

KIC 004737720

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})
004737720-01	OBS	No	0.588998	131.704380	20.2	0.606	10.5	7.1	2.67	7719	1.27	77266.99
004737720-02	OBS	No	0.965337	131.852926	13.6	6.676	8.2	6.3	2.67	7719	1.00	39985.95
004737720-03	OBS	No	45.474176	144.144273	222.1	1.390	11.1	6.6	2.67	7719	4.04	235.03

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004737720-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
004737720-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_SATURATED
004737720-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST

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

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

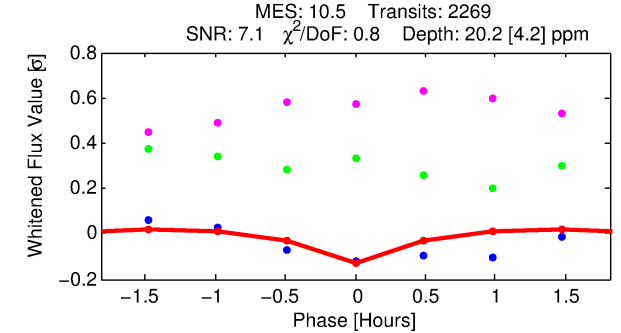
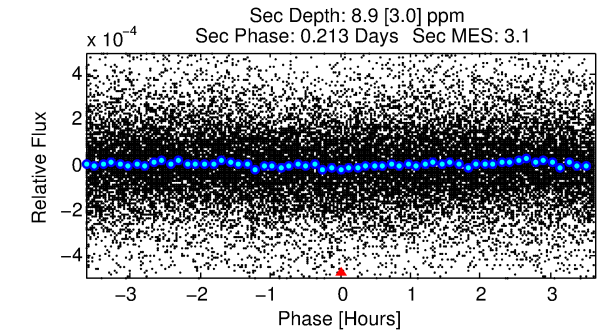
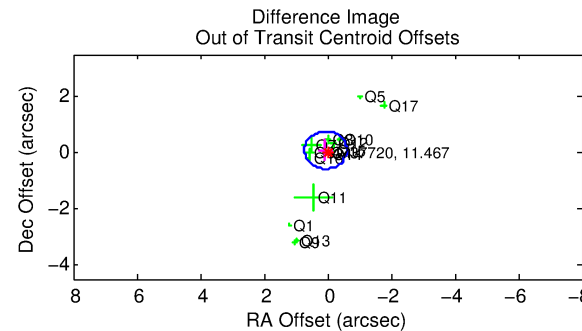
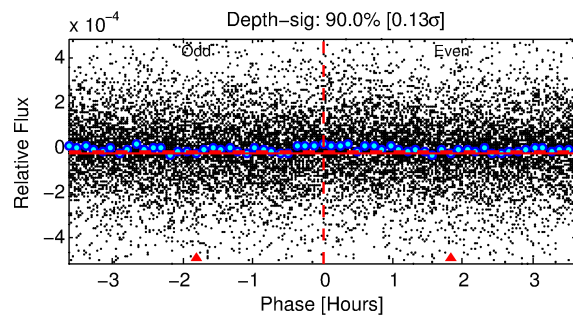
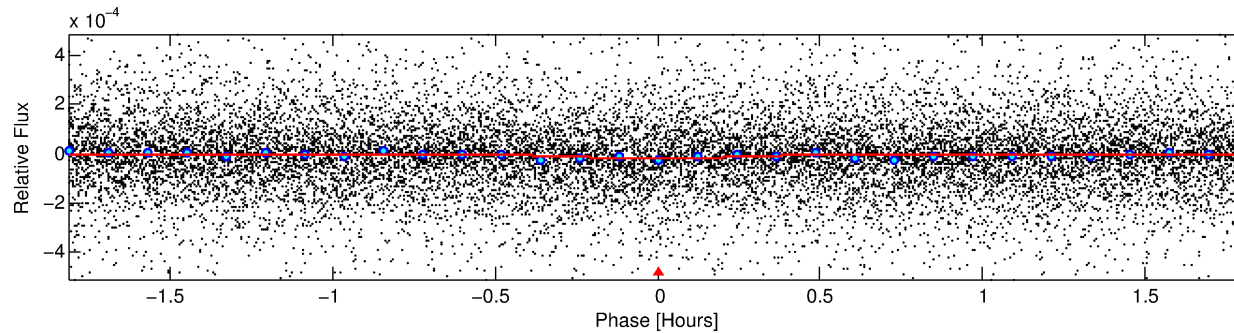
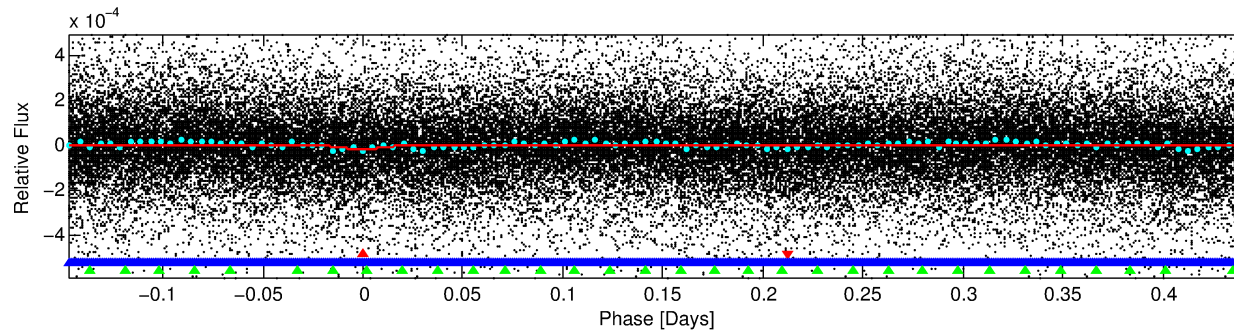
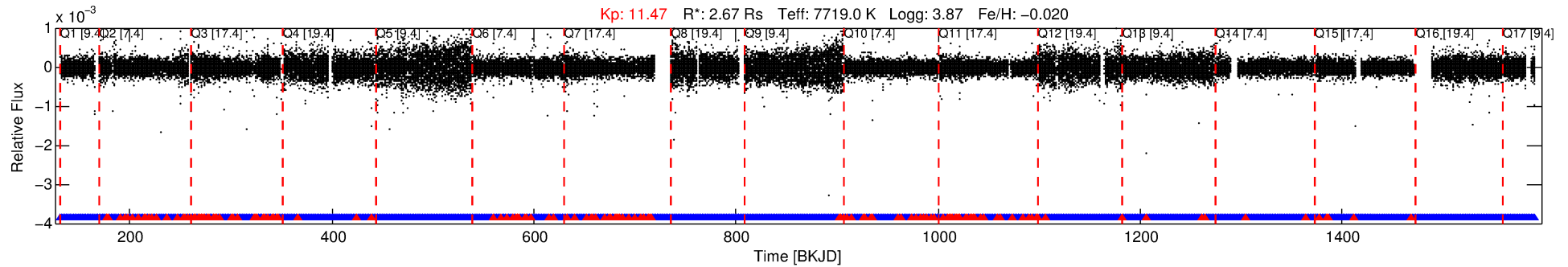
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004737720-01

No Significant Match Found

DV One-Page Summary

KIC: 4737720 Candidate: 1 of 3 Period: 0.589 d



DV Fit Results:

Period = 0.58900 [0.00002] d
Epoch = 131.7044 [0.0019] BKJD
Rp/R* = 0.0044 [0.0014]
a/R* = 6.51 [11.16]
b = 0.50 [2.63]
Seff = 77266.98 [23034.26]
Teq = 4251 [317] K
Rp = 1.28 [0.48] Re
a = 0.0171 [0.0033] AU
Ag = 0.88 [0.67] [-0.18 σ]
Teffp = 6368 [1123] K [1.81 σ]

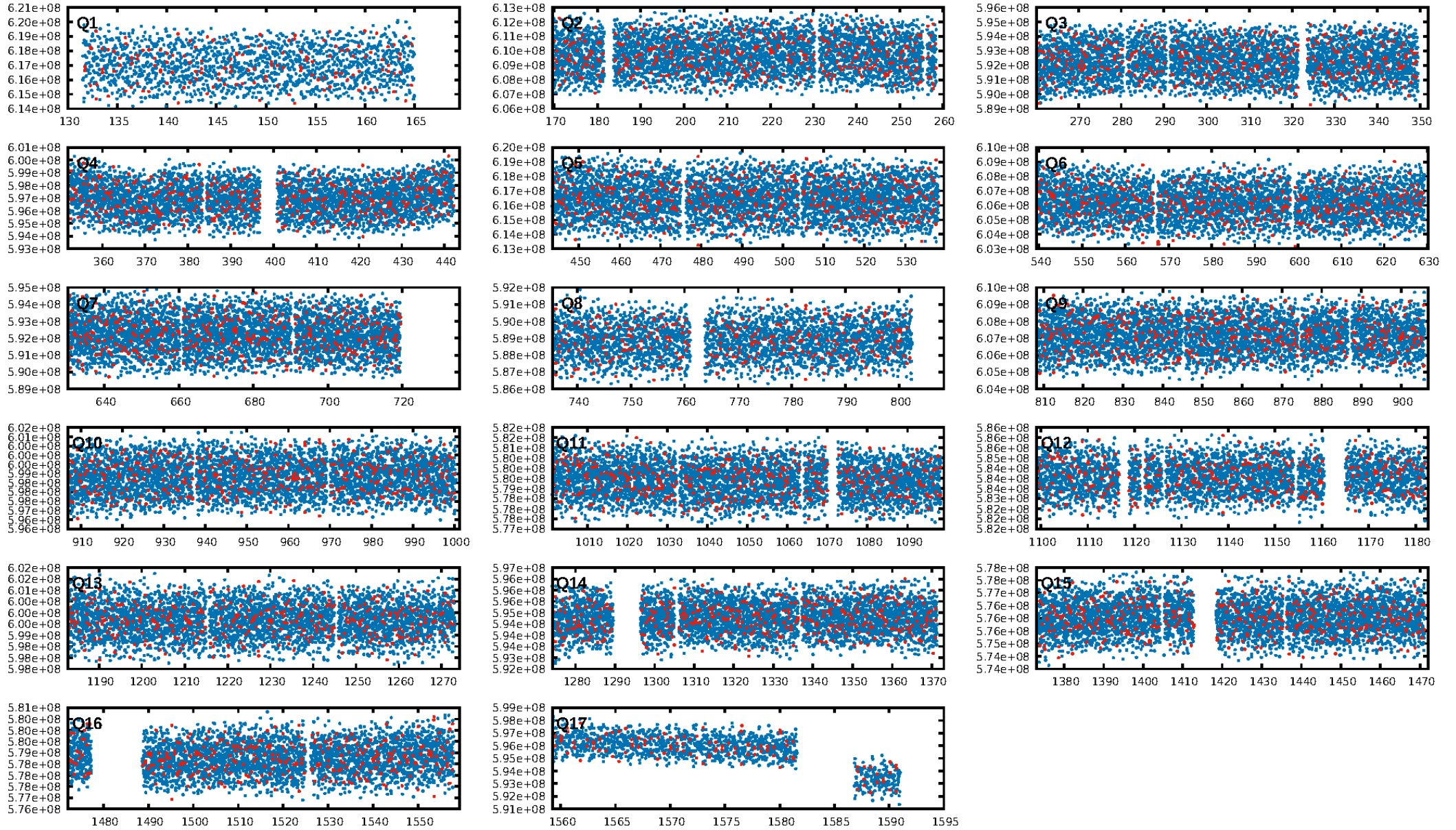
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 82.2% [1.35 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.56e-08
RollingBand-fgt: 0.93 [2016/2167]
GhostDiagnostic-chr: 1.058
Centroid-sig: N/A
Centroid-so: 0.599 arcsec [0.87 σ]
OotOffset-rm: 0.110 arcsec [0.50 σ]
KicOffset-rm: 0.192 arcsec [1.10 σ]
OotOffset-st: 3/3/4/5 [15]
KicOffset-st: 3/3/4/5 [15]
DiffImageQuality-fgm: 0.47 [7/15]
DiffImageOverlap-fno: 1.00 [17/17]

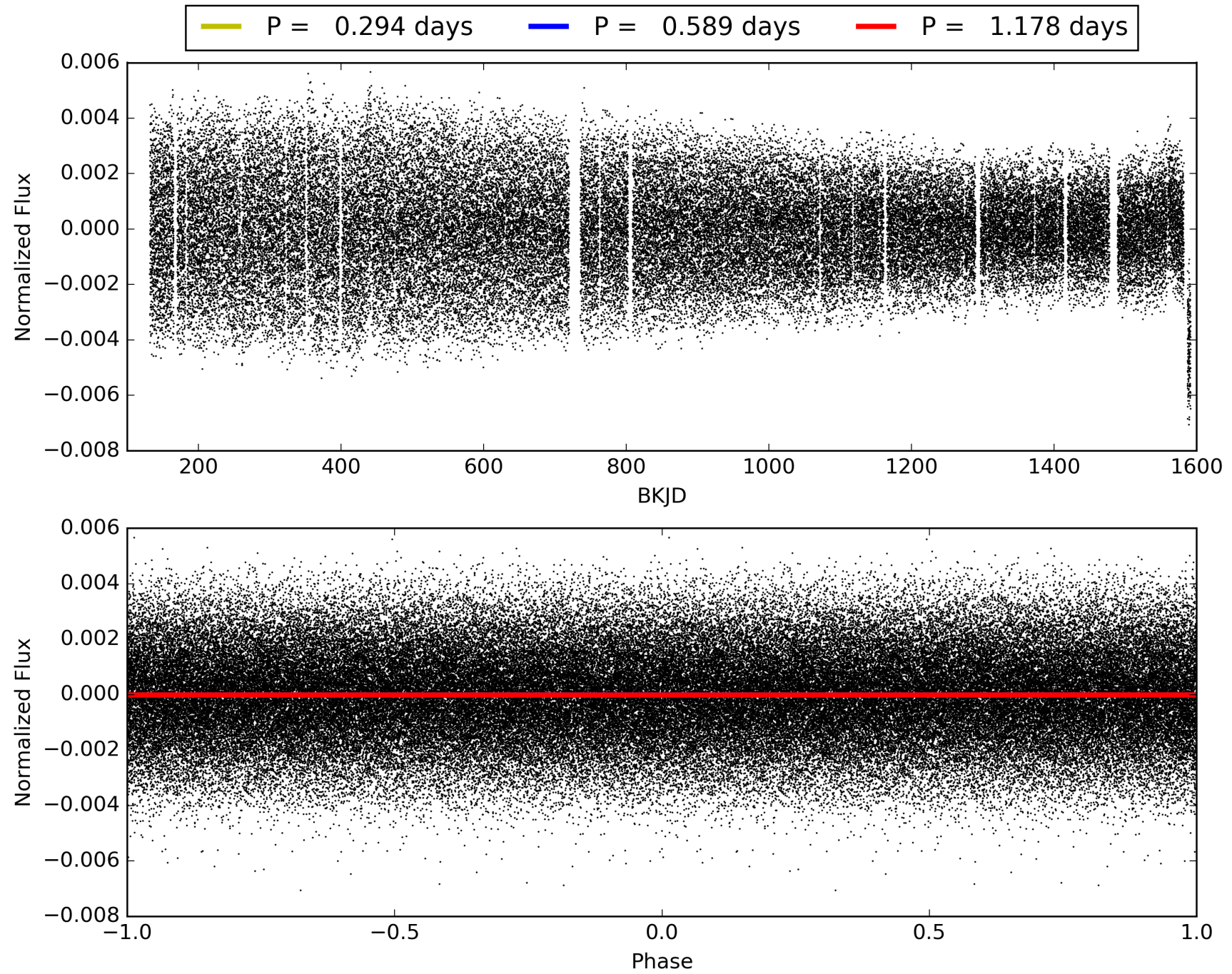
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004737720-01, PDC Light Curves

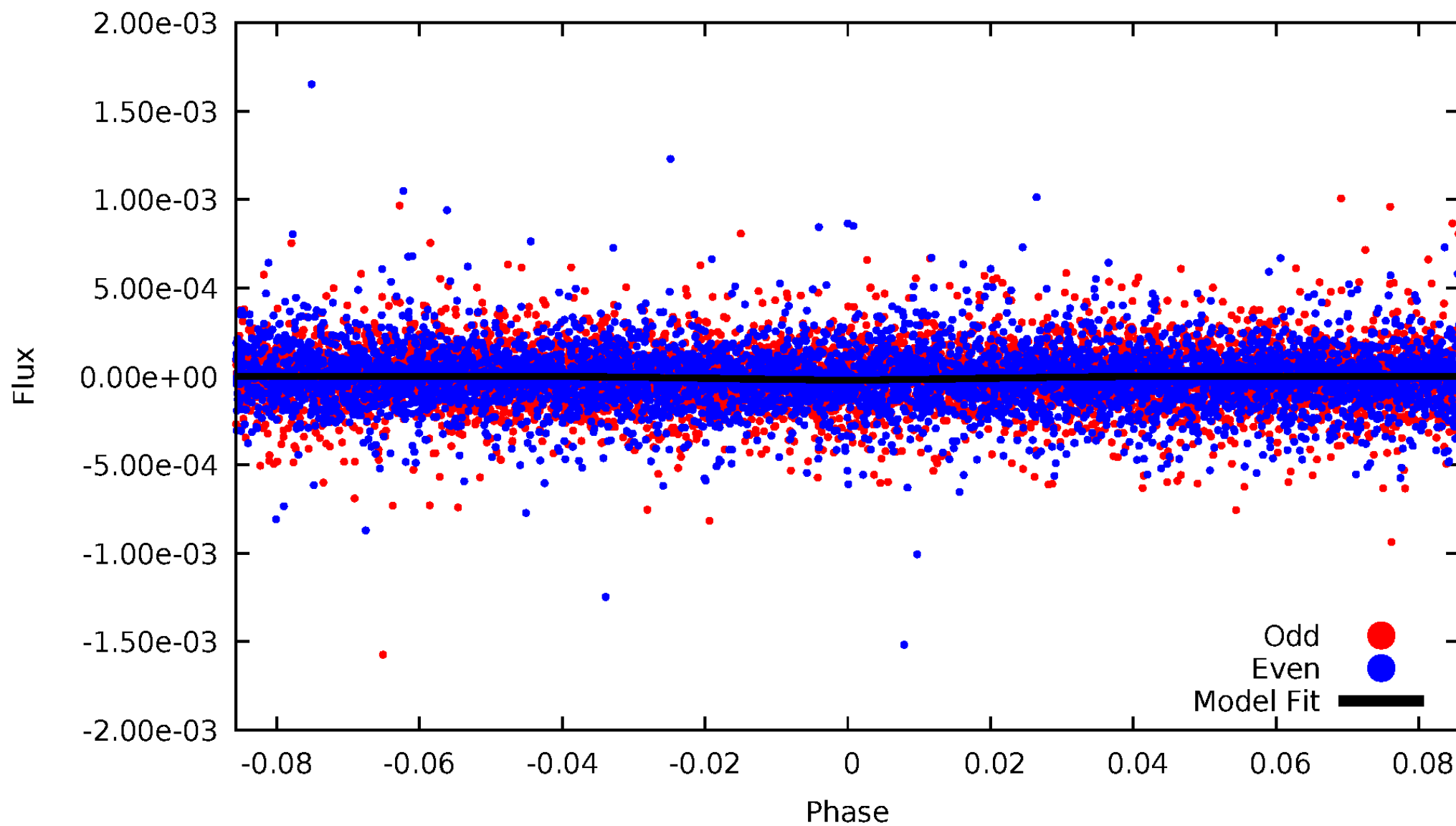


TCE 004737720-01



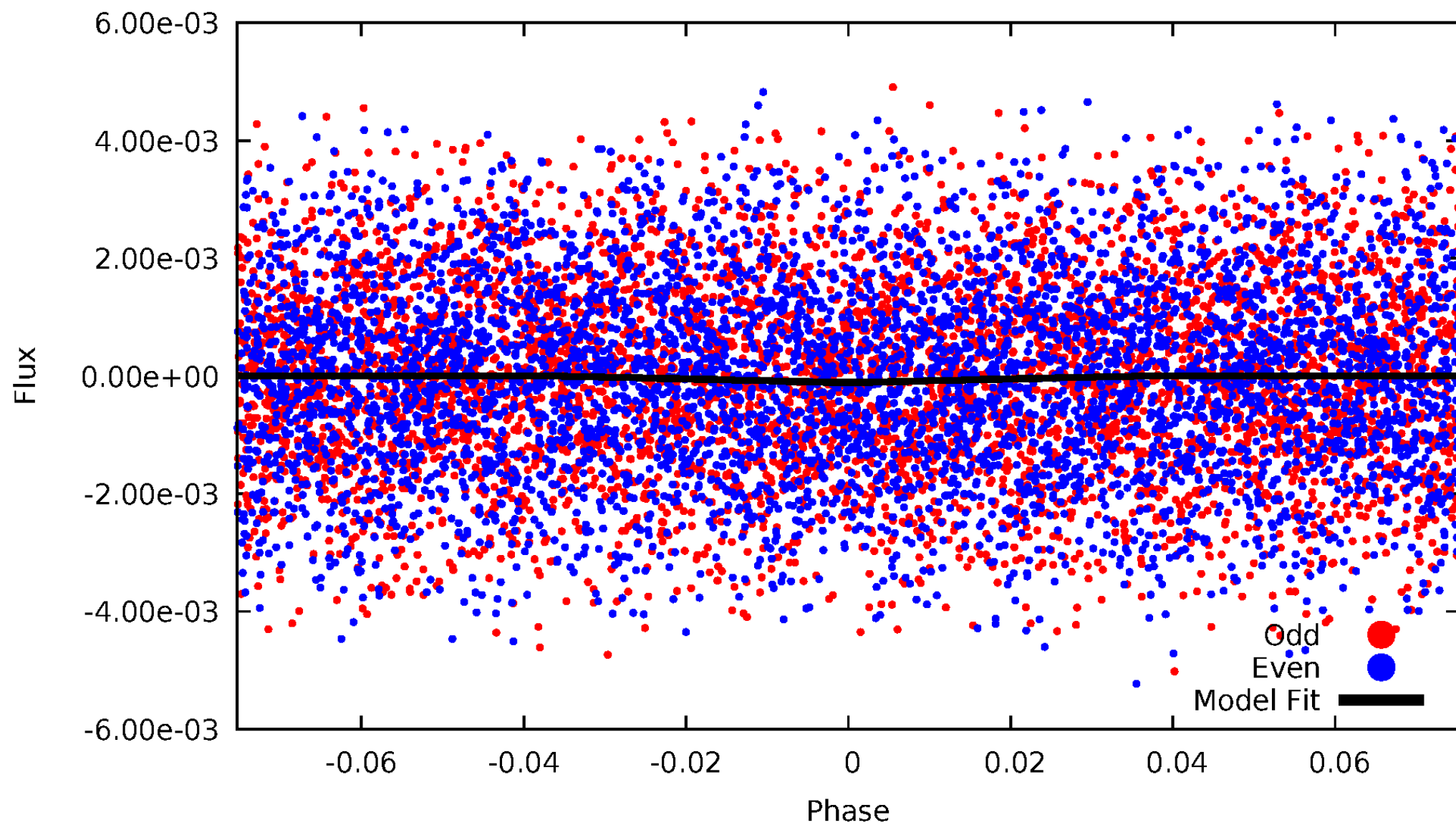
DV Odd/Even

TCE 004737720-01



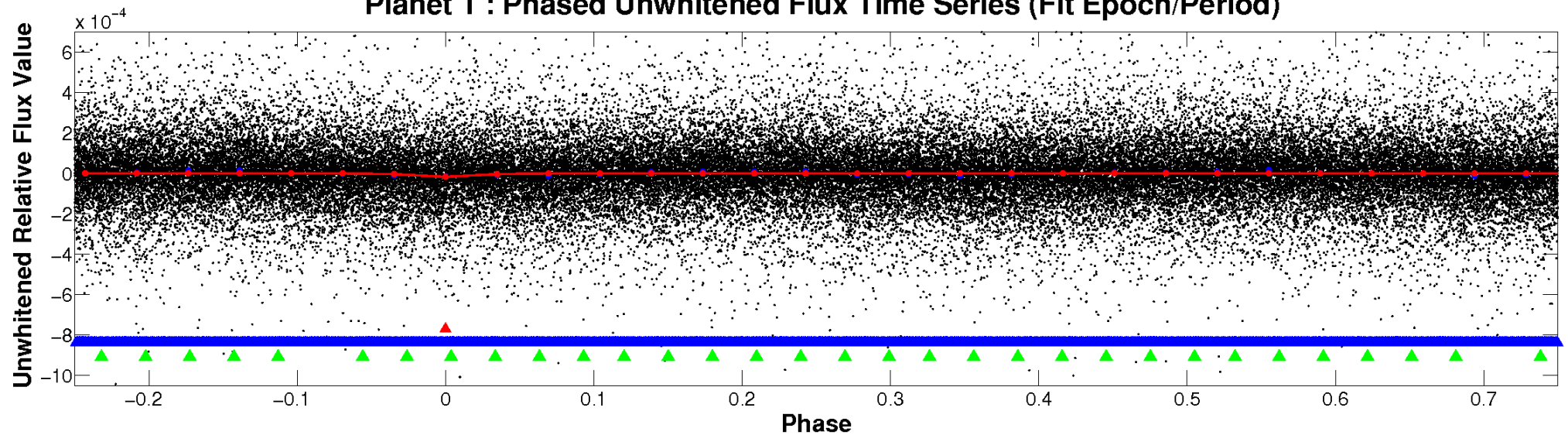
ALT Odd/Even

TCE 004737720-01

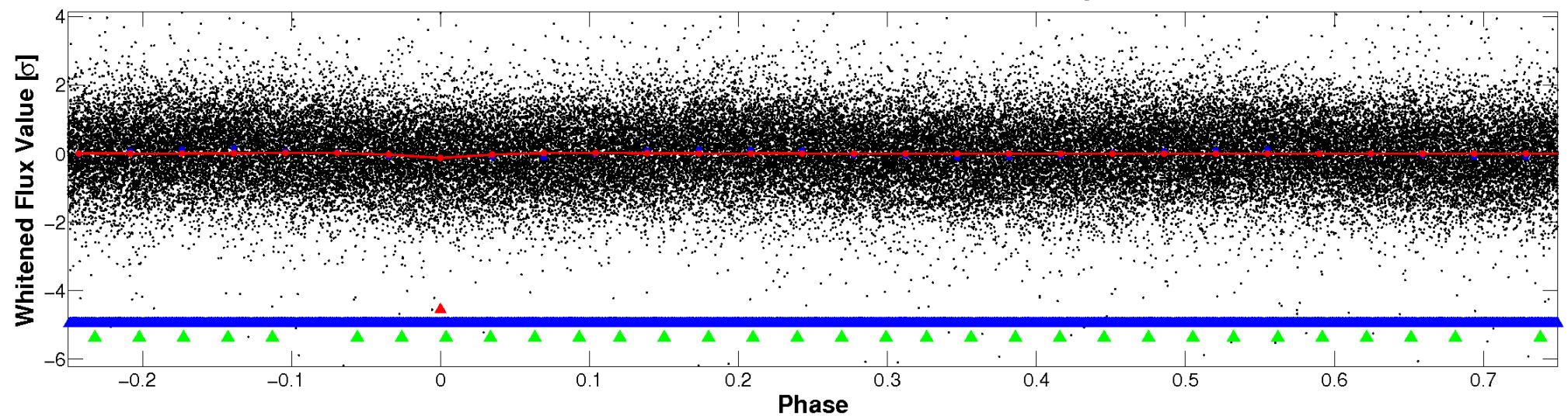


Non-Whitened Vs. Whitened Light Curve

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

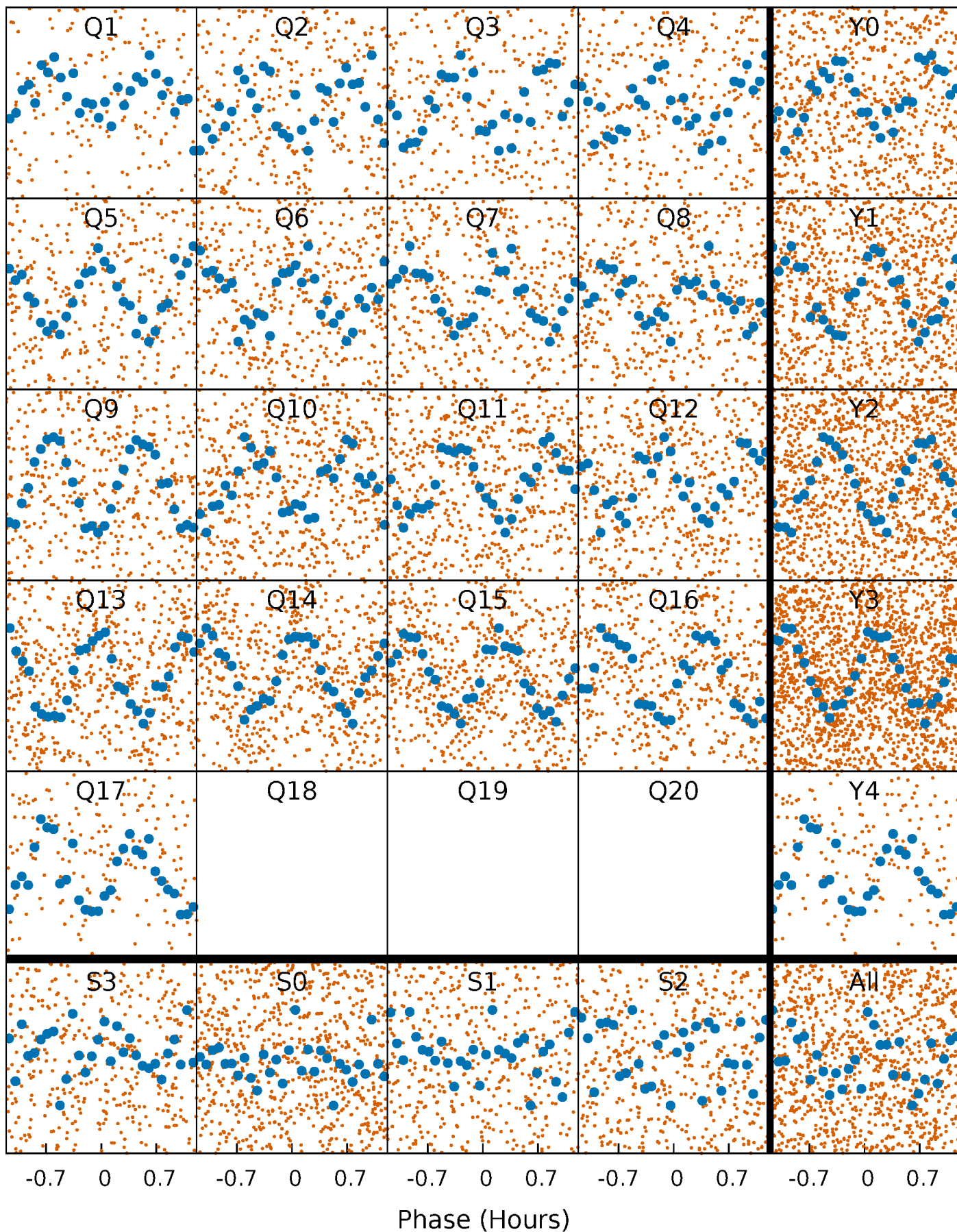


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



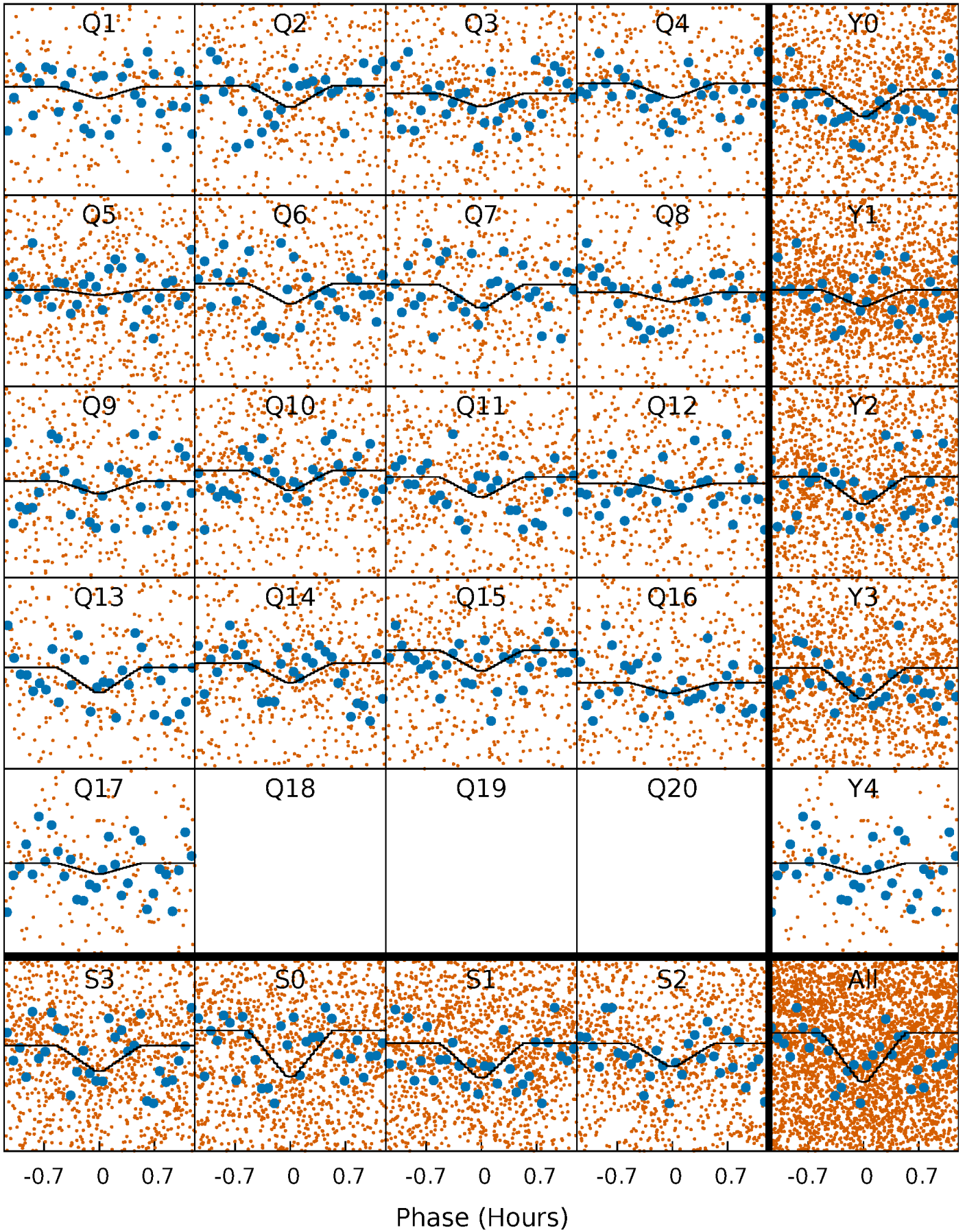
PDC Quarter-Phased Transit Curves

TCE 004737720-01 P= 0.588998 Days $T_0=131.704380$ (BKJD)



