

# KIC 005219580

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005219580-01	OBS	No	2.196547	132.594205	64.7	8.114	7.8	6.4	0.74	4841	0.73	305.86
005219580-02	OBS	No	259.177853	214.740648	994.7	6.162	7.8	7.7	0.74	4841	4.49	0.53
005219580-03	OBS	No	202.793901	269.385223	749.2	7.826	7.5	7.0	0.74	4841	2.12	0.73
005219580-04	OBS	No	390.098929	186.446416	1294.3	3.556	7.6	8.3	0.74	4841	3.28	0.31
005219580-05	OBS	No	179.366731	266.760921	816.1	6.676	7.4	6.7	0.74	4841	2.38	0.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005219580-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-02	OBS	FP	0.00	1	0	1	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

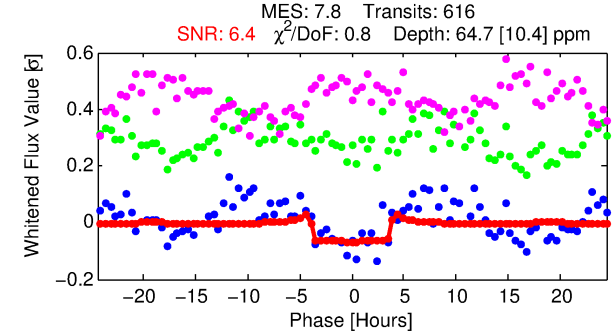
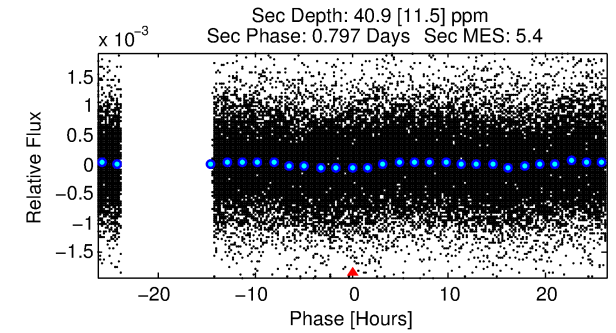
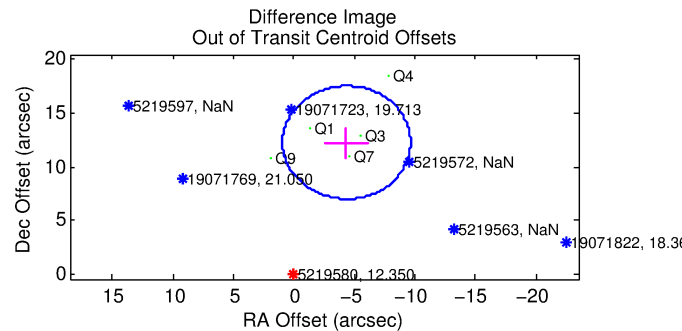
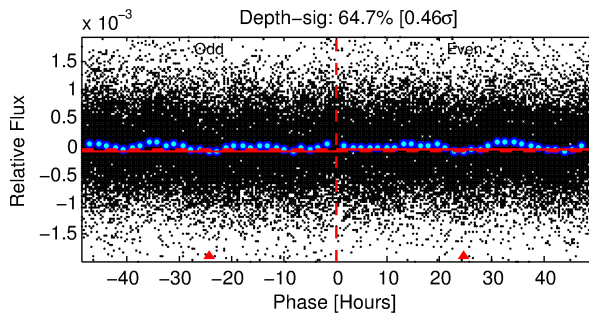
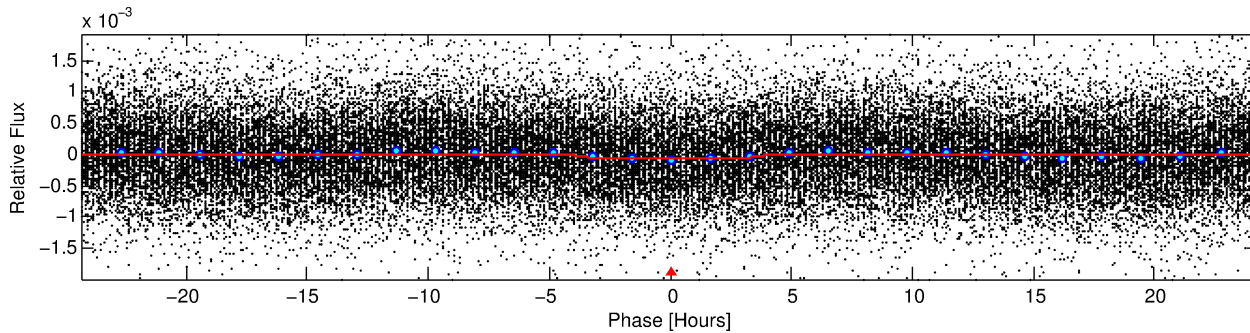
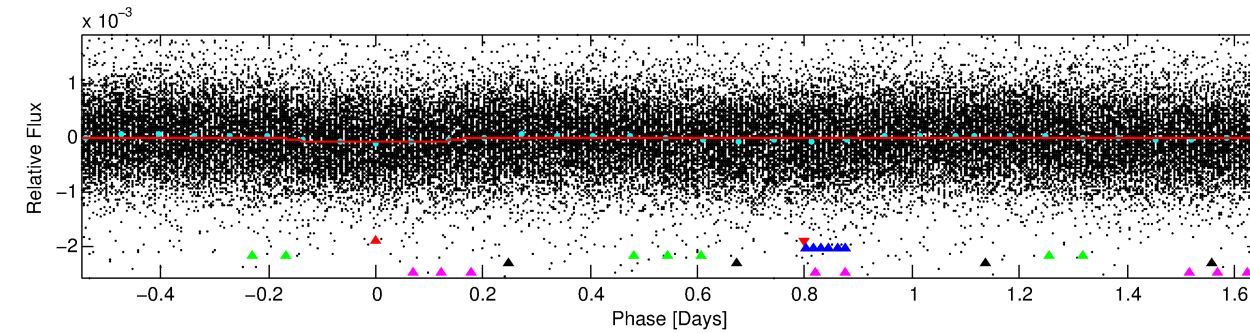
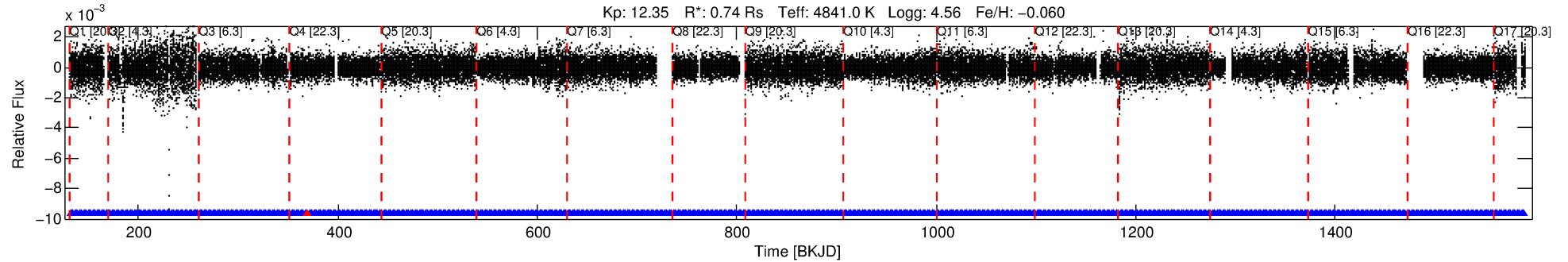
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005219580-01

No Significant Match Found

# DV One-Page Summary

KIC: 5219580 Candidate: 1 of 5 Period: 2.197 d



## DV Fit Results:

Period = 2.19655 [0.00003] d  
Epoch = 132.5942 [0.0075] BKJD  
Rp/R\* = 0.0090 [0.0030]  
a/R\* = 1.33 [0.77]  
b = 0.90 [0.28]  
Seff = 305.86 [55.91]  
Teq = 1066 [49] K  
Rp = 0.73 [0.25] Re  
a = 0.0297 [0.0023] AU  
Ag = 37.51 [27.67] [1.32 $\sigma$ ]  
Teffp = 4080 [758] K [3.97 $\sigma$ ]

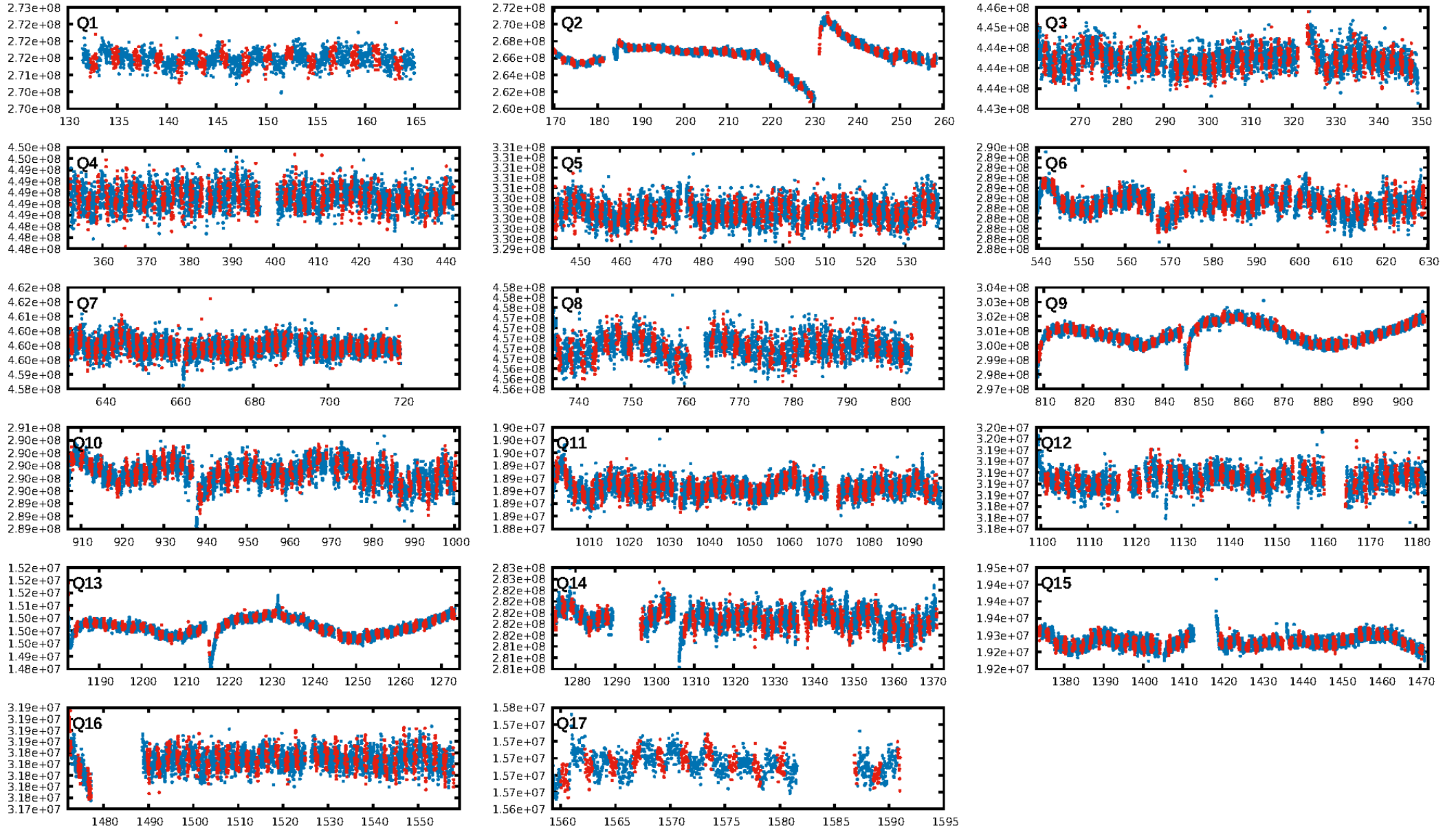
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [404.67 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.03e-10**  
RollingBand-fgt: 1.00 [587/588]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 14.0%  
**Centroid-so: 2.686 arcsec [13.88 $\sigma$ ]**  
**OotOffset-rm: 13.007 arcsec [7.39 $\sigma$ ]**  
**KicOffset-rm: 14.226 arcsec [3.37 $\sigma$ ]**  
OotOffset-st: 0.2/1/2 [5]  
KicOffset-st: 2/2/3/2 [9]  
DiffImageQuality-fgm: 0.67 [6/9]  
DiffImageOverlap-fno: 1.00 [17/17]

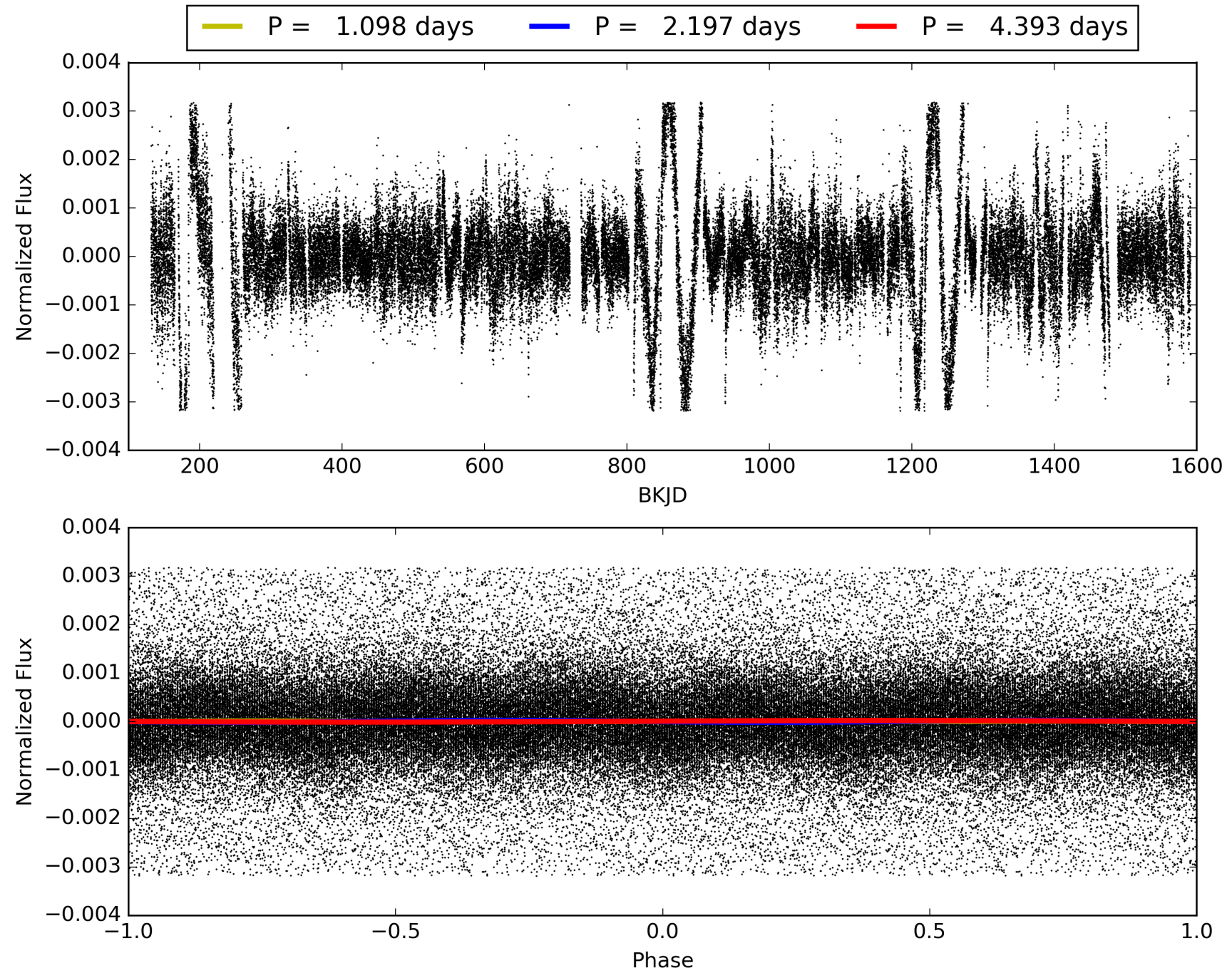
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:54:38 Z

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

# TCE 005219580-01, PDC Light Curves



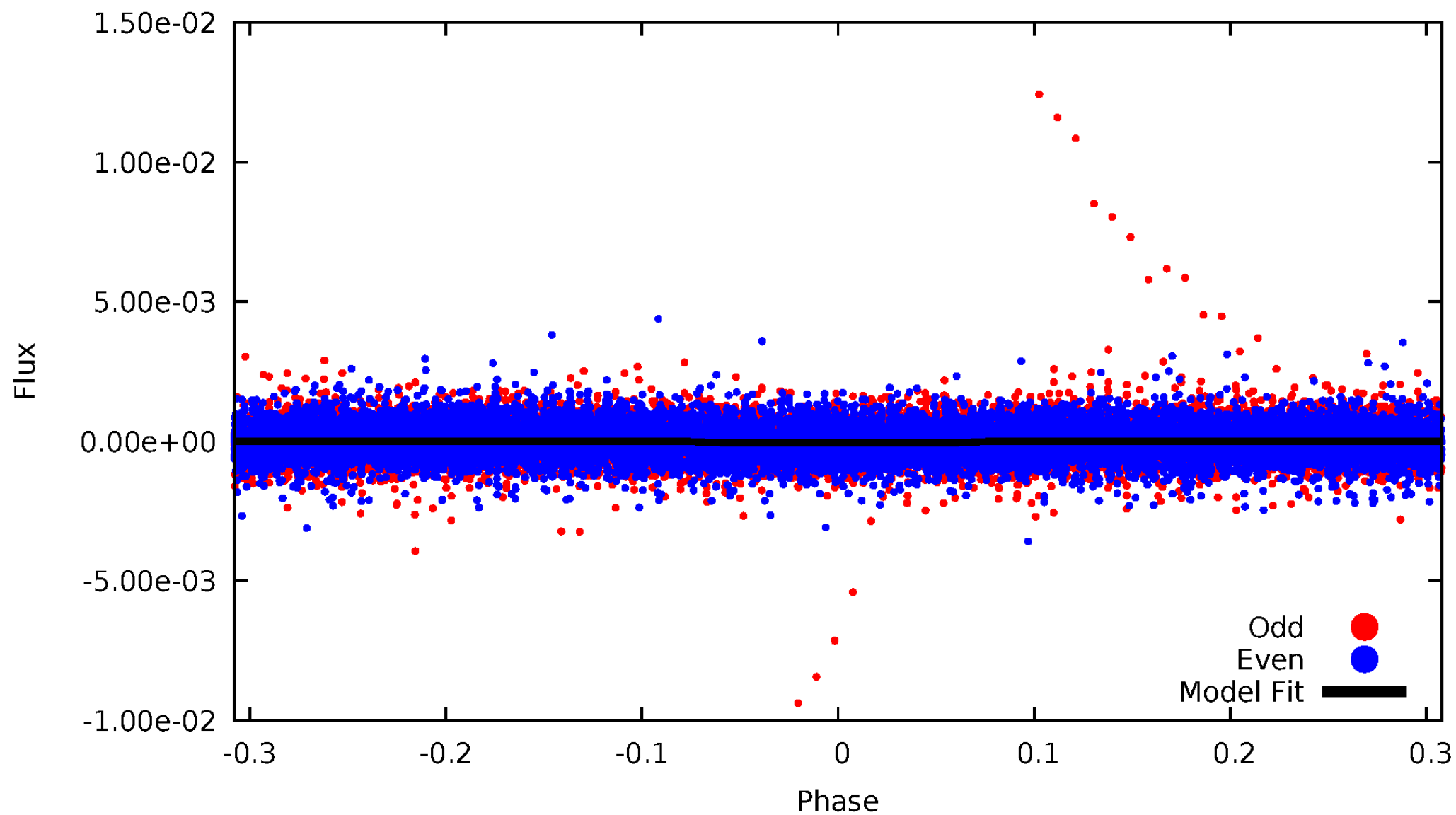
TCE 005219580-01





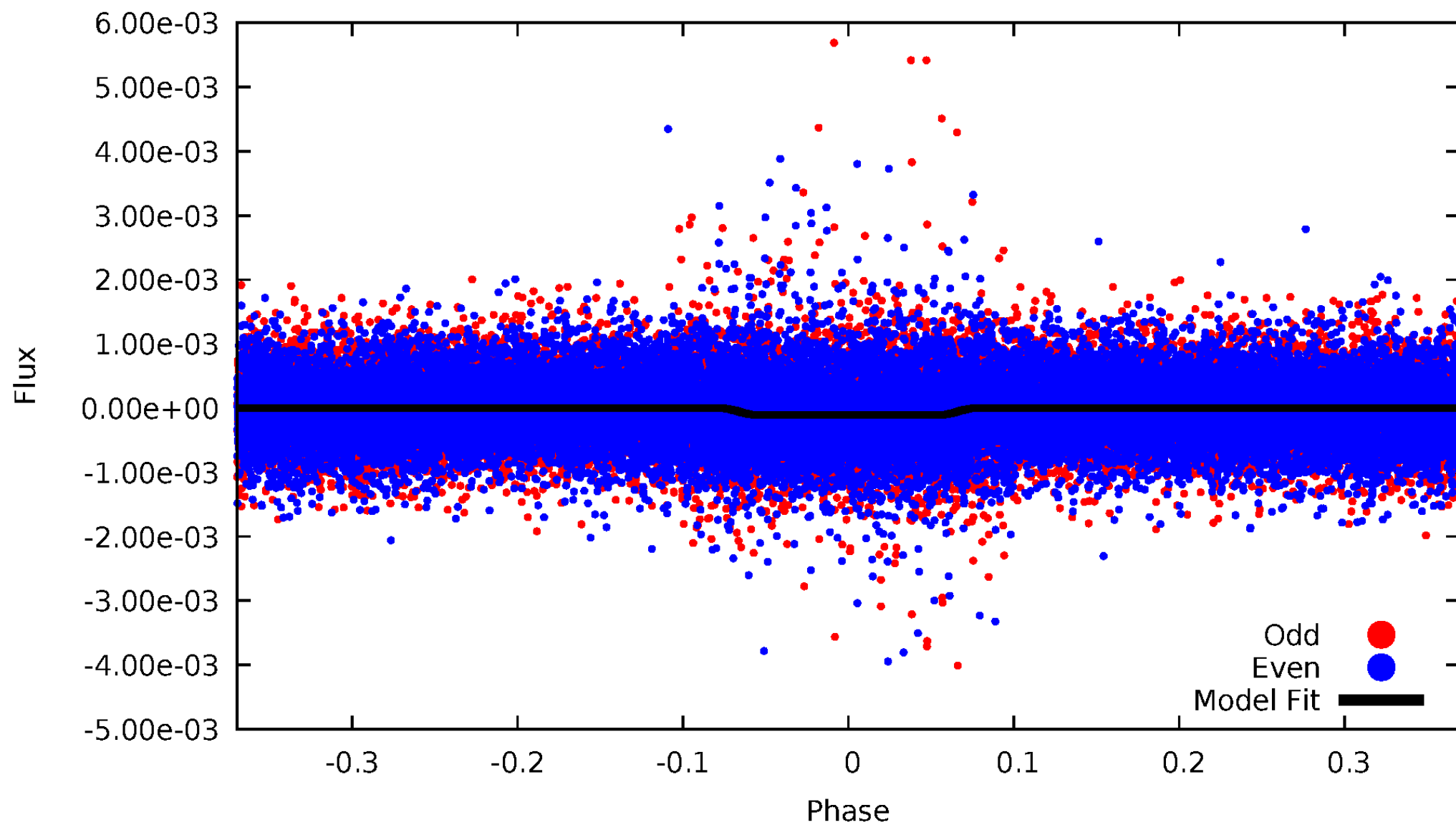
# DV Odd/Even

TCE 005219580-01

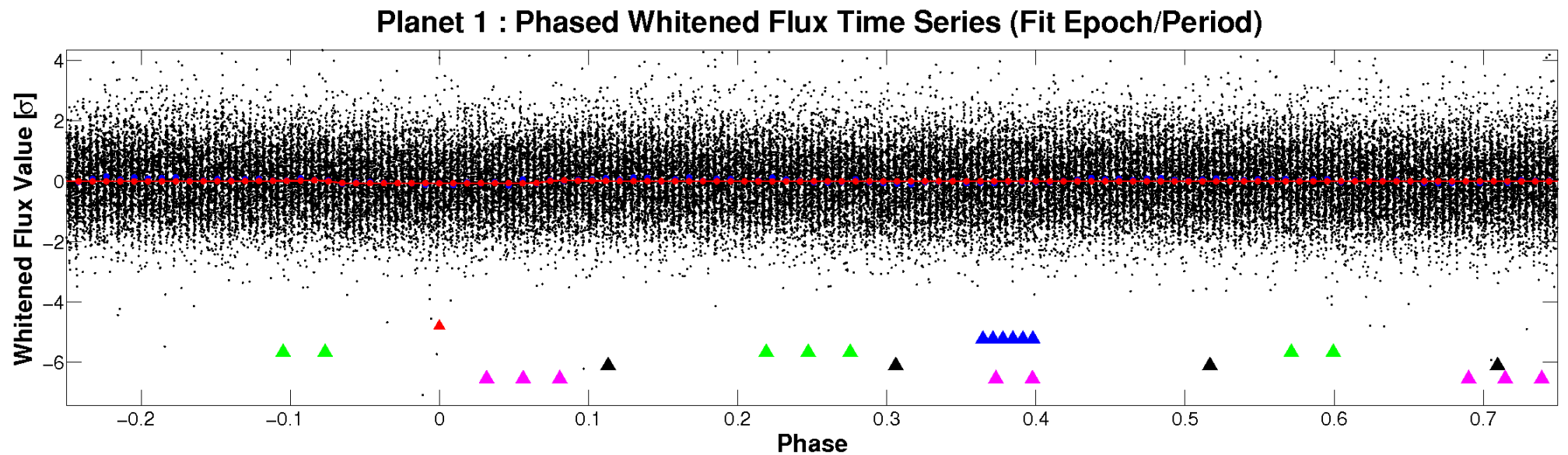
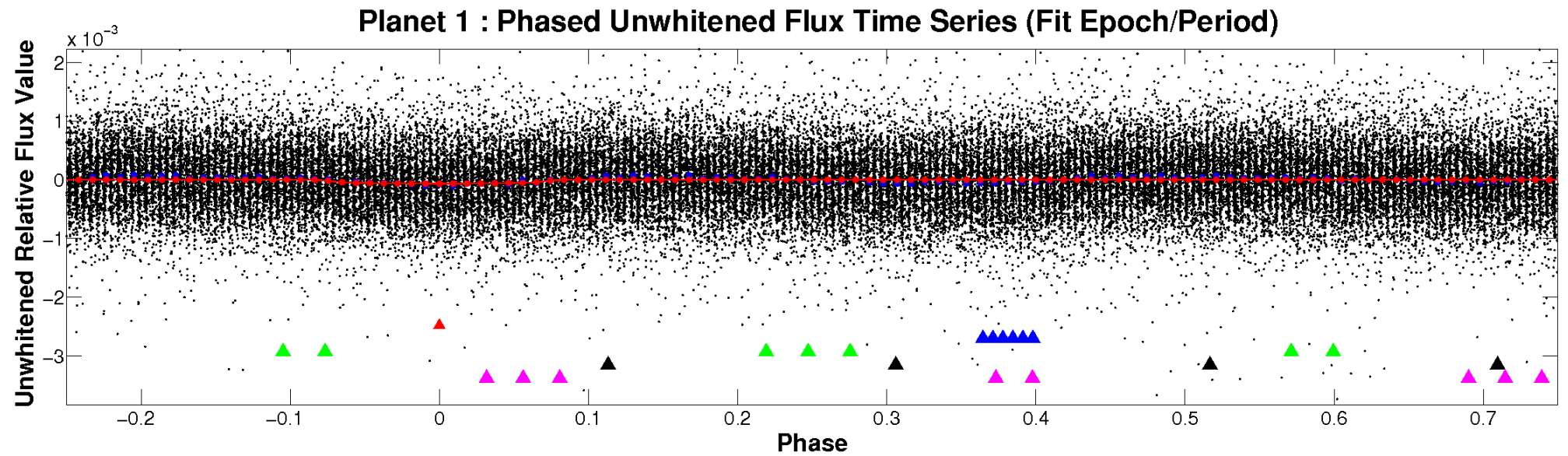


# ALT Odd/Even

TCE 005219580-01

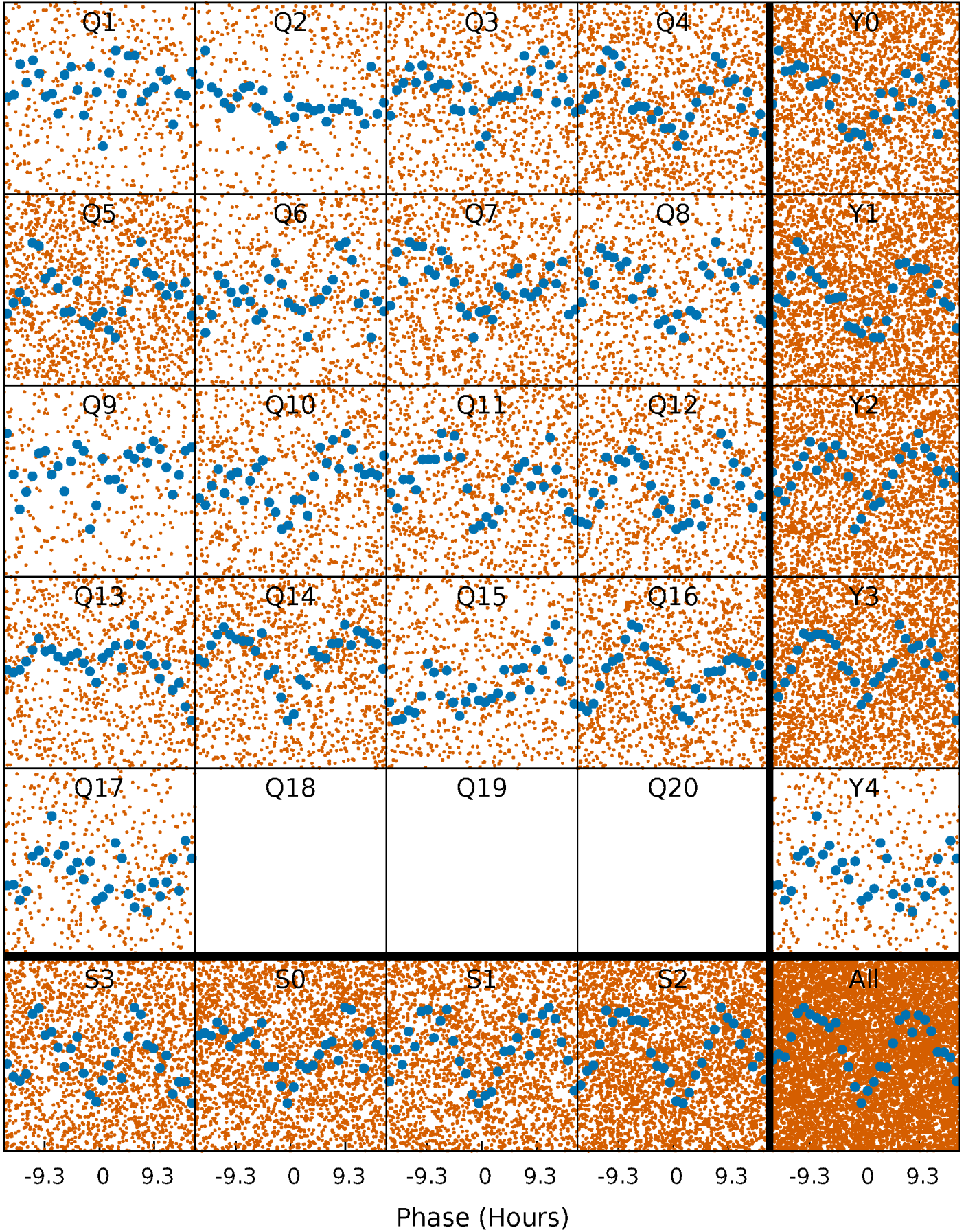


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

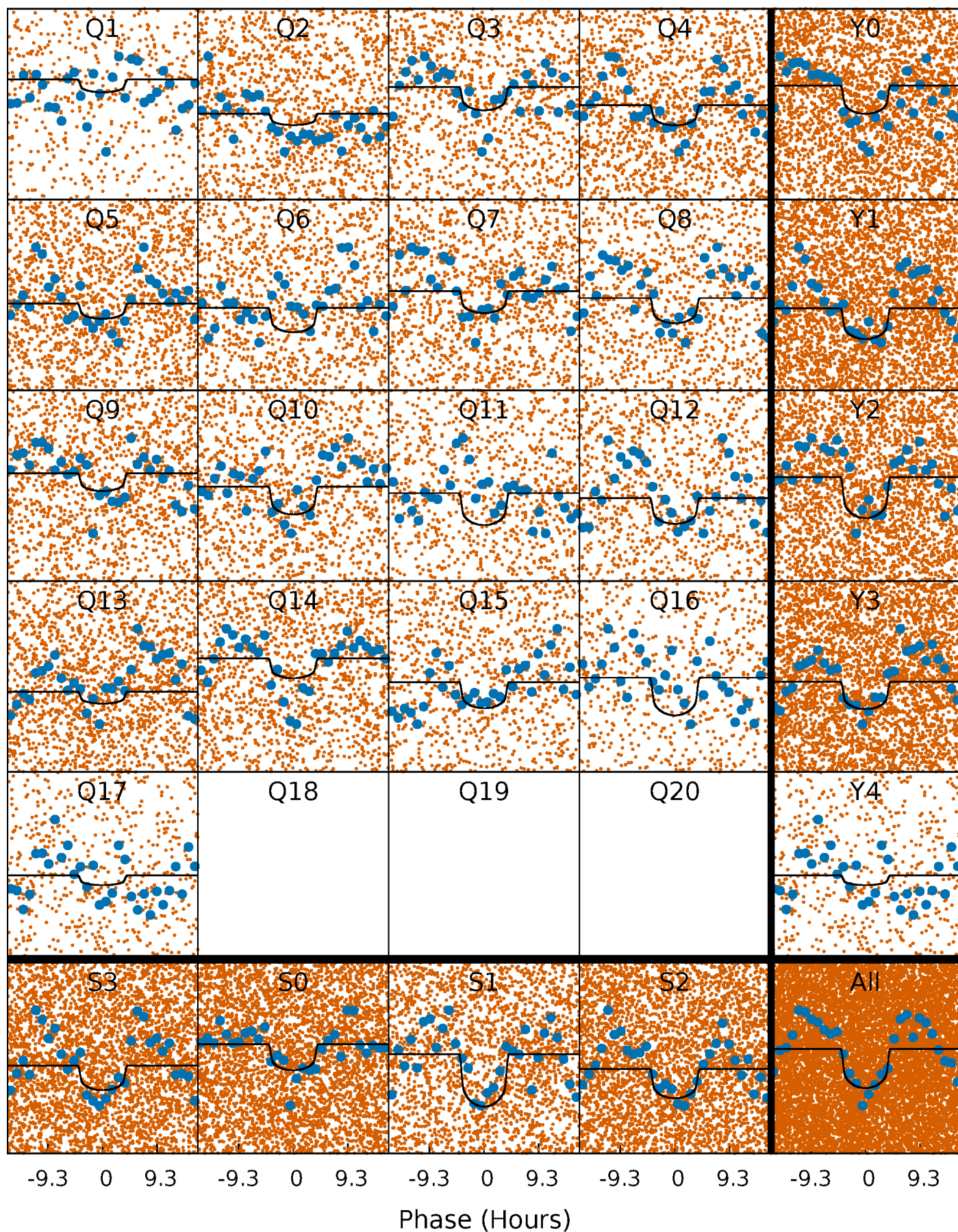
TCE 005219580-01 P= 2.196547 Days  $T_0=132.594205$  (BKJD)





# DV Quarter-Phased Transit Curves

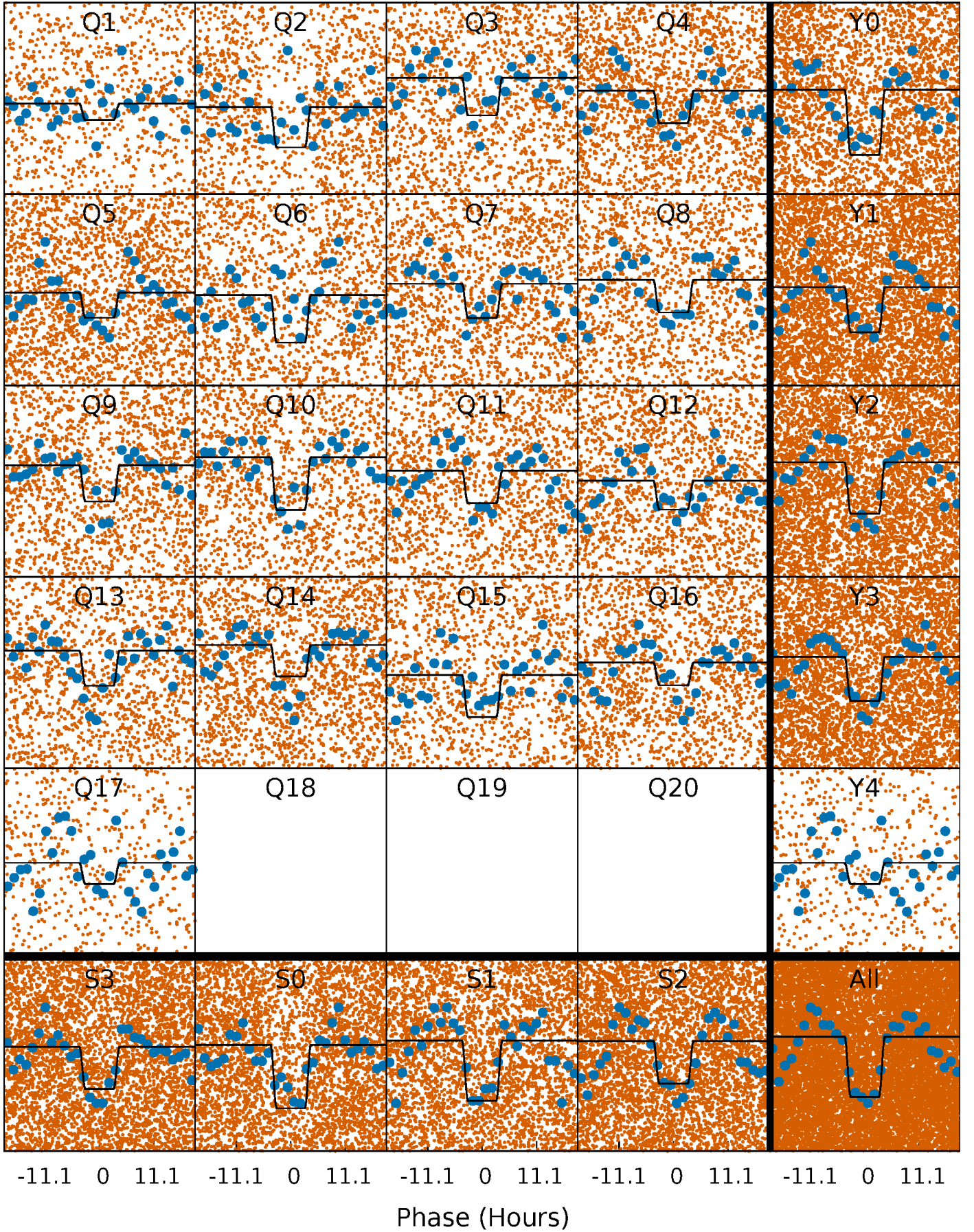
TCE 005219580-01 P= 2.196547 Days  $T_0=132.594205$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

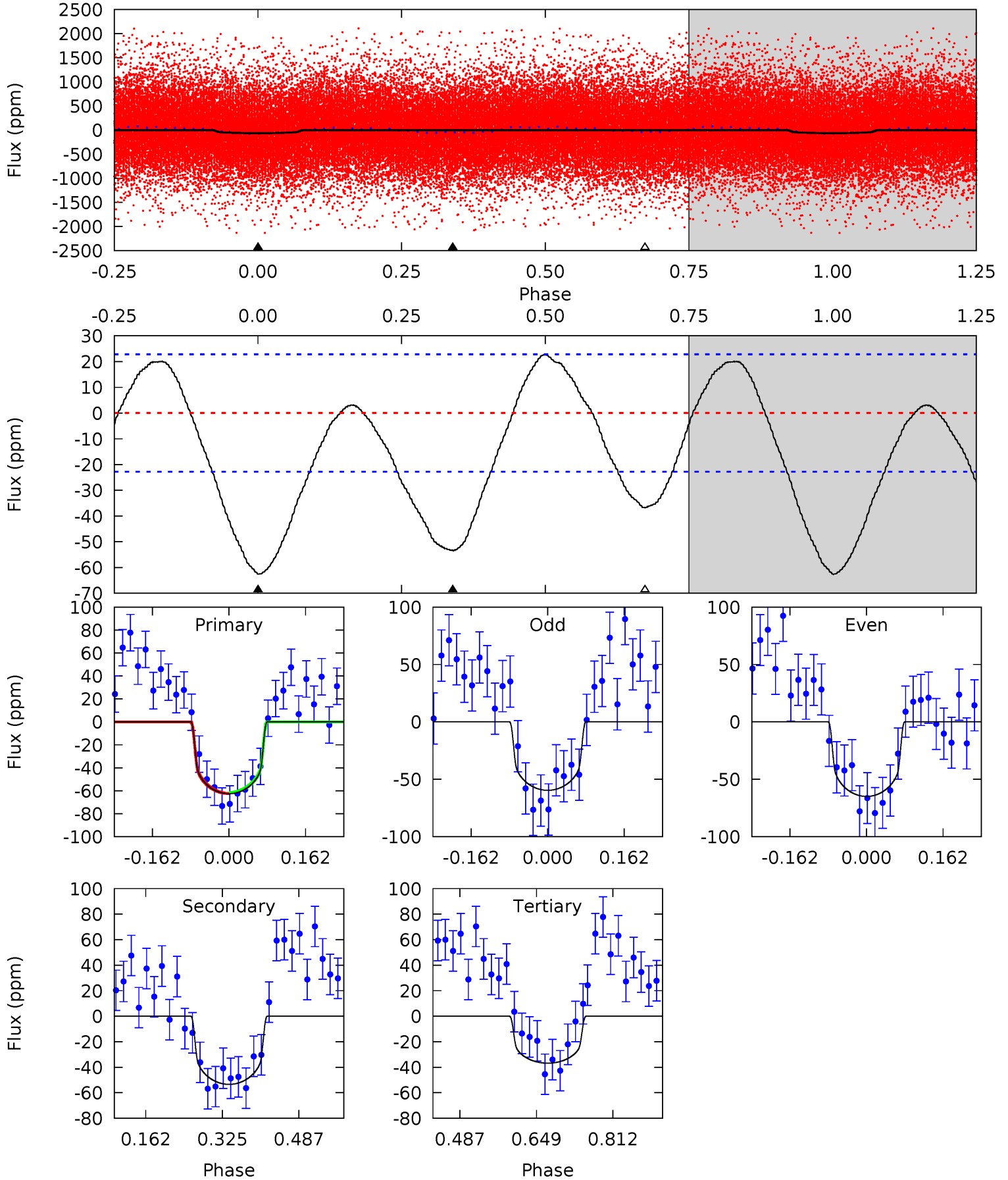
TCE 005219580-01 P= 2.196467 Days  $T_0=132.633458$  (BKJD)



# DV Model-Shift Uniqueness Test

005219580-01, P = 2.196547 Days, E = 130.397658 Days

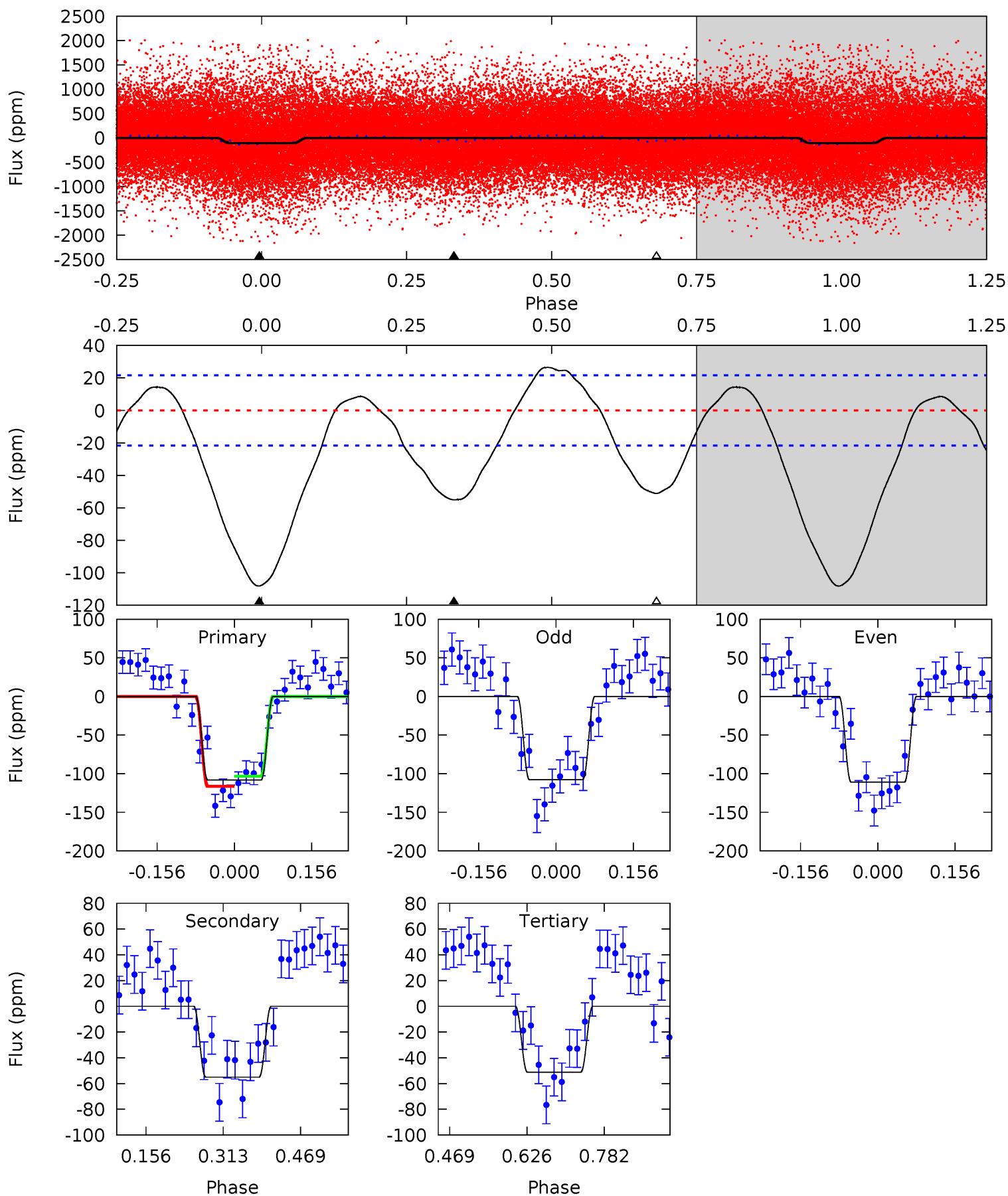
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	10.5	7.21	0	4.46	1.40	3.92	5.04	12.2	3.24	10.5	0.52	0.98	0.27	0.08



# Alt Model-Shift Uniqueness Test

005219580-01, P = 2.196467 Days, E = 130.436991 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
22.4	11.4	10.6	0	4.47	1.42	5.38	11.8	22.4	0.80	11.4	0.33	1.06	0.20	1.35





### Stellar Parameters For KIC 005219580

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4841^{+175}_{-175}$	$4.559^{+0.061}_{-0.039}$	$-0.060^{+0.300}_{-0.300}$	$0.741^{+0.062}_{-0.068}$	$0.726^{+0.081}_{-0.061}$	$2.516^{+0.712}_{-0.385}$
	+4%/-4%	+1%/-1%	+500%/-500%	+8%/-9%	+11%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005219580-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-53 \pm 5$	$0.73^{+0.25}_{-0.25}$	$1483^{+63}_{-62}$	$4434^{+834}_{-488}$	$49^{+62}_{-21}$
Alt.	$-55 \pm 5$	$0.84^{+0.25}_{-0.26}$	$1481^{+61}_{-61}$	$4232^{+659}_{-394}$	$38^{+47}_{-16}$

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

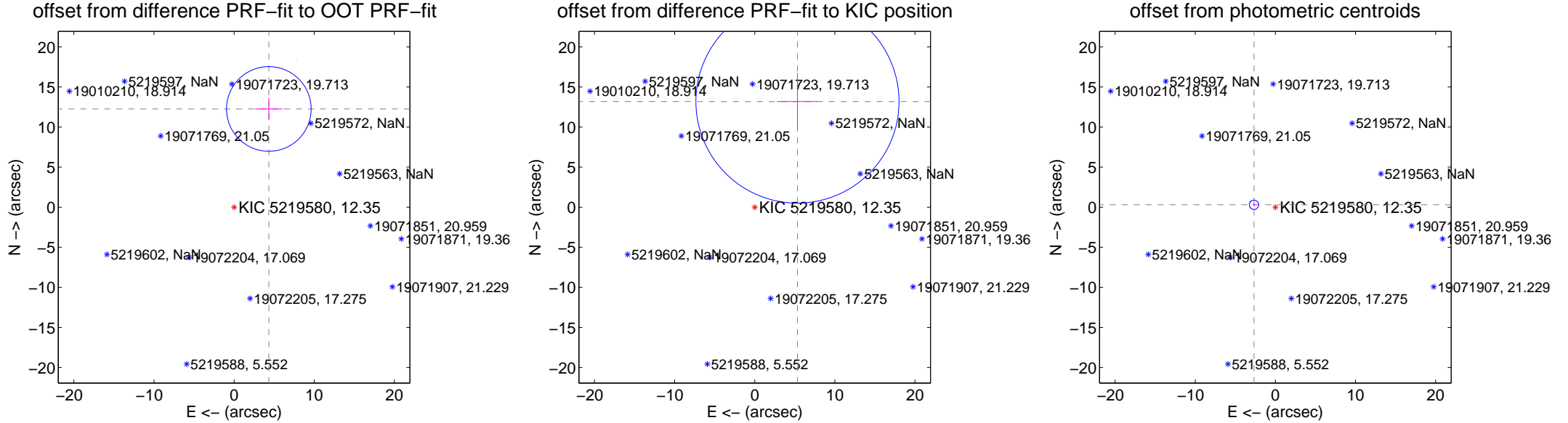
## DV Centroid Data

Supplemental centroid analysis for 005219580-01. Kepler magnitude: 12.35. Transit SNR 6.39

