

KIC 004667989

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})
004667989-01	OBS	No	2.117175	132.993031	28.4	7.941	10.1	9.7	1.54	6851	0.91	3538.93
004667989-02	OBS	No	2.115686	133.148028	59.8	8.693	9.8	12.1	1.54	6851	2.35	3542.25
004667989-03	OBS	No	100.271815	162.509921	184.5	9.967	11.9	6.1	1.54	6851	2.31	20.65
004667989-04	OBS	No	263.750252	146.541889	345.6	8.226	17.6	9.8	1.54	6851	3.32	5.69
004667989-05	OBS	No	2.116854	132.469332	40.0	25.402	9.9	9.3	1.54	6851	0.98	3539.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004667989-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004667989-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV
004667989-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

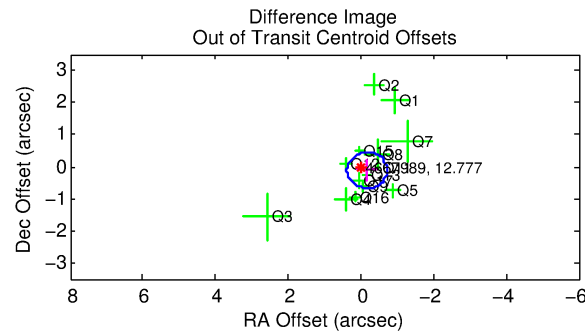
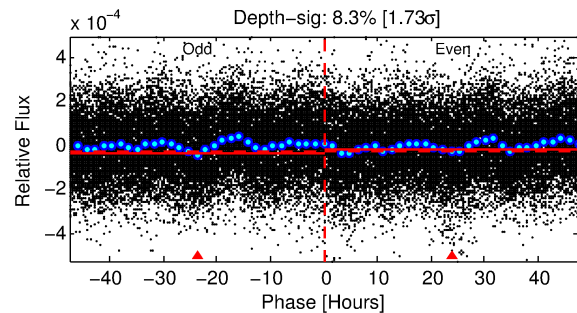
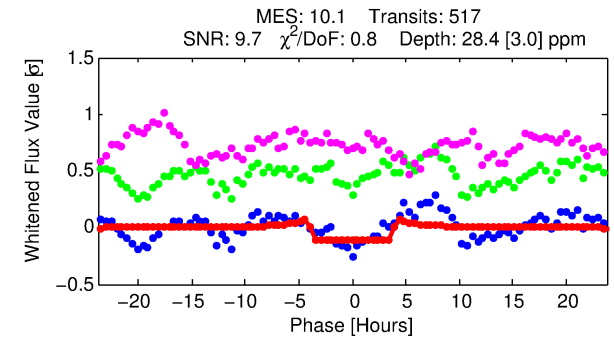
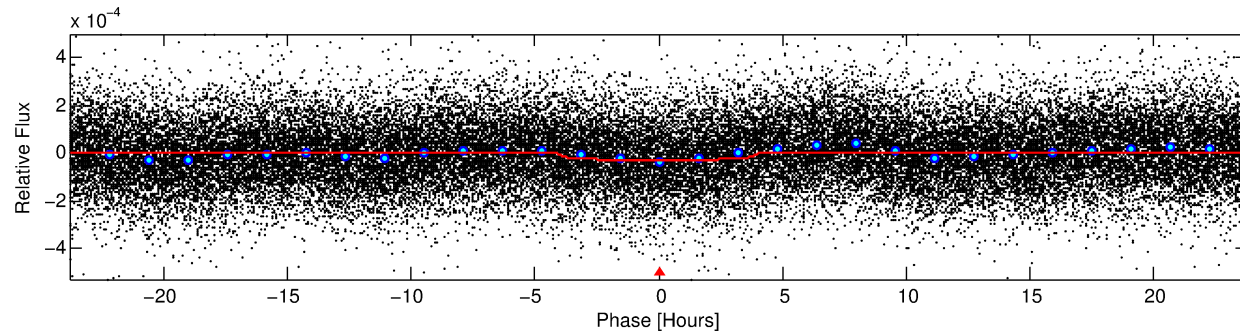
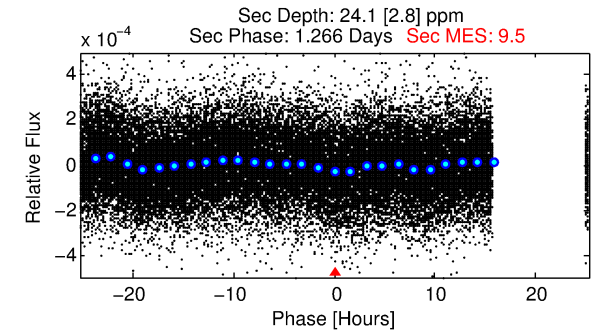
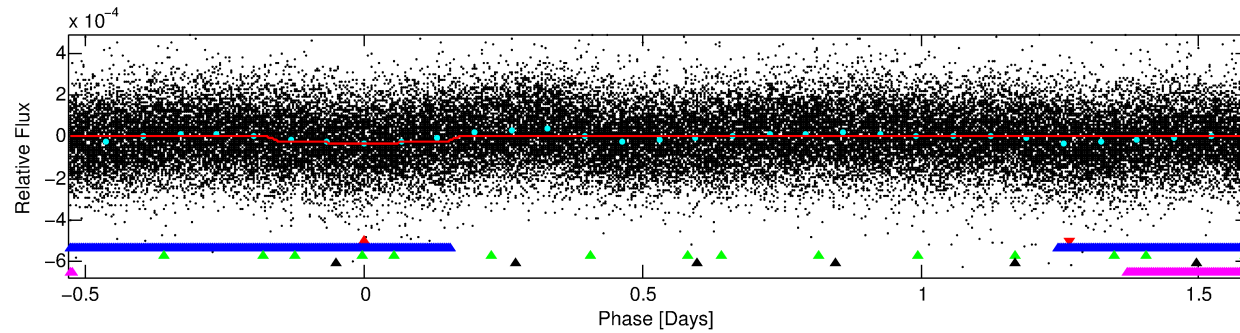
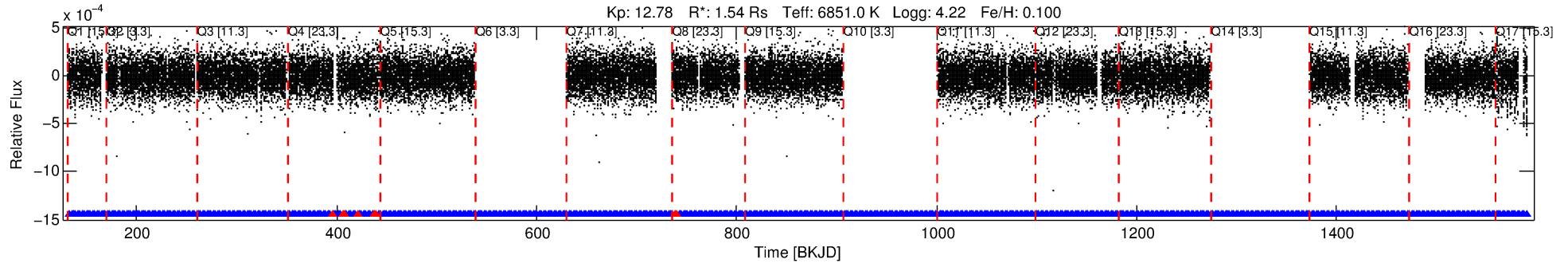
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004667989-01

No Significant Match Found

DV One-Page Summary

KIC: 4667989 Candidate: 1 of 5 Period: 2.117 d



DV Fit Results:

Period = 2.11717 [0.00002] d
Epoch = 132.9930 [0.0043] BKJD
Rp/R* = 0.0054 [0.0011]
a/R* = 1.52 [0.98]
b = 0.80 [0.51]
Seff = 3538.93 [806.36]
Teq = 1967 [112] K
Rp = 0.90 [0.25] Re
a = 0.0363 [0.0056] AU
Ag = 21.34 [10.20] [1.99σ]
Teffp = 6536 [695] K [6.49σ]

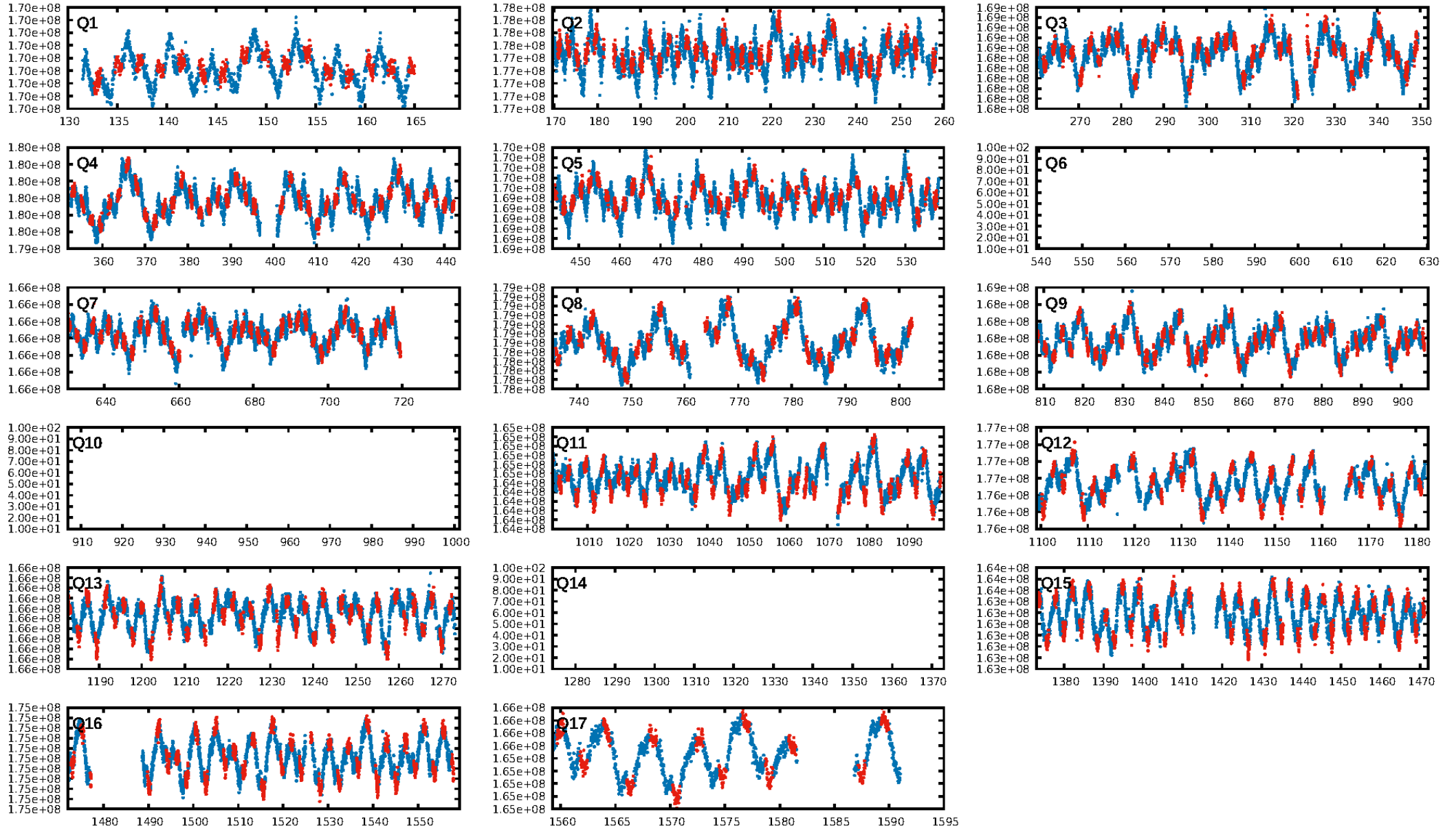
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [184.85σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [480/488]
GhostDiagnostic-chr: 2.284
Centroid-sig: 6.2%
Centroid-so: 1.272 arcsec [1.65σ]
OotOffset-rm: 0.202 arcsec [1.09σ]
KicOffset-rm: 0.127 arcsec [0.64σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.64 [9/14]
DiffImageOverlap-fno: 0.00 [0/14]

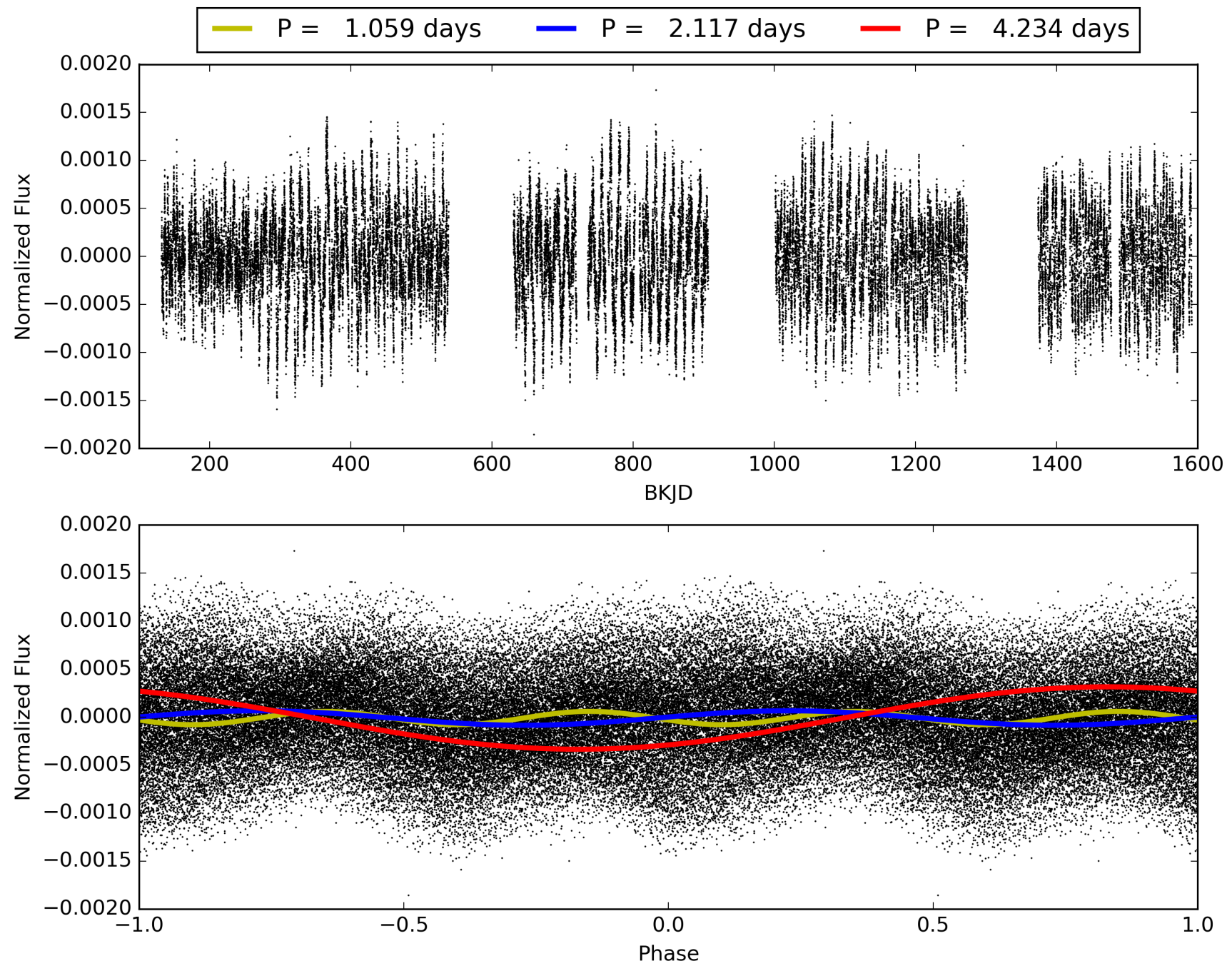
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:38:48 Z

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

TCE 004667989-01, PDC Light Curves

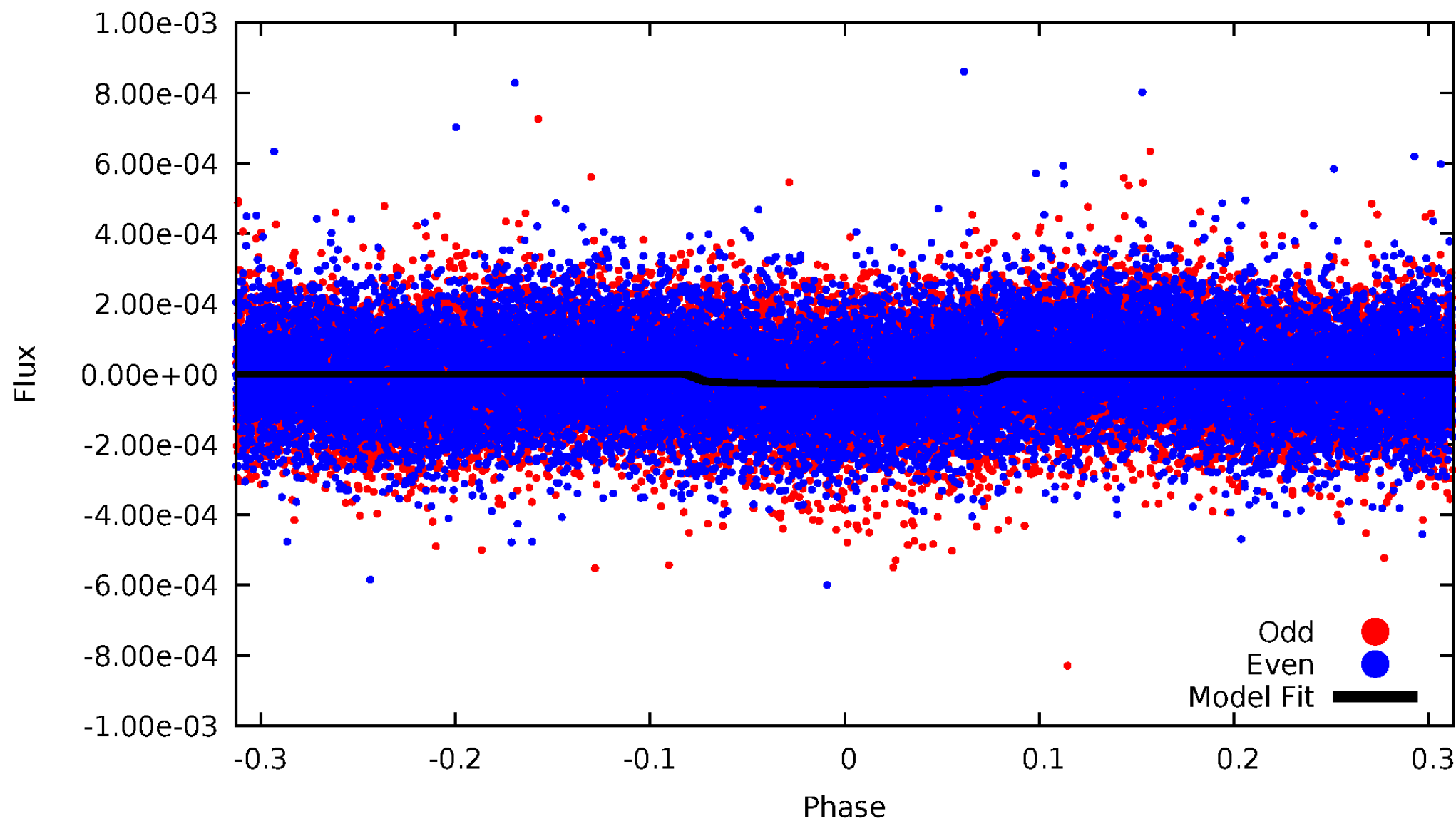


TCE 004667989-01



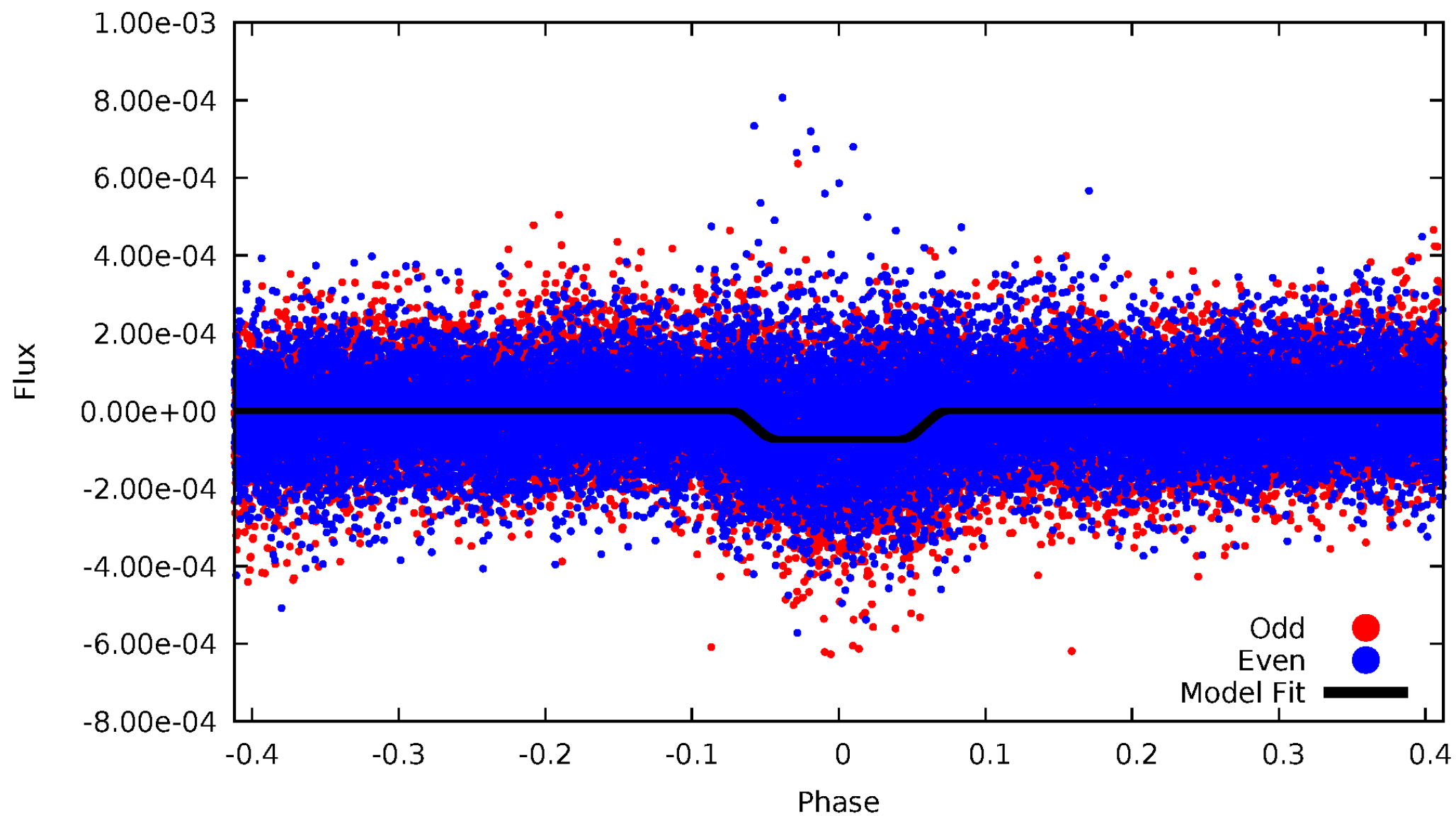
DV Odd/Even

TCE 004667989-01



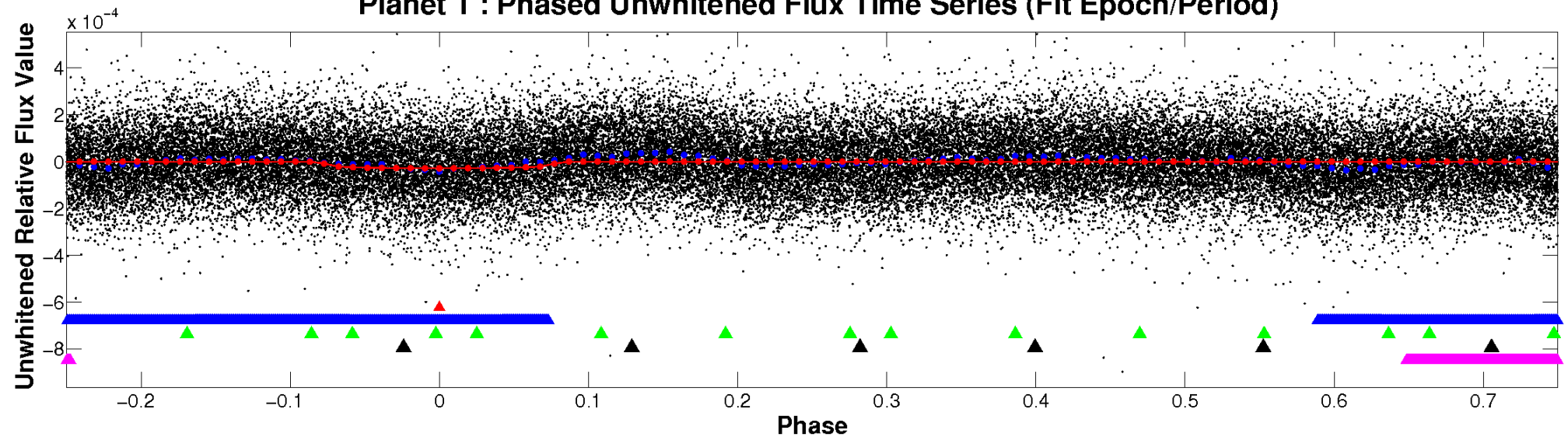
ALT Odd/Even

TCE 004667989-01

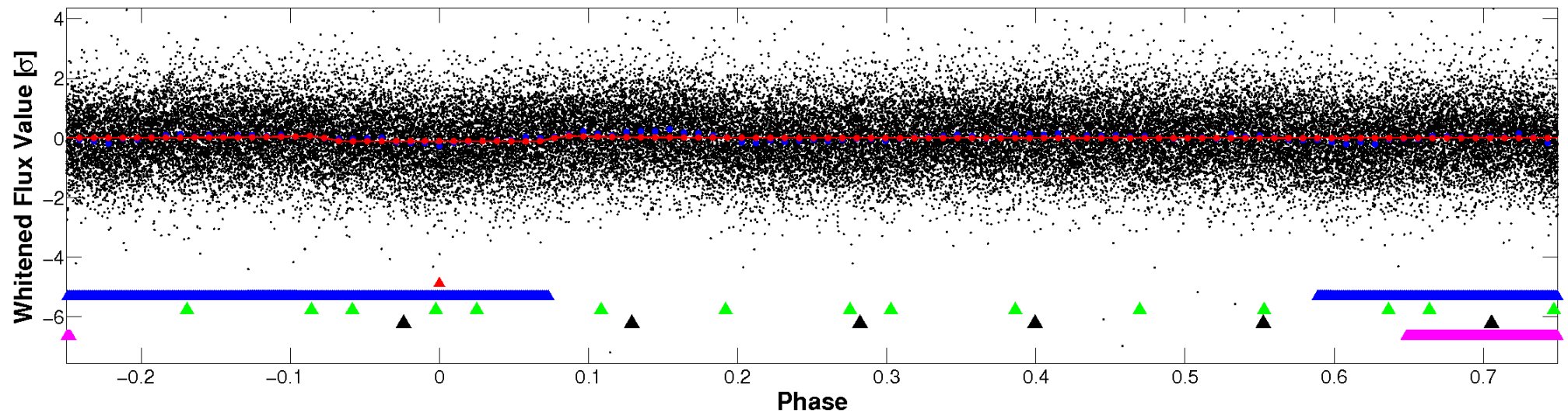


Non-Whitened Vs. Whitened Light Curve

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

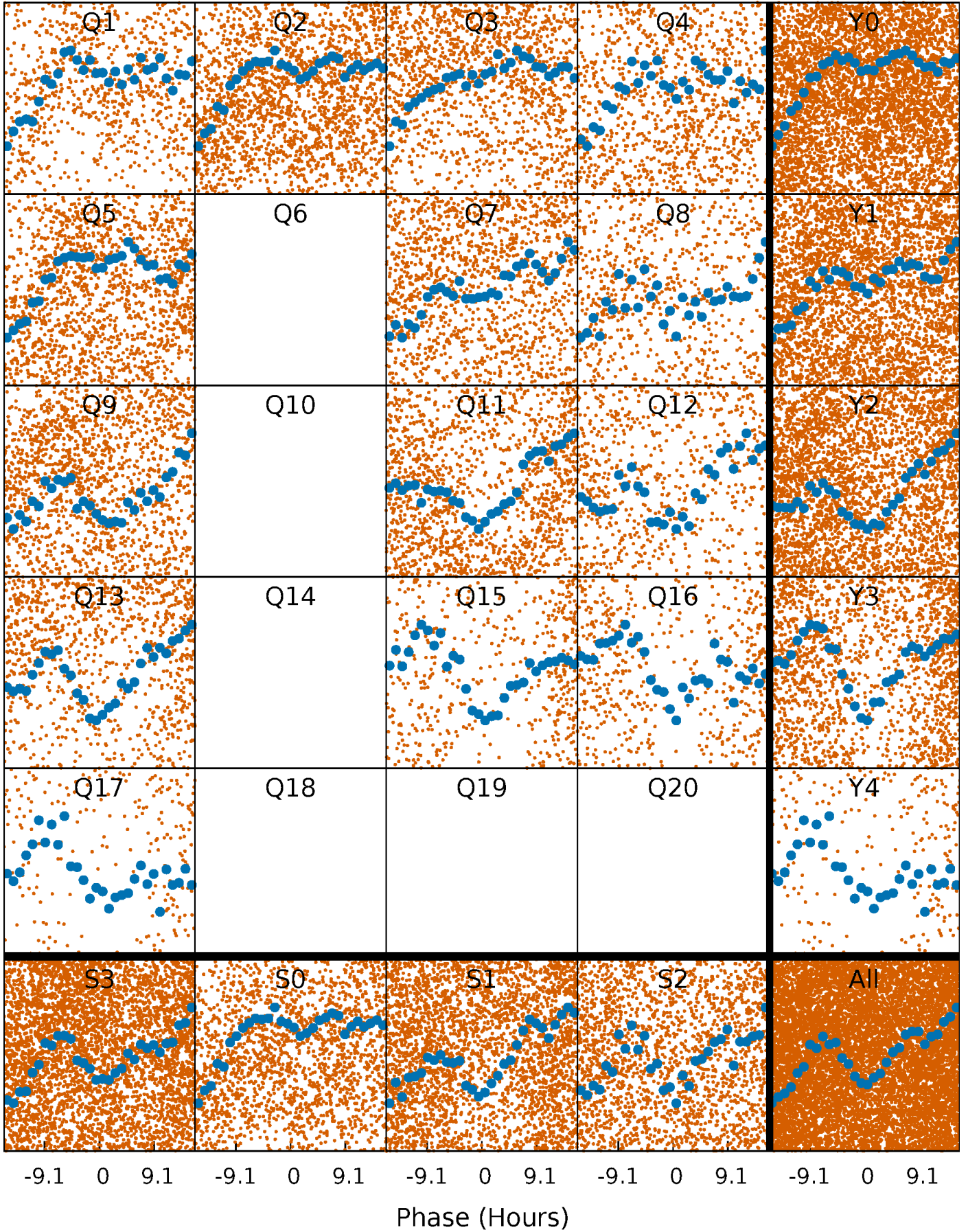


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



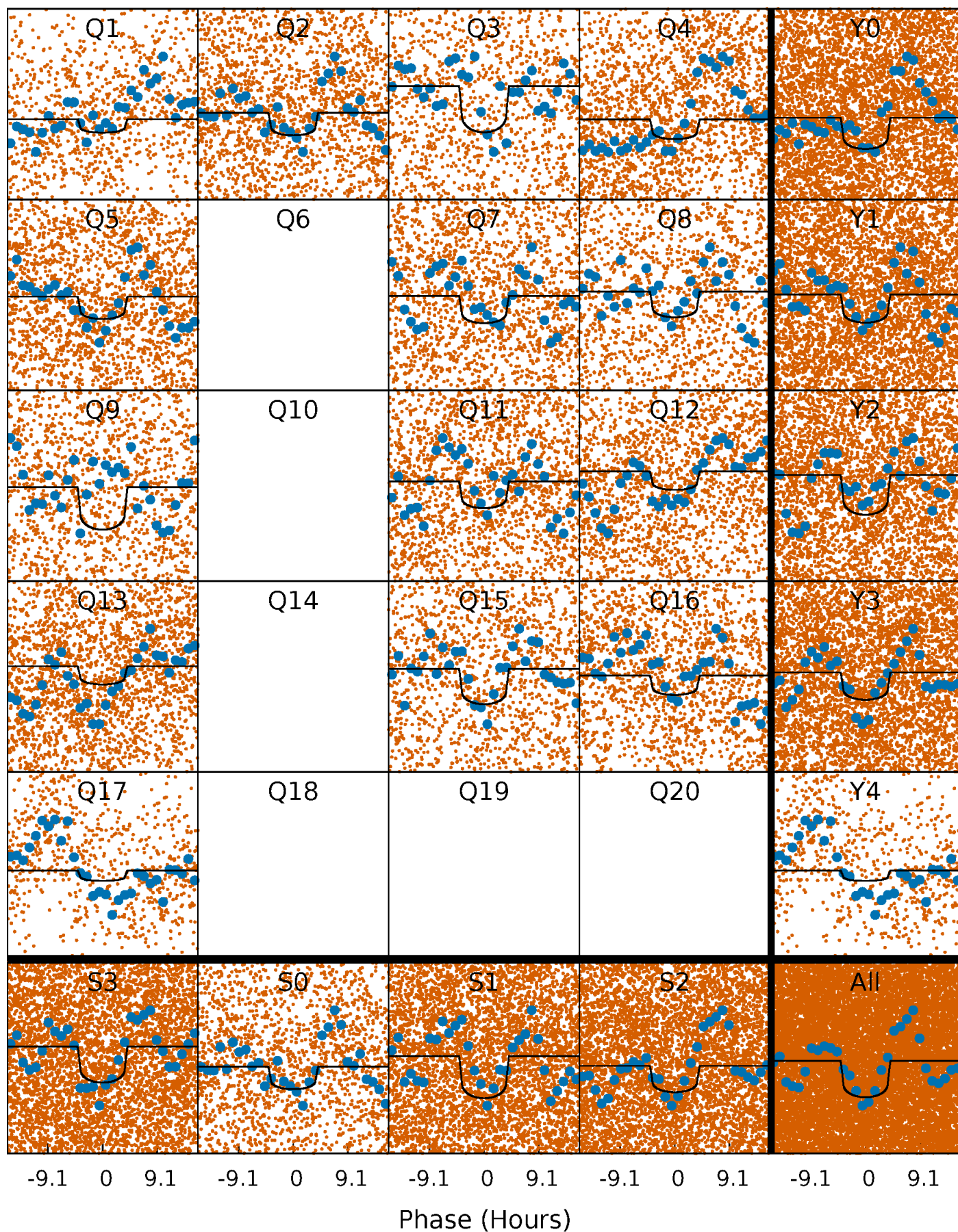
PDC Quarter-Phased Transit Curves

TCE 004667989-01 P= 2.117175 Days $T_0=132.993031$ (BKJD)



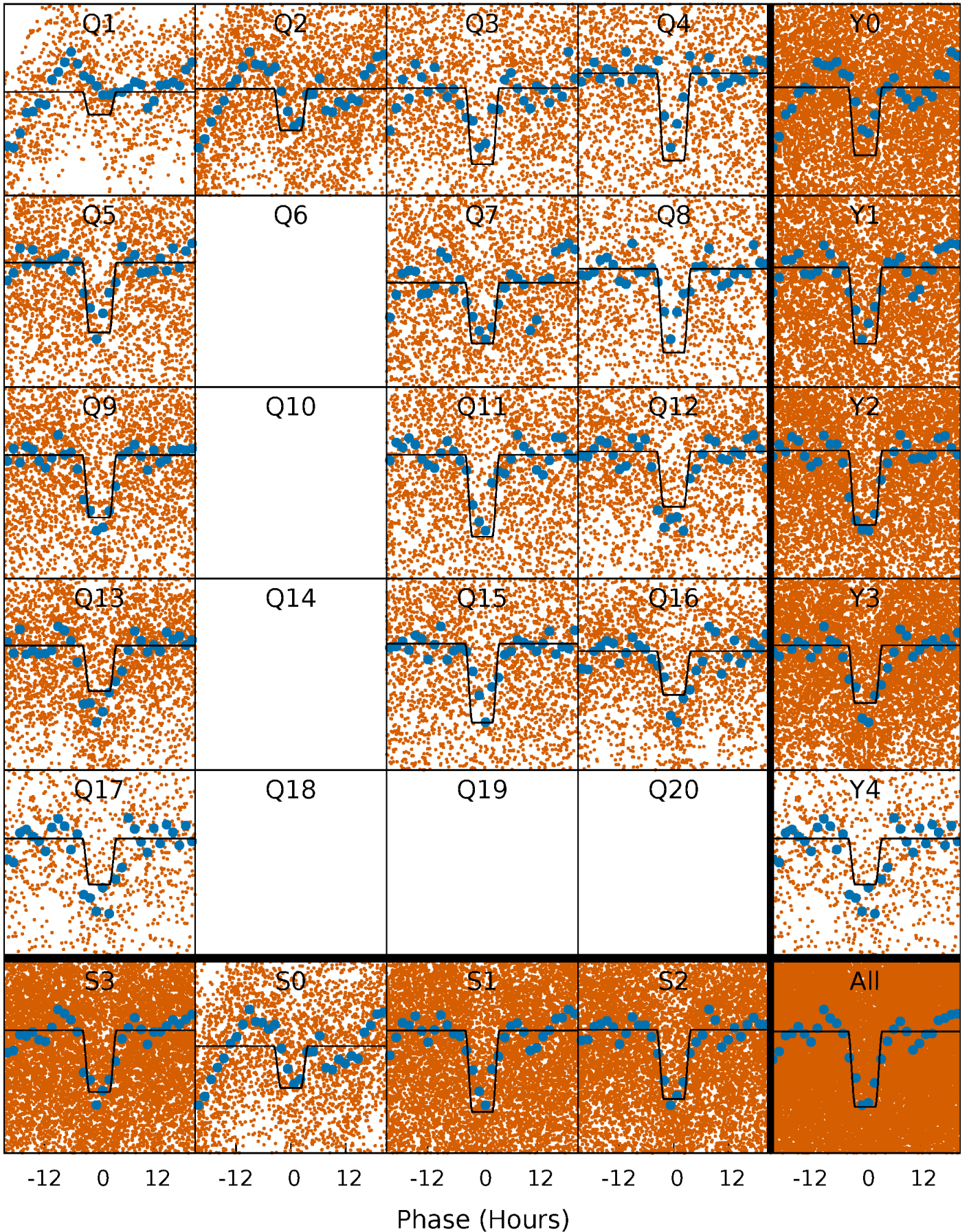
DV Quarter-Phased Transit Curves

TCE 004667989-01 P= 2.117175 Days $T_0=132.993031$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

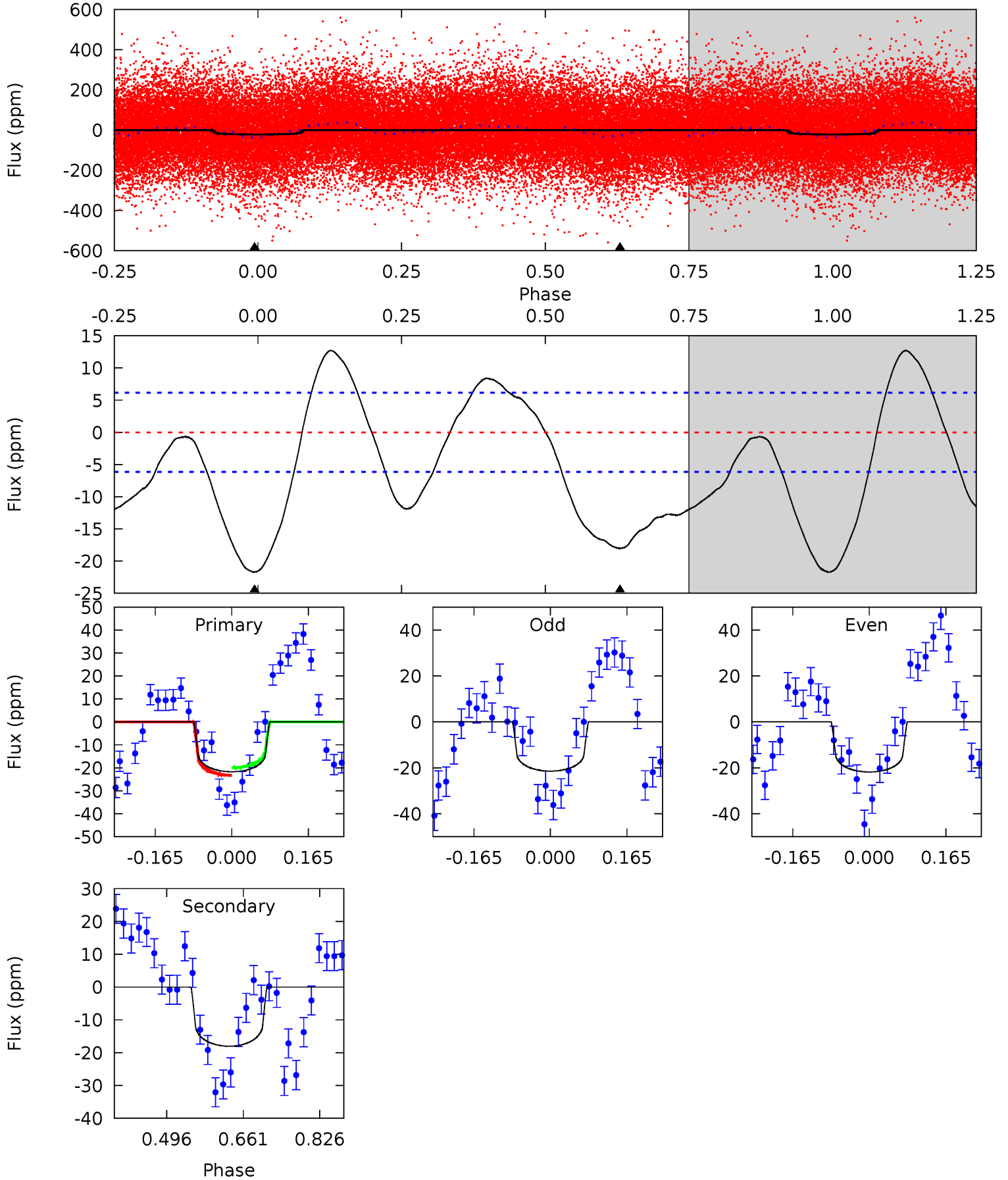
TCE 004667989-01 P= 2.117064 Days $T_0=133.043339$ (BKJD)



DV Model-Shift Uniqueness Test

004667989-01, P = 2.117175 Days, E = 130.875856 Days

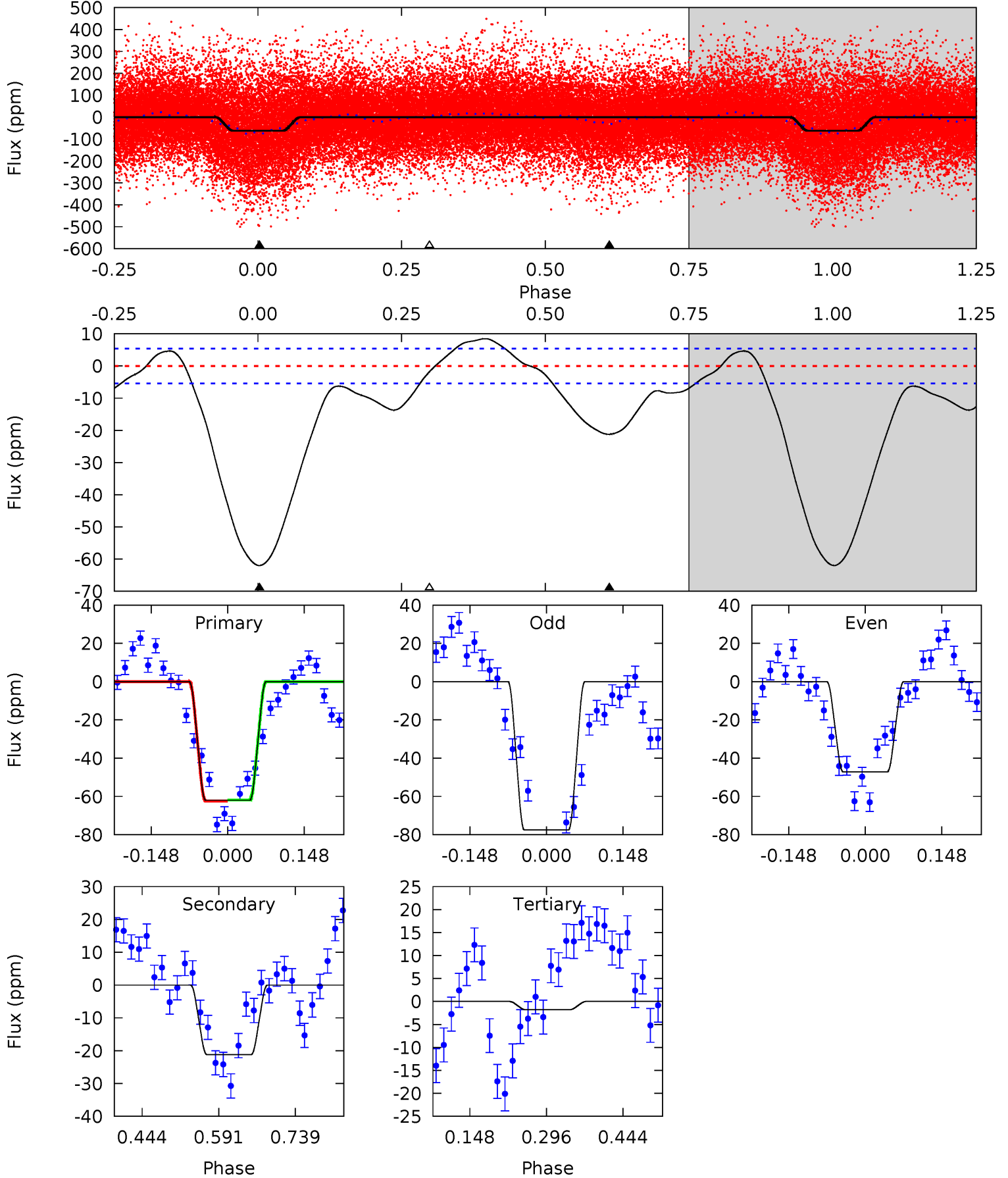
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	13.1	0	0	4.46	1.39	5.09	15.8	15.8	13.1	13.1	0.14	1.00	0.37	1.21



Alt Model-Shift Uniqueness Test

004667989-01, P = 2.117064 Days, E = 130.926275 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
51.3	17.6	1.48	0	4.48	1.45	5.89	49.8	51.3	16.1	17.6	12.6	0.96	0.12	0.26



Stellar Parameters For KIC 004667989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	6851^{+72}_{-82}	$4.218^{+0.048}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$1.538^{+0.289}_{-0.103}$	$1.426^{+0.112}_{-0.071}$	$0.552^{+0.115}_{-0.198}$
	+1%/-1%	+1%/-3%	+150%/-150%	+19%/-7%	+8%/-5%	+21%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004667989-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-18 ± 1	$0.92^{+0.20}_{-0.19}$	2764^{+107}_{-69}	6034^{+759}_{-532}	15^{+9}_{-5}
Alt.	-21 ± 1	$1.45^{+0.22}_{-0.19}$	2757^{+122}_{-70}	5052^{+315}_{-273}	$7.316^{+2.274}_{-1.789}$

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 $A_{obs} \gg 1.0$

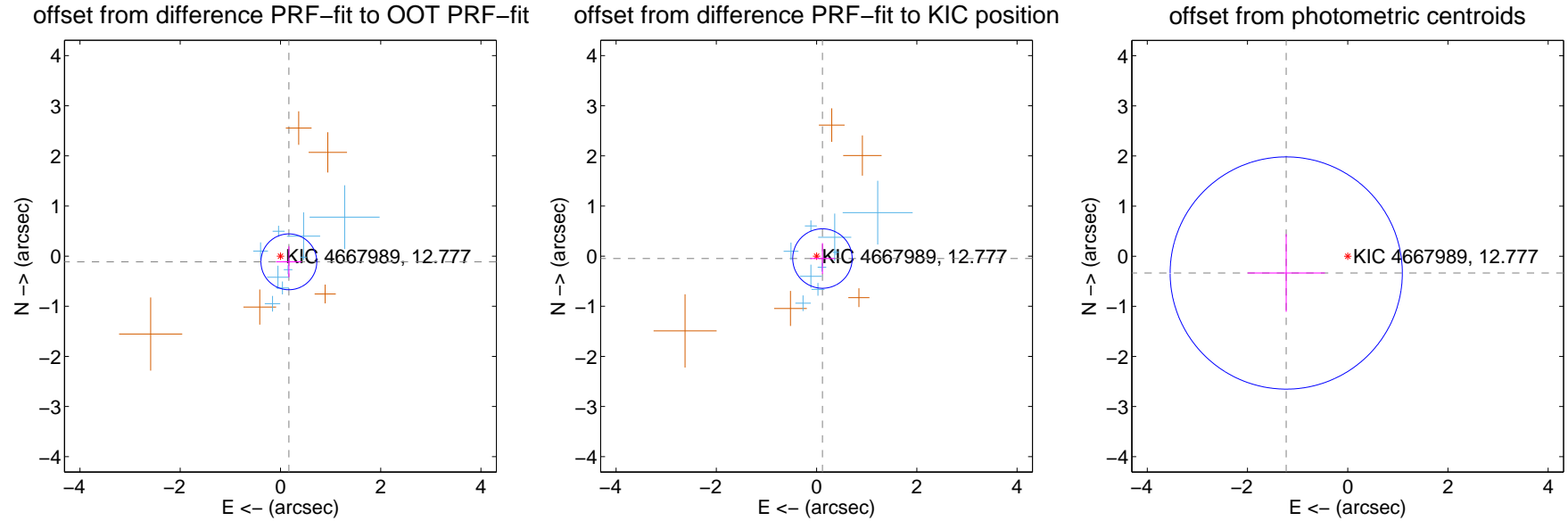
DV Centroid Data

Supplemental centroid analysis for 004667989-01. Kepler magnitude: 12.78. Transit SNR 9.73

