

KIC 012115188

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})
012115188-01	OBS	2396.01	0.990865	131.974609	207.1	1.144	22.2	28.0	0.94	5529	1.63	2012.08
012115188-02	OBS	No	0.990870	132.466741	189.2	1.208	21.5	27.2	0.94	5529	1.43	2012.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012115188-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
012115188-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 012115188-01

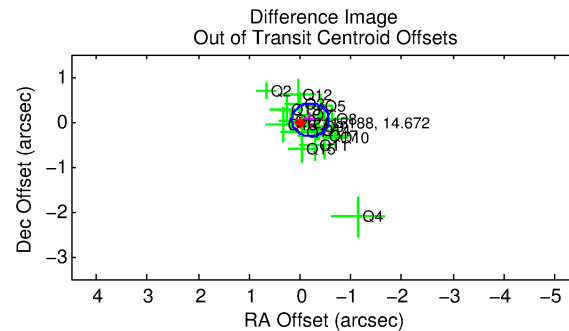
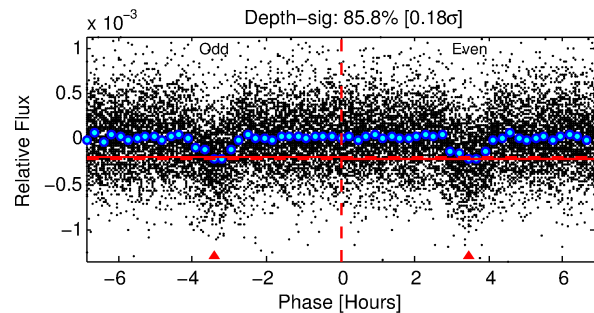
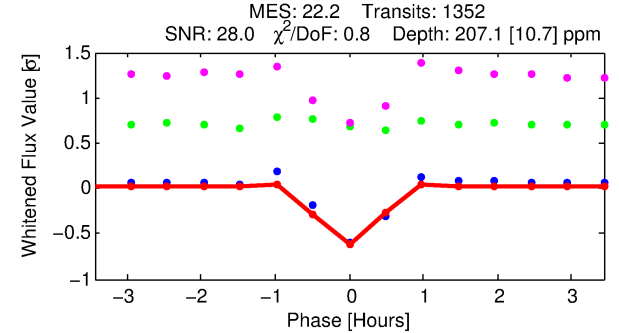
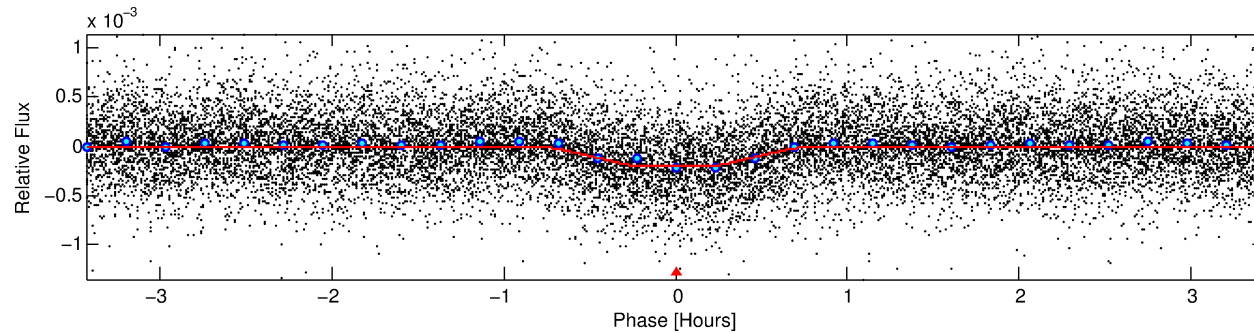
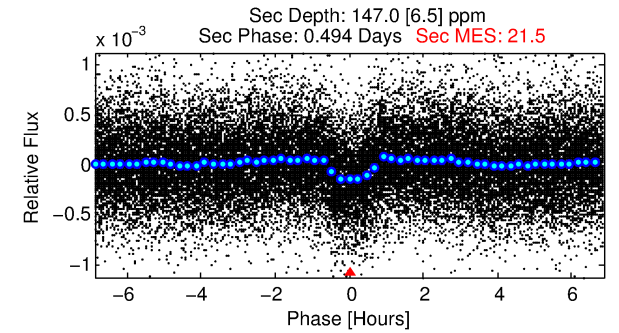
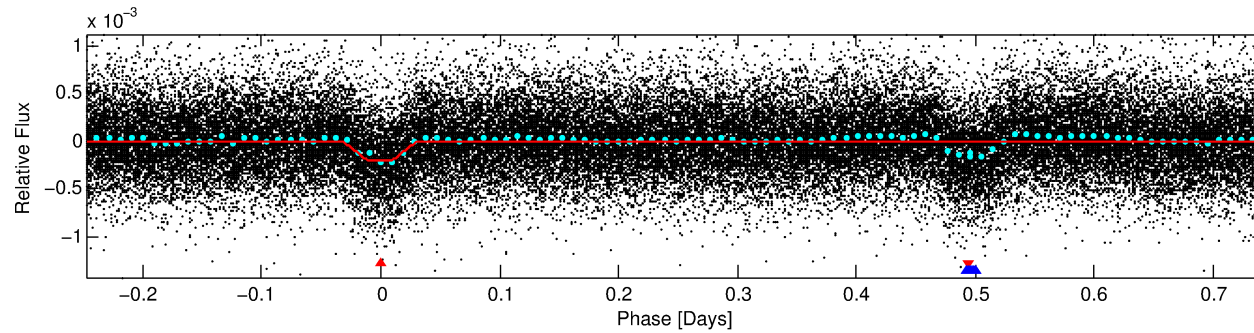
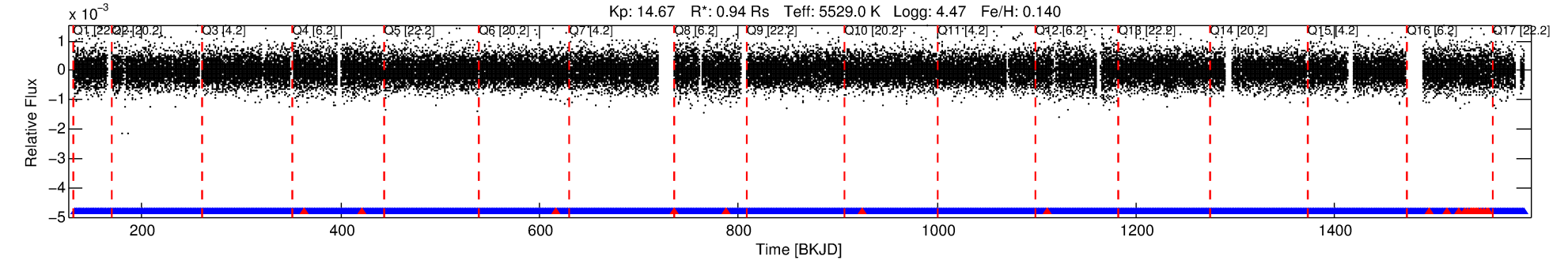
No Significant Match Found

DV One-Page Summary

KIC: 12115188 Candidate: 1 of 2 Period: 0.991 d

KOI: K02396 Corr: No Ephemeris Match

Kp: 14.67 R*: 0.94 Rs Teff: 5529.0 K Logg: 4.47 Fe/H: 0.140



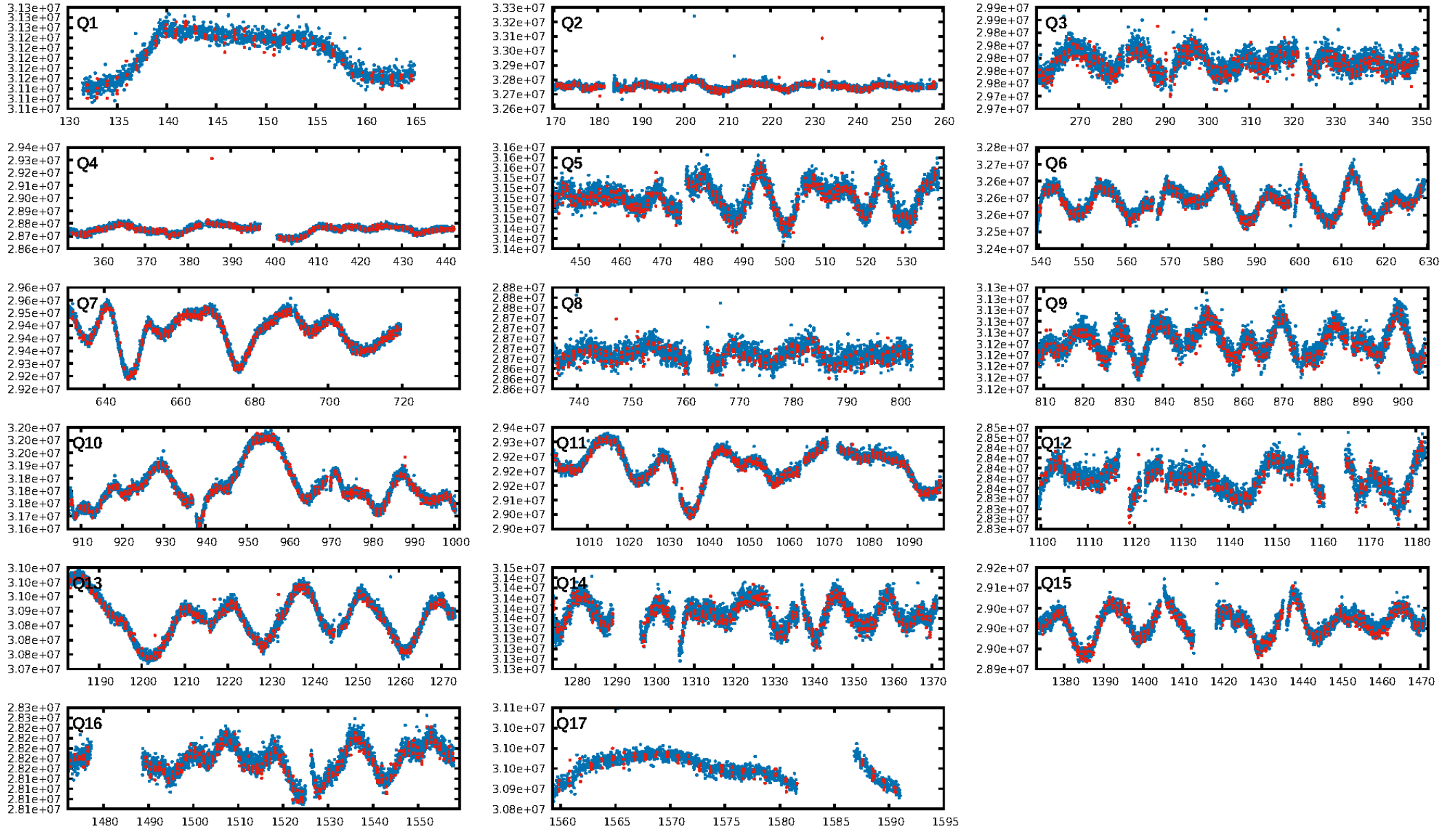
DV Fit Results:

Period = 0.99086 [0.00000] d
Epoch = 131.9746 [0.0006] BKJD
Rp/R* = 0.0160 [0.0042]
a/R* = 3.25 [3.39]
b = 0.90 [0.25]
Seff = 2012.08 [681.15]
Teq = 1708 [145] K
Rp = 1.63 [0.59] Re
a = 0.0191 [0.0041] AU
Ag = 11.09 [6.83] [1.48σ]
Teffp = 4818 [652] K [4.66σ]

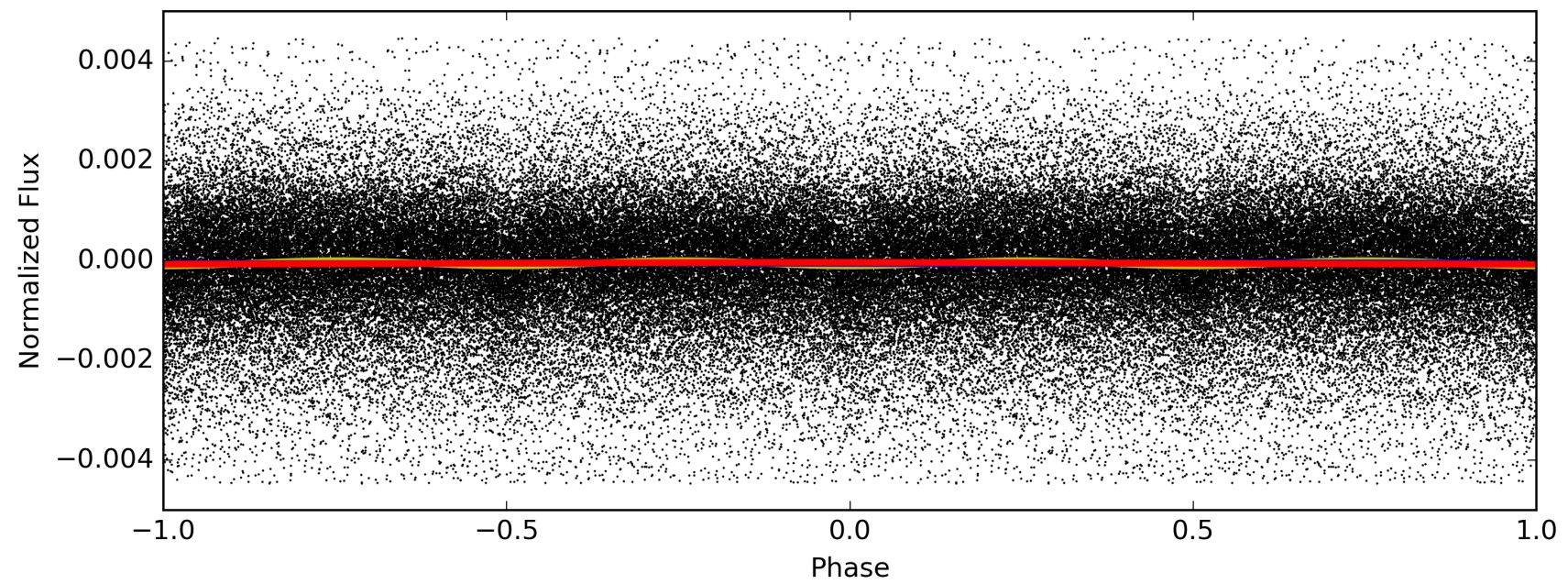
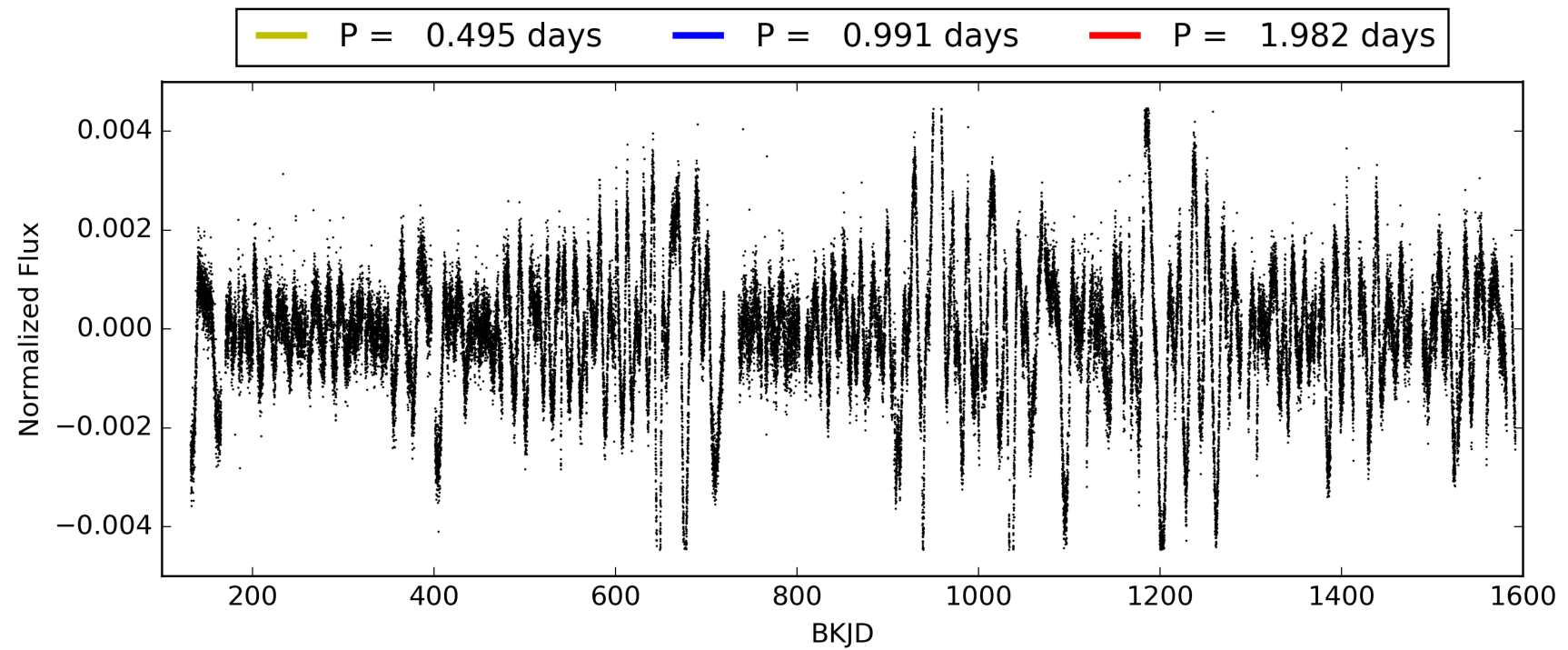
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.28e-98
RollingBand-fgt: 0.98 [1266/1291]
GhostDiagnostic-chr: 7.837
Centroid-sig: 9.2%
Centroid-so: 0.698 arcsec [1.32σ]
OotOffset-rm: 0.202 arcsec [1.65σ]
KicOffset-rm: 0.223 arcsec [1.67σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 012115188-01, PDC Light Curves

