

KIC 005211470

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})
005211470-01	OBS	6541.01	2.404311	132.750771	7997.4	4.438	429.7	369.1	17.03	4697	287.50	0.00
005211470-02	OBS	6541.02	0.938065	132.274036	109.6	1.051	14.4	18.2	17.03	4697	22.01	0.00
005211470-03	OBS	No	0.938071	131.856043	13.1	0.636	8.5	2.1	17.03	4697	7.76	0.00
005211470-04	OBS	No	413.546303	330.859577	2146.9	6.430	8.9	10.1	17.03	4697	128.01	75.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005211470-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED
005211470-02	OBS	FP	0.00	0	1	1	0	PLANET_IN_STAR—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
005211470-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
005211470-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES

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 005211470-01

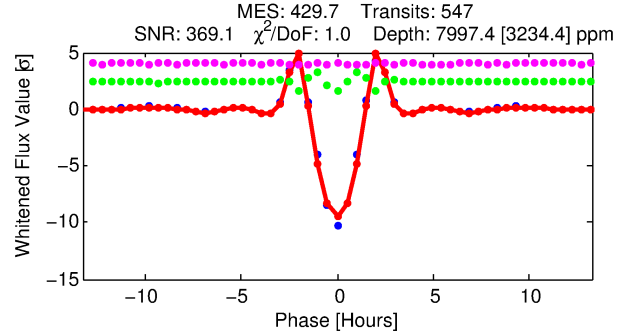
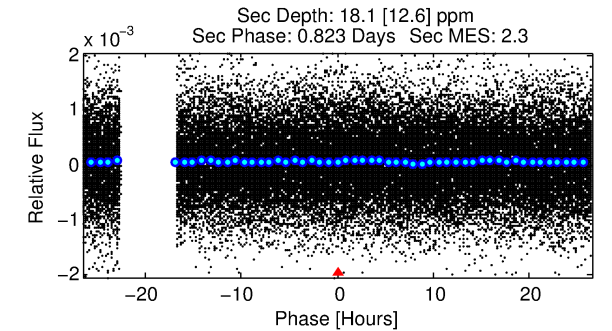
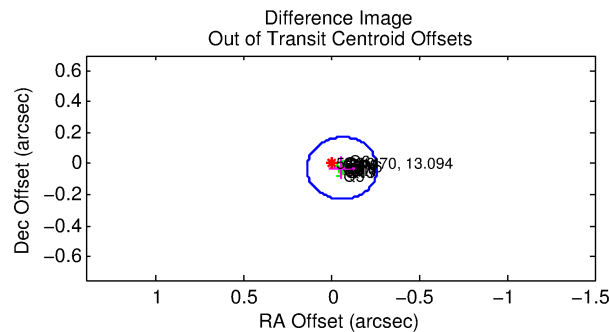
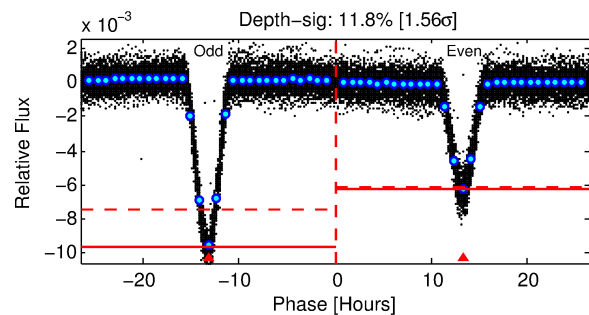
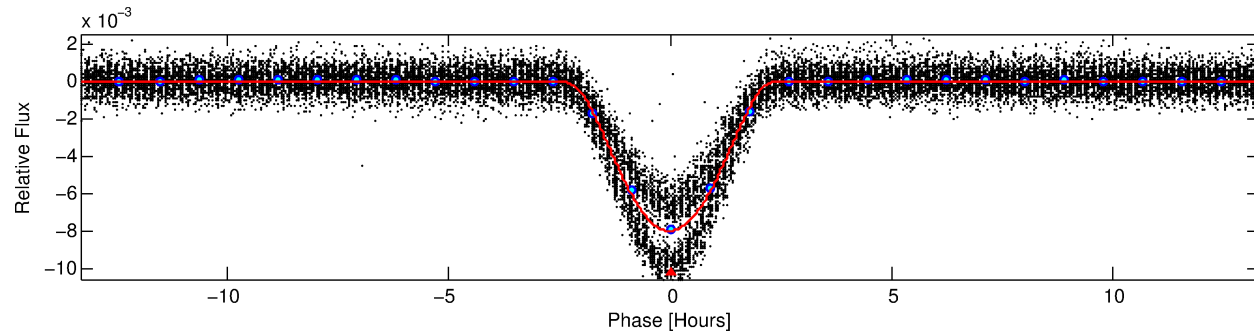
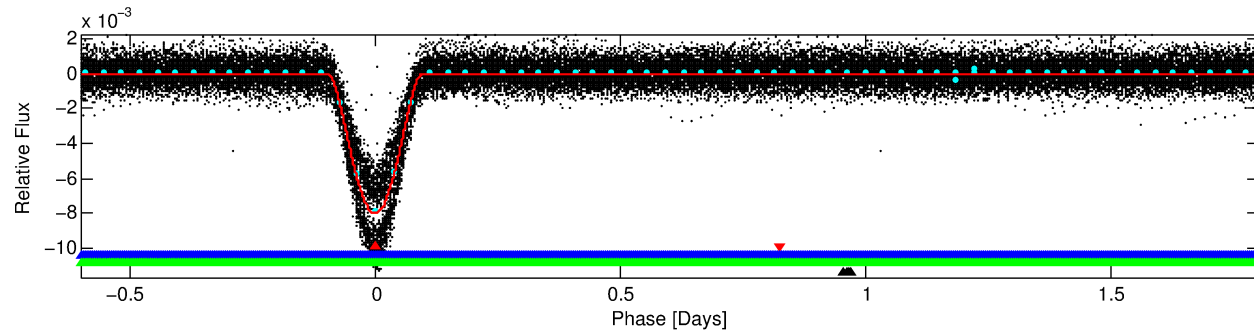
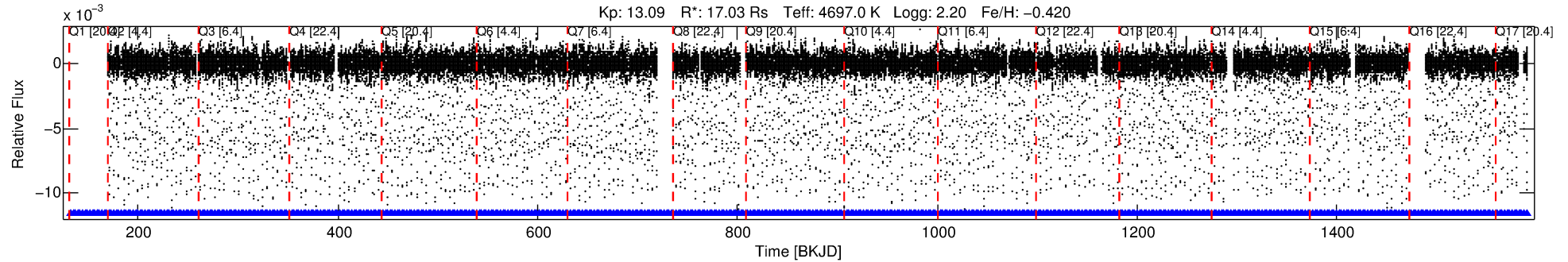
No Significant Match Found

DV One-Page Summary

KIC: 5211470 Candidate: 1 of 4 Period: 2.404 d

KOI: K06541.01 Corr: 0.985

Kp: 13.09 R*: 17.03 Rs Teff: 4697.0 K Logg: 2.20 Fe/H: -0.420



DV Fit Results:

Period = 2.40431 [0.00000] d
Epoch = 132.7508 [0.0001] BKJD
Rp/R* = 0.1547 [0.0058]
a/R* = 2.61 [0.01]
b = 1.00 [0.03]
Seff = N/A
Teq = N/A
Rp = 287.50 [124.09] Re
a = N/A
Ag = N/A
Teffp = N/A

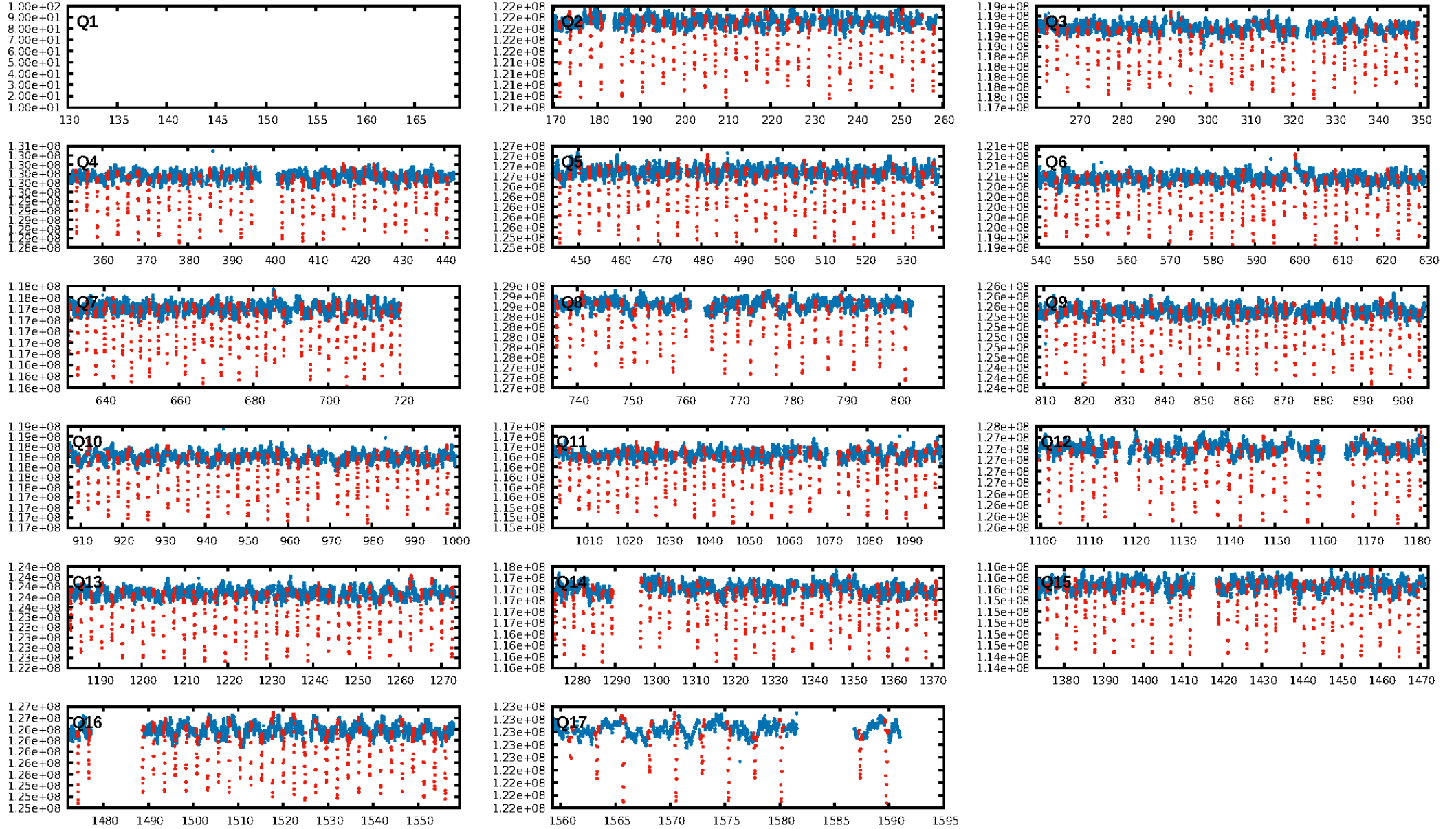
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.85σ]
LongPeriod-sig: 100.0% [1262.95σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [536/536]
GhostDiagnostic-chr: 1.625
Centroid-sig: 0.0%
Centroid-so: 0.130 arcsec [23.64σ]
OotOffset-rm: 0.066 arcsec [0.99σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-rm: 0.025 arcsec [0.37σ]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.00 [0/16]

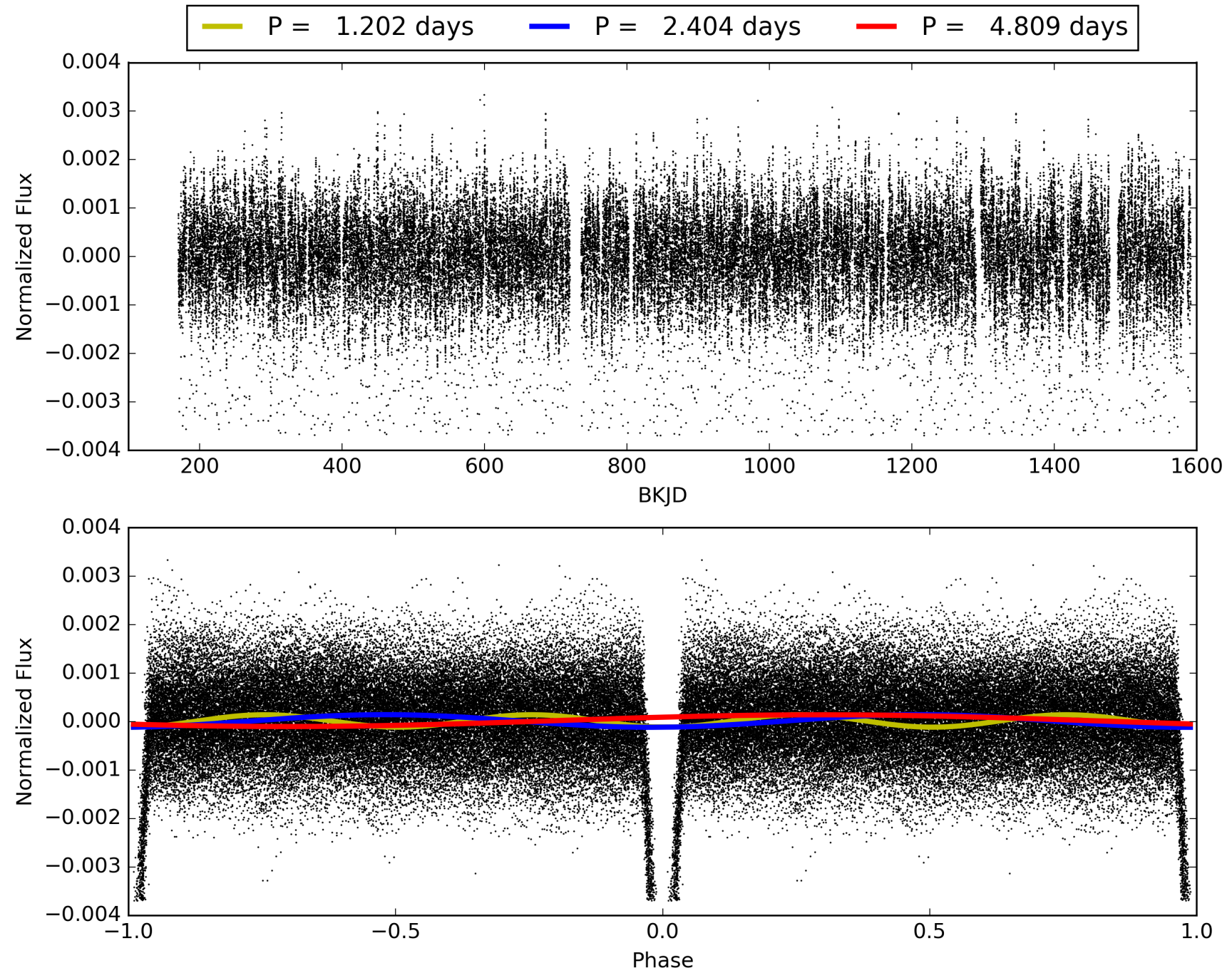
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:38:56 Z

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

TCE 005211470-01, PDC Light Curves

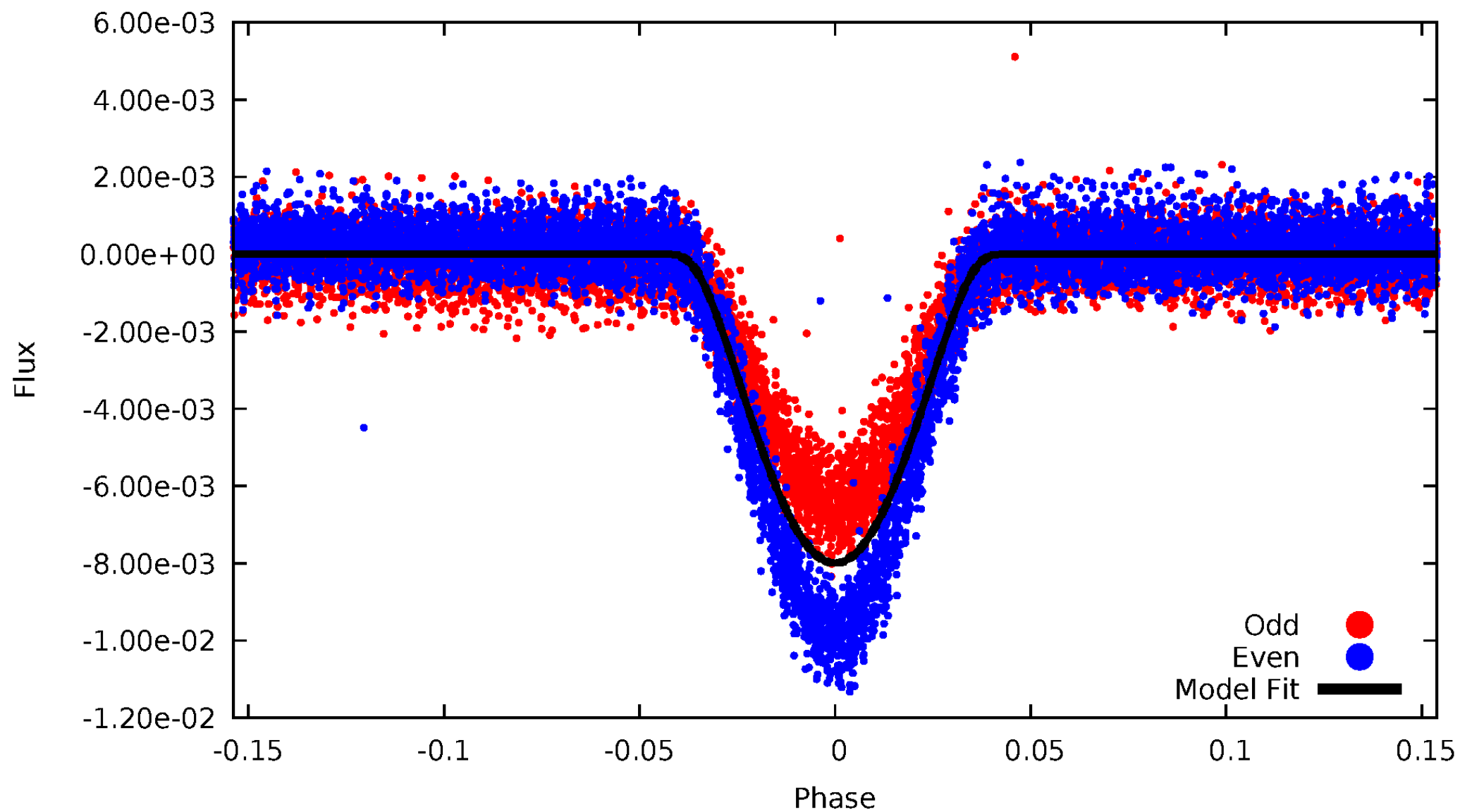


TCE 005211470-01



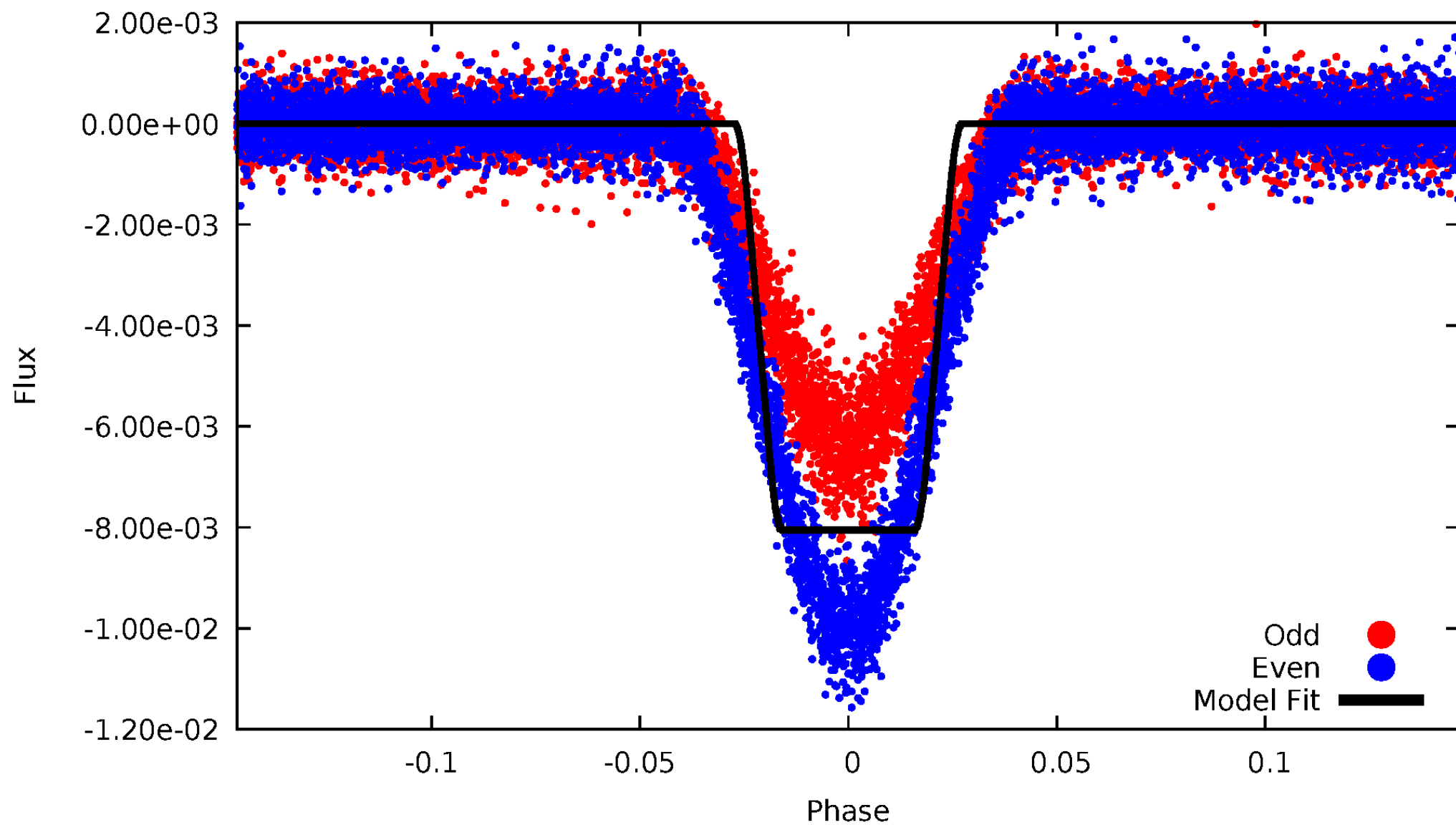
DV Odd/Even

TCE 005211470-01



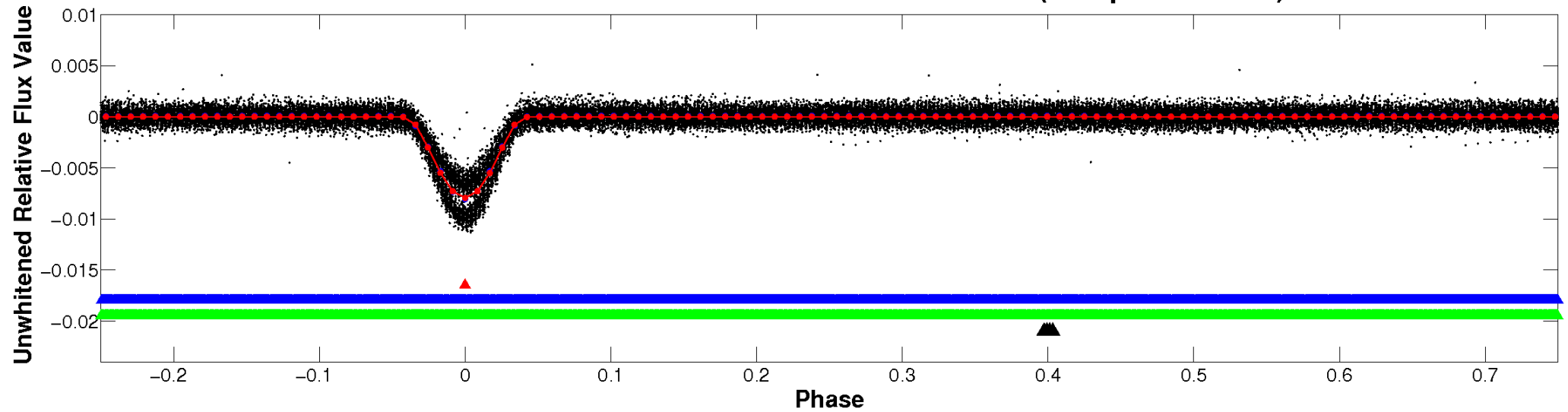
ALT Odd/Even

TCE 005211470-01

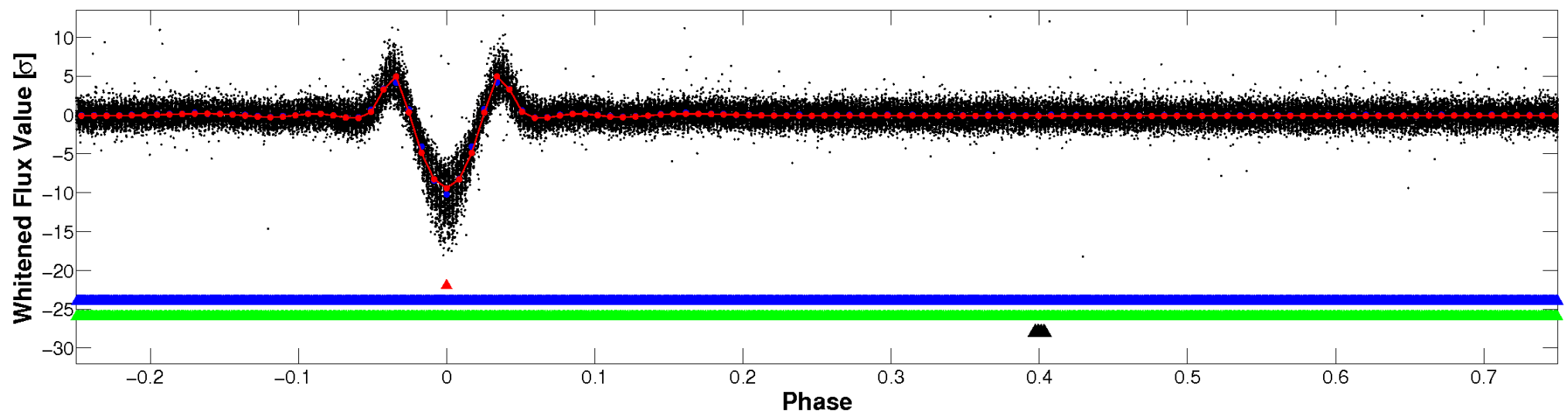


Non-Whitened Vs. Whitened Light Curve

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

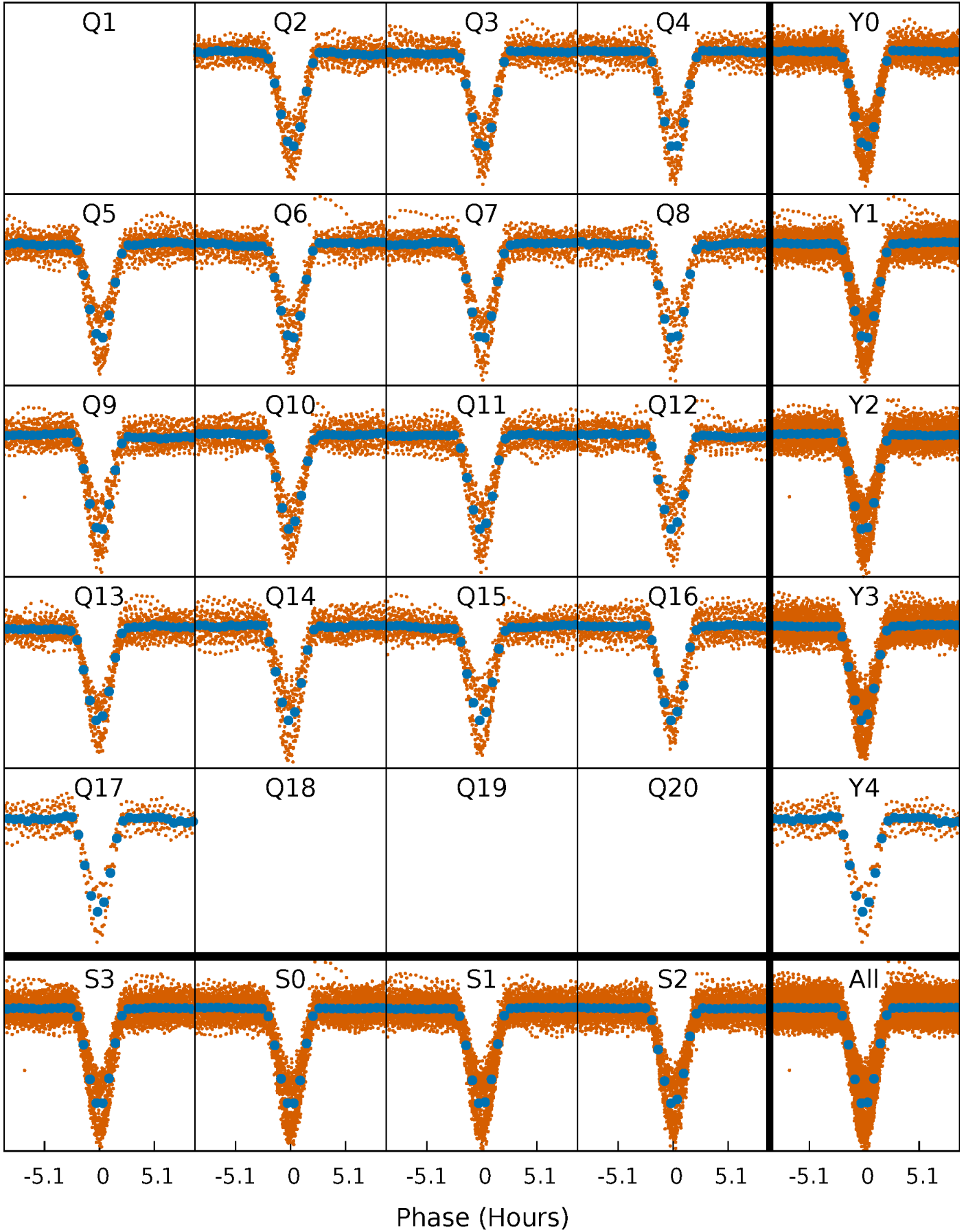


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



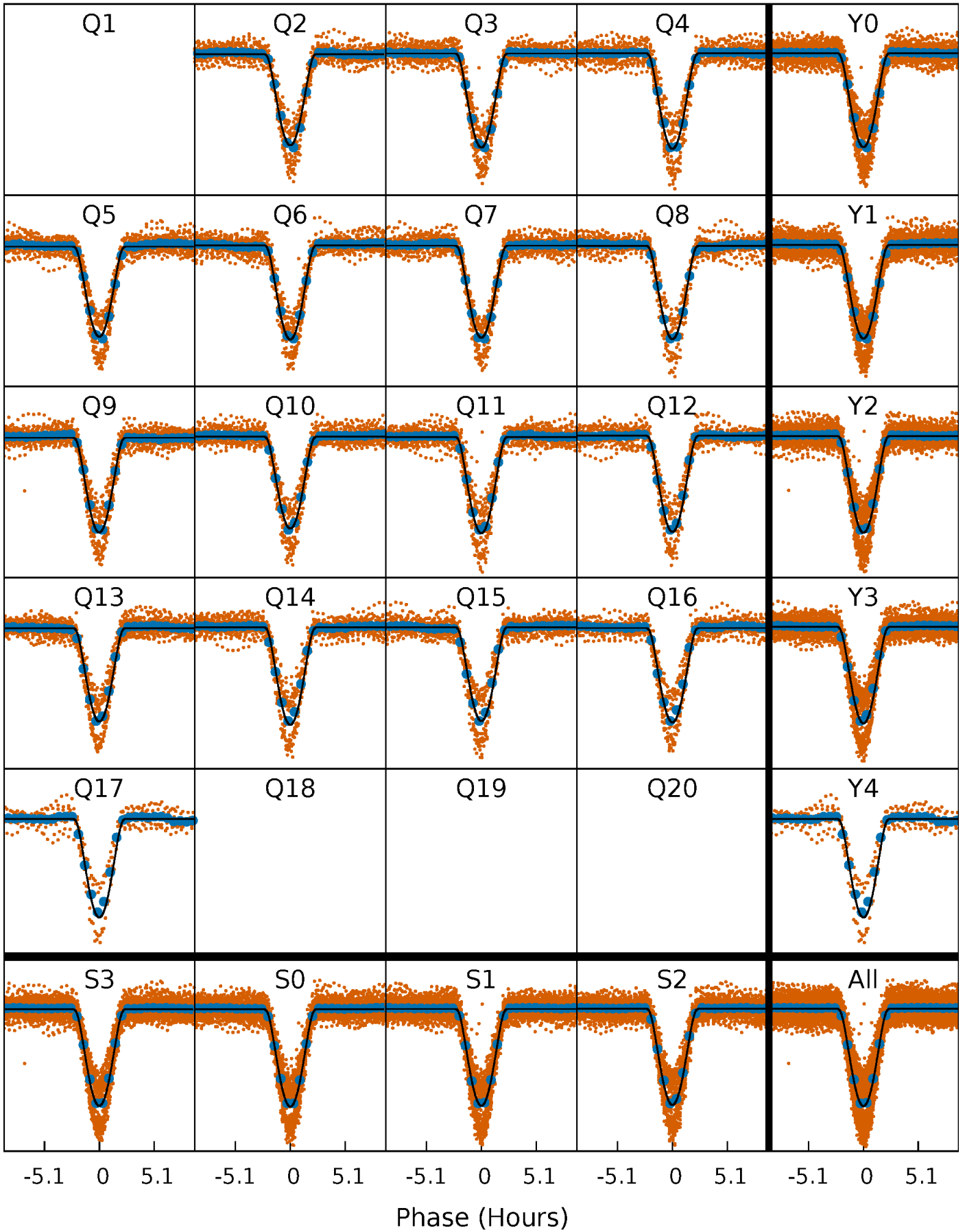
PDC Quarter-Phased Transit Curves

TCE 005211470-01 P= 2.404311 Days $T_0=132.750771$ (BKJD)



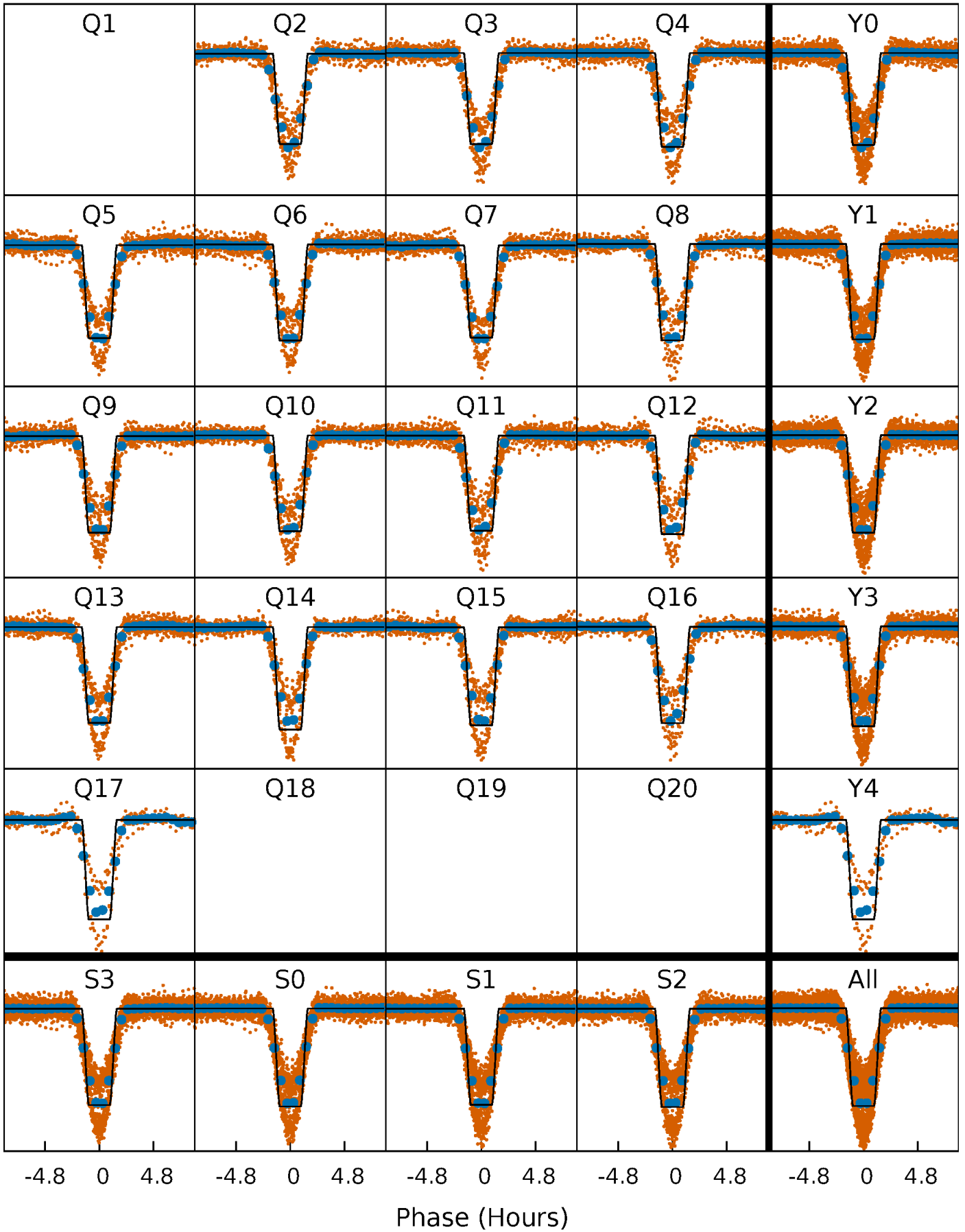
DV Quarter-Phased Transit Curves

TCE 005211470-01 P= 2.404311 Days $T_0=132.750771$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

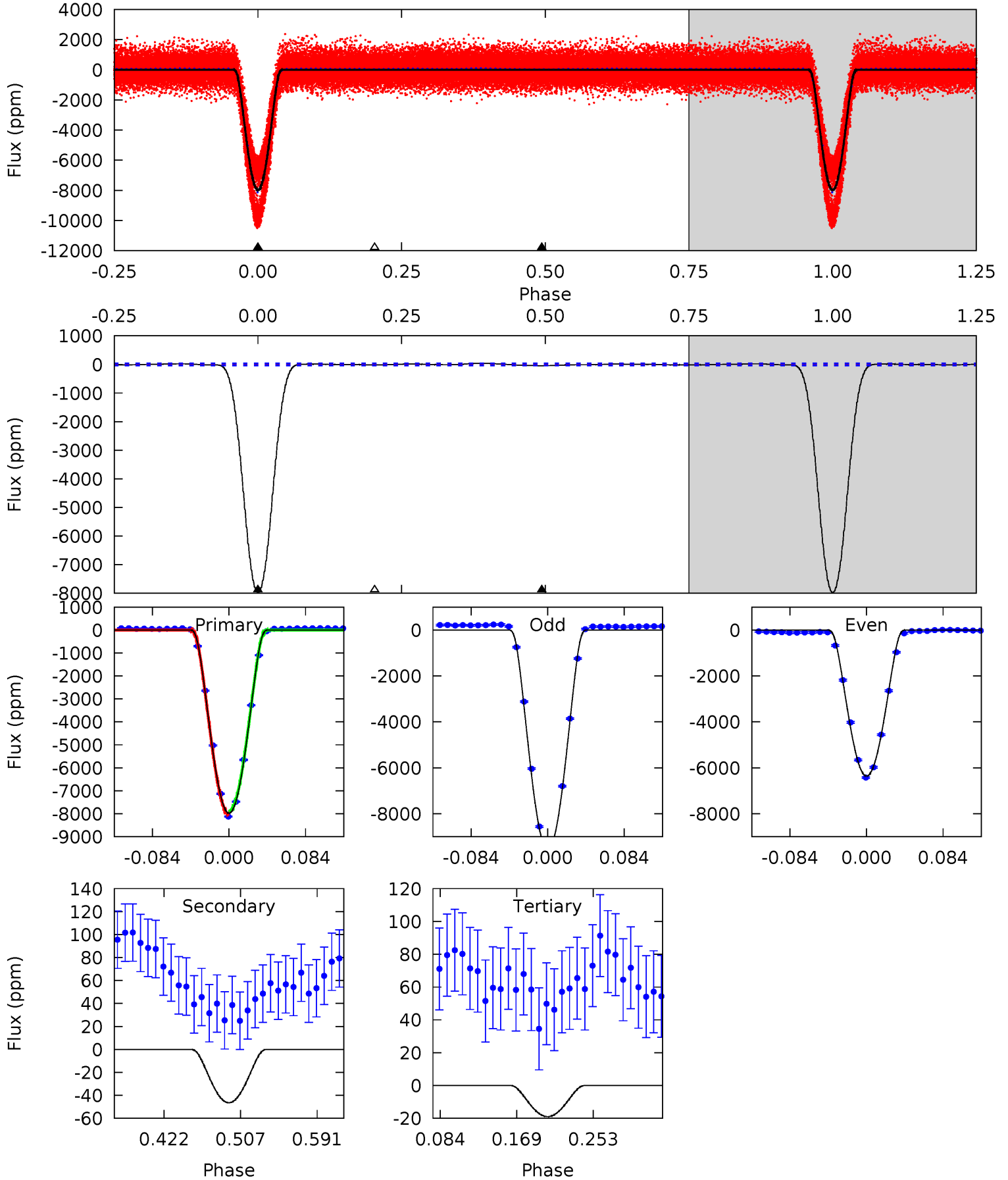
TCE 005211470-01 P= 2.404293 Days $T_0=132.756079$ (BKJD)



