

KIC 006720889

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})
006720889-01	OBS	No	0.817321	131.853453	47.3	2.860	9.2	8.5	1.36	6763	1.06	10065.46
006720889-02	OBS	No	1.489258	132.110336	95.6	3.721	10.0	10.2	1.36	6763	1.56	4522.70
006720889-03	OBS	No	249.773187	251.576219	1313.1	4.841	9.2	9.8	1.36	6763	8.10	4.89
006720889-04	OBS	No	281.044431	141.993349	1360.7	5.998	8.2	8.7	1.36	6763	6.23	4.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006720889-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
006720889-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
006720889-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006720889-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS

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

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

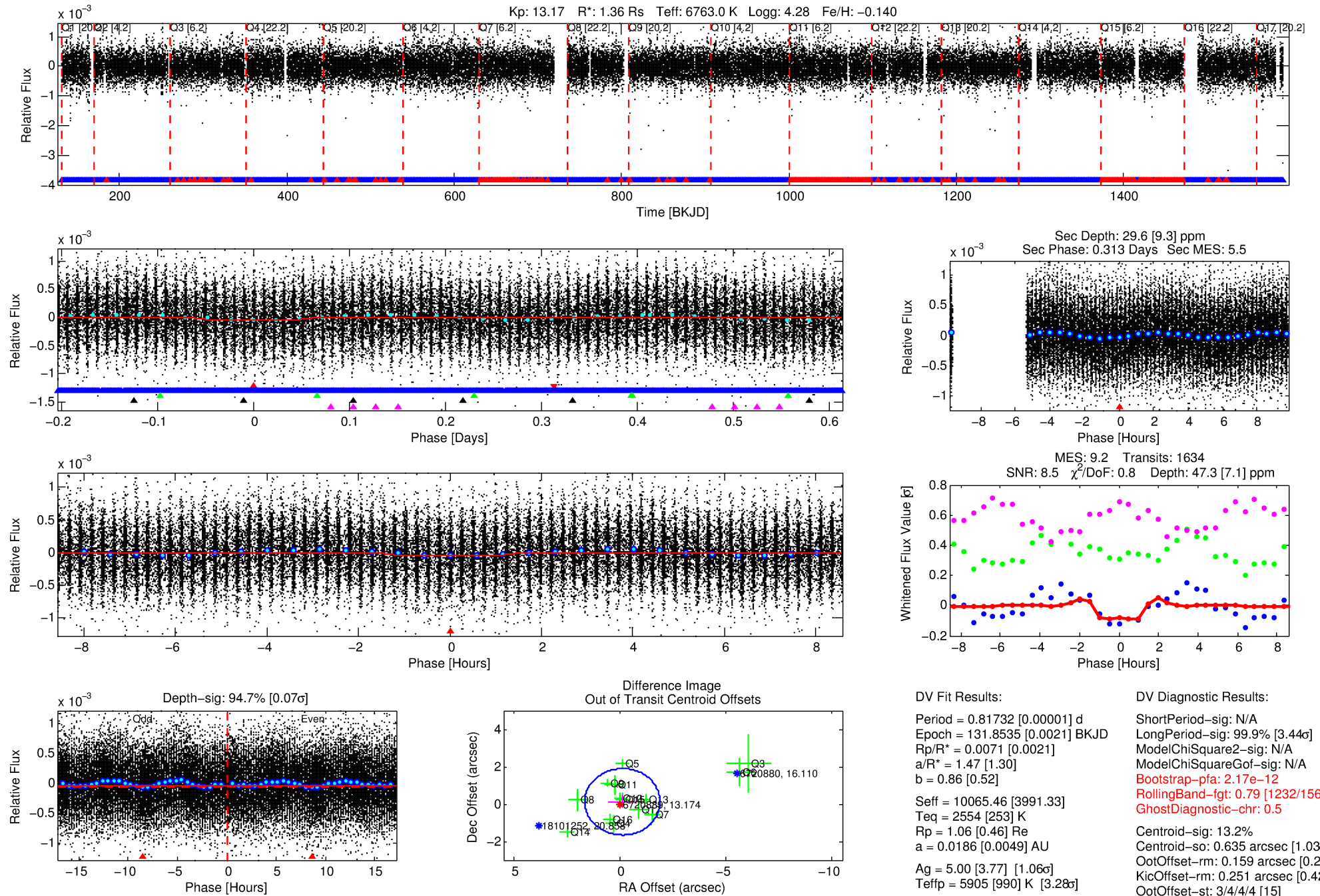
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006720889-01

No Significant Match Found

DV One-Page Summary

KIC: 6720889 Candidate: 1 of 5 Period: 0.817 d



DV Fit Results:

Period = 0.81732 [0.00001] d
Epoch = 131.8535 [0.0021] BKJD
Rp/R* = 0.0071 [0.0021]
a/R* = 1.47 [1.30]
b = 0.86 [0.52]
Seff = 10065.46 [3991.33]
Teff = 2554 [253] K
Rp = 1.06 [0.46] Re
a = 0.0186 [0.0049] AU
Ag = 5.00 [3.77] [1.06σ]
Teffp = 5905 [990] K [3.28σ]

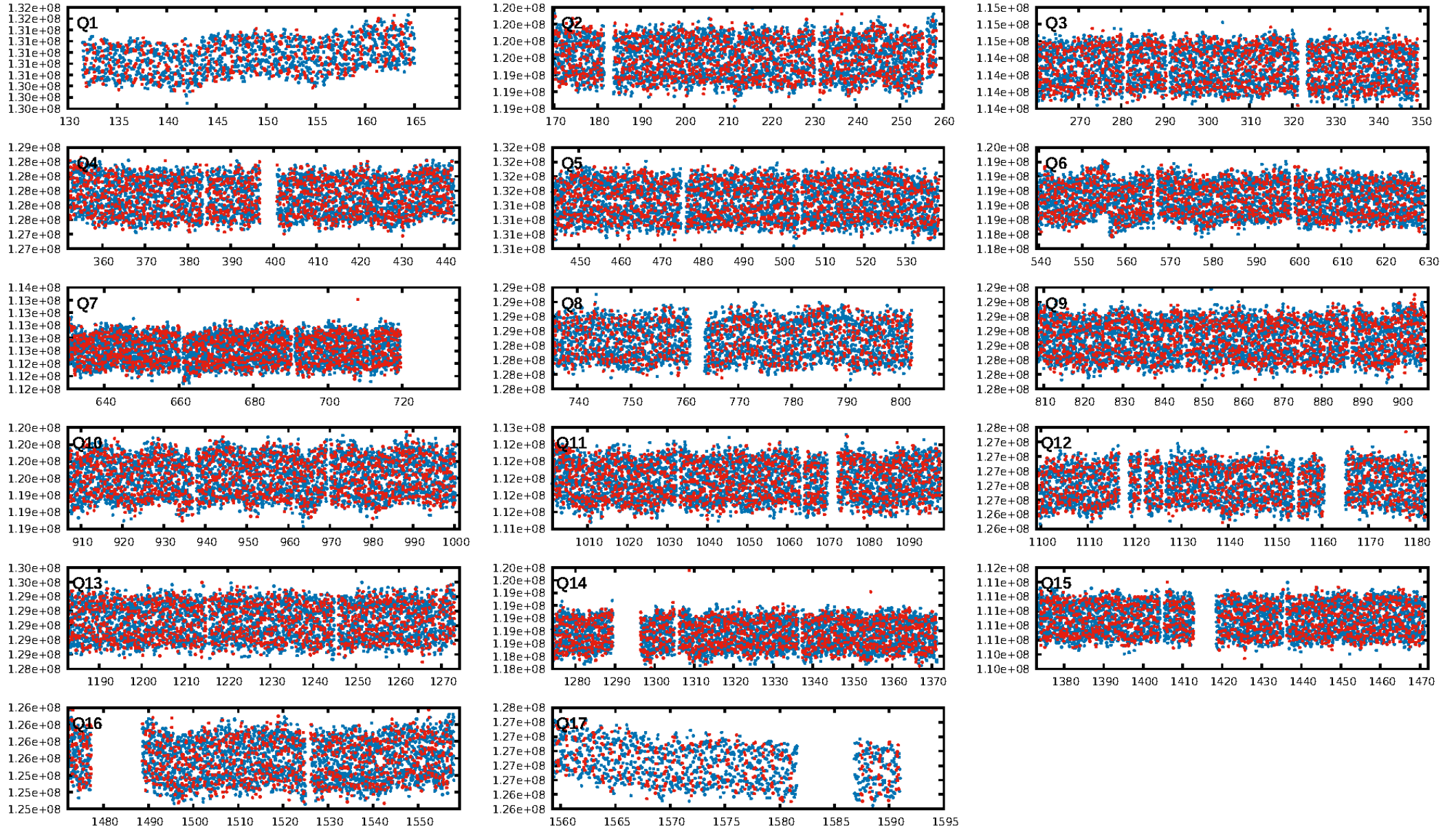
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 99.9% [3.44σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.17e-12
RollingBand-fgt: 0.79 [1232/1561]
GhostDiagnostic-chr: 0.5
Centroid-sig: 13.2%
Centroid-so: 0.635 arcsec [1.03σ]
OotOffset-rm: 0.159 arcsec [0.27σ]
KicOffset-rm: 0.251 arcsec [0.42σ]
OotOffset-st: 3/4/4/4 [15]
KicOffset-st: 3/4/4/4 [15]
DiffImageQuality-fgm: 0.73 [11/15]
DiffImageOverlap-fno: 1.00 [17/17]

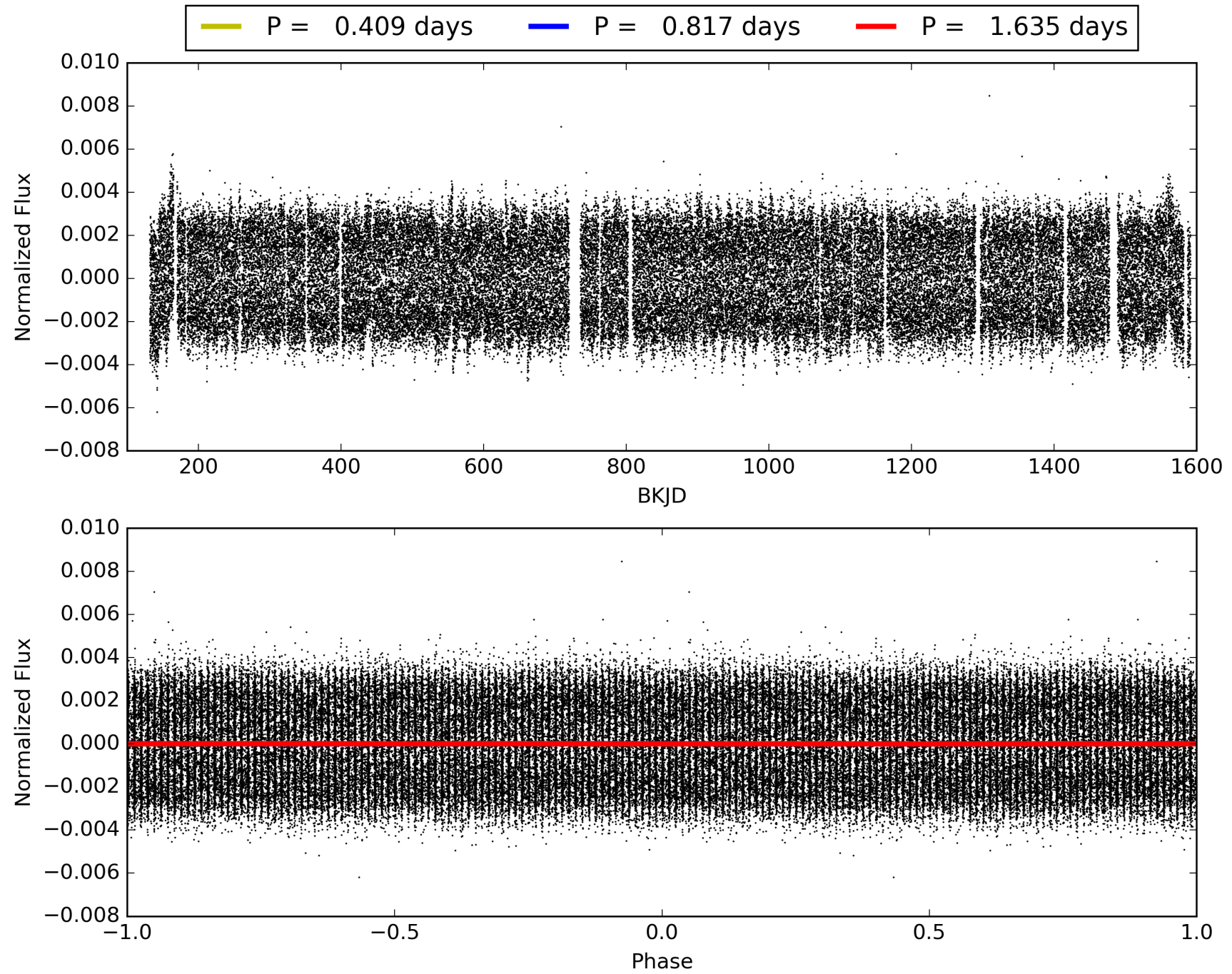
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:03:41 Z

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

TCE 006720889-01, PDC Light Curves

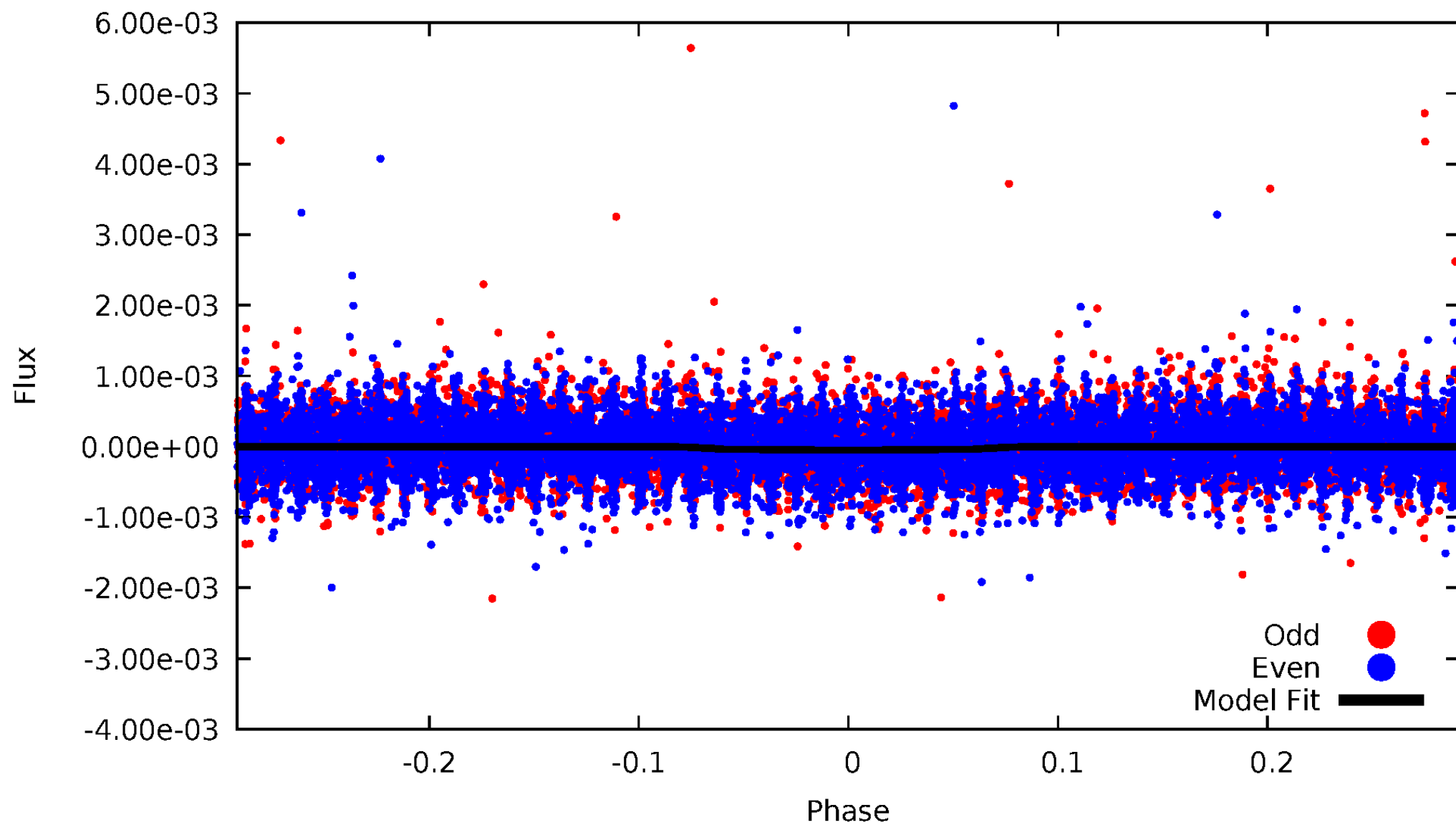


TCE 006720889-01



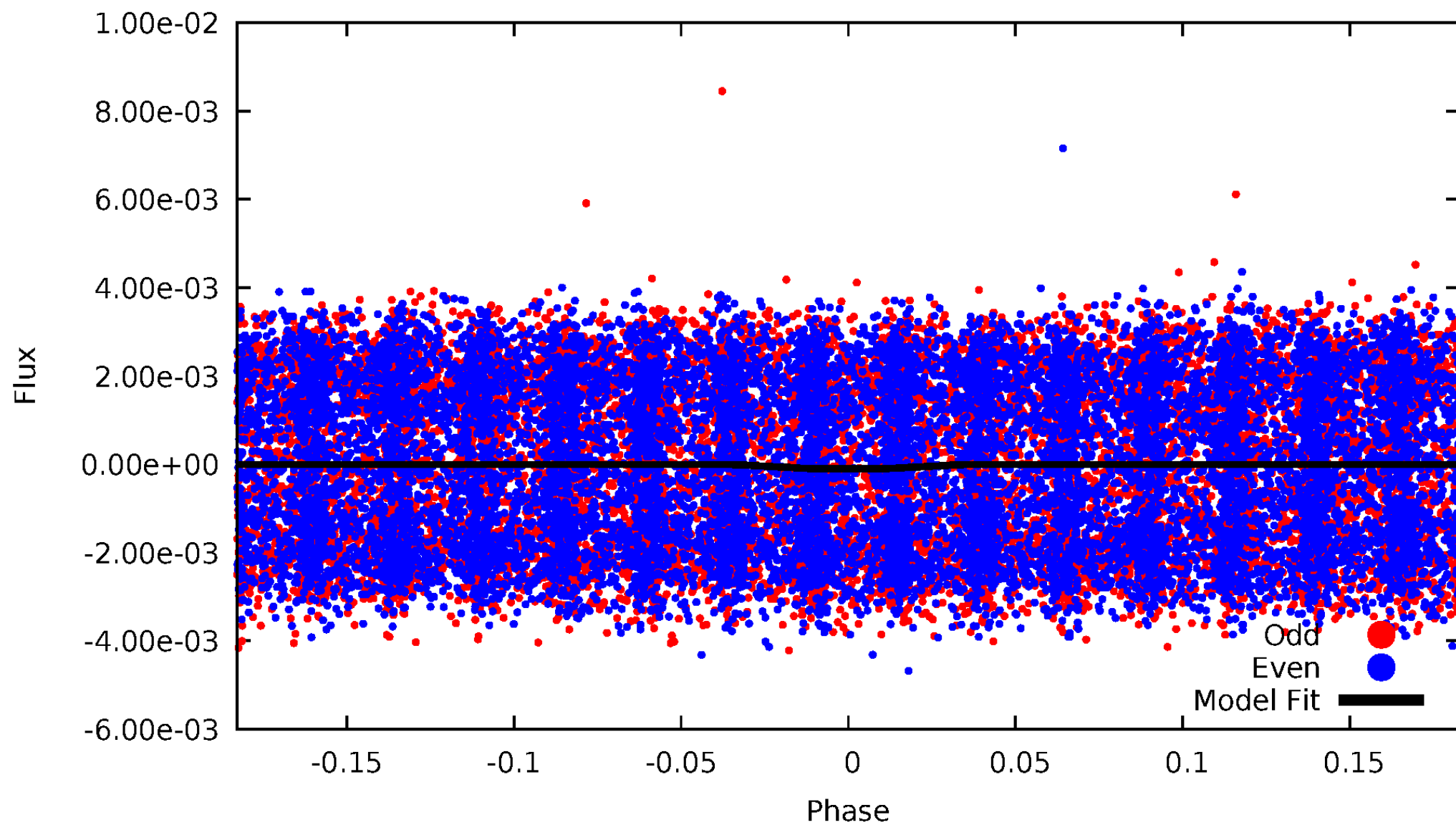
DV Odd/Even

TCE 006720889-01

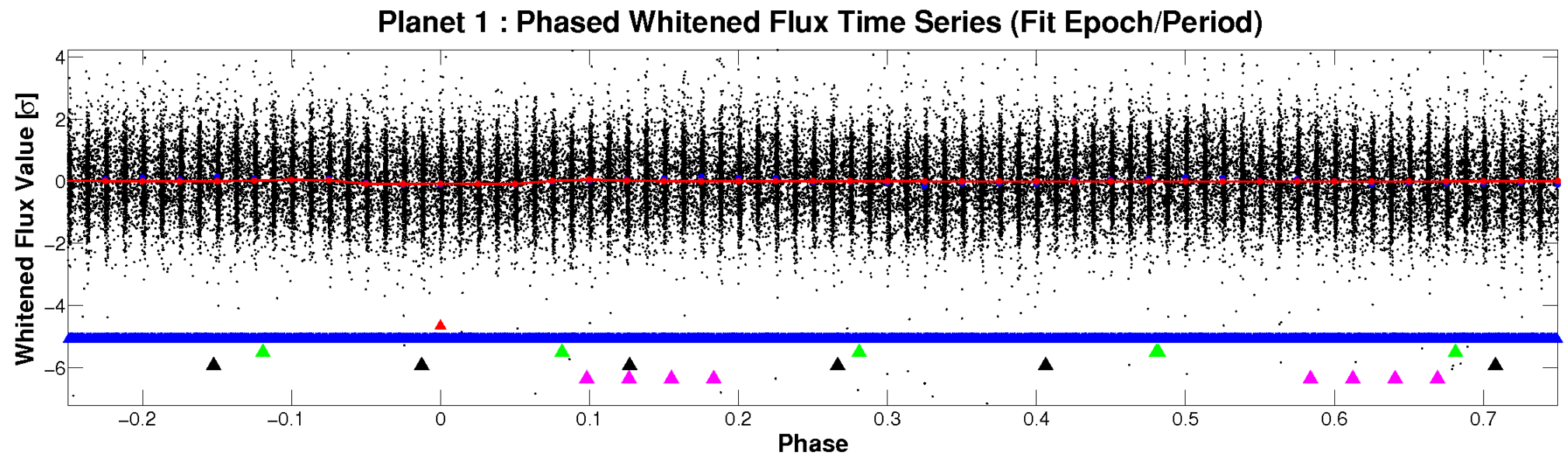
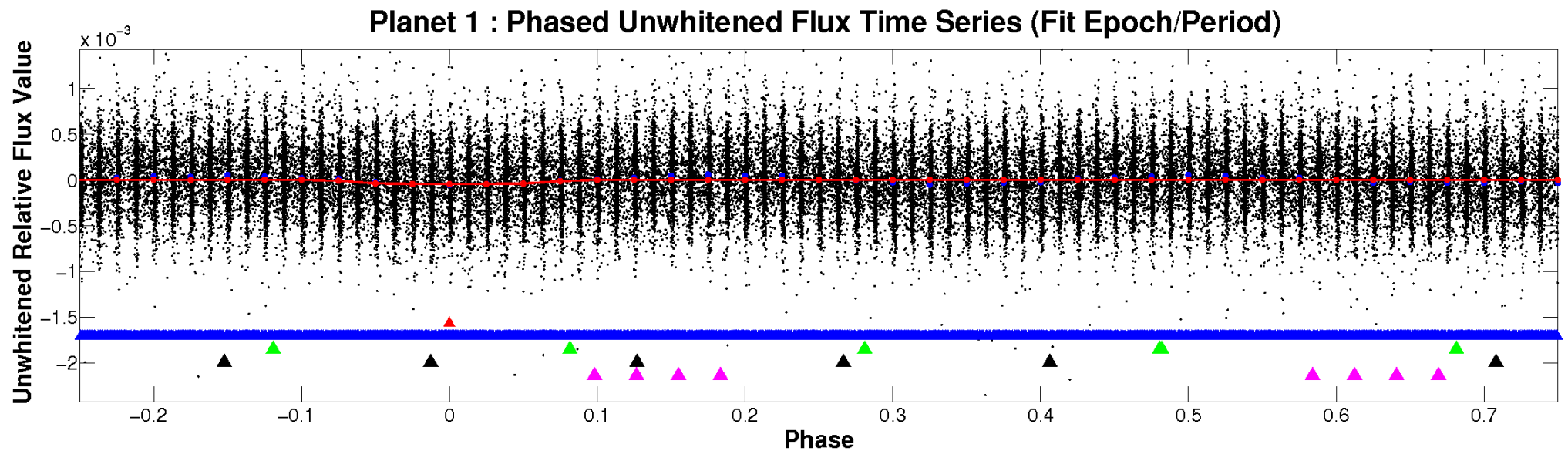


ALT Odd/Even

TCE 006720889-01

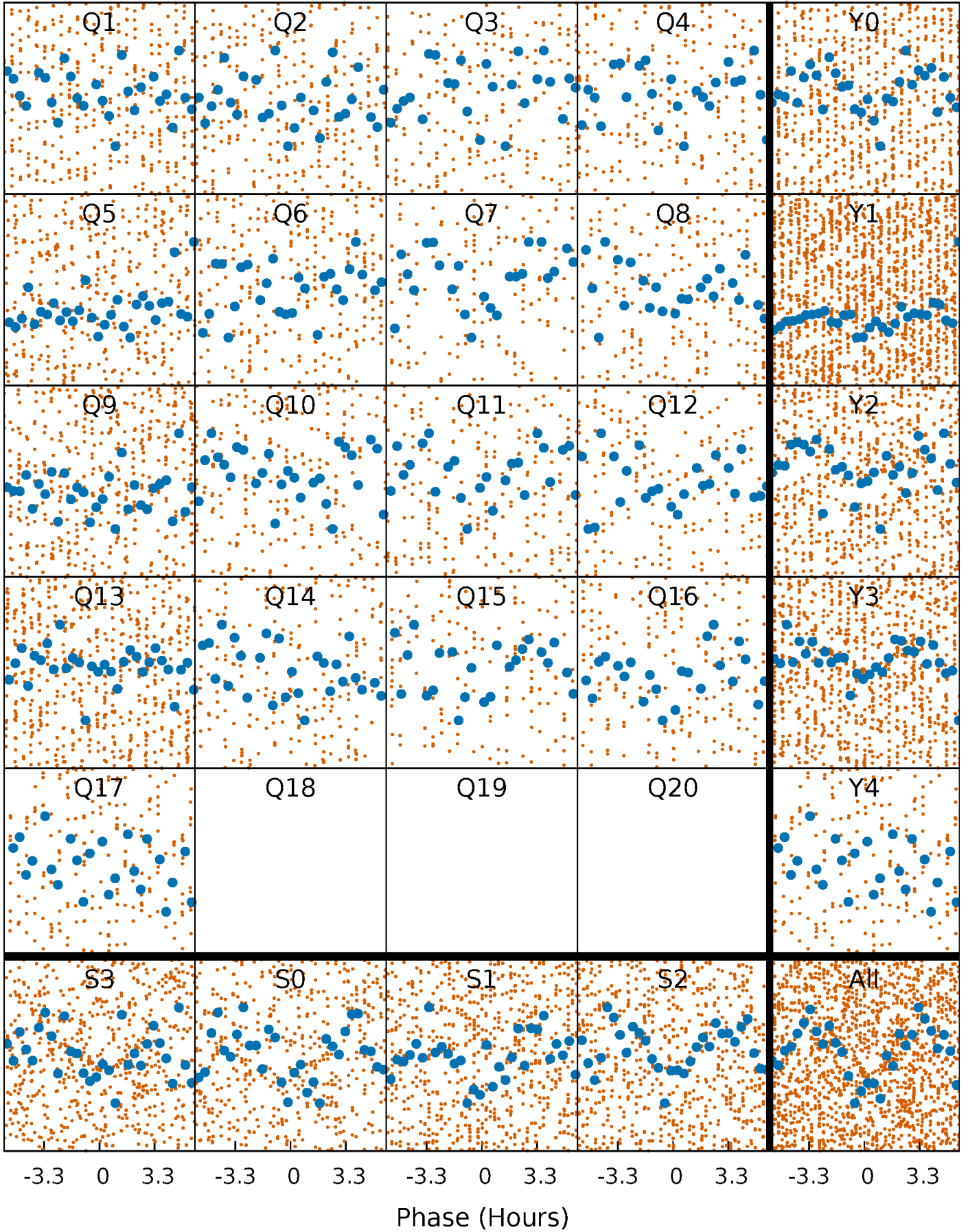


Non-Whitened Vs. Whitened Light Curve



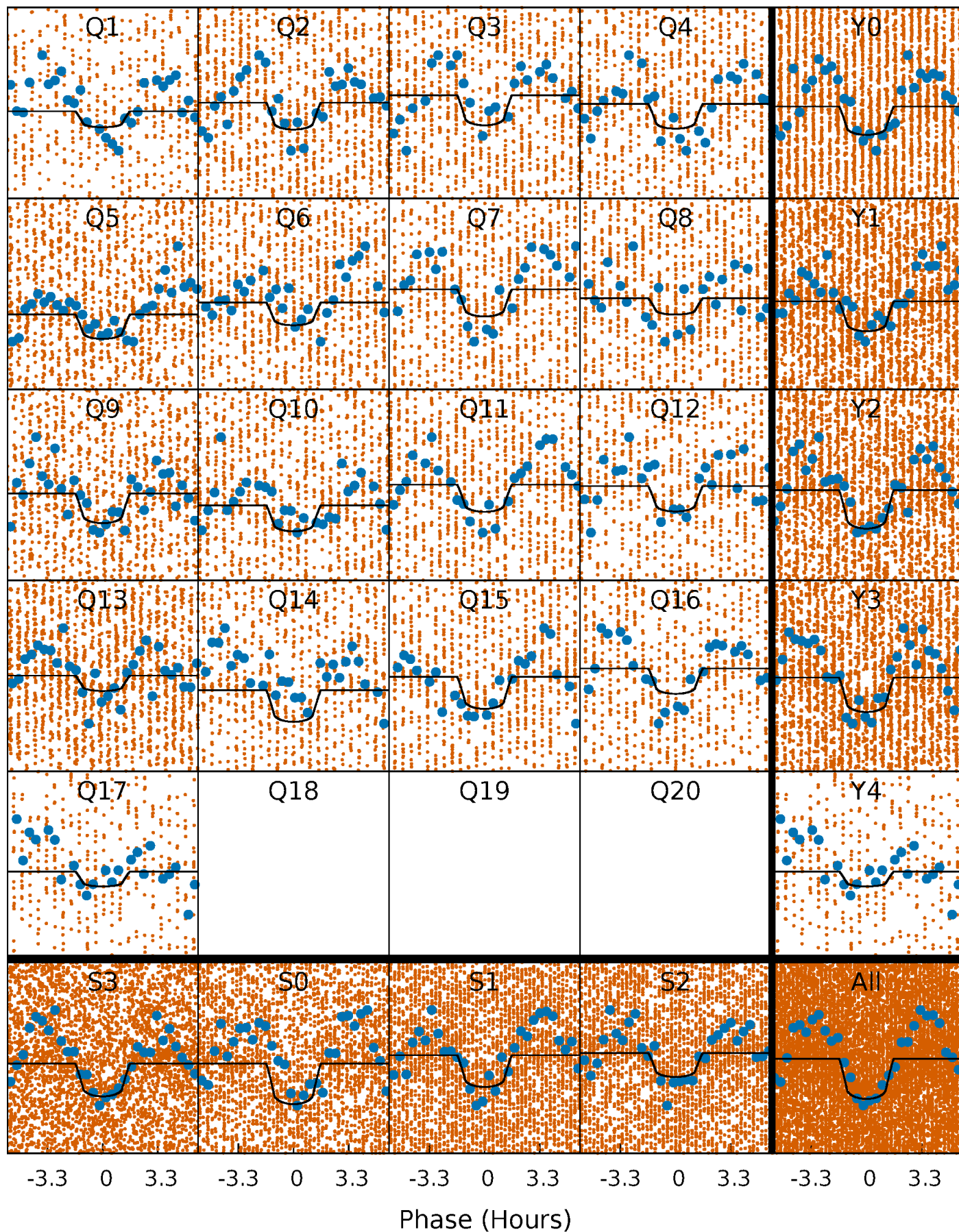
PDC Quarter-Phased Transit Curves

TCE 006720889-01 P= 0.817321 Days $T_0=131.853453$ (BKJD)



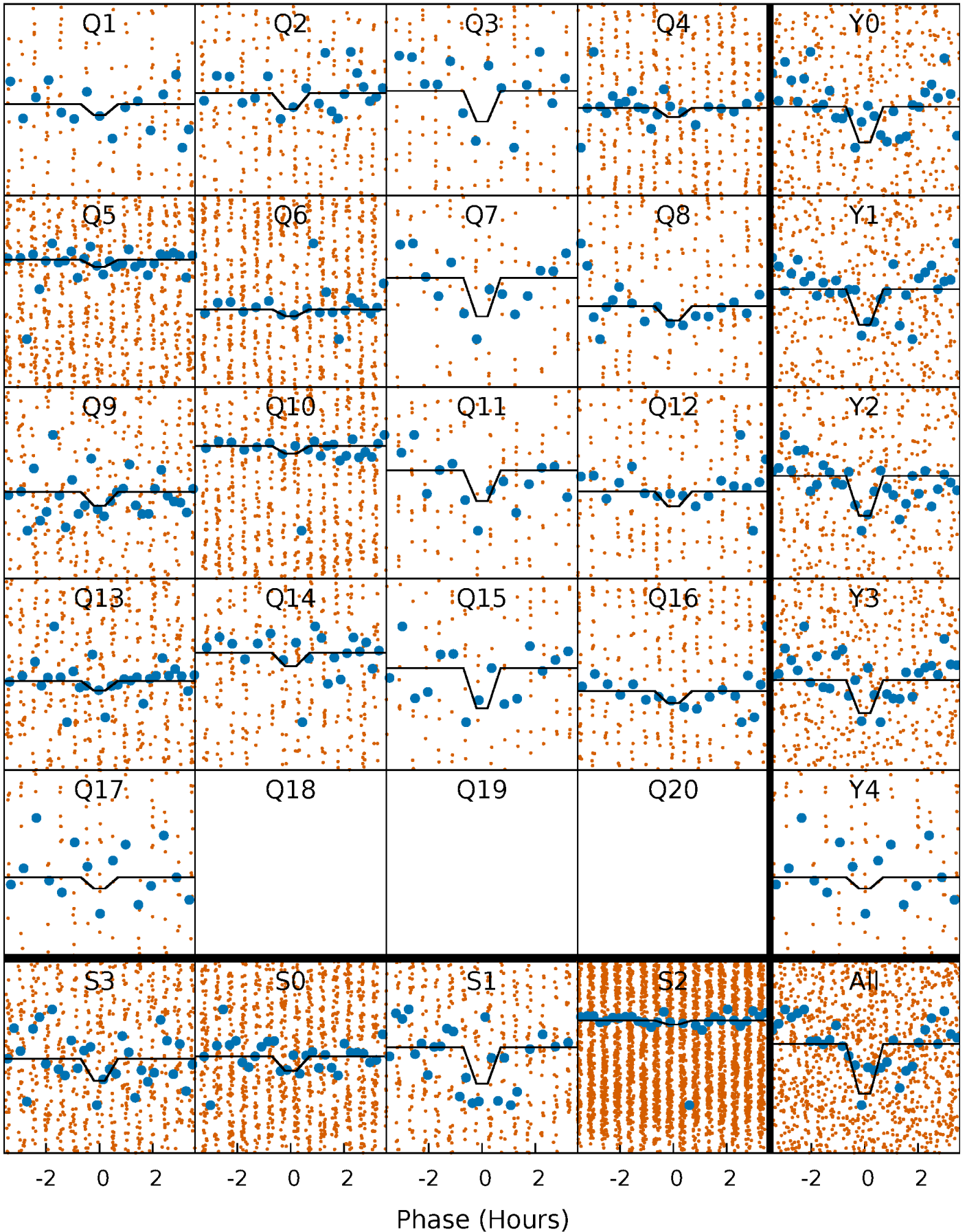
DV Quarter-Phased Transit Curves

TCE 006720889-01 P= 0.817321 Days $T_0=131.853453$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

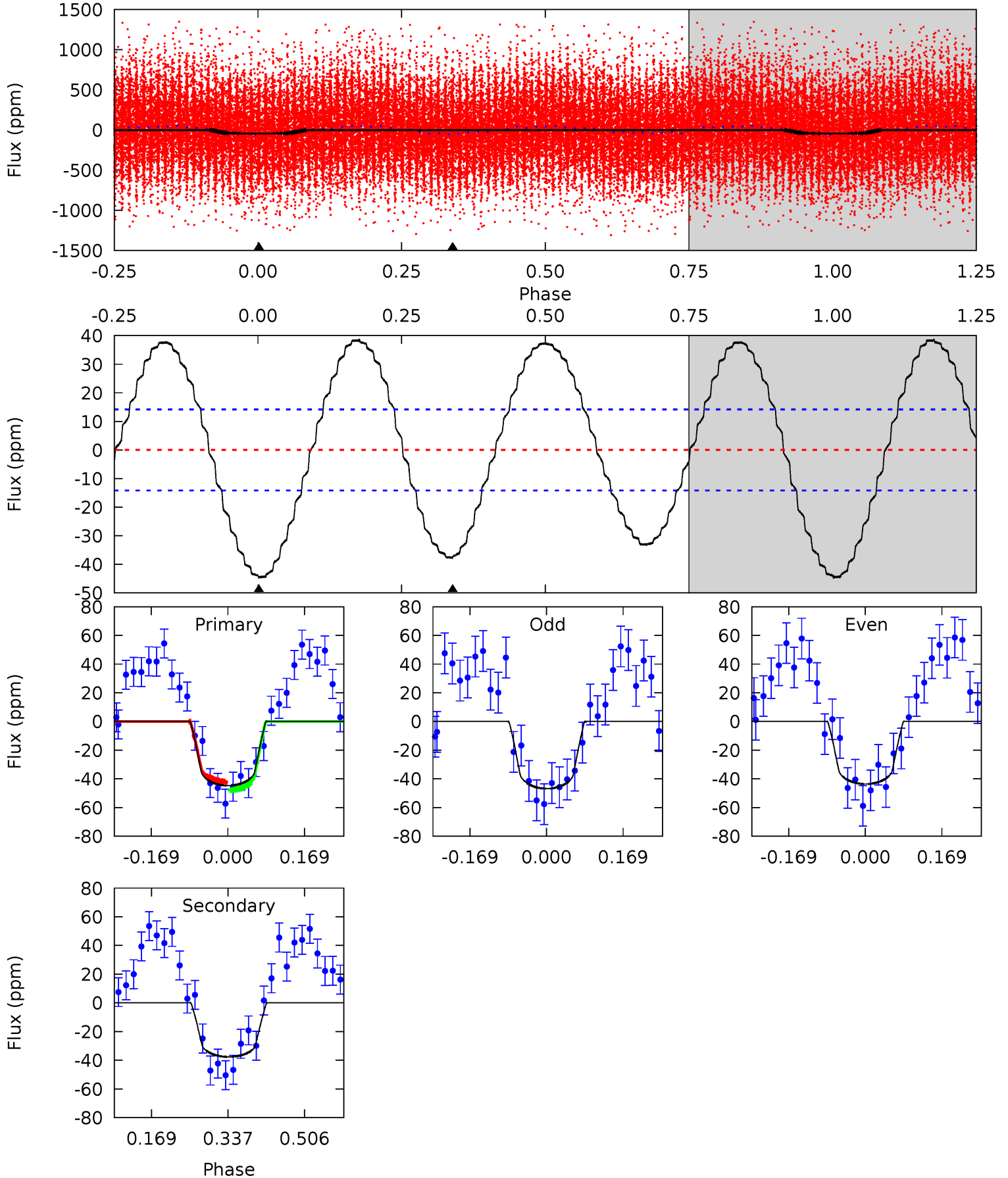
TCE 006720889-01 P= 0.817295 Days $T_0=131.860445$ (BKJD)



