

KIC 012069786

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})
012069786-01	OBS	No	1.533540	132.833065	5.8	2.391	8.0	5.8	2.37	7542	0.66	15657.15
012069786-02	OBS	No	1.533267	131.886388	8.3	5.245	9.5	11.0	2.37	7542	0.86	15660.86
012069786-03	OBS	No	191.293702	227.797196	117.7	10.764	14.0	10.1	2.37	7542	3.18	25.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012069786-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
012069786-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
012069786-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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

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

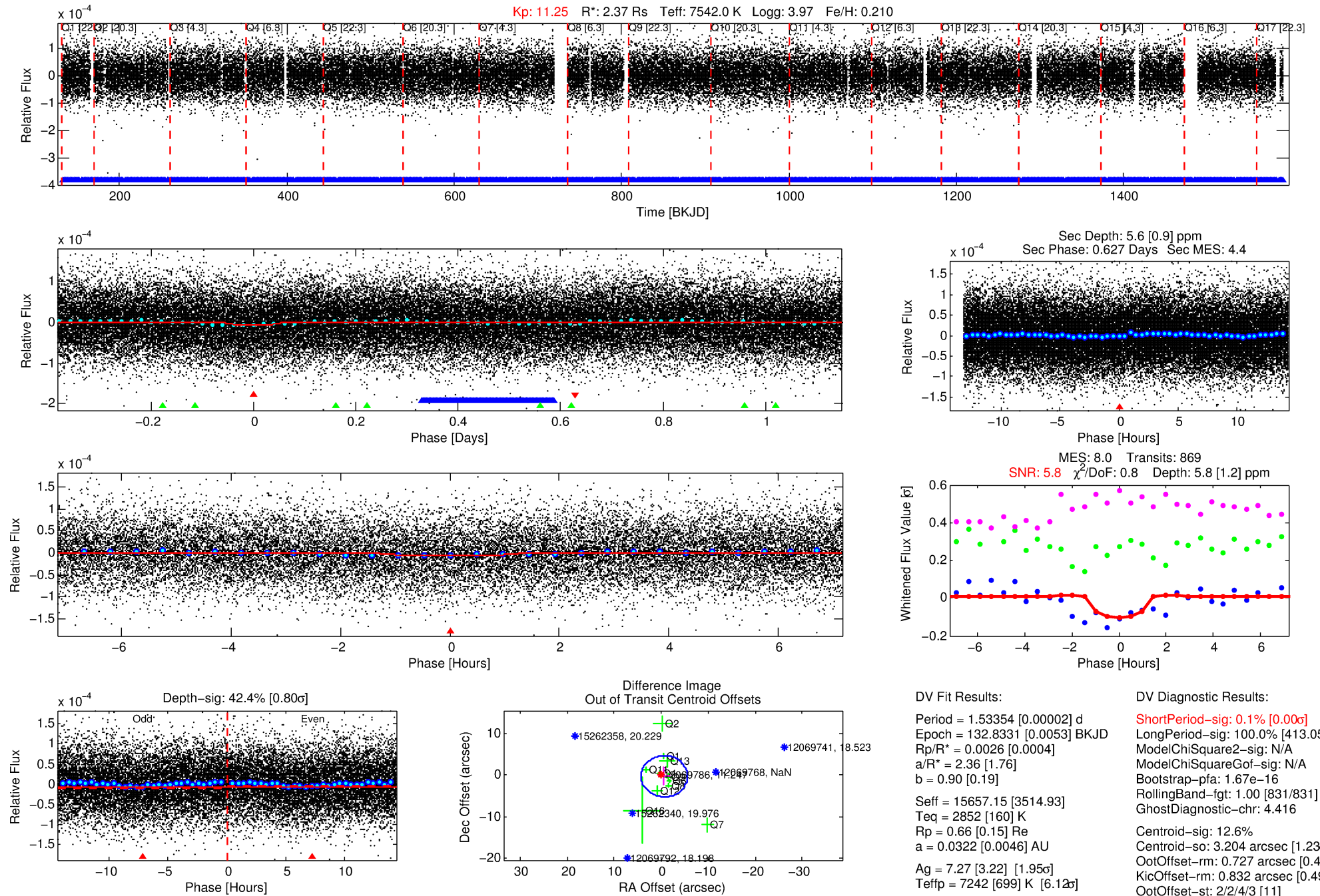
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012069786-01

No Significant Match Found

DV One-Page Summary

KIC: 12069786 Candidate: 1 of 3 Period: 1.534 d



DV Fit Results:

Period = 1.53354 [0.00002] d
Epoch = 132.8331 [0.0053] BKJD
Rp/R* = 0.0026 [0.0004]
a/R* = 2.36 [1.76]
b = 0.90 [0.19]
Seff = 15657.15 [3514.93]
Teq = 2852 [160] K
Rp = 0.66 [0.15] Re
a = 0.0322 [0.0046] AU
Ag = 7.27 [3.22] [1.95σ]
Teff = 7242 [699] K [6.12σ]

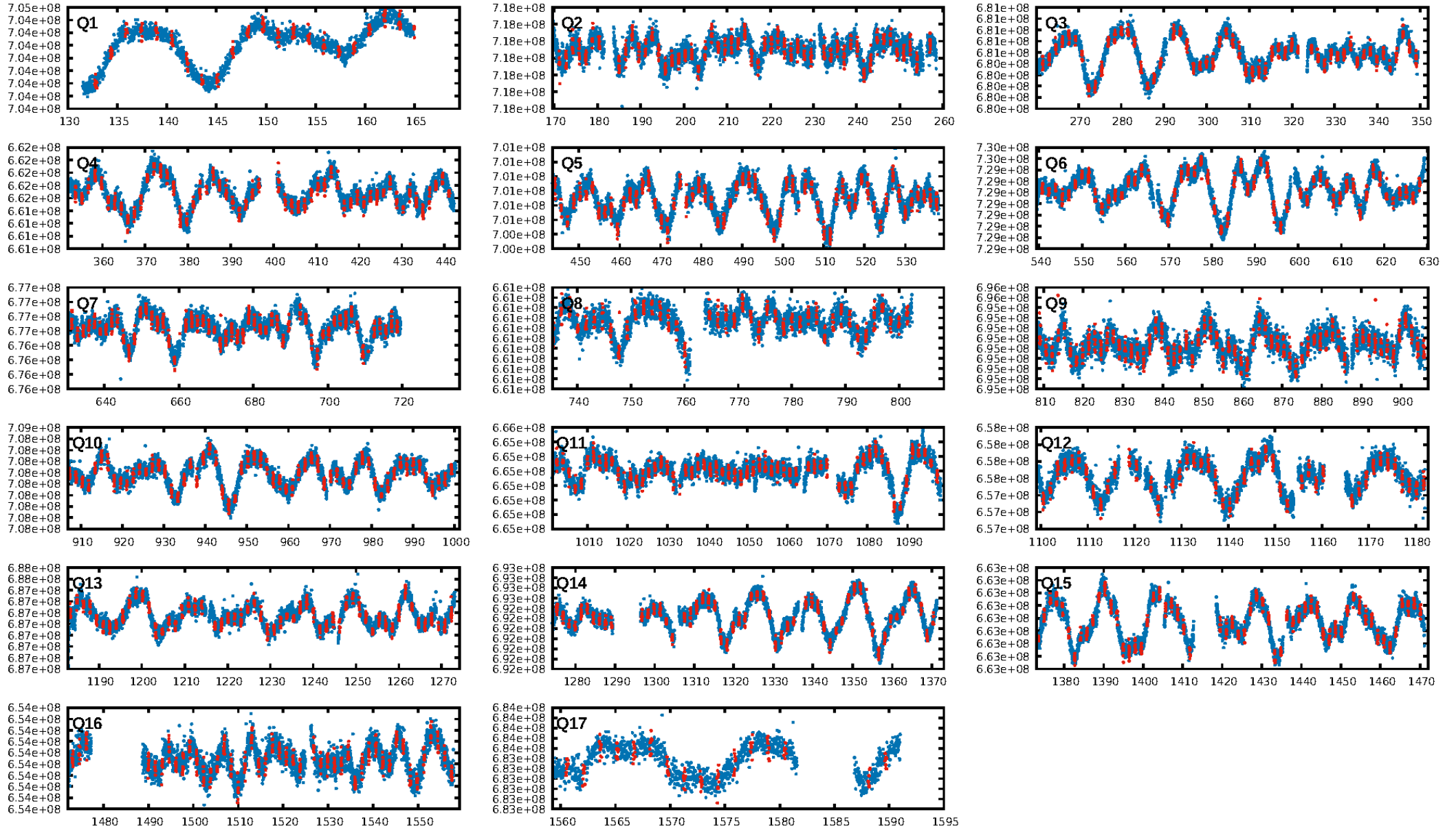
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: 100.0% [413.05σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.67e-16
RollingBand-fgt: 1.00 [831/831]
GhostDiagnostic-chr: 4.416
Centroid-sig: 12.6%
Centroid-so: 3.204 arcsec [1.23σ]
OotOffset-rm: 0.727 arcsec [0.44σ]
KicOffset-rm: 0.832 arcsec [0.49σ]
OotOffset-st: 2/2/4/3 [11]
KicOffset-st: 2/2/4/3 [11]
DiffImageQuality-fgm: 0.27 [3/11]
DiffImageOverlap-fno: 0.82 [14/17]

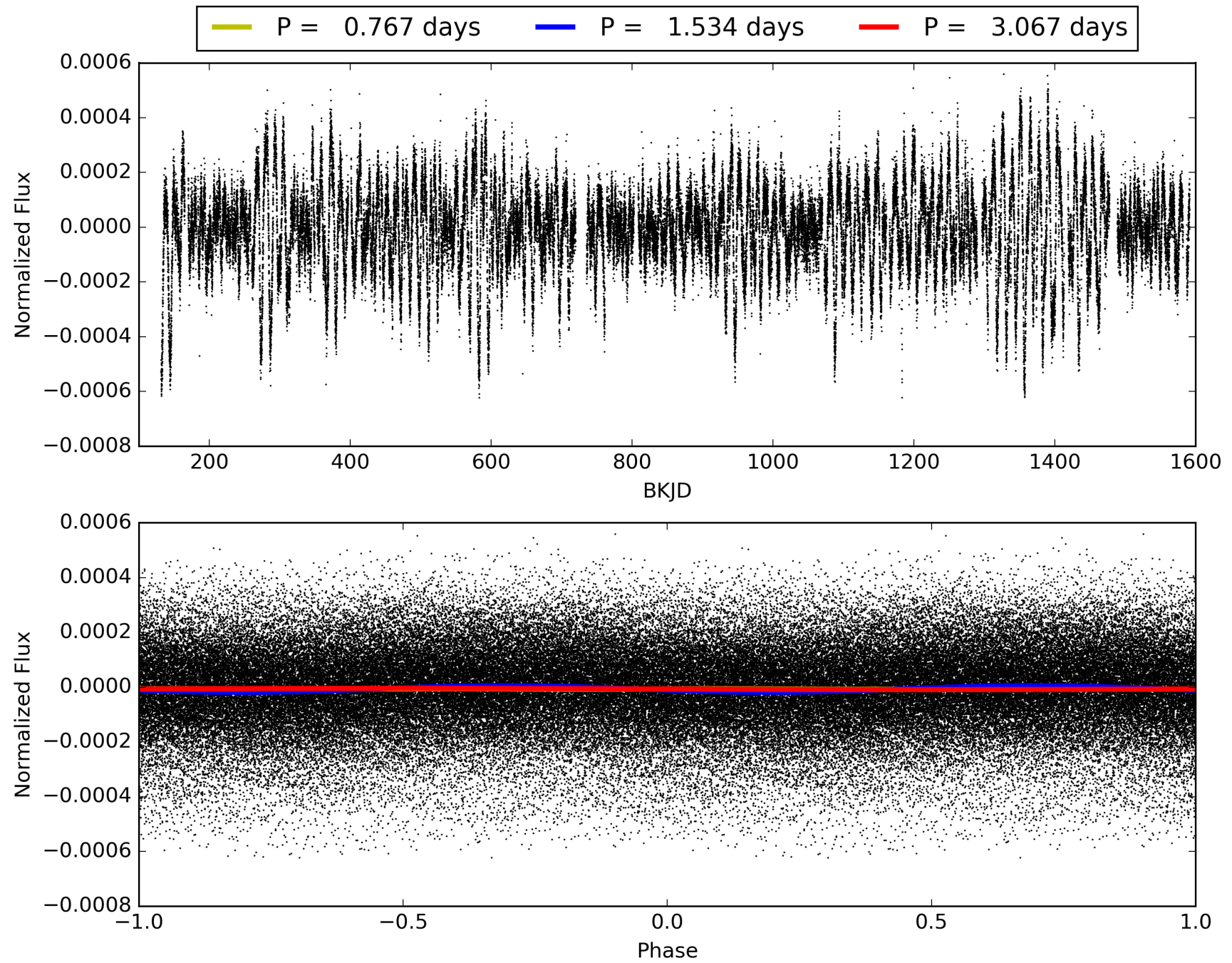
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:46:22 Z