There are 9 quarters with good PRF difference image offsets

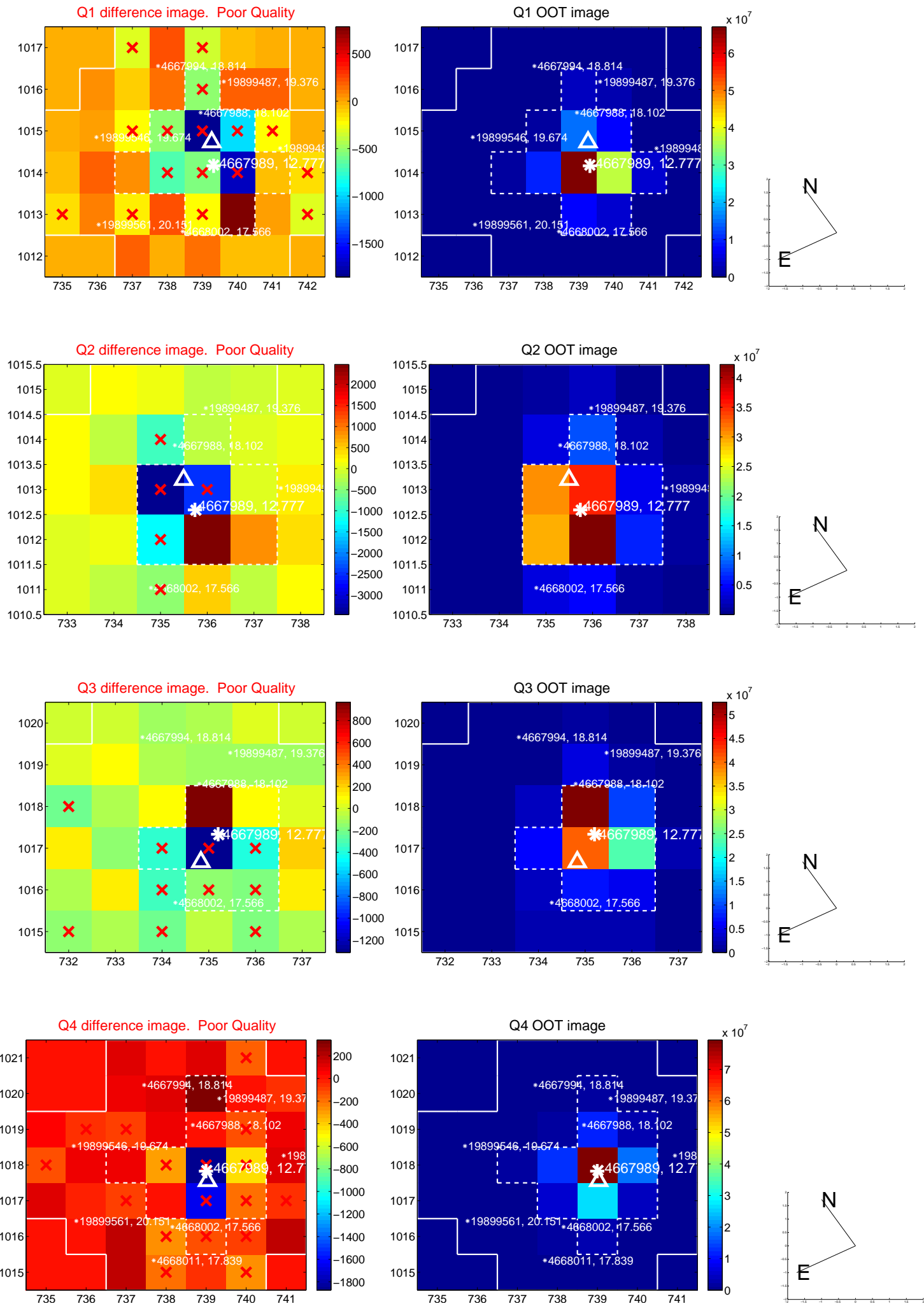
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.202 ± 0.186	1.09	-0.168 ± 0.253	-0.113 ± 0.308
PRF-fit source offset from KIC position	0.127 ± 0.198	0.64	-0.117 ± 0.243	-0.048 ± 0.308
photometric centroid source offset	1.27 ± 0.77	1.65	1.23 ± 0.77	-0.34 ± 0.77

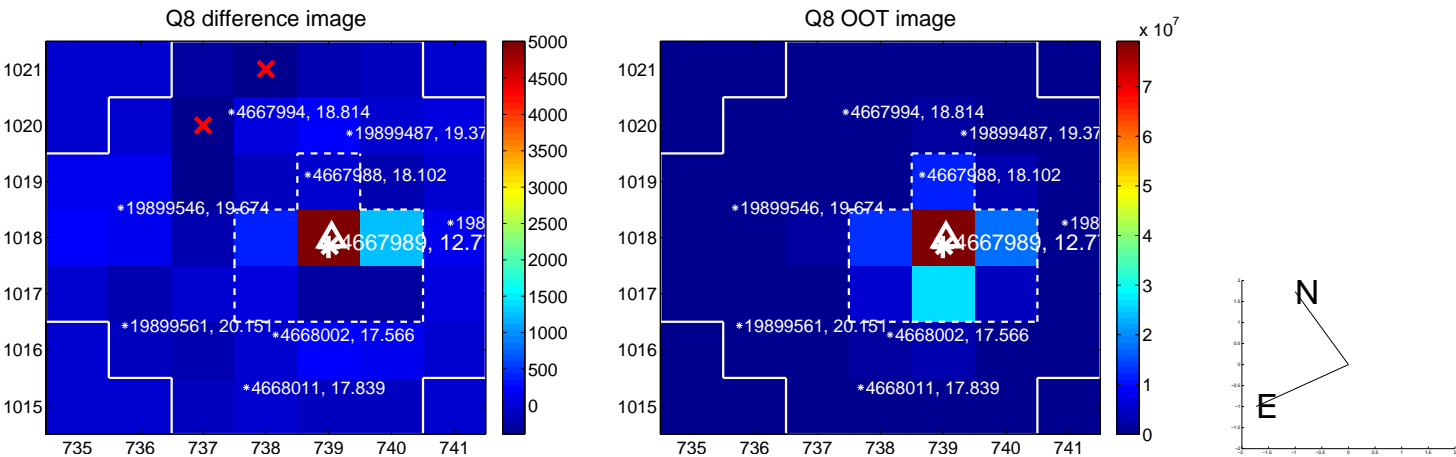
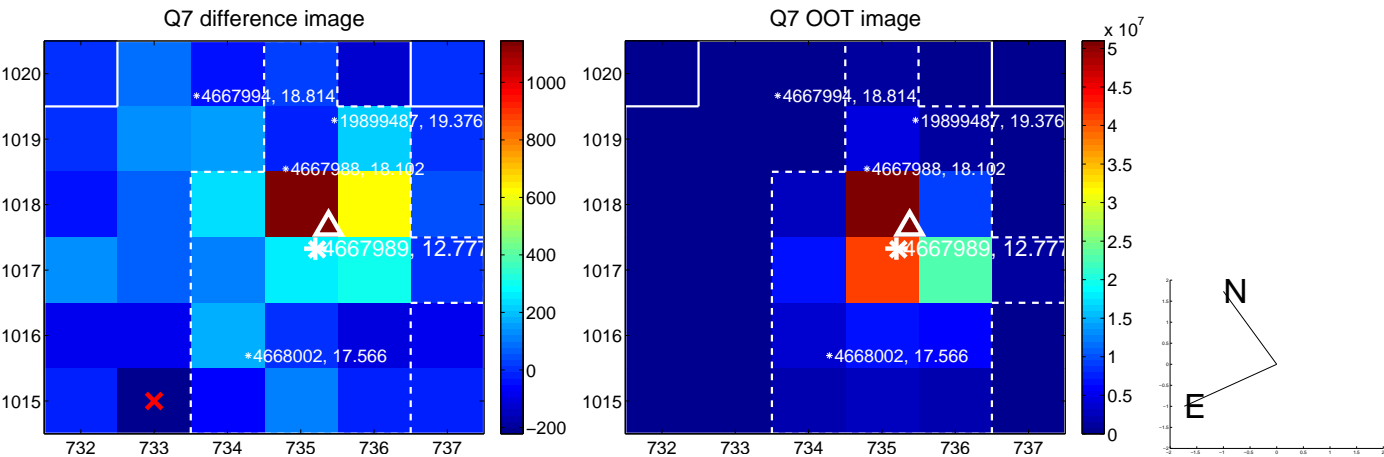
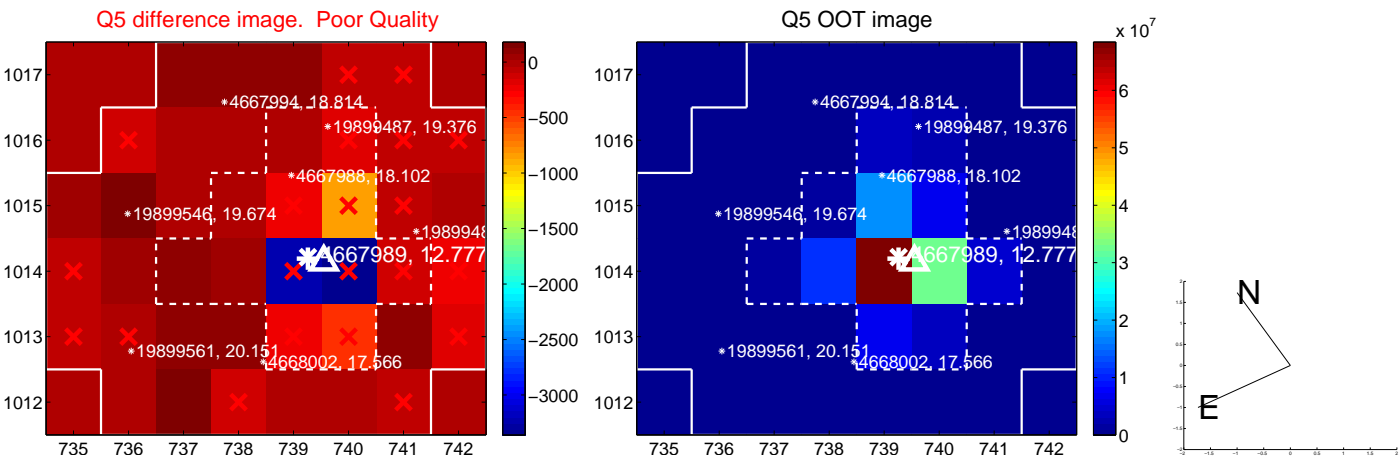


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

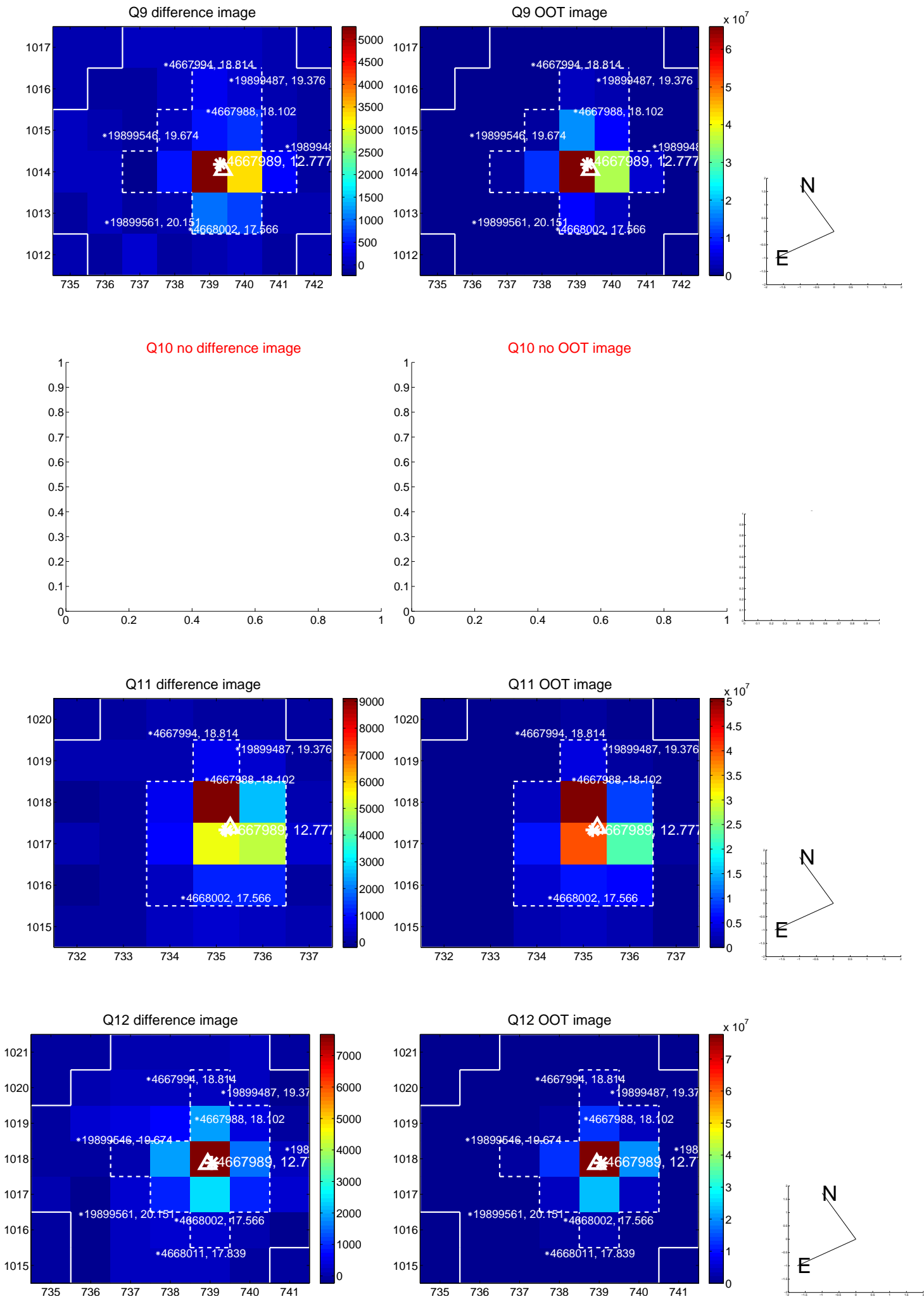
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



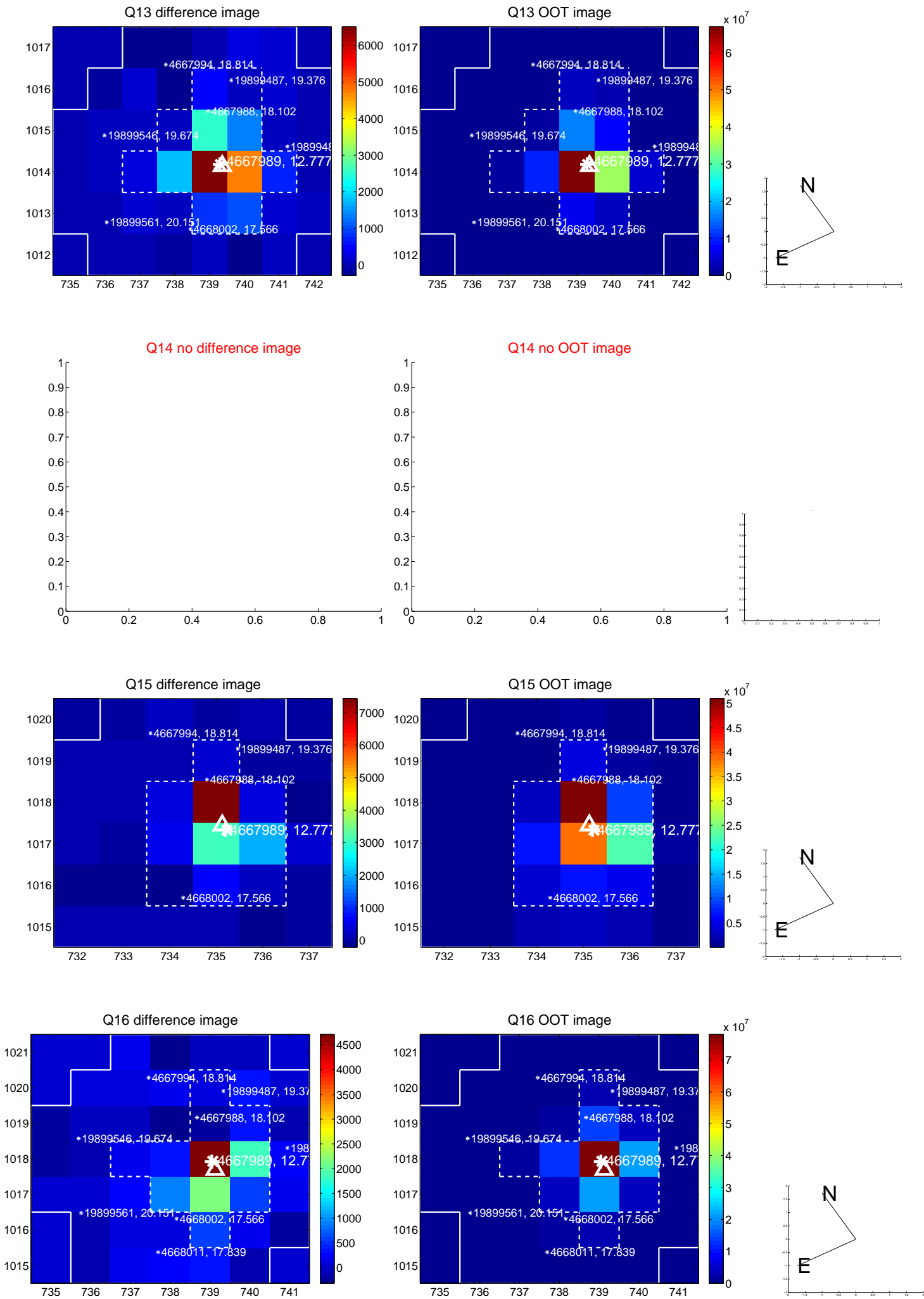
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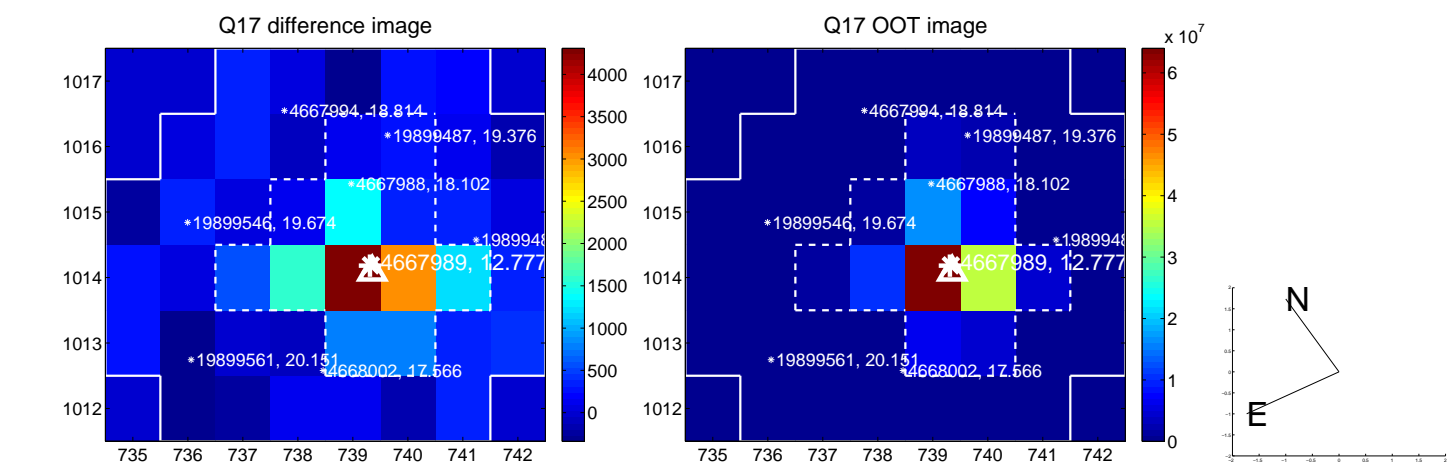
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



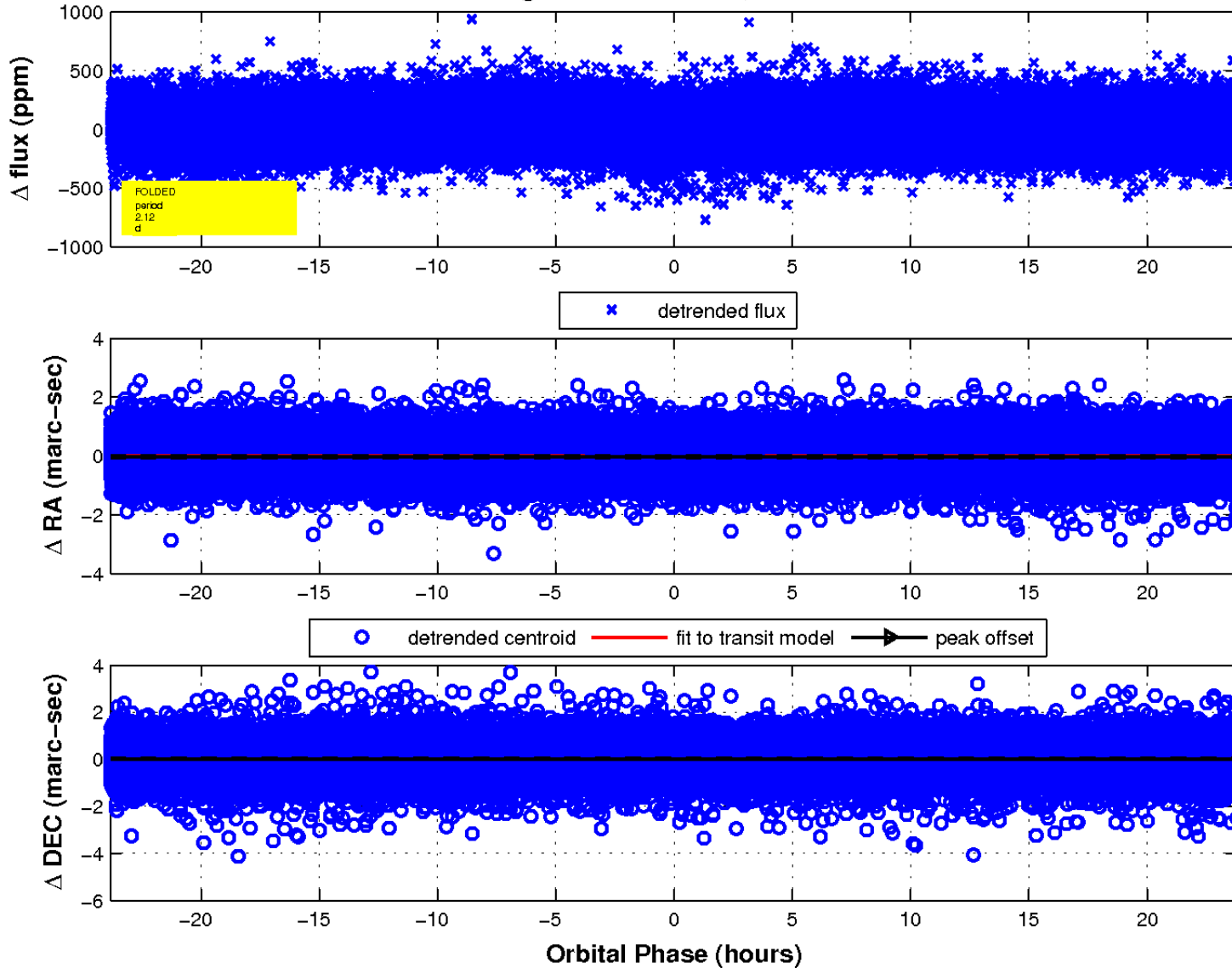
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

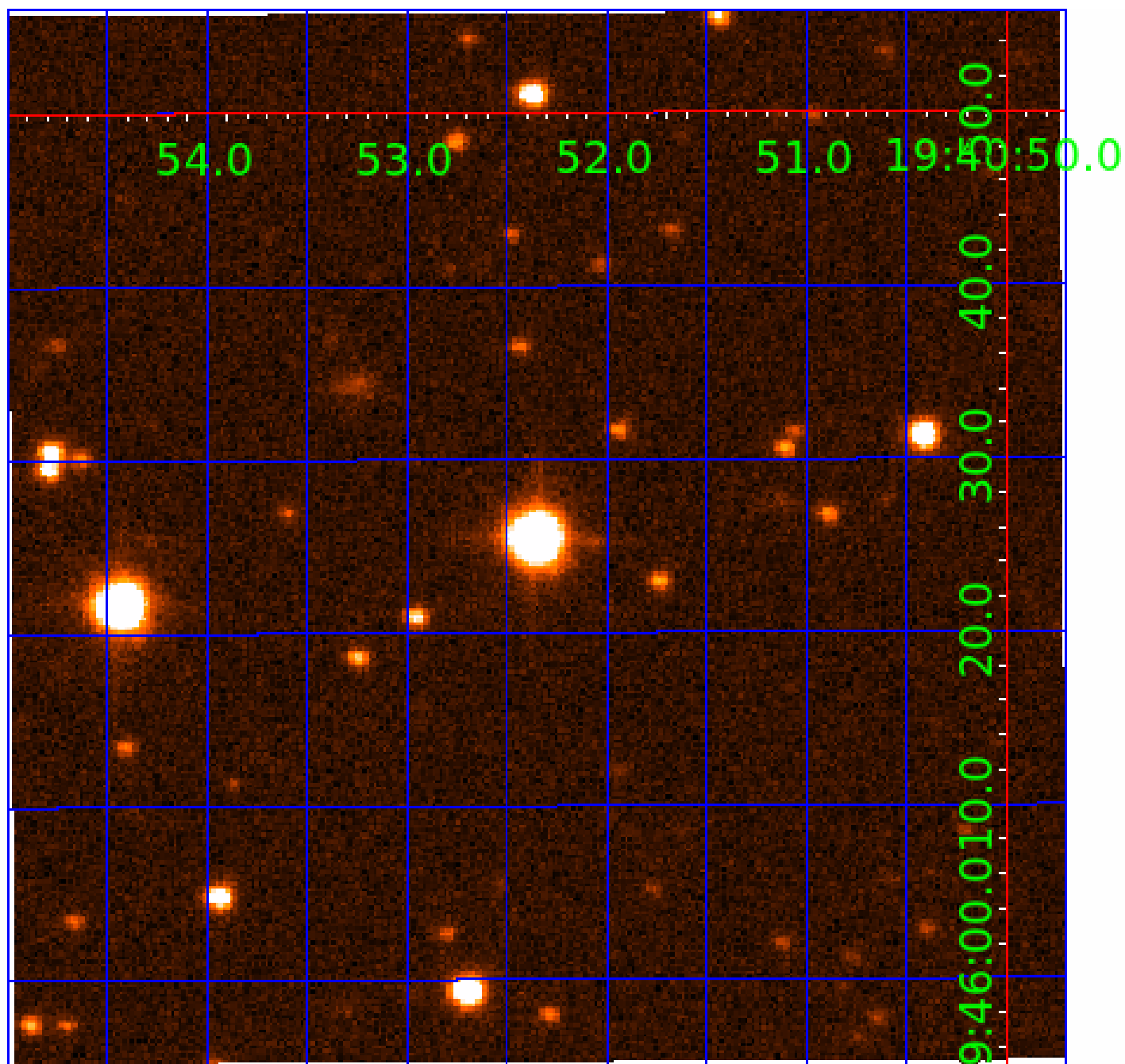


fluxWeightedCentroids, Planet 1 of 5



UKIRT Image

Declination



KIC 004667989

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})
004667989-01	OBS	No	2.117175	132.993031	28.4	7.941	10.1	9.7	1.54	6851	0.91	3538.93
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004667989-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004667989-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV
004667989-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

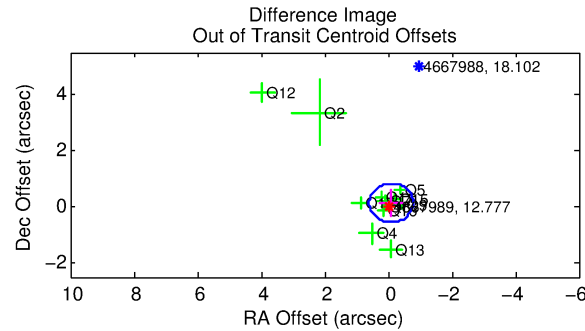
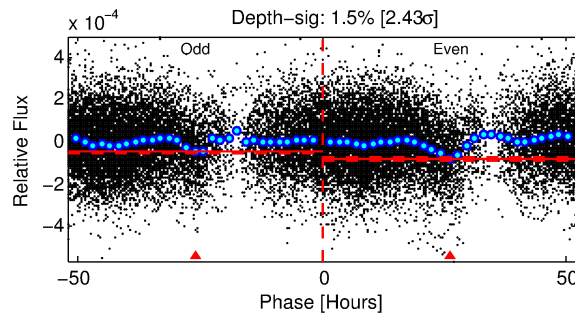
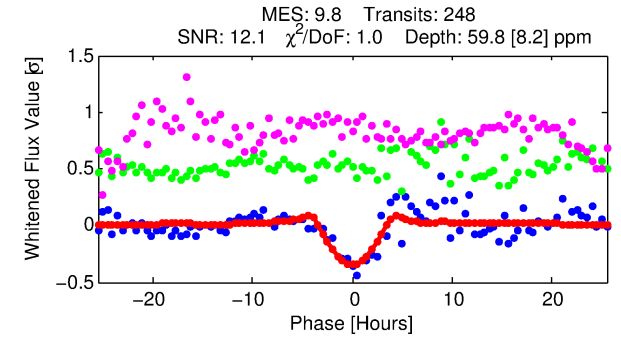
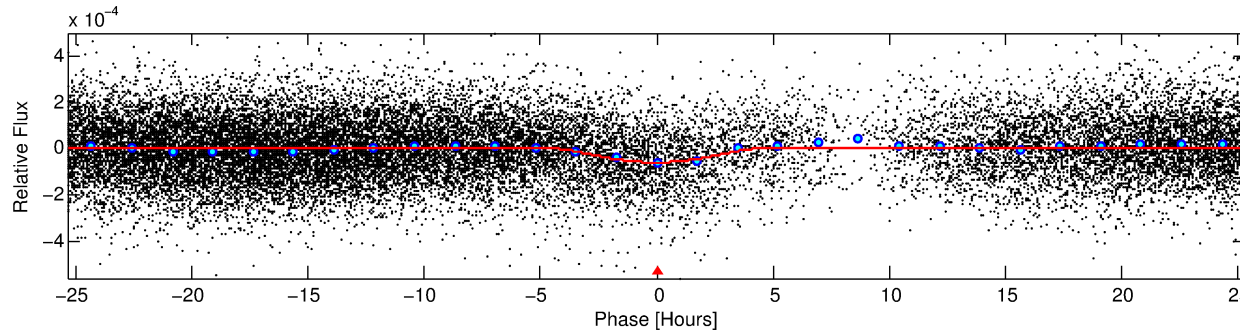
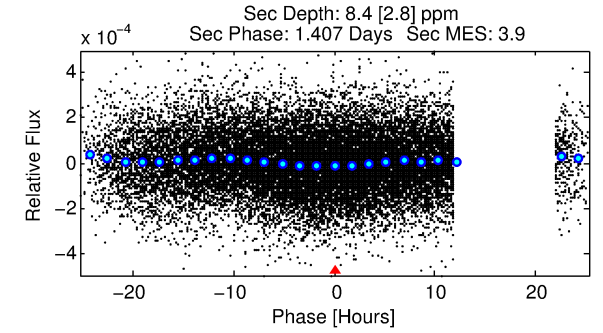
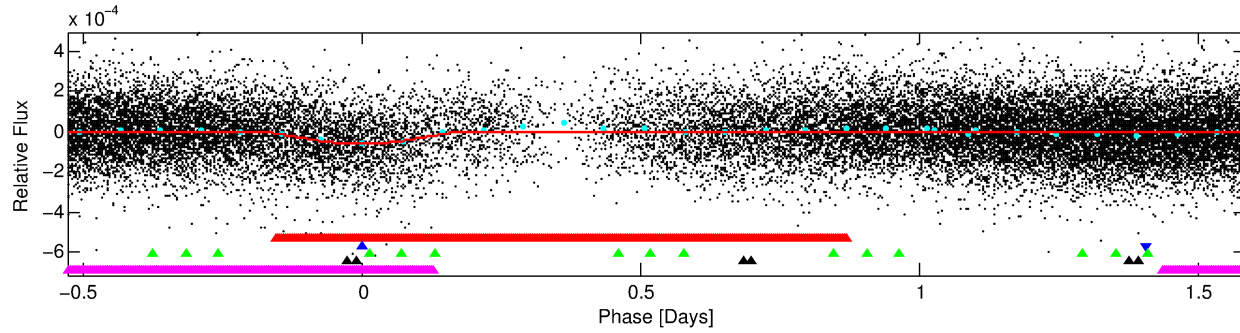
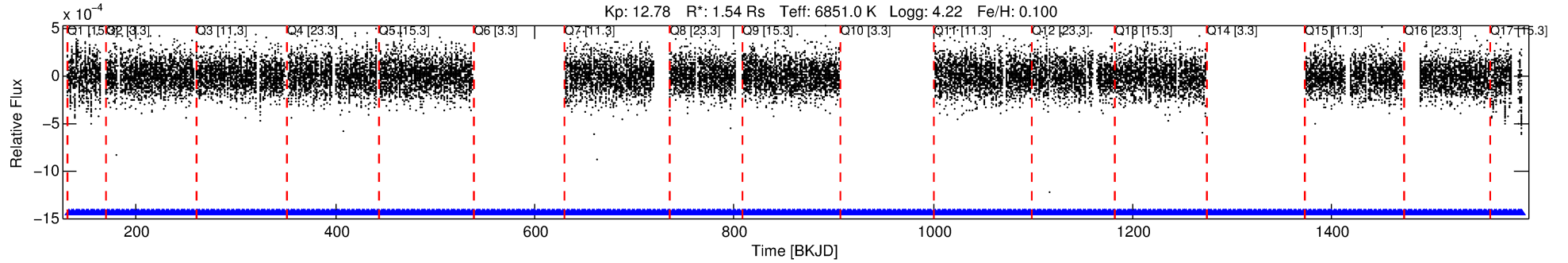
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004667989-02

No Significant Match Found

DV One-Page Summary

KIC: 4667989 Candidate: 2 of 5 Period: 2.116 d



DV Fit Results:

Period = 2.11569 [0.00005] d
Epoch = 133.1480 [0.0256] BKJD
Rp/R* = 0.0140 [0.0277]
a/R* = 1.05 [0.03]
b = 1.00 [0.04]
Seff = 3542.25 [807.11]
Teq = 1967 [112] K
Rp = 2.35 [4.67] Re
a = 0.0363 [0.0056] AU
Ag = 1.10 [4.39] [0.02σ]
Teffp = 3117 [3096] K [0.37σ]

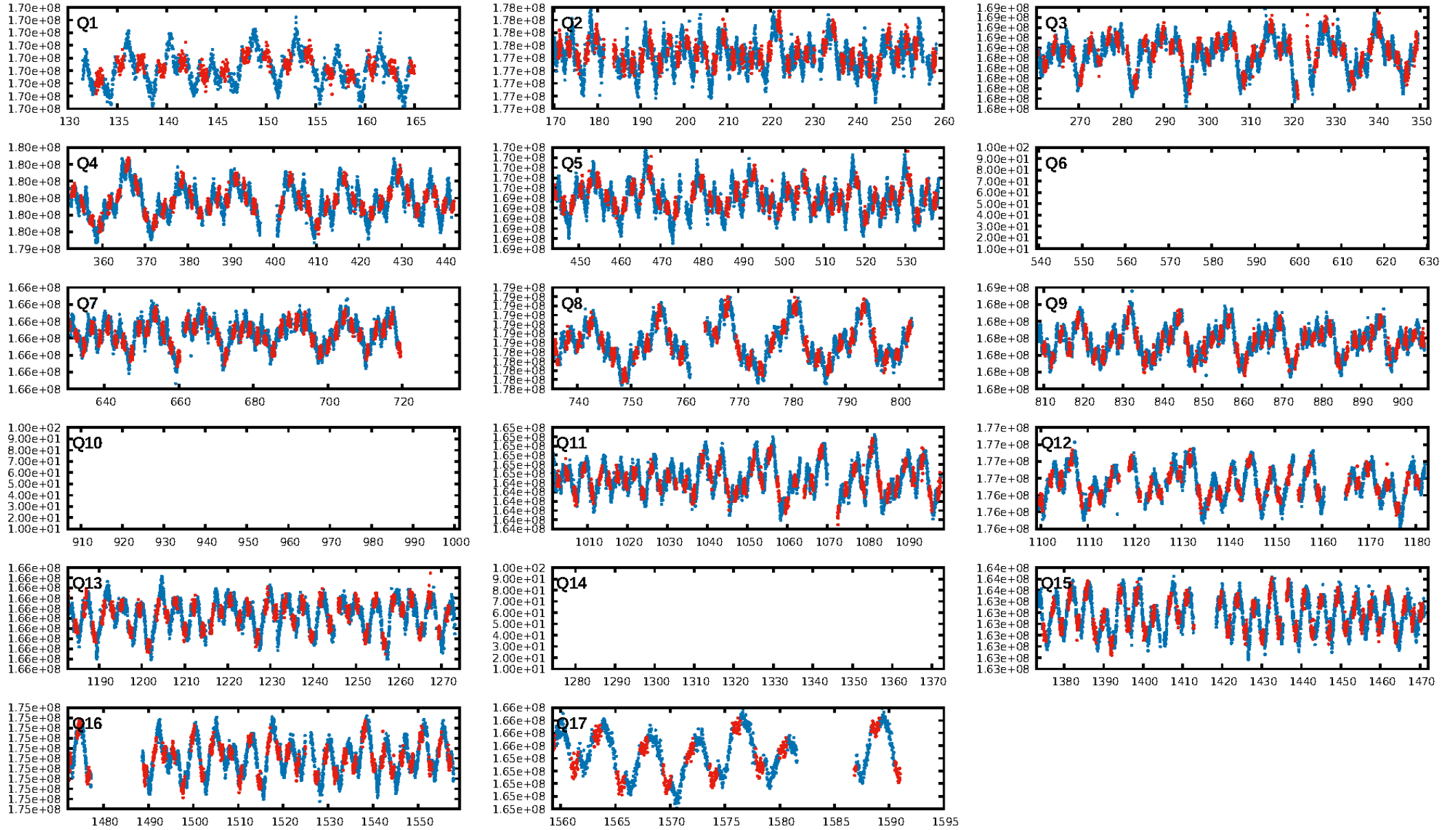
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [235/235]
GhostDiagnostic-chr: 19.43
Centroid-sig: 0.3%
Centroid-so: 0.867 arcsec [1.75σ]
OotOffset-rm: 0.162 arcsec [0.71σ]
KicOffset-rm: 0.138 arcsec [0.34σ]
OotOffset-st: 1/3/4/4 [12]
KicOffset-st: 1/3/4/4 [12]
DiffImageQuality-fgm: 0.33 [4/12]
DiffImageOverlap-fno: 0.00 [0/14]

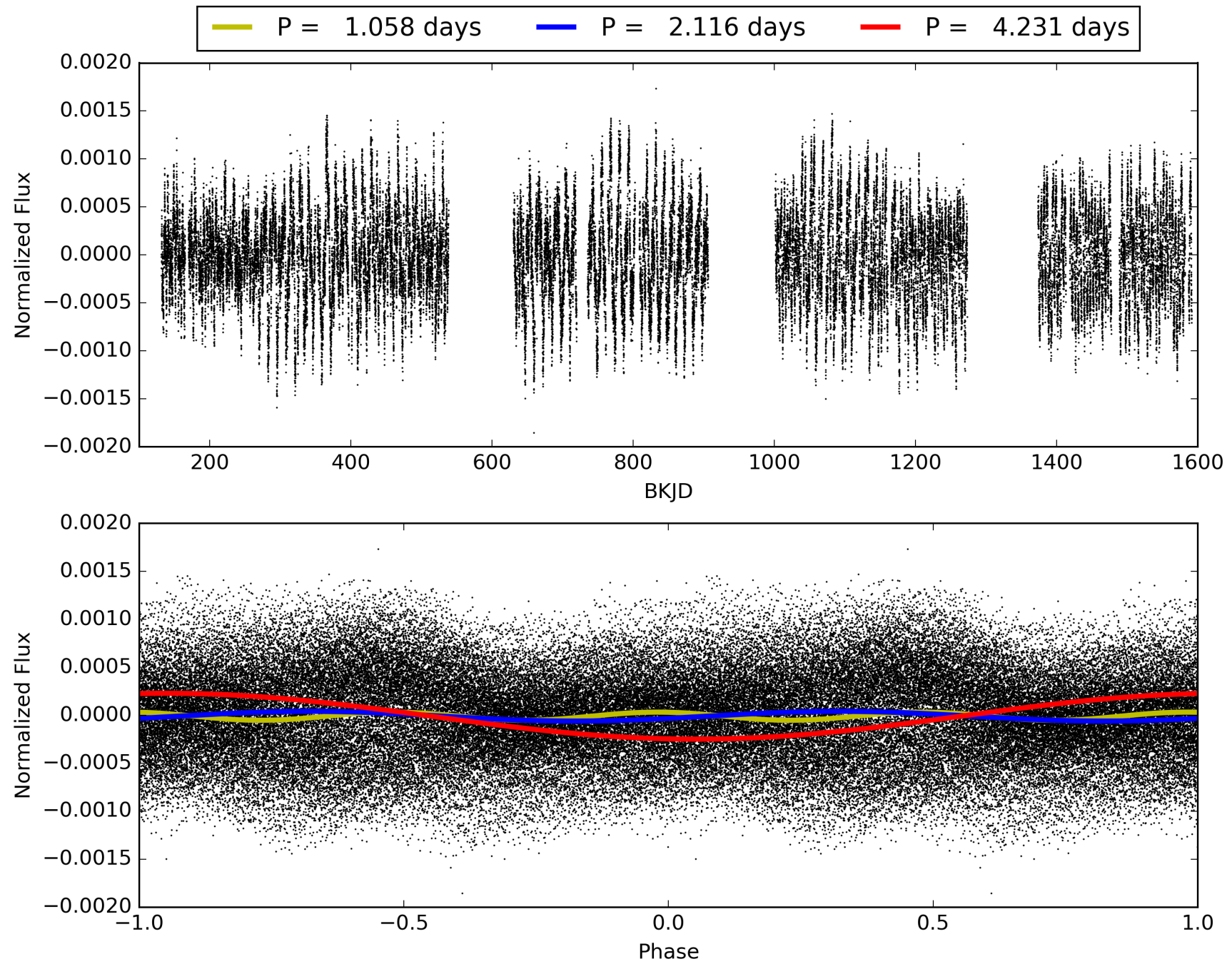
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:39:04 Z