DV Model-Shift Uniqueness Test

006720889-01, P = 0.817321 Days, E = 131.036132 Days

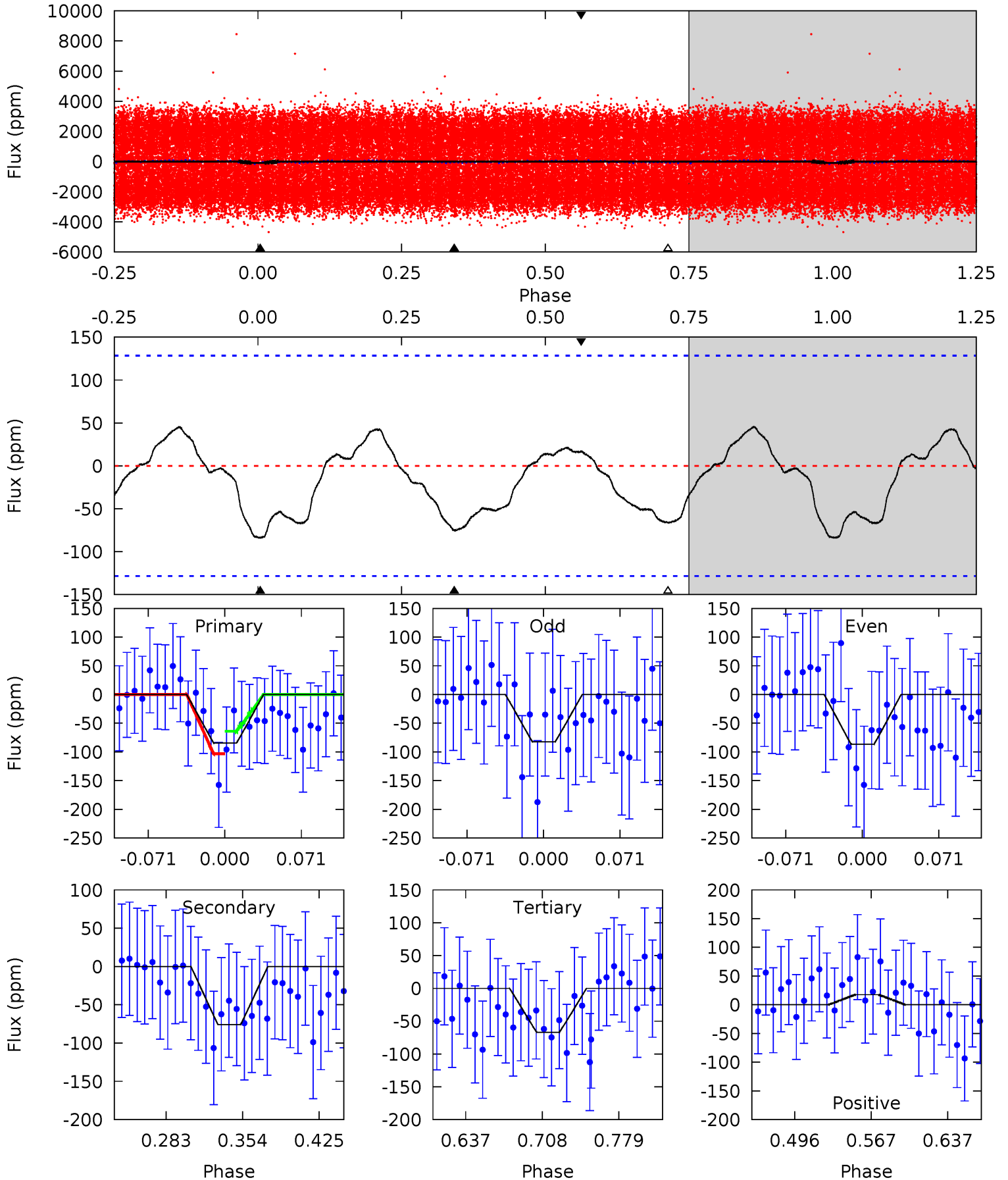
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	11.8	0	0	4.45	1.38	7.59	14.0	14.0	11.8	11.8	0.52	1.12	0.46	0.91



Alt Model-Shift Uniqueness Test

006720889-01, P = 0.817295 Days, E = 131.043150 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.05	2.74	2.41	0.64	4.64	1.81	1.13	0.64	2.42	0.32	2.10	0.08	0.56	0.35	0.70



Stellar Parameters For KIC 006720889

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6763^{+165}_{-236}	$4.277^{+0.105}_{-0.195}$	$-0.140^{+0.250}_{-0.300}$	$1.361^{+0.448}_{-0.224}$	$1.286^{+0.190}_{-0.190}$	$0.718^{+0.355}_{-0.381}$
	+2%/-3%	+2%/-5%	+179%/-214%	+33%/-16%	+15%/-15%	+49%/-53%
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 006720889-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-38 ± 3	$1.10^{+0.35}_{-0.33}$	3611^{+262}_{-220}	6082^{+1299}_{-695}	$5.749^{+6.336}_{-2.421}$
Alt.	-76 ± 28	$1.52^{+0.40}_{-0.34}$	3605^{+246}_{-219}	6075^{+1116}_{-835}	$5.822^{+4.984}_{-2.808}$

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

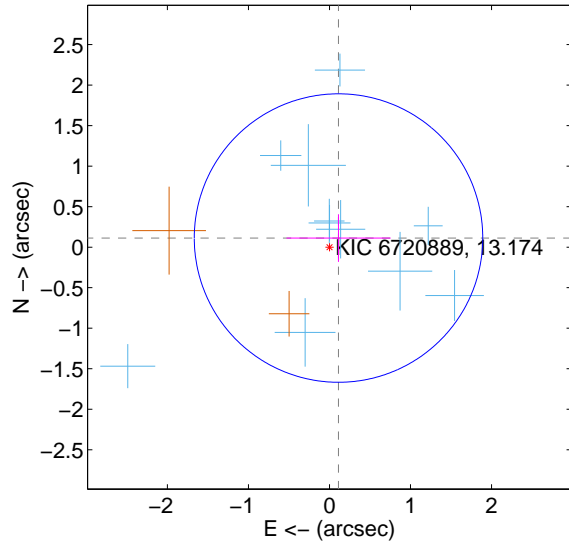
Supplemental centroid analysis for 006720889-01. Kepler magnitude: 13.17. Transit SNR 8.46

There are 11 quarters with good PRF difference image offsets

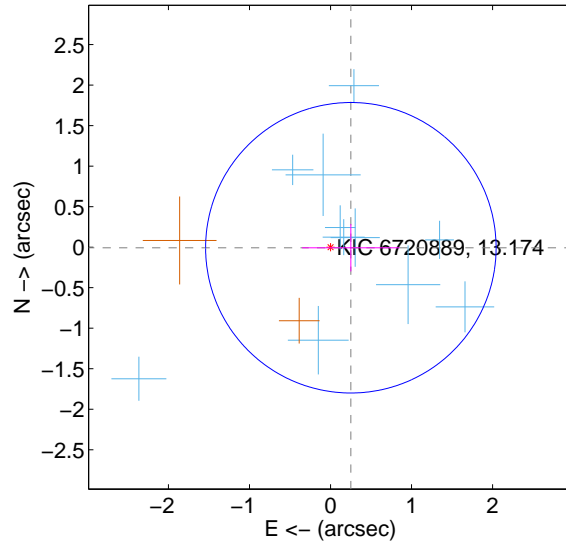
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.159 ± 0.593	0.27	-0.112 ± 0.642	0.113 ± 0.294
PRF-fit source offset from KIC position	0.251 ± 0.597	0.42	-0.251 ± 0.602	-0.007 ± 0.291
photometric centroid source offset	0.63 ± 0.62	1.03	0.63 ± 0.62	-0.05 ± 0.50

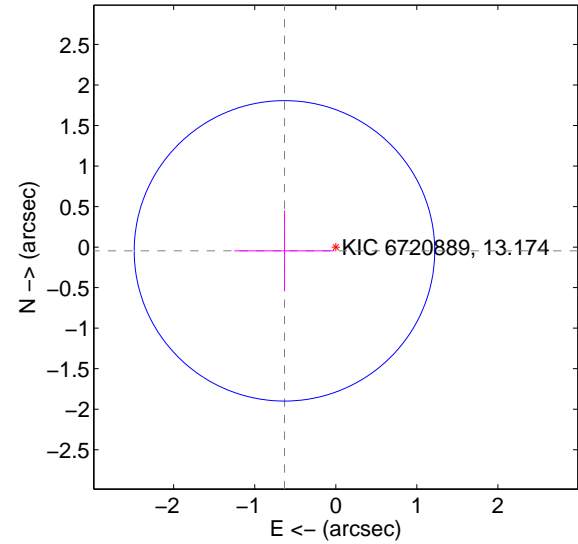
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

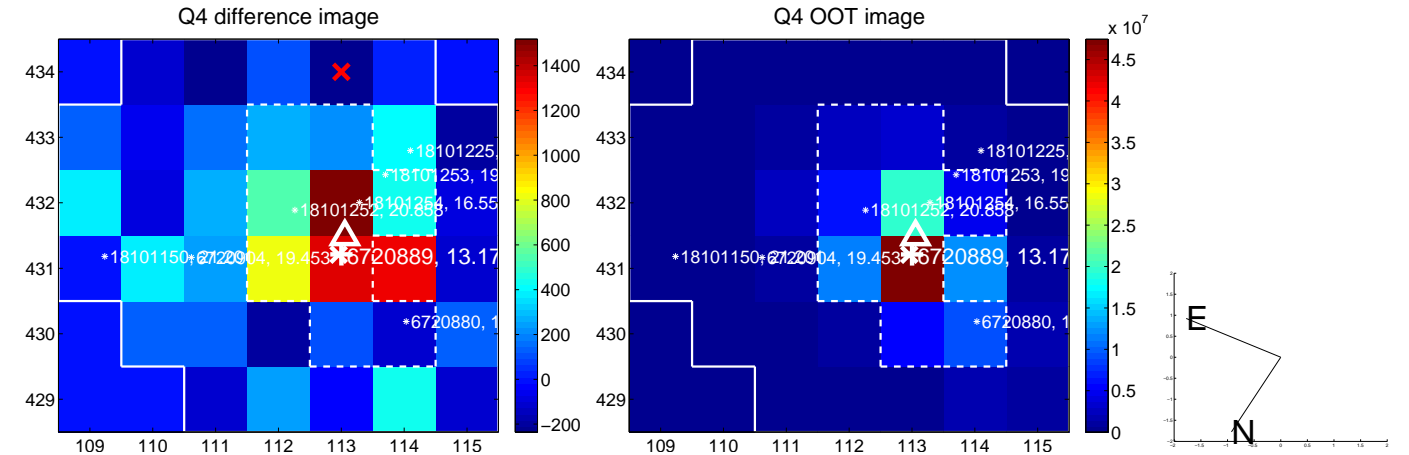
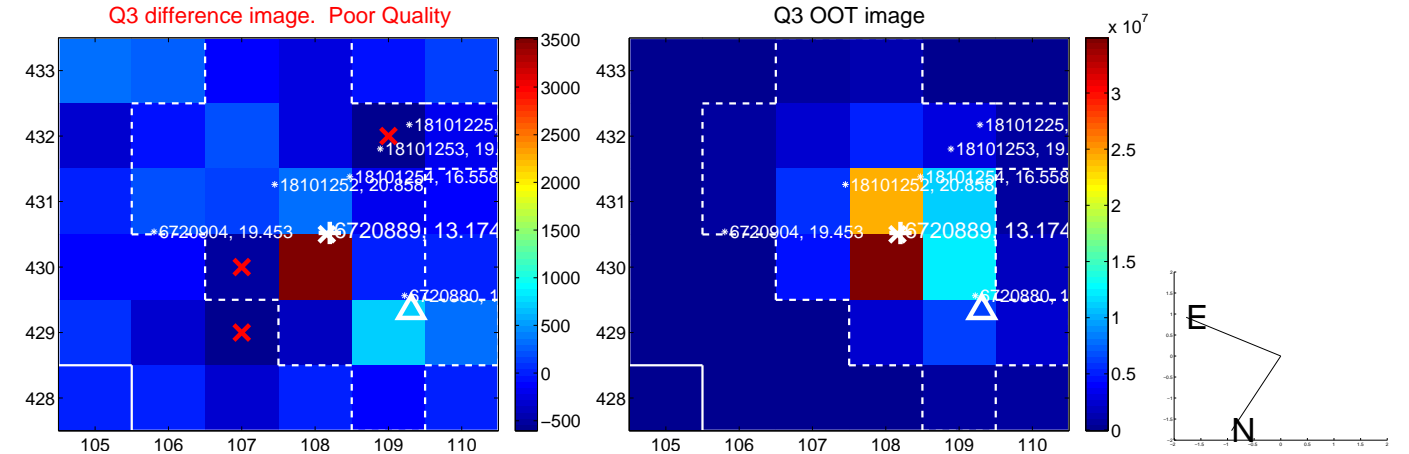
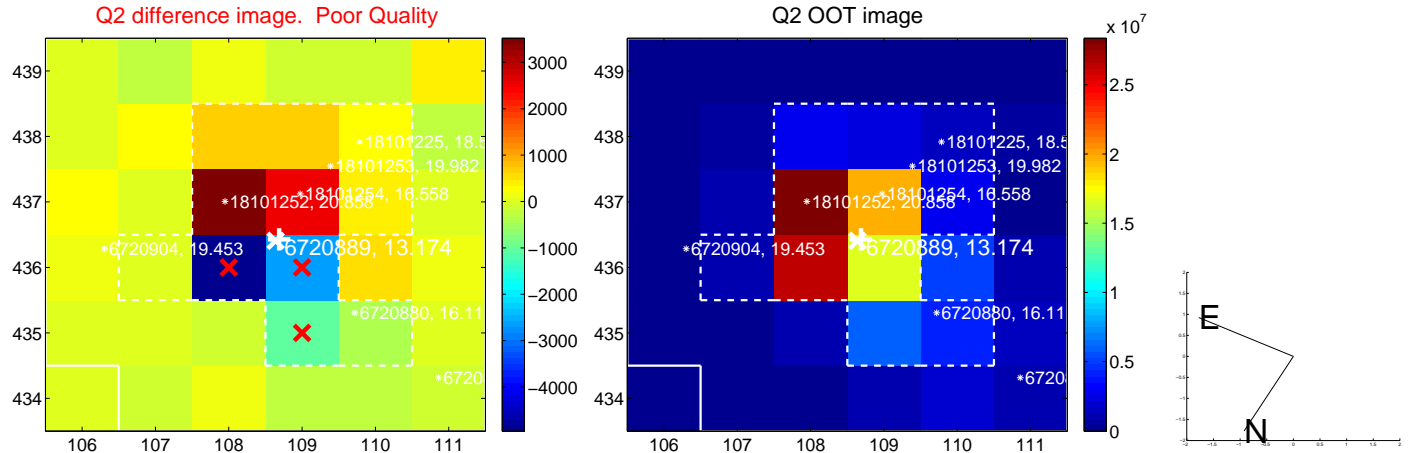
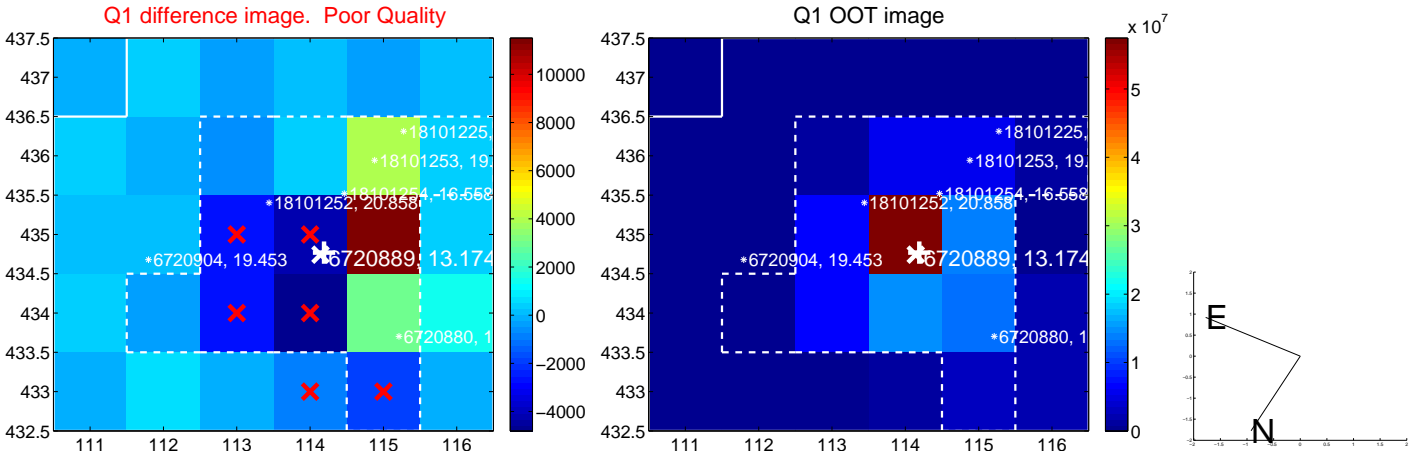


offset from photometric centroids

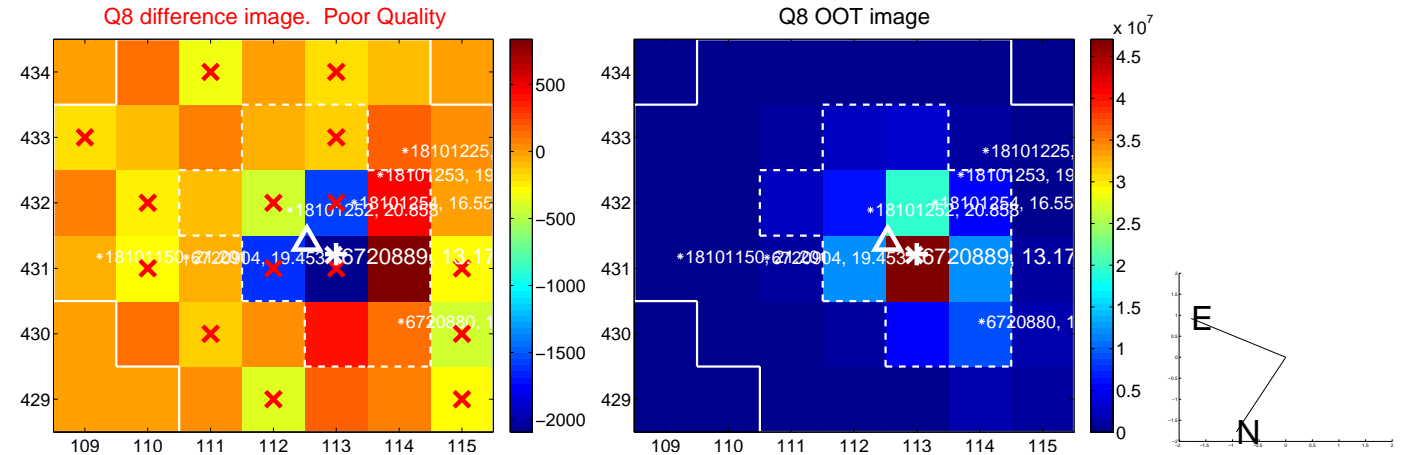
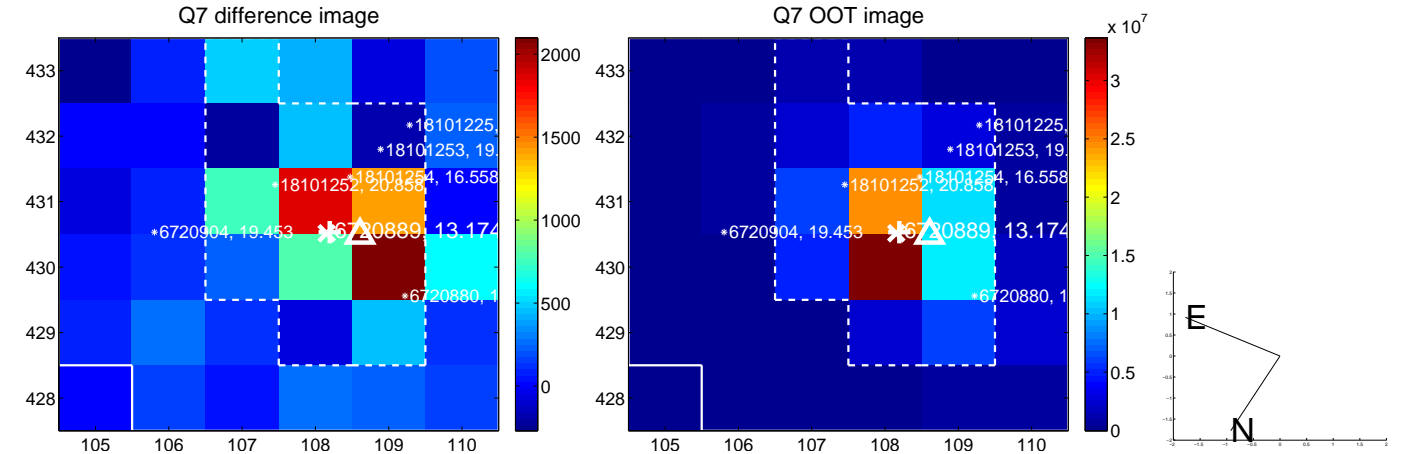
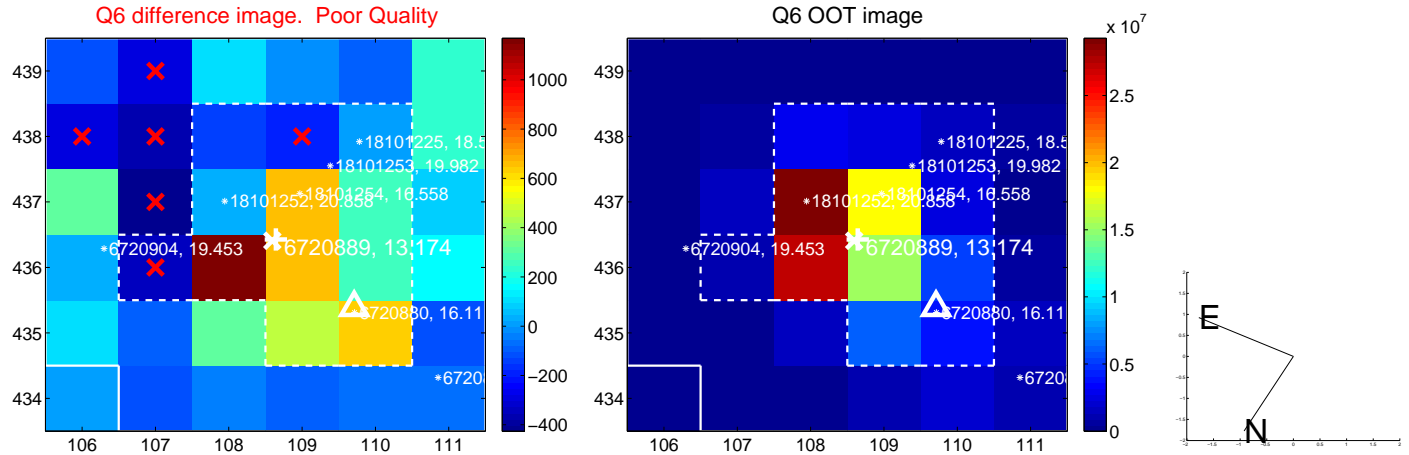
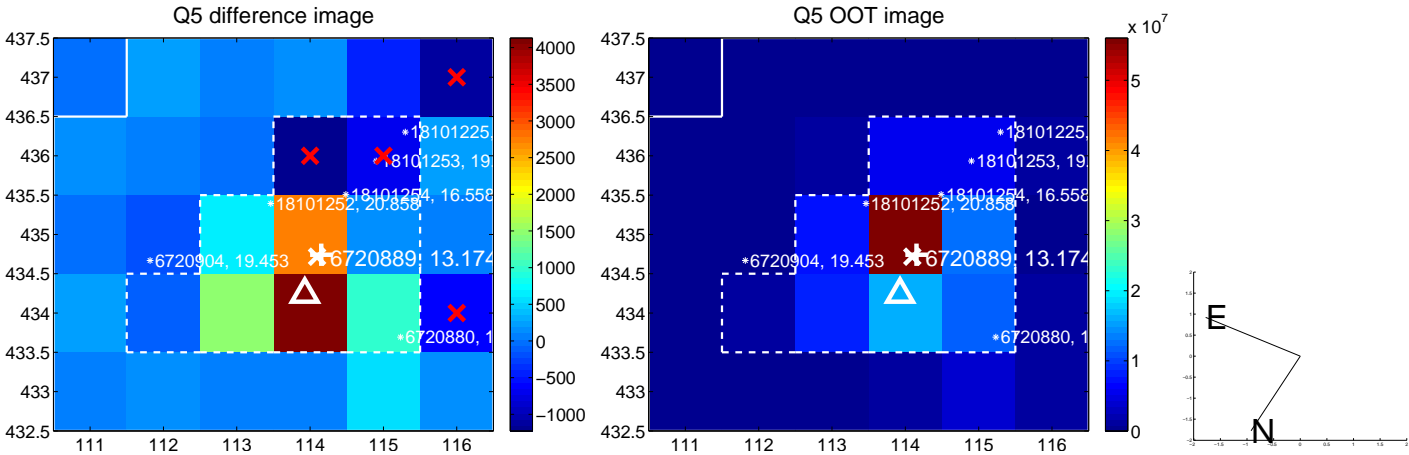


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

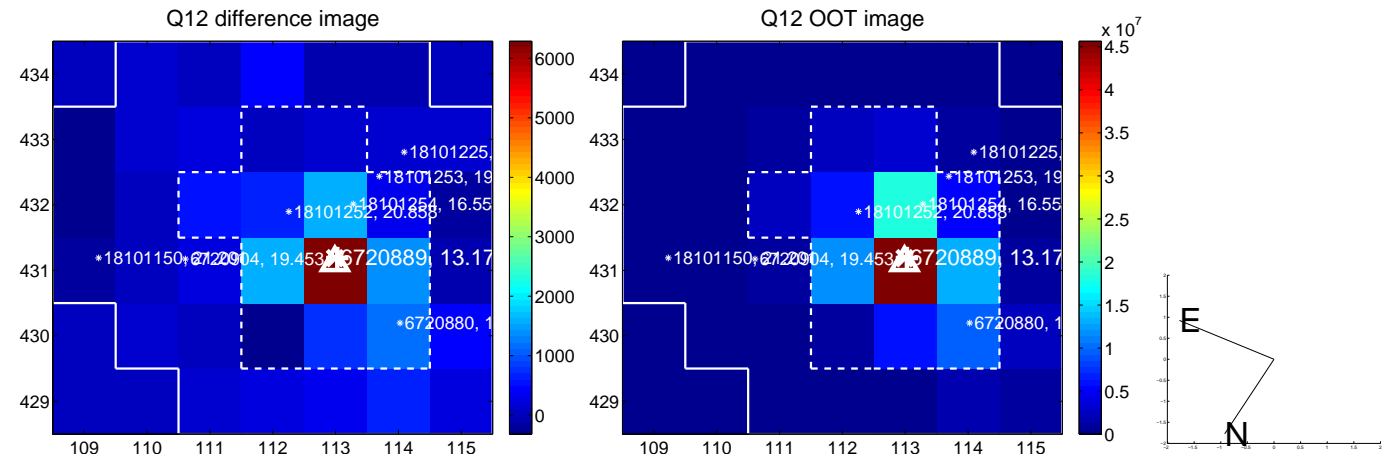
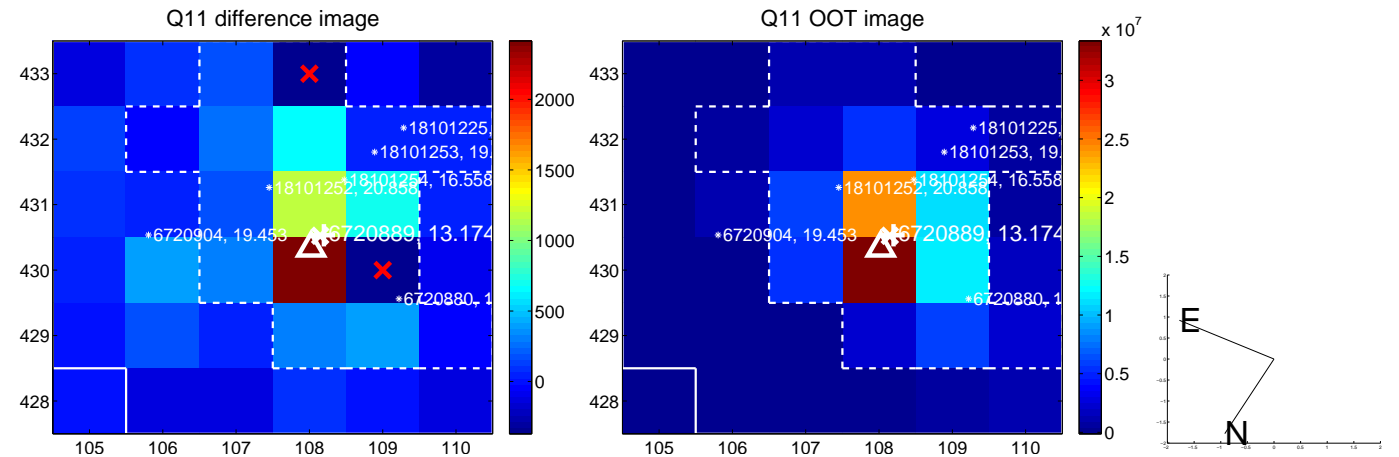
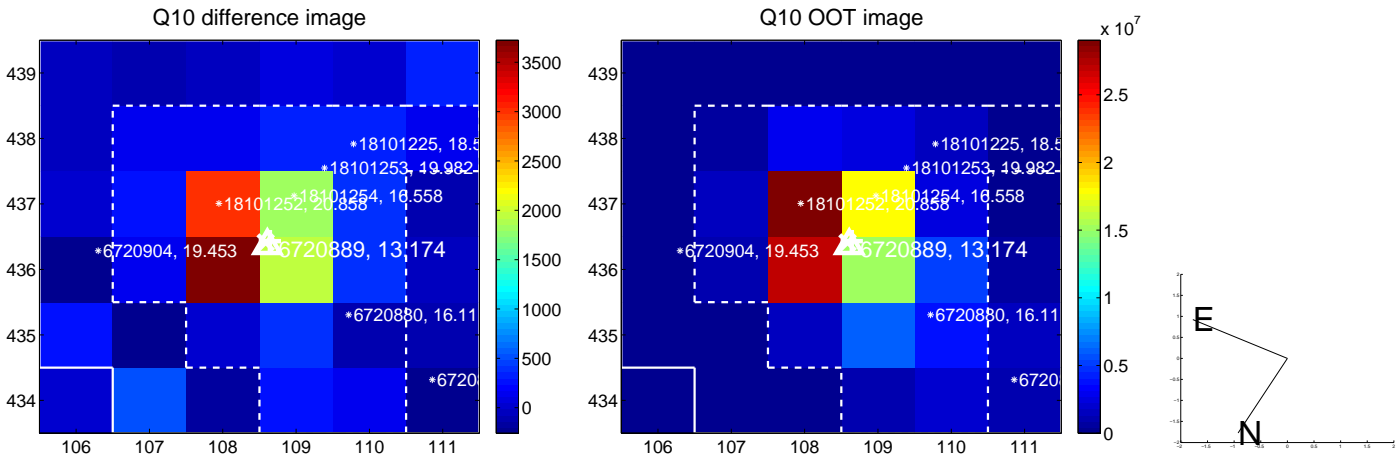
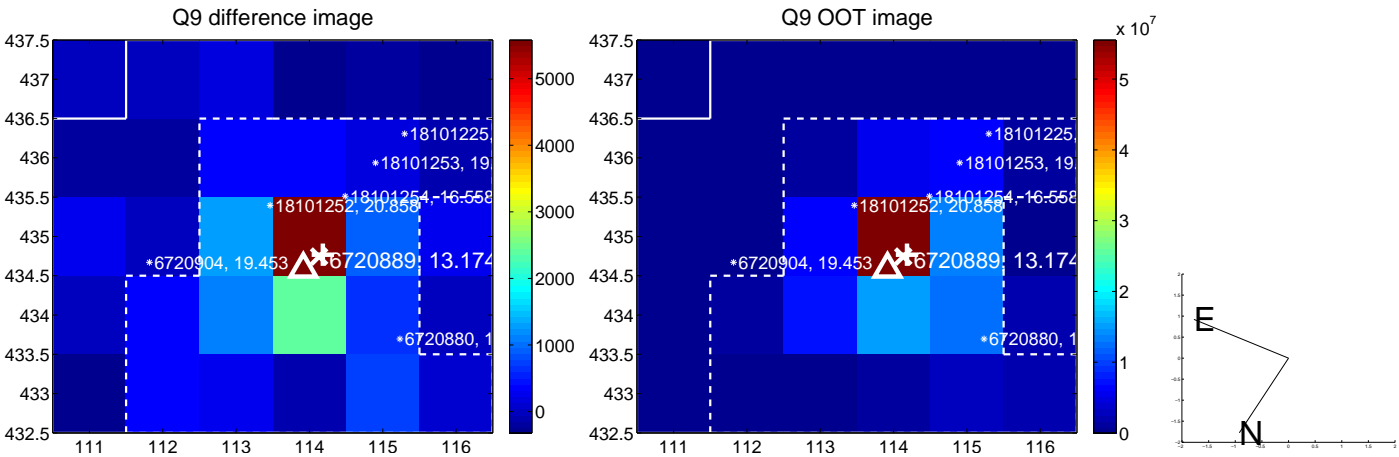
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



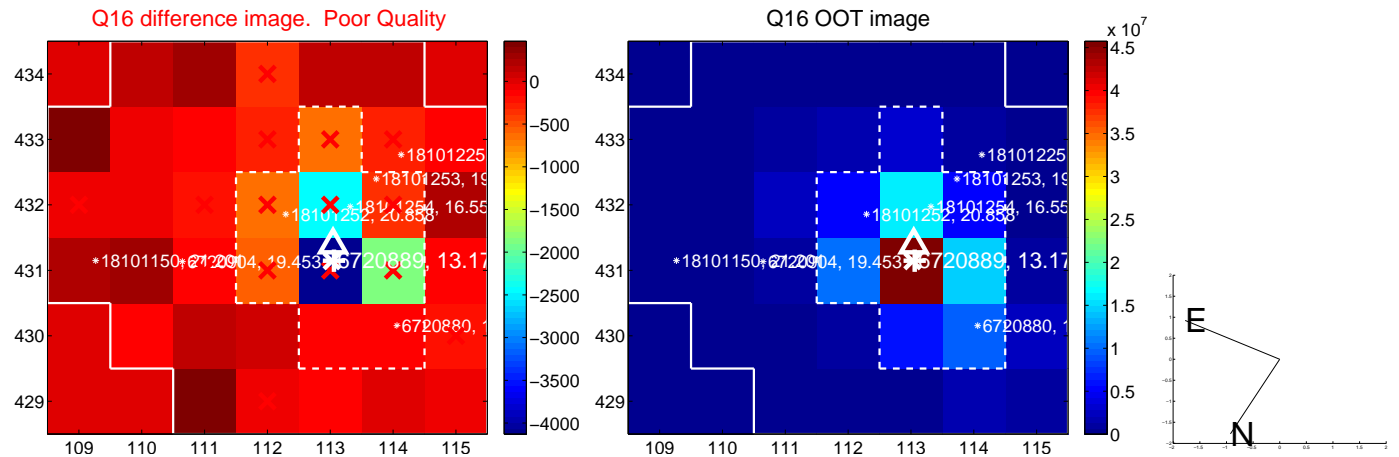
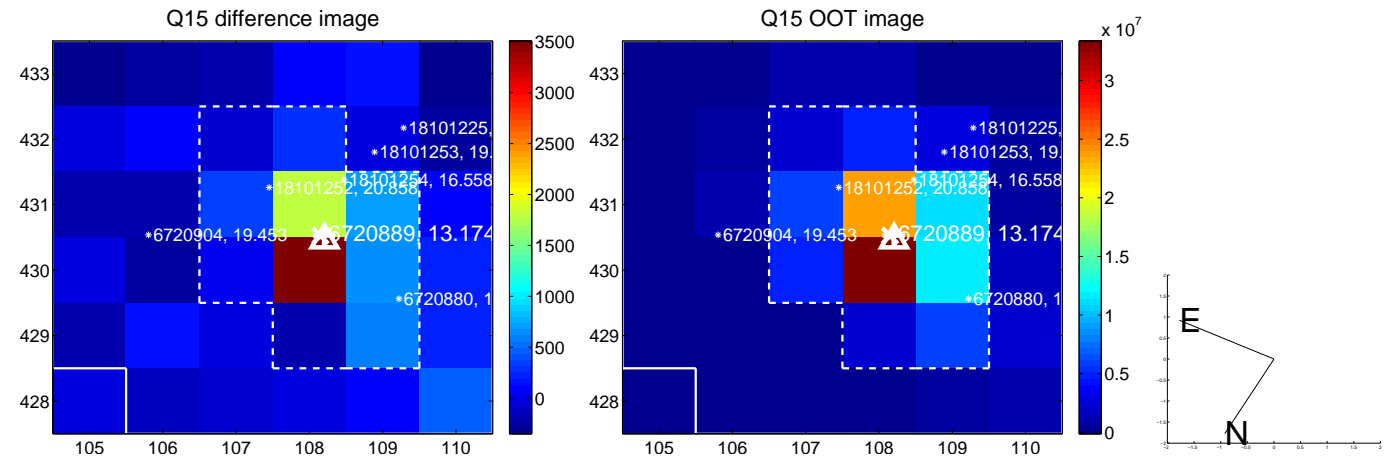
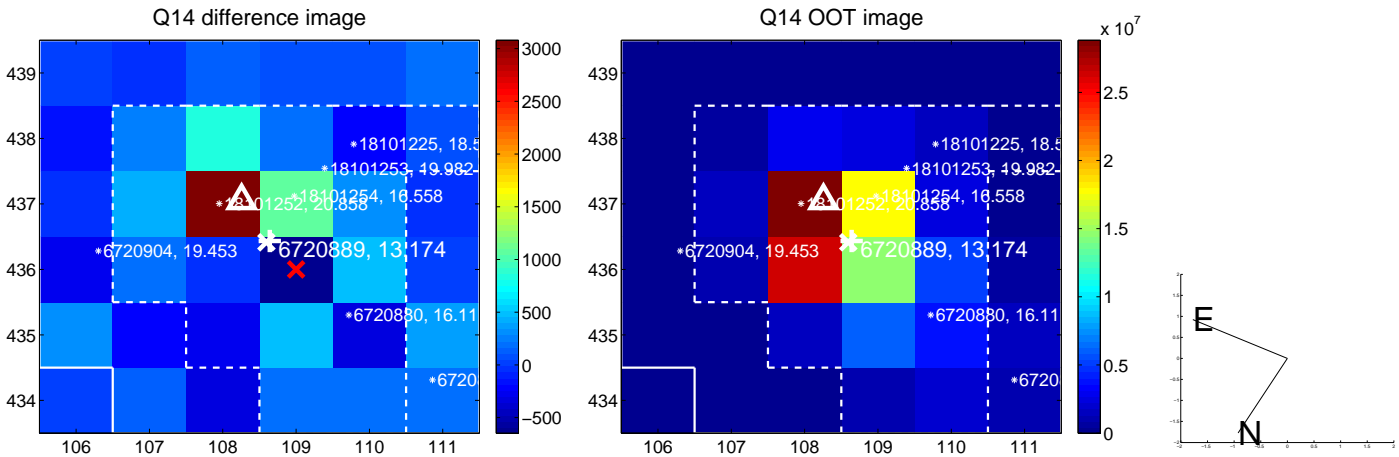
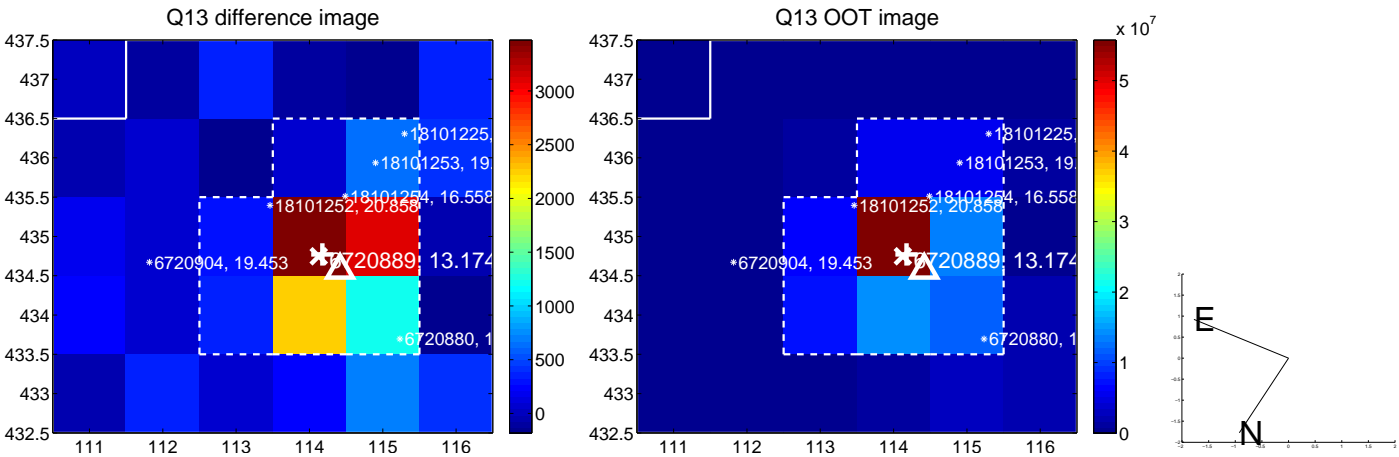
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



