

KIC 009487871

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})
009487871-01	OBS	No	0.583568	131.842756	13.4	4.064	8.9	5.2	13.40	6489	4.98	0.00
009487871-02	OBS	No	37.632845	132.738303	411.8	3.619	13.8	13.2	13.40	6489	52.66	2697.51
009487871-03	OBS	No	17.894001	142.644055	257.9	1.409	11.7	8.3	13.40	6489	25.17	7268.45
009487871-04	OBS	No	40.256404	157.242912	317.9	1.540	9.2	9.5	13.40	6489	30.62	2465.69

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487871-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009487871-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

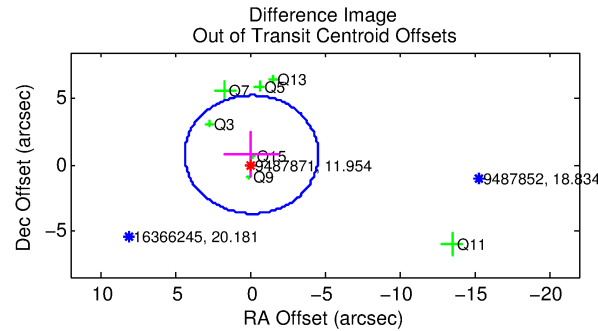
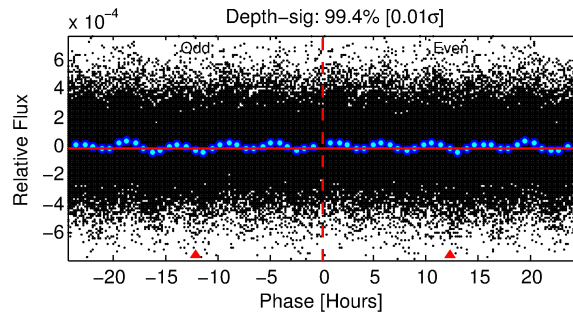
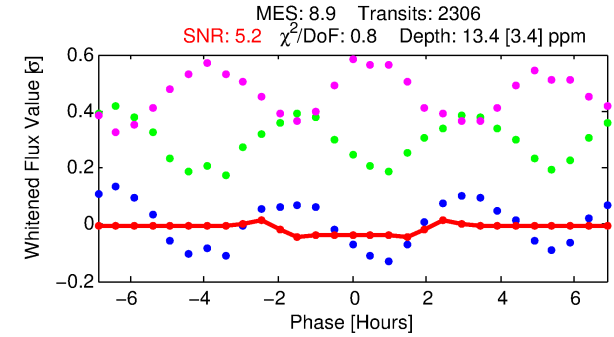
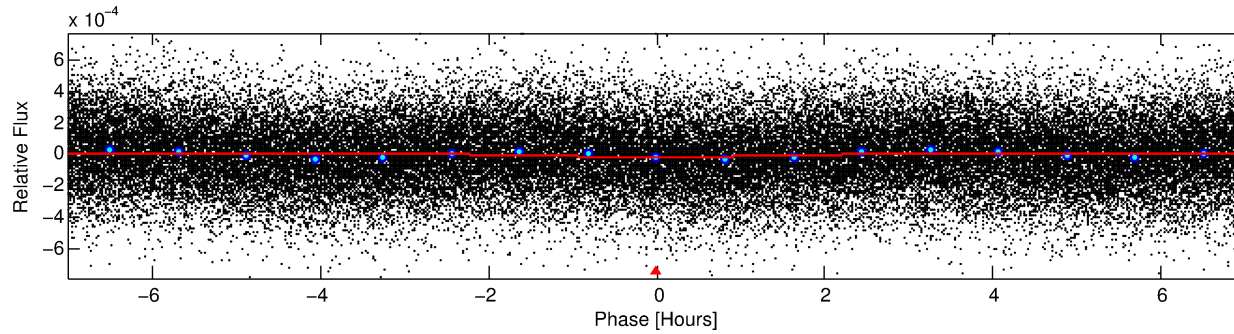
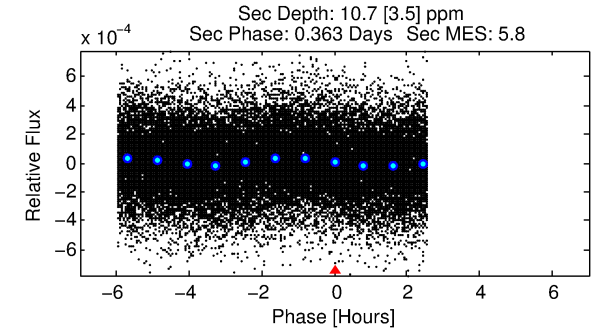
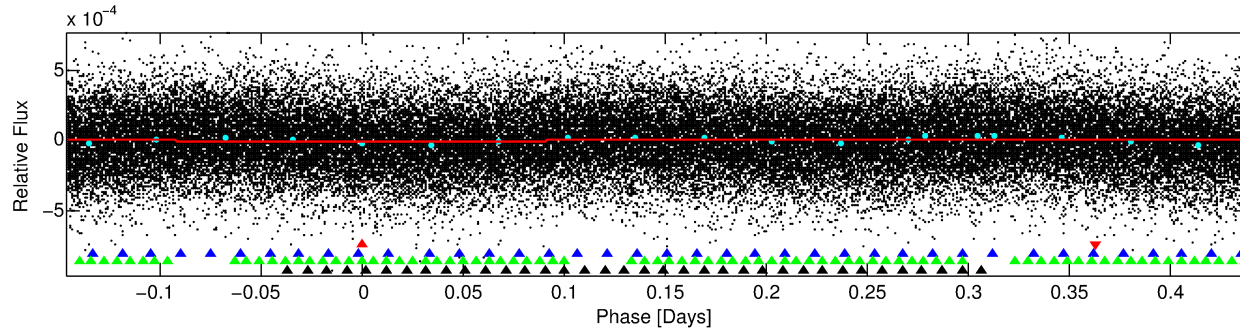
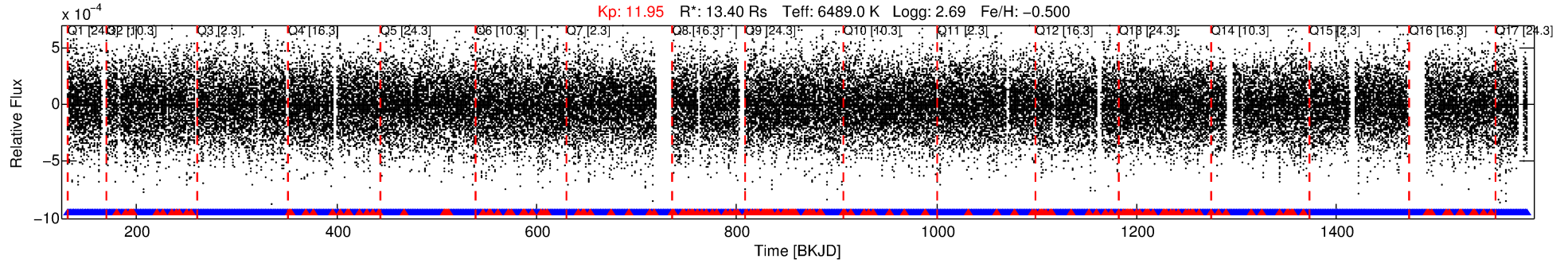
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487871-01

No Significant Match Found

DV One-Page Summary

KIC: 9487871 Candidate: 1 of 4 Period: 0.584 d



DV Fit Results:

Period = 0.58357 [0.00002] d
Epoch = 131.8428 [0.0042] BKJD
Rp/R* = 0.0034 [0.0025]
a/R* = 1.25 [1.77]
b = 0.28 [12.83]
Seff = N/A
Teq = N/A
Rp = 4.98 [4.72] Re
a = N/A
Ag = N/A
Teffp = N/A

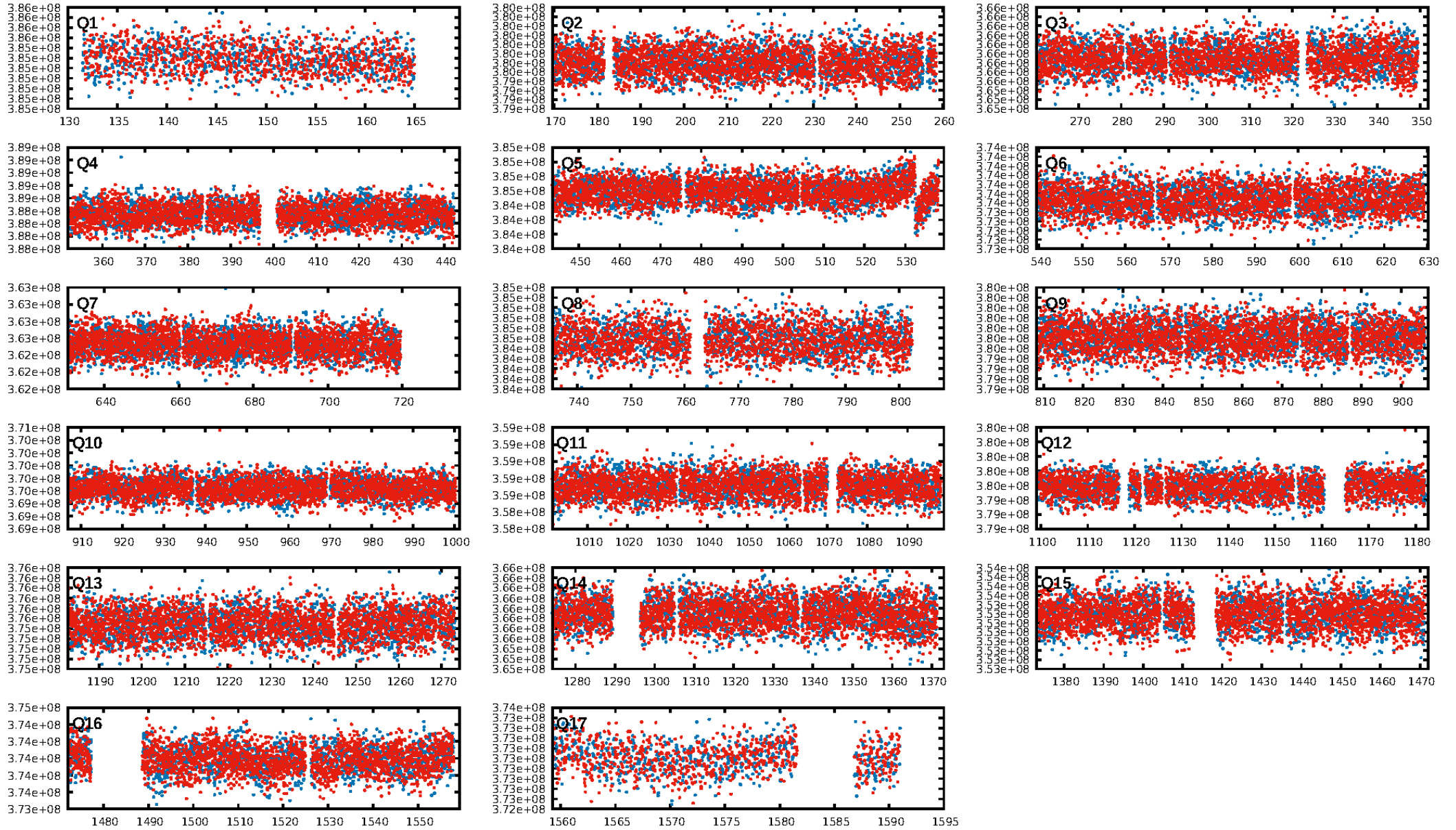
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [96.59σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.97e-18
RollingBand-fgt: 0.91 [2013/2203]
GhostDiagnostic-chr: 1.408
Centroid-sig: 67.8%
Centroid-so: 0.165 arcsec [0.24σ]
OotOffset-rm: 0.778 arcsec [0.52σ]
KicOffset-rm: 0.835 arcsec [0.70σ]
OotOffset-st: 0/4/0/3 [7]
KicOffset-st: 0/4/0/3 [7]
DiffImageQuality-fgm: 0.29 [2/7]
DiffImageOverlap-fno: 1.00 [17/17]

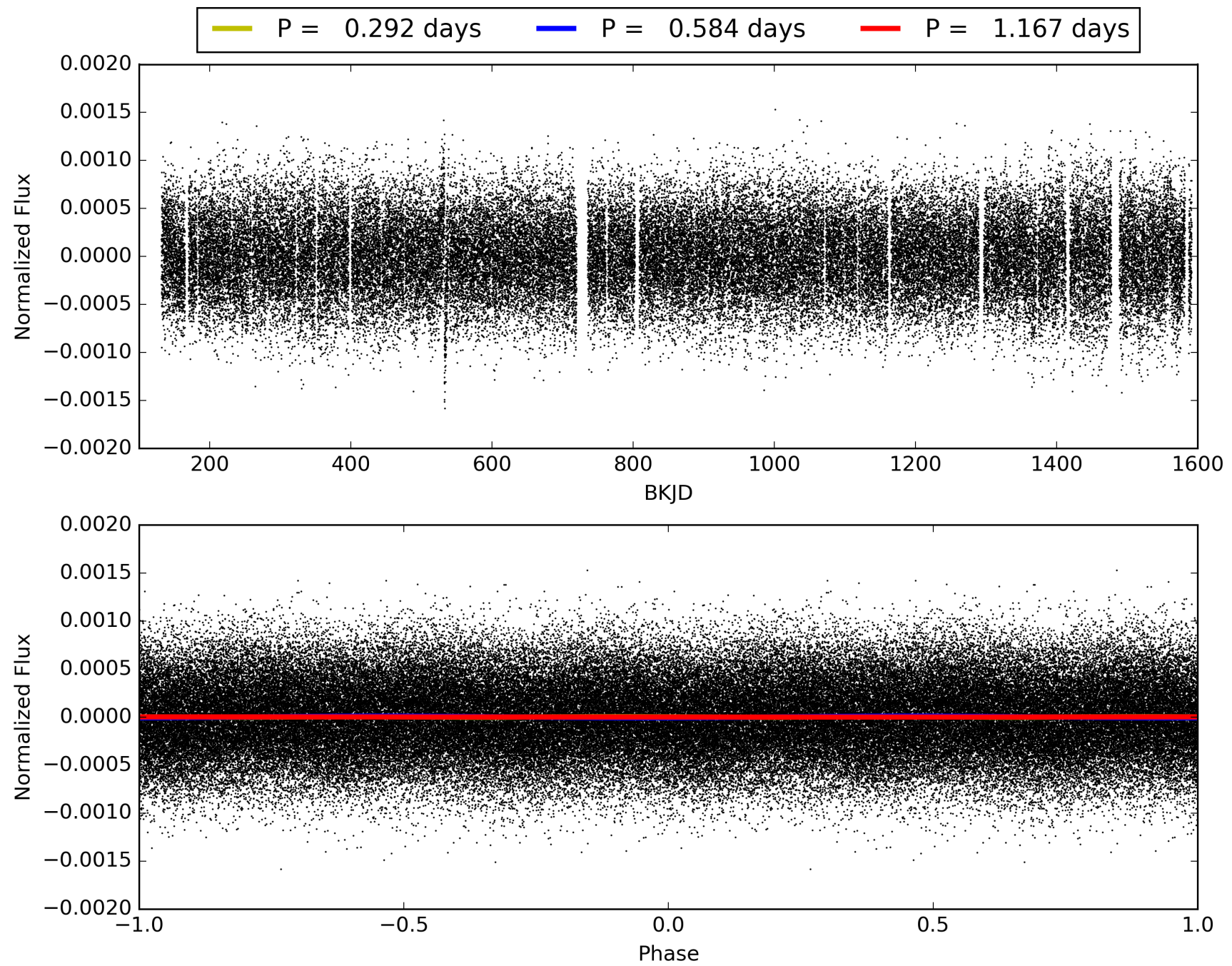
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:21:35 Z

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

TCE 009487871-01, PDC Light Curves

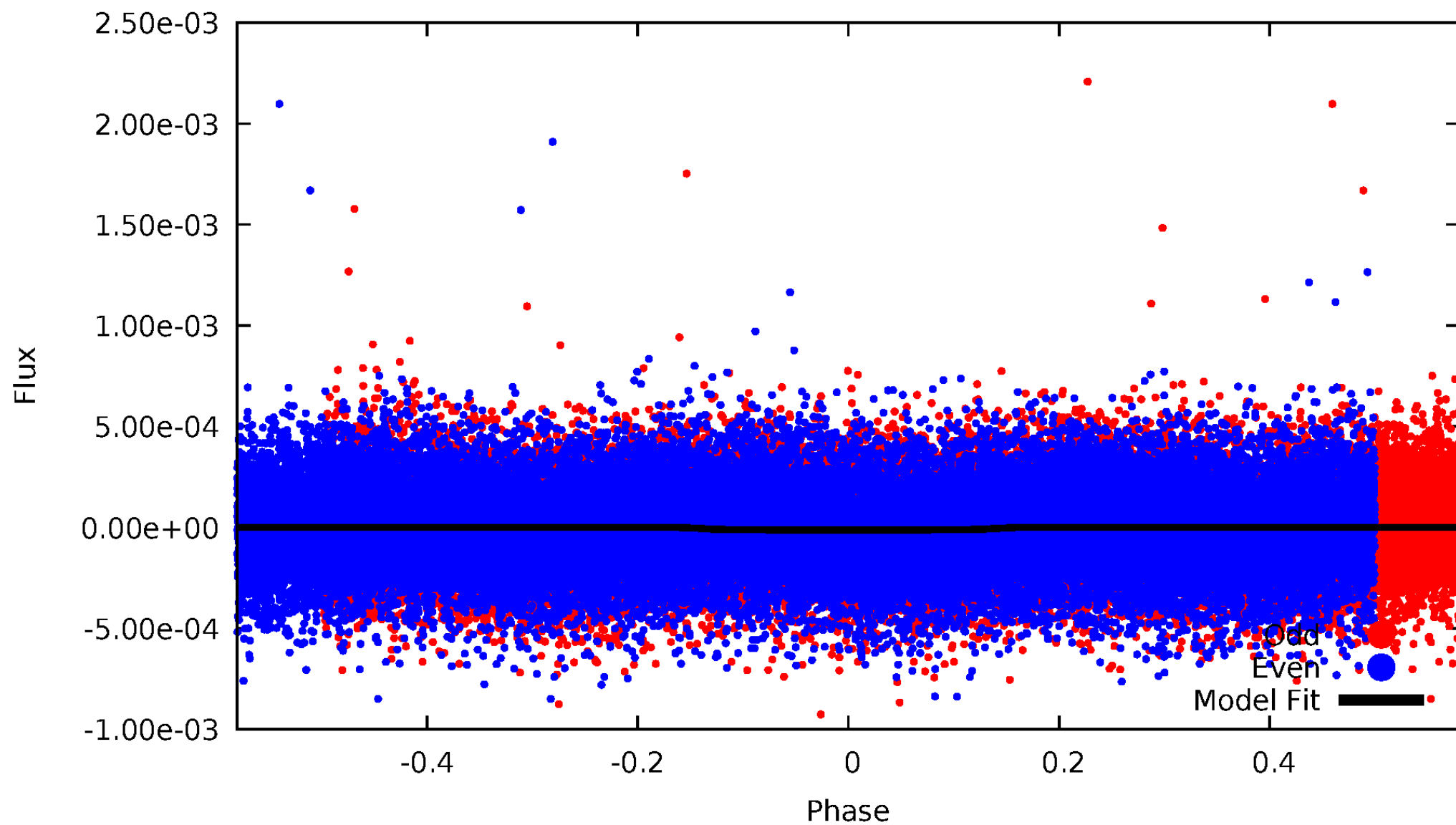


TCE 009487871-01



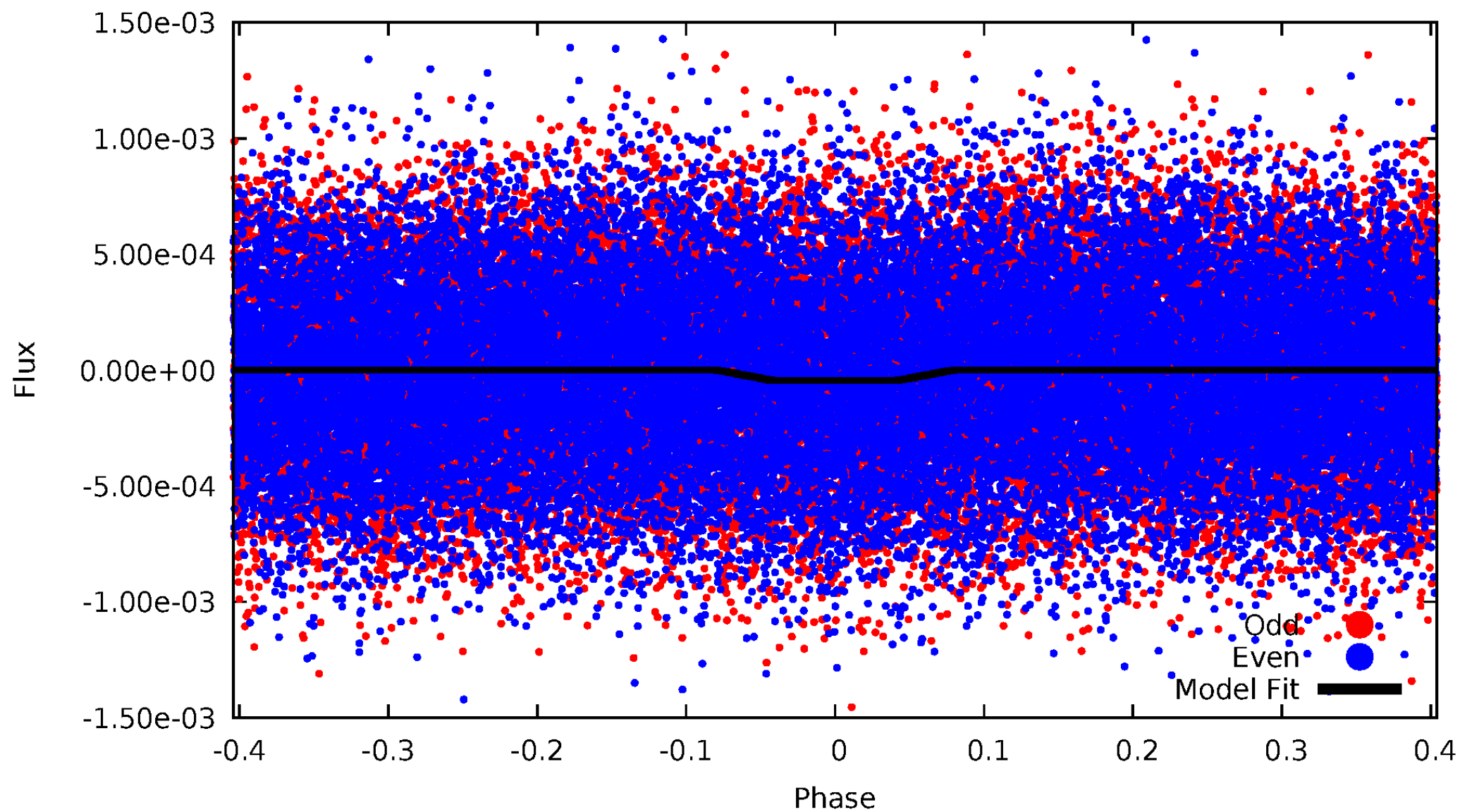
DV Odd/Even

TCE 009487871-01

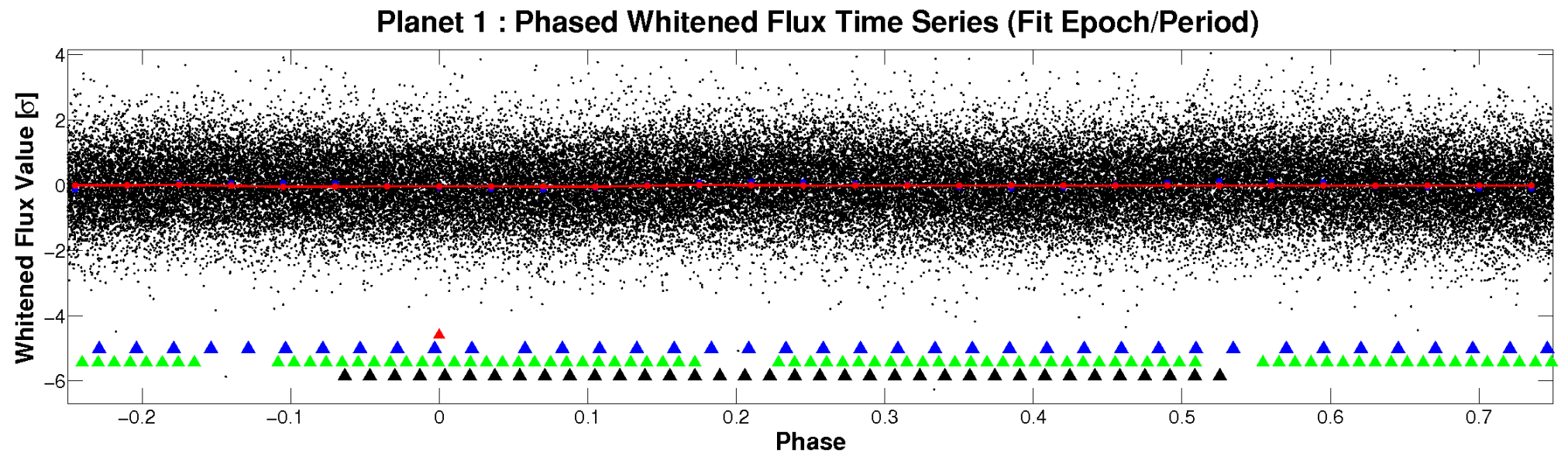
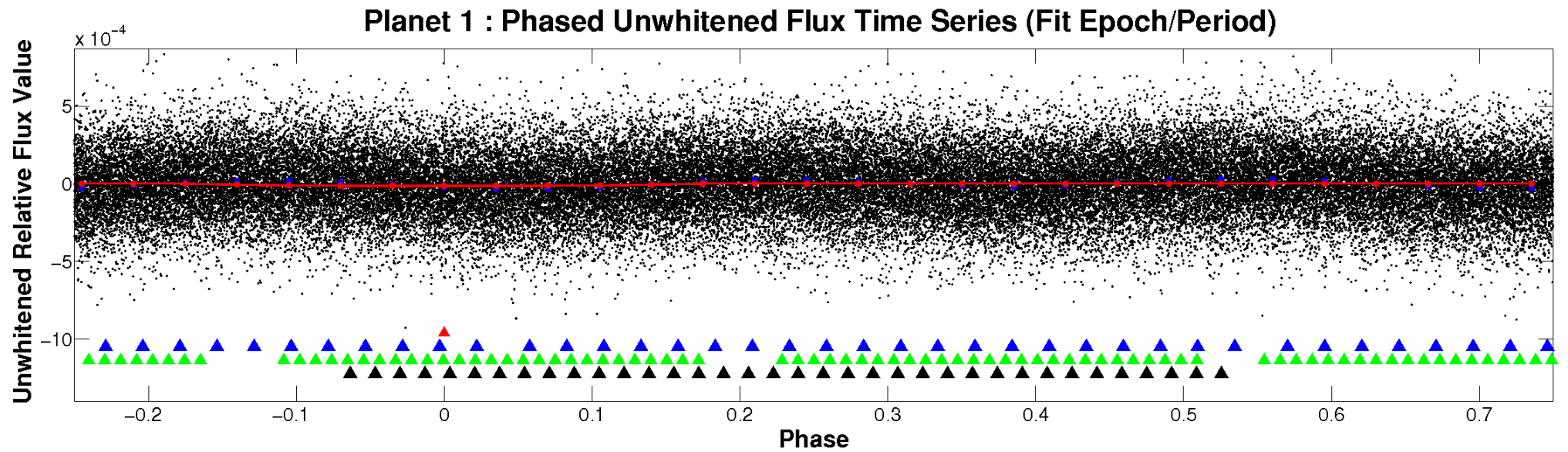


ALT Odd/Even

TCE 009487871-01

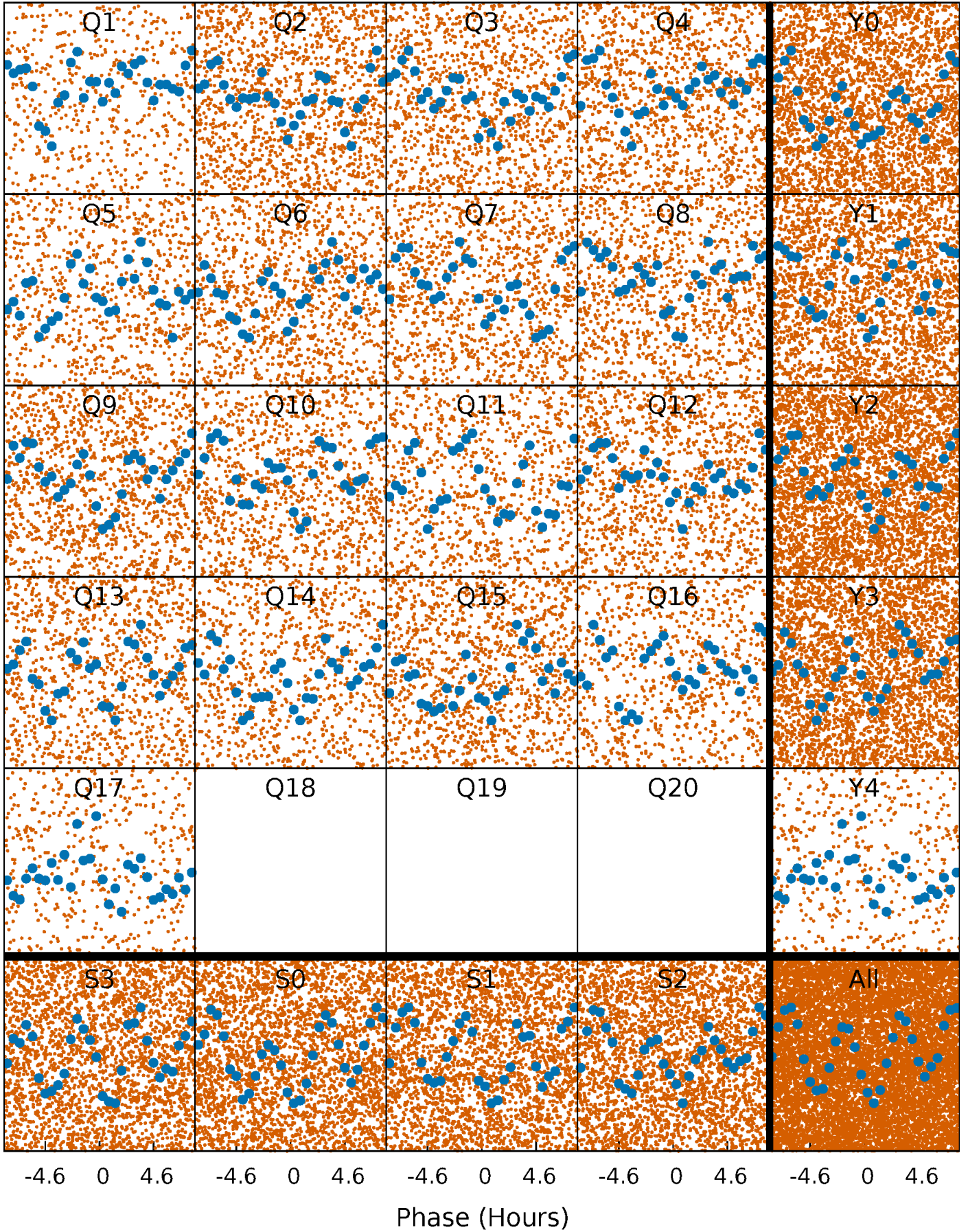


Non-Whitened Vs. Whitened Light Curve



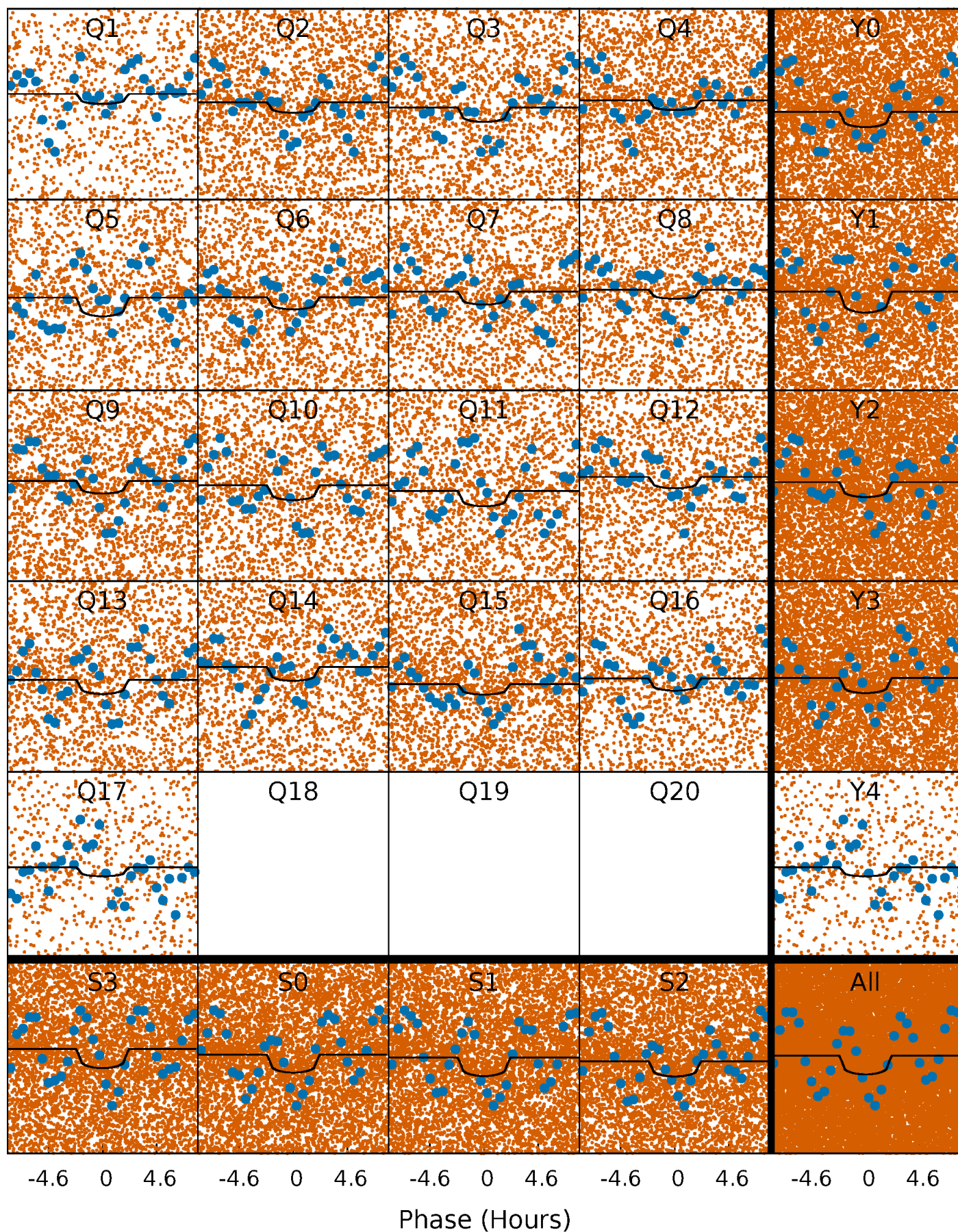
PDC Quarter-Phased Transit Curves

TCE 009487871-01 P= 0.583568 Days $T_0=131.842756$ (BKJD)



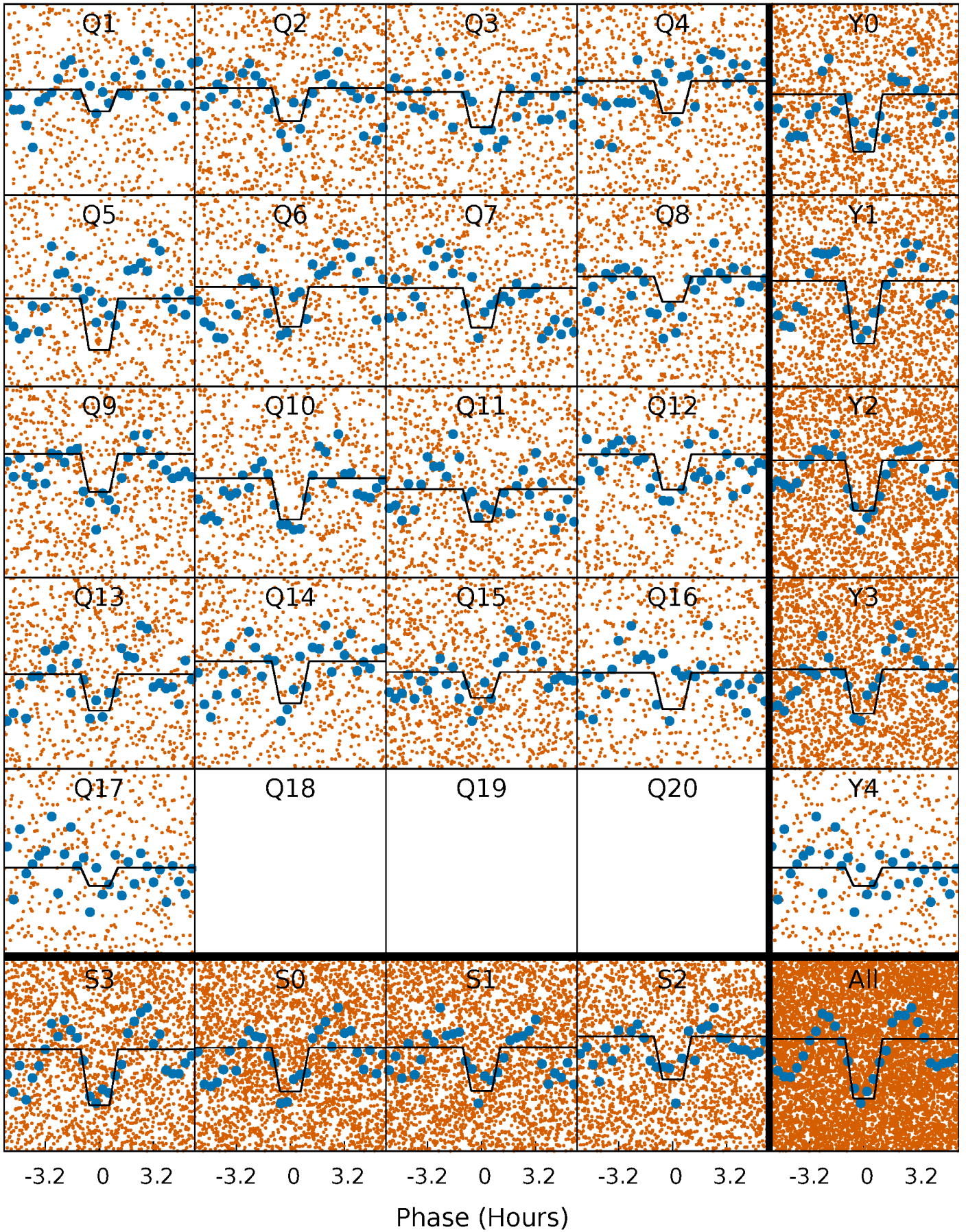
DV Quarter-Phased Transit Curves

TCE 009487871-01 P= 0.583568 Days $T_0=131.842756$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

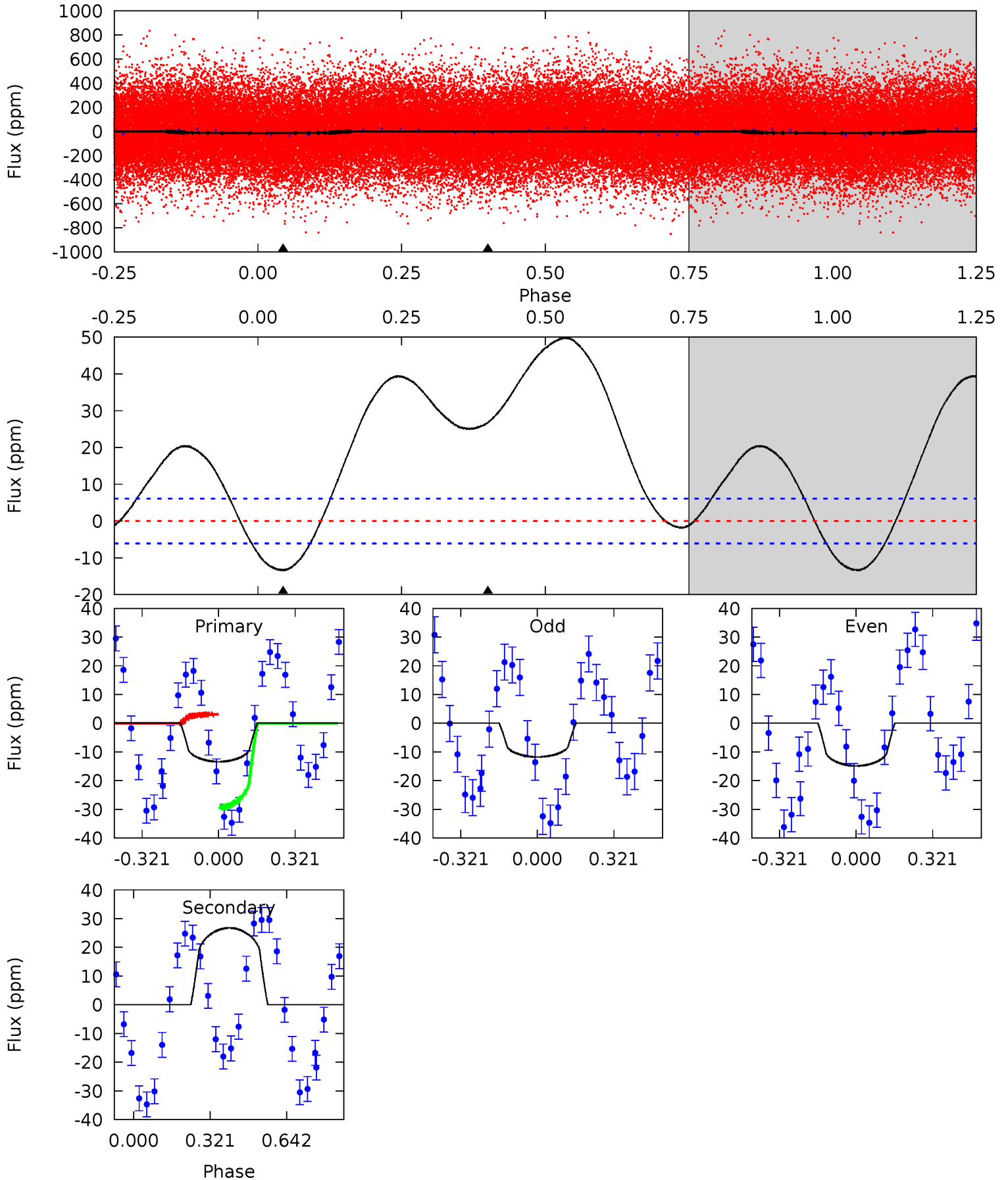
TCE 009487871-01 P= 0.583592 Days $T_0=131.840393$ (BKJD)