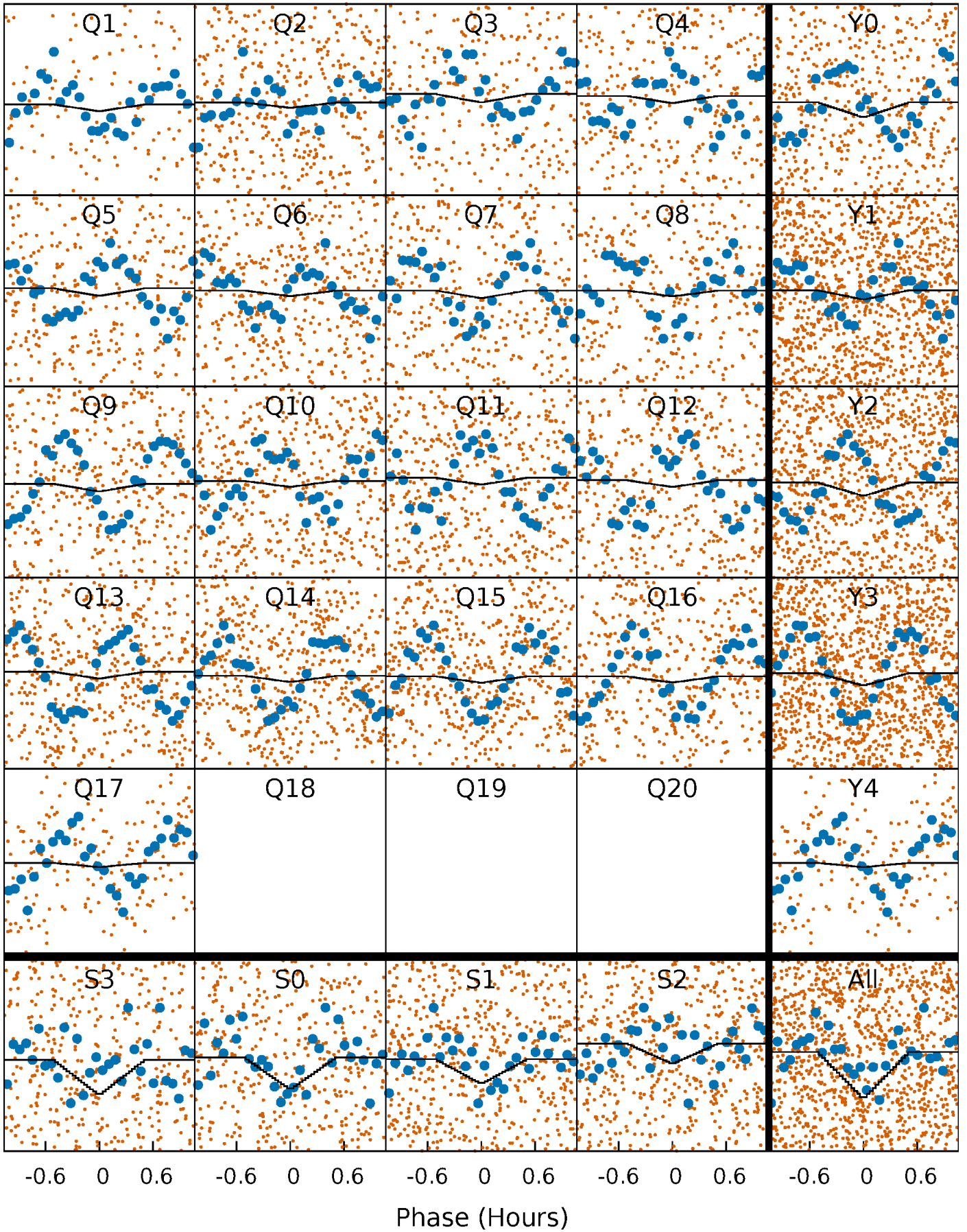
DV Quarter-Phased Transit Curves

TCE 004737720-01 P= 0.588998 Days $T_0=131.704380$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

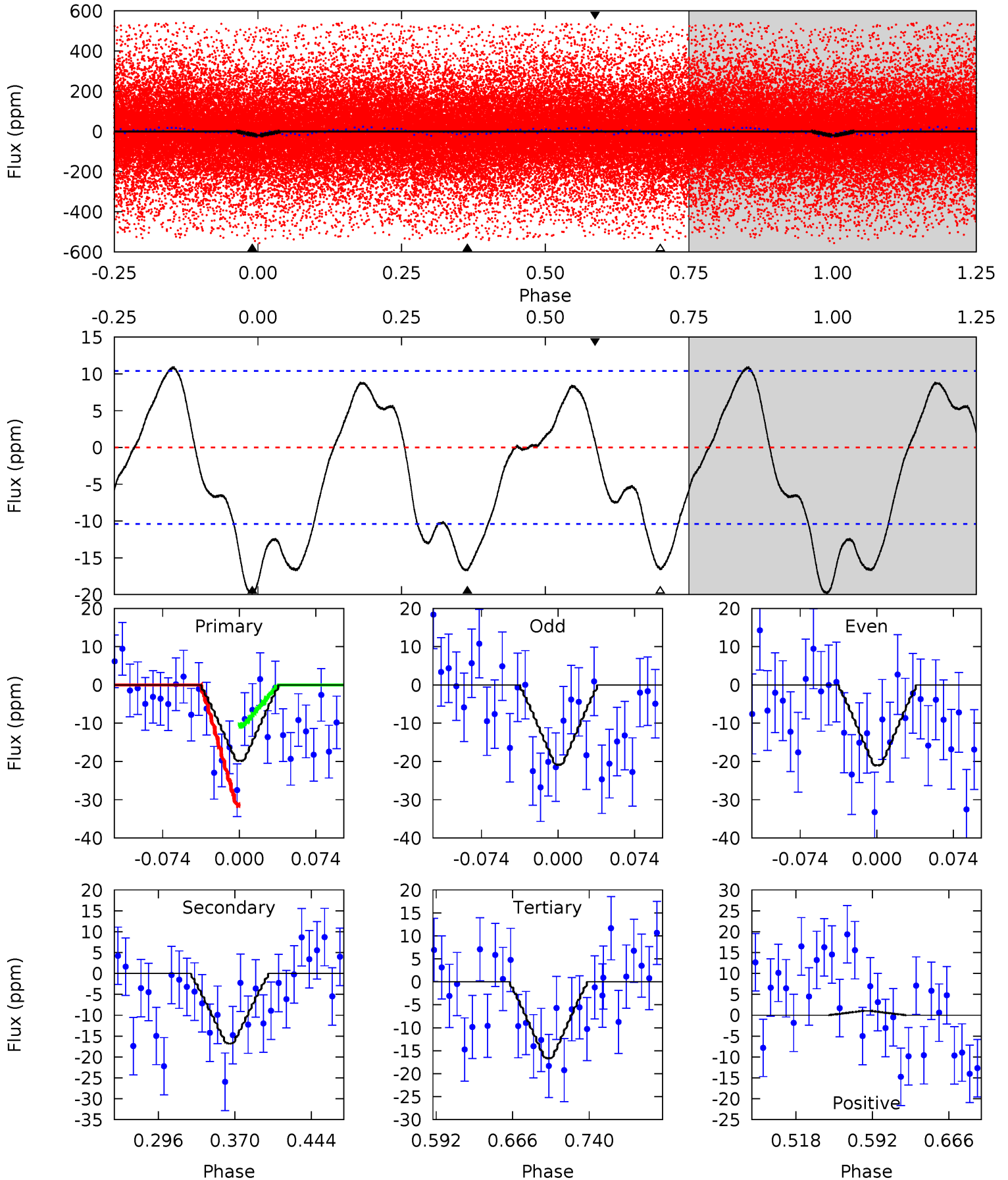
TCE 004737720-01 P= 0.588994 Days $T_0=131.700200$ (BKJD)



DV Model-Shift Uniqueness Test

004737720-01, P = 0.588998 Days, E = 131.115382 Days

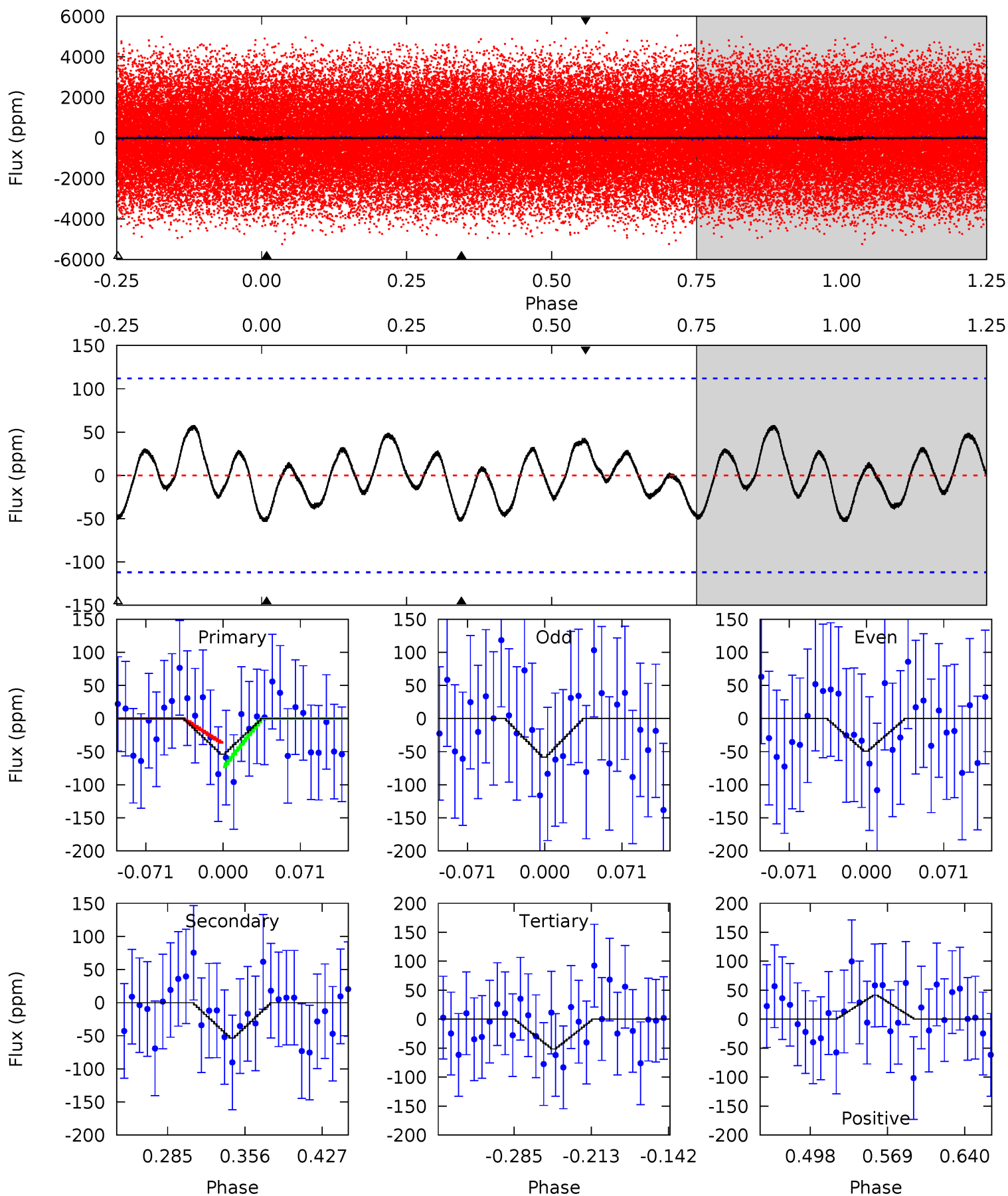
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.85	7.48	7.42	0.46	4.63	1.79	3.33	1.43	8.39	0.06	7.02	0.04	1.02	0.36	4.69



Alt Model-Shift Uniqueness Test

004737720-01, P = 0.588994 Days, E = 131.111206 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.23	2.21	2.13	1.72	4.64	1.80	1.03	0.10	0.51	0.08	0.49	0.18	0.55	0.52	0.77



Stellar Parameters For KIC 004737720

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7719^{+69}_{-84}	$3.871^{+0.168}_{-0.072}$	$-0.020^{+0.100}_{-0.150}$	$2.670^{+0.286}_{-0.573}$	$1.933^{+0.027}_{-0.214}$	$0.143^{+0.126}_{-0.034}$
	+1%/-1%	+4%/-2%	+500%/-750%	+11%/-21%	+1%/-11%	+88%/-24%
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 004737720-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-17 ± 2	$1.20^{+0.46}_{-0.36}$	5896^{+202}_{-287}	7111^{+1905}_{-1377}	$1.823^{+1.891}_{-0.880}$
Alt.	-53 ± 24	$2.89^{+0.47}_{-0.49}$	5899^{+190}_{-327}	5817^{+990}_{-1172}	$1.002^{+0.658}_{-0.461}$

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 $A_{obs} \gg 1.0$

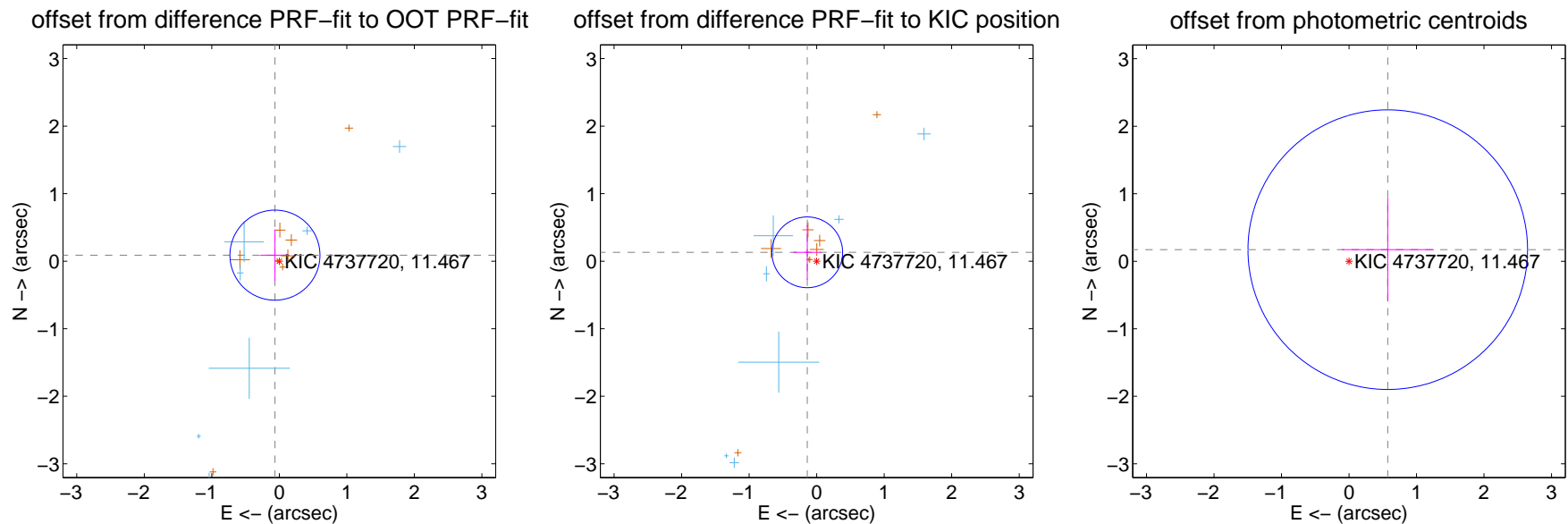
DV Centroid Data

Supplemental centroid analysis for 004737720-01. **Kepler magnitude: 11.47.** Transit SNR 7.12

There are 7 quarters with good PRF difference image offsets

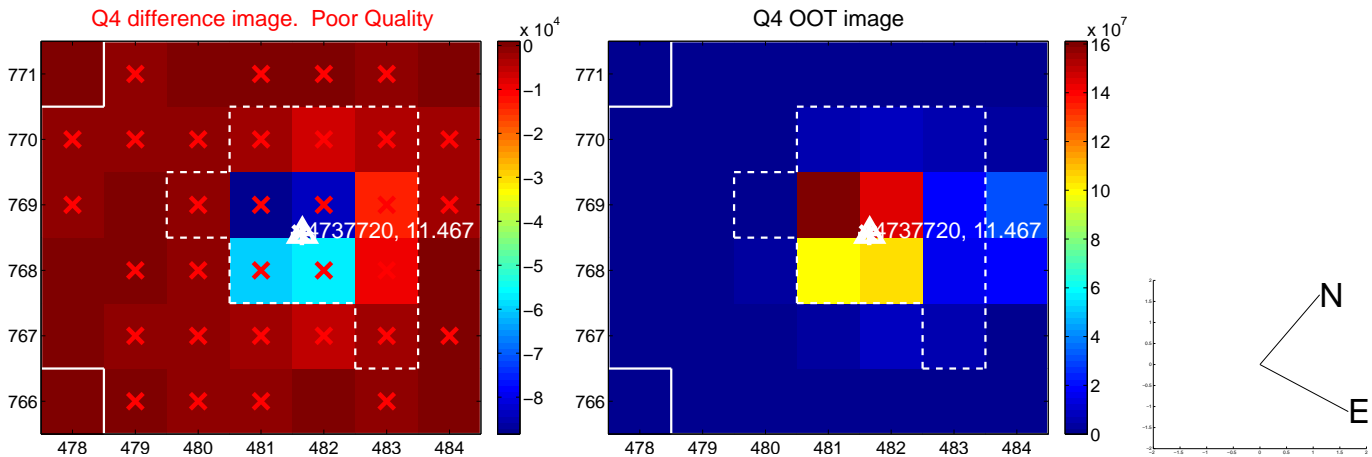
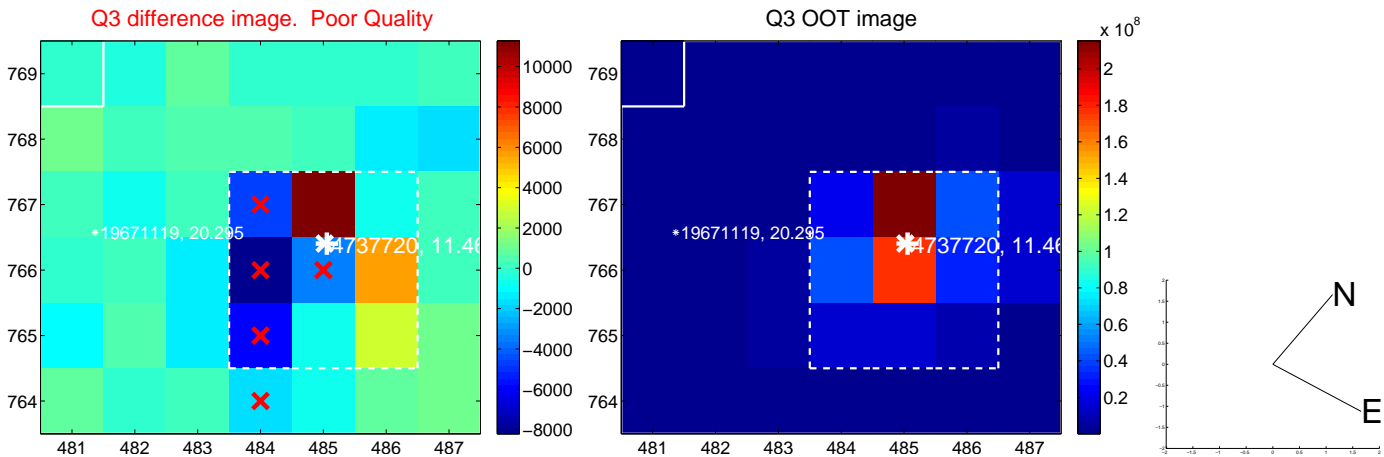
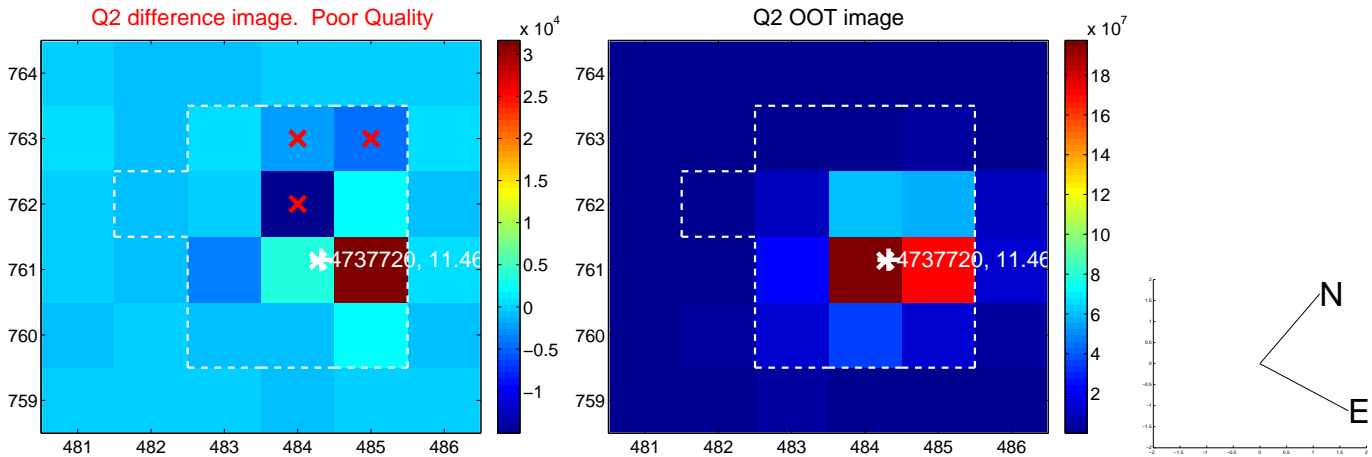
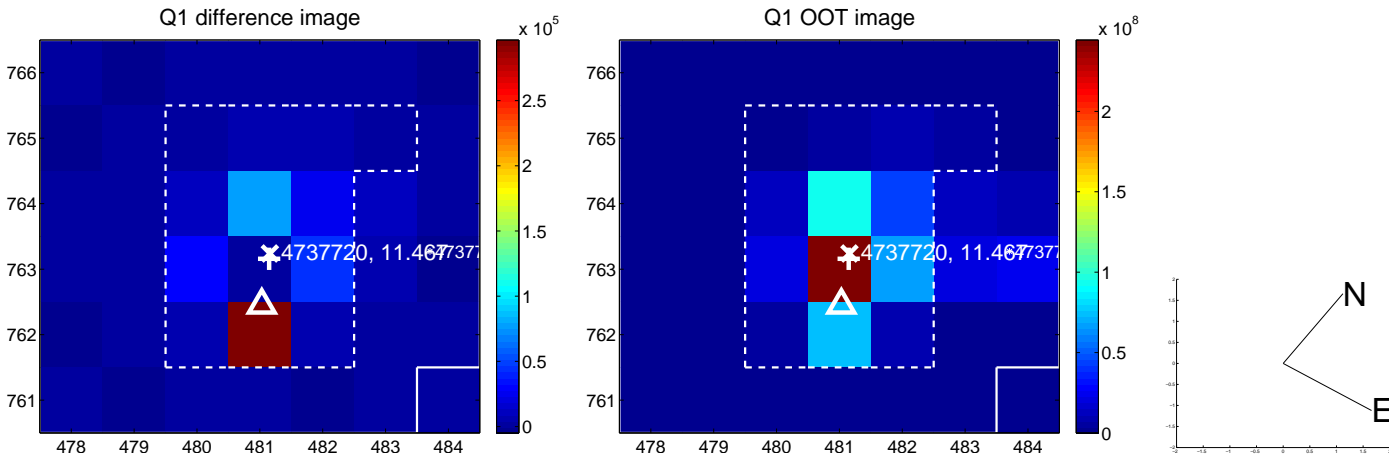
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.110 ± 0.222	0.50	0.064 ± 0.216	0.089 ± 0.380
PRF-fit source offset from KIC position	0.192 ± 0.175	1.10	0.139 ± 0.208	0.132 ± 0.404
photometric centroid source offset	0.60 ± 0.69	0.87	-0.57 ± 0.68	0.17 ± 0.77

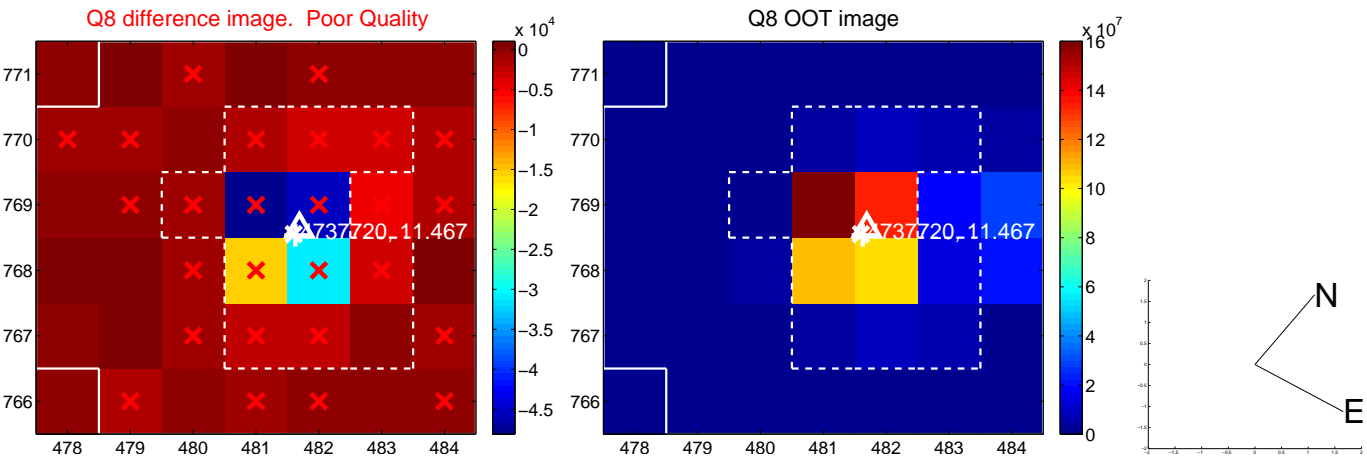
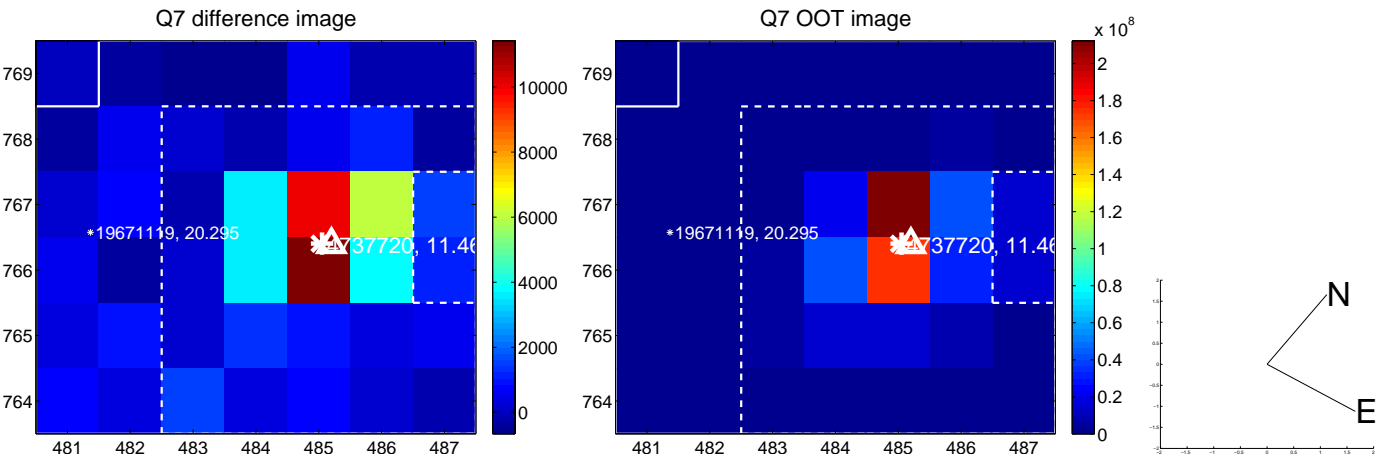
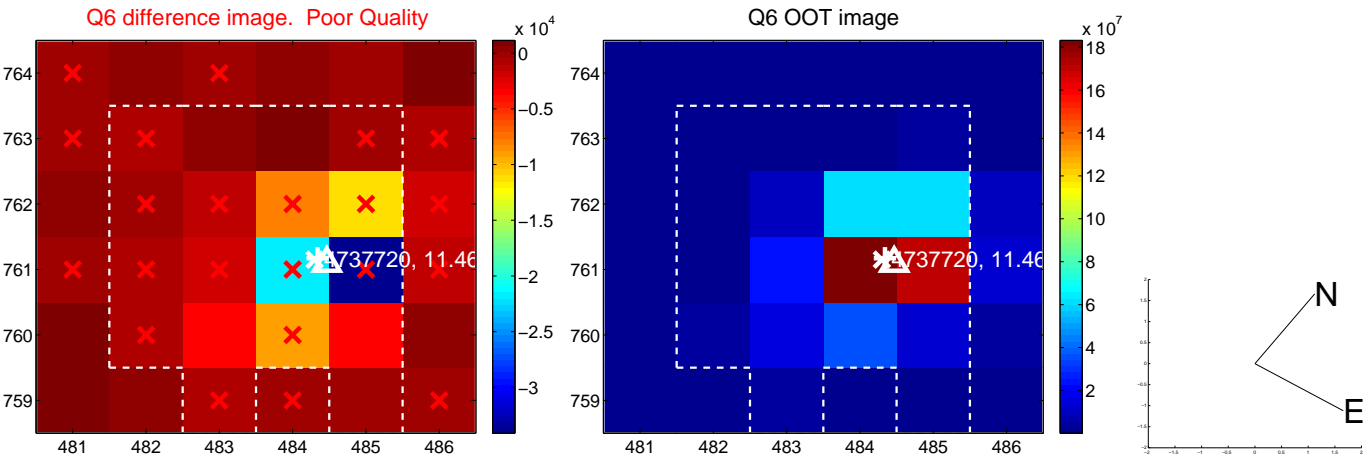
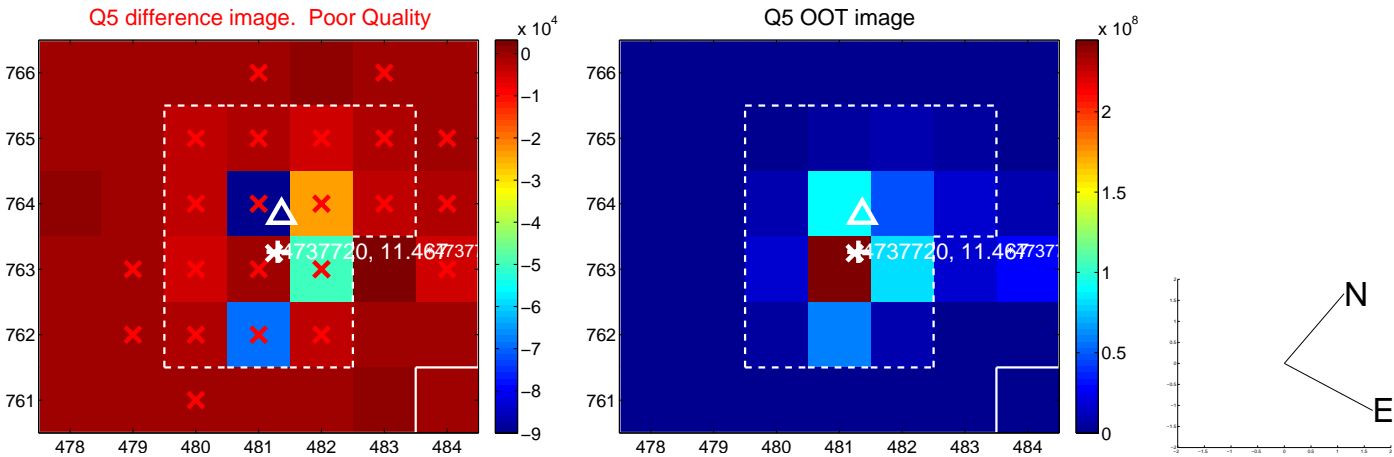