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

TCE 012069786-01, PDC Light Curves

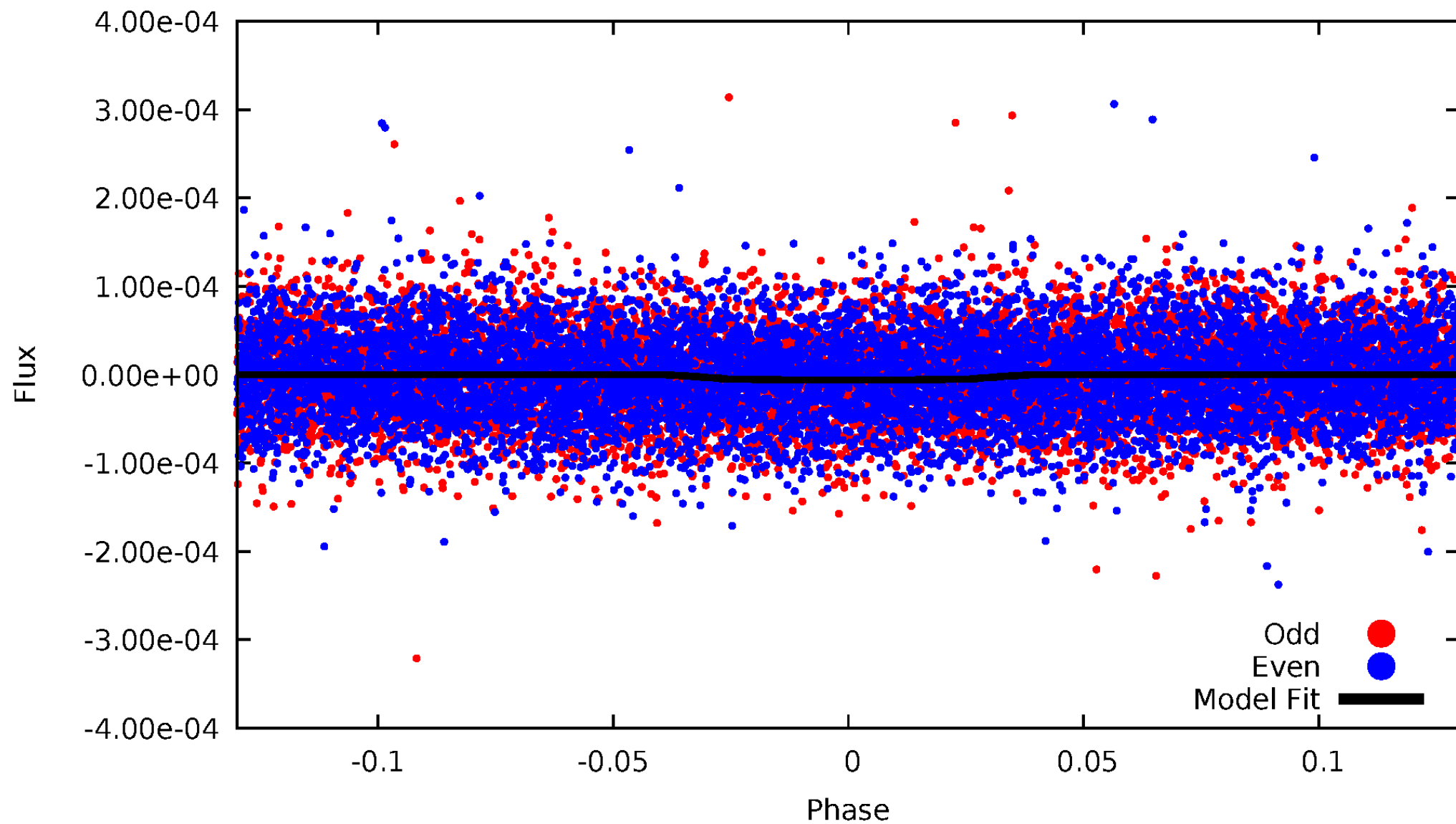


TCE 012069786-01



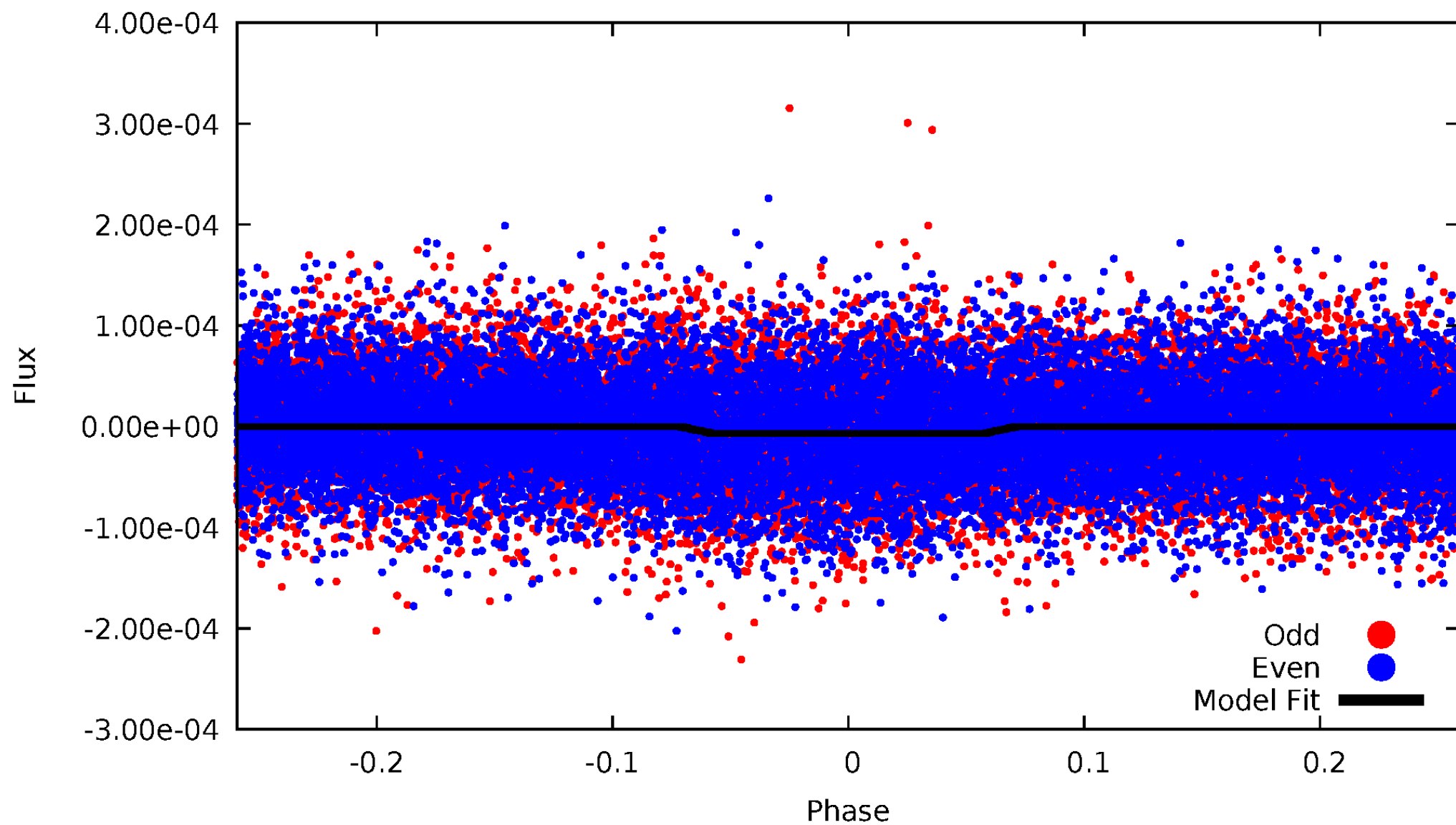
DV Odd/Even

TCE 012069786-01



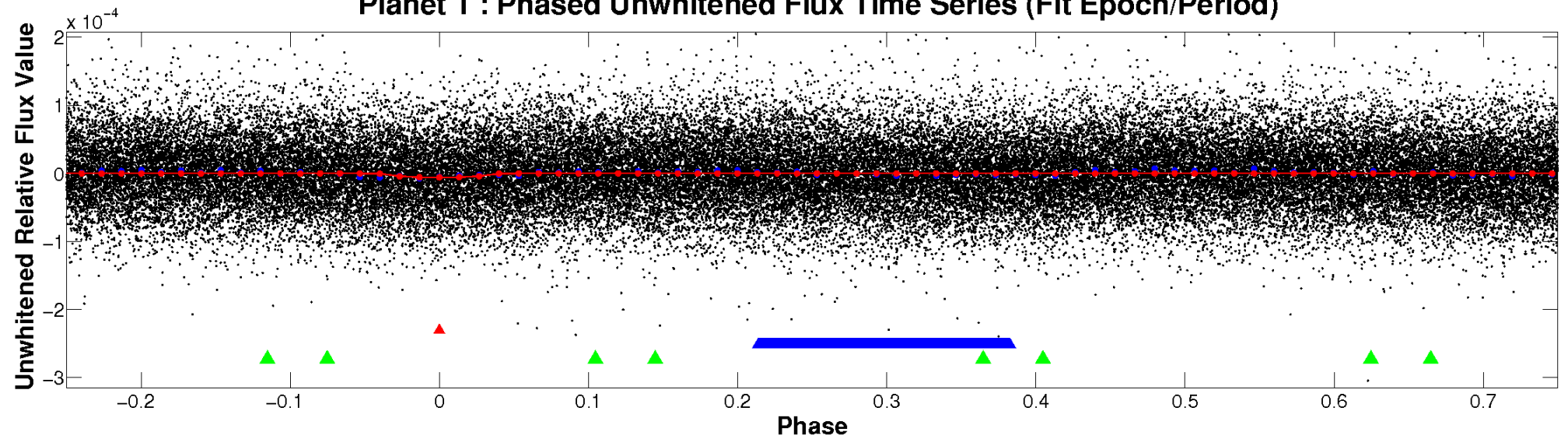
ALT Odd/Even

TCE 012069786-01

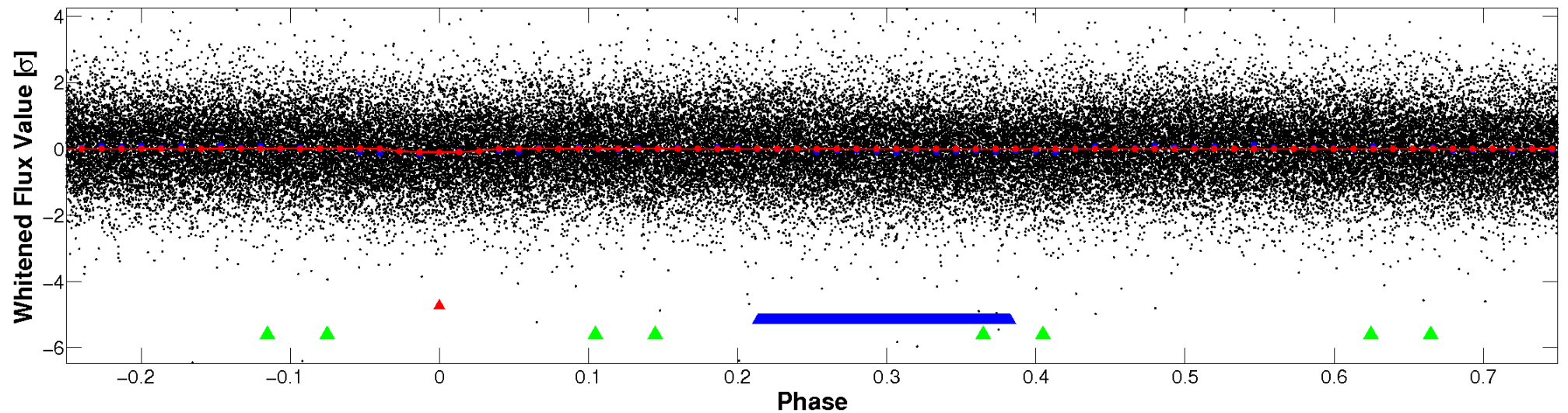


Non-Whitened Vs. Whitened Light Curve

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

