

KIC 002708787

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})
002708787-01	OBS	No	1.829266	133.229559	65.9	10.600	8.2	11.1	0.63	4243	0.57	184.64
002708787-03	OBS	No	57.534060	186.592669	300.5	7.731	7.6	5.0	0.63	4243	1.18	1.86
002708787-04	OBS	No	79.427200	161.028631	721.7	2.901	7.3	8.3	0.63	4243	2.05	1.21

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002708787-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
002708787-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002708787-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

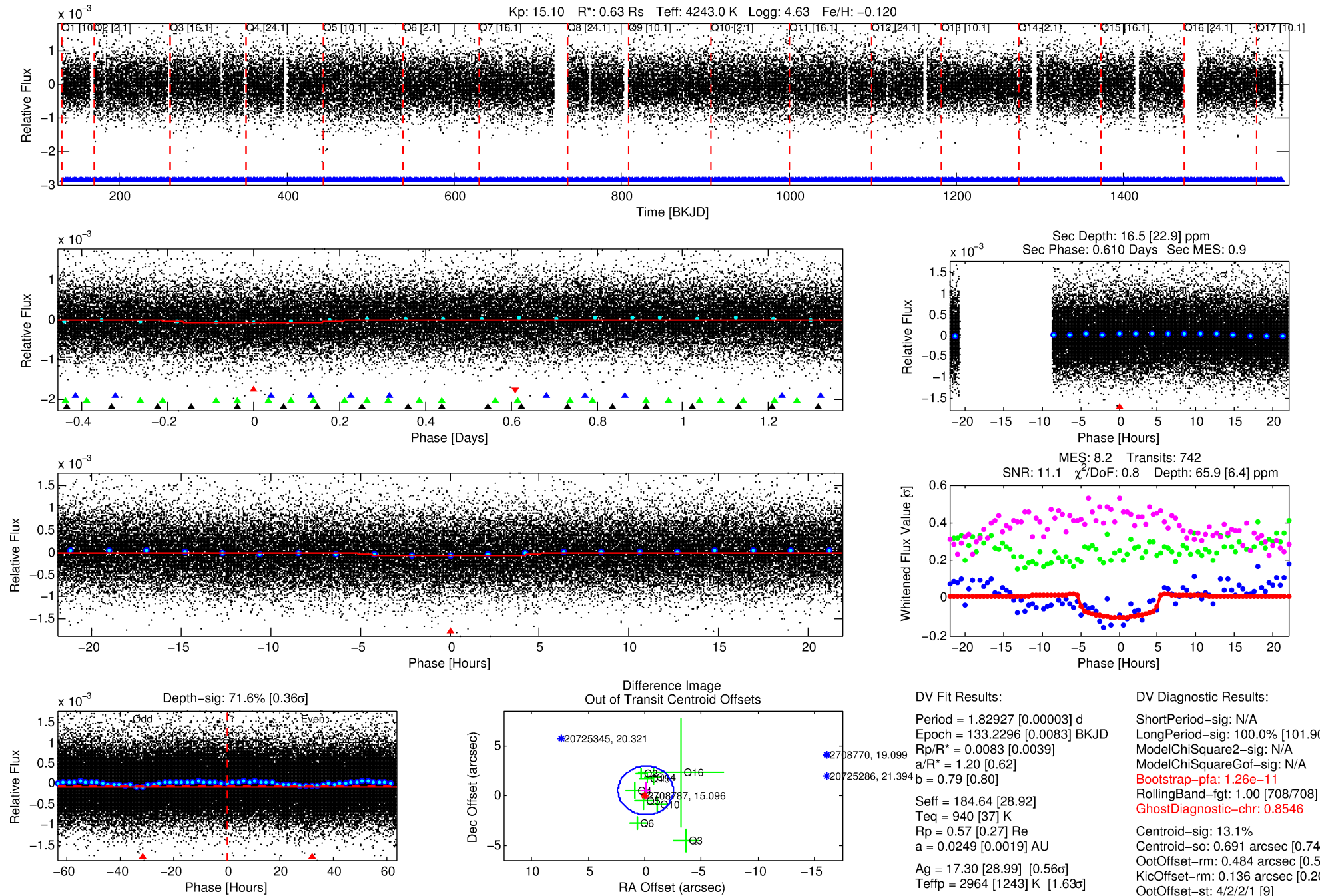
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002708787-01

No Significant Match Found

DV One-Page Summary

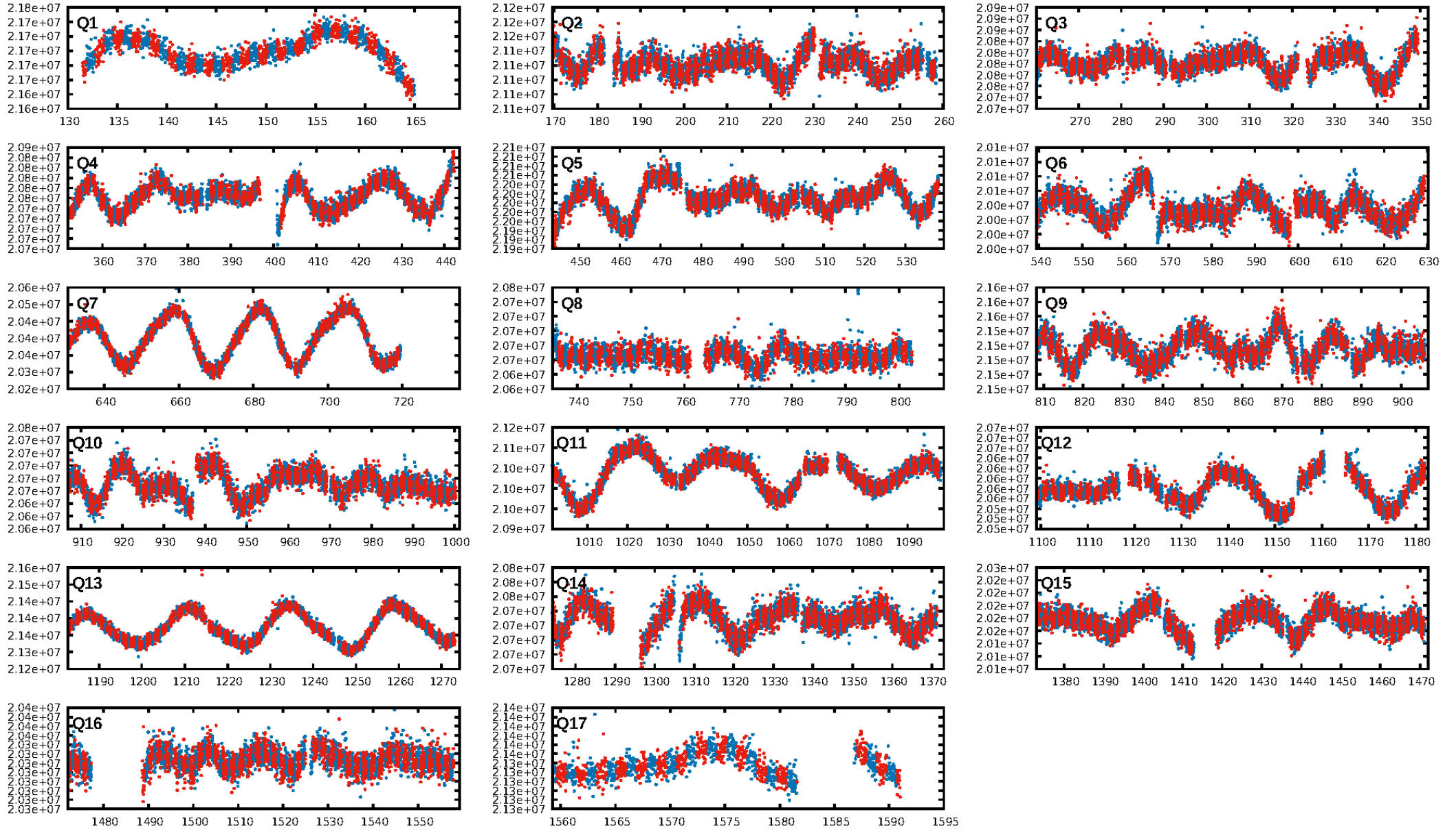
KIC: 2708787 Candidate: 1 of 4 Period: 1.829 d



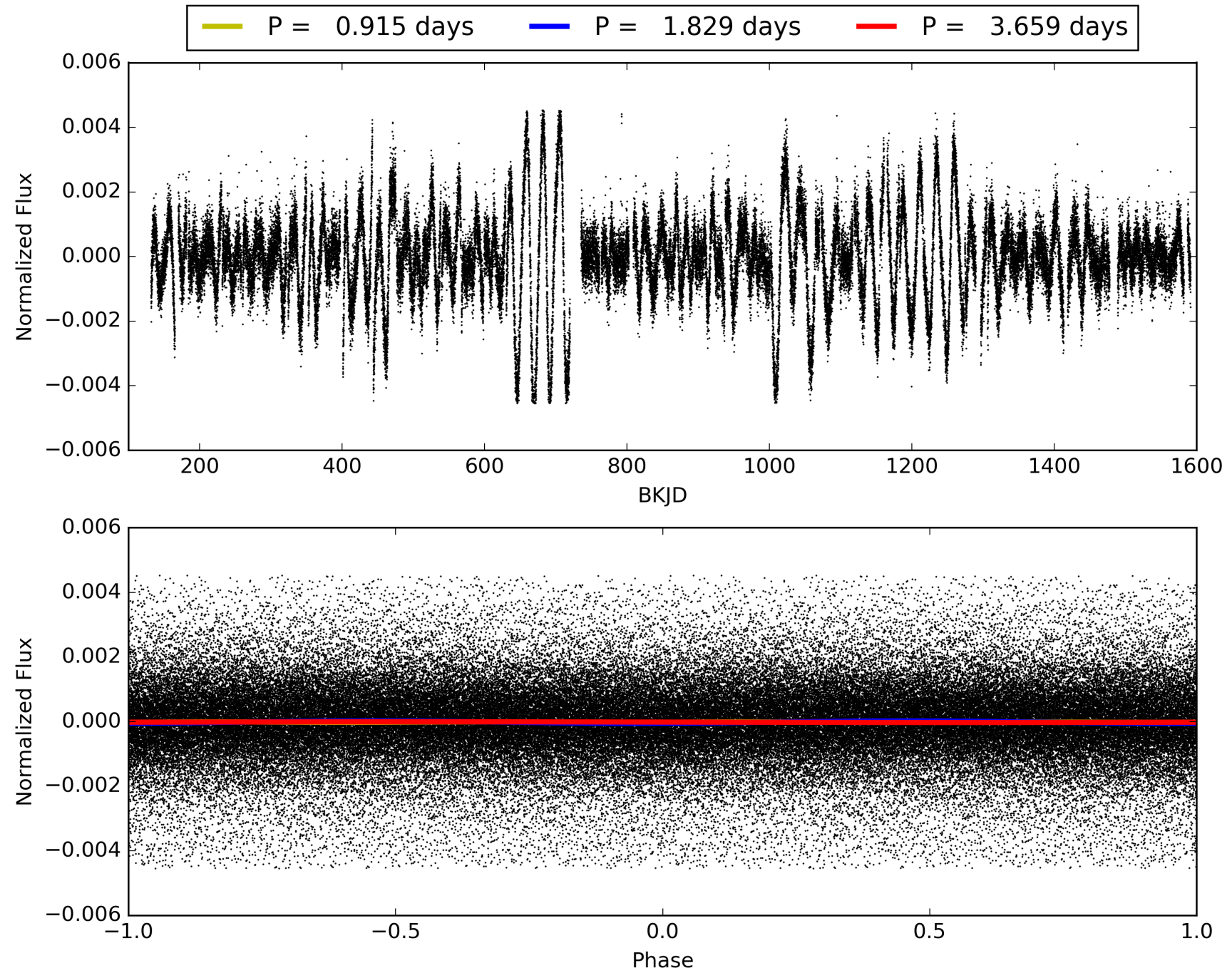
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:38:04 Z

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

TCE 002708787-01, PDC Light Curves

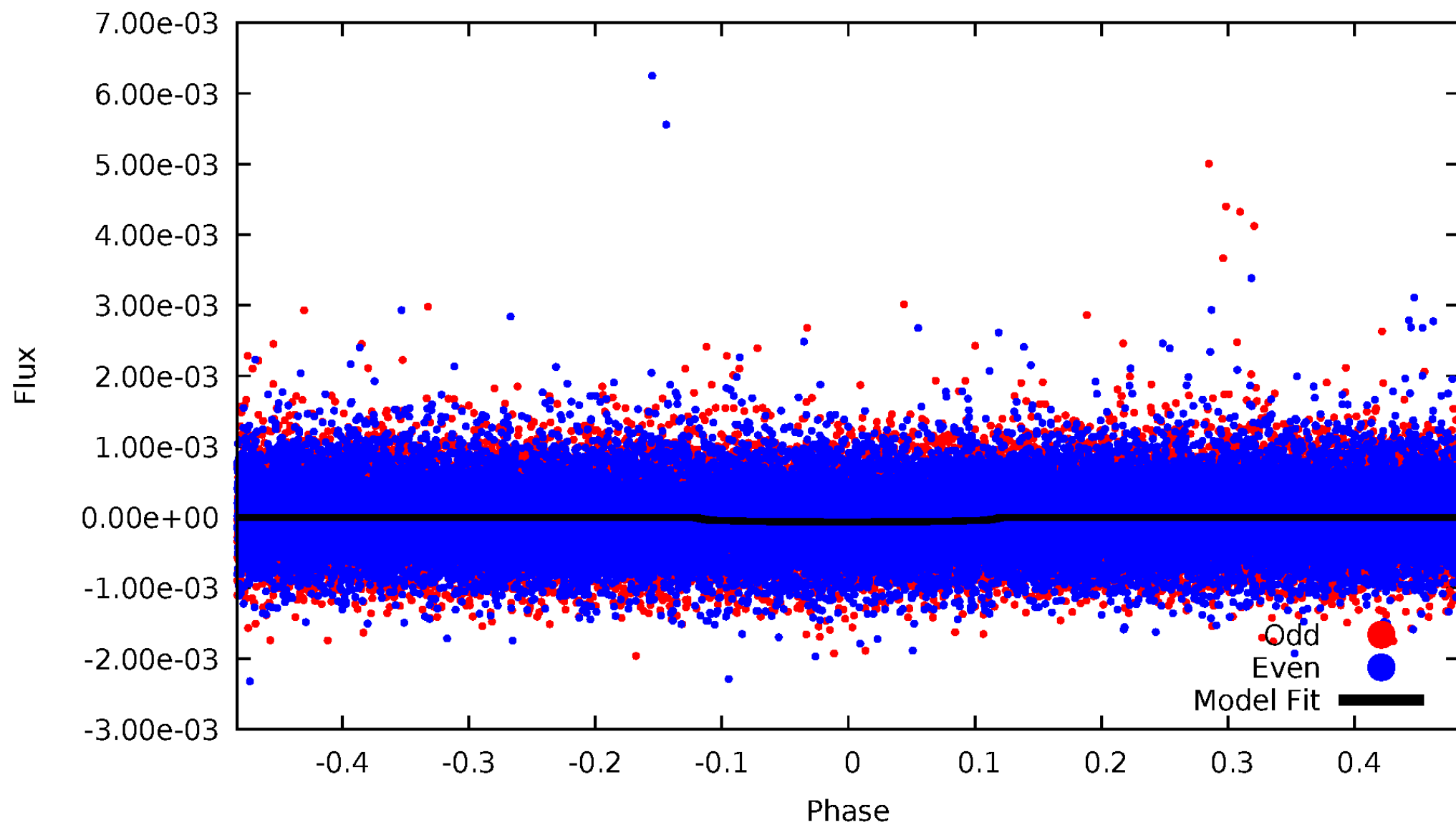


TCE 002708787-01



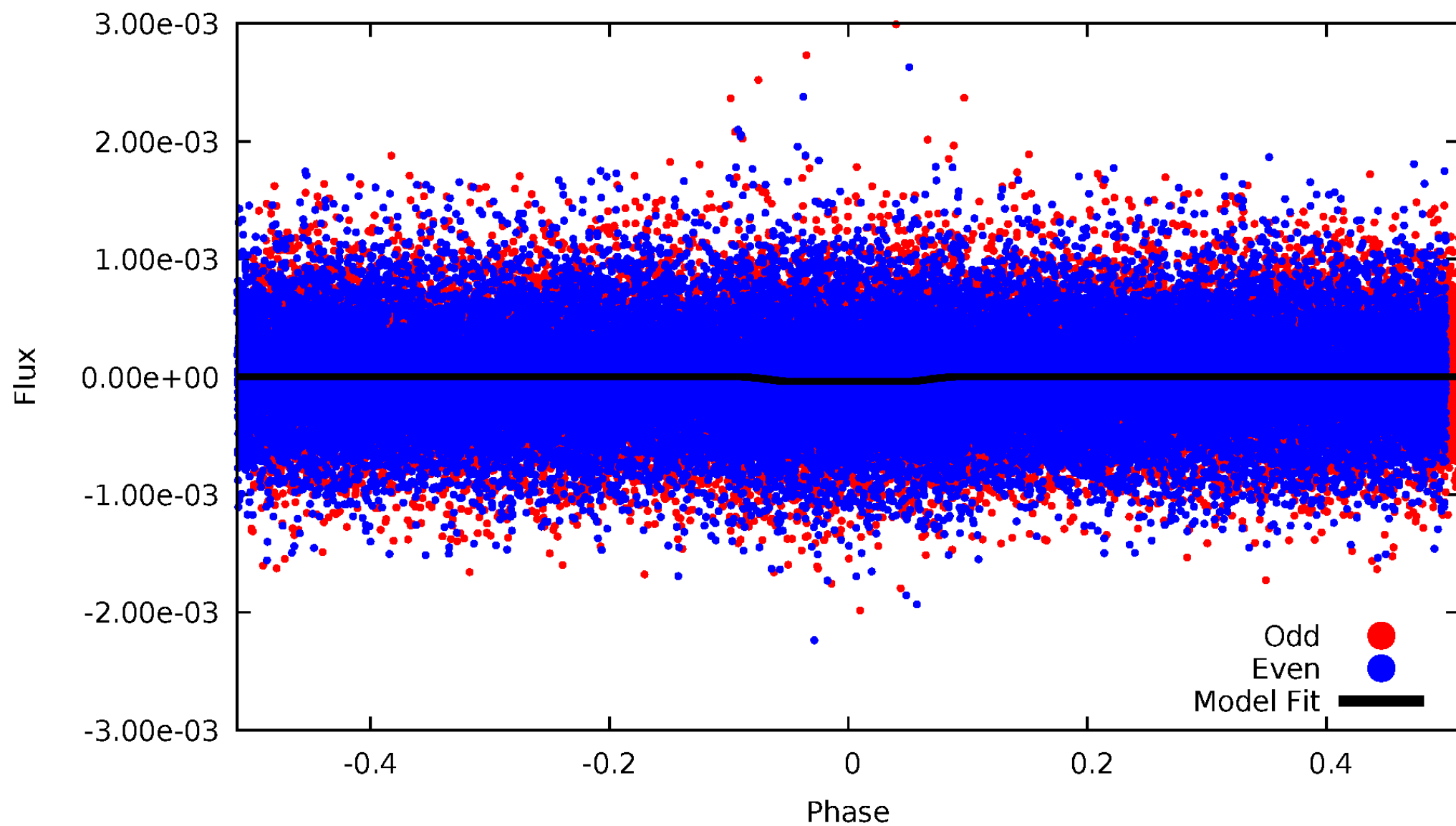
DV Odd/Even

TCE 002708787-01

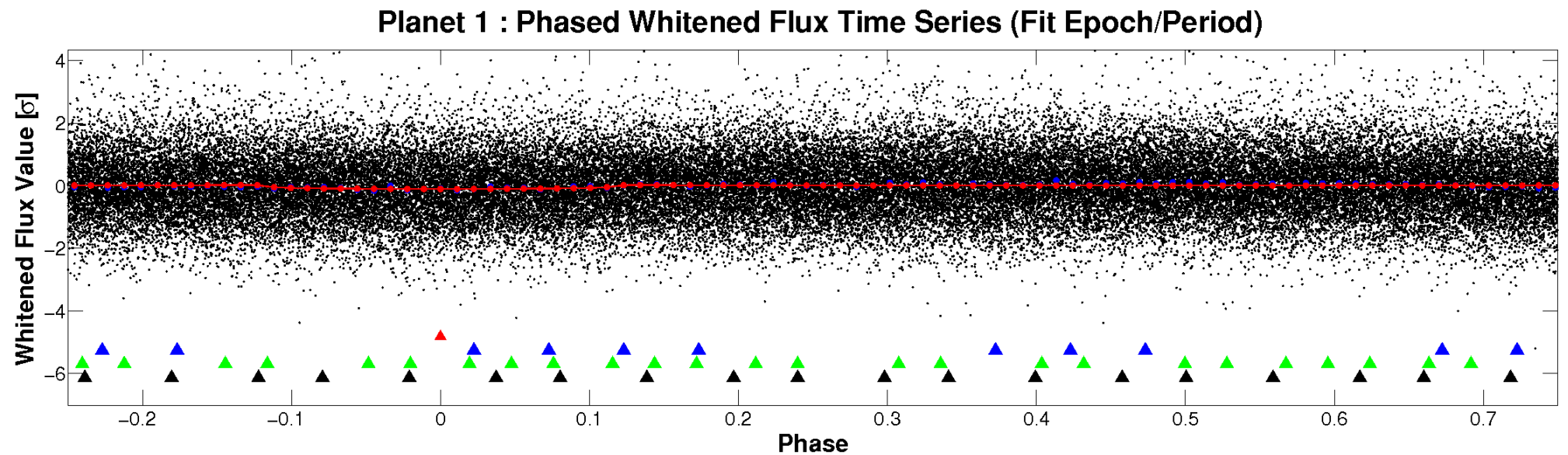
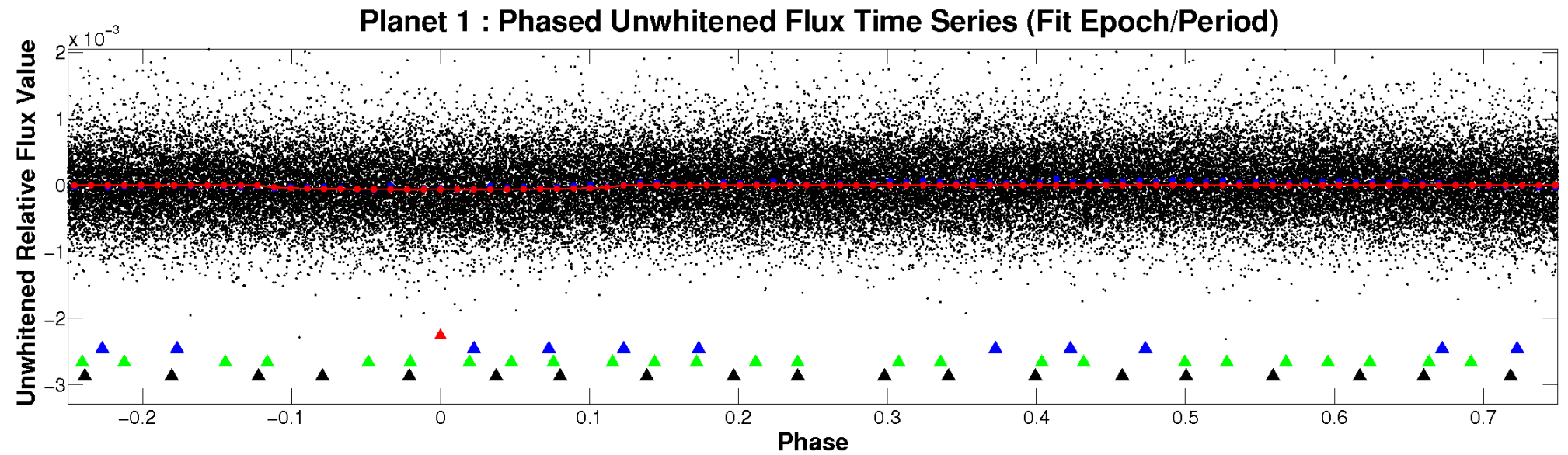


ALT Odd/Even

TCE 002708787-01

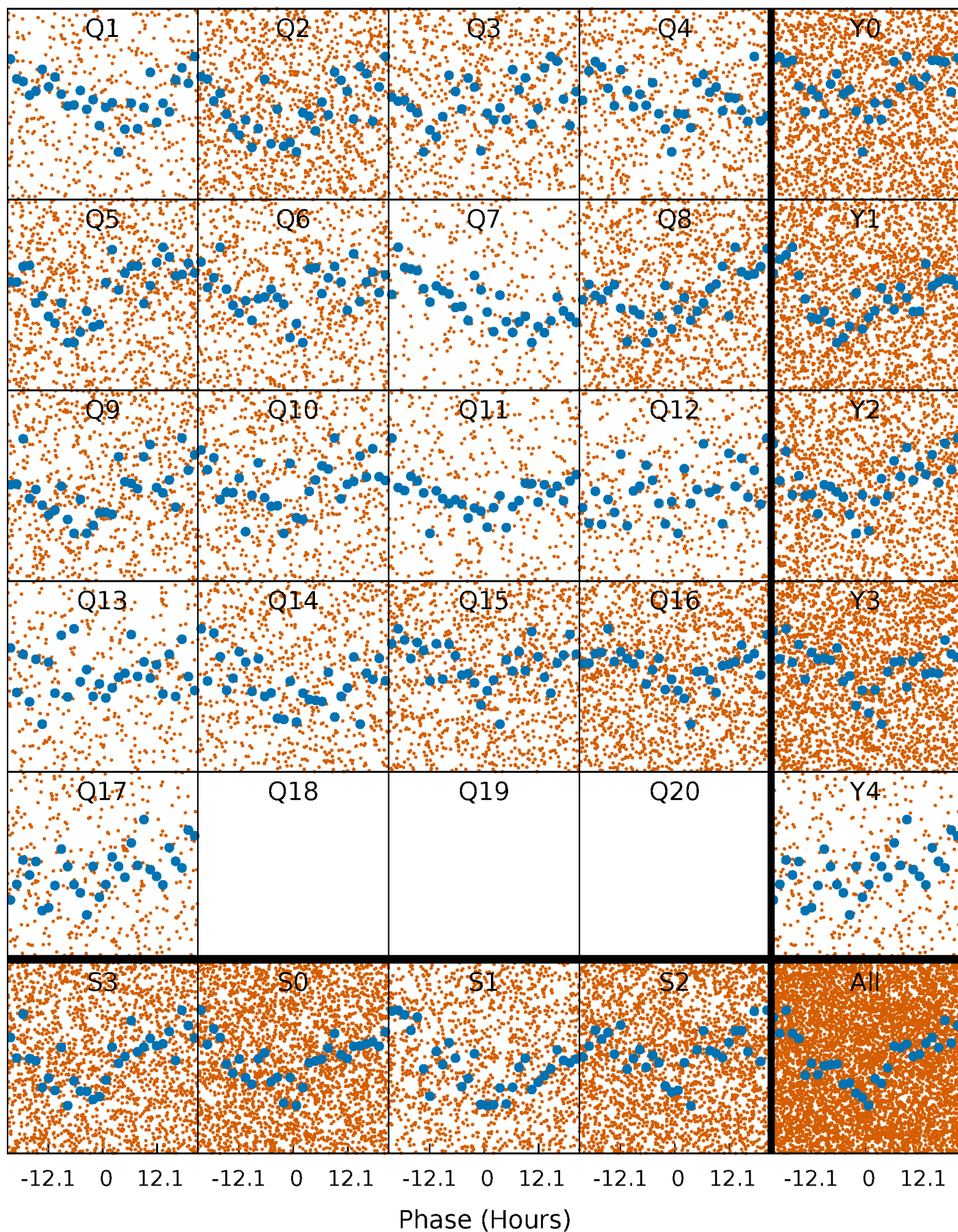


Non-Whitened Vs. Whitened Light Curve



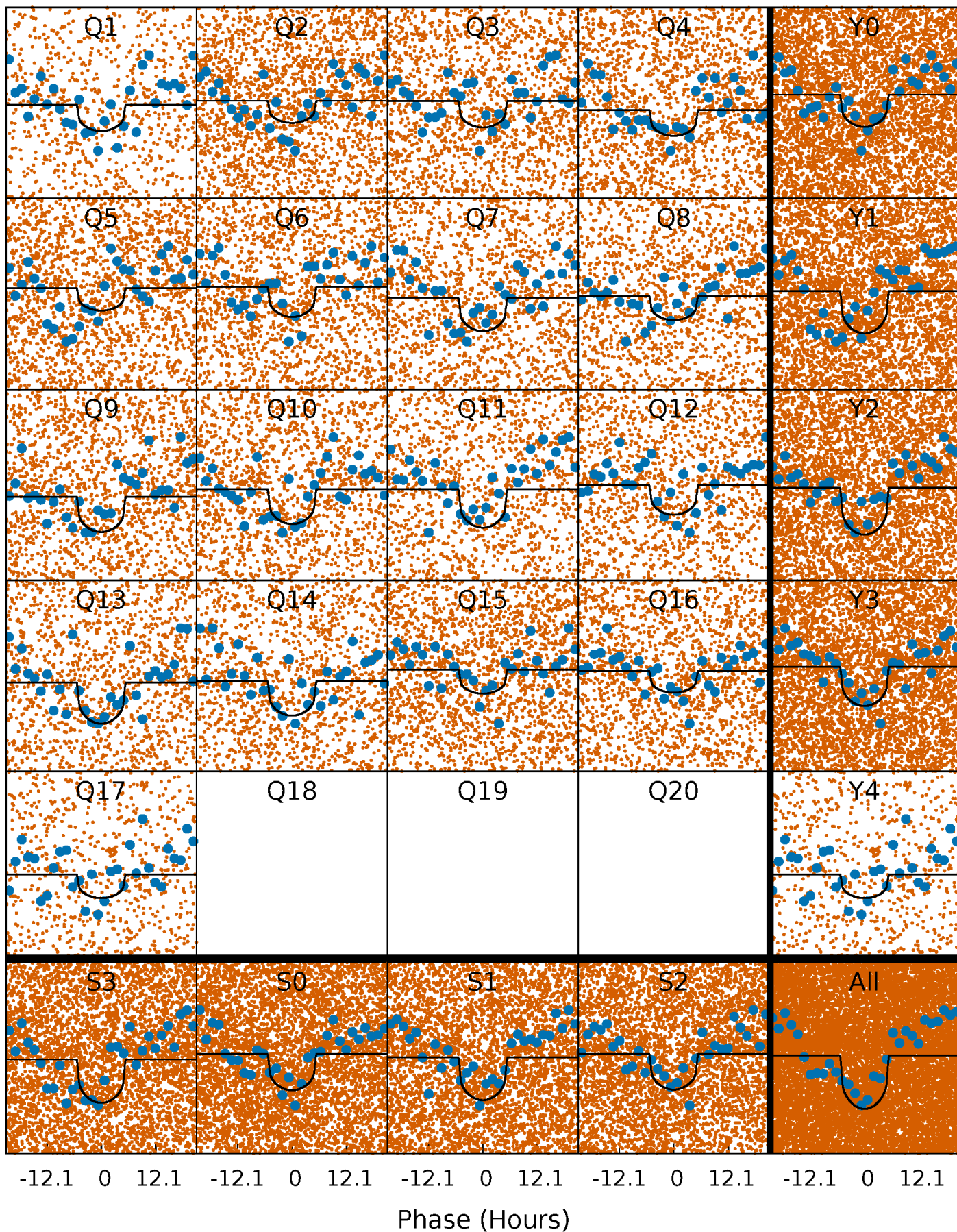
PDC Quarter-Phased Transit Curves

TCE 002708787-01 P= 1.829266 Days $T_0=133.229559$ (BKJD)