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

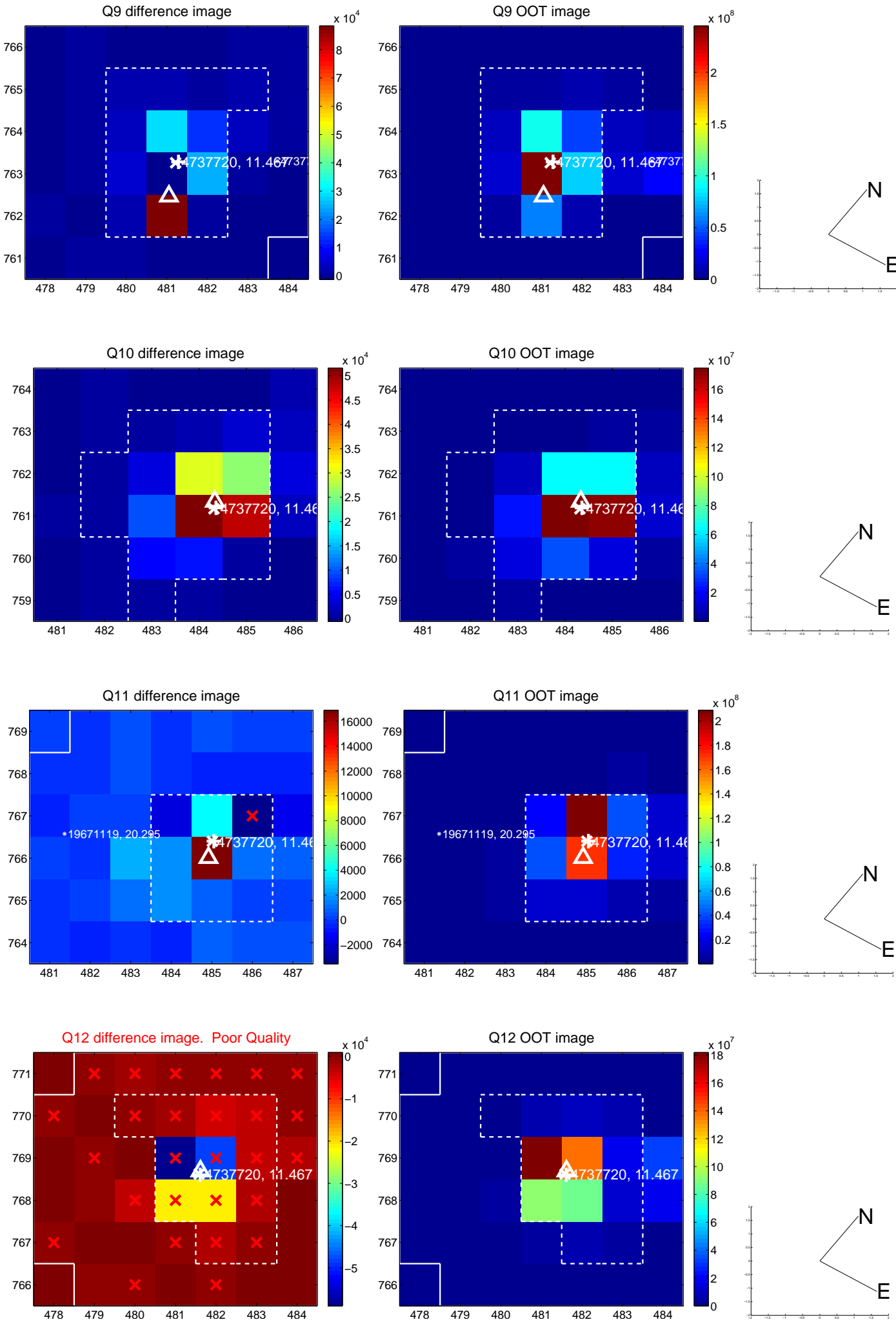
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



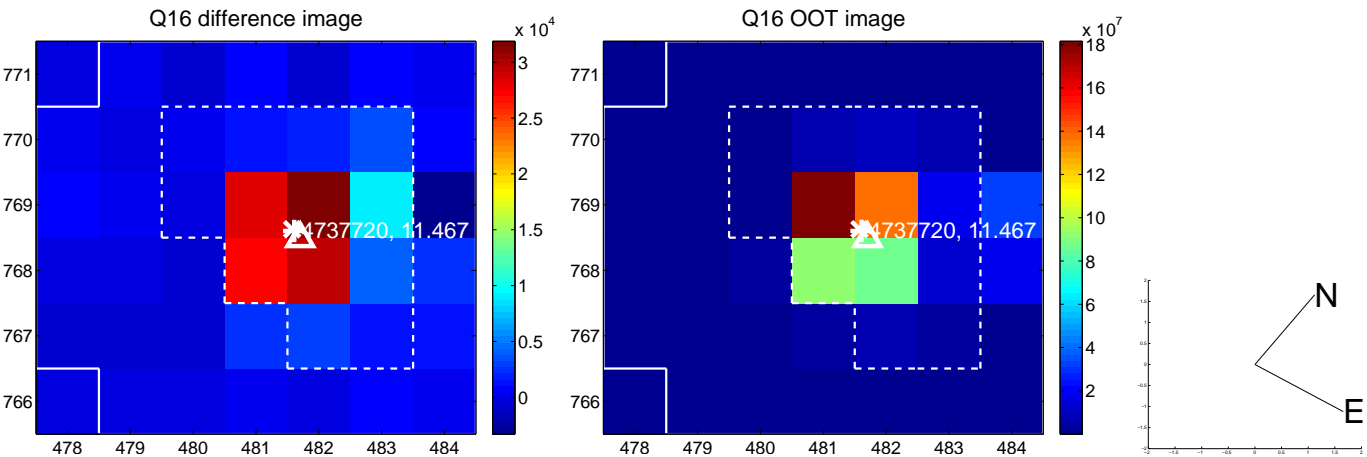
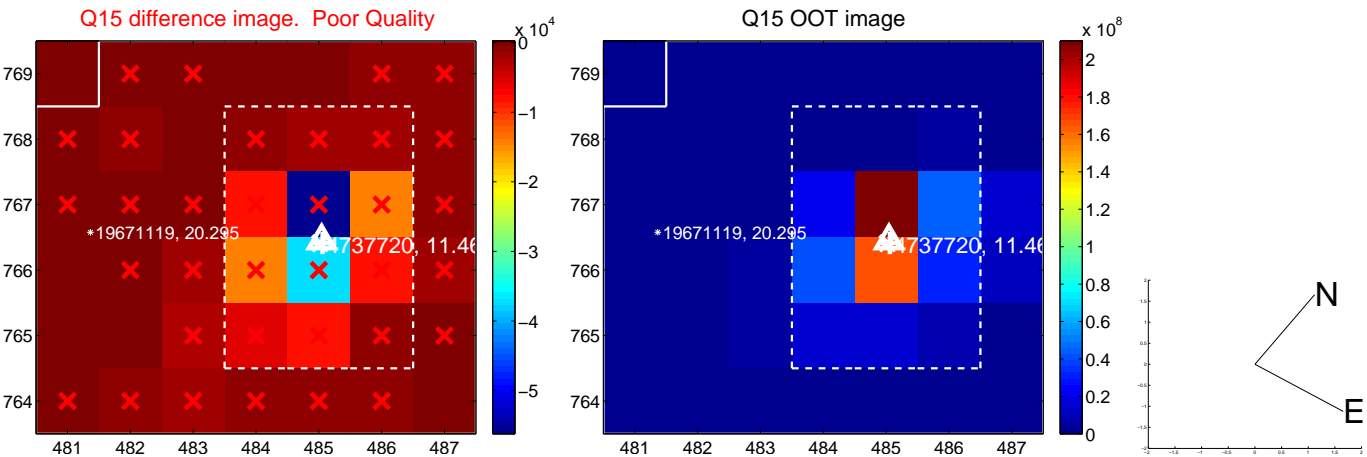
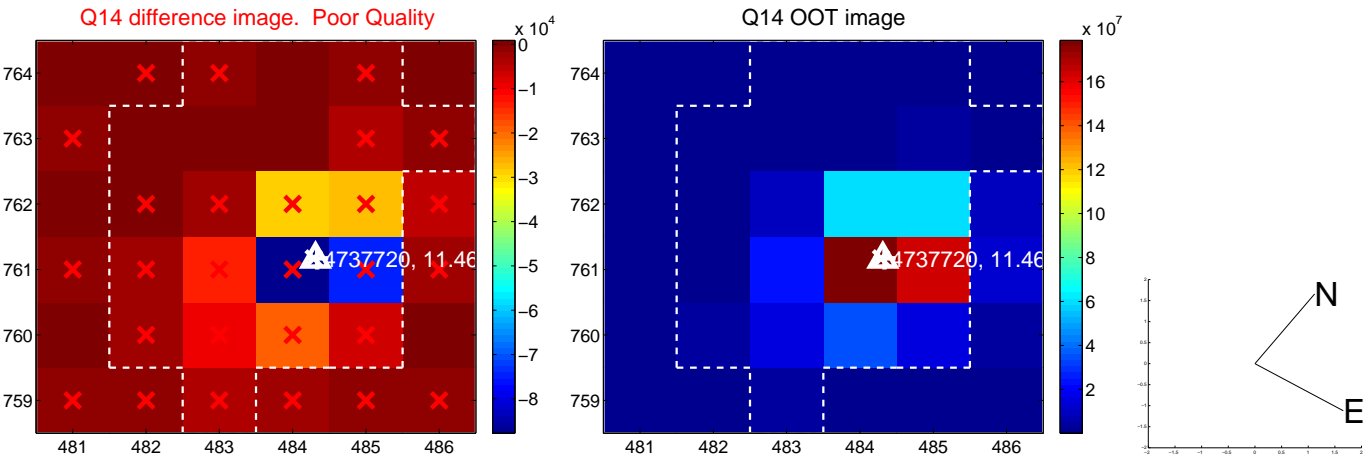
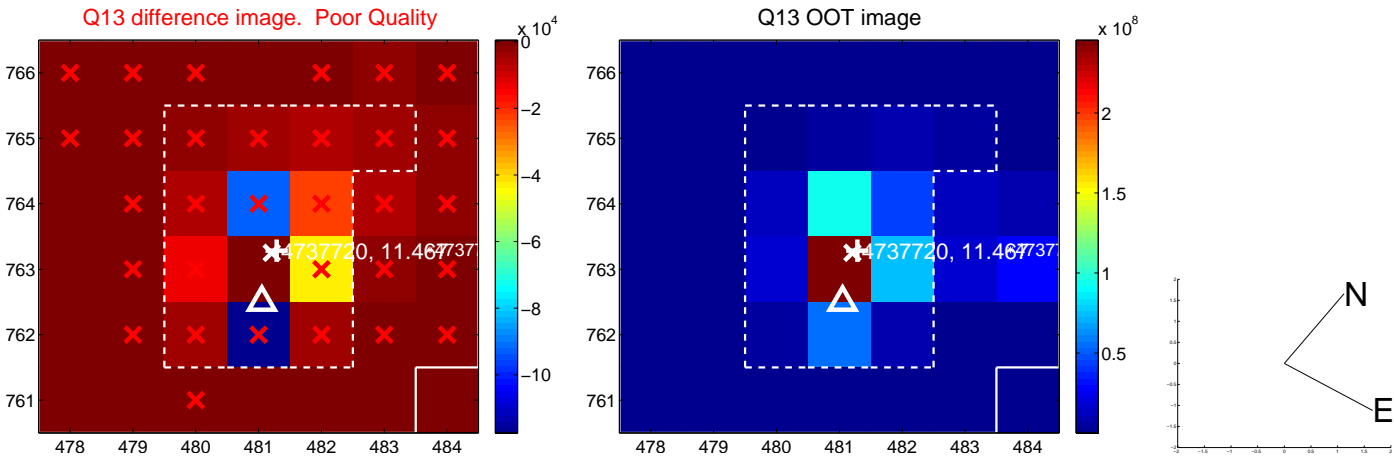
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



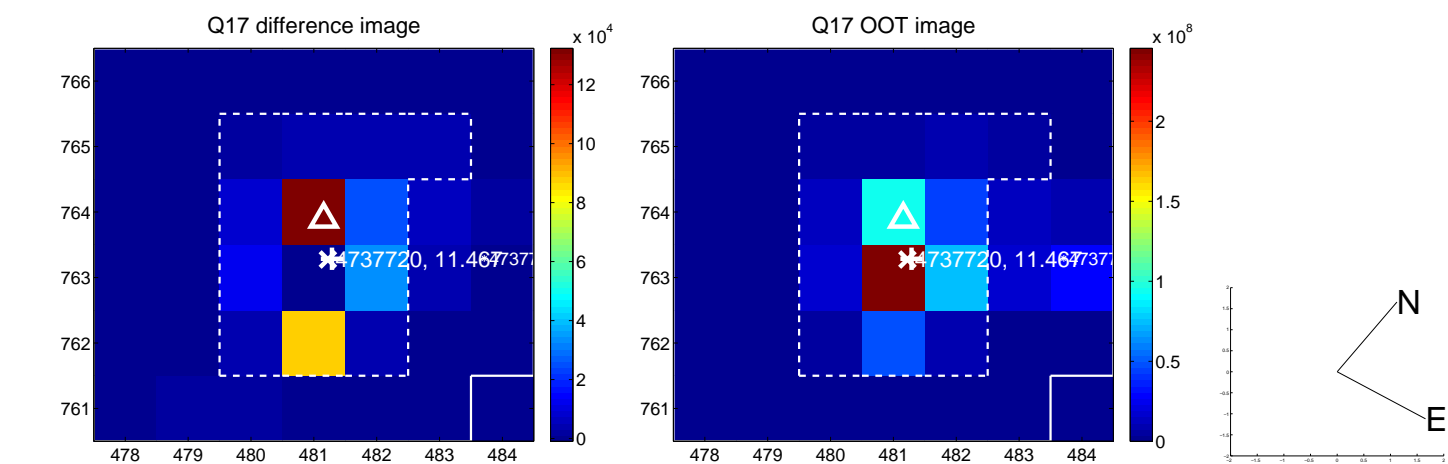
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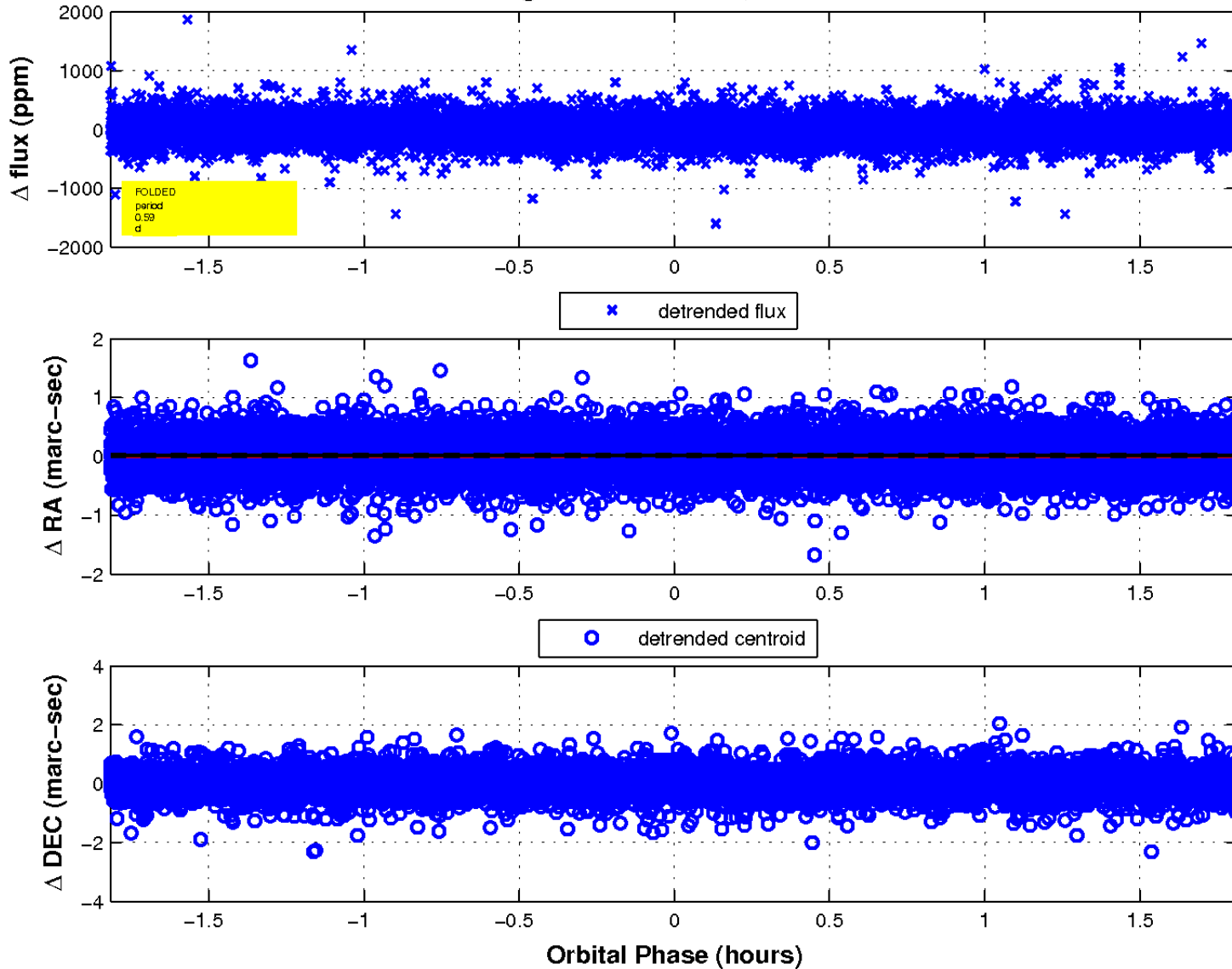
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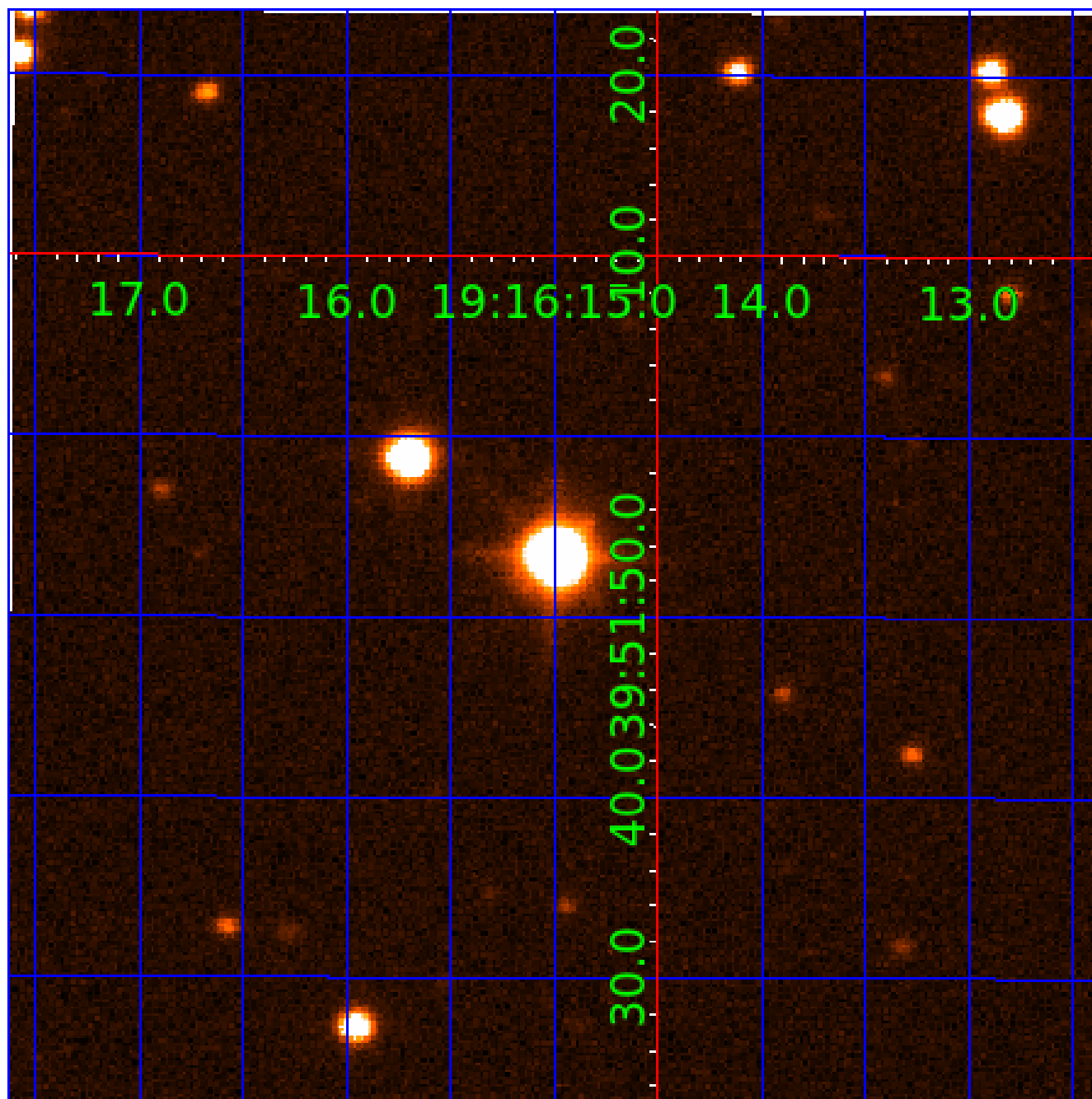


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 004737720

Q1-17 DR25 TCE Parameters

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

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004737720-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
004737720-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_SATURATED
004737720-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST

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

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

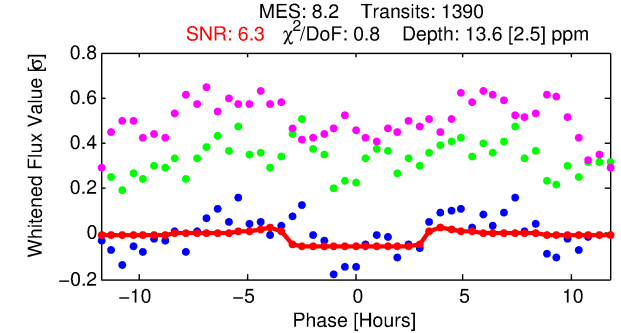
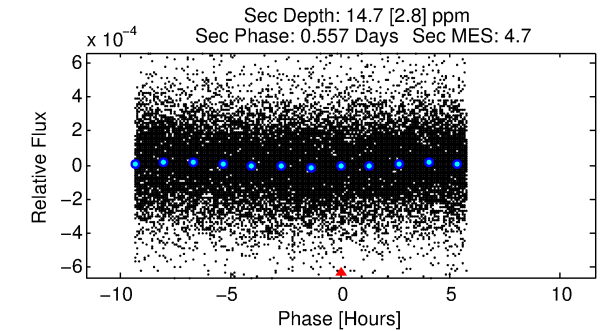
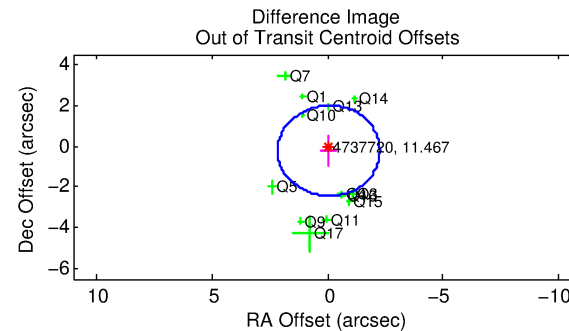
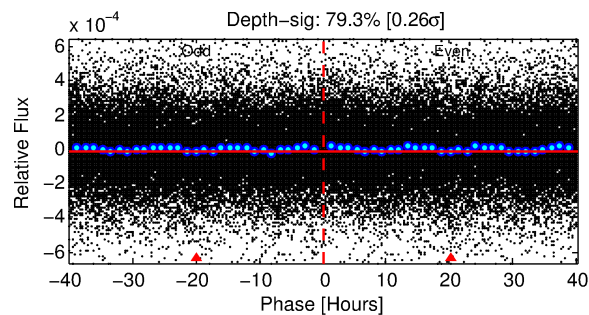
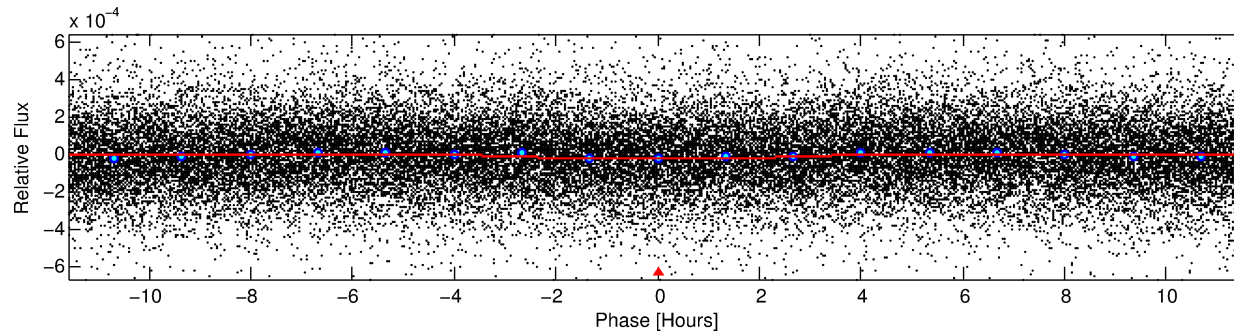
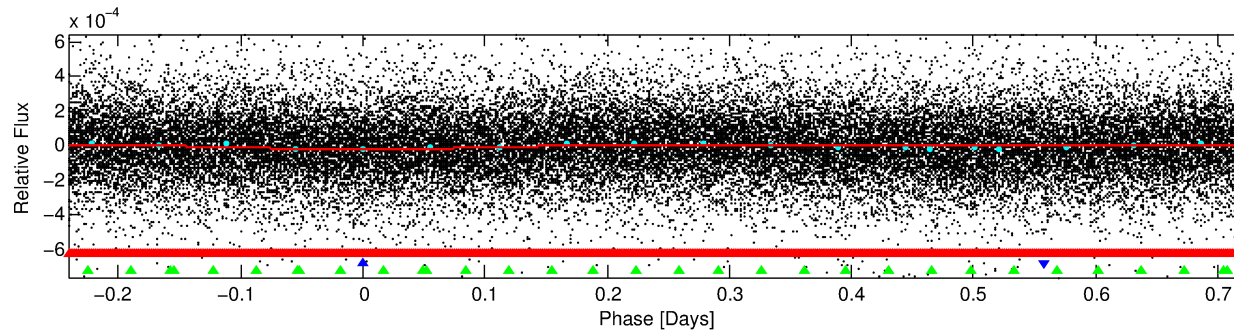
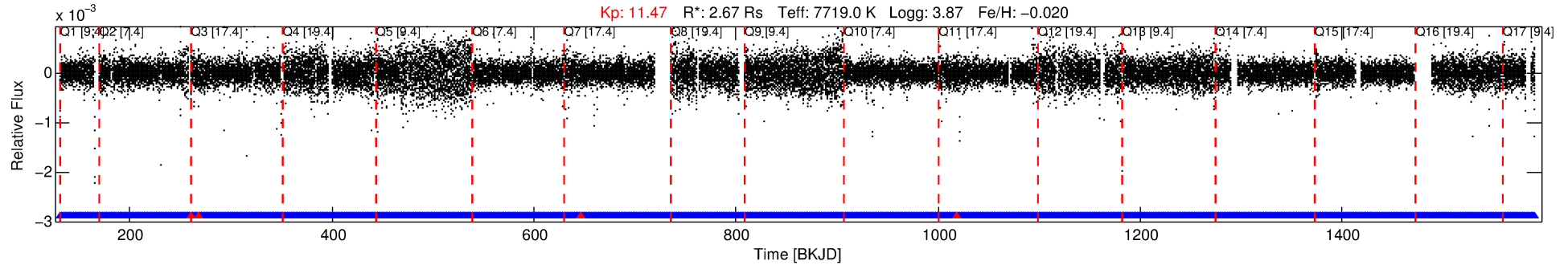
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004737720-02

No Significant Match Found

DV One-Page Summary

KIC: 4737720 Candidate: 2 of 3 Period: 0.965 d



DV Fit Results:

Period = 0.96534 [0.00002] d
Epoch = 131.8529 [0.0072] BKJD
Rp/R* = 0.0034 [0.0034]
a/R* = 1.25 [2.67]
b = 0.30 [17.93]
Seff = 39985.95 [11920.32]
Teq = 3606 [269] K
Rp = 1.00 [1.02] Re
a = 0.0238 [0.0046] AU
Ag = 4.54 [9.14] [0.39 σ]
Teffp = 8137 [4053] K [1.12 σ]