There are 6 quarters with good PRF difference image offsets

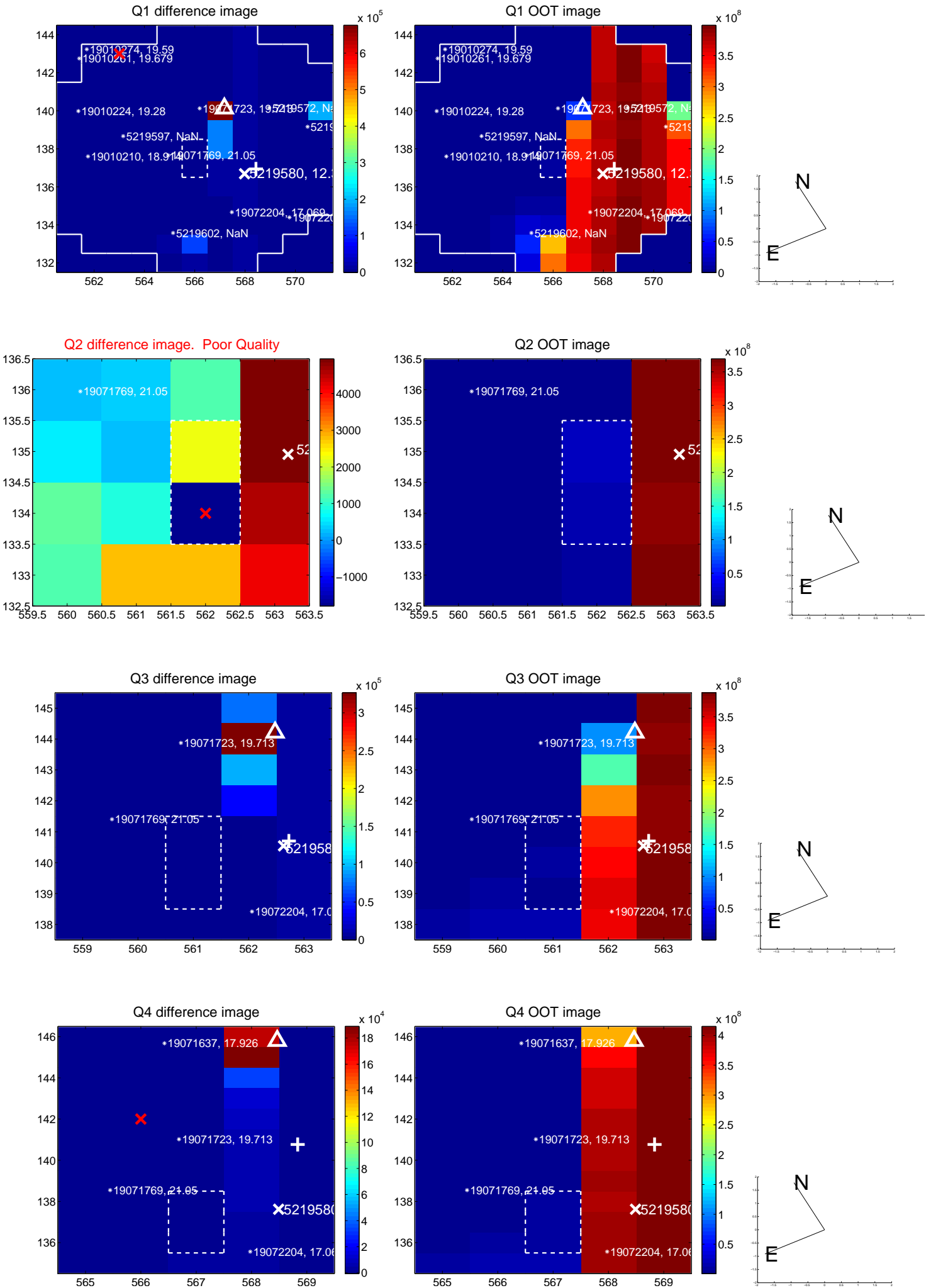
The OOT PRF centroid is offset from the target star catalog position by about 7.03 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$13.007 \pm 1.761$	7.39	$-4.336 \pm 1.718$	$12.263 \pm 1.395$
PRF-fit source offset from KIC position	$14.226 \pm 4.225$	3.37	$-5.332 \pm 2.562$	$13.189 \pm 3.546$
photometric centroid source offset	$2.69 \pm 0.19$	13.88	$2.67 \pm 0.19$	$0.30 \pm 0.20$

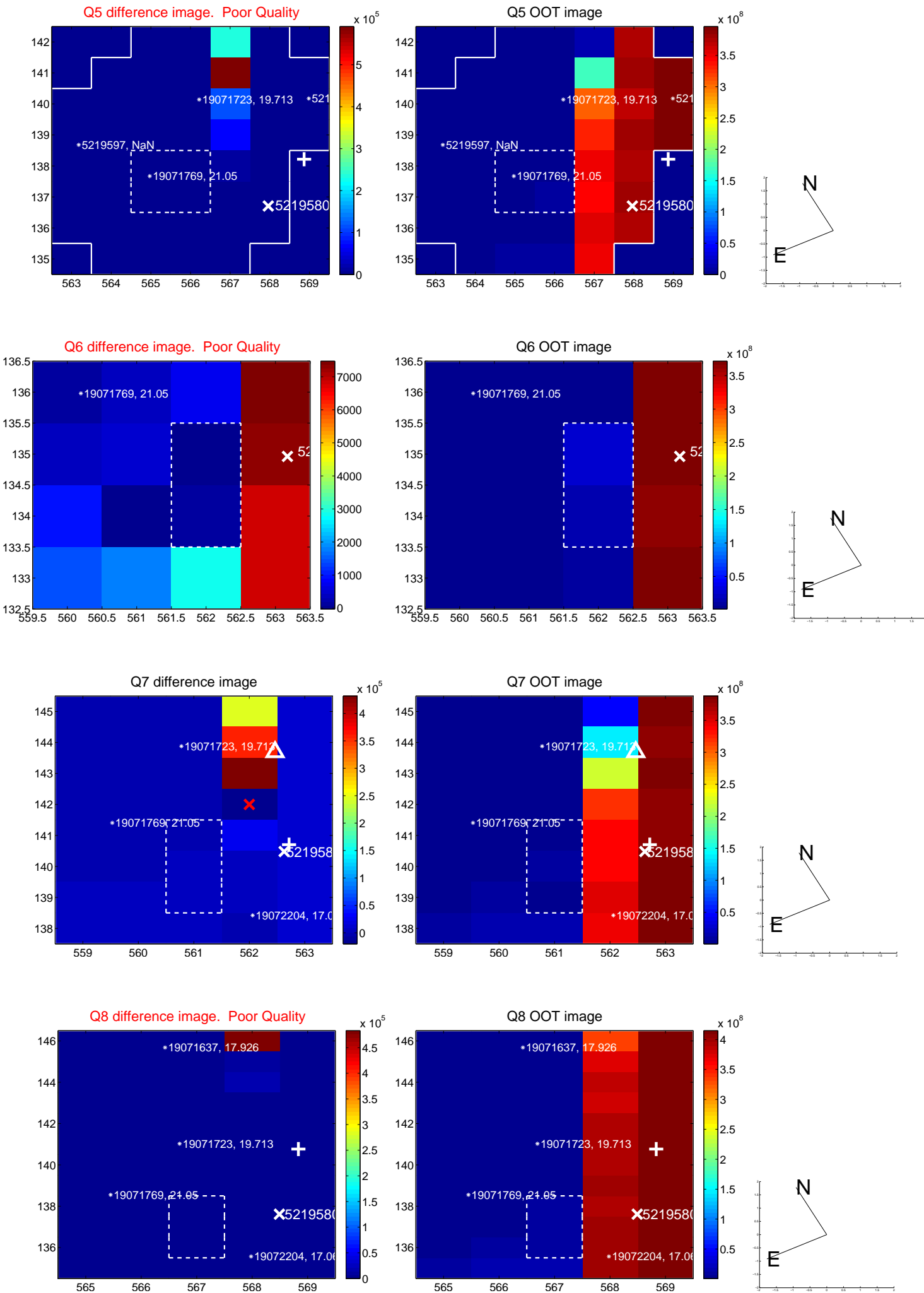


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

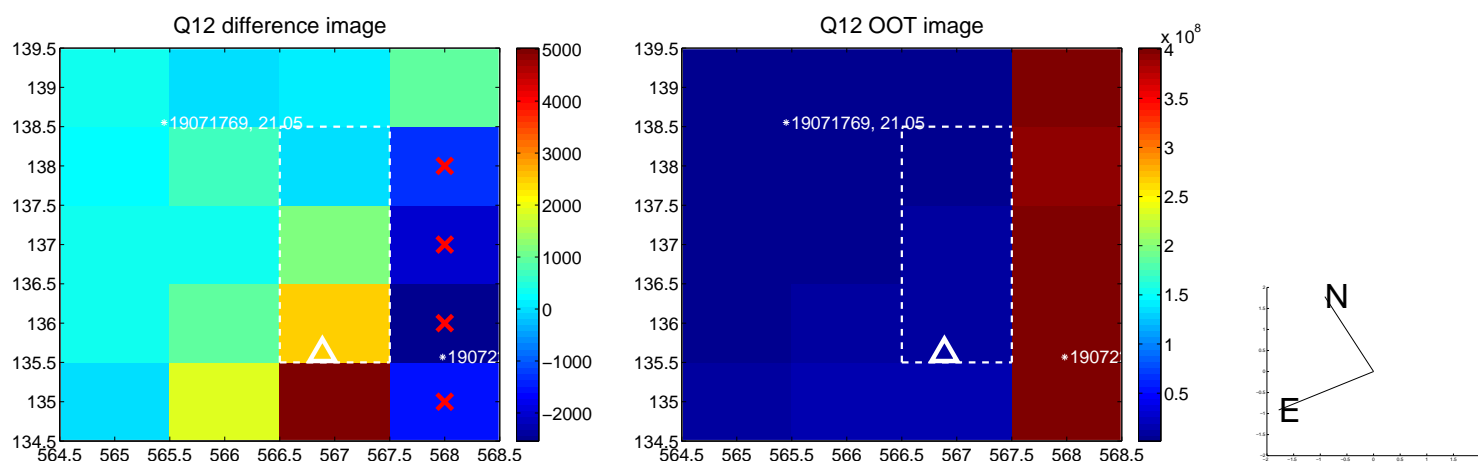
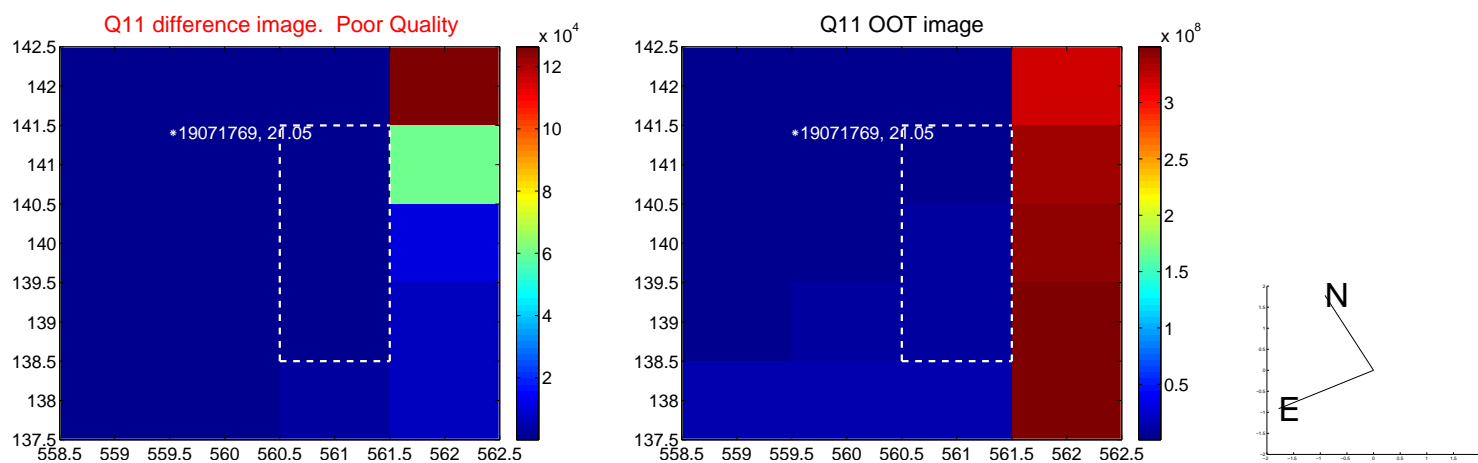
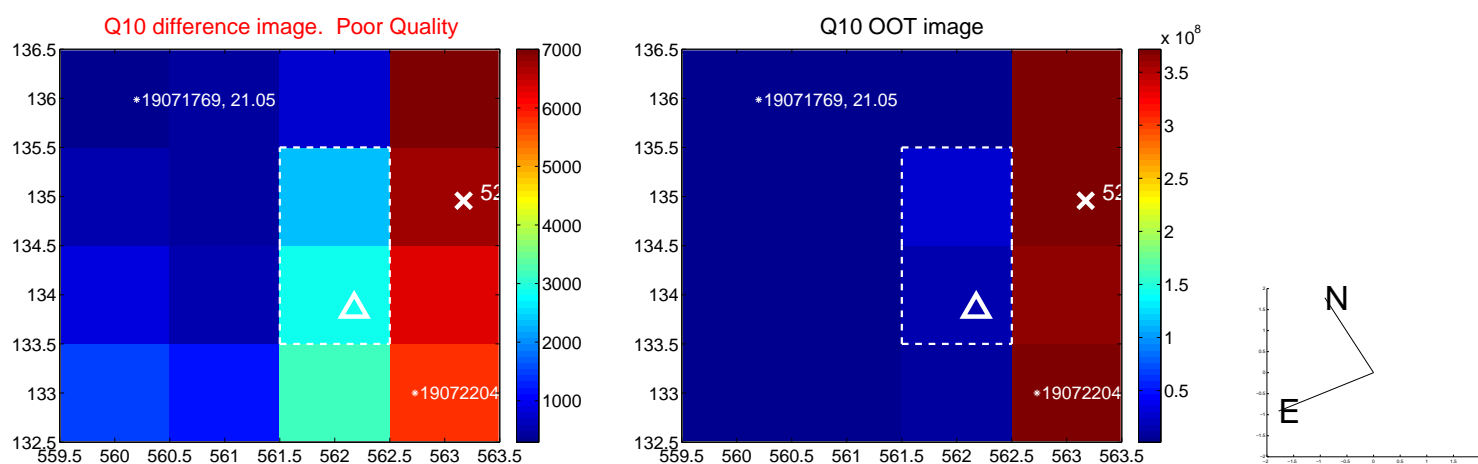
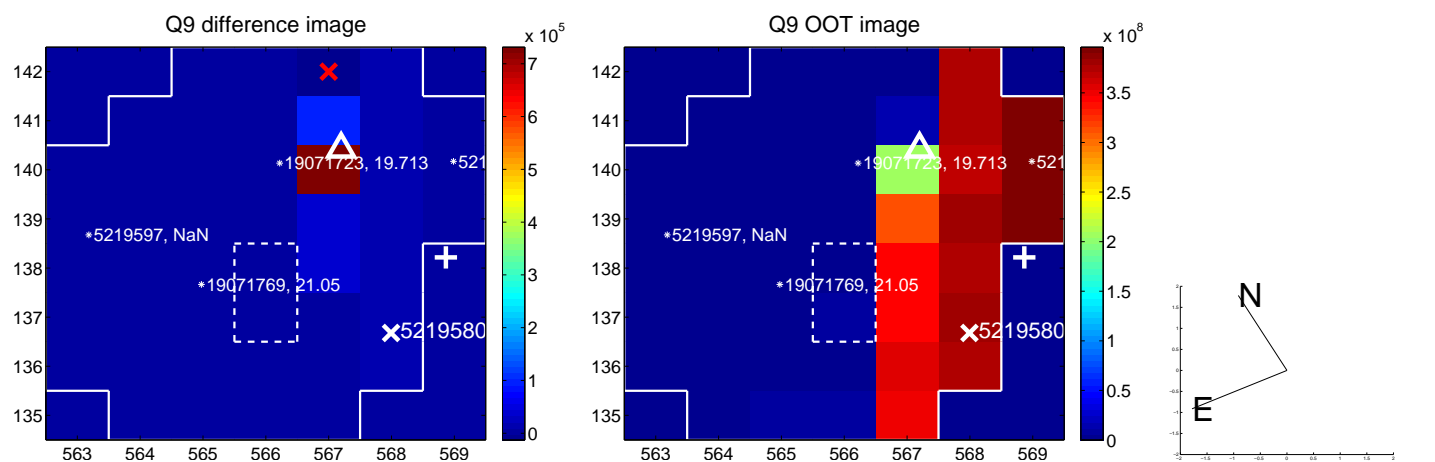


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

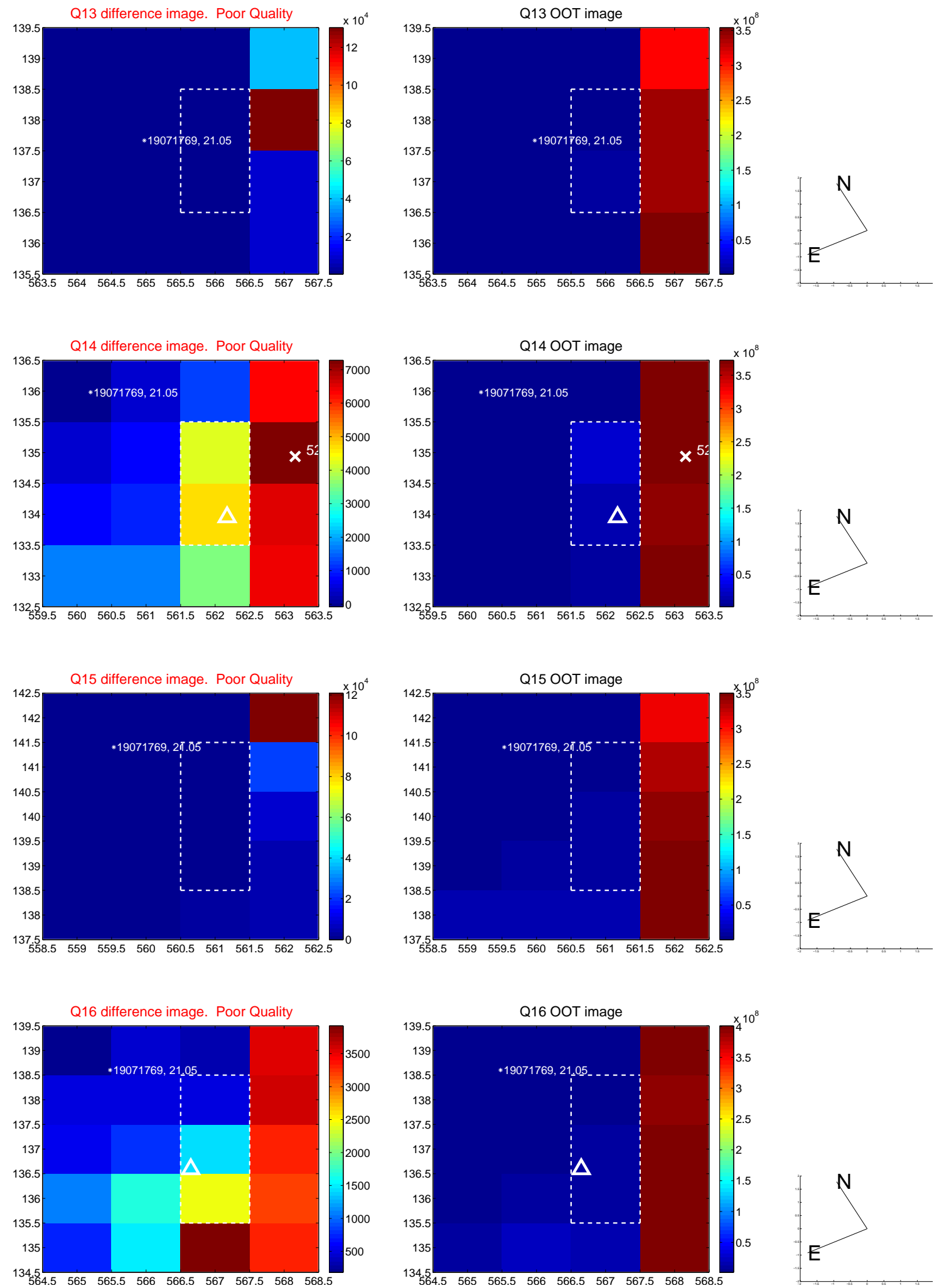




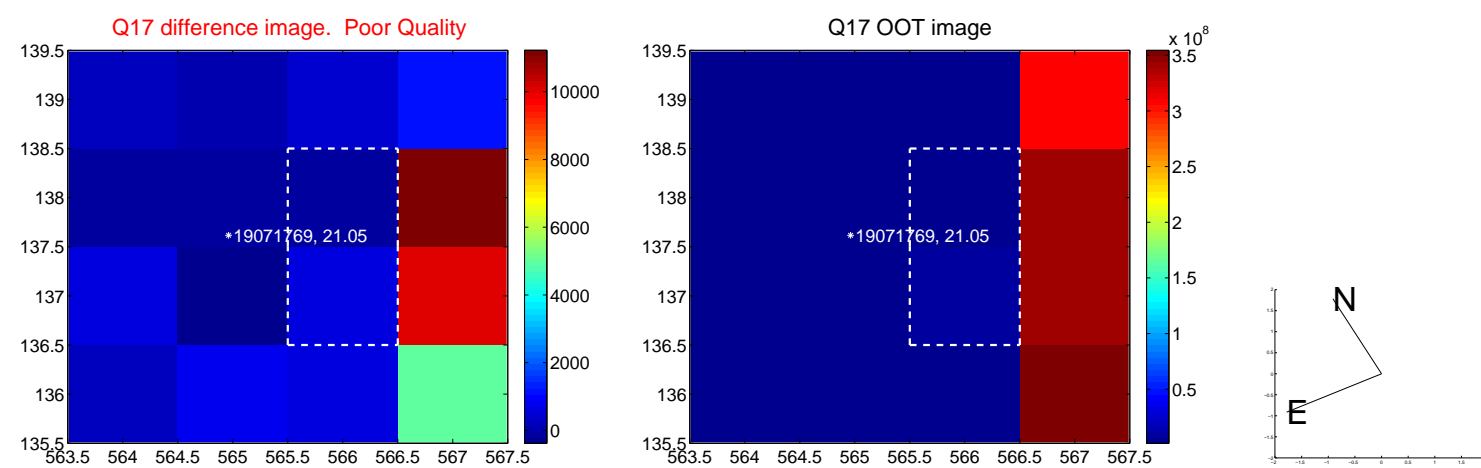
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



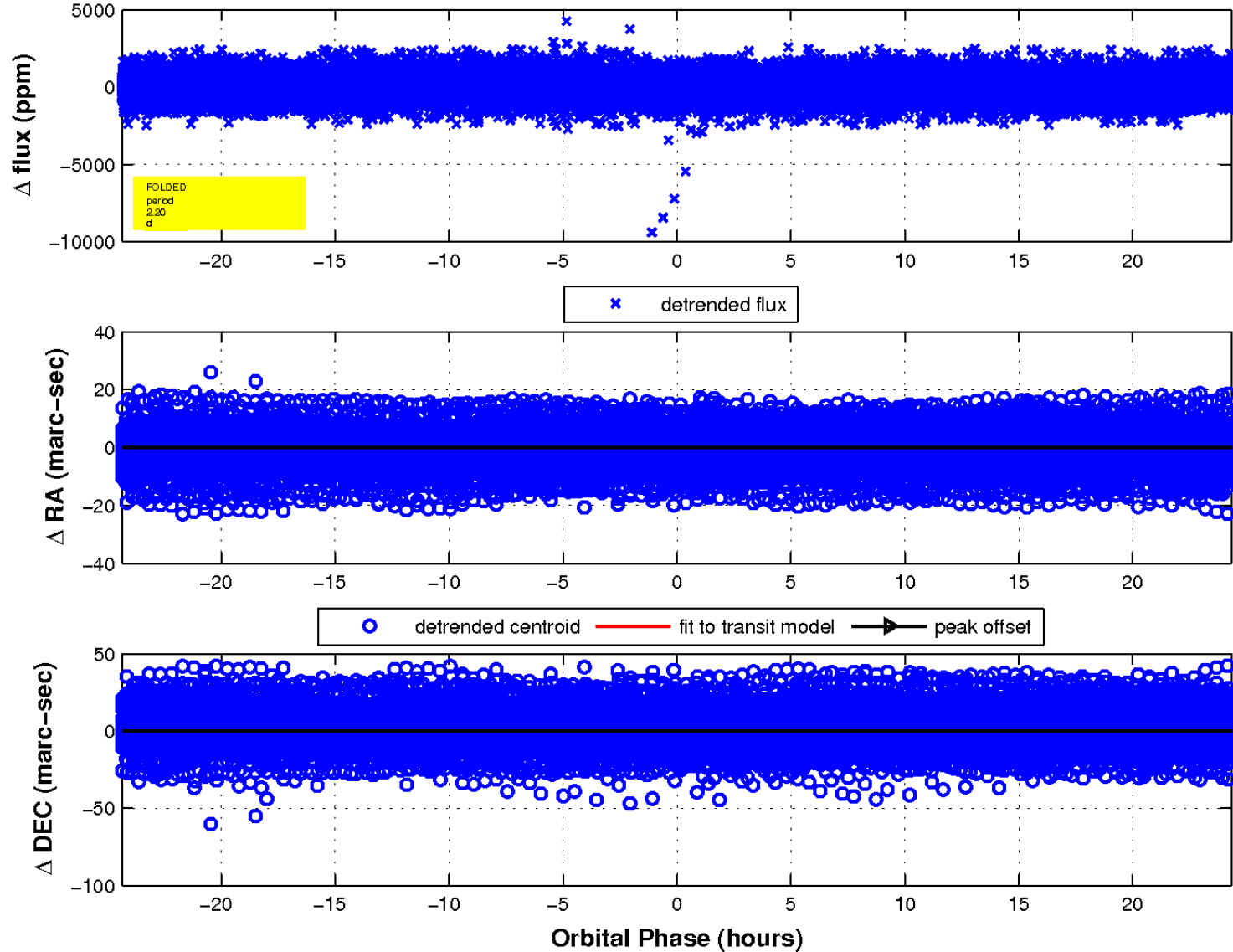
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



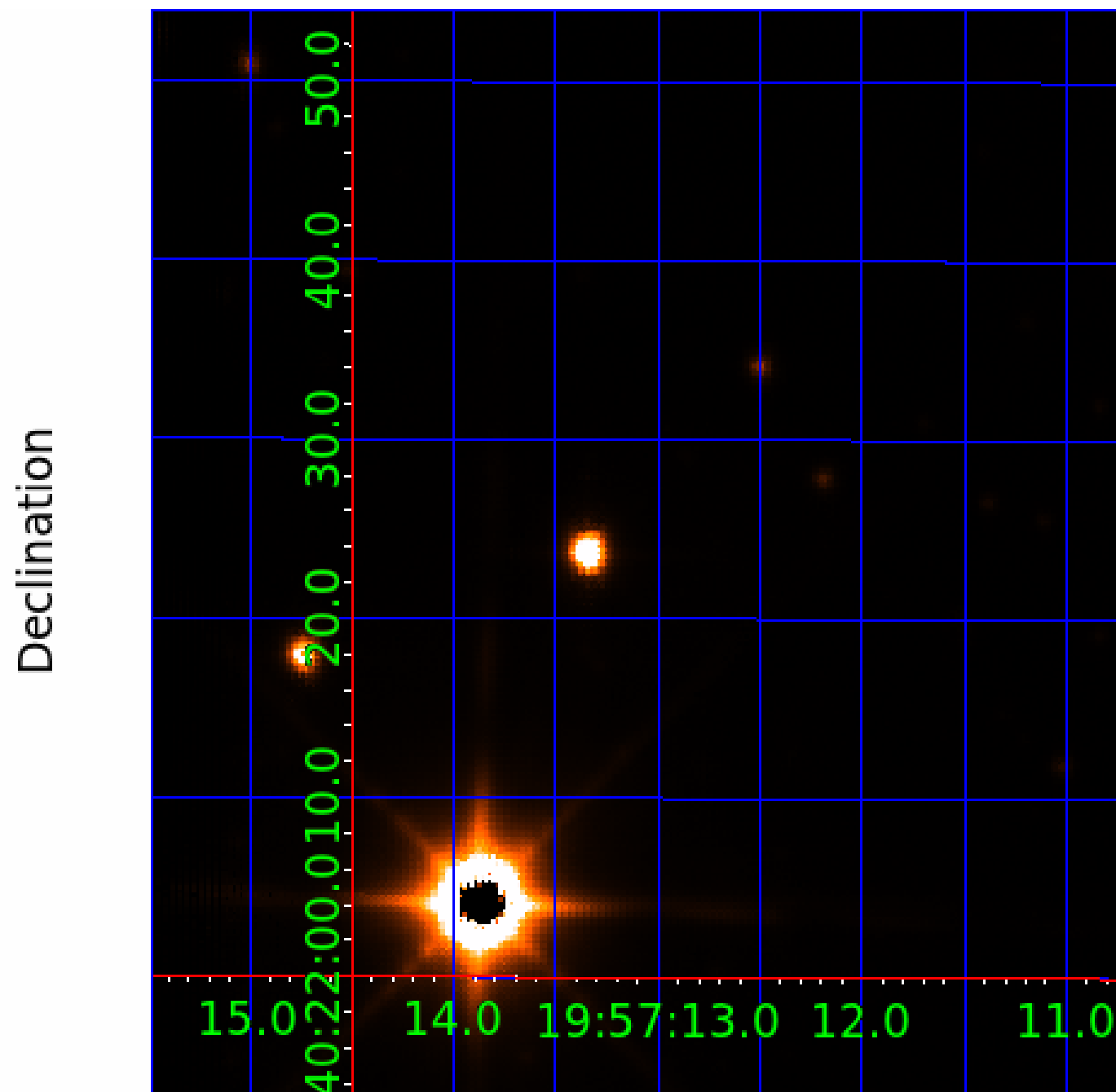
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 5



UKIRT Image





# KIC 005219580

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005219580-01	OBS	No	2.196547	132.594205	64.7	8.114	7.8	6.4	0.74	4841	0.73	305.86
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005219580-03	OBS	No	202.793901	269.385223	749.2	7.826	7.5	7.0	0.74	4841	2.12	0.73
005219580-04	OBS	No	390.098929	186.446416	1294.3	3.556	7.6	8.3	0.74	4841	3.28	0.31
005219580-05	OBS	No	179.366731	266.760921	816.1	6.676	7.4	6.7	0.74	4841	2.38	0.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005219580-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-02	OBS	FP	0.00	1	0	1	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

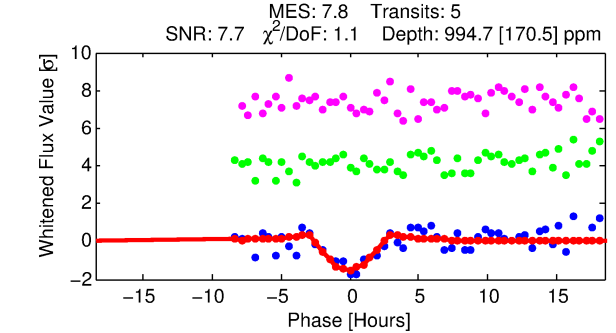
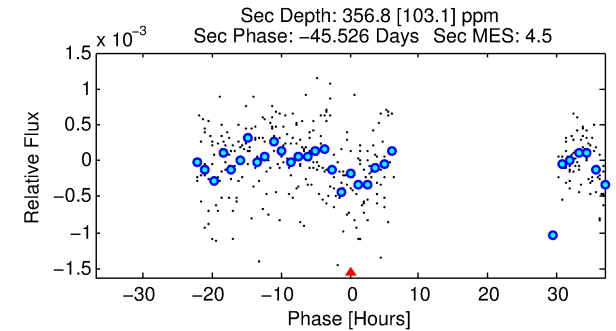
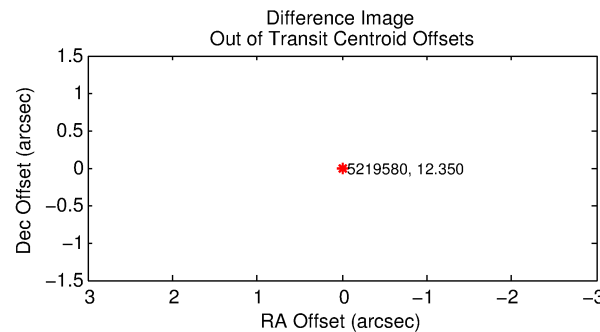
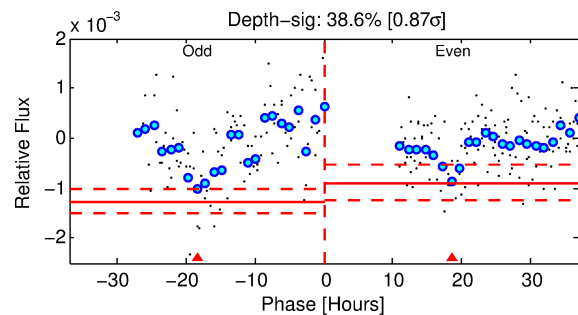
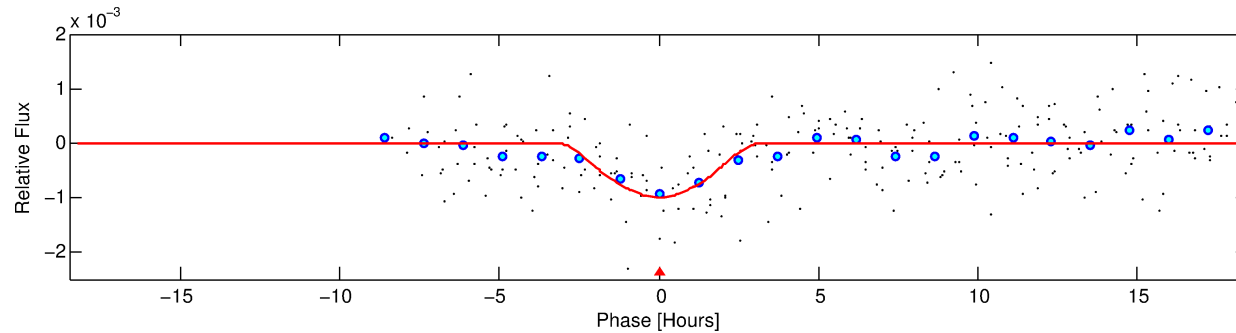
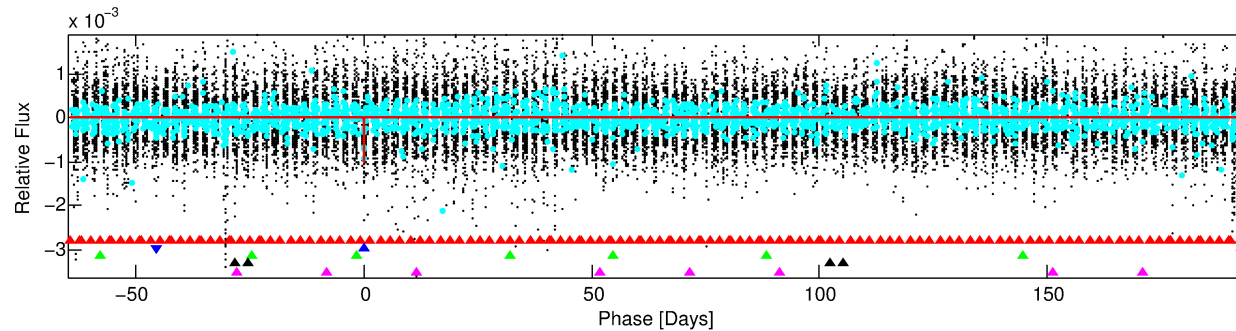
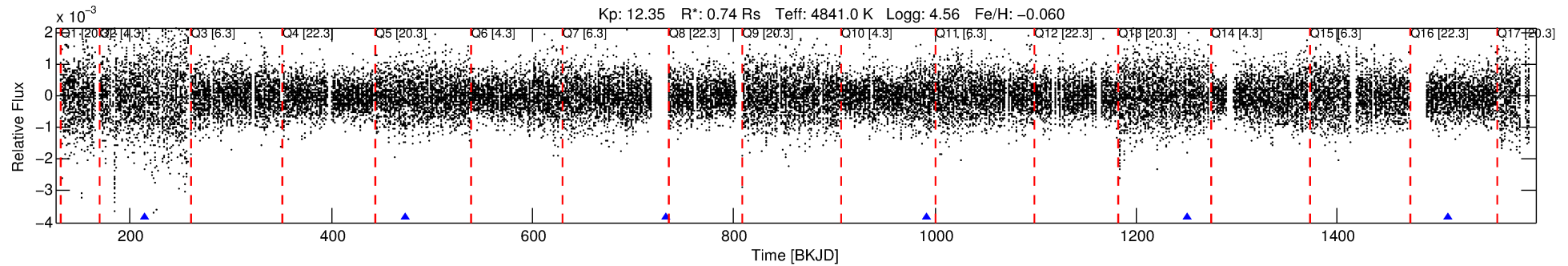
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005219580-02

No Significant Match Found

# DV One-Page Summary

KIC: 5219580 Candidate: 2 of 5 Period: 259.178 d



## DV Fit Results:

Period = 259.17785 [0.00475] d  
Epoch = 214.7406 [0.0169] BKJD  
Rp/R\* = 0.0555 [0.1747]  
a/R\* = 113.68 [89.75]  
b = 0.99 [0.27]  
Seff = 0.53 [0.10]  
Teq = 217 [10] K  
Rp = 4.49 [14.13] Re  
a = 0.7150 [0.0551] AU  
Ag = 4980.15 [31373.46] [0.16 $\sigma$ ]  
Teffp = 2824 [4448] K [0.59 $\sigma$ ]

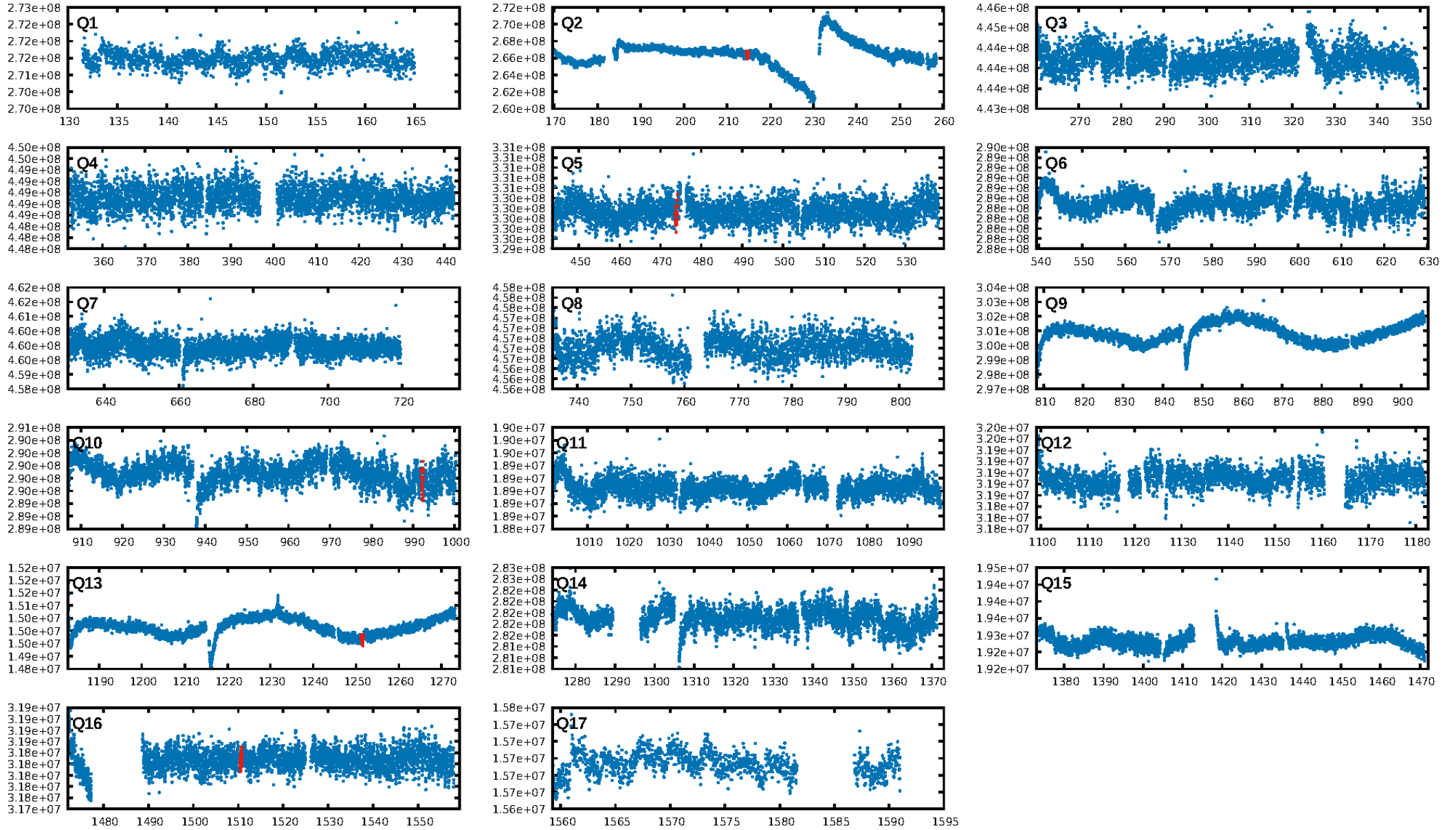
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [135.86 $\sigma$ ]  
LongPeriod-sig: 100.0% [441.67 $\sigma$ ]  
ModelChiSquare2-sig: 42.4%  
ModelChiSquareGof-sig: 98.8%  
**Bootstrap-pfa: 9.50e-09**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 7.2%  
**Centroid-so: 2.928 arcsec [15.00 $\sigma$ ]**  
OotOffset-rm: N/A  
**KicOffset-rm: 1.783 arcsec [4.98 $\sigma$ ]**  
OotOffset-st: 0/0/0 [0]  
KicOffset-st: 2/0/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [5/5]

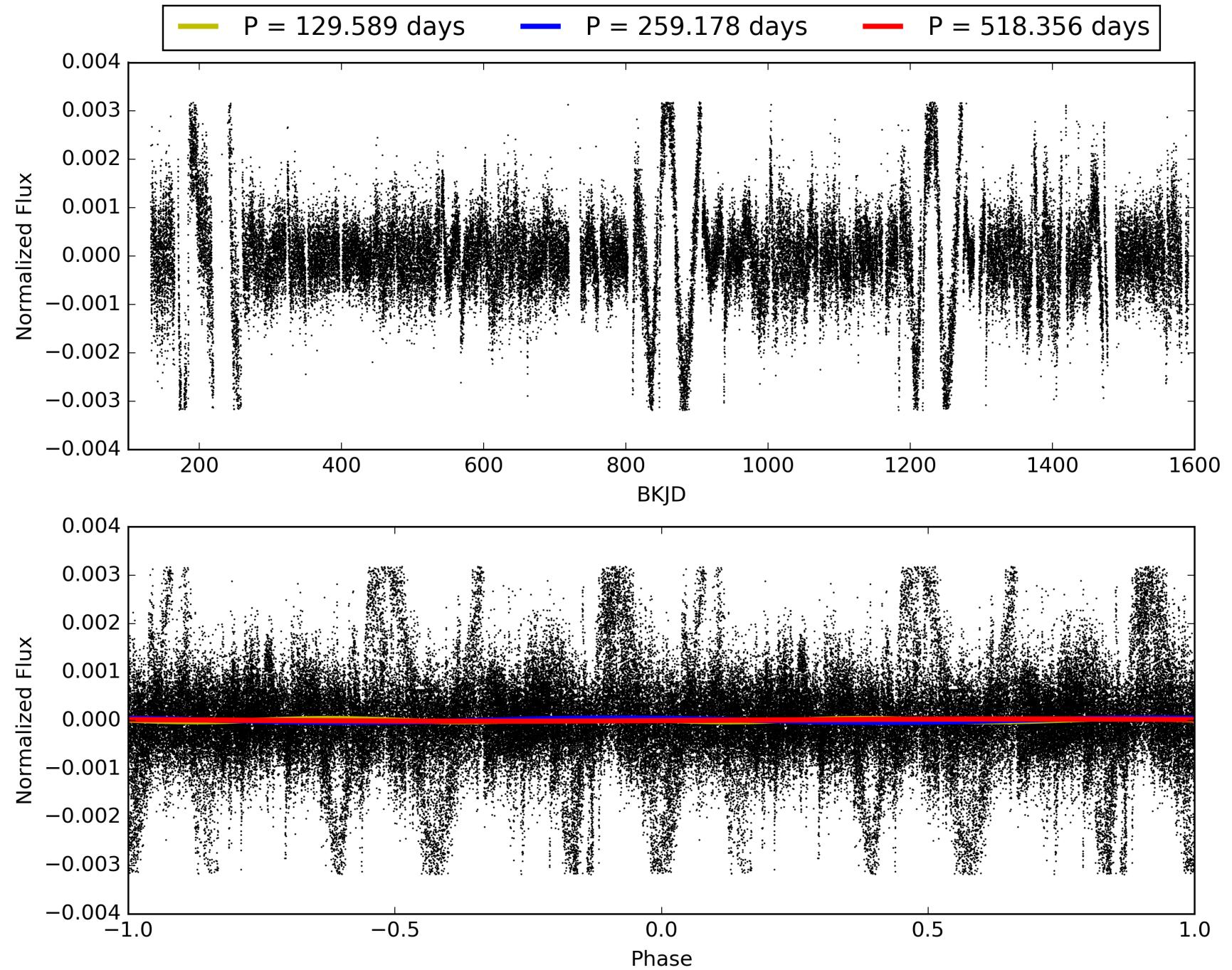
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:54:50 Z