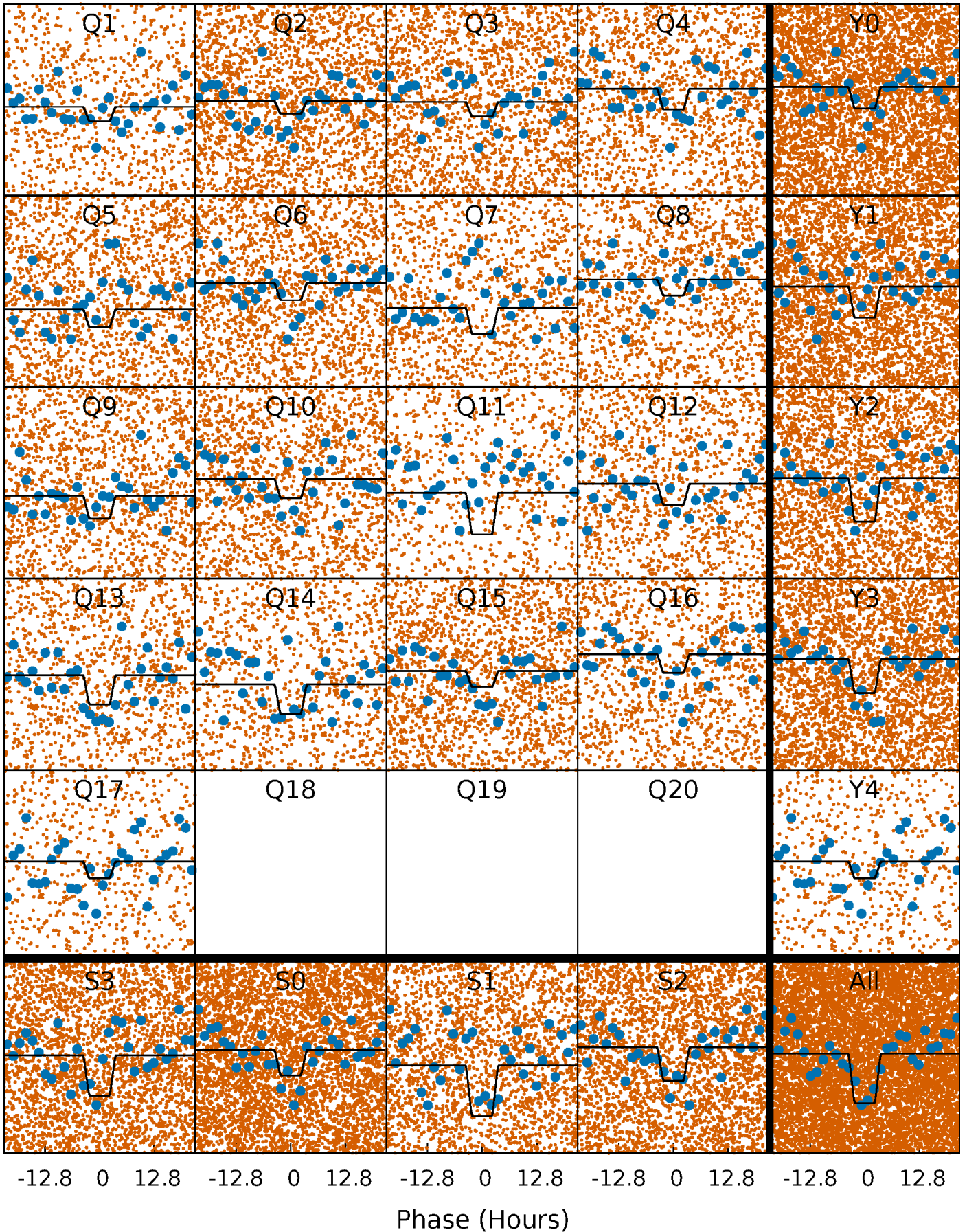
DV Quarter-Phased Transit Curves

TCE 002708787-01 P= 1.829266 Days $T_0=133.229559$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

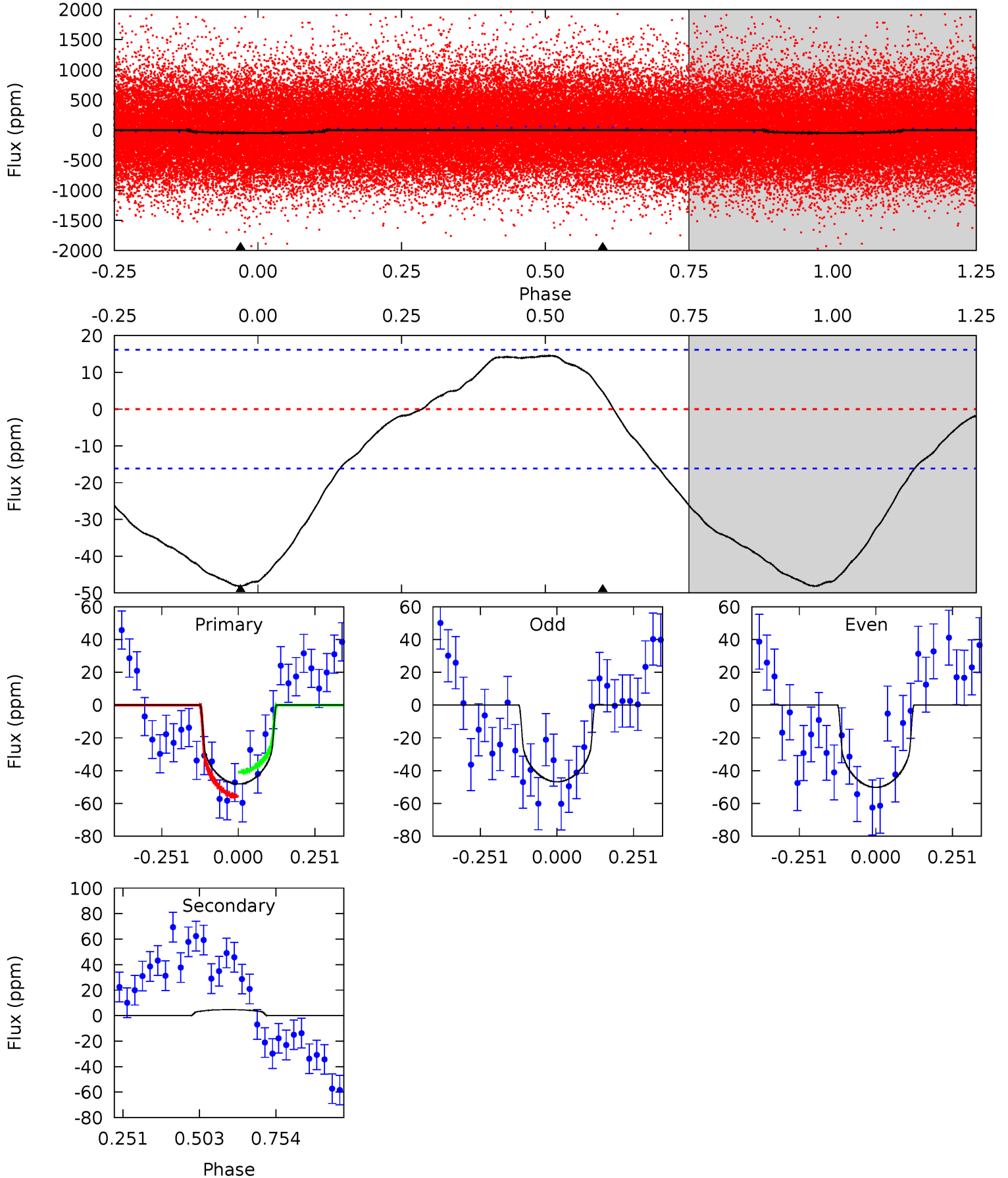
TCE 002708787-01 P= 1.829271 Days $T_0=133.233764$ (BKJD)



DV Model-Shift Uniqueness Test

002708787-01, P = 1.829266 Days, E = 131.400293 Days

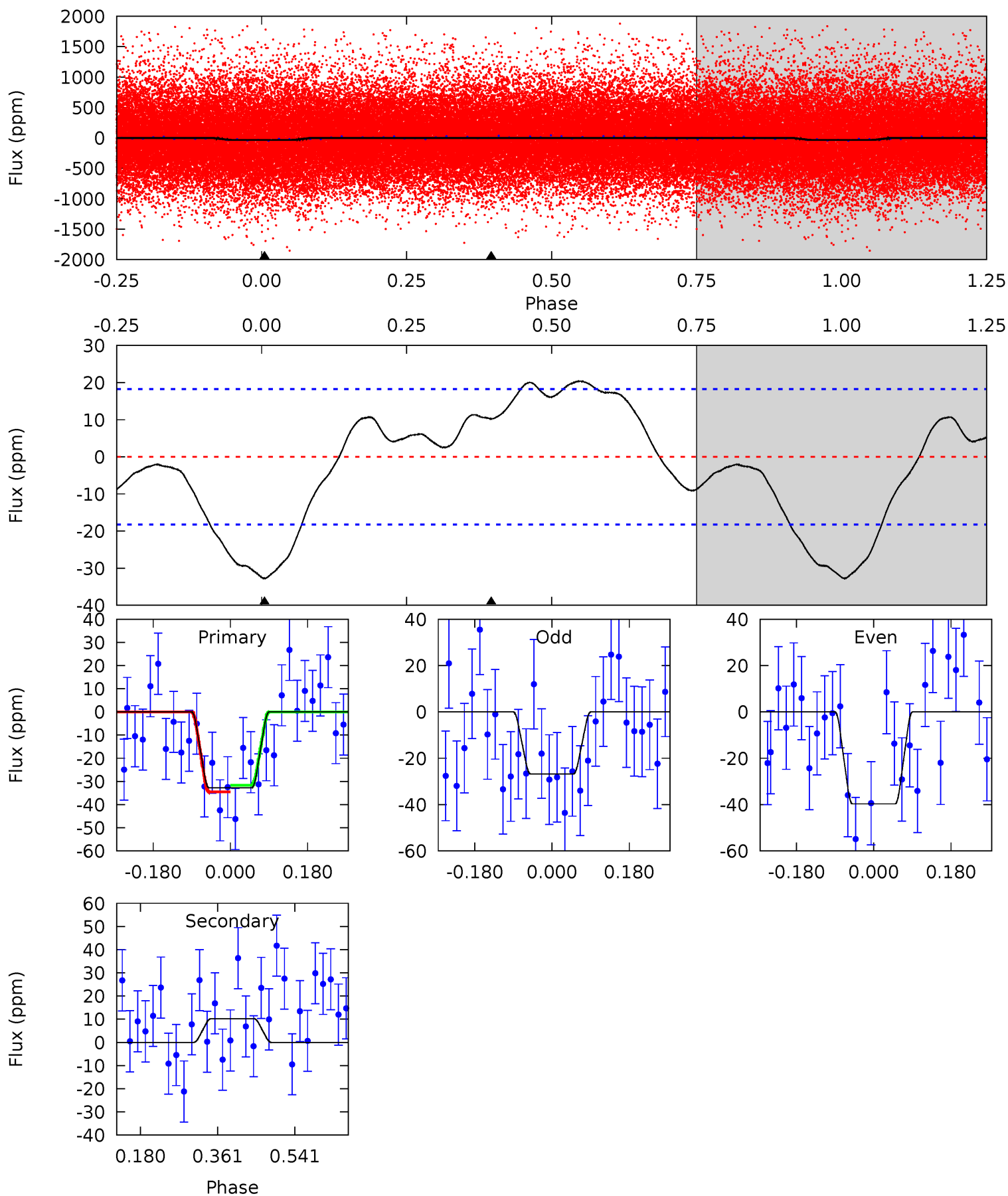
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	-1.27	0	0	4.37	1.15	0.79	13.0	13.0	-1.27	-1.27	0.46	1.04	0.23	2.00



Alt Model-Shift Uniqueness Test

002708787-01, P = 1.829271 Days, E = 131.404493 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.96	-2.48	0	0	4.44	1.34	2.27	7.96	7.96	-2.48	-2.48	1.57	0.82	0.38	0.34



Stellar Parameters For KIC 002708787

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4243^{+126}_{-126}	$4.632^{+0.052}_{-0.020}$	$-0.120^{+0.300}_{-0.300}$	$0.629^{+0.040}_{-0.060}$	$0.617^{+0.061}_{-0.055}$	$3.499^{+0.815}_{-0.348}$
	+3%/-3%	+1%/-0%	+250%/-250%	+6%/-10%	+10%/-9%	+23%/-10%
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 002708787-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	5 ± 4	$0.58^{+0.27}_{-0.26}$	1305^{+44}_{-44}	-2766^{+449}_{-584}	$-4.595^{+3.750}_{-13.029}$
Alt.	10 ± 4	$0.42^{+0.25}_{-0.24}$	1301^{+45}_{-44}	-3395^{+506}_{-1198}	$-19.366^{+13.064}_{-97.587}$

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

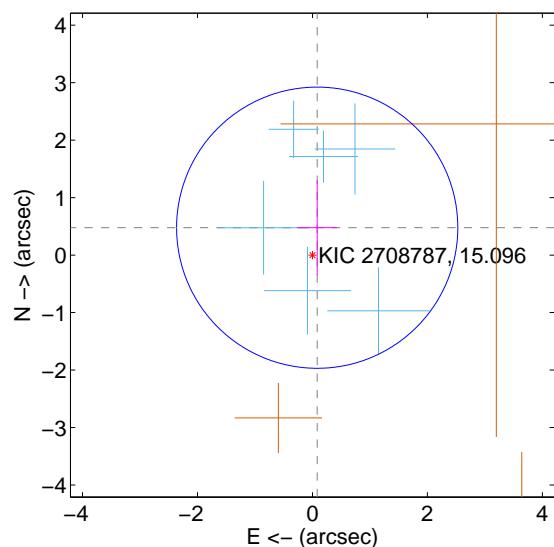
Supplemental centroid analysis for 002708787-01. Kepler magnitude: 15.10. Transit SNR 11.08

There are 6 quarters with good PRF difference image offsets

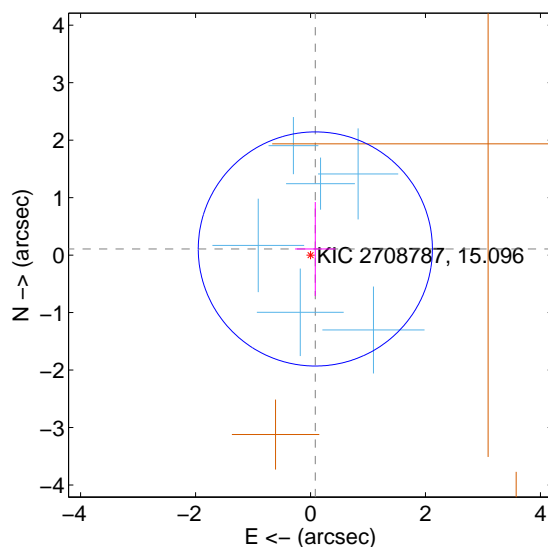
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.484 ± 0.815	0.59	-0.083 ± 0.348	0.477 ± 0.825
PRF-fit source offset from KIC position	0.136 ± 0.679	0.20	-0.084 ± 0.351	0.107 ± 0.817
photometric centroid source offset	0.69 ± 0.94	0.74	0.62 ± 0.95	0.31 ± 0.91

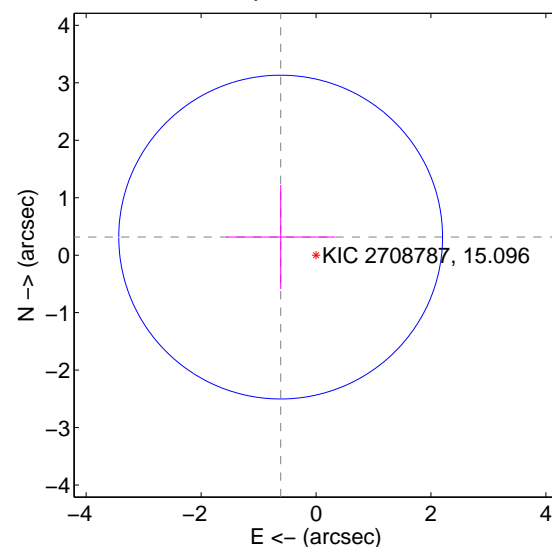
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

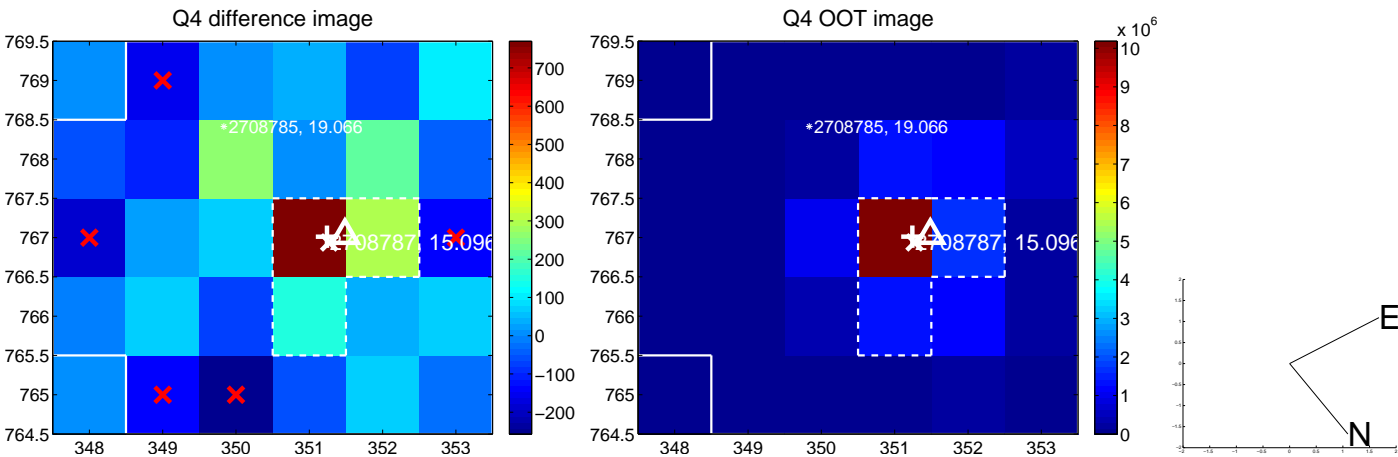
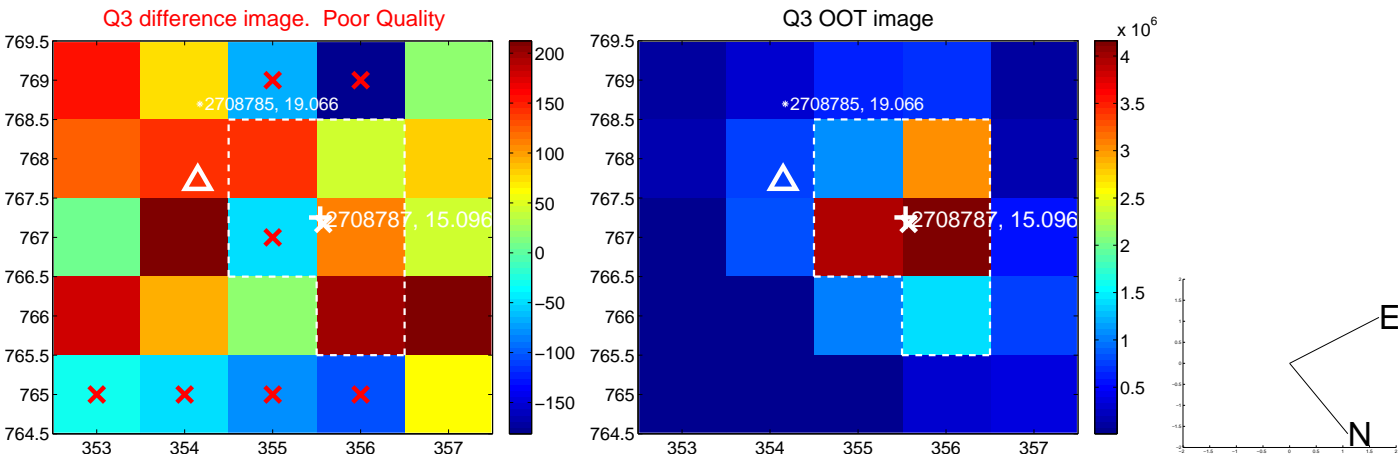
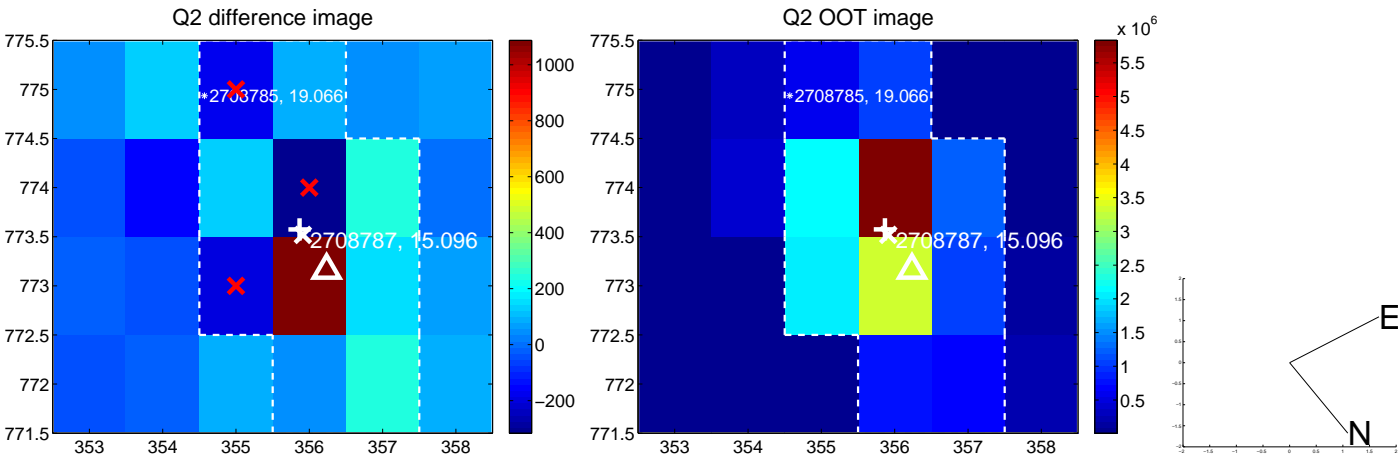
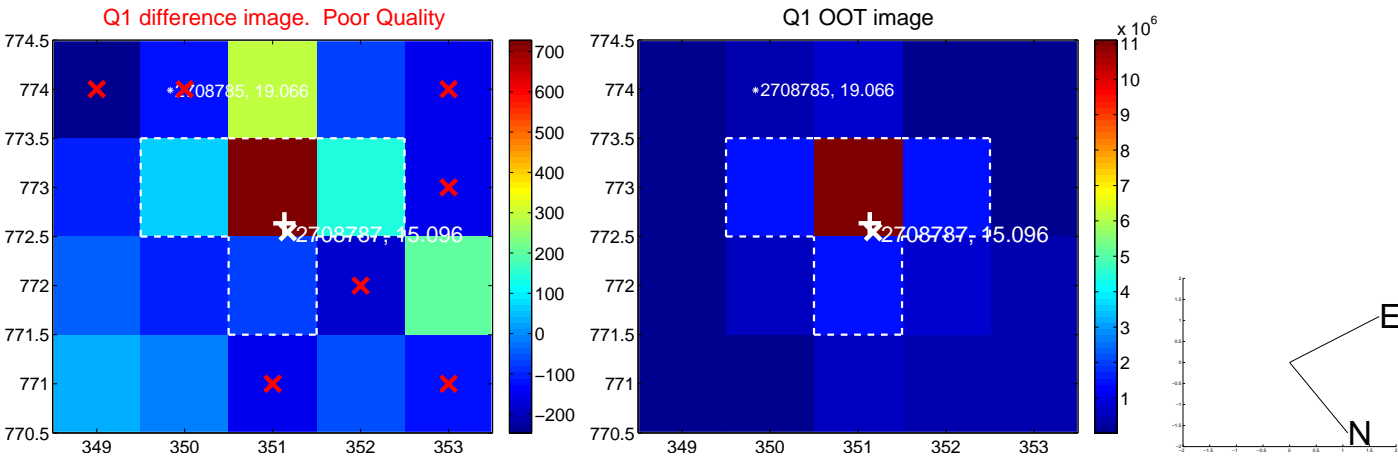


offset from photometric centroids

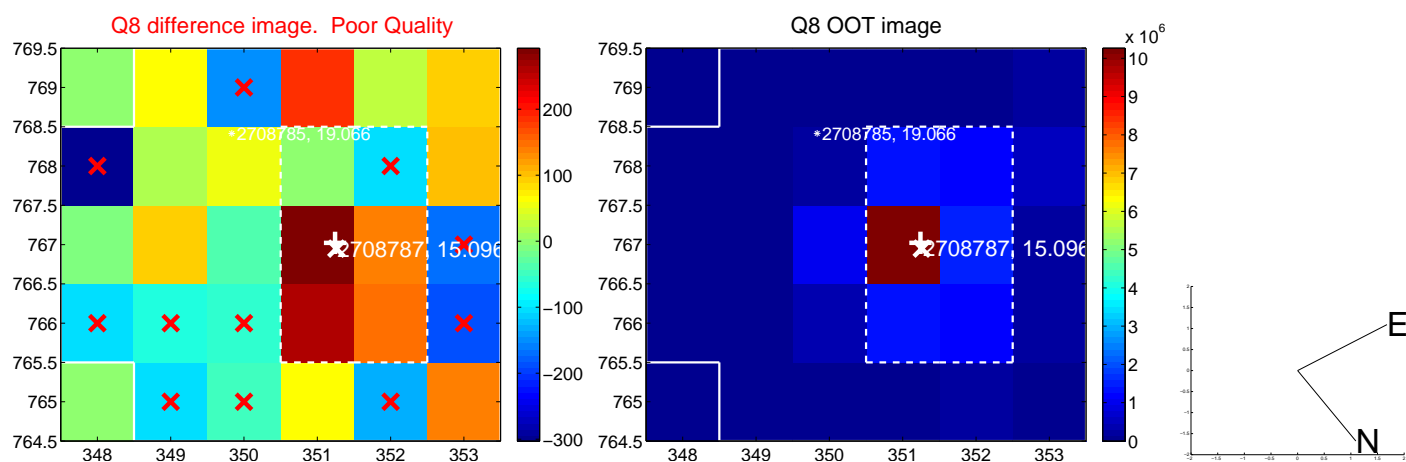
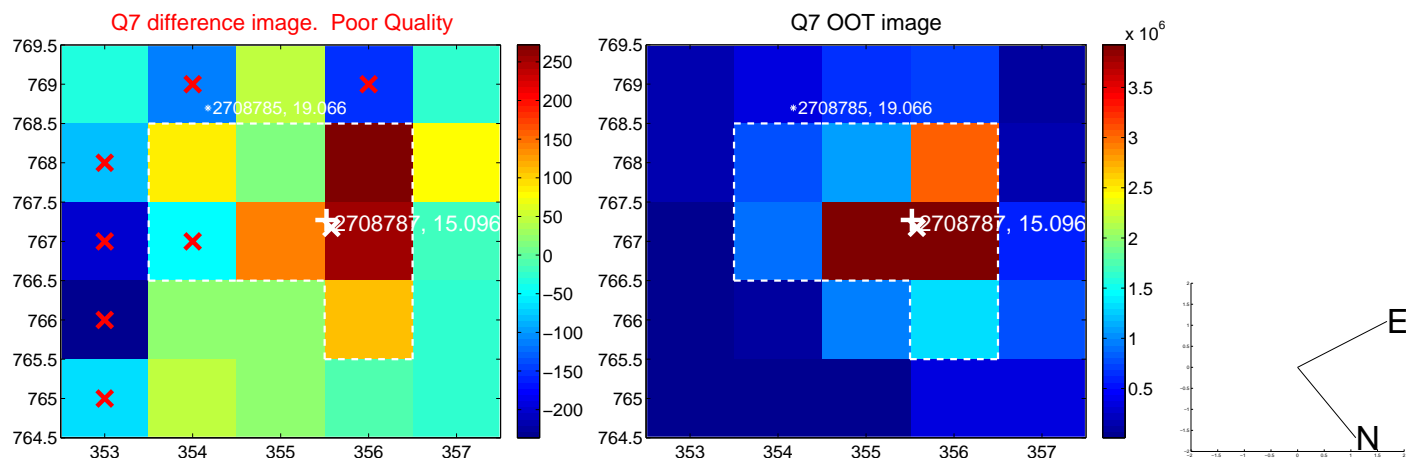
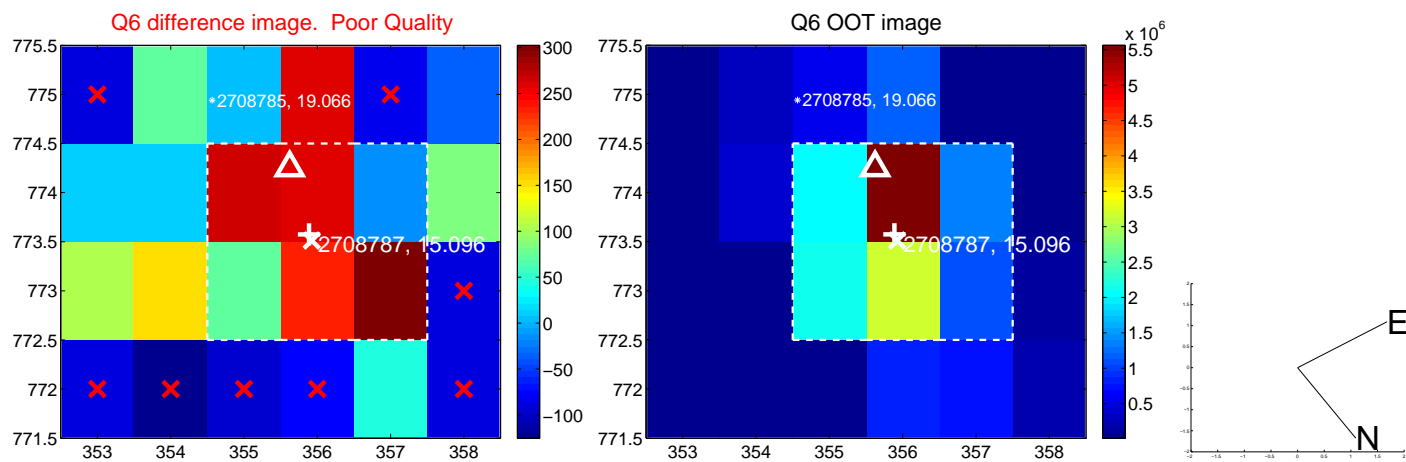
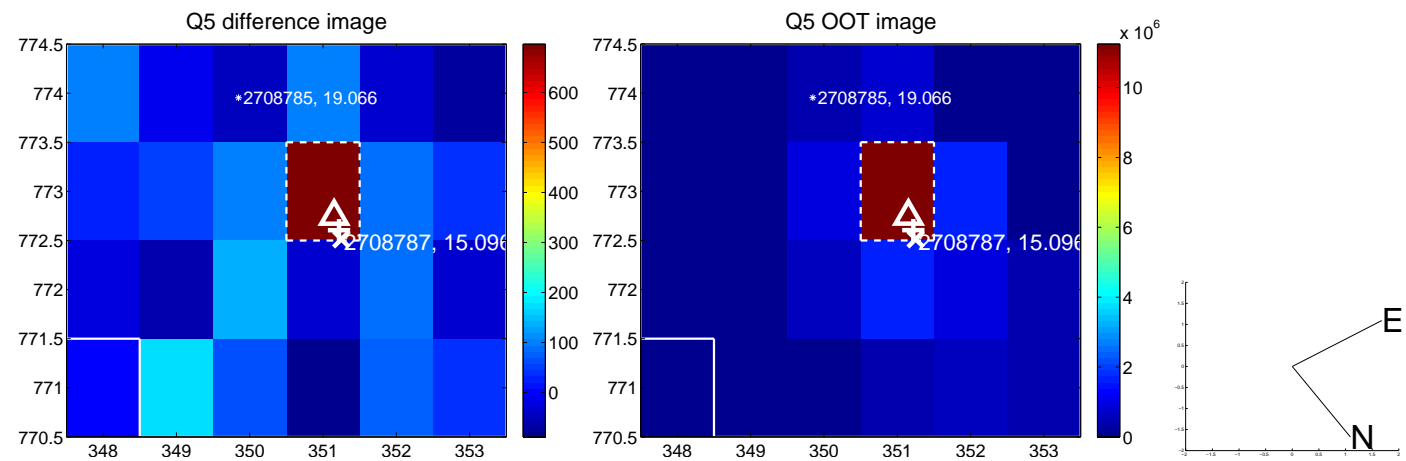