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

TCE 004667989-02, PDC Light Curves

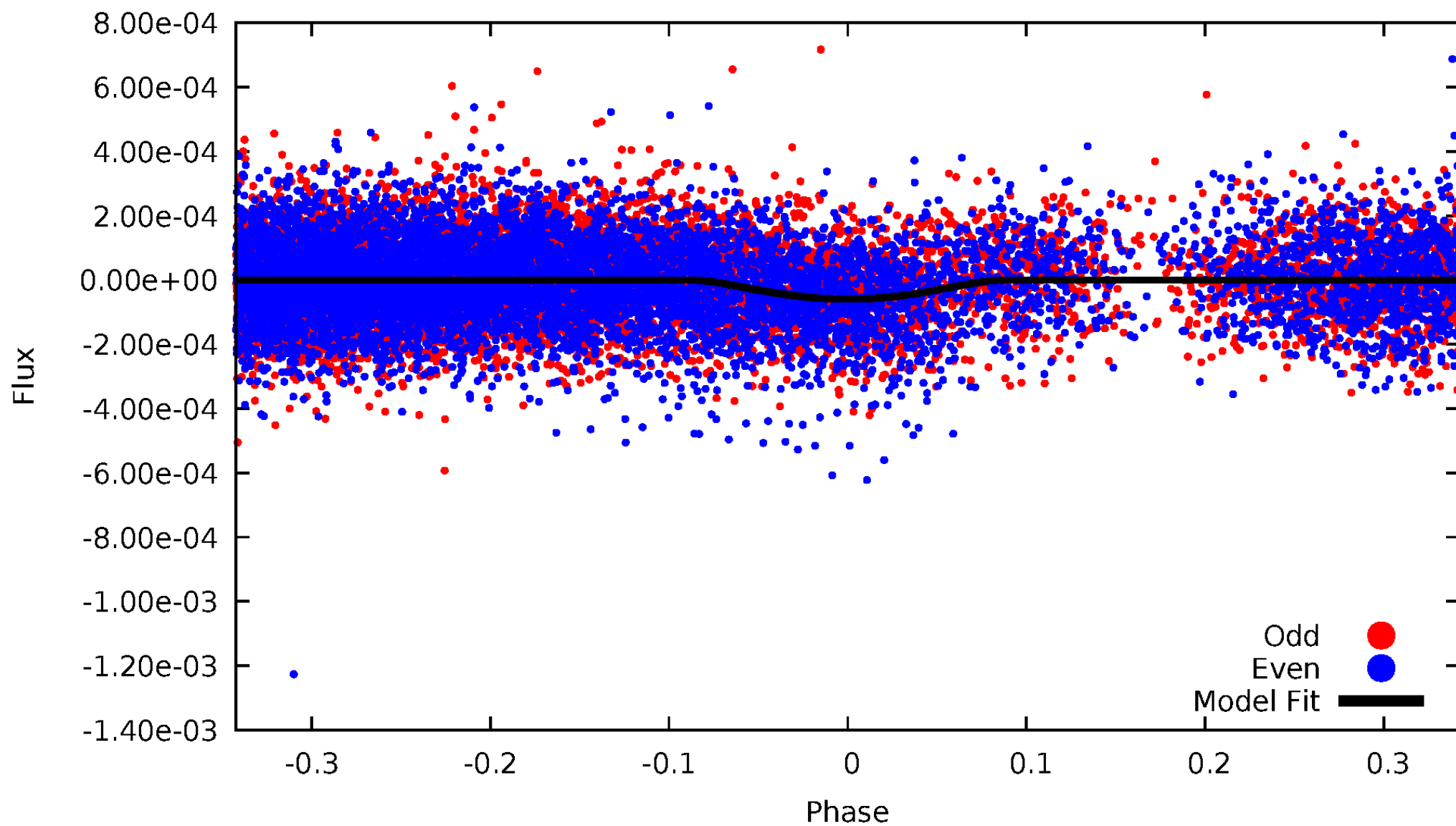


TCE 004667989-02



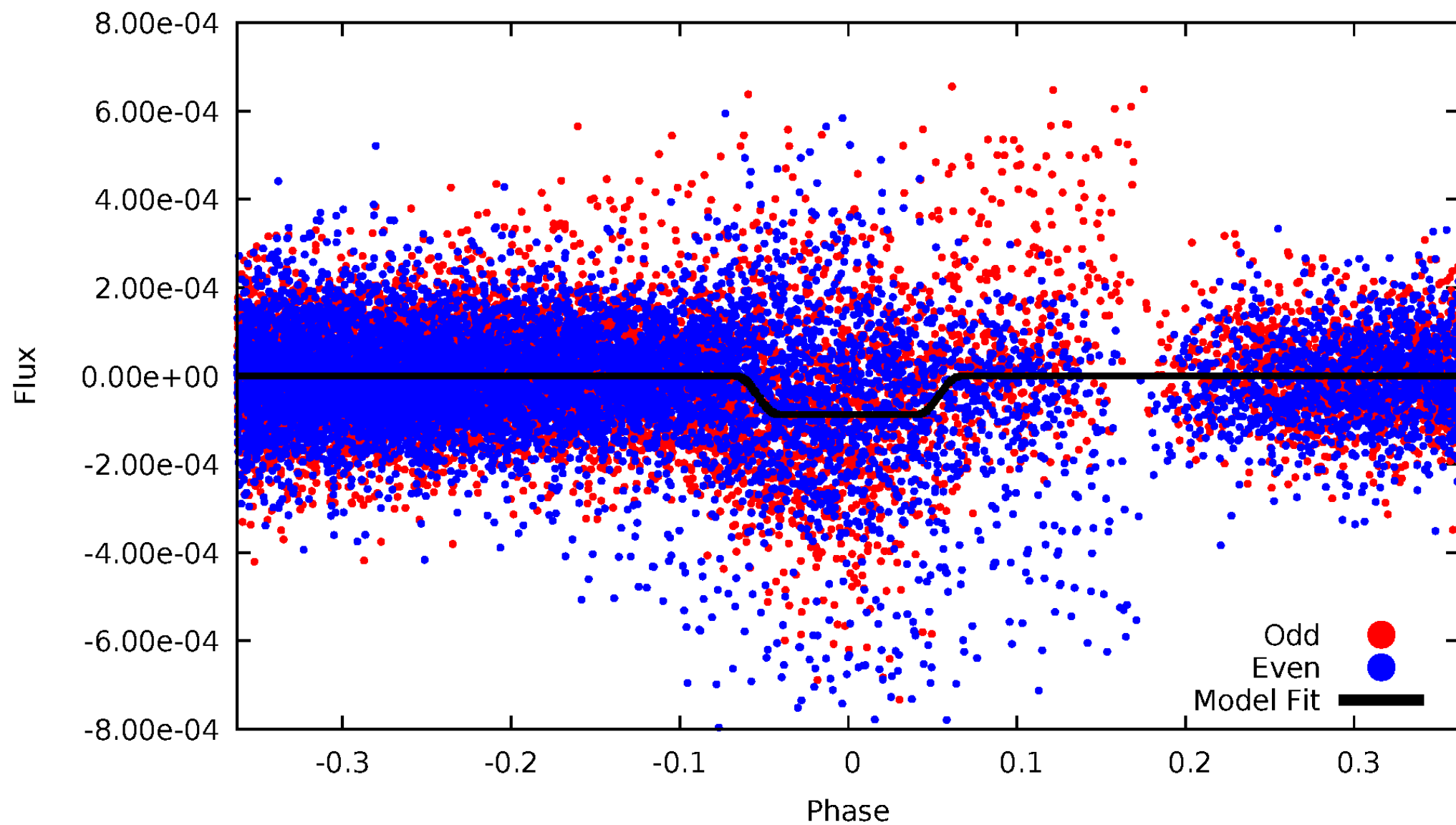
DV Odd/Even

TCE 004667989-02



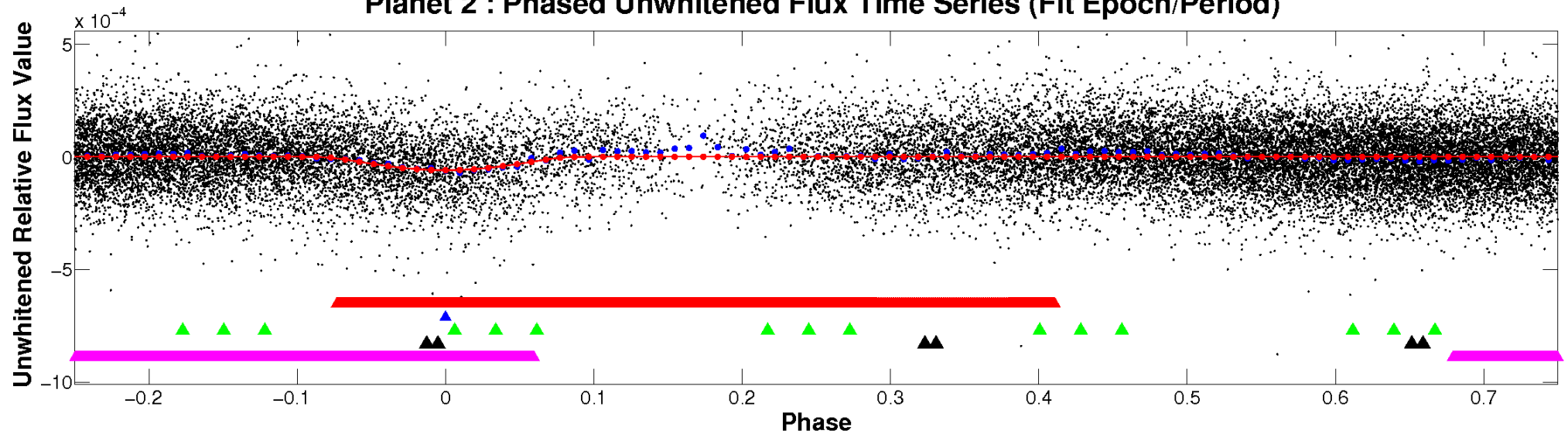
ALT Odd/Even

TCE 004667989-02

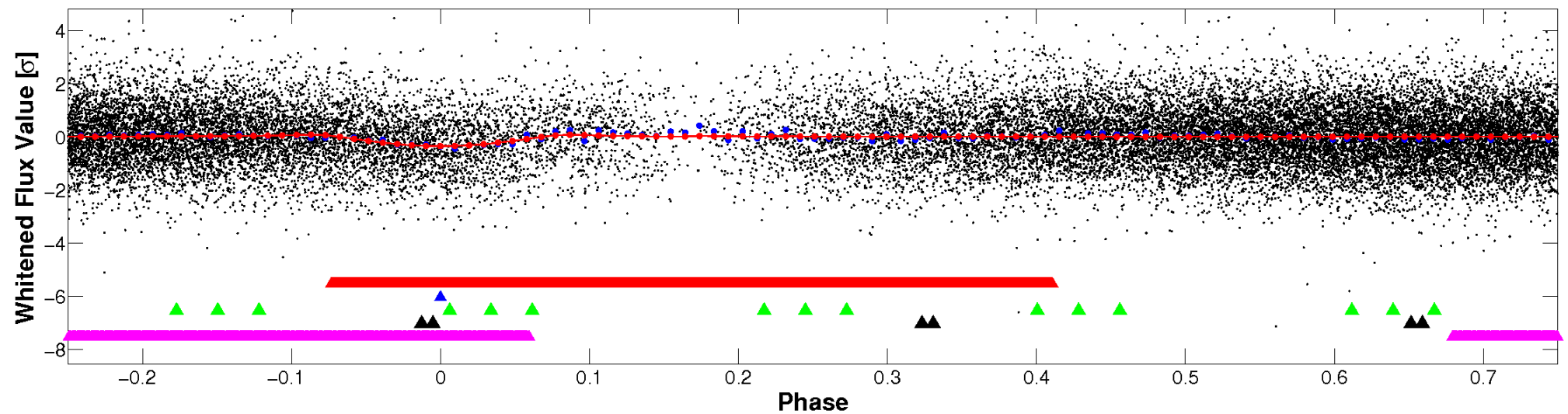


Non-Whitened Vs. Whitened Light Curve

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

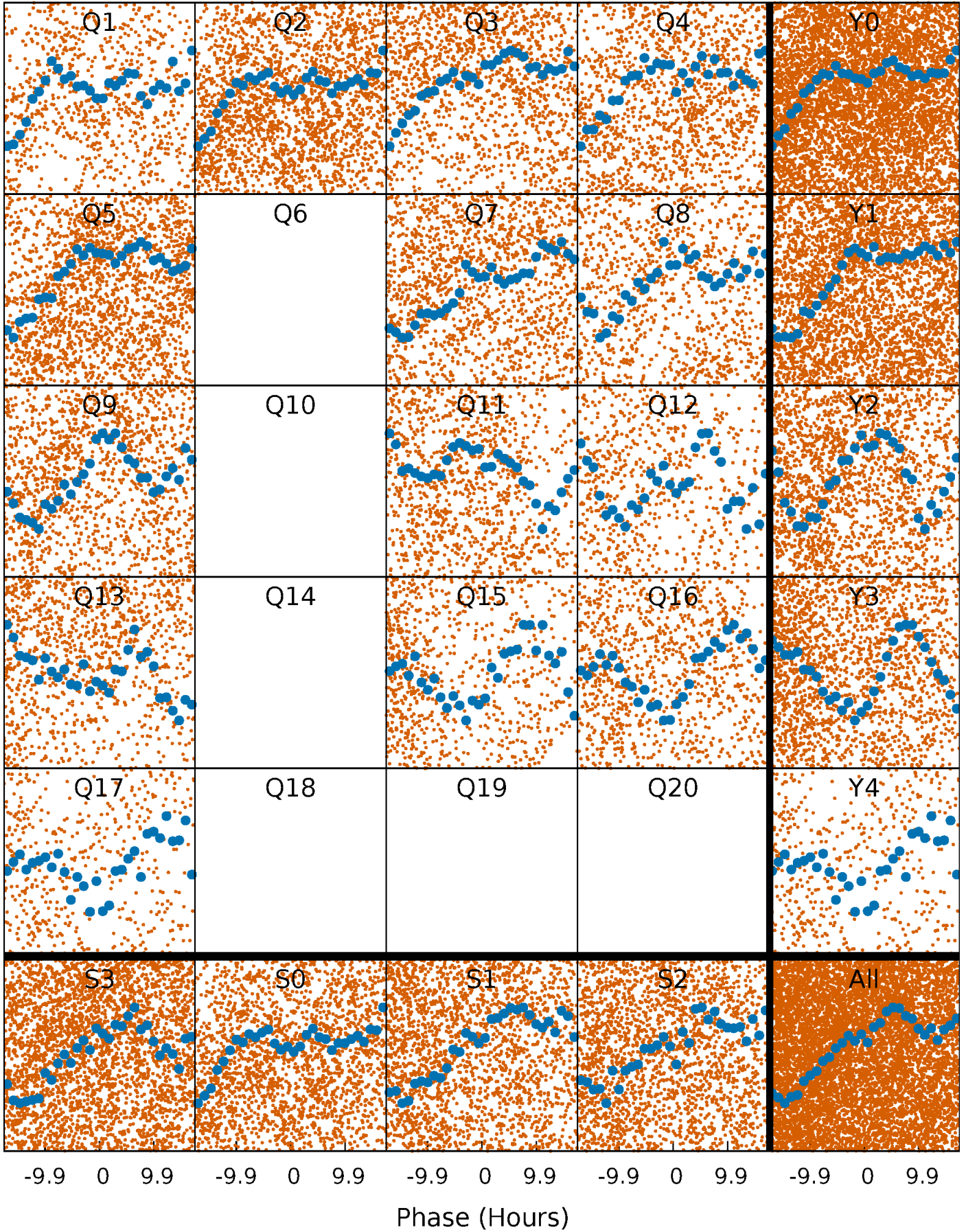


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



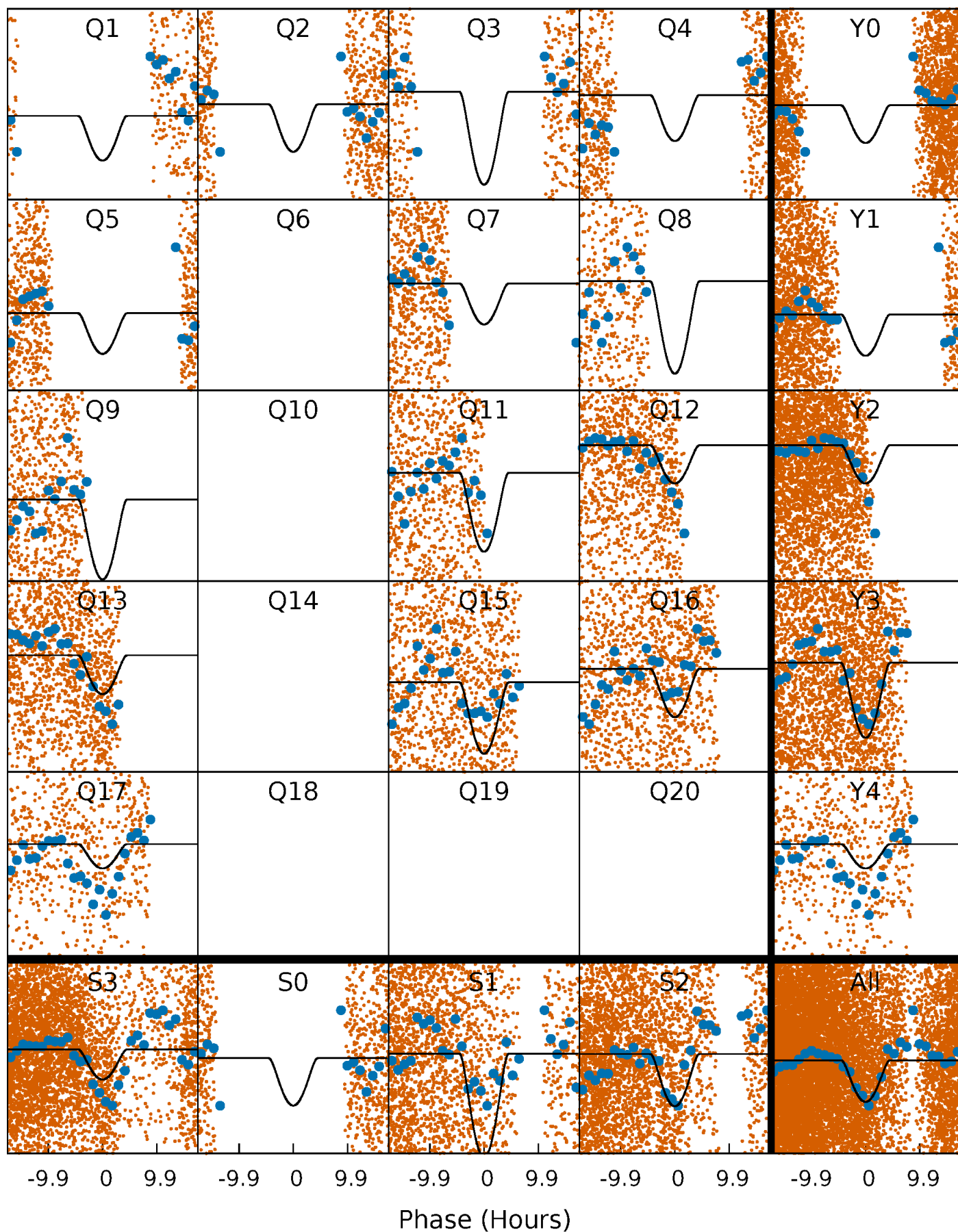
PDC Quarter-Phased Transit Curves

TCE 004667989-02 P= 2.115686 Days $T_0=133.148028$ (BKJD)



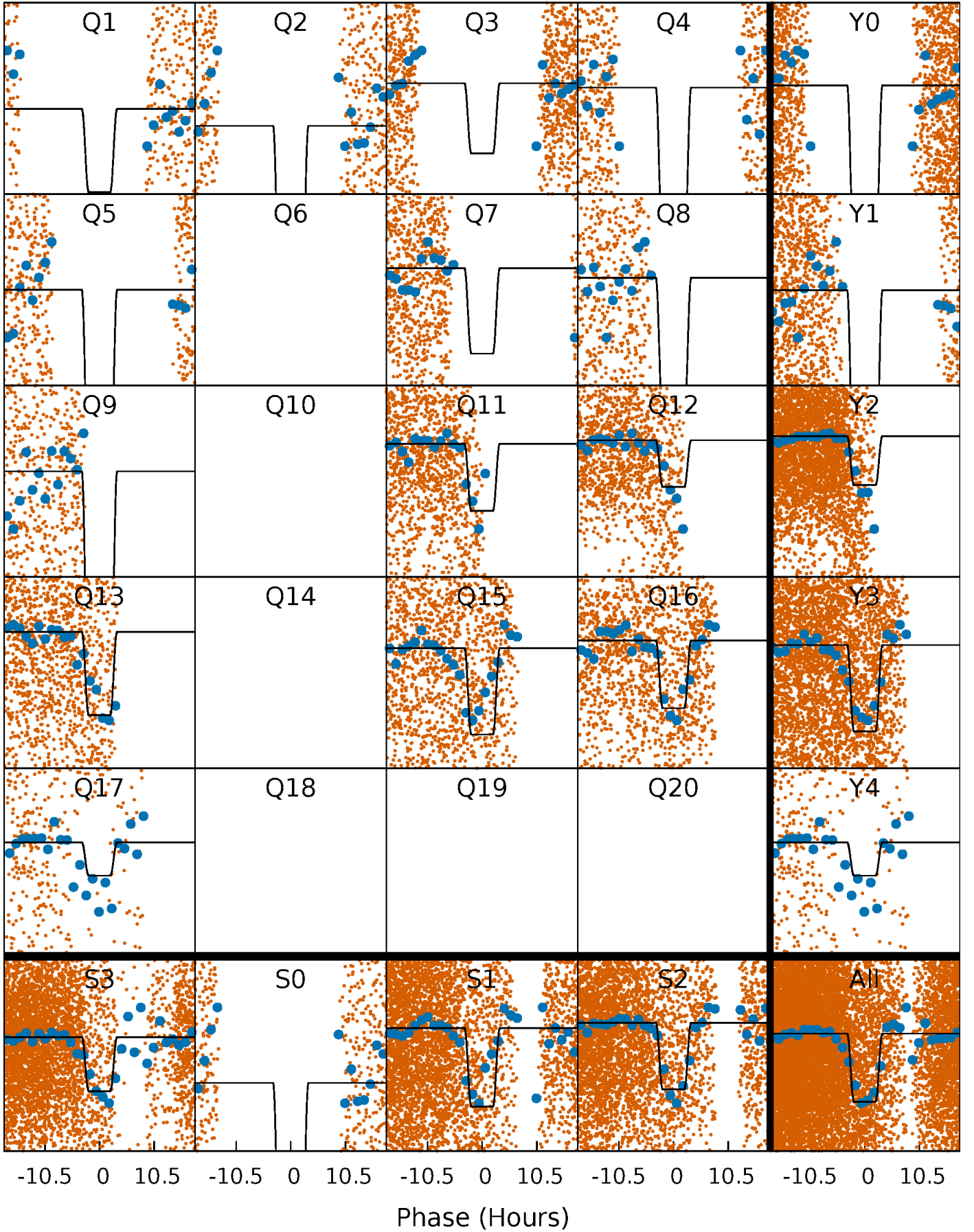
DV Quarter-Phased Transit Curves

TCE 004667989-02 P= 2.115686 Days $T_0=133.148028$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

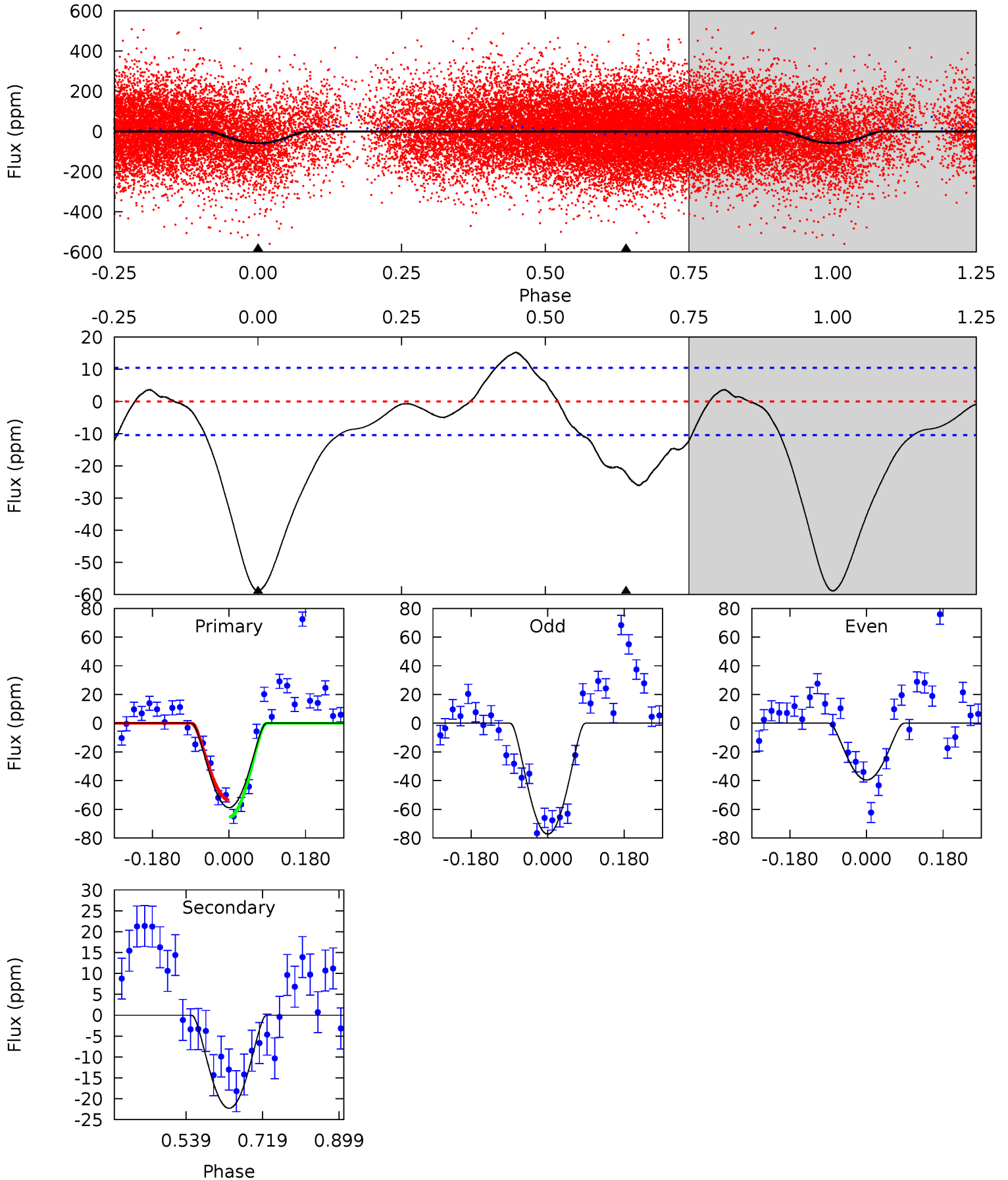
TCE 004667989-02 P= 2.115687 Days $T_0=133.136942$ (BKJD)



DV Model-Shift Uniqueness Test

004667989-02, P = 2.115686 Days, E = 131.032342 Days

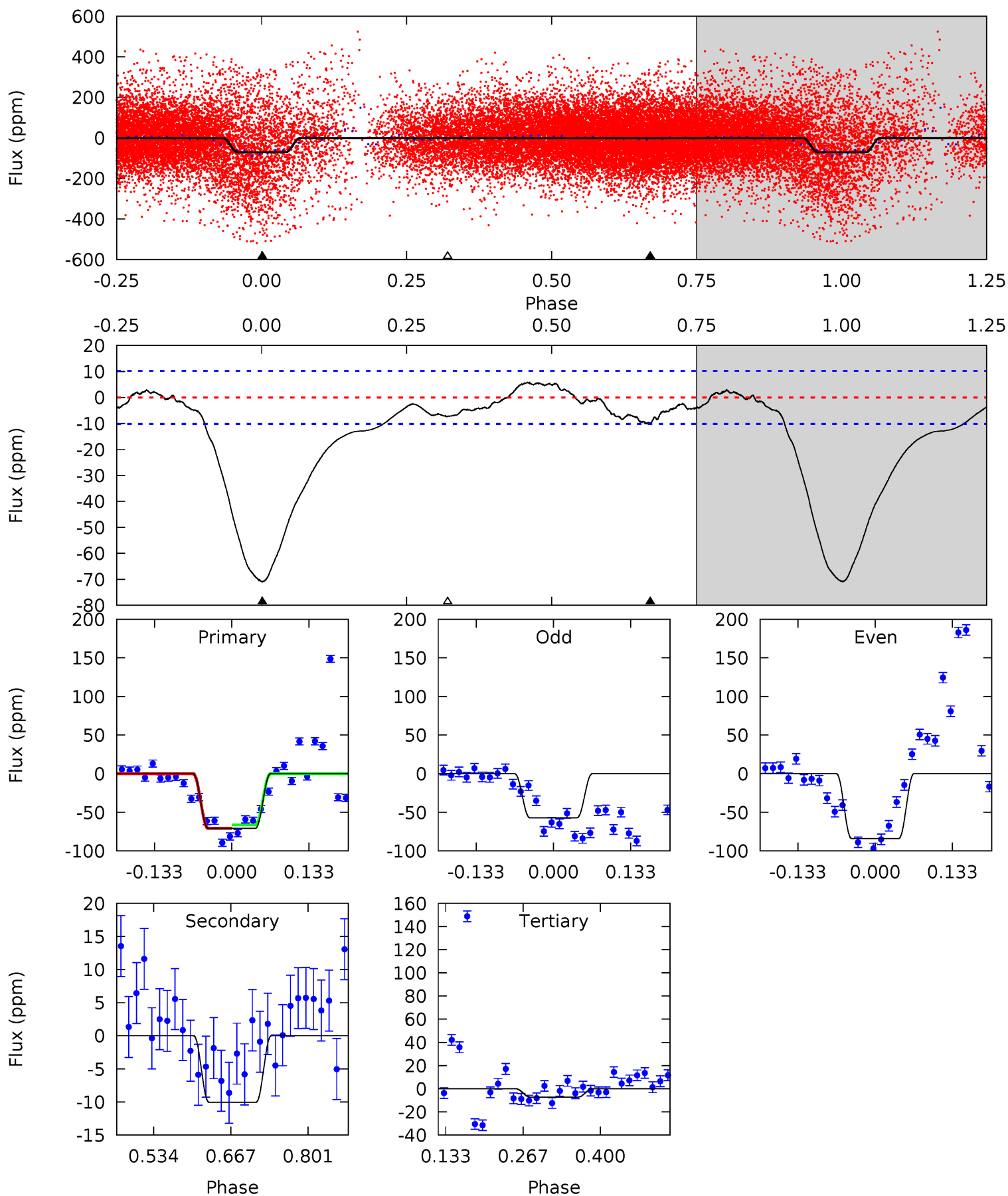
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.1	9.48	0	0	4.44	1.34	3.12	25.1	25.1	9.48	9.48	8.03	0.85	0.21	2.53



Alt Model-Shift Uniqueness Test

004667989-02, P = 2.115687 Days, E = 131.021255 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.3	4.43	3.22	0	4.50	1.50	1.98	28.0	31.3	1.21	4.43	5.87	0.97	0.07	0.97



Stellar Parameters For KIC 004667989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	6851^{+72}_{-82}	$4.218^{+0.048}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$1.538^{+0.289}_{-0.103}$	$1.426^{+0.112}_{-0.071}$	$0.552^{+0.115}_{-0.198}$
	+1%/-1%	+1%/-3%	+150%/-150%	+19%/-7%	+8%/-5%	+21%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004667989-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-22 ± 2	$4.34^{+3.71}_{-2.99}$	2760^{+127}_{-67}	3197^{+2081}_{-5566}	$0.830^{+7.938}_{-0.584}$
Alt.	-10 ± 2	$4.05^{+3.81}_{-2.70}$	2766^{+122}_{-66}	2623^{+1802}_{-5393}	$0.422^{+3.298}_{-0.313}$

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 $A_{obs} \gg 1.0$

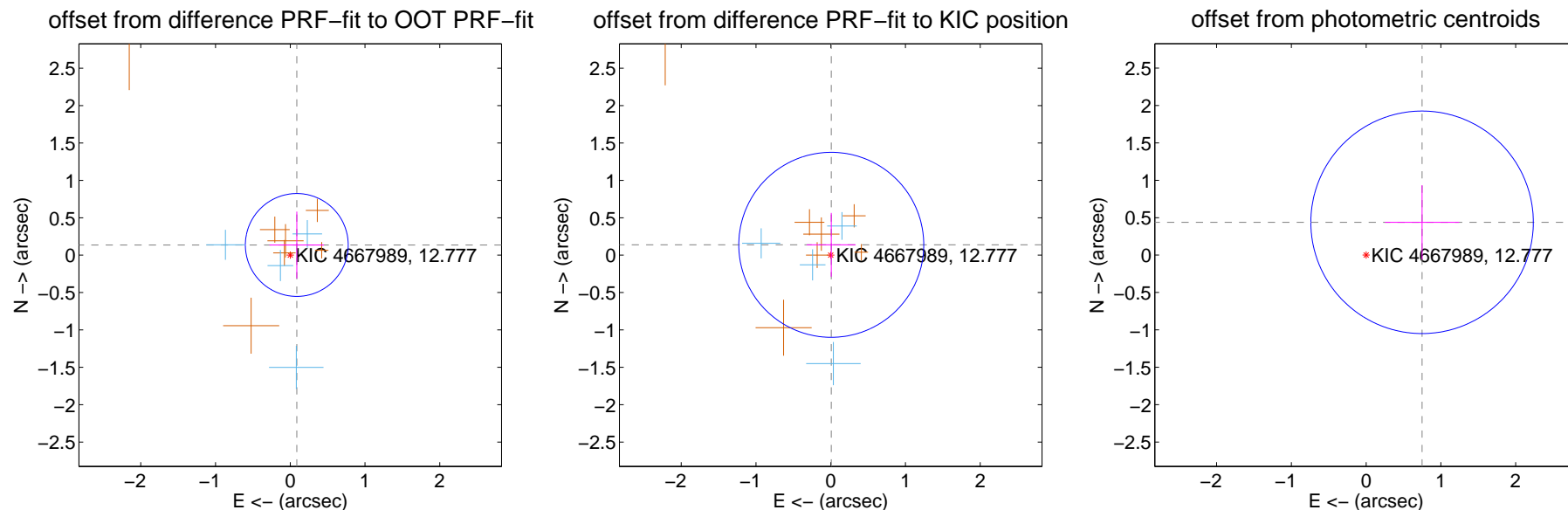
DV Centroid Data

Supplemental centroid analysis for 004667989-02. Kepler magnitude: 12.78. Transit SNR 12.06

There are 4 quarters with good PRF difference image offsets

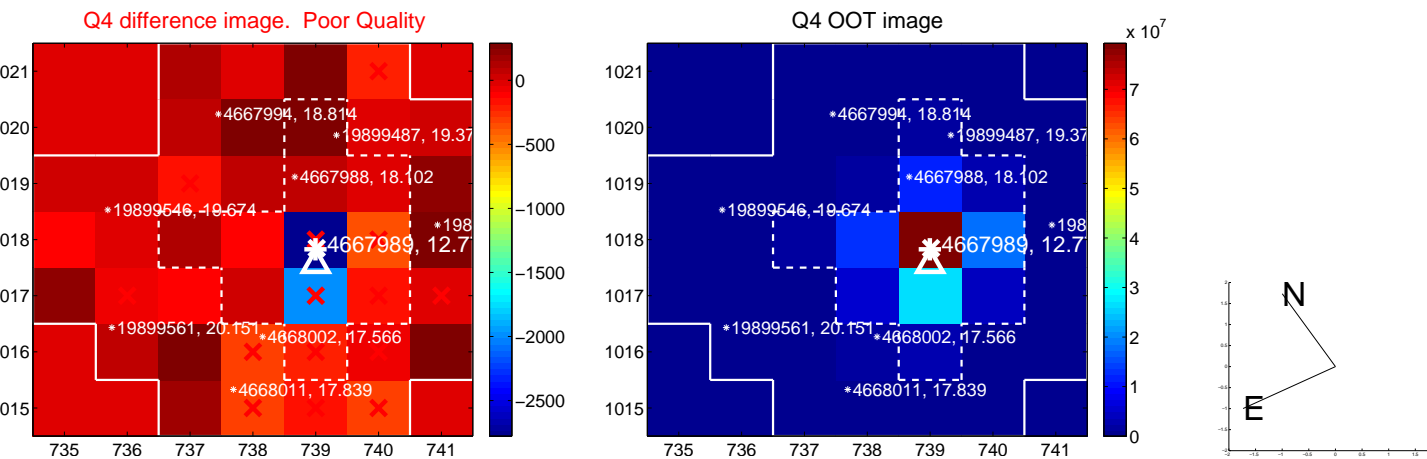
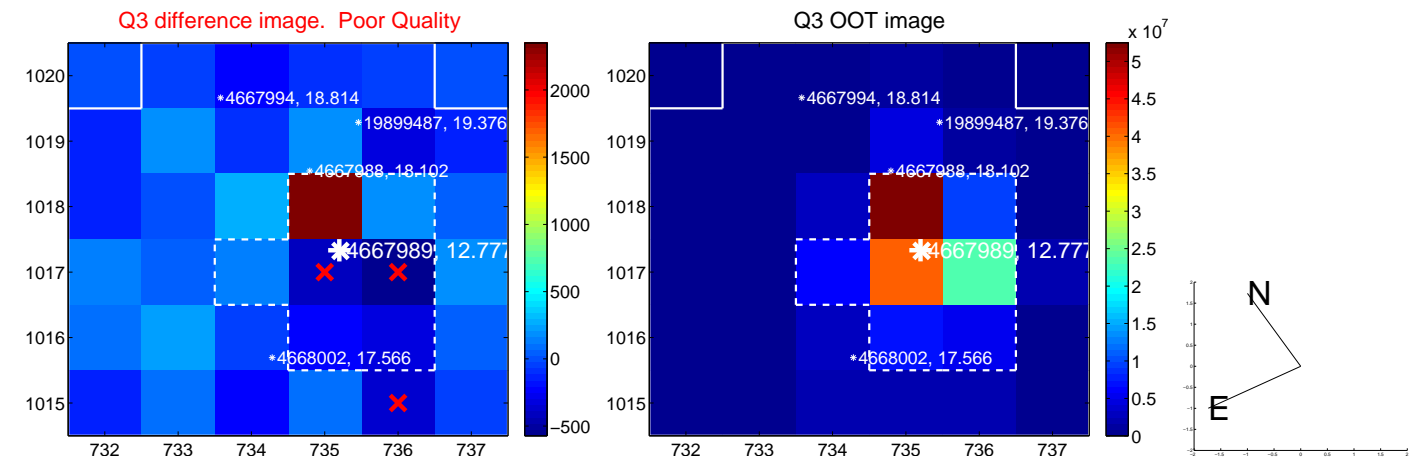
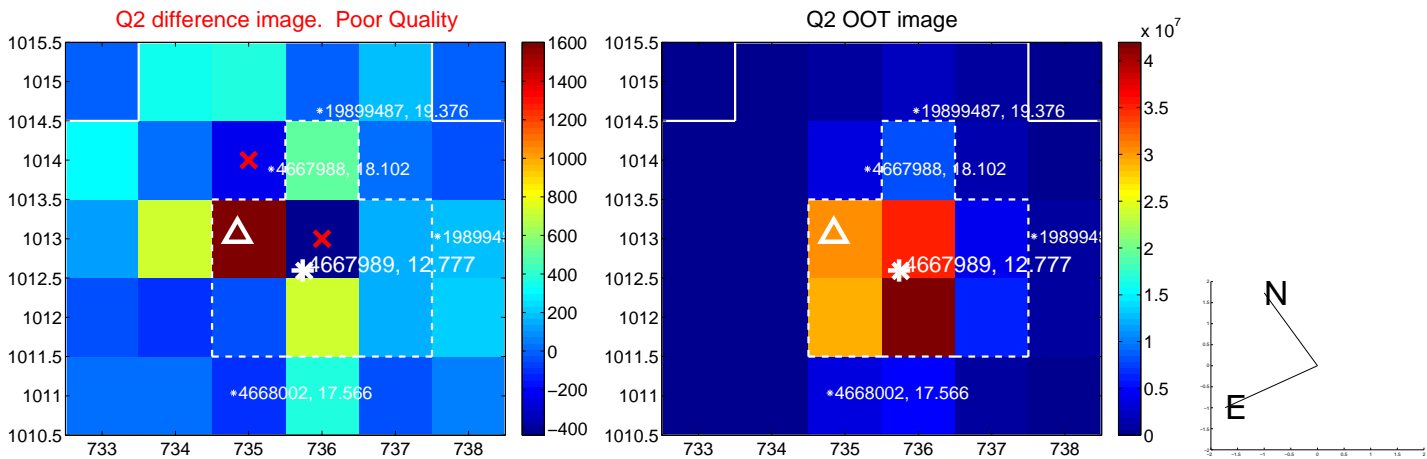
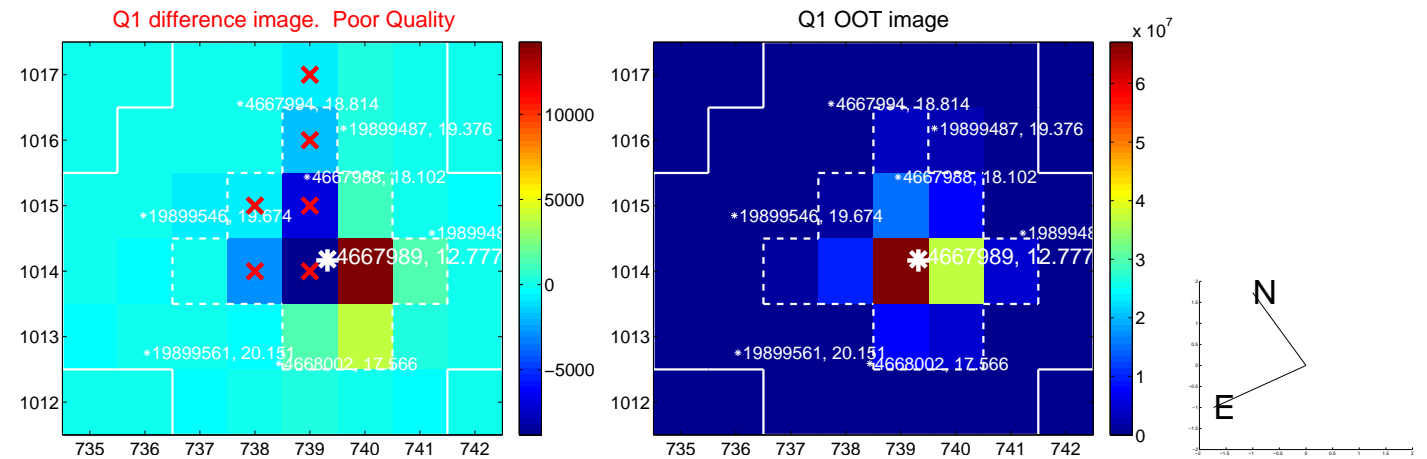
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.162 ± 0.229	0.71	-0.087 ± 0.365	0.136 ± 0.447
PRF-fit source offset from KIC position	0.138 ± 0.412	0.34	-0.007 ± 0.327	0.138 ± 0.426
photometric centroid source offset	0.87 ± 0.50	1.75	-0.75 ± 0.50	0.44 ± 0.50

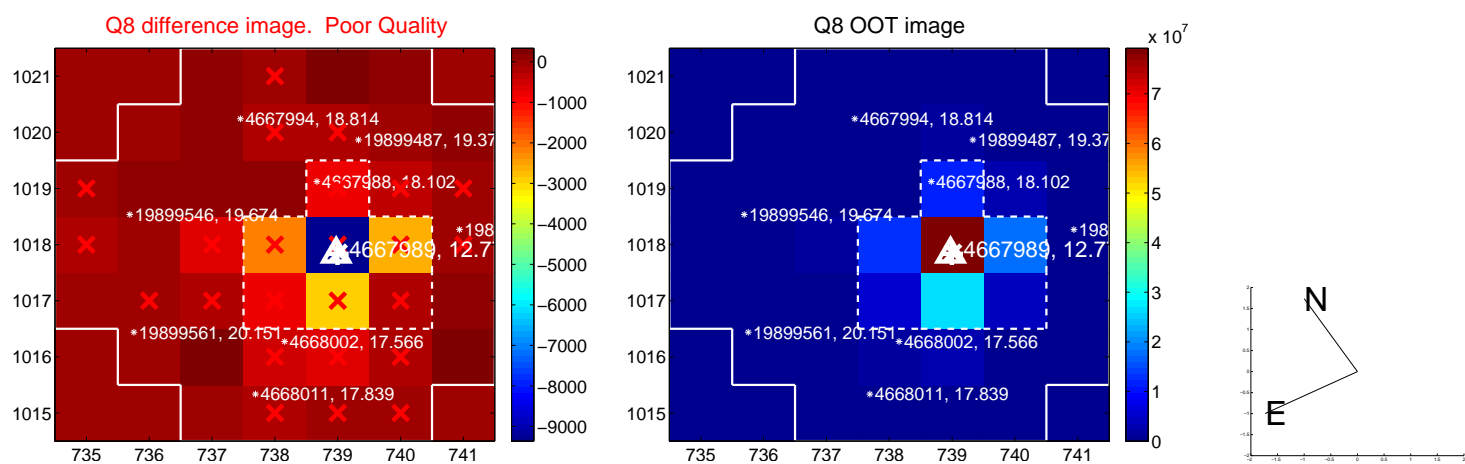
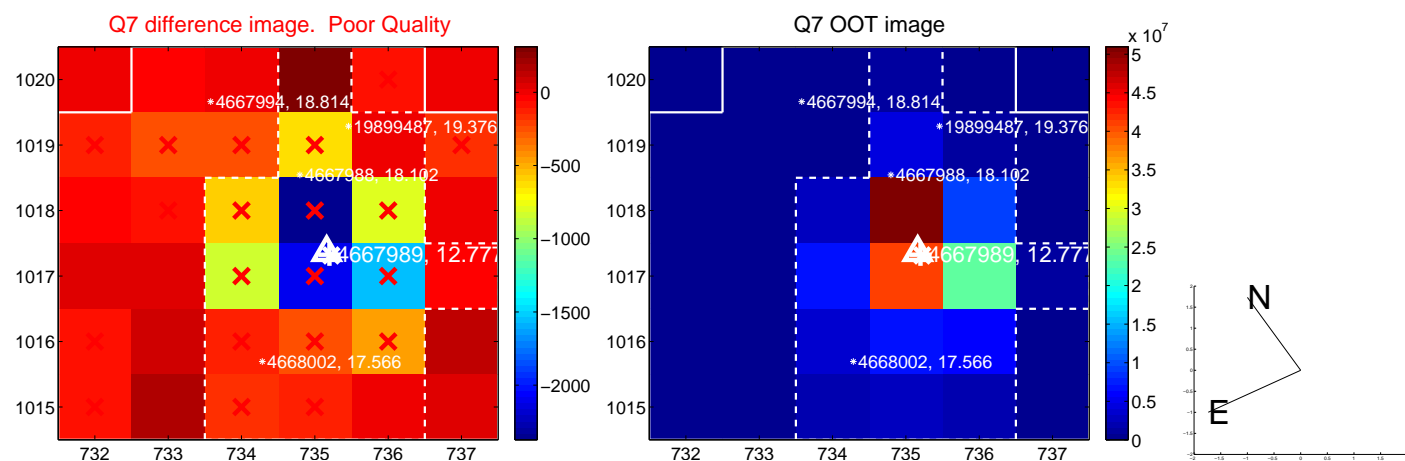
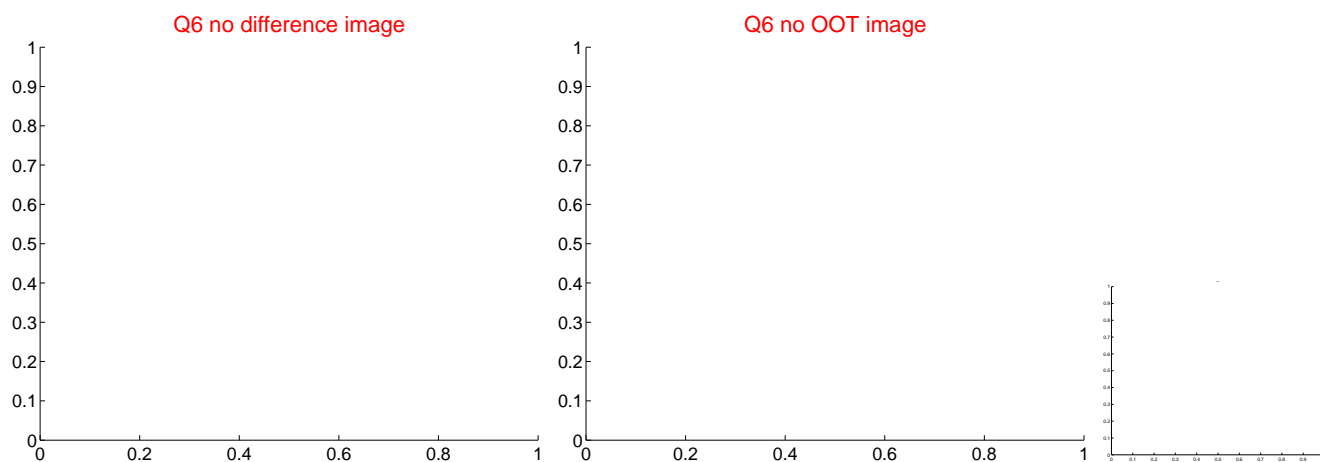
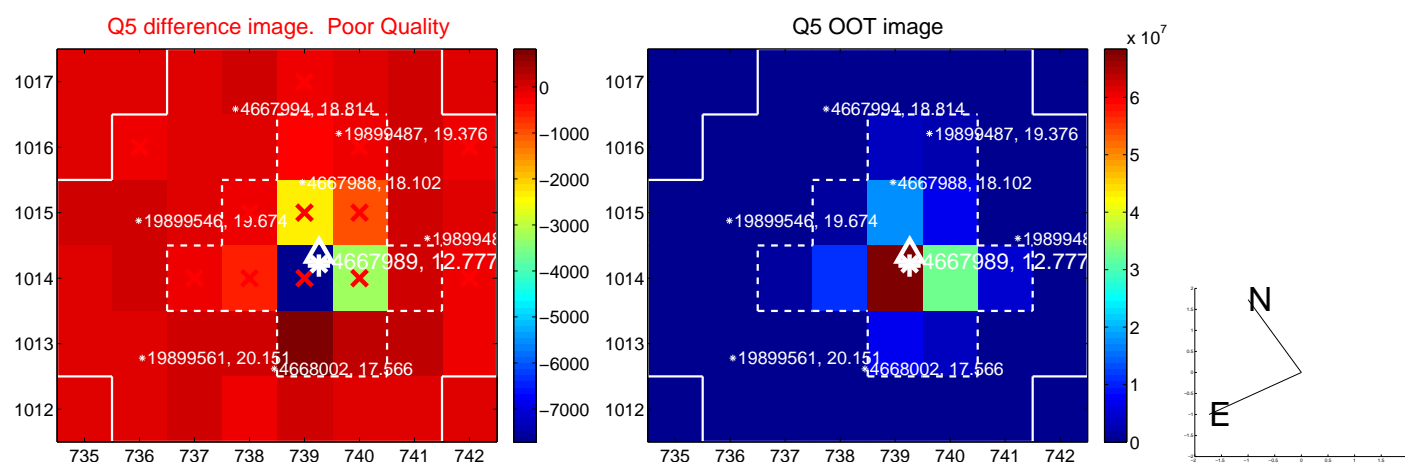