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

# TCE 005219580-02, PDC Light Curves

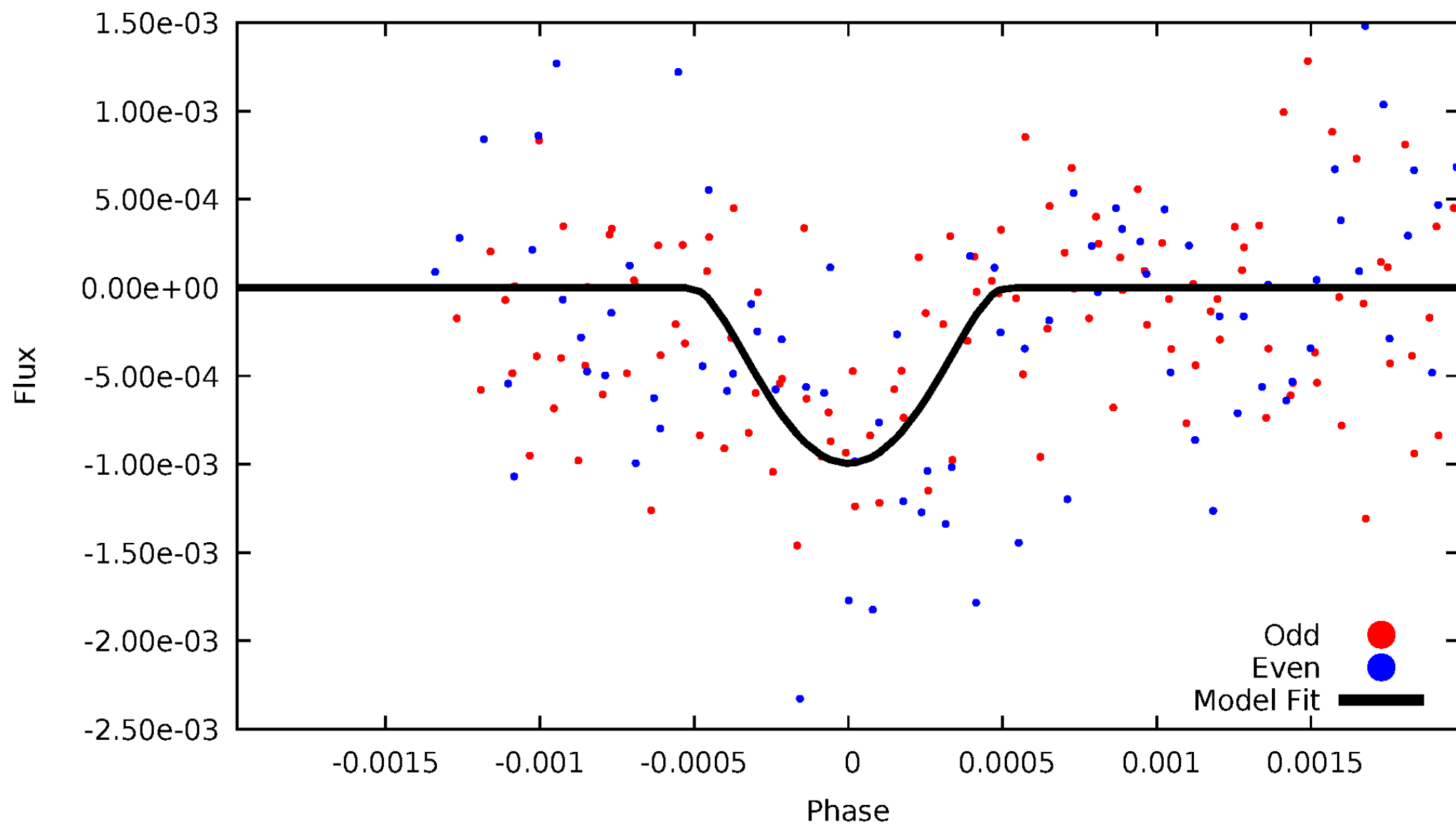


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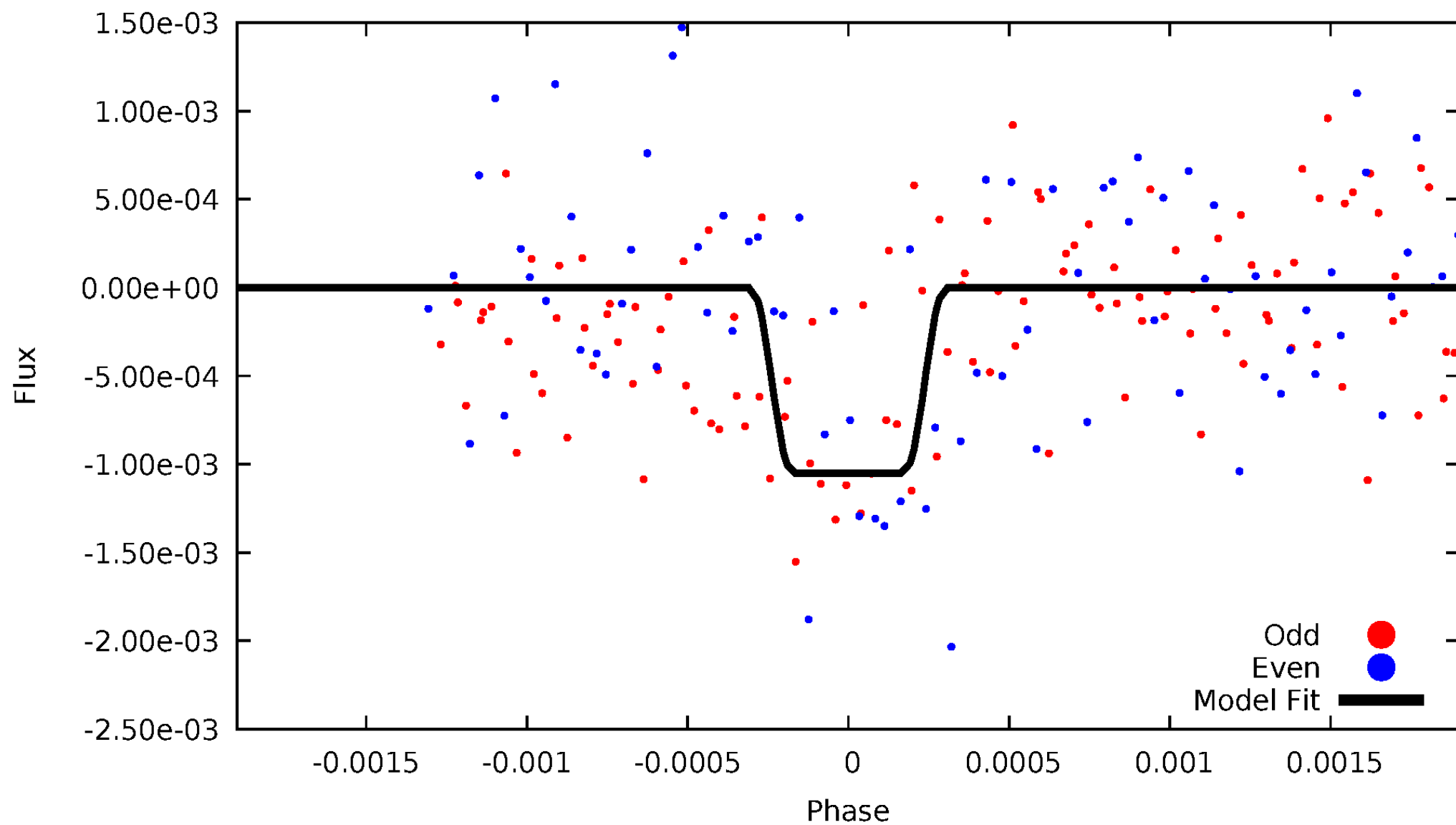
# DV Odd/Even

TCE 005219580-02



# ALT Odd/Even

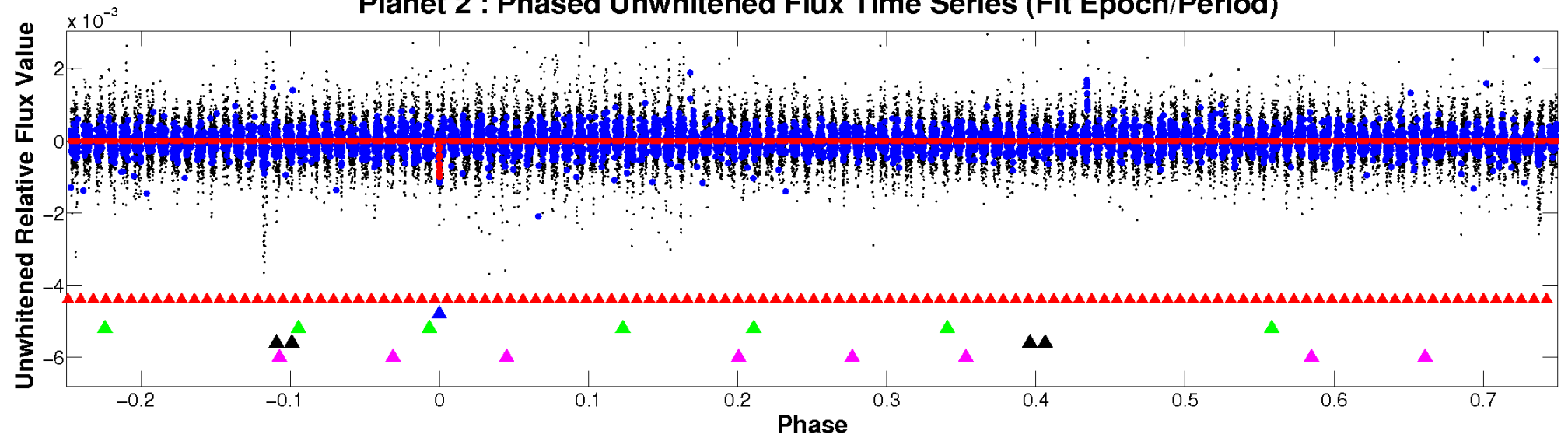
TCE 005219580-02



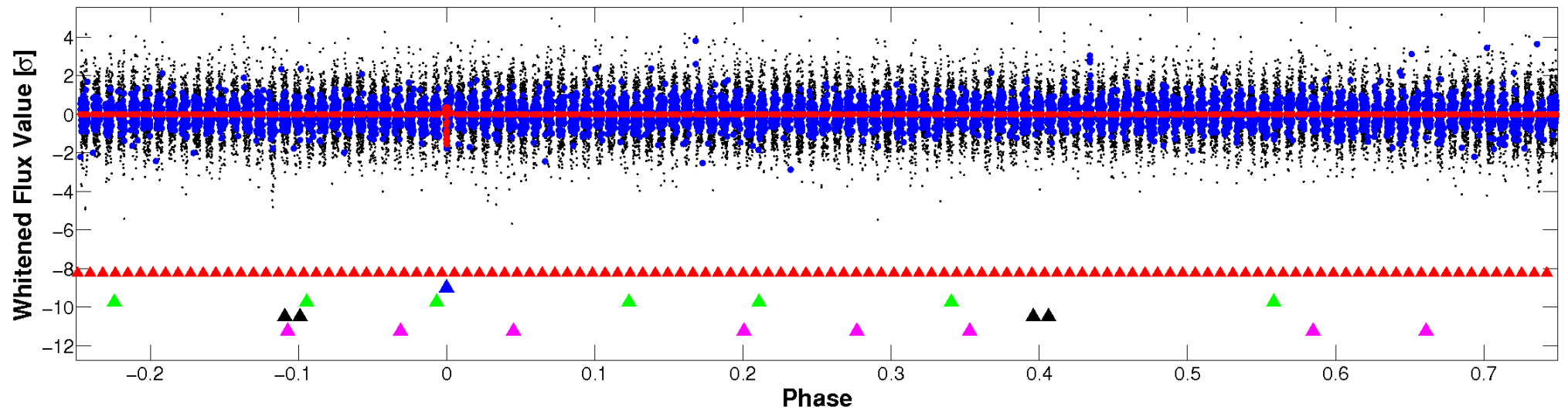


# Non-Whitened Vs. Whitened Light Curve

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

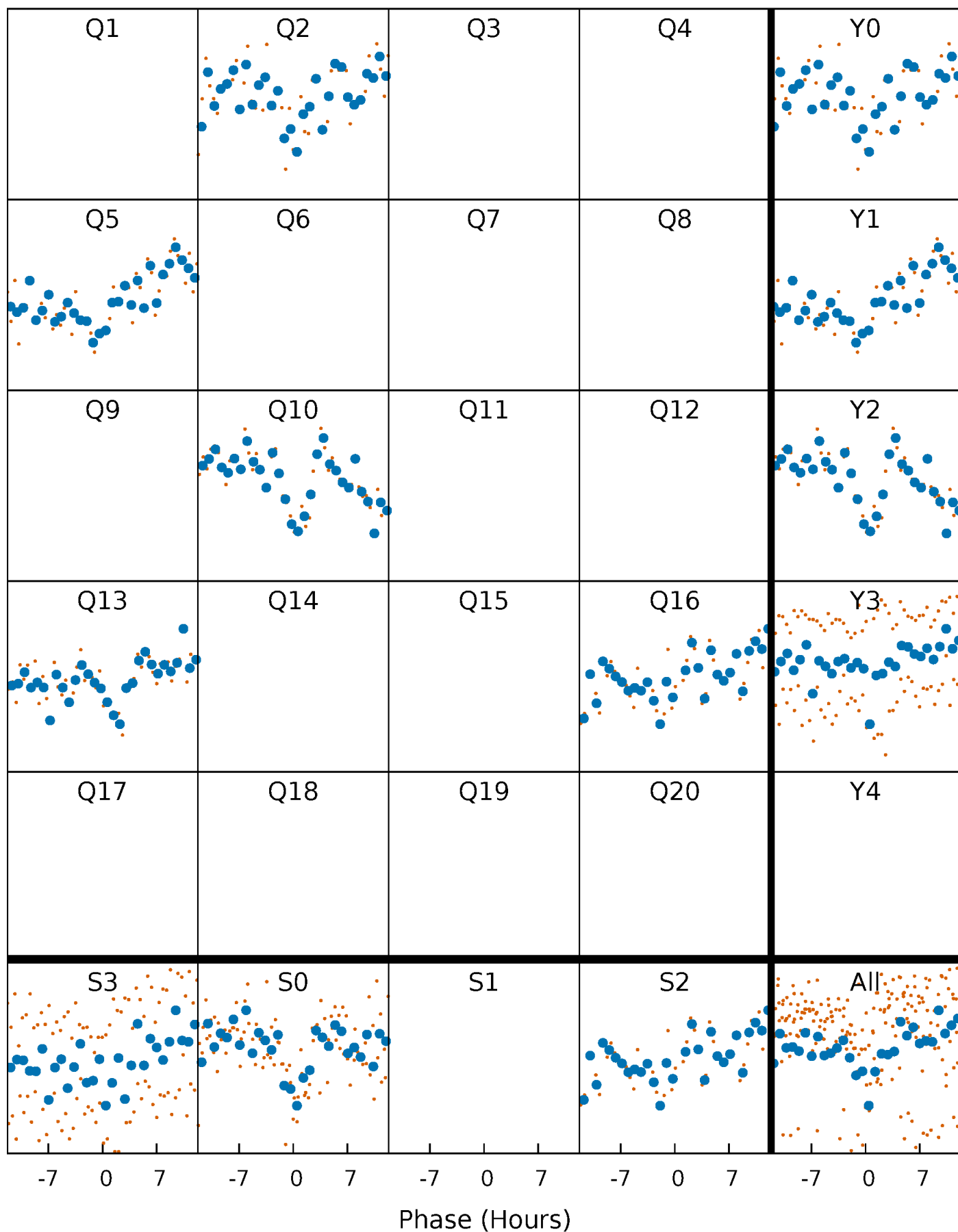


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



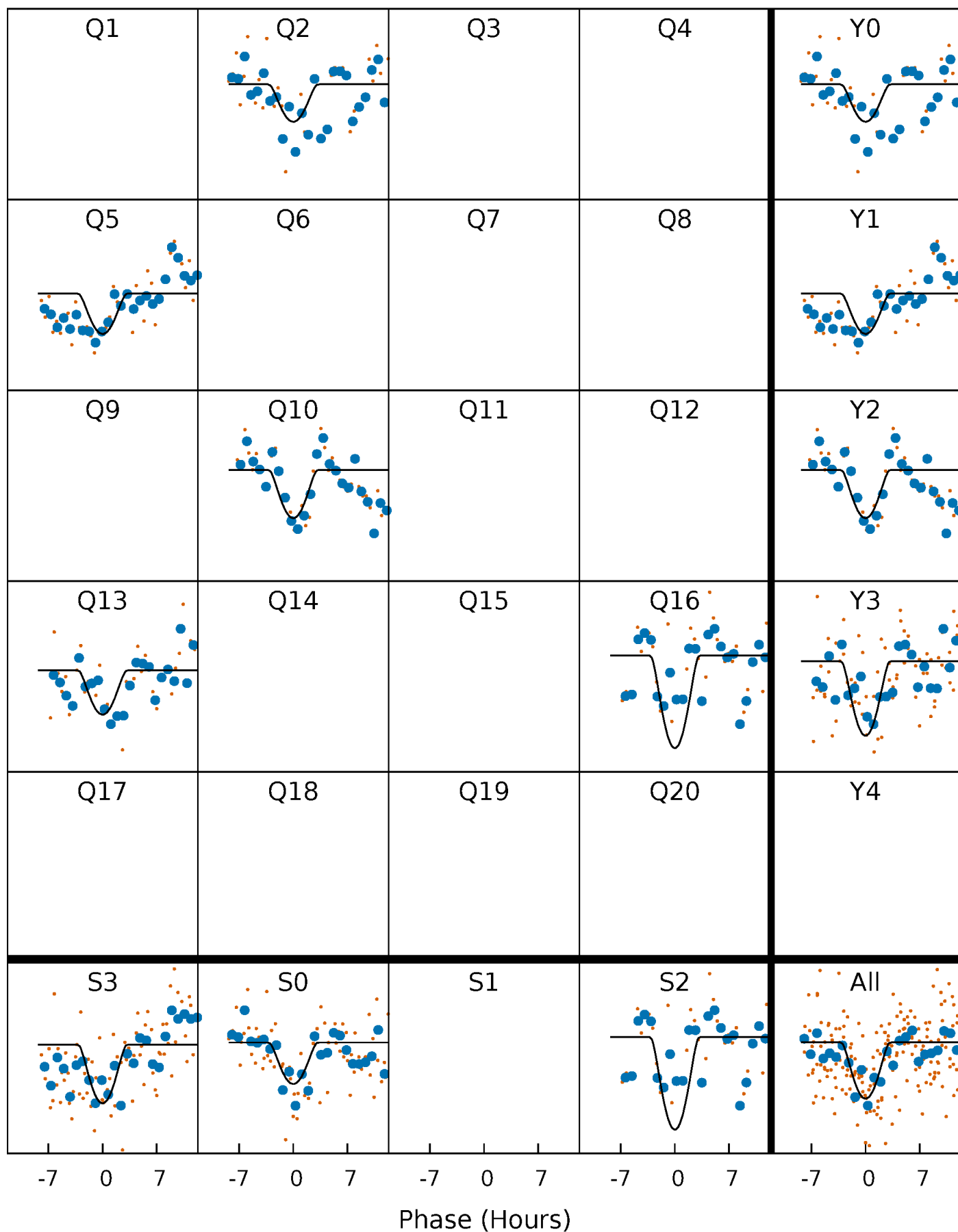
# PDC Quarter-Phased Transit Curves

TCE 005219580-02     $P=259.177853$  Days     $T_0=214.740648$  (BKJD)



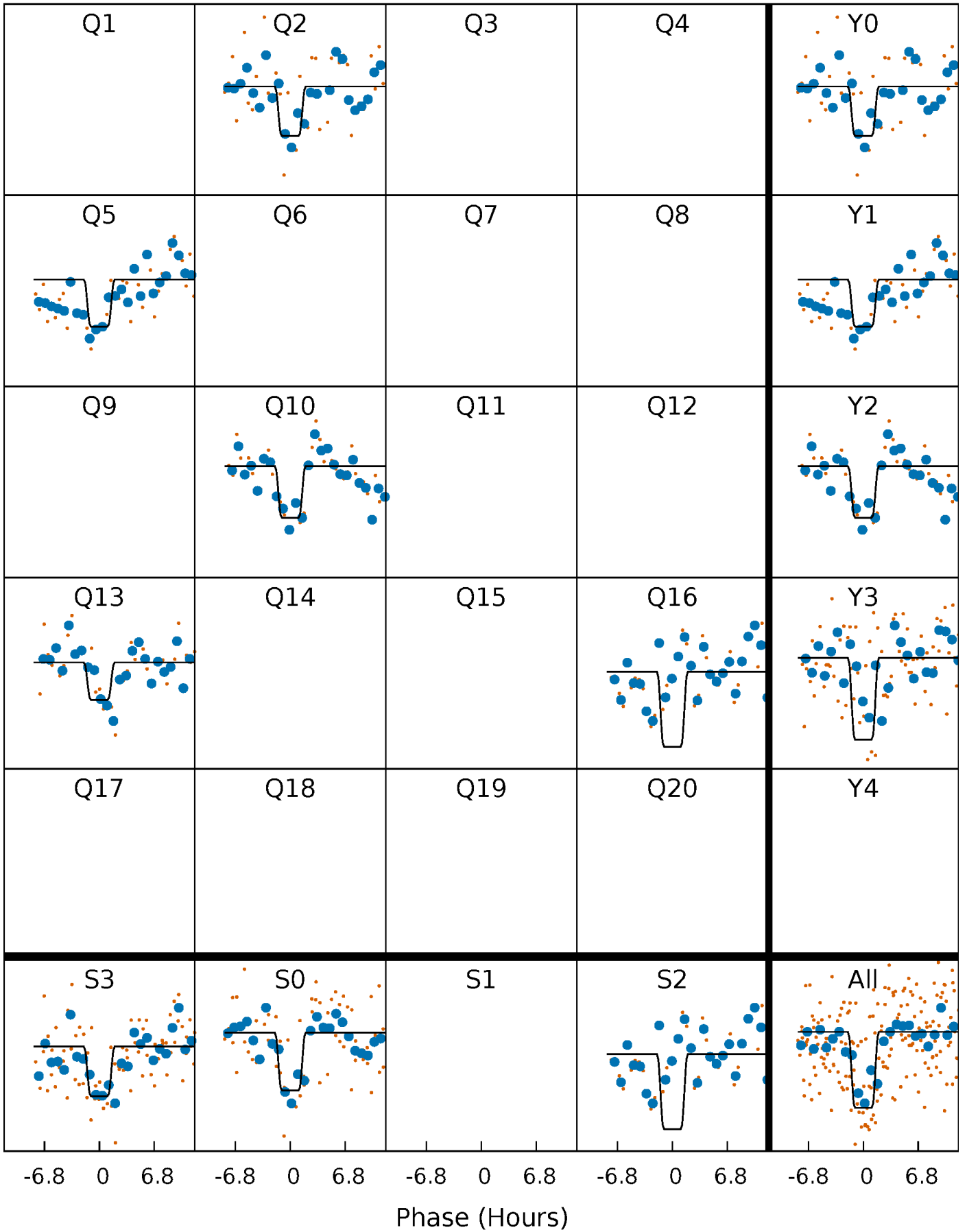
# DV Quarter-Phased Transit Curves

TCE 005219580-02     $P=259.177853$  Days     $T_0=214.740648$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

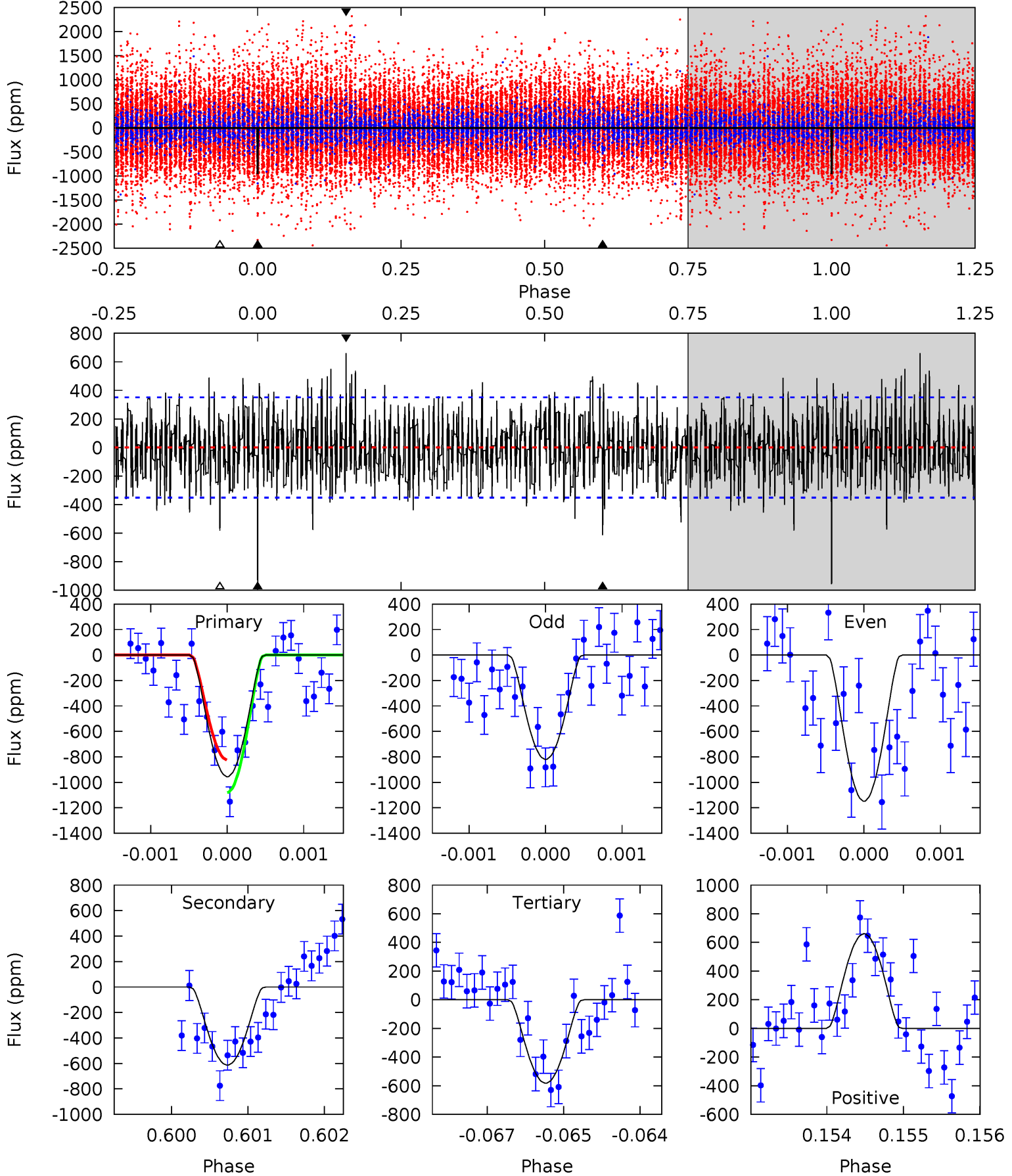
TCE 005219580-02 P=259.186086 Days  $T_0=214.732014$  (BKJD)



# DV Model-Shift Uniqueness Test

005219580-02, P = 259.177853 Days, E = 214.740648 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
14.8	9.49	9.01	10.2	5.44	3.27	2.66	5.78	4.57	0.48	-0.73	2.45	0.95	0.41	1.98

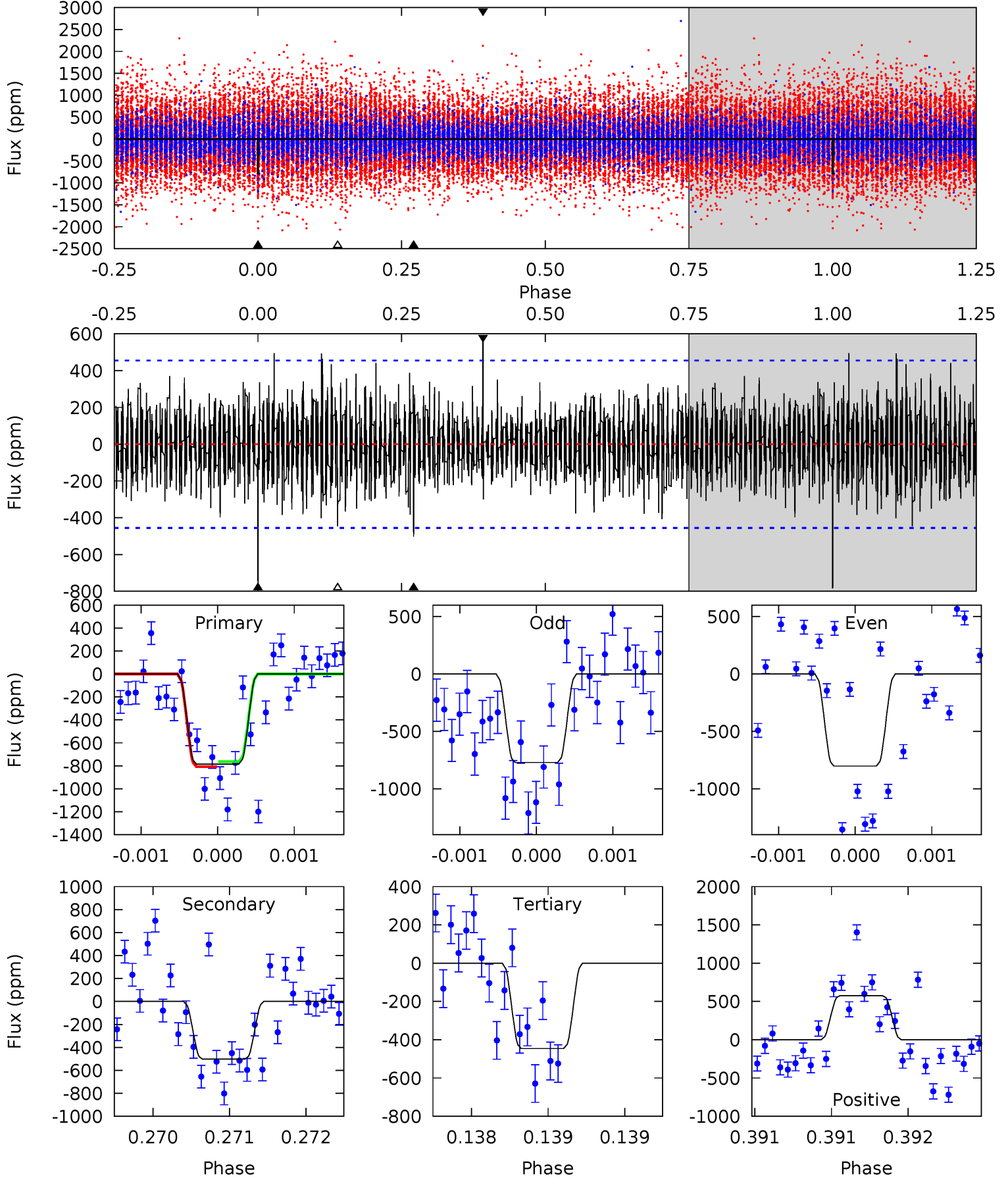




# Alt Model-Shift Uniqueness Test

005219580-02, P = 259.186086 Days, E = 214.732014 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.55	6.13	5.43	7.03	5.54	3.44	1.62	4.12	2.52	0.69	-0.90	0.18	0.92	0.42	0.26



### Stellar Parameters For KIC 005219580

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4841^{+175}_{-175}$	$4.559^{+0.061}_{-0.039}$	$-0.060^{+0.300}_{-0.300}$	$0.741^{+0.062}_{-0.068}$	$0.726^{+0.081}_{-0.061}$	$2.516^{+0.712}_{-0.385}$
	+4%/-4%	+1%/-1%	+500%/-500%	+8%/-9%	+11%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005219580-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-613 \pm 65$	$11.95^{+11.07}_{-8.35}$	$302^{+12}_{-13}$	$2705^{+1117}_{-402}$	$1230^{+12245}_{-908}$
Alt.	$-503 \pm 82$	$10.10^{+10.76}_{-7.48}$	$302^{+13}_{-12}$	$2747^{+1399}_{-454}$	$1291^{+18563}_{-984}$

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

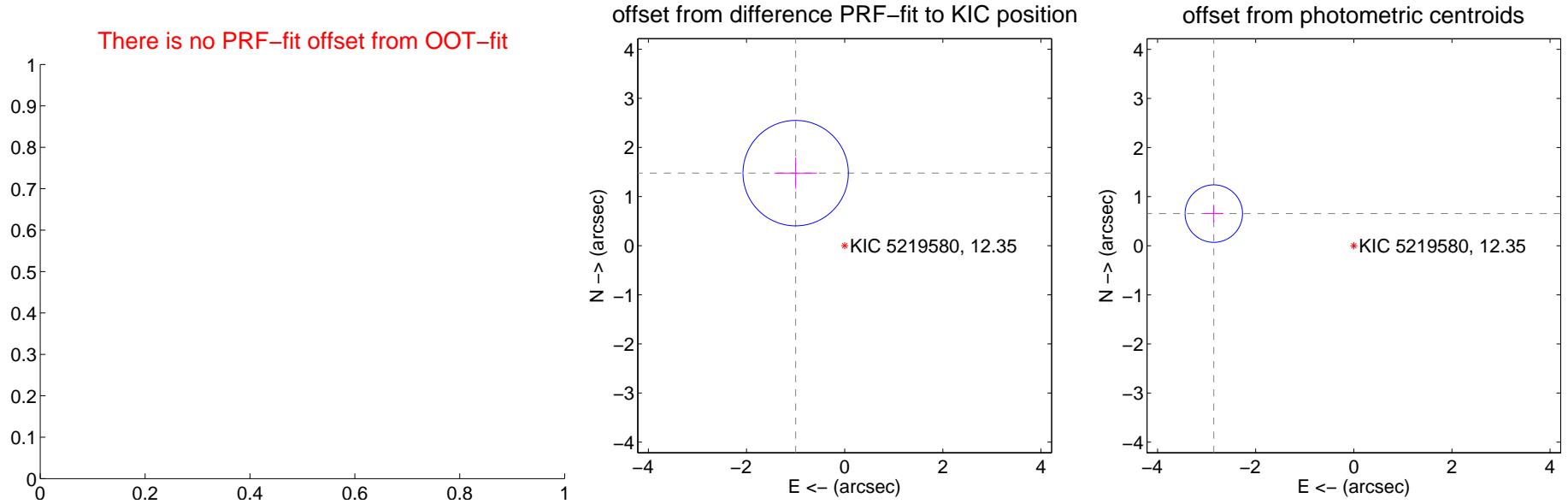
## DV Centroid Data

Supplemental centroid analysis for 005219580-02. Kepler magnitude: 12.35. Transit SNR 7.70

There are 2 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	$1.783 \pm 0.358$	4.98	$0.999 \pm 0.434$	$1.477 \pm 0.317$
photometric centroid source offset	$2.93 \pm 0.20$	15.00	$2.85 \pm 0.20$	$0.65 \pm 0.18$



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;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.

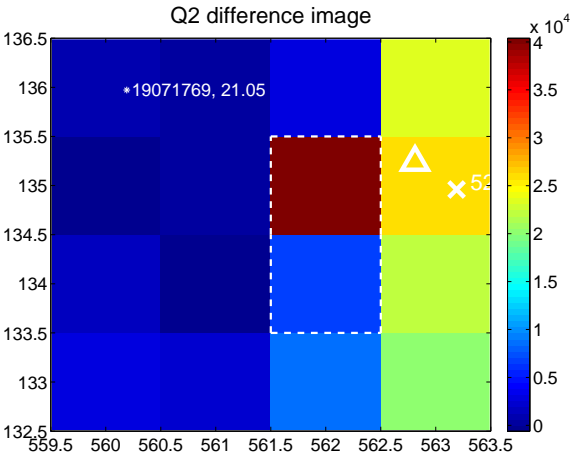
Q1 no difference image



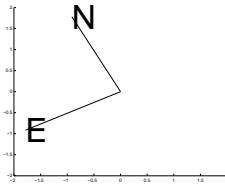
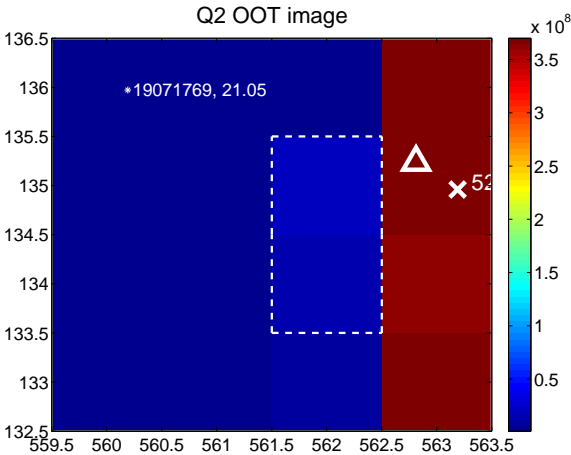
Q1 no OOT image



Q2 difference image



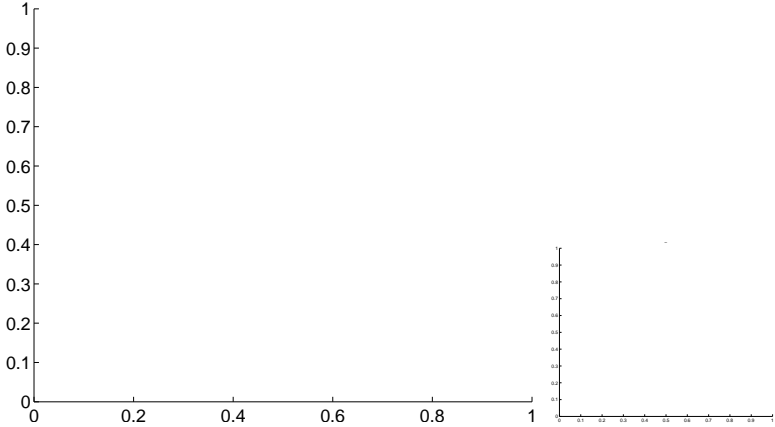
Q2 OOT image



Q3 no difference image



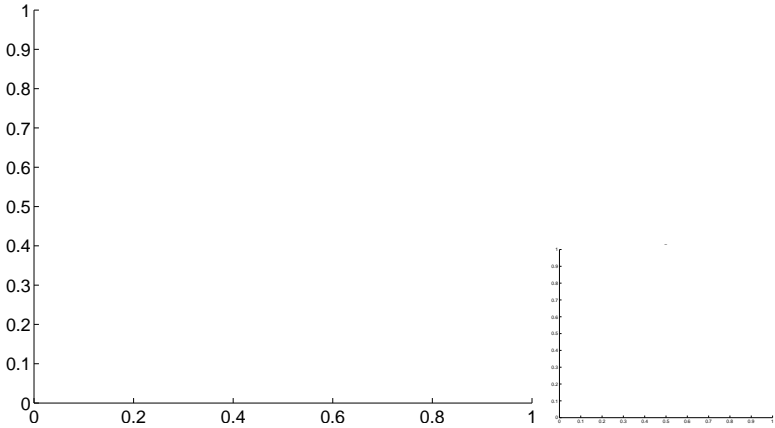
Q3 no OOT image



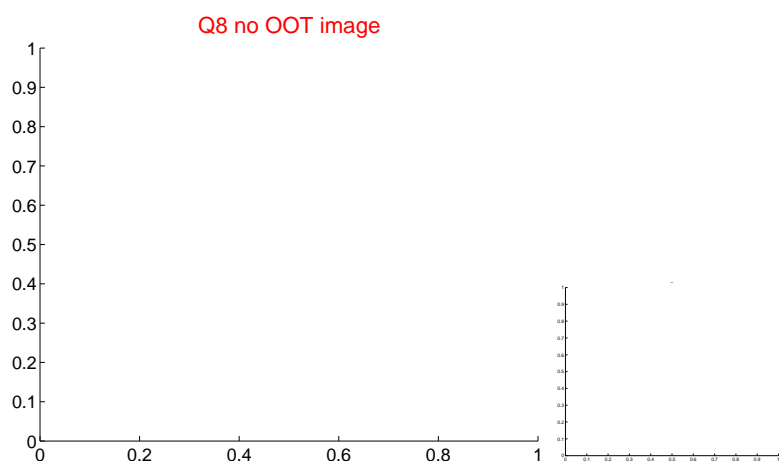
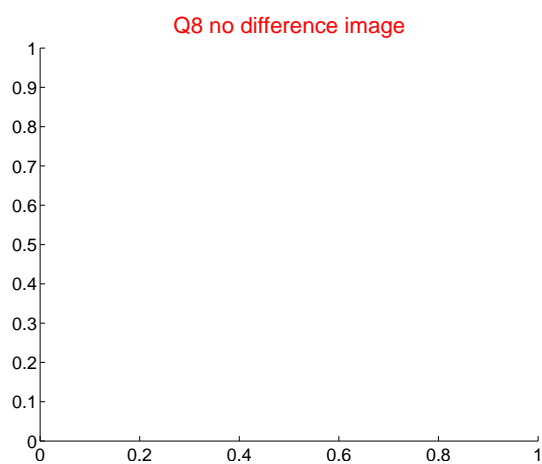
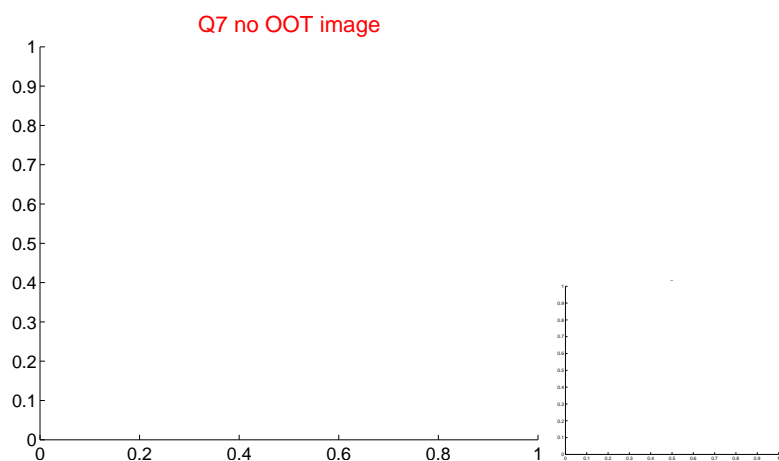
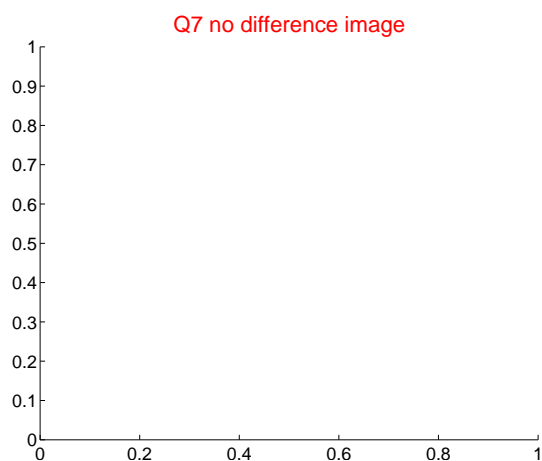
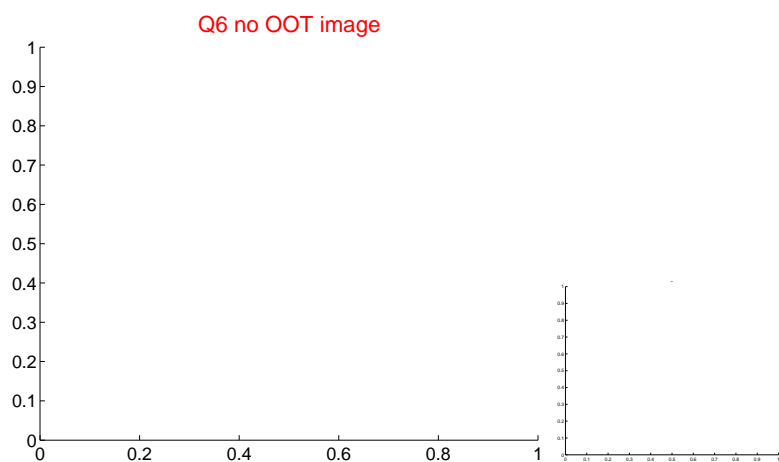
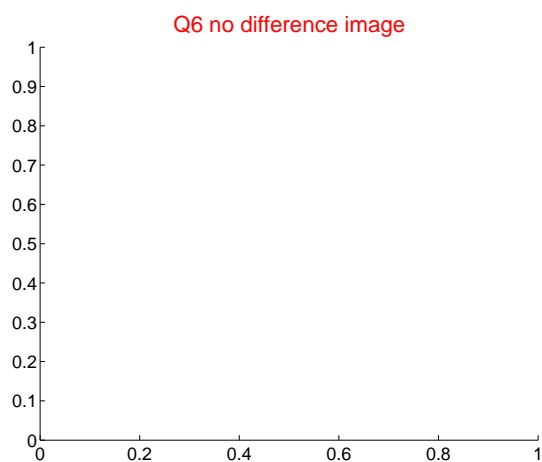
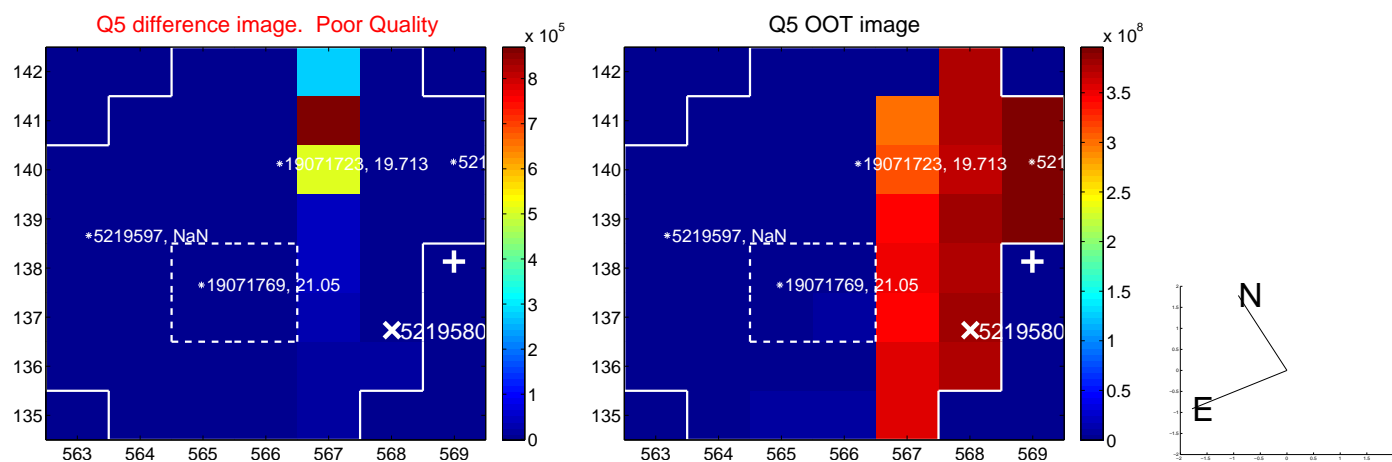
Q4 no difference image



Q4 no OOT image

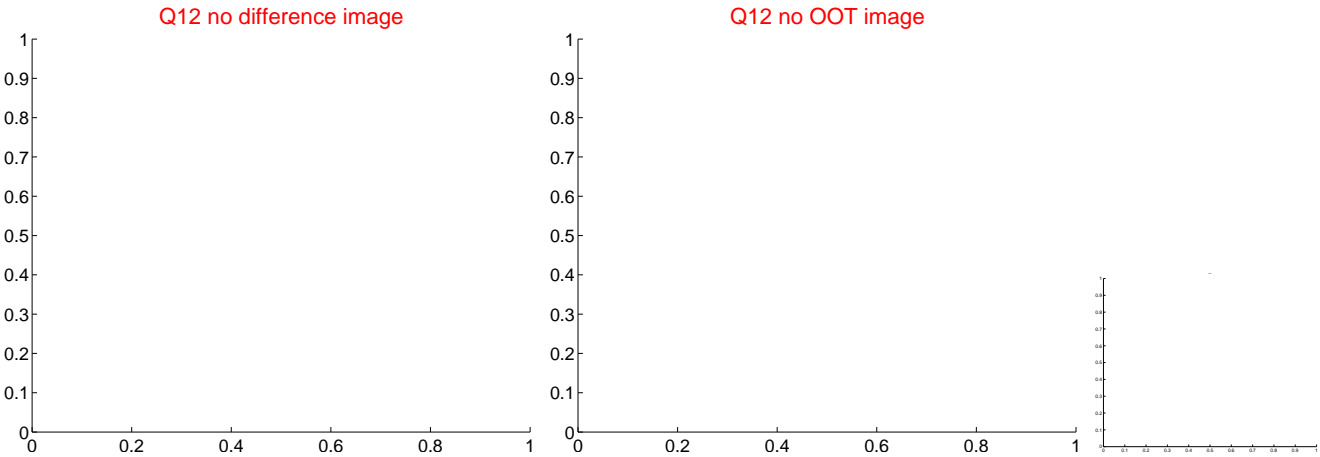
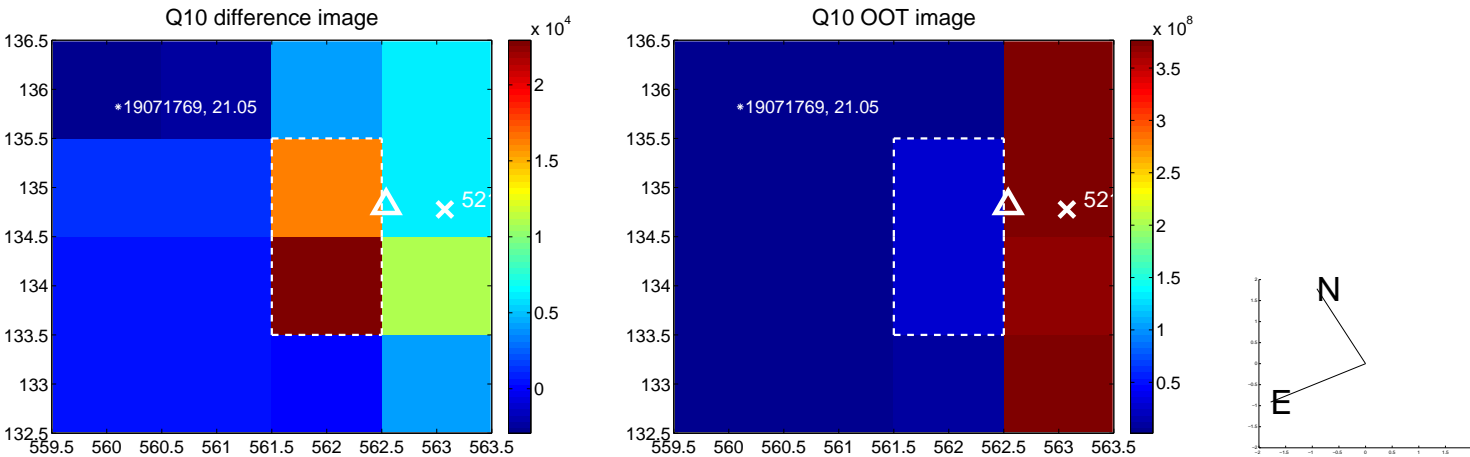
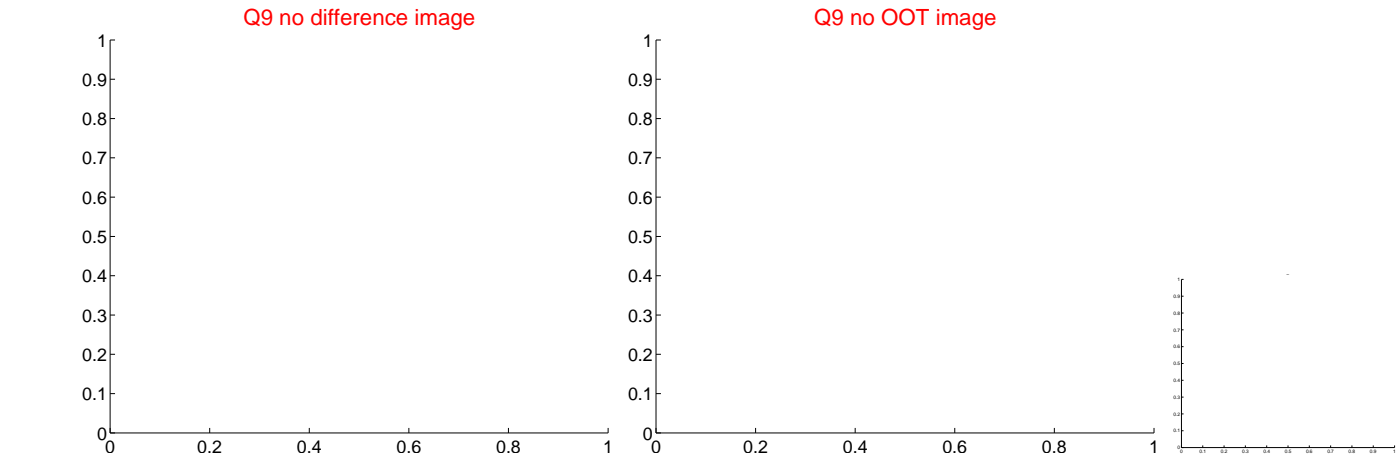


