

KIC 007778838

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})
007778838-01	OBS	No	5.876760	134.699593	45.8	5.436	14.4	14.5	4.66	11287	3.66	33890.09
007778838-02	OBS	No	3.526170	134.408838	25.8	13.303	12.0	11.4	4.66	11287	2.70	66965.67
007778838-03	OBS	No	5.876749	133.241035	78.6	12.500	10.5	-1.0	4.66	11287	4.26	33890.17
007778838-04	OBS	No	230.861548	336.480034	160.7	3.500	9.1	-1.0	4.66	11287	6.10	253.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007778838-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007778838-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
007778838-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
007778838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

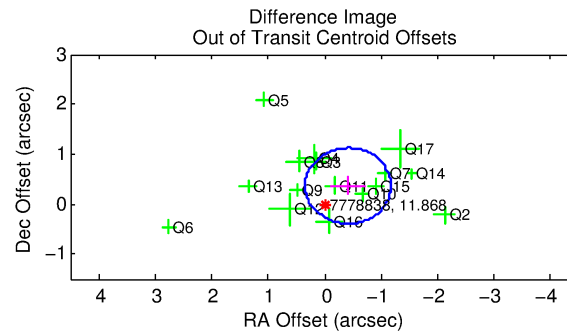
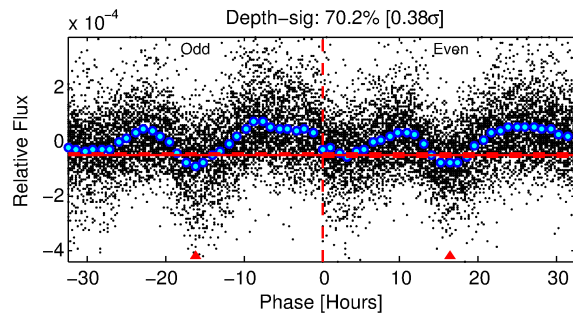
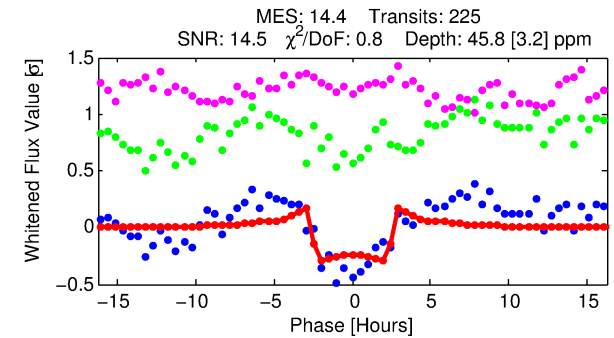
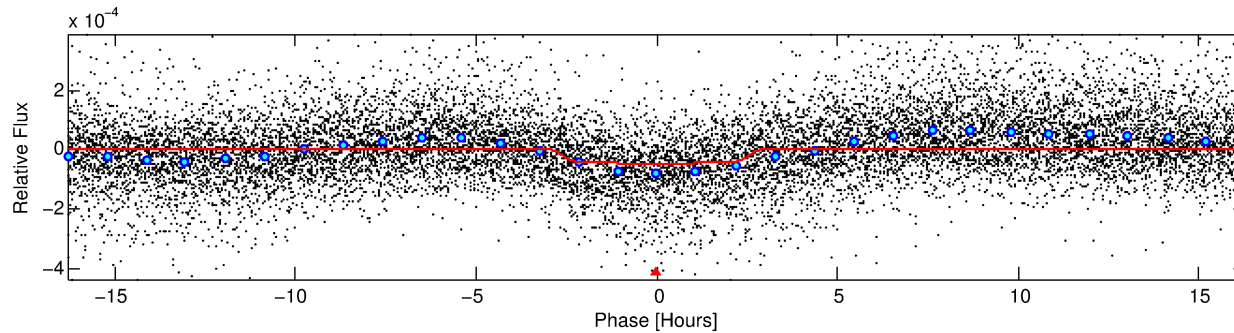
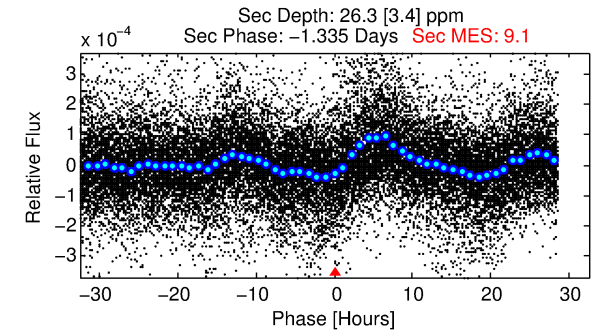
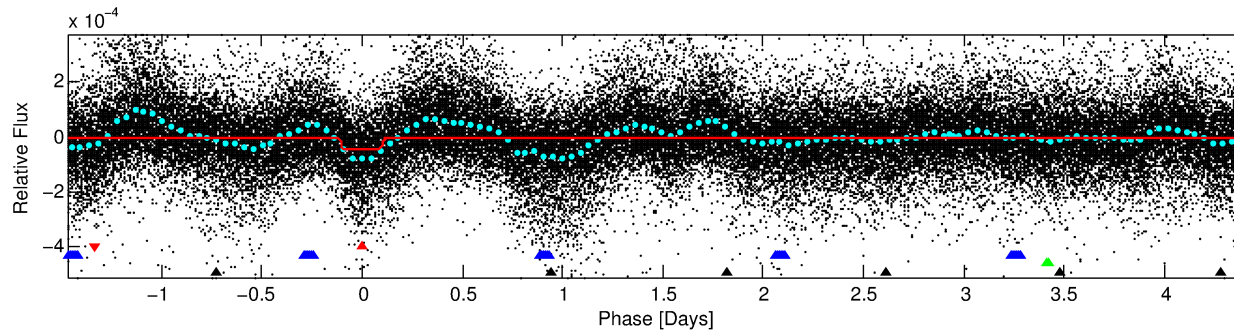
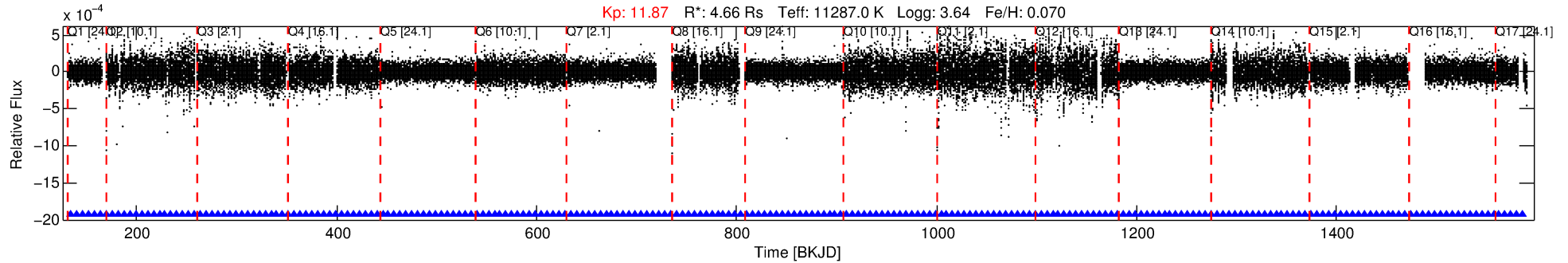
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007778838-01

No Significant Match Found

DV One-Page Summary

KIC: 7778838 Candidate: 1 of 4 Period: 5.877 d



DV Fit Results:

Period = 5.87676 [0.00003] d
Epoch = 134.6996 [0.0031] BKJD
Rp/R* = 0.0072 [0.0006]
a/R* = 3.40 [1.90]
b = 0.93 [0.09]
Seff = 33890.09 [34228.12]
Teq = 3460 [874] K
Rp = 3.66 [1.89] Re
a = 0.0966 [0.0483] AU
Ag = 10.08 [8.39] [1.08σ]
Teffp = 9532 [1529] K [3.45σ]

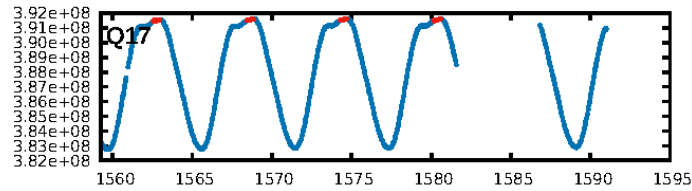
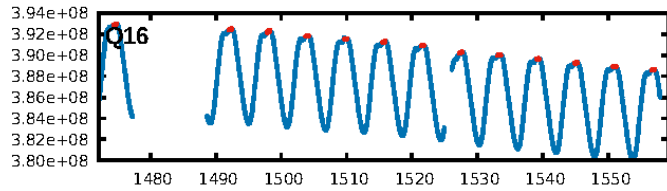
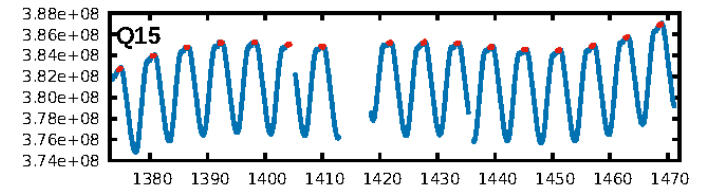
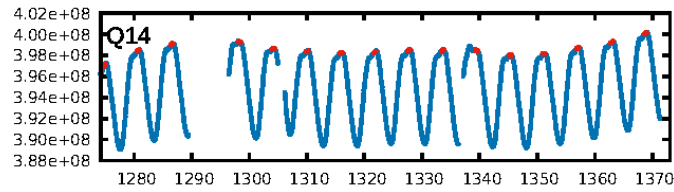
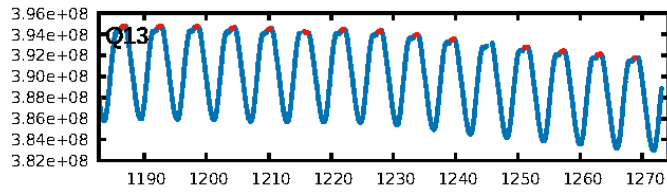
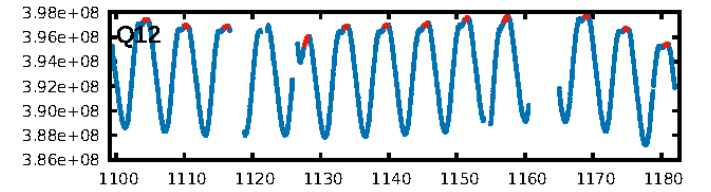
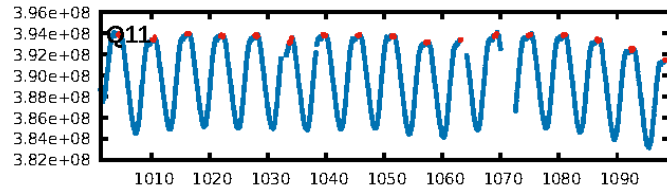
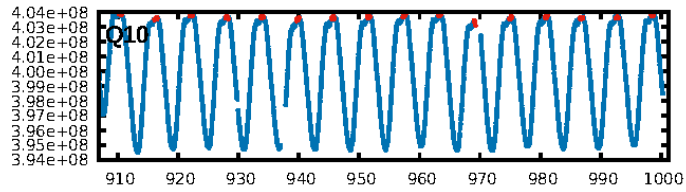
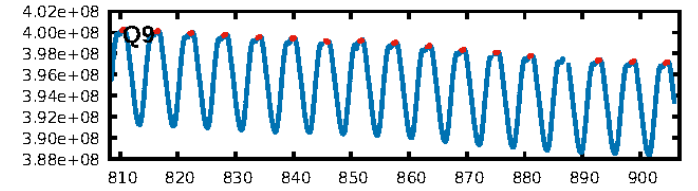
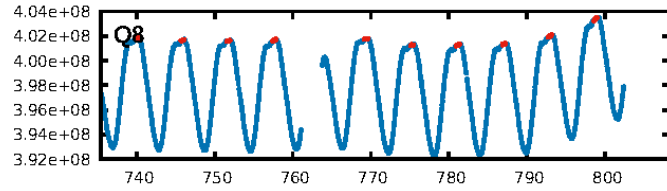
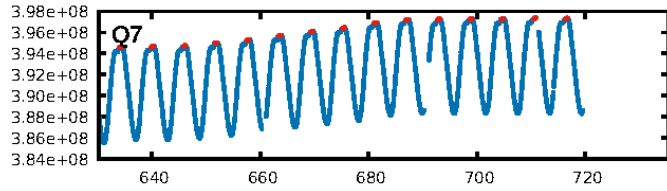
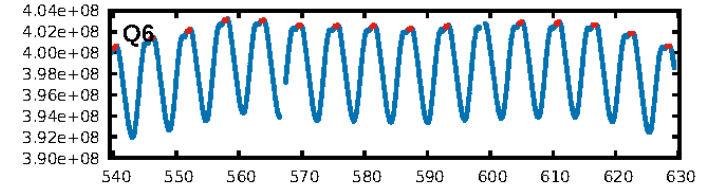
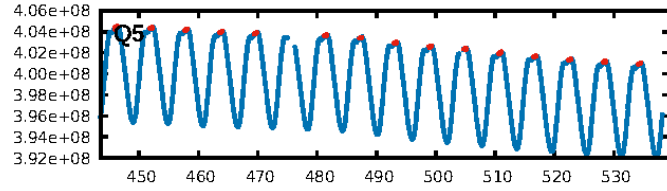
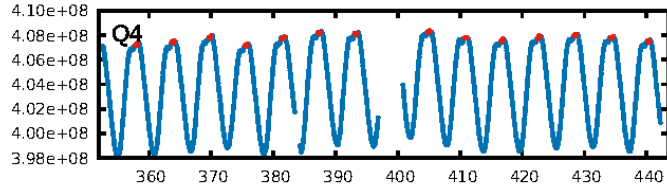
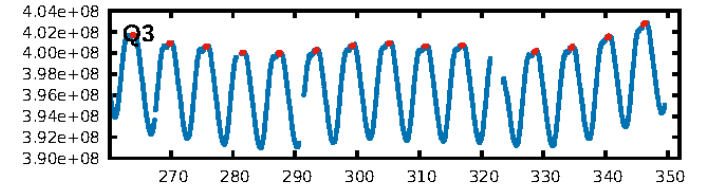
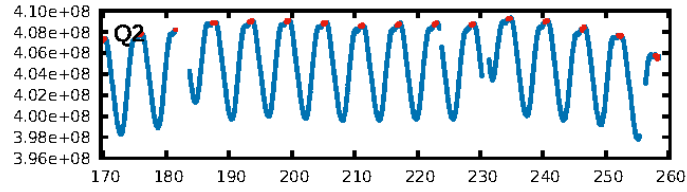
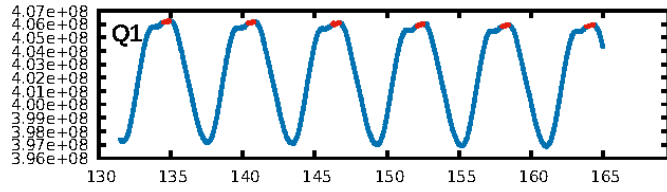
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [835.22σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.36e-25
RollingBand-fgt: 1.00 [215/215]
GhostDiagnostic-chr: -17.26
Centroid-sig: 95.9%
Centroid-so: 0.195 arcsec [0.24σ]
OotOffset-rm: 0.551 arcsec [2.18σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-rm: 0.530 arcsec [1.87σ]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.00 [0/16]
DiffImageOverlap-fno: 1.00 [17/17]

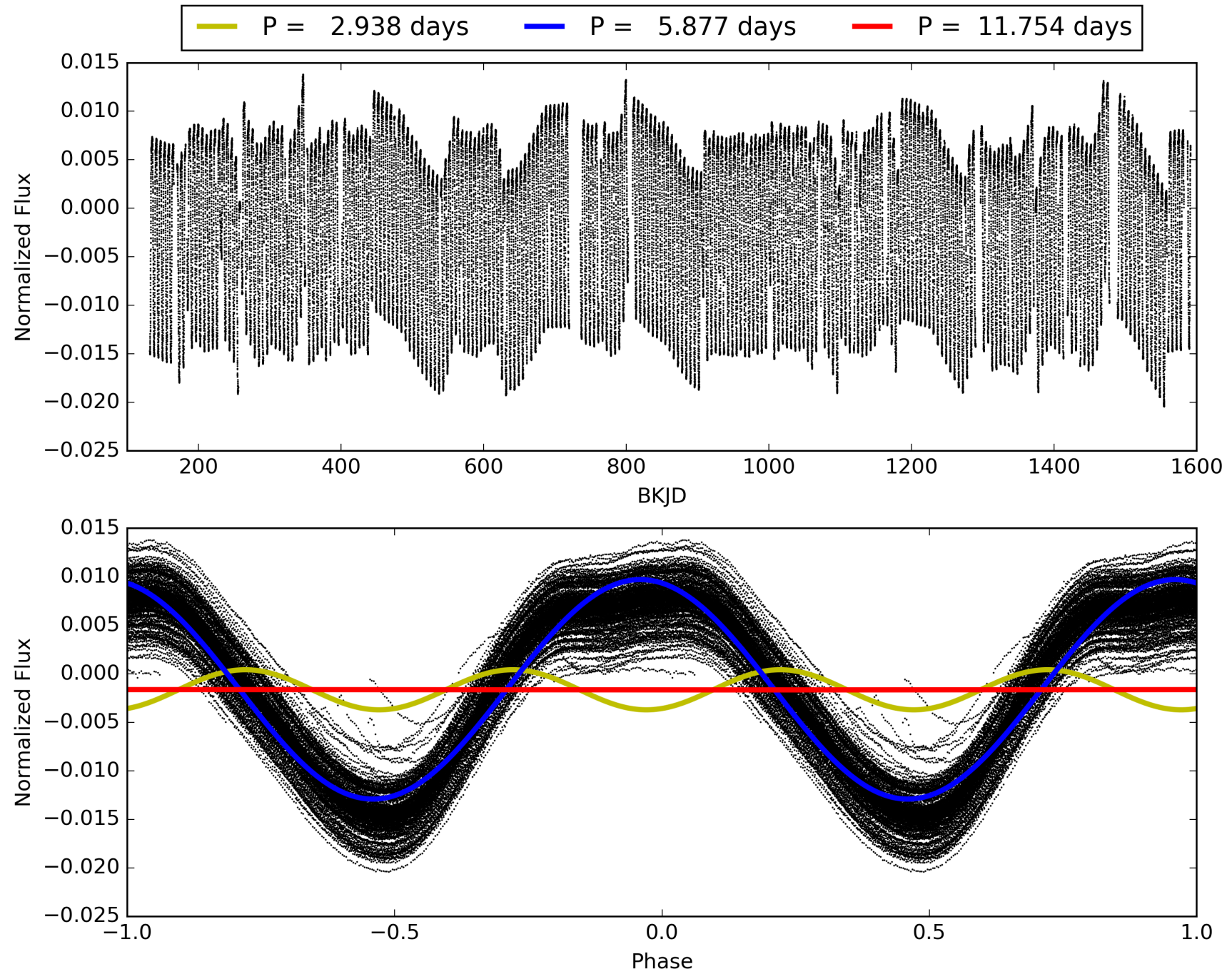
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:18:58 Z

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

TCE 007778838-01, PDC Light Curves

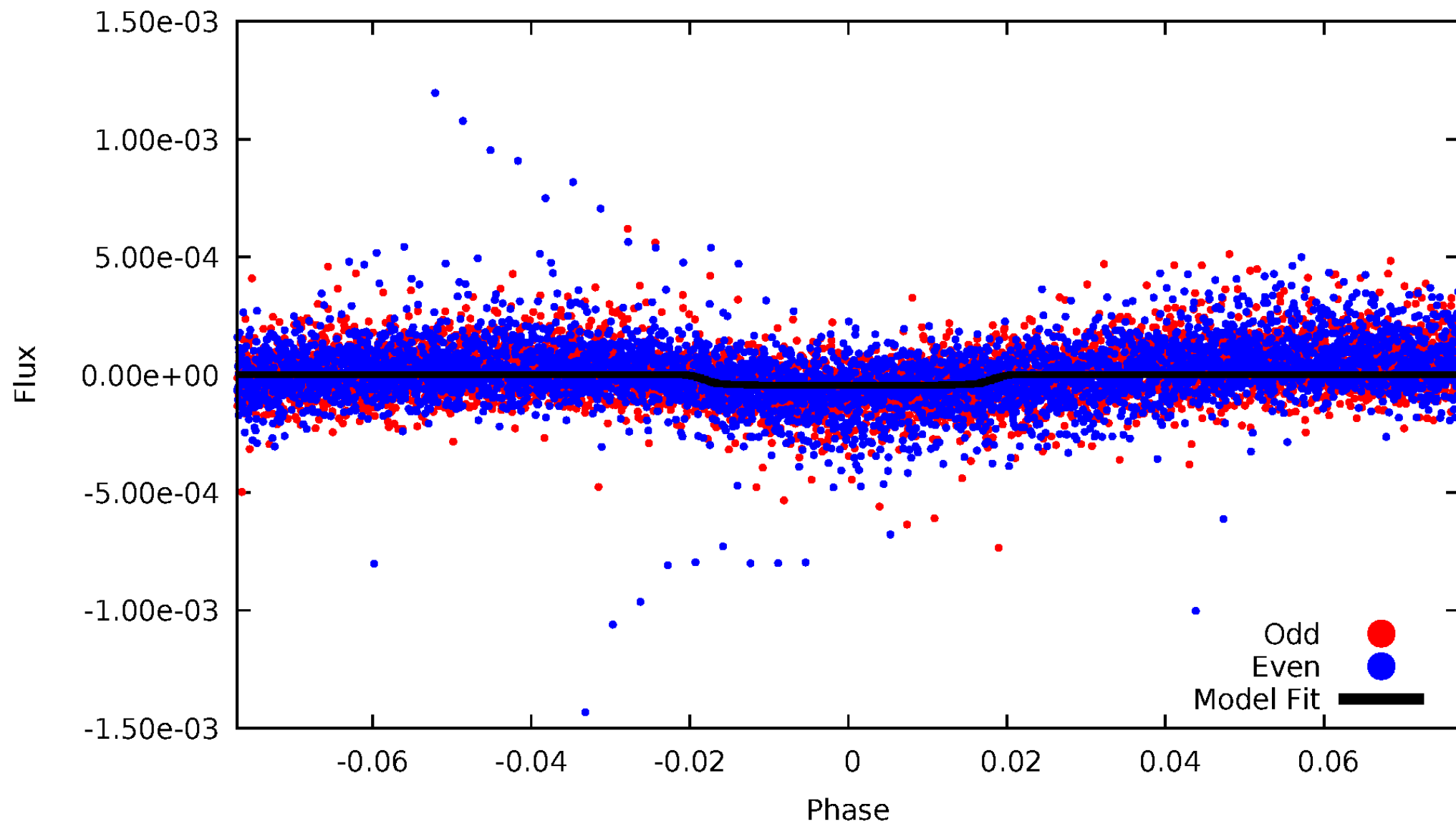


TCE 007778838-01



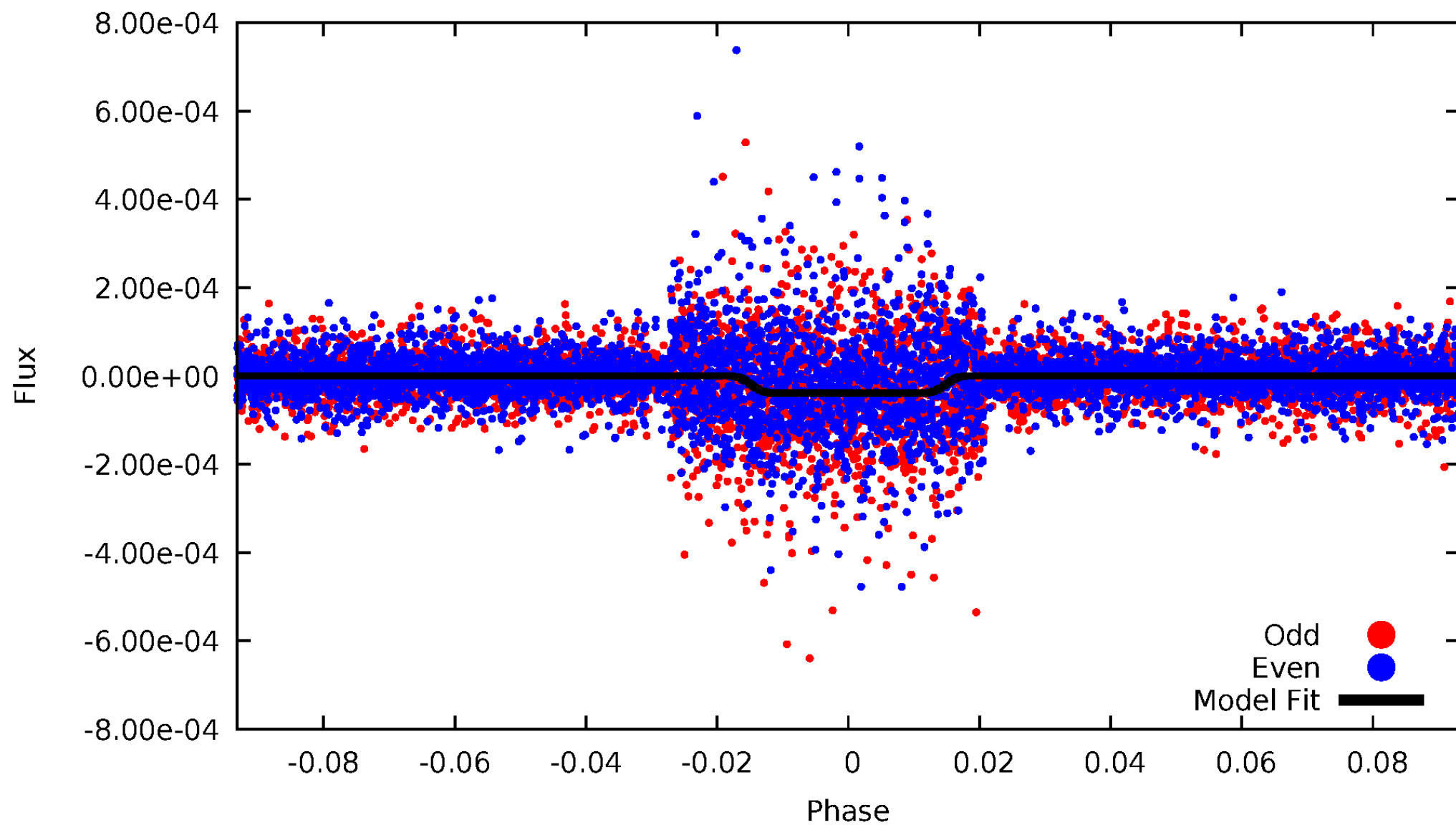
DV Odd/Even

TCE 007778838-01

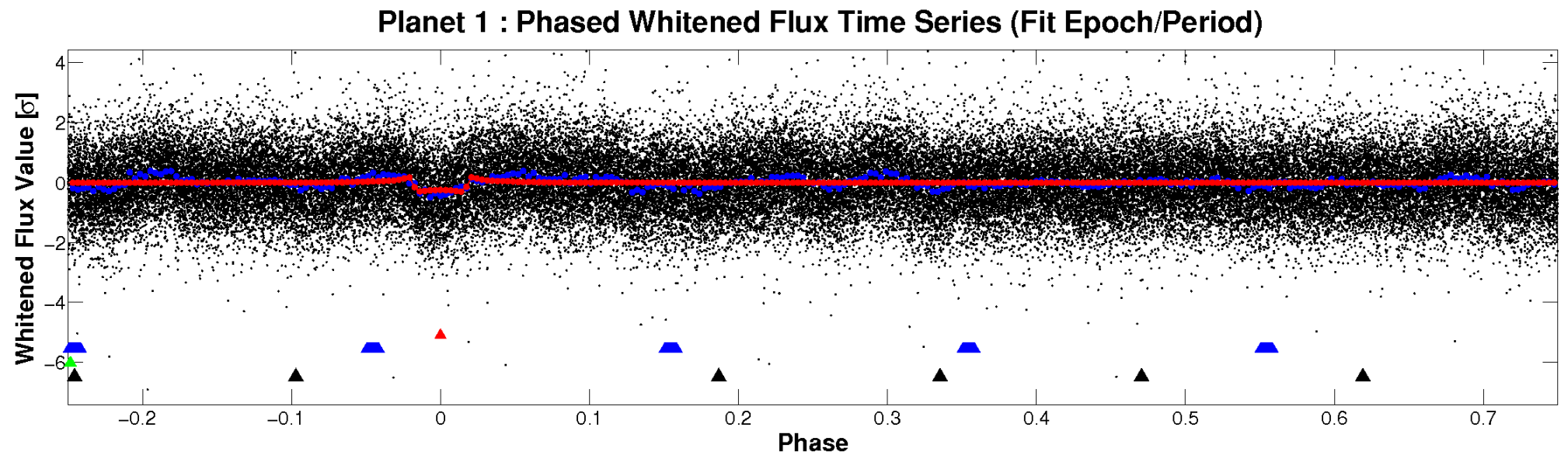
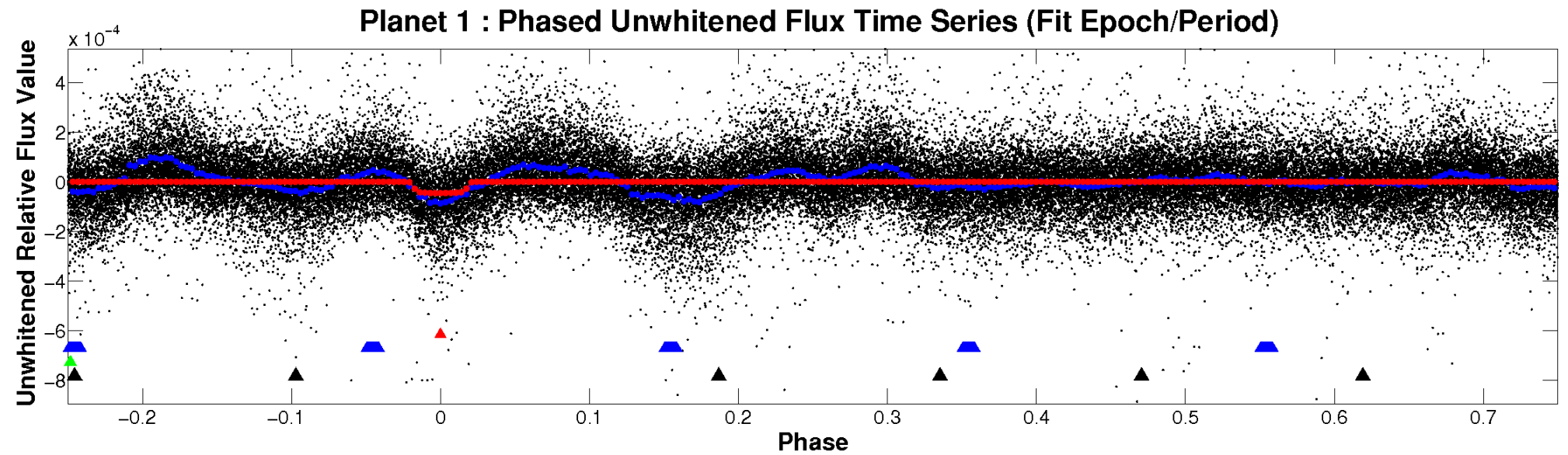


ALT Odd/Even

TCE 007778838-01

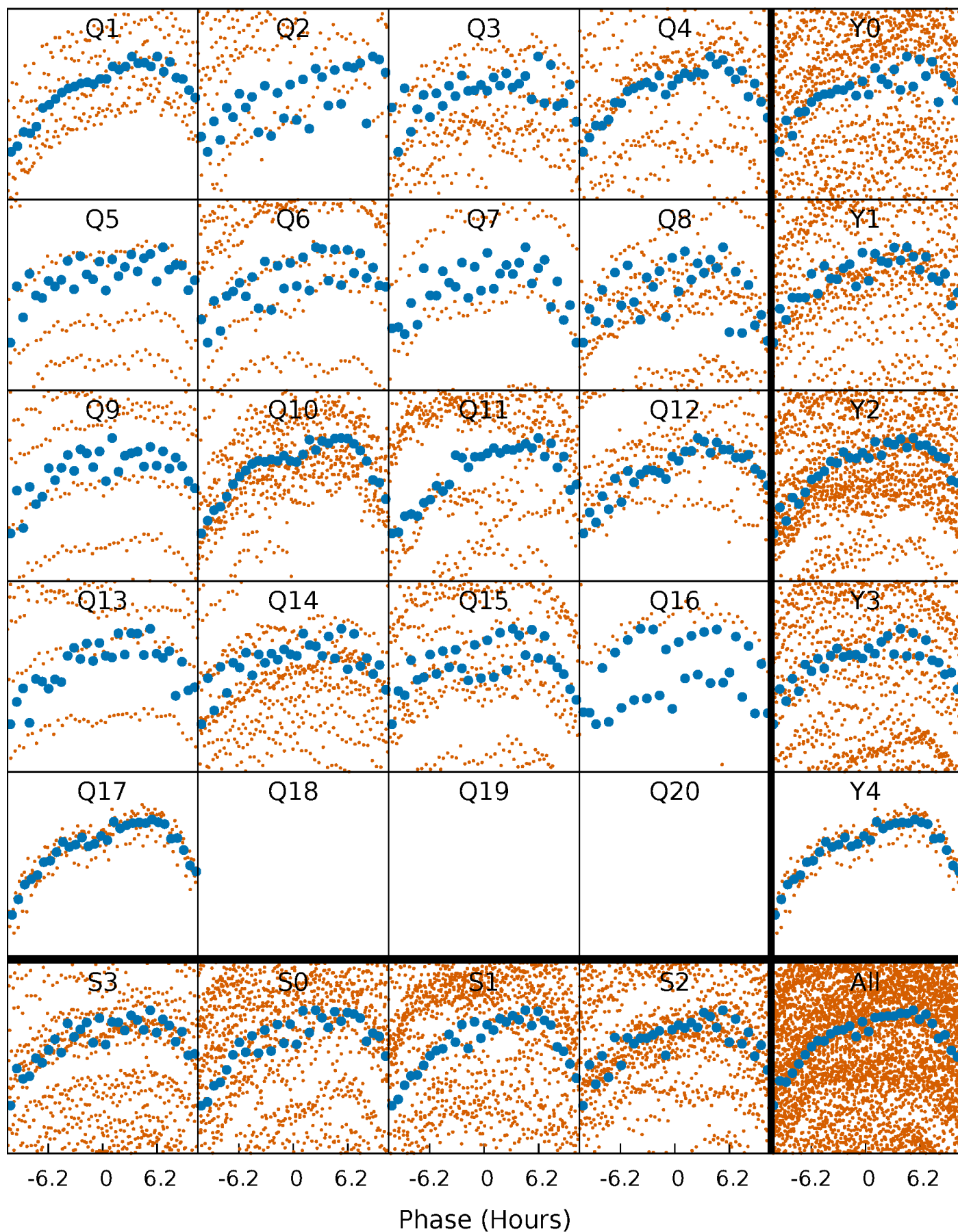


Non-Whitened Vs. Whitened Light Curve



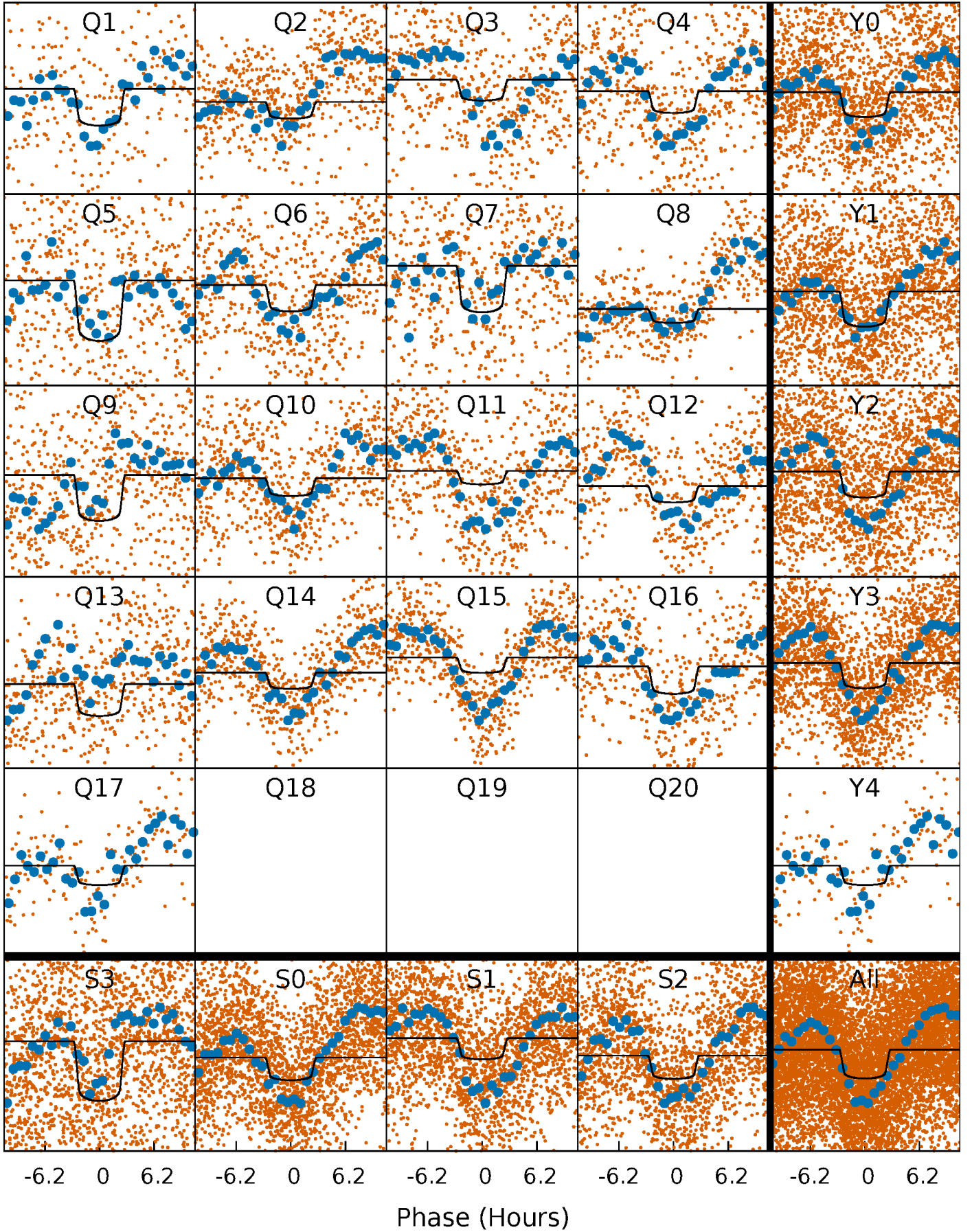
PDC Quarter-Phased Transit Curves

TCE 007778838-01 P= 5.876760 Days $T_0=134.699593$ (BKJD)



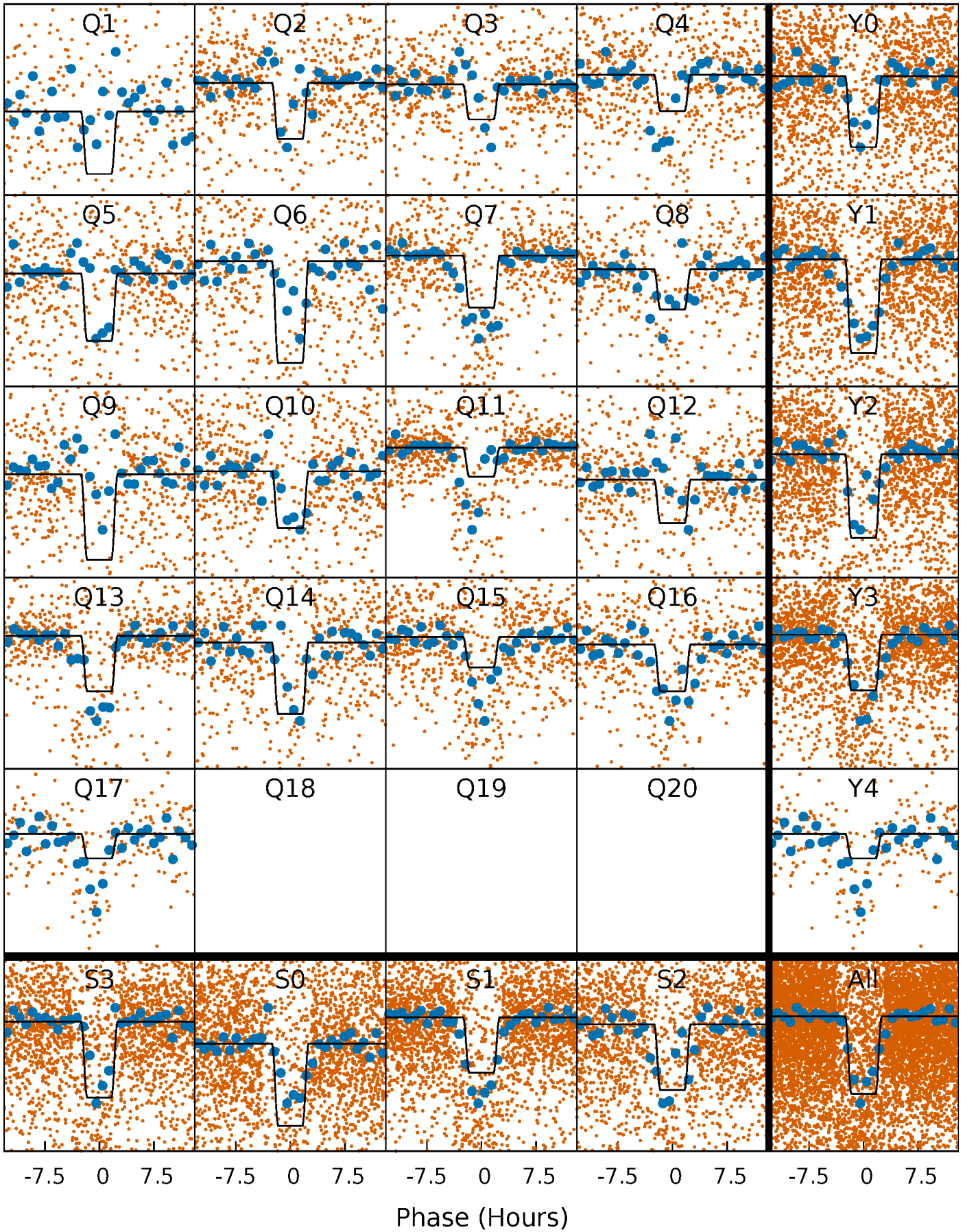
DV Quarter-Phased Transit Curves

TCE 007778838-01 P= 5.876760 Days $T_0=134.699593$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