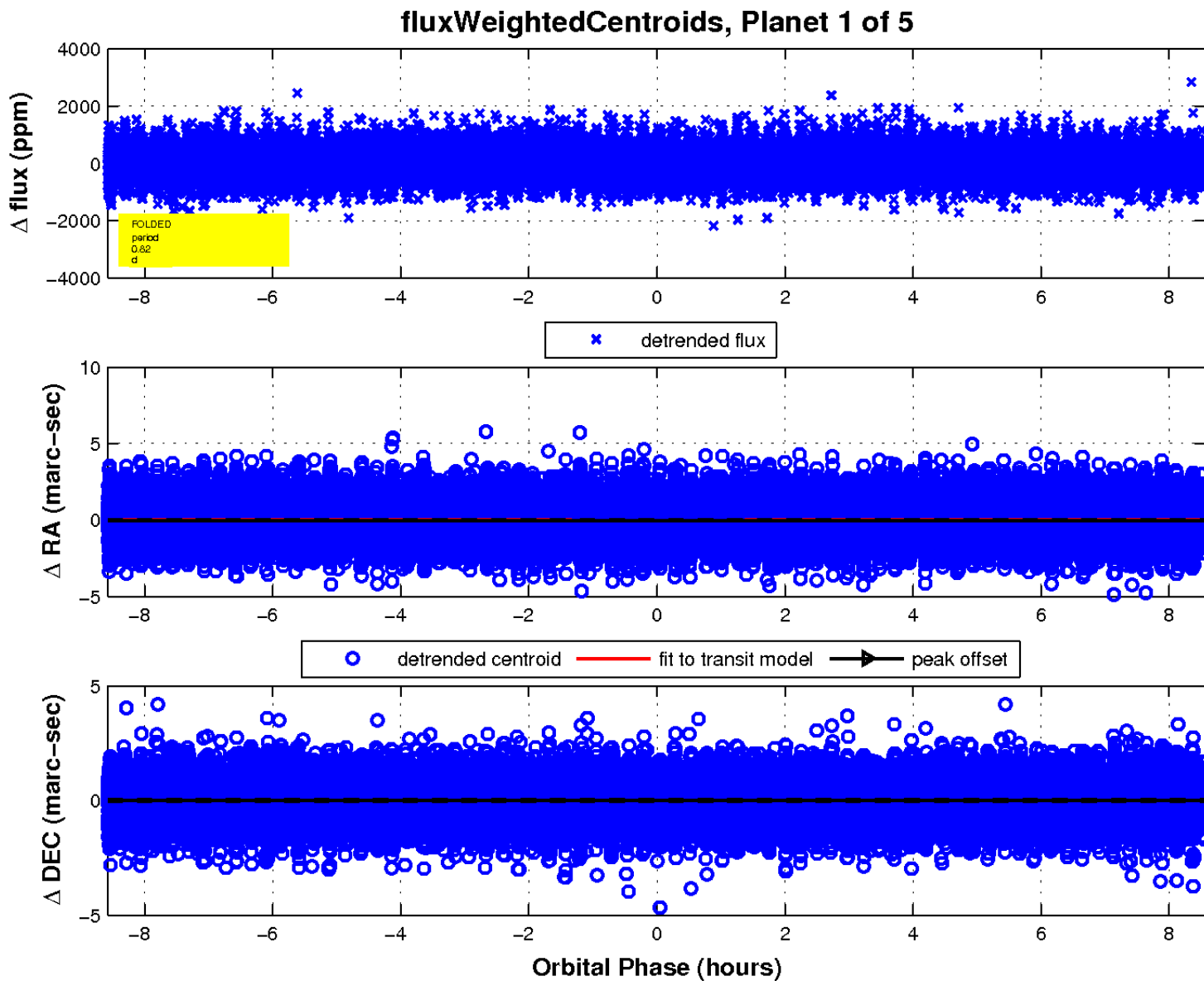
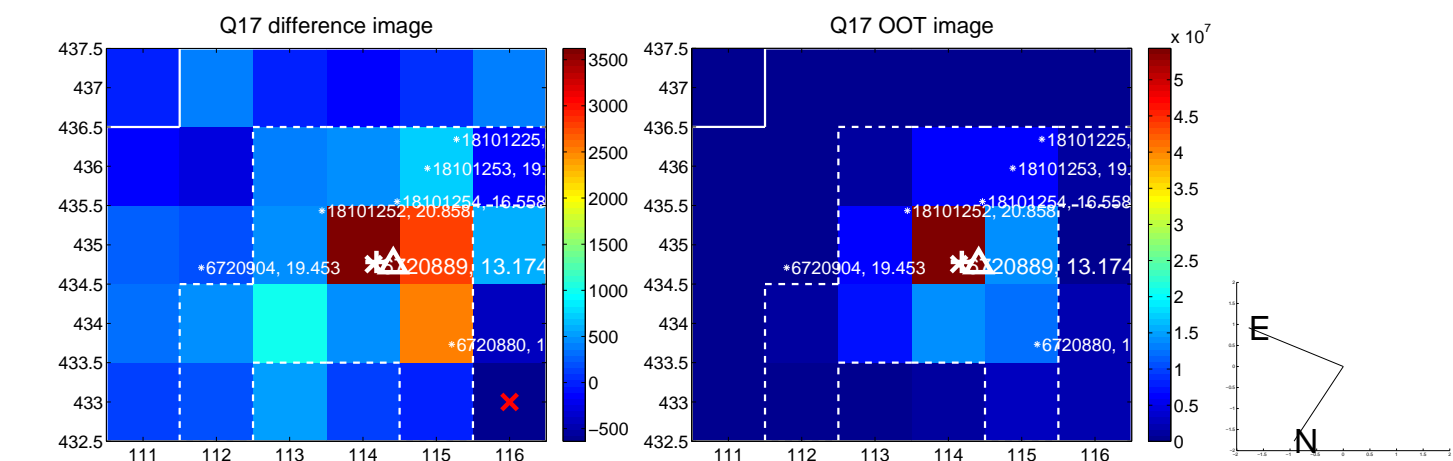
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

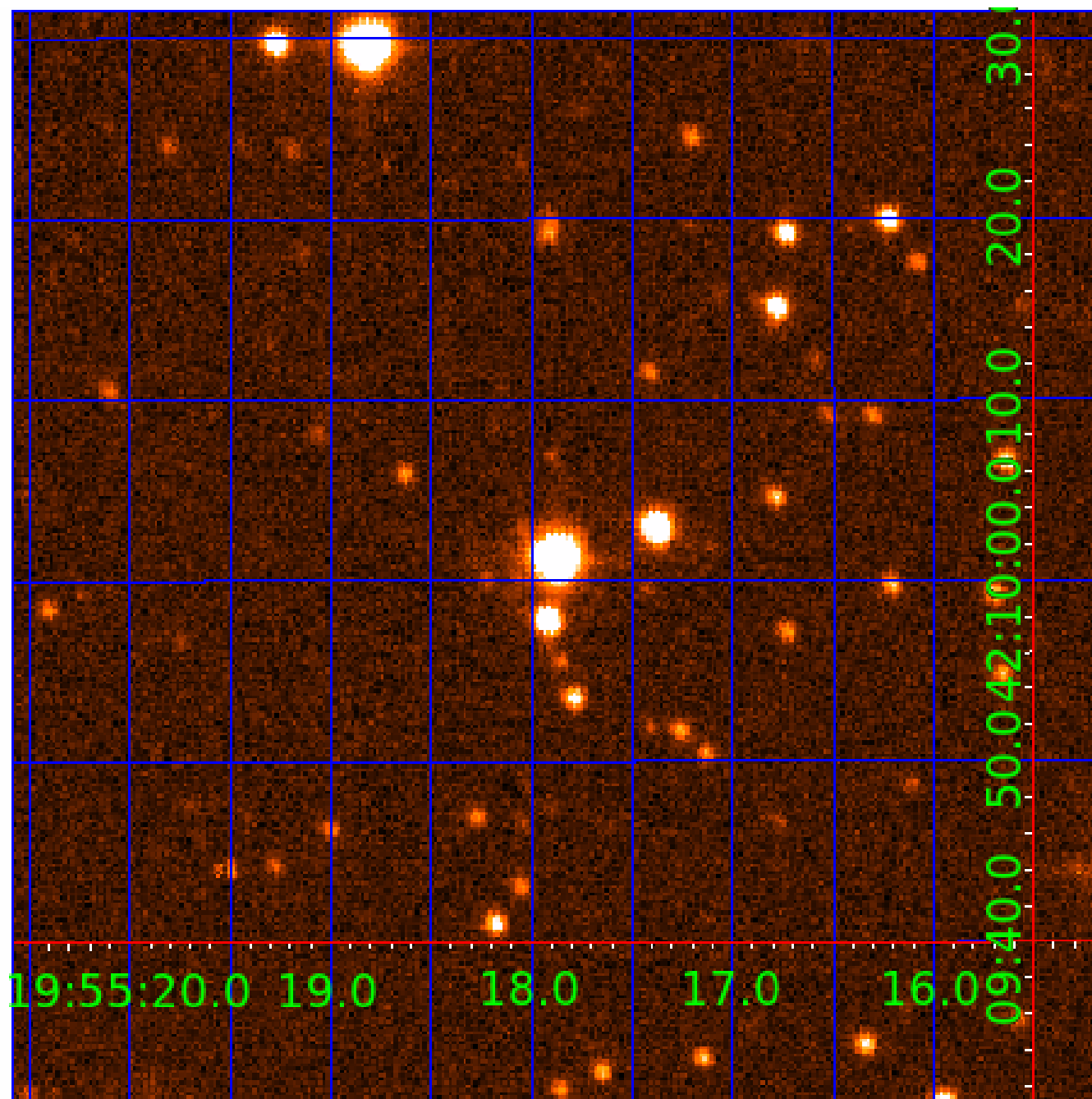


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006720889

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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006720889-02	OBS	No	1.489258	132.110336	95.6	3.721	10.0	10.2	1.36	6763	1.56	4522.70
006720889-03	OBS	No	249.773187	251.576219	1313.1	4.841	9.2	9.8	1.36	6763	8.10	4.89
006720889-04	OBS	No	281.044431	141.993349	1360.7	5.998	8.2	8.7	1.36	6763	6.23	4.18

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006720889-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
006720889-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006720889-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS

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

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

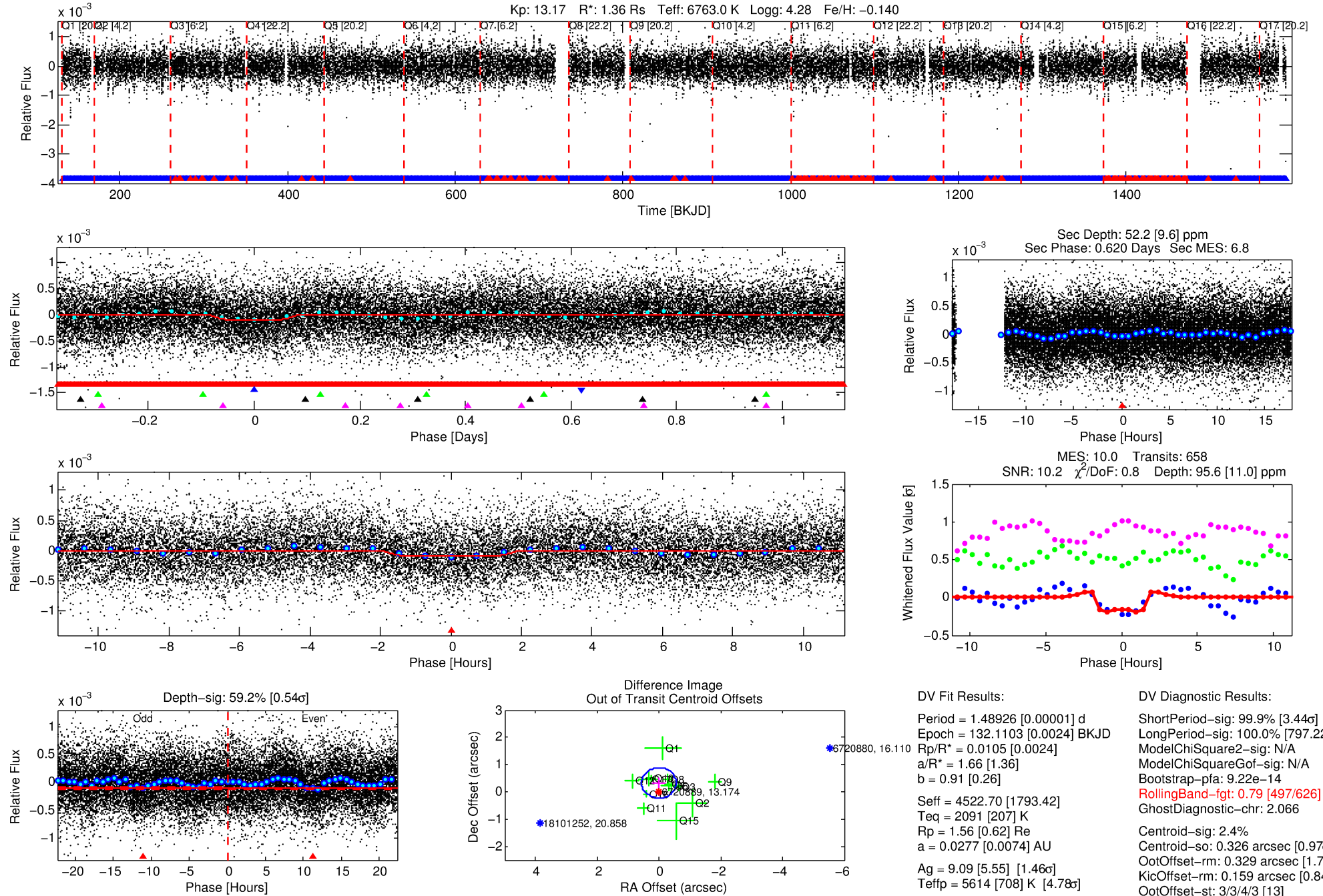
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006720889-02

No Significant Match Found

DV One-Page Summary

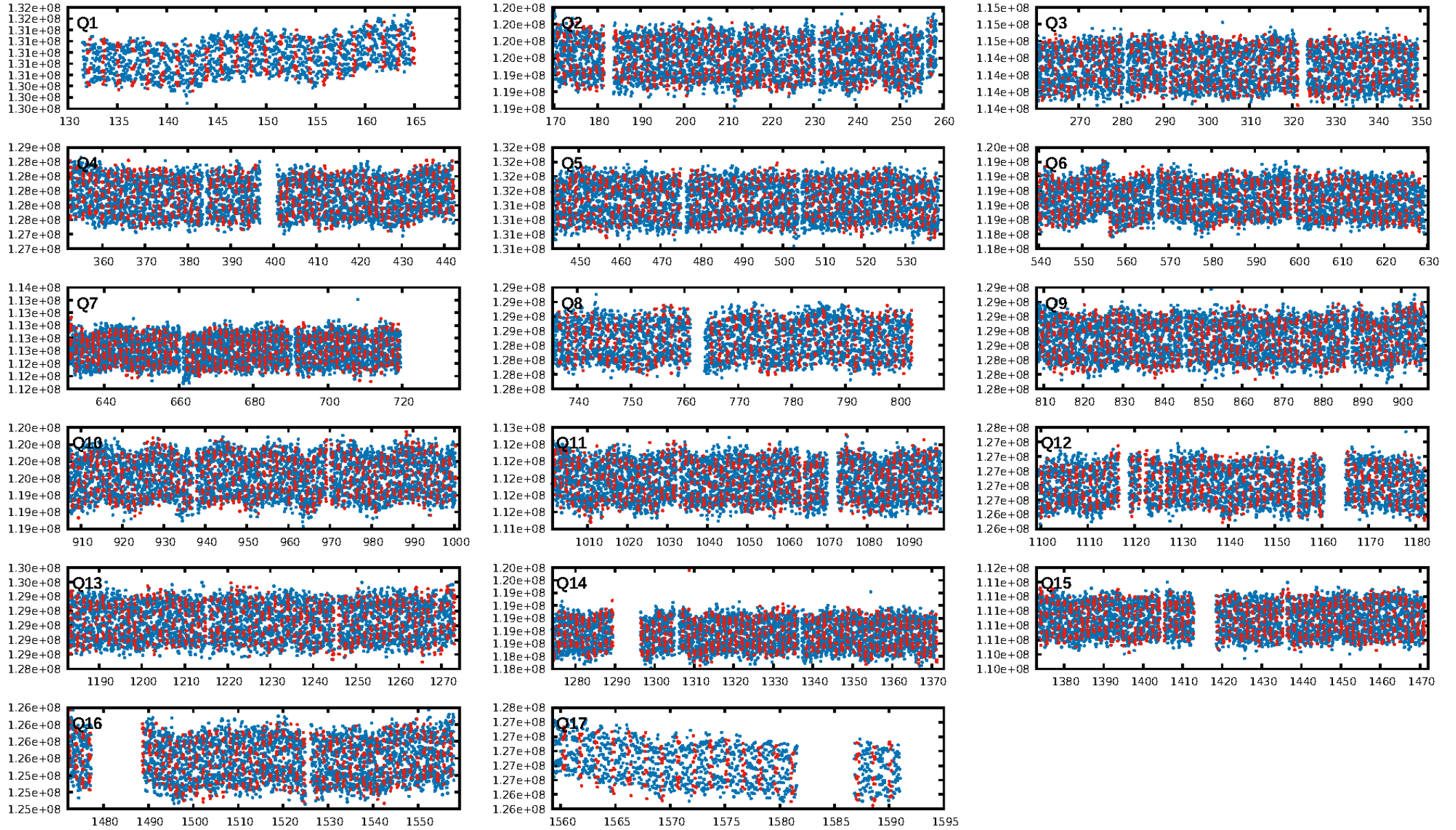
KIC: 6720889 Candidate: 2 of 5 Period: 1.489 d



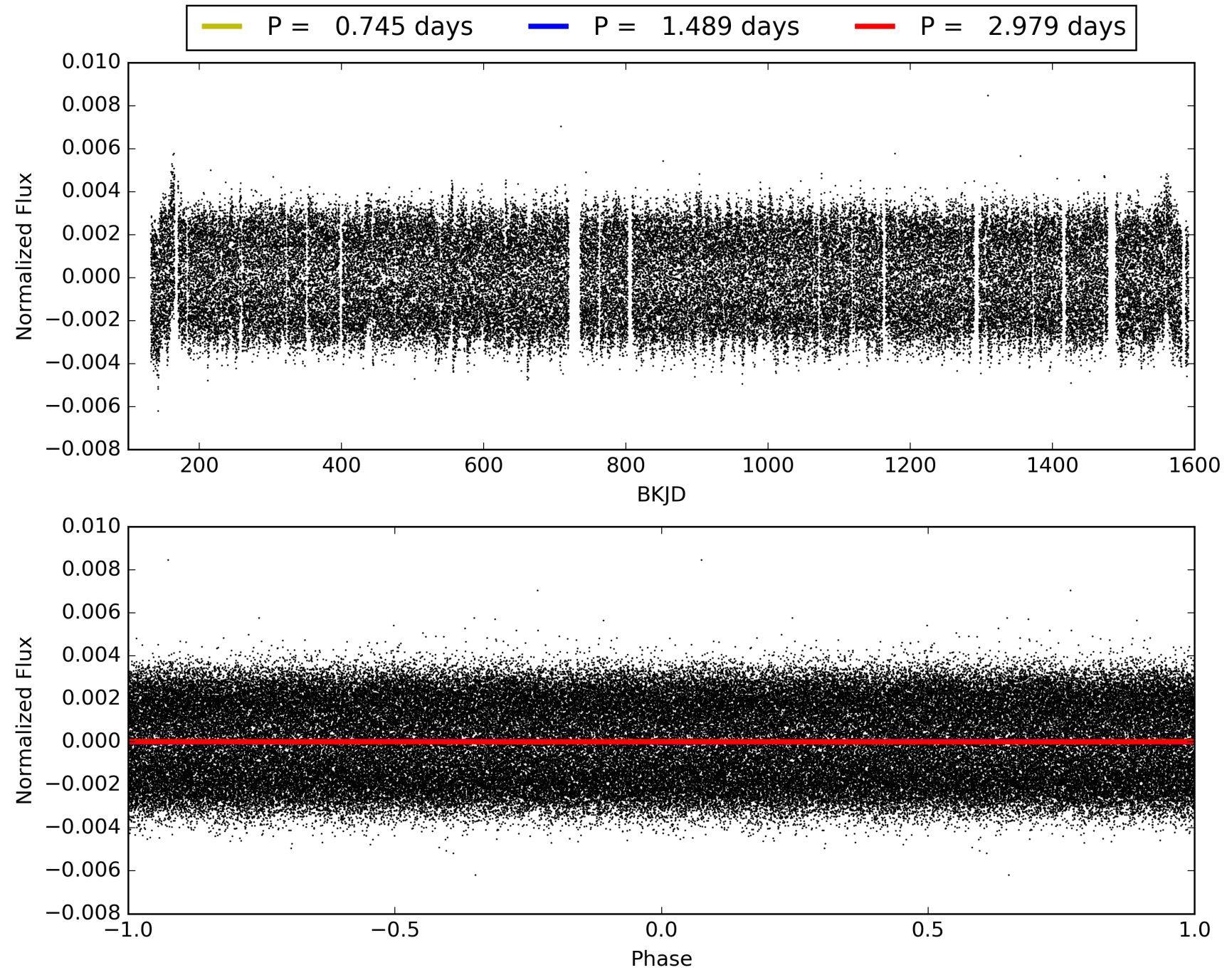
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:03:52 Z

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

TCE 006720889-02, PDC Light Curves

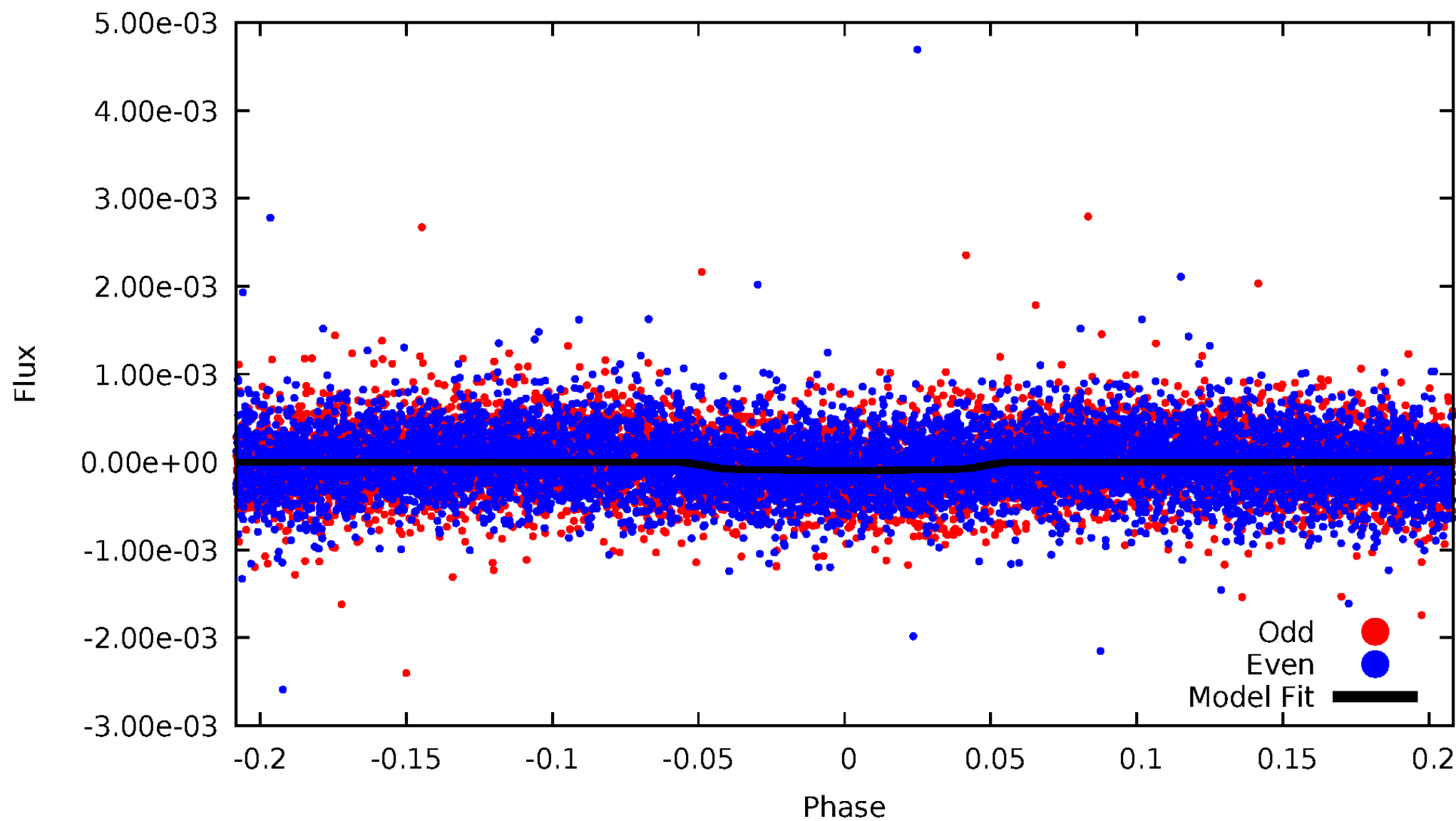


TCE 006720889-02



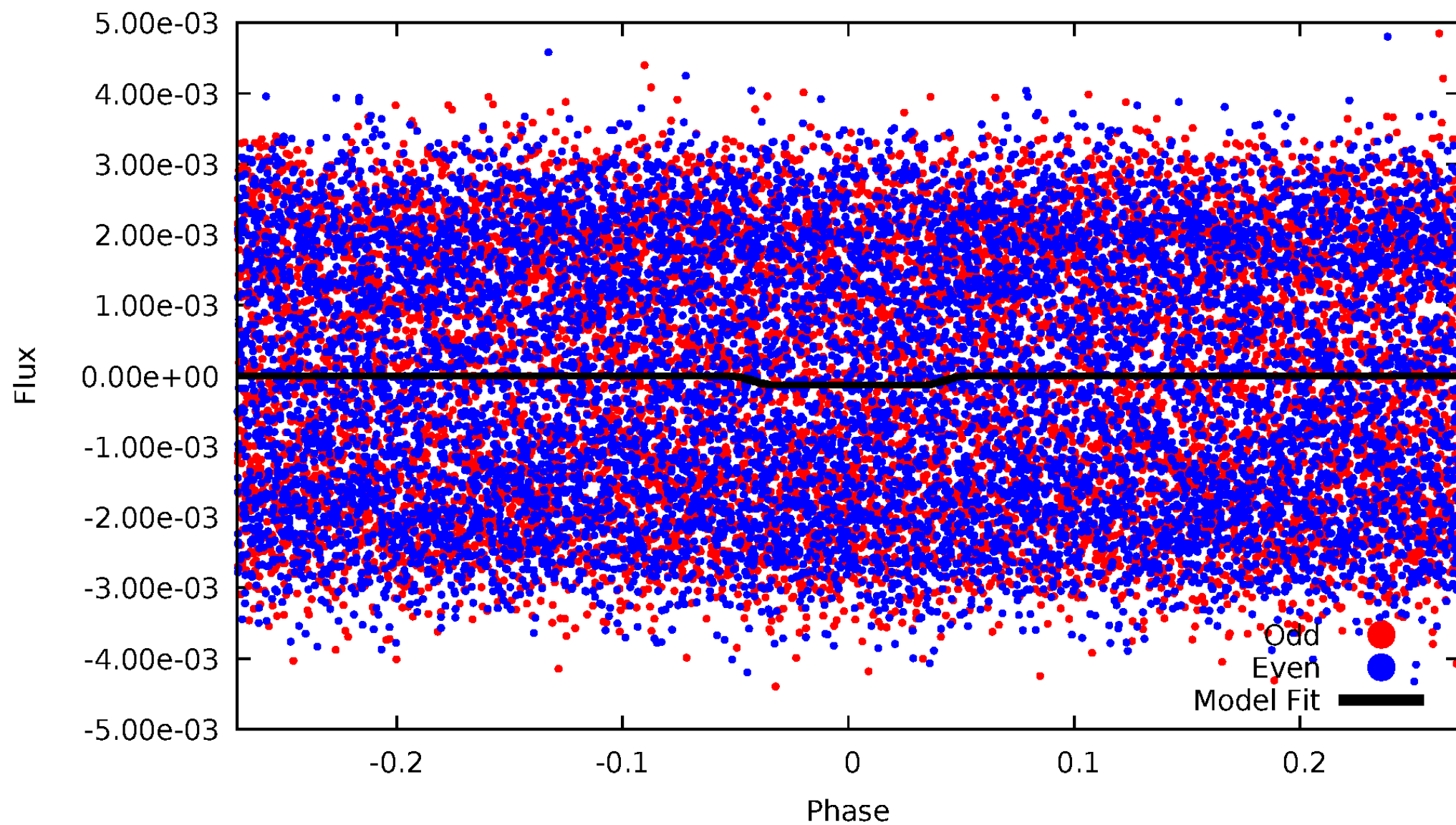
DV Odd/Even

TCE 006720889-02



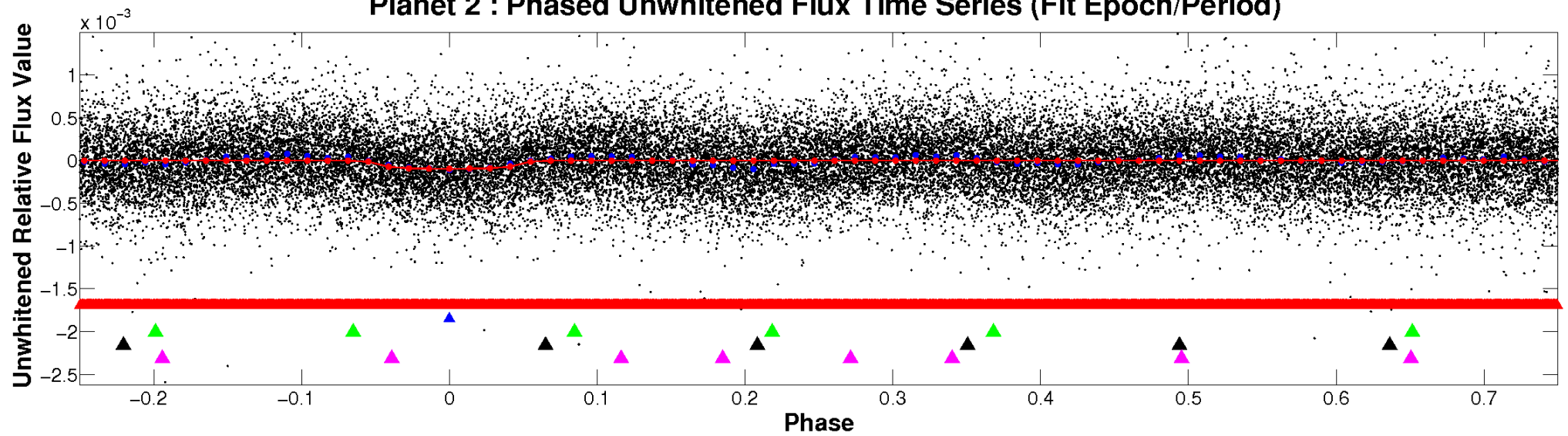
ALT Odd/Even

TCE 006720889-02

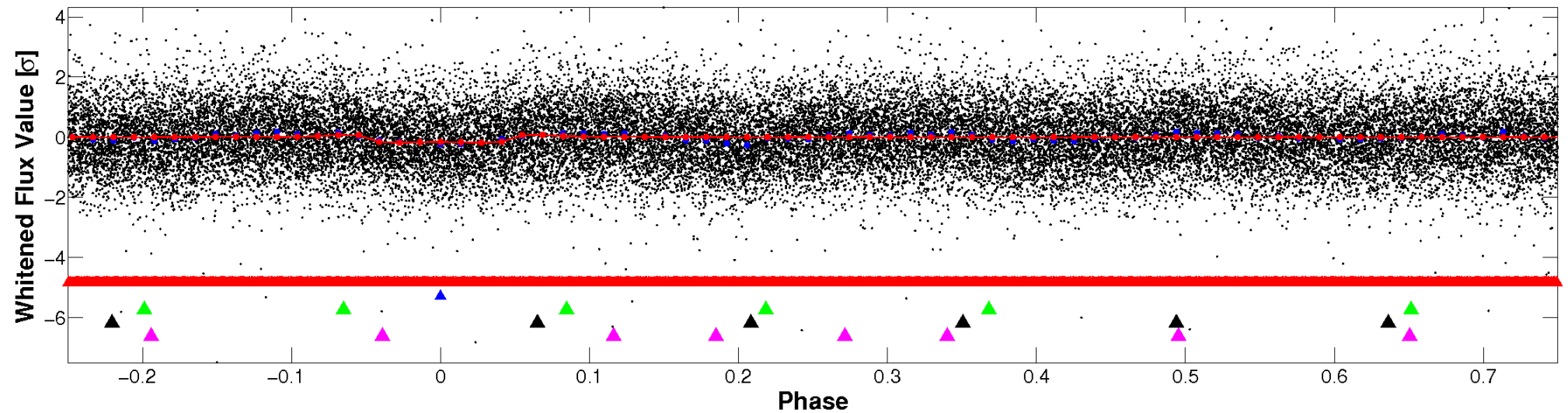


Non-Whitened Vs. Whitened Light Curve

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

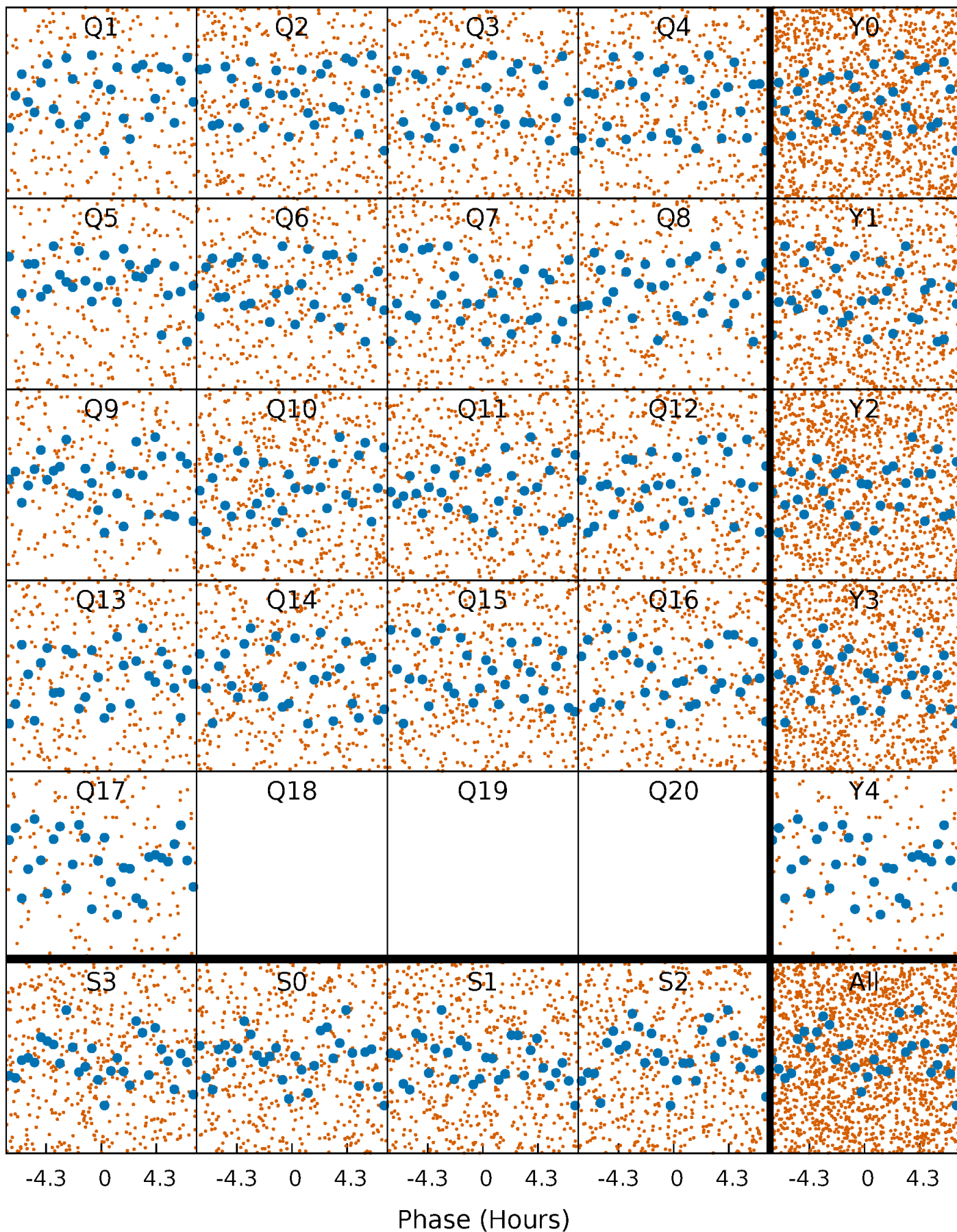


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



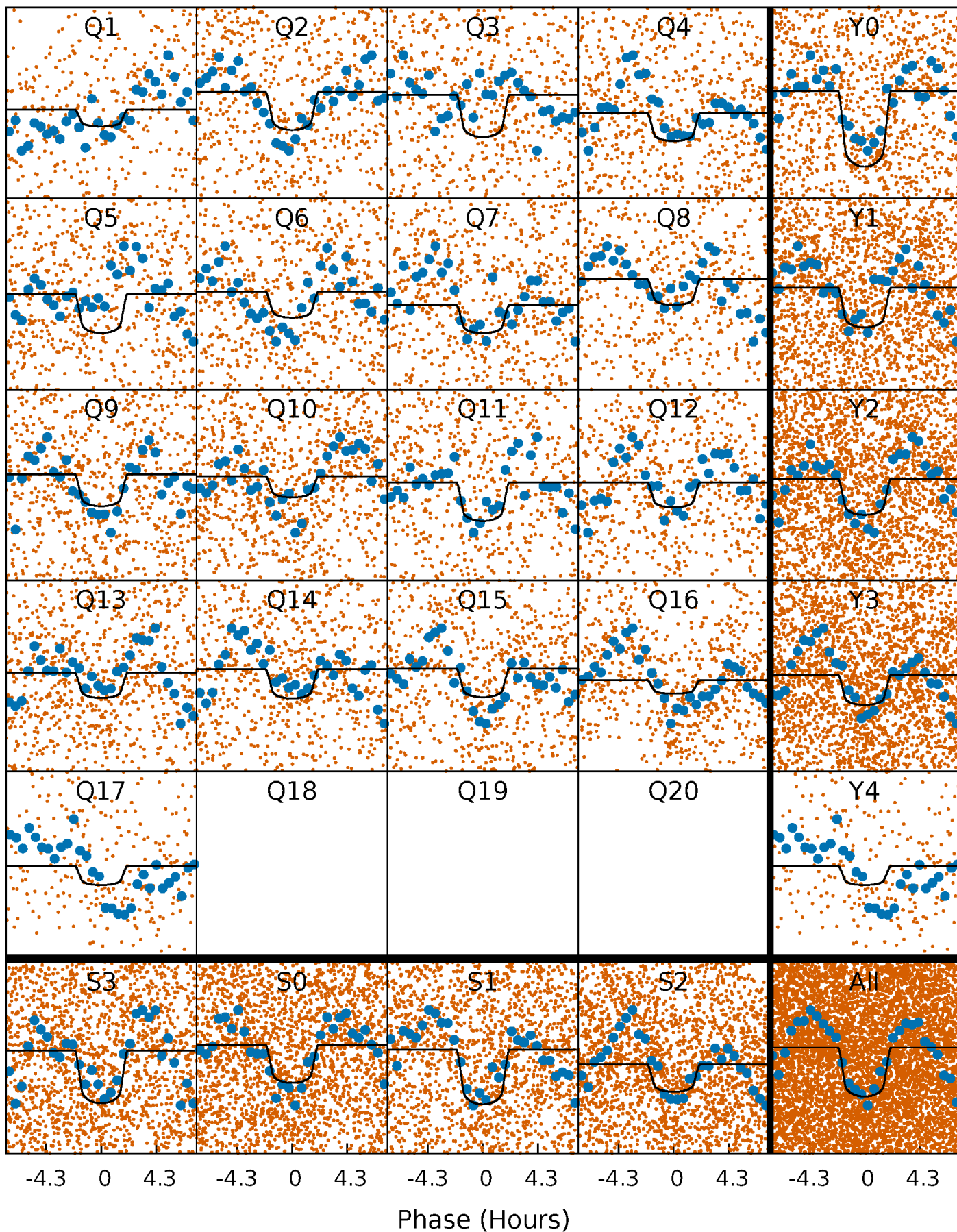
PDC Quarter-Phased Transit Curves

TCE 006720889-02 P= 1.489258 Days $T_0=132.110336$ (BKJD)