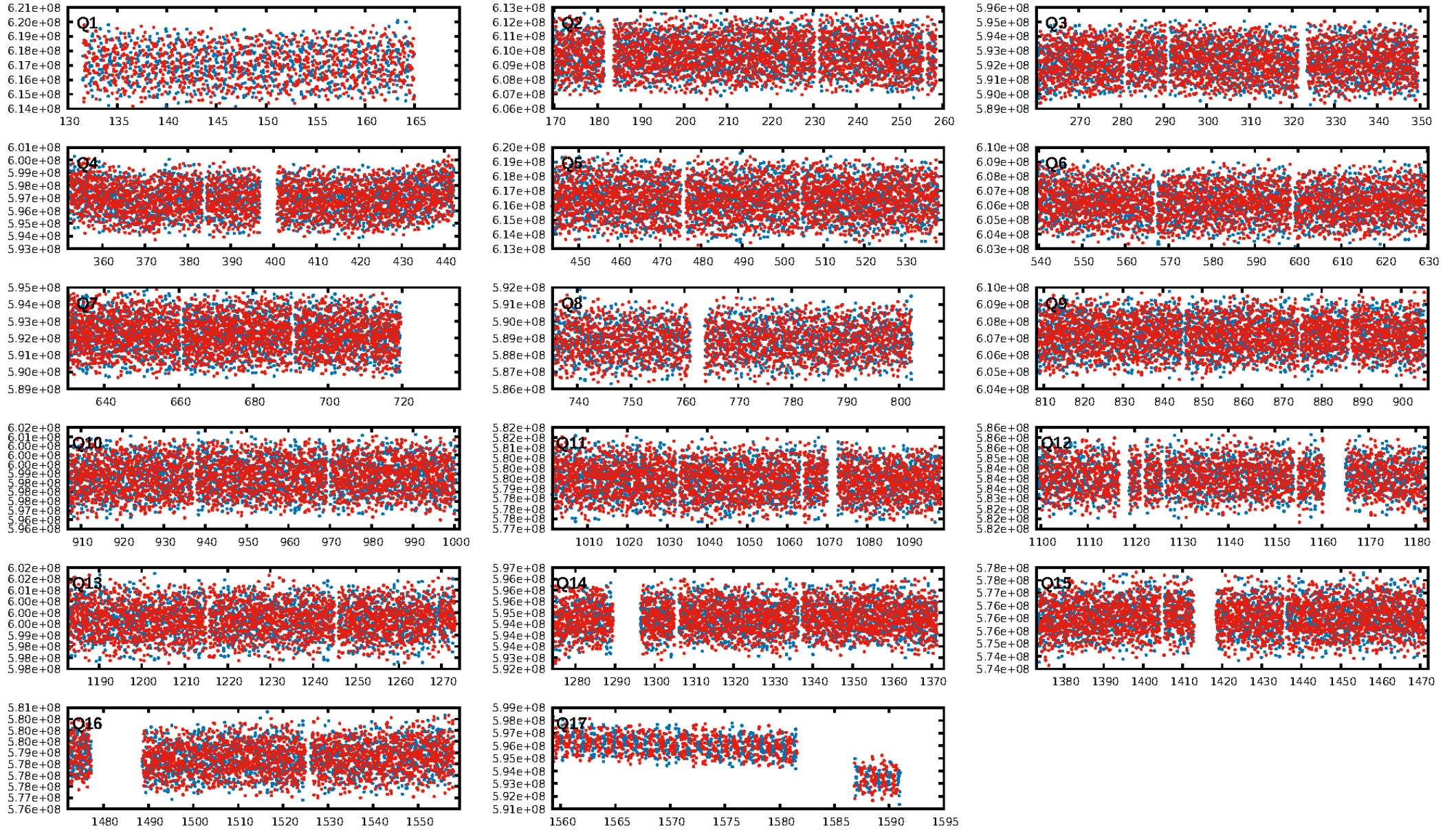
DV Diagnostic Results:

ShortPeriod-sig: 82.2% [1.35 σ]
LongPeriod-sig: 100.0% [156.66 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.45e-04
RollingBand-fgt: 1.00 [1324/1328]
GhostDiagnostic-chr: 1.505
Centroid-sig: N/A
Centroid-so: 0.567 arcsec [1.15 σ]
OotOffset-rm: 0.229 arcsec [0.31 σ]
KicOffset-rm: 0.177 arcsec [0.26 σ]
OotOffset-st: 2/4/2/5 [13]
KicOffset-st: 2/4/2/5 [13]
DiffImageQuality-fgm: 0.77 [10/13]
DiffImageOverlap-fno: 0.00 [0/17]

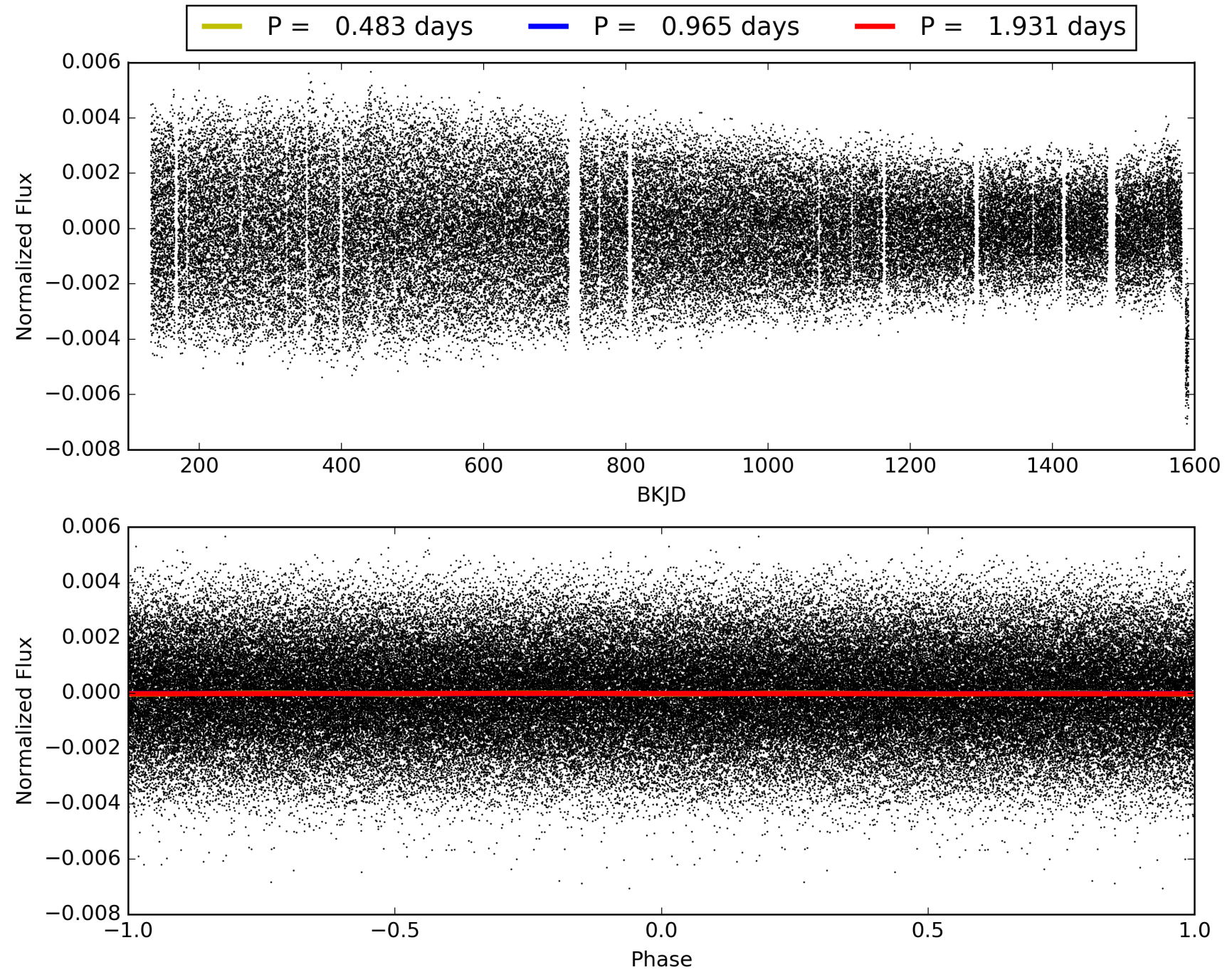
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:19:44 Z

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

TCE 004737720-02, PDC Light Curves

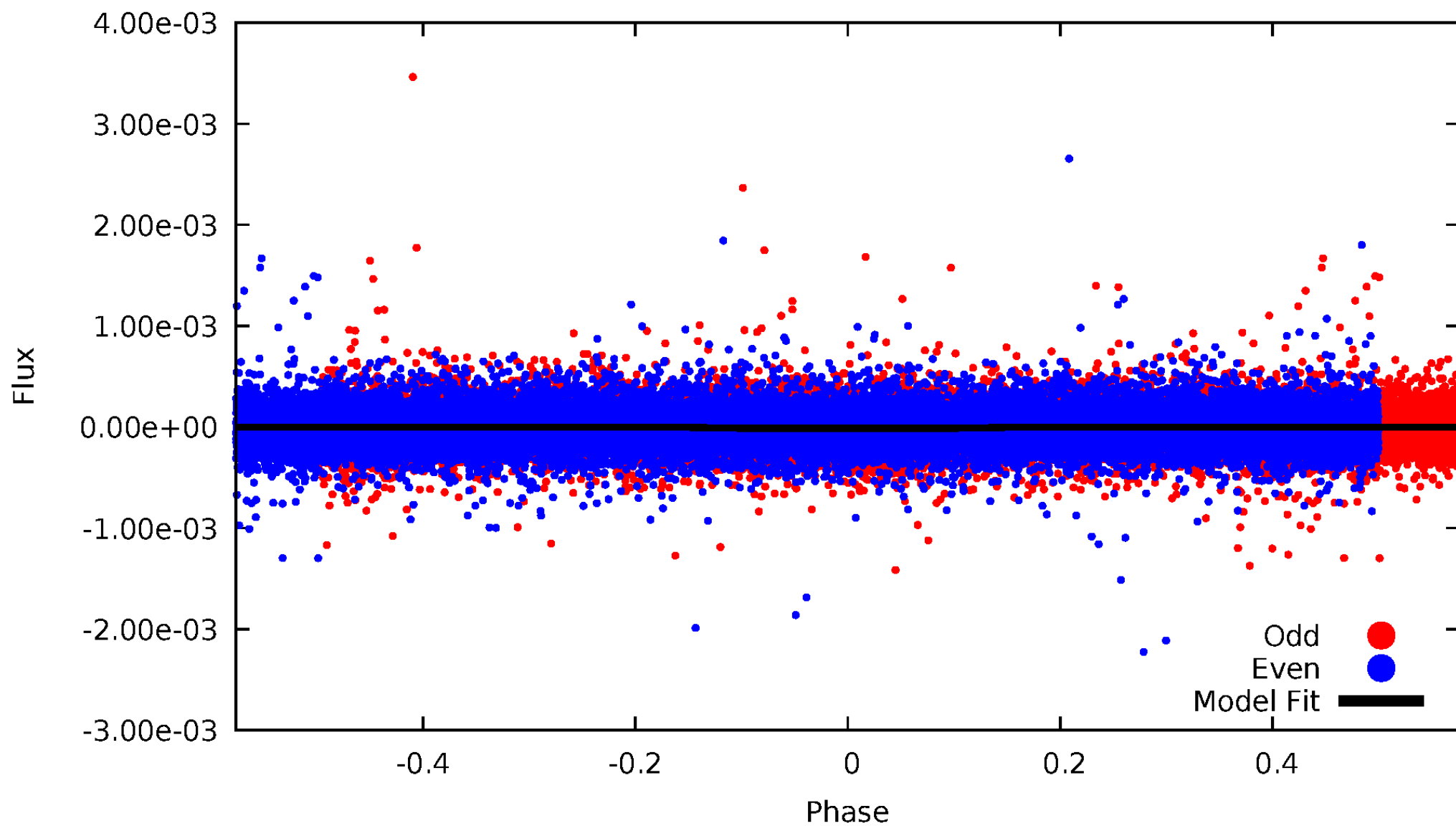


TCE 004737720-02



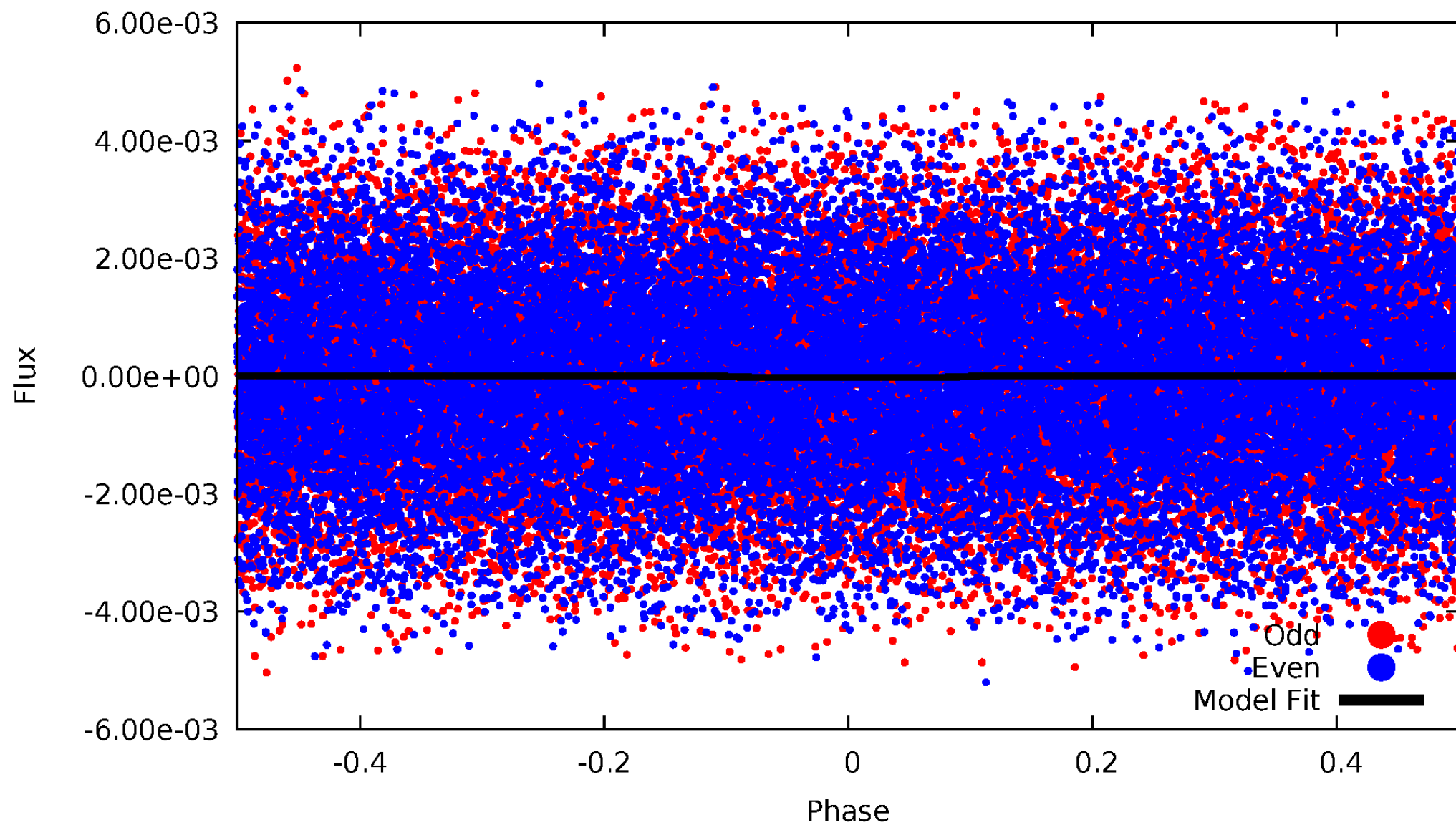
DV Odd/Even

TCE 004737720-02



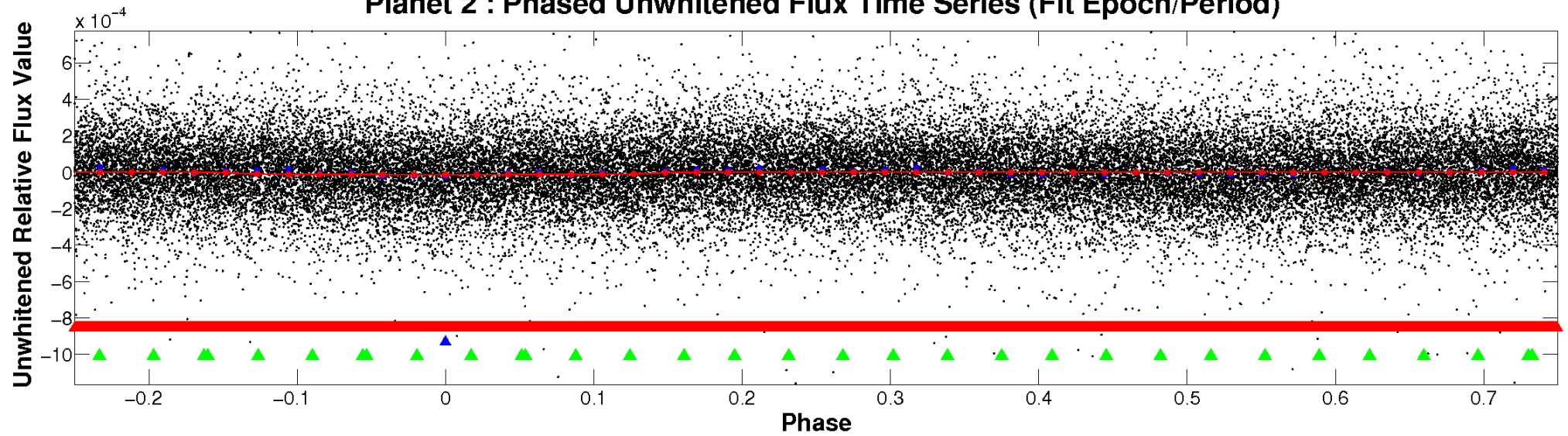
ALT Odd/Even

TCE 004737720-02

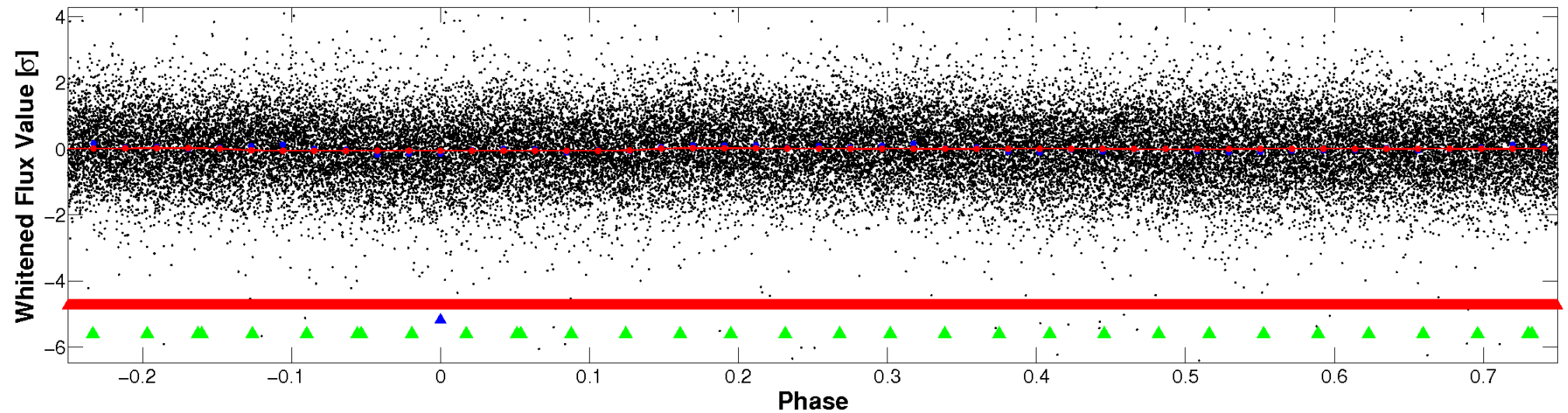


Non-Whitened Vs. Whitened Light Curve

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

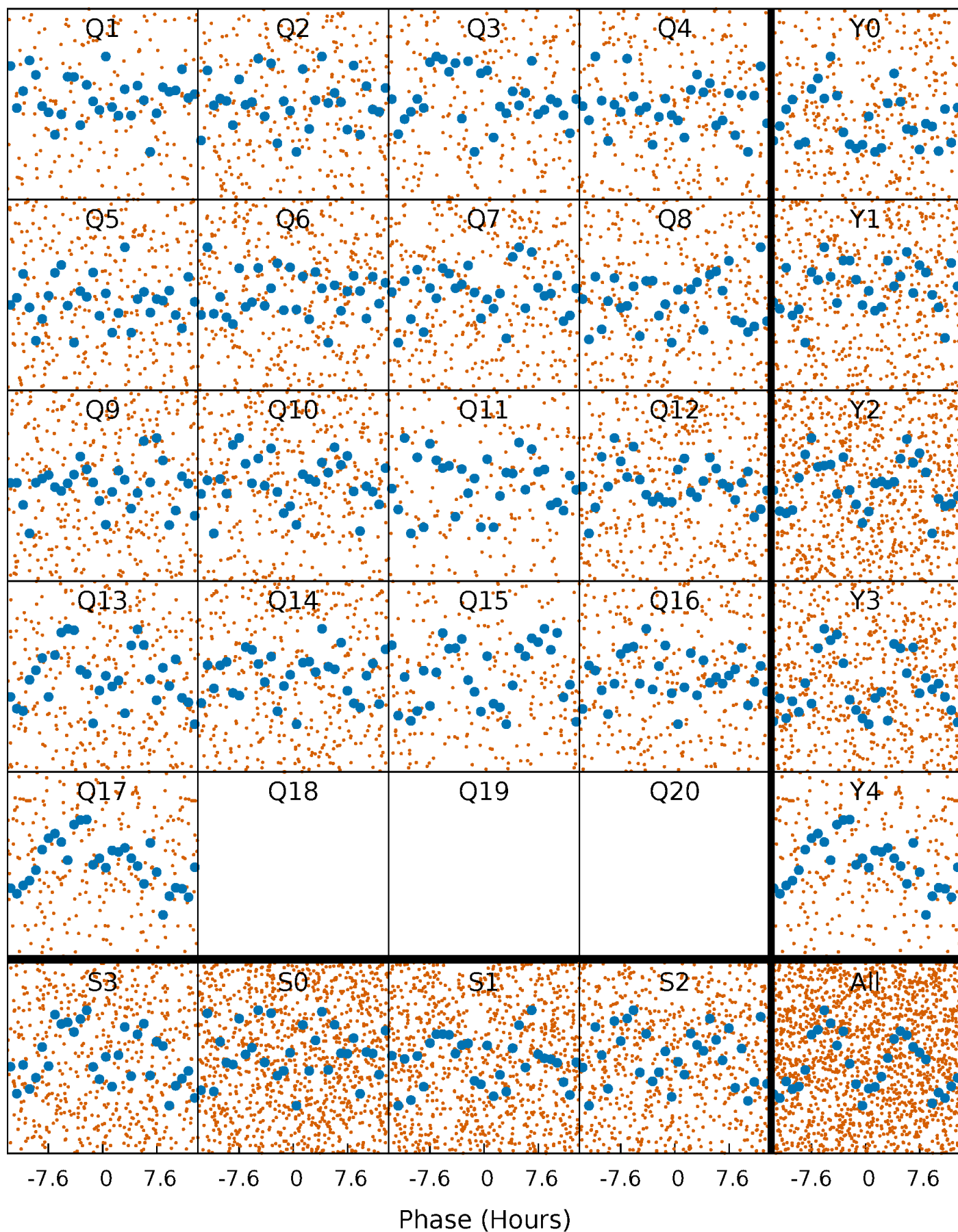


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



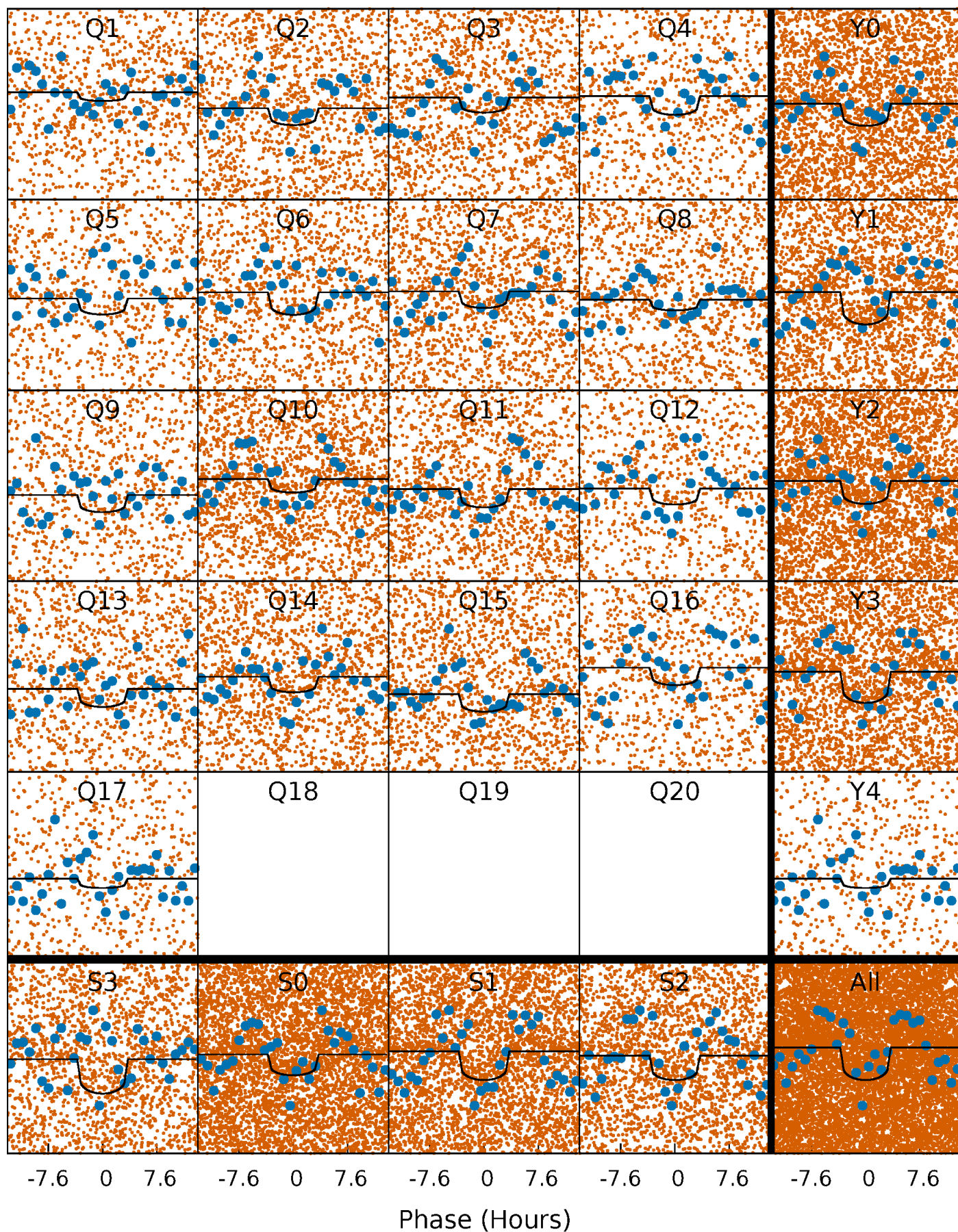
PDC Quarter-Phased Transit Curves

TCE 004737720-02 P= 0.965337 Days $T_0=131.852926$ (BKJD)



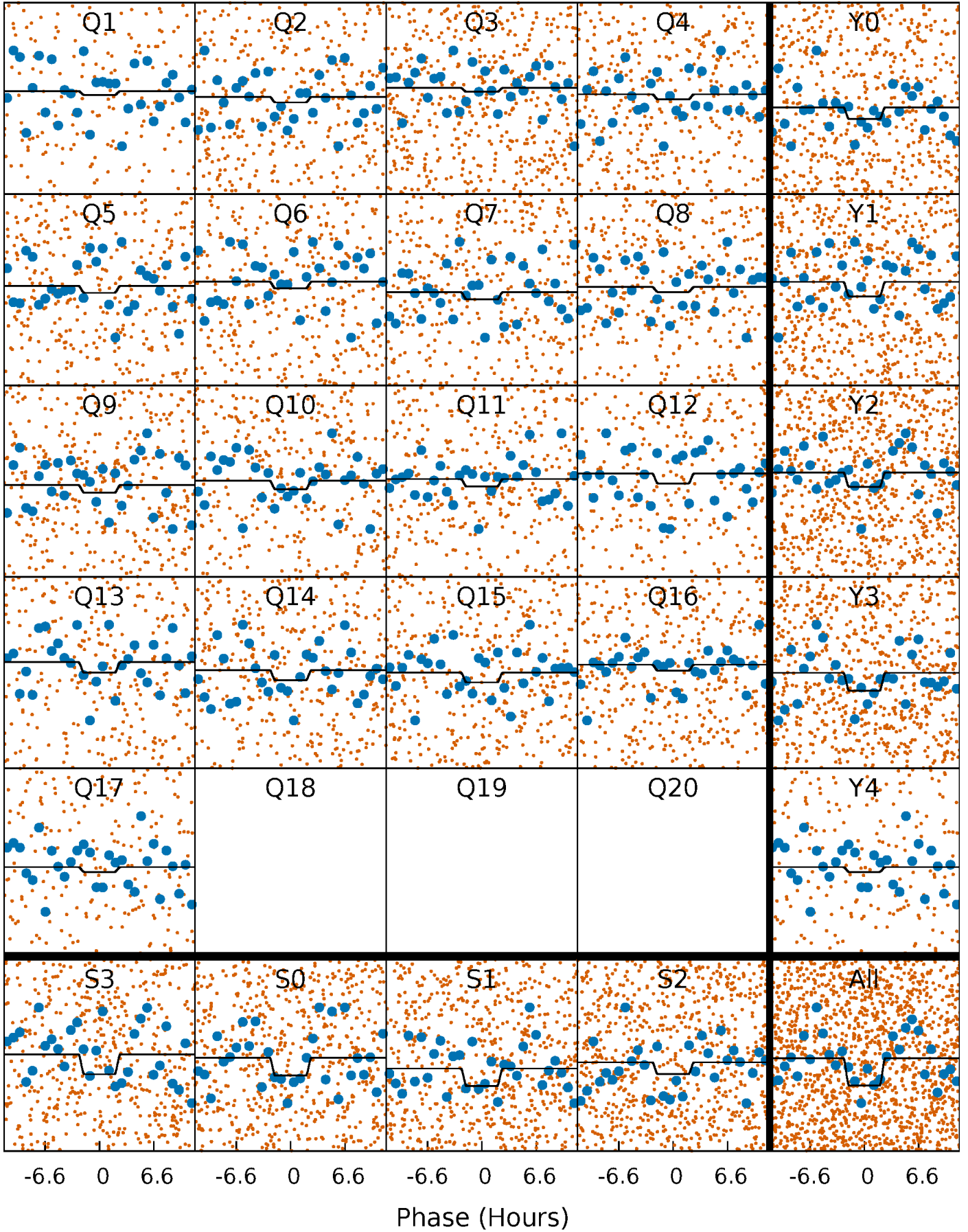
DV Quarter-Phased Transit Curves

TCE 004737720-02 P= 0.965337 Days $T_0=131.852926$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

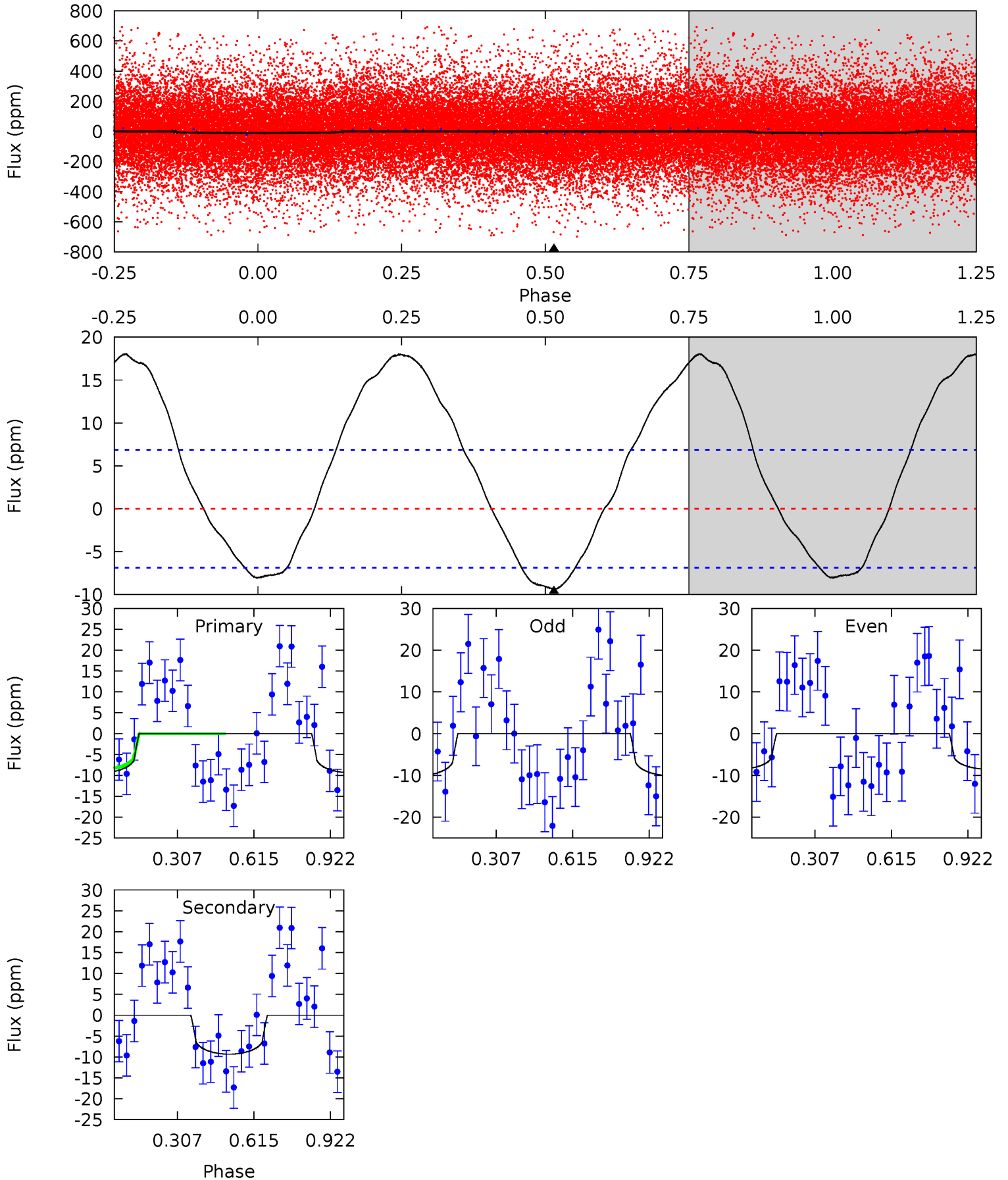
TCE 004737720-02 P= 0.965348 Days $T_0=131.861992$ (BKJD)