DV Model-Shift Uniqueness Test

005211470-01, P = 2.404311 Days, E = 132.750771 Days

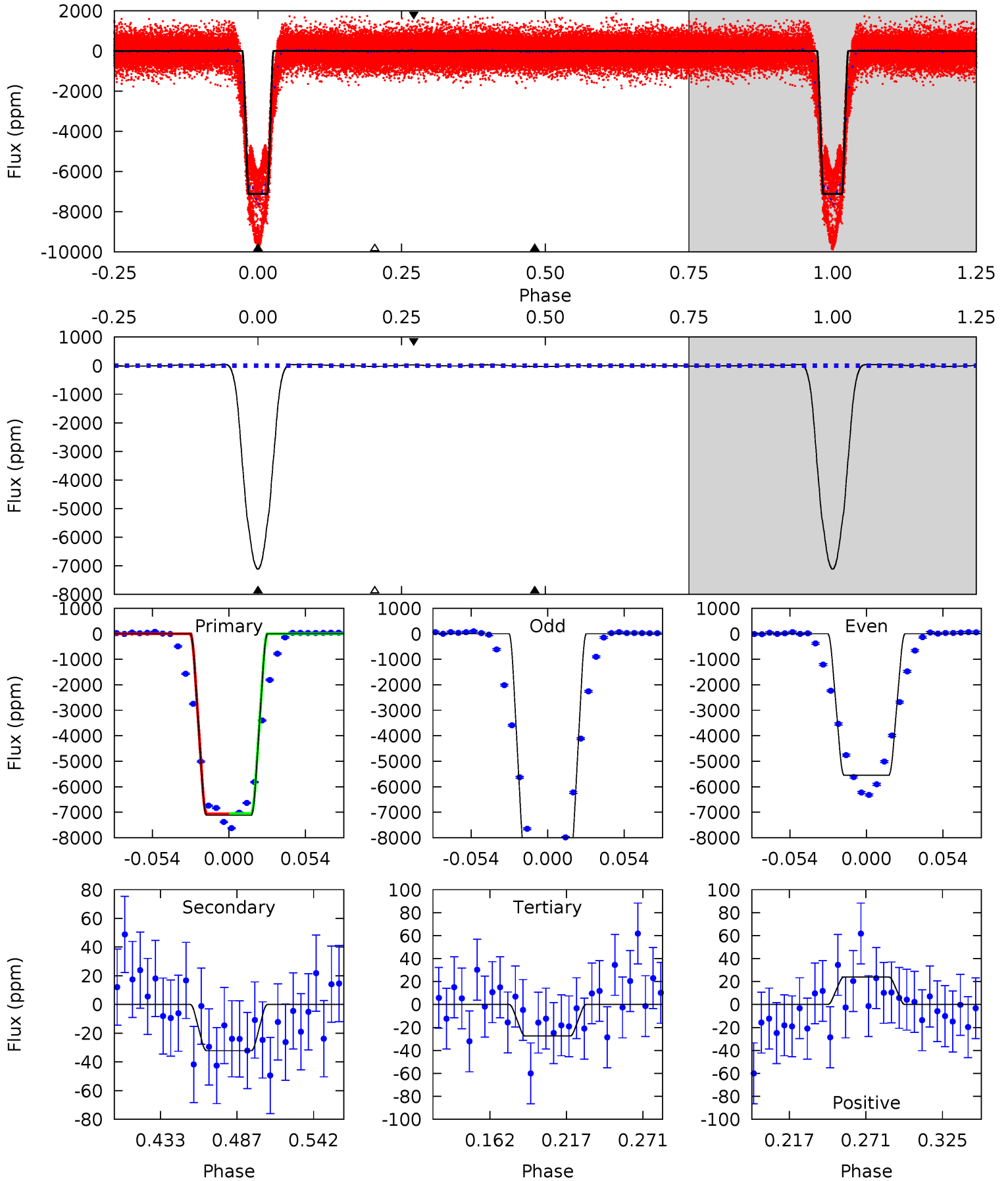
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1015	5.91	2.41	0	4.60	1.73	1.70	1013	1015	3.50	5.91	209.1	0.99	0.00	9.04



Alt Model-Shift Uniqueness Test

005211470-01, P = 2.404293 Days, E = 132.756079 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
789.7	3.56	3.05	2.66	4.69	1.93	1.76	786.7	787.0	0.52	0.91	214.0	0.99	0.01	0.99



Stellar Parameters For KIC 005211470

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4697^{+117}_{-117}	$2.204^{+0.331}_{-0.178}$	$-0.420^{+0.300}_{-0.250}$	$17.032^{+3.944}_{-7.324}$	$1.691^{+0.164}_{-0.656}$	$0.000^{+0.001}_{-0.000}$
	+2%/-2%	+15%/-8%	+71%/-60%	+23%/-43%	+10%/-39%	+249%/-50%
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 005211470-01 / KOI 6541.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-46 ± 8	$285.77^{+43.44}_{-69.24}$	5831^{+423}_{-596}	-4753^{+392}_{-301}	$0.001^{+0.000}_{-0.000}$
Alt.	-32 ± 9	$162.47^{+27.82}_{-38.67}$	5809^{+450}_{-560}	-4740^{+368}_{-311}	$0.001^{+0.001}_{-0.000}$

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 $A_{obs} \gg 1.0$

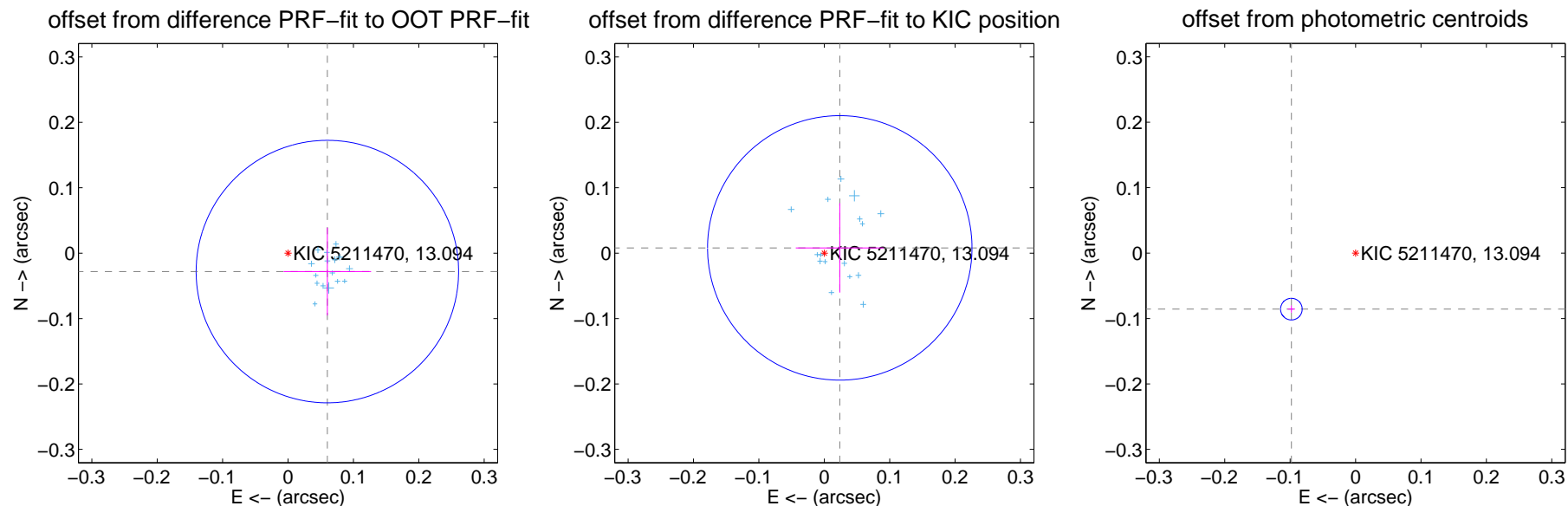
DV Centroid Data

Supplemental centroid analysis for 005211470-01. Kepler magnitude: 13.09. Transit SNR 369.13

There are 16 quarters with good PRF difference image offsets

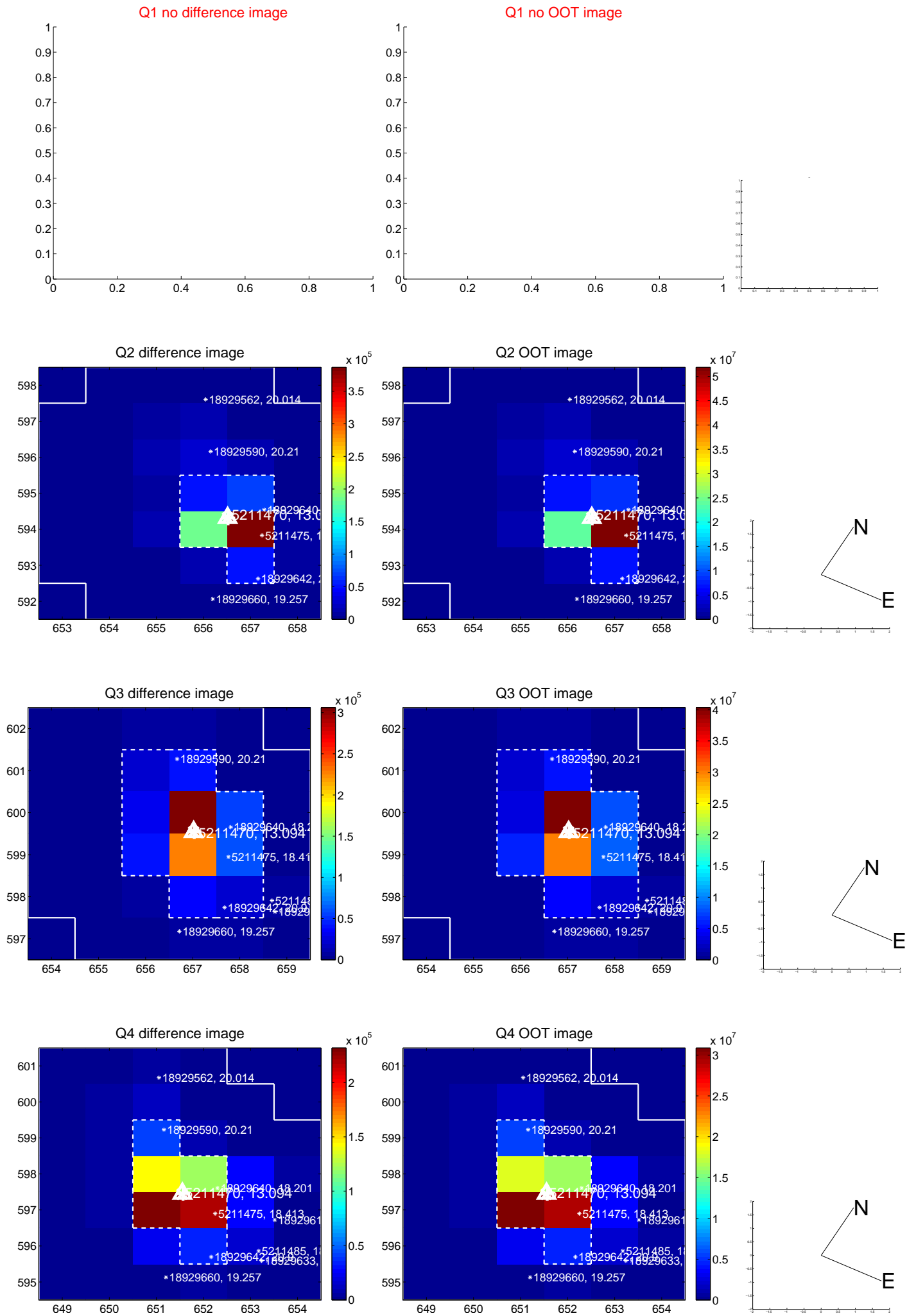
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.066 ± 0.067	0.99	-0.060 ± 0.067	-0.028 ± 0.067
PRF-fit source offset from KIC position	0.025 ± 0.067	0.37	-0.024 ± 0.067	0.008 ± 0.068
photometric centroid source offset	0.13 ± 0.01	23.64	0.10 ± 0.01	-0.09 ± 0.01

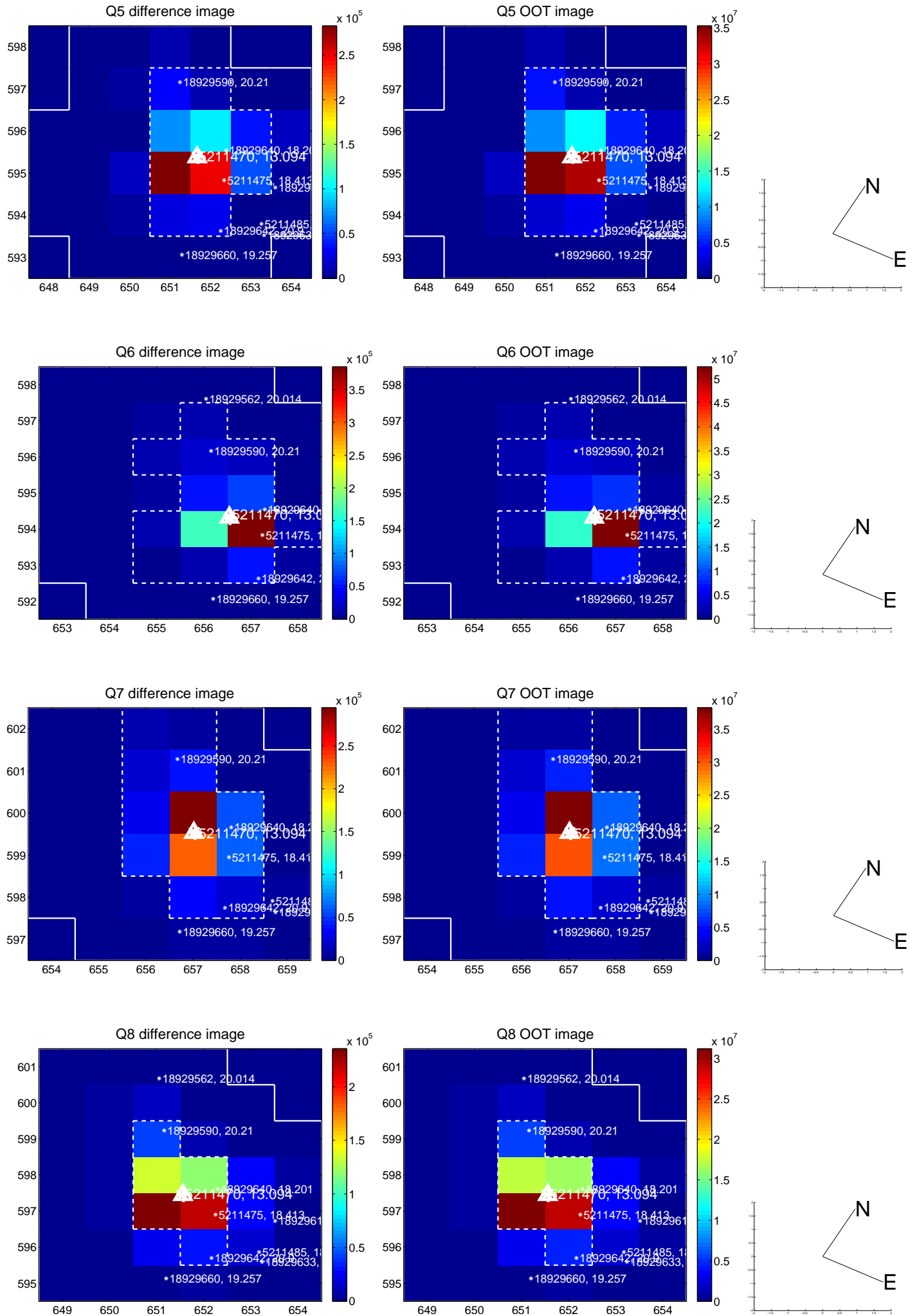


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

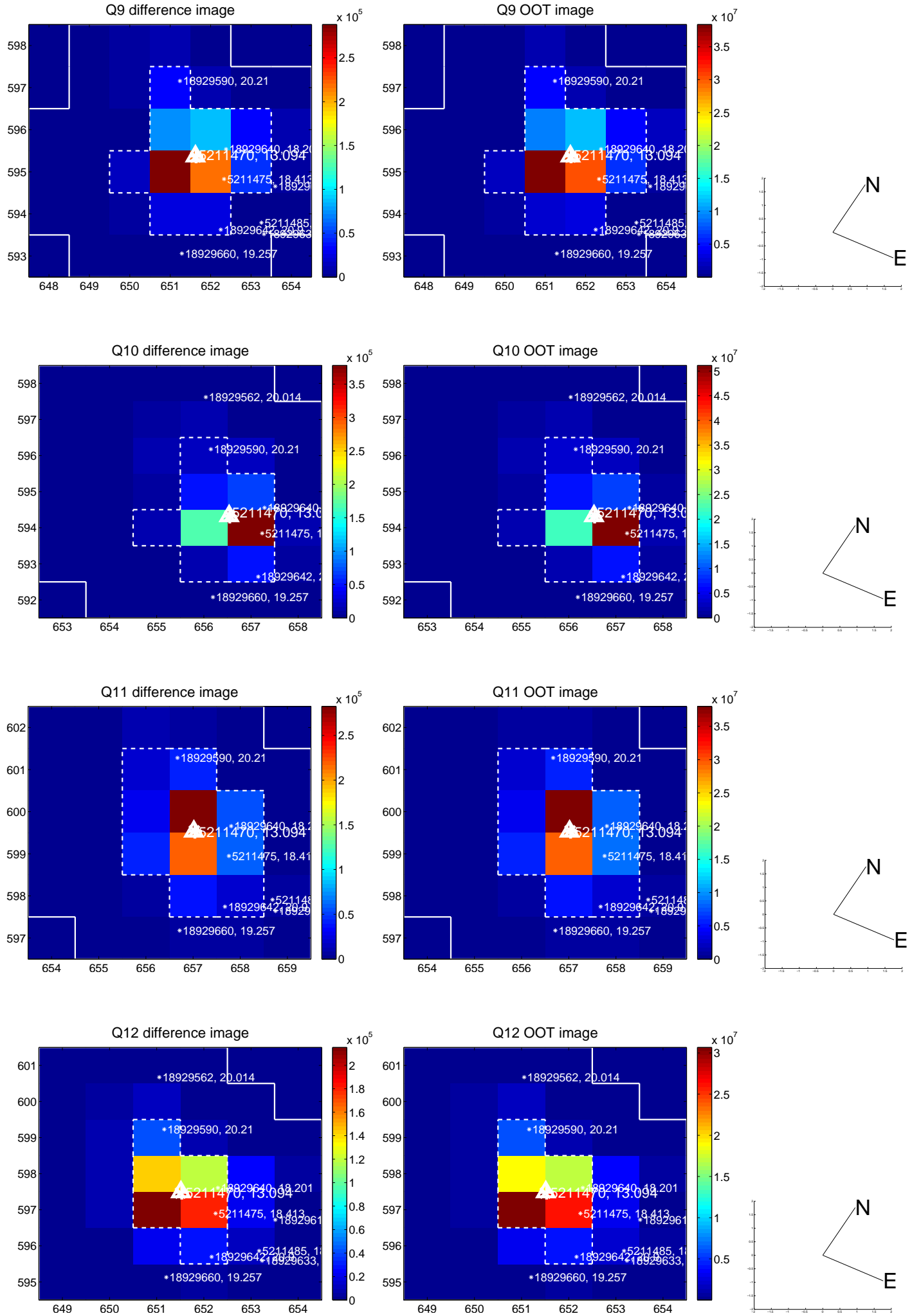
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



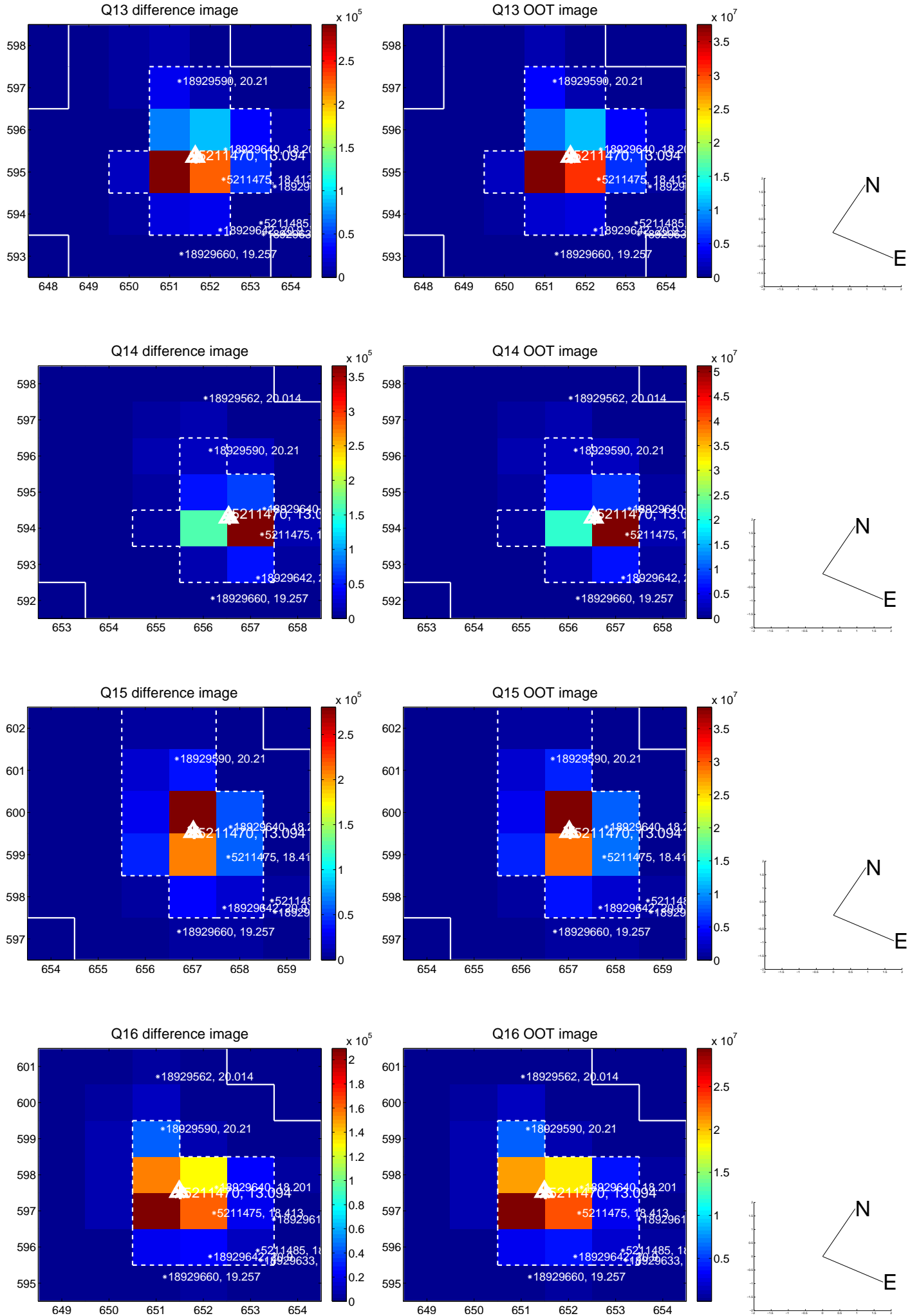
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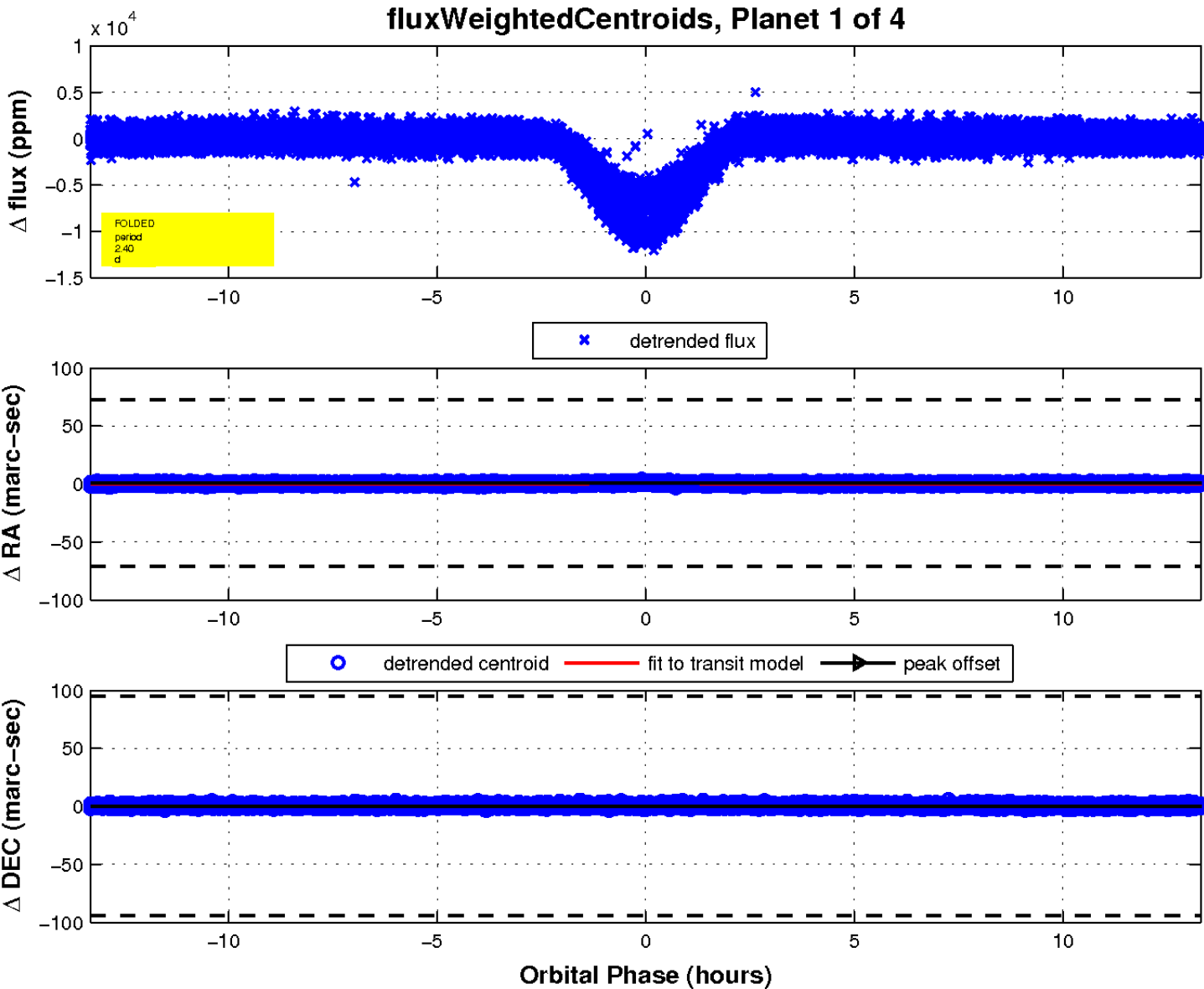
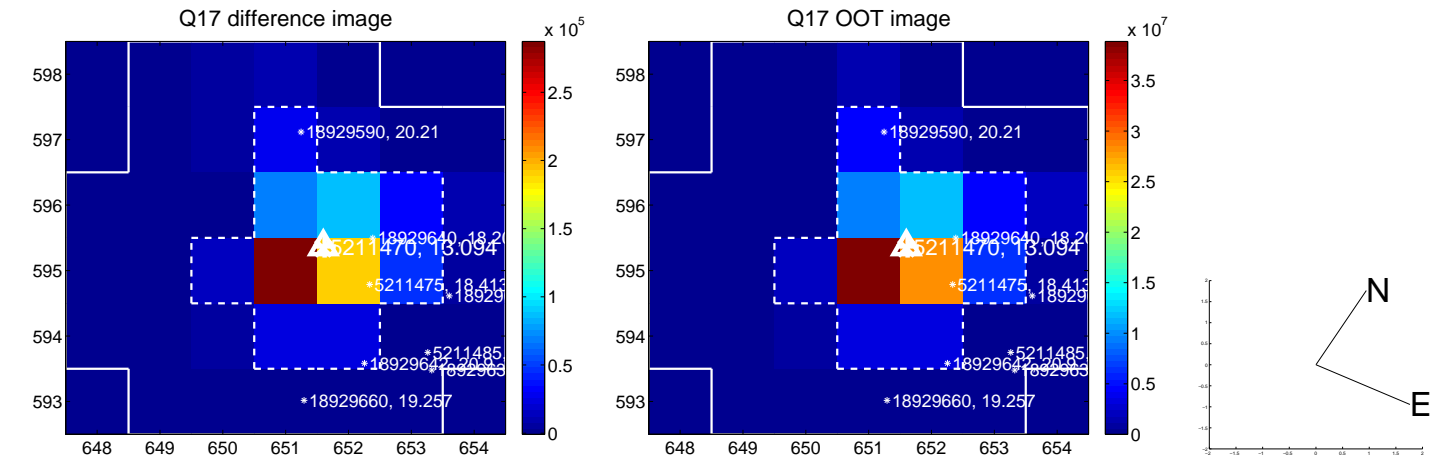
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

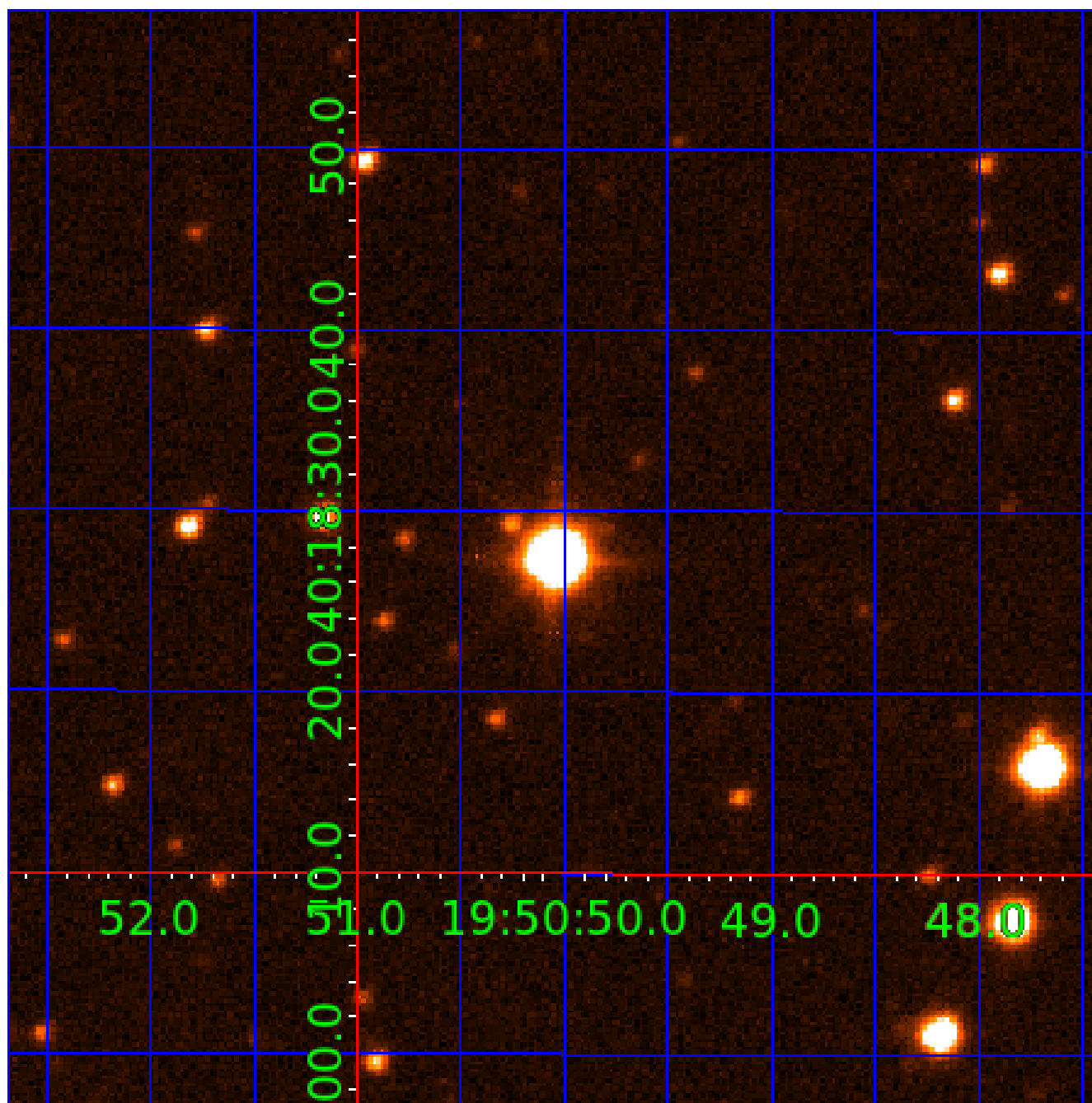


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005211470

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})
005211470-01	OBS	6541.01	2.404311	132.750771	7997.4	4.438	429.7	369.1	17.03	4697	287.50	0.00
005211470-02	OBS	6541.02	0.938065	132.274036	109.6	1.051	14.4	18.2	17.03	4697	22.01	0.00
005211470-03	OBS	No	0.938071	131.856043	13.1	0.636	8.5	2.1	17.03	4697	7.76	0.00
005211470-04	OBS	No	413.546303	330.859577	2146.9	6.430	8.9	10.1	17.03	4697	128.01	75.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005211470-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED
005211470-02	OBS	FP	0.00	0	1	1	0	PLANET_IN_STAR—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
005211470-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
005211470-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES

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

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

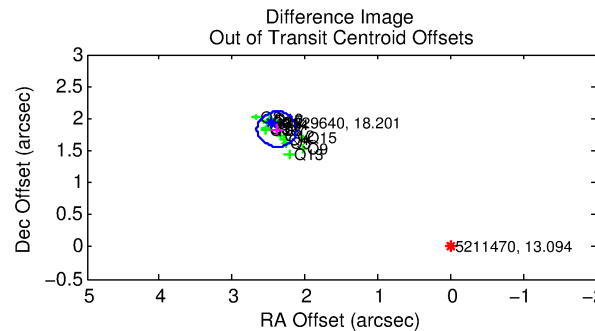
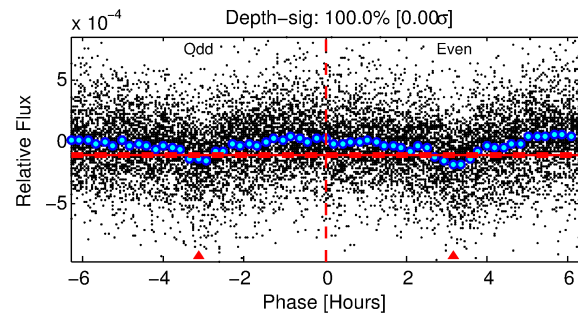
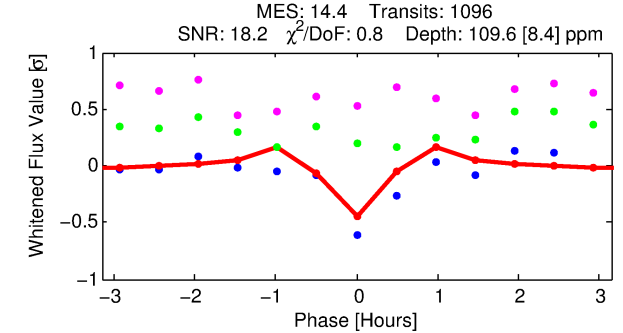
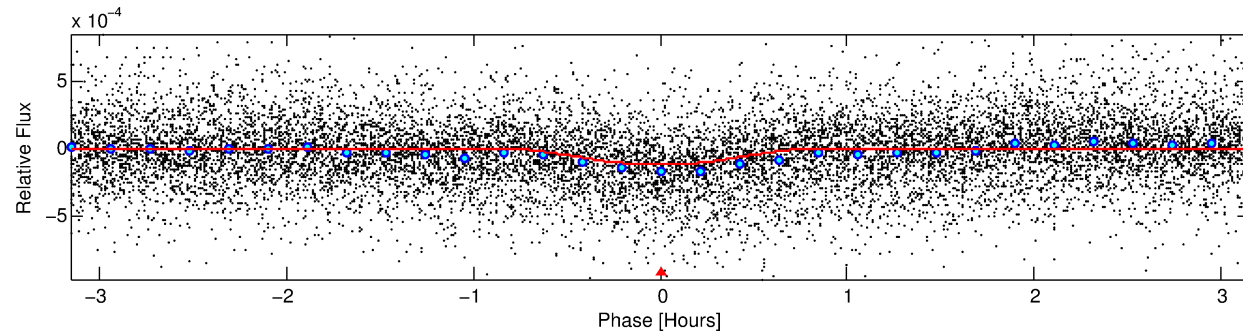
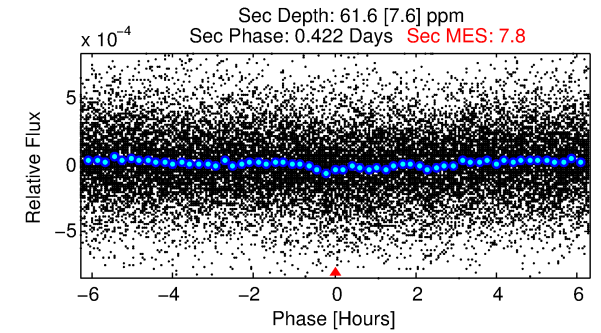
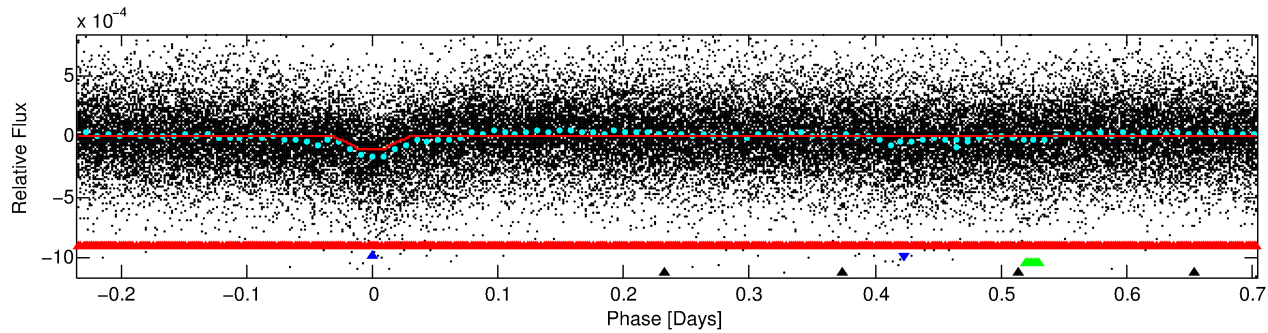
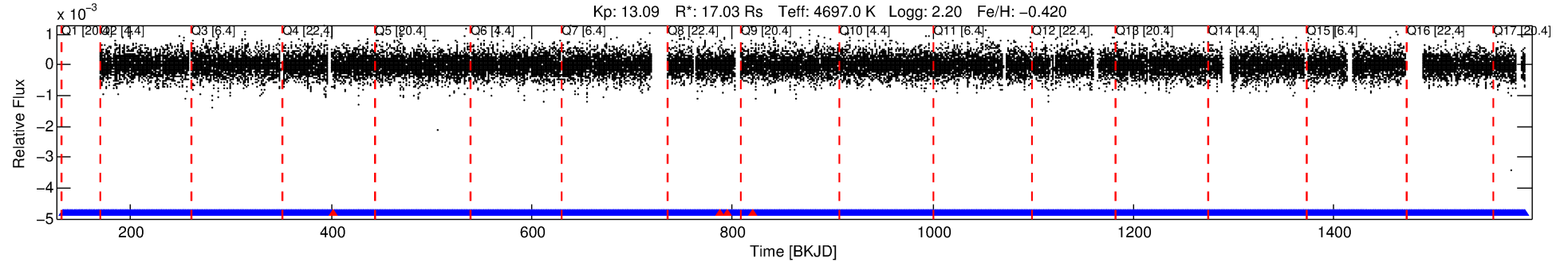
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005211470-02