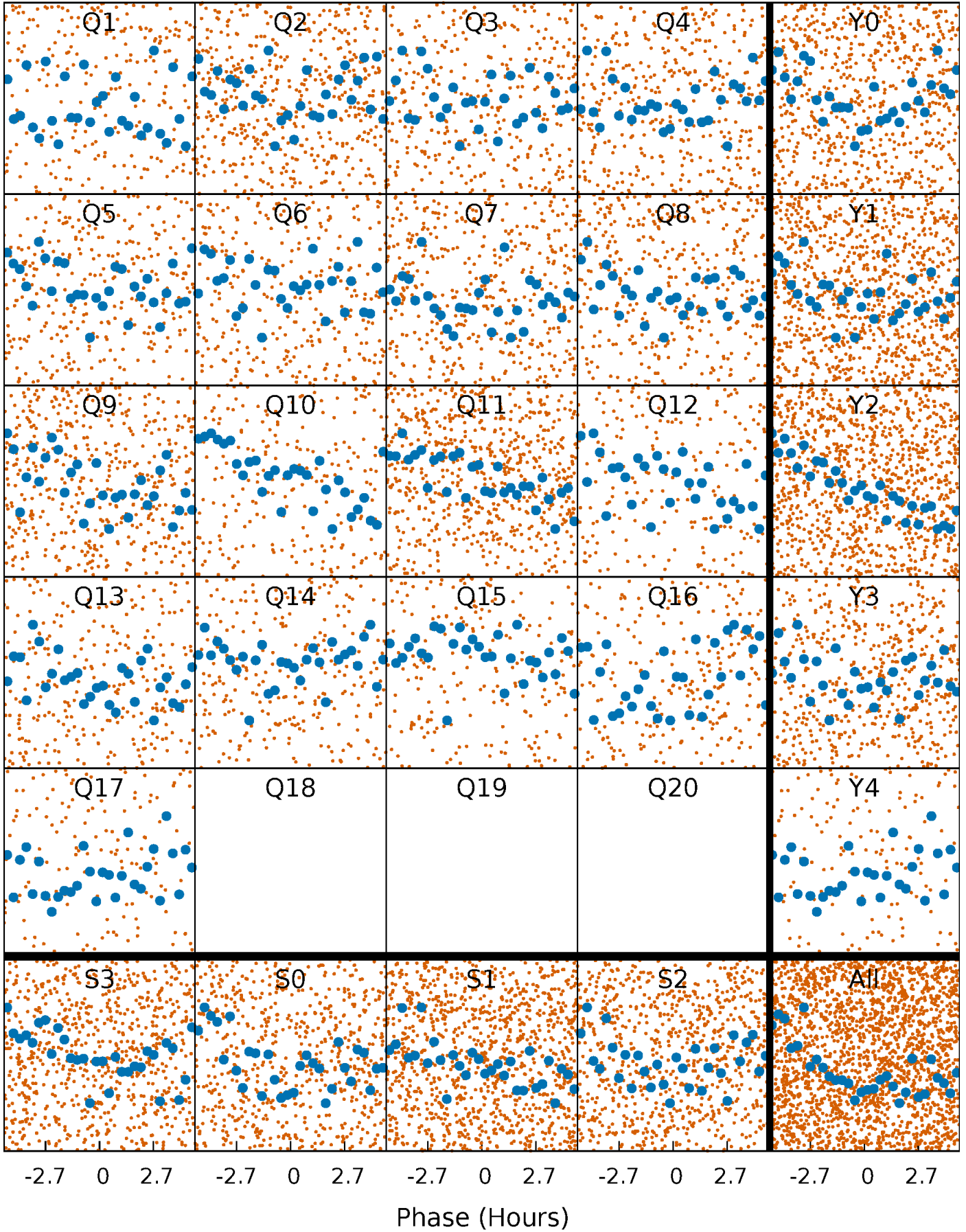


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



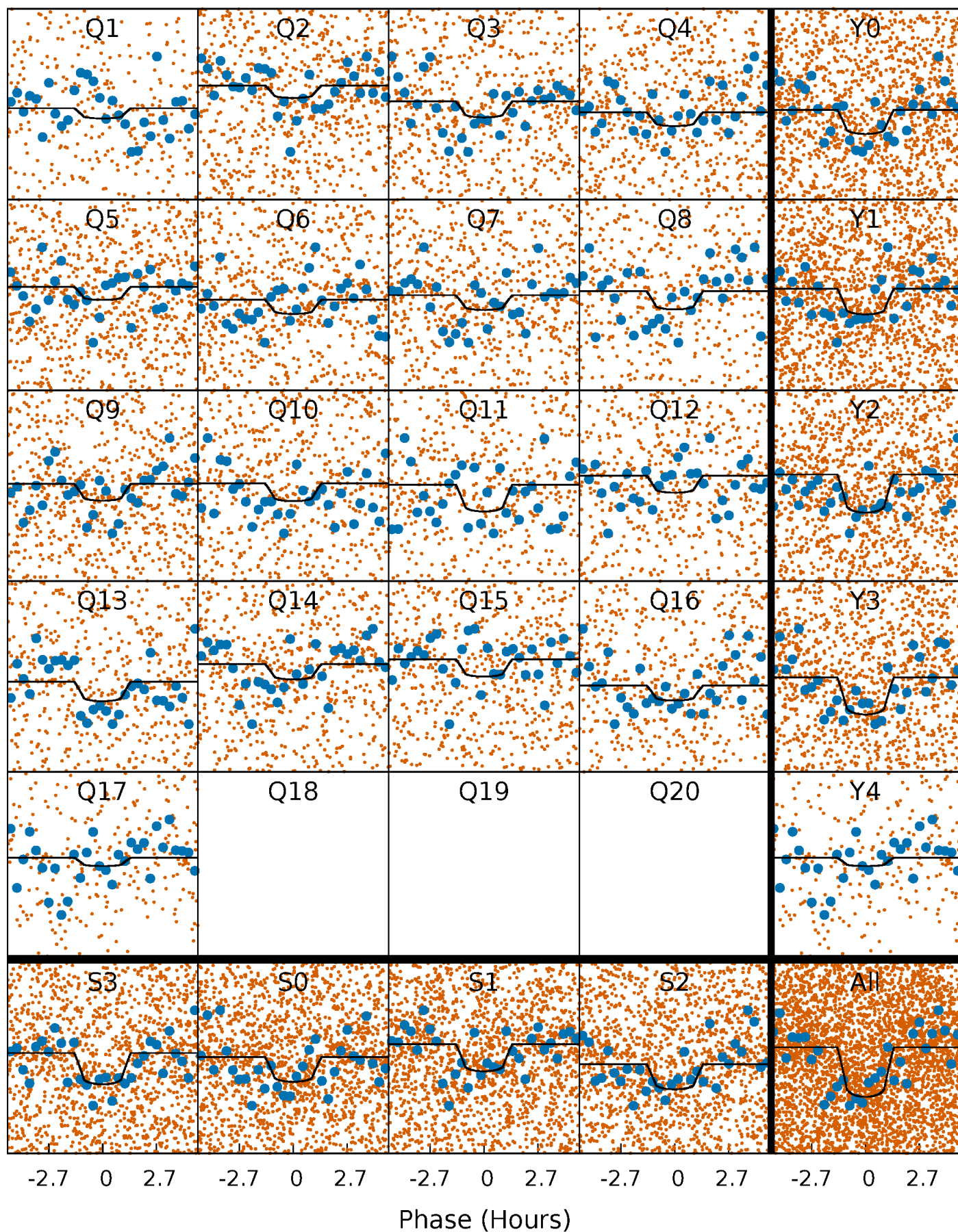
PDC Quarter-Phased Transit Curves

TCE 012069786-01 P= 1.533540 Days $T_0=132.833065$ (BKJD)



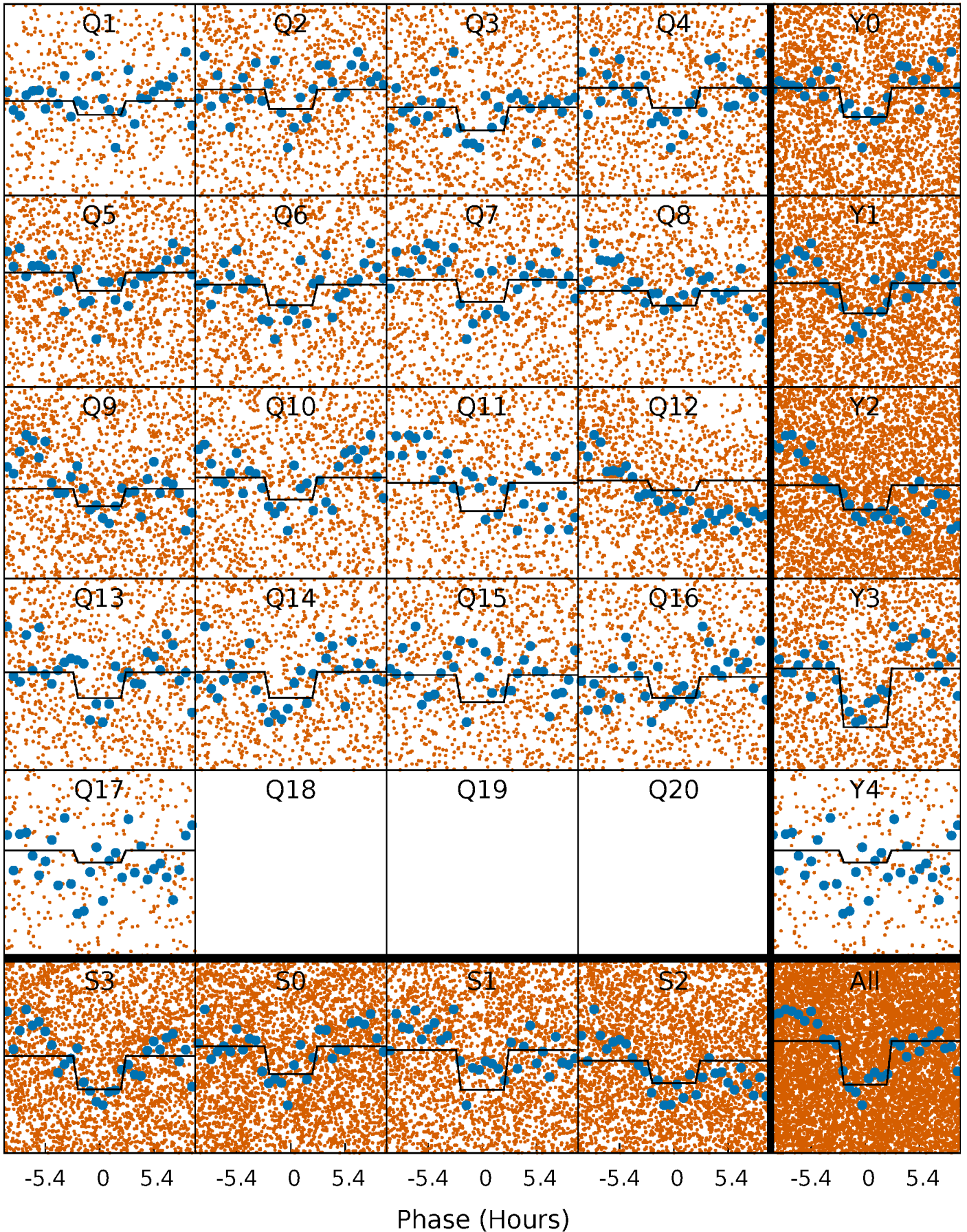
DV Quarter-Phased Transit Curves

TCE 012069786-01 P= 1.533540 Days $T_0=132.833065$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