DV Model-Shift Uniqueness Test

009487871-01, P = 0.583568 Days, E = 131.259188 Days

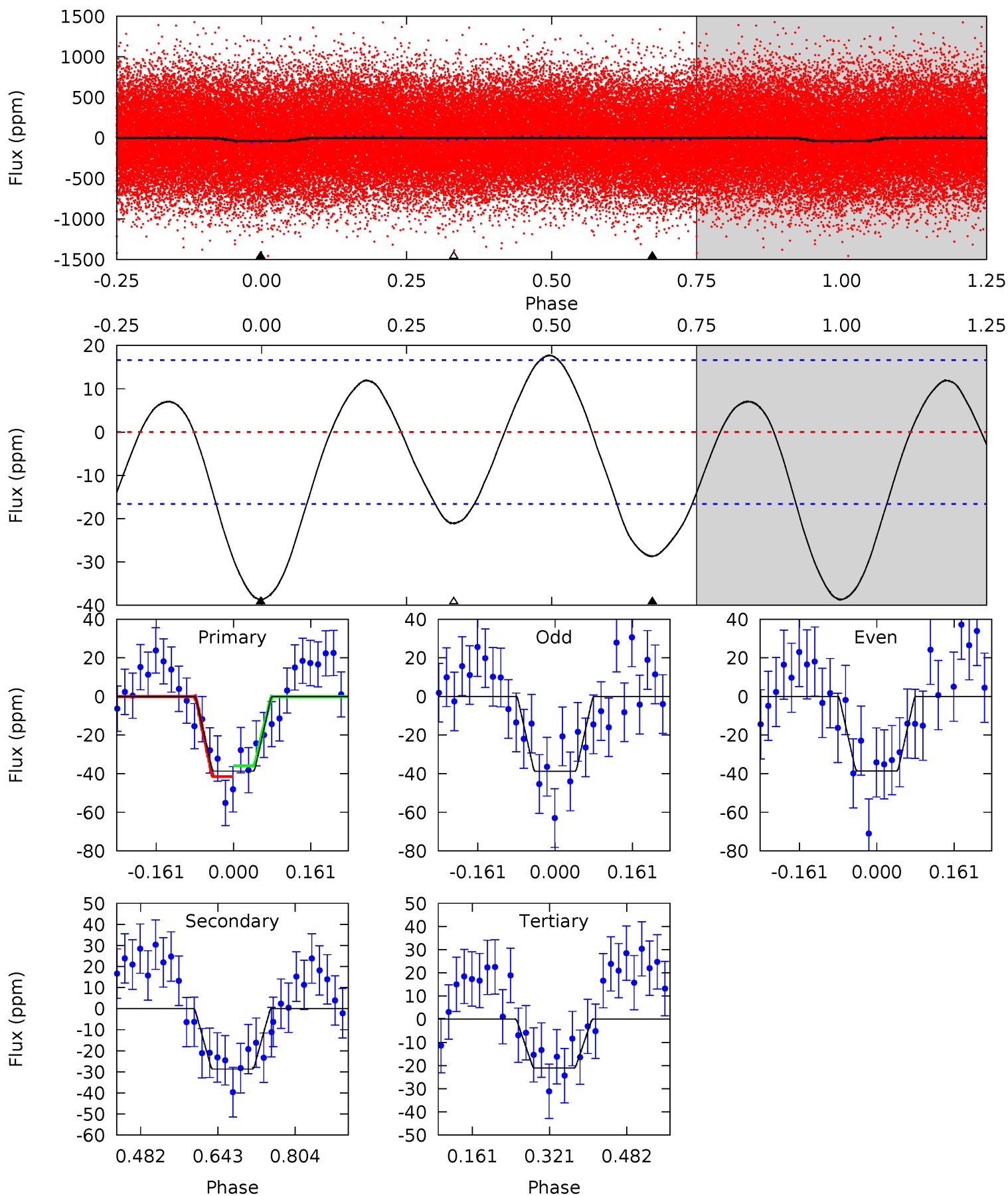
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.48	-18.9	0	0	4.31	0.99	1.91	9.48	9.48	-18.9	-18.9	1.10	0.95	0.79	9.28



Alt Model-Shift Uniqueness Test

009487871-01, P = 0.583592 Days, E = 131.256801 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	7.71	5.67	0	4.46	1.40	3.49	4.73	10.4	2.04	7.71	0.03	0.96	0.31	0.74



Stellar Parameters For KIC 009487871

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6489^{+137}_{-255}	$2.694^{+0.586}_{-0.138}$	$-0.500^{+0.550}_{-0.450}$	$13.402^{+0.861}_{-8.176}$	$3.239^{+0.069}_{-1.247}$	$0.002^{+0.016}_{-0.000}$
	+2%/-4%	+22%/-5%	+110%/-90%	+6%/-61%	+2%/-38%	+839%/-22%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009487871-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	27 ± 1	$4.58^{+3.46}_{-2.74}$	10175^{+544}_{-1457}	-10604^{+1613}_{-6987}	$-0.265^{+0.176}_{-1.369}$
Alt.	-29 ± 4	$8.58^{+3.98}_{-3.37}$	10133^{+550}_{-1383}	-7740^{+2652}_{-900}	$0.083^{+0.141}_{-0.044}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

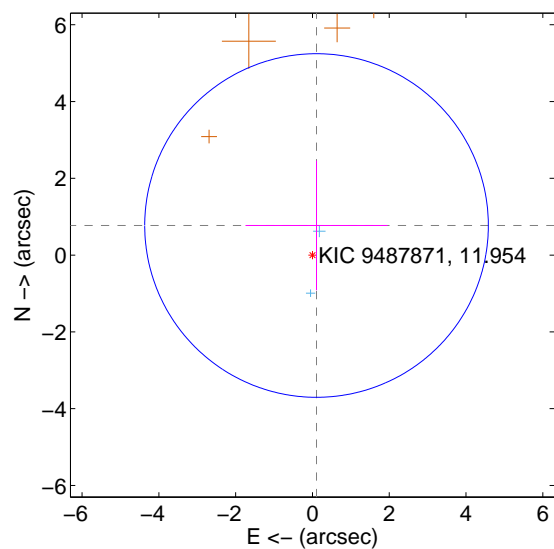
Supplemental centroid analysis for 009487871-01. **Kepler magnitude: 11.95.** Transit SNR 5.22

There are 2 quarters with good PRF difference image offsets

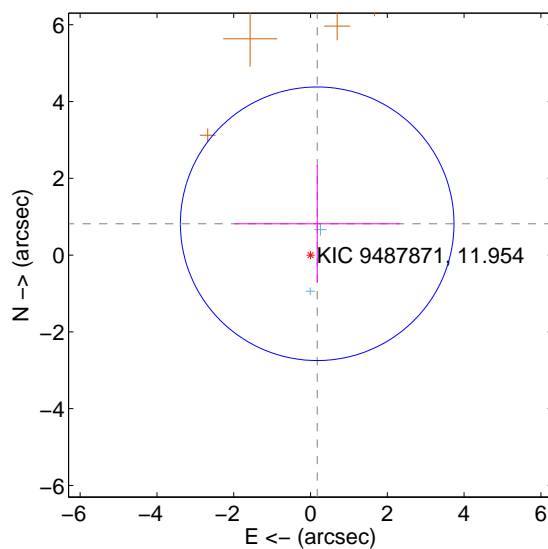
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.778 ± 1.492	0.52	-0.107 ± 1.850	0.771 ± 1.689
PRF-fit source offset from KIC position	0.835 ± 1.188	0.70	-0.174 ± 2.149	0.816 ± 1.528
photometric centroid source offset	0.16 ± 0.69	0.24	-0.09 ± 0.81	0.14 ± 0.64

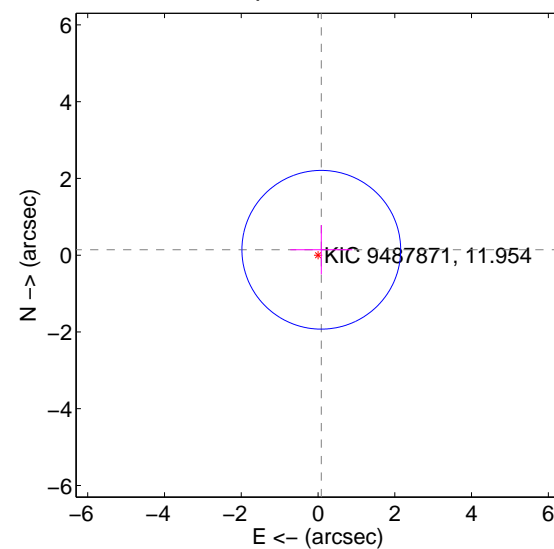
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

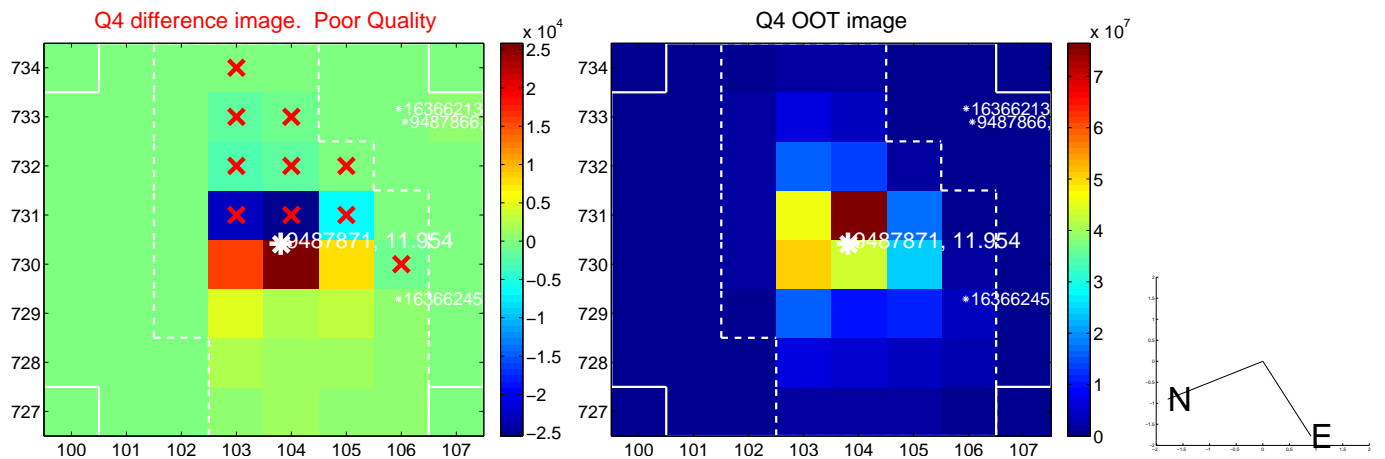
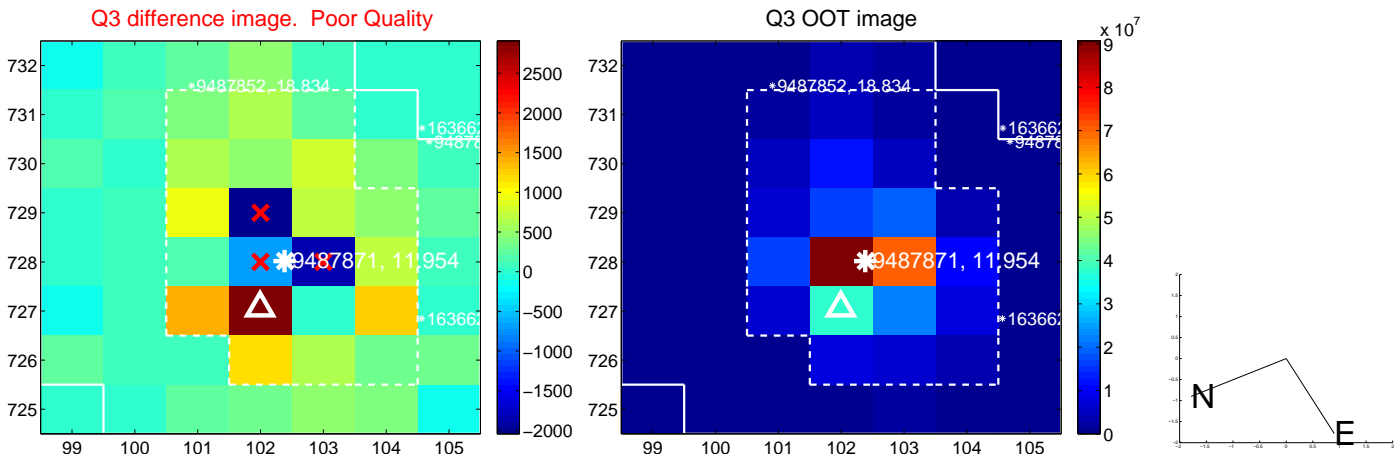
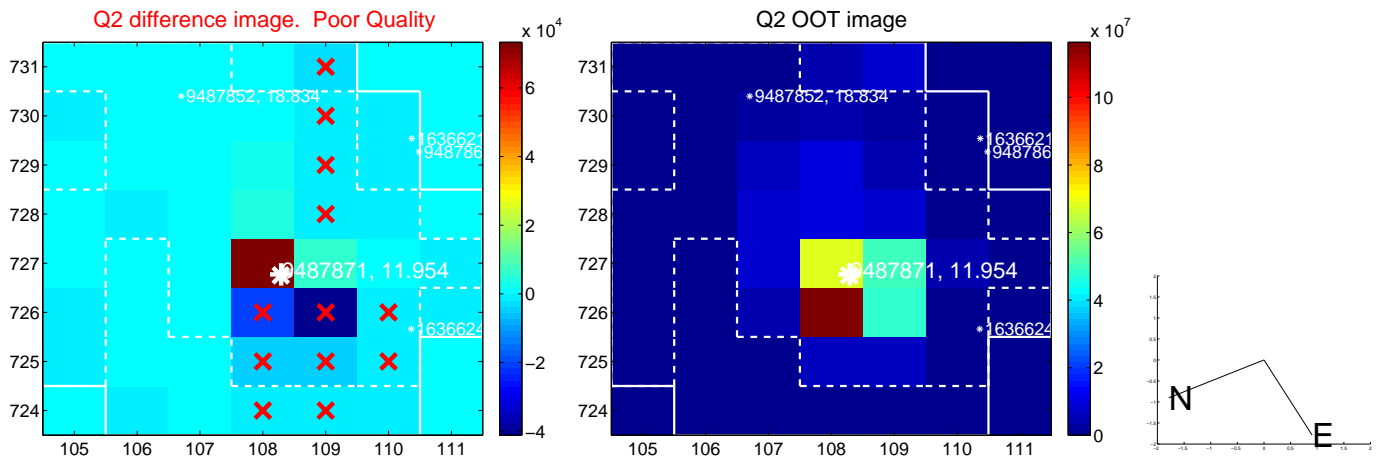
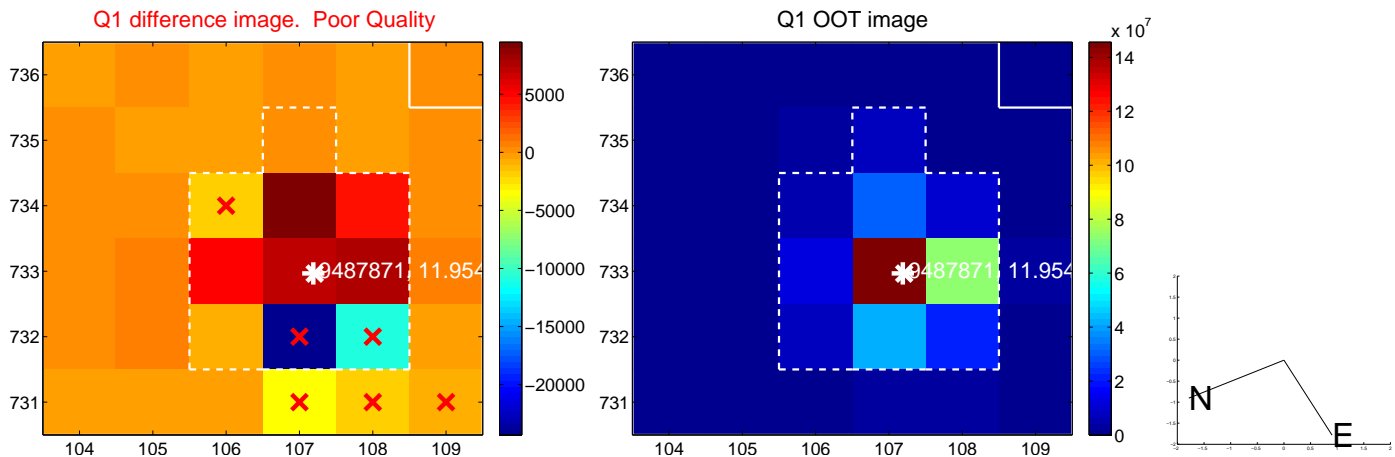


offset from photometric centroids

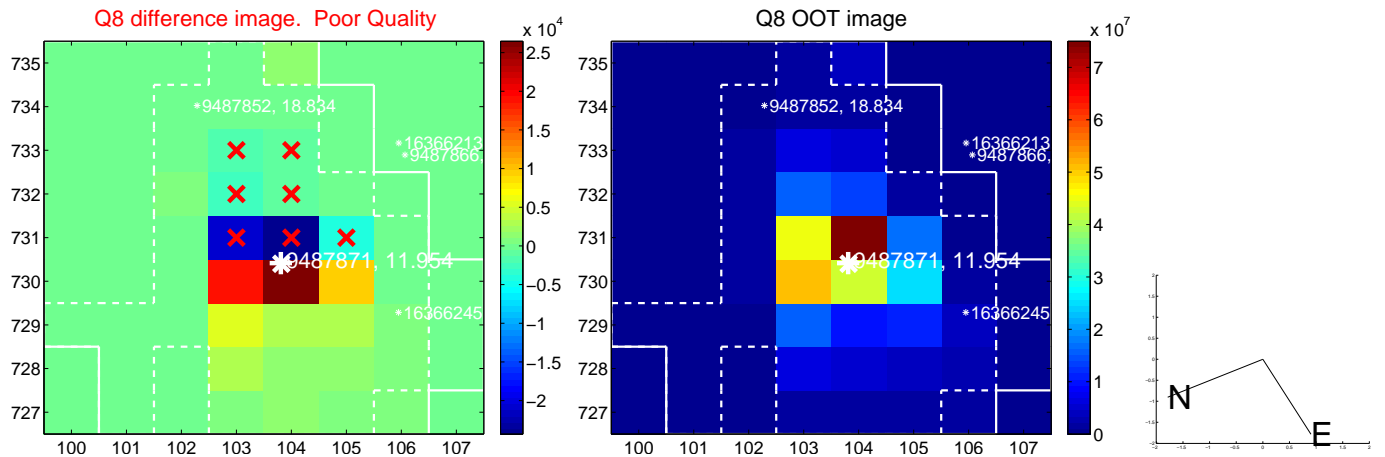
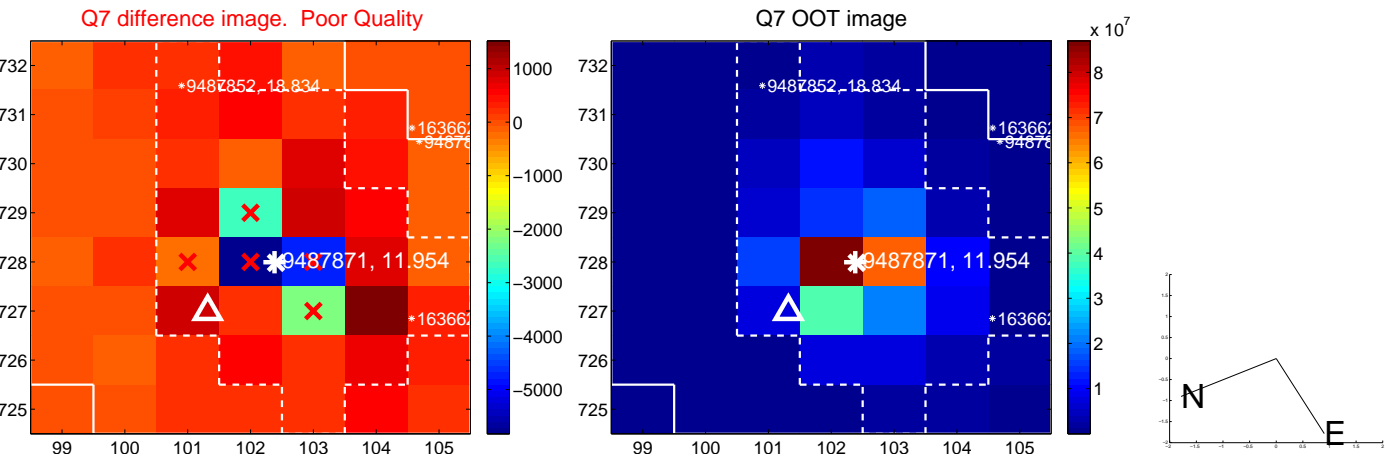
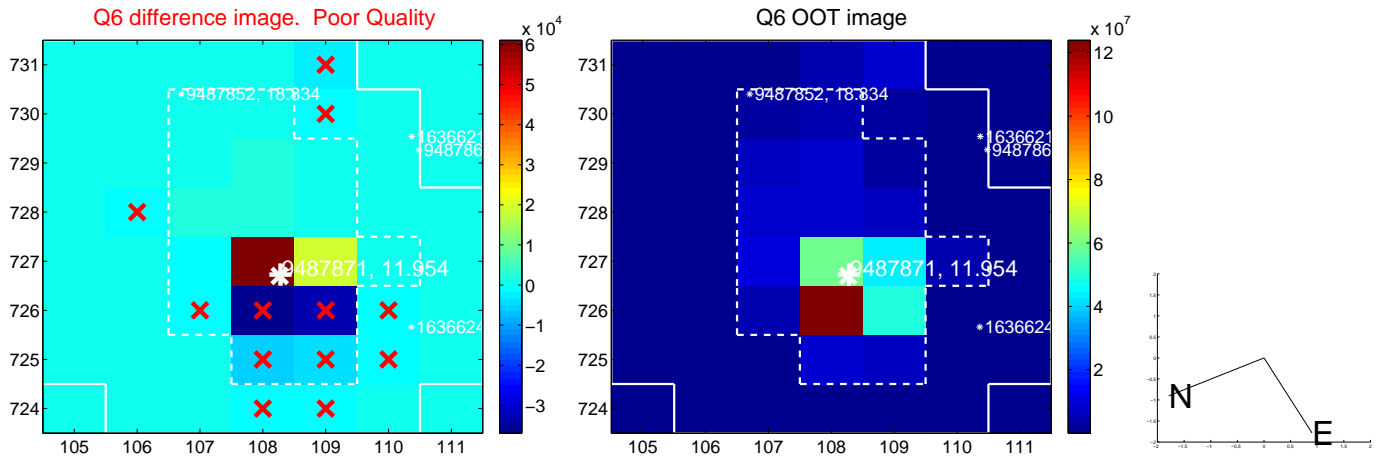
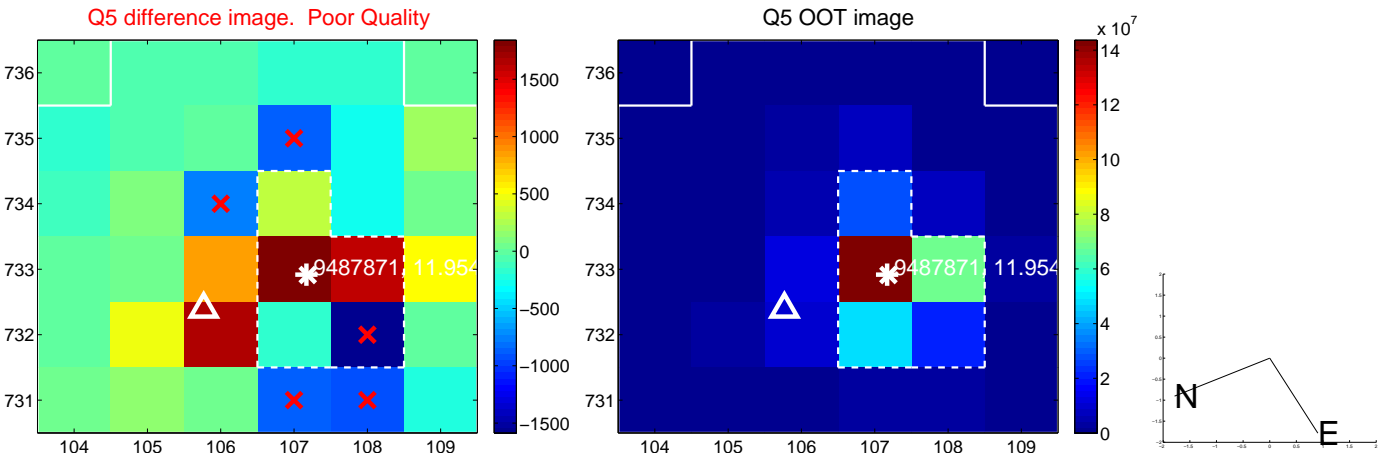


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

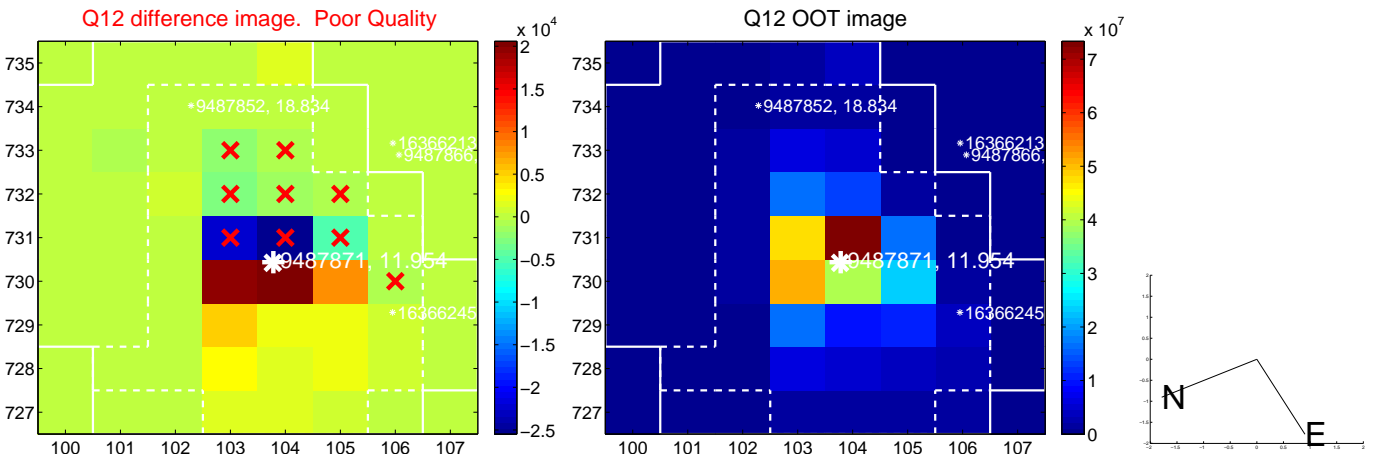
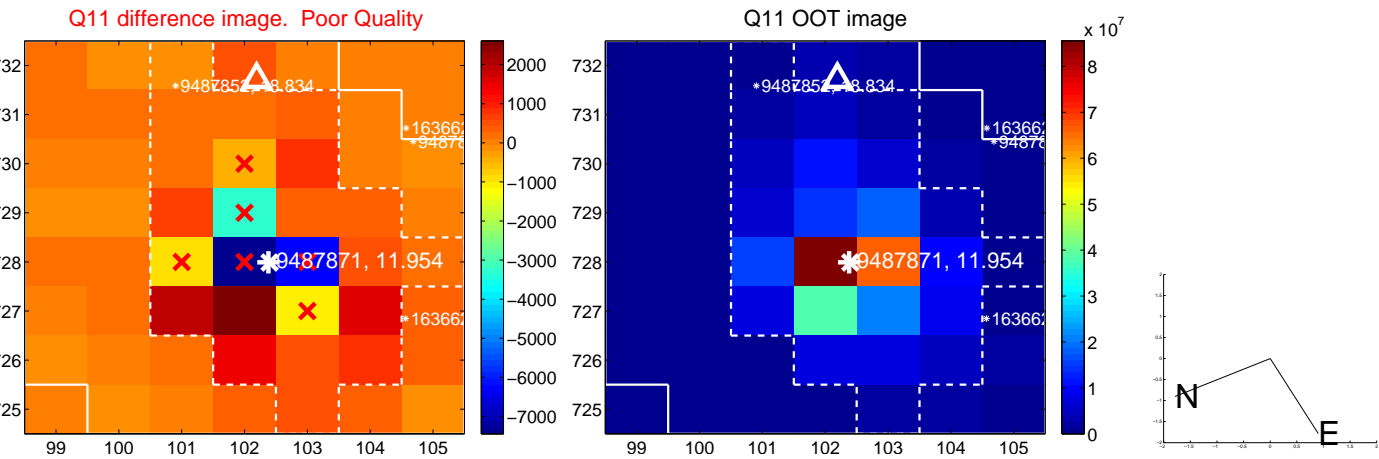
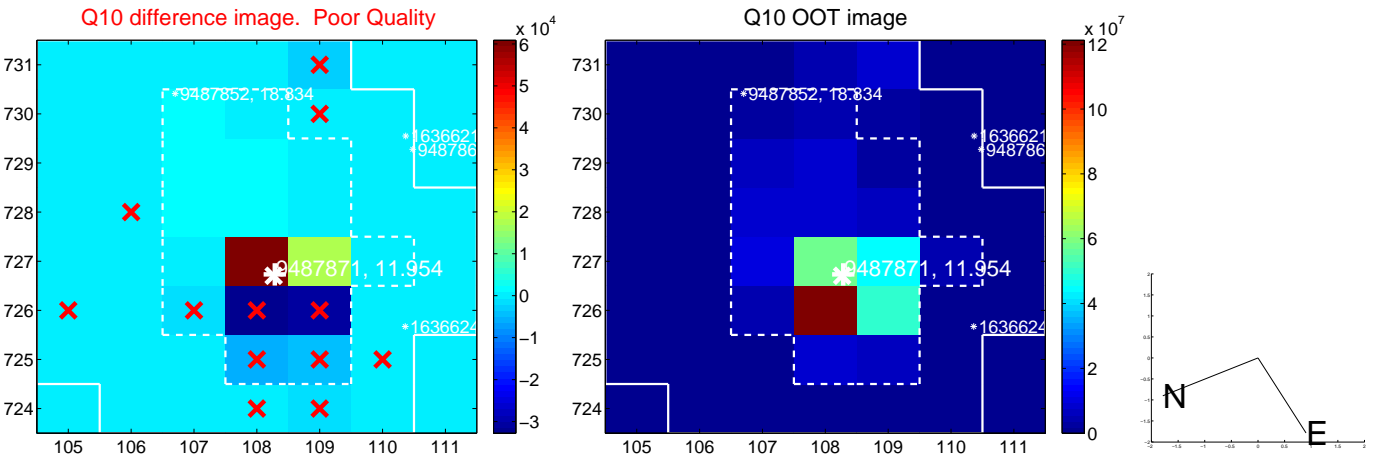
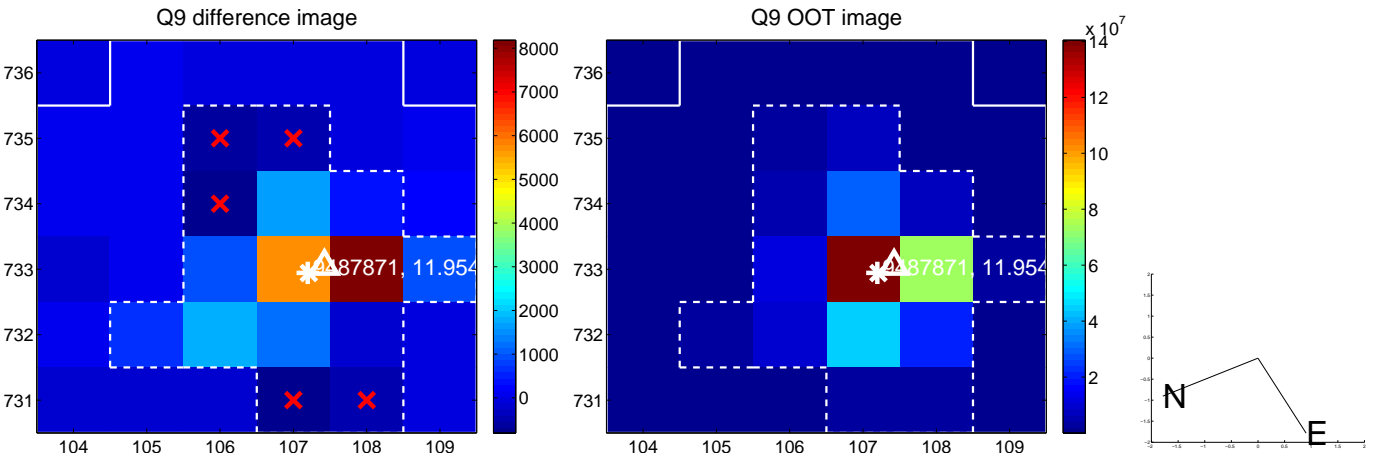
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



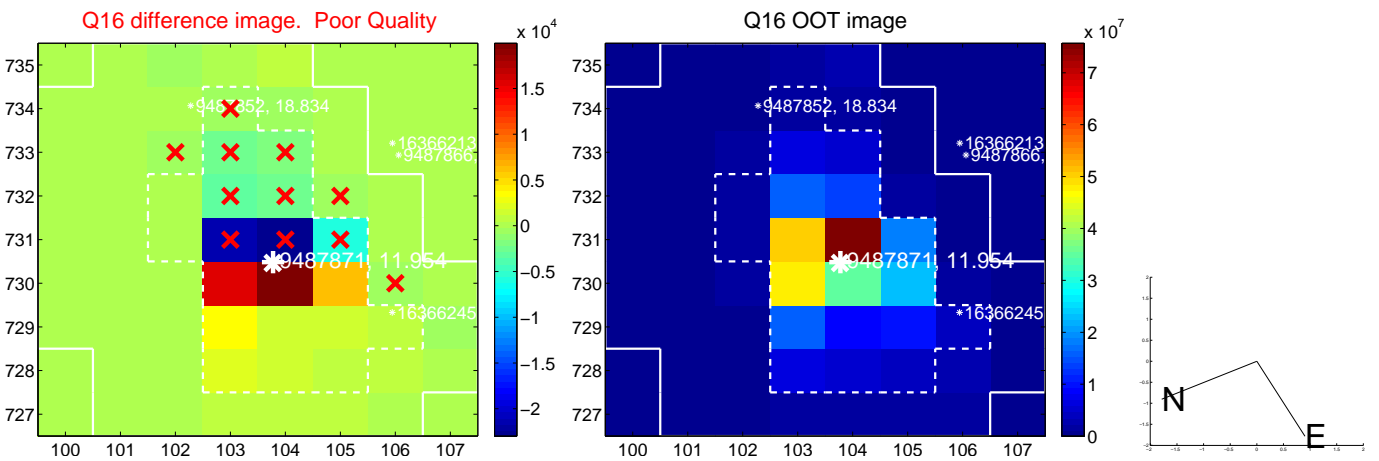
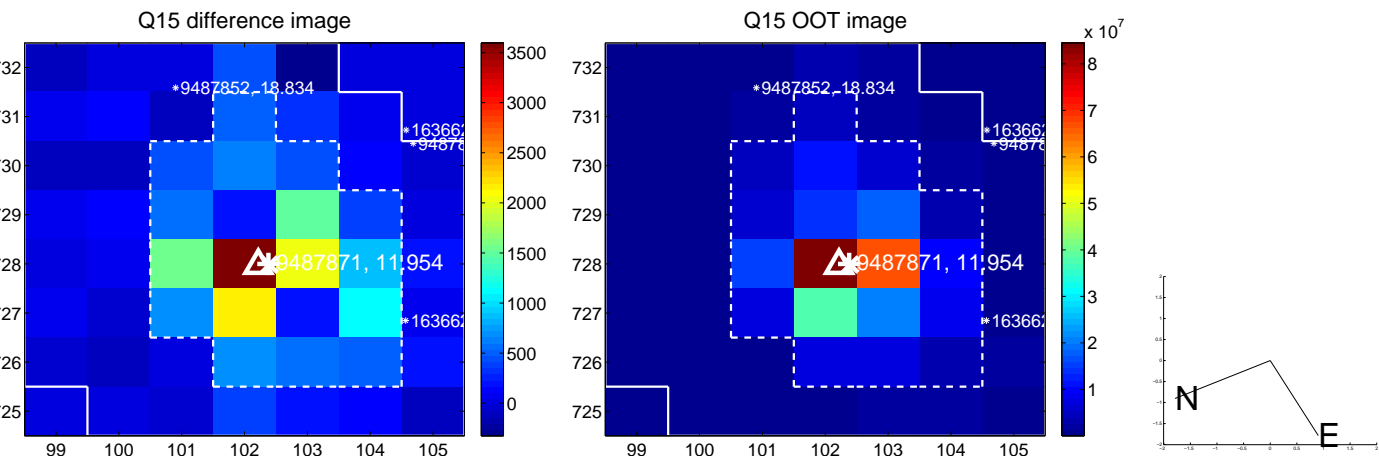
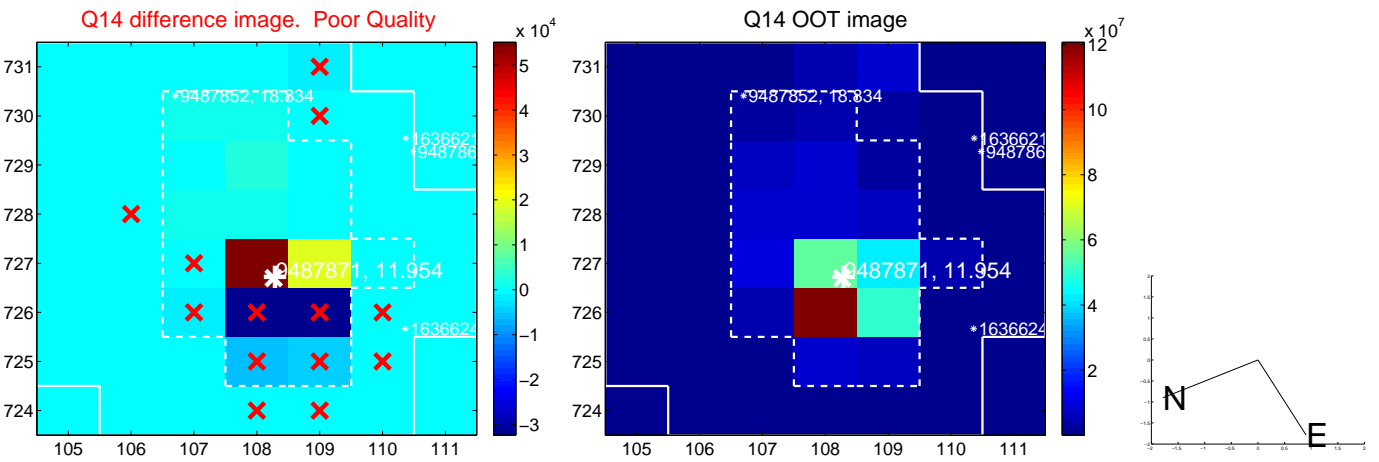
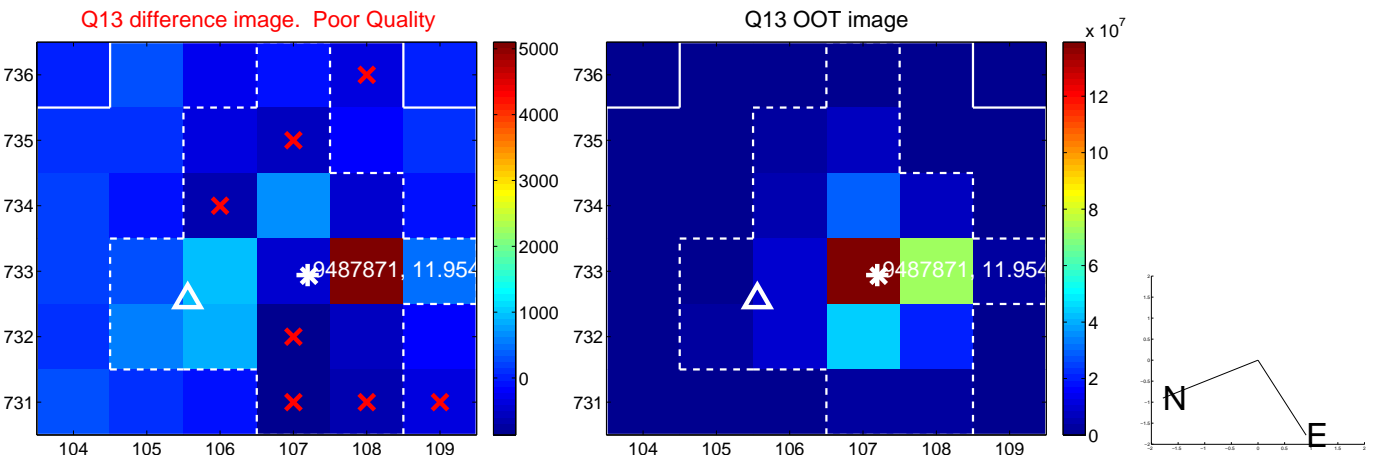
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



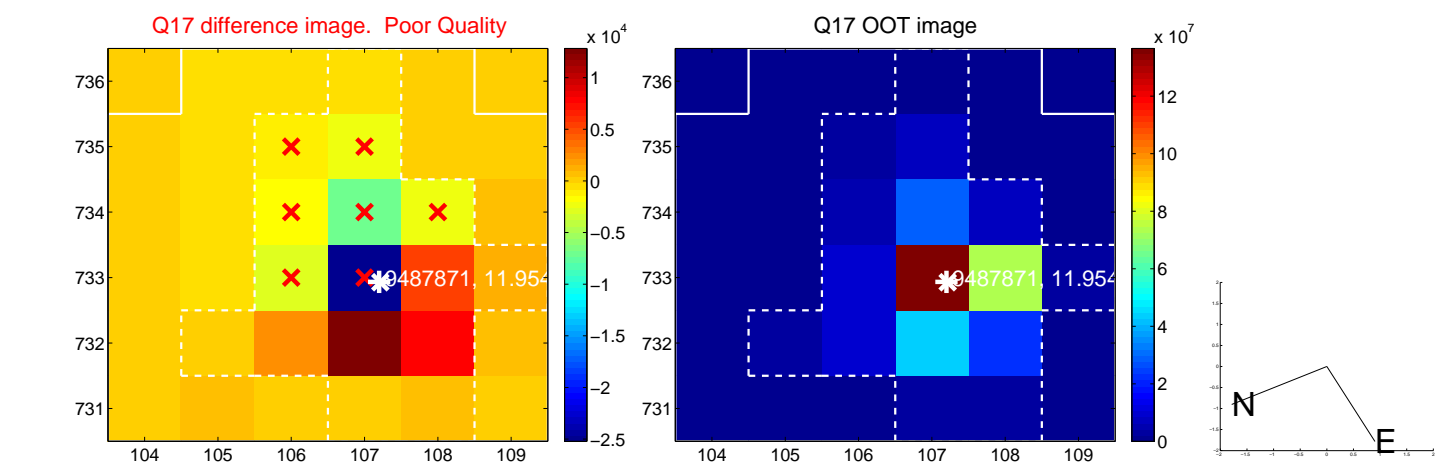
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