No Significant Match Found

DV One-Page Summary

KIC: 5211470 Candidate: 2 of 4 Period: 0.938 d
KOI: K06541.02 Corr: 0.882



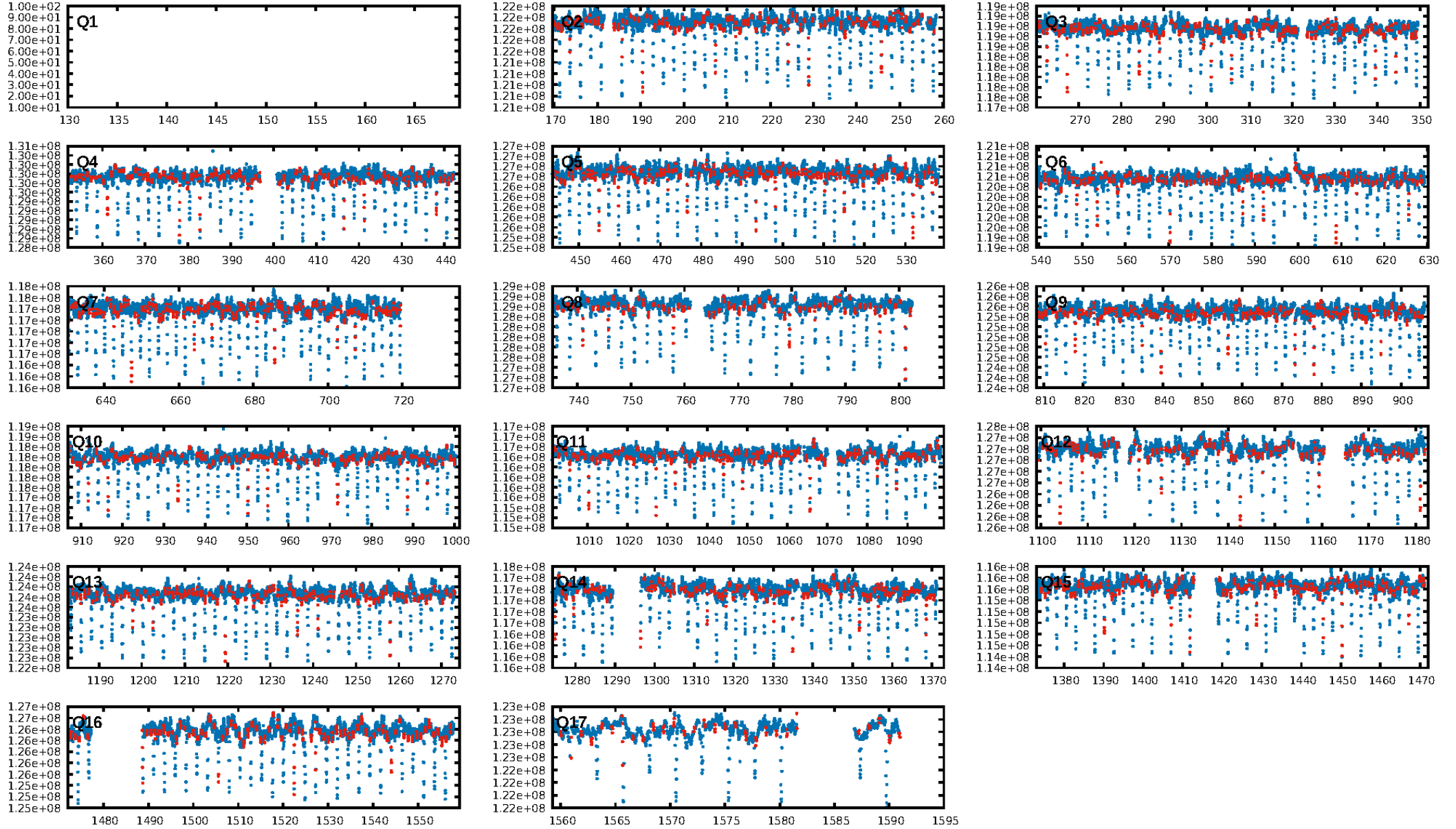
DV Fit Results:

Period = 0.93807 [0.00001] d
Epoch = 132.2740 [0.0007] BKJD
Rp/R* = 0.0118 [0.0049]
a/R* = 3.29 [4.74]
b = 0.90 [0.35]
Seff = N/A
Teq = N/A
Rp = 22.01 [13.10] Re
a = N/A
Ag = N/A
Teffp = N/A

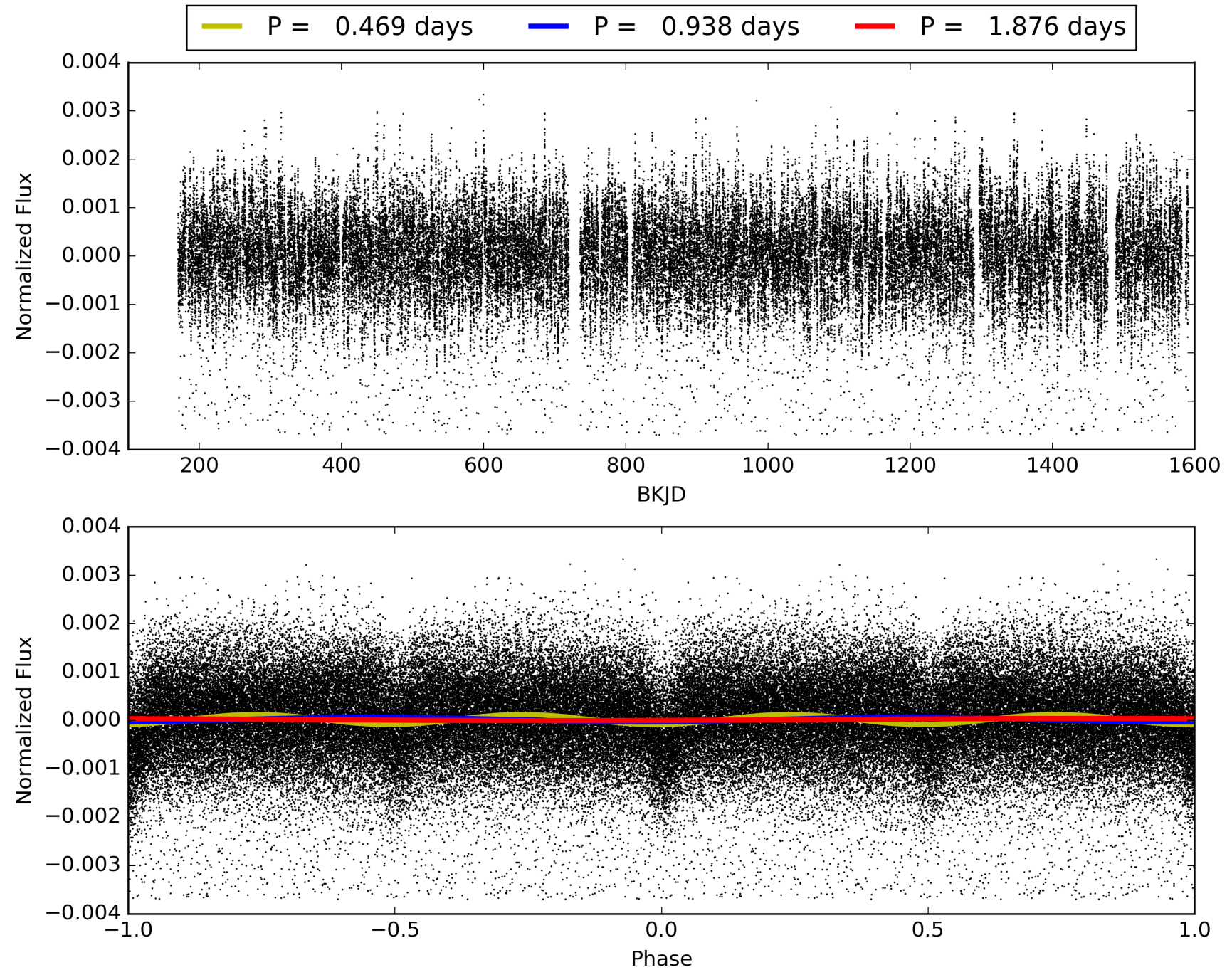
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.23e-52
RollingBand-fgt: 1.00 [1069/1073]
GhostDiagnostic-chr: 0.8741
Centroid-sig: 0.0%
Centroid-so: 4.833 arcsec [12.50σ]
OotOffset-rm: 3.010 arcsec [33.26σ]
KicOffset-rm: 3.057 arcsec [34.88σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 005211470-02, PDC Light Curves

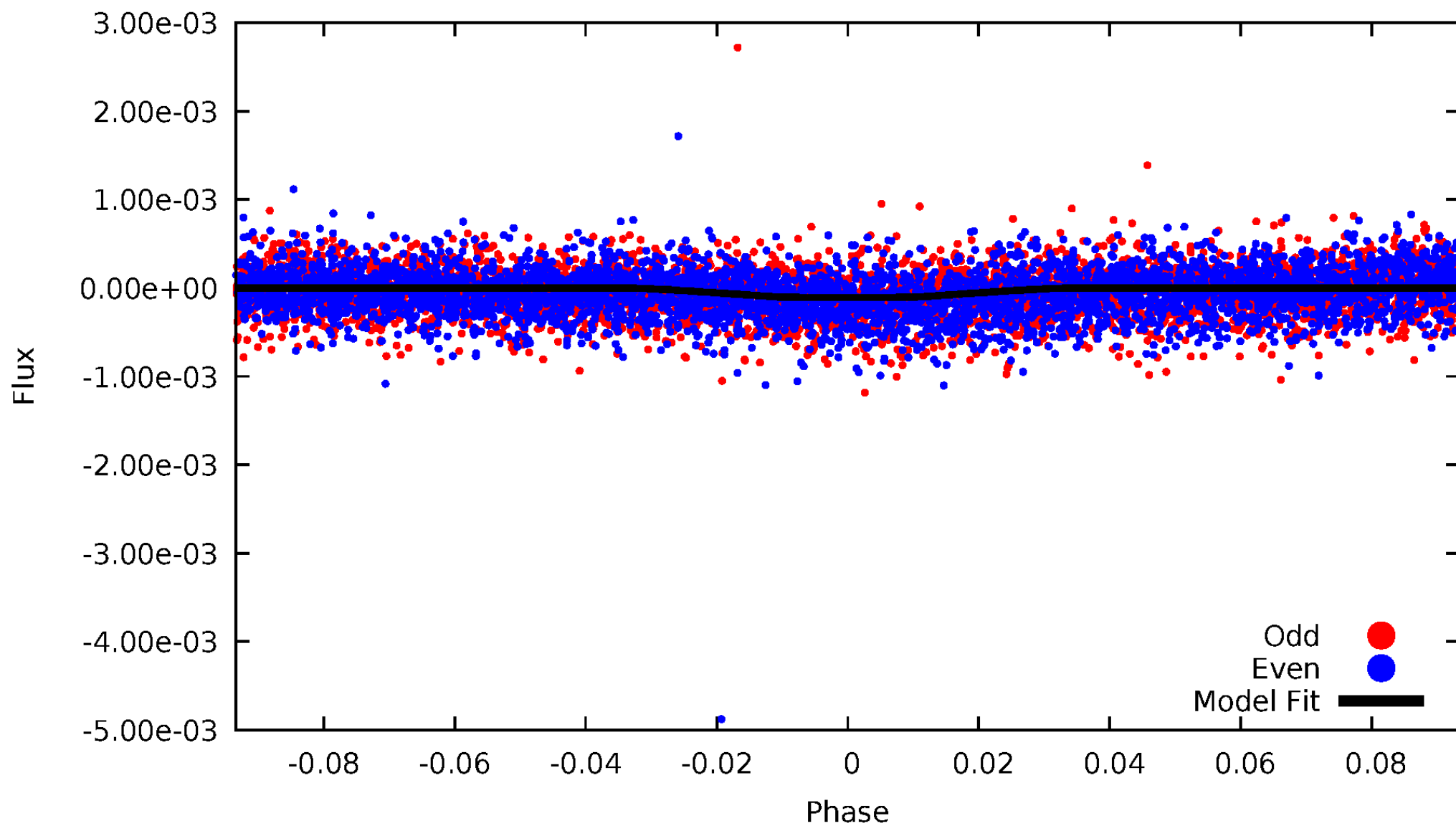


TCE 005211470-02



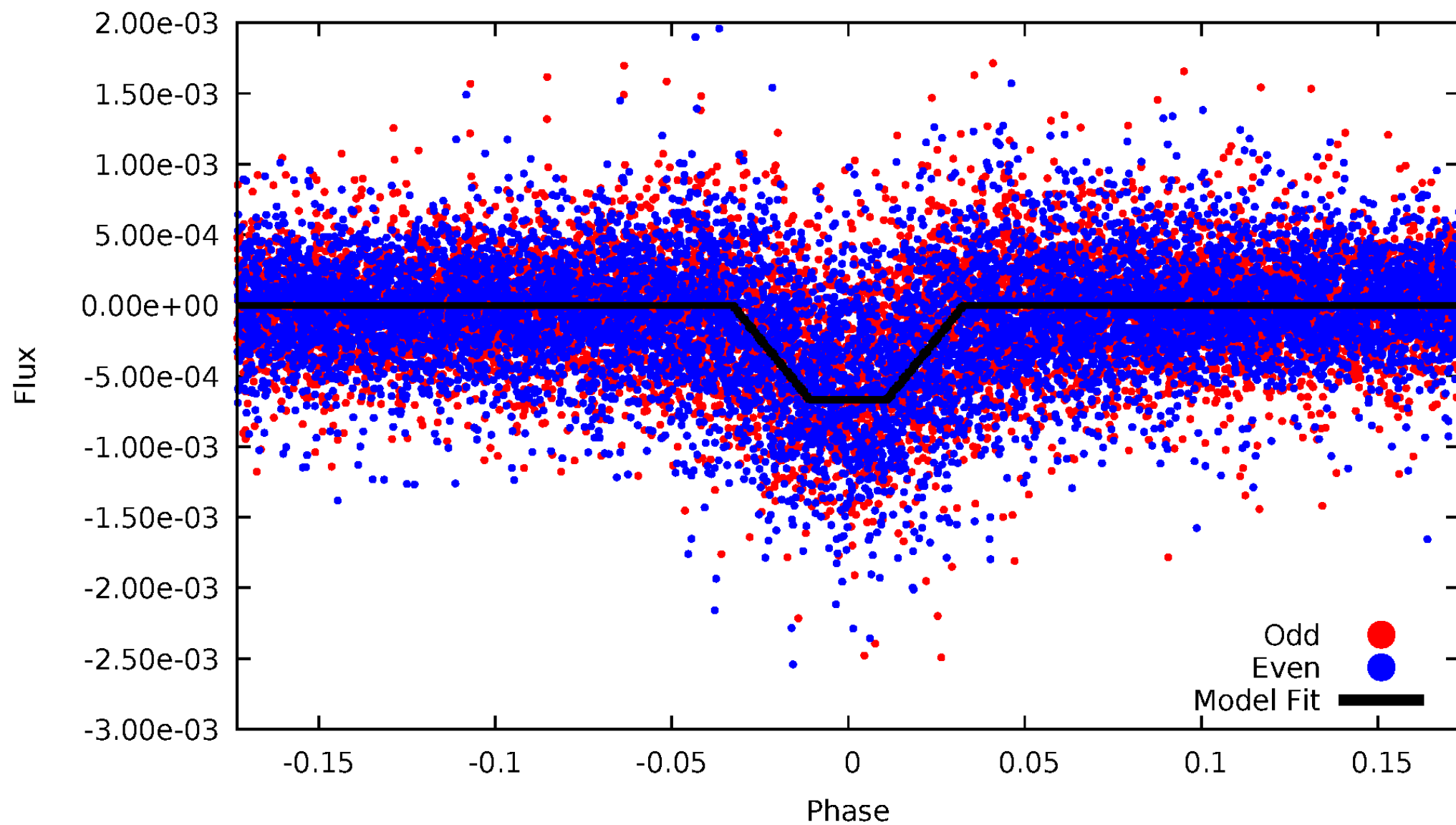
DV Odd/Even

TCE 005211470-02



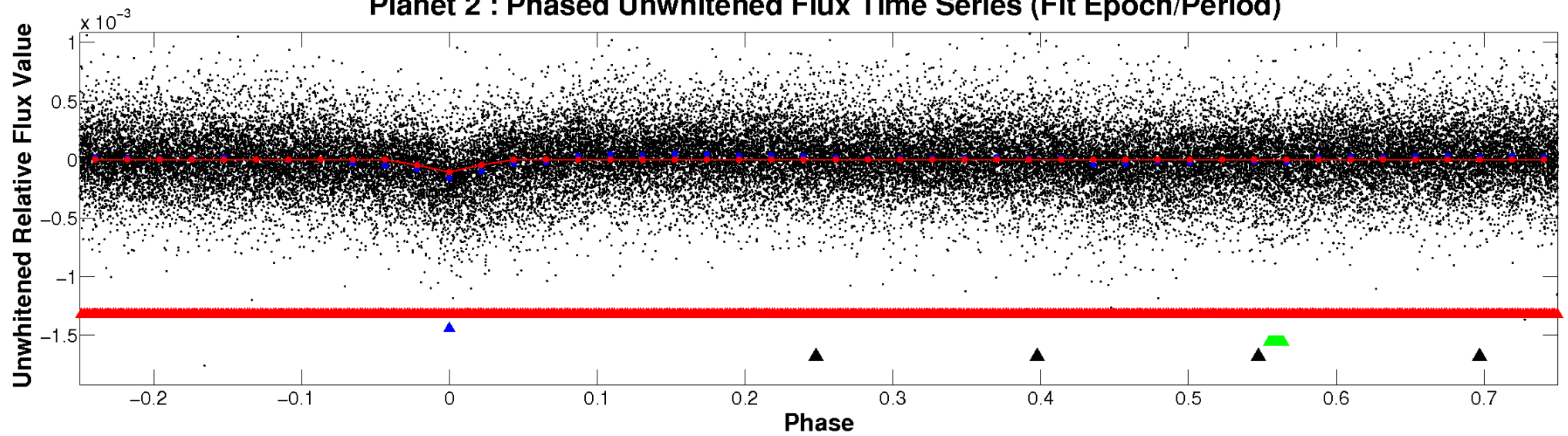
ALT Odd/Even

TCE 005211470-02

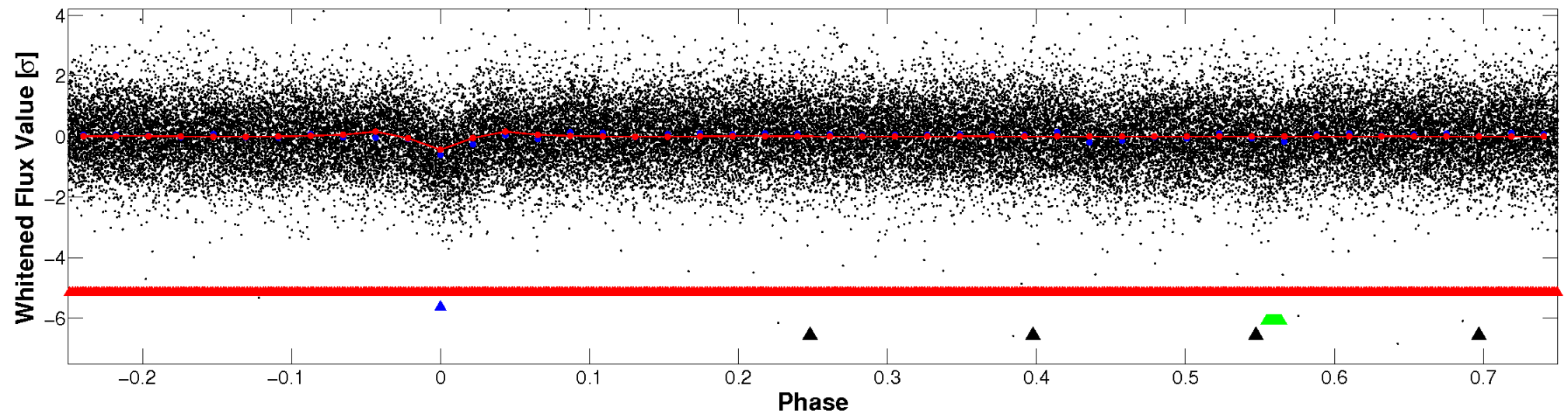


Non-Whitened Vs. Whitened Light Curve

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

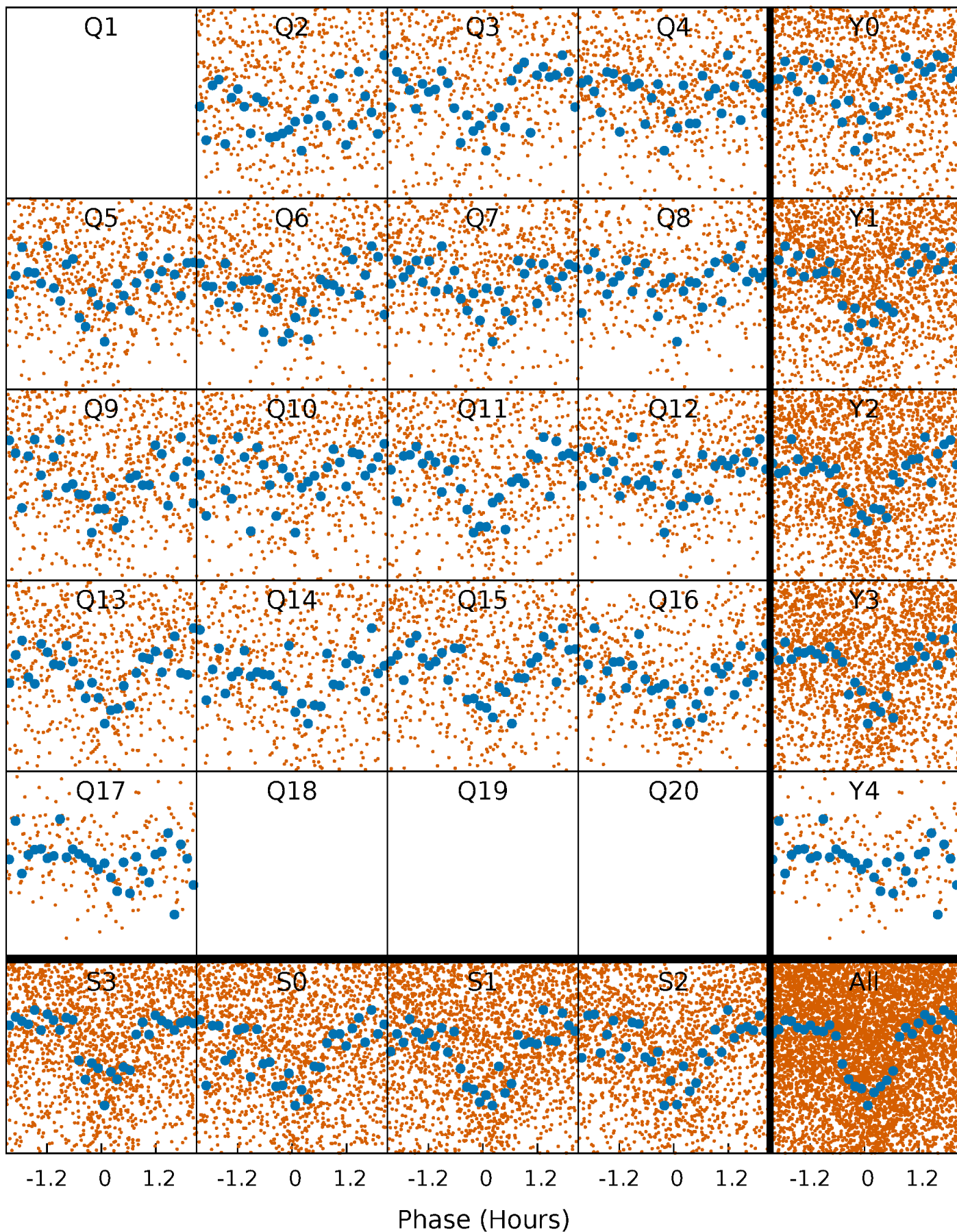


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



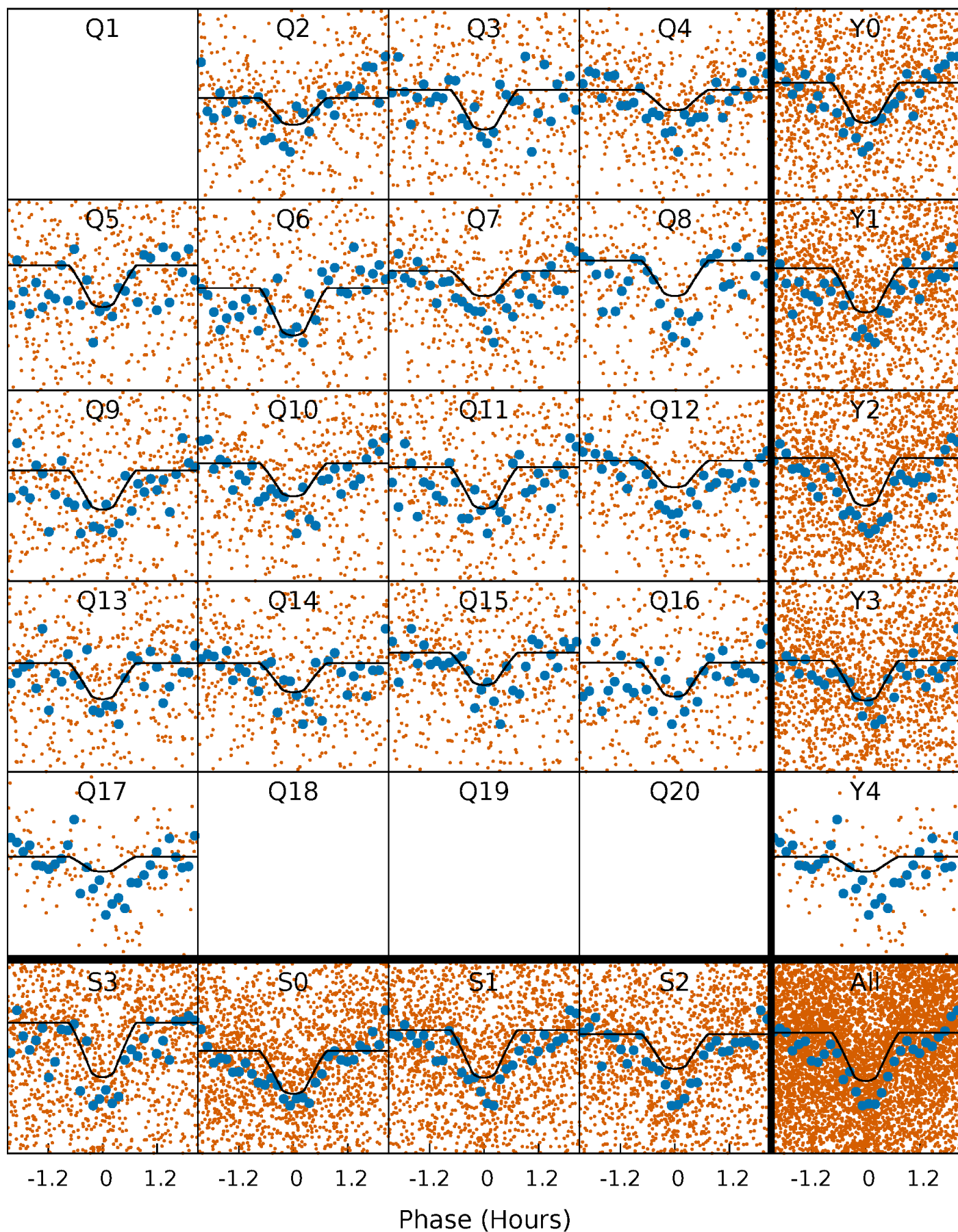
PDC Quarter-Phased Transit Curves

TCE 005211470-02 P= 0.938065 Days $T_0=132.274036$ (BKJD)



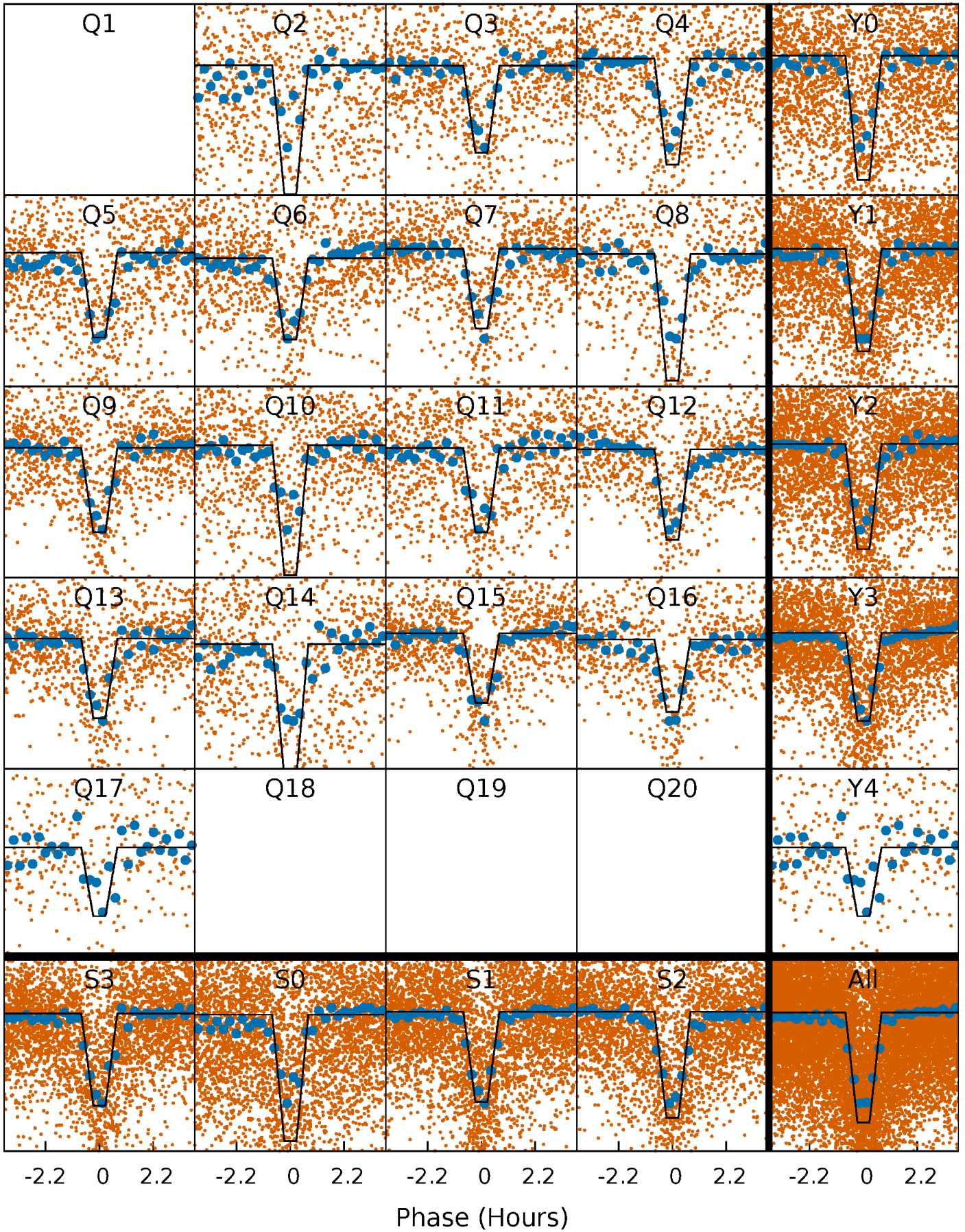
DV Quarter-Phased Transit Curves

TCE 005211470-02 P= 0.938065 Days $T_0=132.274036$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

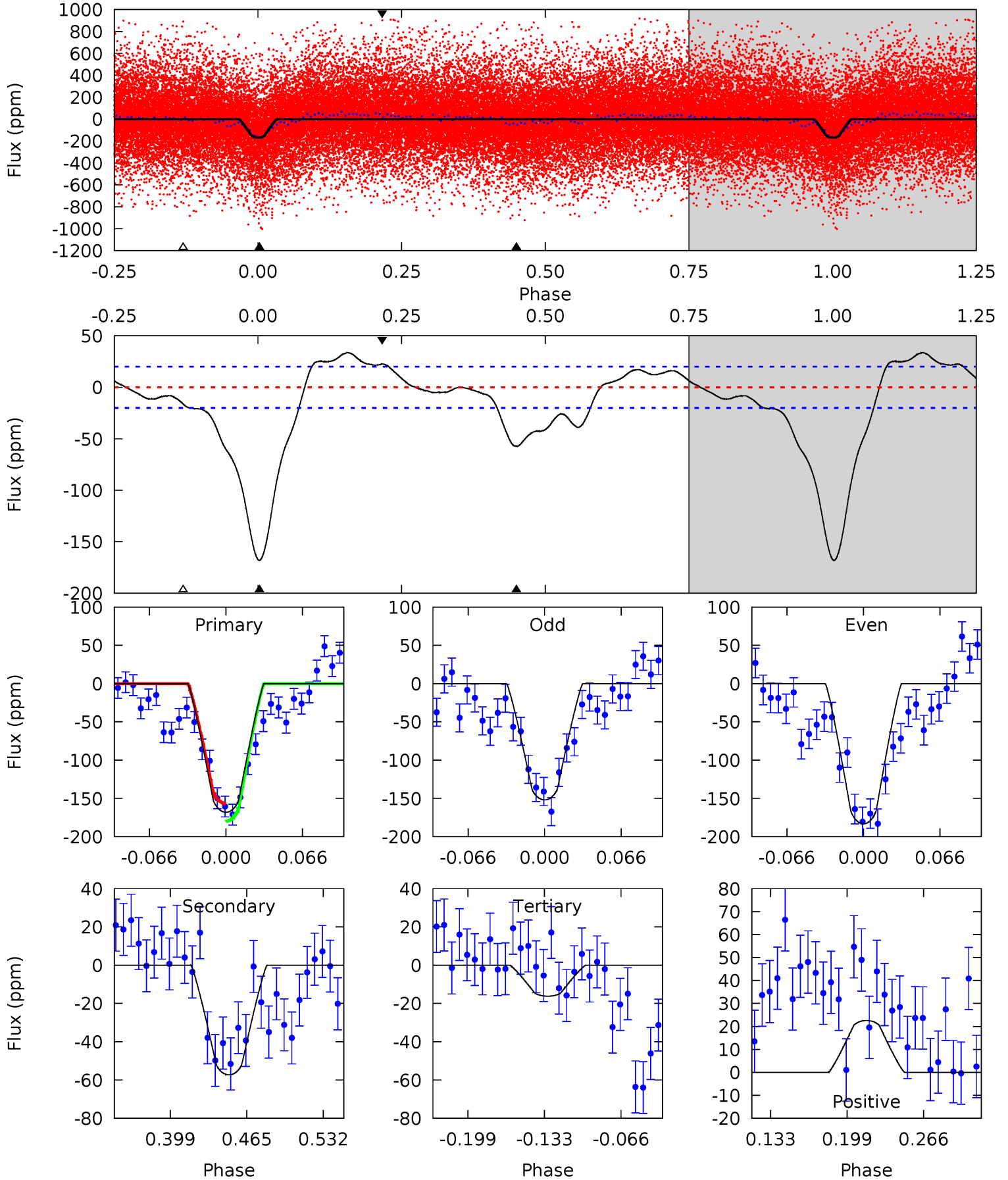
TCE 005211470-02 $P = 0.938074$ Days $T_0 = 132.270536$ (BKJD)



DV Model-Shift Uniqueness Test

005211470-02, P = 0.938065 Days, E = 132.274036 Days

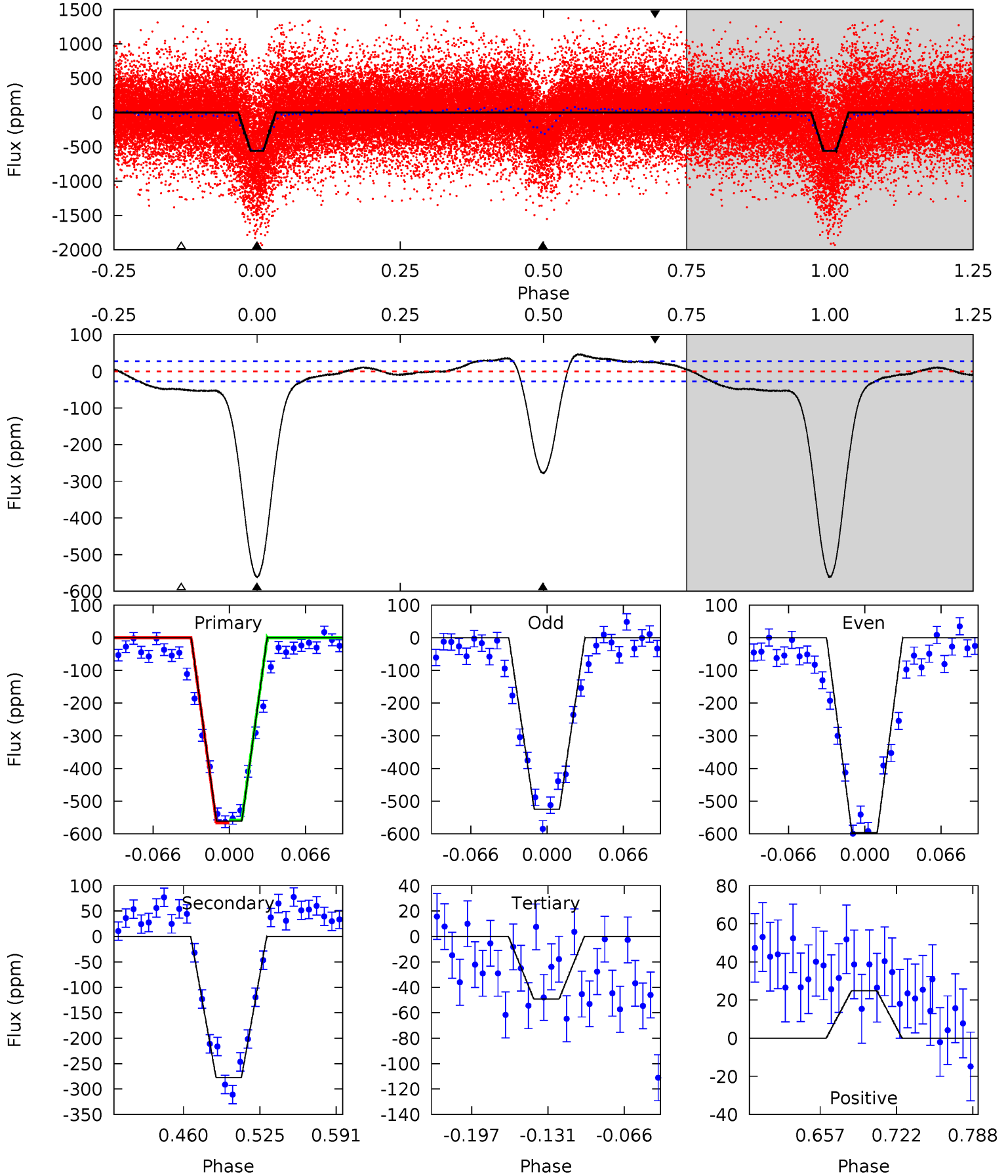
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.1	13.3	3.77	5.26	4.65	1.84	4.29	35.3	33.9	9.57	8.08	3.65	1.09	0.17	2.73



Alt Model-Shift Uniqueness Test

005211470-02, P = 0.938074 Days, E = 132.270536 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
94.3	46.7	8.26	4.18	4.65	1.84	4.67	86.0	90.1	38.4	42.5	6.03	1.00	0.08	0.73



Stellar Parameters For KIC 005211470

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4697^{+117}_{-117}	$2.204^{+0.331}_{-0.178}$	$-0.420^{+0.300}_{-0.250}$	$17.032^{+3.944}_{-7.324}$	$1.691^{+0.164}_{-0.656}$	$0.000^{+0.001}_{-0.000}$
	+2%/-2%	+15%/-8%	+71%/-60%	+23%/-43%	+10%/-39%	+249%/-50%
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 005211470-02 / KOI 6541.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-57 ± 4	$20.77^{+9.84}_{-8.60}$	8021^{+579}_{-872}	-6064^{+864}_{-565}	$0.035^{+0.058}_{-0.019}$
Alt.	-278 ± 6	$45.72^{+13.37}_{-11.89}$	7986^{+585}_{-829}	-6113^{+678}_{-552}	$0.035^{+0.027}_{-0.014}$