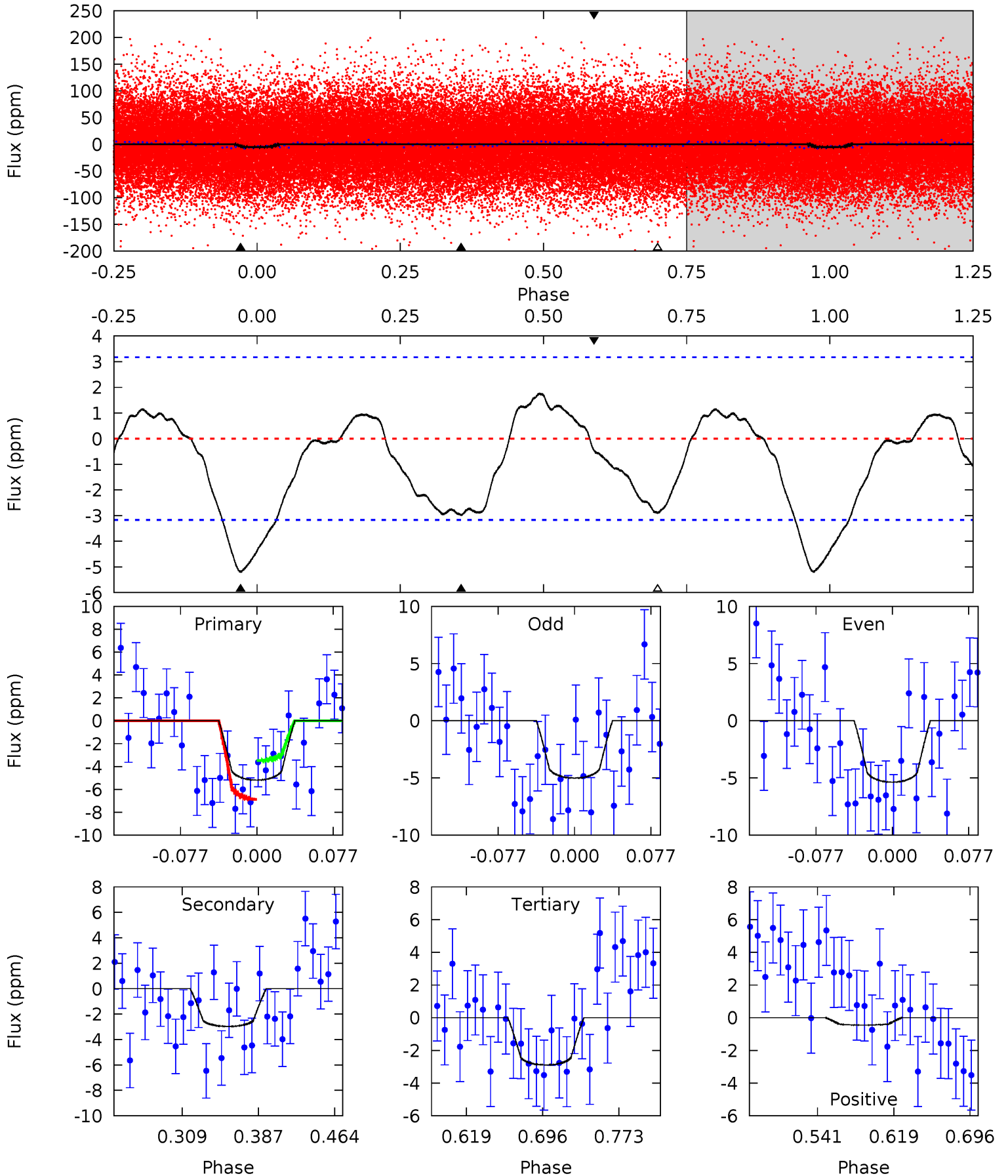
TCE 012069786-01 P= 1.533531 Days $T_0=132.836040$ (BKJD)



DV Model-Shift Uniqueness Test

012069786-01, P = 1.533540 Days, E = 131.299525 Days

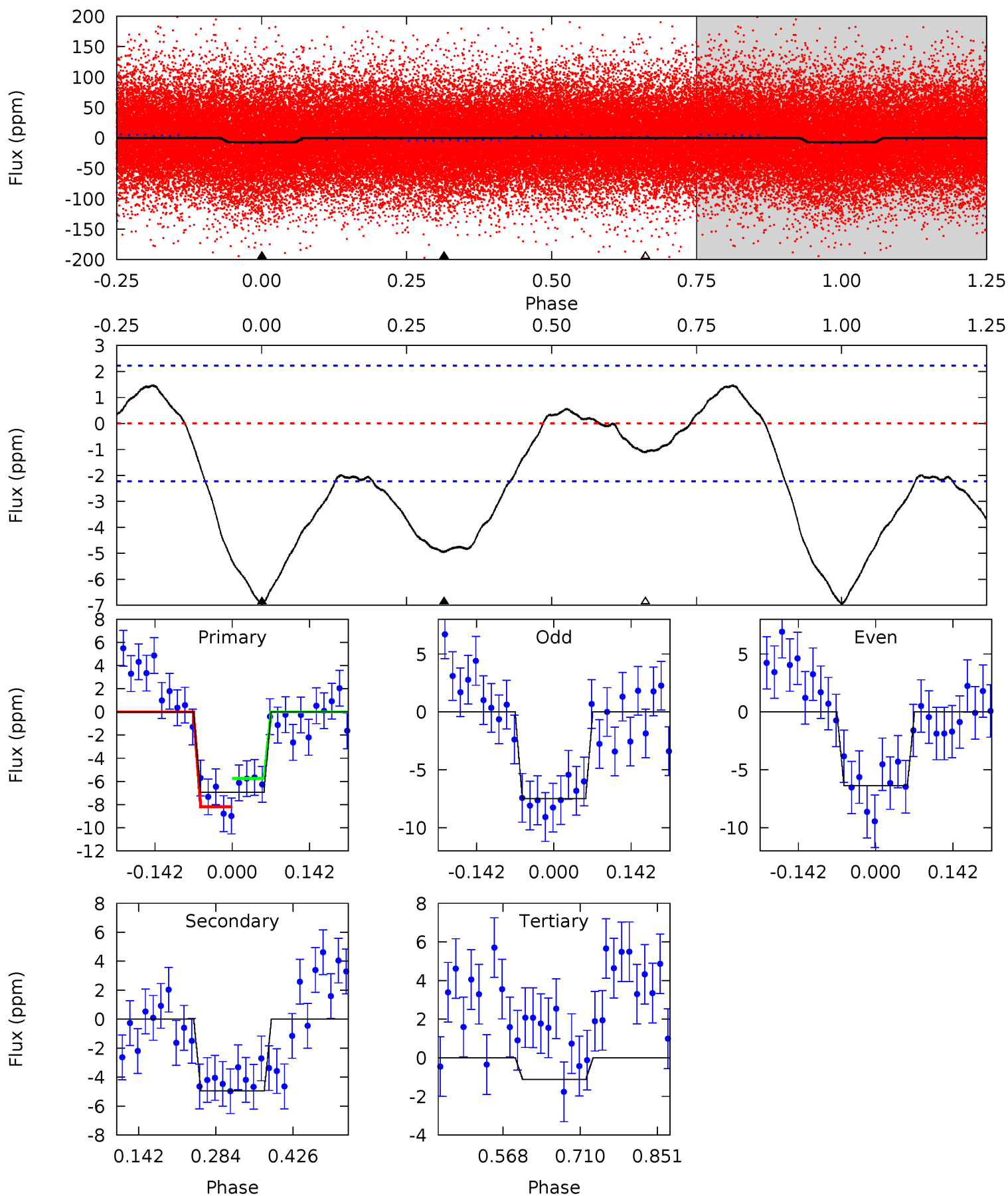
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.55	4.34	4.21	-0.66	4.62	1.77	1.77	3.34	8.21	0.12	4.99	0.26	0.87	0.25	2.48



Alt Model-Shift Uniqueness Test

012069786-01, P = 1.533531 Days, E = 131.302509 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	10.00	2.25	0	4.49	1.47	1.81	11.8	14.0	7.75	10.00	1.12	1.04	0.17	2.45



Stellar Parameters For KIC 012069786

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7542^{+75}_{-82}	$3.967^{+0.126}_{-0.084}$	$0.210^{+0.150}_{-0.100}$	$2.367^{+0.306}_{-0.374}$	$1.895^{+0.088}_{-0.155}$	$0.201^{+0.123}_{-0.061}$
	+1%/-1%	+3%/-2%	+71%/-48%	+13%/-16%	+5%/-8%	+61%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012069786-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3 ± 1	$0.65^{+0.13}_{-0.13}$	3952^{+156}_{-172}	5956^{+718}_{-634}	$3.990^{+2.389}_{-1.455}$
Alt.	-5 ± 0	$0.65^{+0.12}_{-0.12}$	3972^{+139}_{-182}	6846^{+753}_{-629}	$6.560^{+3.329}_{-2.053}$

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

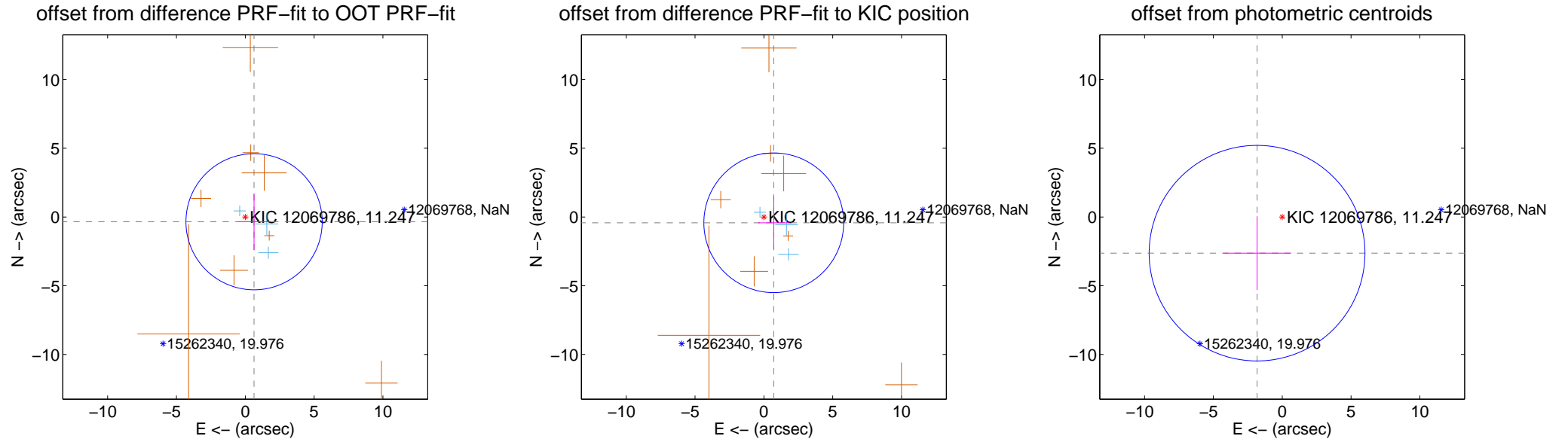
DV Centroid Data

Supplemental centroid analysis for 012069786-01. **Kepler magnitude: 11.25.** Transit SNR 5.79