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

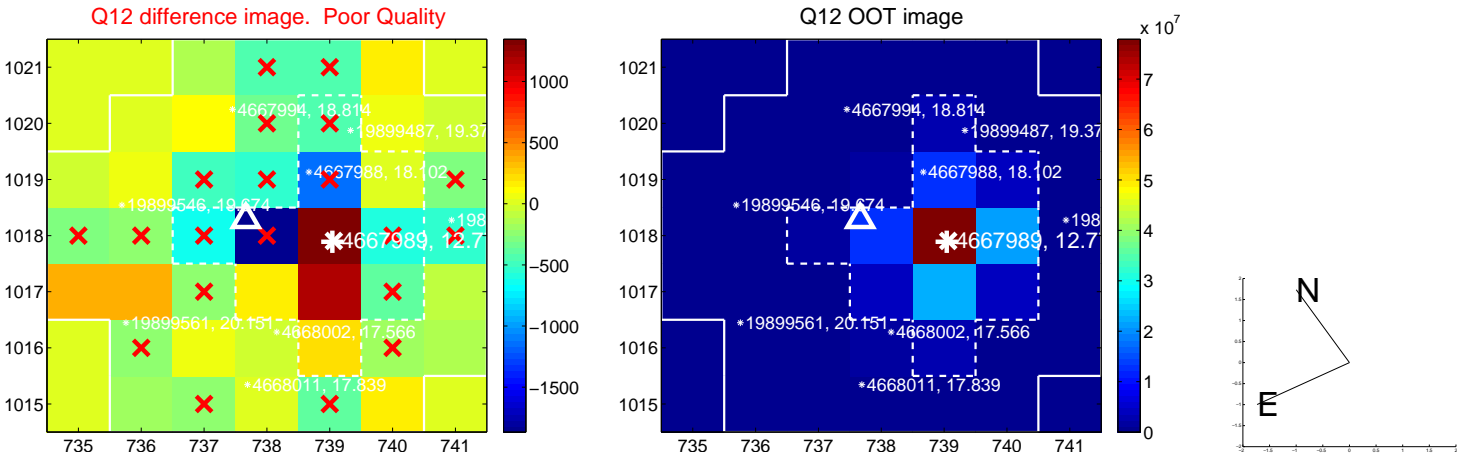
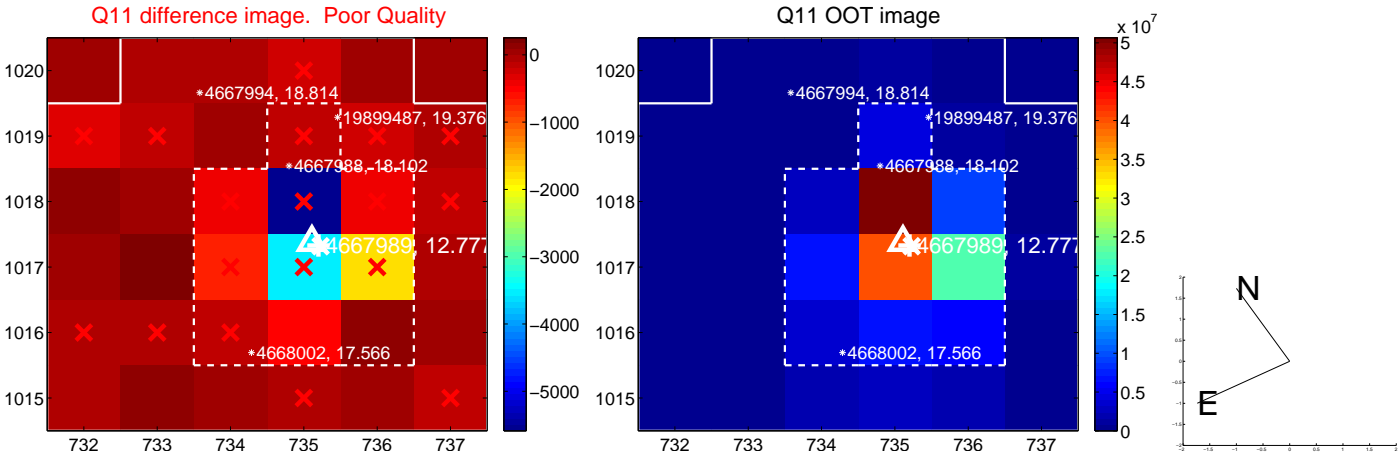
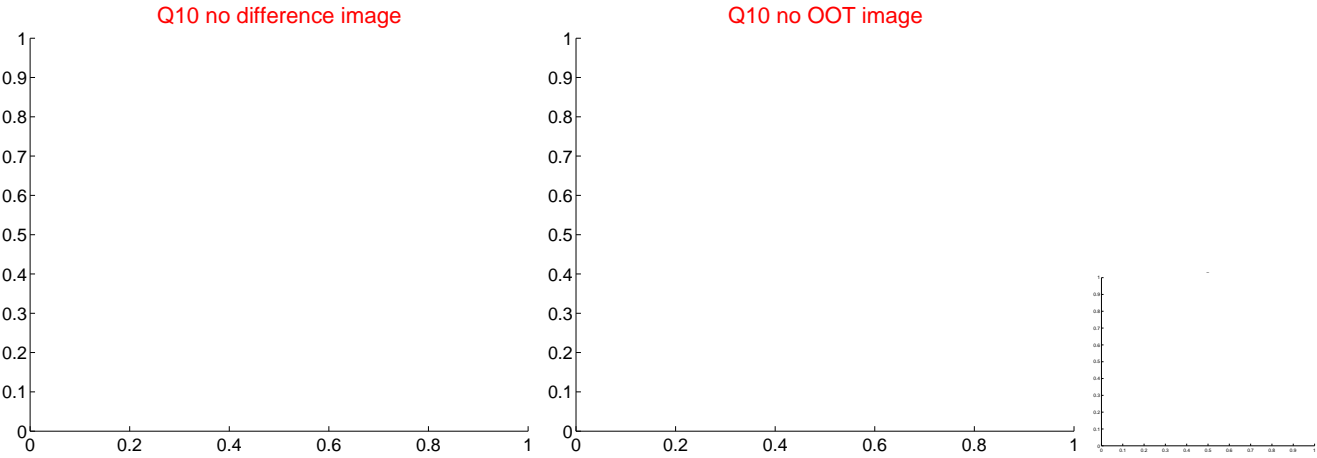
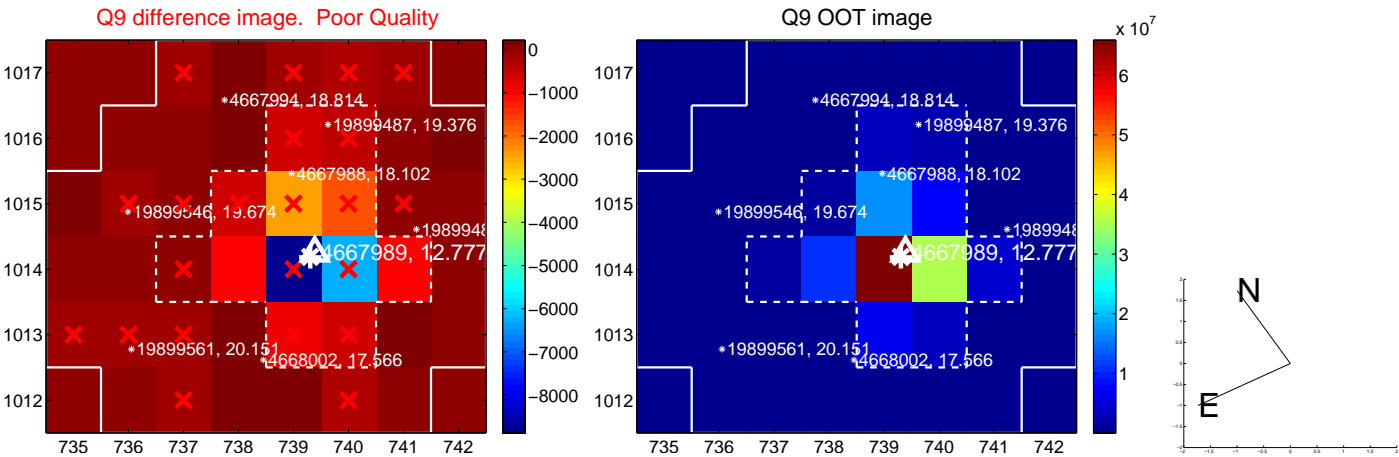
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



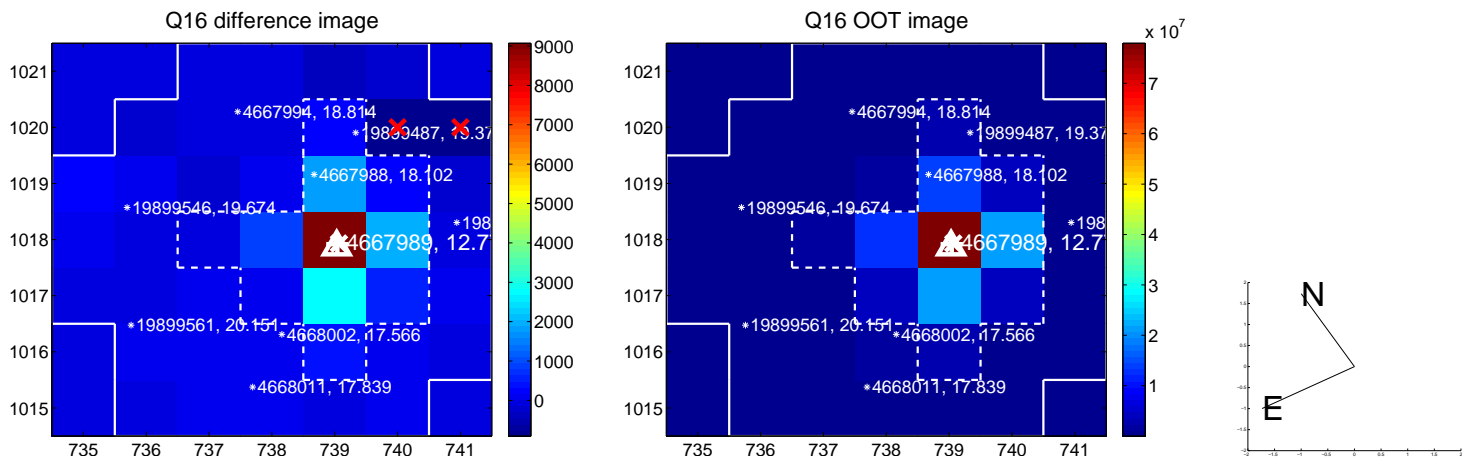
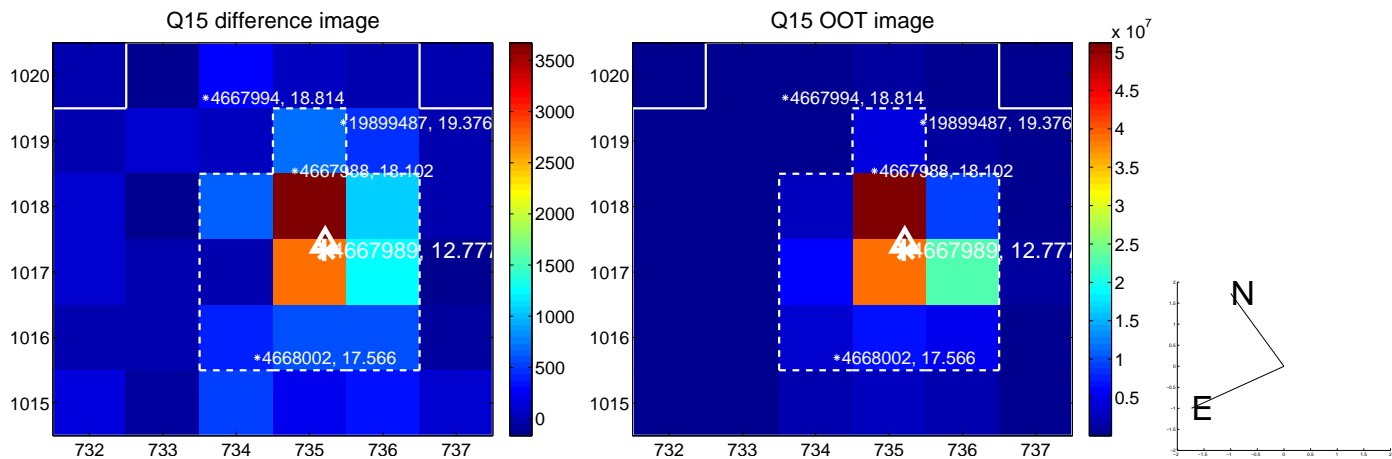
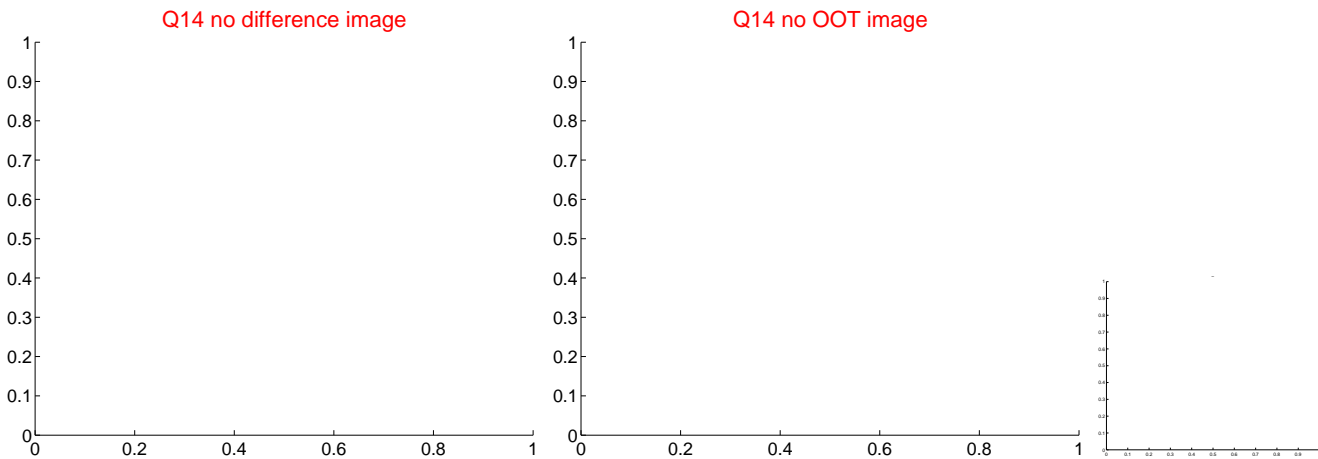
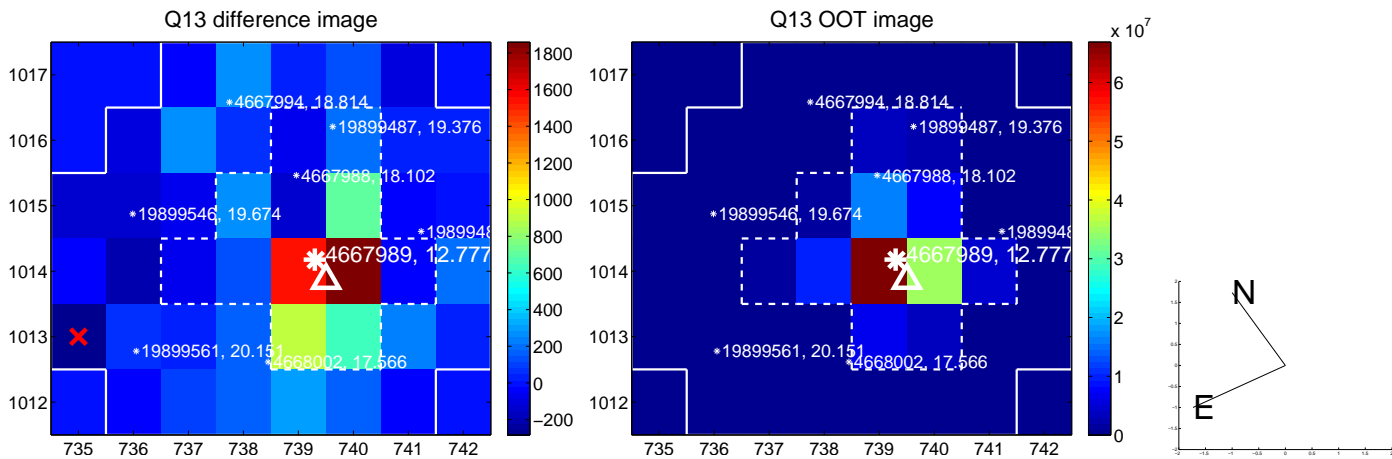
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



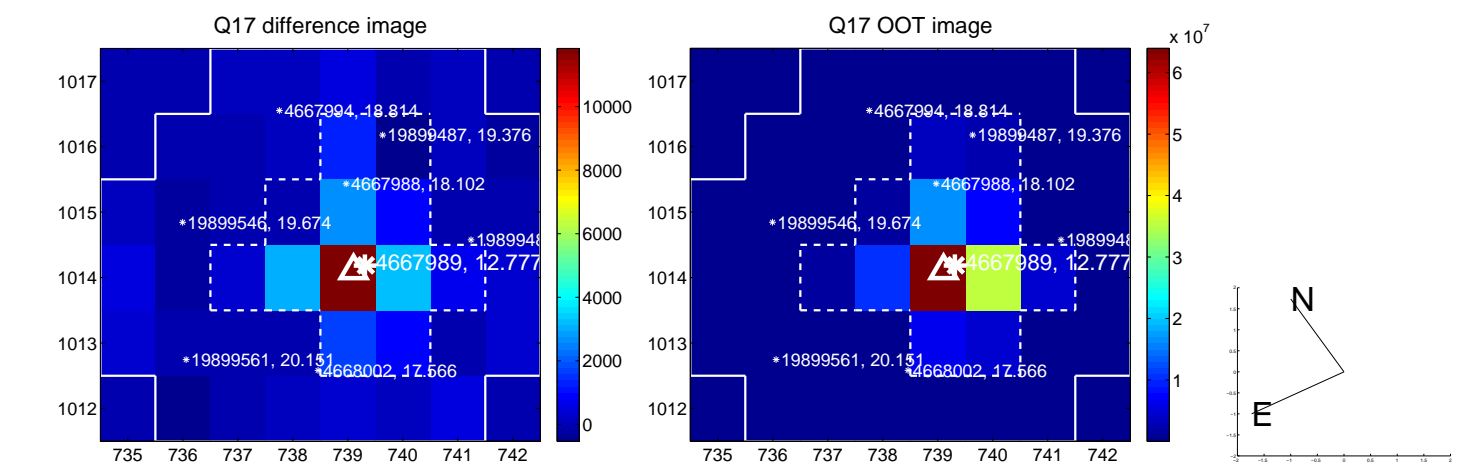
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



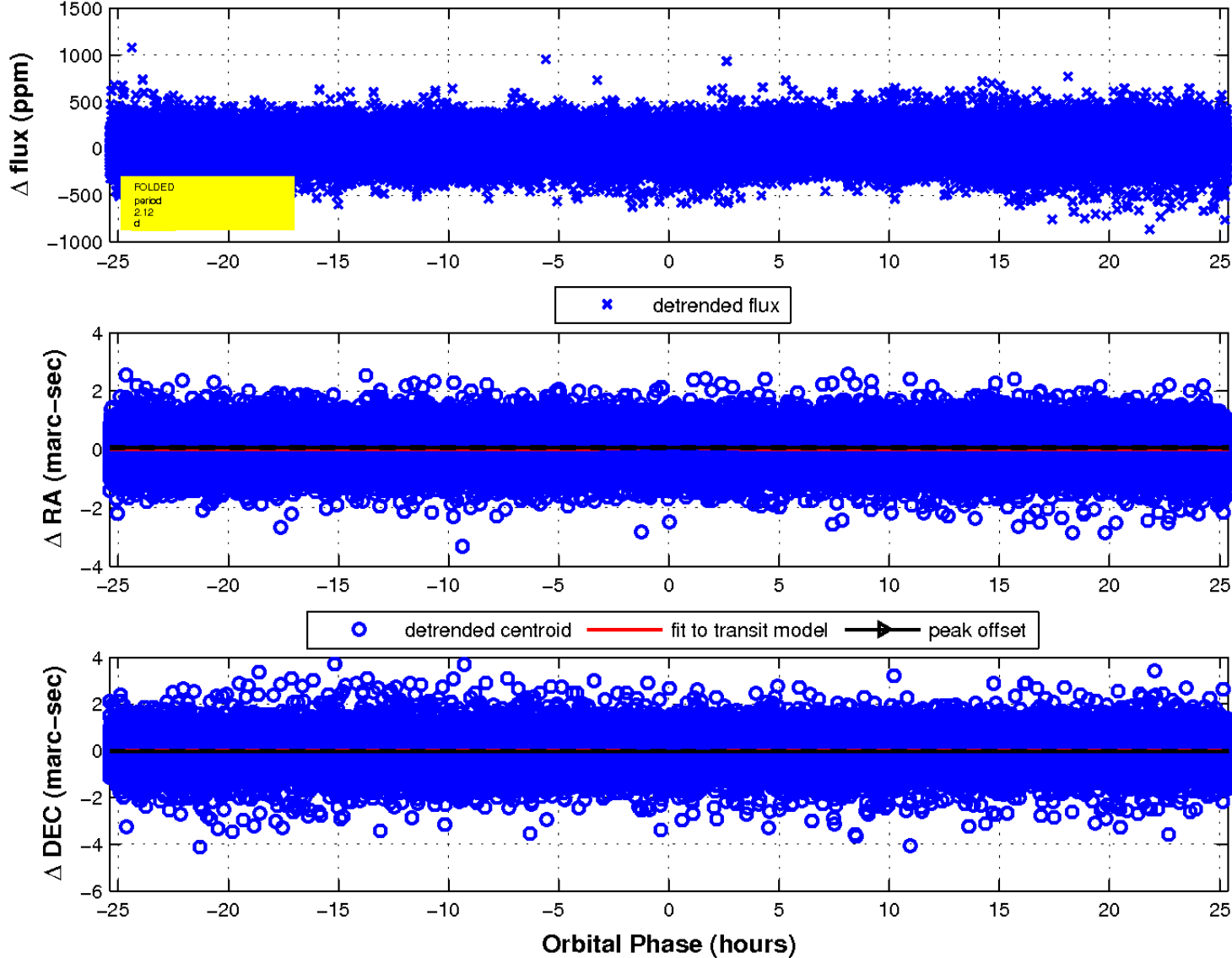
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

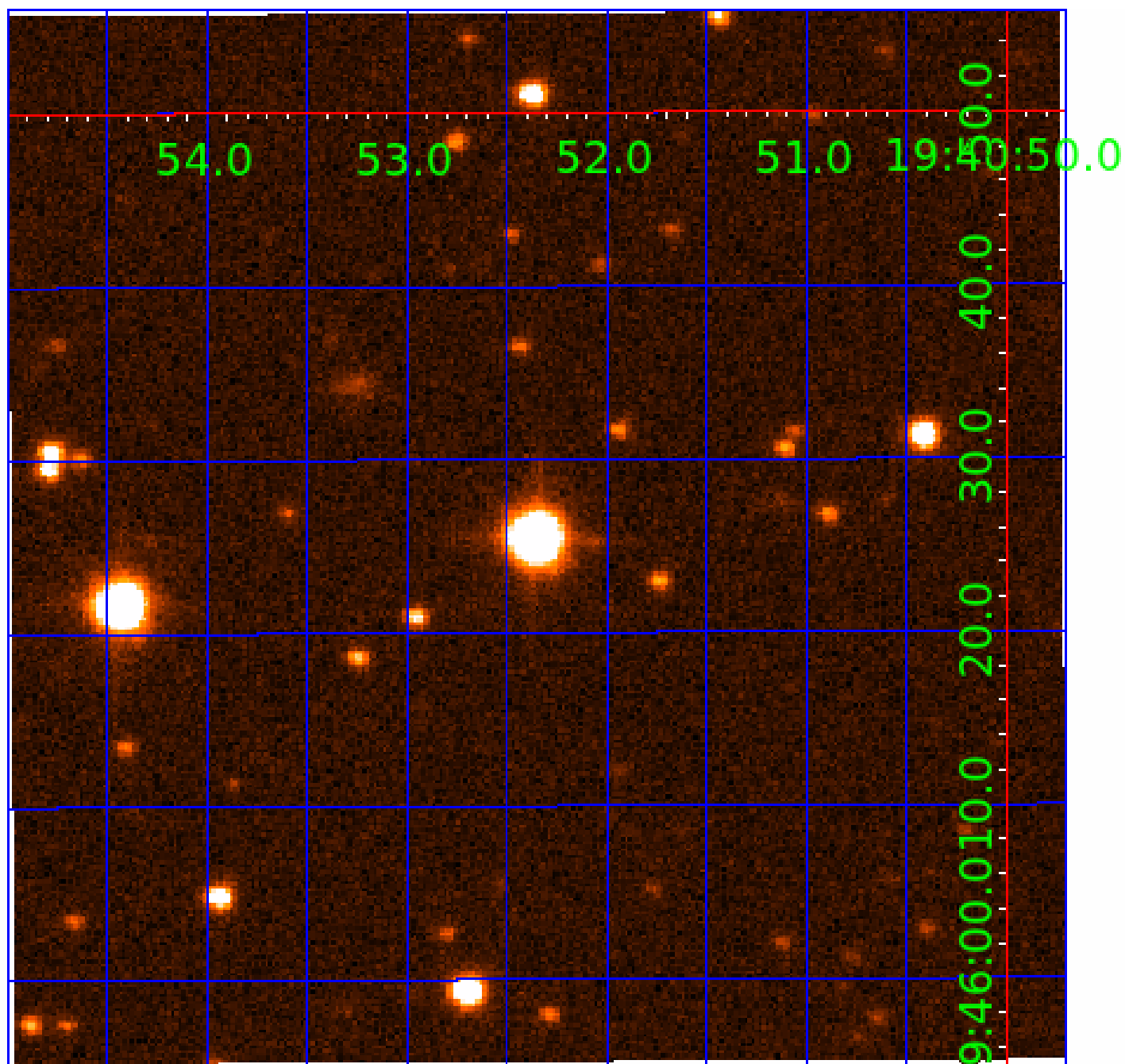


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination



KIC 004667989

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})
004667989-01	OBS	No	2.117175	132.993031	28.4	7.941	10.1	9.7	1.54	6851	0.91	3538.93
004667989-02	OBS	No	2.115686	133.148028	59.8	8.693	9.8	12.1	1.54	6851	2.35	3542.25
004667989-03	OBS	No	100.271815	162.509921	184.5	9.967	11.9	6.1	1.54	6851	2.31	20.65
004667989-04	OBS	No	263.750252	146.541889	345.6	8.226	17.6	9.8	1.54	6851	3.32	5.69
004667989-05	OBS	No	2.116854	132.469332	40.0	25.402	9.9	9.3	1.54	6851	0.98	3539.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004667989-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004667989-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV
004667989-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

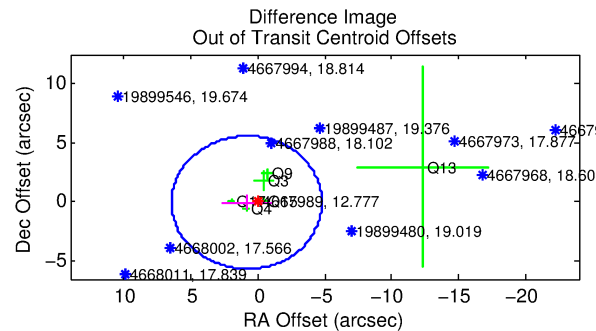
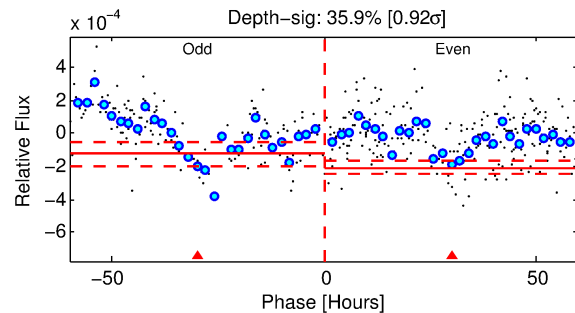
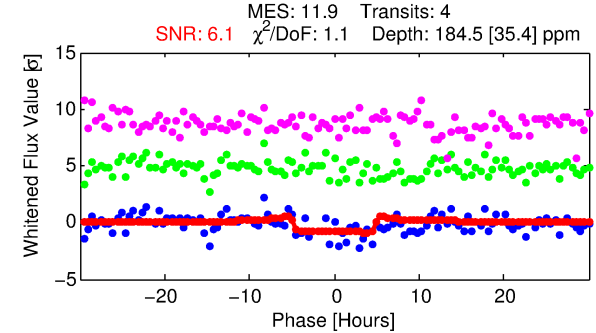
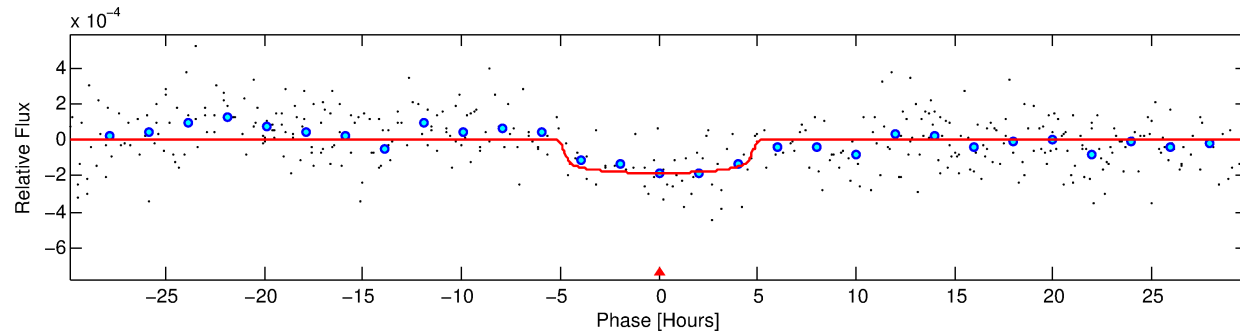
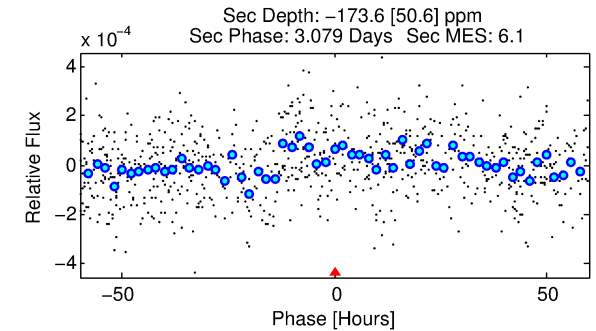
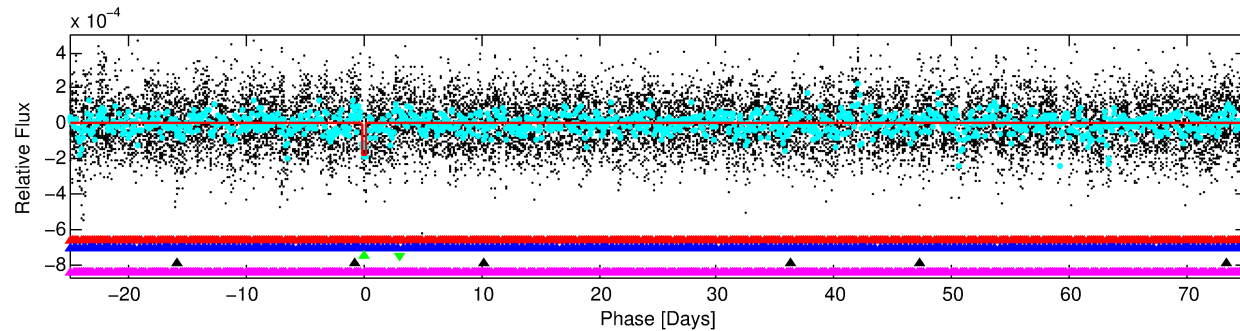
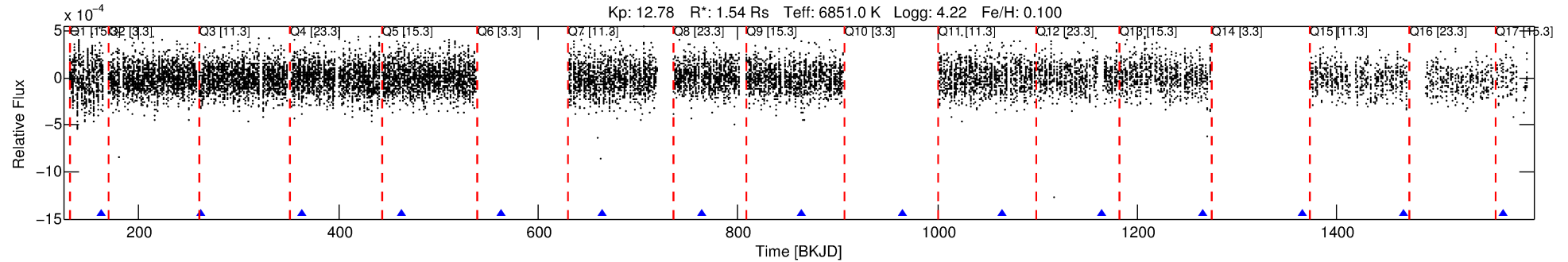
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004667989-03

No Significant Match Found

DV One-Page Summary

KIC: 4667989 Candidate: 3 of 5 Period: 100.272 d



DV Fit Results:

Period = 100.27182 [0.00305] d
Epoch = 162.5099 [0.0182] BKJD
Rp/R* = 0.0138 [0.0065]
a/R* = 47.44 [124.70]
b = 0.80 [1.16]
Seff = 20.65 [4.71]
Teq = 544 [31] K
Rp = 2.31 [1.17] Re
a = 0.4755 [0.0739] AU
Ag = N/A
Teffp = N/A

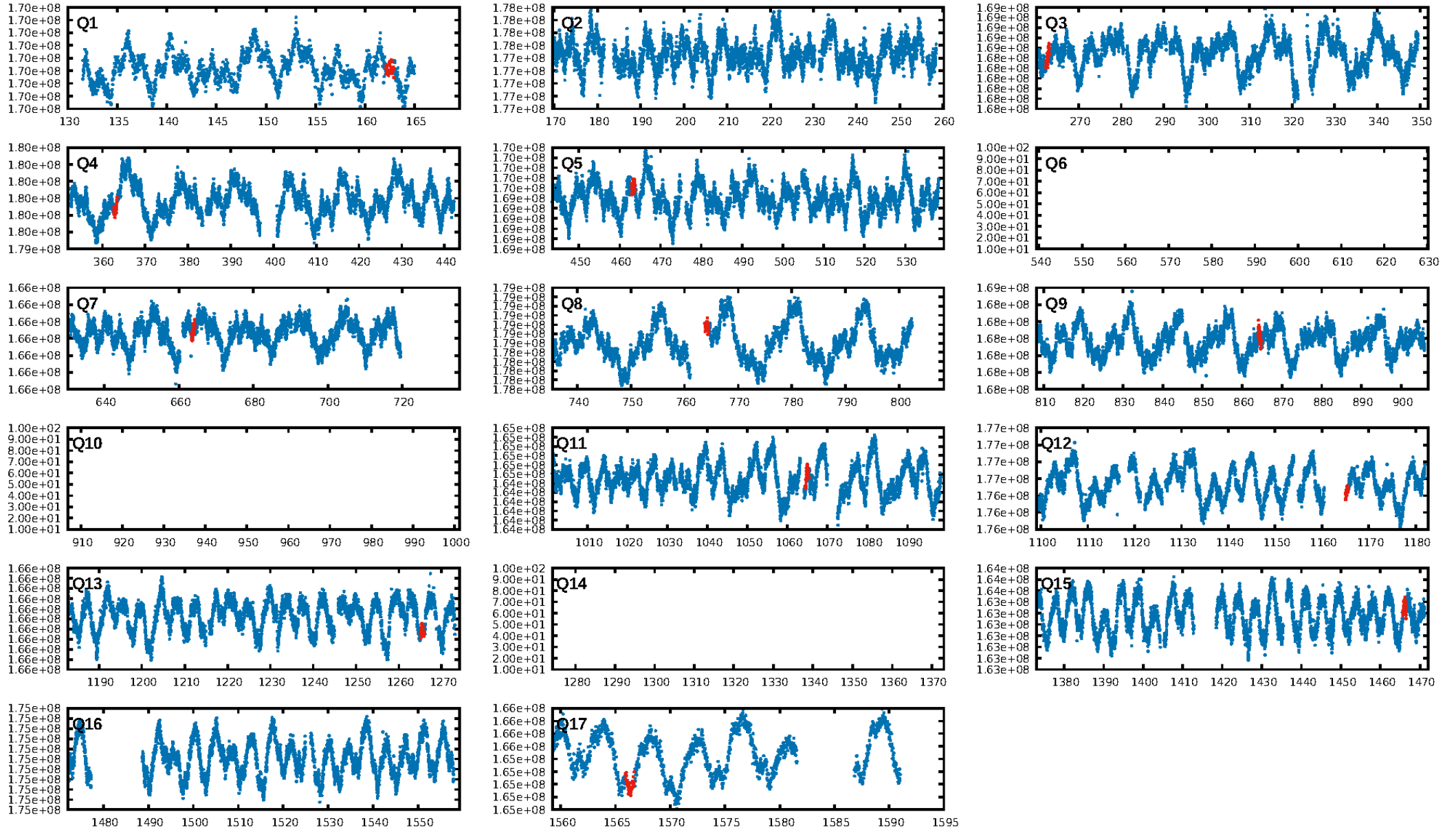
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [184.85σ]
LongPeriod-sig: 100.0% [303.61σ]
ModelChiSquare2-sig: 65.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.341
Centroid-sig: 18.7%
Centroid-so: 0.689 arcsec [0.98σ]
OotOffset-rm: 0.812 arcsec [0.43σ]
KicOffset-rm: 0.869 arcsec [0.44σ]
OotOffset-st: 0/2/1/3 [6]
KicOffset-st: 0/2/1/3 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.00 [0/9]

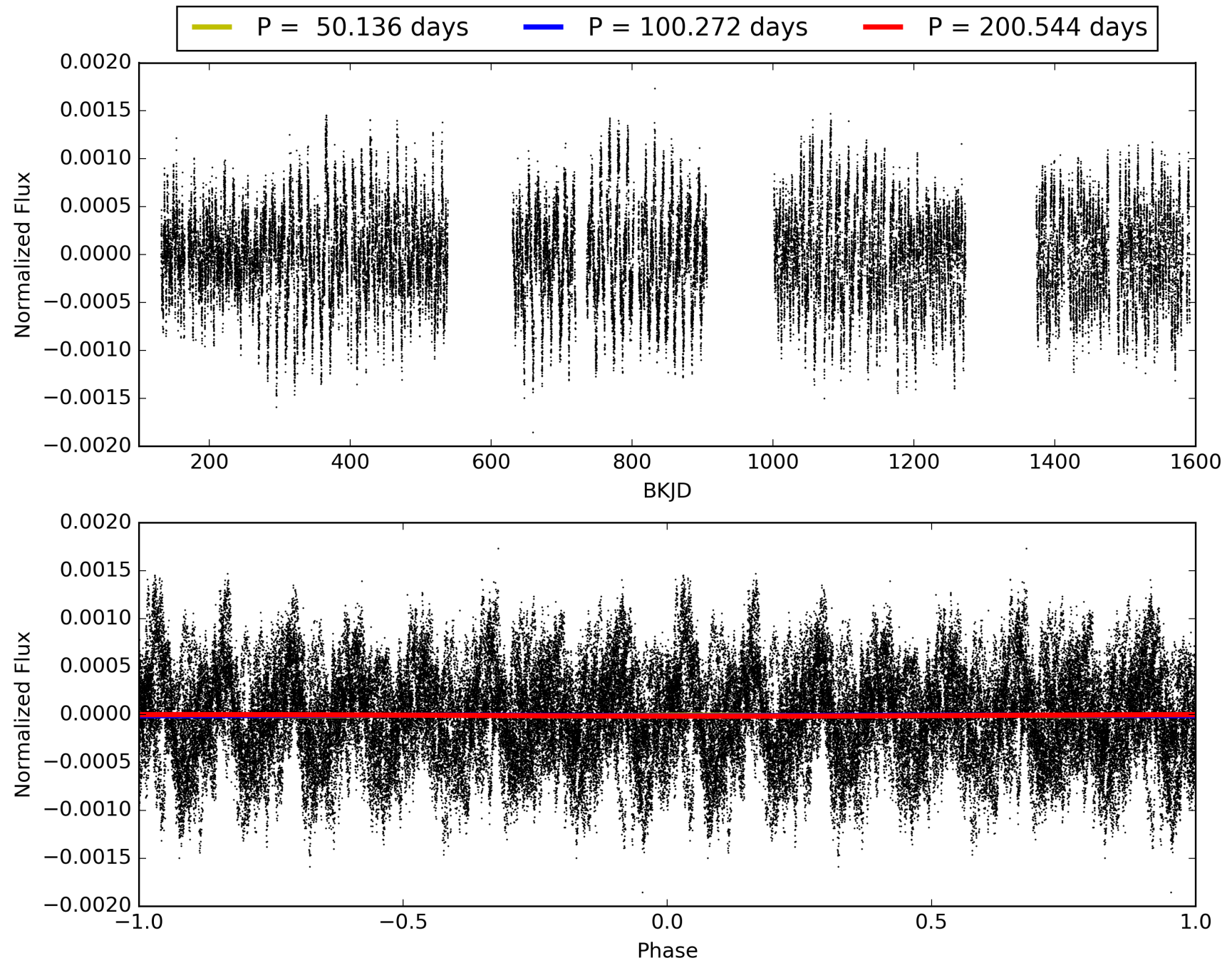
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:39:10 Z

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

TCE 004667989-03, PDC Light Curves

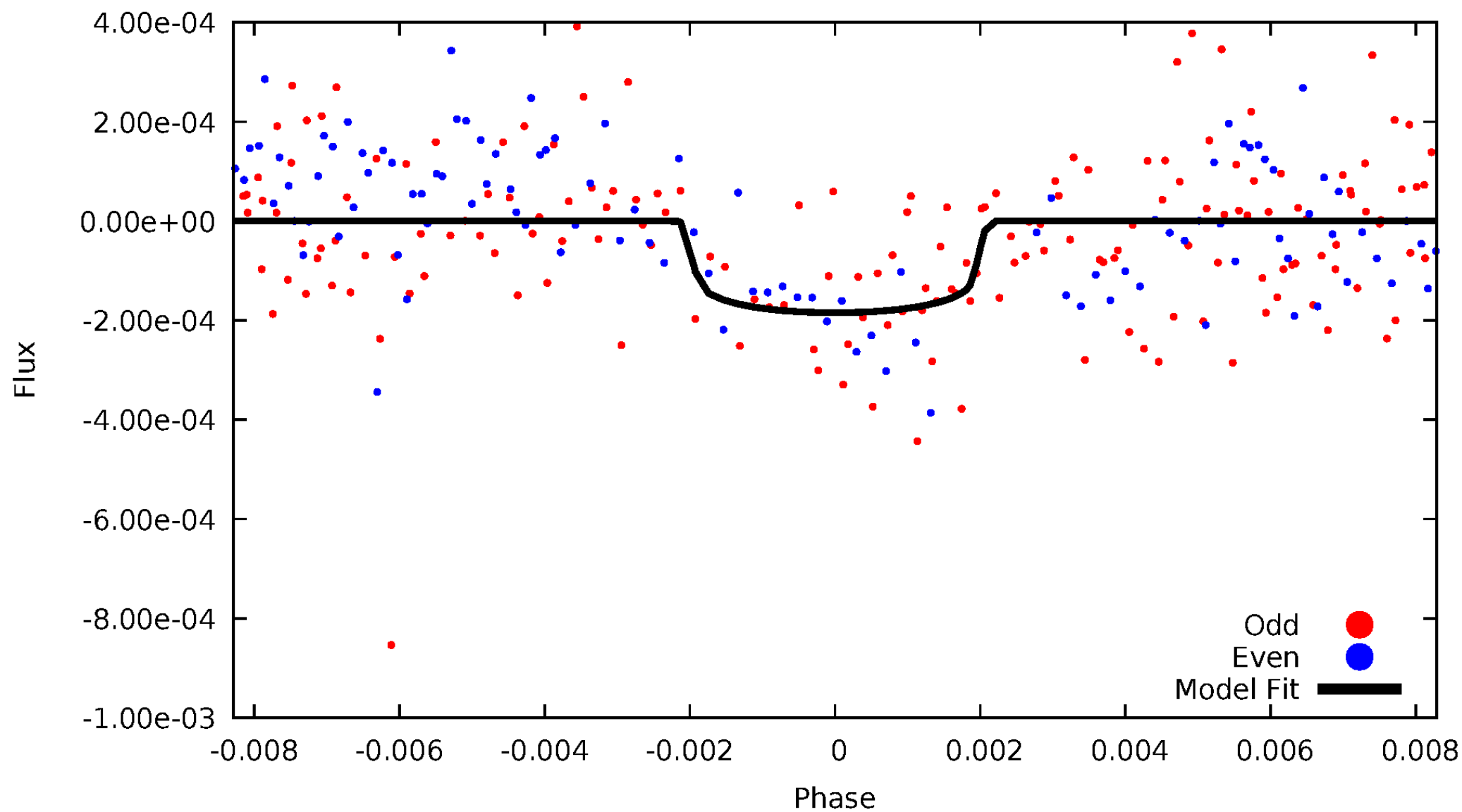


TCE 004667989-03



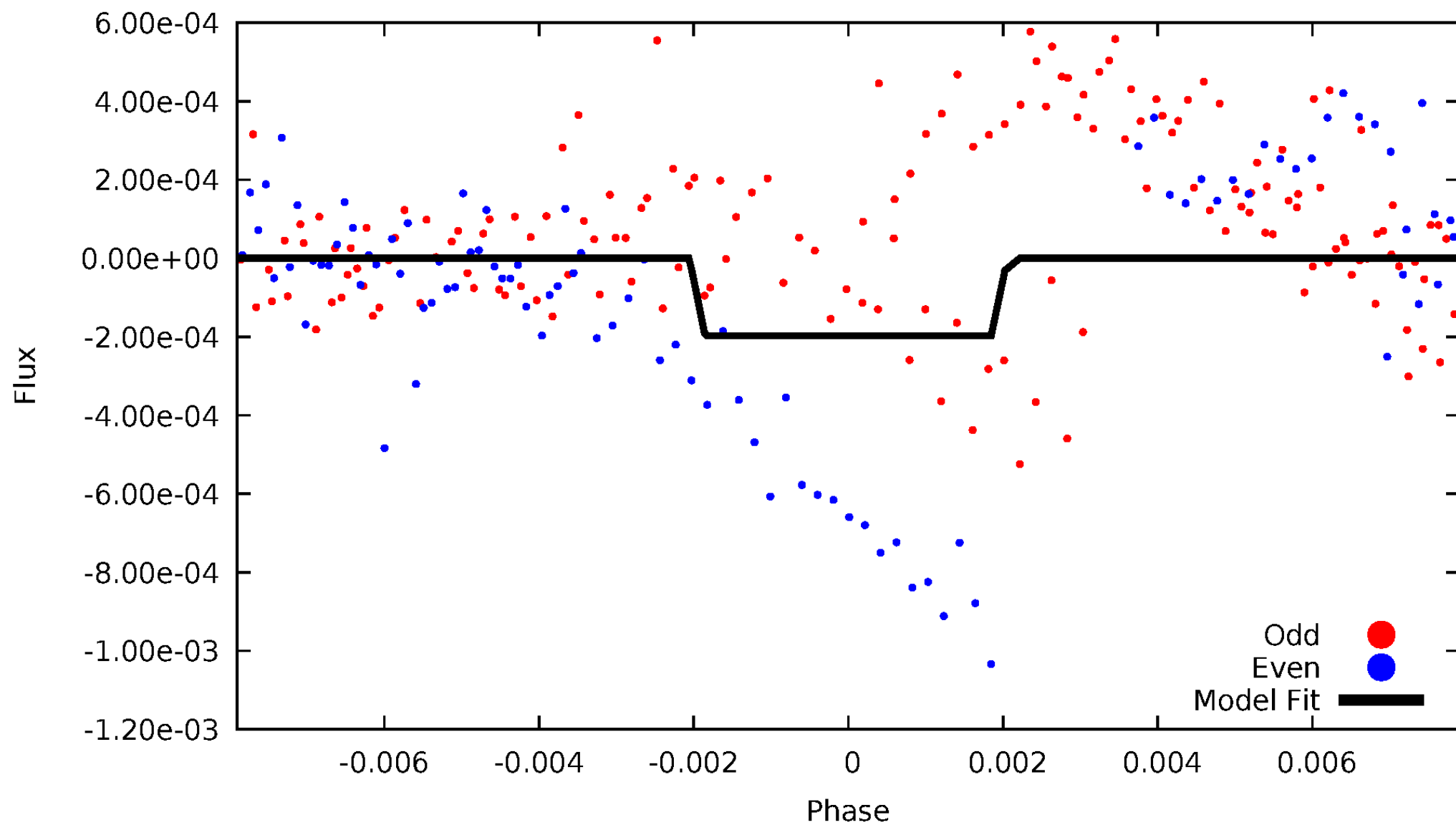
DV Odd/Even

TCE 004667989-03

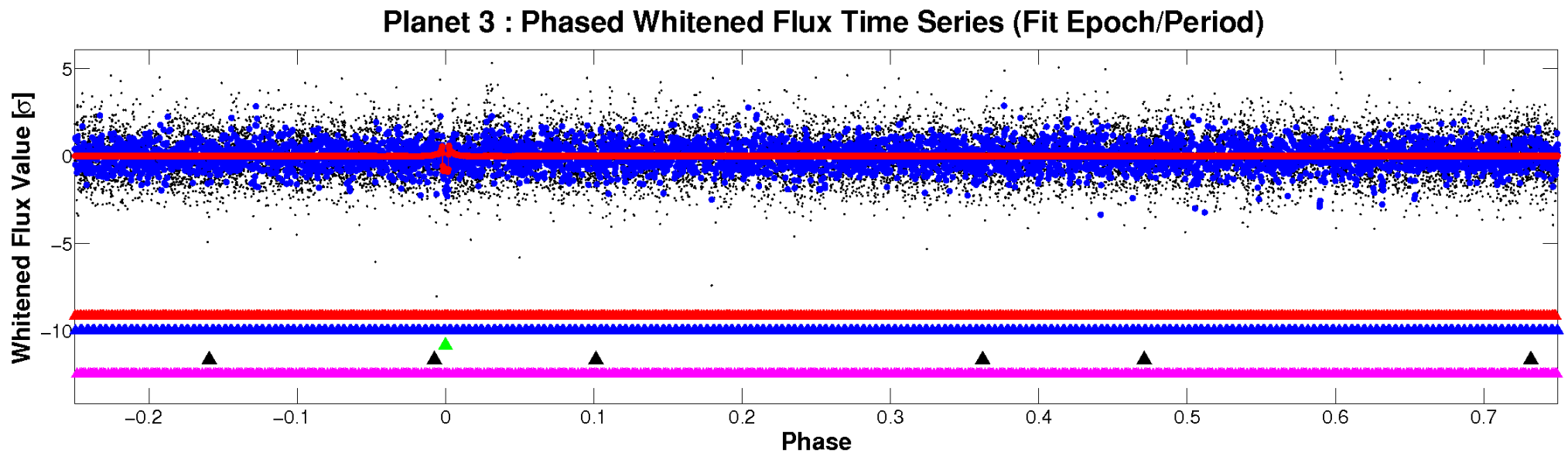
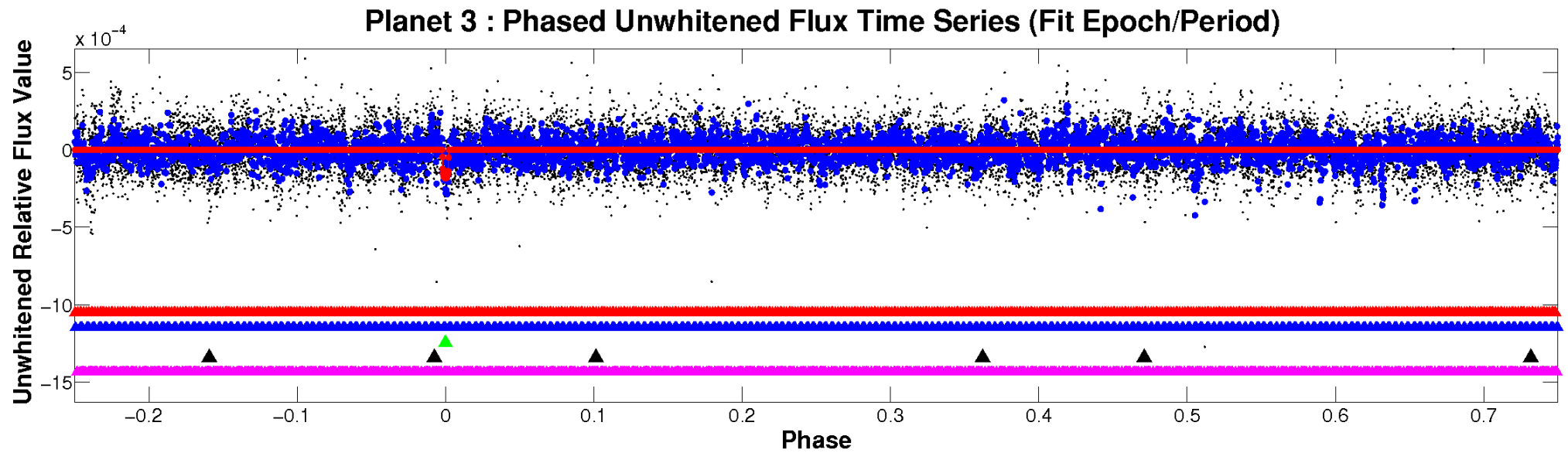