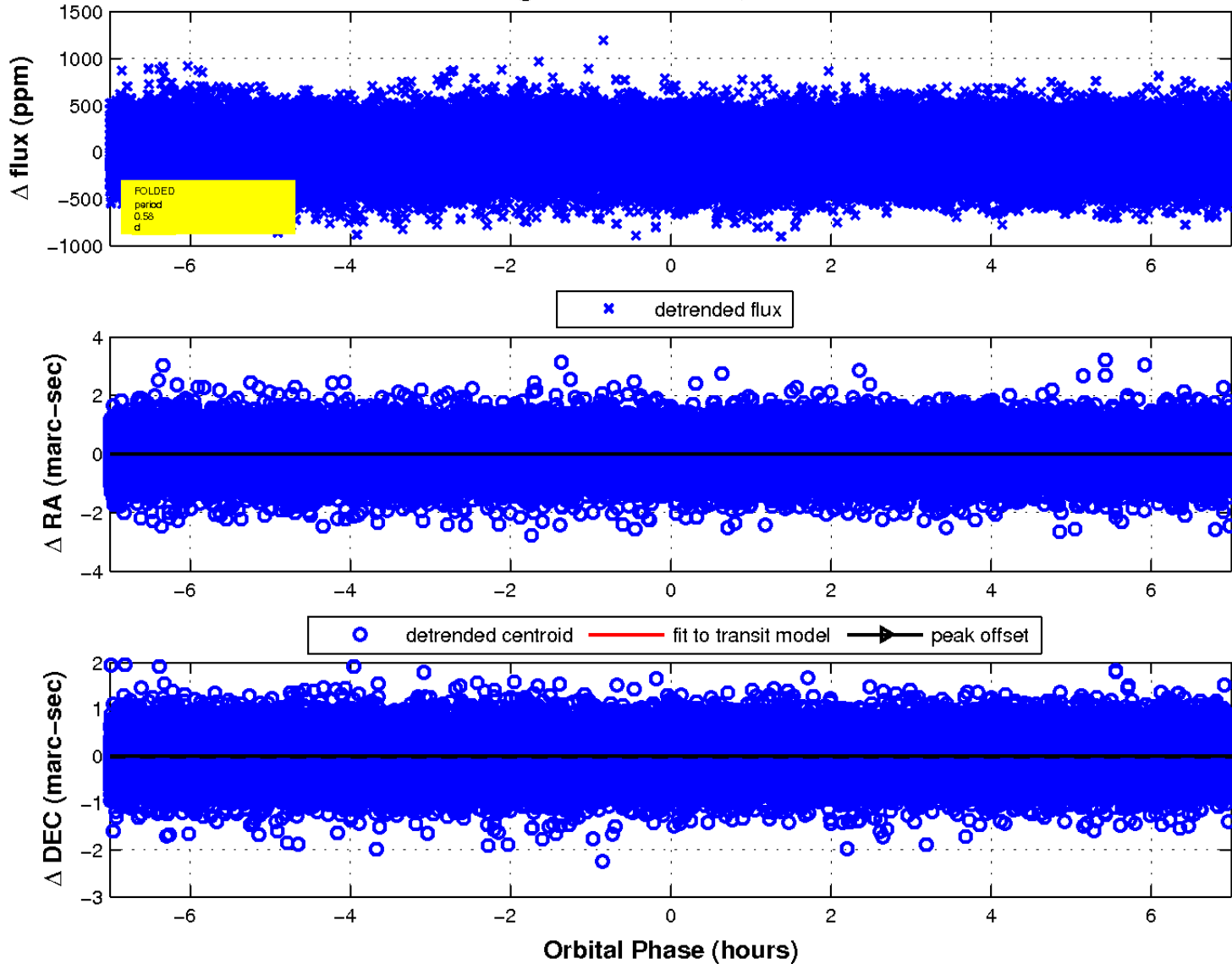
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

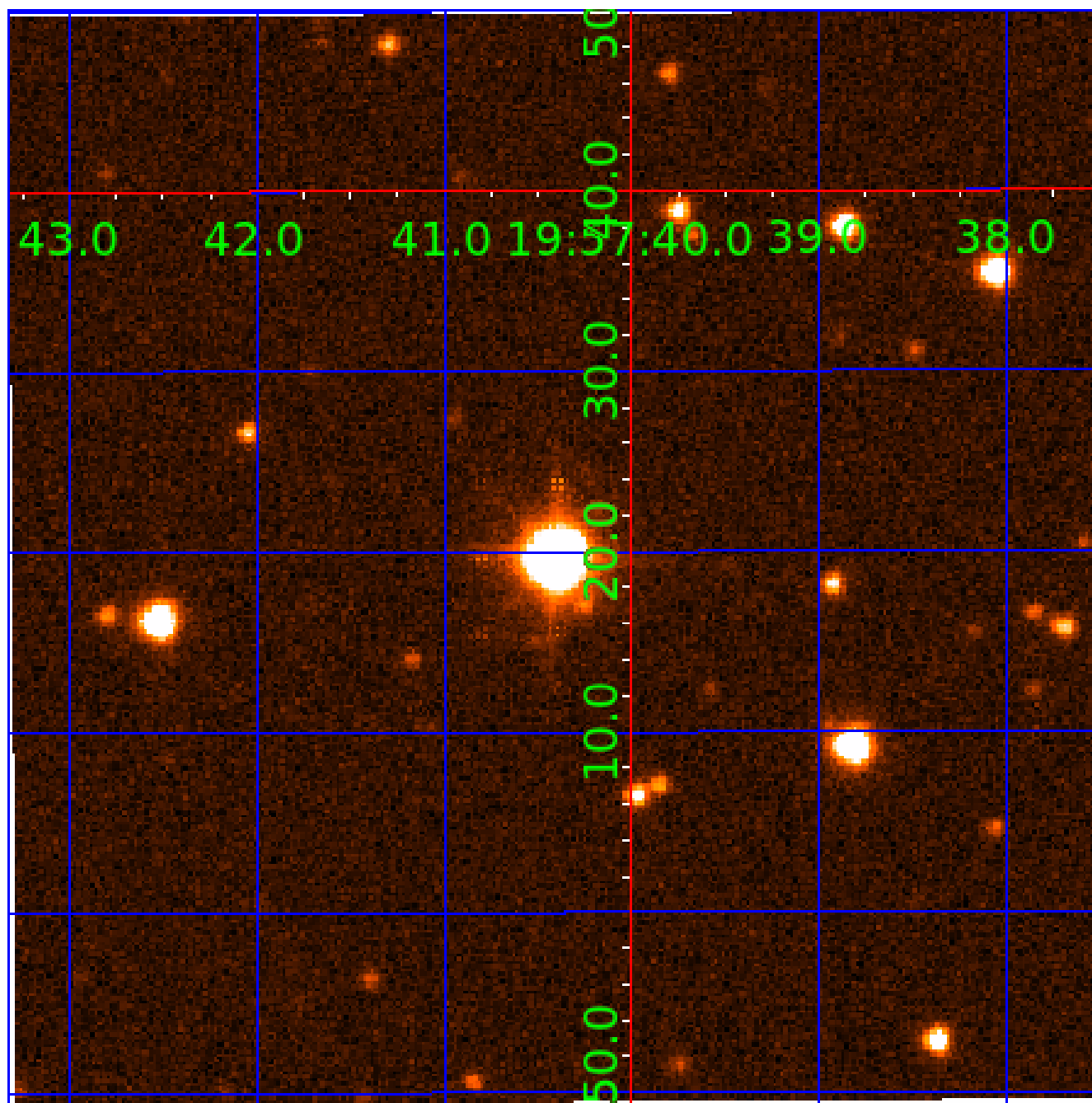


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 009487871

Q1-17 DR25 TCE Parameters

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Robovetter Results

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009487871-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

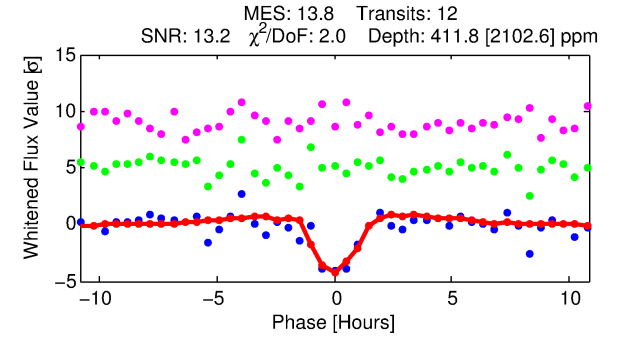
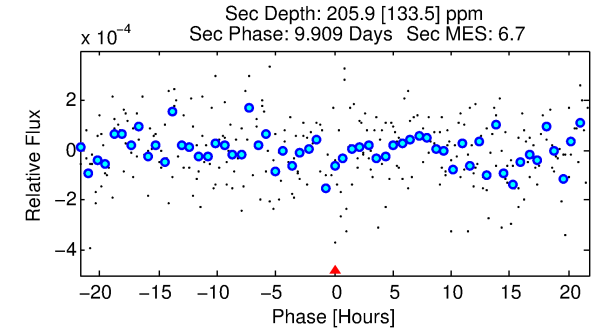
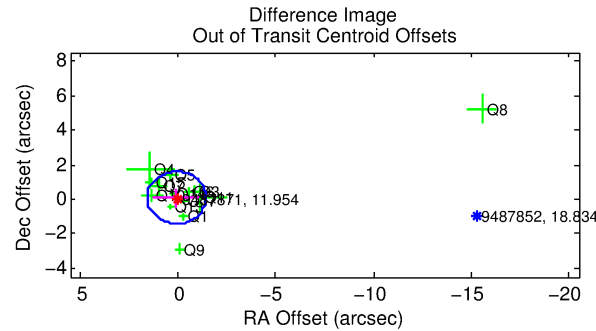
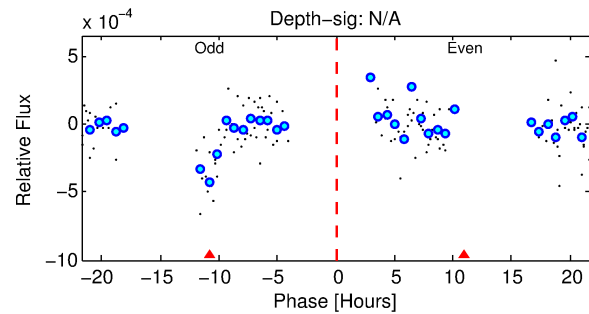
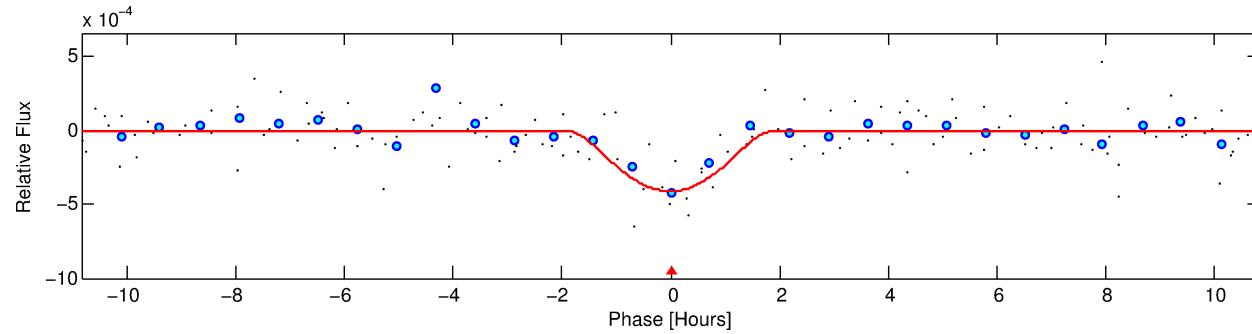
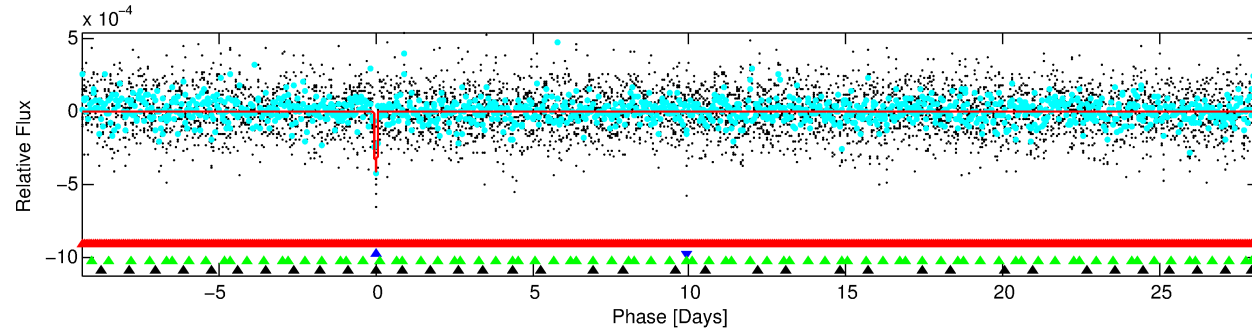
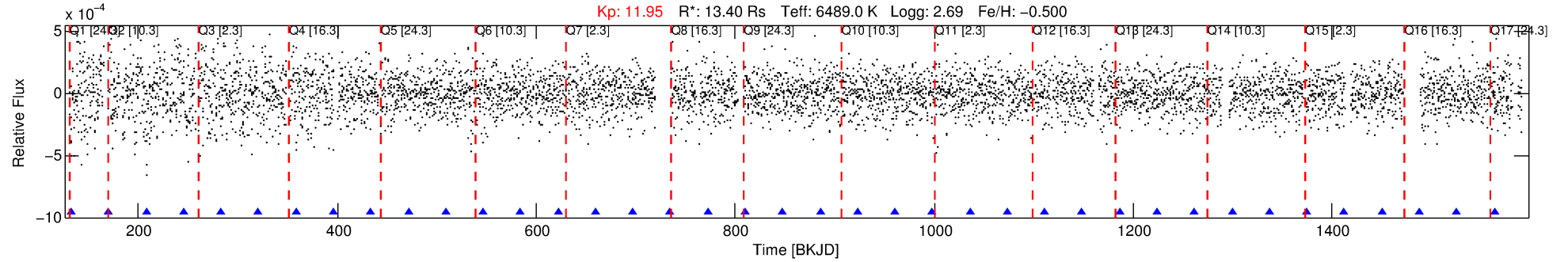
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487871-02

No Significant Match Found

DV One-Page Summary

KIC: 9487871 Candidate: 2 of 4 Period: 37.633 d



DV Fit Results:

Period = 37.63285 [0.00054] d
Epoch = 132.7383 [0.0096] BKJD
Rp/R* = 0.0360 [0.1572]
a/R* = 21.53 [24.09]
b = 1.00 [0.10]
Seff = 2697.51 [2696.56]
Teff = 1838 [459] K
Rp = 52.66 [232.15] Re
a = 0.3252 [0.1972] AU
Ag = 4.32 [38.08] [0.09σ]
Teffp = 4096 [8969] K [0.25σ]

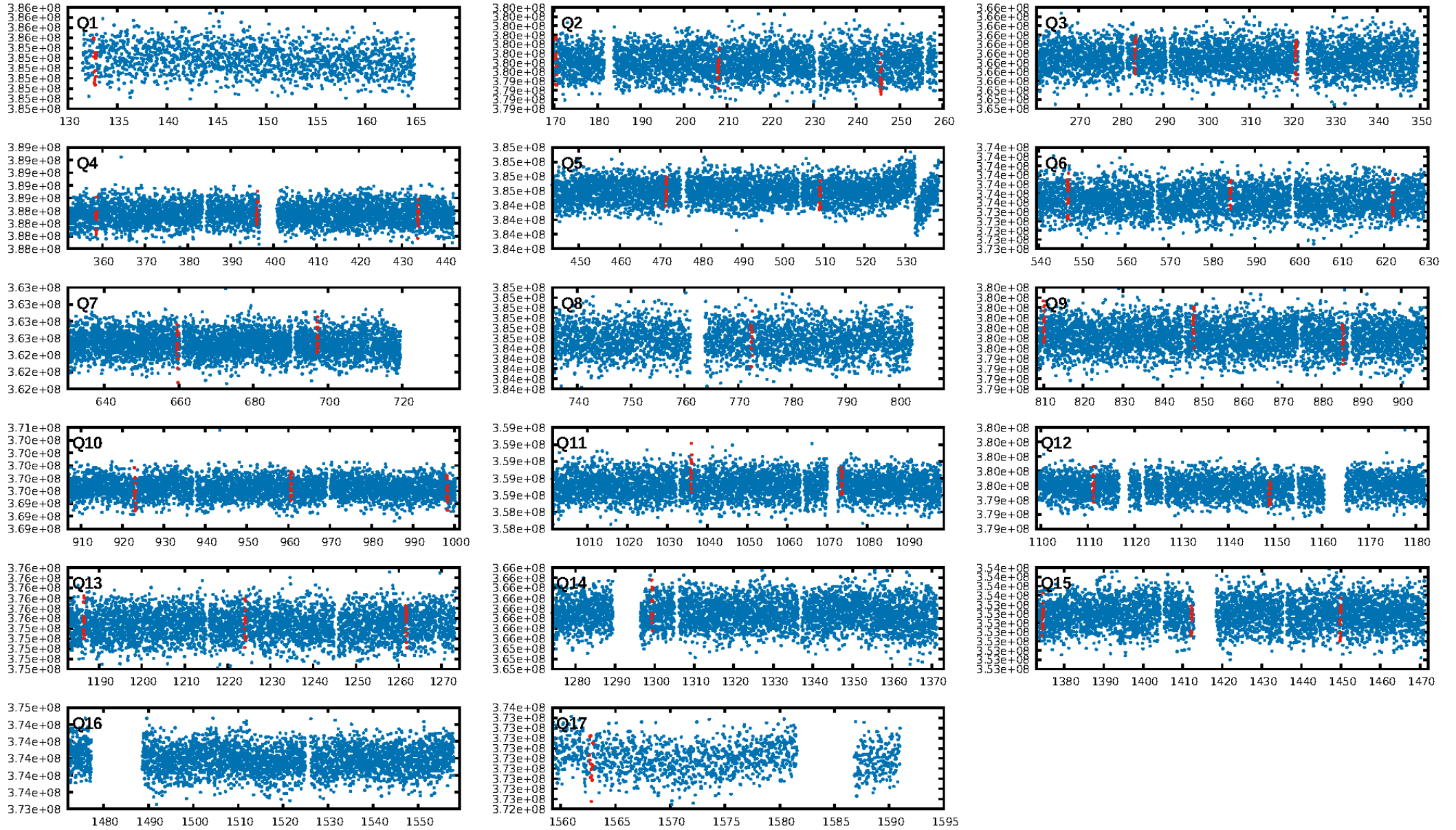
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [121.97σ]
LongPeriod-sig: 100.0% [16.01σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.29e-20
RollingBand-fgt: 1.00 [11/11]
GhostDiagnostic-chr: 3.104
Centroid-sig: 78.4%
Centroid-so: 0.200 arcsec [0.81σ]
OotOffset-rm: 0.113 arcsec [0.23σ]
KicOffset-rm: 0.067 arcsec [0.25σ]
OotOffset-st: 3/4/2/5 [14]
KicOffset-st: 3/4/2/5 [14]
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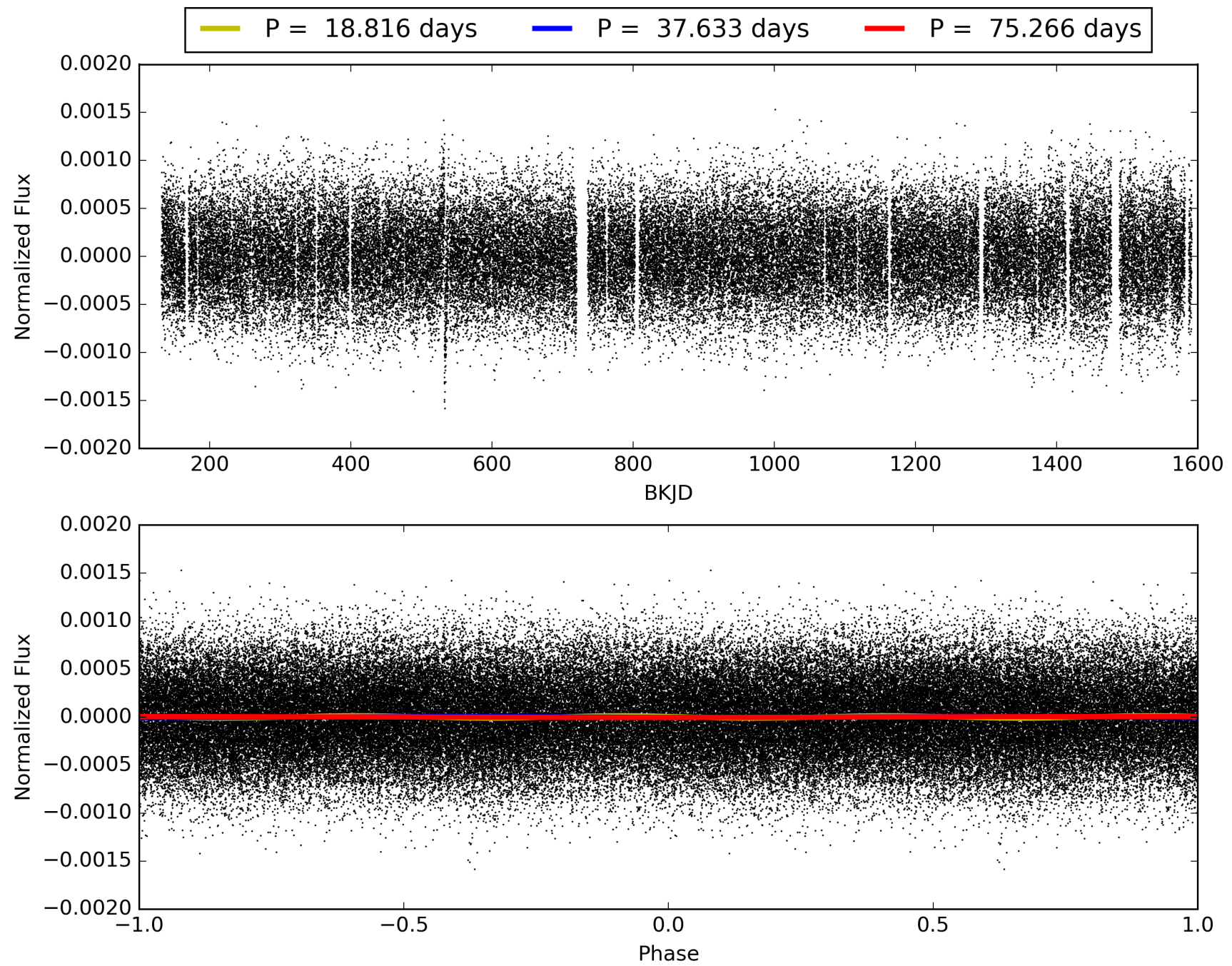
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009487871-02, PDC Light Curves

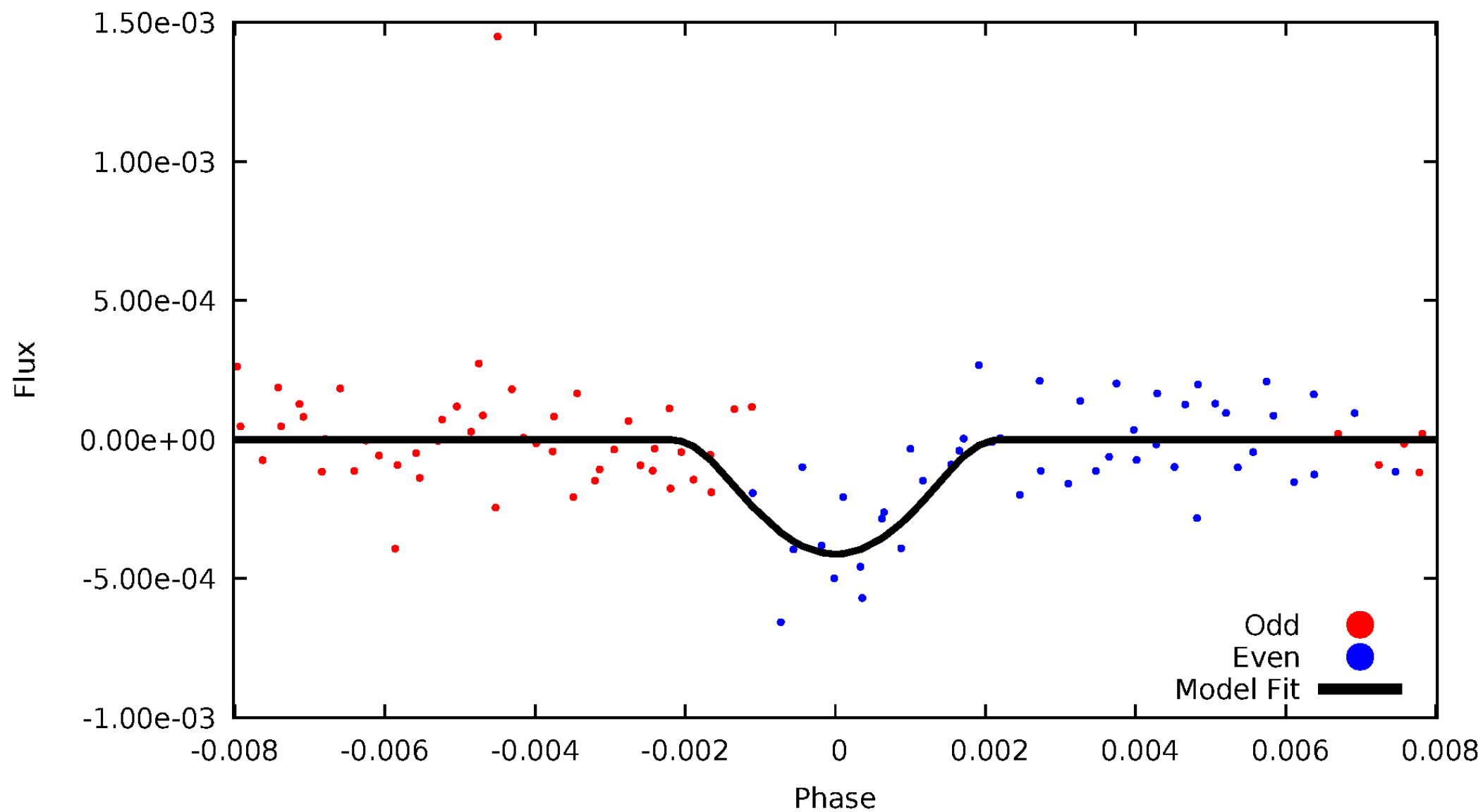


TCE 009487871-02



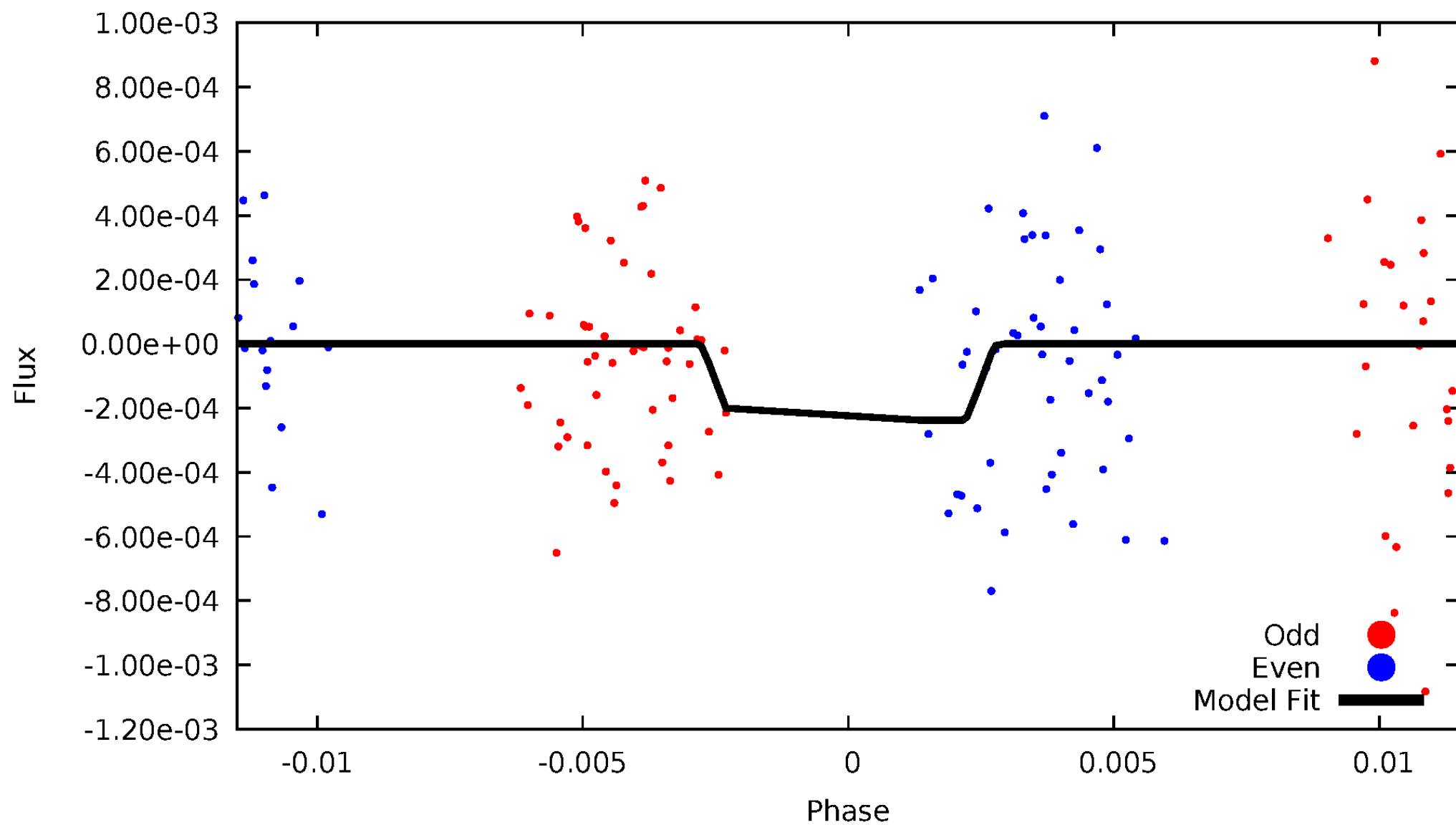
DV Odd/Even

TCE 009487871-02



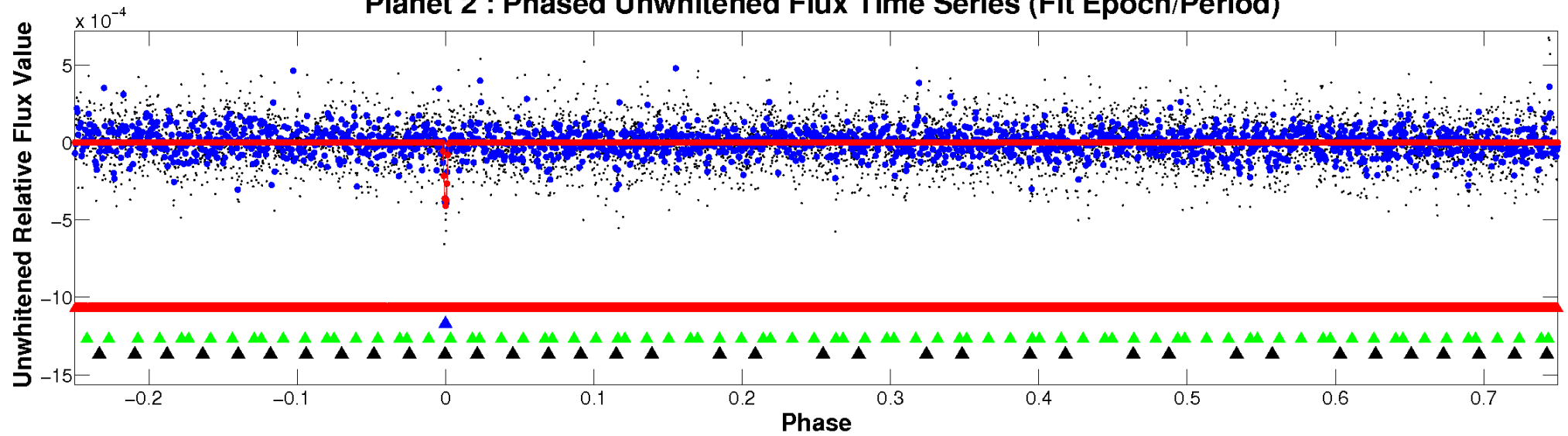
ALT Odd/Even

TCE 009487871-02

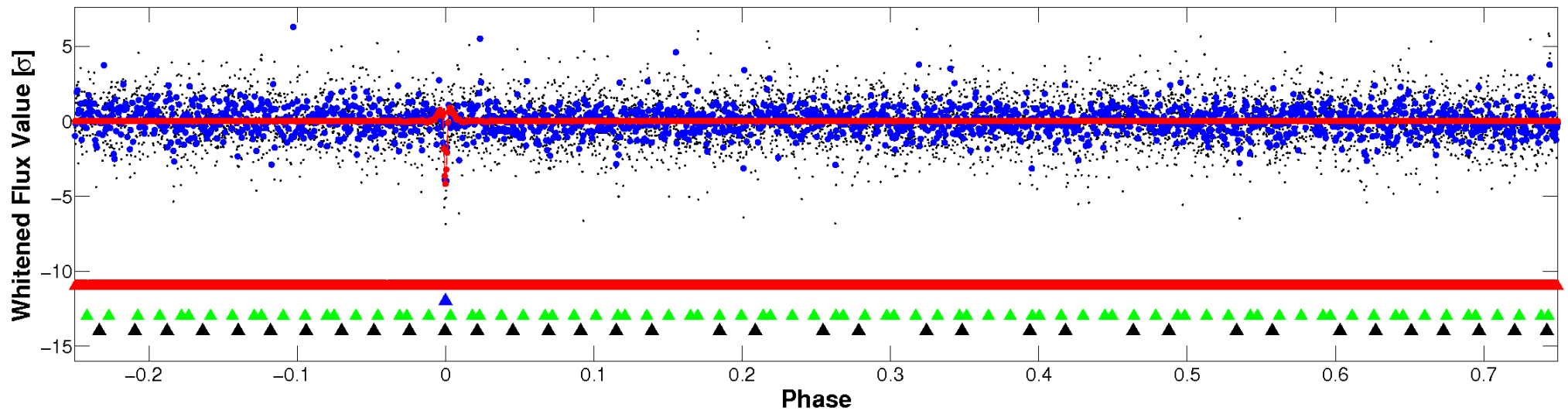


Non-Whitened Vs. Whitened Light Curve

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

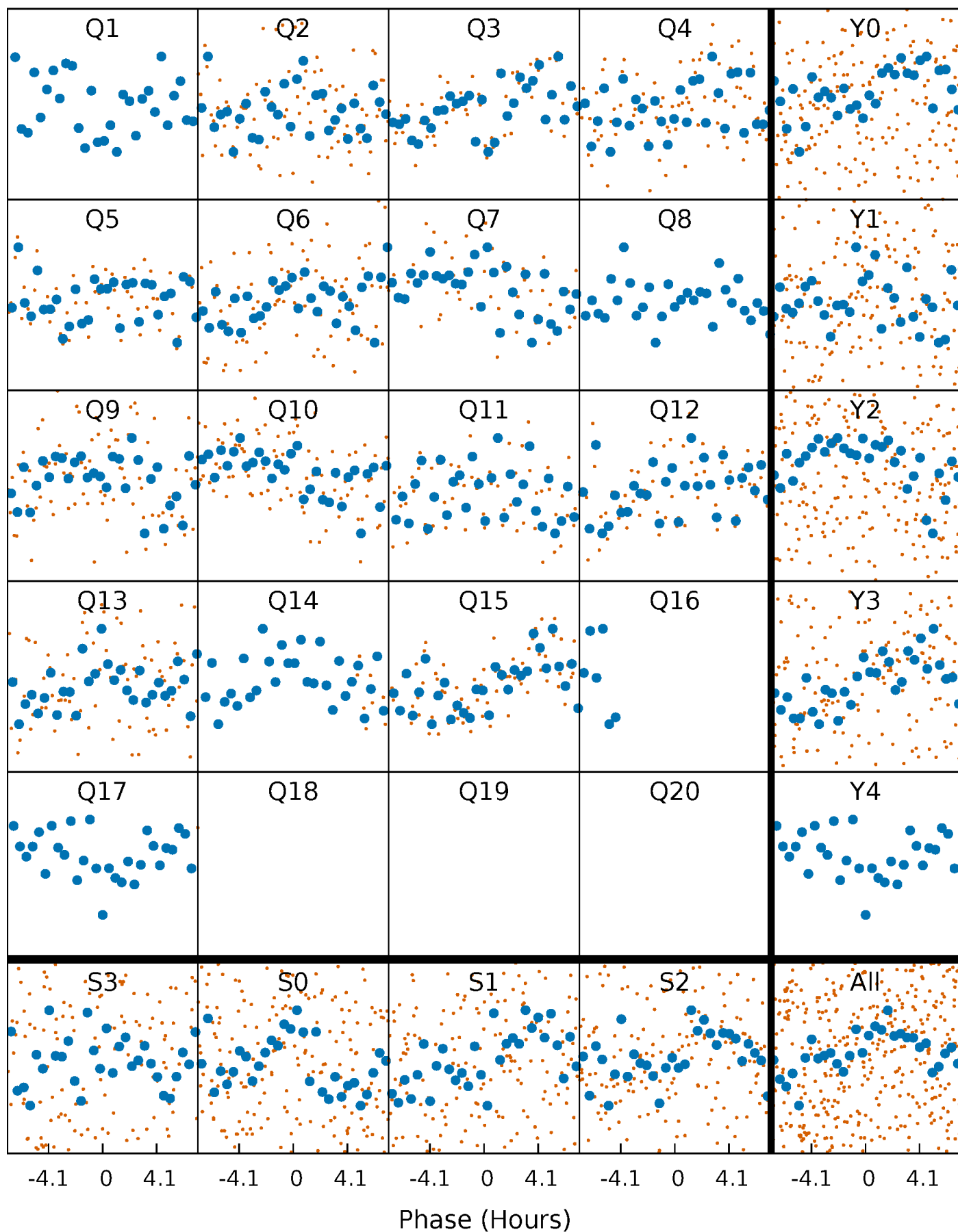


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



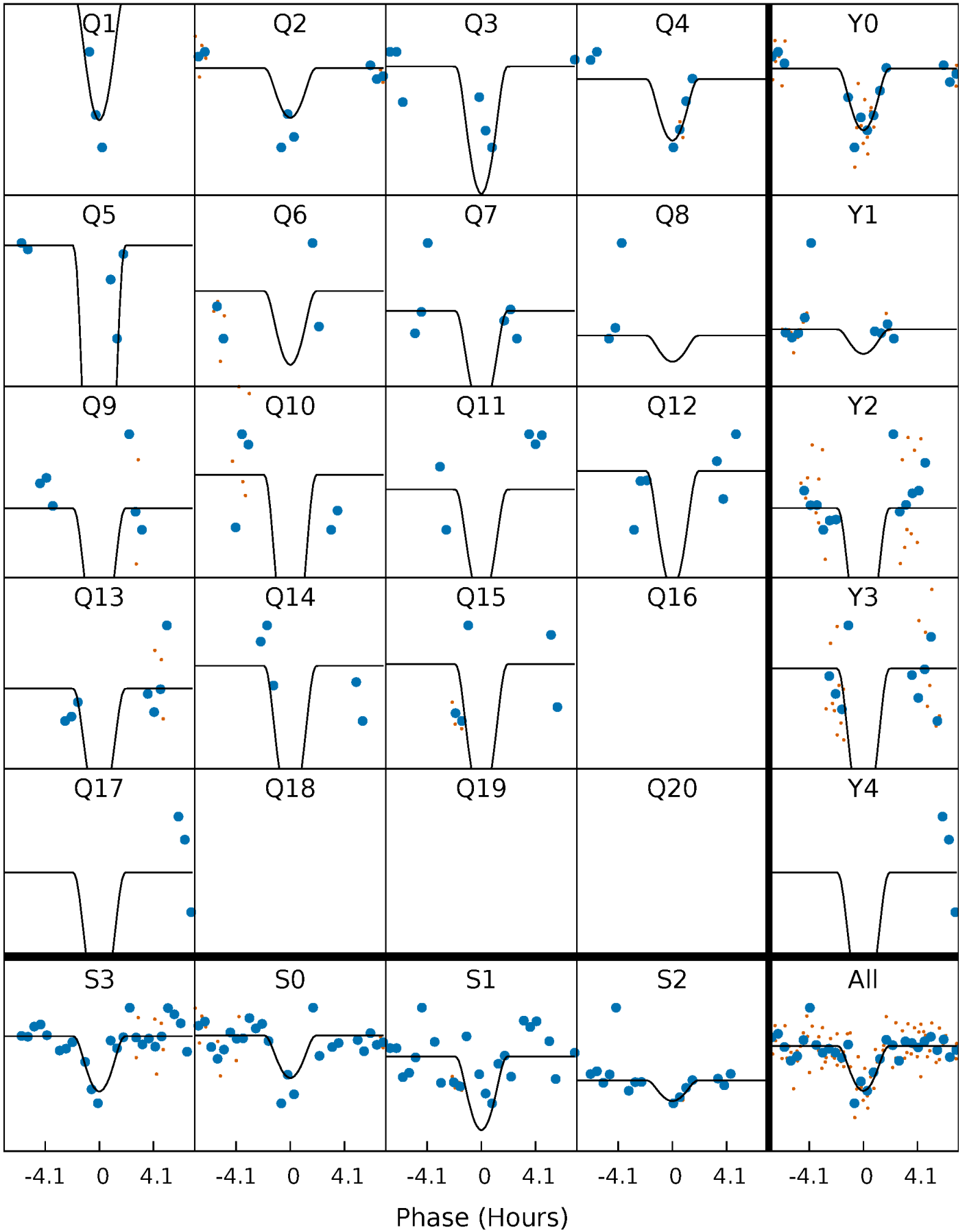
PDC Quarter-Phased Transit Curves

TCE 009487871-02 P= 37.632845 Days $T_0=132.738303$ (BKJD)



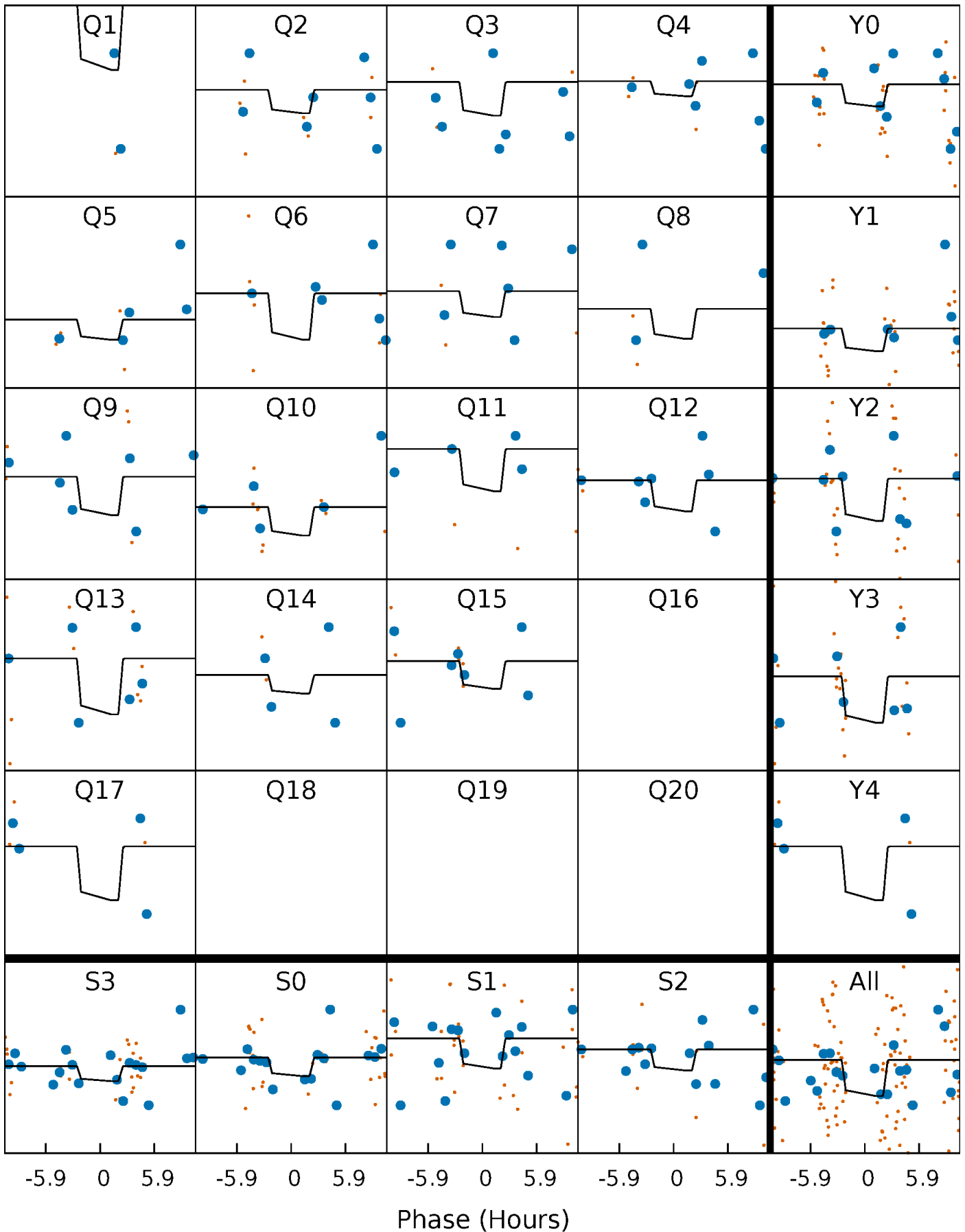
DV Quarter-Phased Transit Curves

TCE 009487871-02 P= 37.632845 Days $T_0=132.738303$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