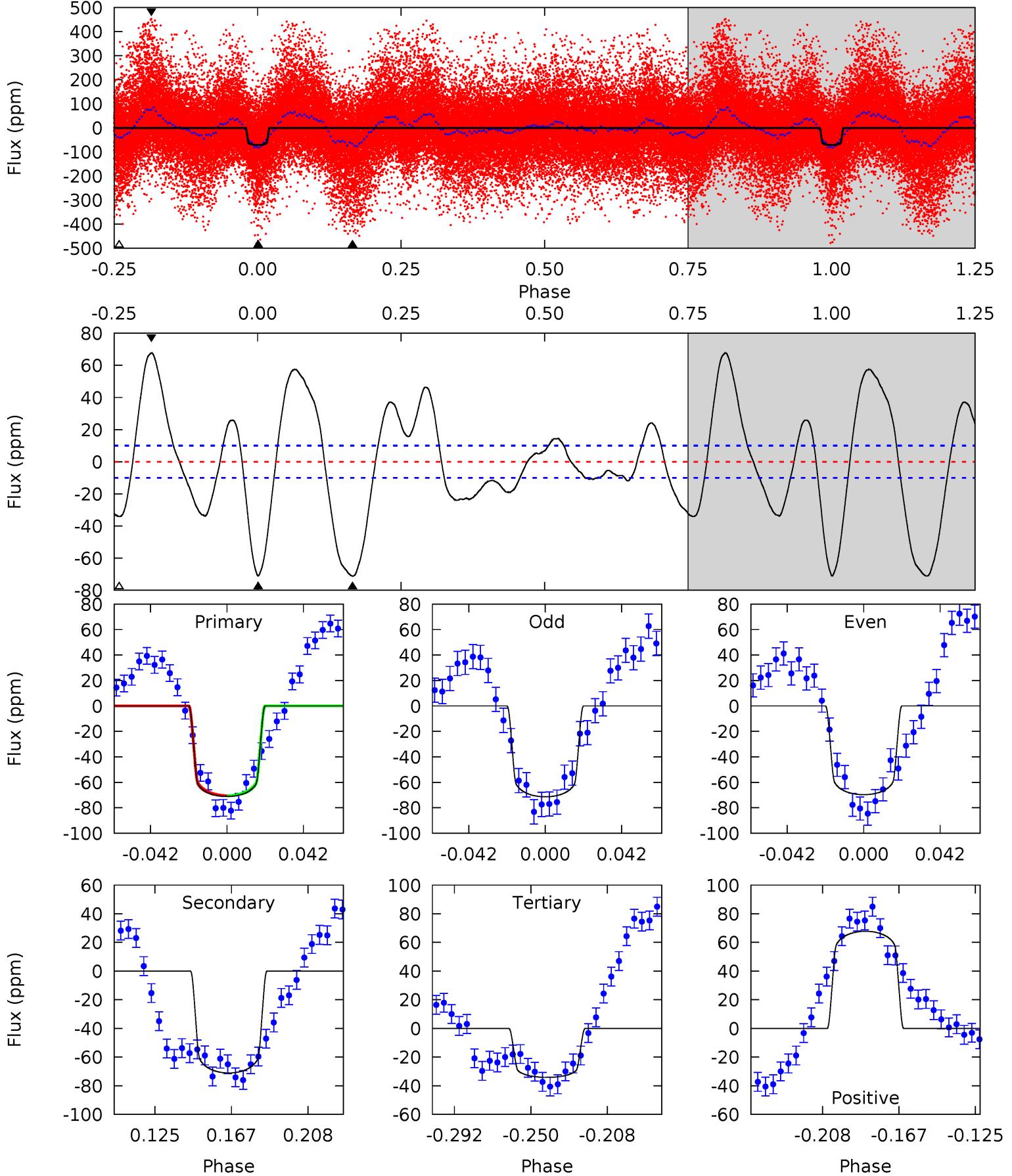
TCE 007778838-01 P= 5.876691 Days $T_0=134.697745$ (BKJD)



DV Model-Shift Uniqueness Test

007778838-01, P = 5.876760 Days, E = 128.822833 Days

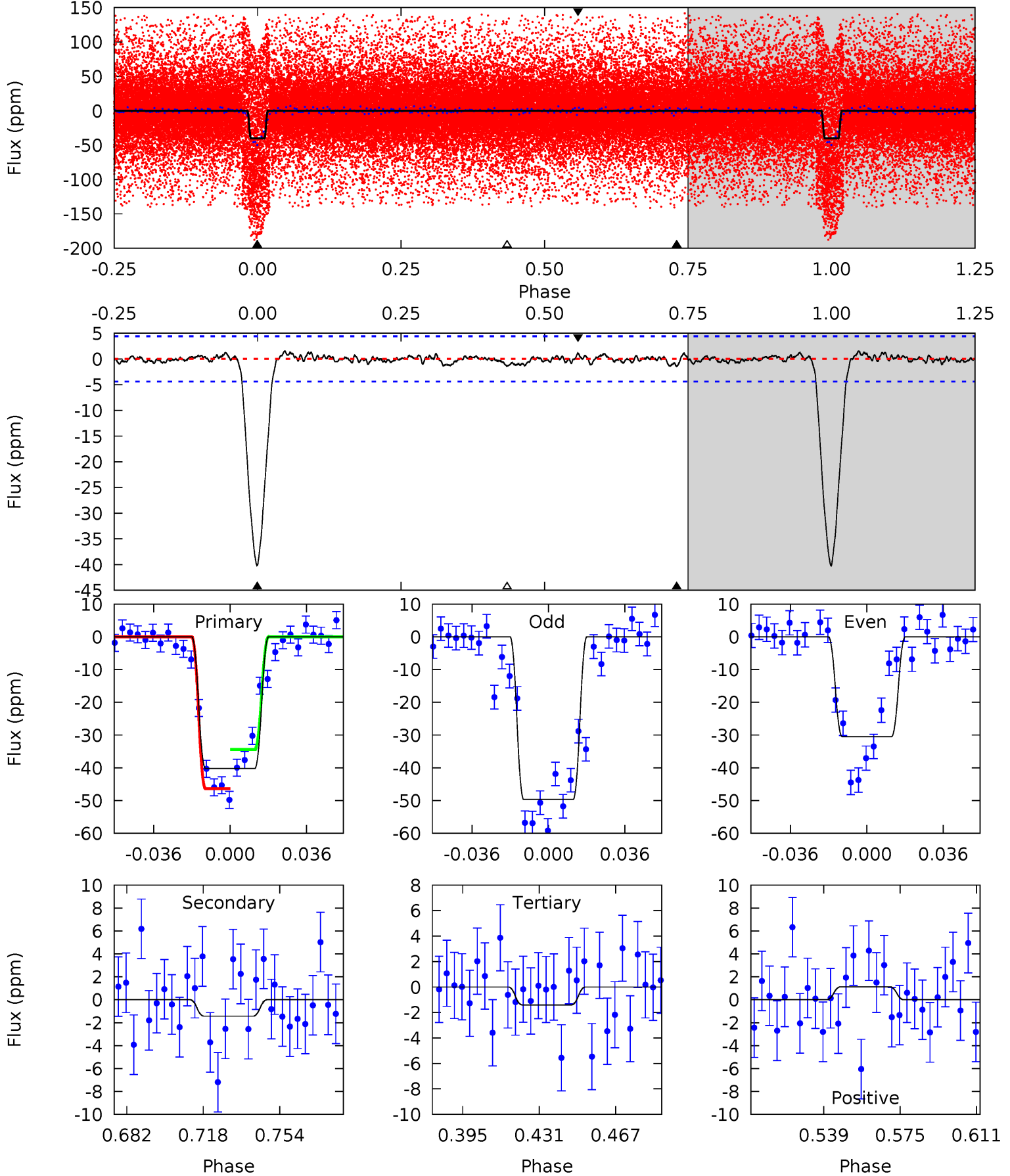
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.7	33.6	16.2	32.1	4.75	2.04	12.1	17.5	1.57	17.5	1.56	0.40	1.22	0.49	0.02



Alt Model-Shift Uniqueness Test

007778838-01, P = 5.876691 Days, E = 128.821054 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.5	1.54	1.51	1.22	4.78	2.10	0.57	42.0	42.2	0.03	0.32	10.4	0.92	0.04	0



Stellar Parameters For KIC 007778838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	11287^{+612}_{-1716}	$3.642^{+0.476}_{-0.084}$	$0.070^{+0.150}_{-0.600}$	$4.662^{+0.447}_{-2.385}$	$3.471^{+0.069}_{-1.164}$	$0.048^{+0.248}_{-0.013}$
	+5%/-15%	+13%/-2%	+214%/-857%	+10%/-51%	+2%/-34%	+514%/-27%
Source	KIC0	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 007778838-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-71 ± 2	$3.38^{+0.59}_{-0.85}$	4522^{+535}_{-787}	12497^{+1499}_{-1923}	31^{+20}_{-8}
Alt.	-1 ± 1	$2.90^{+0.55}_{-0.78}$	4492^{+573}_{-809}	4094^{+705}_{-1570}	$0.890^{+0.863}_{-0.562}$

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

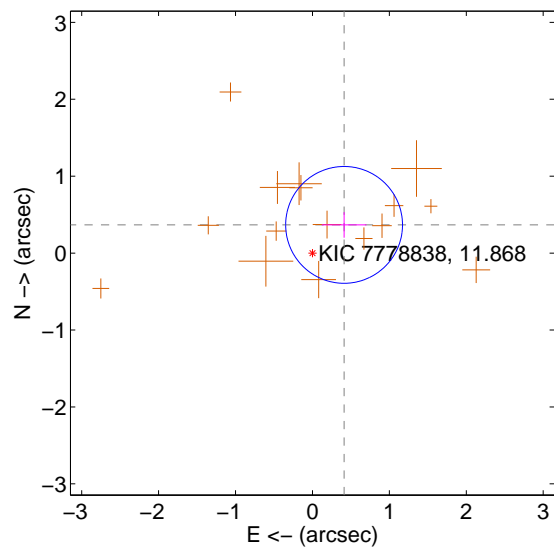
Supplemental centroid analysis for 007778838-01. **Kepler magnitude: 11.87.** Transit SNR 14.53

There are 0 quarters with good PRF difference image offsets

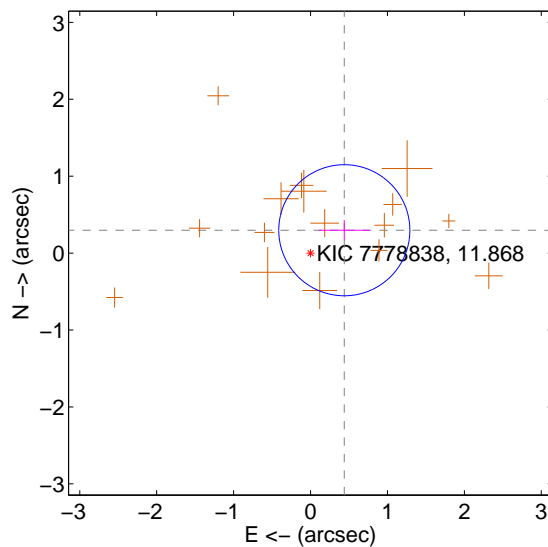
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.551 ± 0.253	2.18	-0.411 ± 0.290	0.367 ± 0.166
PRF-fit source offset from KIC position	0.530 ± 0.284	1.87	-0.439 ± 0.331	0.297 ± 0.132
photometric centroid source offset	0.19 ± 0.81	0.24	-0.18 ± 0.84	-0.07 ± 0.50

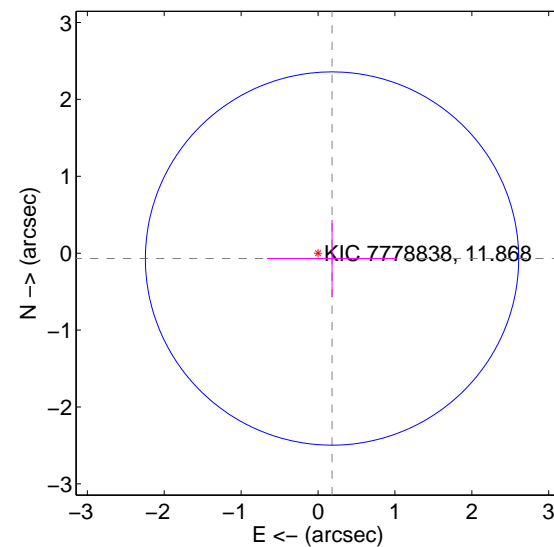
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

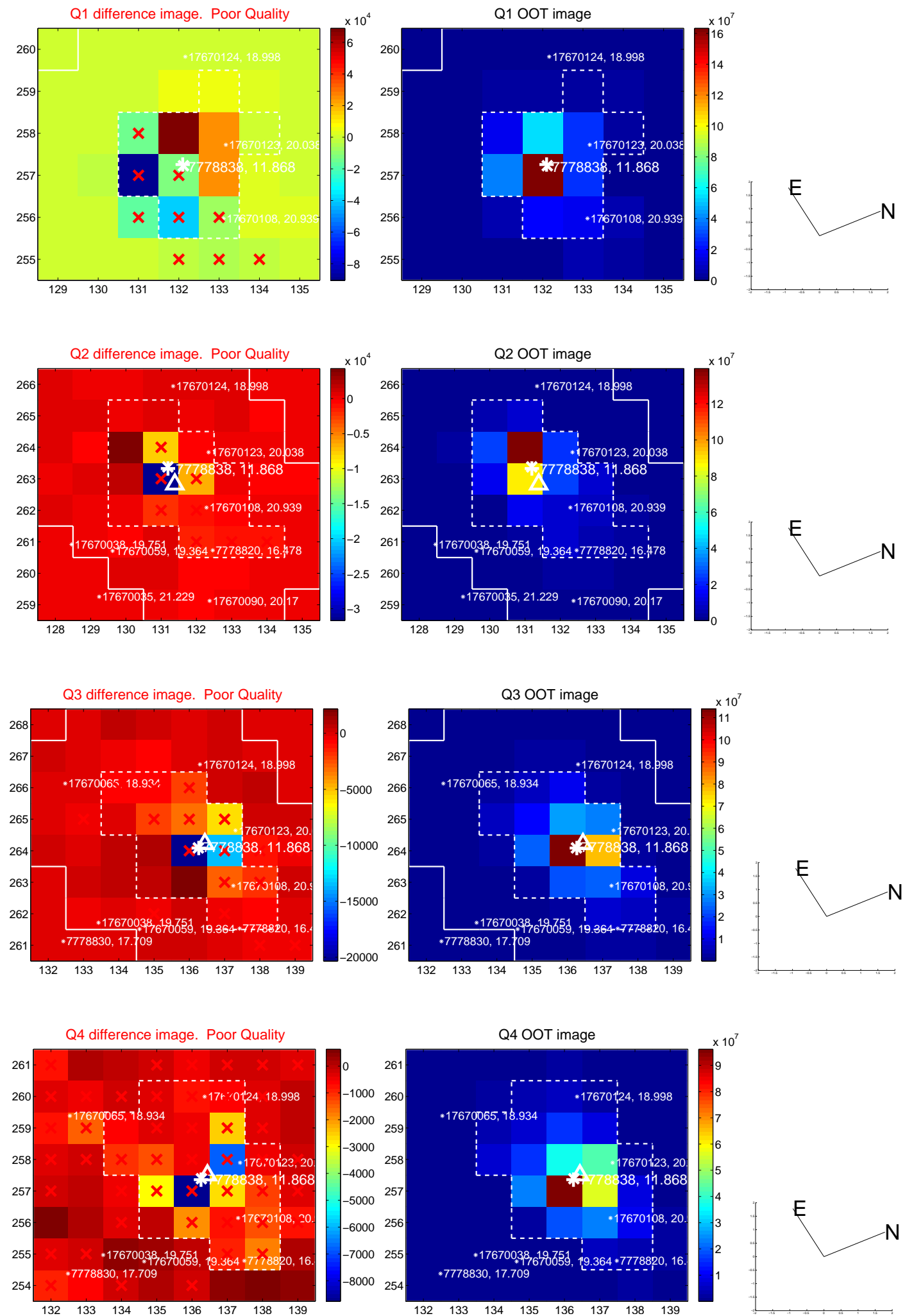


offset from photometric centroids

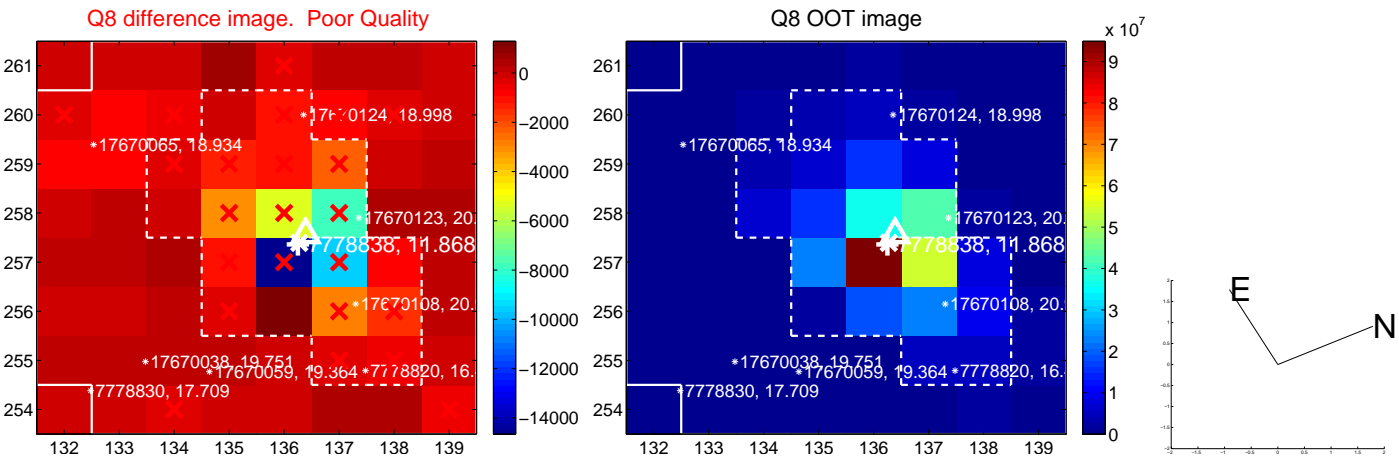
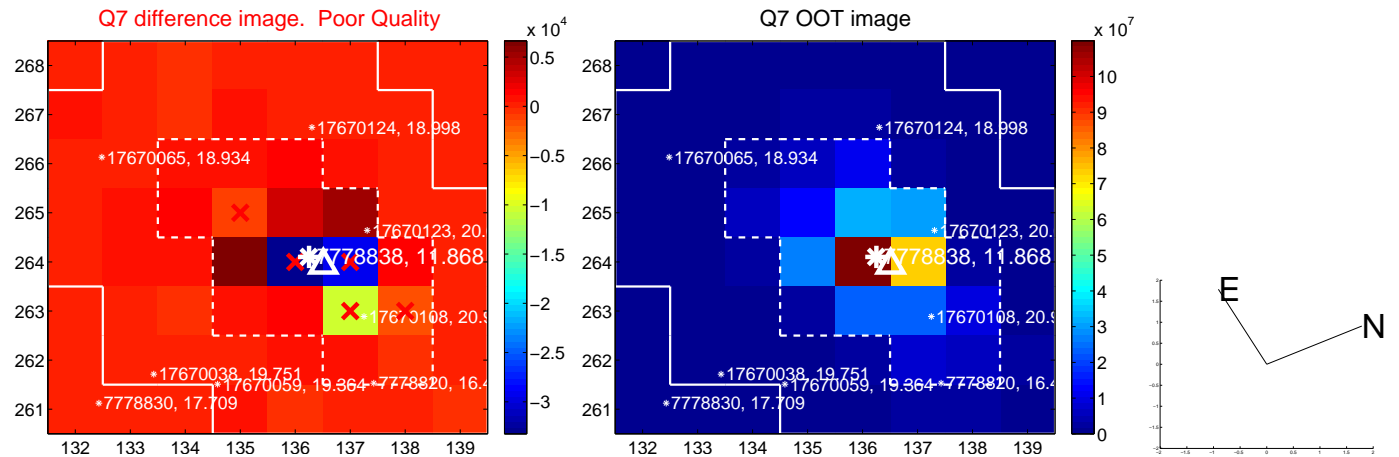
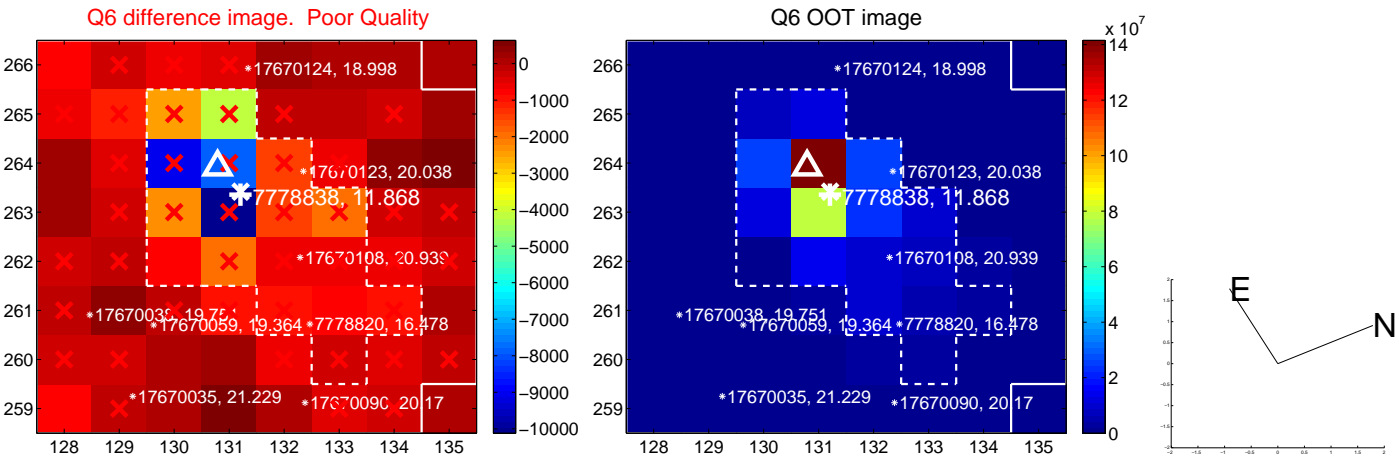
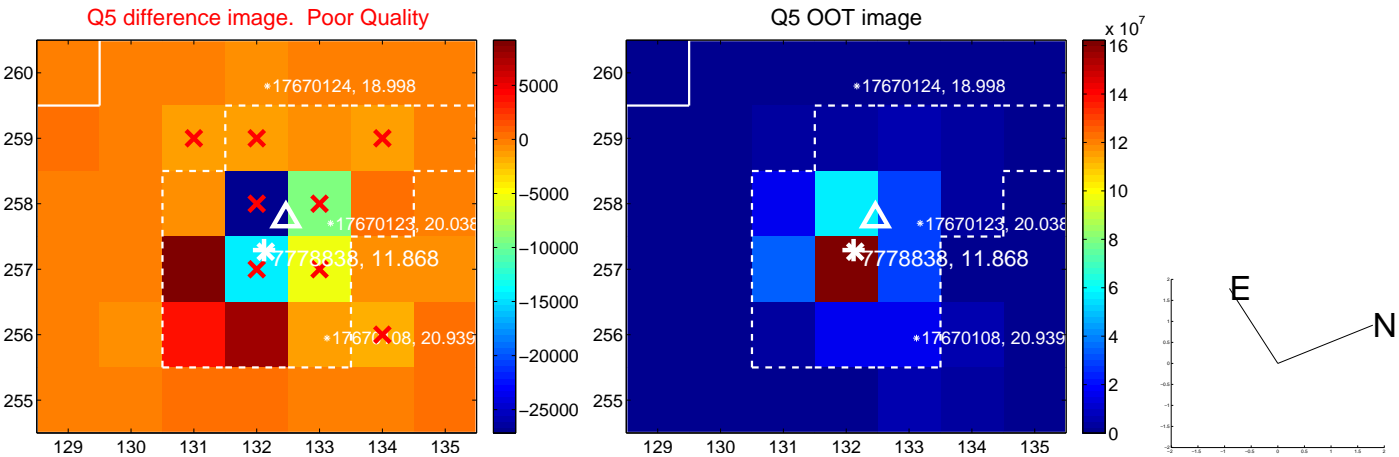


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

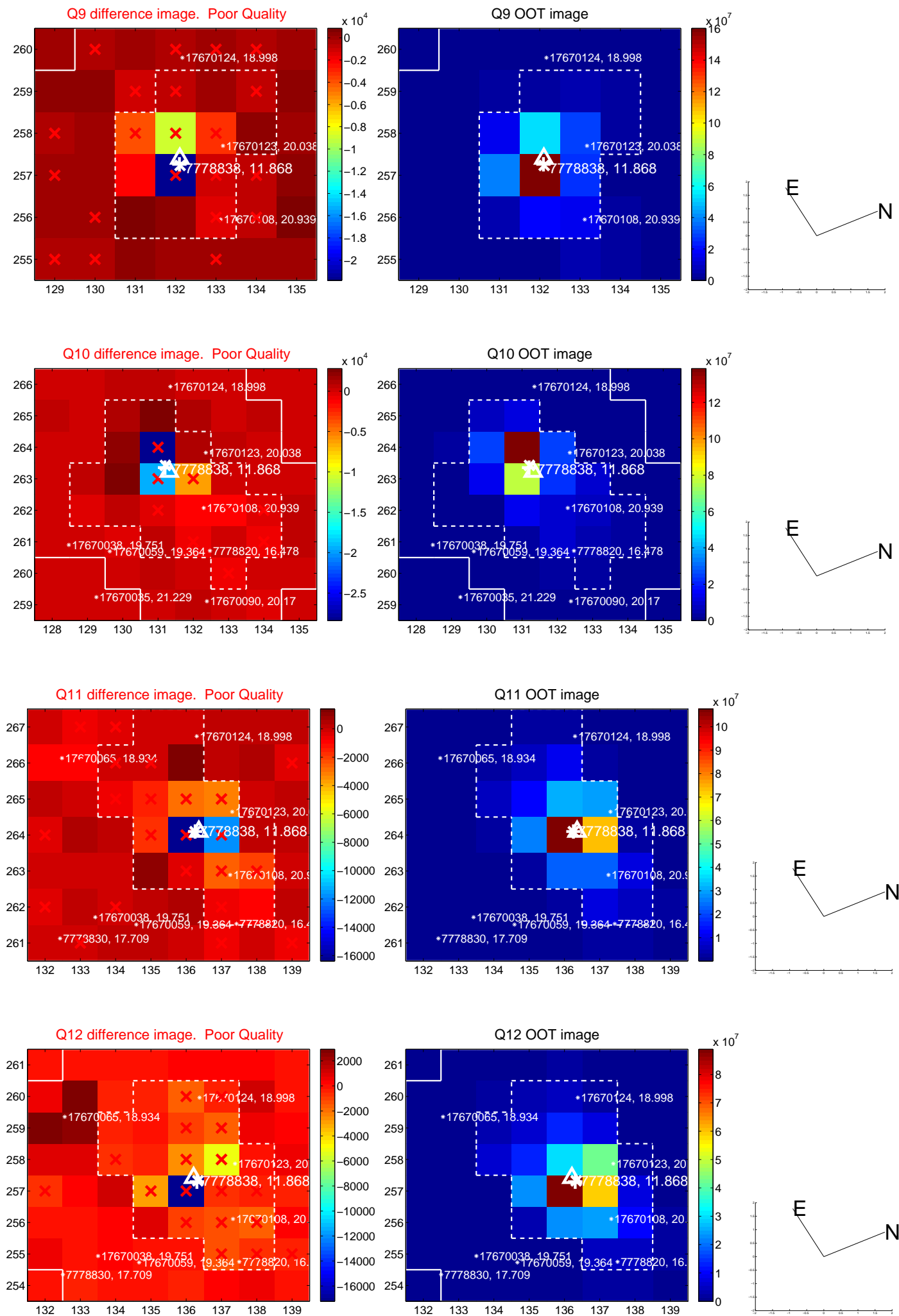
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



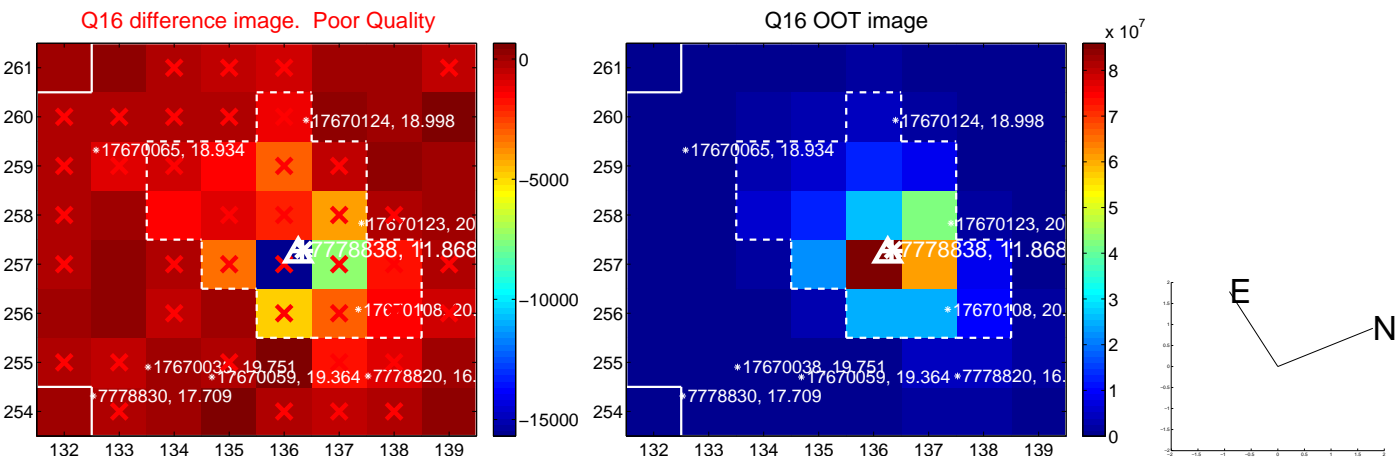
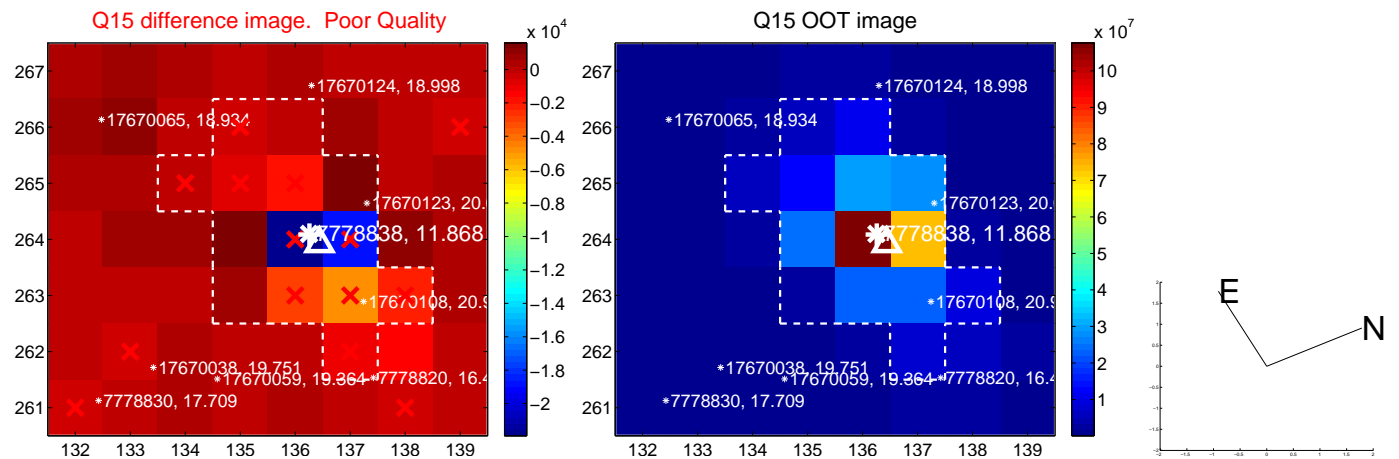
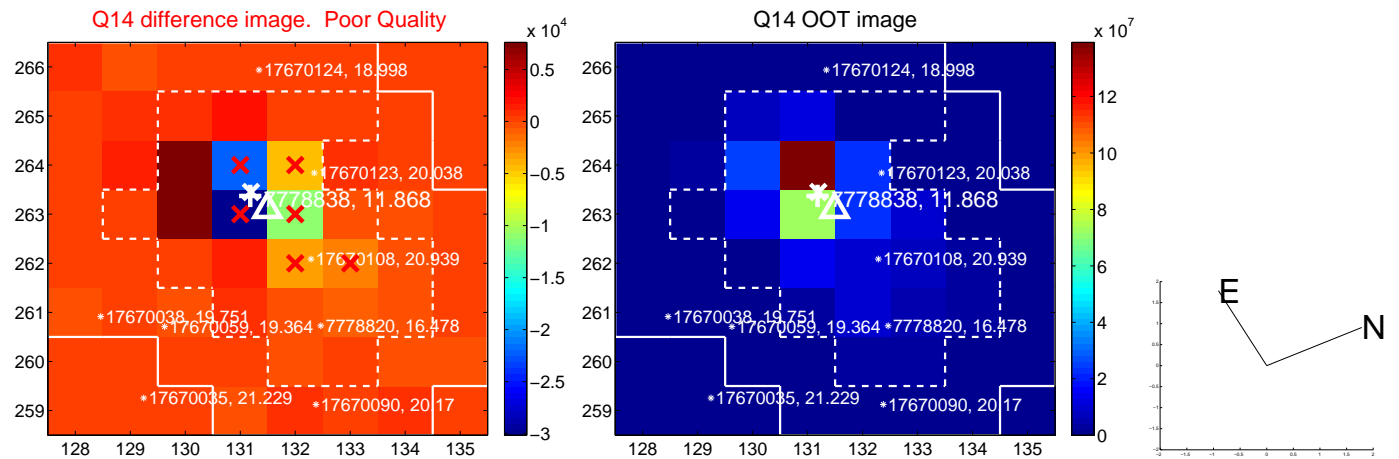
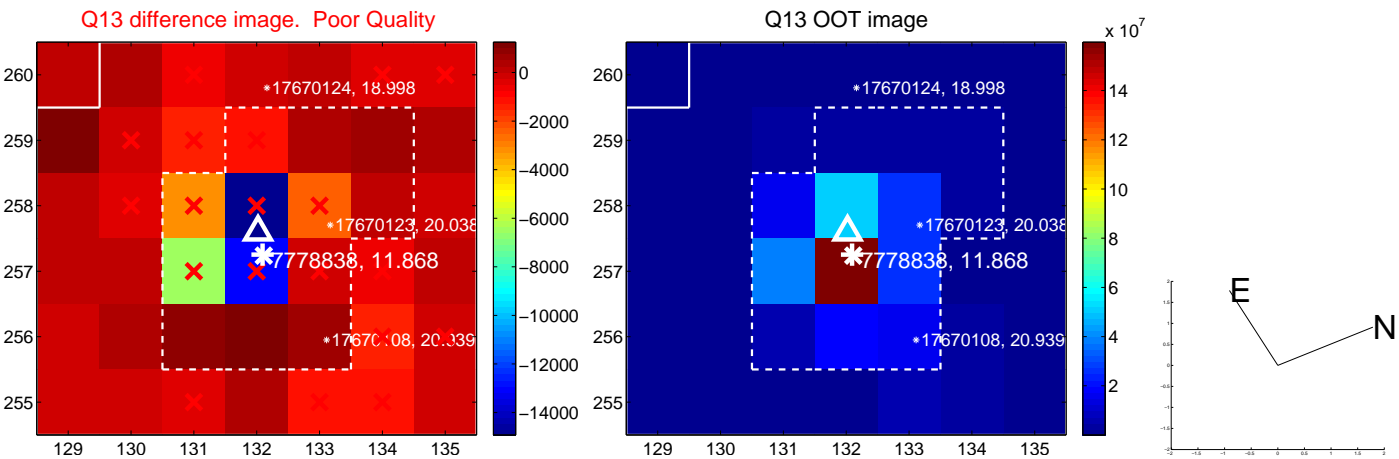
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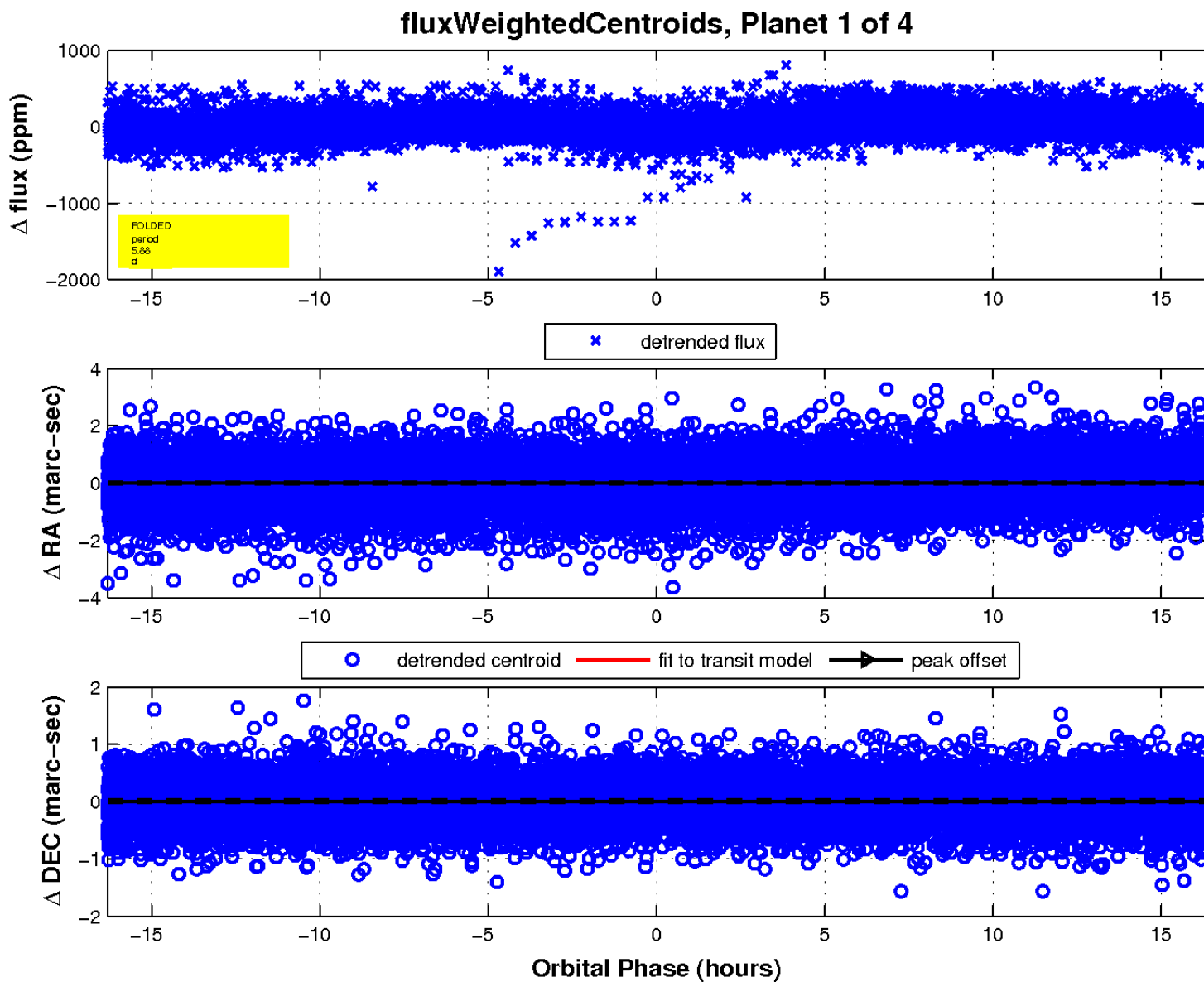
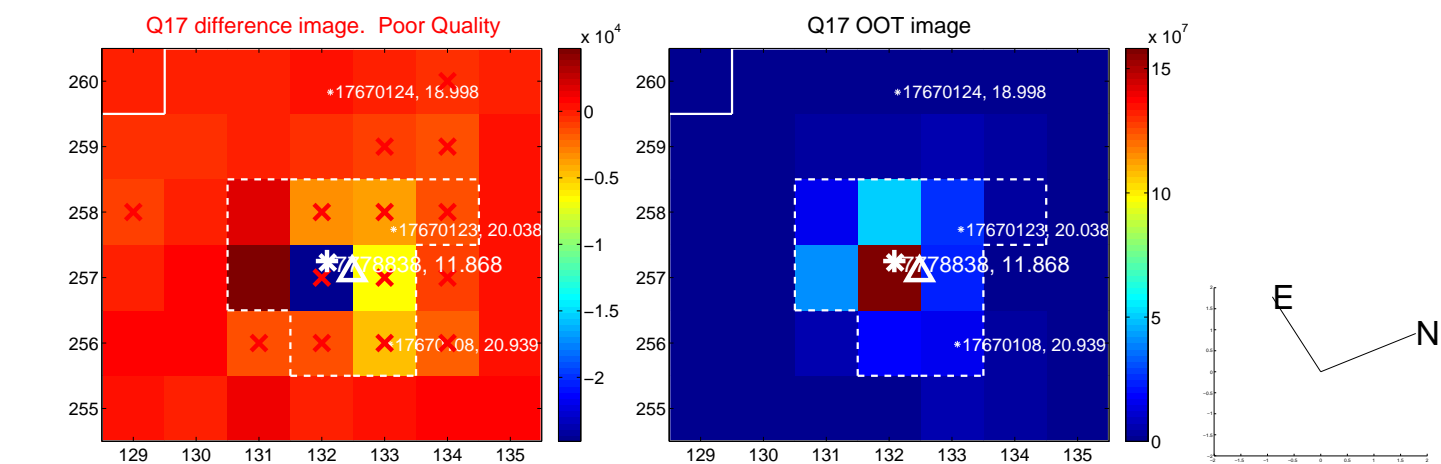
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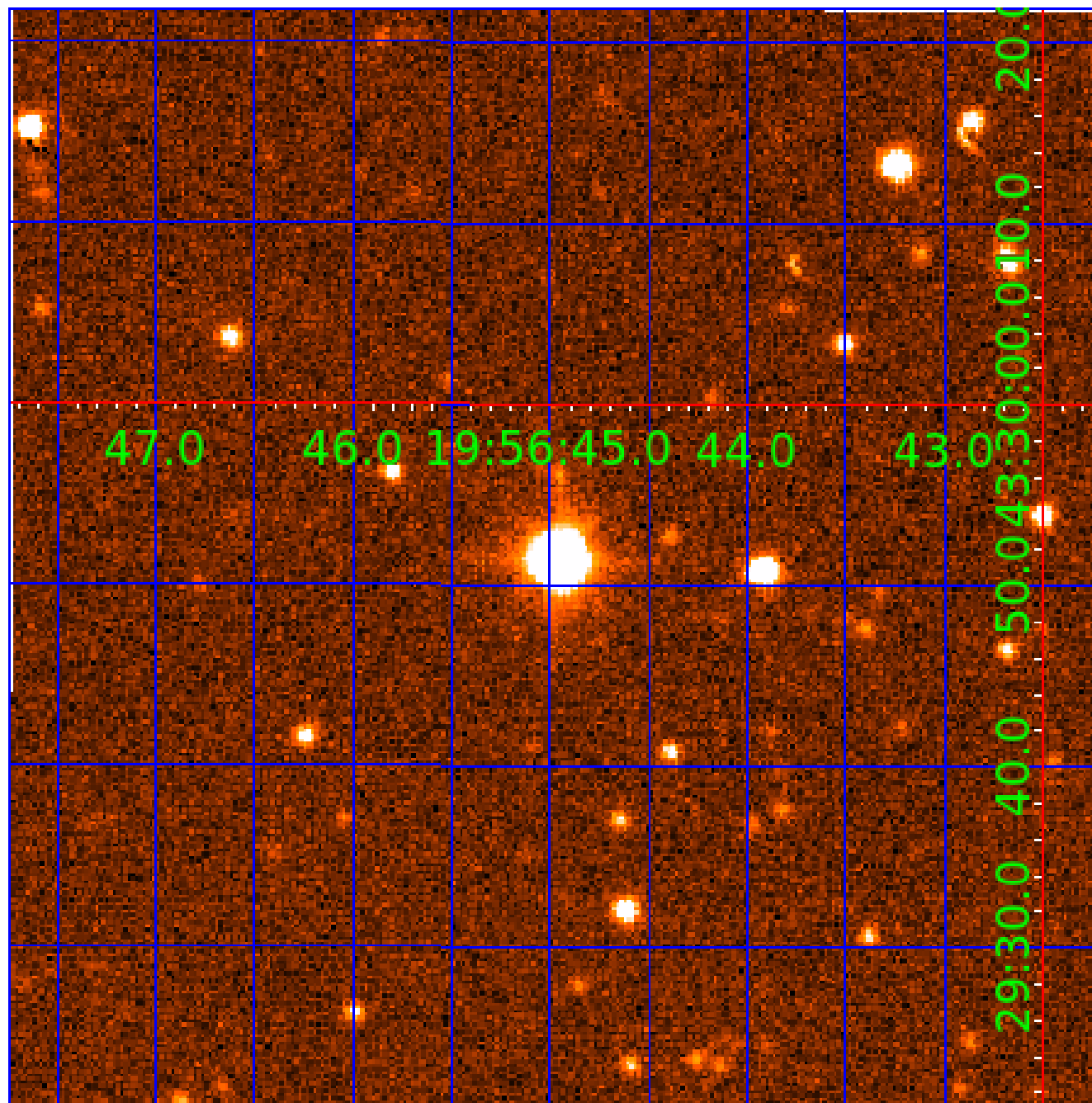