There are 3 quarters with good PRF difference image offsets

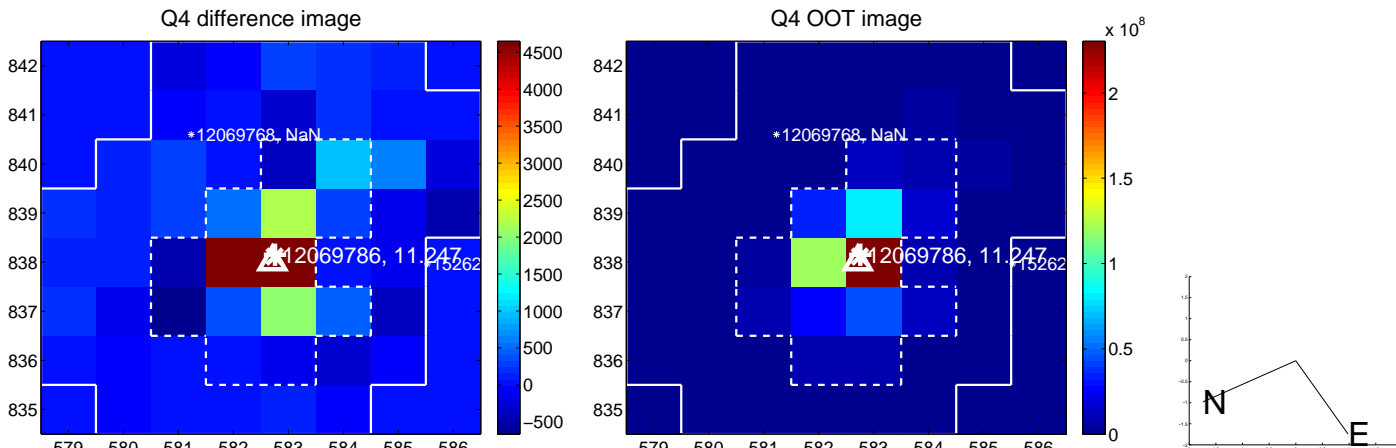
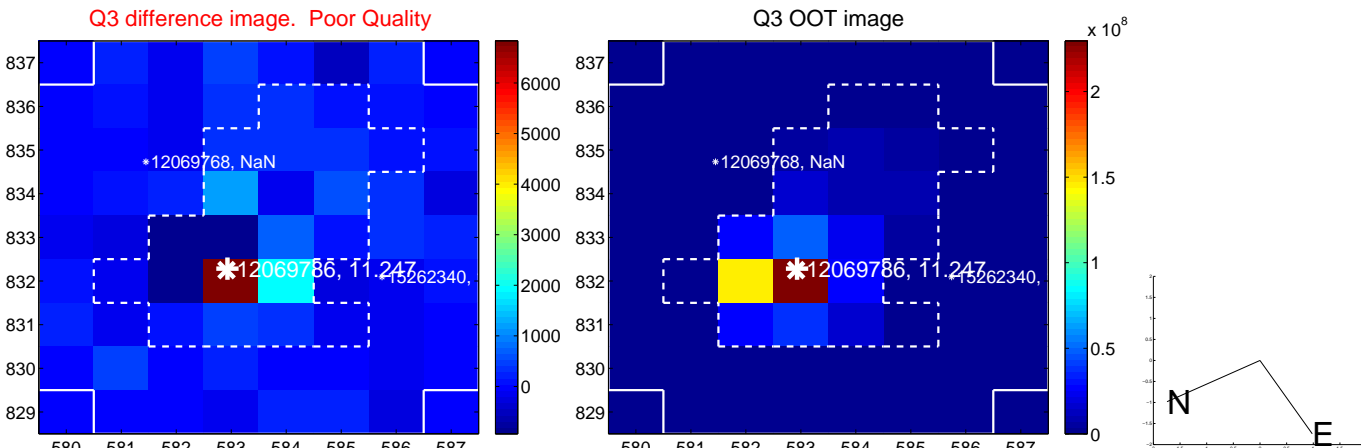
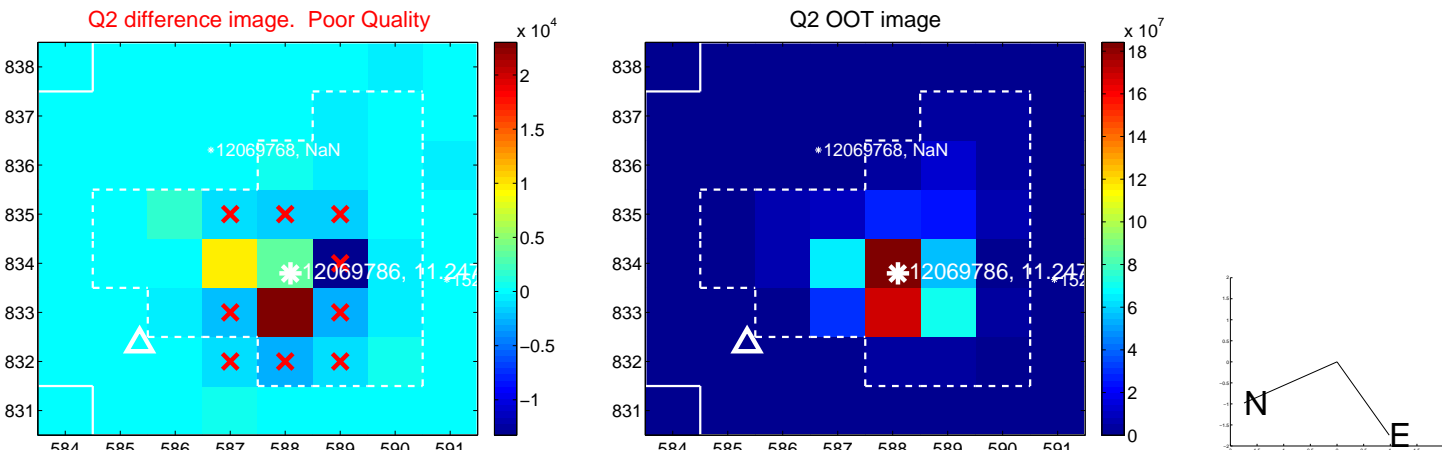
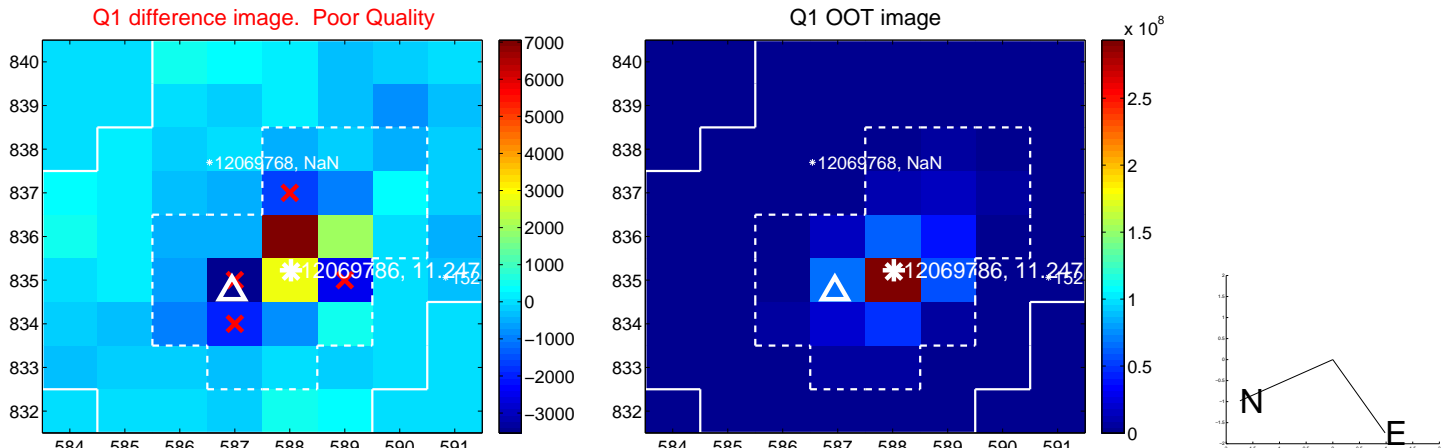
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.727 ± 1.650	0.44	-0.640 ± 1.154	-0.347 ± 2.062
PRF-fit source offset from KIC position	0.832 ± 1.693	0.49	-0.718 ± 1.135	-0.421 ± 1.932
photometric centroid source offset	3.20 ± 2.61	1.23	1.83 ± 2.46	-2.63 ± 2.68

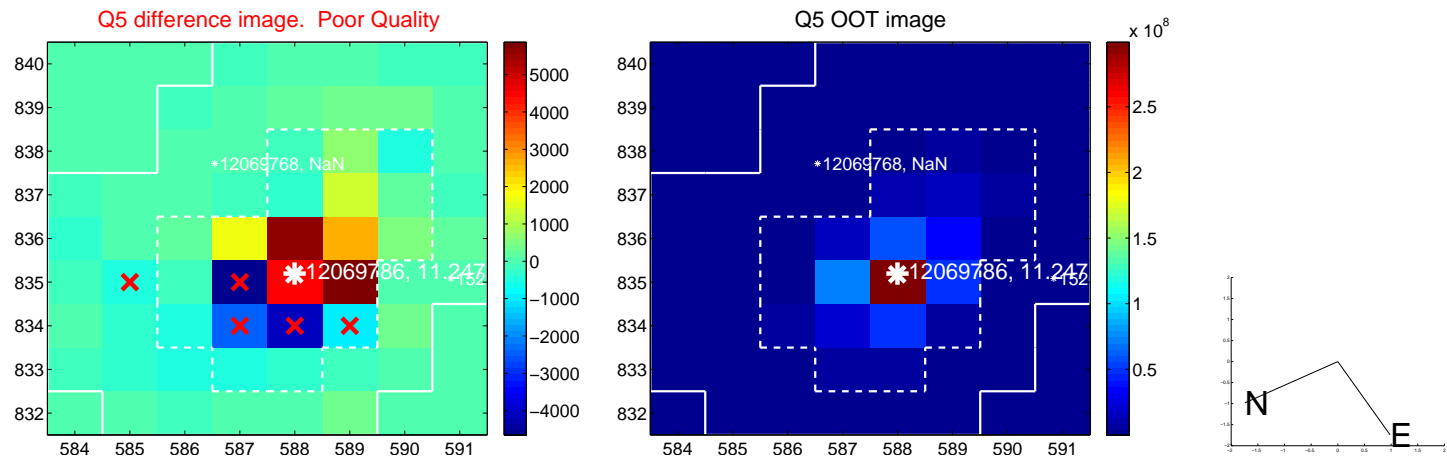


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

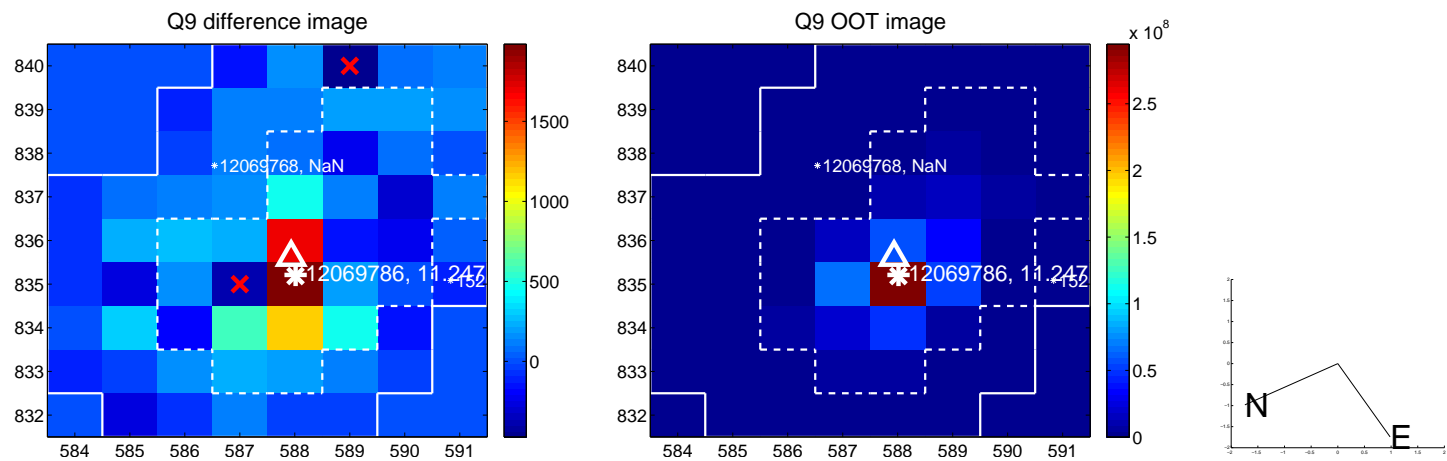
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