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

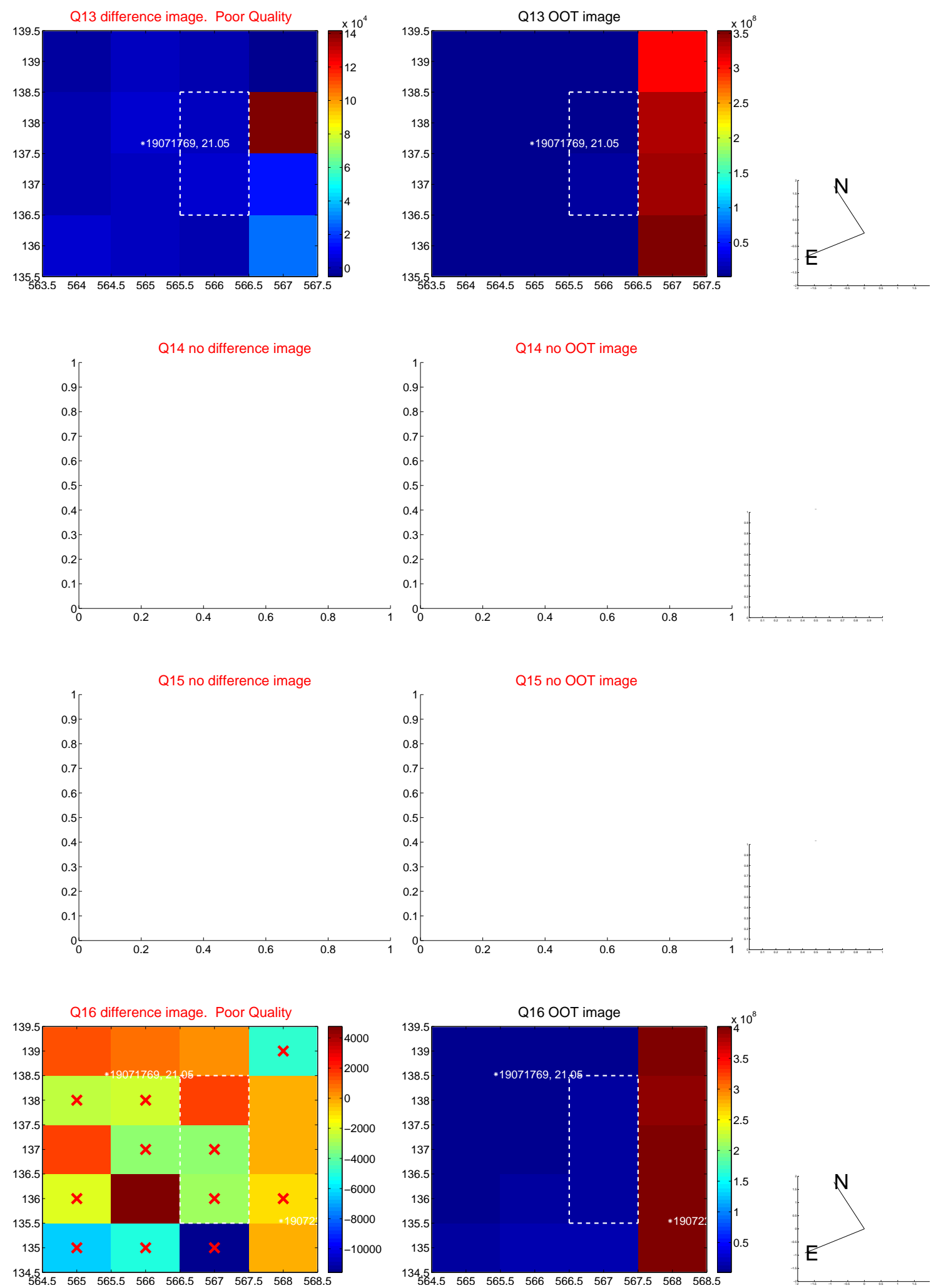




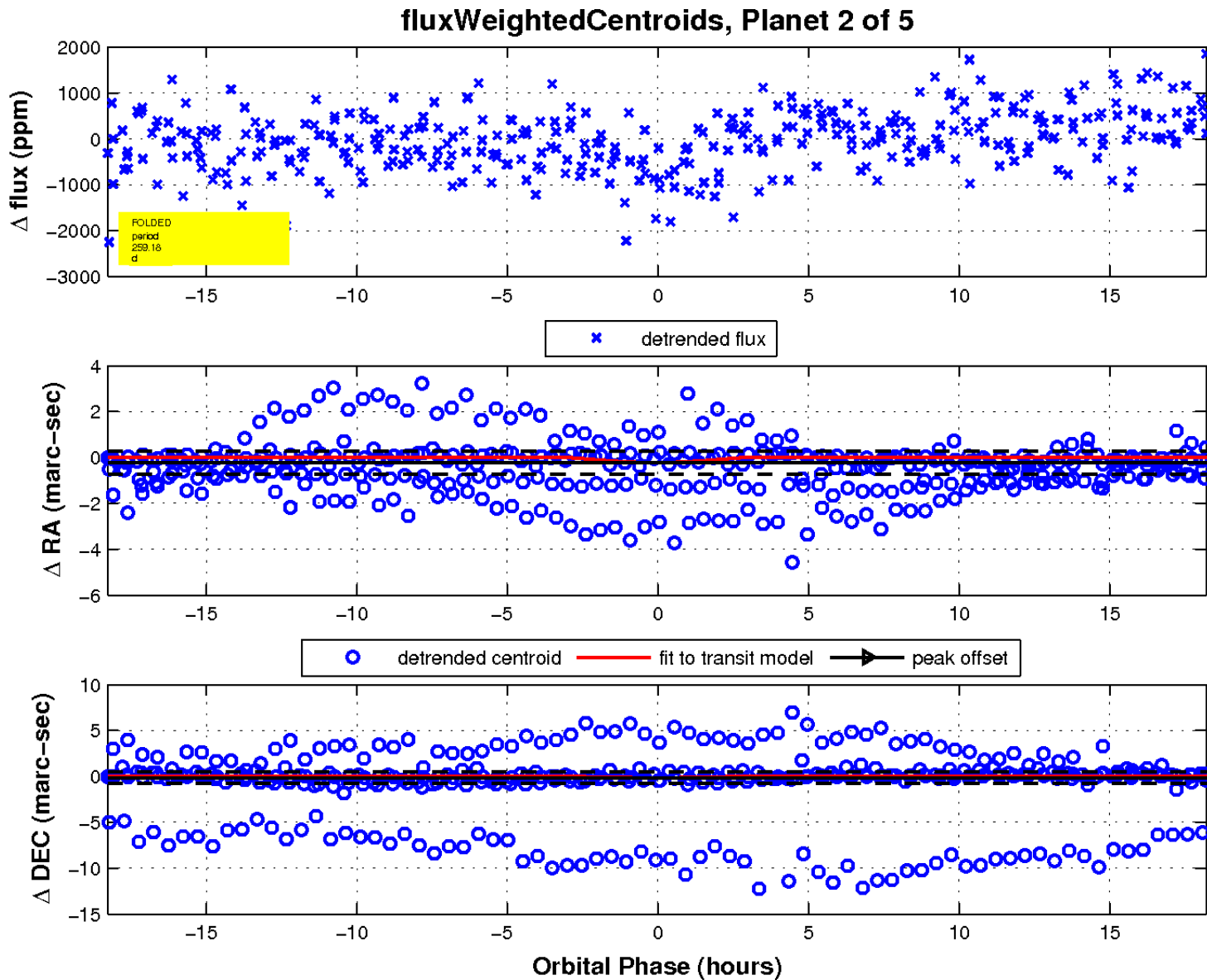
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



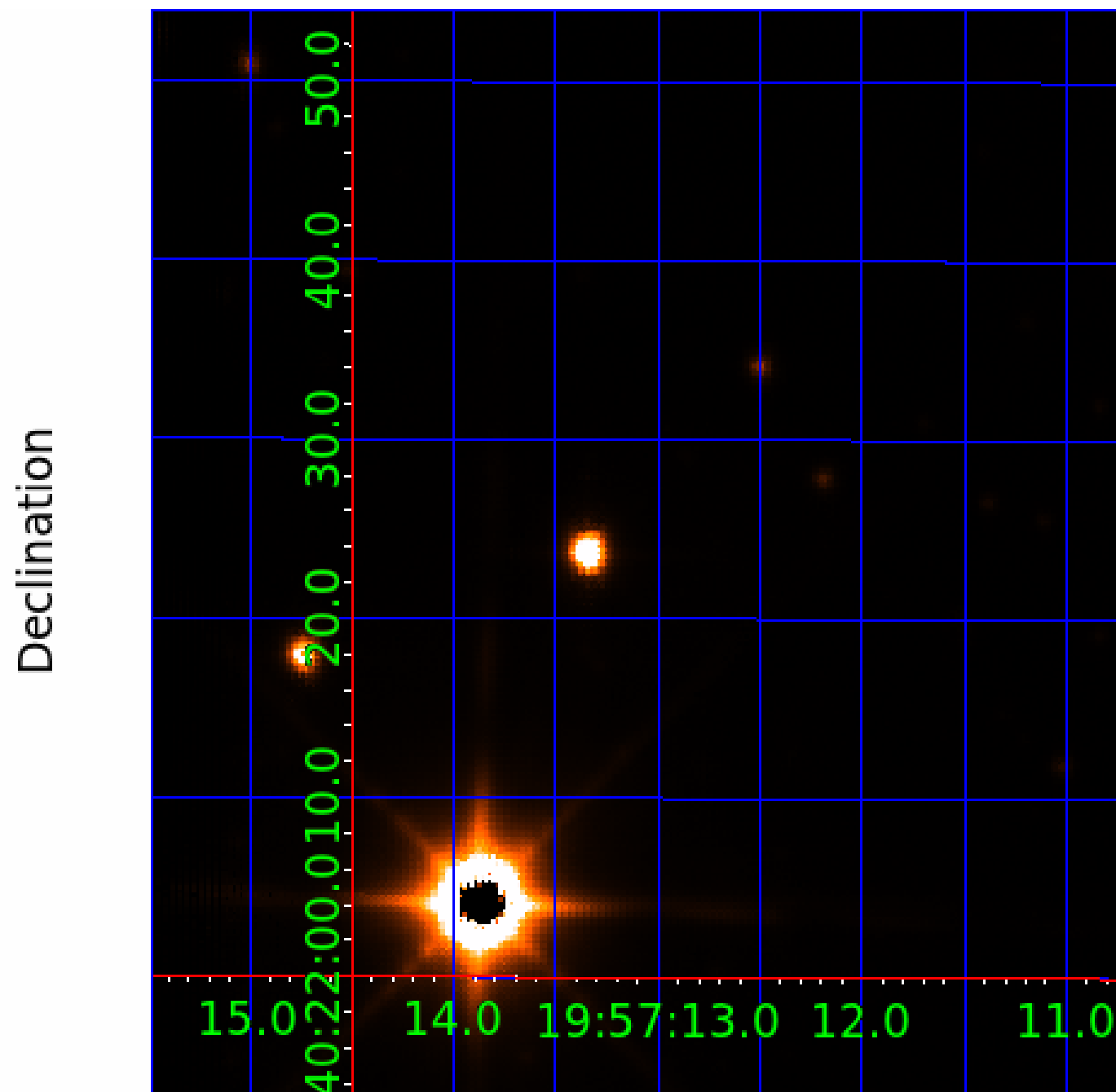
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005219580

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005219580-01	OBS	No	2.196547	132.594205	64.7	8.114	7.8	6.4	0.74	4841	0.73	305.86
005219580-02	OBS	No	259.177853	214.740648	994.7	6.162	7.8	7.7	0.74	4841	4.49	0.53
005219580-03	OBS	No	202.793901	269.385223	749.2	7.826	7.5	7.0	0.74	4841	2.12	0.73
005219580-04	OBS	No	390.098929	186.446416	1294.3	3.556	7.6	8.3	0.74	4841	3.28	0.31
005219580-05	OBS	No	179.366731	266.760921	816.1	6.676	7.4	6.7	0.74	4841	2.38	0.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005219580-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-02	OBS	FP	0.00	1	0	1	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

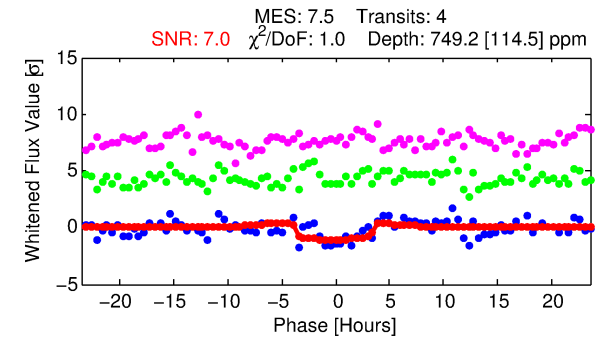
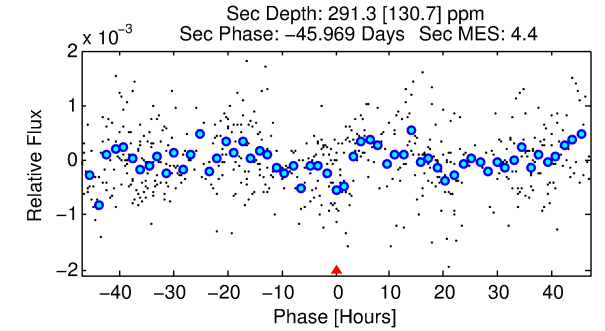
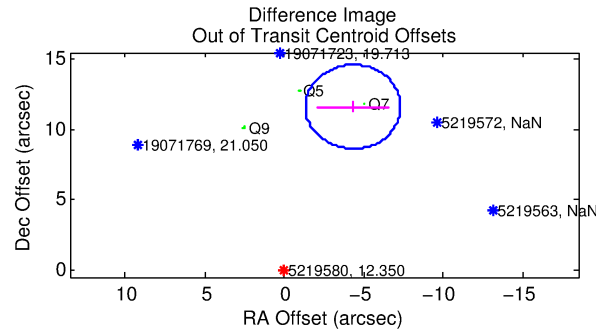
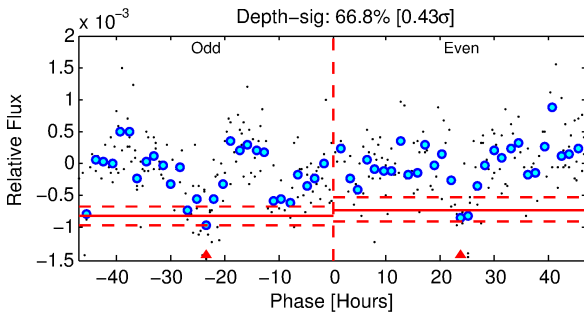
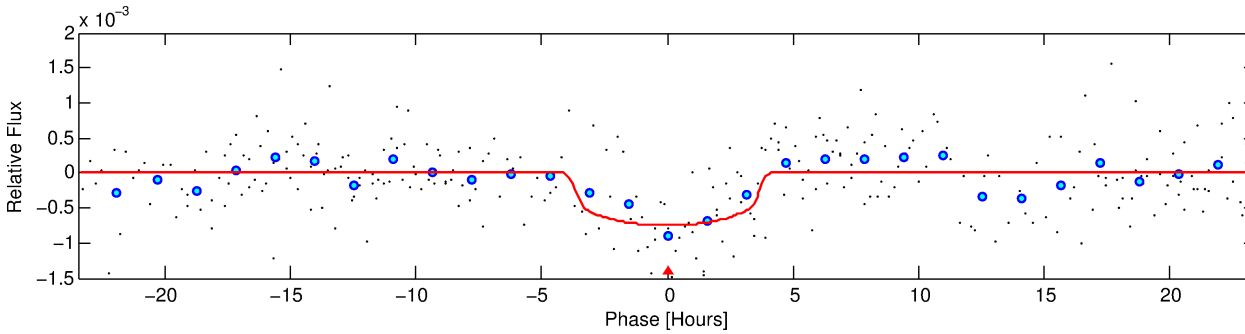
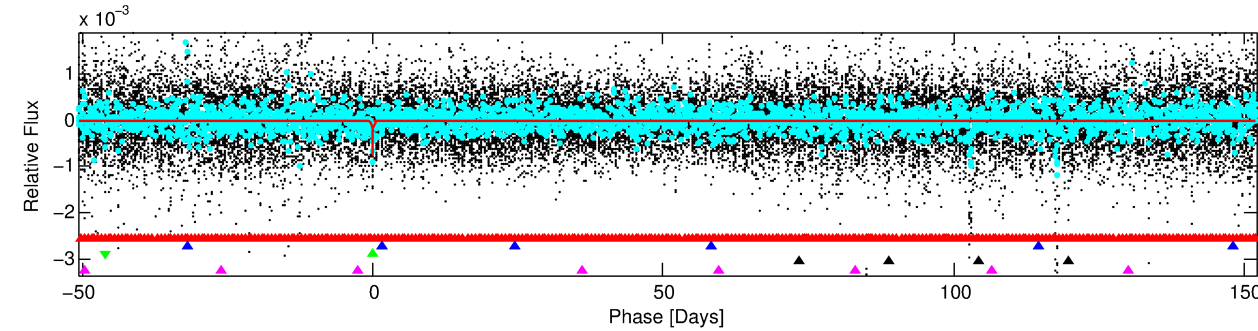
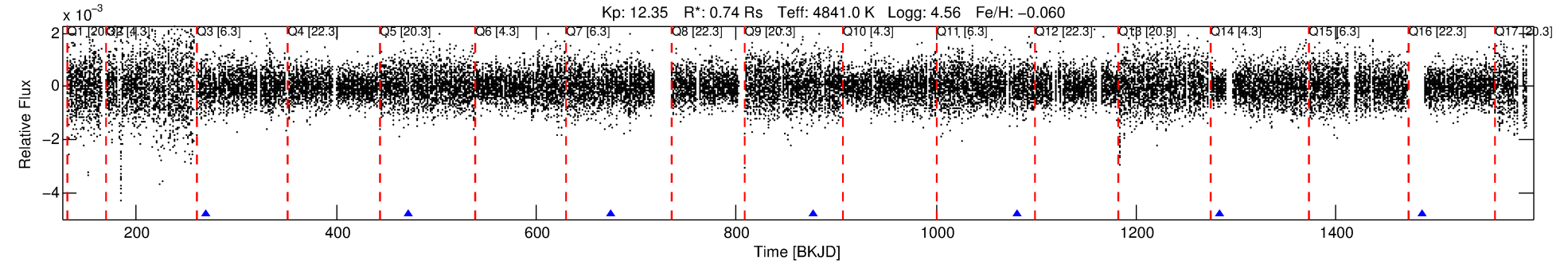
Ephemeris Match Information For 005219580-03

No Significant Match Found



# DV One-Page Summary

KIC: 5219580 Candidate: 3 of 5 Period: 202.794 d



## DV Fit Results:

Period = 202.79390 [0.00541] d  
Epoch = 269.3852 [0.0179] BKJD  
Rp/R\* = 0.0262 [0.0251]  
a/R\* = 157.64 [497.42]  
b = 0.65 [2.89]  
Seff = 0.73 [0.13]  
Teq = 236 [11] K  
Rp = 2.12 [2.04] Re  
a = 0.6071 [0.0468] AU  
Ag = 13134.03 [25866.91] [0.51 $\sigma$ ]  
Teff = 3905 [1925] K [1.91 $\sigma$ ]

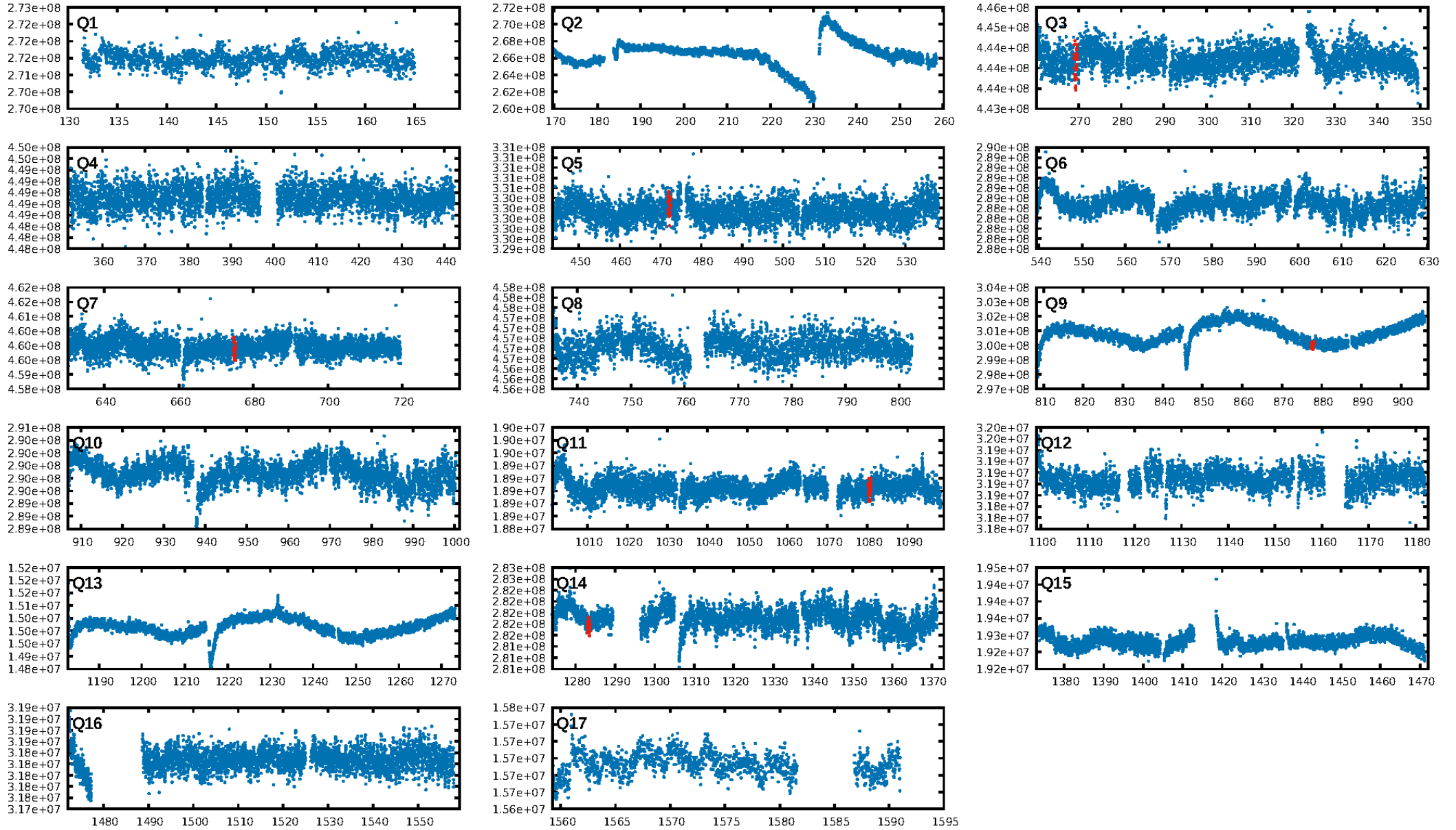
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.66 $\sigma$ ]  
LongPeriod-sig: 100.0% [135.86 $\sigma$ ]  
ModelChiSquare2-sig: 77.4%  
ModelChiSquareGof-sig: 97.4%  
Bootstrap-pfa: 1.29e-08  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 2.0%  
Centroid-so: 3.050 arcsec [15.62 $\sigma$ ]  
OotOffset-rm: 12.402 arcsec [12.45 $\sigma$ ]  
OotOffset-st: 0.1/0/2 [3]  
KicOffset-rm: 15.215 arcsec [2.72 $\sigma$ ]  
KicOffset-st: 0.2/0/2 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.40 [2/5]

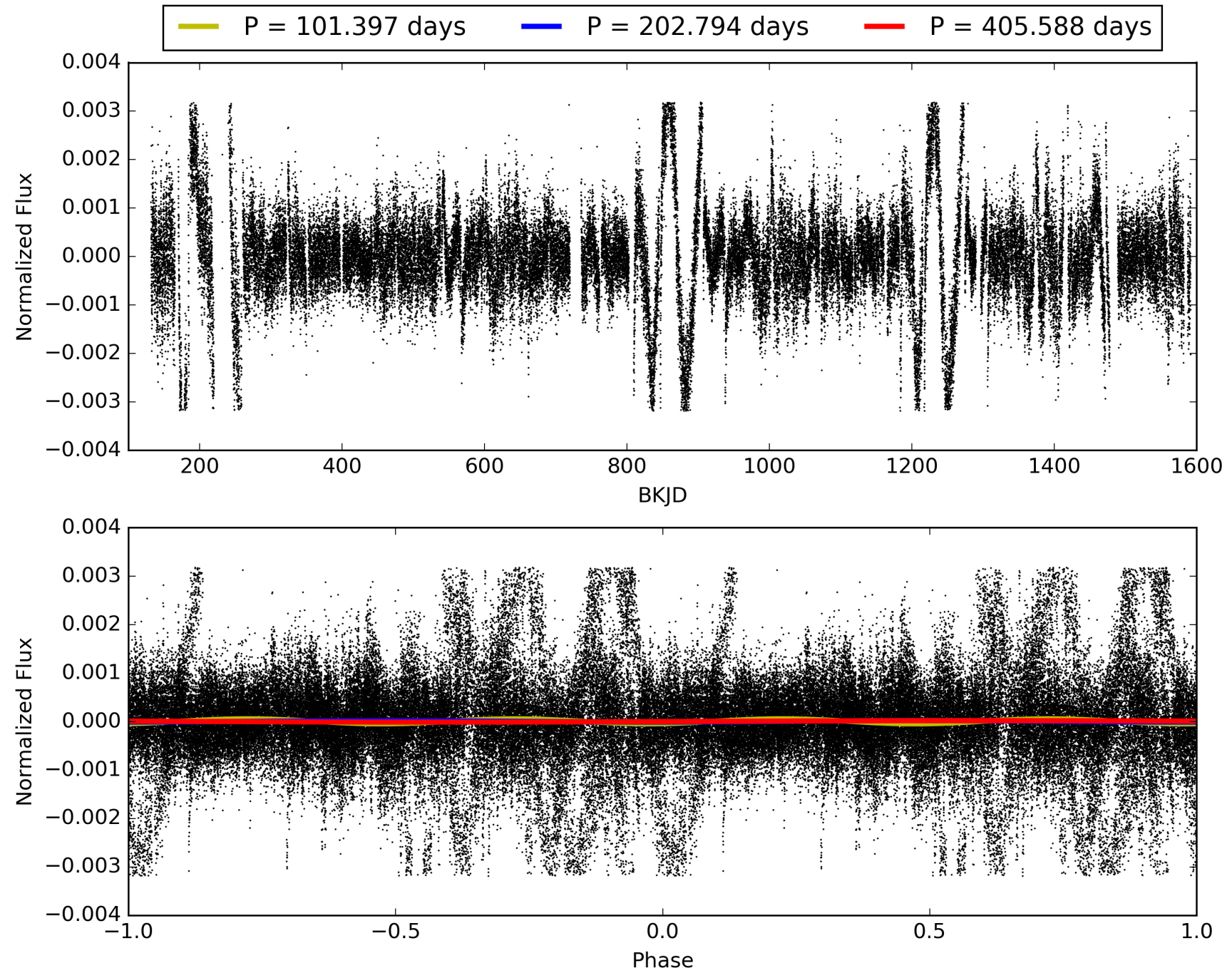
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:54:56 Z

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

# TCE 005219580-03, PDC Light Curves

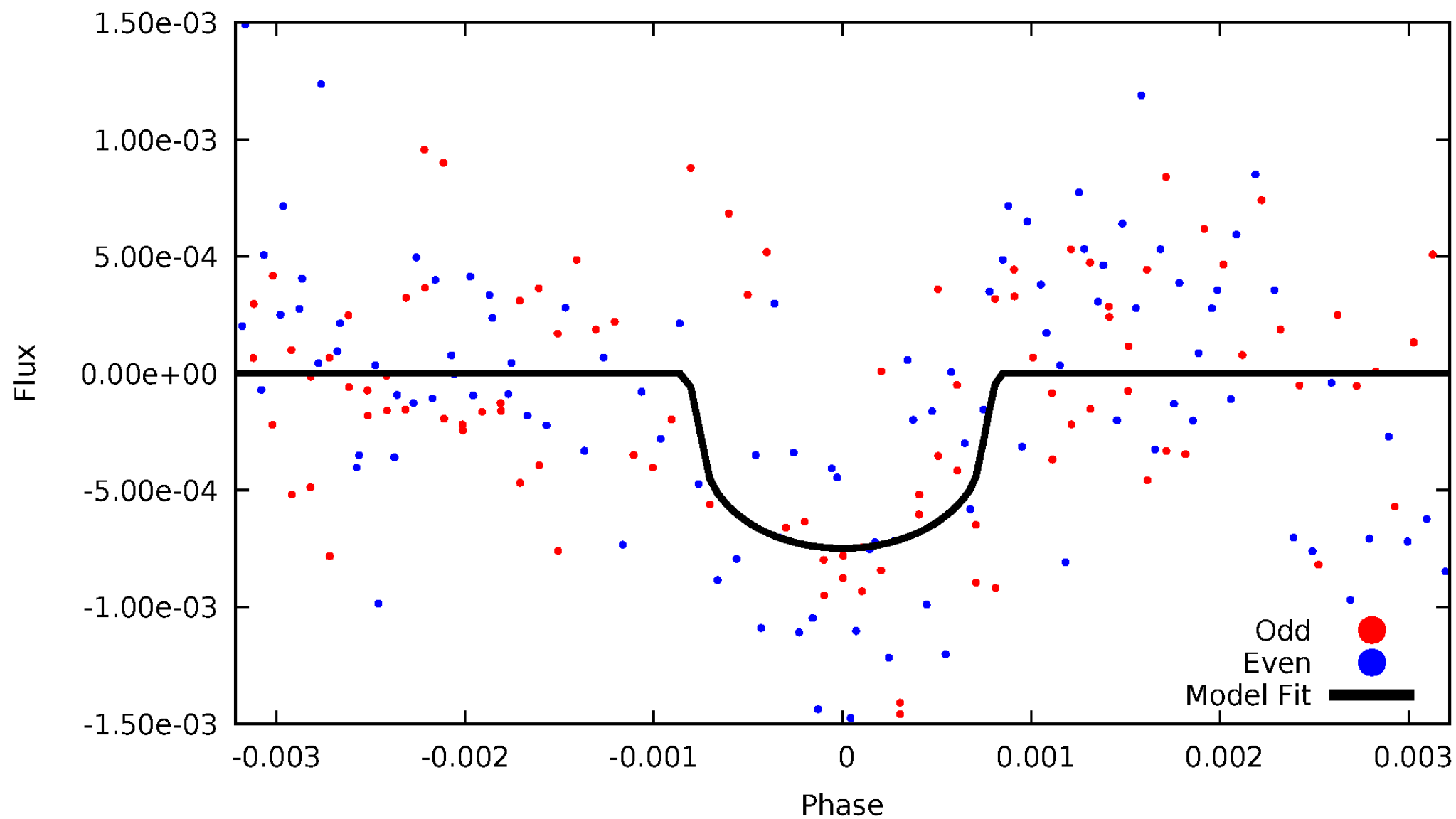


TCE 005219580-03



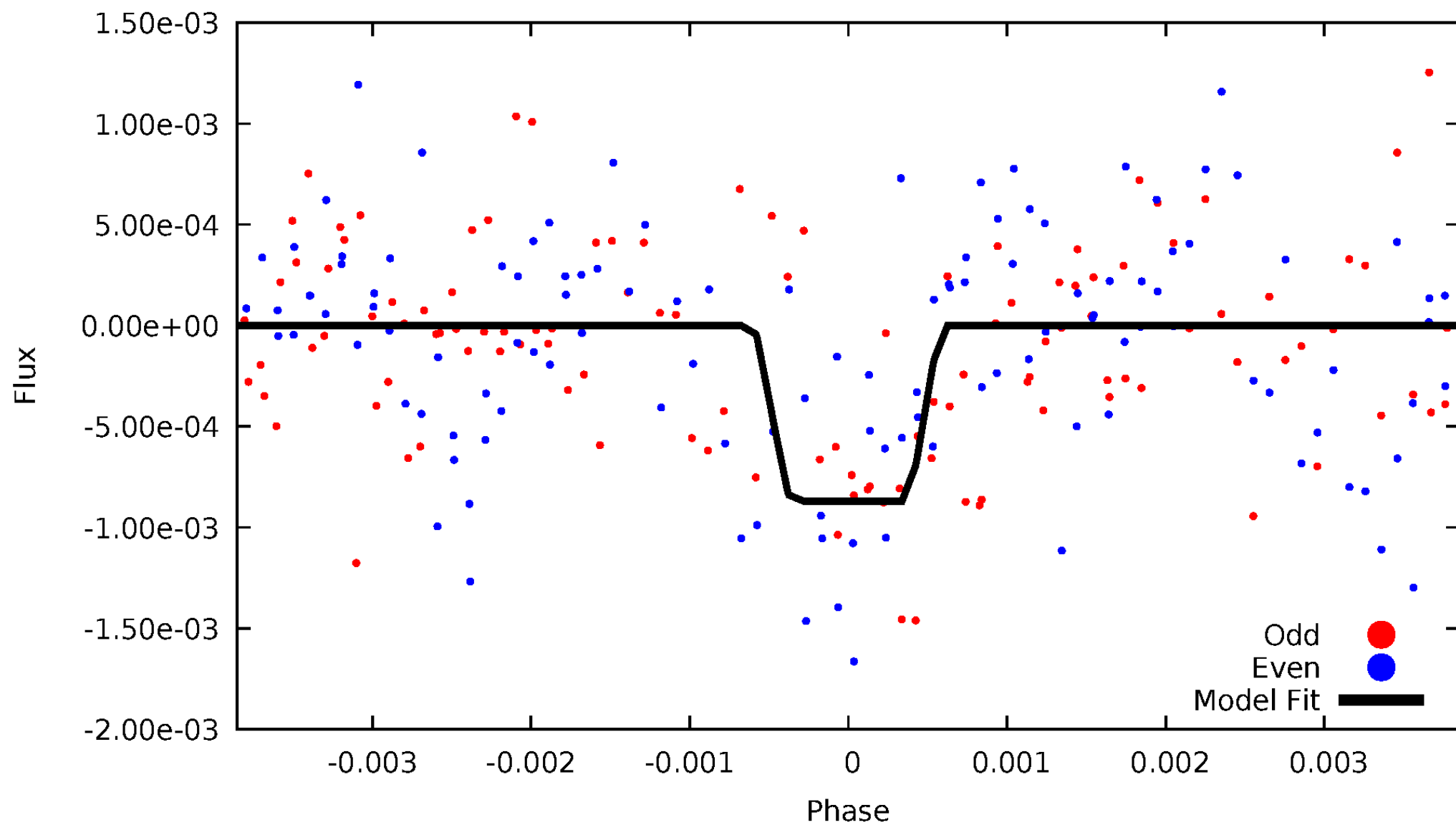
# DV Odd/Even

TCE 005219580-03



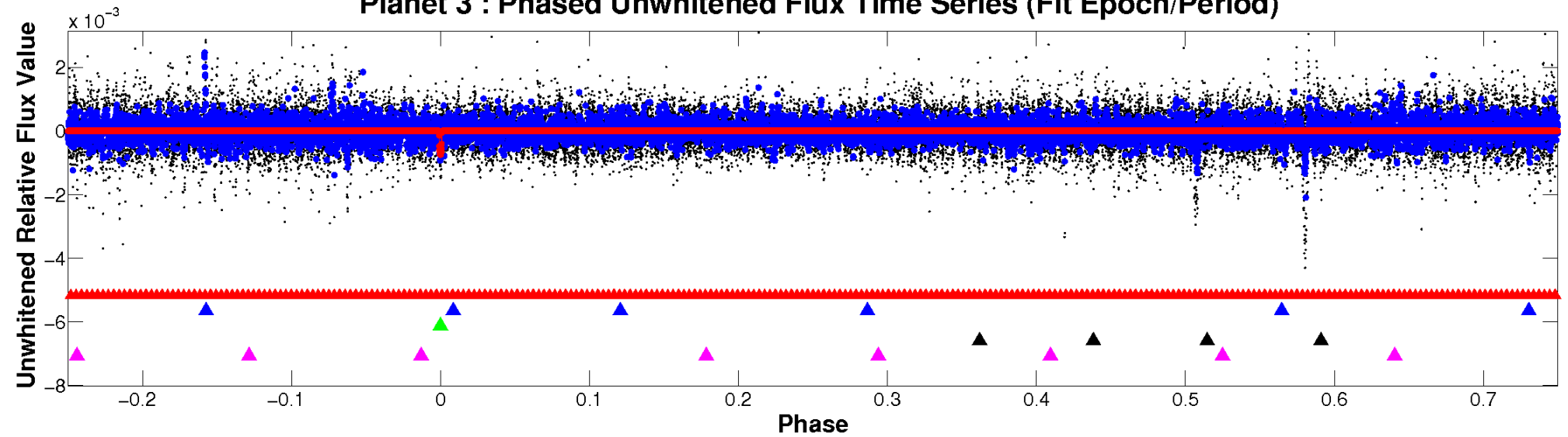
# ALT Odd/Even

TCE 005219580-03

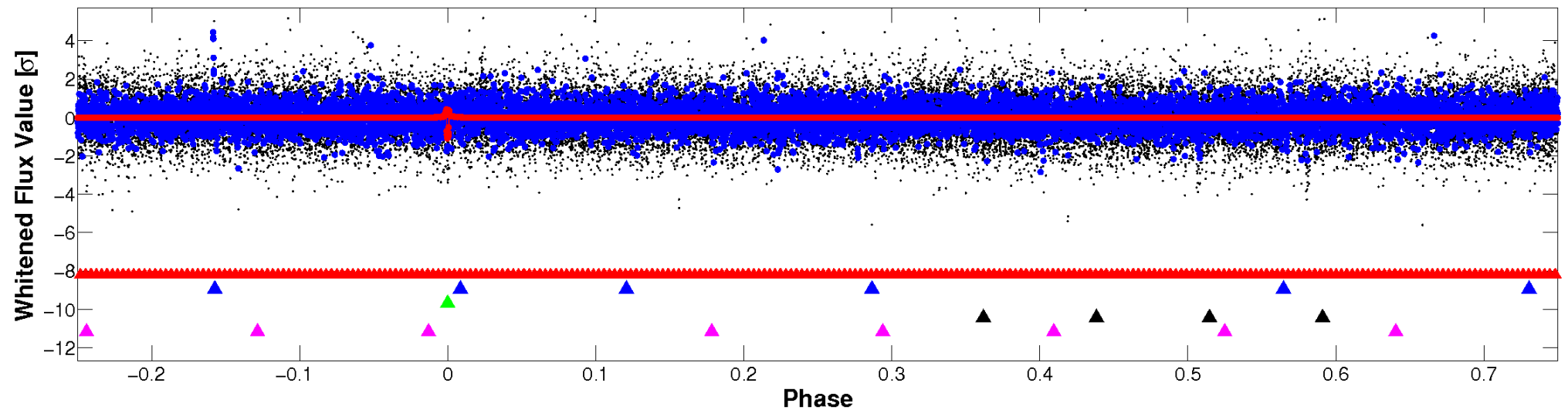


# Non-Whitened Vs. Whitened Light Curve

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



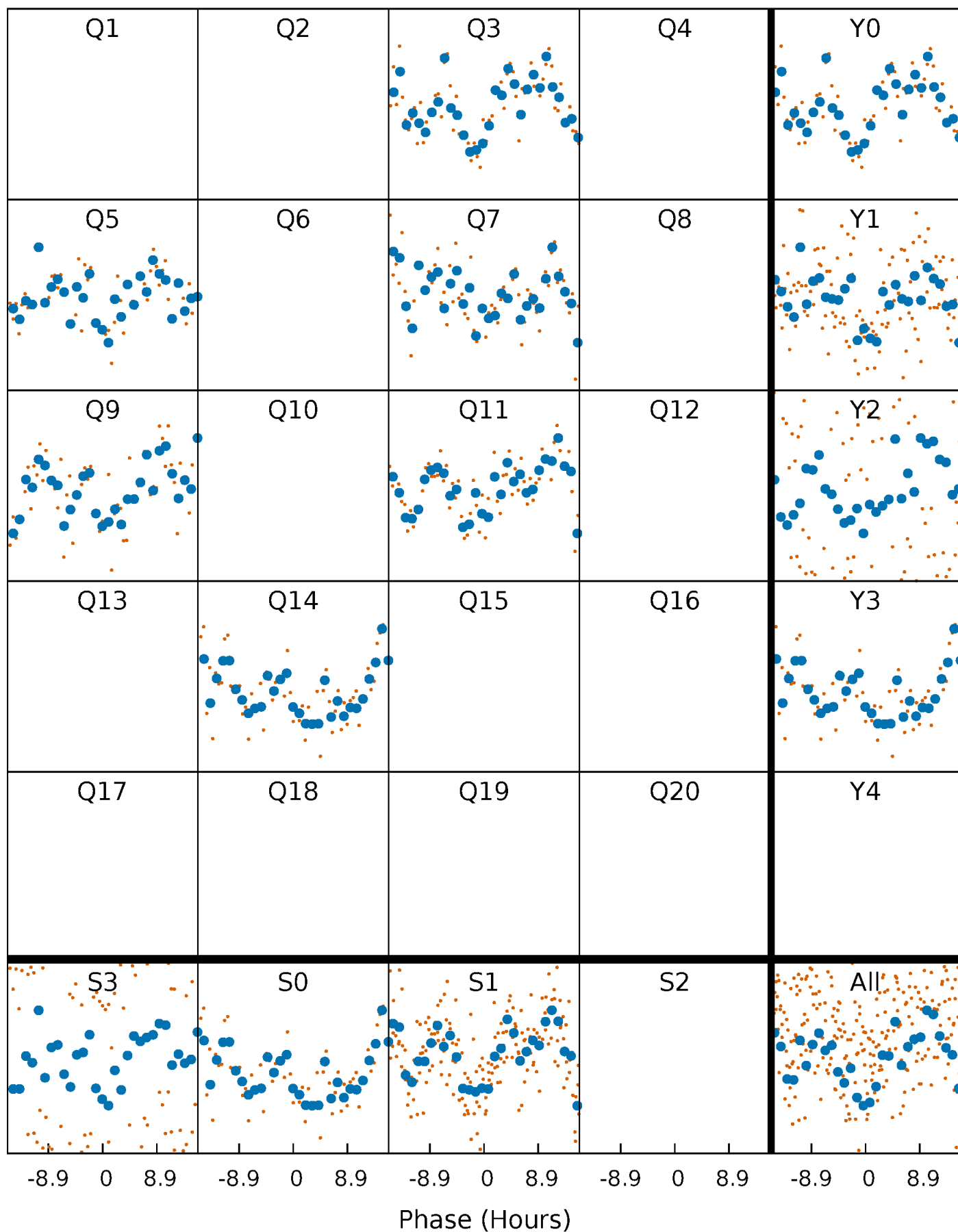
Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





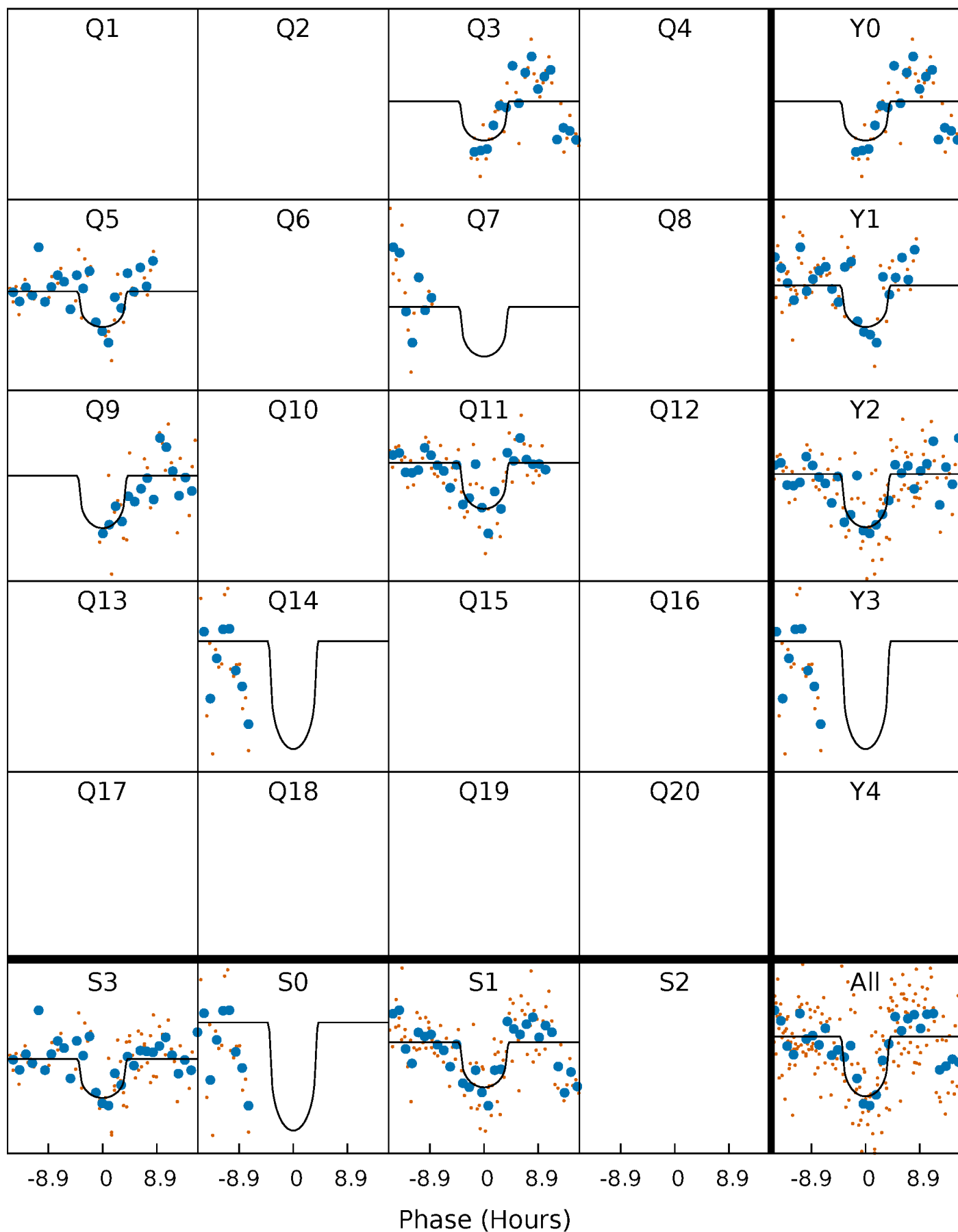
# PDC Quarter-Phased Transit Curves

TCE 005219580-03 P=202.793902 Days  $T_0=269.385223$  (BKJD)



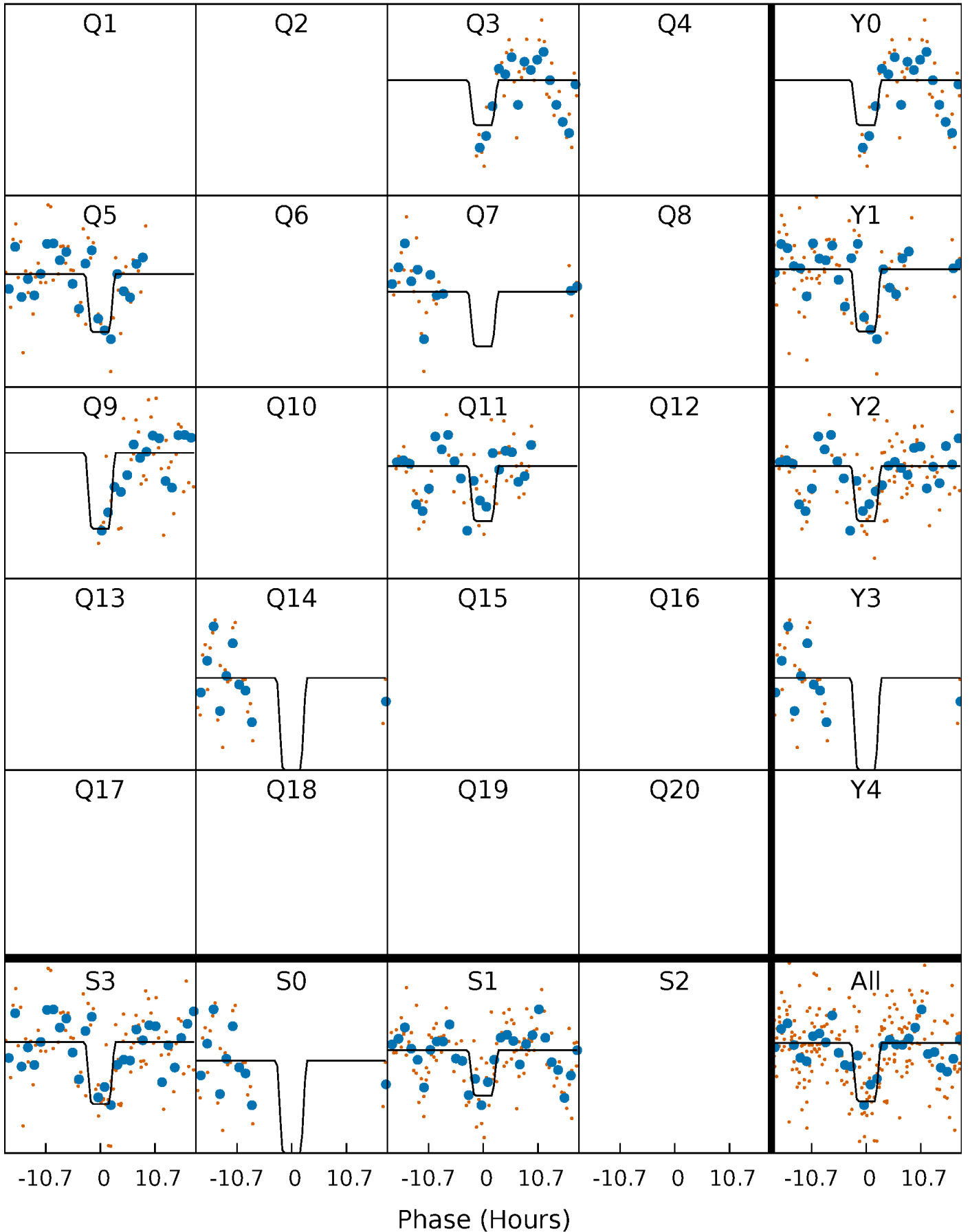
# DV Quarter-Phased Transit Curves

TCE 005219580-03     $P=202.793902$  Days     $T_0=269.385223$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