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007778838

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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007778838-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
007778838-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
007778838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

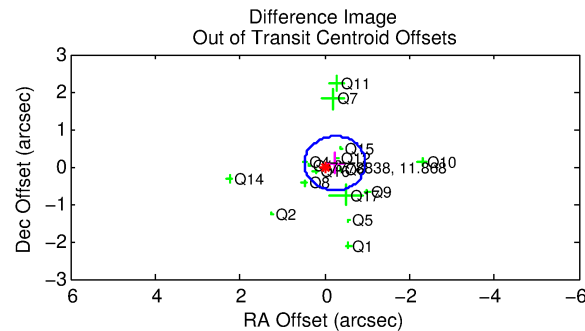
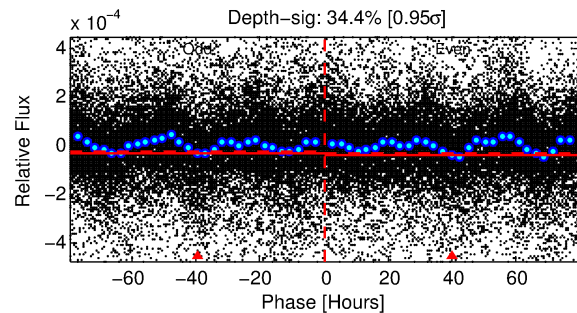
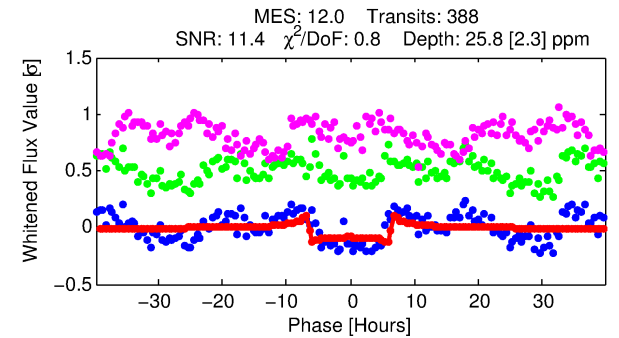
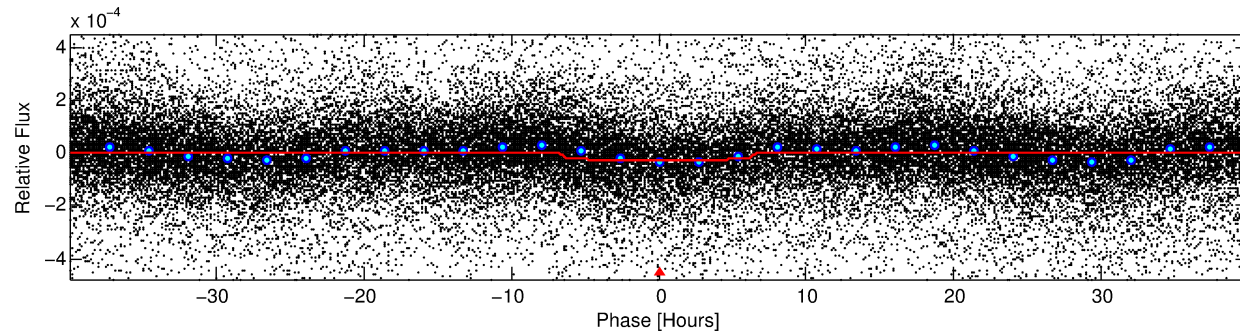
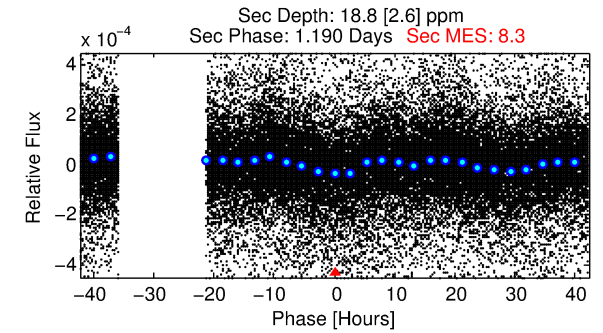
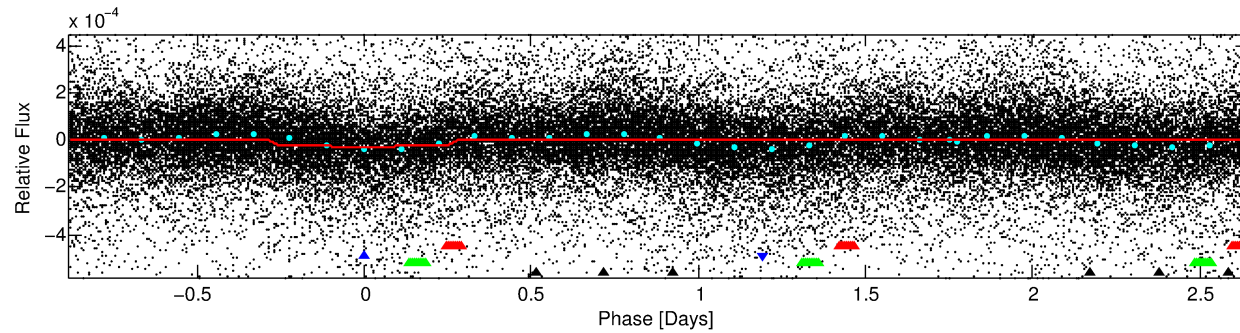
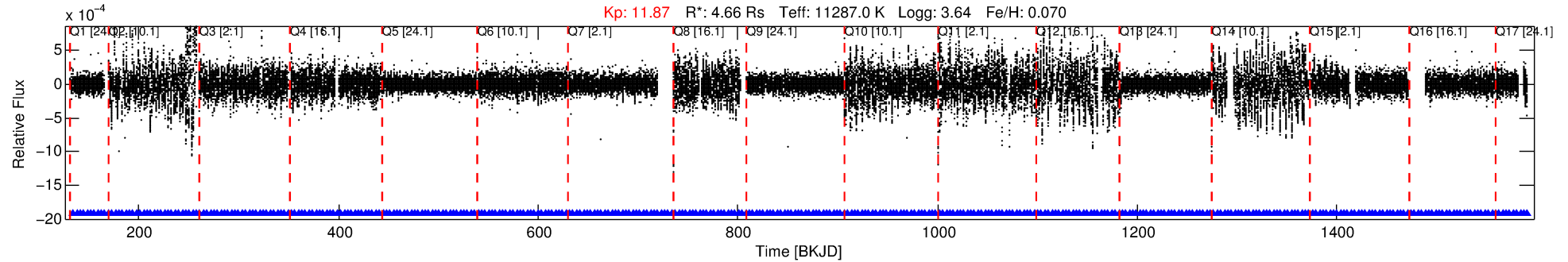
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007778838-02

No Significant Match Found

DV One-Page Summary

KIC: 7778838 Candidate: 2 of 4 Period: 3.526 d



DV Fit Results:

Period = 3.52617 [0.00003] d
Epoch = 134.4088 [0.0044] BKJD
Rp/R* = 0.0053 [0.0004]
a/R* = 1.30 [0.22]
b = 0.90 [0.09]
Seff = 66965.67 [67633.62]
Teq = 4102 [1036] K
Rp = 2.70 [1.39] Re
a = 0.0687 [0.0343] AU
Ag = 6.68 [5.54] [1.03σ]
Teffp = 10197 [1624] K [3.16σ]

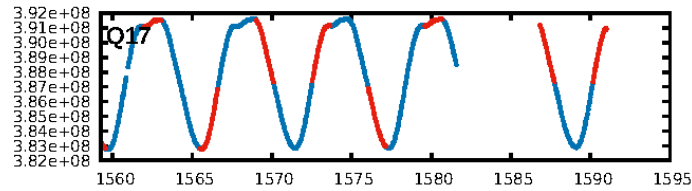
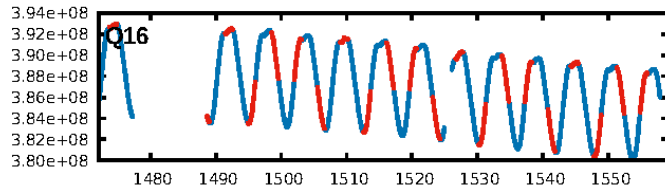
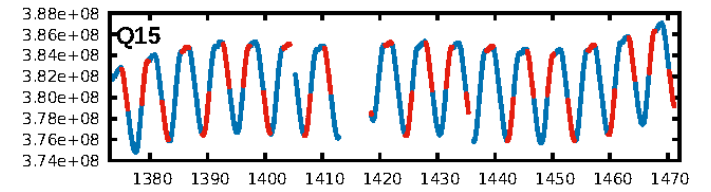
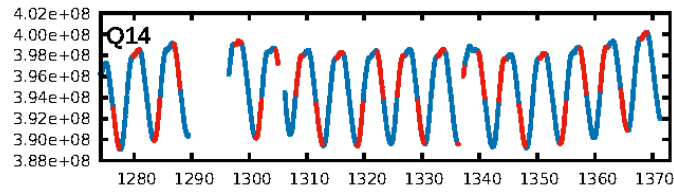
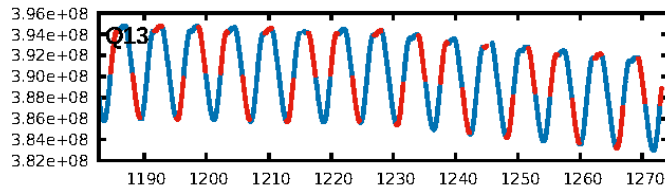
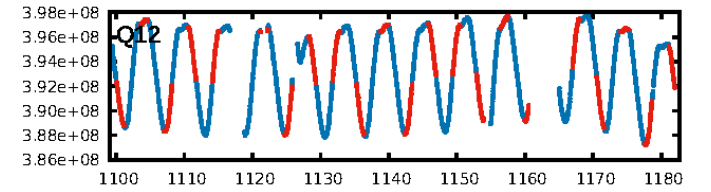
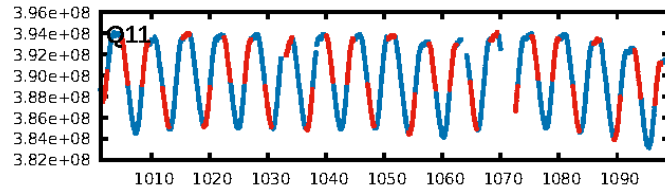
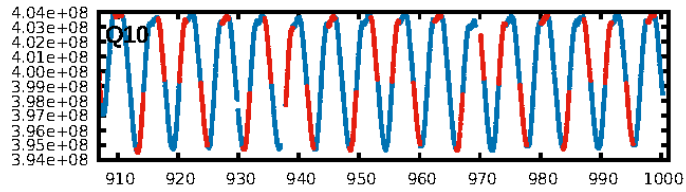
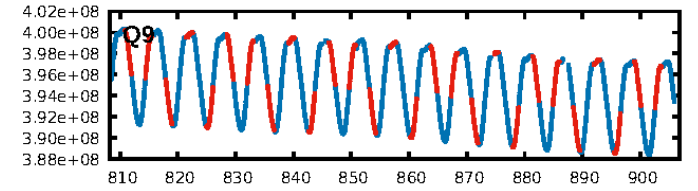
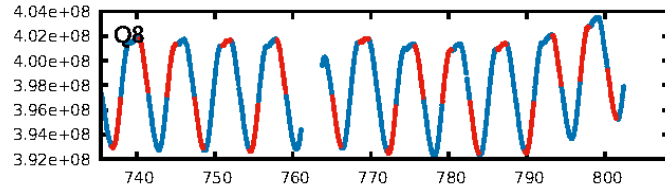
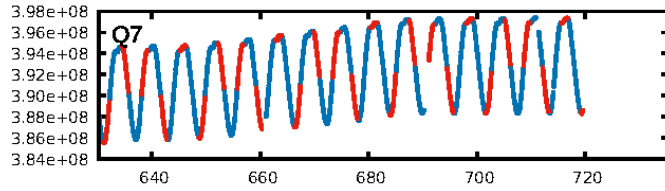
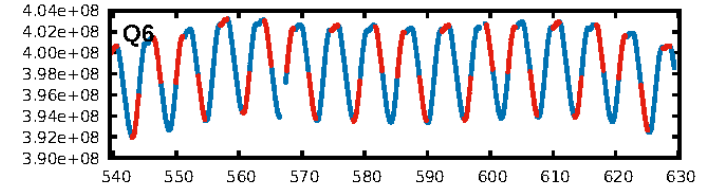
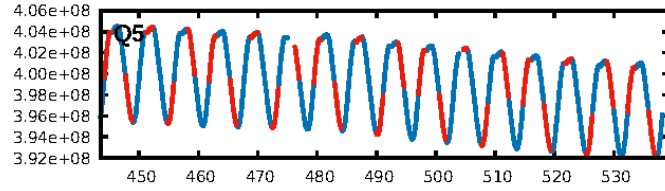
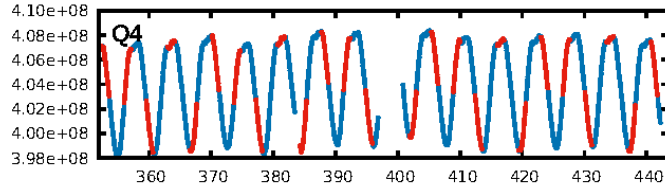
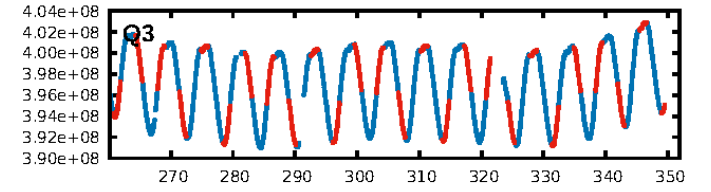
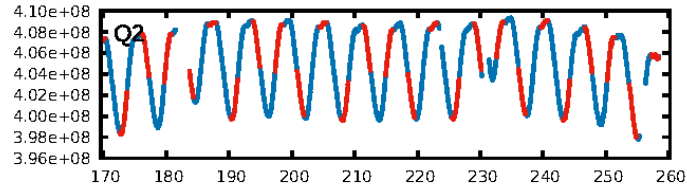
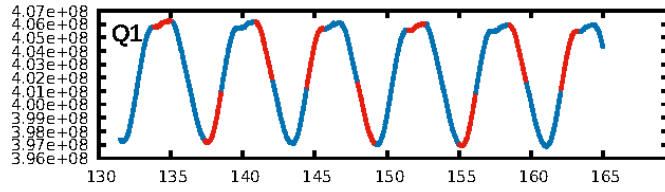
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 99.8% [3.09σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.36e-16
RollingBand-fgt: 1.00 [370/370]
GhostDiagnostic-chr: 21.48
Centroid-sig: 0.1%
Centroid-so: 2.223 arcsec [2.04σ]
OotOffset-rm: 0.257 arcsec [1.07σ]
KicOffset-rm: 0.108 arcsec [0.43σ]
OotOffset-st: 4/3/4/5 [16]
KicOffset-st: 4/3/4/5 [16]
DiffImageQuality-fgm: 0.50 [8/16]
DiffImageOverlap-fno: 0.00 [0/17]

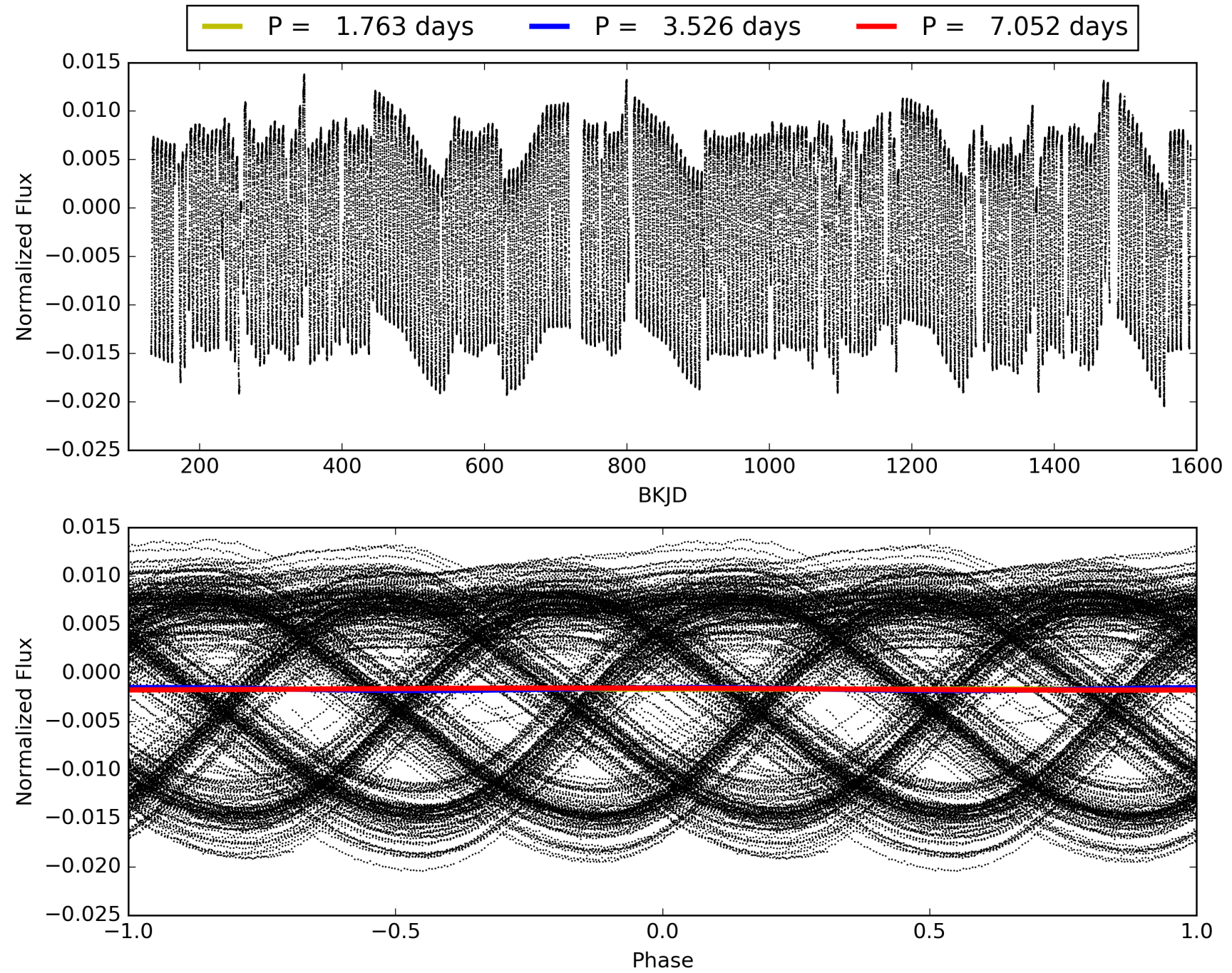
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:19:08 Z

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

TCE 007778838-02, PDC Light Curves

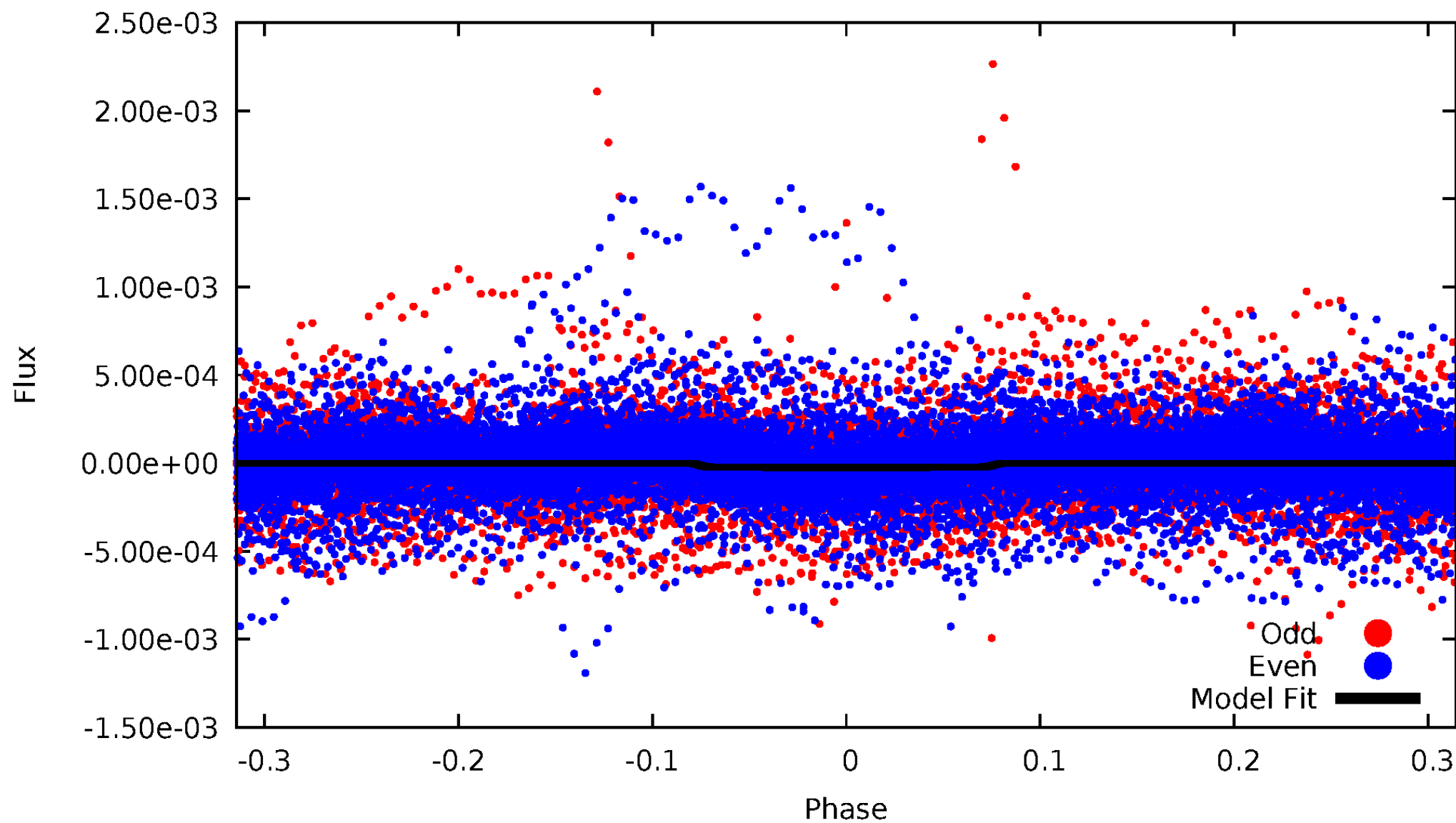


TCE 007778838-02



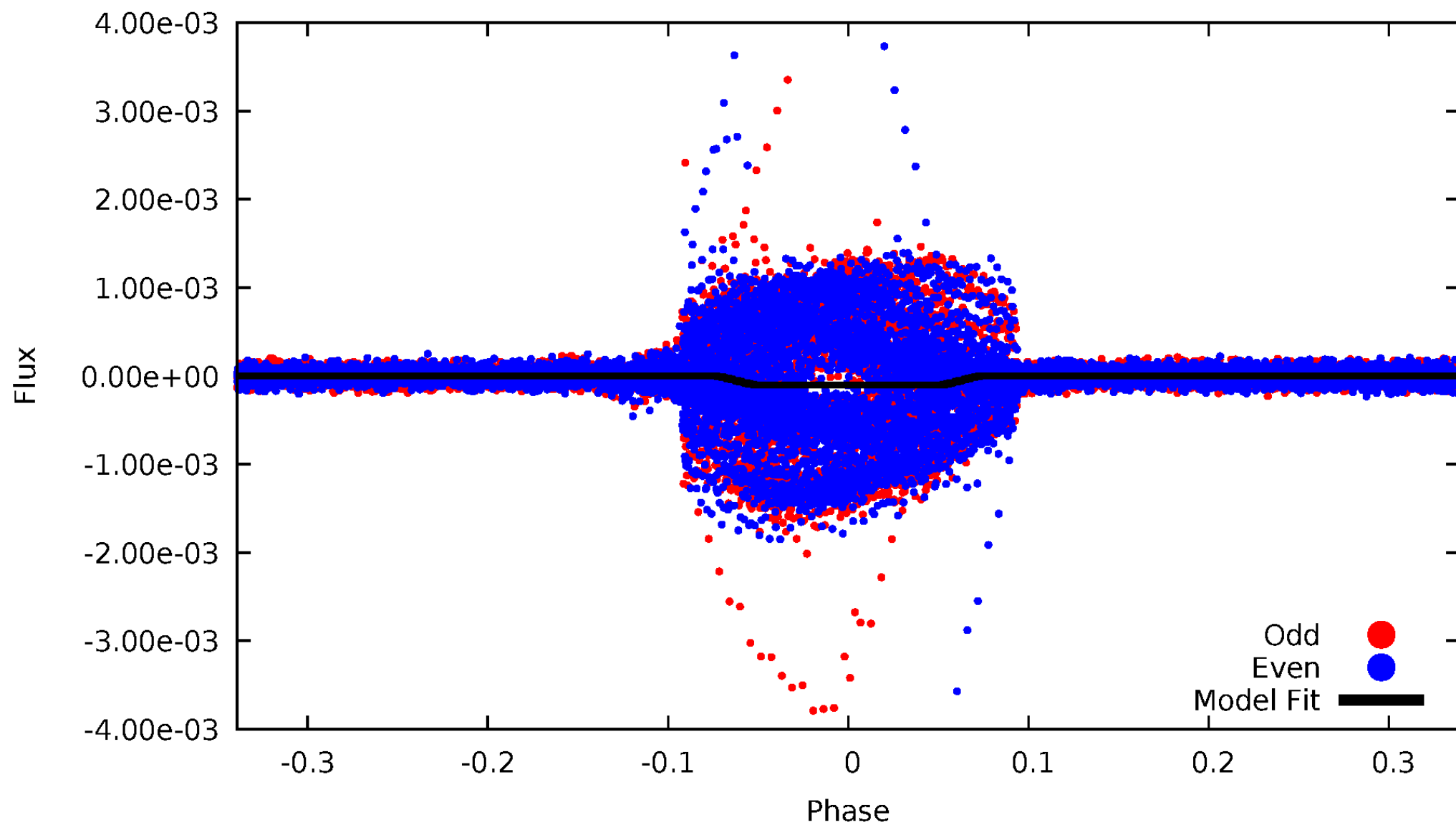
DV Odd/Even

TCE 007778838-02



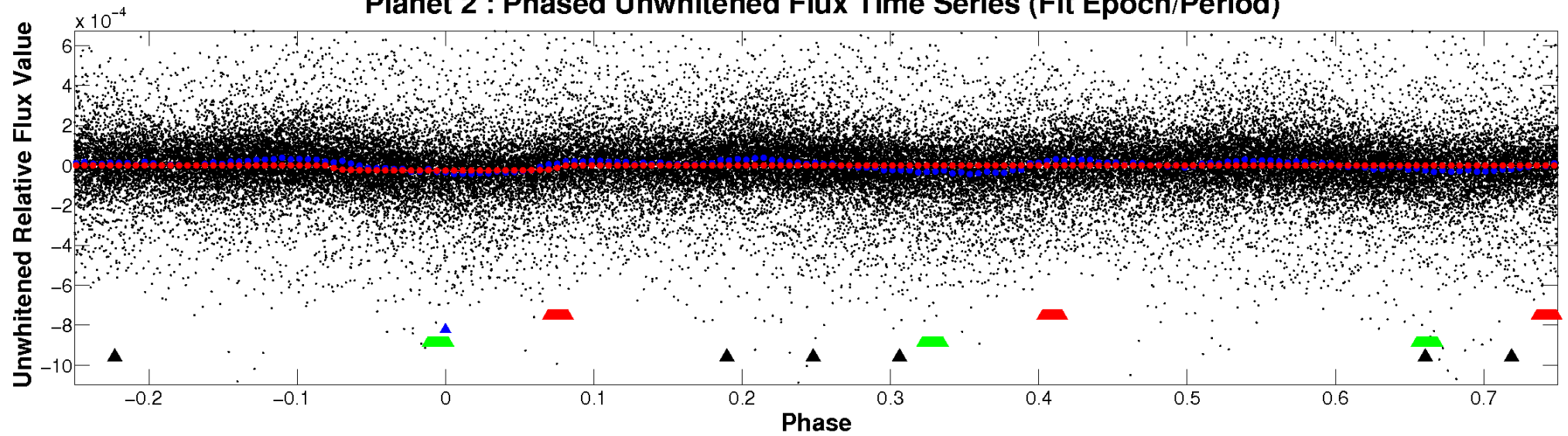
ALT Odd/Even

TCE 007778838-02

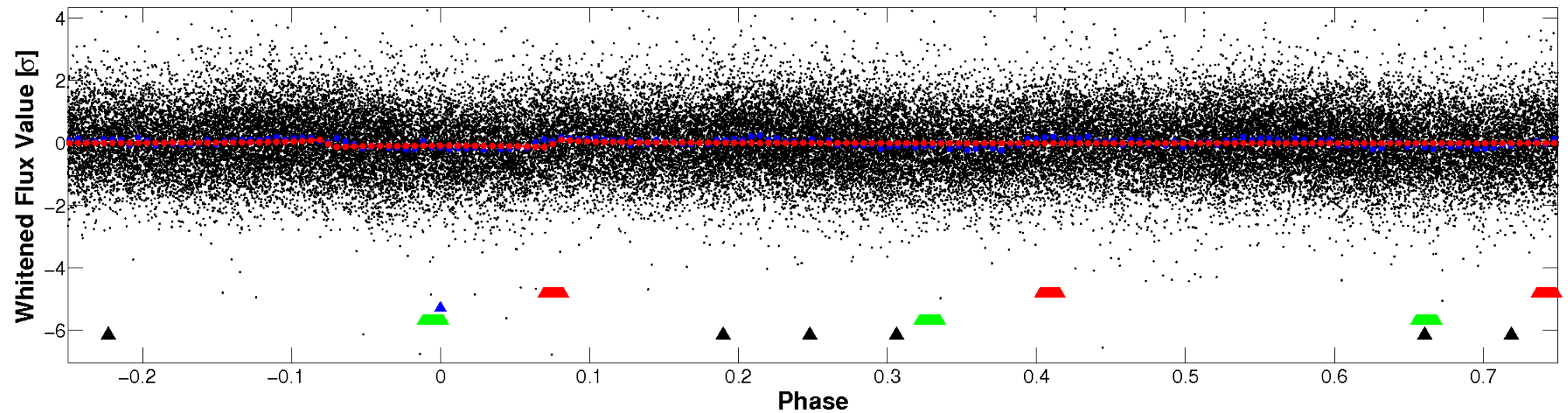


Non-Whitened Vs. Whitened Light Curve

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

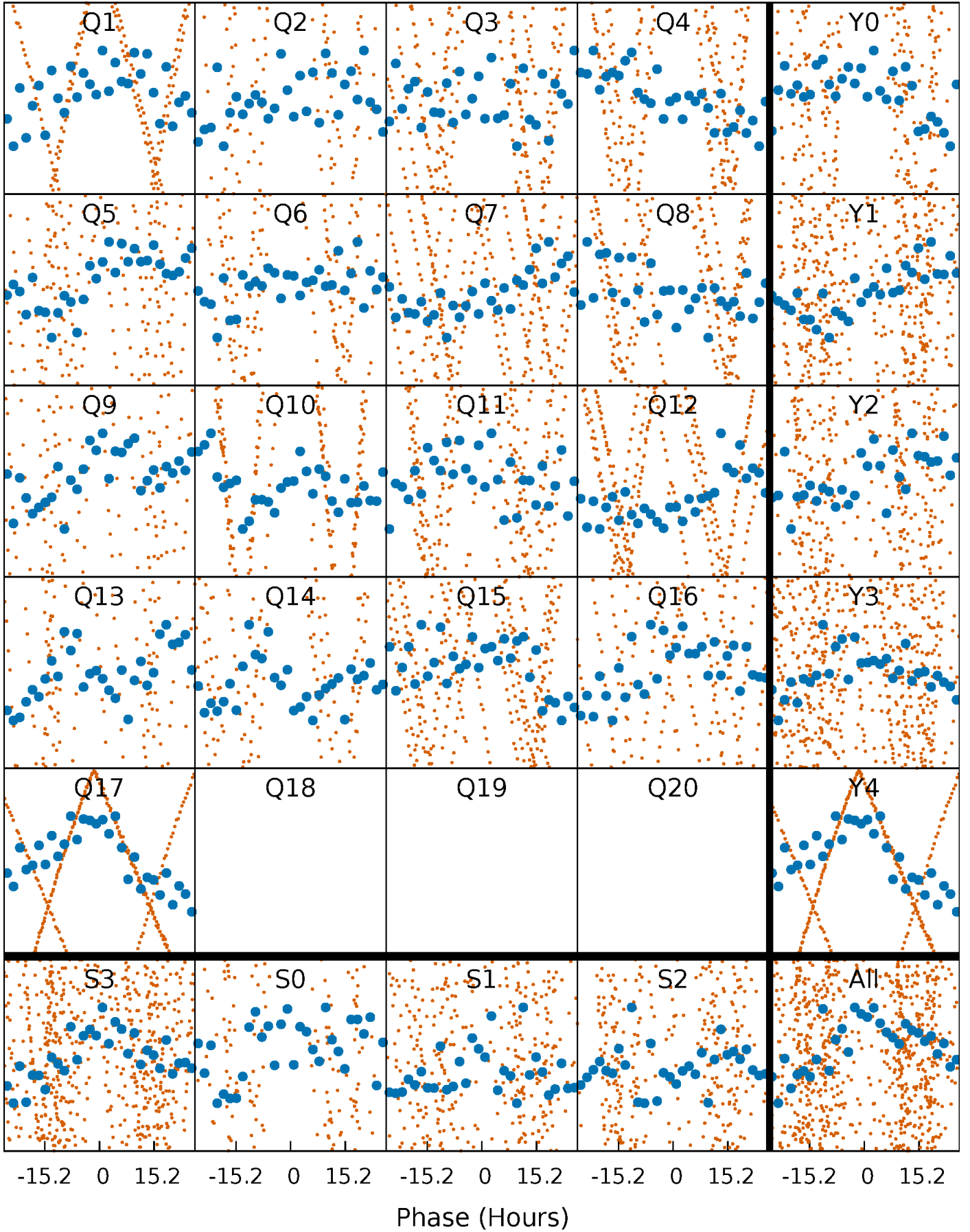


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



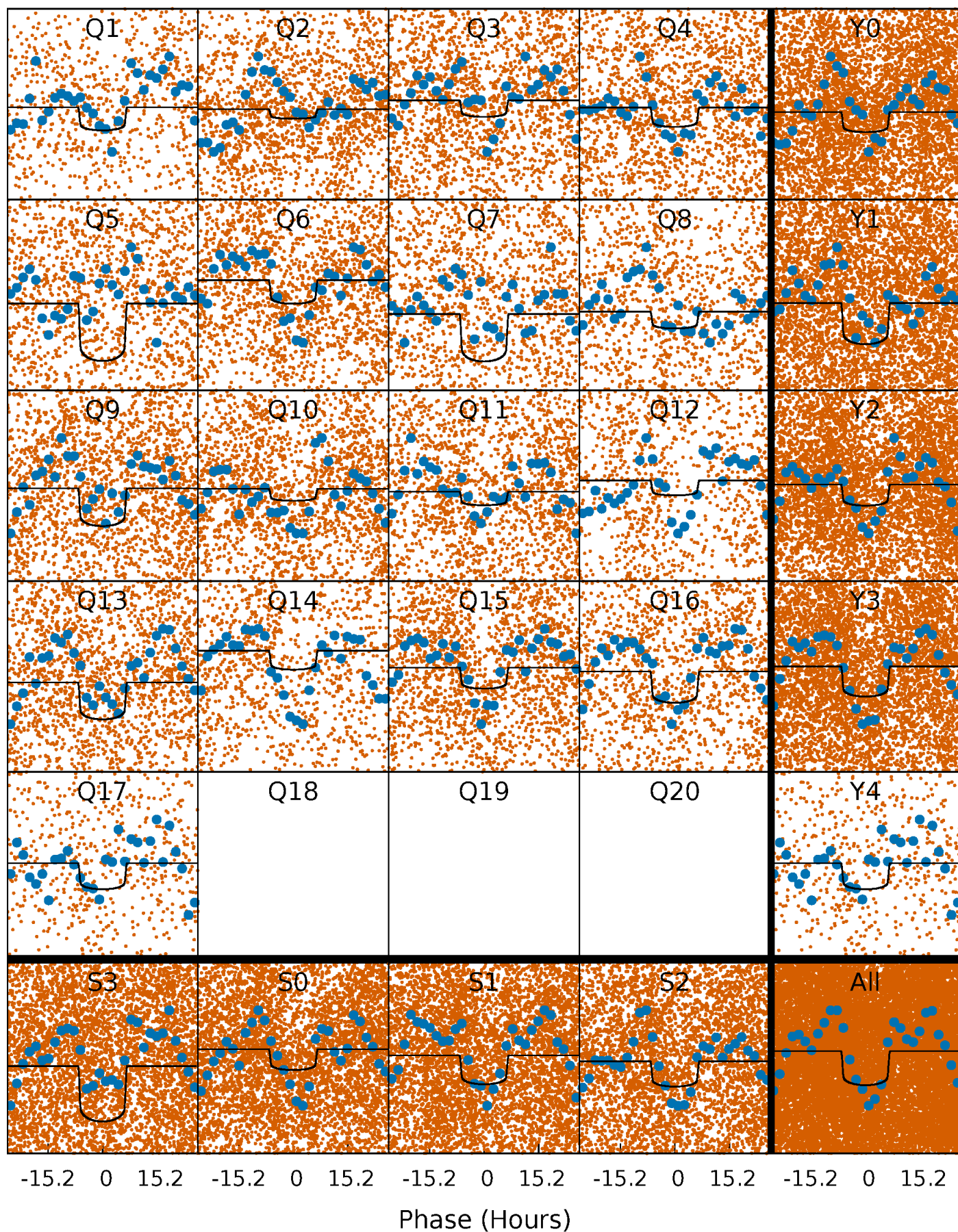
PDC Quarter-Phased Transit Curves

TCE 007778838-02 P= 3.526170 Days $T_0=134.408838$ (BKJD)