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

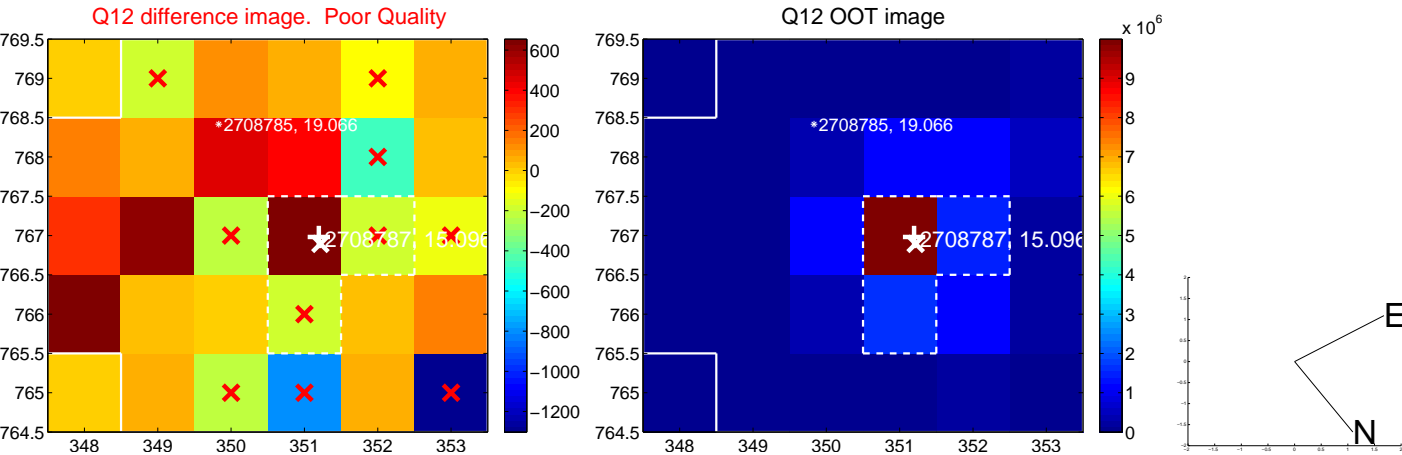
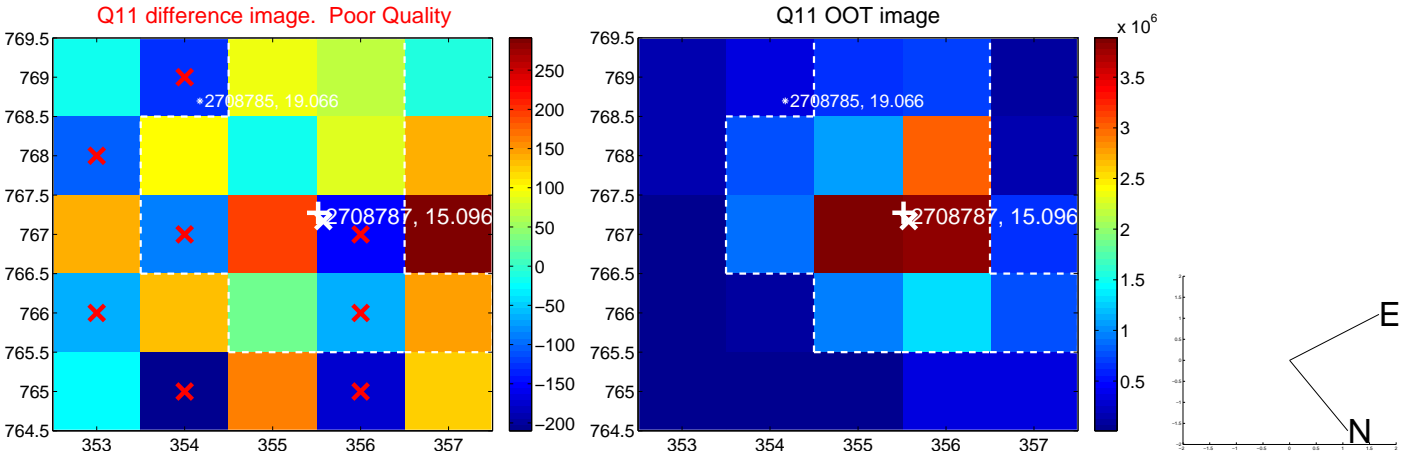
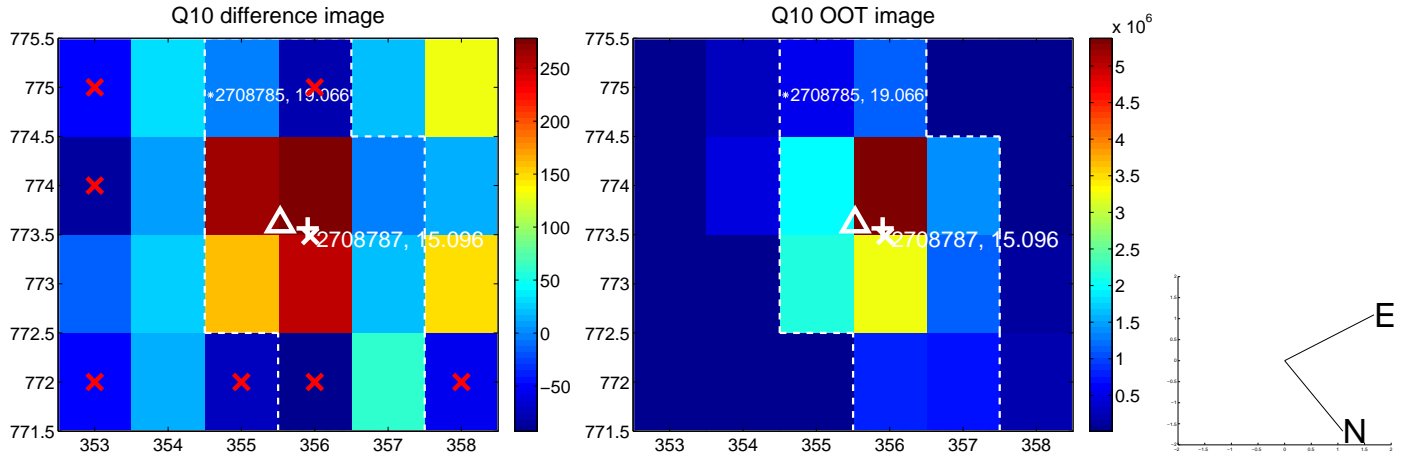
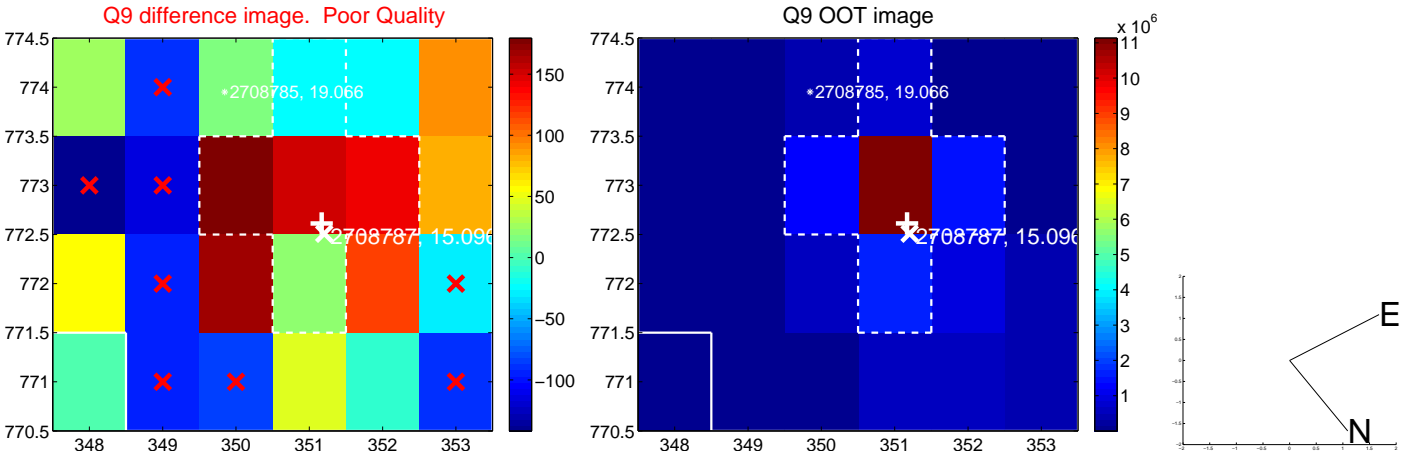
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



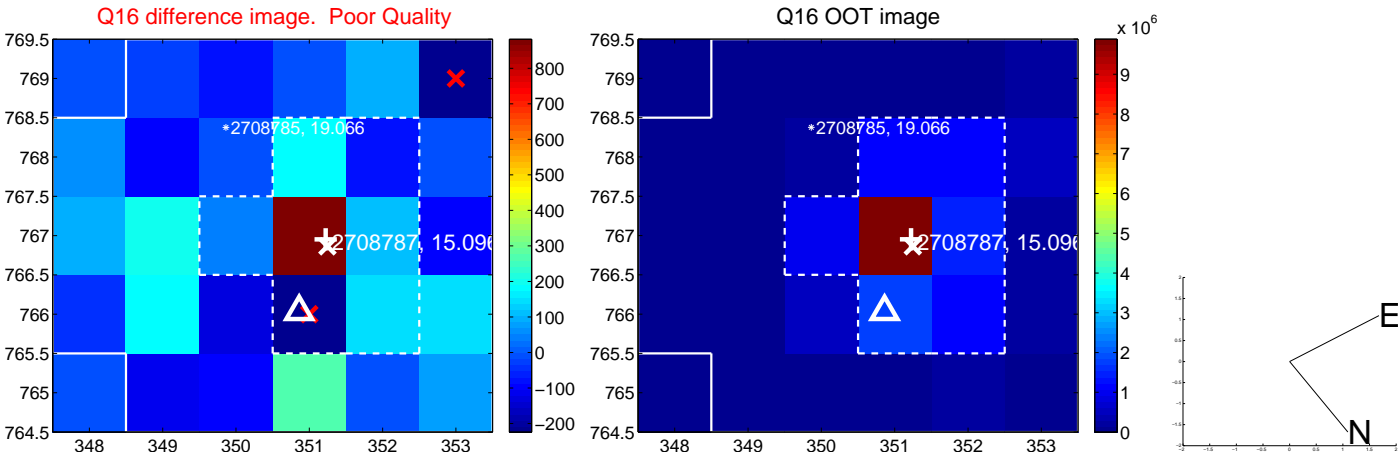
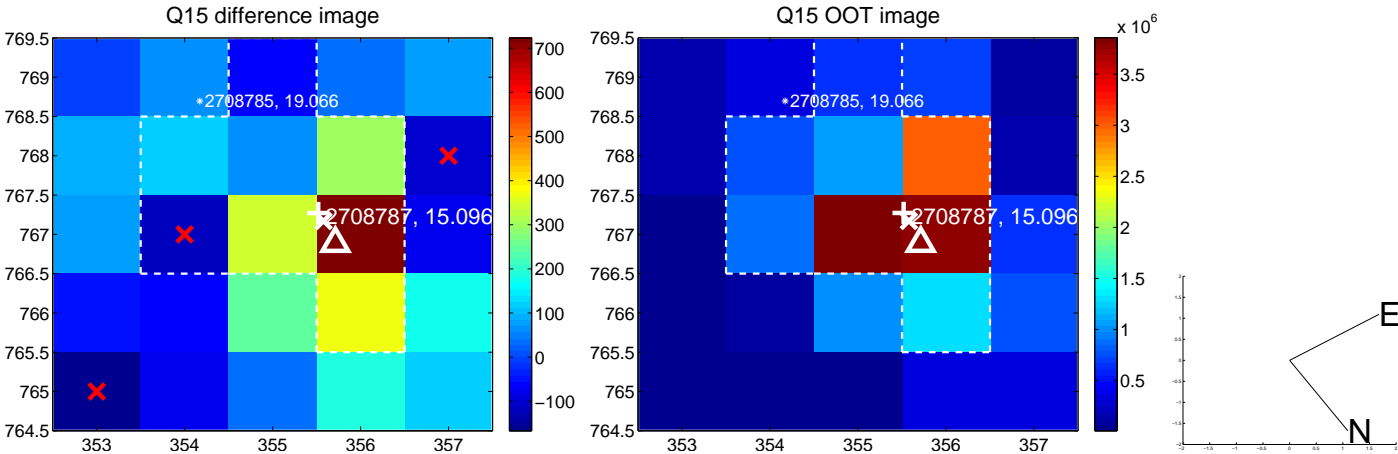
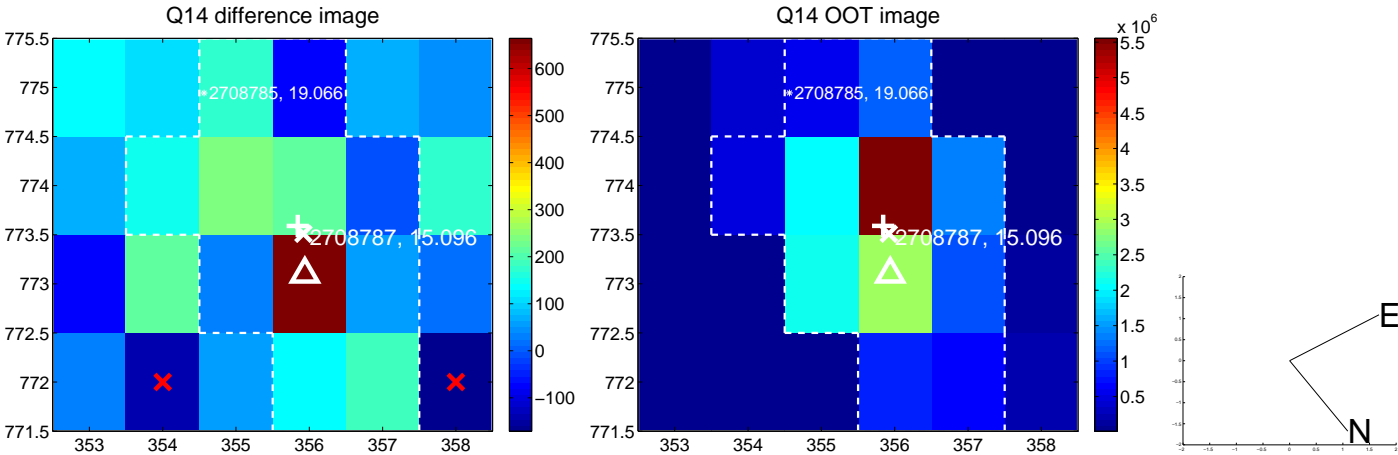
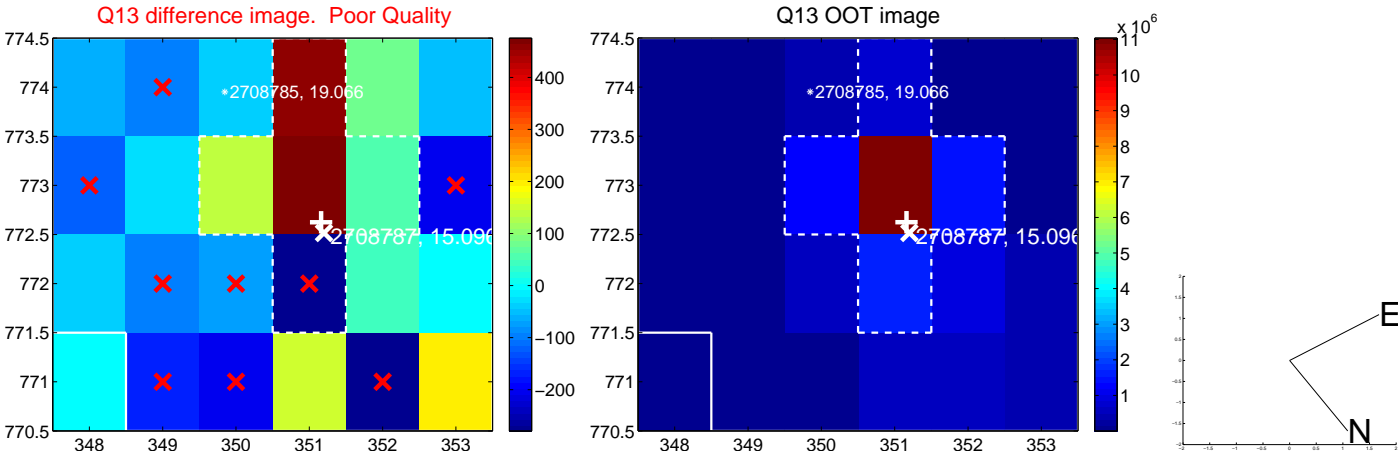
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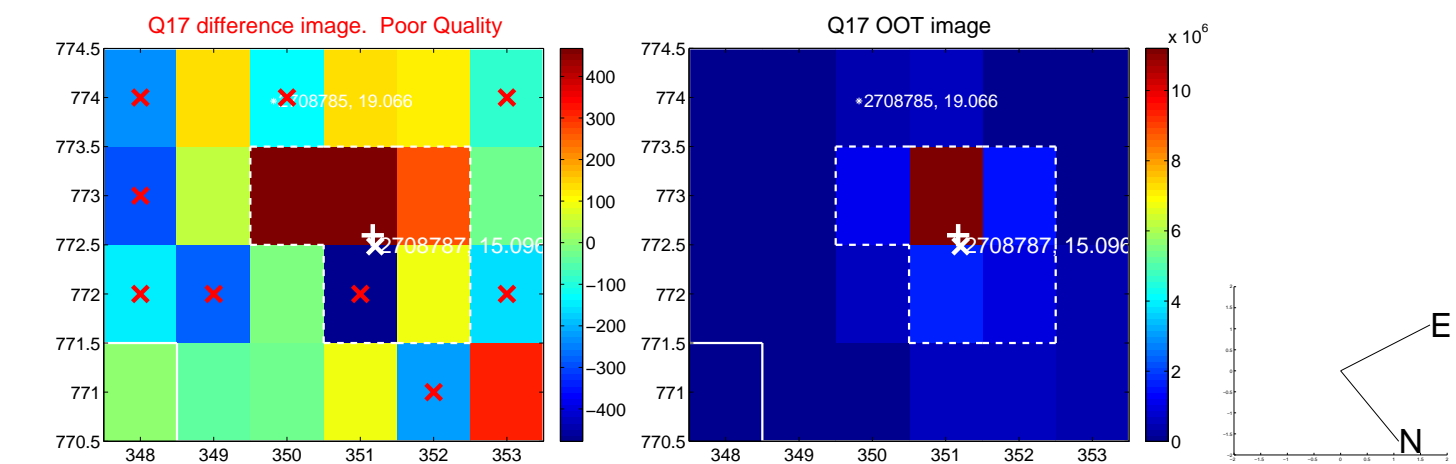
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



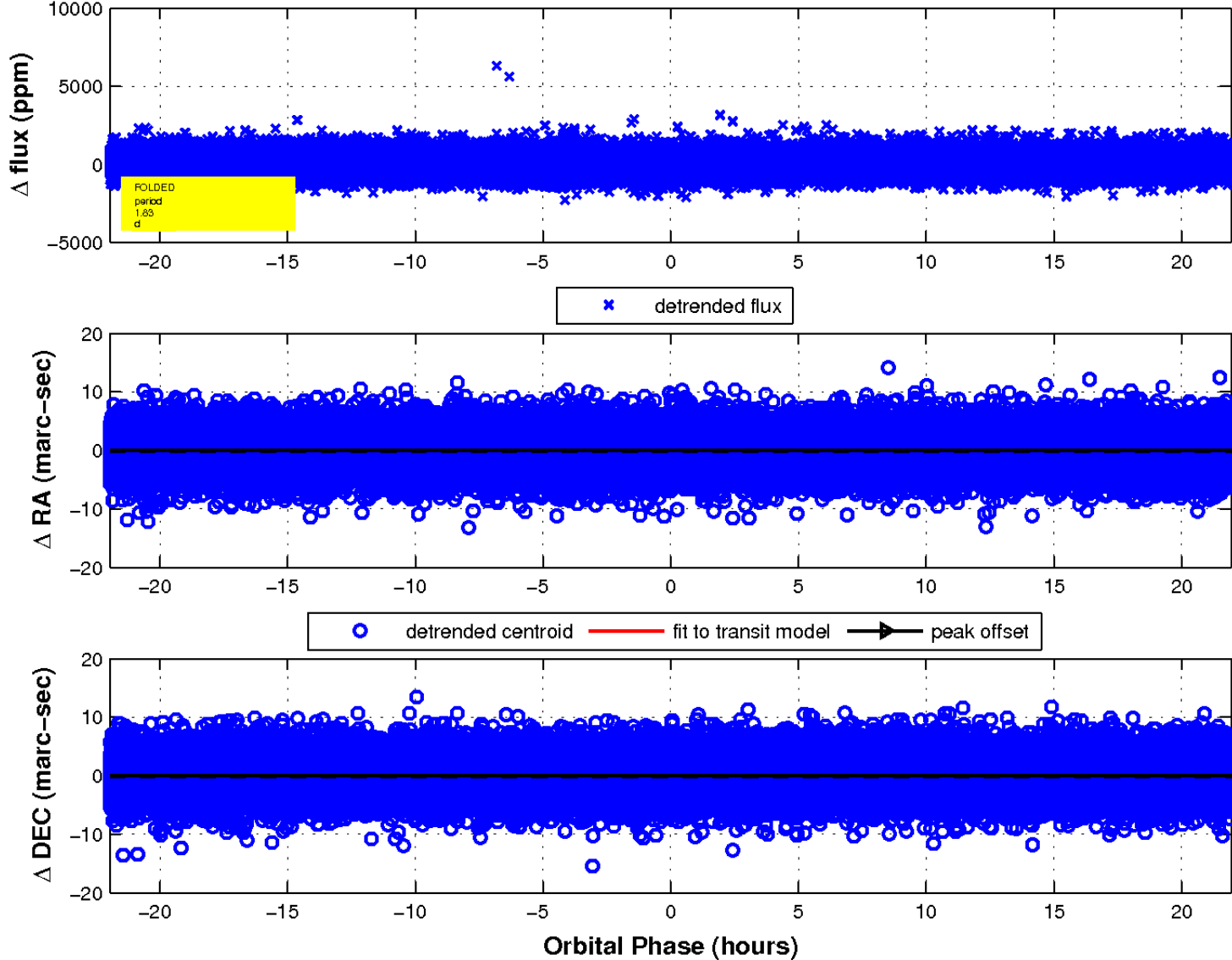
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

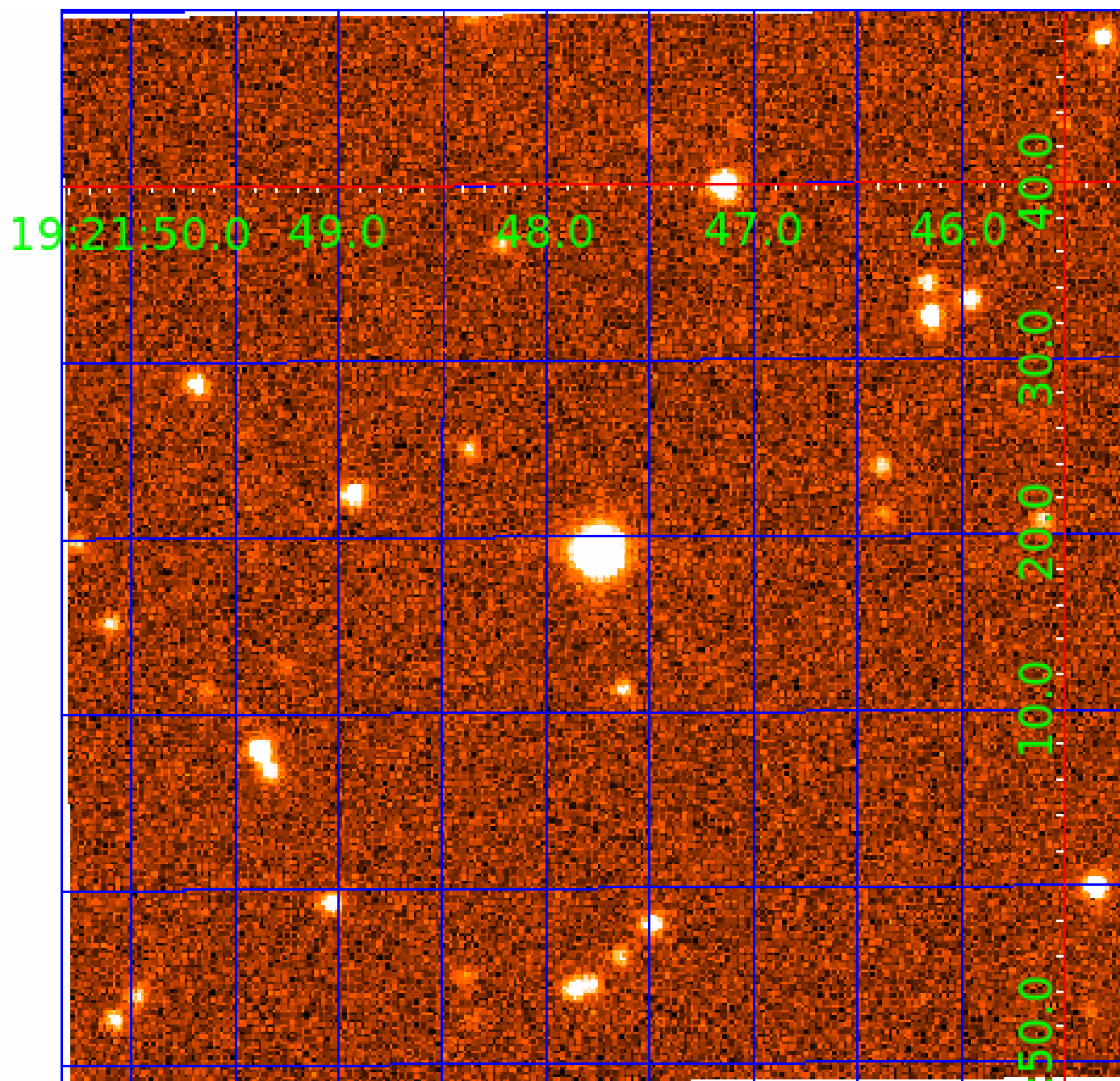


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 002708787

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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Robovetter Results

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002708787-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002708787-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

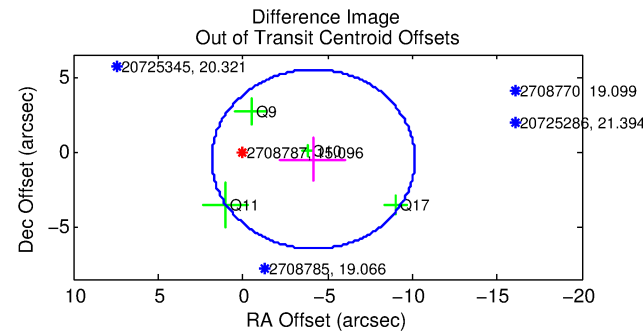
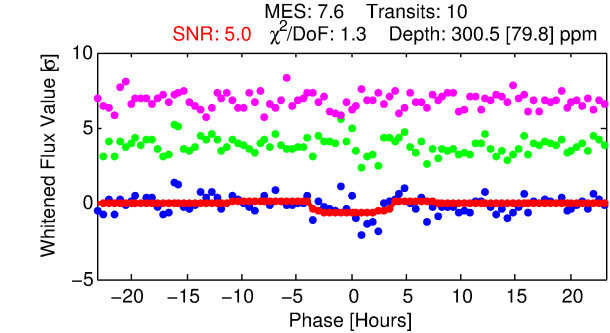
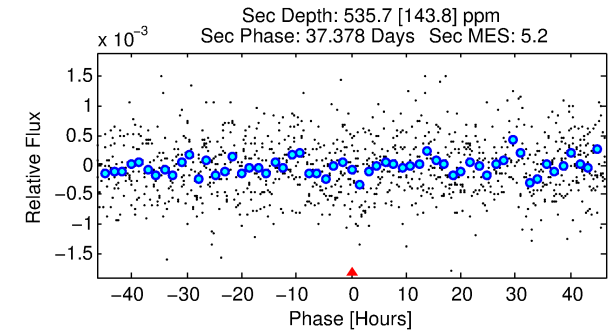
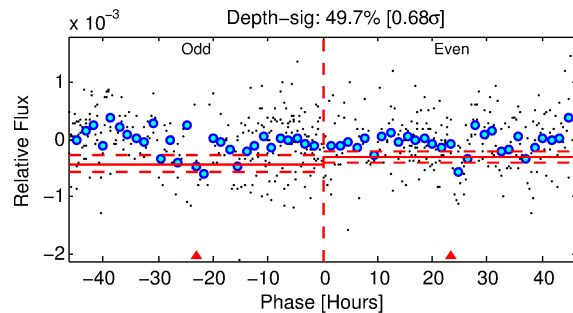
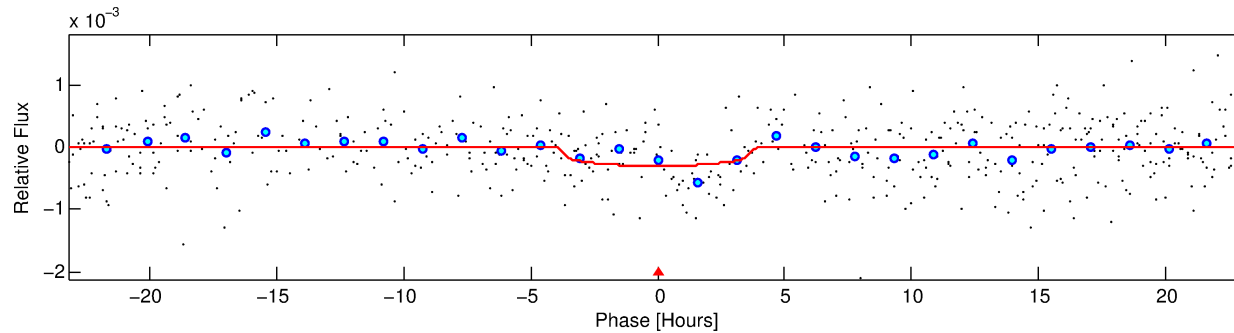
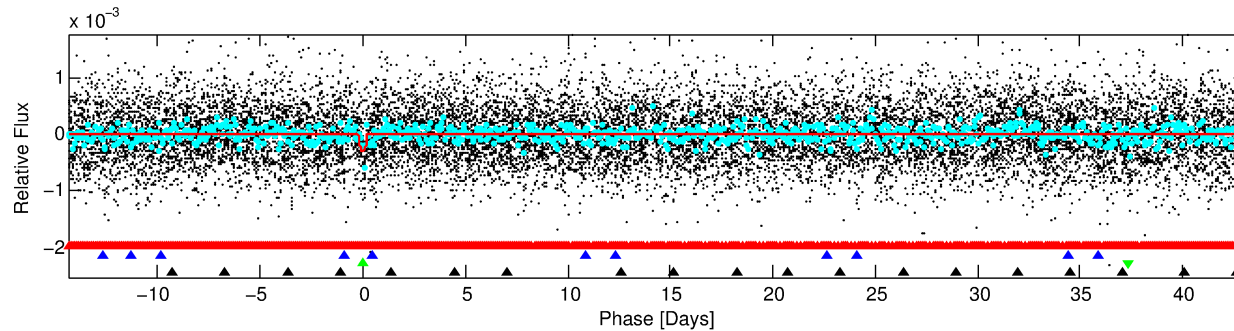
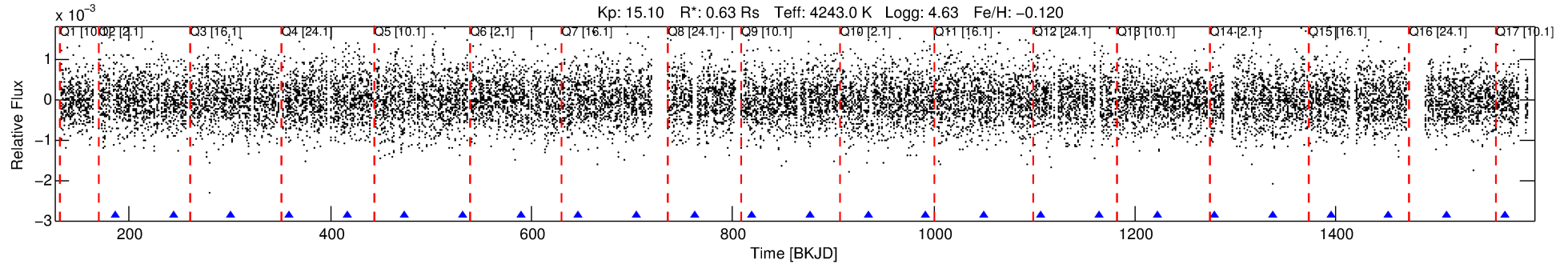
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002708787-03

No Significant Match Found

DV One-Page Summary

KIC: 2708787 Candidate: 3 of 4 Period: 57.534 d



DV Fit Results:

Period = 57.53406 [0.00201] d
Epoch = 186.5927 [0.0281] BKJD
Rp/R* = 0.0172 [0.0268]
a/R* = 39.82 [213.41]
b = 0.74 [3.37]
Seff = 1.86 [0.29]
Teq = 298 [12] K
Rp = 1.18 [1.84] Re
a = 0.2486 [0.0187] AU
Ag = 13003.79 [40639.73] [0.32 σ]
Teffp = 4916 [3842] K [1.20 σ]