ALT Odd/Even

TCE 004667989-03

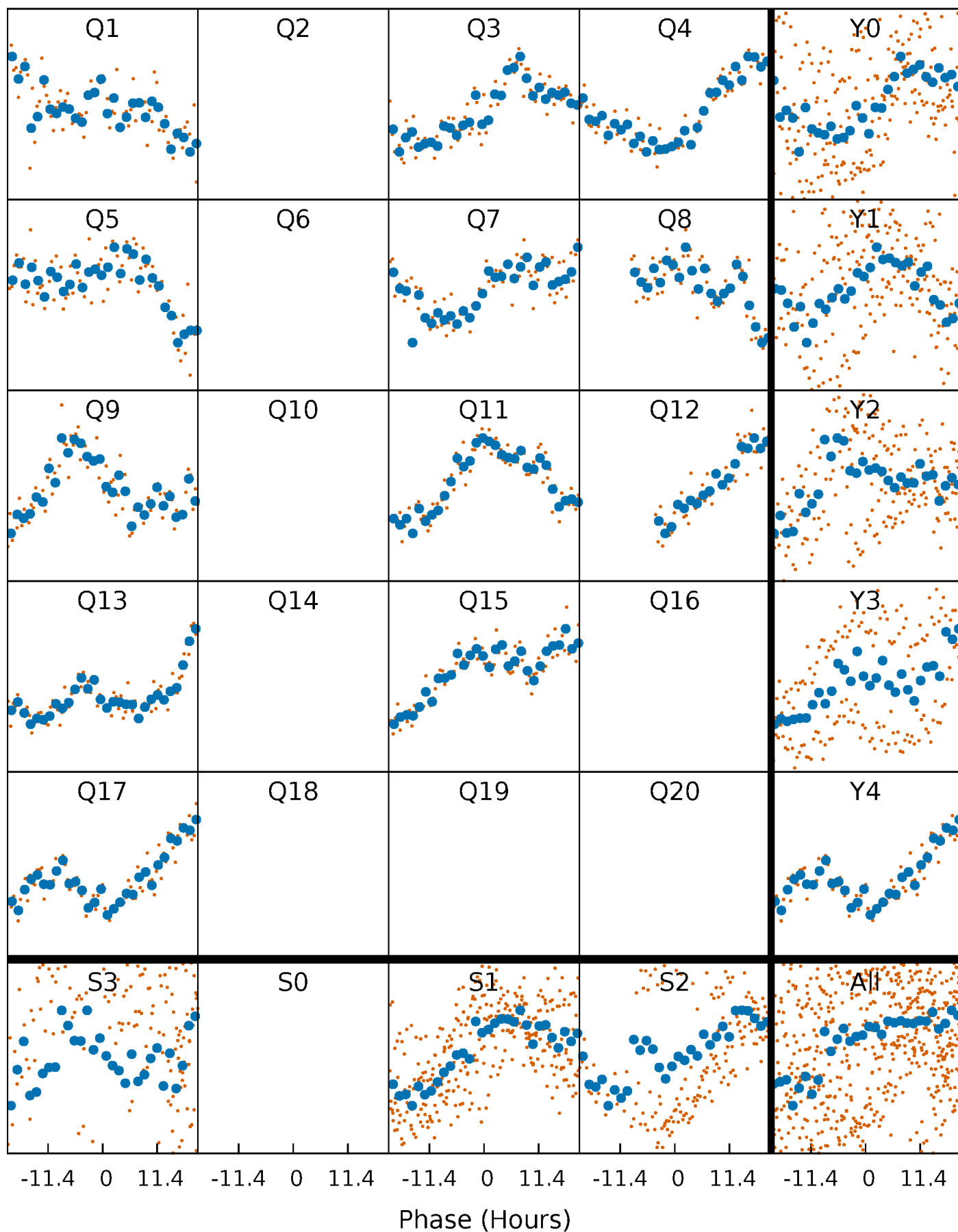


Non-Whitened Vs. Whitened Light Curve



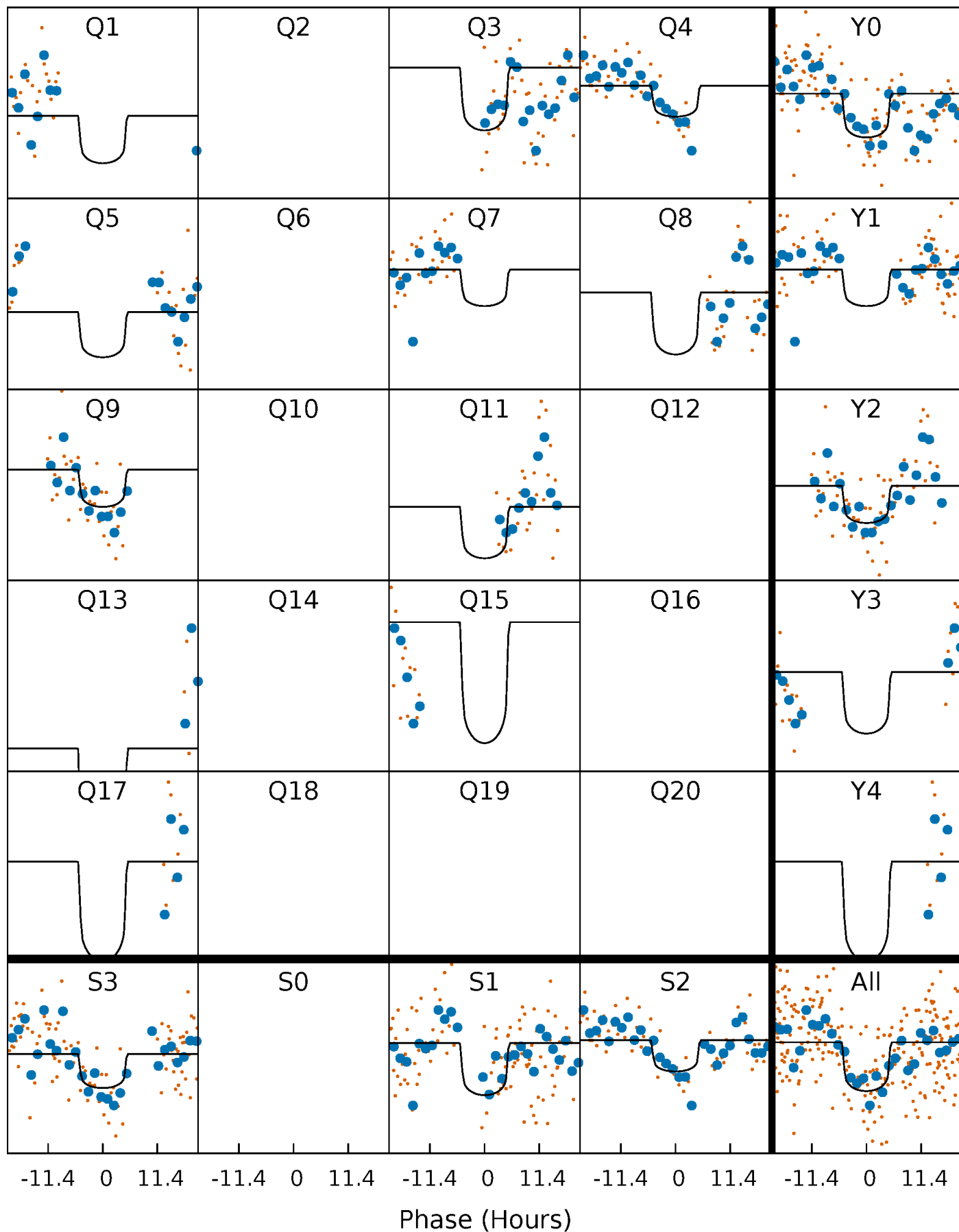
PDC Quarter-Phased Transit Curves

TCE 004667989-03 $P=100.271816$ Days $T_0=162.509921$ (BKJD)



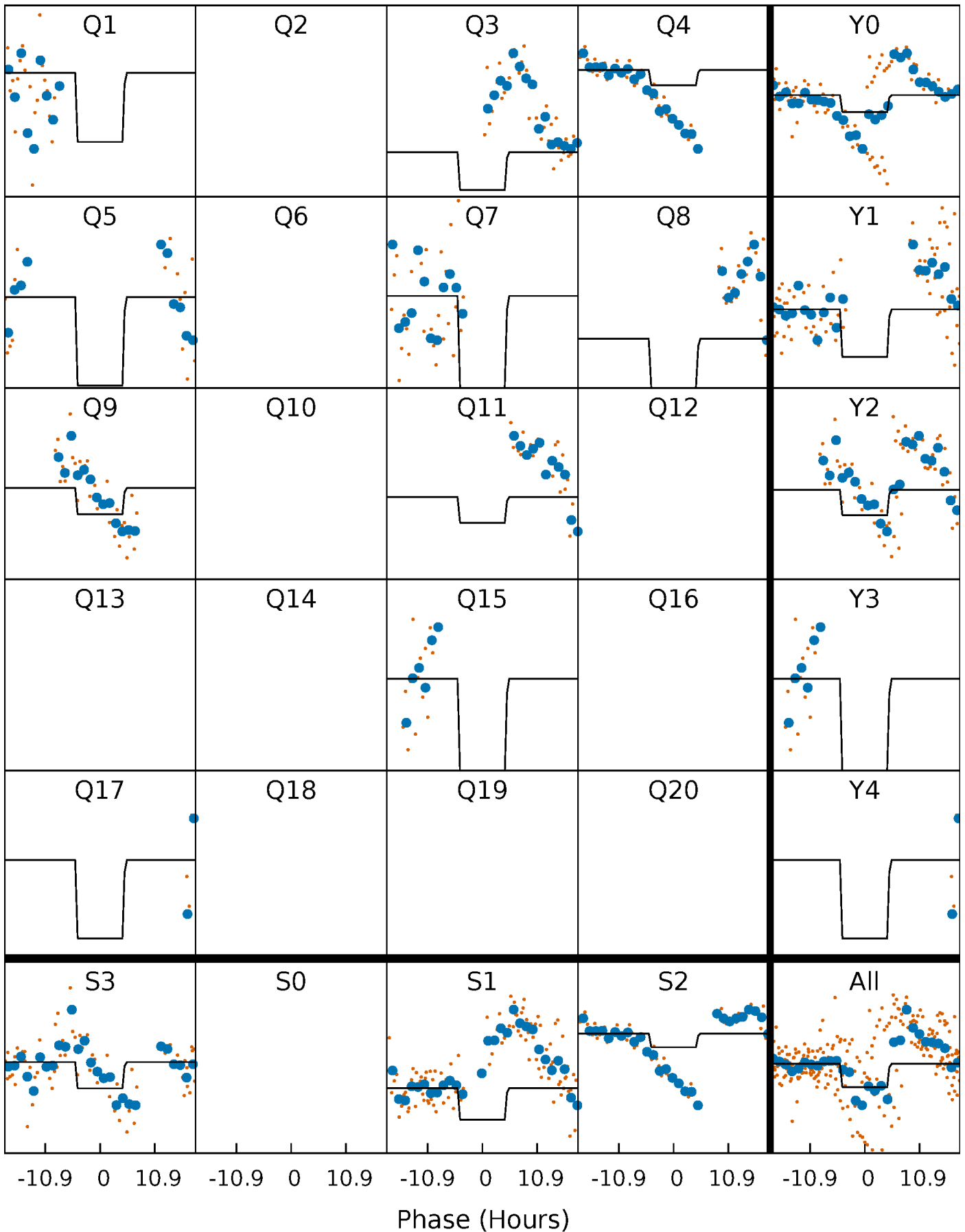
DV Quarter-Phased Transit Curves

TCE 004667989-03 P=100.271816 Days $T_0=162.509921$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

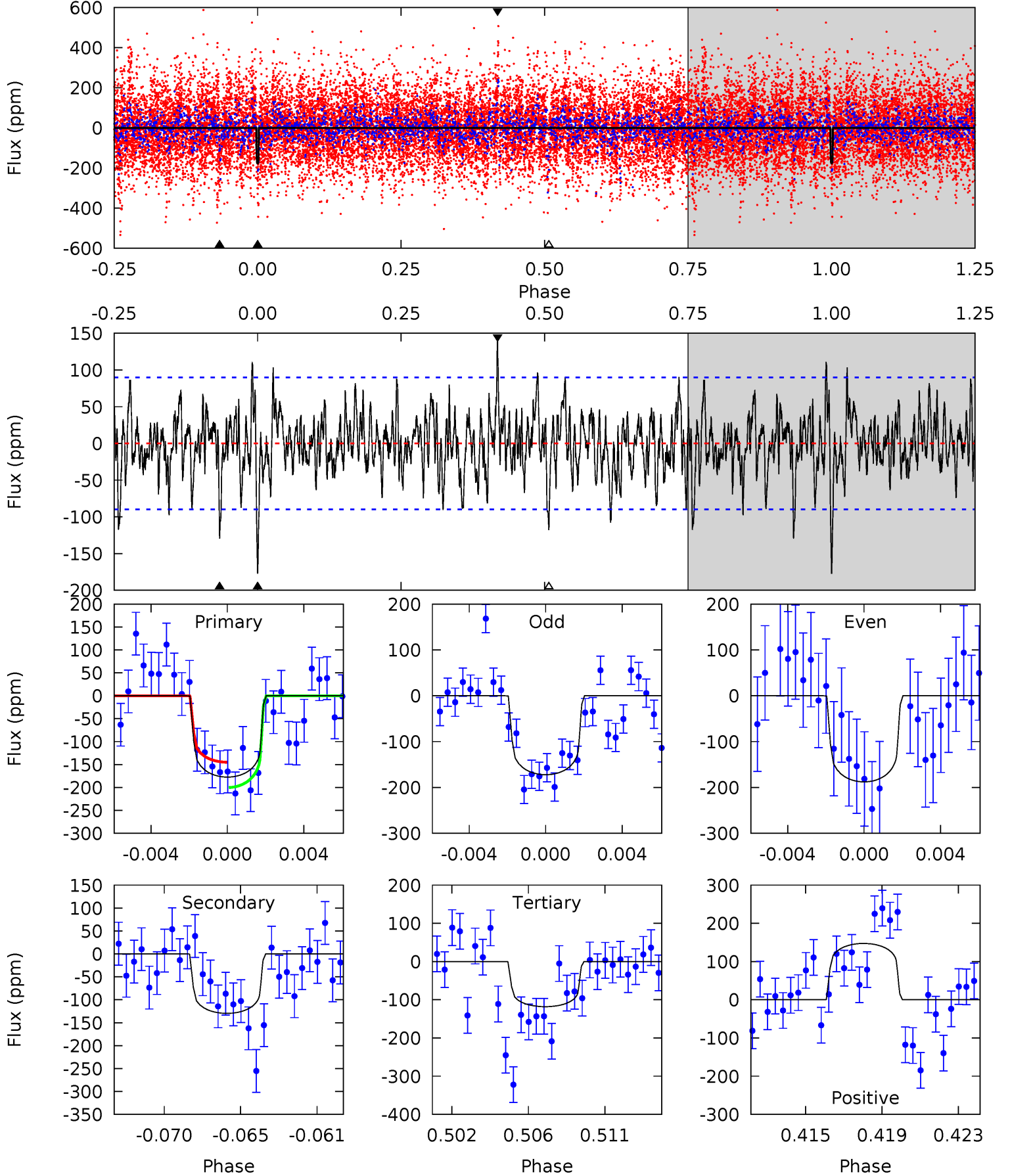
TCE 004667989-03 P=100.260668 Days $T_0=162.479281$ (BKJD)



DV Model-Shift Uniqueness Test

004667989-03, $P = 100.271816$ Days, $E = 62.238105$ Days

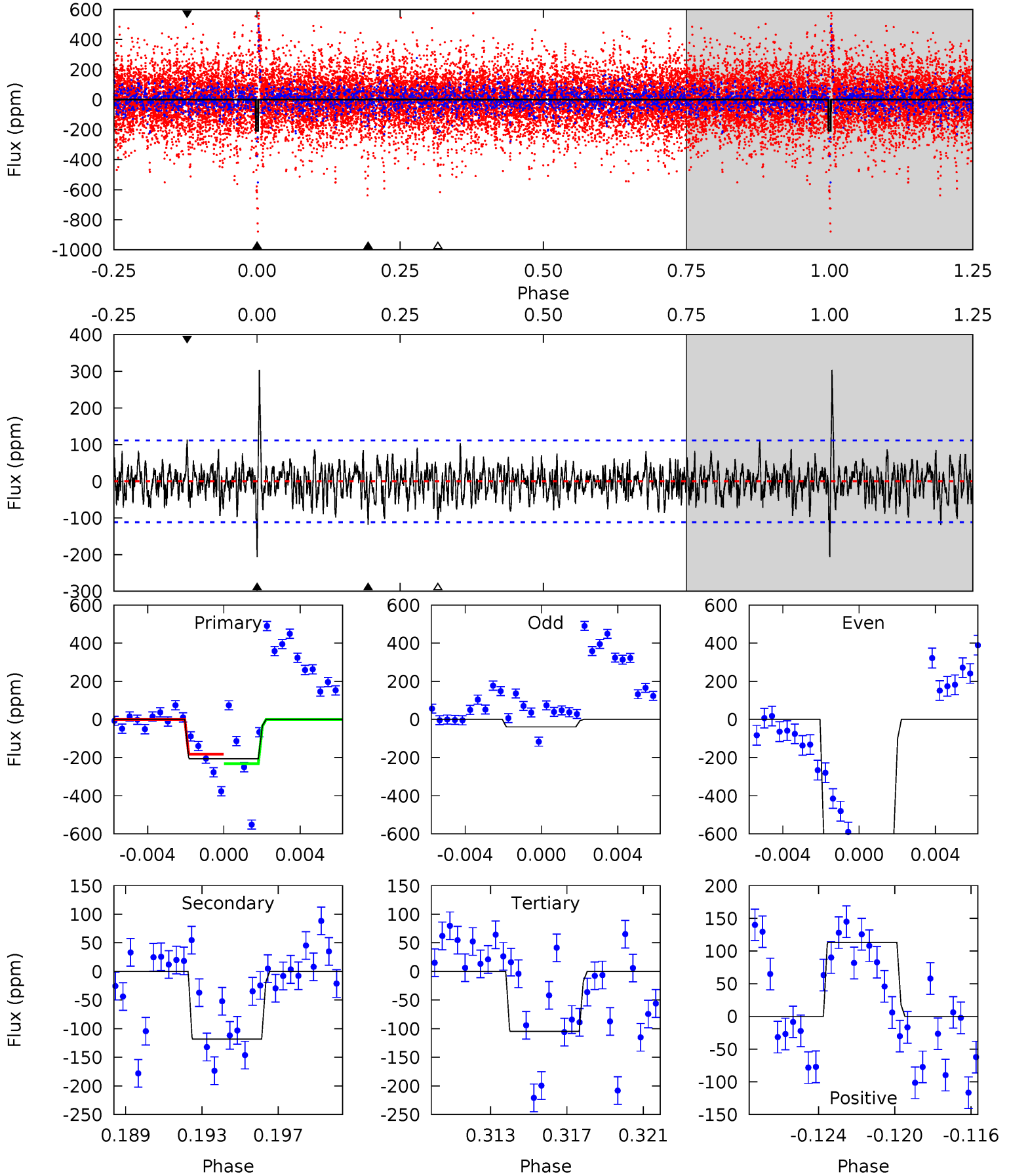
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	7.49	6.82	8.51	5.18	2.85	2.03	3.43	1.74	0.67	-1.02	0.41	0.98	0.45	1.56



Alt Model-Shift Uniqueness Test

004667989-03, P = 100.260668 Days, E = 62.218613 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.61	5.53	4.89	5.28	5.20	2.88	1.61	4.73	4.33	0.64	0.25	14.9	2.50	0.60	1.15



Stellar Parameters For KIC 004667989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	6851^{+72}_{-82}	$4.218^{+0.048}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$1.538^{+0.289}_{-0.103}$	$1.426^{+0.112}_{-0.071}$	$0.552^{+0.115}_{-0.198}$
	+1%/-1%	+1%/-3%	+150%/-150%	+19%/-7%	+8%/-5%	+21%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004667989-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-130 ± 17	$2.38^{+1.15}_{-0.96}$	762^{+33}_{-18}	6169^{+2044}_{-1033}	2870^{+5223}_{-1590}
Alt.	-118 ± 21	$2.41^{+1.13}_{-1.10}$	762^{+32}_{-18}	5970^{+2350}_{-948}	2482^{+6342}_{-1334}

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 $A_{obs} \gg 1.0$

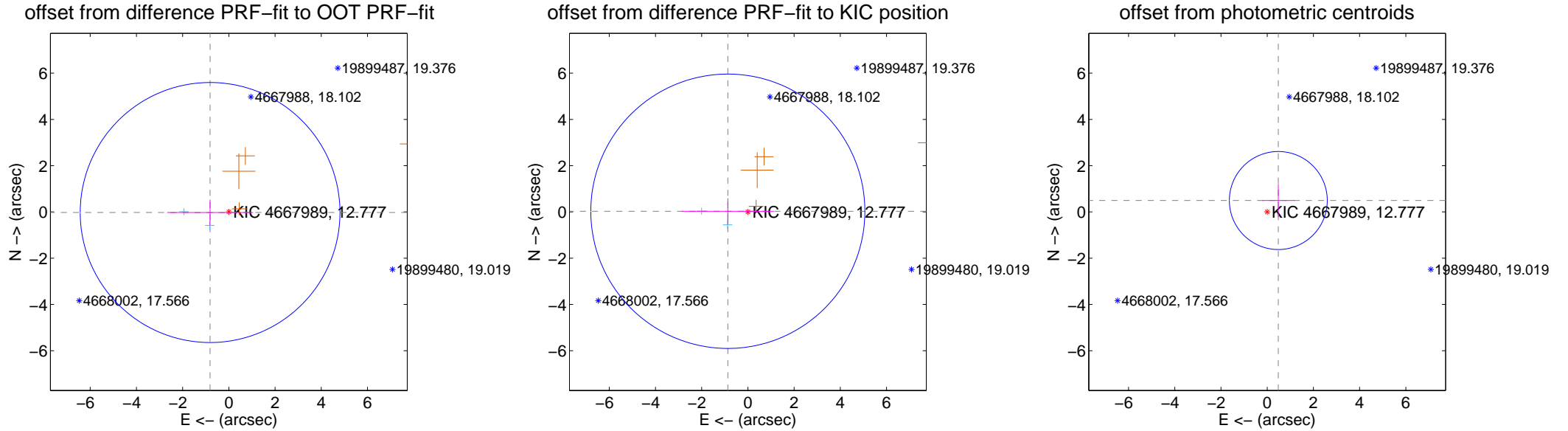
DV Centroid Data

Supplemental centroid analysis for 004667989-03. Kepler magnitude: 12.78. Transit SNR 6.11

There are 2 quarters with good PRF difference image offsets

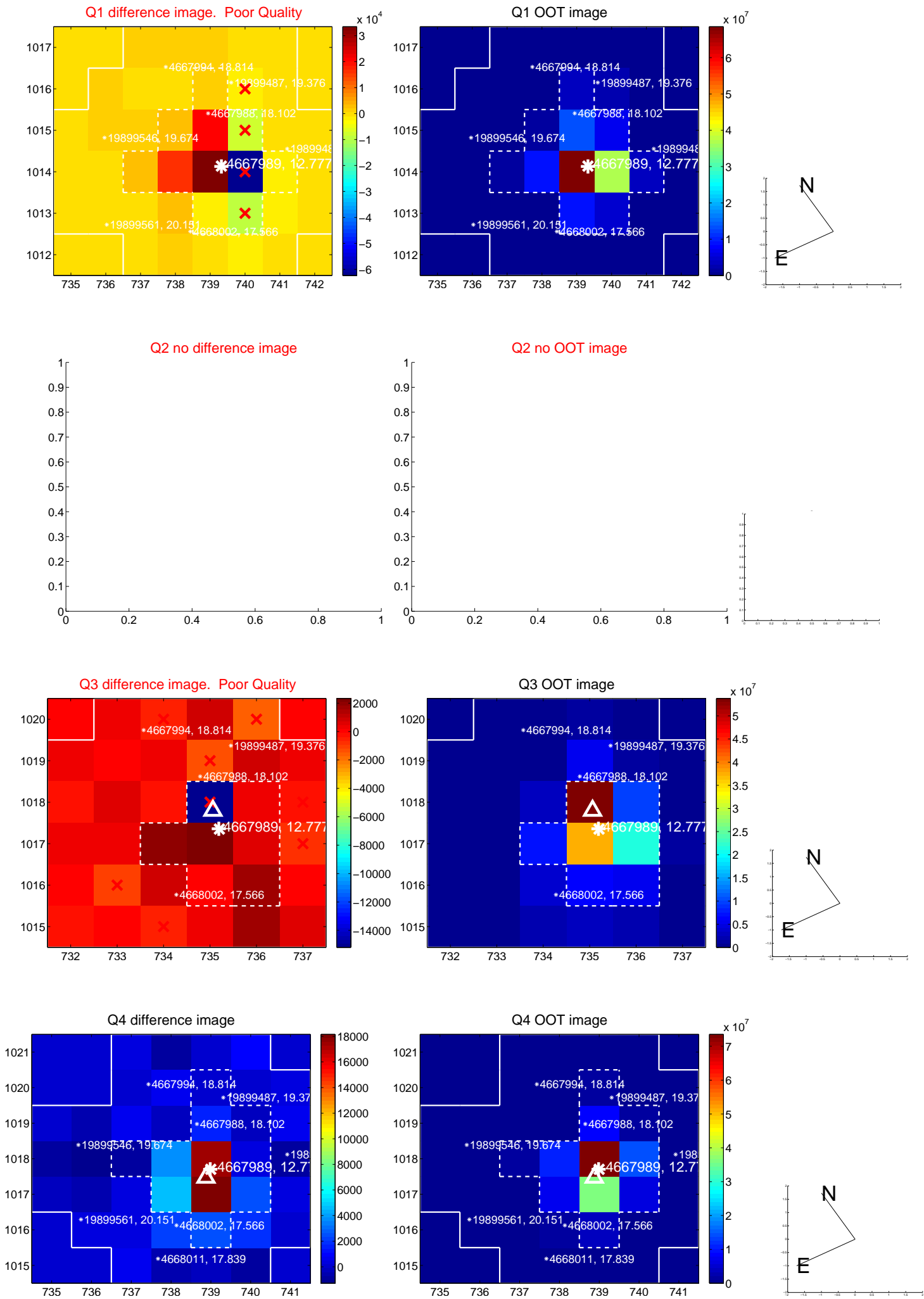
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.812 ± 1.874	0.43	0.812 ± 1.862	-0.025 ± 0.555
PRF-fit source offset from KIC position	0.869 ± 1.977	0.44	0.868 ± 1.992	0.029 ± 0.560
photometric centroid source offset	0.69 ± 0.71	0.98	-0.48 ± 0.70	0.49 ± 0.71

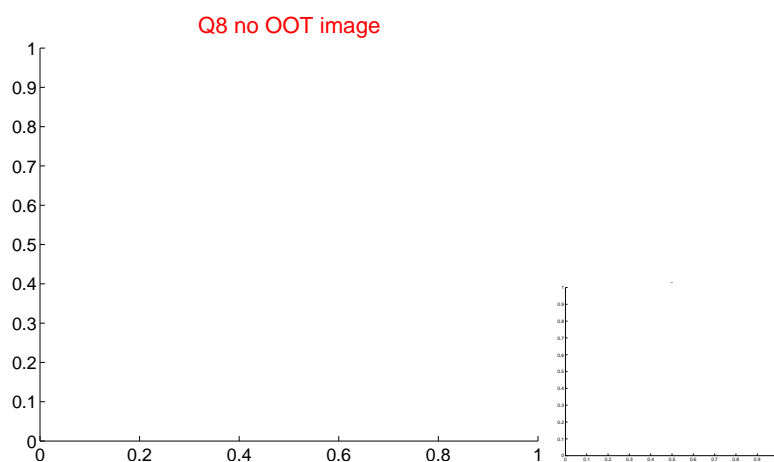
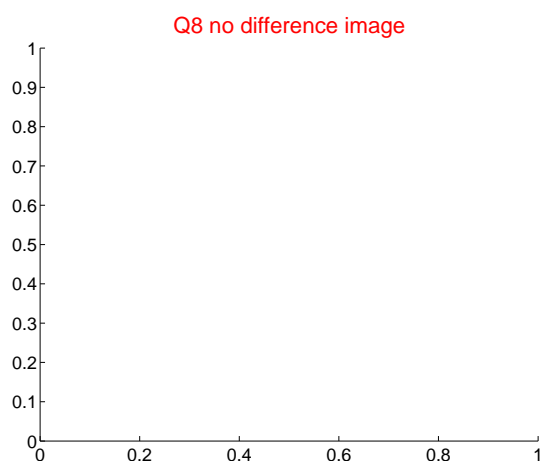
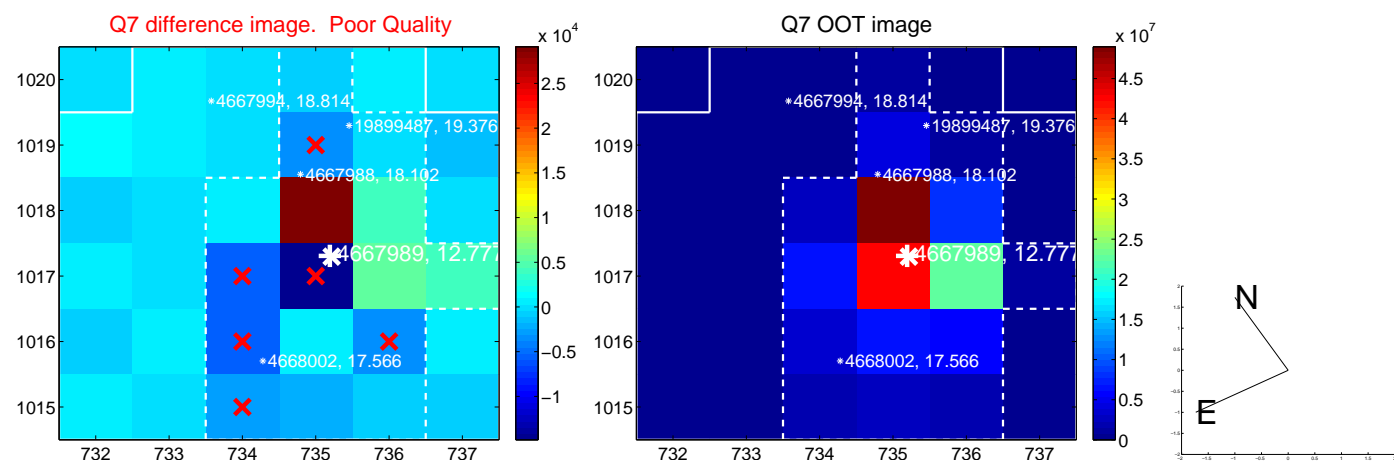
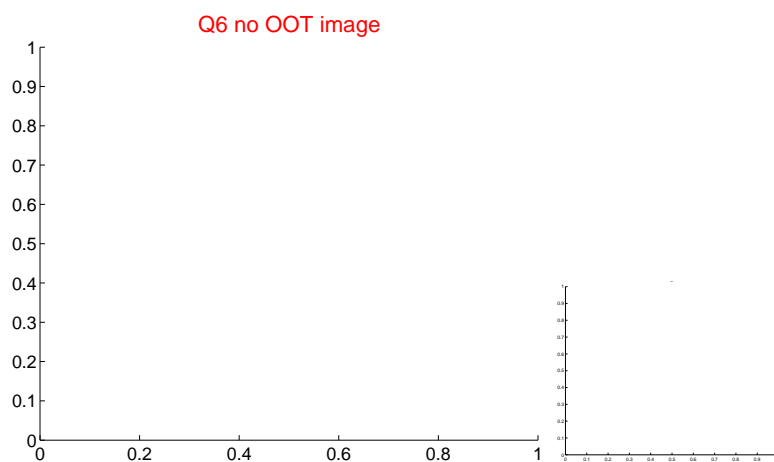
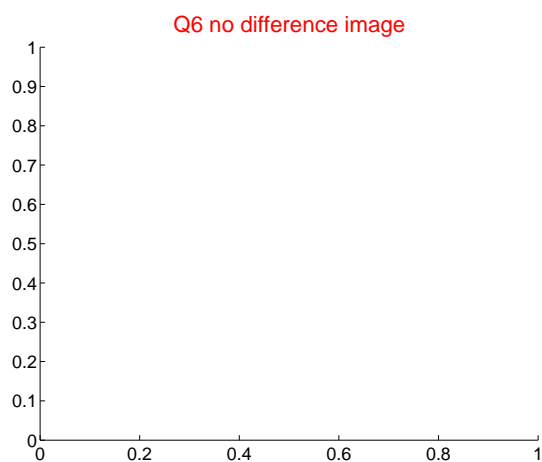
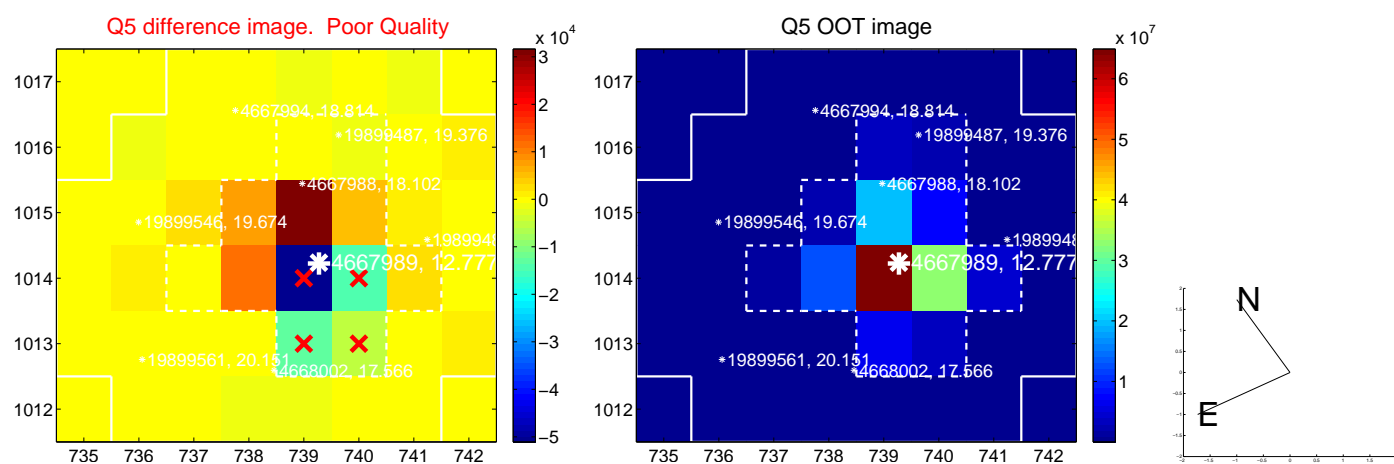


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

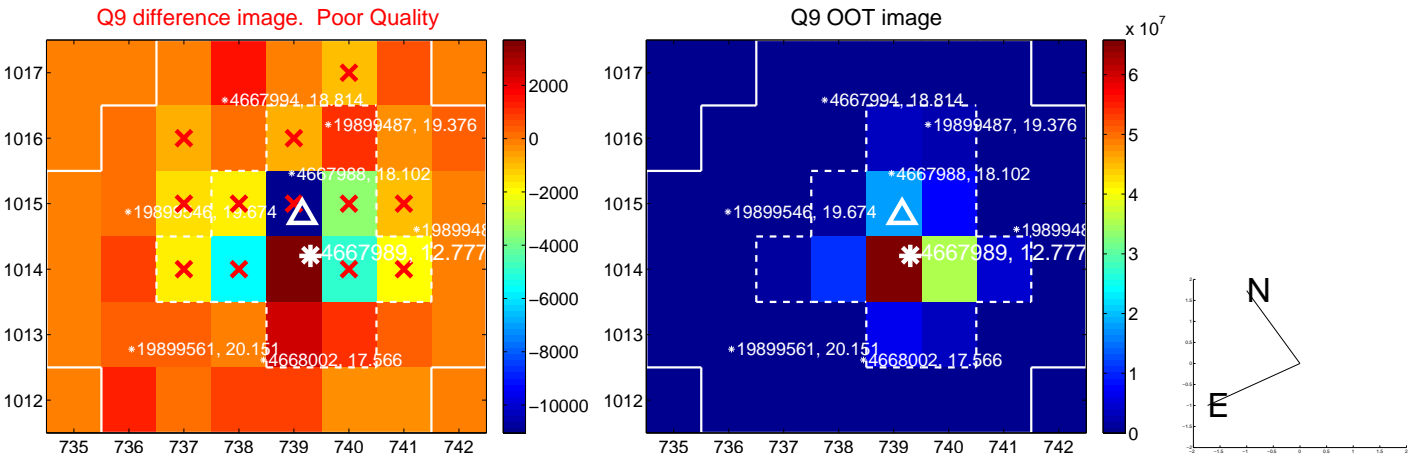
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



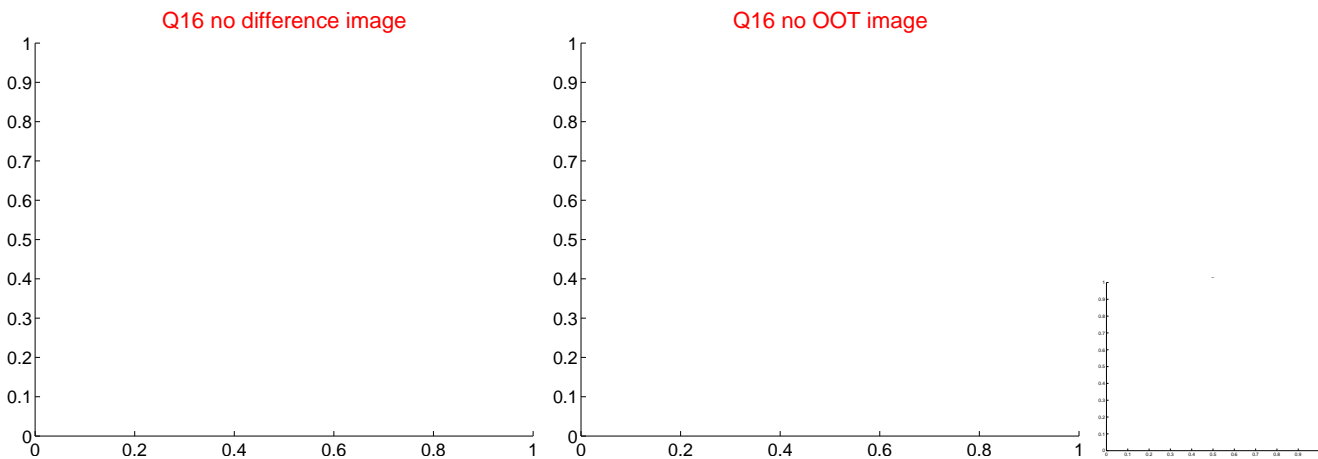
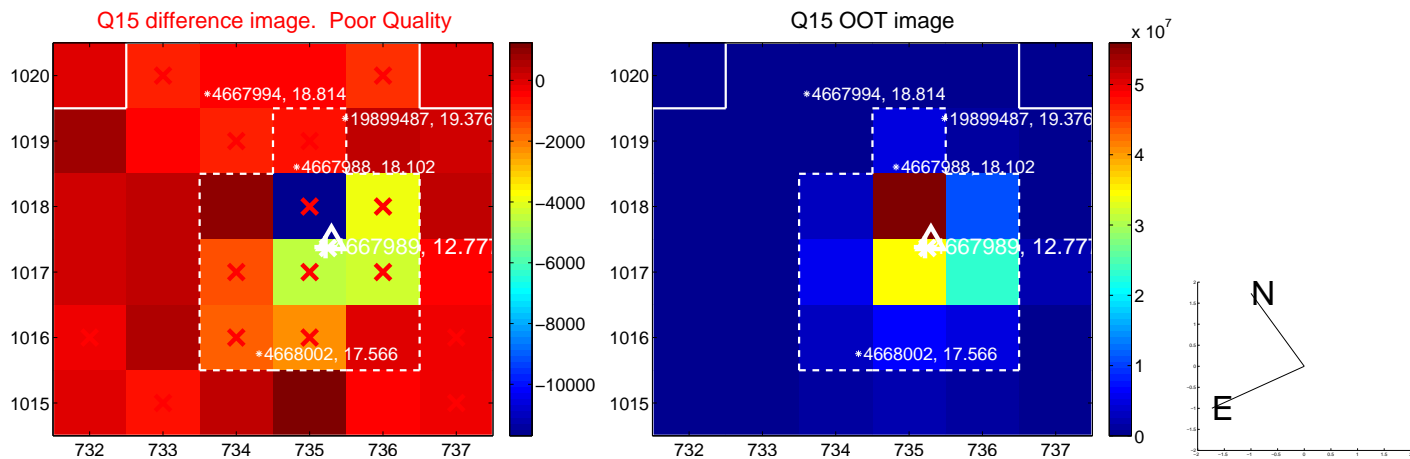
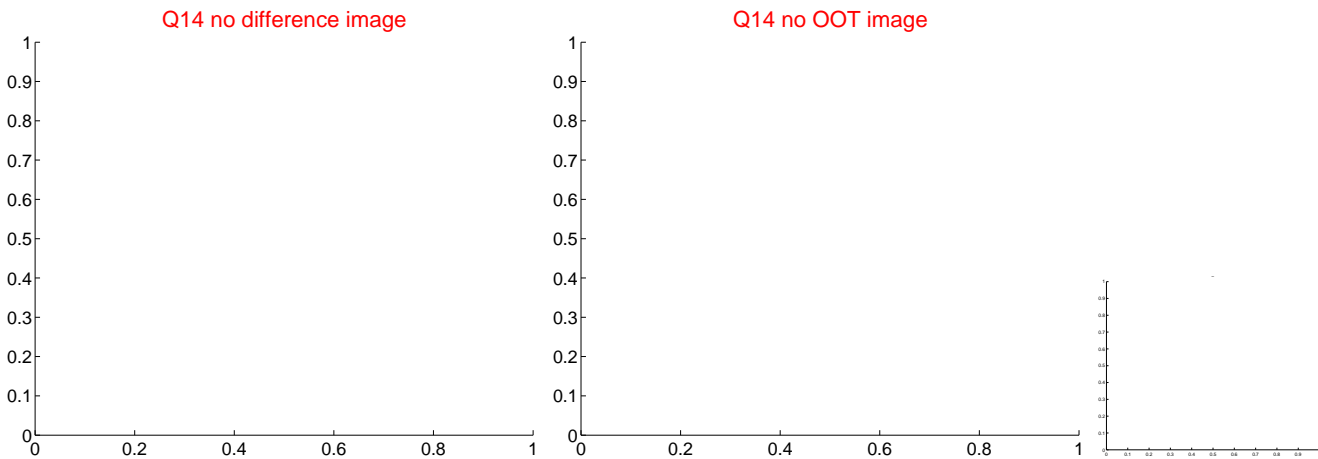
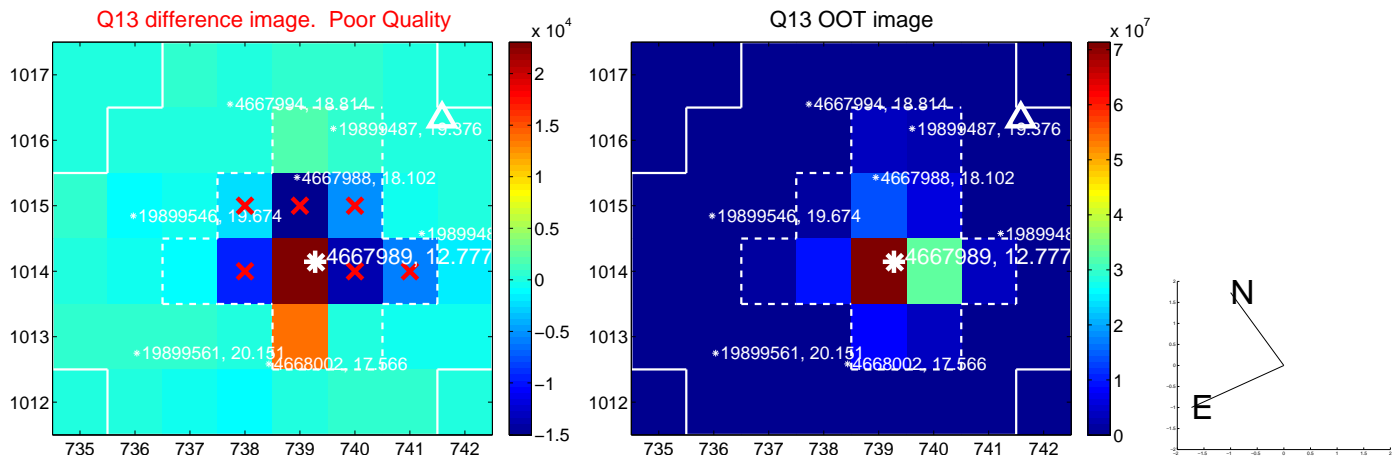
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



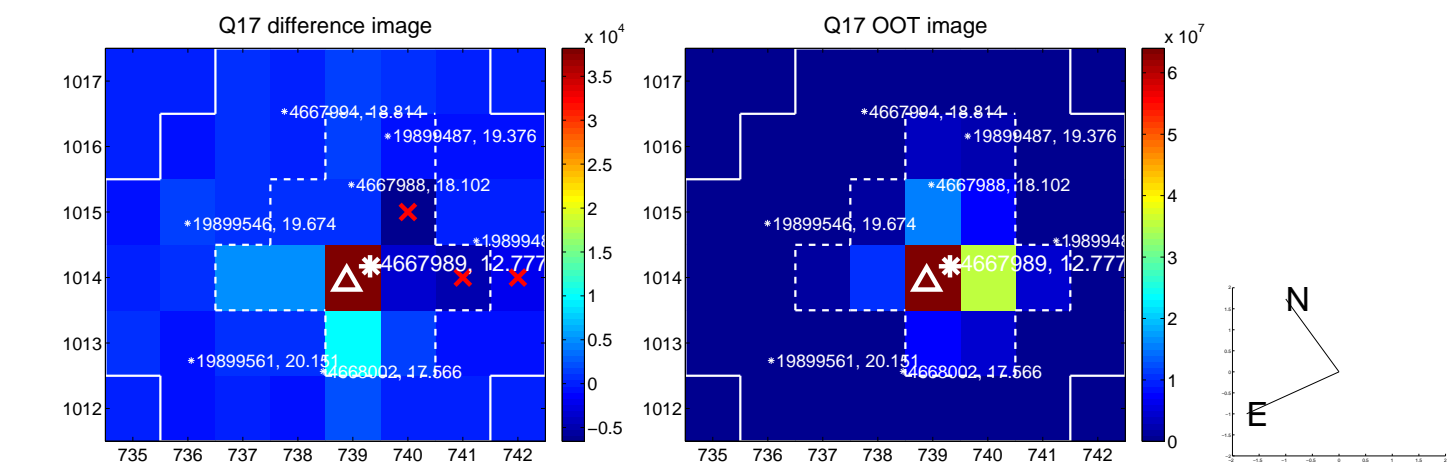
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