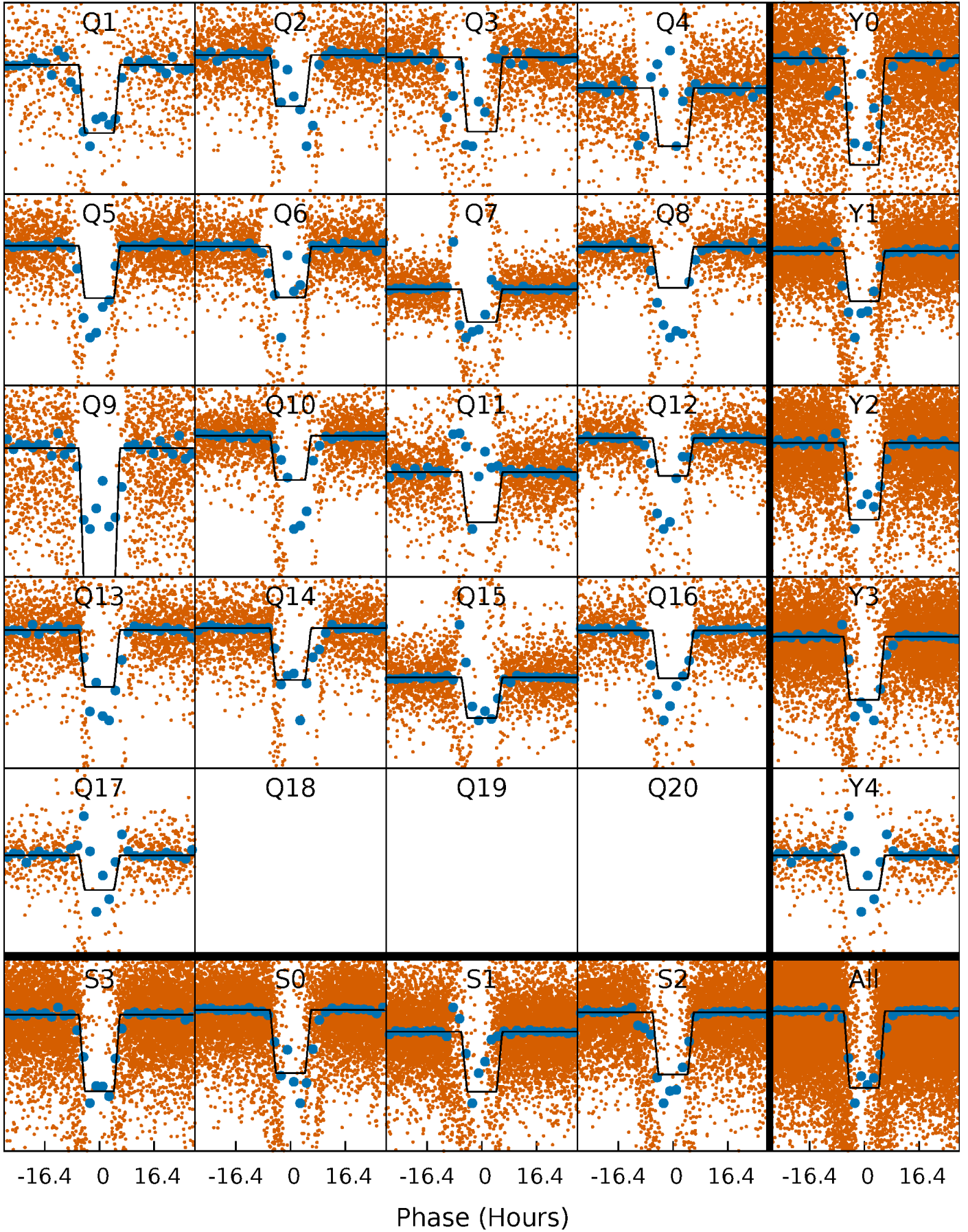
DV Quarter-Phased Transit Curves

TCE 007778838-02 P= 3.526170 Days $T_0=134.408838$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

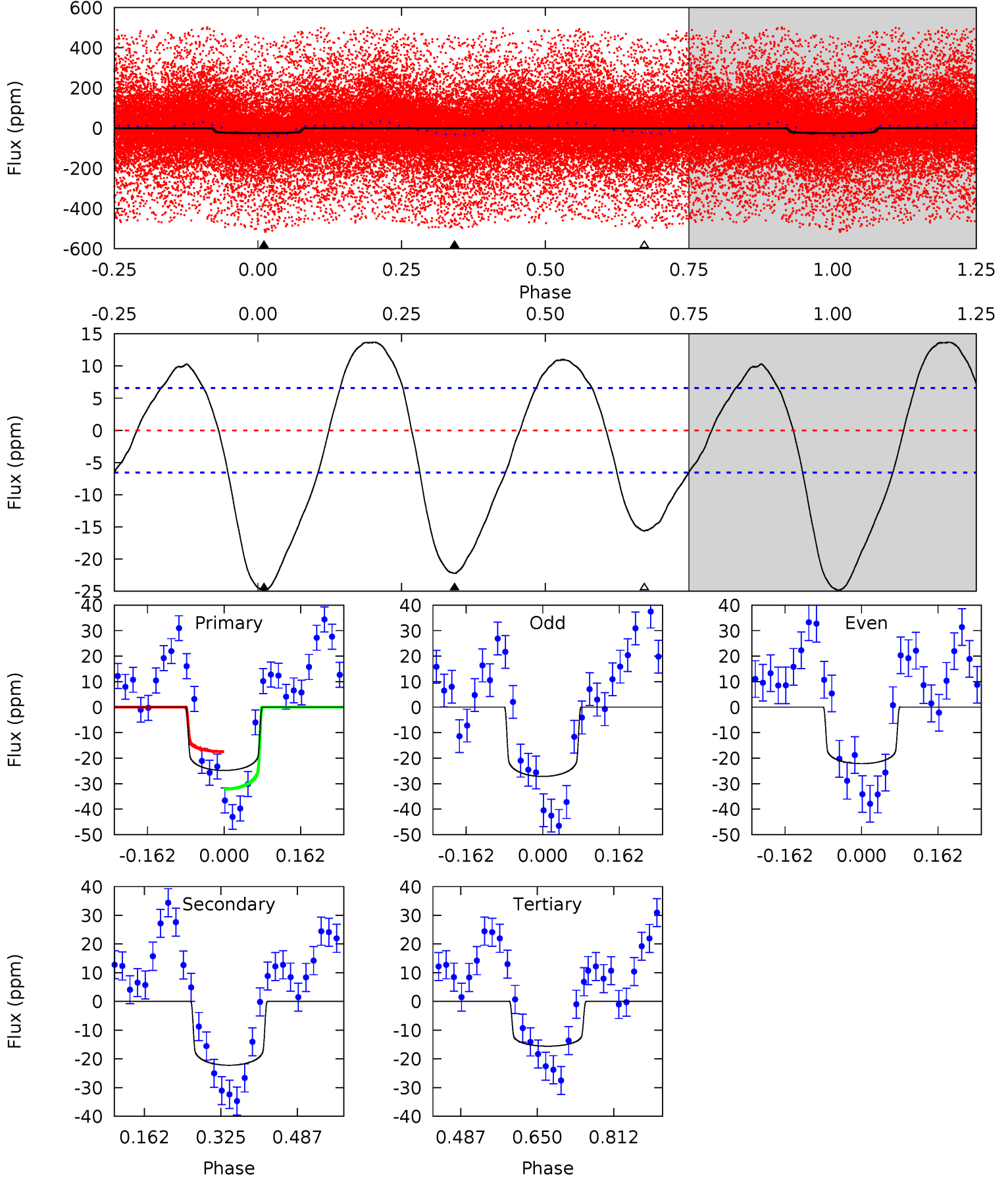
TCE 007778838-02 P= 3.526052 Days $T_0=134.430506$ (BKJD)



DV Model-Shift Uniqueness Test

007778838-02, P = 3.526170 Days, E = 130.882668 Days

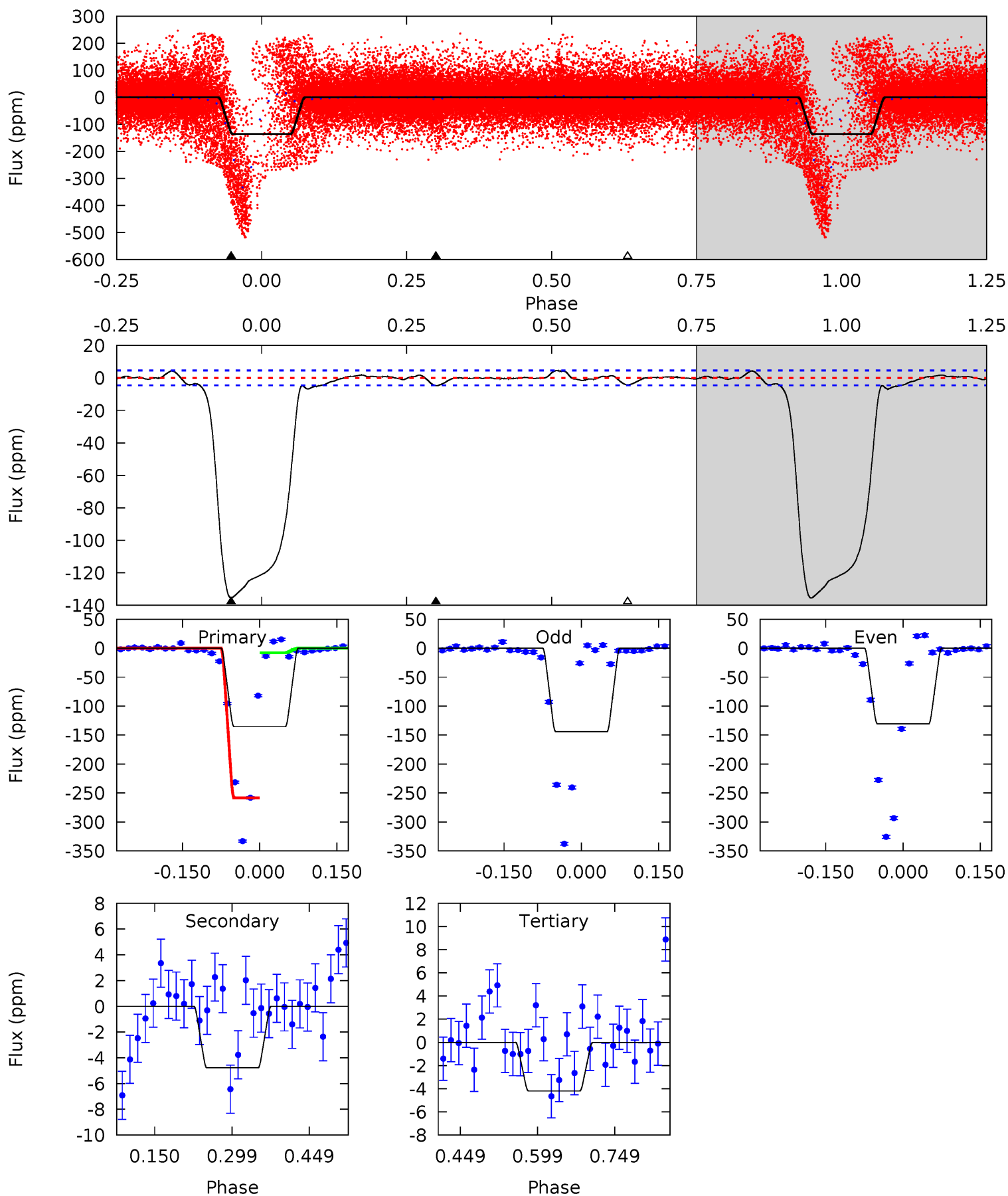
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	15.1	10.6	0	4.46	1.40	6.32	6.27	16.9	4.51	15.1	1.68	0.94	0.36	4.96



Alt Model-Shift Uniqueness Test

007778838-02, P = 3.526052 Days, E = 130.904454 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
133.0	4.69	4.12	0	4.48	1.44	1.82	128.9	133.0	0.57	4.69	6.64	0.48	0.03	0



Stellar Parameters For KIC 007778838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	11287^{+612}_{-1716}	$3.642^{+0.476}_{-0.084}$	$0.070^{+0.150}_{-0.600}$	$4.662^{+0.447}_{-2.385}$	$3.471^{+0.069}_{-1.164}$	$0.048^{+0.248}_{-0.013}$
	+5%/-15%	+13%/-2%	+214%/-857%	+10%/-51%	+2%/-34%	+514%/-27%
Source	KIC0	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 007778838-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-22 ± 1	$2.55^{+0.37}_{-0.62}$	5407^{+654}_{-885}	10009^{+964}_{-1359}	$8.676^{+5.590}_{-2.012}$
Alt.	-5 ± 1	$4.98^{+0.52}_{-1.35}$	5354^{+663}_{-958}	3922^{+484}_{-643}	$0.510^{+0.332}_{-0.142}$

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 $A_{obs} \gg 1.0$

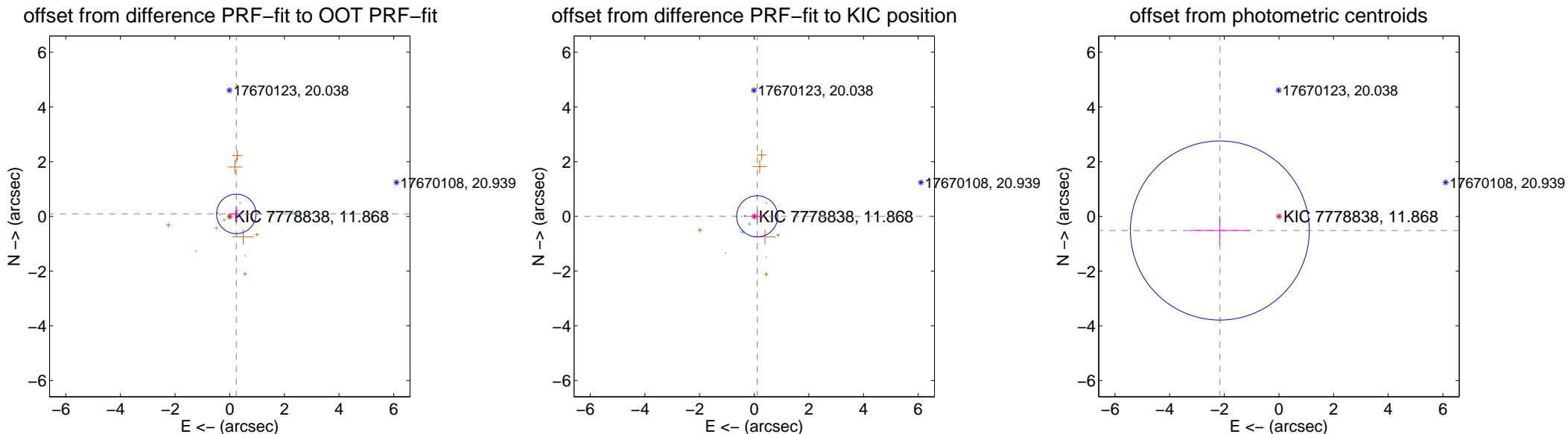
DV Centroid Data

Supplemental centroid analysis for 007778838-02. **Kepler magnitude: 11.87.** Transit SNR 11.37

There are 8 quarters with good PRF difference image offsets

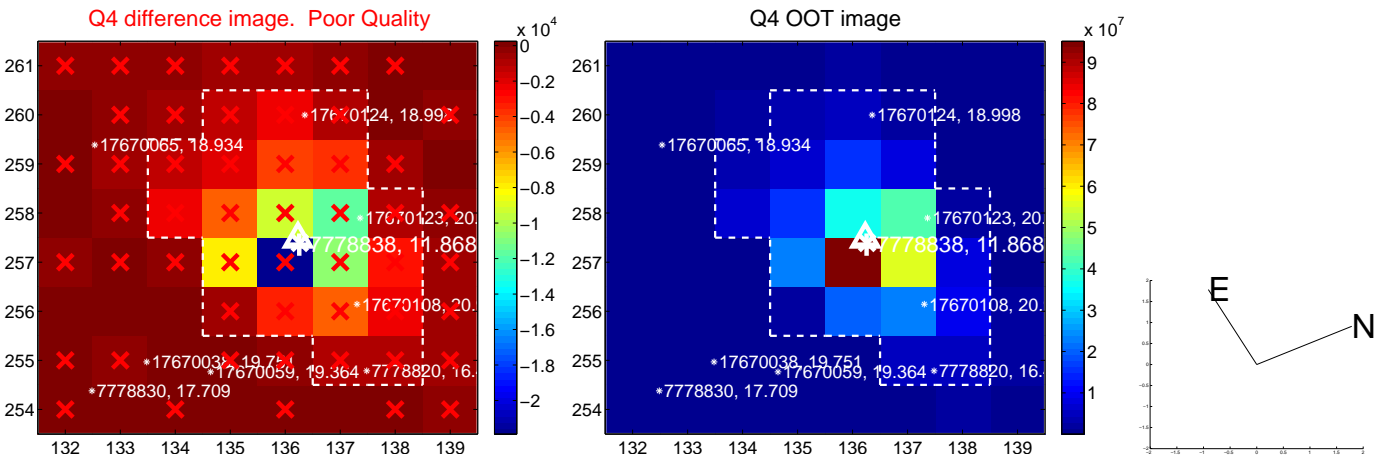
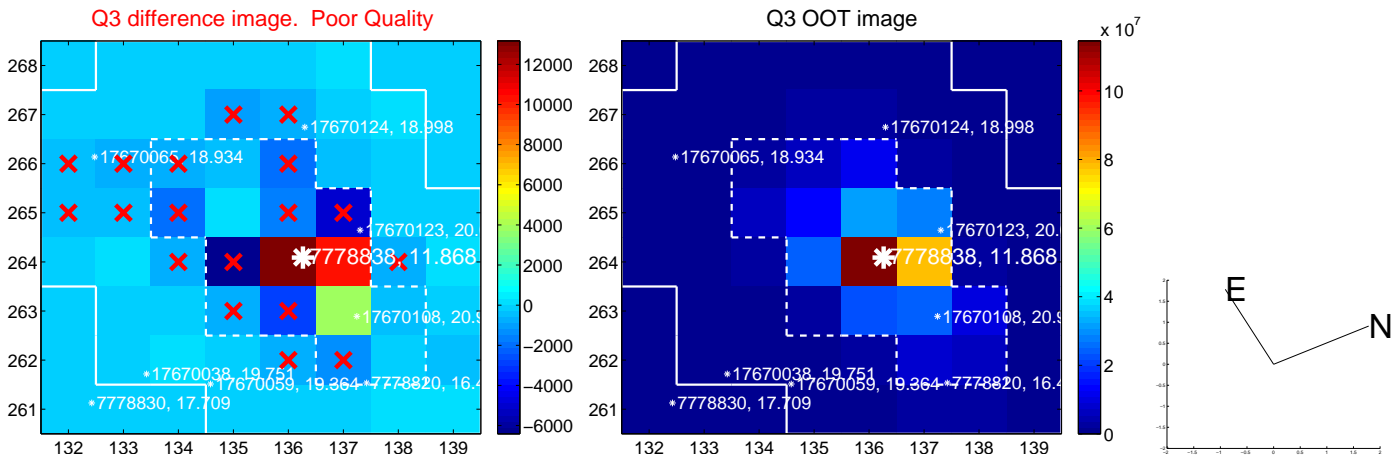
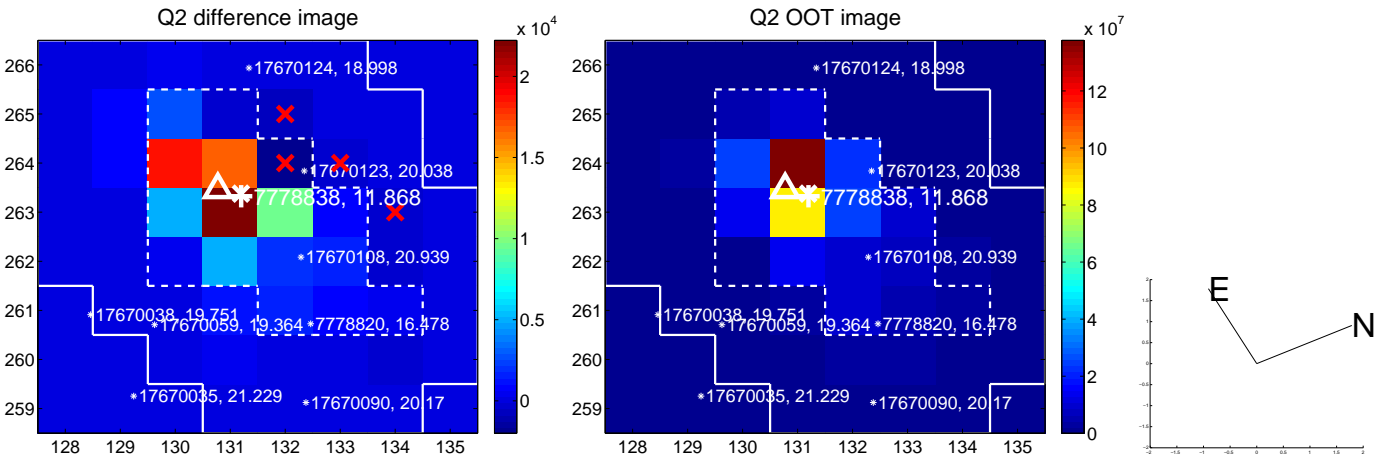
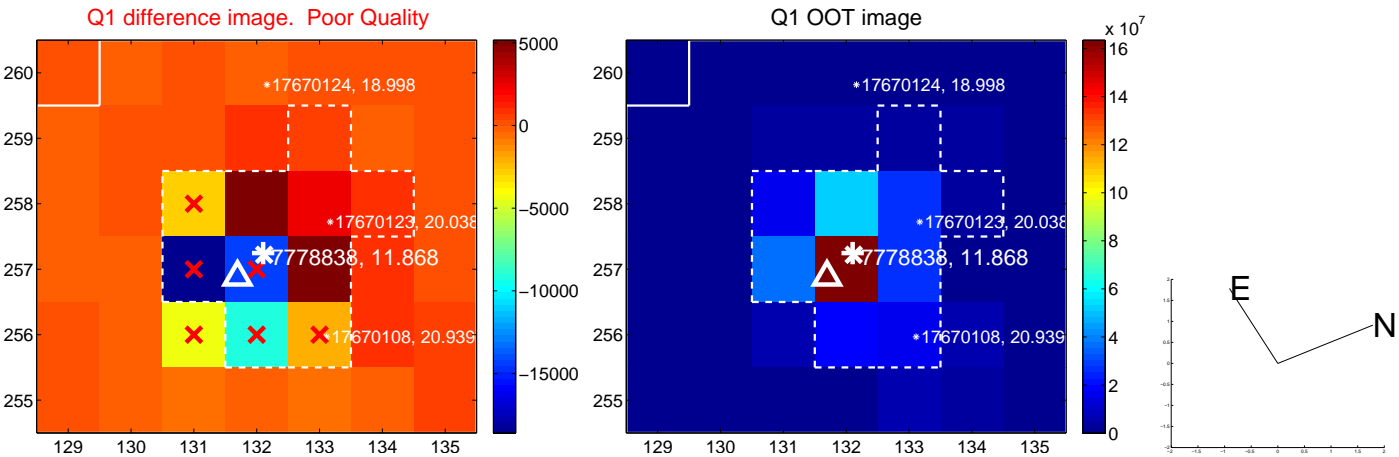
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.257 ± 0.241	1.07	-0.240 ± 0.232	0.090 ± 0.279
PRF-fit source offset from KIC position	0.108 ± 0.250	0.43	-0.108 ± 0.250	0.001 ± 0.255
photometric centroid source offset	2.22 ± 1.09	2.04	2.16 ± 1.11	-0.52 ± 0.53

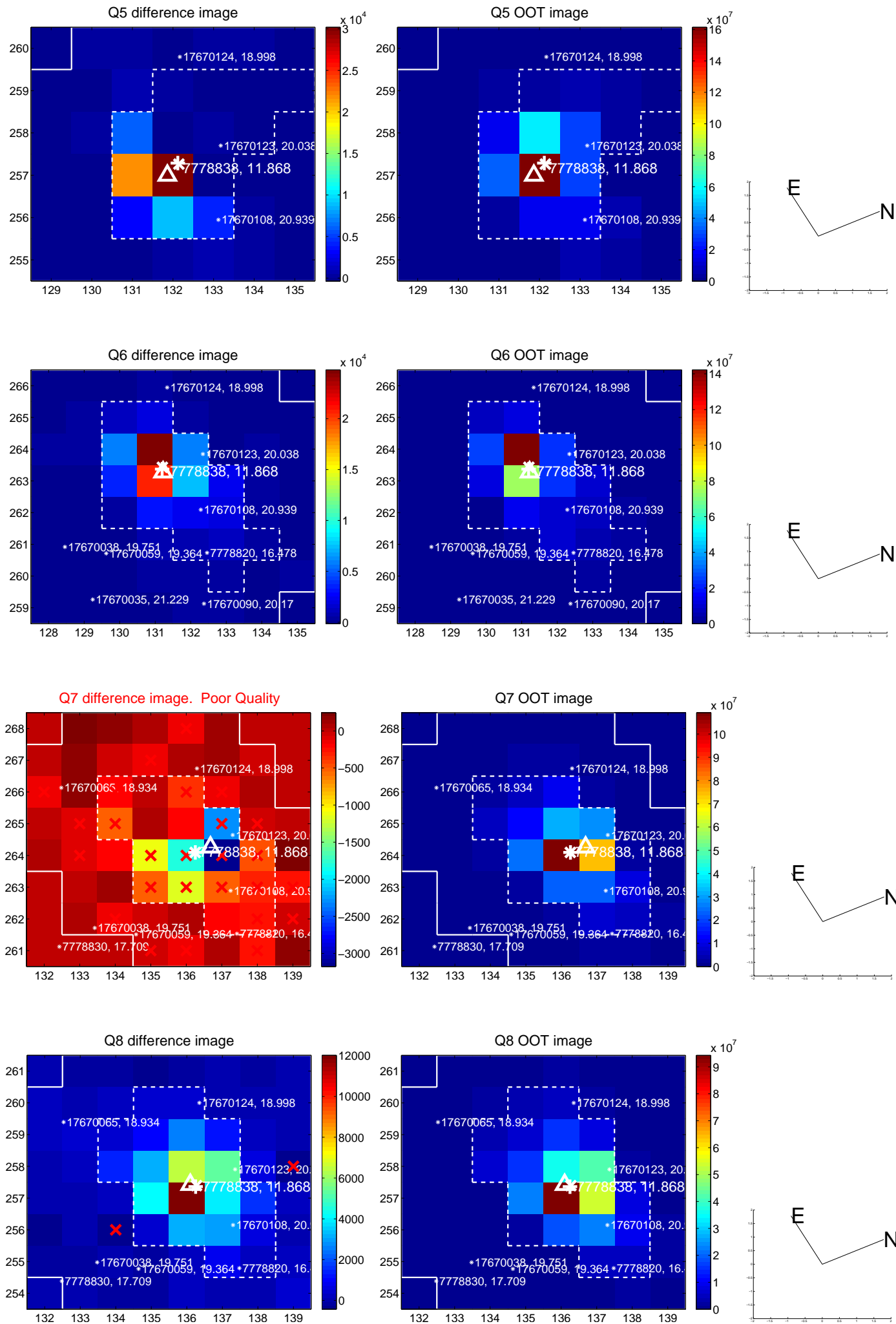


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

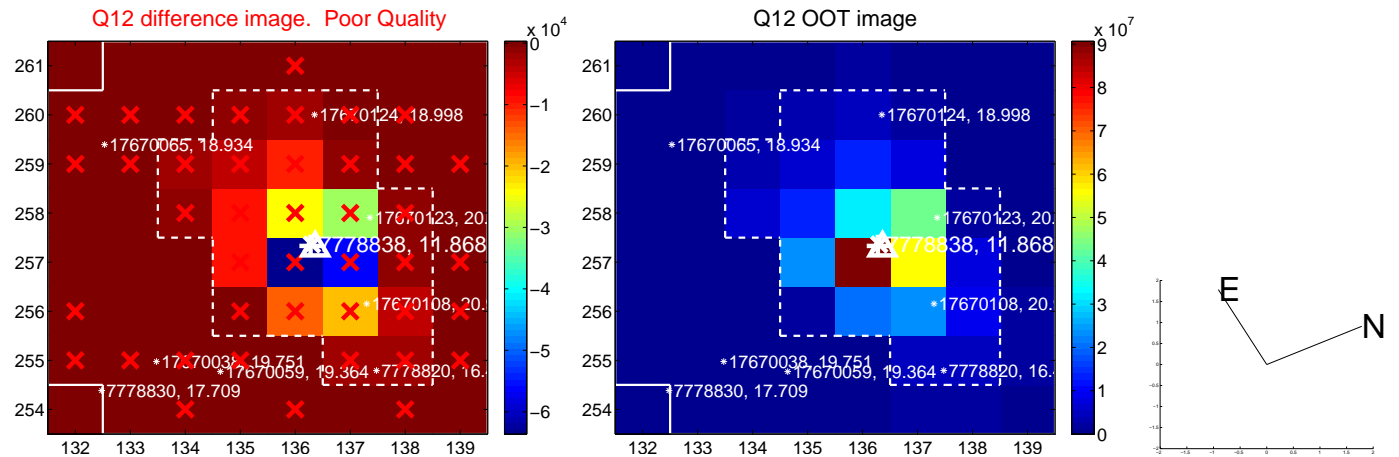
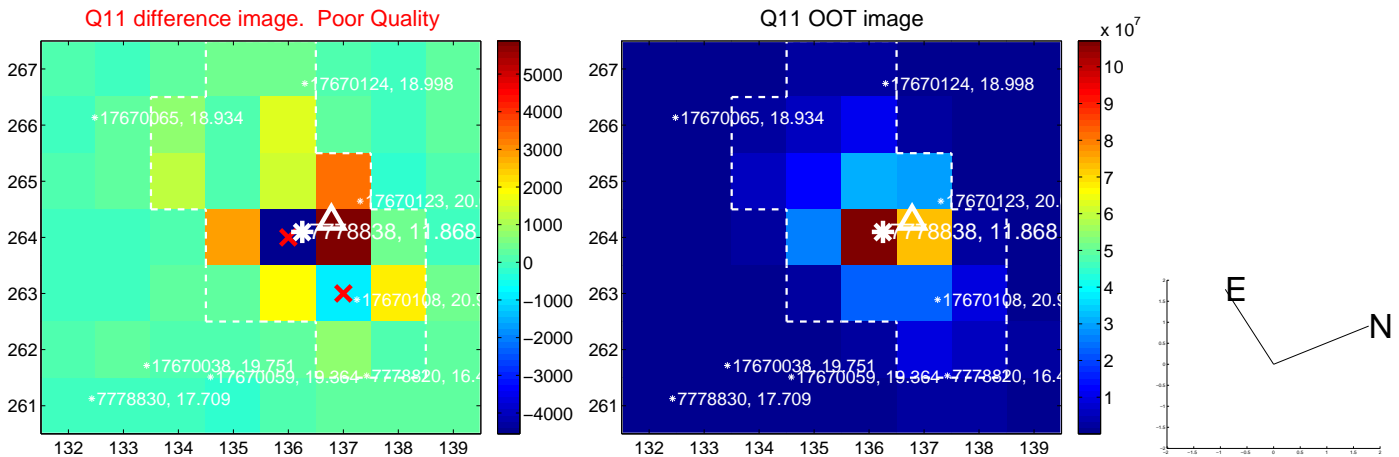
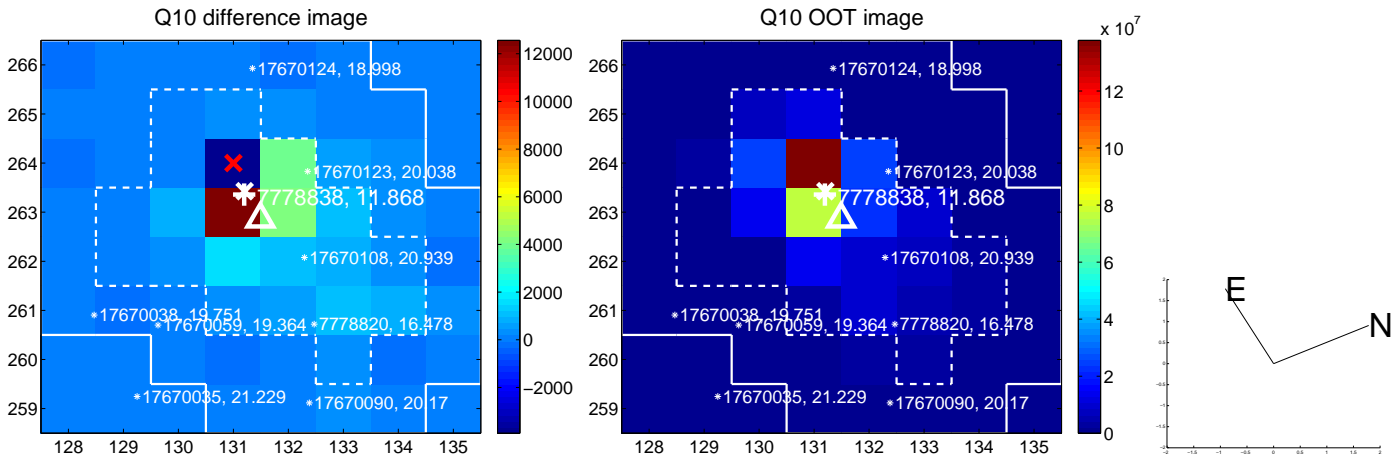
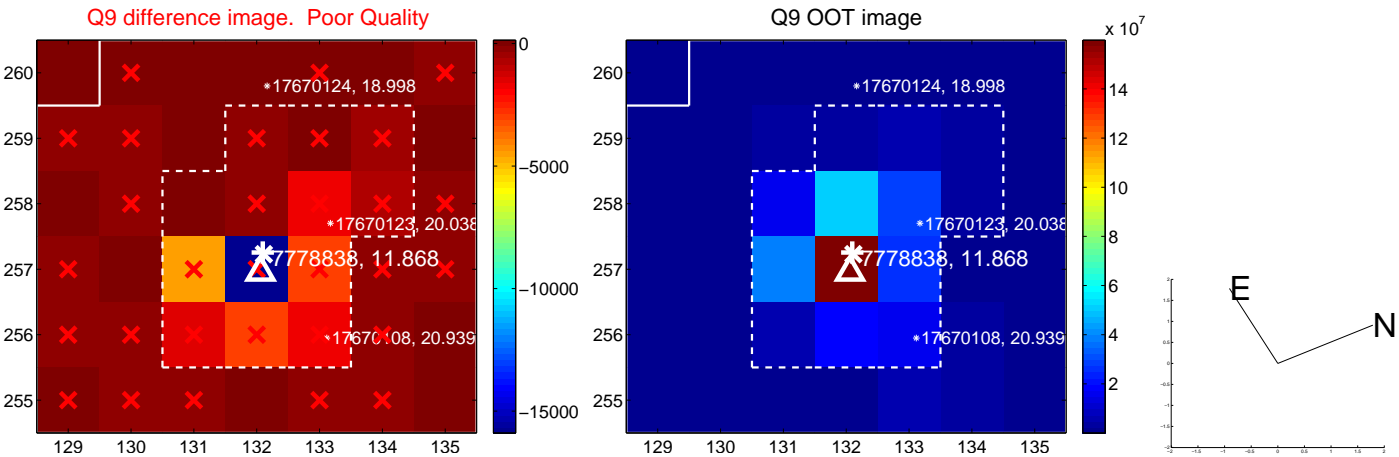
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



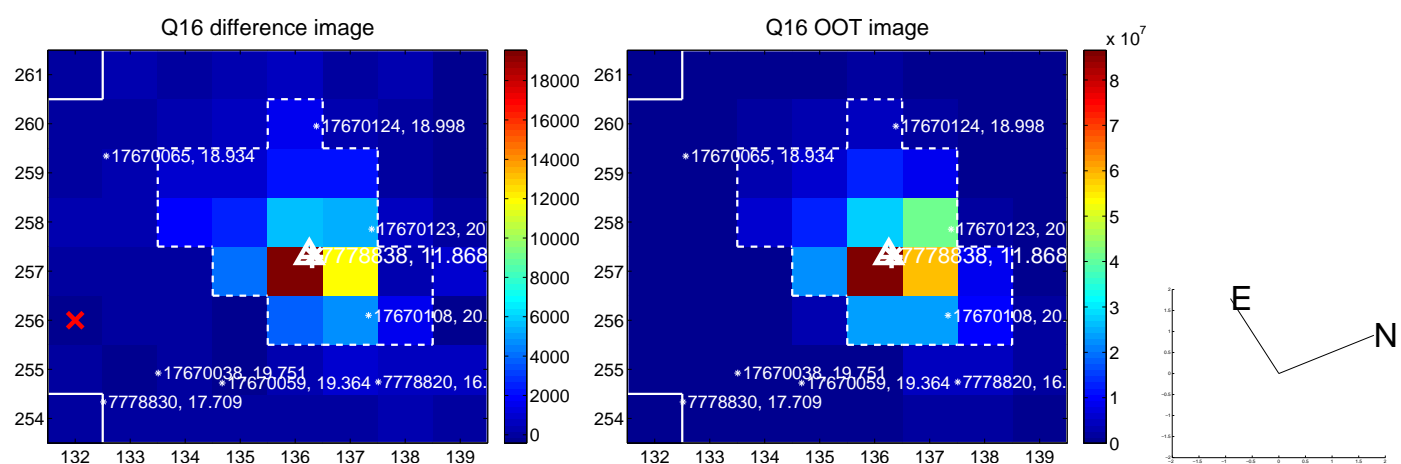
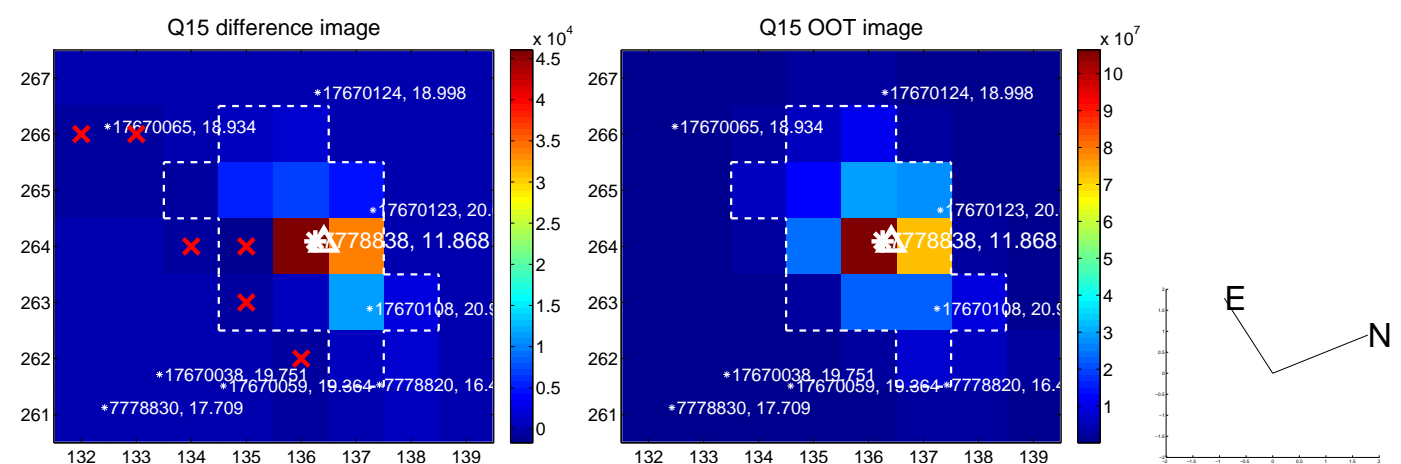
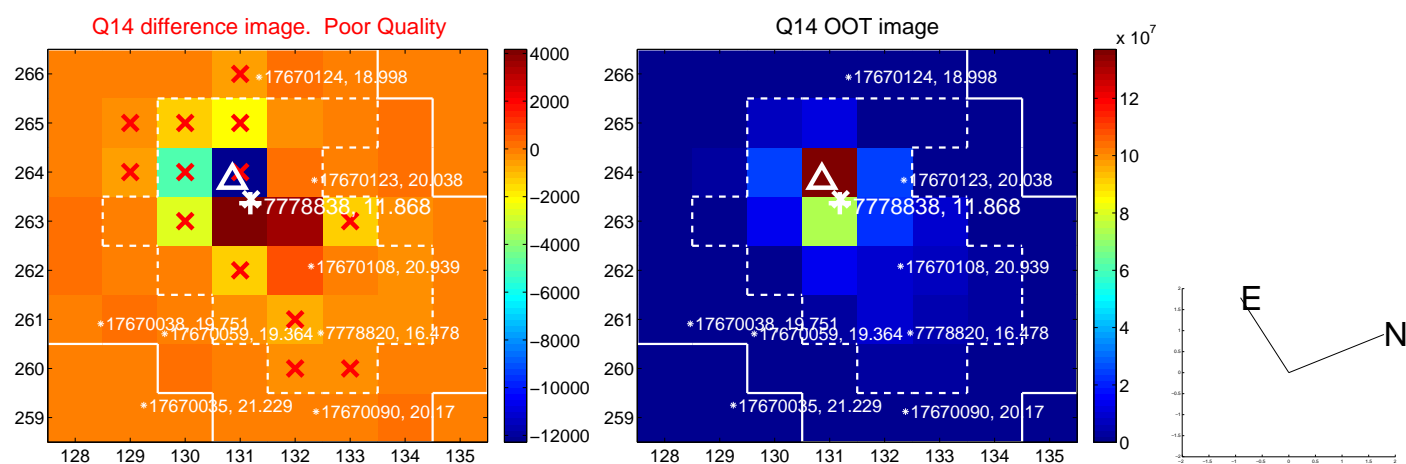
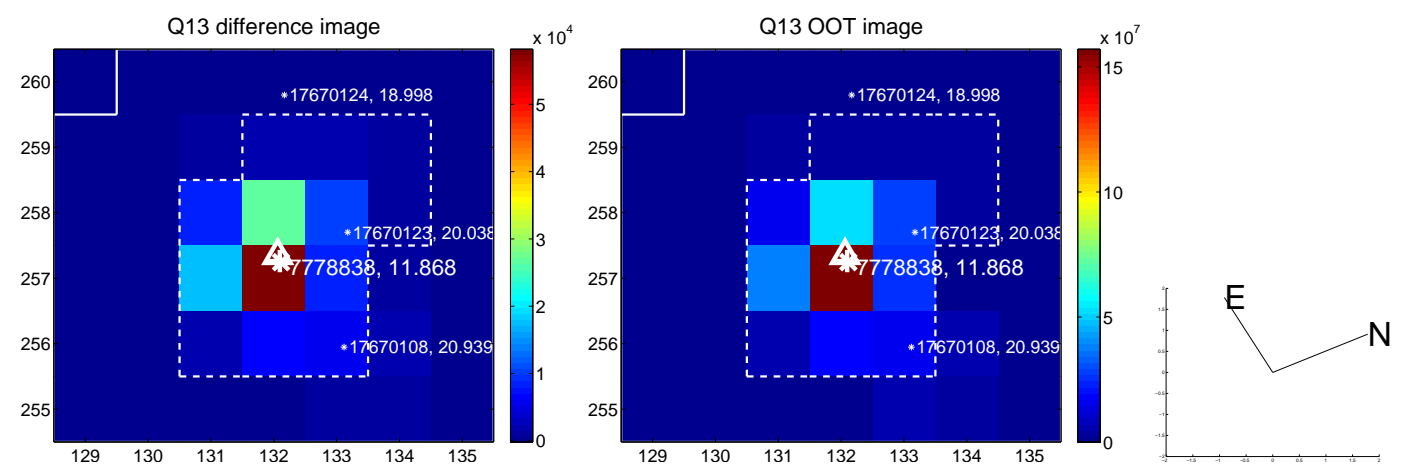
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