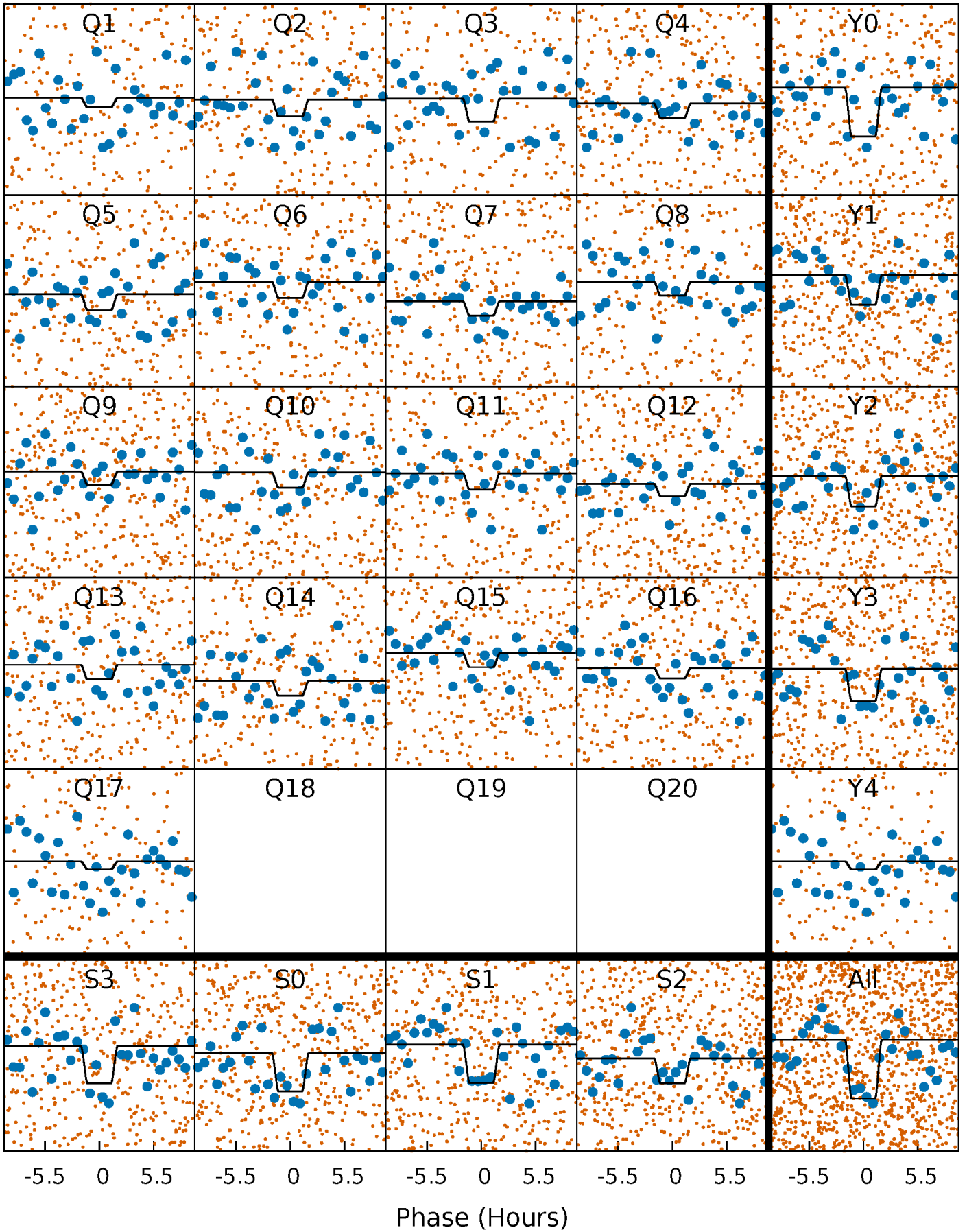
DV Quarter-Phased Transit Curves

TCE 006720889-02 P= 1.489258 Days $T_0=132.110336$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

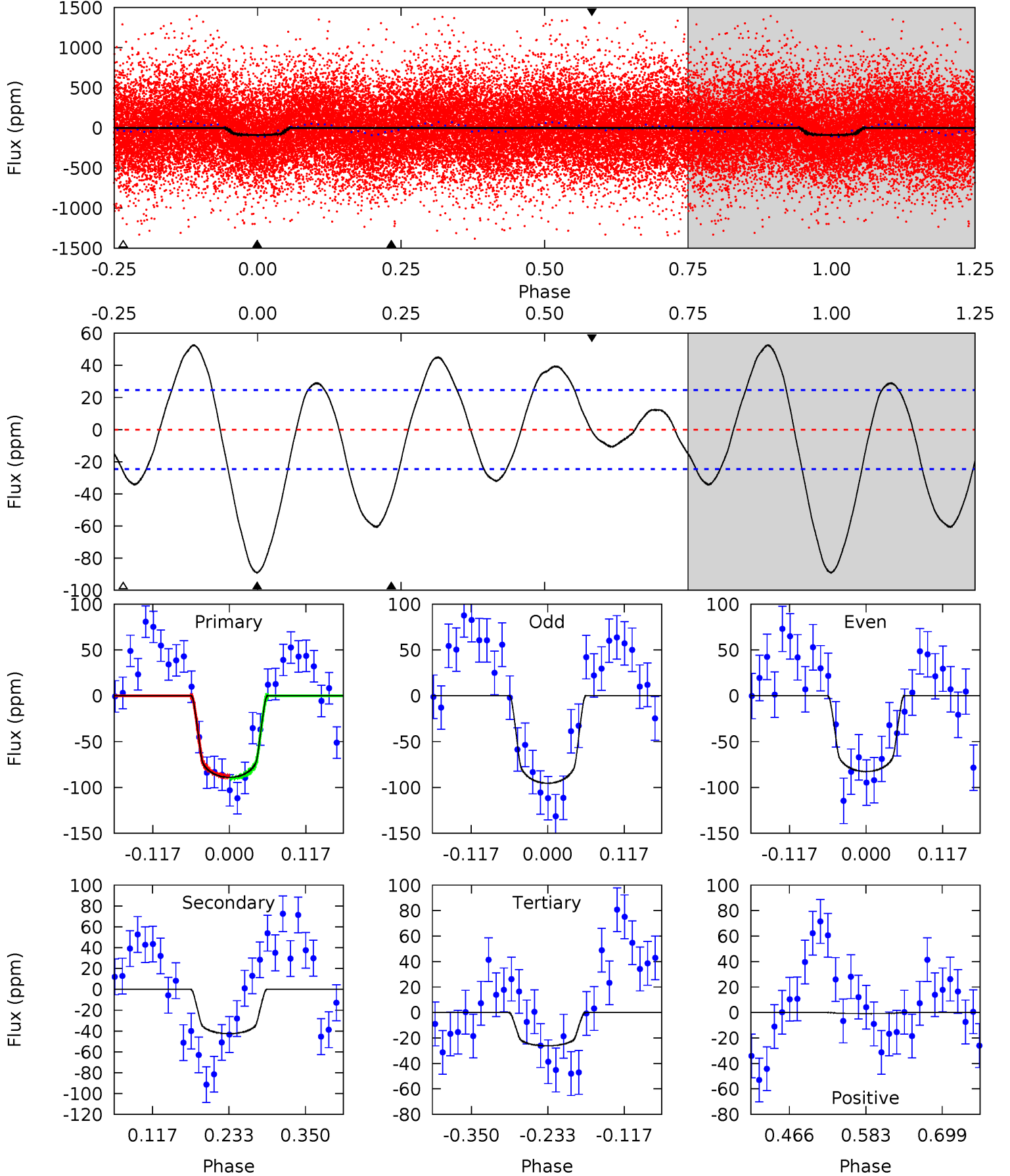
TCE 006720889-02 P= 1.489309 Days $T_0=132.087081$ (BKJD)



DV Model-Shift Uniqueness Test

006720889-02, P = 1.489258 Days, E = 130.621078 Days

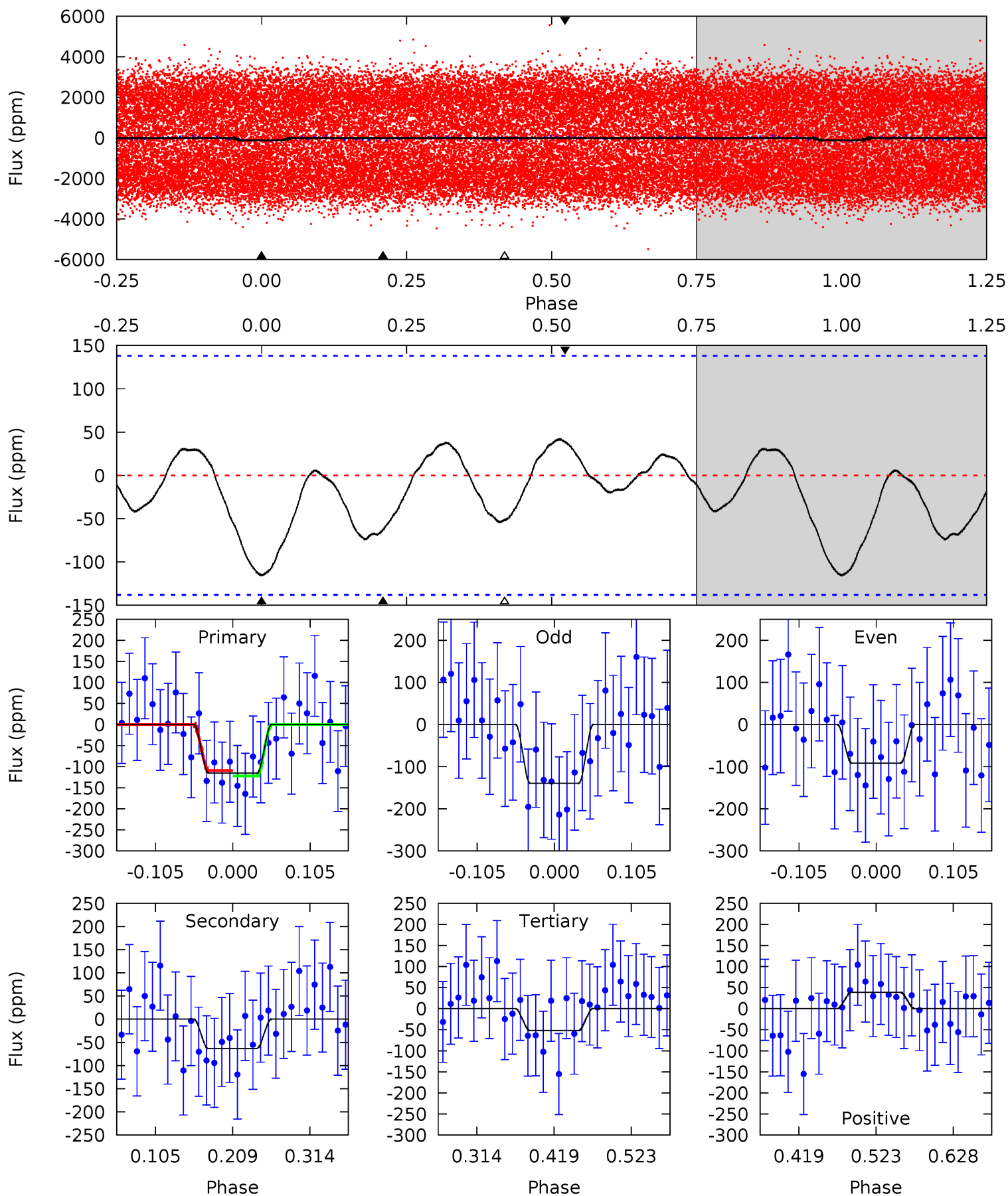
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	7.84	4.81	-0.15	4.53	1.57	4.12	11.6	16.6	3.03	7.99	1.19	0.92	0.37	0.17



Alt Model-Shift Uniqueness Test

006720889-02, P = 1.489309 Days, E = 130.597772 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.81	2.09	1.71	1.28	4.56	1.62	0.88	2.10	2.53	0.37	0.81	0.79	0.73	0.27	0.21



Stellar Parameters For KIC 006720889

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6763^{+165}_{-236}	$4.277^{+0.105}_{-0.195}$	$-0.140^{+0.250}_{-0.300}$	$1.361^{+0.448}_{-0.224}$	$1.286^{+0.190}_{-0.190}$	$0.718^{+0.355}_{-0.381}$
	+2%/-3%	+2%/-5%	+179%/-214%	+33%/-16%	+15%/-15%	+49%/-53%
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 006720889-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-43 ± 5	$1.60^{+0.44}_{-0.39}$	2951^{+213}_{-162}	5288^{+719}_{-515}	$6.949^{+5.079}_{-2.708}$
Alt.	-63 ± 30	$1.74^{+0.47}_{-0.39}$	2966^{+220}_{-192}	5523^{+923}_{-949}	$8.130^{+7.899}_{-4.639}$

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 $A_{obs} \gg 1.0$

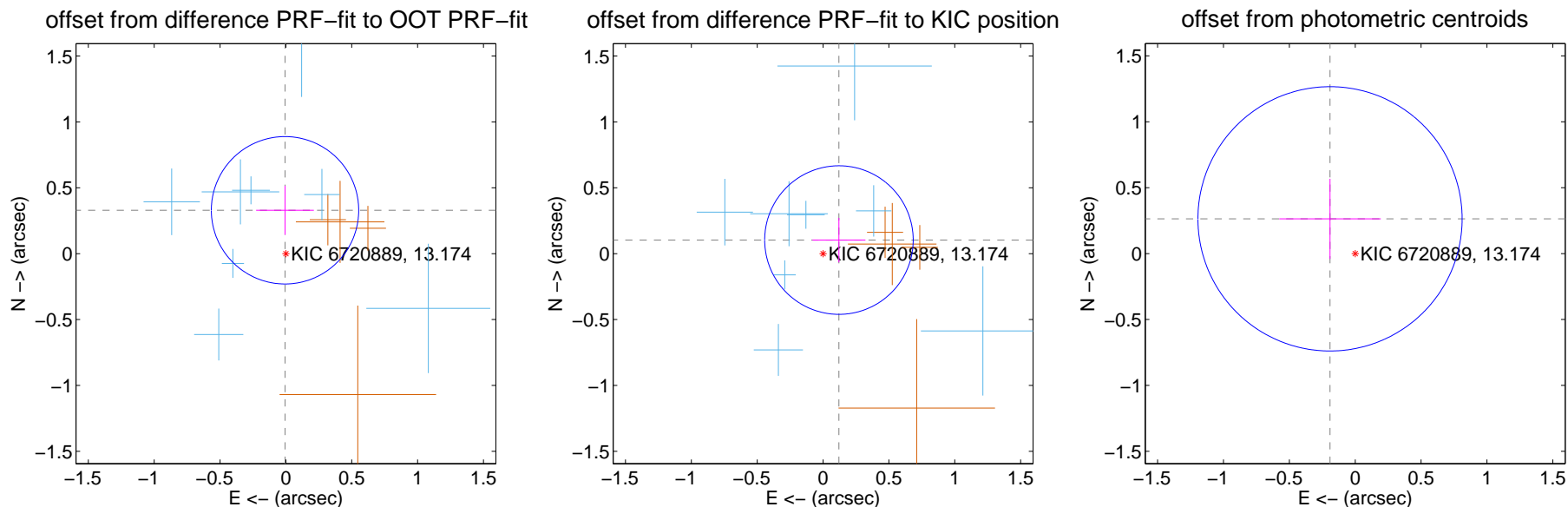
DV Centroid Data

Supplemental centroid analysis for 006720889-02. Kepler magnitude: 13.17. Transit SNR 10.24

There are 9 quarters with good PRF difference image offsets

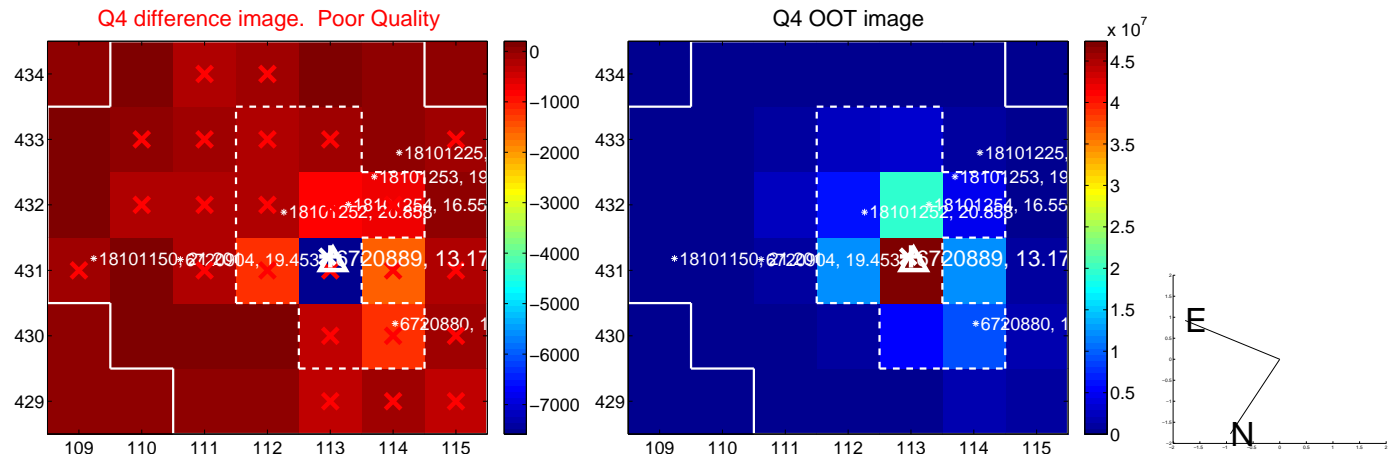
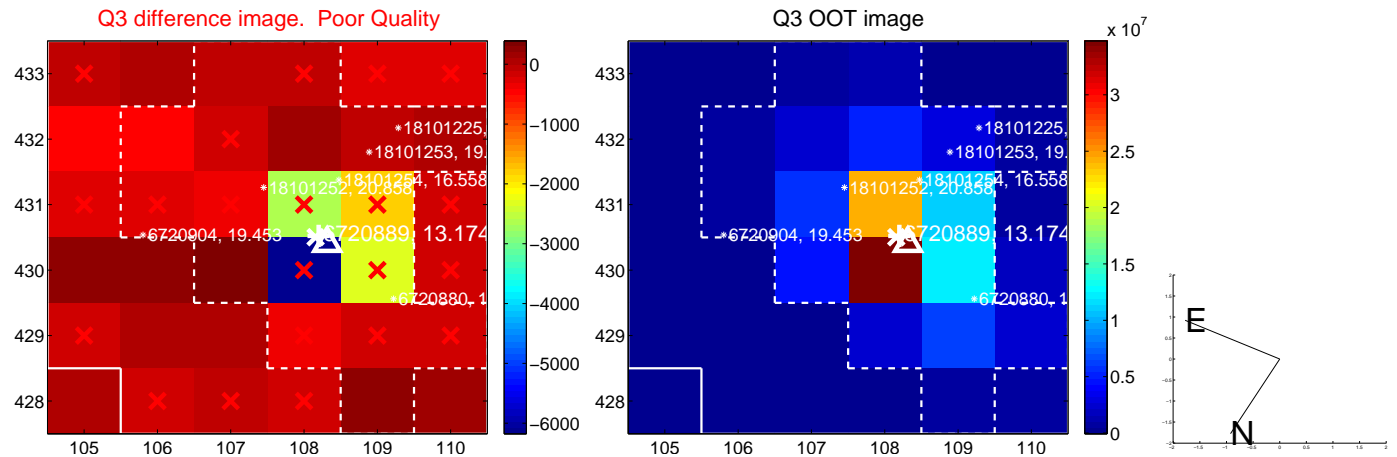
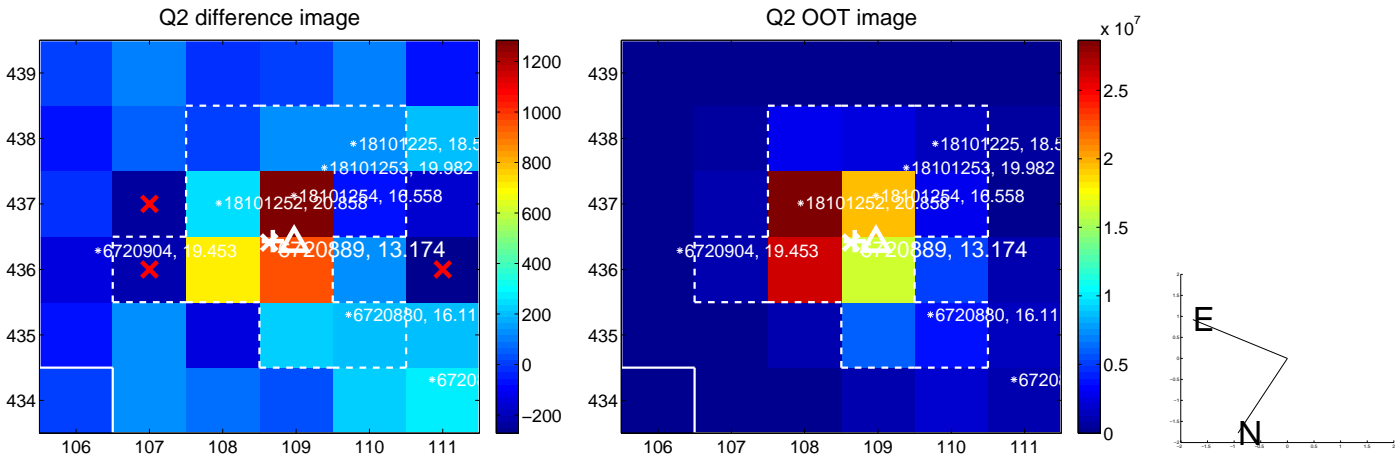
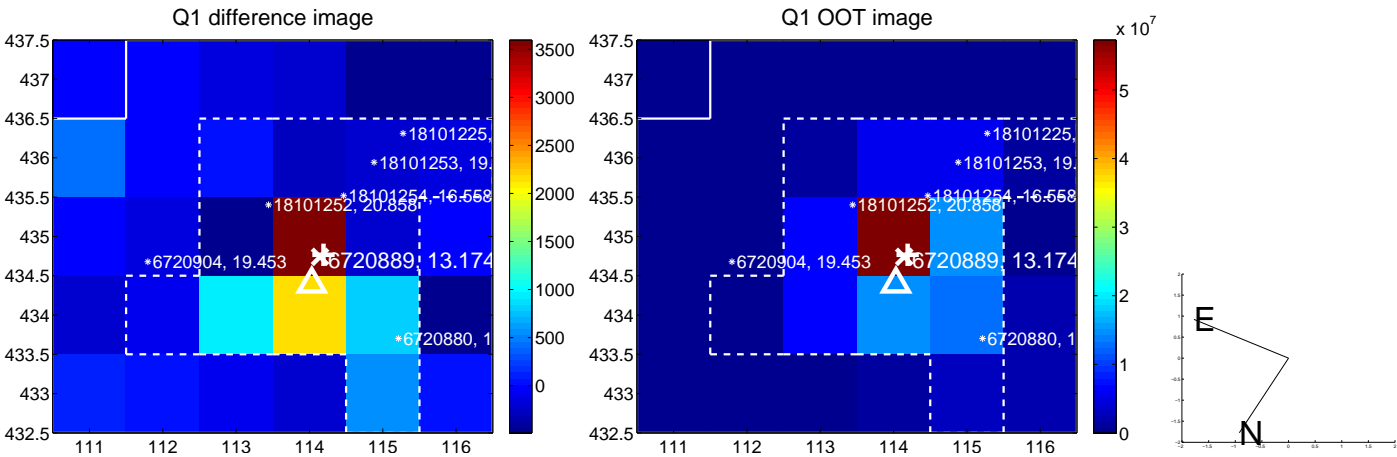
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.329 ± 0.186	1.77	0.007 ± 0.219	0.329 ± 0.186
PRF-fit source offset from KIC position	0.159 ± 0.188	0.84	-0.121 ± 0.201	0.103 ± 0.168
photometric centroid source offset	0.33 ± 0.33	0.97	0.19 ± 0.39	0.26 ± 0.30

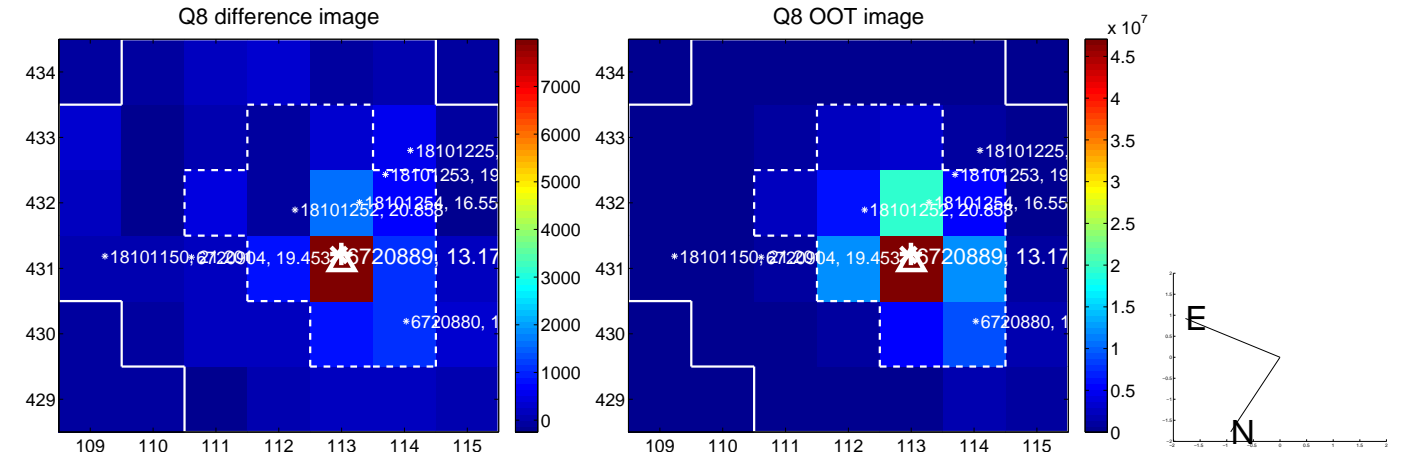
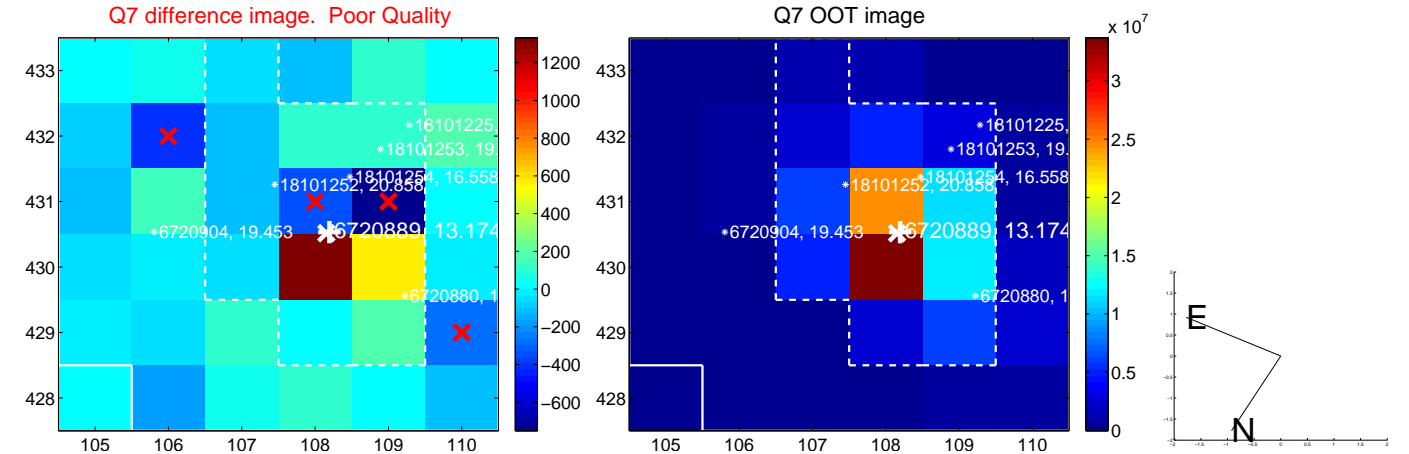
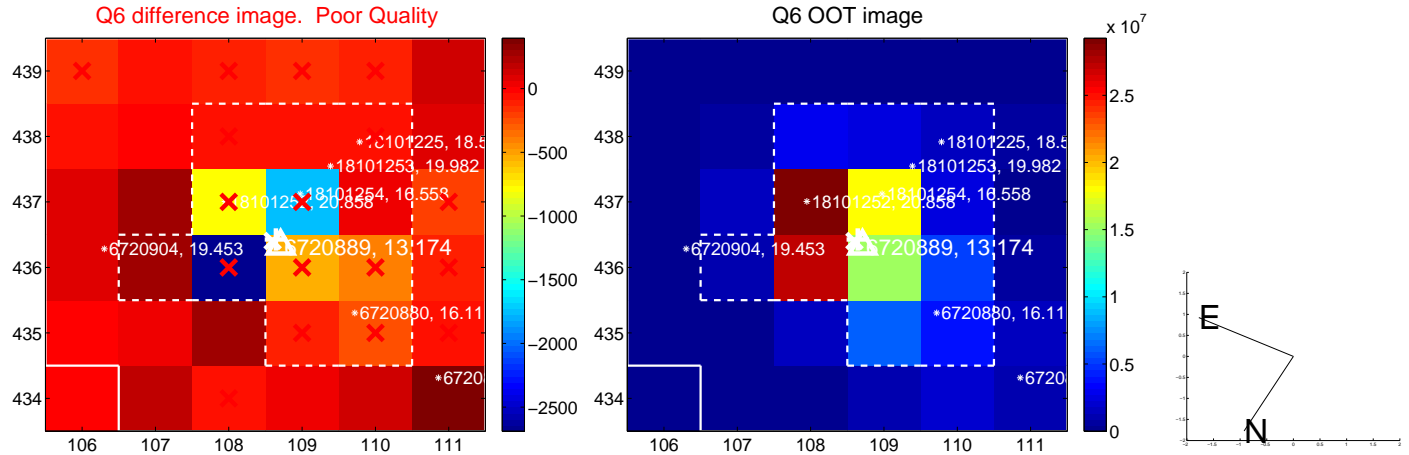
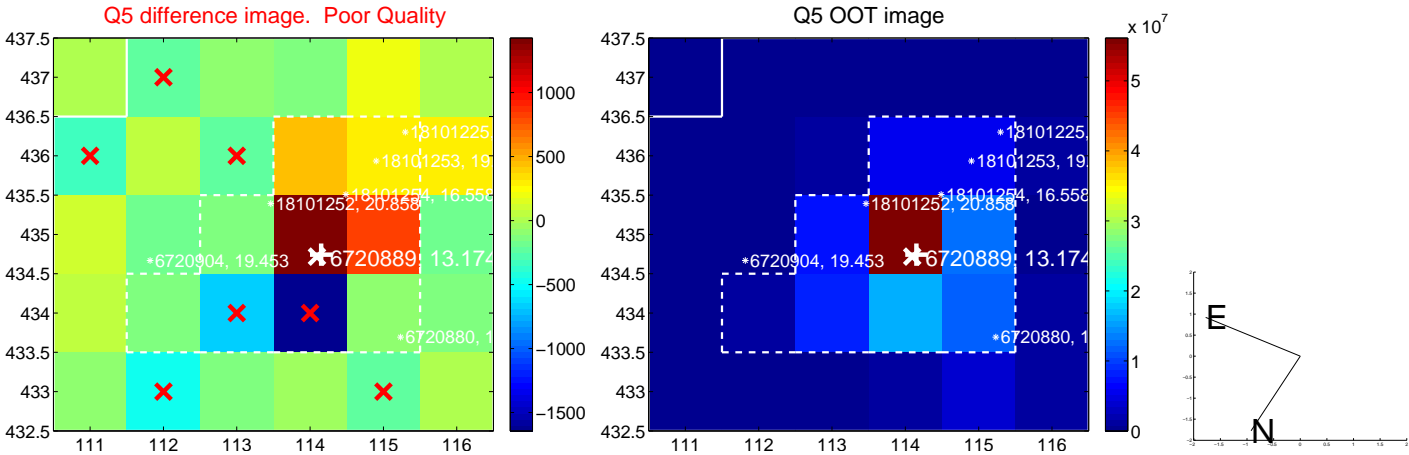


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

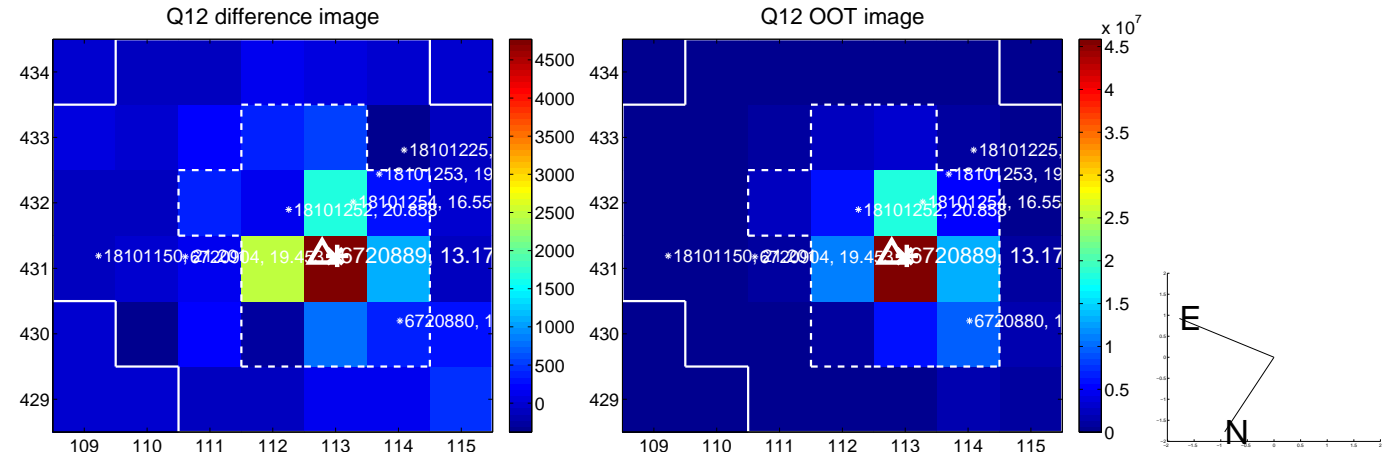
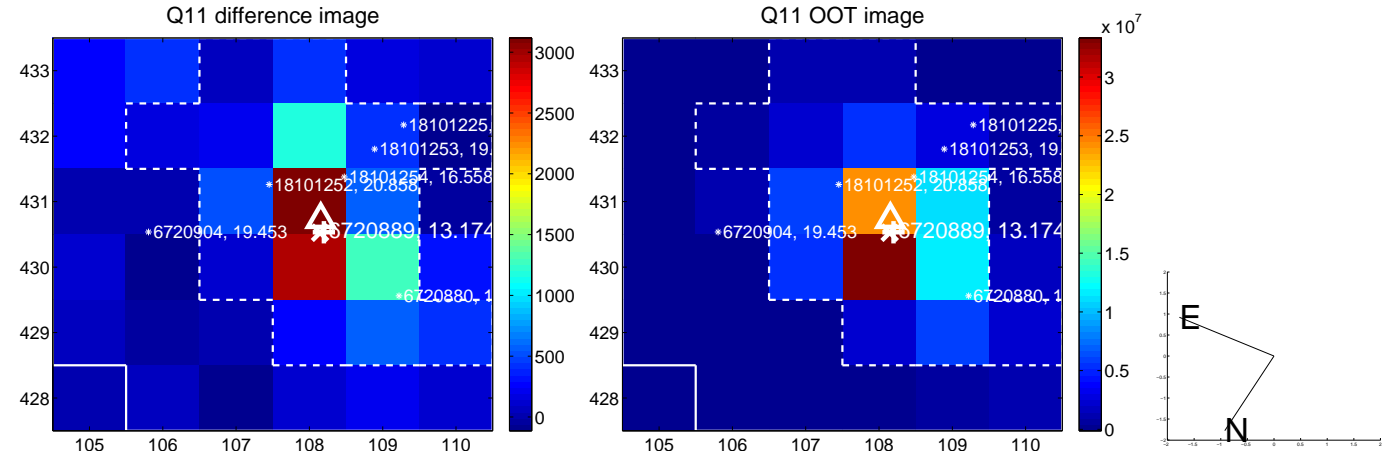
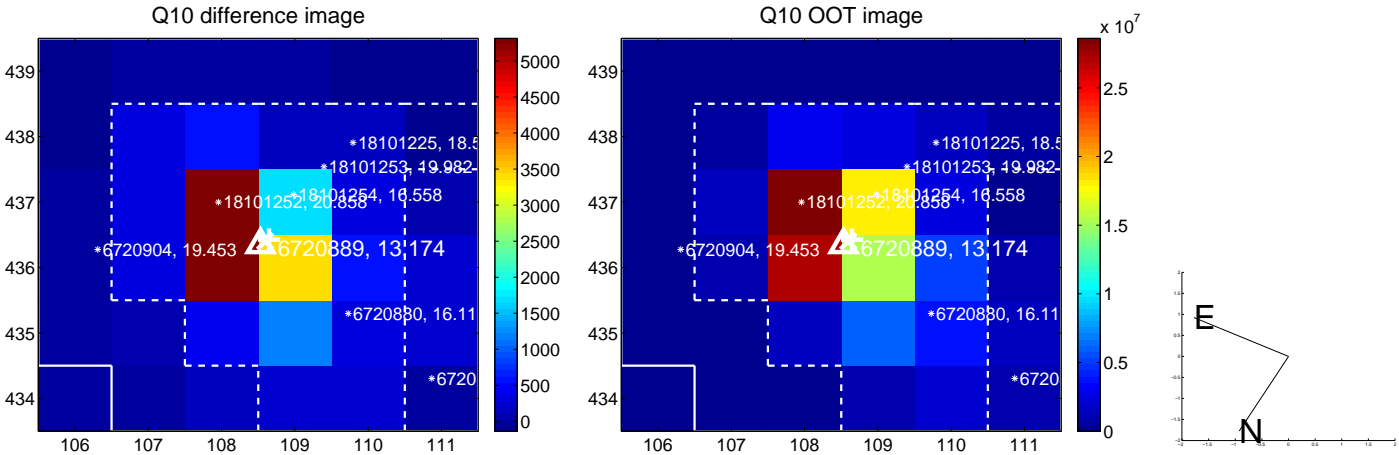
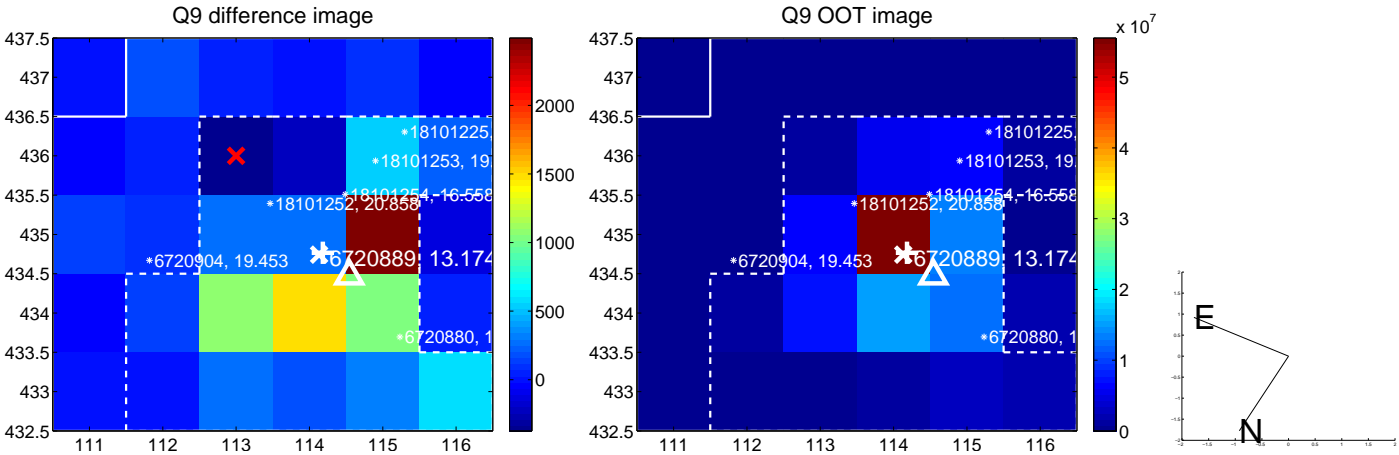
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