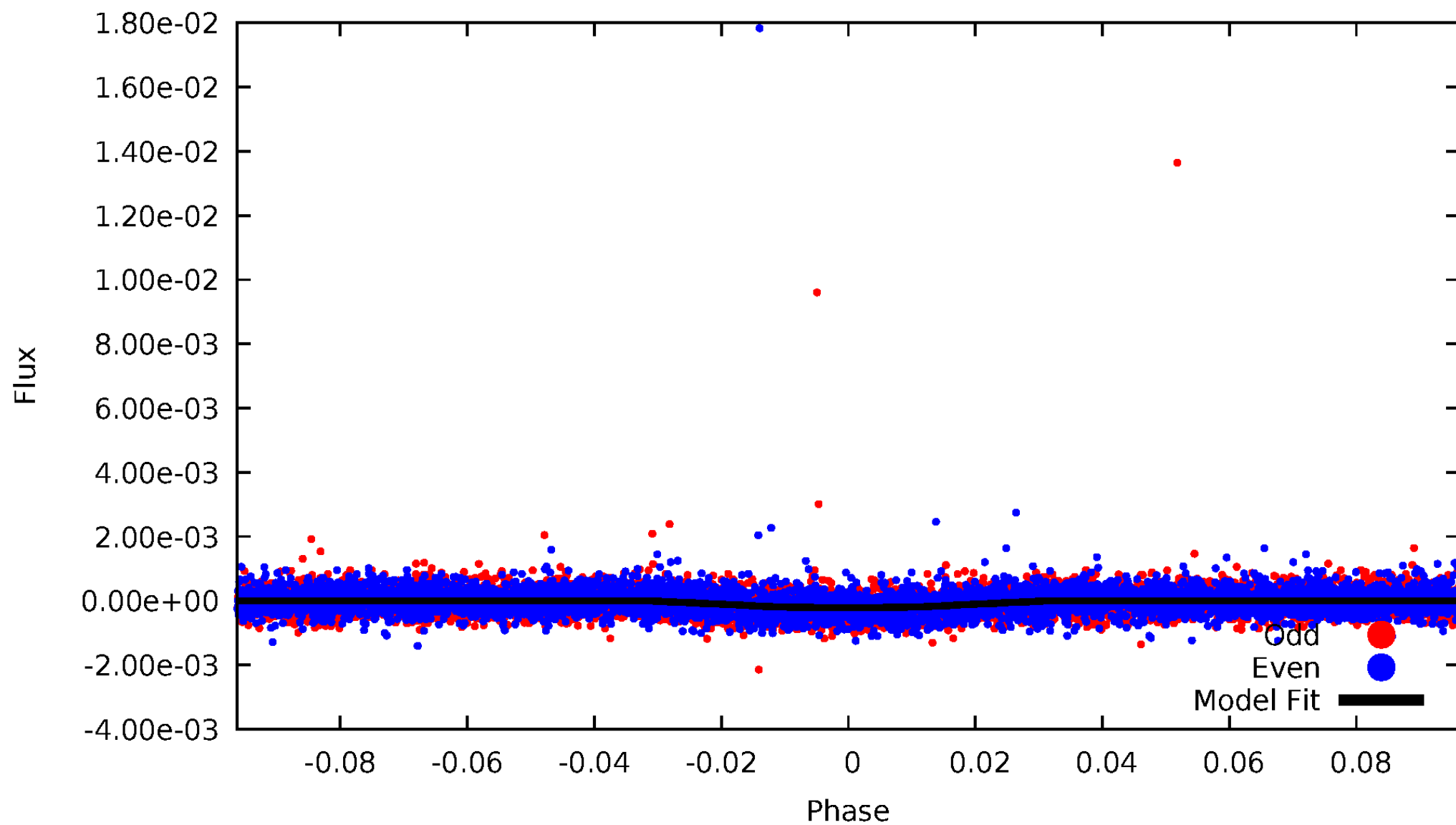


TCE 012115188-01



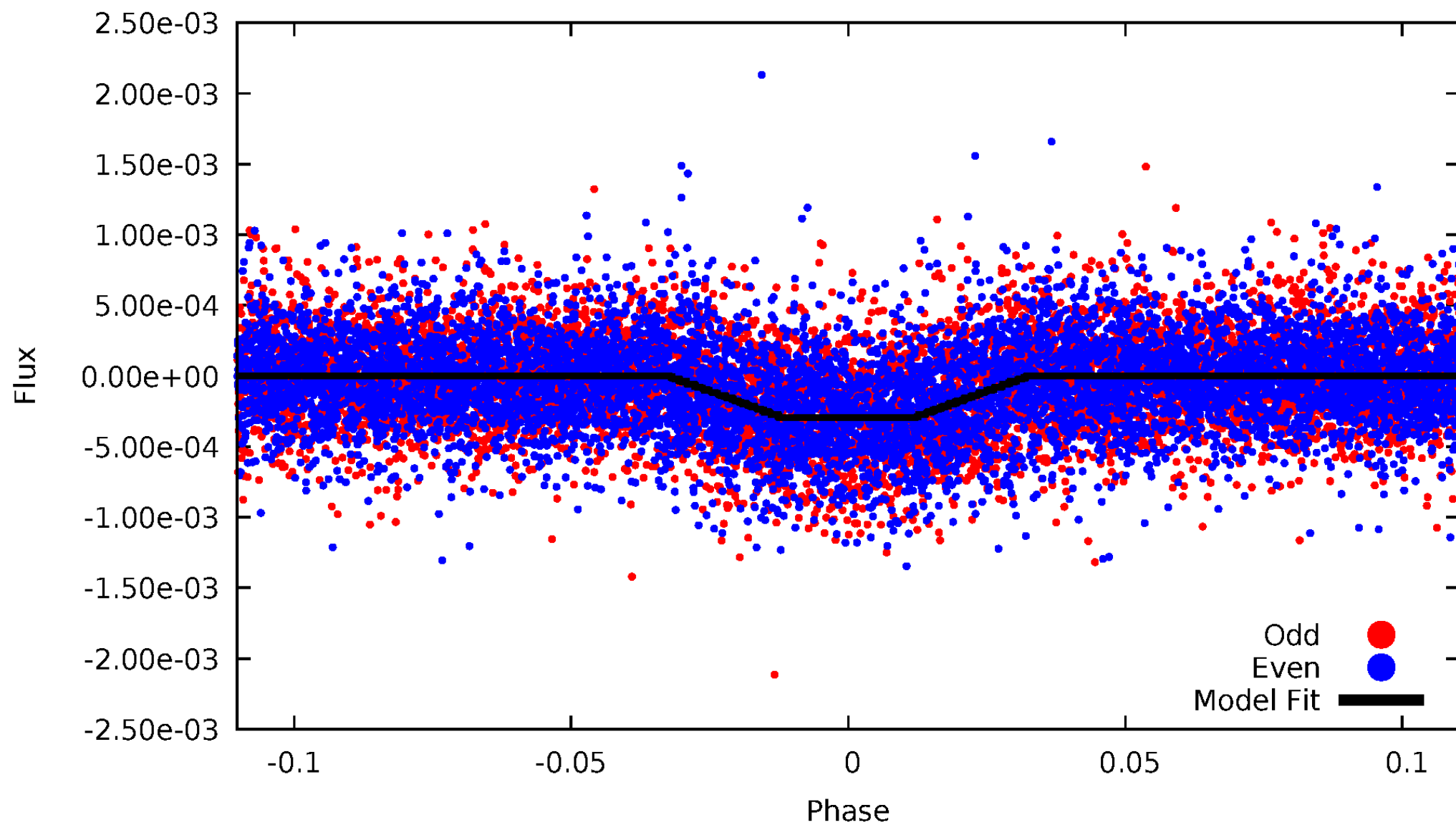
DV Odd/Even

TCE 012115188-01



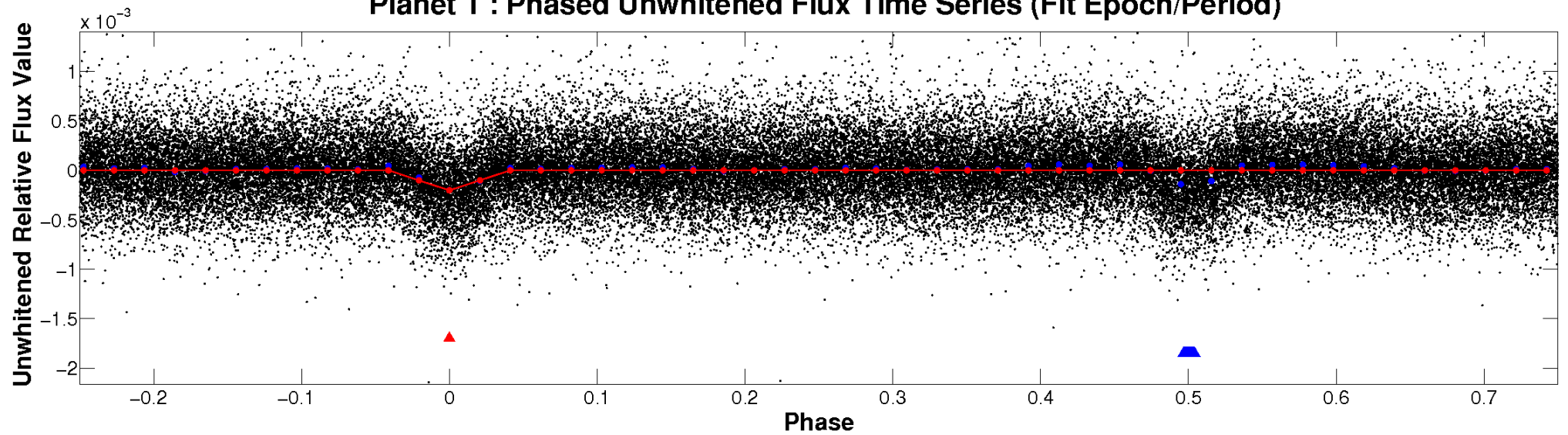
ALT Odd/Even

TCE 012115188-01

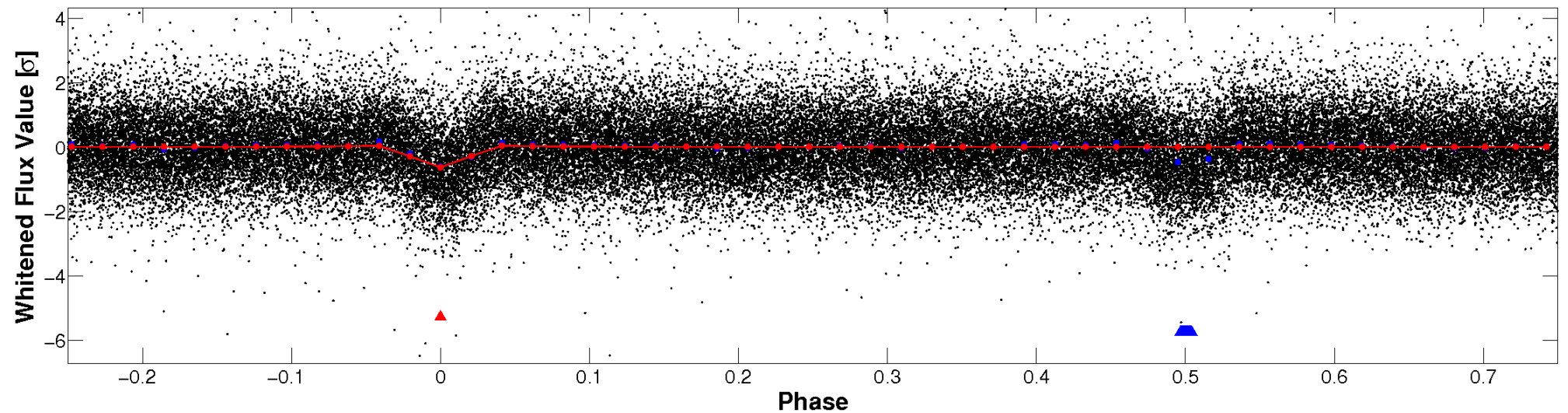


Non-Whitened Vs. Whitened Light Curve

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

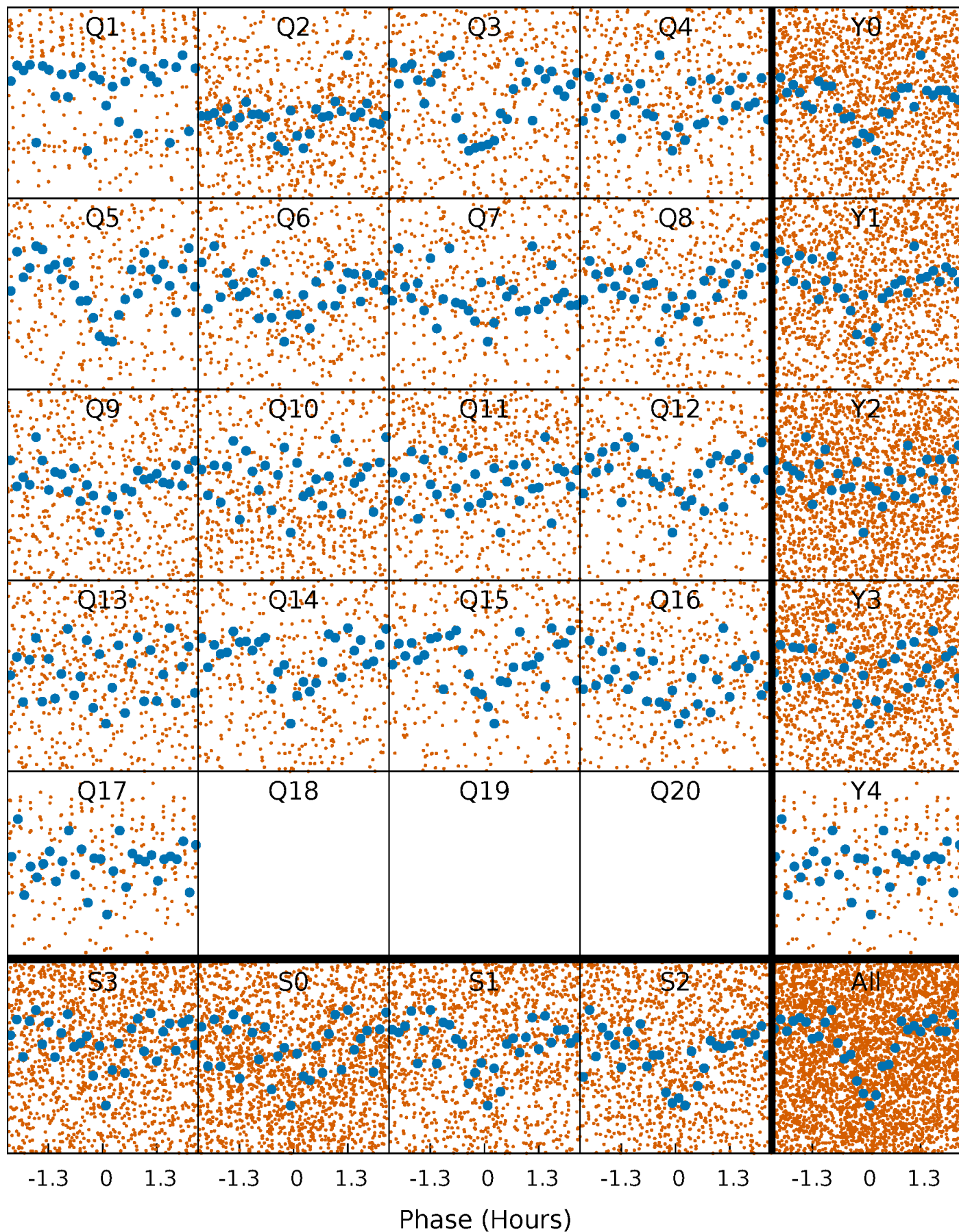


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



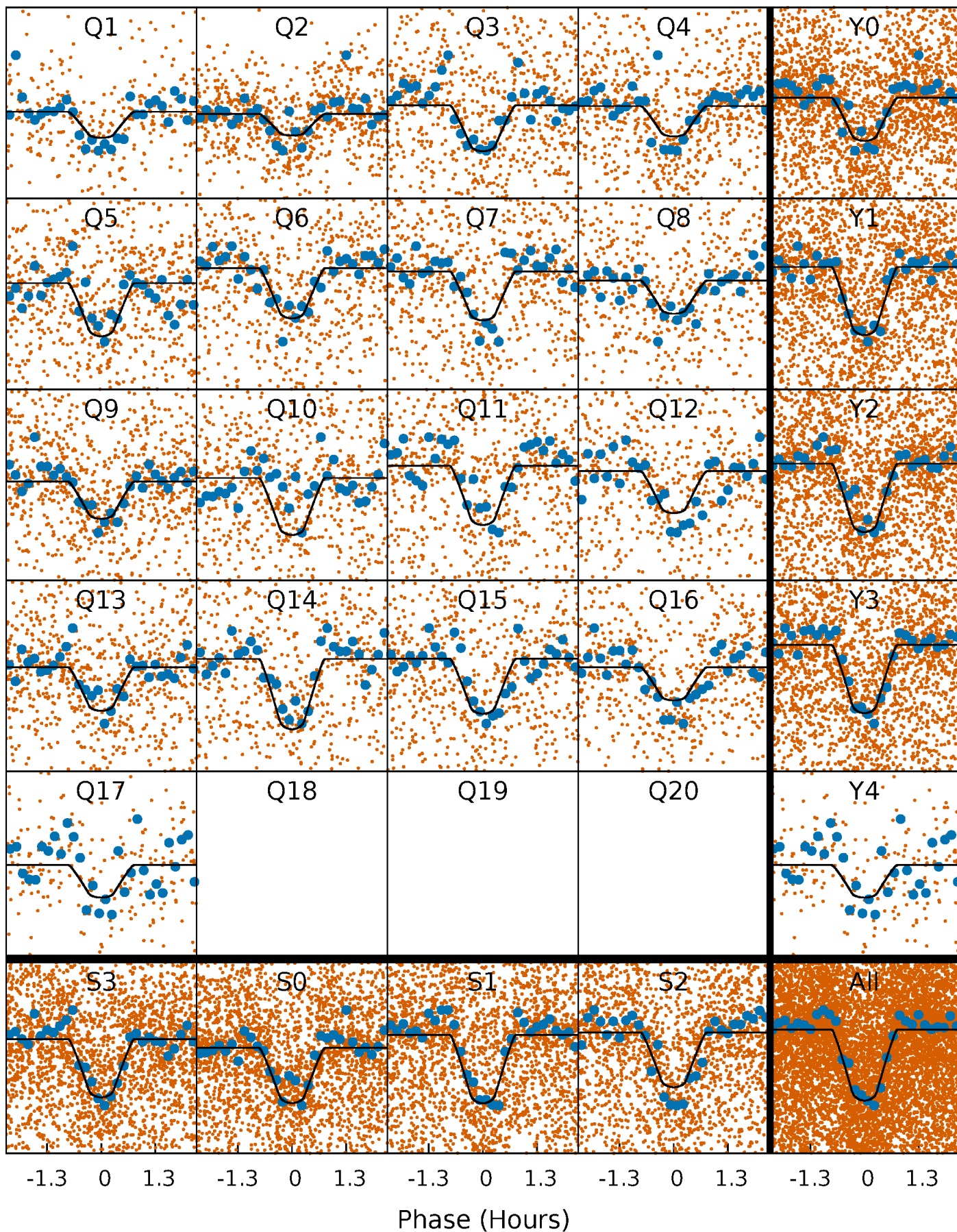
PDC Quarter-Phased Transit Curves

TCE 012115188-01 P= 0.990865 Days $T_0=131.974609$ (BKJD)



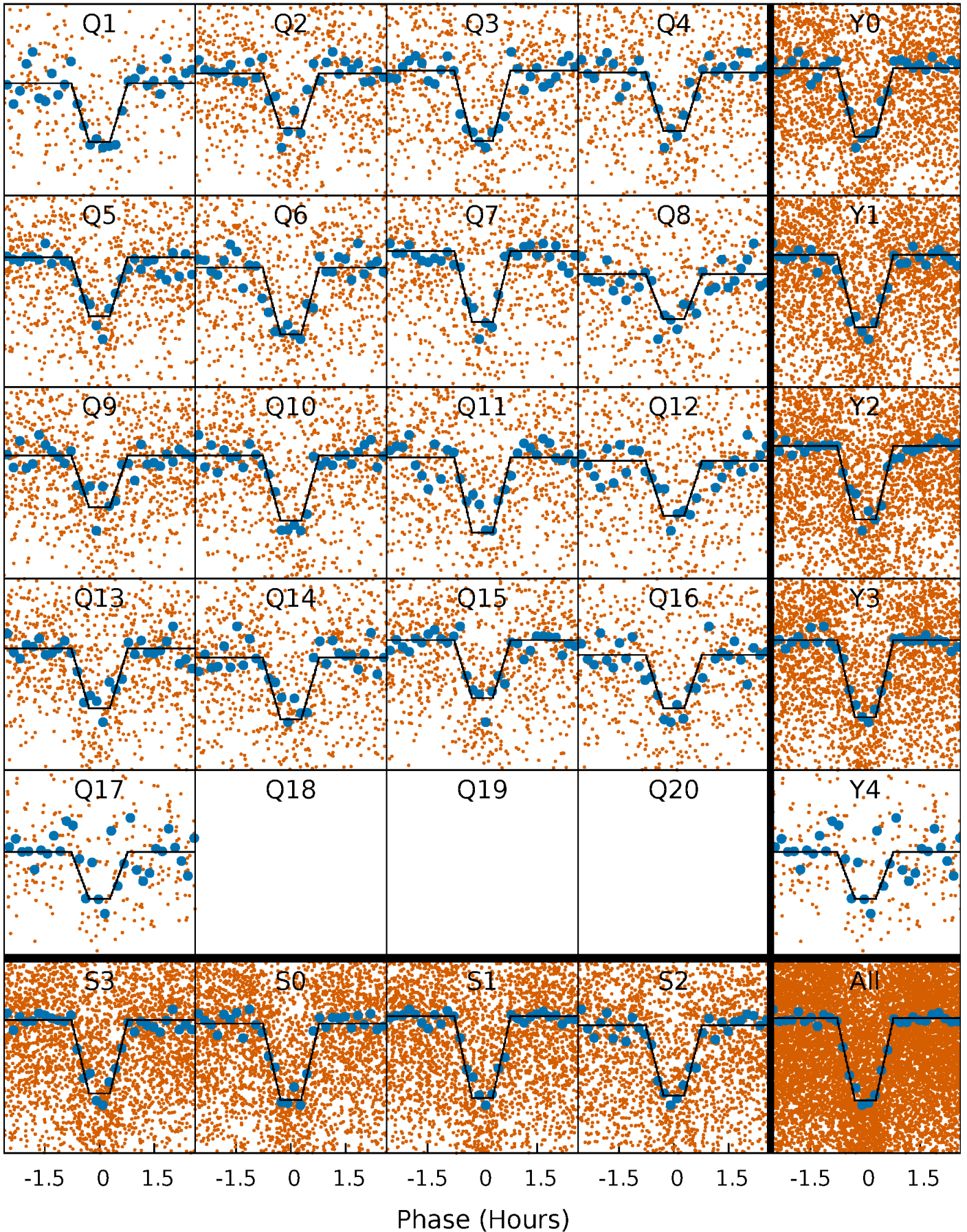
DV Quarter-Phased Transit Curves

TCE 012115188-01 P= 0.990865 Days $T_0=131.974609$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