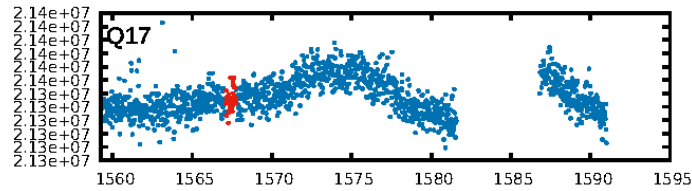
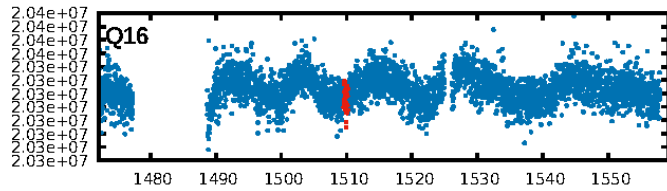
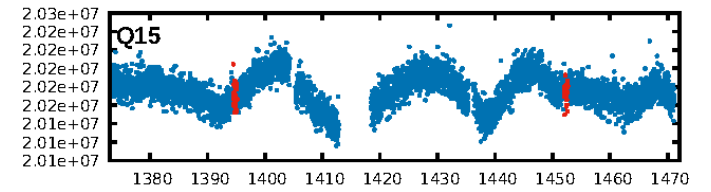
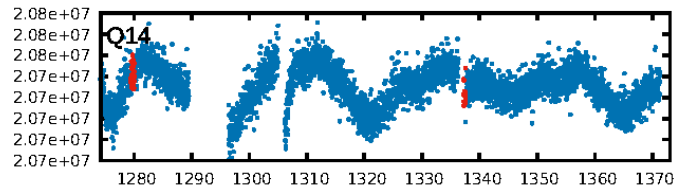
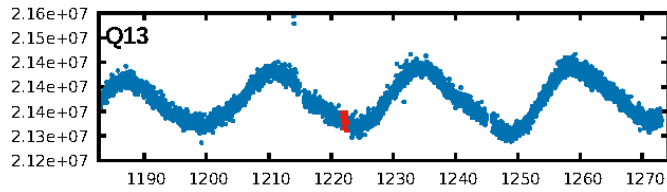
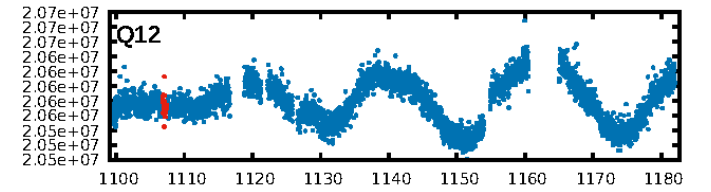
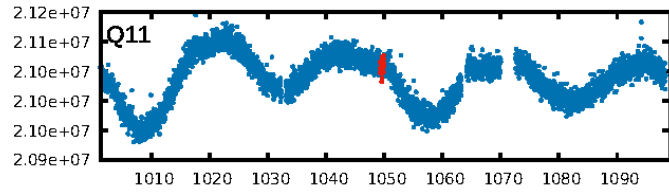
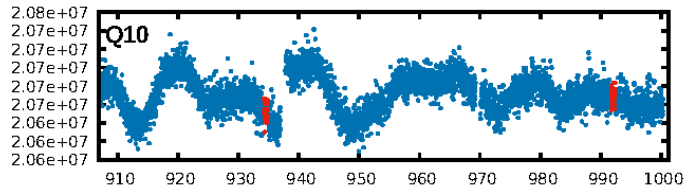
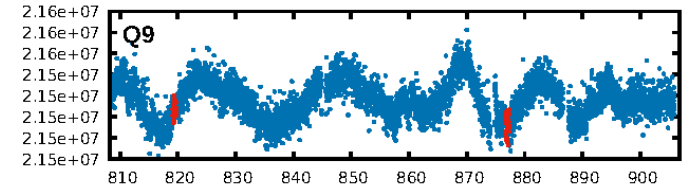
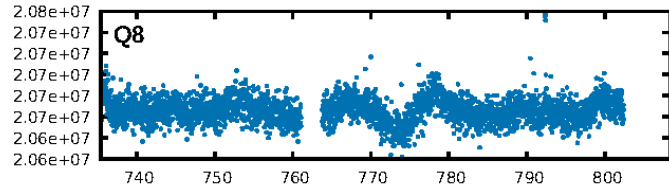
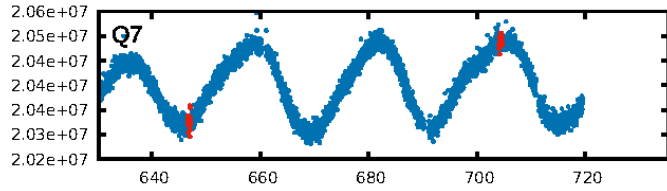
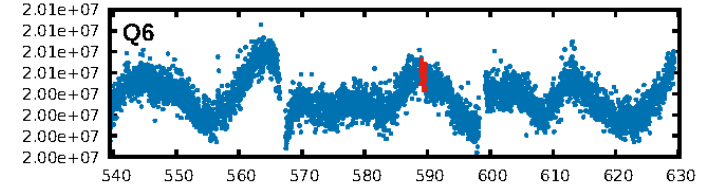
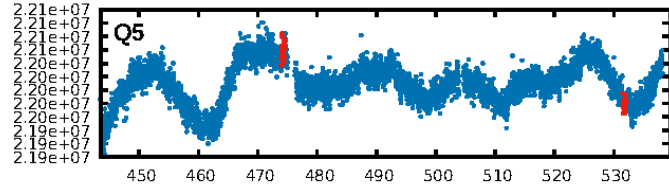
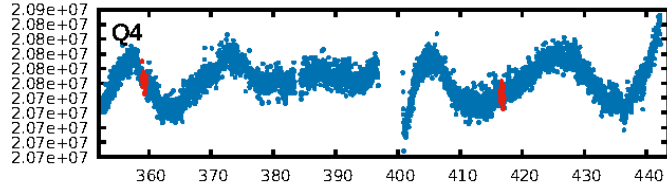
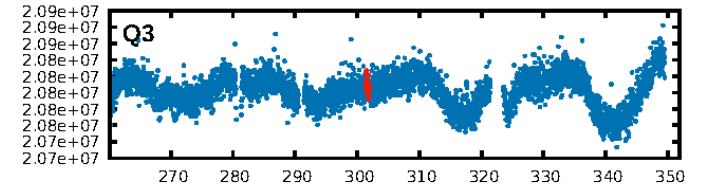
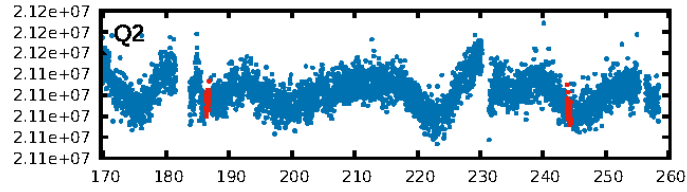
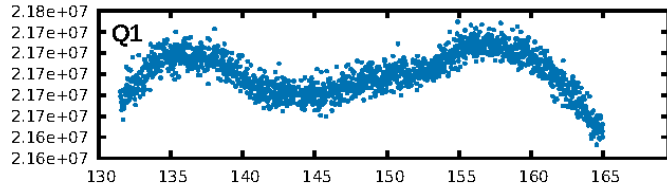
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [101.90 σ]
LongPeriod-sig: 100.0% [63.63 σ]
ModelChiSquare2-sig: 10.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 9.09e-09
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: -2.884
Centroid-sig: 72.1%
Centroid-so: 1.043 arcsec [0.79 σ]
OotOffset-rm: 4.189 arcsec [2.10 σ]
KicOffset-rm: 4.336 arcsec [2.68 σ]
OotOffset-st: 1/1/0/2 [4]
KicOffset-st: 1/1/0/2 [4]
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DiffImageOverlap-fno: 0.08 [1/13]

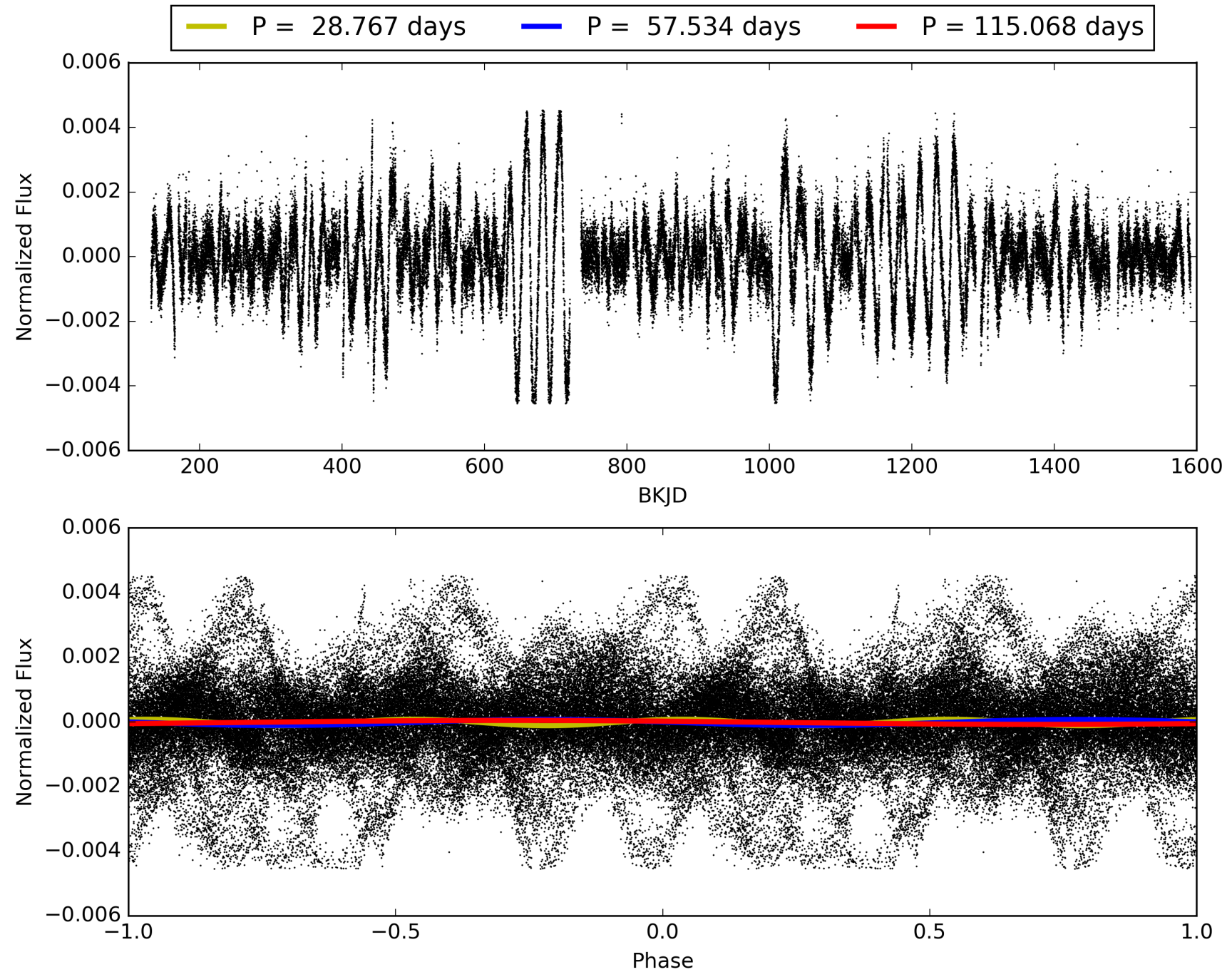
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:38:19 Z

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

TCE 002708787-03, PDC Light Curves

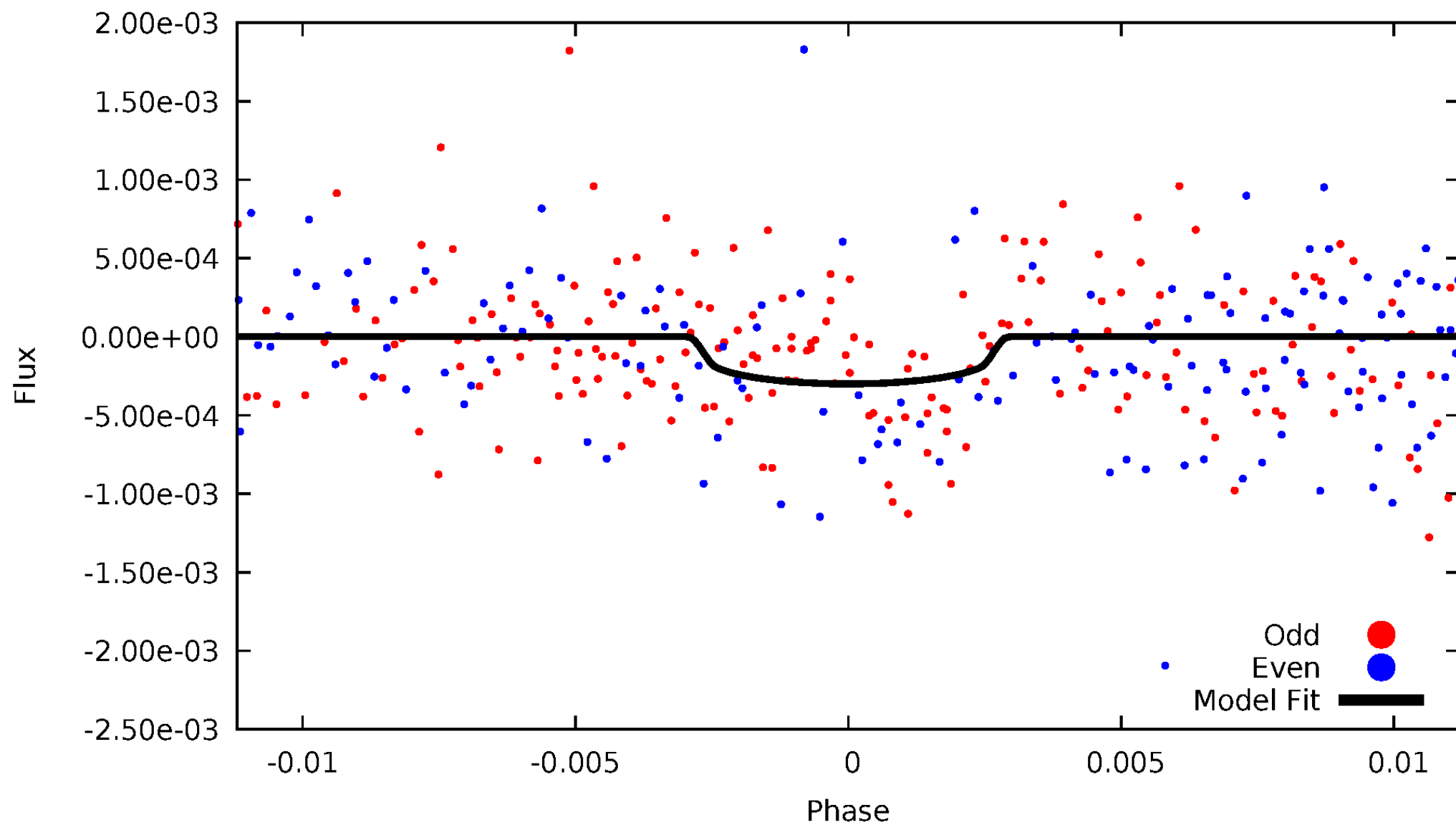


TCE 002708787-03



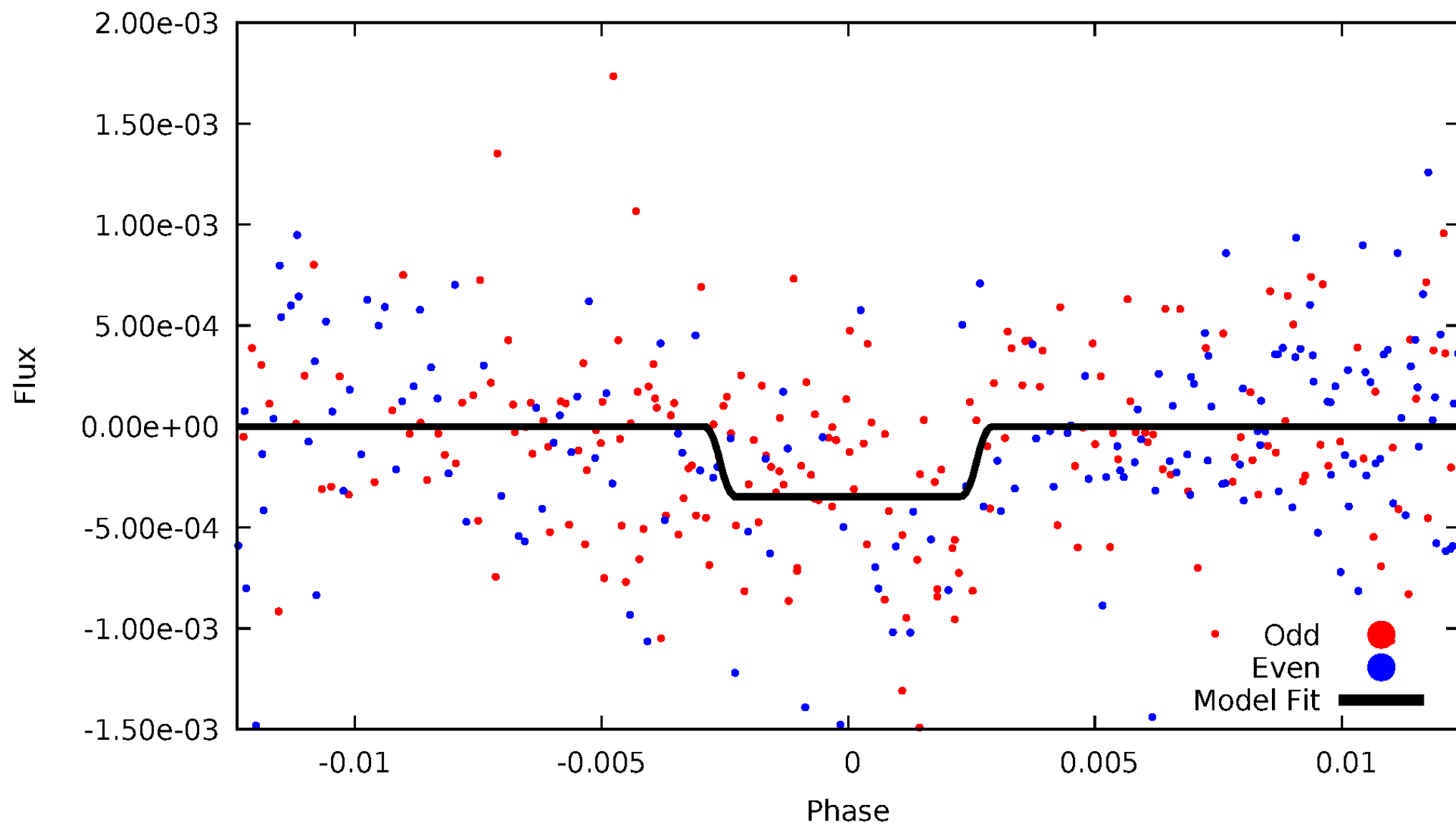
DV Odd/Even

TCE 002708787-03



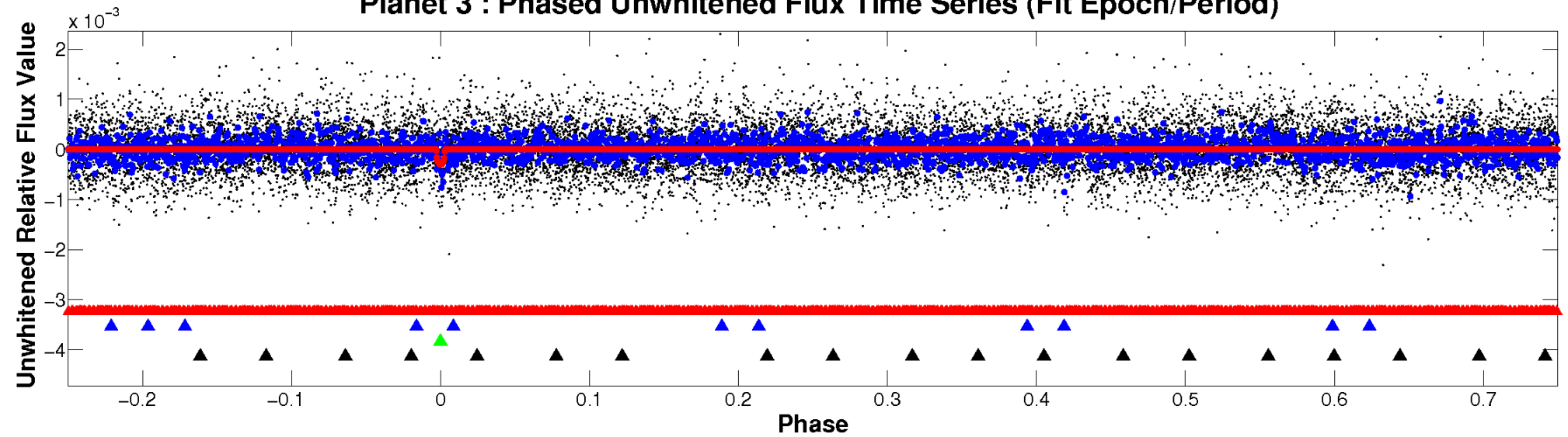
ALT Odd/Even

TCE 002708787-03

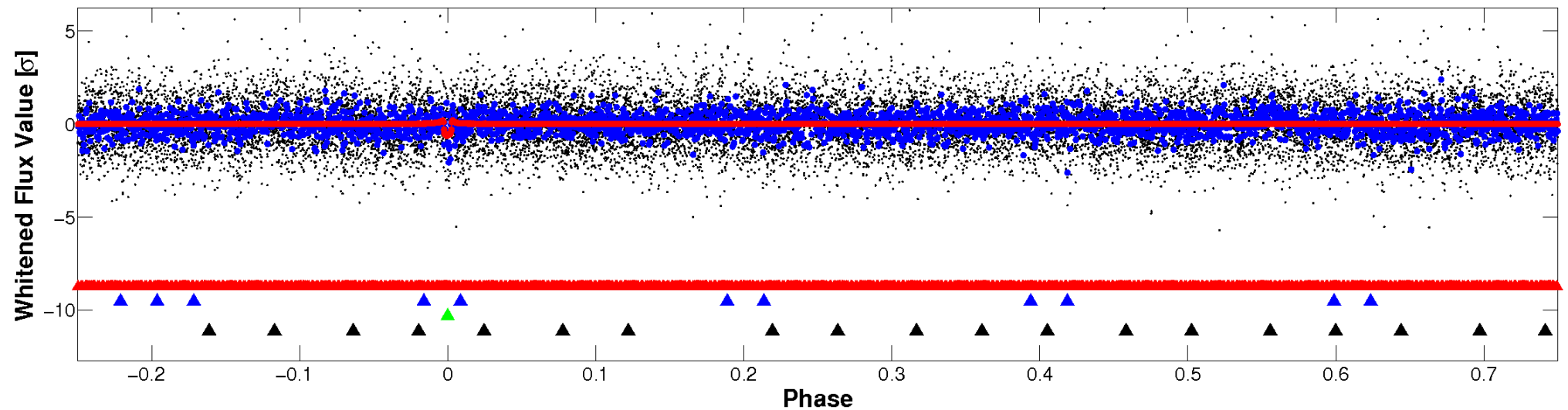


Non-Whitened Vs. Whitened Light Curve

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

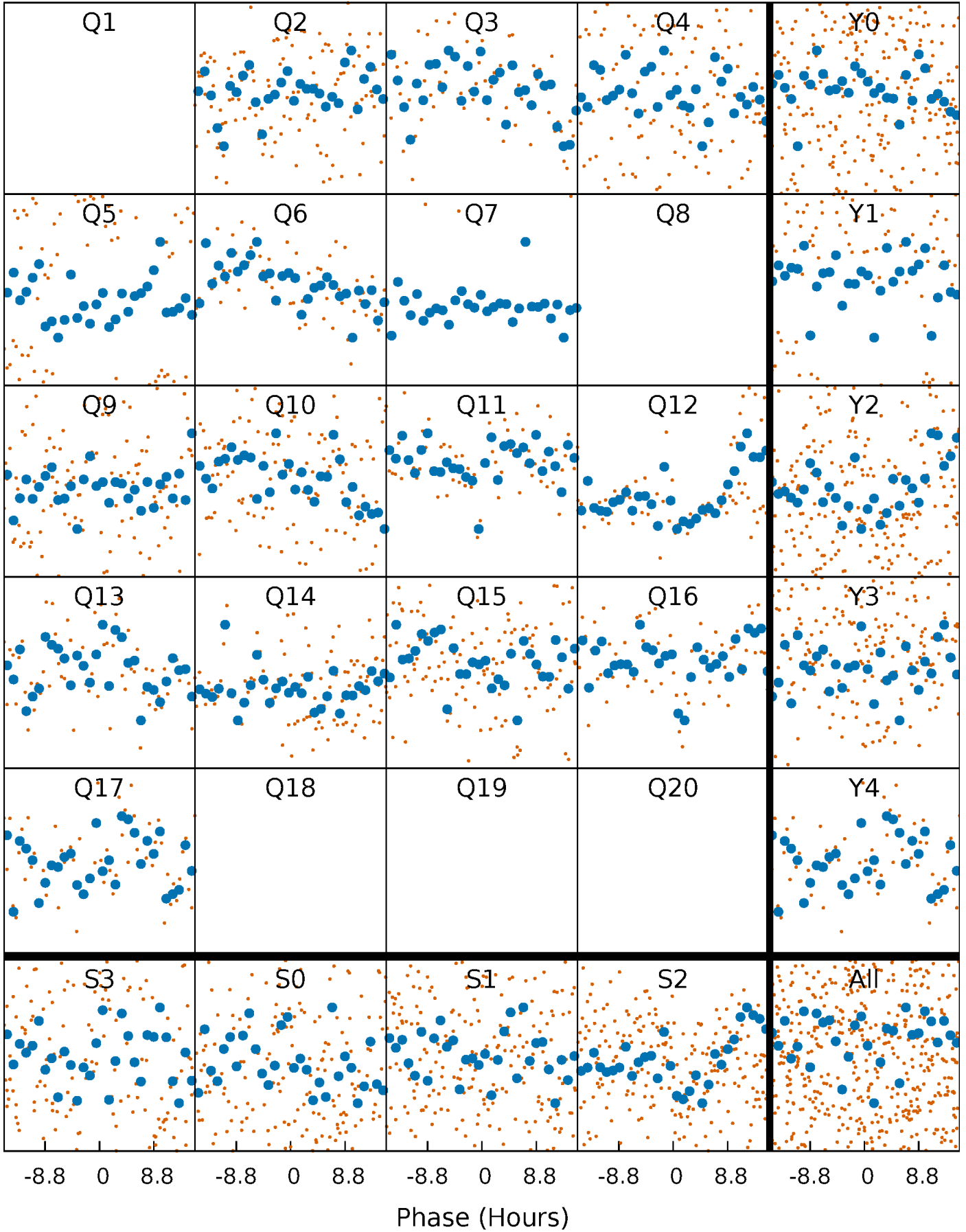


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



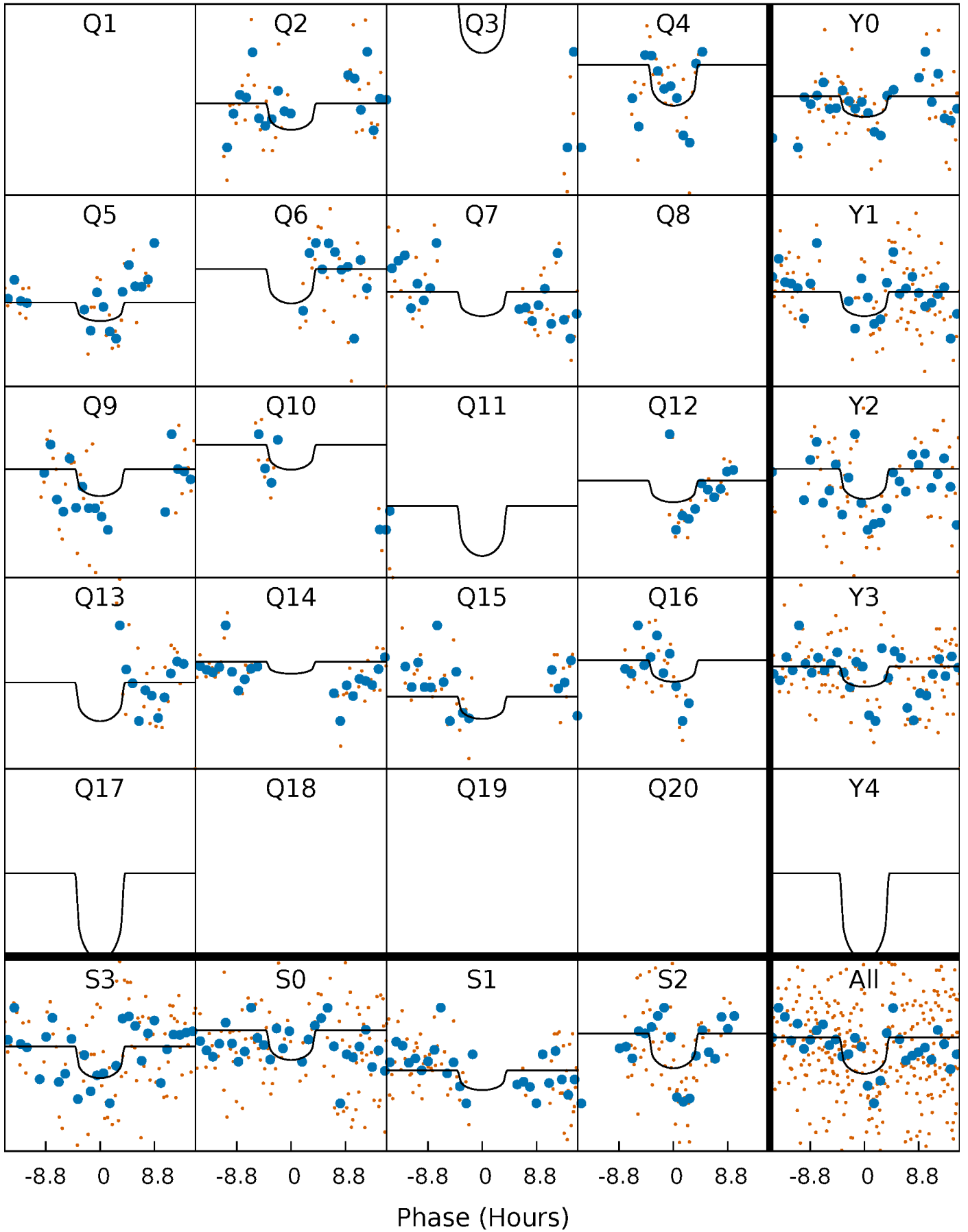
PDC Quarter-Phased Transit Curves

TCE 002708787-03 $P = 57.534060$ Days $T_0 = 186.592669$ (BKJD)



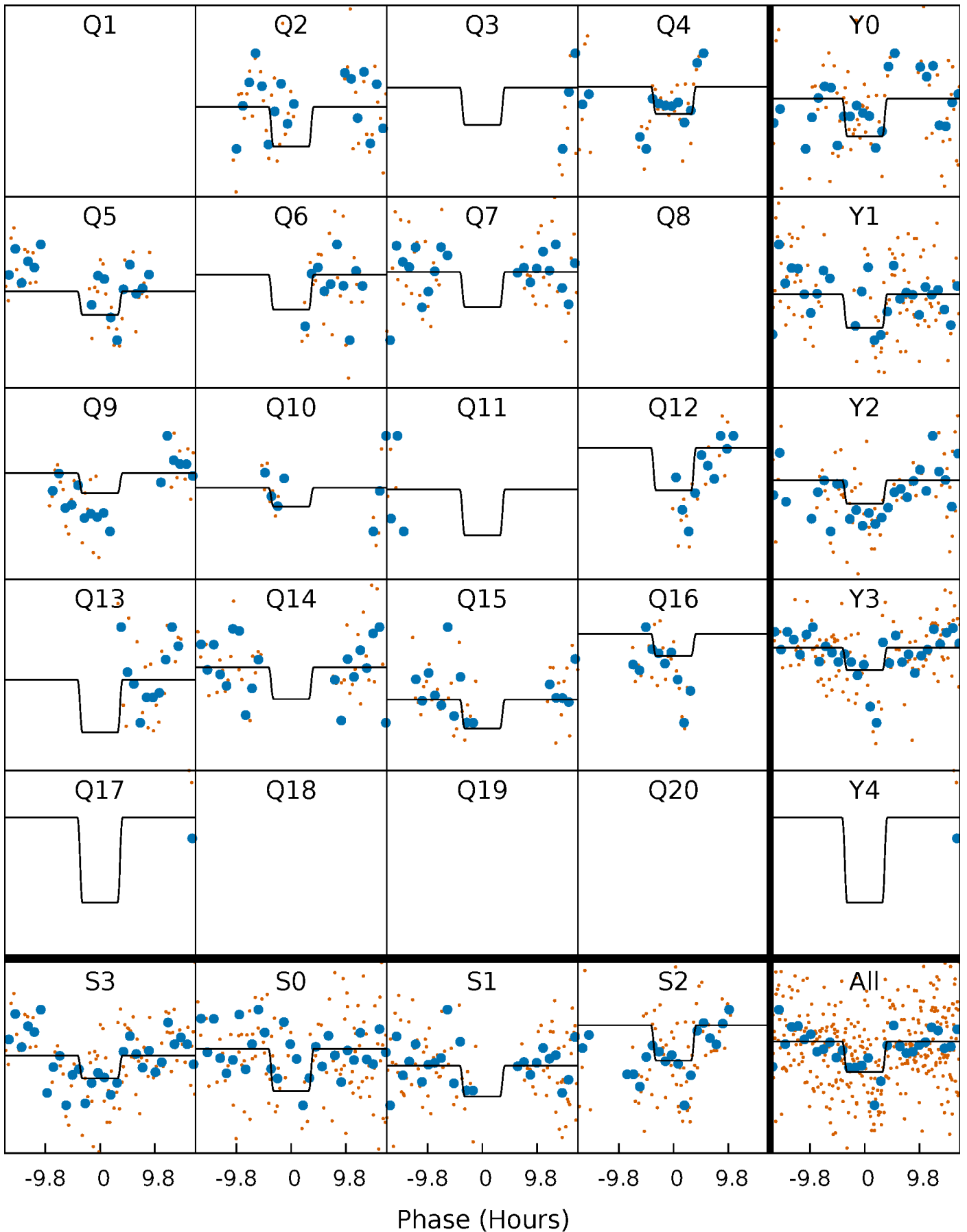
DV Quarter-Phased Transit Curves

TCE 002708787-03 P= 57.534060 Days $T_0=186.592669$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