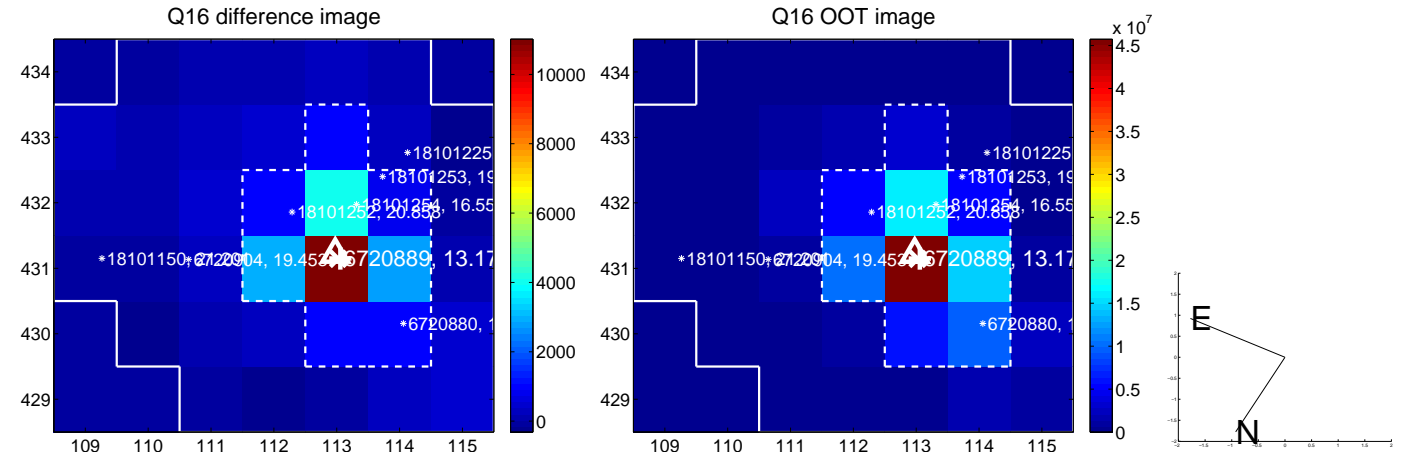
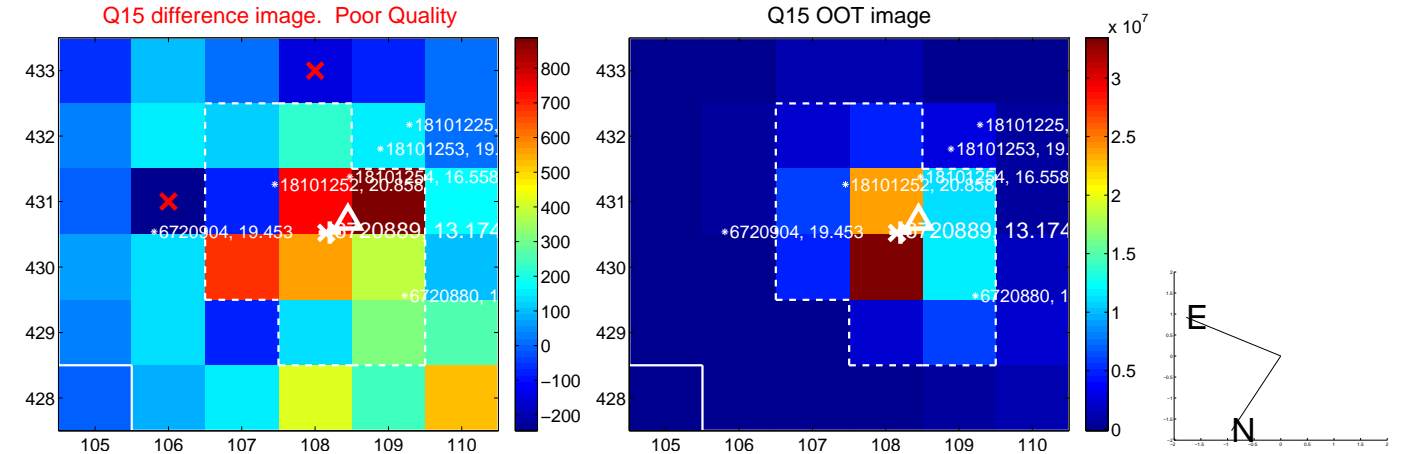
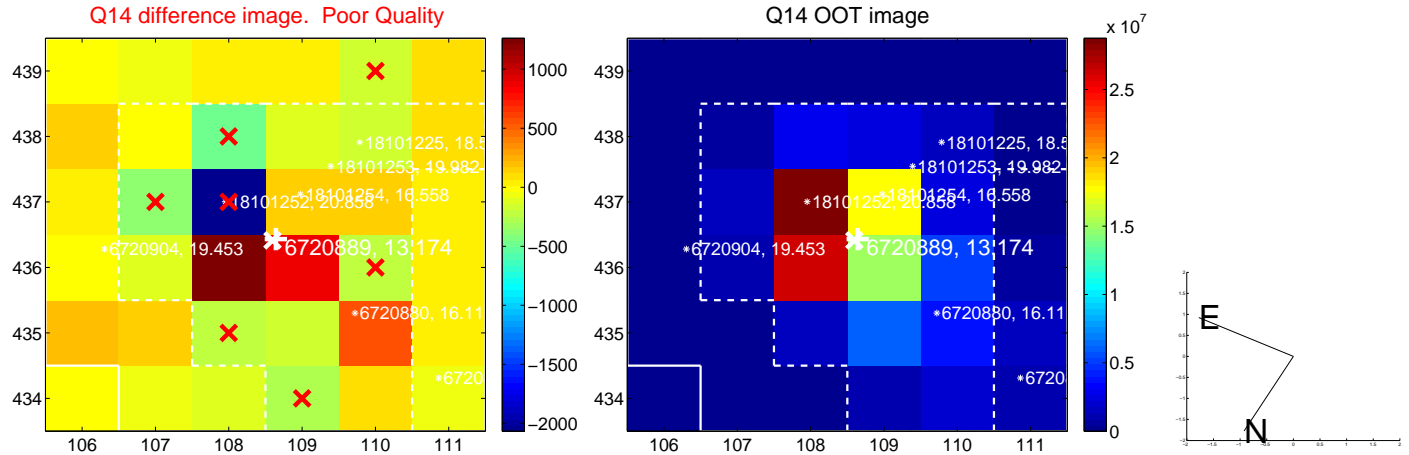
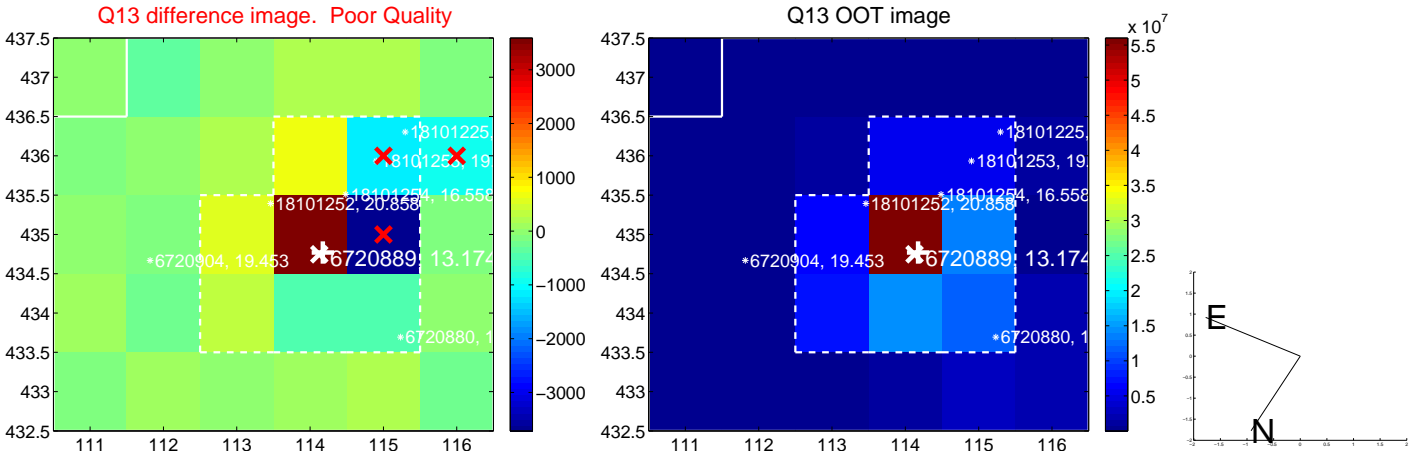
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



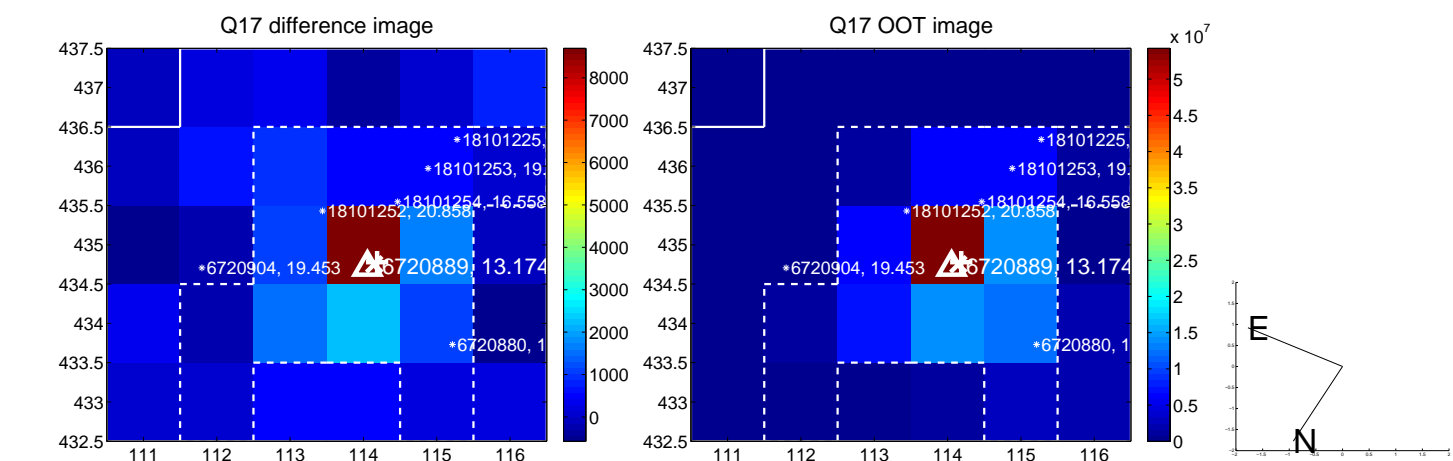
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



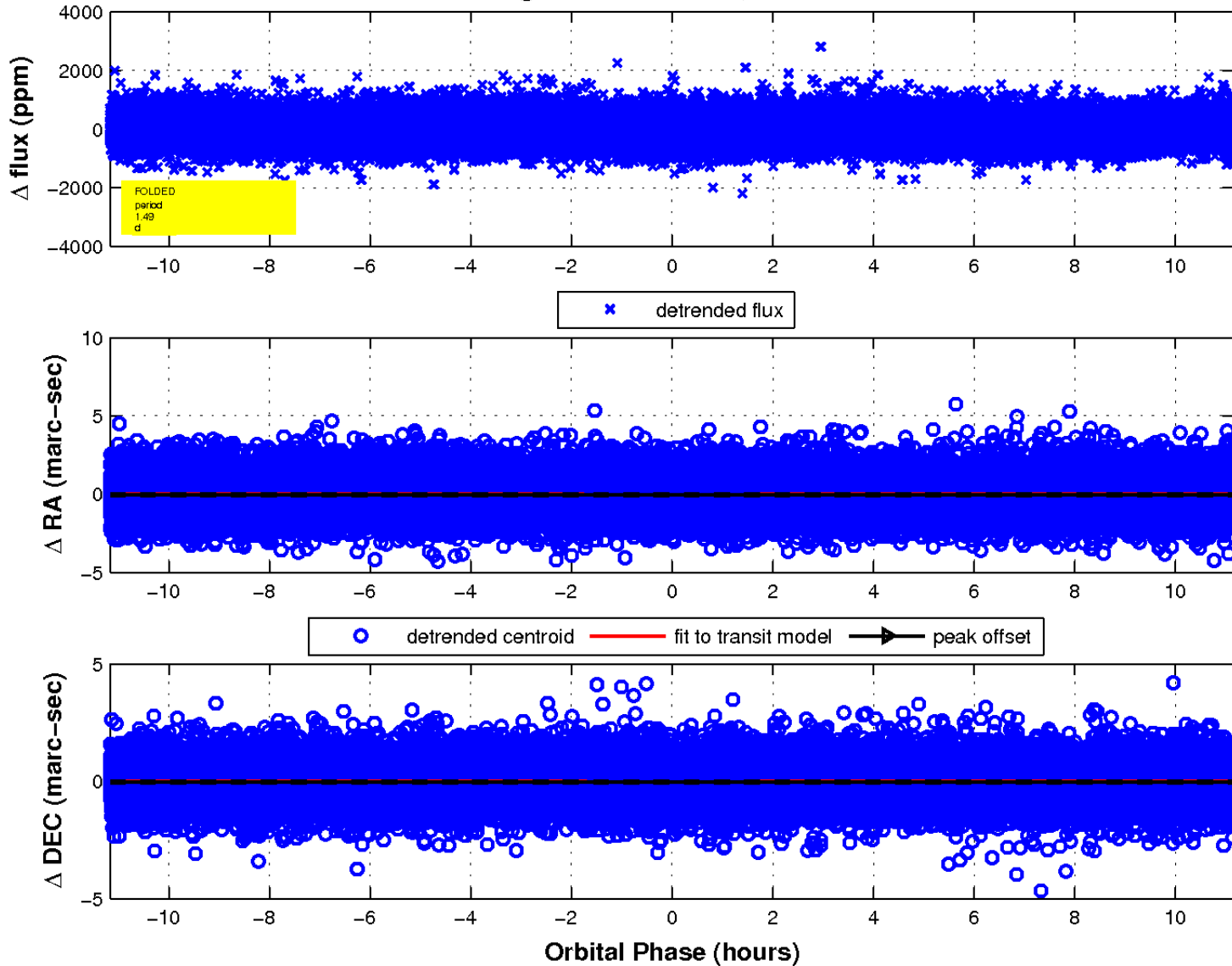
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

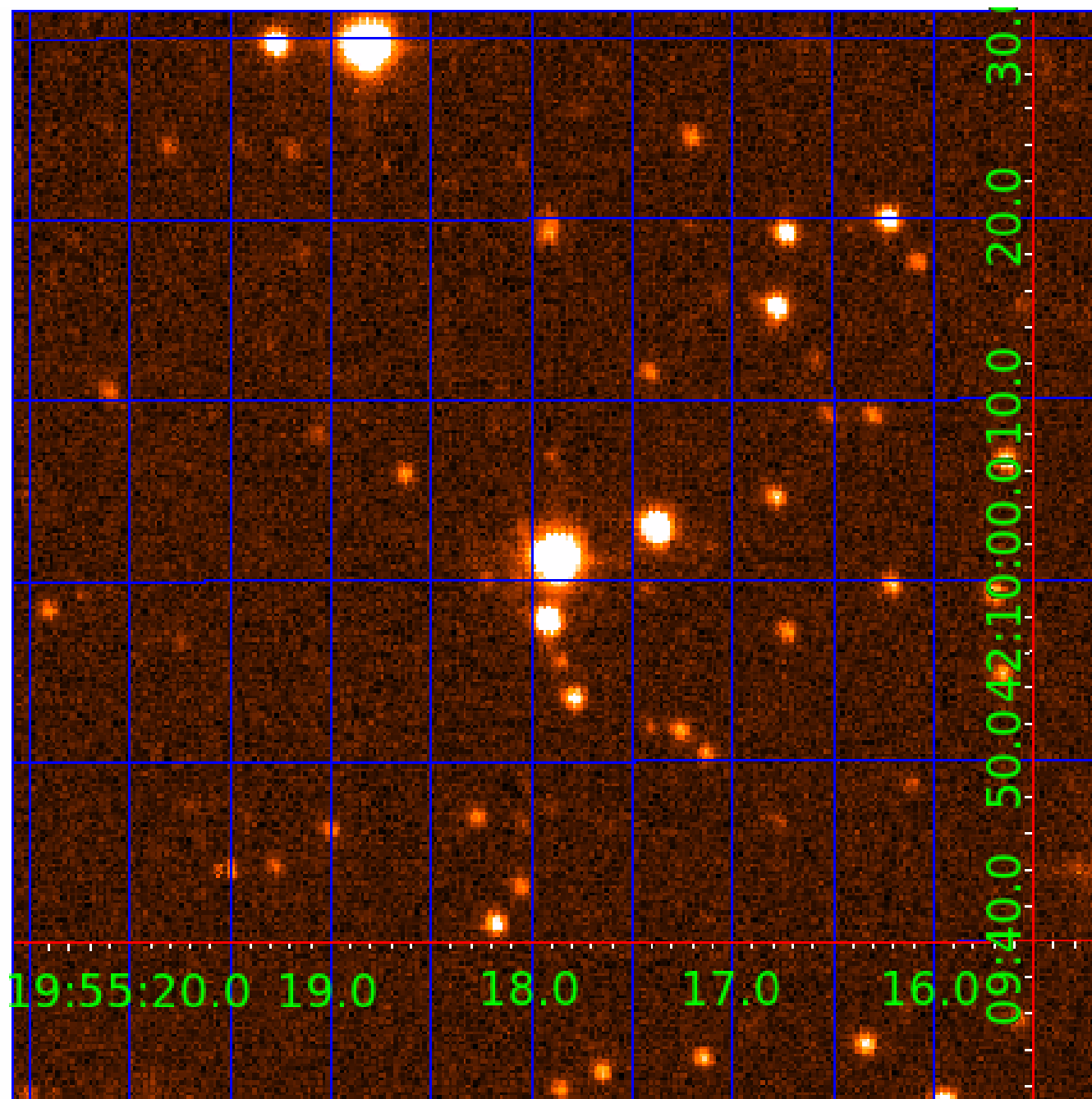


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination



KIC 006720889

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})
006720889-01	OBS	No	0.817321	131.853453	47.3	2.860	9.2	8.5	1.36	6763	1.06	10065.46
006720889-02	OBS	No	1.489258	132.110336	95.6	3.721	10.0	10.2	1.36	6763	1.56	4522.70
006720889-03	OBS	No	249.773187	251.576219	1313.1	4.841	9.2	9.8	1.36	6763	8.10	4.89
006720889-04	OBS	No	281.044431	141.993349	1360.7	5.998	8.2	8.7	1.36	6763	6.23	4.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006720889-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
006720889-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
006720889-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006720889-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS

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

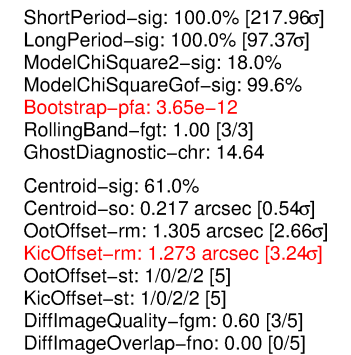
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

Ephemeris Match Information For 006720889-03

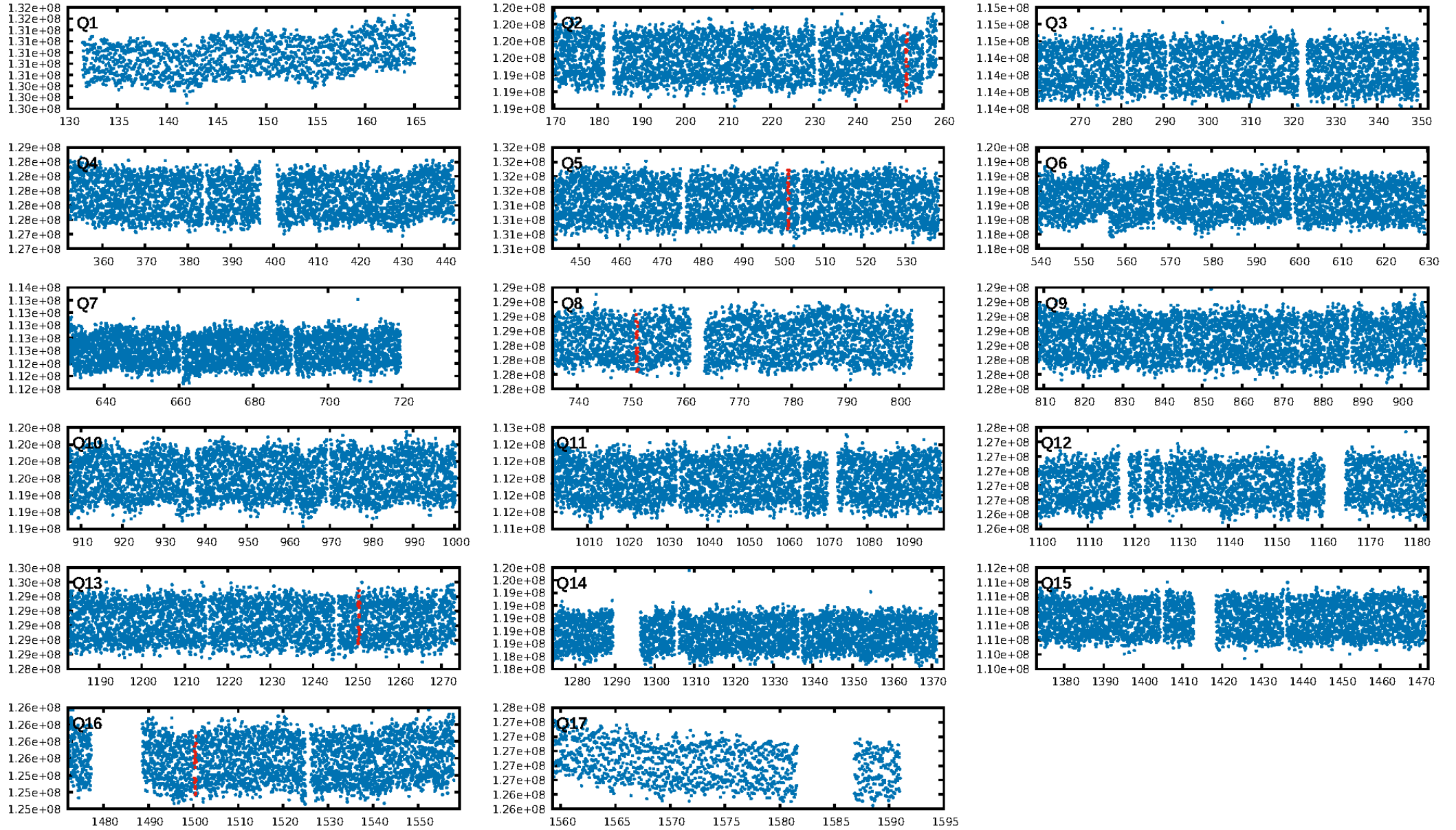
No Significant Match Found

KIC: 6720889 Candidate: 3 of 5 Period: 249.773 d

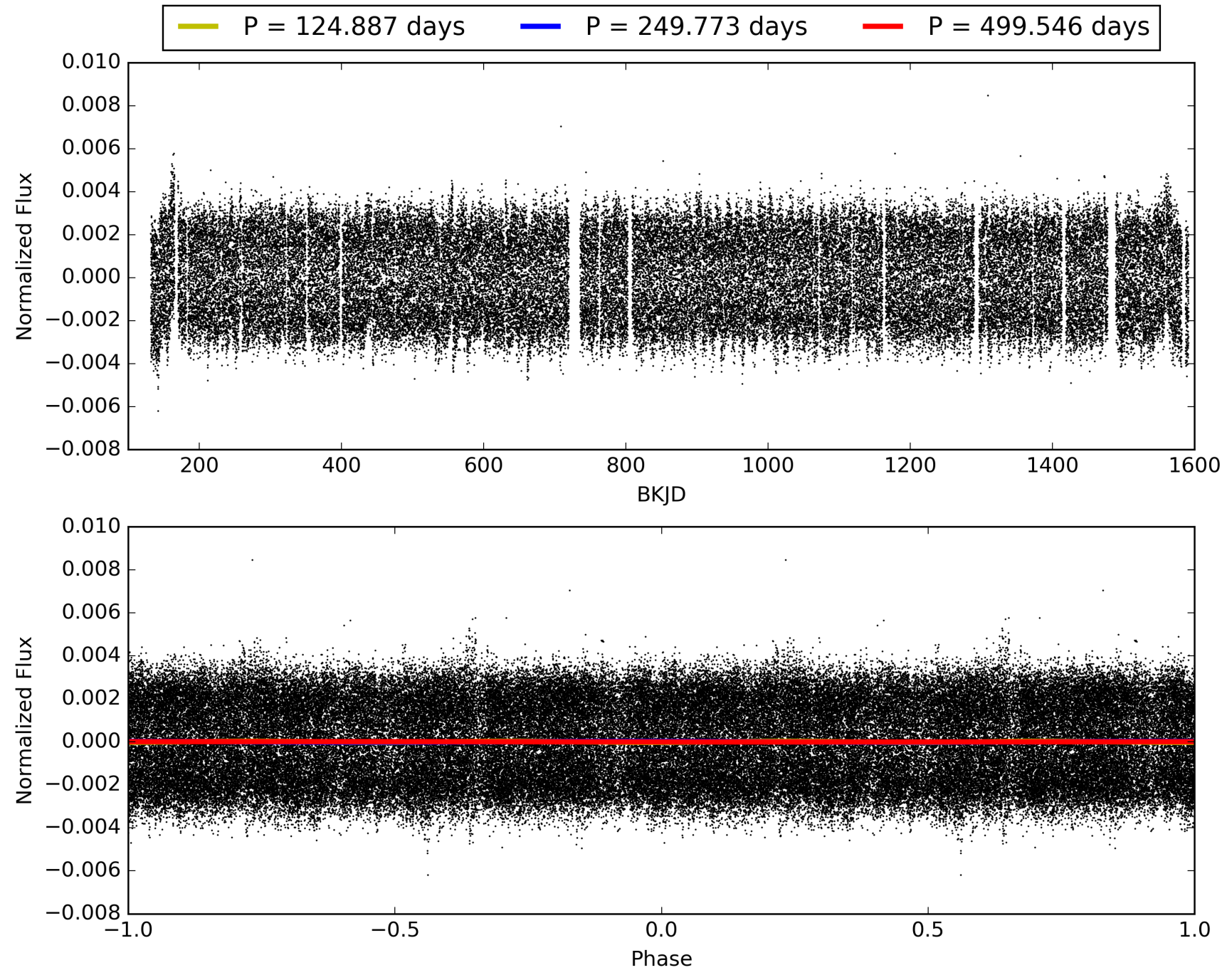


This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006720889-03, PDC Light Curves