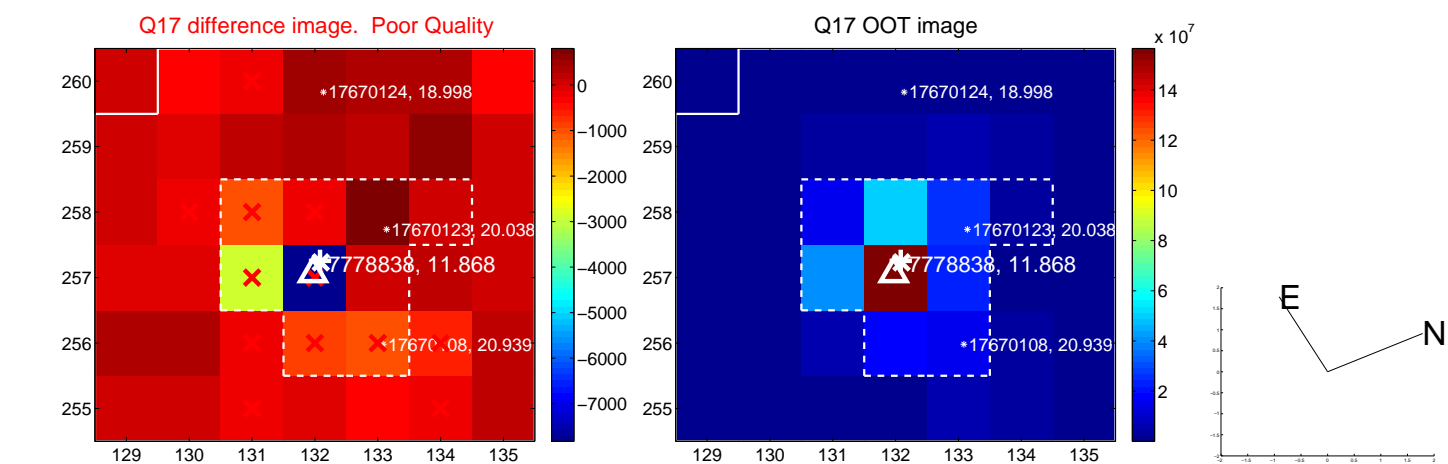
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



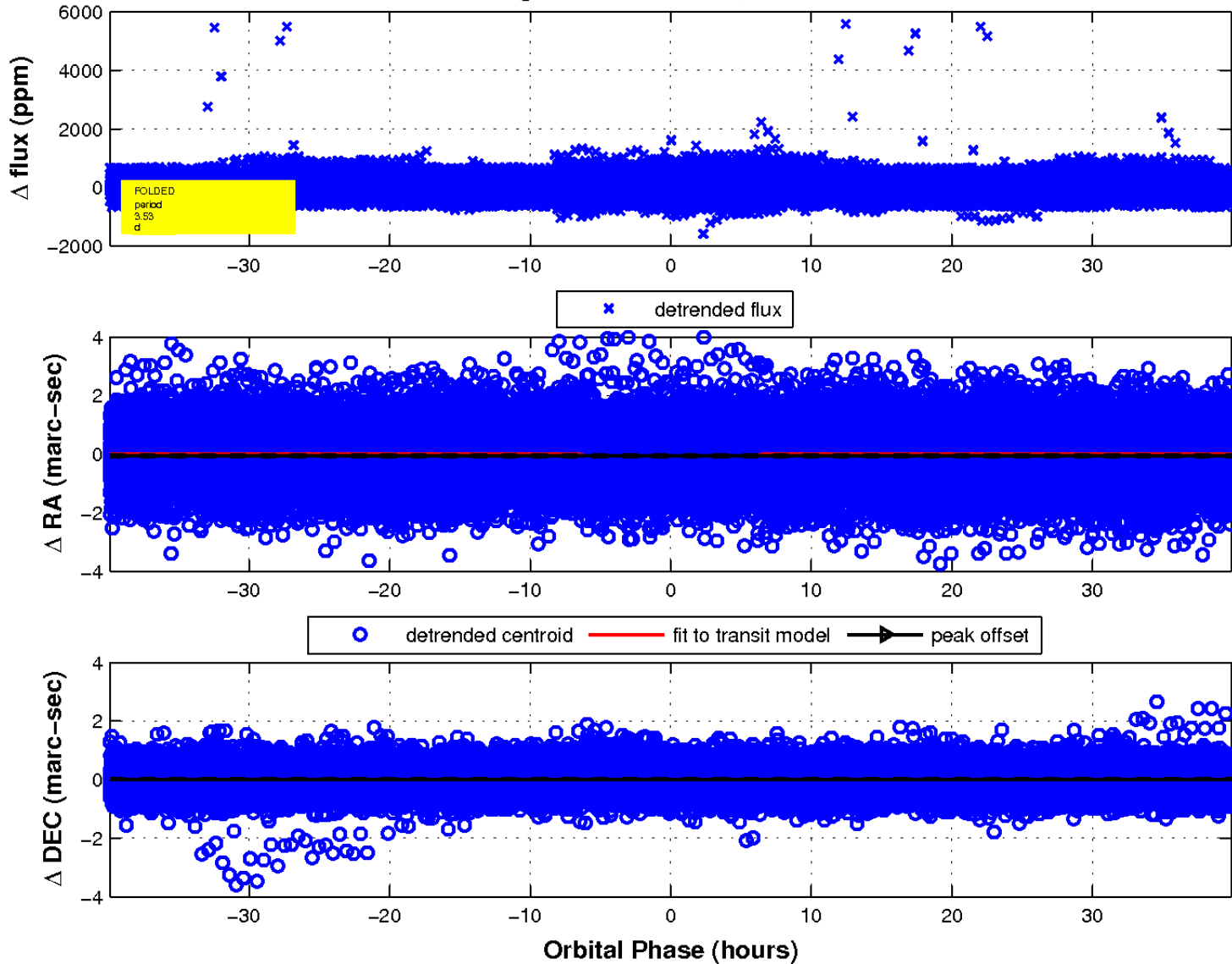
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

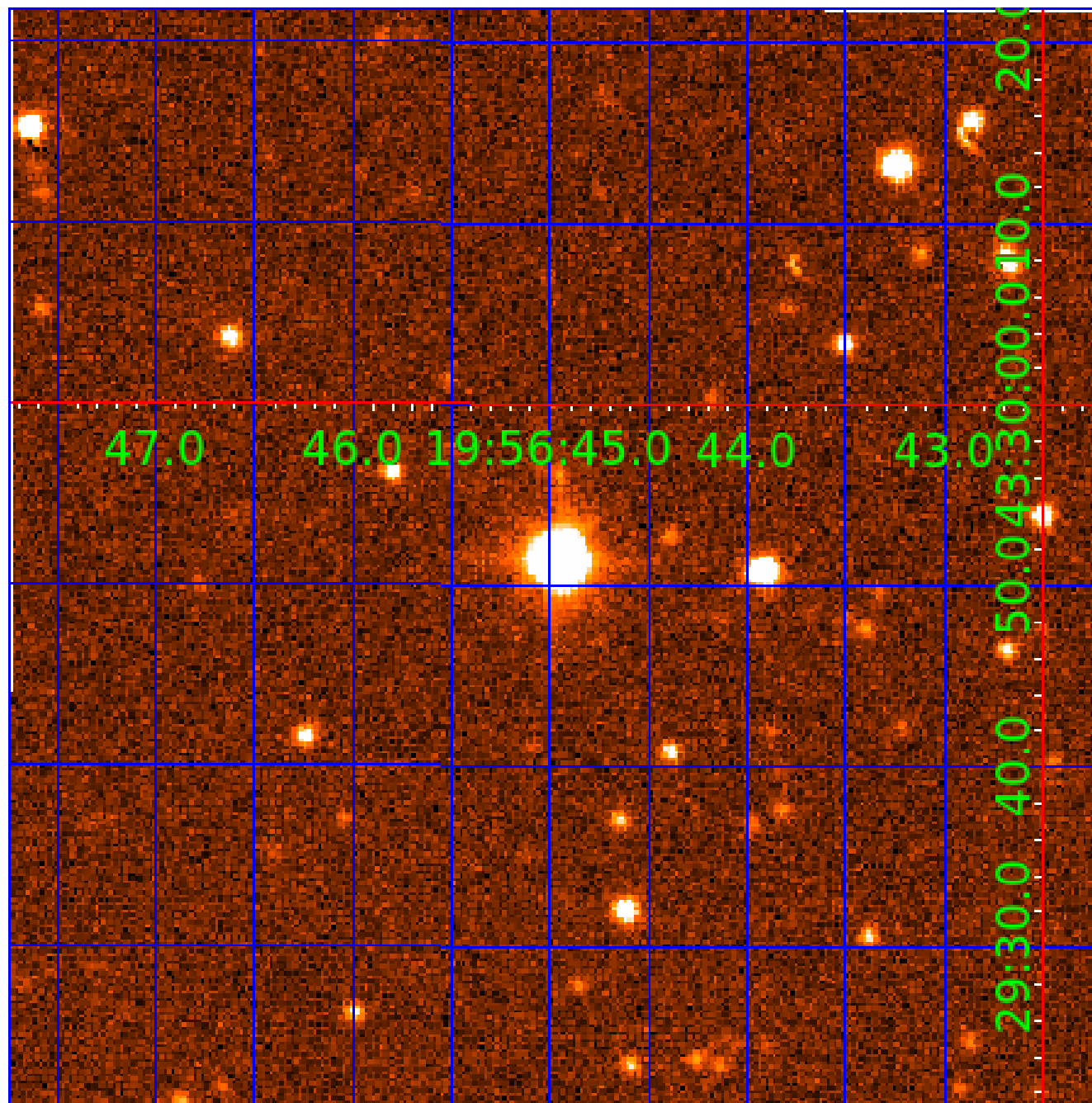


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 007778838

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})
007778838-01	OBS	No	5.876760	134.699593	45.8	5.436	14.4	14.5	4.66	11287	3.66	33890.09
007778838-02	OBS	No	3.526170	134.408838	25.8	13.303	12.0	11.4	4.66	11287	2.70	66965.67
007778838-03	OBS	No	5.876749	133.241035	78.6	12.500	10.5	-1.0	4.66	11287	4.26	33890.17
007778838-04	OBS	No	230.861548	336.480034	160.7	3.500	9.1	-1.0	4.66	11287	6.10	253.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007778838-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007778838-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
007778838-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
007778838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

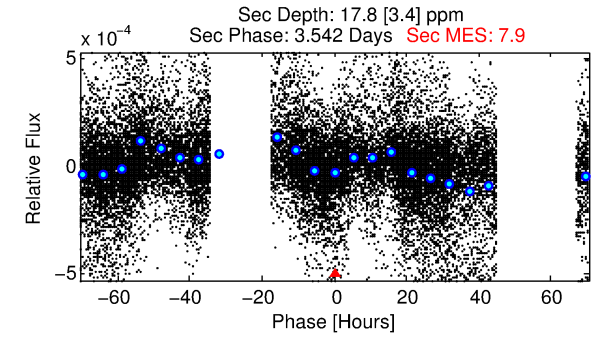
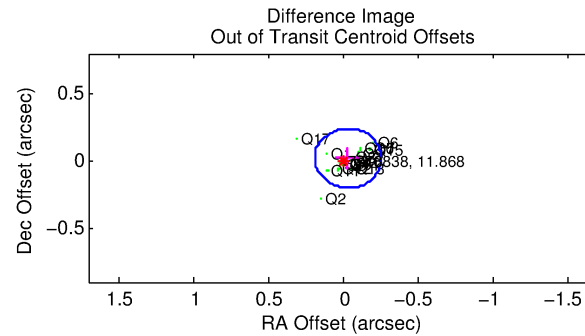
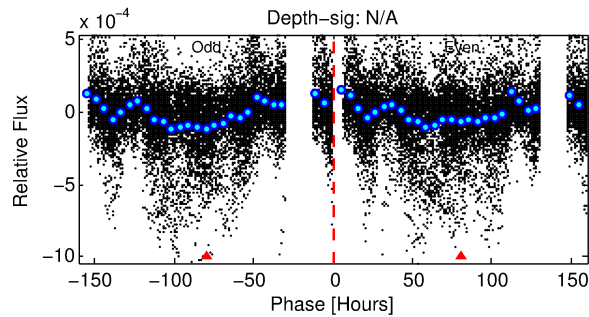
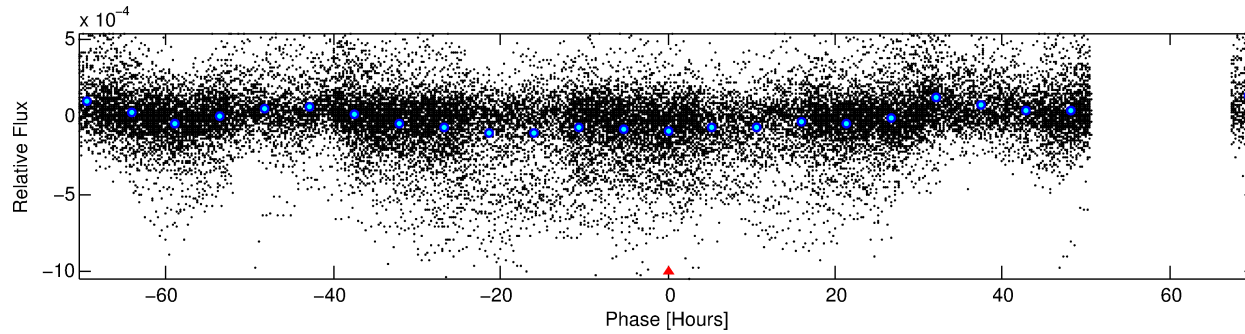
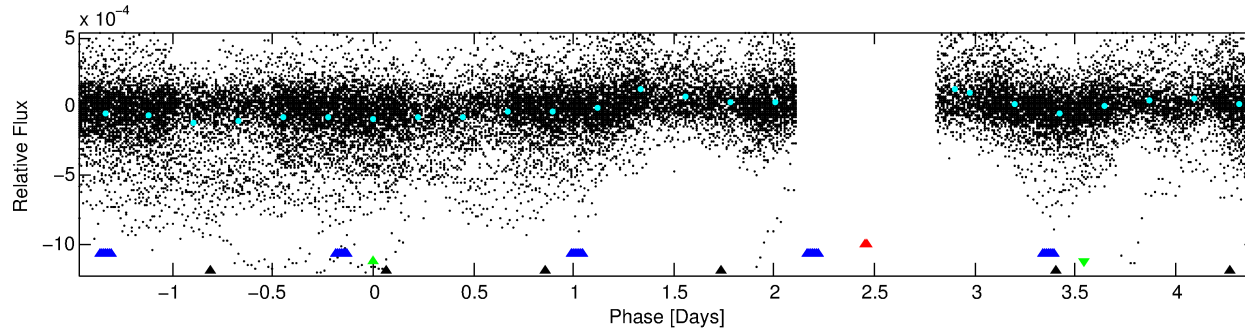
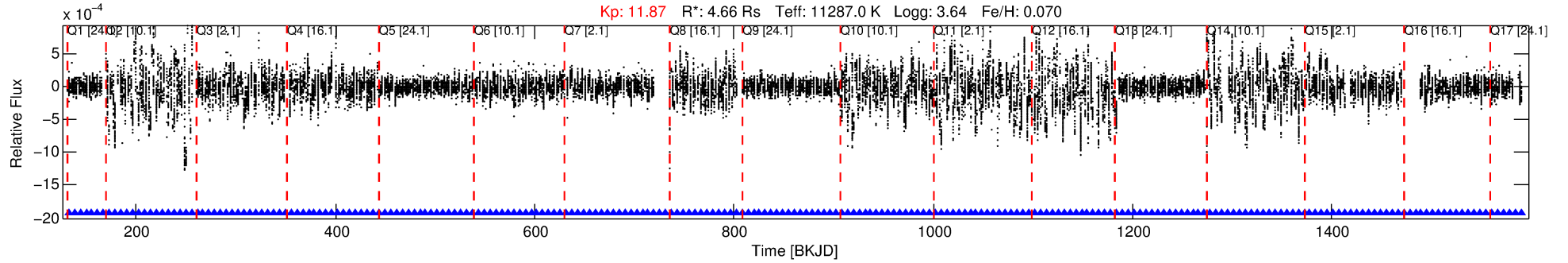
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007778838-03

No Significant Match Found

DV One-Page Summary

KIC: 7778838 Candidate: 3 of 4 Period: 5.877 d



TPS TCE Results:

Period = 5.87675 d
Epoch = 133.2410 BKJD

DV fit results are unavailable

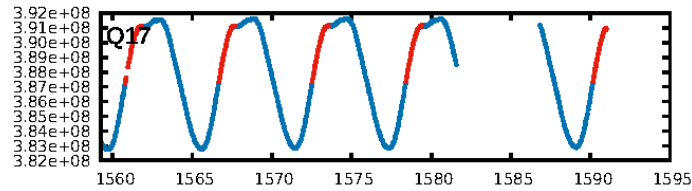
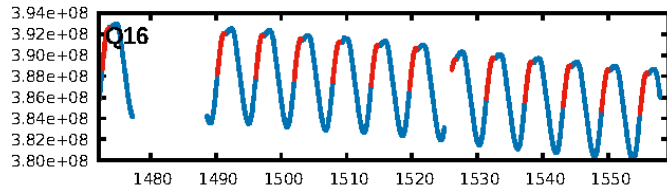
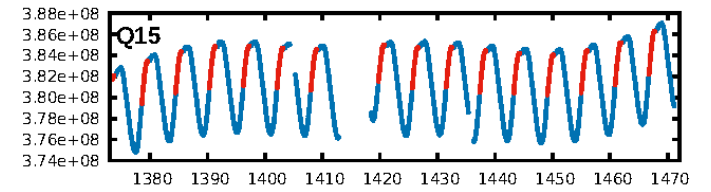
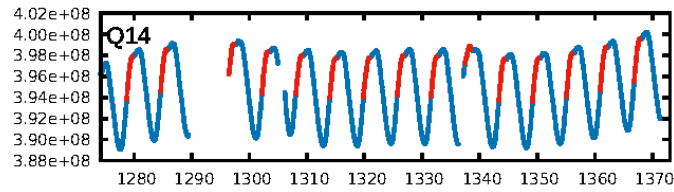
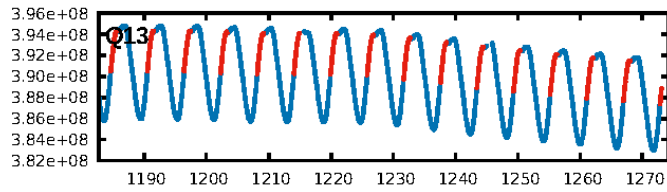
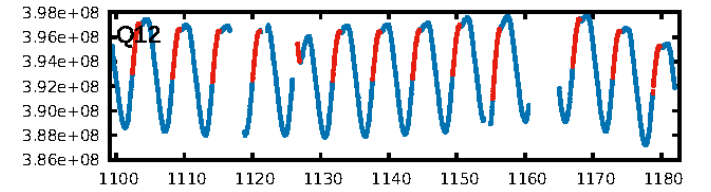
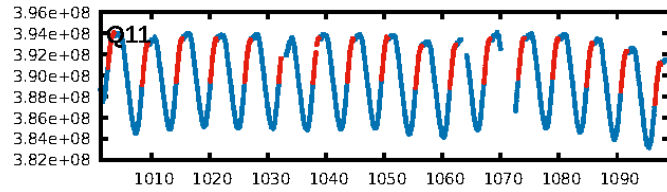
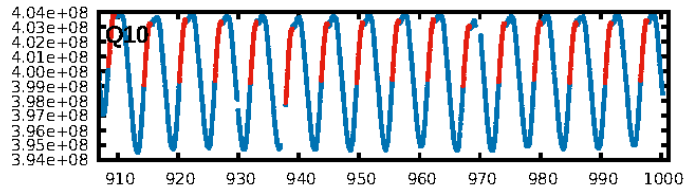
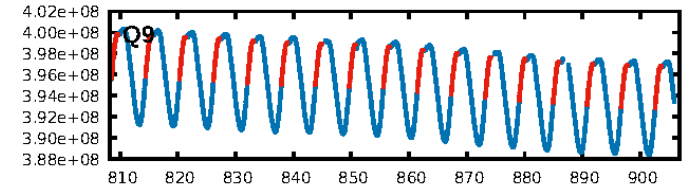
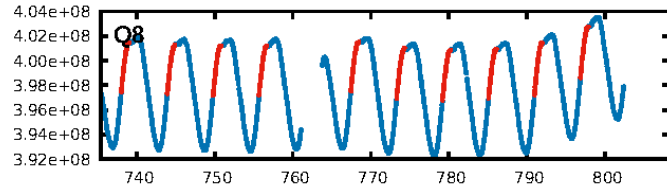
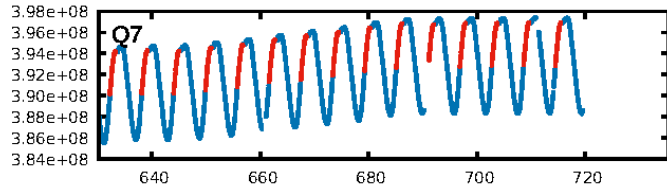
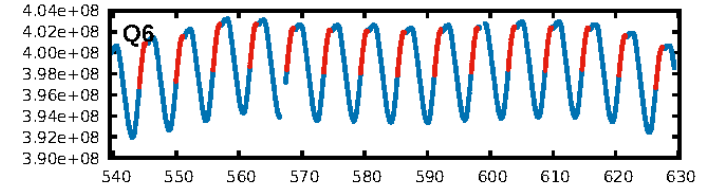
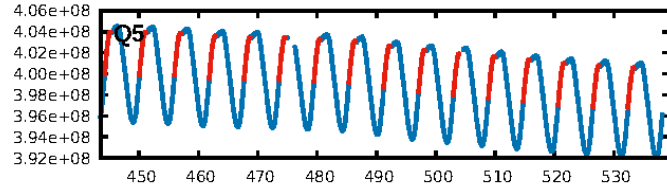
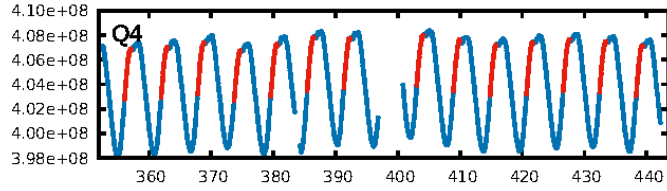
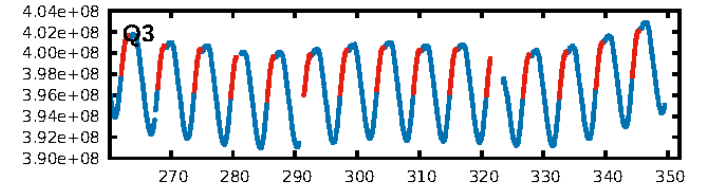
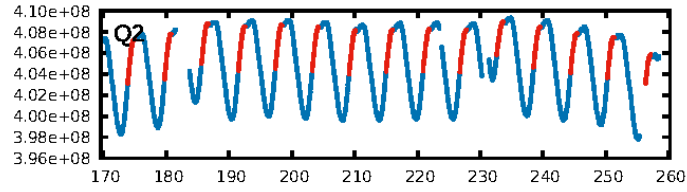
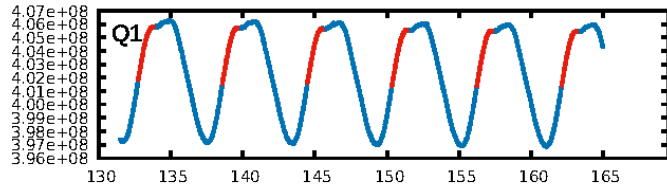
DV Diagnostic Results:

ShortPeriod-sig: 99.8% [3.09 σ]
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.99e-11
RollingBand-fgt: 1.00 [150/150]
GhostDiagnostic-chr: 0.4414
Centroid-sig: 0.0%
Centroid-so: 0.324 arcsec [3.58 σ]
OotOffset-rm: 0.041 arcsec [0.55 σ]
KicOffset-rm: 0.102 arcsec [1.22 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

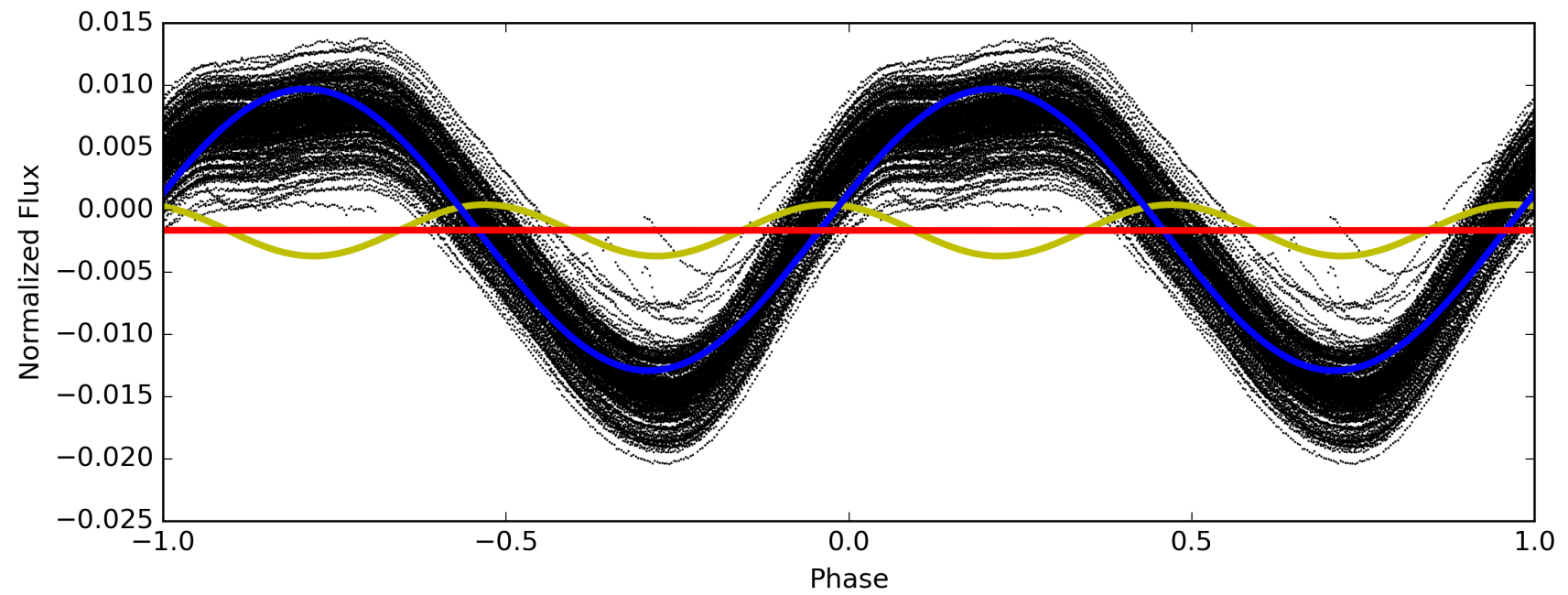
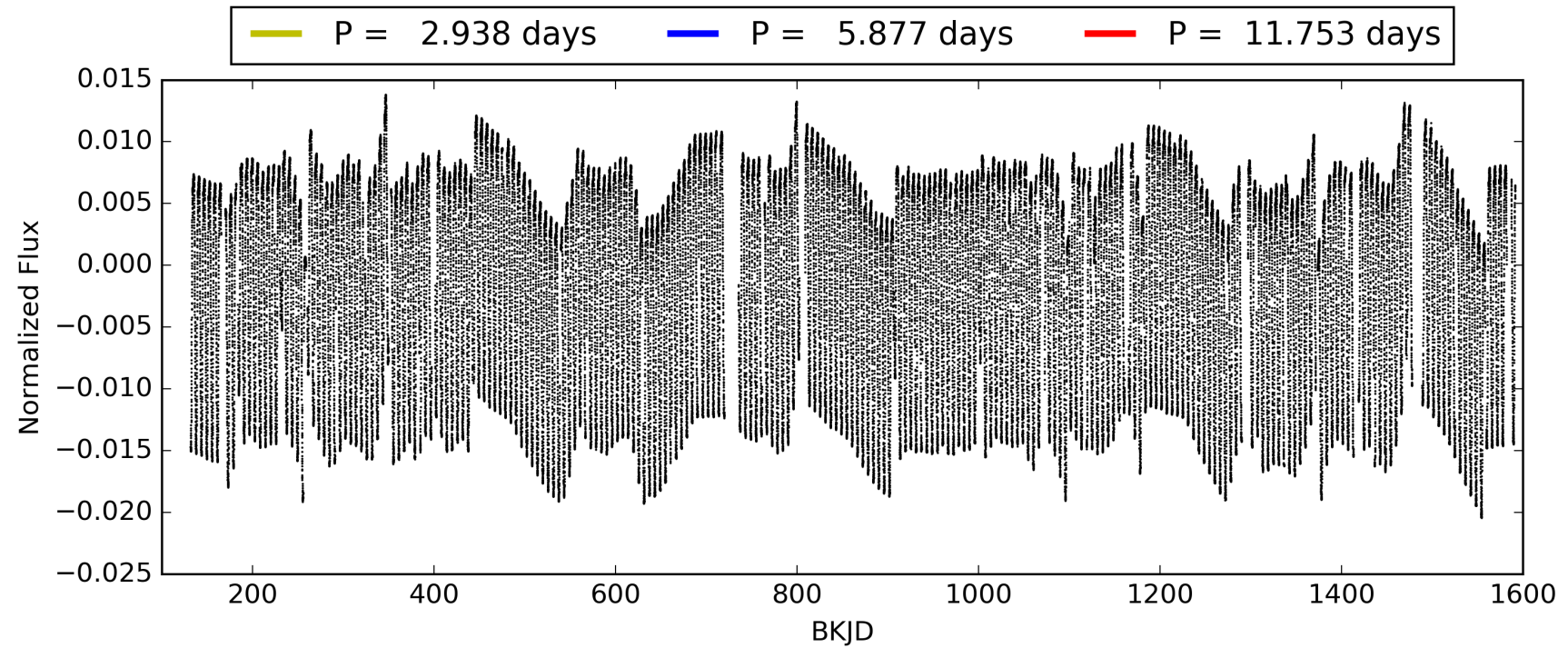
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:19:19 Z

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

TCE 007778838-03, PDC Light Curves

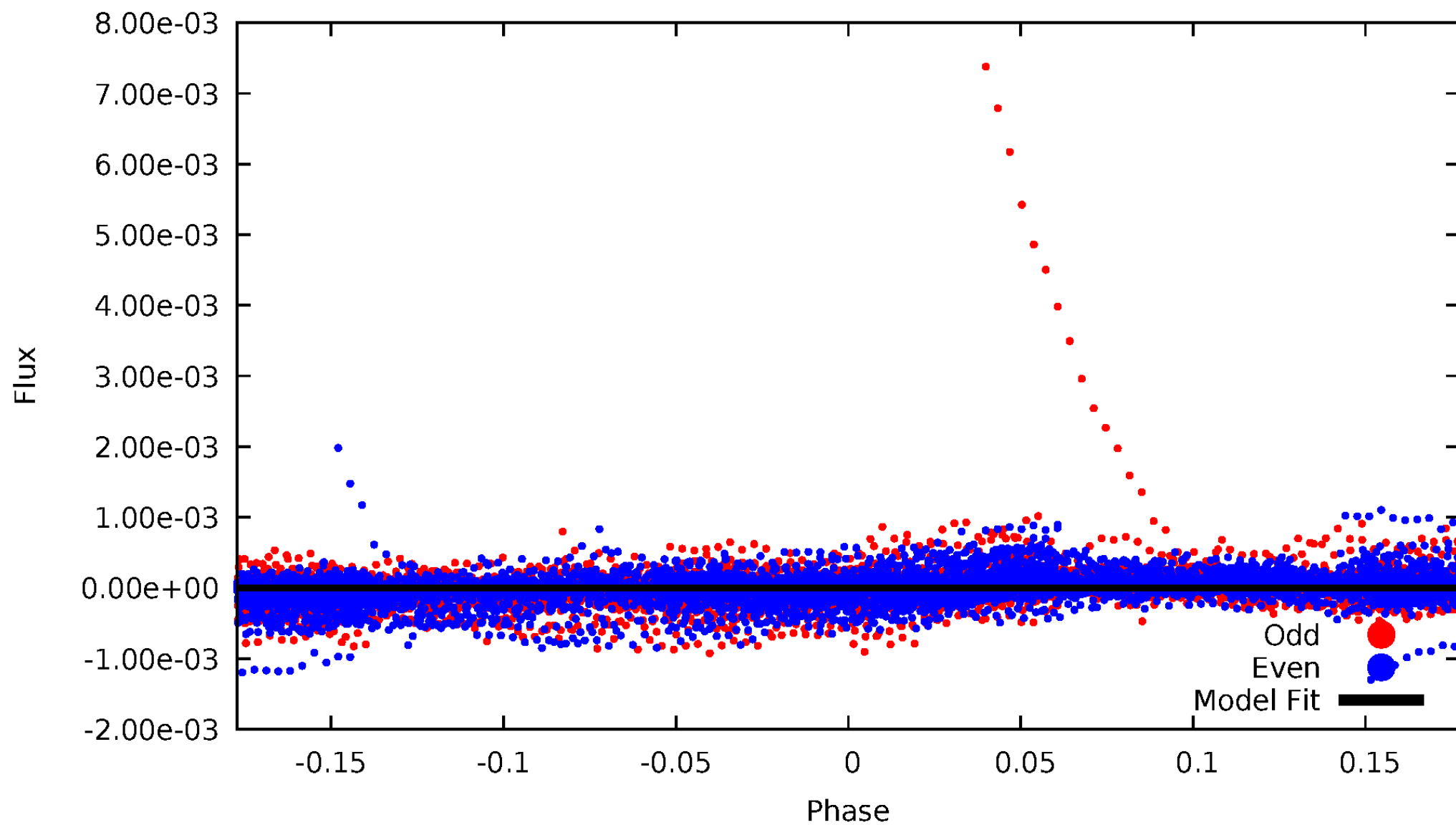


TCE 007778838-03



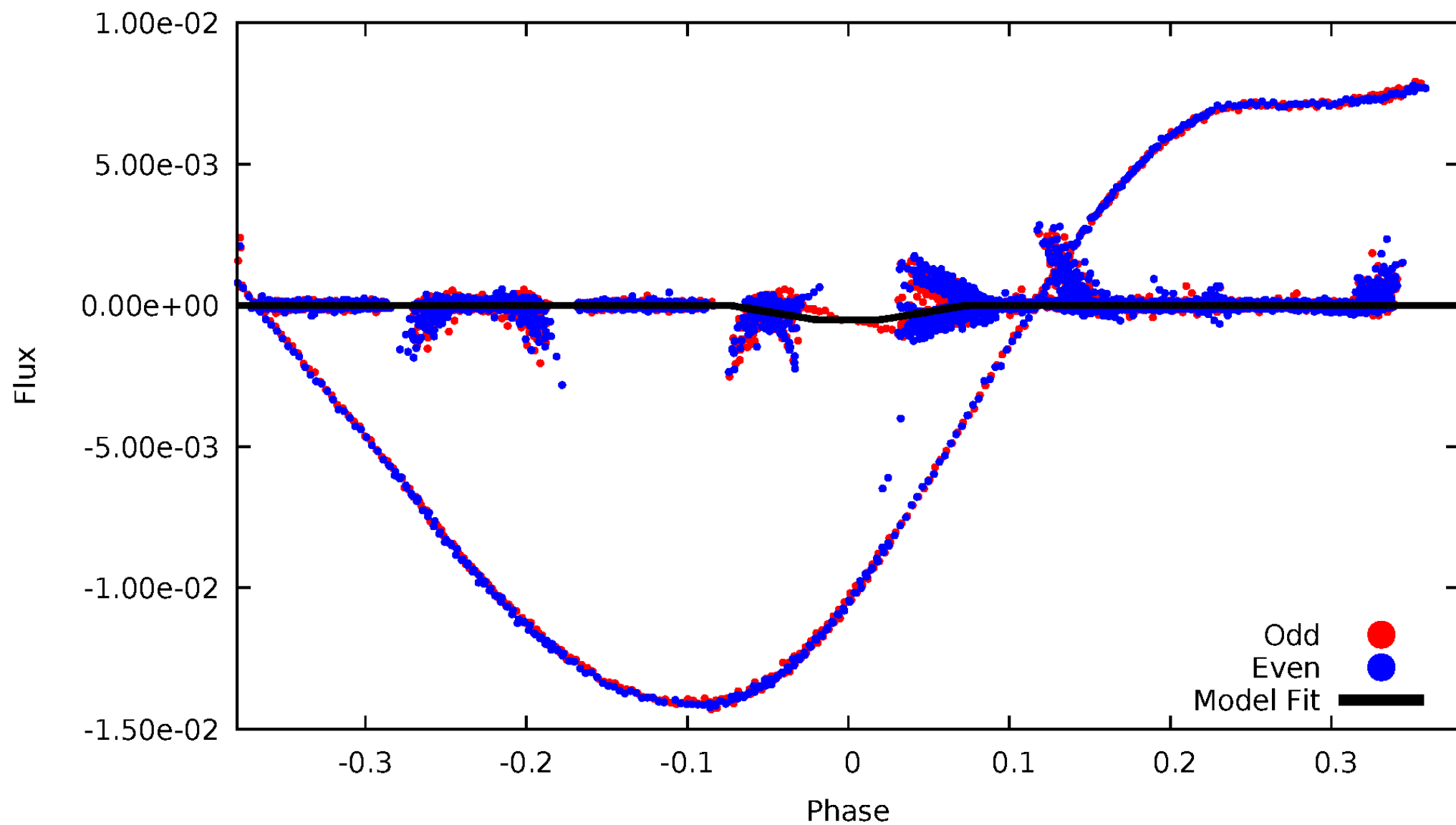
DV Odd/Even

TCE 007778838-03

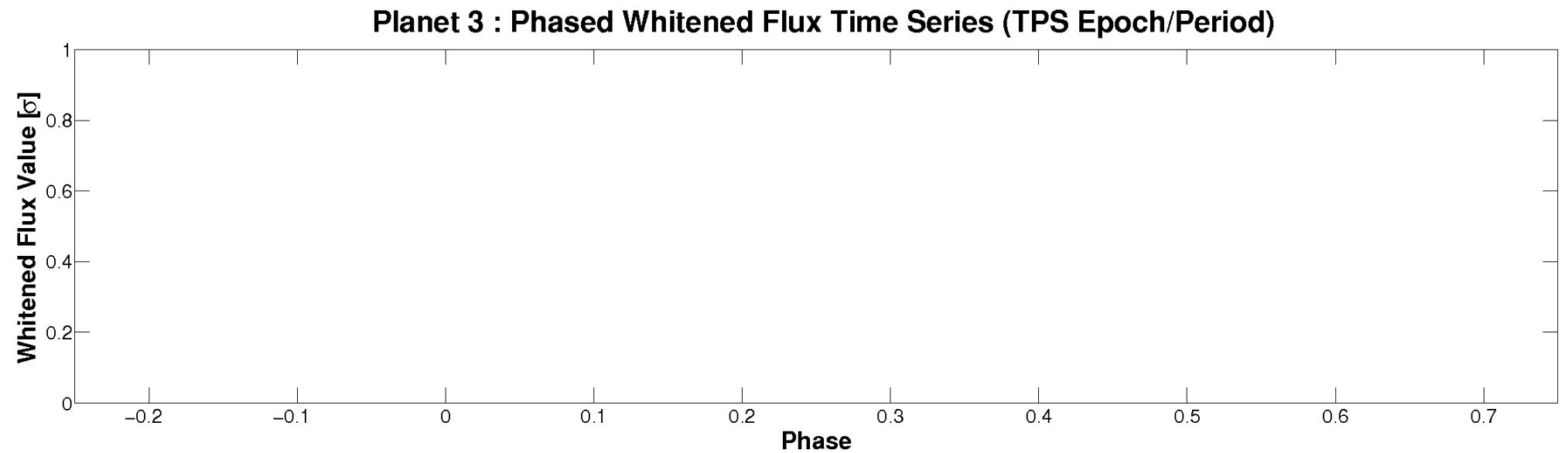
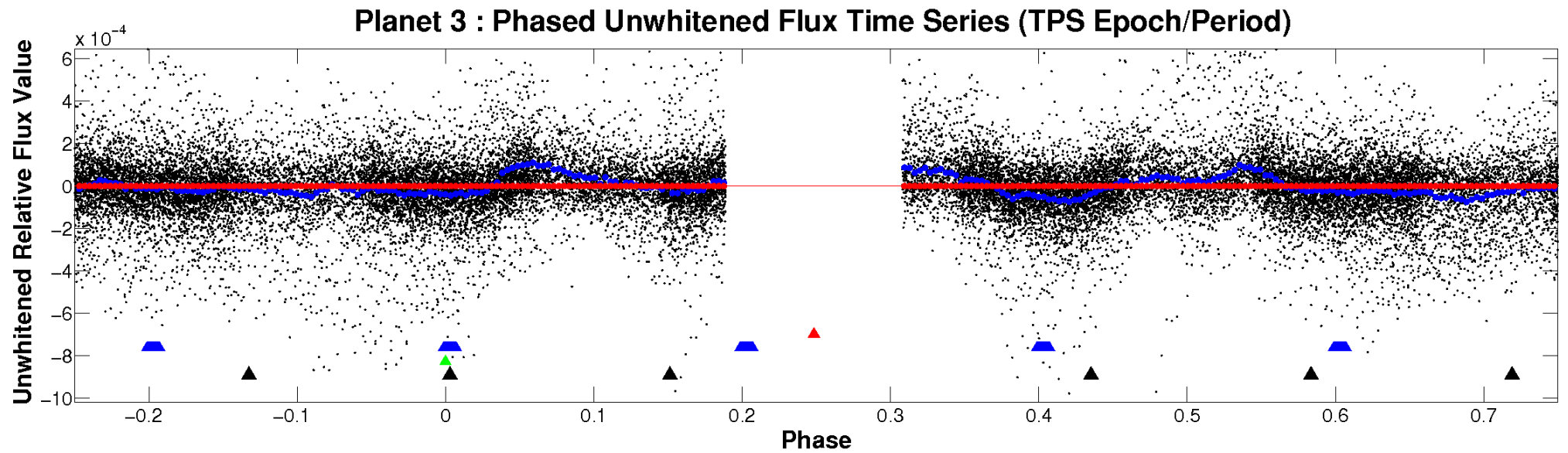


