

KIC 006138109

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})
006138109-01	OBS	No	1.085644	132.520521	18.2	4.597	11.6	10.4	3.92	7206	1.75	61405.21
006138109-02	OBS	No	240.656511	275.107126	138.0	3.920	10.2	3.9	3.92	7206	5.36	45.77
006138109-03	OBS	No	526.636697	482.463973	189.1	10.053	10.6	7.7	3.92	7206	6.18	16.11
006138109-05	OBS	No	333.600082	279.552048	244.4	3.280	7.9	7.7	3.92	7206	7.12	29.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006138109-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006138109-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
006138109-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
006138109-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

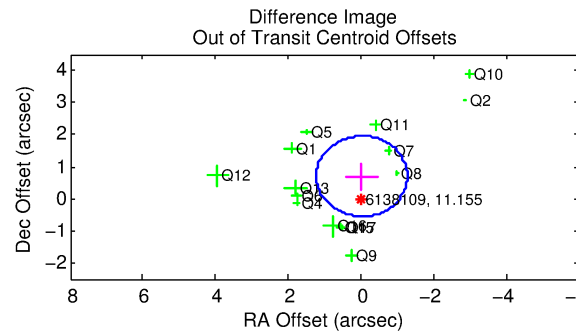
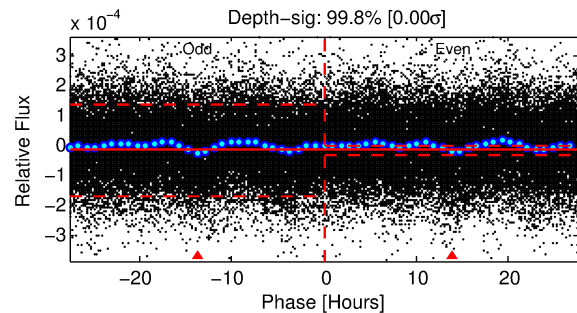
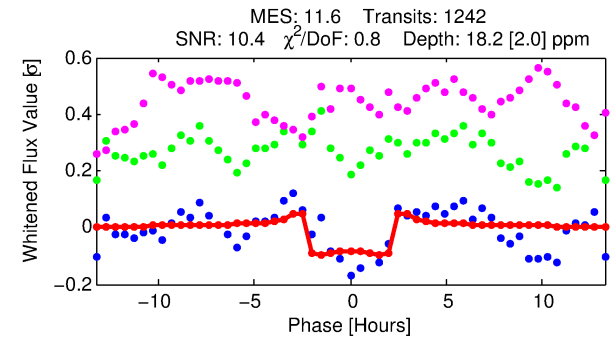
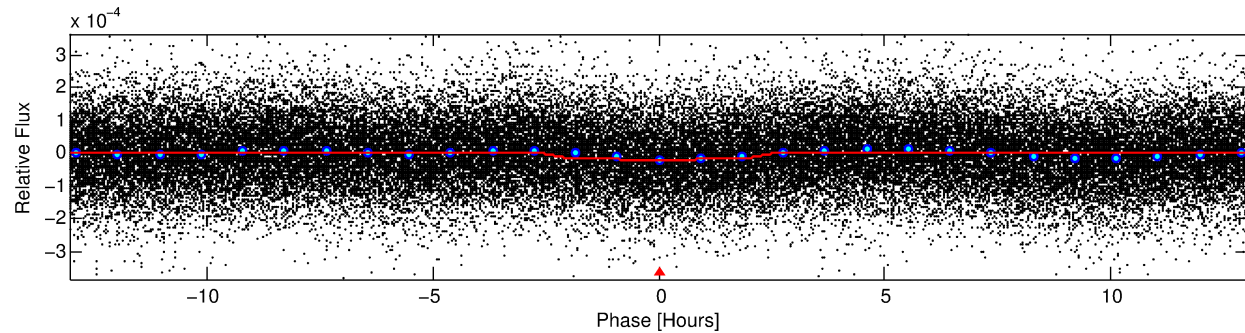
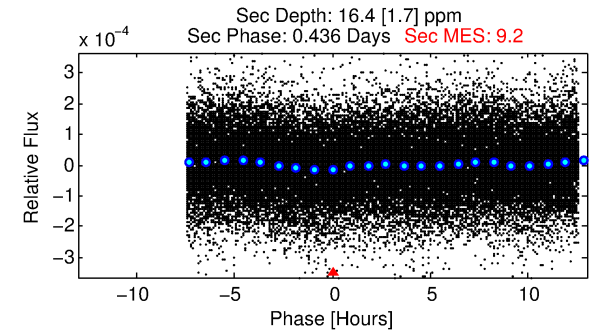
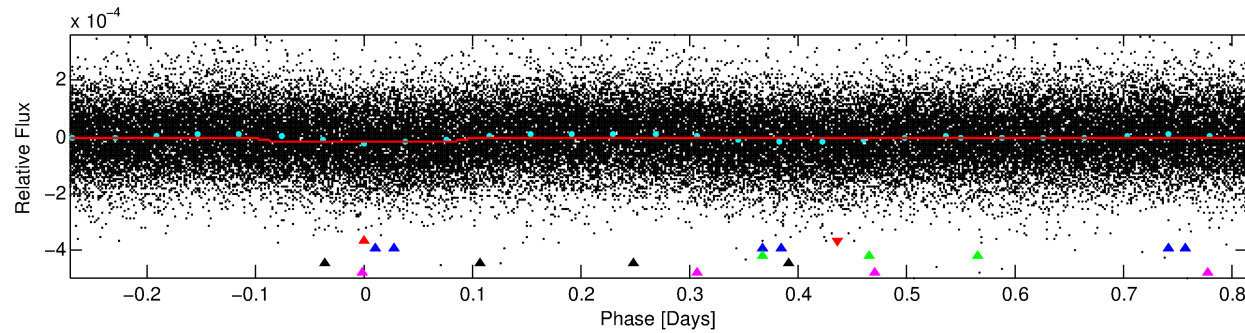
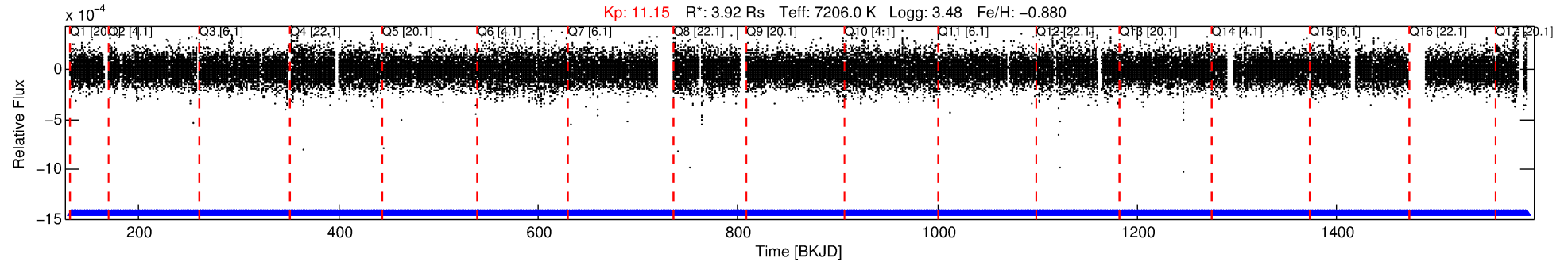
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006138109-01

No Significant Match Found

DV One-Page Summary

KIC: 6138109 Candidate: 1 of 5 Period: 1.086 d



DV Fit Results:

Period = 1.08564 [0.00001] d
Epoch = 132.5205 [0.0023] BKJD
 R_p/R^* = 0.0041 [0.0006]
 a/R^* = 1.69 [0.85]
 b = 0.54 [1.00]
 S_{eff} = 61405.20 [80637.46]
 T_{eq} = 4014 [1318] K
 R_p = 1.74 [1.17] R_e
 a = 0.0246 [0.0185] AU
 A_g = 1.79 [2.40] [0.33σ]
 T_{eff} = 7181 [600] K [2.19σ]

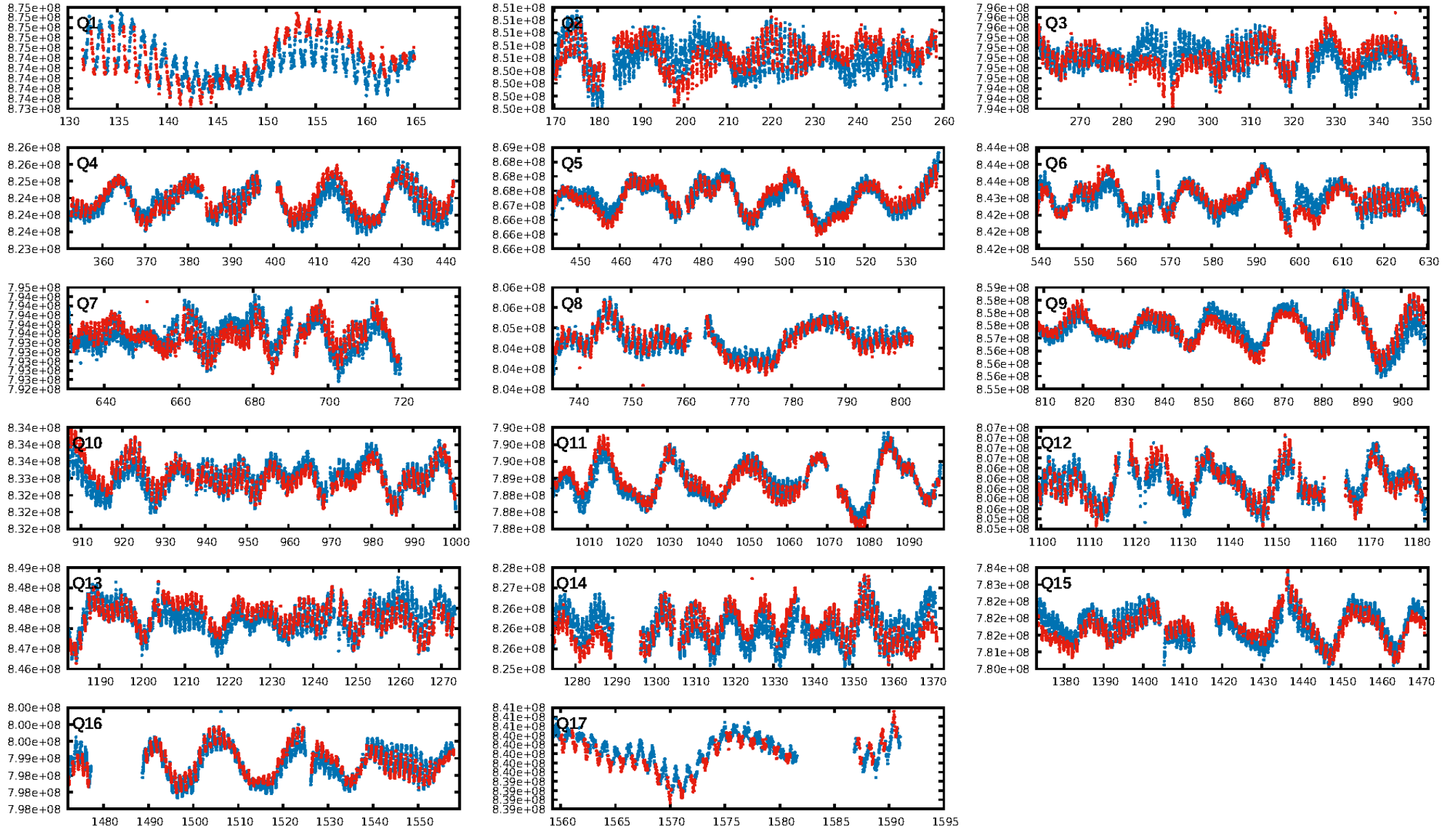
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [951.76σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.98e-20
RollingBand-fgt: 1.00 [1187/1187]
GhostDiagnostic-chr: 4.313
Centroid-sig: 12.4%
Centroid-so: 0.568 arcsec [0.95σ]
OotOffset-rm: 0.701 arcsec [1.68σ]
KicOffset-rm: 0.602 arcsec [1.64σ]
OotOffset-st: 3/3/4/5 [15]
KicOffset-st: 3/3/4/5 [15]
DiffImageQuality-fgm: 0.67 [10/15]
DiffImageOverlap-fno: 1.00 [17/17]

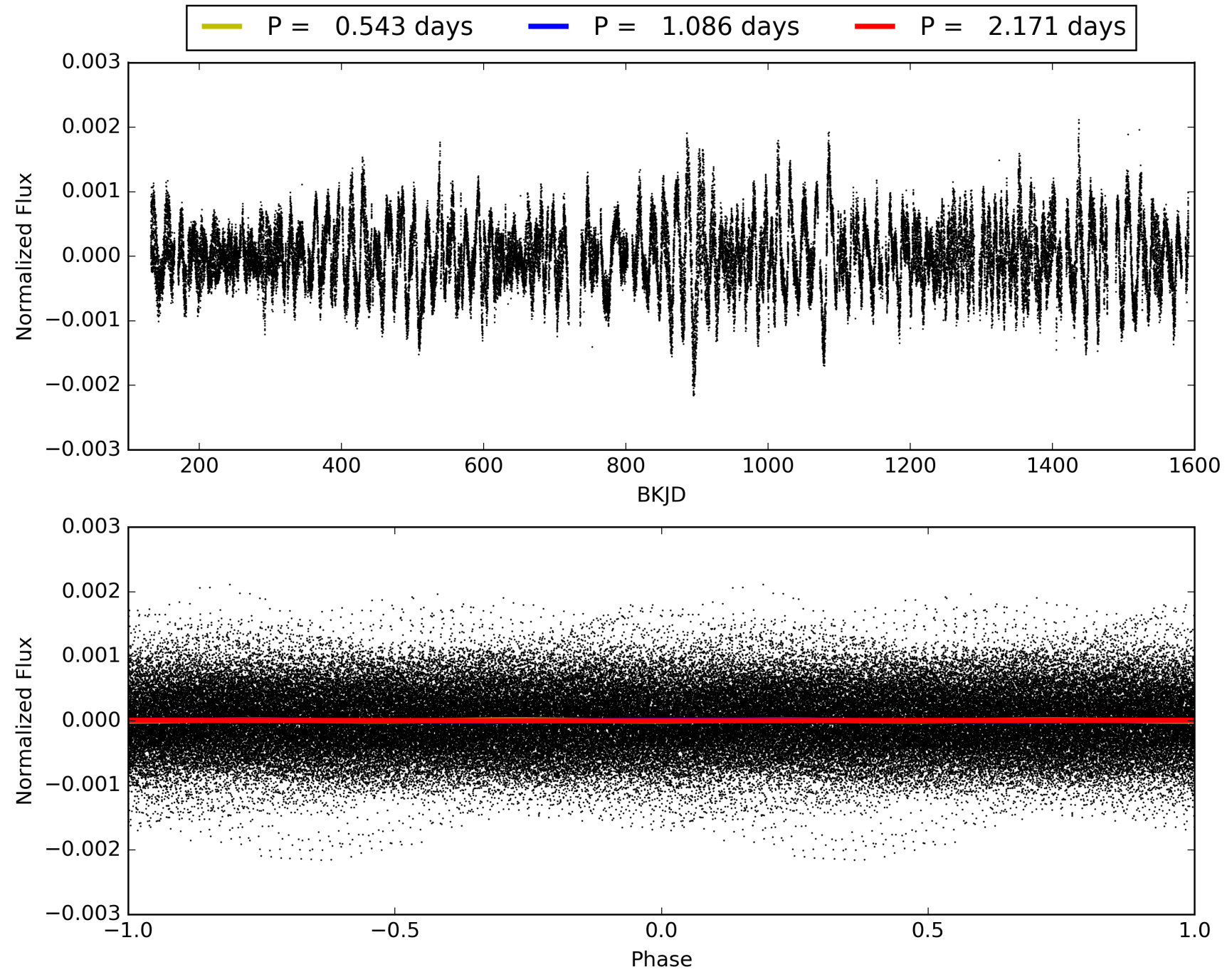
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006138109-01, PDC Light Curves

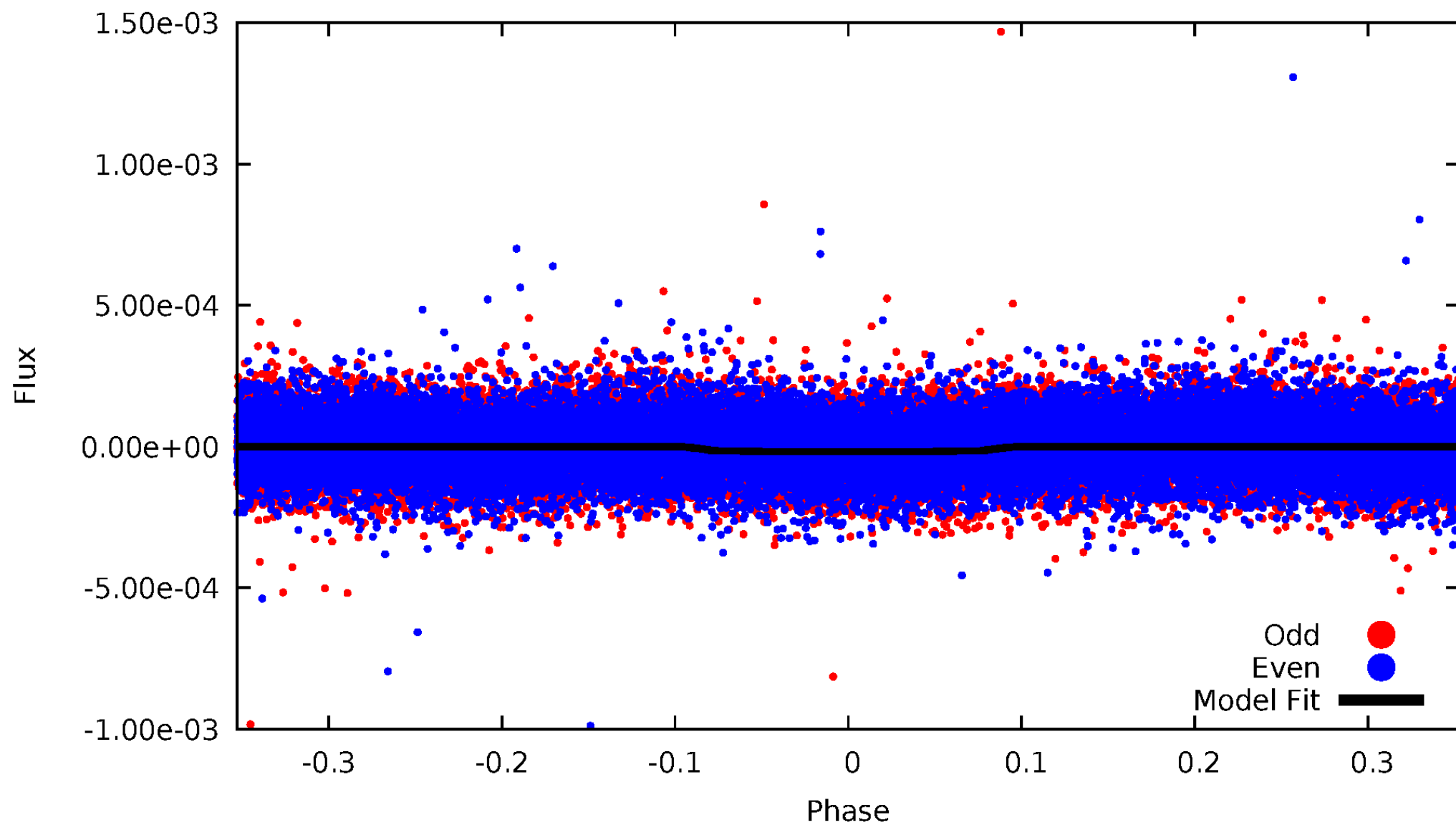


TCE 006138109-01



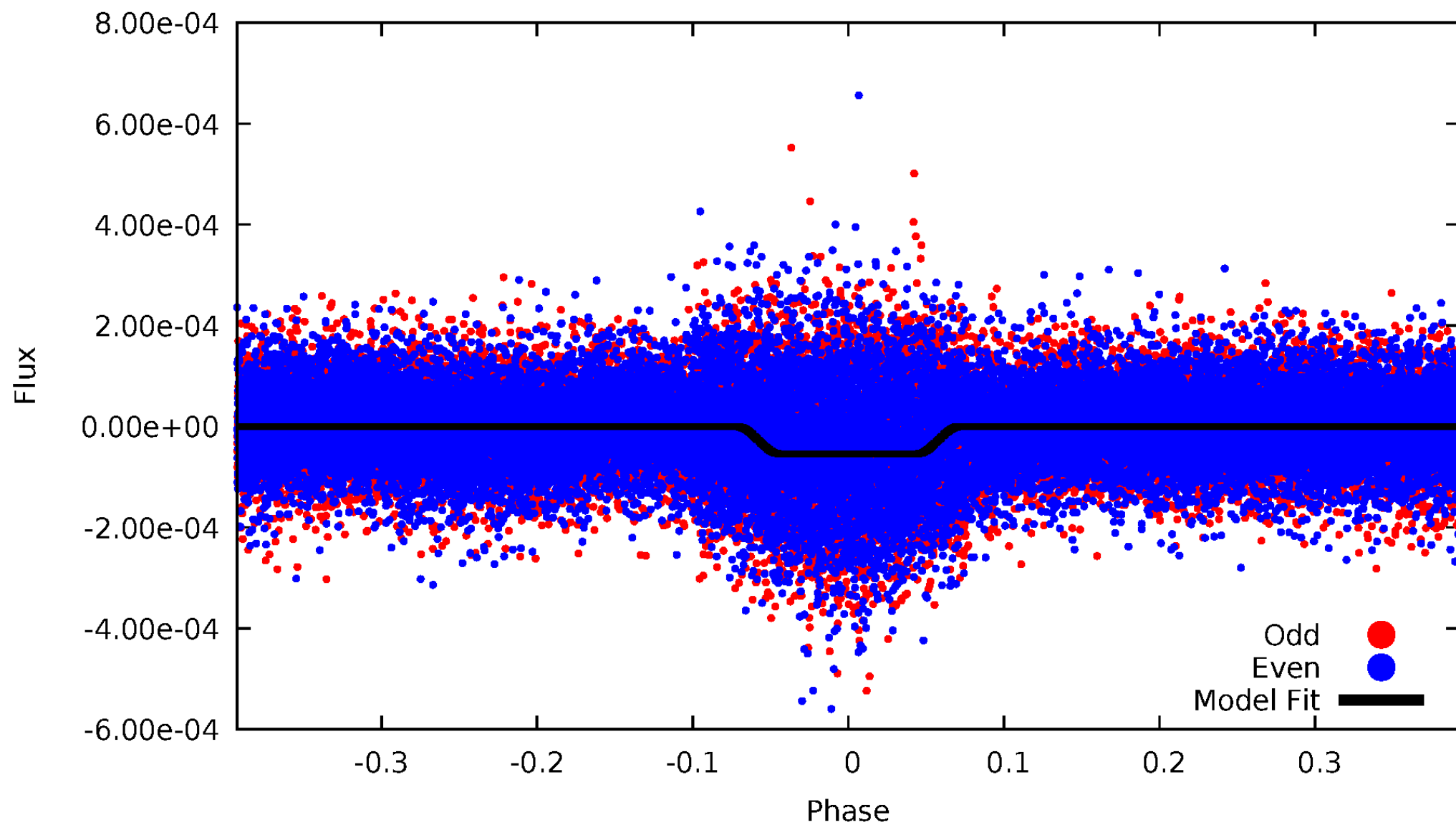
DV Odd/Even

TCE 006138109-01

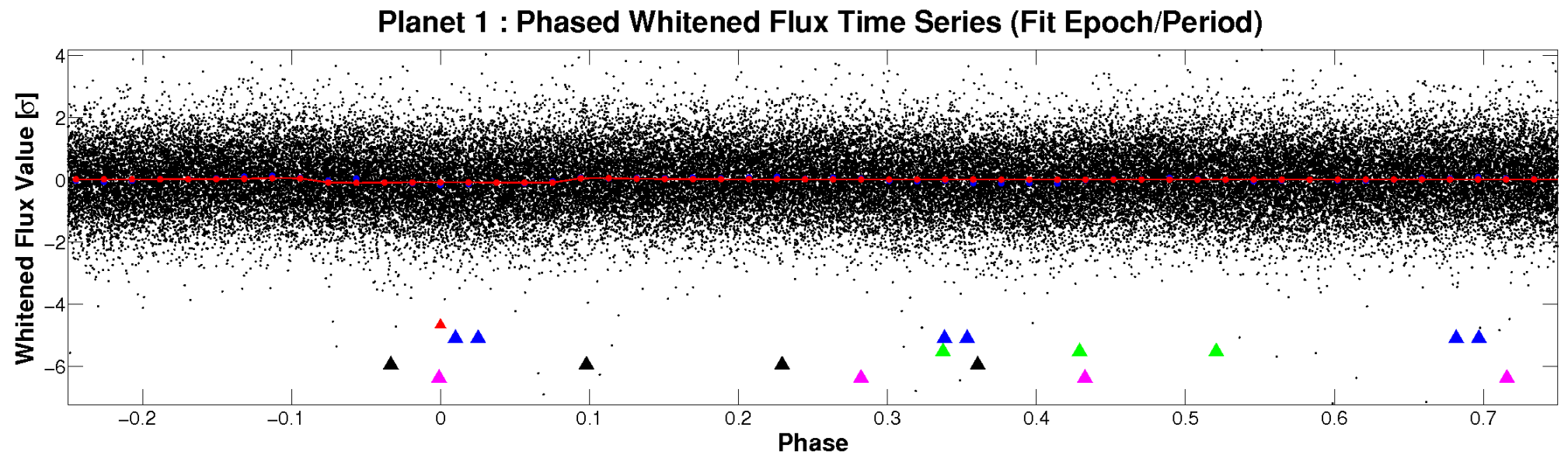
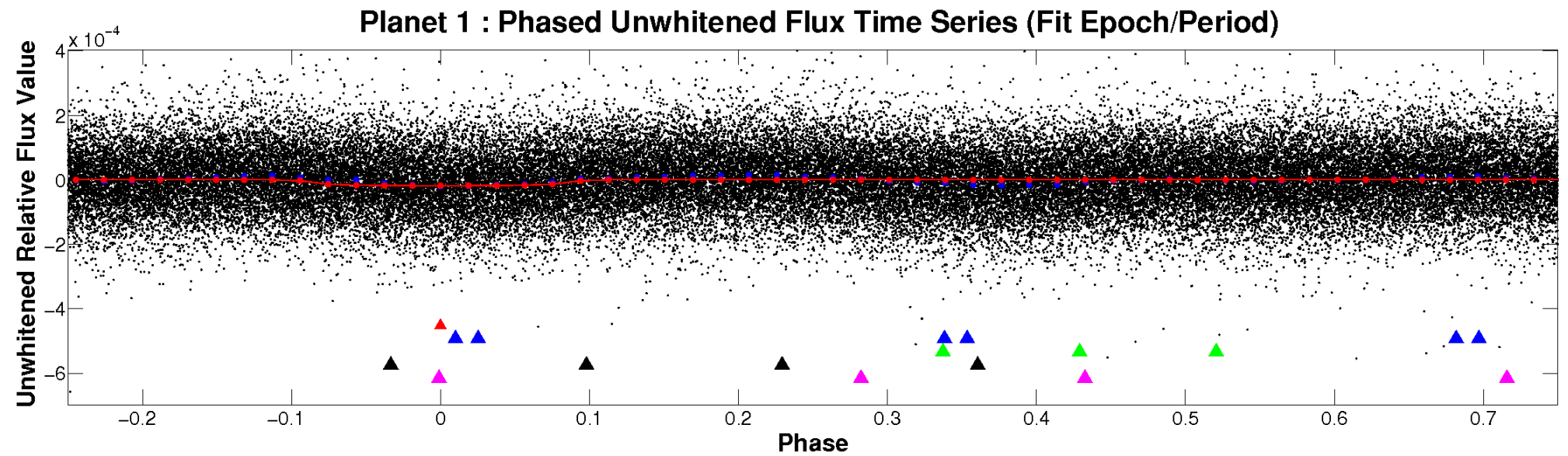


ALT Odd/Even

TCE 006138109-01

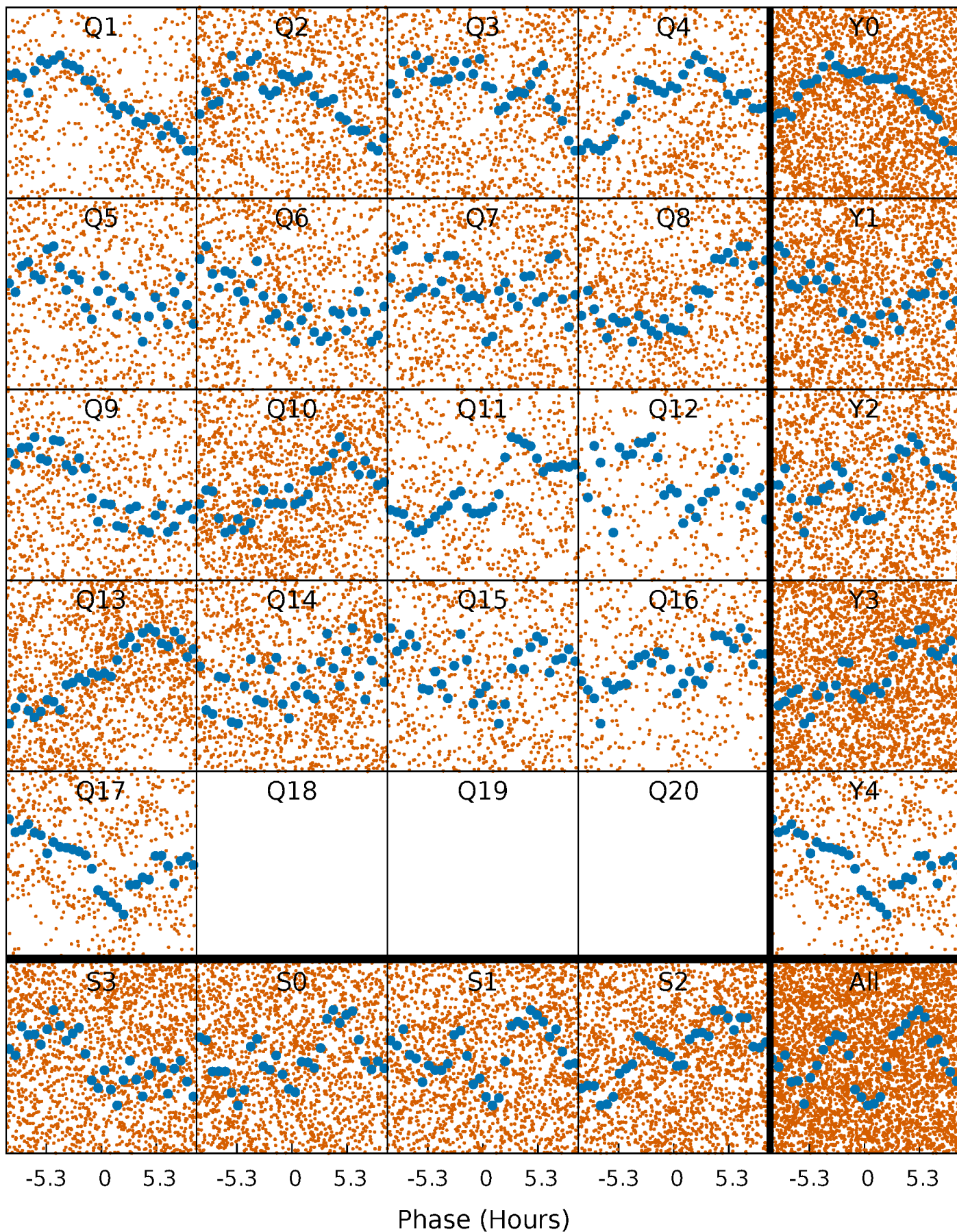


Non-Whitened Vs. Whitened Light Curve



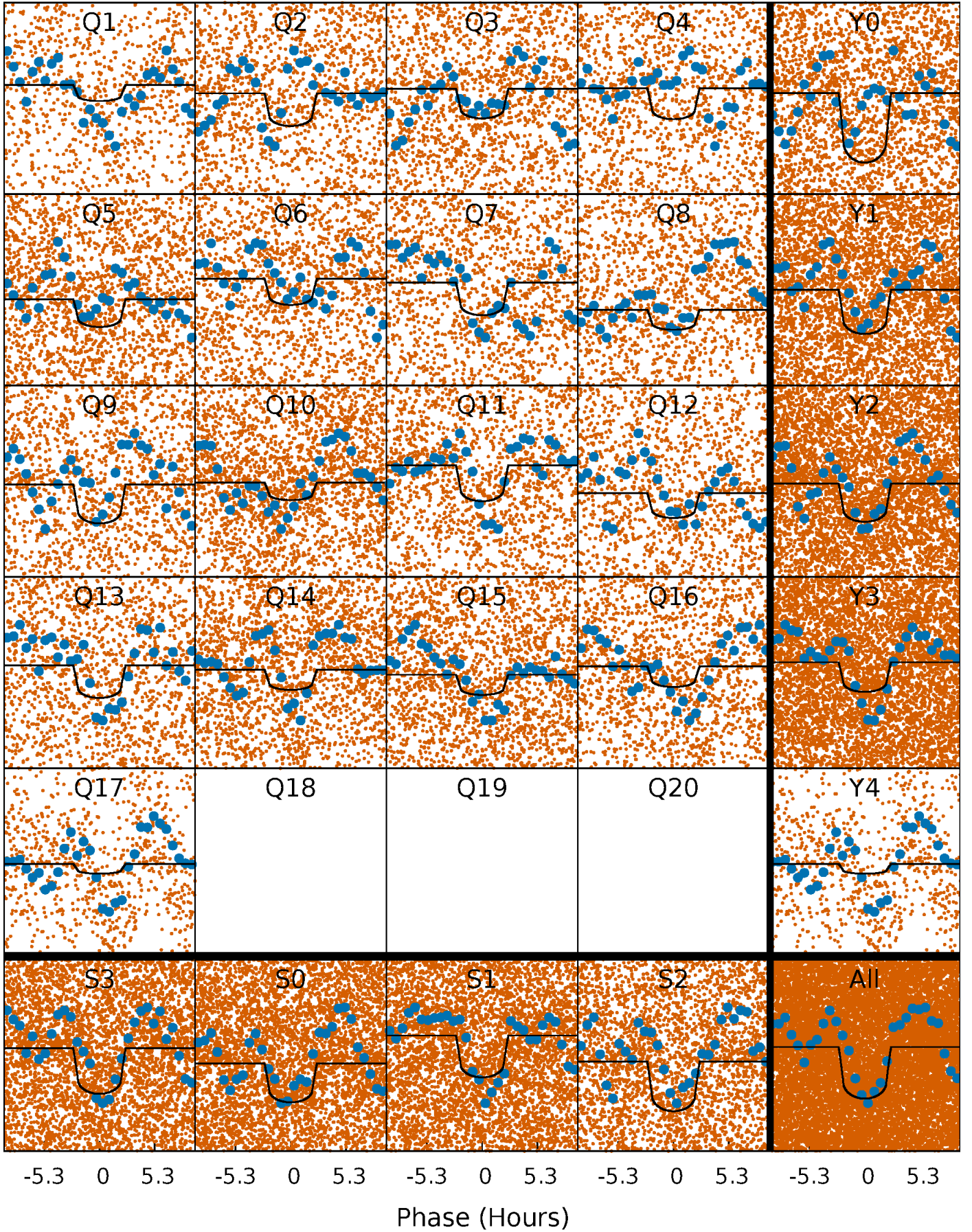
PDC Quarter-Phased Transit Curves

TCE 006138109-01 P= 1.085644 Days $T_0=132.520521$ (BKJD)



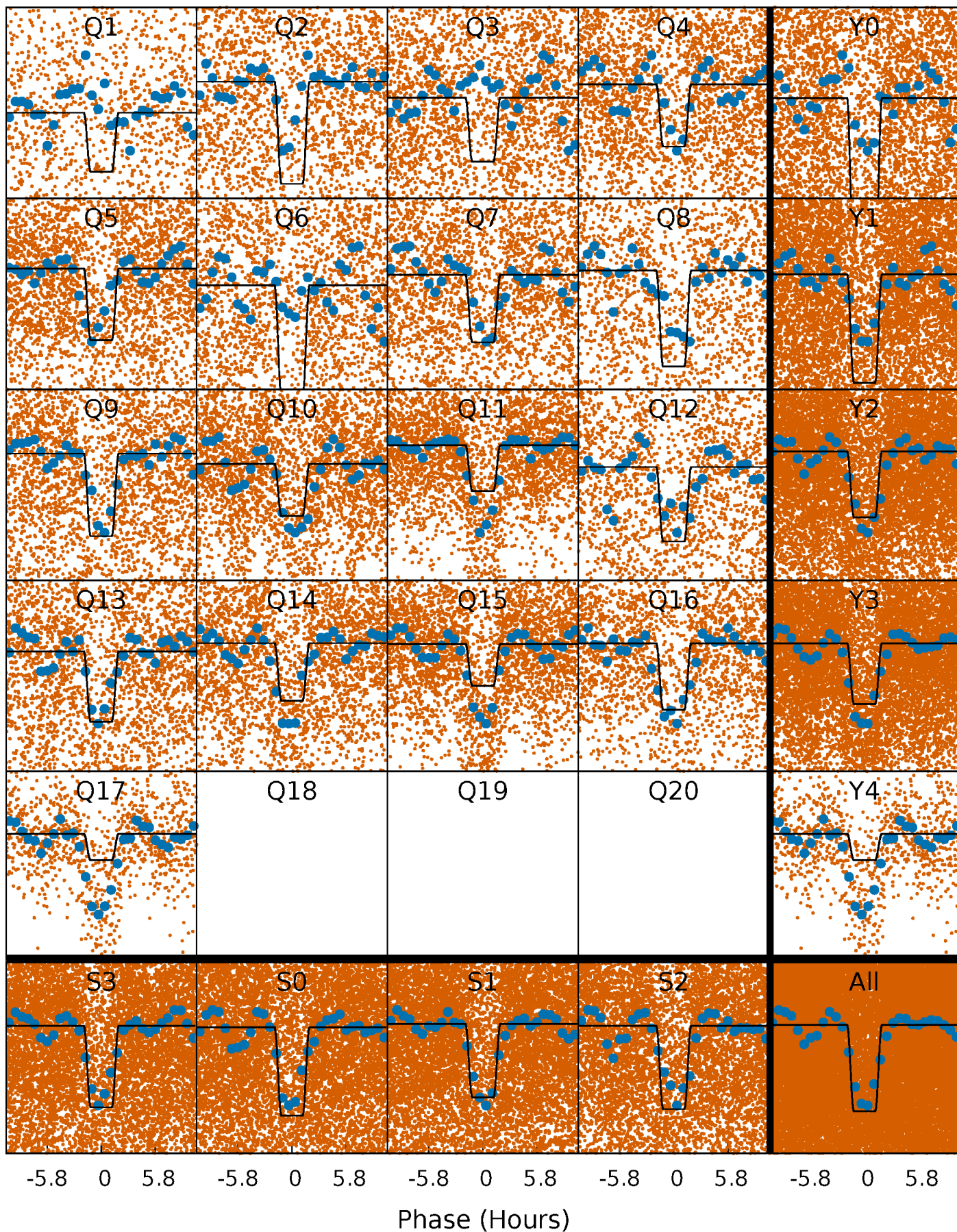
DV Quarter-Phased Transit Curves

TCE 006138109-01 P= 1.085644 Days $T_0=132.520521$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

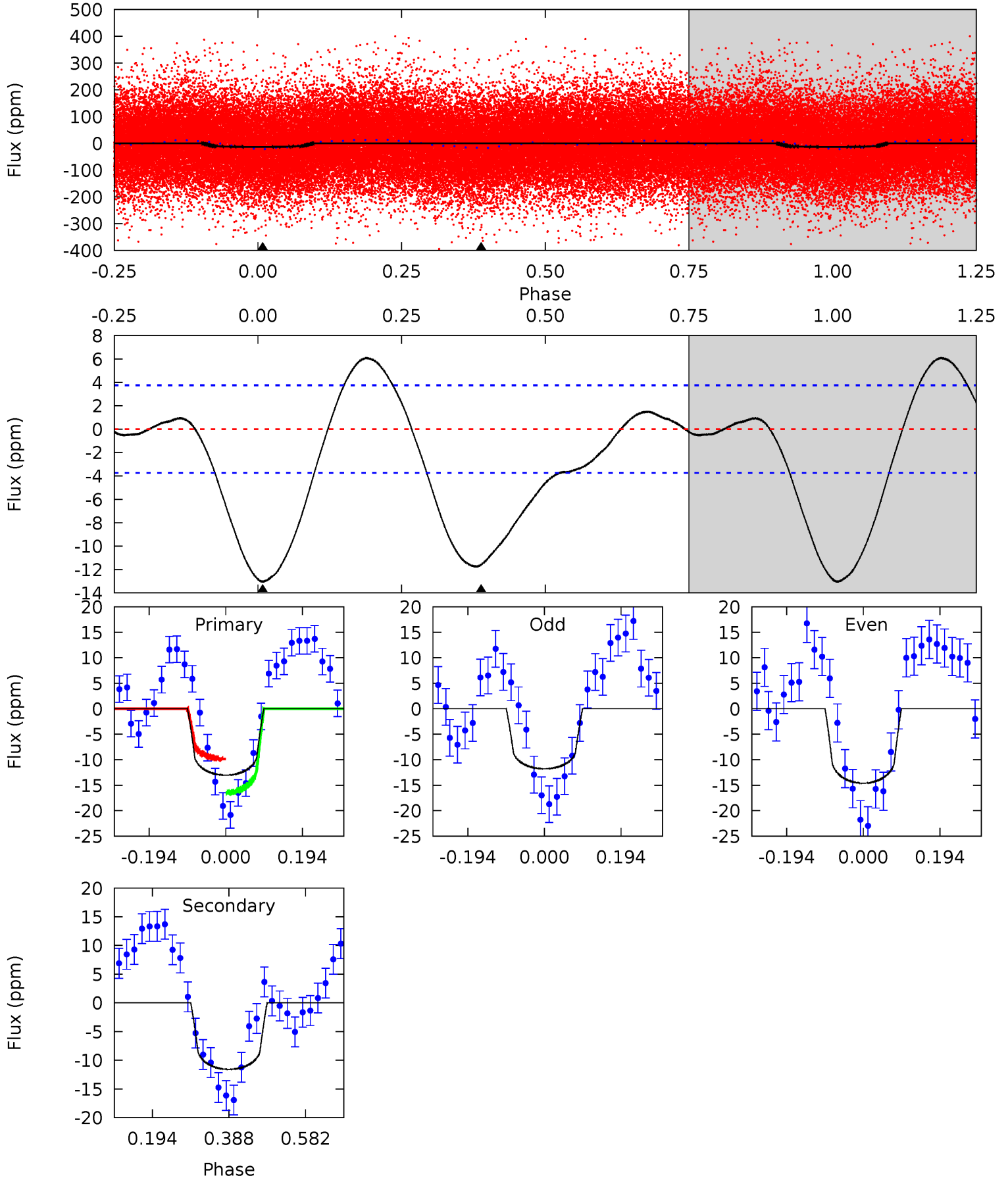
TCE 006138109-01 P= 1.085731 Days $T_0=132.463718$ (BKJD)