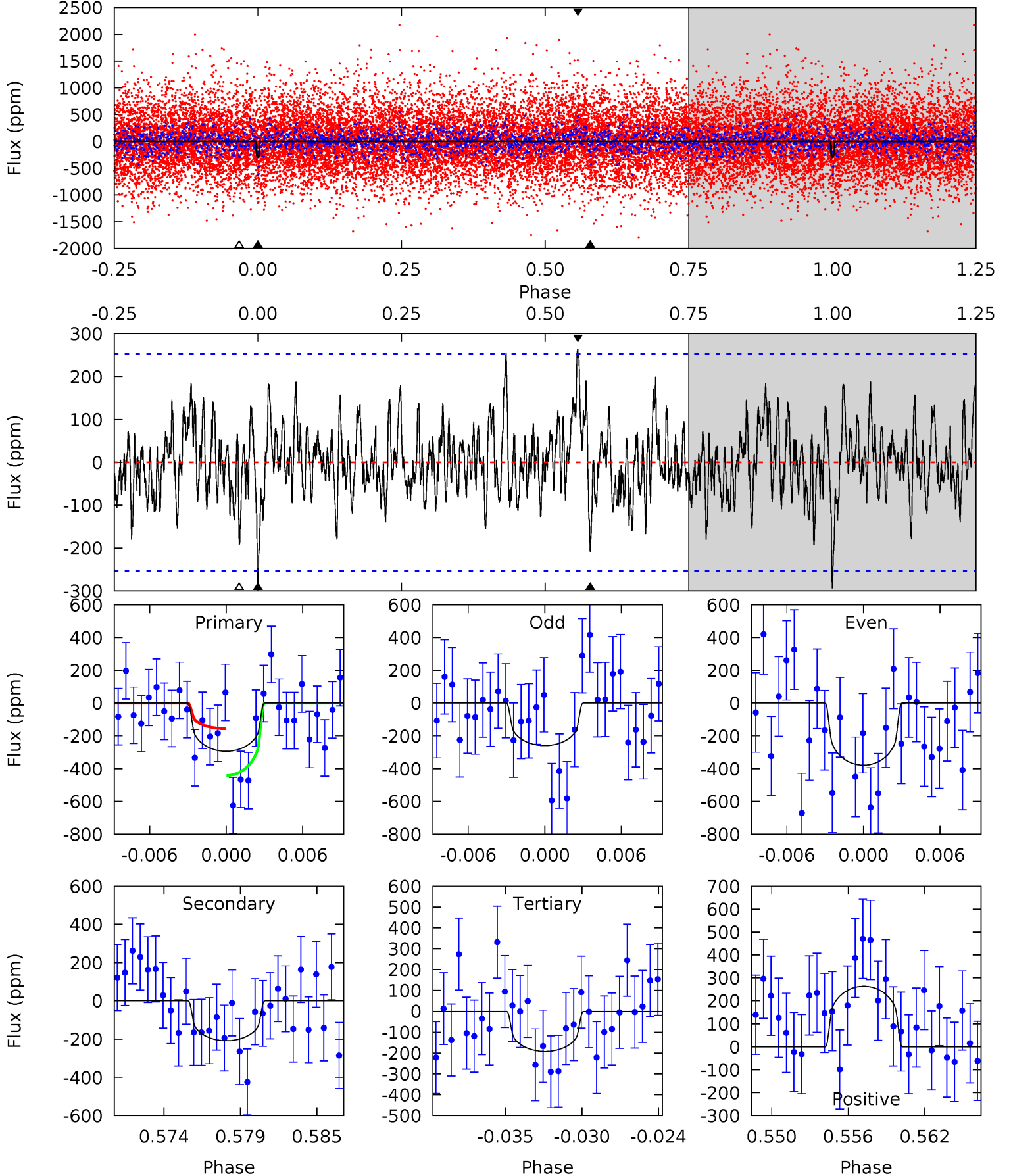
TCE 002708787-03 P= 57.534082 Days $T_0=186.571844$ (BKJD)



DV Model-Shift Uniqueness Test

002708787-03, P = 57.534060 Days, E = 129.058609 Days

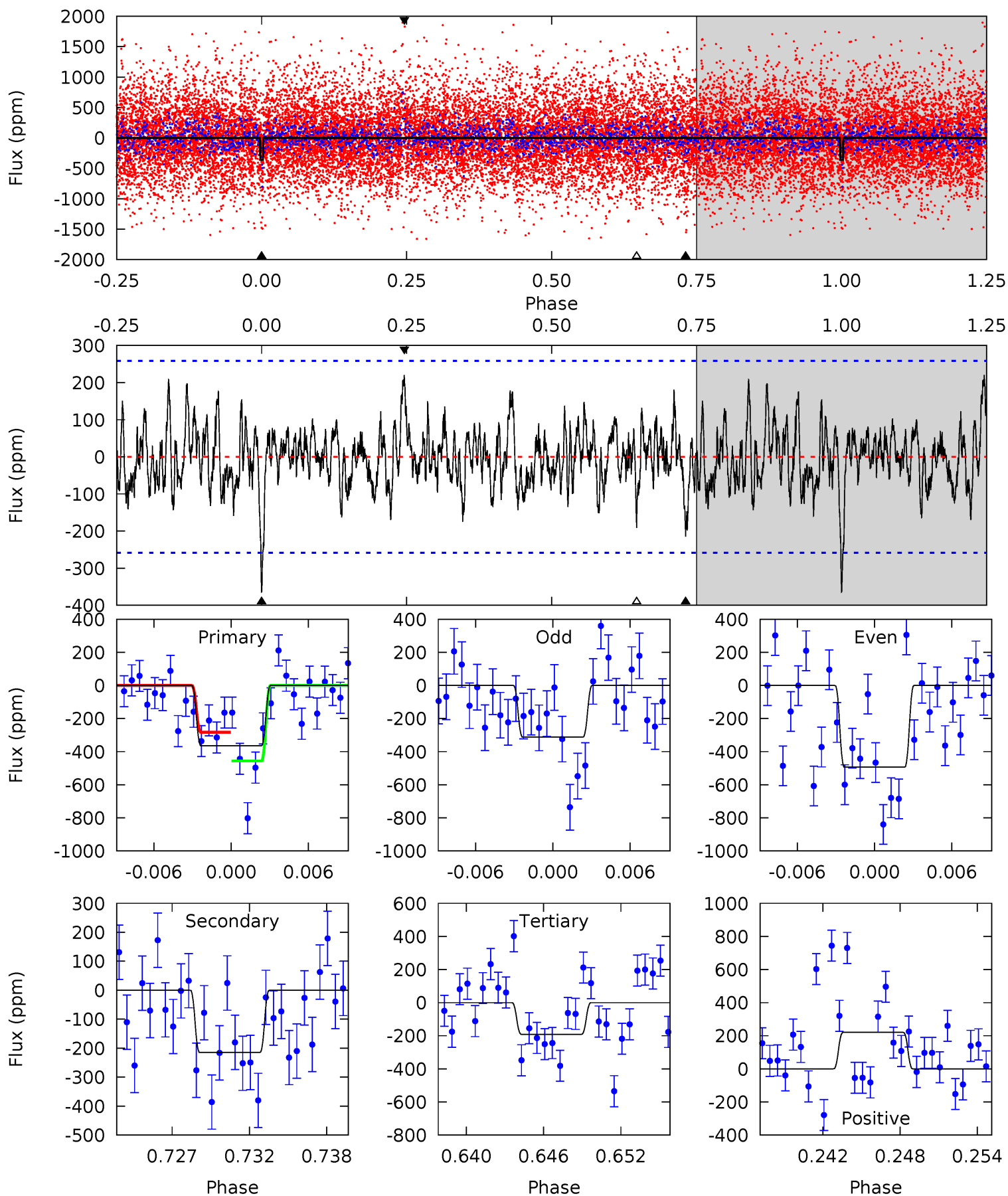
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.96	4.23	3.90	5.35	5.13	2.75	1.46	2.06	0.61	0.33	-1.13	1.11	0.62	0.47	2.91



Alt Model-Shift Uniqueness Test

002708787-03, P = 57.534082 Days, E = 129.037762 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.24	4.27	3.80	4.37	5.13	2.76	1.31	3.44	2.87	0.47	-0.11	1.66	0.89	0.38	1.72



Stellar Parameters For KIC 002708787

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4243^{+126}_{-126}	$4.632^{+0.052}_{-0.020}$	$-0.120^{+0.300}_{-0.300}$	$0.629^{+0.040}_{-0.060}$	$0.617^{+0.061}_{-0.055}$	$3.499^{+0.815}_{-0.348}$
	+3%/-3%	+1%/-0%	+250%/-250%	+6%/-10%	+10%/-9%	+23%/-10%
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 002708787-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-208 ± 49	$1.76^{+1.62}_{-1.19}$	415^{+13}_{-15}	3492^{+1786}_{-633}	2334^{+19269}_{-1727}
Alt.	-215 ± 50	$1.89^{+1.57}_{-1.22}$	413^{+15}_{-14}	3451^{+1499}_{-598}	2114^{+14776}_{-1518}

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

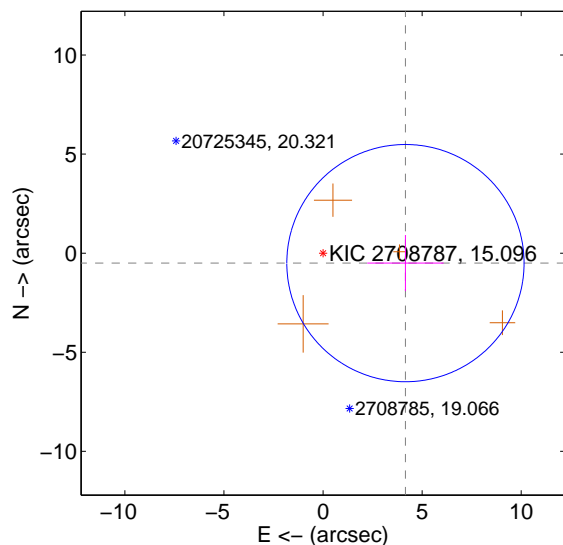
Supplemental centroid analysis for 002708787-03. Kepler magnitude: 15.10. Transit SNR 4.97

There are 0 quarters with good PRF difference image offsets

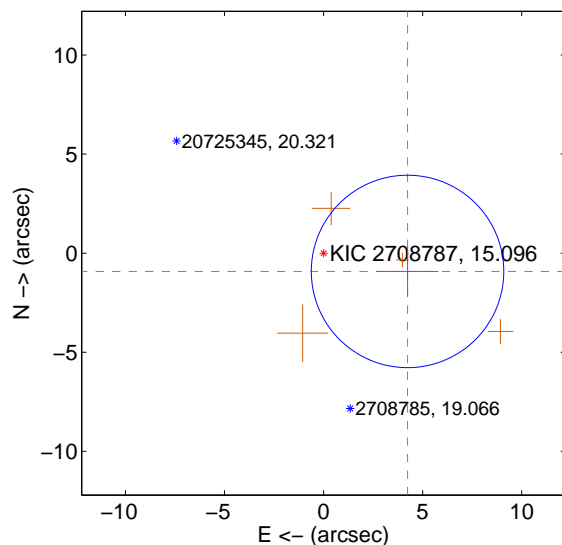
The direct PRF centroid is offset from the target star catalog position by about 0.46 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.189 ± 1.995	2.10	-4.158 ± 1.924	-0.502 ± 1.416
PRF-fit source offset from KIC position	4.336 ± 1.619	2.68	-4.237 ± 1.565	-0.921 ± 1.217
photometric centroid source offset	1.04 ± 1.32	0.79	-0.54 ± 1.36	-0.89 ± 1.30

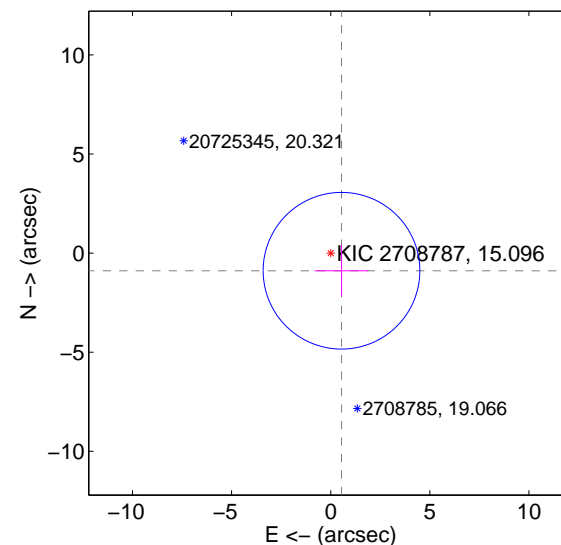
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

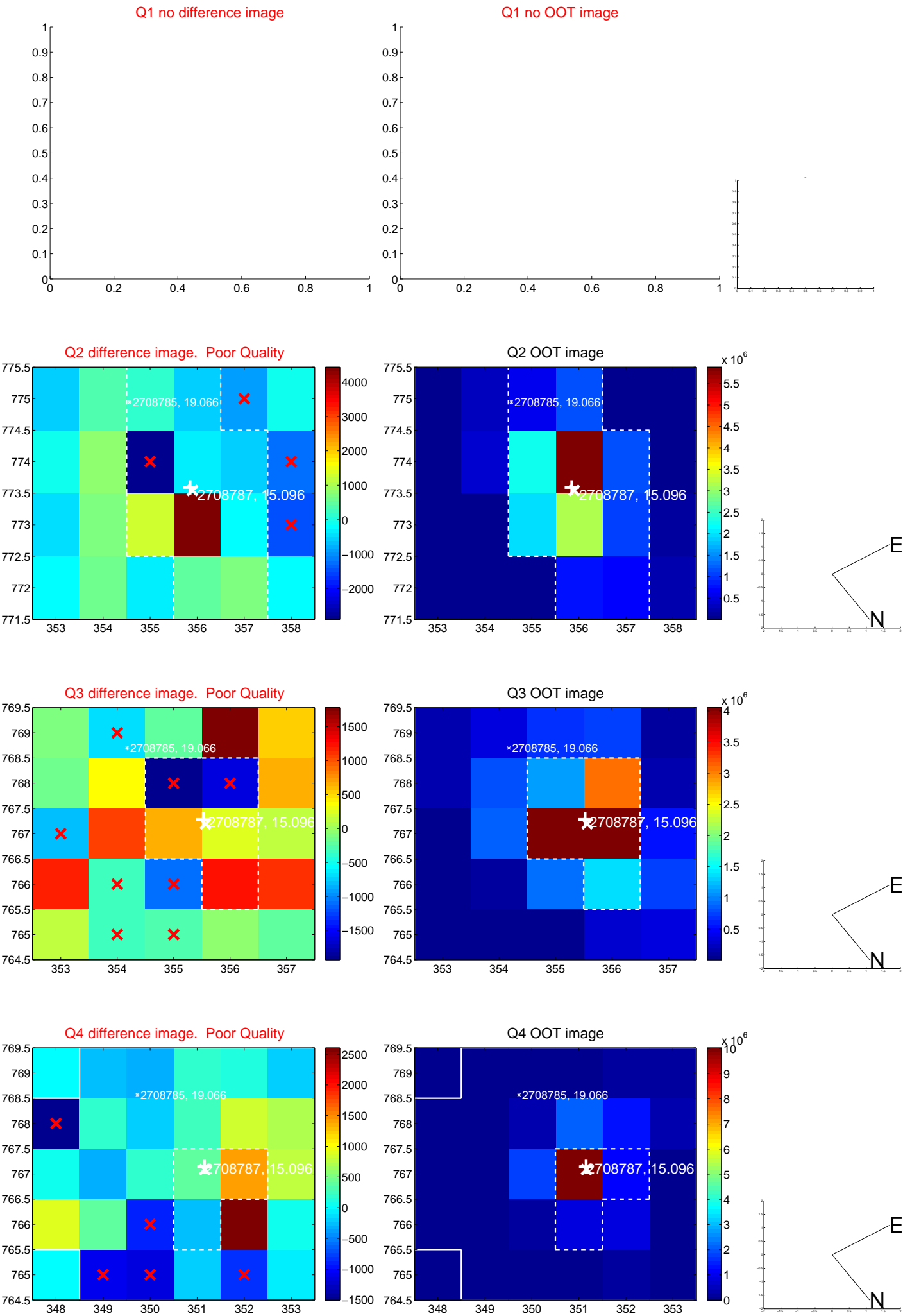


offset from photometric centroids

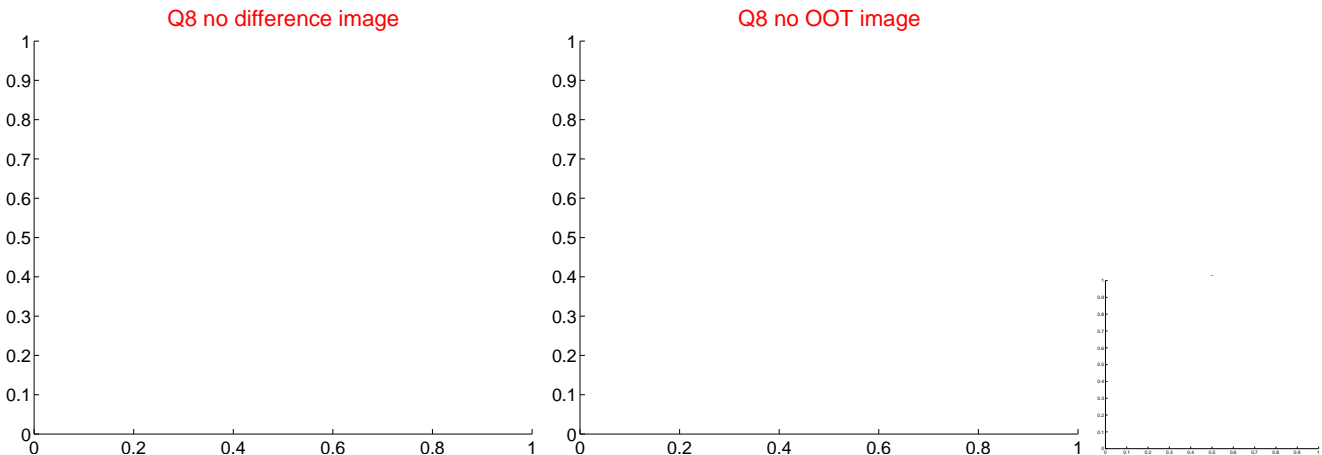
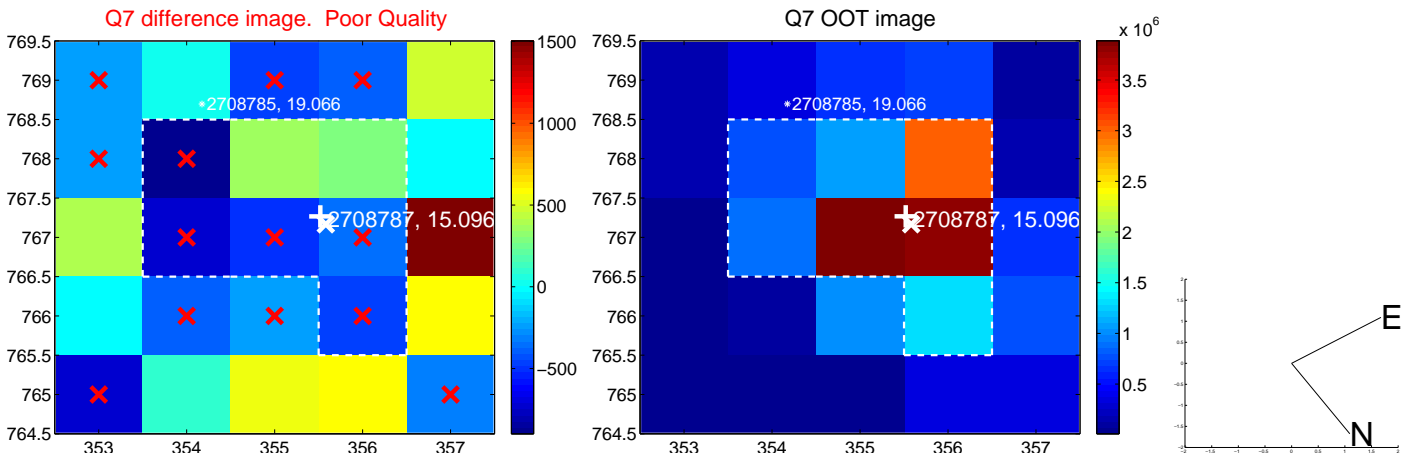
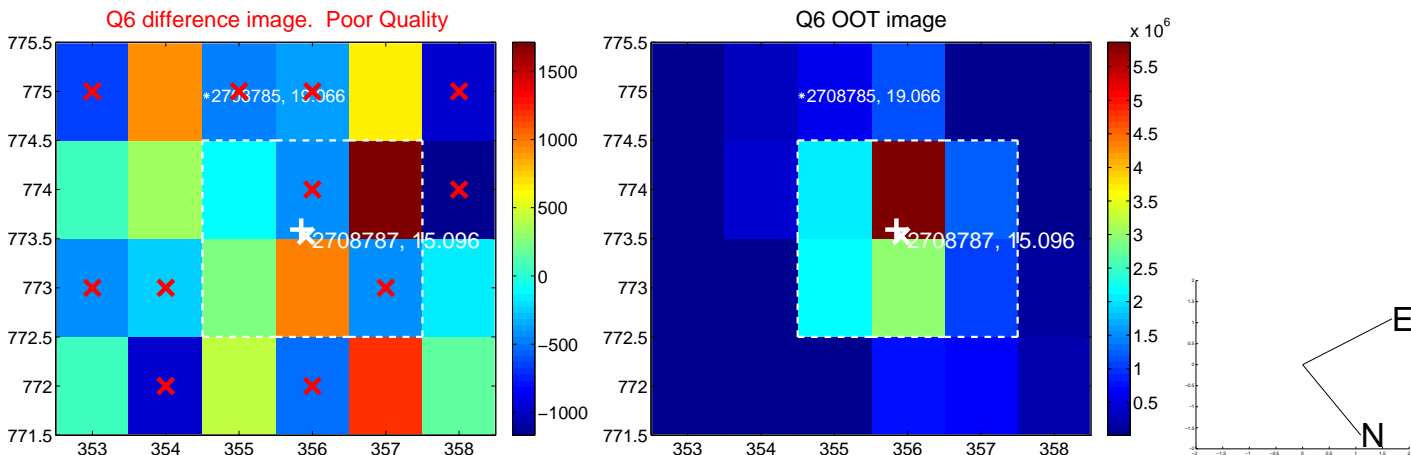
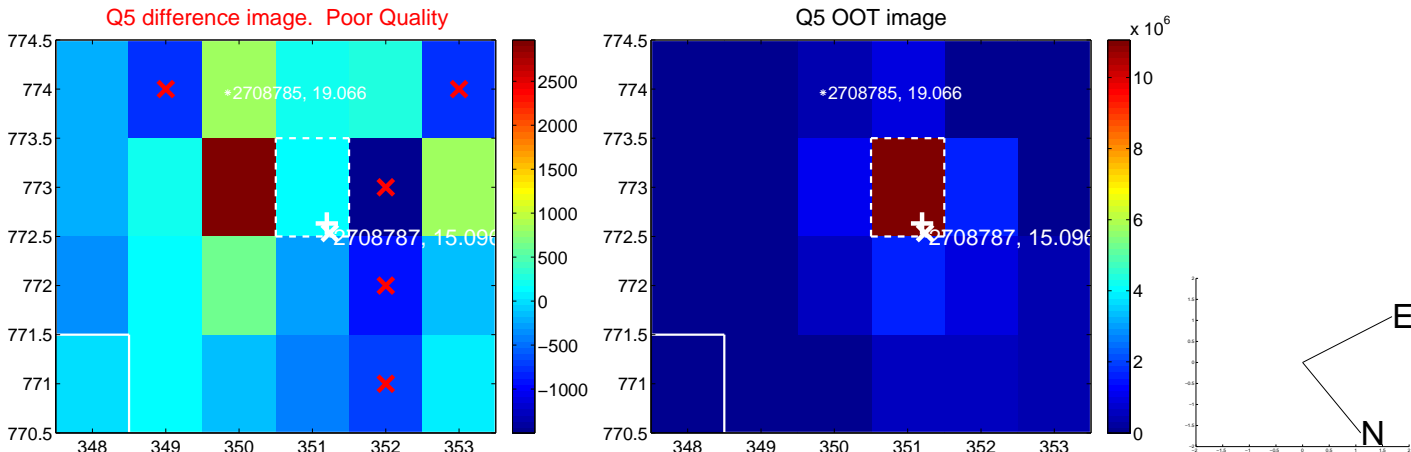


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

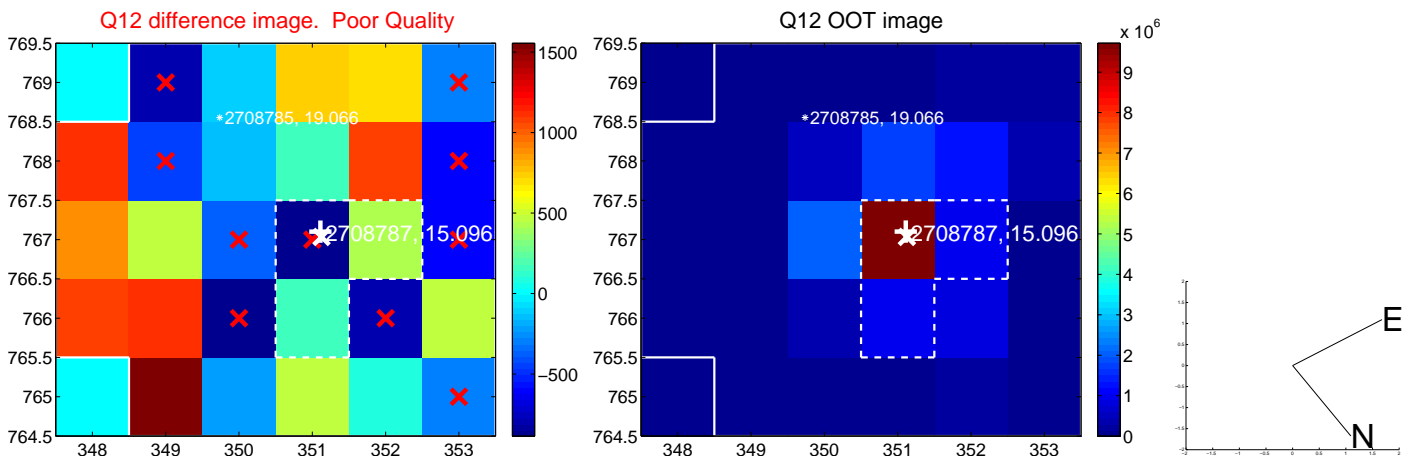
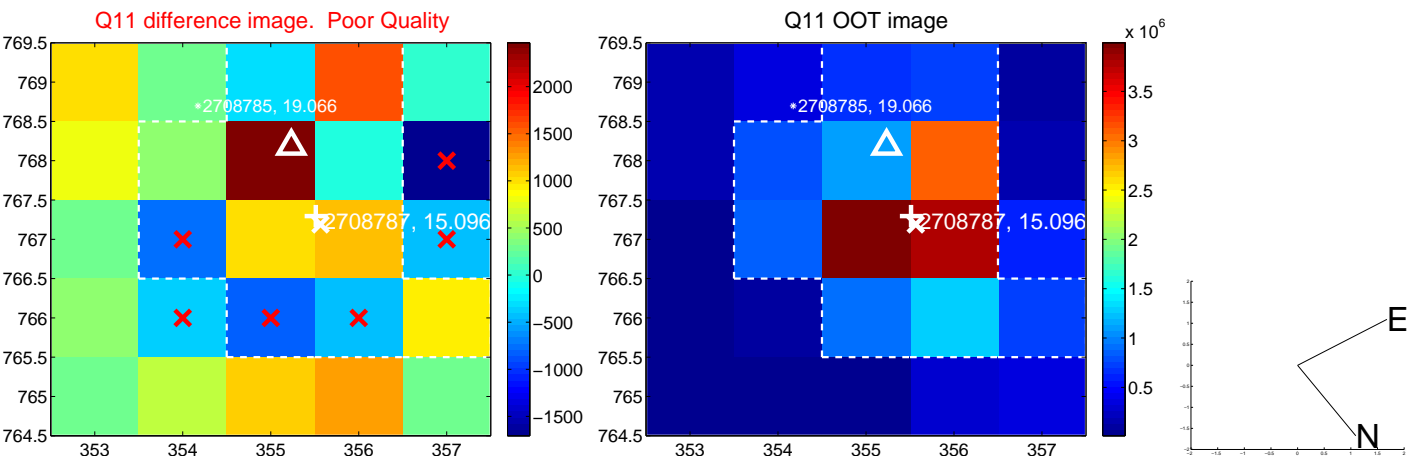
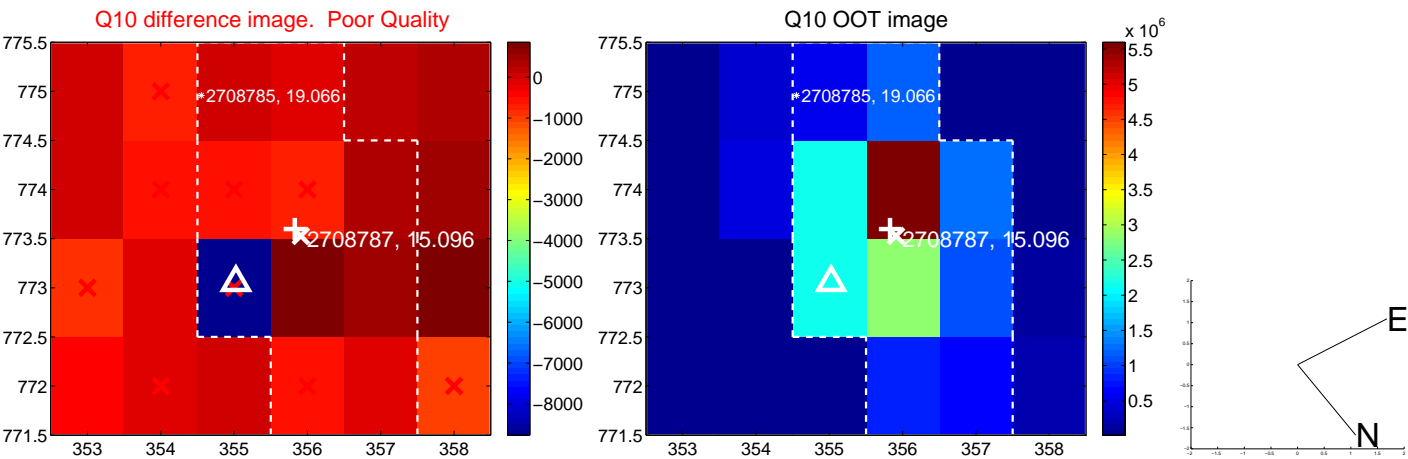
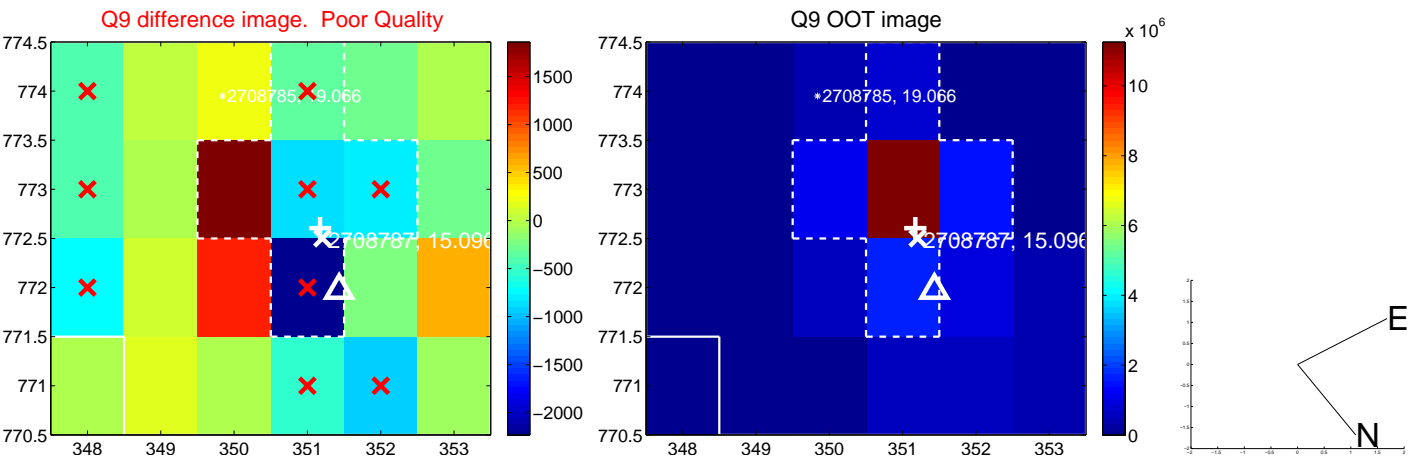
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



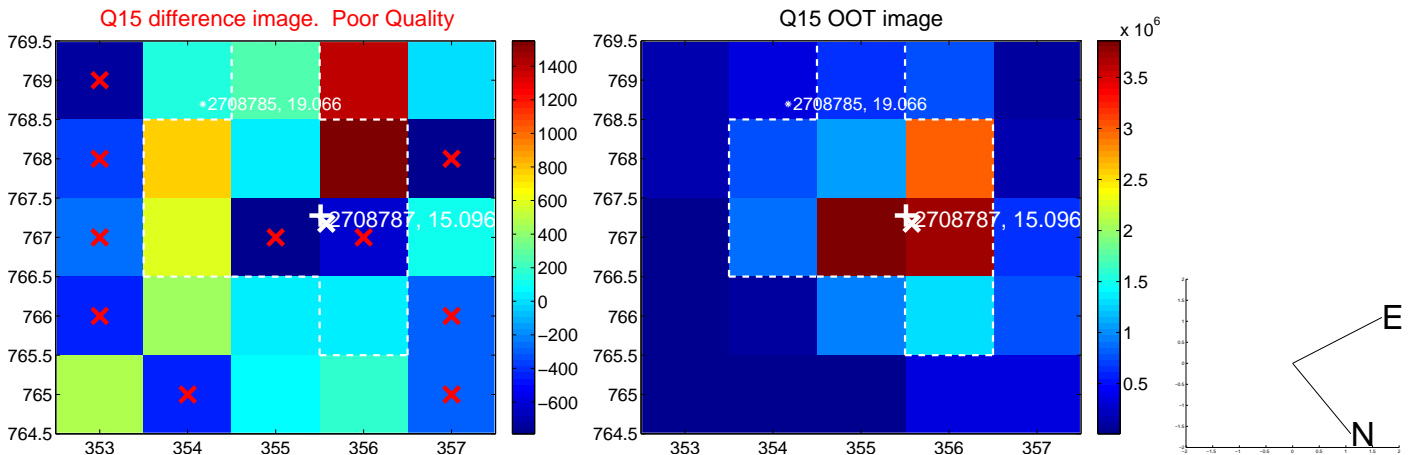
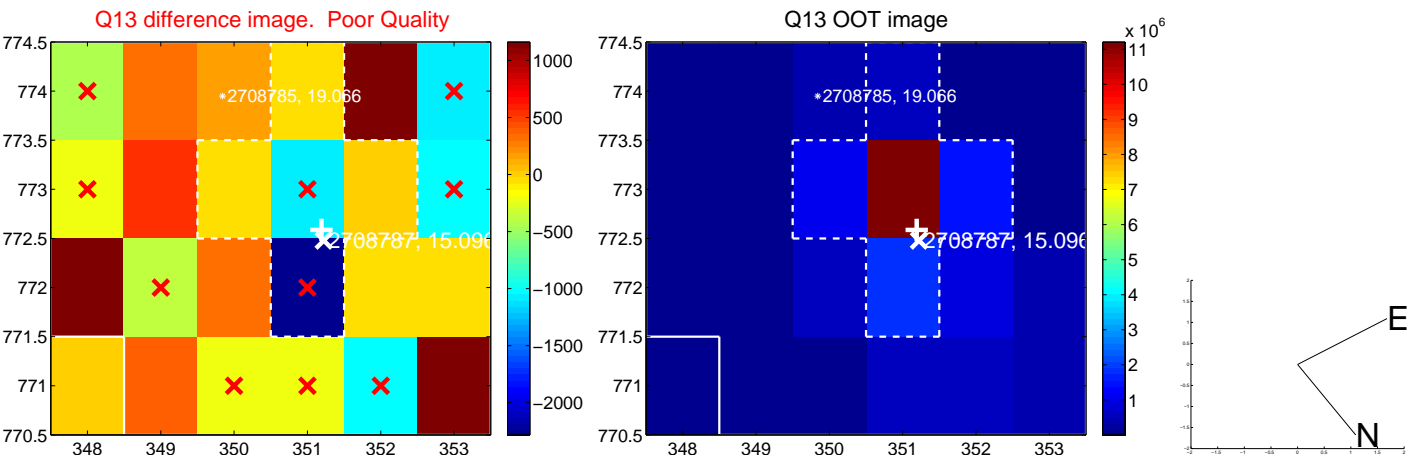
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