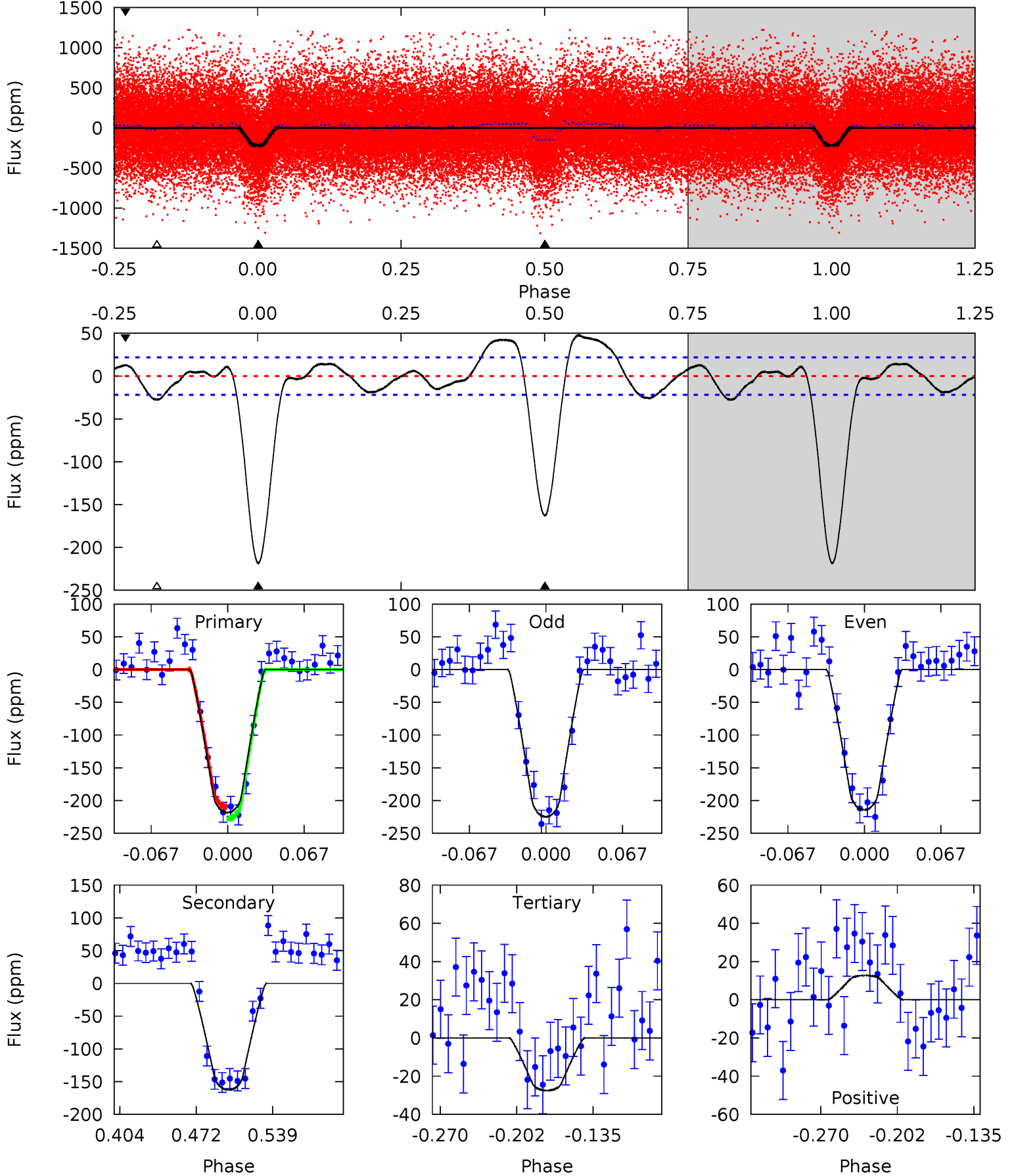
TCE 012115188-01 P= 0.990867 Days $T_0=131.973708$ (BKJD)



DV Model-Shift Uniqueness Test

012115188-01, P = 0.990865 Days, E = 130.983744 Days

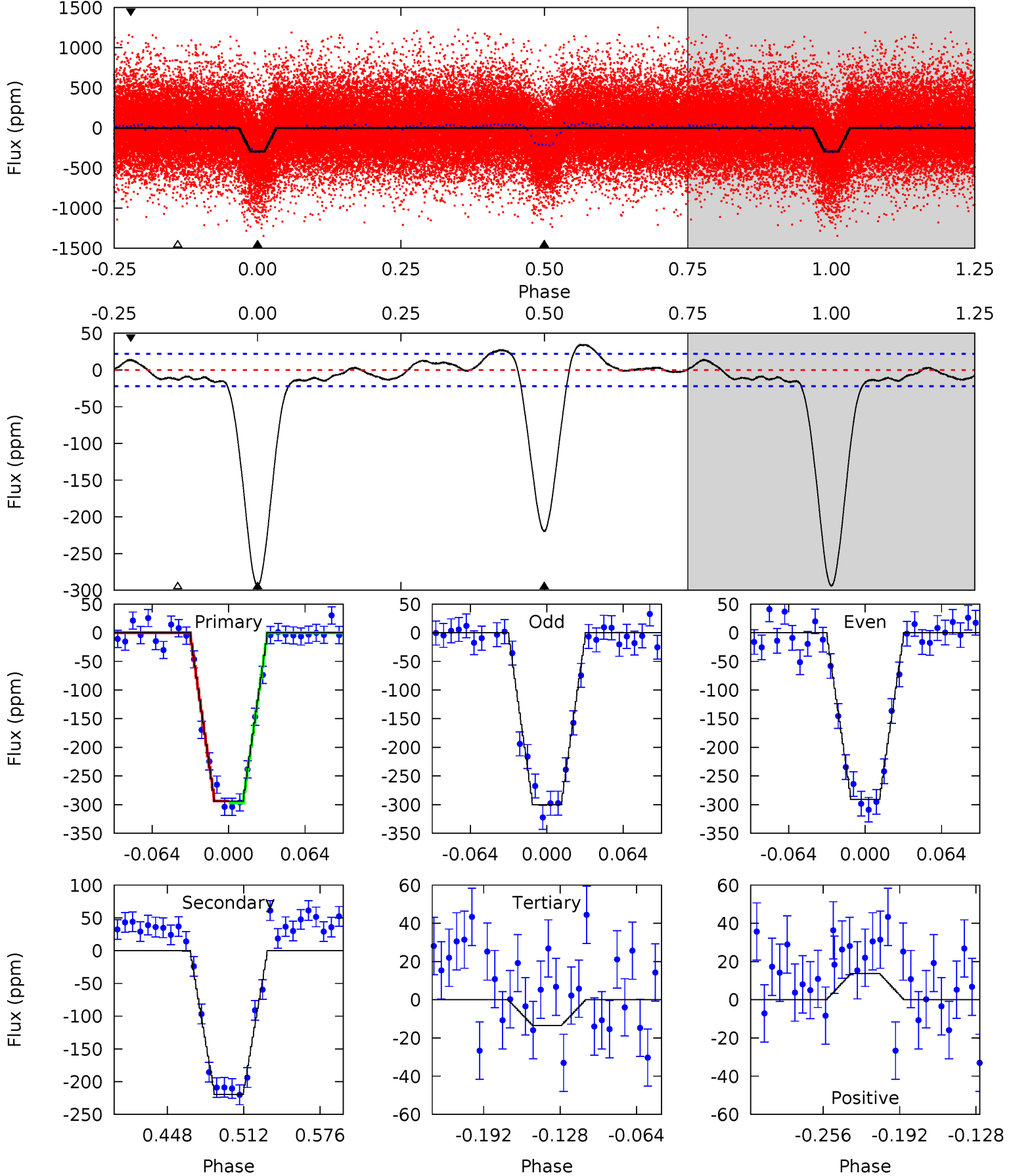
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
46.6	34.7	5.86	2.71	4.65	1.83	3.88	40.7	43.8	28.8	31.9	1.13	0.98	0.18	1.94



Alt Model-Shift Uniqueness Test

012115188-01, P = 0.990867 Days, E = 130.982841 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.0	46.3	2.85	2.90	4.66	1.85	2.51	59.1	59.1	43.5	43.4	0.97	0.99	0.10	0.36



Stellar Parameters For KIC 012115188

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5529^{+166}_{-150}	$4.471^{+0.062}_{-0.175}$	$0.140^{+0.250}_{-0.300}$	$0.936^{+0.235}_{-0.101}$	$0.945^{+0.092}_{-0.084}$	$1.621^{+0.519}_{-0.775}$
	+3%/-3%	+1%/-4%	+179%/-214%	+25%/-11%	+10%/-9%	+32%/-48%
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 012115188-01 / KOI 2396.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-163 ± 5	$1.69^{+0.50}_{-0.46}$	2430^{+146}_{-116}	4998^{+744}_{-496}	11^{+10}_{-5}
Alt.	-220 ± 5	$1.81^{+0.53}_{-0.42}$	2426^{+164}_{-105}	5146^{+729}_{-490}	13^{+10}_{-6}

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 $A_{obs} \gg 1.0$

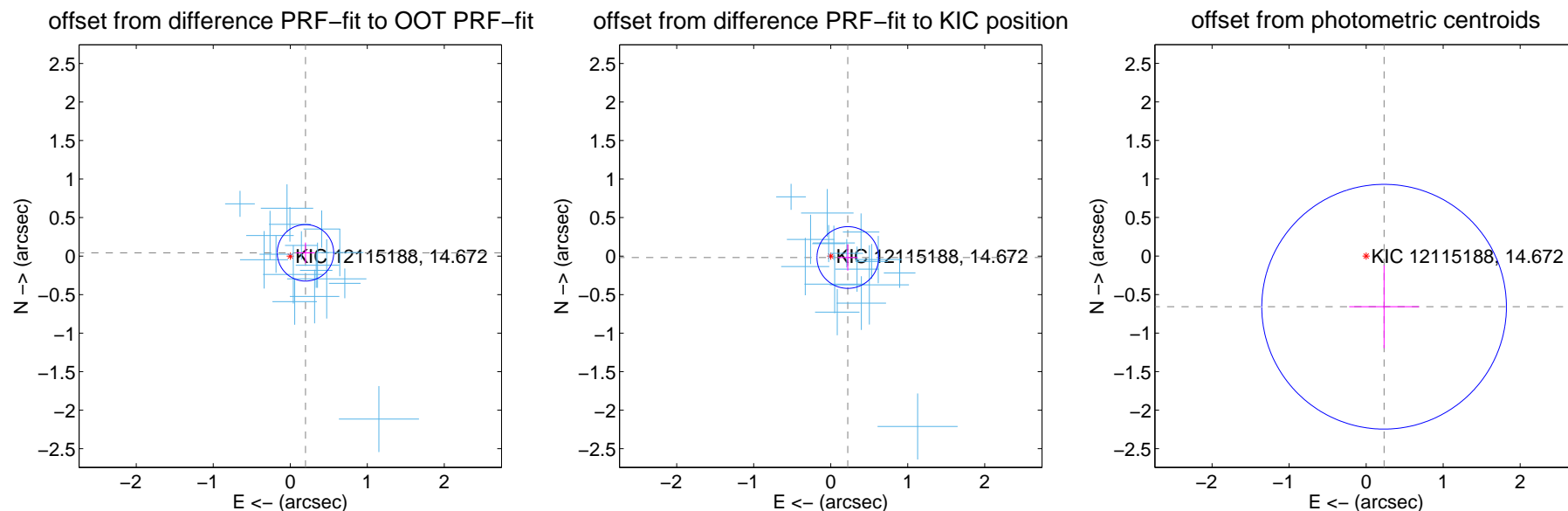
DV Centroid Data

Supplemental centroid analysis for 012115188-01. Kepler magnitude: 14.67. Transit SNR 28.04

There are 17 quarters with good PRF difference image offsets

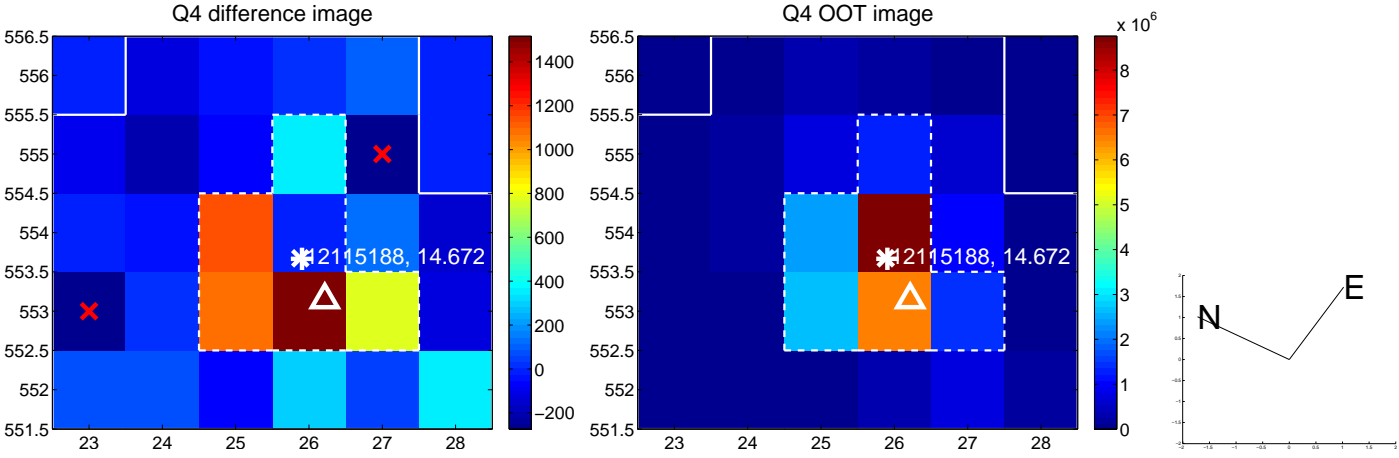
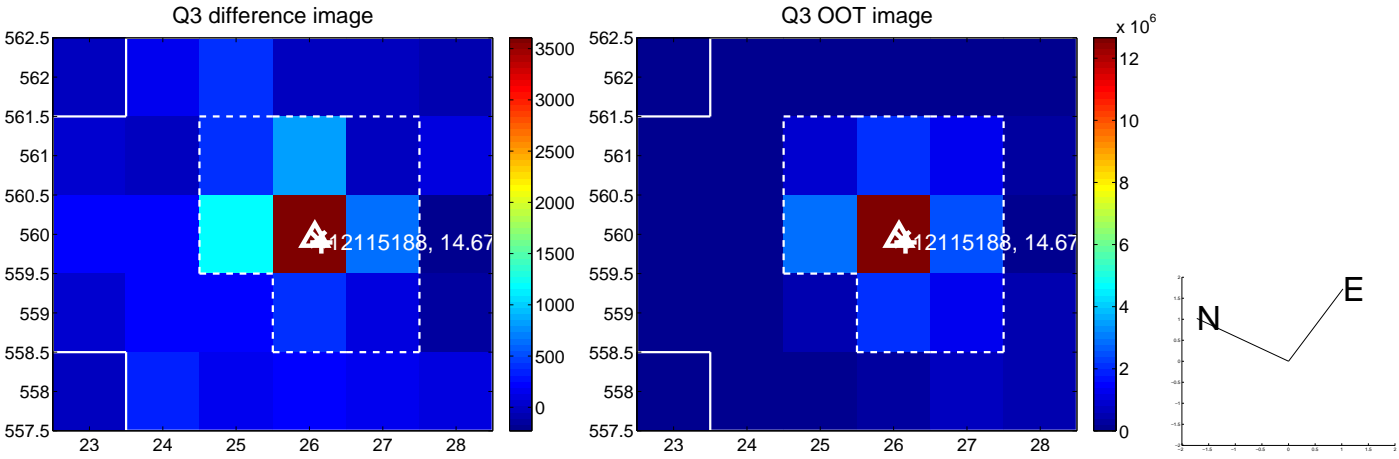
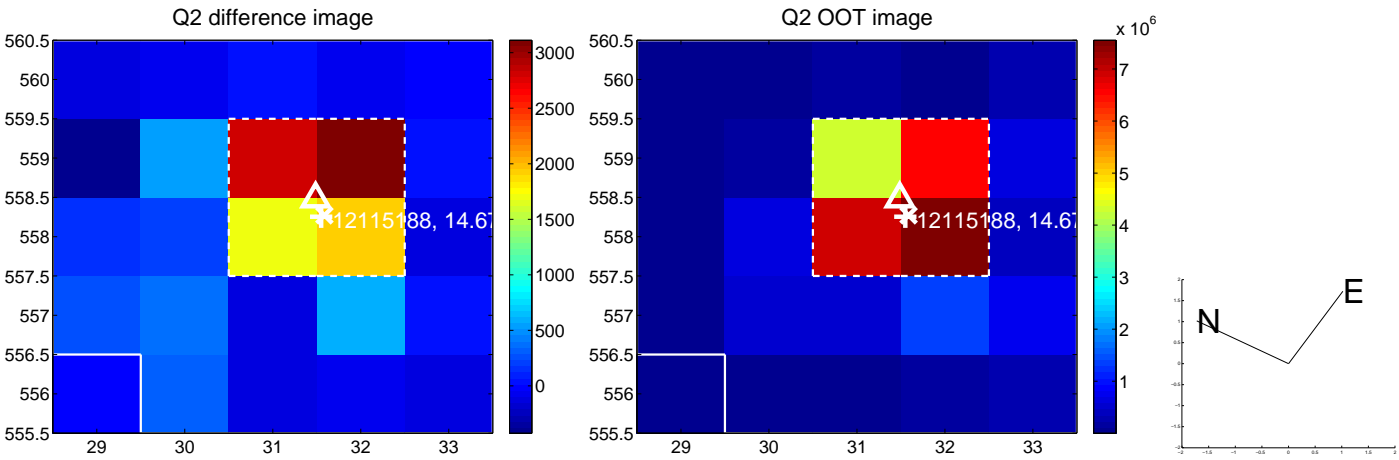
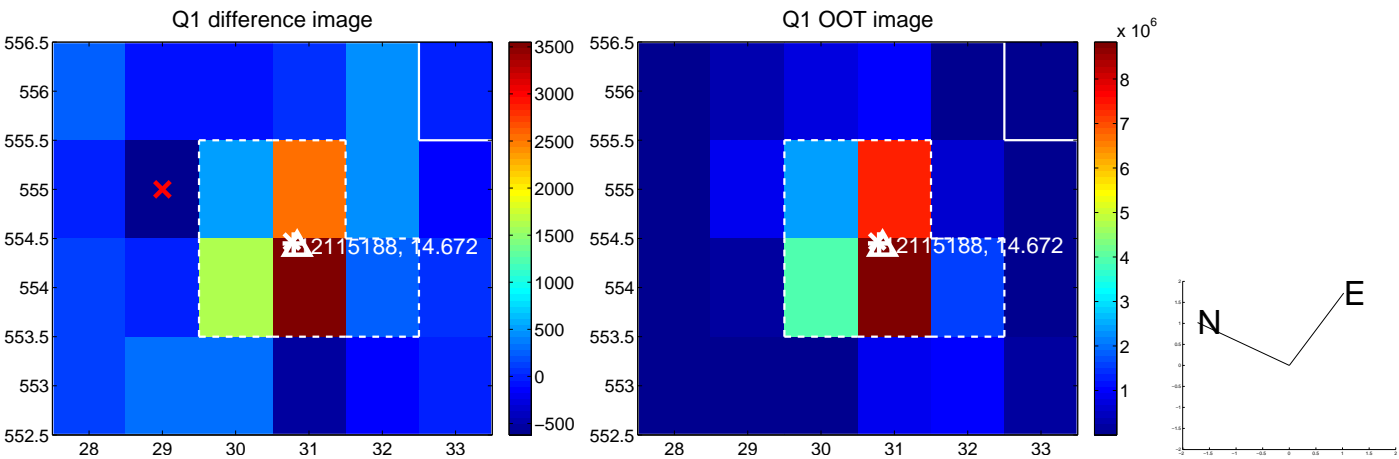
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.202 ± 0.122	1.65	-0.197 ± 0.122	0.042 ± 0.133
PRF-fit source offset from KIC position	0.223 ± 0.134	1.67	-0.222 ± 0.126	-0.018 ± 0.171
photometric centroid source offset	0.70 ± 0.53	1.32	-0.23 ± 0.45	-0.66 ± 0.54