DV Model-Shift Uniqueness Test

006138109-01, P = 1.085644 Days, E = 131.434877 Days

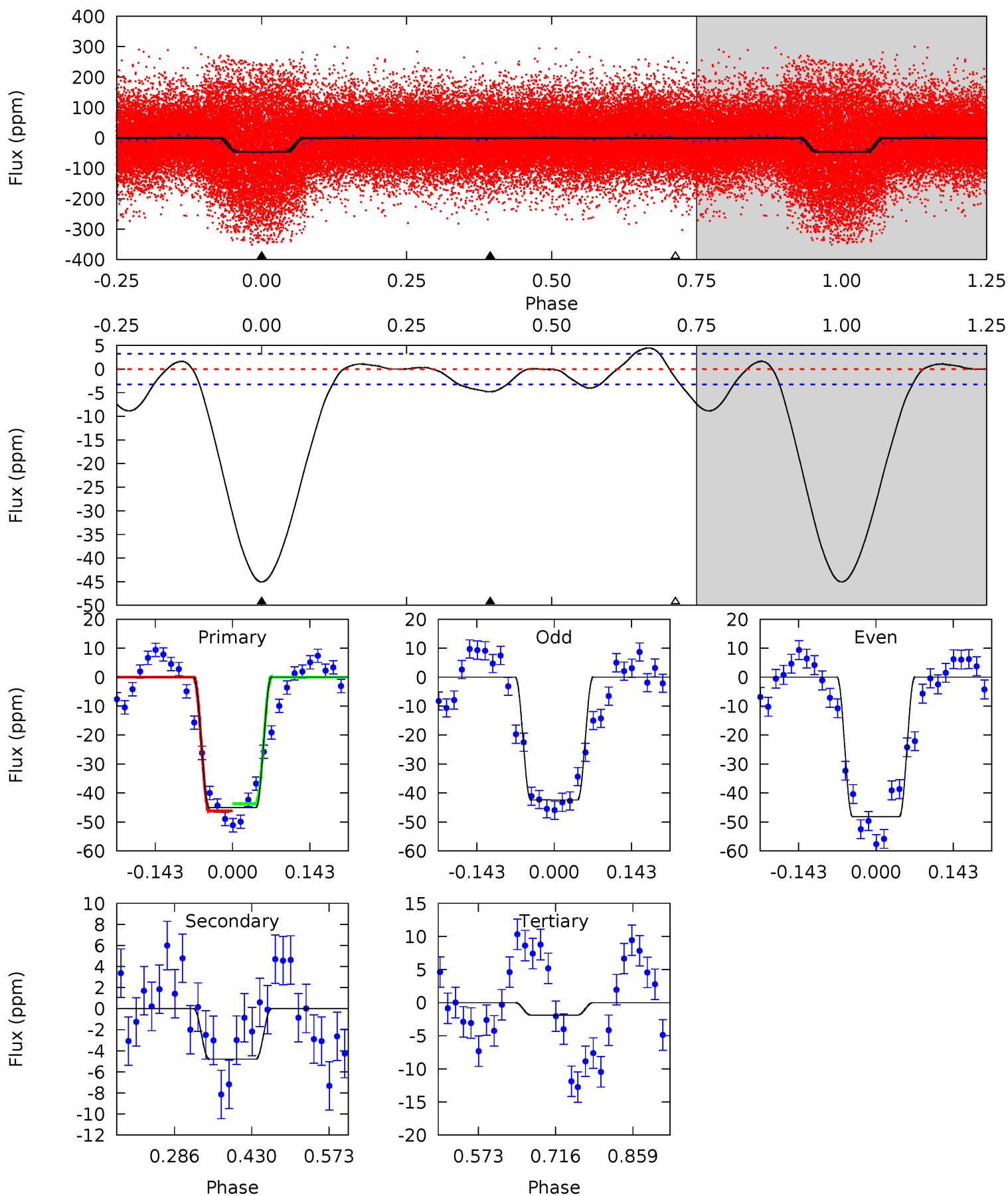
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.4	13.7	0	0	4.42	1.30	1.23	15.4	15.4	13.7	13.7	1.67	0.95	0.32	3.92



Alt Model-Shift Uniqueness Test

006138109-01, P = 1.085731 Days, E = 131.377987 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.3	6.63	2.60	0	4.49	1.46	4.93	59.7	62.3	4.03	6.63	3.96	1.03	0.09	1.72



Stellar Parameters For KIC 006138109

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	7206^{+224}_{-274}	$3.477^{+0.801}_{-0.089}$	$-0.880^{+0.300}_{-0.300}$	$3.919^{+0.640}_{-2.559}$	$1.678^{+0.148}_{-0.629}$	$0.039^{+0.698}_{-0.011}$
	+3%/-4%	+23%/-3%	+34%/-34%	+16%/-65%	+9%/-37%	+1779%/-27%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006138109-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-12 ± 1	$1.52^{+0.43}_{-0.57}$	5325^{+480}_{-968}	6191^{+664}_{-557}	$1.602^{+2.090}_{-0.571}$
Alt.	-5 ± 1	$2.79^{+0.66}_{-1.04}$	5305^{+491}_{-927}	-3705^{+7216}_{-546}	$0.197^{+0.247}_{-0.063}$

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 $A_{obs} \gg 1.0$

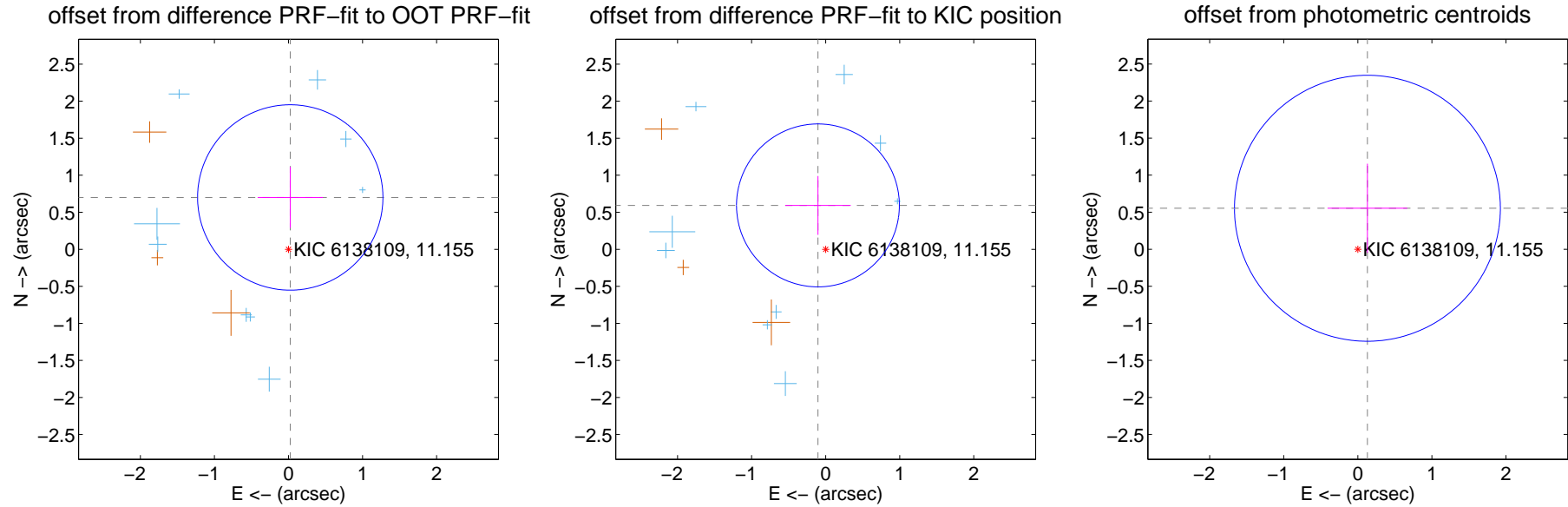
DV Centroid Data

Supplemental centroid analysis for 006138109-01. **Kepler magnitude: 11.15.** Transit SNR 10.39

There are 10 quarters with good PRF difference image offsets

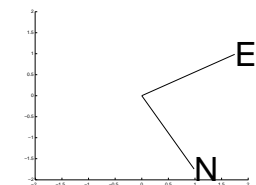
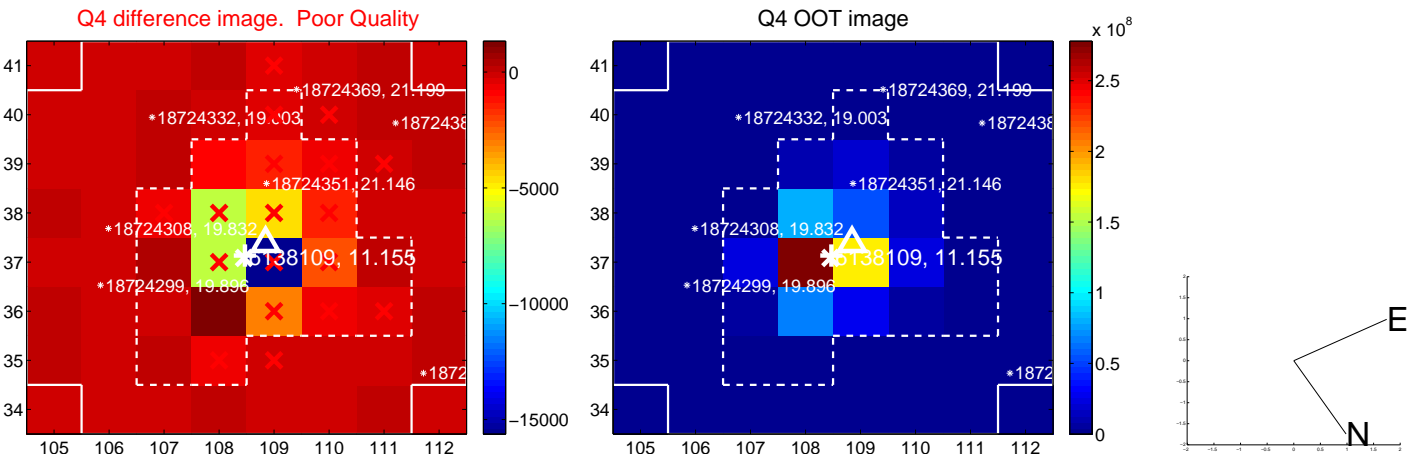
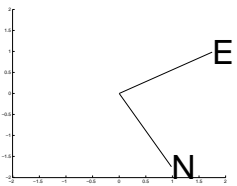
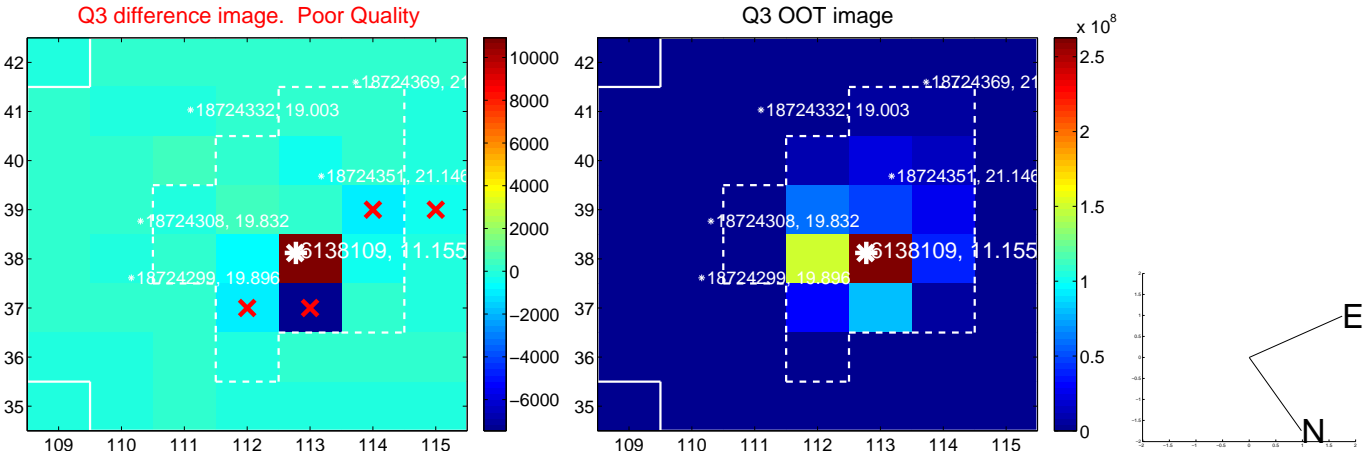
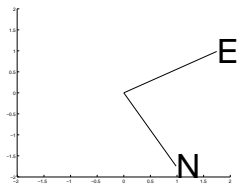
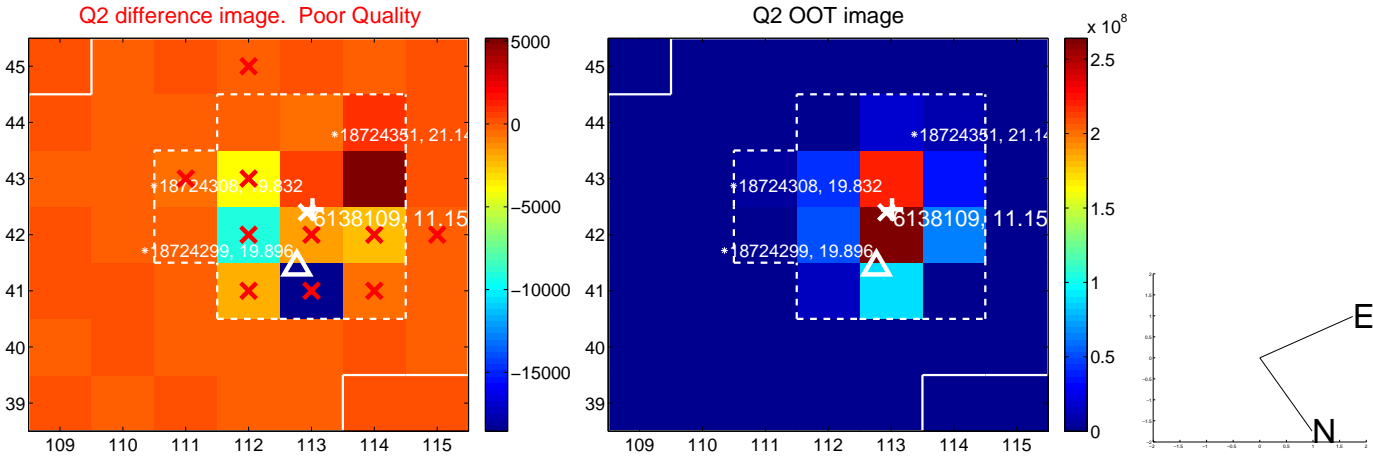
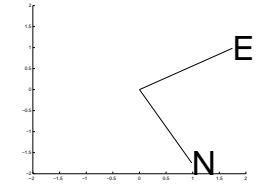
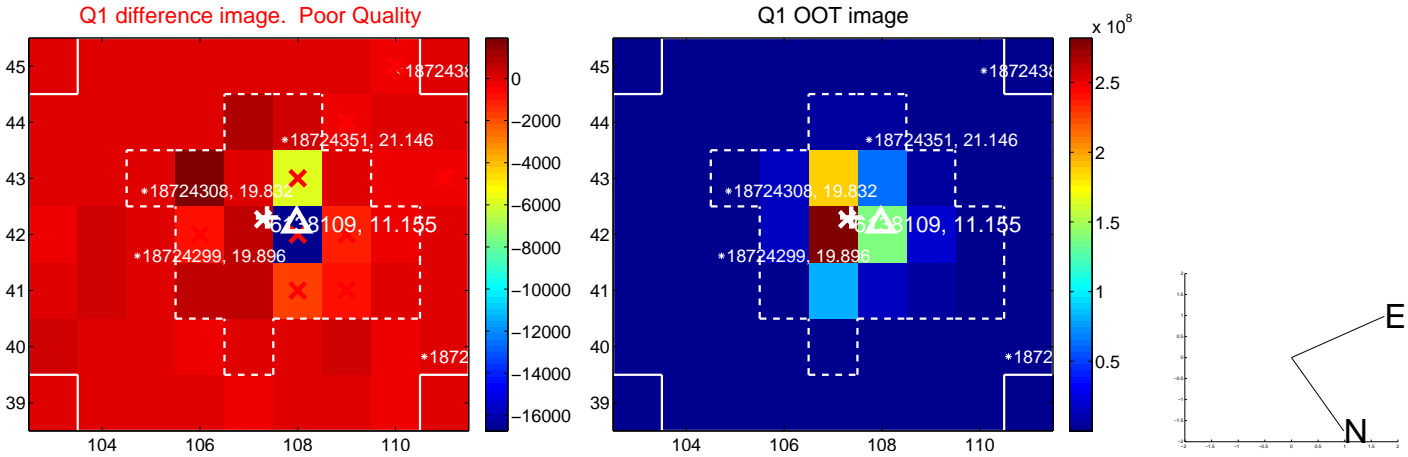
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.701 ± 0.417	1.68	-0.024 ± 0.441	0.700 ± 0.410
PRF-fit source offset from KIC position	0.602 ± 0.367	1.64	0.104 ± 0.443	0.593 ± 0.398
photometric centroid source offset	0.57 ± 0.60	0.95	-0.13 ± 0.54	0.55 ± 0.60

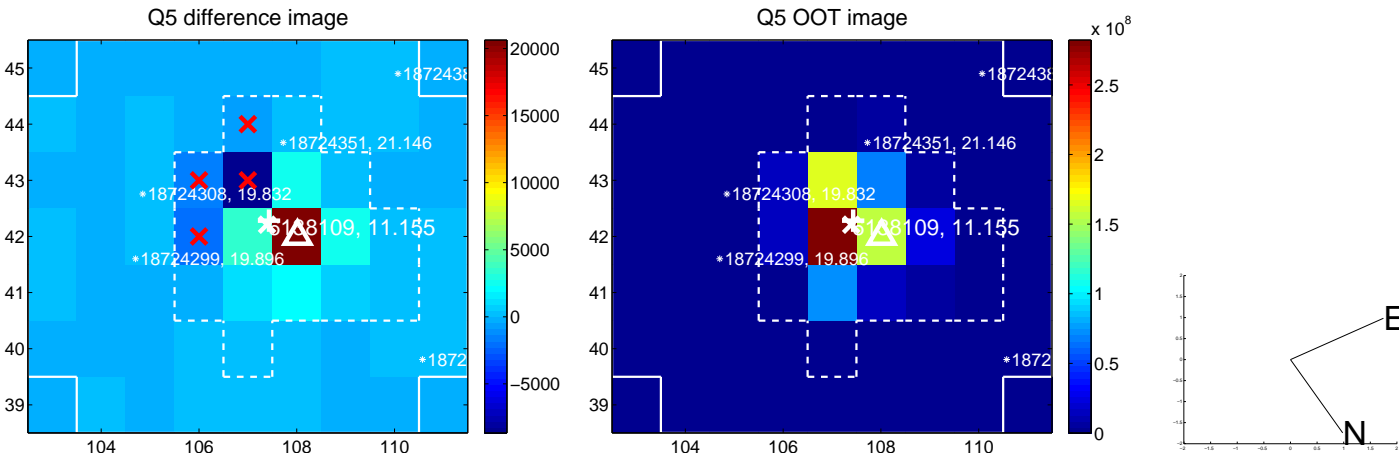


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

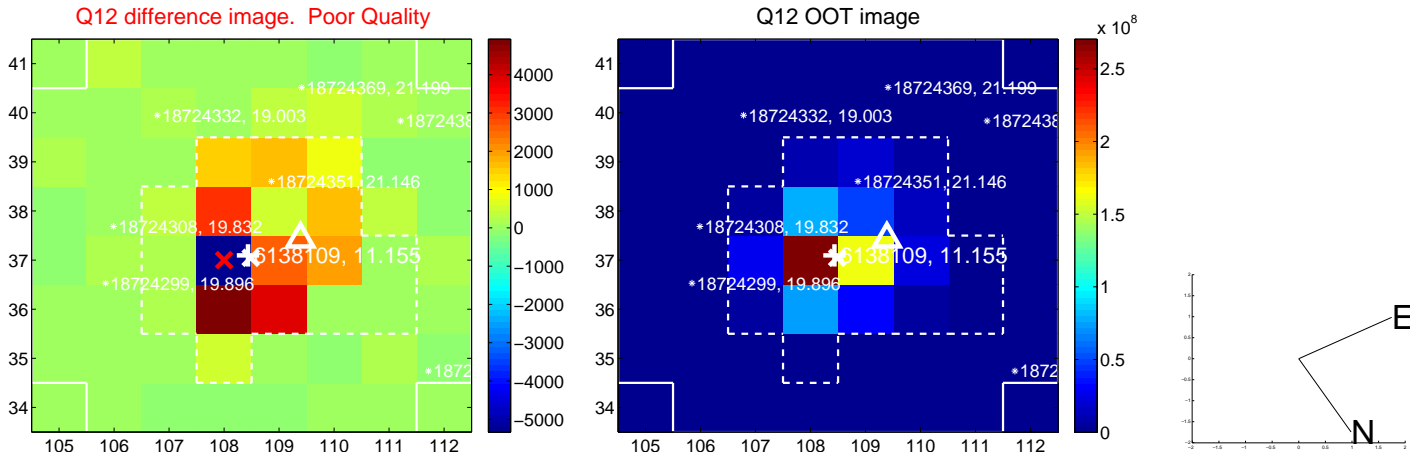
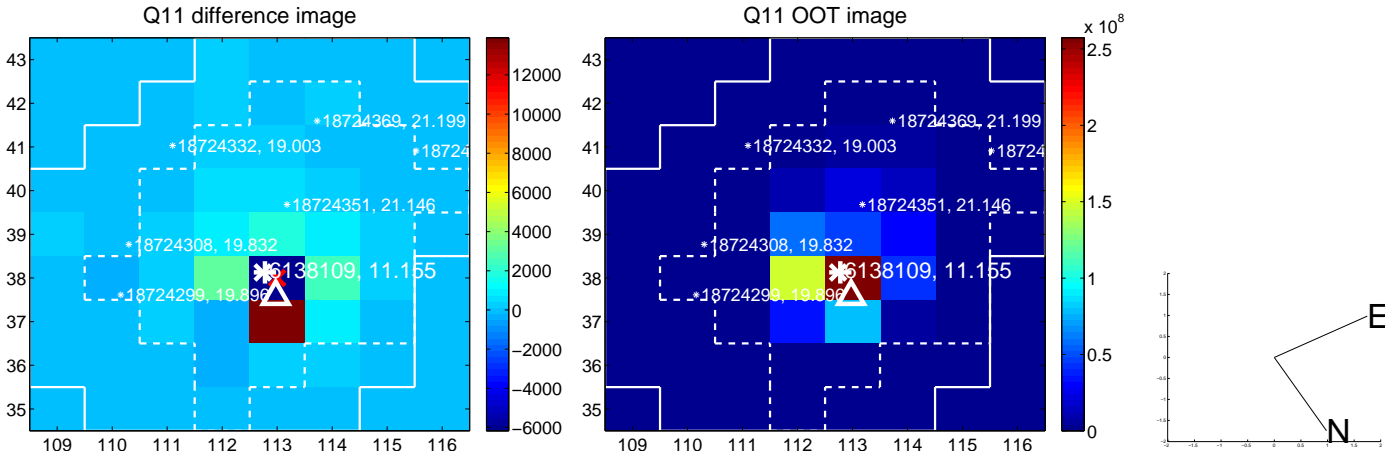
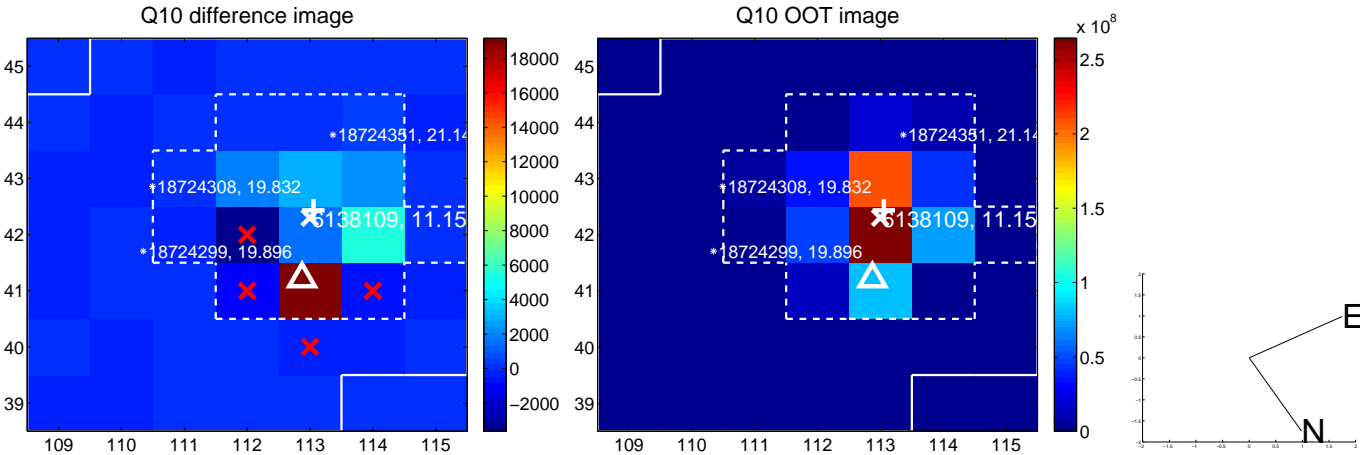
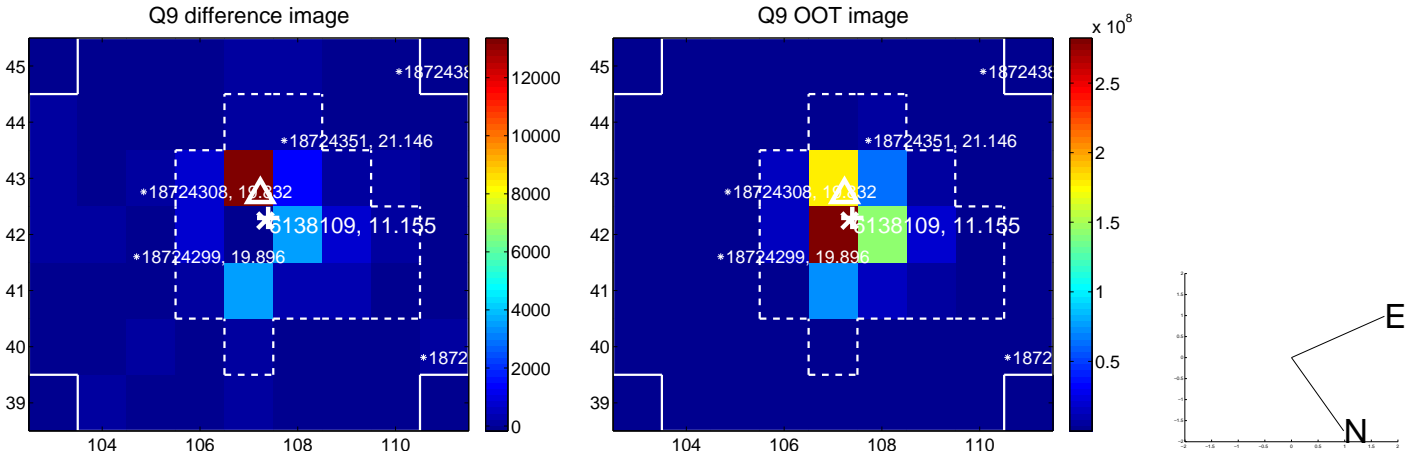
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



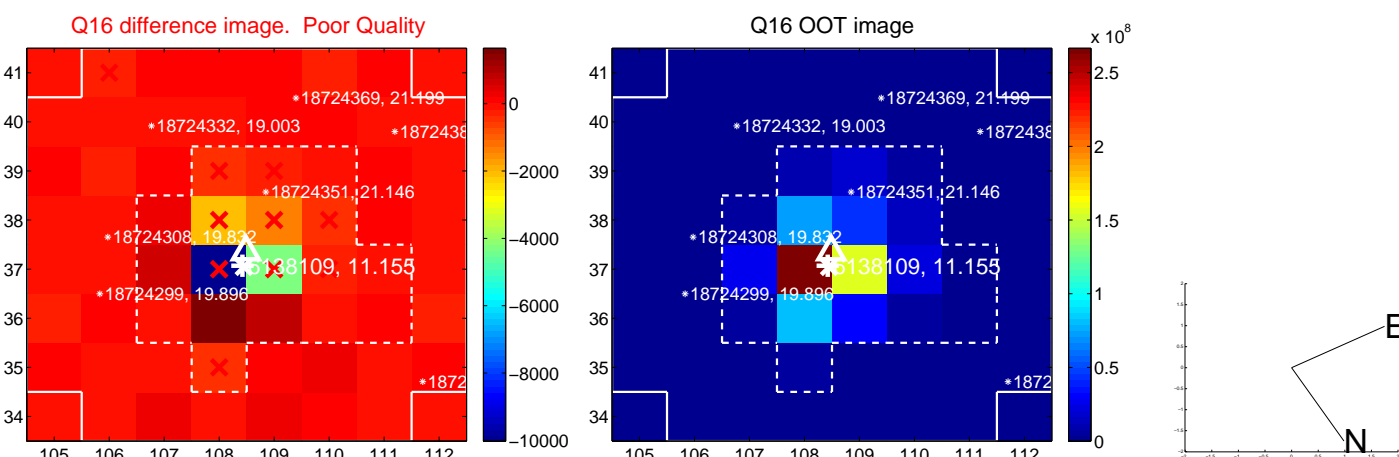
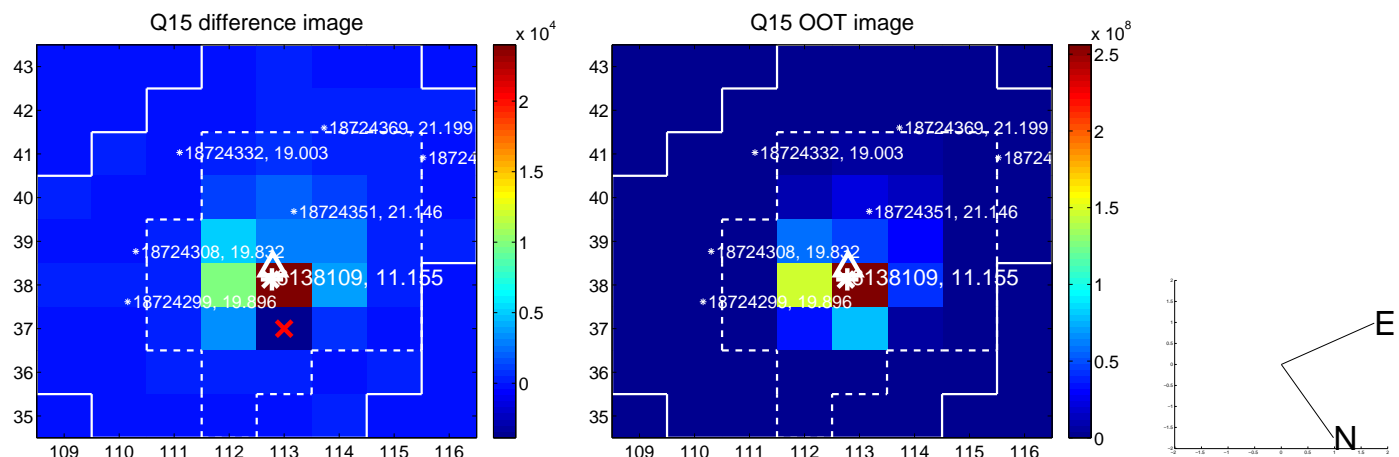
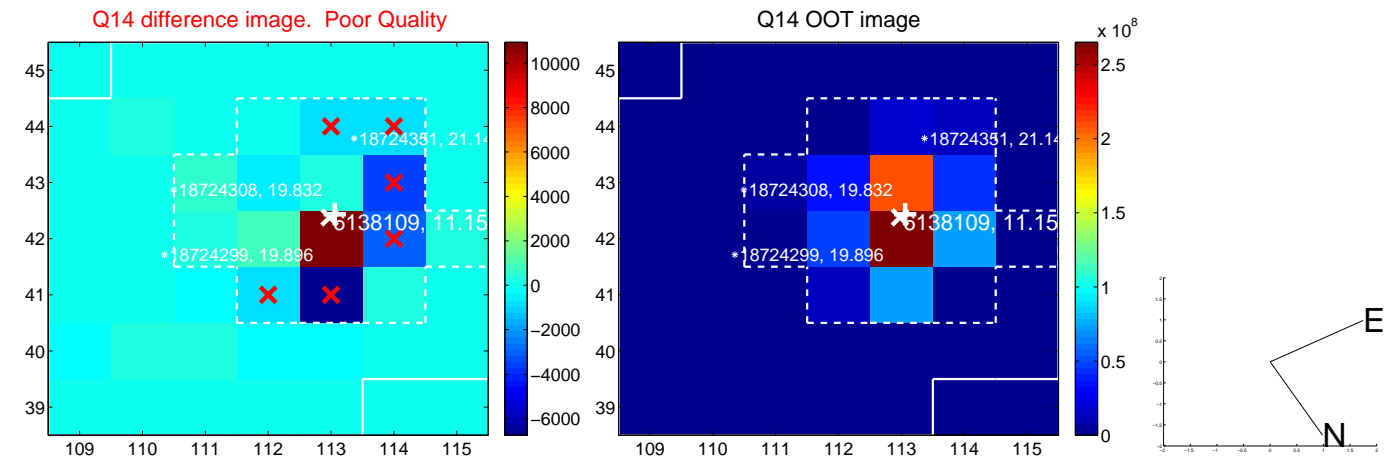
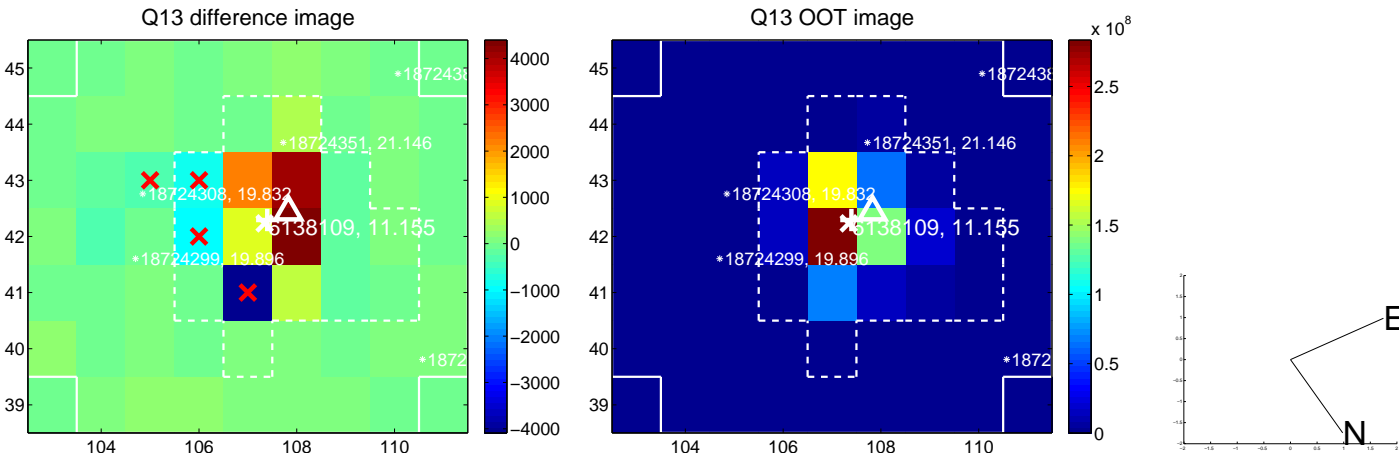
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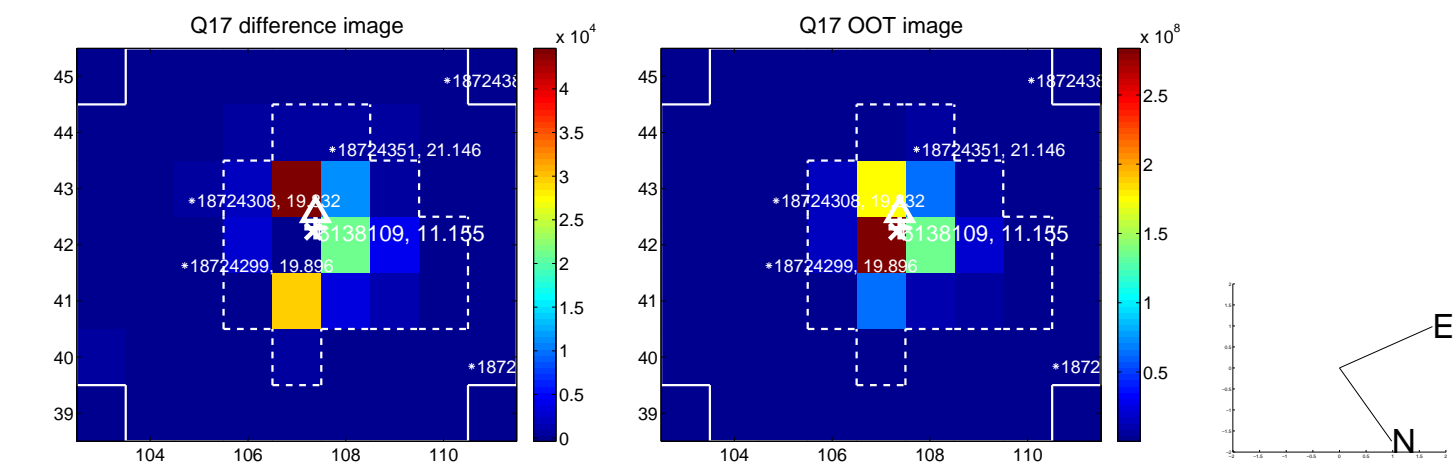
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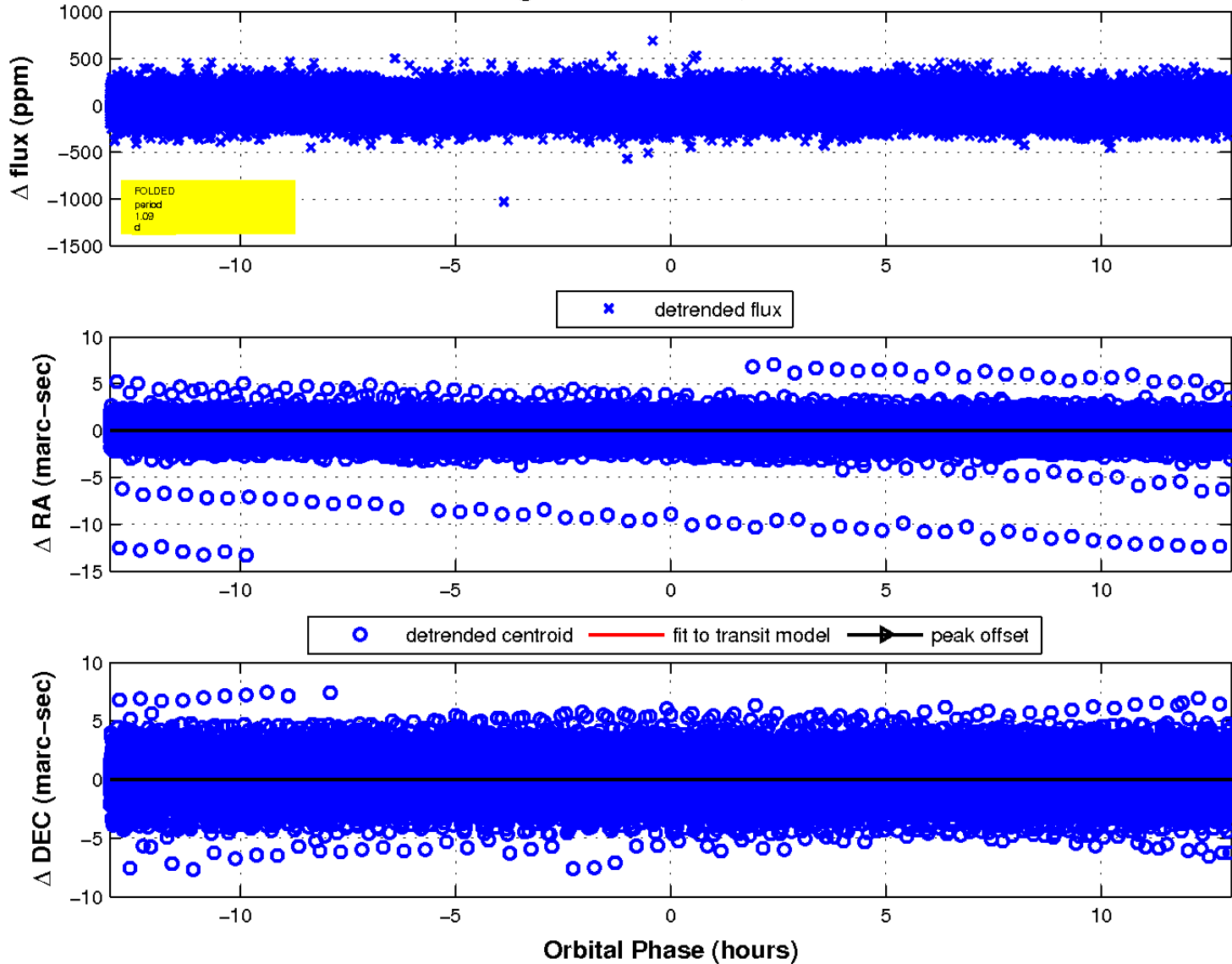
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

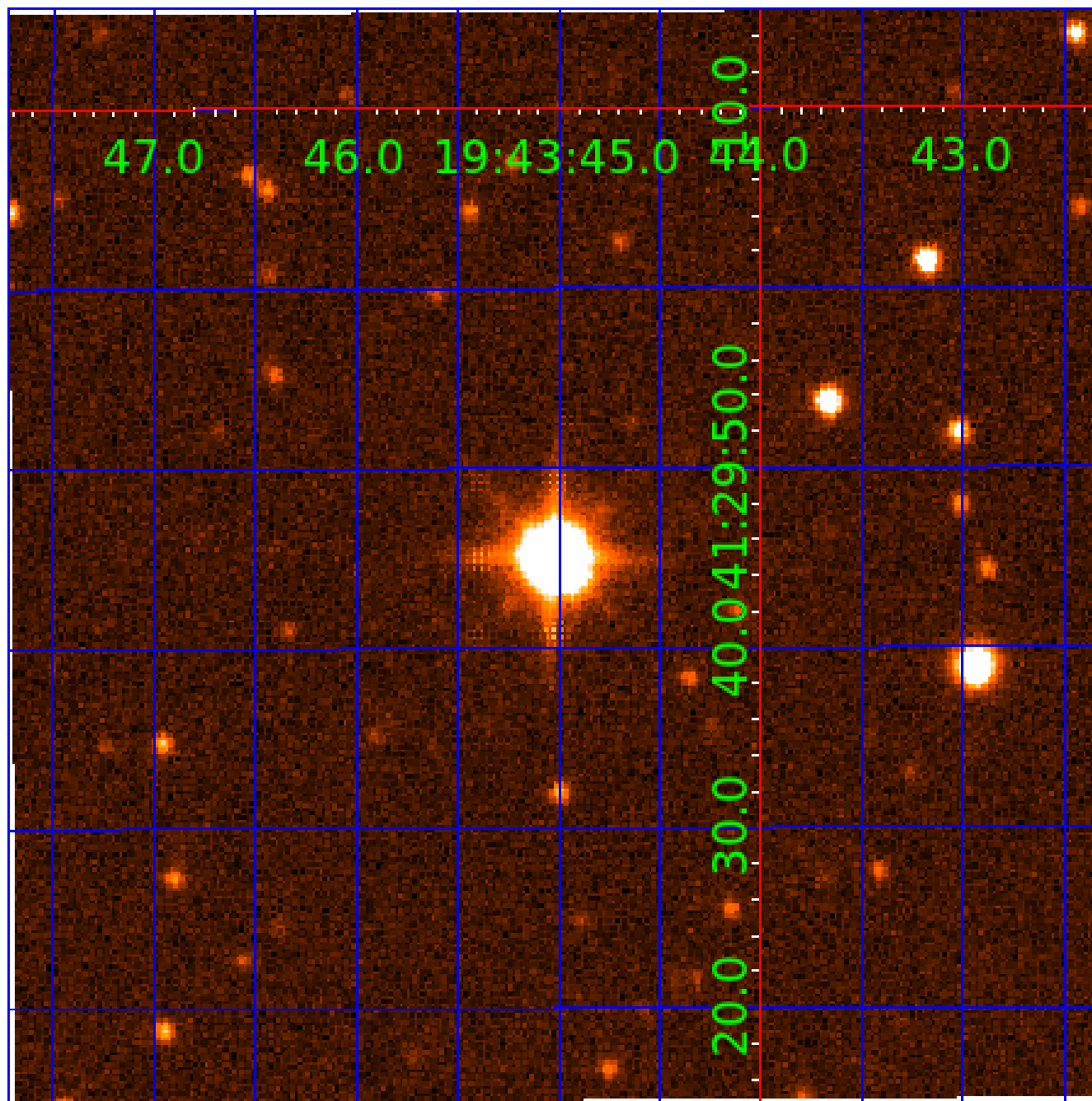


fluxWeightedCentroids, Planet 1 of 5



UKIRT Image

Declination



KIC 006138109

Q1-17 DR25 TCE Parameters

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006138109-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
006138109-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

