

KIC 005209910

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})
005209910-01	OBS	No	1.553653	132.377279	49.5	6.442	9.6	9.7	1.65	7194	1.34	7226.73
005209910-02	OBS	No	0.764694	132.034154	70.7	8.631	9.1	11.5	1.65	7194	1.40	18596.47

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005209910-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005209910-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—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.

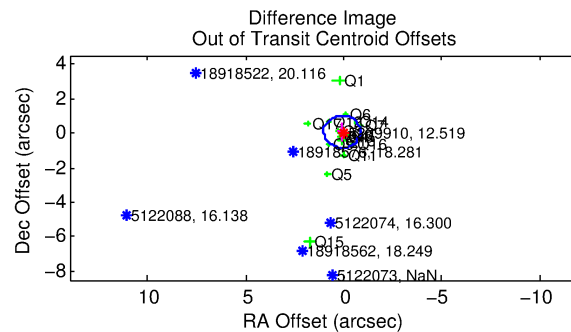
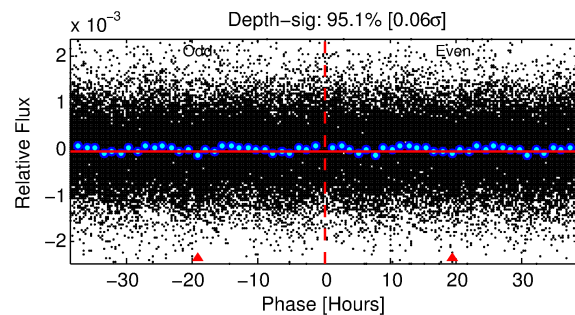
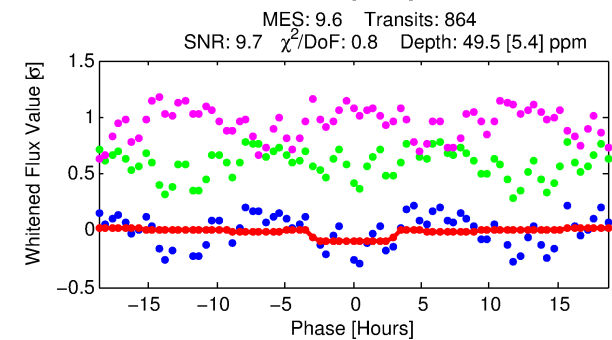
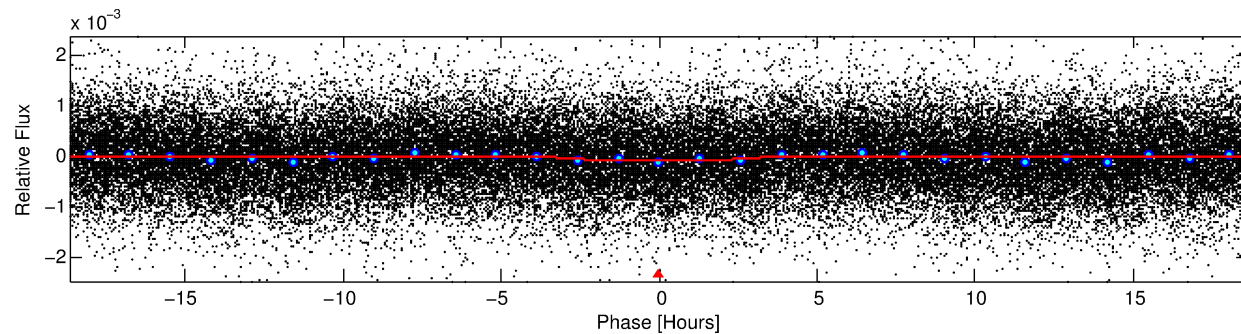
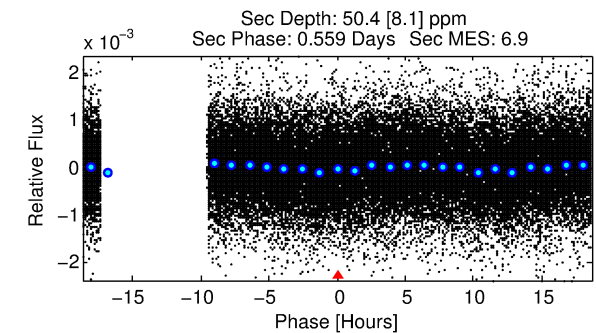
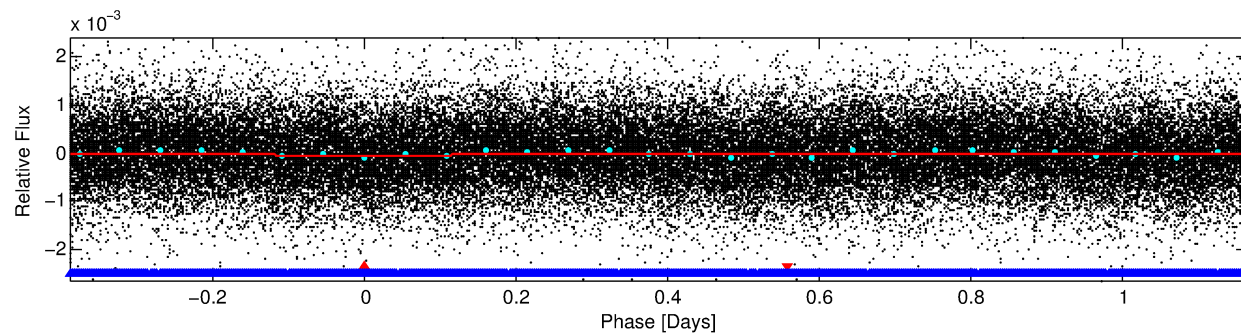
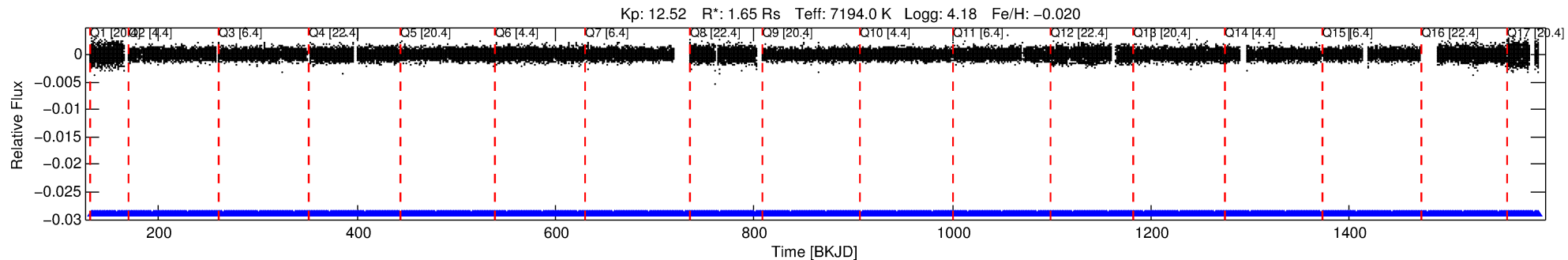
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005209910-01

No Significant Match Found

DV One-Page Summary

KIC: 5209910 Candidate: 1 of 2 Period: 1.554 d



DV Fit Results:

Period = 1.55365 [0.00002] d
Epoch = 132.3773 [0.0081] BKJD
Rp/R* = 0.0075 [0.0035]
a/R* = 1.26 [1.39]
b = 0.90 [0.64]
Seff = 7226.73 [2947.85]
Teq = 2351 [240] K
Rp = 1.34 [0.78] Re
a = 0.0300 [0.0080] AU
Ag = 13.84 [14.28] [0.90σ]
Teff = 7011 [1712] K [2.69σ]

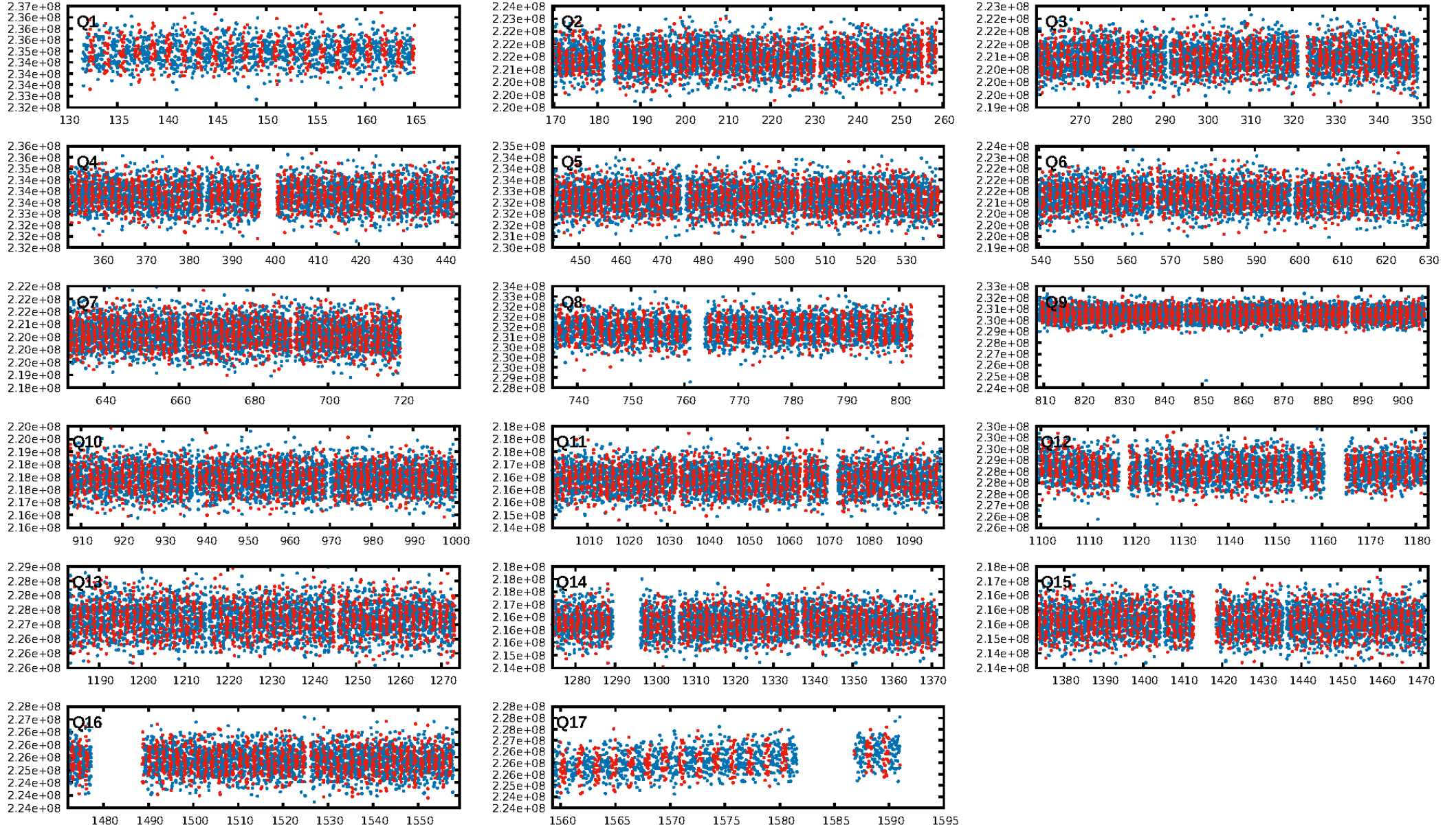
DV Diagnostic Results:

ShortPeriod-sig: 92.1% [1.76σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [826/826]
GhostDiagnostic-chr: 1.626
Centroid-sig: 0.4%
Centroid-so: 0.697 arcsec [2.04σ]
OotOffset-rm: 0.127 arcsec [0.41σ]
KicOffset-rm: 0.210 arcsec [0.55σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.88 [14/16]
DiffImageOverlap-fno: 0.00 [0/17]

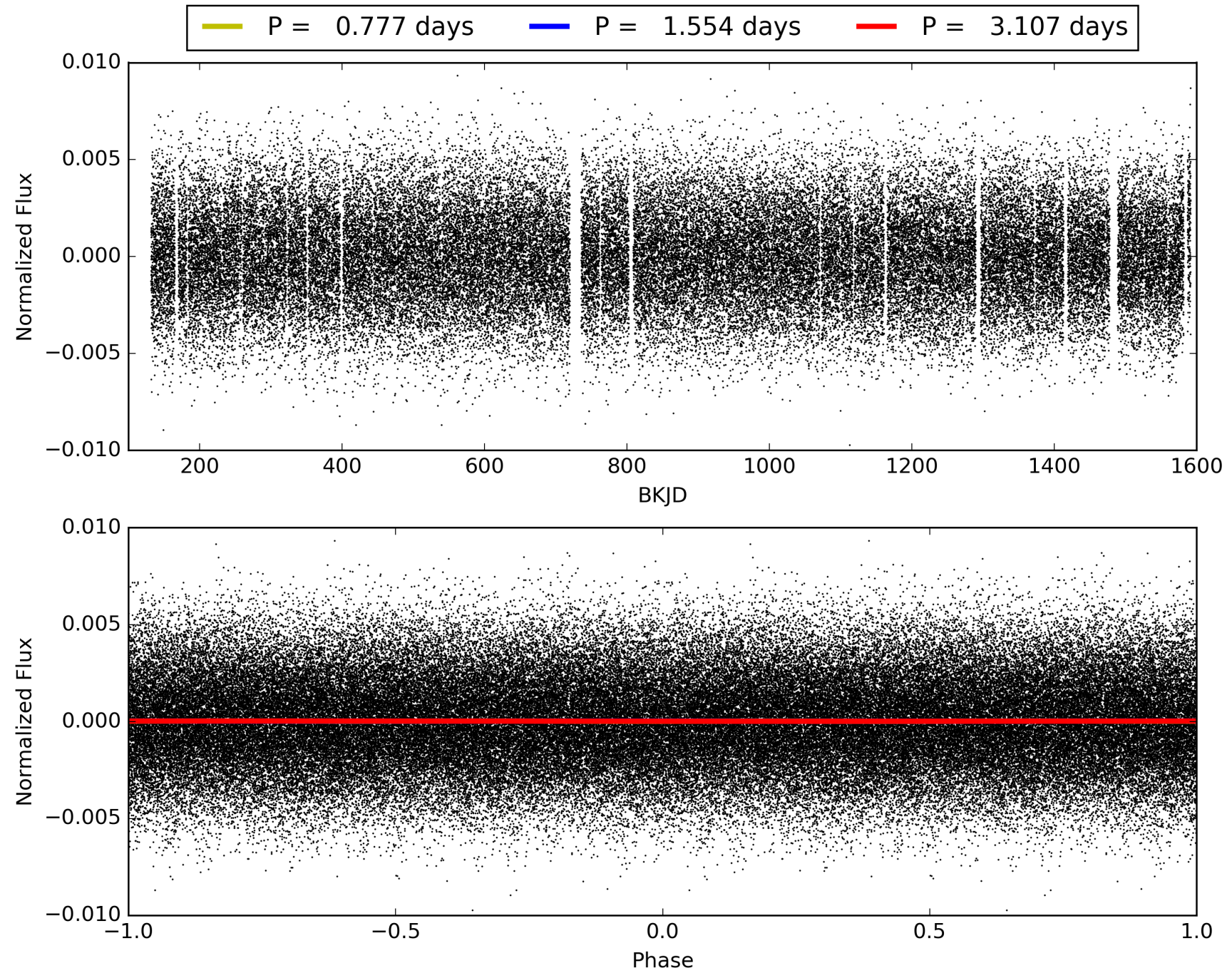
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:44:42 Z