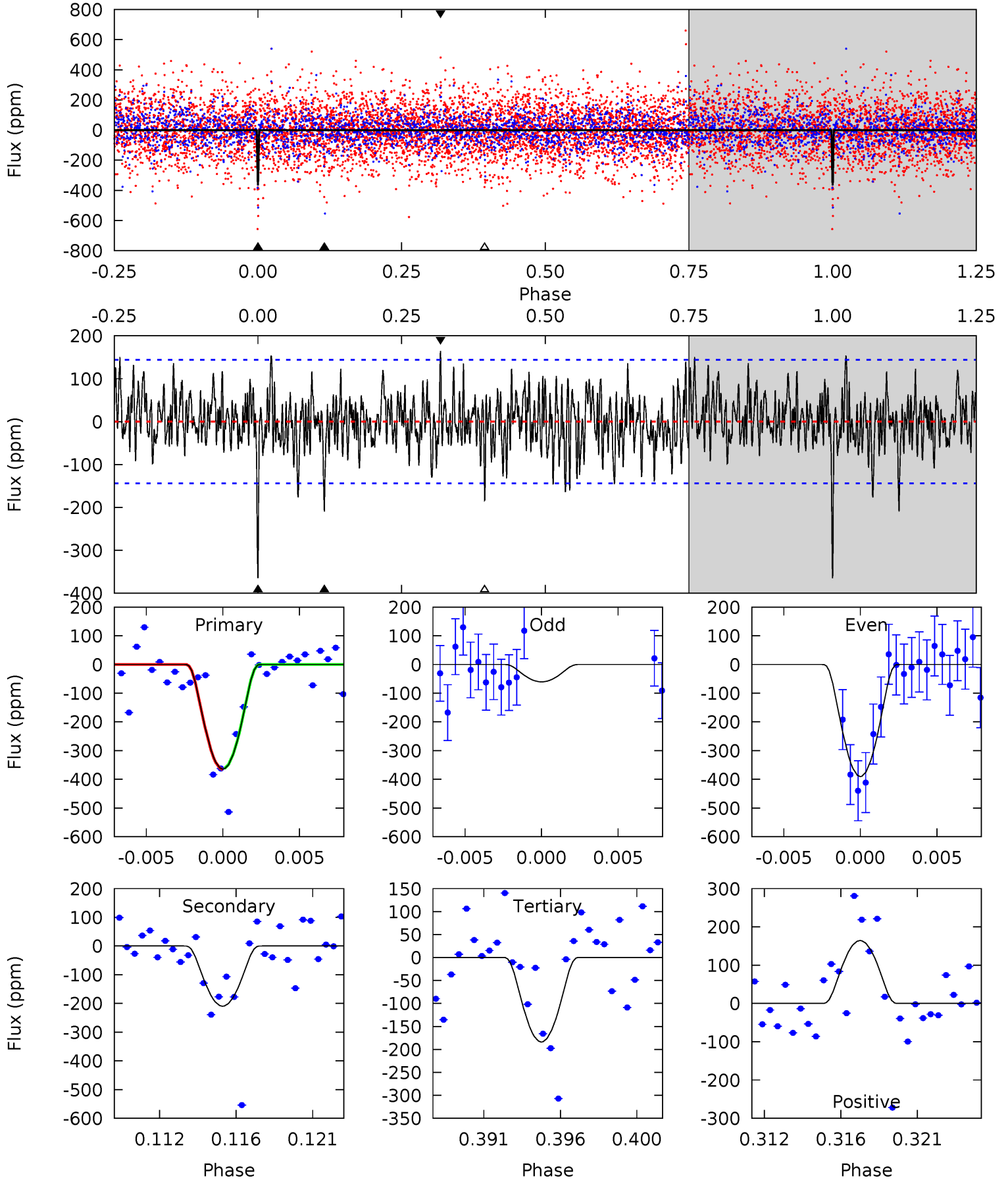
TCE 009487871-02 P= 37.636756 Days $T_0=132.646418$ (BKJD)



DV Model-Shift Uniqueness Test

009487871-02, P = 37.632845 Days, E = 95.105458 Days

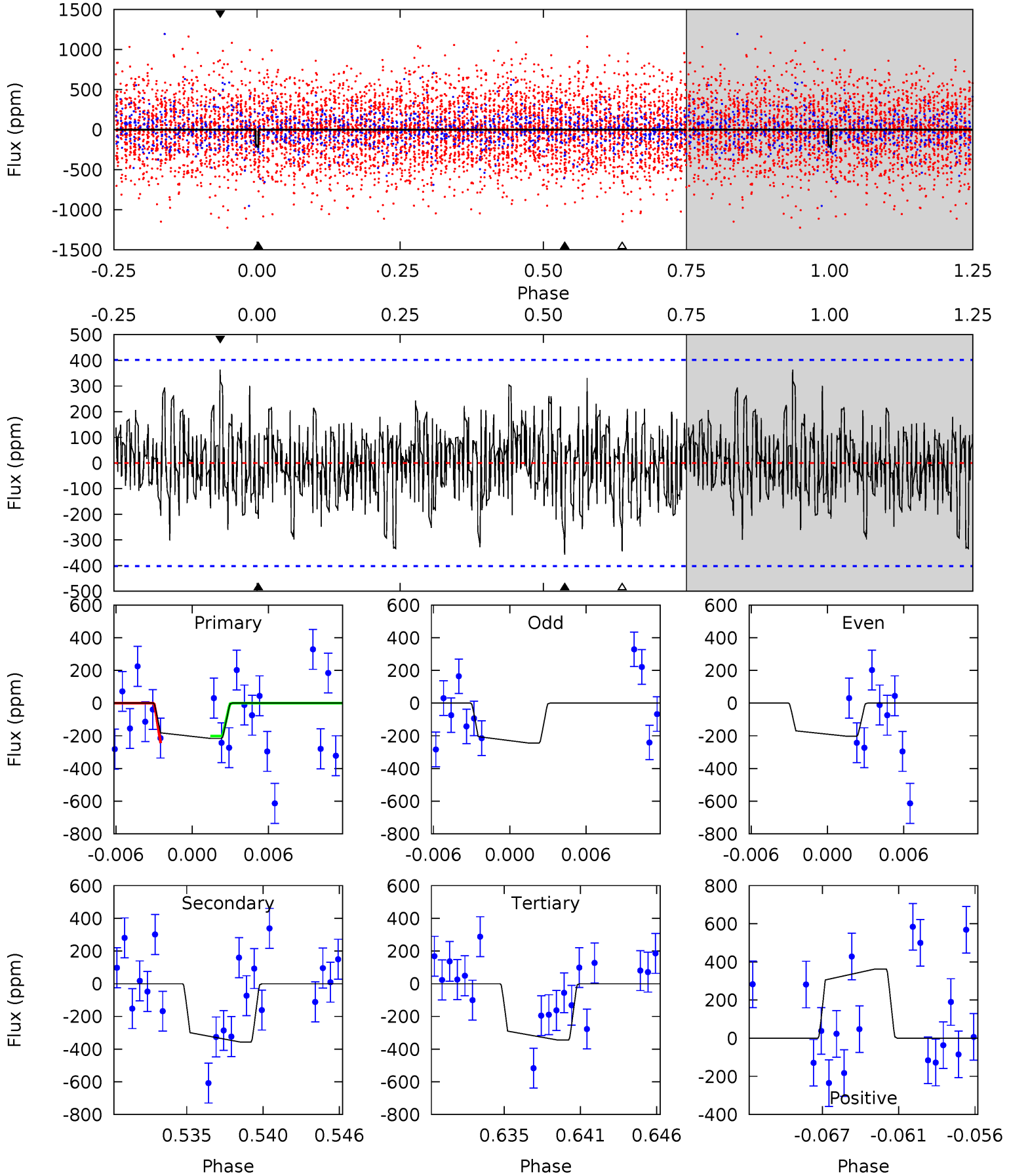
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.1	7.53	6.61	5.90	5.17	2.83	1.87	6.49	7.20	0.92	1.63	5.07	0.89	0.31	0.06



Alt Model-Shift Uniqueness Test

009487871-02, P = 37.636756 Days, E = 95.009662 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.77	4.56	4.41	4.64	5.14	2.77	1.24	-1.64	-1.88	0.15	-0.08	0.20	1.23	0.50	0.20



Stellar Parameters For KIC 009487871

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6489^{+137}_{-255}	$2.694^{+0.586}_{-0.138}$	$-0.500^{+0.550}_{-0.450}$	$13.402^{+0.861}_{-8.176}$	$3.239^{+0.069}_{-1.247}$	$0.002^{+0.016}_{-0.000}$
	+2%/-4%	+22%/-5%	+110%/-90%	+6%/-61%	+2%/-38%	+839%/-22%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009487871-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-210 ± 28	$149.82^{+171.03}_{-103.94}$	2530^{+141}_{-348}	2614^{+1672}_{-5267}	$0.512^{+4.832}_{-0.402}$
Alt.	-356 ± 78	$142.34^{+175.23}_{-97.27}$	2531^{+131}_{-341}	3038^{+1704}_{-5482}	$0.968^{+8.506}_{-0.774}$

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 $A_{obs} \gg 1.0$

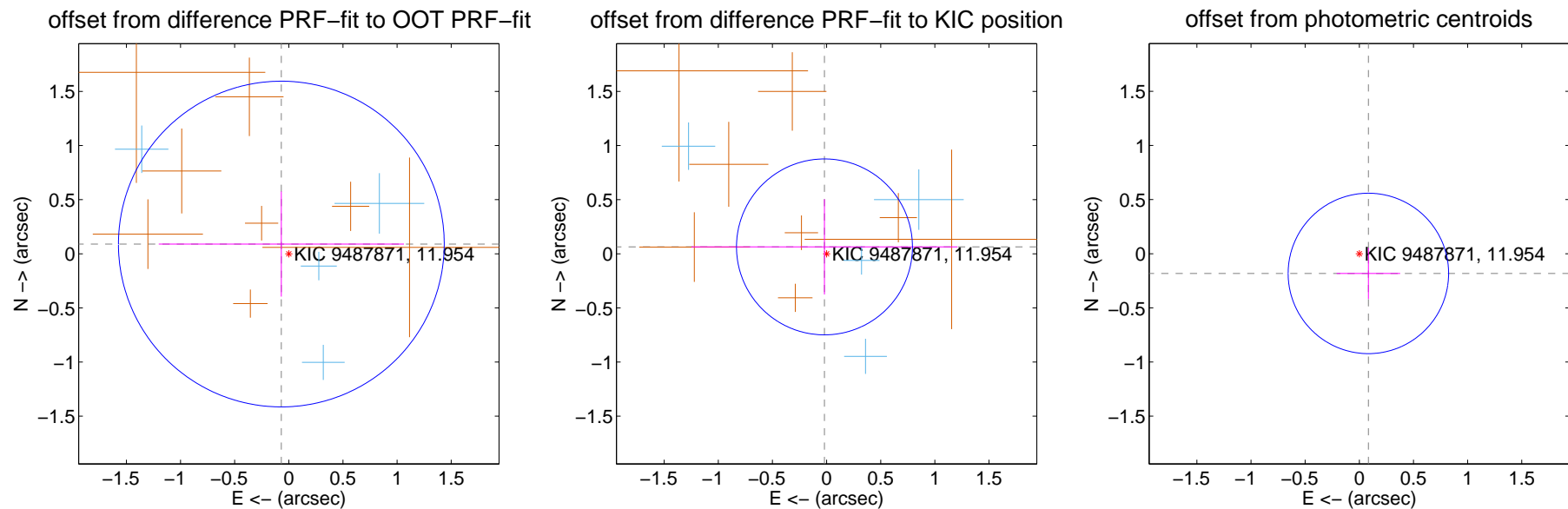
DV Centroid Data

Supplemental centroid analysis for 009487871-02. **Kepler magnitude: 11.95.** Transit SNR 13.22

There are 4 quarters with good PRF difference image offsets

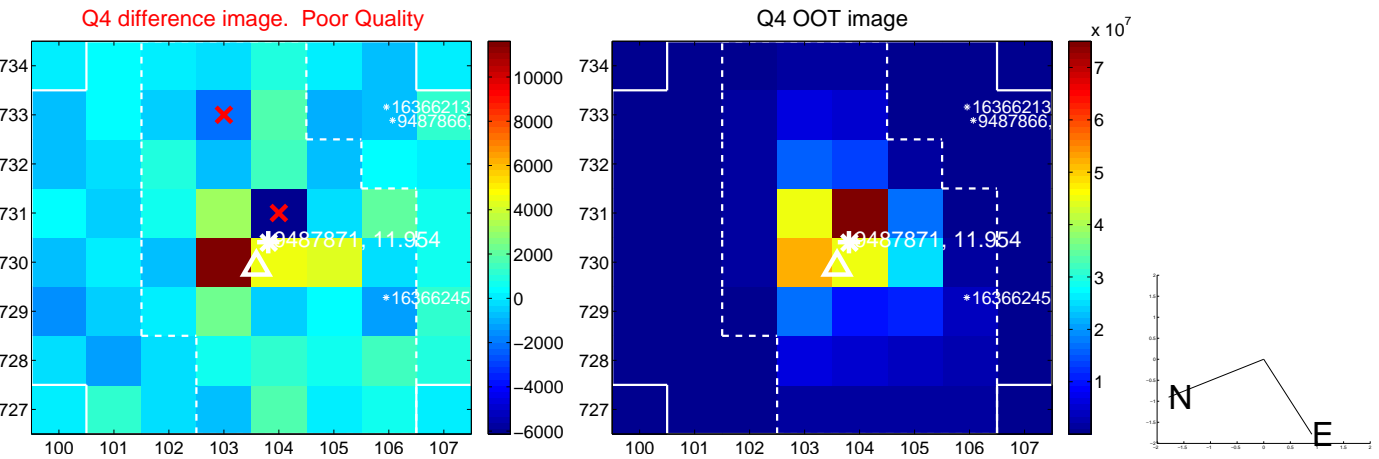
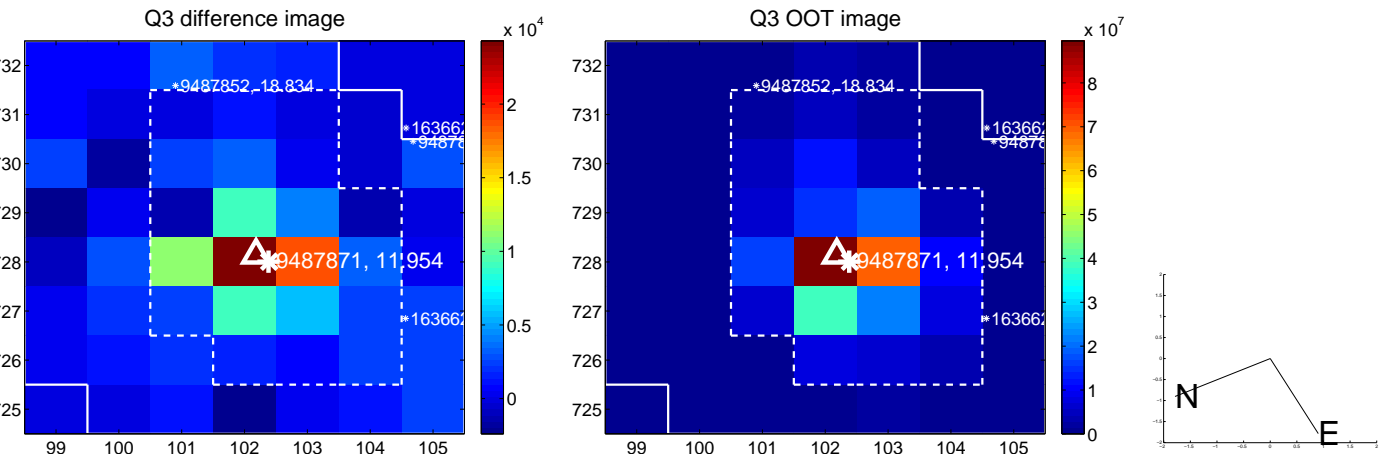
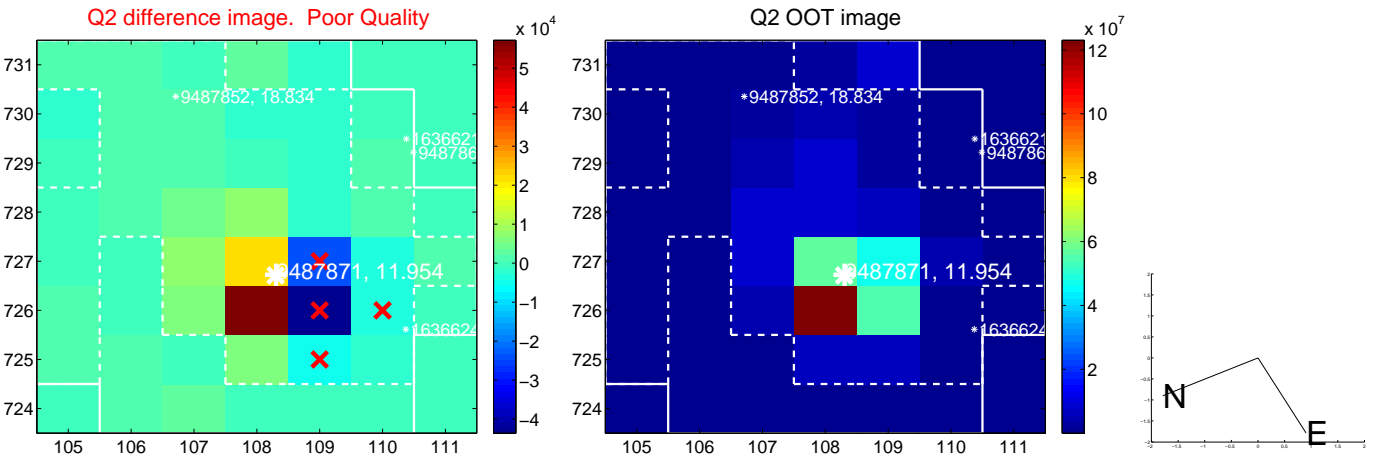
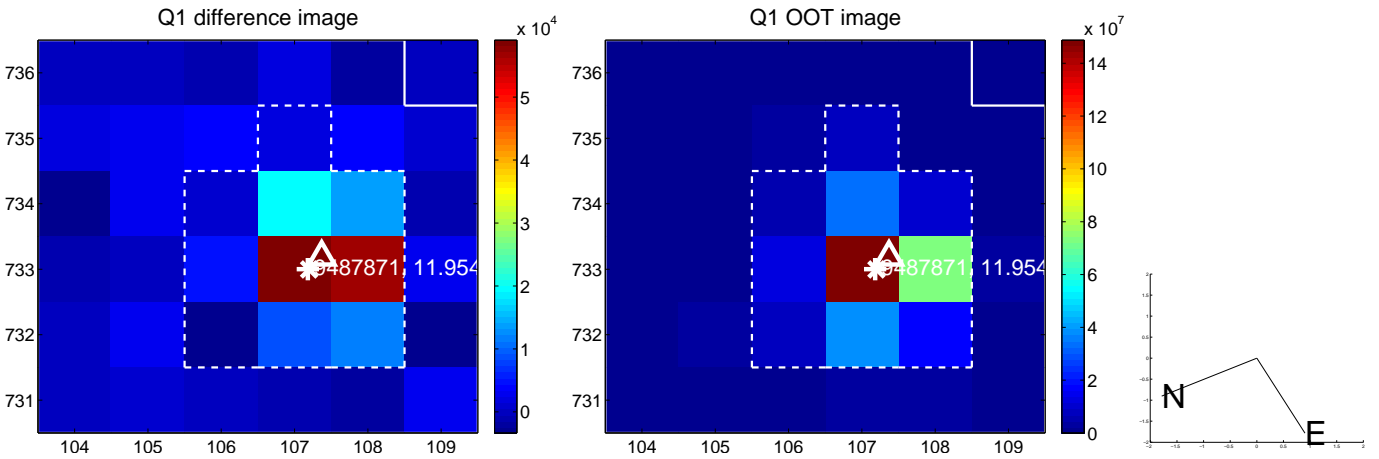
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.113 ± 0.502	0.23	0.069 ± 1.132	0.090 ± 0.486
PRF-fit source offset from KIC position	0.067 ± 0.271	0.25	0.019 ± 1.229	0.064 ± 0.440
photometric centroid source offset	0.20 ± 0.25	0.81	-0.08 ± 0.29	-0.18 ± 0.24

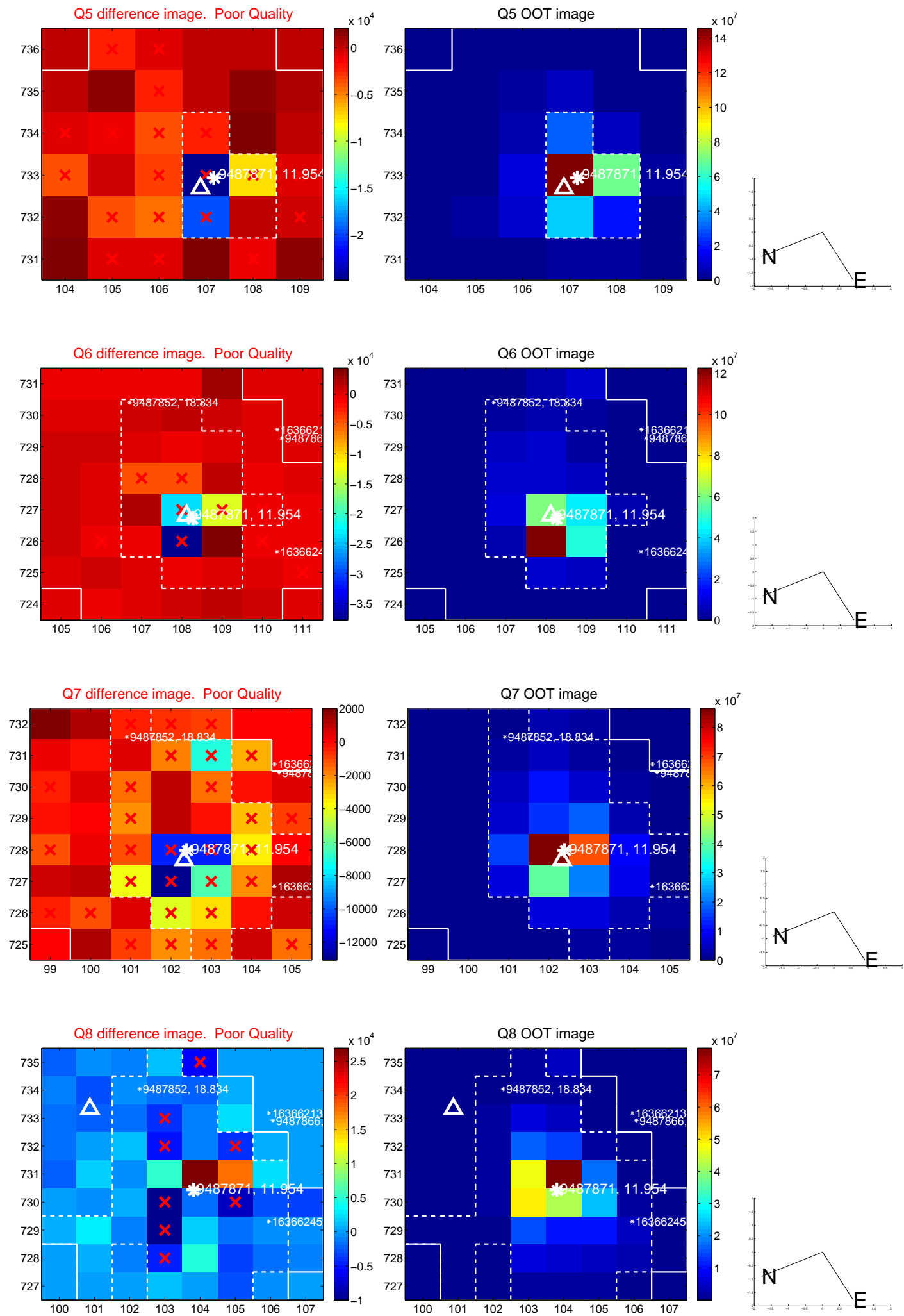


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

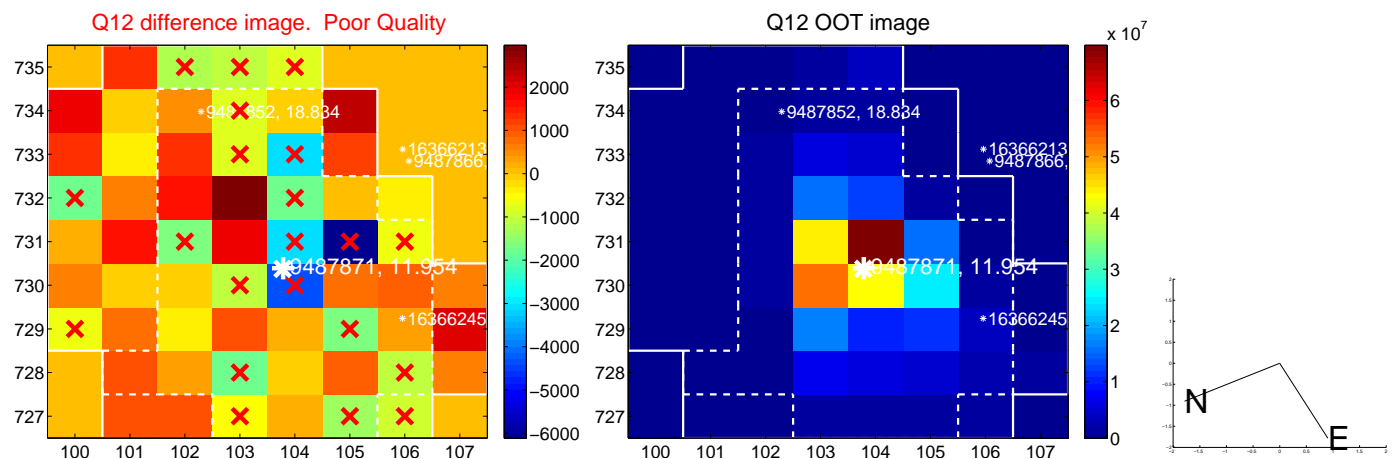
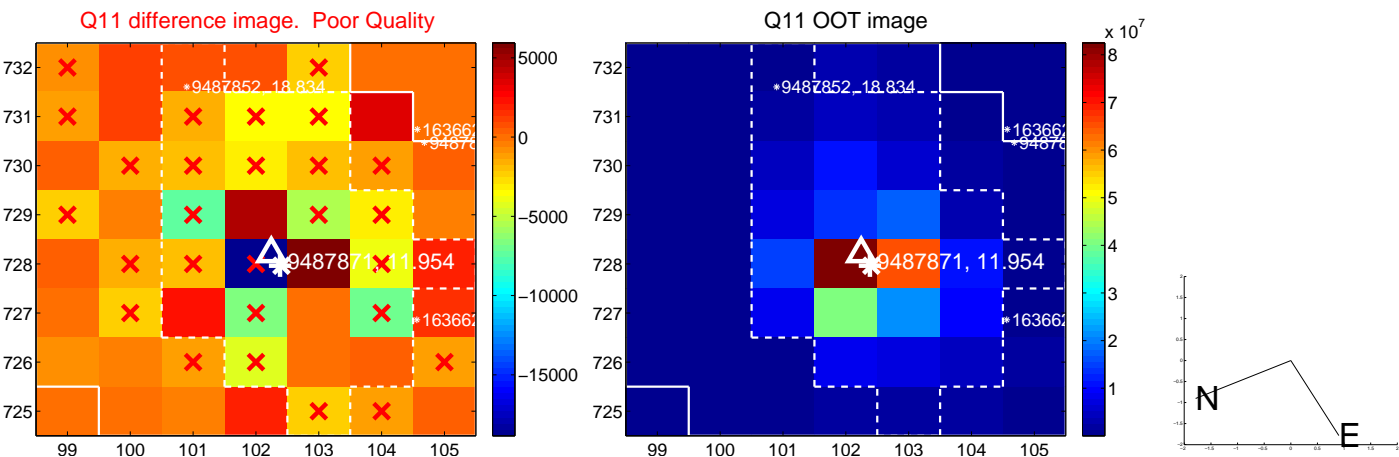
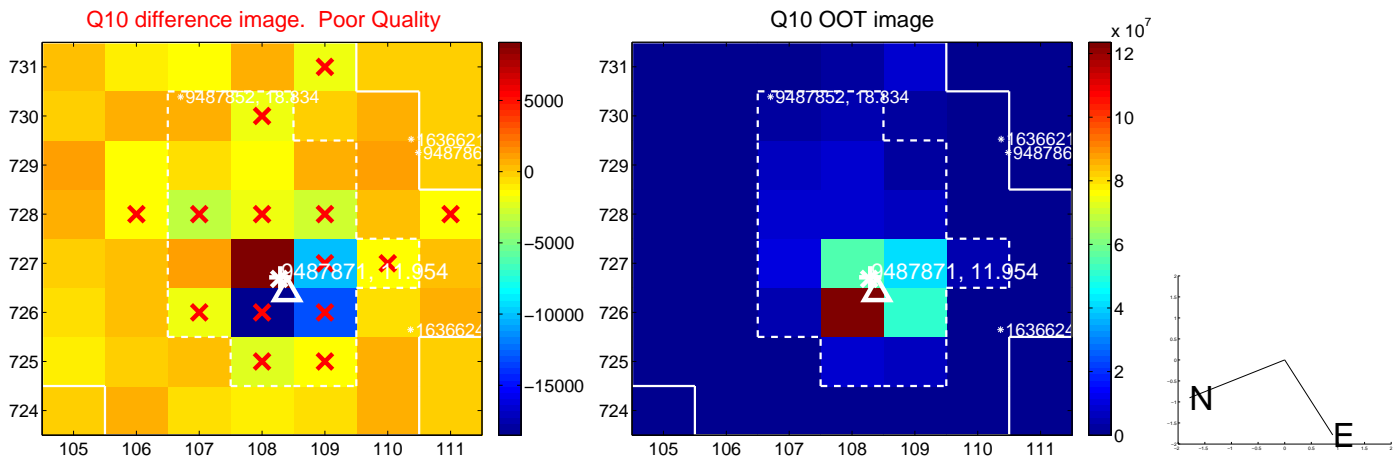
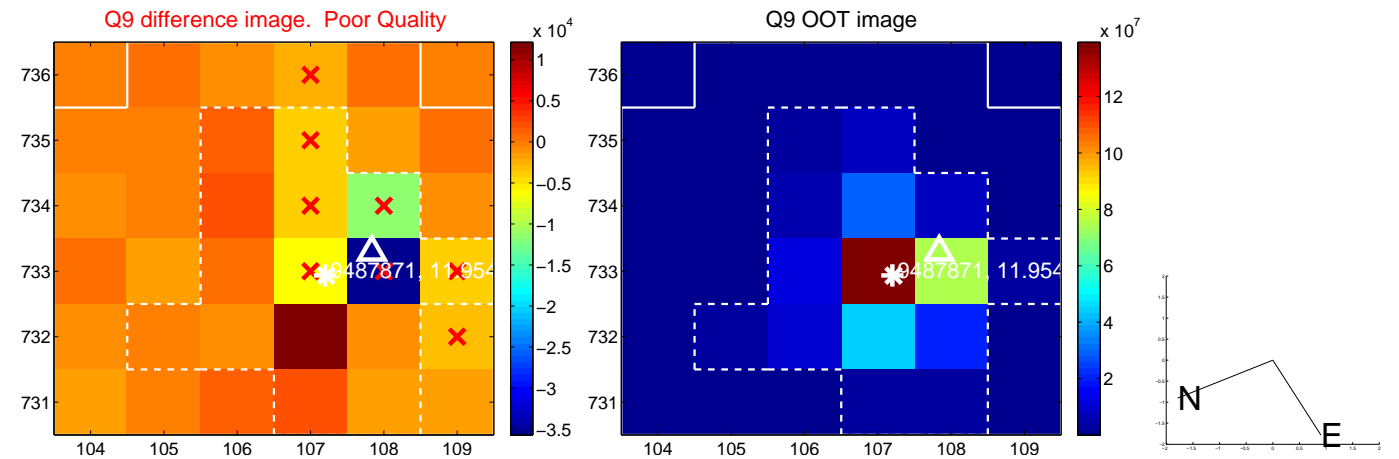
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



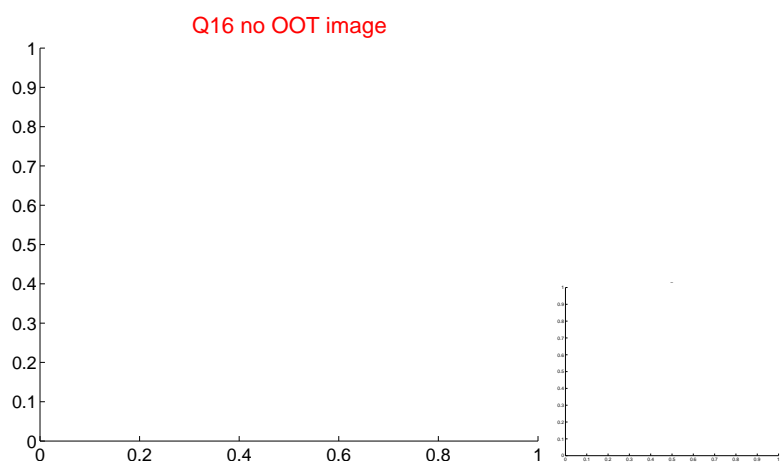
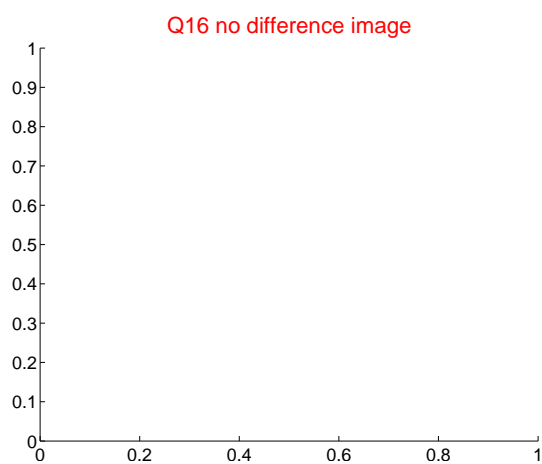
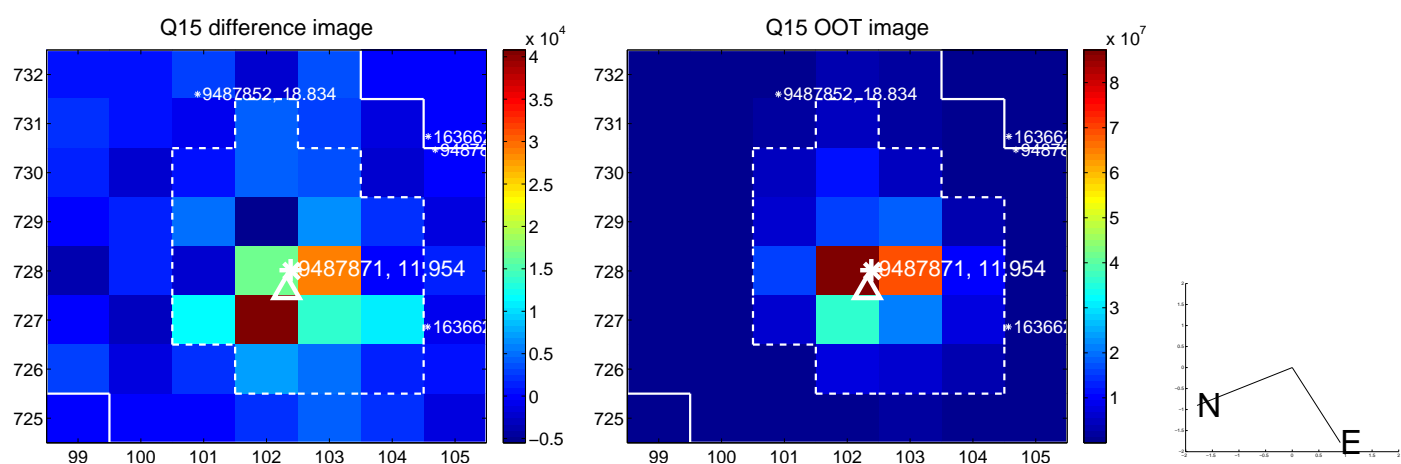
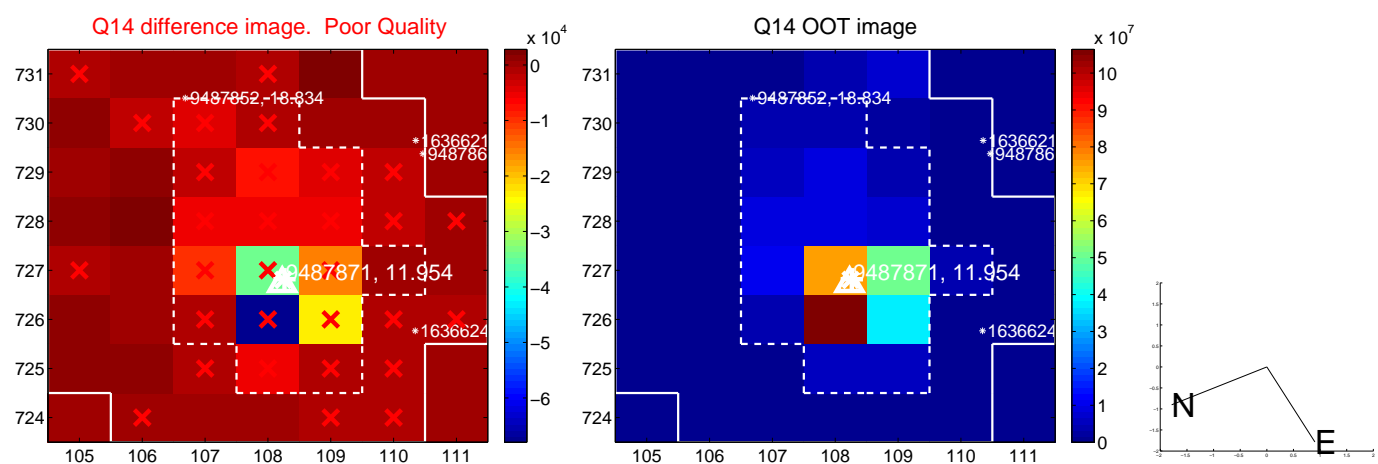
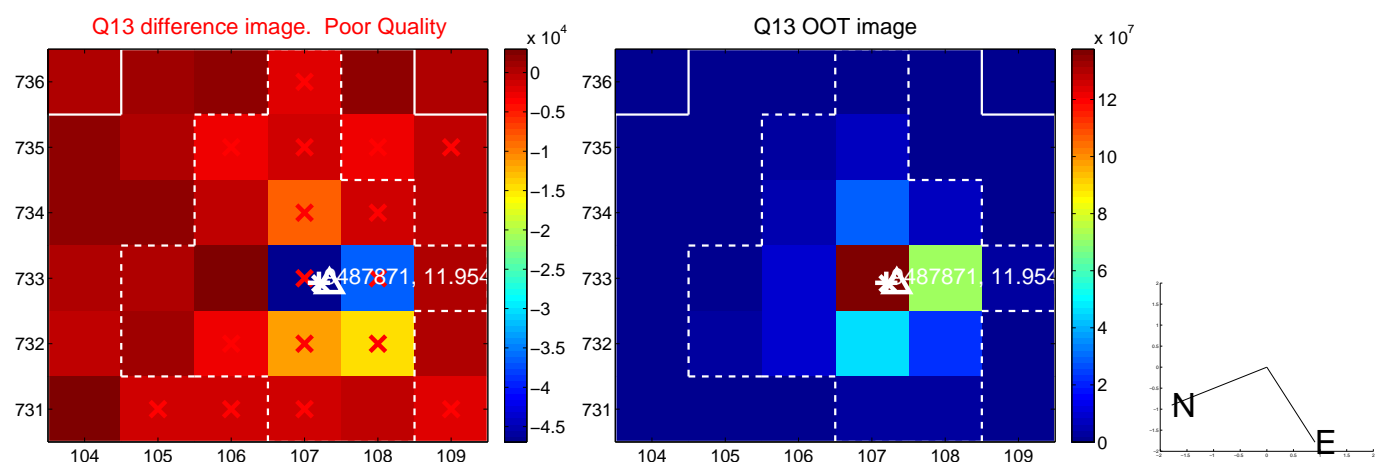
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