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 $A_{obs} \gg 1.0$

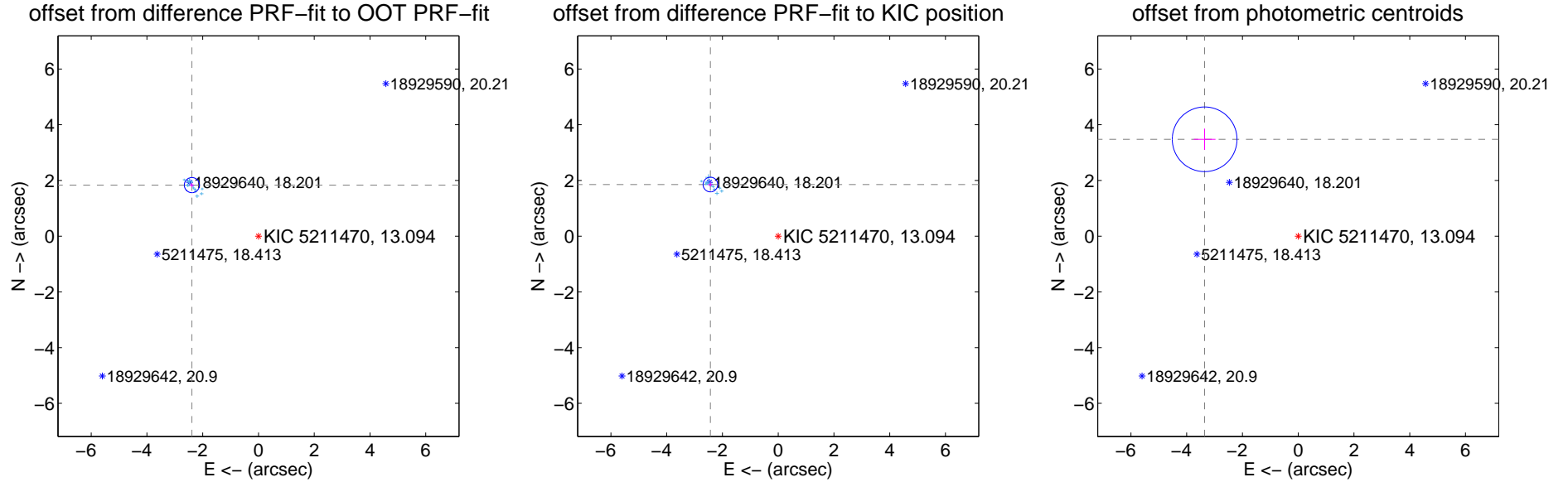
DV Centroid Data

Supplemental centroid analysis for 005211470-02. Kepler magnitude: 13.09. Transit SNR 18.23

There are 16 quarters with good PRF difference image offsets

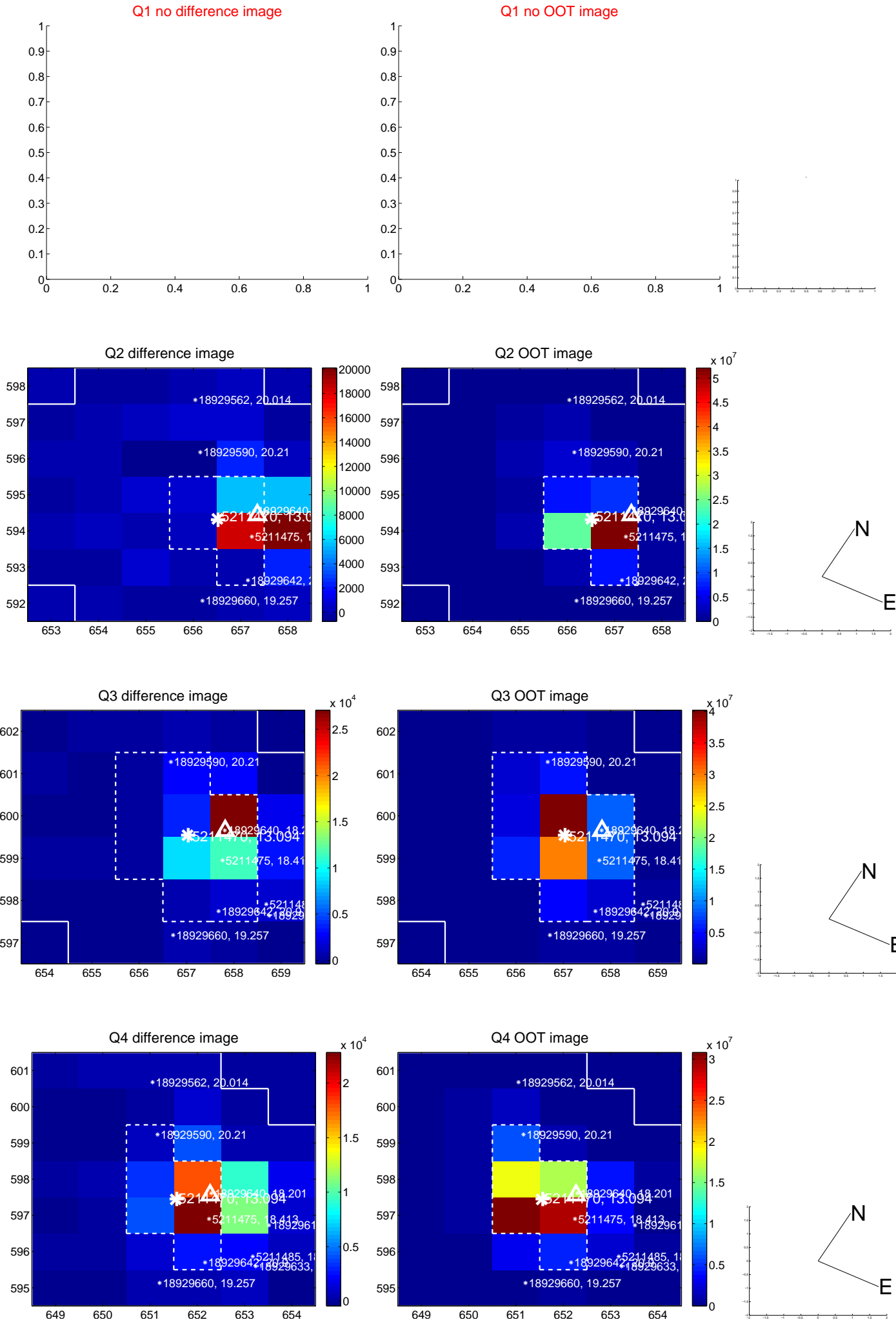
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.010 ± 0.091	33.26	2.388 ± 0.081	1.833 ± 0.080
PRF-fit source offset from KIC position	3.057 ± 0.088	34.88	2.431 ± 0.082	1.853 ± 0.075
photometric centroid source offset	4.83 ± 0.39	12.50	3.36 ± 0.39	3.48 ± 0.38

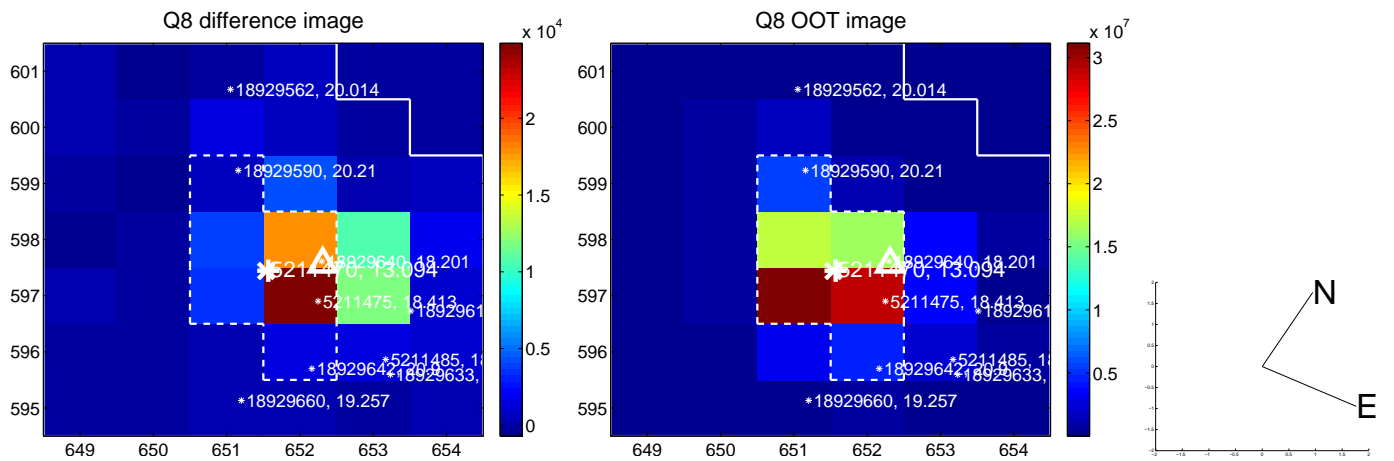
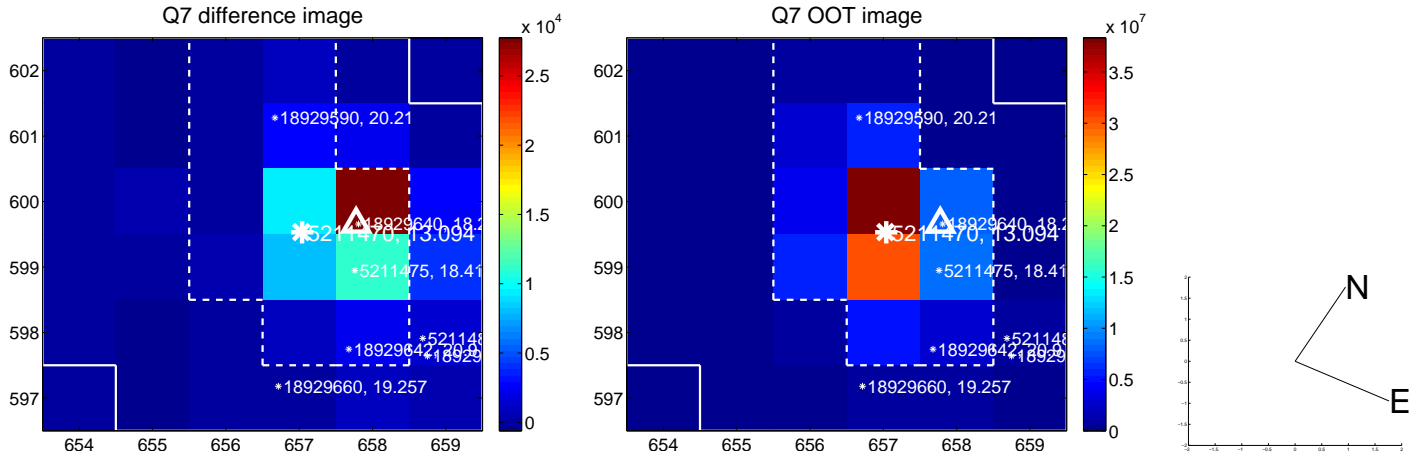
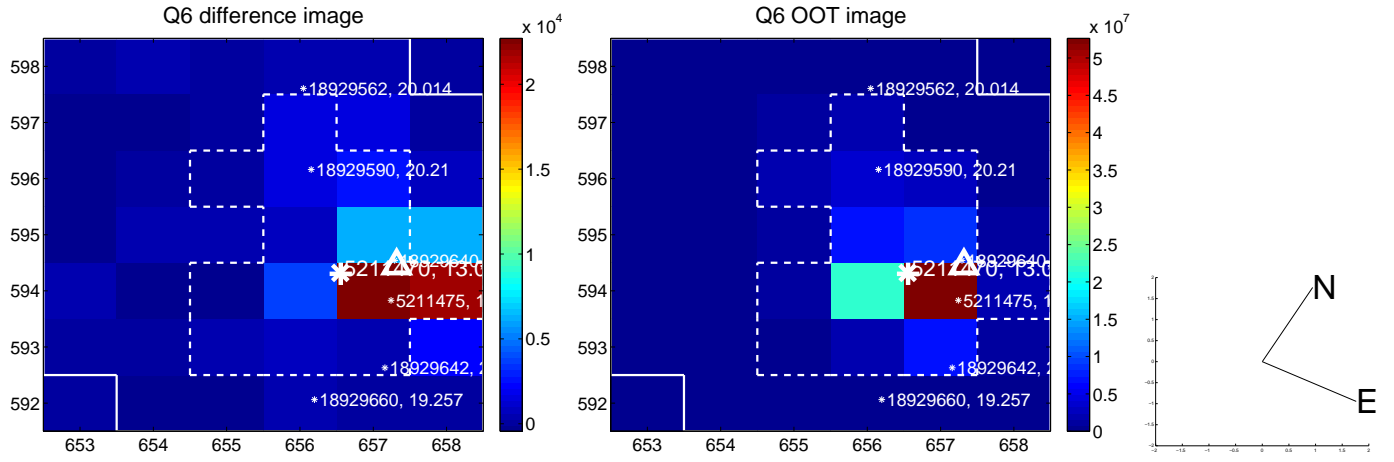
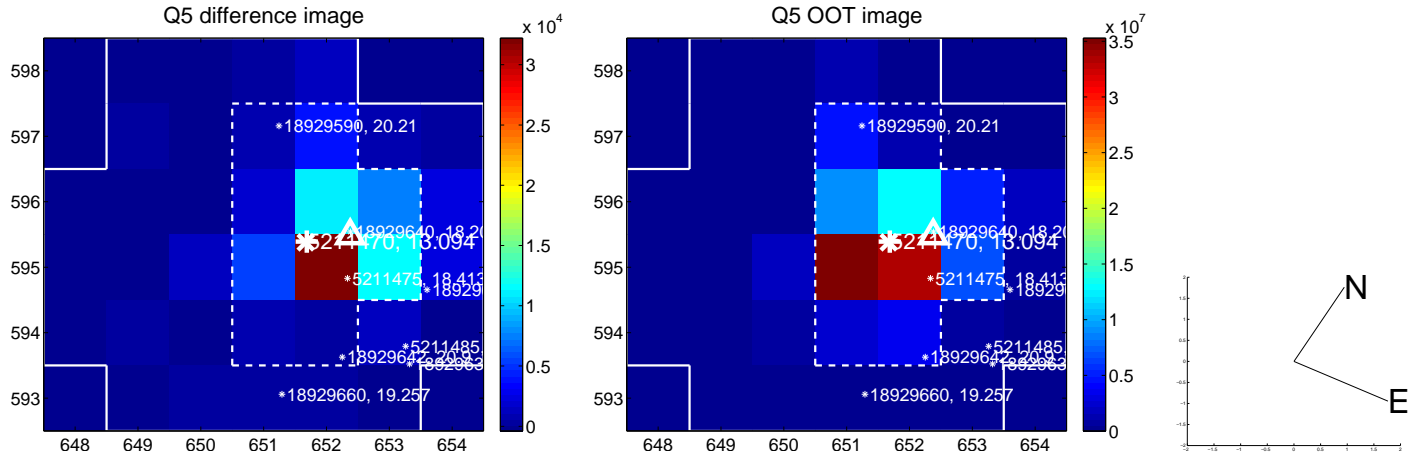


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

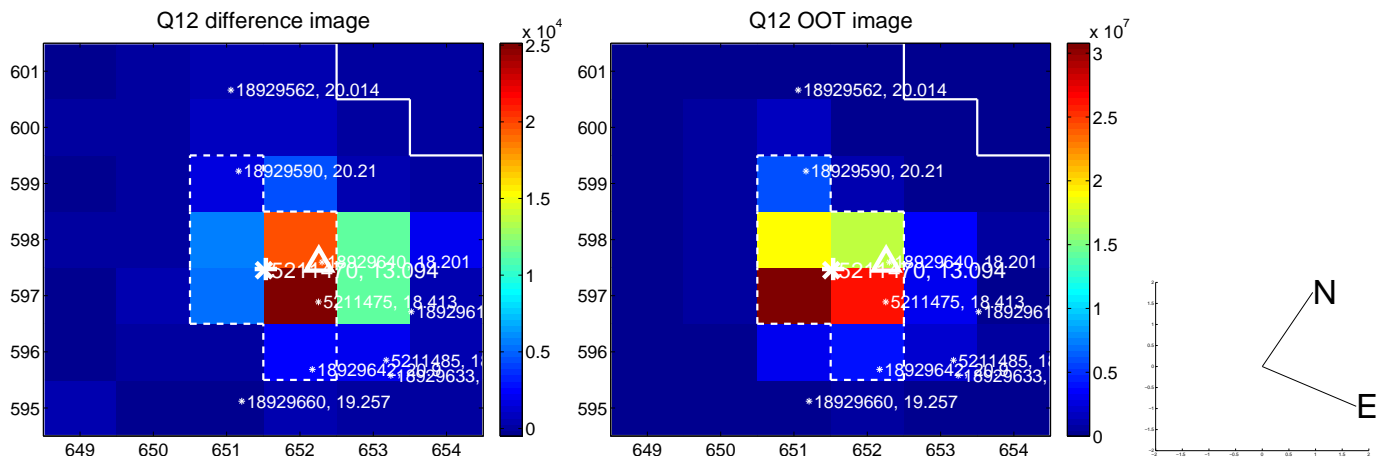
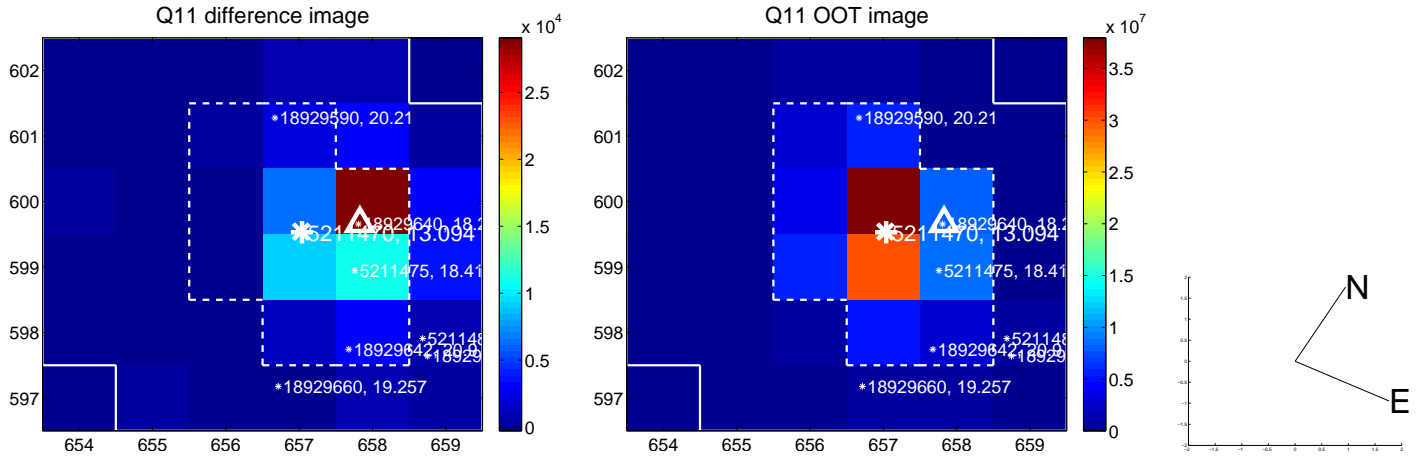
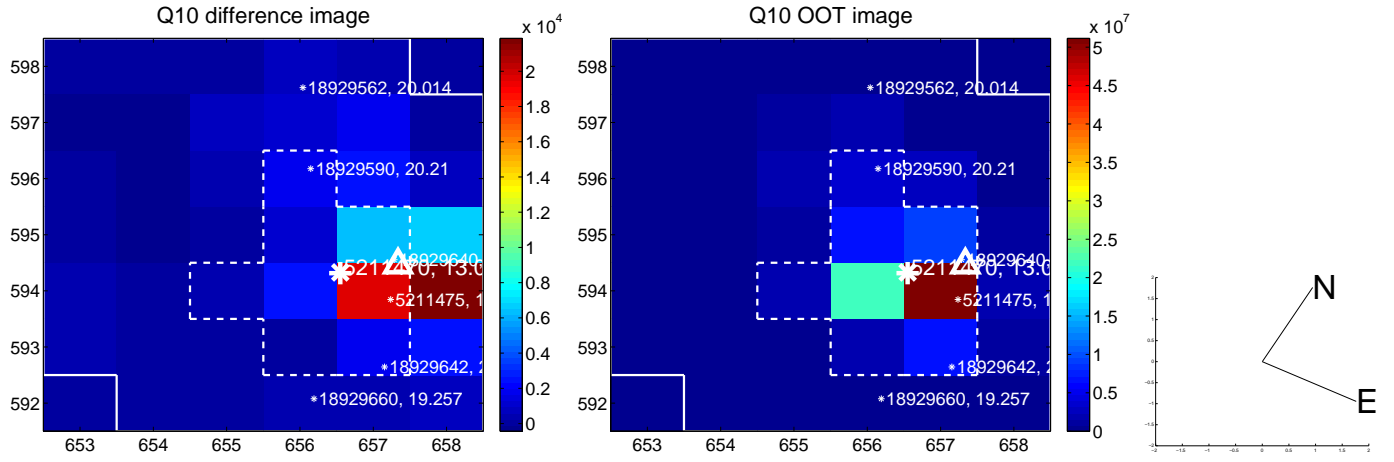
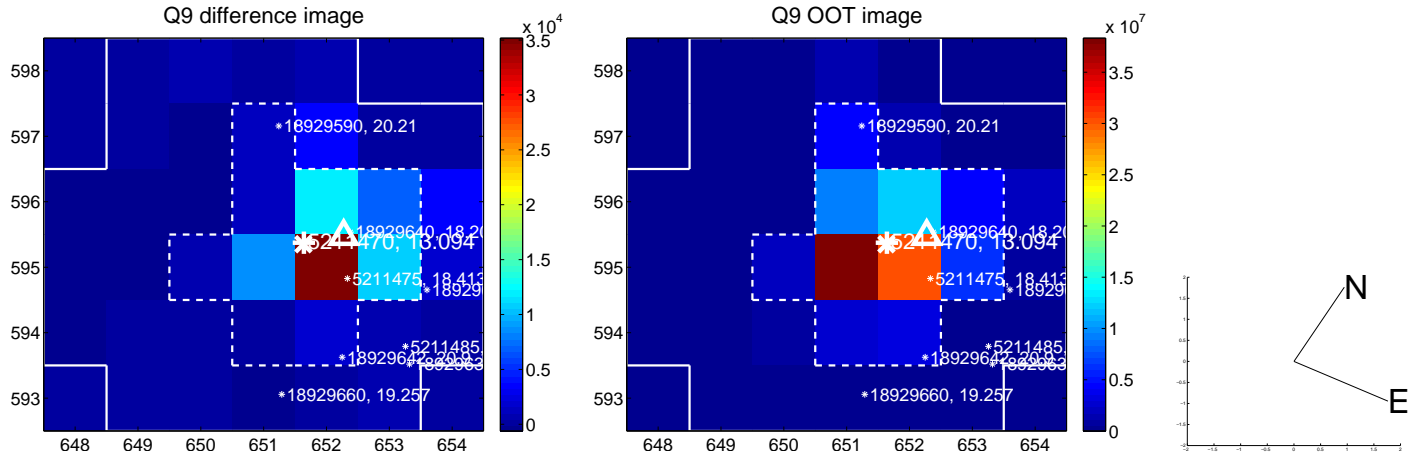
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



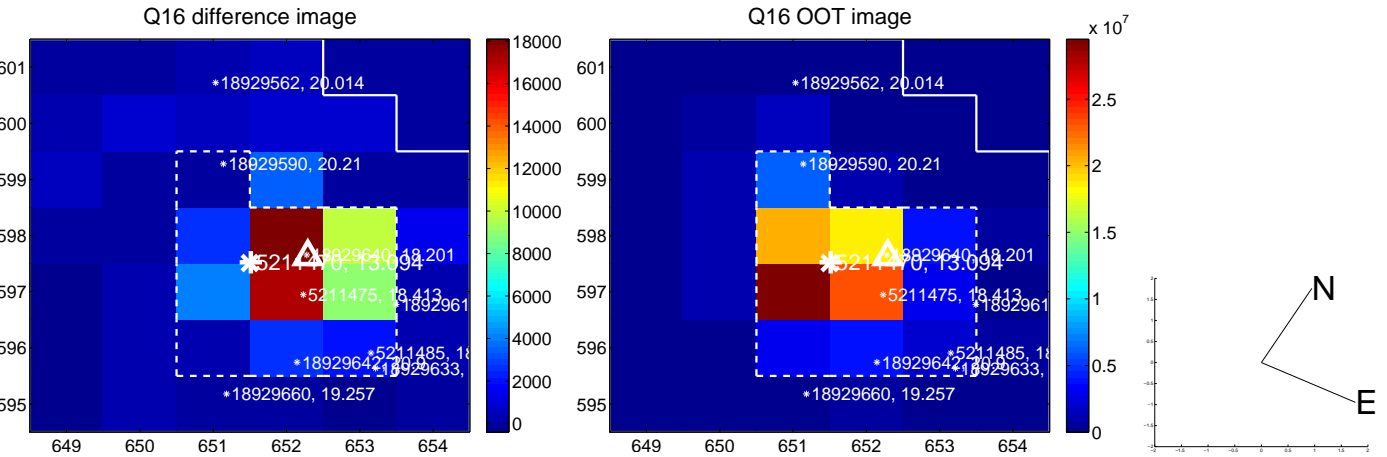
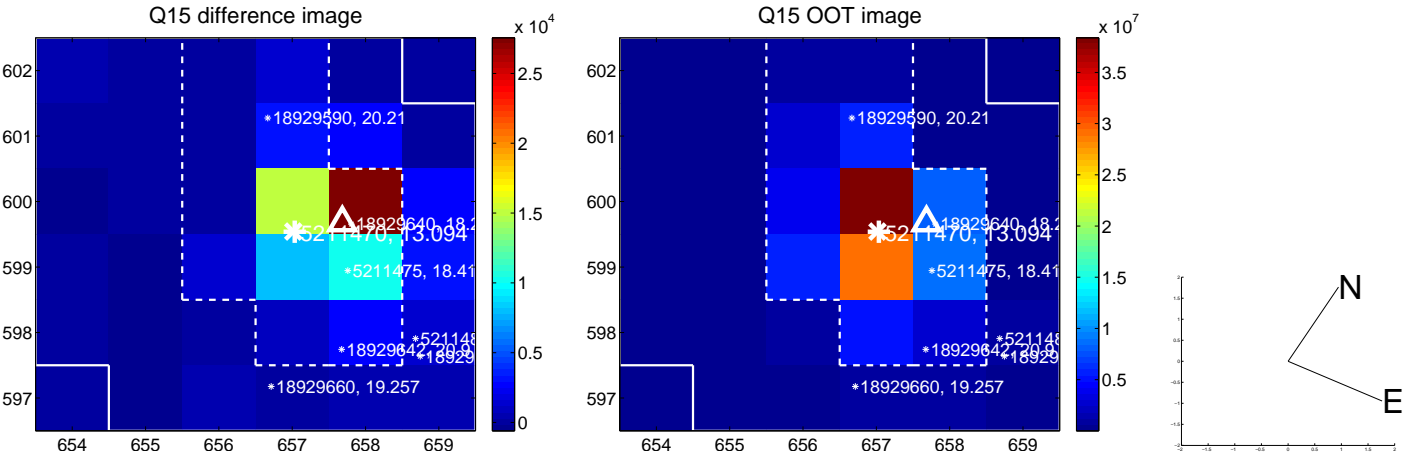
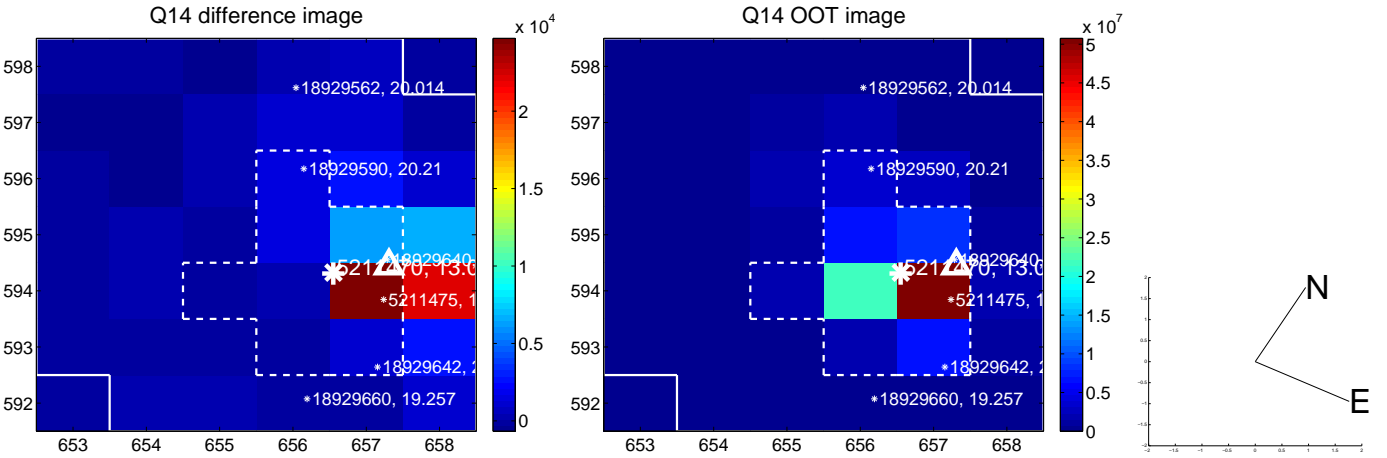
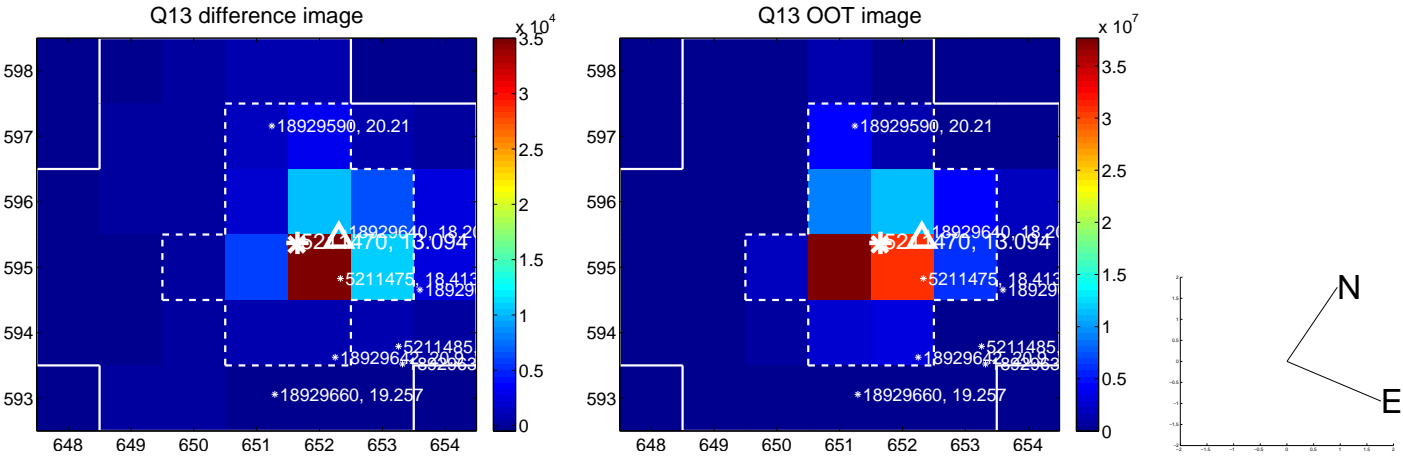
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



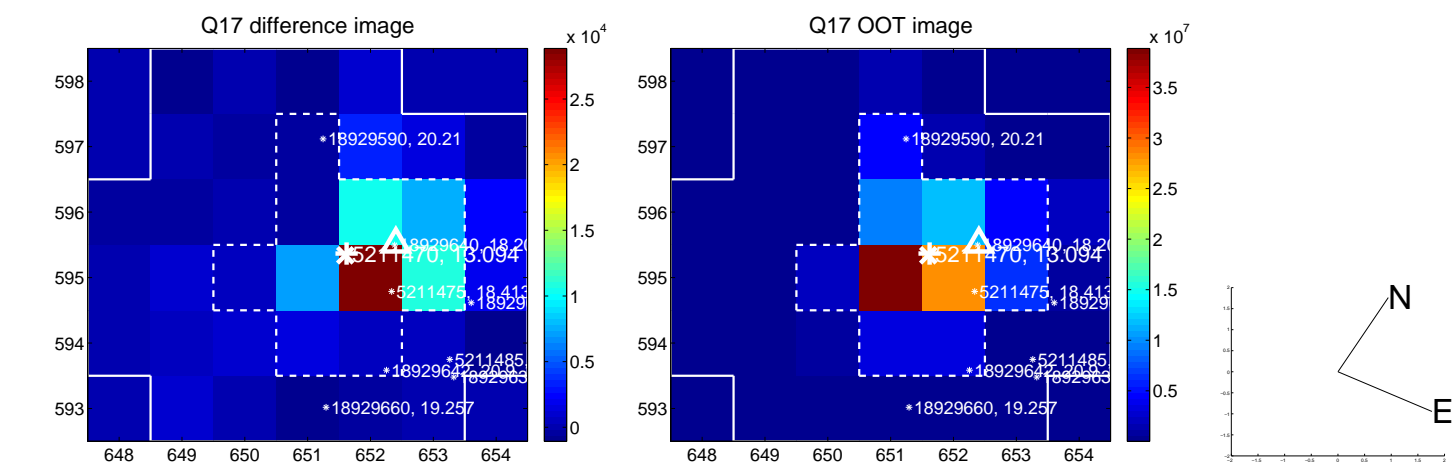
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



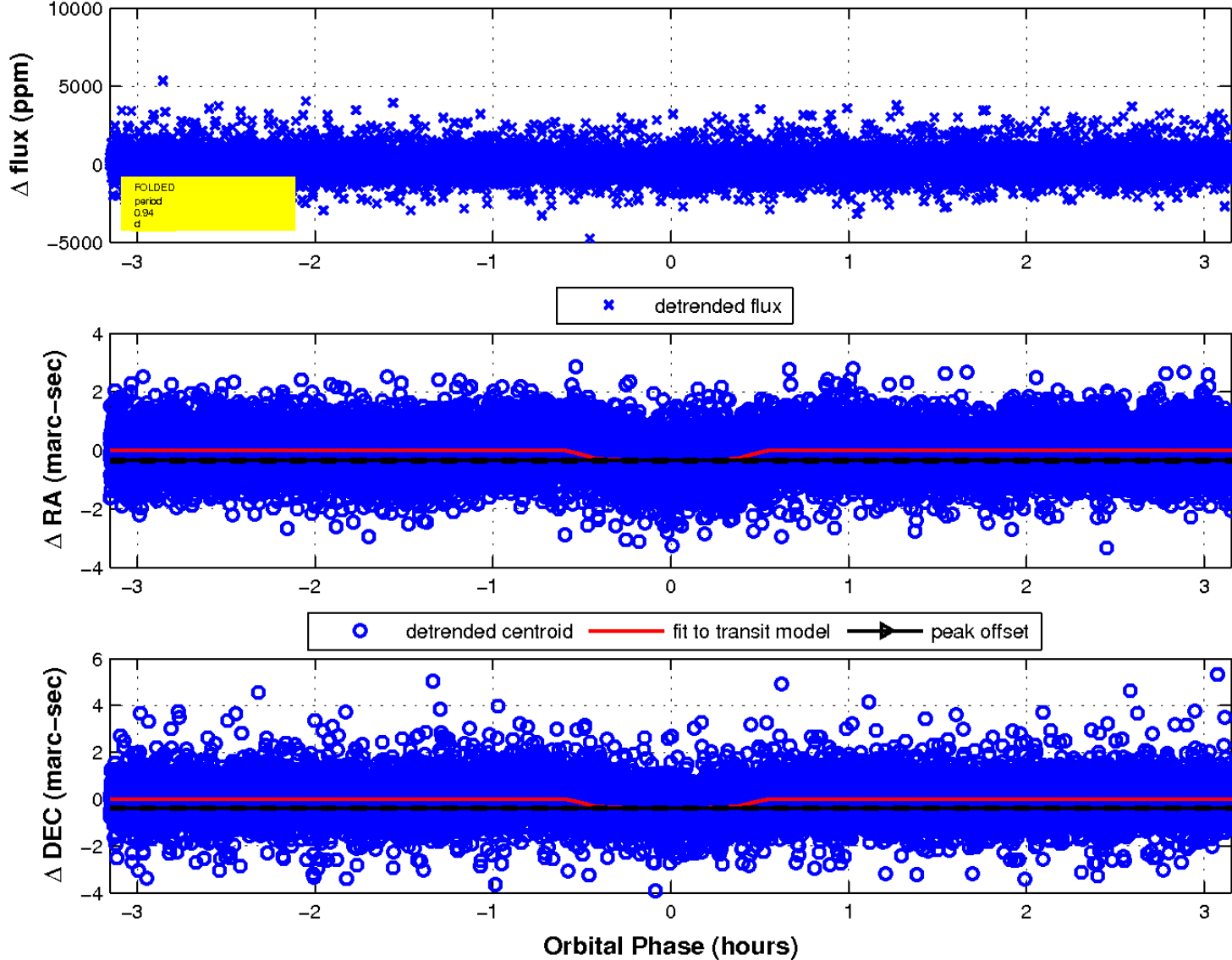
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

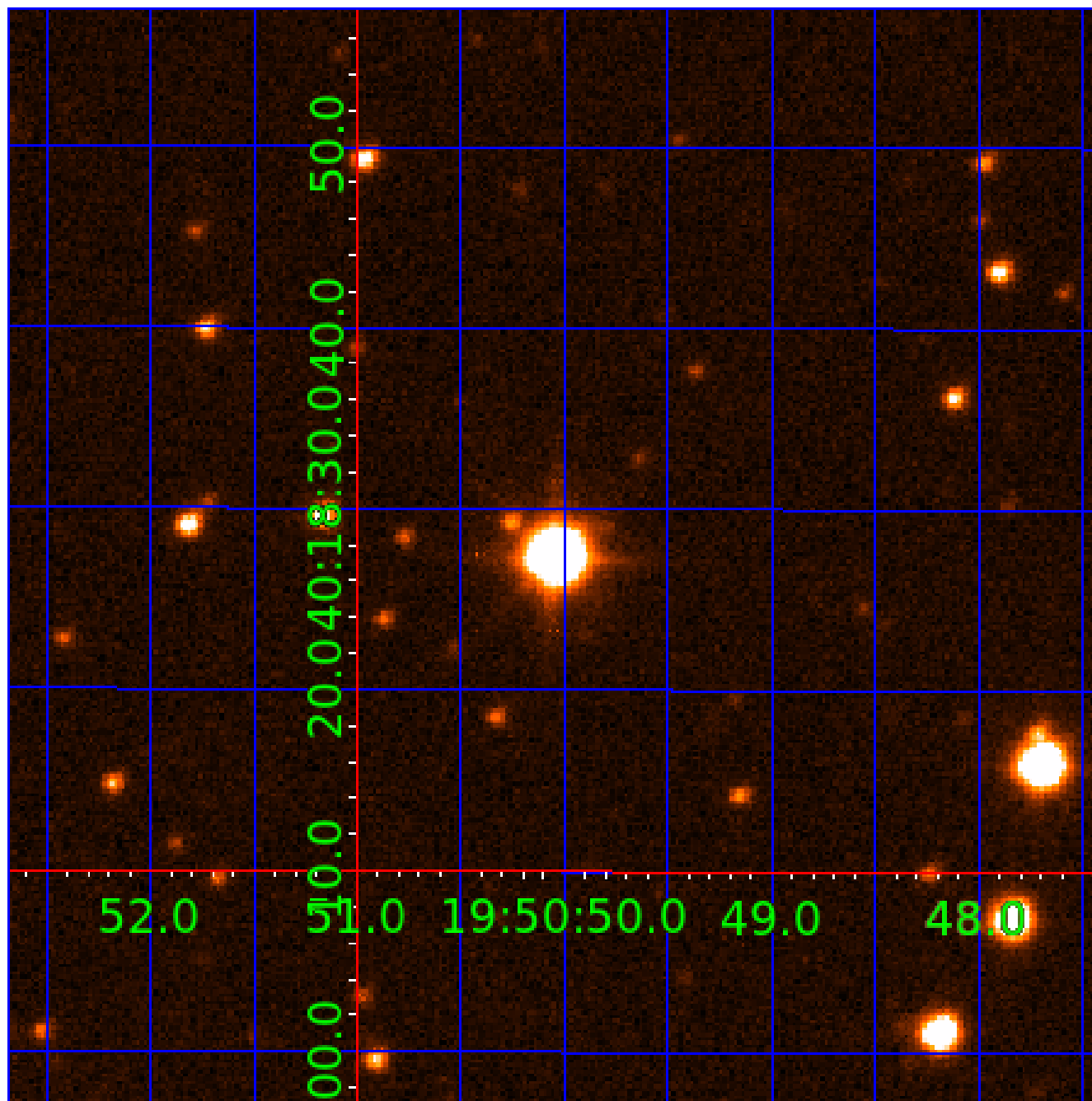


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 005211470

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})
005211470-01	OBS	6541.01	2.404311	132.750771	7997.4	4.438	429.7	369.1	17.03	4697	287.50	0.00
005211470-02	OBS	6541.02	0.938065	132.274036	109.6	1.051	14.4	18.2	17.03	4697	22.01	0.00
005211470-03	OBS	No	0.938071	131.856043	13.1	0.636	8.5	2.1	17.03	4697	7.76	0.00
005211470-04	OBS	No	413.546303	330.859577	2146.9	6.430	8.9	10.1	17.03	4697	128.01	75.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005211470-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED
005211470-02	OBS	FP	0.00	0	1	1	0	PLANET_IN_STAR—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
005211470-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
005211470-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES

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

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

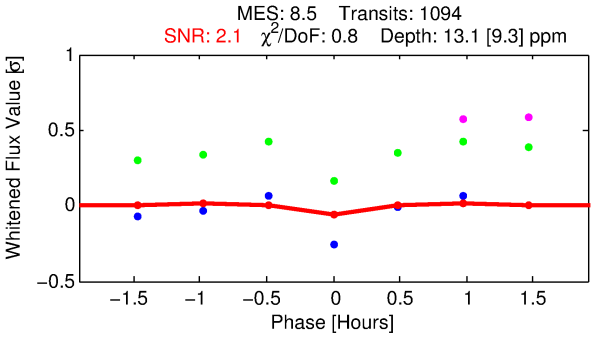
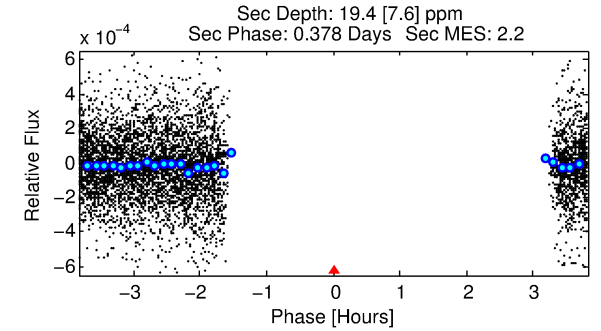
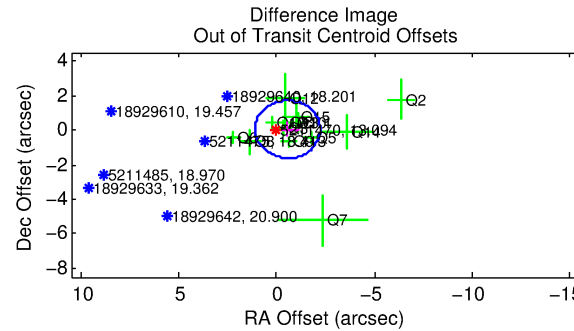
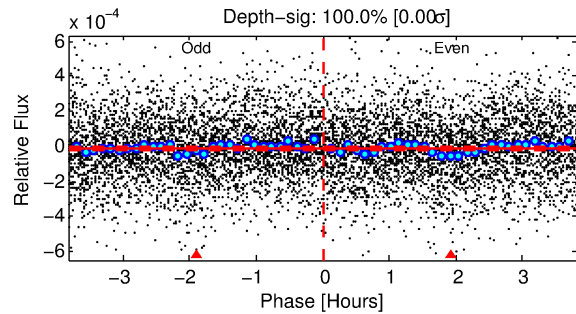
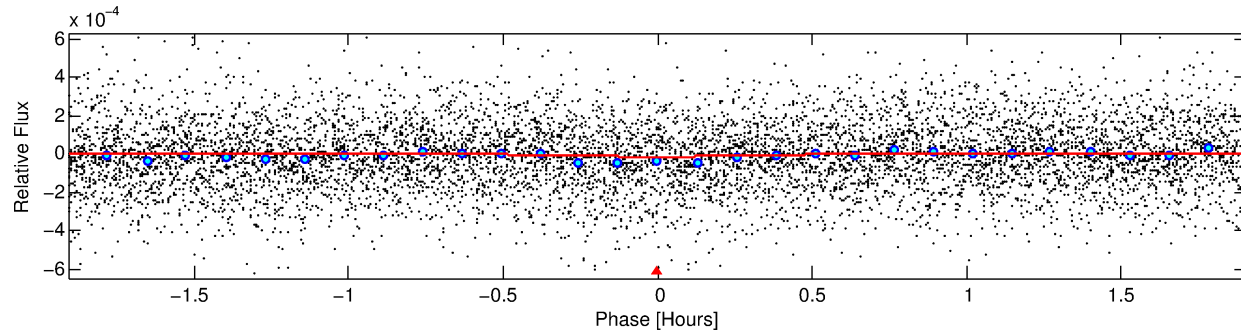
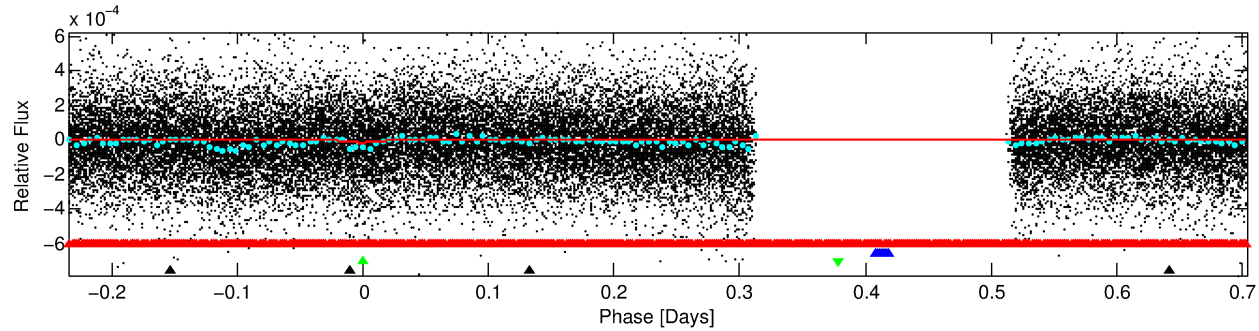
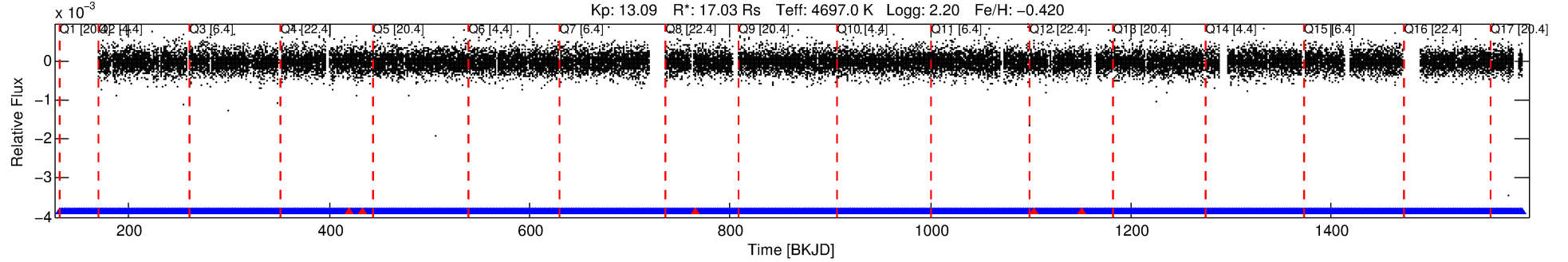
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005211470-03

No Significant Match Found

DV One-Page Summary

KIC: 5211470 Candidate: 3 of 4 Period: 0.938 d
KOI: K06541 Corr: No Ephemeris Match



DV Fit Results:

Period = 0.93807 [0.00005] d
Epoch = 131.8560 [0.0049] BKJD
Rp/R* = 0.0042 [0.0044]
a/R* = 5.11 [20.29]
b = 0.90 [0.88]
Seff = N/A
Teq = N/A
Rp = 7.76 [8.86] Re
a = N/A
Ag = N/A
Teffp = N/A

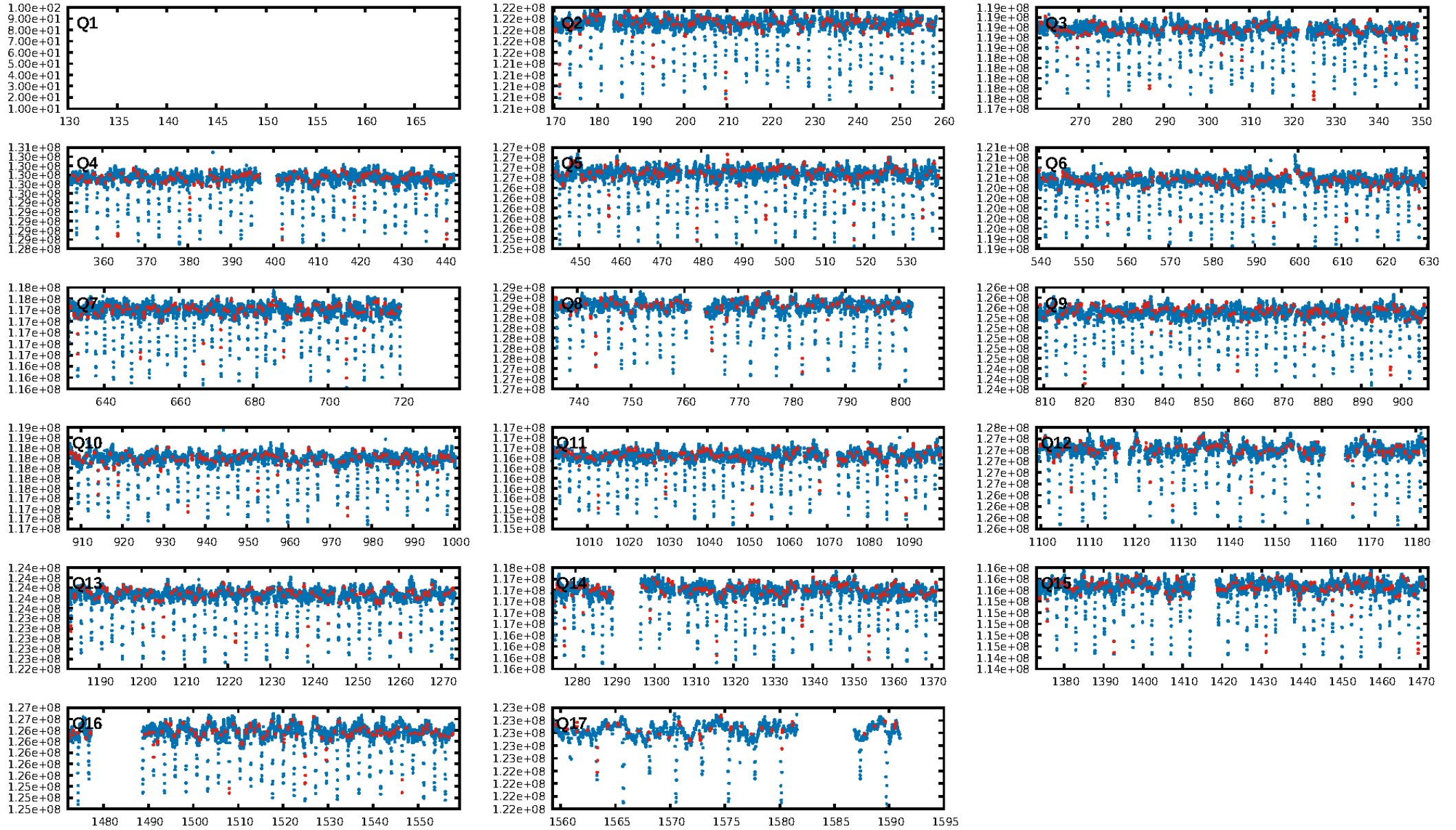
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: 100.0% [7.85 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.58e-21
RollingBand-fgt: 1.00 [1066/1071]
GhostDiagnostic-chr: -1.656
Centroid-sig: 23.2%
Centroid-so: 4.196 arcsec [1.01 σ]
OotOffset-rm: 0.565 arcsec [1.02 σ]
KicOffset-rm: 0.558 arcsec [0.93 σ]
OotOffset-st: 4/4/2/4 [14]
KicOffset-st: 4/4/2/4 [14]
DiffImageQuality-fgm: 0.50 [7/14]
DiffImageOverlap-fno: 1.00 [16/16]

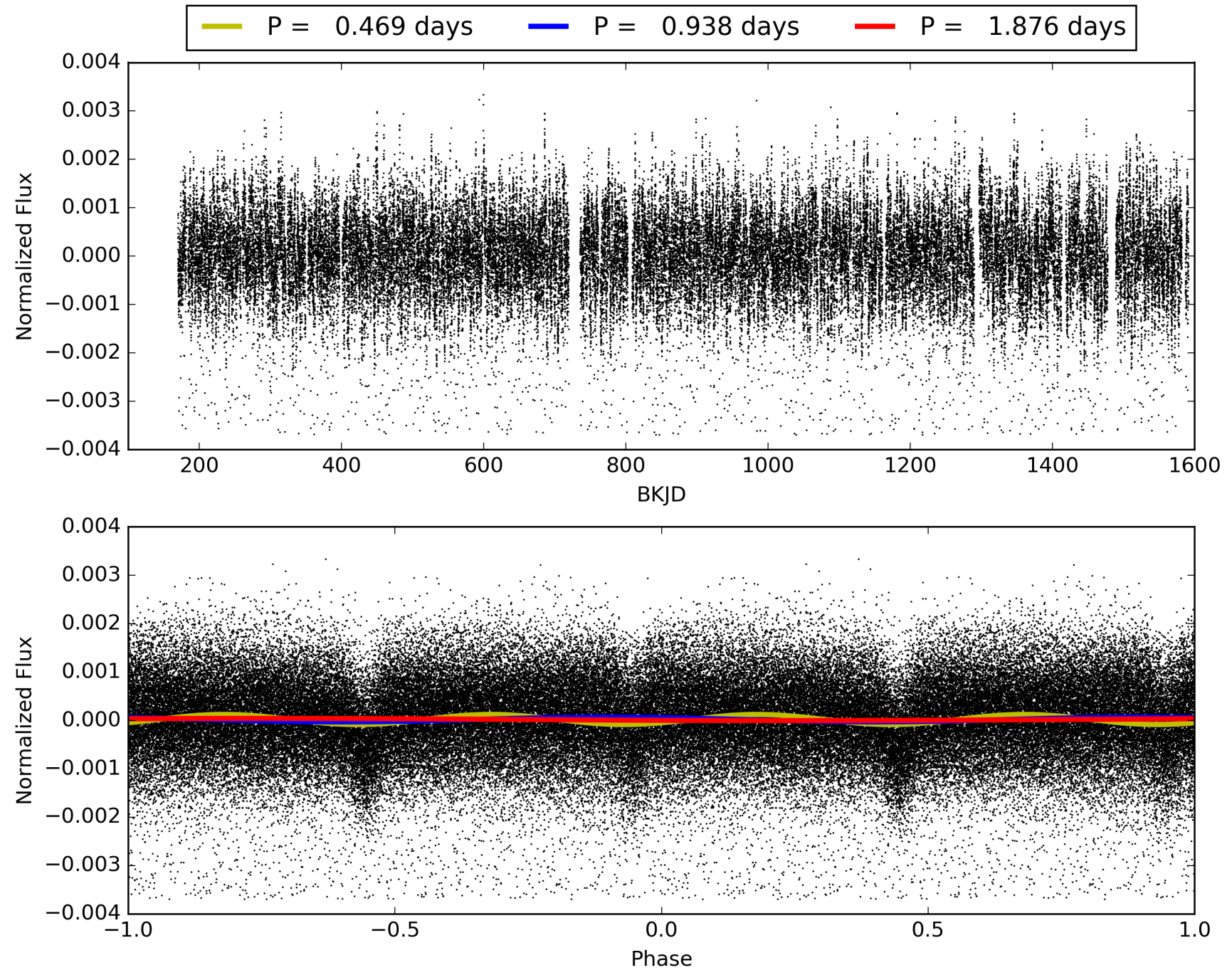
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:39:12 Z

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

TCE 005211470-03, PDC Light Curves

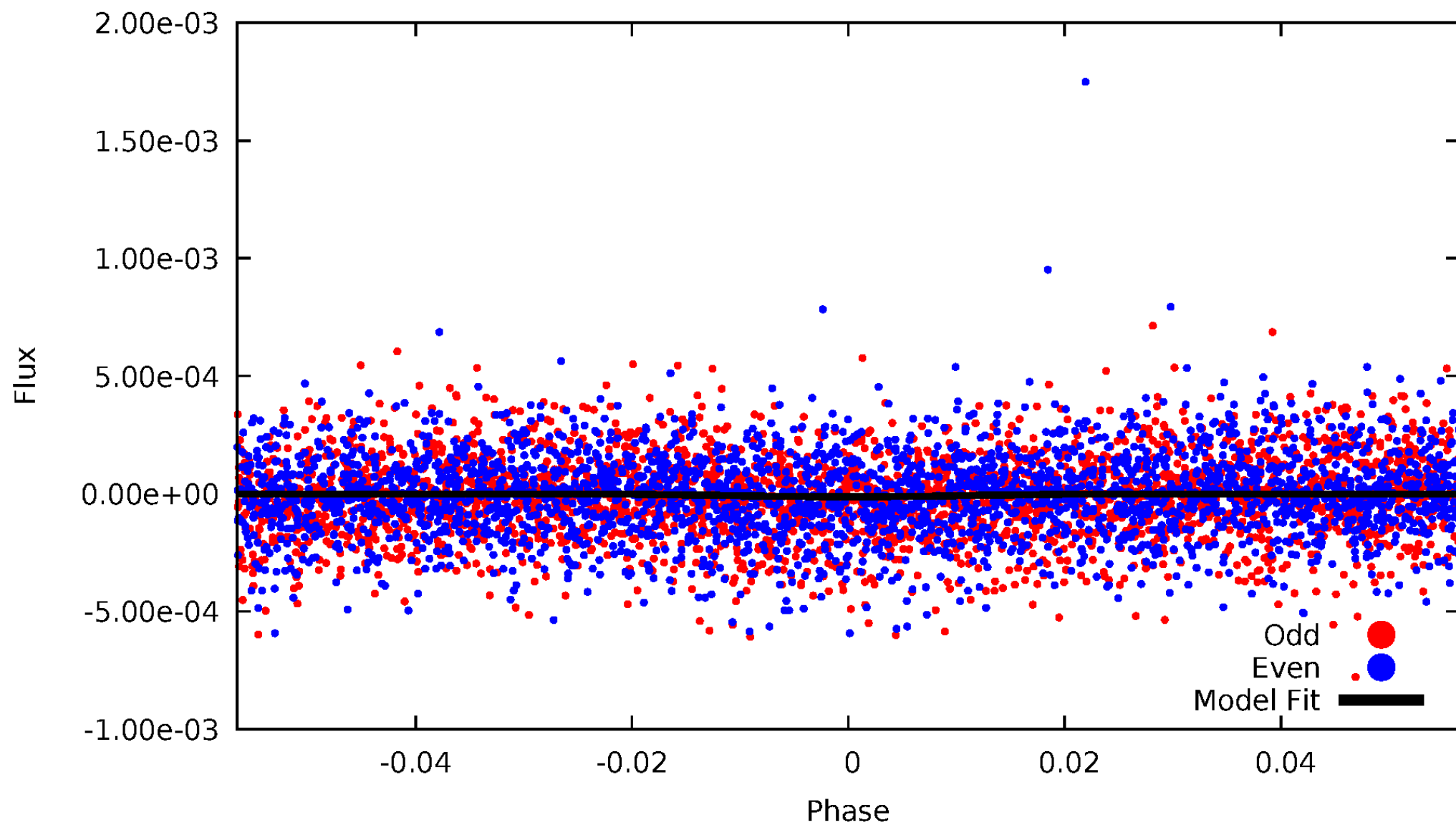


TCE 005211470-03



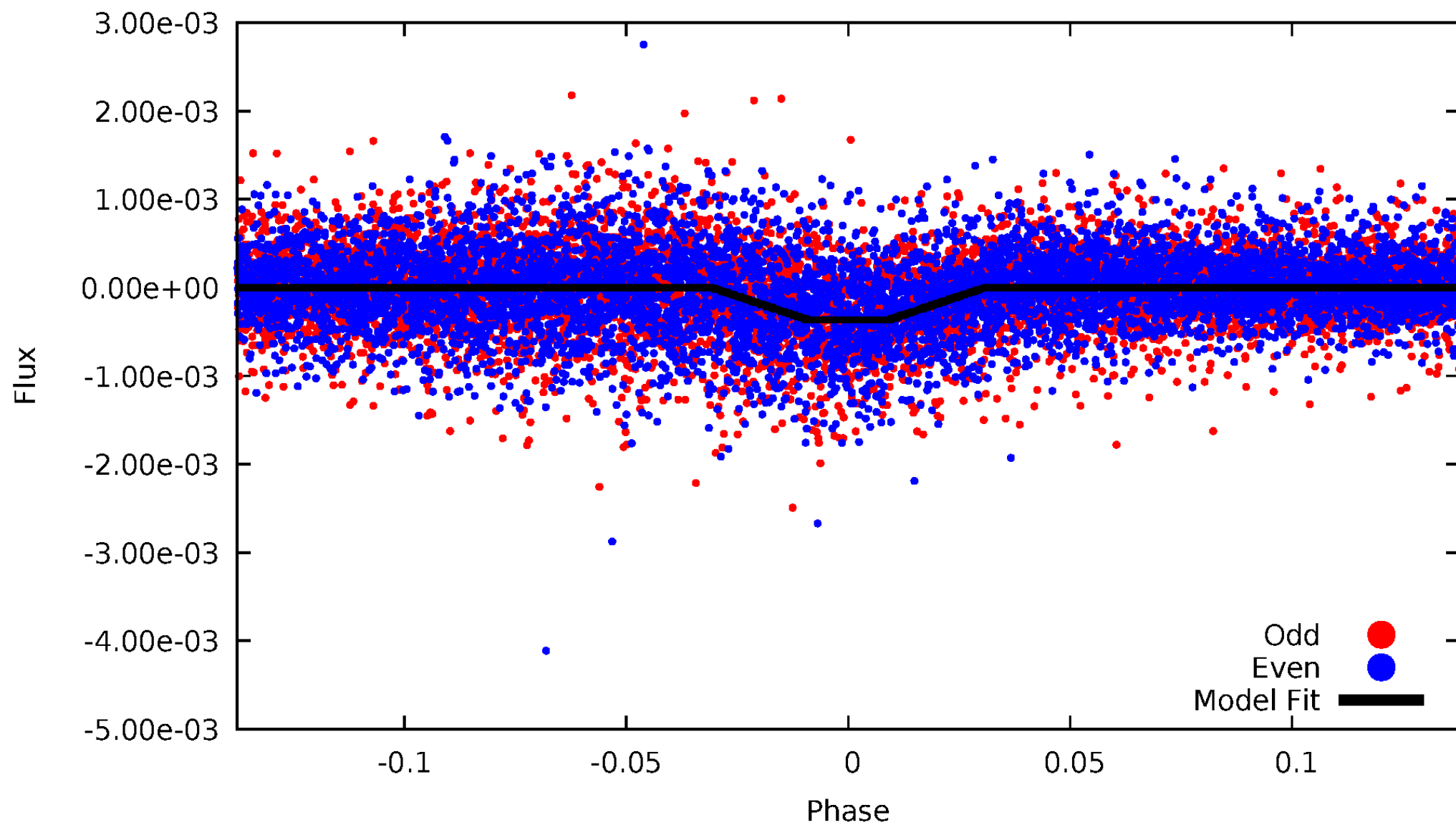
DV Odd/Even

TCE 005211470-03

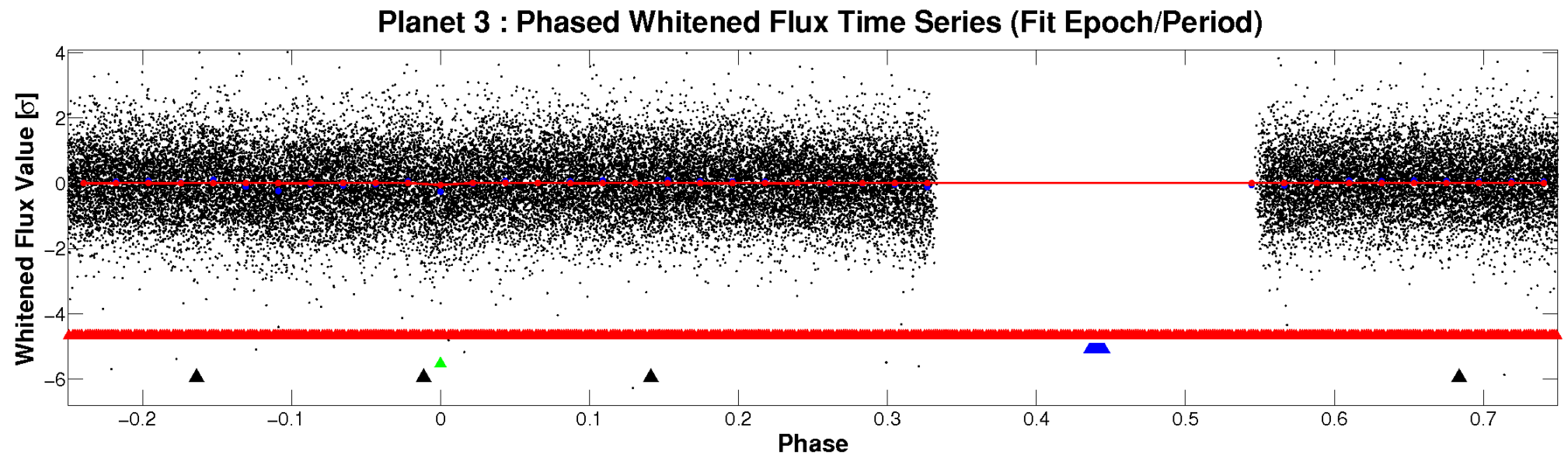
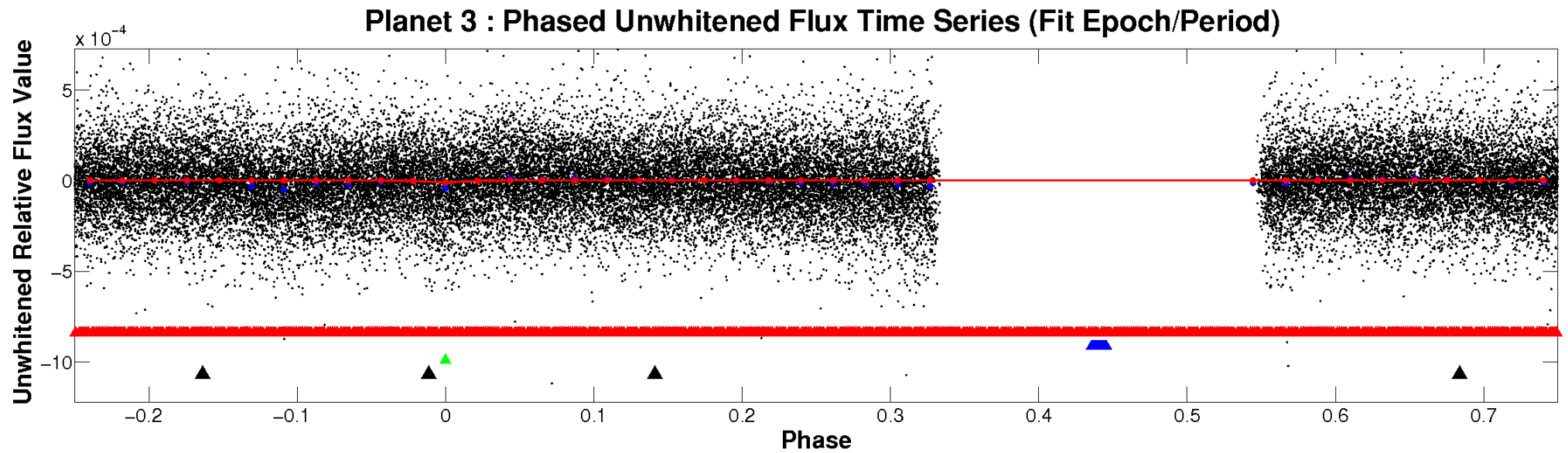


ALT Odd/Even

TCE 005211470-03

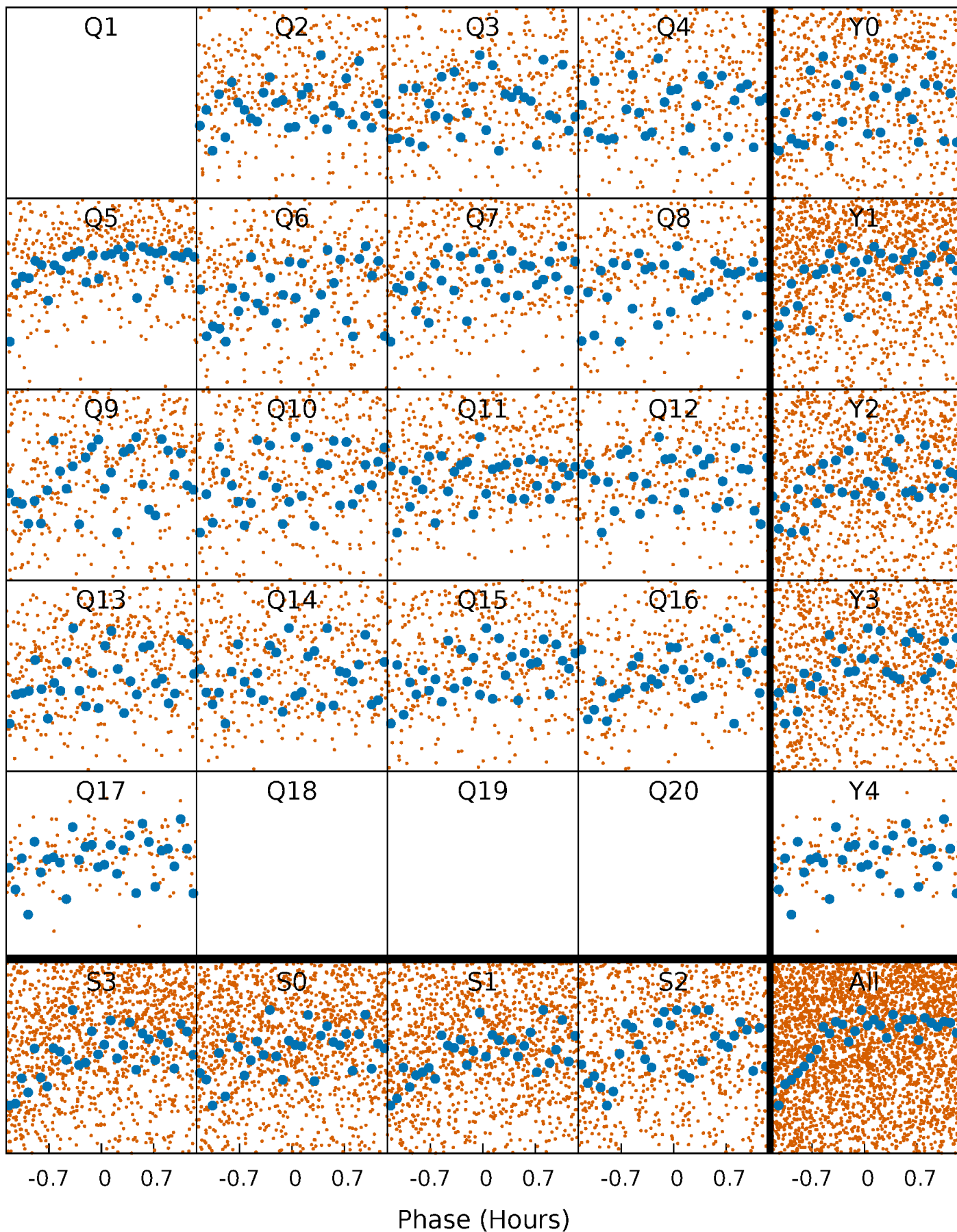


Non-Whitened Vs. Whitened Light Curve



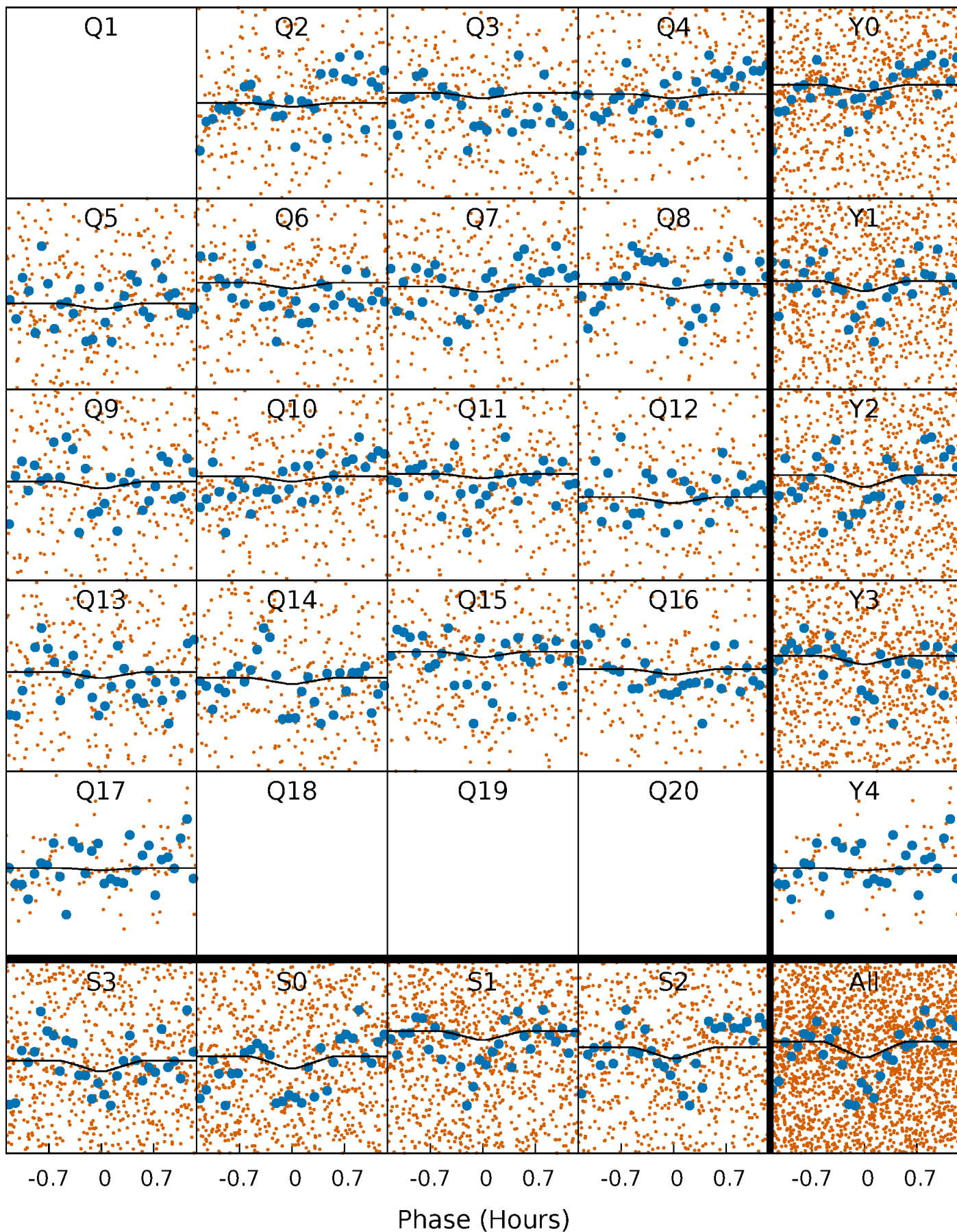
PDC Quarter-Phased Transit Curves

TCE 005211470-03 P= 0.938071 Days $T_0=131.856043$ (BKJD)



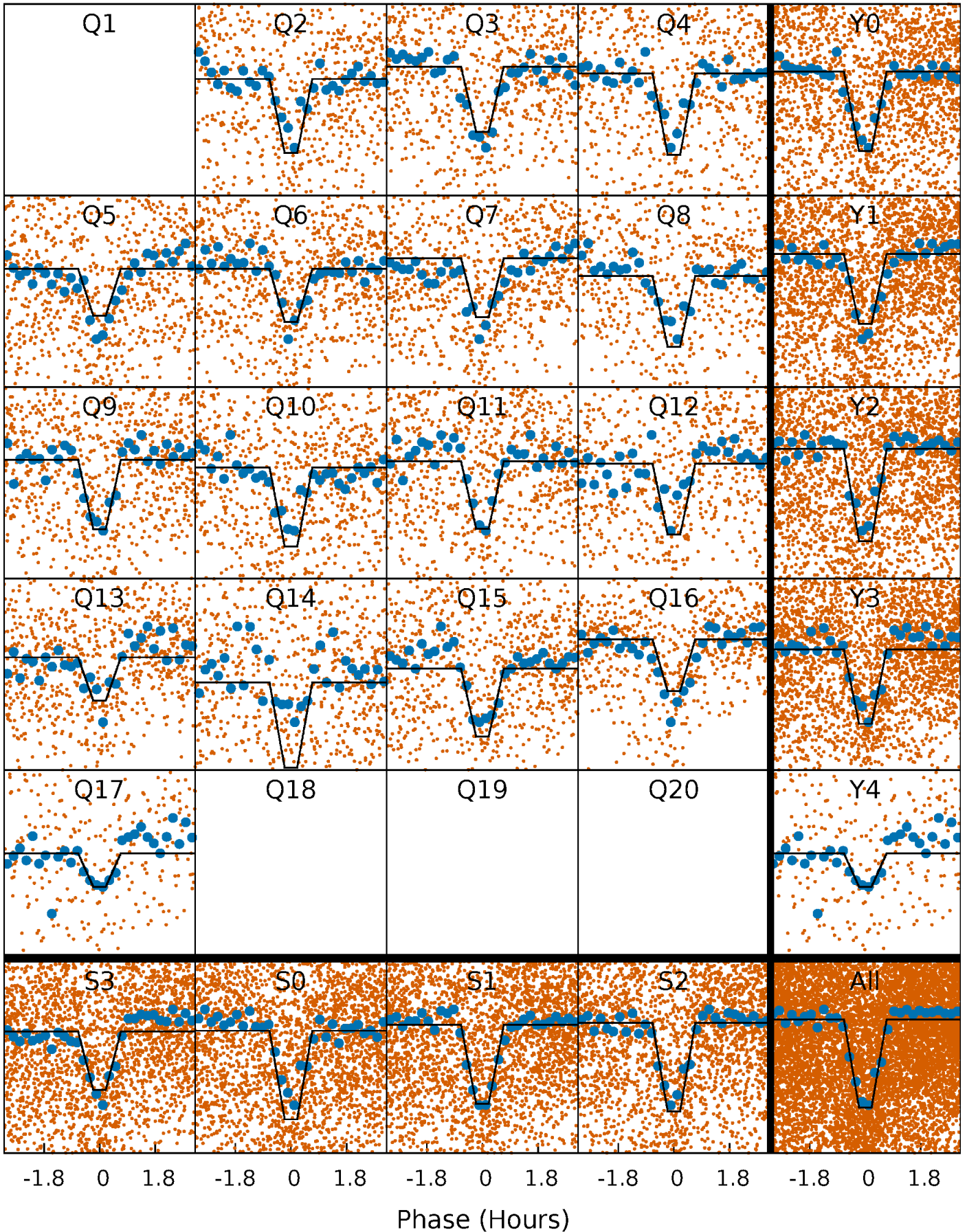
DV Quarter-Phased Transit Curves

TCE 005211470-03 P= 0.938071 Days $T_0=131.856043$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

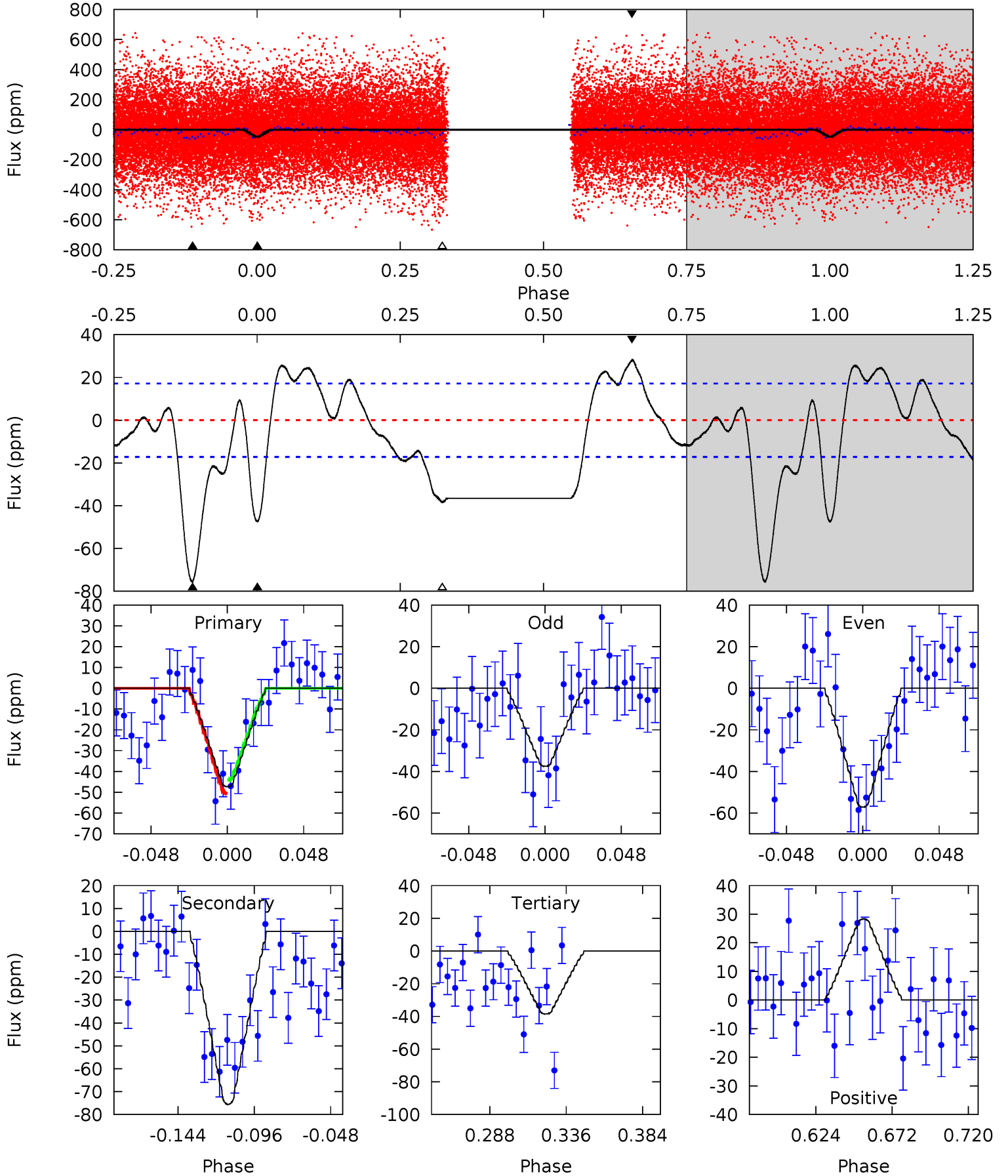
TCE 005211470-03 P= 0.938074 Days $T_0=131.800099$ (BKJD)