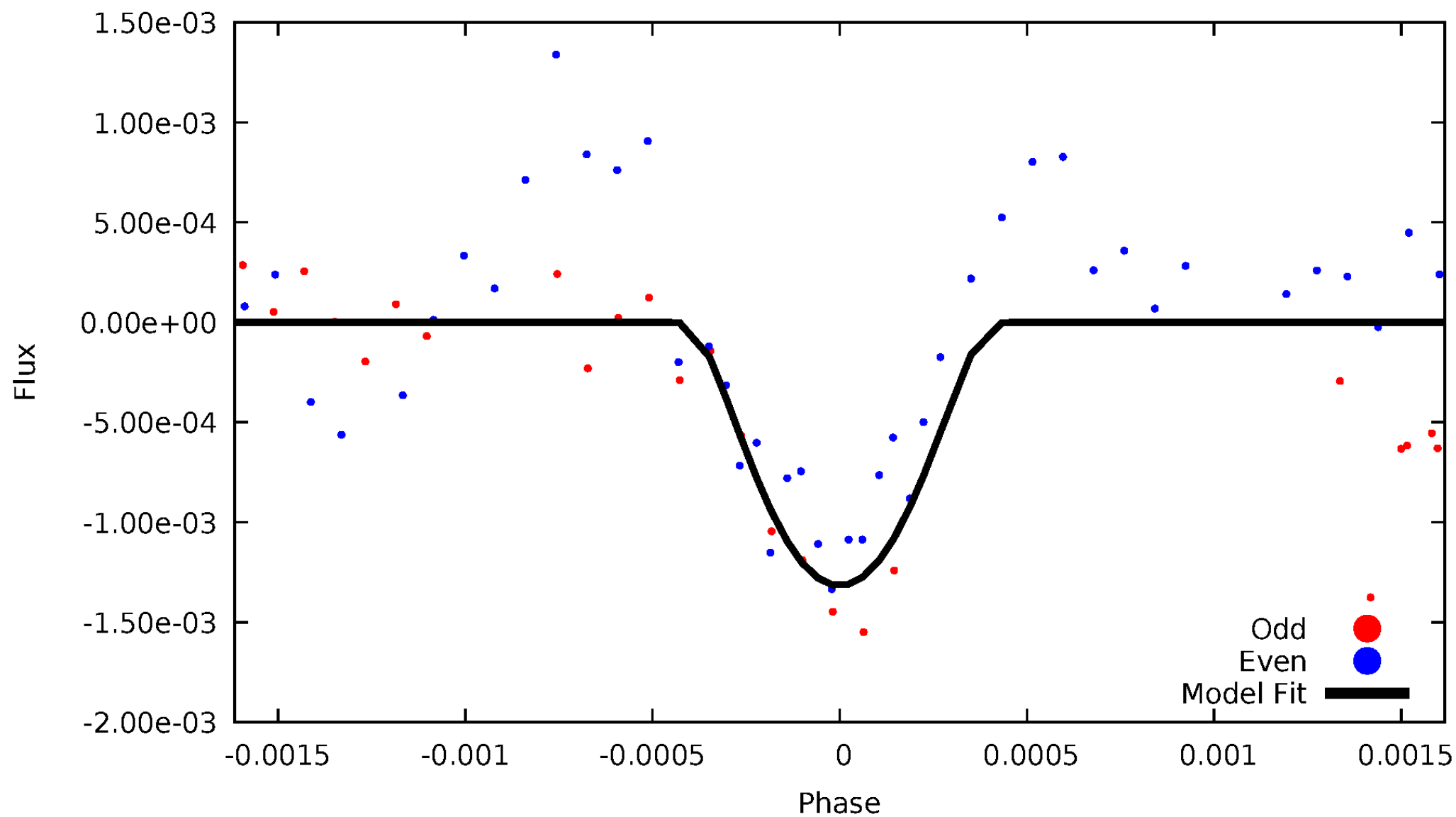


TCE 006720889-03



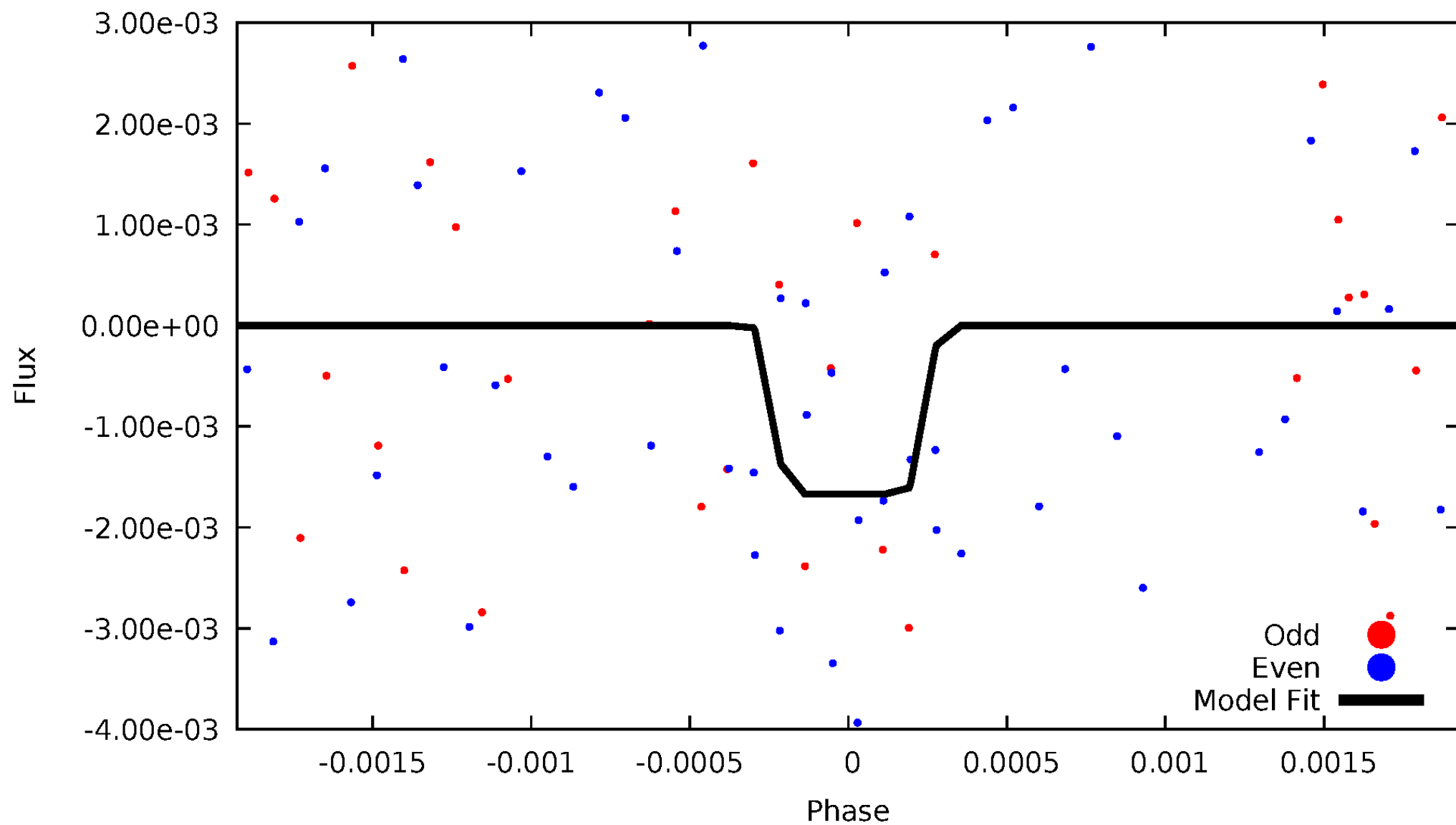
DV Odd/Even

TCE 006720889-03



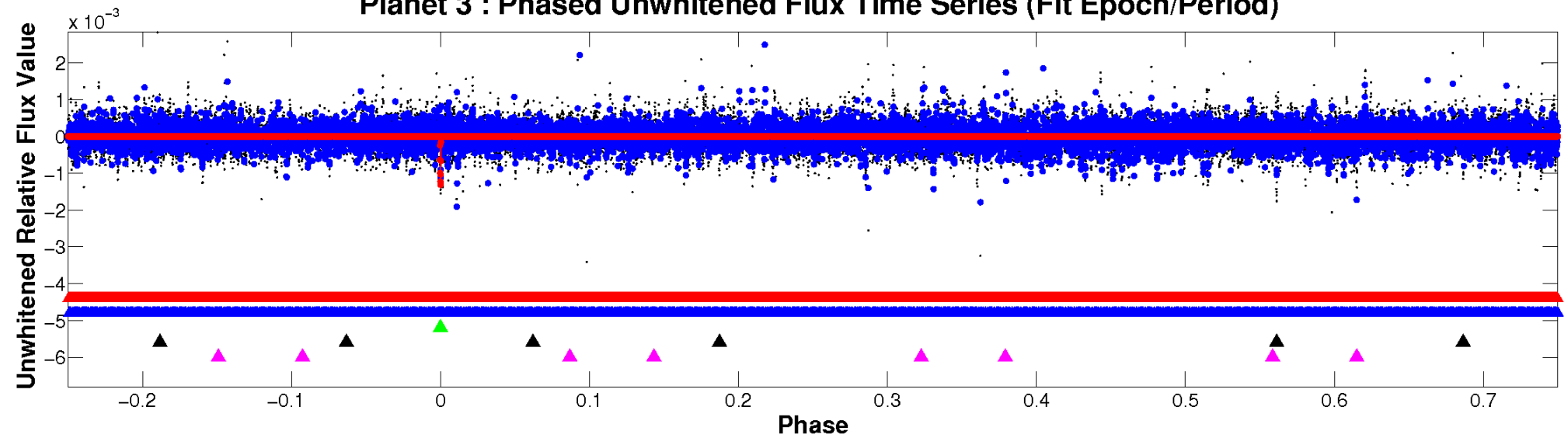
ALT Odd/Even

TCE 006720889-03

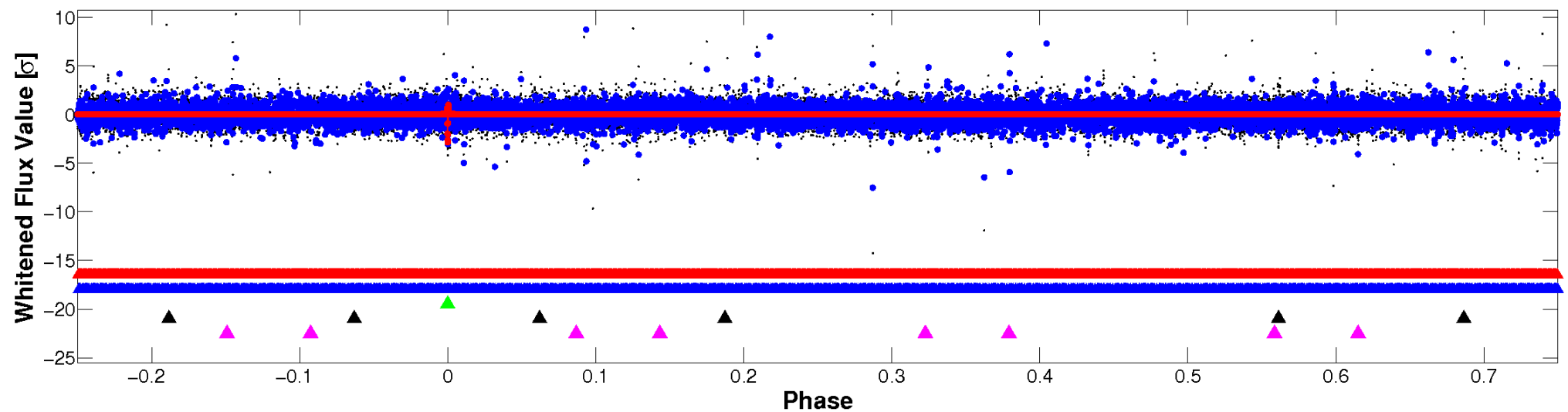


Non-Whitened Vs. Whitened Light Curve

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

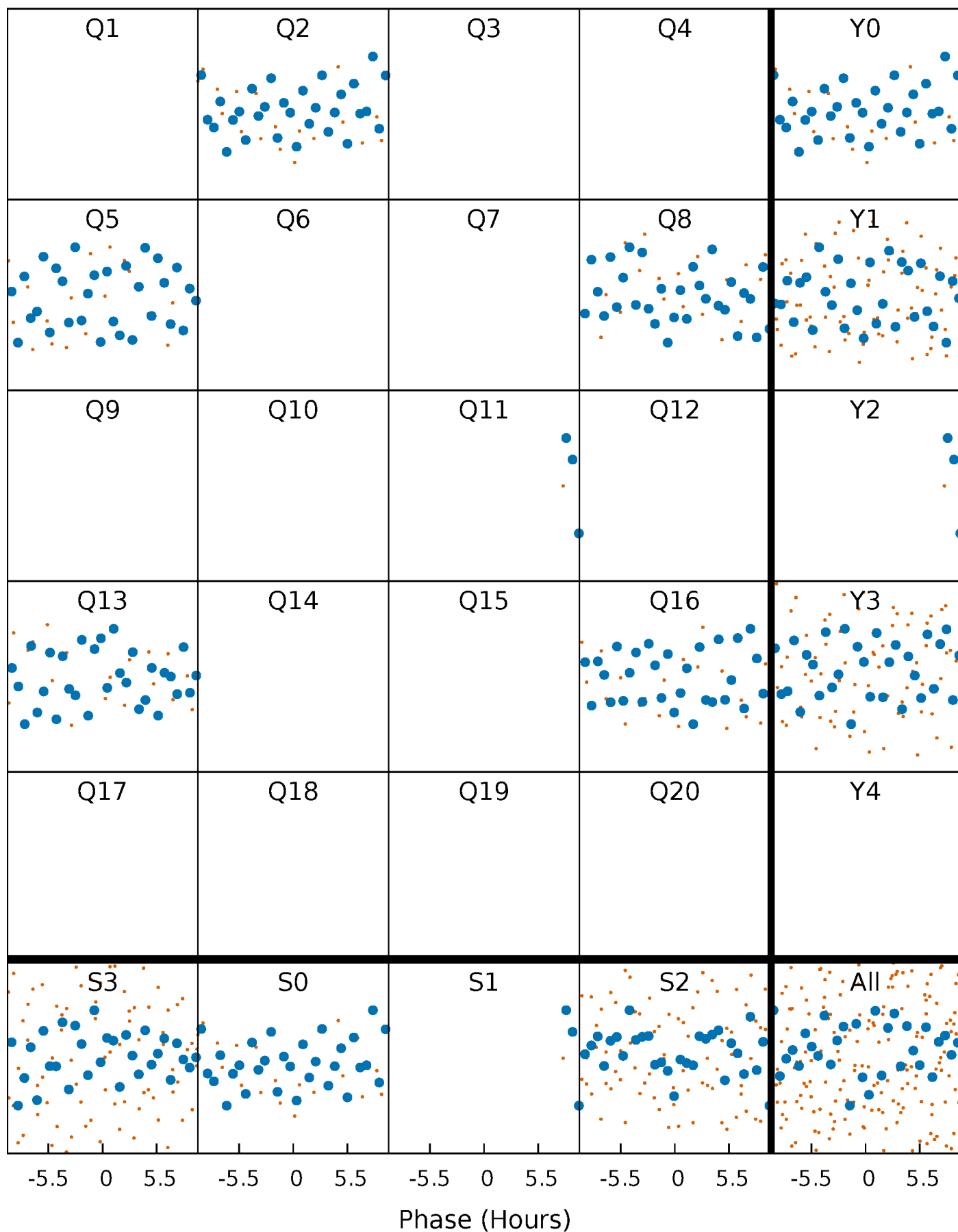


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



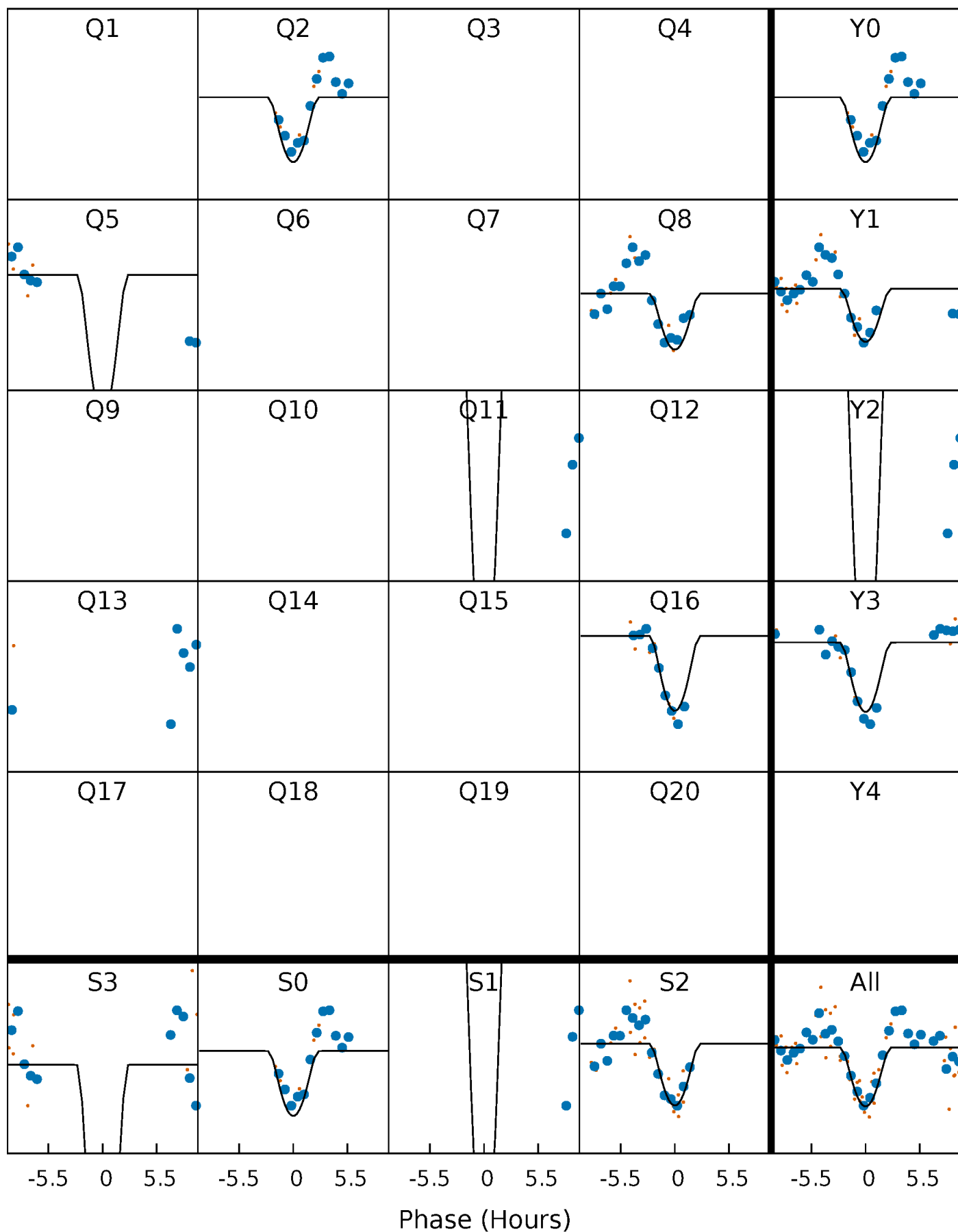
PDC Quarter-Phased Transit Curves

TCE 006720889-03 P=249.773187 Days $T_0=251.576220$ (BKJD)



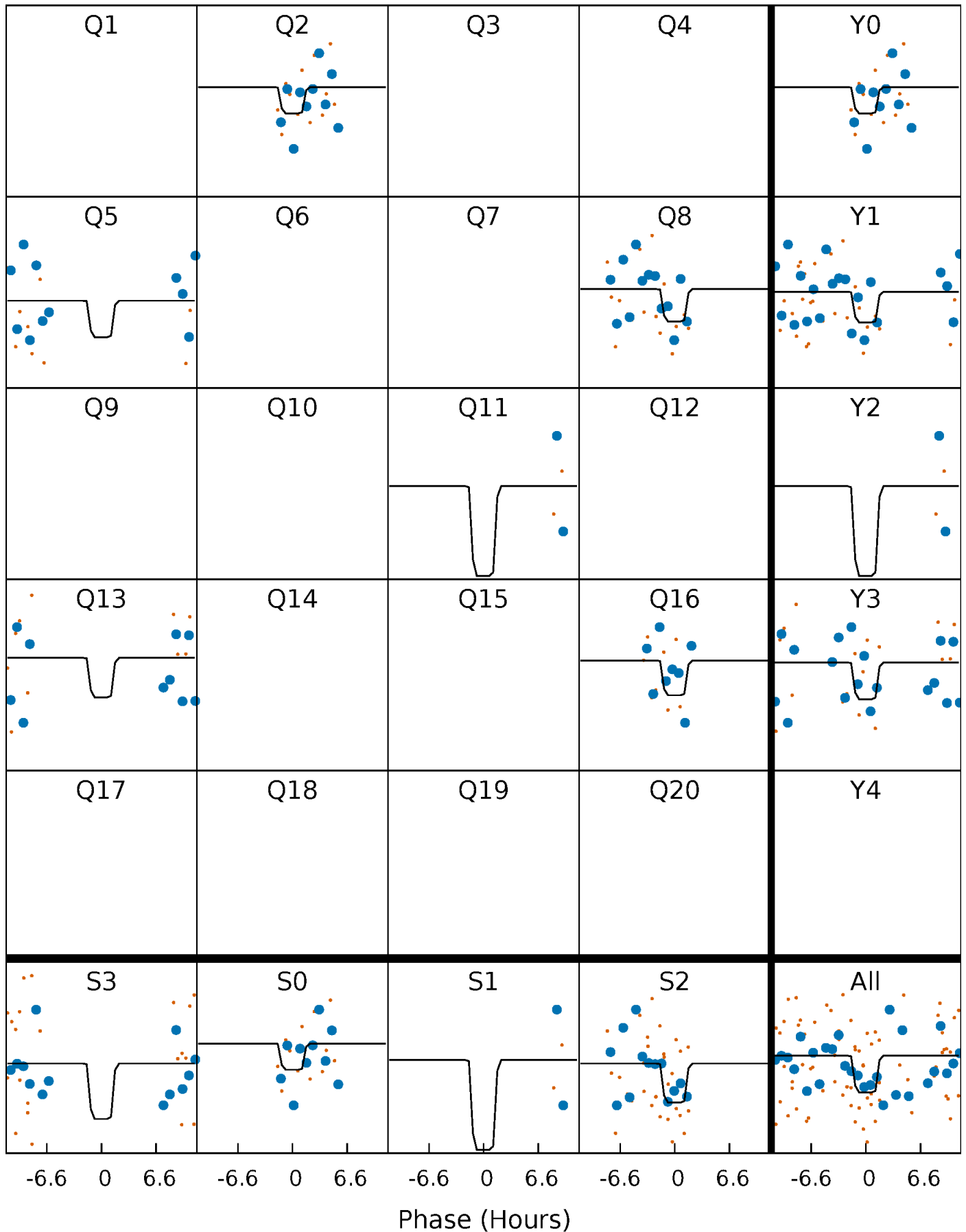
DV Quarter-Phased Transit Curves

TCE 006720889-03 P=249.773187 Days $T_0=251.576220$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

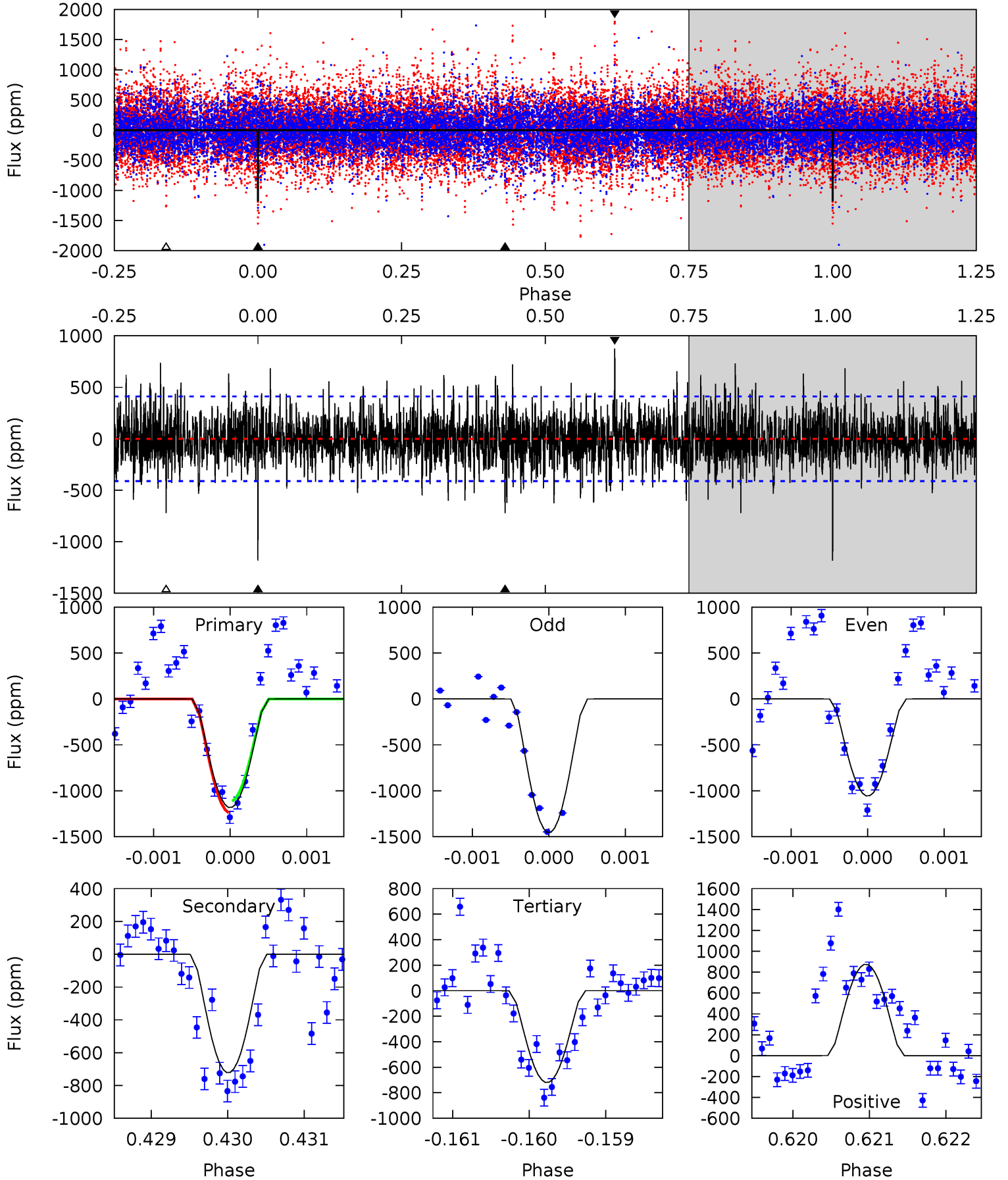
TCE 006720889-03 P=249.767108 Days $T_0=251.574897$ (BKJD)



DV Model-Shift Uniqueness Test

006720889-03, P = 249.773187 Days, E = 1.803033 Days

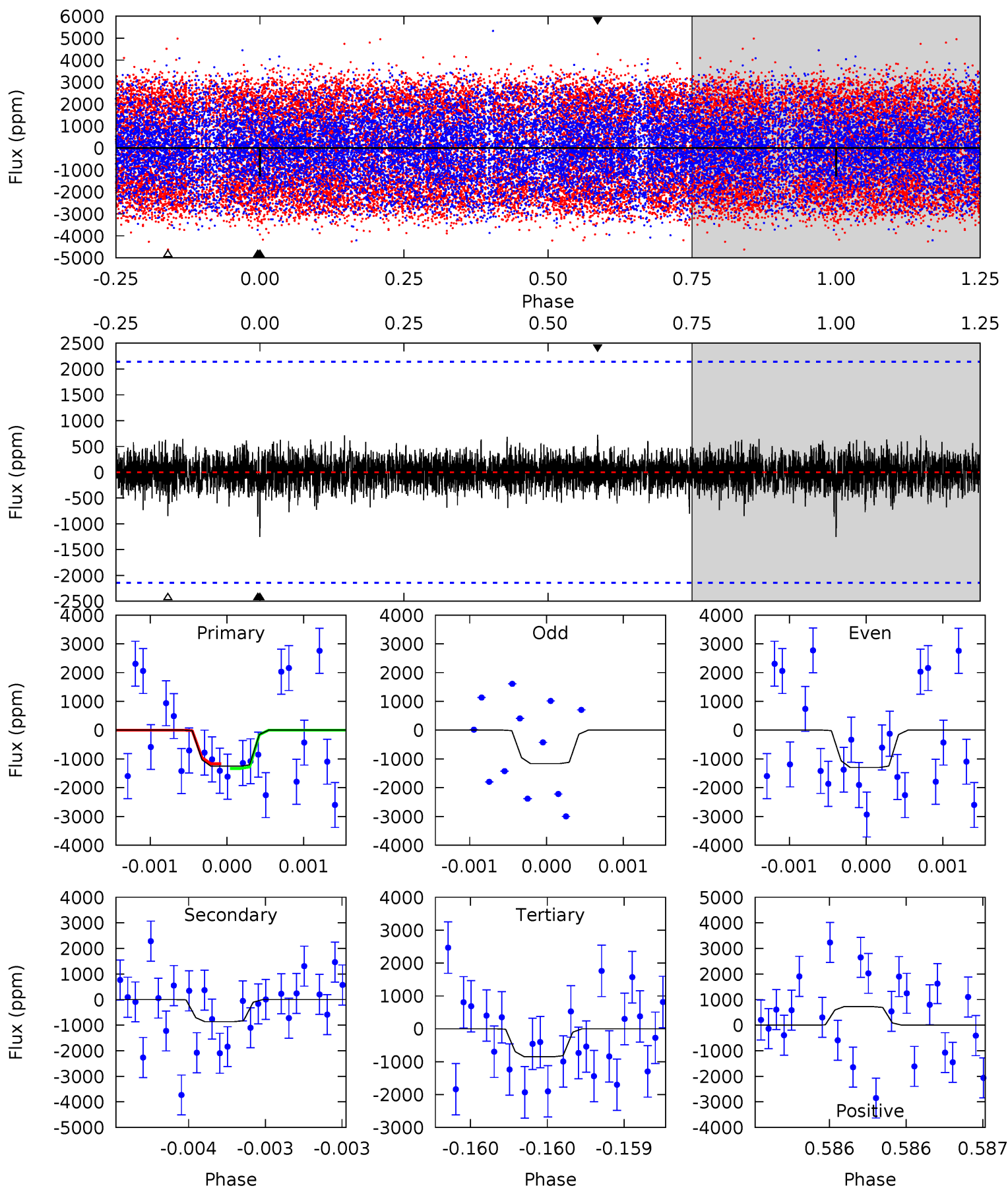
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.7	9.61	9.57	11.6	5.48	3.33	2.50	6.16	4.10	0.04	-2.03	2.40	1.08	0.43	0.82



Alt Model-Shift Uniqueness Test

006720889-03, P = 249.767108 Days, E = 1.807789 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.24	2.22	2.19	1.87	5.53	3.41	0.51	1.04	1.37	0.03	0.36	0.16	1.00	0.37	0.21



Stellar Parameters For KIC 006720889

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6763^{+165}_{-236}	$4.277^{+0.105}_{-0.195}$	$-0.140^{+0.250}_{-0.300}$	$1.361^{+0.448}_{-0.224}$	$1.286^{+0.190}_{-0.190}$	$0.718^{+0.355}_{-0.381}$
	+2%/-3%	+2%/-5%	+179%/-214%	+33%/-16%	+15%/-15%	+49%/-53%
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 006720889-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-721 ± 75	$14.24^{+12.92}_{-9.72}$	535^{+38}_{-30}	3940^{+2489}_{-752}	1389^{+11942}_{-1010}
Alt.	-862 ± 388	$13.82^{+12.62}_{-9.21}$	533^{+40}_{-29}	4090^{+2396}_{-898}	1729^{+12720}_{-1378}

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

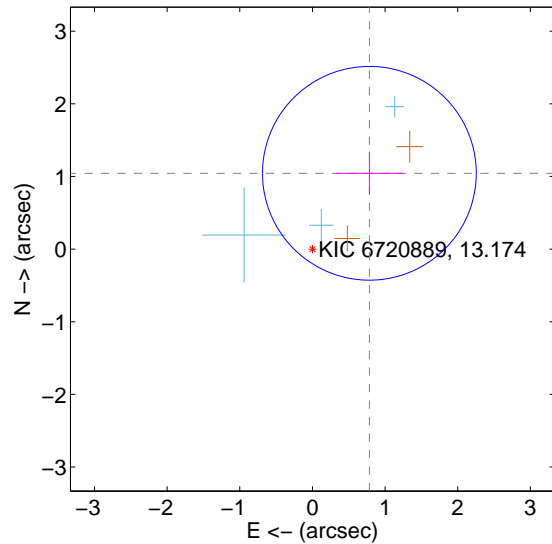
Supplemental centroid analysis for 006720889-03. Kepler magnitude: 13.17. Transit SNR 9.79

There are 3 quarters with good PRF difference image offsets

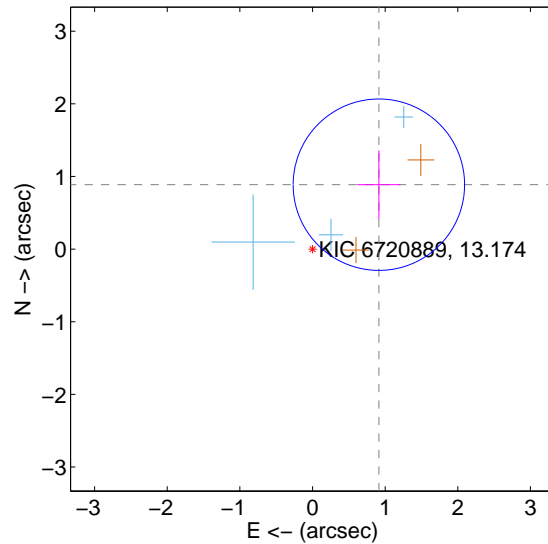
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.305 ± 0.490	2.66	-0.784 ± 0.459	1.044 ± 0.299
PRF-fit source offset from KIC position	1.273 ± 0.393	3.24	-0.913 ± 0.299	0.887 ± 0.473
photometric centroid source offset	0.22 ± 0.40	0.54	-0.20 ± 0.41	0.08 ± 0.33

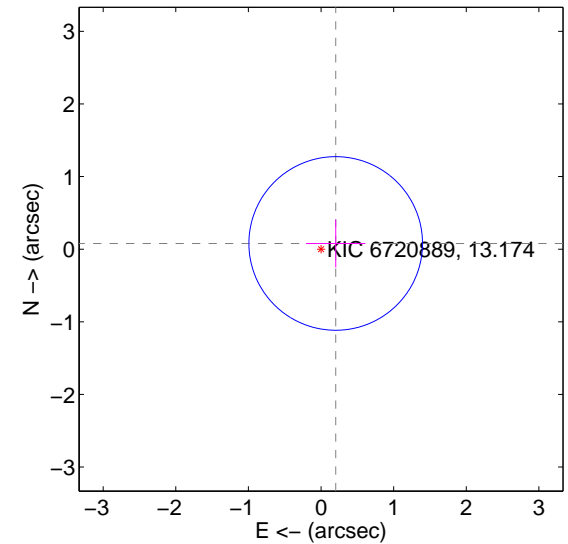
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

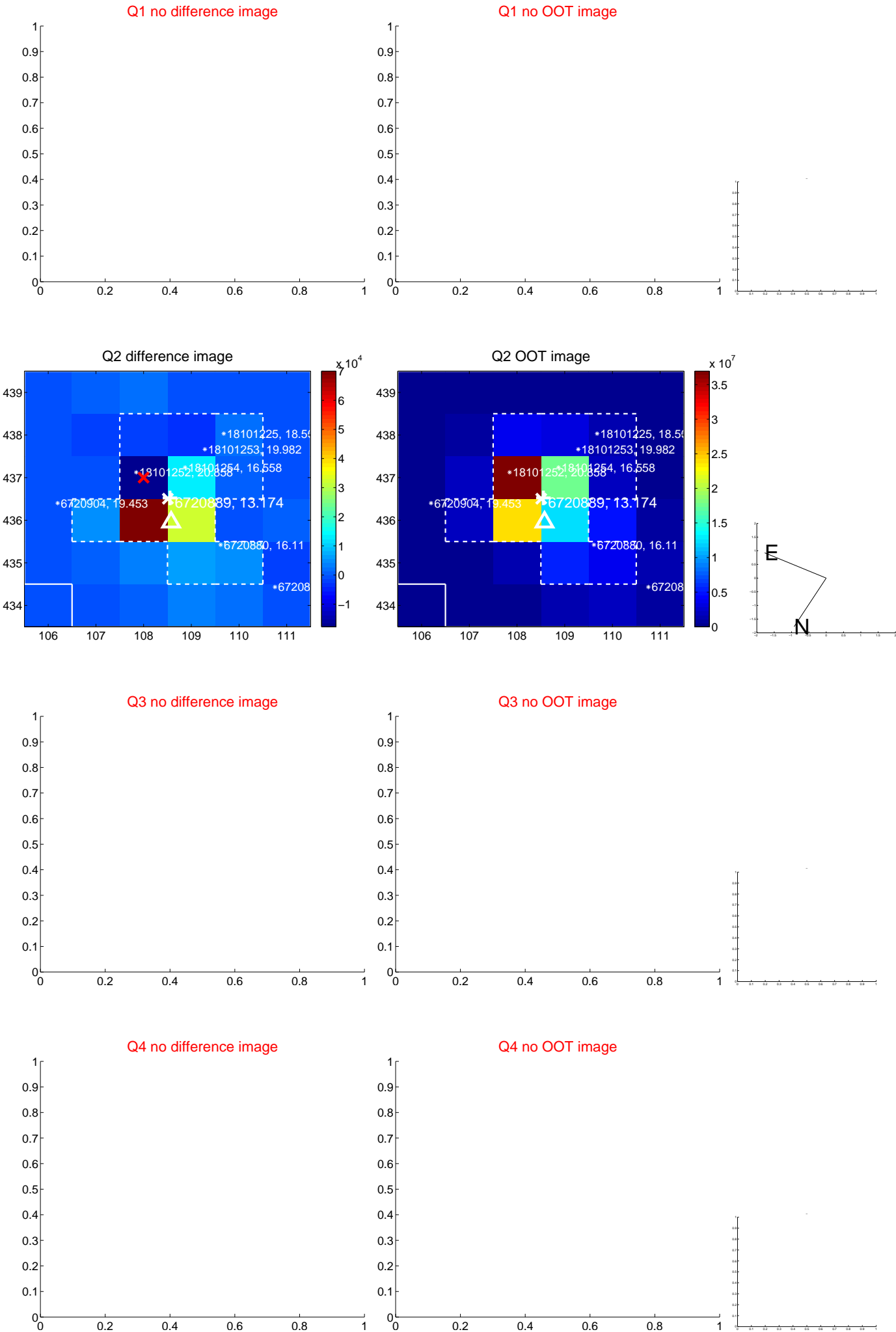


offset from photometric centroids

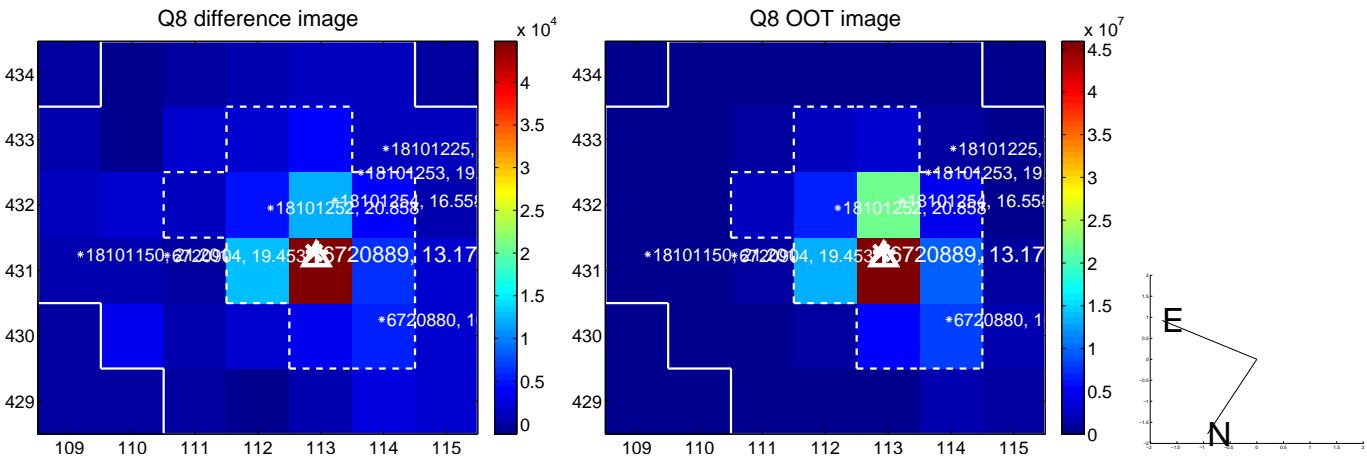
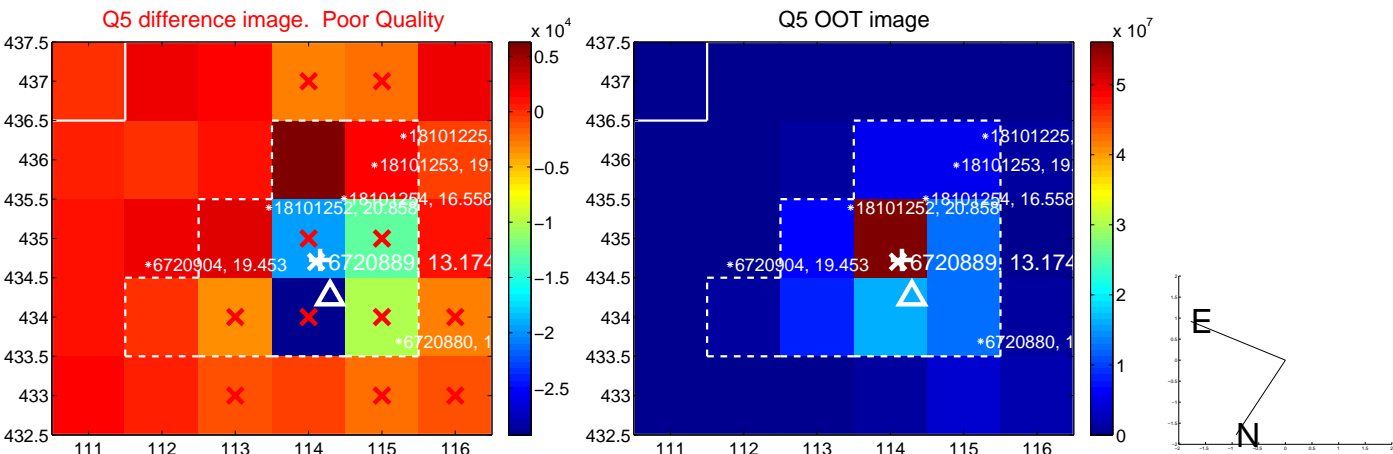


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



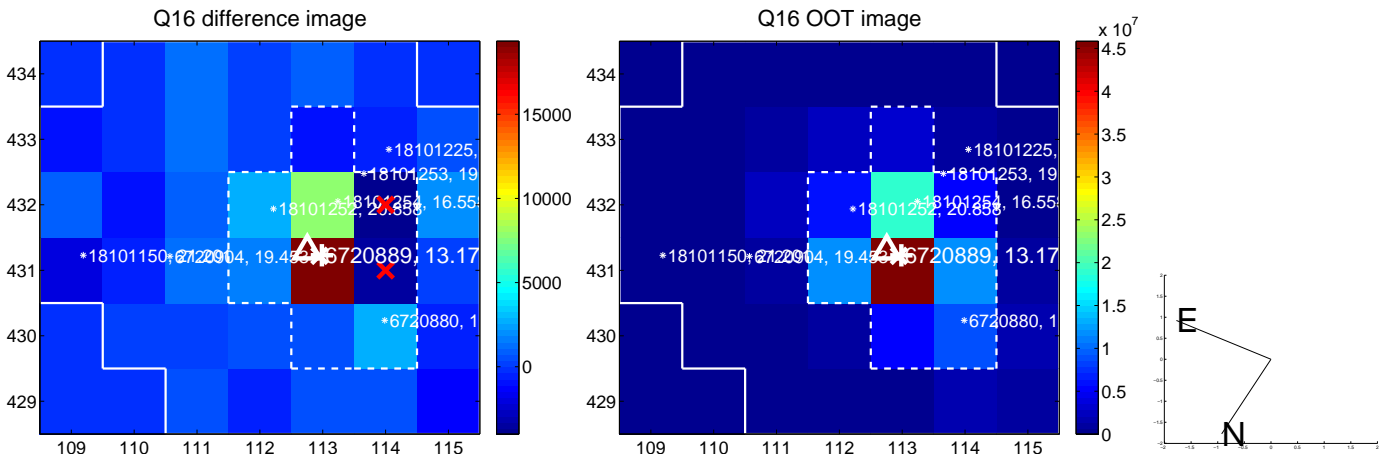
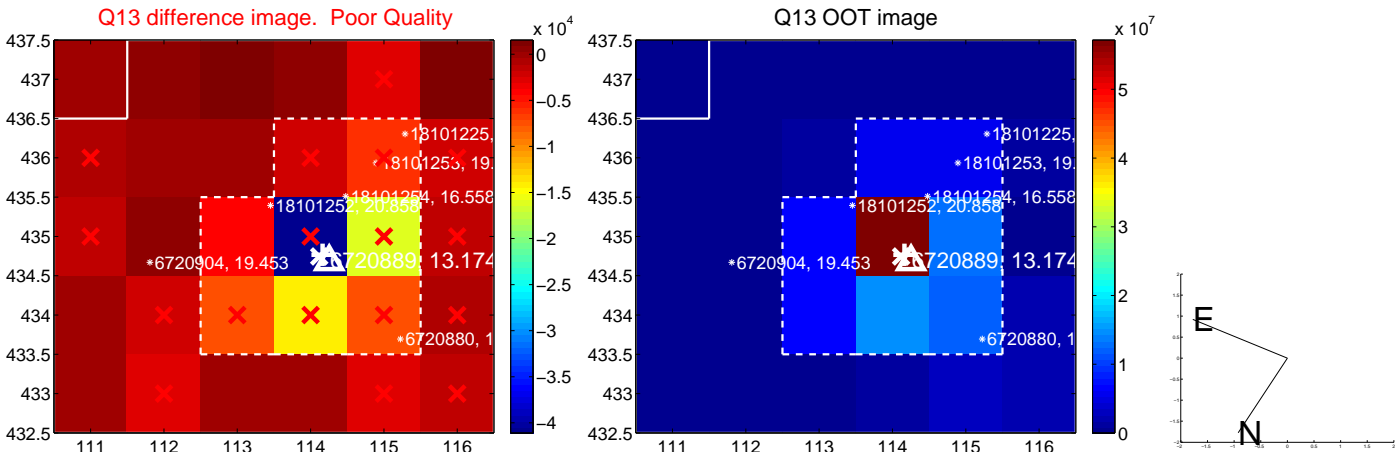
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



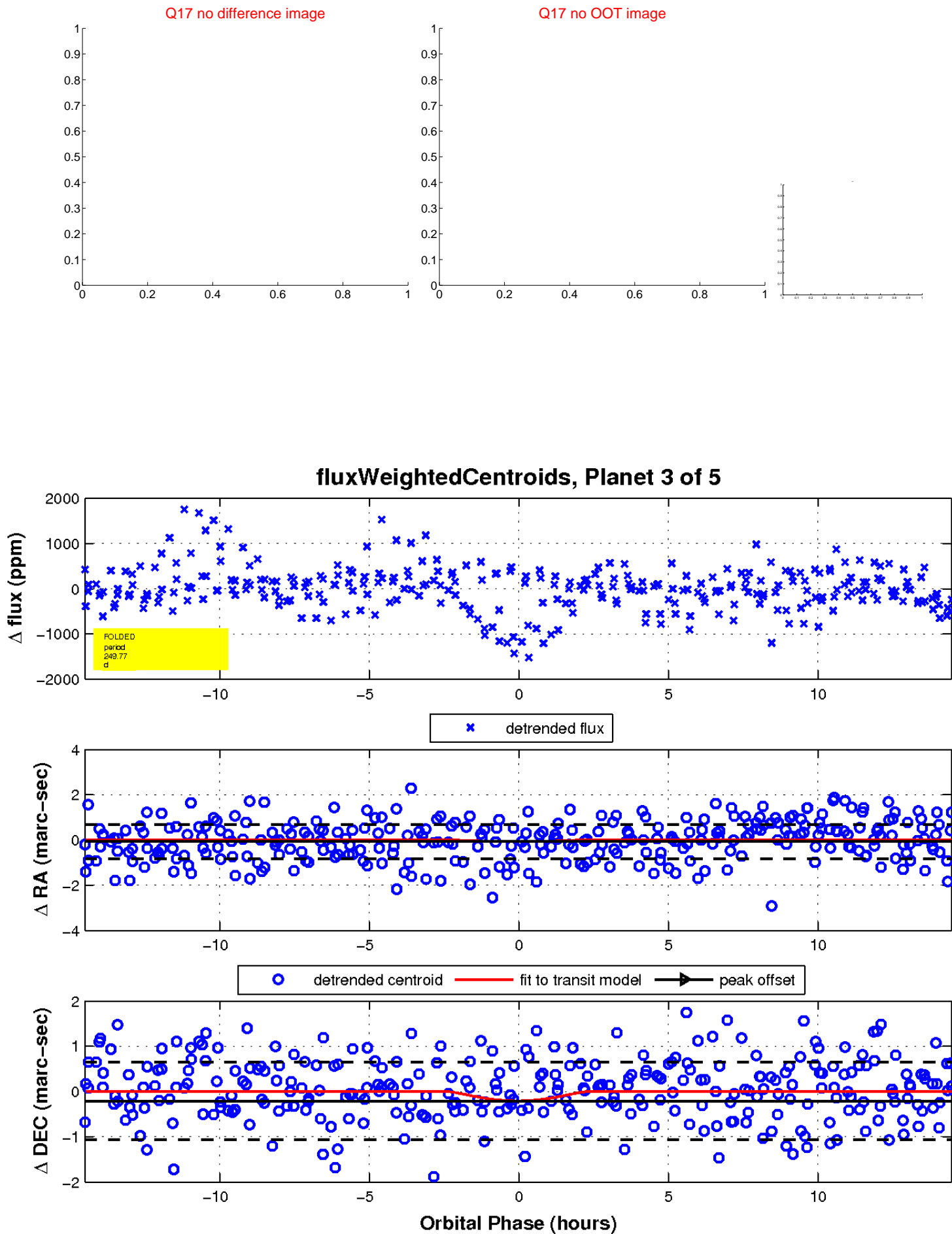
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