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

TCE 005209910-01, PDC Light Curves

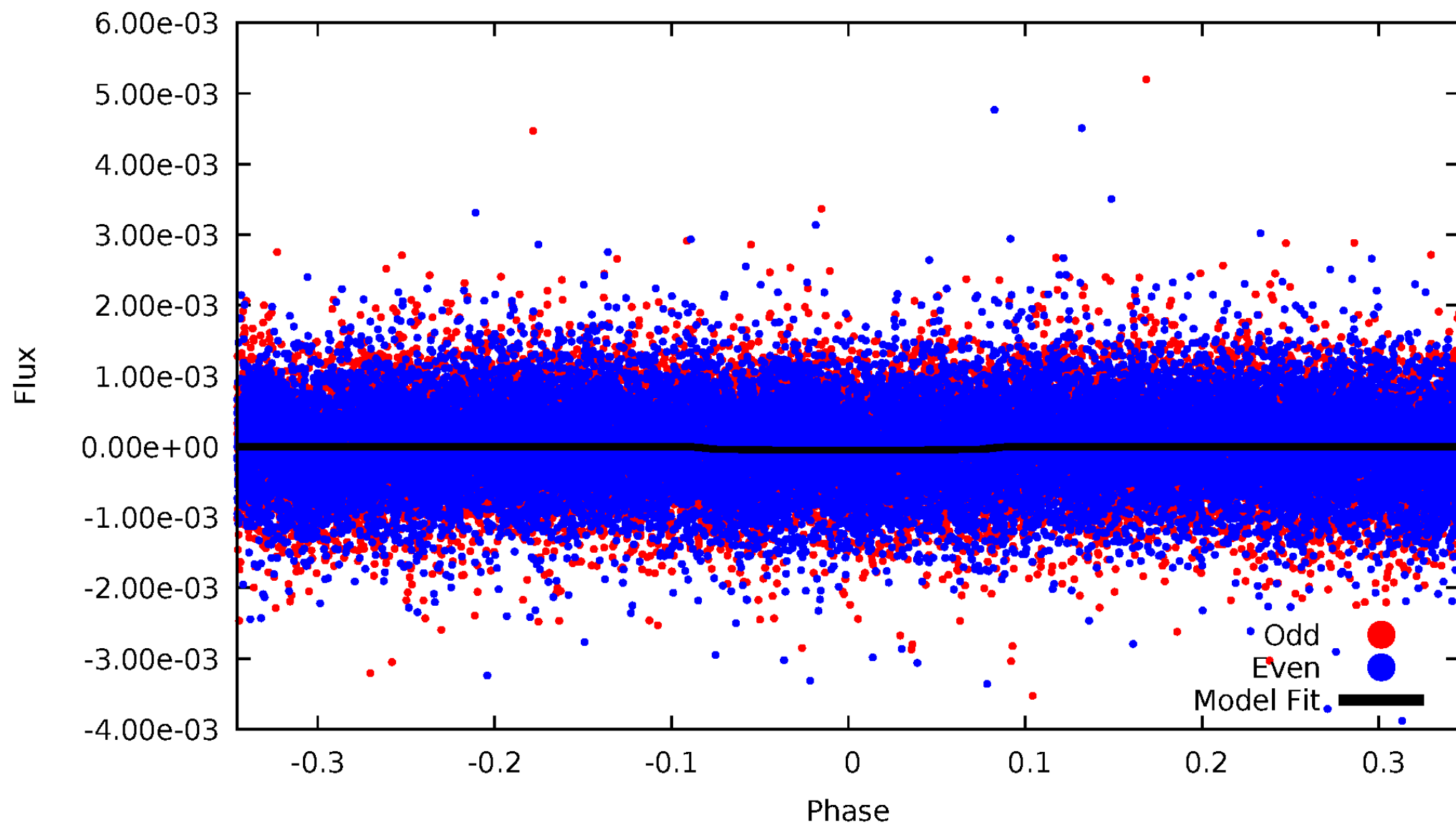


TCE 005209910-01



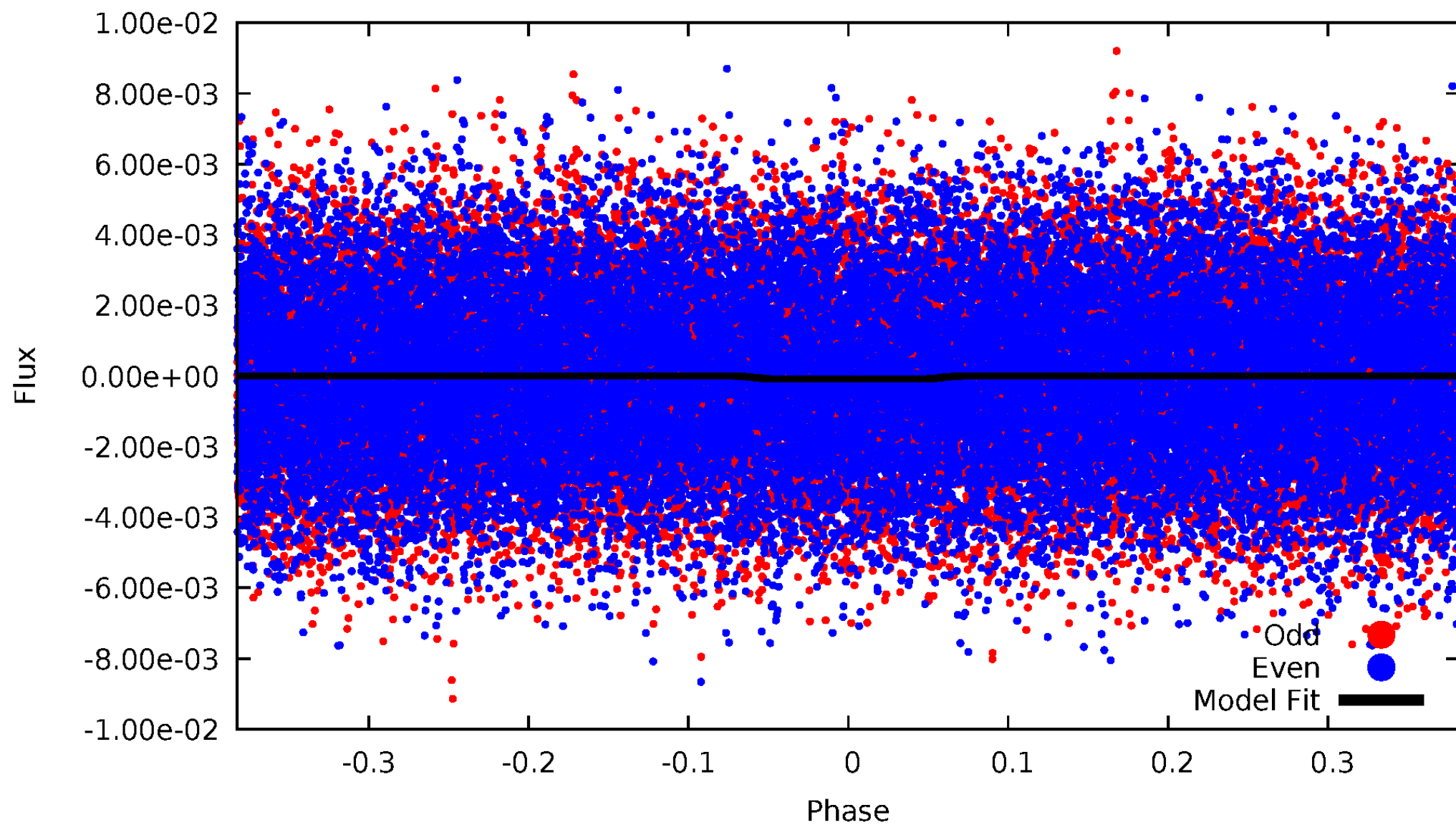
DV Odd/Even

TCE 005209910-01



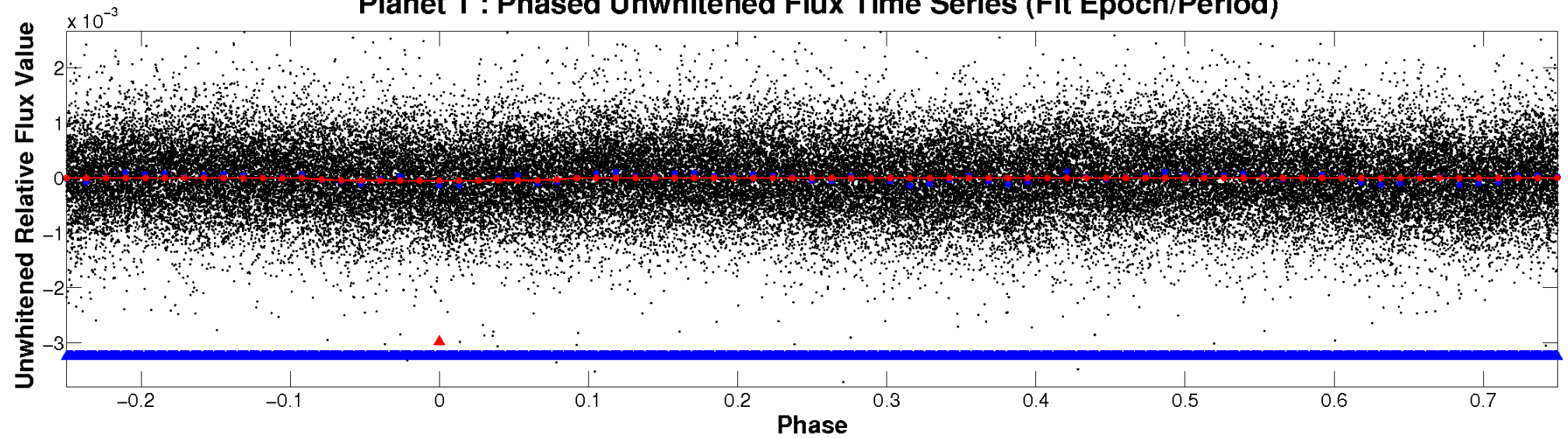
ALT Odd/Even

TCE 005209910-01

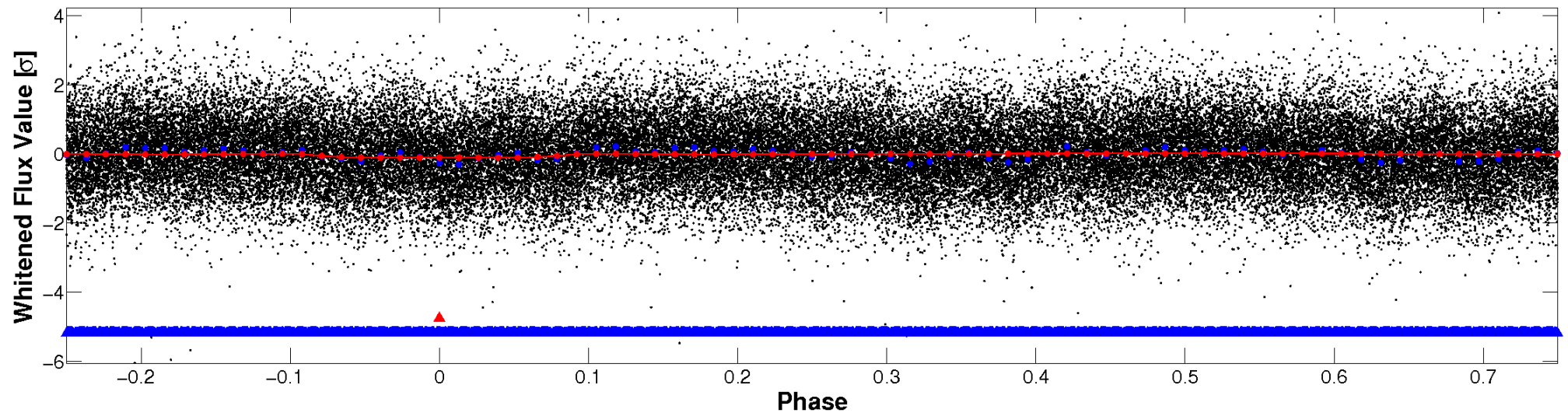


Non-Whitened Vs. Whitened Light Curve

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

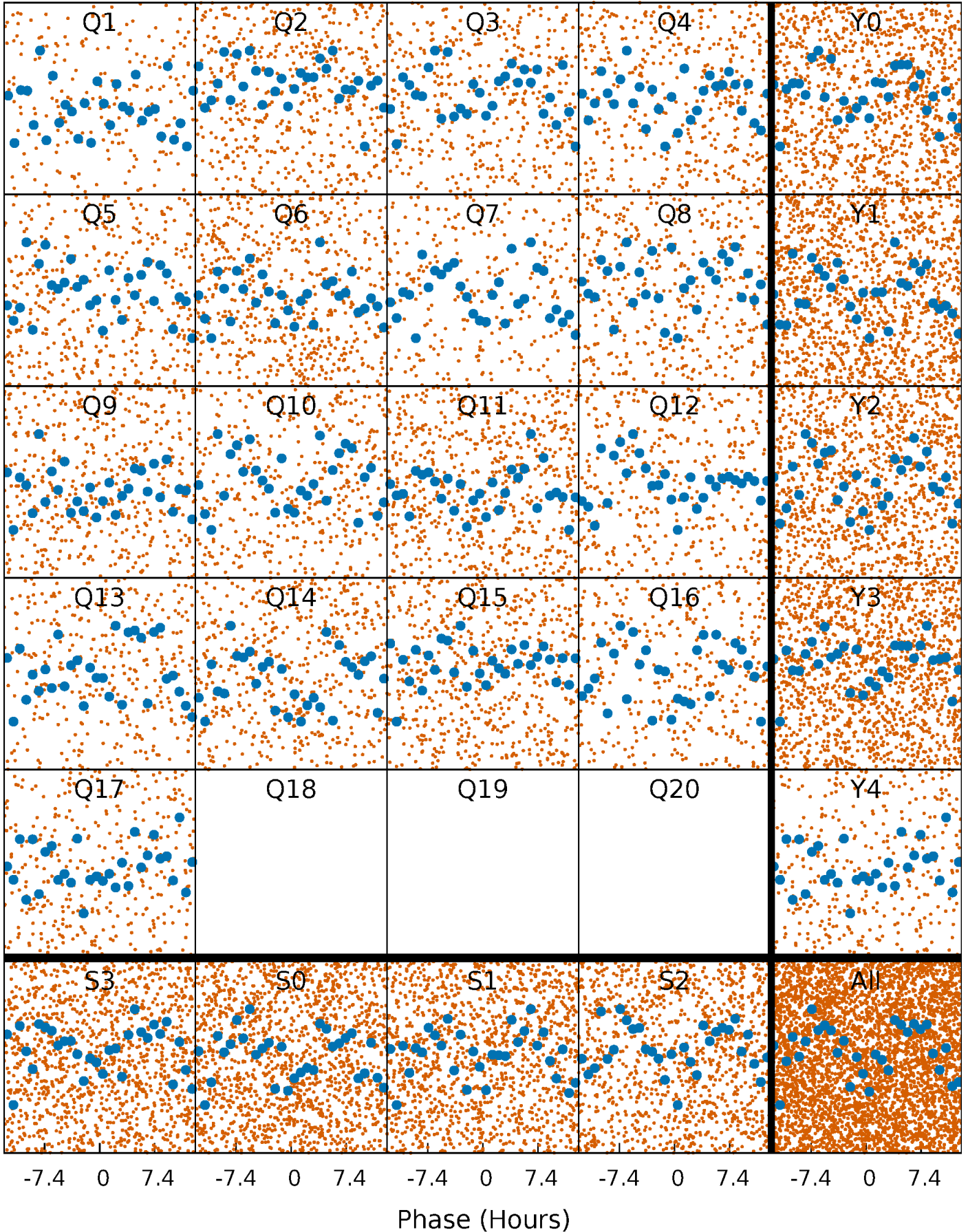


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



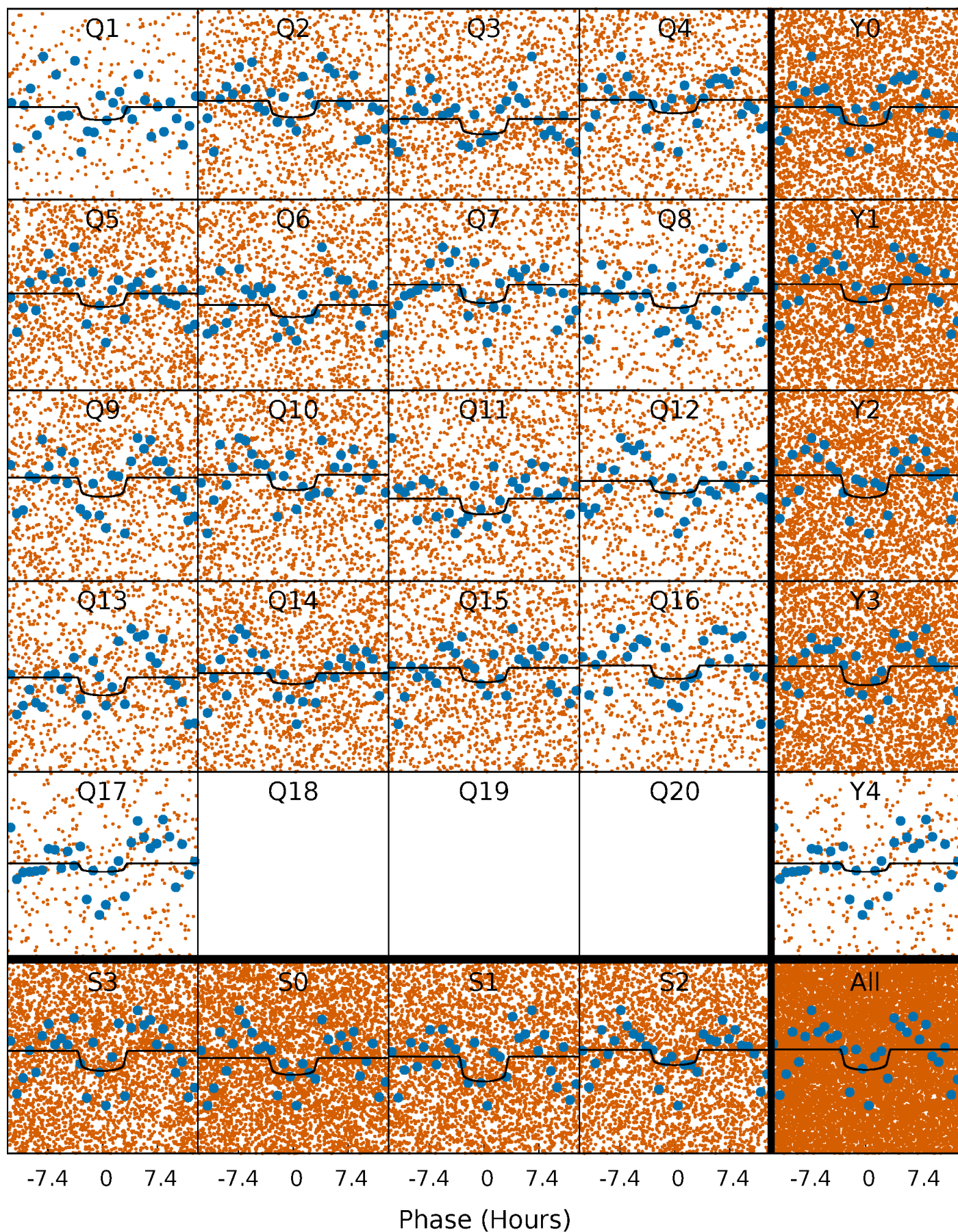
PDC Quarter-Phased Transit Curves

TCE 005209910-01 P= 1.553653 Days $T_0=132.377279$ (BKJD)



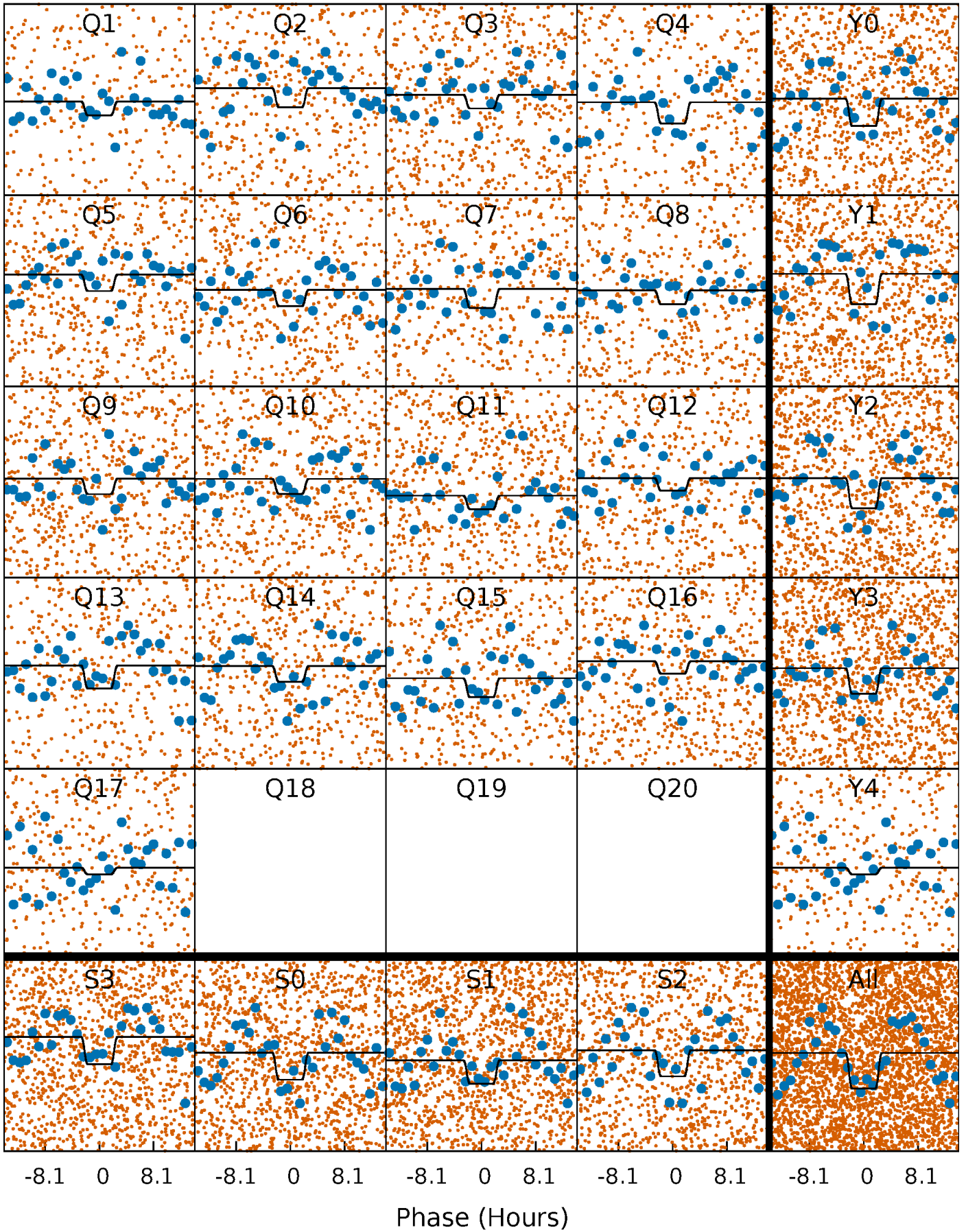
DV Quarter-Phased Transit Curves

TCE 005209910-01 P= 1.553653 Days $T_0=132.377279$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

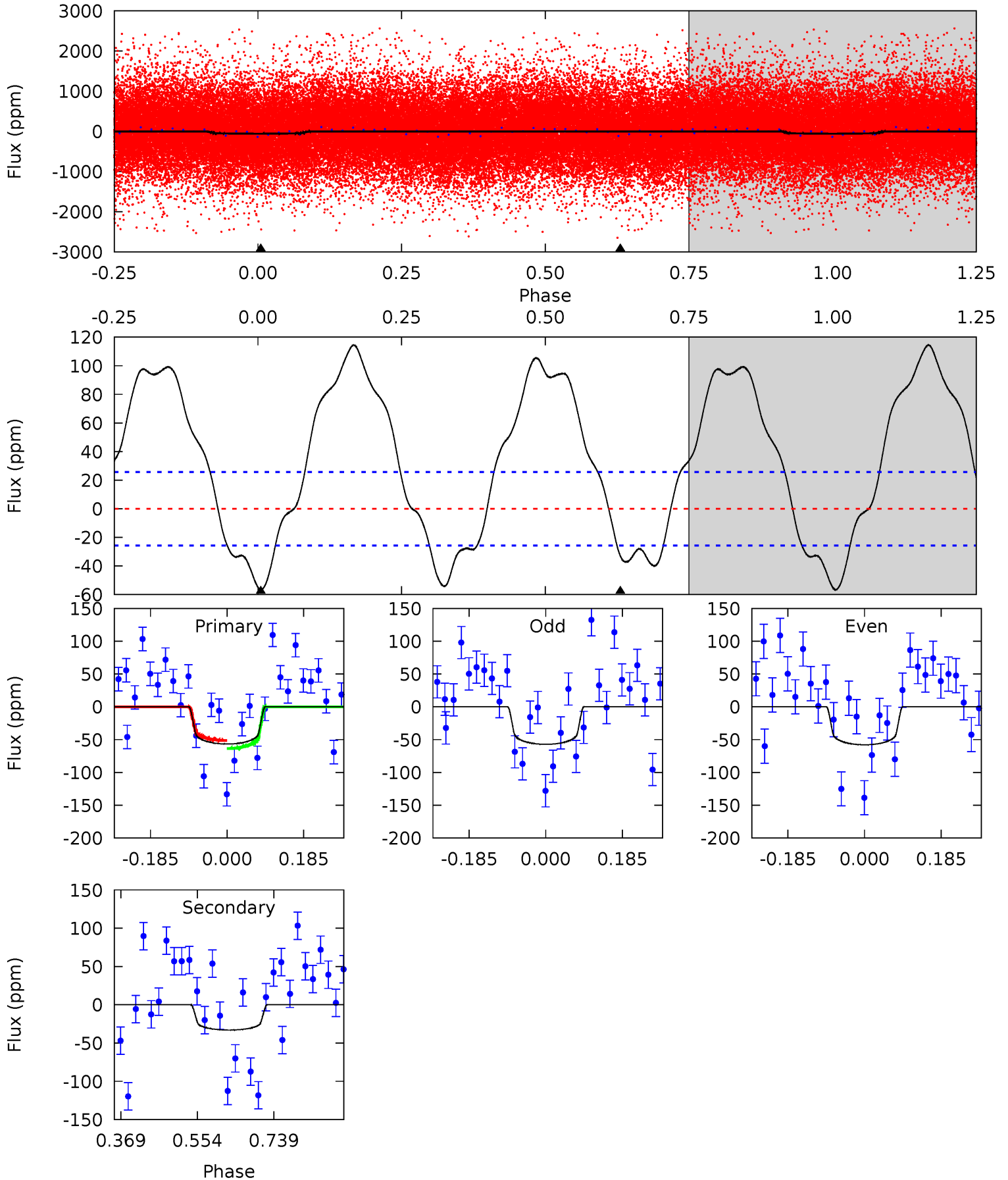
TCE 005209910-01 P= 1.553759 Days $T_0=132.317503$ (BKJD)