DV Model-Shift Uniqueness Test

005211470-03, P = 0.938071 Days, E = 131.856043 Days

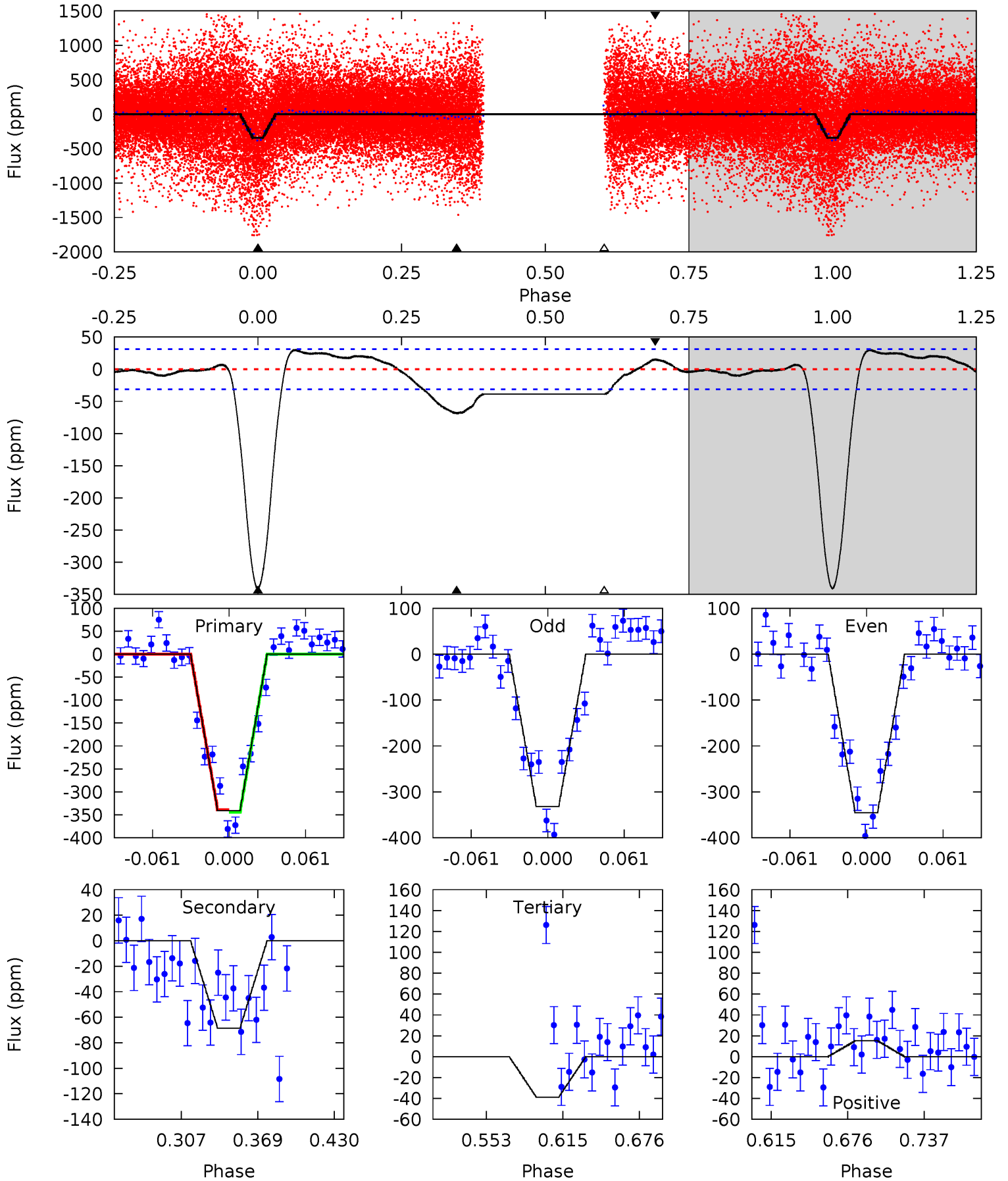
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	20.7	10.6	7.77	4.72	1.98	4.67	2.43	5.23	10.2	13.0	2.70	1.19	0.27	0.90



Alt Model-Shift Uniqueness Test

005211470-03, P = 0.938074 Days, E = 131.800099 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
50.8	10.2	5.78	2.27	4.67	1.87	2.05	45.0	48.5	4.43	7.95	0.99	1.05	0.08	0.40



Stellar Parameters For KIC 005211470

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4697^{+117}_{-117}	$2.204^{+0.331}_{-0.178}$	$-0.420^{+0.300}_{-0.250}$	$17.032^{+3.944}_{-7.324}$	$1.691^{+0.164}_{-0.656}$	$0.000^{+0.001}_{-0.000}$
	+2%/-2%	+15%/-8%	+71%/-60%	+23%/-43%	+10%/-39%	+249%/-50%
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 005211470-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-76 ± 4	$8.96^{+7.51}_{-5.65}$	7952^{+610}_{-787}	-4113^{+14014}_{-1886}	$0.252^{+1.480}_{-0.178}$
Alt.	-69 ± 7	$34.08^{+10.89}_{-9.59}$	7994^{+624}_{-833}	-6235^{+685}_{-565}	$0.016^{+0.014}_{-0.007}$

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 $A_{obs} \gg 1.0$

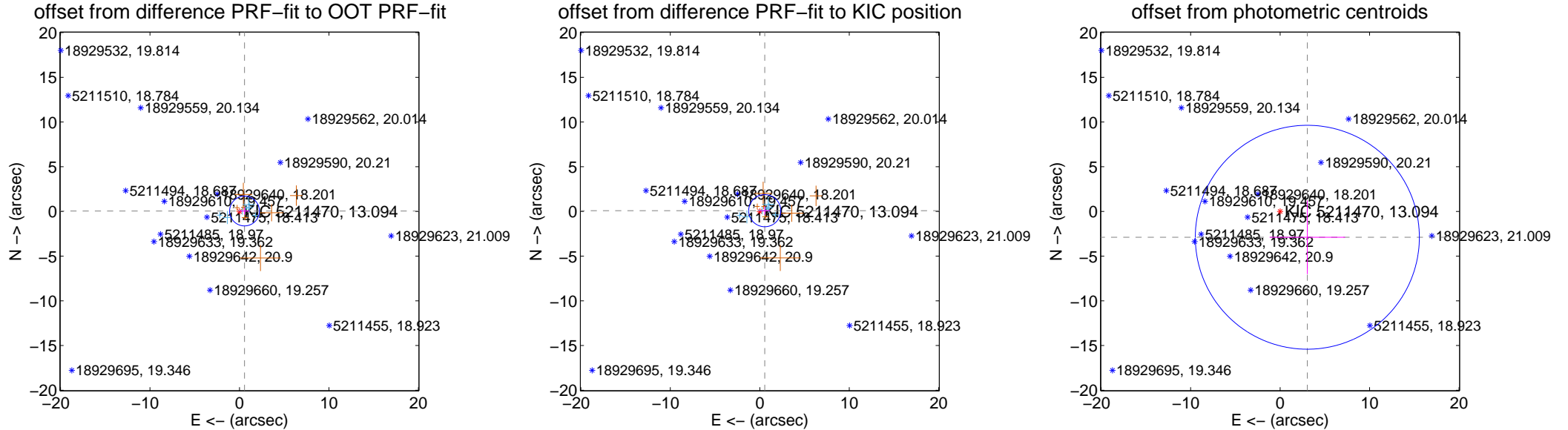
DV Centroid Data

Supplemental centroid analysis for 005211470-03. Kepler magnitude: 13.09. Transit SNR 2.06

There are 7 quarters with good PRF difference image offsets

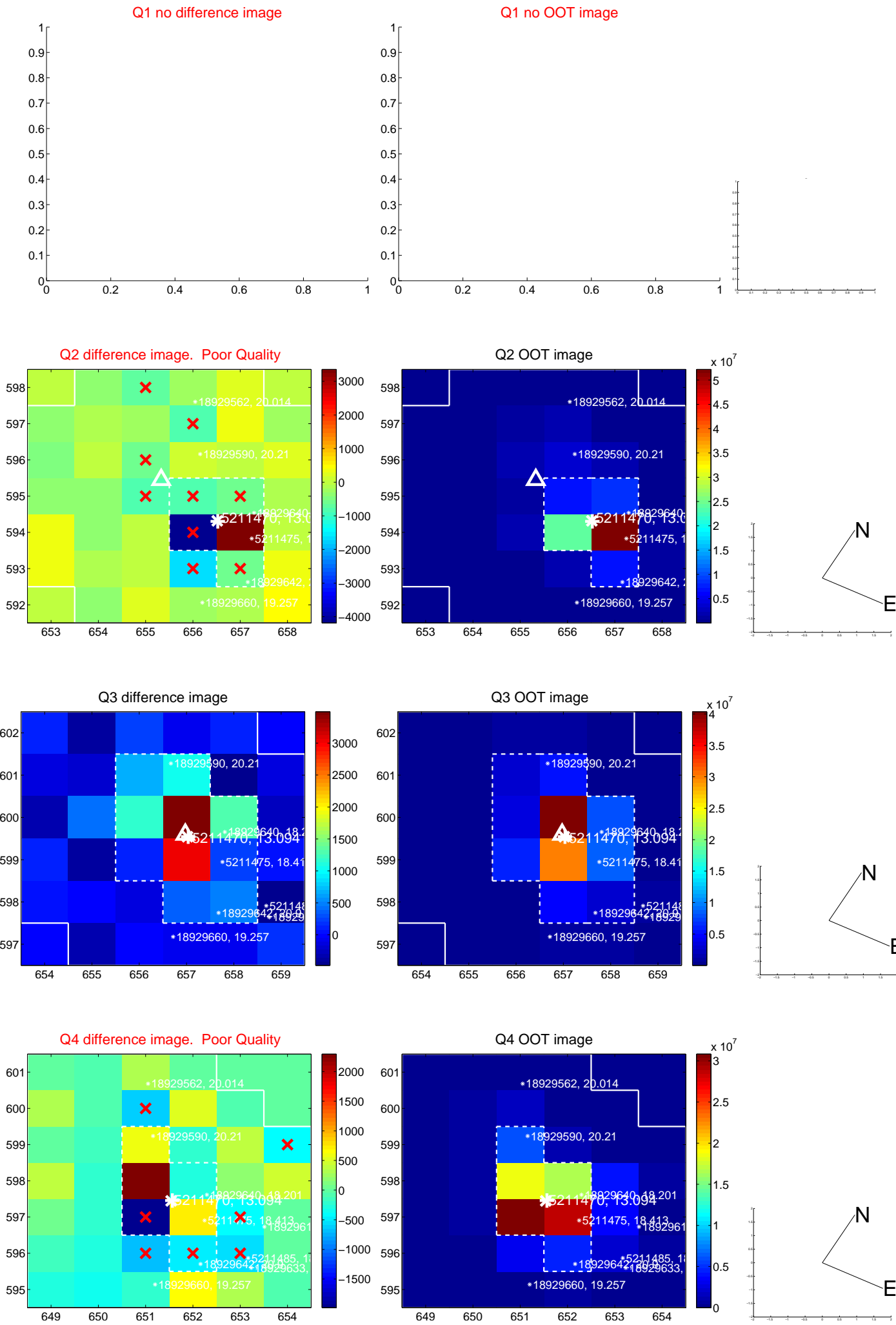
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.565 ± 0.555	1.02	-0.563 ± 0.556	0.045 ± 0.392
PRF-fit source offset from KIC position	0.558 ± 0.598	0.93	-0.552 ± 0.604	0.079 ± 0.464
photometric centroid source offset	4.20 ± 4.17	1.01	-3.04 ± 4.22	-2.89 ± 4.12

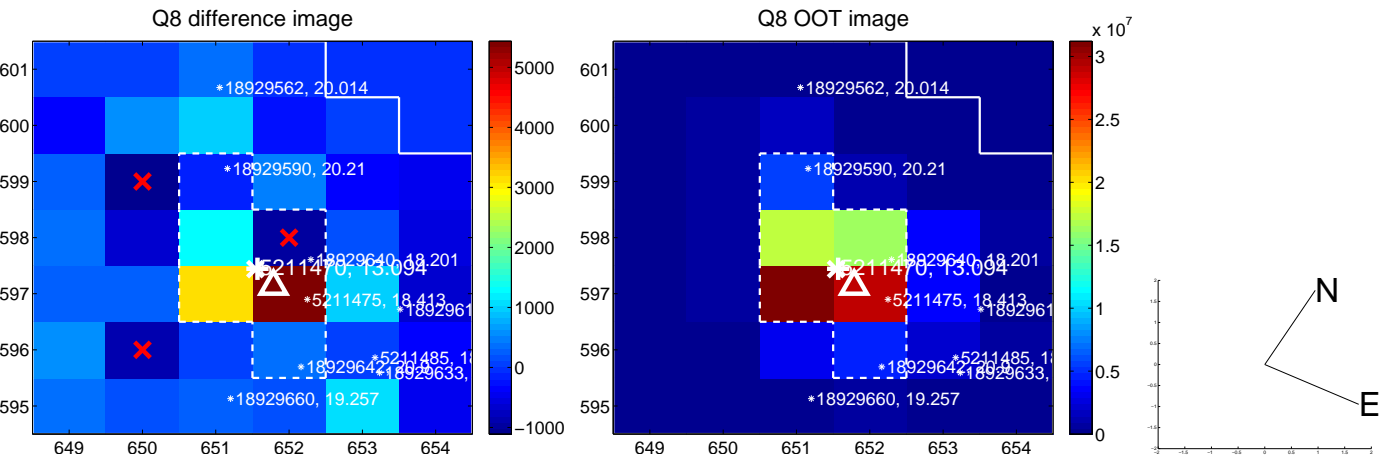
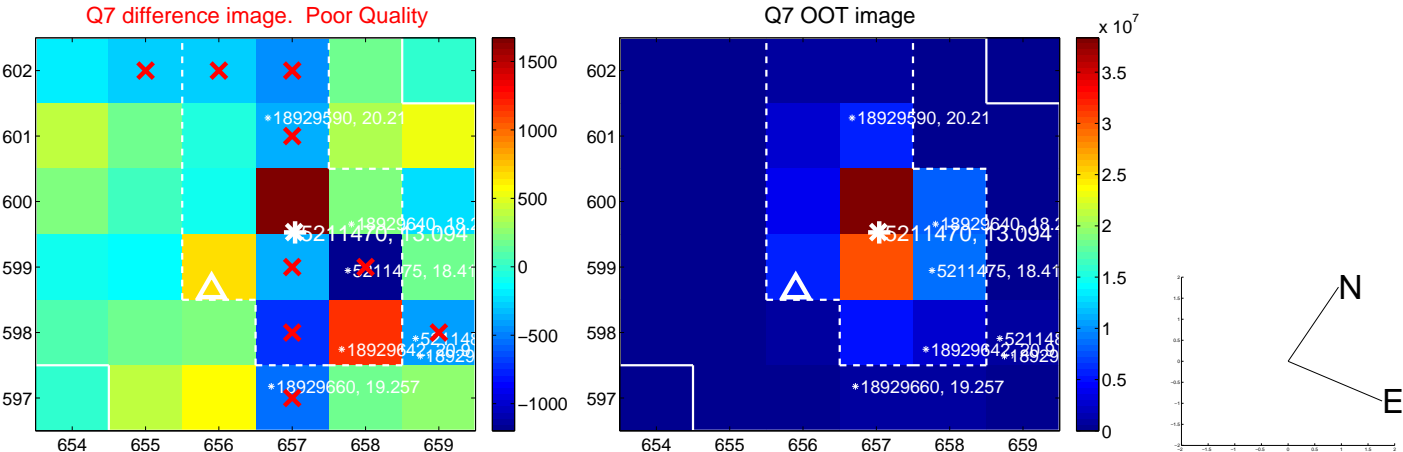
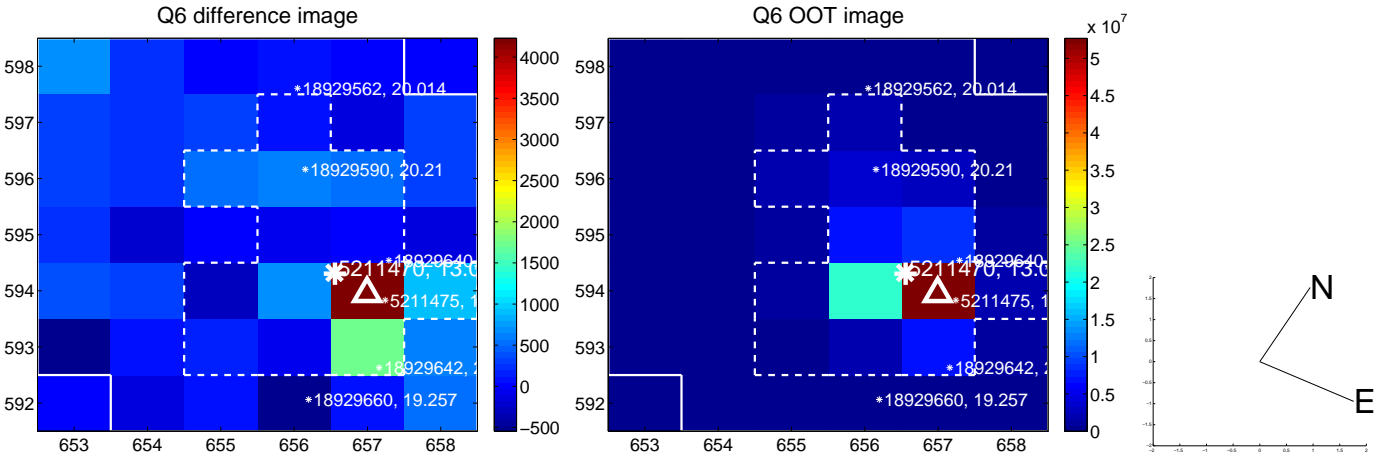
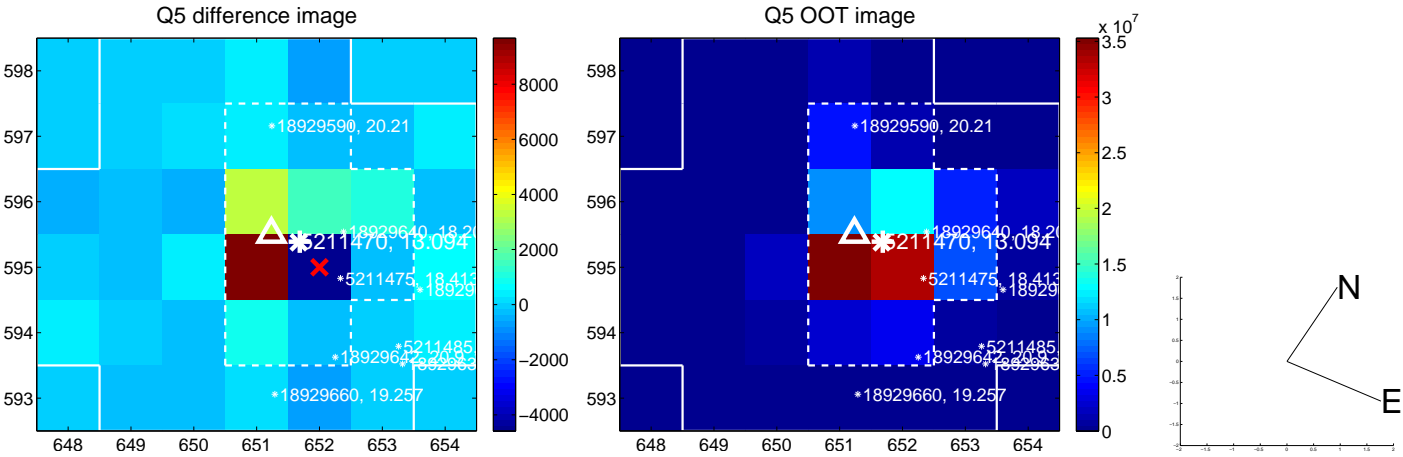


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

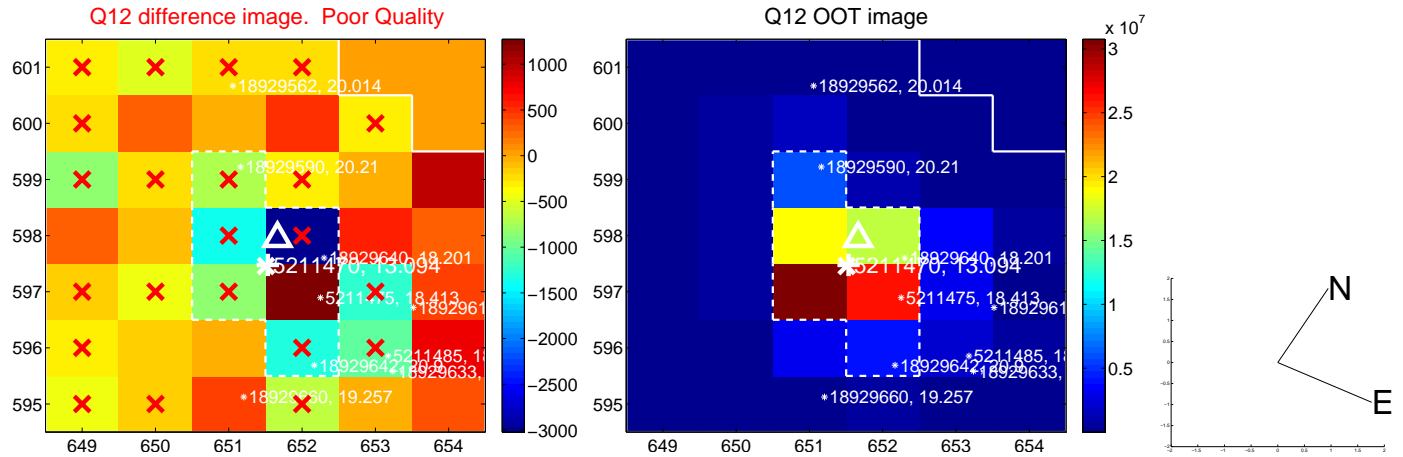
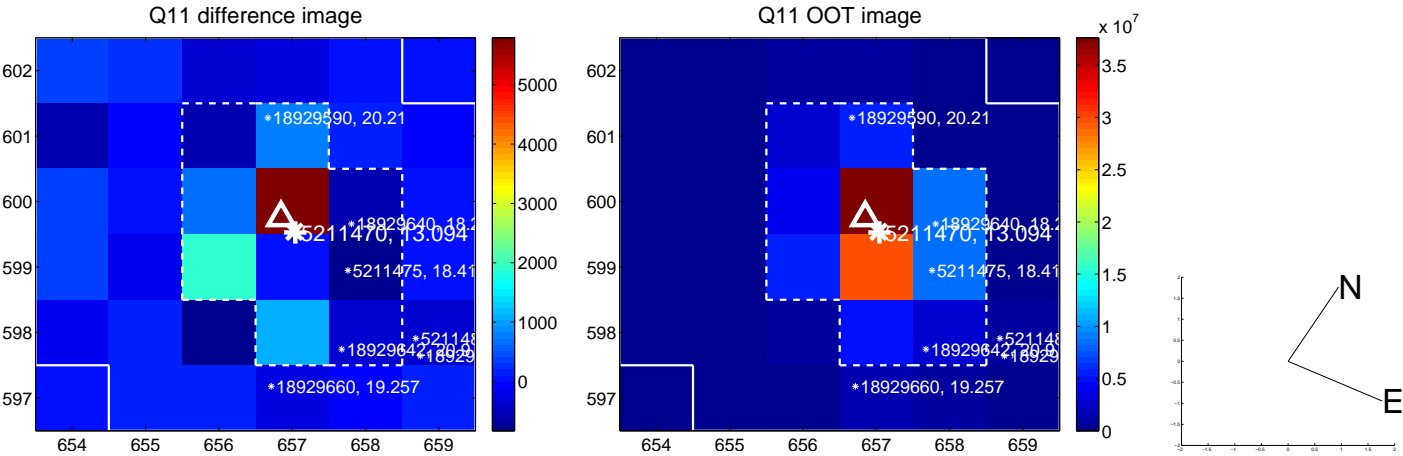
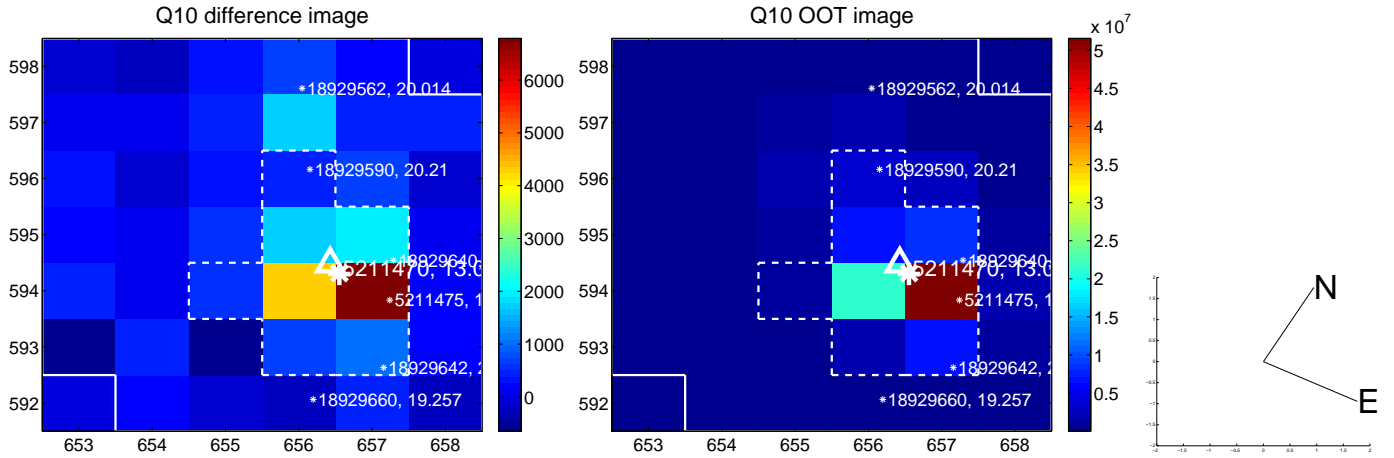
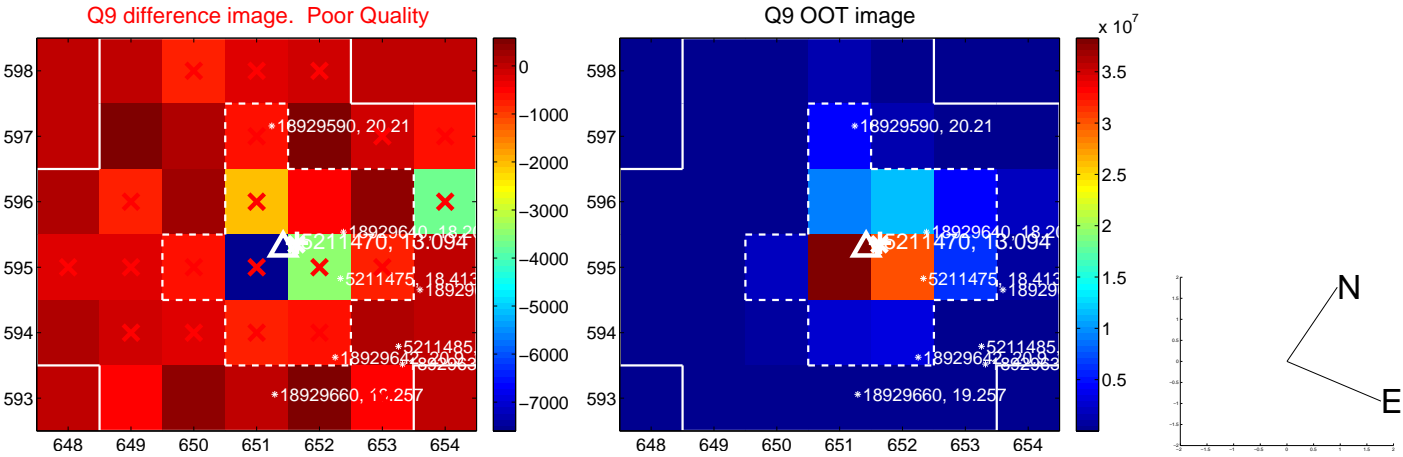
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



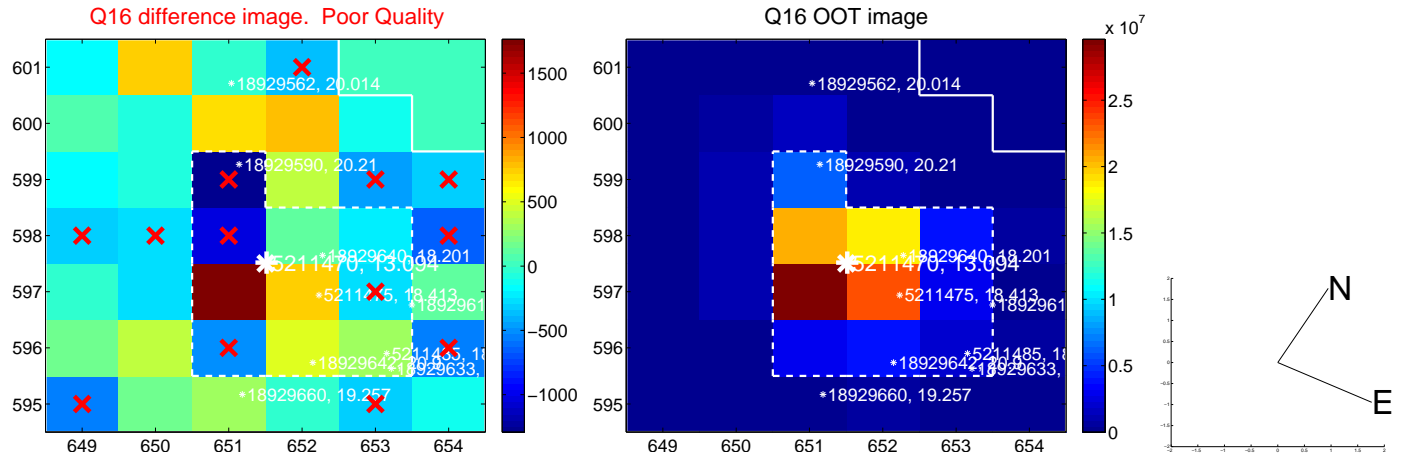
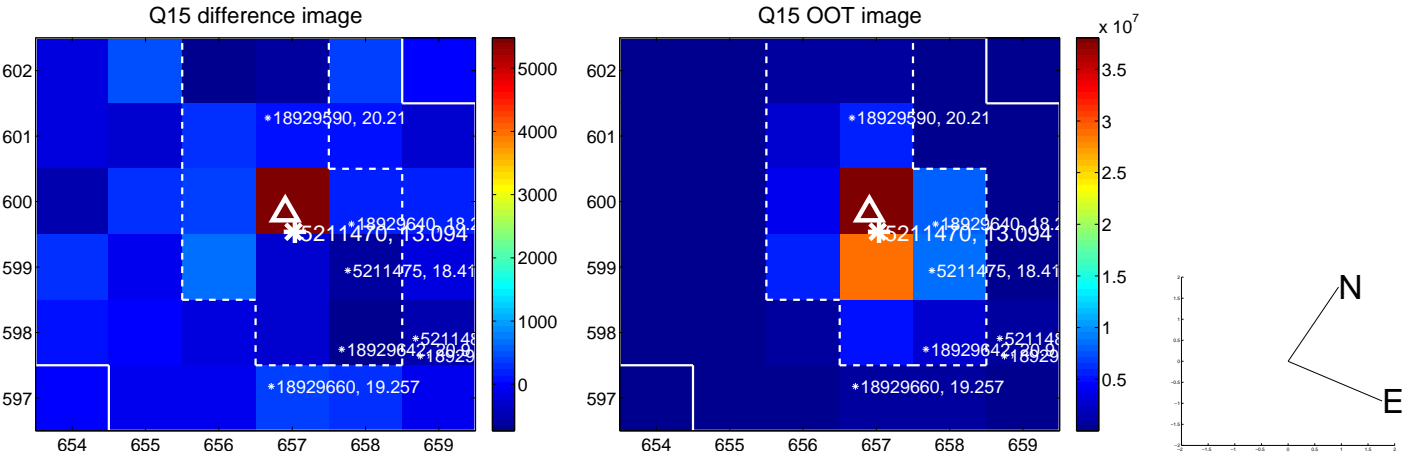
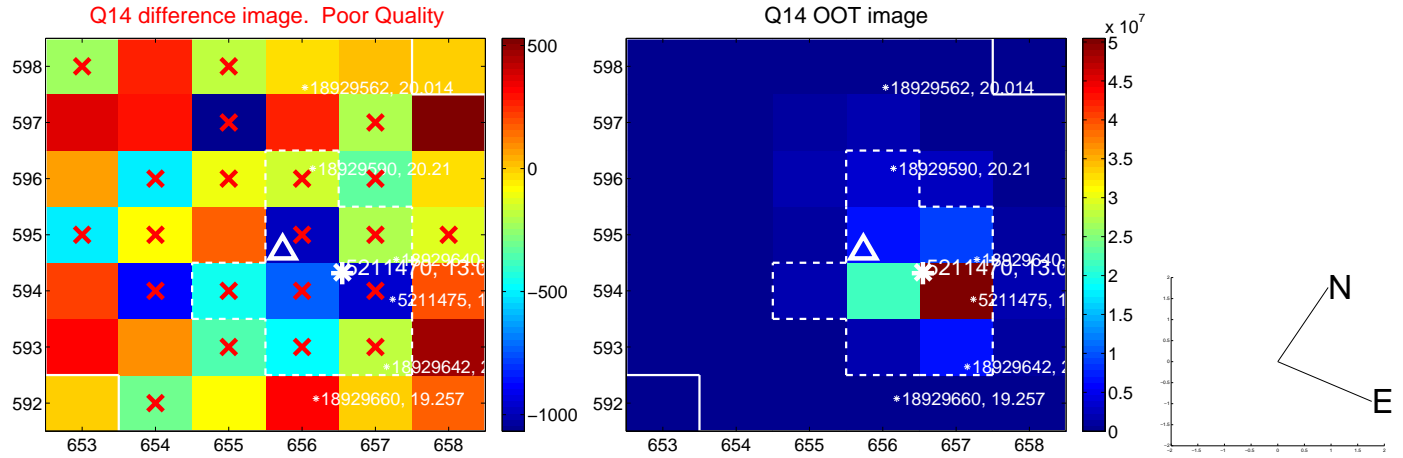
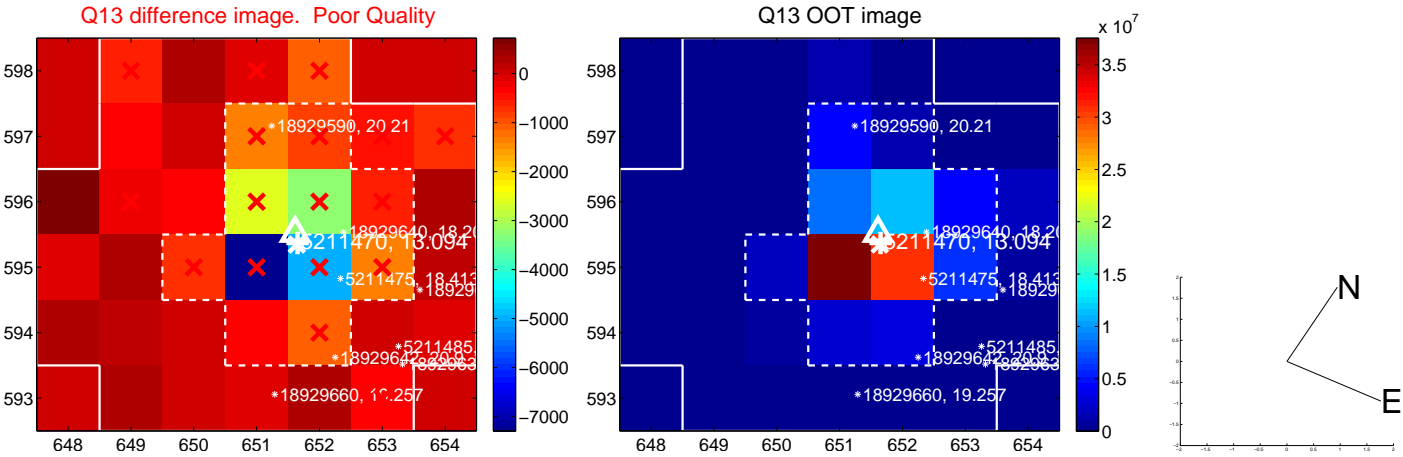
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



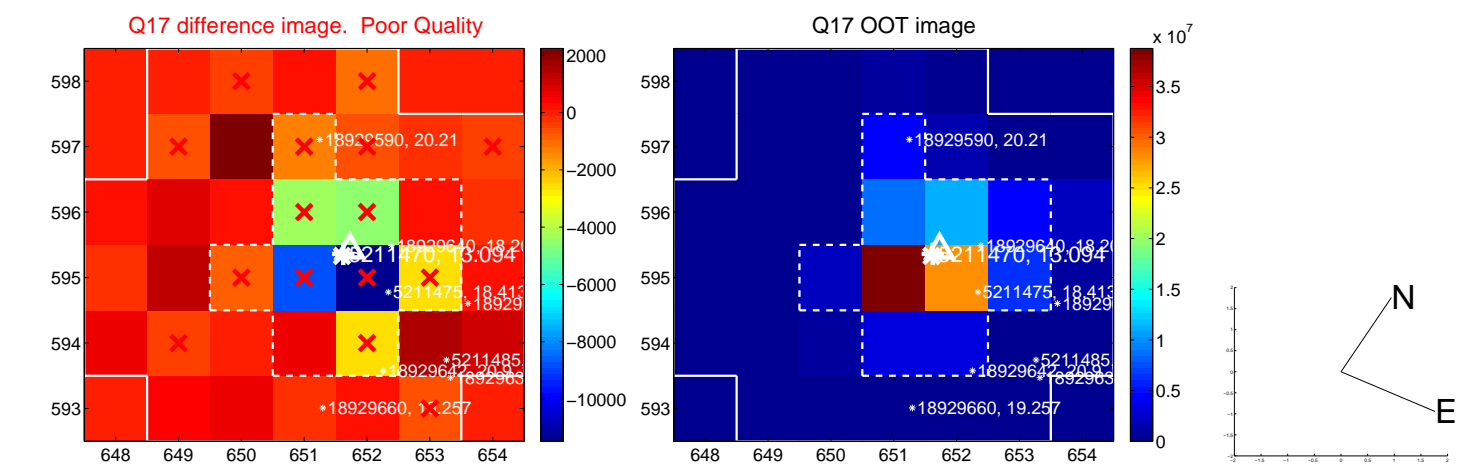
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