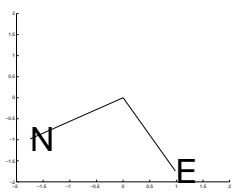
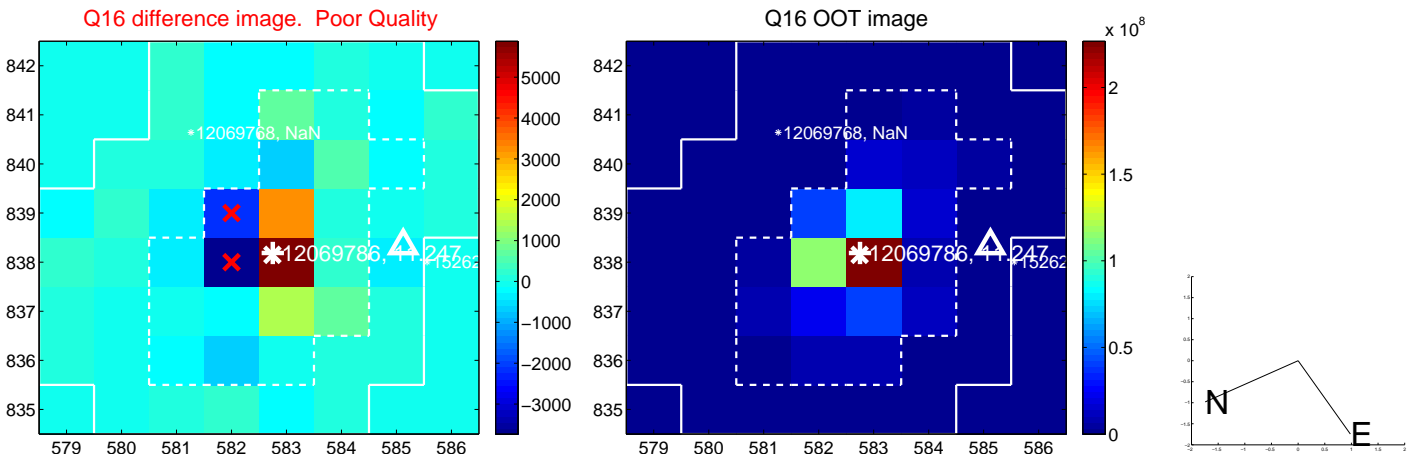
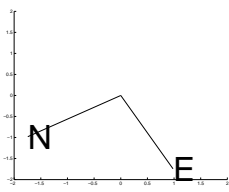
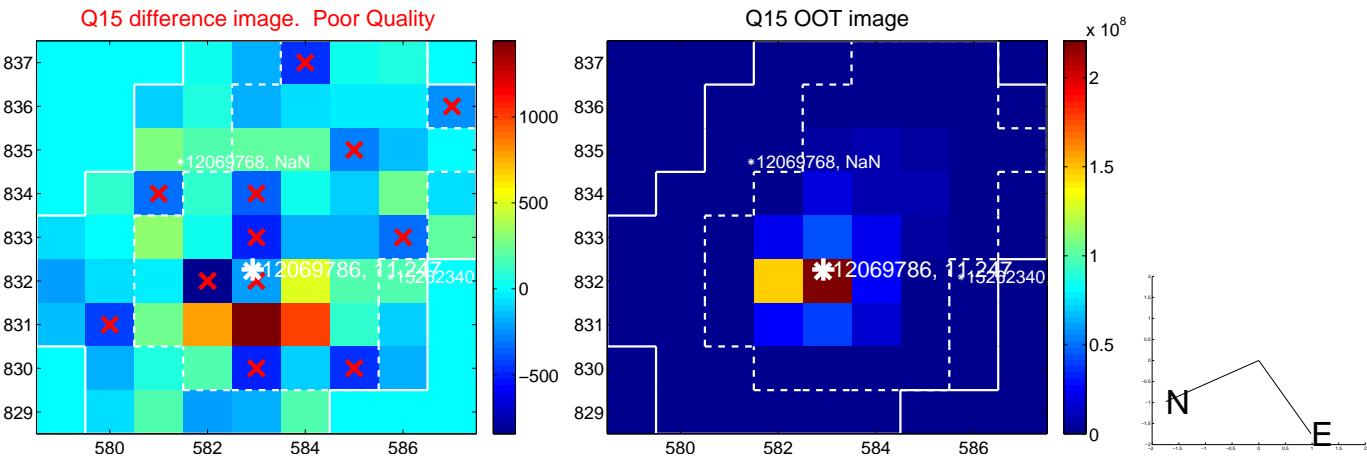
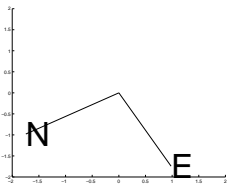
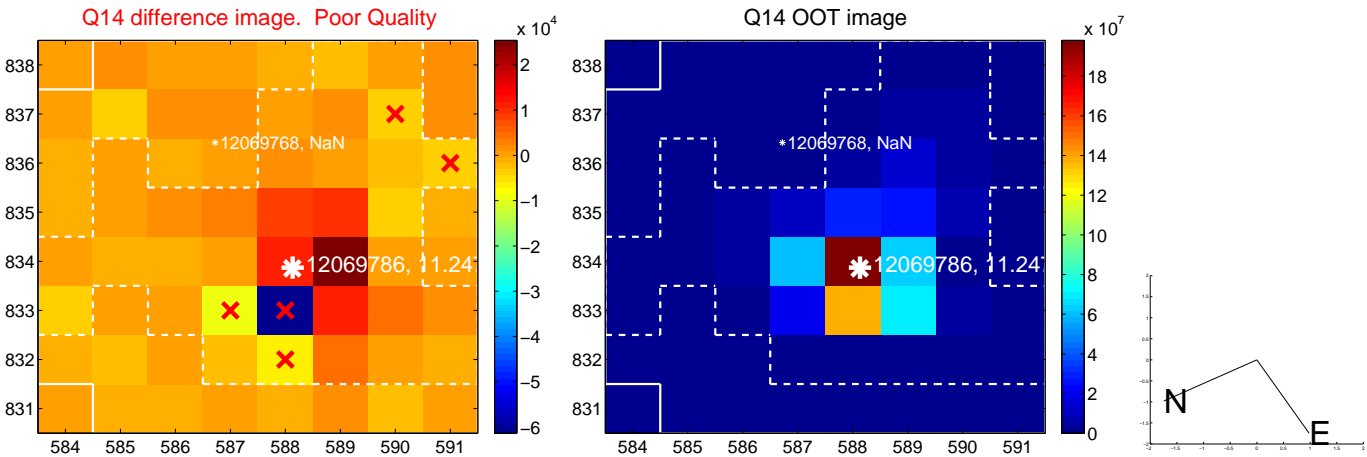
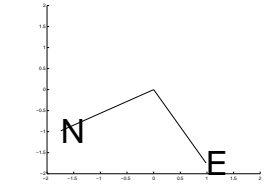
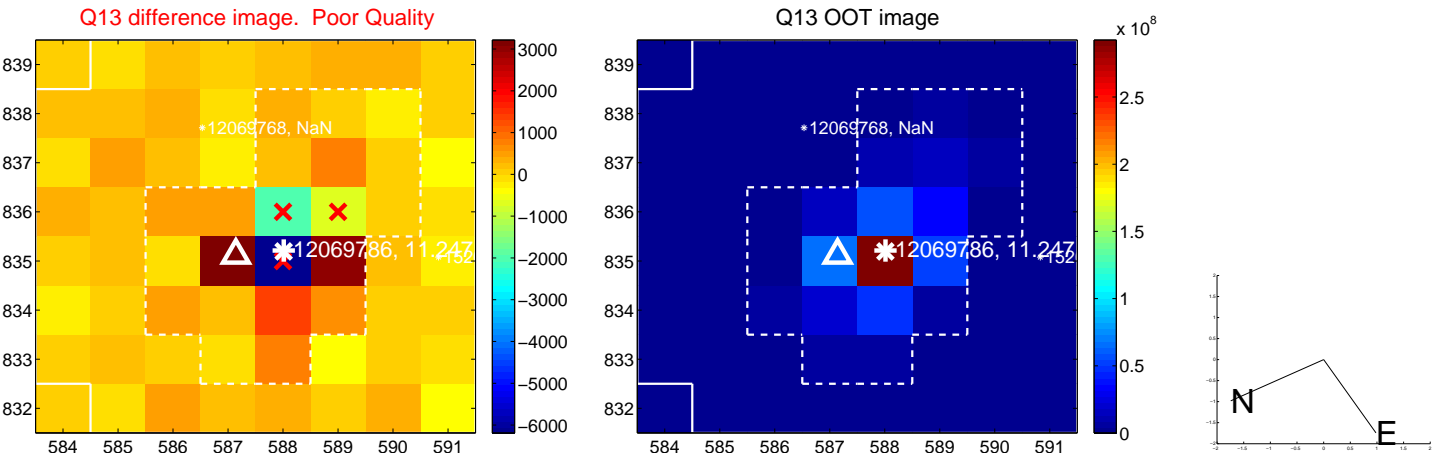
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



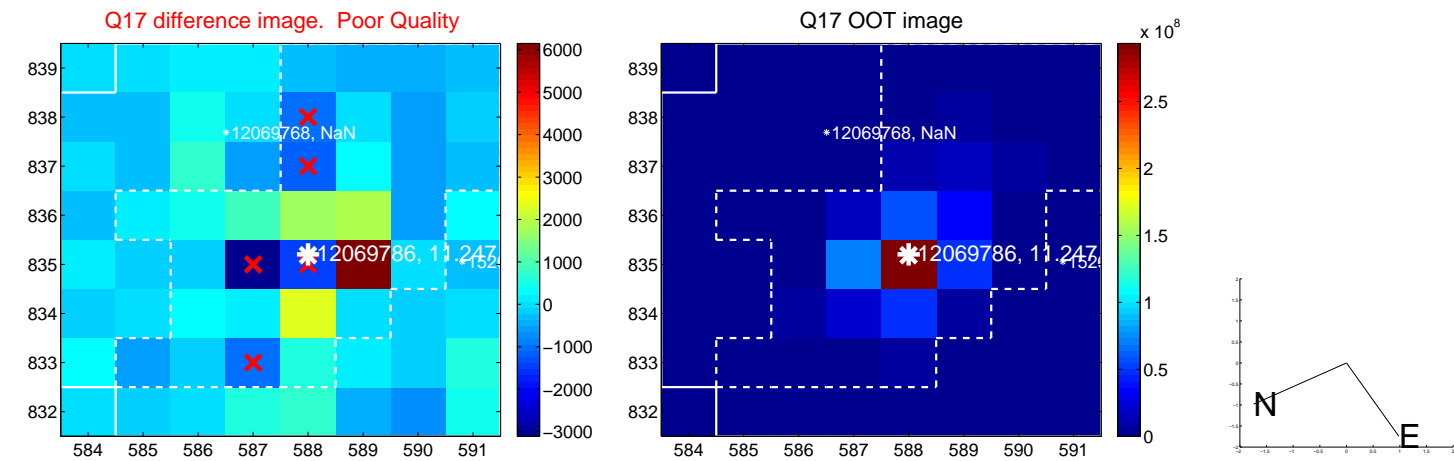
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



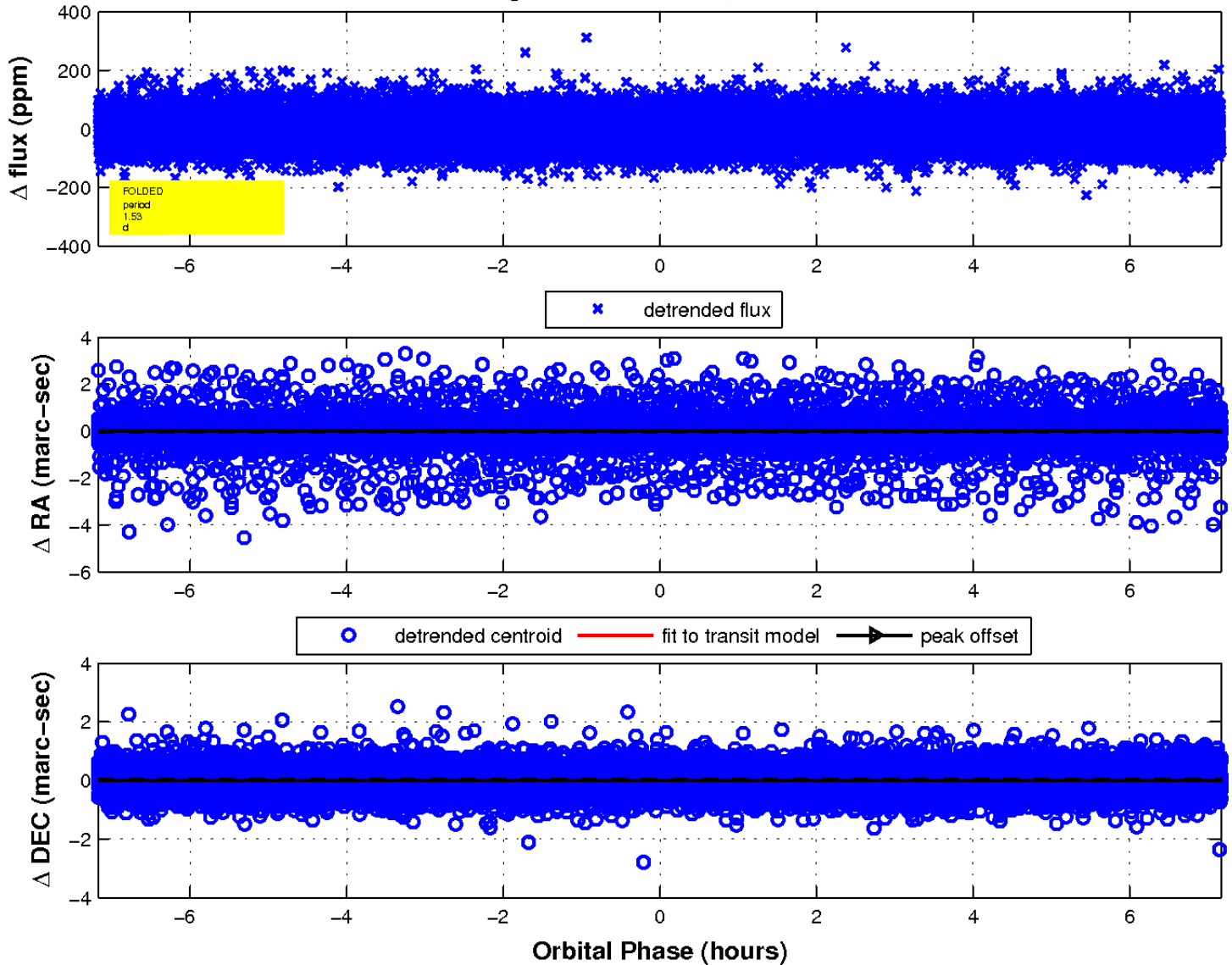
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



