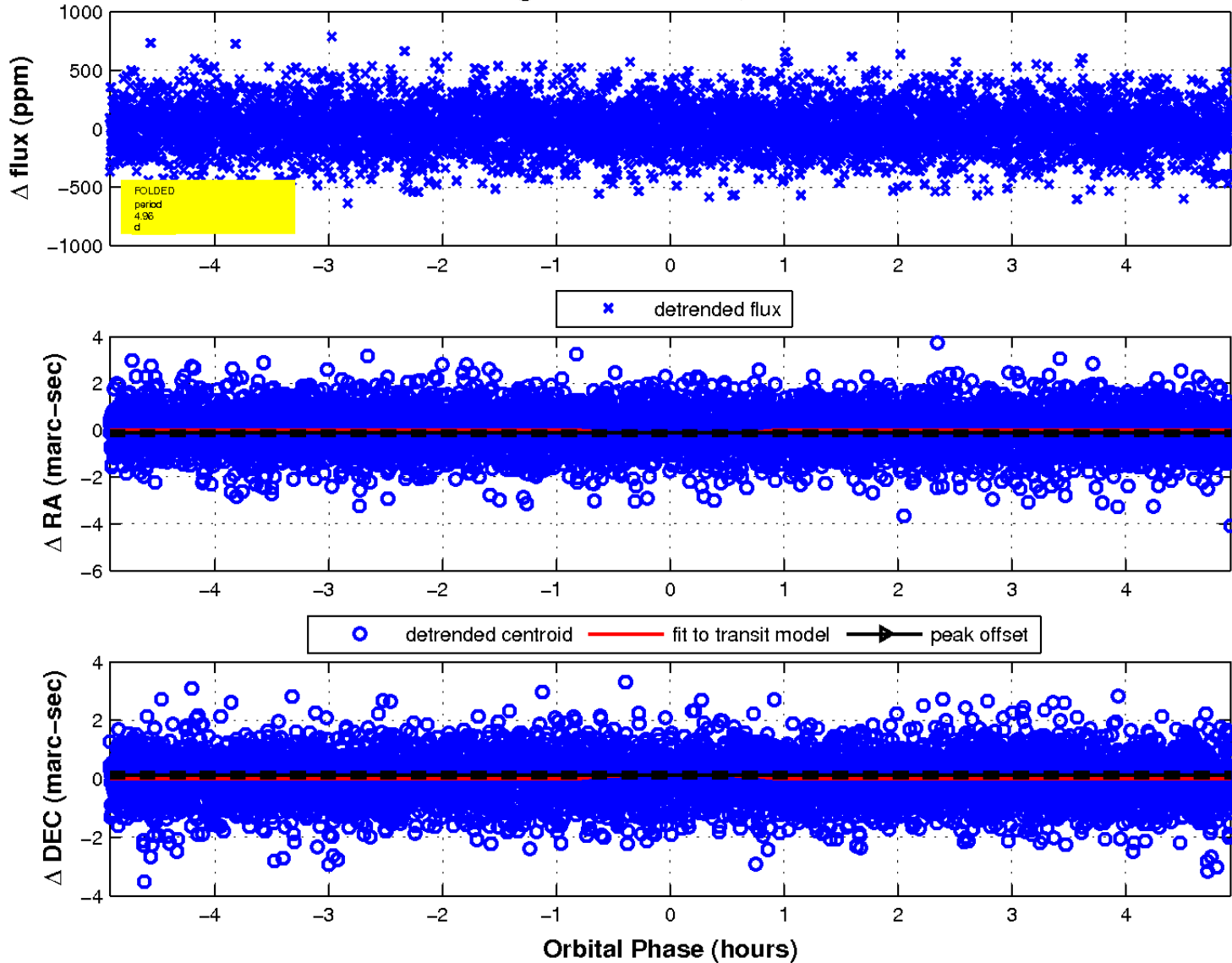
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