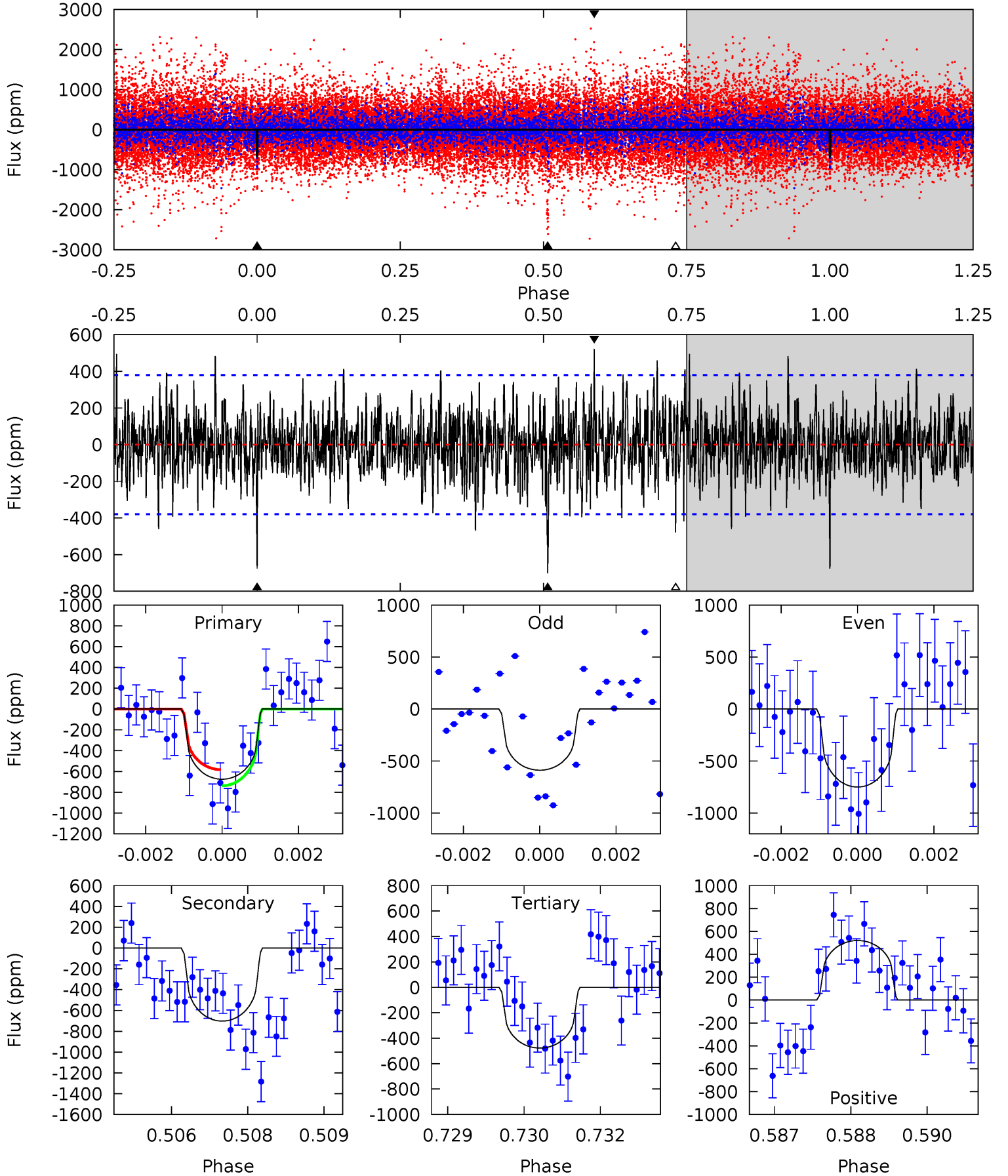
TCE 005219580-03     $P=202.802998$  Days     $T_0=269.351649$  (BKJD)



# DV Model-Shift Uniqueness Test

005219580-03, P = 202.793902 Days, E = 66.591321 Days

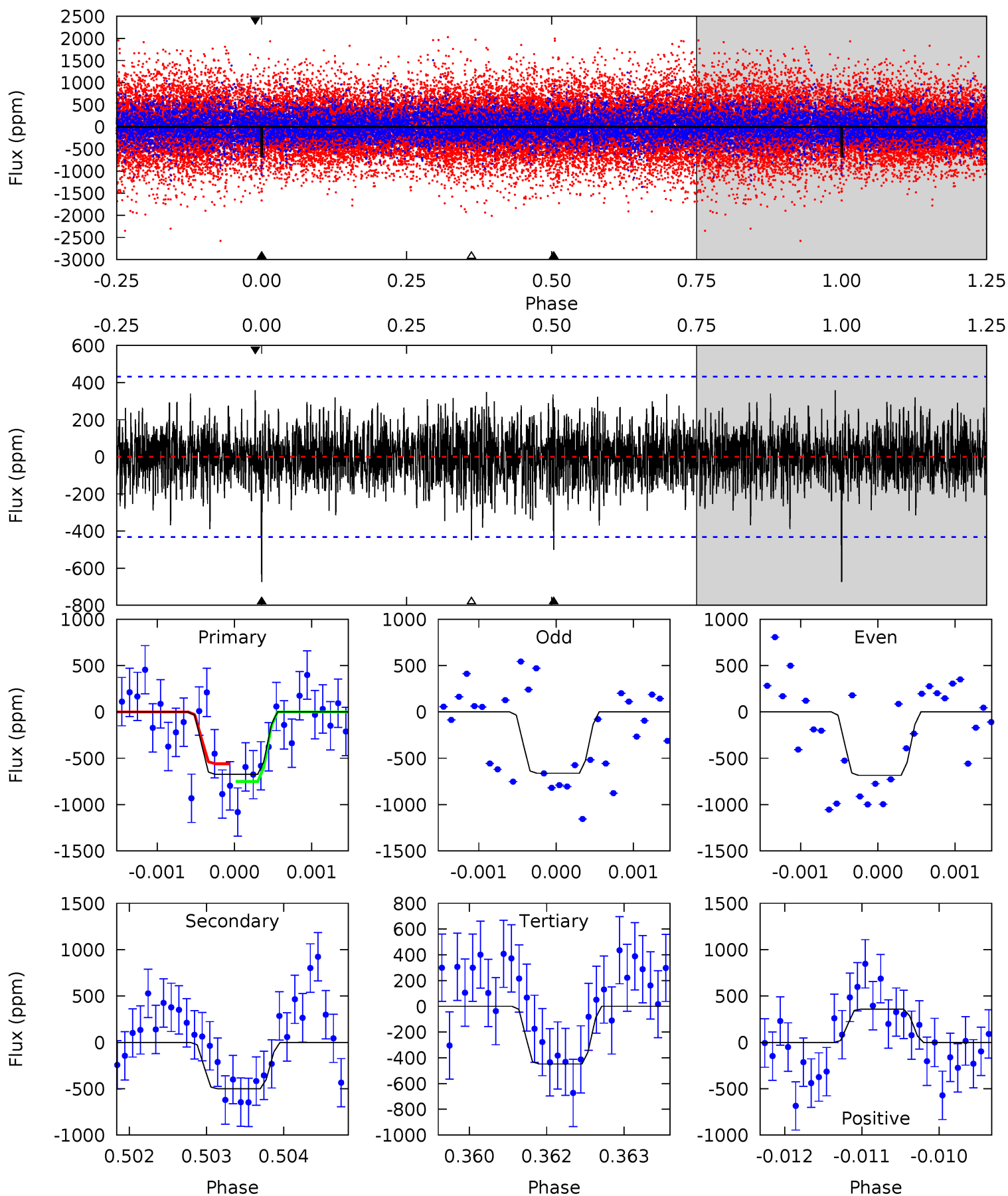
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.54	9.93	6.75	7.35	5.37	3.15	1.98	2.79	2.19	3.18	2.57	1.11	0.92	0.43	1.02



# Alt Model-Shift Uniqueness Test

005219580-03, P = 202.802998 Days, E = 66.548651 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
8.47	6.30	5.63	4.50	5.43	3.26	1.40	2.84	3.97	0.67	1.80	0.14	1.01	0.35	1.16



### Stellar Parameters For KIC 005219580

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4841^{+175}_{-175}$	$4.559^{+0.061}_{-0.039}$	$-0.060^{+0.300}_{-0.300}$	$0.741^{+0.062}_{-0.068}$	$0.726^{+0.081}_{-0.061}$	$2.516^{+0.712}_{-0.385}$
	+4%/-4%	+1%/-1%	+500%/-500%	+8%/-9%	+11%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005219580-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-702 \pm 71$	$2.61^{+1.87}_{-1.66}$	$328^{+14}_{-13}$	$4467^{+2620}_{-800}$	$21042^{+140378}_{-13860}$
Alt.	$-501 \pm 80$	$2.57^{+1.87}_{-1.51}$	$328^{+14}_{-14}$	$4248^{+1917}_{-784}$	$15849^{+75593}_{-10743}$

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

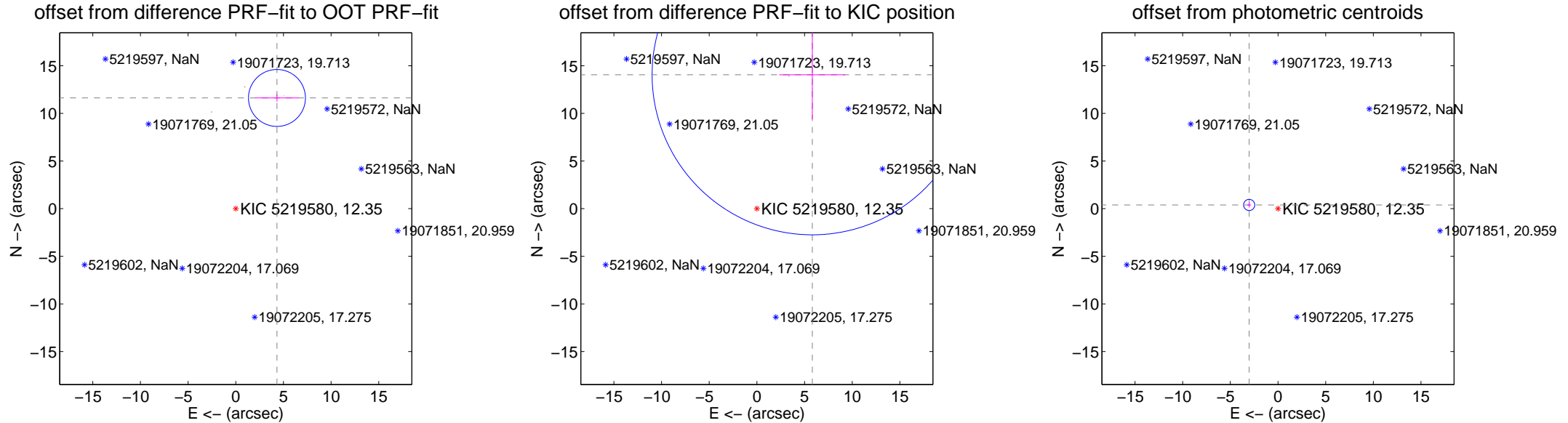
## DV Centroid Data

Supplemental centroid analysis for 005219580-03. Kepler magnitude: 12.35. Transit SNR 6.99

There are 2 quarters with good PRF difference image offsets

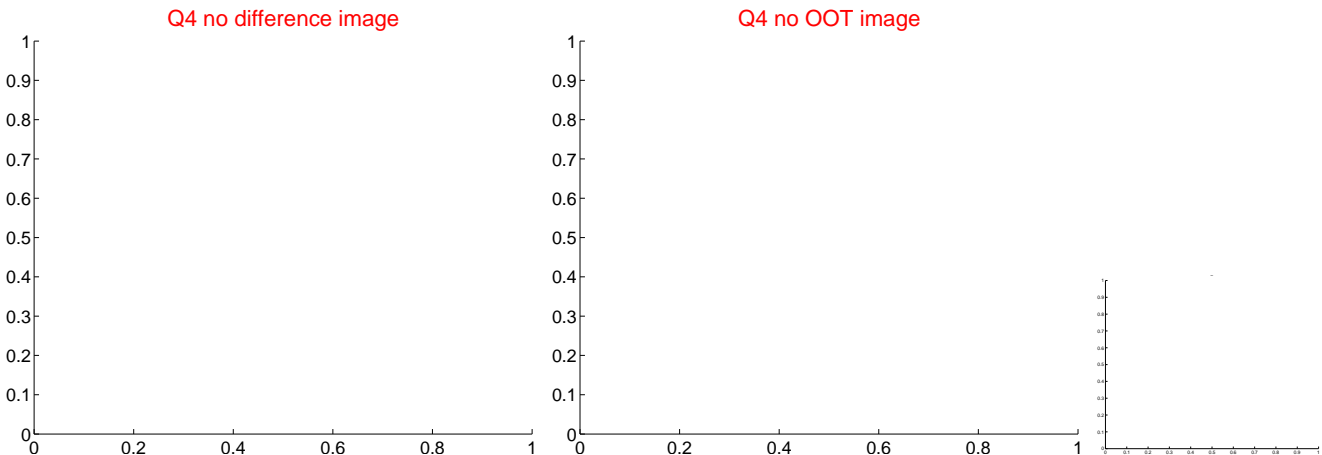
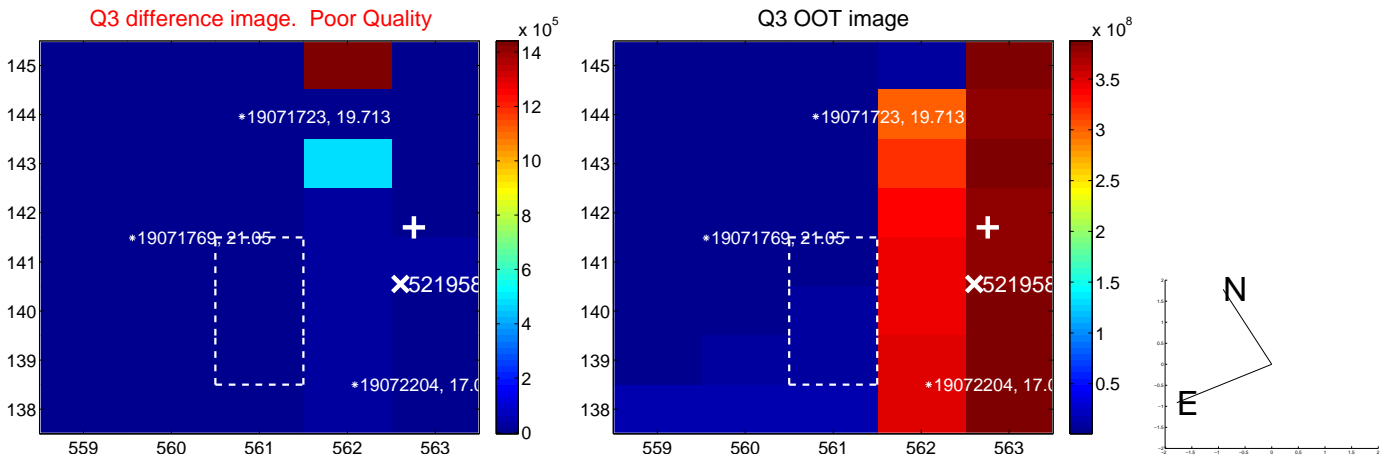
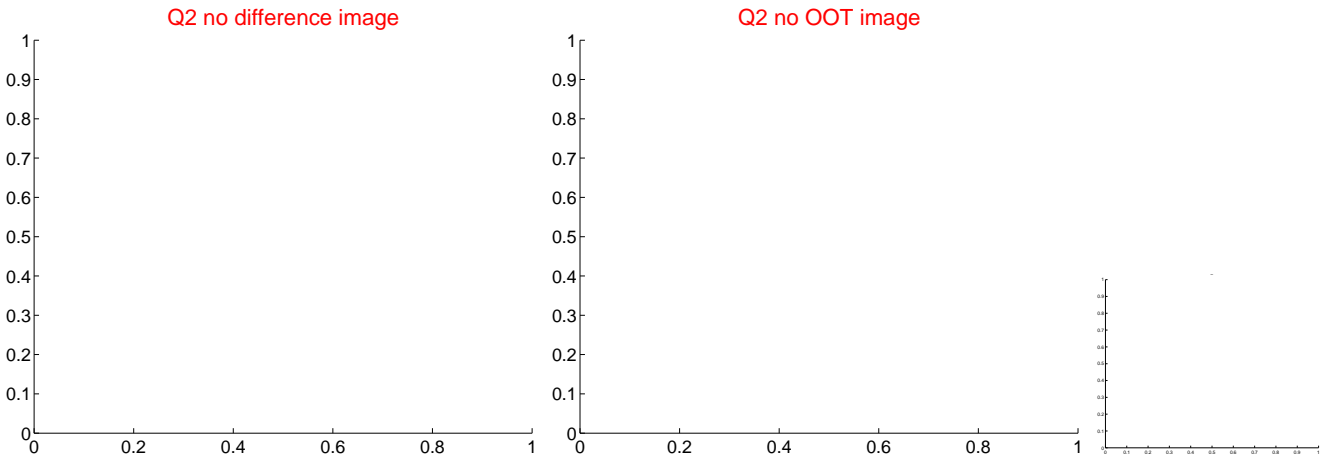
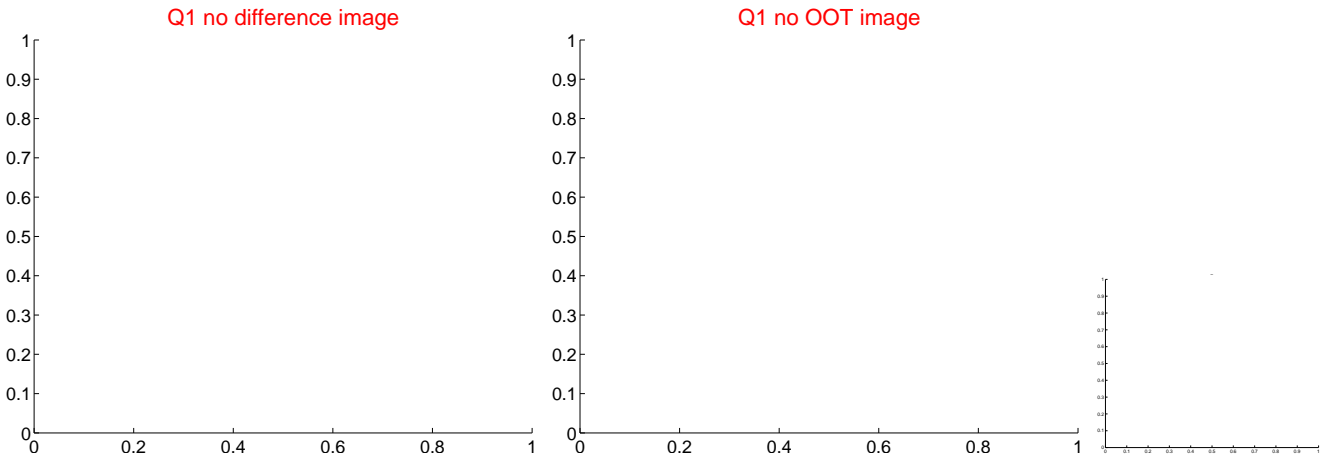
The OOT PRF centroid is offset from the target star catalog position by about 7.03 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$12.402 \pm 0.996$	12.45	$-4.321 \pm 2.245$	$11.625 \pm 0.390$
PRF-fit source offset from KIC position	$15.215 \pm 5.602$	2.72	$-5.813 \pm 3.467$	$14.061 \pm 4.659$
photometric centroid source offset	$3.05 \pm 0.20$	15.62	$3.02 \pm 0.19$	$0.39 \pm 0.27$

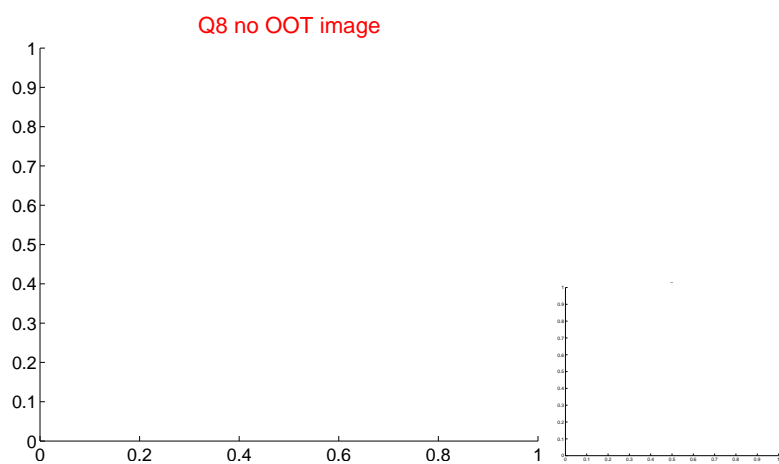
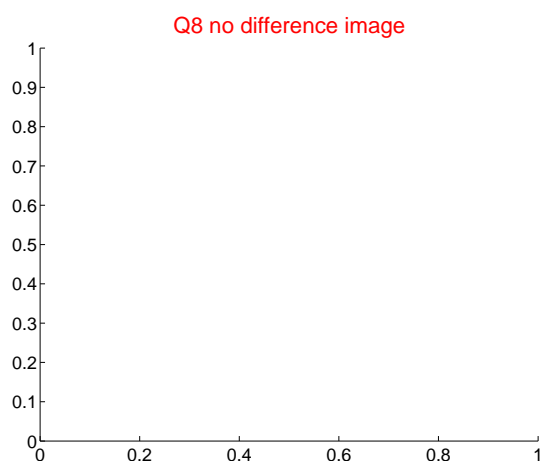
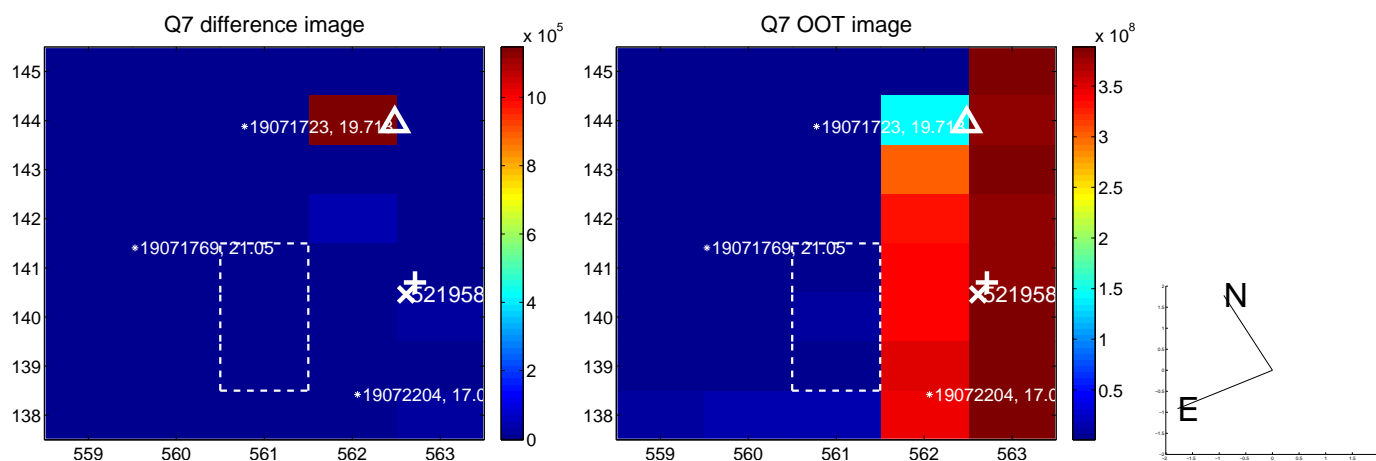
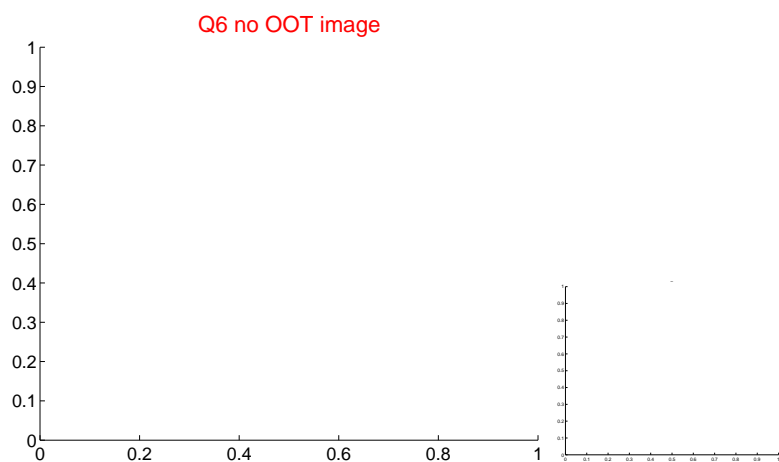
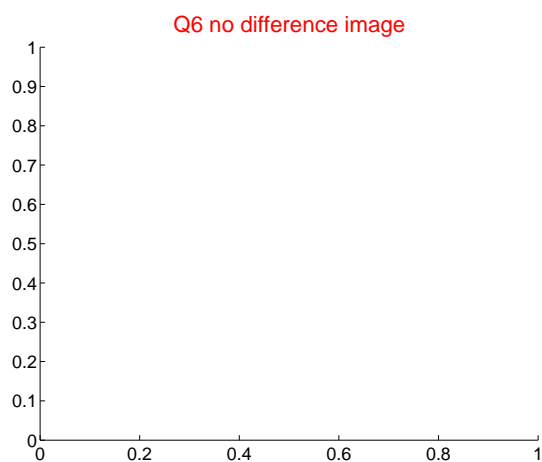
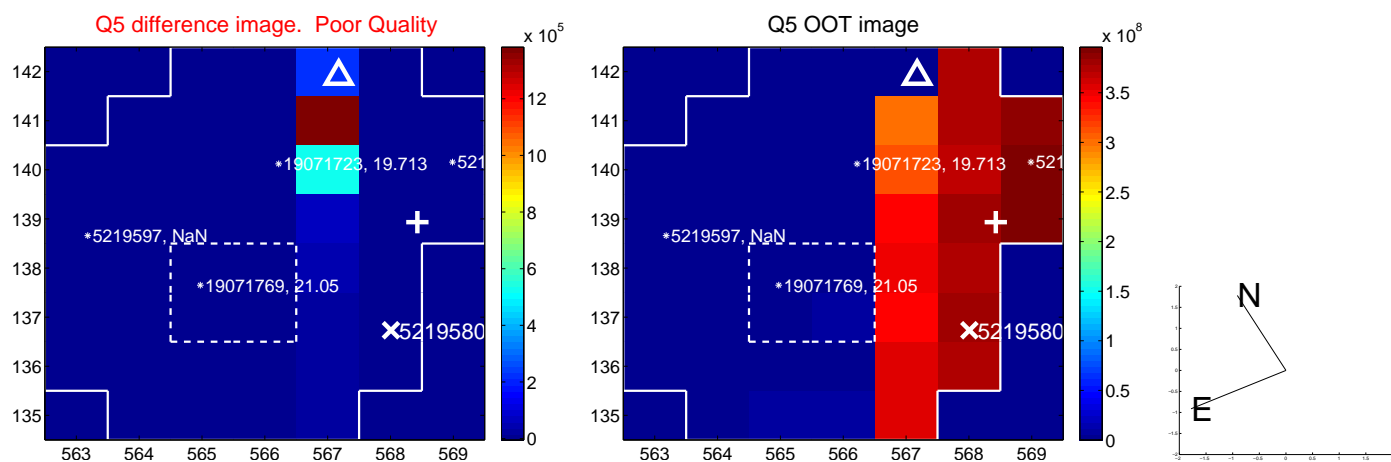




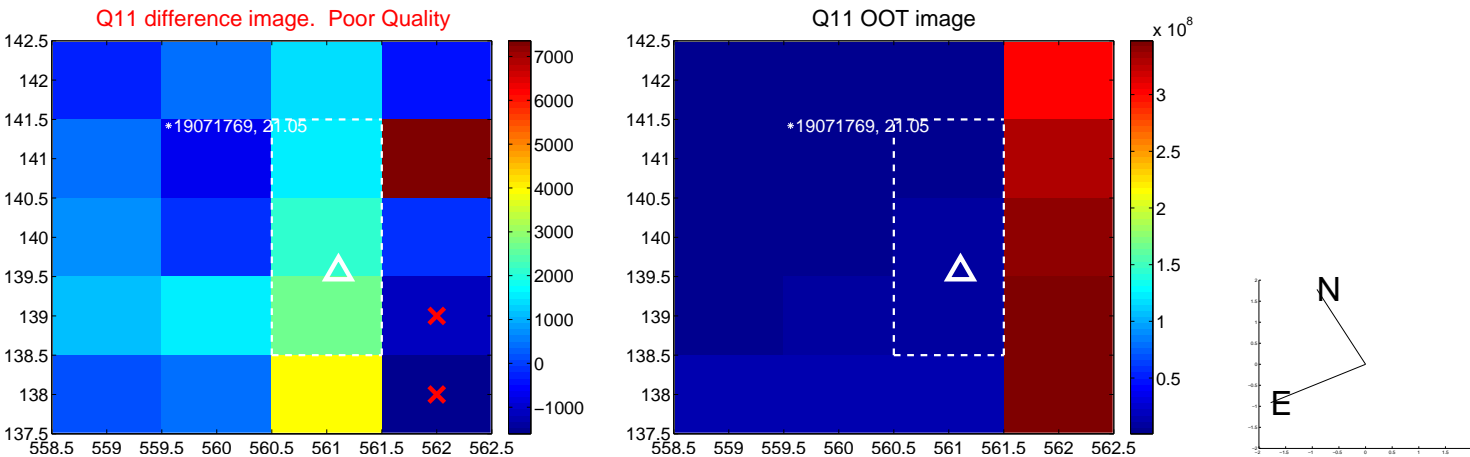
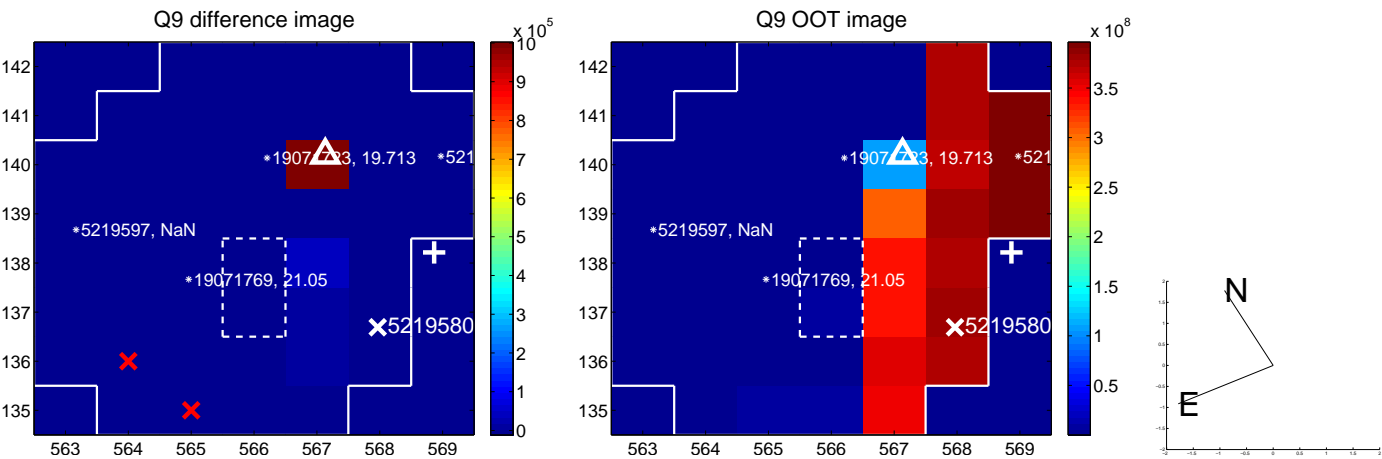
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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



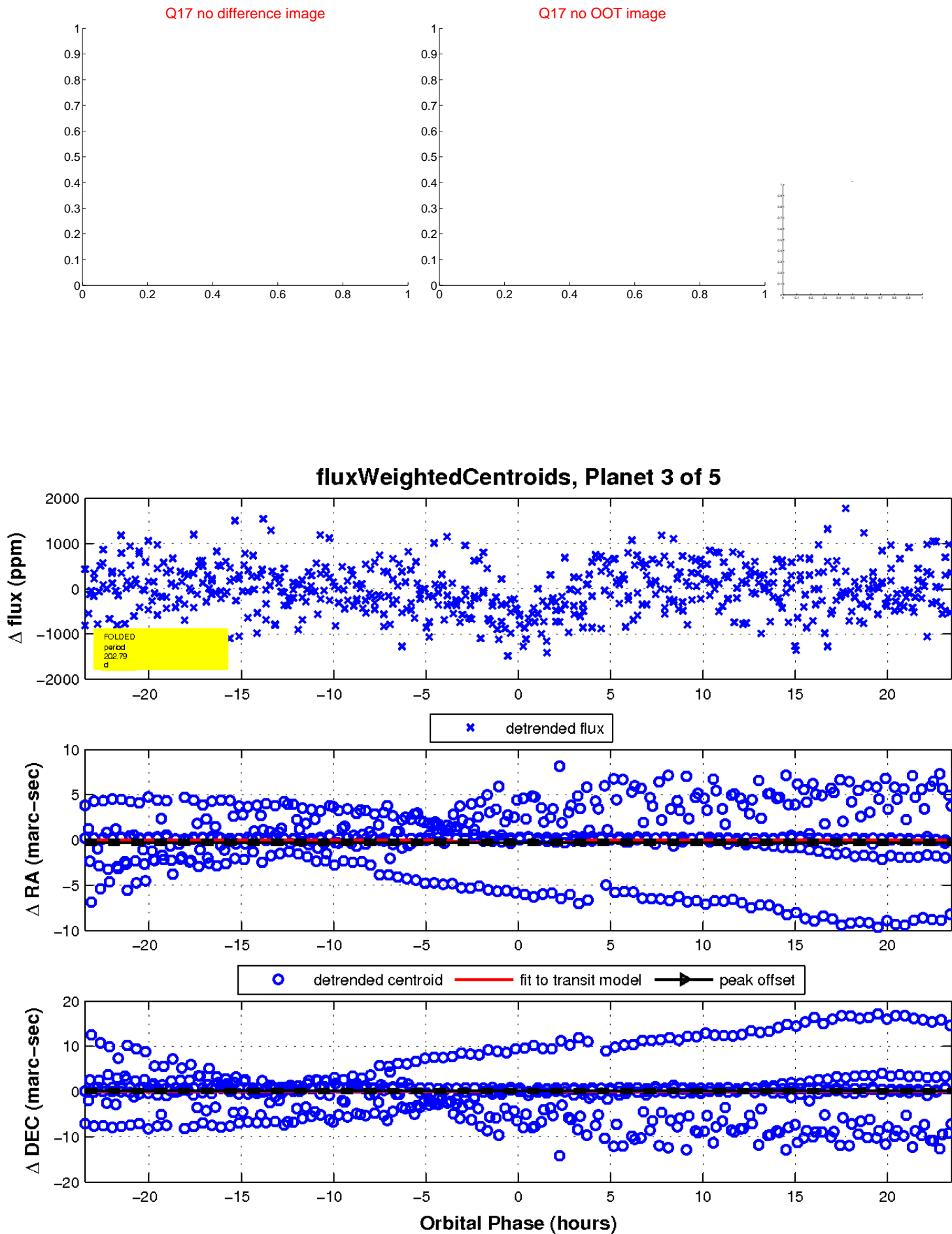
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



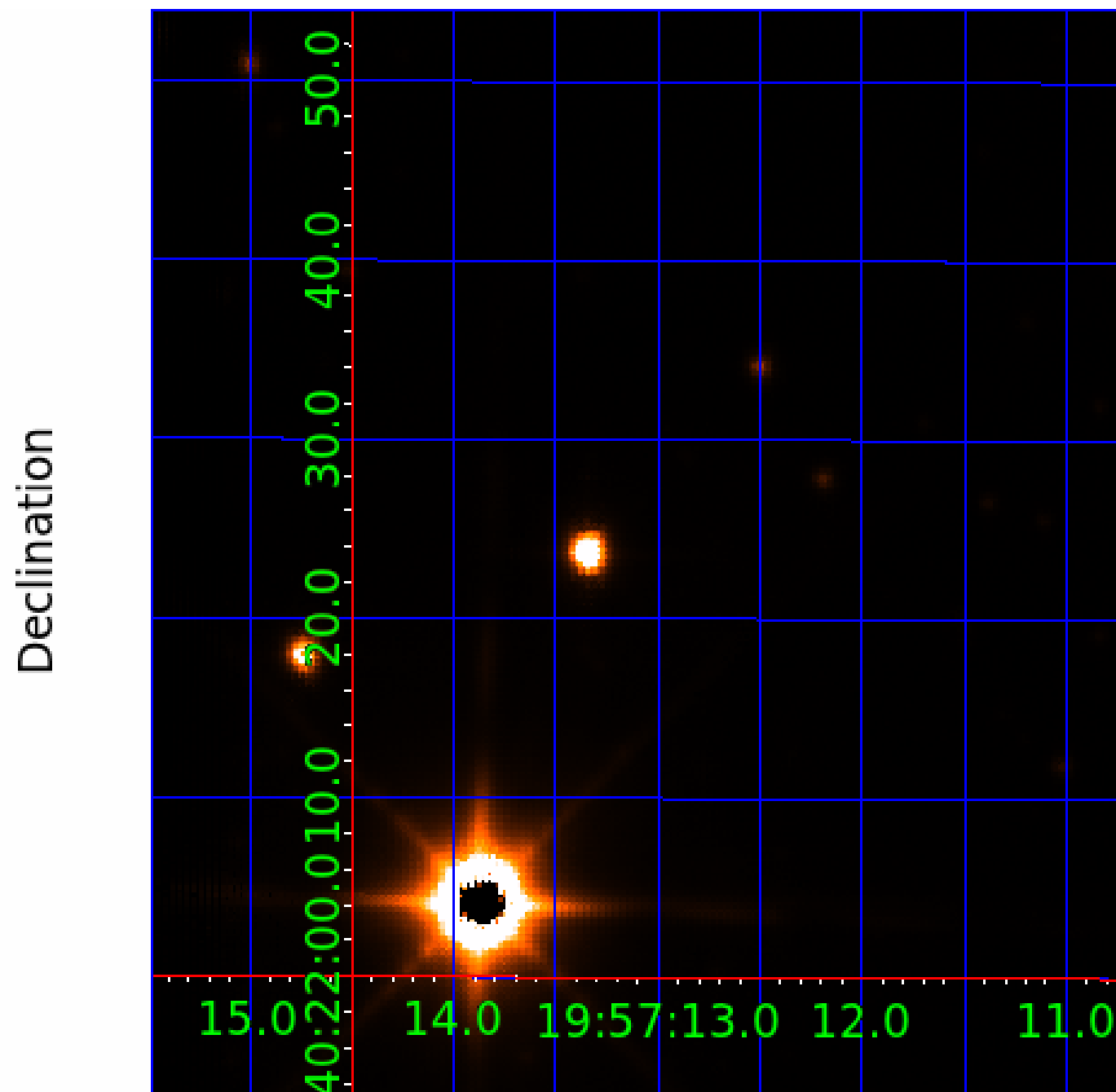
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005219580

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005219580-01	OBS	No	2.196547	132.594205	64.7	8.114	7.8	6.4	0.74	4841	0.73	305.86
005219580-02	OBS	No	259.177853	214.740648	994.7	6.162	7.8	7.7	0.74	4841	4.49	0.53
005219580-03	OBS	No	202.793901	269.385223	749.2	7.826	7.5	7.0	0.74	4841	2.12	0.73
005219580-04	OBS	No	390.098929	186.446416	1294.3	3.556	7.6	8.3	0.74	4841	3.28	0.31
005219580-05	OBS	No	179.366731	266.760921	816.1	6.676	7.4	6.7	0.74	4841	2.38	0.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005219580-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-02	OBS	FP	0.00	1	0	1	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

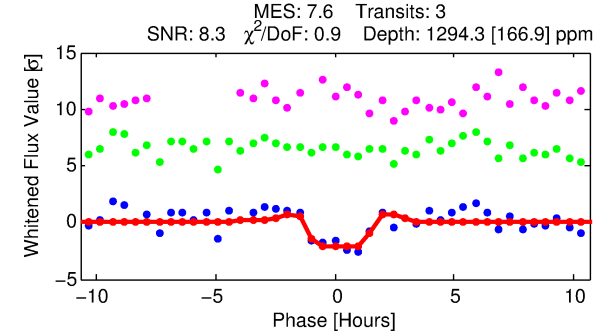
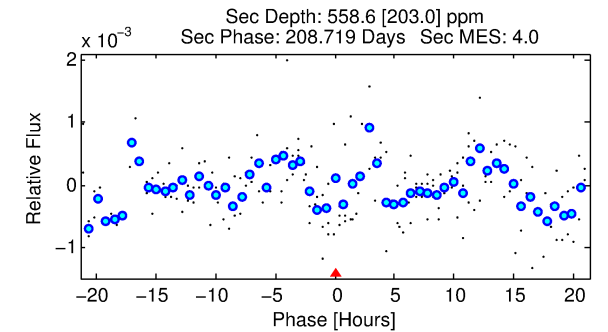
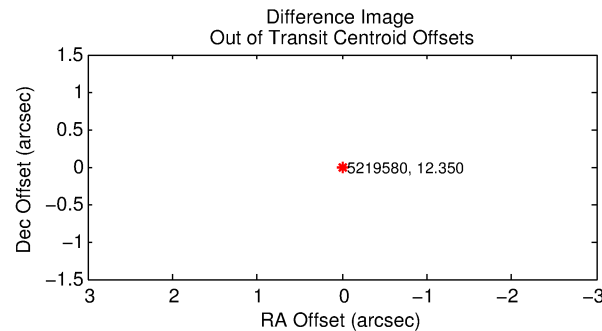
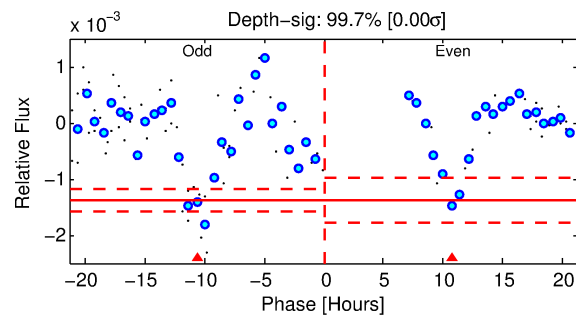
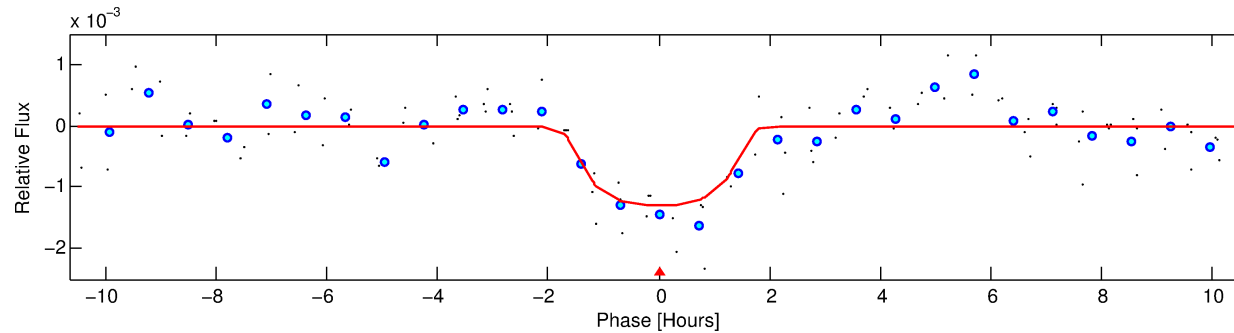
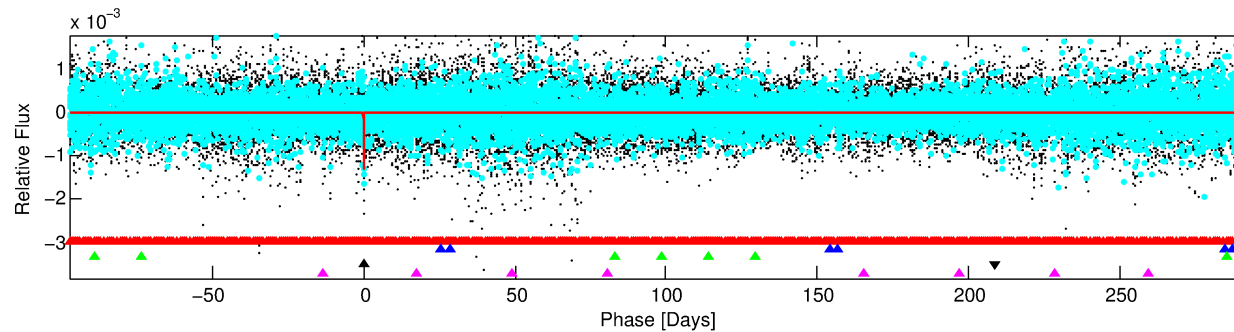
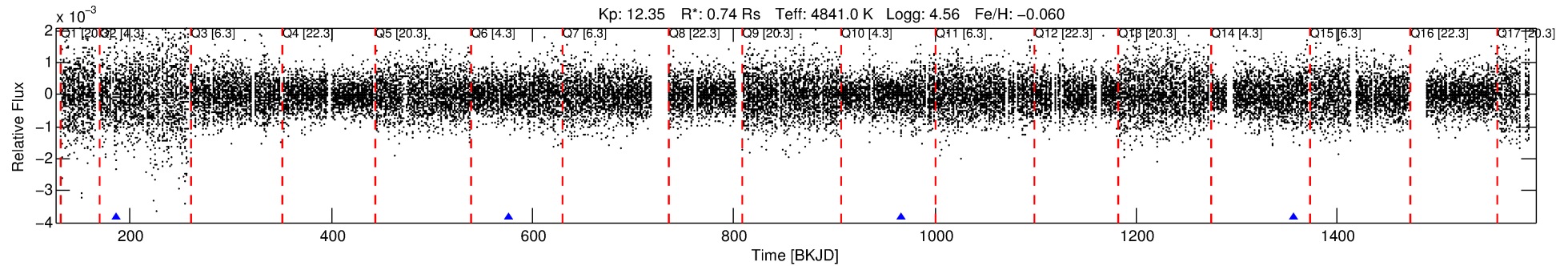
Ephemeris Match Information For 005219580-04

No Significant Match Found



# DV One-Page Summary

KIC: 5219580 Candidate: 4 of 5 Period: 390.099 d



## DV Fit Results:

Period = 390.09893 [0.00413] d  
Epoch = 186.4464 [0.0100] BKJD  
Rp/R\* = 0.0405 [0.0057]  
a/R\* = 436.18 [187.06]  
b = 0.90 [0.09]  
Seff = 0.31 [0.06]  
Teq = 190 [9] K  
Rp = 3.28 [0.55] Re  
a = 0.9391 [0.0723] AU  
Ag = 25244.00 [11952.11] [2.11σ]  
Teffp = 3697 [446] K [7.87σ]