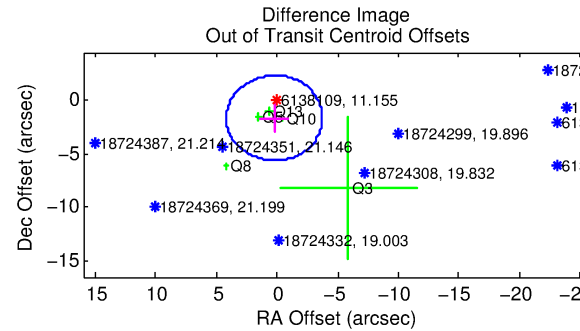
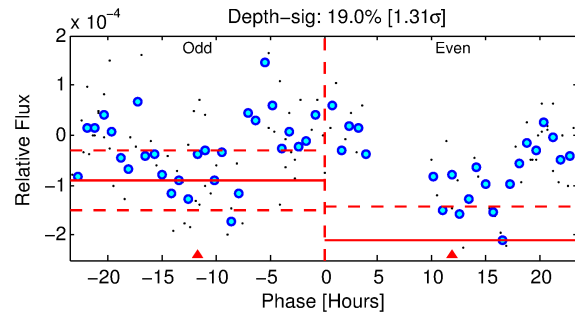
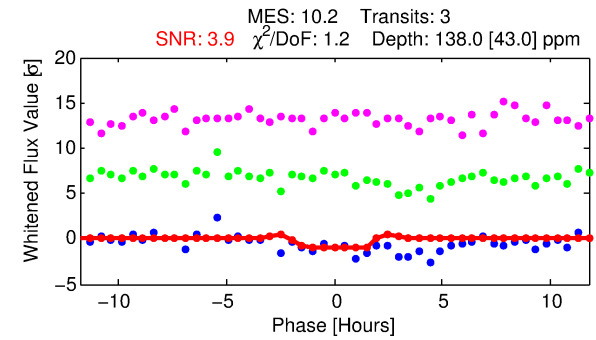
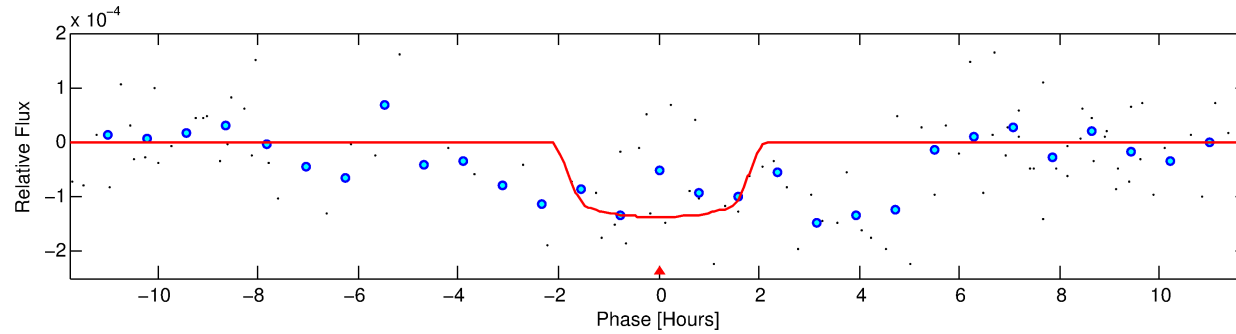
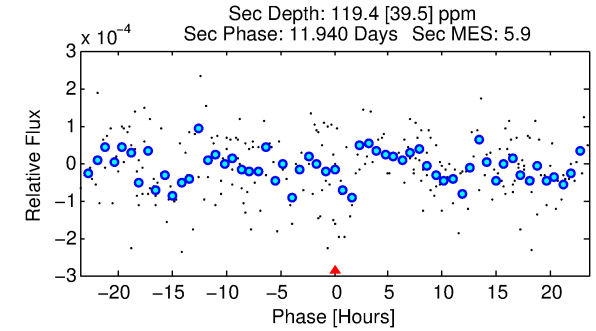
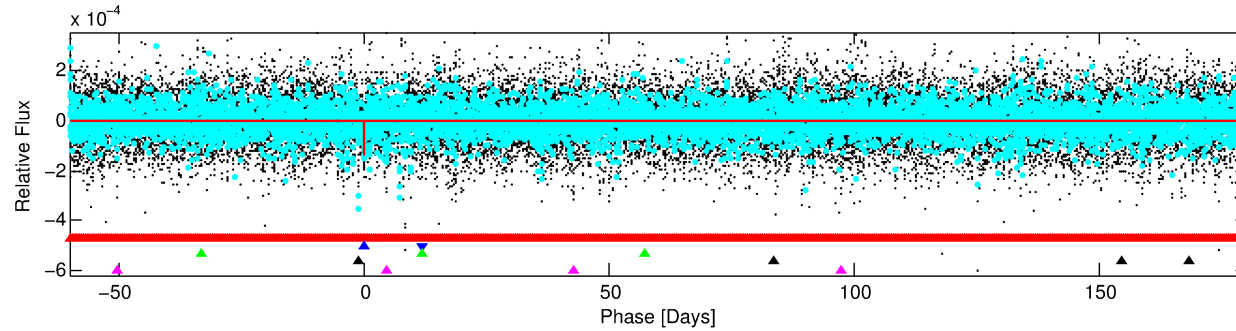
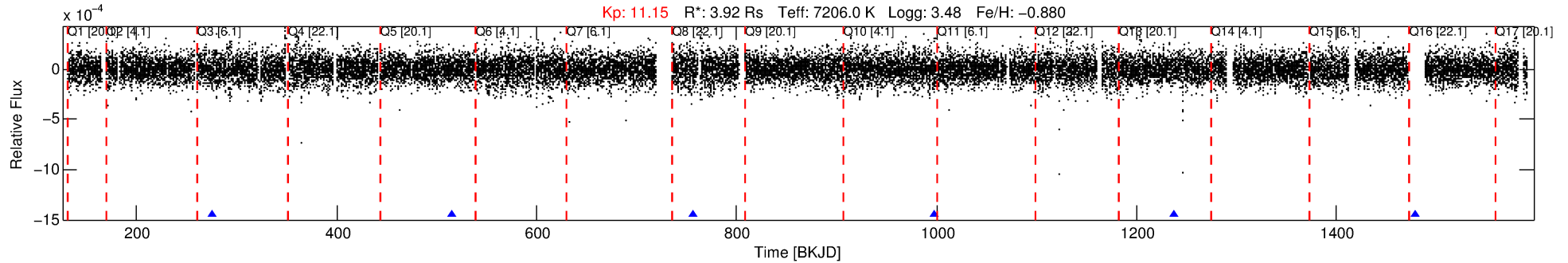
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006138109-02

No Significant Match Found

DV One-Page Summary

KIC: 6138109 Candidate: 2 of 5 Period: 240.657 d



DV Fit Results:

Period = 240.65651 [0.00645] d
Epoch = 275.1071 [0.0123] BKJD
Rp/R* = 0.0125 [0.0086]
a/R* = 213.76 [883.58]
b = 0.90 [0.83]
Seff = 45.77 [60.11]
Teq = 663 [218] K
Rp = 5.36 [5.08] Re
a = 0.9004 [0.6782] AU
Ag = 1854.15 [3562.19] [0.52σ]
Teffp = 6729 [2387] K [2.53σ]

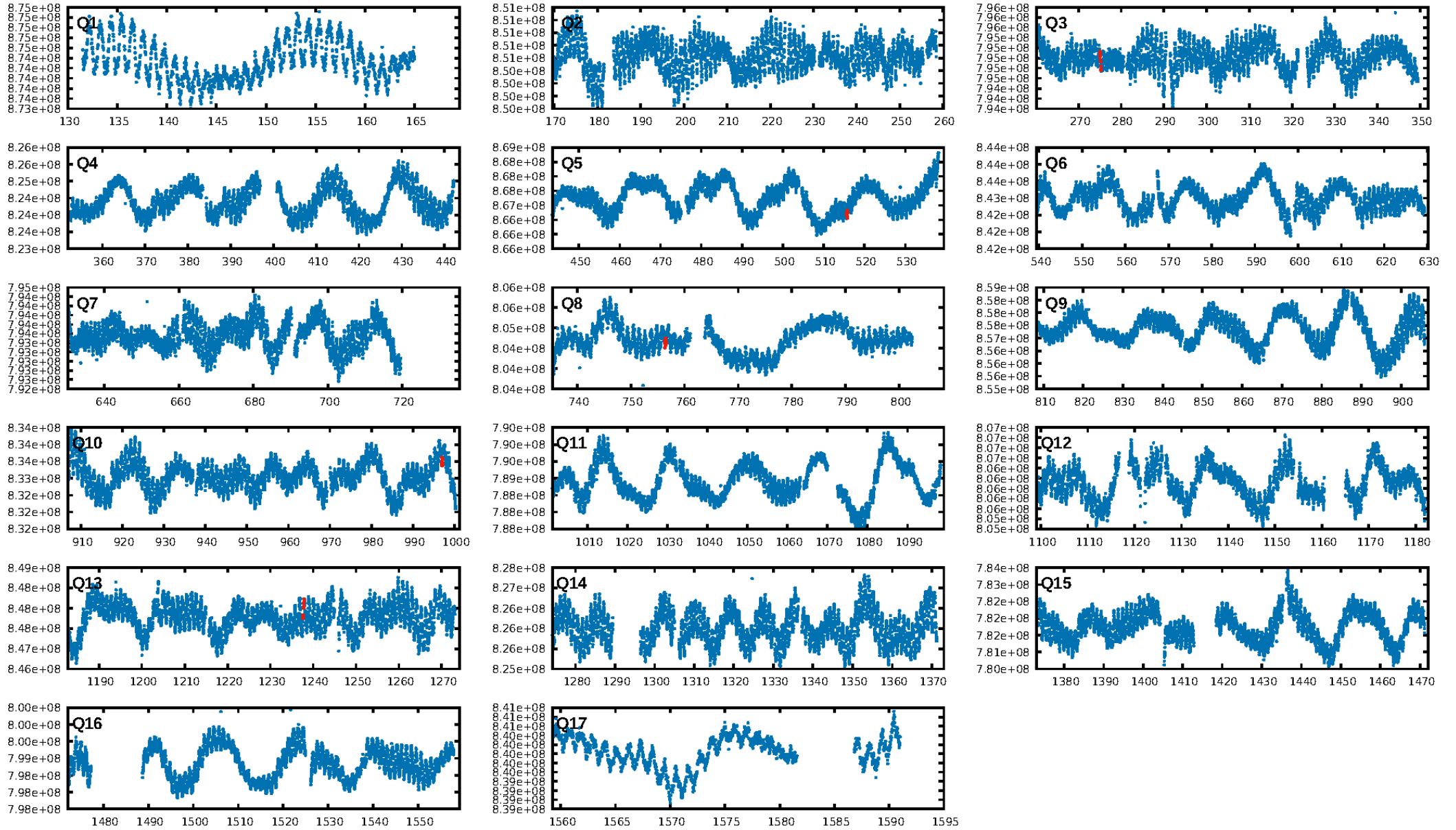
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [951.76σ]
LongPeriod-sig: 100.0% [436.45σ]
ModelChiSquare2-sig: 0.8%
ModelChiSquareGof-sig: 95.8%
Bootstrap-pfa: 2.98e-20
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.5628
Centroid-sig: 1.9%
Centroid-so: 2.848 arcsec [2.32σ]
OotOffset-rm: 1.657 arcsec [1.25σ]
KicOffset-rm: 1.891 arcsec [1.44σ]
OotOffset-st: 1/1/1/2 [5]
KicOffset-st: 1/1/1/2 [5]
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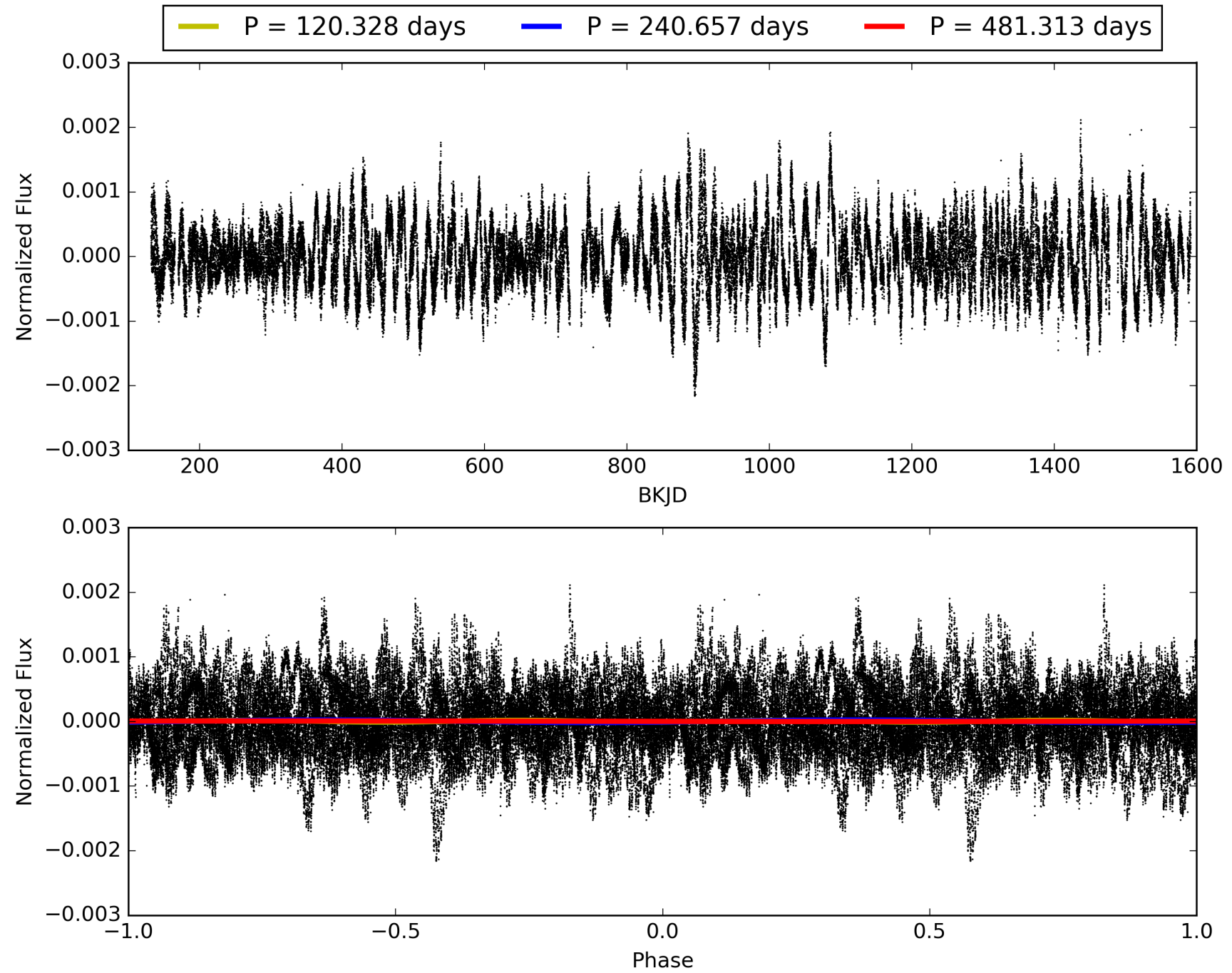
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006138109-02, PDC Light Curves

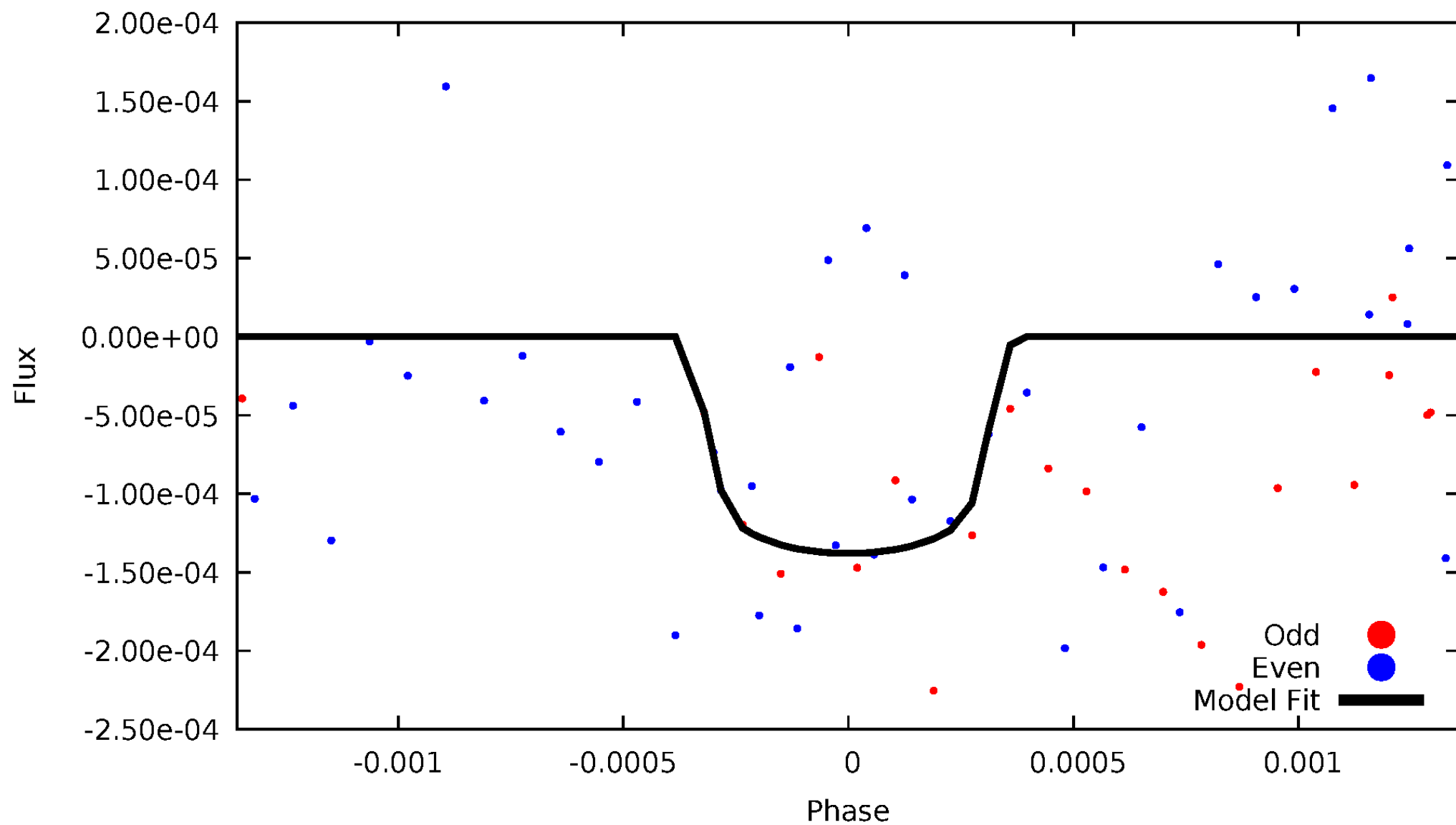


TCE 006138109-02



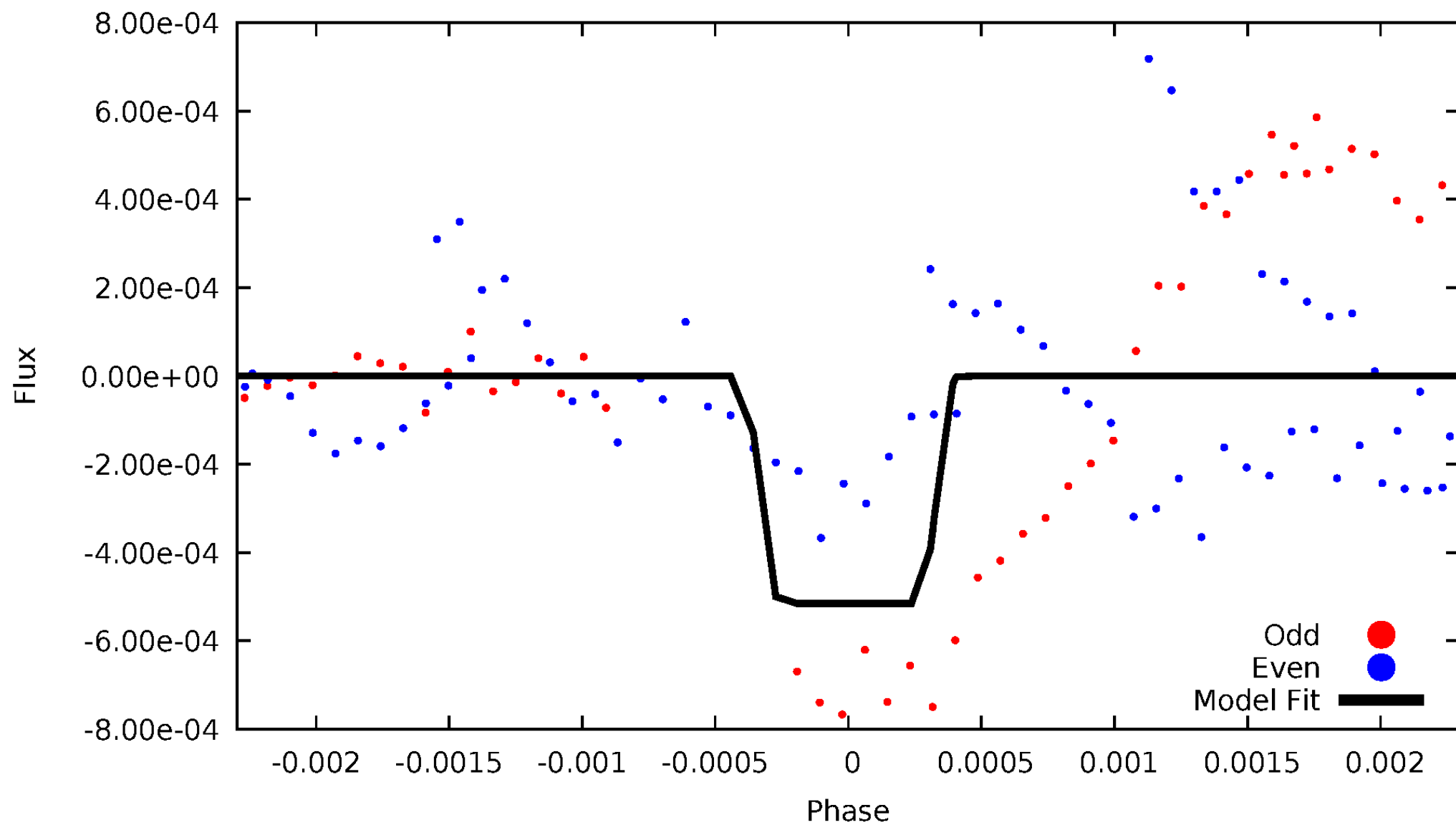
DV Odd/Even

TCE 006138109-02



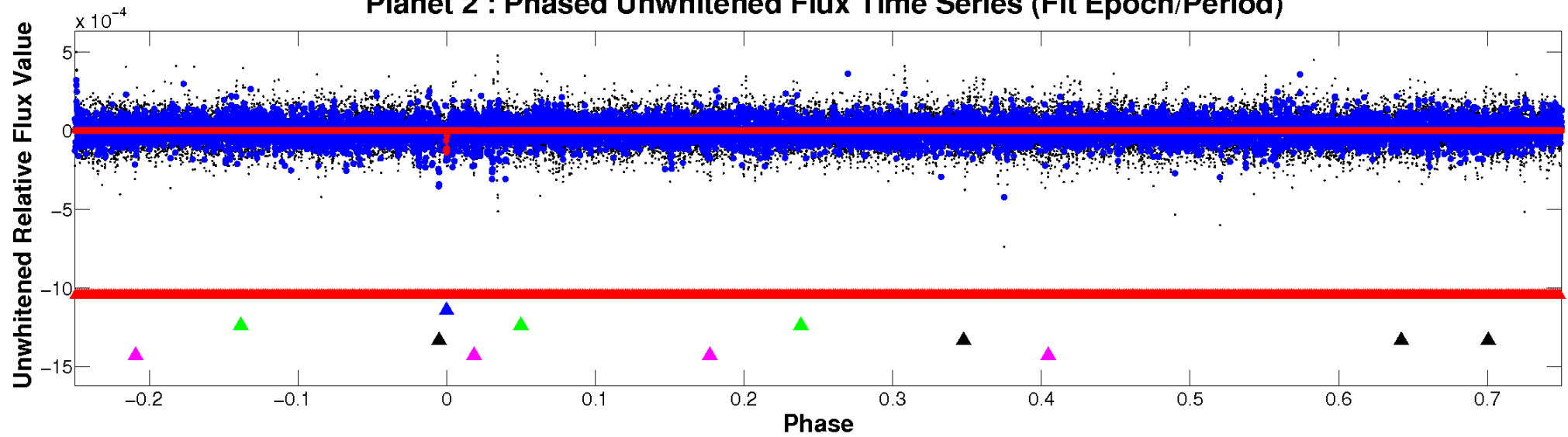
ALT Odd/Even

TCE 006138109-02

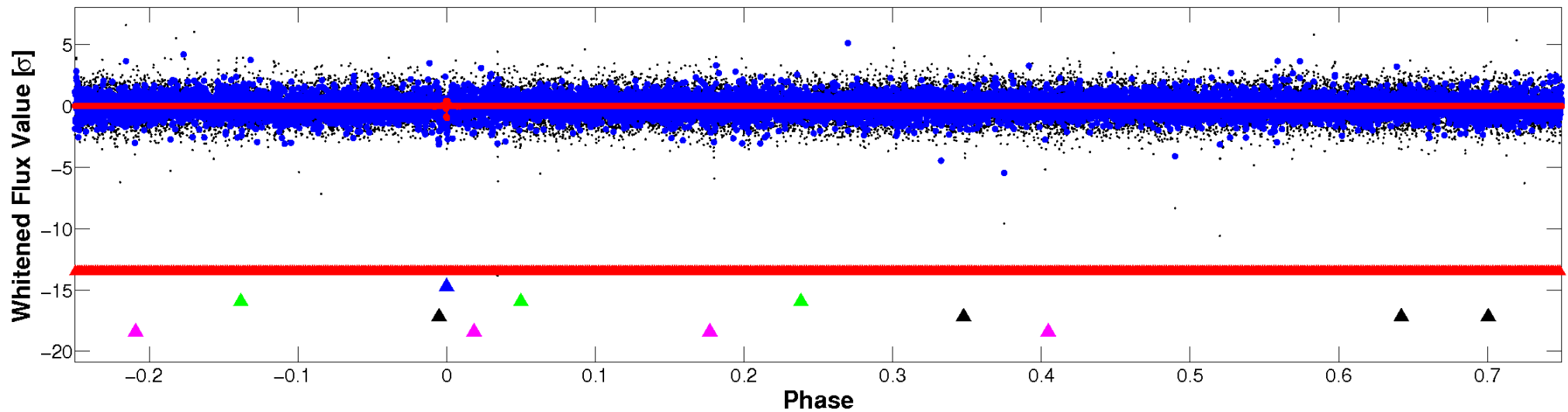


Non-Whitened Vs. Whitened Light Curve

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

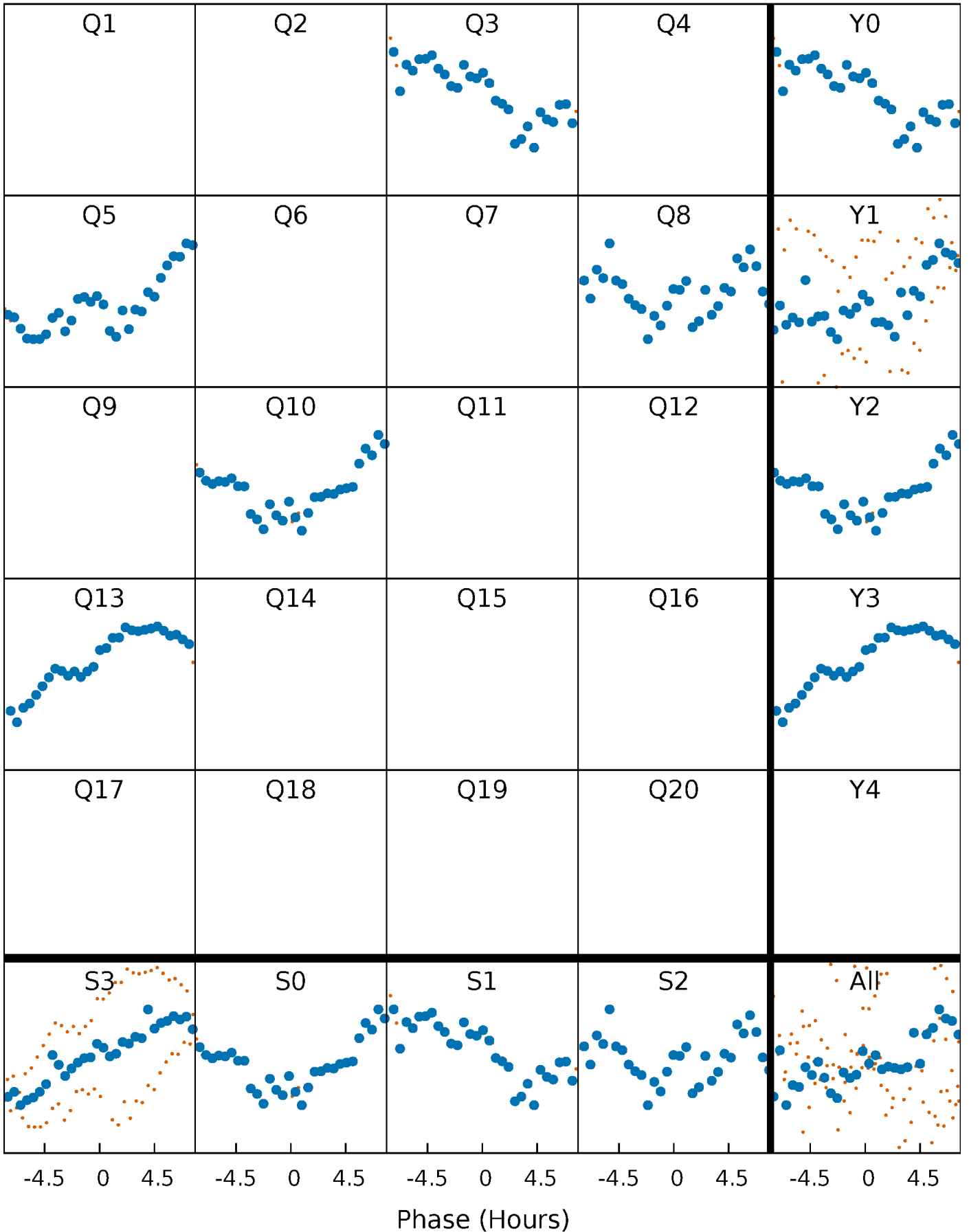


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



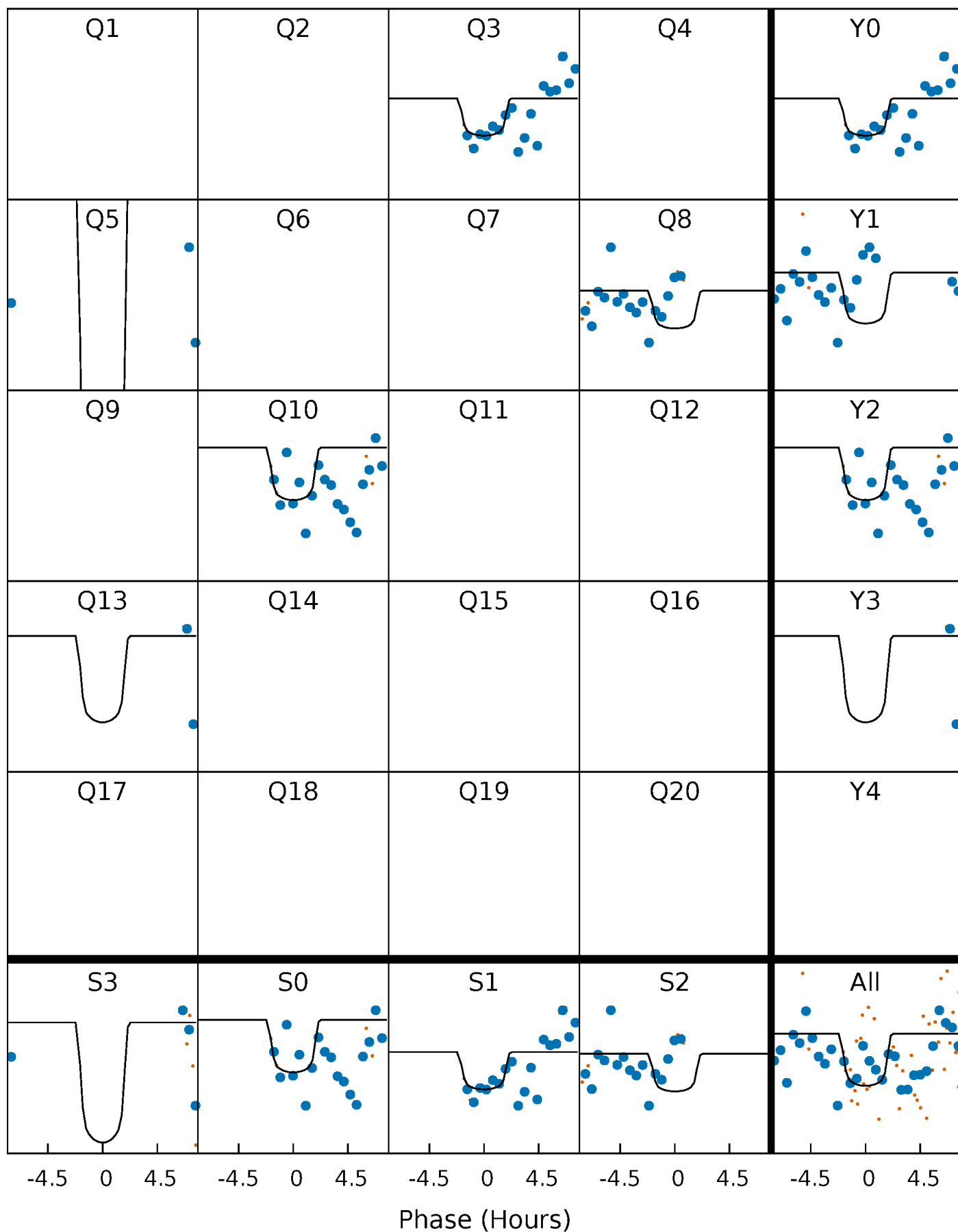
PDC Quarter-Phased Transit Curves

TCE 006138109-02 $P=240.656511$ Days $T_0=275.107126$ (BKJD)



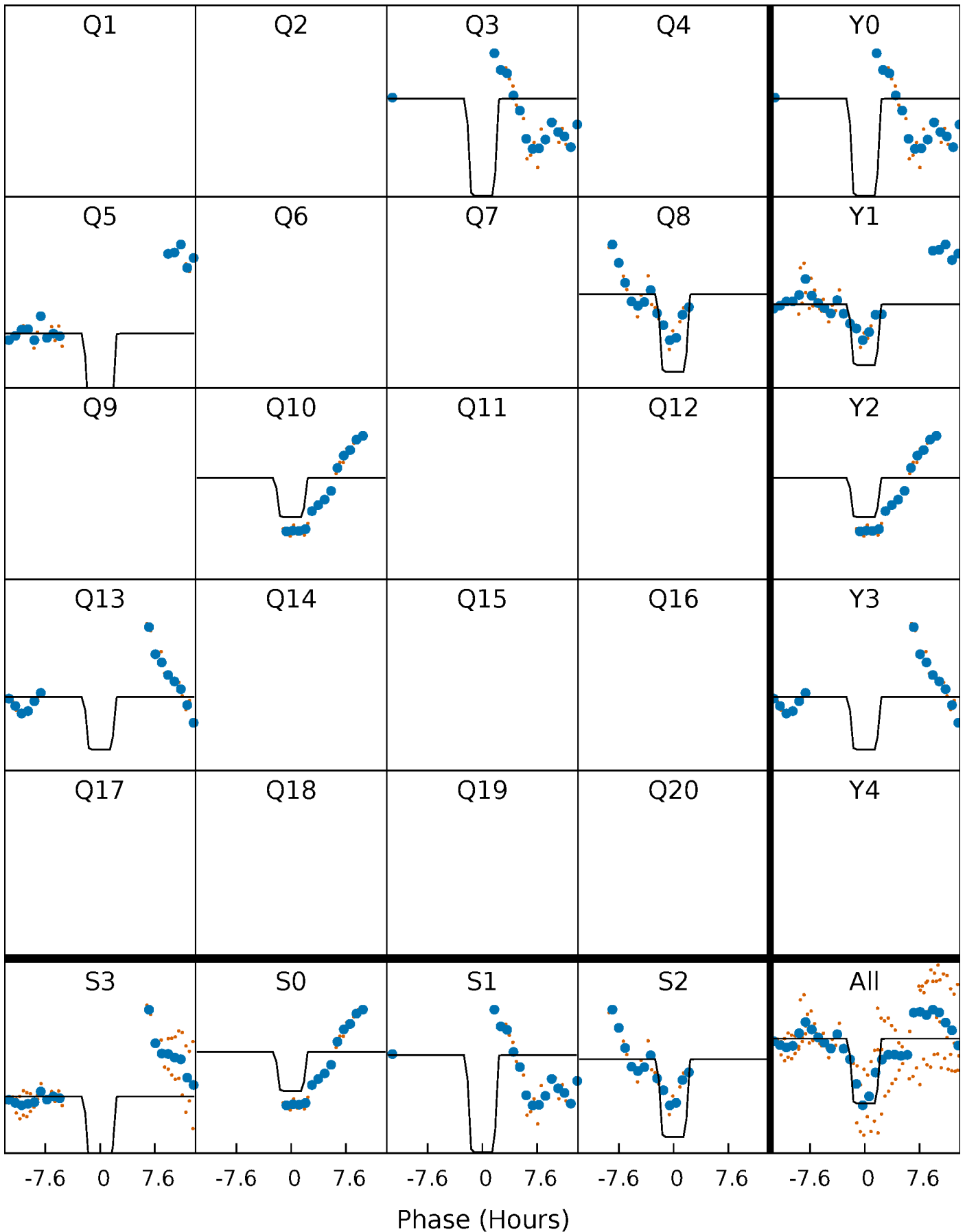
DV Quarter-Phased Transit Curves

TCE 006138109-02 P=240.656511 Days $T_0=275.107126$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

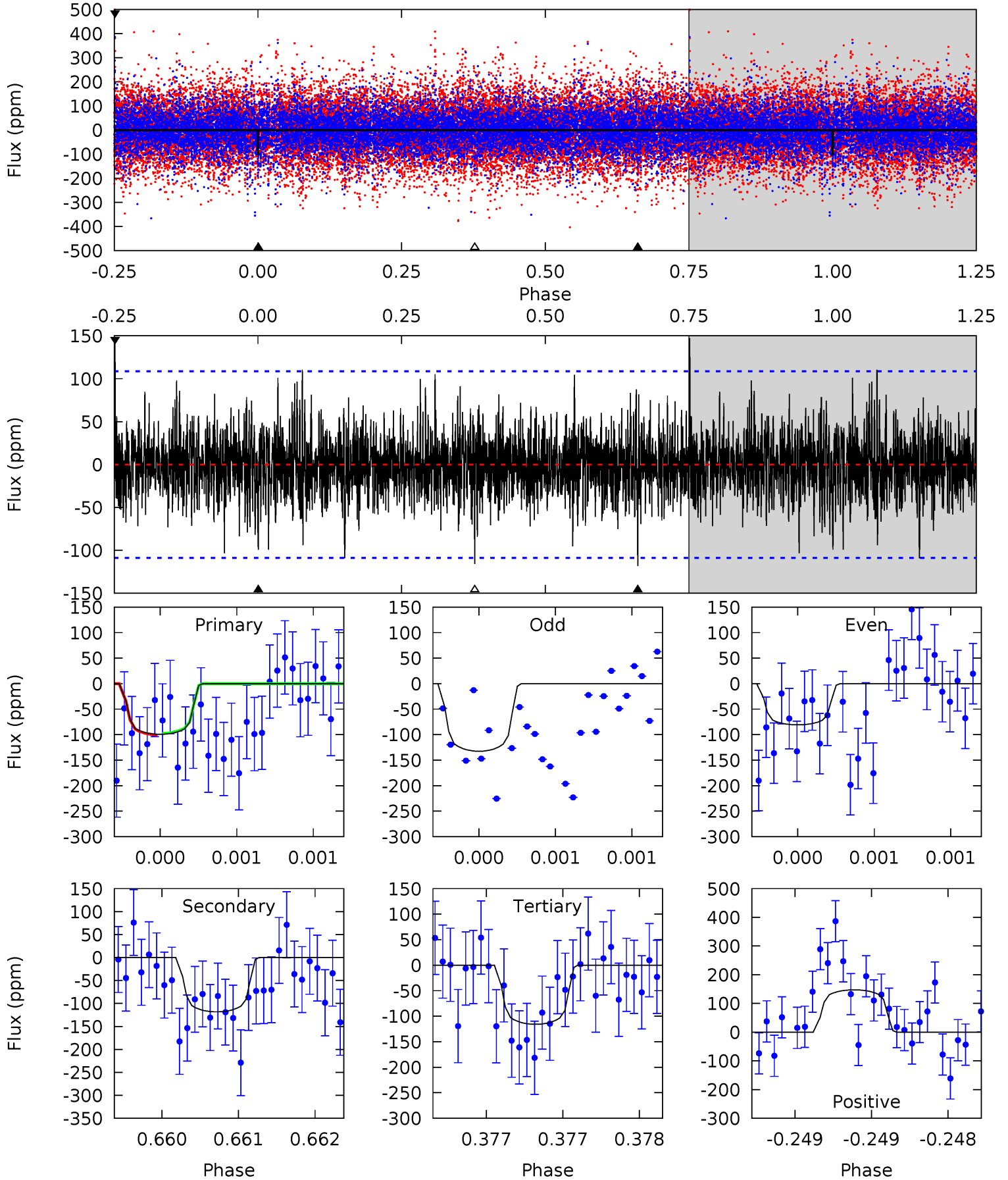
TCE 006138109-02 P=240.693714 Days $T_0=274.964917$ (BKJD)