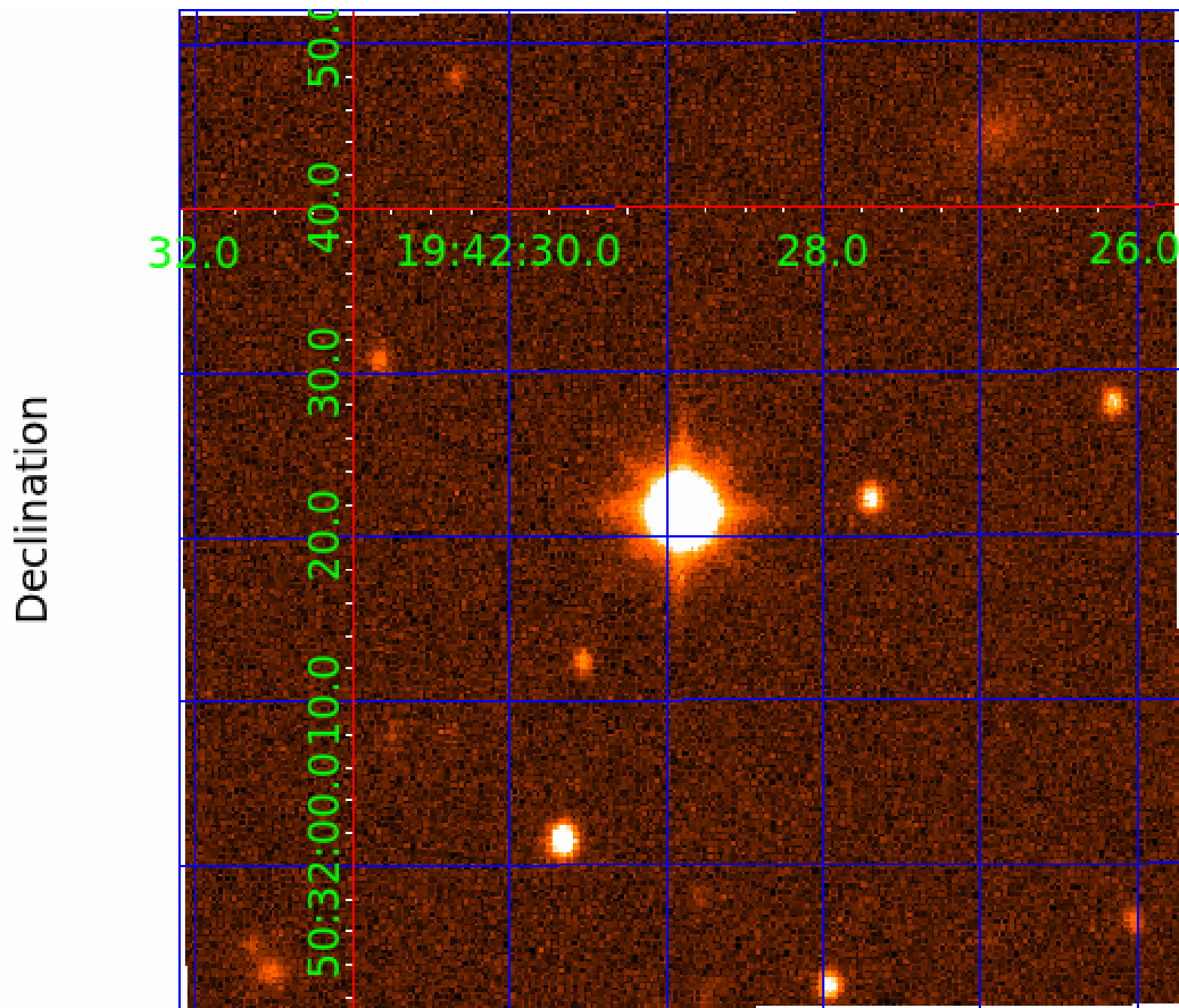
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



fluxWeightedCentroids, Planet 1 of 3



UKIRT Image



KIC 012069786

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})
012069786-01	OBS	No	1.533540	132.833065	5.8	2.391	8.0	5.8	2.37	7542	0.66	15657.15
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012069786-03	OBS	No	191.293702	227.797196	117.7	10.764	14.0	10.1	2.37	7542	3.18	25.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012069786-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
012069786-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
012069786-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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

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

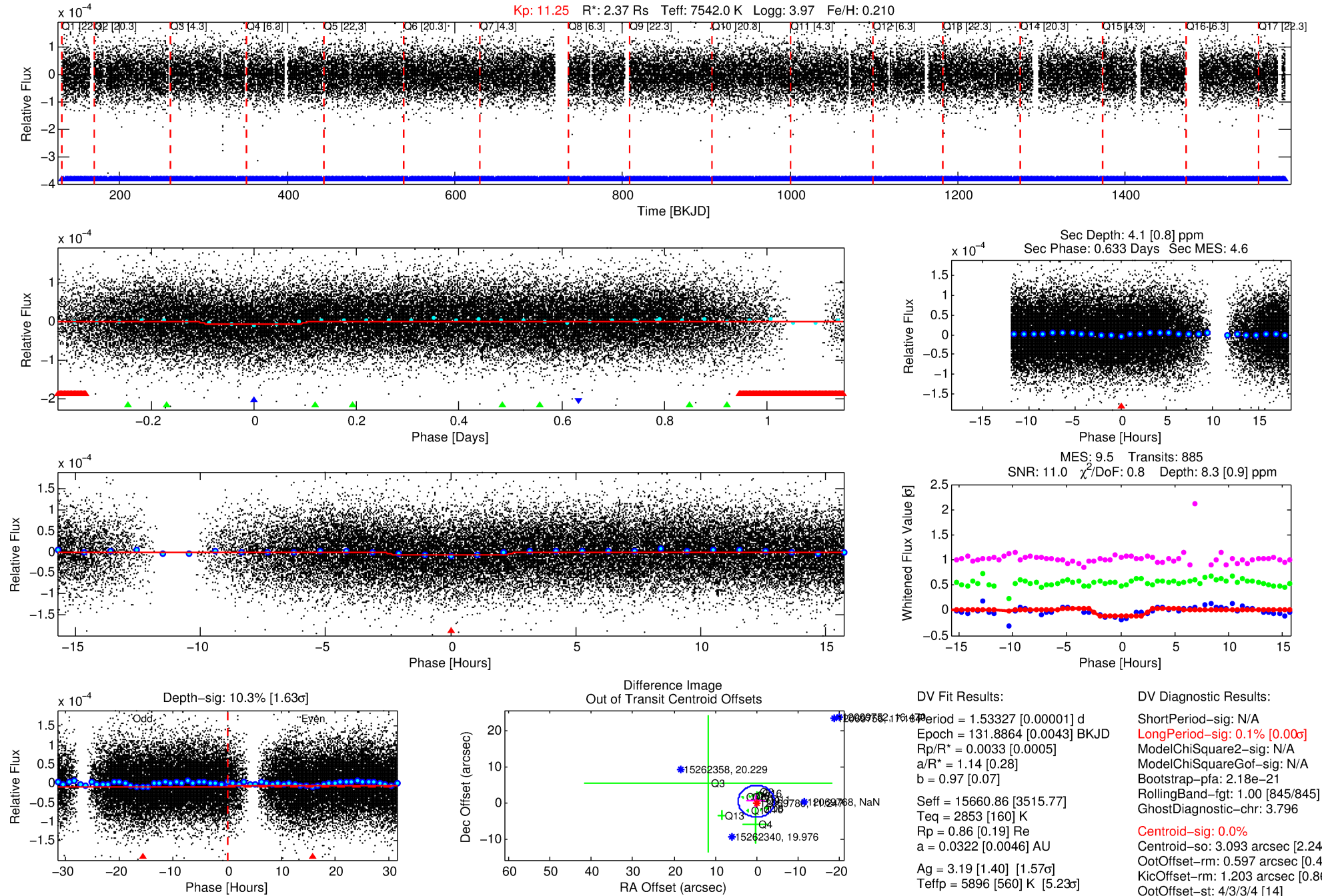
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012069786-02

No Significant Match Found

DV One-Page Summary

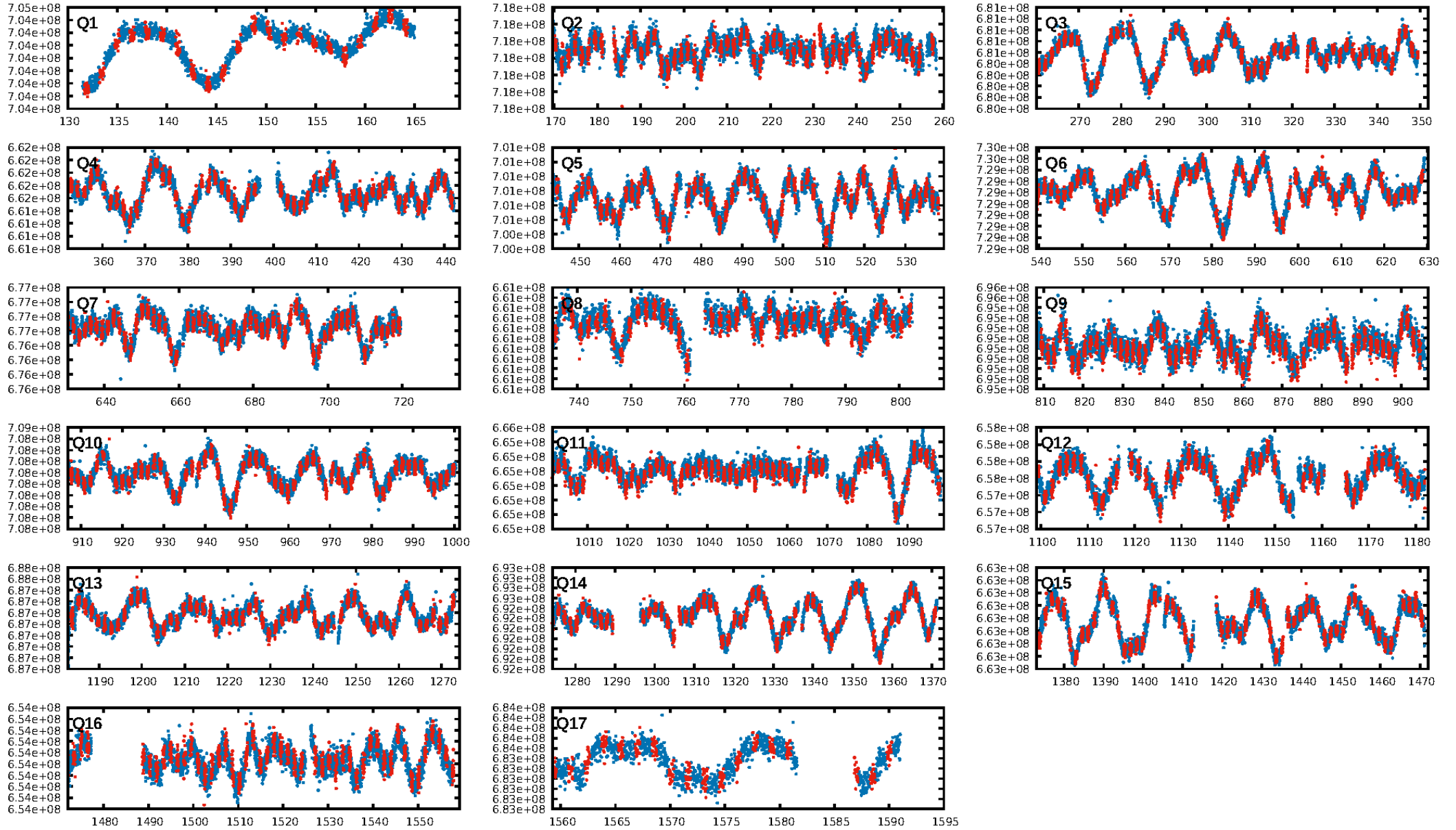
KIC: 12069786 Candidate: 2 of 3 Period: 1.533 d