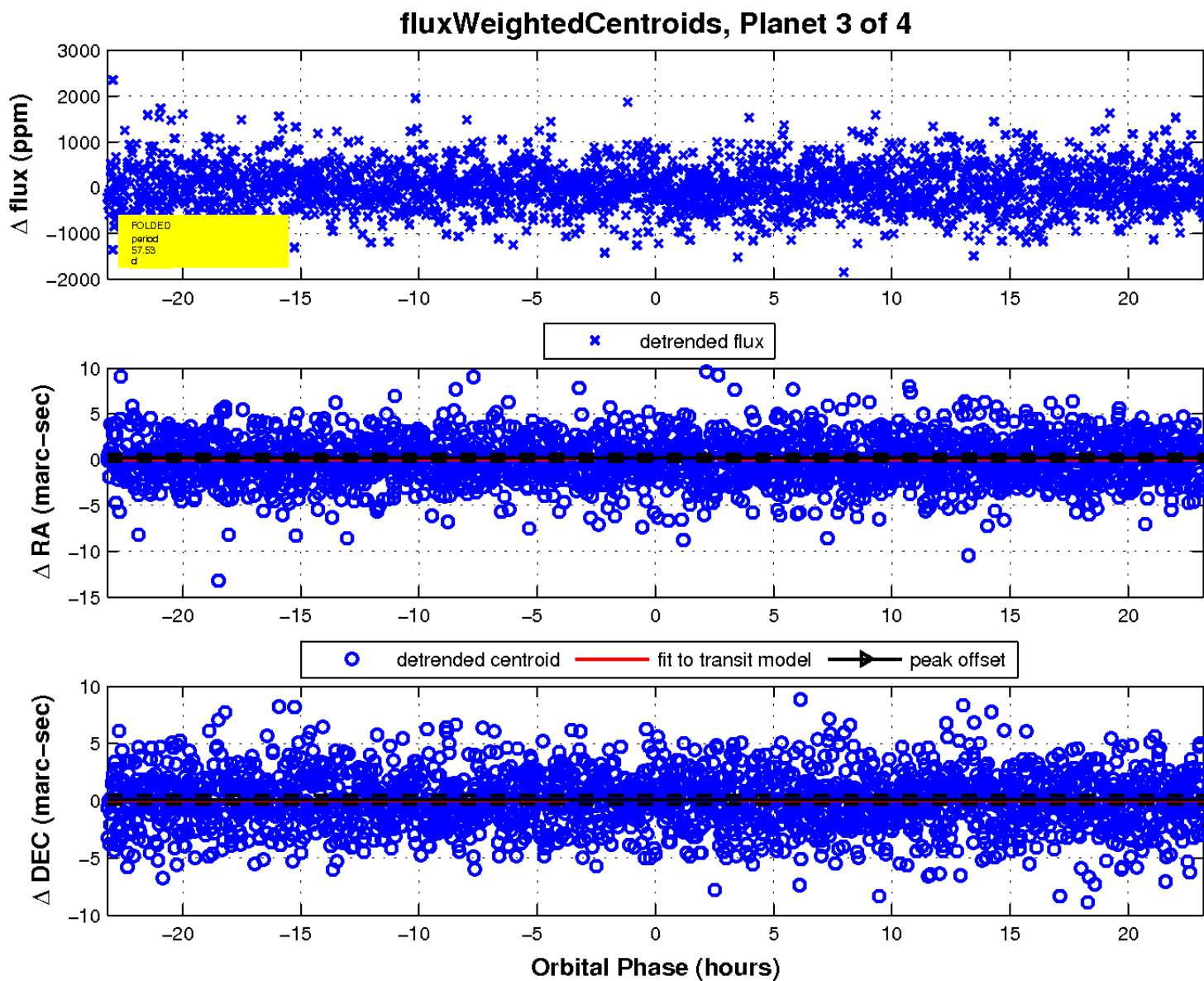
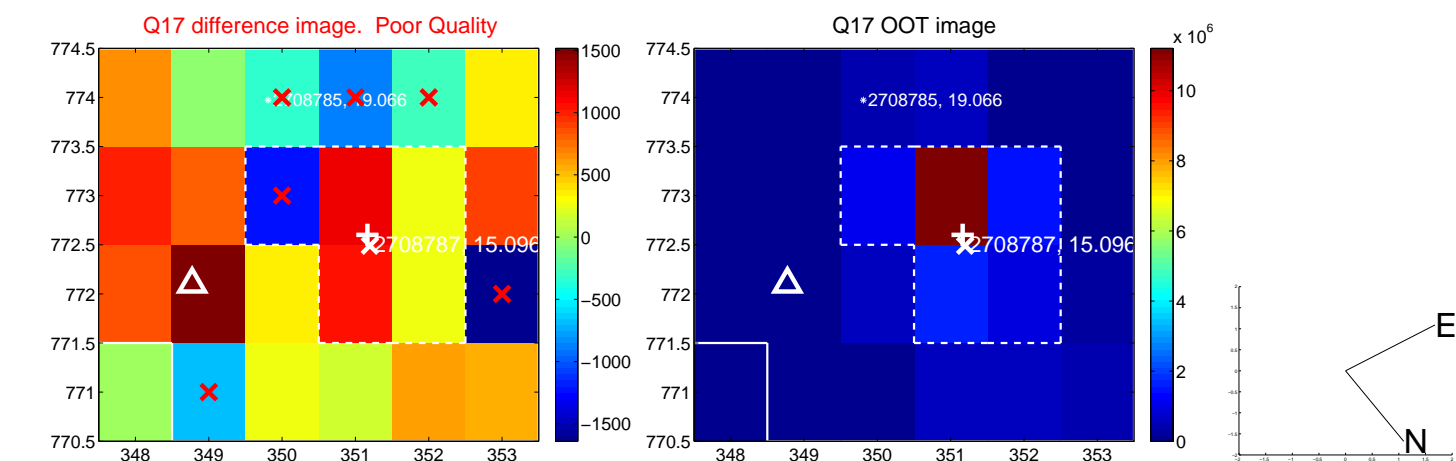
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

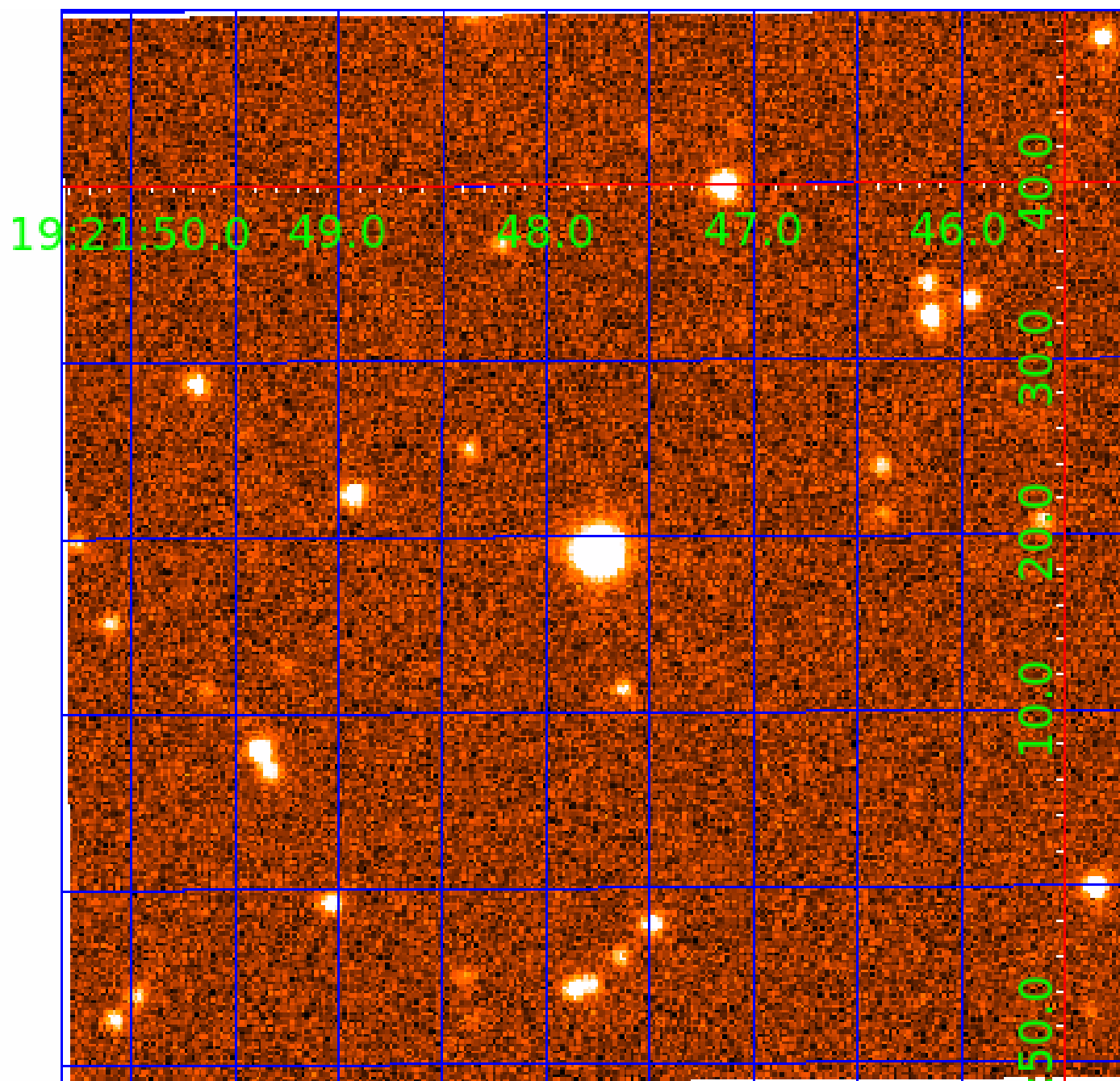


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002708787

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})
002708787-01	OBS	No	1.829266	133.229559	65.9	10.600	8.2	11.1	0.63	4243	0.57	184.64
002708787-03	OBS	No	57.534060	186.592669	300.5	7.731	7.6	5.0	0.63	4243	1.18	1.86
002708787-04	OBS	No	79.427200	161.028631	721.7	2.901	7.3	8.3	0.63	4243	2.05	1.21

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002708787-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT
002708787-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002708787-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

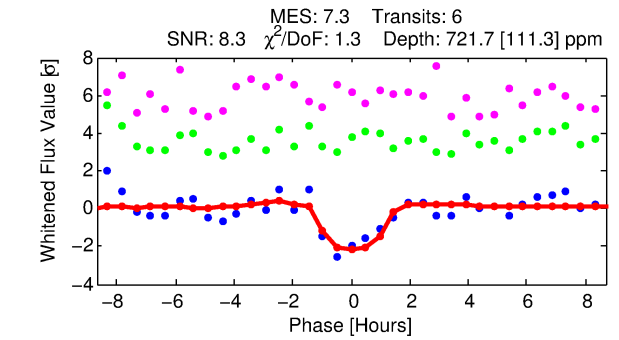
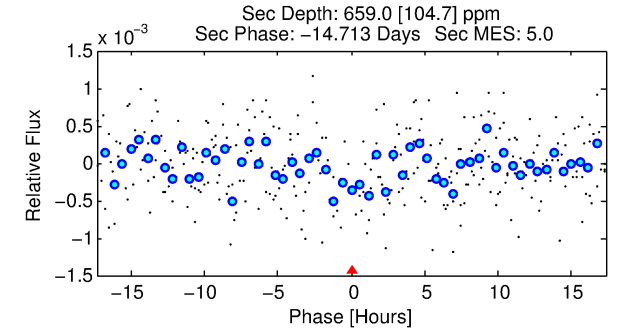
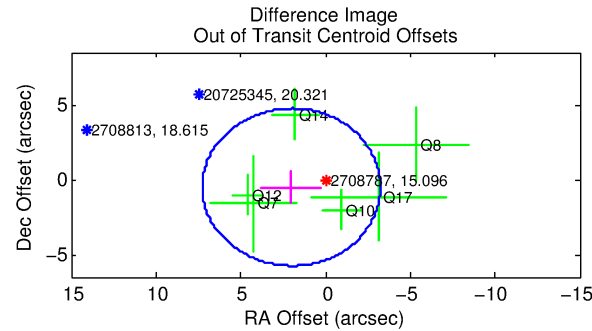
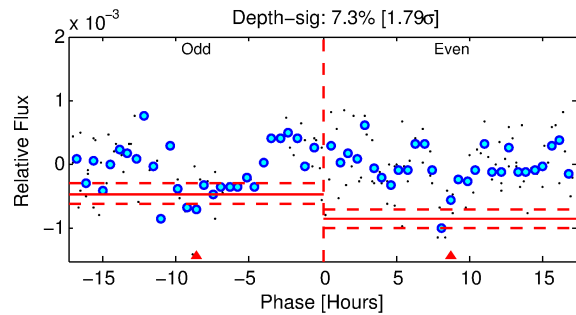
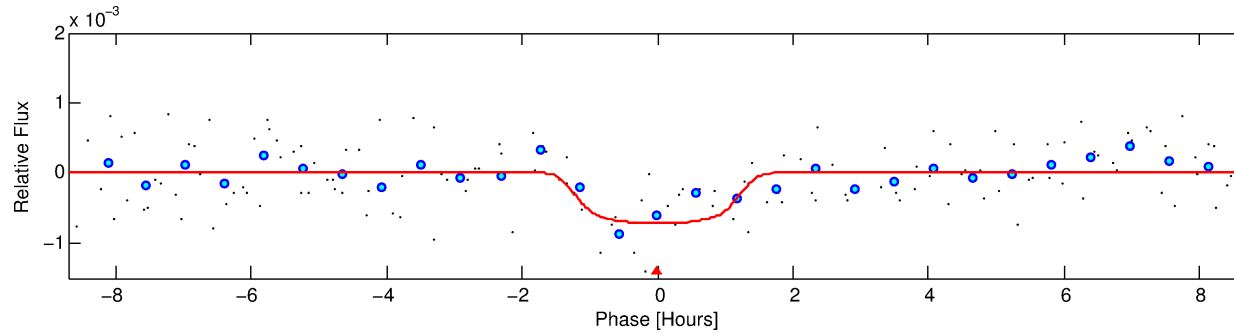
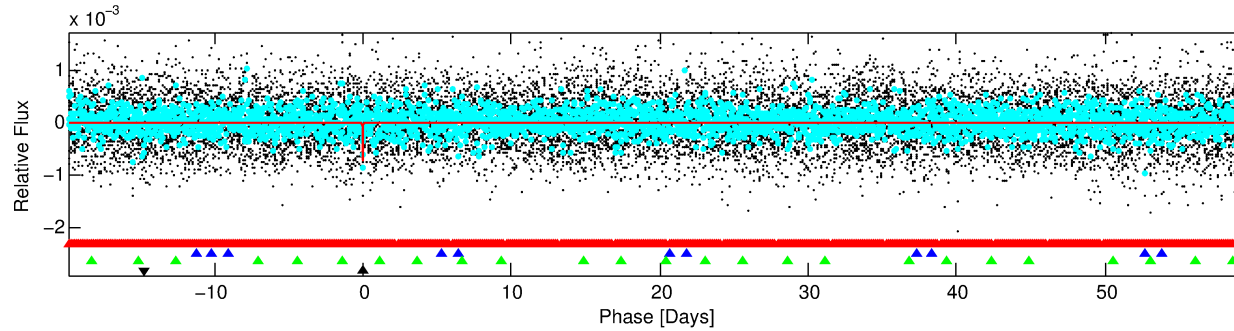
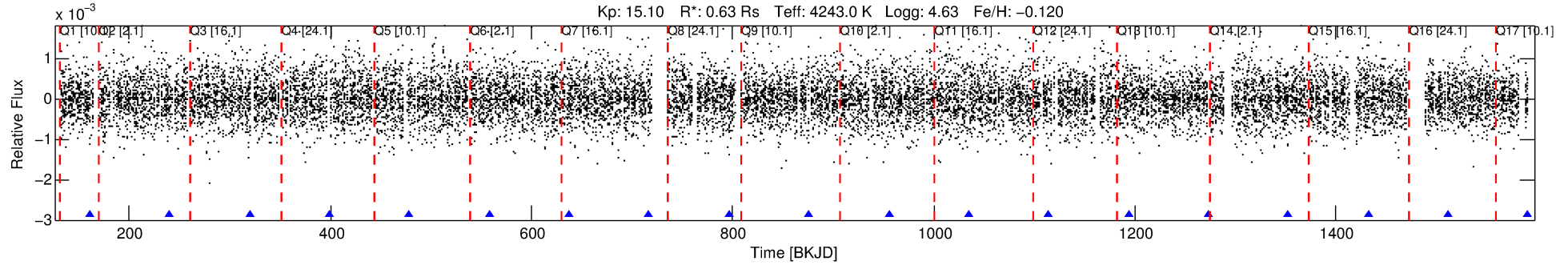
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002708787-04

No Significant Match Found

DV One-Page Summary

KIC: 2708787 Candidate: 4 of 4 Period: 79.427 d



DV Fit Results:

Period = 79.42720 [0.00083] d
Epoch = 161.0286 [0.0089] BKJD
Rp/R* = 0.0298 [0.0337]
a/R* = 108.28 [461.19]
b = 0.89 [1.02]
Seff = 1.21 [0.19]
Teq = 267 [10] K
Rp = 2.05 [2.32] Re
a = 0.3082 [0.0231] AU
Ag = 8208.05 [18625.57] [0.44 σ]
Teffp = 3936 [2233] K [1.64 σ]

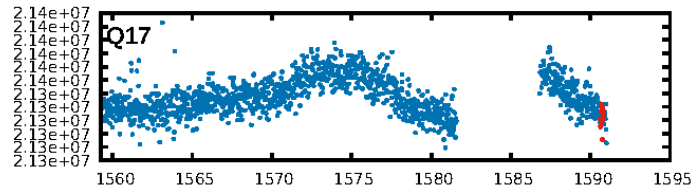
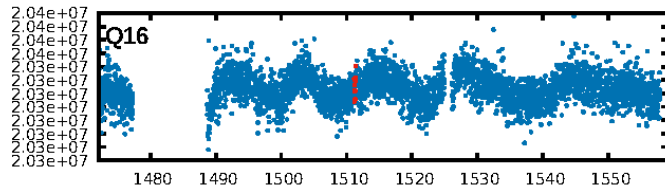
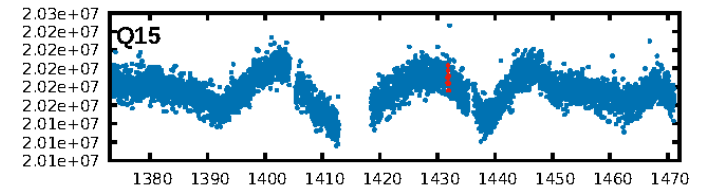
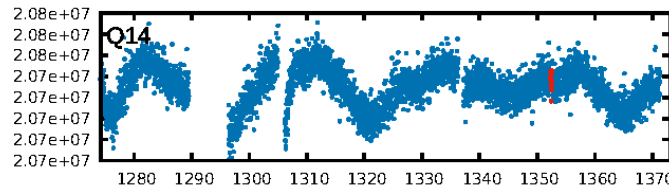
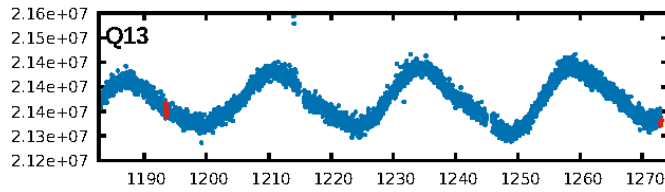
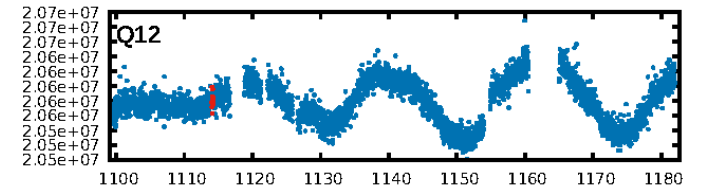
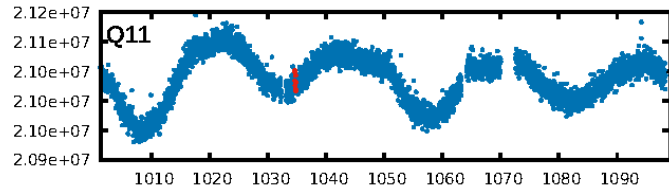
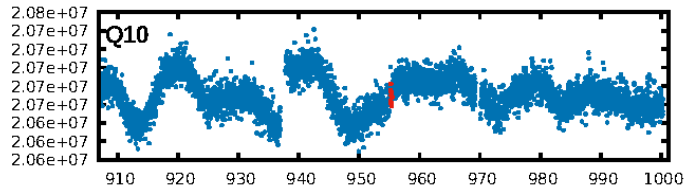
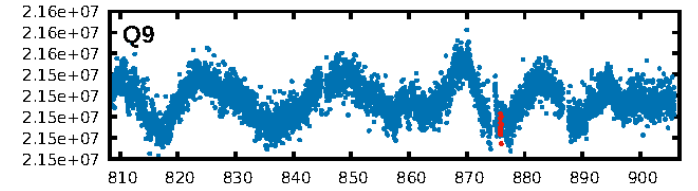
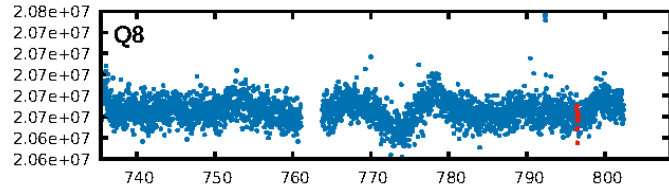
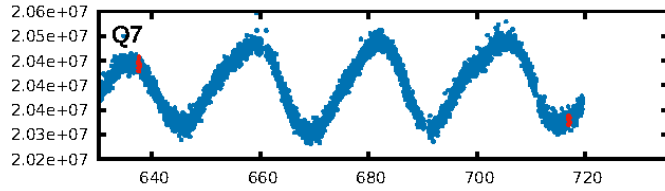
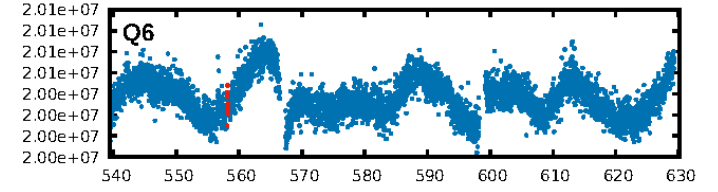
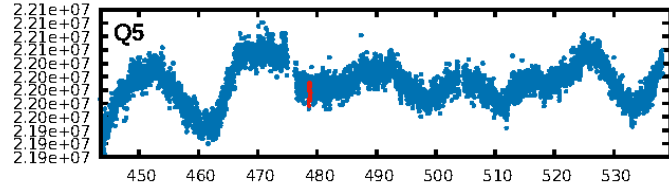
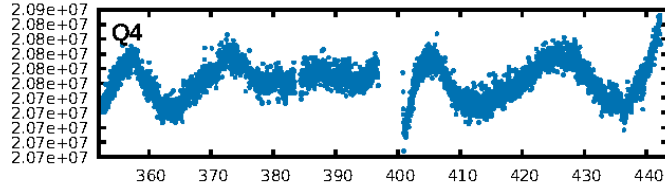
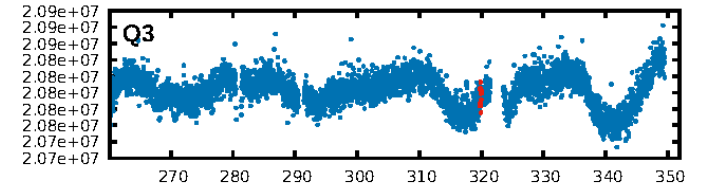
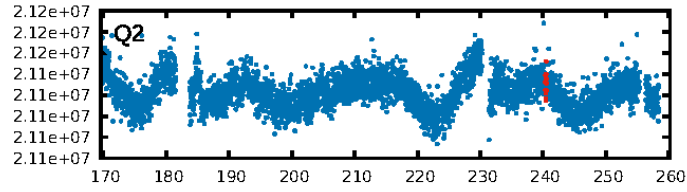
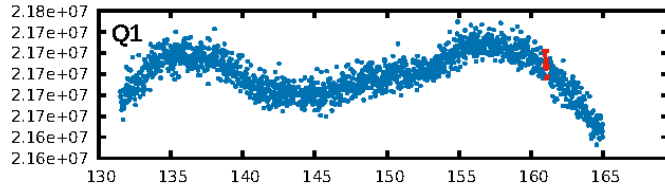
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [63.63 σ]
LongPeriod-sig: 100.0% [118.08 σ]
ModelChiSquare2-sig: 33.2%
ModelChiSquareGof-sig: 97.6%
Bootstrap-pfa: 1.07e-08
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 1.755
Centroid-sig: 52.9%
Centroid-so: 0.924 arcsec [0.84 σ]
OotOffset-rm: 2.075 arcsec [1.19 σ]
KicOffset-rm: 2.198 arcsec [1.48 σ]
OotOffset-st: 2/1/2/1 [6]
KicOffset-st: 2/1/2/1 [6]
DiffImageQuality-fgm: 0.00 [0/6]
DiffImageOverlap-fno: 0.47 [7/15]

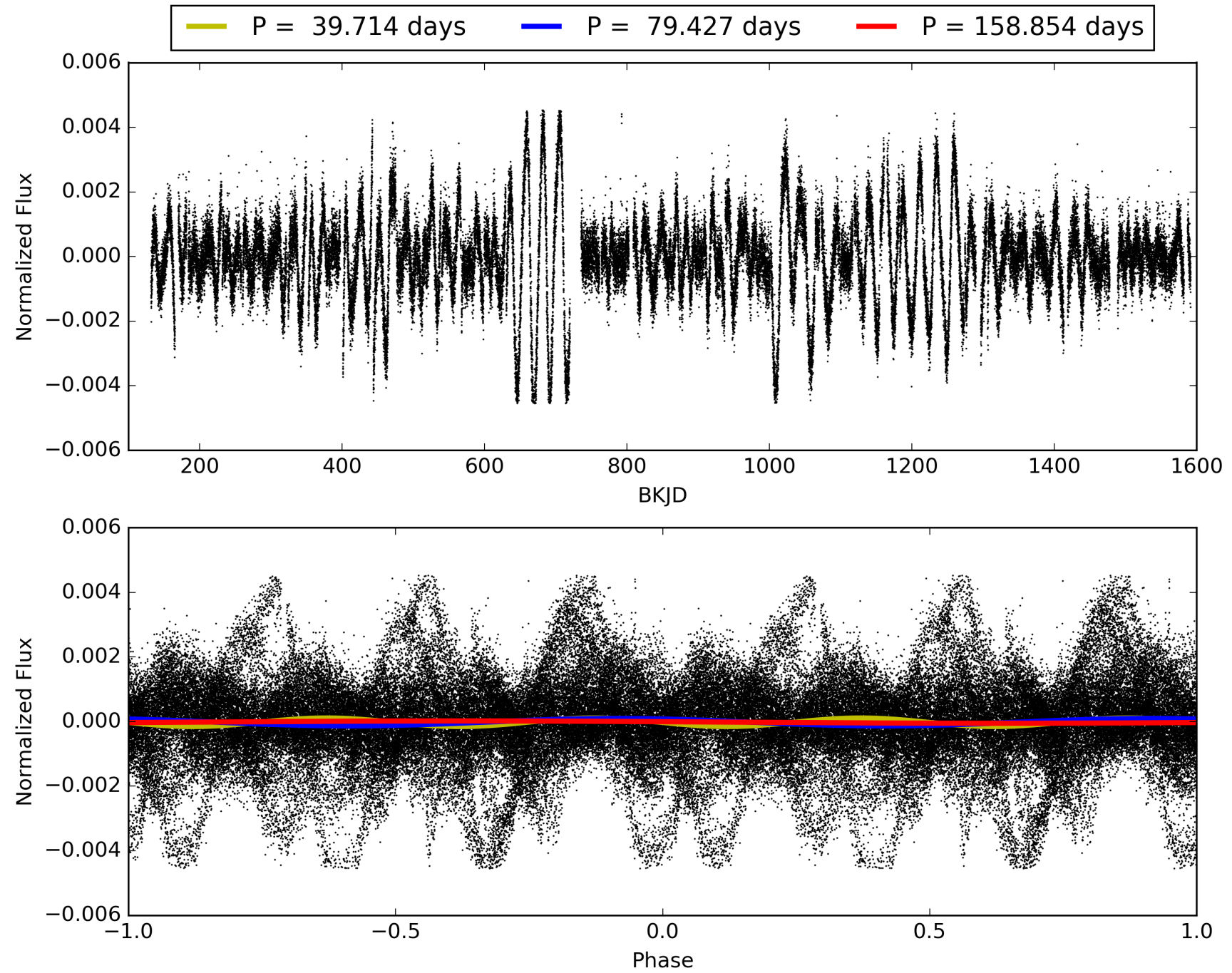
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:38:24 Z