DV Model-Shift Uniqueness Test

006138109-02, $P = 240.656511$ Days, $E = 34.450615$ Days

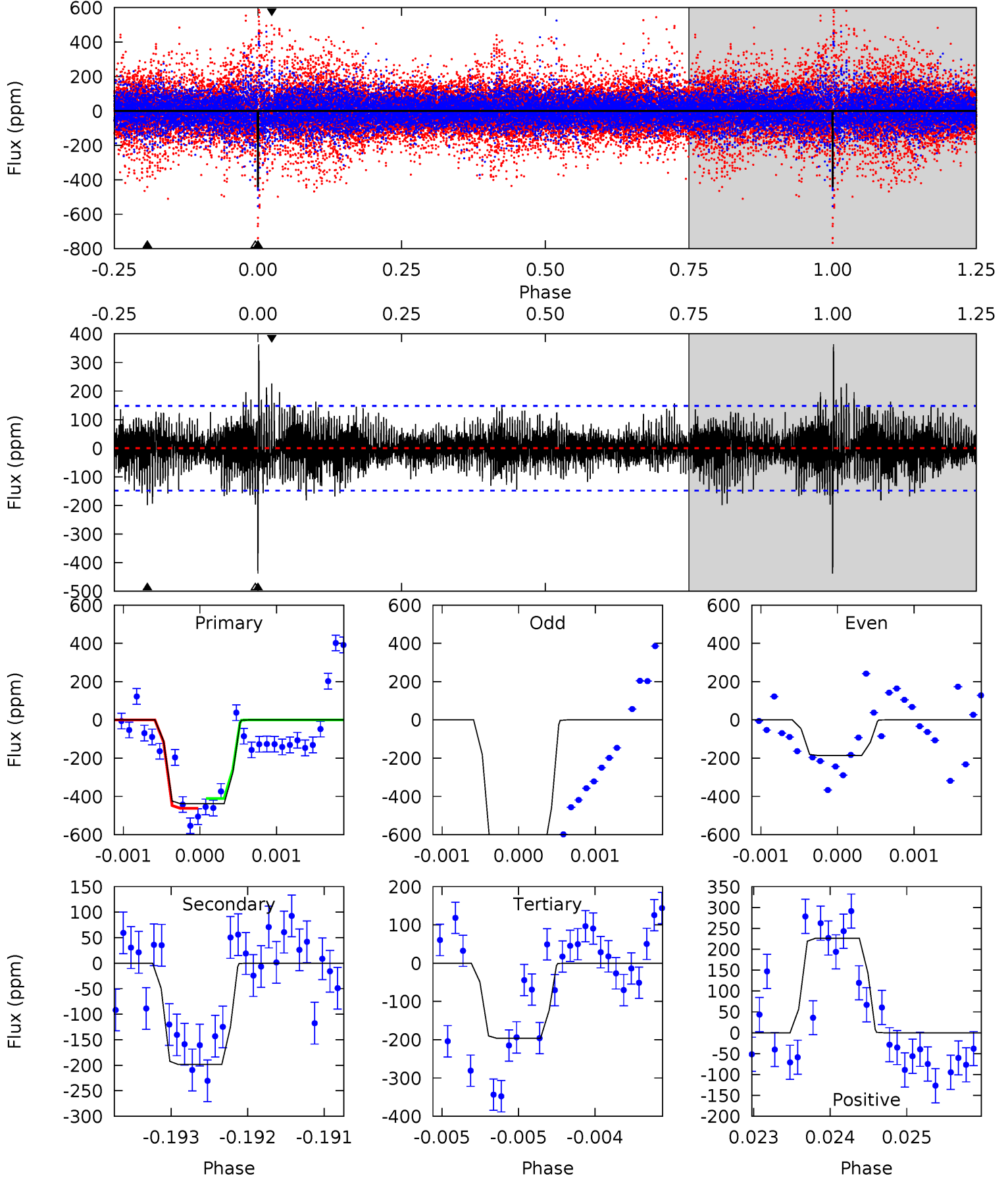
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.03	5.99	5.87	7.46	5.51	3.38	1.46	-0.84	-2.44	0.12	-1.48	1.26	0.70	0.55	0.07



Alt Model-Shift Uniqueness Test

006138109-02, P = 240.693714 Days, E = 34.271203 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	7.38	7.29	8.42	5.50	3.37	1.76	8.98	7.85	0.08	-1.04	10.8	0.93	0.45	0.94



Stellar Parameters For KIC 006138109

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	7206^{+224}_{-274}	$3.477^{+0.801}_{-0.089}$	$-0.880^{+0.300}_{-0.300}$	$3.919^{+0.640}_{-2.559}$	$1.678^{+0.148}_{-0.629}$	$0.039^{+0.698}_{-0.011}$
	+3%/-4%	+23%/-3%	+34%/-34%	+16%/-65%	+9%/-37%	+1779%/-27%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006138109-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-118 ± 20	$4.55^{+3.88}_{-2.61}$	883^{+69}_{-147}	6472^{+4327}_{-1423}	2484^{+10726}_{-1755}
Alt.	-198 ± 27	$7.93^{+4.25}_{-3.77}$	880^{+74}_{-155}	5595^{+1704}_{-764}	1378^{+3685}_{-783}

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 $A_{obs} \gg 1.0$

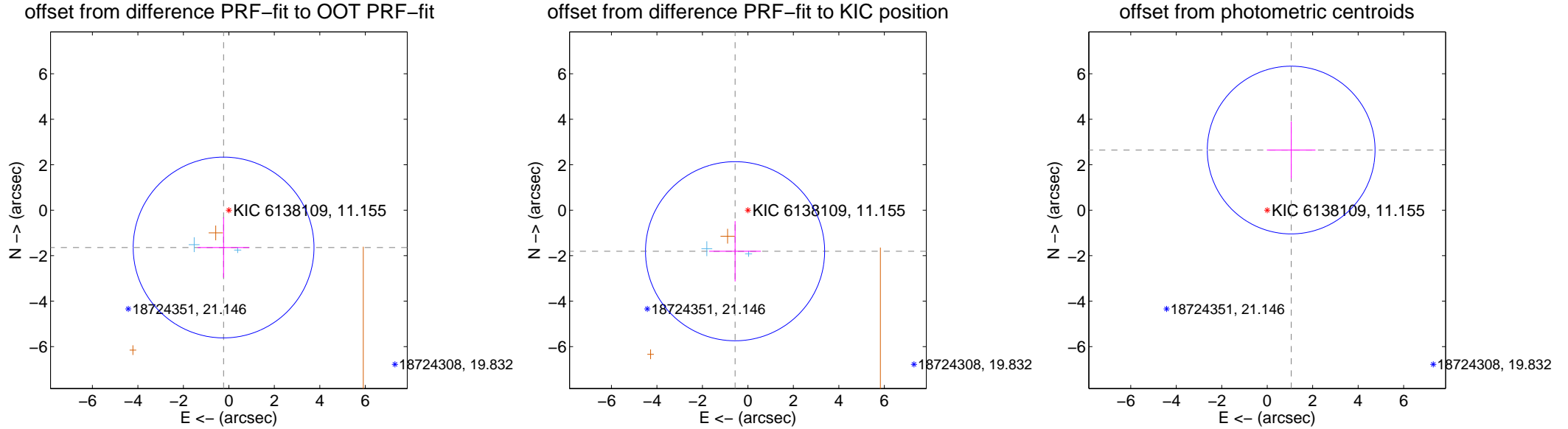
DV Centroid Data

Supplemental centroid analysis for 006138109-02. **Kepler magnitude: 11.15.** Transit SNR 3.92

There are 2 quarters with good PRF difference image offsets

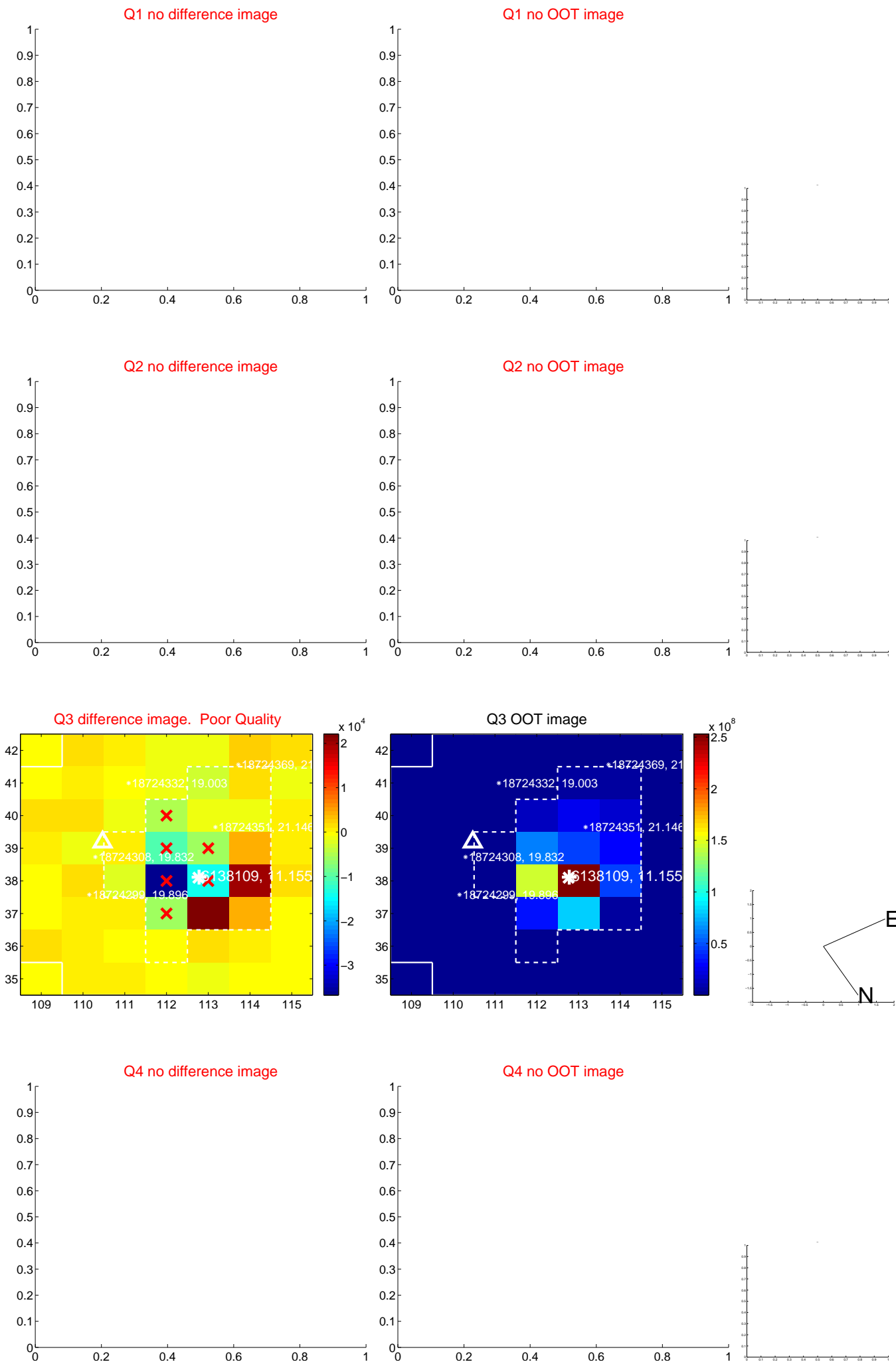
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.657 ± 1.325	1.25	0.231 ± 1.137	-1.641 ± 1.329
PRF-fit source offset from KIC position	1.891 ± 1.313	1.44	0.563 ± 1.137	-1.805 ± 1.329
photometric centroid source offset	2.85 ± 1.23	2.32	-1.05 ± 1.07	2.65 ± 1.25

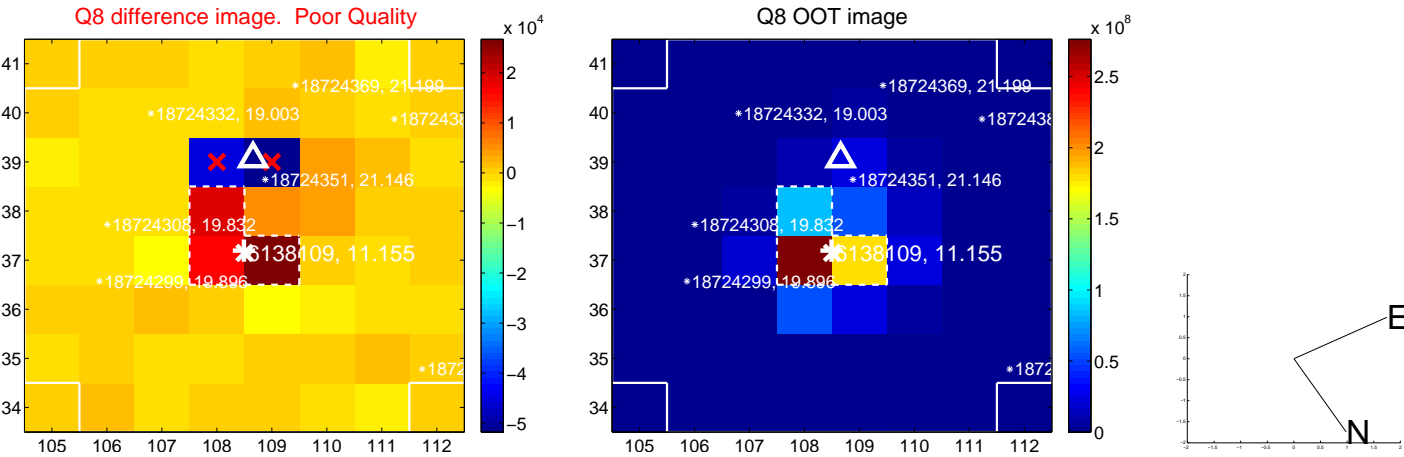
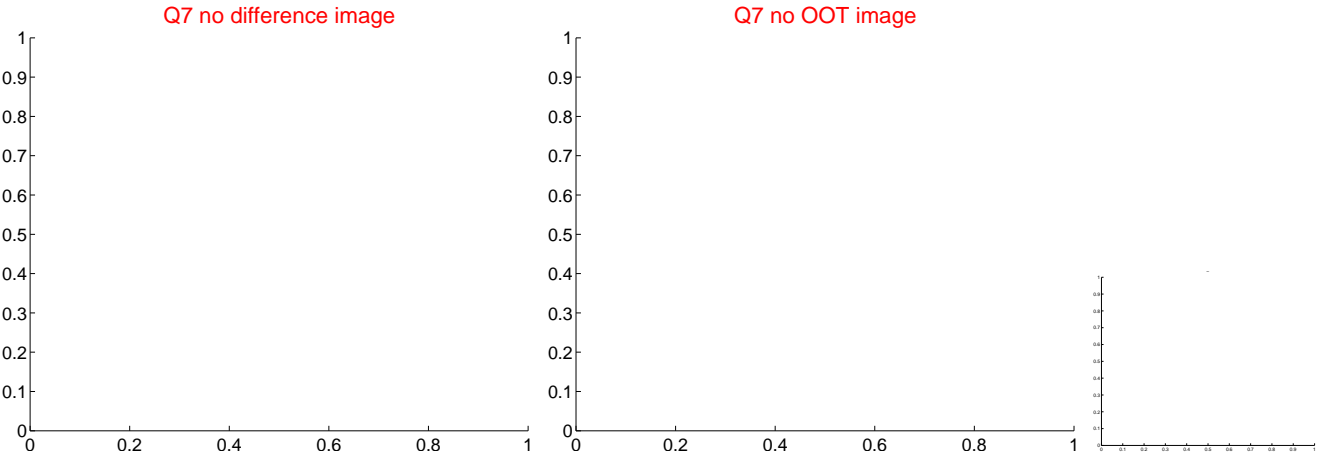
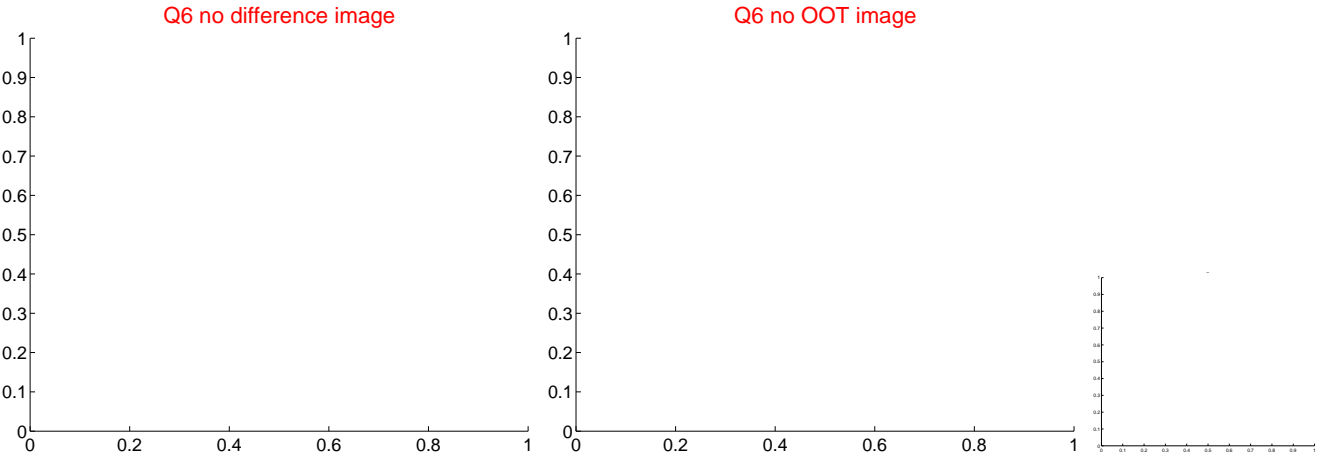
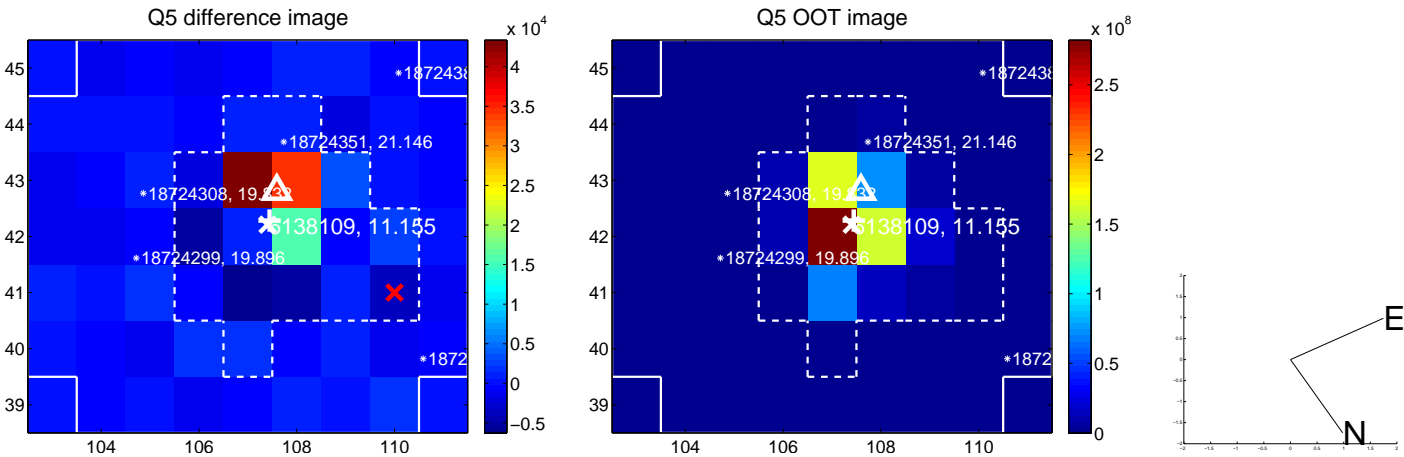


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

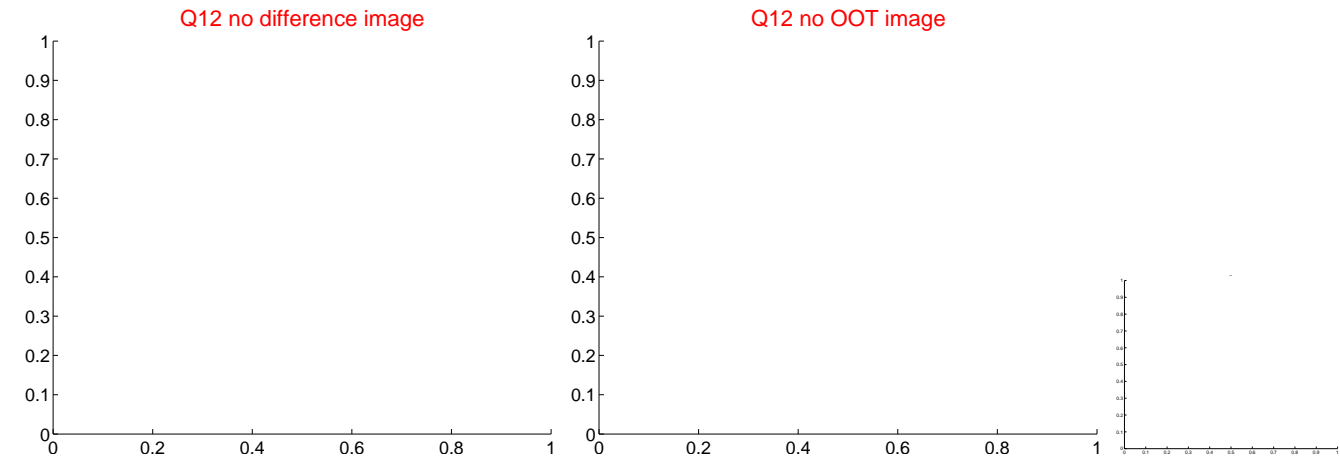
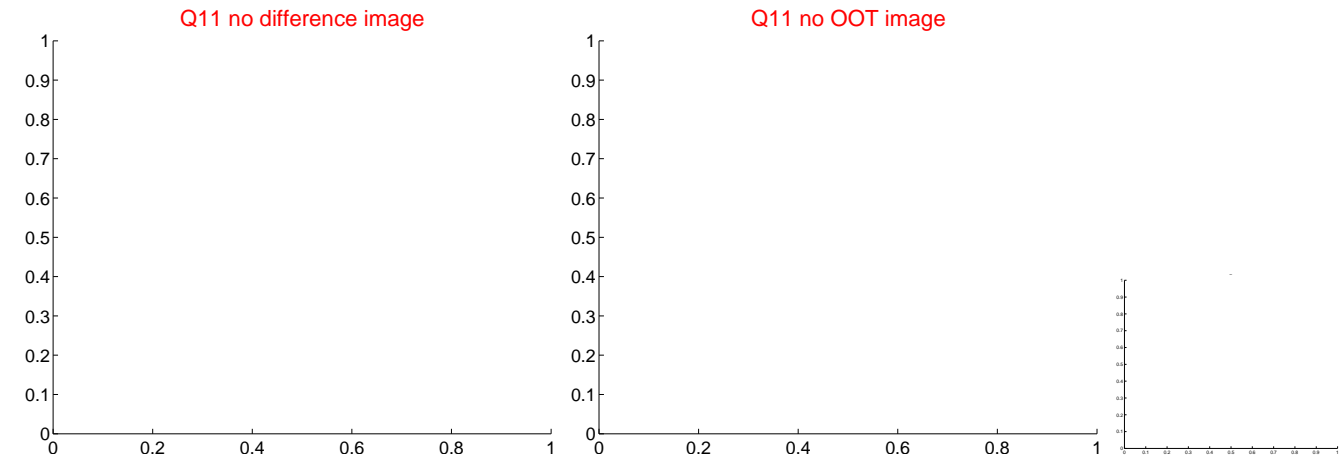
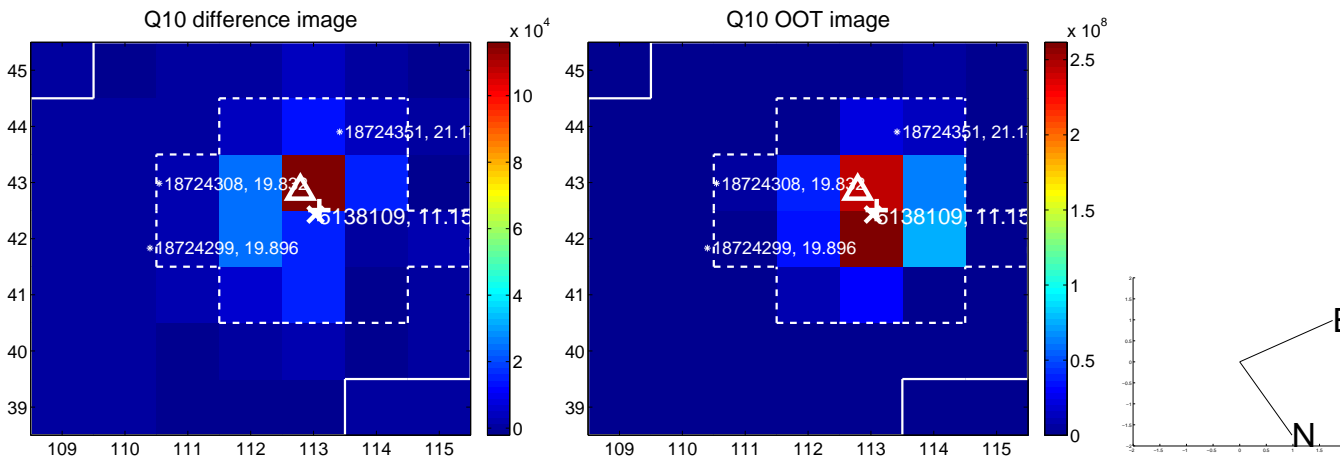
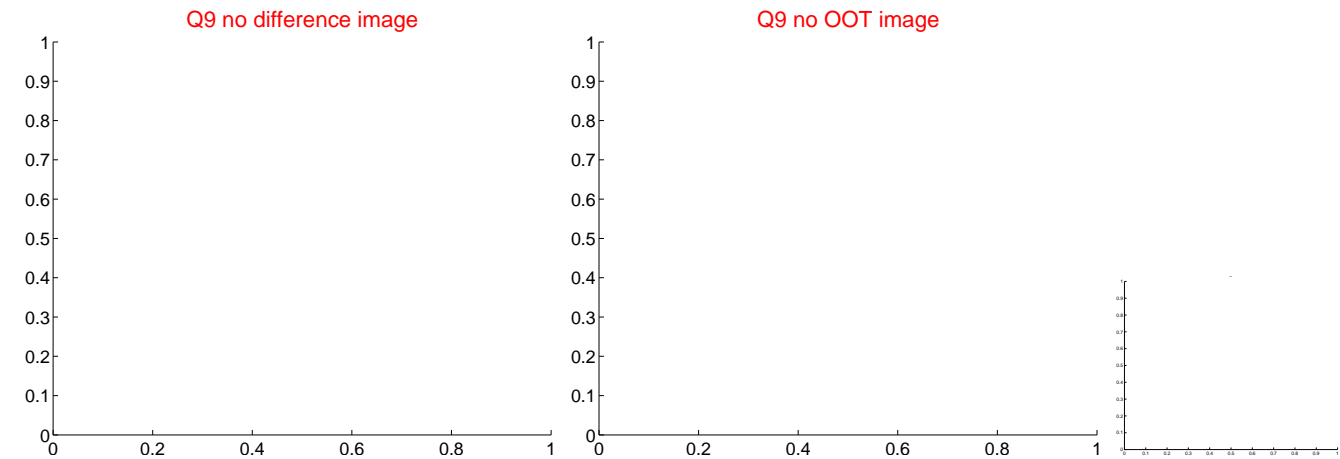
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



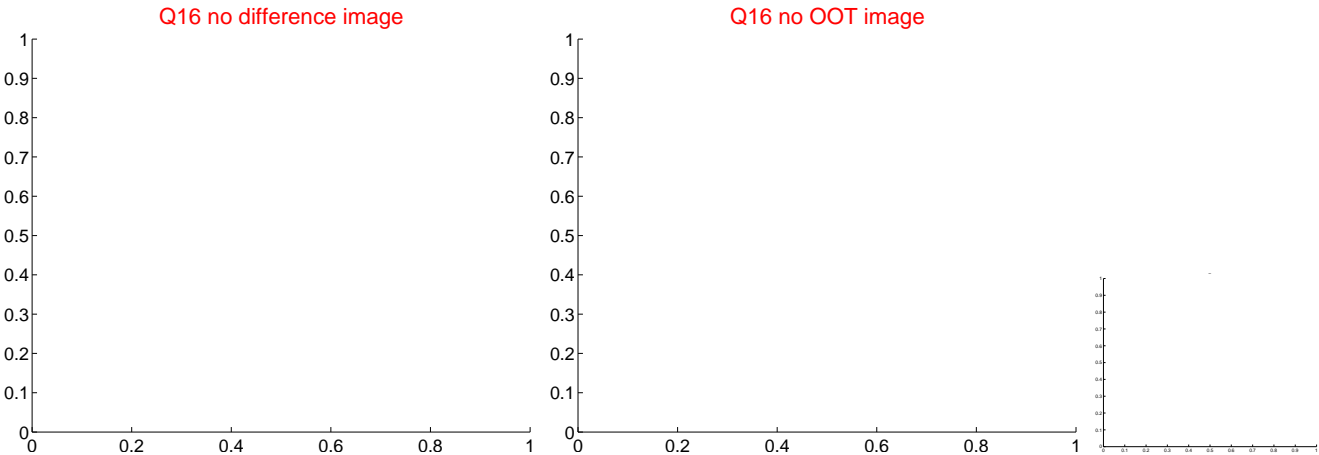
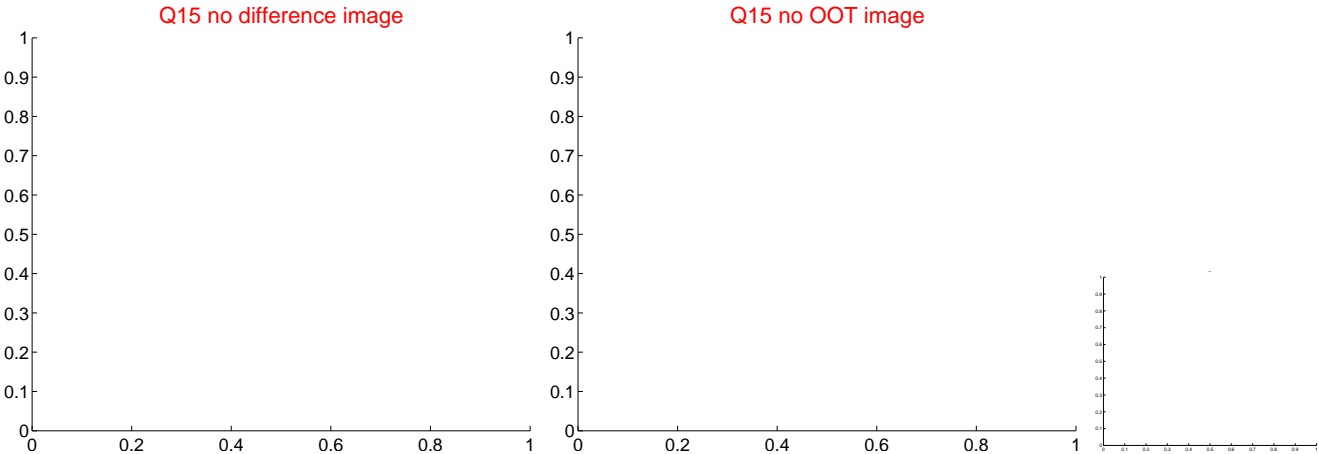
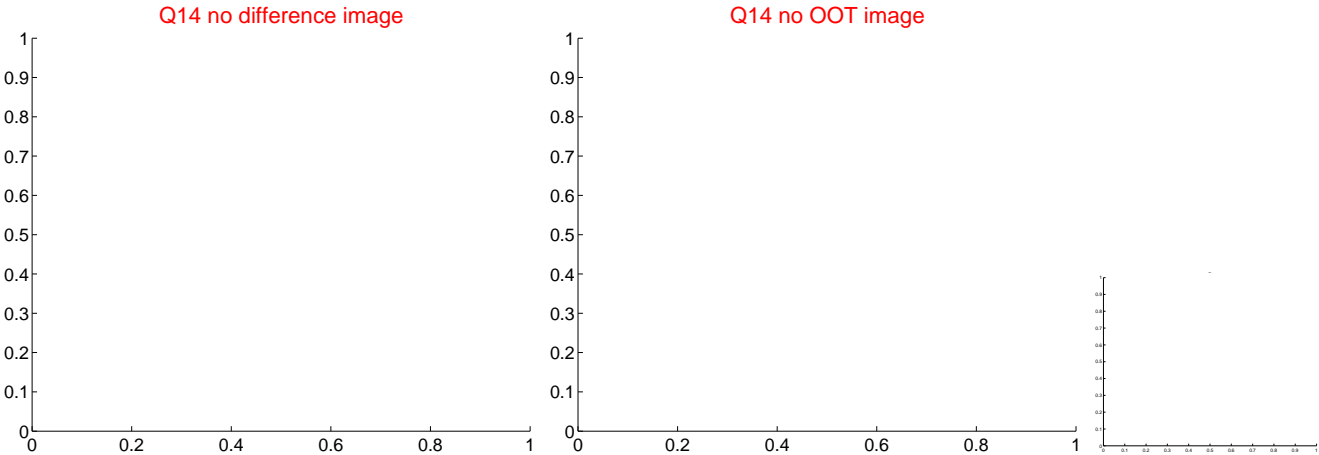
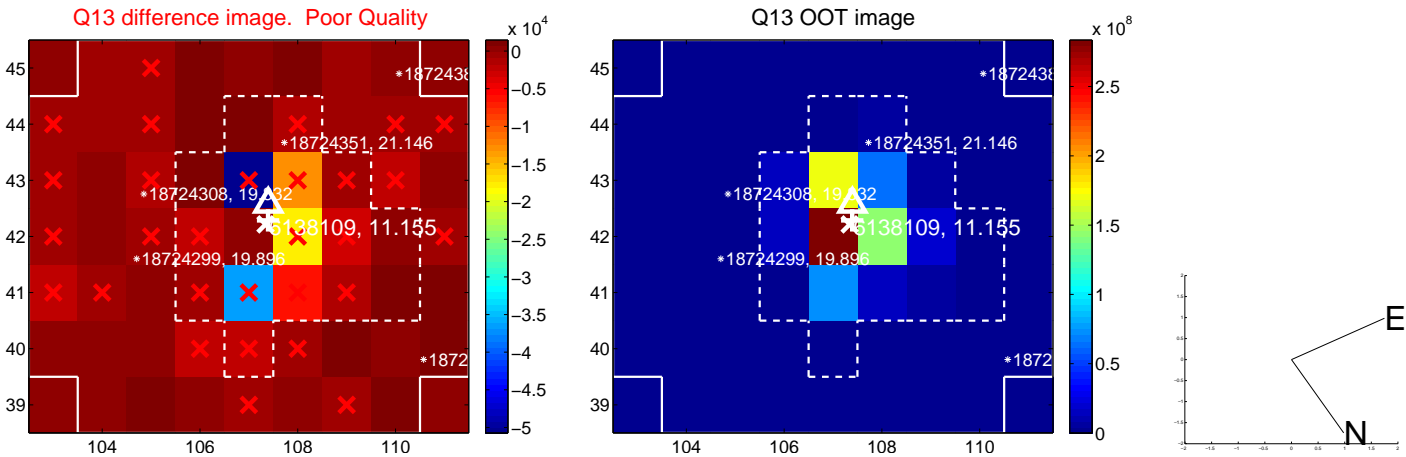
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



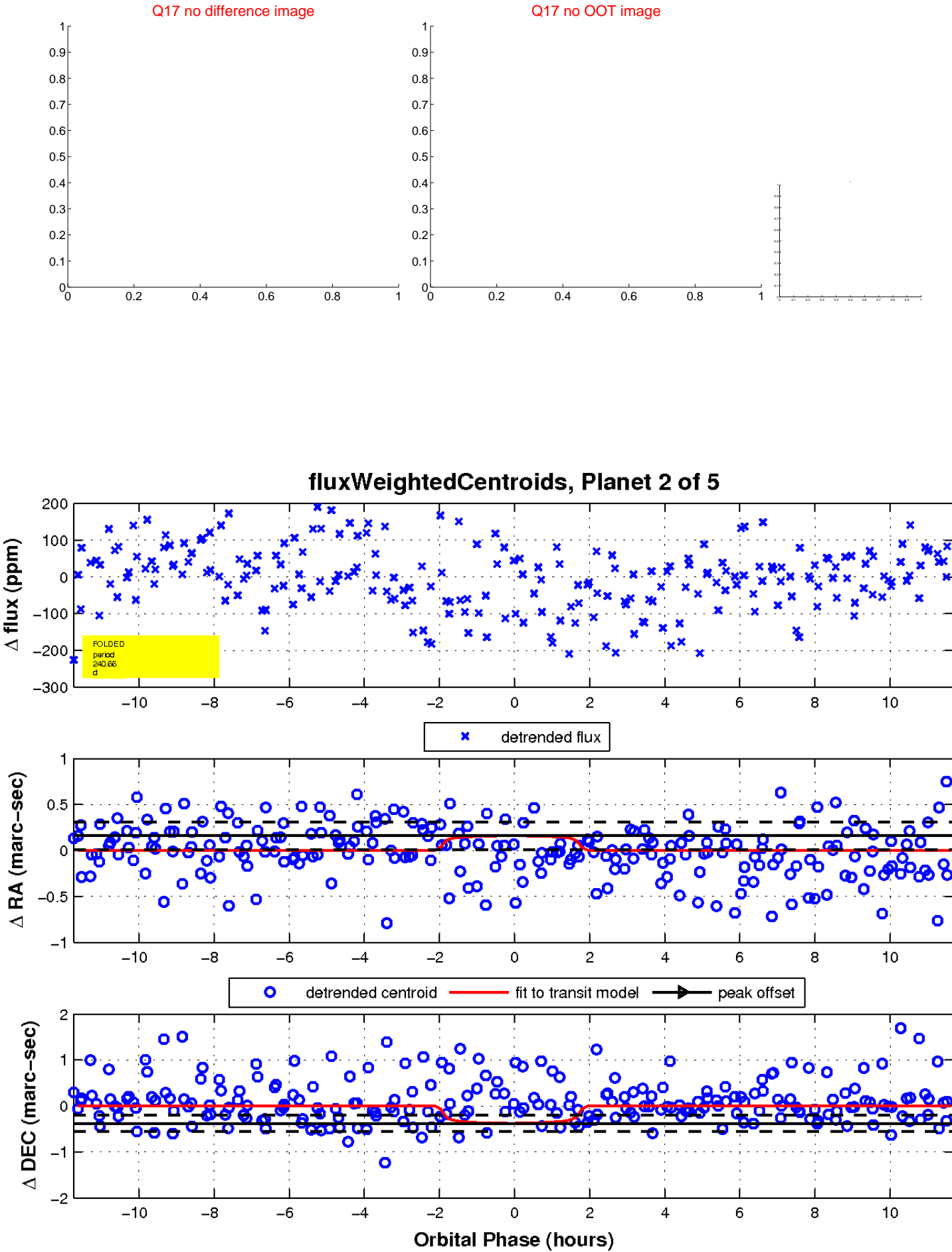
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

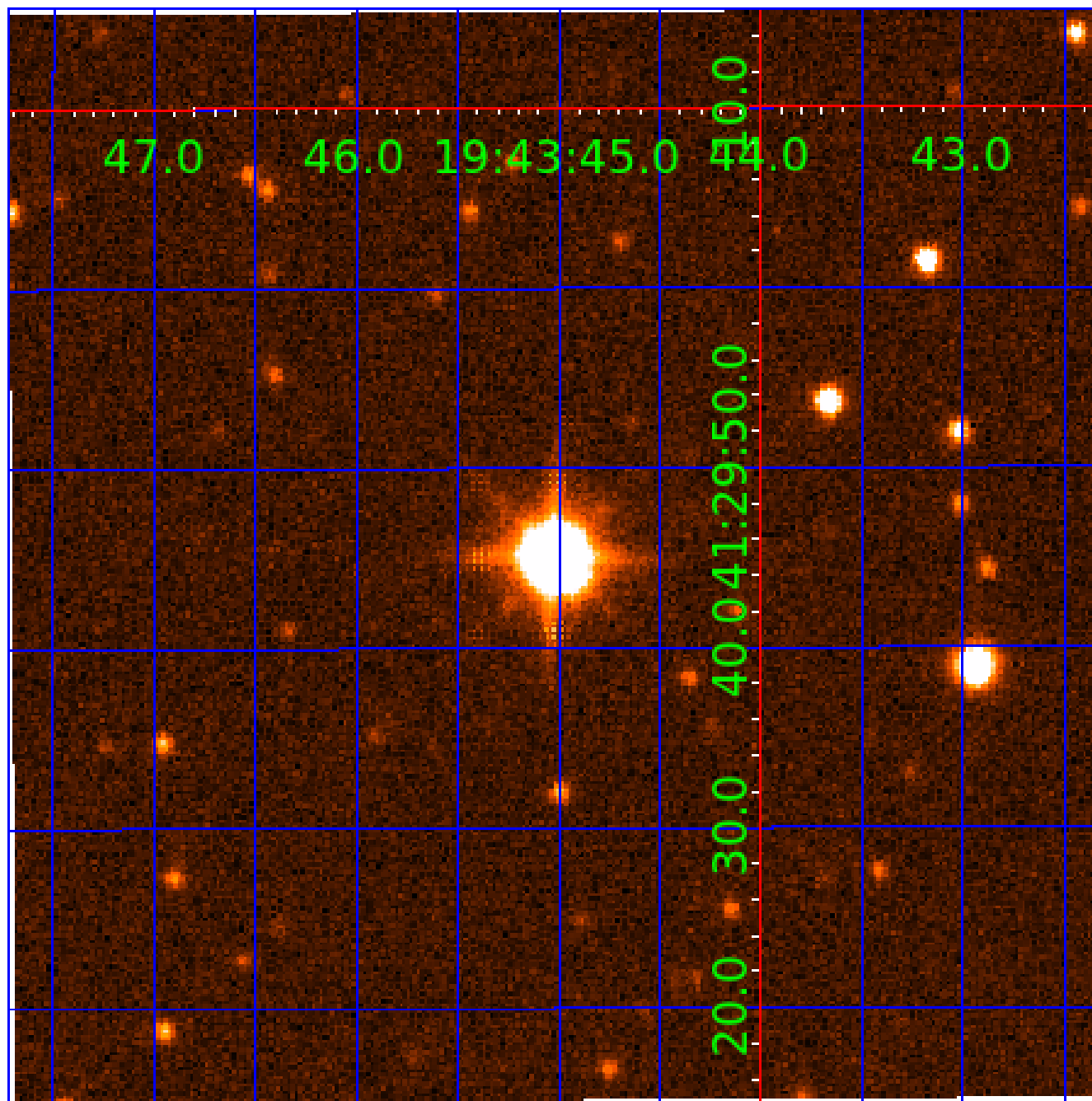


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006138109

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})
006138109-01	OBS	No	1.085644	132.520521	18.2	4.597	11.6	10.4	3.92	7206	1.75	61405.21
006138109-02	OBS	No	240.656511	275.107126	138.0	3.920	10.2	3.9	3.92	7206	5.36	45.77
006138109-03	OBS	No	526.636697	482.463973	189.1	10.053	10.6	7.7	3.92	7206	6.18	16.11
006138109-05	OBS	No	333.600082	279.552048	244.4	3.280	7.9	7.7	3.92	7206	7.12	29.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006138109-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006138109-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
006138109-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
006138109-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