DV Model-Shift Uniqueness Test

004737720-02, P = 0.965337 Days, E = 130.887589 Days

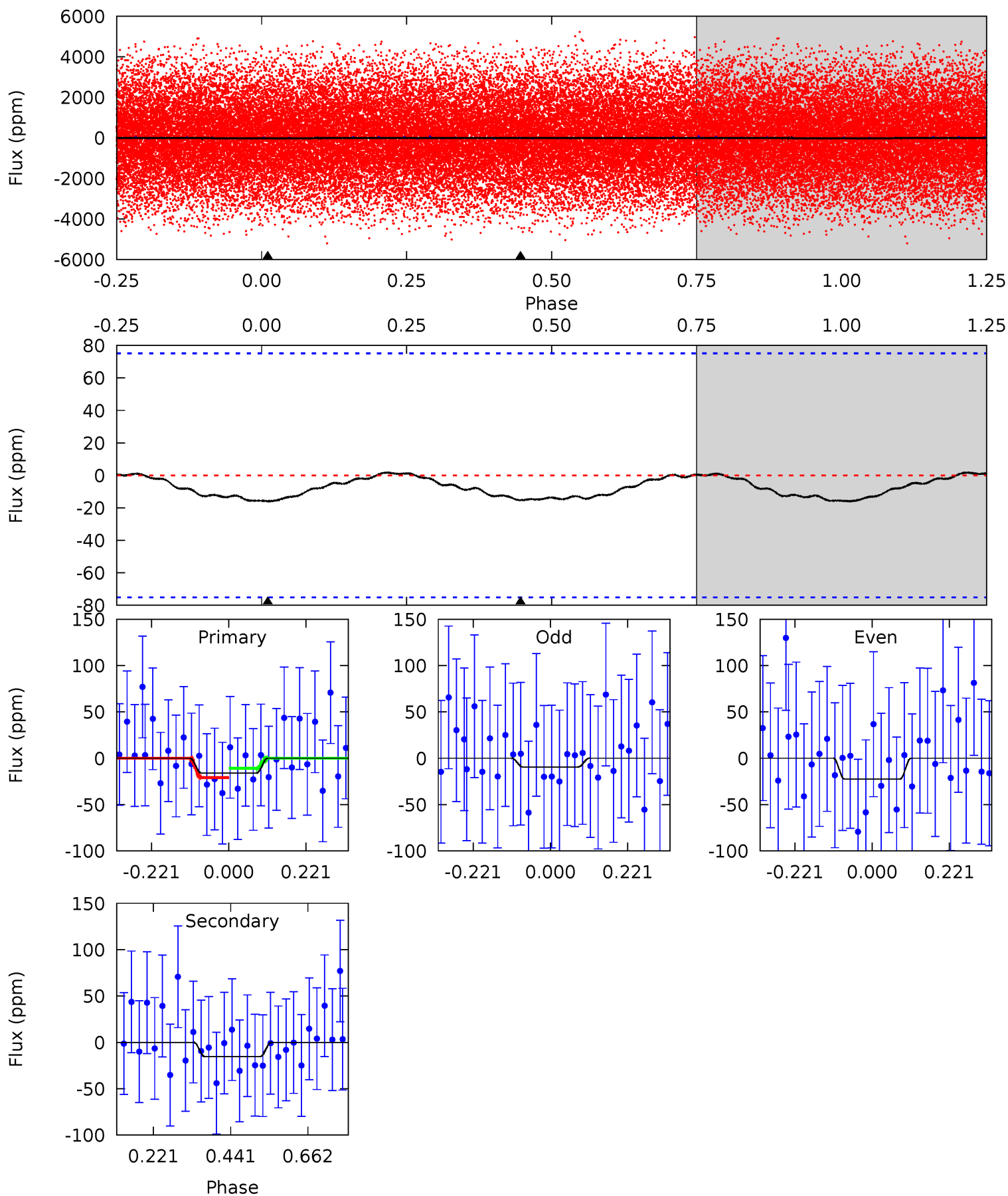
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.89	5.89	0	0	4.32	1.02	4.86	5.89	5.89	5.89	5.89	0.48	1.35	0.66	0.36



Alt Model-Shift Uniqueness Test

004737720-02, P = 0.965348 Days, E = 130.896644 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.93	0.90	0	0	4.40	1.23	0.07	0.93	0.93	0.90	0.90	0.38	0.98	0.10	0.29



Stellar Parameters For KIC 004737720

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7719^{+69}_{-84}	$3.871^{+0.168}_{-0.072}$	$-0.020^{+0.100}_{-0.150}$	$2.670^{+0.286}_{-0.573}$	$1.933^{+0.027}_{-0.214}$	$0.143^{+0.126}_{-0.034}$
	+1%/-1%	+4%/-2%	+500%/-750%	+11%/-21%	+1%/-11%	+88%/-24%
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 004737720-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-9 ± 2	$1.13^{+0.98}_{-0.68}$	5010^{+173}_{-280}	6309^{+5792}_{-1972}	$2.173^{+11.657}_{-1.526}$
Alt.	-15 ± 17	$1.29^{+0.99}_{-0.78}$	4998^{+173}_{-247}	6113^{+6853}_{-10807}	$1.950^{+15.324}_{-2.140}$

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 $A_{obs} \gg 1.0$

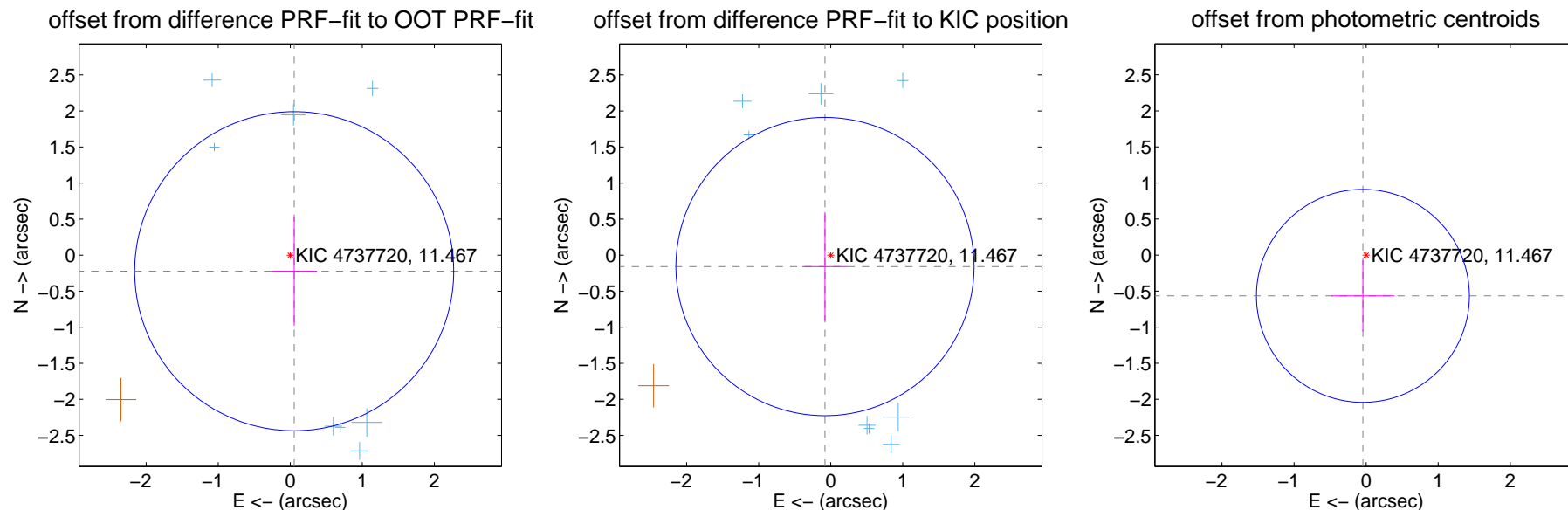
DV Centroid Data

Supplemental centroid analysis for 004737720-02. **Kepler magnitude: 11.47.** Transit SNR 6.30

There are 10 quarters with good PRF difference image offsets

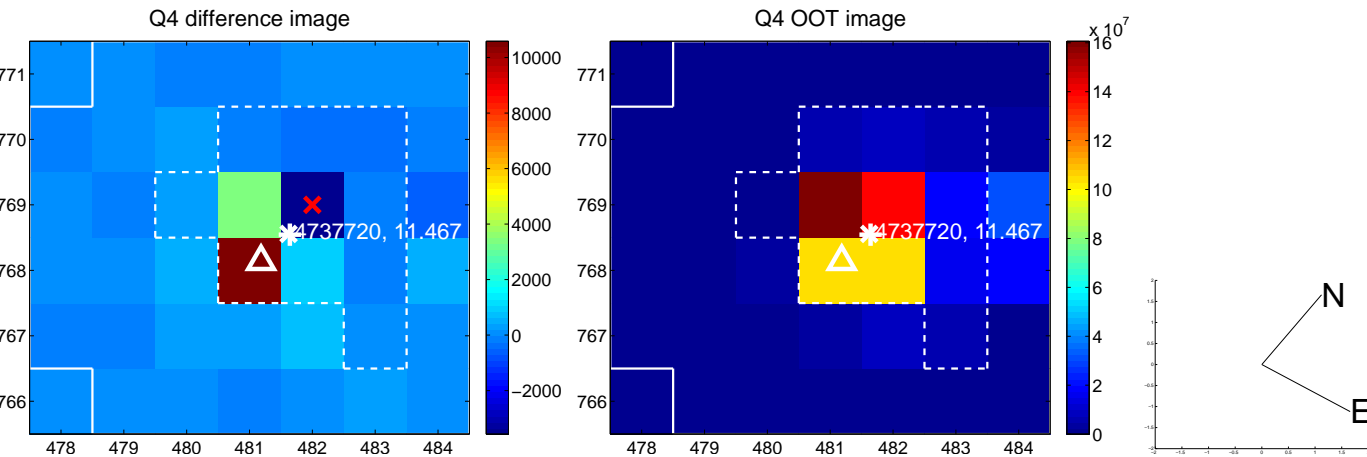
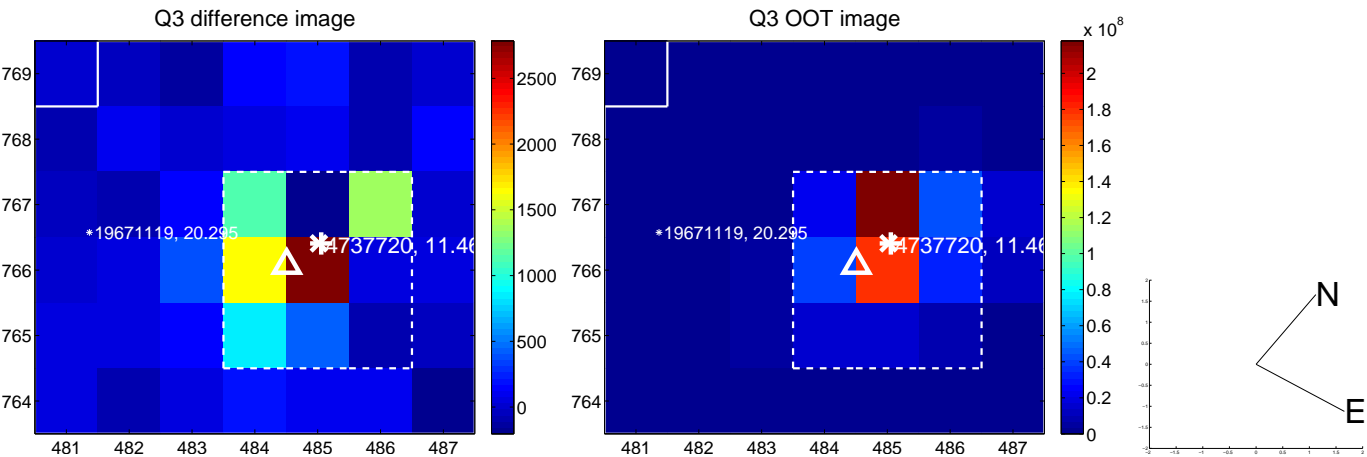
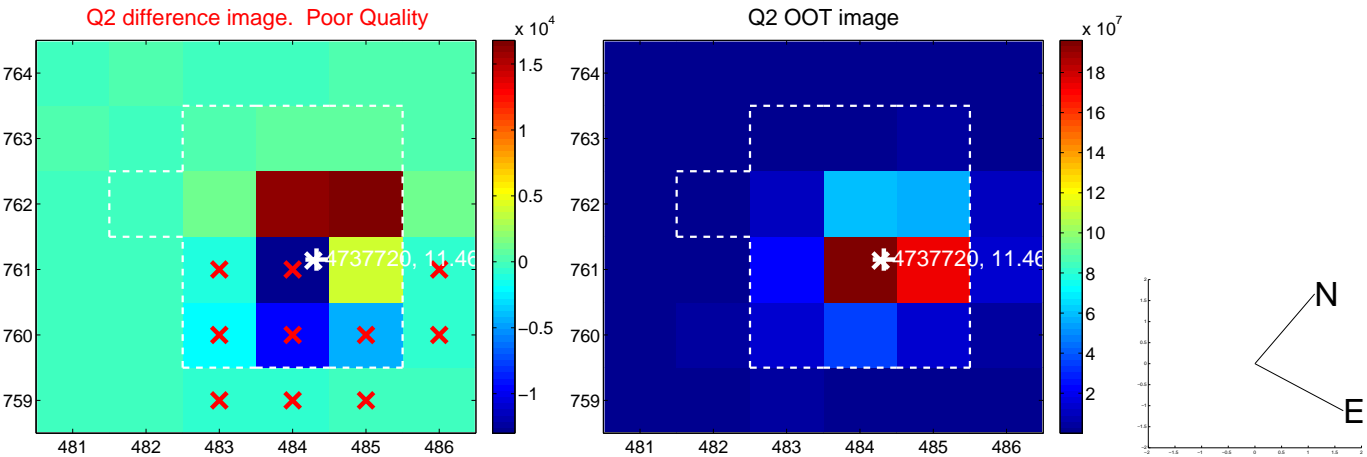
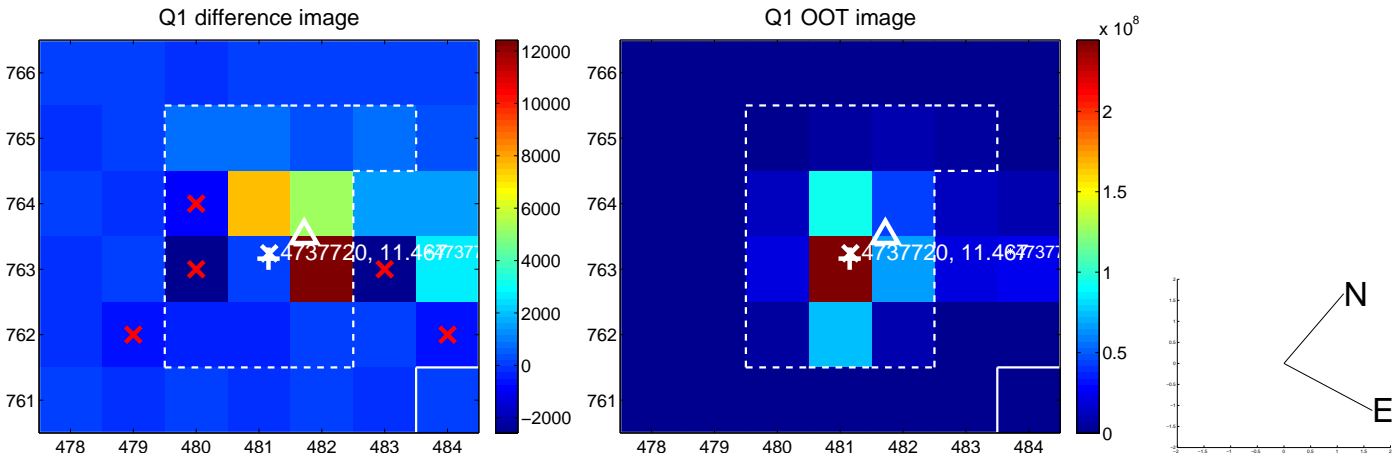
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.229 ± 0.738	0.31	-0.054 ± 0.316	-0.223 ± 0.756
PRF-fit source offset from KIC position	0.177 ± 0.690	0.26	0.079 ± 0.314	-0.158 ± 0.755
photometric centroid source offset	0.57 ± 0.49	1.15	0.04 ± 0.44	-0.57 ± 0.49

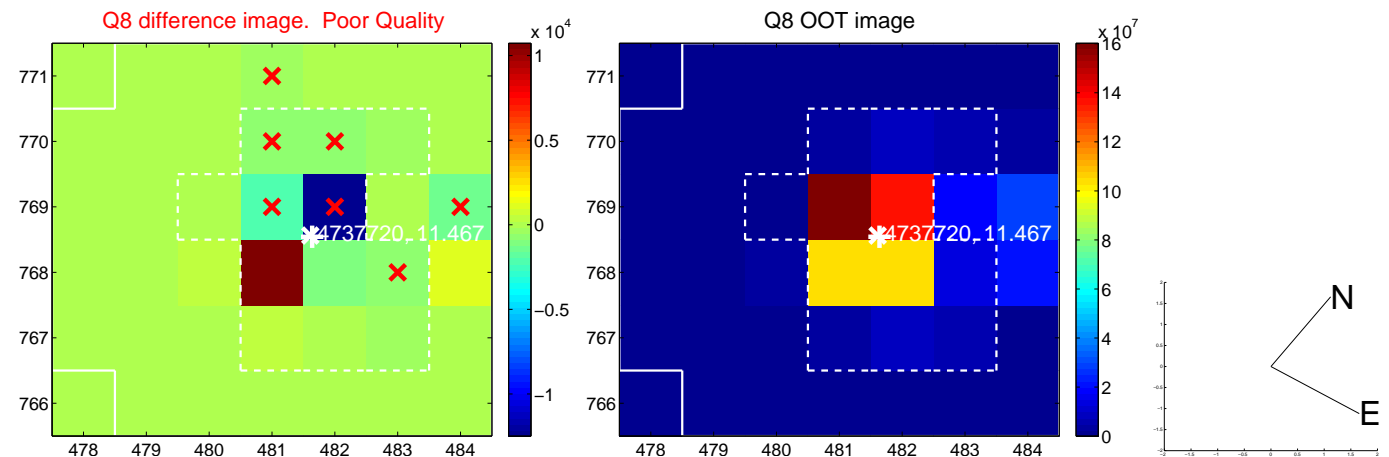
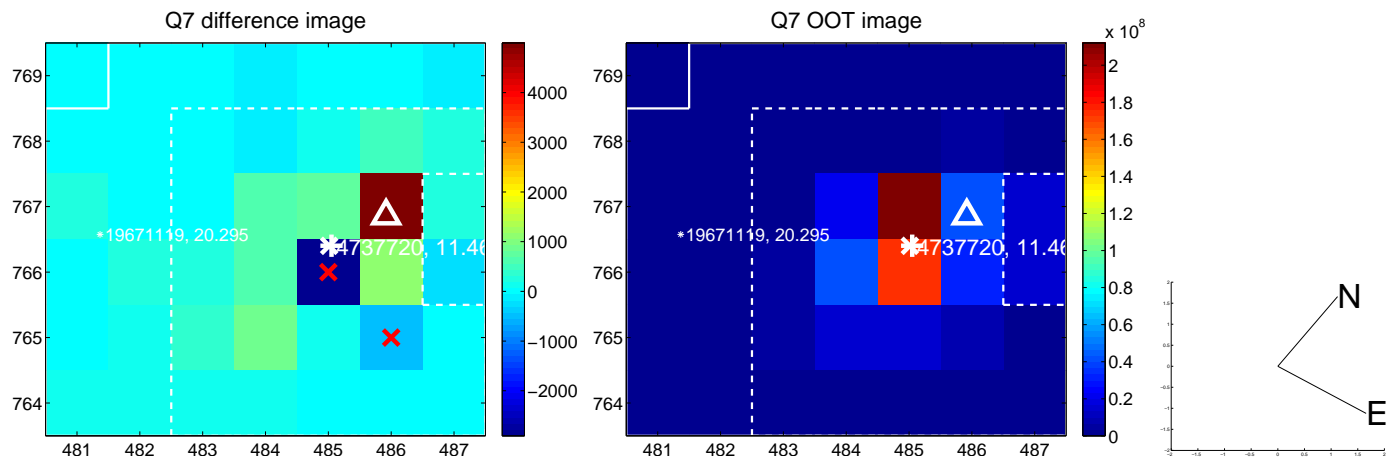
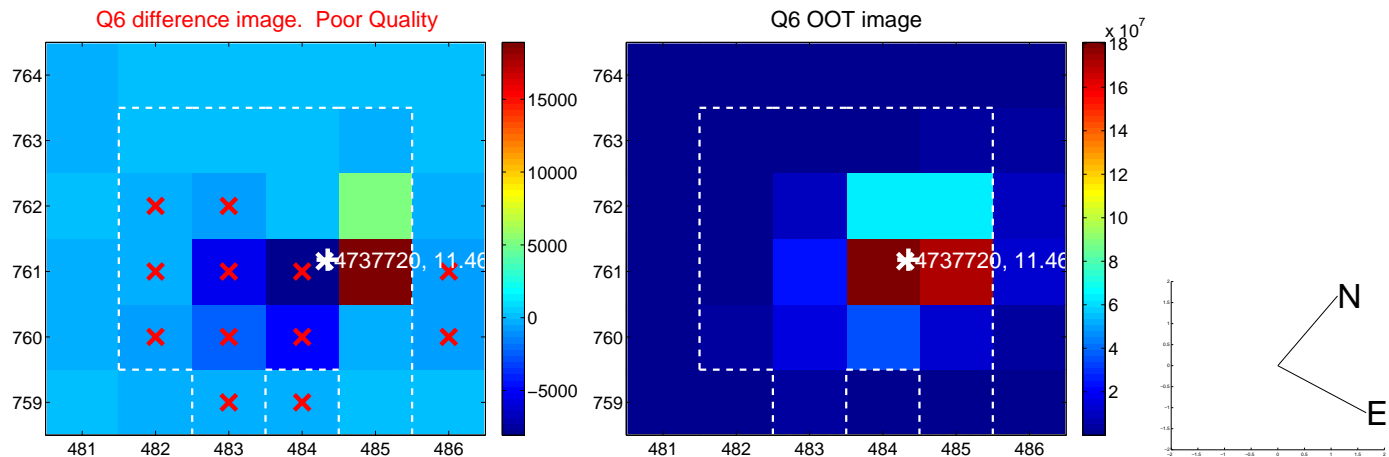
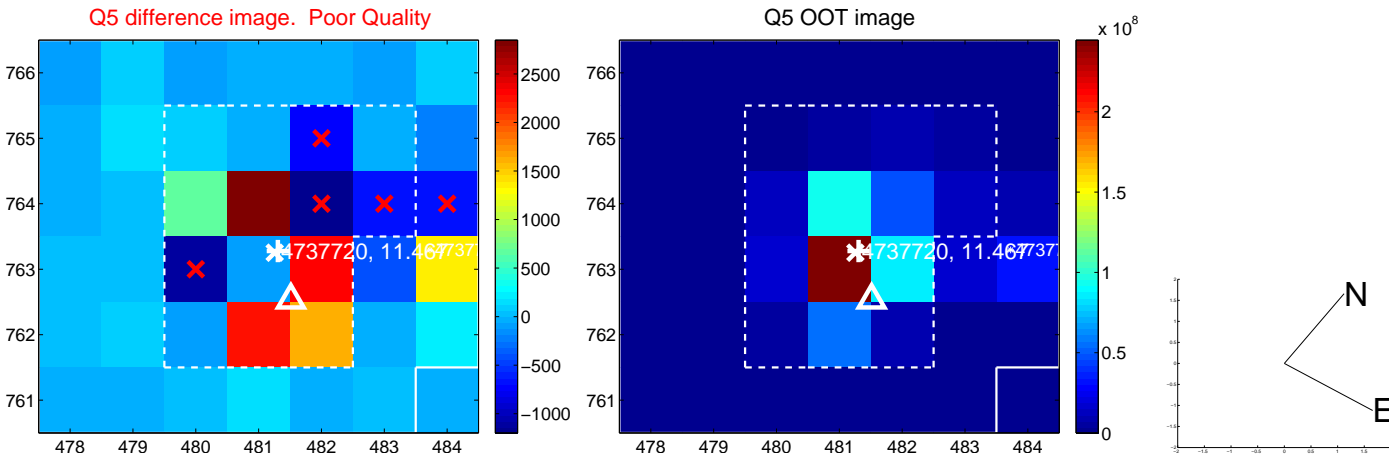


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

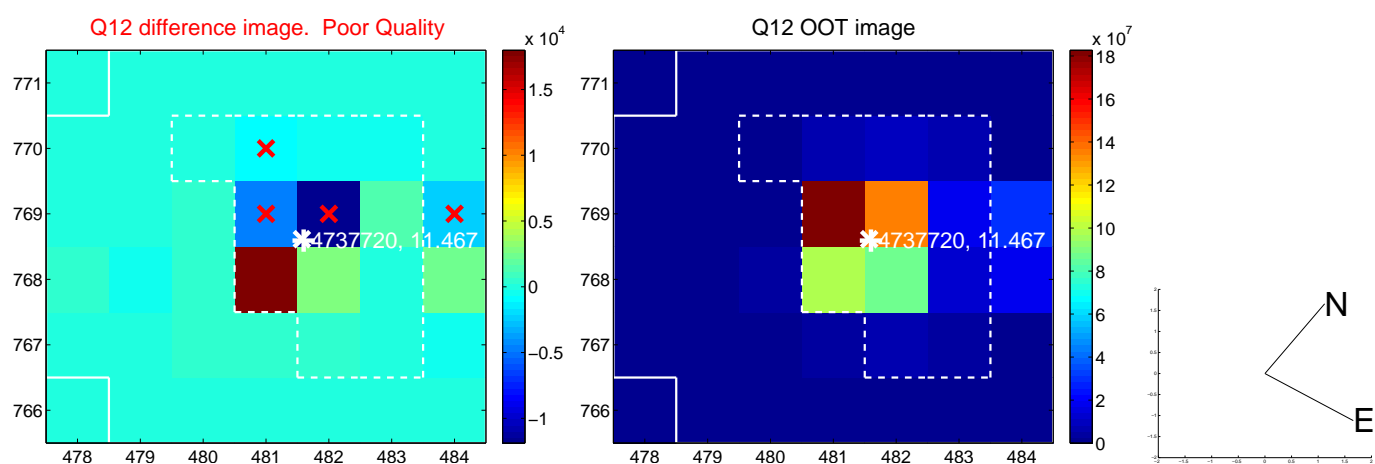
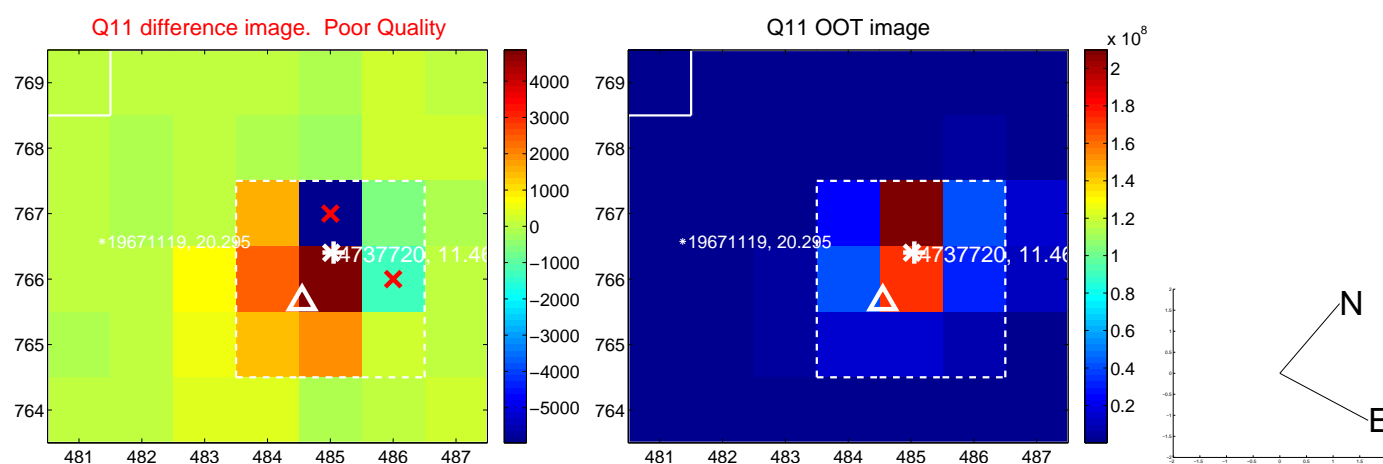
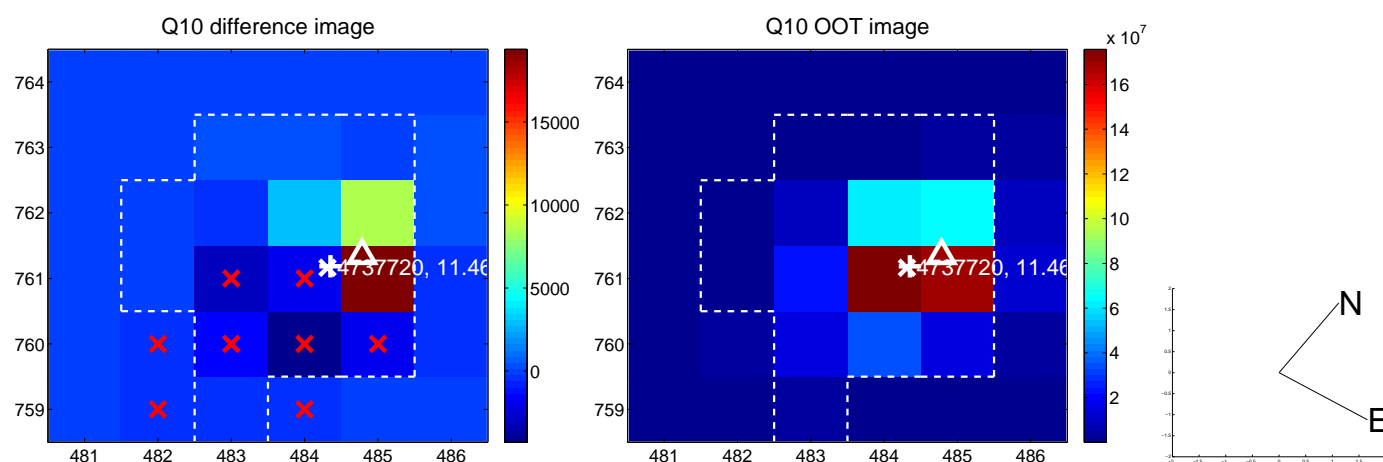
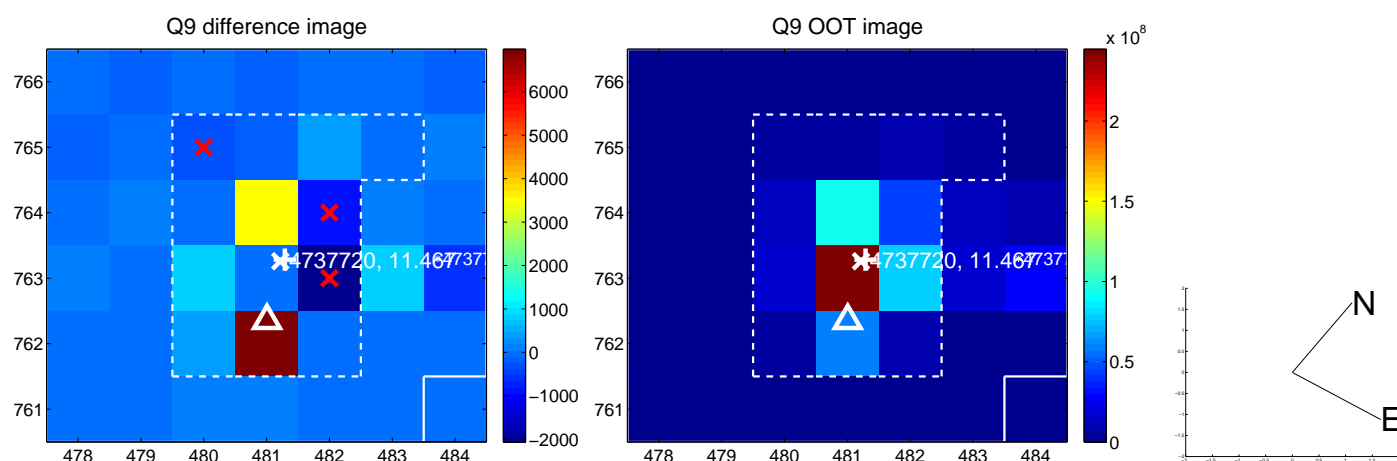
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