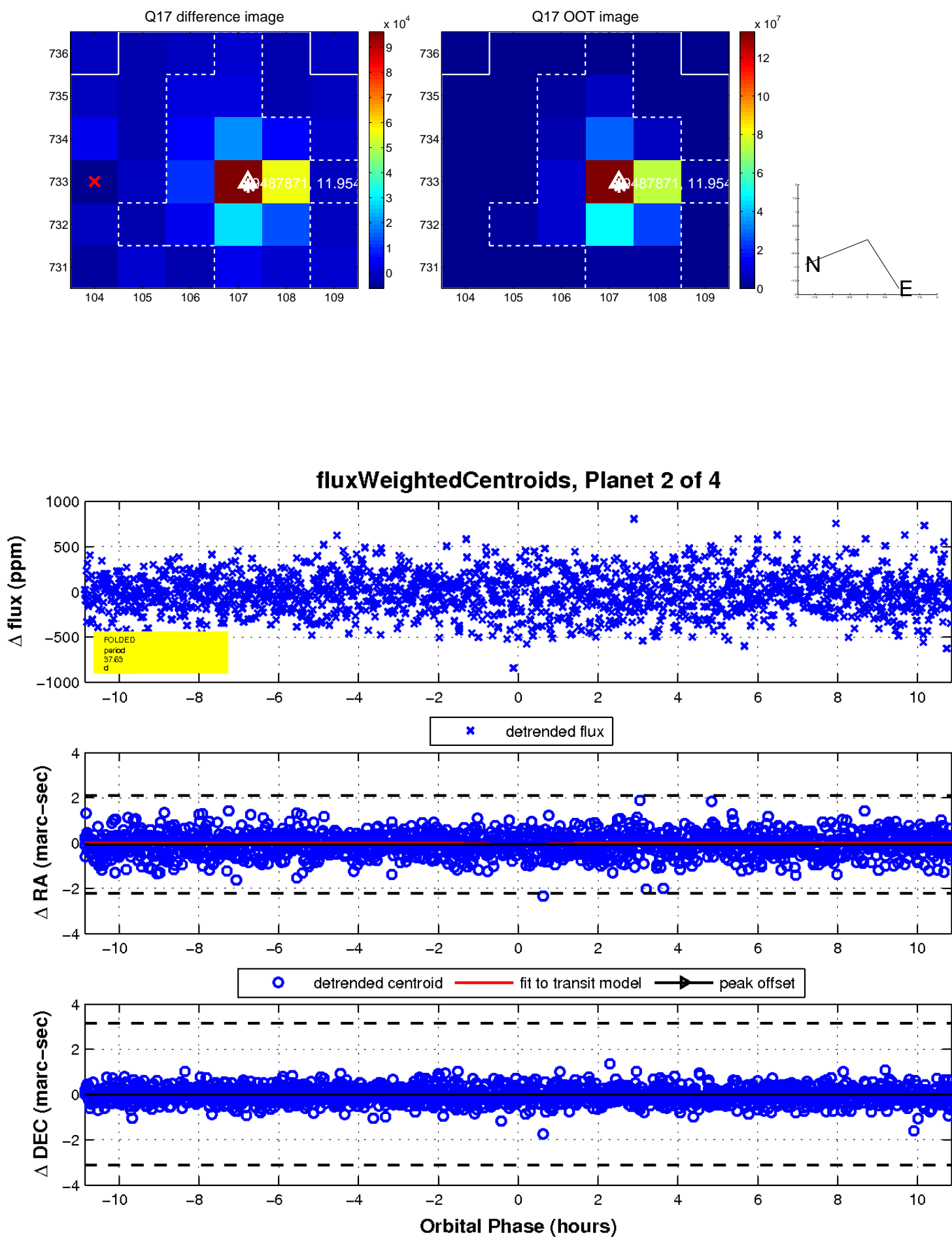
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

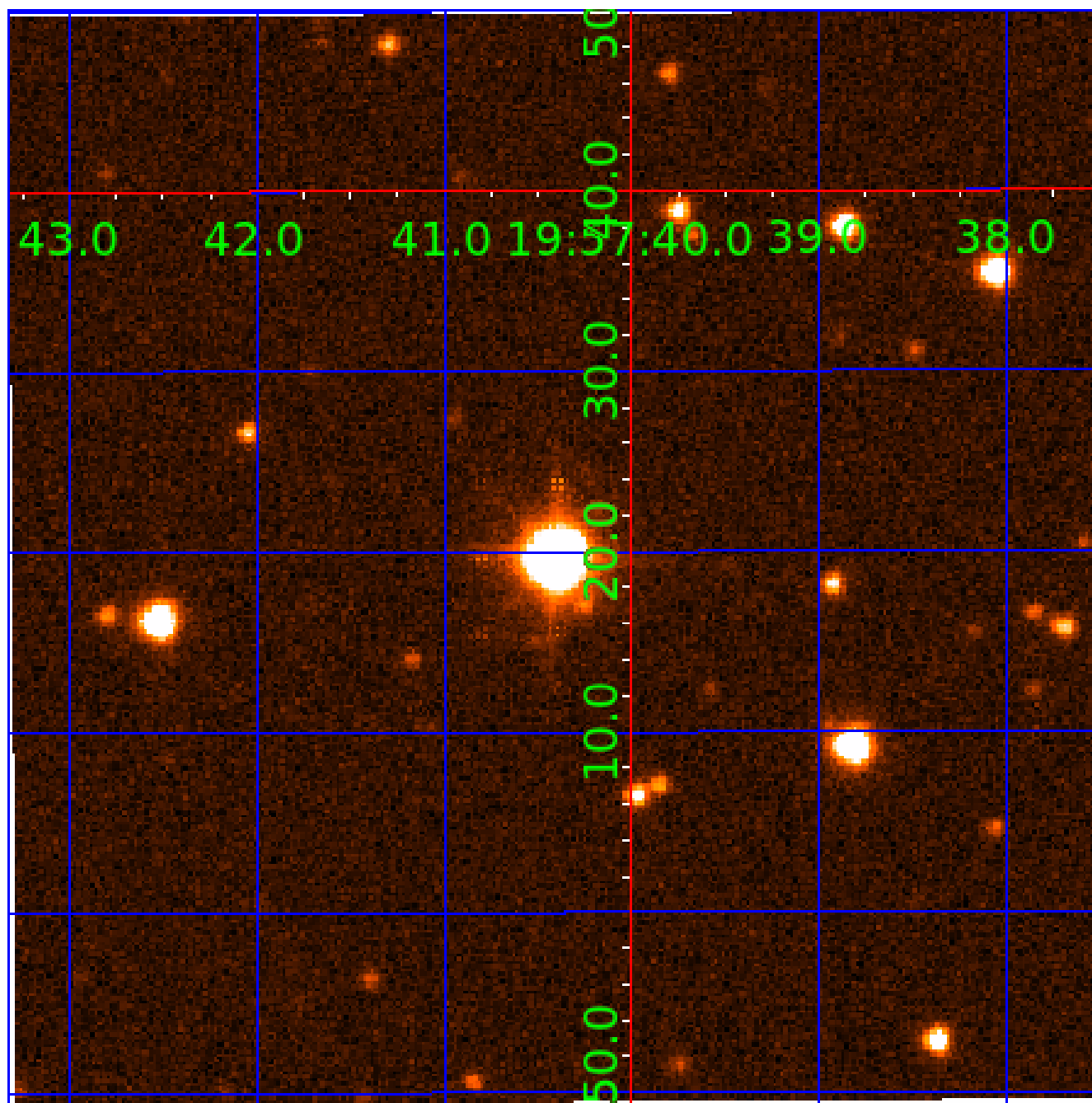


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009487871

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})
009487871-01	OBS	No	0.583568	131.842756	13.4	4.064	8.9	5.2	13.40	6489	4.98	0.00
009487871-02	OBS	No	37.632845	132.738303	411.8	3.619	13.8	13.2	13.40	6489	52.66	2697.51
009487871-03	OBS	No	17.894001	142.644055	257.9	1.409	11.7	8.3	13.40	6489	25.17	7268.45
009487871-04	OBS	No	40.256404	157.242912	317.9	1.540	9.2	9.5	13.40	6489	30.62	2465.69

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487871-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009487871-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

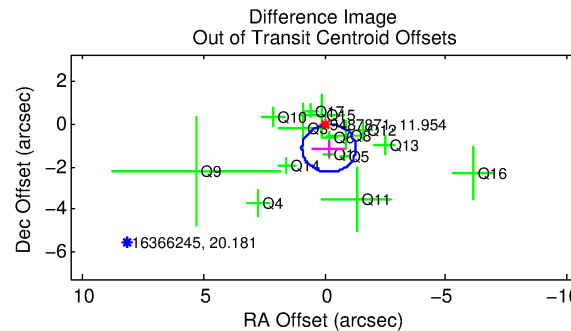
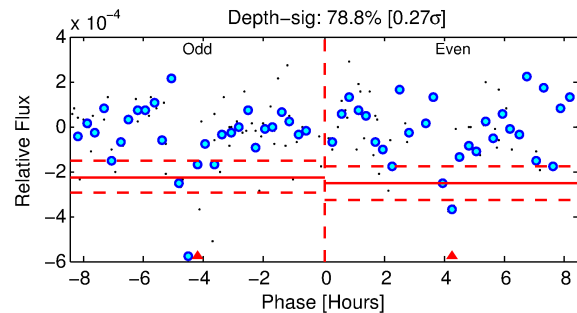
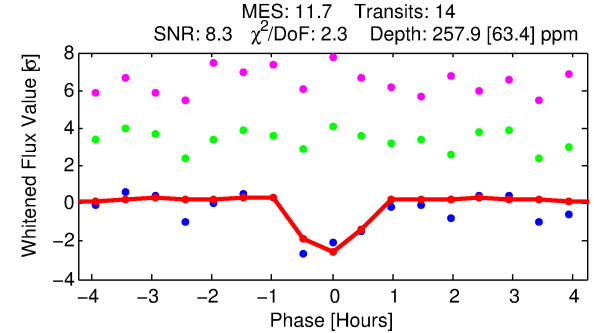
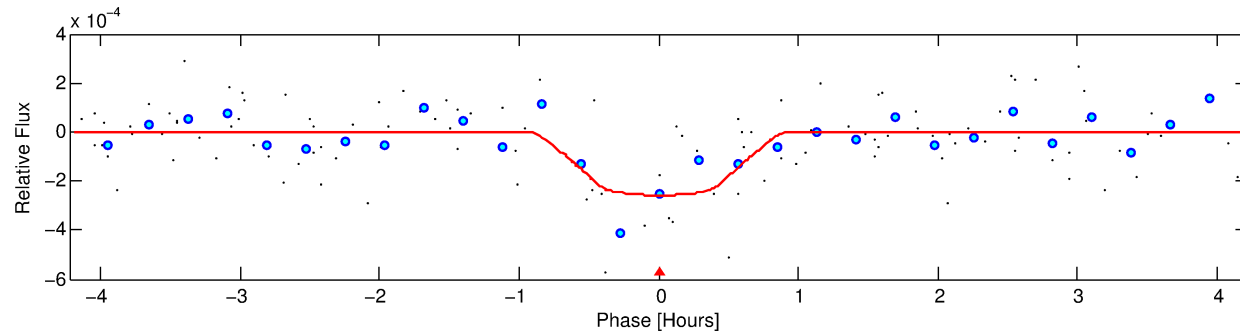
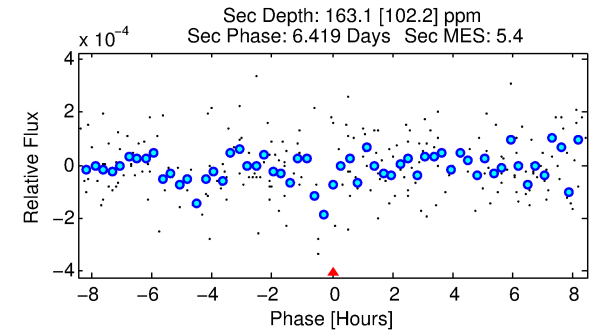
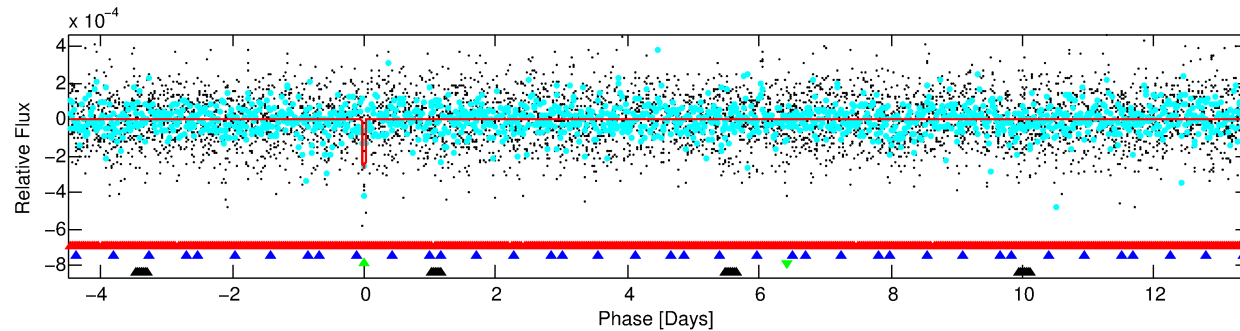
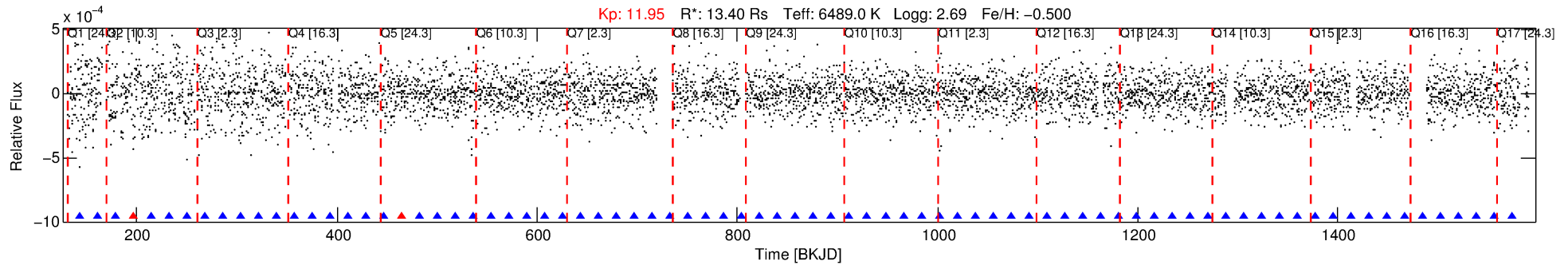
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487871-03

No Significant Match Found

DV One-Page Summary

KIC: 9487871 Candidate: 3 of 4 Period: 17.894 d



DV Fit Results:

Period = 17.89400 [0.00016] d
Epoch = 142.6441 [0.0055] BKJD
Rp/R* = 0.0172 [0.0171]
a/R* = 46.21 [262.74]
b = 0.90 [1.23]
Seff = 7268.45 [7265.89]
Teq = 2354 [588] K
Rp = 25.17 [29.31] Re
a = 0.1981 [0.1201] AU
Ag = 5.56 [12.81] [0.36σ]
Teffp = 5590 [2916] K [1.09σ]

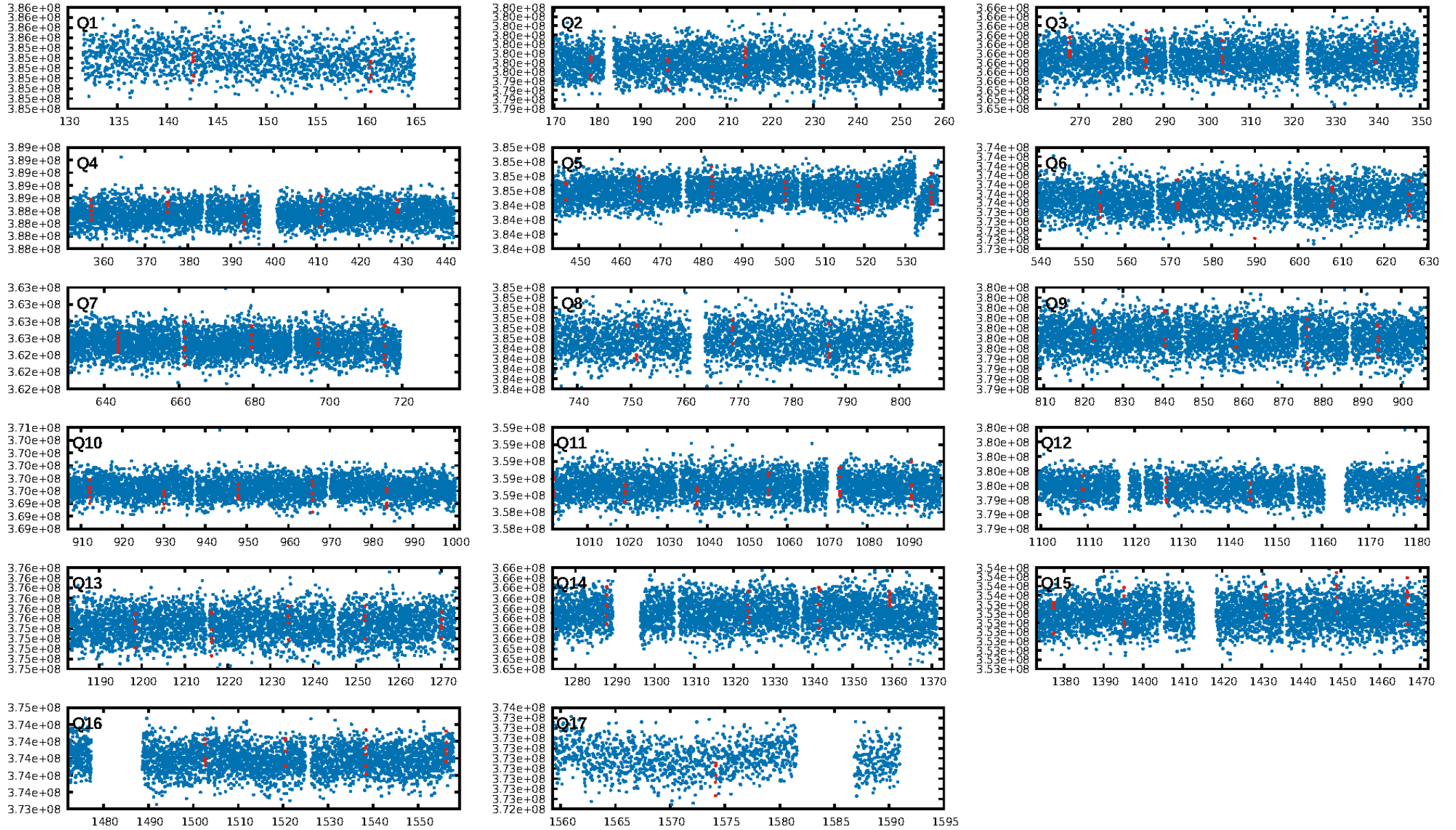
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [96.59σ]
LongPeriod-sig: 100.0% [121.97σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 74.9%
Bootstrap-pfa: 8.53e-17
RollingBand-fgt: 0.83 [10/12]
GhostDiagnostic-chr: -0.9472
Centroid-sig: 81.4%
Centroid-so: 0.110 arcsec [0.31σ]
OotOffset-rm: 1.160 arcsec [3.13σ]
KicOffset-rm: 1.163 arcsec [3.02σ]
OotOffset-st: 3/3/4/5 [15]
KicOffset-st: 3/3/4/5 [15]
DiffImageQuality-fgm: 0.40 [6/15]
DiffImageOverlap-fno: 0.00 [0/17]

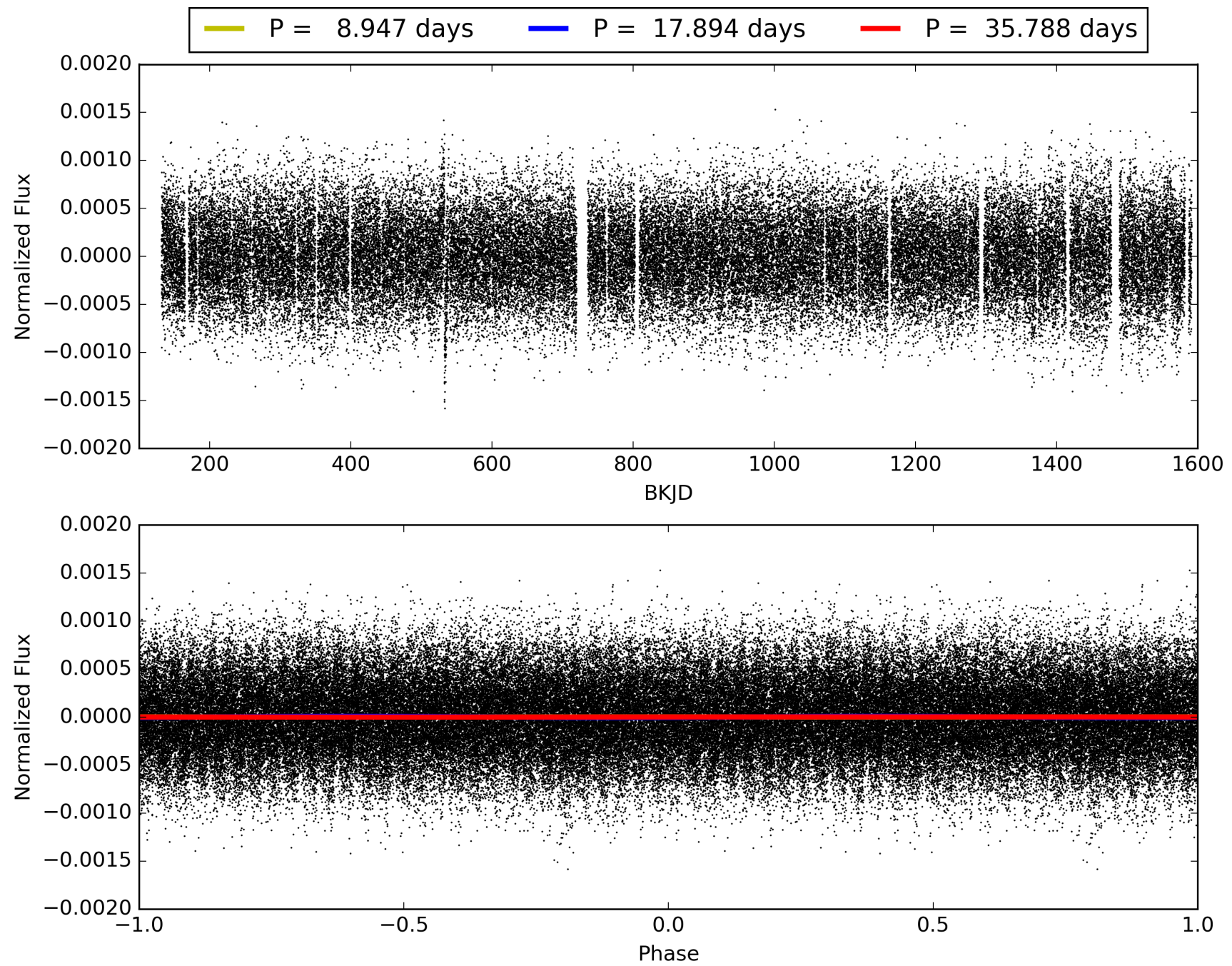
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:21:49 Z

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

TCE 009487871-03, PDC Light Curves

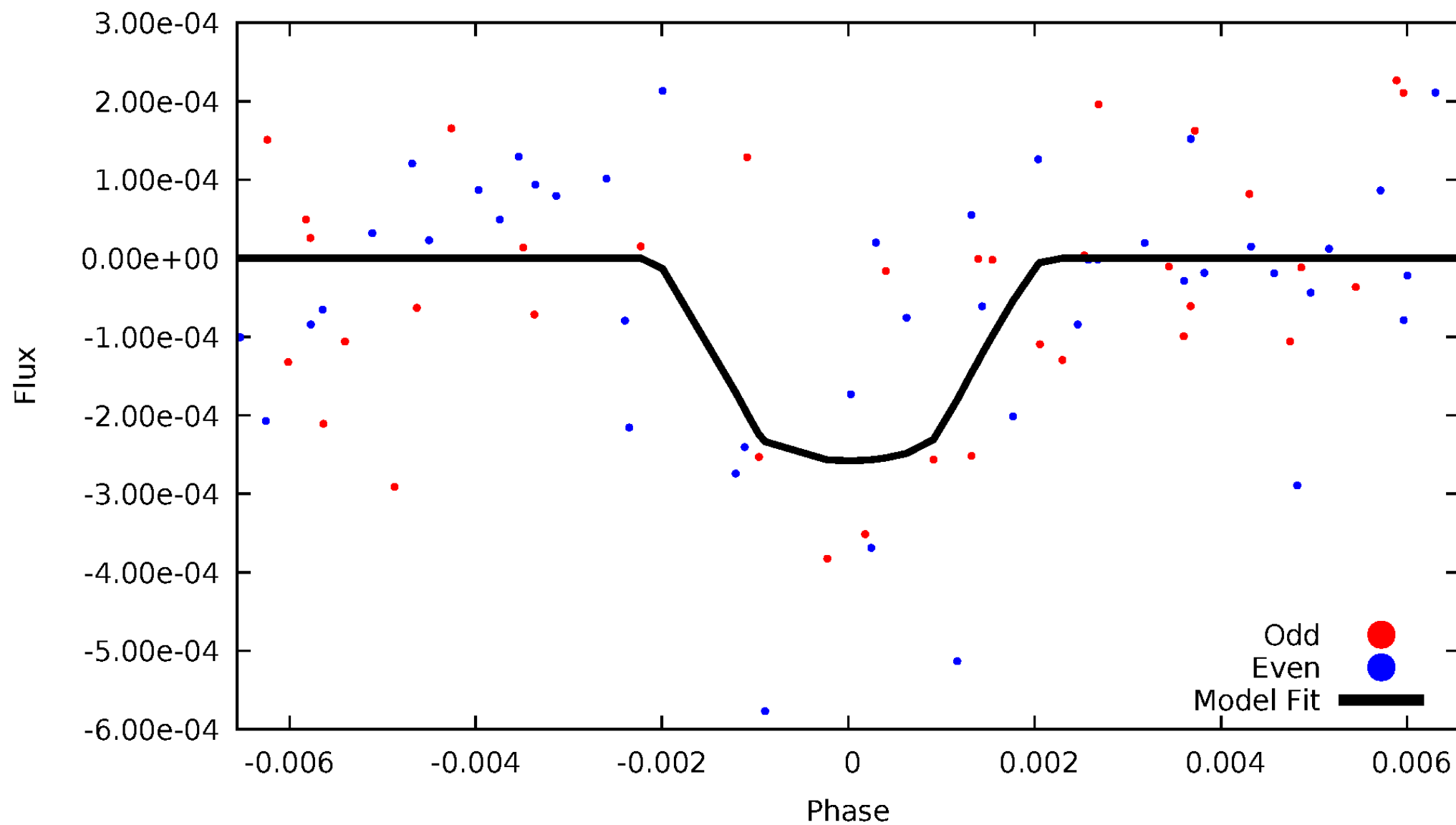


TCE 009487871-03



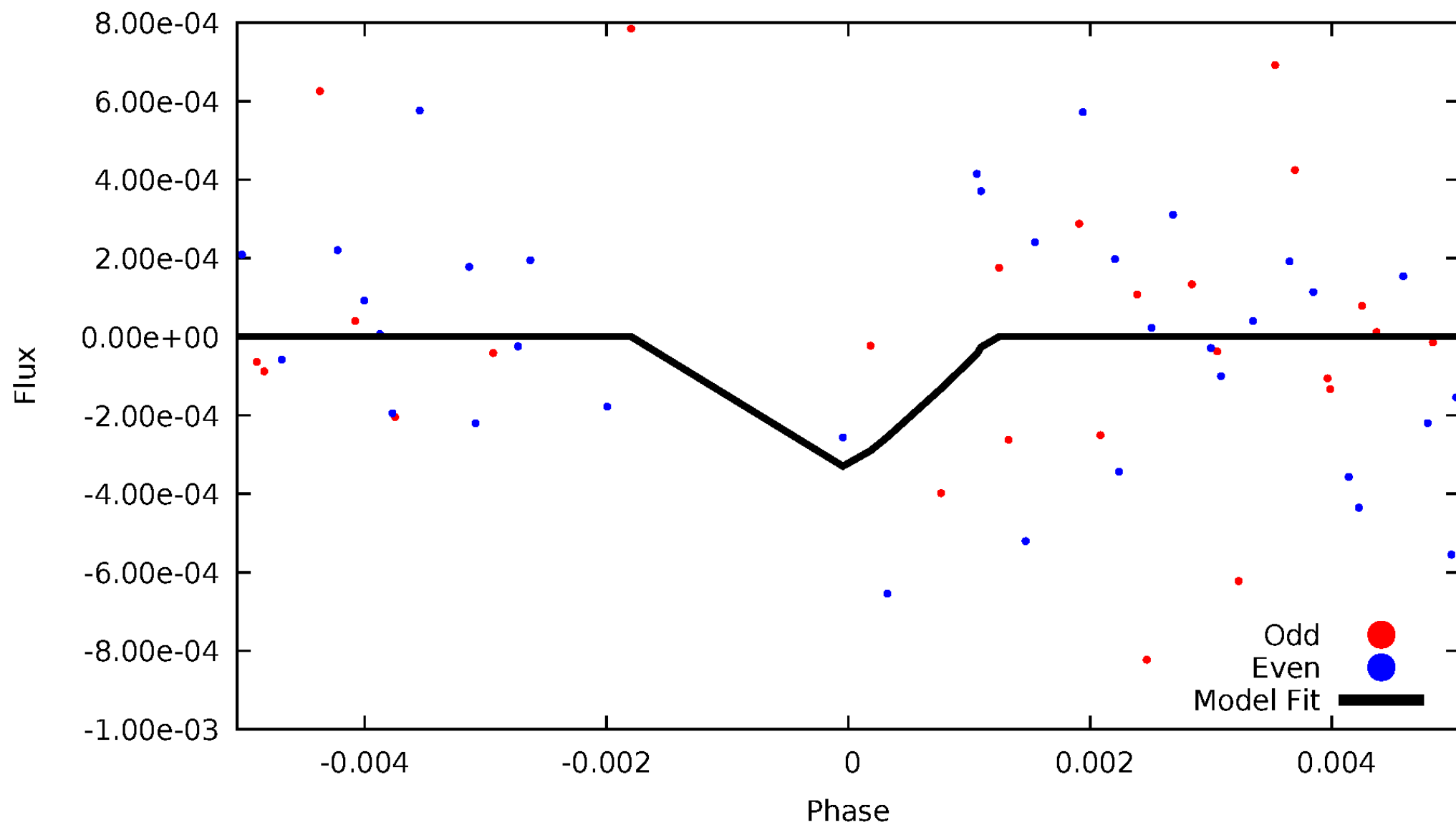
DV Odd/Even

TCE 009487871-03



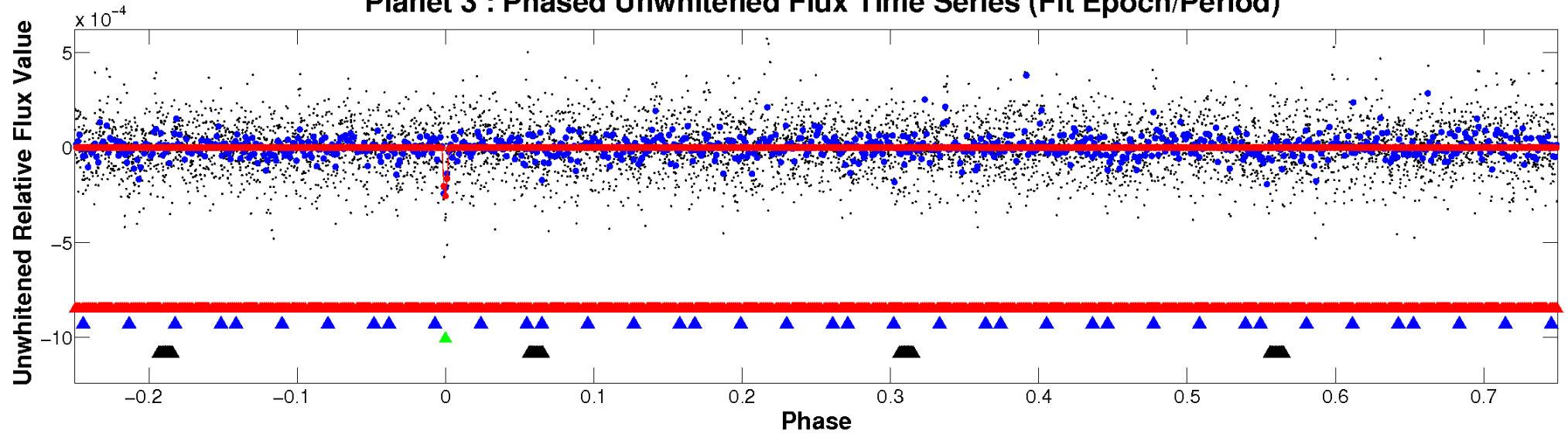
ALT Odd/Even

TCE 009487871-03

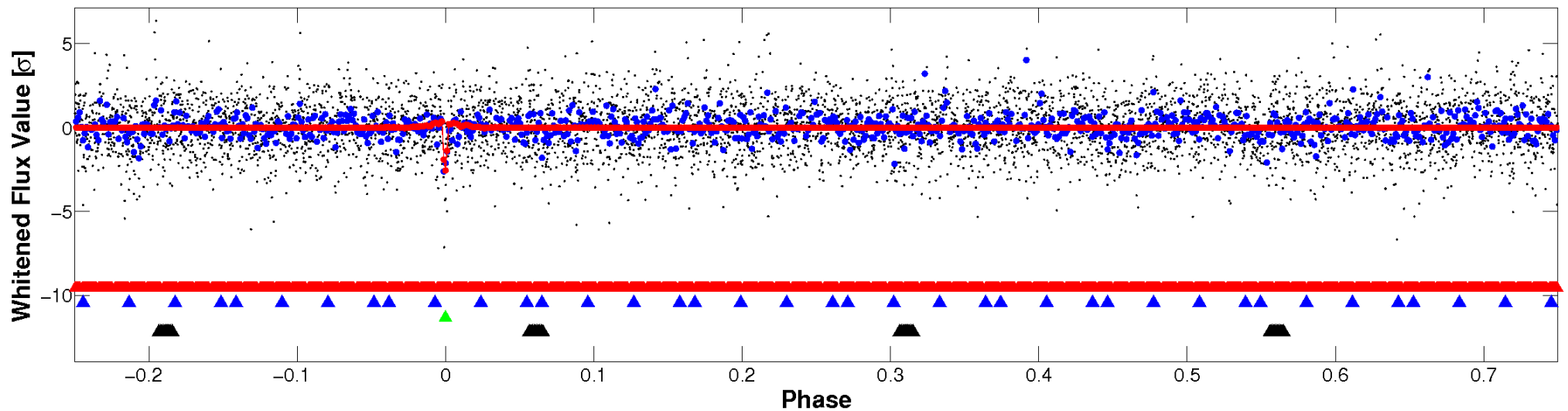


Non-Whitened Vs. Whitened Light Curve

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

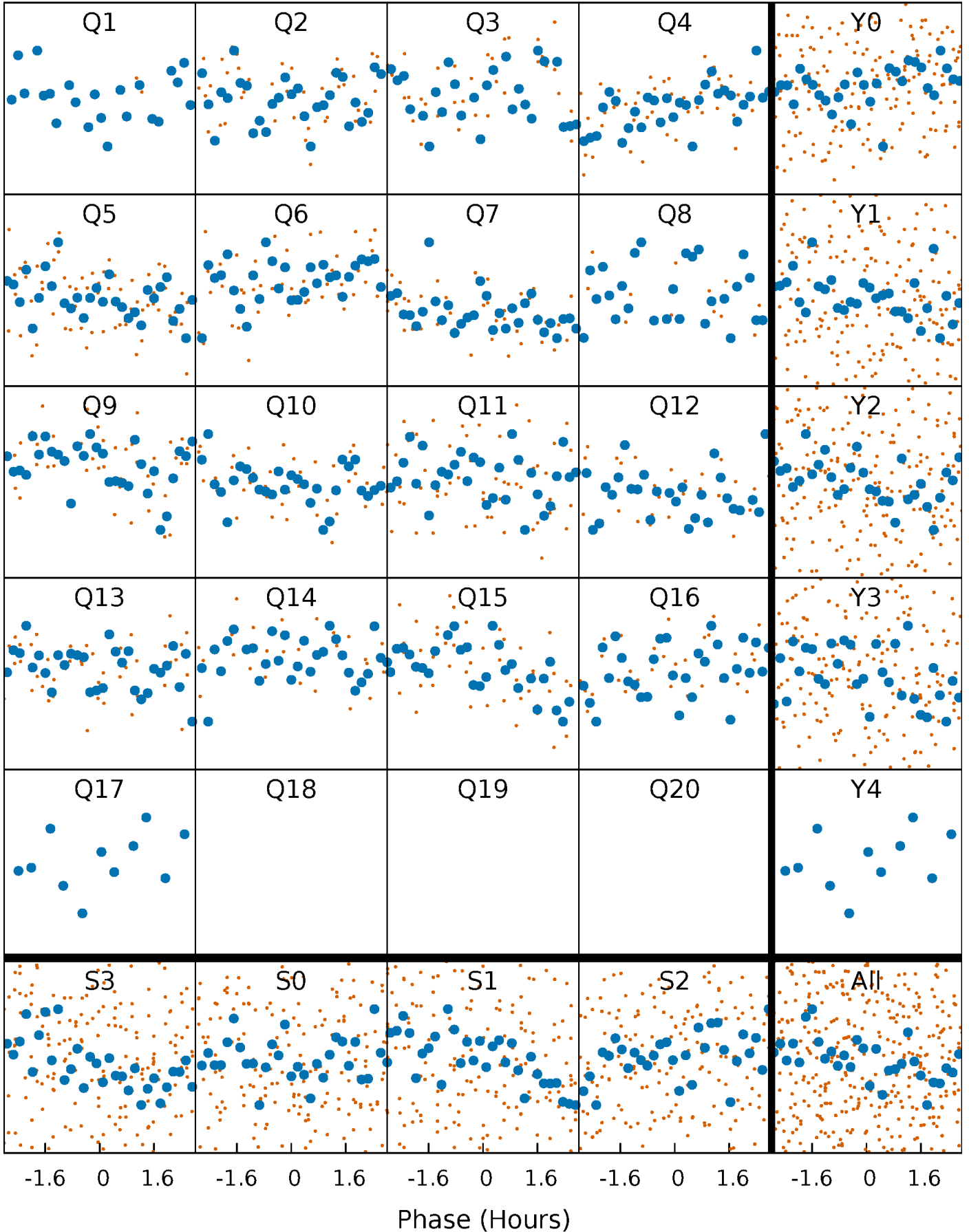


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



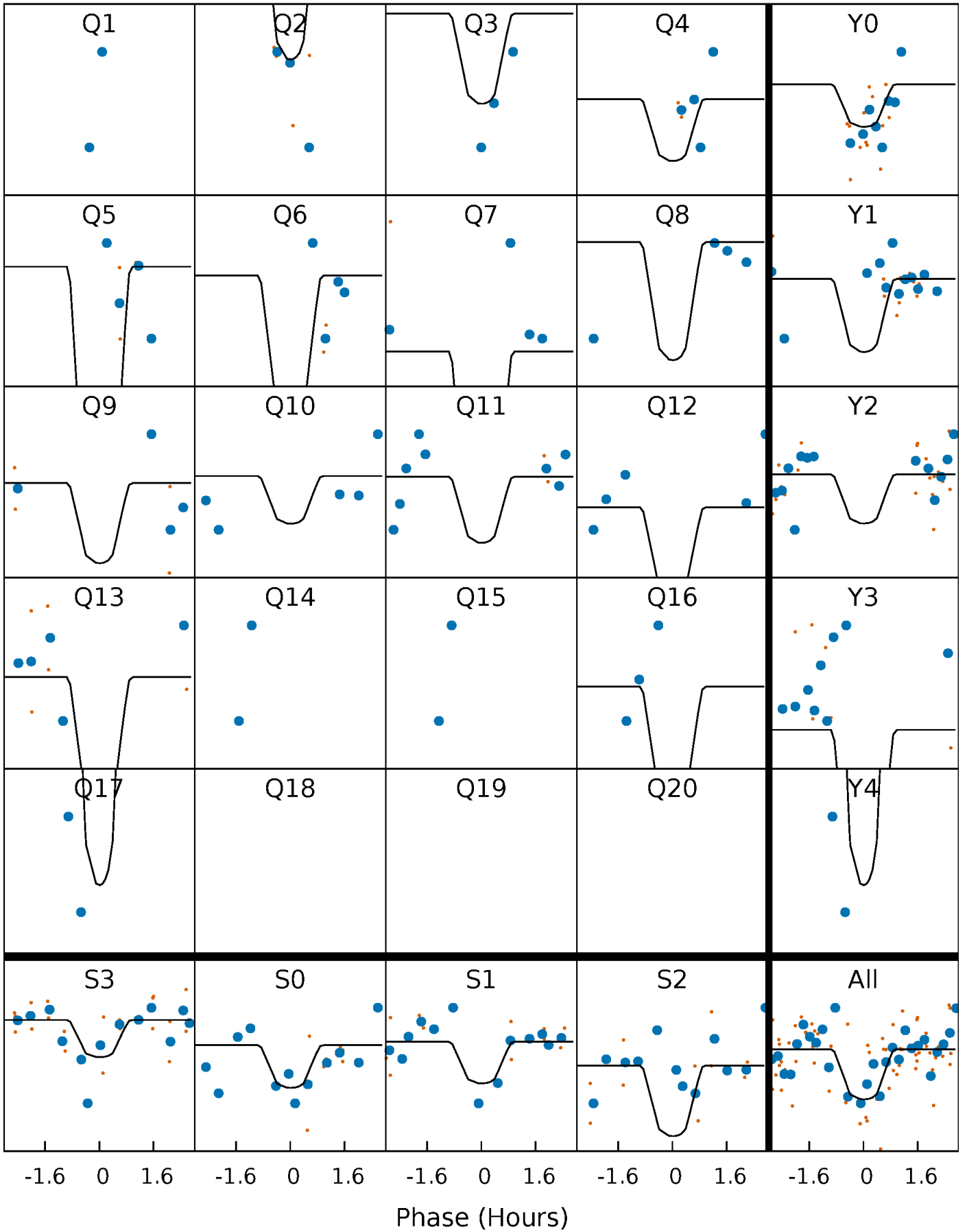
PDC Quarter-Phased Transit Curves

TCE 009487871-03 P= 17.894001 Days $T_0=142.644055$ (BKJD)



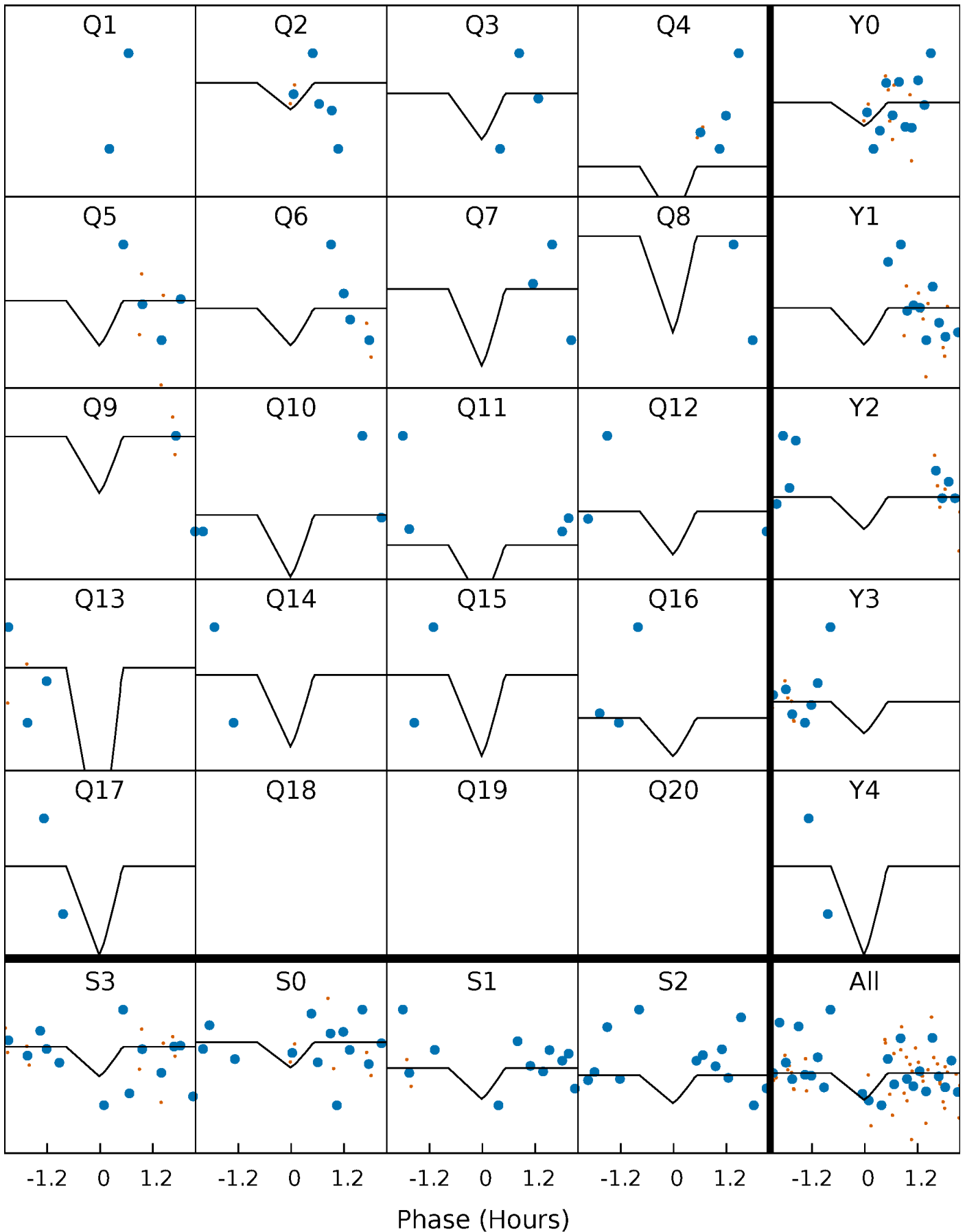
DV Quarter-Phased Transit Curves

TCE 009487871-03 P= 17.894001 Days $T_0=142.644055$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