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

TCE 002708787-04, PDC Light Curves

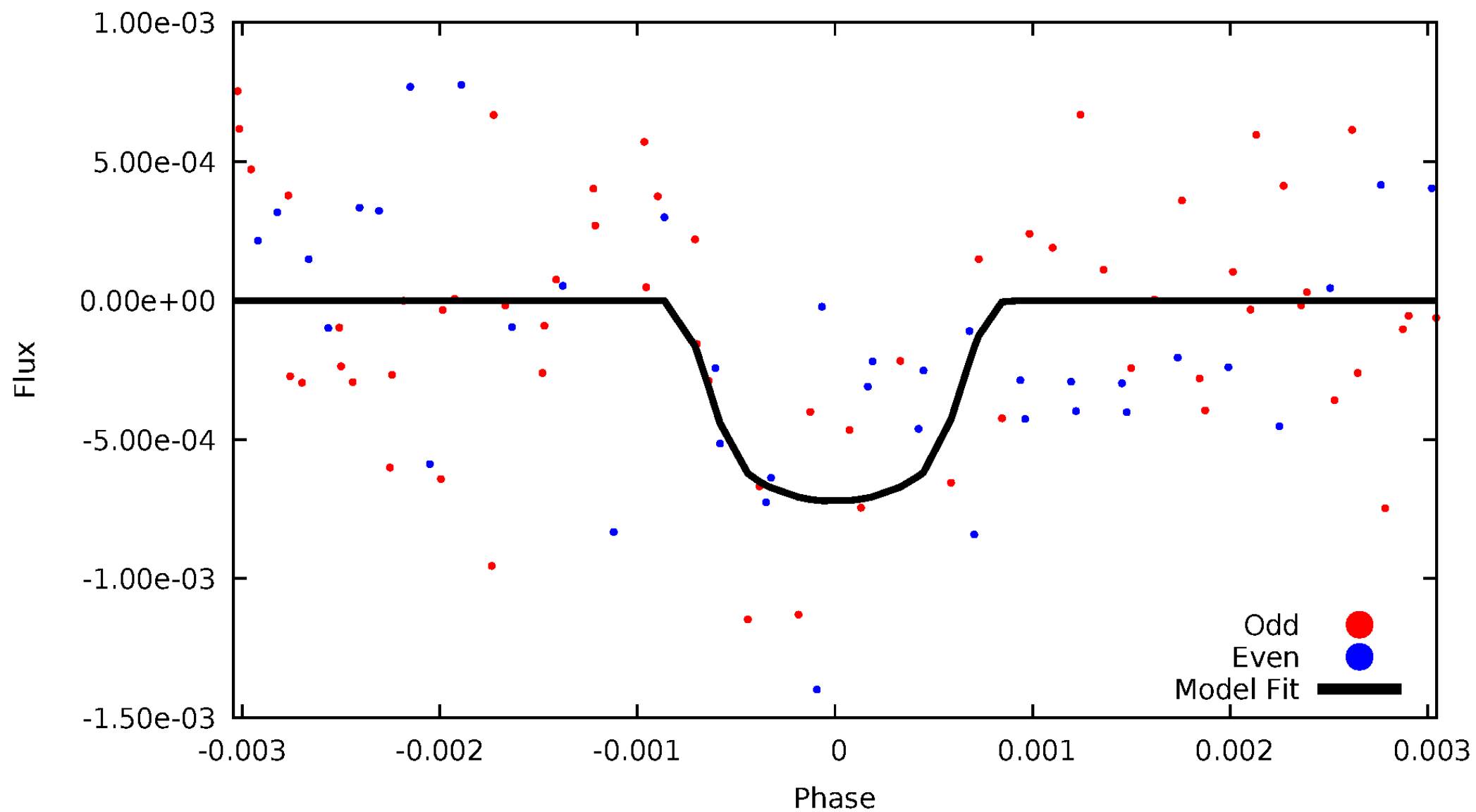


TCE 002708787-04



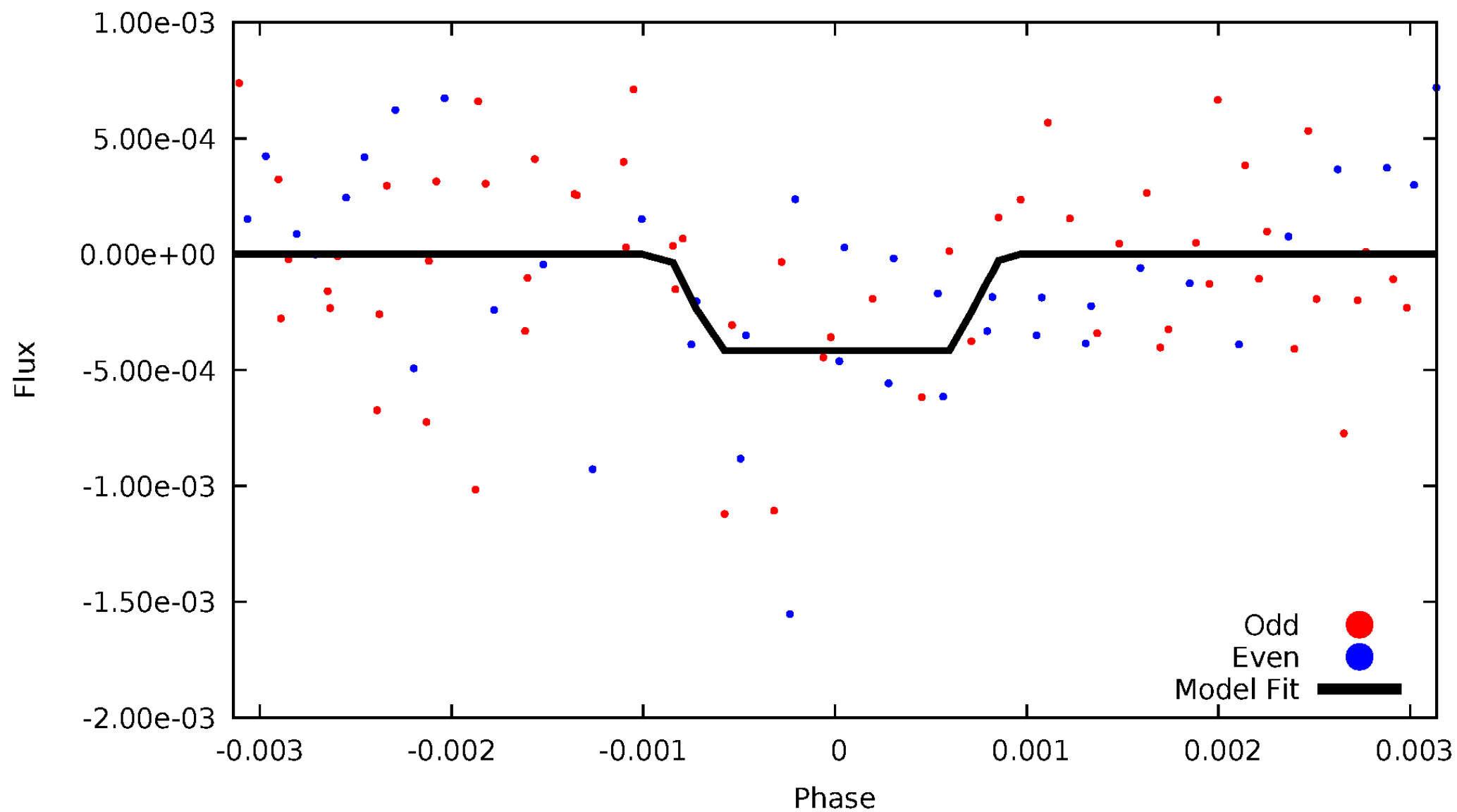
DV Odd/Even

TCE 002708787-04



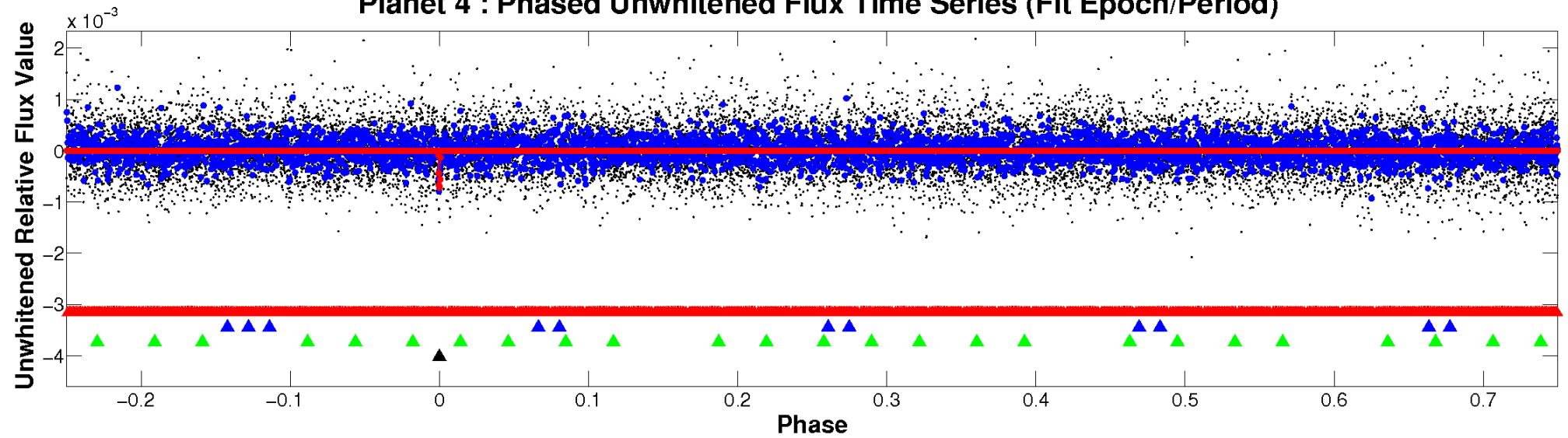
ALT Odd/Even

TCE 002708787-04

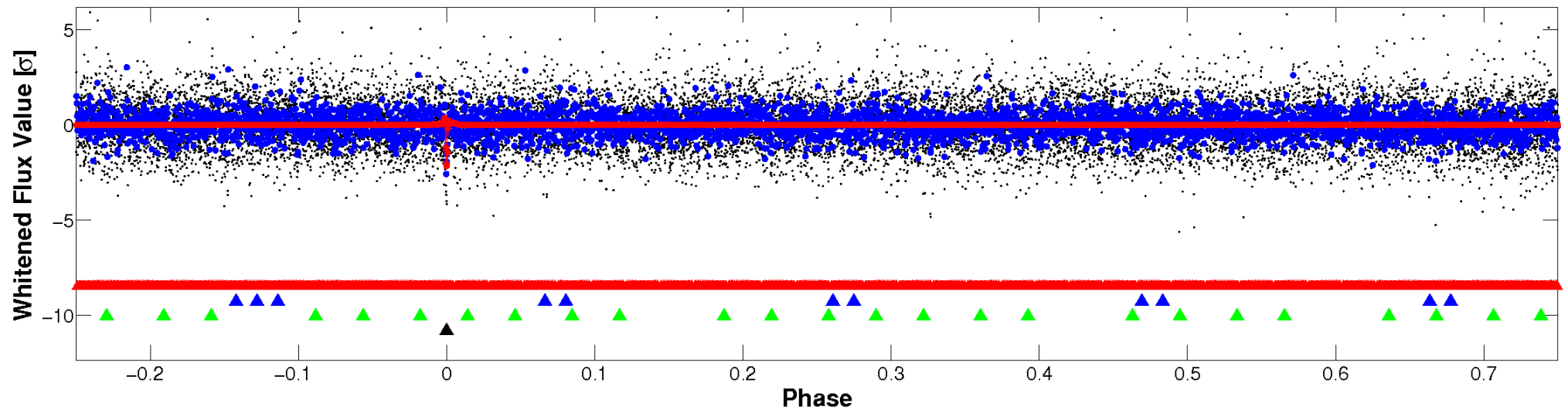


Non-Whitened Vs. Whitened Light Curve

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

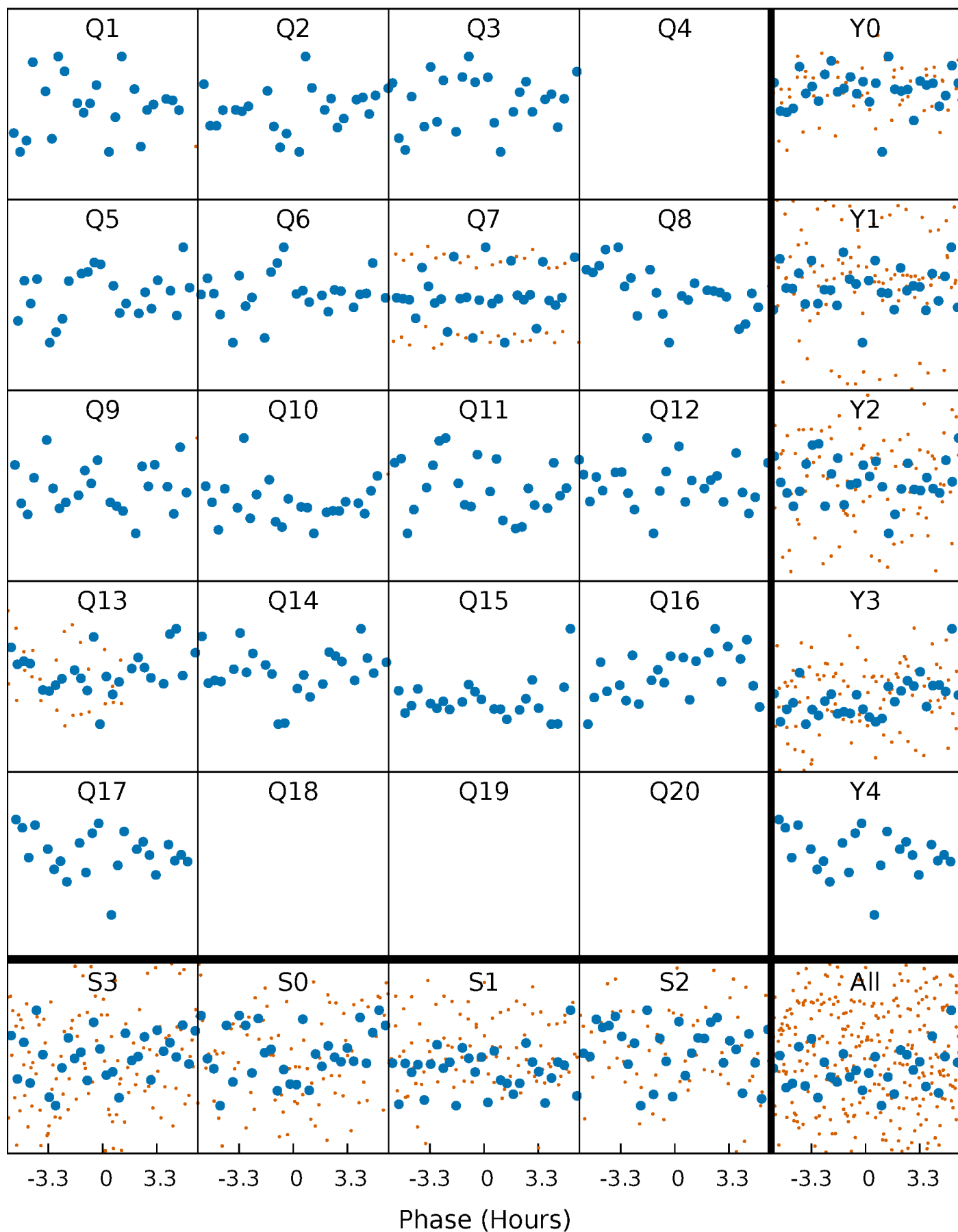


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



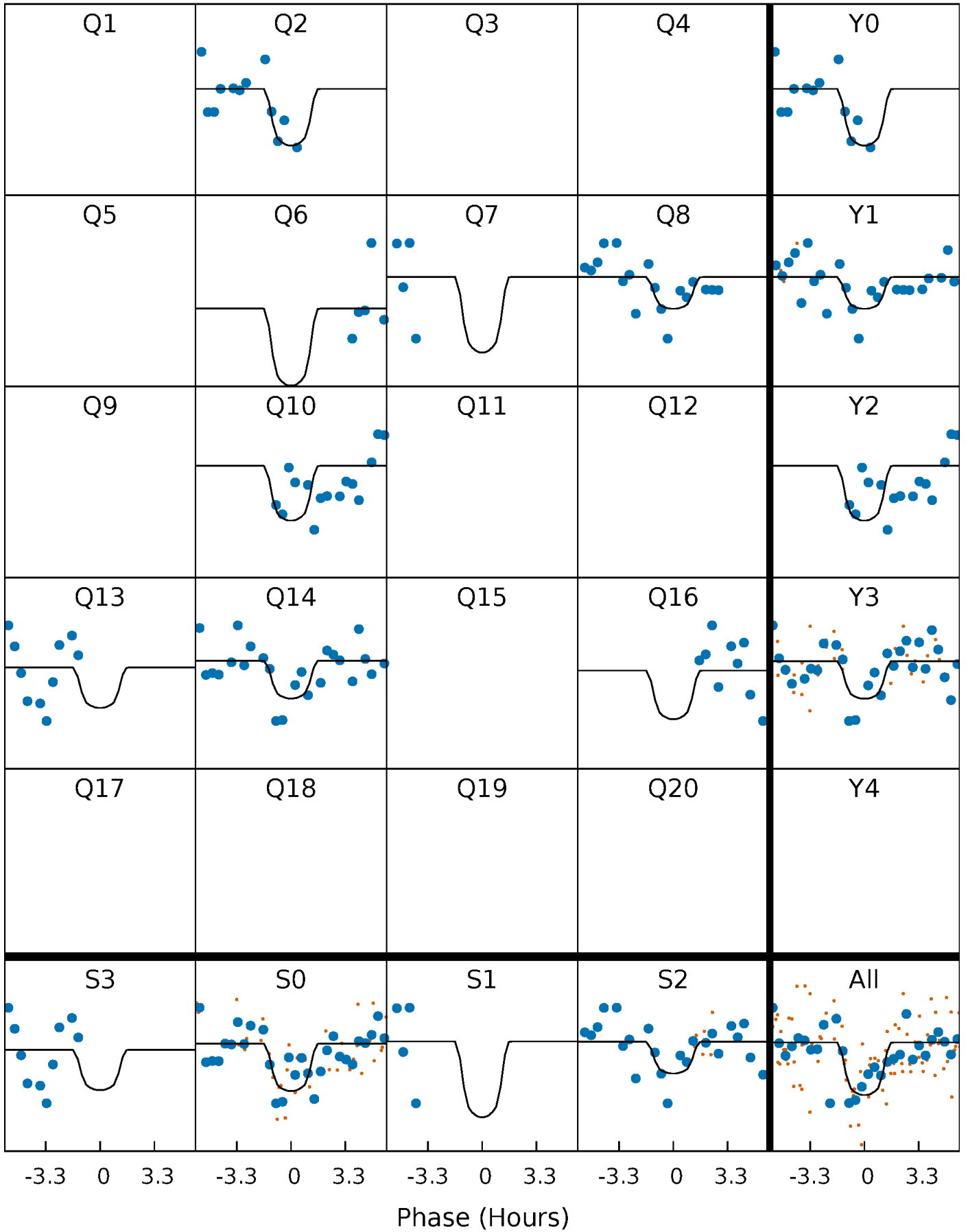
PDC Quarter-Phased Transit Curves

TCE 002708787-04 P= 79.427200 Days $T_0=161.028631$ (BKJD)



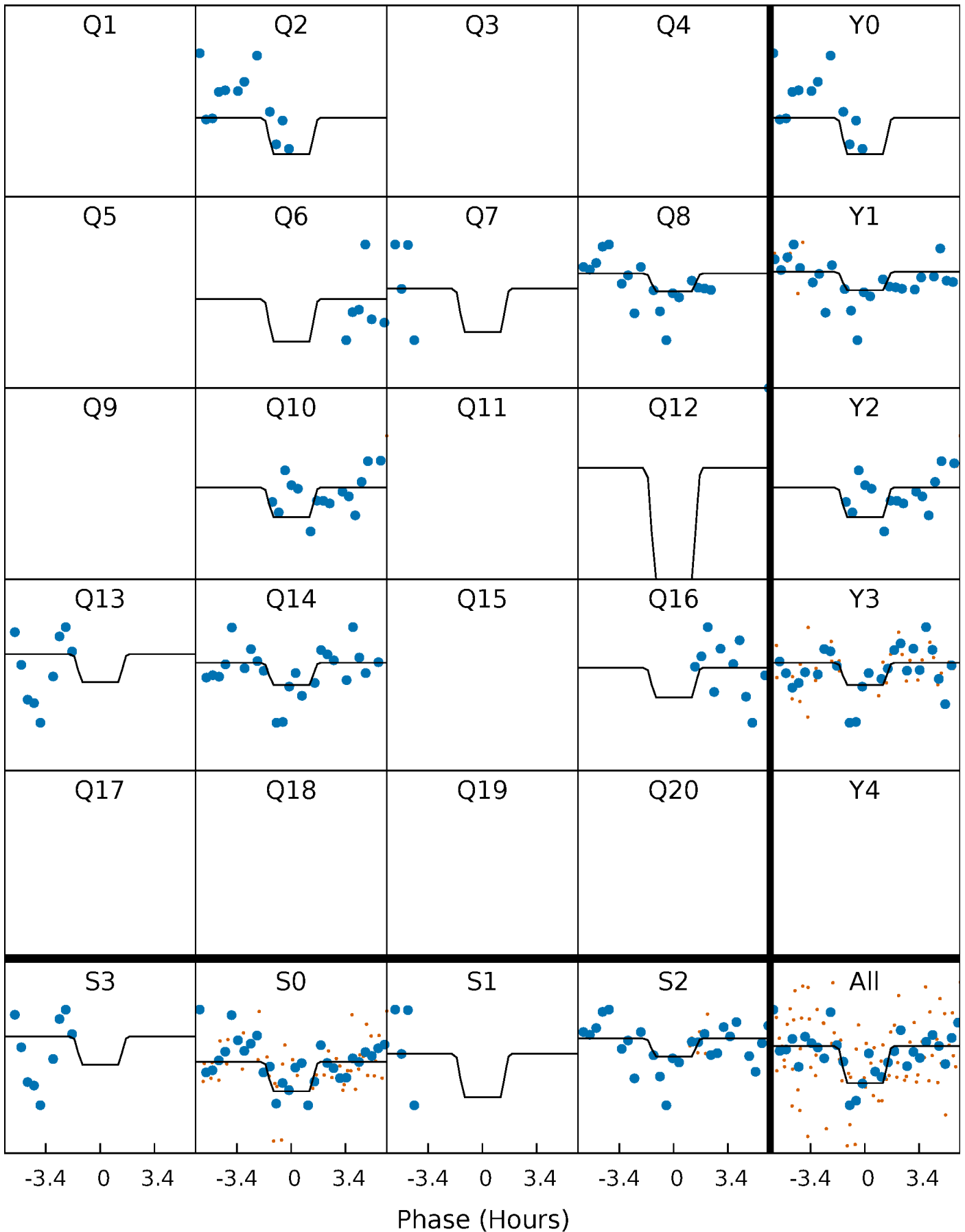
DV Quarter-Phased Transit Curves

TCE 002708787-04 $P = 79.427200$ Days $T_0 = 161.028631$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

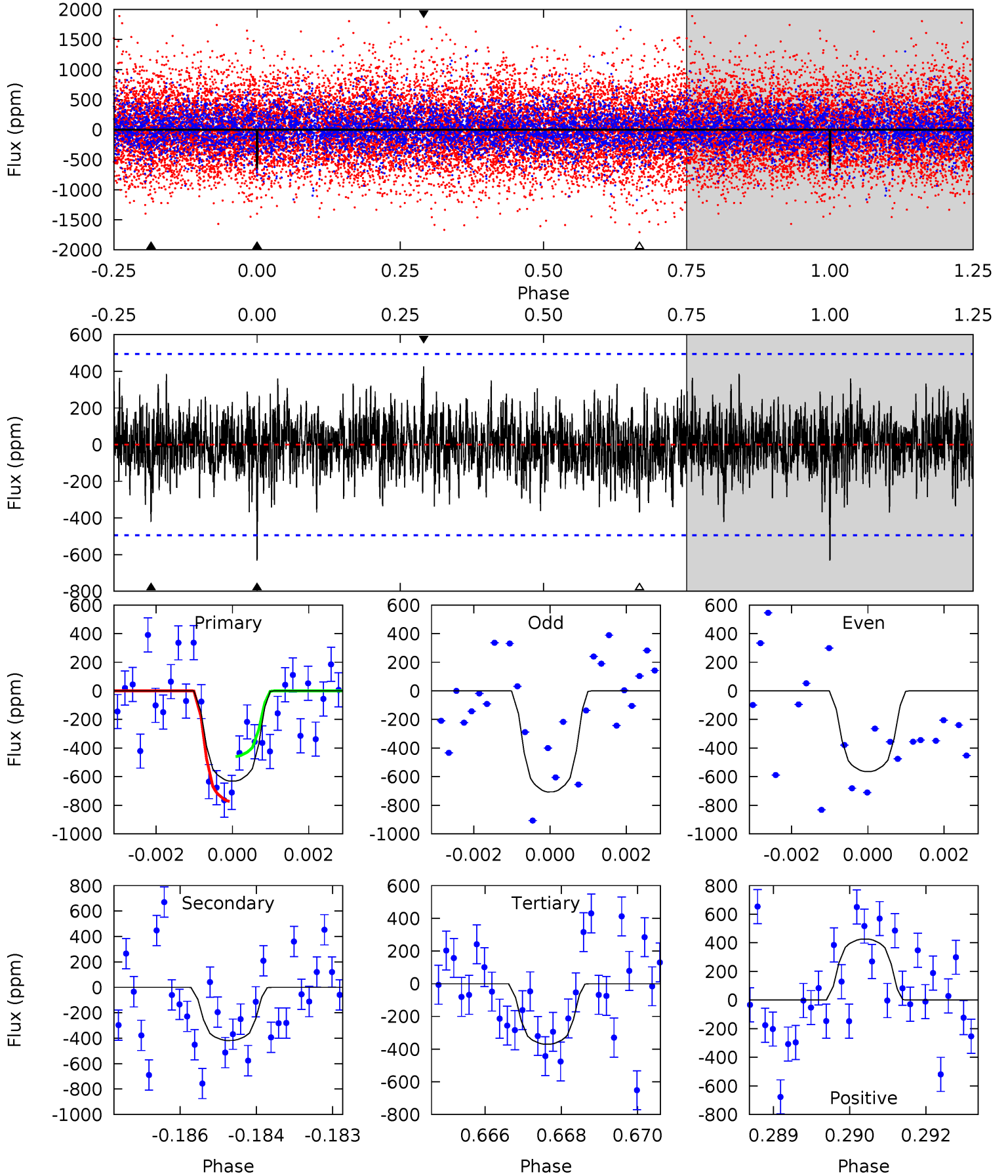
TCE 002708787-04 $P = 79.427087$ Days $T_0 = 161.040975$ (BKJD)



DV Model-Shift Uniqueness Test

002708787-04, P = 79.427200 Days, E = 81.601431 Days

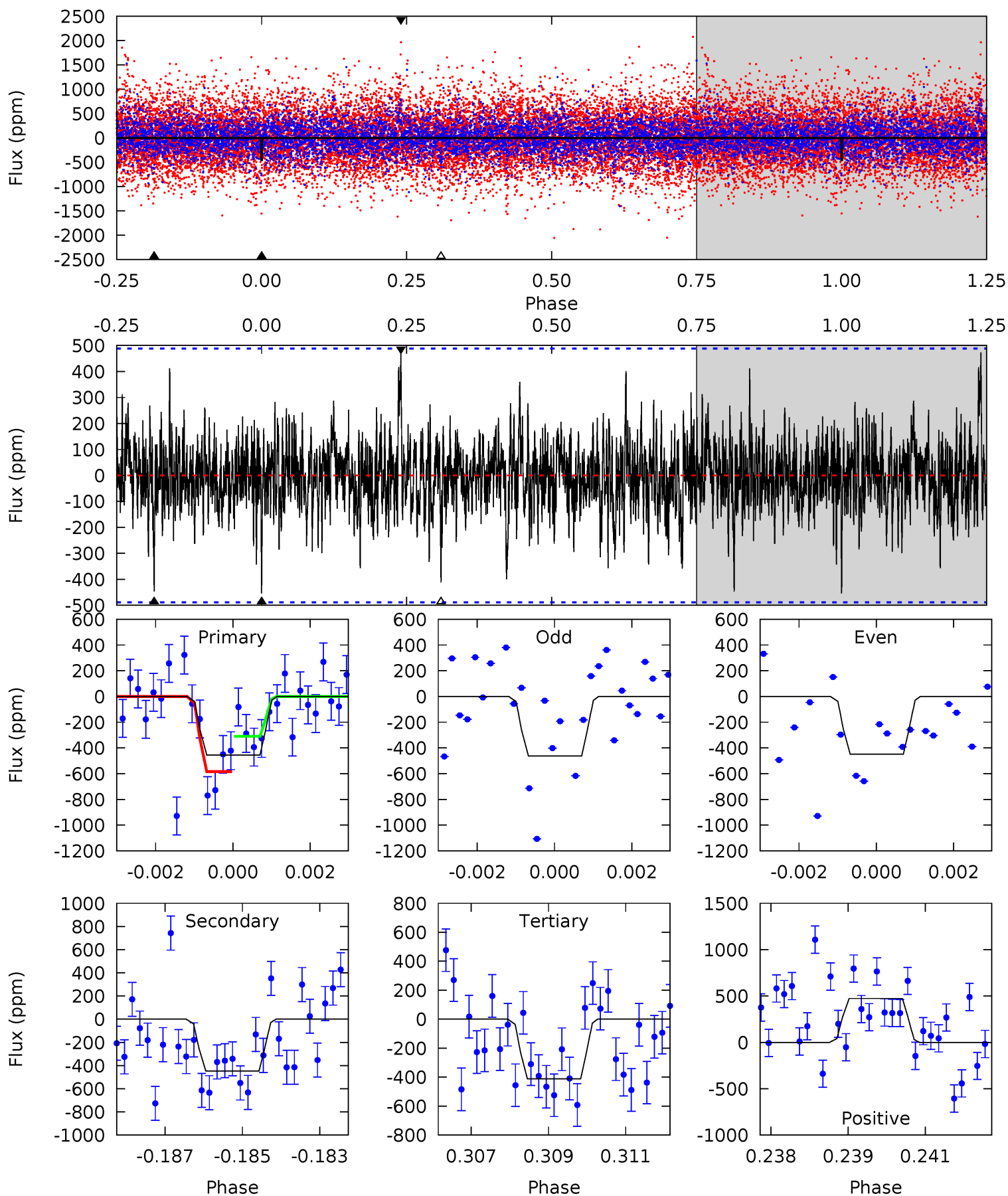
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.83	4.52	4.00	4.62	5.36	3.14	1.29	2.83	2.22	0.52	-0.09	0.77	0.94	0.40	1.69



Alt Model-Shift Uniqueness Test

002708787-04, P = 79.427087 Days, E = 81.613888 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.98	4.90	4.52	5.19	5.36	3.14	1.24	0.46	-0.20	0.38	-0.28	0.08	1.63	0.51	1.50



Stellar Parameters For KIC 002708787

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4243^{+126}_{-126}	$4.632^{+0.052}_{-0.020}$	$-0.120^{+0.300}_{-0.300}$	$0.629^{+0.040}_{-0.060}$	$0.617^{+0.061}_{-0.055}$	$3.499^{+0.815}_{-0.348}$
	+3%/-3%	+1%/-0%	+250%/-250%	+6%/-10%	+10%/-9%	+23%/-10%
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 002708787-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-418 ± 92	$2.67^{+1.93}_{-1.62}$	371^{+12}_{-12}	3376^{+1336}_{-527}	2899^{+17117}_{-1951}
Alt.	-447 ± 91	$2.24^{+1.73}_{-1.52}$	371^{+12}_{-12}	3626^{+1950}_{-587}	4738^{+37488}_{-3199}

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

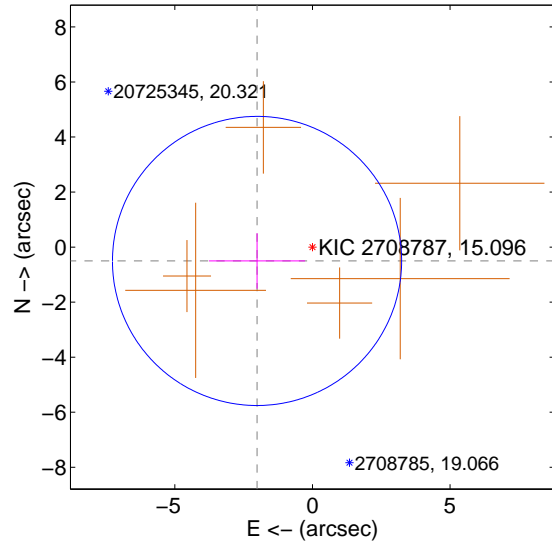
Supplemental centroid analysis for 002708787-04. Kepler magnitude: 15.10. Transit SNR 8.33

There are 0 quarters with good PRF difference image offsets

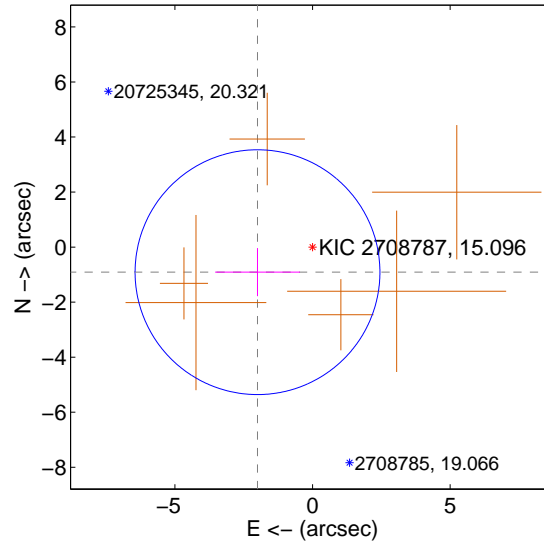
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.075 ± 1.751	1.19	2.013 ± 1.746	-0.504 ± 1.010
PRF-fit source offset from KIC position	2.198 ± 1.483	1.48	2.000 ± 1.542	-0.911 ± 0.874
photometric centroid source offset	0.92 ± 1.09	0.84	0.83 ± 1.11	-0.40 ± 1.04

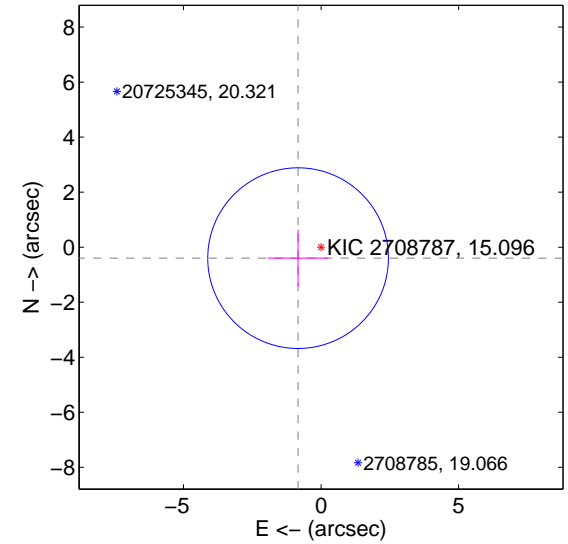
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