ALT Odd/Even

TCE 007778838-03

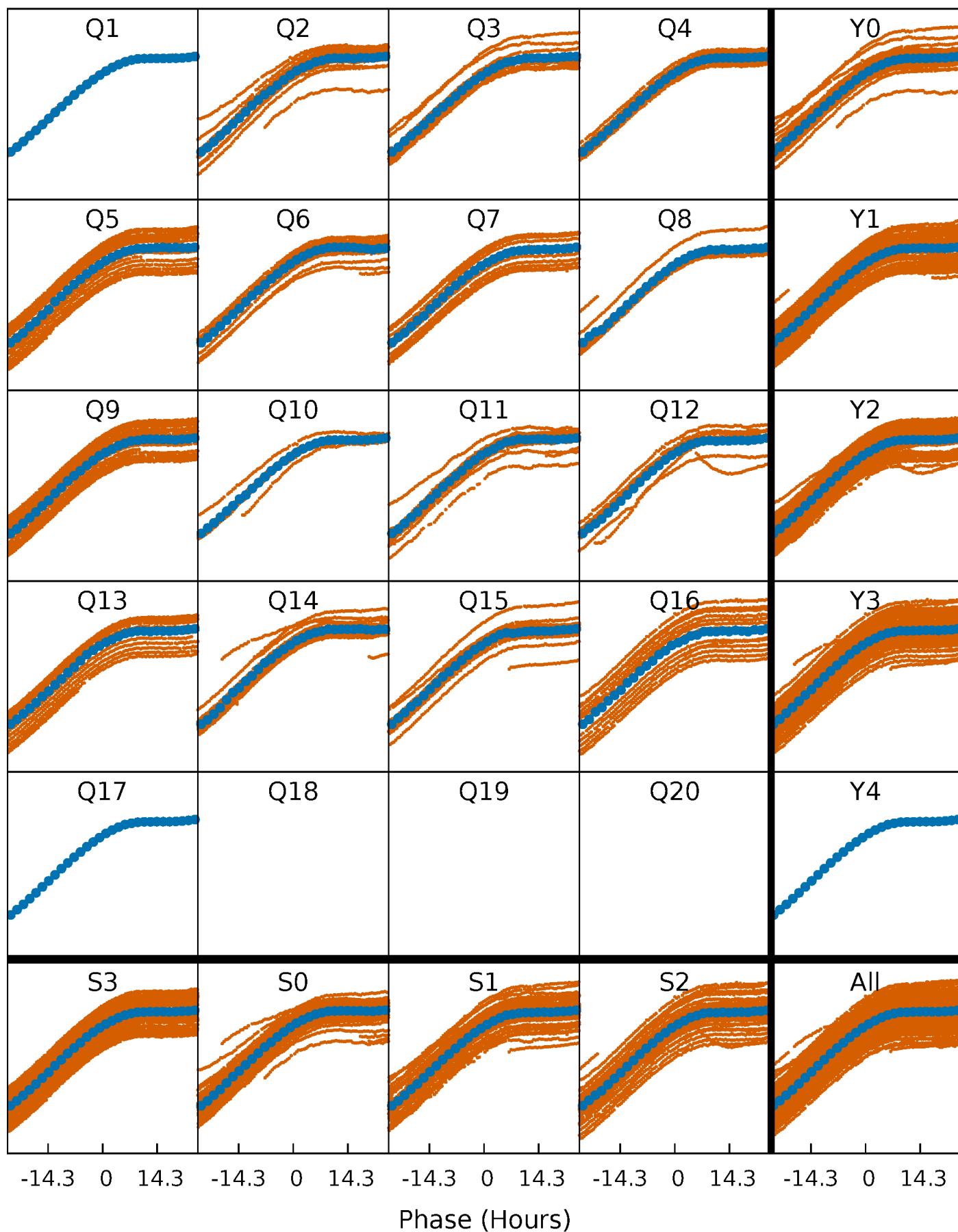


Non-Whitened Vs. Whitened Light Curve



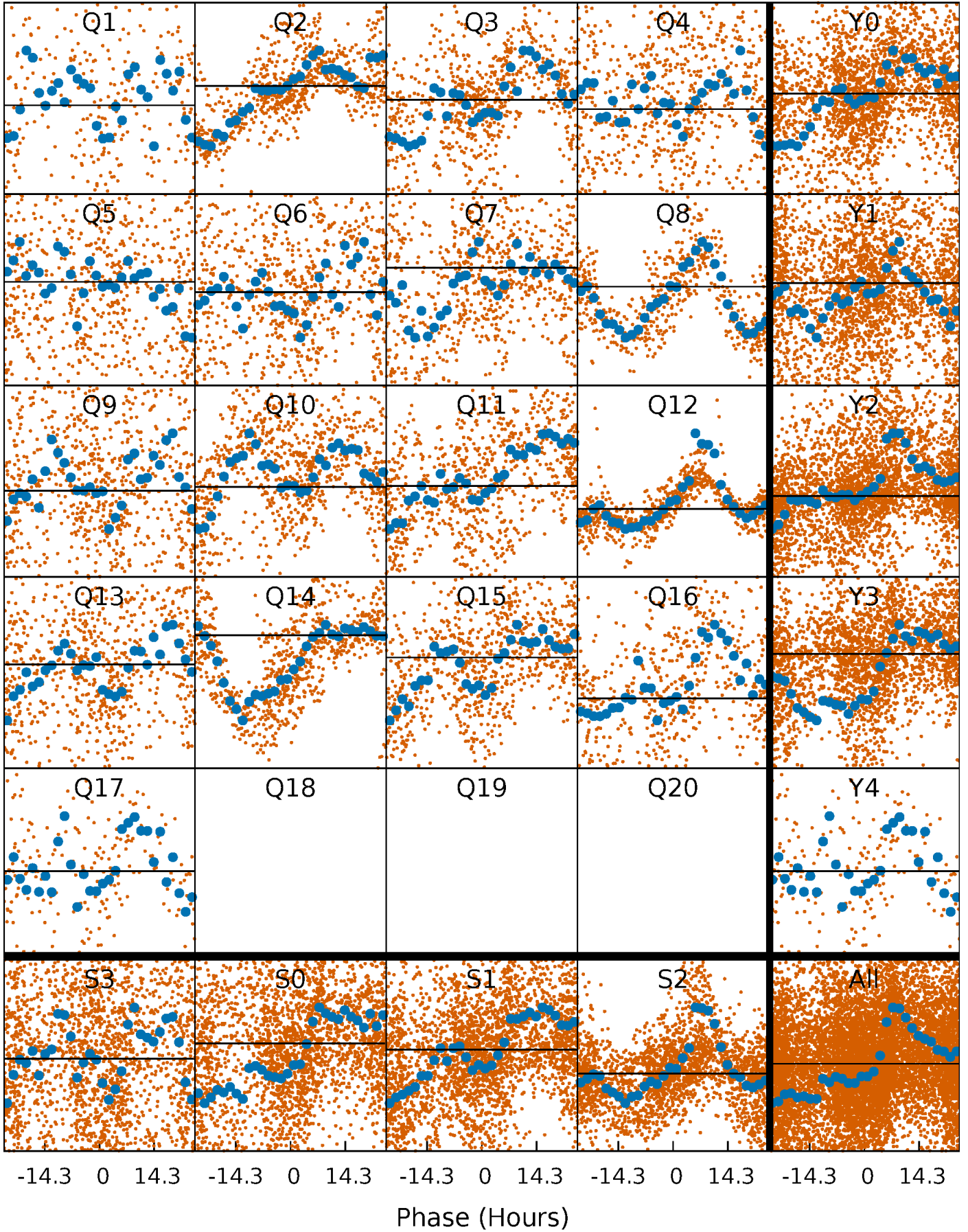
PDC Quarter-Phased Transit Curves

TCE 007778838-03 P= 5.876749 Days $T_0=133.241035$ (BKJD)



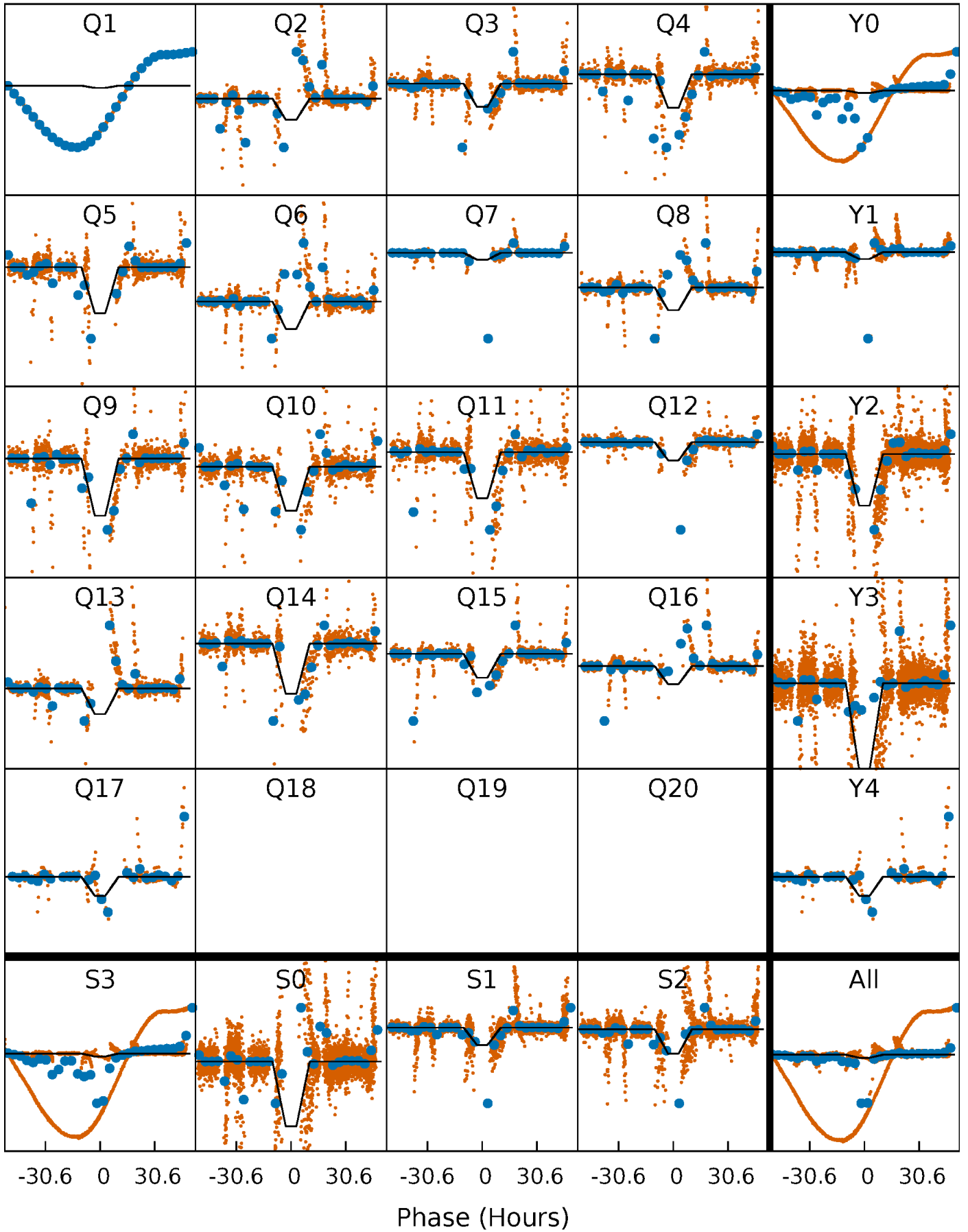
DV Quarter-Phased Transit Curves

TCE 007778838-03 P= 5.876749 Days $T_0=133.241035$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

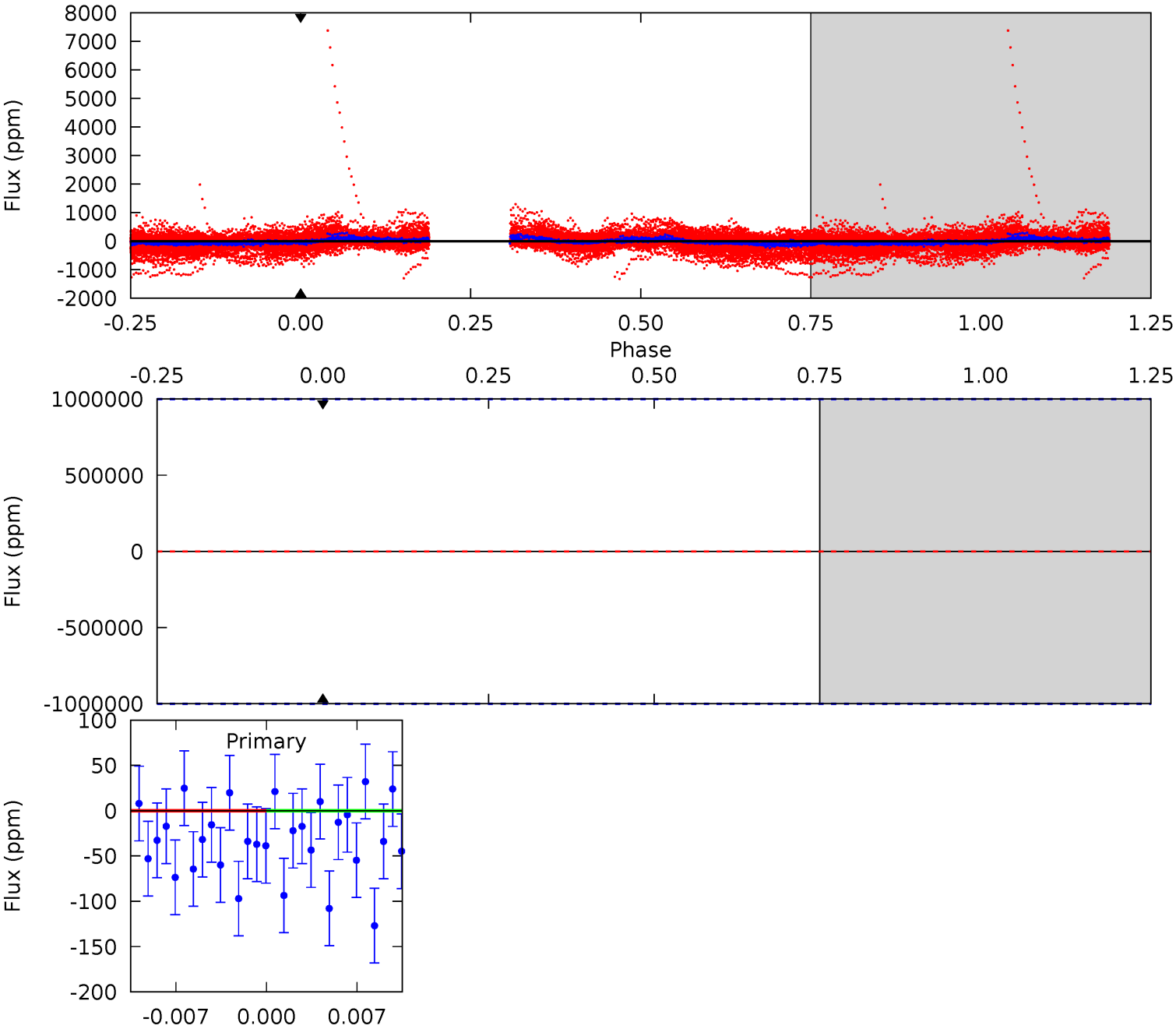
TCE 007778838-03 P= 5.876749 Days $T_0=132.241816$ (BKJD)



DV Model-Shift Uniqueness Test

007778838-03, P = 5.876749 Days, E = 127.364286 Days

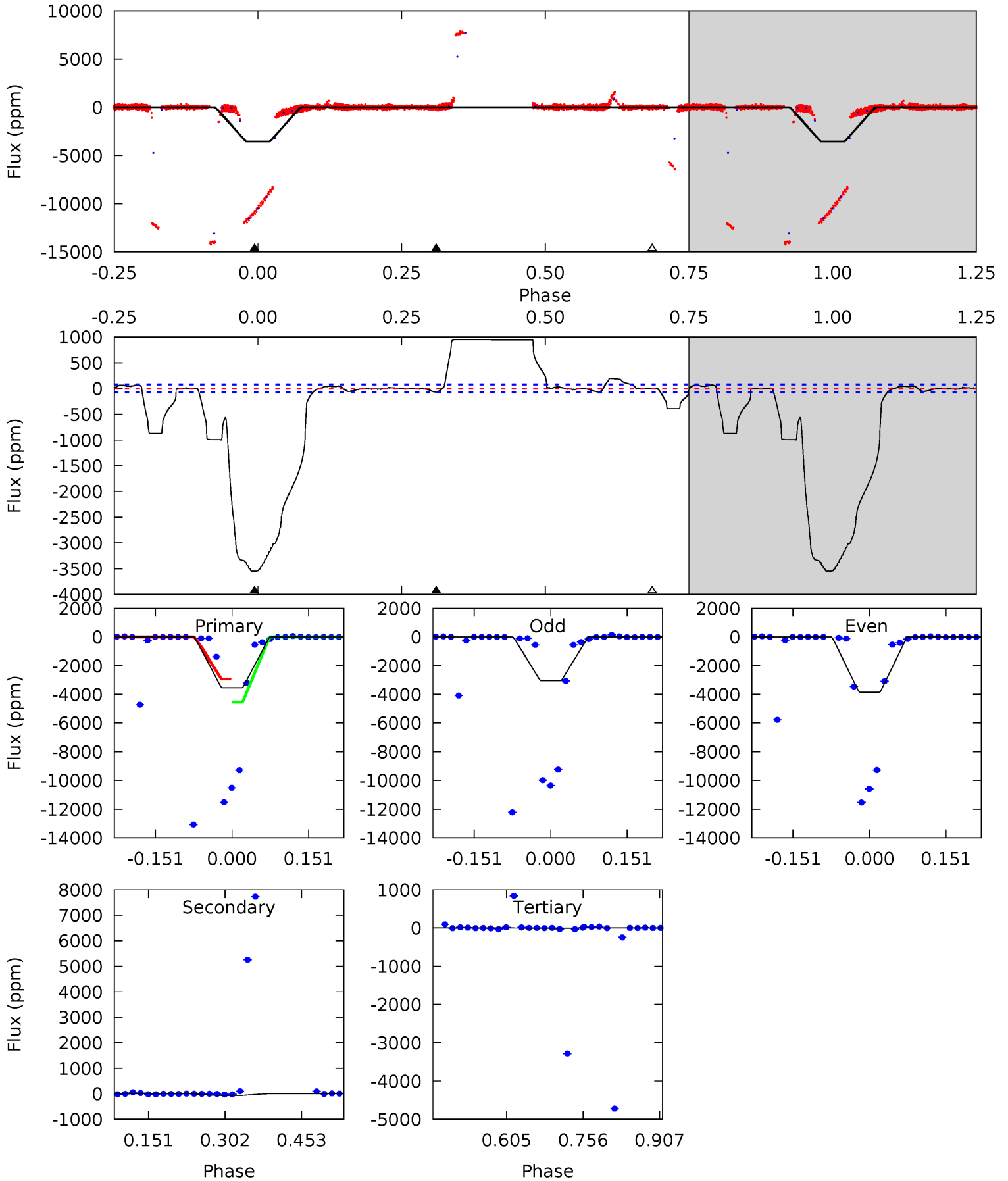
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

007778838-03, P = 5.876749 Days, E = 126.365067 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
204.0	3.93	0.41	0	4.48	1.44	9.50	203.6	204.0	3.52	3.93	20.7	1.37	0.21	42.9



Stellar Parameters For KIC 007778838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	11287^{+612}_{-1716}	$3.642^{+0.476}_{-0.084}$	$0.070^{+0.150}_{-0.600}$	$4.662^{+0.447}_{-2.385}$	$3.471^{+0.069}_{-1.164}$	$0.048^{+0.248}_{-0.013}$
	+5%/-15%	+13%/-2%	+214%/-857%	+10%/-51%	+2%/-34%	+514%/-27%
Source	KIC0	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 007778838-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$31.35^{+32.87}_{-21.09}$	4488^{+595}_{-705}	4821^{+95171}_{-97079}	$1.431^{+950.554}_{-756.037}$
Alt.	-68 ± 17	$34.80^{+37.03}_{-24.37}$	4521^{+556}_{-818}	-2546^{+8054}_{-1085}	$0.273^{+2.763}_{-0.209}$

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 $A_{obs} \gg 1.0$

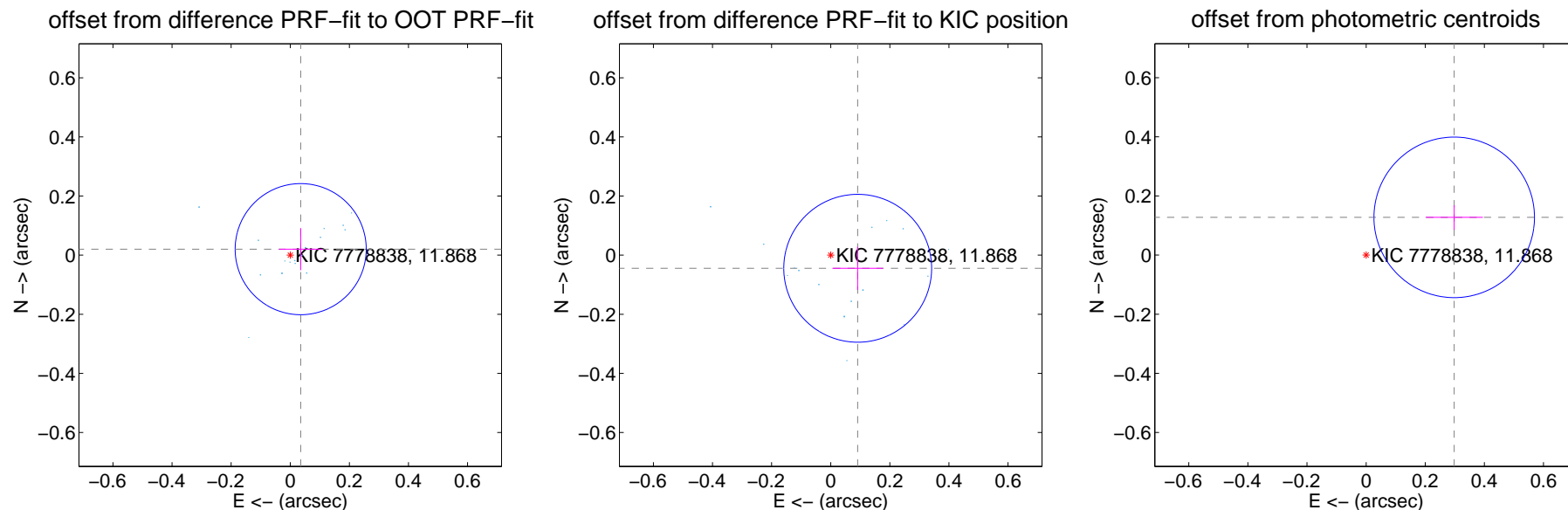
DV Centroid Data

Supplemental centroid analysis for 007778838-03. **Kepler magnitude: 11.87.** Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

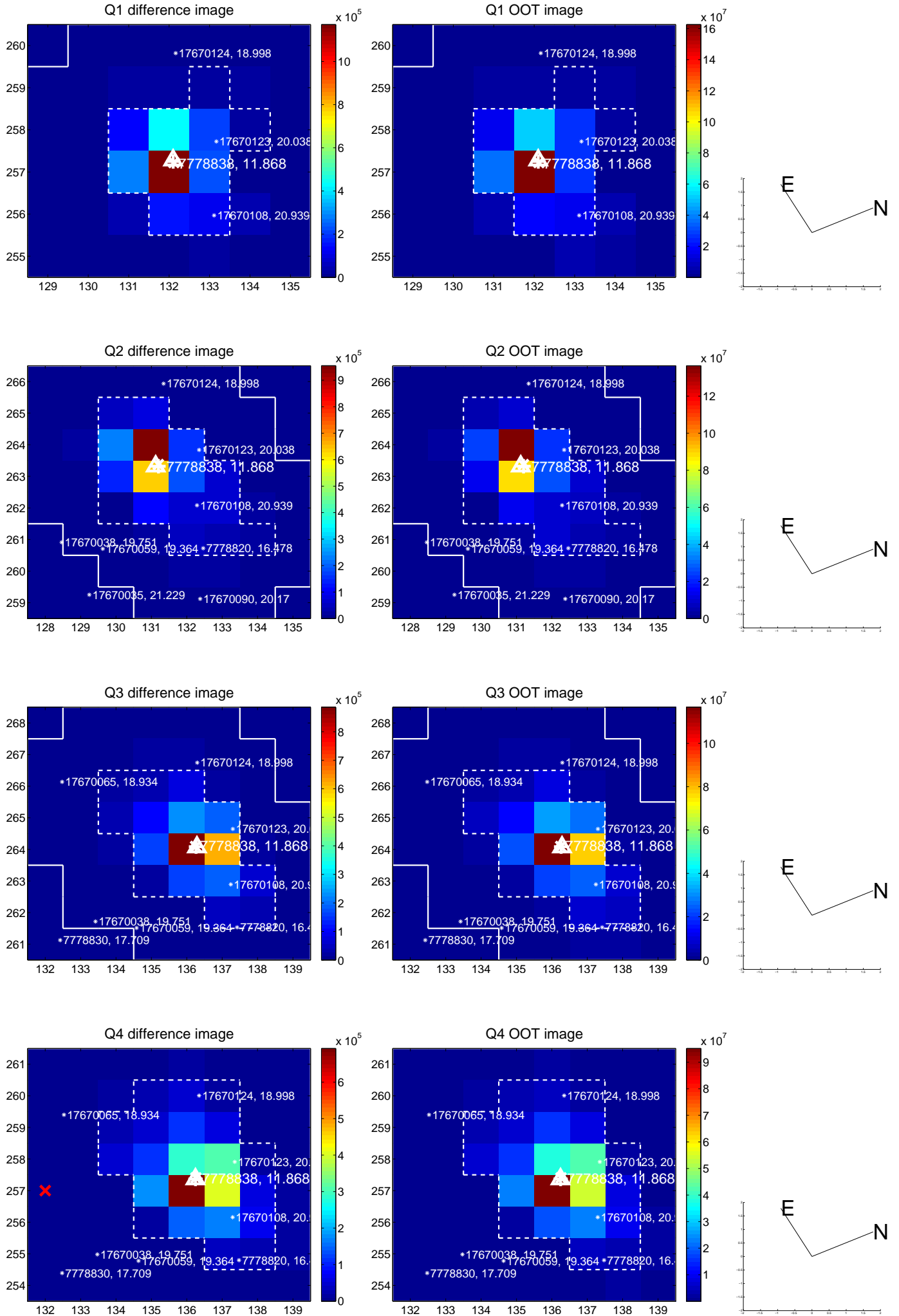
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.041 ± 0.074	0.55	-0.035 ± 0.073	0.020 ± 0.071
PRF-fit source offset from KIC position	0.102 ± 0.083	1.22	-0.091 ± 0.086	-0.044 ± 0.073
photometric centroid source offset	0.32 ± 0.09	3.58	-0.30 ± 0.10	0.13 ± 0.04

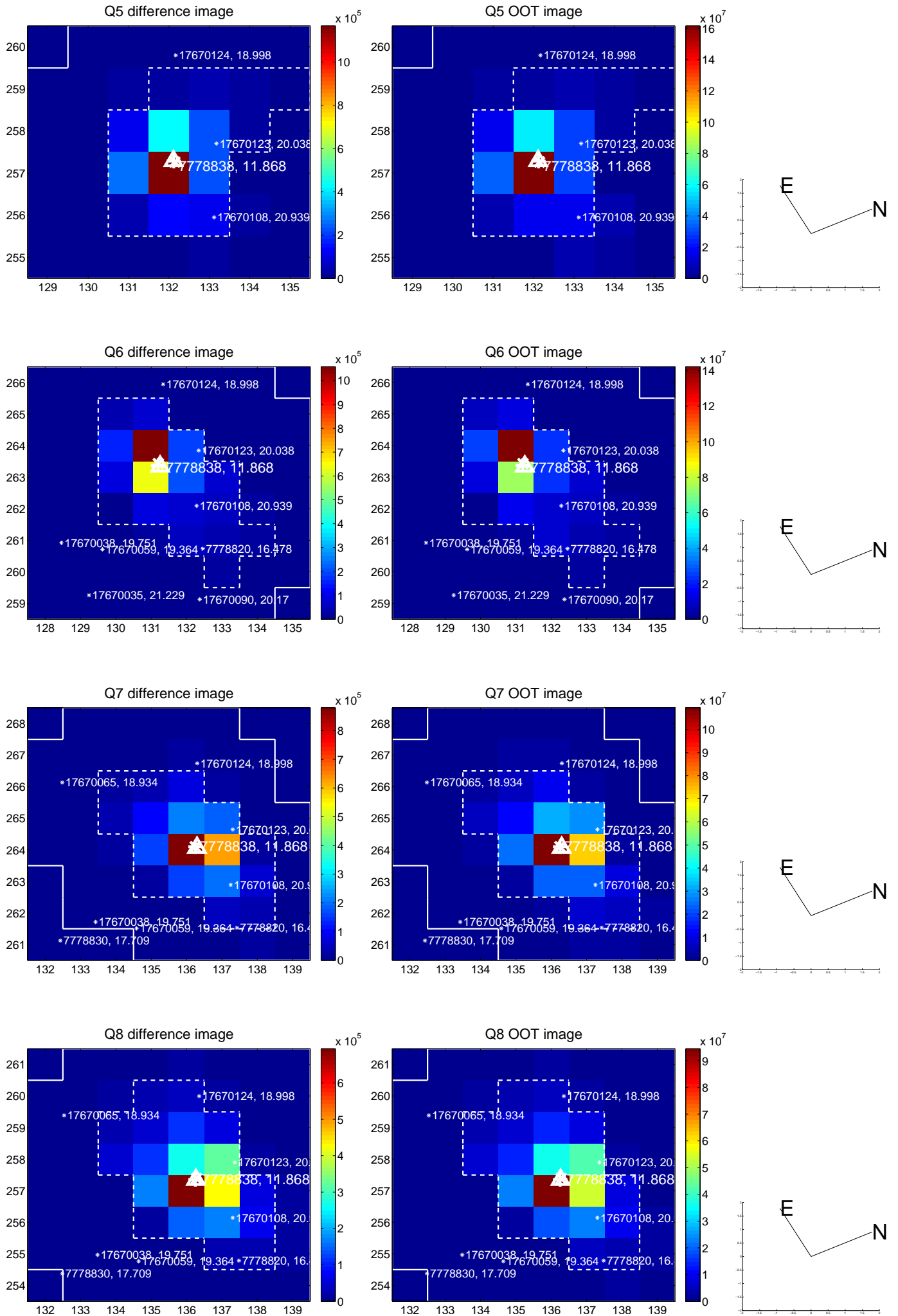


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

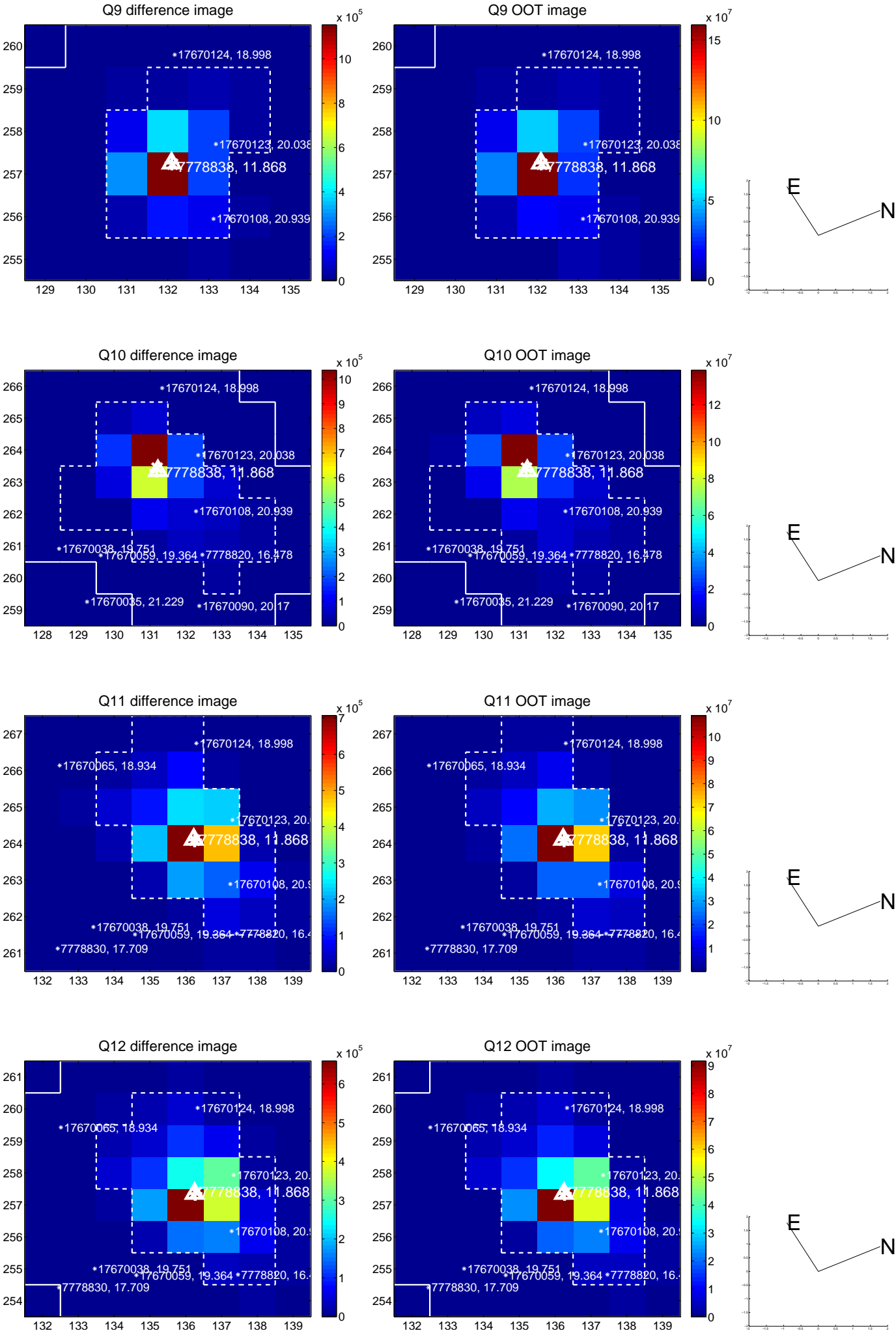
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



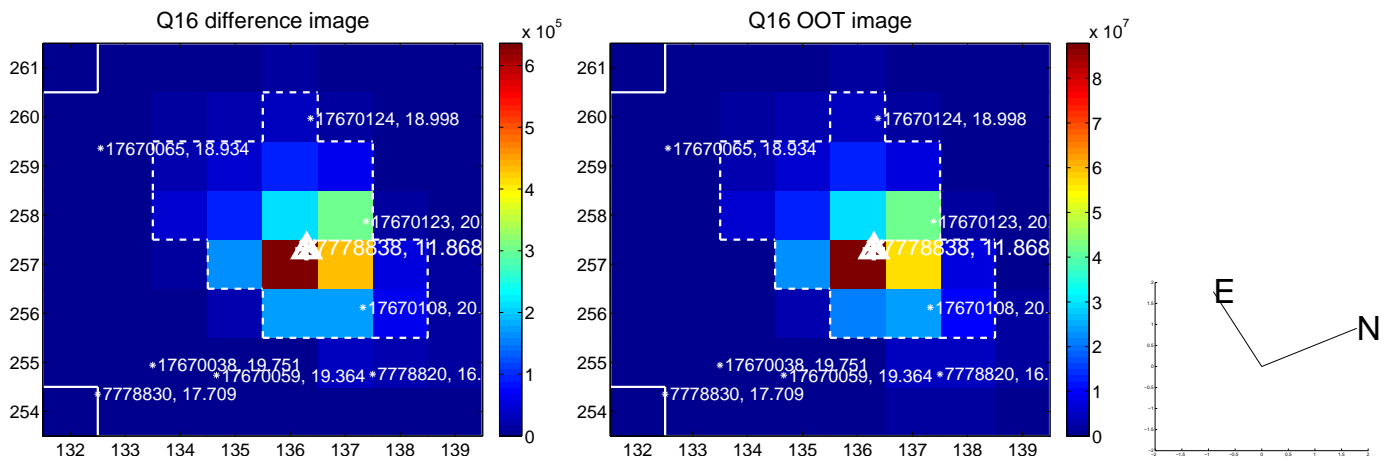
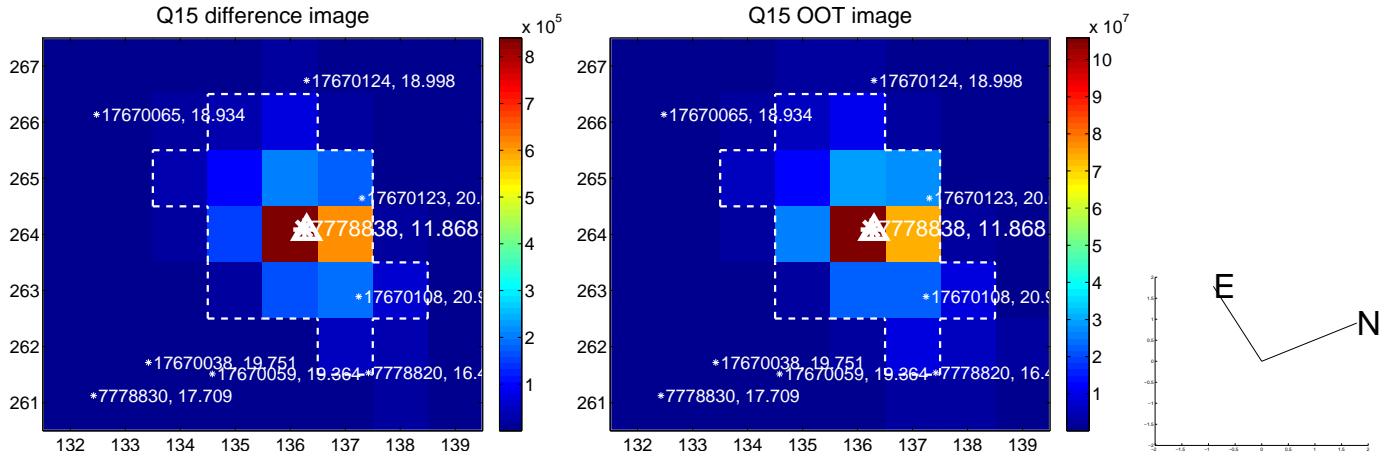
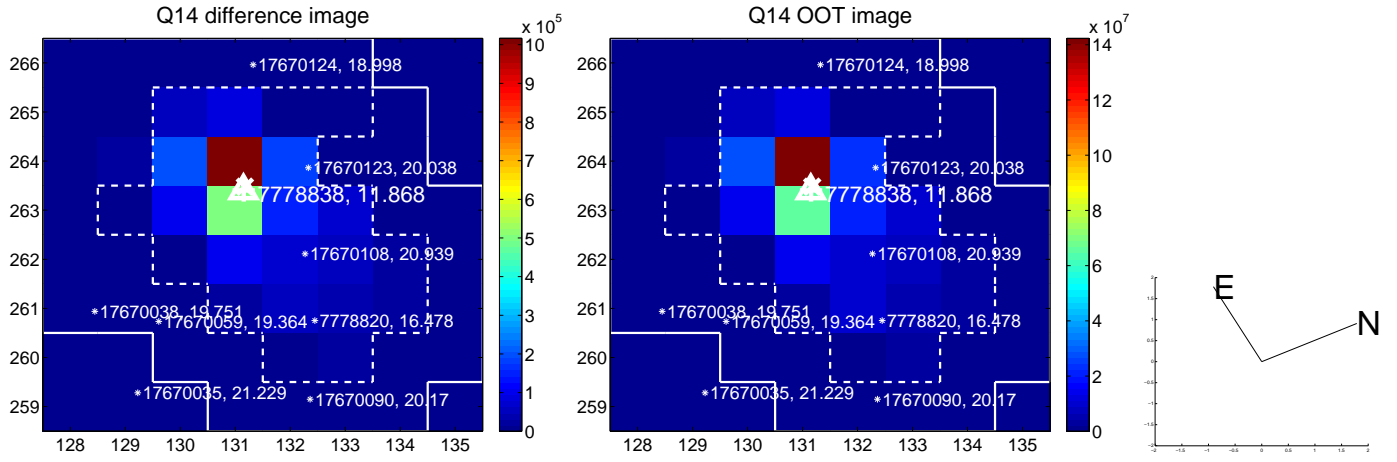
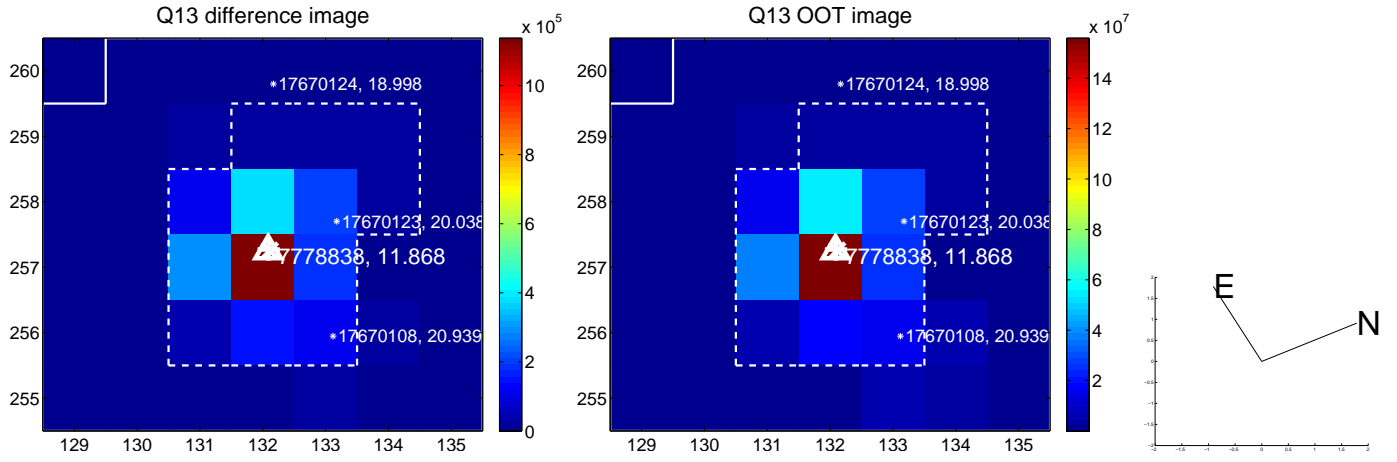
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