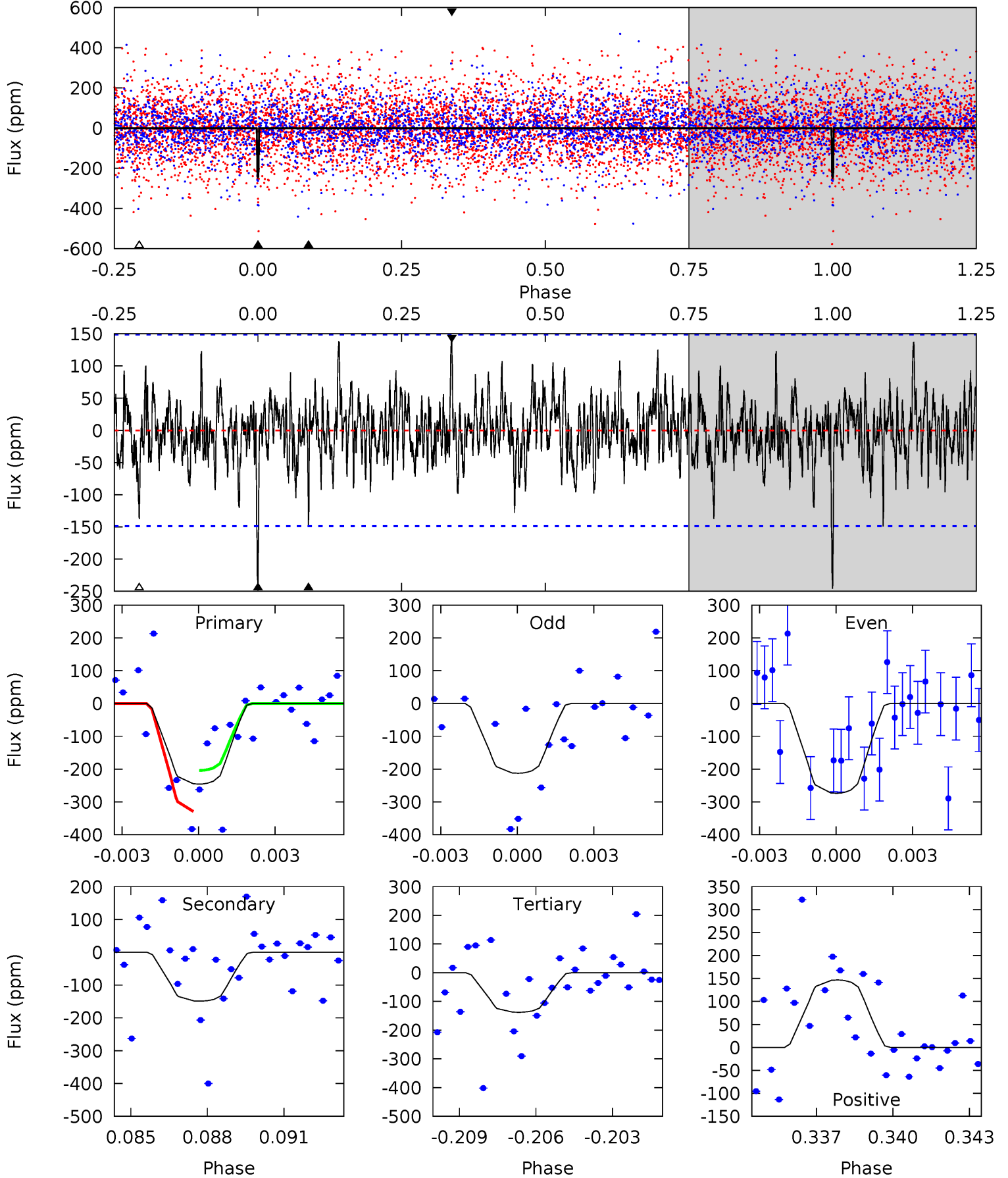
TCE 009487871-03 P= 17.894449 Days $T_0=142.622238$ (BKJD)



DV Model-Shift Uniqueness Test

009487871-03, P = 17.894001 Days, E = 124.750054 Days

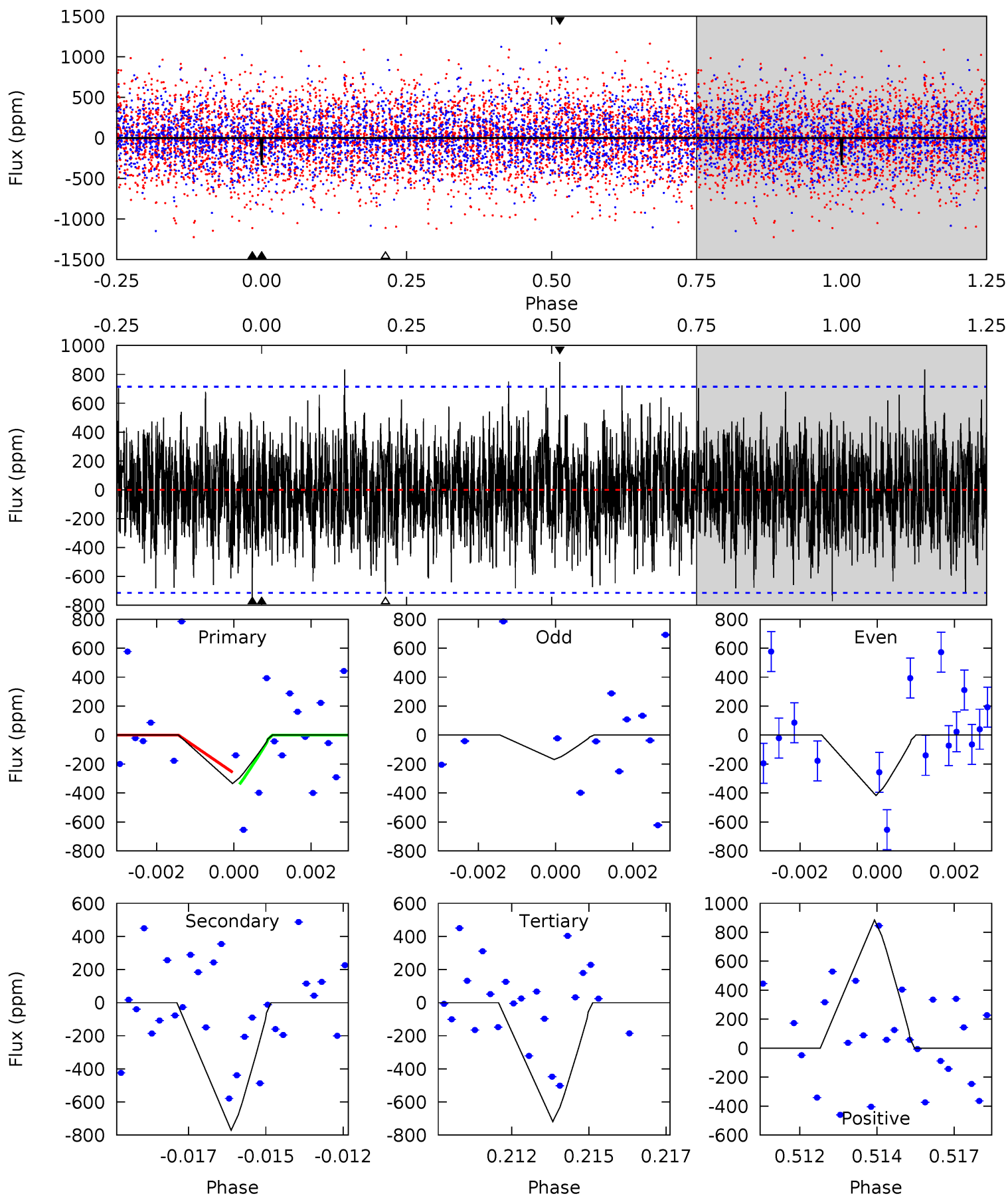
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.65	5.24	4.84	5.16	5.24	2.94	1.35	3.80	3.48	0.40	0.08	1.10	0.70	0.37	1.92



Alt Model-Shift Uniqueness Test

009487871-03, P = 17.894449 Days, E = 124.727789 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.48	5.71	5.32	6.55	5.29	3.02	1.58	-2.84	-4.07	0.39	-0.84	0.87	1.00	0.53	0.23



Stellar Parameters For KIC 009487871

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6489^{+137}_{-255}	$2.694^{+0.586}_{-0.138}$	$-0.500^{+0.550}_{-0.450}$	$13.402^{+0.861}_{-8.176}$	$3.239^{+0.069}_{-1.247}$	$0.002^{+0.016}_{-0.000}$
	+2%/-4%	+22%/-5%	+110%/-90%	+6%/-61%	+2%/-38%	+839%/-22%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009487871-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-149 ± 28	$25.84^{+22.43}_{-16.78}$	3239^{+184}_{-458}	4997^{+3407}_{-1080}	$4.424^{+30.228}_{-3.130}$
Alt.	-771 ± 135	$27.27^{+21.35}_{-17.49}$	3245^{+185}_{-483}	7392^{+8858}_{-1918}	21^{+136}_{-15}

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 $A_{obs} \gg 1.0$

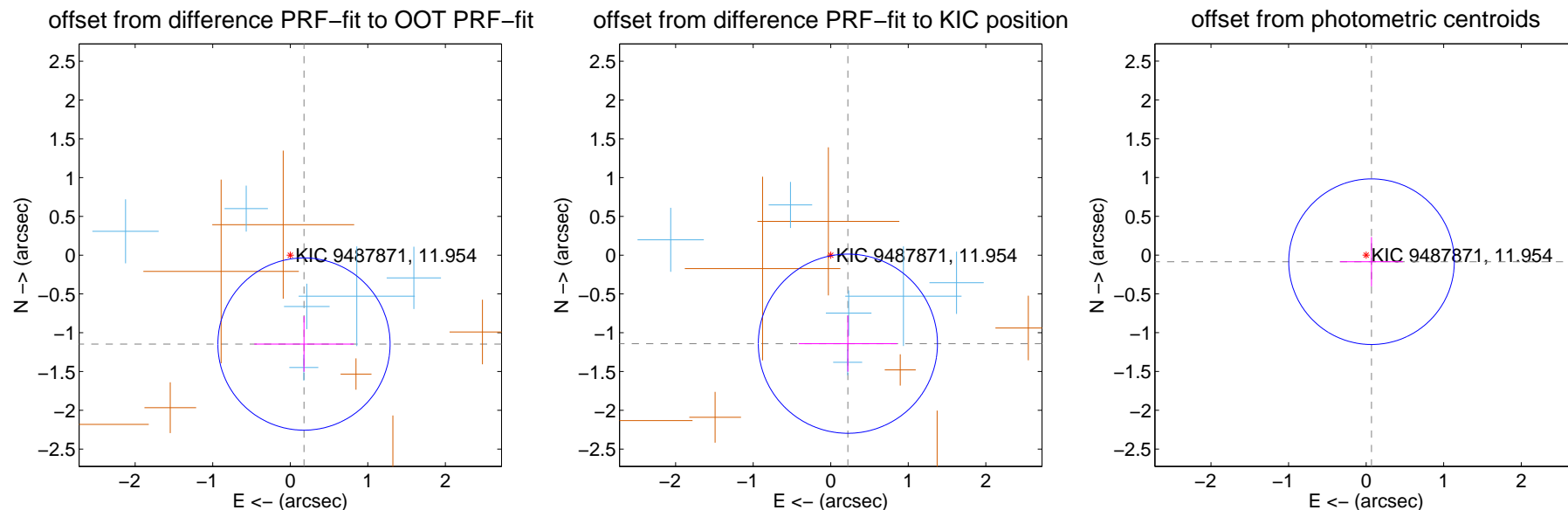
DV Centroid Data

Supplemental centroid analysis for 009487871-03. **Kepler magnitude: 11.95.** Transit SNR 8.30

There are 6 quarters with good PRF difference image offsets

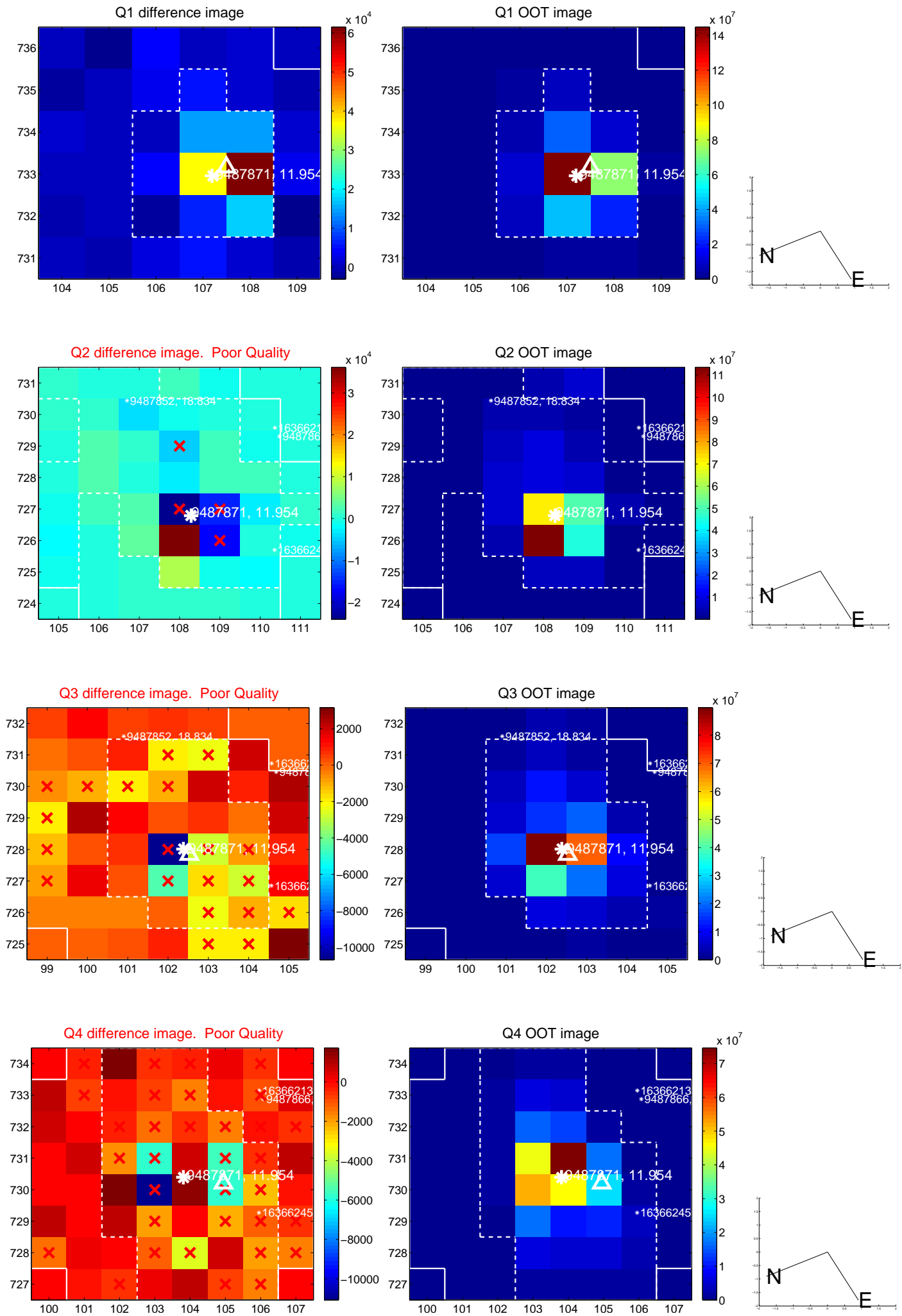
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.160 ± 0.370	3.13	-0.177 ± 0.642	-1.146 ± 0.358
PRF-fit source offset from KIC position	1.163 ± 0.385	3.02	-0.221 ± 0.634	-1.142 ± 0.362
photometric centroid source offset	0.11 ± 0.36	0.31	-0.07 ± 0.41	-0.09 ± 0.32

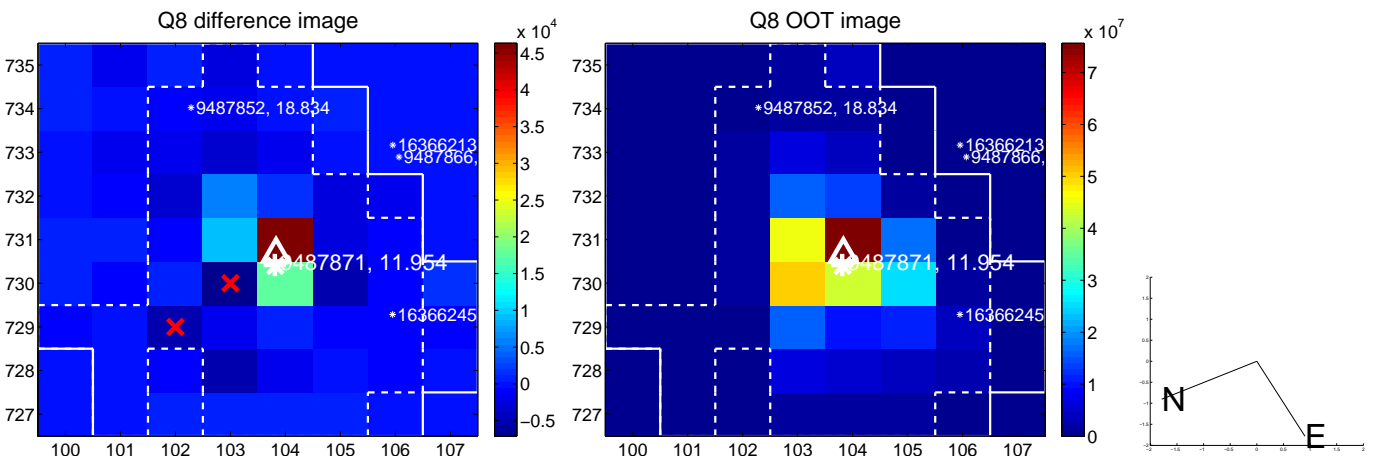
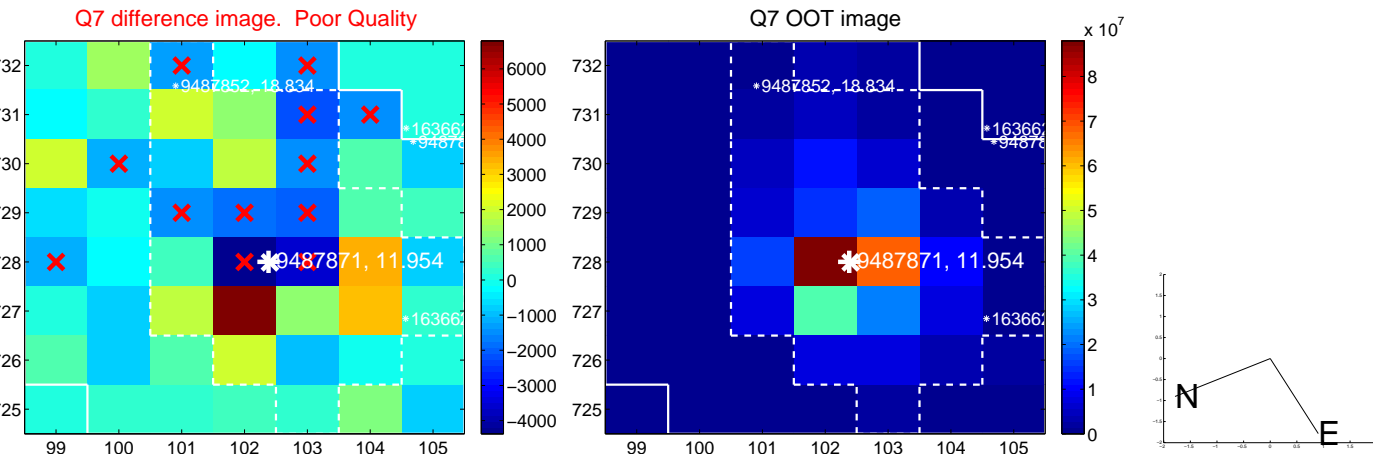
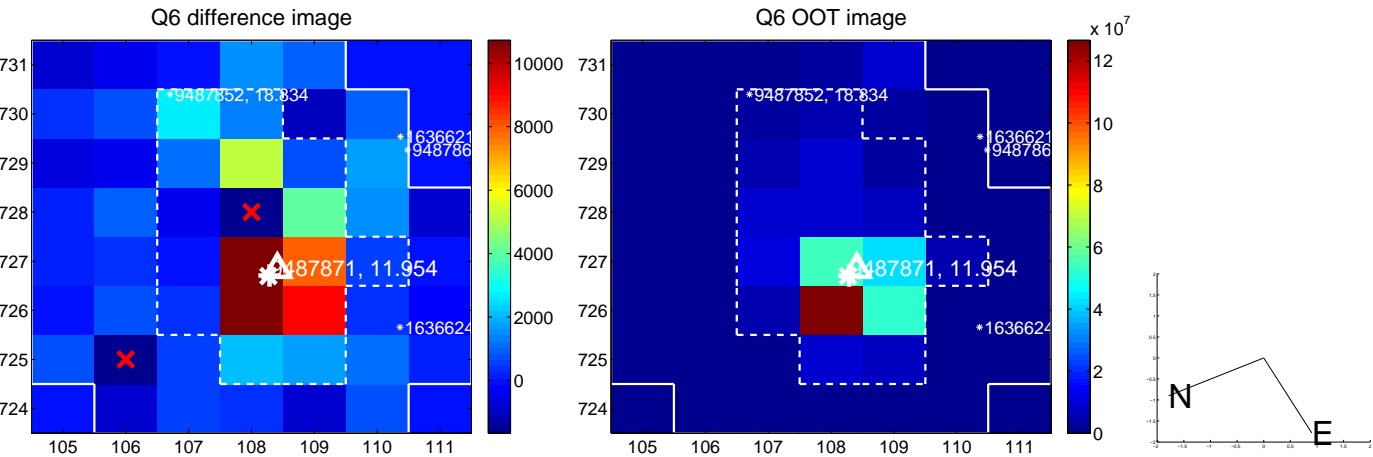
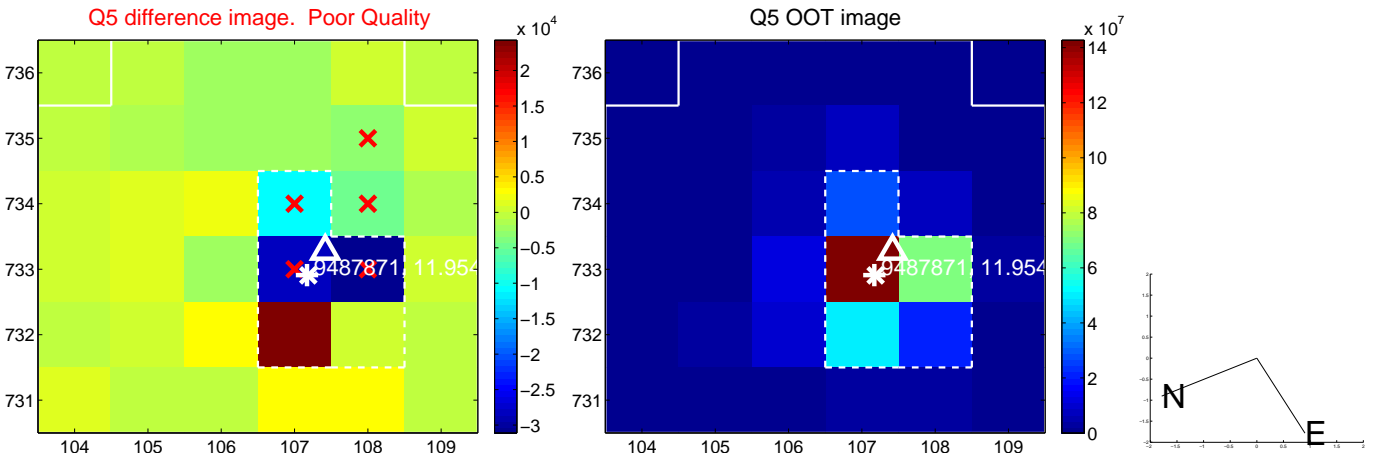


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

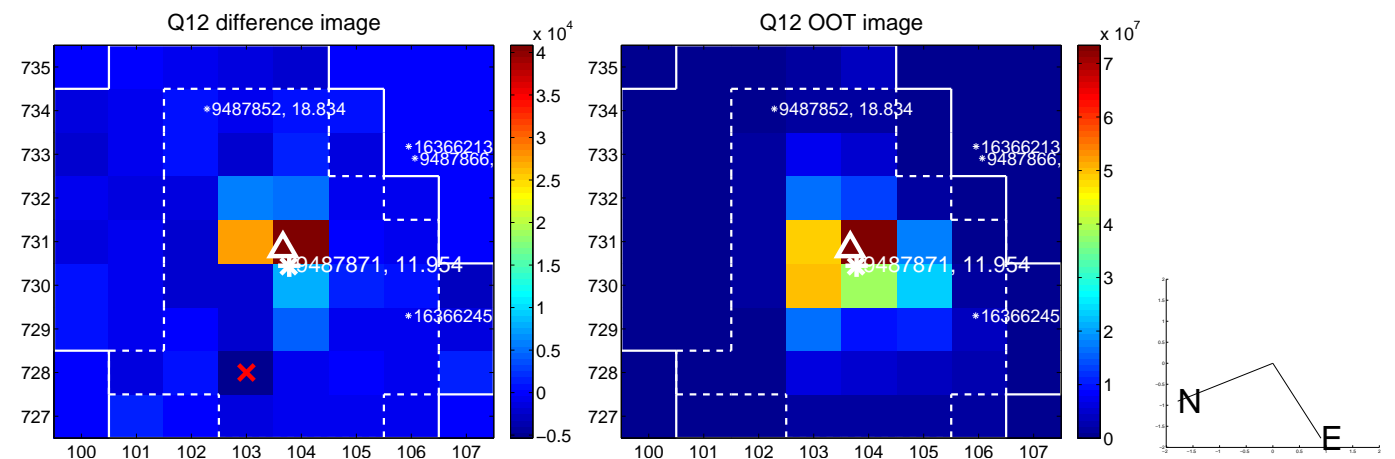
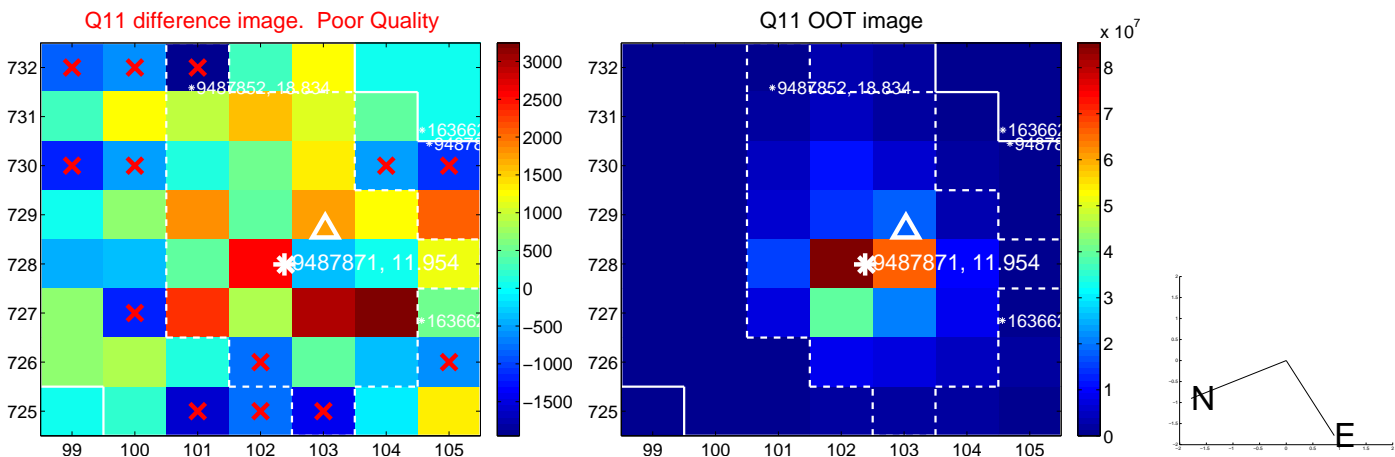
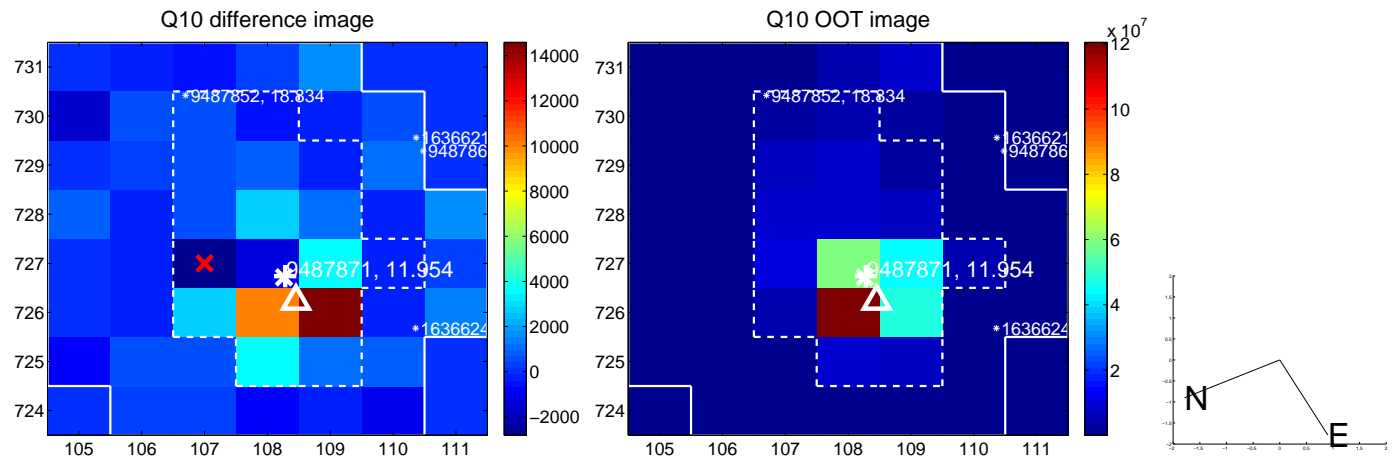
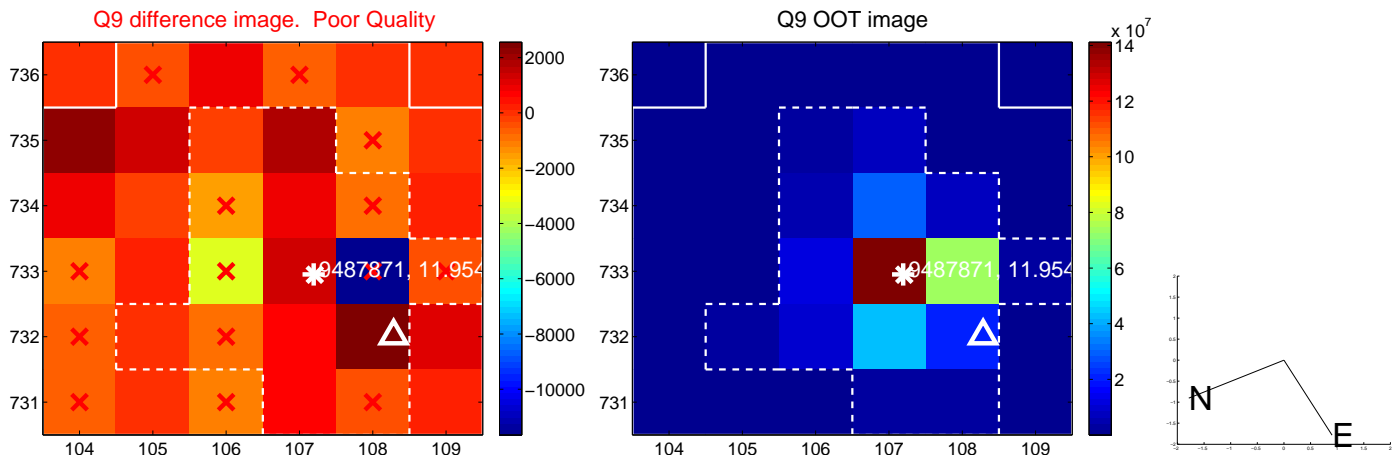
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



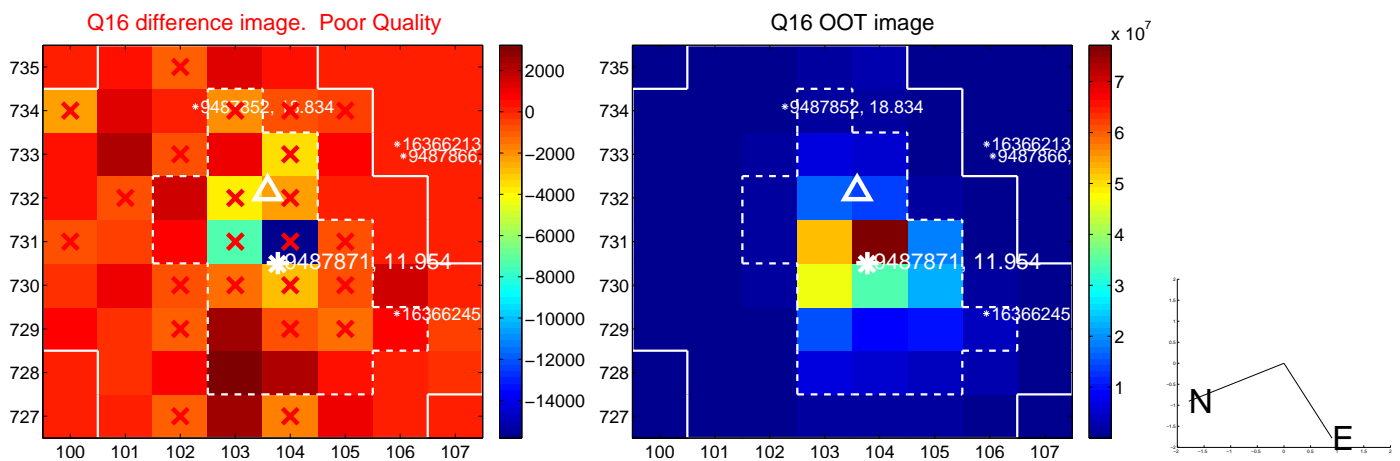
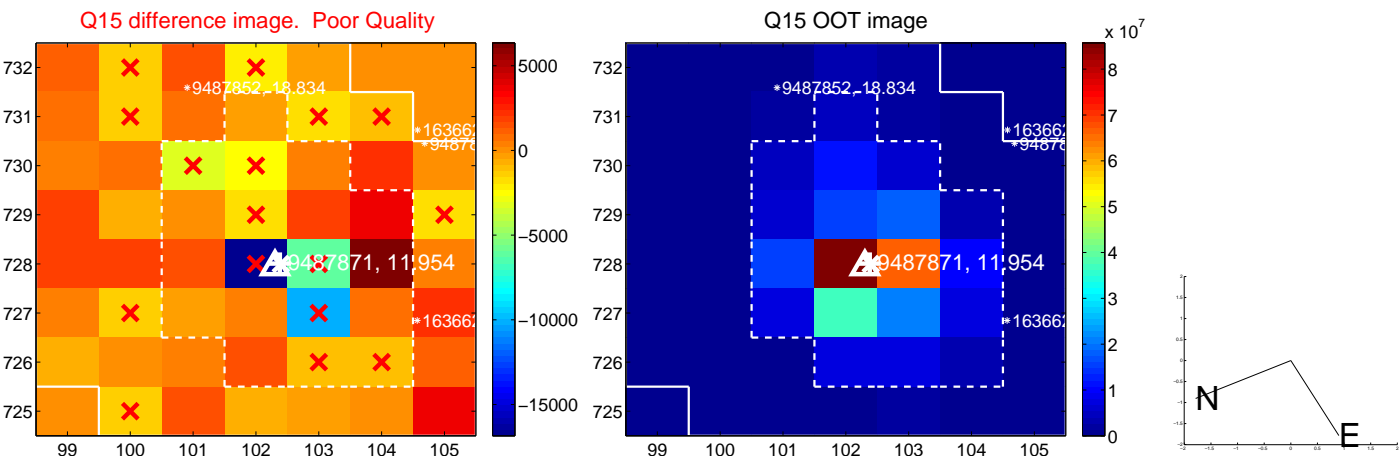
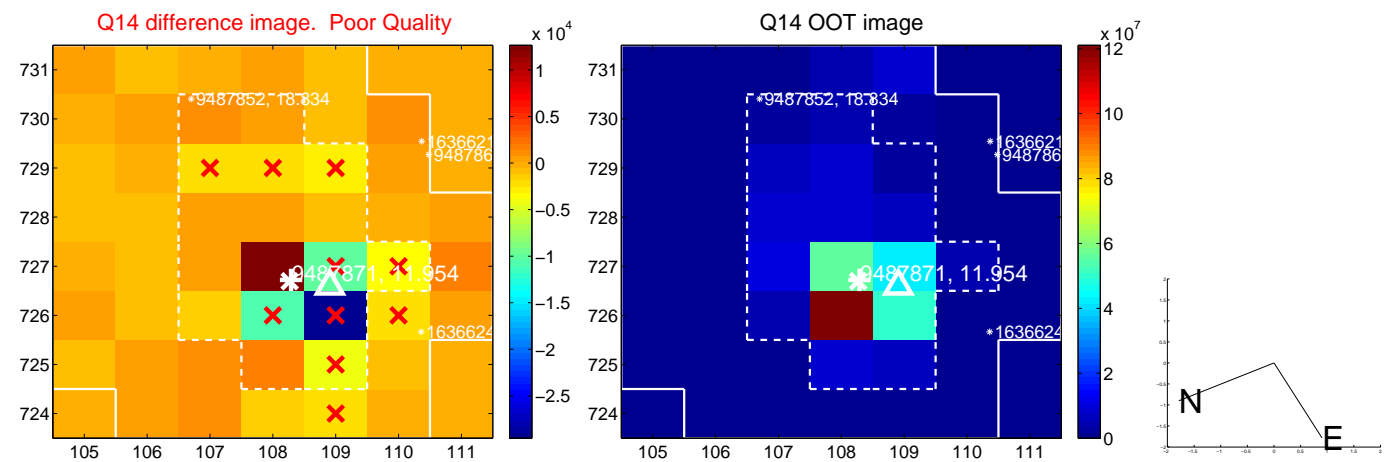
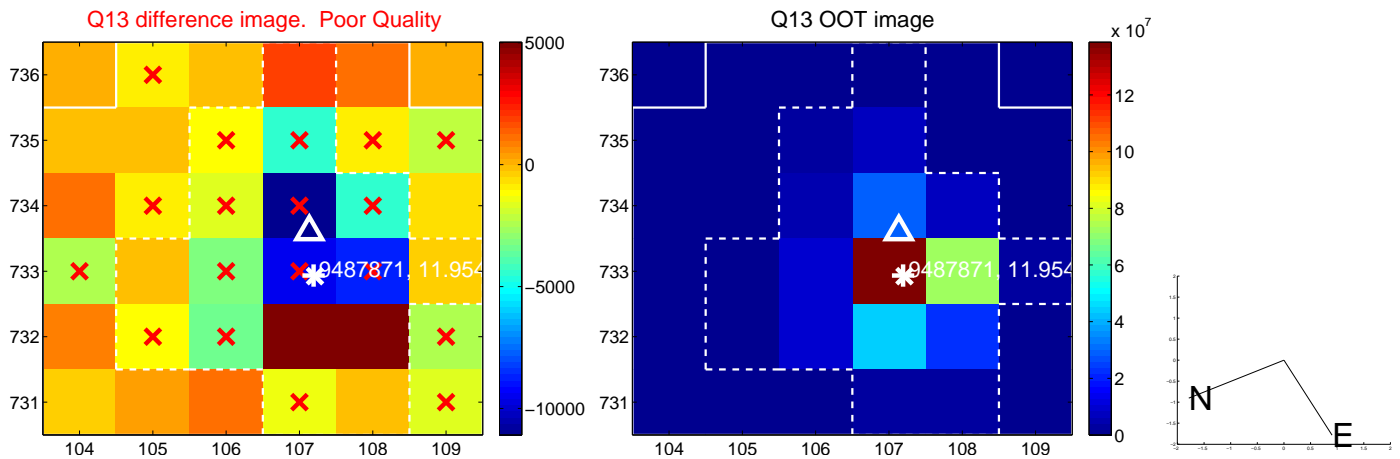
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