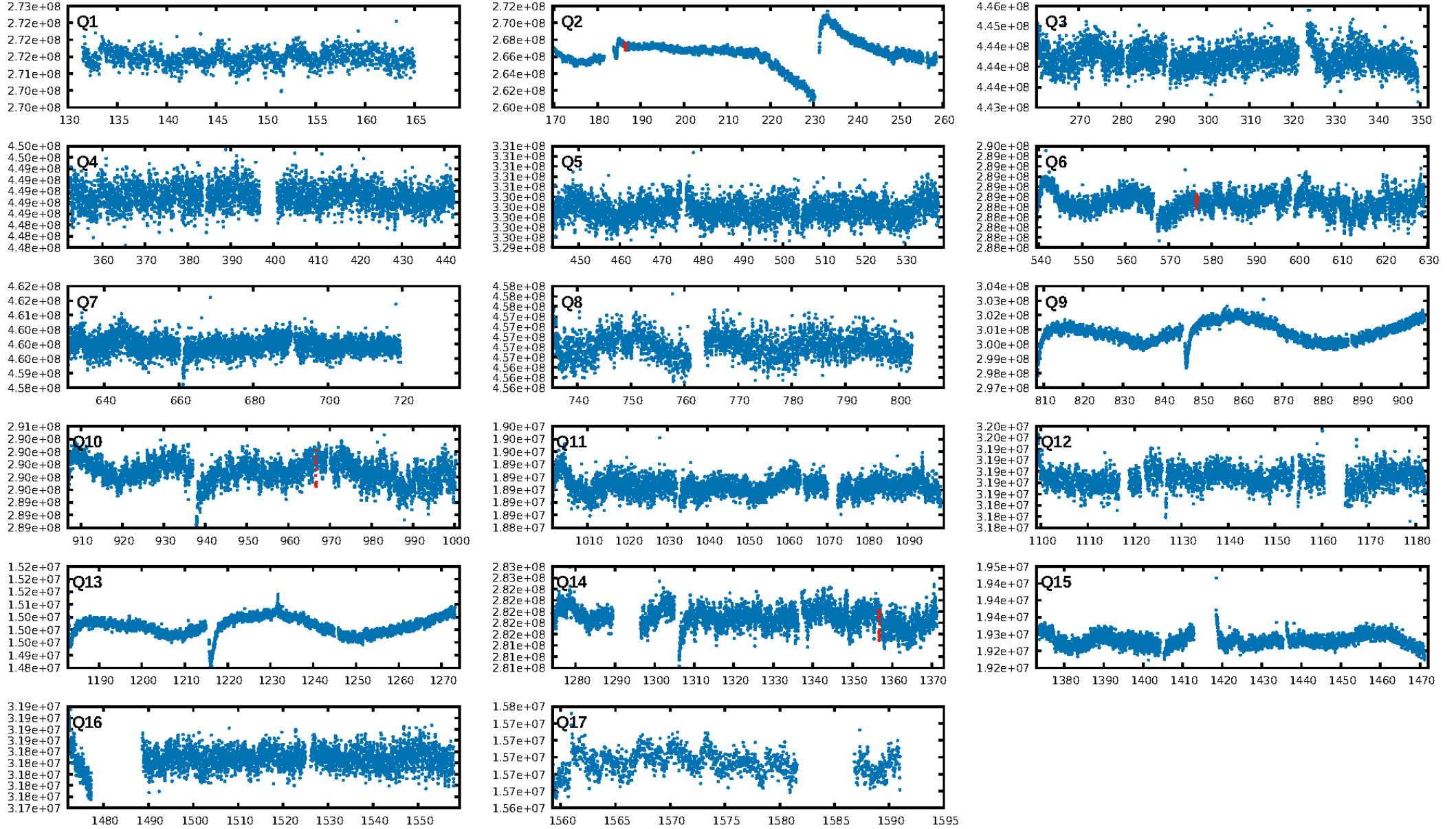
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [441.67σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 42.1%  
ModelChiSquareGof-sig: 99.7%  
**Bootstrap-pfa: 2.66e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 16.2%  
**Centroid-so: 2.682 arcsec [37.53σ]**  
OotOffset-rm: N/A  
KicOffset-rm: 5.393 arcsec [2.82σ]  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.67 [2/3]

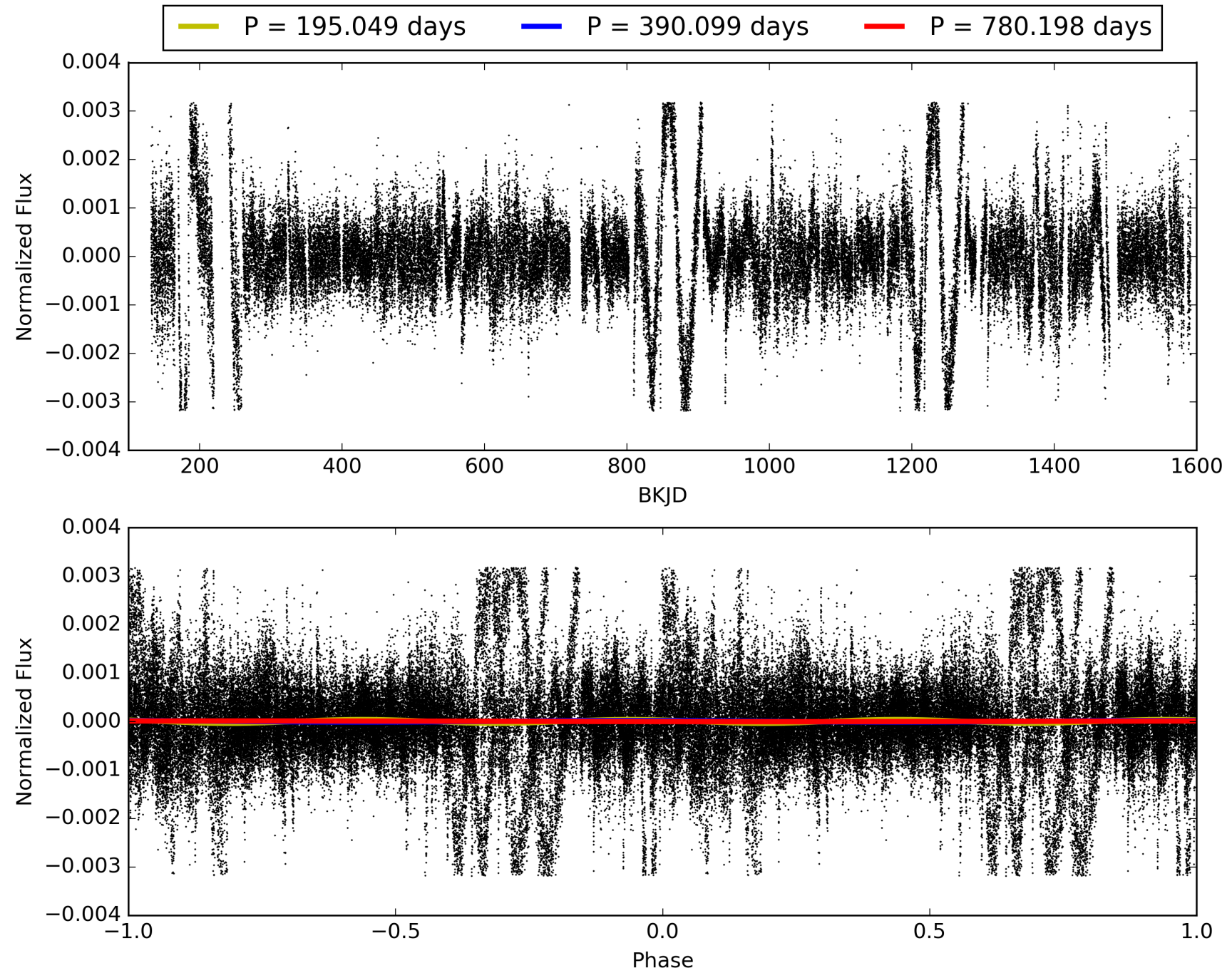
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:55:06 Z

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

# TCE 005219580-04, PDC Light Curves

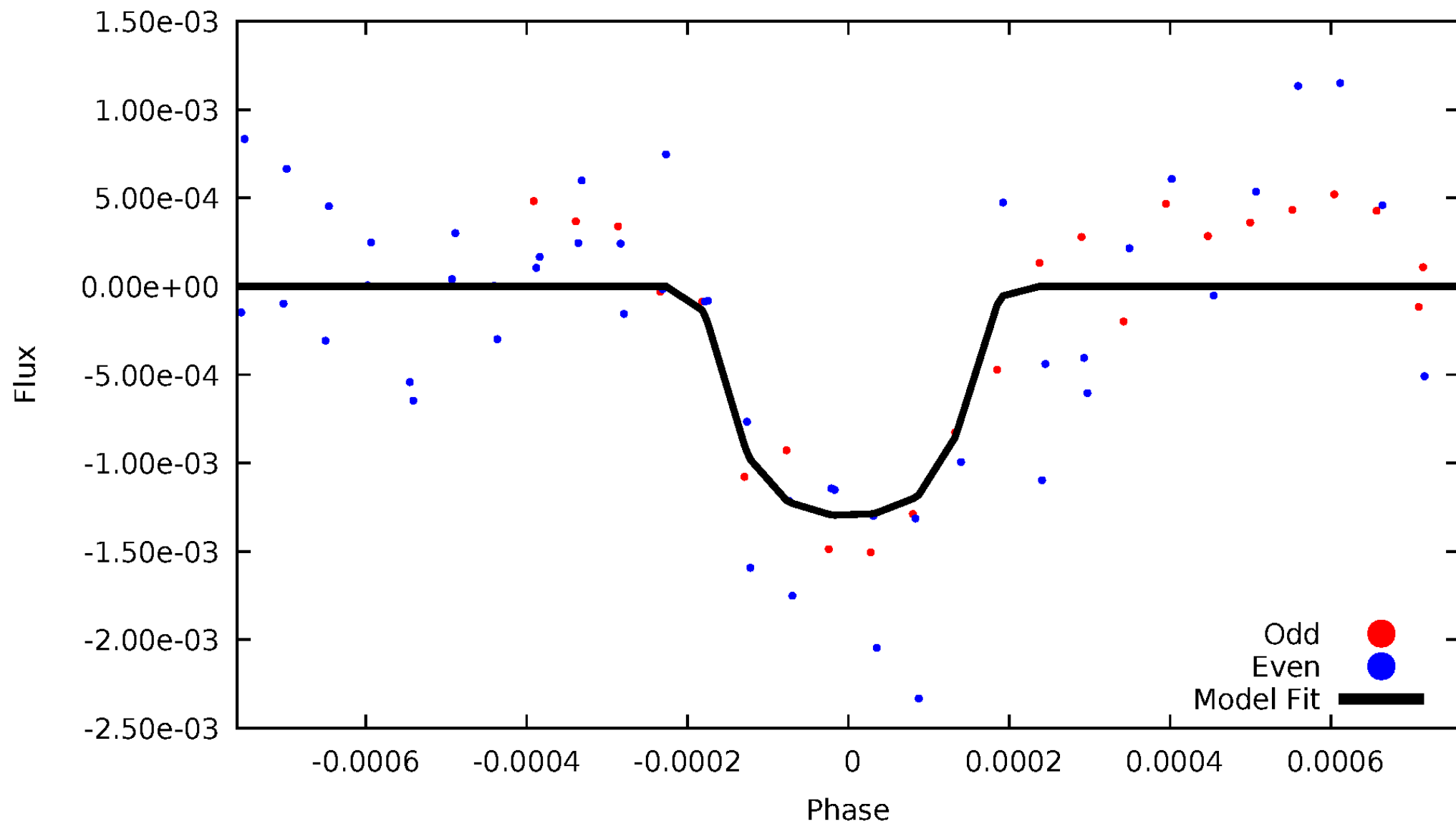


TCE 005219580-04



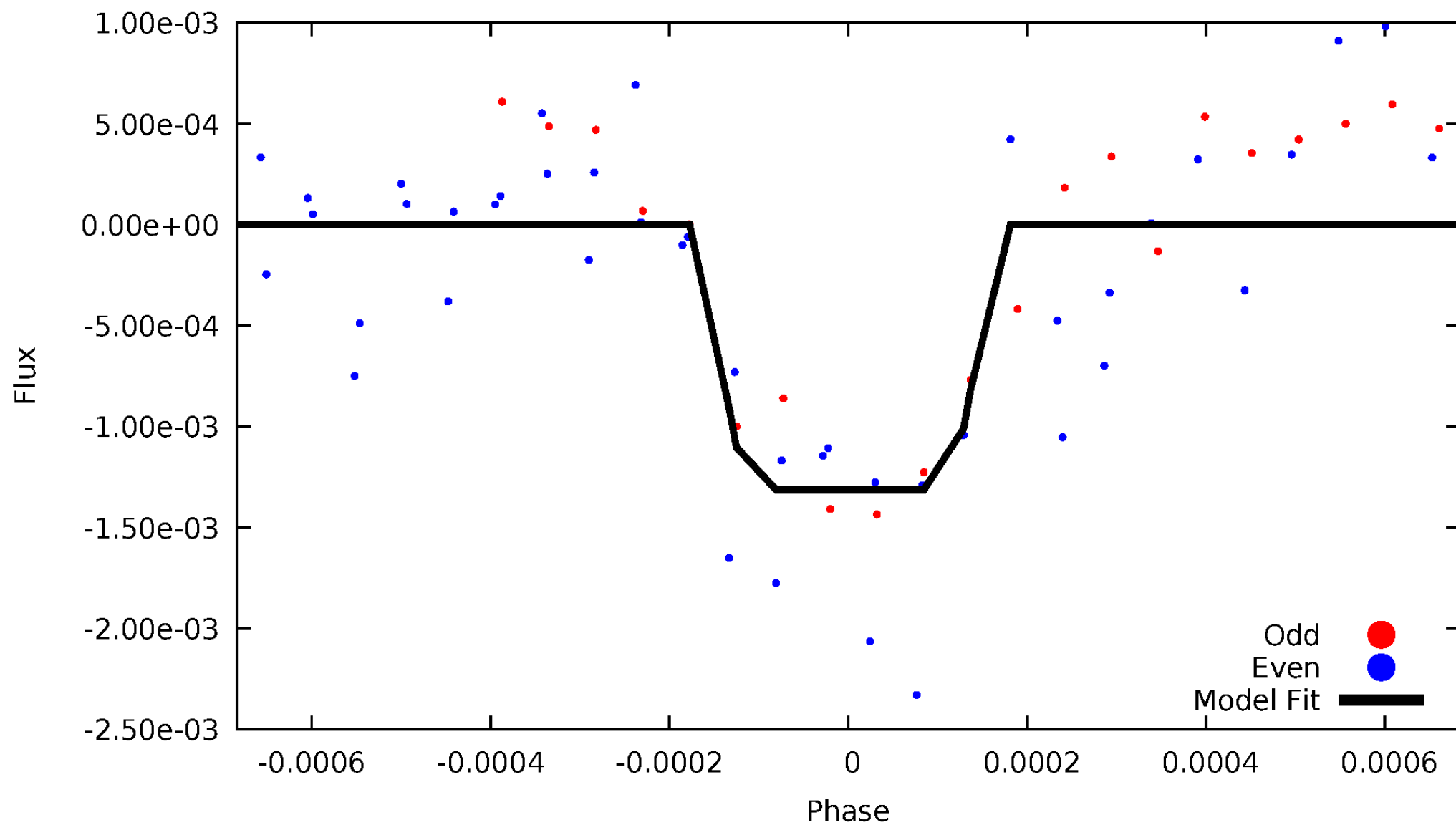
# DV Odd/Even

TCE 005219580-04



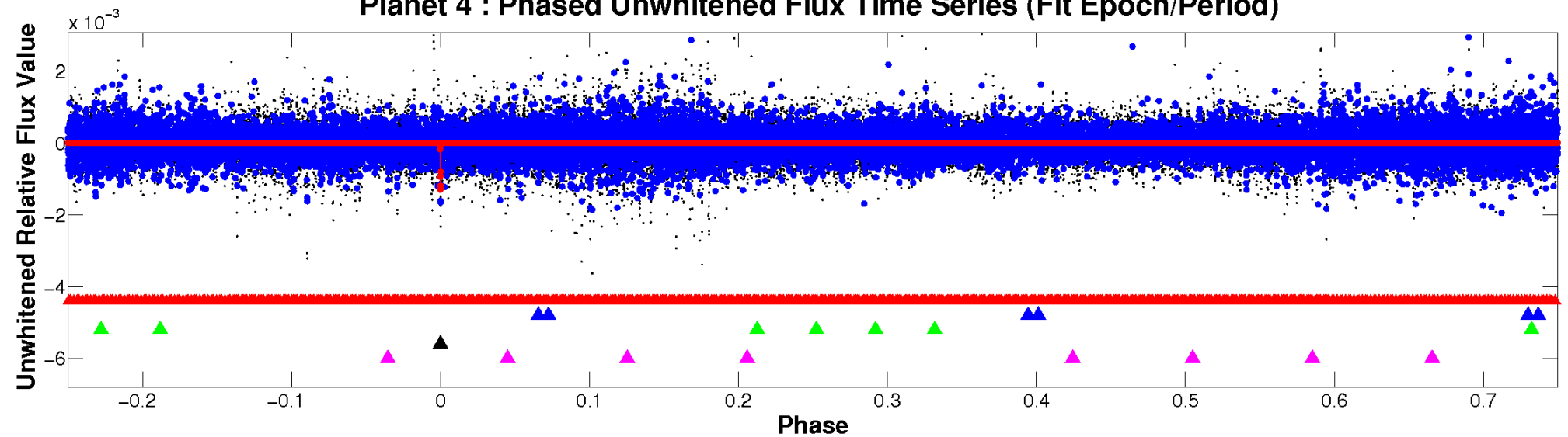
# ALT Odd/Even

TCE 005219580-04

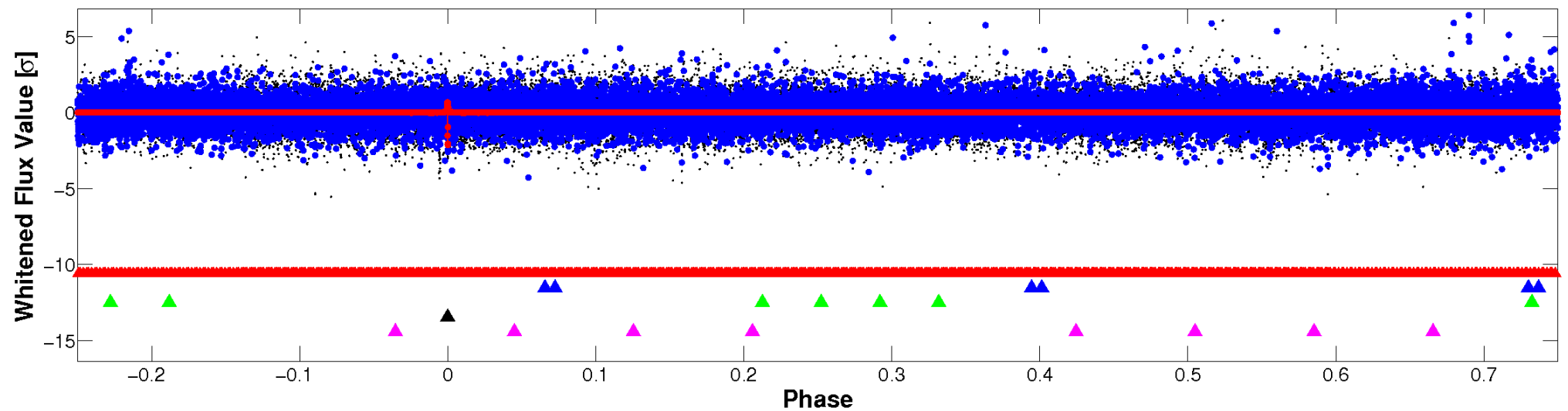


# Non-Whitened Vs. Whitened Light Curve

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

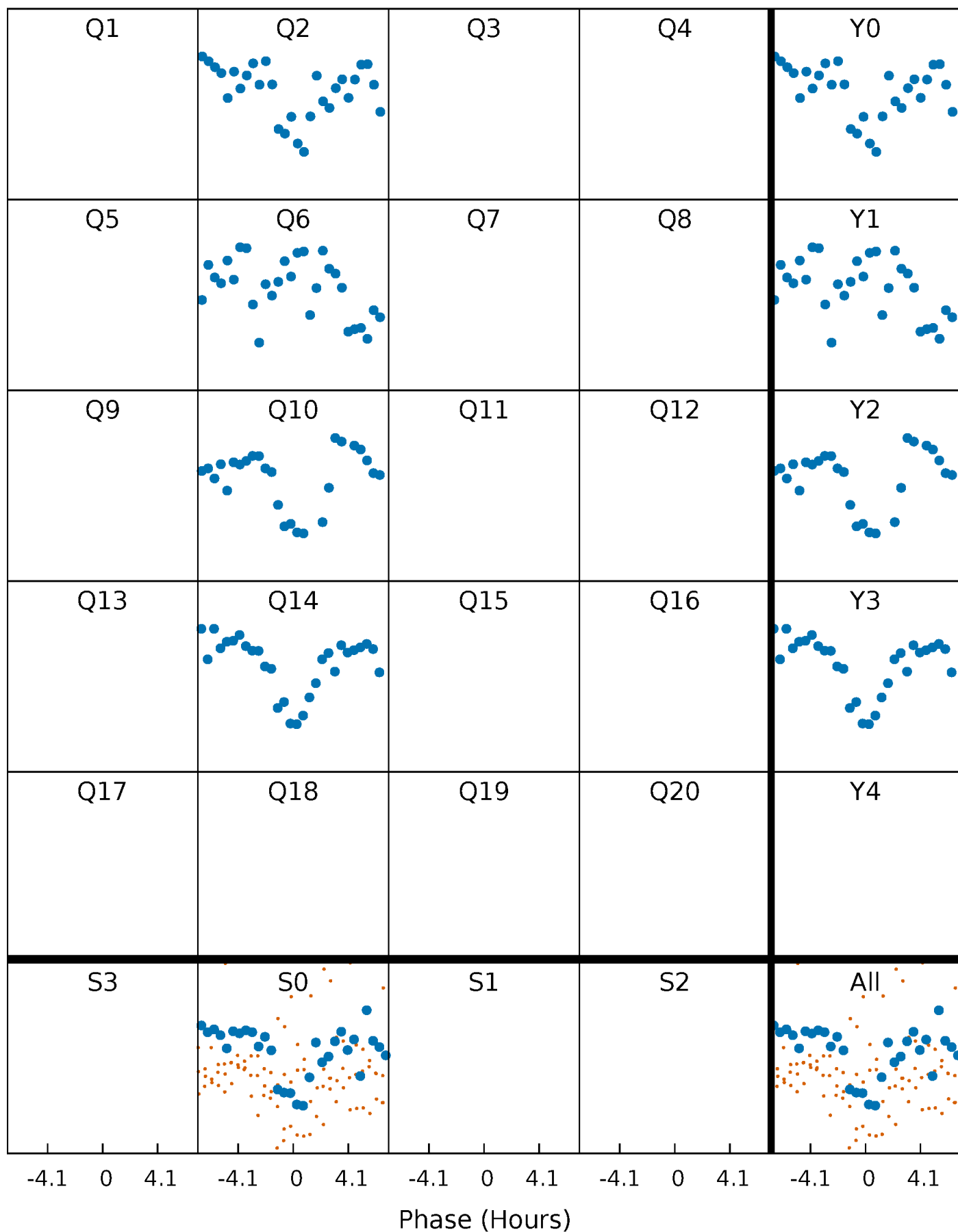


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

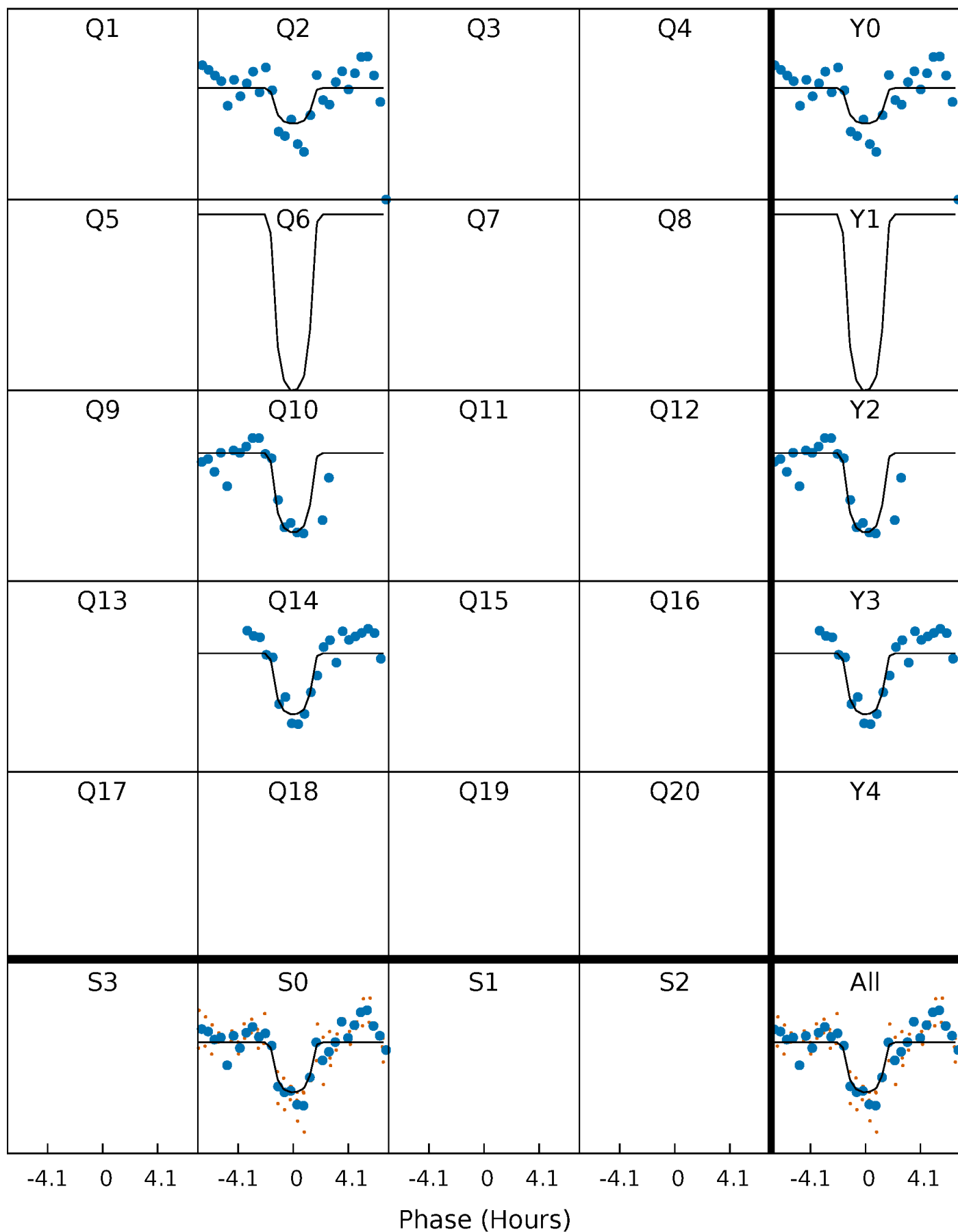
TCE 005219580-04 P=390.098929 Days  $T_0=186.446416$  (BKJD)





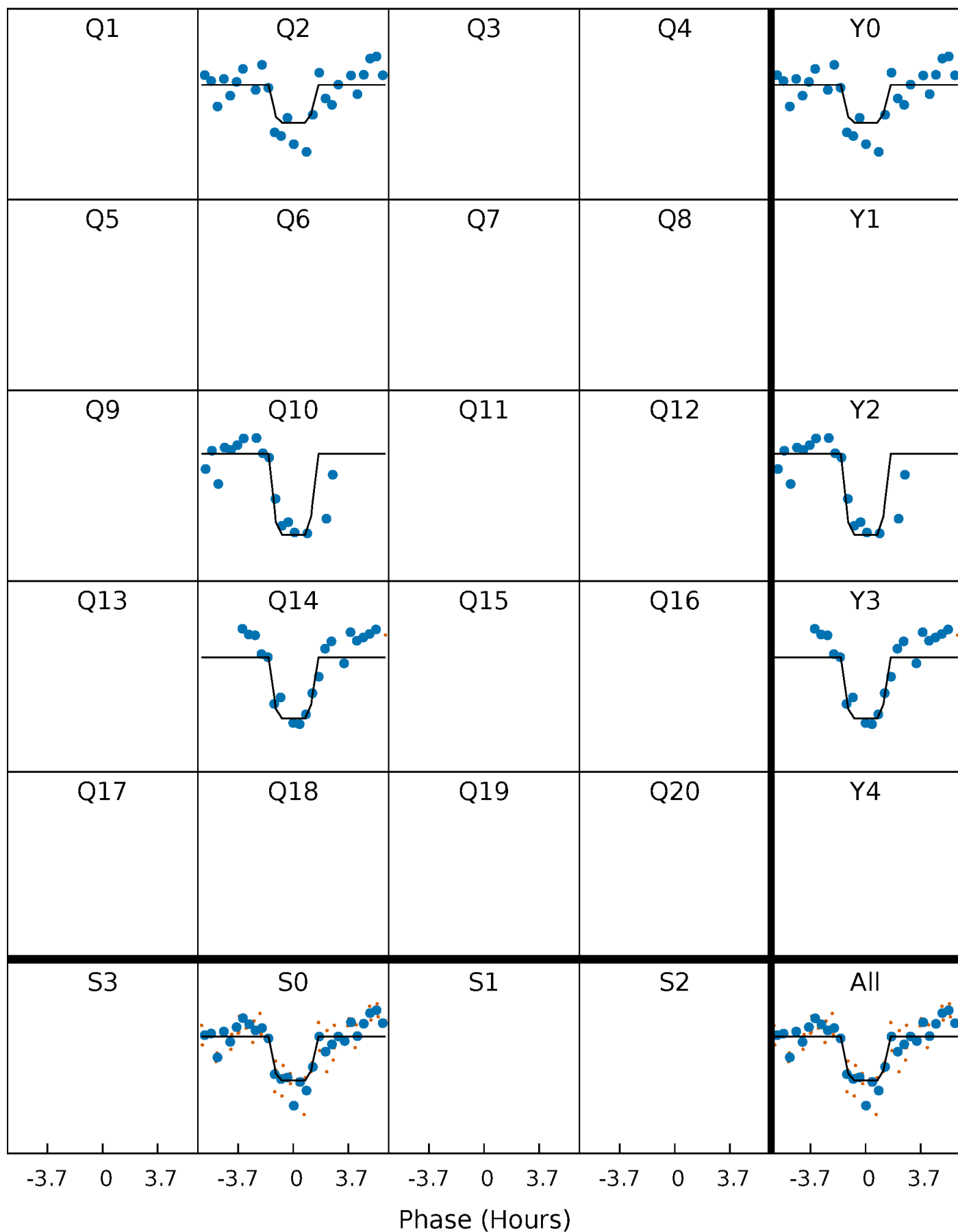
# DV Quarter-Phased Transit Curves

TCE 005219580-04     $P=390.098929$  Days     $T_0=186.446416$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

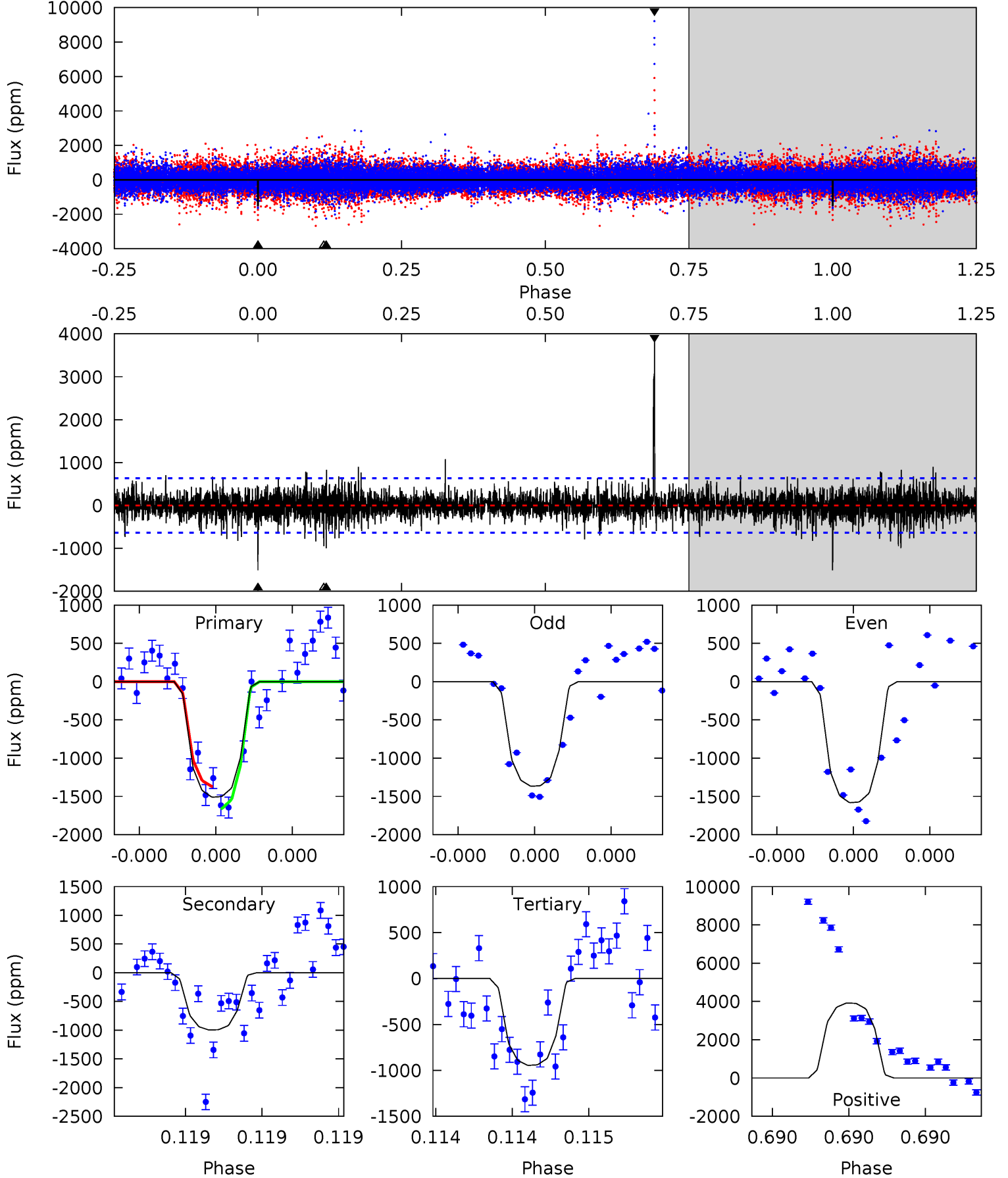
TCE 005219580-04 P=390.096943 Days  $T_0=186.450772$  (BKJD)



# DV Model-Shift Uniqueness Test

005219580-04, P = 390.098929 Days, E = 186.446416 Days

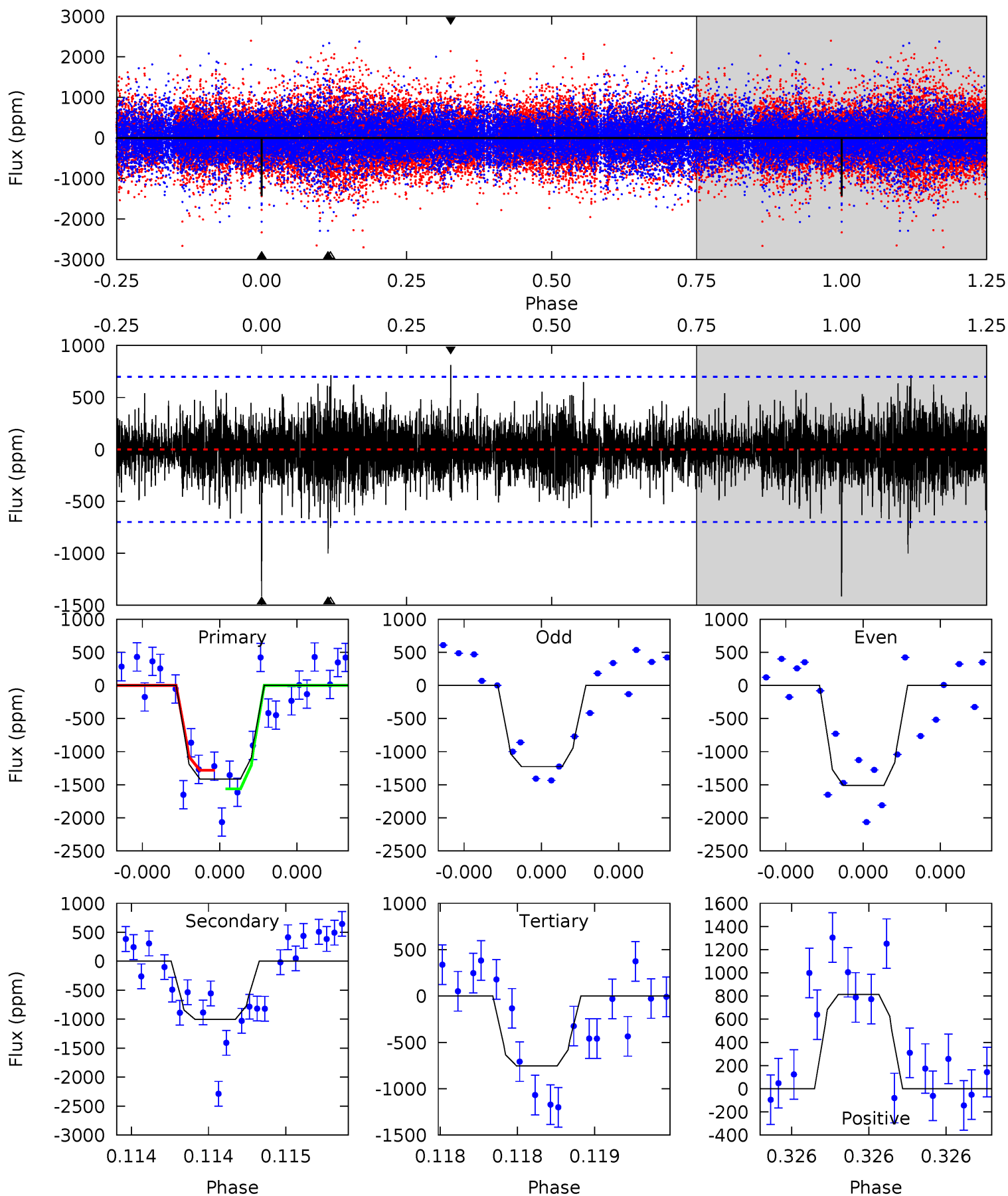
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.3	8.81	8.35	34.6	5.61	3.53	1.88	4.98	-21.3	0.46	-25.8	0.92	1.10	0.72	1.28



# Alt Model-Shift Uniqueness Test

005219580-04, P = 390.096943 Days, E = 186.450772 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	8.09	6.11	6.58	5.65	3.60	1.41	5.33	4.86	1.99	1.52	1.12	1.15	0.37	1.14



### Stellar Parameters For KIC 005219580

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4841^{+175}_{-175}$	$4.559^{+0.061}_{-0.039}$	$-0.060^{+0.300}_{-0.300}$	$0.741^{+0.062}_{-0.068}$	$0.726^{+0.081}_{-0.061}$	$2.516^{+0.712}_{-0.385}$
	+4%/-4%	+1%/-1%	+500%/-500%	+8%/-9%	+11%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005219580-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-997 \pm 113$	$3.30^{+0.49}_{-0.50}$	$263^{+11}_{-10}$	$4359^{+305}_{-238}$	$44984^{+17286}_{-11276}$
Alt.	$-1001 \pm 124$	$2.92^{+0.55}_{-0.51}$	$263^{+11}_{-11}$	$4592^{+387}_{-333}$	$57710^{+26083}_{-16902}$

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

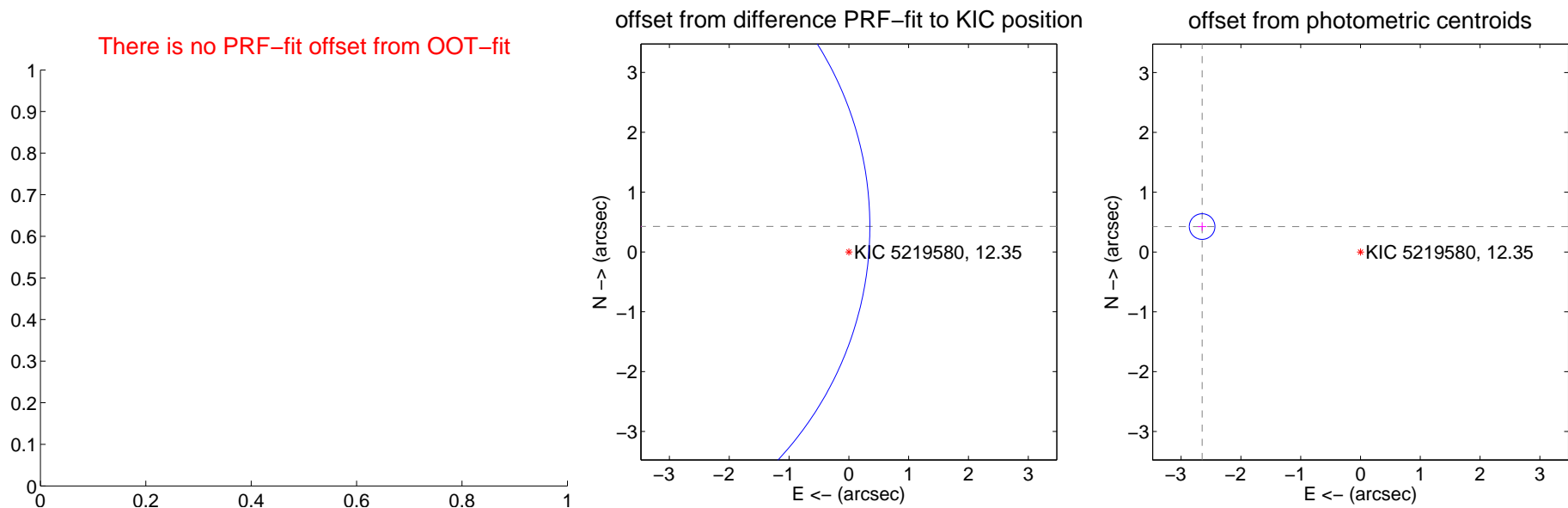
## DV Centroid Data

Supplemental centroid analysis for 005219580-04. Kepler magnitude: 12.35. Transit SNR 8.28

There are 1 quarters with good PRF difference image offsets

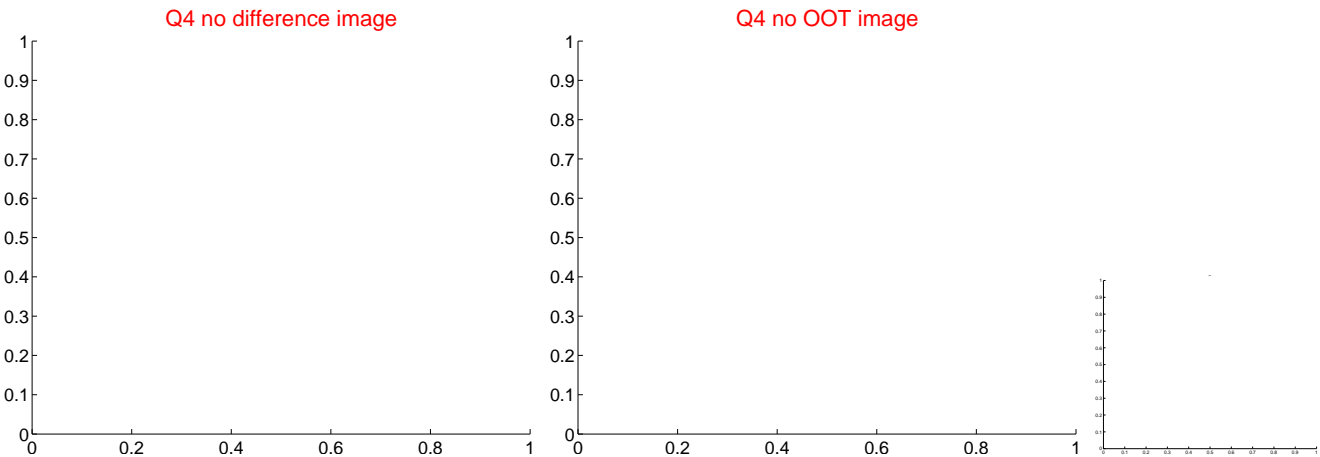
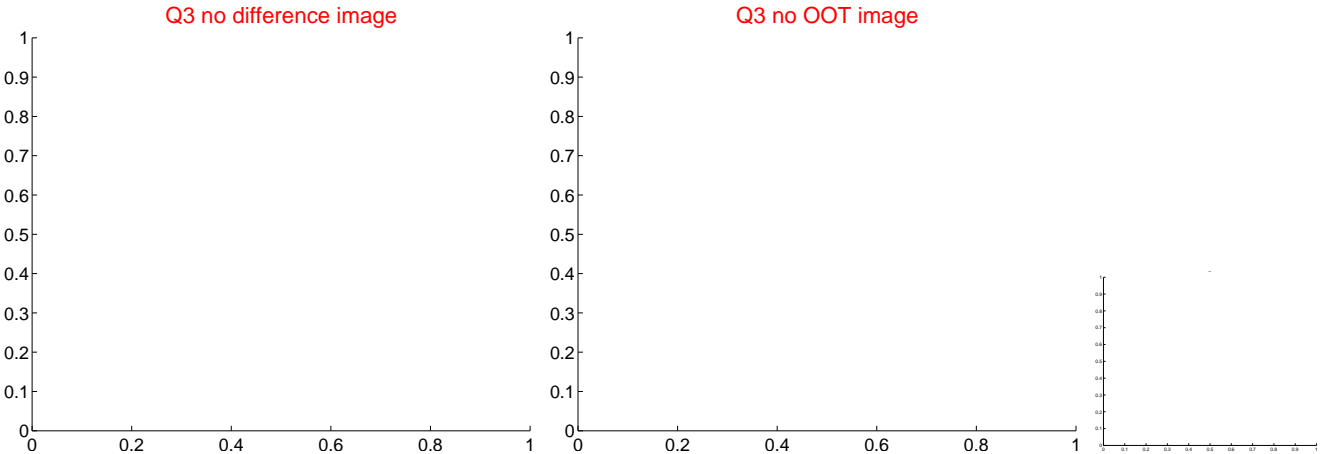
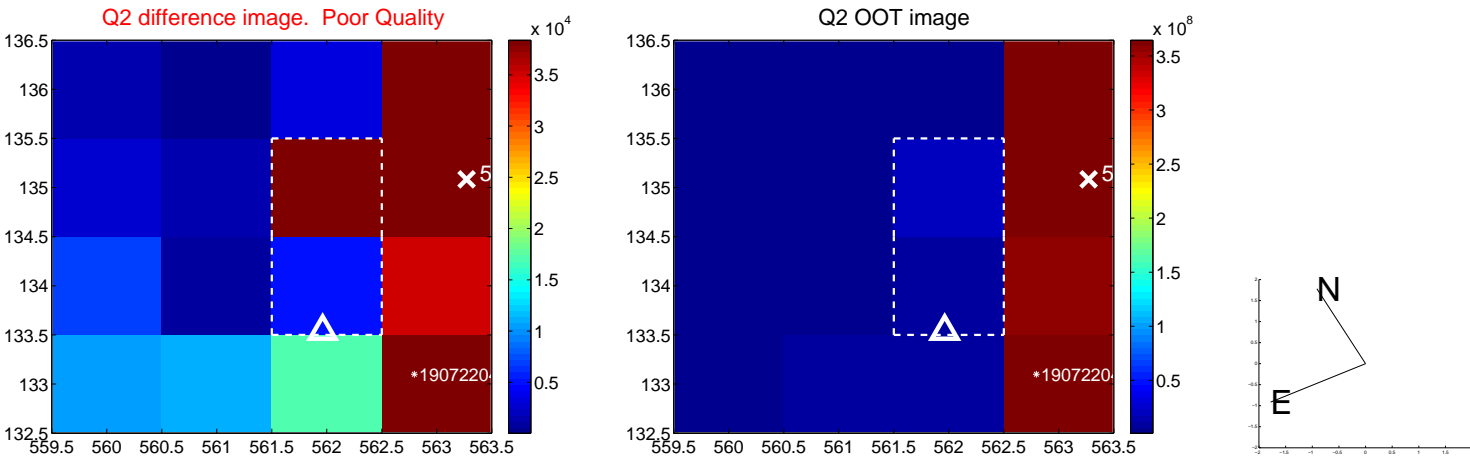
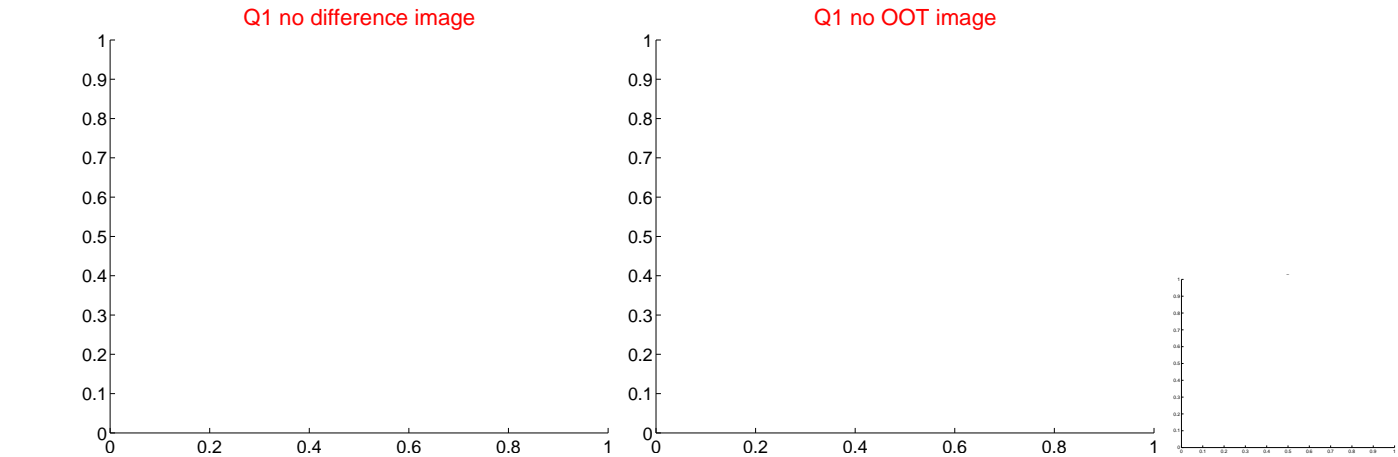
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	$5.393 \pm 1.909$	2.82	$5.376 \pm 1.911$	$0.426 \pm 1.575$
photometric centroid source offset	$2.68 \pm 0.07$	37.53	$2.65 \pm 0.07$	$0.43 \pm 0.07$