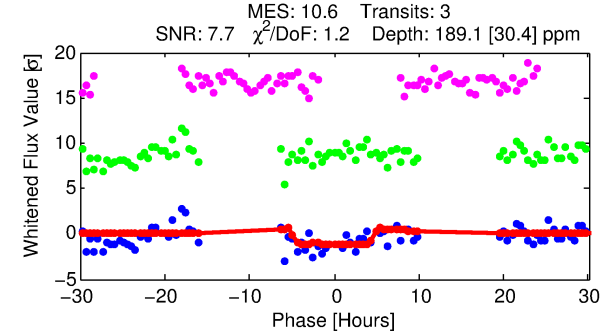
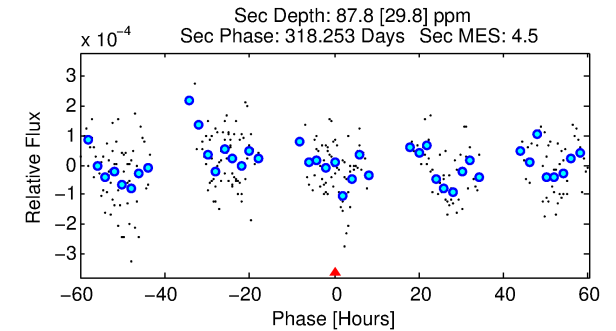
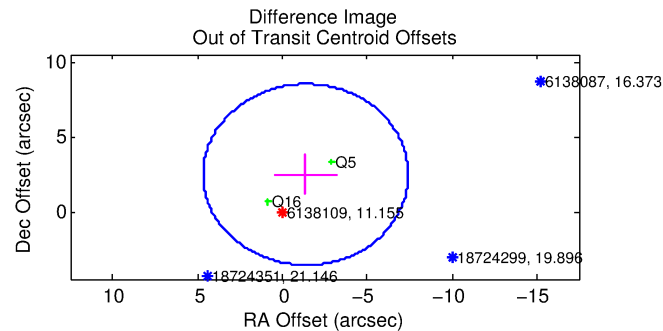
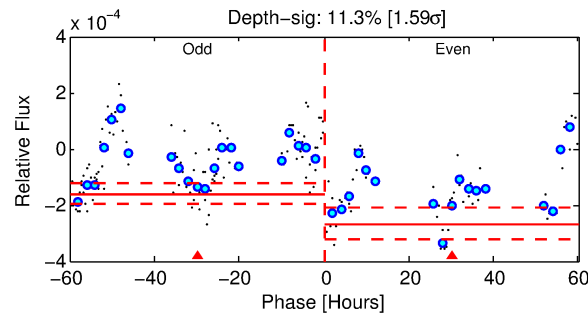
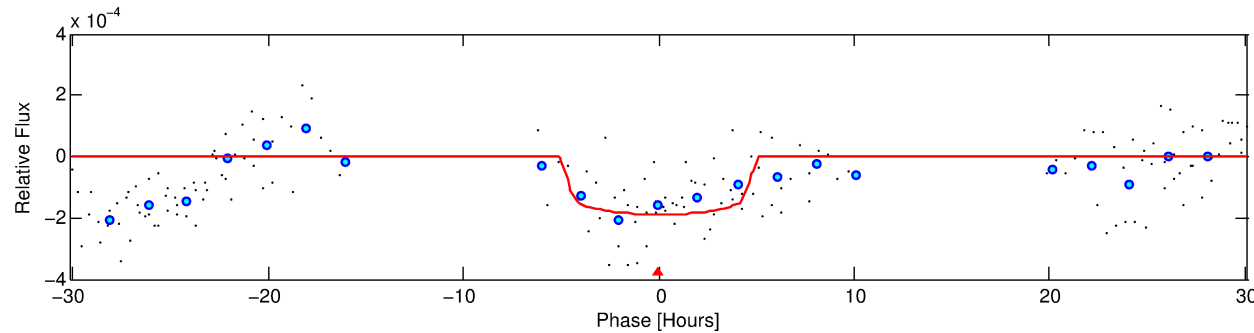
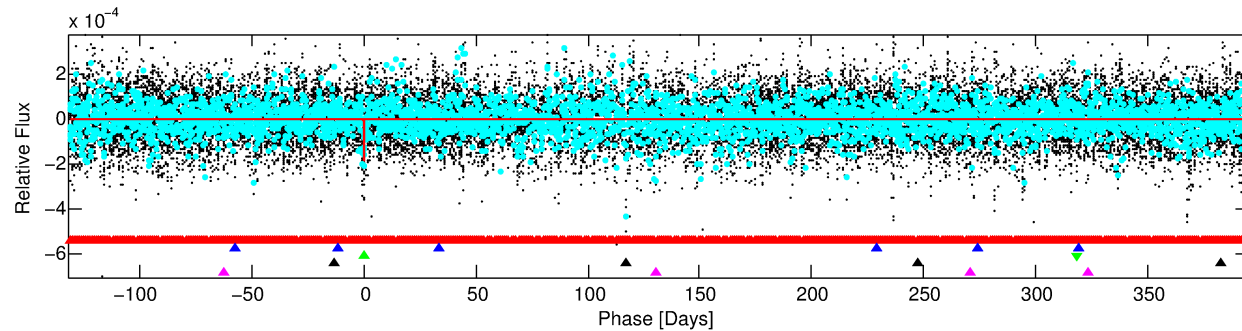
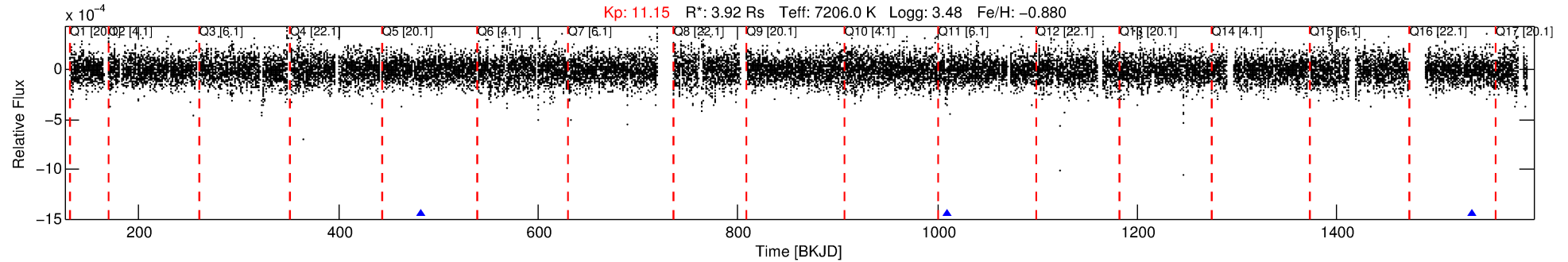
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006138109-03

No Significant Match Found

DV One-Page Summary

KIC: 6138109 Candidate: 3 of 5 Period: 526.637 d



DV Fit Results:

Period = 526.63670 [0.01215] d
Epoch = 482.4640 [0.0219] BKJD
Rp/R* = 0.0145 [0.0035]
a/R* = 199.05 [270.06]
b = 0.88 [0.33]
Seff = 16.11 [21.16]
Teq = 511 [168] K
Rp = 6.18 [4.31] Re
a = 1.5176 [1.1432] AU
Ag = 2909.46 [4165.67] [0.70σ]
Teffp = 5801 [884] K [5.88σ]

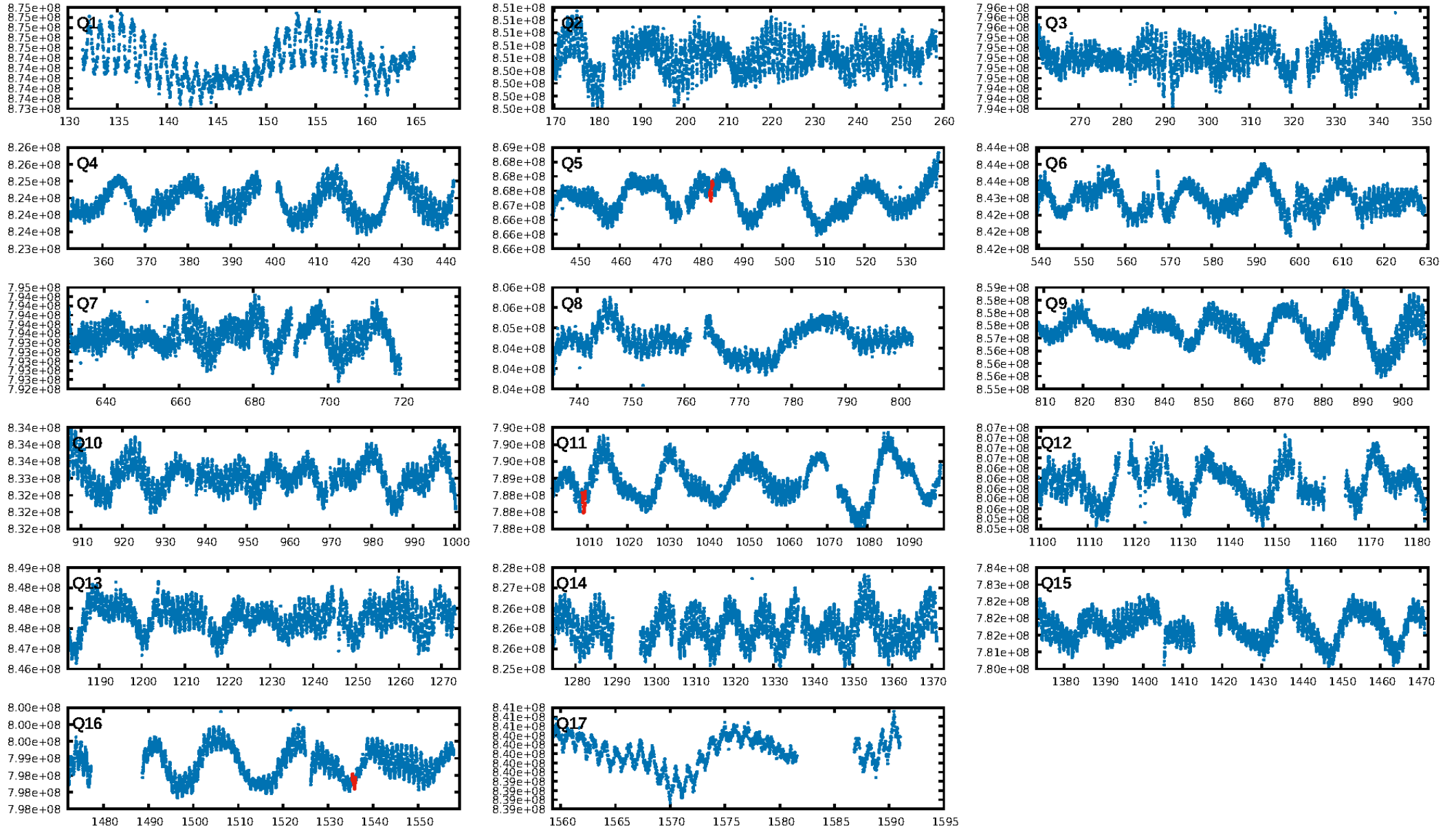
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [147.46σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 9.8%
ModelChiSquareGof-sig: 99.6%
Bootstrap-pfa: 1.00e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 20.32
Centroid-sig: 3.3%
Centroid-so: 2.023 arcsec [1.95σ]
OotOffset-rm: 2.830 arcsec [1.40σ]
KicOffset-rm: 2.594 arcsec [1.64σ]
OotOffset-st: 0/0/1/1 [2]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.00 [0/2]

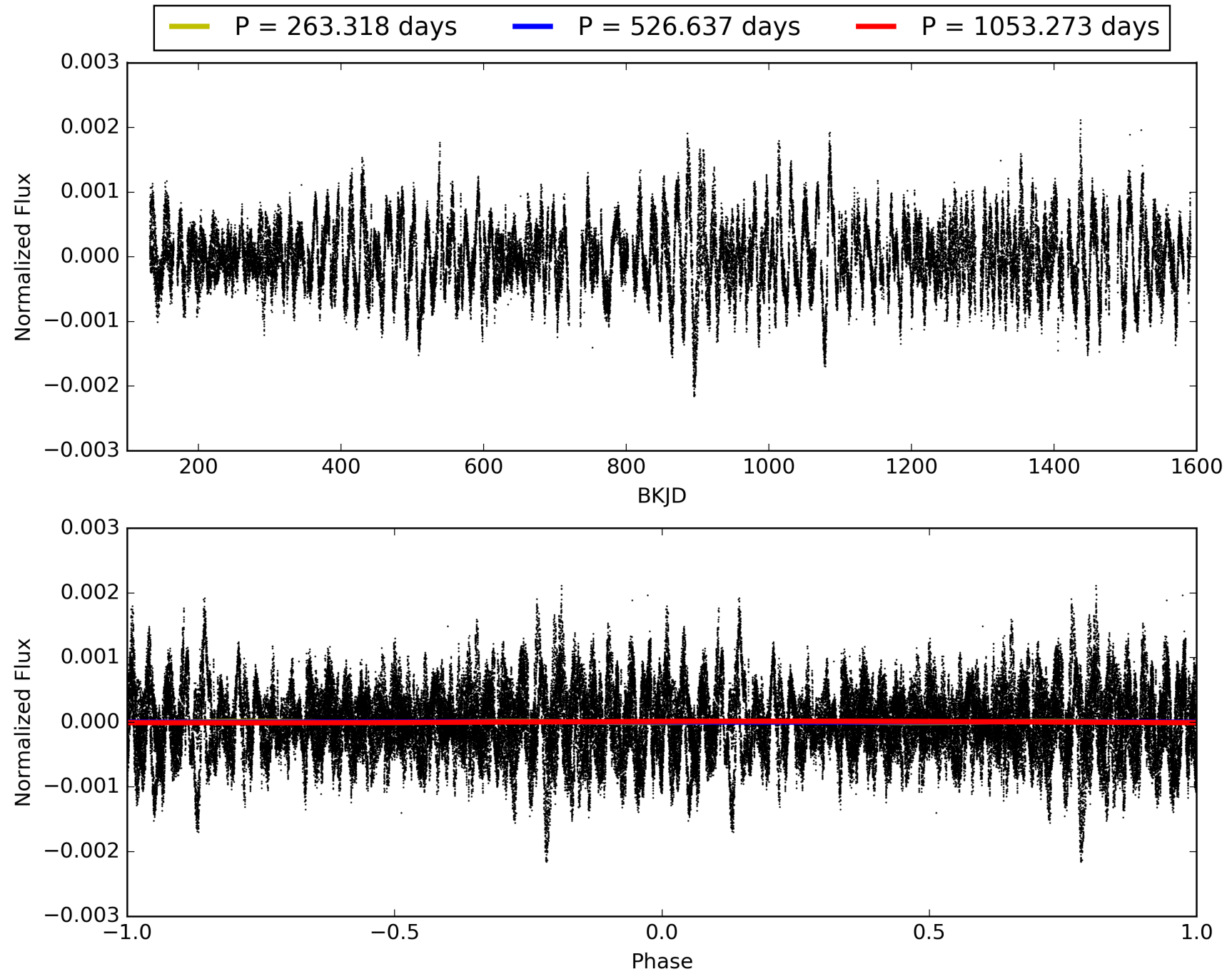
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:22:11 Z

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

TCE 006138109-03, PDC Light Curves

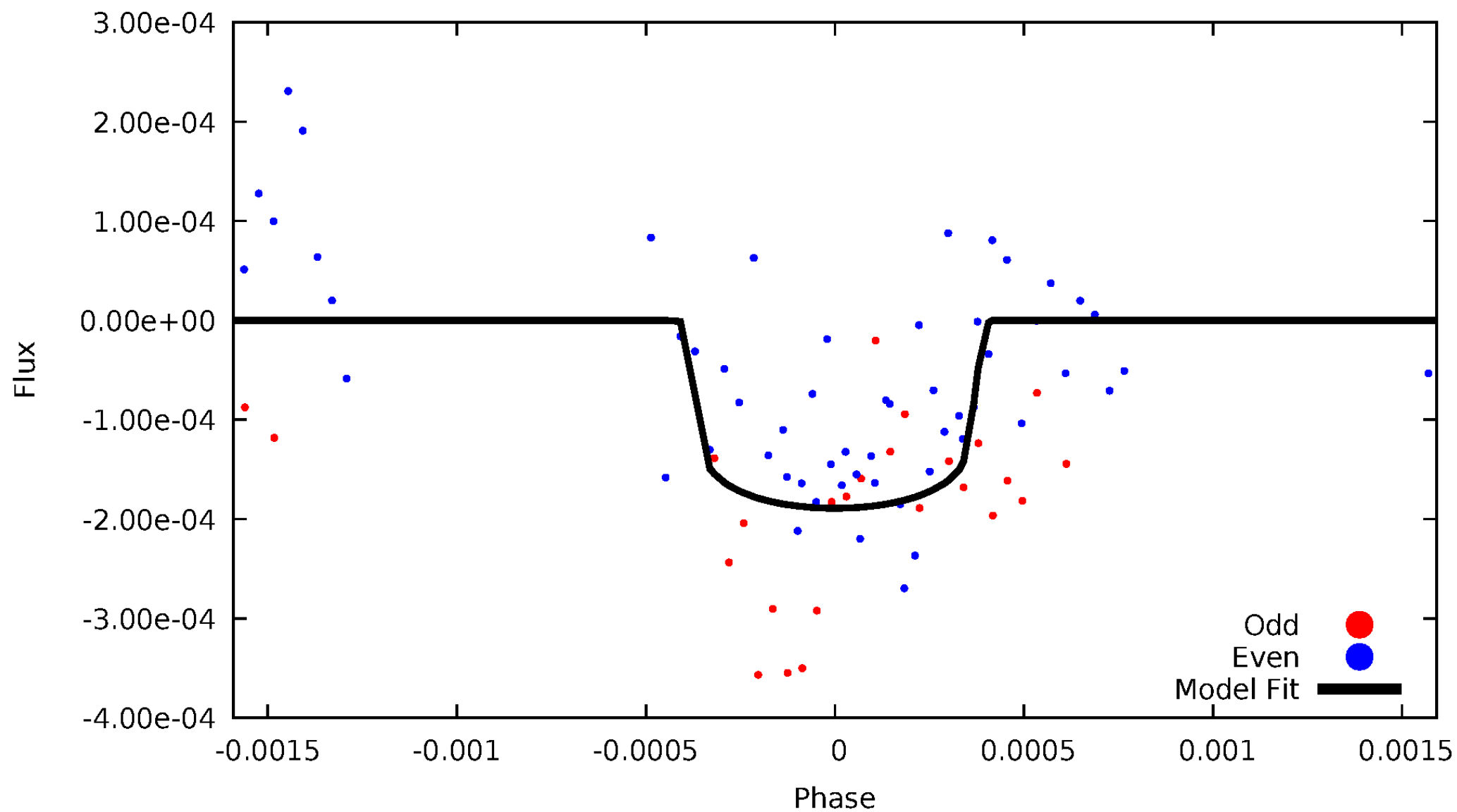


TCE 006138109-03



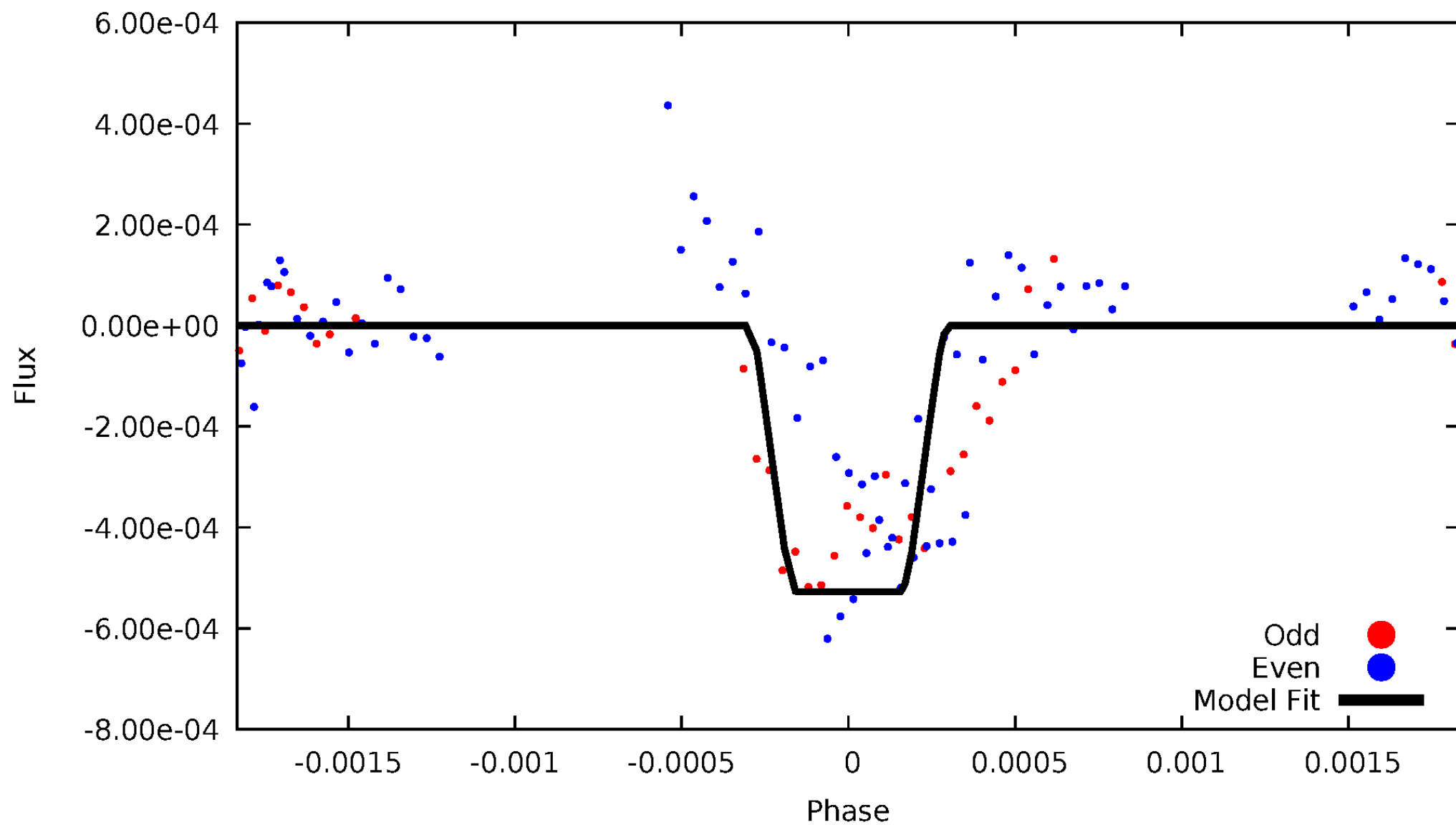
DV Odd/Even

TCE 006138109-03

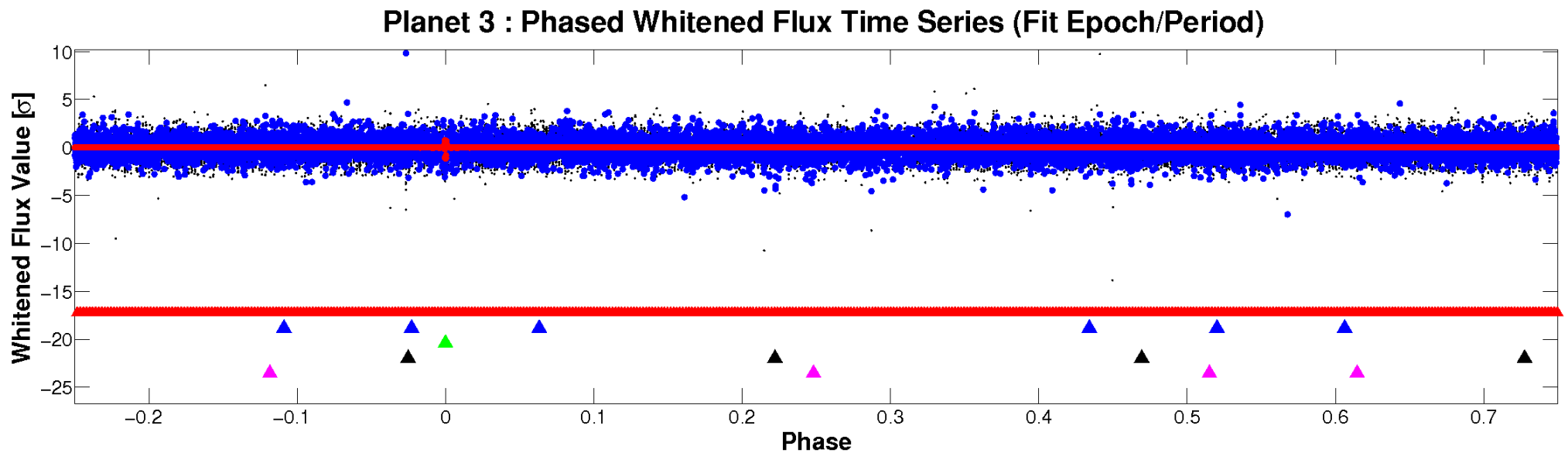
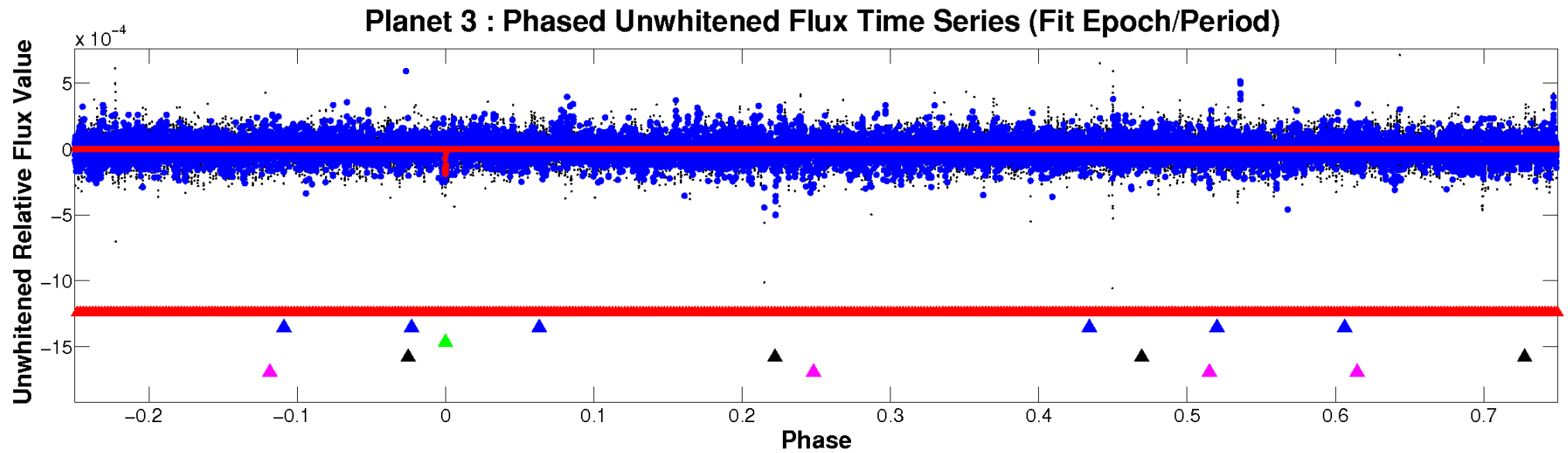


ALT Odd/Even

TCE 006138109-03

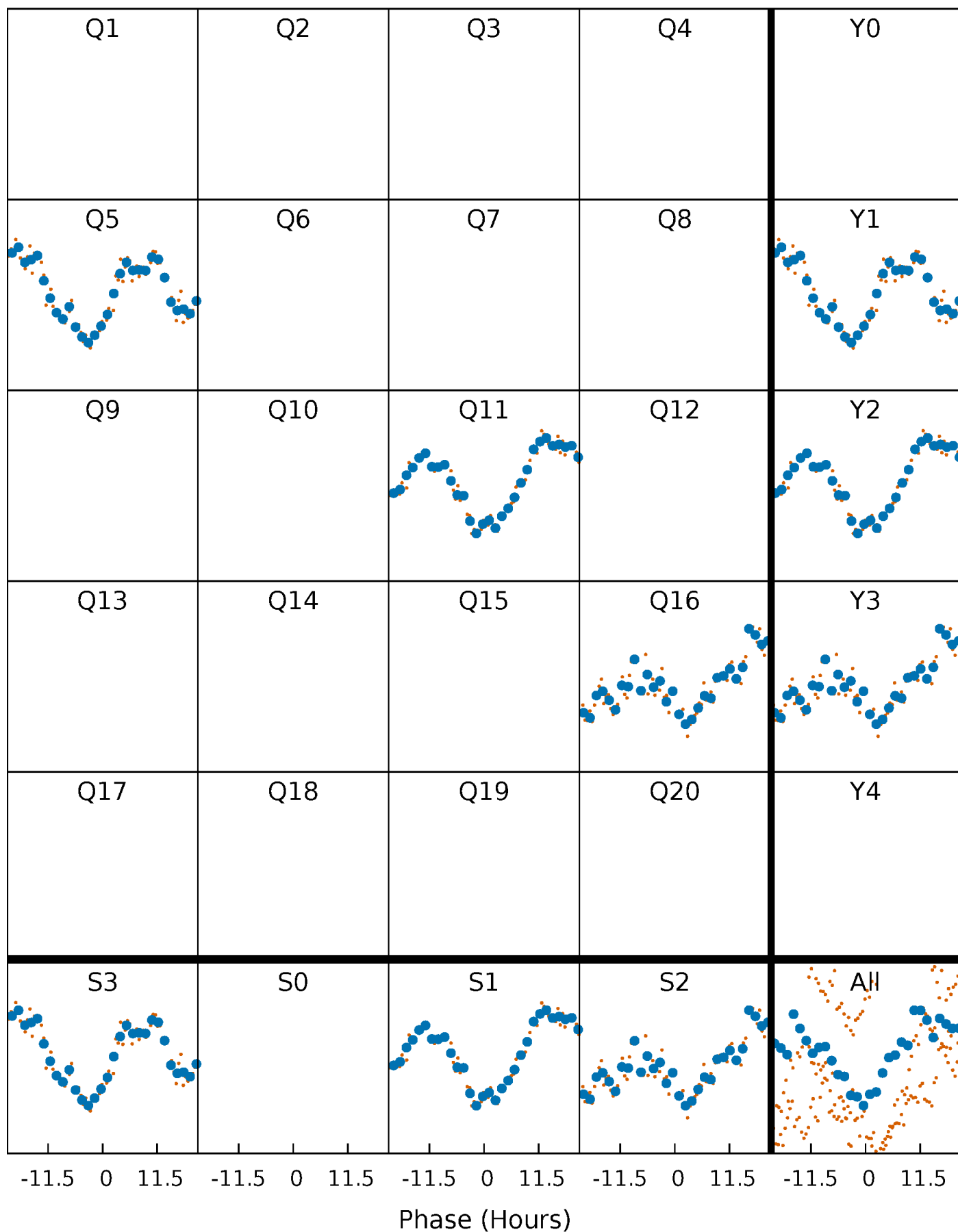


Non-Whitened Vs. Whitened Light Curve



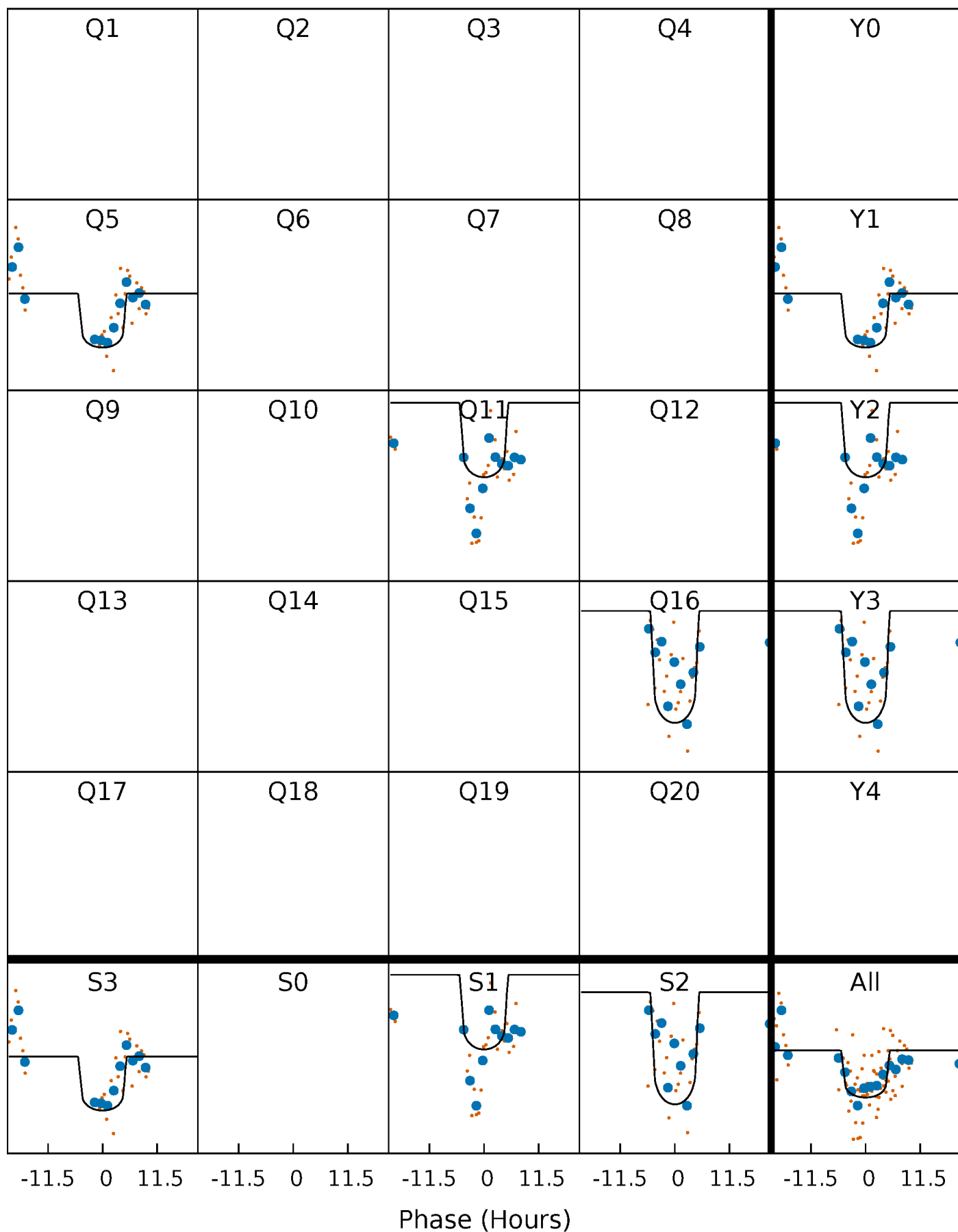
PDC Quarter-Phased Transit Curves

TCE 006138109-03 P=526.636697 Days $T_0=482.463973$ (BKJD)



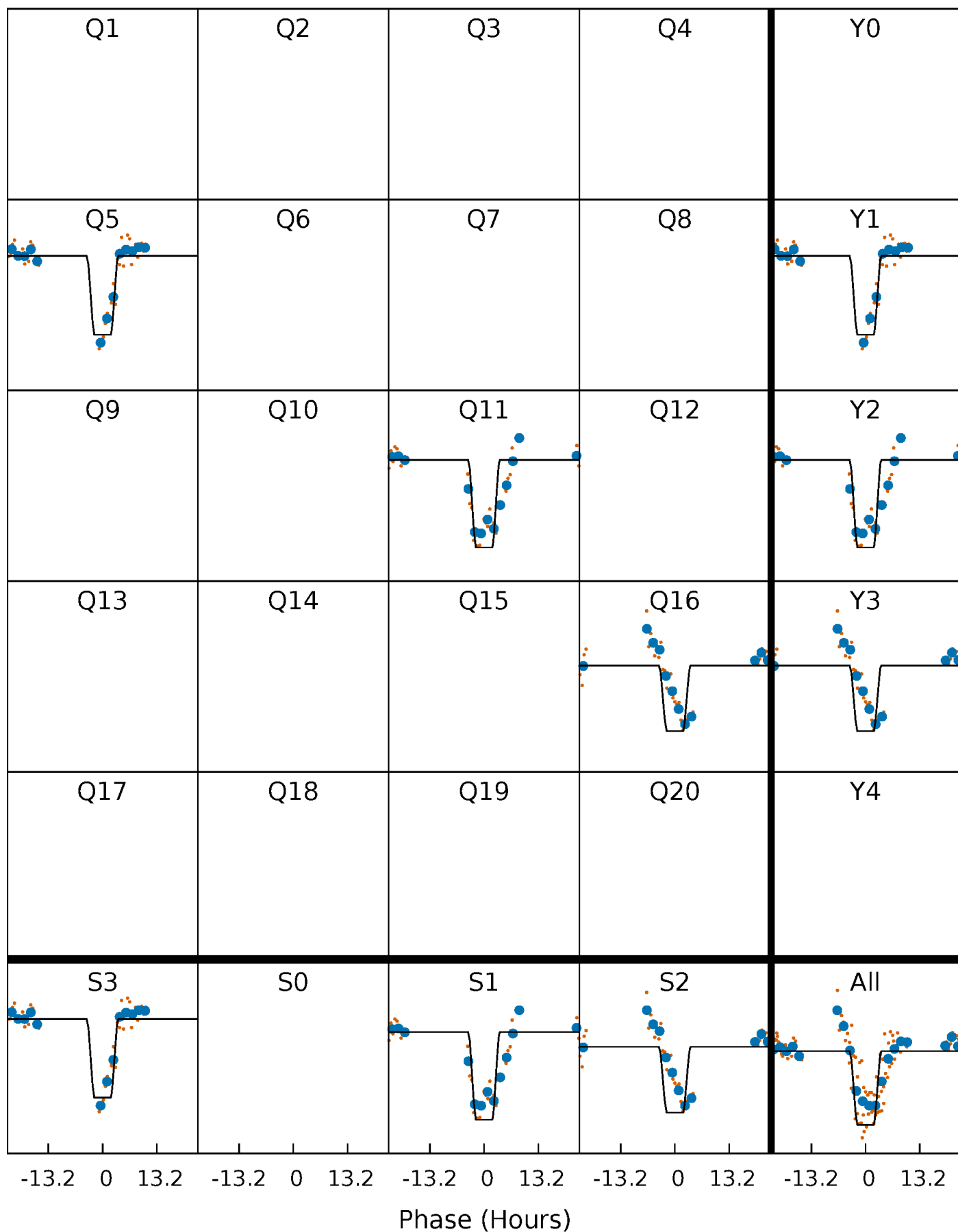
DV Quarter-Phased Transit Curves

TCE 006138109-03 $P=526.636697$ Days $T_0=482.463973$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

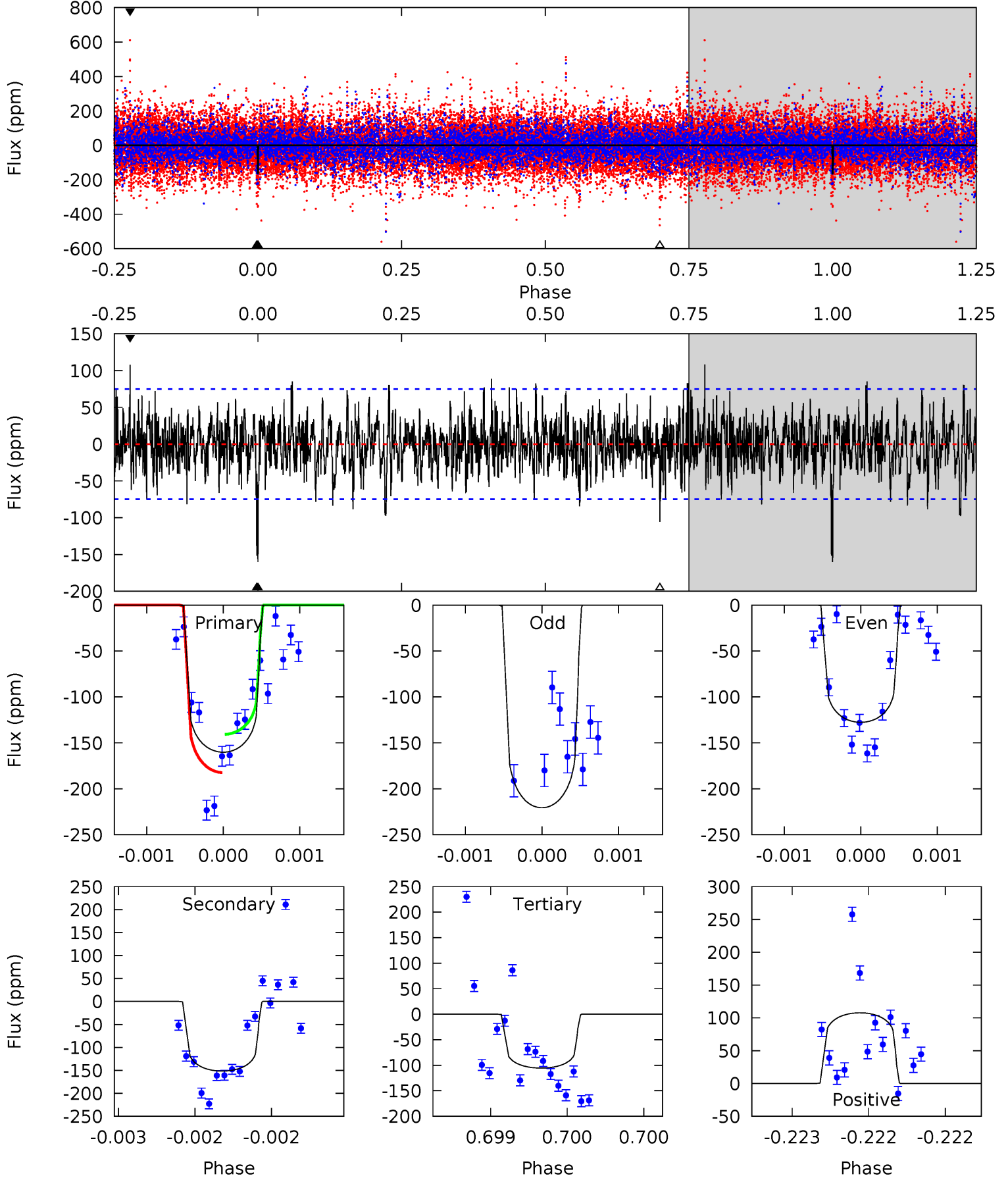
TCE 006138109-03 $P=526.668198$ Days $T_0=482.429759$ (BKJD)



DV Model-Shift Uniqueness Test

006138109-03, P = 526.636697 Days, E = 482.463973 Days

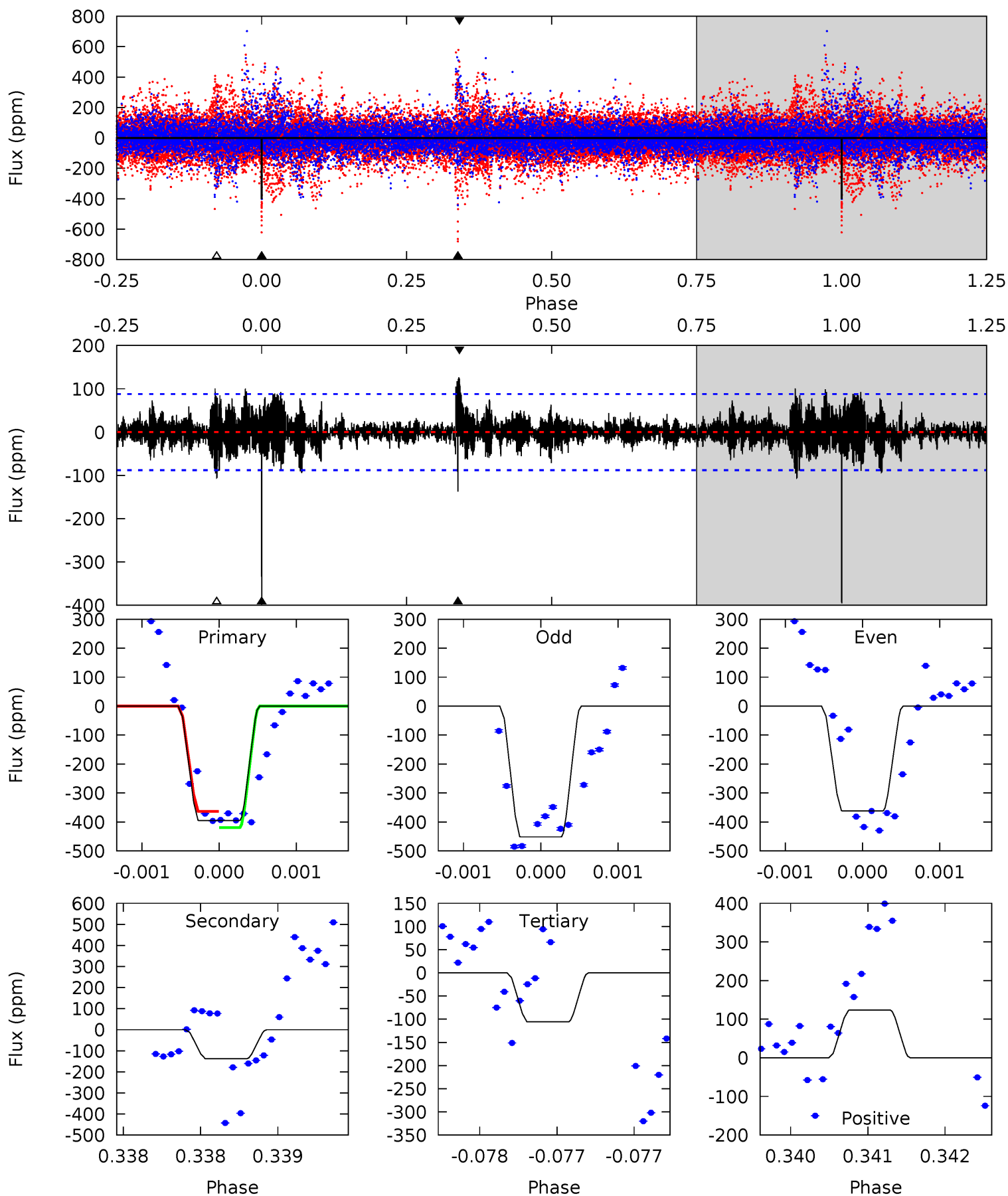
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	11.1	7.74	7.90	5.49	3.36	1.98	4.01	3.85	3.38	3.22	3.26	1.19	0.40	1.51