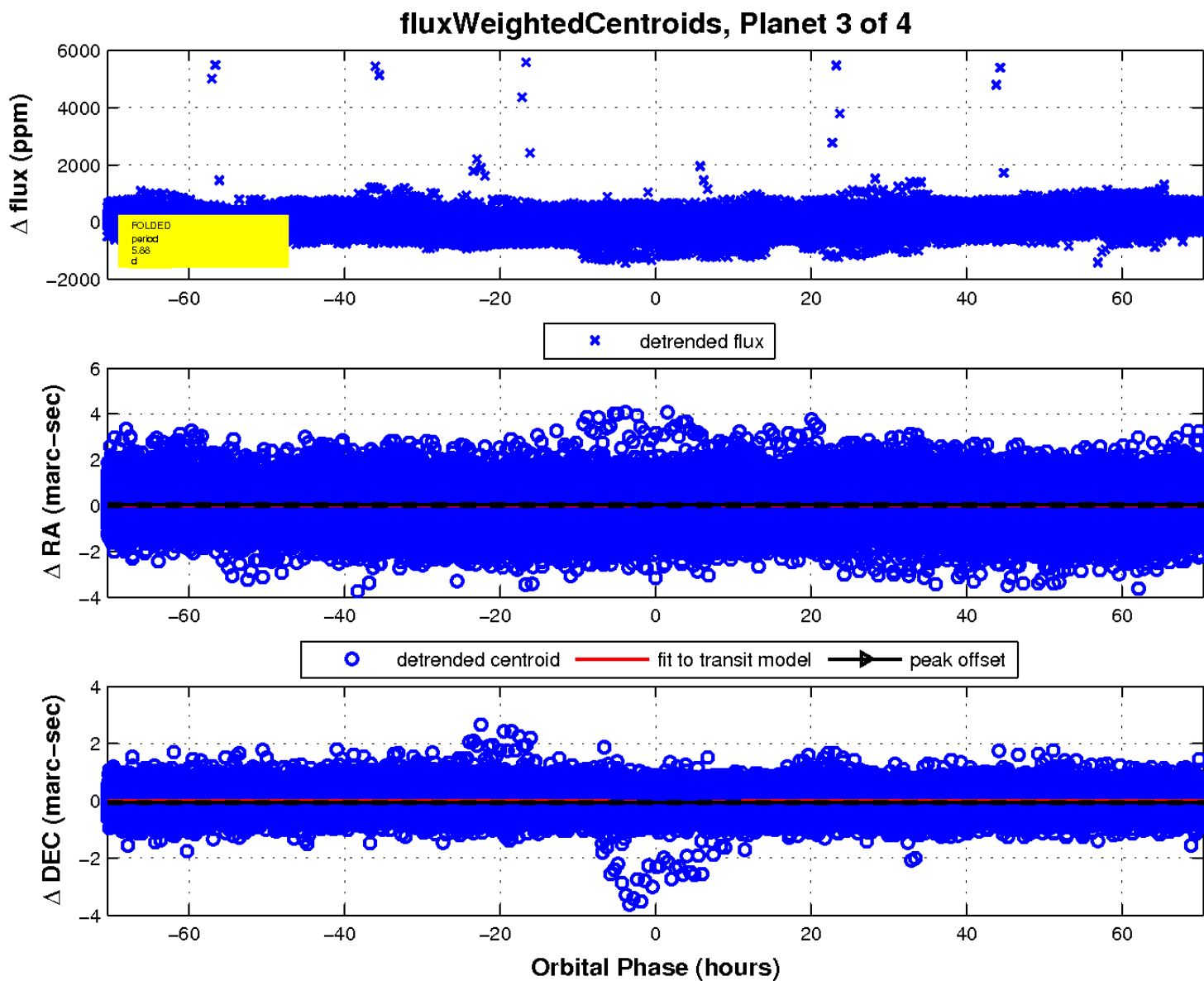
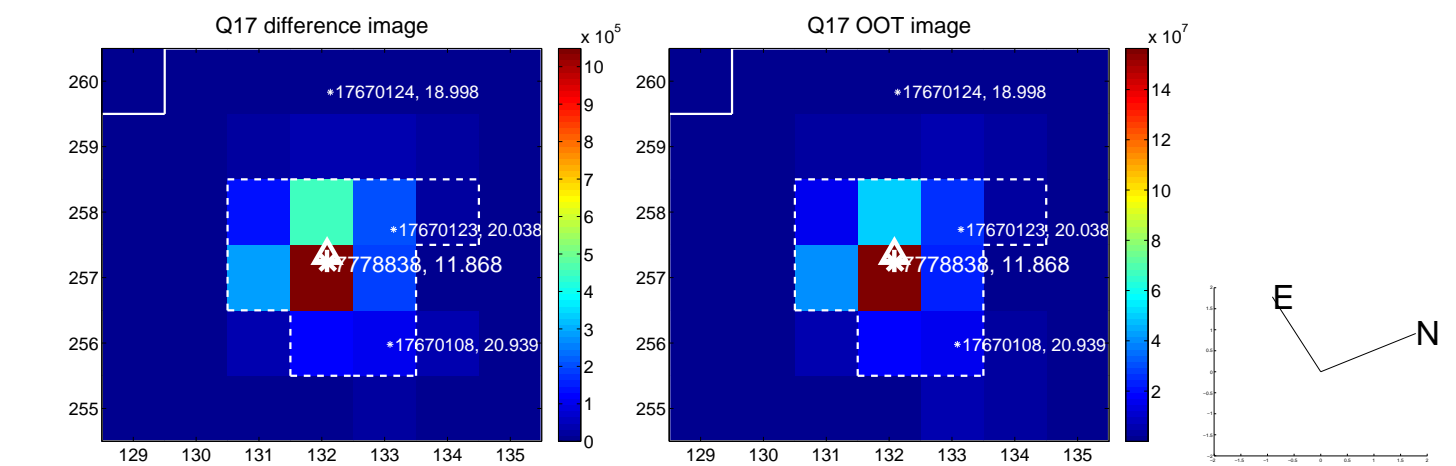
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

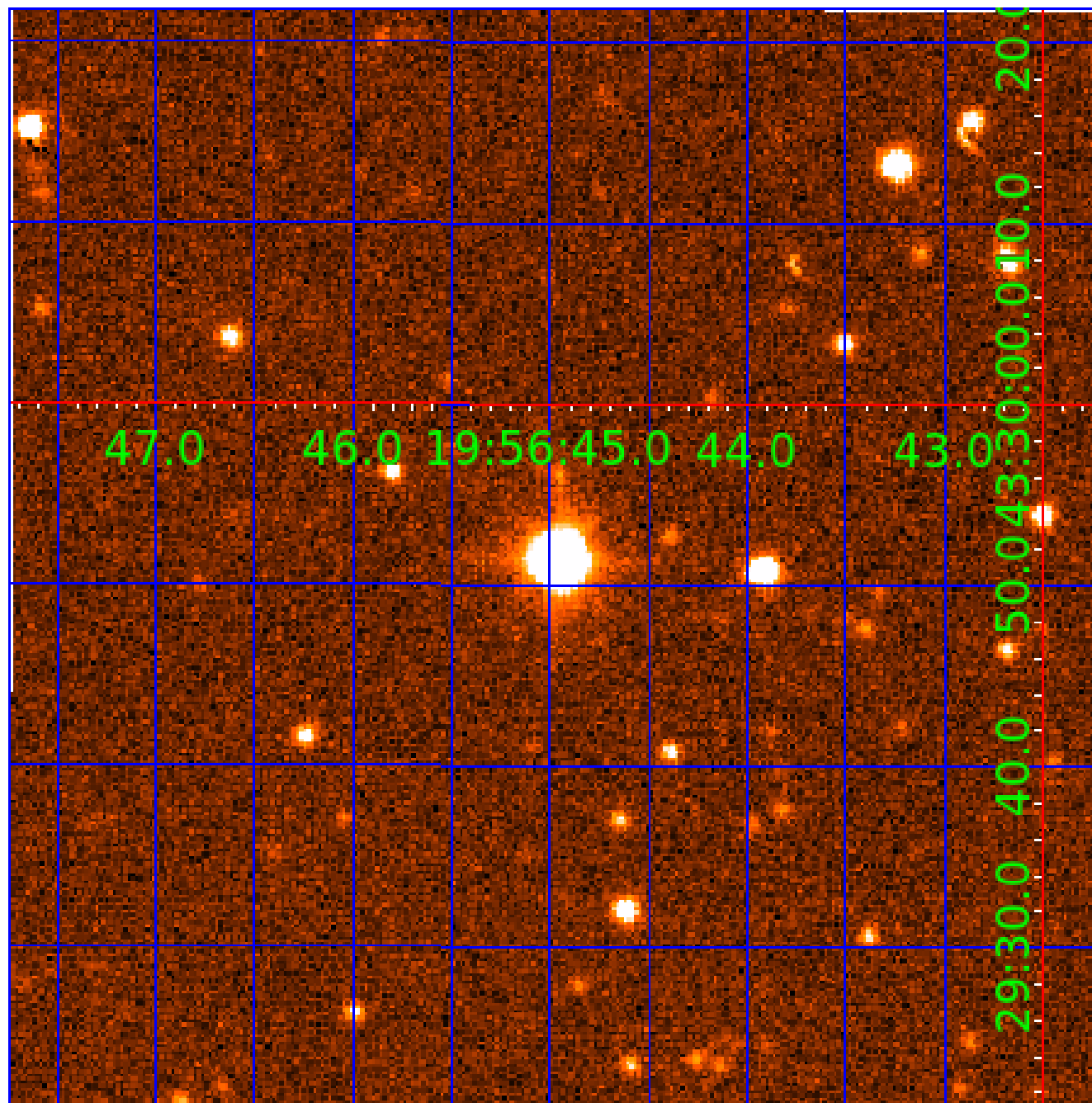


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007778838

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})
007778838-01	OBS	No	5.876760	134.699593	45.8	5.436	14.4	14.5	4.66	11287	3.66	33890.09
007778838-02	OBS	No	3.526170	134.408838	25.8	13.303	12.0	11.4	4.66	11287	2.70	66965.67
007778838-03	OBS	No	5.876749	133.241035	78.6	12.500	10.5	-1.0	4.66	11287	4.26	33890.17
007778838-04	OBS	No	230.861548	336.480034	160.7	3.500	9.1	-1.0	4.66	11287	6.10	253.78

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007778838-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007778838-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
007778838-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_NOFITS
007778838-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

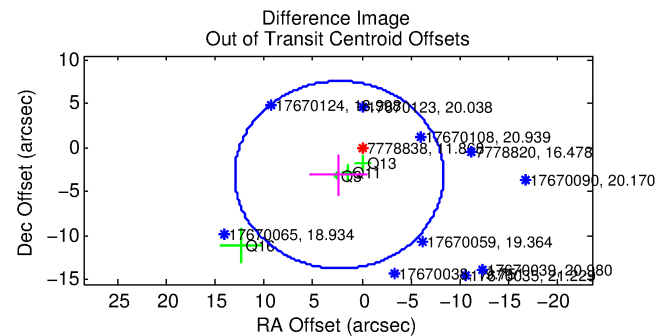
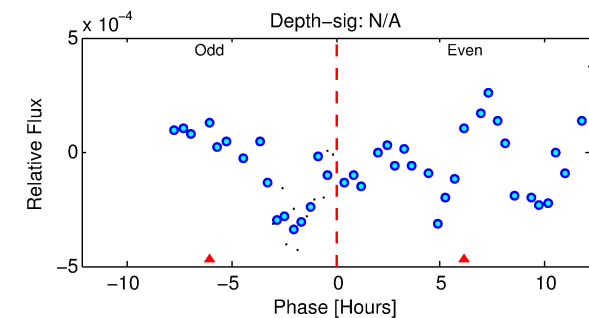
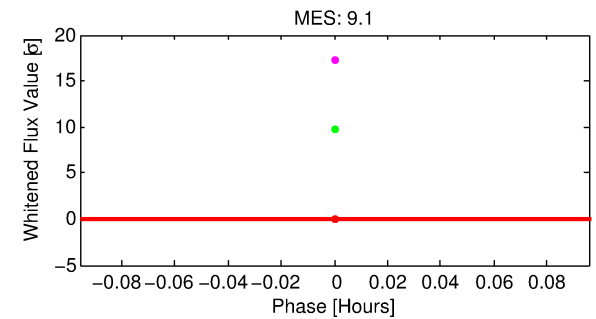
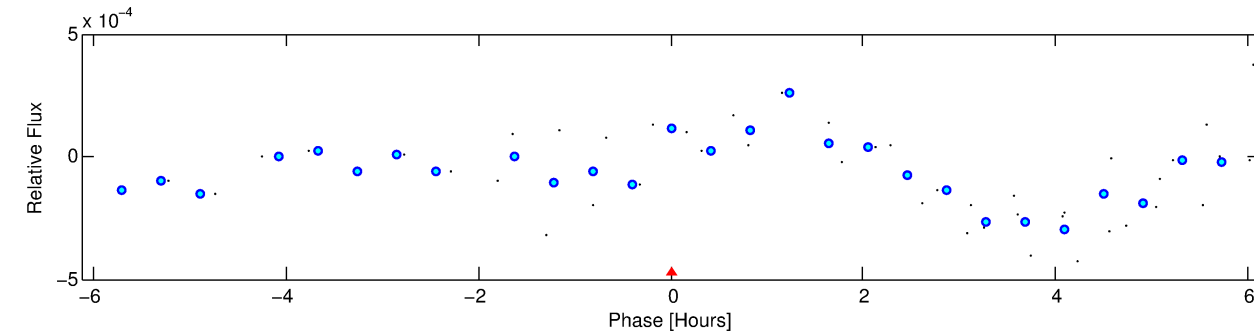
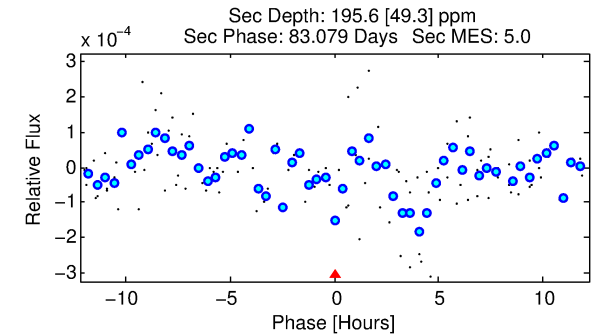
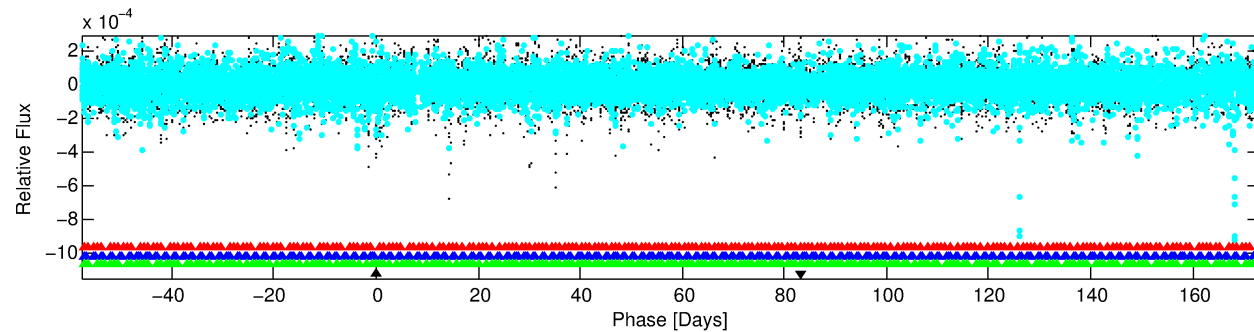
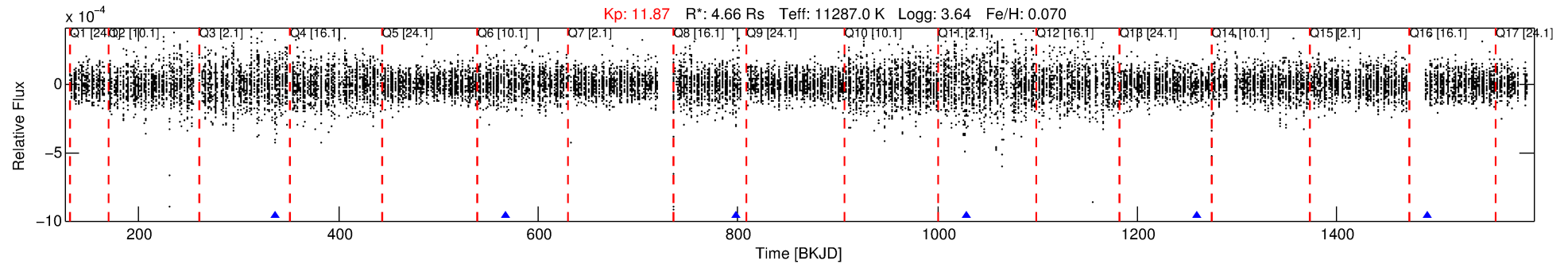
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007778838-04

No Significant Match Found

DV One-Page Summary

KIC: 7778838 Candidate: 4 of 4 Period: 230.862 d



TPS TCE Results:

Period = 230.86155 d
Epoch = 336.4800 BKJD

DV fit results are unavailable

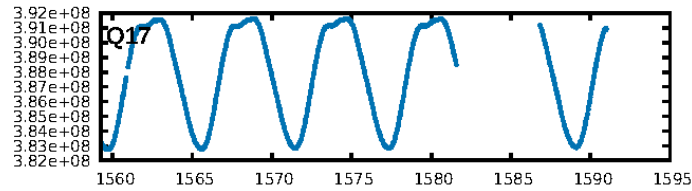
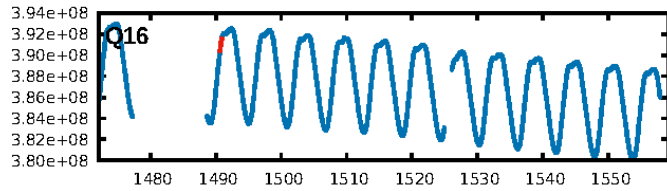
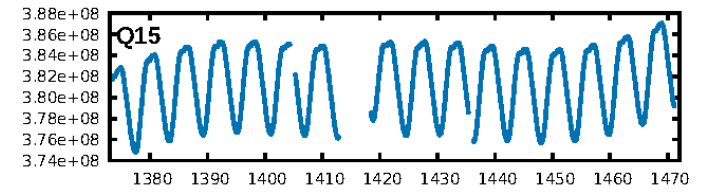
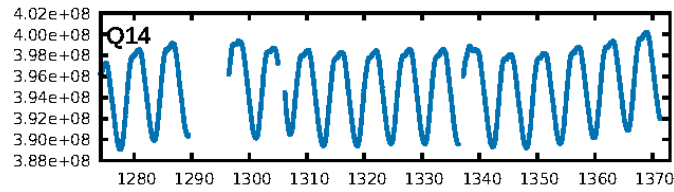
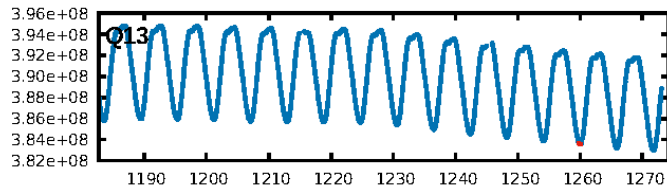
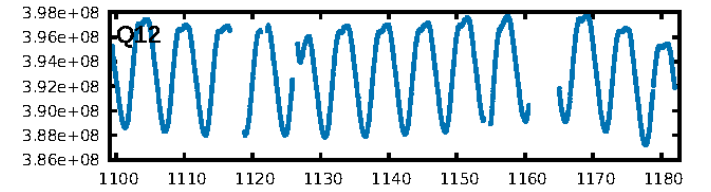
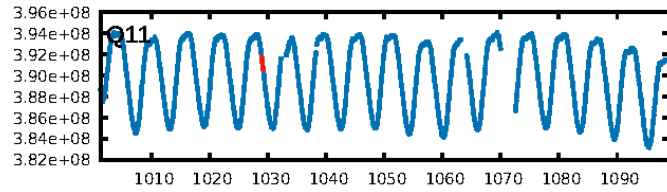
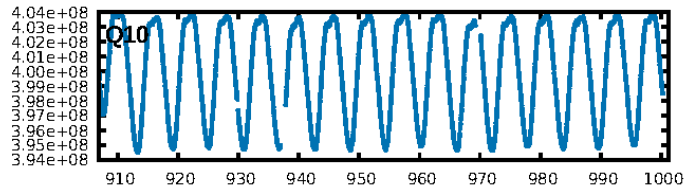
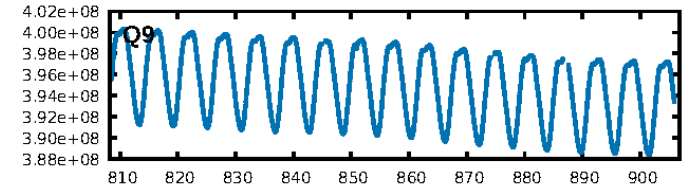
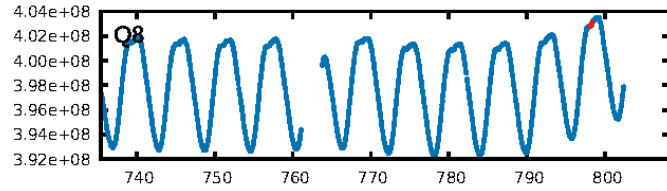
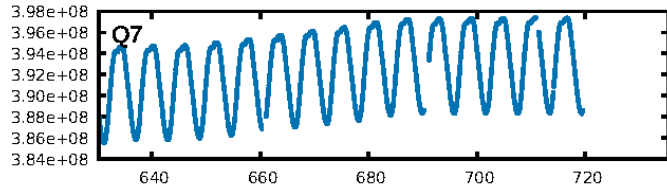
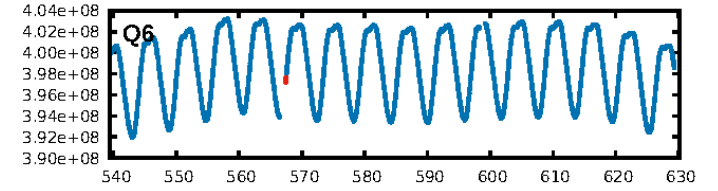
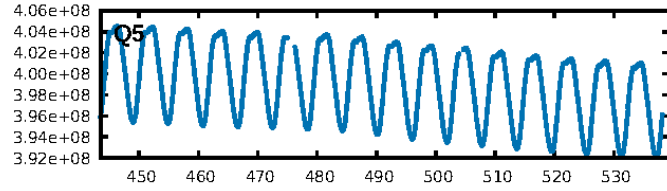
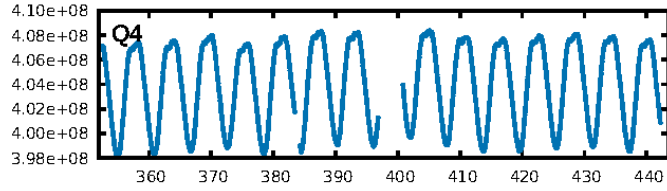
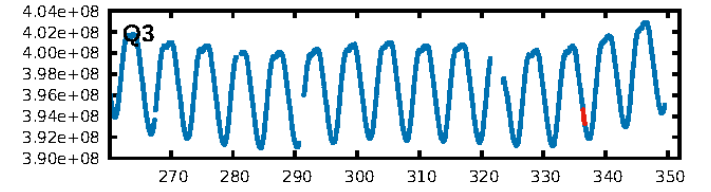
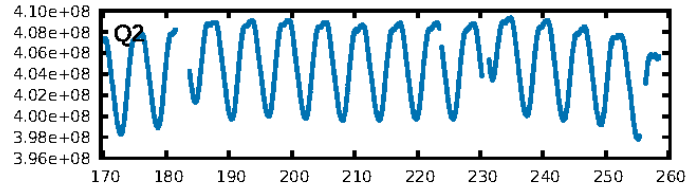
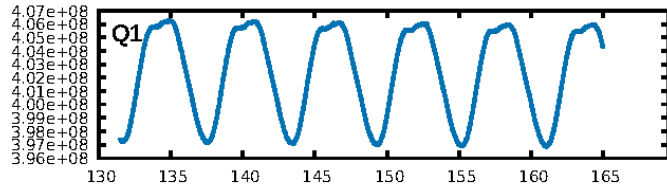
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [835.22σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.28e-09
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -0.07756
Centroid-sig: 75.2%
Centroid-so: 0.240 arcsec [3.18σ]
OotOffset-rm: 3.874 arcsec [1.09σ]
KicOffset-rm: 3.824 arcsec [1.40σ]
OotOffset-st: 0/2/1/1 [4]
KicOffset-st: 0/2/1/1 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 0.80 [4/5]

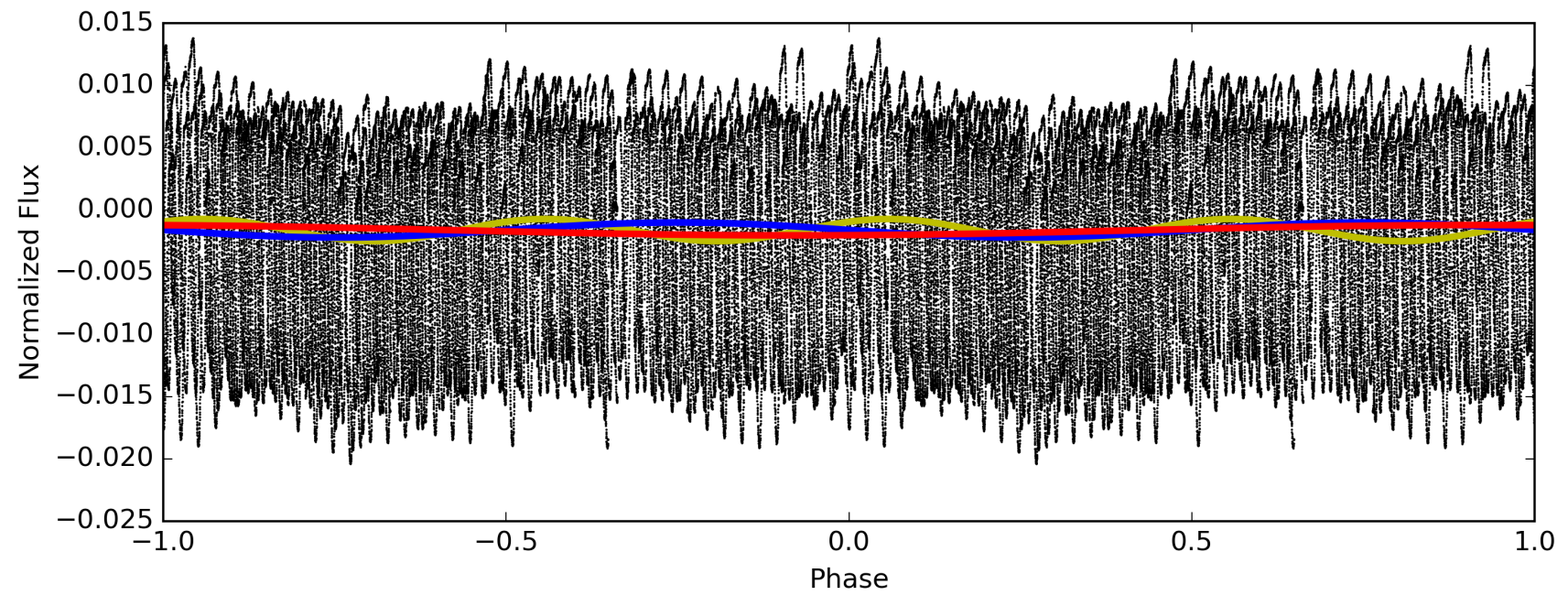
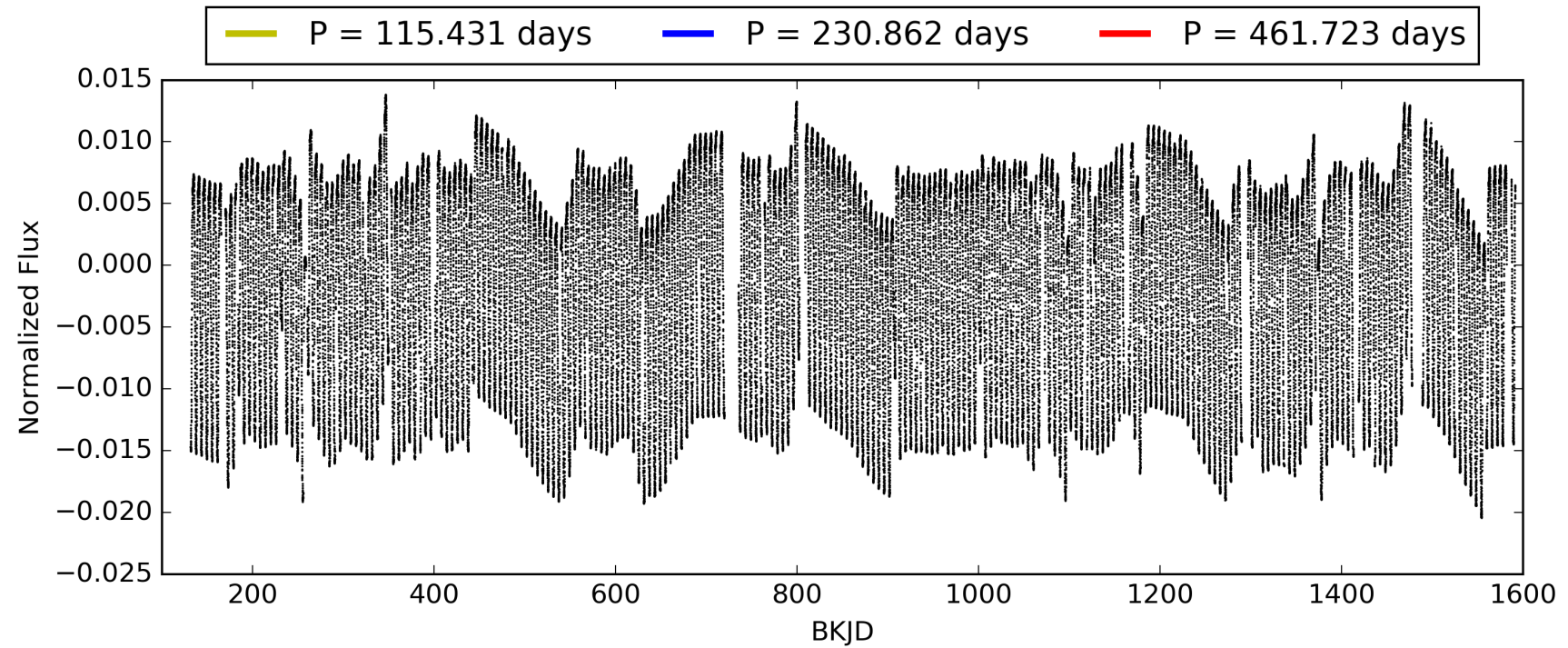
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:19:29 Z