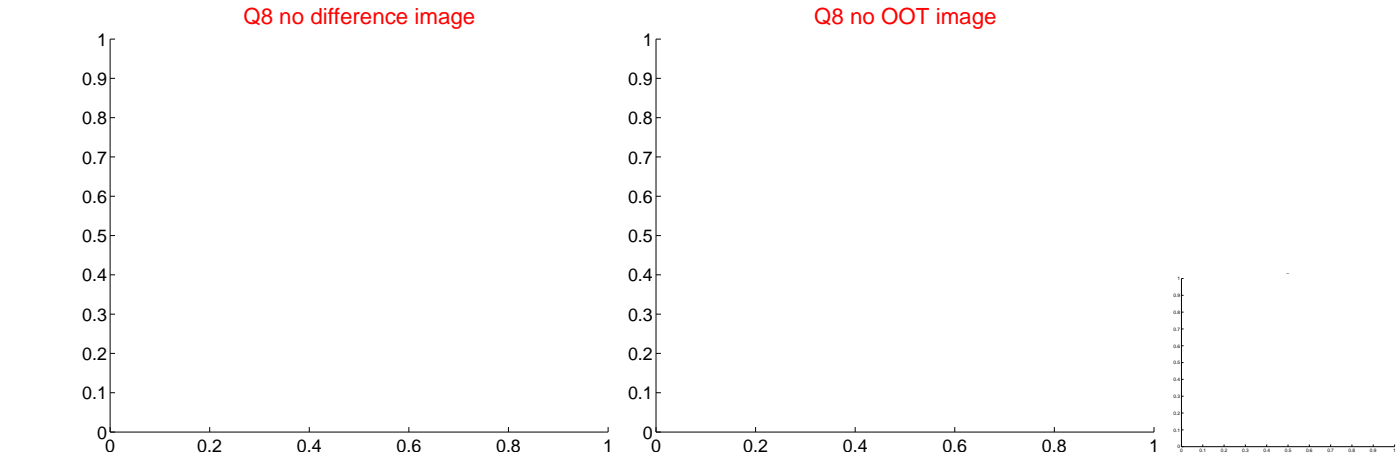
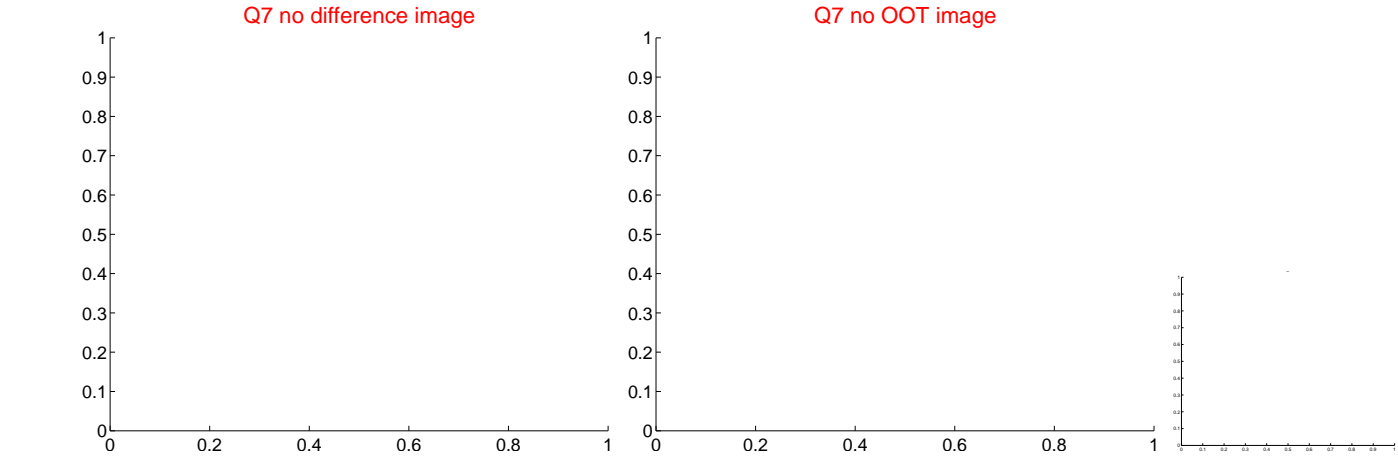
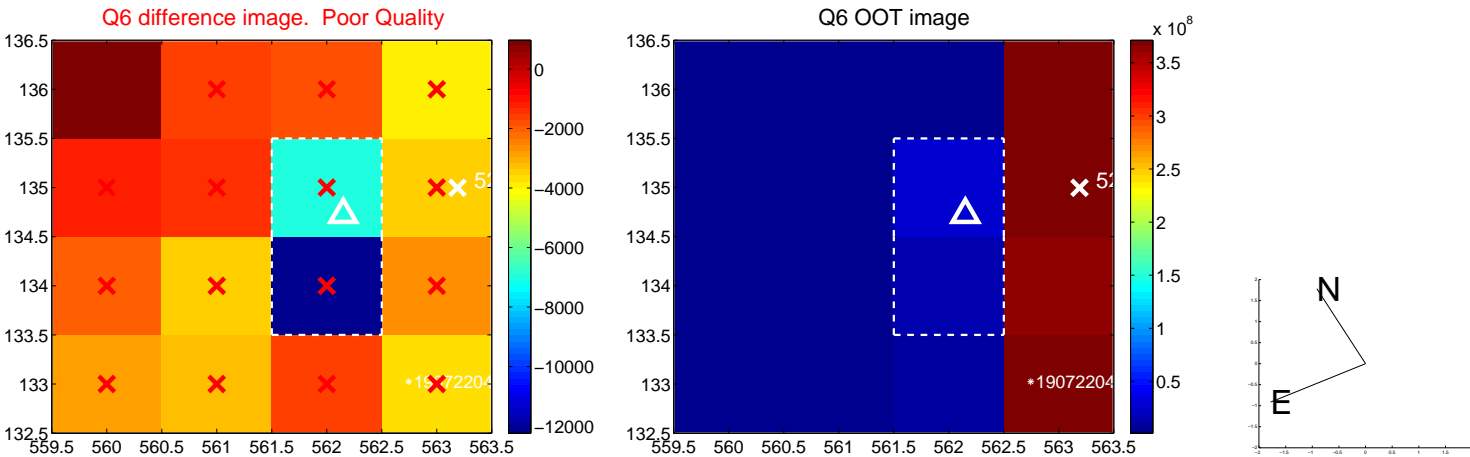
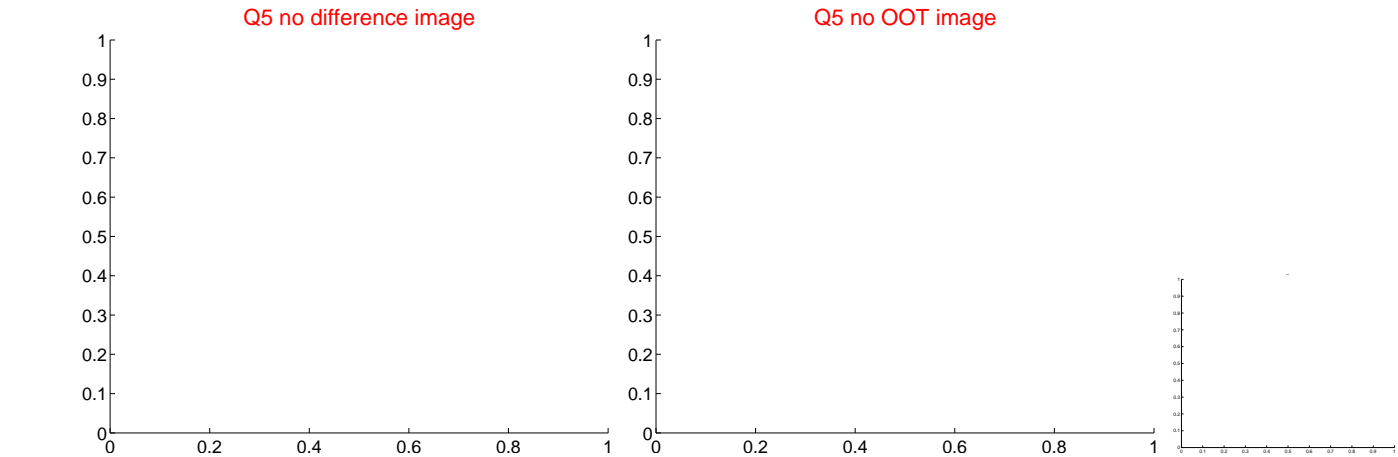
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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





white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

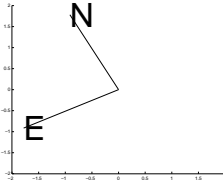
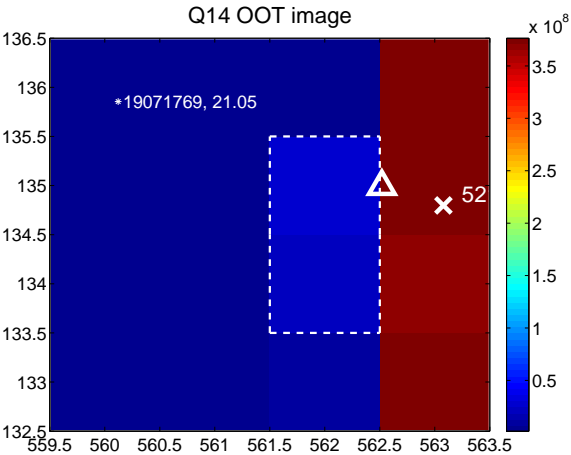
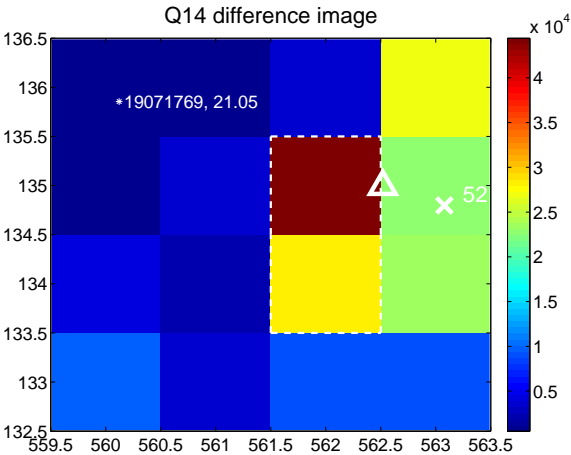


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

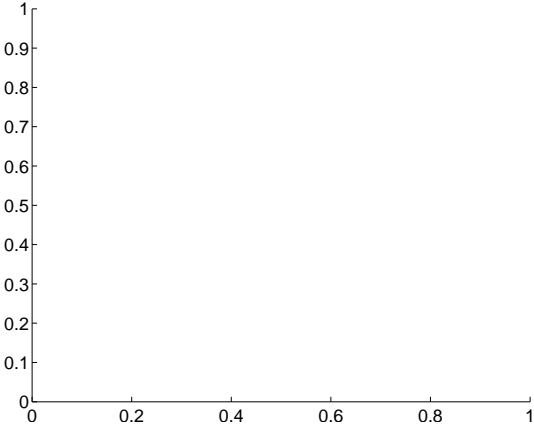
Q13 no difference image



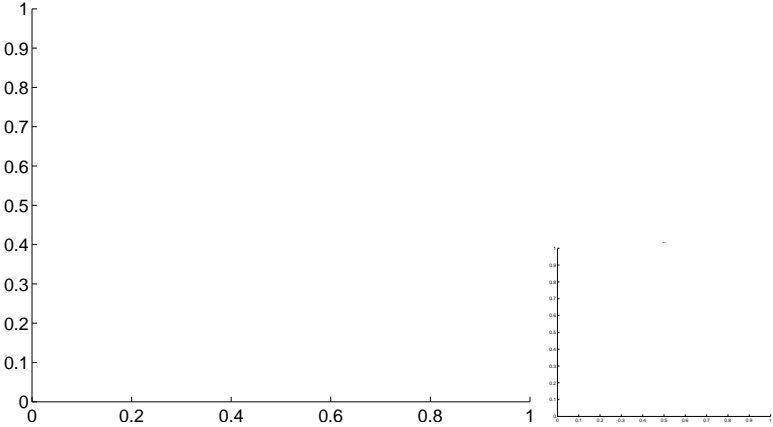
Q13 no OOT image



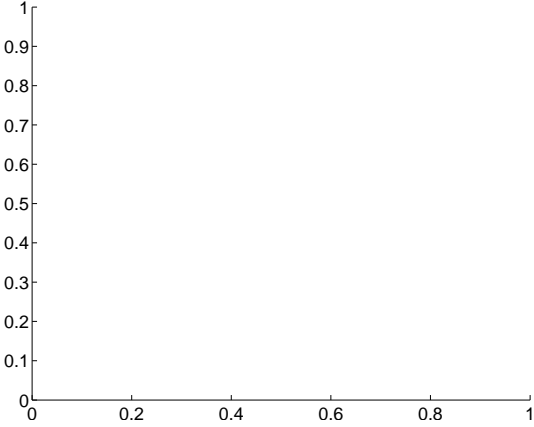
Q15 no difference image



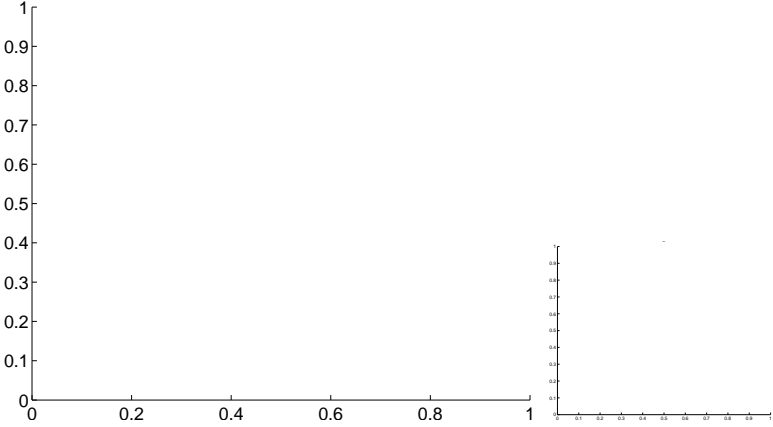
Q15 no OOT image



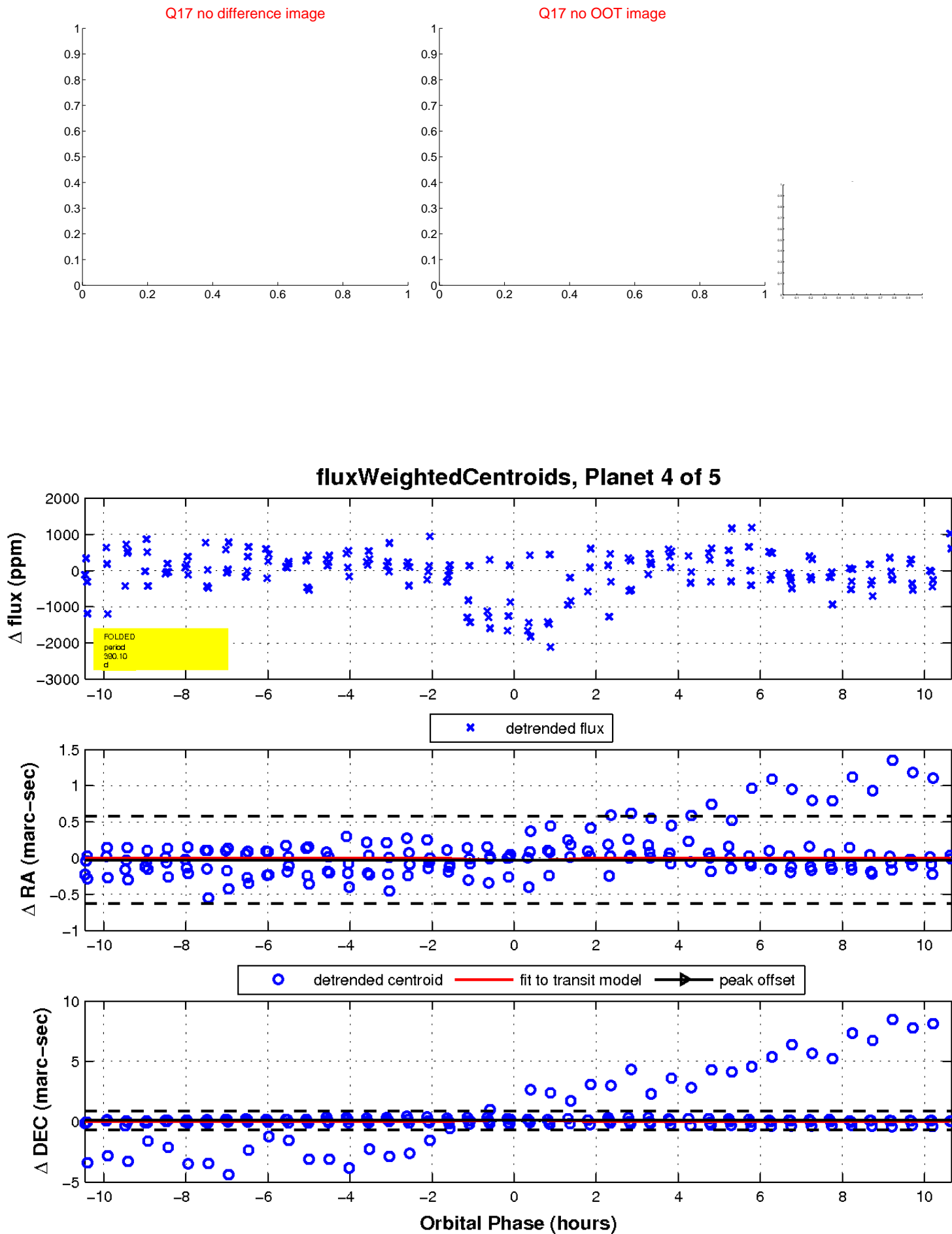
Q16 no difference image



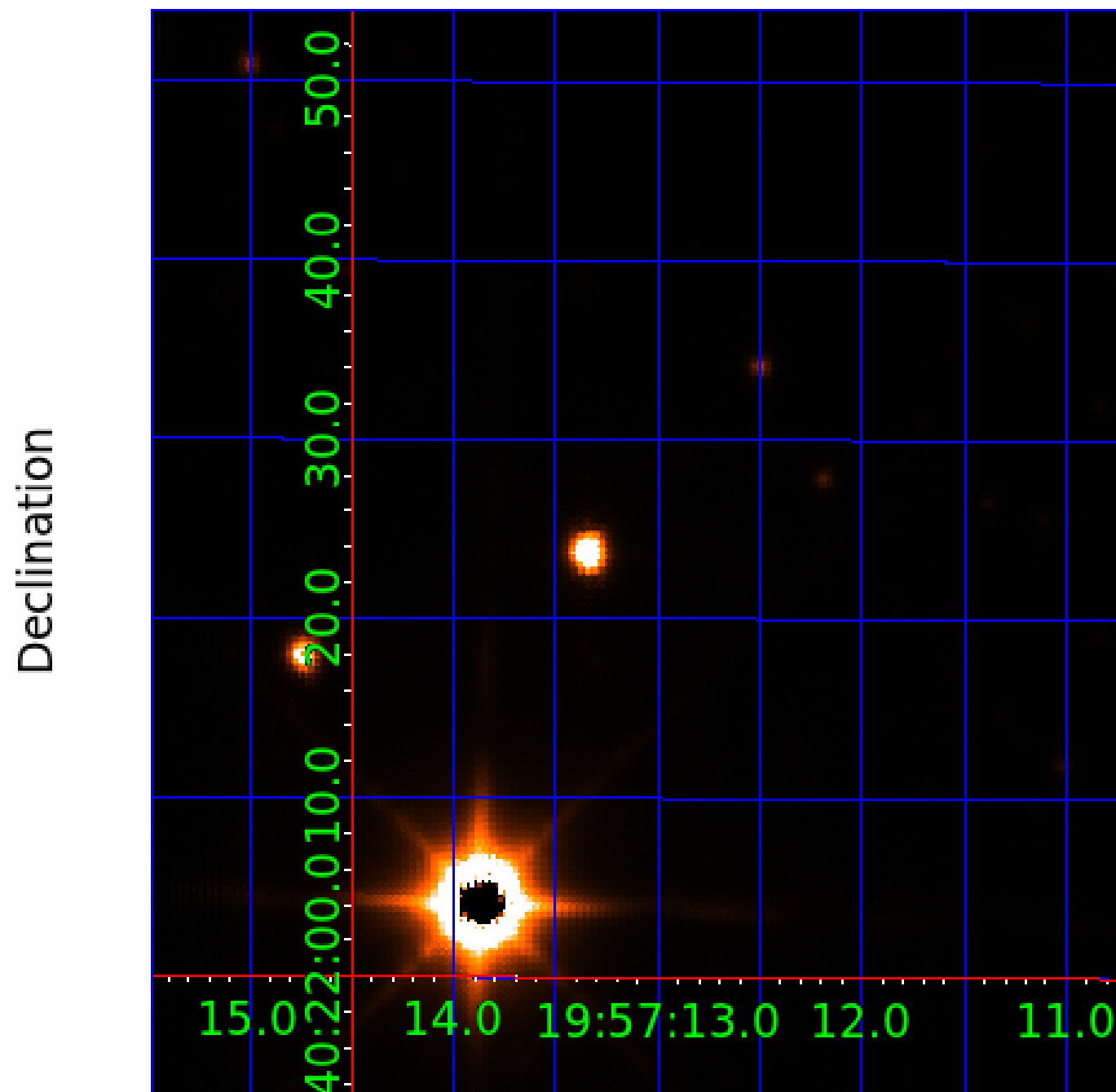
Q16 no OOT image



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



UKIRT Image



# KIC 005219580

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005219580-01	OBS	No	2.196547	132.594205	64.7	8.114	7.8	6.4	0.74	4841	0.73	305.86
005219580-02	OBS	No	259.177853	214.740648	994.7	6.162	7.8	7.7	0.74	4841	4.49	0.53
005219580-03	OBS	No	202.793901	269.385223	749.2	7.826	7.5	7.0	0.74	4841	2.12	0.73
005219580-04	OBS	No	390.098929	186.446416	1294.3	3.556	7.6	8.3	0.74	4841	3.28	0.31
005219580-05	OBS	No	179.366731	266.760921	816.1	6.676	7.4	6.7	0.74	4841	2.38	0.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005219580-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-02	OBS	FP	0.00	1	0	1	0	ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005219580-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
005219580-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

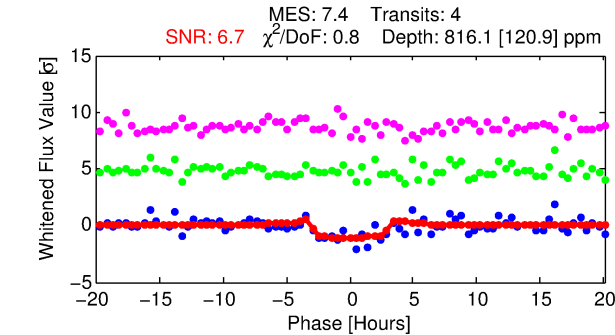
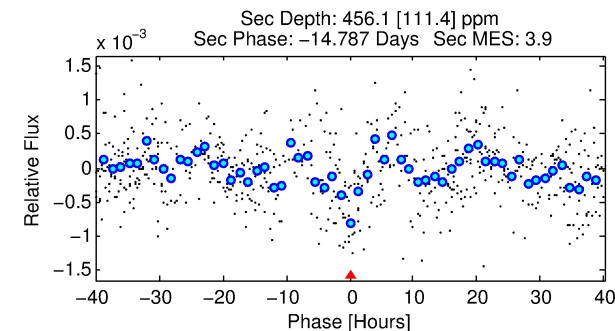
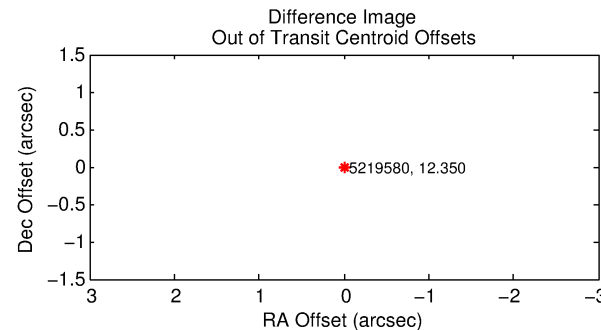
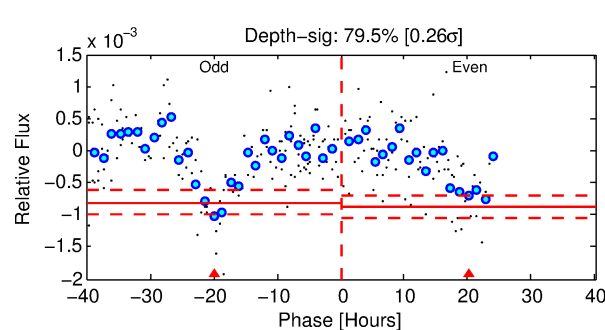
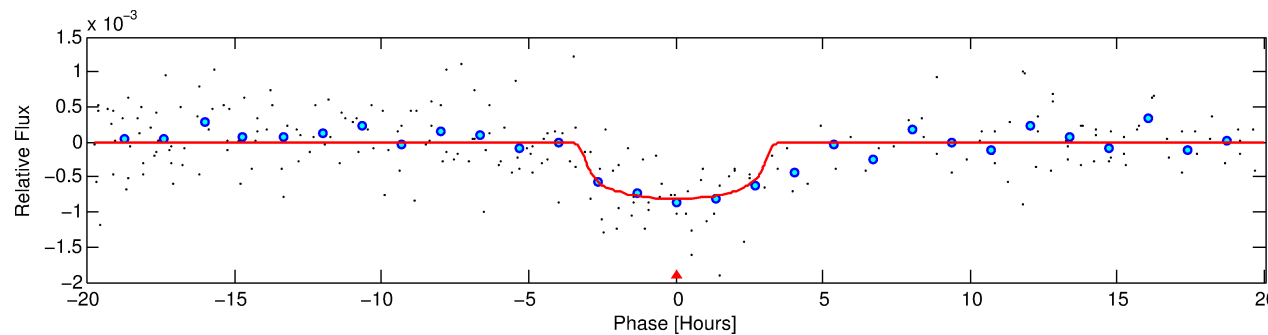
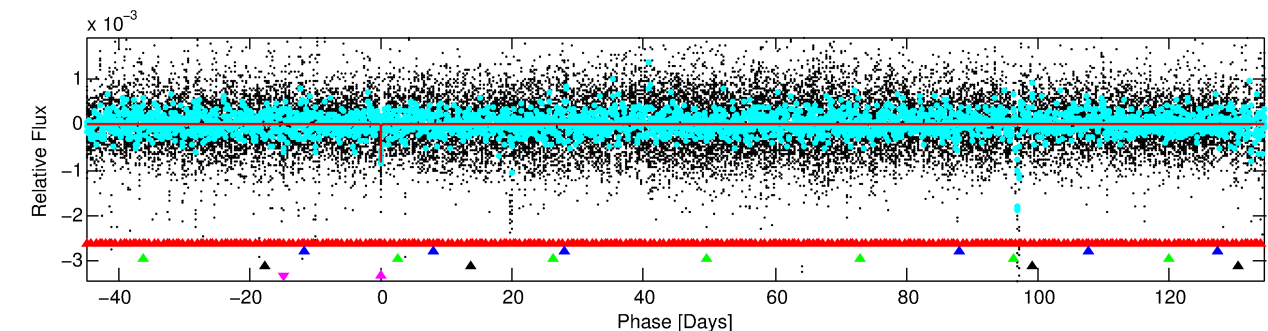
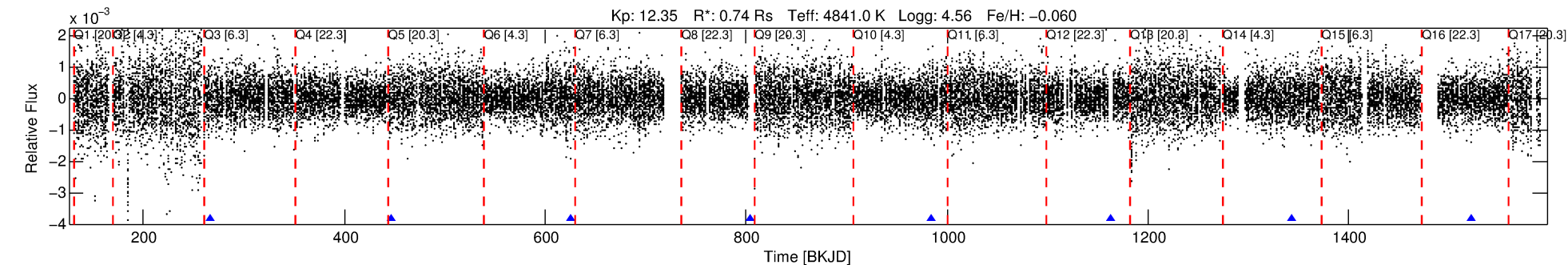
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005219580-05

No Significant Match Found

# DV One-Page Summary

KIC: 5219580 Candidate: 5 of 5 Period: 179.367 d



## DV Fit Results:

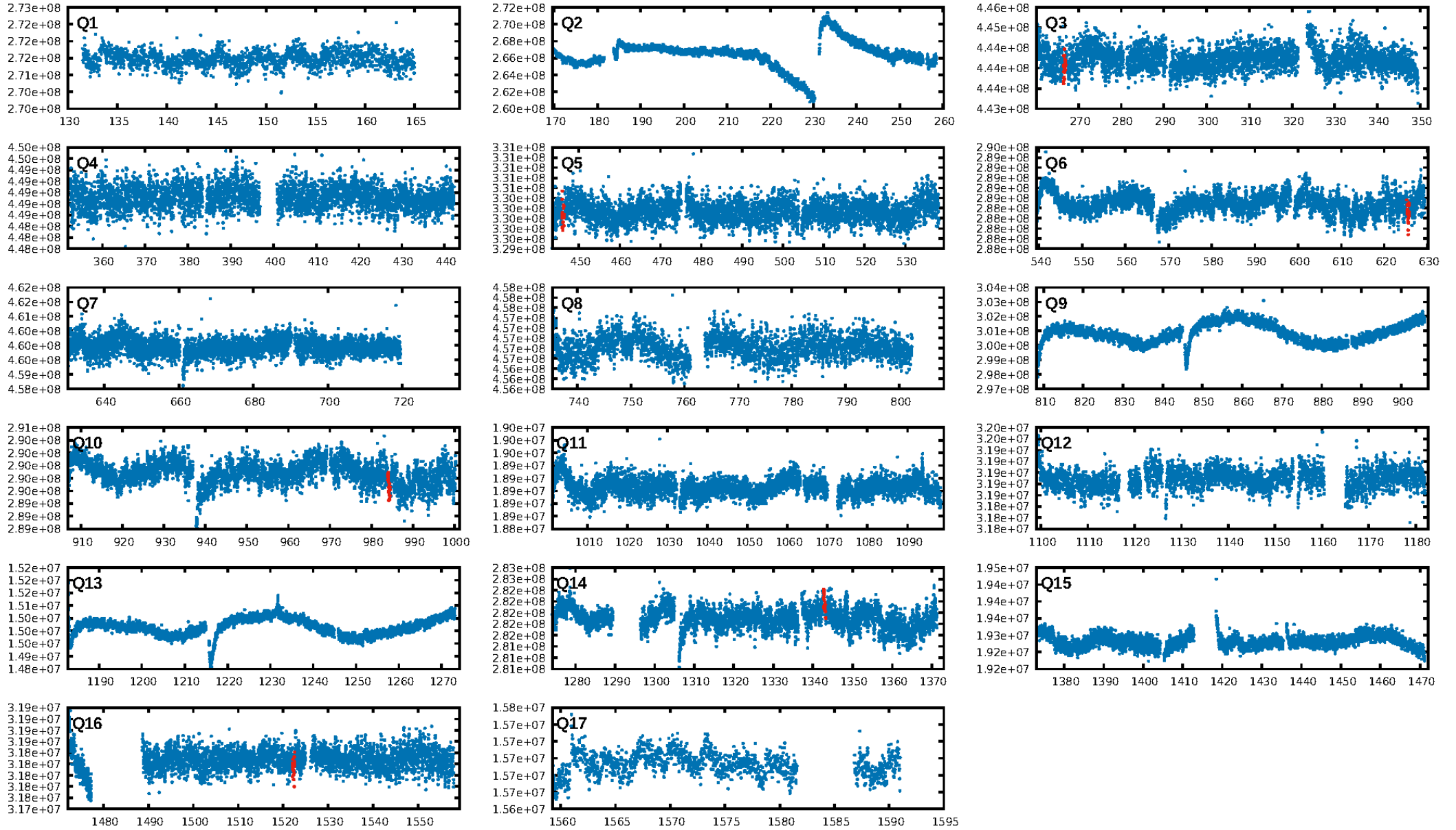
Period = 179.36673 [0.00289] d  
Epoch = 266.7609 [0.0139] BKJD  
Rp/R\* = 0.0294 [0.0112]  
a/R\* = 132.79 [173.45]  
b = 0.80 [0.60]  
Seff = 0.86 [0.16]  
Teq = 246 [11] K  
Rp = 2.38 [0.93] Re  
a = 0.5594 [0.0431] AU  
Ag = 13911.02 [11233.79] [1.24 $\sigma$ ]  
Teffp = 4127 [839] K [4.63 $\sigma$ ]

## DV Diagnostic Results:

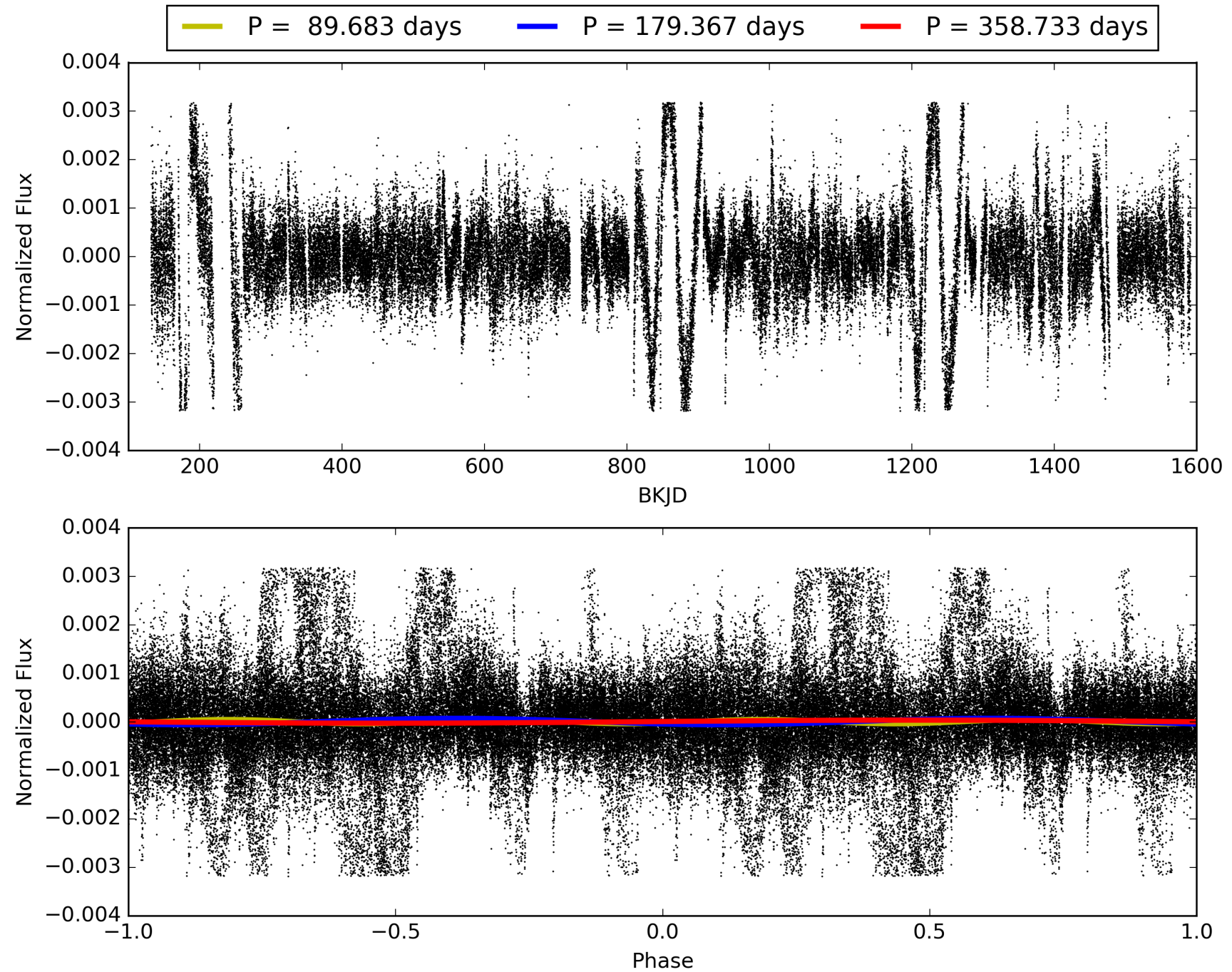
ShortPeriod-sig: 100.0% [404.67 $\sigma$ ]  
LongPeriod-sig: 100.0% [54.66 $\sigma$ ]  
ModelChiSquare2-sig: 35.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.89e-08  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 86.1%  
Centroid-so: 2.671 arcsec [21.43 $\sigma$ ]  
OotOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-rm: 7.020 arcsec [3.01 $\sigma$ ]  
KicOffset-st: 2/0/1/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.17 [1/6]



# TCE 005219580-05, PDC Light Curves

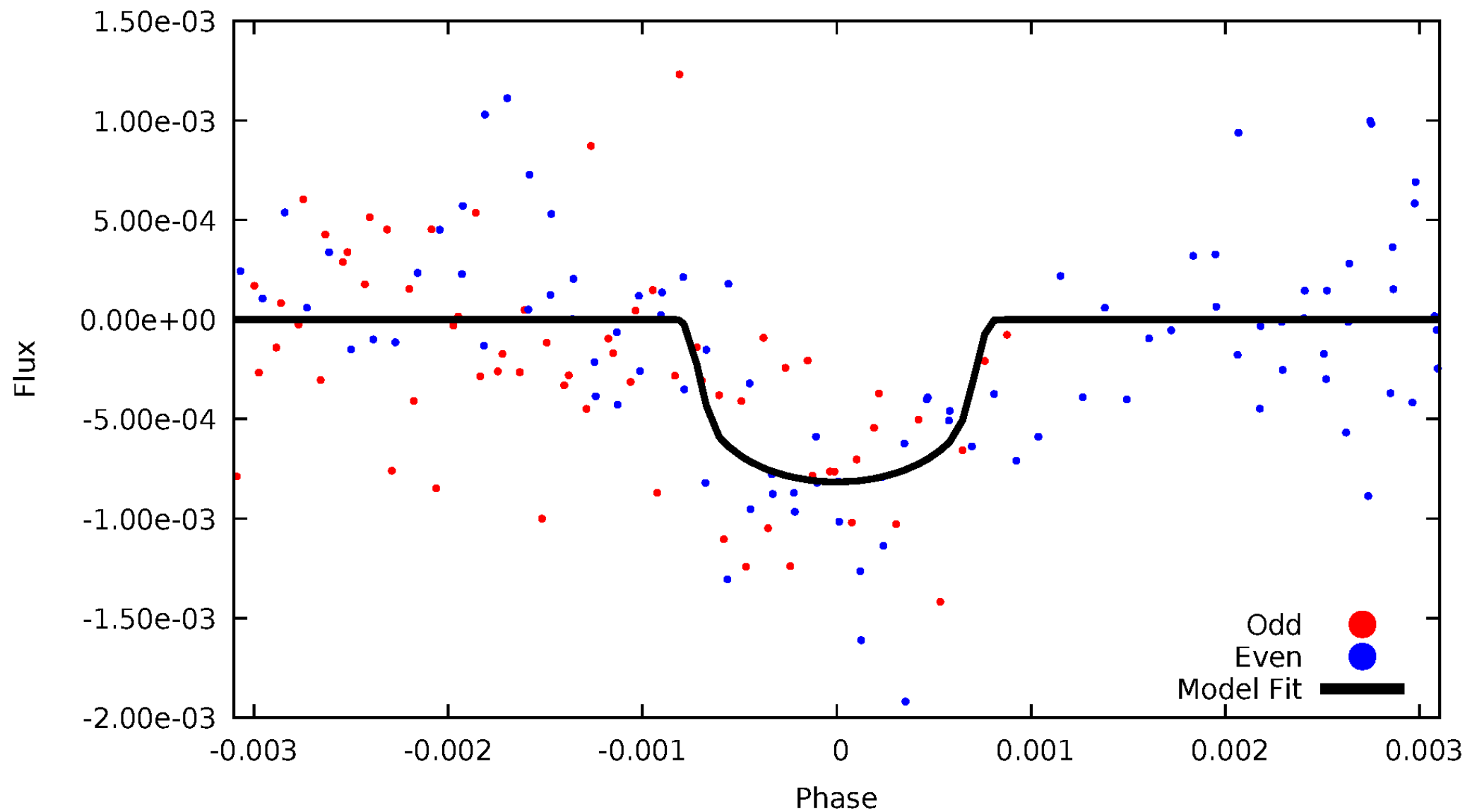


TCE 005219580-05



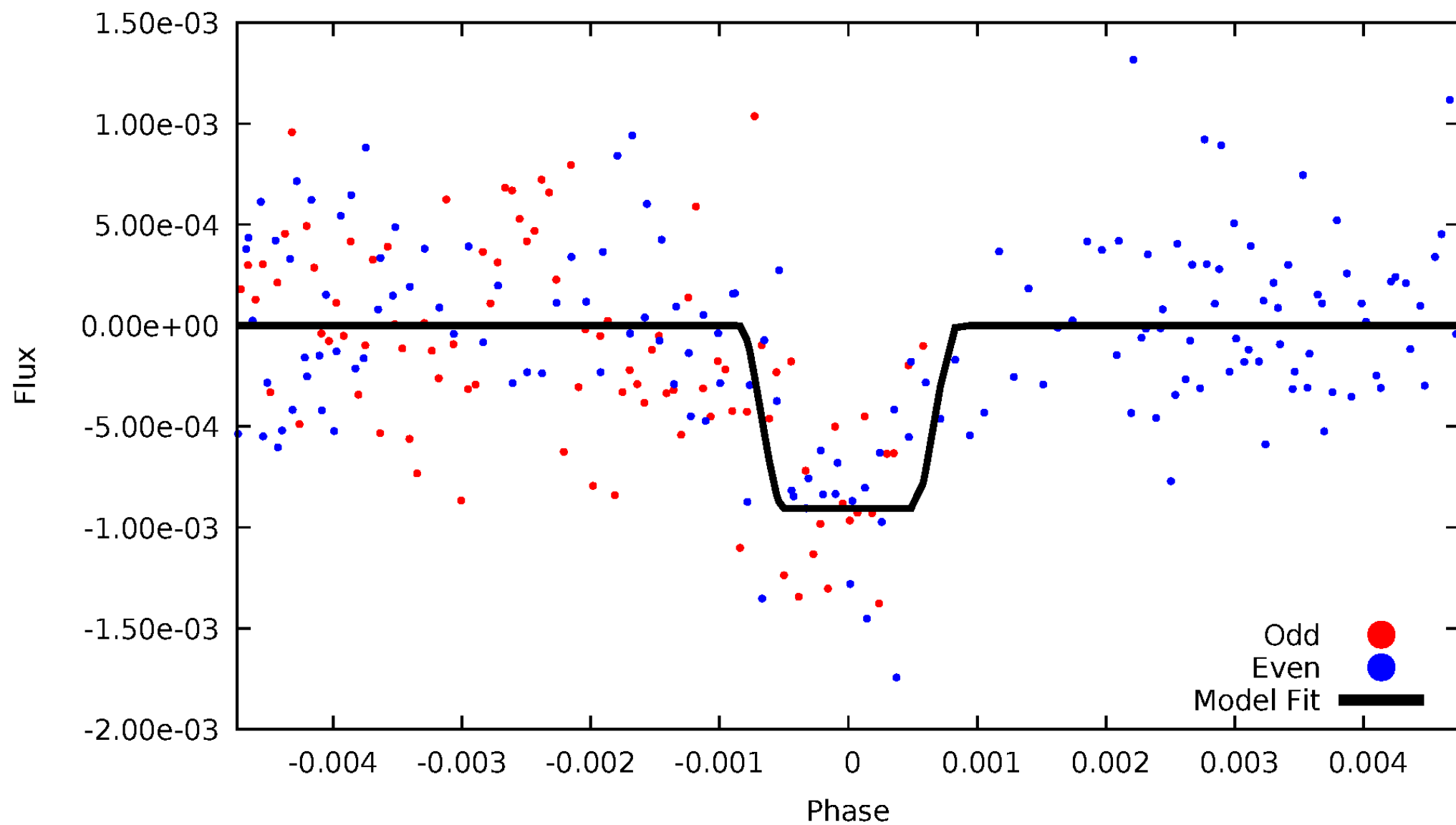
# DV Odd/Even

TCE 005219580-05



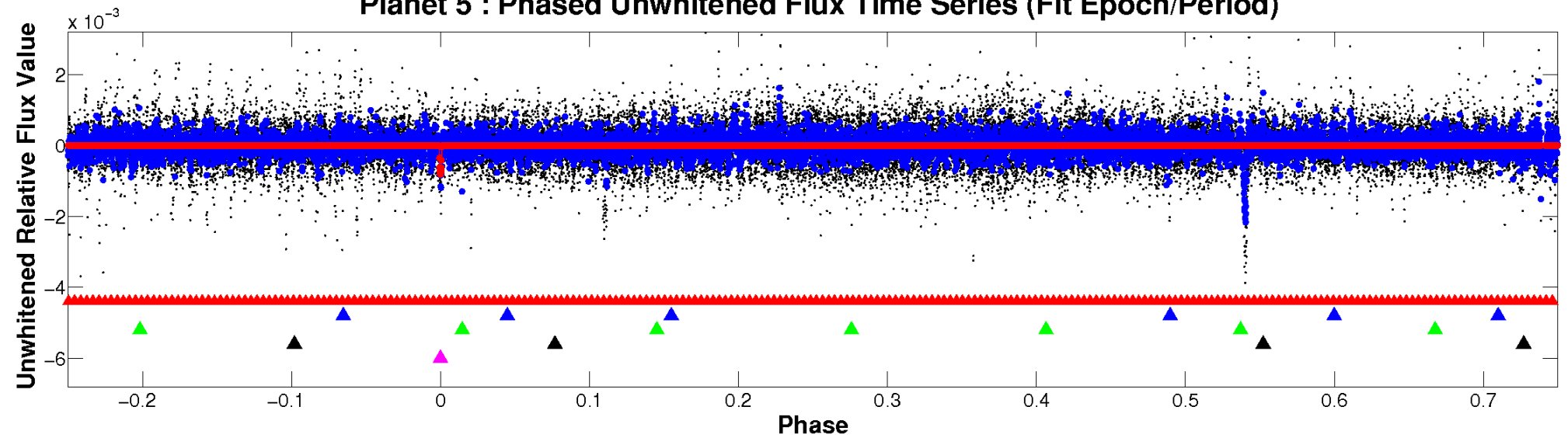
# ALT Odd/Even

TCE 005219580-05

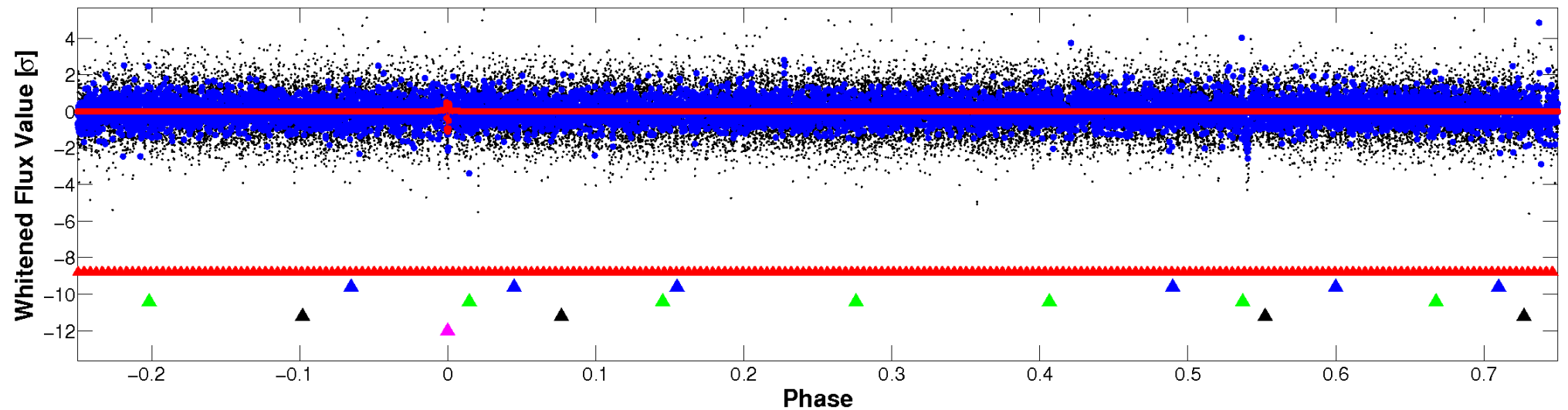


# Non-Whitened Vs. Whitened Light Curve

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

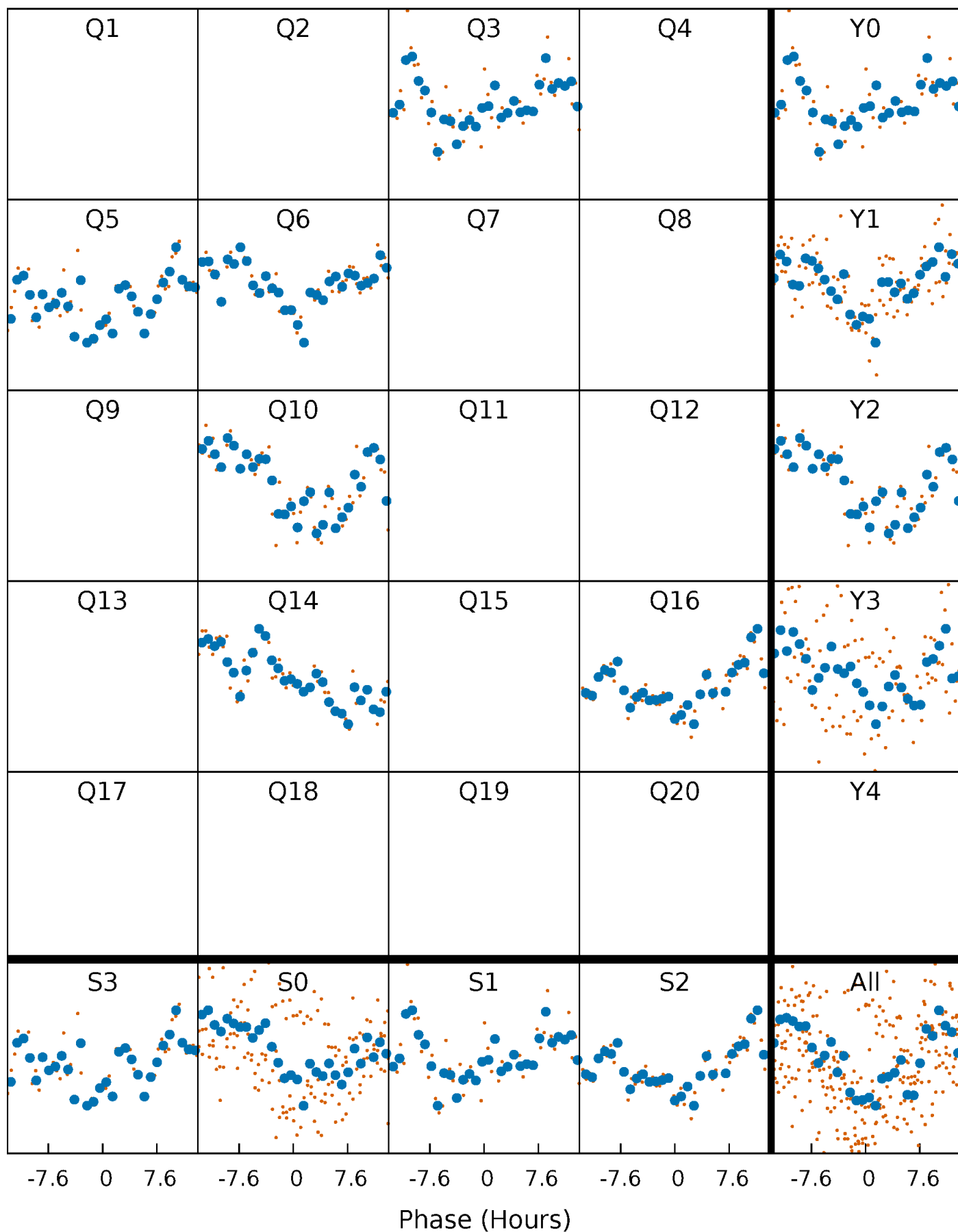


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



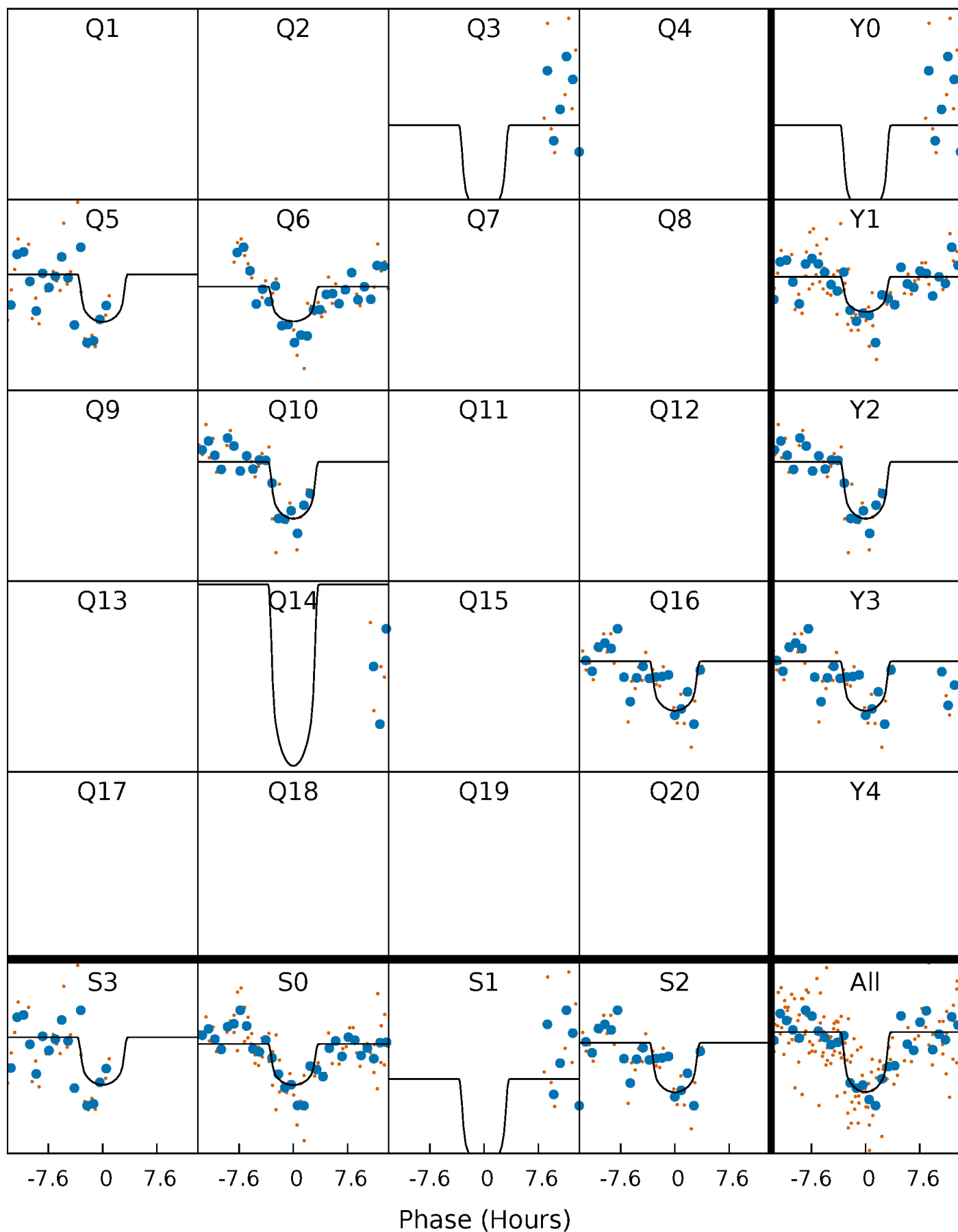
# PDC Quarter-Phased Transit Curves

TCE 005219580-05     $P=179.366731$  Days     $T_0=266.760921$  (BKJD)