DV Model-Shift Uniqueness Test

005209910-01, P = 1.553653 Days, E = 130.823626 Days

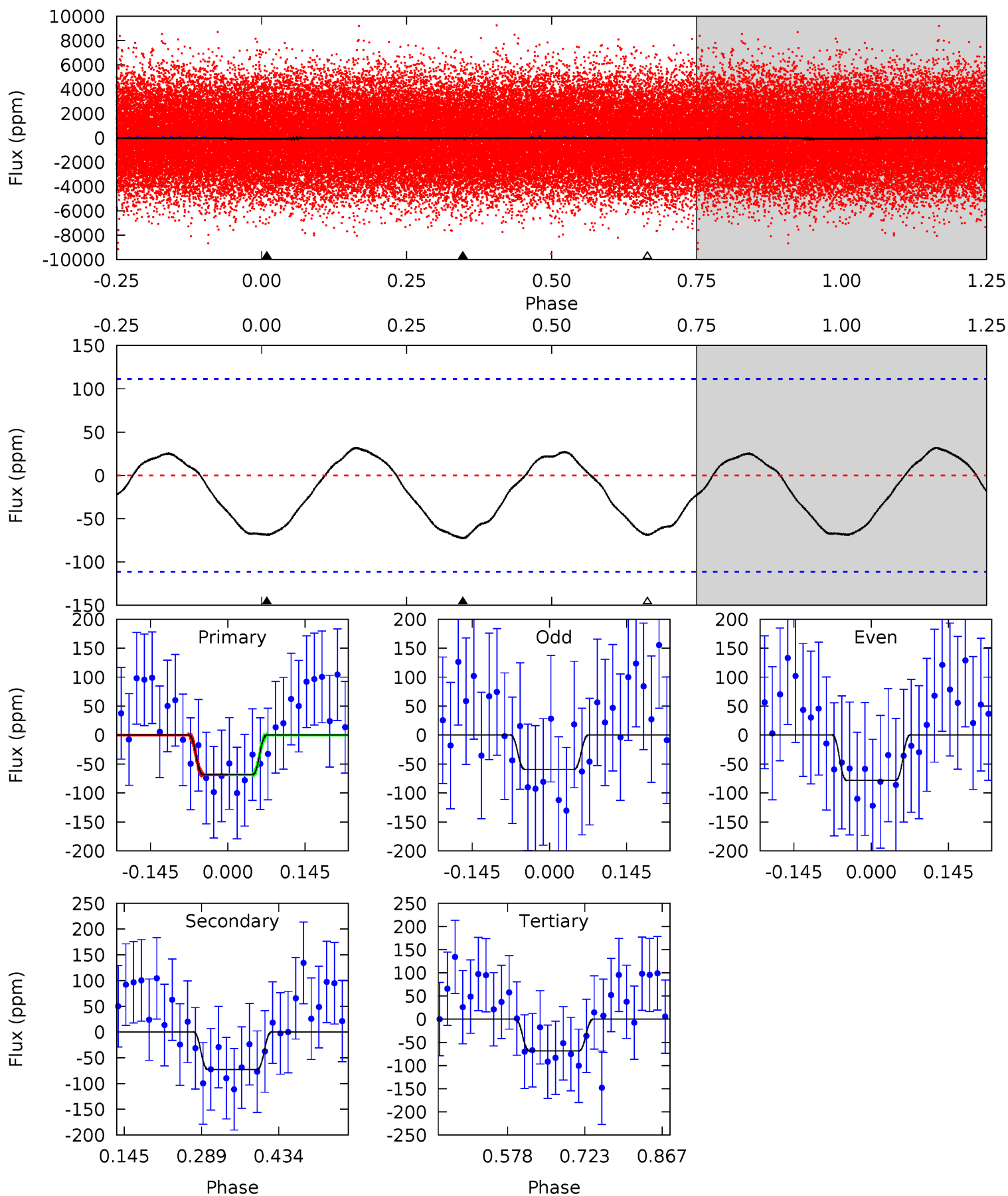
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.78	5.69	0	0	4.43	1.33	7.68	9.78	9.78	5.69	5.69	0.06	0.94	0.67	1.05



Alt Model-Shift Uniqueness Test

005209910-01, P = 1.553759 Days, E = 130.763744 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.76	2.92	2.76	0	4.49	1.46	1.38	-0.00	2.76	0.16	2.92	0.38	0.98	0.30	0.01



Stellar Parameters For KIC 005209910

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7194^{+200}_{-300}	$4.179^{+0.105}_{-0.195}$	$-0.020^{+0.200}_{-0.350}$	$1.648^{+0.547}_{-0.294}$	$1.494^{+0.211}_{-0.211}$	$0.470^{+0.272}_{-0.245}$
	+3%/-4%	+3%/-5%	+1000%/-1750%	+33%/-18%	+14%/-14%	+58%/-52%
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 005209910-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-33 ± 6	$1.44^{+0.68}_{-0.71}$	3322^{+244}_{-225}	6091^{+2797}_{-1068}	$7.808^{+22.312}_{-4.375}$
Alt.	-72 ± 25	$1.64^{+0.77}_{-0.65}$	3319^{+253}_{-221}	6899^{+2579}_{-1328}	13^{+22}_{-7}

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

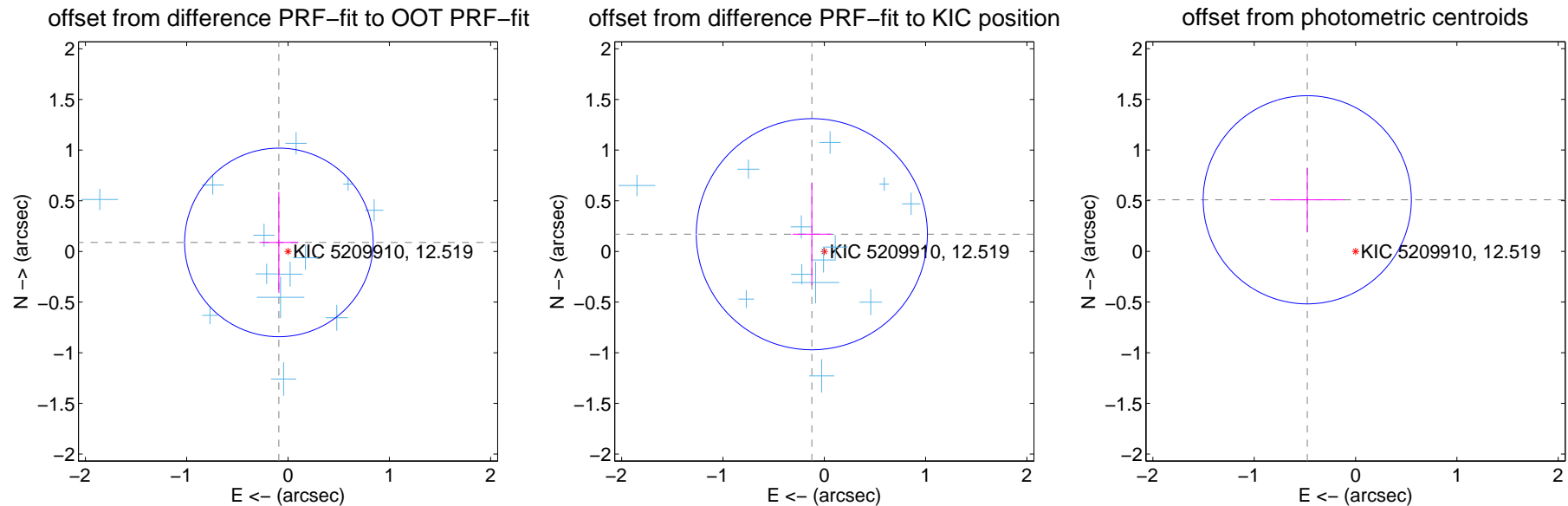
DV Centroid Data

Supplemental centroid analysis for 005209910-01. Kepler magnitude: 12.52. Transit SNR 9.70

There are 14 quarters with good PRF difference image offsets

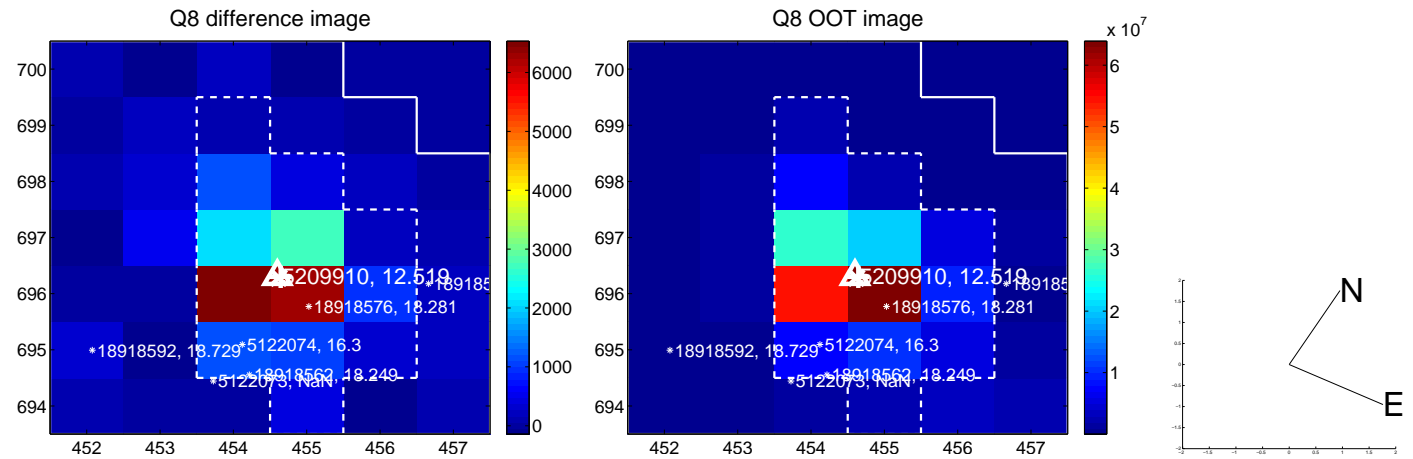
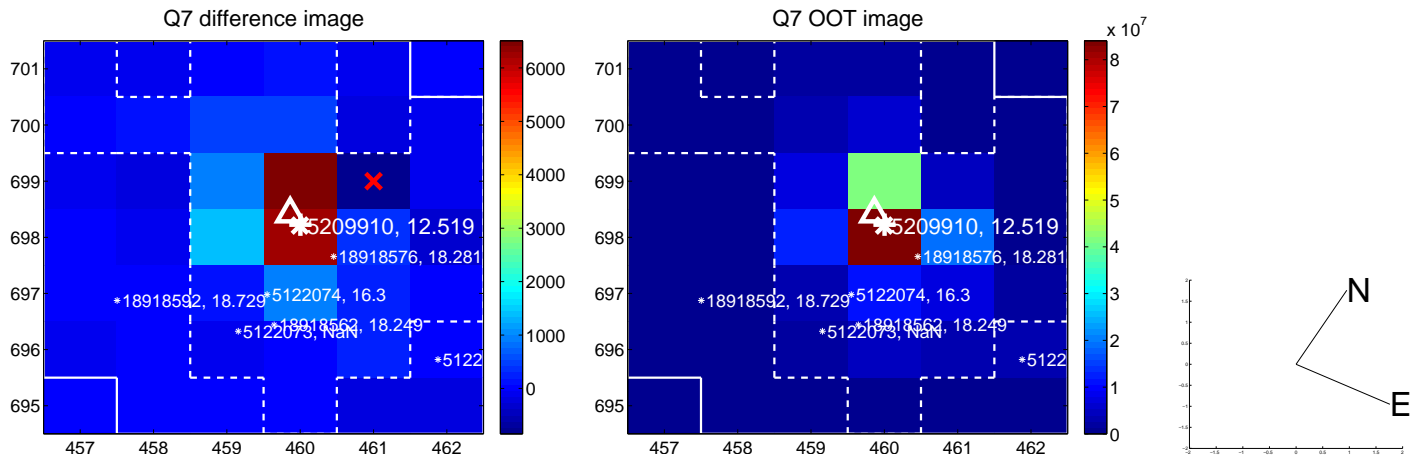
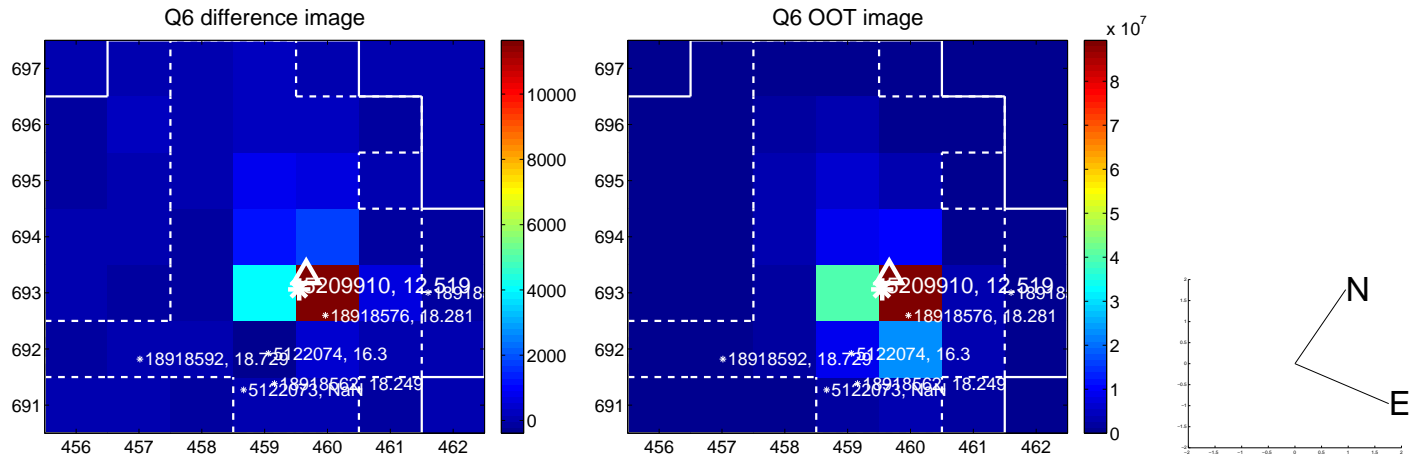
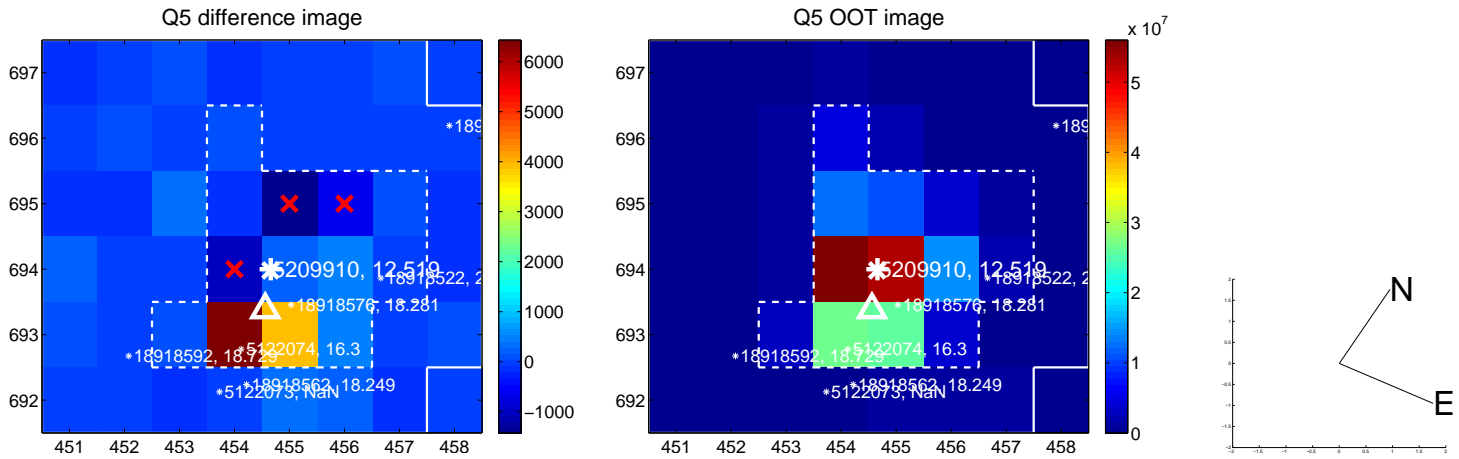
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.127 ± 0.310	0.41	0.090 ± 0.192	0.089 ± 0.498
PRF-fit source offset from KIC position	0.210 ± 0.380	0.55	0.123 ± 0.191	0.170 ± 0.506
photometric centroid source offset	0.70 ± 0.34	2.04	0.48 ± 0.37	0.51 ± 0.32