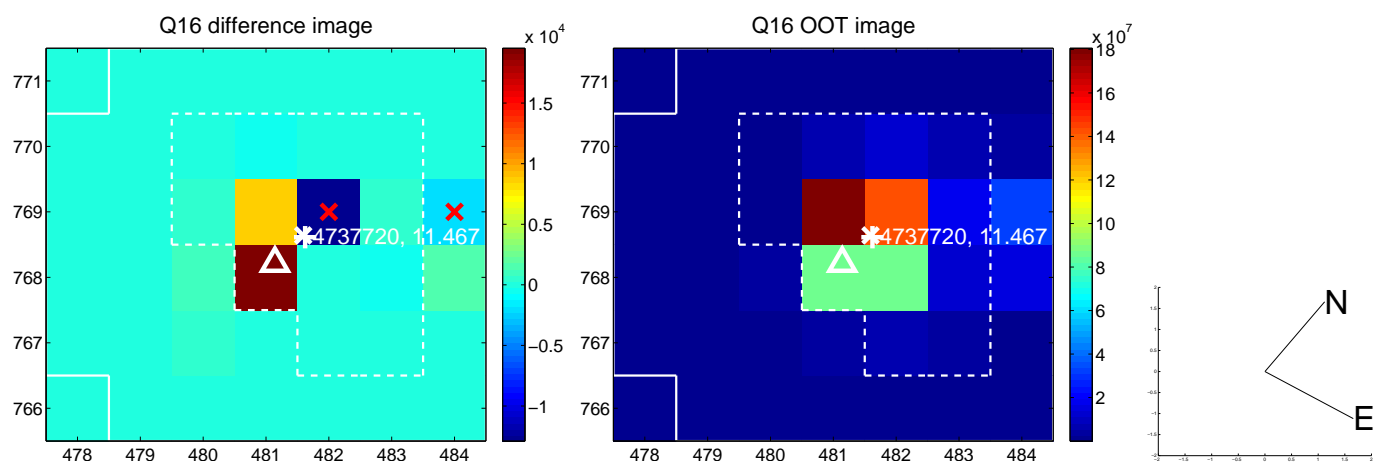
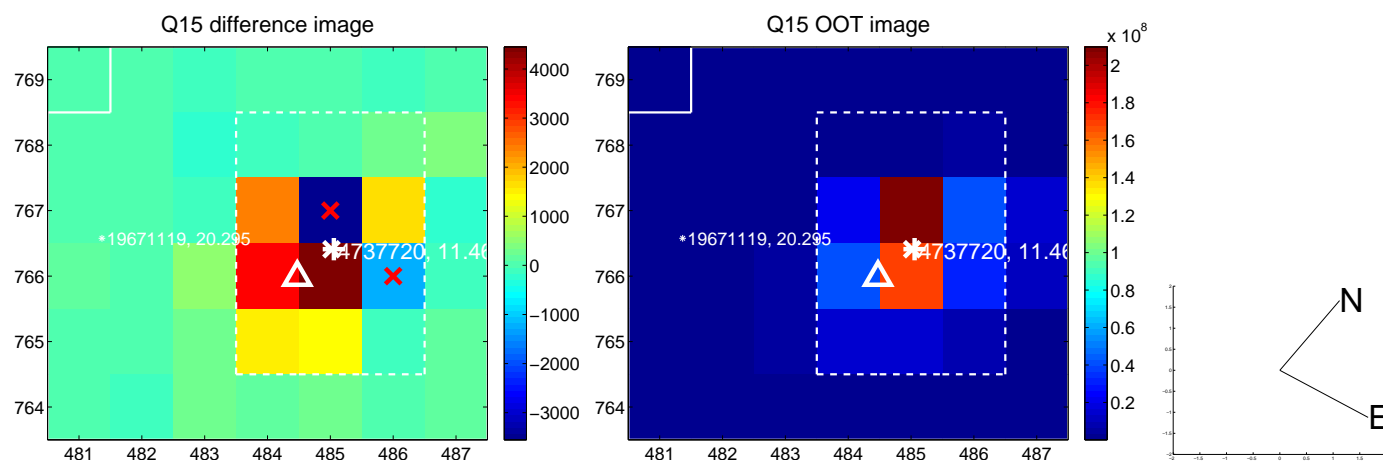
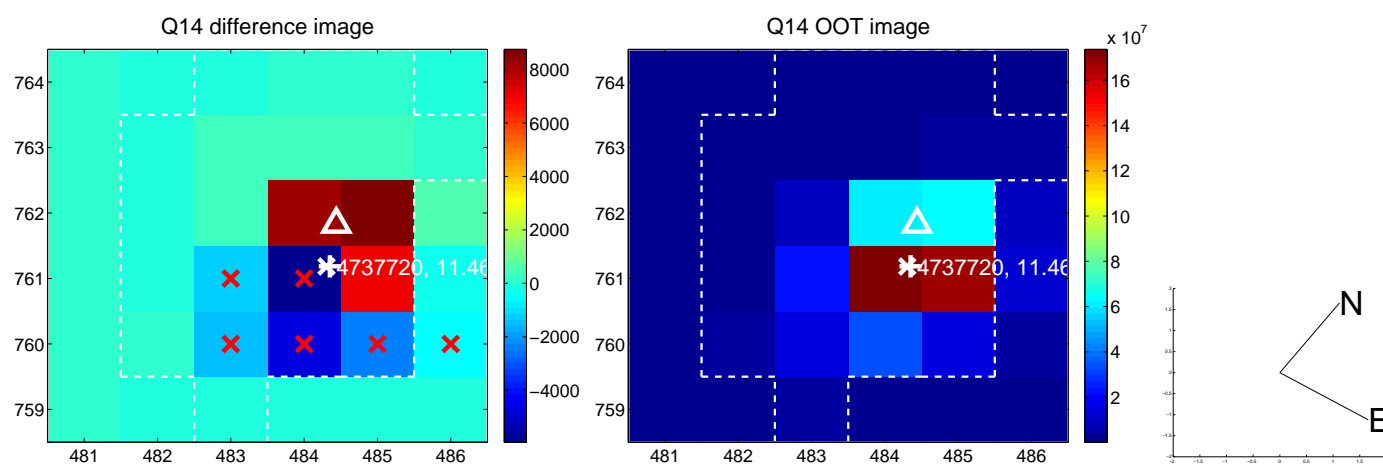
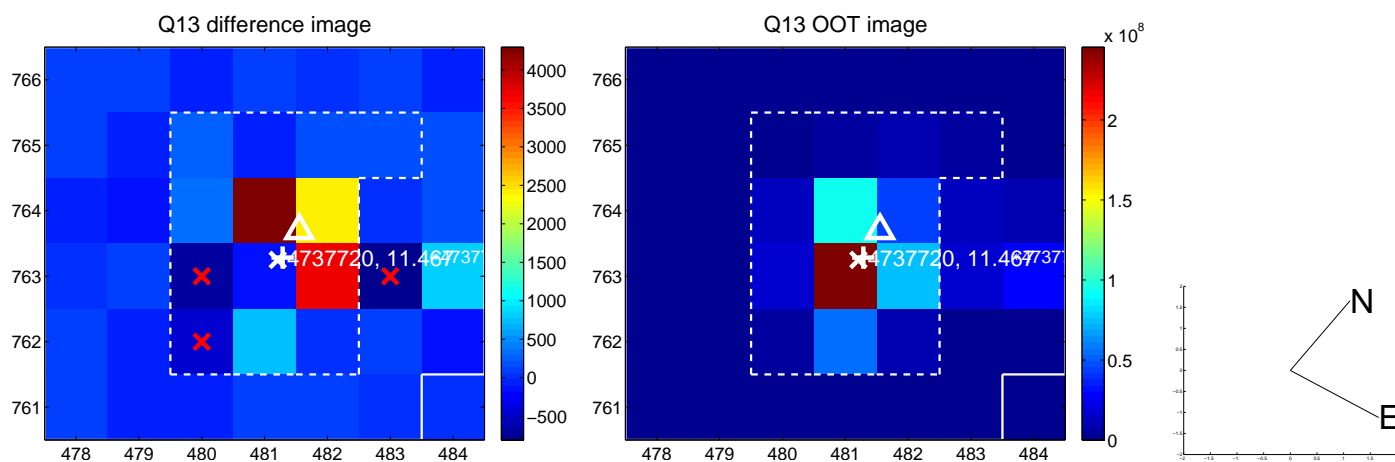
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



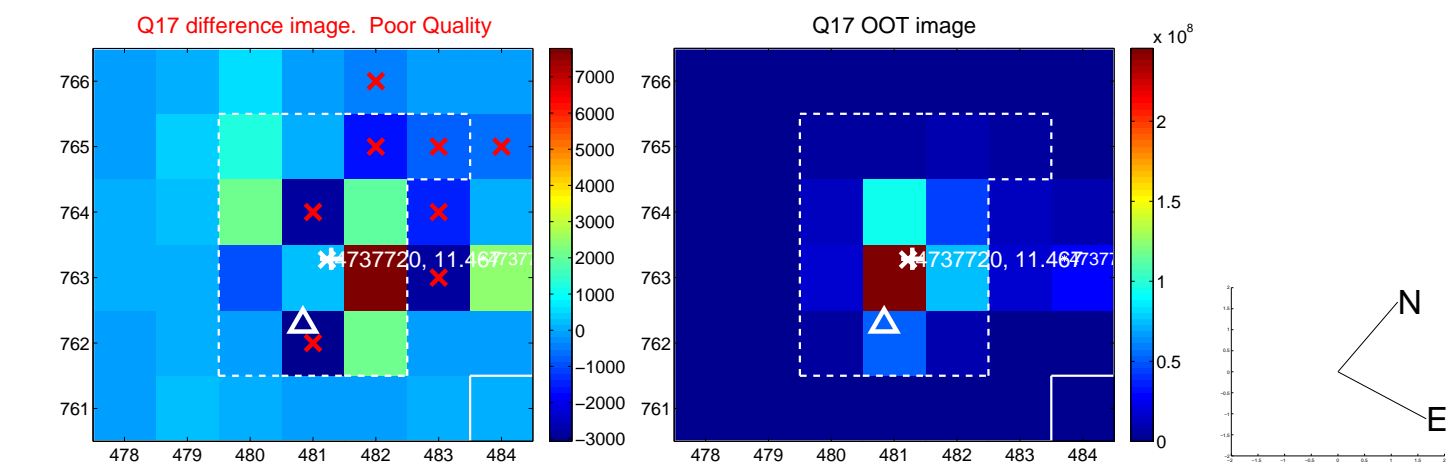
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



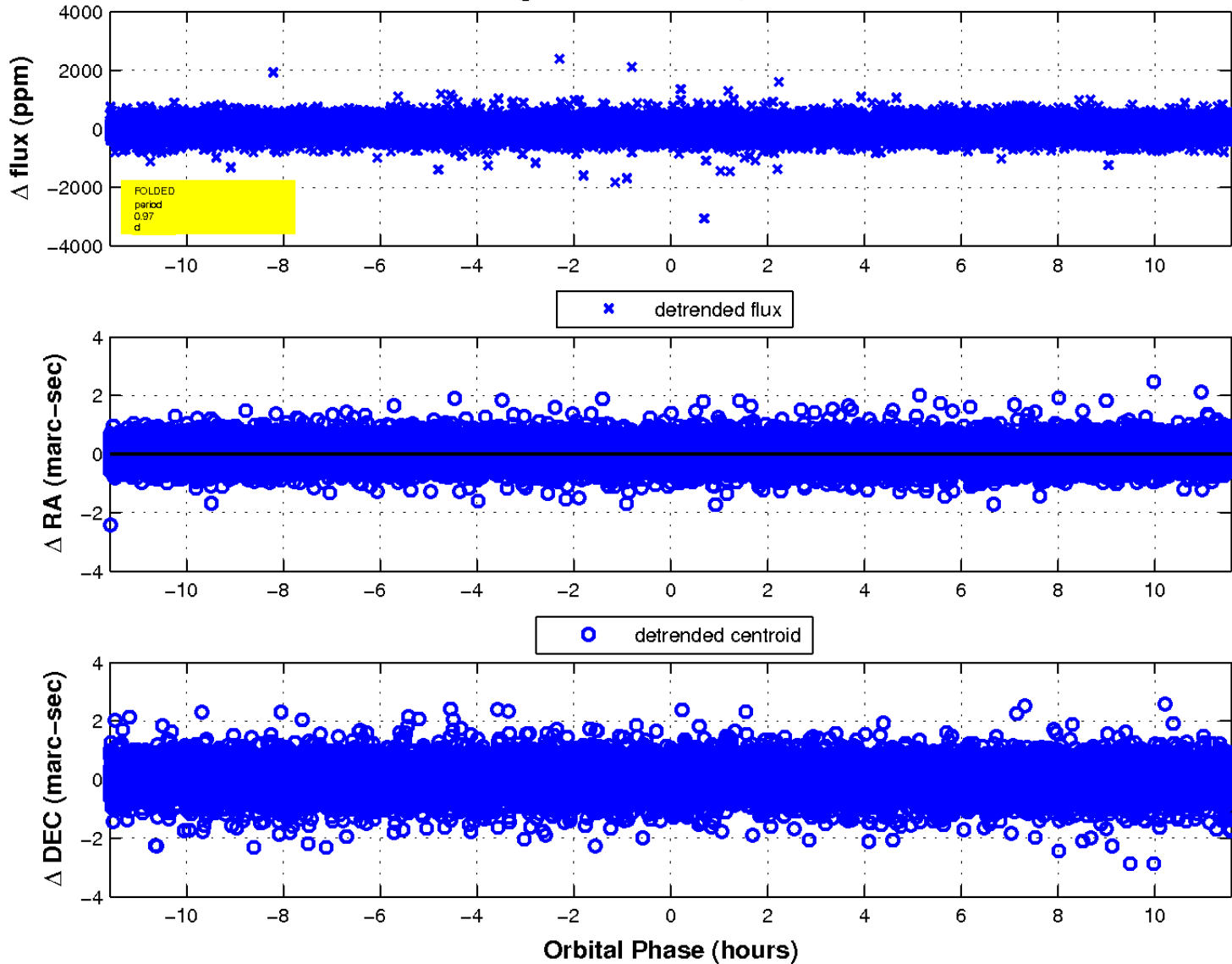
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

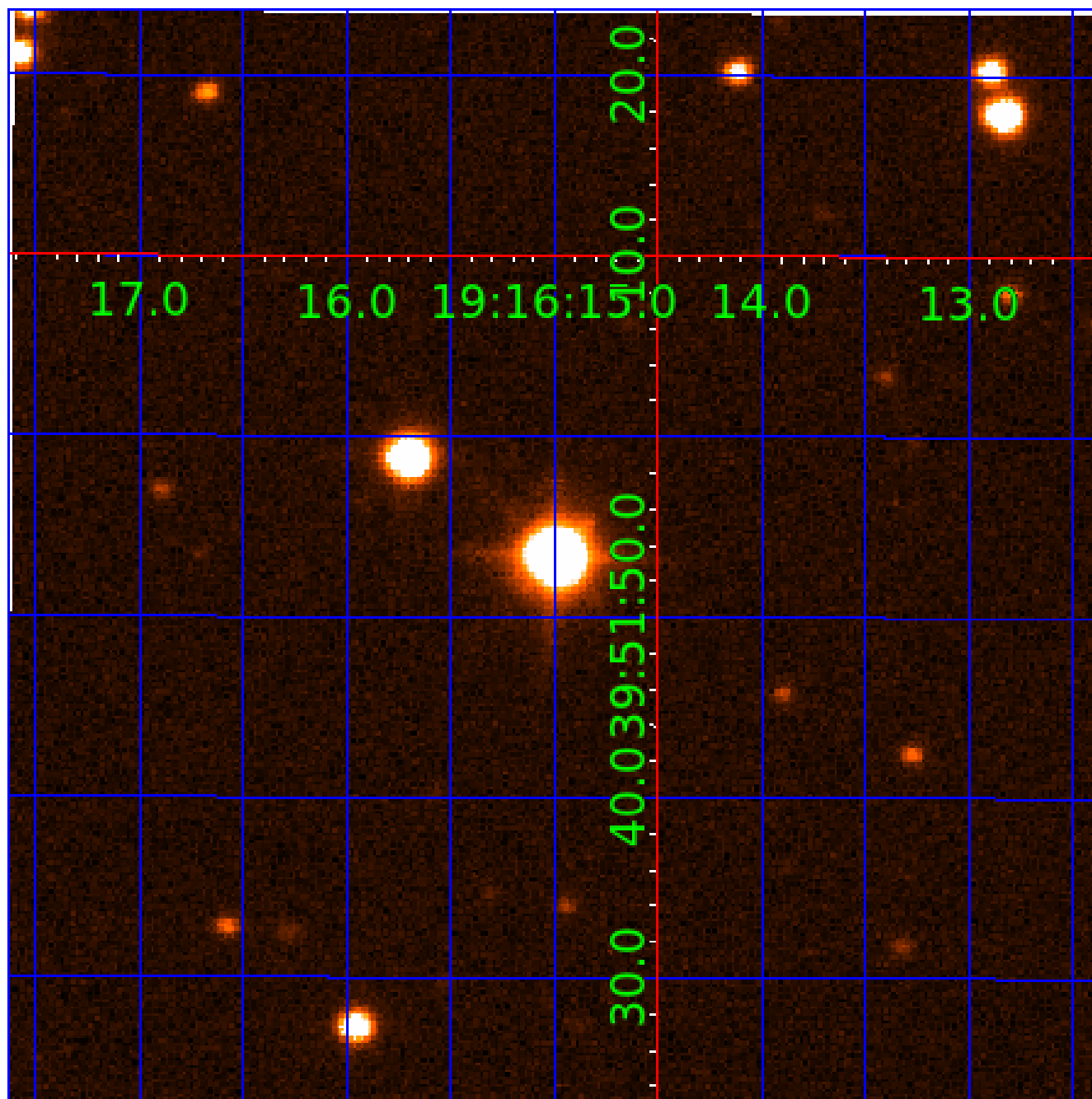


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 004737720

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})
004737720-01	OBS	No	0.588998	131.704380	20.2	0.606	10.5	7.1	2.67	7719	1.27	77266.99
004737720-02	OBS	No	0.965337	131.852926	13.6	6.676	8.2	6.3	2.67	7719	1.00	39985.95
004737720-03	OBS	No	45.474176	144.144273	222.1	1.390	11.1	6.6	2.67	7719	4.04	235.03

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004737720-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
004737720-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—CENT_SATURATED
004737720-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST

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

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

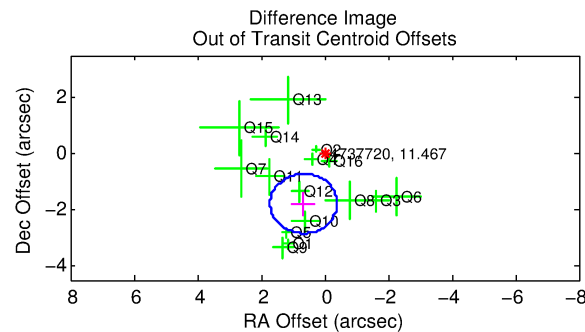
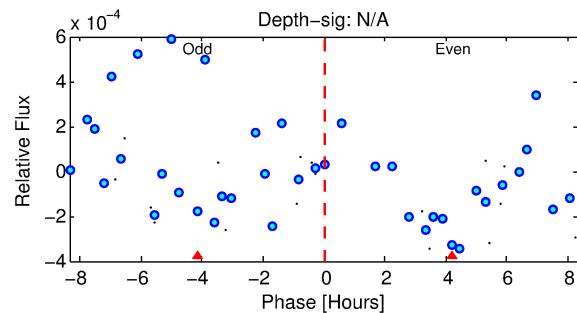
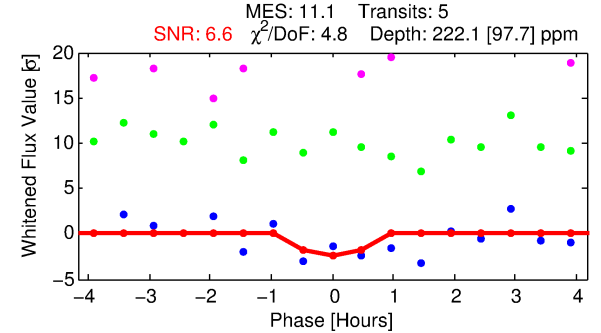
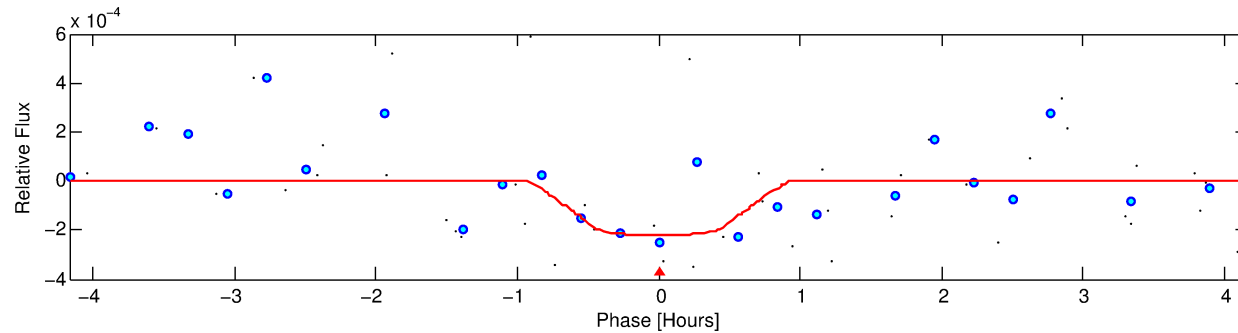
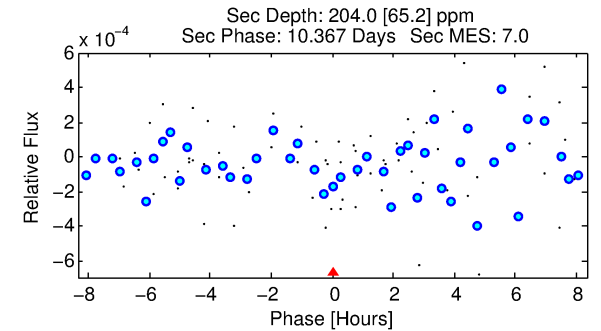
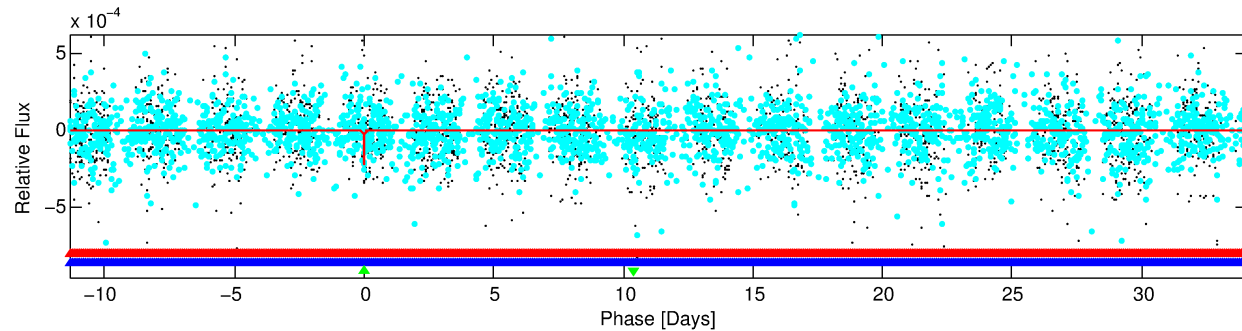
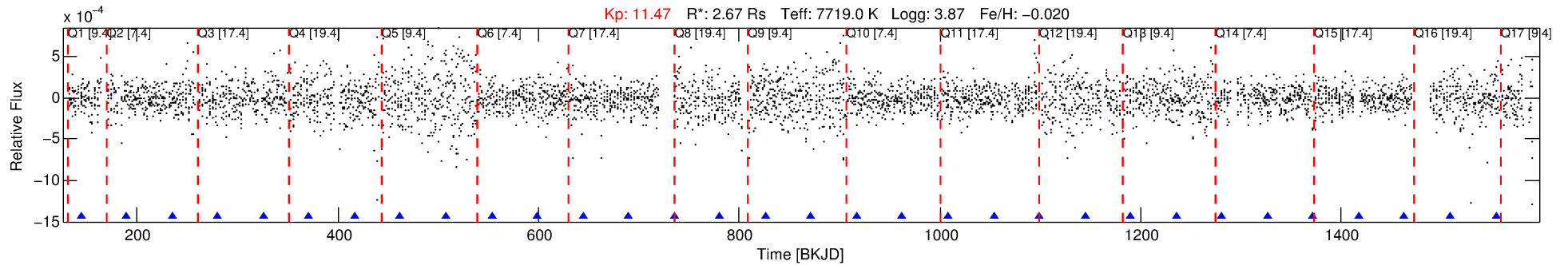
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004737720-03

No Significant Match Found

DV One-Page Summary

KIC: 4737720 Candidate: 3 of 3 Period: 45.474 d



DV Fit Results:

Period = 45.47418 [0.00179] d
Epoch = 144.1443 [0.0340] BKJD
Rp/R* = 0.0139 [0.0790]
a/R* = 253.39 [8369.27]
b = 0.02 [1324.92]
Seff = 235.03 [70.07]
Teq = 998 [74] K
Rp = 4.04 [23.04] Re
a = 0.3106 [0.0598] AU
Ag = 662.25 [7546.99] [0.09σ]
Teffp = 7831 [22303] K [0.31σ]

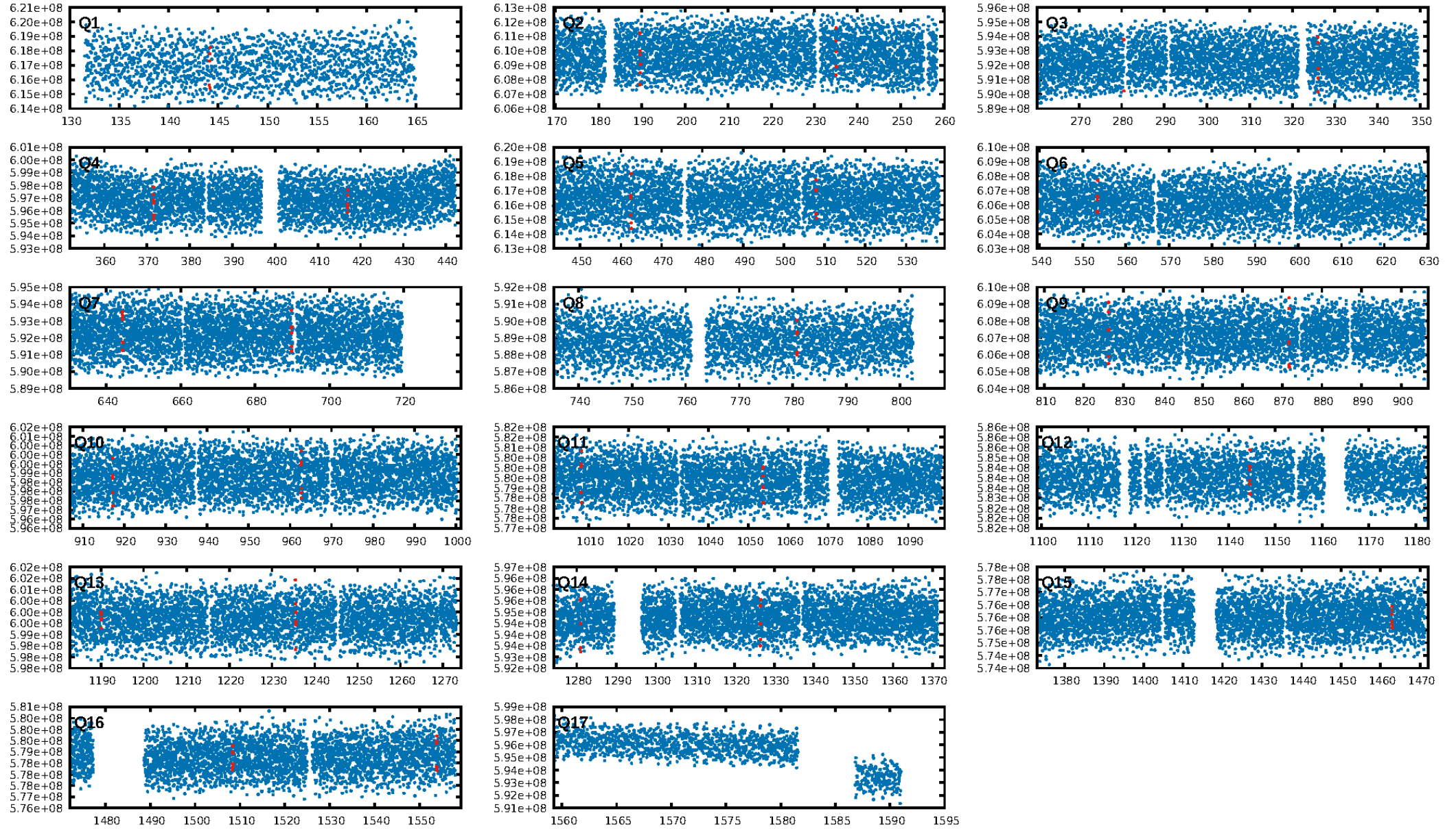
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [156.66σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 5.4%
Bootstrap-pfa: 3.72e-12
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.233
Centroid-sig: N/A
Centroid-so: 1.012 arcsec [2.69σ]
OotOffset-rm: 1.904 arcsec [5.41σ]
KicOffset-rm: 1.863 arcsec [5.88σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.69 [11/16]
DiffImageOverlap-fno: 0.12 [2/16]