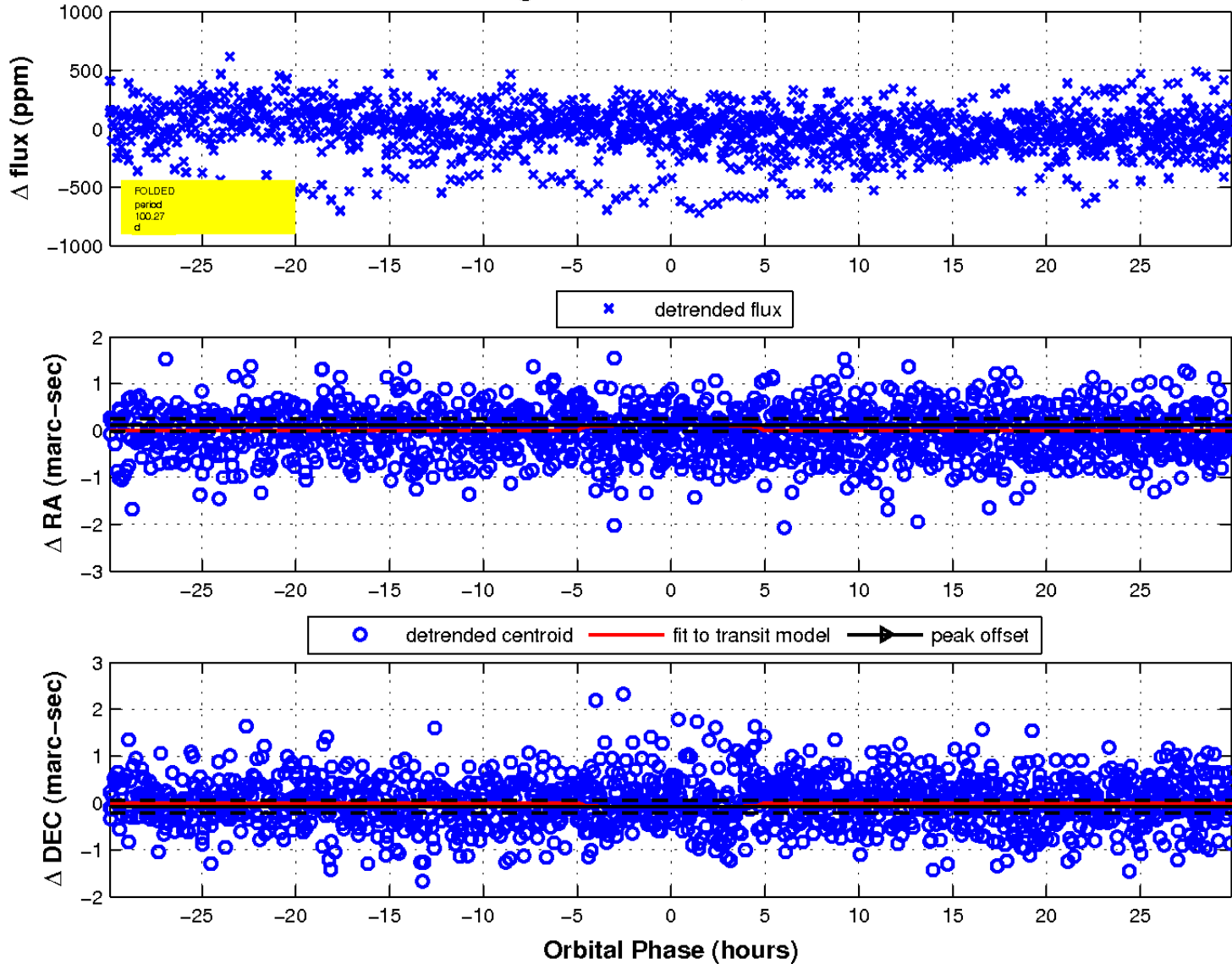
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

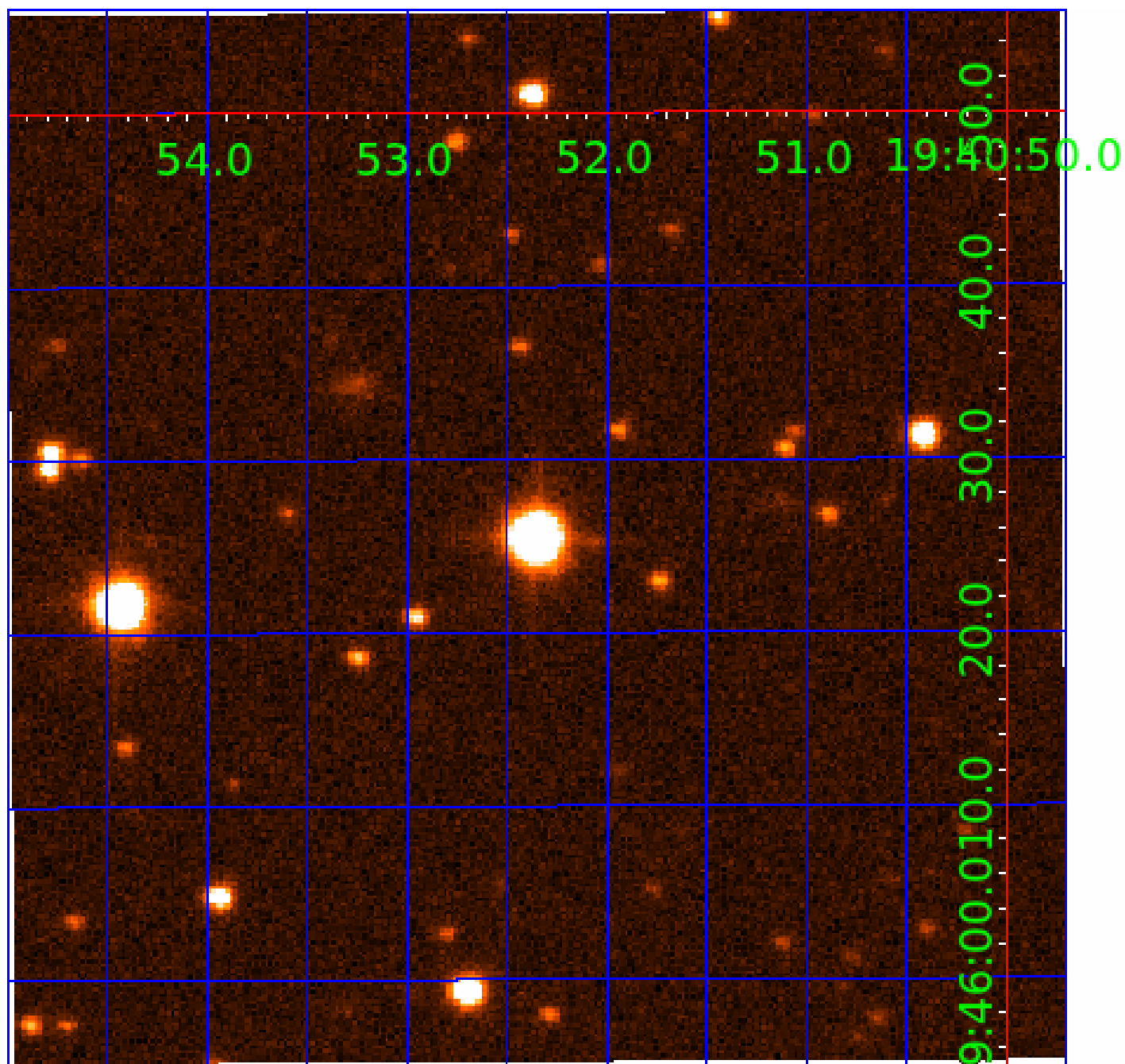


fluxWeightedCentroids, Planet 3 of 5



UKIRT Image

Declination



KIC 004667989

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})
004667989-01	OBS	No	2.117175	132.993031	28.4	7.941	10.1	9.7	1.54	6851	0.91	3538.93
004667989-02	OBS	No	2.115686	133.148028	59.8	8.693	9.8	12.1	1.54	6851	2.35	3542.25
004667989-03	OBS	No	100.271815	162.509921	184.5	9.967	11.9	6.1	1.54	6851	2.31	20.65
004667989-04	OBS	No	263.750252	146.541889	345.6	8.226	17.6	9.8	1.54	6851	3.32	5.69
004667989-05	OBS	No	2.116854	132.469332	40.0	25.402	9.9	9.3	1.54	6851	0.98	3539.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004667989-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004667989-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV
004667989-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

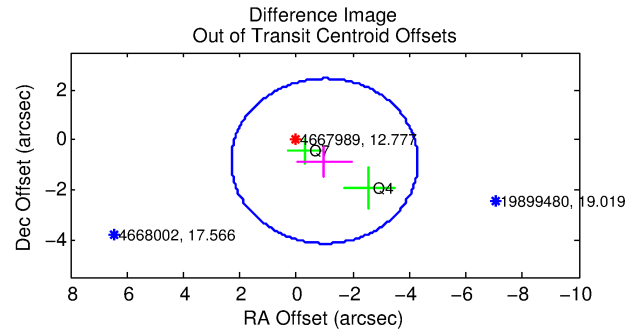
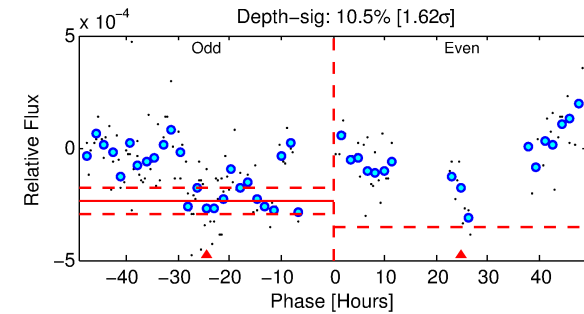
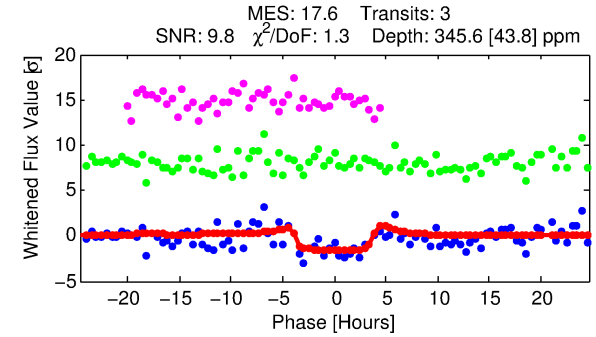
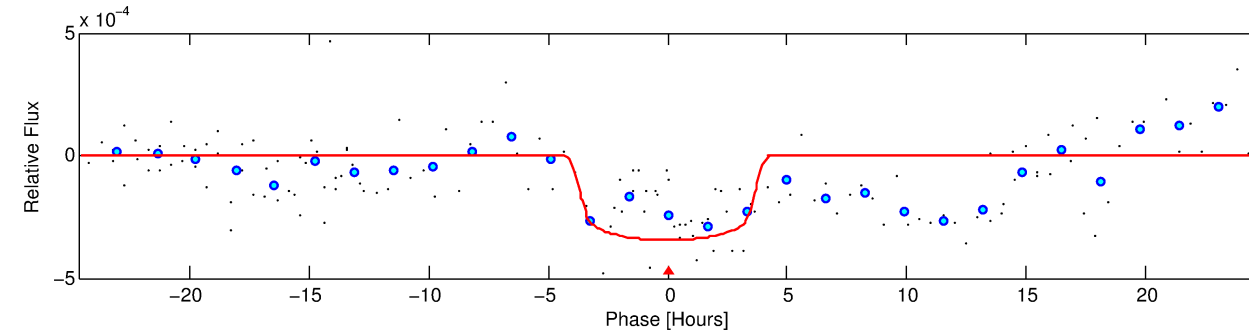
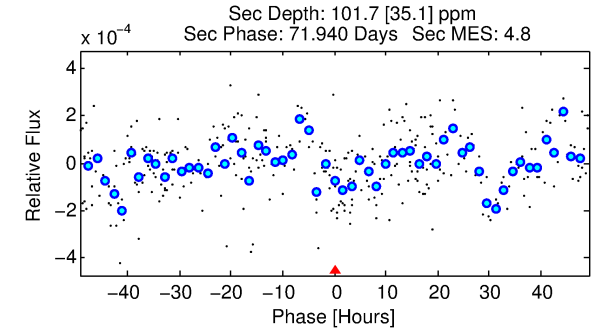
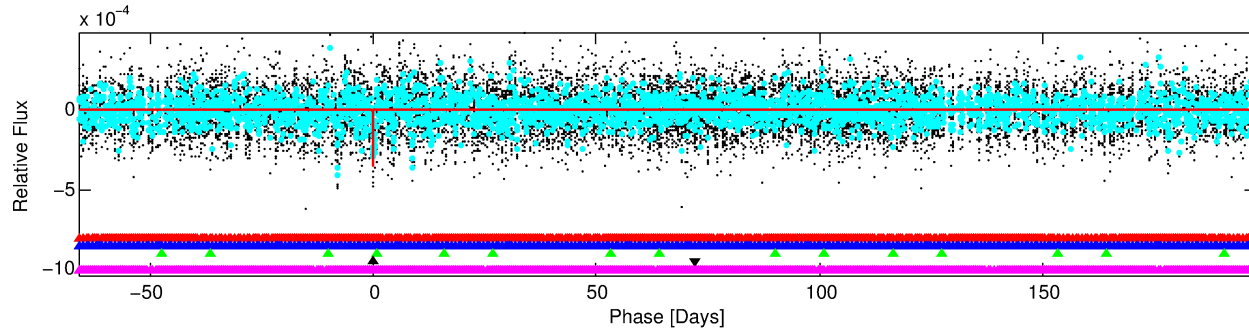
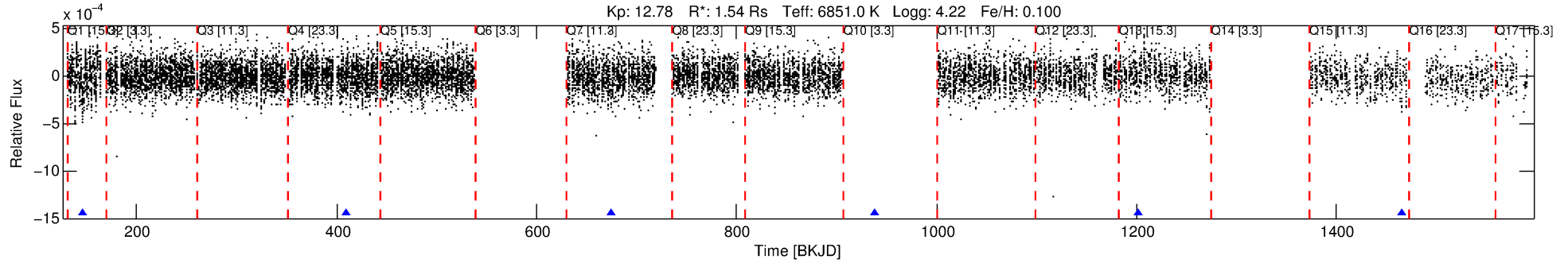
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004667989-04

No Significant Match Found

DV One-Page Summary

KIC: 4667989 Candidate: 4 of 5 Period: 263.750 d



DV Fit Results:

Period = 263.75025 [0.01006] d
Epoch = 146.5419 [0.0168] BKJD
Rp/R* = 0.0198 [0.0026]
a/R* = 119.69 [77.10]
b = 0.90 [0.14]
Seff = 5.69 [1.30]
Teq = 394 [22] K
Rp = 3.32 [0.76] Re
a = 0.9060 [0.1409] AU
Ag = 4174.53 [2034.66] [2.05σ]
Teffp = 4894 [534] K [8.43σ]

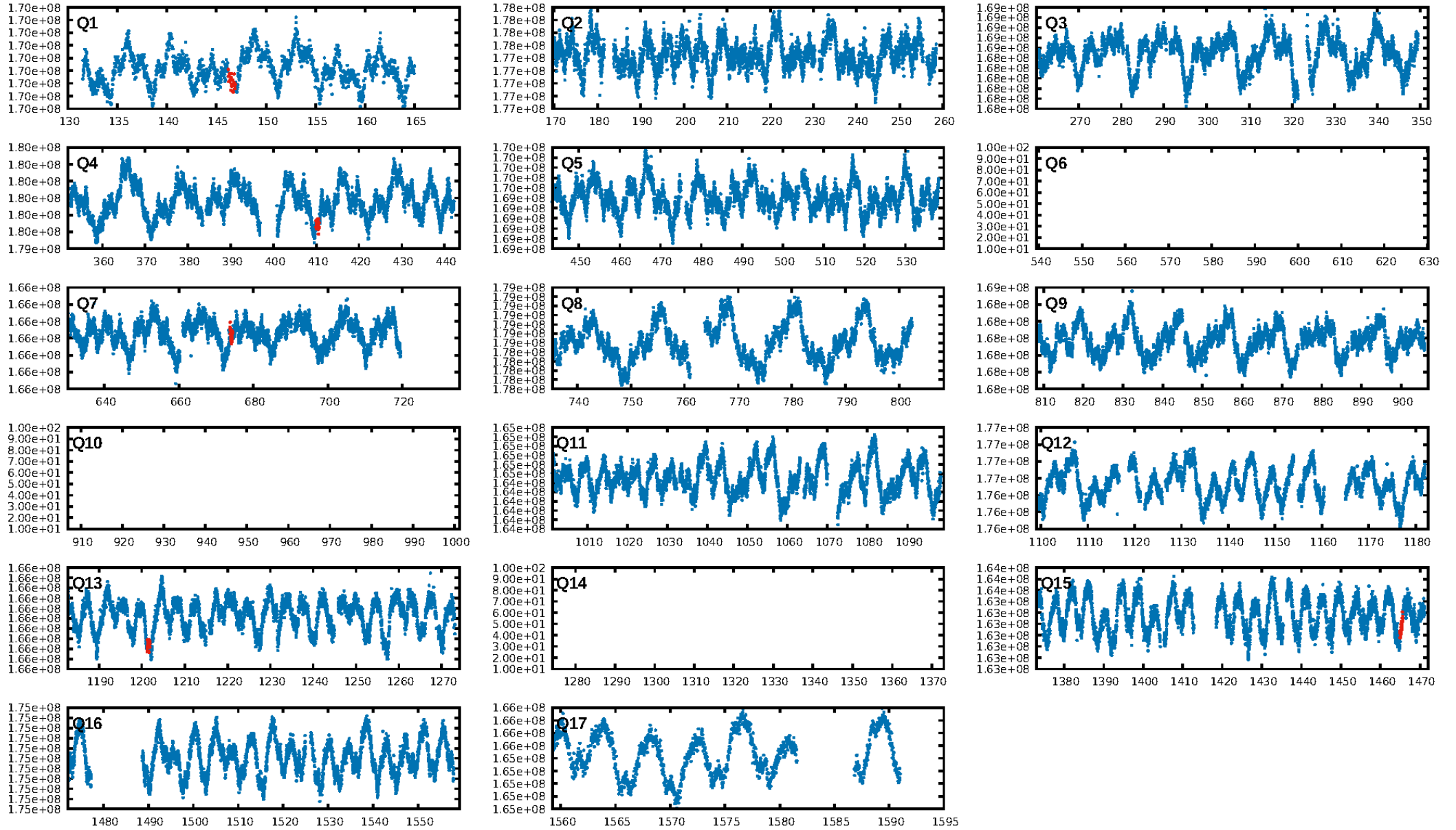
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [303.61σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 85.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -2.727
Centroid-sig: 0.0%
Centroid-so: 1.241 arcsec [1.98σ]
OotOffset-rm: 1.314 arcsec [1.19σ]
KicOffset-rm: 1.217 arcsec [1.14σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 0.00 [0/5]

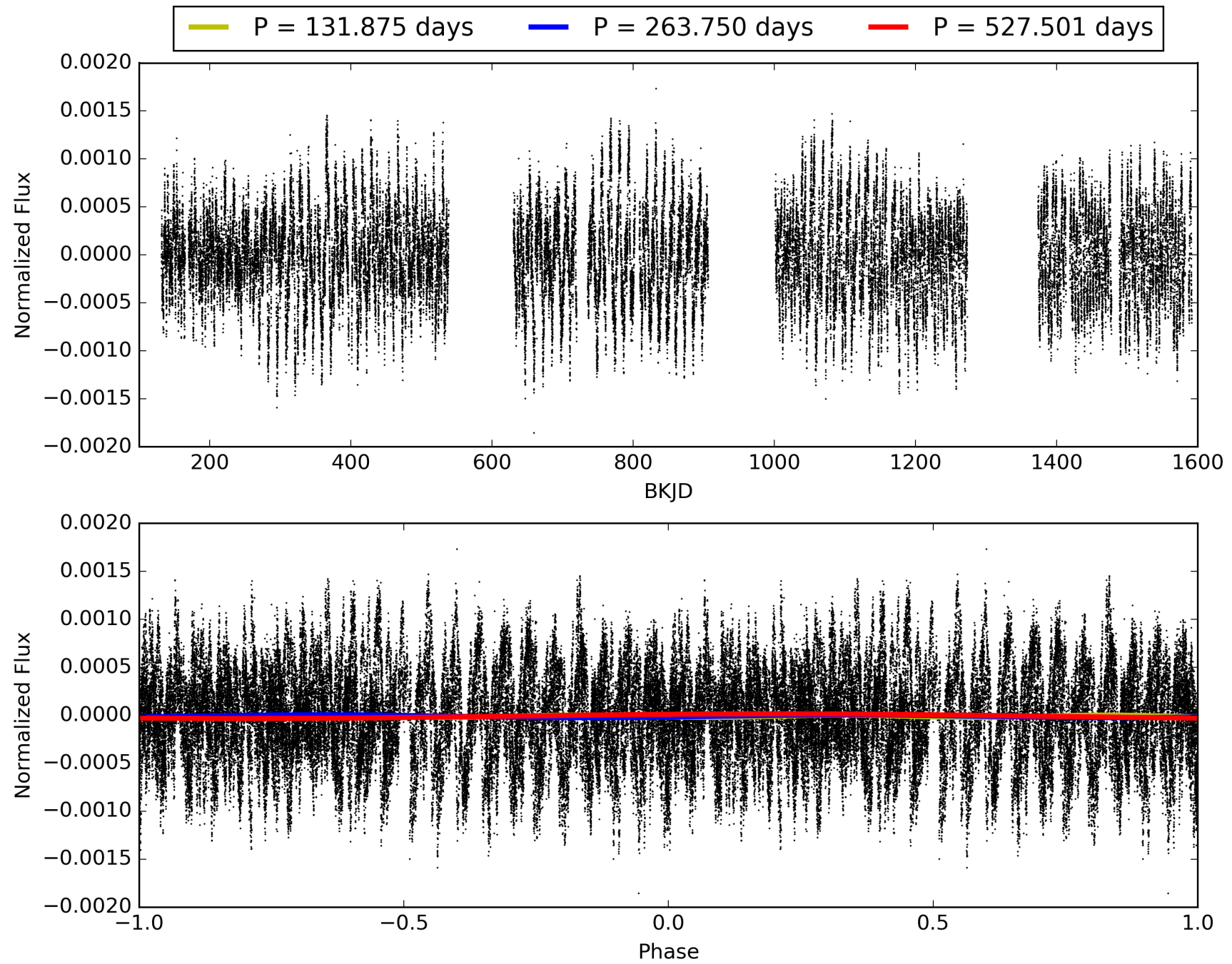
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:39:15 Z

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

TCE 004667989-04, PDC Light Curves

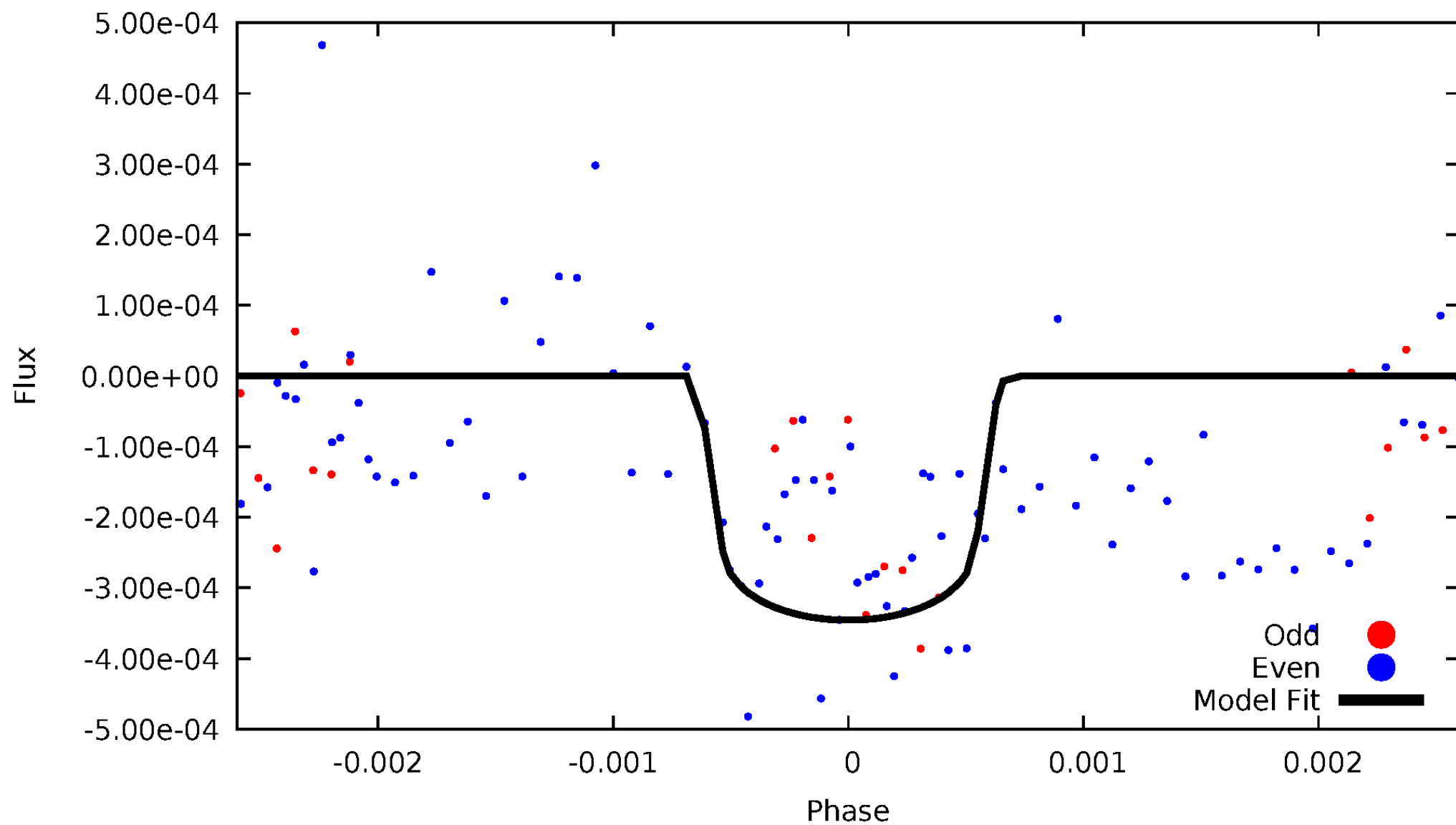


TCE 004667989-04



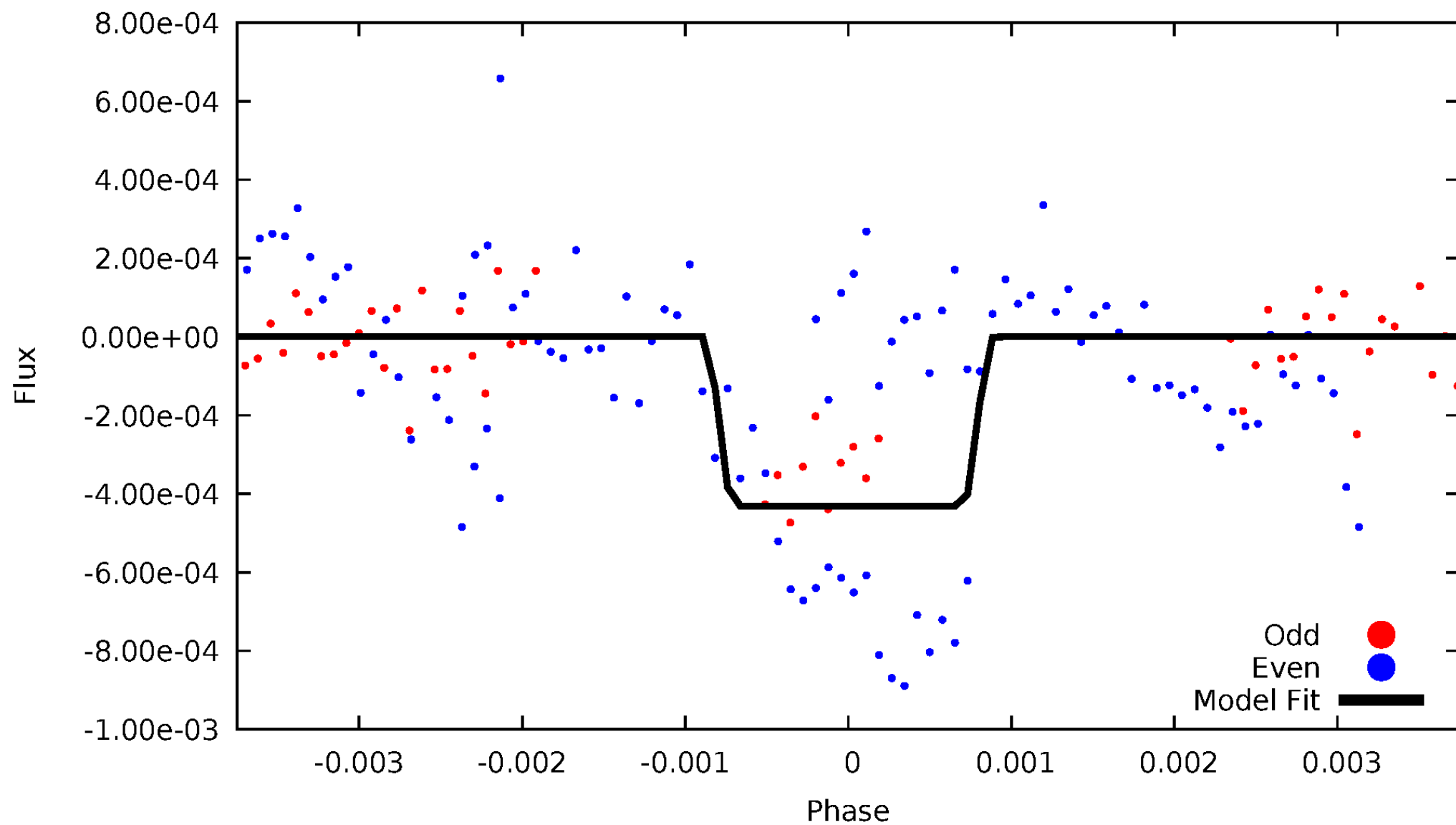
DV Odd/Even

TCE 004667989-04



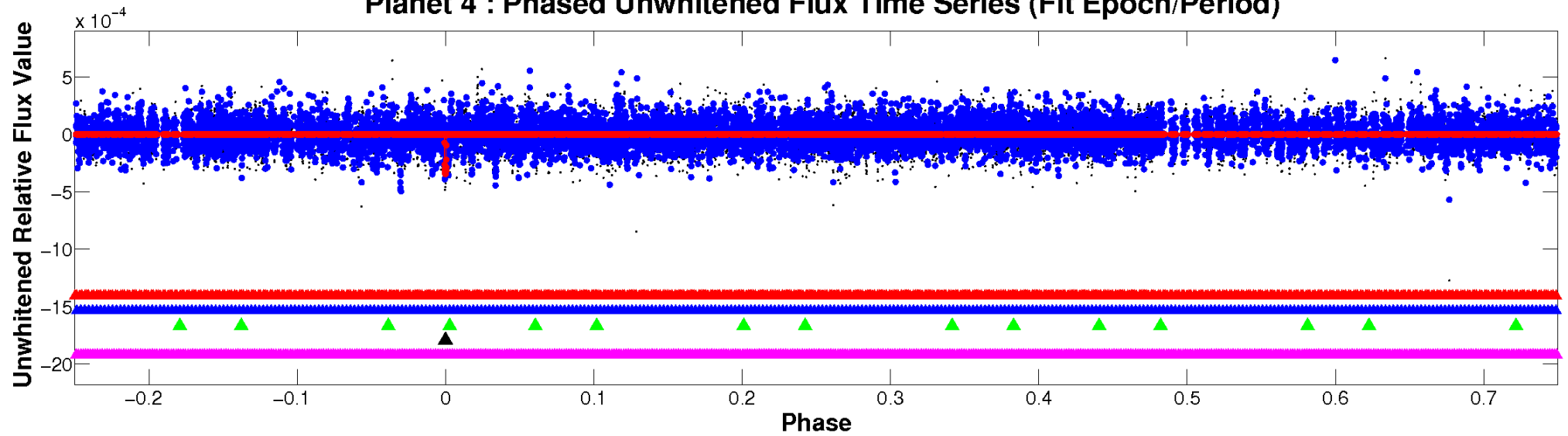
ALT Odd/Even

TCE 004667989-04

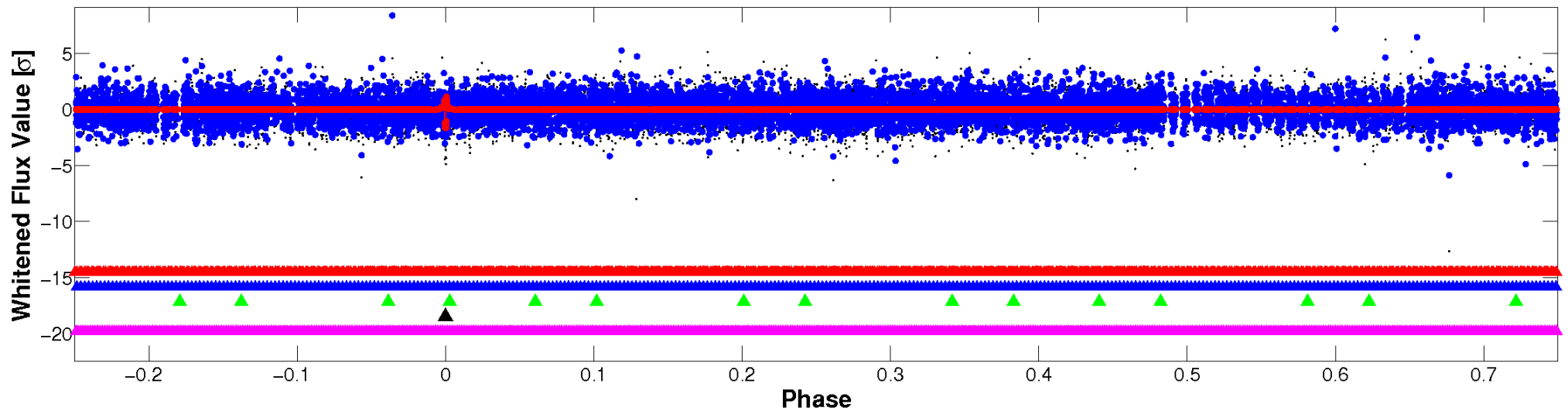


Non-Whitened Vs. Whitened Light Curve

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

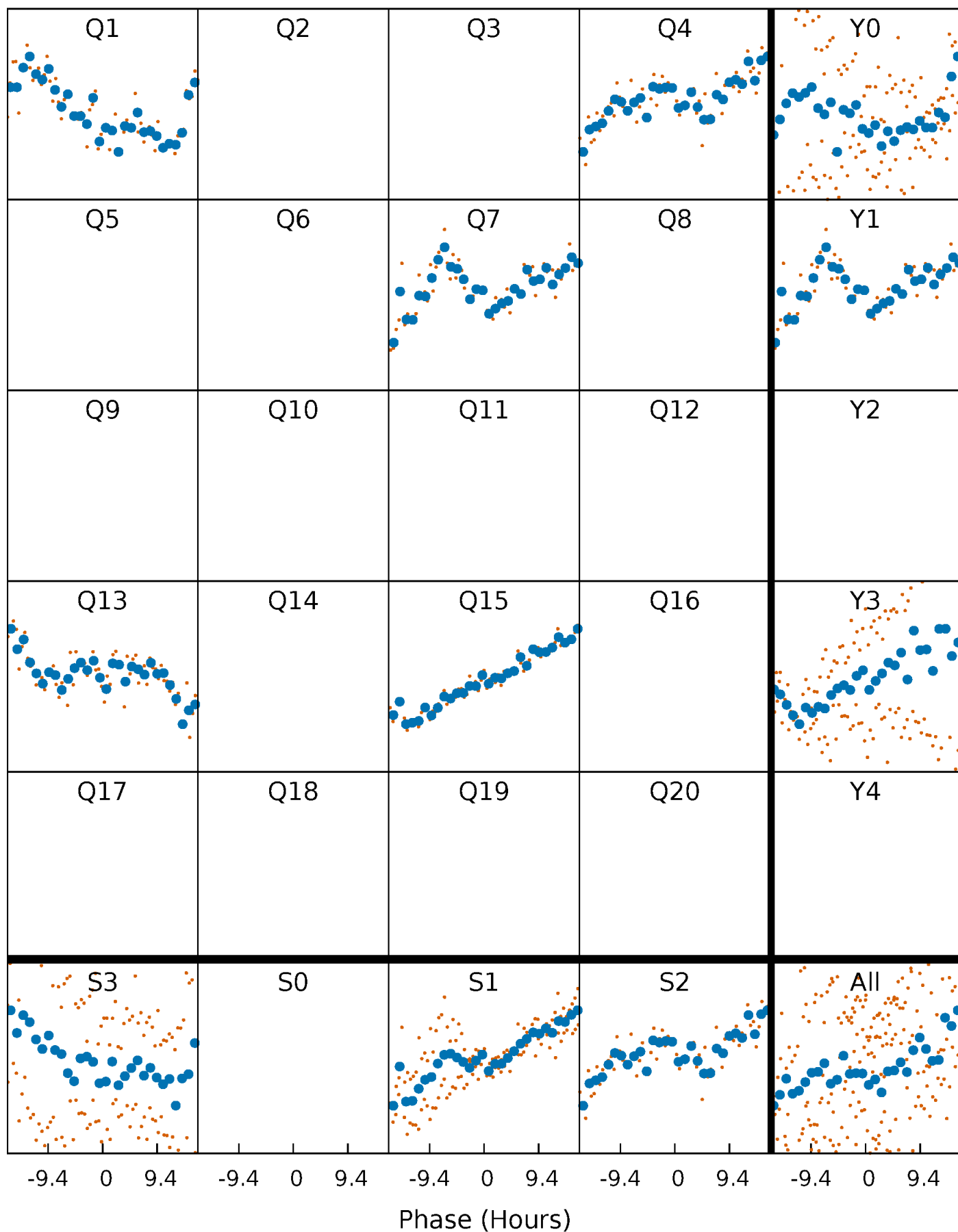


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



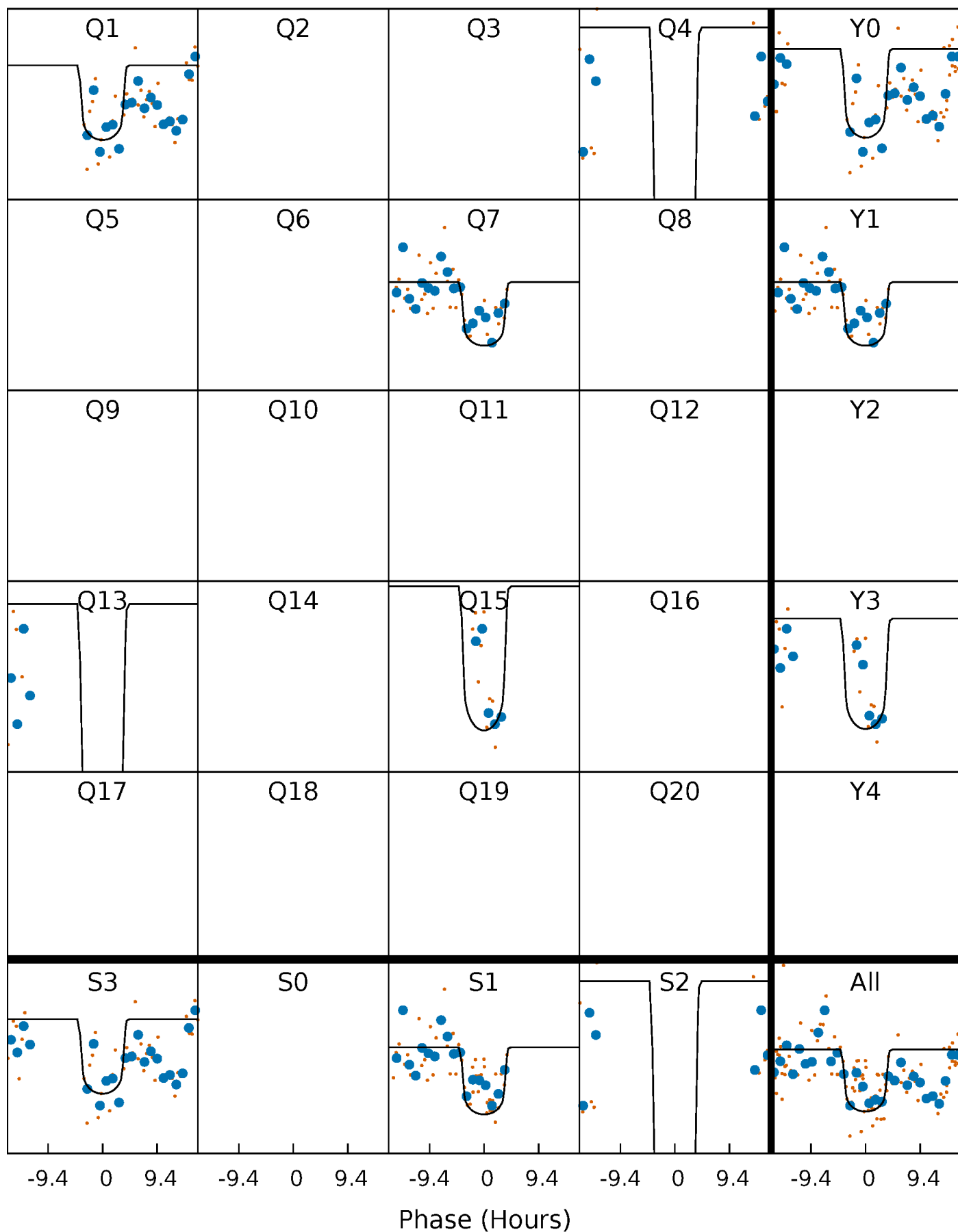
PDC Quarter-Phased Transit Curves

TCE 004667989-04 $P=263.750252$ Days $T_0=146.541889$ (BKJD)



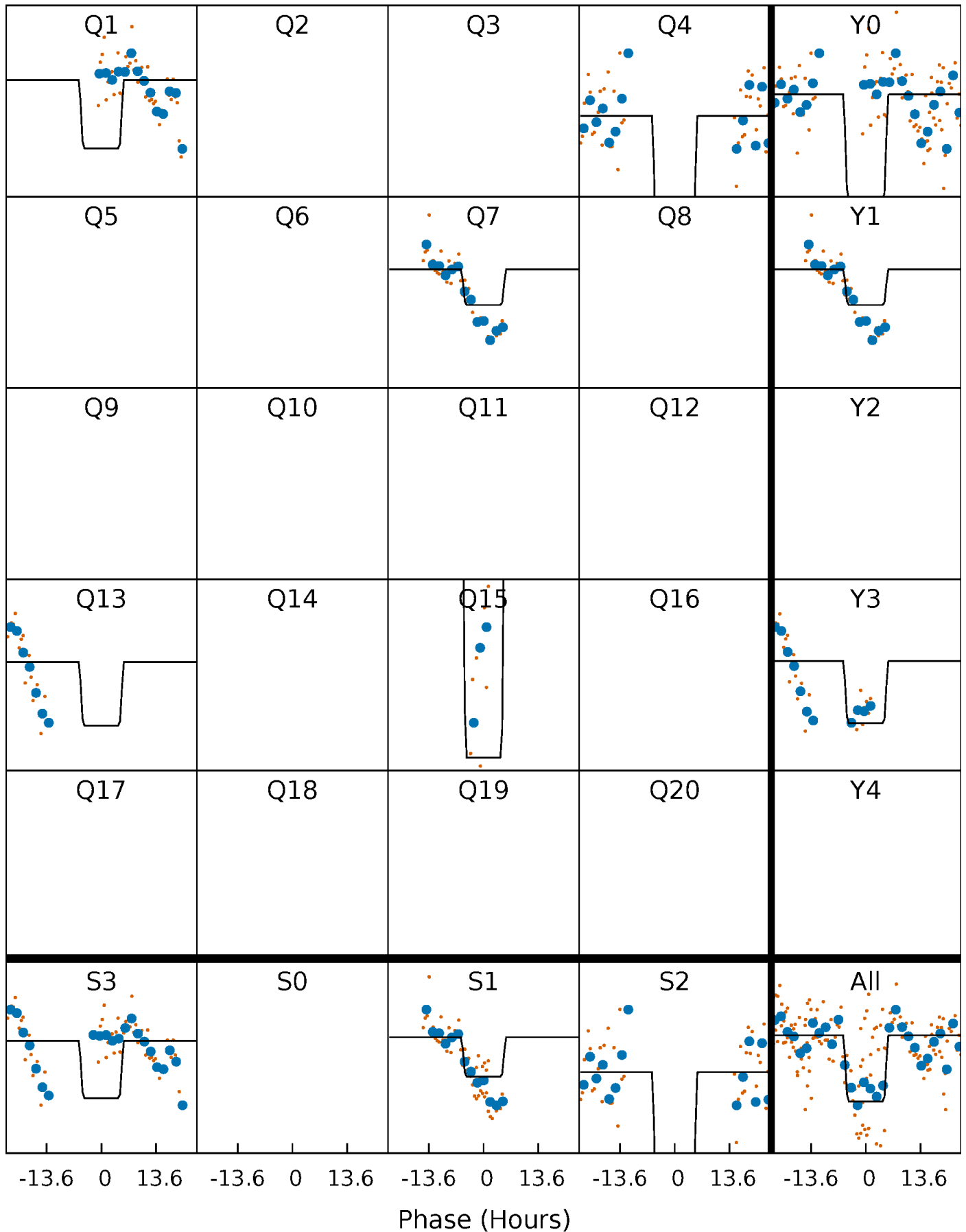
DV Quarter-Phased Transit Curves

TCE 004667989-04 $P=263.750252$ Days $T_0=146.541889$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

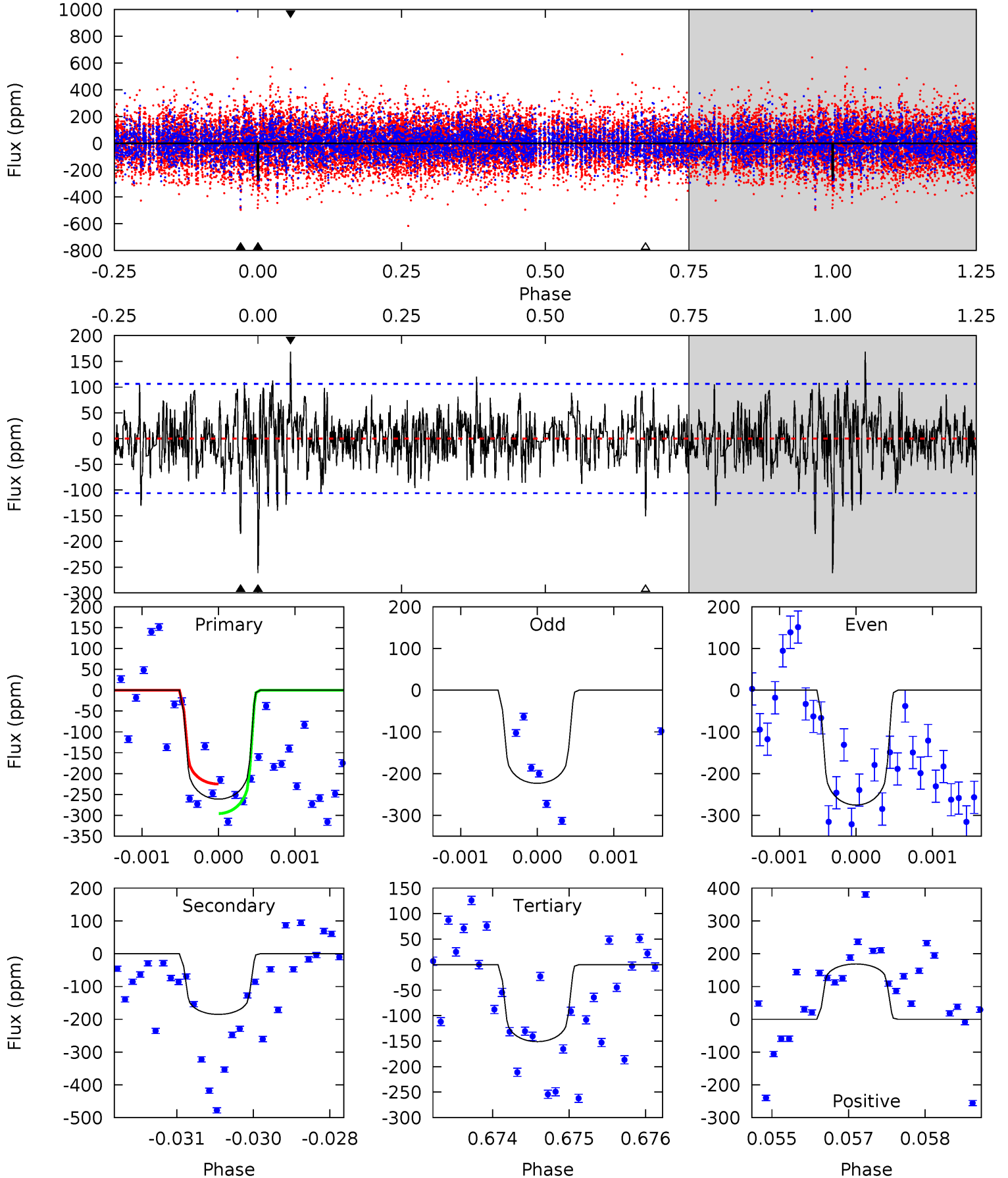
TCE 004667989-04 P=263.776826 Days $T_0=146.461590$ (BKJD)