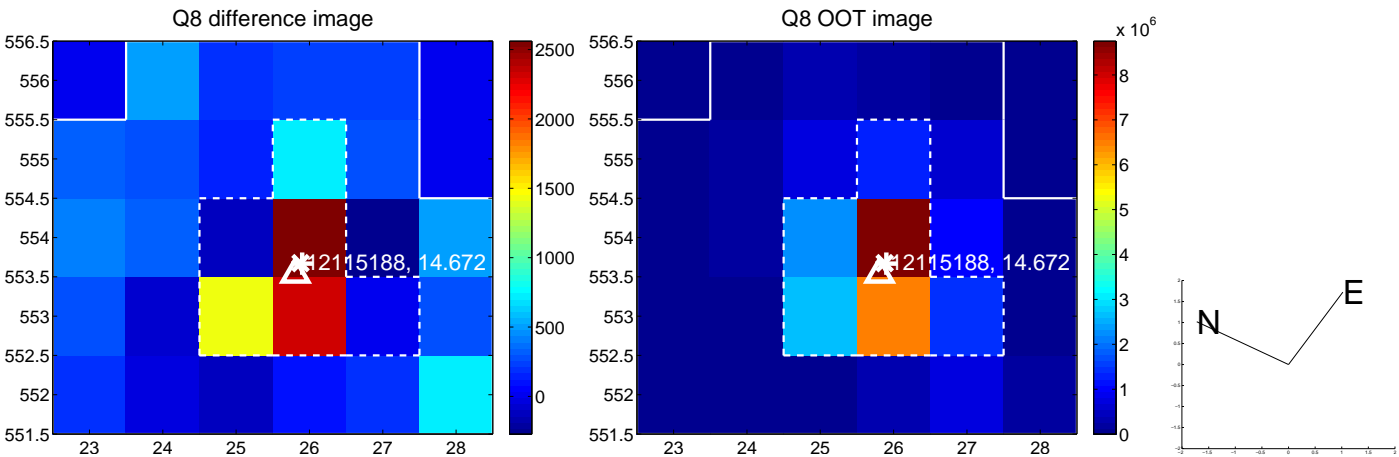
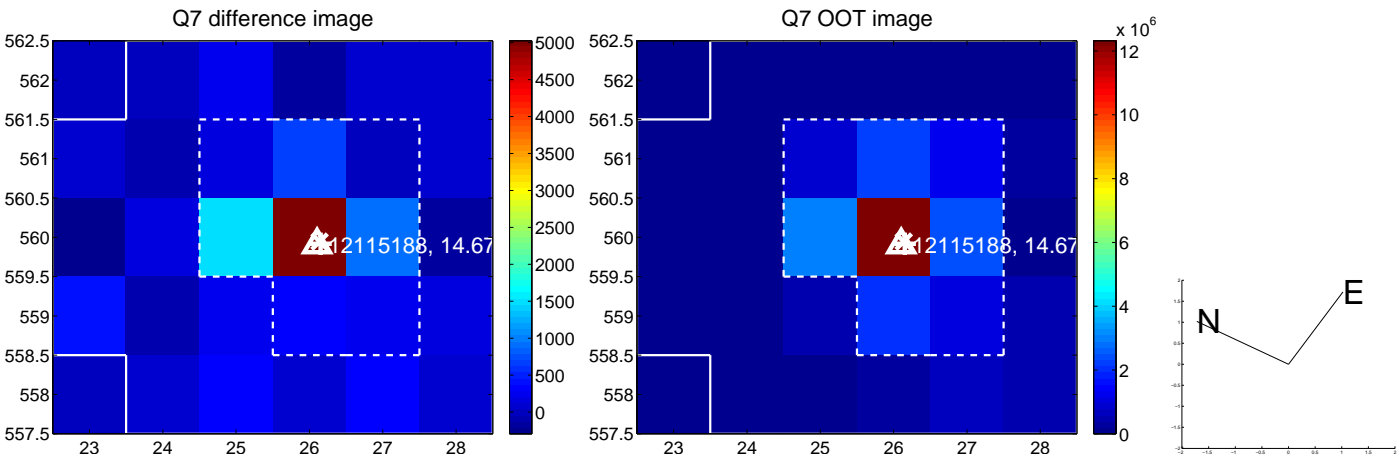
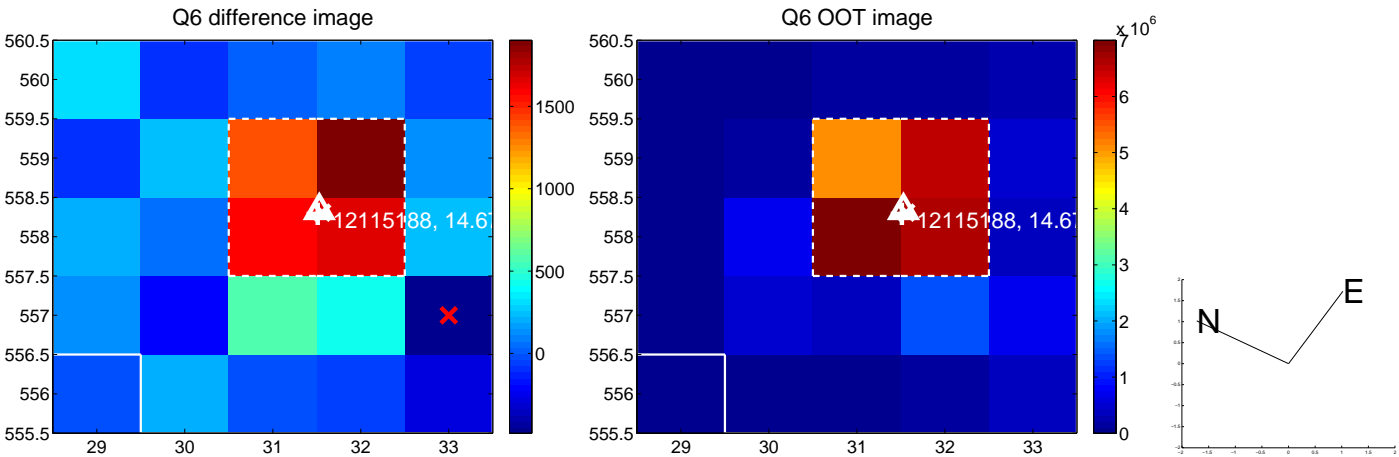
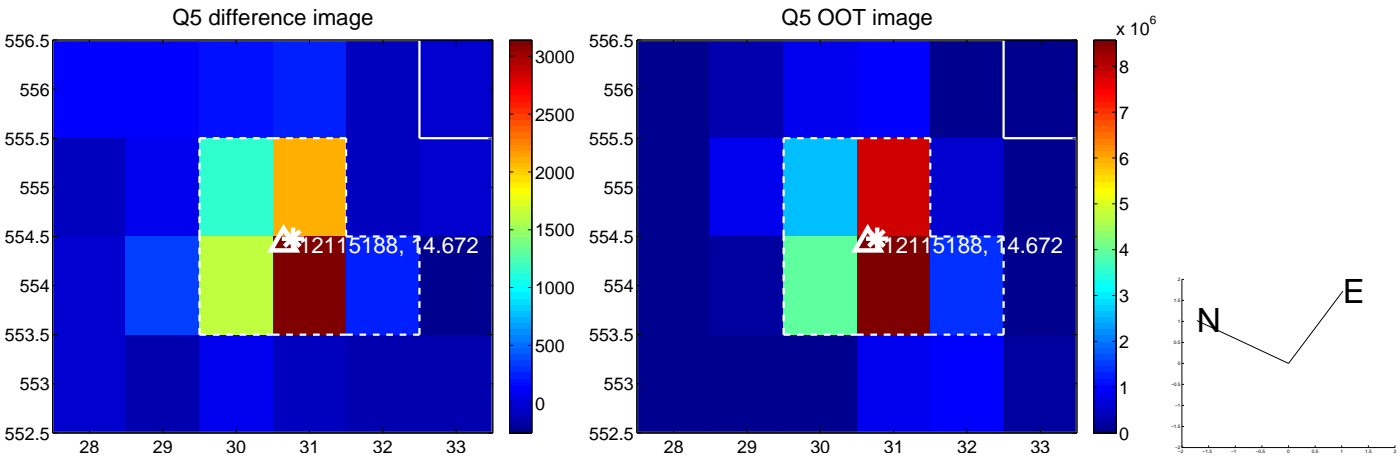


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

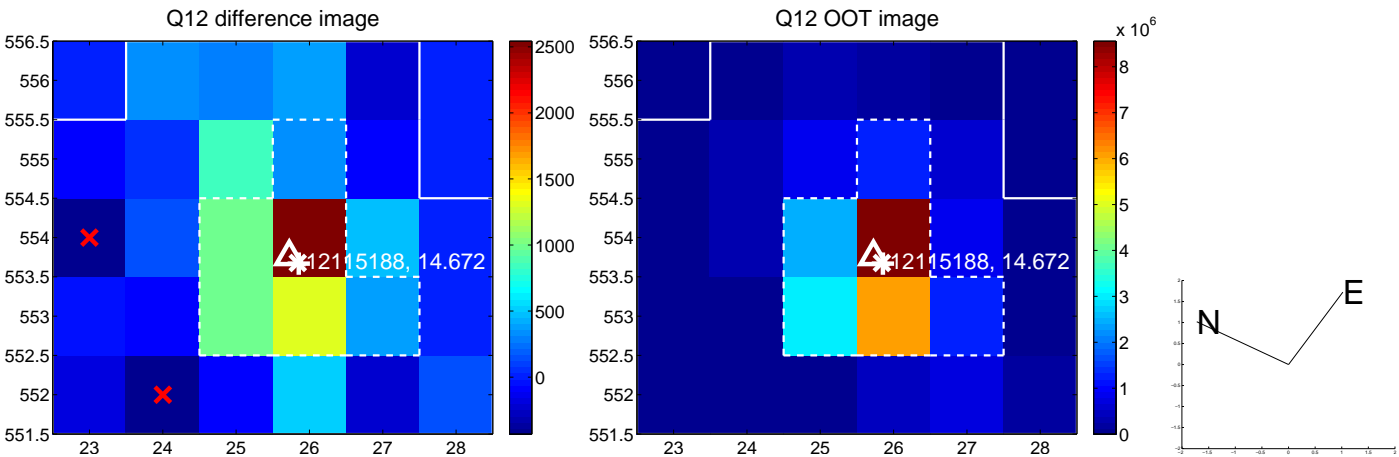
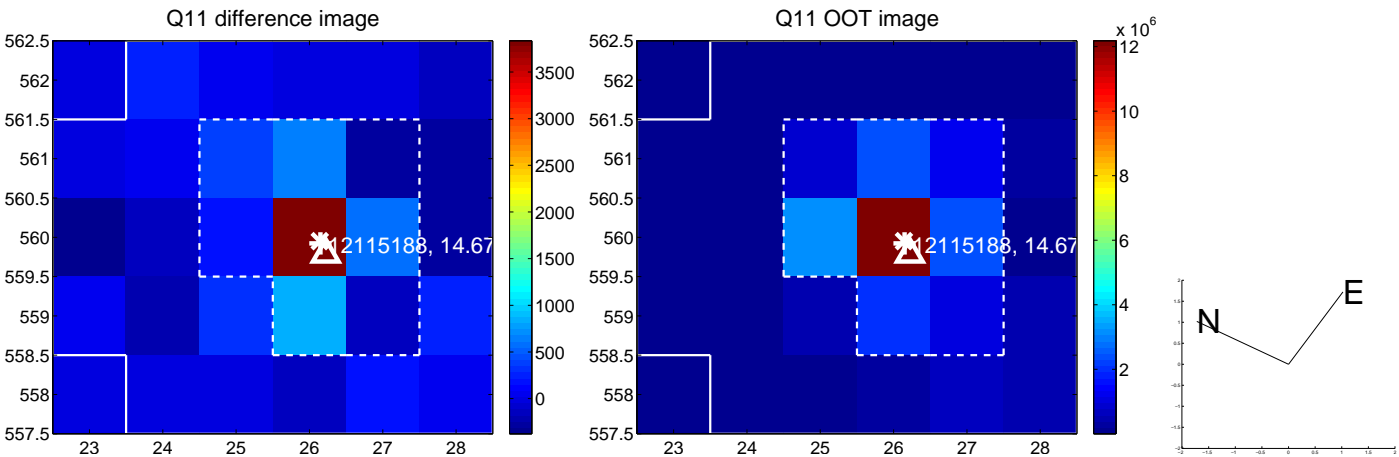
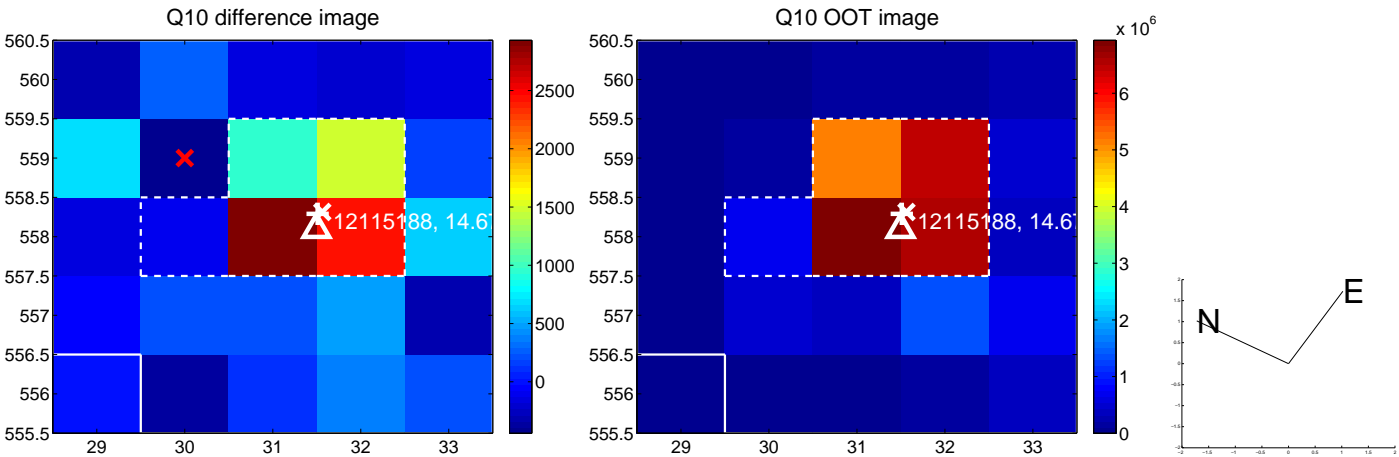
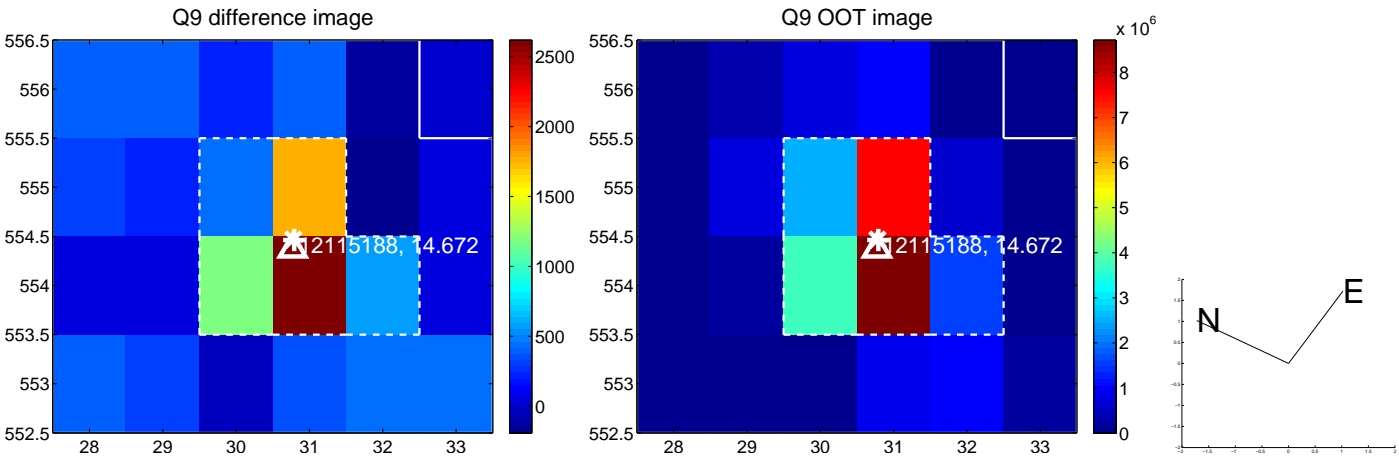
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



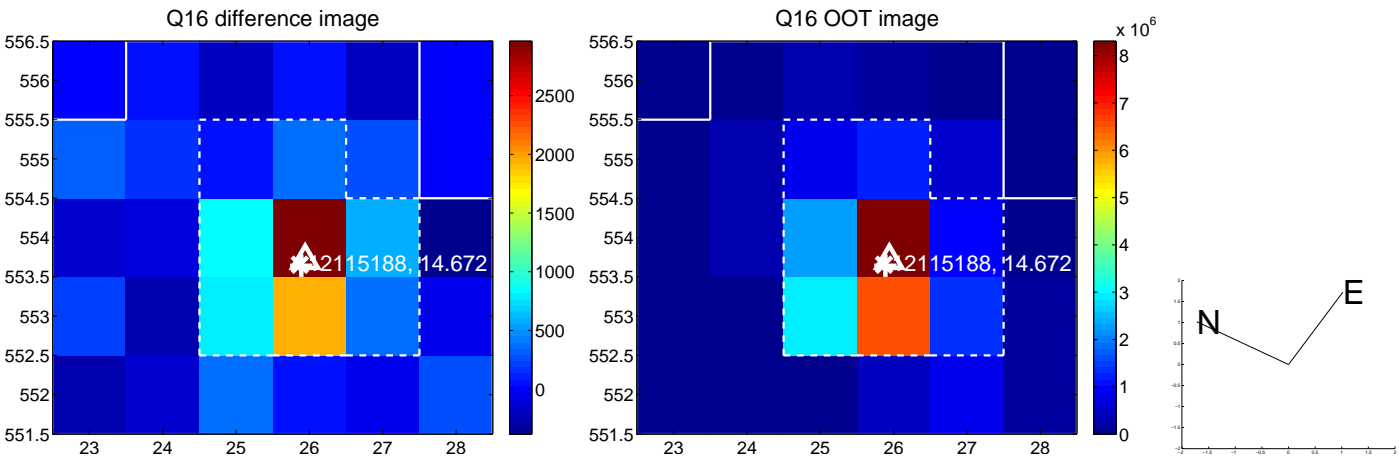
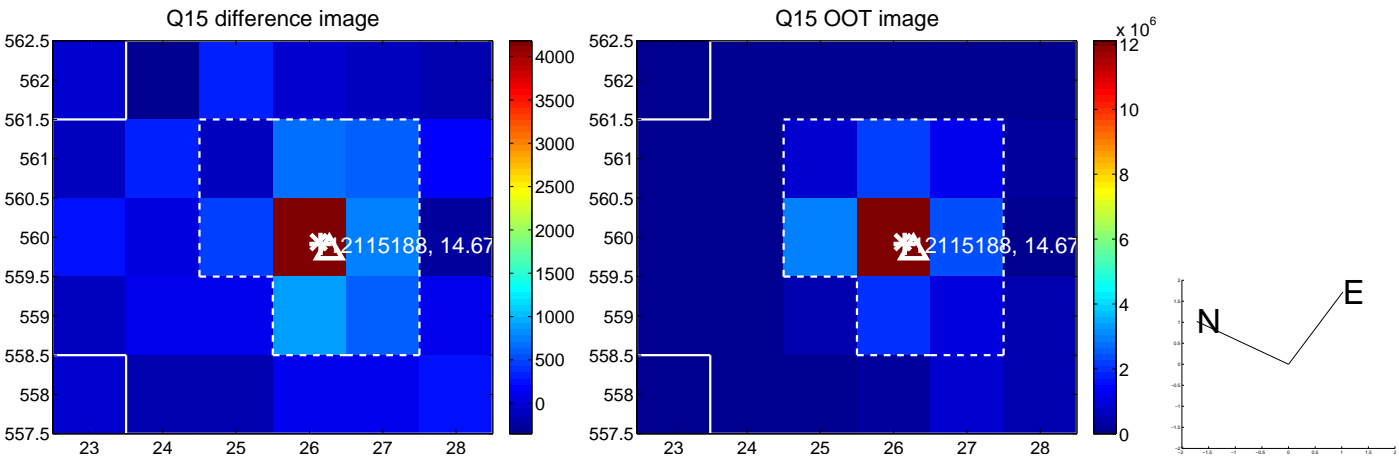
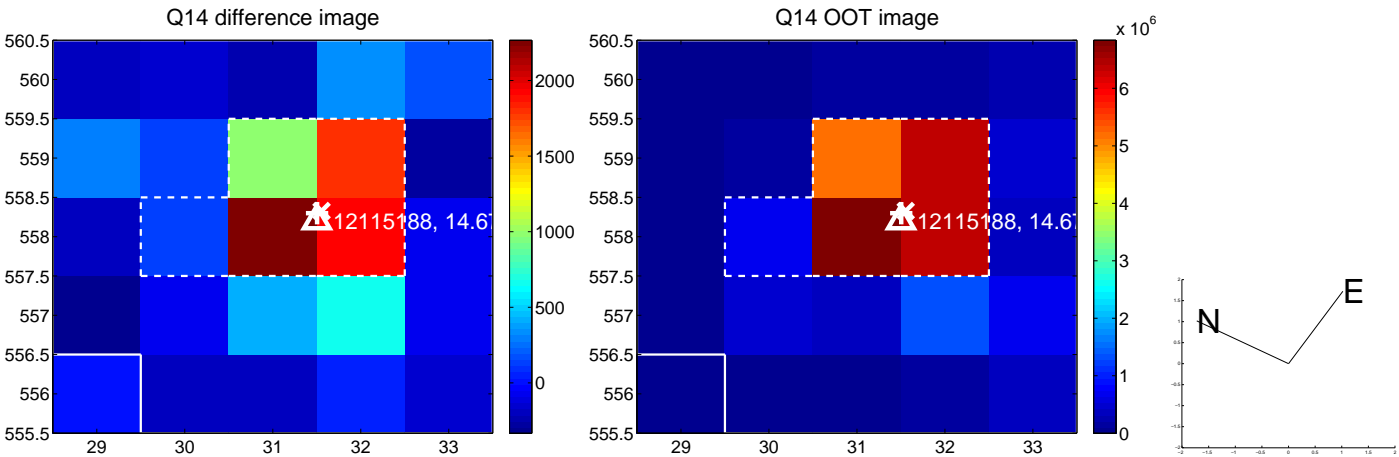
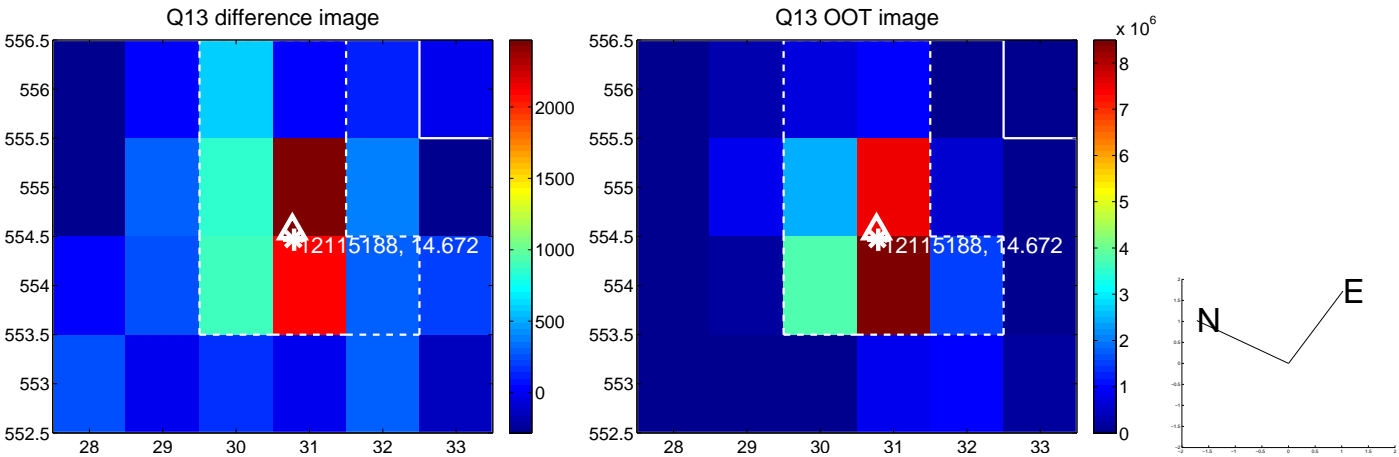
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