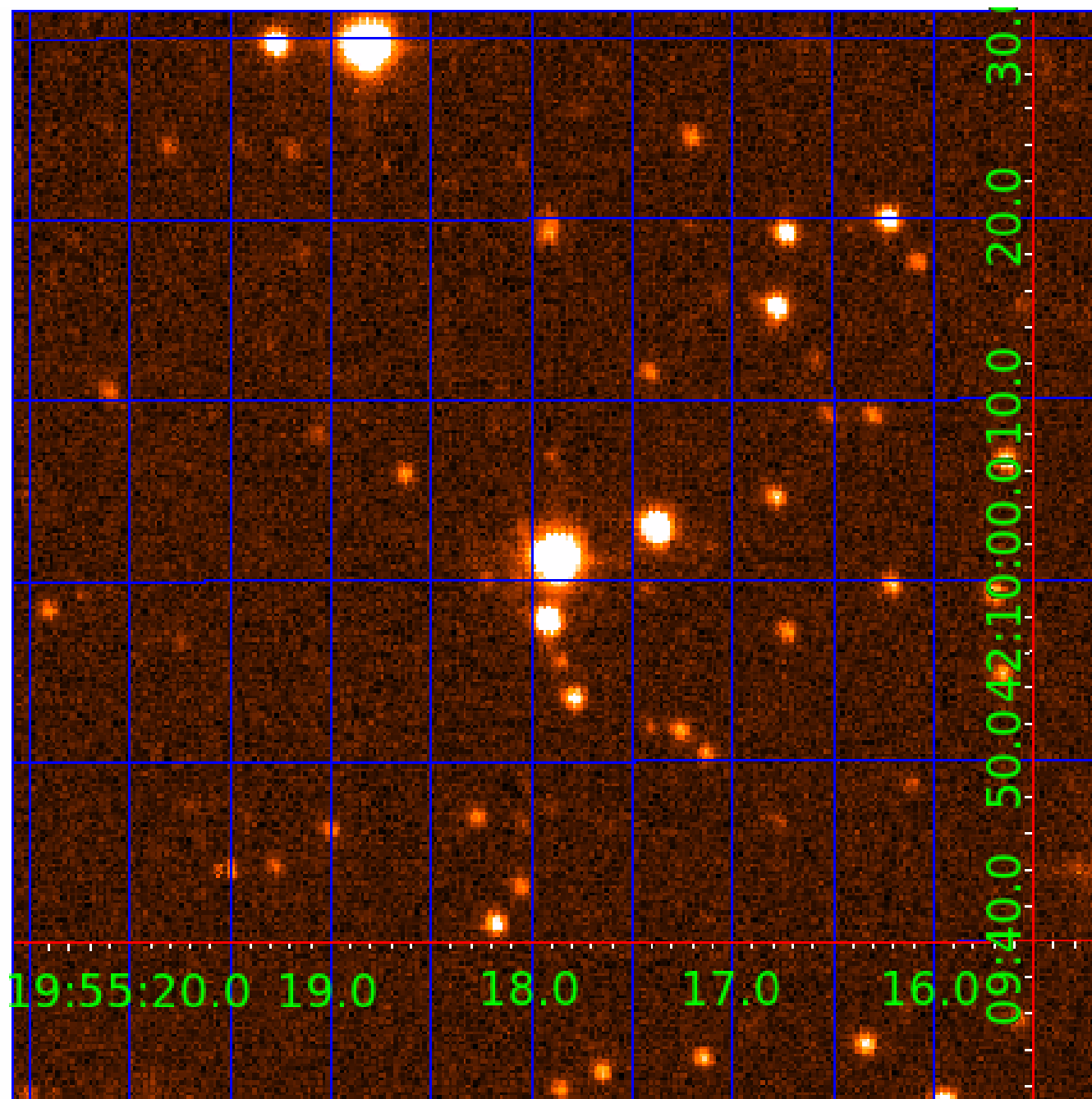


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006720889

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})
006720889-01	OBS	No	0.817321	131.853453	47.3	2.860	9.2	8.5	1.36	6763	1.06	10065.46
006720889-02	OBS	No	1.489258	132.110336	95.6	3.721	10.0	10.2	1.36	6763	1.56	4522.70
006720889-03	OBS	No	249.773187	251.576219	1313.1	4.841	9.2	9.8	1.36	6763	8.10	4.89
006720889-04	OBS	No	281.044431	141.993349	1360.7	5.998	8.2	8.7	1.36	6763	6.23	4.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006720889-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
006720889-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
006720889-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006720889-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS

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

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

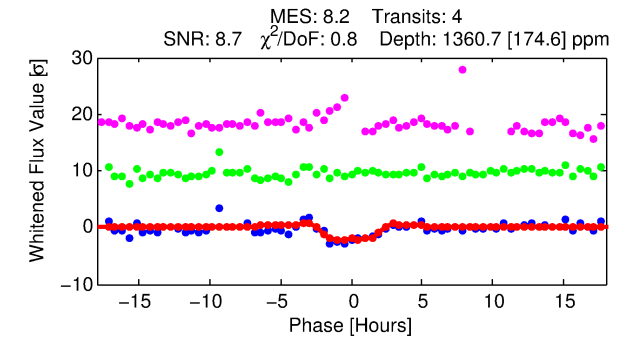
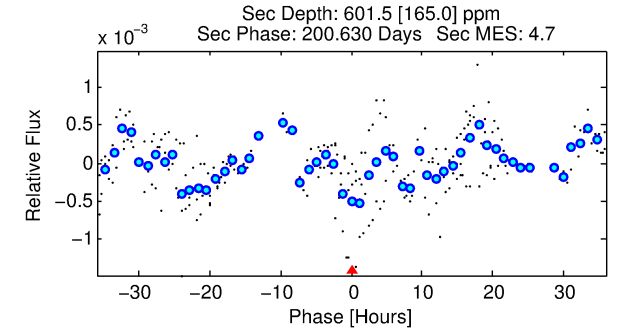
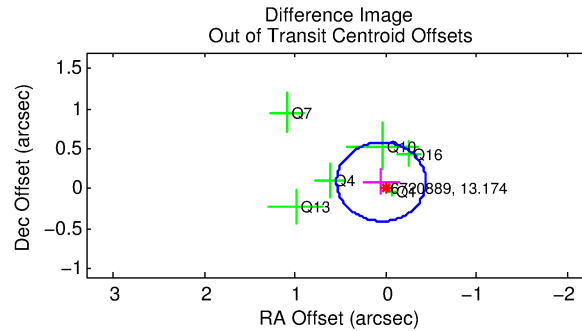
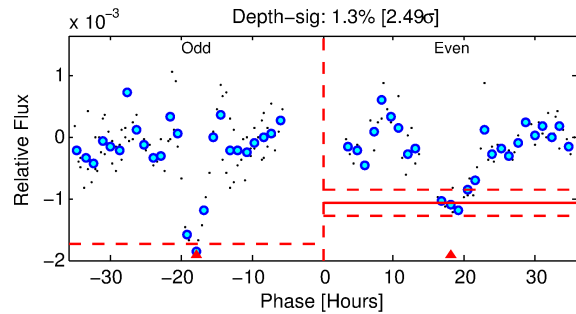
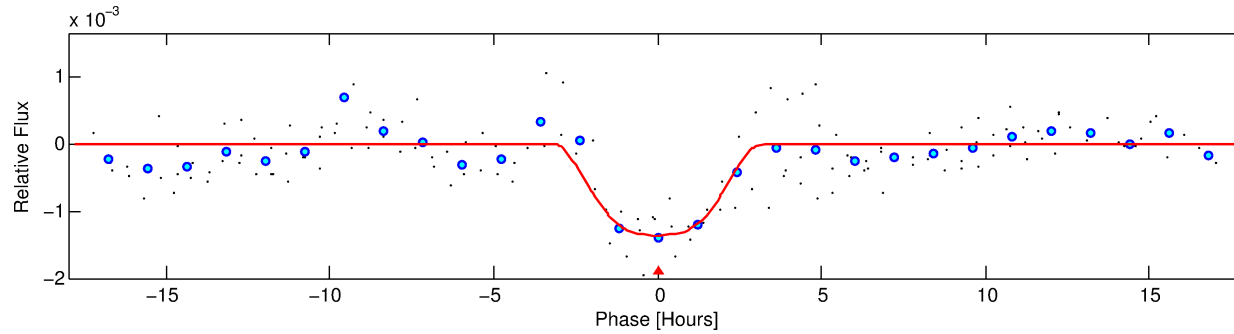
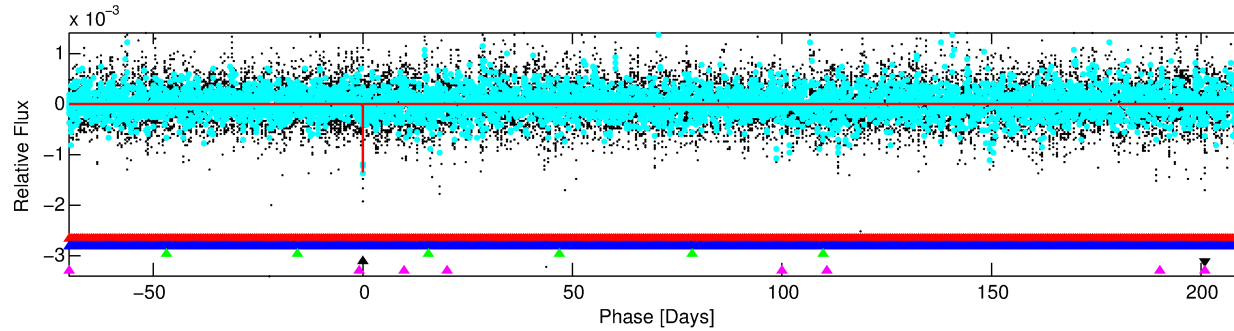
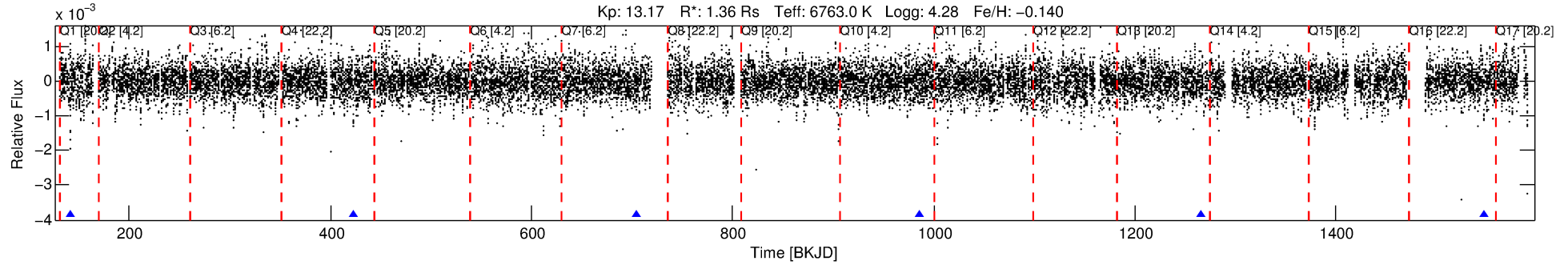
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006720889-04

No Significant Match Found

DV One-Page Summary

KIC: 6720889 Candidate: 4 of 5 Period: 281.044 d



DV Fit Results:

Period = 281.04443 [0.00401] d
Epoch = 141.9933 [0.0092] BKJD
Rp/R* = 0.0420 [0.0031]
a/R* = 151.37 [20.38]
b = 0.95 [0.01]
Seff = 4.18 [1.66]
Teq = 365 [36] K
Rp = 6.23 [2.10] Re
a = 0.9116 [0.2421] AU
Ag = 7079.79 [3434.29] [2.06 σ]
Teffp = 5170 [442] K [10.83 σ]

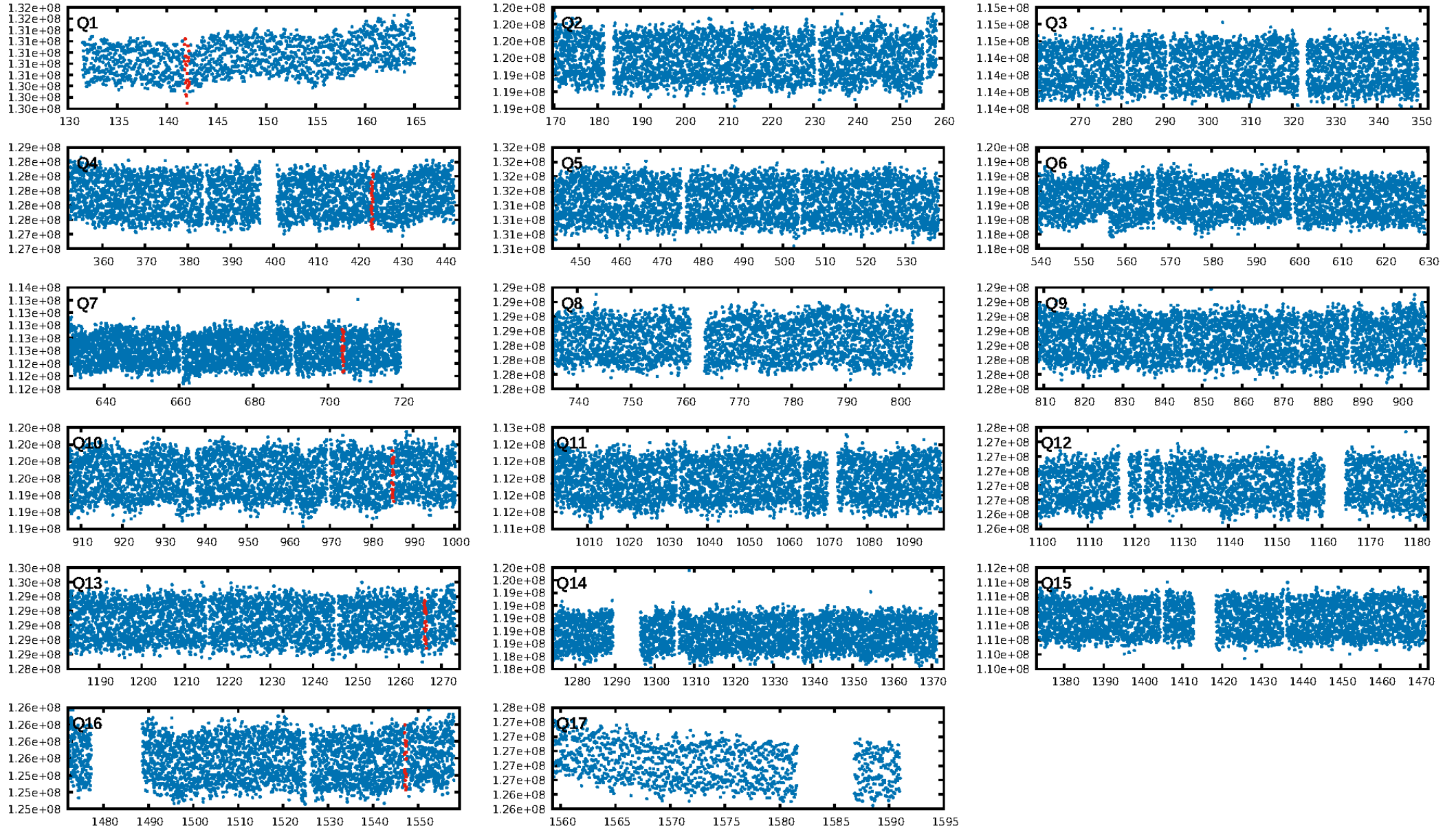
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [97.37 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 8.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.13e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -18.04
Centroid-sig: 12.8%
Centroid-so: 0.789 arcsec [2.33 σ]
OotOffset-rm: 0.101 arcsec [0.62 σ]
KicOffset-rm: 0.086 arcsec [0.35 σ]
OotOffset-st: 1/1/2/2 [6]
KicOffset-st: 1/1/2/2 [6]
DiffImageQuality-fgm: 0.83 [5/6]
DiffImageOverlap-fno: 0.00 [0/6]

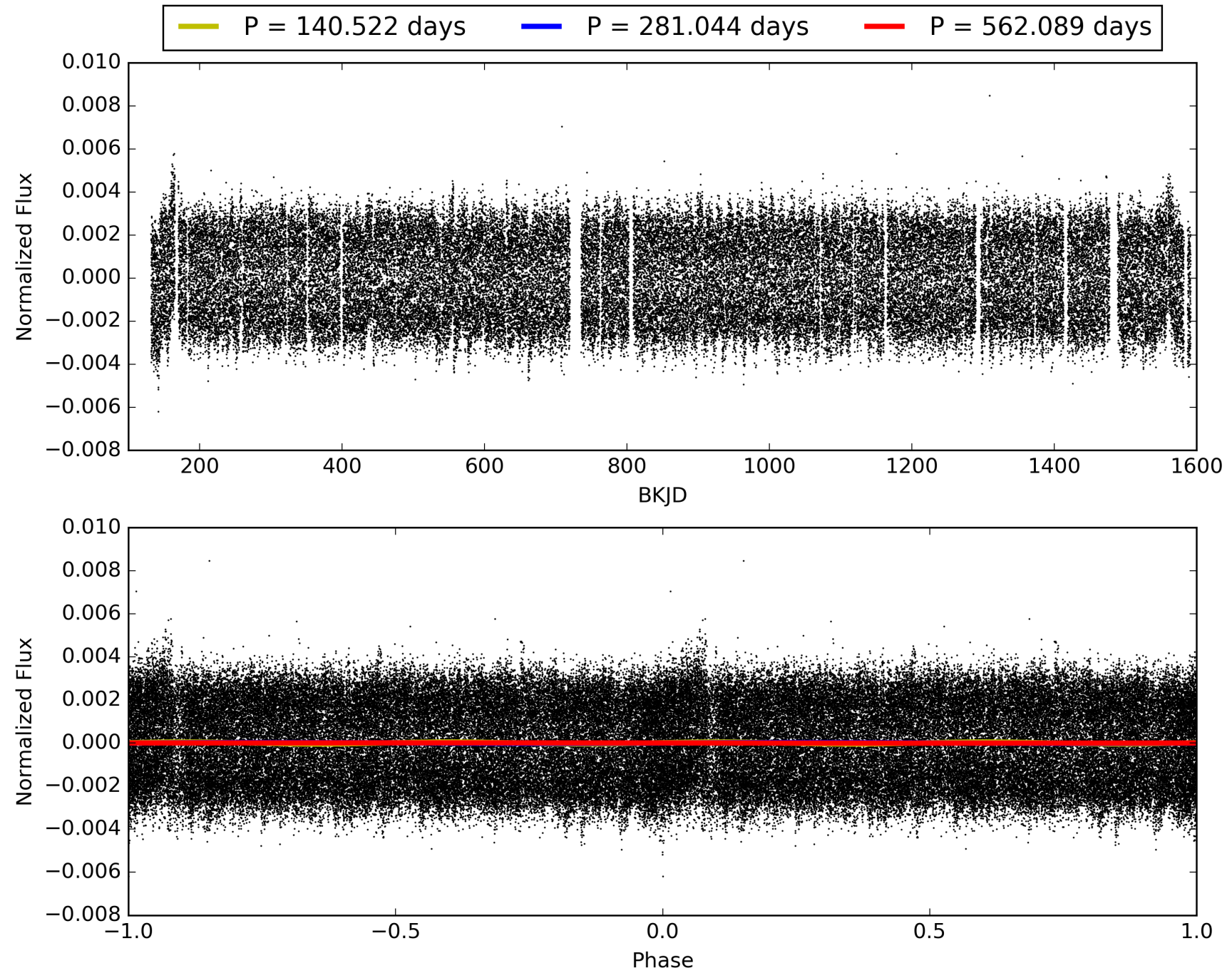
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:04:07 Z

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

TCE 006720889-04, PDC Light Curves

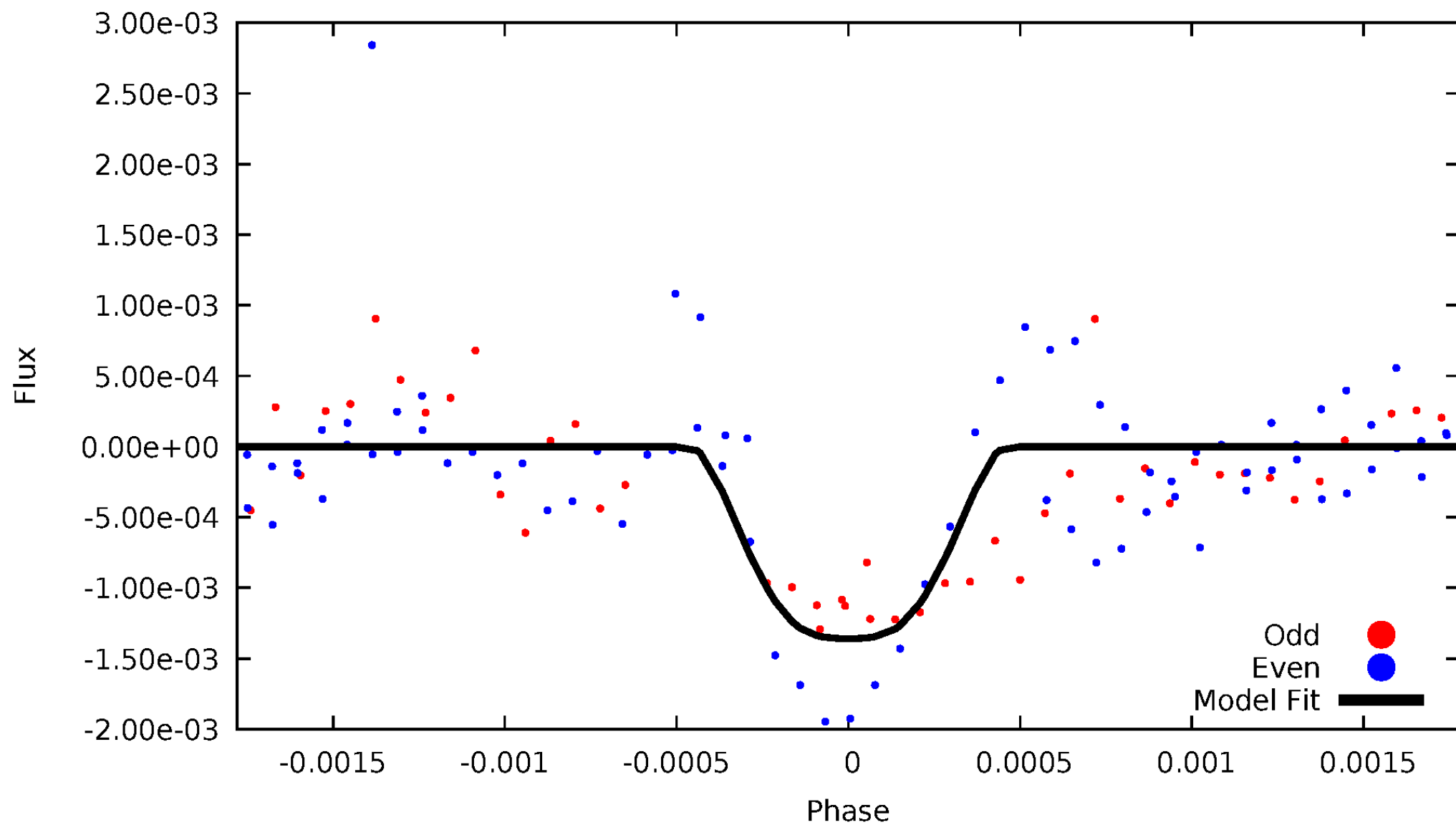


TCE 006720889-04



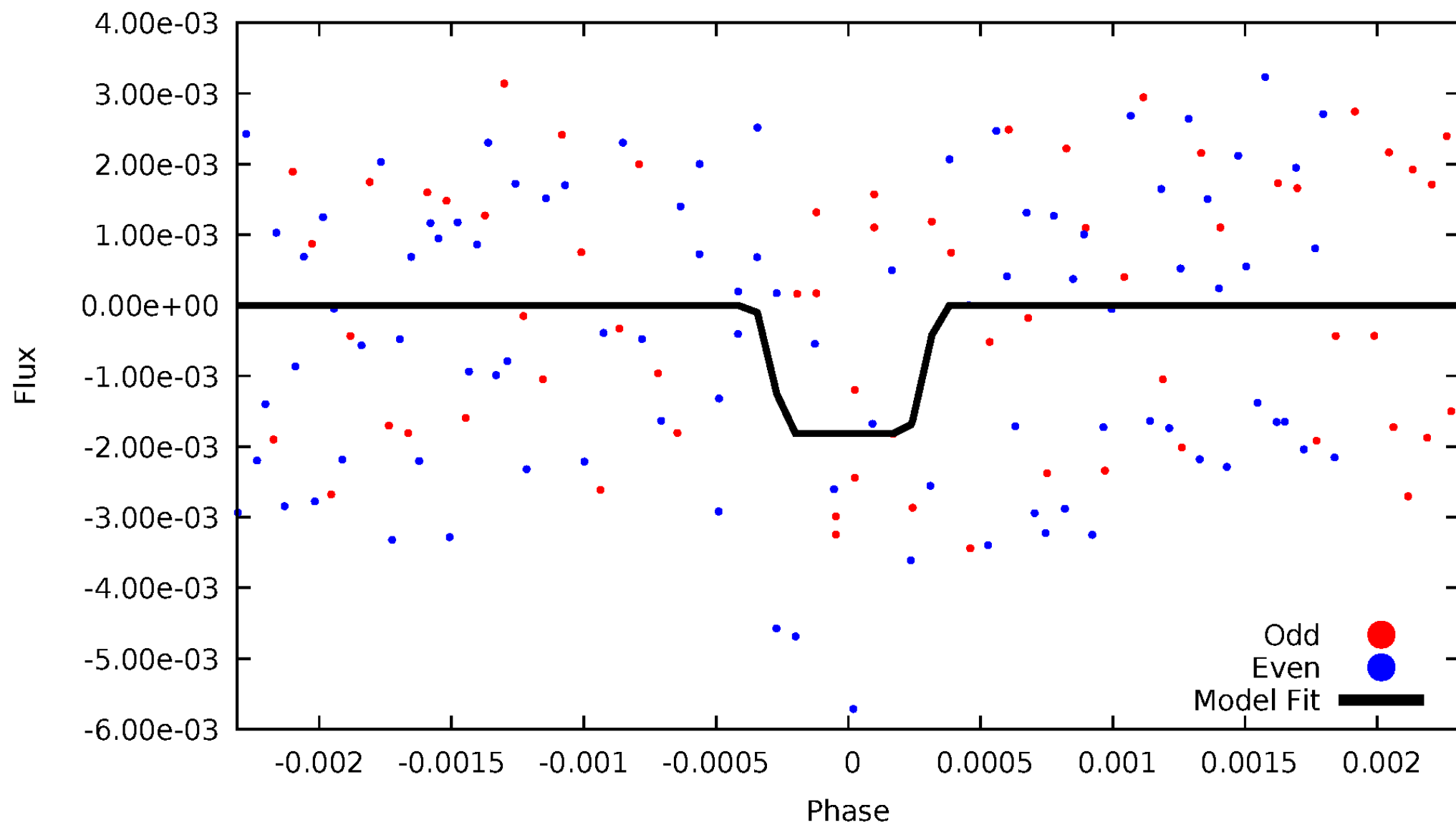
DV Odd/Even

TCE 006720889-04



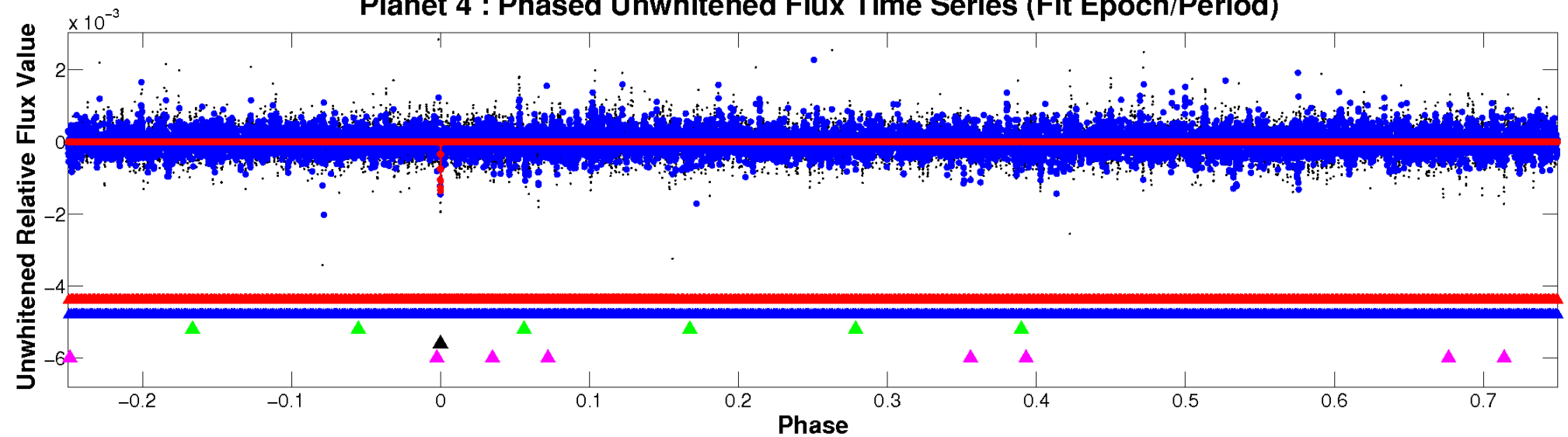
ALT Odd/Even

TCE 006720889-04

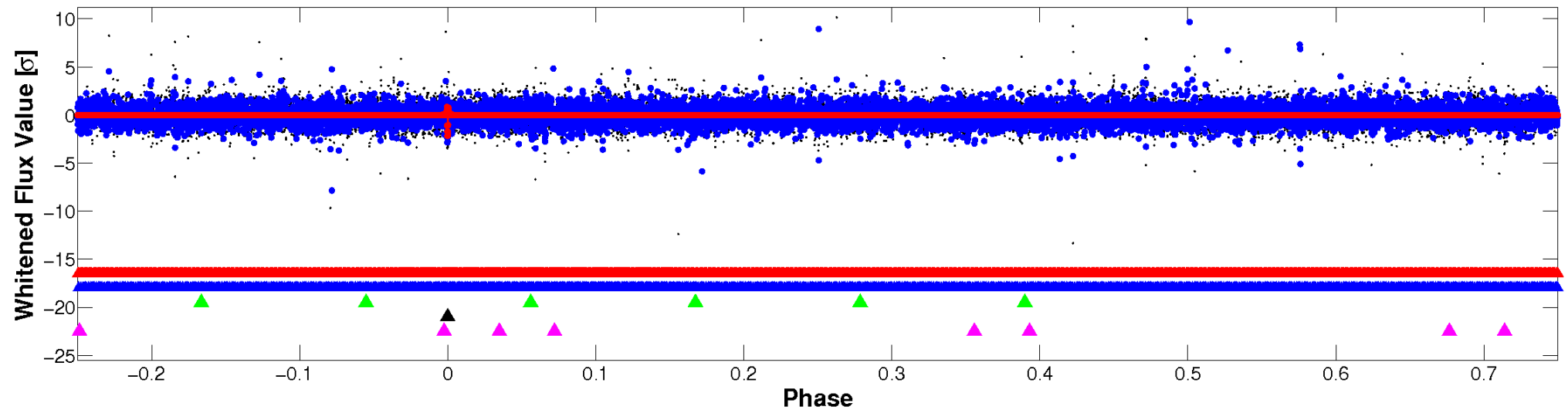


Non-Whitened Vs. Whitened Light Curve

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

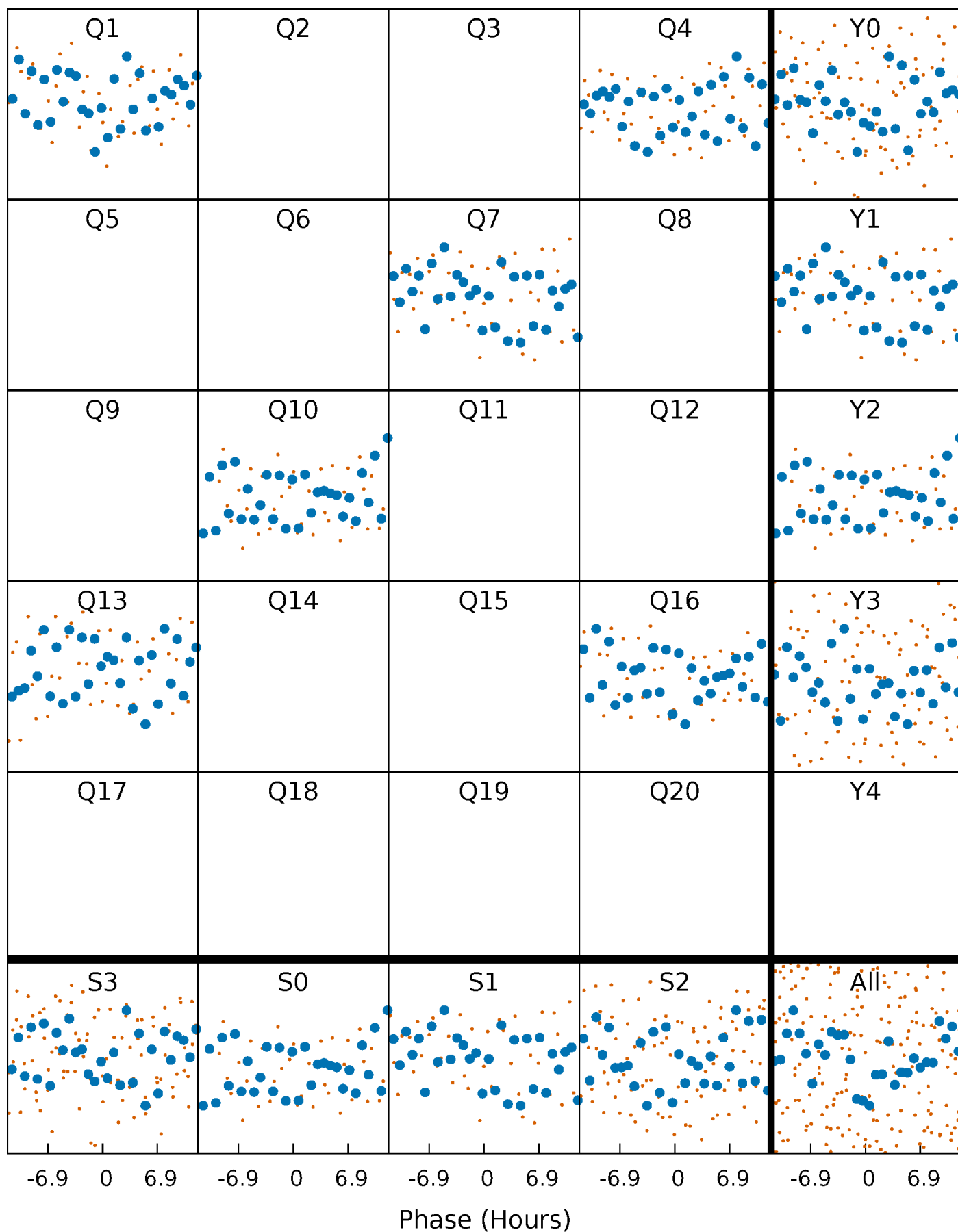


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



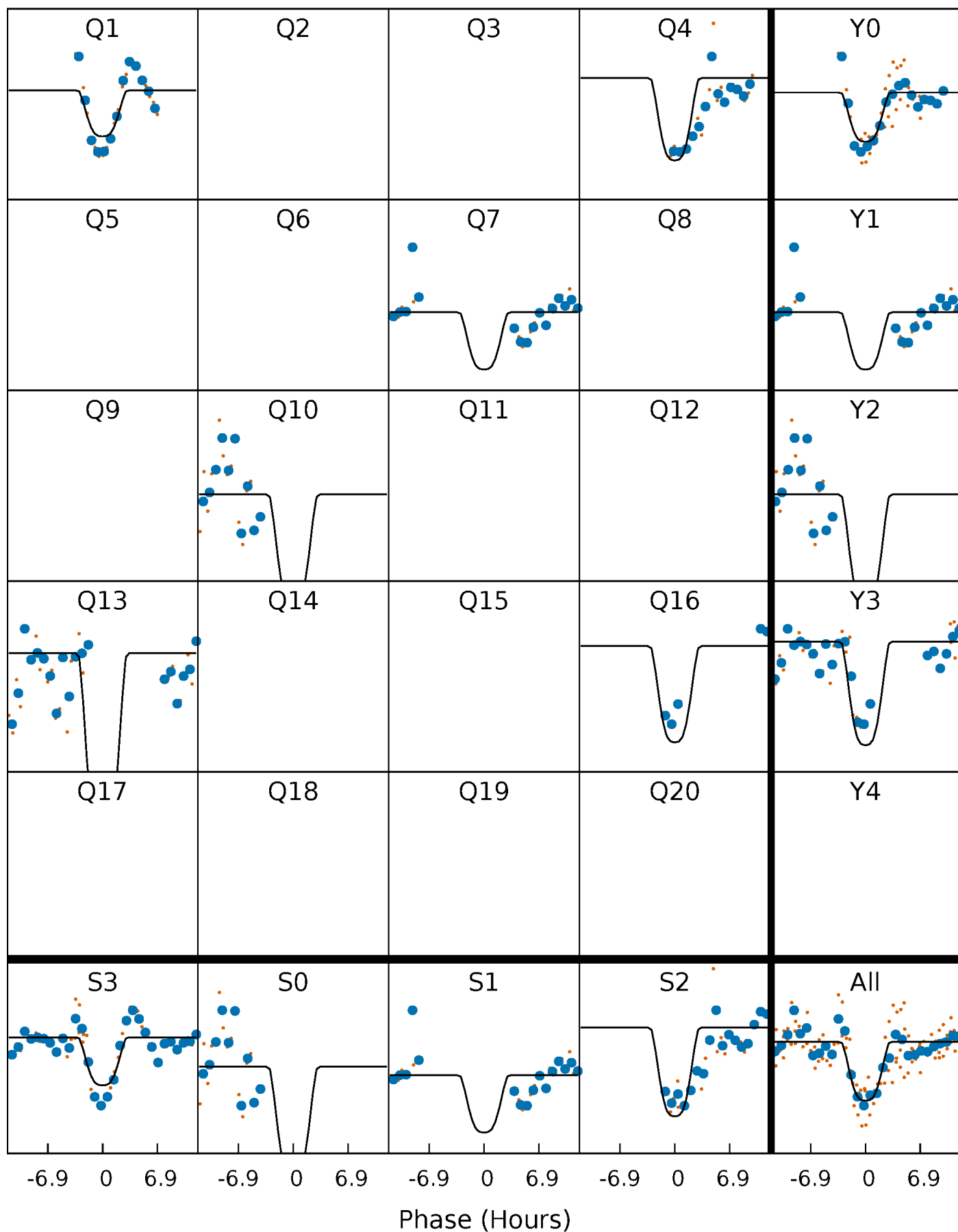
PDC Quarter-Phased Transit Curves

TCE 006720889-04 P=281.044431 Days $T_0=141.993349$ (BKJD)



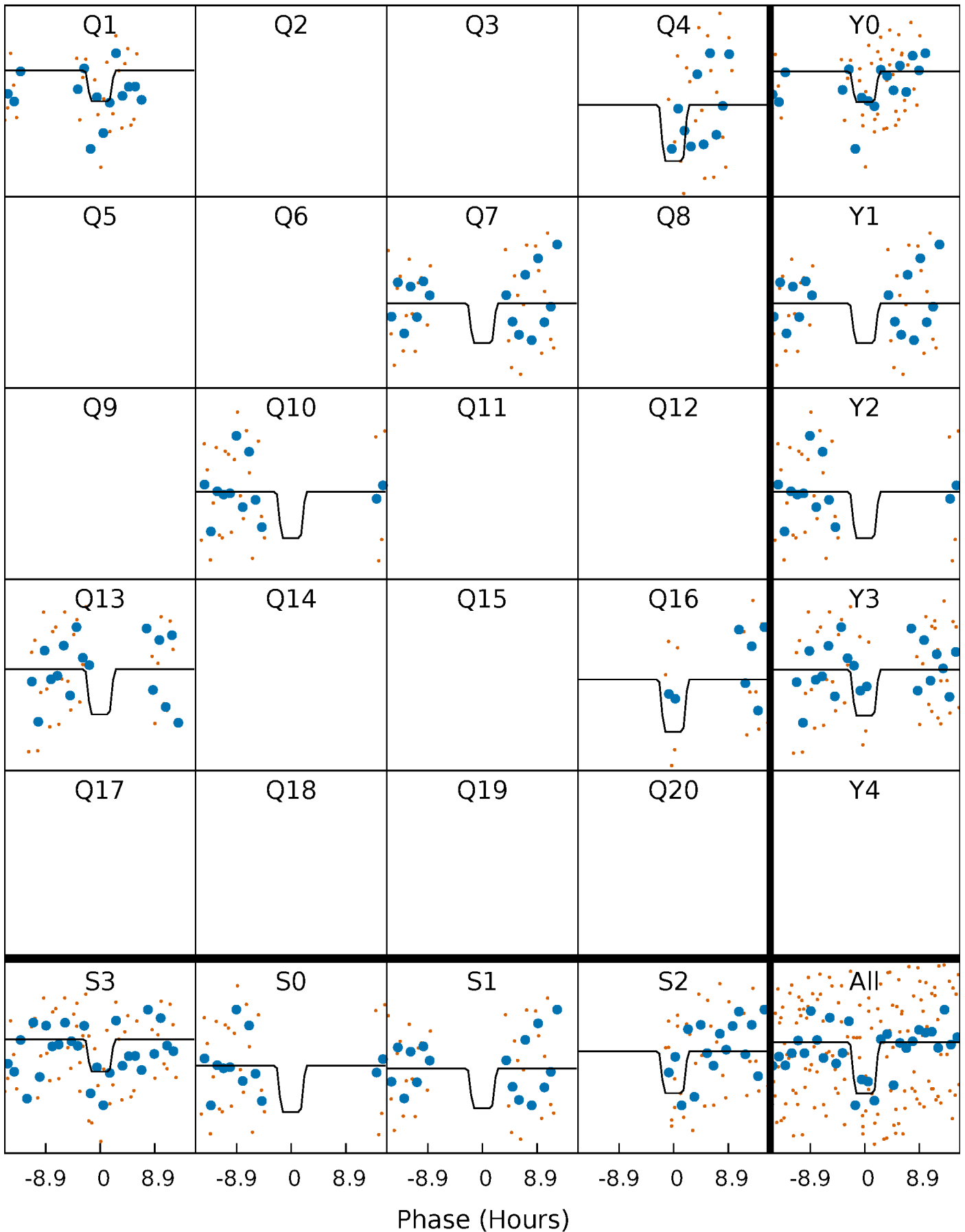
DV Quarter-Phased Transit Curves

TCE 006720889-04 P=281.044431 Days $T_0=141.993349$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