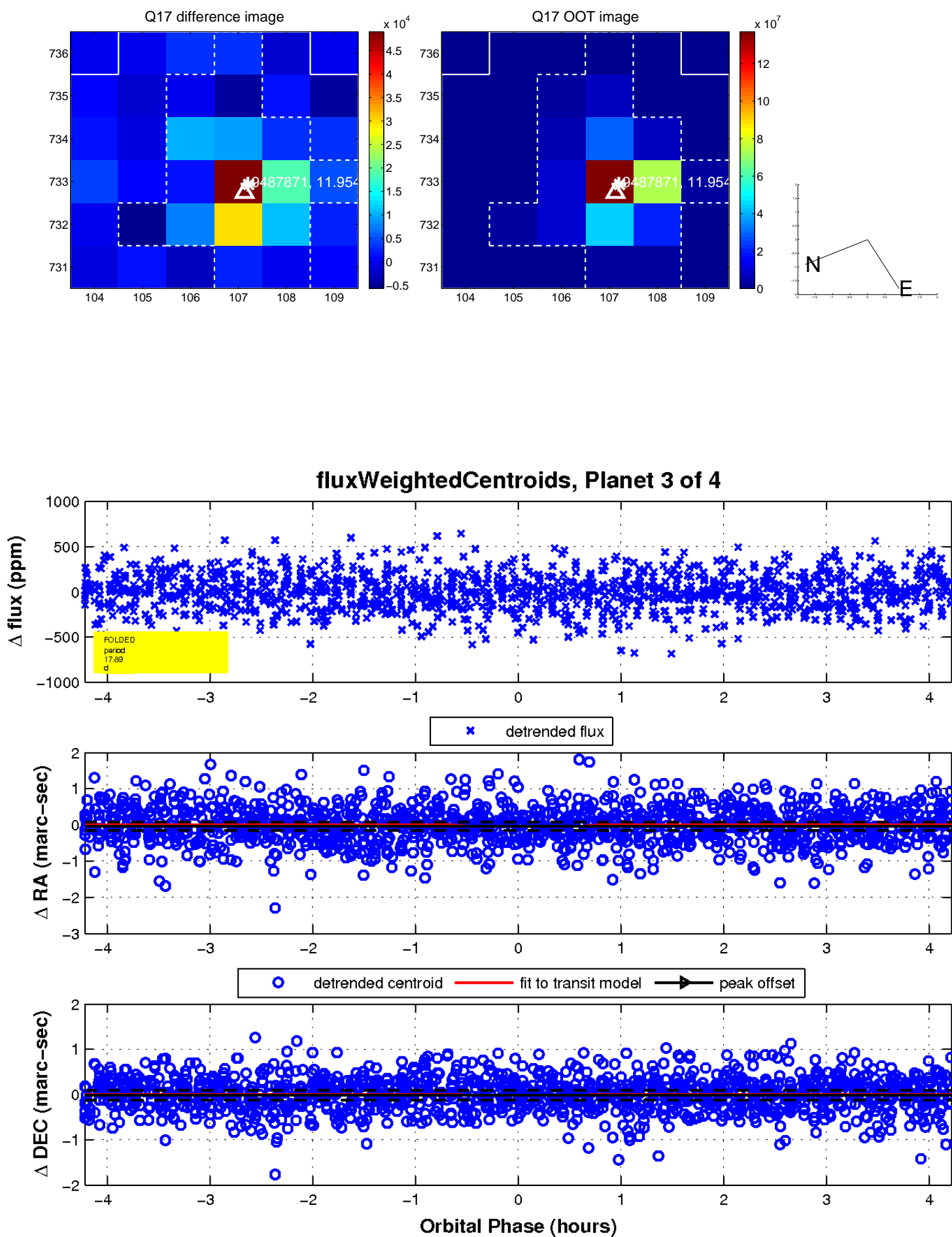
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

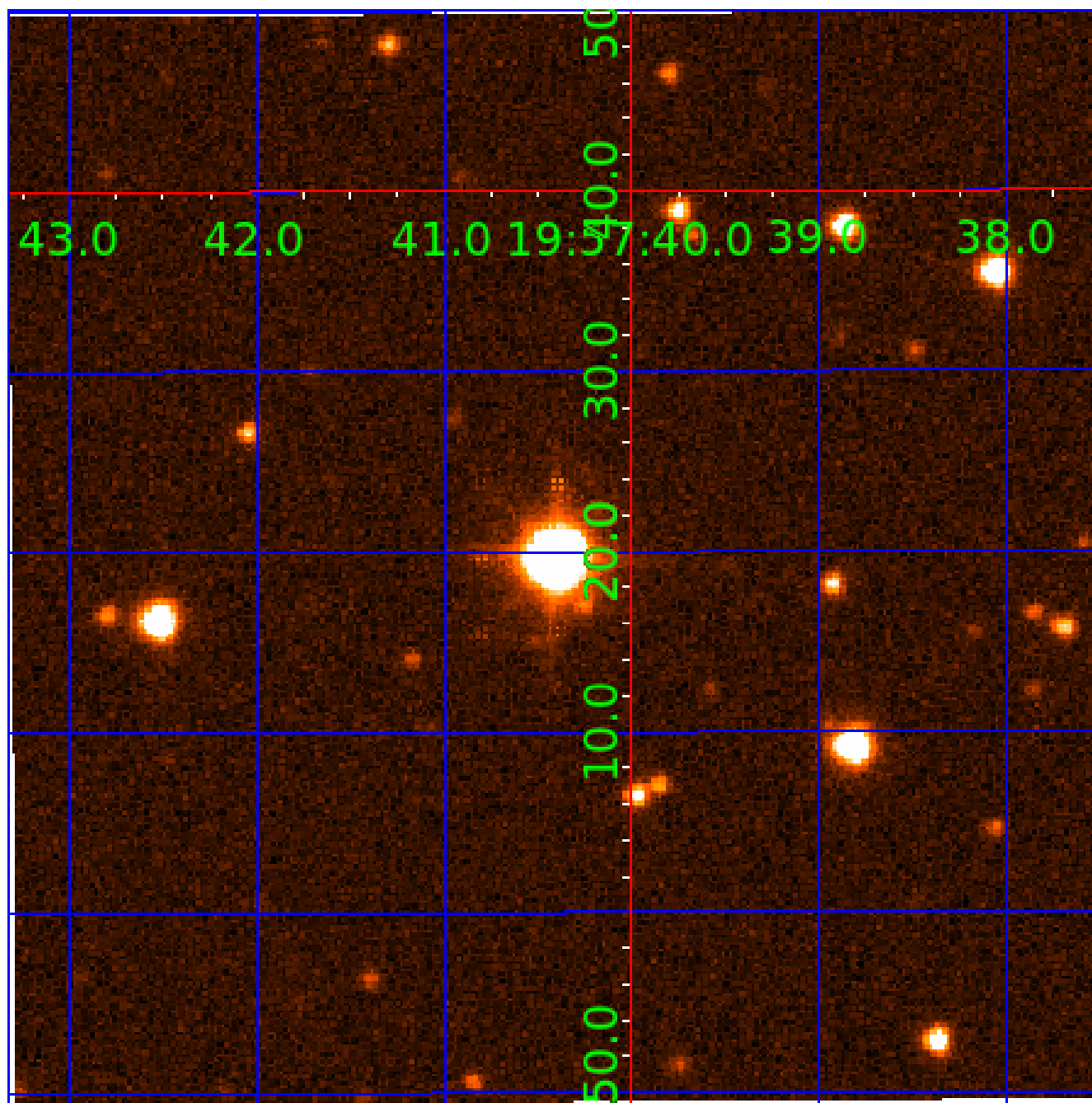


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009487871

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})
009487871-01	OBS	No	0.583568	131.842756	13.4	4.064	8.9	5.2	13.40	6489	4.98	0.00
009487871-02	OBS	No	37.632845	132.738303	411.8	3.619	13.8	13.2	13.40	6489	52.66	2697.51
009487871-03	OBS	No	17.894001	142.644055	257.9	1.409	11.7	8.3	13.40	6489	25.17	7268.45
009487871-04	OBS	No	40.256404	157.242912	317.9	1.540	9.2	9.5	13.40	6489	30.62	2465.69

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009487871-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009487871-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009487871-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

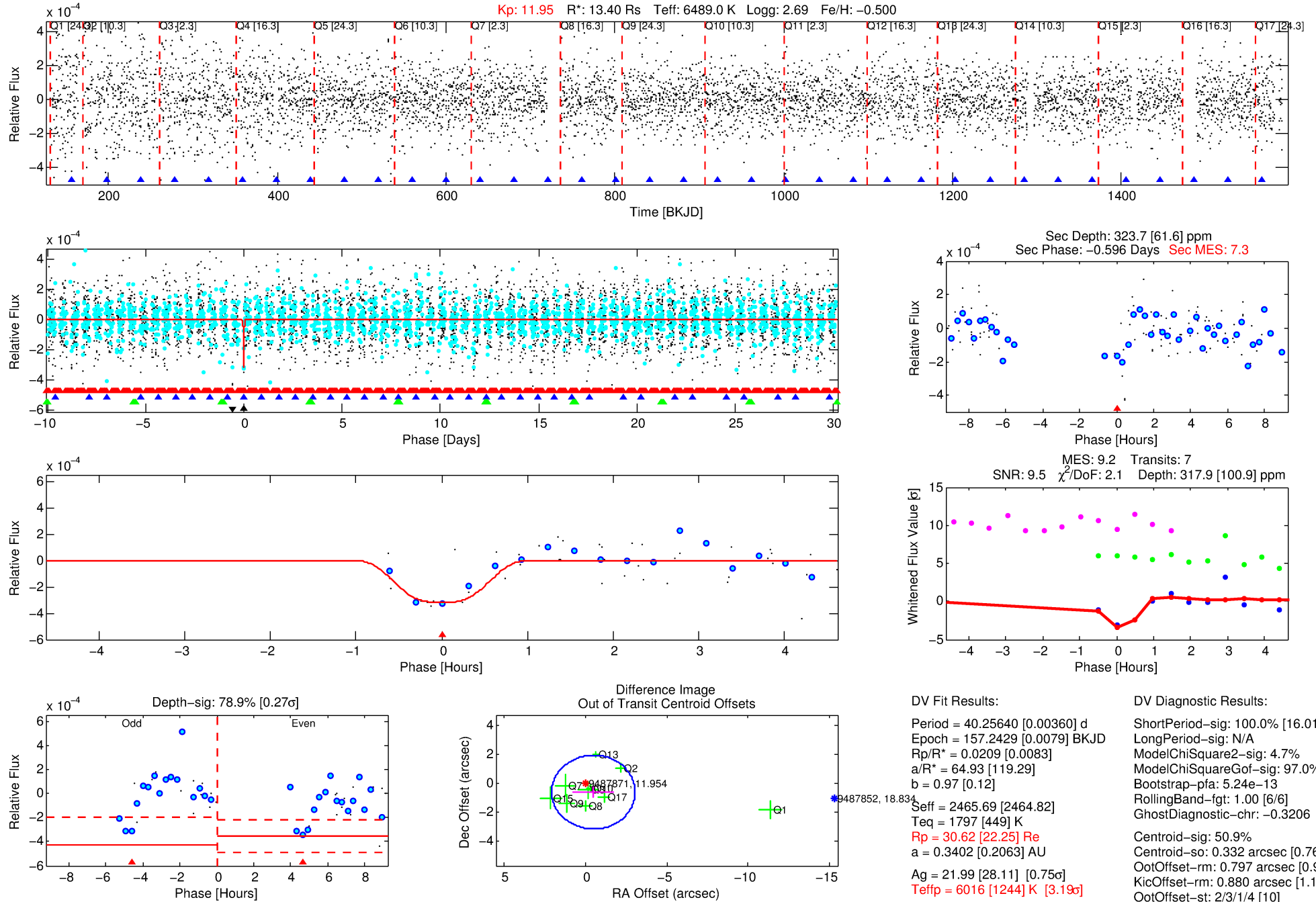
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009487871-04

No Significant Match Found

DV One-Page Summary

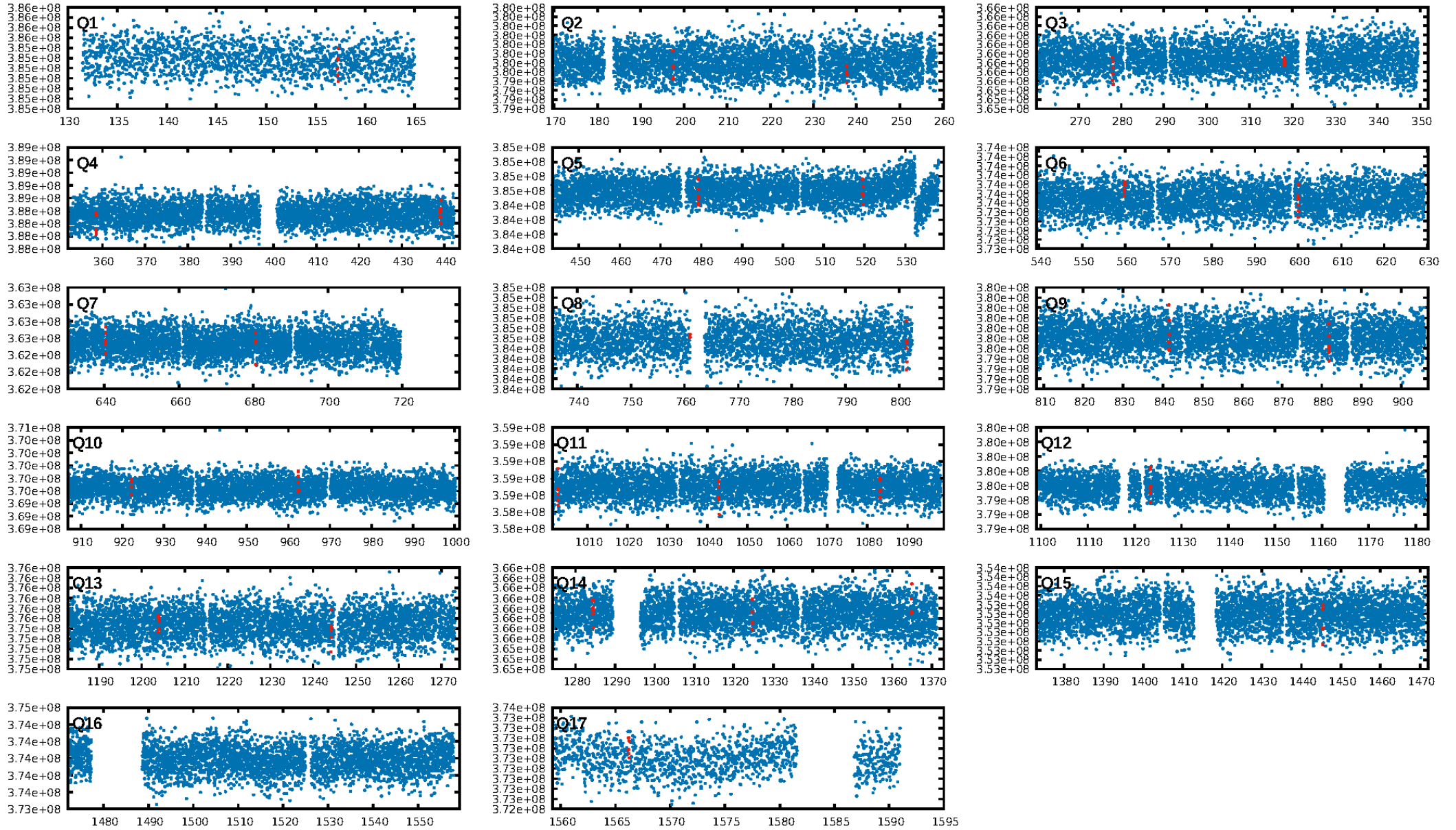
KIC: 9487871 Candidate: 4 of 4 Period: 40.256 d



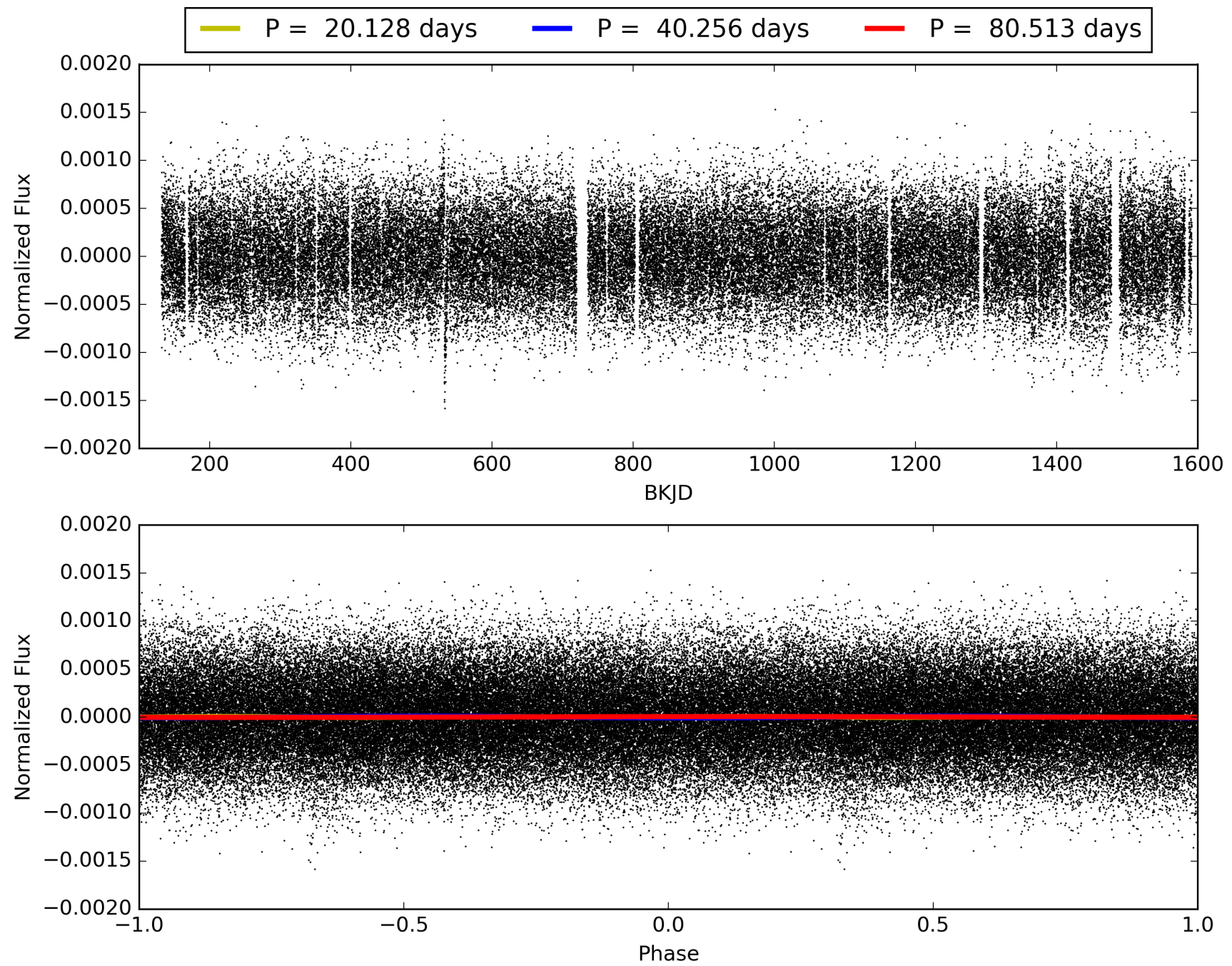
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:21:52 Z

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

TCE 009487871-04, PDC Light Curves

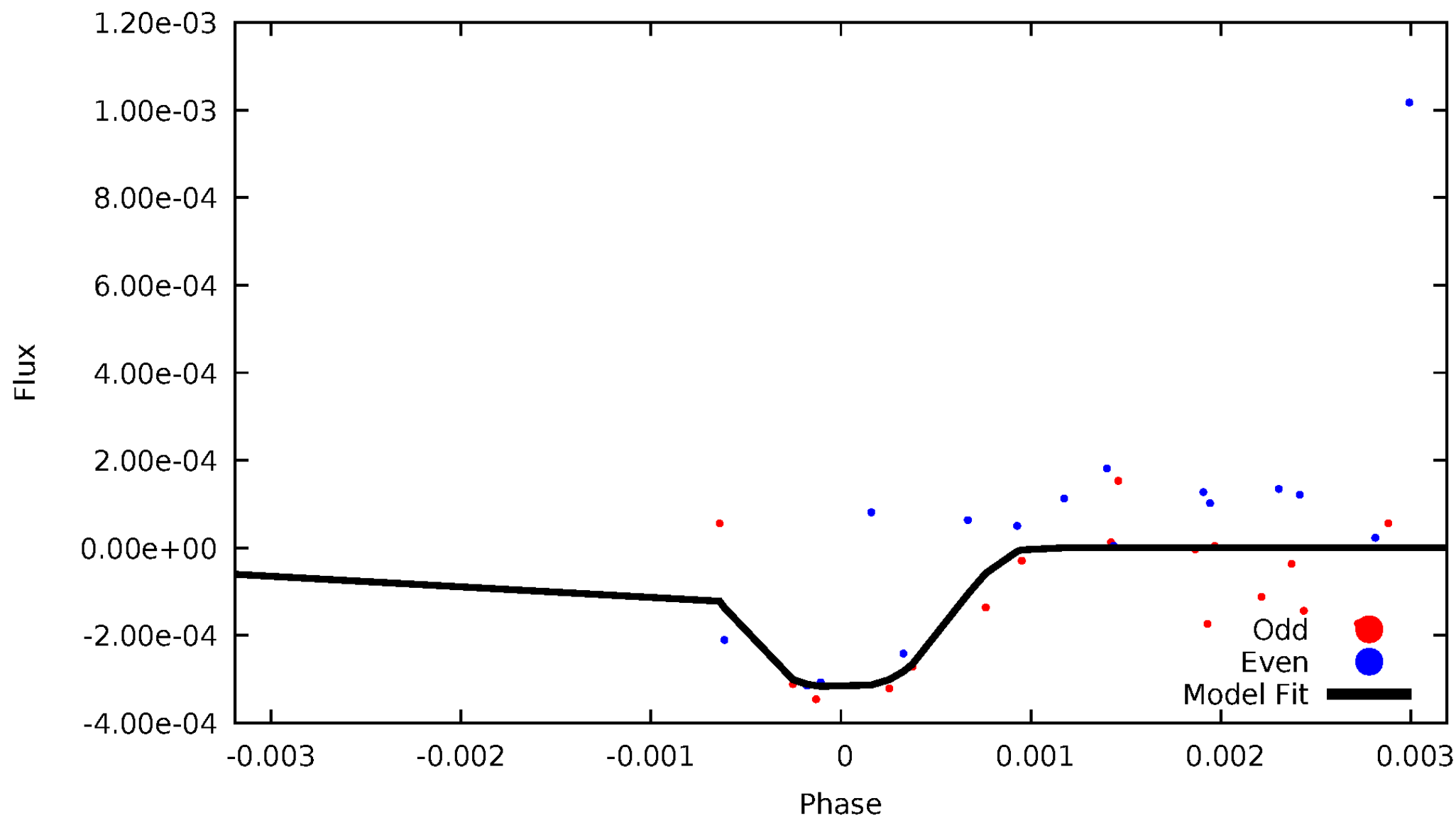


TCE 009487871-04



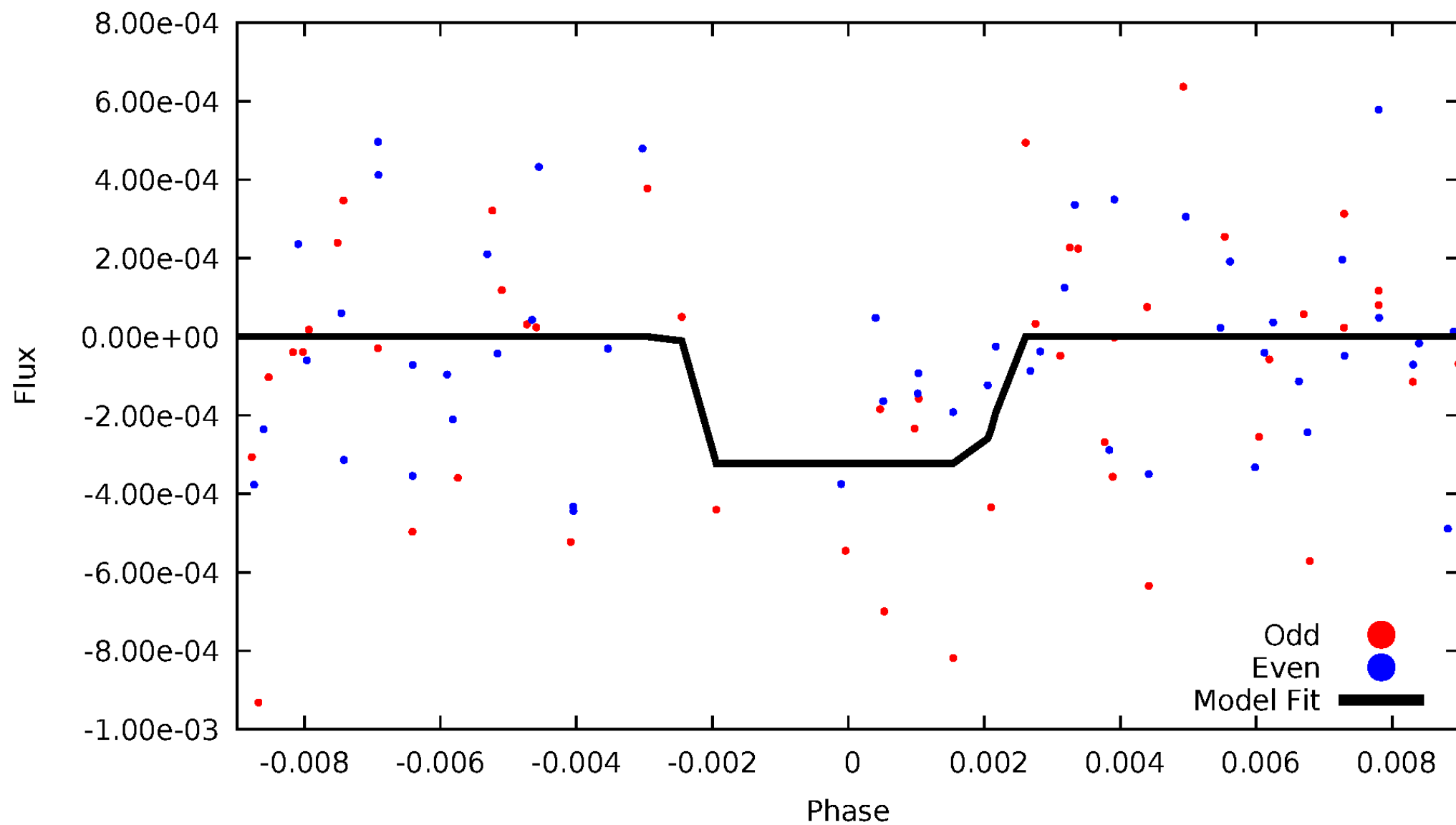
DV Odd/Even

TCE 009487871-04



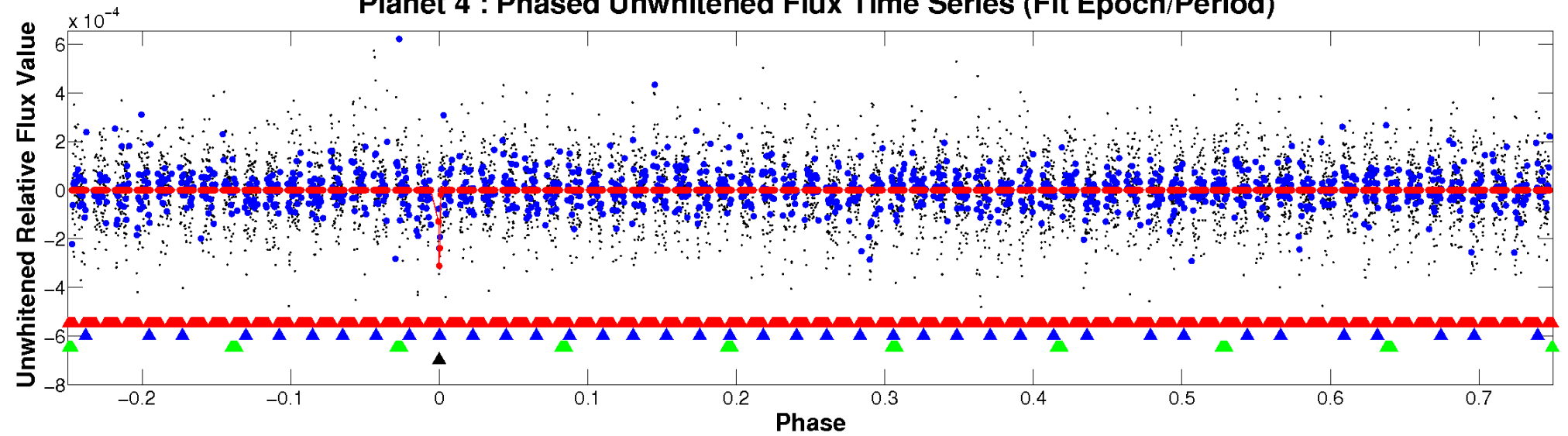
ALT Odd/Even

TCE 009487871-04

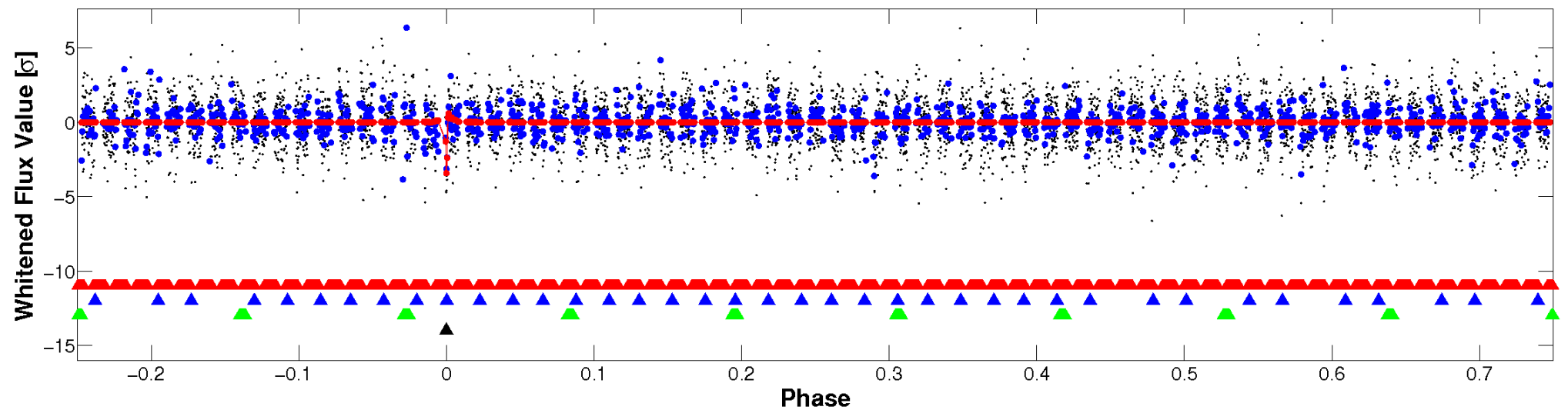


Non-Whitened Vs. Whitened Light Curve

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

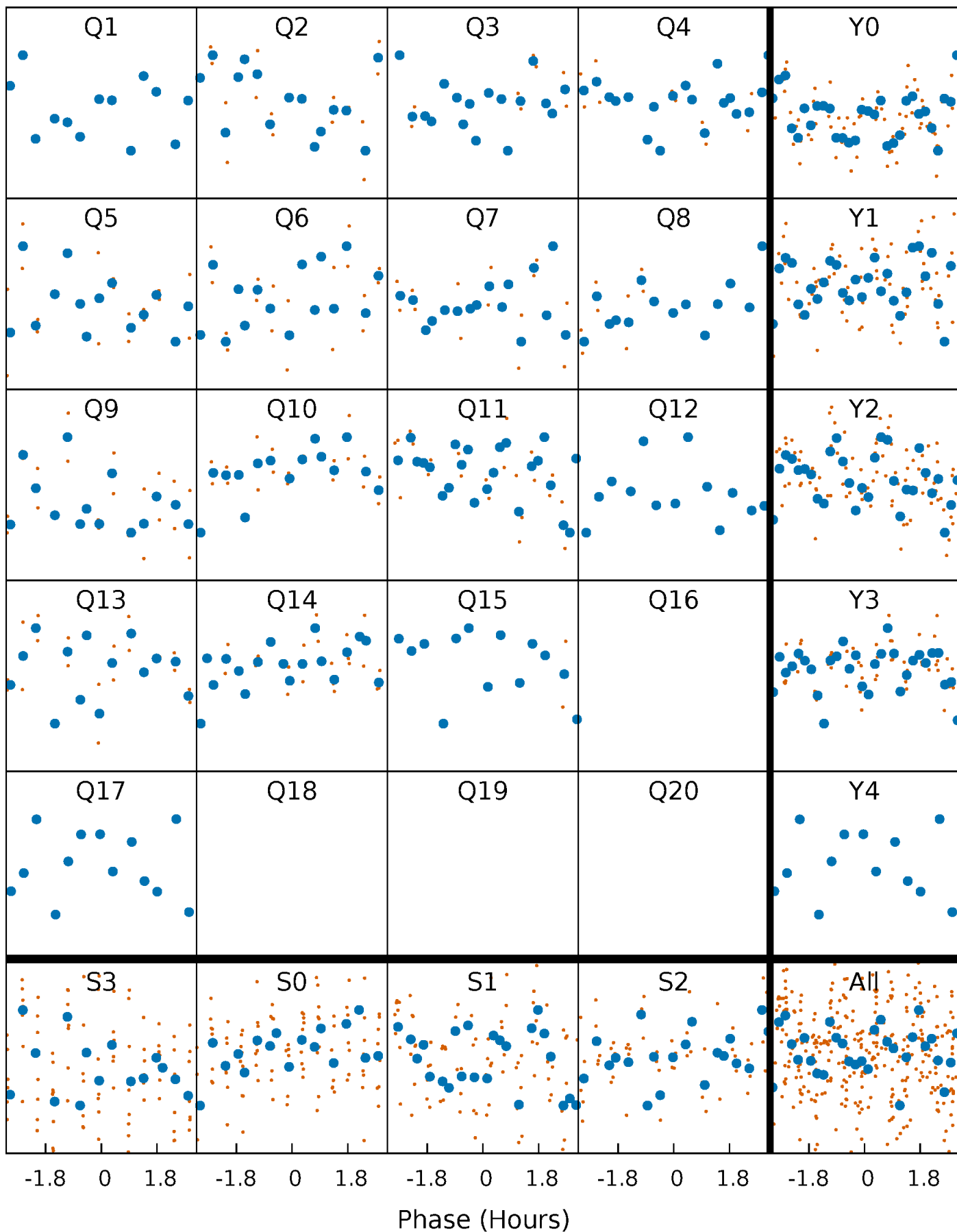


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



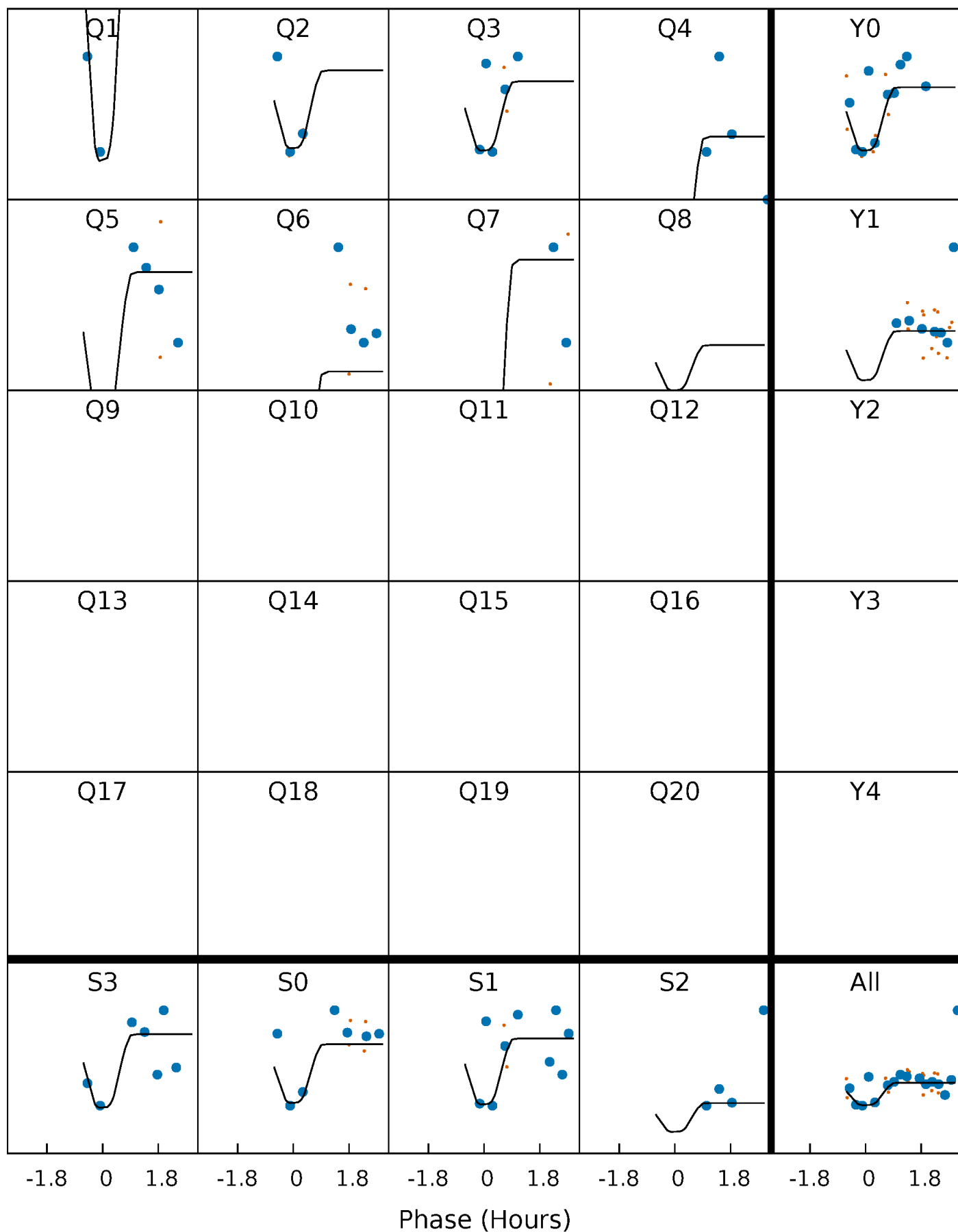
PDC Quarter-Phased Transit Curves

TCE 009487871-04 P= 40.256404 Days $T_0=157.242912$ (BKJD)



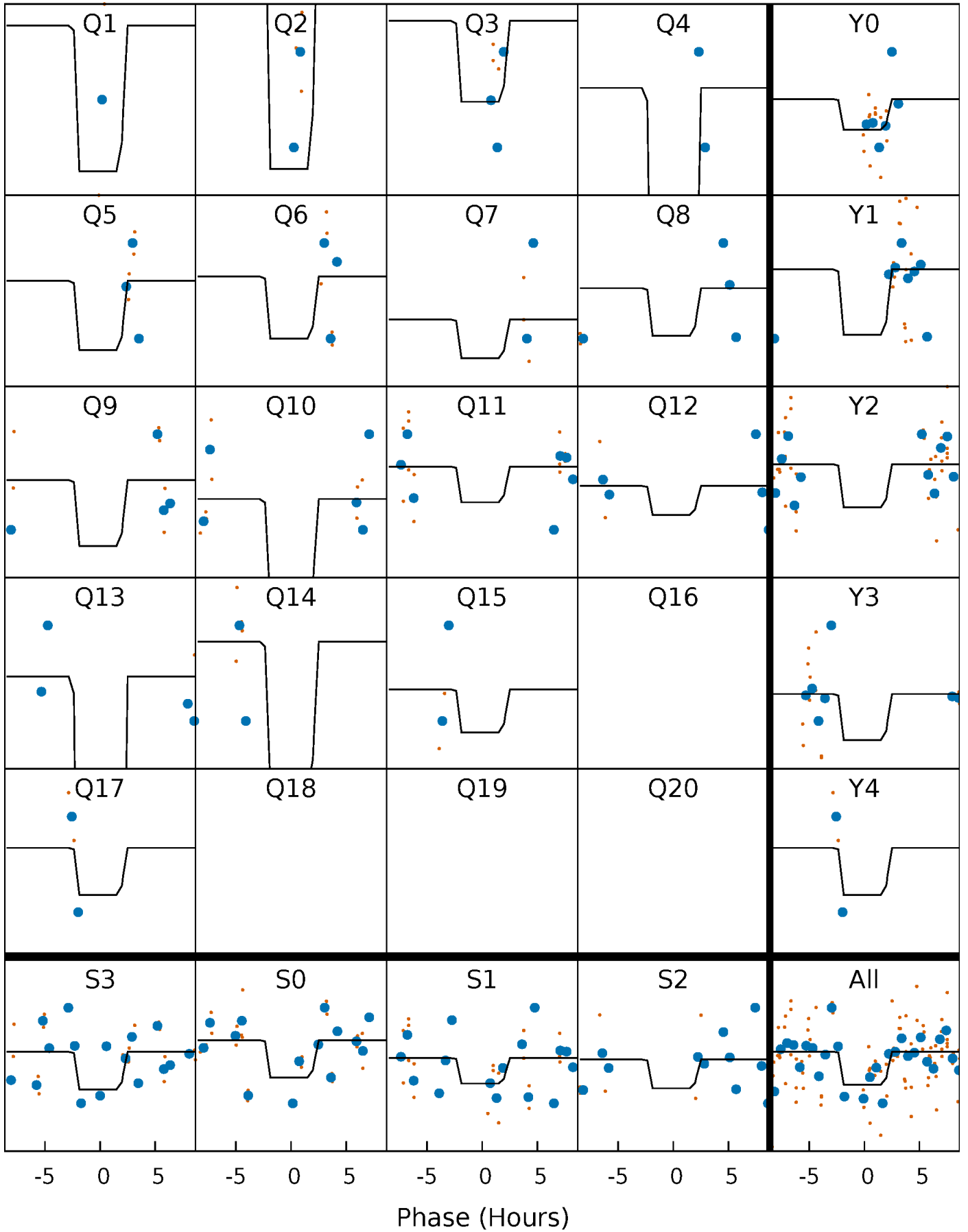
DV Quarter-Phased Transit Curves

TCE 009487871-04 $P = 40.256404$ Days $T_0 = 157.242912$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

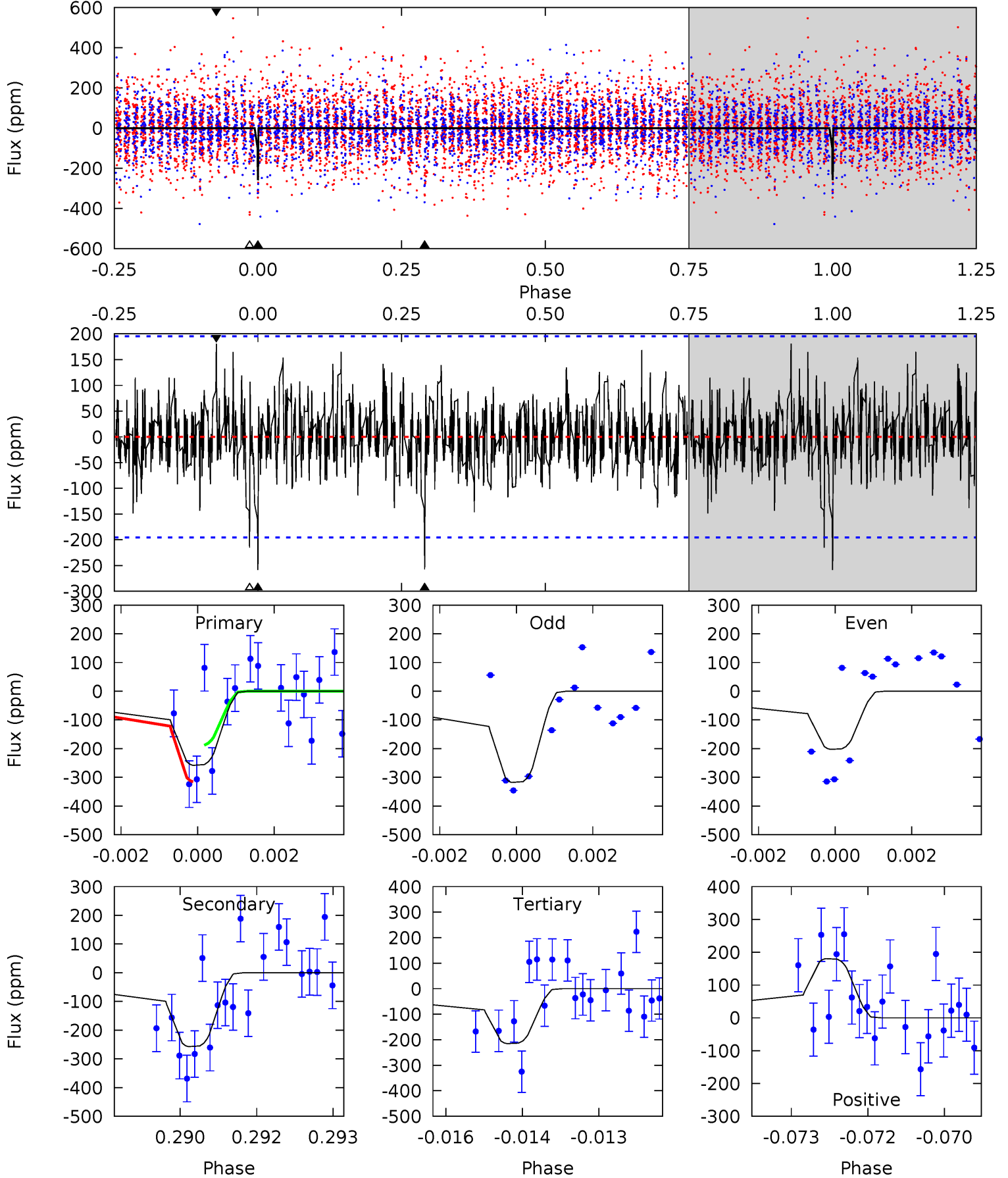
TCE 009487871-04 P= 40.252713 Days $T_0=157.222479$ (BKJD)