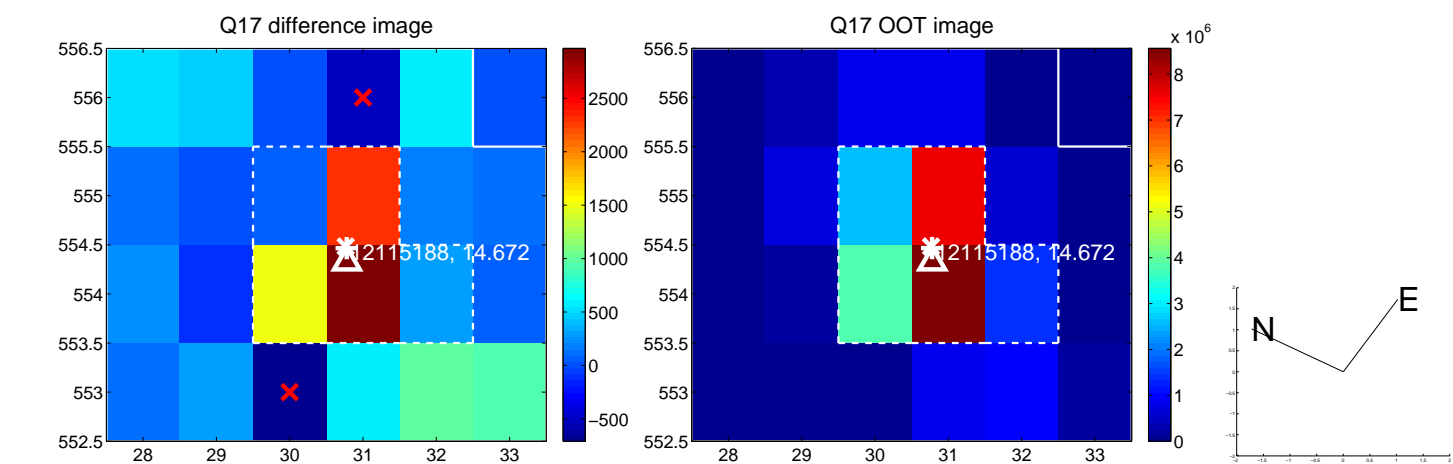
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



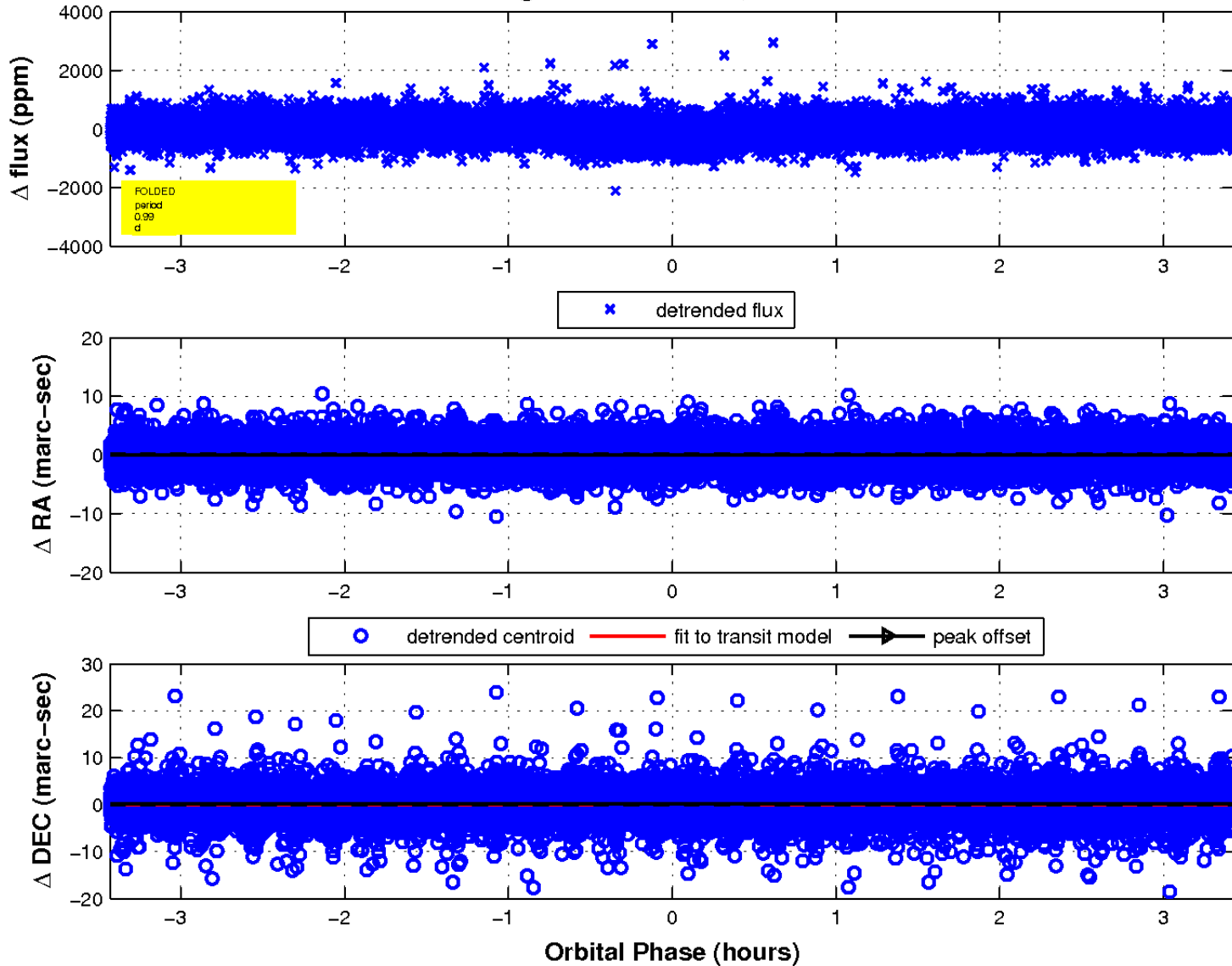
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

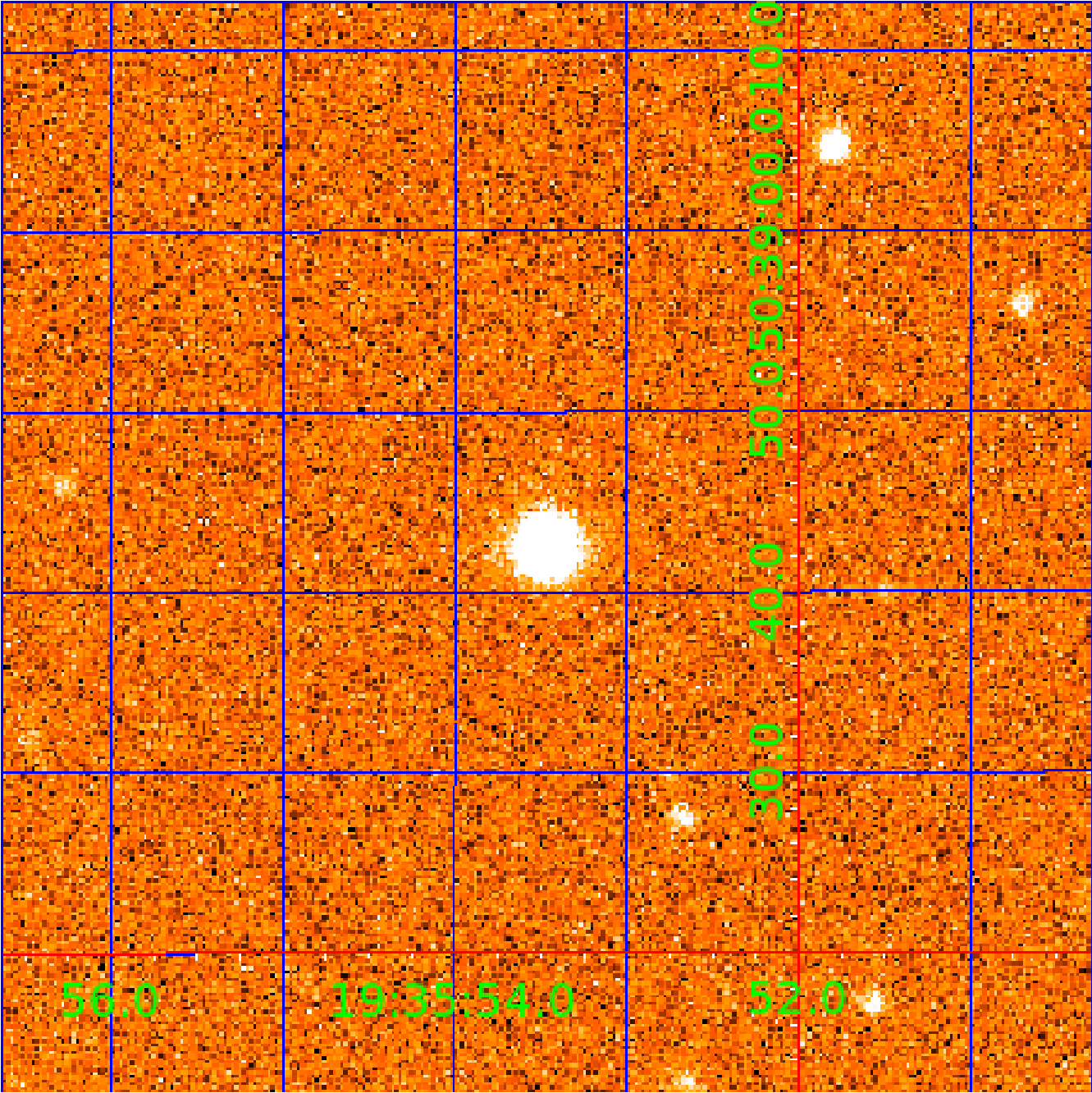


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 012115188

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})
012115188-01	OBS	2396.01	0.990865	131.974609	207.1	1.144	22.2	28.0	0.94	5529	1.63	2012.08
012115188-02	OBS	No	0.990870	132.466741	189.2	1.208	21.5	27.2	0.94	5529	1.43	2012.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012115188-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
012115188-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 012115188-02

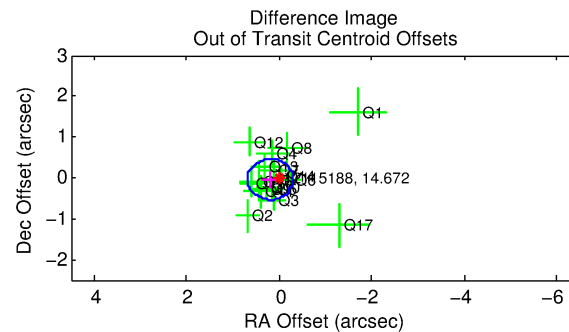
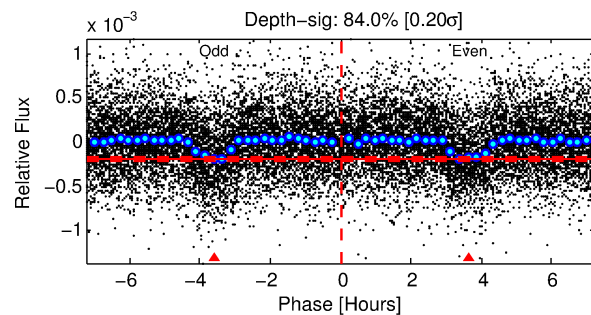
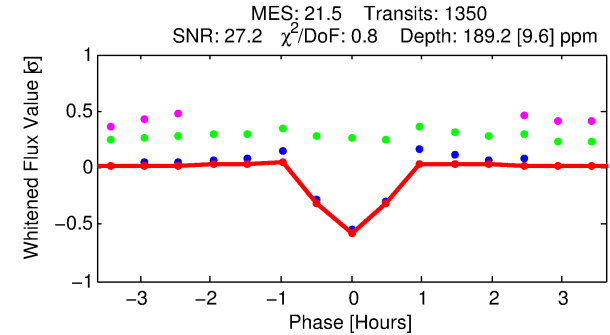
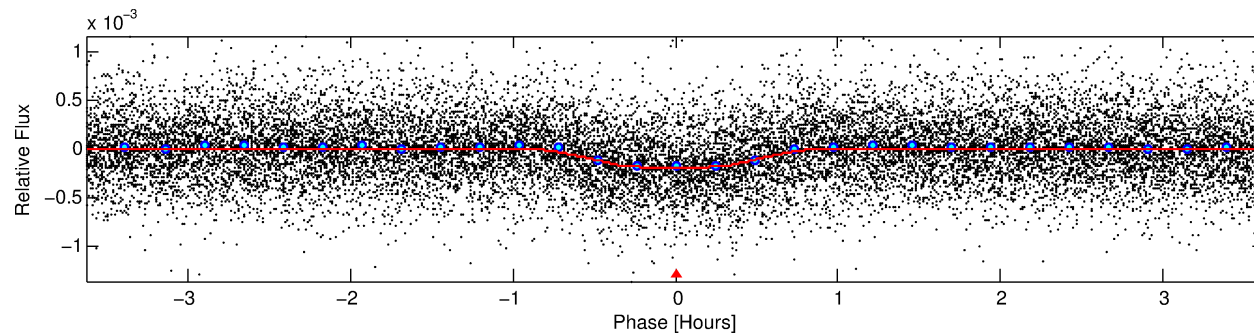
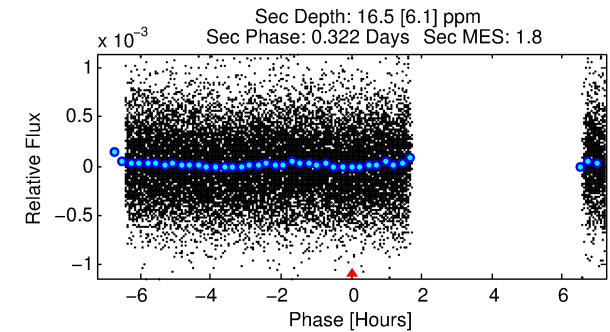
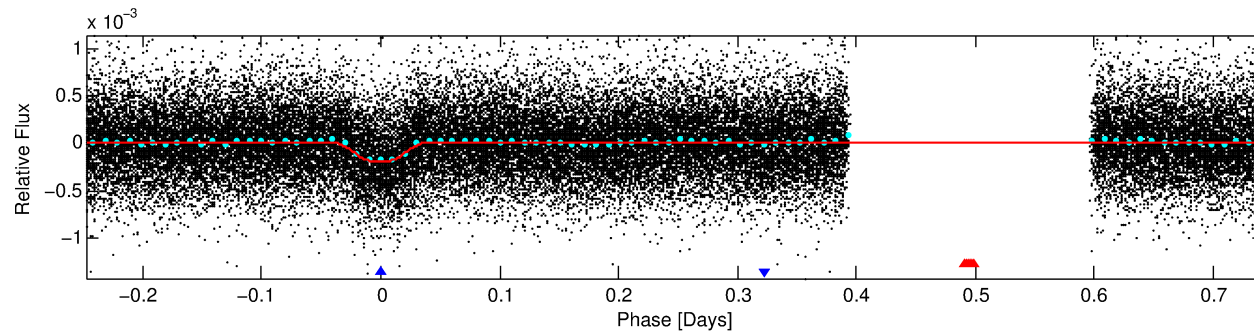
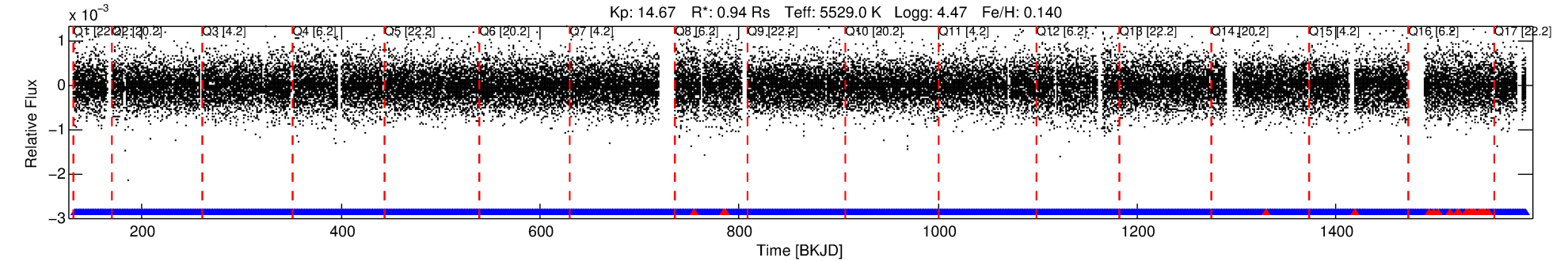
No Significant Match Found

DV One-Page Summary

KIC: 12115188 Candidate: 2 of 2 Period: 0.991 d

KOI: K02396 Corr: No Ephemeris Match

Kp: 14.67 R*: 0.94 Rs Teff: 5529.0 K Logg: 4.47 Fe/H: 0.140



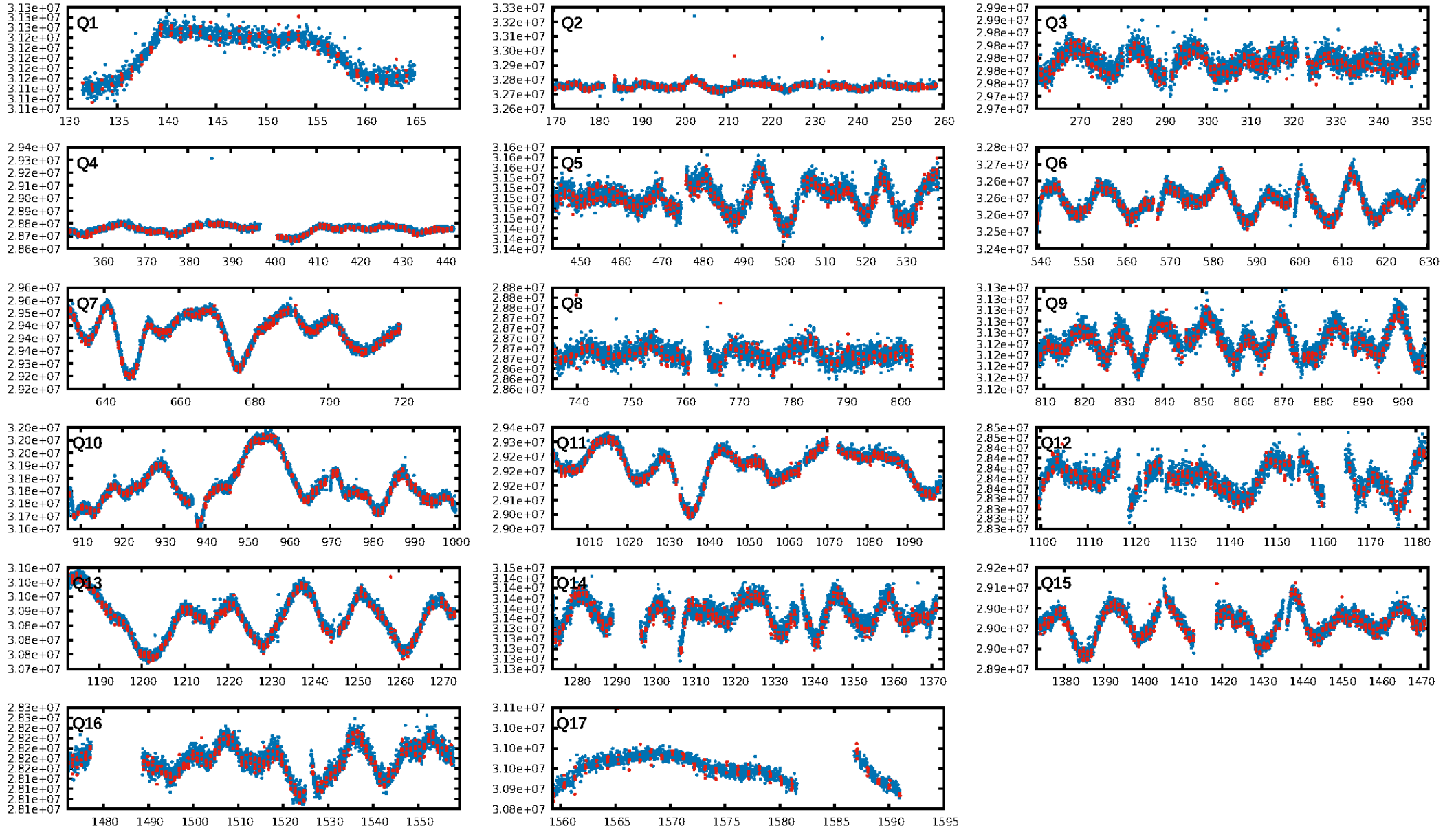
DV Fit Results:

Period = 0.99087 [0.00000] d
Epoch = 132.4667 [0.0007] BKJD
Rp/R* = 0.0140 [0.0030]
a/R* = 4.17 [3.46]
b = 0.78 [0.46]
Seff = 2012.07 [681.15]
Teff = 1708 [145] K
Rp = 1.43 [0.47] Re
a = 0.0191 [0.0041] AU
Ag = 1.63 [1.06] [0.59σ]
Teffp = 2983 [434] K [2.79σ]