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

TCE 007778838-04, PDC Light Curves

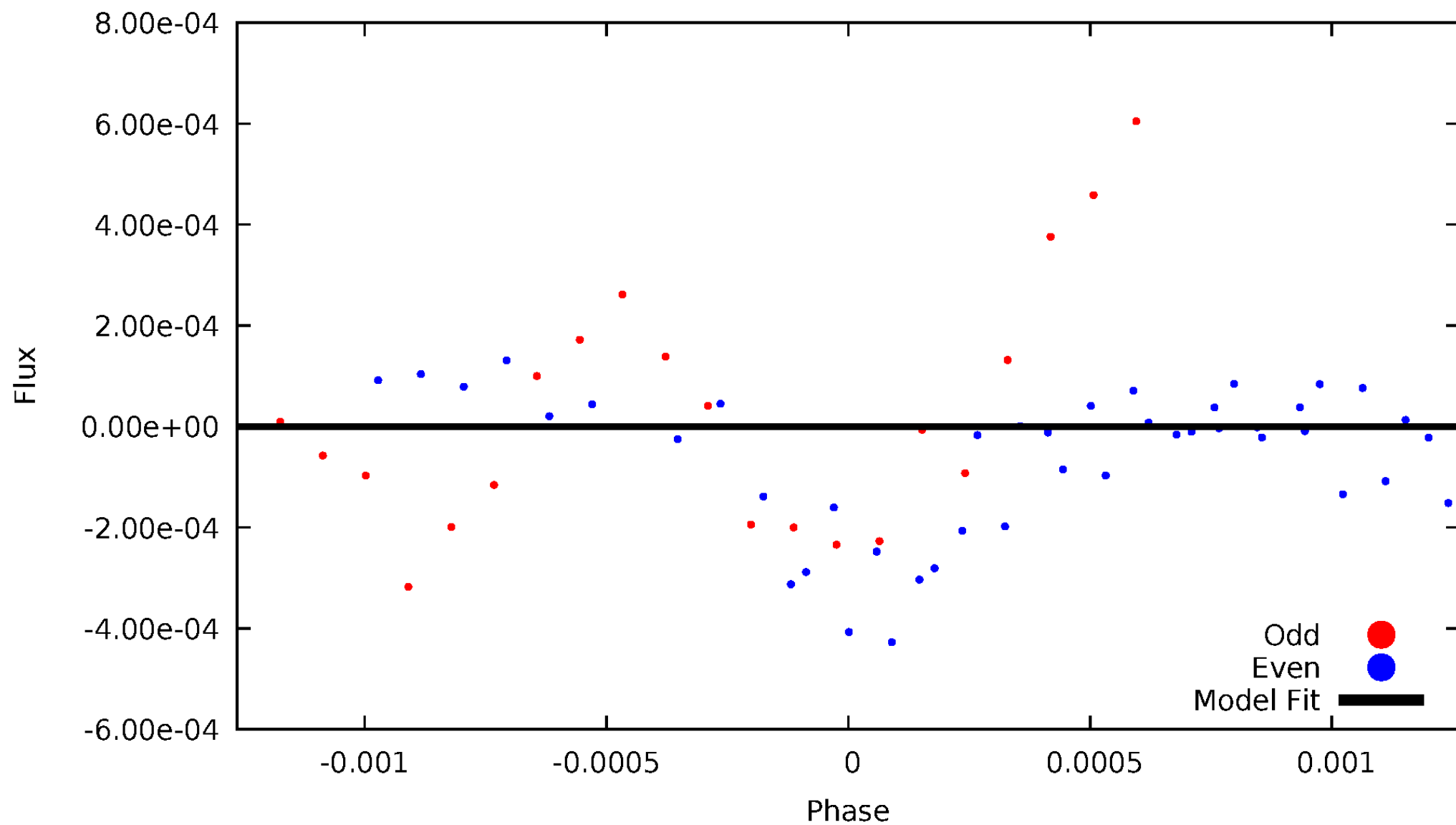


TCE 007778838-04



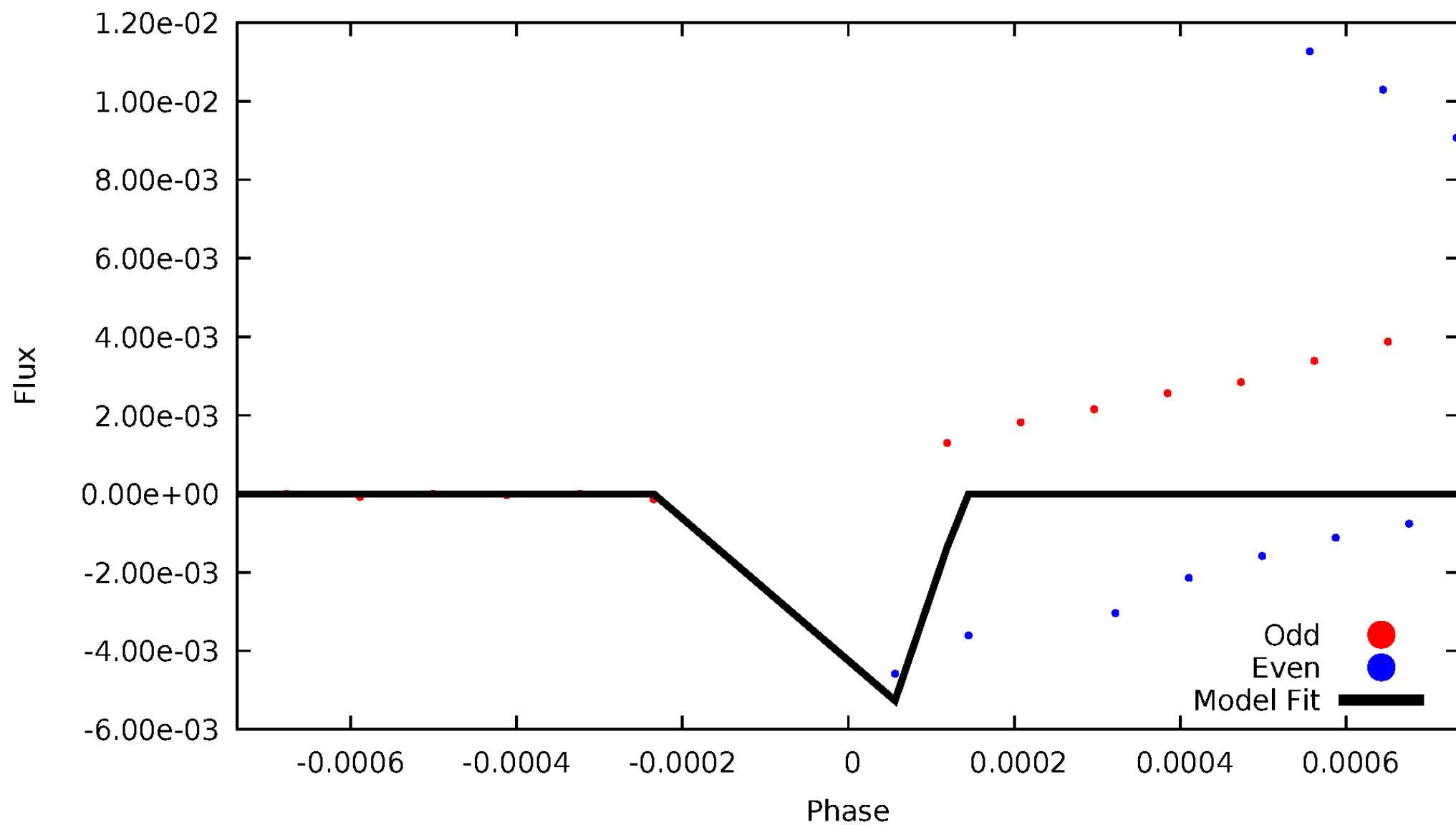
DV Odd/Even

TCE 007778838-04



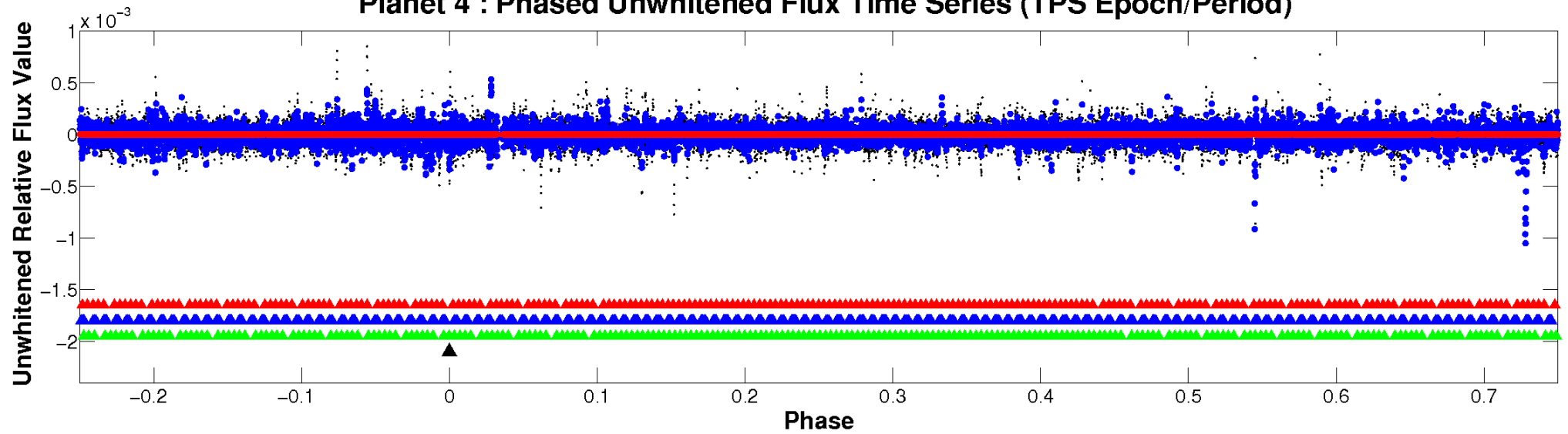
ALT Odd/Even

TCE 007778838-04

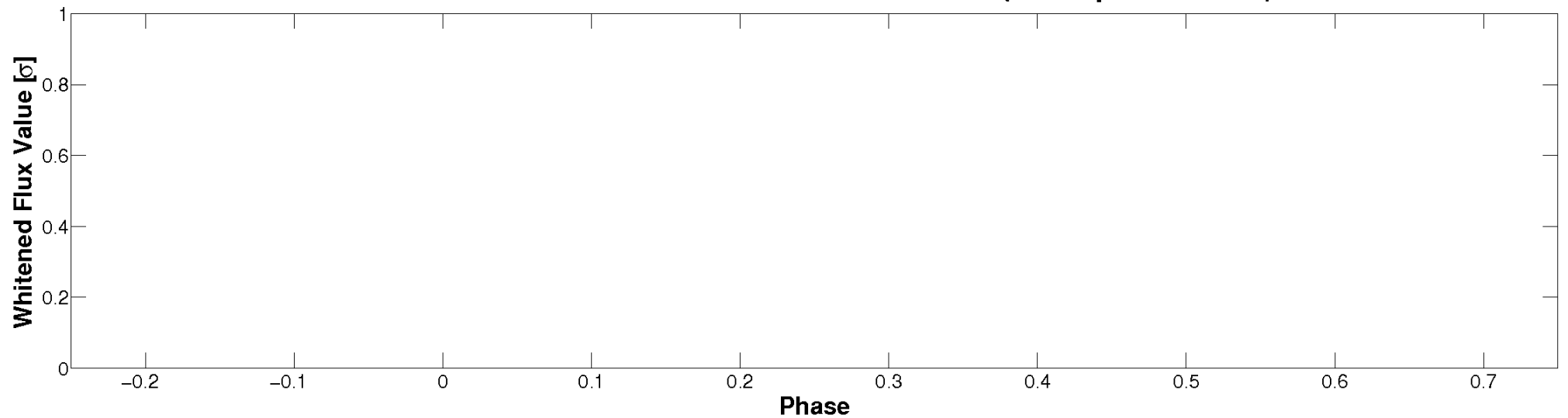


Non-Whitened Vs. Whitened Light Curve

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

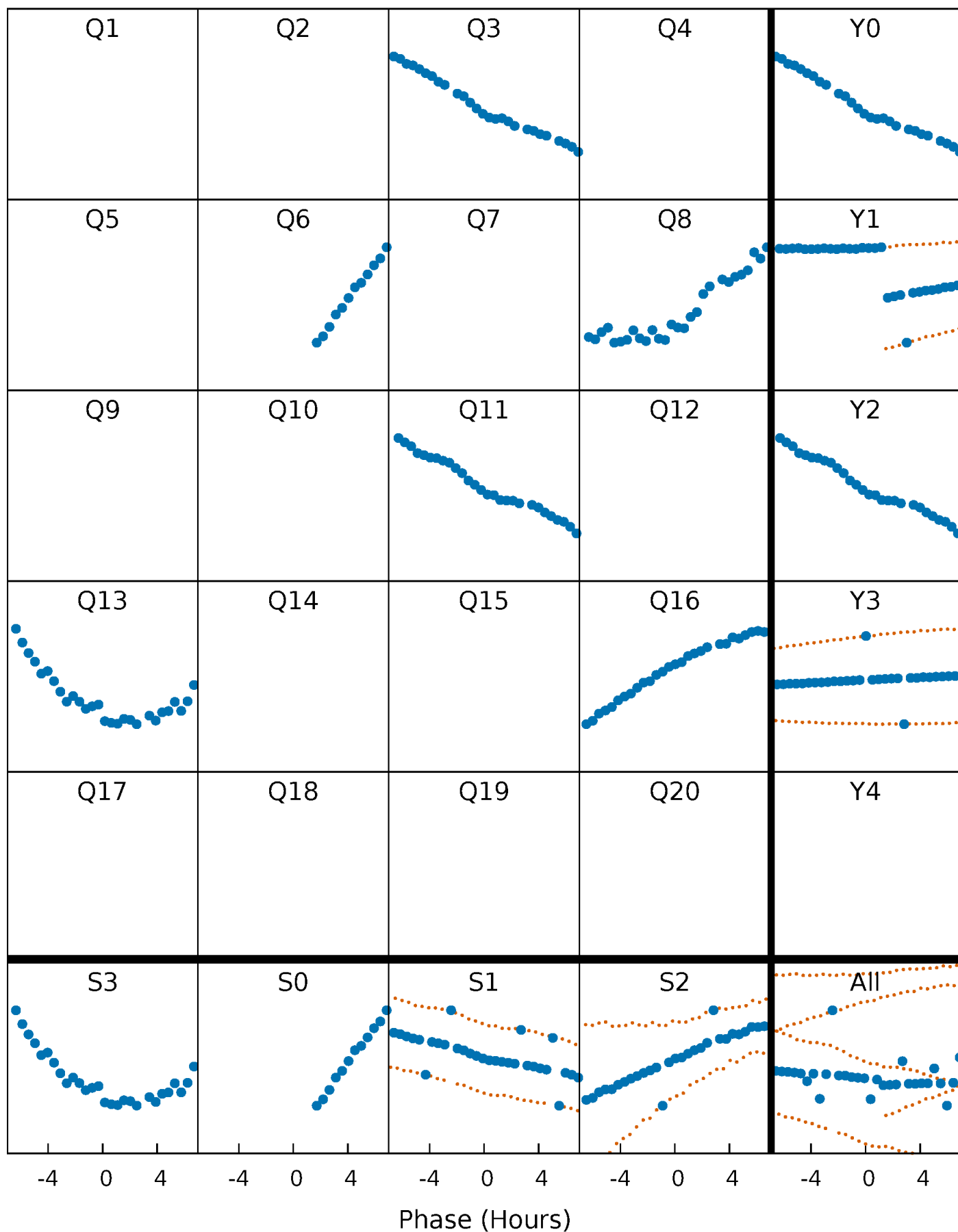


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



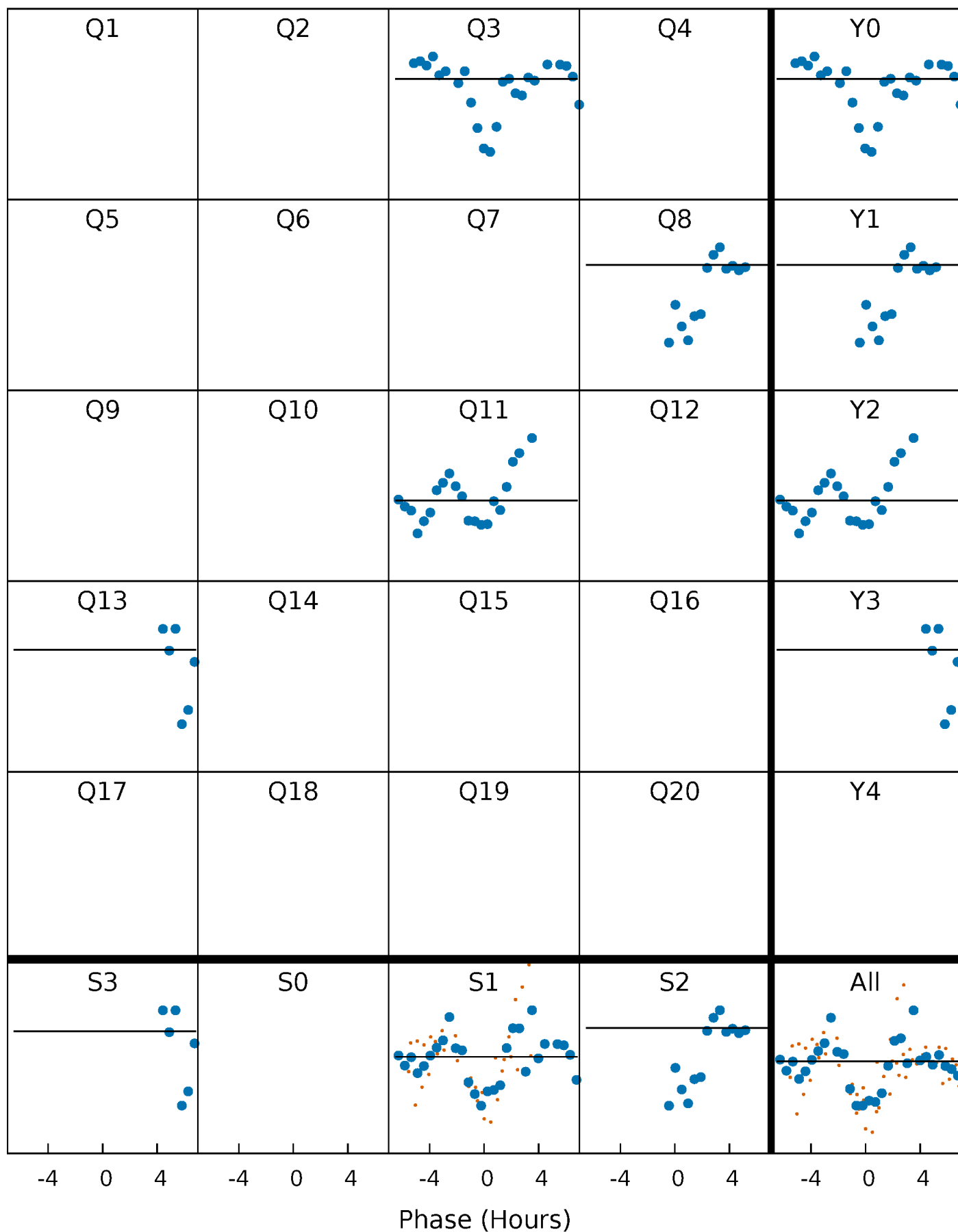
PDC Quarter-Phased Transit Curves

TCE 007778838-04 P=230.861548 Days $T_0=336.480034$ (BKJD)



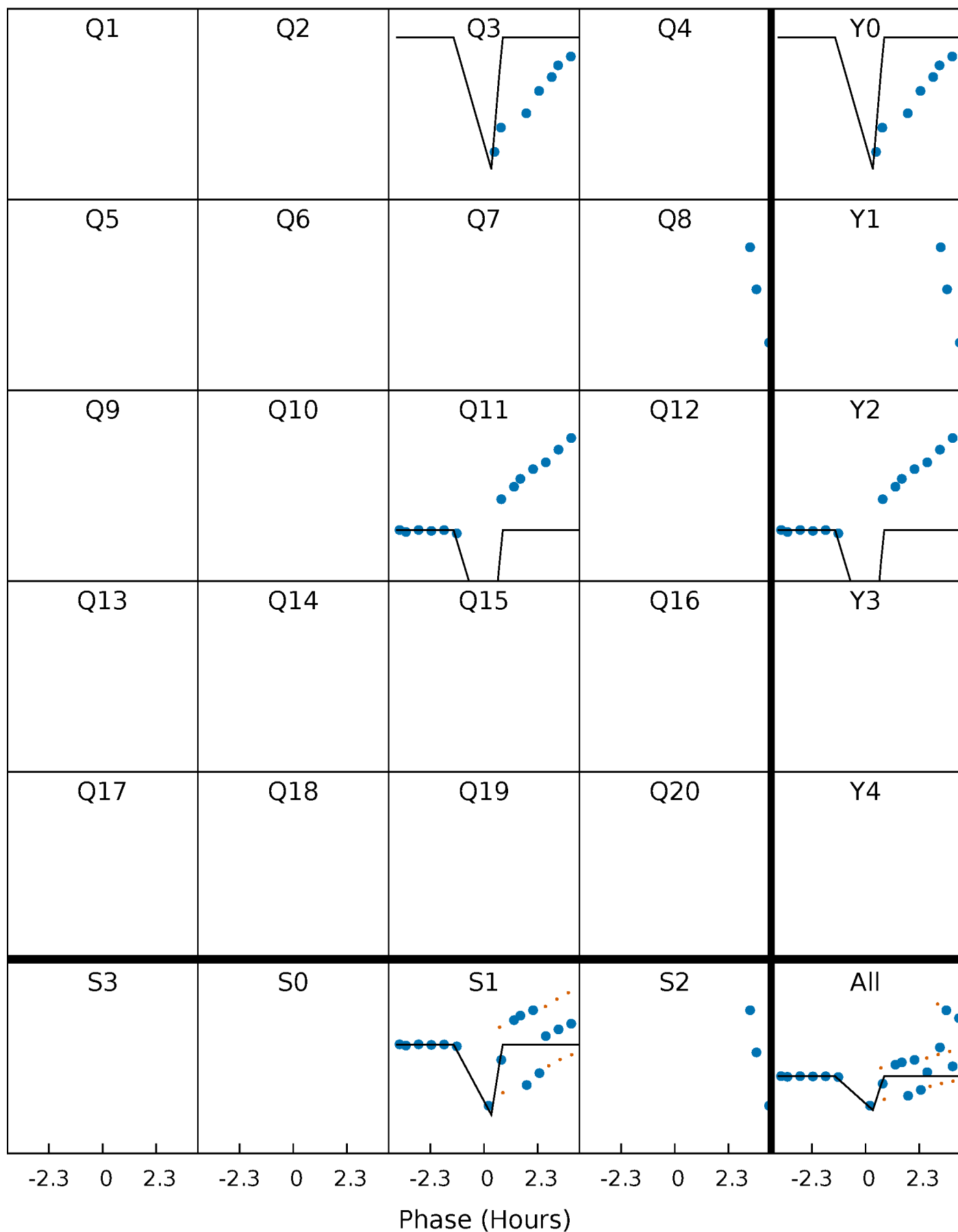
DV Quarter-Phased Transit Curves

TCE 007778838-04 P=230.861548 Days $T_0=336.480034$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

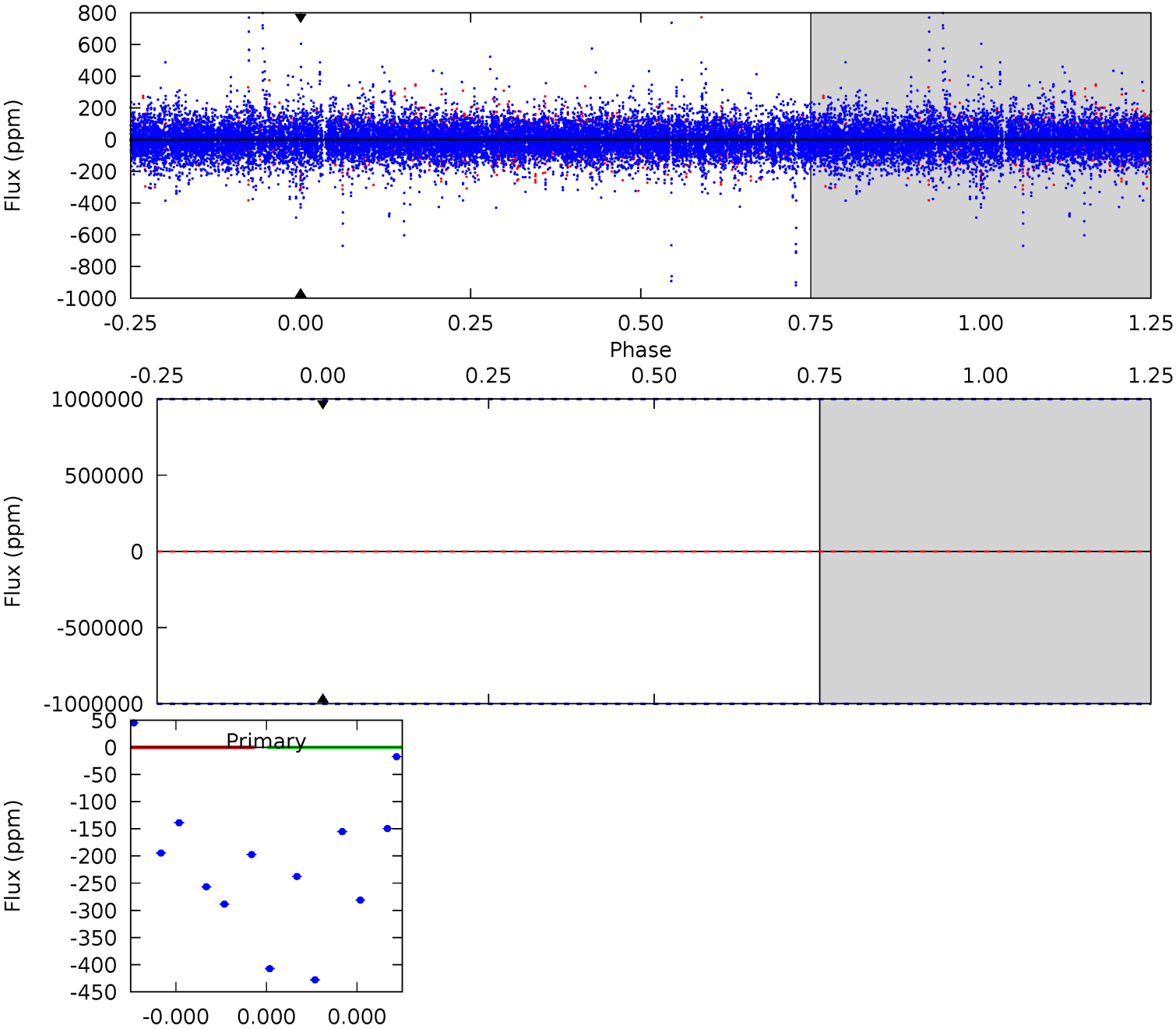
TCE 007778838-04 P=230.861548 Days $T_0=336.324299$ (BKJD)



DV Model-Shift Uniqueness Test

007778838-04, P = 230.861548 Days, E = 105.618486 Days

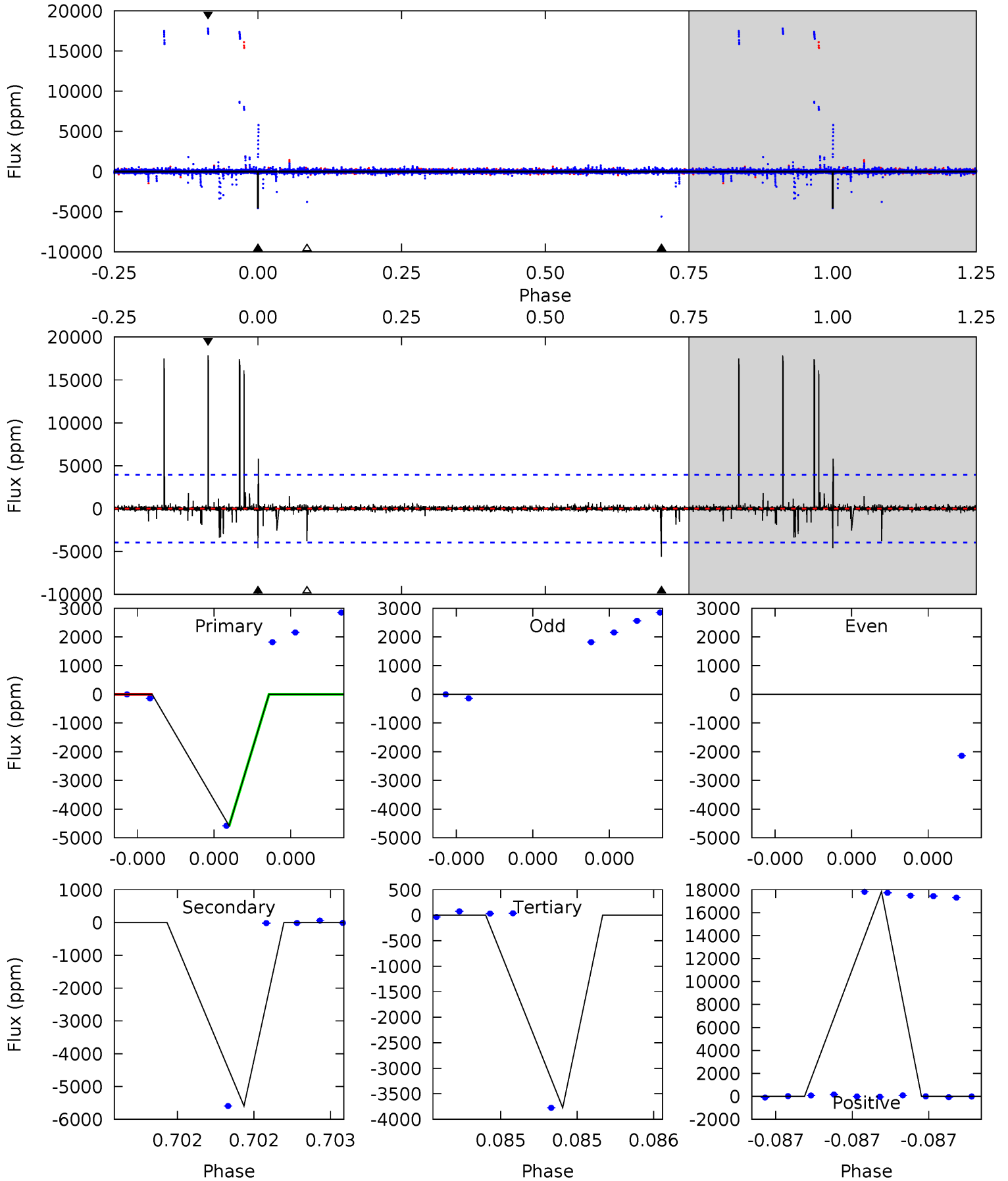
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

007778838-04, P = 230.861548 Days, E = 105.462751 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.55	8.00	5.40	25.5	5.67	3.62	1.00	1.16	-18.9	2.60	-17.5	0	0	0.76	0



Stellar Parameters For KIC 007778838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	11287^{+612}_{-1716}	$3.642^{+0.476}_{-0.084}$	$0.070^{+0.150}_{-0.600}$	$4.662^{+0.447}_{-2.385}$	$3.471^{+0.069}_{-1.164}$	$0.048^{+0.248}_{-0.013}$
	+5%/-15%	+13%/-2%	+214%/-857%	+10%/-51%	+2%/-34%	+514%/-27%
Source	KIC0	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 007778838-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$34.07^{+35.91}_{-23.59}$	1322^{+164}_{-223}	$-5697^{+116328}_{-77049}$	$-491.946^{+130217.860}_{-97090.921}$
Alt.	-5594 ± 699	$49.00^{+44.51}_{-33.07}$	1335^{+167}_{-232}	8331^{+12867}_{-2356}	1526^{+12221}_{-1087}

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 $A_{obs} \gg 1.0$

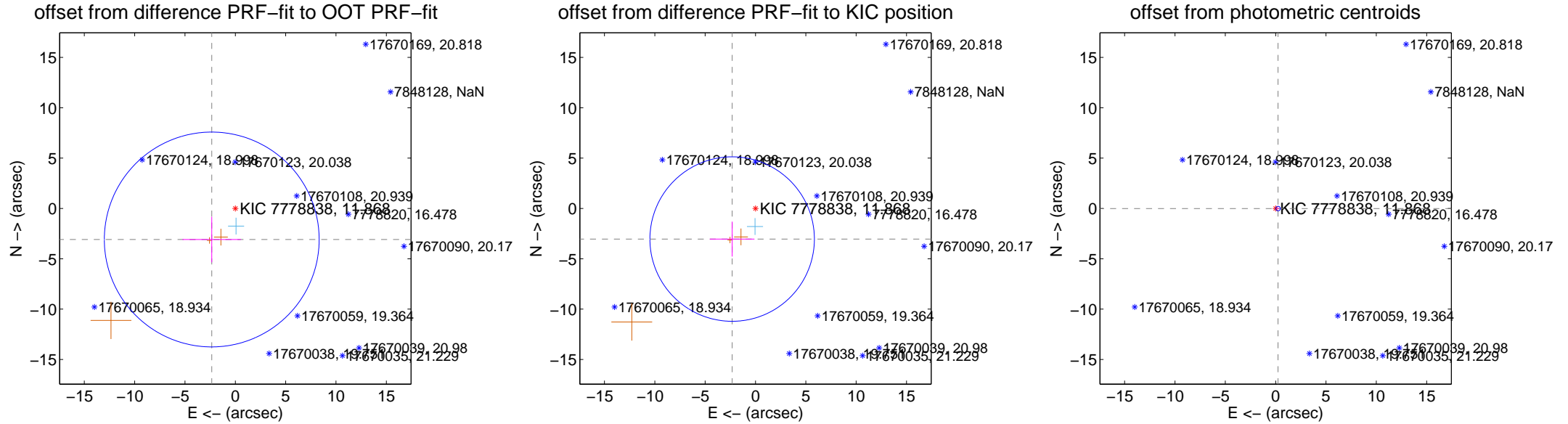
DV Centroid Data

Supplemental centroid analysis for 007778838-04. **Kepler magnitude: 11.87.** Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

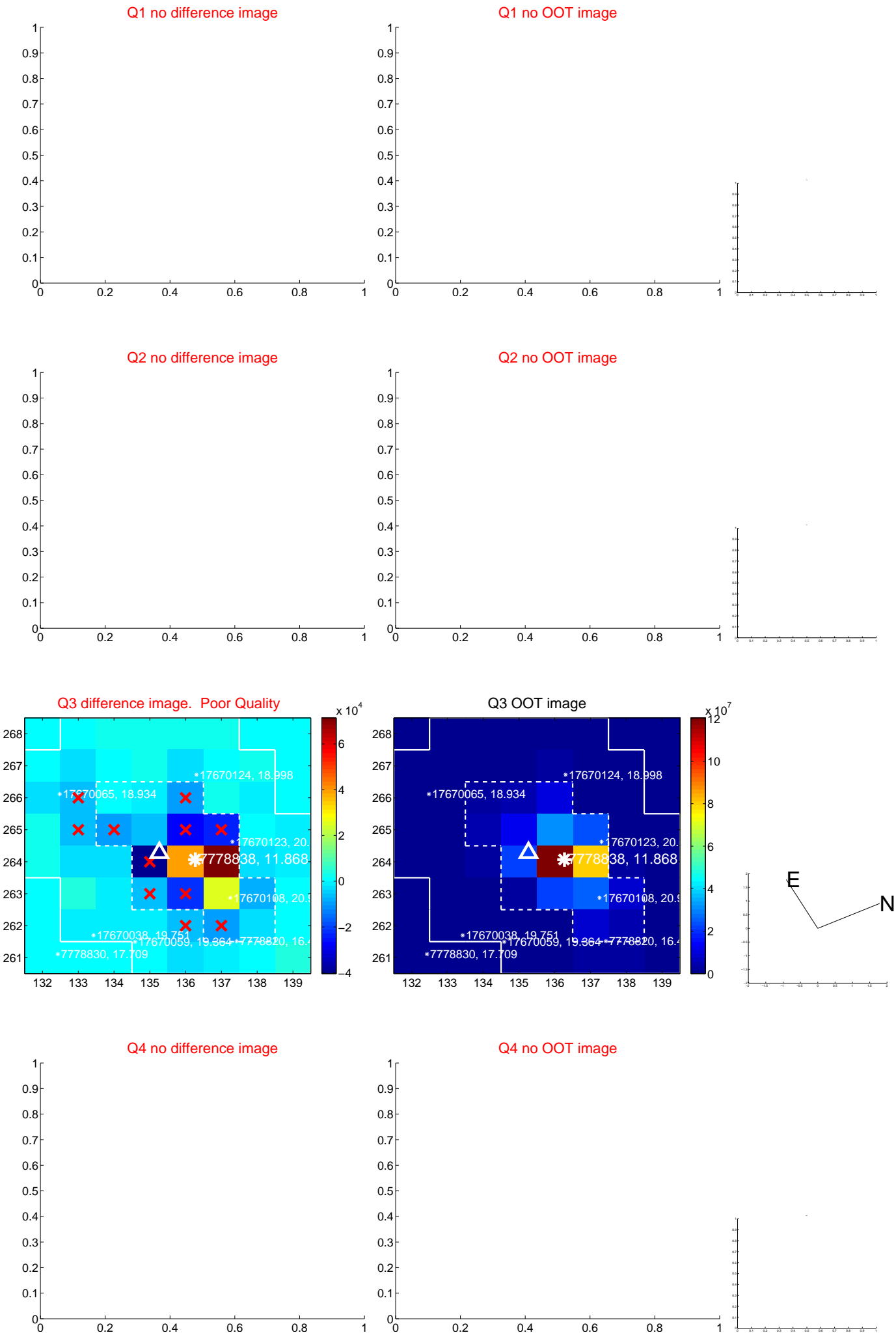
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.874 ± 3.557	1.09	2.344 ± 2.902	-3.084 ± 2.264
PRF-fit source offset from KIC position	3.824 ± 2.723	1.40	2.319 ± 2.219	-3.041 ± 1.735
photometric centroid source offset	0.24 ± 0.08	3.18	-0.24 ± 0.08	-0.01 ± 0.05



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.

Q5 no difference image



Q5 no OOT image



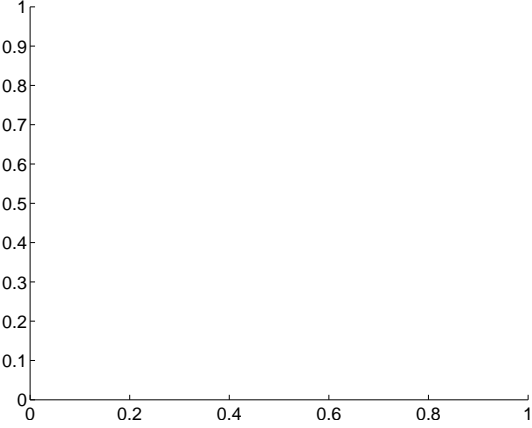
Q6 no difference image



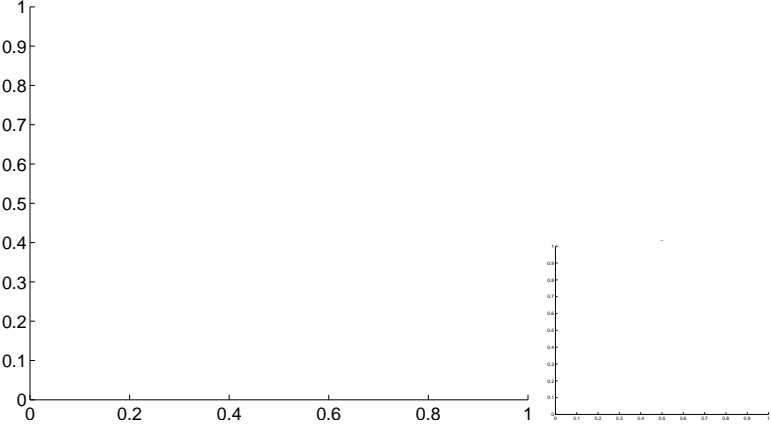
Q6 no OOT image



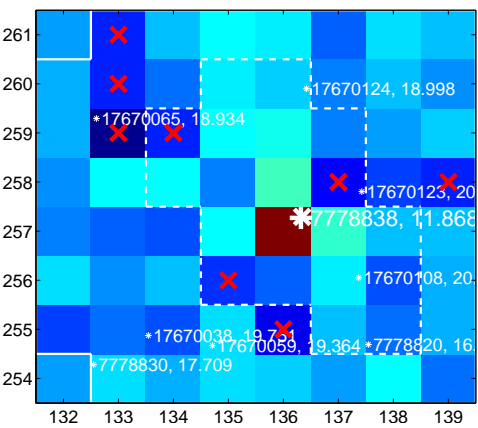
Q7 no difference image



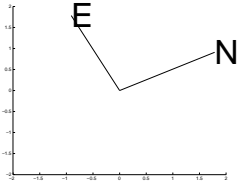
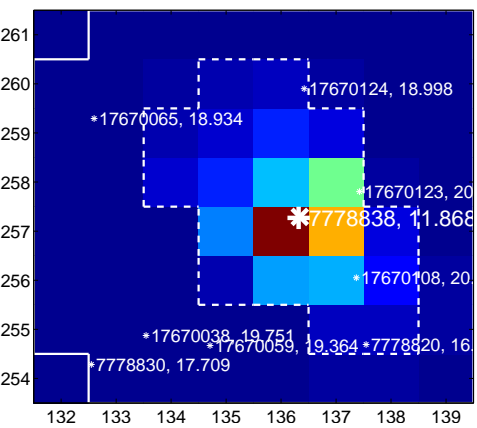
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image



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

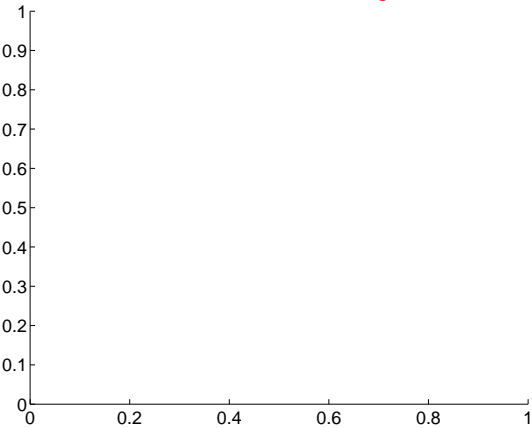
Q9 no difference image



Q9 no OOT image



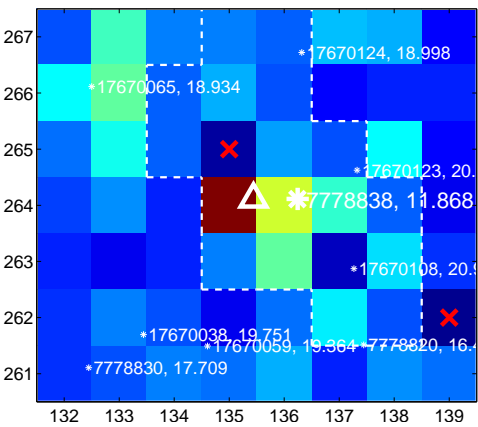
Q10 no difference image



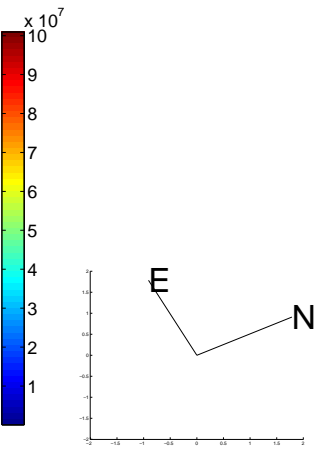
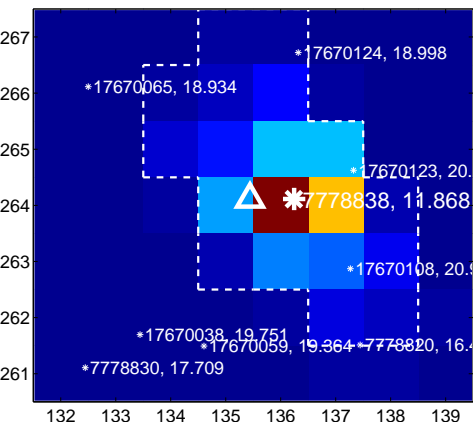
Q10 no OOT image



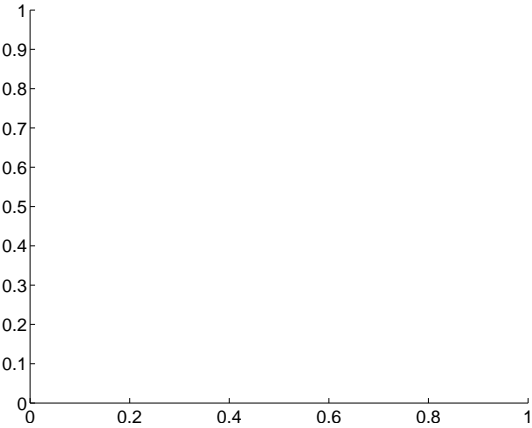
Q11 difference image. Poor Quality



Q11 OOT image



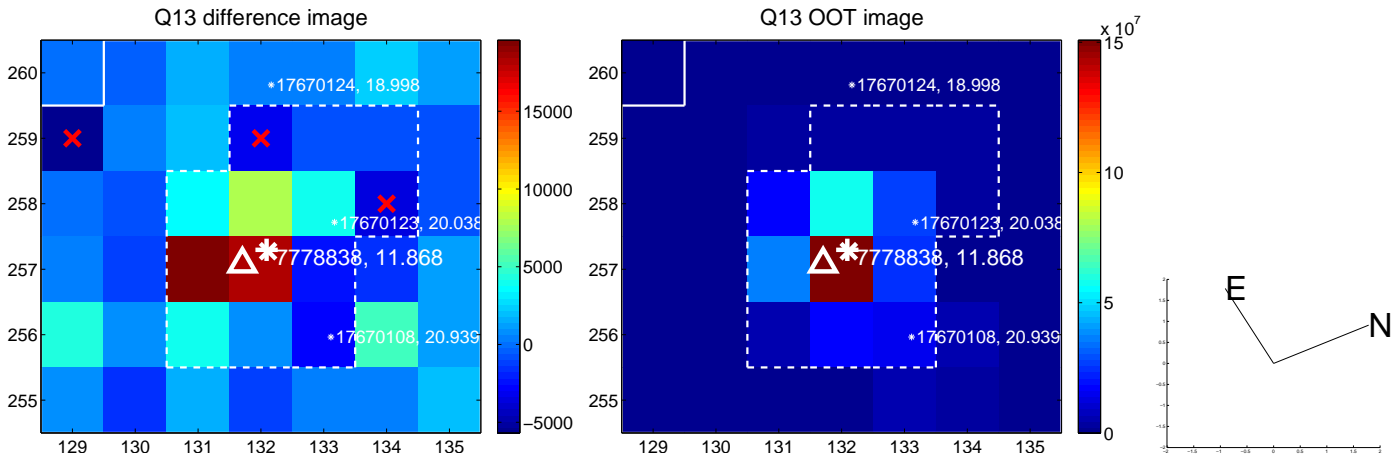
Q12 no difference image



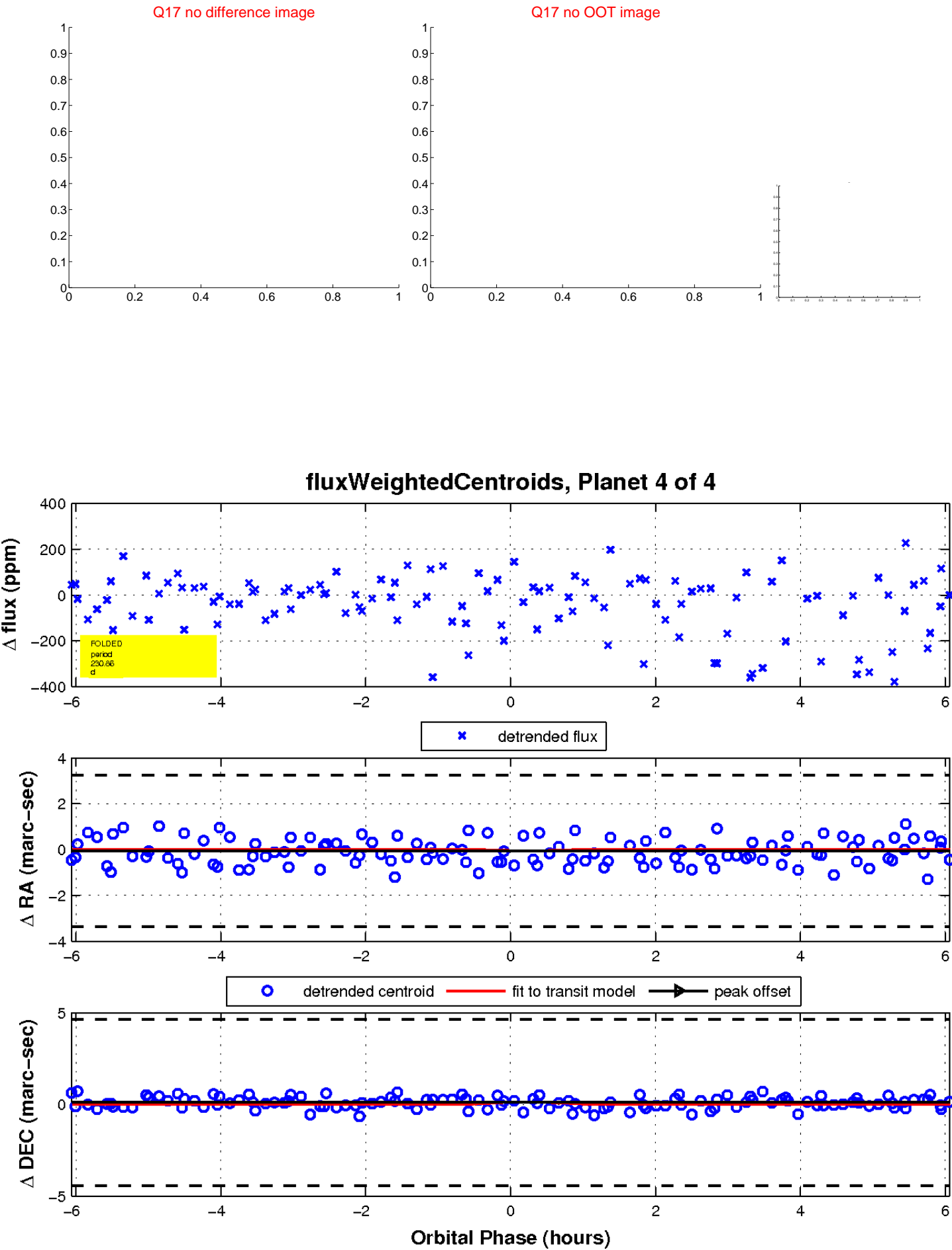
Q12 no OOT image



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



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



UKIRT Image

Declination