# DV Quarter-Phased Transit Curves

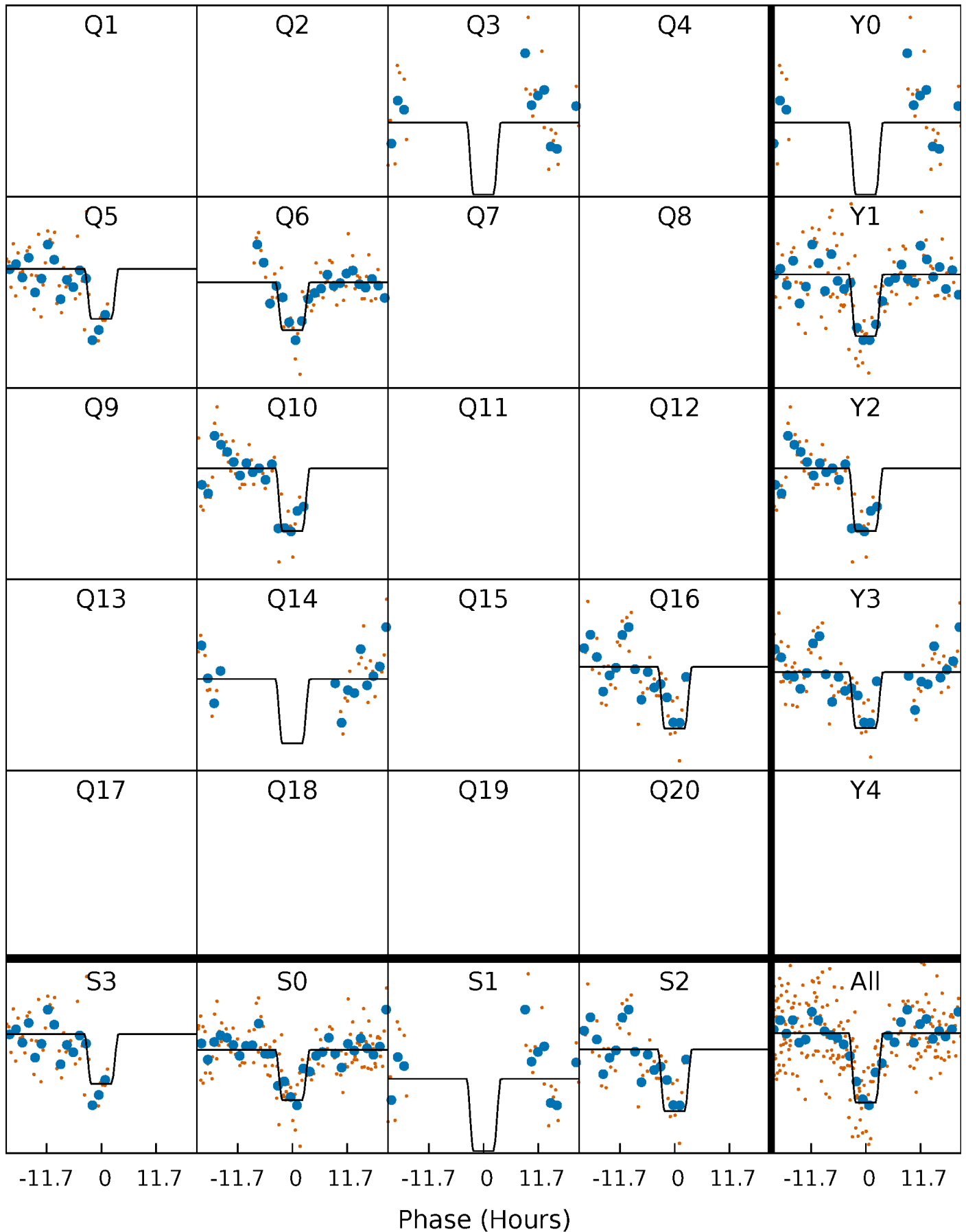
TCE 005219580-05     $P=179.366731$  Days     $T_0=266.760921$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

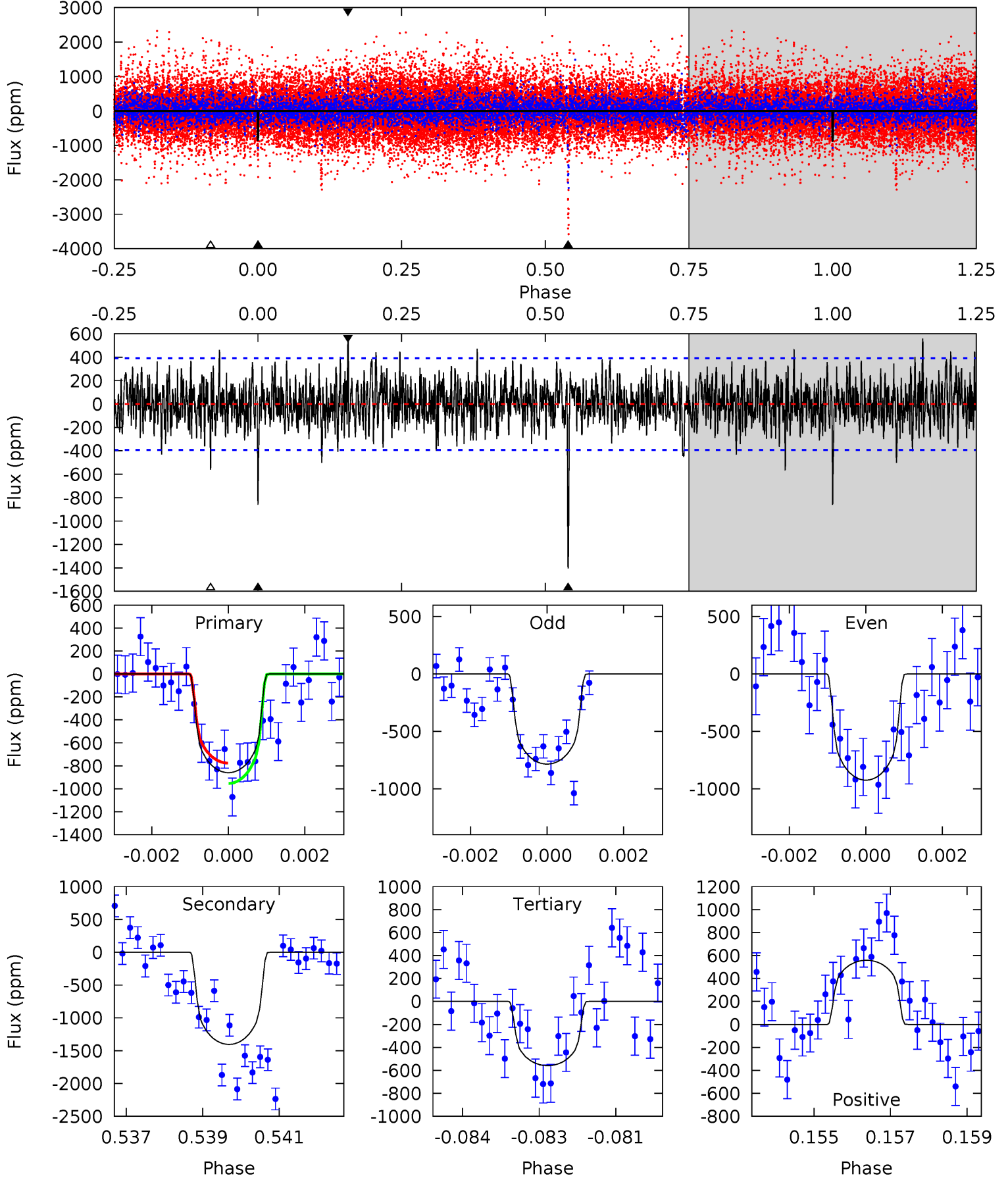
TCE 005219580-05     $P=179.377993$  Days     $T_0=266.735029$  (BKJD)



# DV Model-Shift Uniqueness Test

005219580-05, P = 179.366731 Days, E = 87.394190 Days

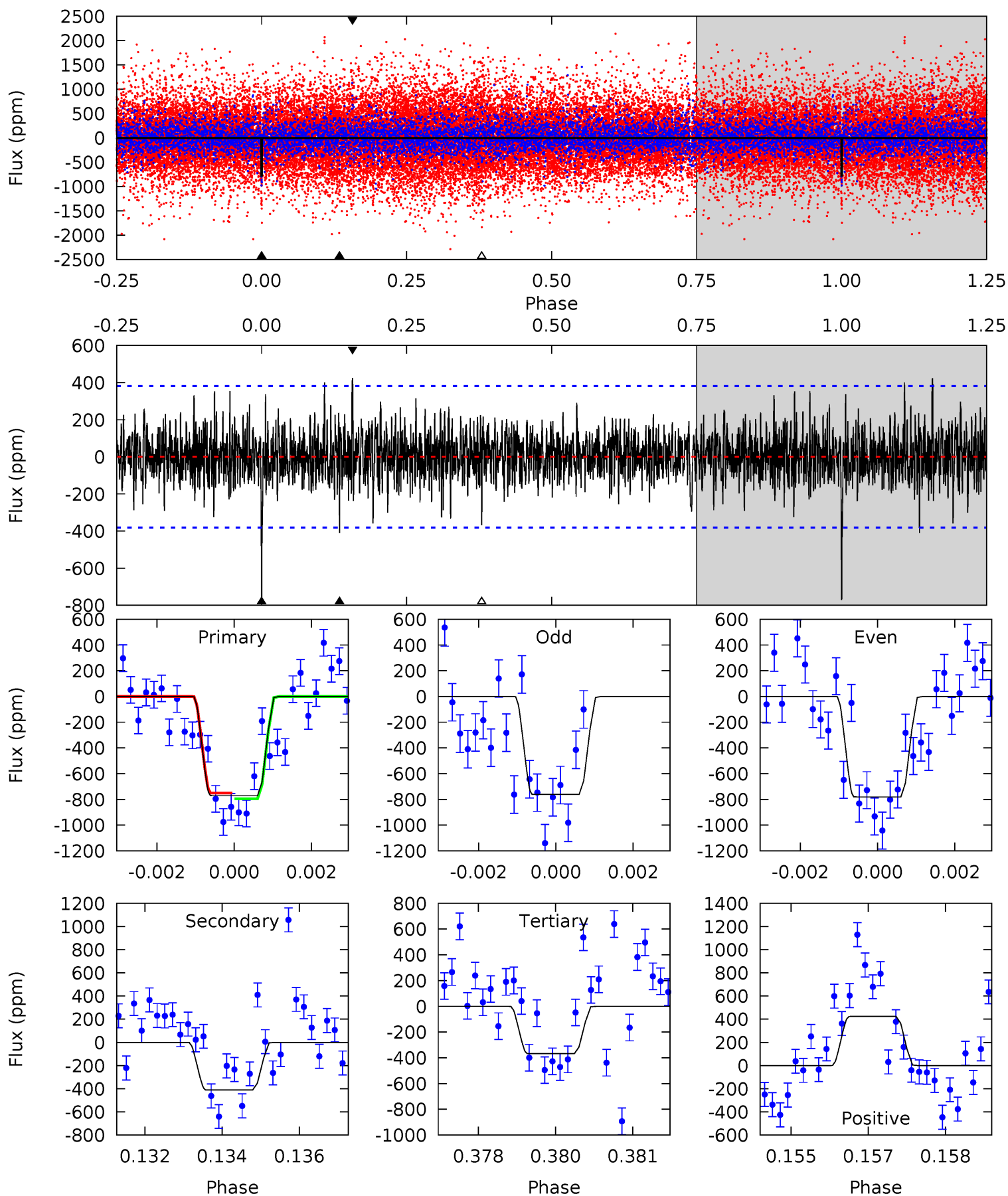
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	19.2	7.66	7.66	5.37	3.15	1.95	4.12	4.12	11.6	11.6	0.96	0.97	0.28	1.21



# Alt Model-Shift Uniqueness Test

005219580-05,  $P = 179.377993$  Days,  $E = 87.357036$  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
10.9	5.78	5.18	5.96	5.37	3.15	1.42	5.68	4.90	0.60	-0.18	0.14	1.00	0.35	0.31



### Stellar Parameters For KIC 005219580

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$4841^{+175}_{-175}$	$4.559^{+0.061}_{-0.039}$	$-0.060^{+0.300}_{-0.300}$	$0.741^{+0.062}_{-0.068}$	$0.726^{+0.081}_{-0.061}$	$2.516^{+0.712}_{-0.385}$
	+4%/-4%	+1%/-1%	+500%/-500%	+8%/-9%	+11%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005219580-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1405 \pm 73$	$2.44^{+0.86}_{-0.94}$	$342^{+12}_{-15}$	$5306^{+1372}_{-677}$	$40856^{+69071}_{-18074}$
Alt.	$-411 \pm 71$	$2.48^{+0.87}_{-0.92}$	$342^{+13}_{-14}$	$4118^{+870}_{-438}$	$11718^{+19589}_{-5515}$

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

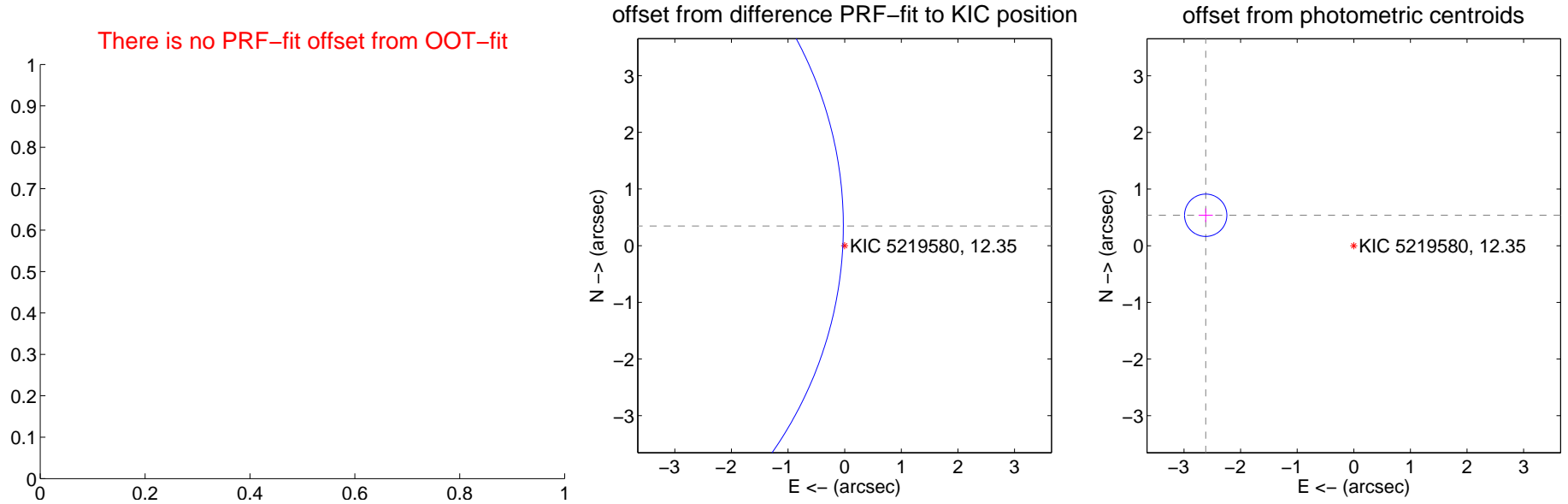
## DV Centroid Data

Supplemental centroid analysis for 005219580-05. Kepler magnitude: 12.35. Transit SNR 6.65

There are 1 quarters with good PRF difference image offsets

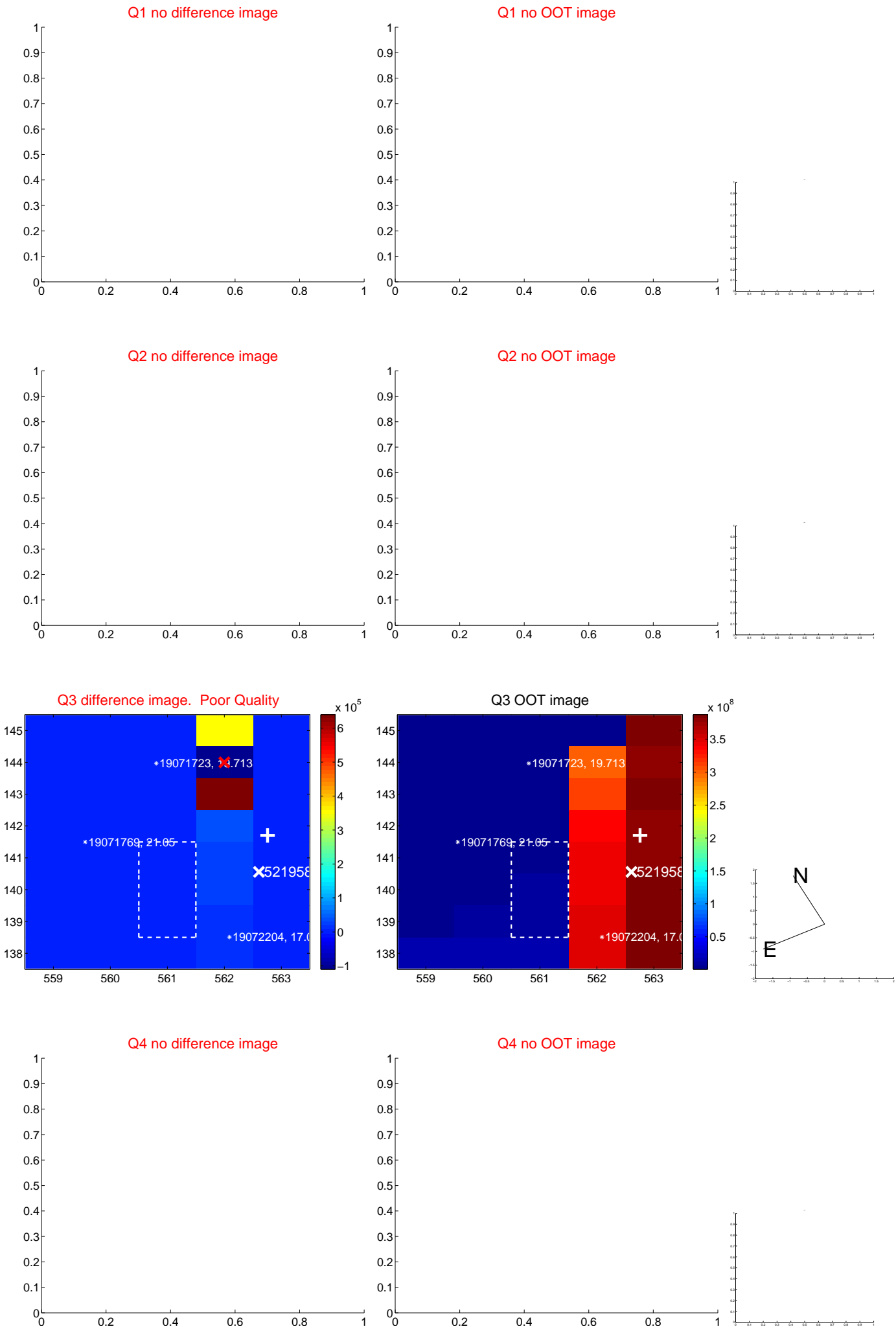
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	$7.020 \pm 2.329$	3.01	$7.012 \pm 2.338$	$0.346 \pm 0.459$
photometric centroid source offset	$2.67 \pm 0.12$	21.43	$2.62 \pm 0.12$	$0.54 \pm 0.12$

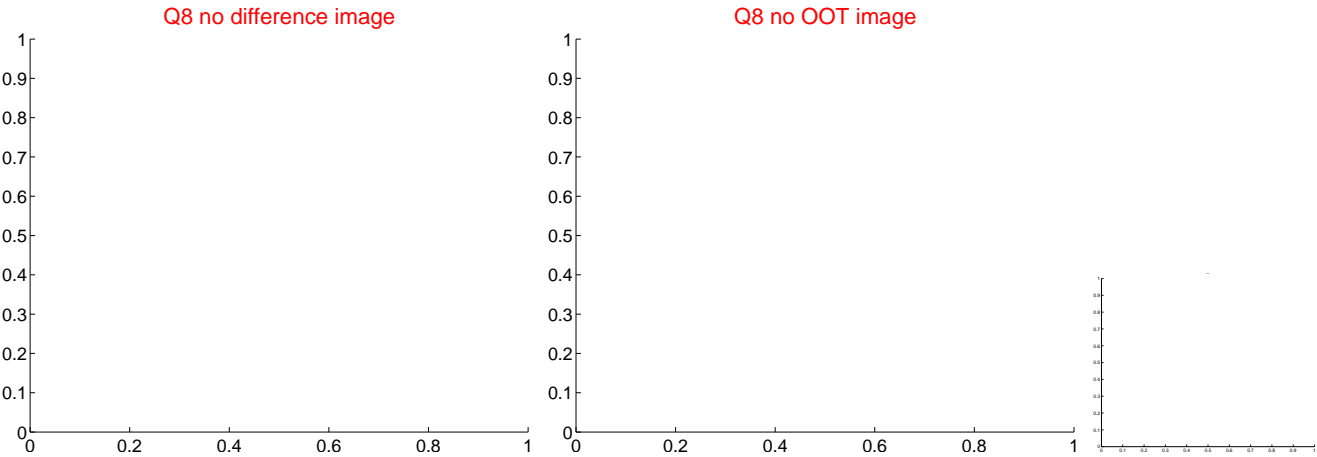
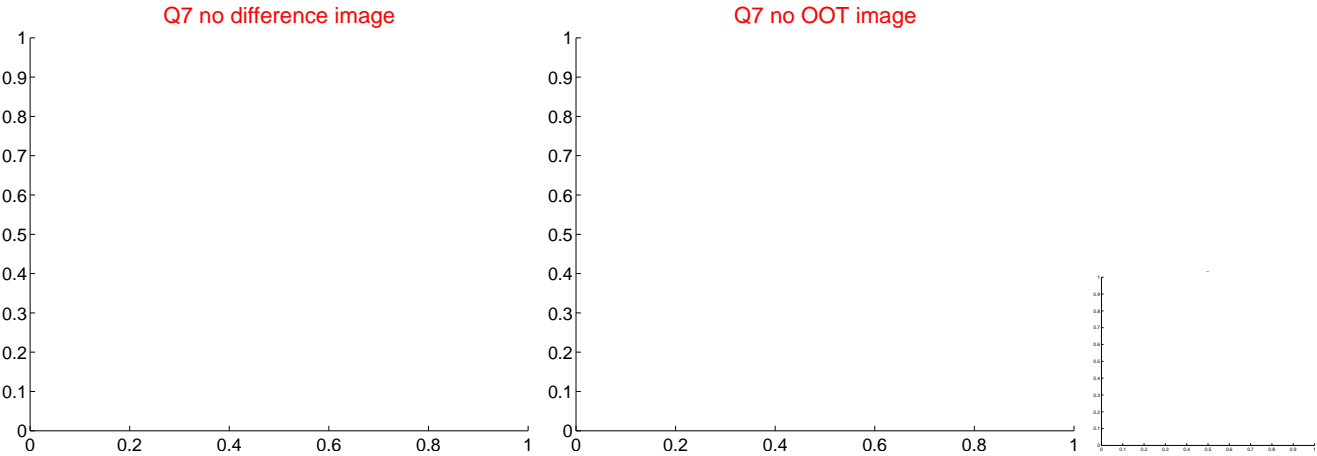
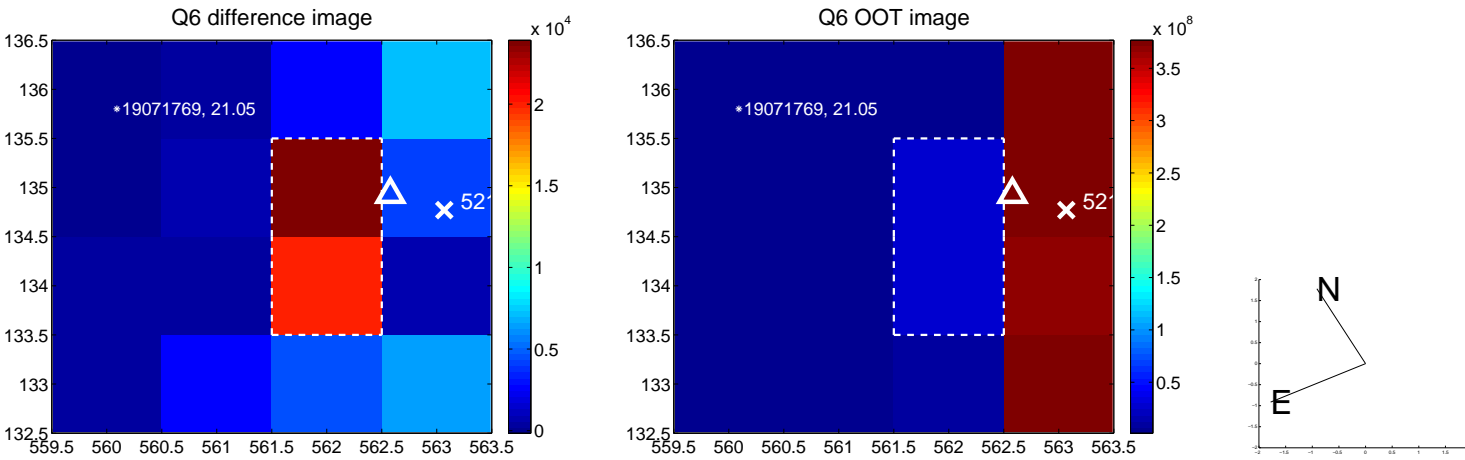
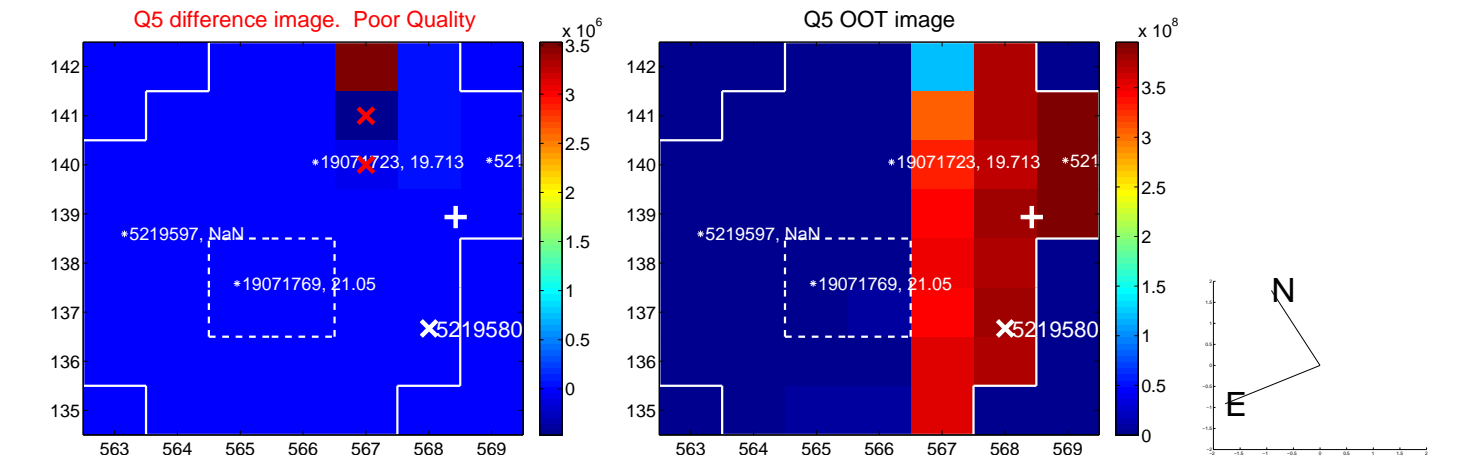


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

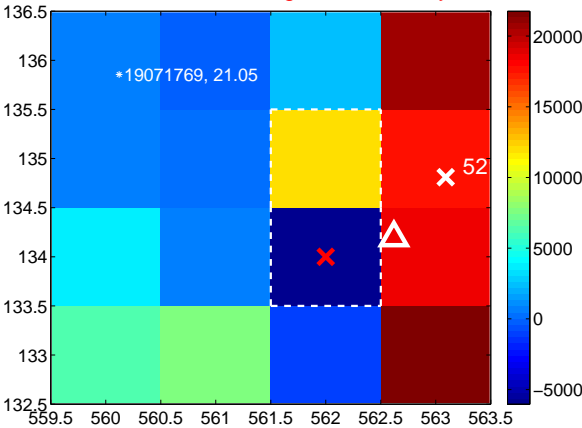
Q9 no difference image



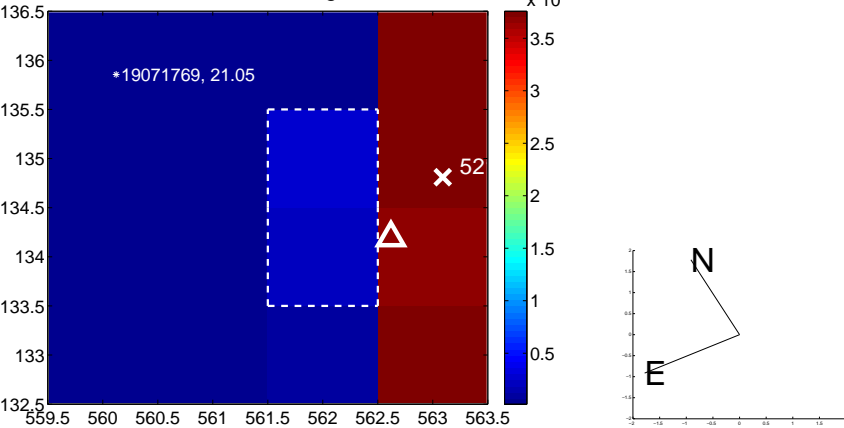
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



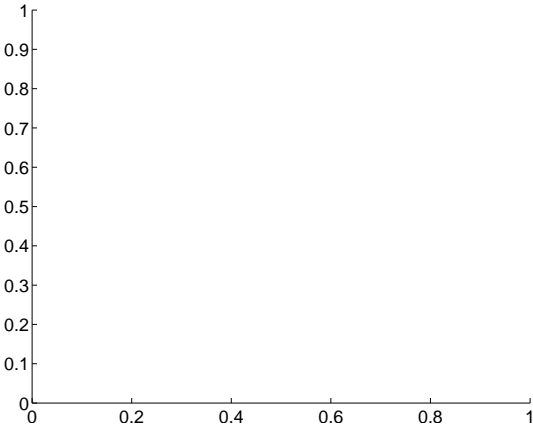
Q11 no difference image



Q11 no OOT image



Q12 no difference image

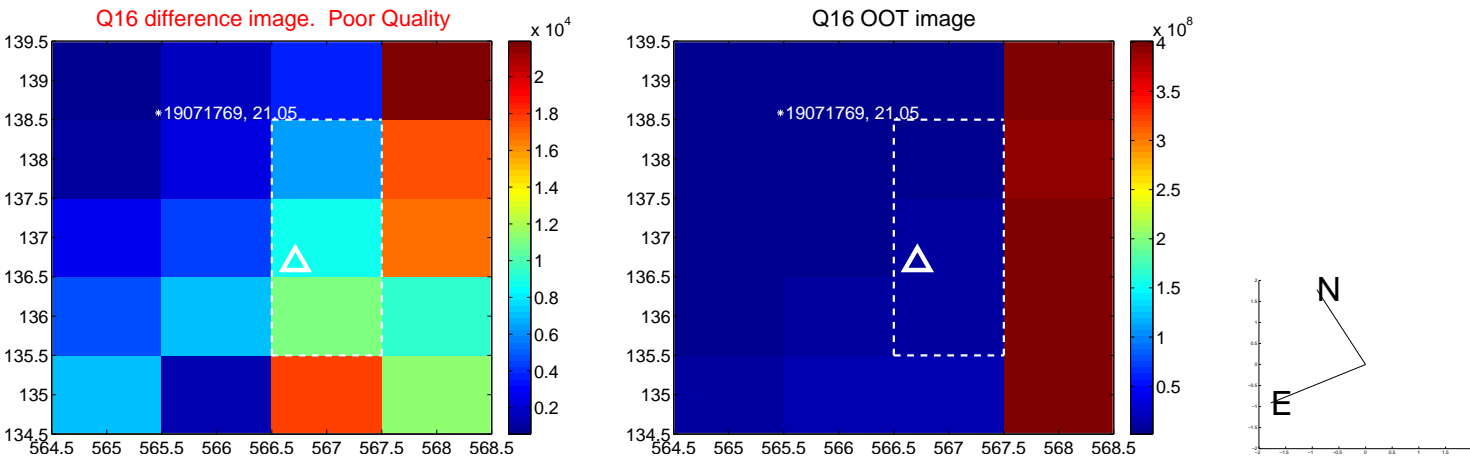
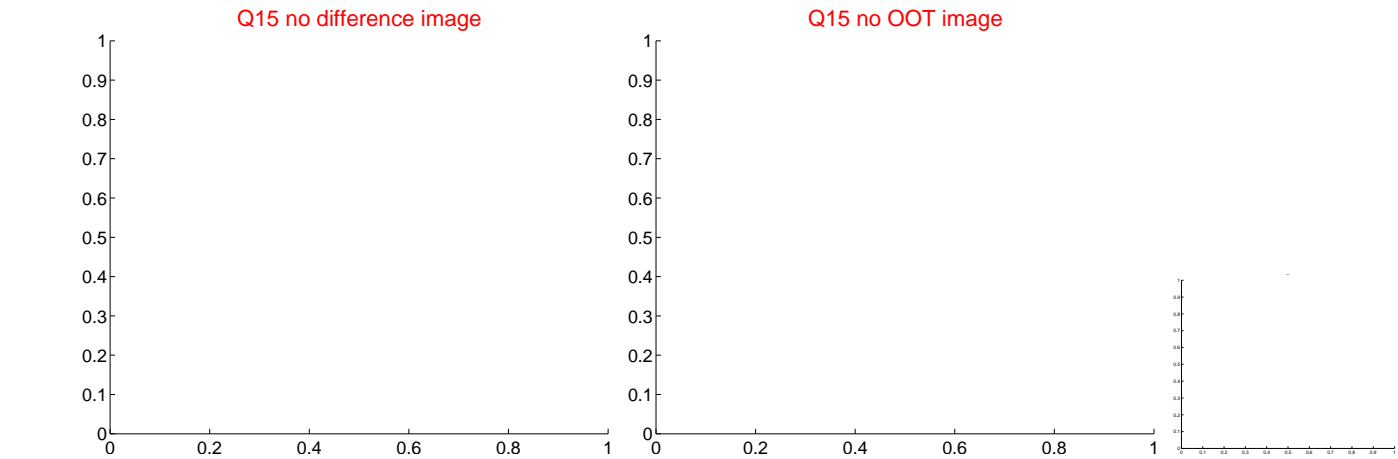
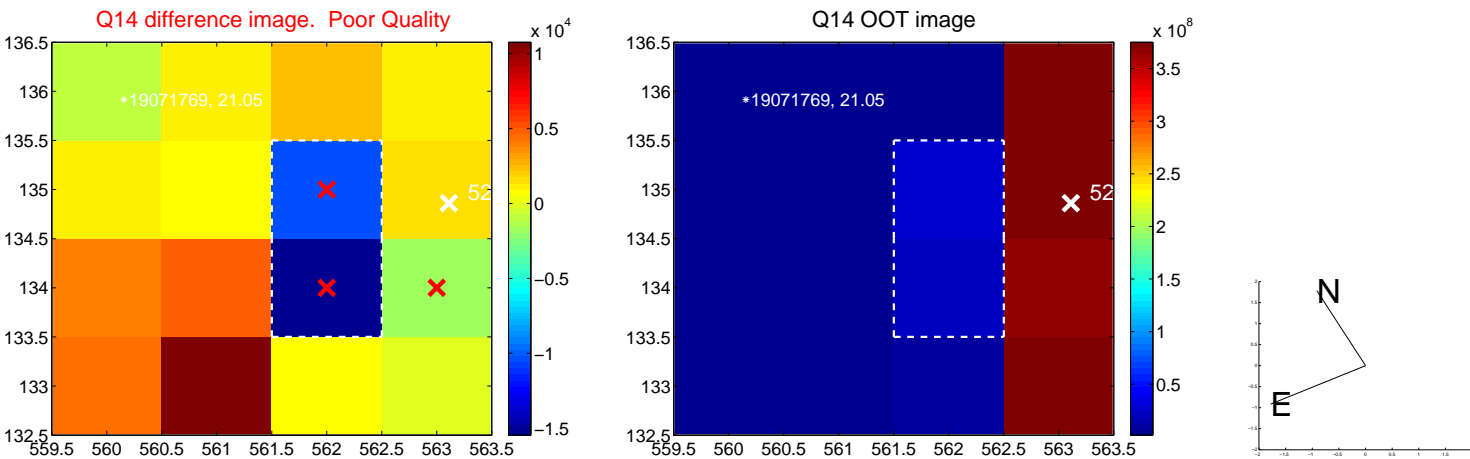
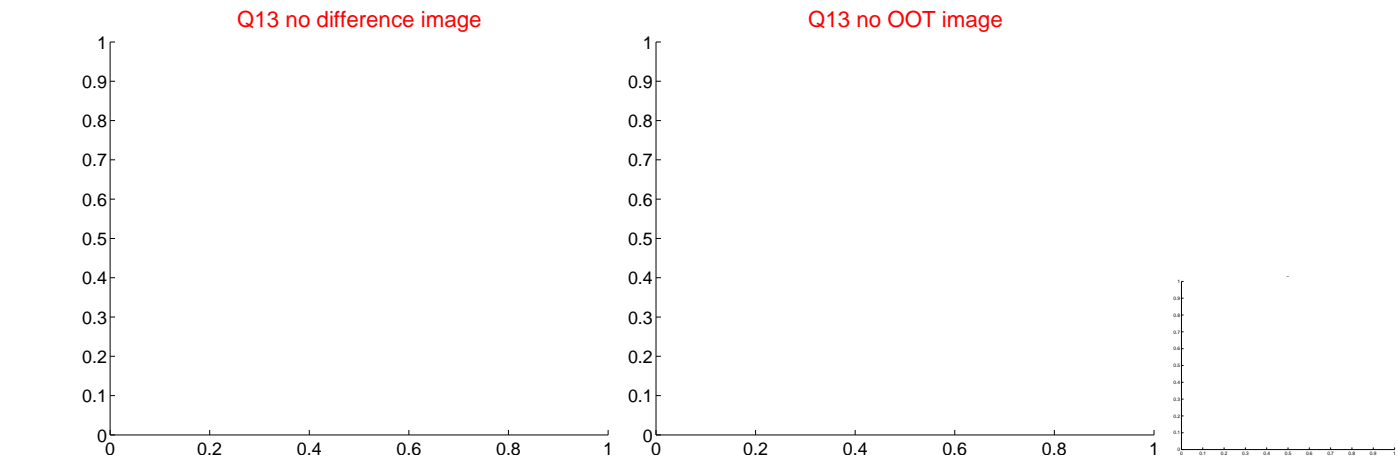


Q12 no OOT image

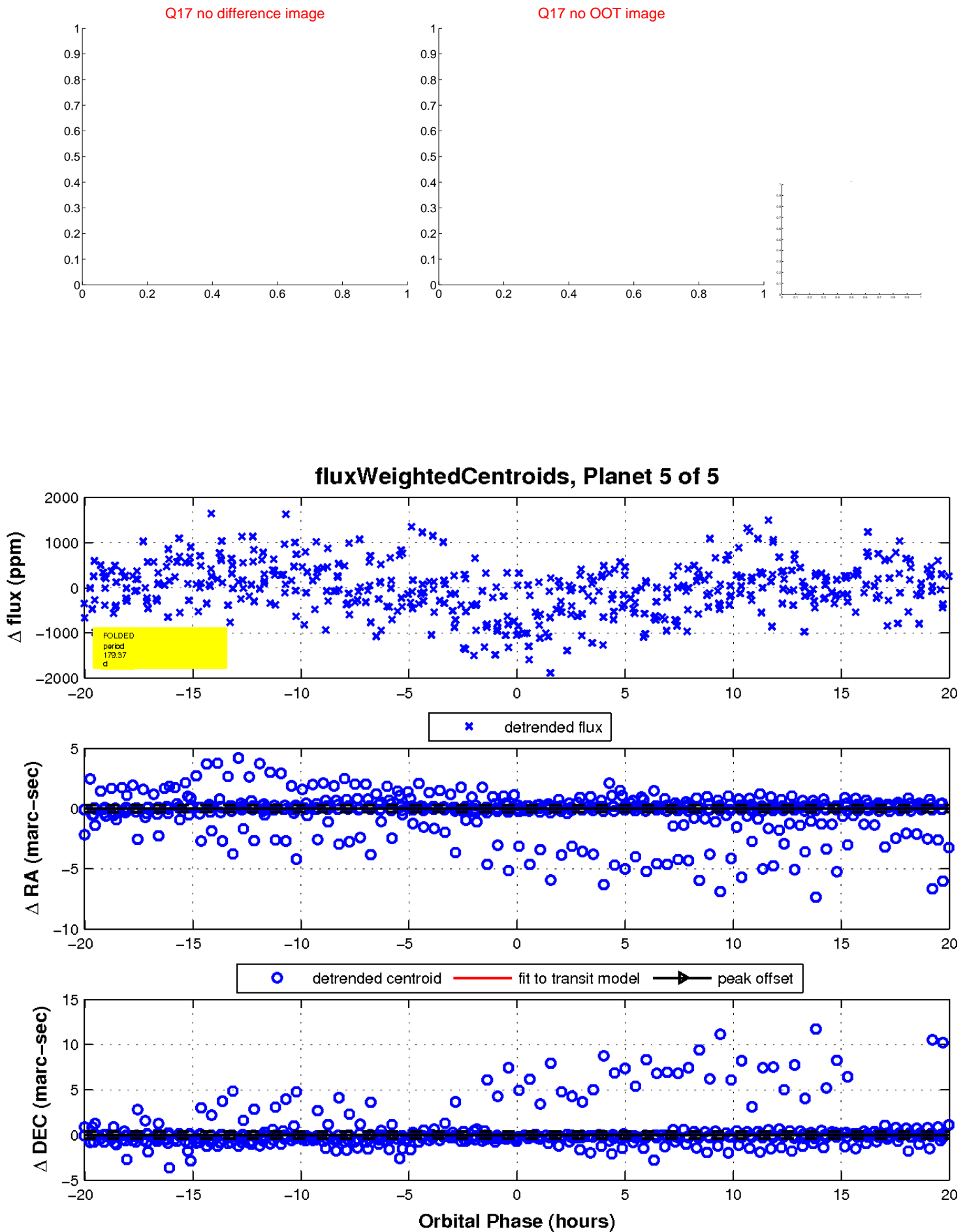




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