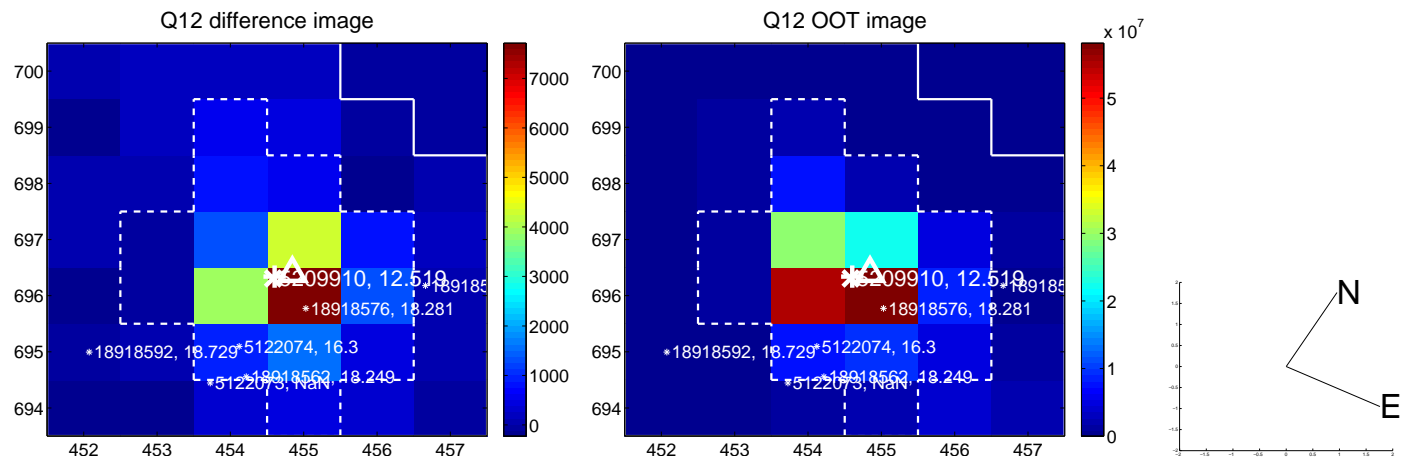
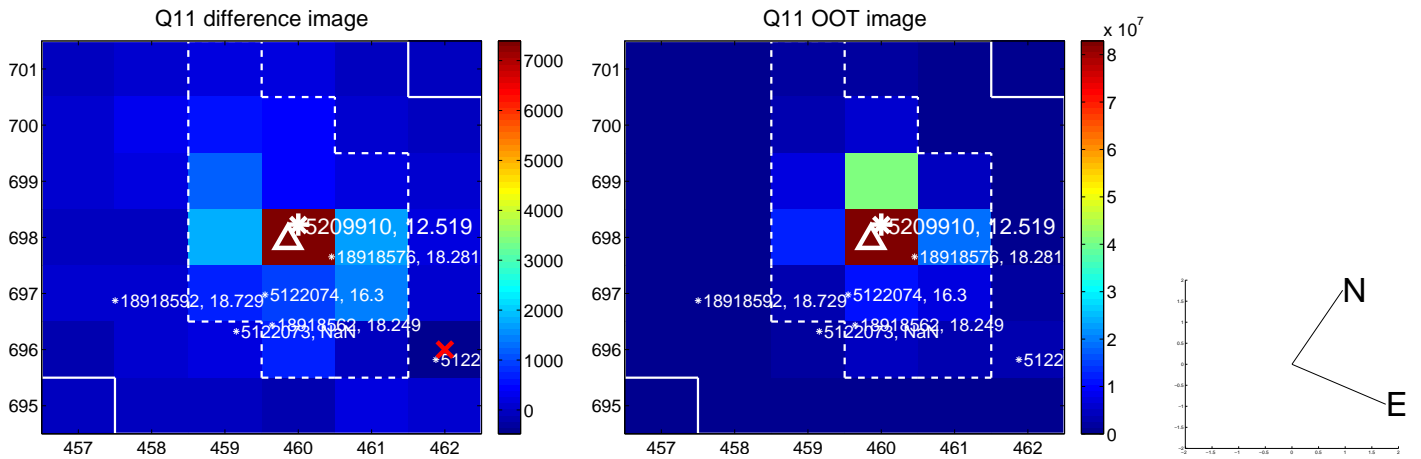
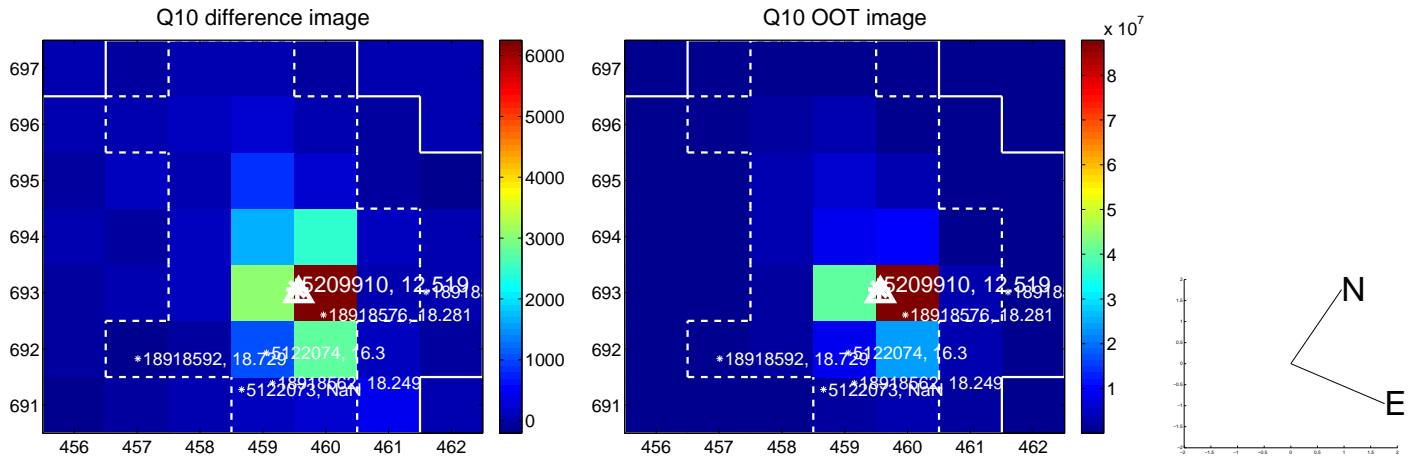
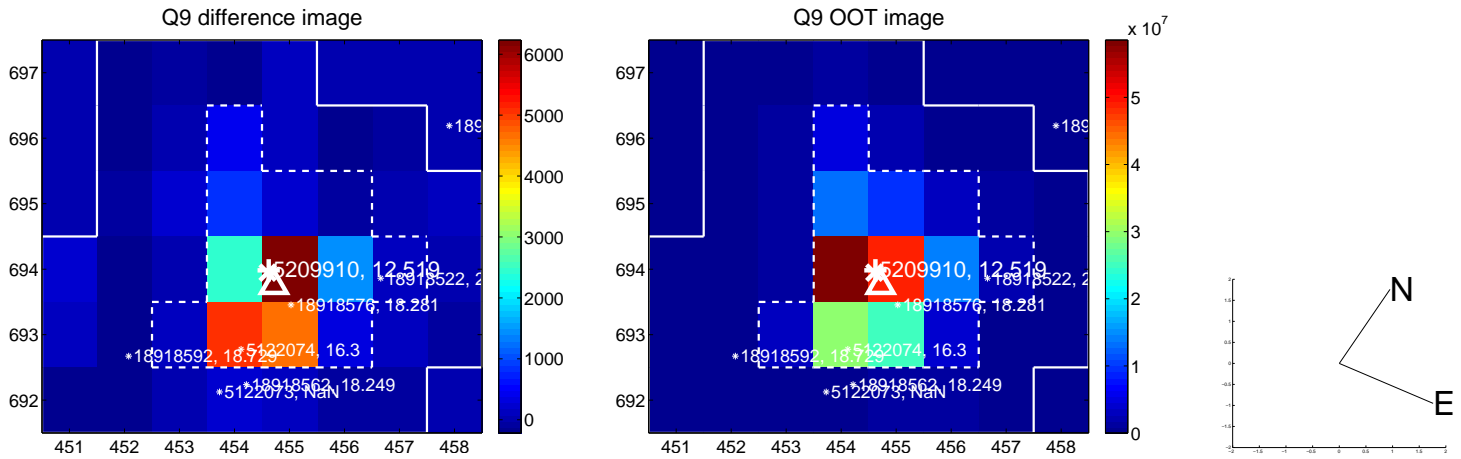


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

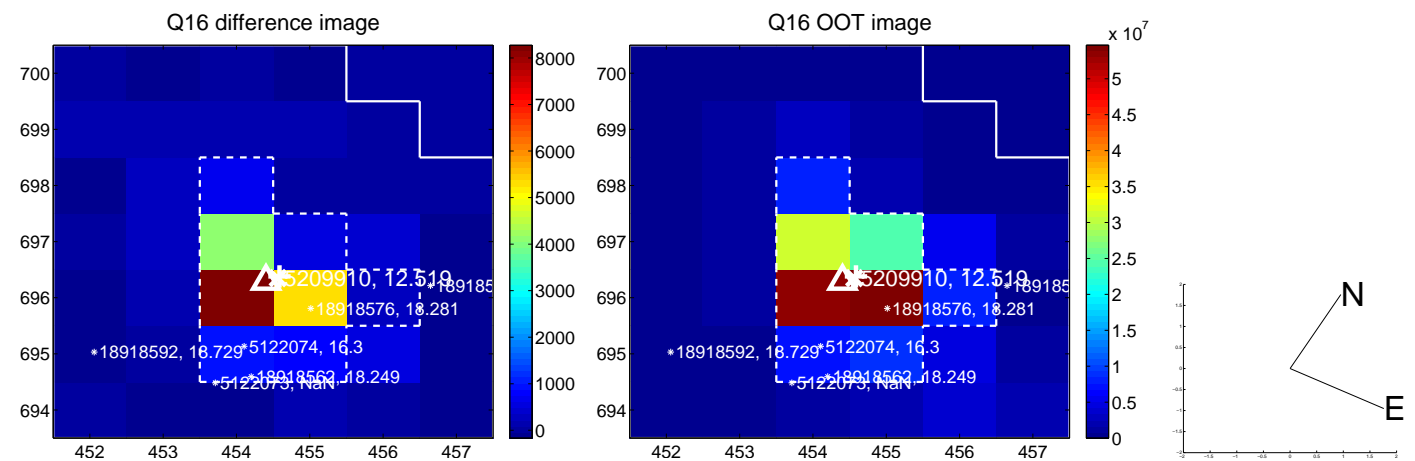
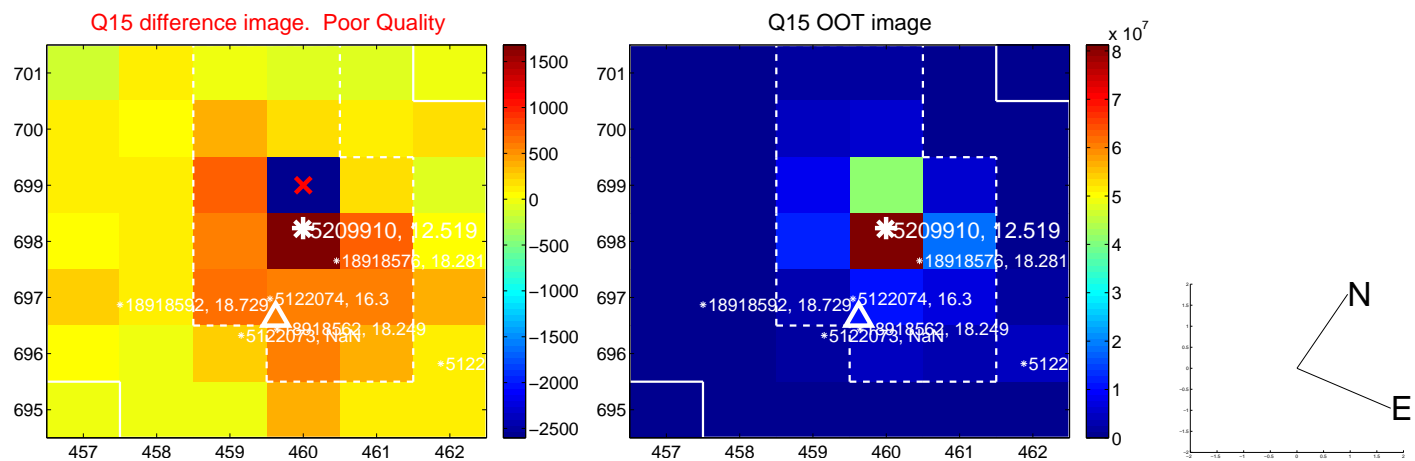
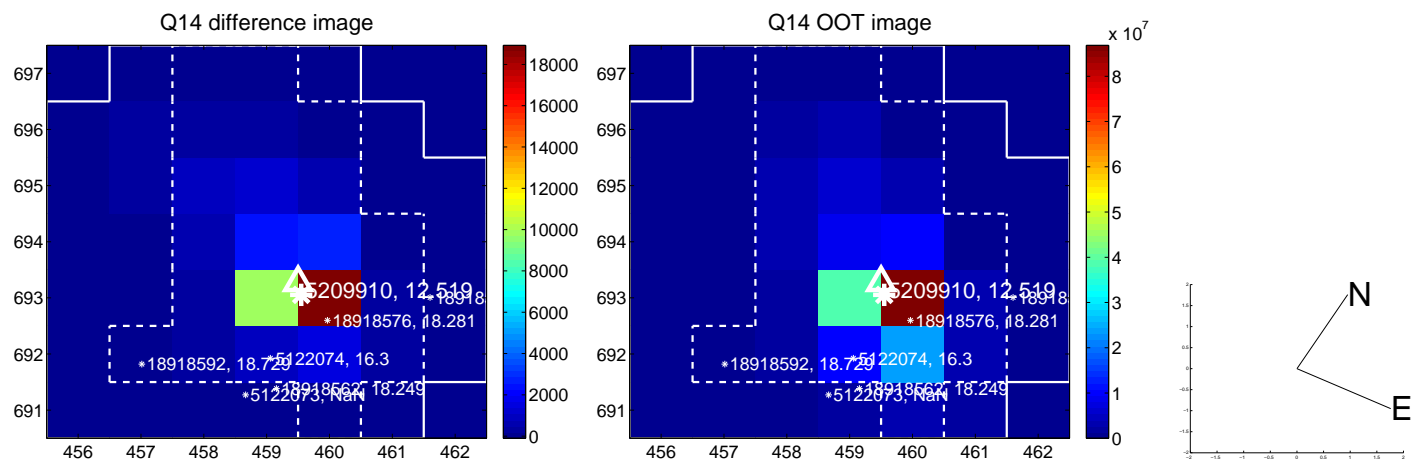
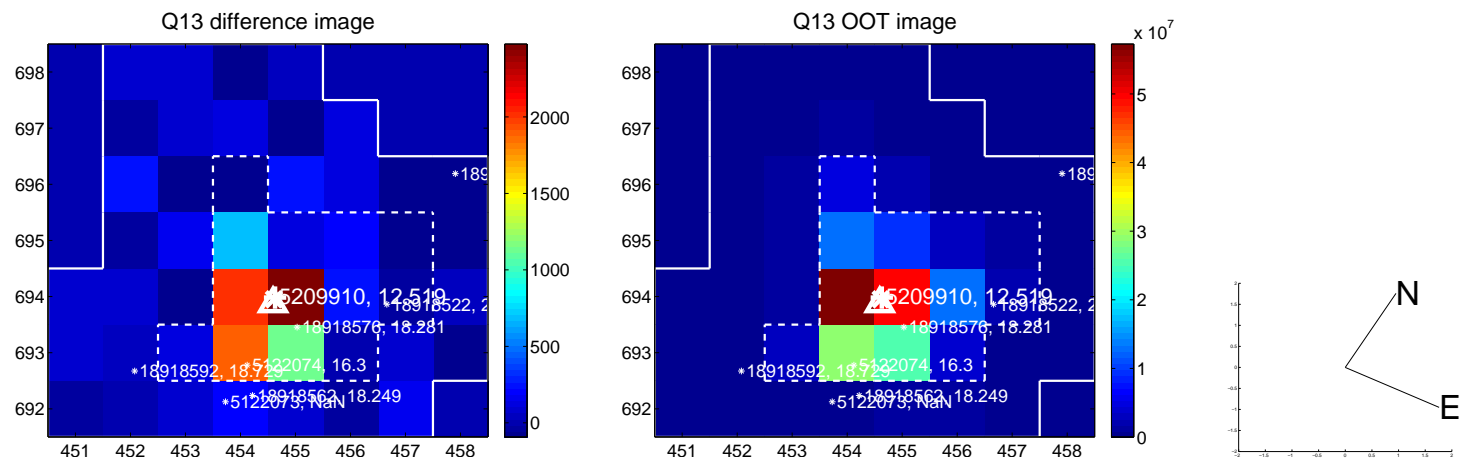
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



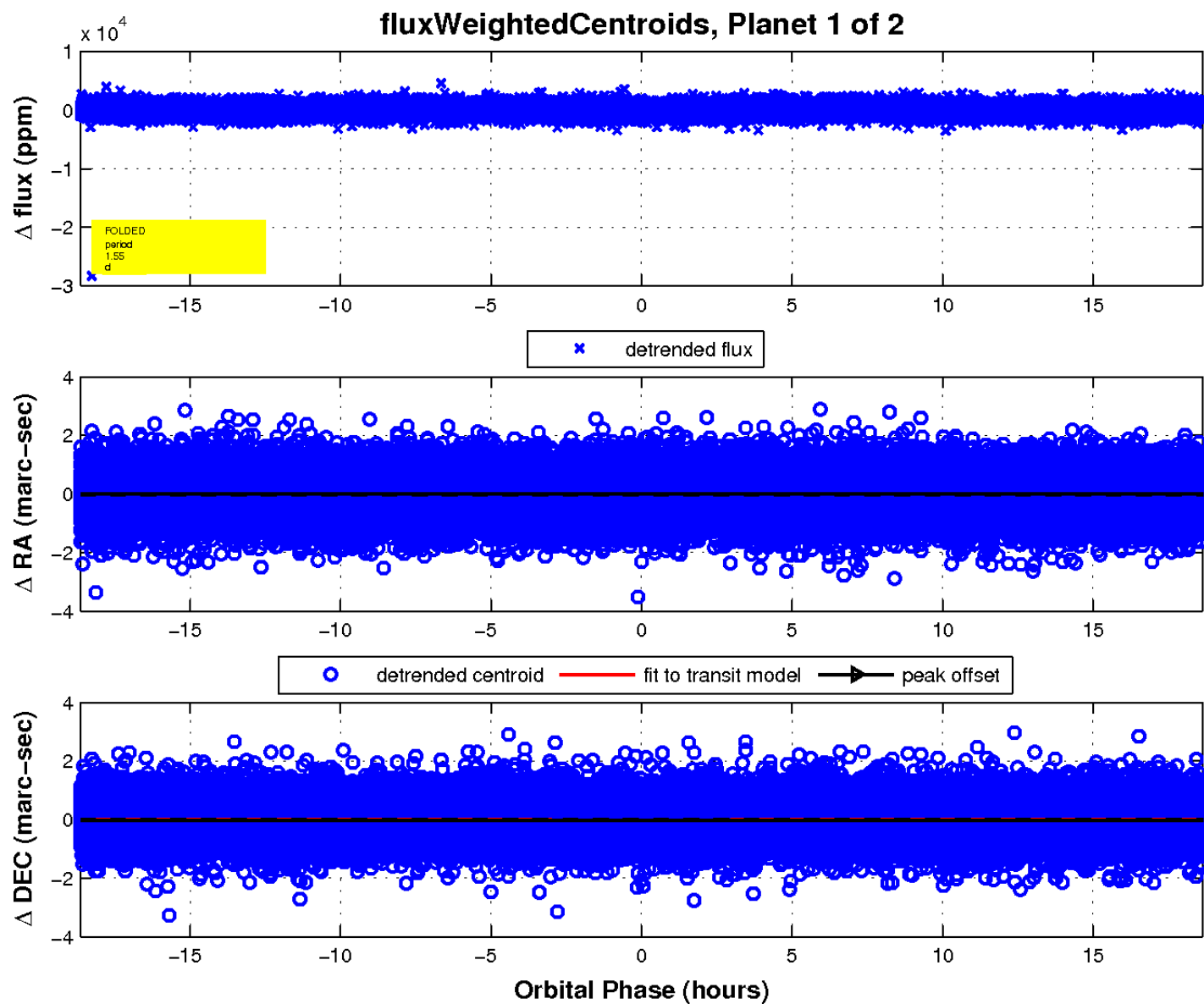
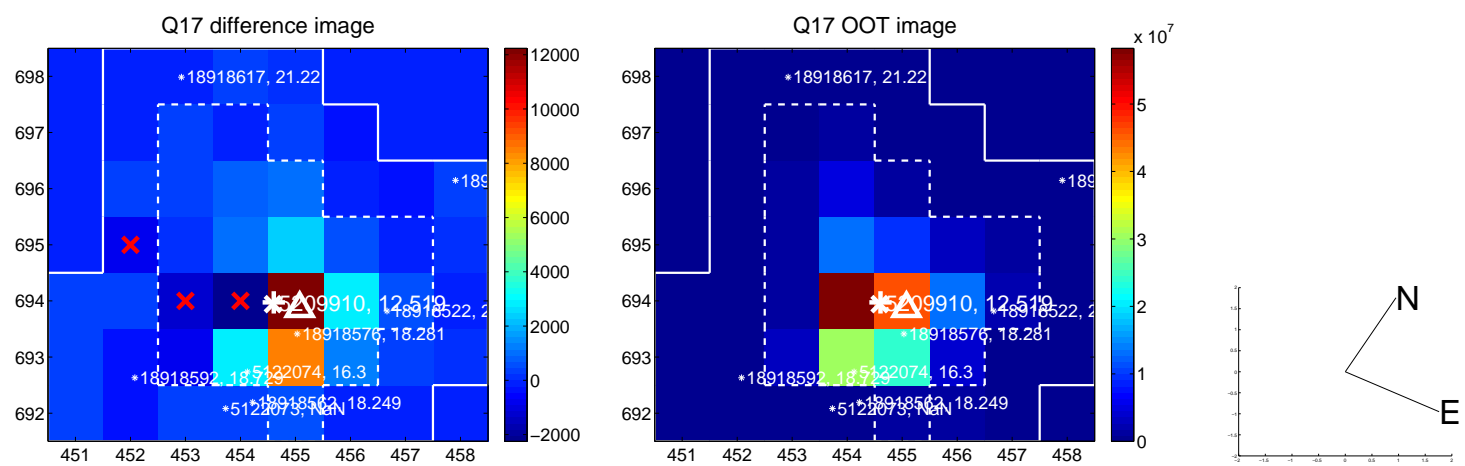
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



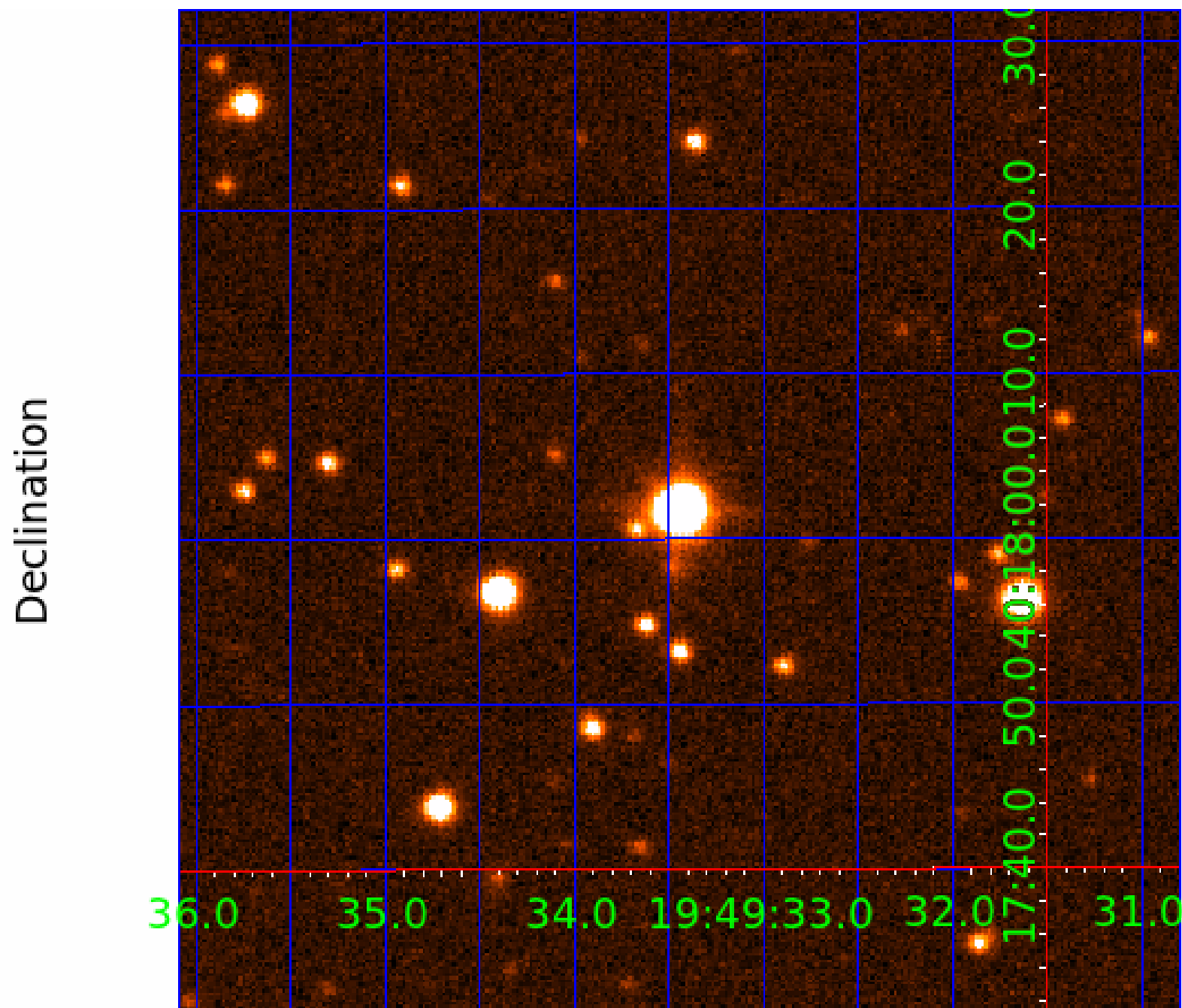
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



KIC 005209910

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})
005209910-01	OBS	No	1.553653	132.377279	49.5	6.442	9.6	9.7	1.65	7194	1.34	7226.73
005209910-02	OBS	No	0.764694	132.034154	70.7	8.631	9.1	11.5	1.65	7194	1.40	18596.47

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005209910-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
005209910-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—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.