DV Model-Shift Uniqueness Test

004667989-04, P = 263.750252 Days, E = 146.541889 Days

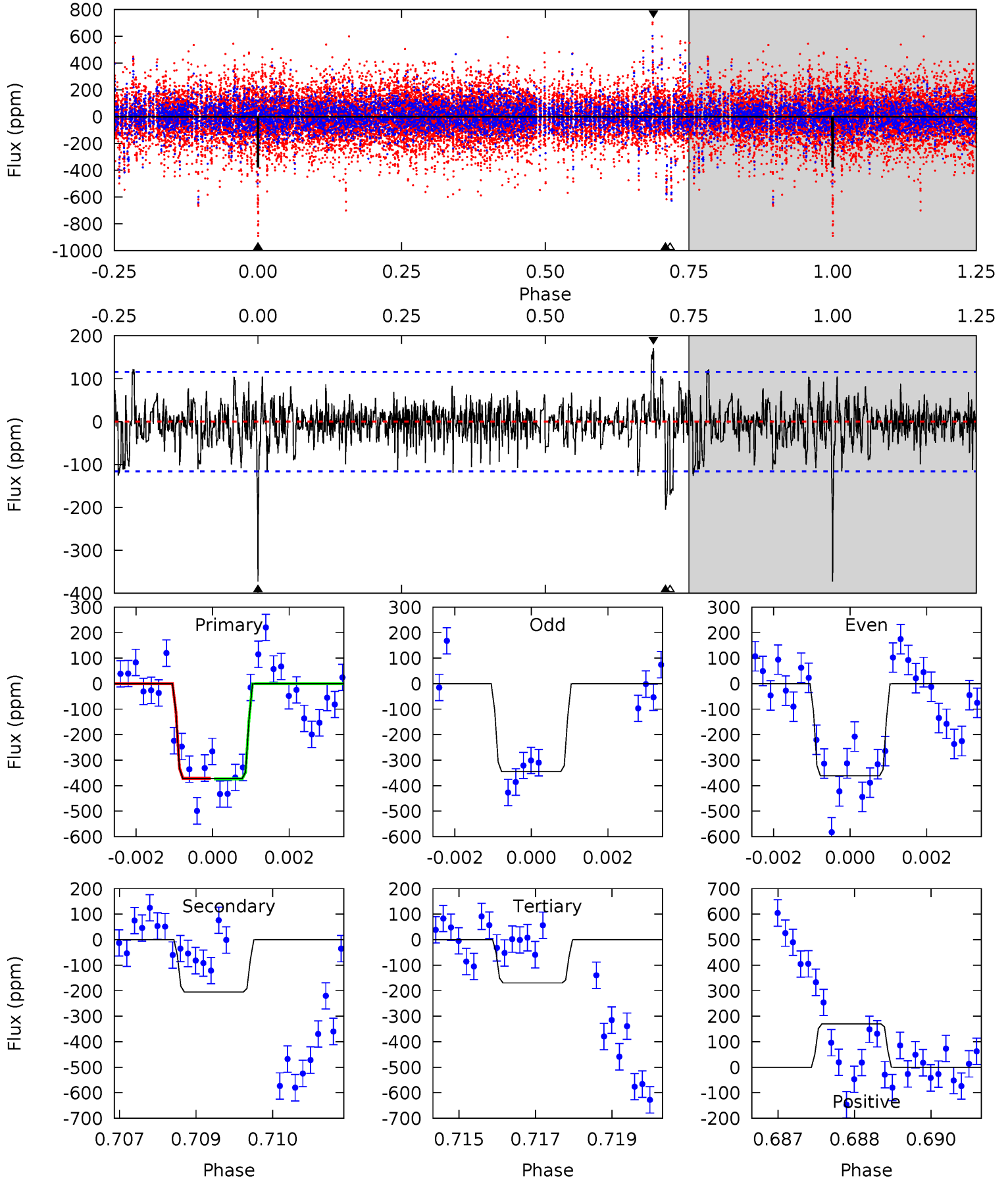
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.3	9.41	7.68	8.57	5.40	3.21	1.98	5.60	4.71	1.74	0.84	1.14	1.11	0.39	1.80



Alt Model-Shift Uniqueness Test

004667989-04, P = 263.776826 Days, E = 146.461590 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	9.49	7.86	7.87	5.36	3.14	1.66	9.39	9.39	1.63	1.63	0.33	0.90	0.31	0.05



Stellar Parameters For KIC 004667989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	6851^{+72}_{-82}	$4.218^{+0.048}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$1.538^{+0.289}_{-0.103}$	$1.426^{+0.112}_{-0.071}$	$0.552^{+0.115}_{-0.198}$
	+1%/-1%	+1%/-3%	+150%/-150%	+19%/-7%	+8%/-5%	+21%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004667989-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-185 ± 20	$3.40^{+0.51}_{-0.46}$	552^{+24}_{-13}	5668^{+415}_{-344}	7235^{+2679}_{-1891}
Alt.	-205 ± 22	$3.57^{+0.52}_{-0.49}$	553^{+23}_{-14}	5669^{+409}_{-324}	7350^{+2572}_{-1907}

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 $A_{obs} \gg 1.0$

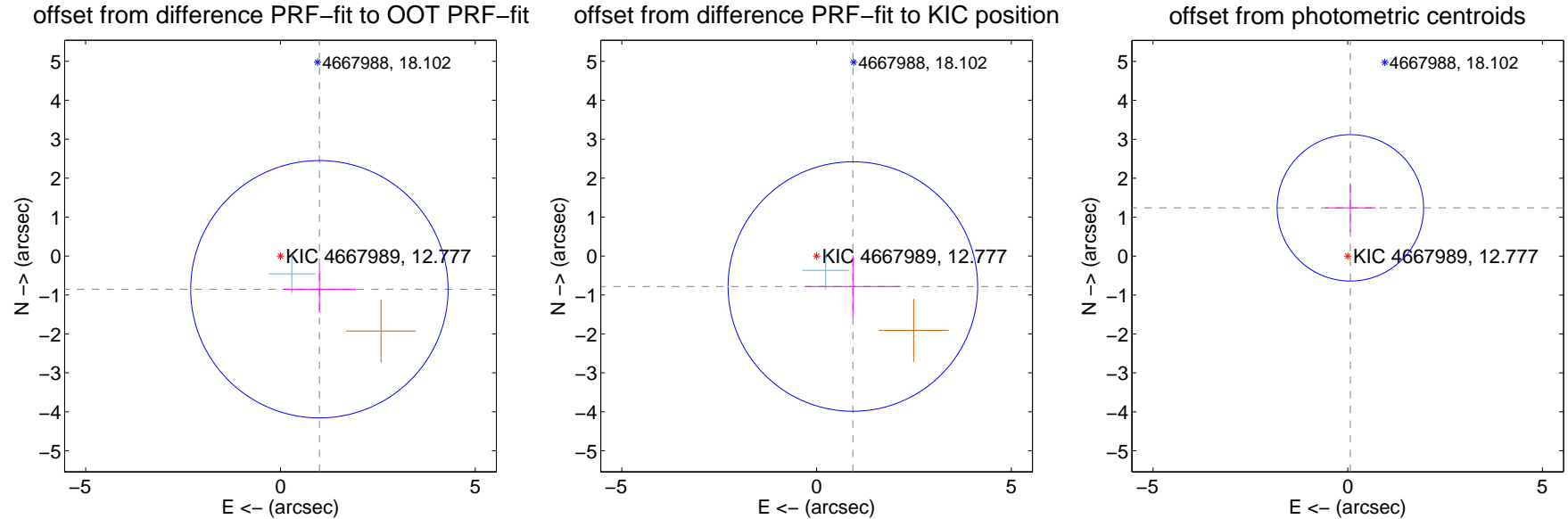
DV Centroid Data

Supplemental centroid analysis for 004667989-04. Kepler magnitude: 12.78. Transit SNR 9.81

There are 1 quarters with good PRF difference image offsets

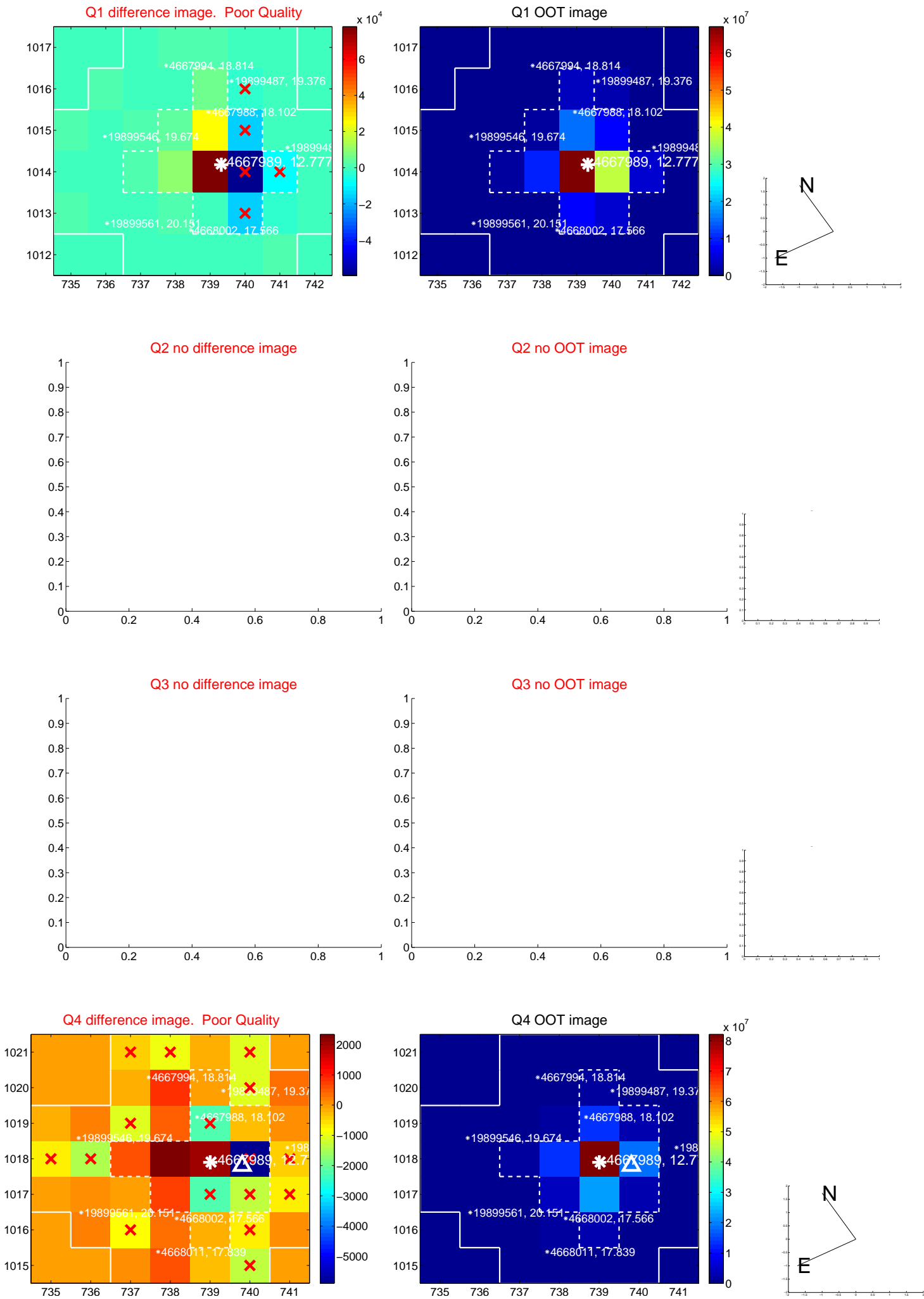
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.314 ± 1.101	1.19	-0.999 ± 0.937	-0.853 ± 0.603
PRF-fit source offset from KIC position	1.217 ± 1.068	1.14	-0.932 ± 1.222	-0.783 ± 0.801
photometric centroid source offset	1.24 ± 0.63	1.98	-0.07 ± 0.65	1.24 ± 0.63



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



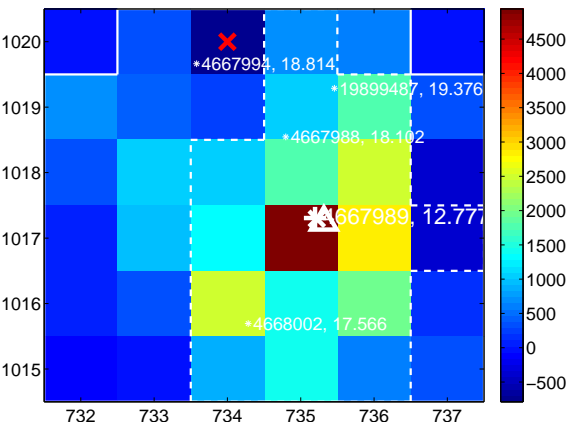
Q6 no difference image



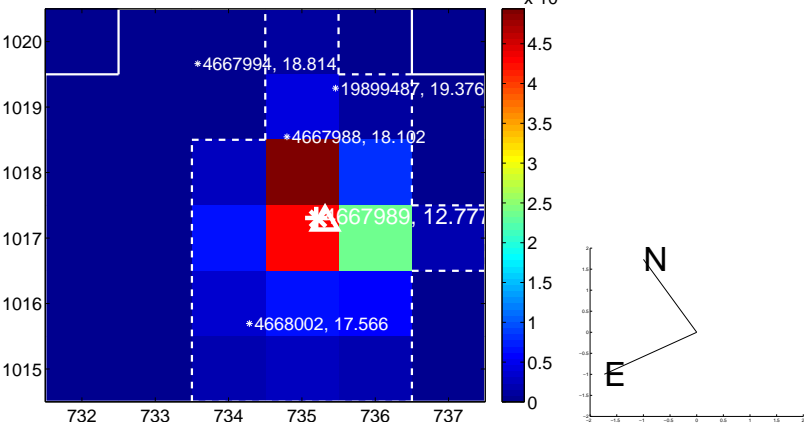
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image



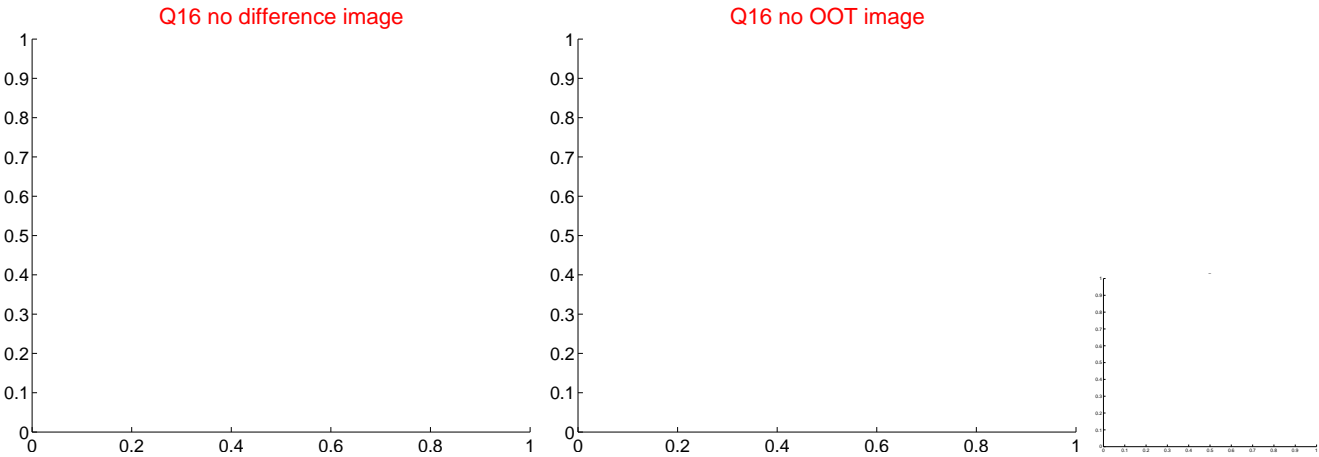
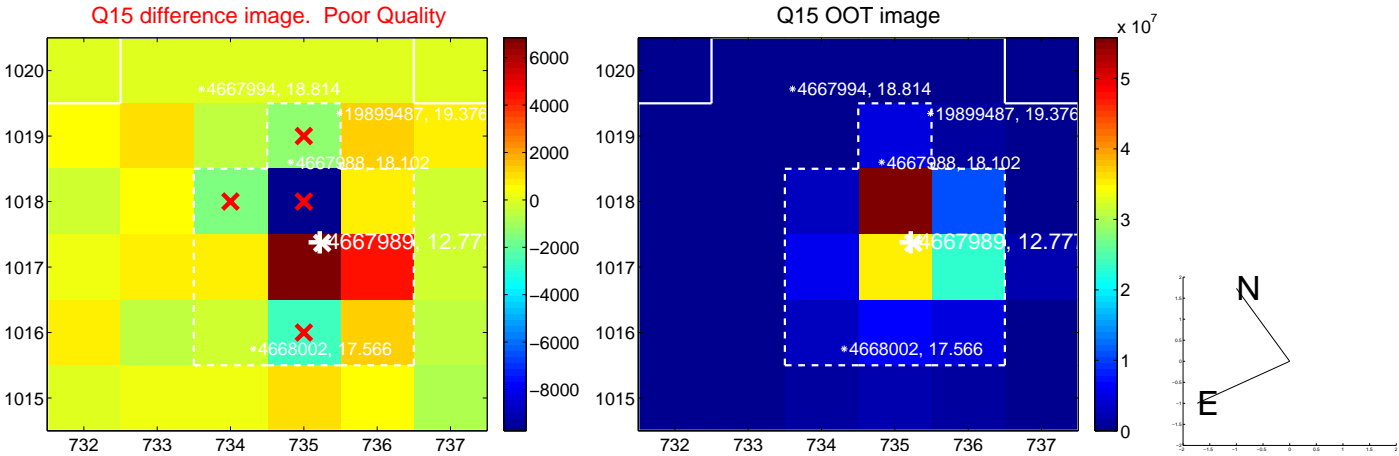
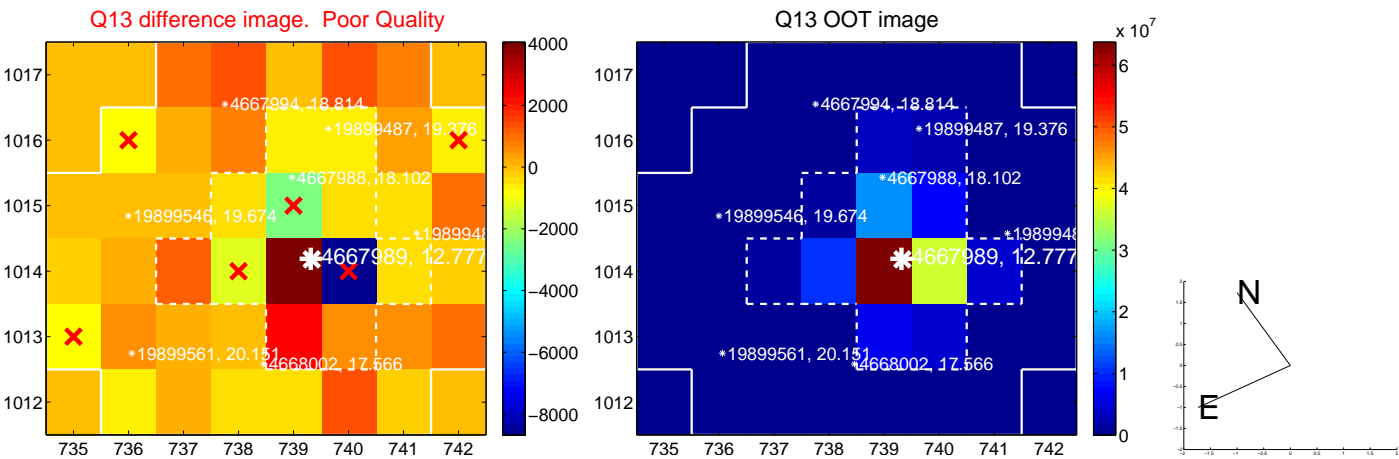
Q8 no OOT image



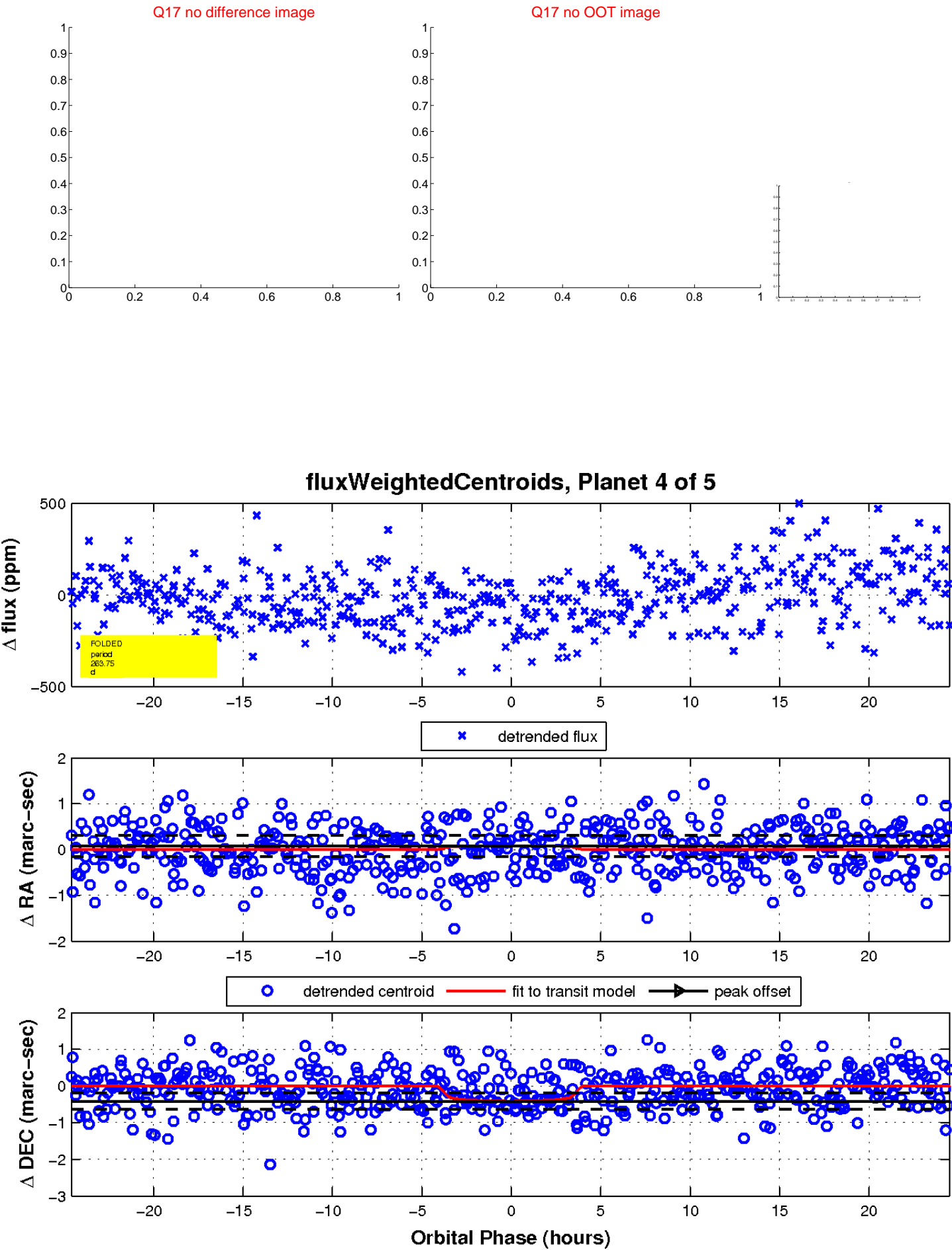
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

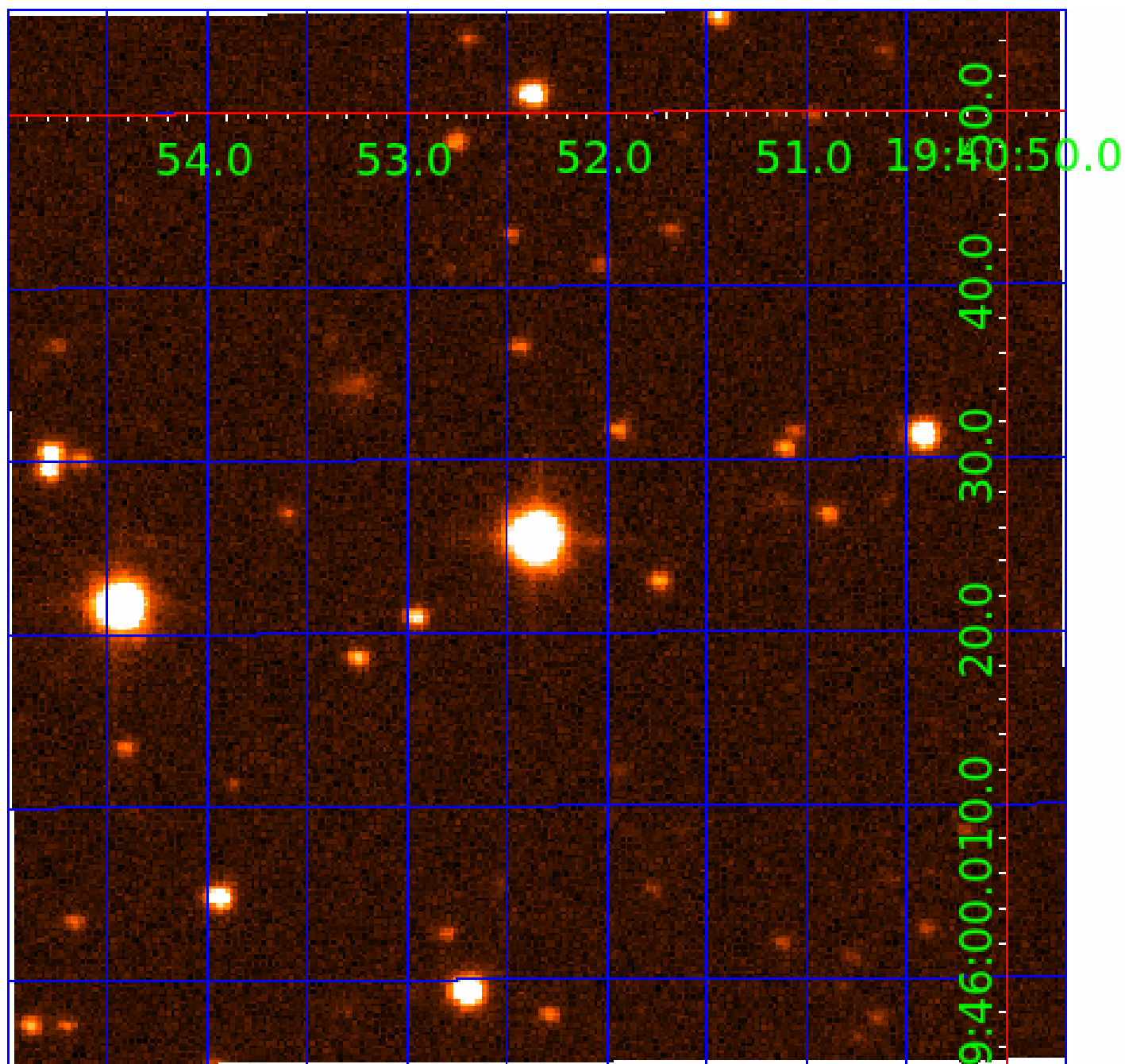


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004667989

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})
004667989-01	OBS	No	2.117175	132.993031	28.4	7.941	10.1	9.7	1.54	6851	0.91	3538.93
004667989-02	OBS	No	2.115686	133.148028	59.8	8.693	9.8	12.1	1.54	6851	2.35	3542.25
004667989-03	OBS	No	100.271815	162.509921	184.5	9.967	11.9	6.1	1.54	6851	2.31	20.65
004667989-04	OBS	No	263.750252	146.541889	345.6	8.226	17.6	9.8	1.54	6851	3.32	5.69
004667989-05	OBS	No	2.116854	132.469332	40.0	25.402	9.9	9.3	1.54	6851	0.98	3539.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004667989-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004667989-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—SWEET_NTL—LPP_DV
004667989-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004667989-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

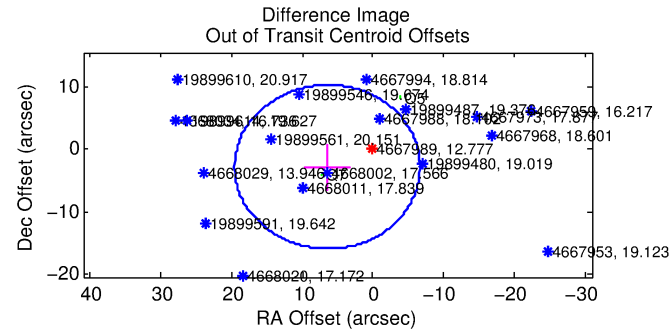
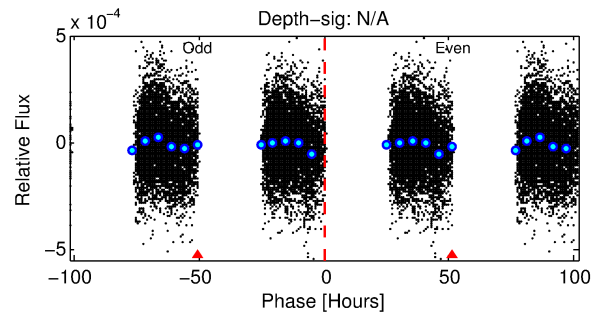
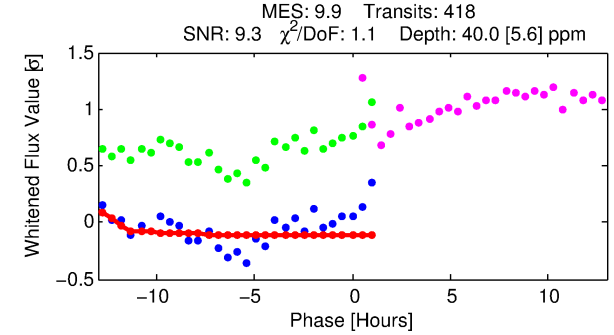
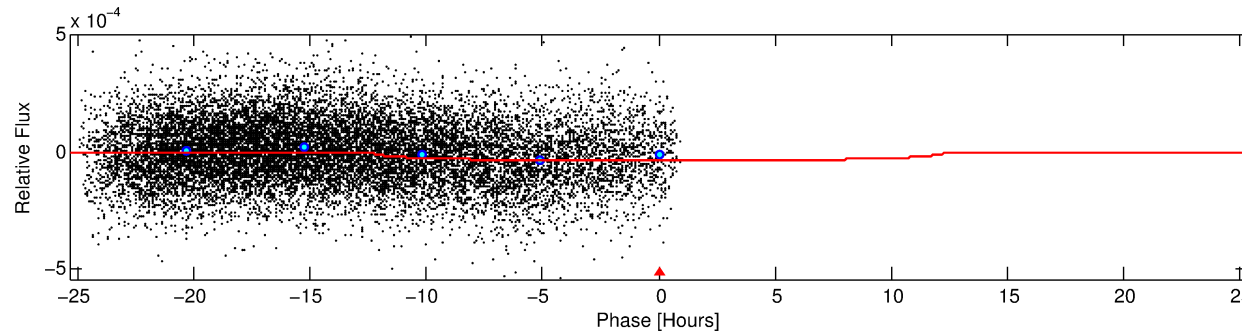
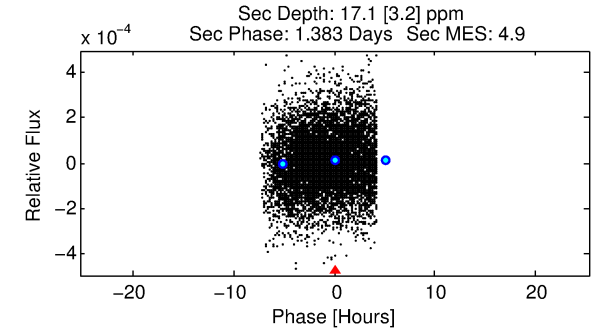
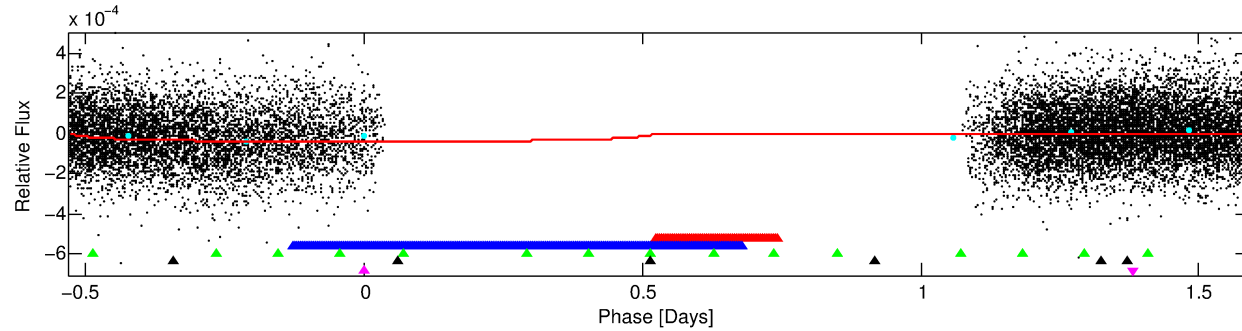
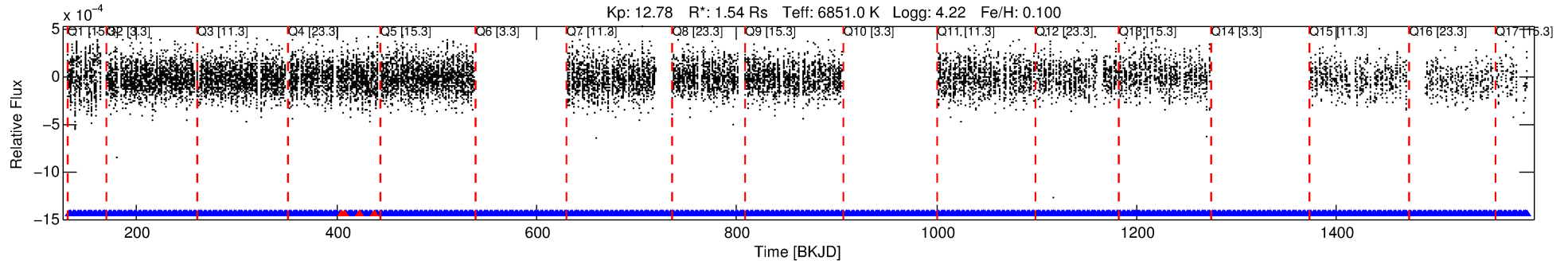
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004667989-05

No Significant Match Found

DV One-Page Summary

KIC: 4667989 Candidate: 5 of 5 Period: 2.117 d



DV Fit Results:

Period = 2.11685 [0.00006] d
Epoch = 132.4693 [0.0339] BKJD
Rp/R* = 0.0058 [0.0009]
a/R* = 1.00 [0.01]
b = 0.02 [41.67]
Seff = 3539.65 [806.52]
Teq = 1967 [112] K
Rp = 0.98 [0.23] Re
a = 0.0363 [0.0056] AU
Ag = 12.95 [5.38] [2.22σ]
Teffp = 5768 [511] K [7.27σ]

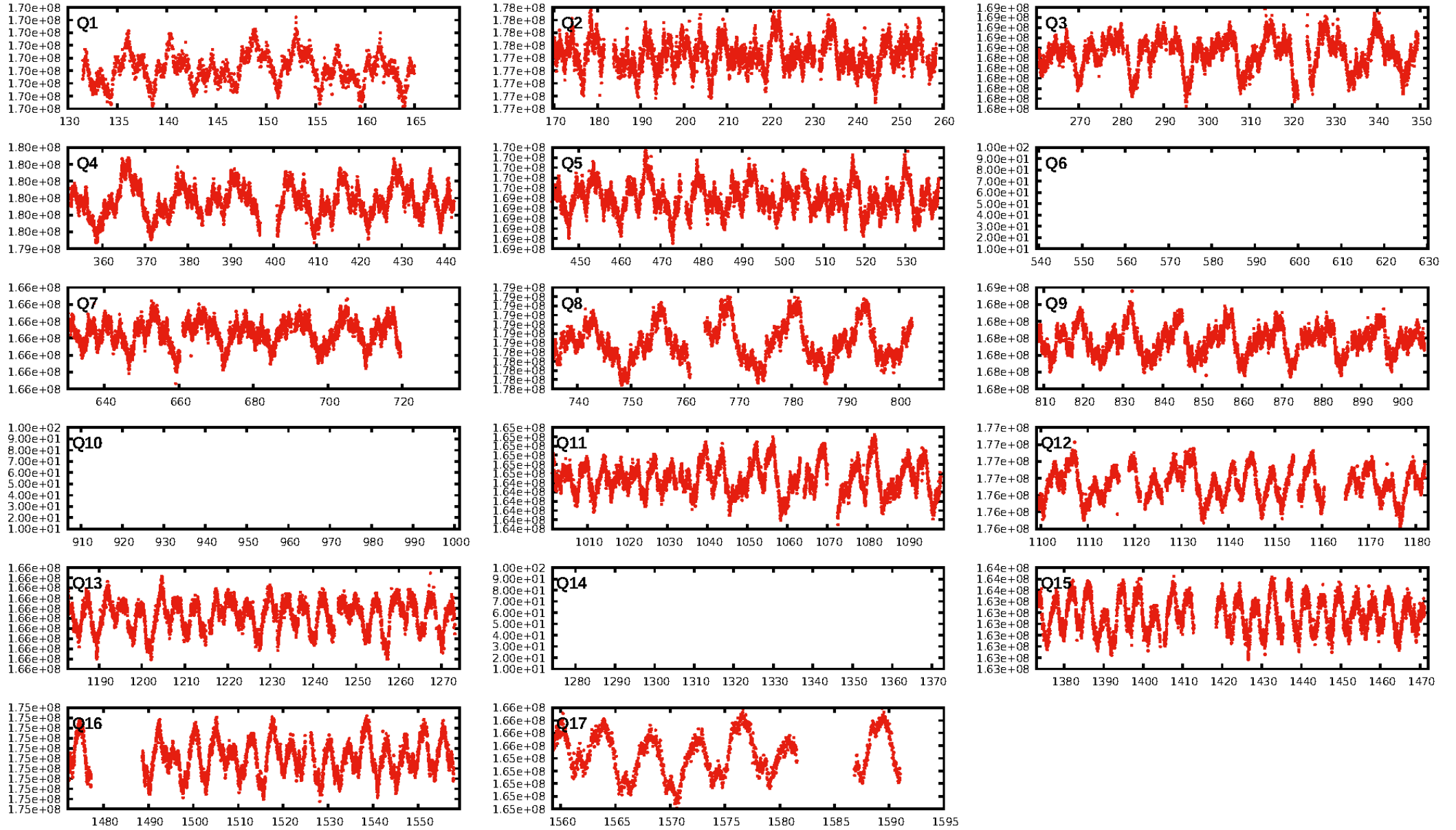
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [398/402]
GhostDiagnostic-chr: 1.998
Centroid-sig: 0.5%
Centroid-so: 0.853 arcsec [2.19σ]
OotOffset-rm: 7.060 arcsec [1.61σ]
KicOffset-rm: 7.088 arcsec [1.89σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.00 [0/14]

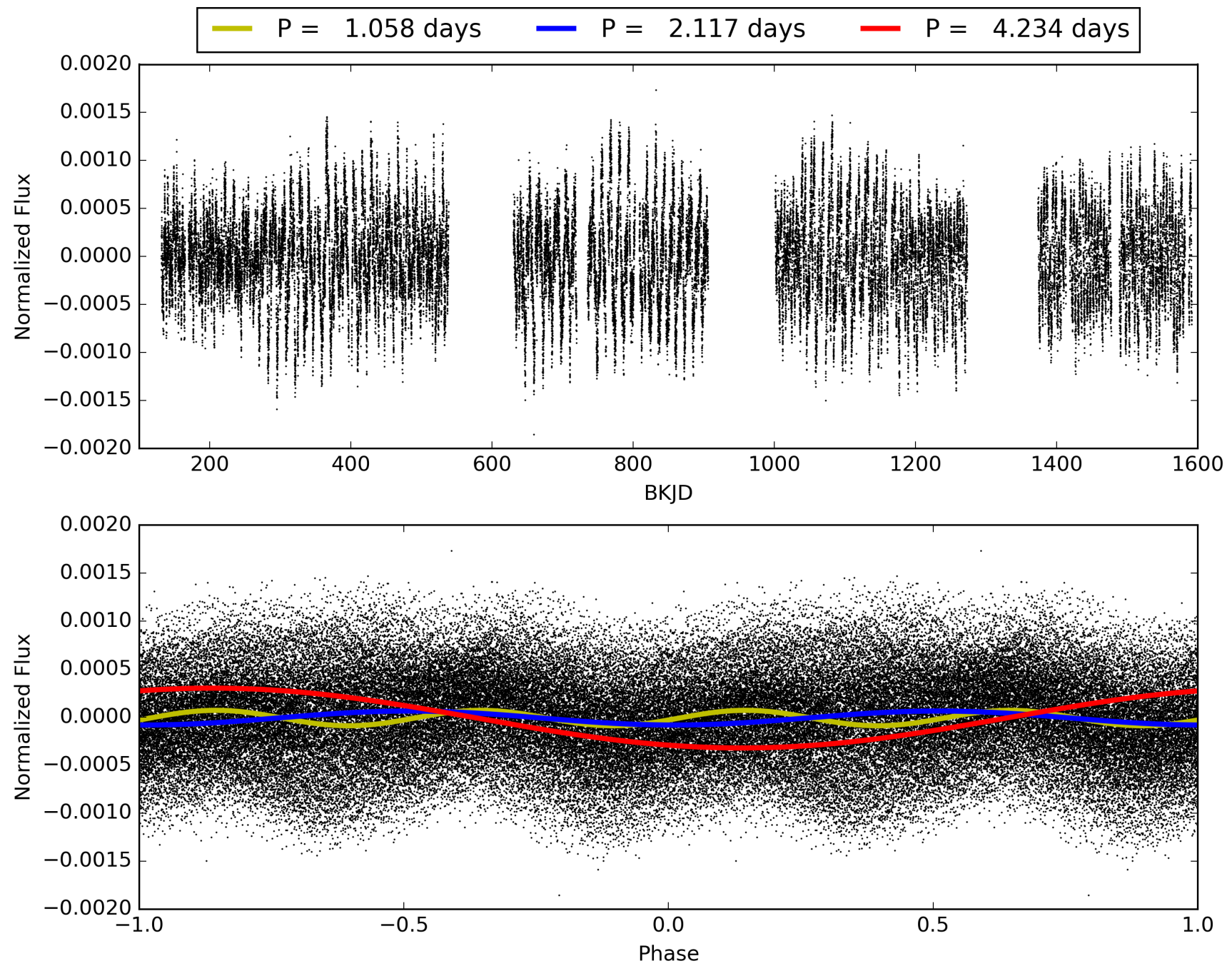
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:39:26 Z

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

TCE 004667989-05, PDC Light Curves

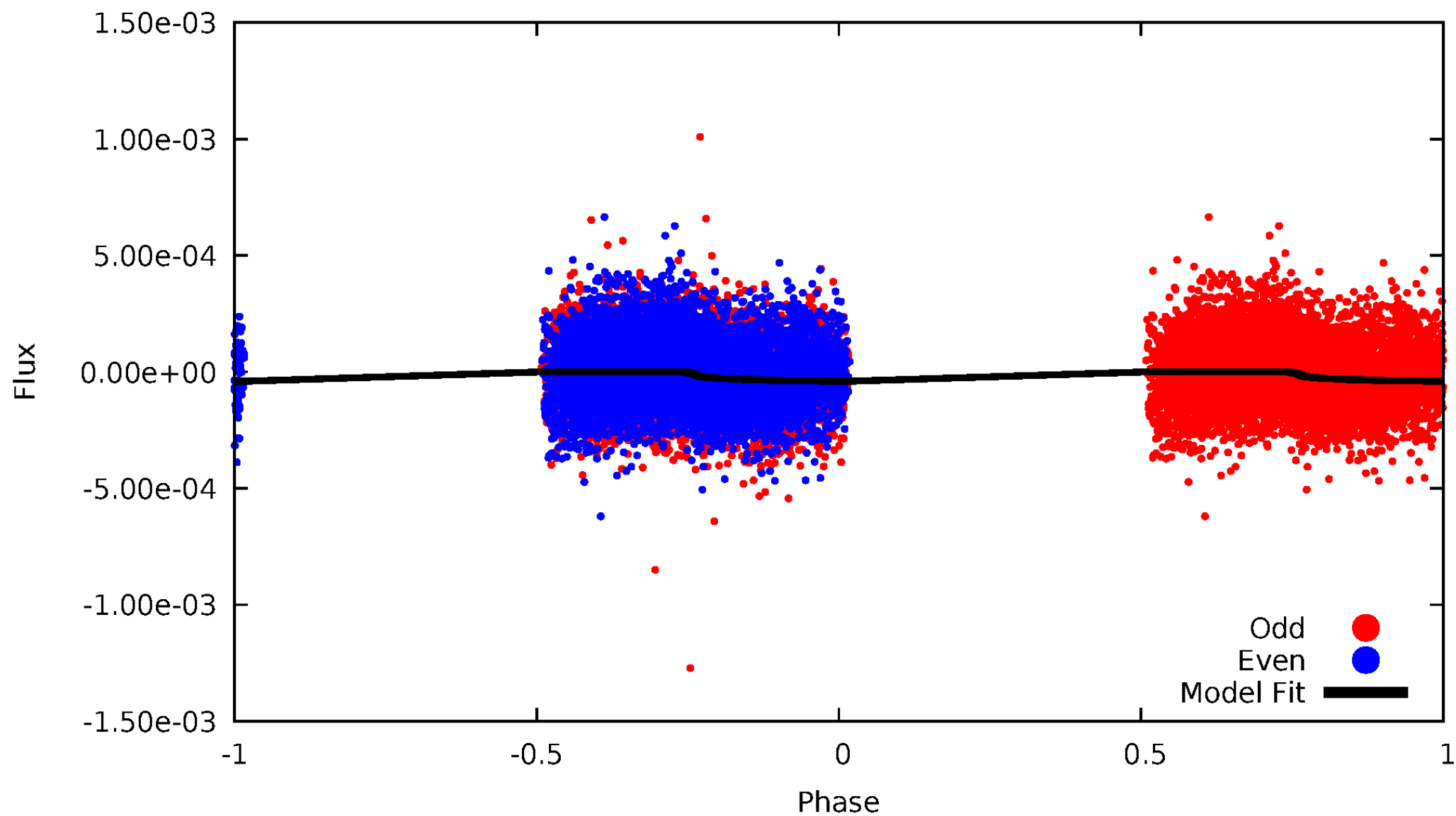


TCE 004667989-05



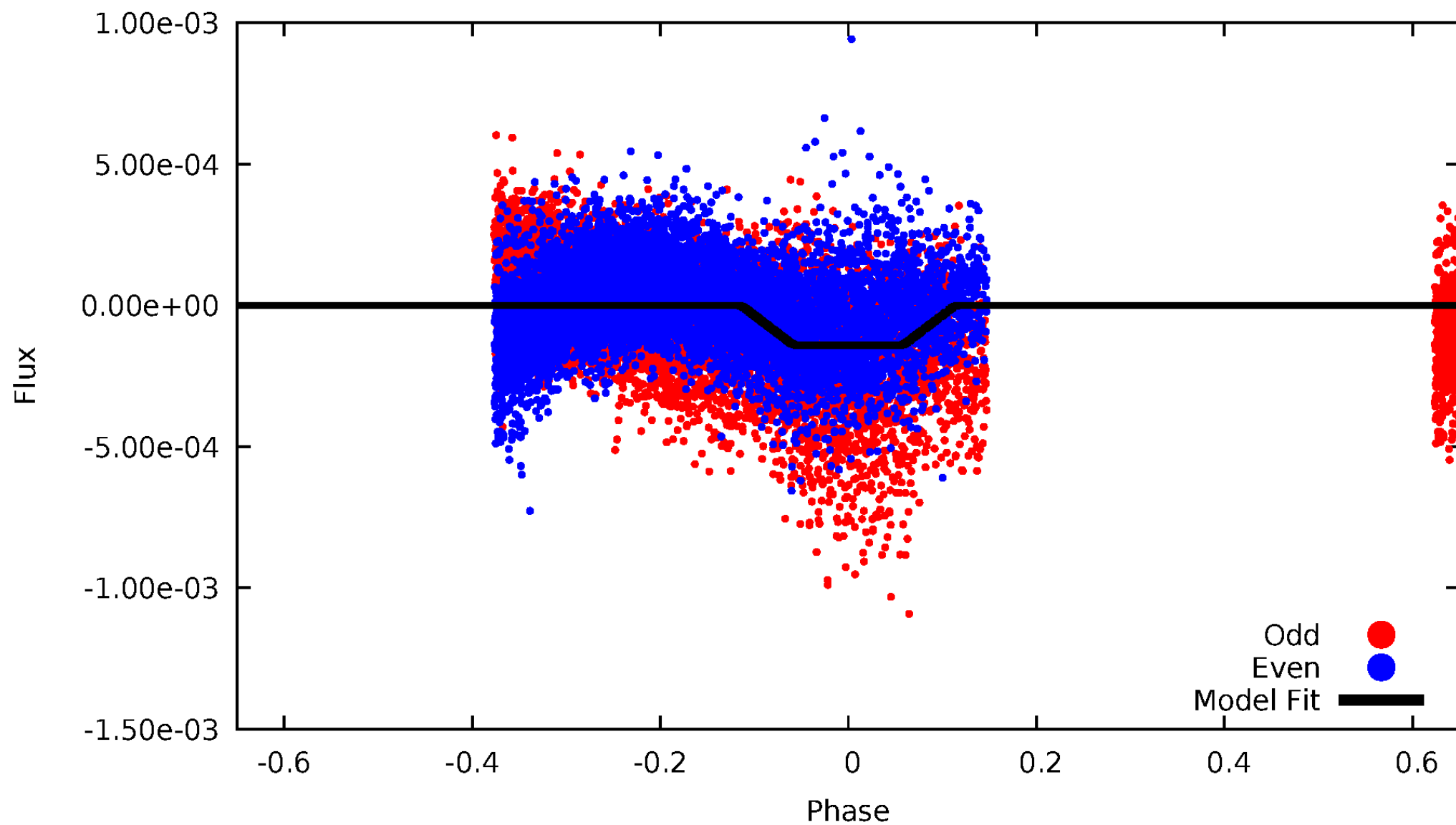
DV Odd/Even

TCE 004667989-05

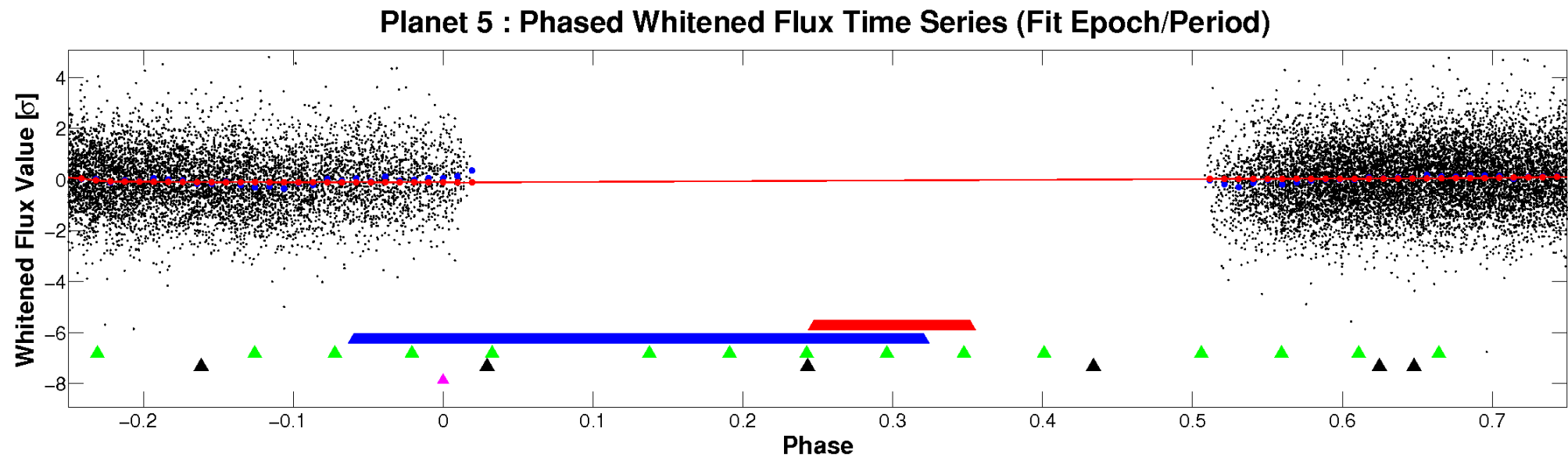
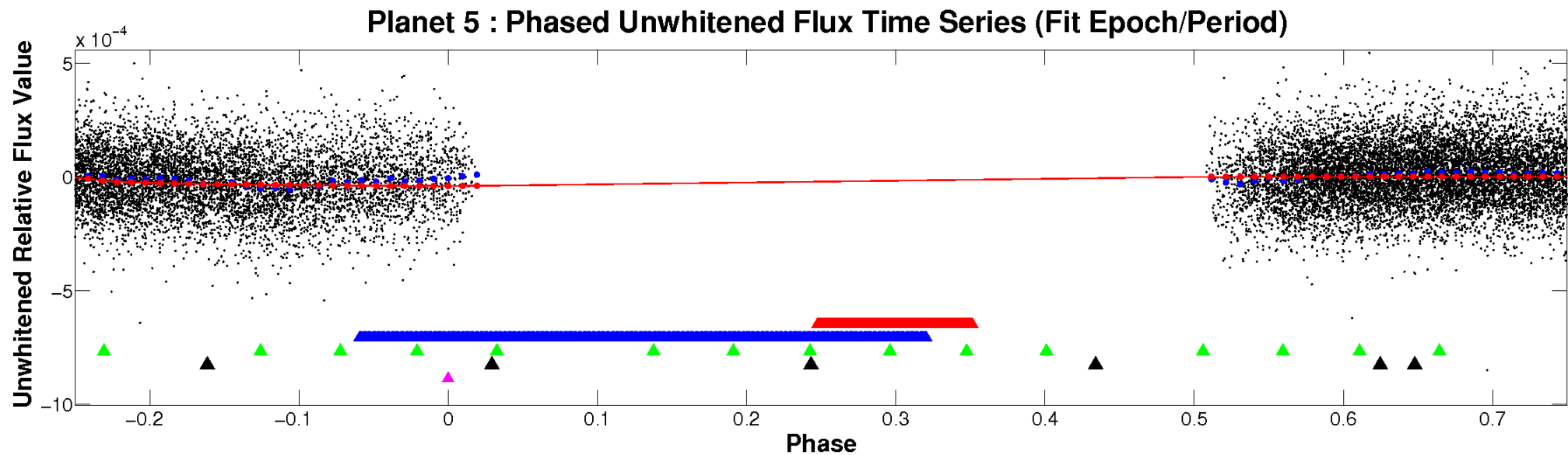