DV Model-Shift Uniqueness Test

009487871-04, P = 40.256404 Days, E = 116.986508 Days

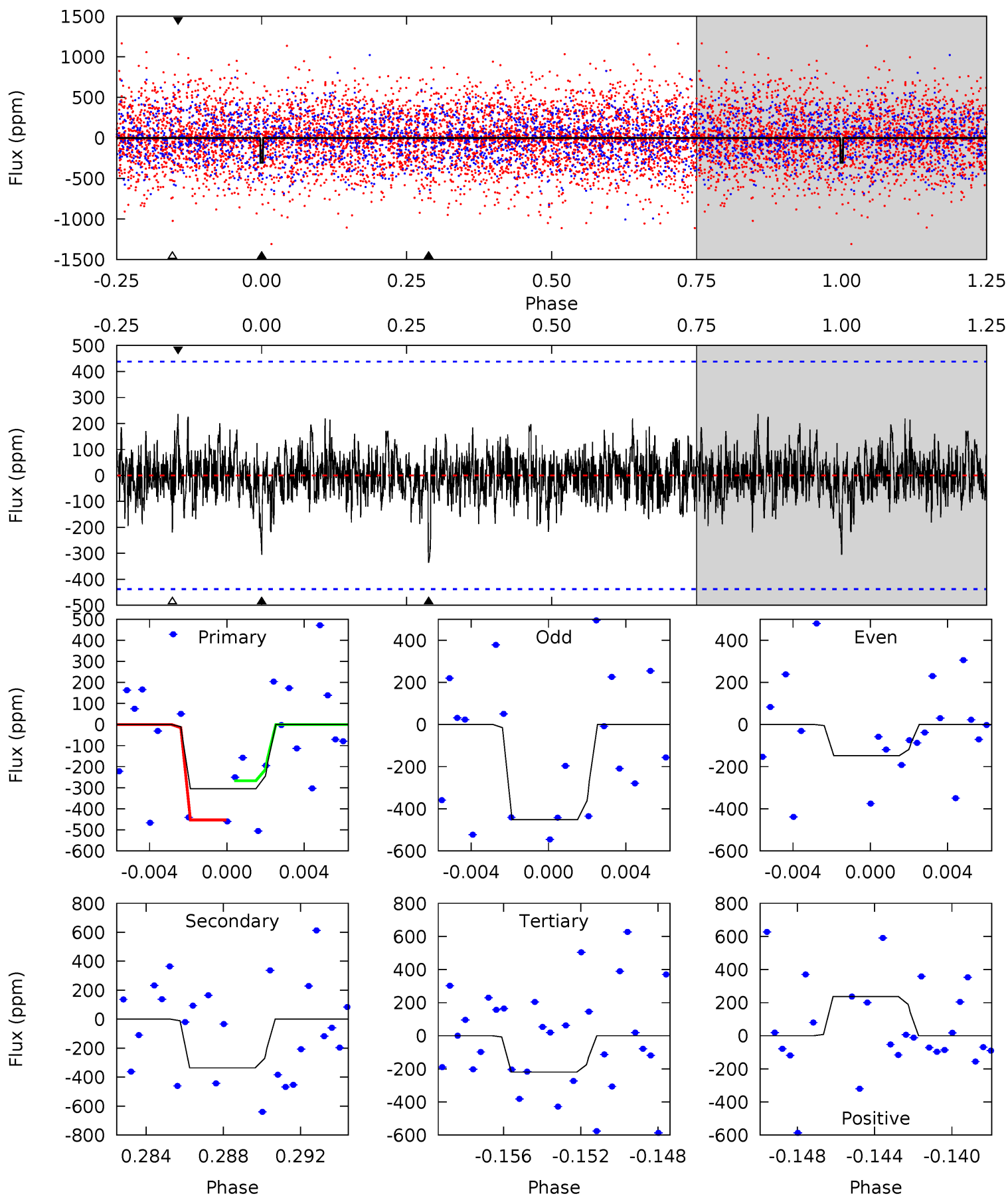
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.07	7.05	5.89	4.94	5.35	3.12	1.28	1.18	2.13	1.15	2.10	1.58	0.79	0.41	1.65



Alt Model-Shift Uniqueness Test

009487871-04, P = 40.252713 Days, E = 116.969766 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.62	3.99	2.60	2.80	5.19	2.87	0.80	1.01	0.82	1.39	1.19	1.81	1.22	0.41	0.77



Stellar Parameters For KIC 009487871

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6489^{+137}_{-255}	$2.694^{+0.586}_{-0.138}$	$-0.500^{+0.550}_{-0.450}$	$13.402^{+0.861}_{-8.176}$	$3.239^{+0.069}_{-1.247}$	$0.002^{+0.016}_{-0.000}$
	+2%/-4%	+22%/-5%	+110%/-90%	+6%/-61%	+2%/-38%	+839%/-22%
Source	PHO1	FLK73	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009487871-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-257 ± 37	$27.99^{+13.40}_{-12.91}$	2486^{+129}_{-297}	5669^{+1778}_{-865}	21^{+44}_{-12}
Alt.	-336 ± 84	$23.93^{+12.64}_{-11.25}$	2470^{+138}_{-327}	6384^{+2534}_{-1095}	34^{+80}_{-19}

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 $A_{obs} \gg 1.0$

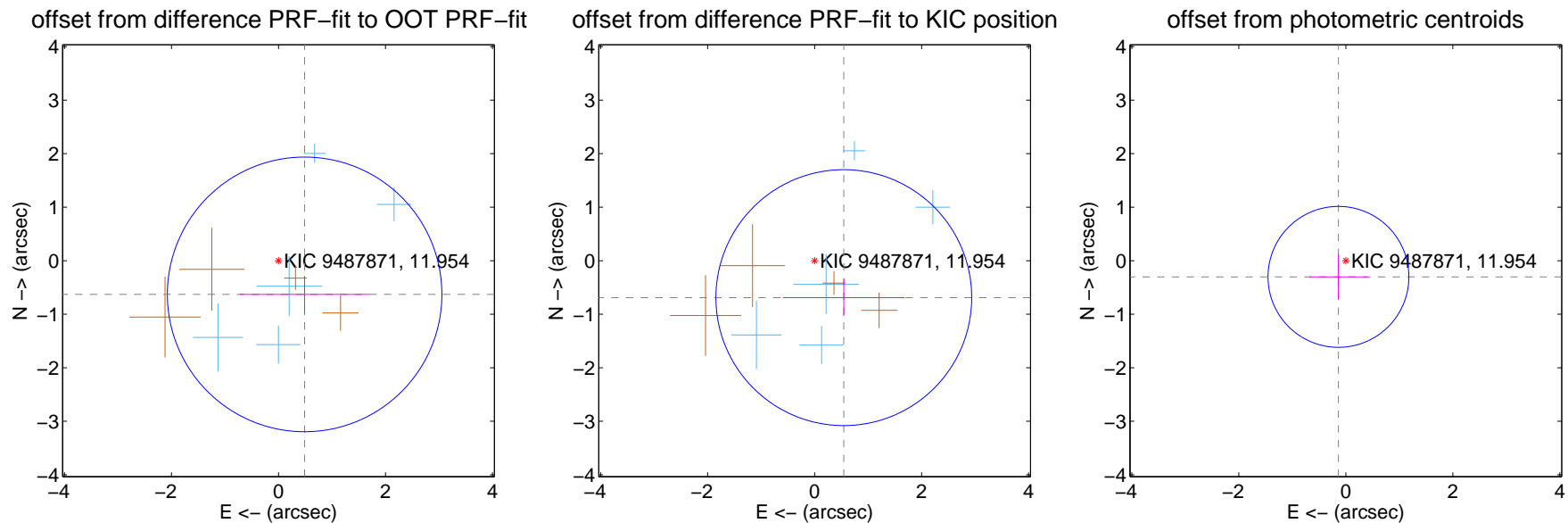
DV Centroid Data

Supplemental centroid analysis for 009487871-04. **Kepler magnitude: 11.95.** Transit SNR 9.53

There are 5 quarters with good PRF difference image offsets

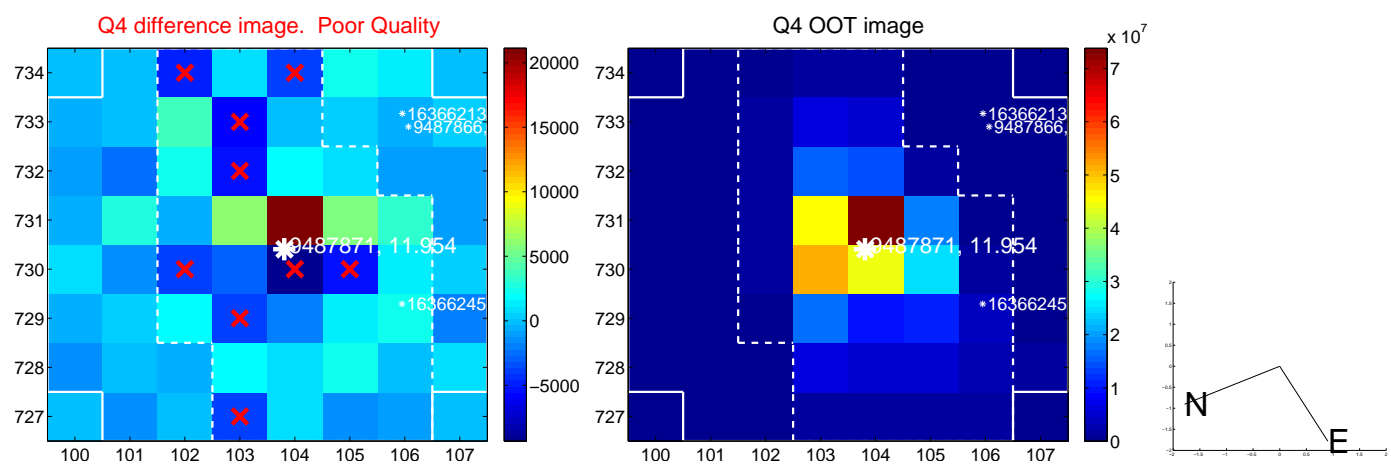
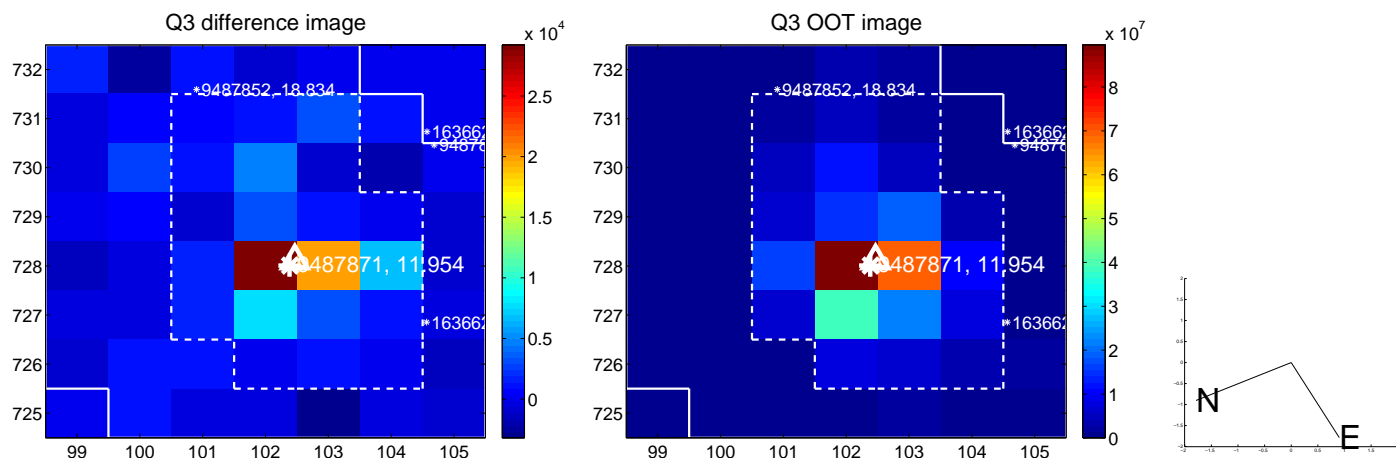
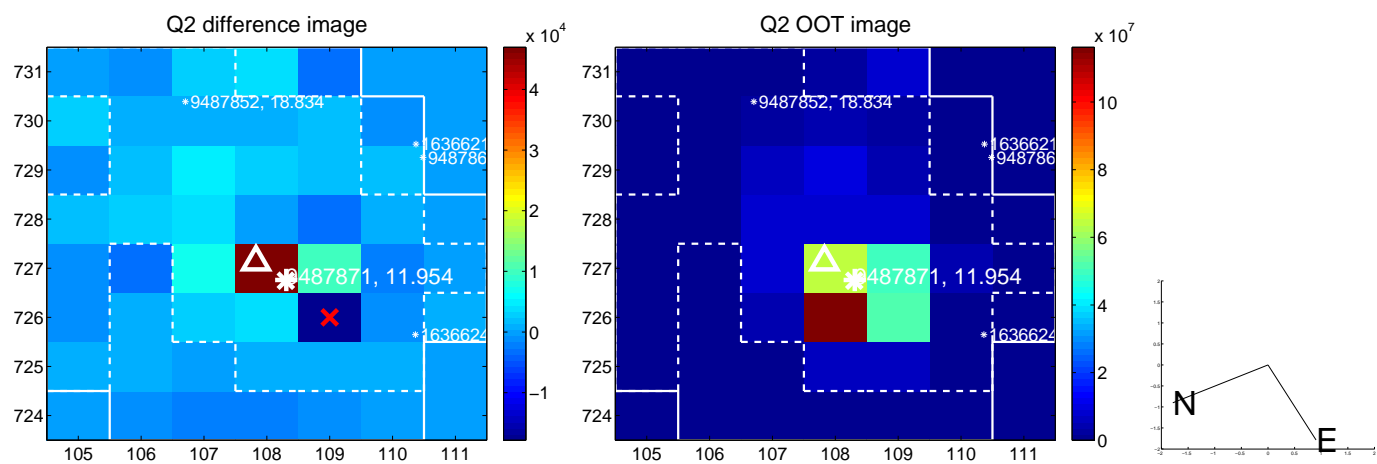
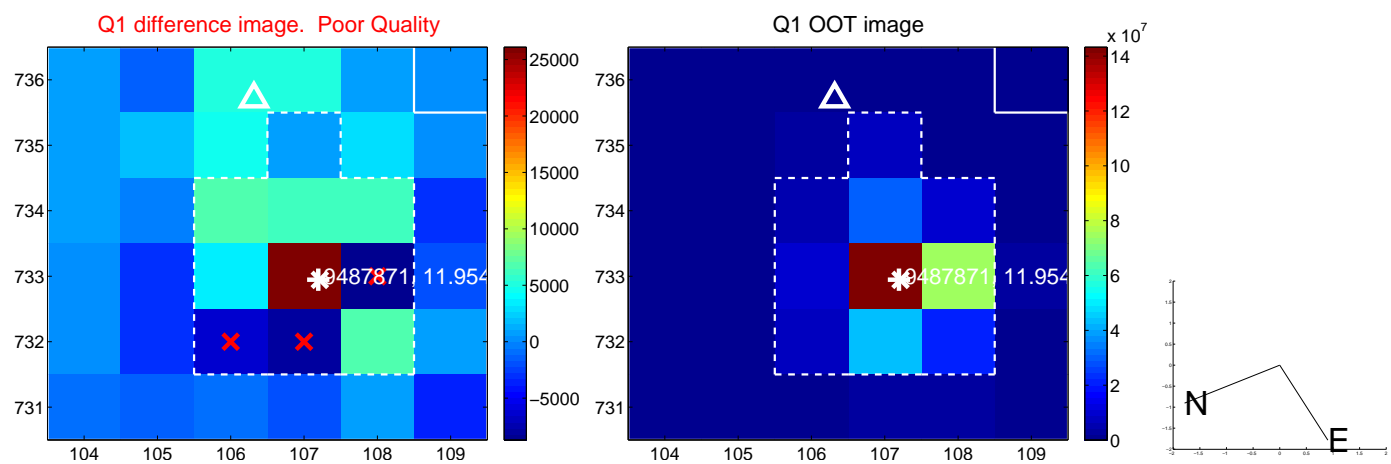
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.797 ± 0.855	0.93	-0.489 ± 1.211	-0.630 ± 0.339
PRF-fit source offset from KIC position	0.880 ± 0.797	1.10	-0.546 ± 1.134	-0.690 ± 0.343
photometric centroid source offset	0.33 ± 0.44	0.76	0.14 ± 0.55	-0.30 ± 0.41

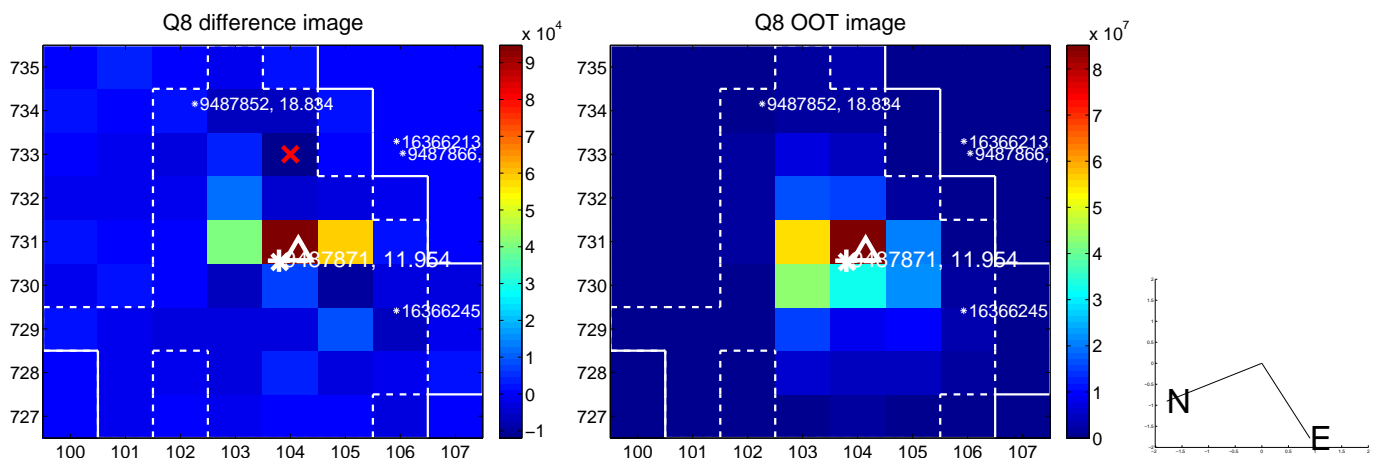
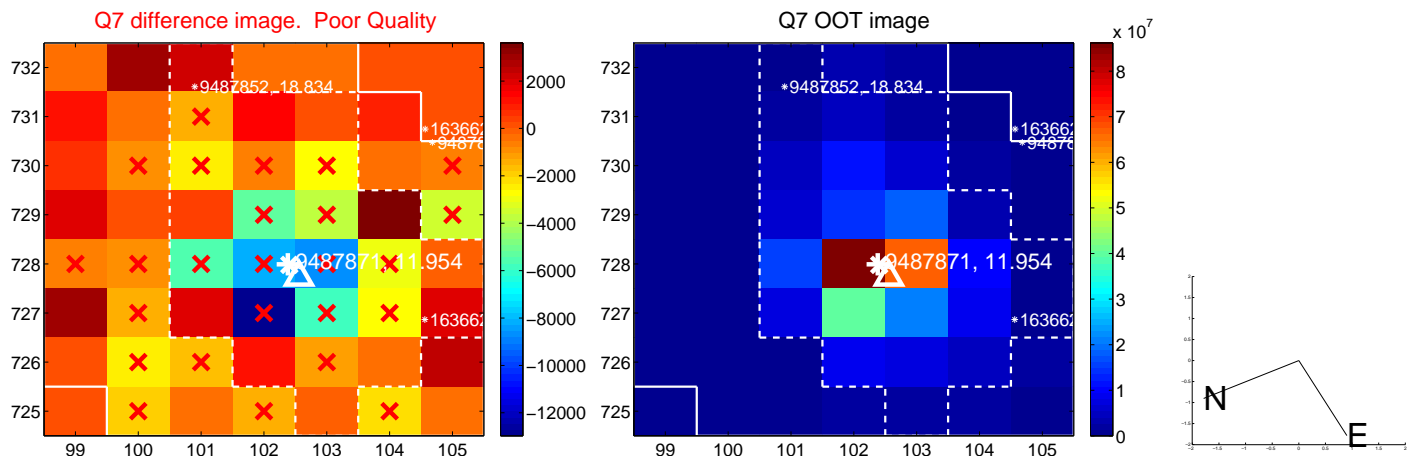
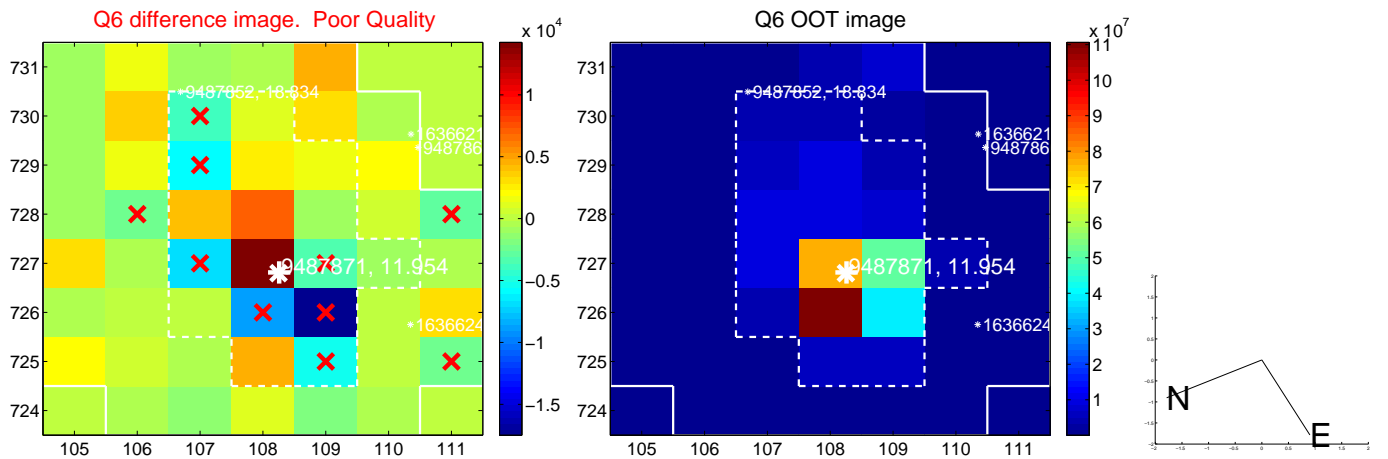
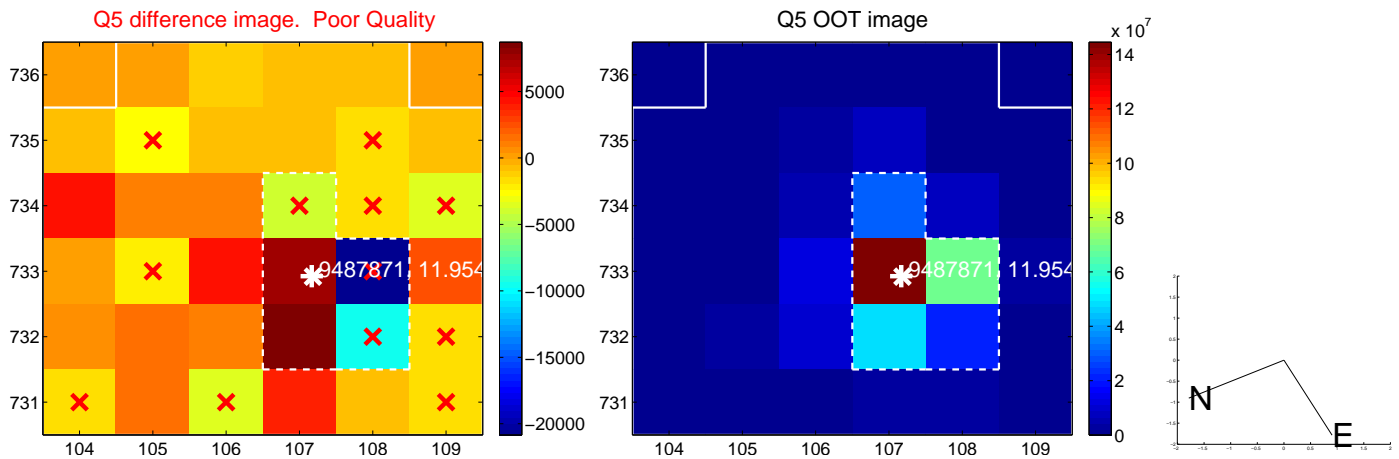


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

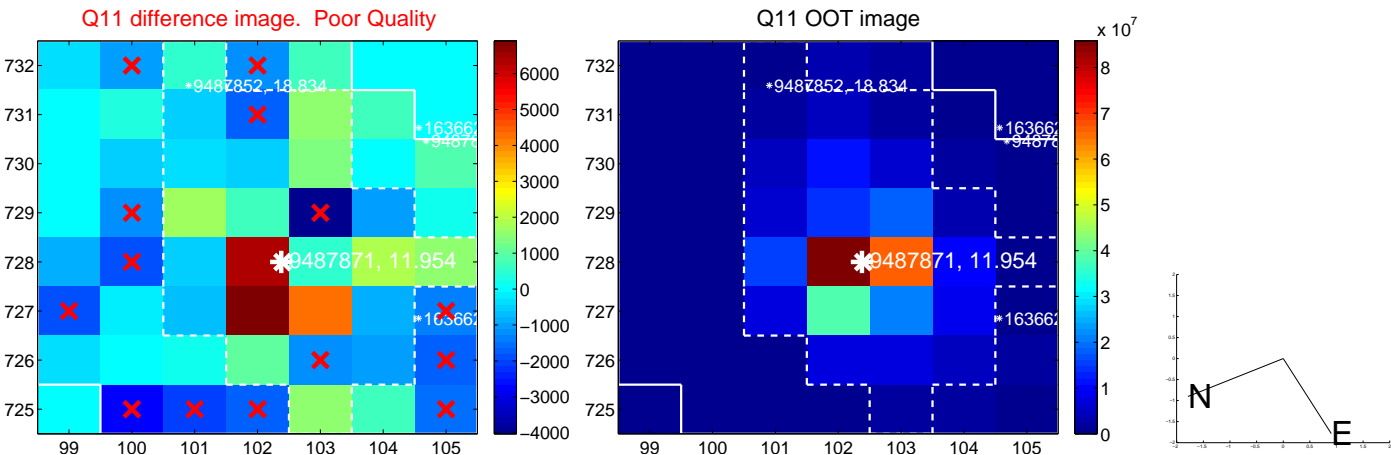
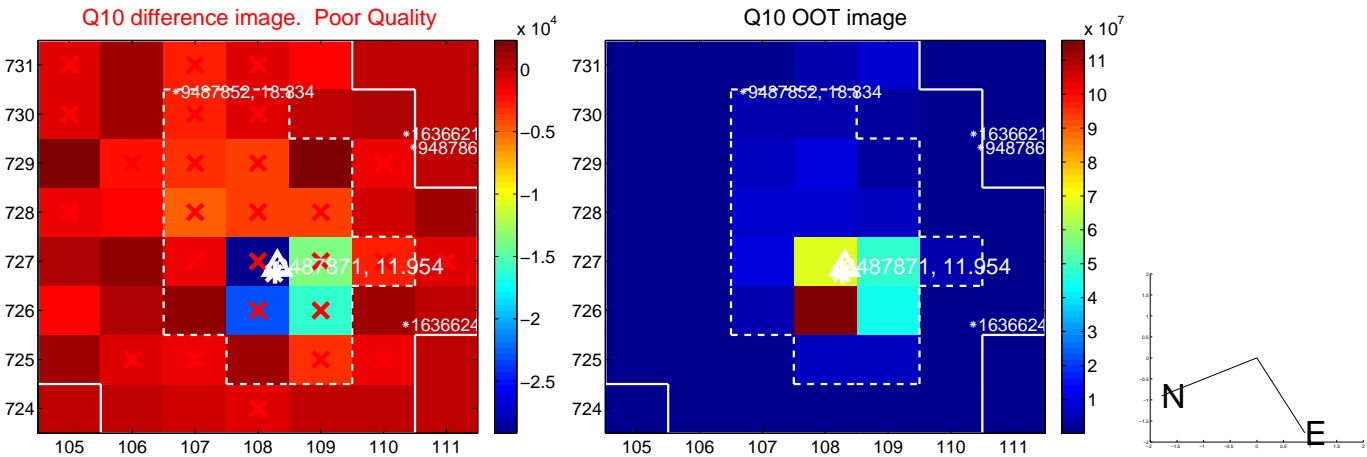
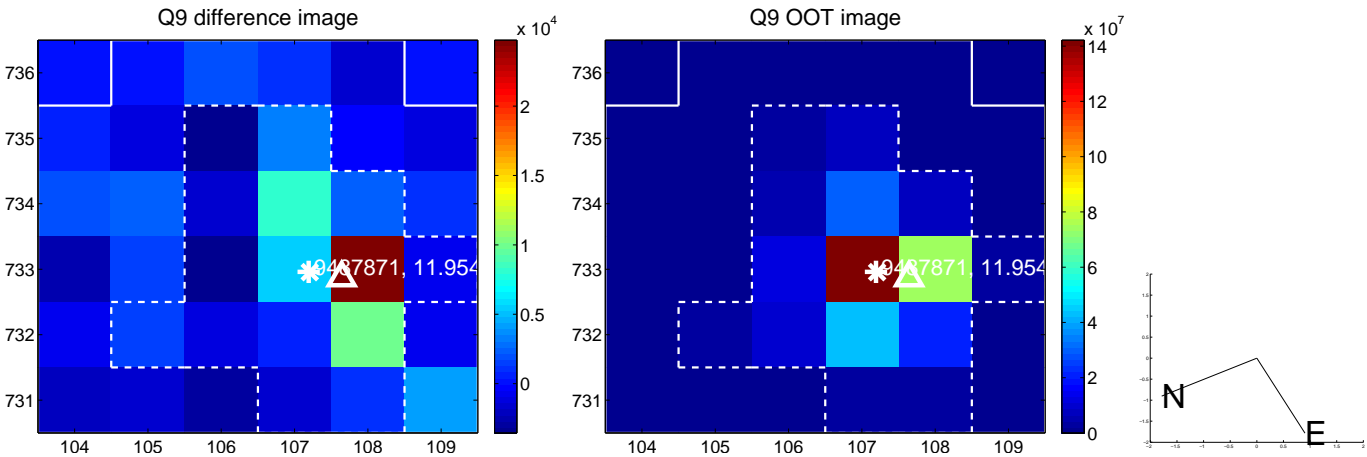
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



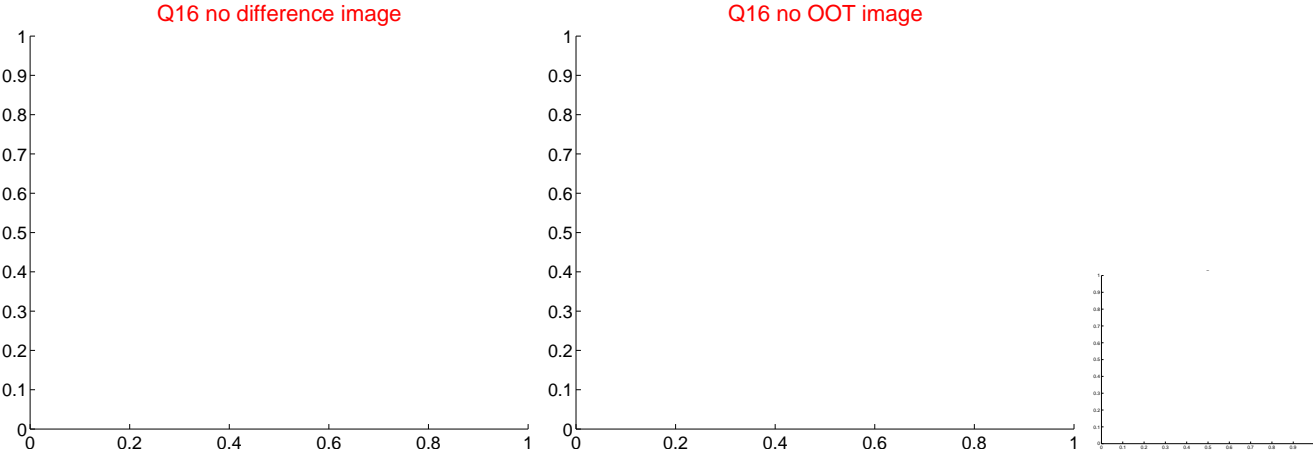
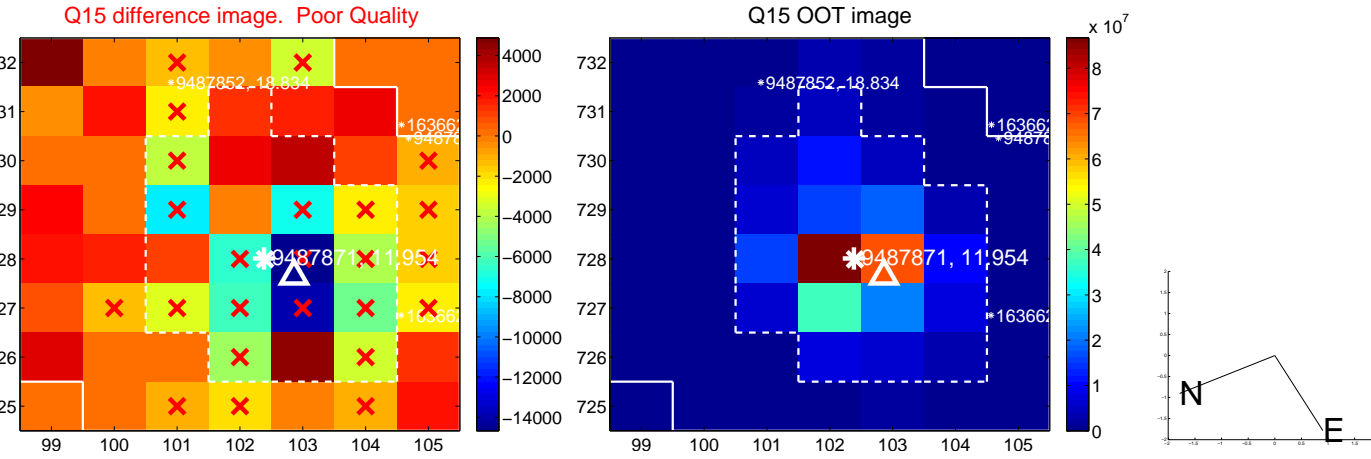
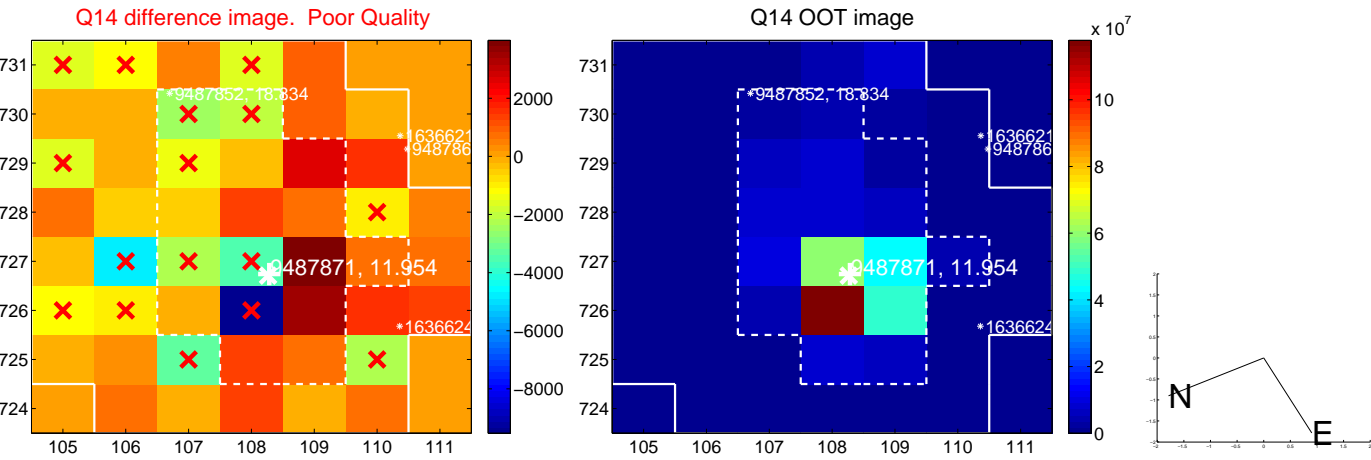
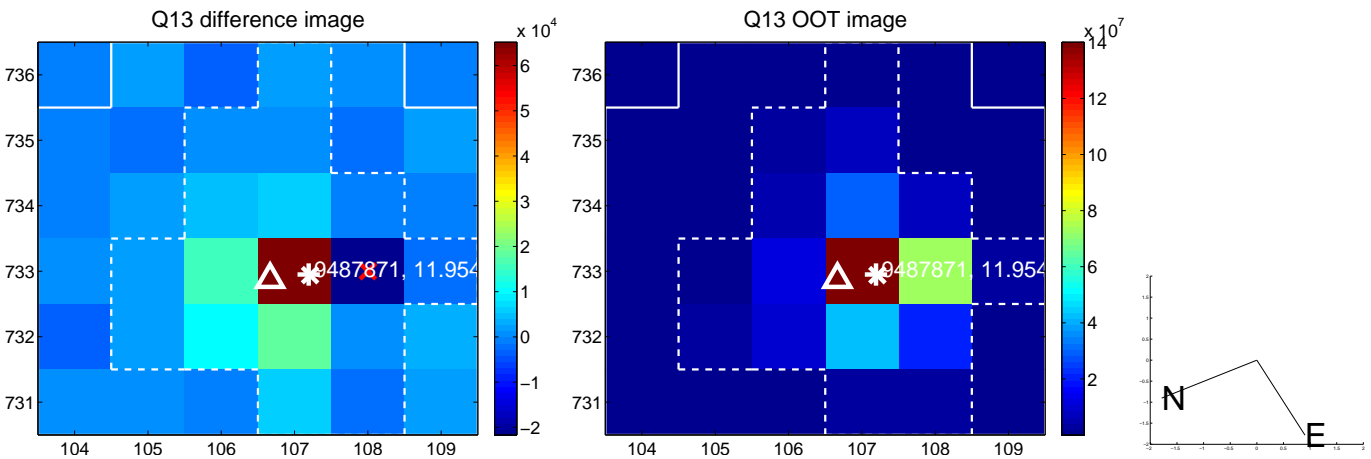
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



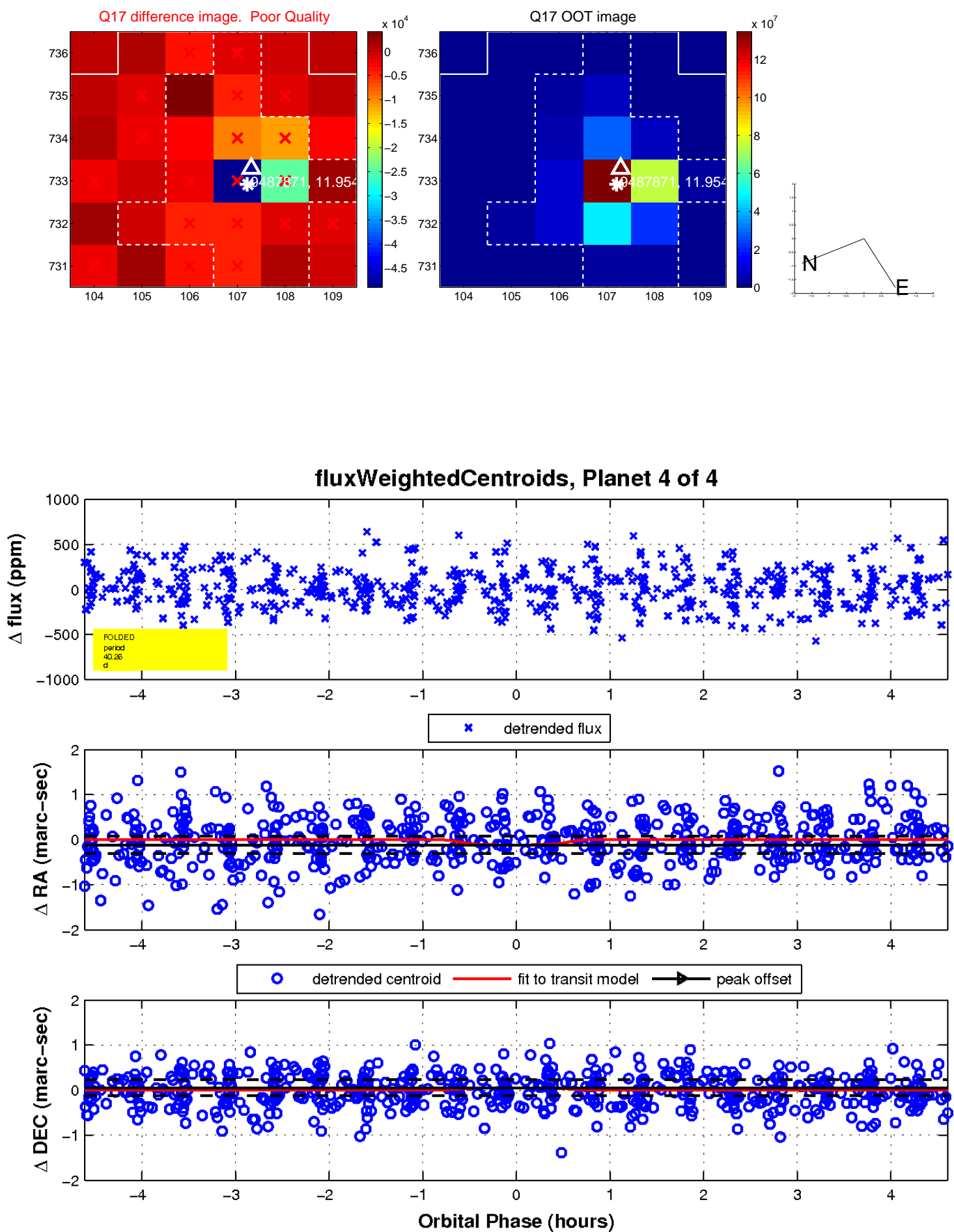
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