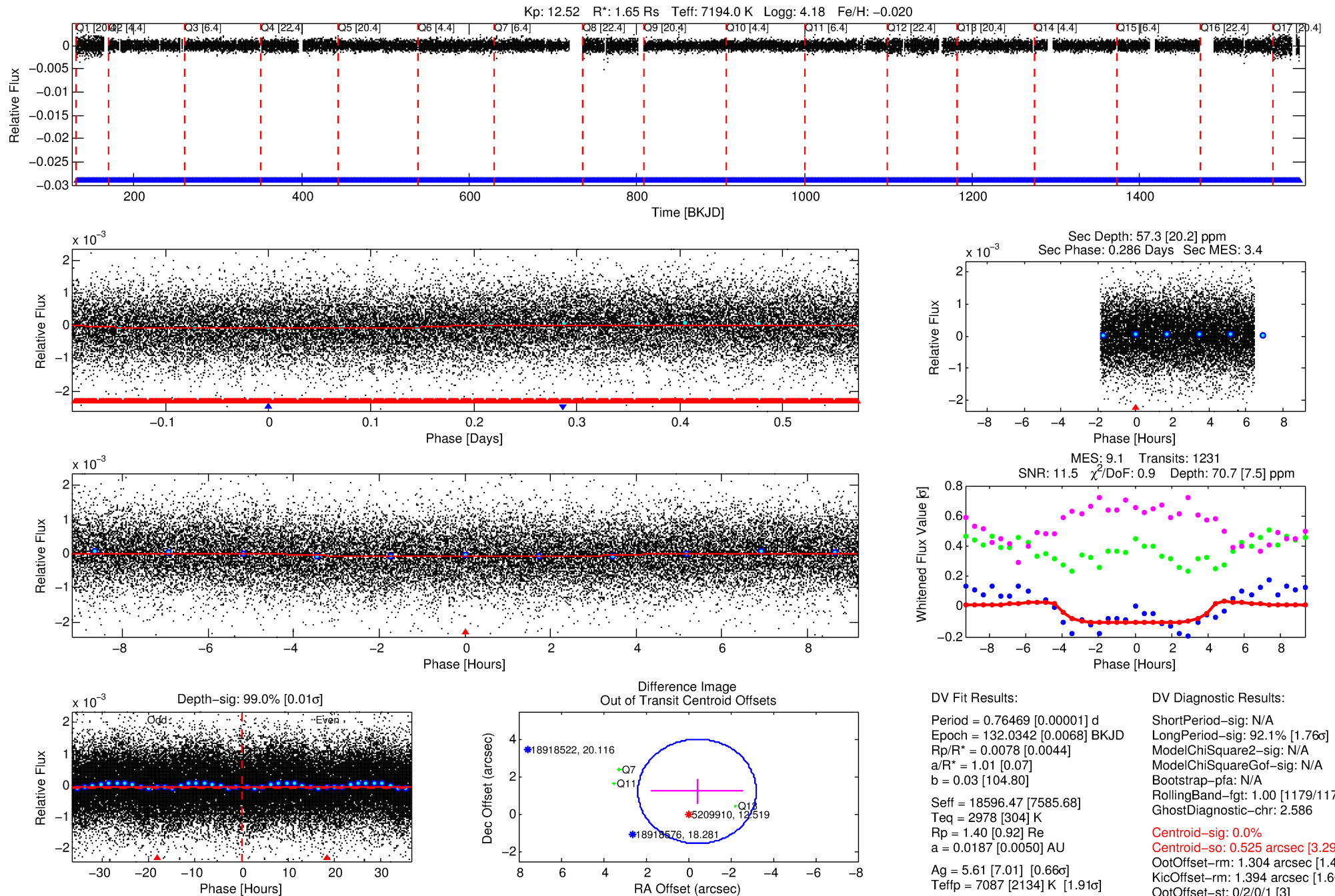
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005209910-02

No Significant Match Found

DV One-Page Summary

KIC: 5209910 Candidate: 2 of 2 Period: 0.765 d



DV Fit Results:

Period = 0.76469 [0.00001] d
Epoch = 132.0342 [0.0068] BKJD
Rp/R* = 0.0078 [0.0044]
a/R* = 1.01 [0.07]
b = 0.03 [104.80]
Seff = 18596.47 [7585.68]
Teq = 2978 [304] K
Rp = 1.40 [0.92] Re
a = 0.0187 [0.0050] AU
Ag = 5.61 [7.01] [0.66 σ]
Teff = 7087 [2134] K [1.91 σ]

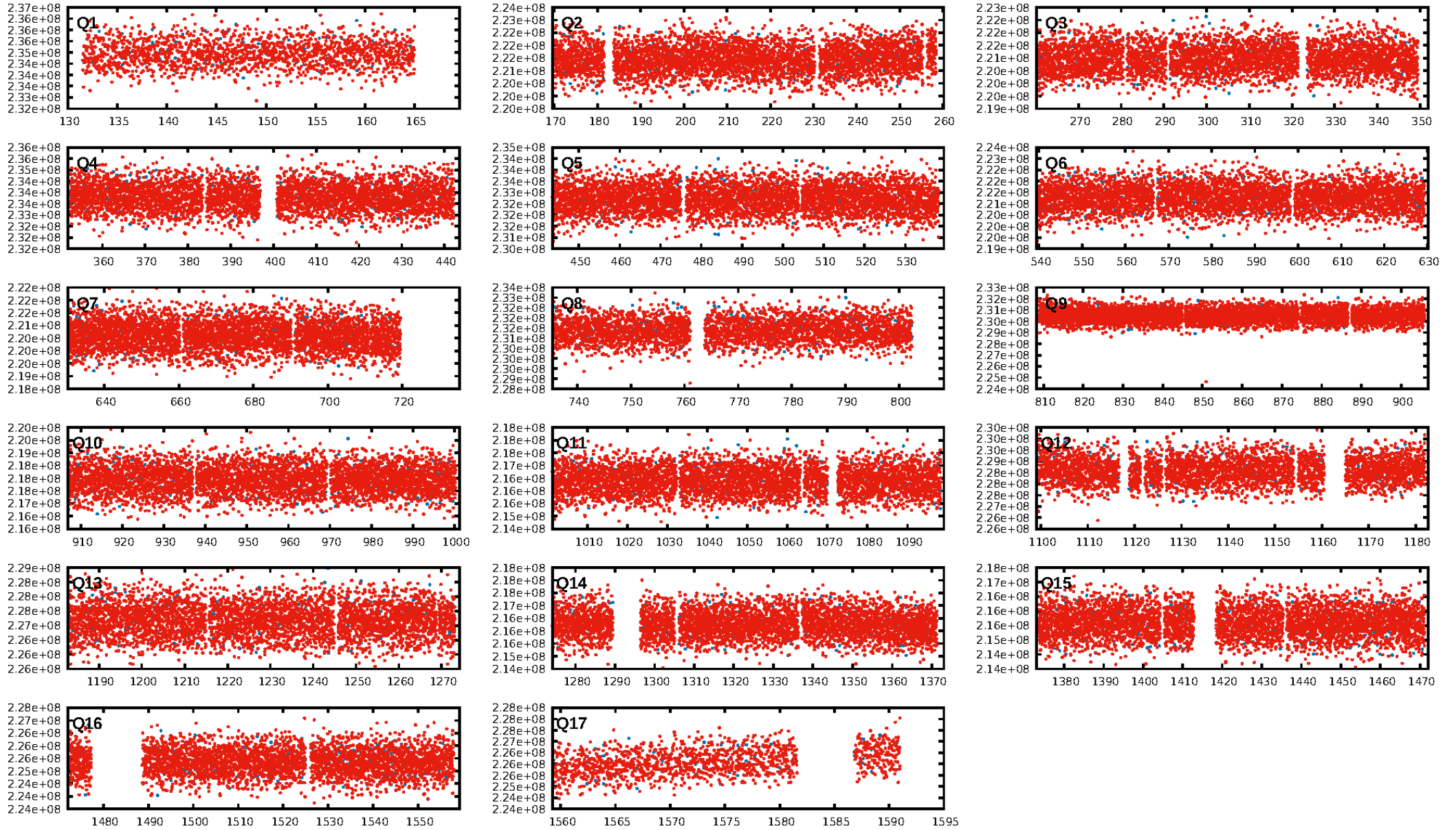
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 92.1% [1.76 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1179/1179]
GhostDiagnostic-chr: 2.586
Centroid-sig: 0.0%
Centroid-so: 0.525 arcsec [3.29 σ]
OotOffset-rm: 1.304 arcsec [1.40 σ]
KicOffset-rm: 1.394 arcsec [1.60 σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [17/17]

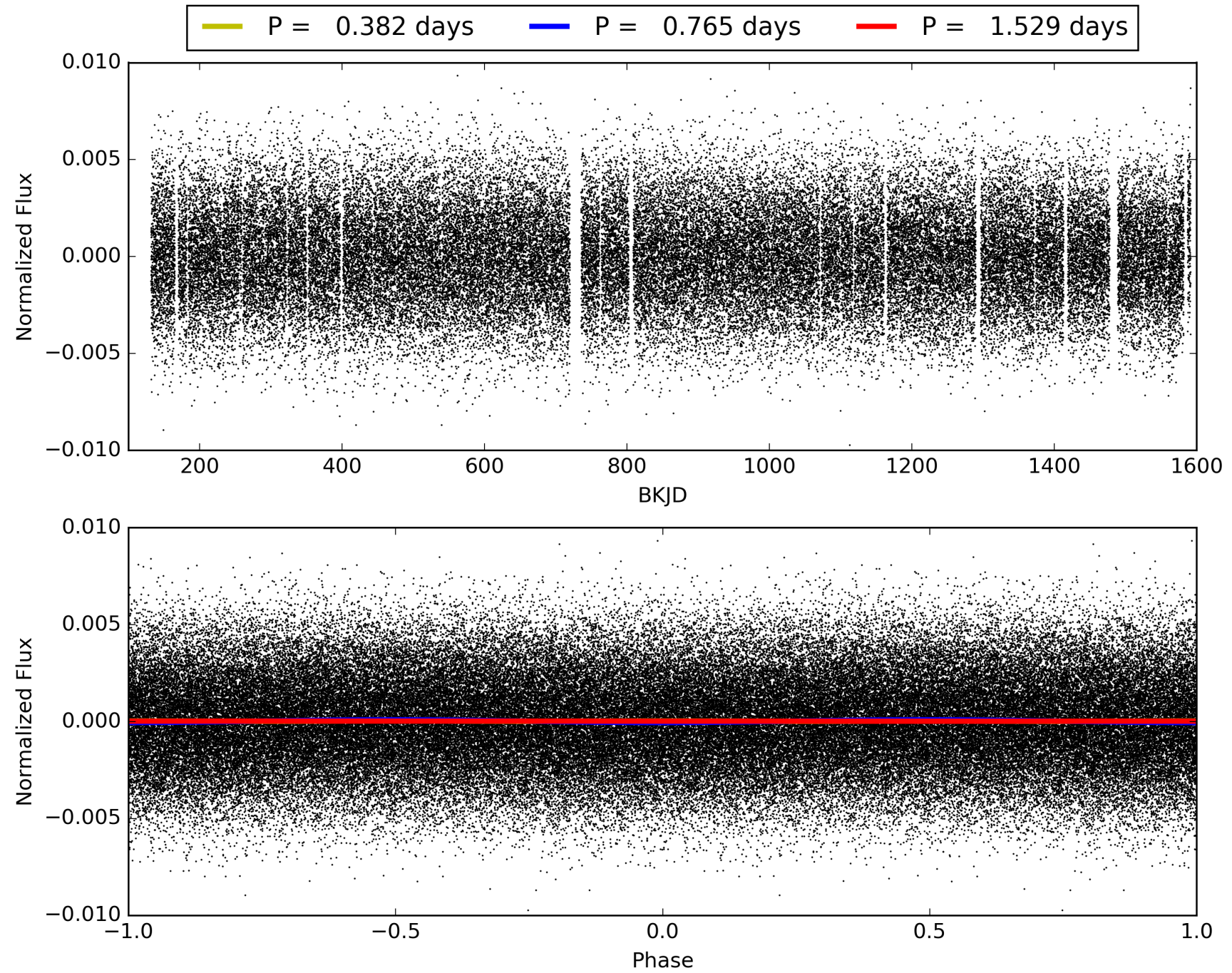
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:44:58 Z