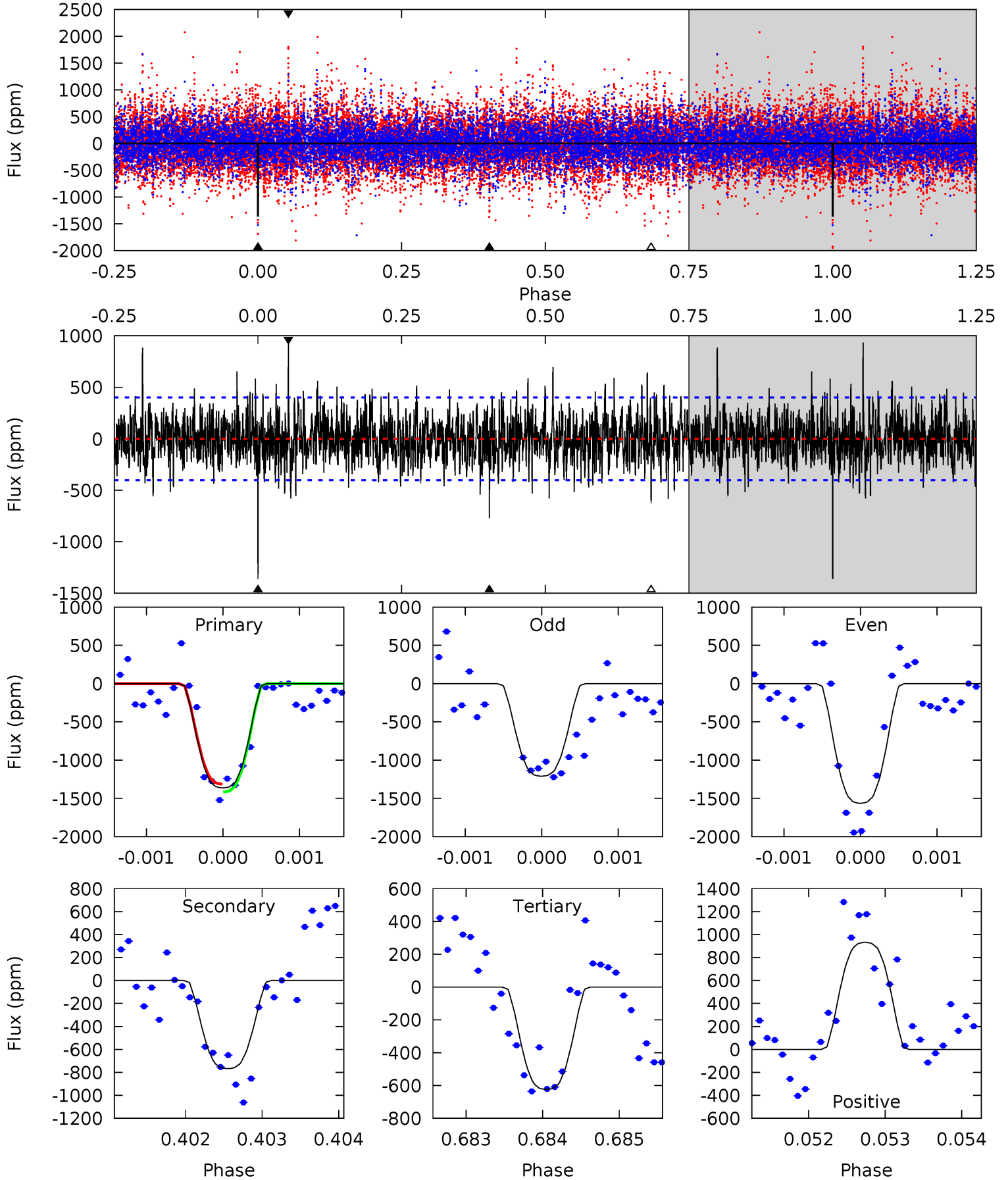
TCE 006720889-04 P=281.038643 Days $T_0=142.009972$ (BKJD)



DV Model-Shift Uniqueness Test

006720889-04, P = 281.044431 Days, E = 141.993349 Days

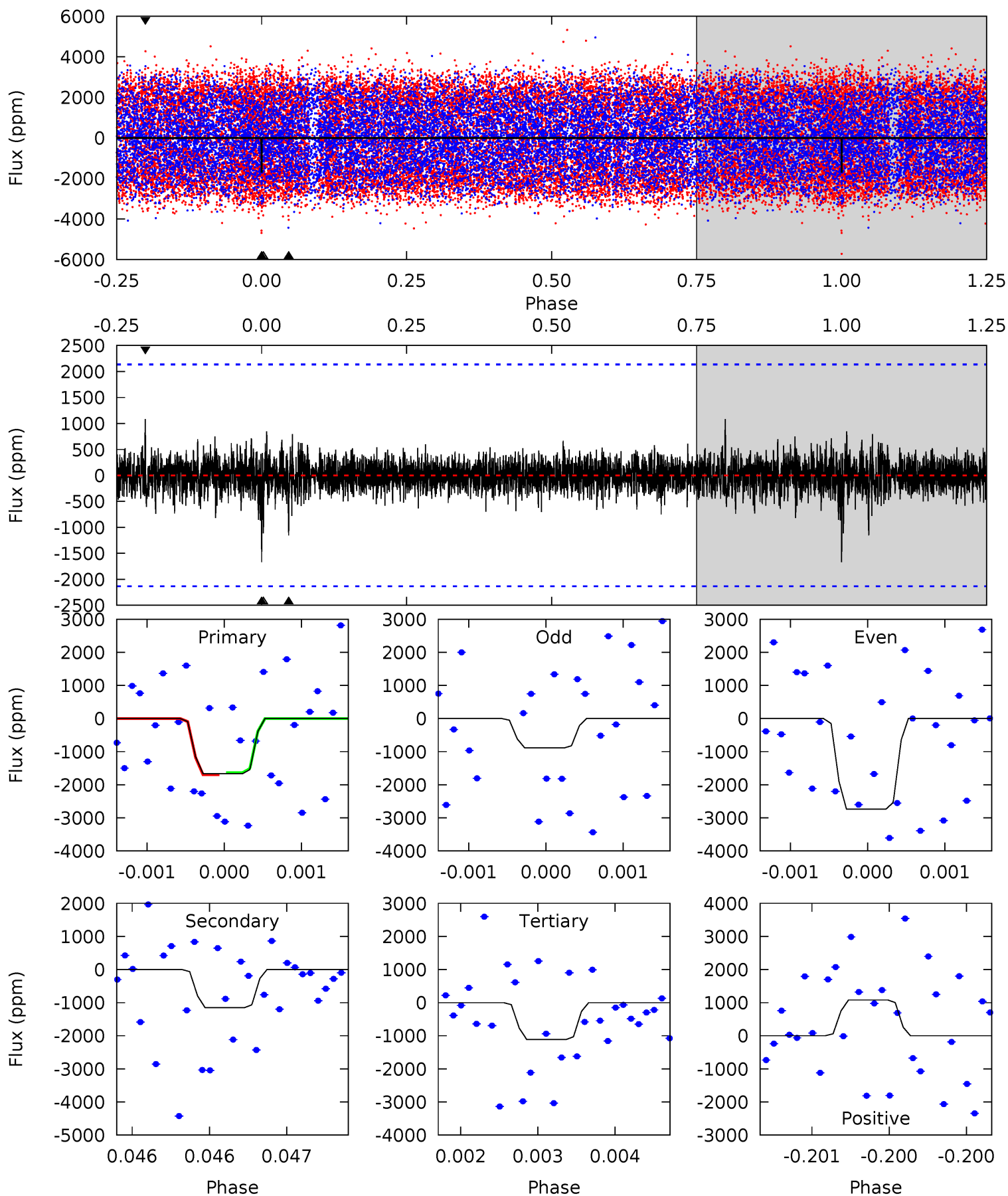
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.5	10.5	8.49	12.7	5.48	3.33	2.51	10.1	5.86	1.96	-2.24	2.50	0.84	0.41	0.70



Alt Model-Shift Uniqueness Test

006720889-04, P = 281.038643 Days, E = 142.009972 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.30	2.97	2.88	2.79	5.51	3.38	0.53	1.43	1.52	0.10	0.19	2.38	1.19	0.39	0.08



Stellar Parameters For KIC 006720889

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6763^{+165}_{-236}	$4.277^{+0.105}_{-0.195}$	$-0.140^{+0.250}_{-0.300}$	$1.361^{+0.448}_{-0.224}$	$1.286^{+0.190}_{-0.190}$	$0.718^{+0.355}_{-0.381}$
	+2%/-3%	+2%/-5%	+179%/-214%	+33%/-16%	+15%/-15%	+49%/-53%
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 006720889-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-768 ± 73	$6.39^{+1.07}_{-0.79}$	515^{+39}_{-31}	5487^{+261}_{-257}	8505^{+2766}_{-2238}
Alt.	-1152 ± 387	$6.45^{+1.17}_{-0.81}$	513^{+41}_{-31}	5968^{+569}_{-582}	11998^{+6010}_{-4554}

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

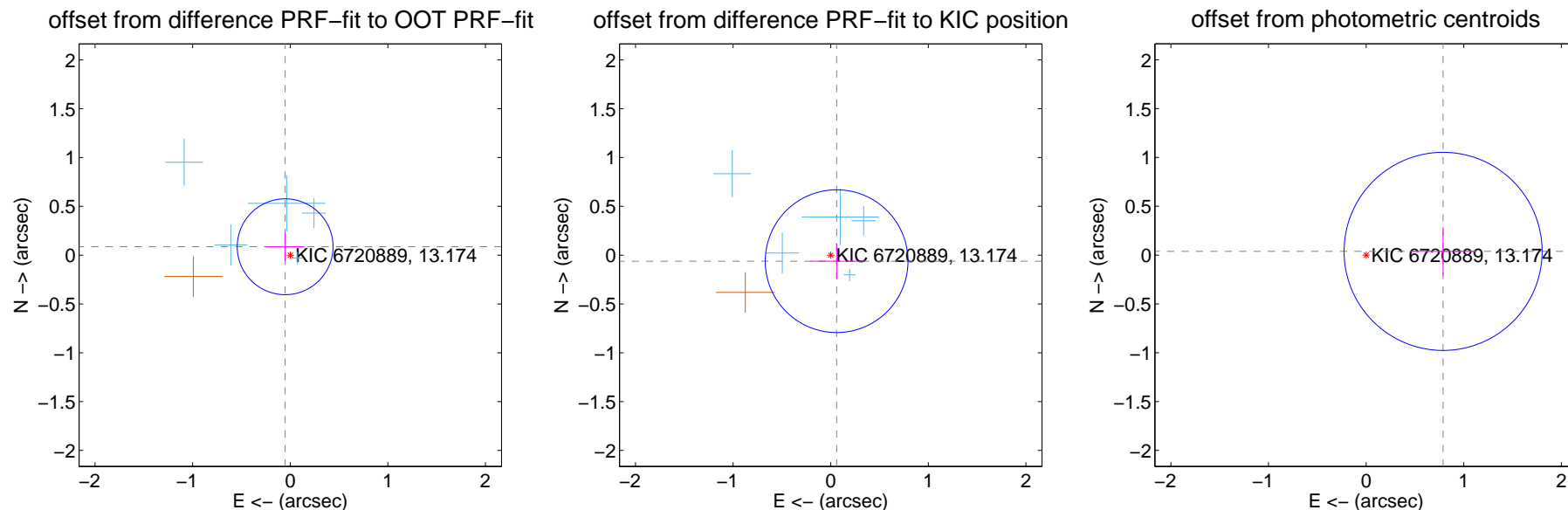
DV Centroid Data

Supplemental centroid analysis for 006720889-04. Kepler magnitude: 13.17. Transit SNR 8.75

There are 5 quarters with good PRF difference image offsets

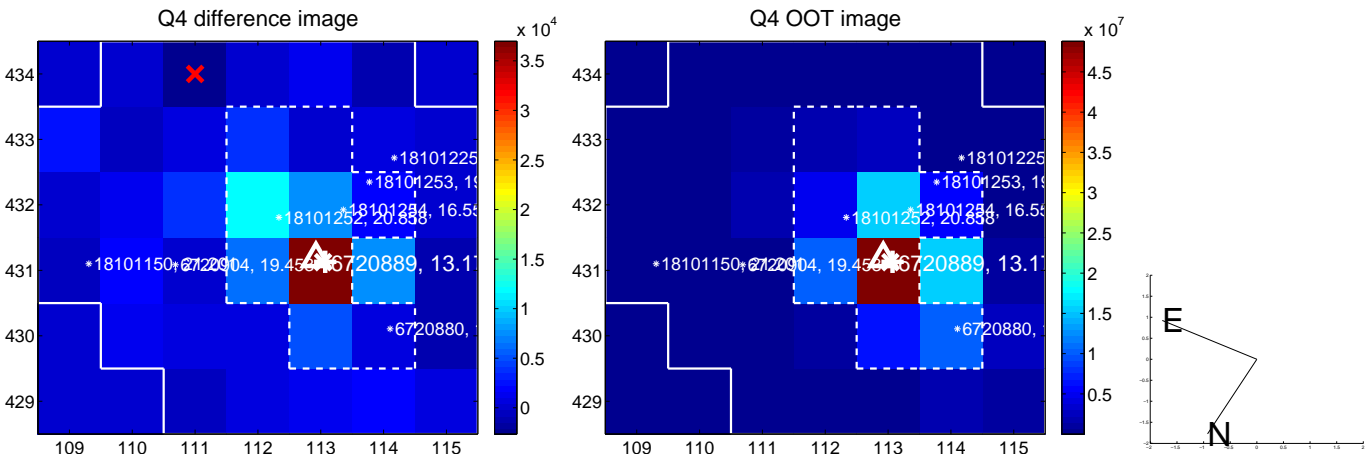
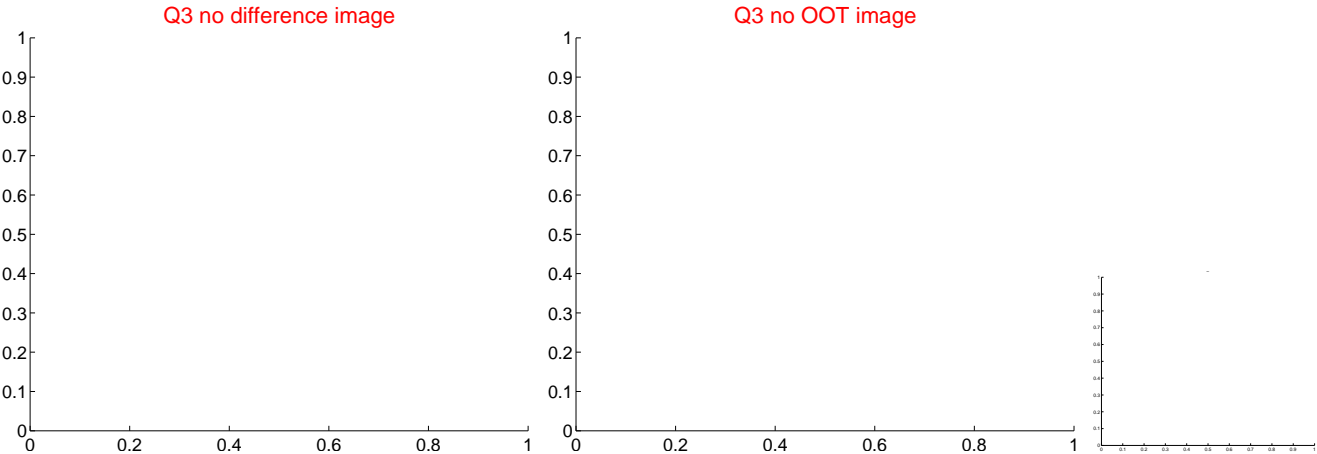
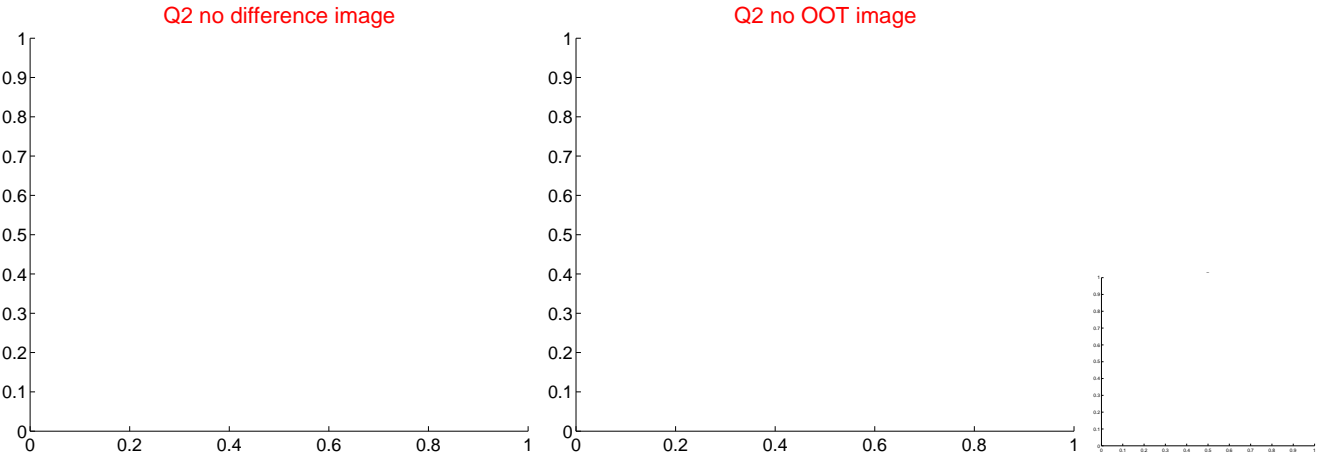
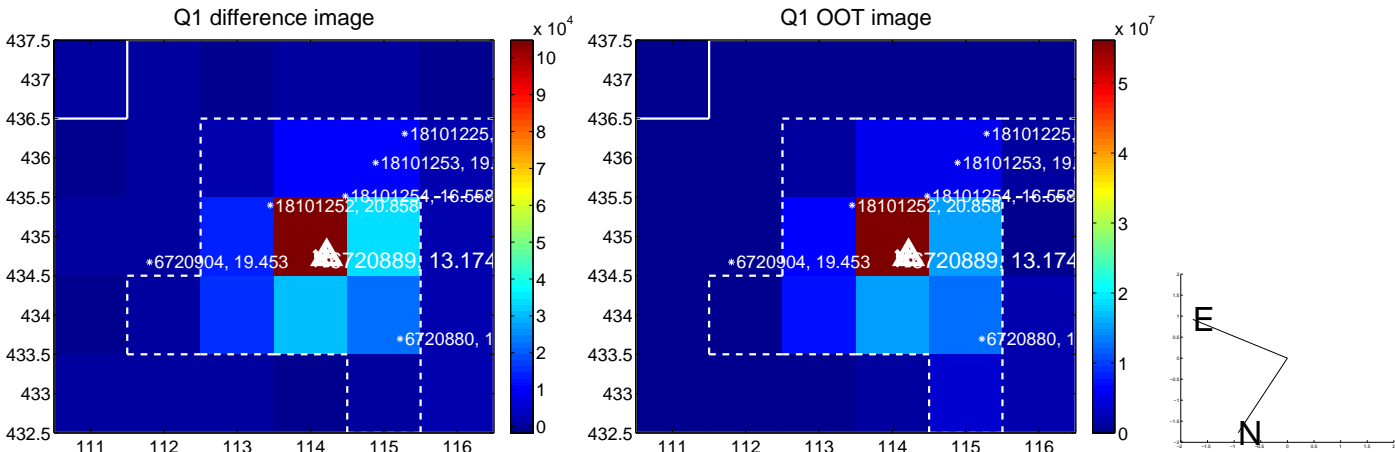
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.101 ± 0.164	0.62	0.052 ± 0.195	0.086 ± 0.150
PRF-fit source offset from KIC position	0.086 ± 0.244	0.35	-0.061 ± 0.266	-0.062 ± 0.179
photometric centroid source offset	0.79 ± 0.34	2.33	-0.79 ± 0.34	0.04 ± 0.25

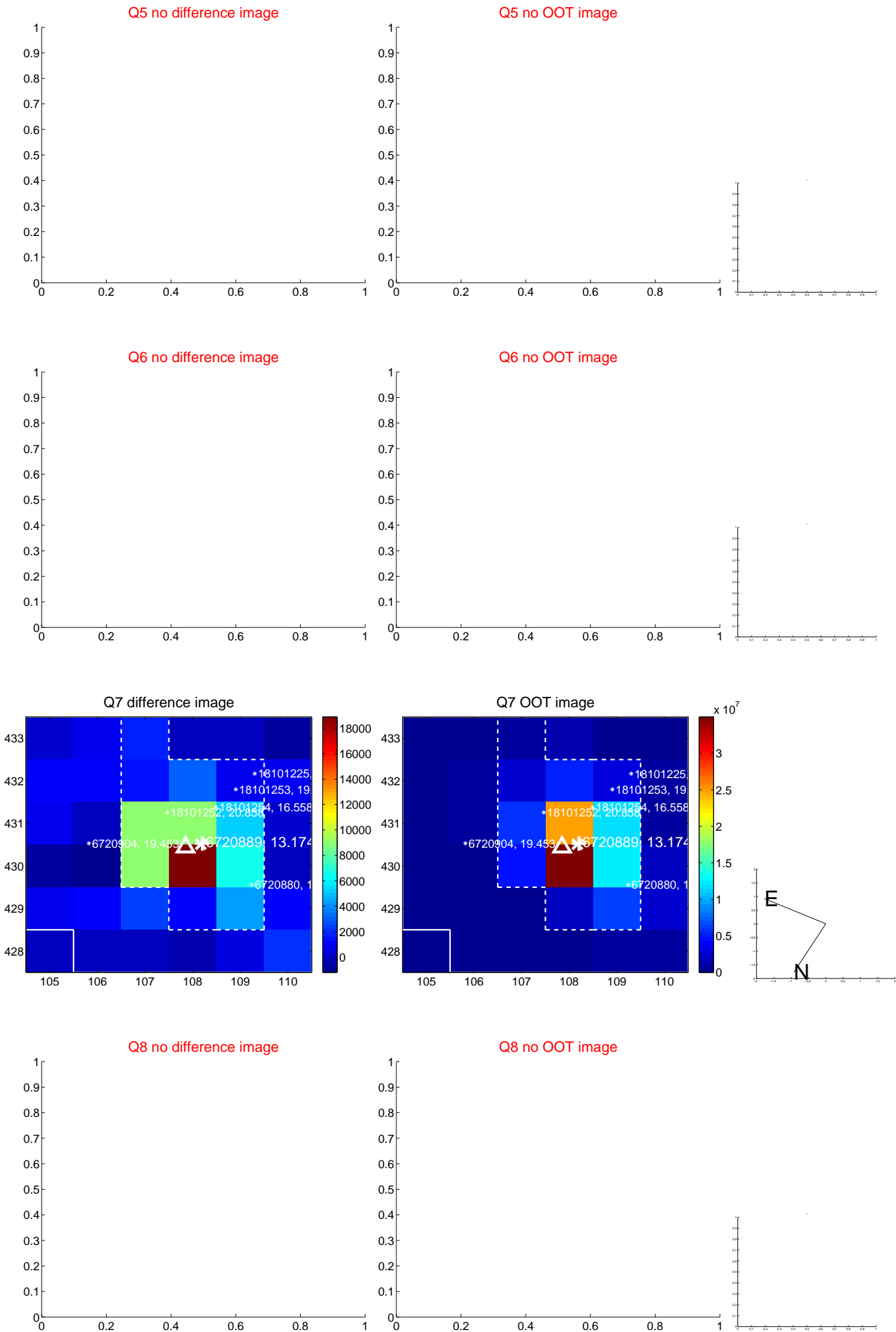


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

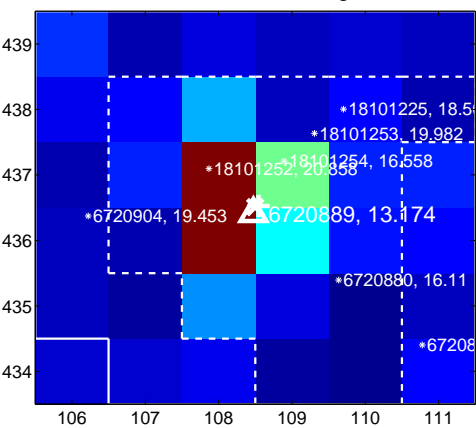
Q9 no difference image



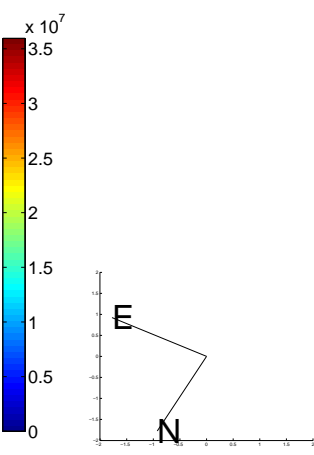
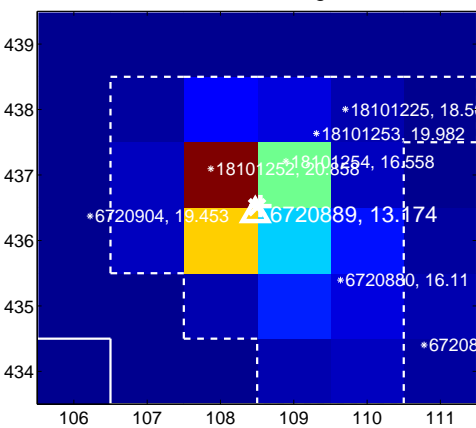
Q9 no OOT image



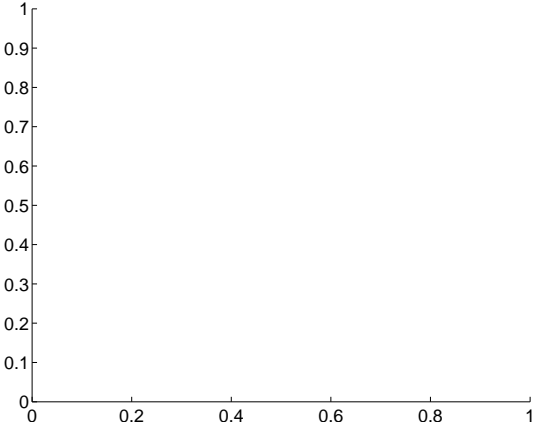
Q10 difference image



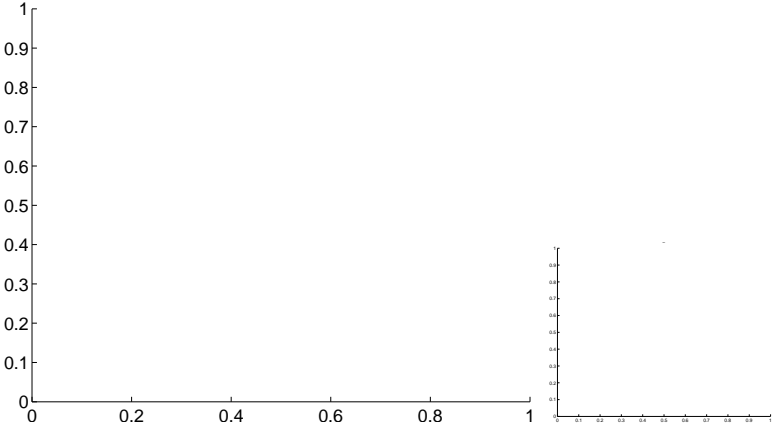
Q10 OOT image



Q11 no difference image



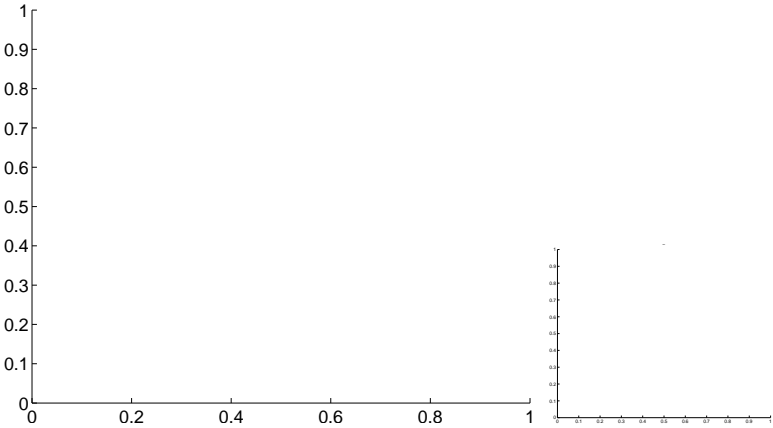
Q11 no OOT image



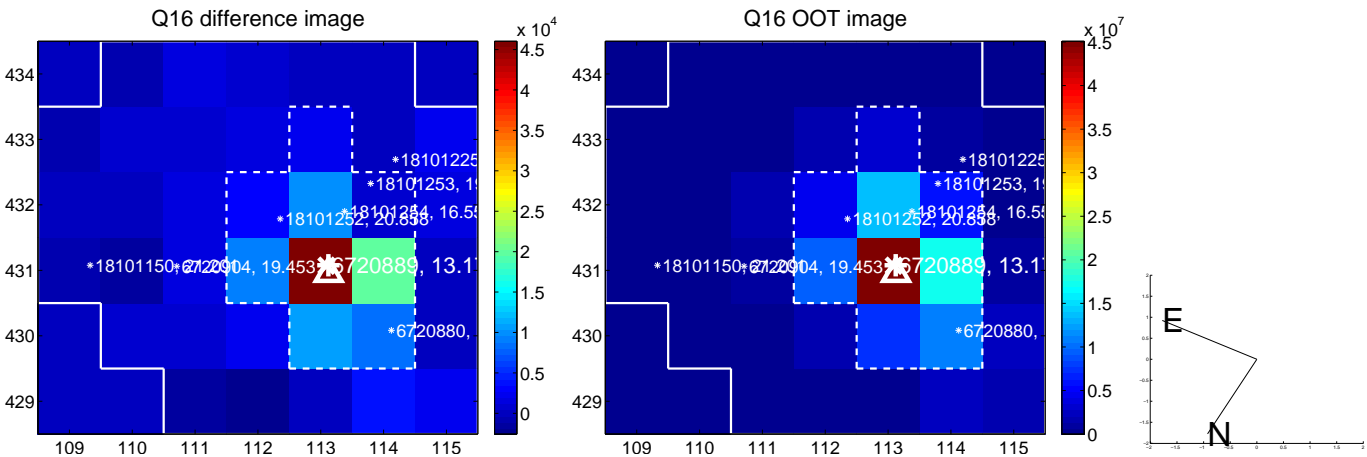
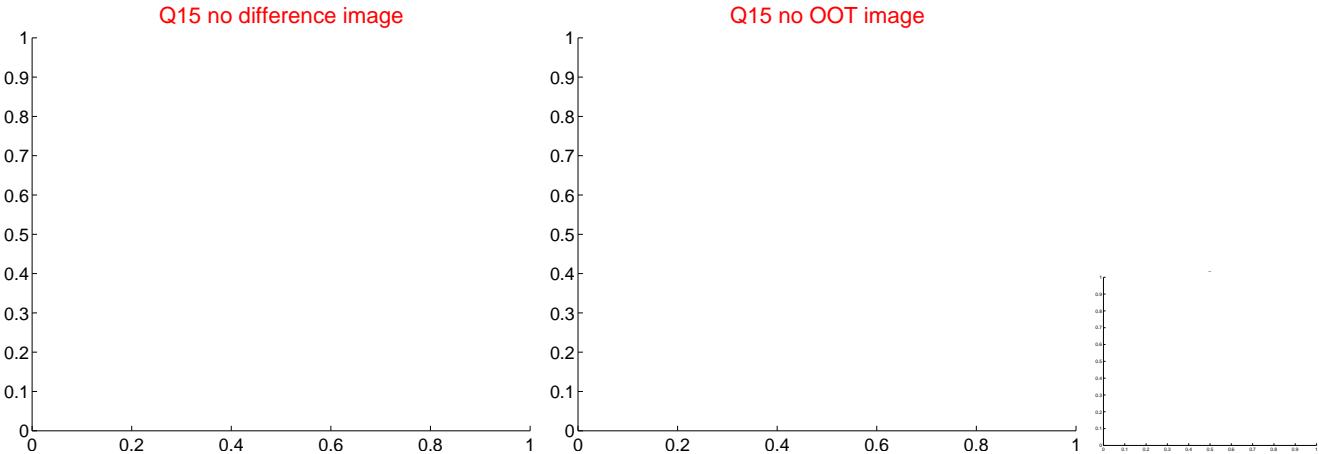
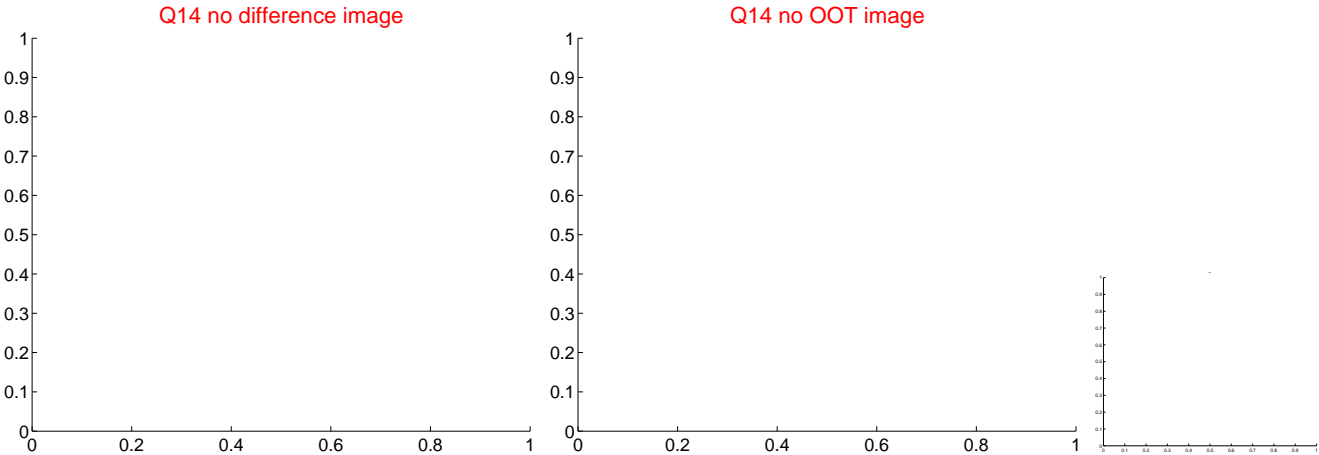
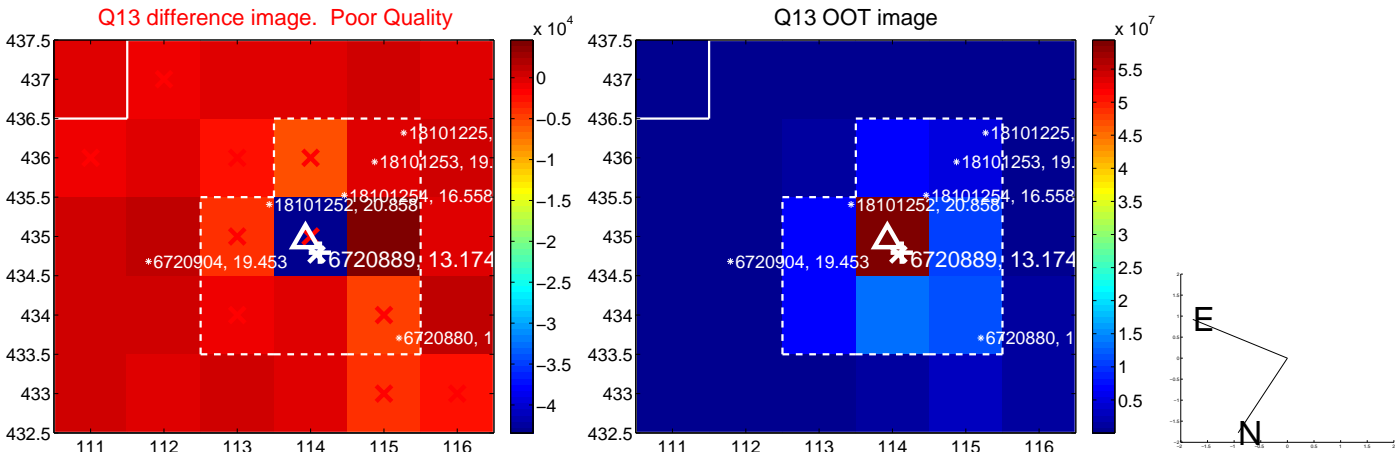
Q12 no difference image



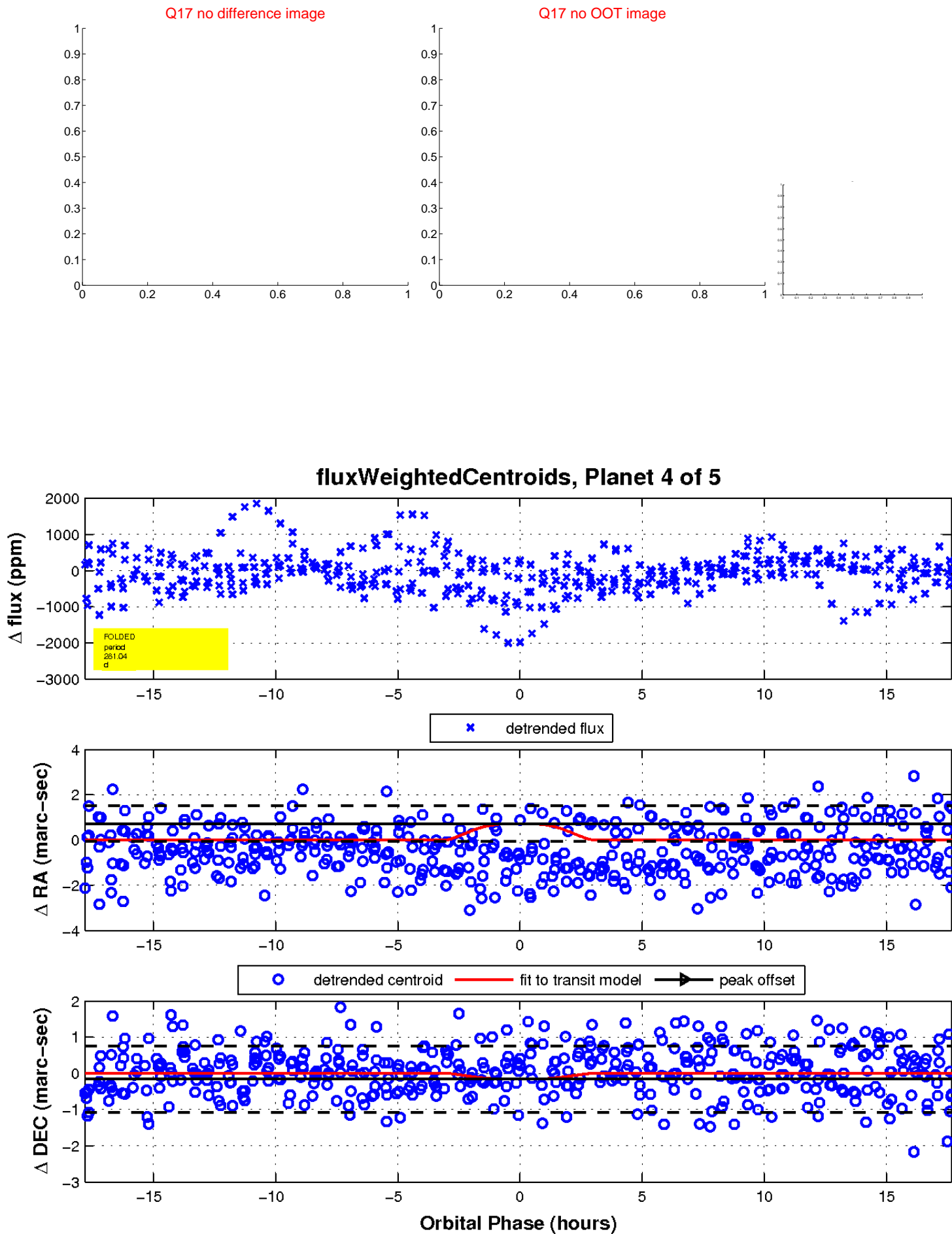
Q12 no OOT image



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



UKIRT Image

Declination