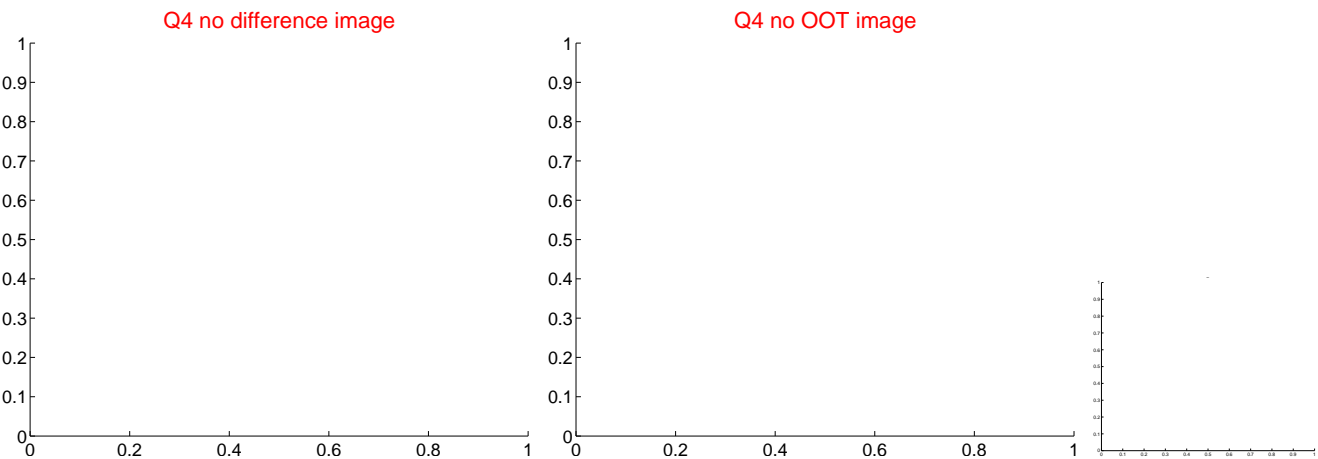
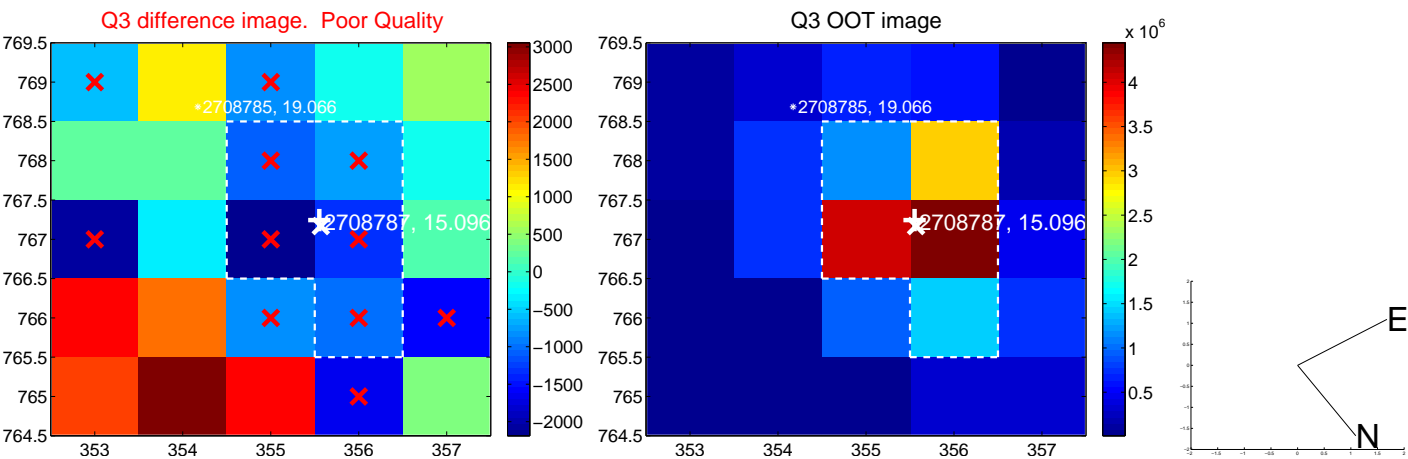
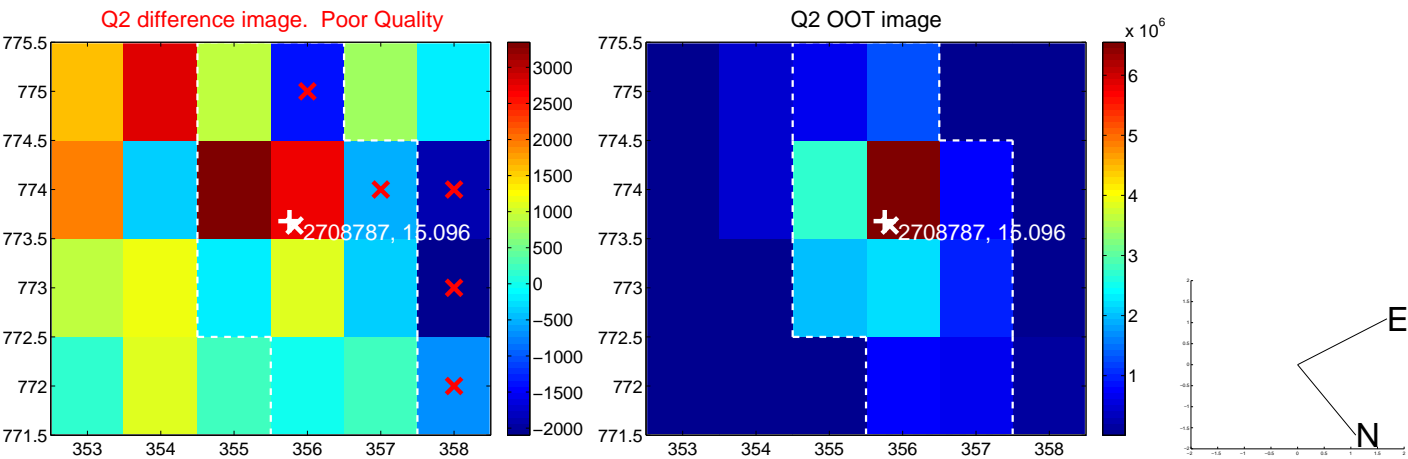
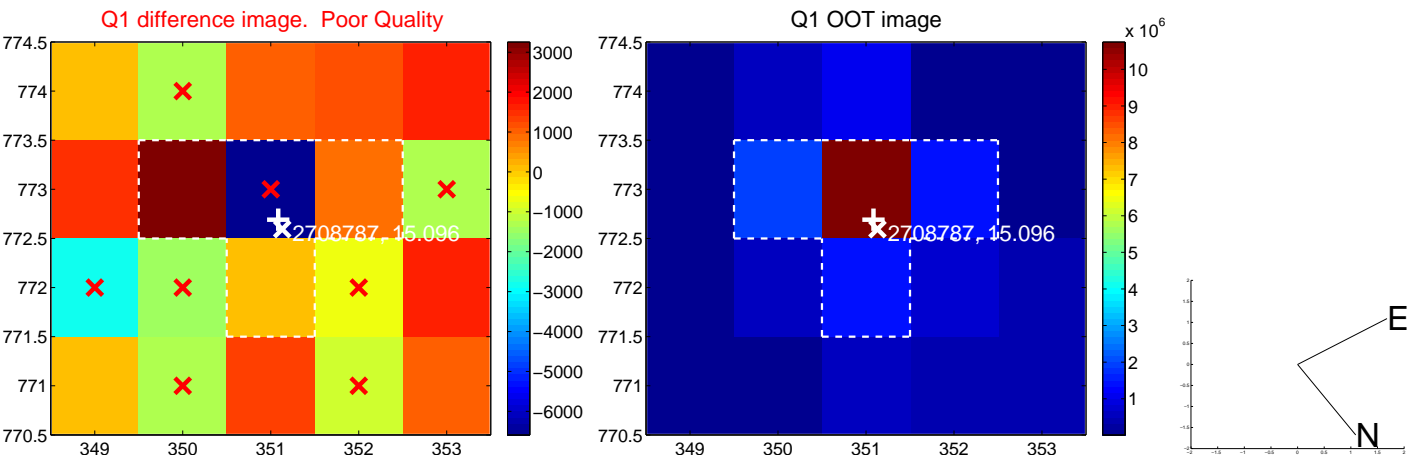


offset from photometric centroids

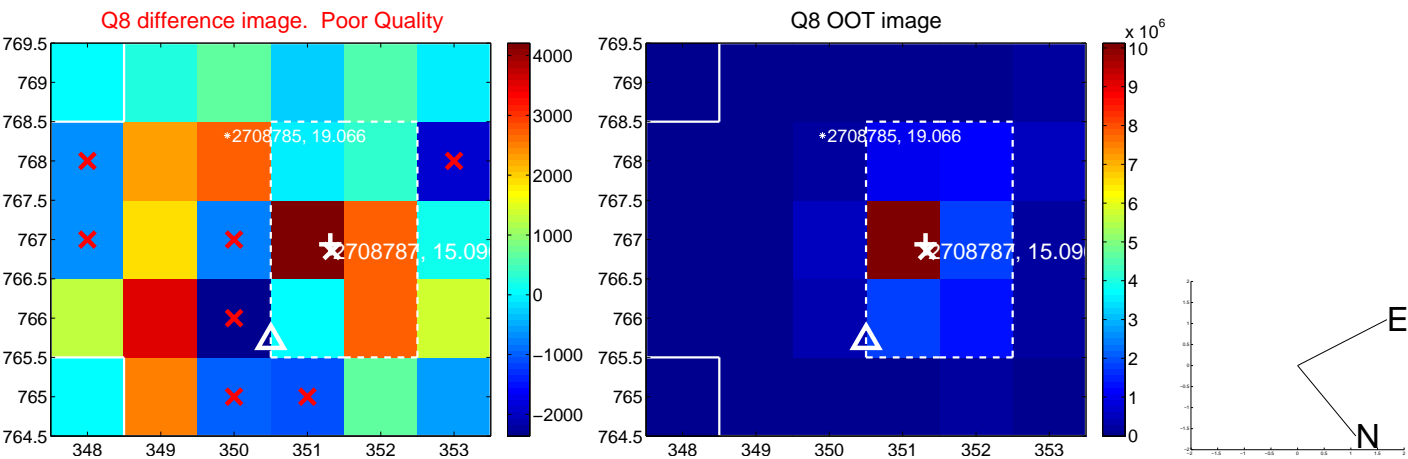
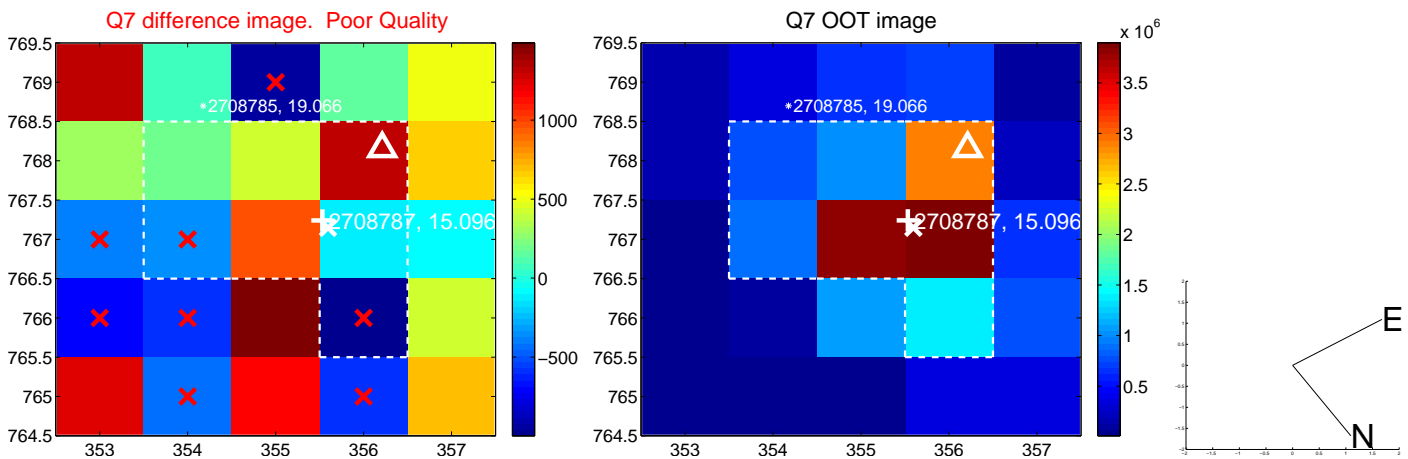
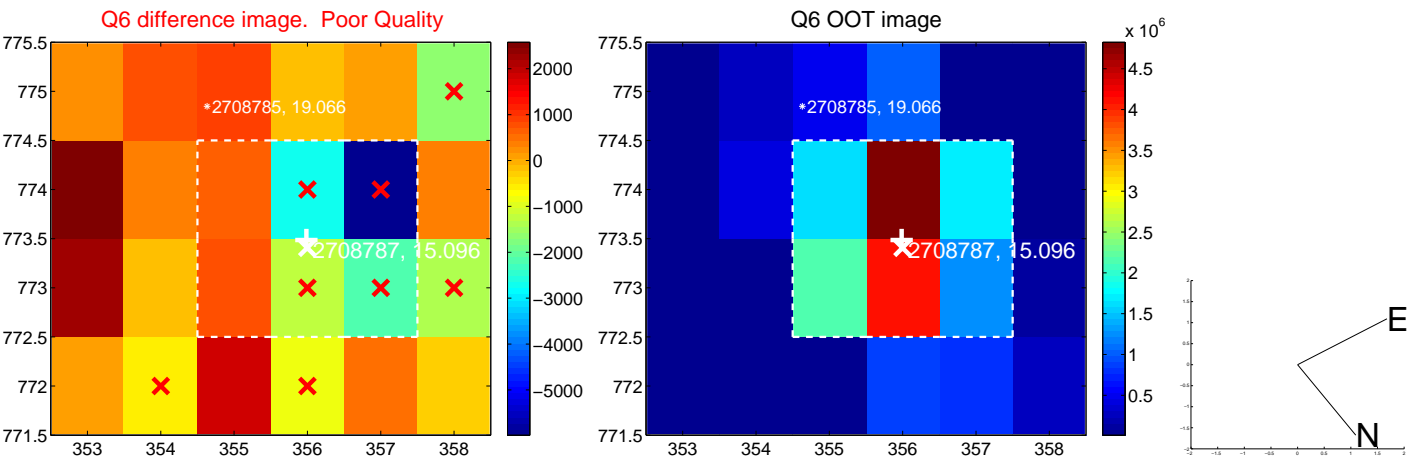
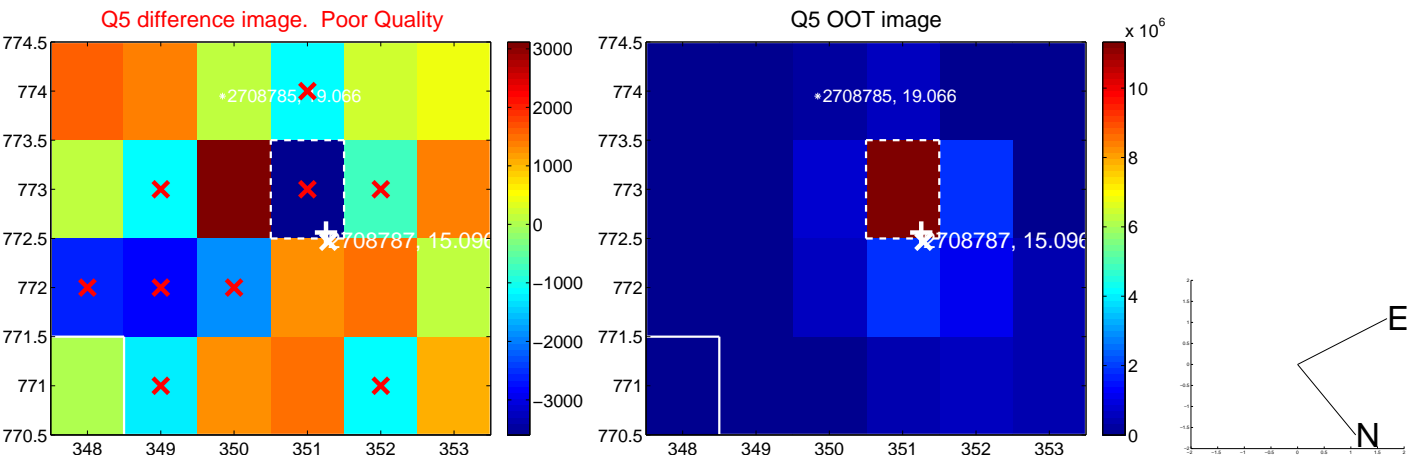


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

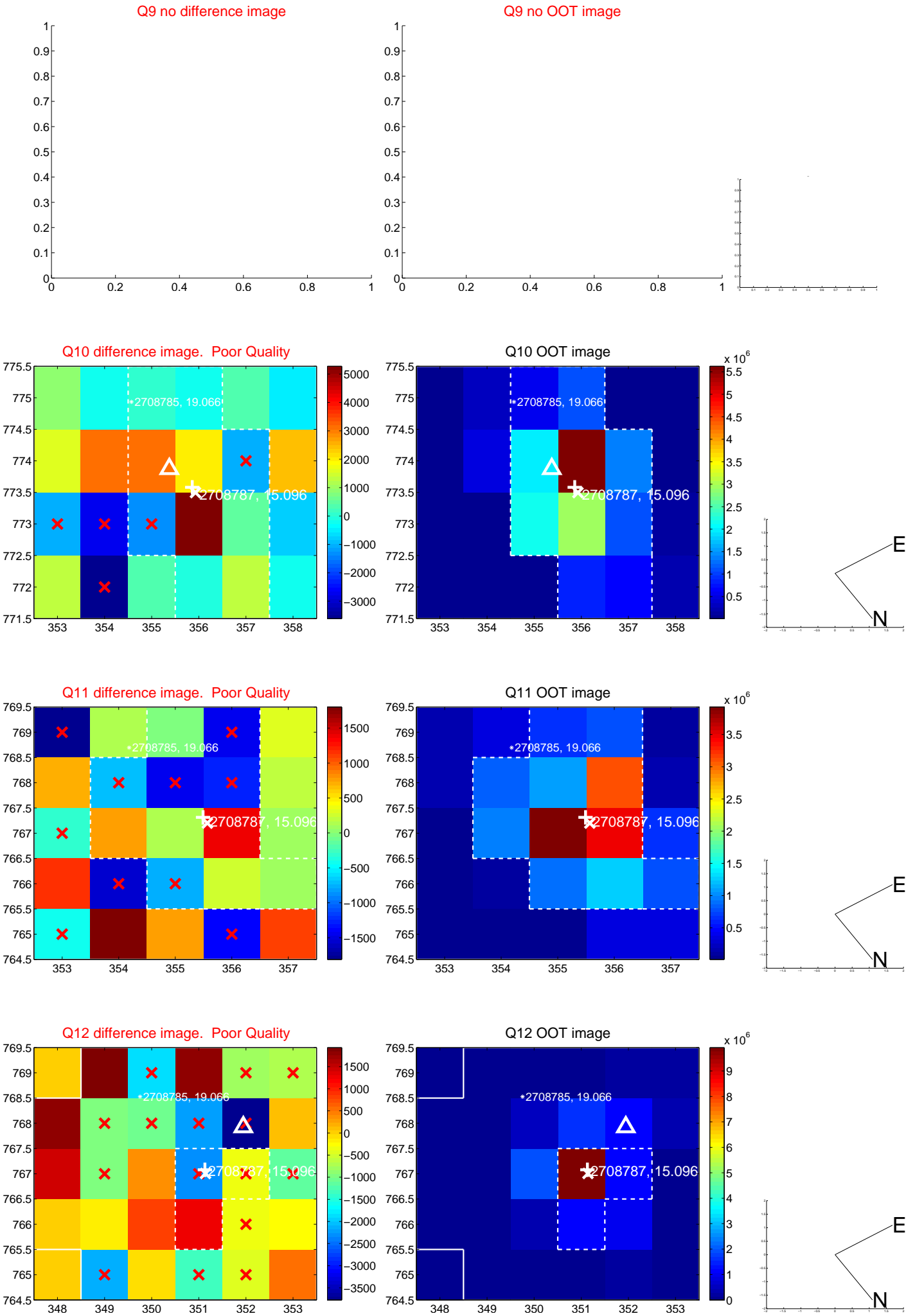
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



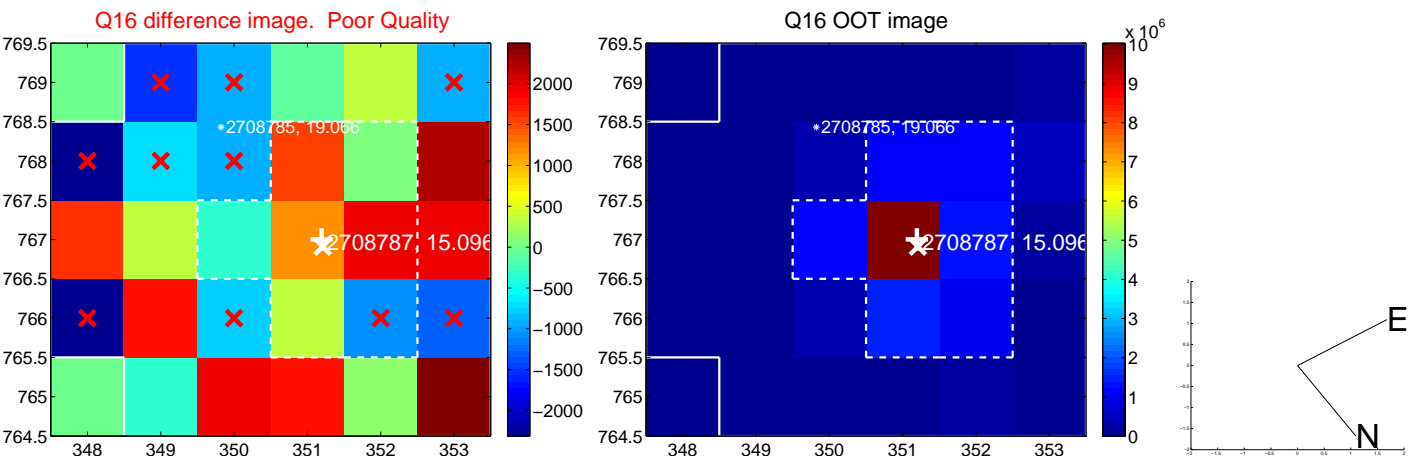
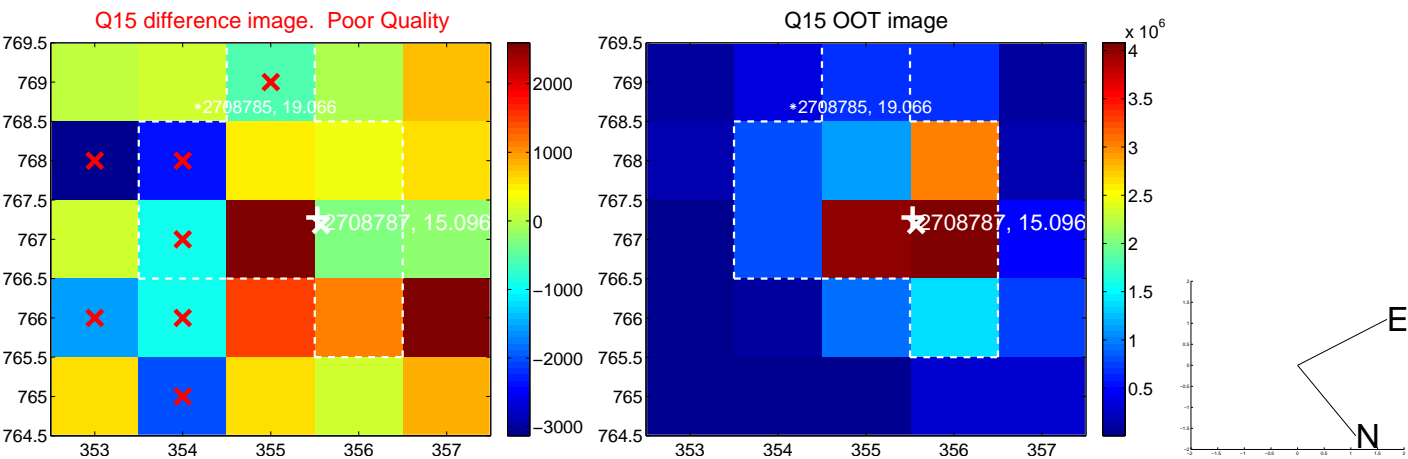
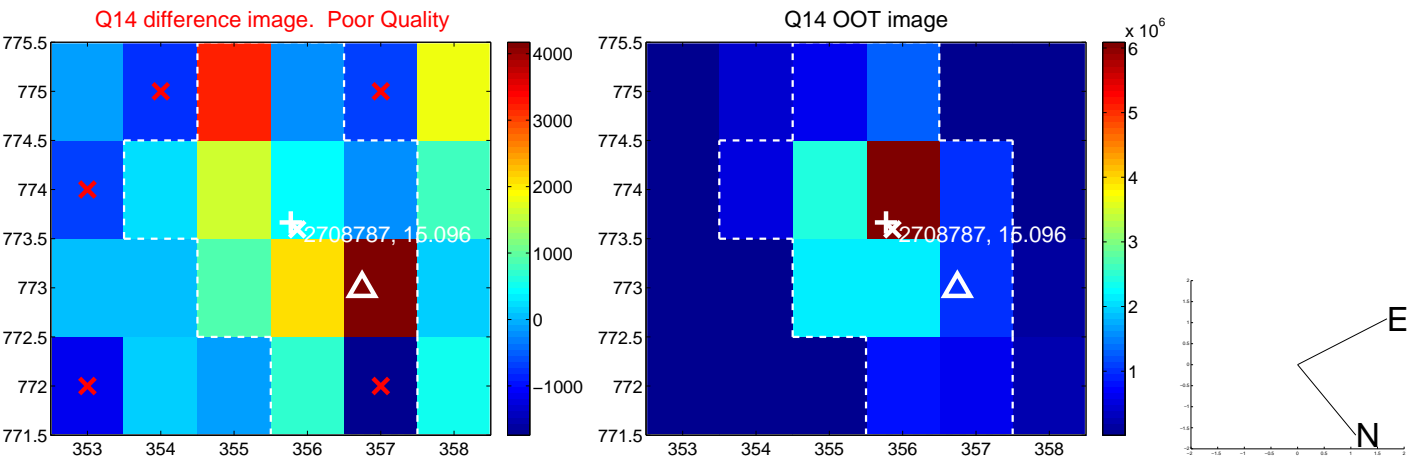
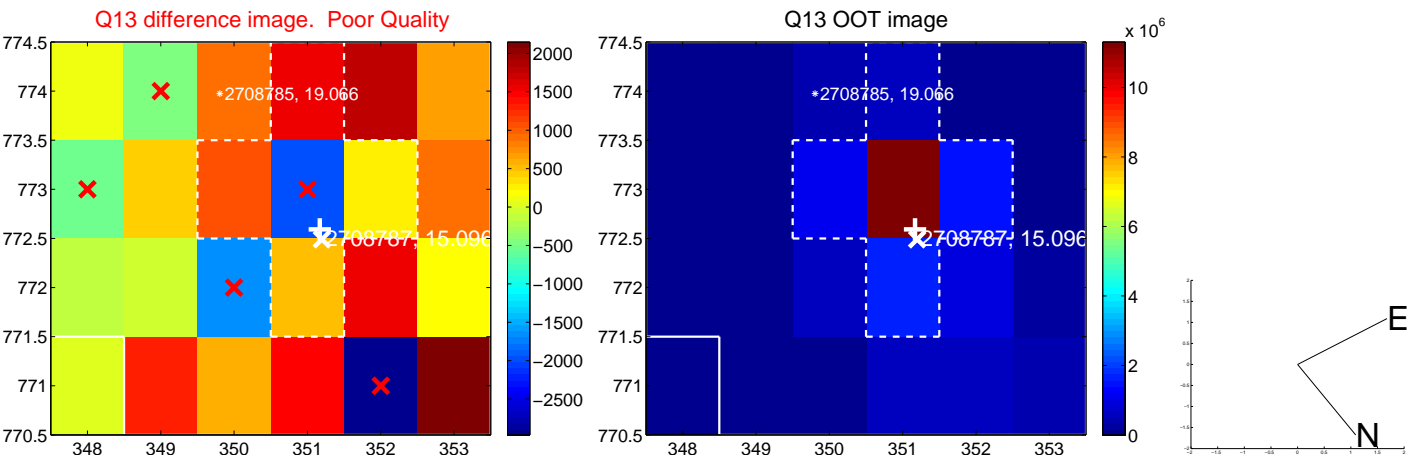
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



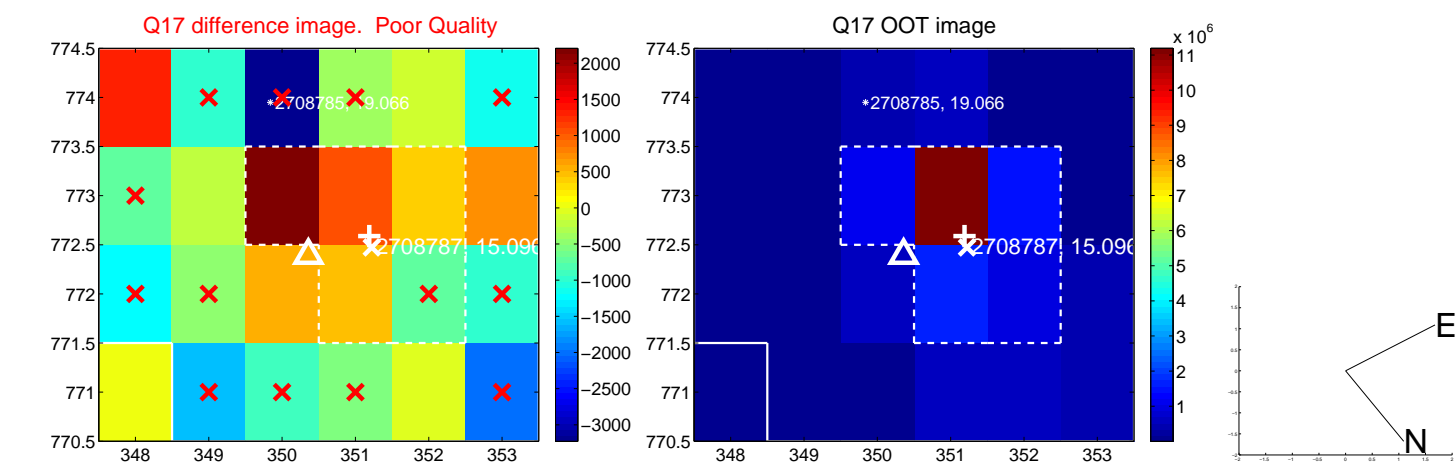
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



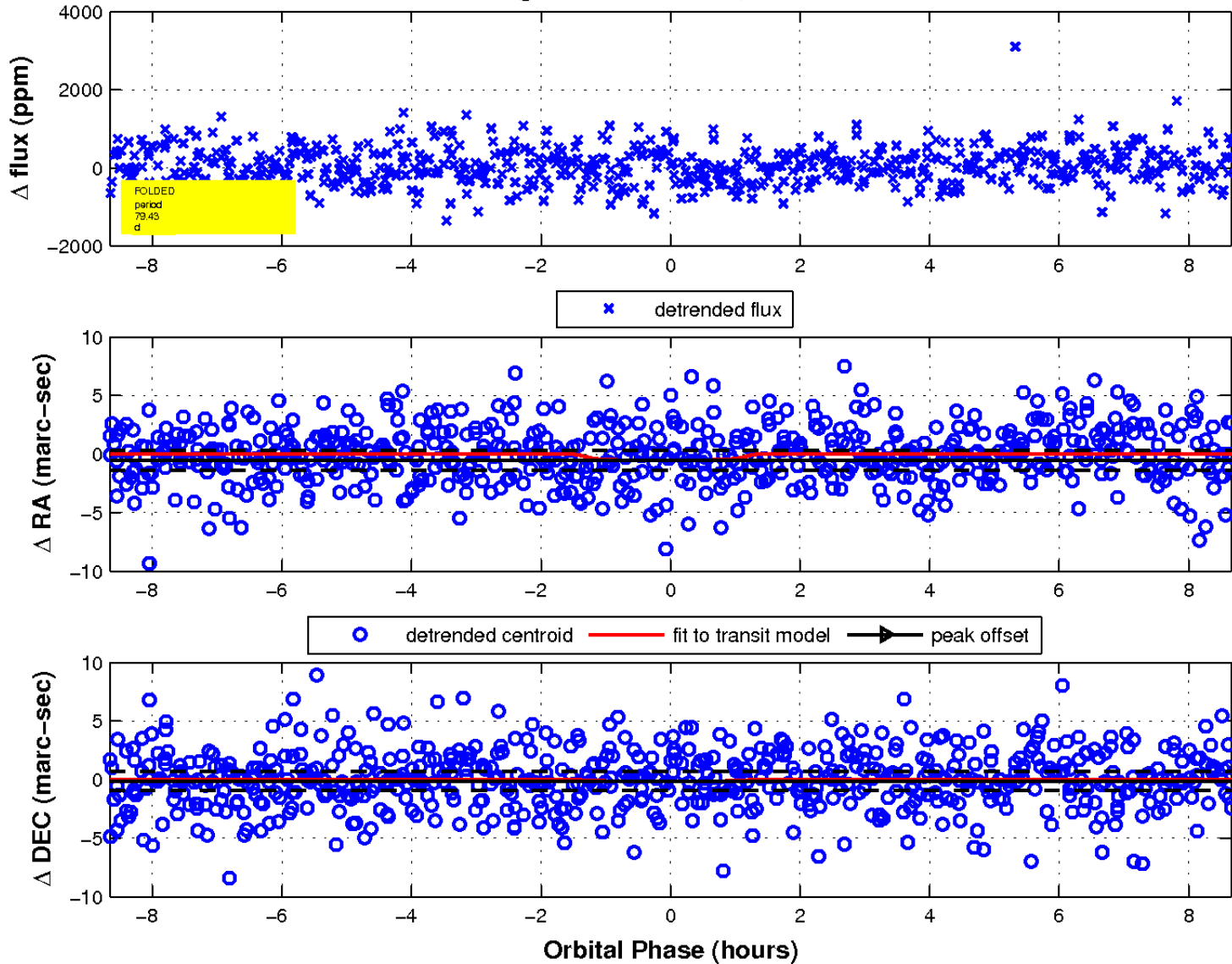
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