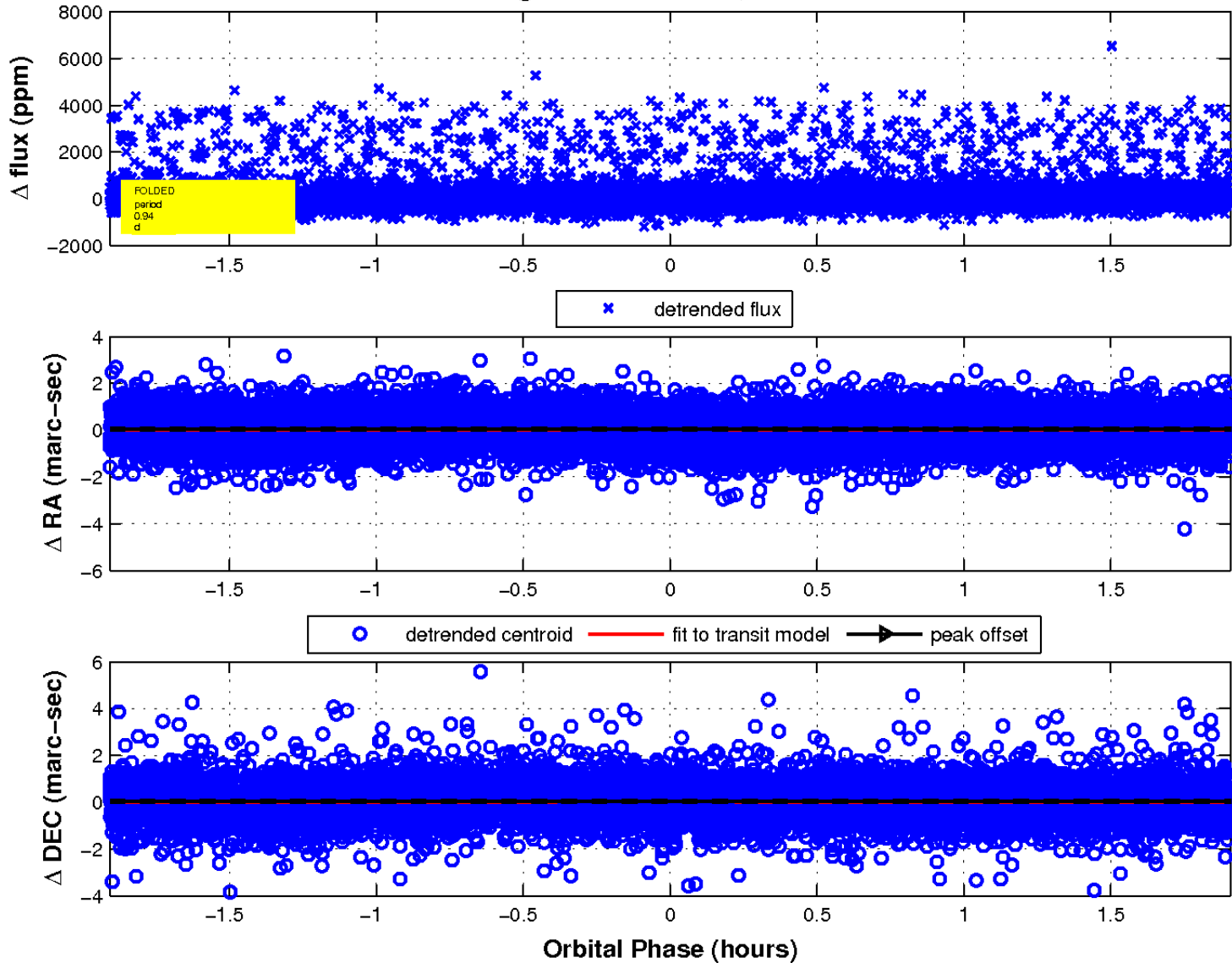
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

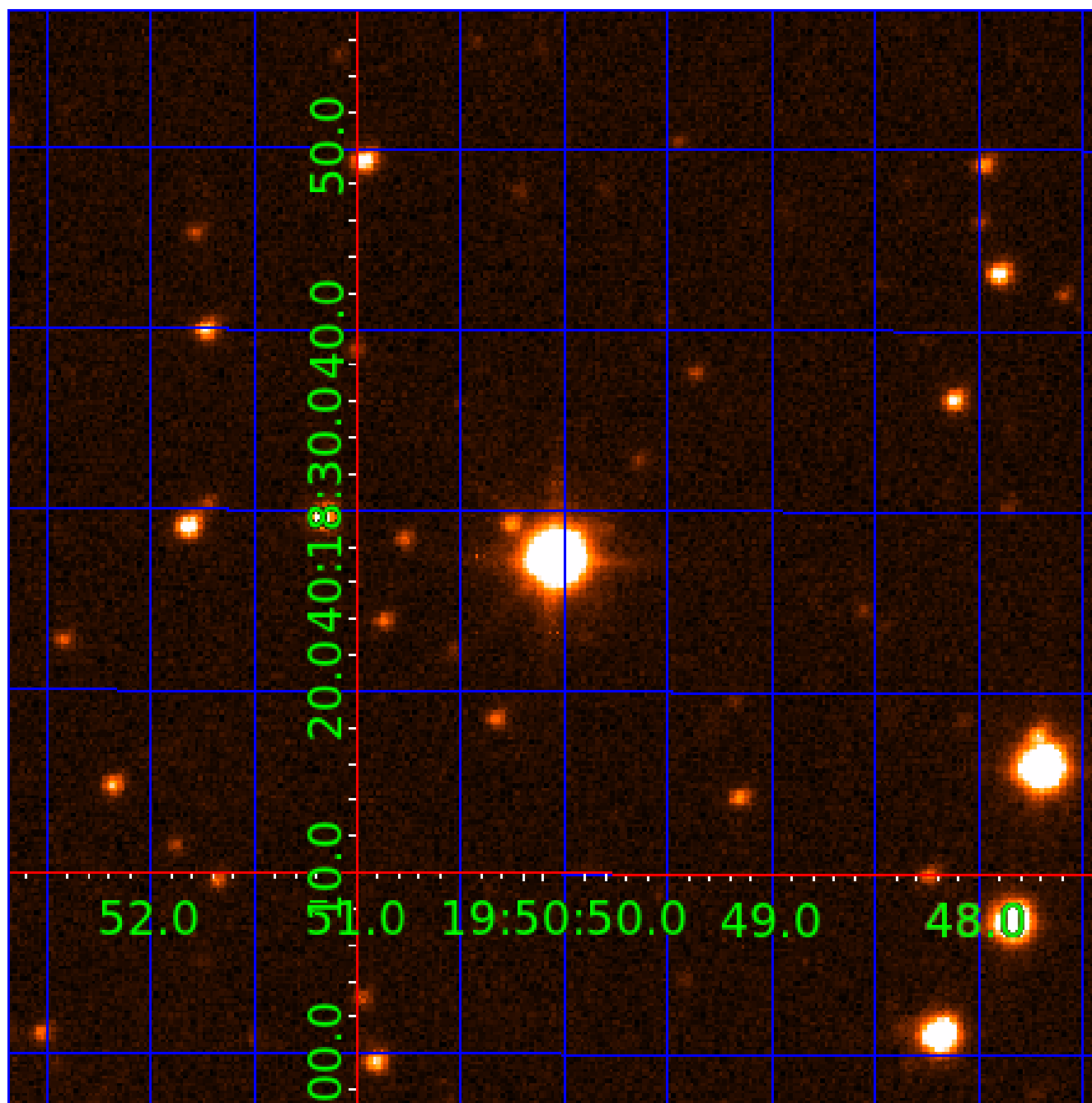


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 005211470

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})
005211470-01	OBS	6541.01	2.404311	132.750771	7997.4	4.438	429.7	369.1	17.03	4697	287.50	0.00
005211470-02	OBS	6541.02	0.938065	132.274036	109.6	1.051	14.4	18.2	17.03	4697	22.01	0.00
005211470-03	OBS	No	0.938071	131.856043	13.1	0.636	8.5	2.1	17.03	4697	7.76	0.00
005211470-04	OBS	No	413.546303	330.859577	2146.9	6.430	8.9	10.1	17.03	4697	128.01	75.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005211470-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED
005211470-02	OBS	FP	0.00	0	1	1	0	PLANET_IN_STAR—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
005211470-03	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
005211470-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES

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.

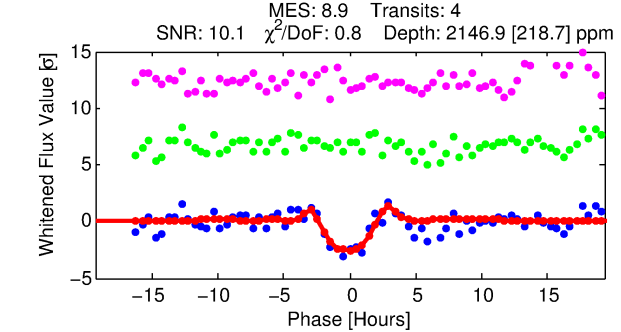
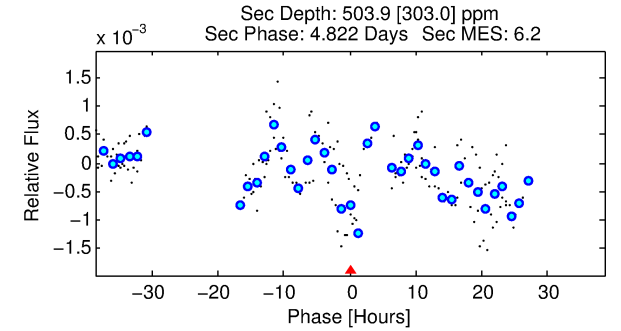
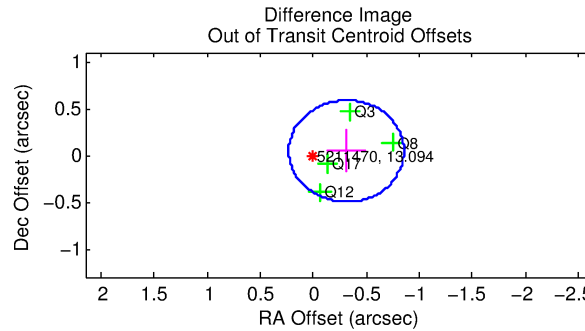
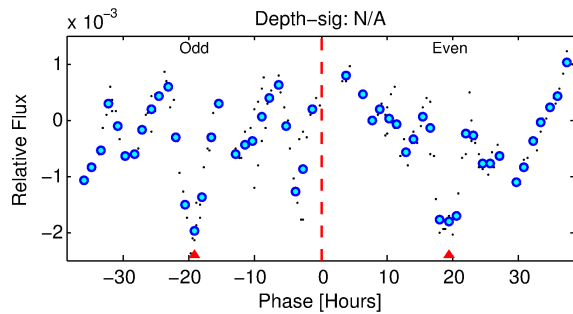
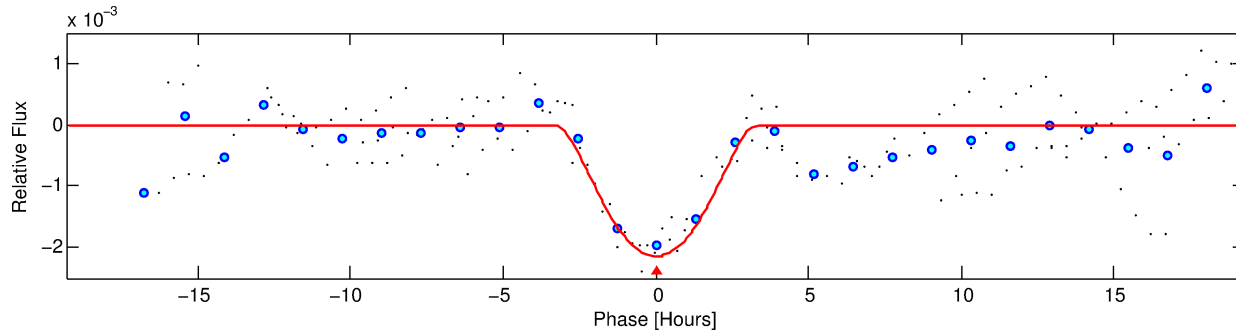
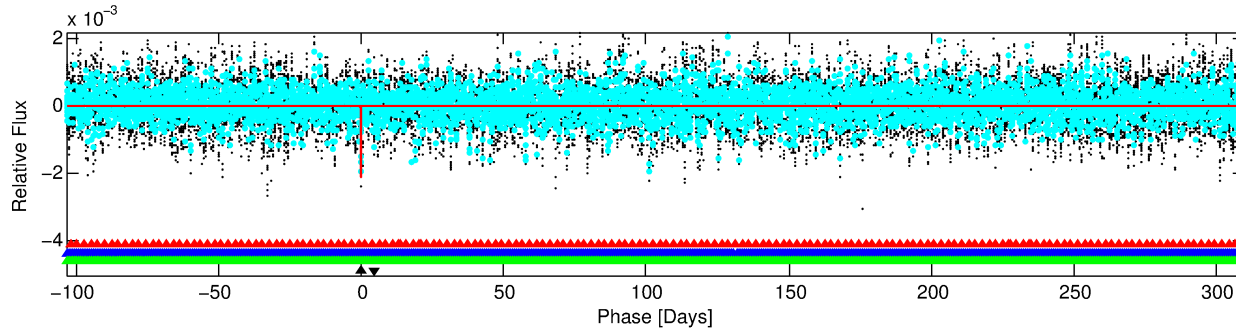
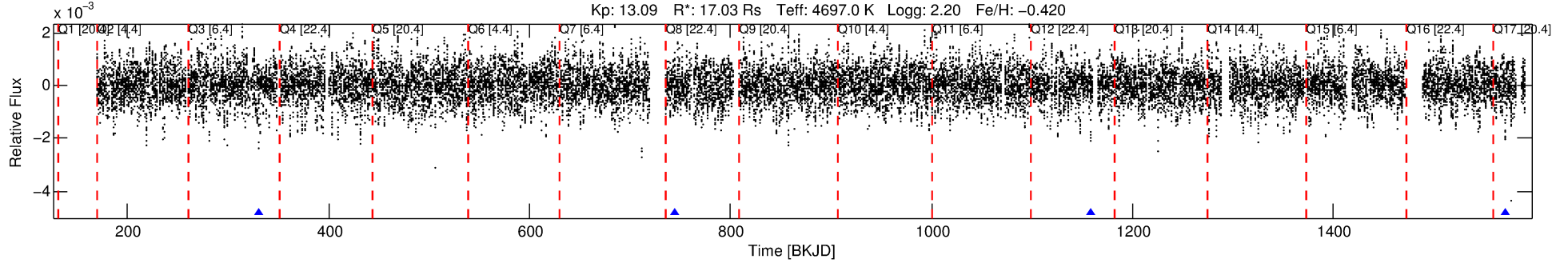
Ephemeris Match Information For 005211470-04

No Significant Match Found

DV One-Page Summary

KIC: 5211470 Candidate: 4 of 4 Period: 413.546 d
KOI: K06541 Corr: No Ephemeris Match

Kp: 13.09 R*: 17.03 Rs Teff: 4697.0 K Logg: 2.20 Fe/H: -0.420



DV Fit Results:

Period = 413.54630 [0.00438] d
Epoch = 330.8596 [0.0114] BKJD
Rp/R* = 0.0689 [0.0420]
a/R* = 214.81 [40.60]
b = 0.98 [0.07]
Seff = 75.45 [44.65]
Teff = 752 [111] K
Rp = 128.01 [95.49] Re
a = 1.2949 [0.4960] AU
Ag = 28.37 [41.96] [0.65σ]
Teffp = 2682 [914] K [2.10σ]

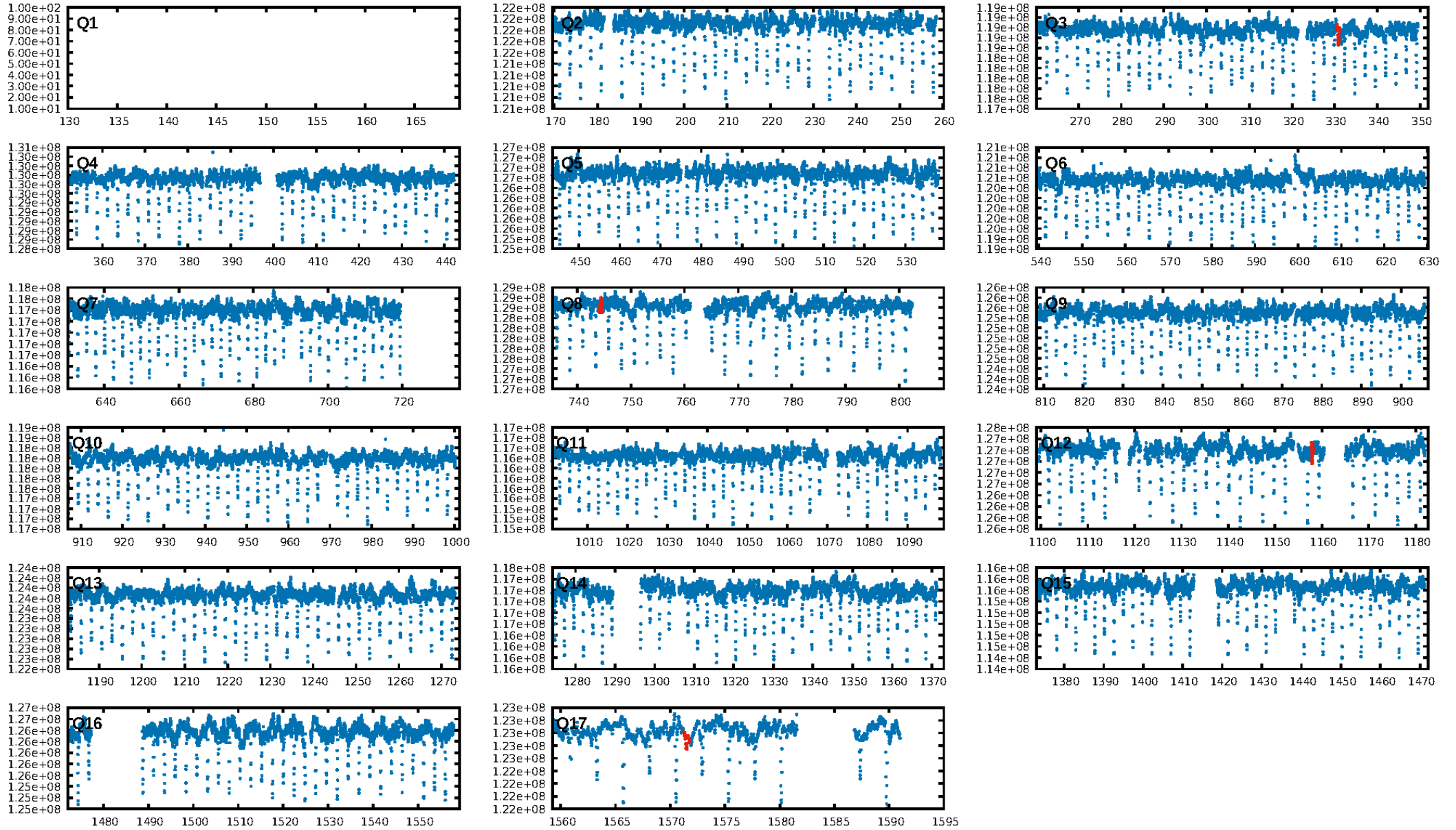
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1262.95σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 78.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.30e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 4.202
Centroid-sig: 42.9%
Centroid-so: 0.072 arcsec [0.38σ]
OotOffset-rm: 0.314 arcsec [1.74σ]
KicOffset-rm: 0.287 arcsec [1.23σ]
OotOffset-st: 0/1/2/1 [4]
KicOffset-st: 0/1/2/1 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 0.00 [0/4]

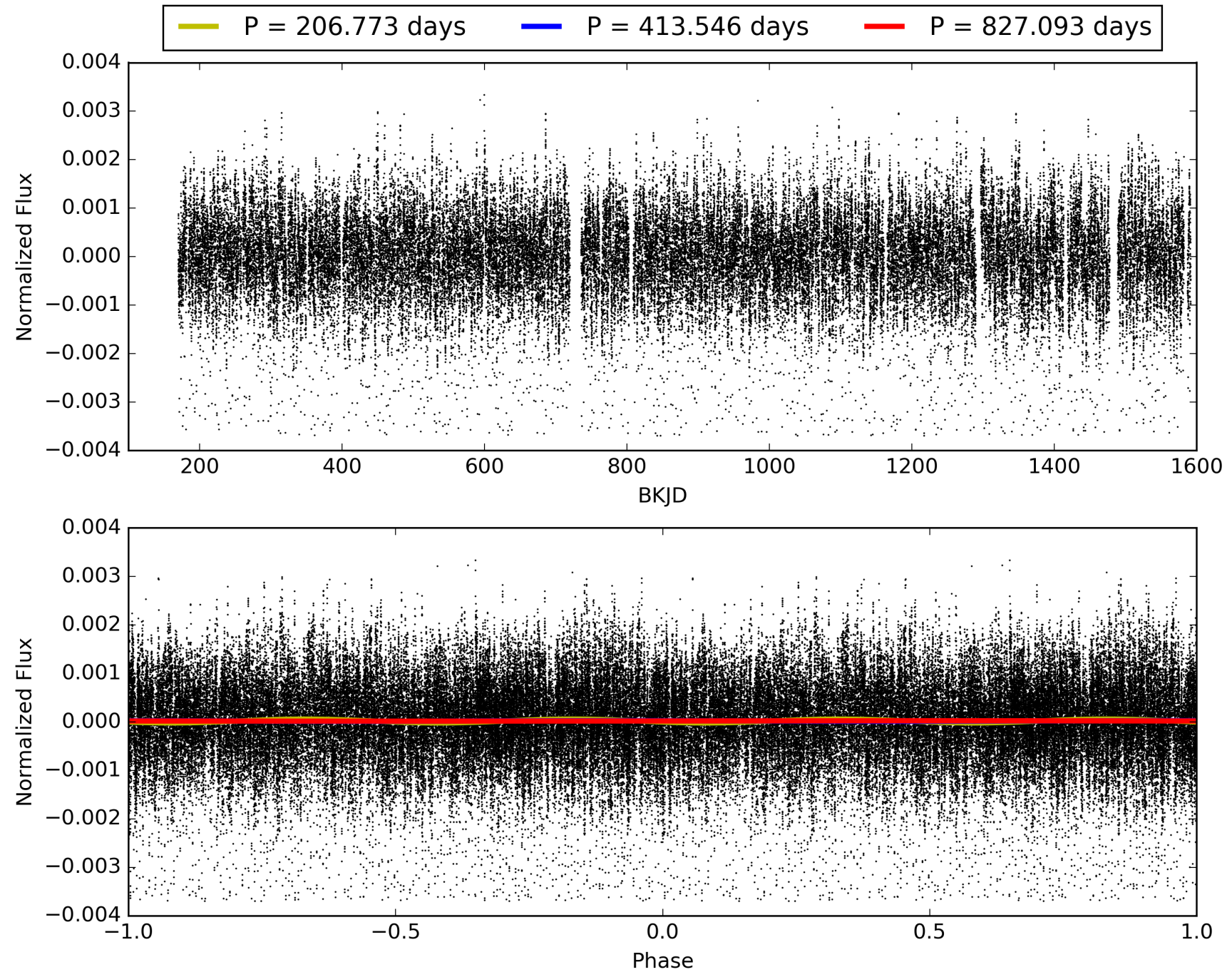
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:39:20 Z

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

TCE 005211470-04, PDC Light Curves

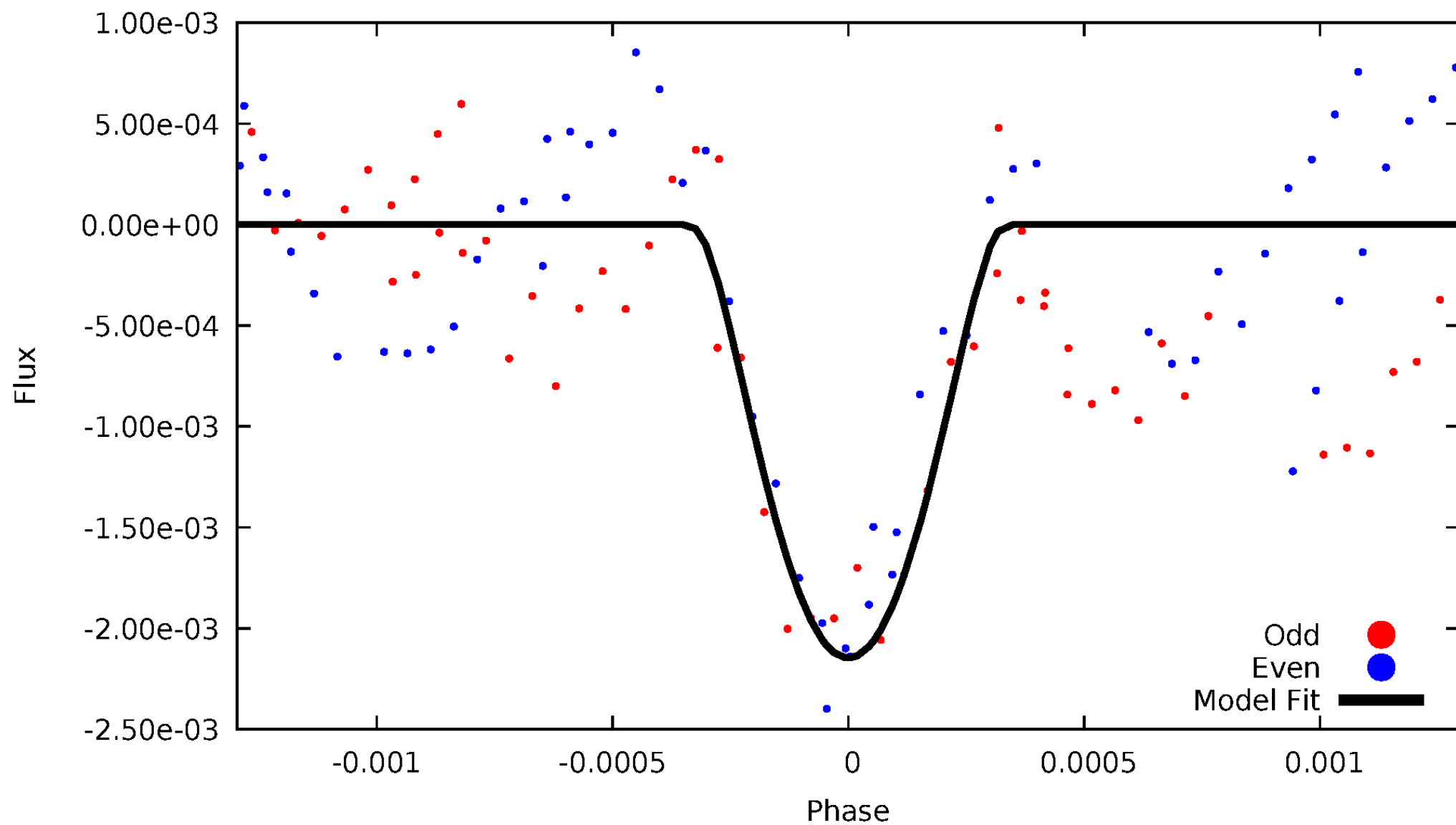


TCE 005211470-04



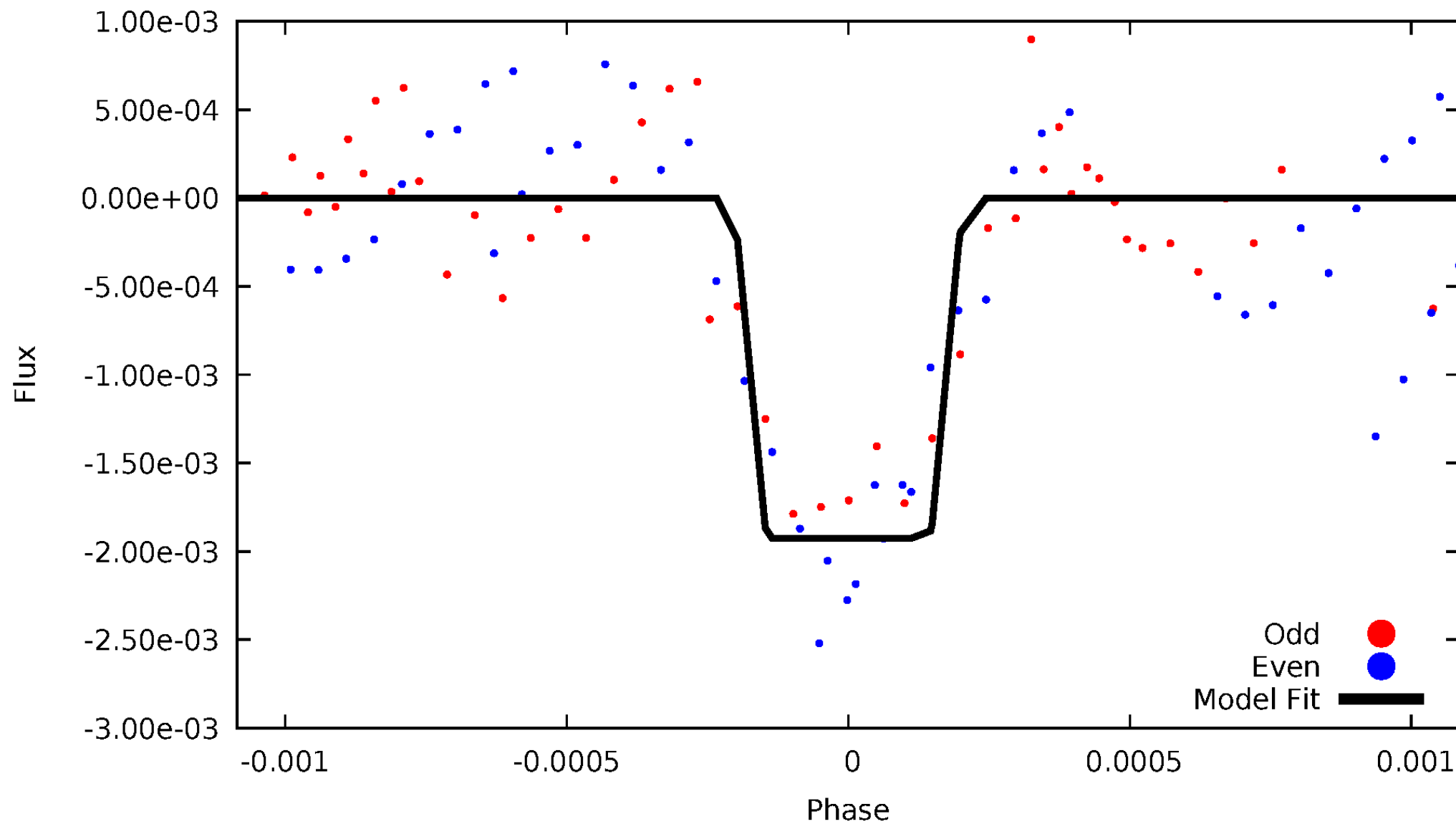
DV Odd/Even

TCE 005211470-04



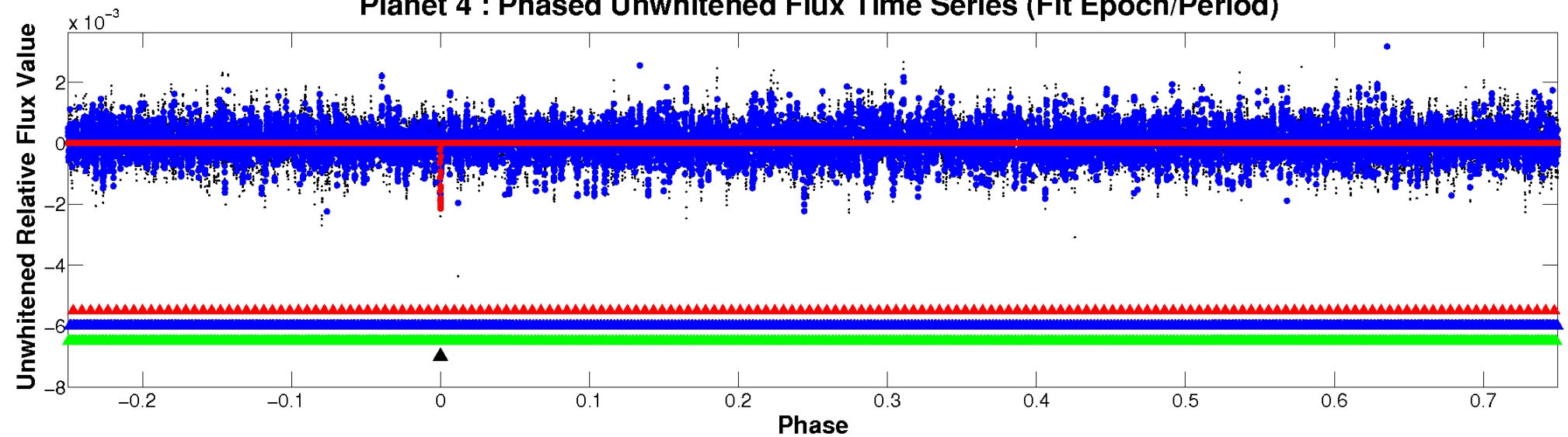
ALT Odd/Even

TCE 005211470-04

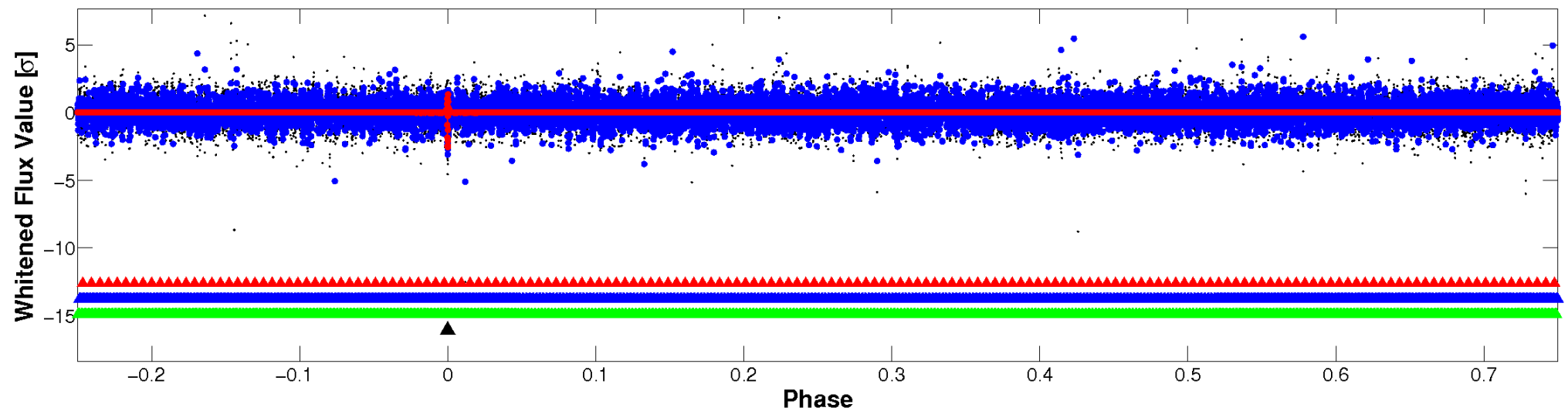


Non-Whitened Vs. Whitened Light Curve

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

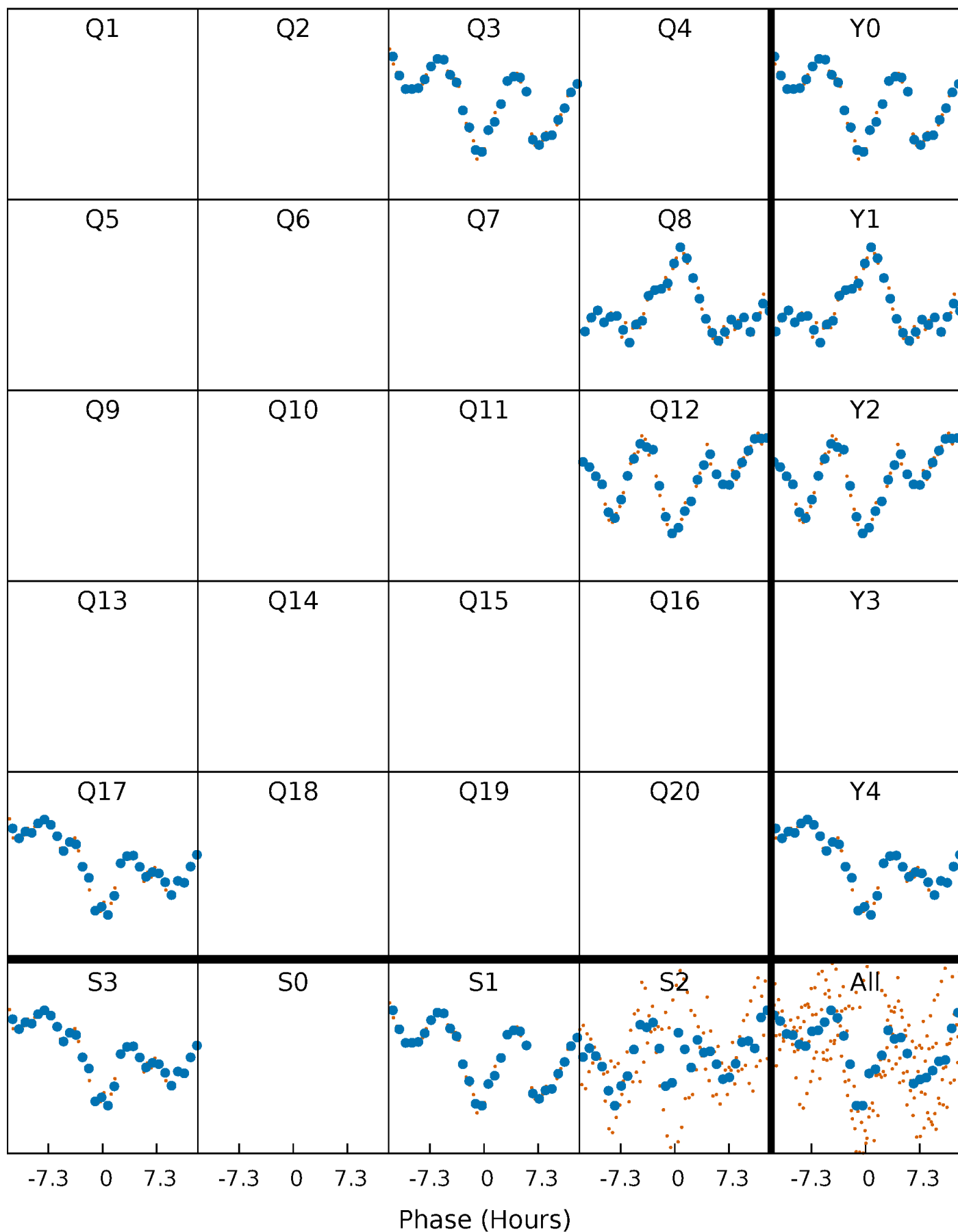


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



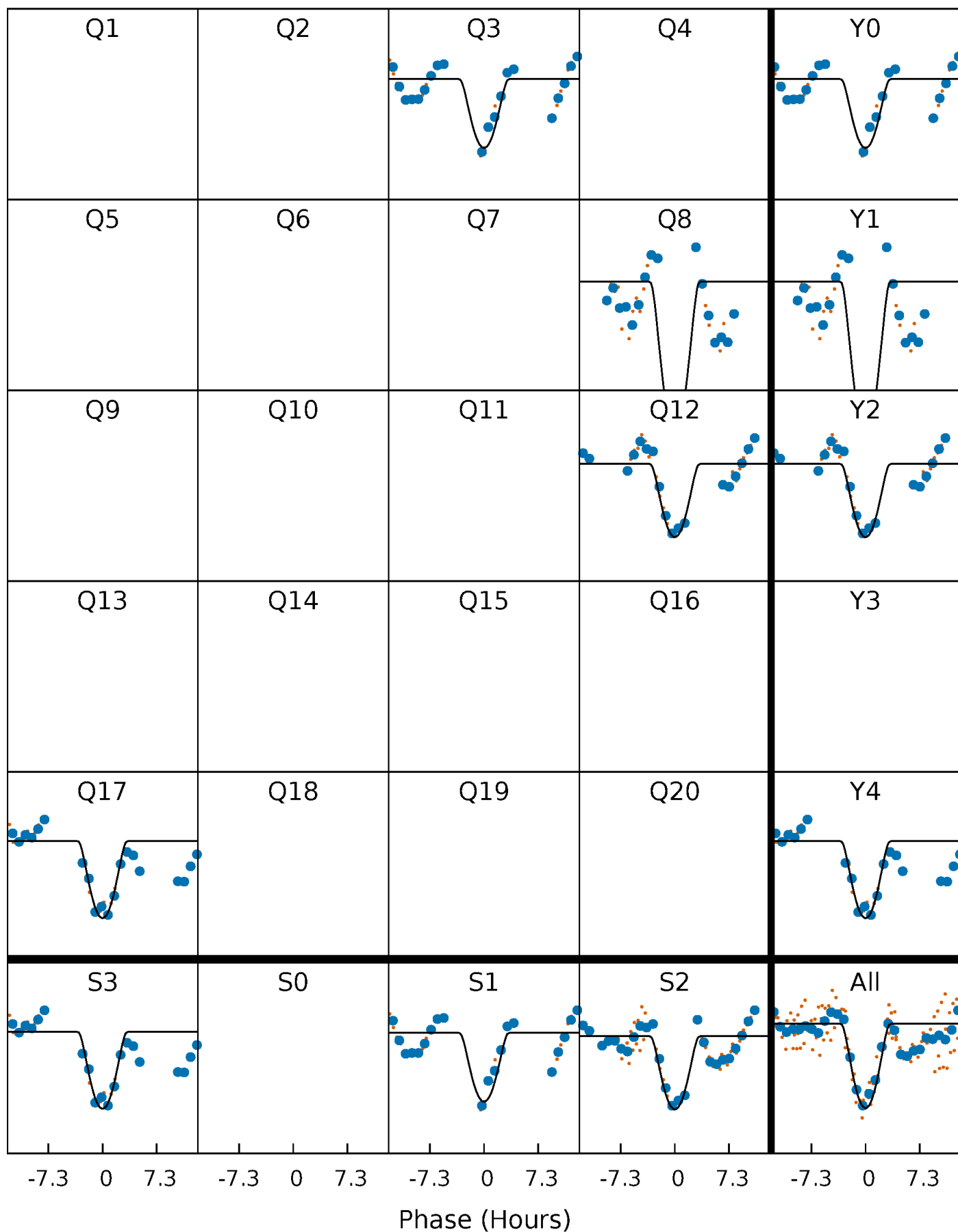
PDC Quarter-Phased Transit Curves

TCE 005211470-04 $P=413.546303$ Days $T_0=330.859577$ (BKJD)