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

TCE 005209910-02, PDC Light Curves

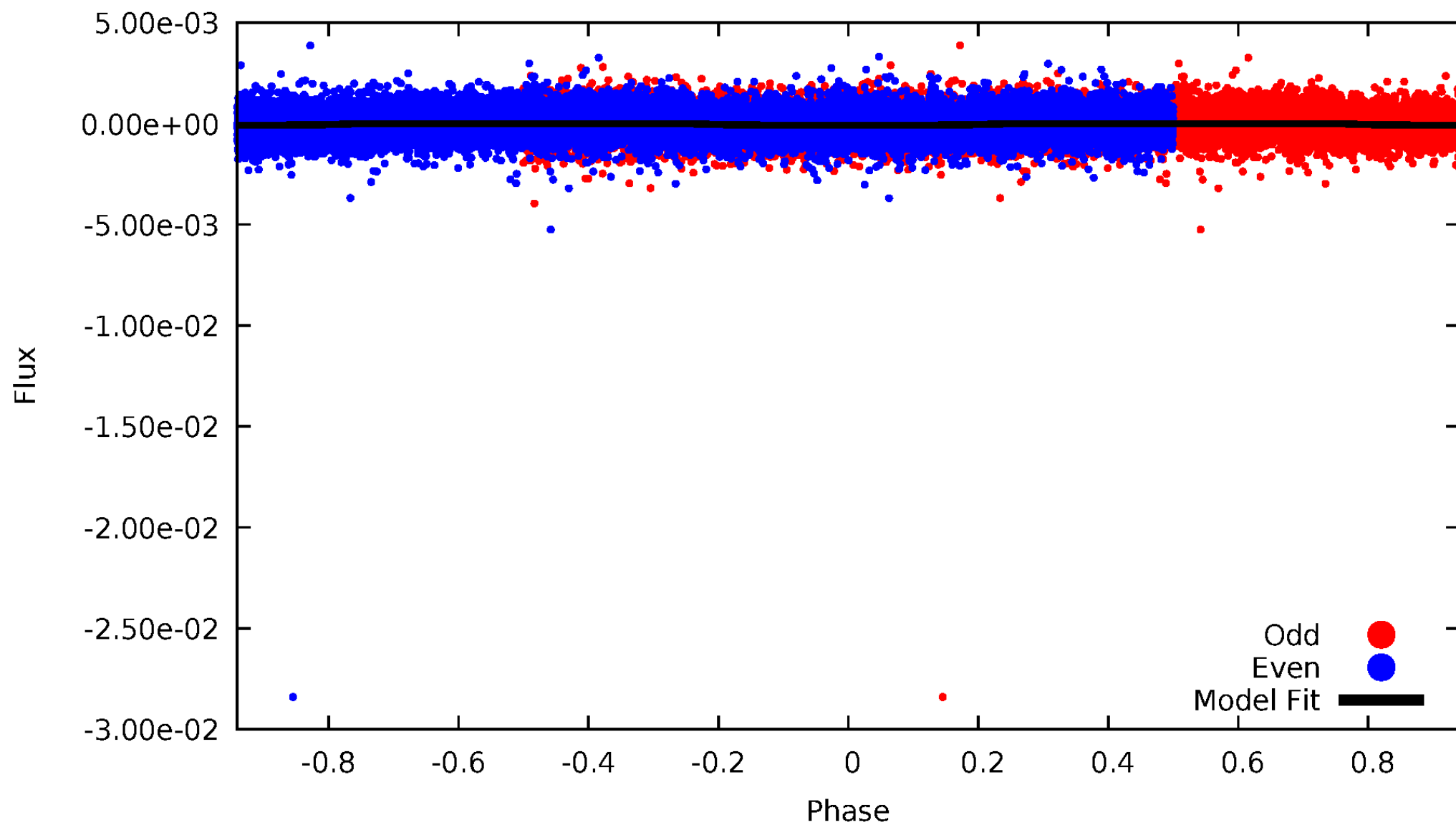


TCE 005209910-02



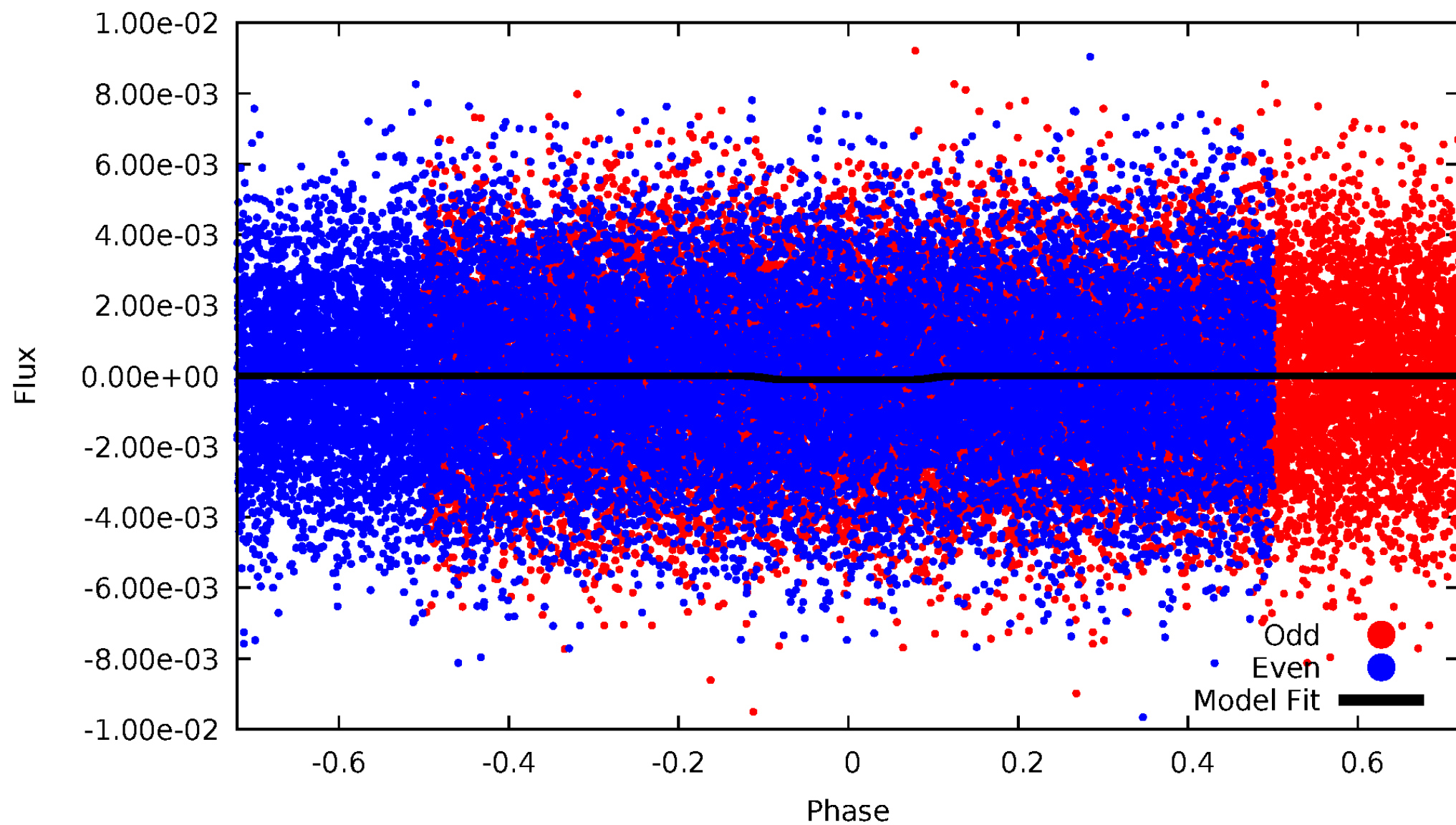
DV Odd/Even

TCE 005209910-02



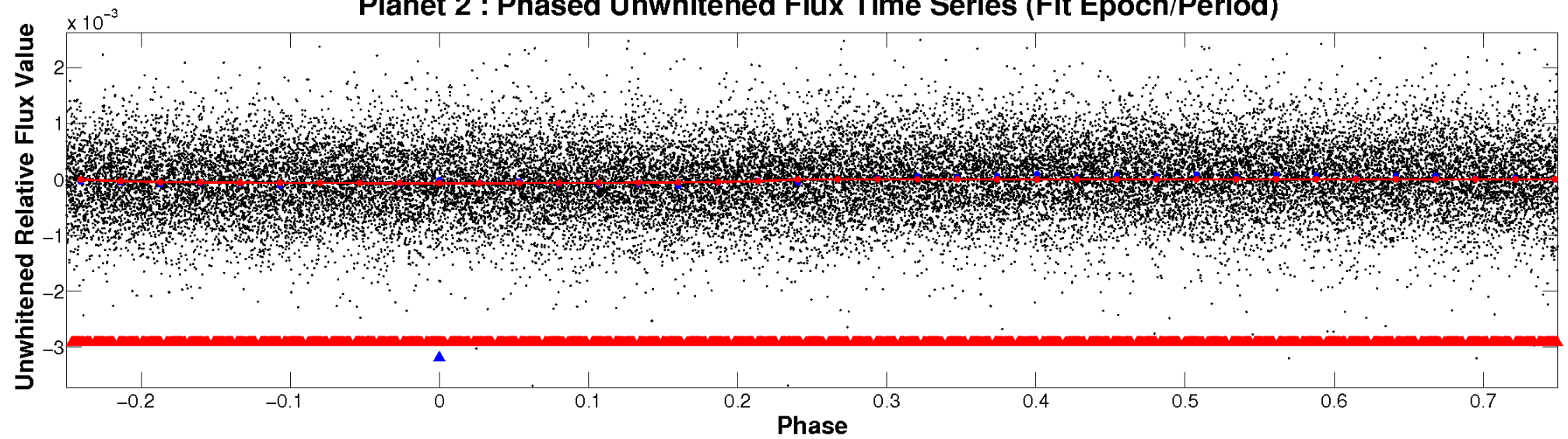
ALT Odd/Even

TCE 005209910-02

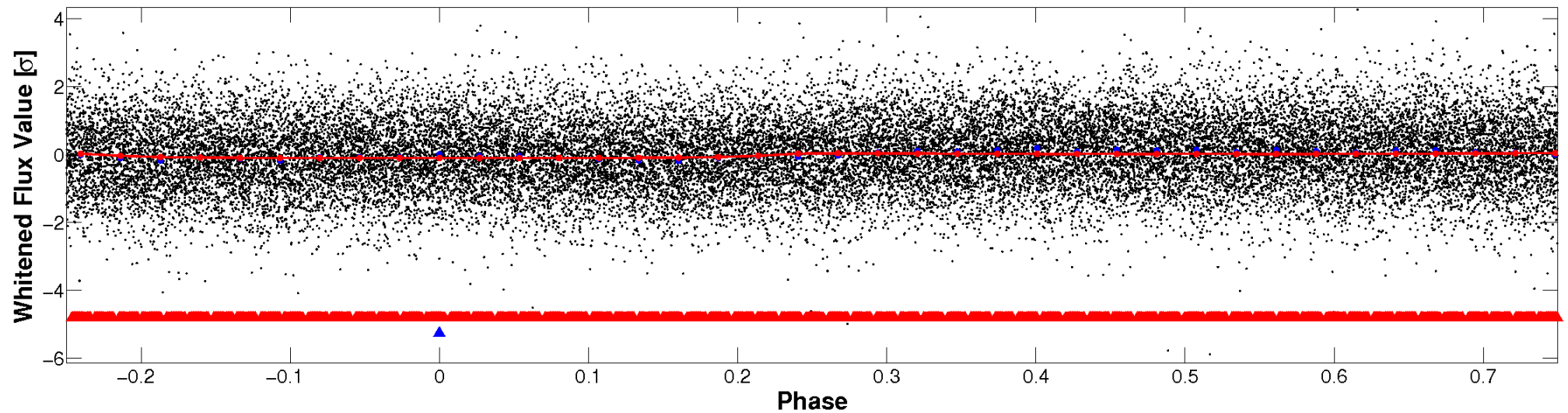


Non-Whitened Vs. Whitened Light Curve

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

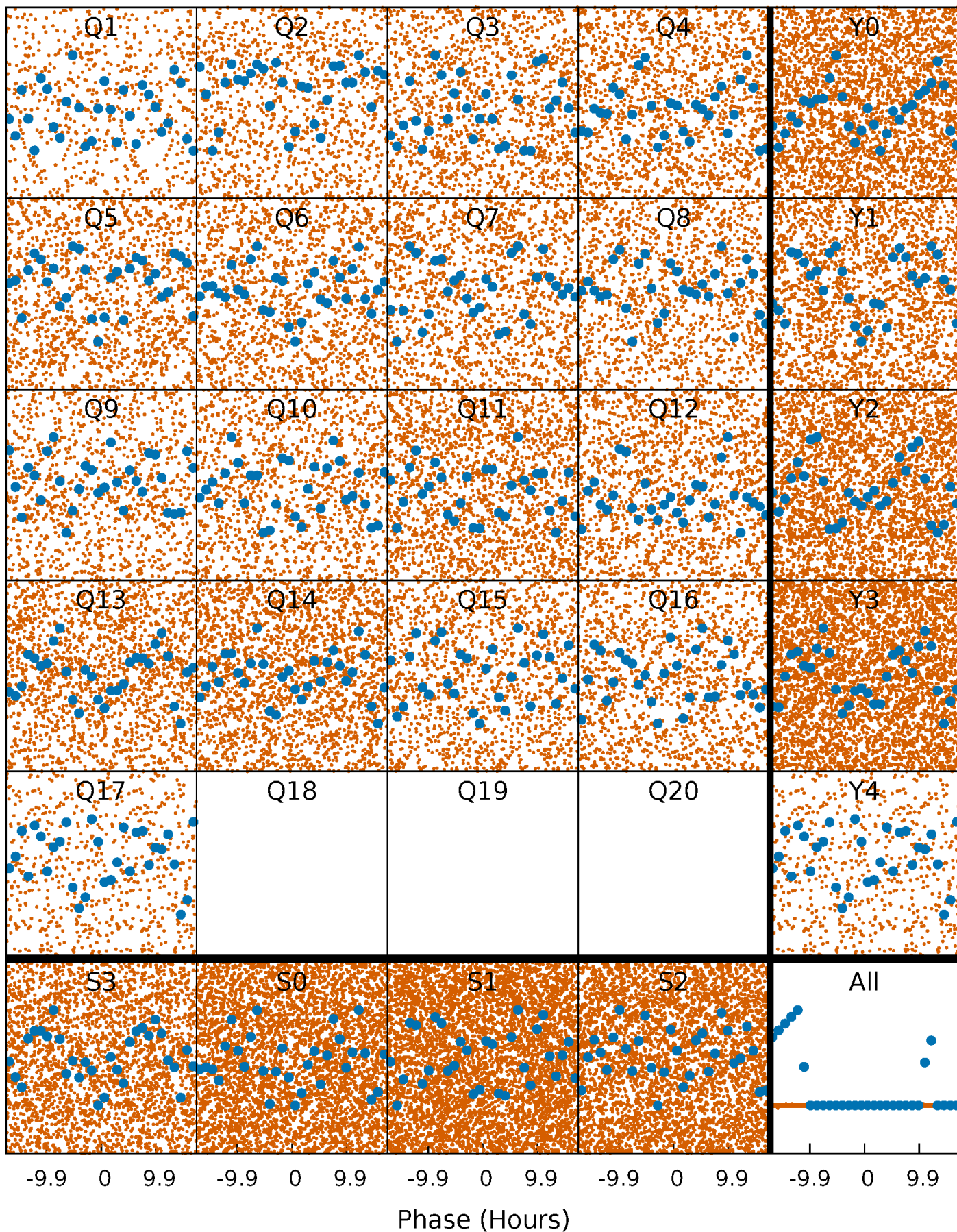


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



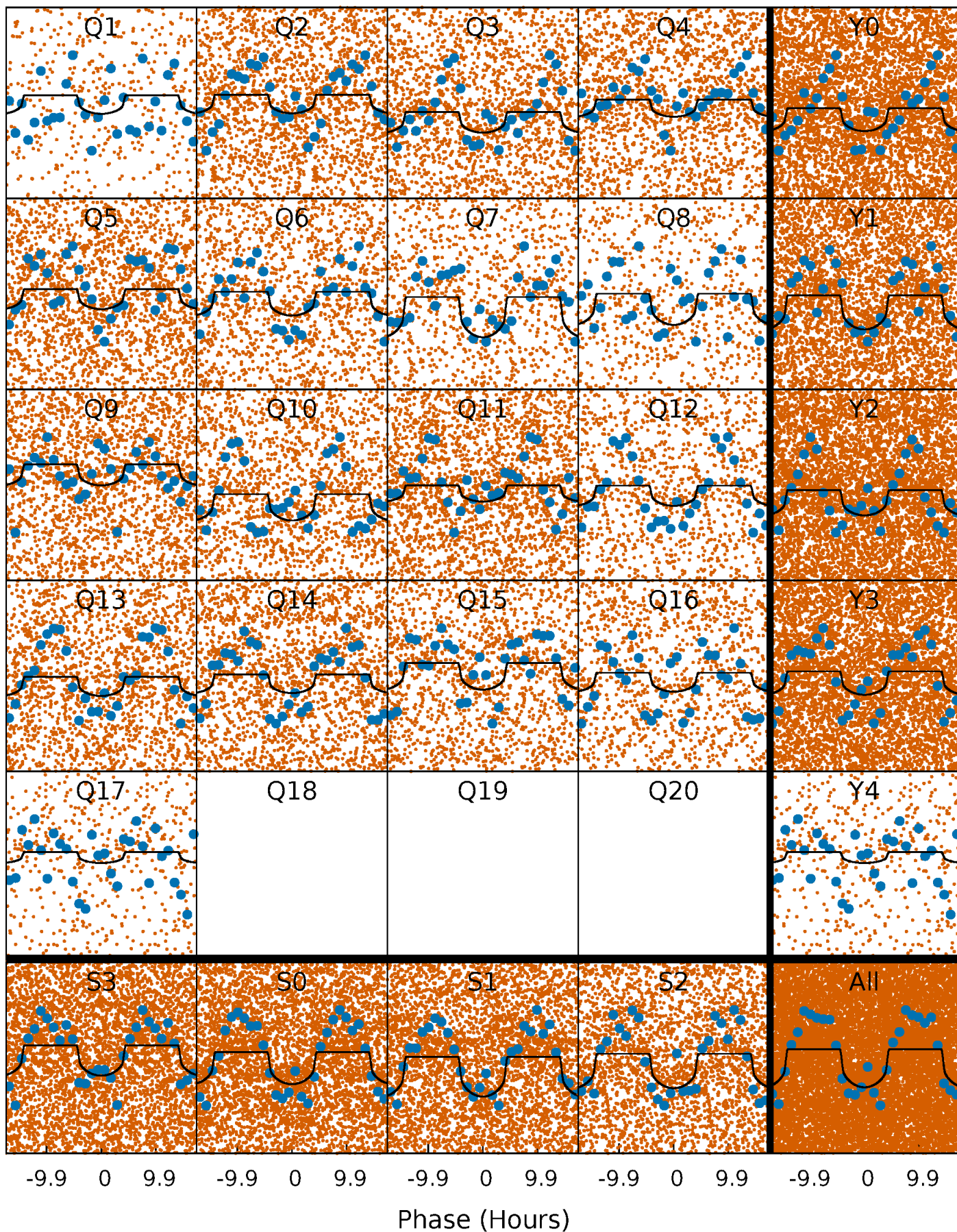
PDC Quarter-Phased Transit Curves

TCE 005209910-02 P= 0.764694 Days $T_0=132.034154$ (BKJD)



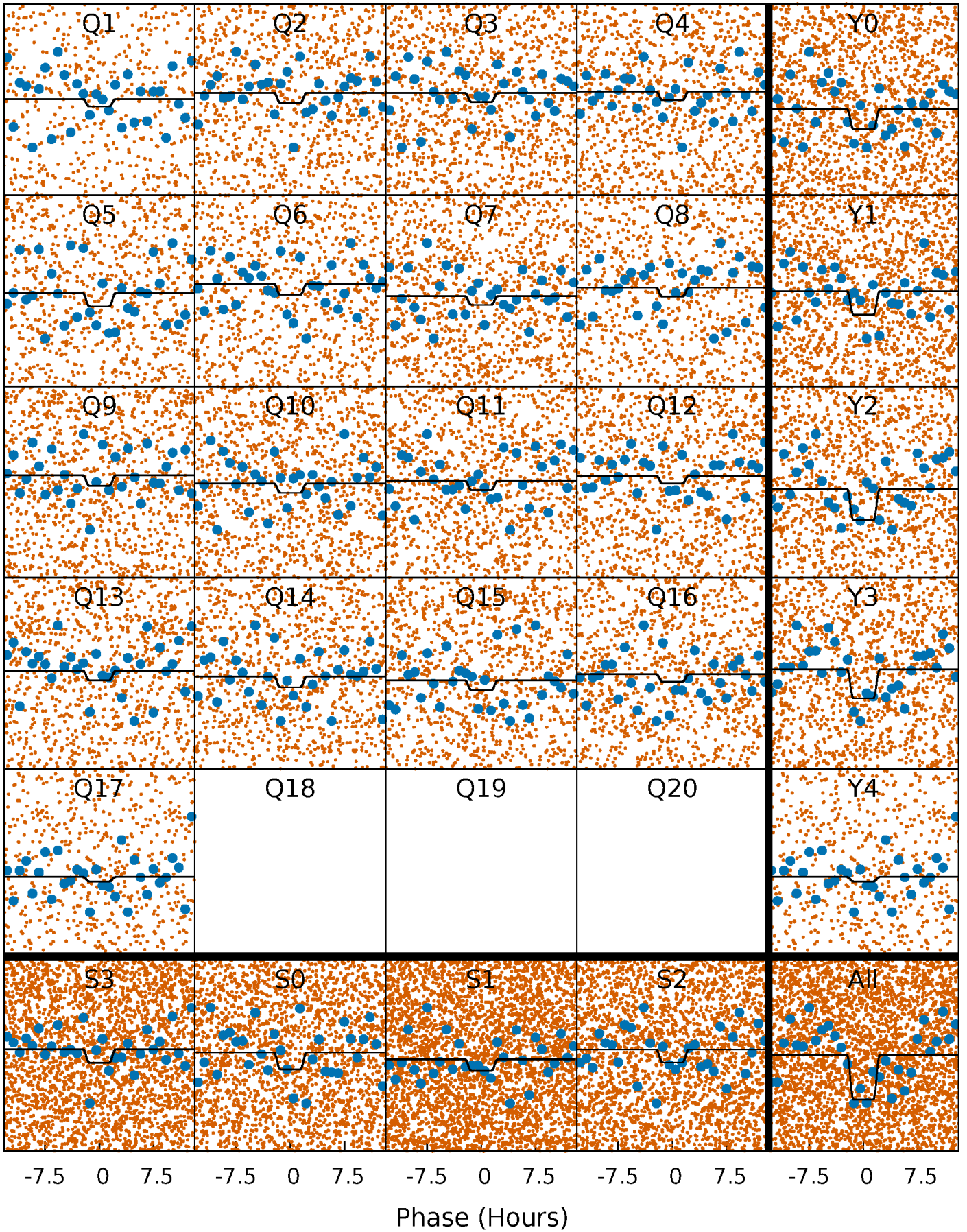
DV Quarter-Phased Transit Curves

TCE 005209910-02 P= 0.764694 Days $T_0=132.034154$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

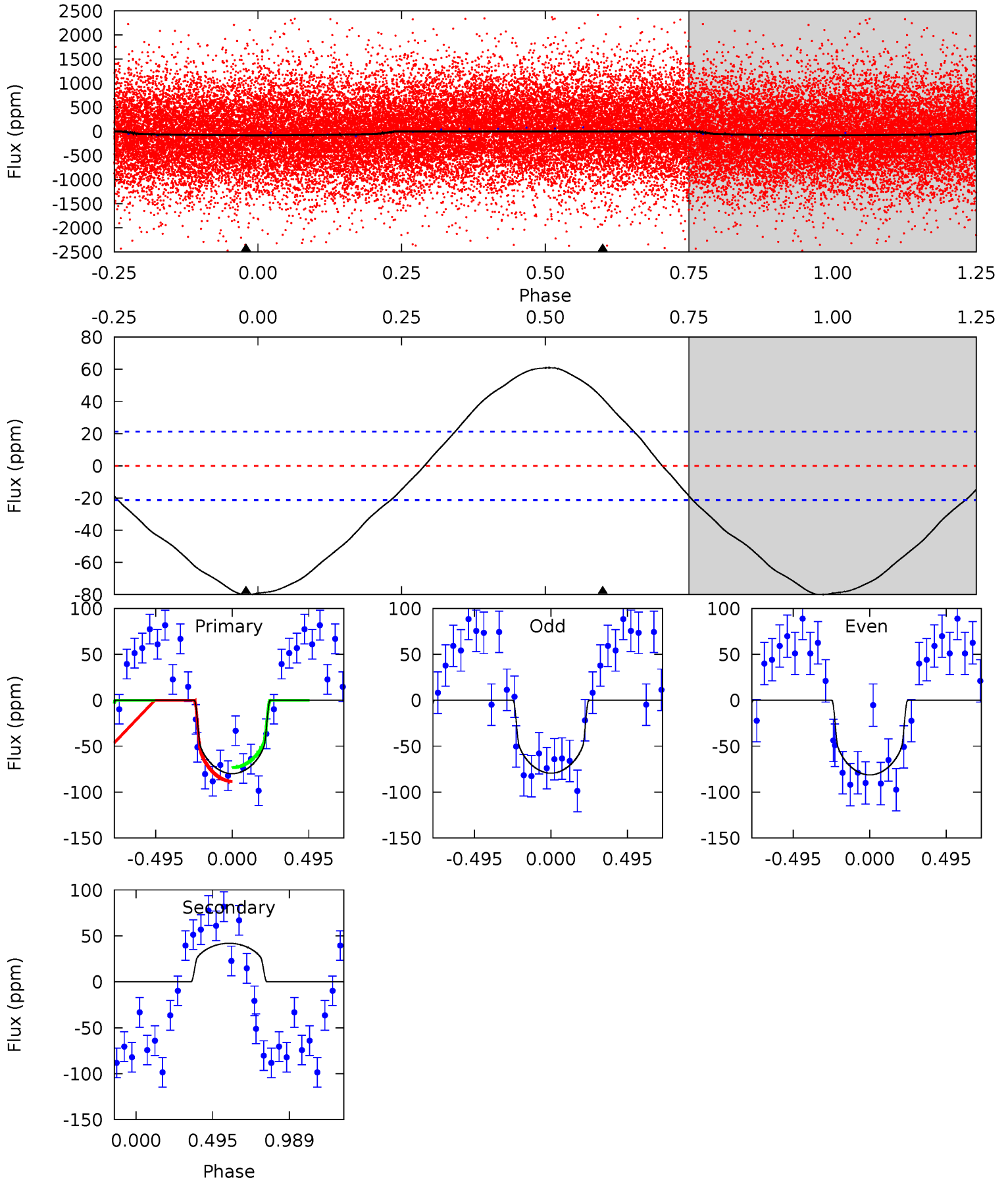
TCE 005209910-02 P= 0.764639 Days $T_0=131.997153$ (BKJD)