Alt Model-Shift Uniqueness Test

006138109-03, P = 526.668198 Days, E = 482.429759 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.0	8.69	6.67	7.80	5.55	3.44	1.59	18.3	17.2	2.01	0.88	2.60	0.89	0.24	1.74



Stellar Parameters For KIC 006138109

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7206^{+224}_{-274}	$3.477^{+0.801}_{-0.089}$	$-0.880^{+0.300}_{-0.300}$	$3.919^{+0.640}_{-2.559}$	$1.678^{+0.148}_{-0.629}$	$0.039^{+0.698}_{-0.011}$
	+3%/-4%	+23%/-3%	+34%/-34%	+16%/-65%	+9%/-37%	+1779%/-27%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006138109-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-152 ± 14	$5.35^{+1.86}_{-2.00}$	680^{+61}_{-118}	6580^{+1155}_{-723}	6605^{+9121}_{-2996}
Alt.	-137 ± 16	$8.77^{+2.56}_{-3.03}$	681^{+56}_{-110}	5128^{+425}_{-353}	2258^{+2484}_{-893}

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 $A_{obs} \gg 1.0$

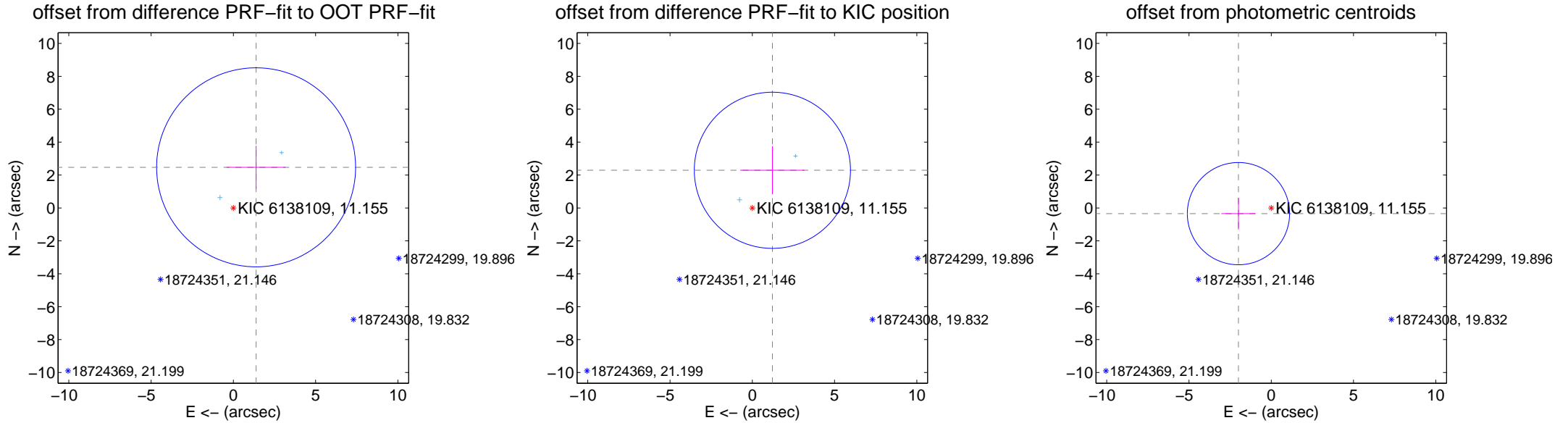
DV Centroid Data

Supplemental centroid analysis for 006138109-03. **Kepler magnitude: 11.15.** Transit SNR 7.66

There are 2 quarters with good PRF difference image offsets

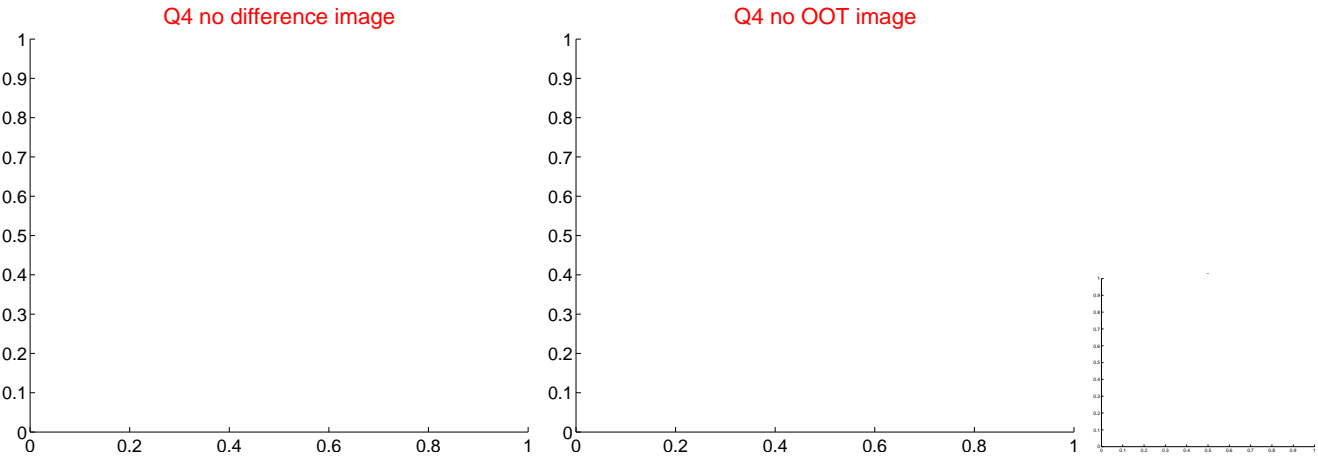
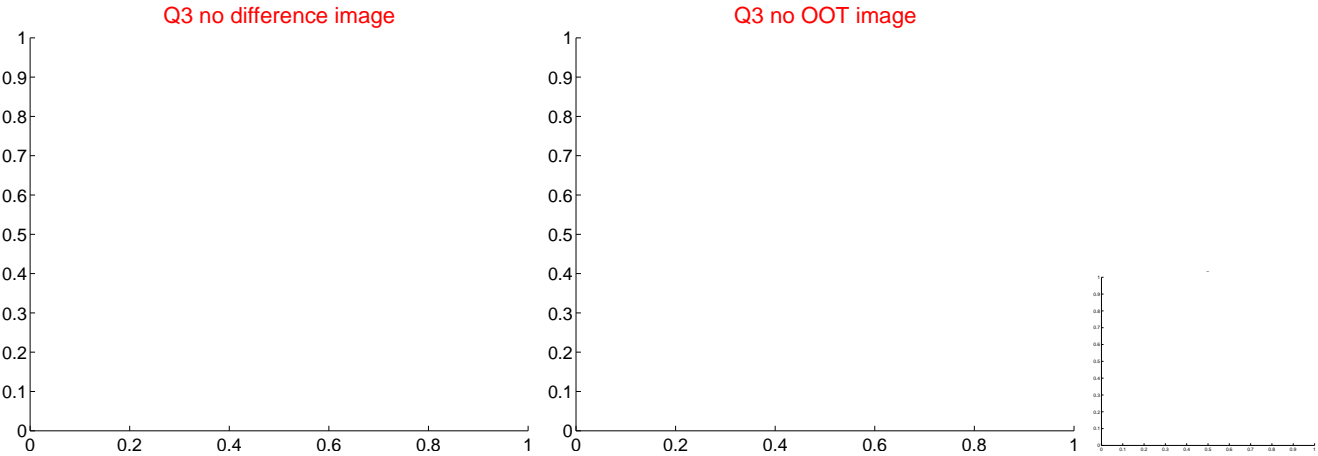
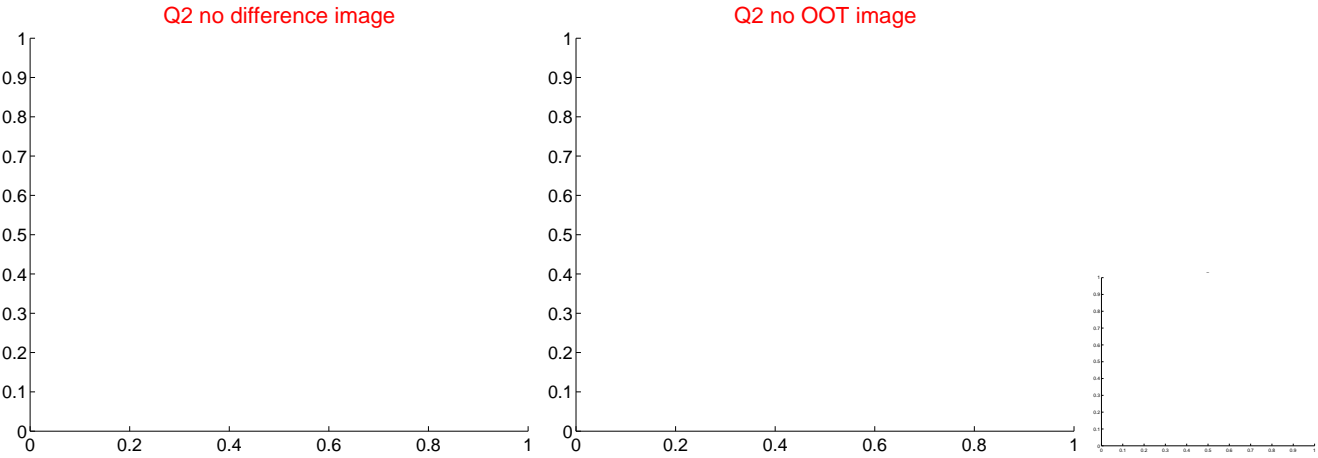
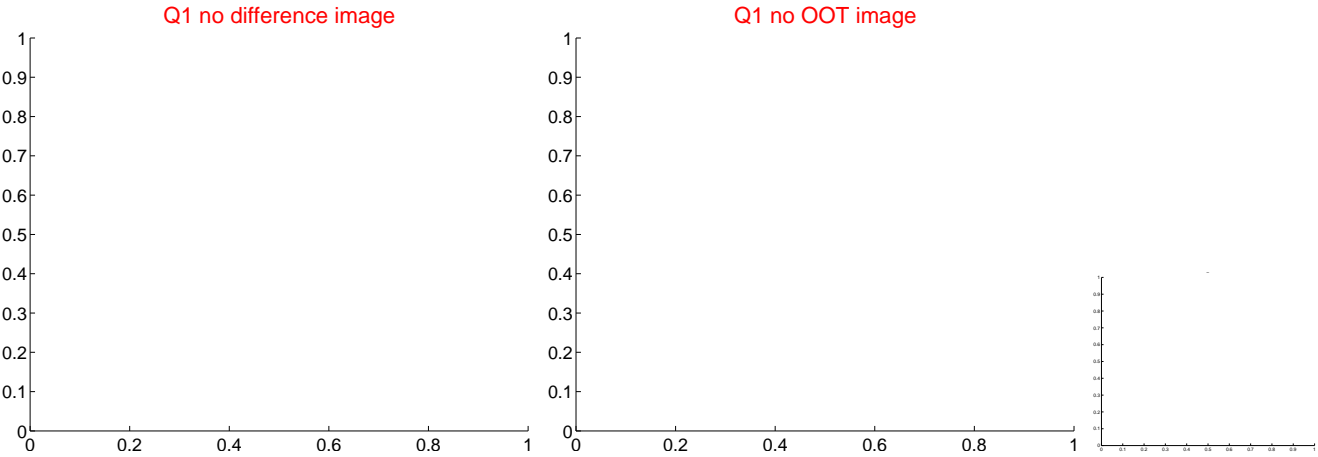
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.830 ± 2.016	1.40	-1.383 ± 1.793	2.469 ± 1.307
PRF-fit source offset from KIC position	2.594 ± 1.582	1.64	-1.221 ± 1.958	2.289 ± 1.457
photometric centroid source offset	2.02 ± 1.04	1.95	1.99 ± 1.04	-0.35 ± 0.97

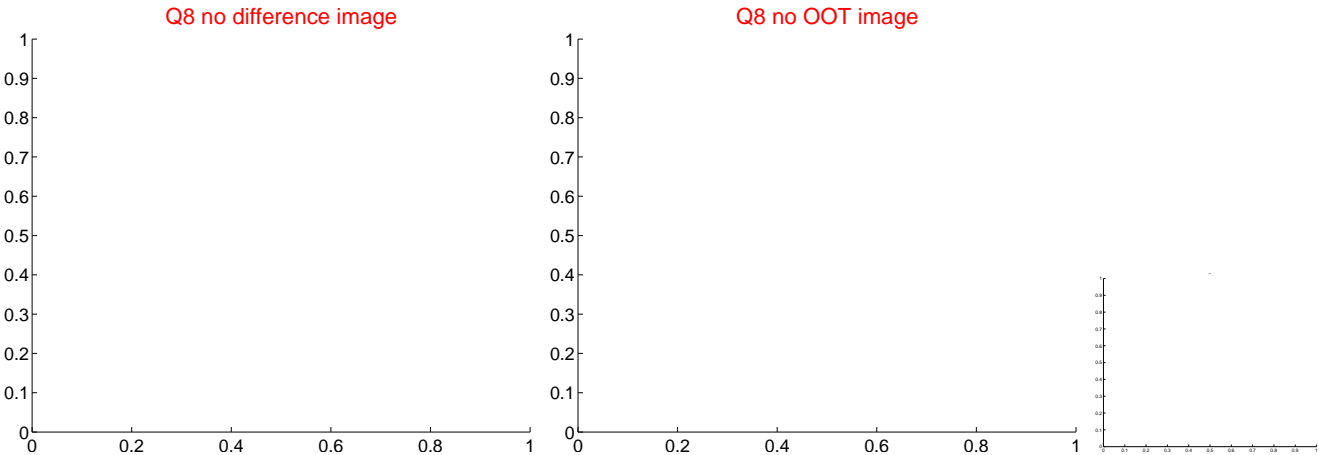
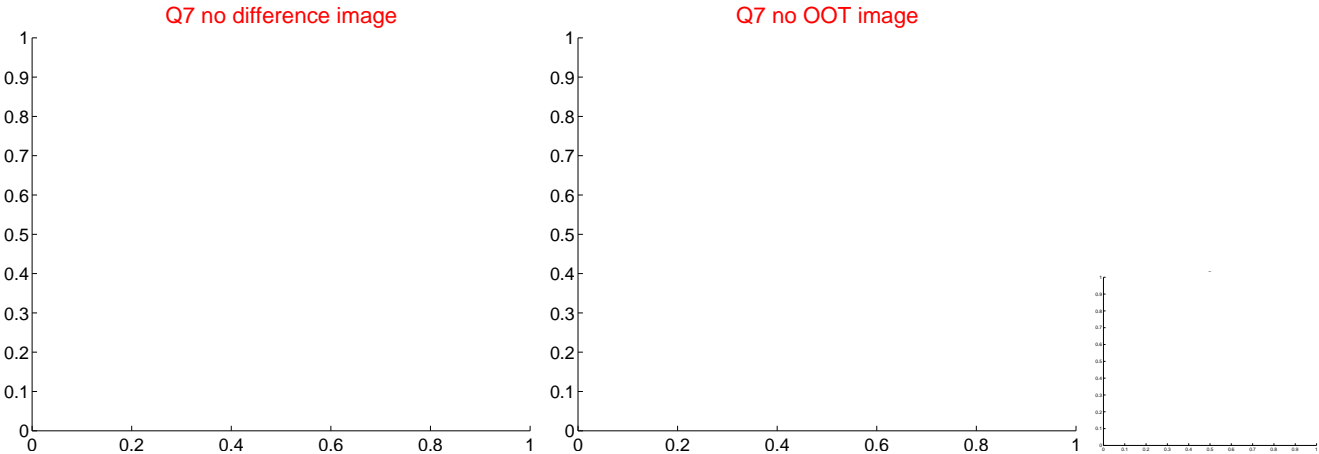
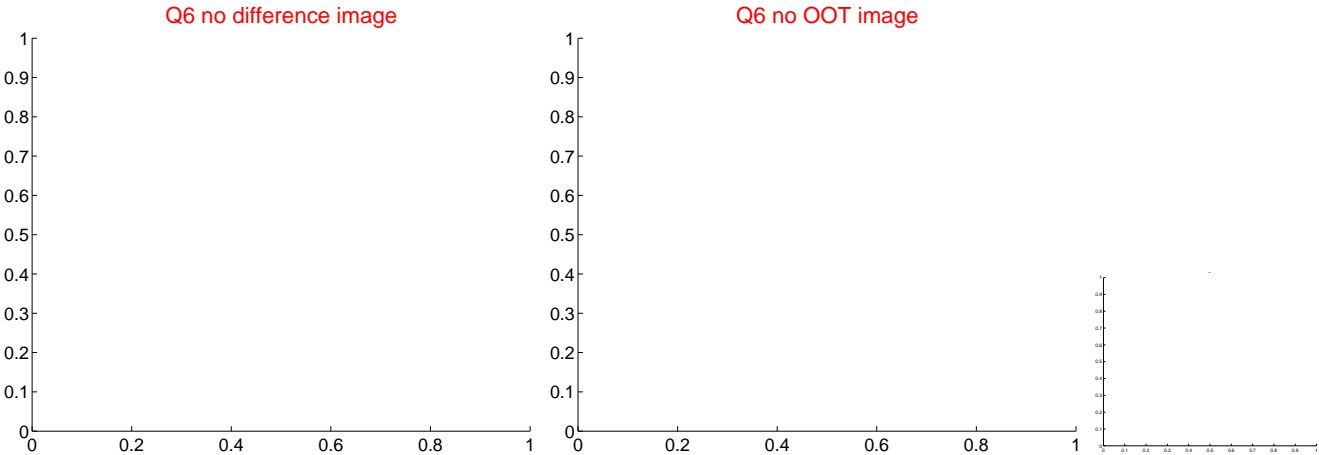
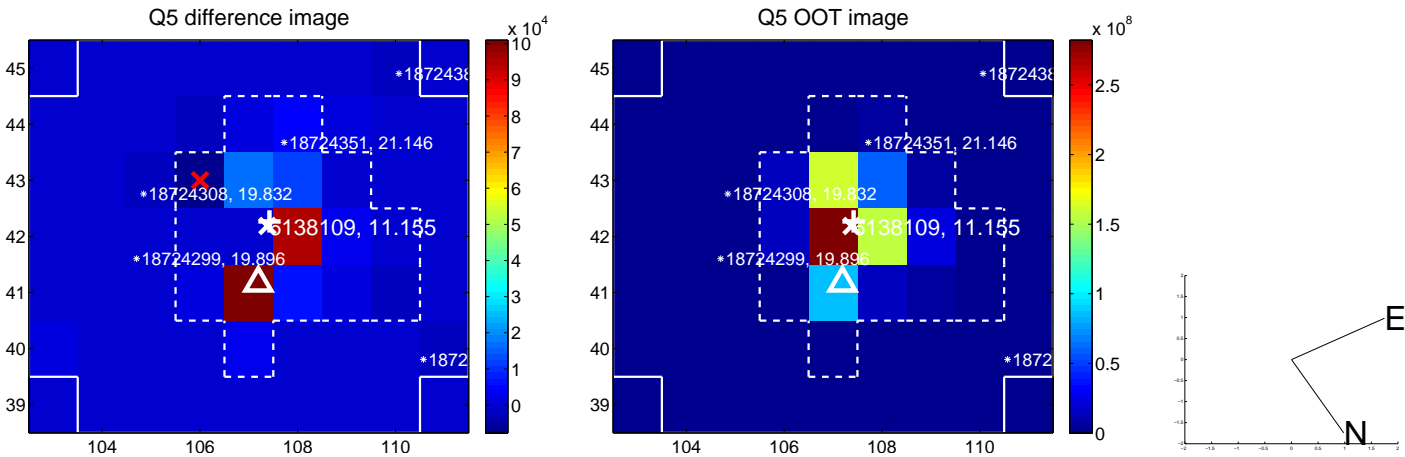


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

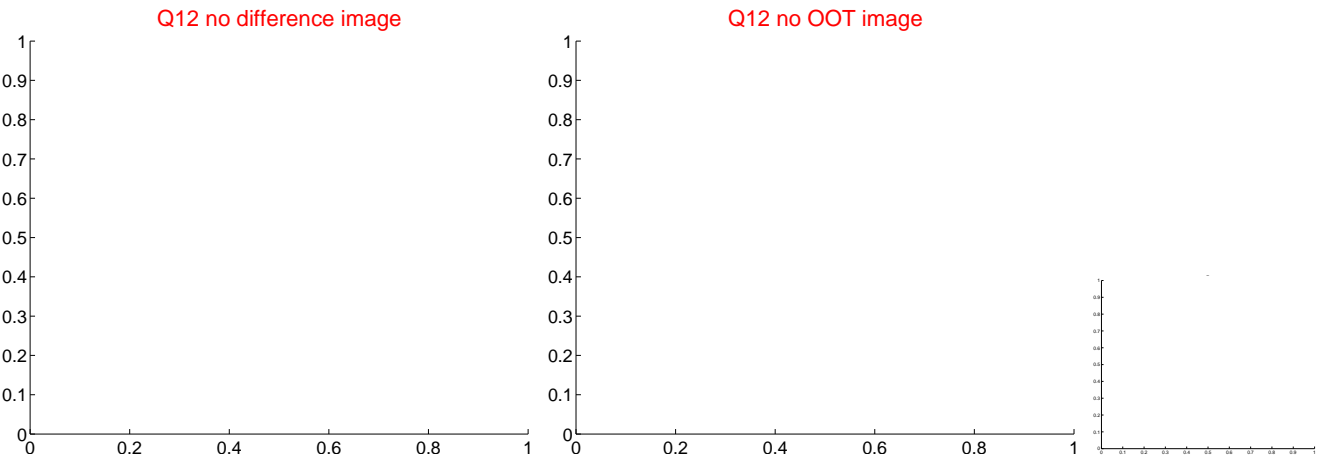
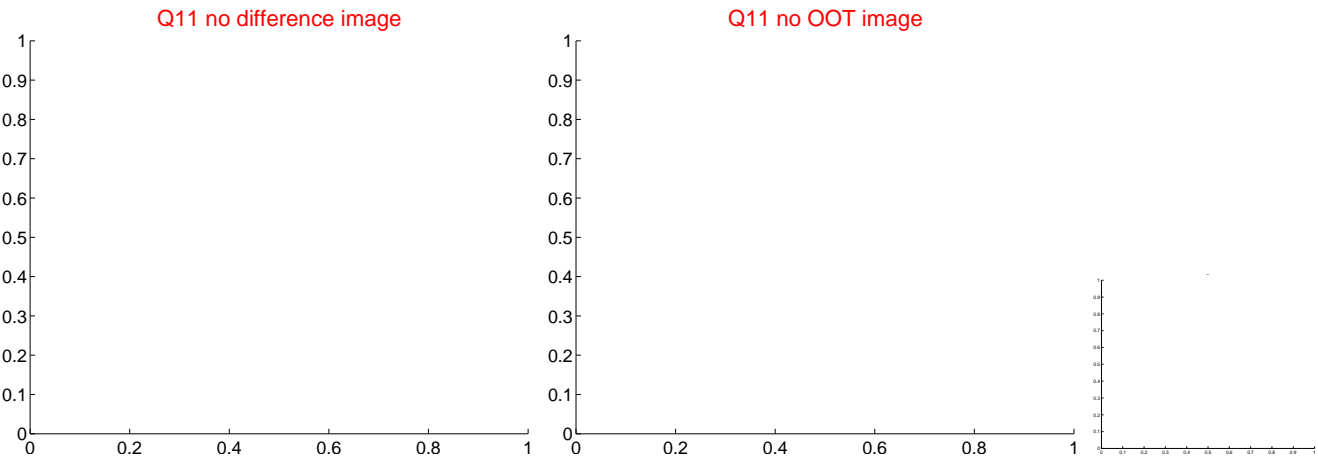
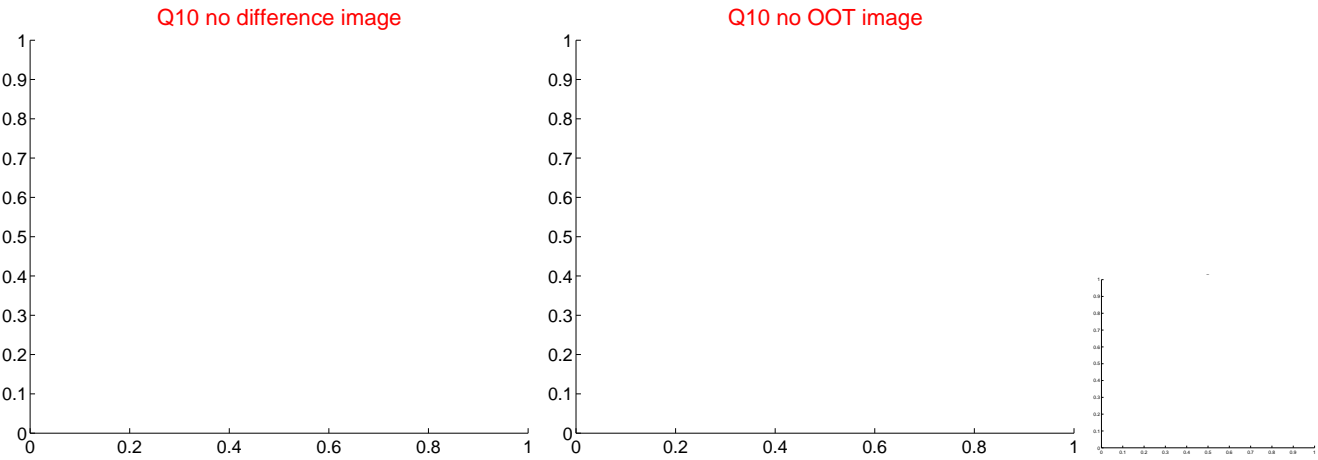
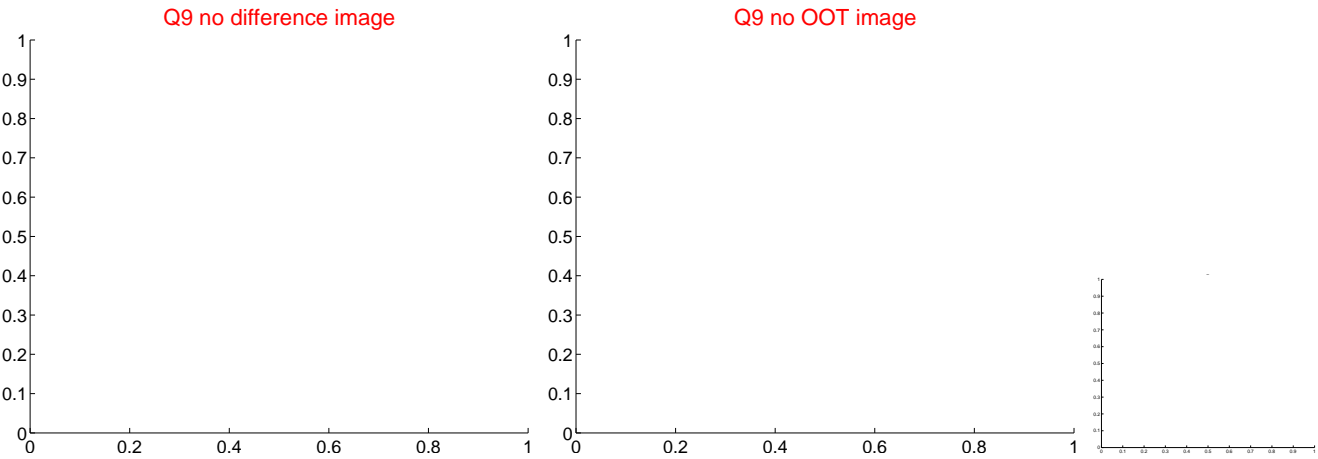
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



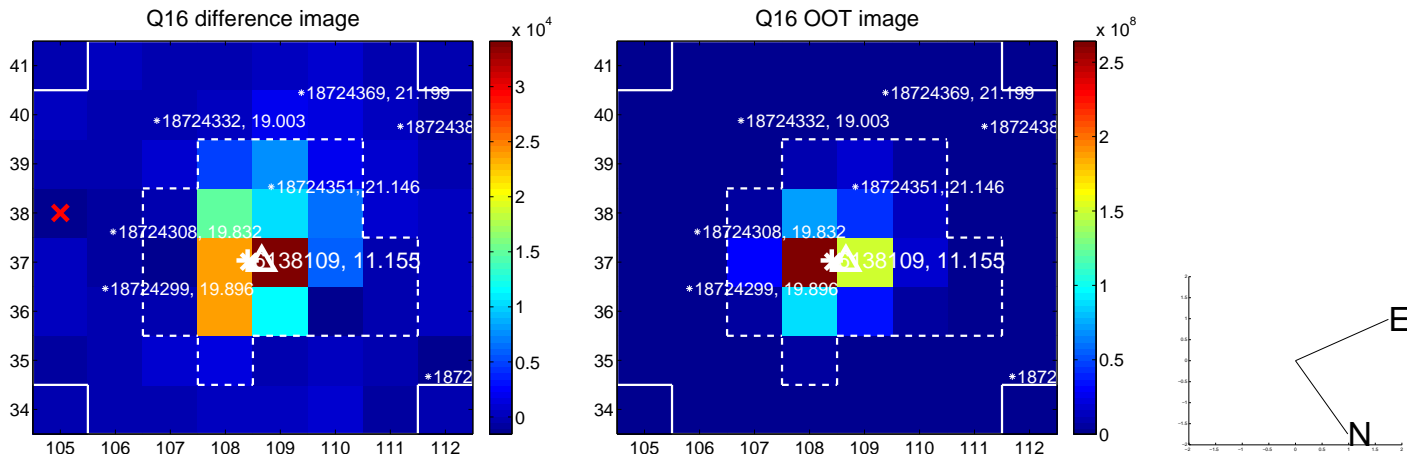
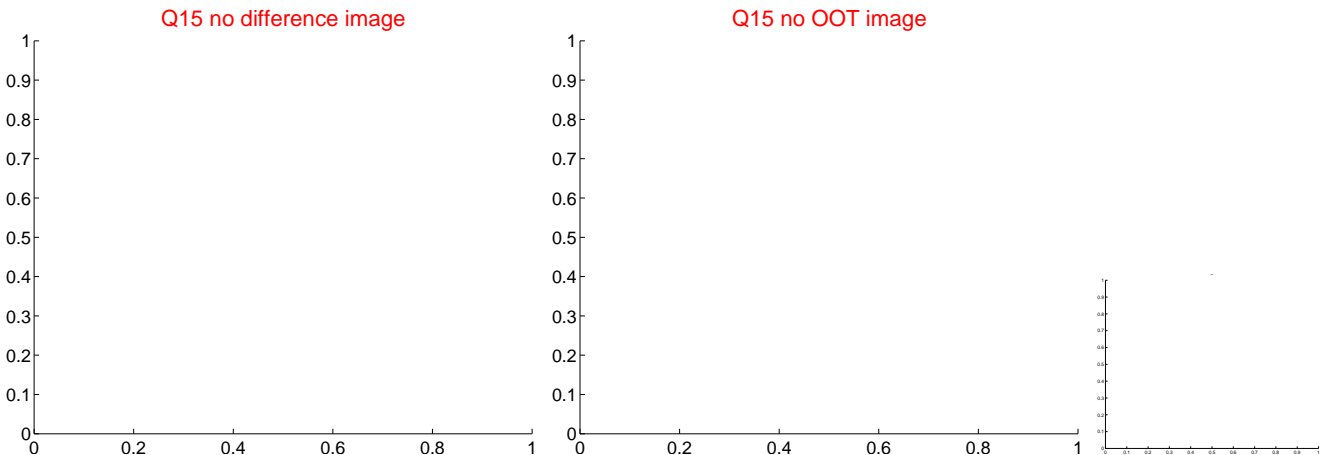
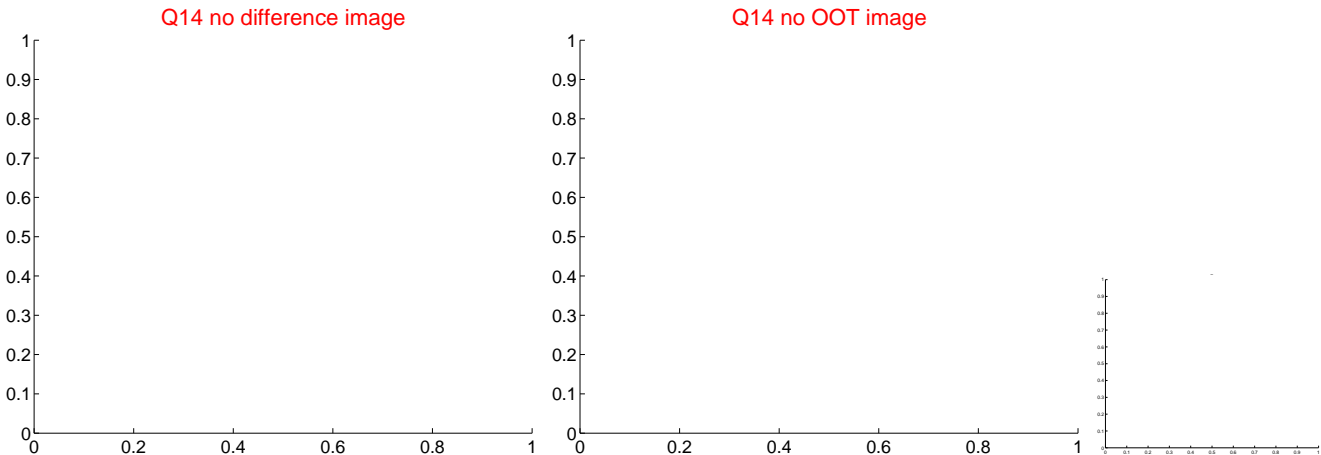
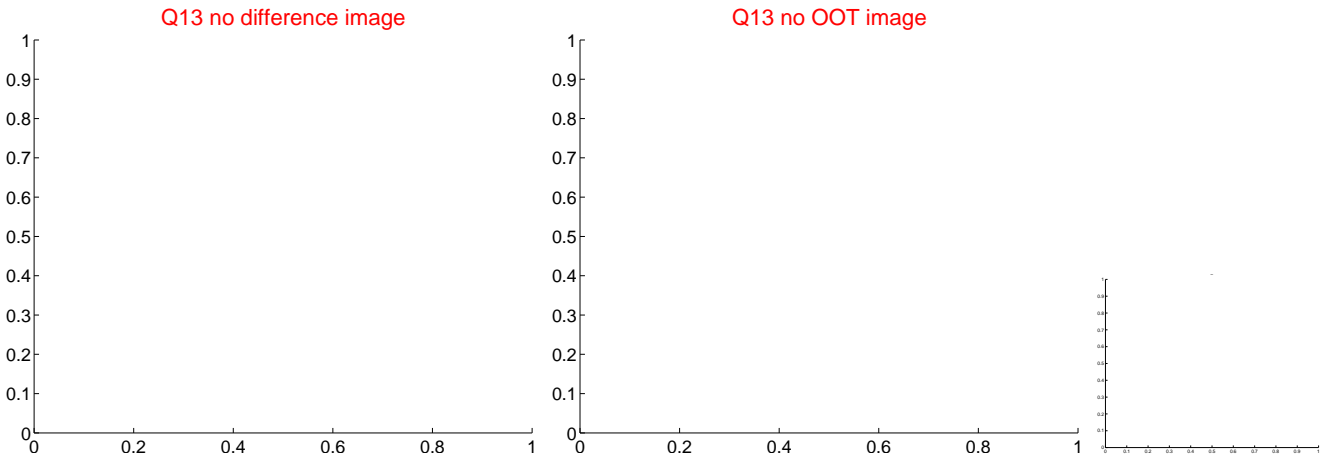
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



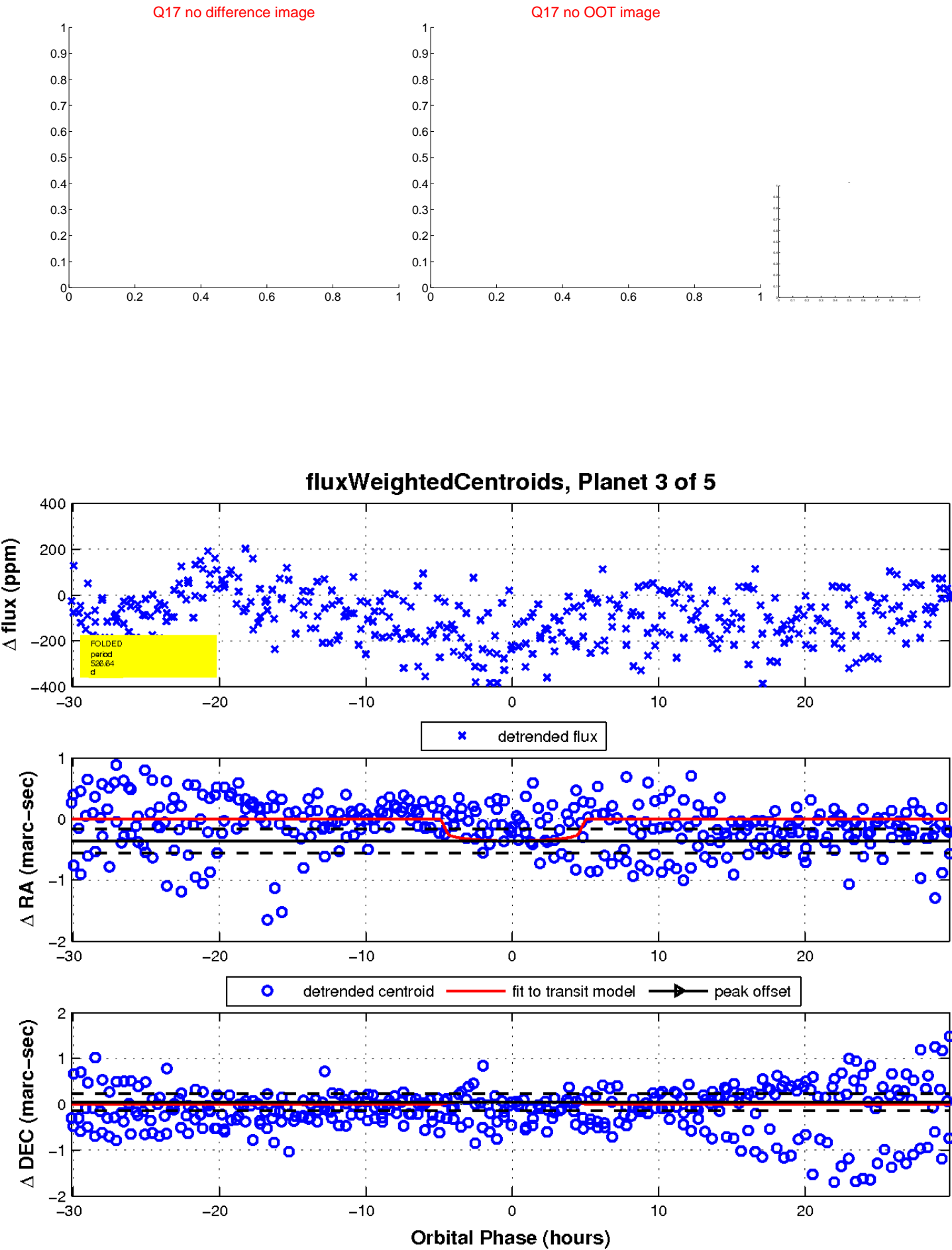
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

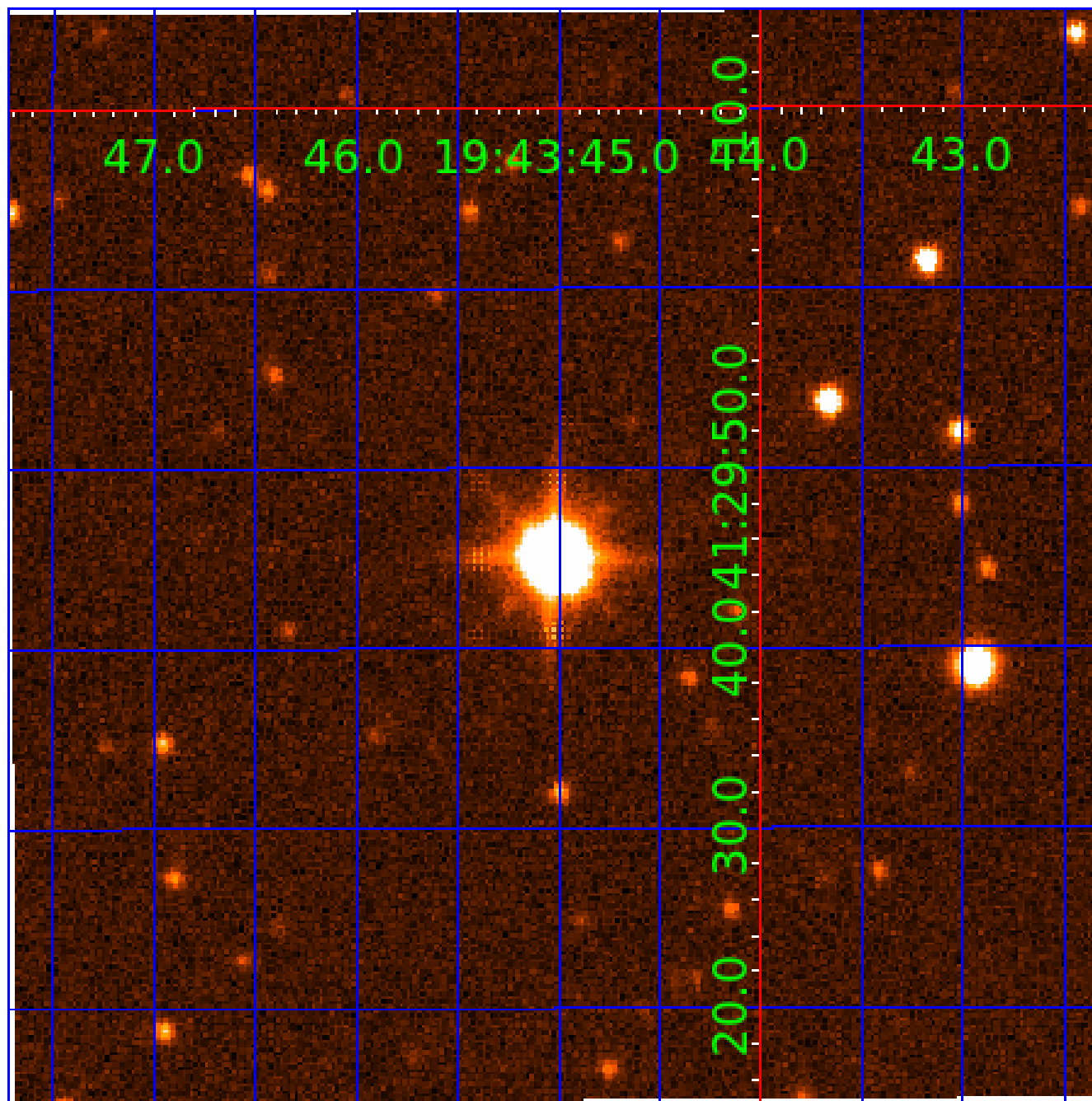


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006138109

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})
006138109-01	OBS	No	1.085644	132.520521	18.2	4.597	11.6	10.4	3.92	7206	1.75	61405.21
006138109-02	OBS	No	240.656511	275.107126	138.0	3.920	10.2	3.9	3.92	7206	5.36	45.77
006138109-03	OBS	No	526.636697	482.463973	189.1	10.053	10.6	7.7	3.92	7206	6.18	16.11
006138109-05	OBS	No	333.600082	279.552048	244.4	3.280	7.9	7.7	3.92	7206	7.12	29.61