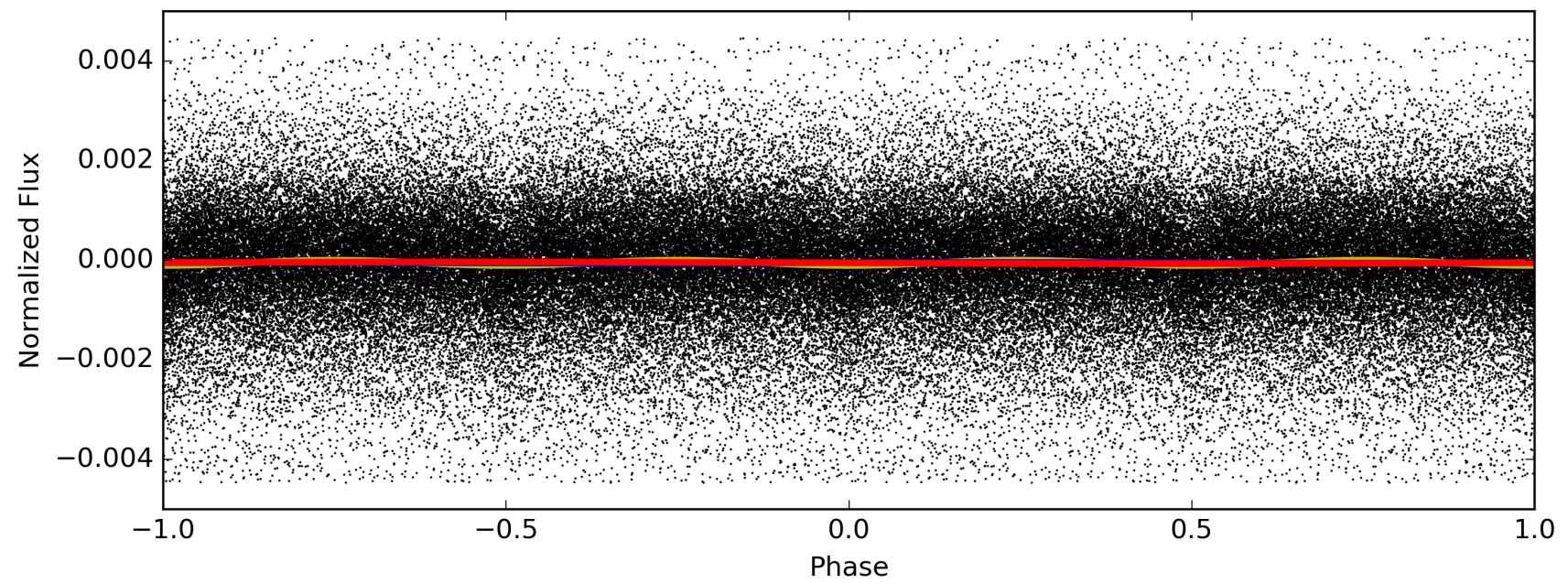
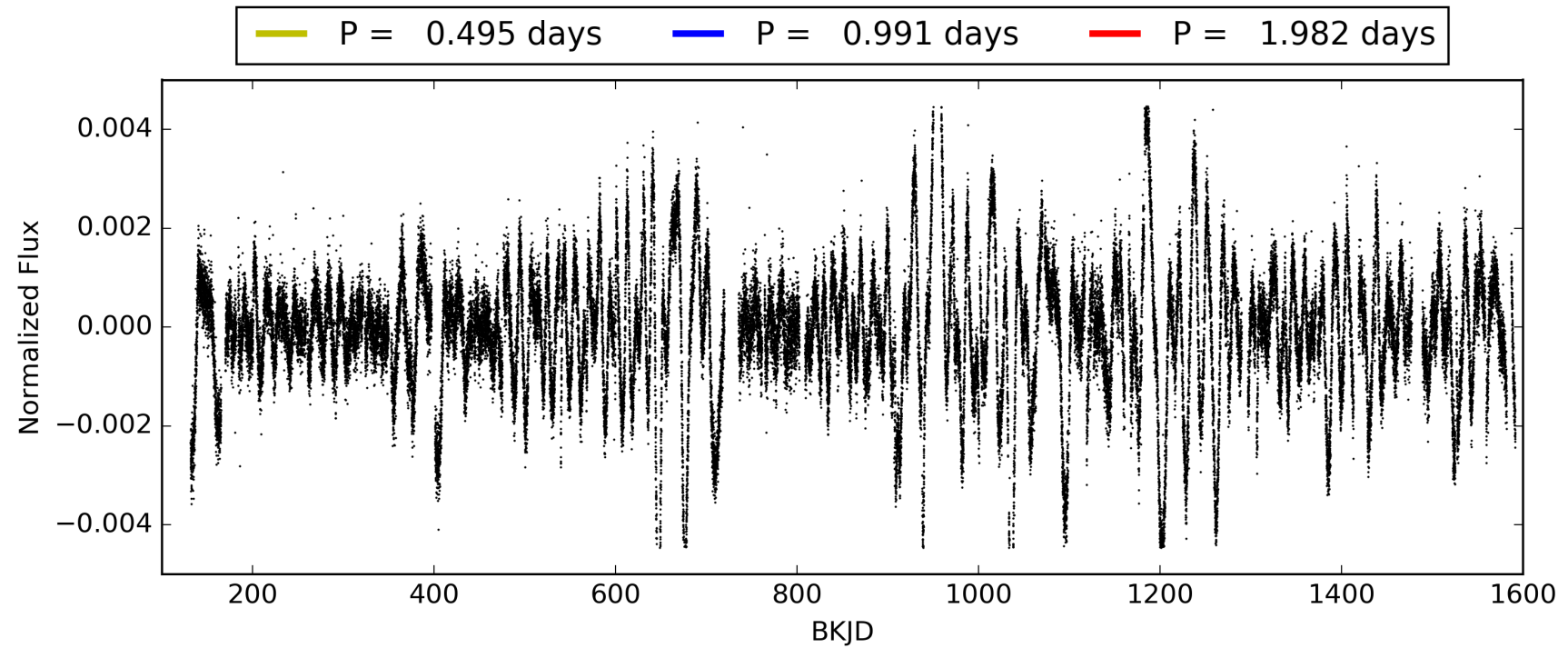
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.09e-92
RollingBand-fgt: 0.98 [1265/1288]
GhostDiagnostic-chr: 3.02
Centroid-sig: 19.9%
Centroid-so: 0.504 arcsec [0.90σ]
OotOffset-rm: 0.198 arcsec [1.20σ]
KicOffset-rm: 0.142 arcsec [0.83σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 012115188-02, PDC Light Curves