DV Model-Shift Uniqueness Test

005209910-02, P = 0.764694 Days, E = 131.269460 Days

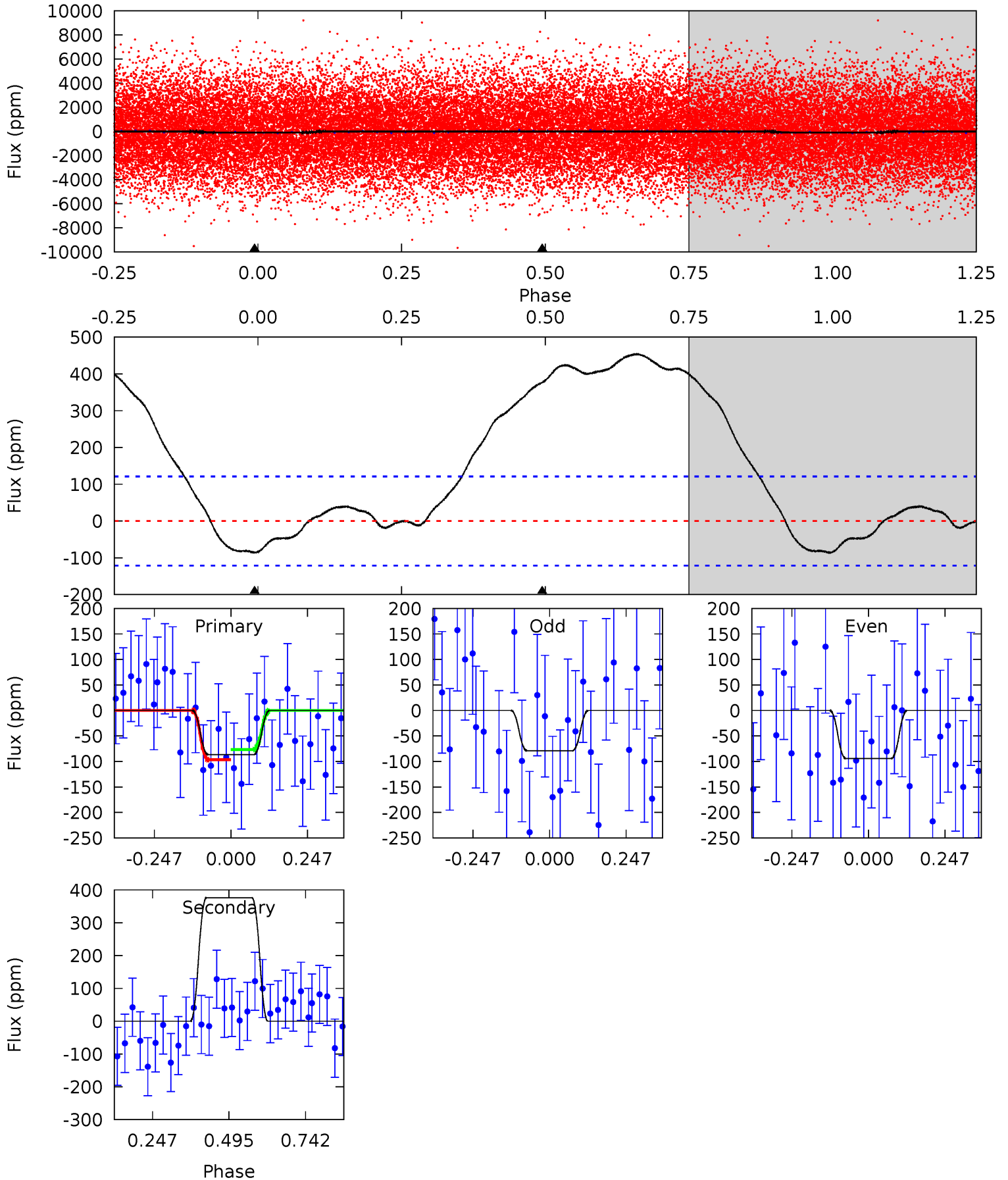
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	-8.33	0	0	4.22	0.68	2.25	15.9	15.9	-8.33	-8.33	0.19	1.21	0.43	1.45



Alt Model-Shift Uniqueness Test

005209910-02, P = 0.764639 Days, E = 131.232514 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.13	-13.6	0	0	4.37	1.16	7.36	3.13	3.13	-13.6	-13.6	0.28	1.07	0.84	0.36



Stellar Parameters For KIC 005209910

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7194^{+200}_{-300}	$4.179^{+0.105}_{-0.195}$	$-0.020^{+0.200}_{-0.350}$	$1.648^{+0.547}_{-0.294}$	$1.494^{+0.211}_{-0.211}$	$0.470^{+0.272}_{-0.245}$
	+3%/-4%	+3%/-5%	+1000%/-1750%	+33%/-18%	+14%/-14%	+58%/-52%
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 005209910-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	42 ± 5	$1.47^{+0.81}_{-0.77}$	4198^{+302}_{-280}	-6526^{+1115}_{-3612}	$-3.786^{+2.232}_{-13.373}$
Alt.	376 ± 28	$1.88^{+0.84}_{-0.80}$	4205^{+346}_{-253}	-11266^{+2727}_{-7053}	$-20.210^{+10.547}_{-40.917}$

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

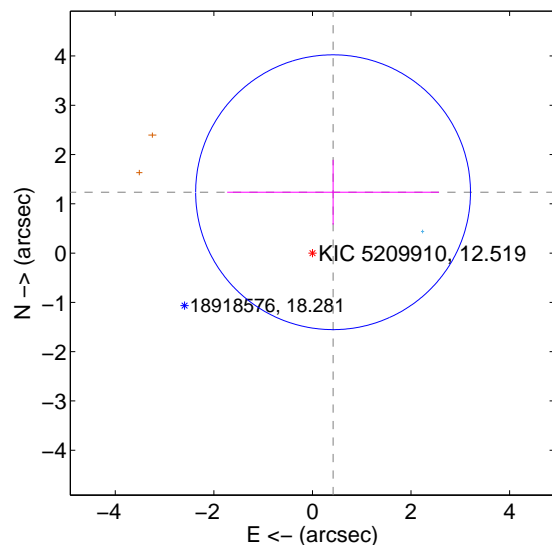
Supplemental centroid analysis for 005209910-02. Kepler magnitude: 12.52. Transit SNR 11.53

There are 1 quarters with good PRF difference image offsets

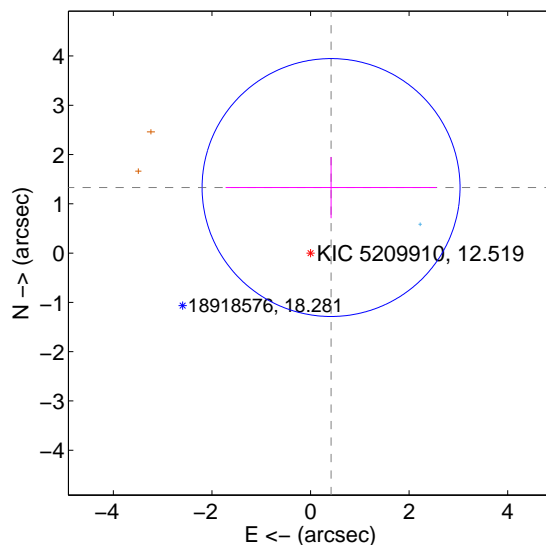
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.304 ± 0.929	1.40	-0.419 ± 2.148	1.235 ± 0.658
PRF-fit source offset from KIC position	1.394 ± 0.872	1.60	-0.417 ± 2.139	1.330 ± 0.622
photometric centroid source offset	0.53 ± 0.16	3.29	-0.50 ± 0.16	0.15 ± 0.14

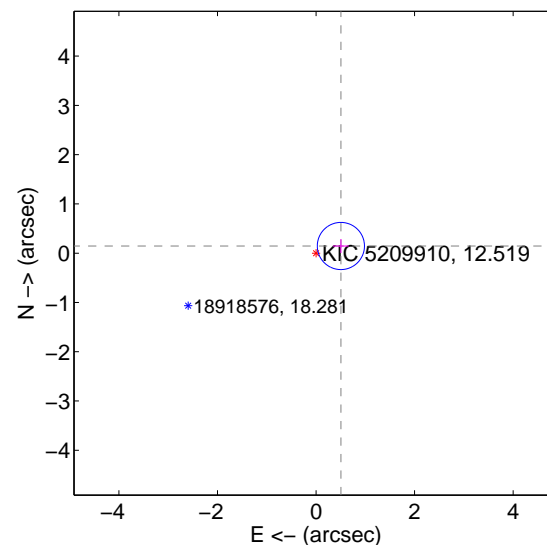
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

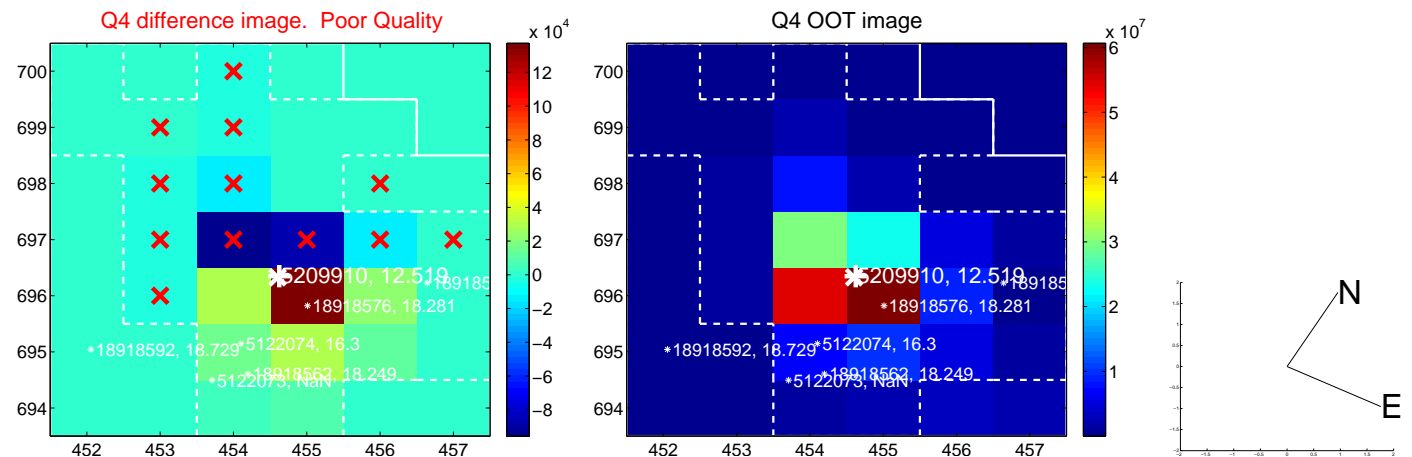
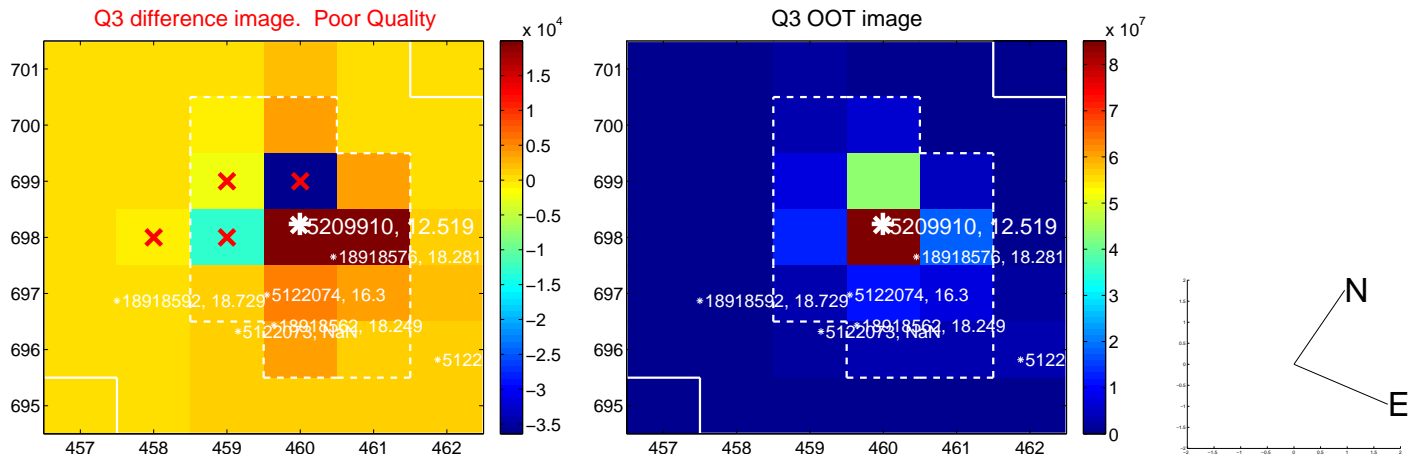
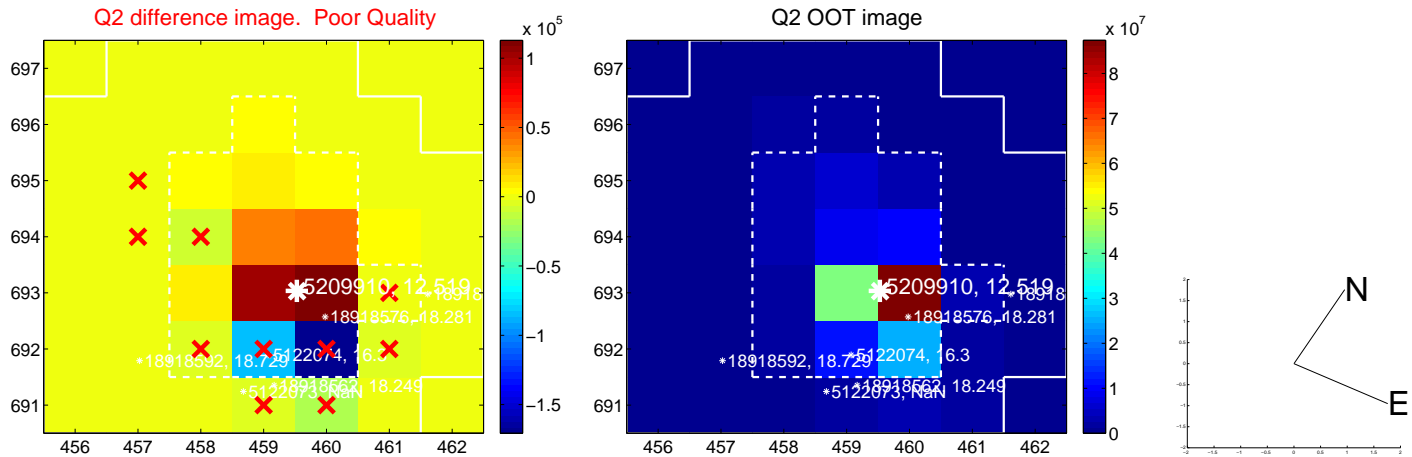
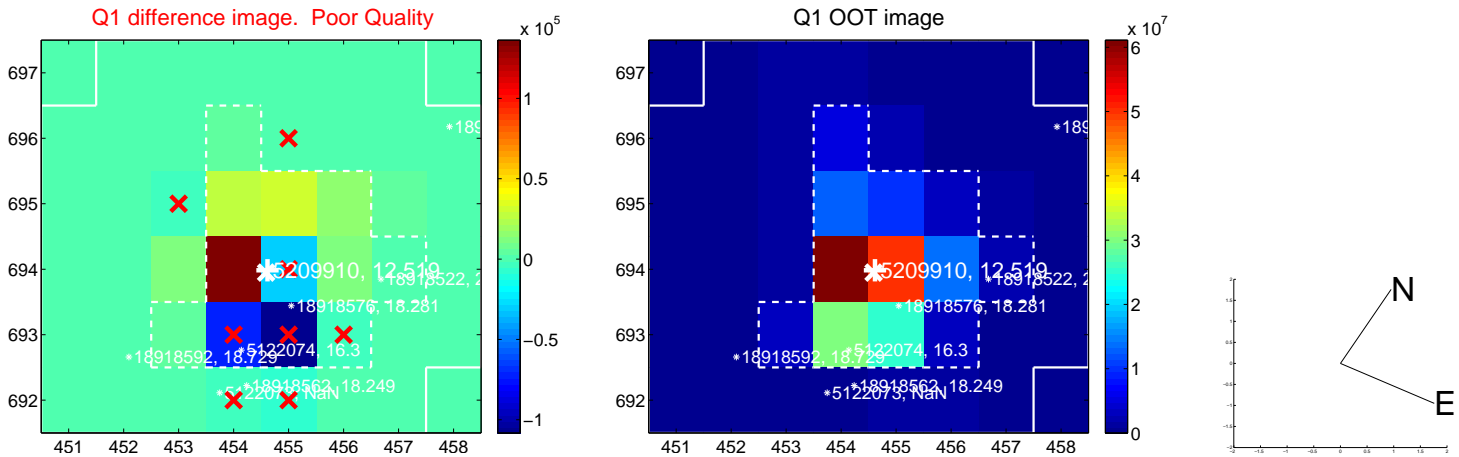