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006138109-01	OBS	FP	0.00	1	0	0	0	LPP_DV—CENT_SATURATED
006138109-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_SATURATED
006138109-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
006138109-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

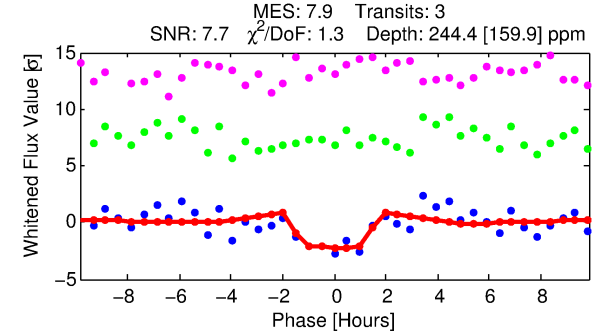
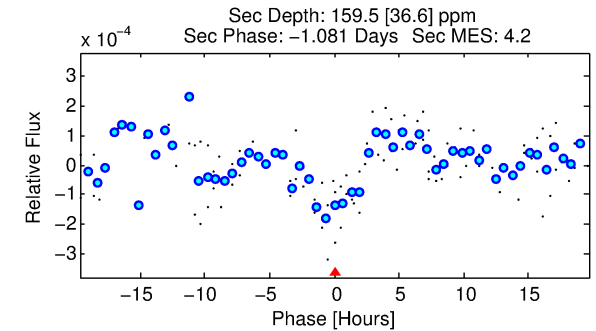
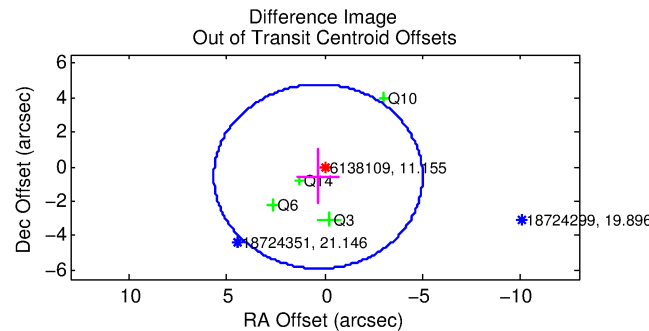
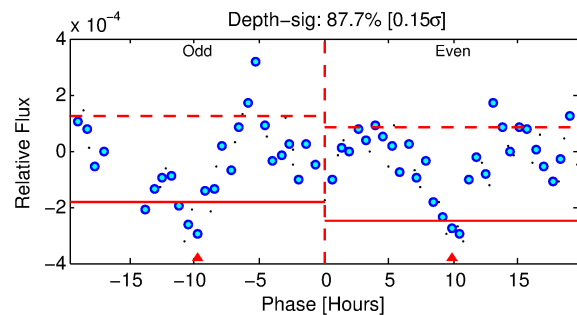
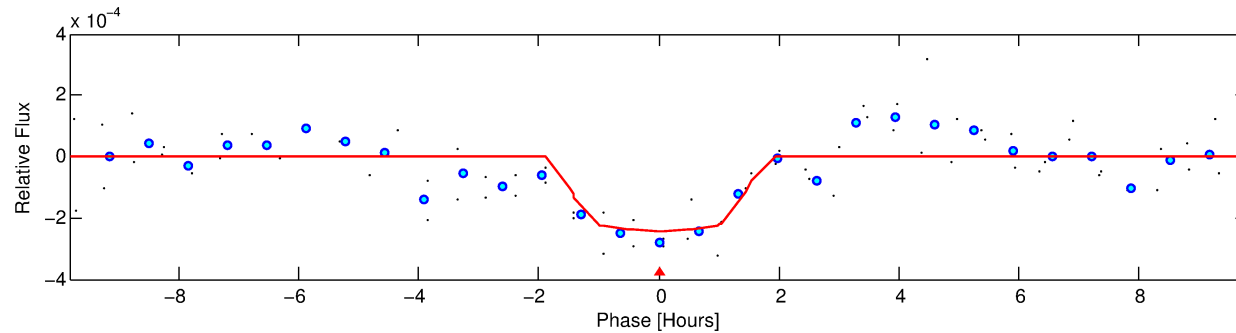
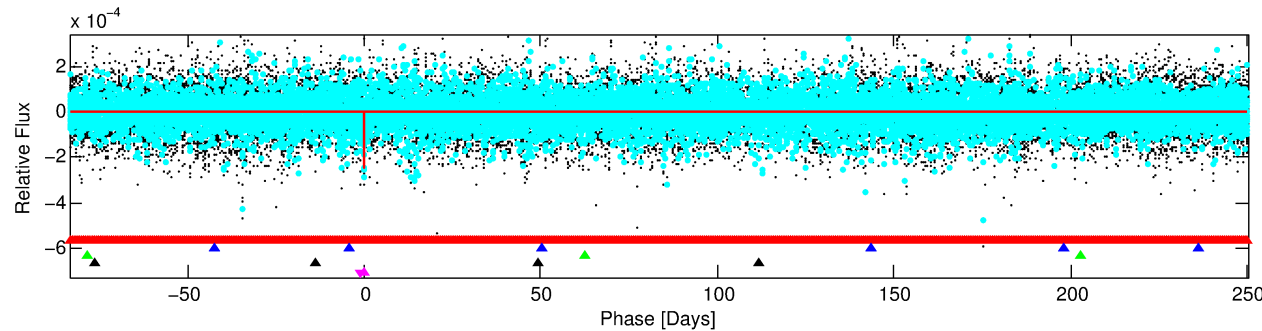
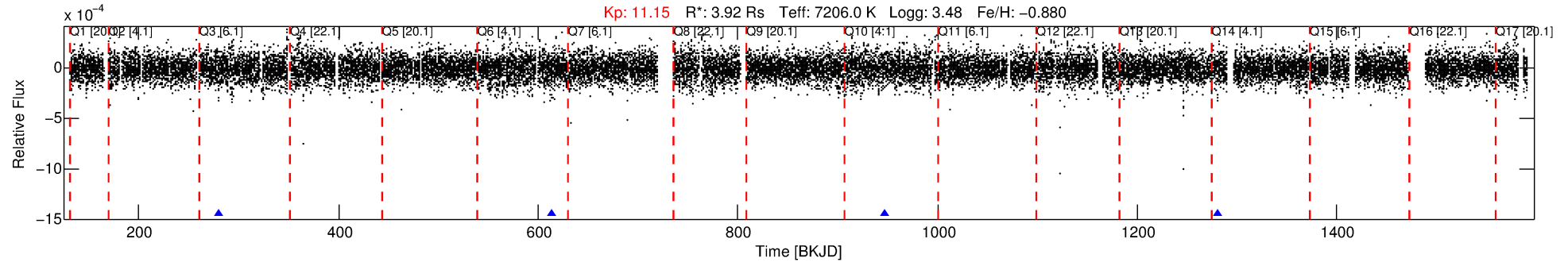
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006138109-05

No Significant Match Found

DV One-Page Summary

KIC: 6138109 Candidate: 5 of 5 Period: 333.600 d



DV Fit Results:

Period = 333.60008 [0.00845] d
Epoch = 279.5520 [0.0108] BKJD
Rp/R* = 0.0166 [0.1766]
a/R* = 366.18 [24342.31]
b = 0.90 [14.18]
Seff = 29.61 [38.89]
Teq = 595 [195] K
Rp = 7.12 [75.67] Re
a = 1.1193 [0.8432] AU
Ag = 2170.92 [46166.14] [0.05 σ]
Teffp = 6278 [33313] K [0.17 σ]

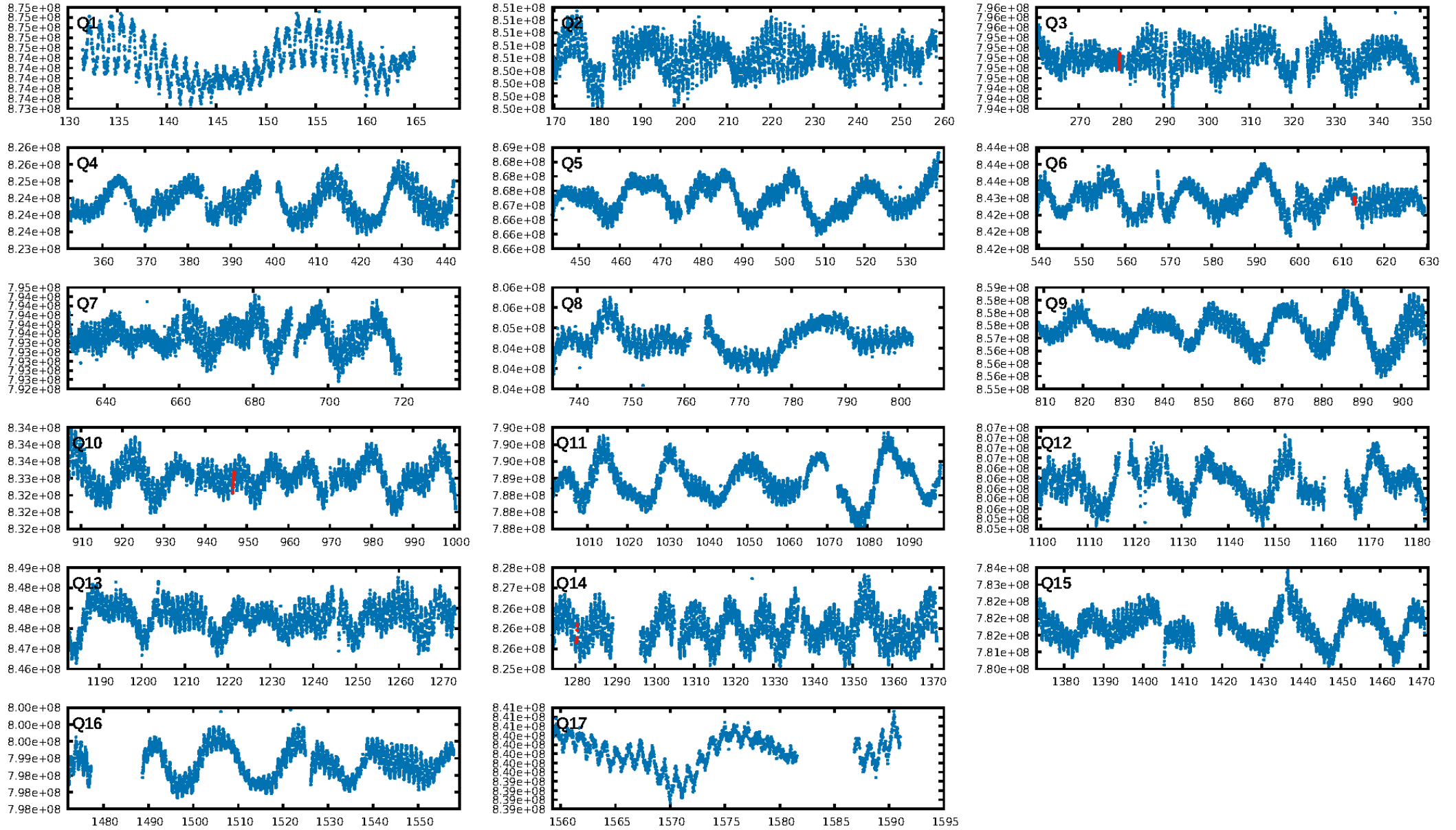
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [436.45 σ]
LongPeriod-sig: 100.0% [79.55 σ]
ModelChiSquare2-sig: 40.9%
ModelChiSquareGof-sig: 99.8%
Bootstrap-pfa: 1.10e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -13.2
Centroid-sig: 74.5%
Centroid-so: 0.424 arcsec [0.44 σ]
OotOffset-rm: 0.657 arcsec [0.37 σ]
KicOffset-rm: 1.179 arcsec [0.69 σ]
OotOffset-st: 3/1/0/0 [4]
KicOffset-st: 3/1/0/0 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 0.25 [1/4]

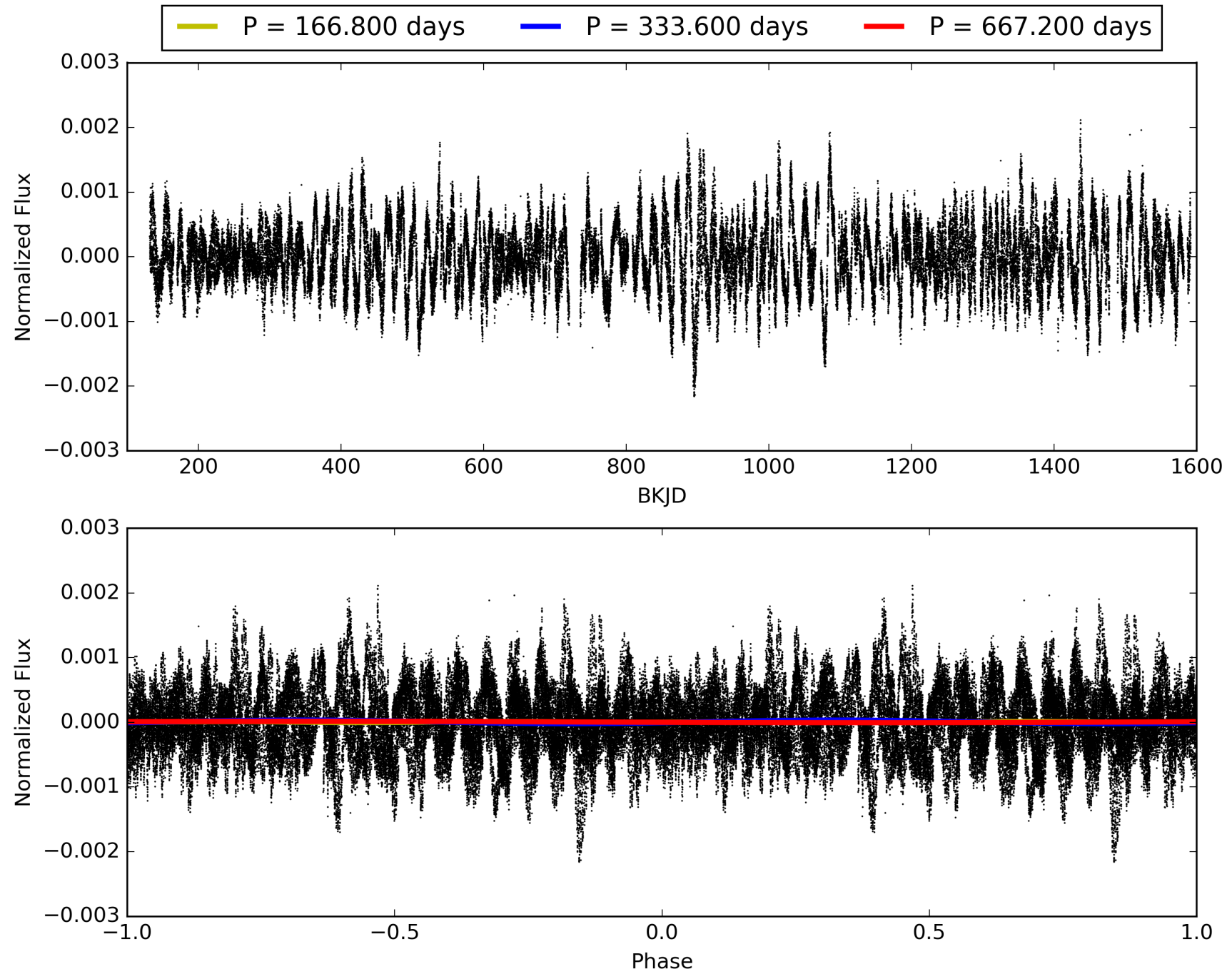
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:22:26 Z

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

TCE 006138109-05, PDC Light Curves

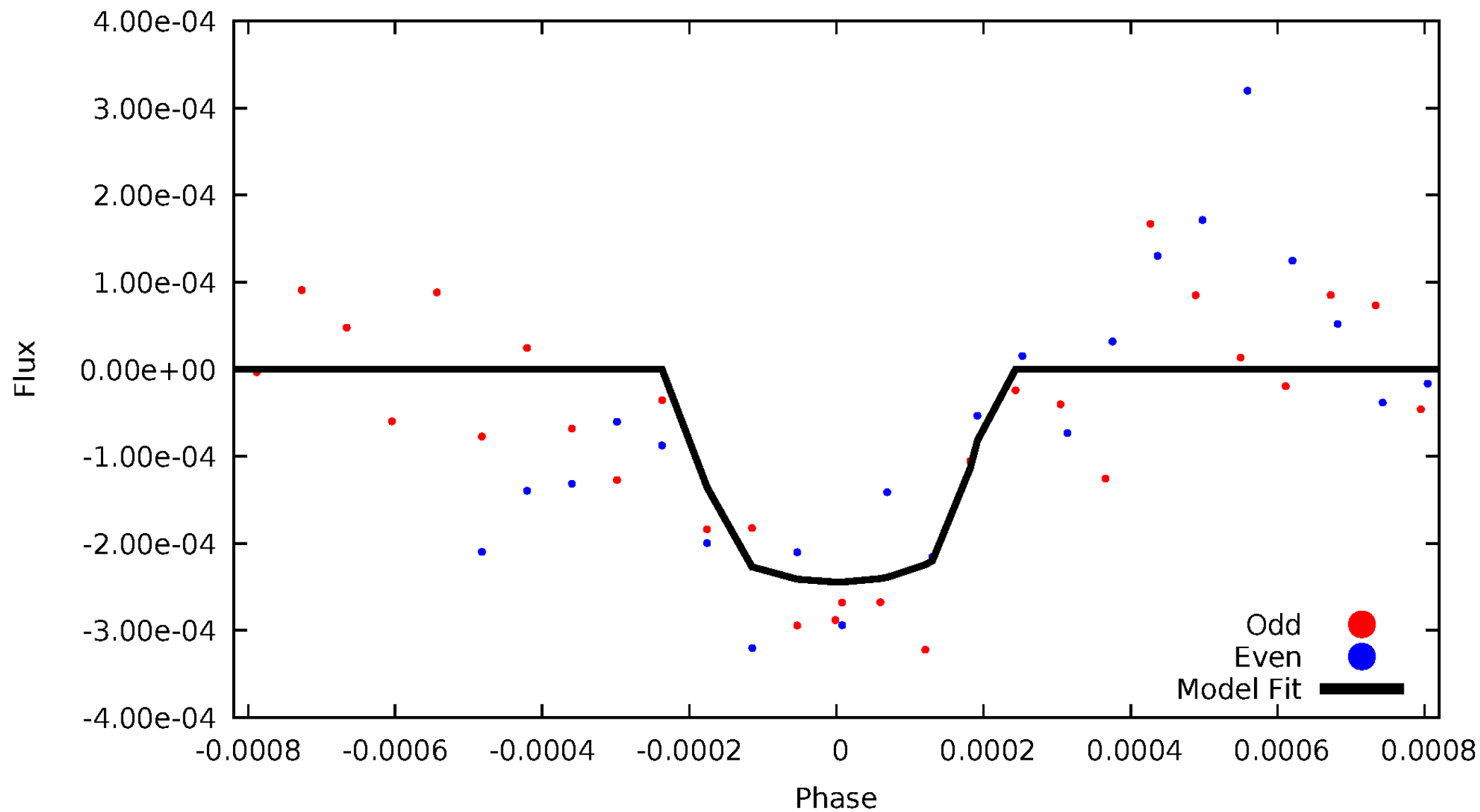


TCE 006138109-05



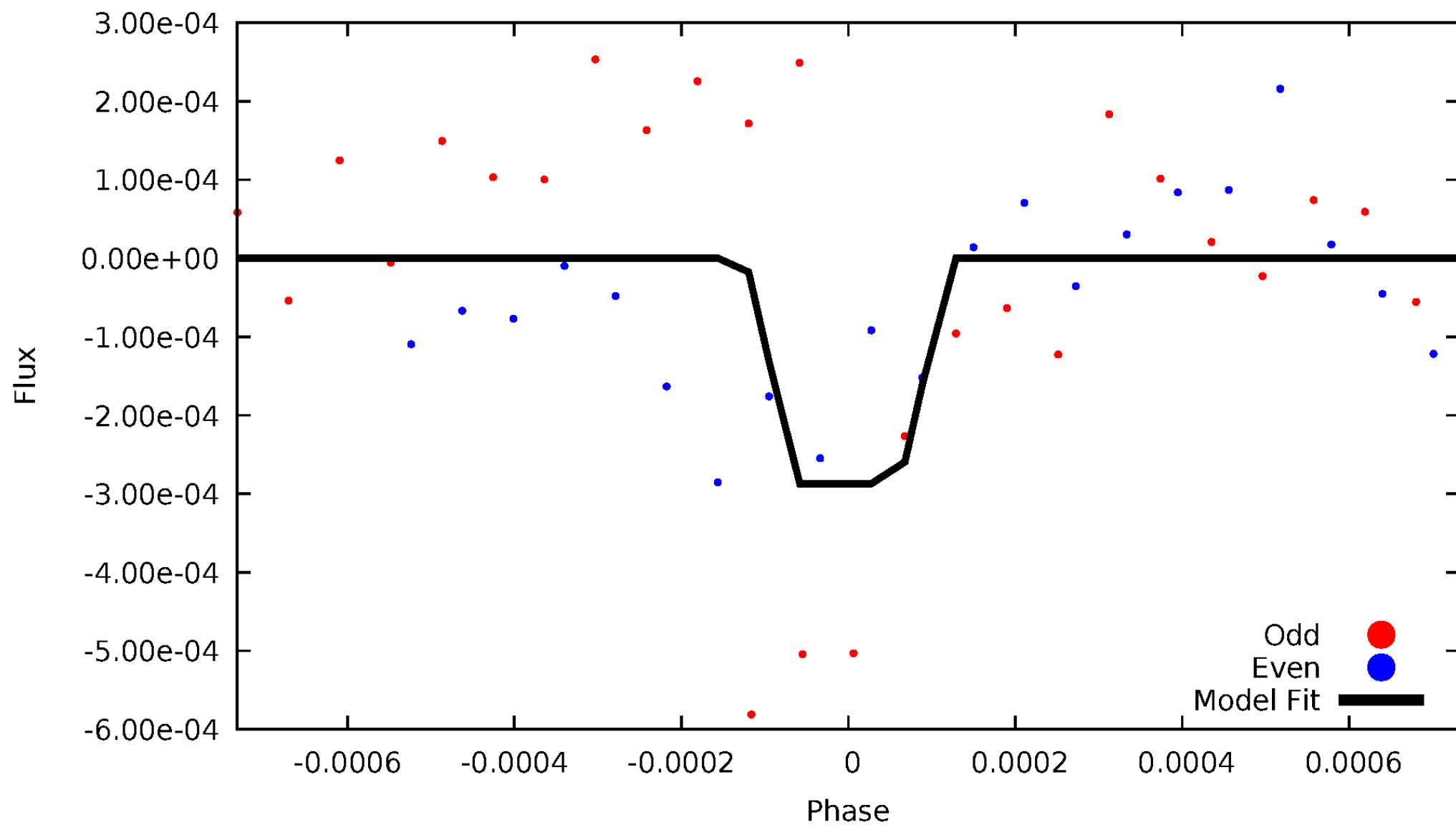
DV Odd/Even

TCE 006138109-05



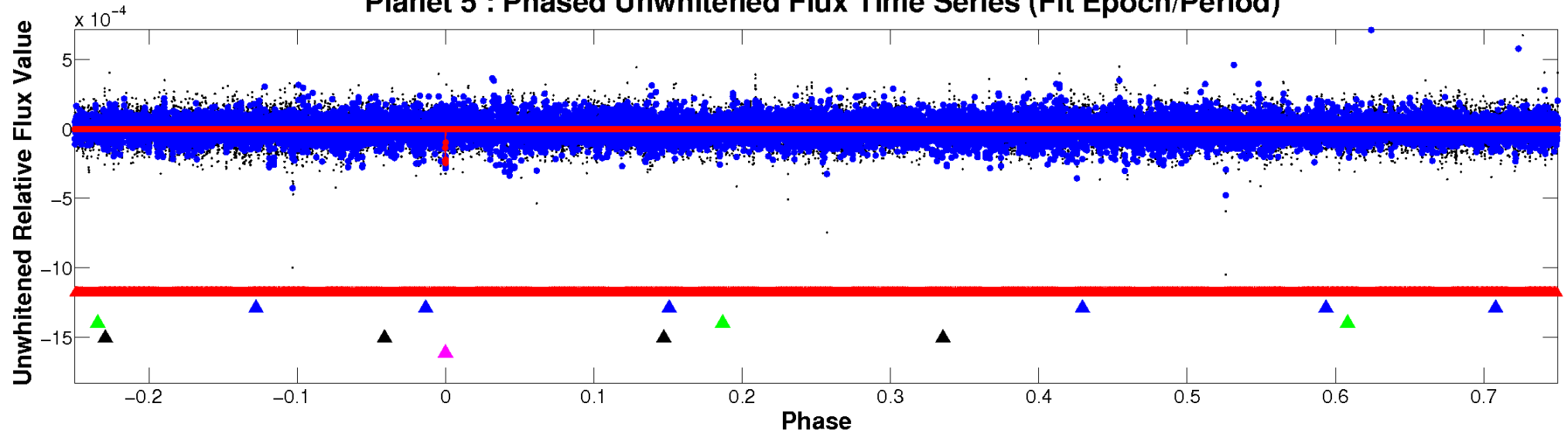
ALT Odd/Even

TCE 006138109-05

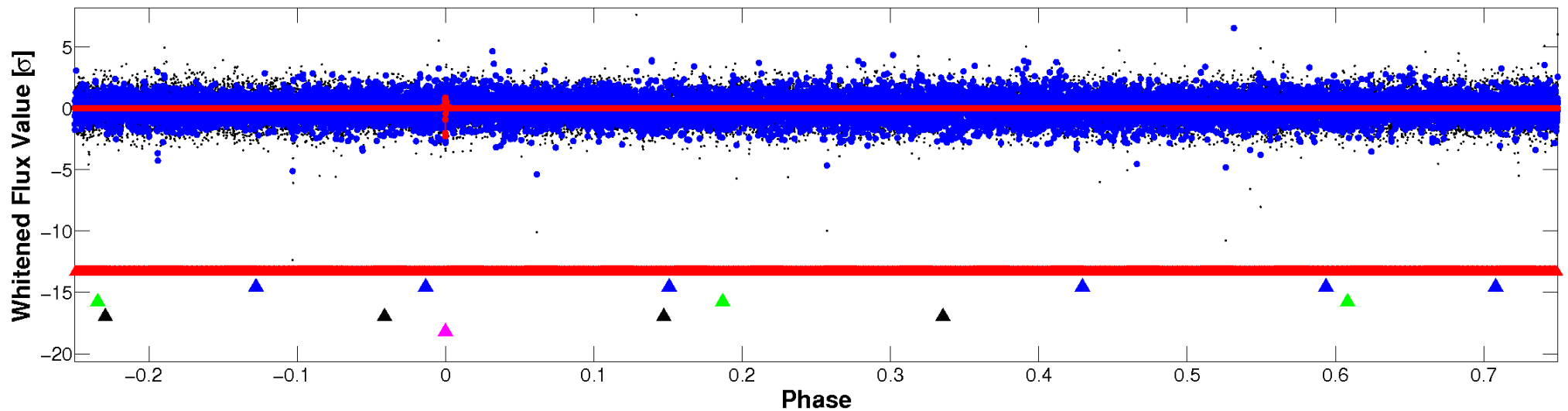


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

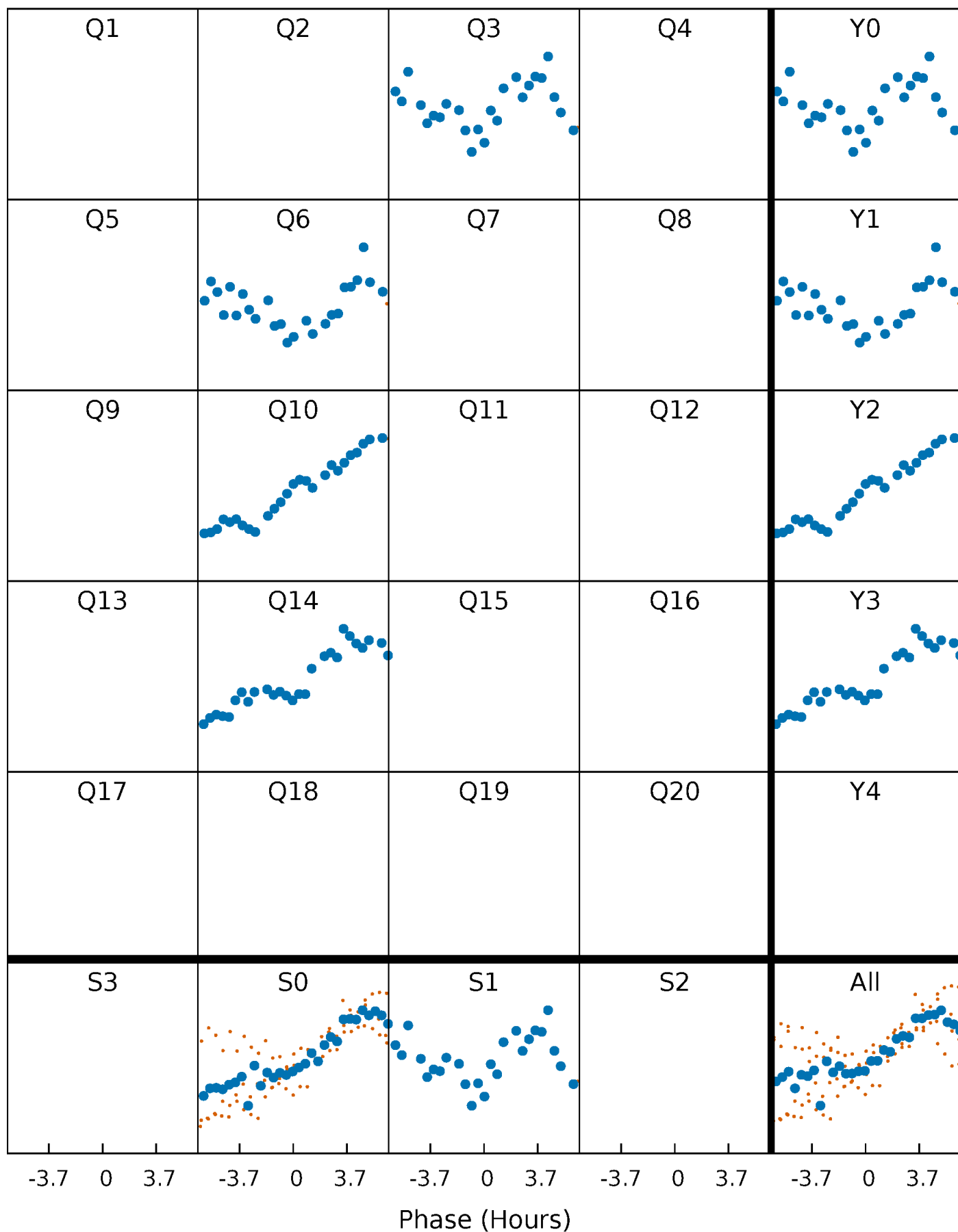


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



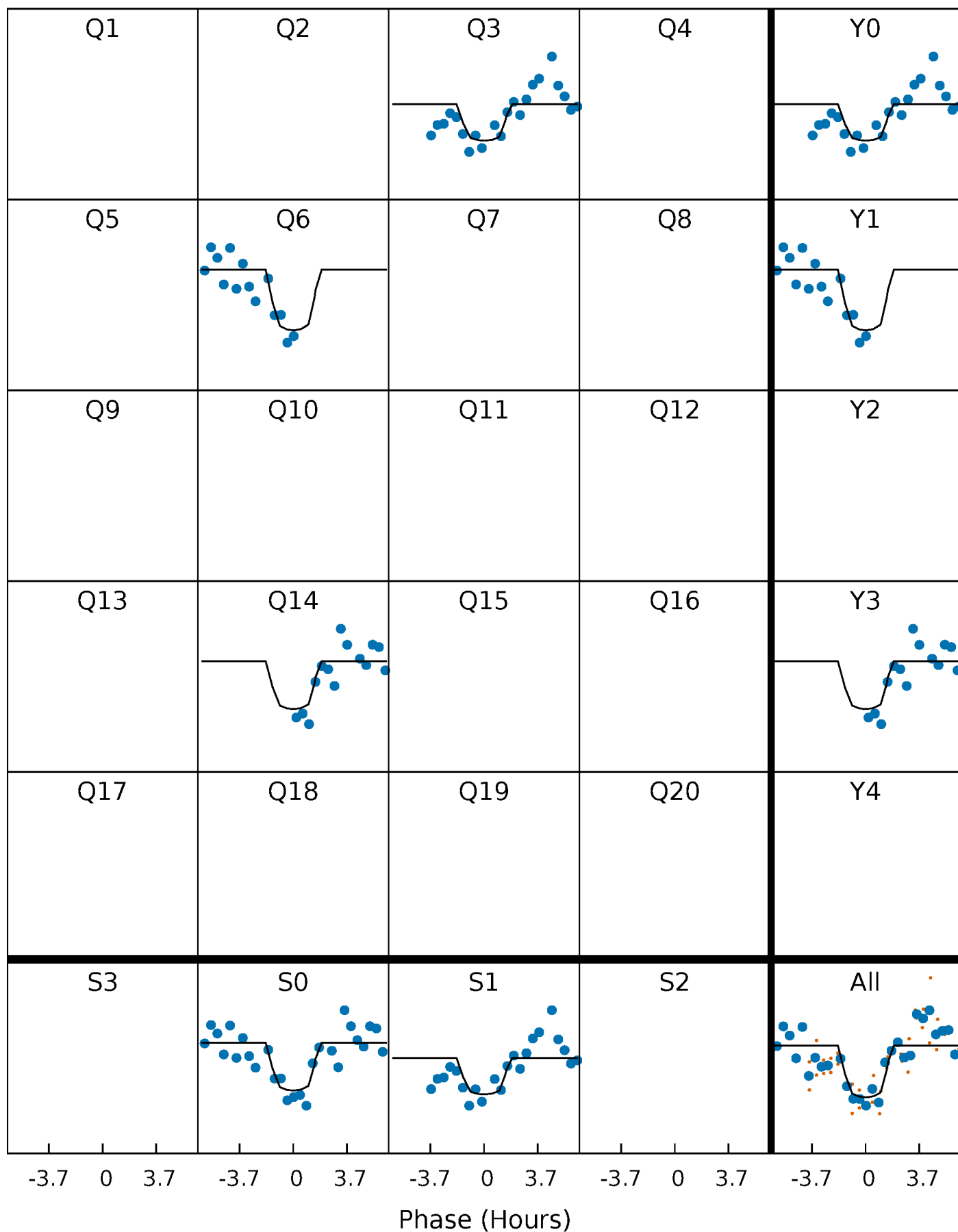
PDC Quarter-Phased Transit Curves

TCE 006138109-05 $P=333.600082$ Days $T_0=279.552048$ (BKJD)



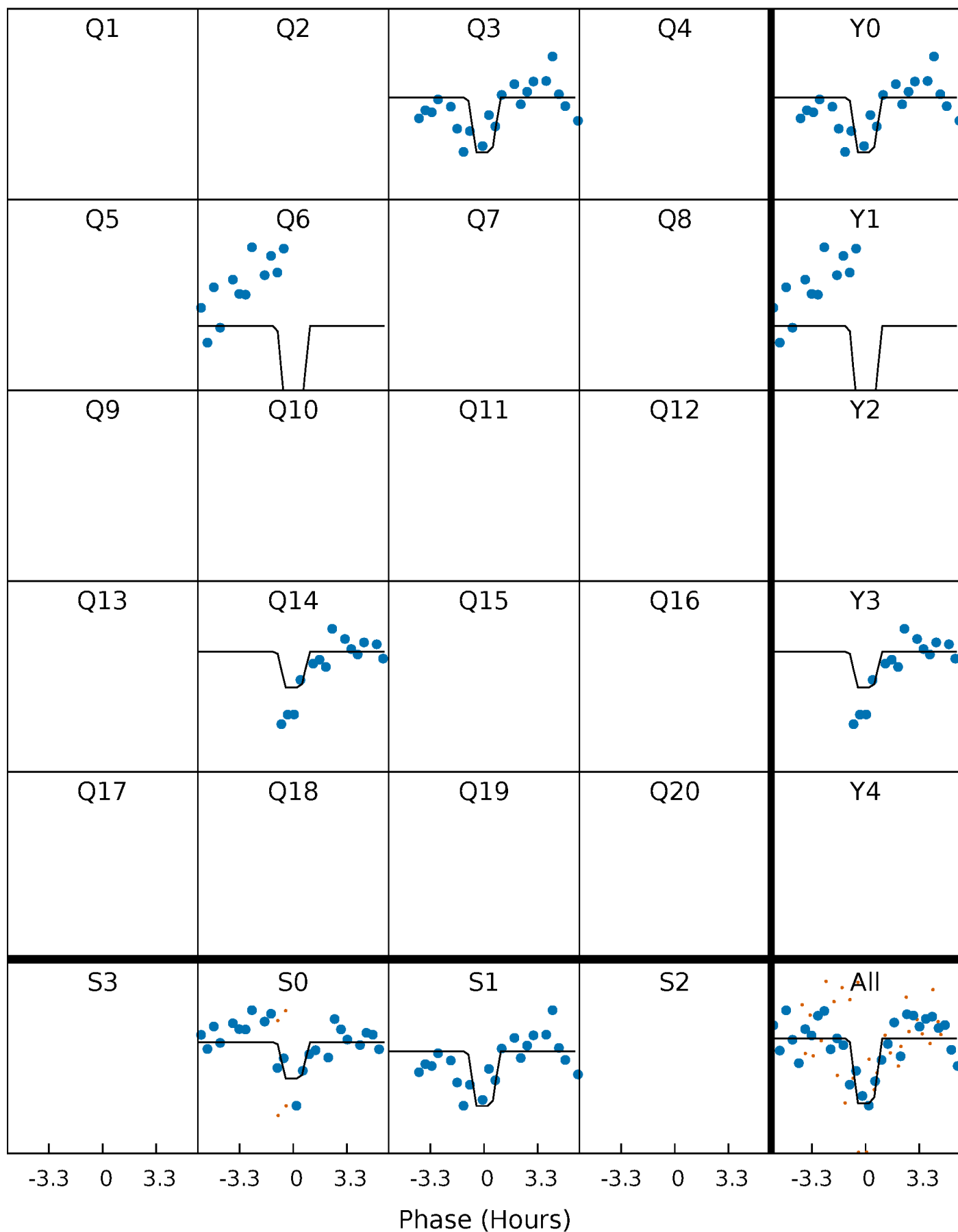
DV Quarter-Phased Transit Curves

TCE 006138109-05 $P=333.600082$ Days $T_0=279.552048$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

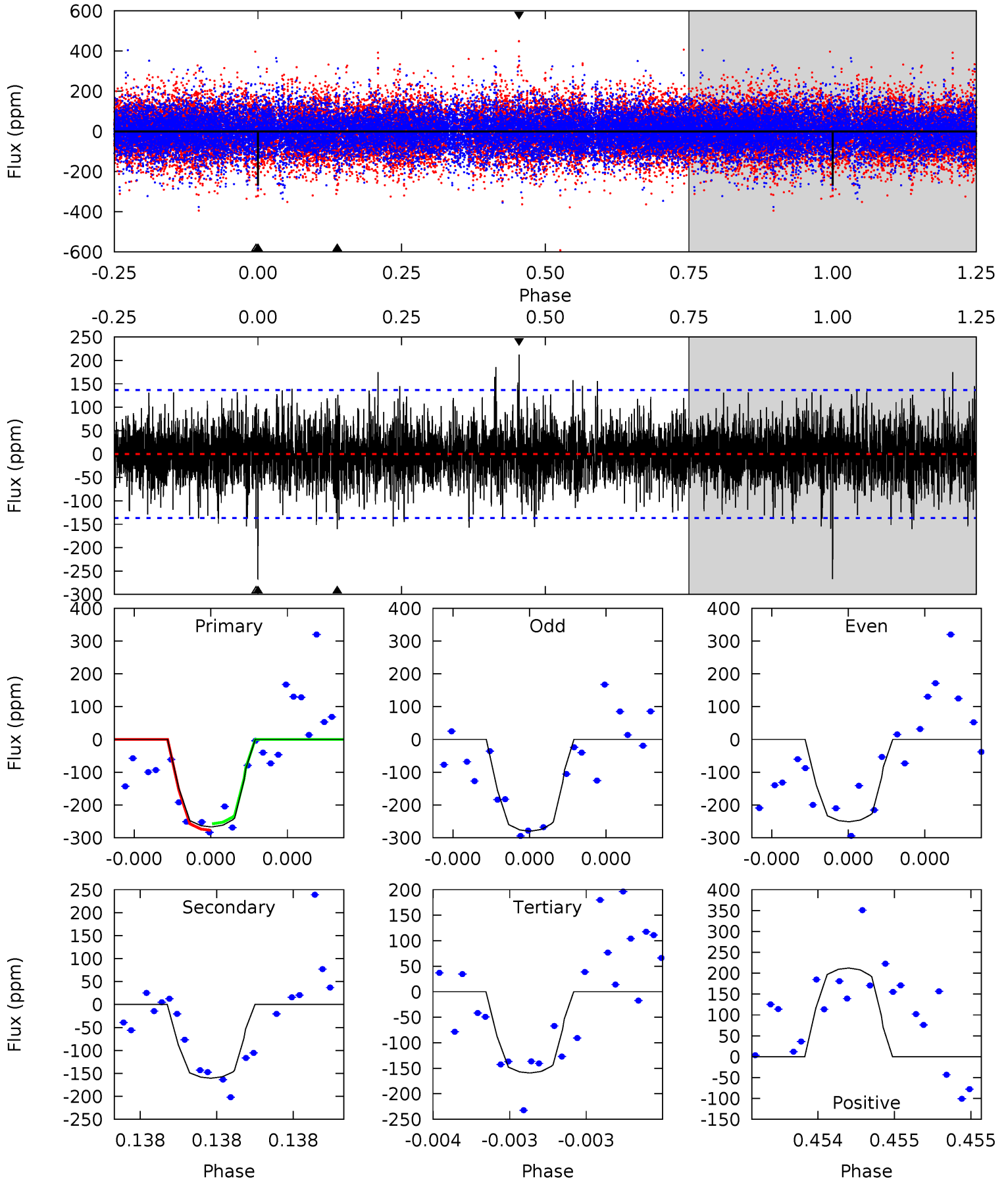
TCE 006138109-05 $P=333.608179$ Days $T_0=279.565980$ (BKJD)