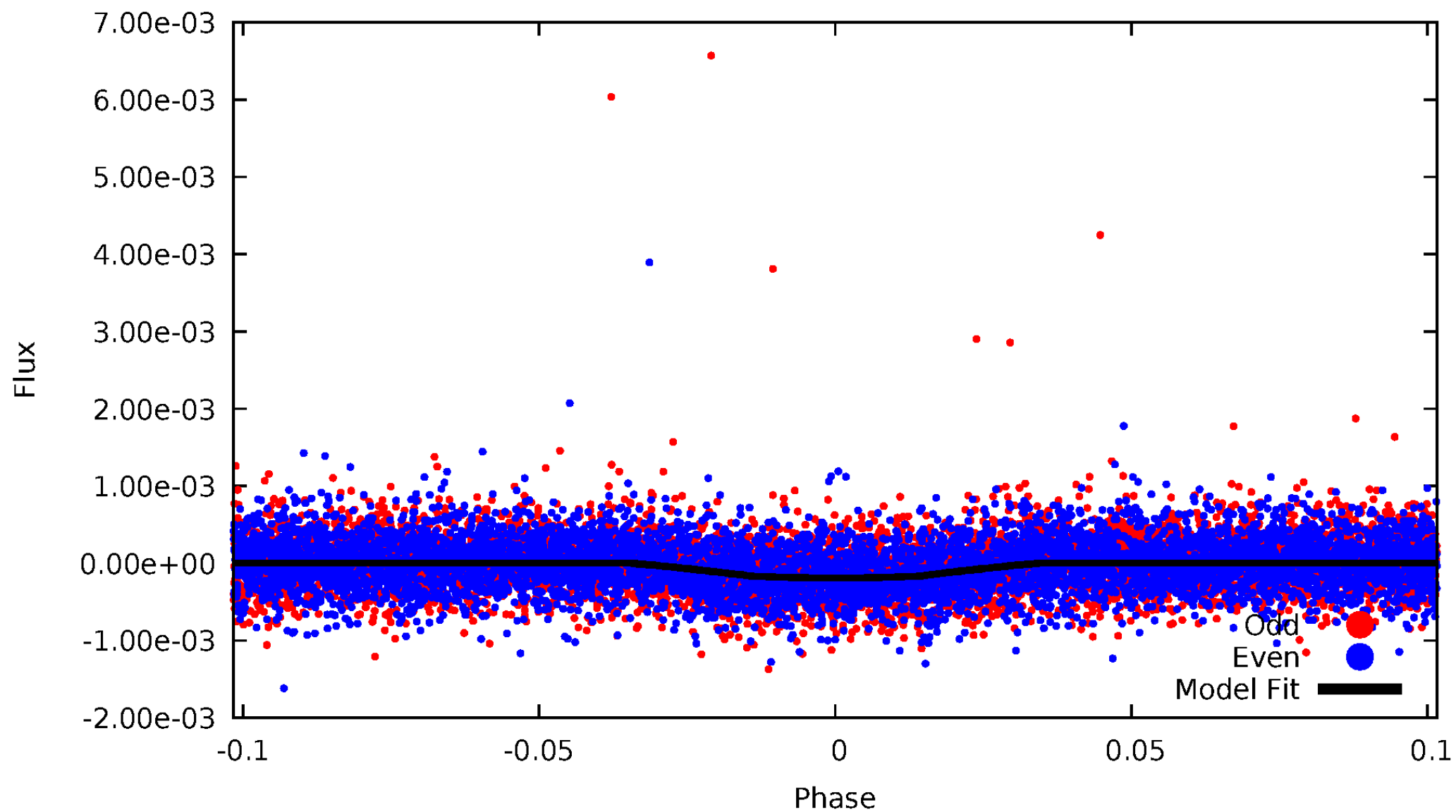


TCE 012115188-02



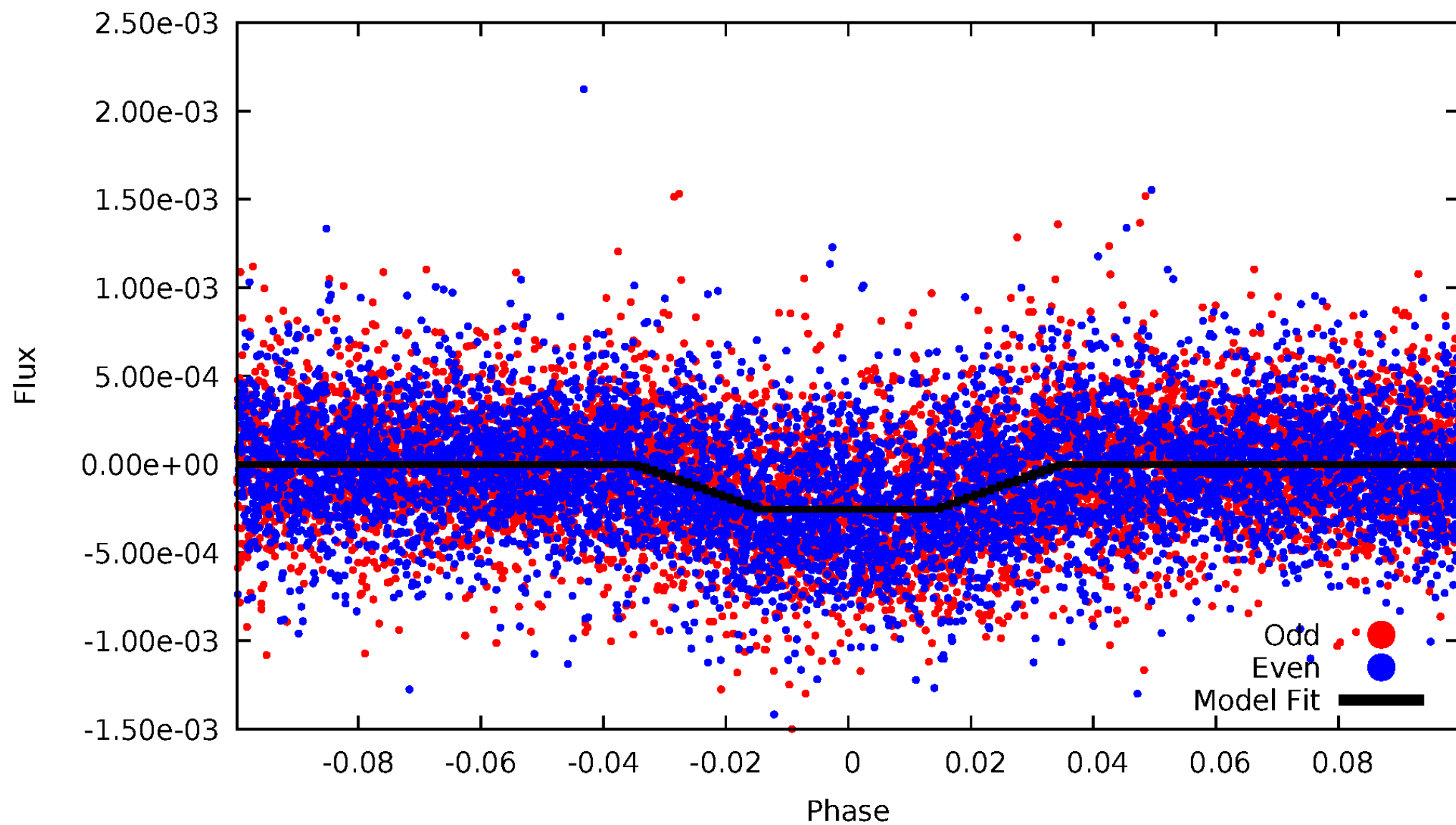
DV Odd/Even

TCE 012115188-02



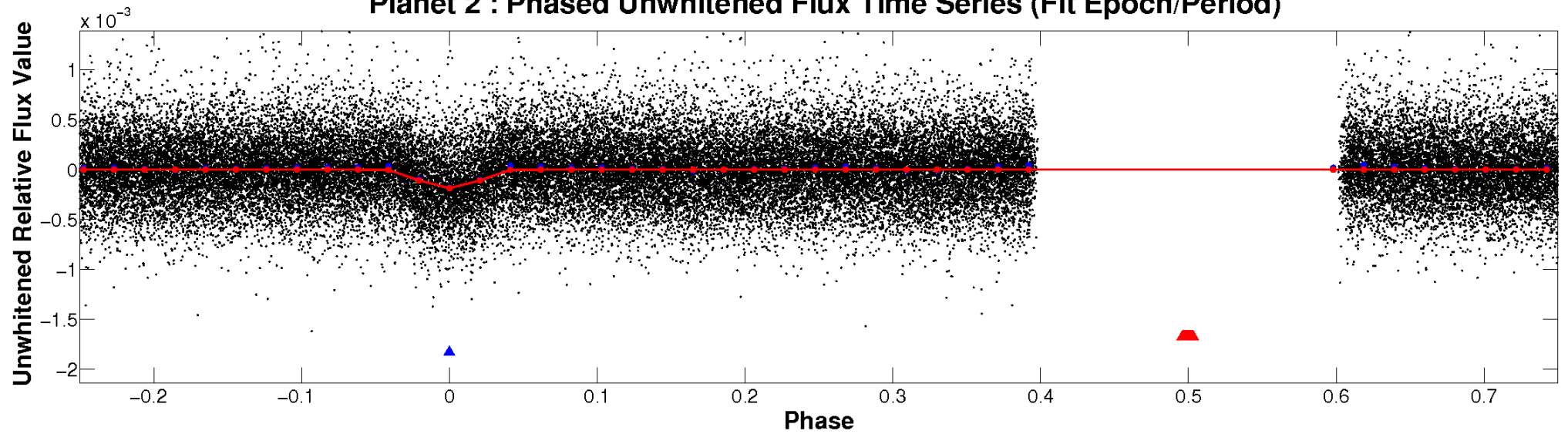
ALT Odd/Even

TCE 012115188-02

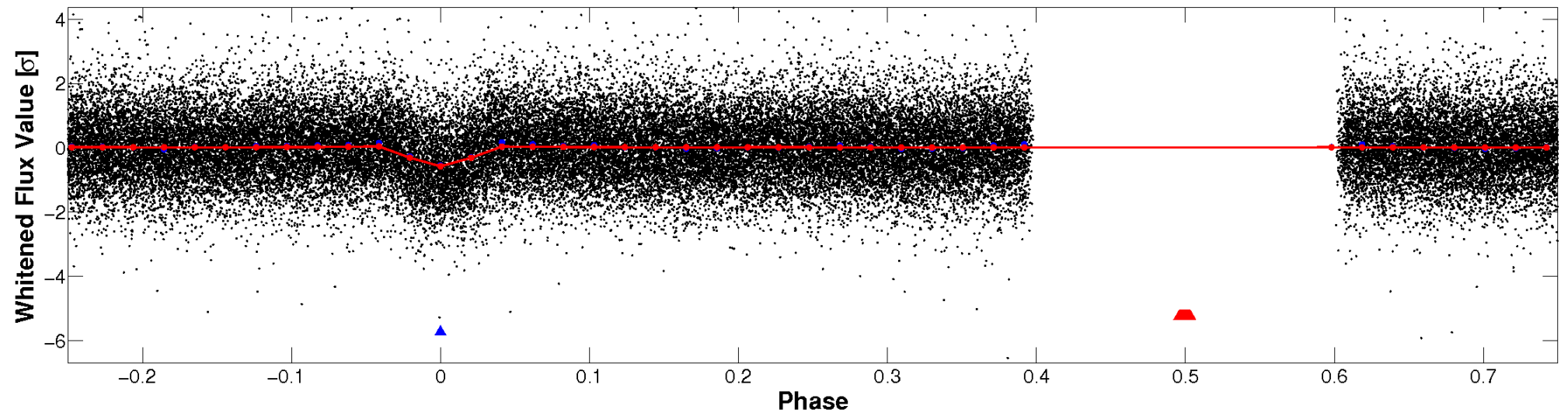


Non-Whitened Vs. Whitened Light Curve

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

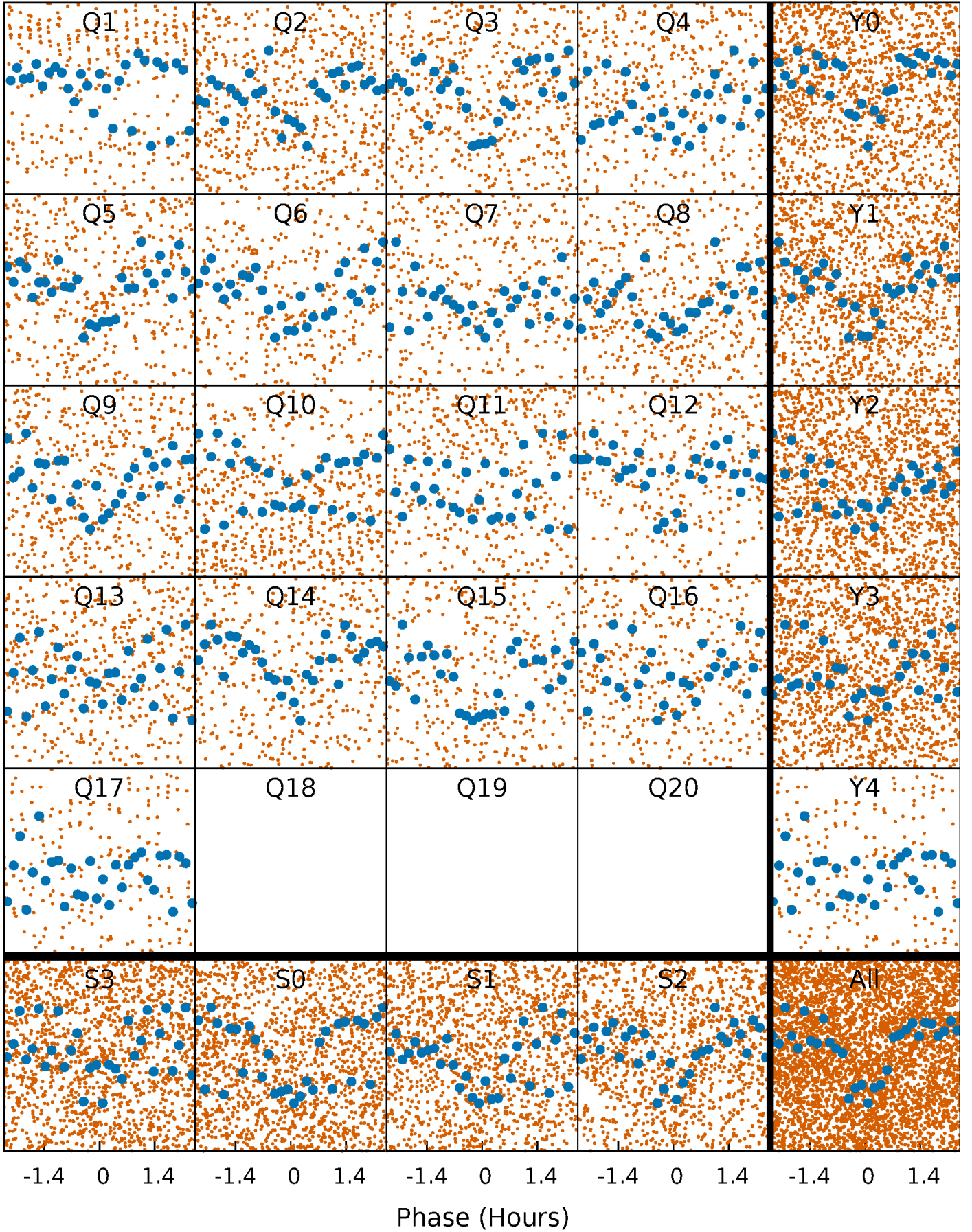


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



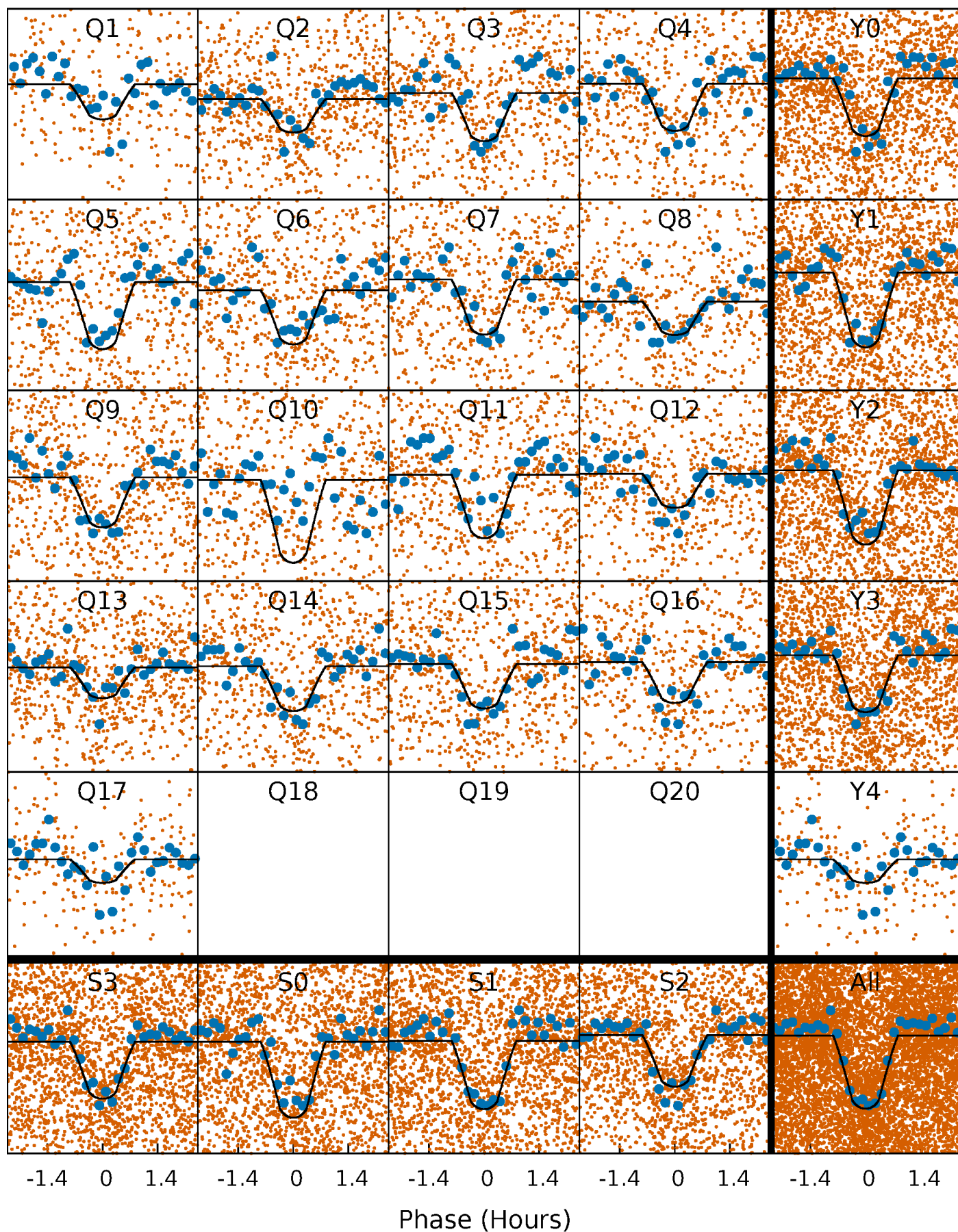
PDC Quarter-Phased Transit Curves

TCE 012115188-02 P= 0.990870 Days $T_0=132.466741$ (BKJD)



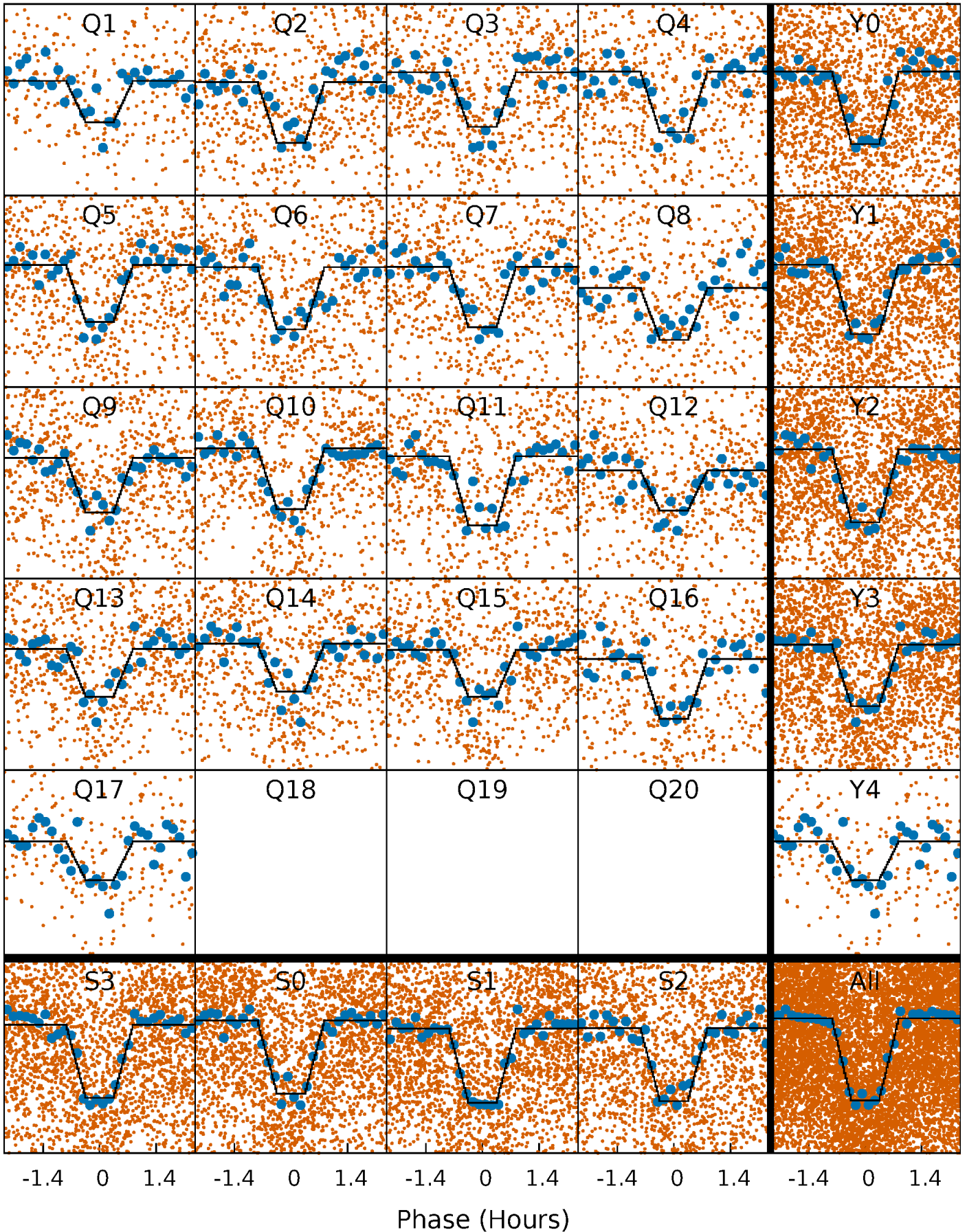
DV Quarter-Phased Transit Curves

TCE 012115188-02 P= 0.990870 Days $T_0=132.466741$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

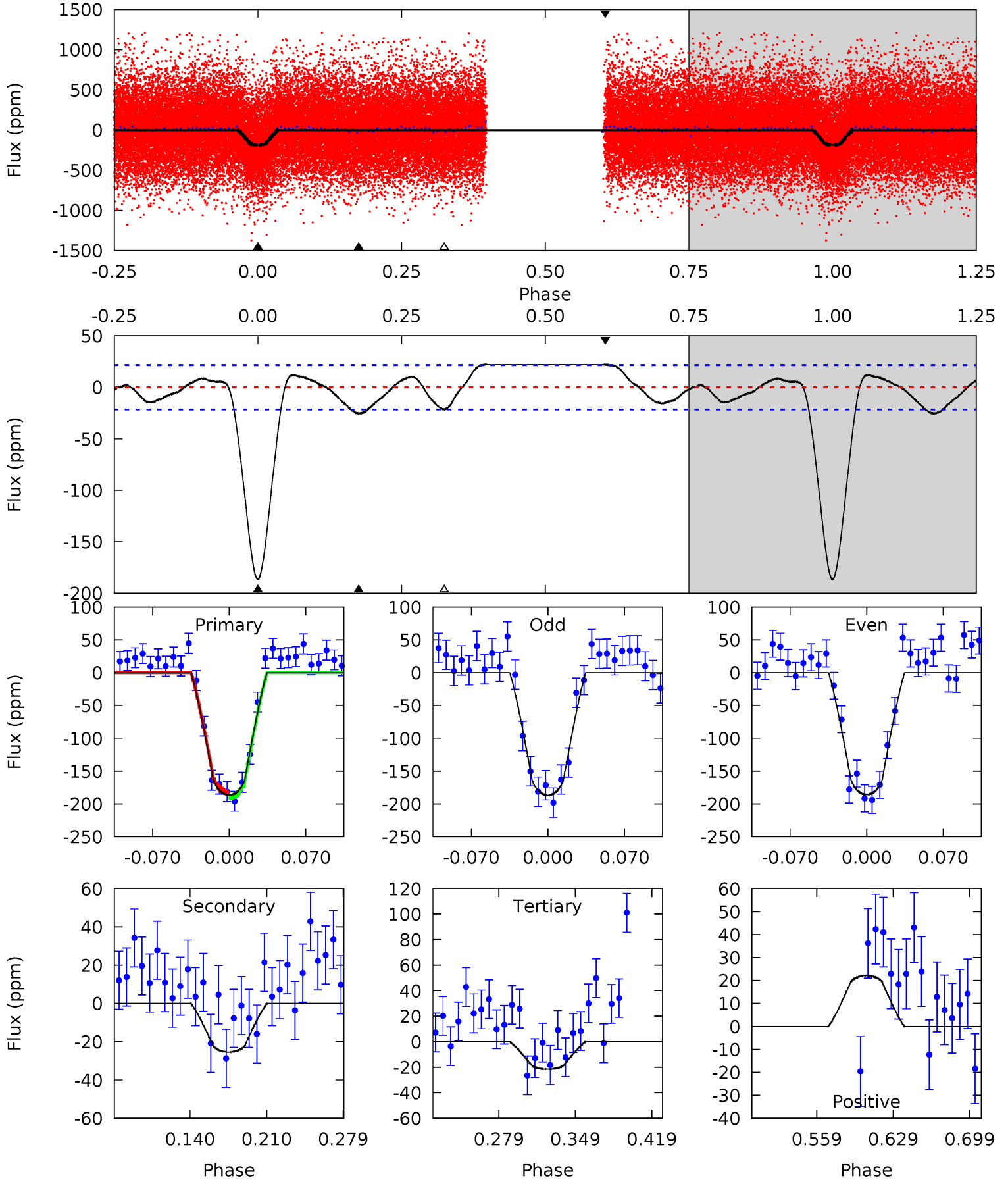
TCE 012115188-02 P= 0.990867 Days $T_0=132.468662$ (BKJD)



DV Model-Shift Uniqueness Test

012115188-02, P = 0.990870 Days, E = 131.475871 Days

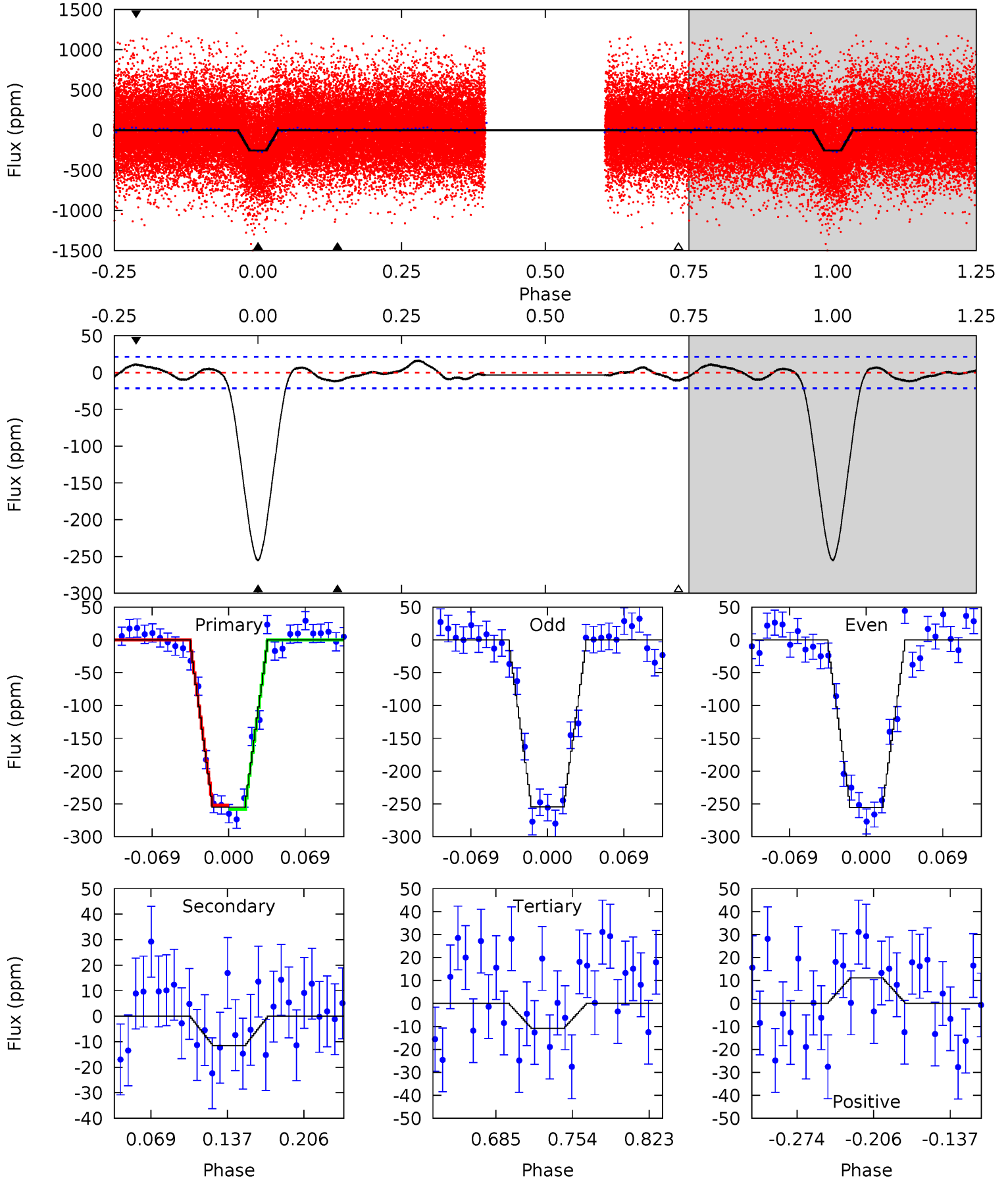
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.2	5.47	4.63	4.77	4.64	1.81	2.39	35.5	35.4	0.84	0.70	0.10	0.94	0.11	0.74



Alt Model-Shift Uniqueness Test

012115188-02, P = 0.990867 Days, E = 131.477795 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.6	2.50	2.36	2.42	4.64	1.82	1.44	53.2	53.1	0.14	0.08	0.09	0.96	0.06	0.71



Stellar Parameters For KIC 012115188

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5529^{+166}_{-150}	$4.471^{+0.062}_{-0.175}$	$0.140^{+0.250}_{-0.300}$	$0.936^{+0.235}_{-0.101}$	$0.945^{+0.092}_{-0.084}$	$1.621^{+0.519}_{-0.775}$
	+3%/-3%	+1%/-4%	+179%/-214%	+25%/-11%	+10%/-9%	+32%/-48%
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 012115188-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-25 ± 5	$1.47^{+0.38}_{-0.32}$	2424^{+157}_{-103}	3633^{+401}_{-304}	$2.310^{+1.549}_{-0.906}$
Alt.	-11 ± 5	$1.71^{+0.37}_{-0.36}$	2421^{+156}_{-106}	2926^{+368}_{-488}	$0.796^{+0.631}_{-0.386}$

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 $A_{\text{obs}} \gg 1.0$

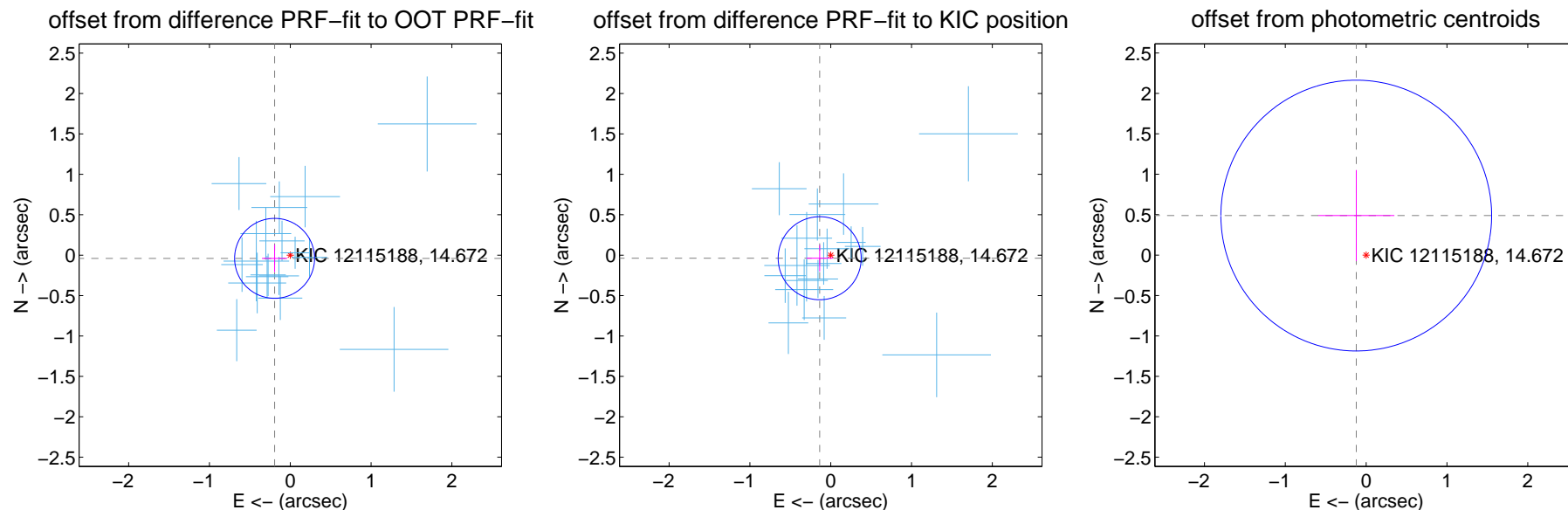
DV Centroid Data

Supplemental centroid analysis for 012115188-02. Kepler magnitude: 14.67. Transit SNR 27.23