offset from photometric centroids

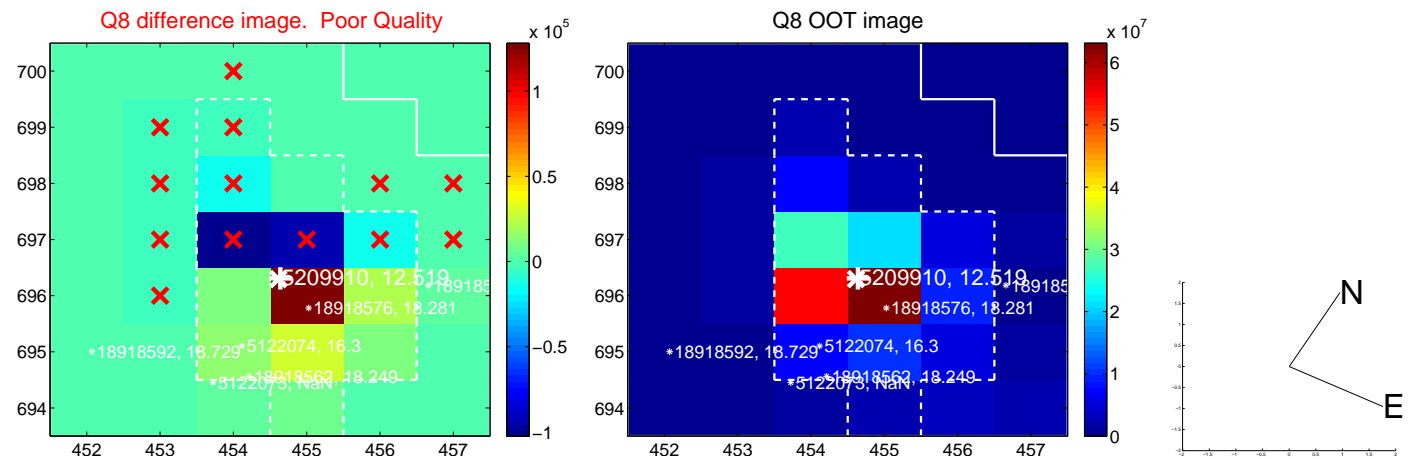
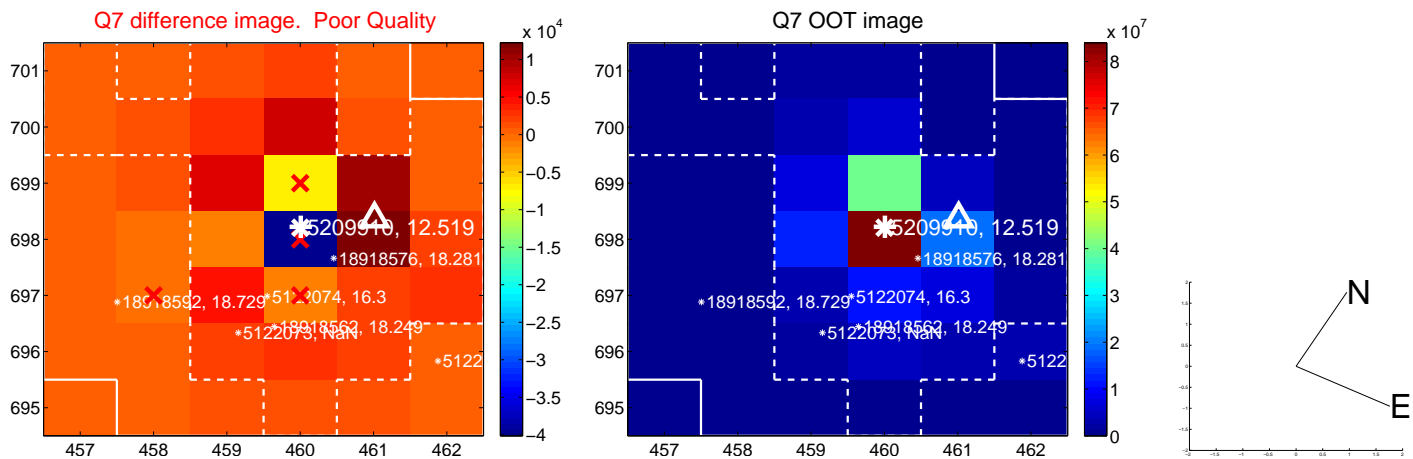
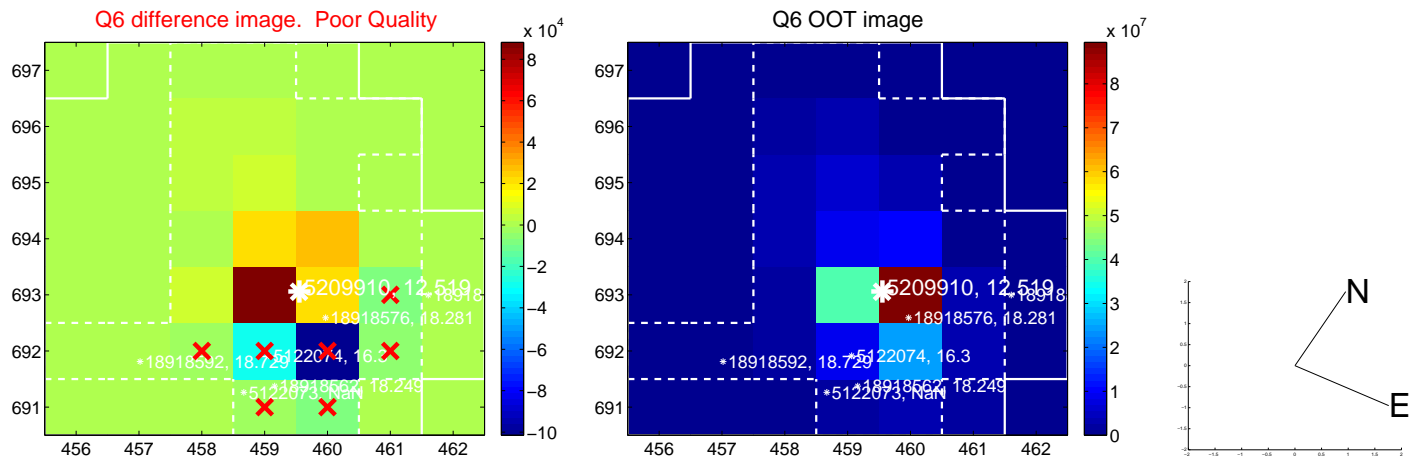
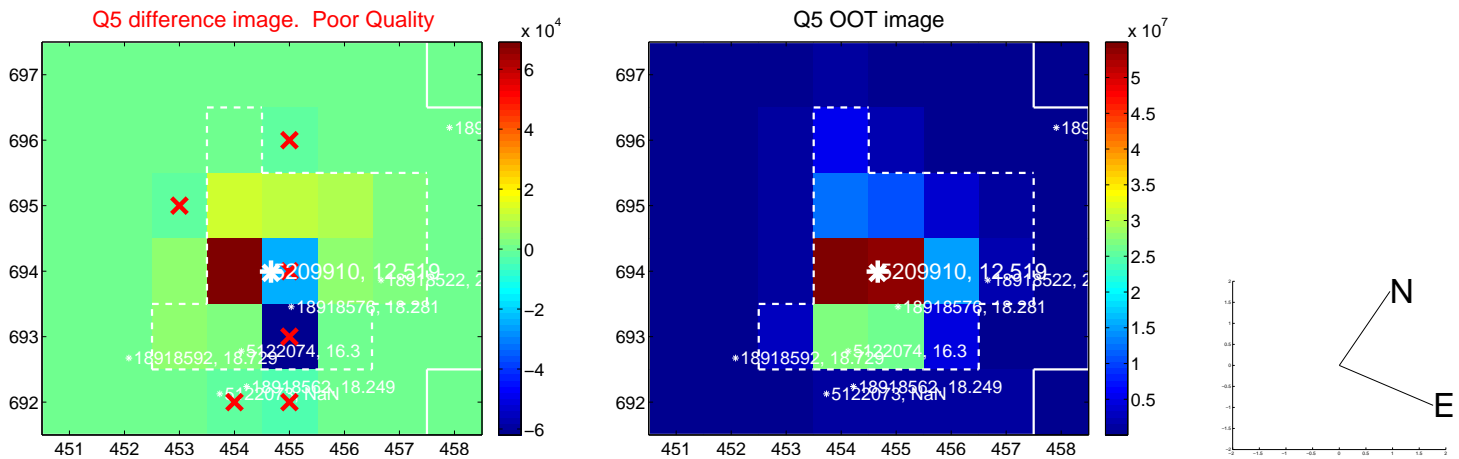


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

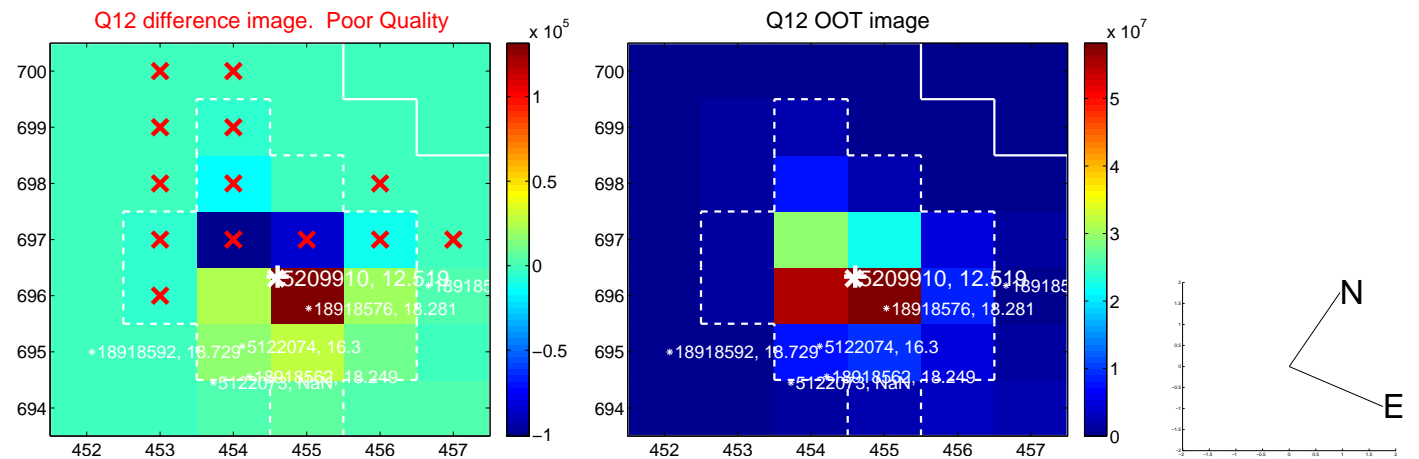
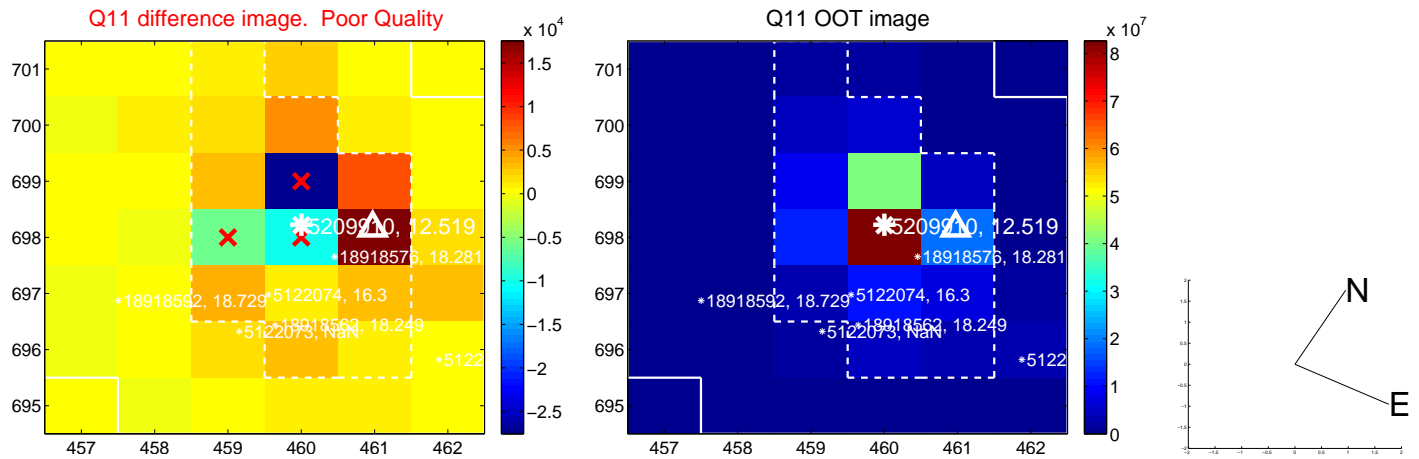
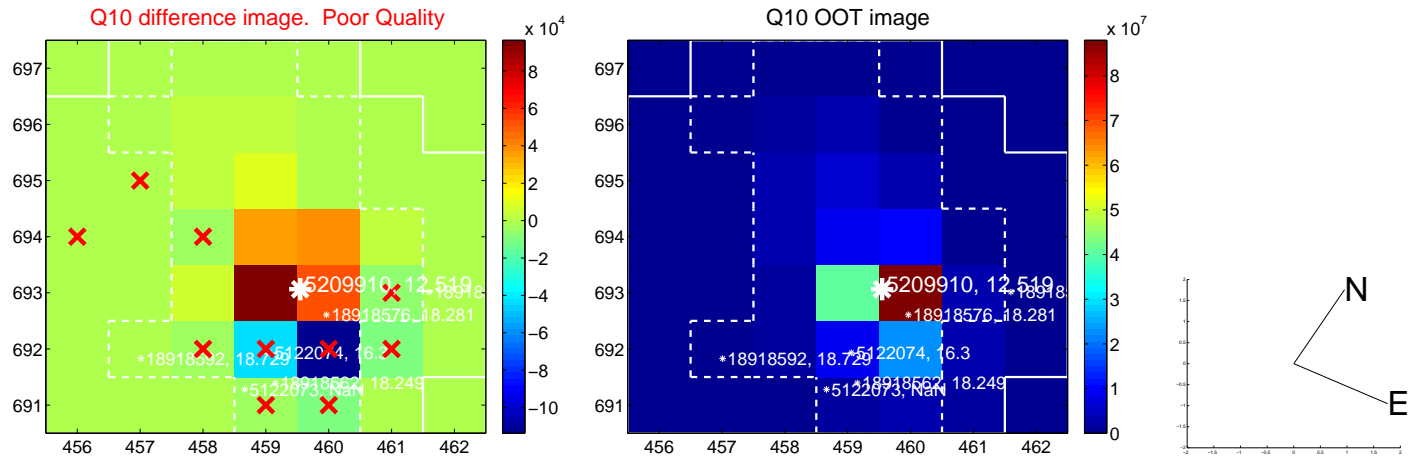
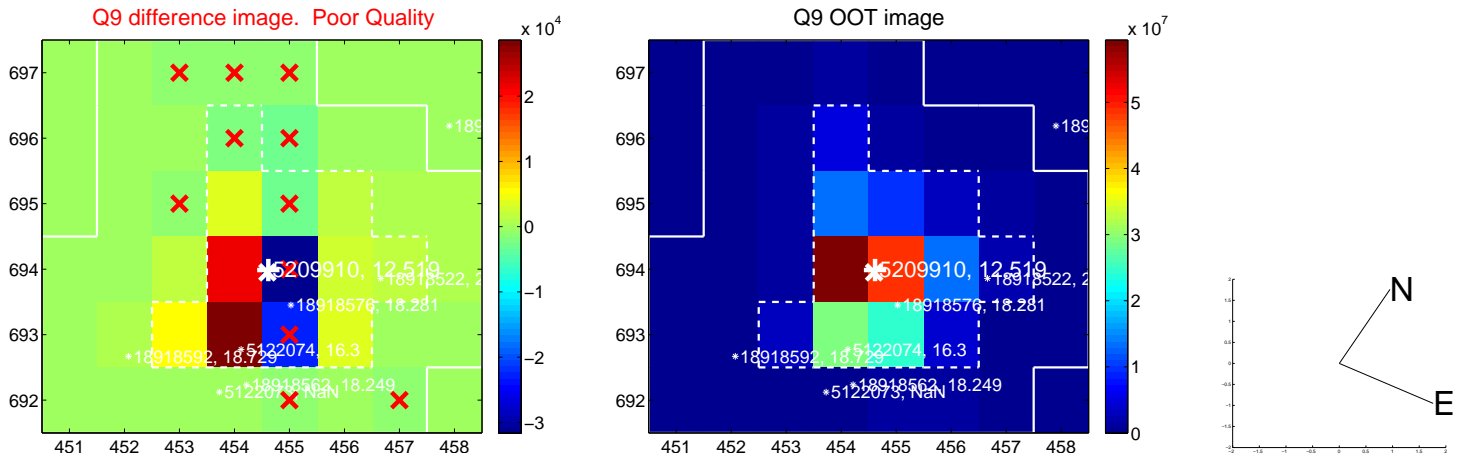
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



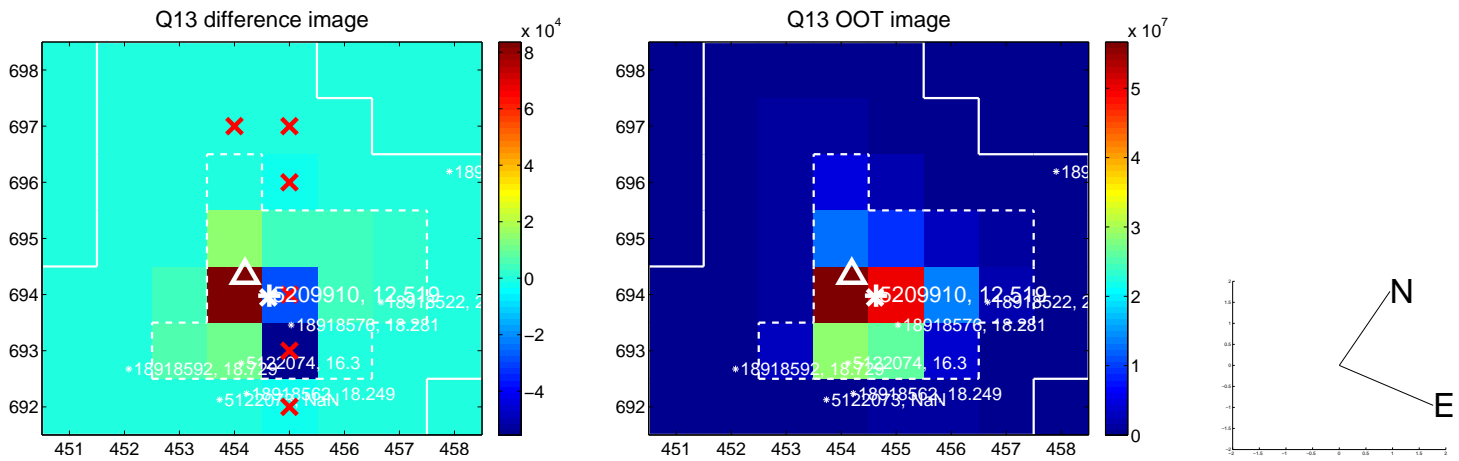
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



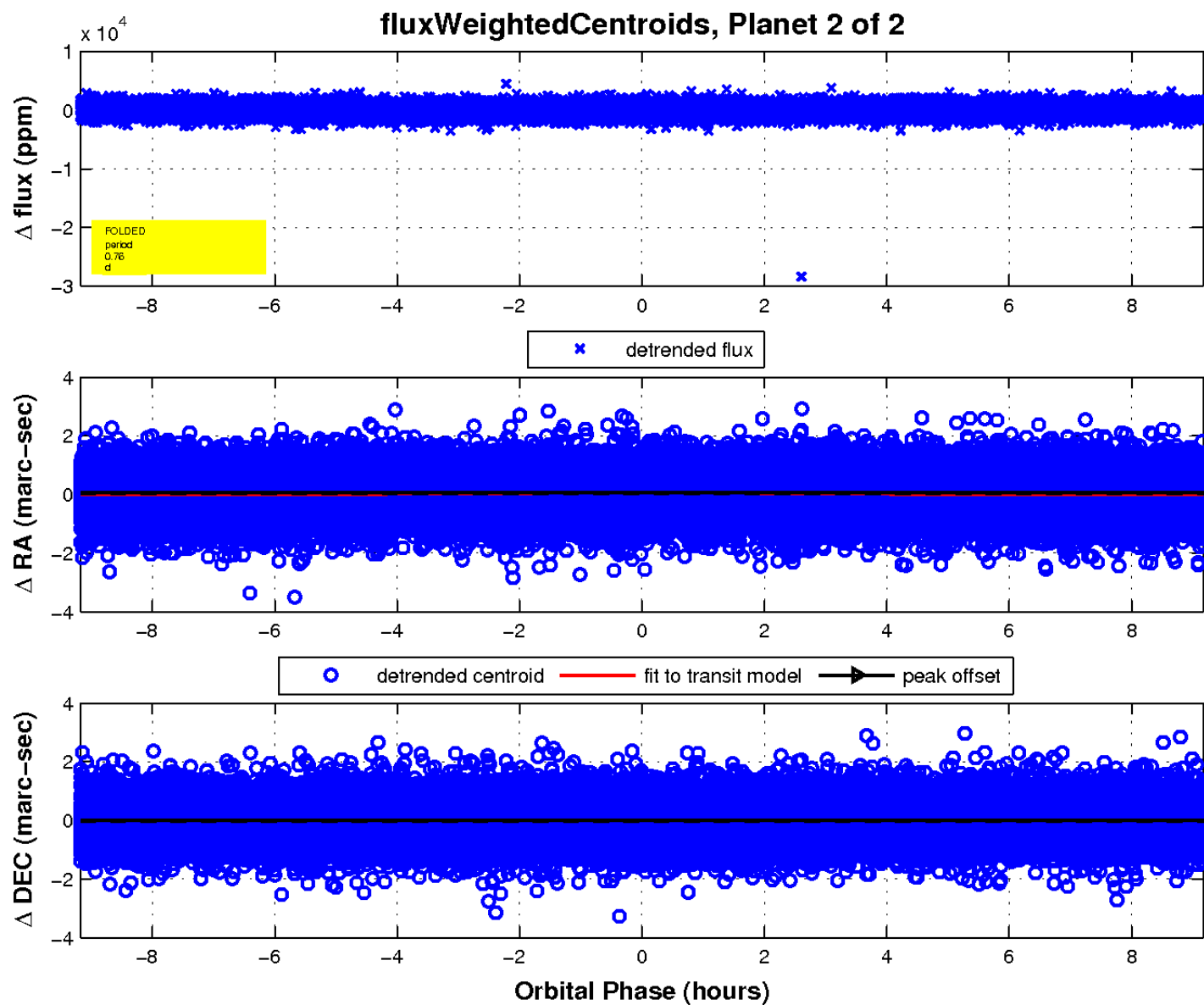
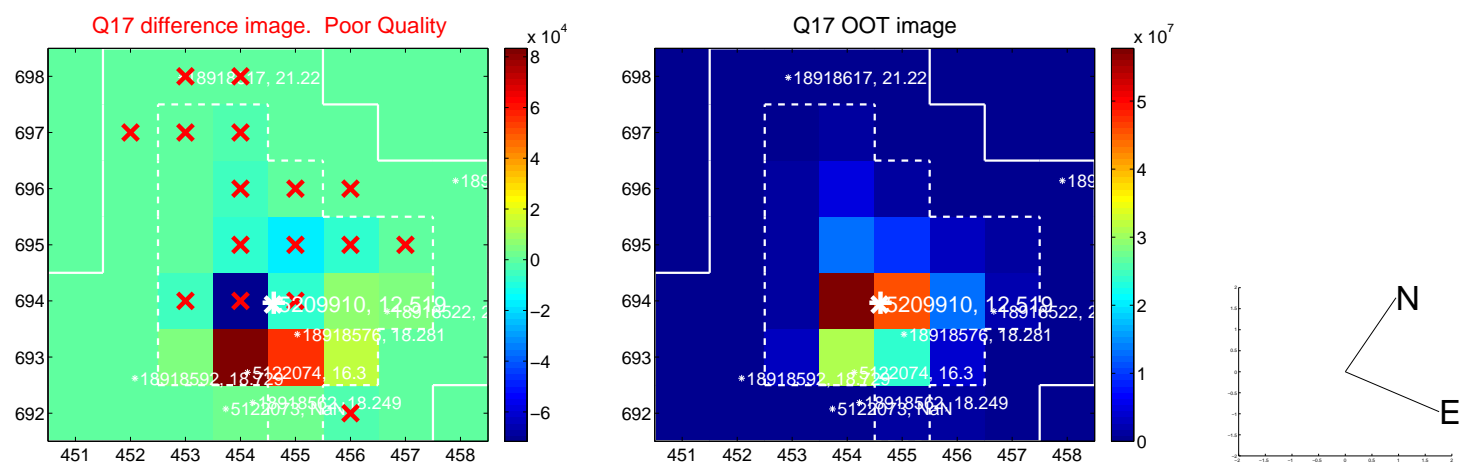
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