DV Model-Shift Uniqueness Test

006138109-05, P = 333.600082 Days, E = 279.552048 Days

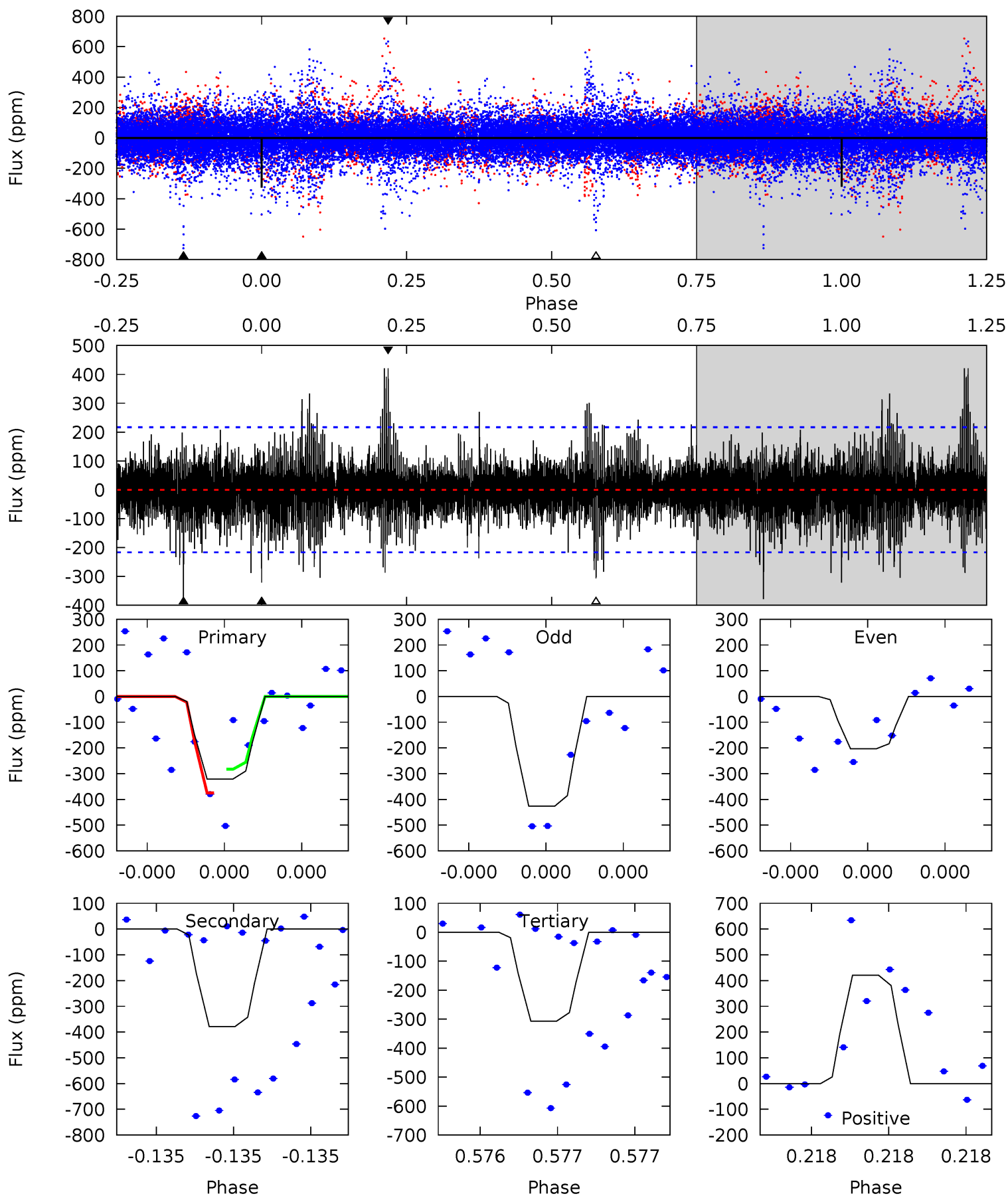
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	6.58	6.53	8.70	5.60	3.53	1.75	4.41	2.24	0.05	-2.13	0.59	1.02	0.44	0.40



Alt Model-Shift Uniqueness Test

006138109-05, P = 333.608179 Days, E = 279.565980 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.42	9.94	8.05	11.1	5.70	3.67	1.62	0.37	-2.63	1.89	-1.12	2.81	0.65	0.53	1.20



Stellar Parameters For KIC 006138109

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	7206^{+224}_{-274}	$3.477^{+0.801}_{-0.089}$	$-0.880^{+0.300}_{-0.300}$	$3.919^{+0.640}_{-2.559}$	$1.678^{+0.148}_{-0.629}$	$0.039^{+0.698}_{-0.011}$
	+3%/-4%	+23%/-3%	+34%/-34%	+16%/-65%	+9%/-37%	+1779%/-27%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 006138109-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-160 ± 24	$40.30^{+54.11}_{-28.16}$	791^{+70}_{-133}	2963^{+1530}_{-508}	64^{+685}_{-52}
Alt.	-378 ± 38	$43.11^{+55.93}_{-31.69}$	794^{+67}_{-145}	3349^{+1876}_{-655}	134^{+1833}_{-107}

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 $A_{obs} \gg 1.0$

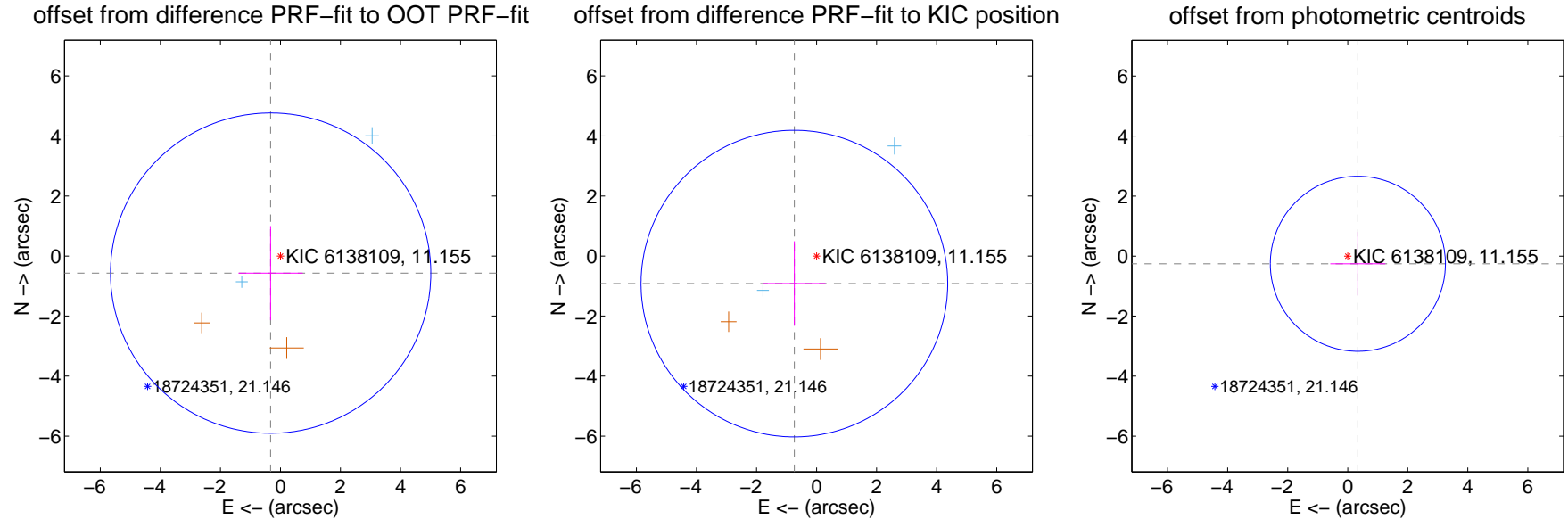
DV Centroid Data

Supplemental centroid analysis for 006138109-05. **Kepler magnitude: 11.15.** Transit SNR 7.68

There are 2 quarters with good PRF difference image offsets

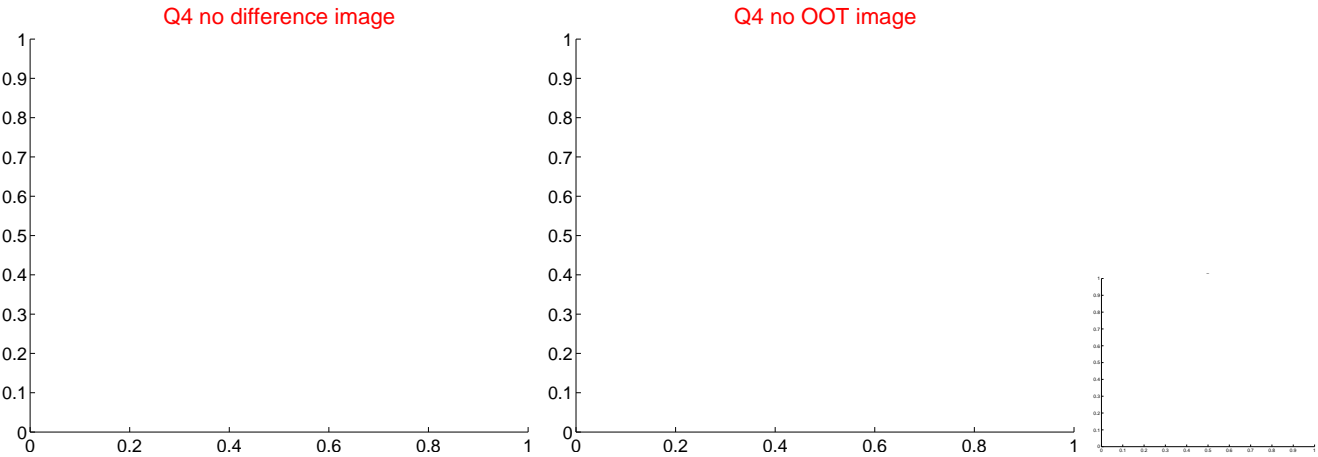
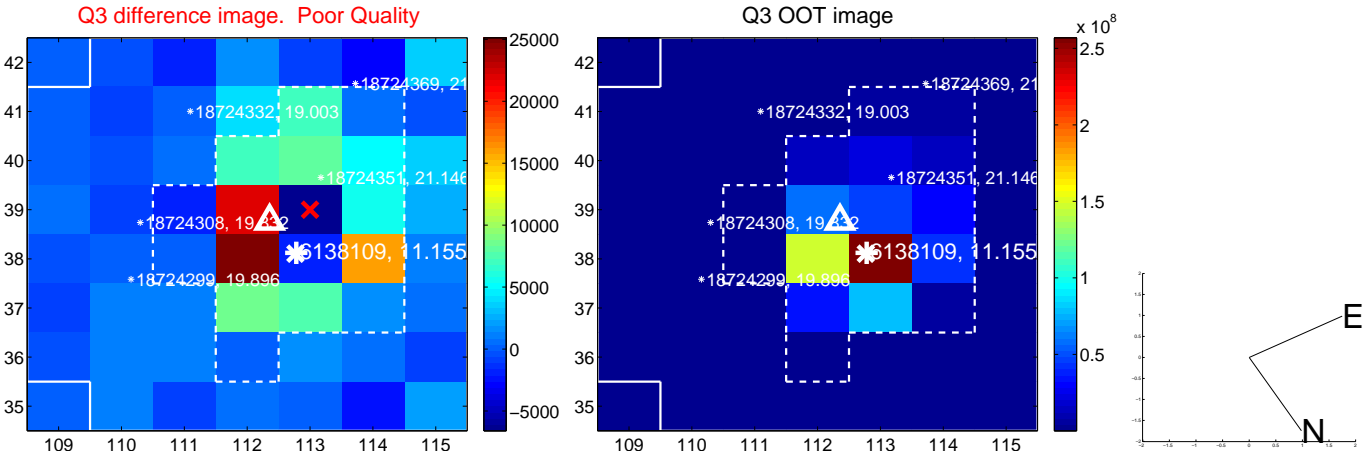
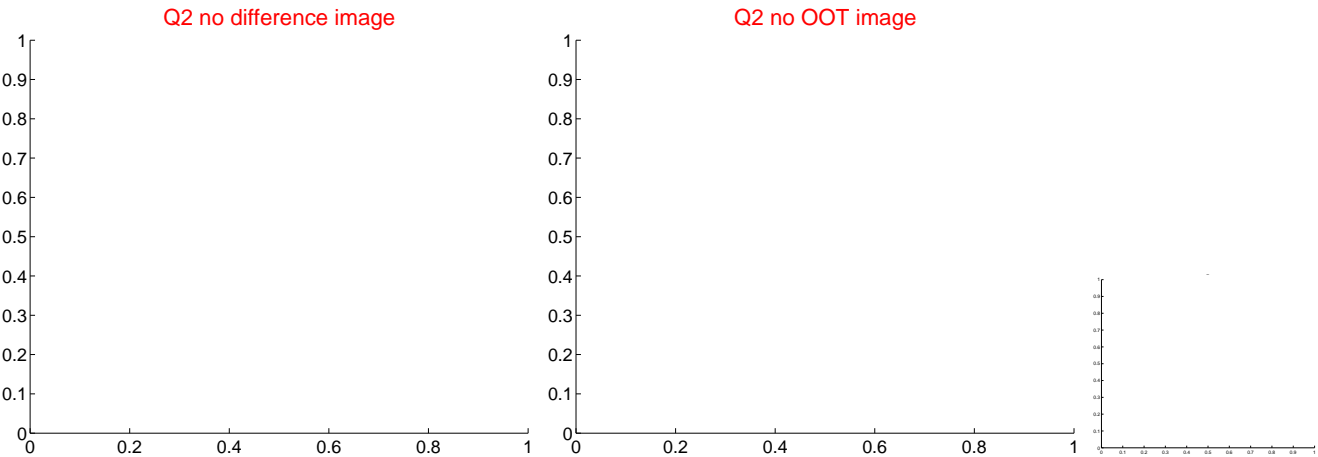
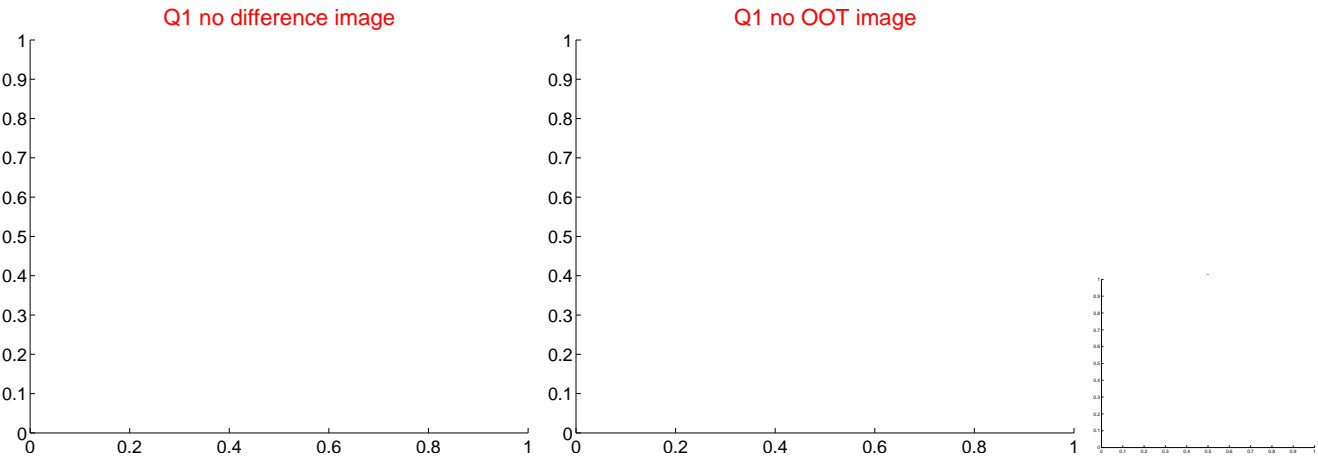
The direct PRF centroid is offset from the target star catalog position by about 0.58 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.657 ± 1.778	0.37	0.327 ± 1.069	-0.570 ± 1.568
PRF-fit source offset from KIC position	1.179 ± 1.702	0.69	0.740 ± 1.036	-0.918 ± 1.408
photometric centroid source offset	0.42 ± 0.97	0.44	-0.34 ± 0.92	-0.26 ± 1.06

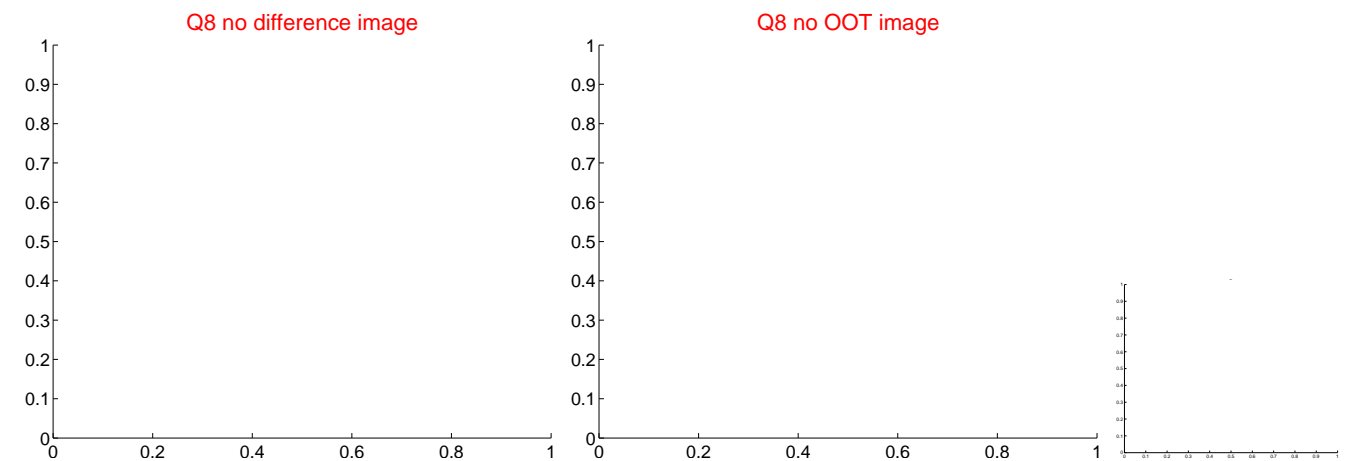
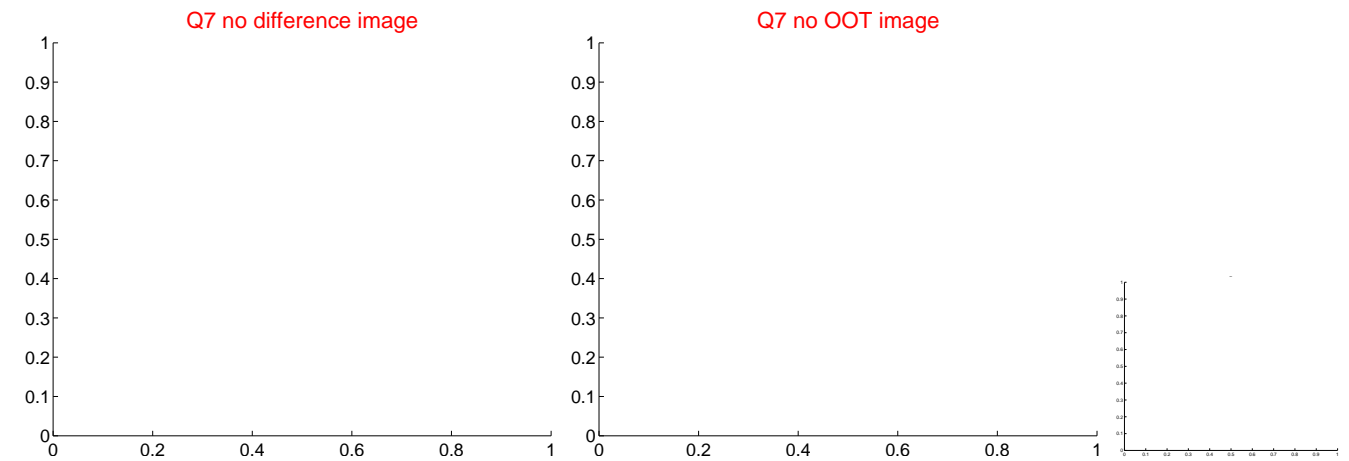
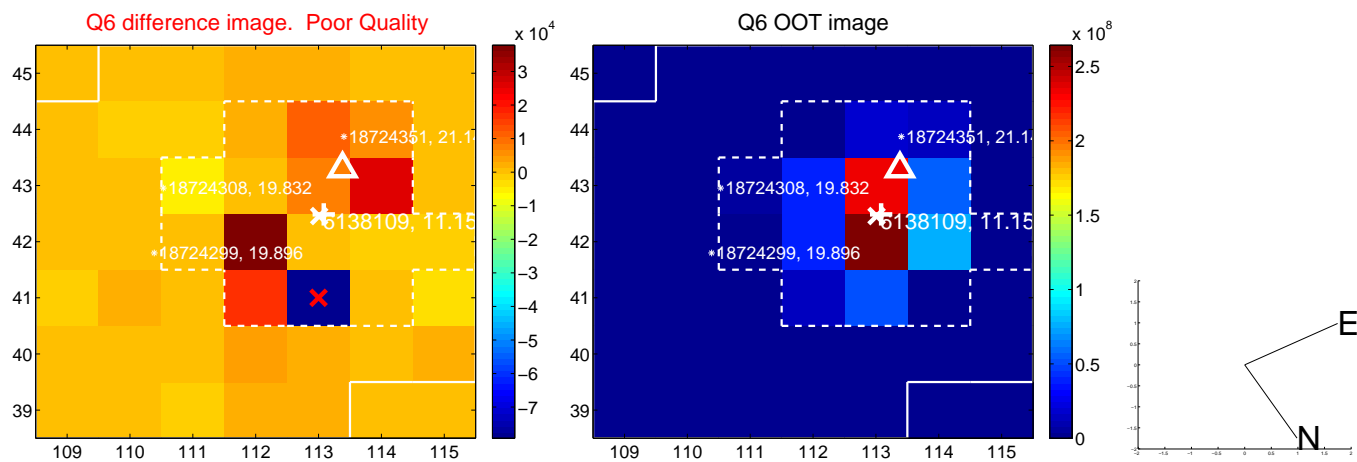
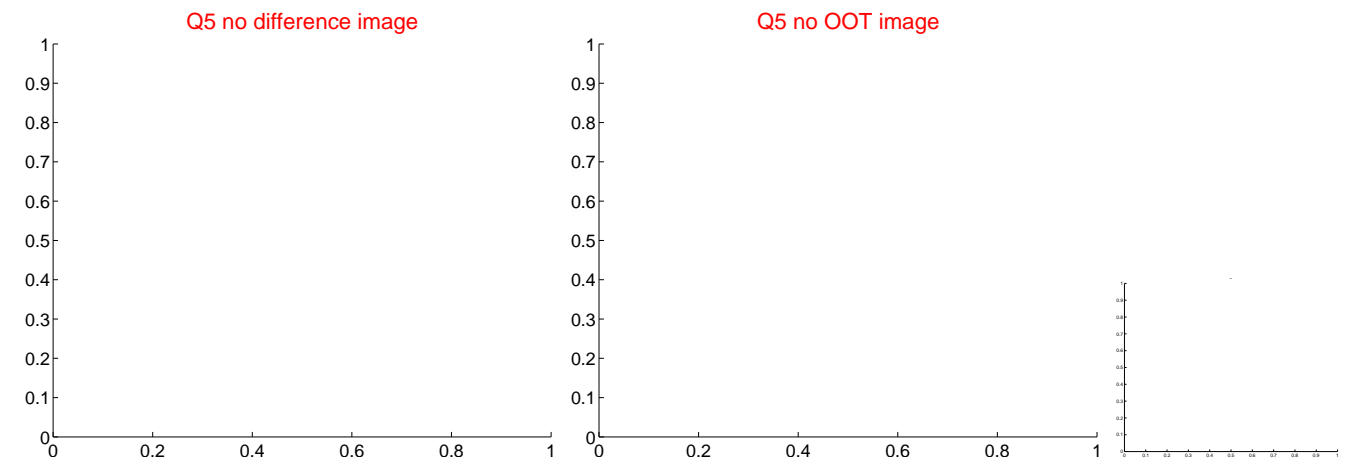


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

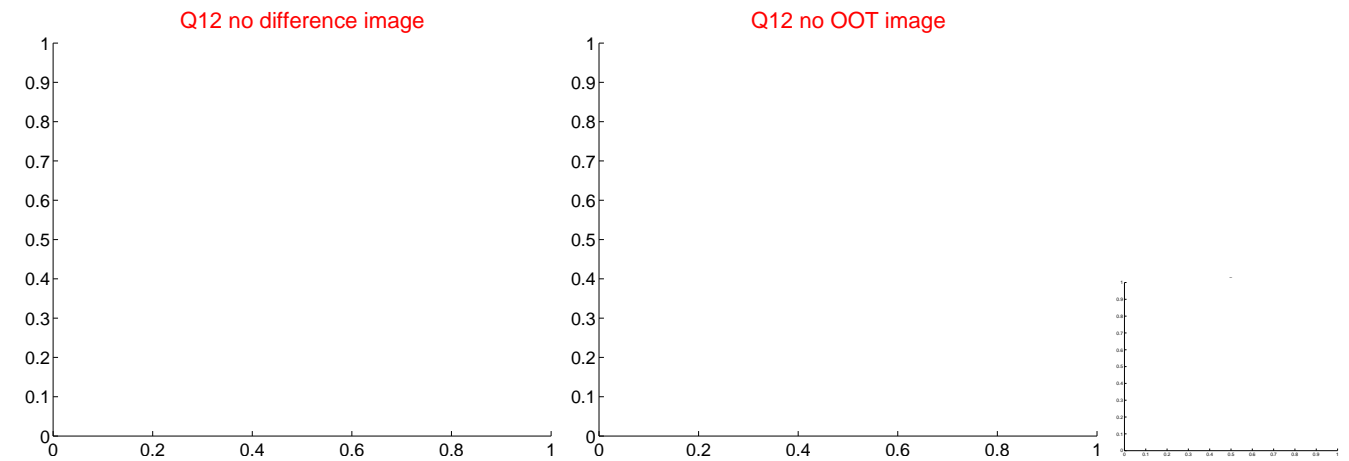
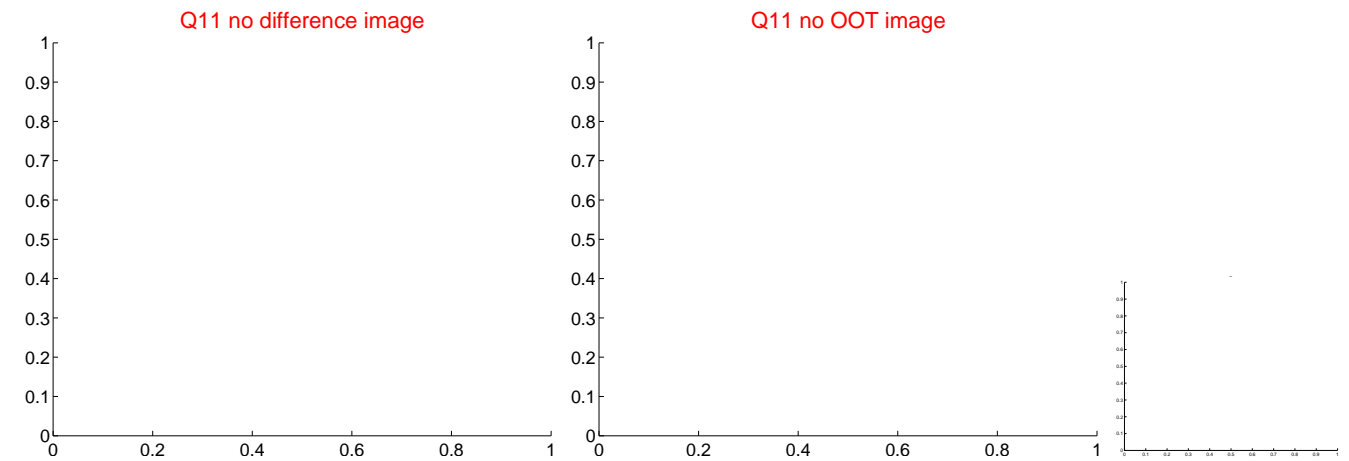
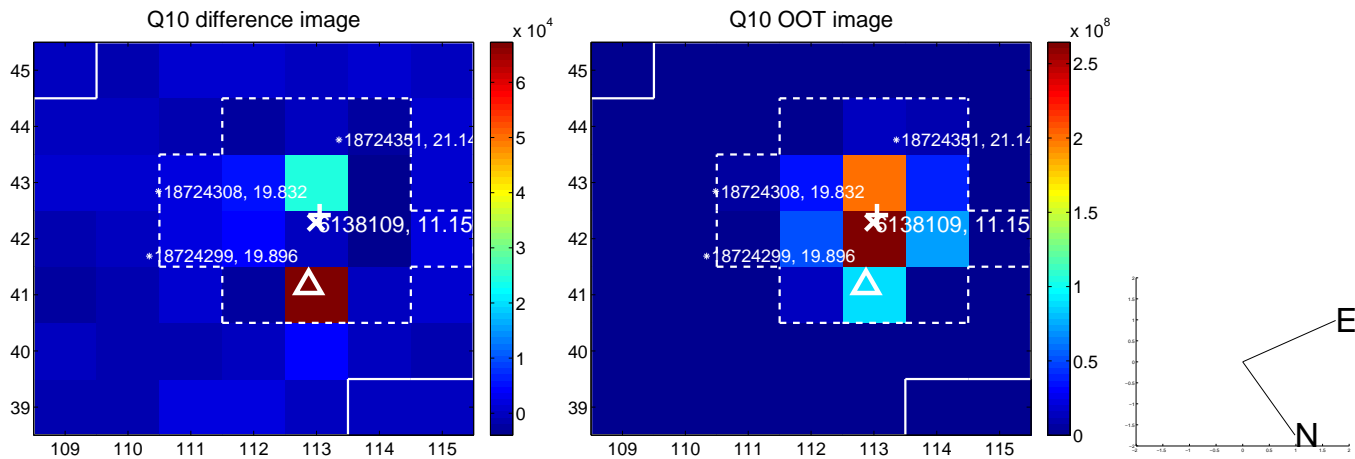
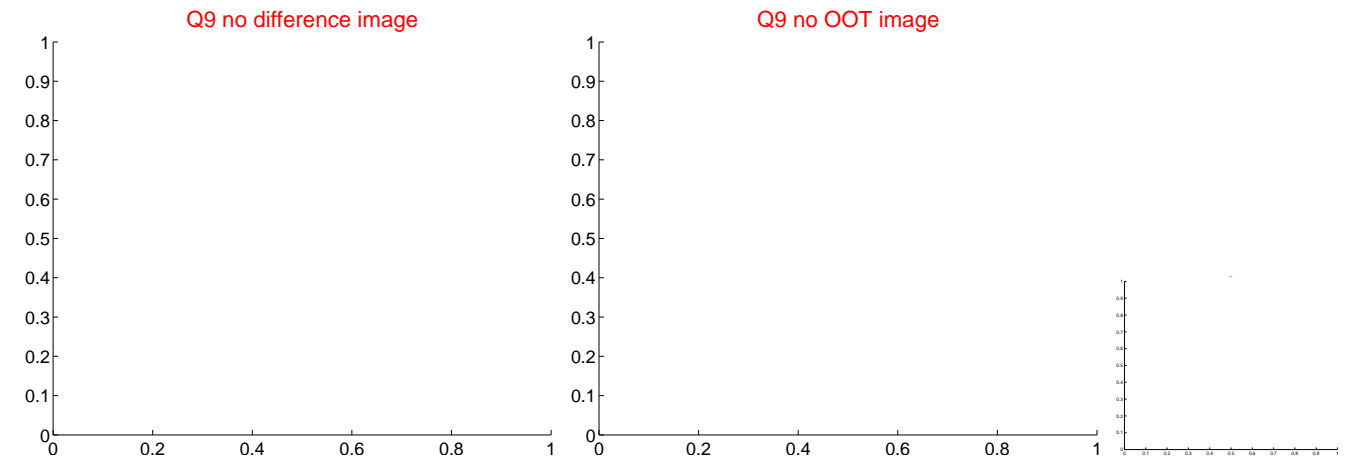
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

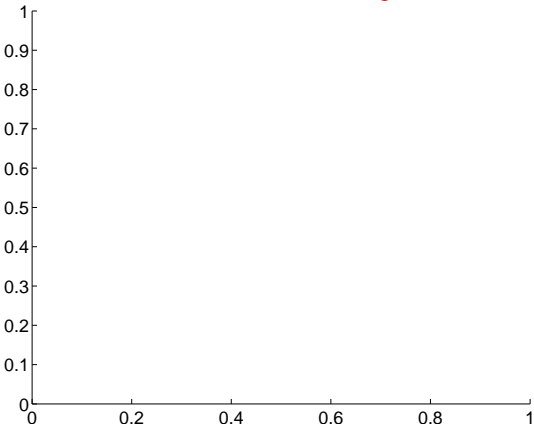


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

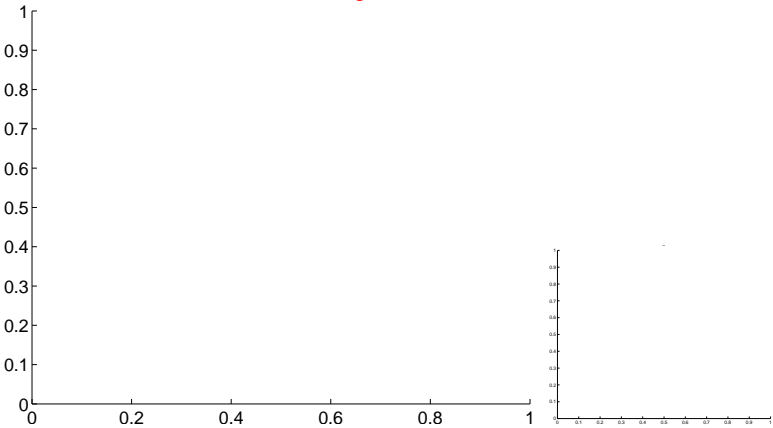


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

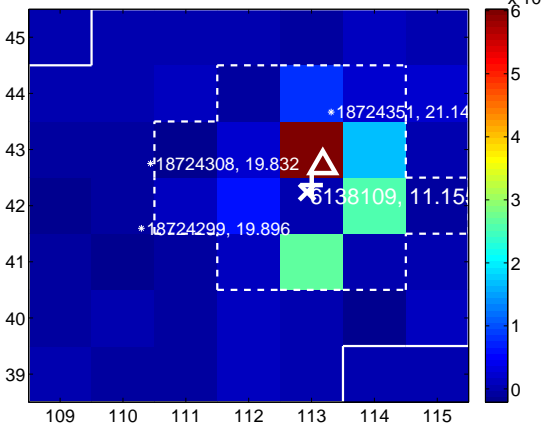
Q13 no difference image



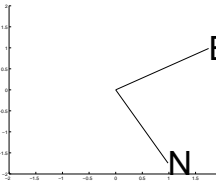
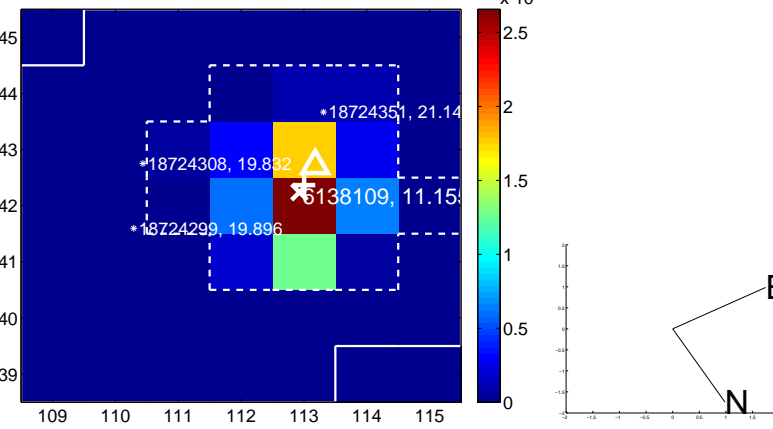
Q13 no OOT image



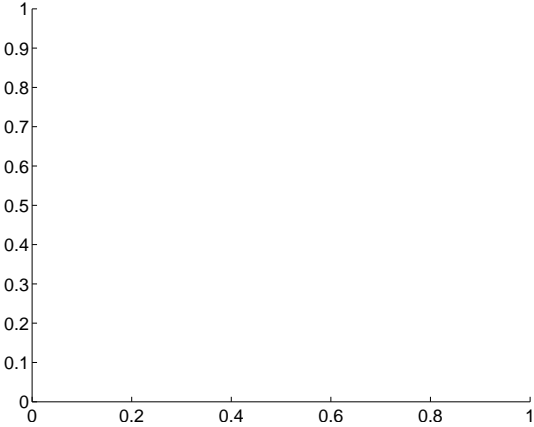
Q14 difference image



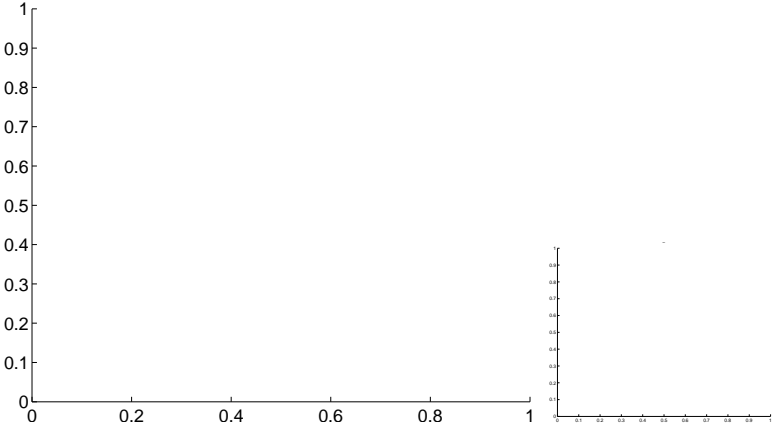
Q14 OOT image



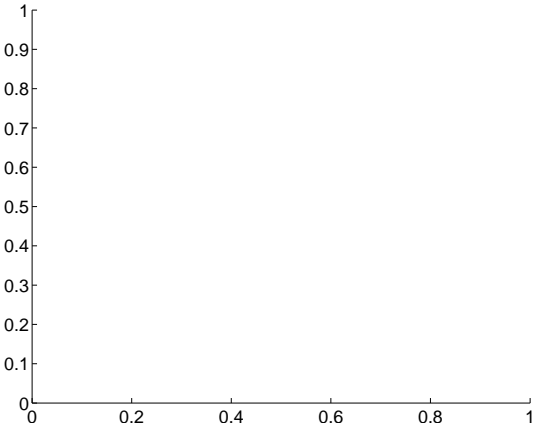
Q15 no difference image



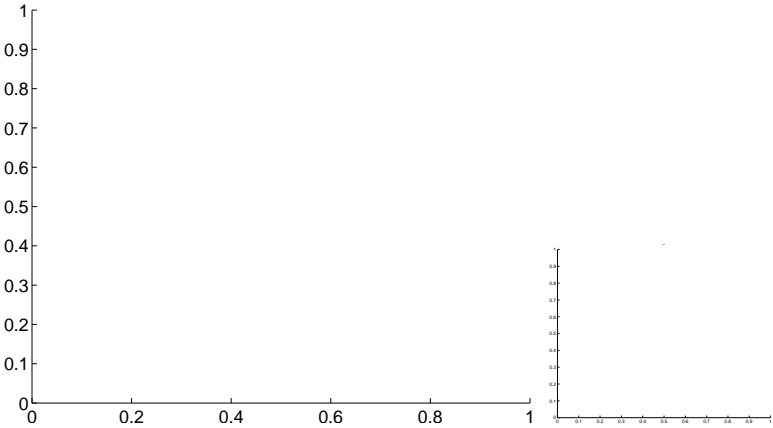
Q15 no OOT image



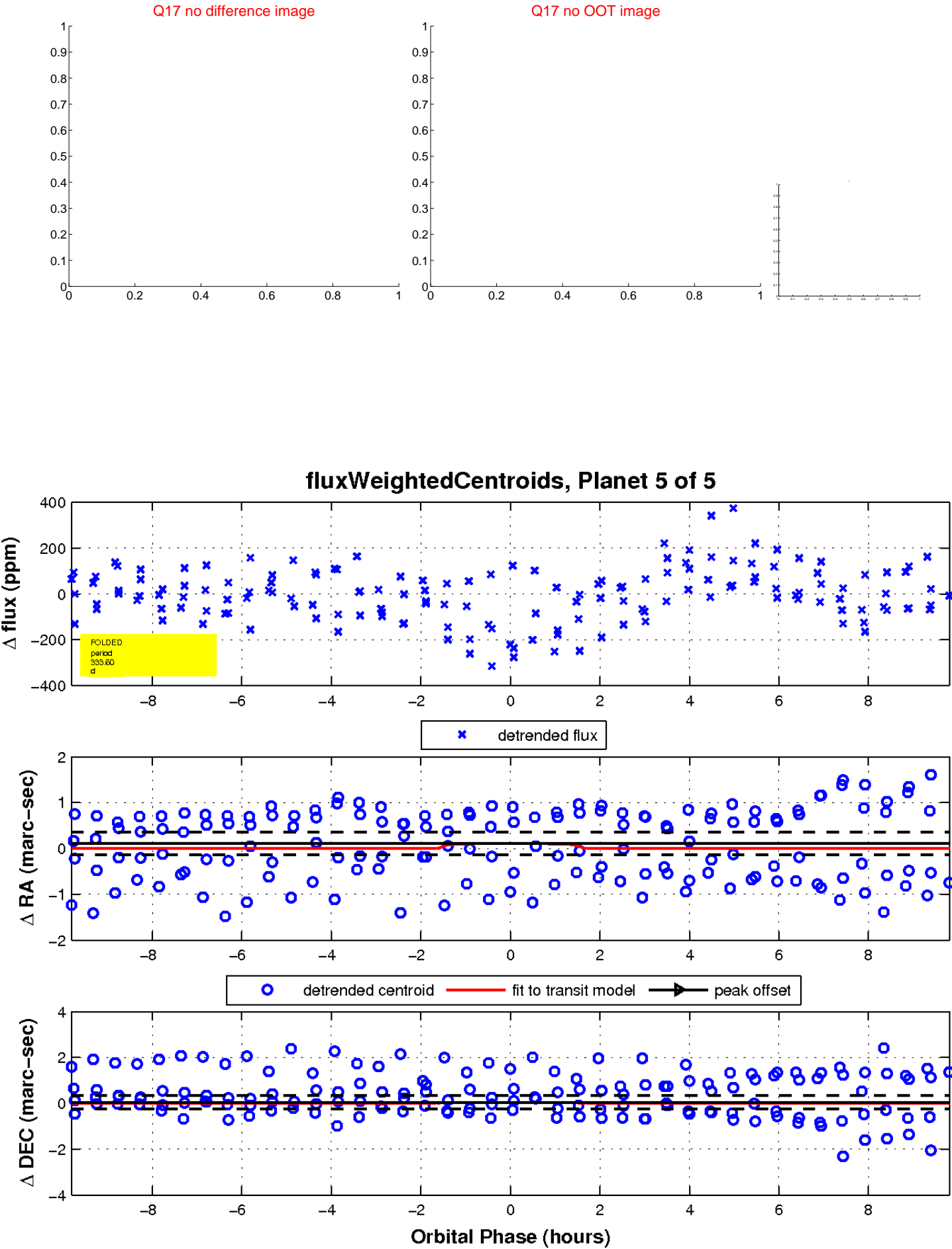
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