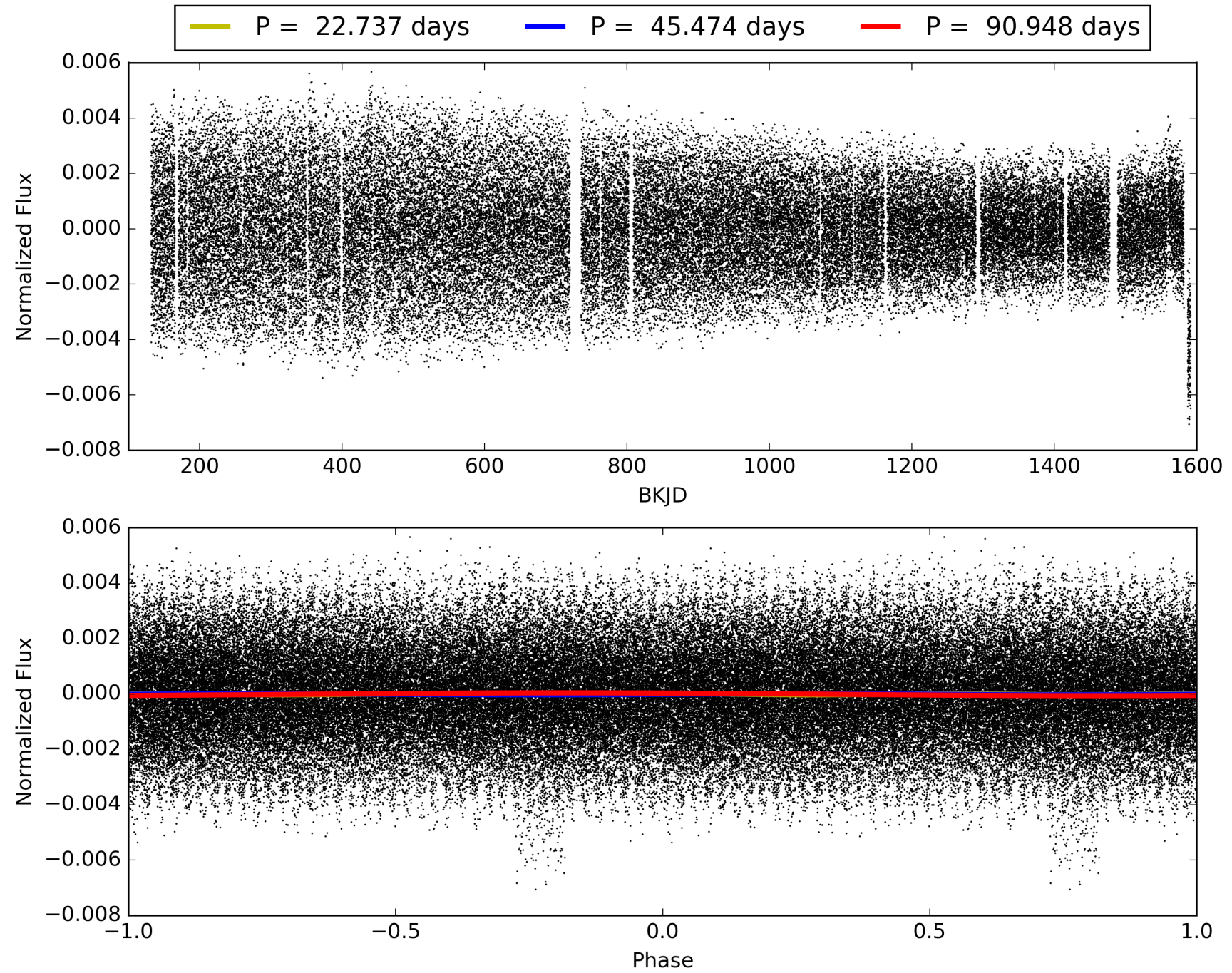
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:19:53 Z

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

TCE 004737720-03, PDC Light Curves

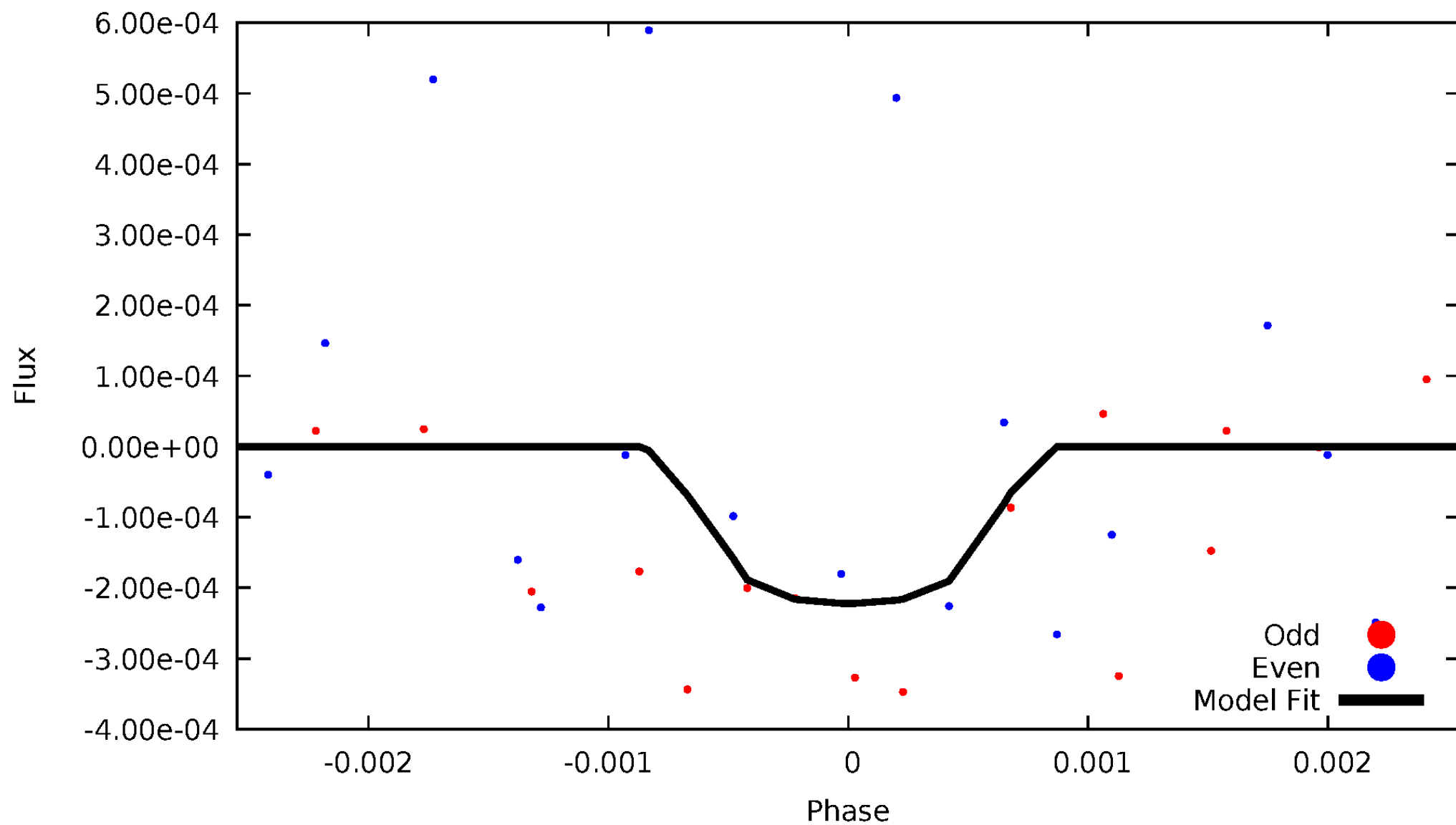


TCE 004737720-03



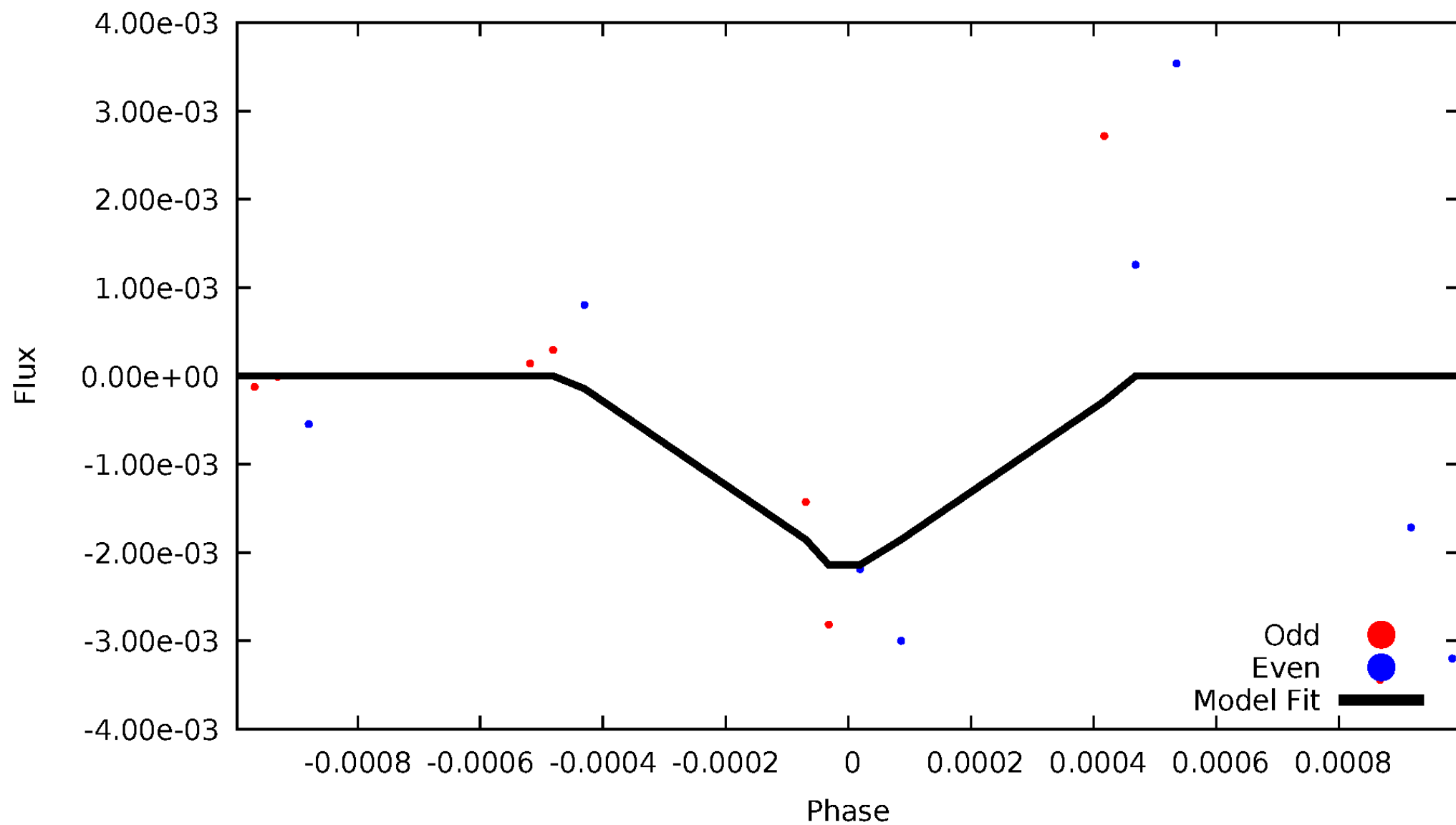
DV Odd/Even

TCE 004737720-03

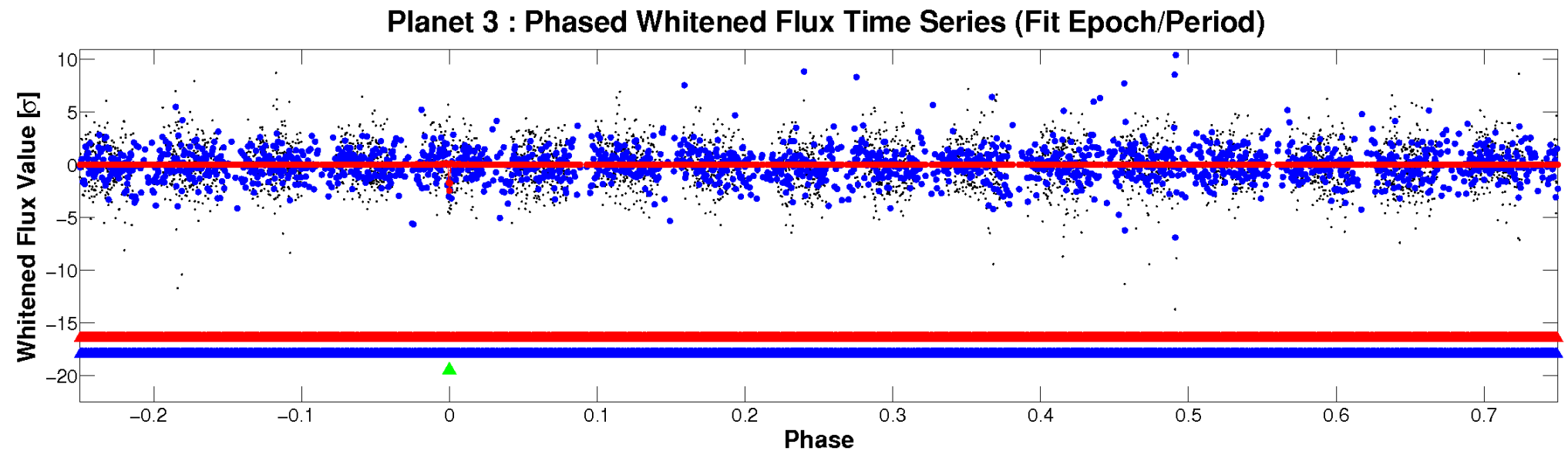
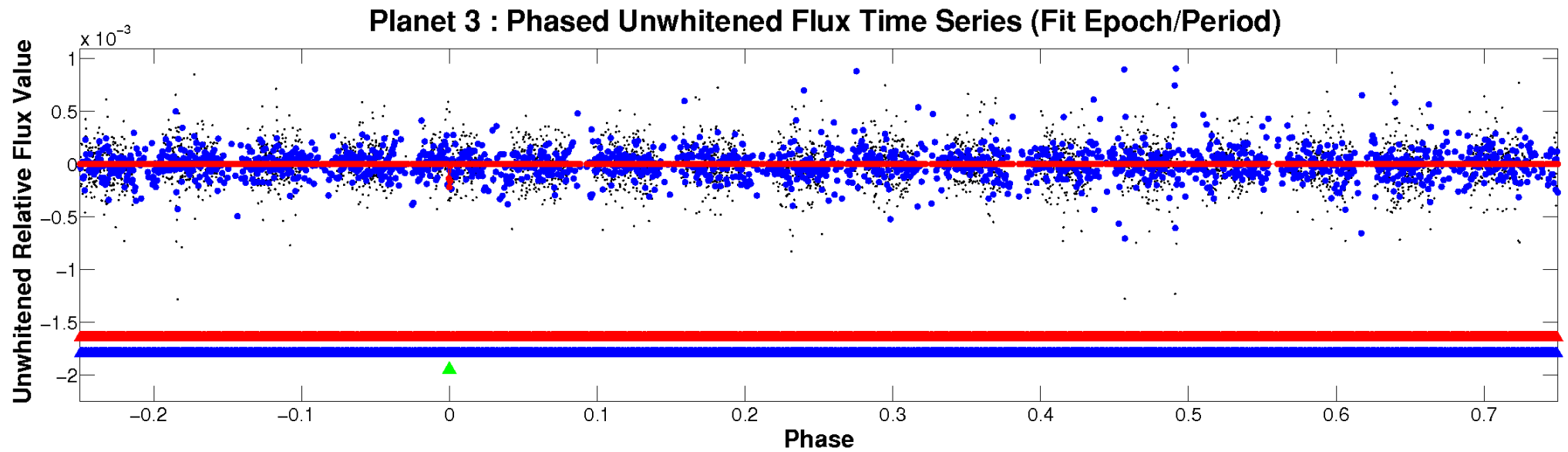


ALT Odd/Even

TCE 004737720-03

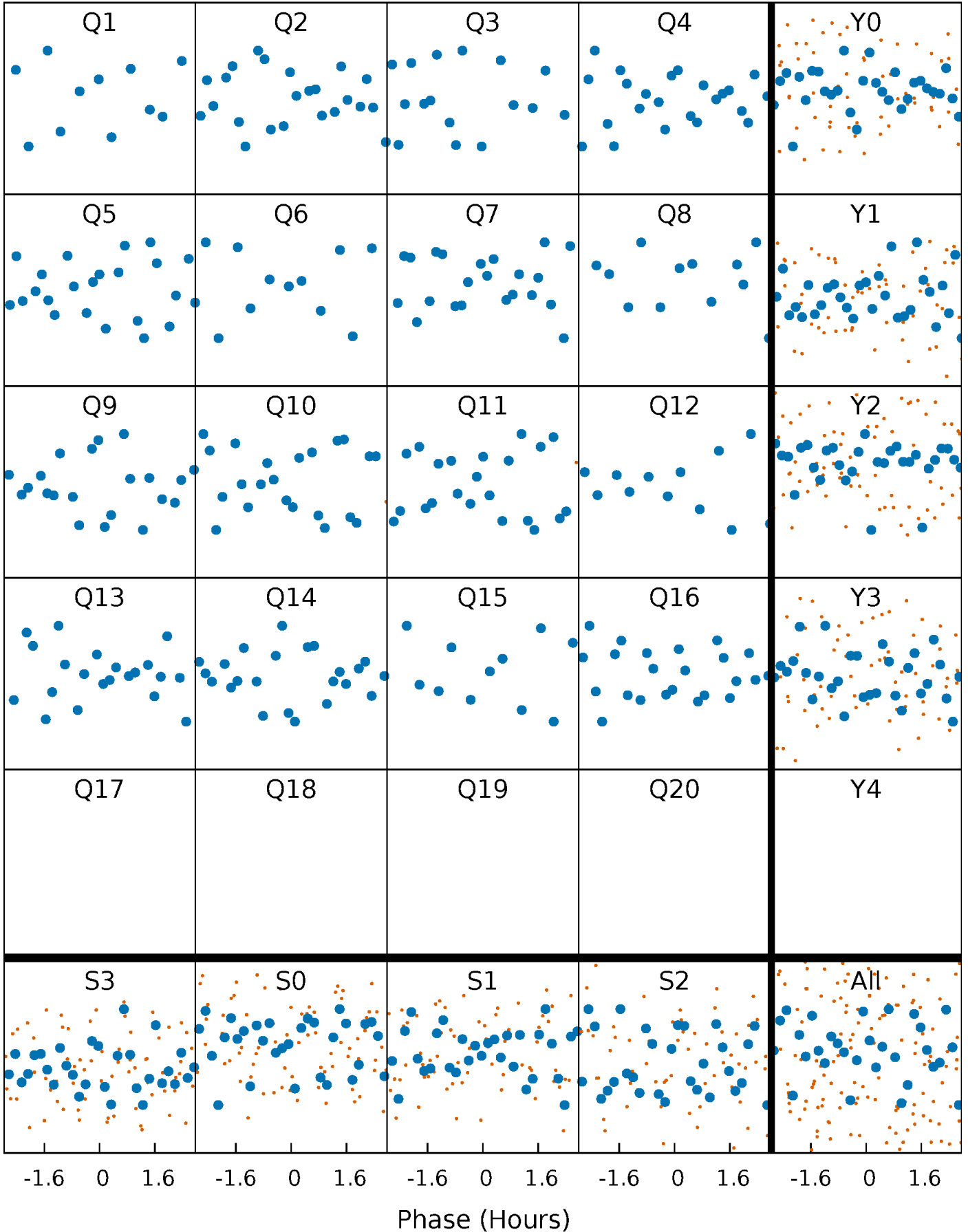


Non-Whitened Vs. Whitened Light Curve



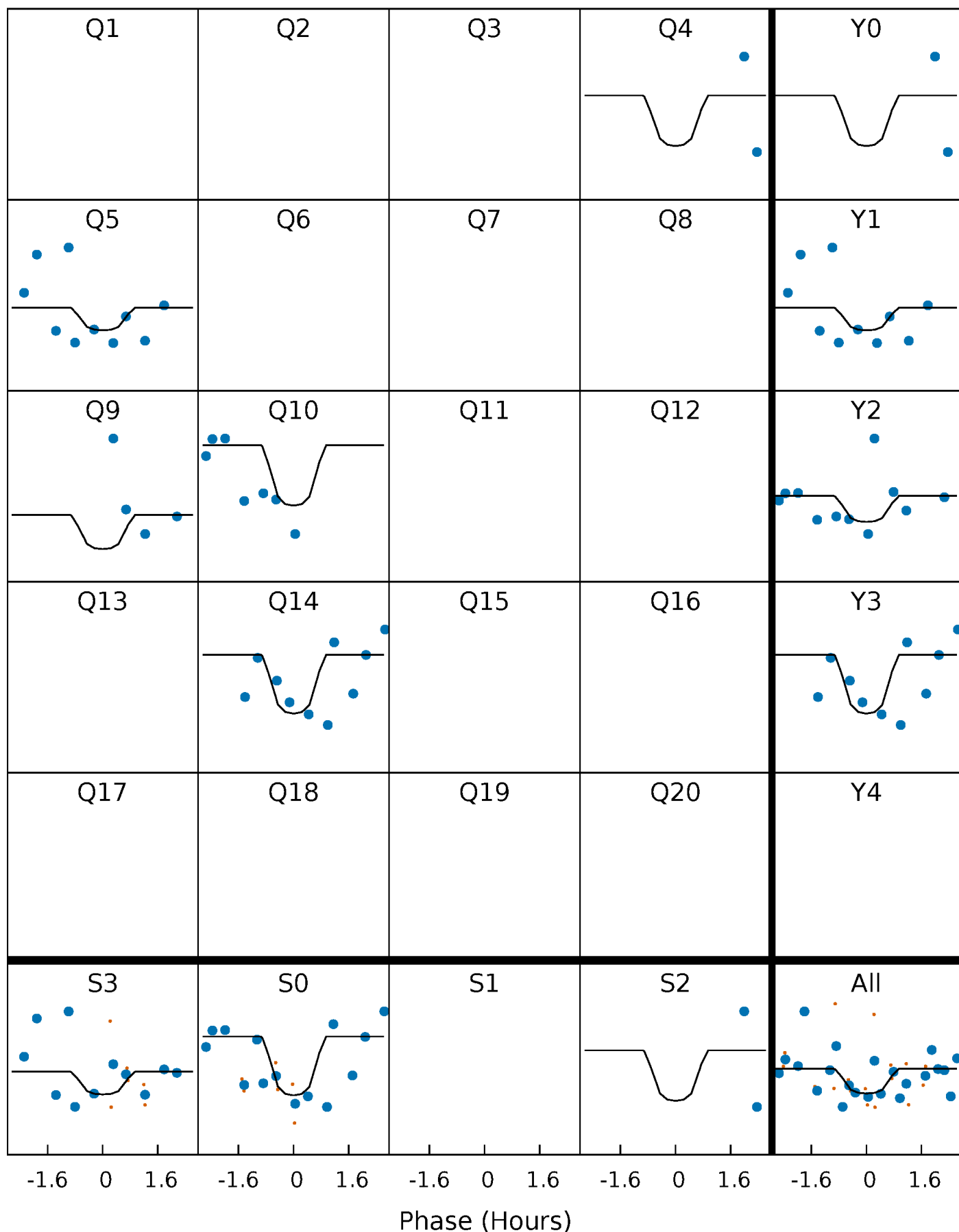
PDC Quarter-Phased Transit Curves

TCE 004737720-03 P= 45.474176 Days $T_0=144.144273$ (BKJD)



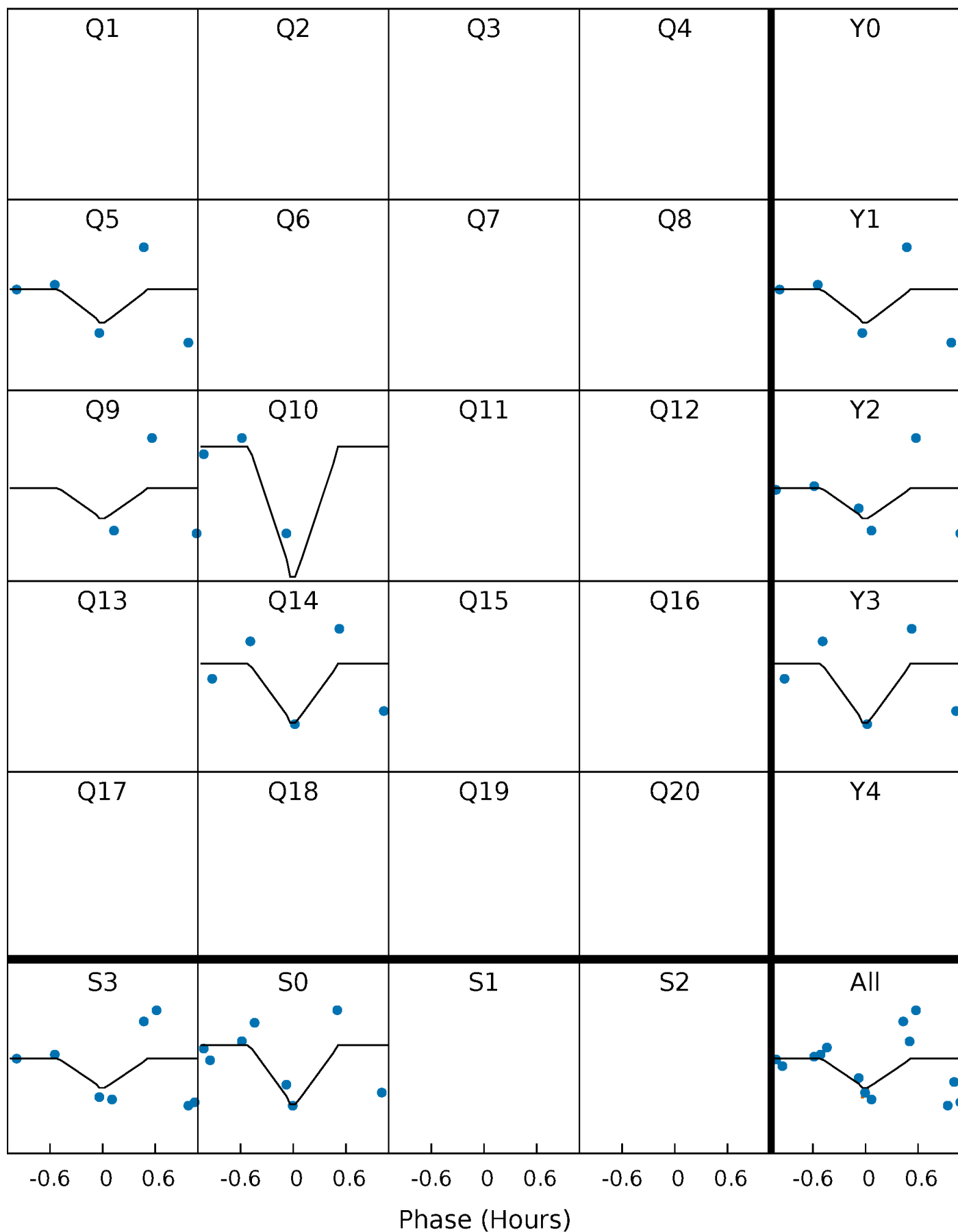
DV Quarter-Phased Transit Curves

TCE 004737720-03 P= 45.474176 Days $T_0=144.144273$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

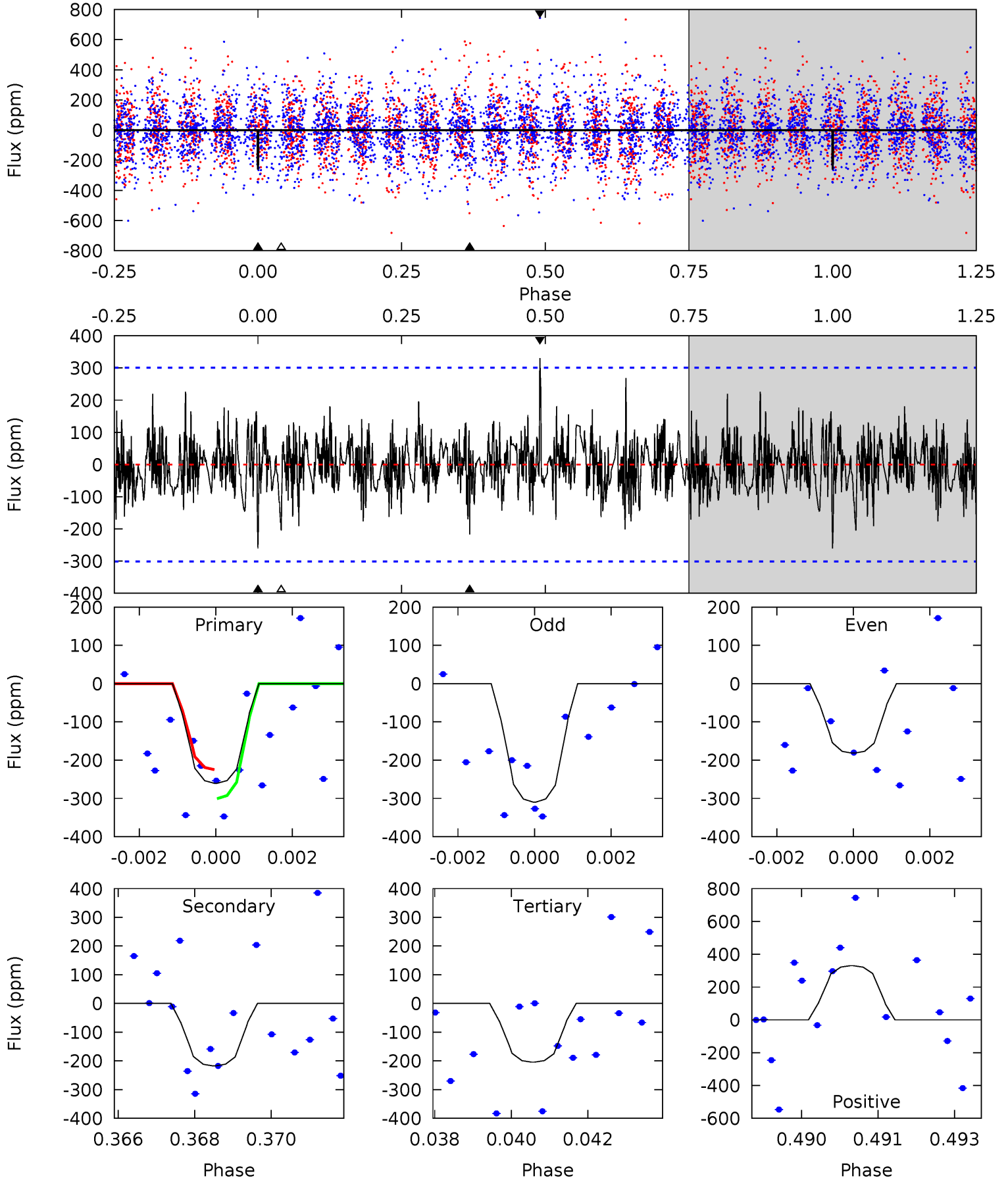
TCE 004737720-03 P= 45.473437 Days $T_0=144.161264$ (BKJD)



DV Model-Shift Uniqueness Test

004737720-03, P = 45.474176 Days, E = 98.670097 Days

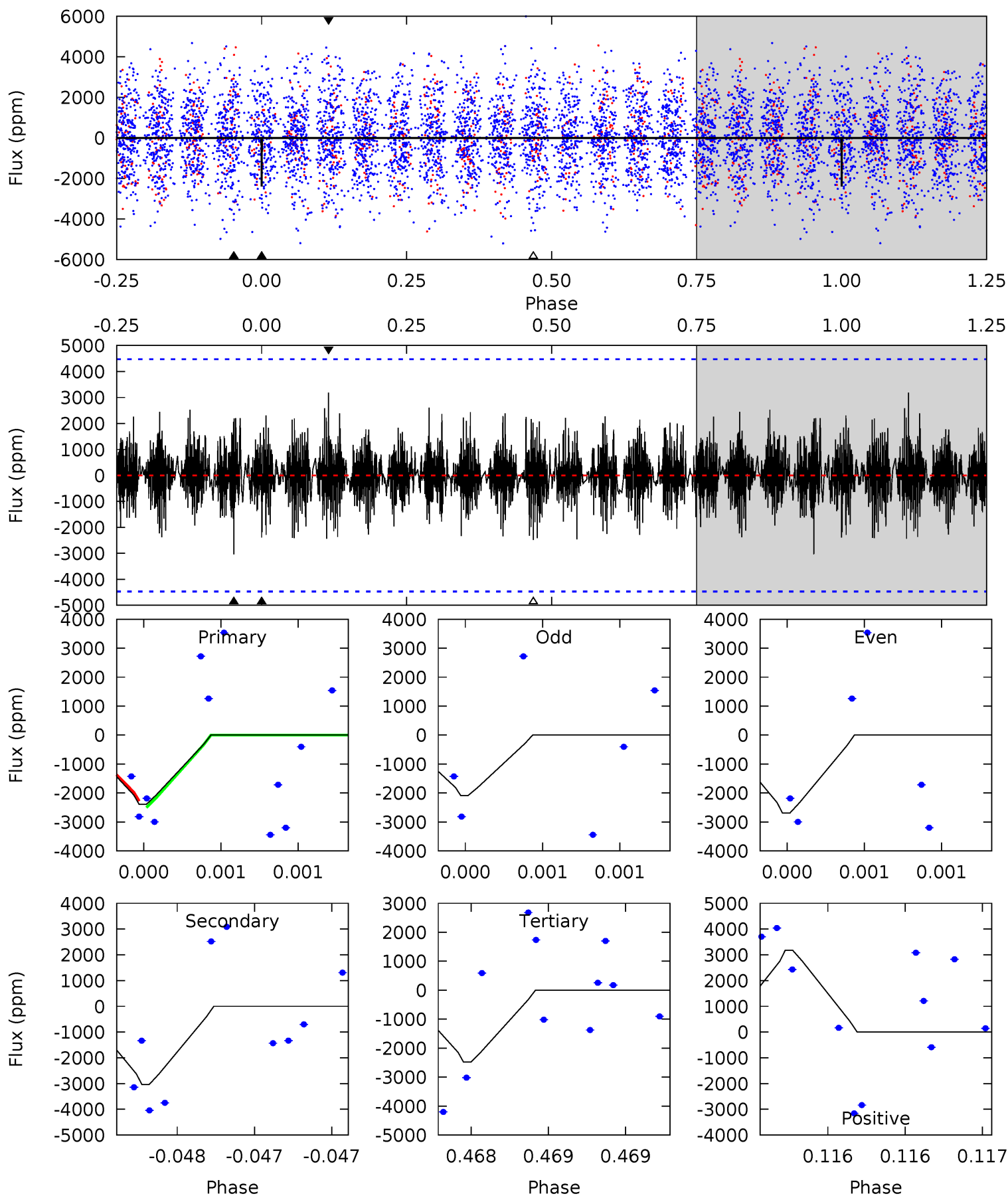
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.65	3.88	3.65	5.89	5.37	3.17	1.13	0.99	-1.24	0.23	-2.01	1.14	0.37	0.56	0.68