There are 17 quarters with good PRF difference image offsets

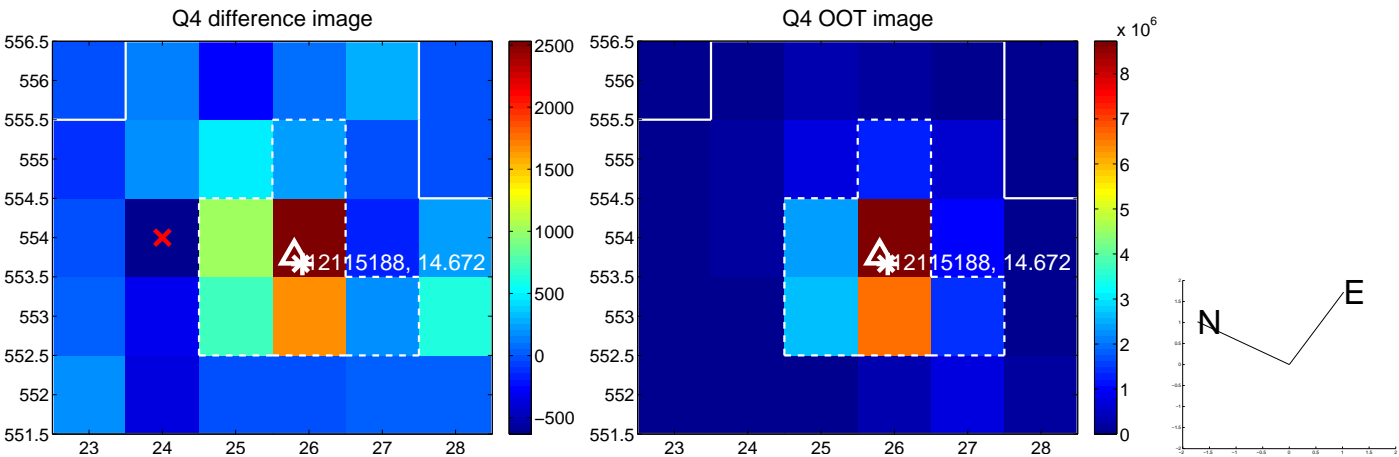
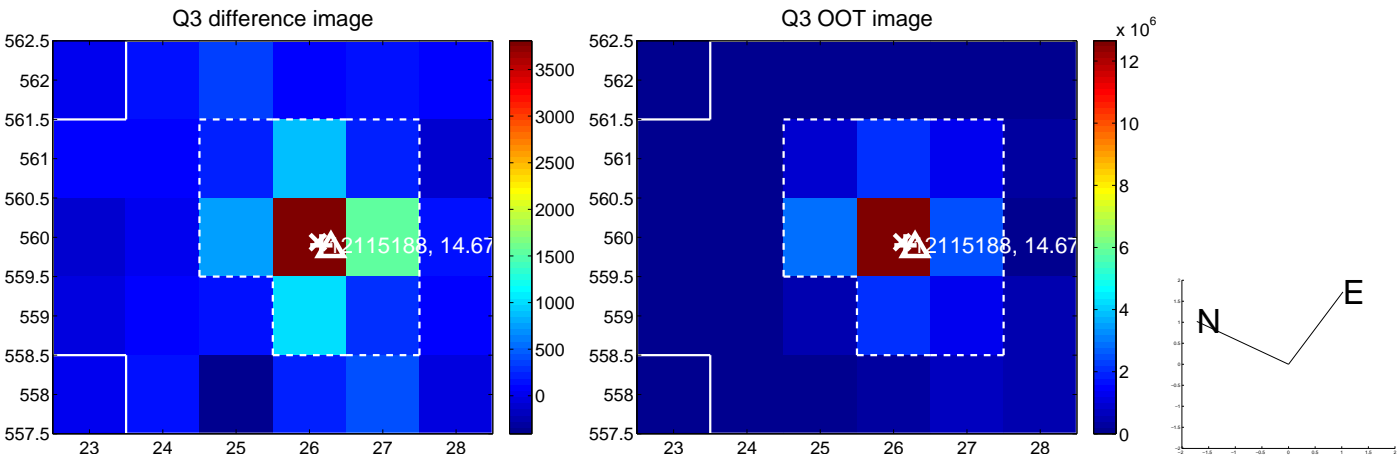
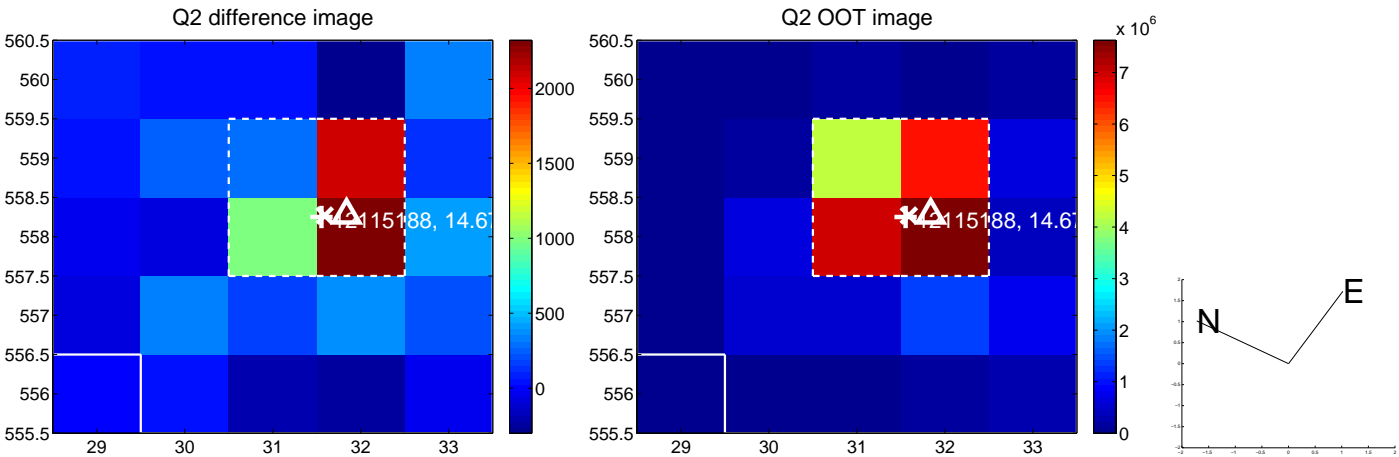
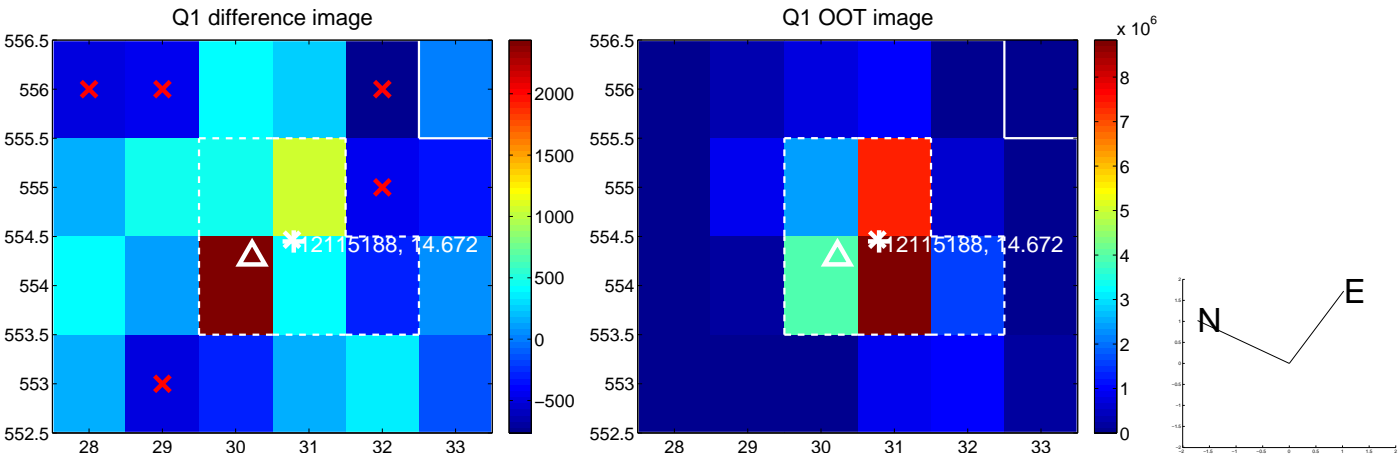
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.198 ± 0.165	1.20	0.194 ± 0.157	-0.040 ± 0.169
PRF-fit source offset from KIC position	0.142 ± 0.171	0.83	0.137 ± 0.163	-0.038 ± 0.163
photometric centroid source offset	0.50 ± 0.56	0.90	0.12 ± 0.47	0.49 ± 0.56

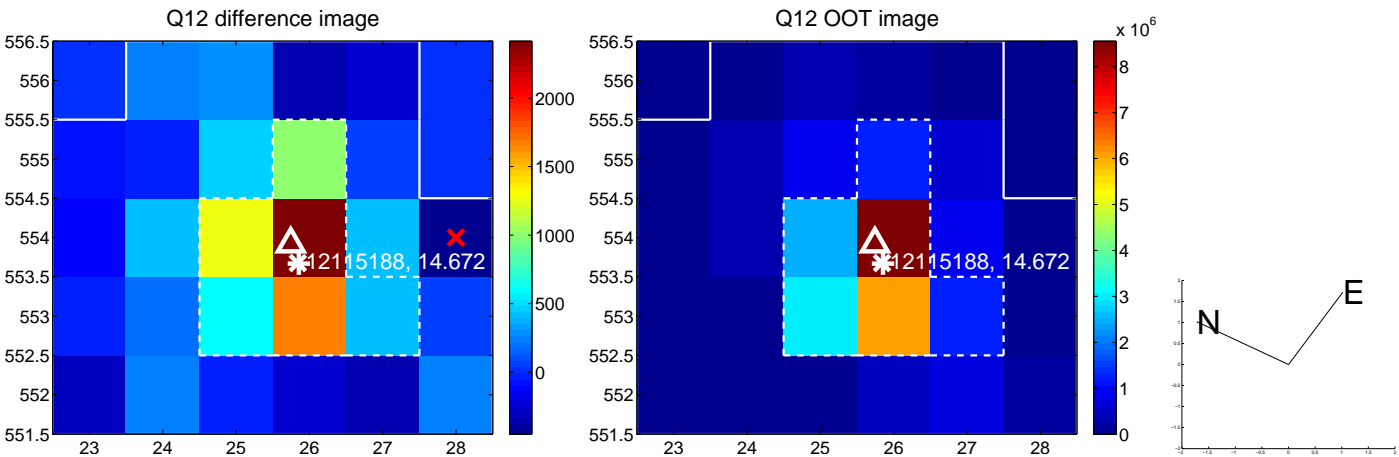
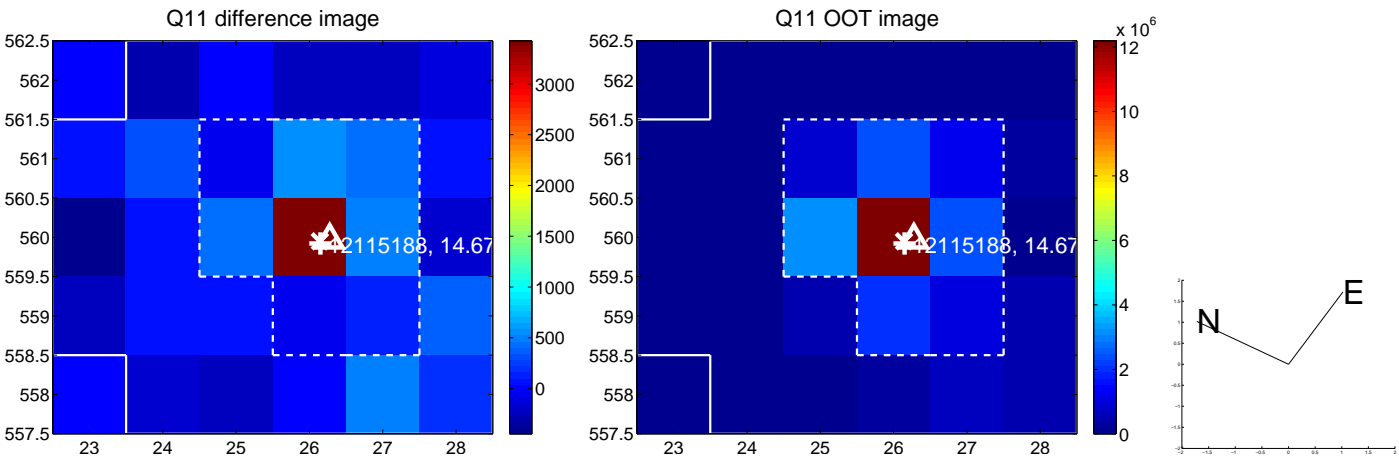
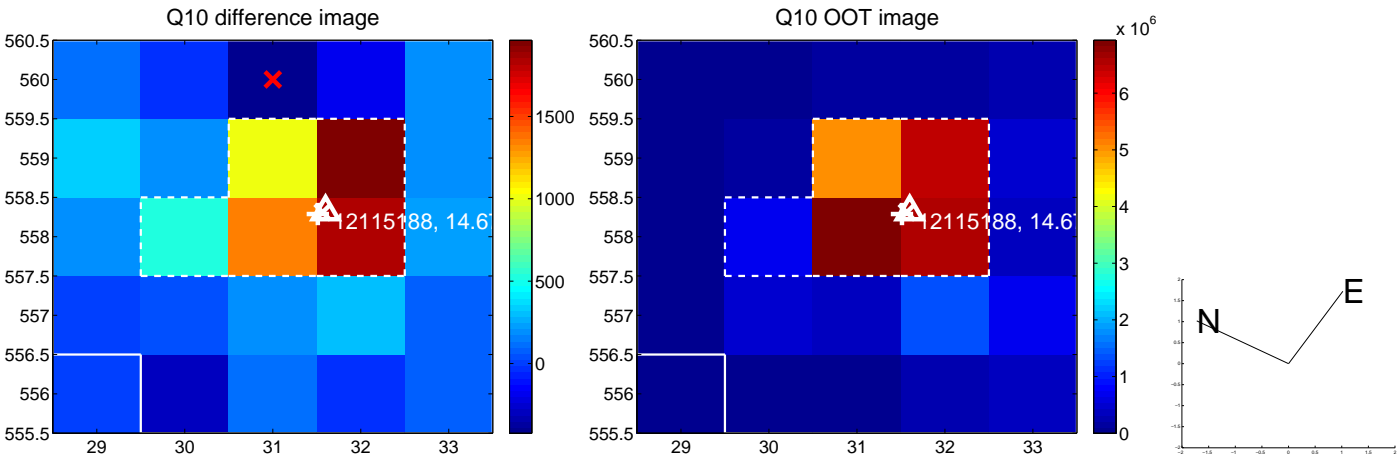
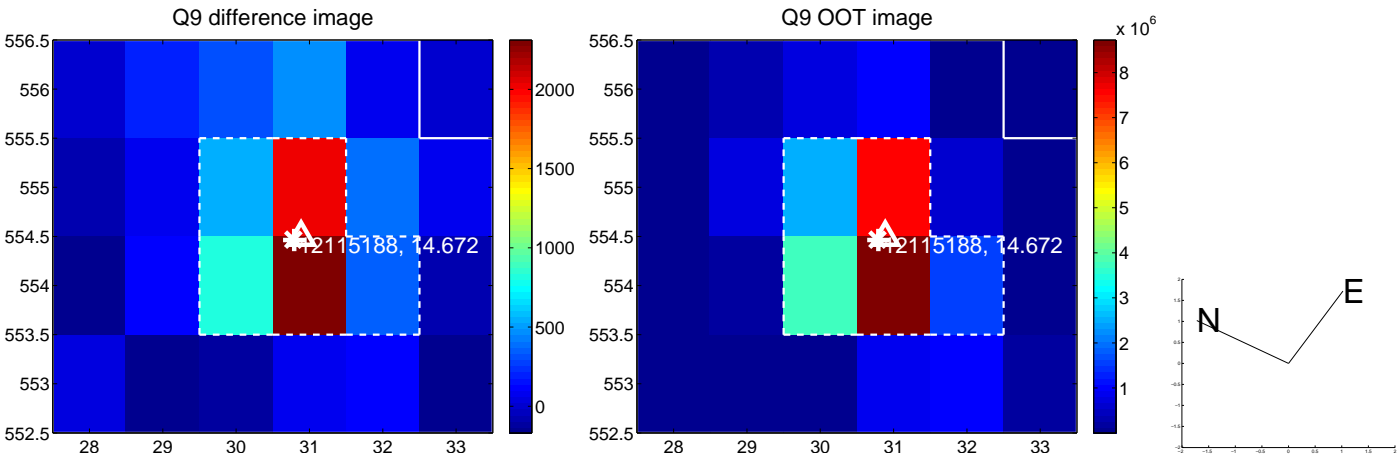


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

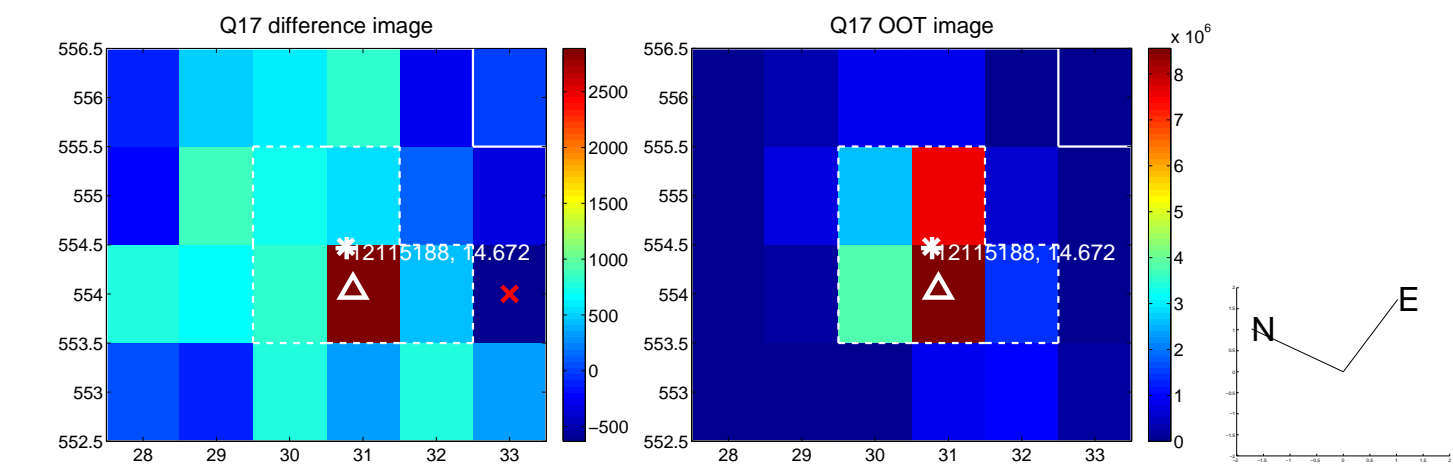
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



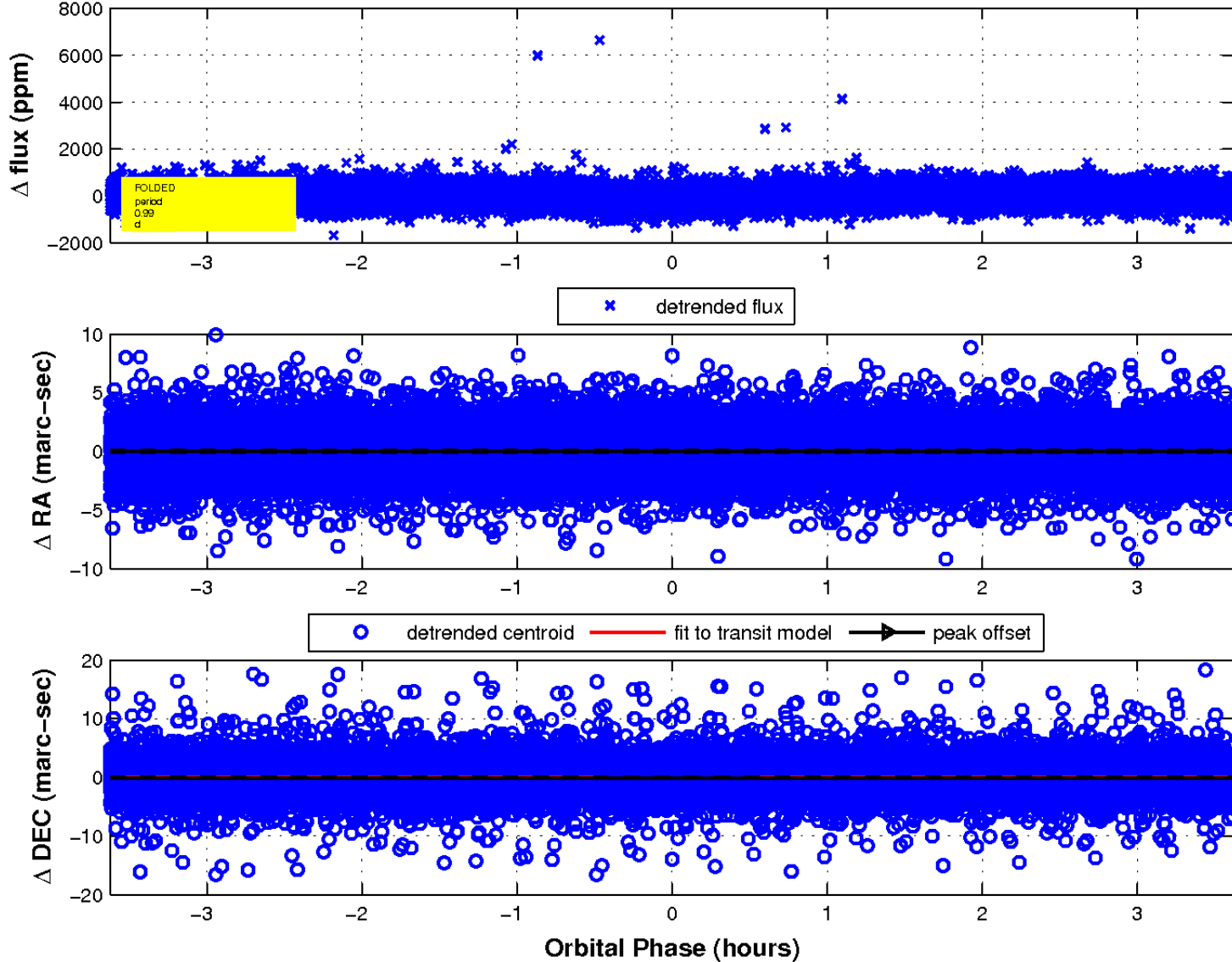
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