ALT Odd/Even

TCE 004667989-05

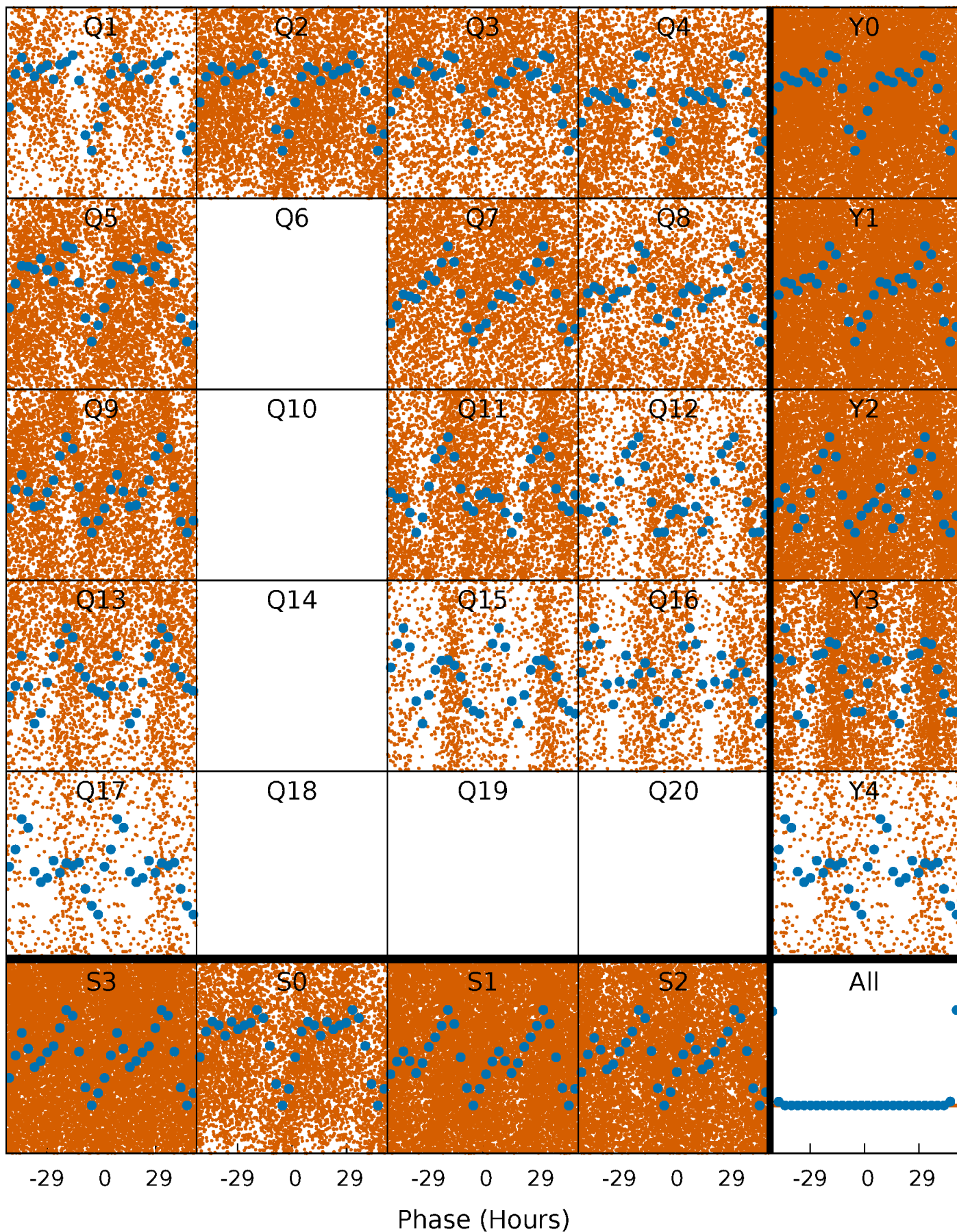


Non-Whitened Vs. Whitened Light Curve



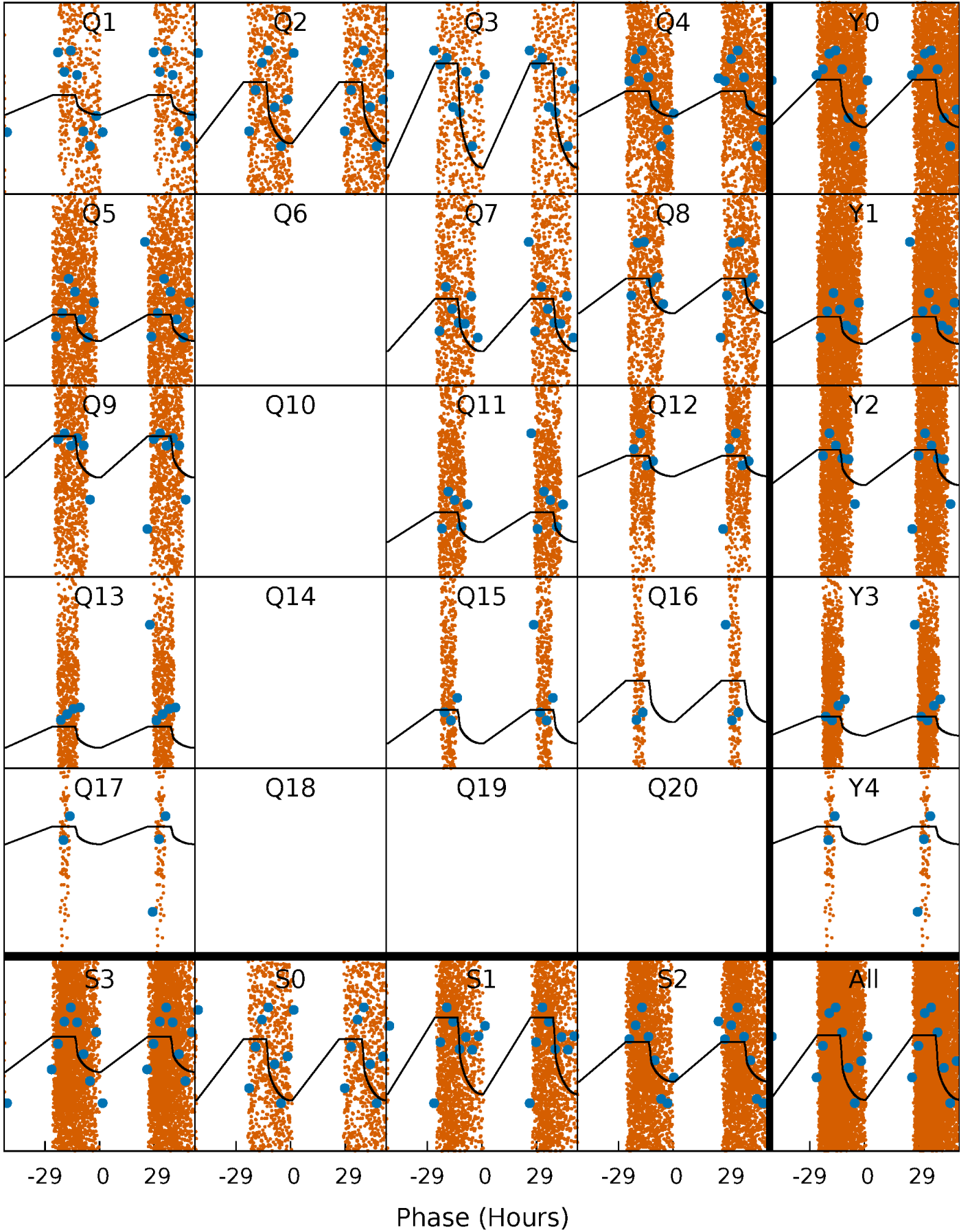
PDC Quarter-Phased Transit Curves

TCE 004667989-05 $P = 2.116854$ Days $T_0 = 132.469332$ (BKJD)



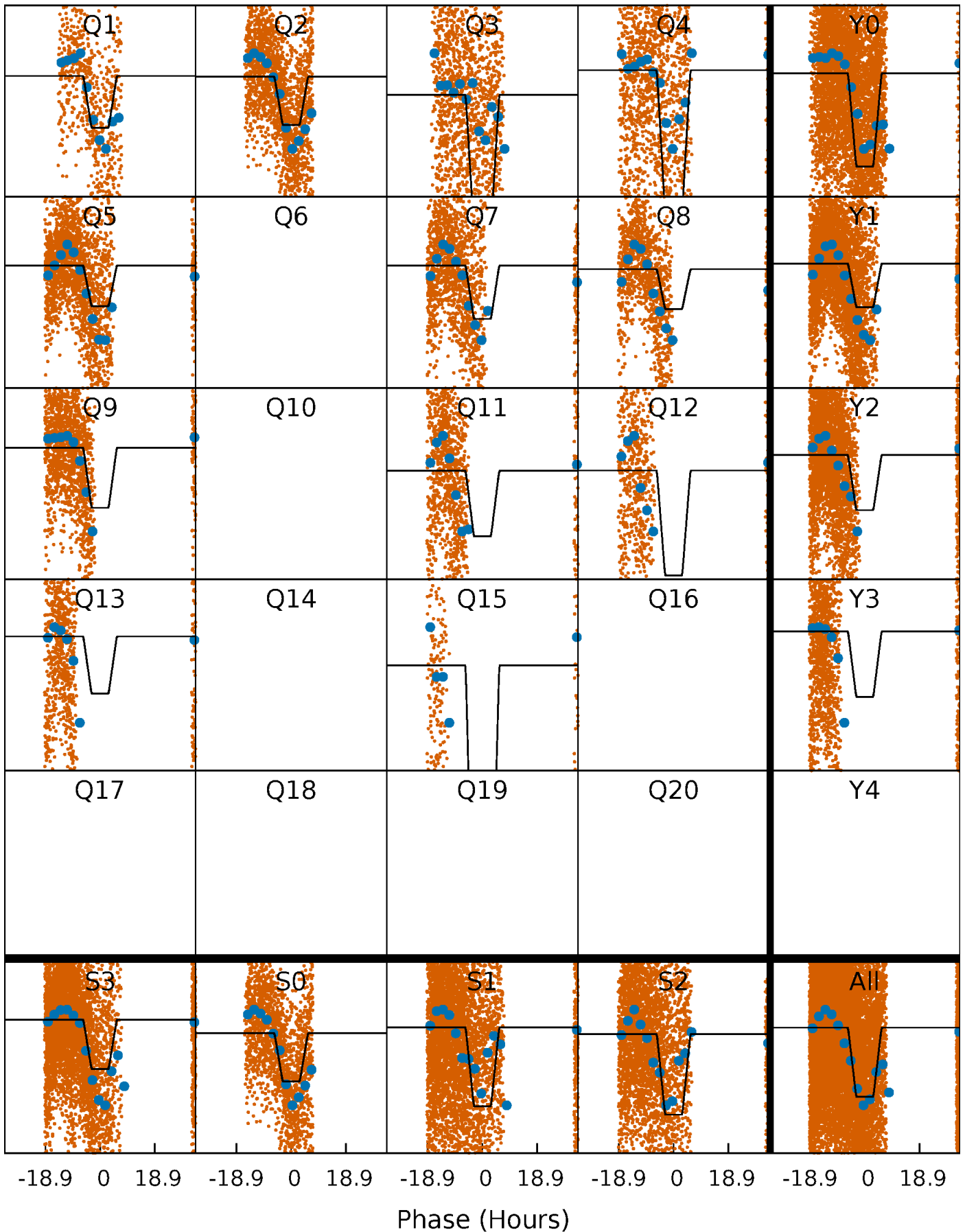
DV Quarter-Phased Transit Curves

TCE 004667989-05 $P = 2.116854$ Days $T_0 = 132.469332$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

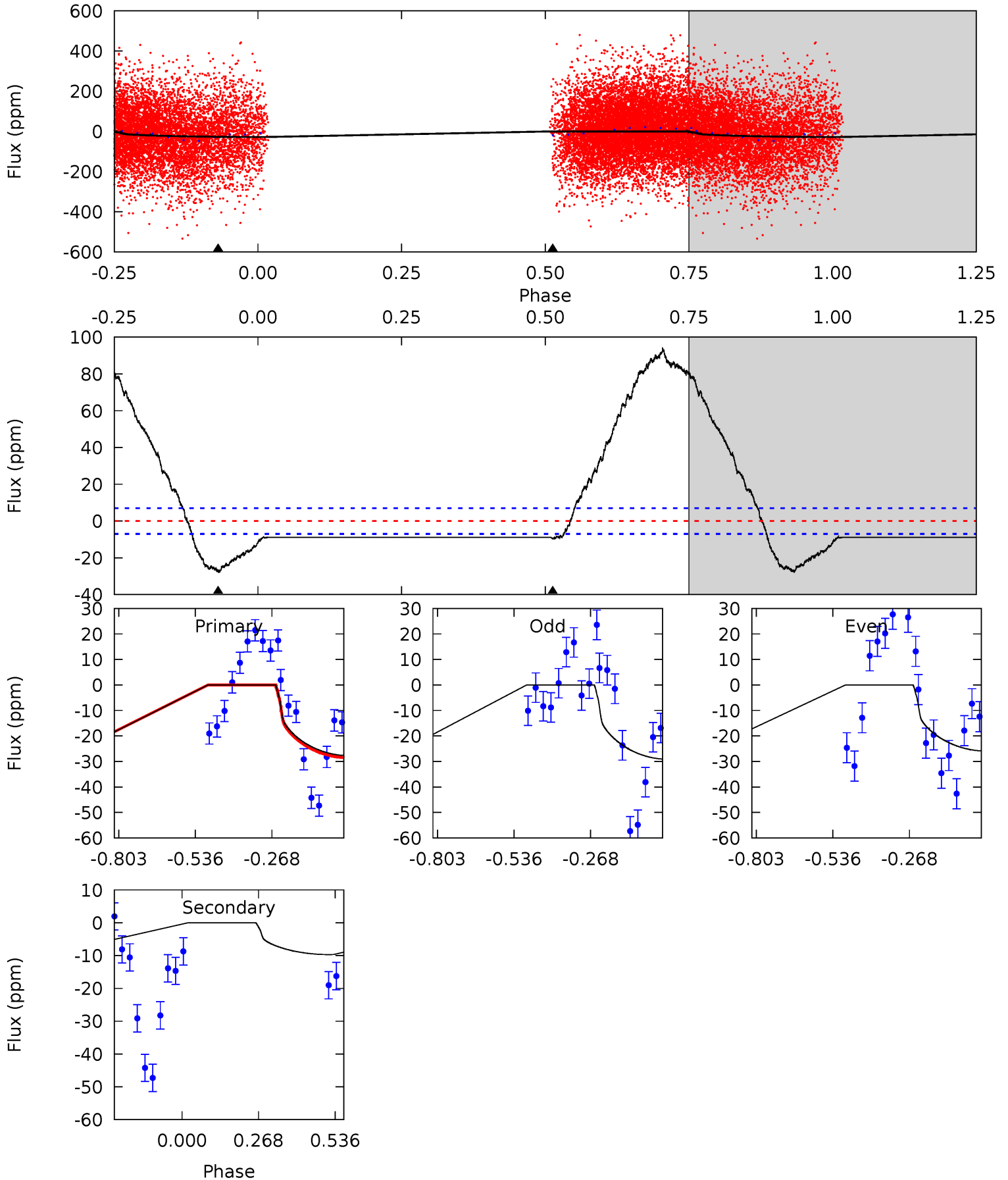
TCE 004667989-05 P= 2.117186 Days $T_0=132.173868$ (BKJD)



DV Model-Shift Uniqueness Test

004667989-05, P = 2.116854 Days, E = 130.352478 Days

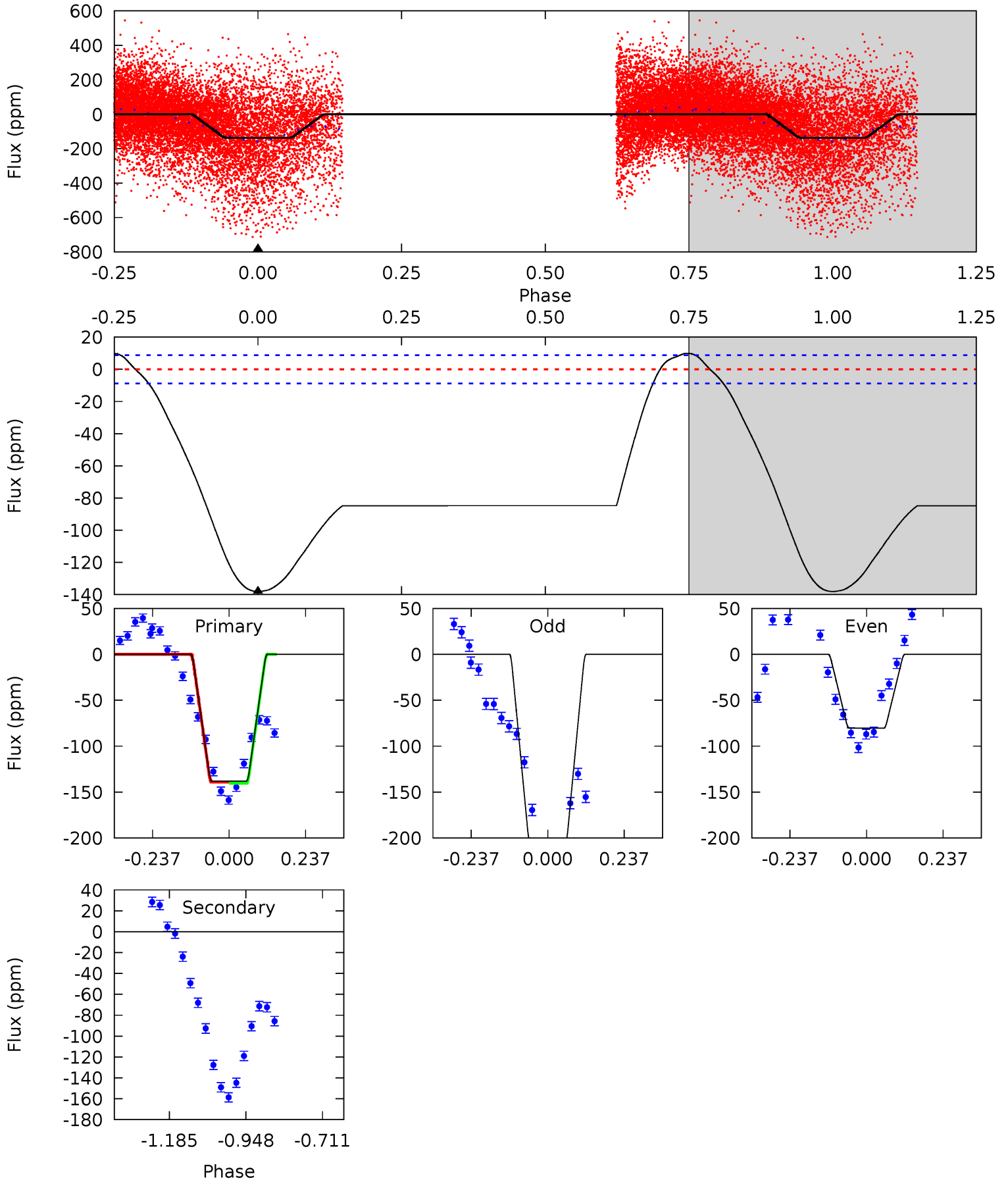
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	6.04	0	0	4.35	1.11	8.79	17.2	17.2	6.04	6.04	0.99	0.68	0.77	3.69



Alt Model-Shift Uniqueness Test

004667989-05, P = 2.117186 Days, E = 130.056682 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.9	0	0	0	4.38	1.18	13.9	68.9	68.9	0	0	31.2	1.44	0.07	0.20



Stellar Parameters For KIC 004667989

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	6851^{+72}_{-82}	$4.218^{+0.048}_{-0.120}$	$0.100^{+0.150}_{-0.150}$	$1.538^{+0.289}_{-0.103}$	$1.426^{+0.112}_{-0.071}$	$0.552^{+0.115}_{-0.198}$
	+1%/-1%	+1%/-3%	+150%/-150%	+19%/-7%	+8%/-5%	+21%/-36%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004667989-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-10 ± 2	$1.01^{+0.17}_{-0.17}$	2768^{+112}_{-73}	5007^{+419}_{-362}	$6.817^{+3.219}_{-2.004}$
Alt.	0 ± 2	$2.04^{+0.22}_{-0.20}$	2764^{+113}_{-73}	-2986^{+5116}_{-320}	$-0.023^{+0.343}_{-0.333}$

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 $A_{obs} \gg 1.0$

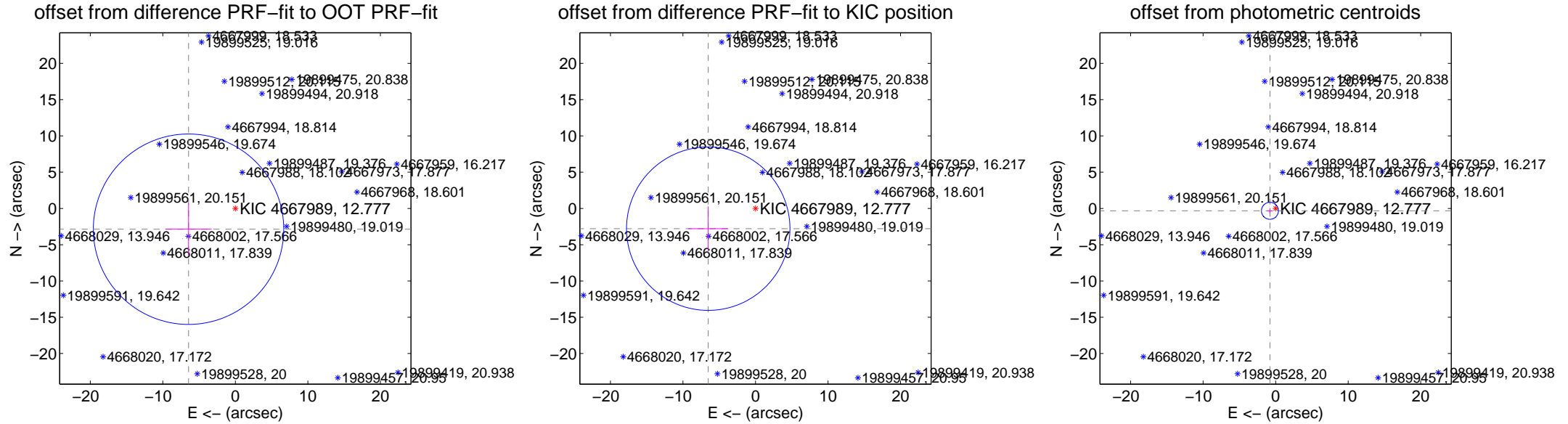
DV Centroid Data

Supplemental centroid analysis for 004667989-05. Kepler magnitude: 12.78. Transit SNR 9.32

There are 0 quarters with good PRF difference image offsets

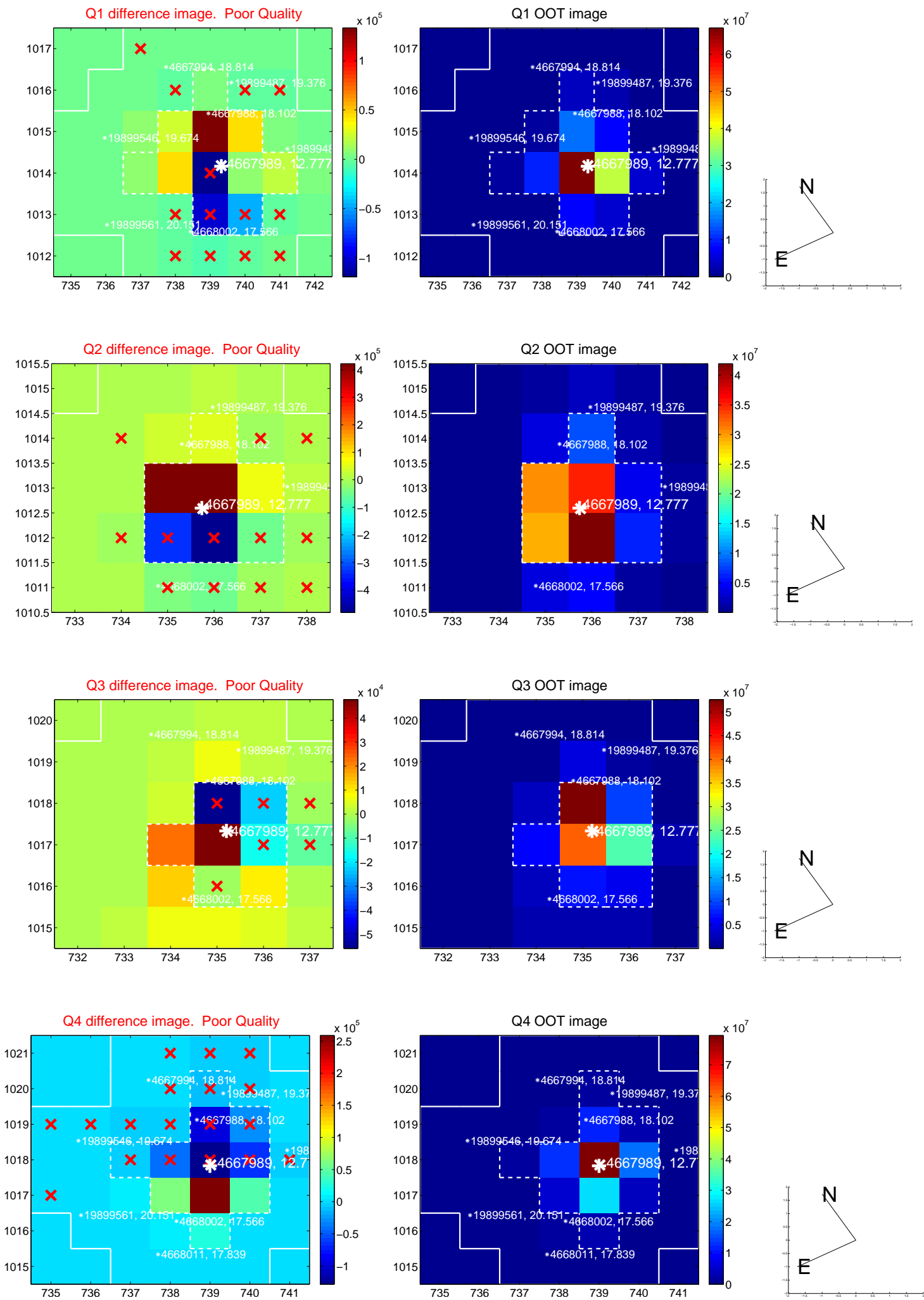
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.060 ± 4.376	1.61	6.454 ± 3.198	-2.862 ± 3.584
PRF-fit source offset from KIC position	7.088 ± 3.756	1.89	6.516 ± 2.774	-2.788 ± 3.063
photometric centroid source offset	0.85 ± 0.39	2.19	0.79 ± 0.39	-0.33 ± 0.38

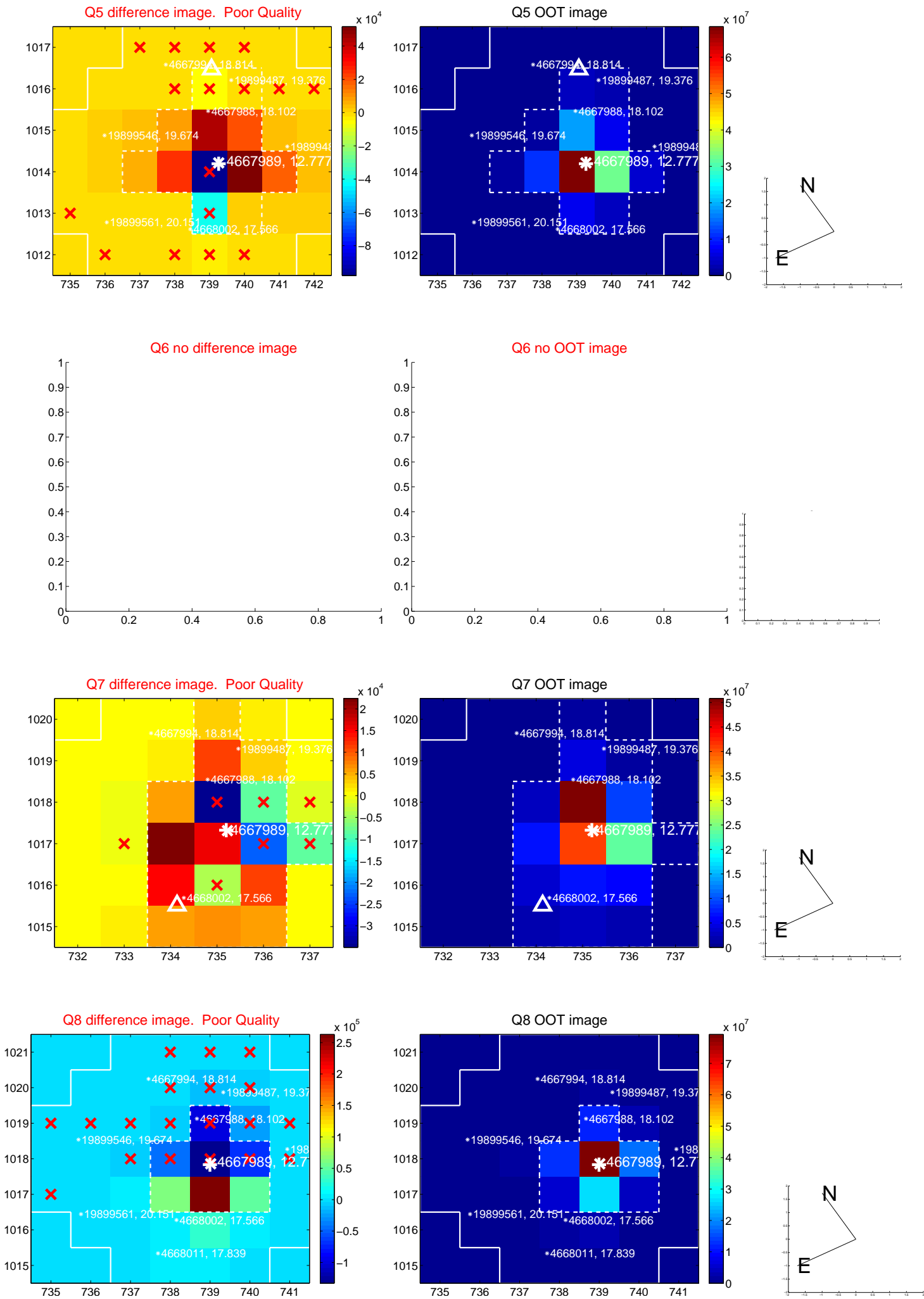


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

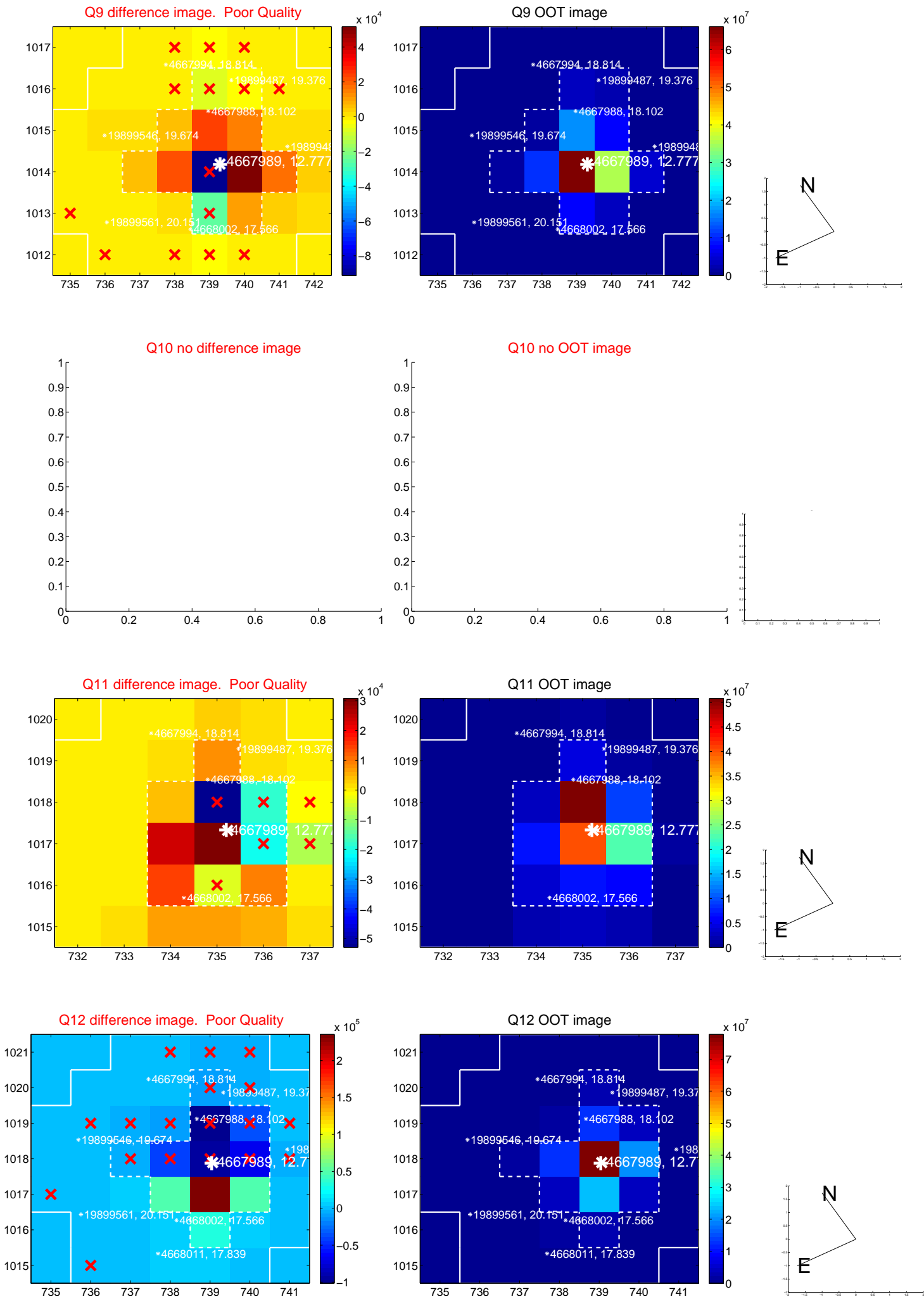
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



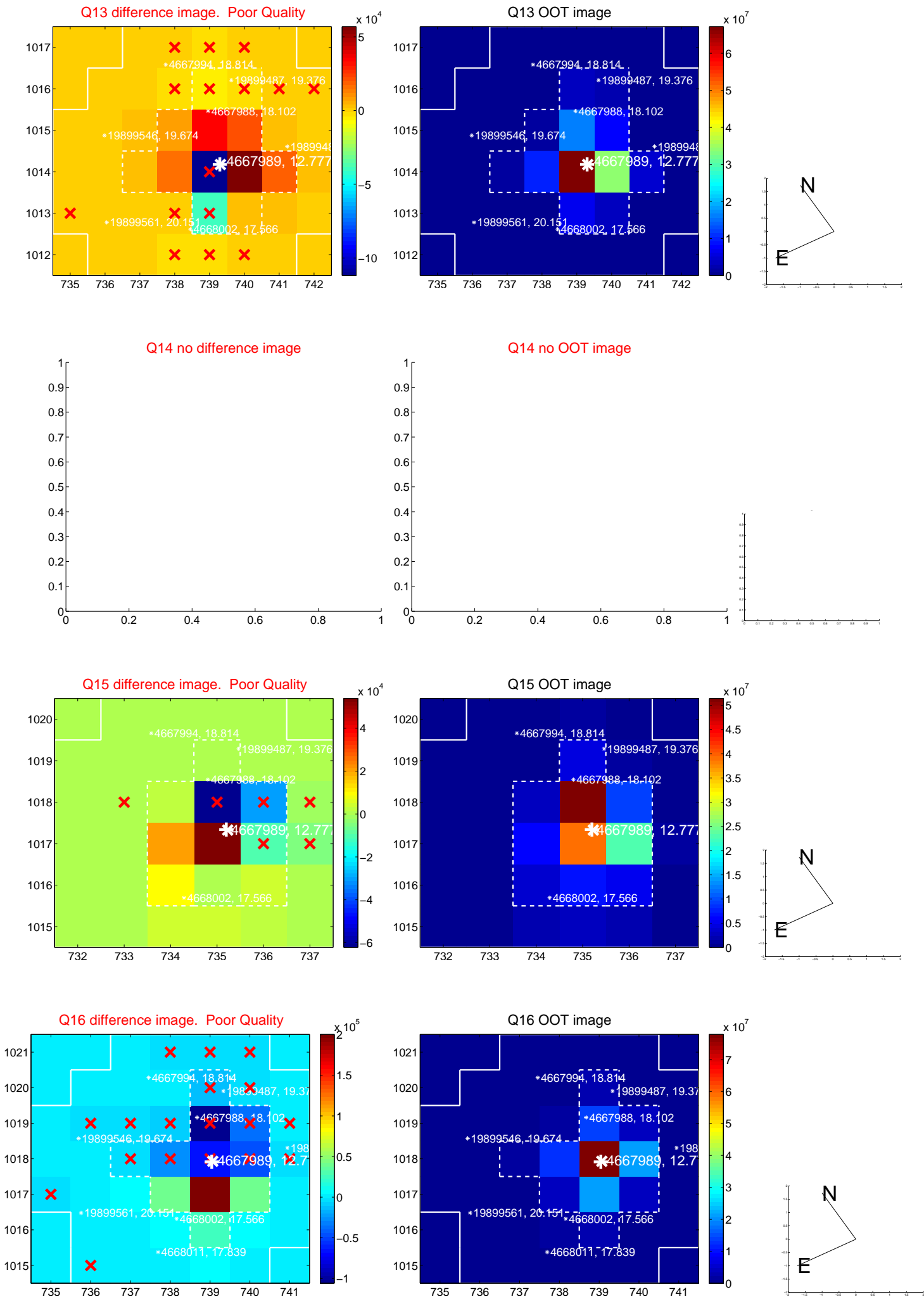
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



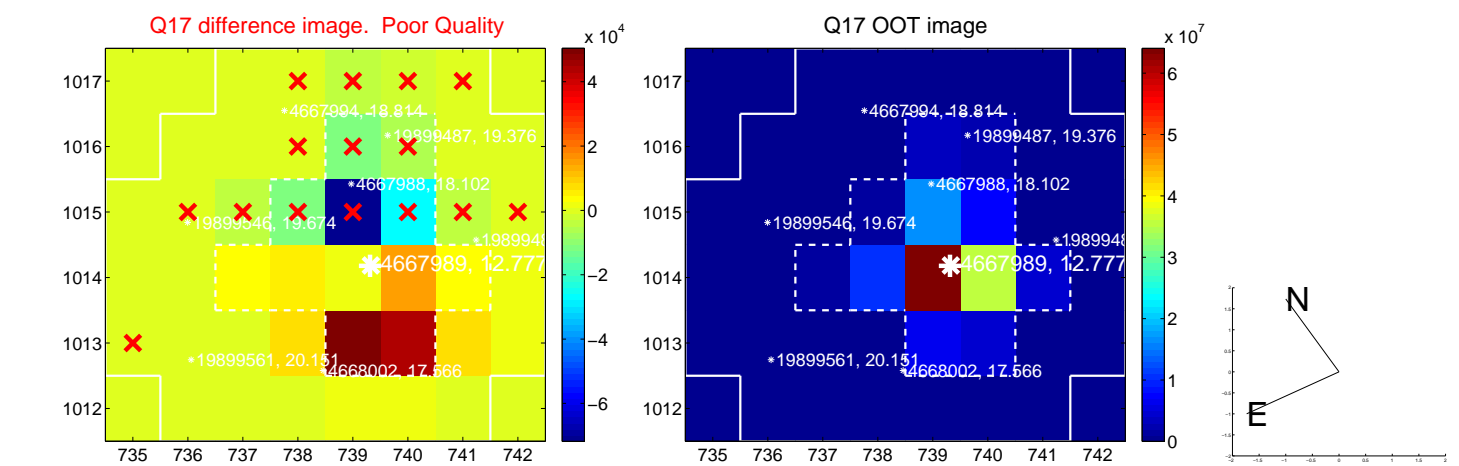
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



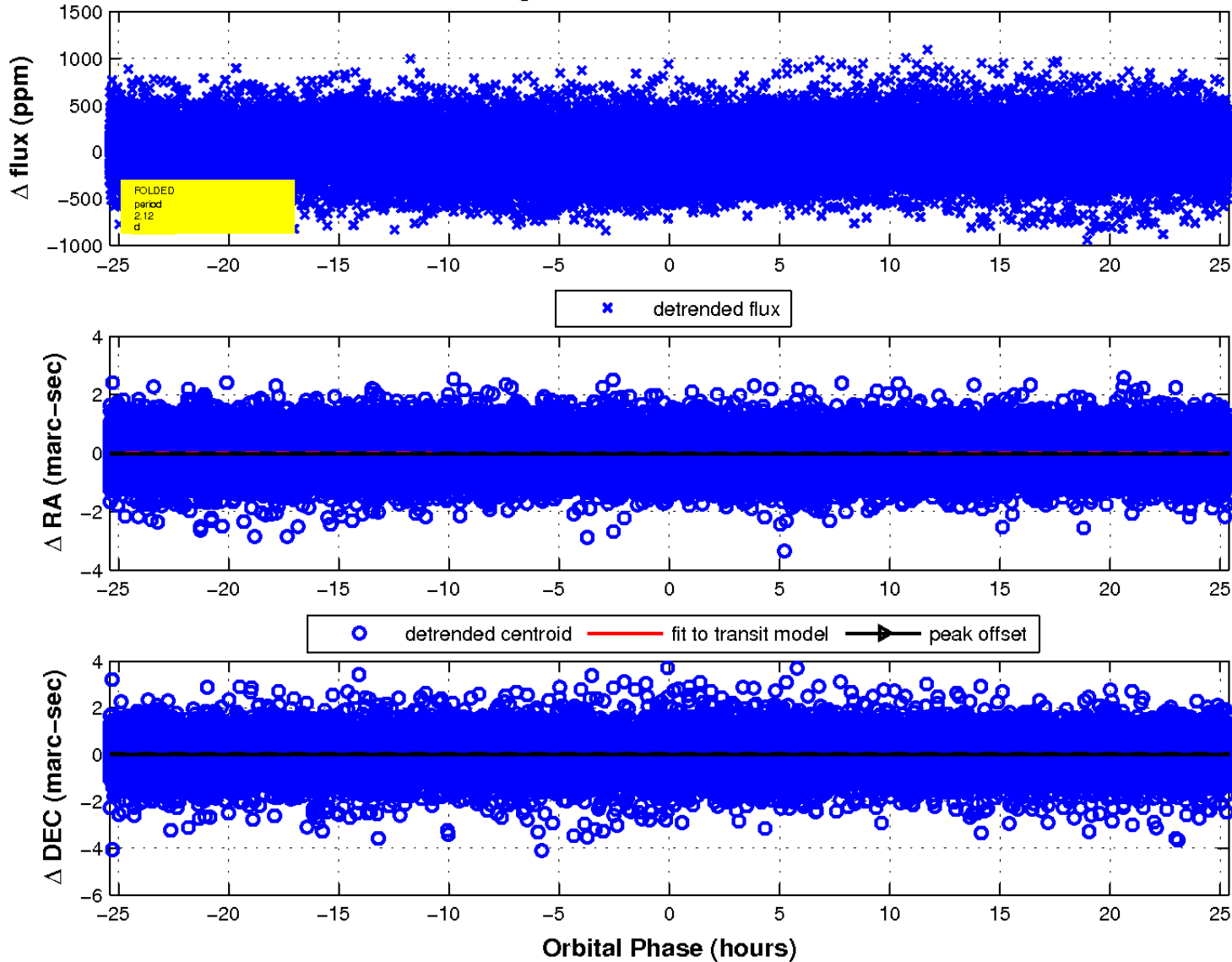
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 5 of 5



UKIRT Image

Declination