Alt Model-Shift Uniqueness Test

004737720-03, P = 45.473437 Days, E = 98.687827 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.97	3.78	3.08	3.95	5.56	3.46	0.90	-0.11	-0.98	0.69	-0.18	0.39	1.00	0.51	0.12



Stellar Parameters For KIC 004737720

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7719^{+69}_{-84}	$3.871^{+0.168}_{-0.072}$	$-0.020^{+0.100}_{-0.150}$	$2.670^{+0.286}_{-0.573}$	$1.933^{+0.027}_{-0.214}$	$0.143^{+0.126}_{-0.034}$
	+1%/-1%	+4%/-2%	+500%/-750%	+11%/-21%	+1%/-11%	+88%/-24%
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 004737720-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-217 ± 56	$17.04^{+16.45}_{-12.30}$	1385^{+47}_{-71}	3966^{+3068}_{-742}	36^{+450}_{-27}
Alt.	-3036 ± 804	$19.90^{+18.88}_{-13.13}$	1387^{+45}_{-69}	6624^{+7749}_{-1780}	379^{+3157}_{-283}

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 $A_{obs} \gg 1.0$

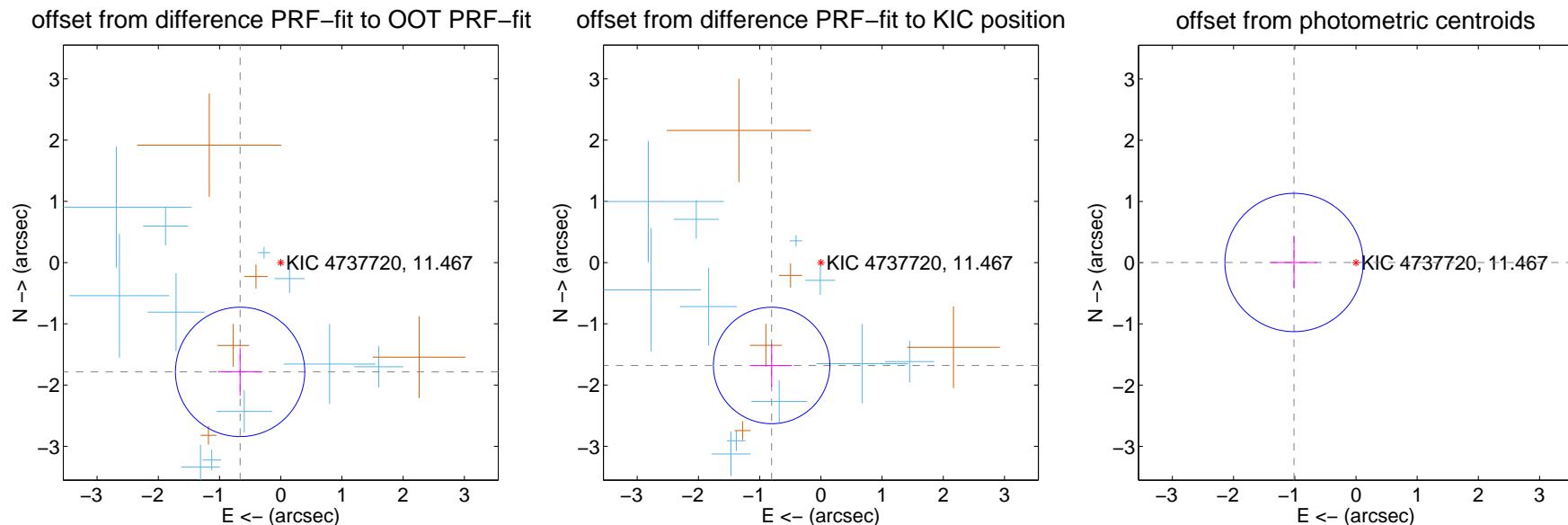
DV Centroid Data

Supplemental centroid analysis for 004737720-03. **Kepler magnitude: 11.47.** Transit SNR 6.62

There are 11 quarters with good PRF difference image offsets

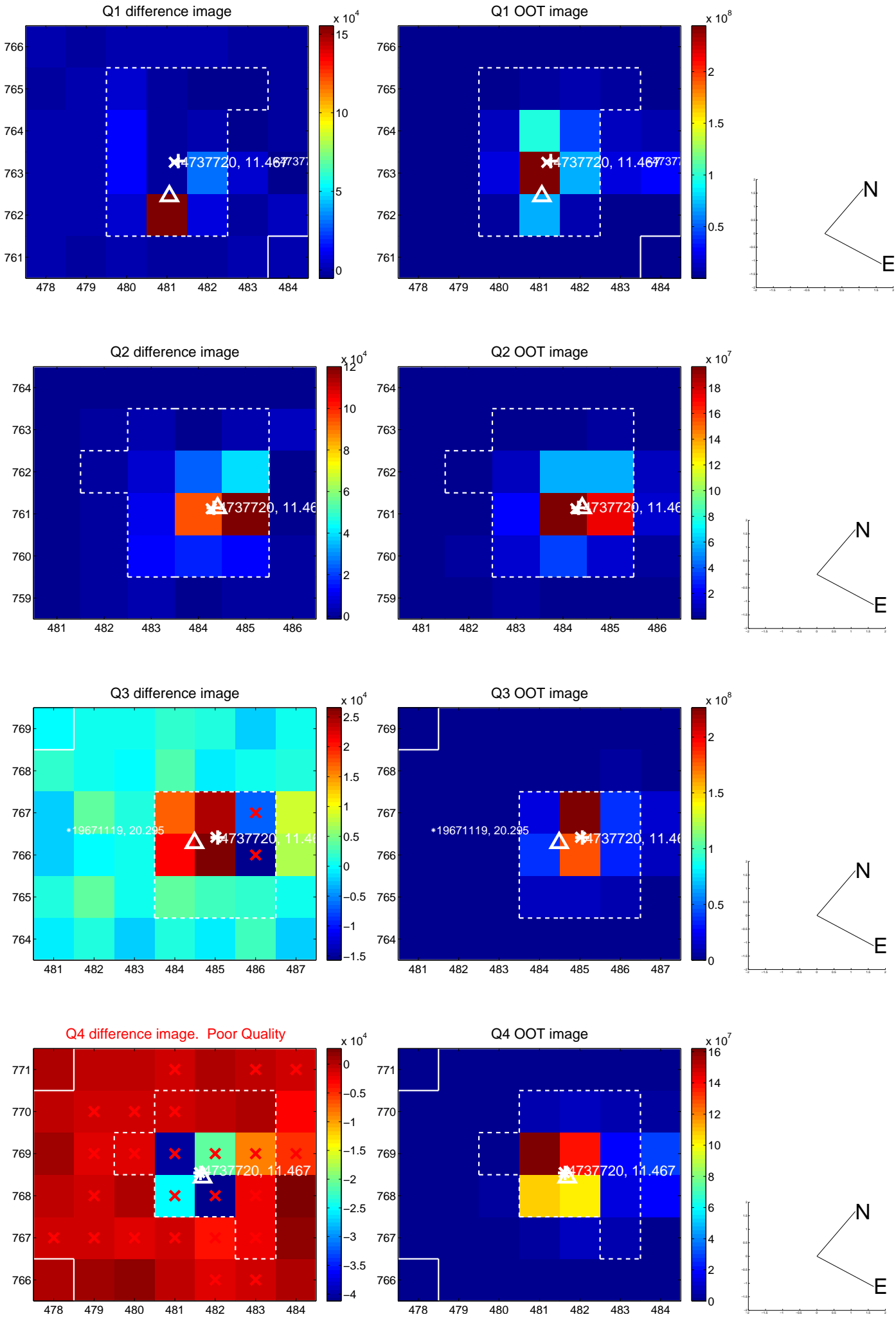
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.904 ± 0.352	5.41	0.664 ± 0.364	-1.785 ± 0.389
PRF-fit source offset from KIC position	1.863 ± 0.317	5.88	0.804 ± 0.334	-1.680 ± 0.349
photometric centroid source offset	1.01 ± 0.38	2.69	1.01 ± 0.38	0.00 ± 0.42

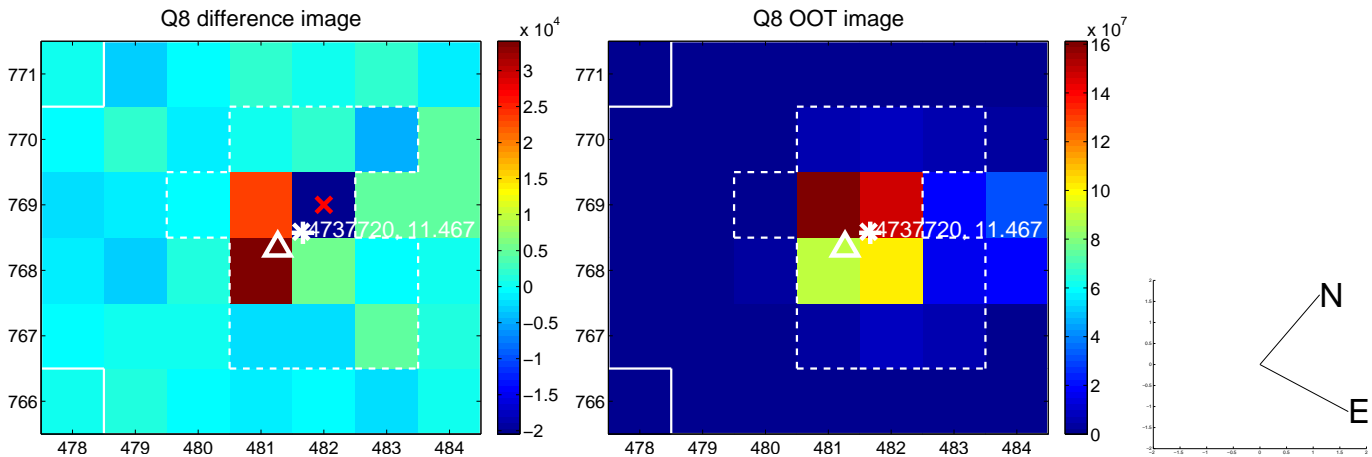
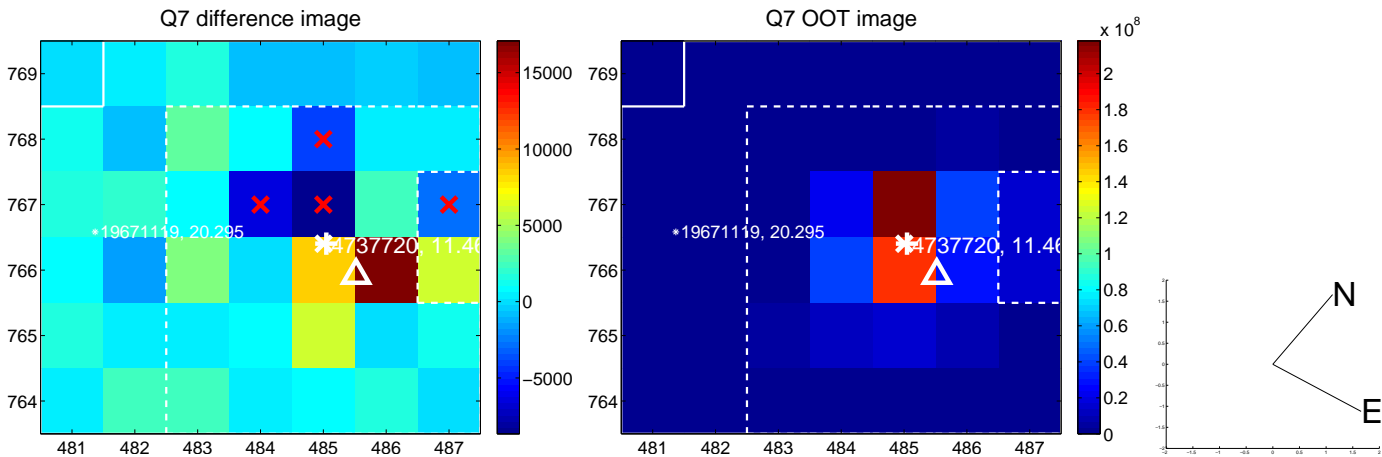
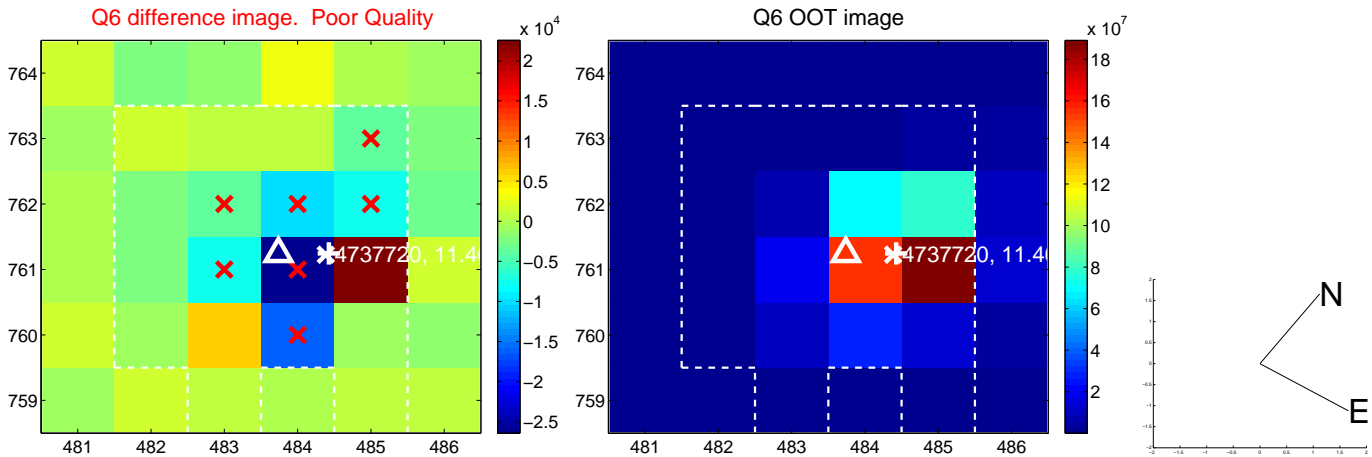
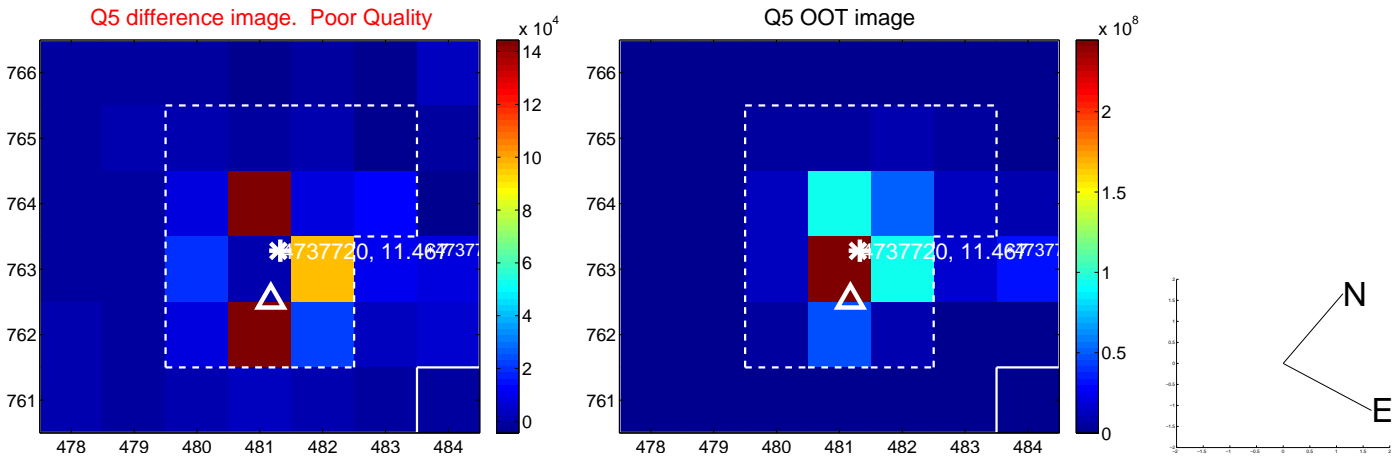


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

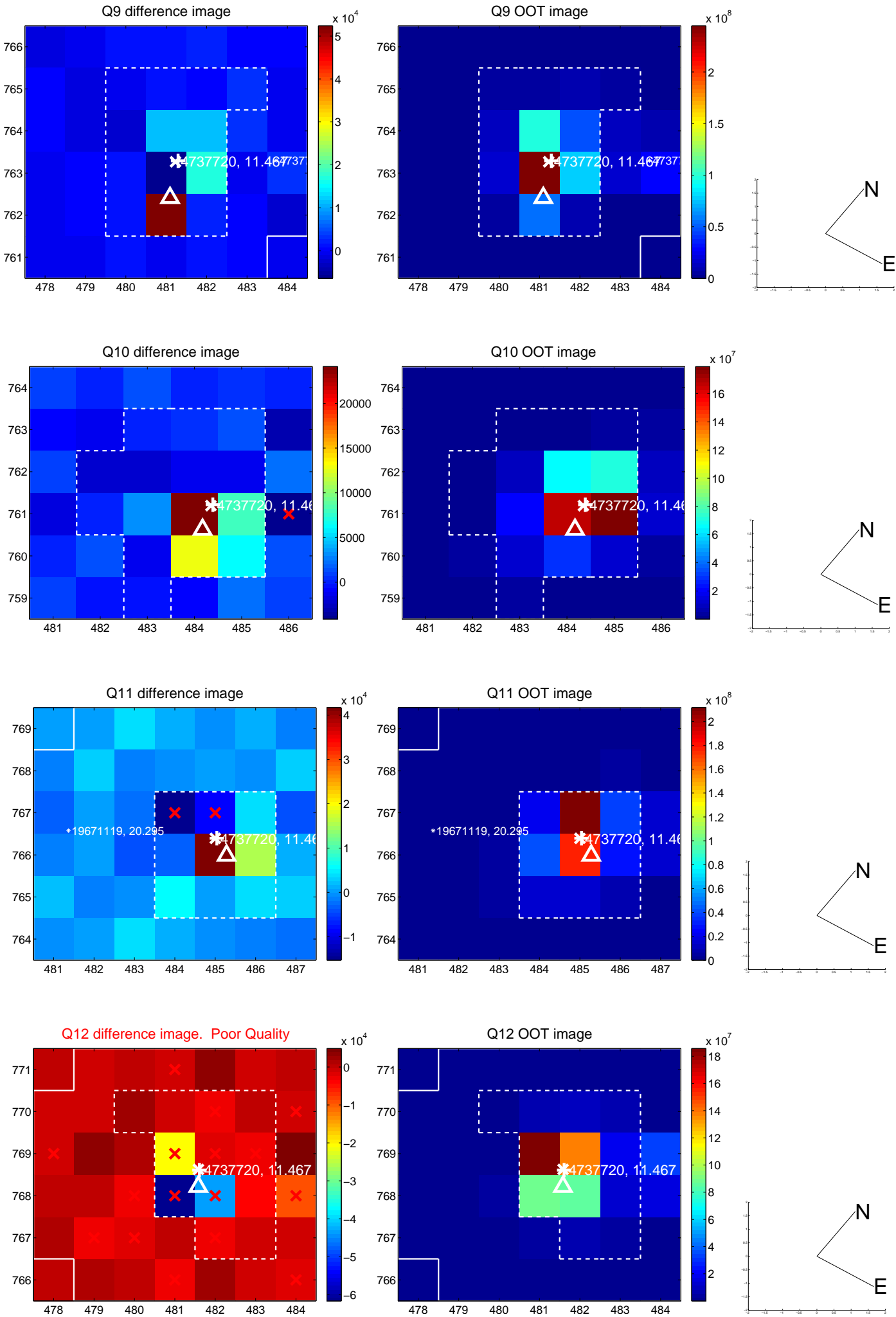
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



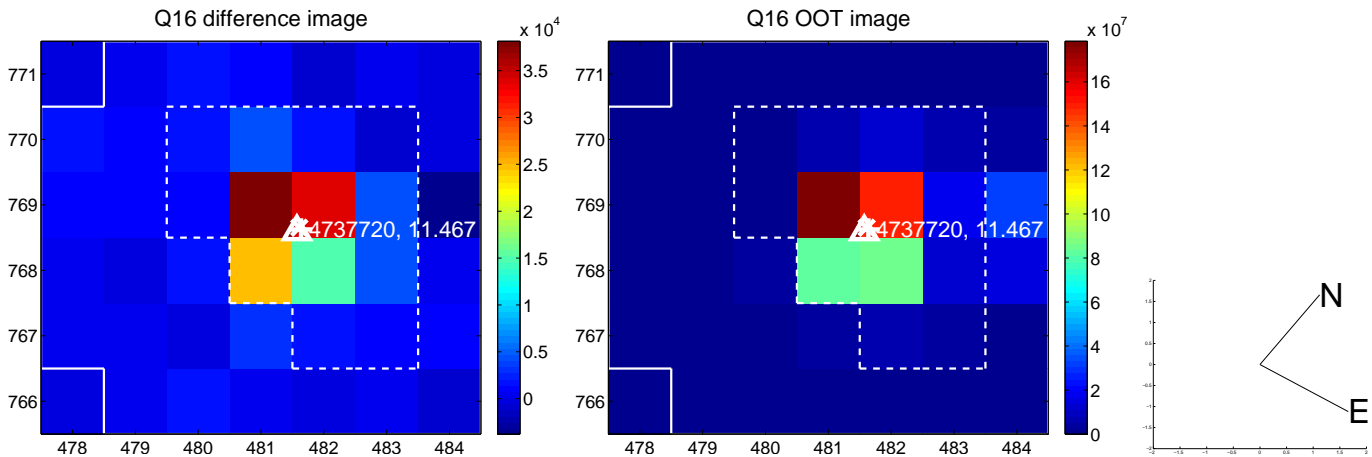
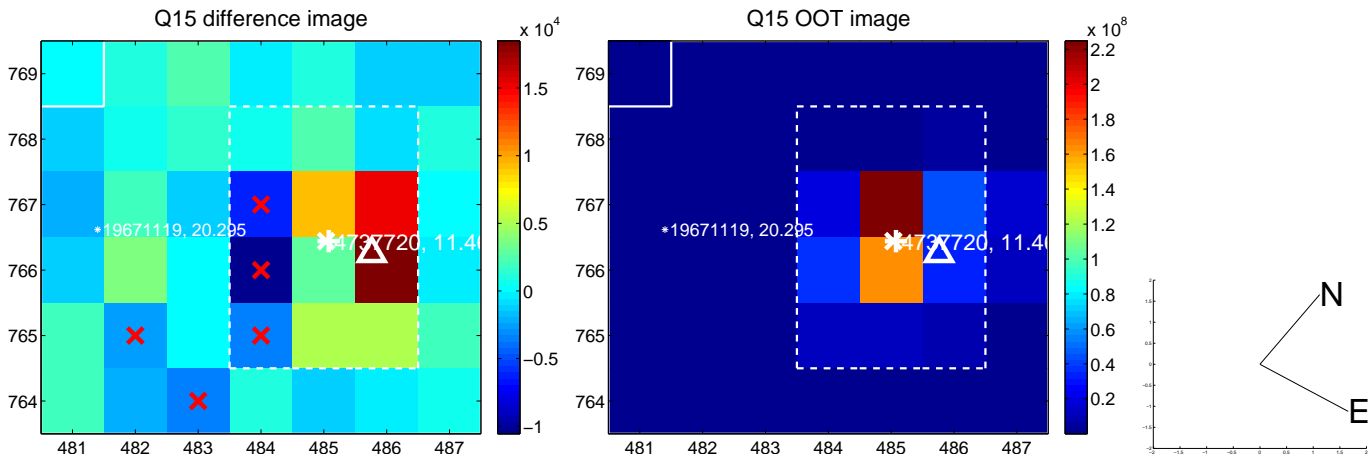
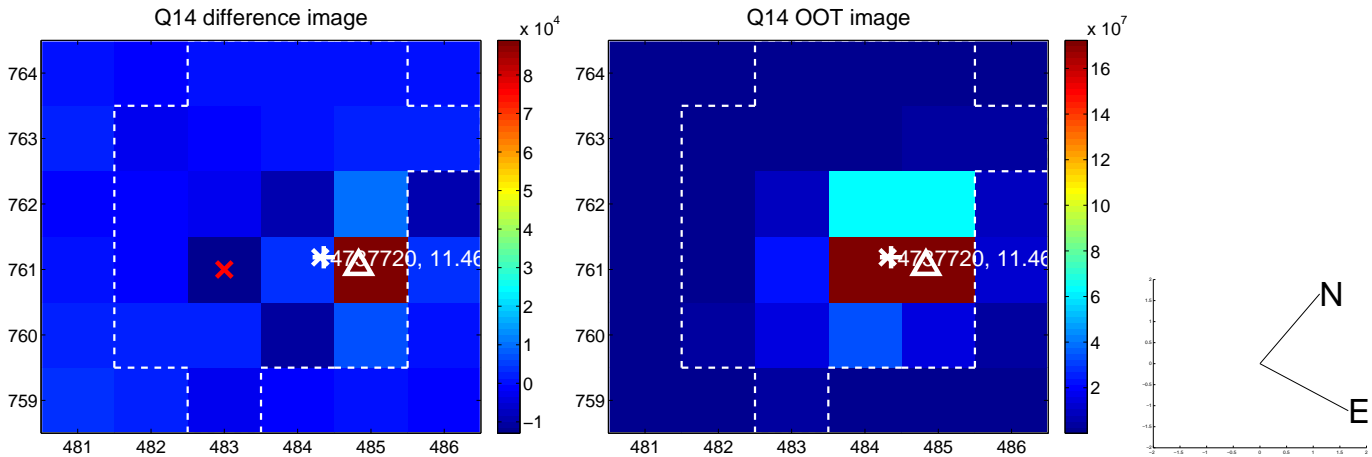
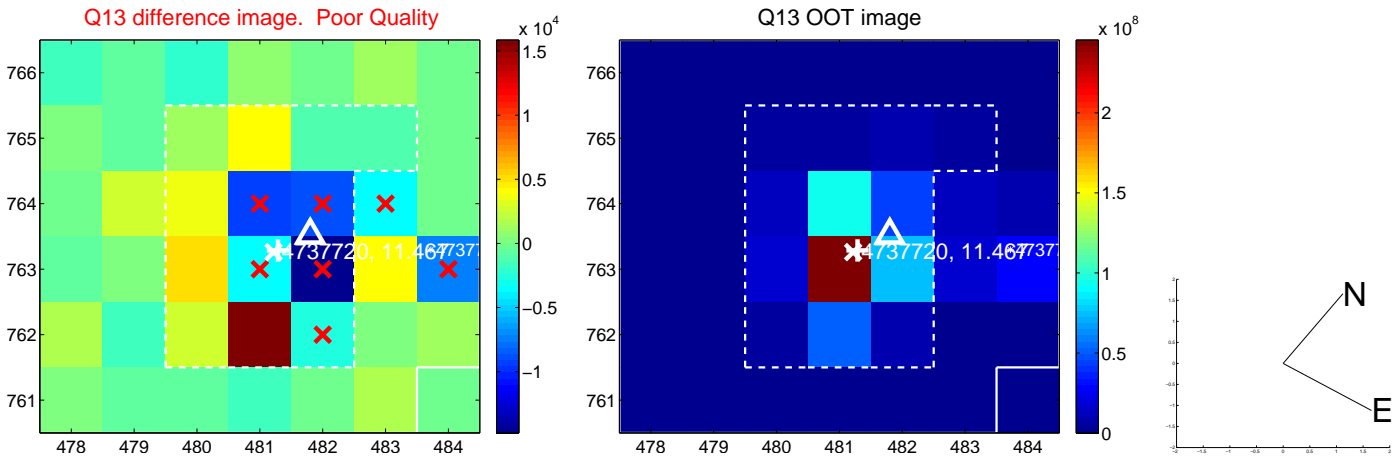
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



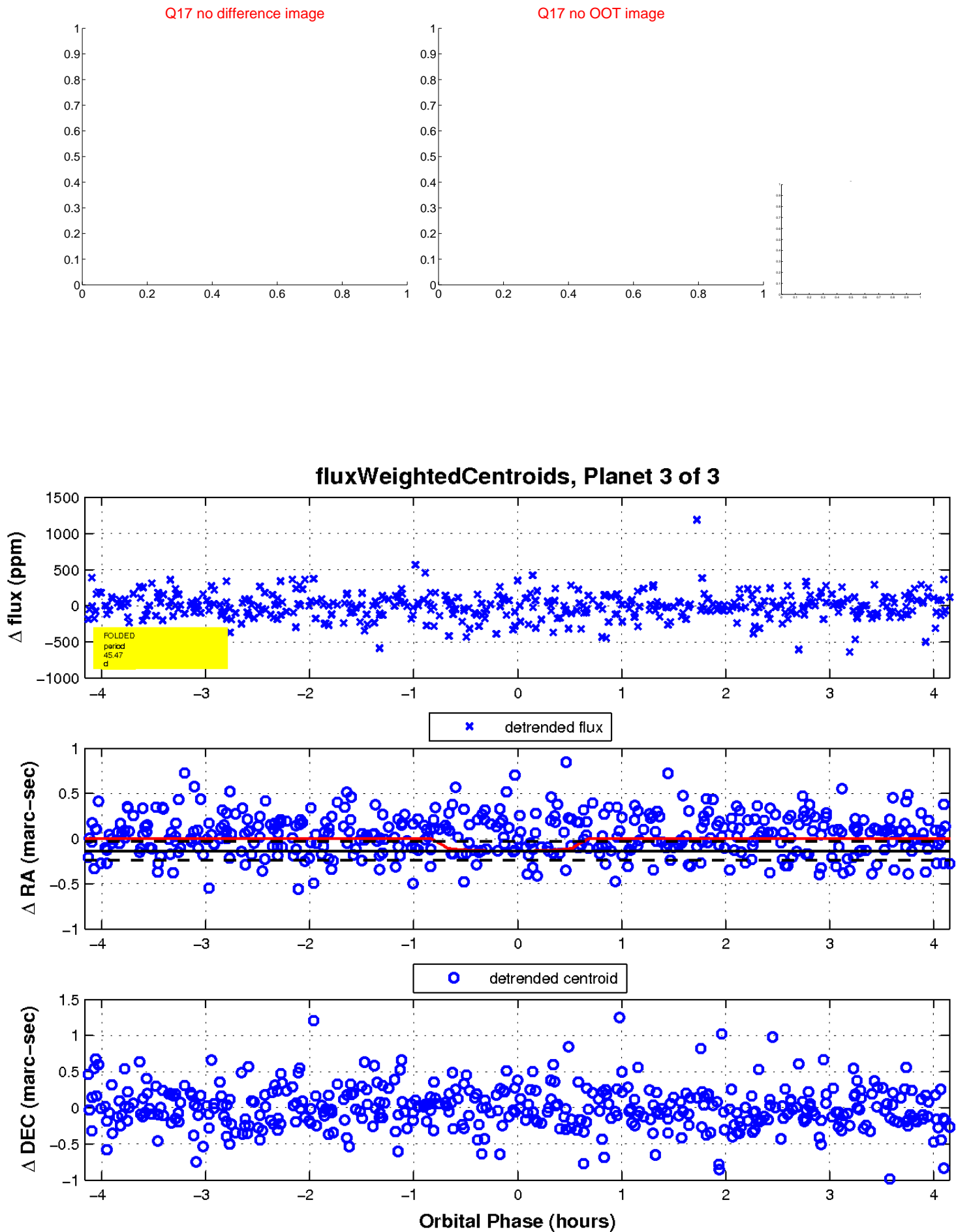
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