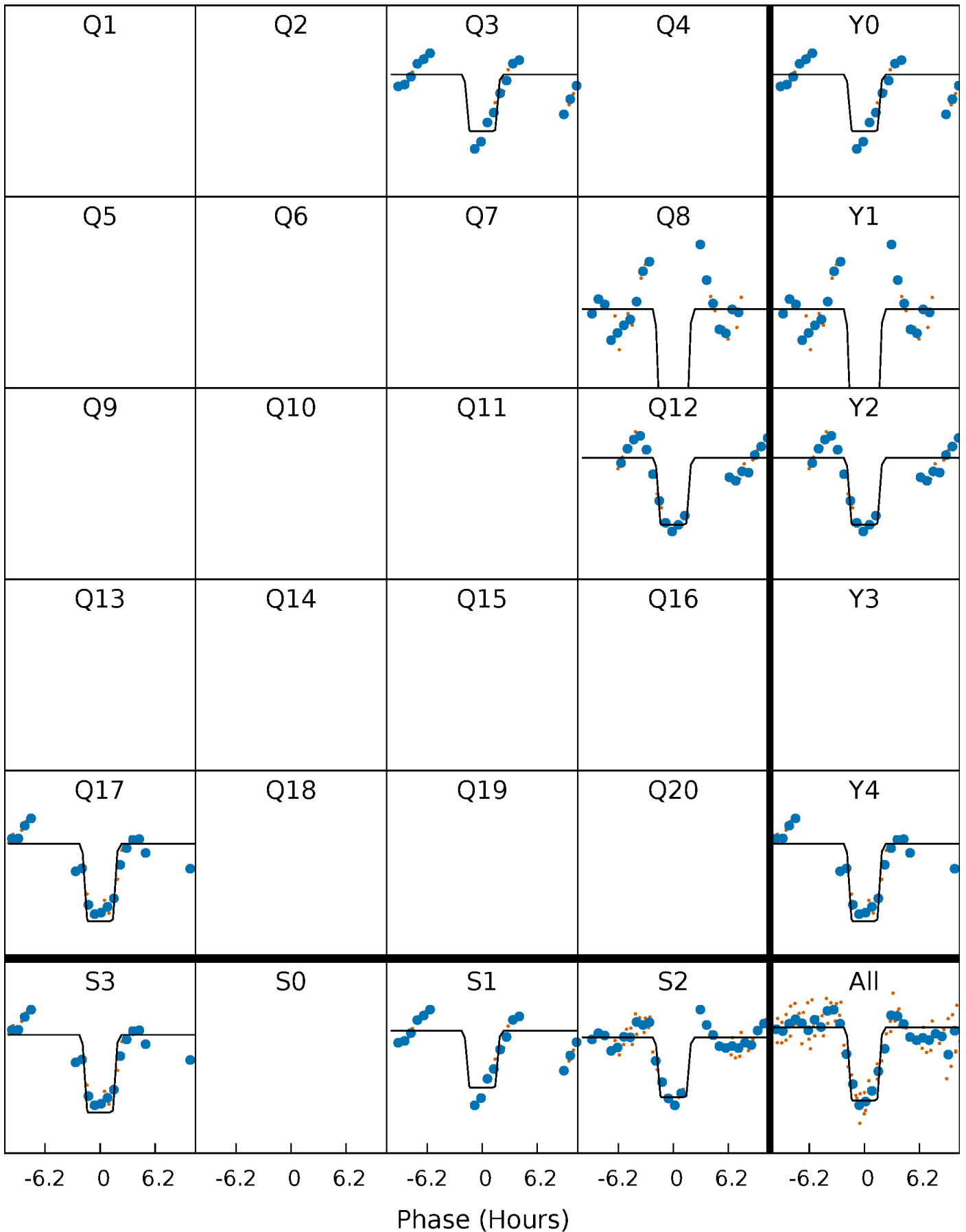
DV Quarter-Phased Transit Curves

TCE 005211470-04 $P=413.546303$ Days $T_0=330.859577$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

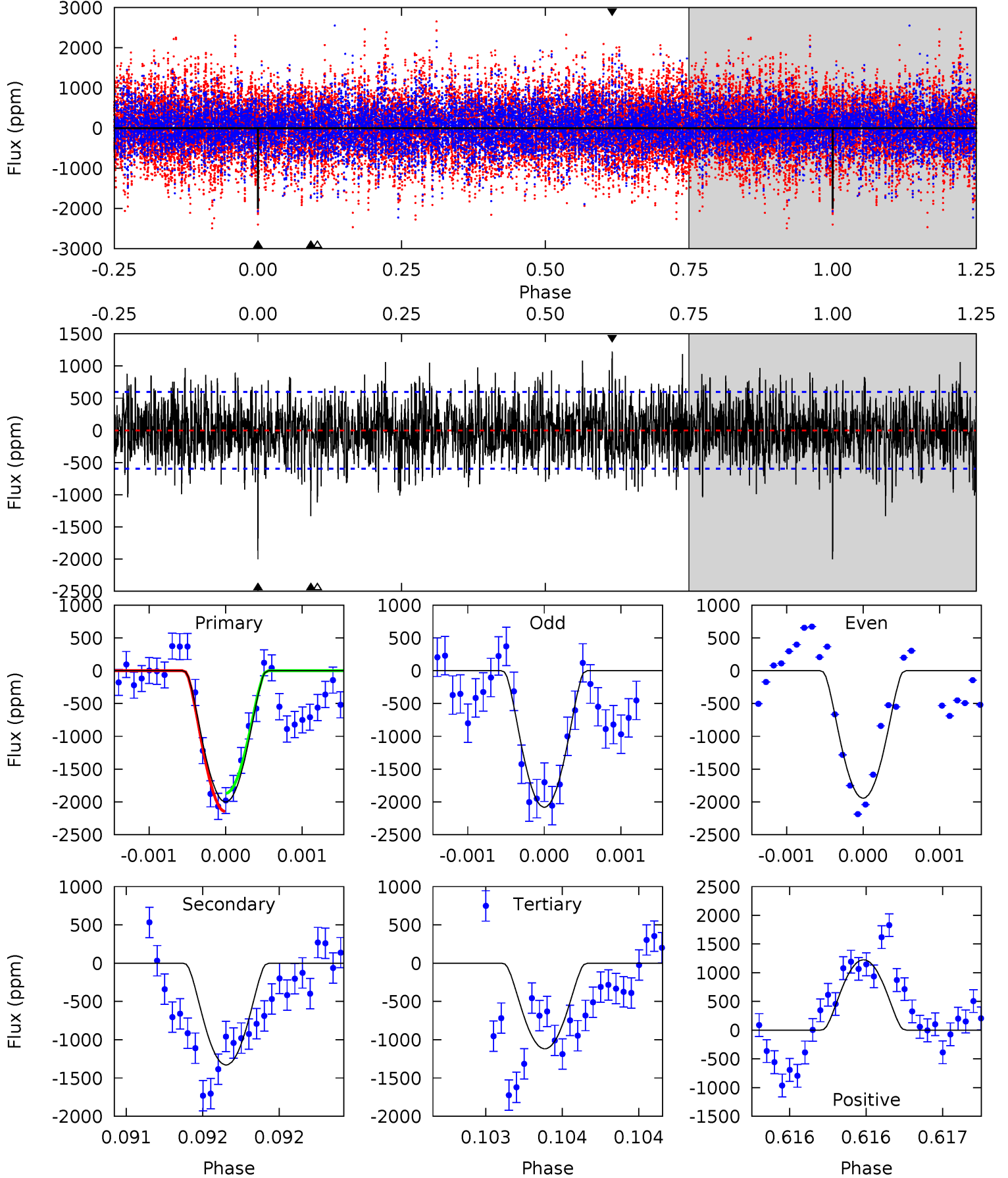
TCE 005211470-04 $P=413.541199$ Days $T_0=330.862064$ (BKJD)



DV Model-Shift Uniqueness Test

005211470-04, P = 413.546303 Days, E = 330.859577 Days

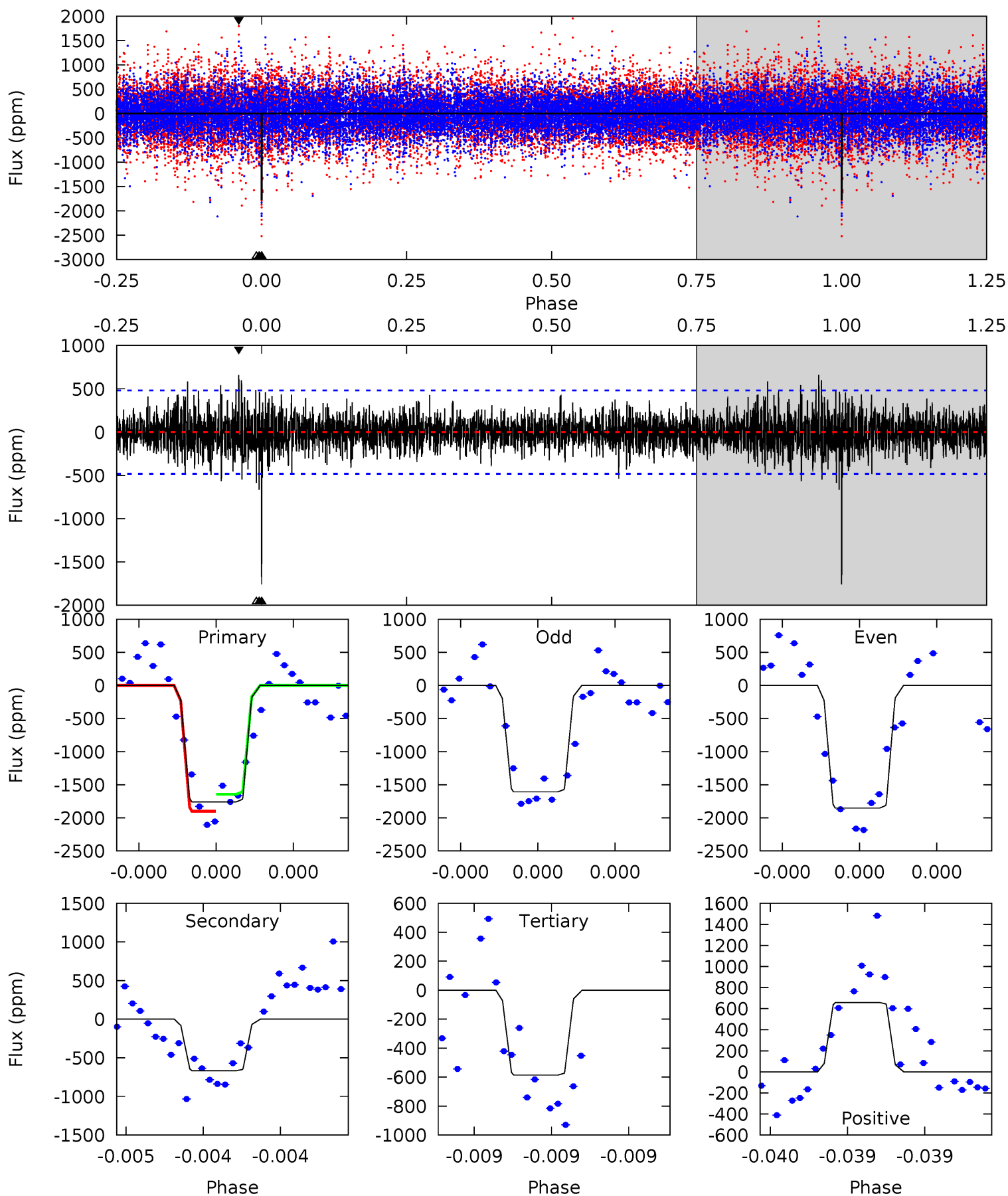
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.6	12.3	10.4	11.4	5.54	3.42	3.03	8.18	7.19	1.96	0.96	0.64	0.41	0.38	1.30



Alt Model-Shift Uniqueness Test

005211470-04, P = 413.541199 Days, E = 330.862064 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.5	7.76	6.82	7.67	5.60	3.52	1.61	13.7	12.8	0.94	0.09	1.45	0.97	0.27	1.46



Stellar Parameters For KIC 005211470

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4697^{+117}_{-117}	$2.204^{+0.331}_{-0.178}$	$-0.420^{+0.300}_{-0.250}$	$17.032^{+3.944}_{-7.324}$	$1.691^{+0.164}_{-0.656}$	$0.000^{+0.001}_{-0.000}$
	+2%/-2%	+15%/-8%	+71%/-60%	+23%/-43%	+10%/-39%	+249%/-50%
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 005211470-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1330 ± 108	$121.35^{+82.15}_{-63.78}$	1044^{+79}_{-113}	3681^{+1116}_{-486}	76^{+277}_{-47}
Alt.	-666 ± 86	$86.12^{+78.11}_{-54.10}$	1048^{+78}_{-115}	3695^{+1655}_{-601}	80^{+513}_{-58}

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 $A_{obs} \gg 1.0$

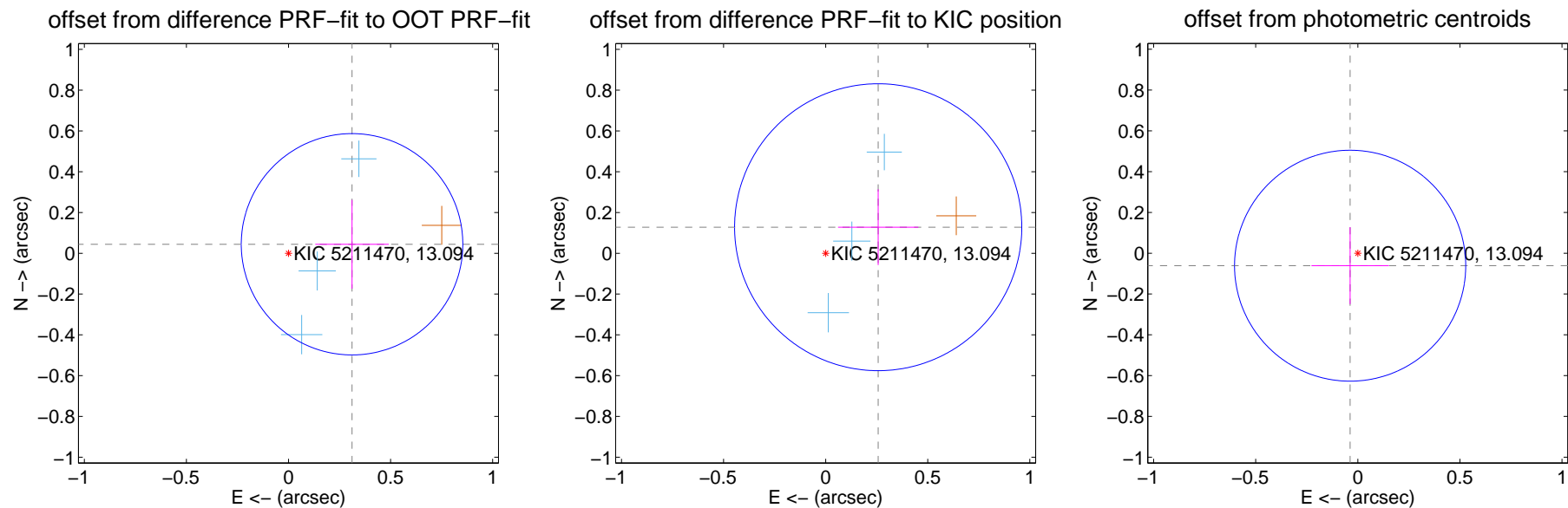
DV Centroid Data

Supplemental centroid analysis for 005211470-04. Kepler magnitude: 13.09. Transit SNR 10.08

There are 3 quarters with good PRF difference image offsets

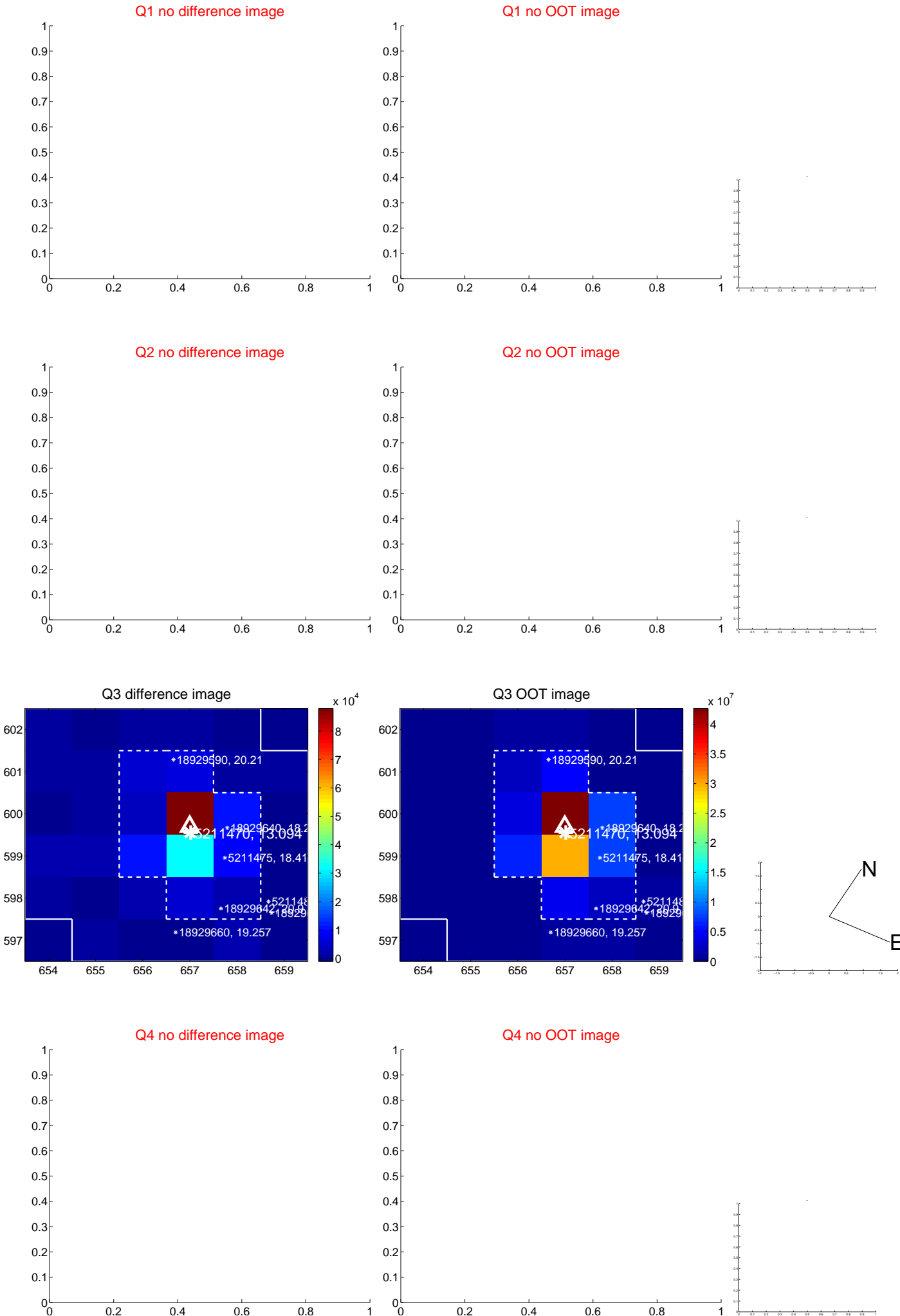
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.314 ± 0.181	1.74	-0.311 ± 0.180	0.044 ± 0.218
PRF-fit source offset from KIC position	0.287 ± 0.234	1.23	-0.257 ± 0.196	0.128 ± 0.186
photometric centroid source offset	0.07 ± 0.19	0.38	0.04 ± 0.19	-0.06 ± 0.19

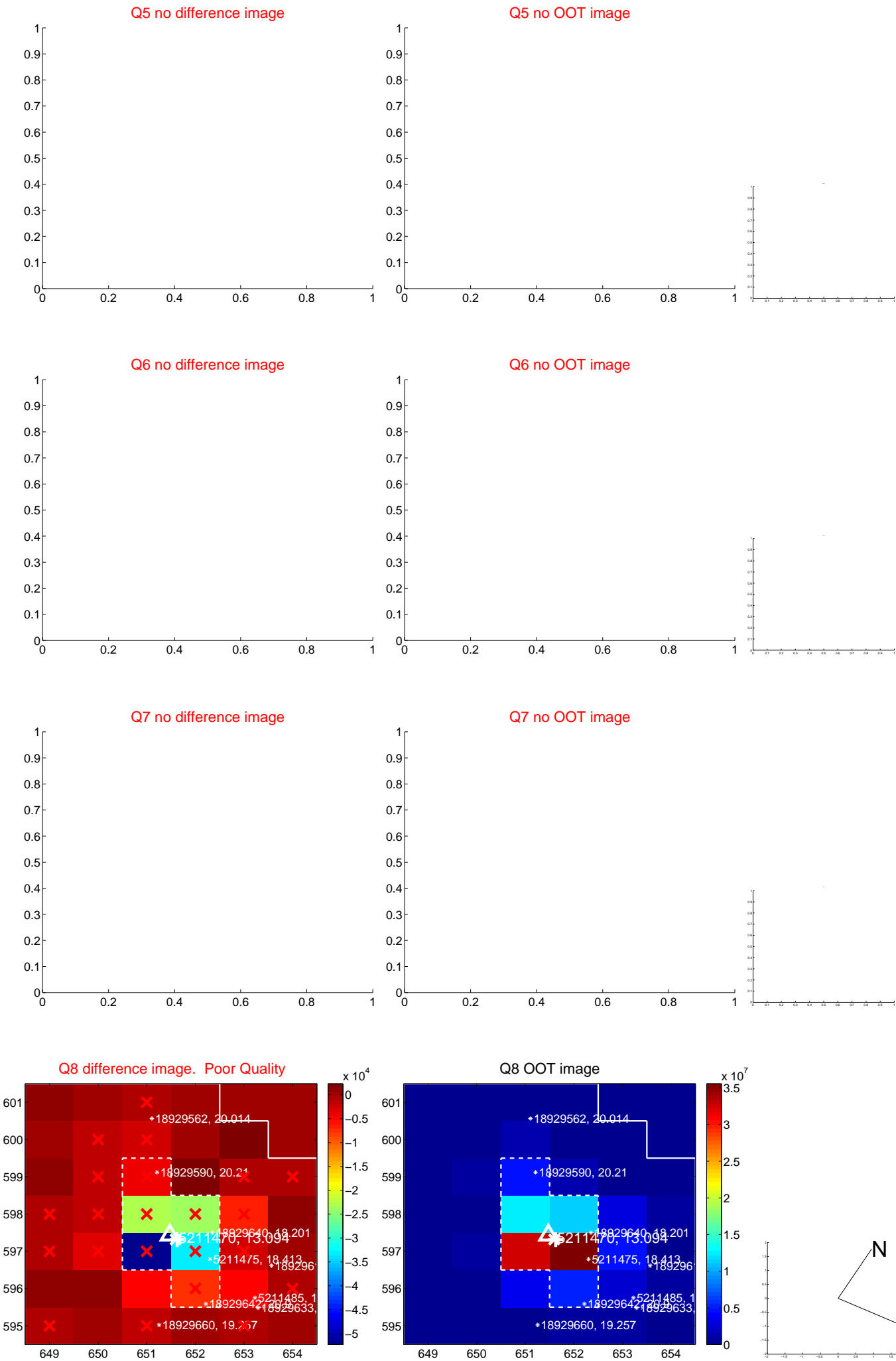


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

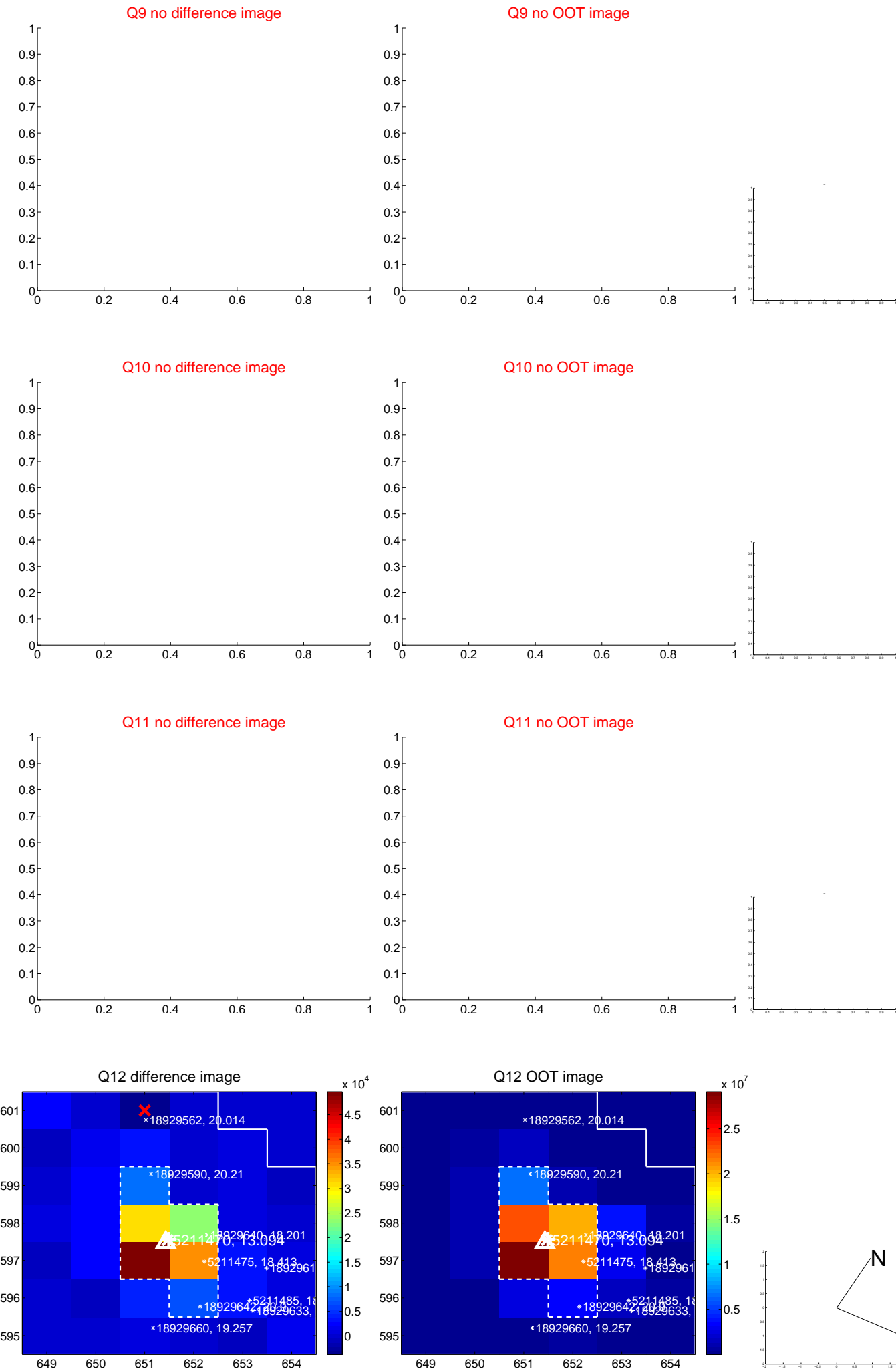
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



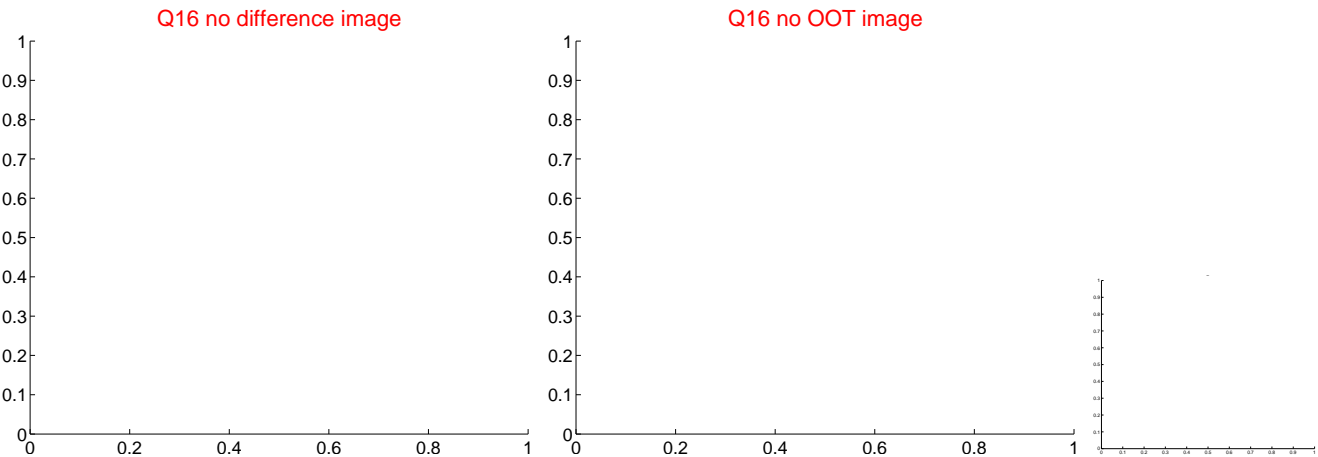
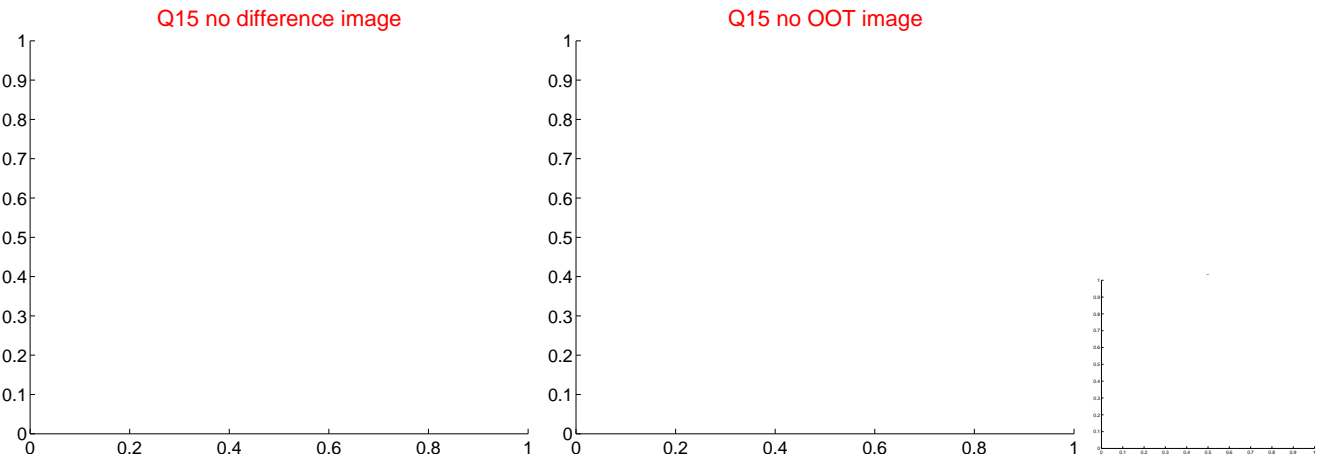
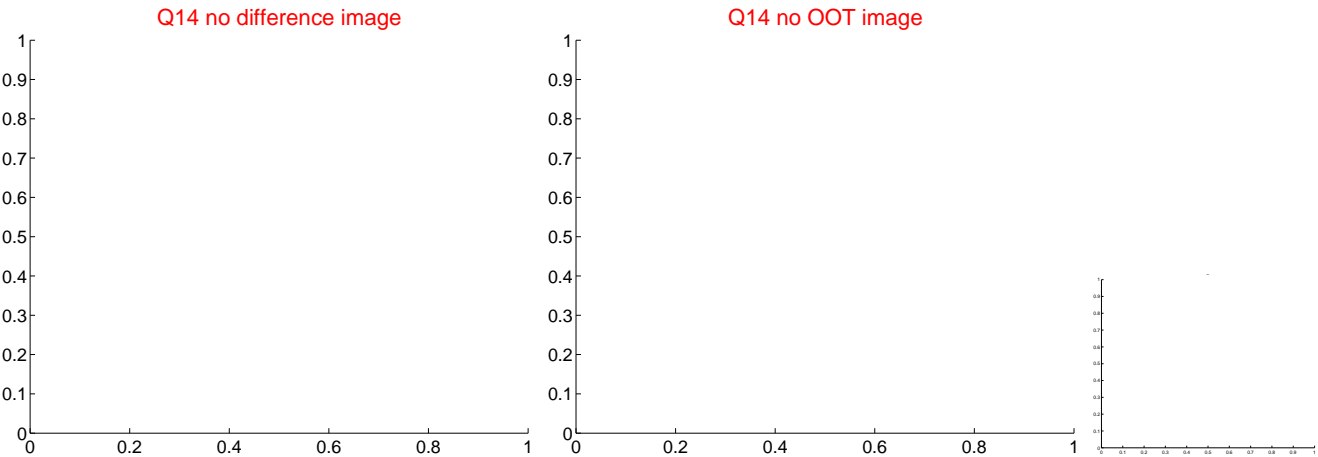
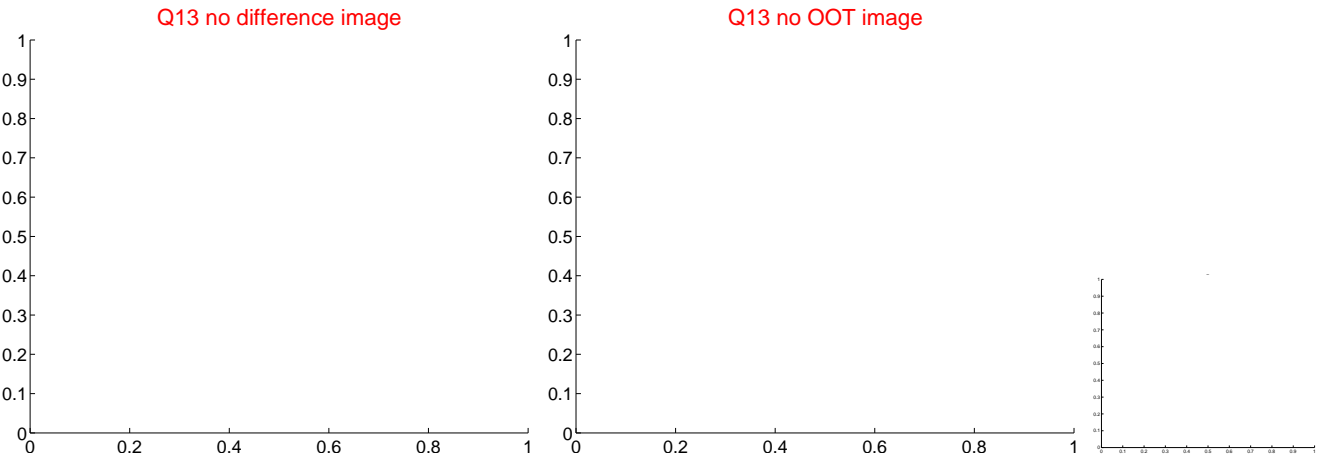
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



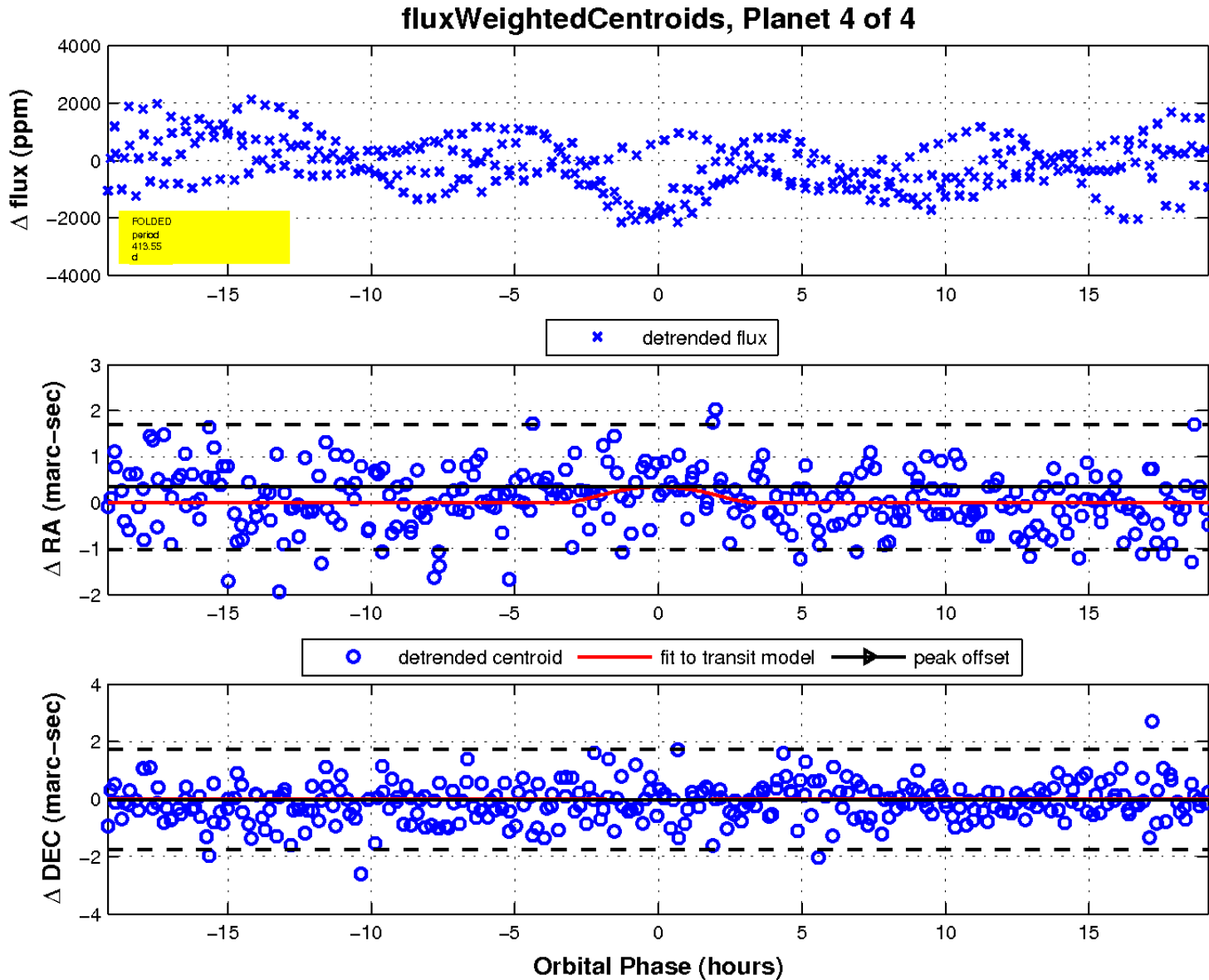
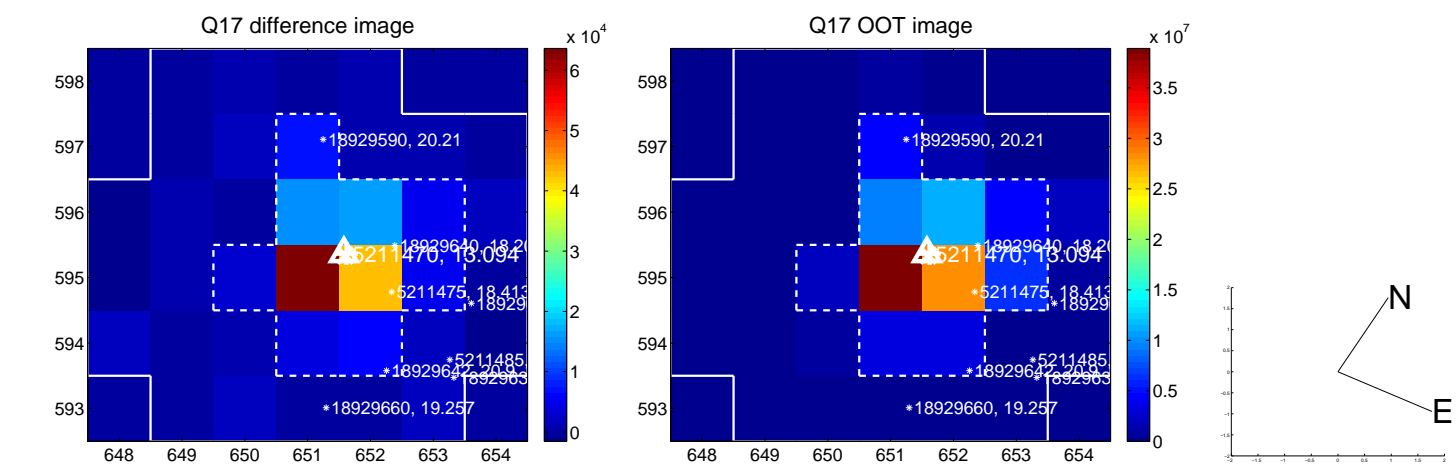
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white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