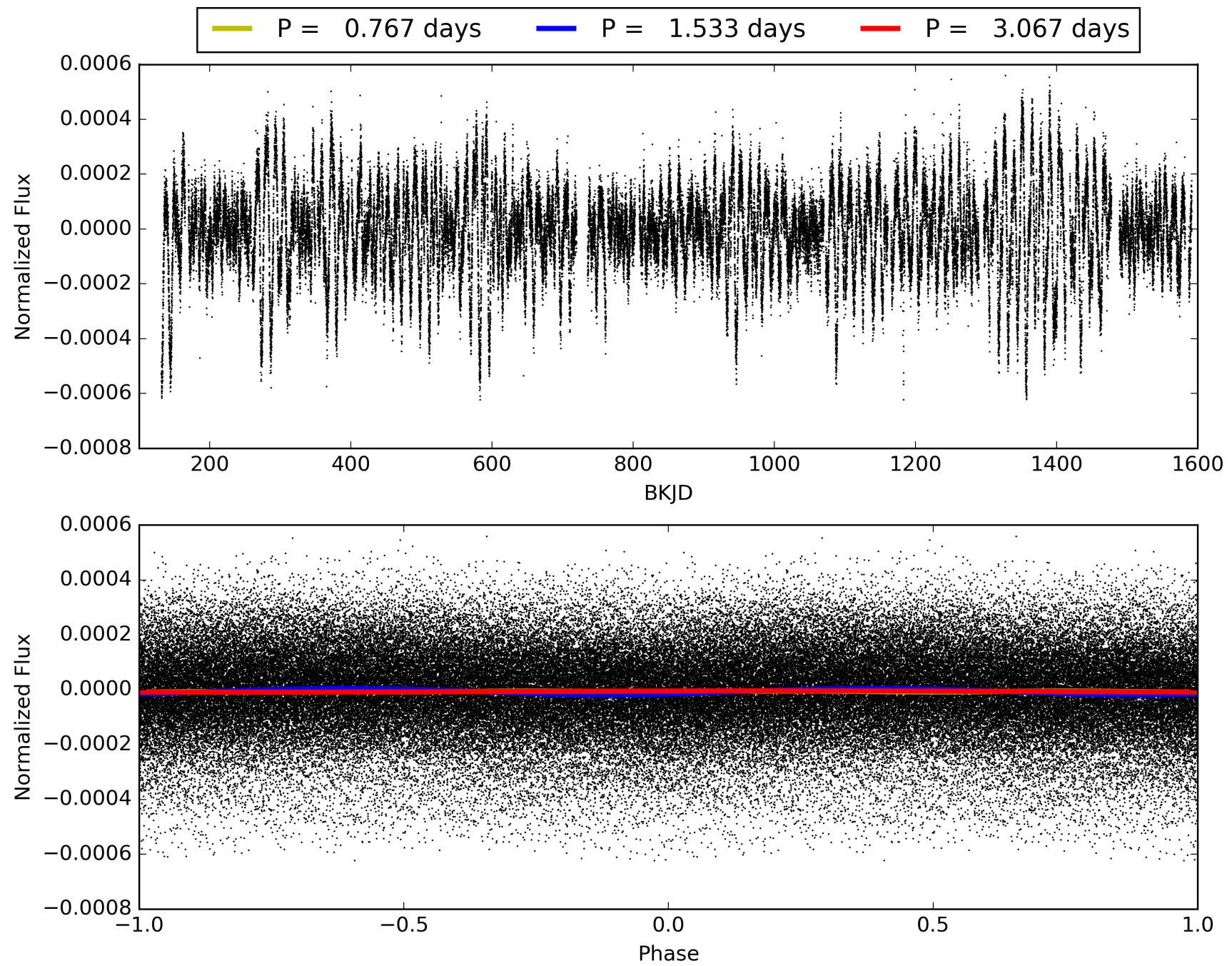
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:46:32 Z

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

TCE 012069786-02, PDC Light Curves

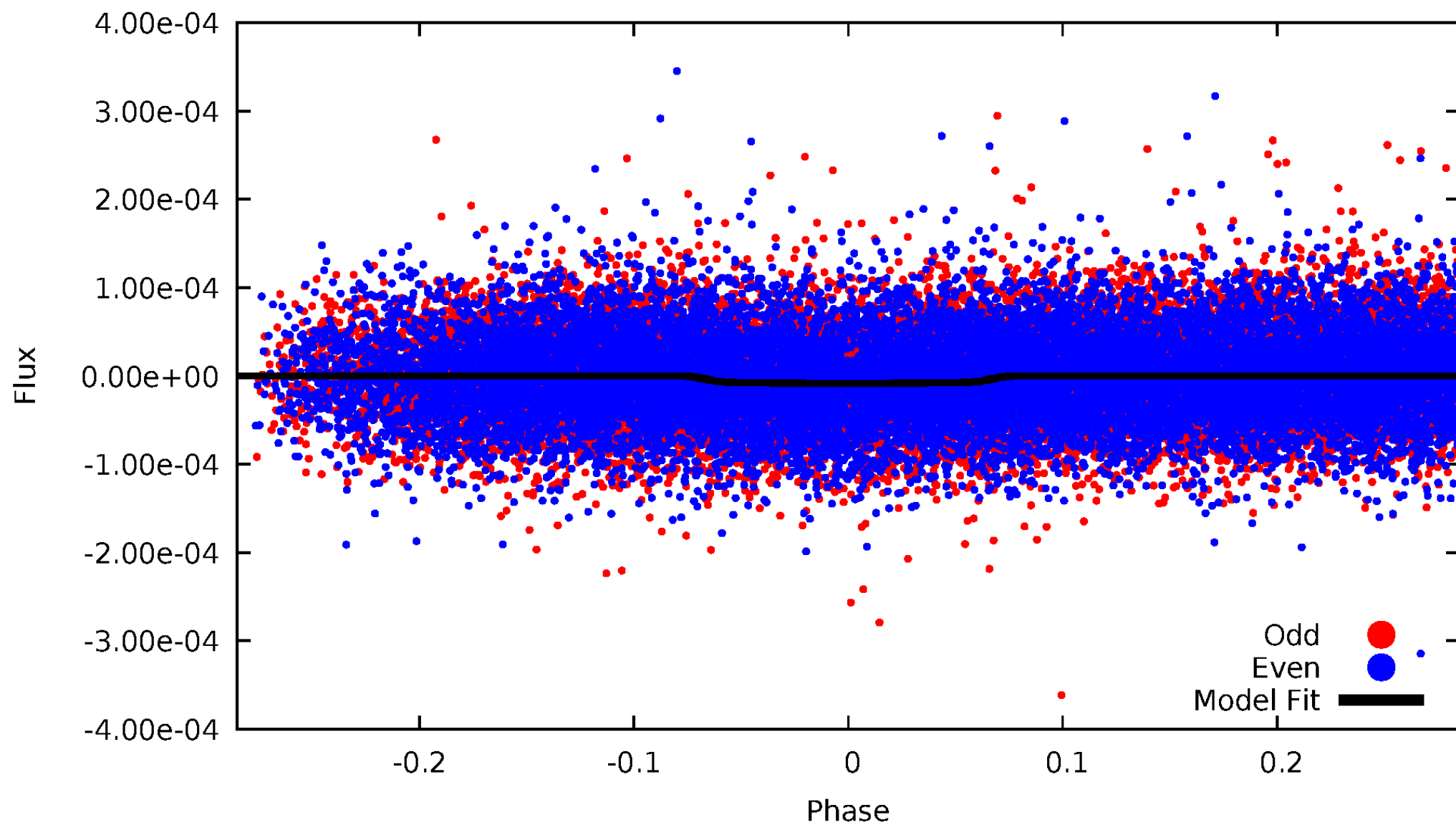


TCE 012069786-02



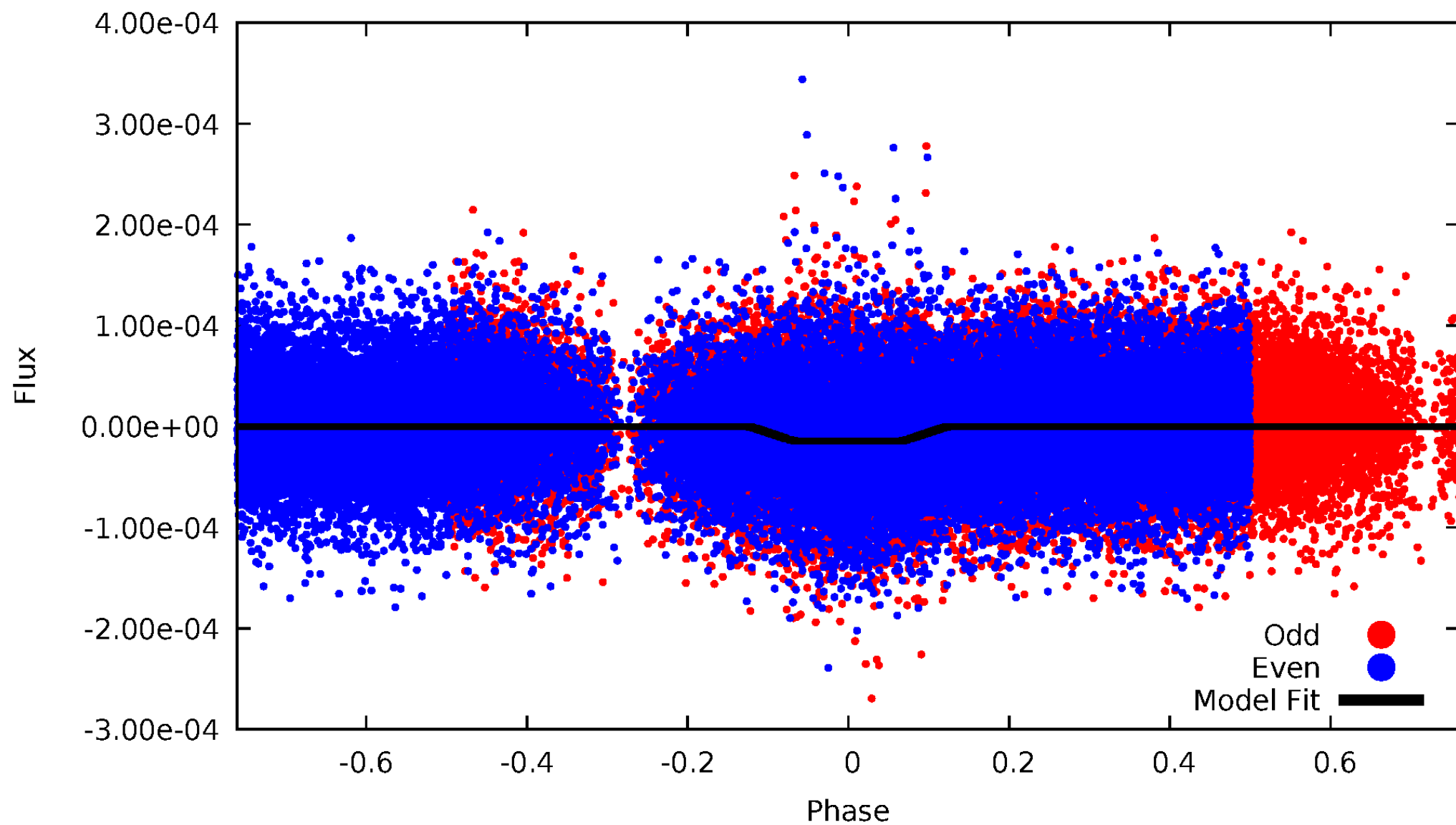
DV Odd/Even

TCE 012069786-02



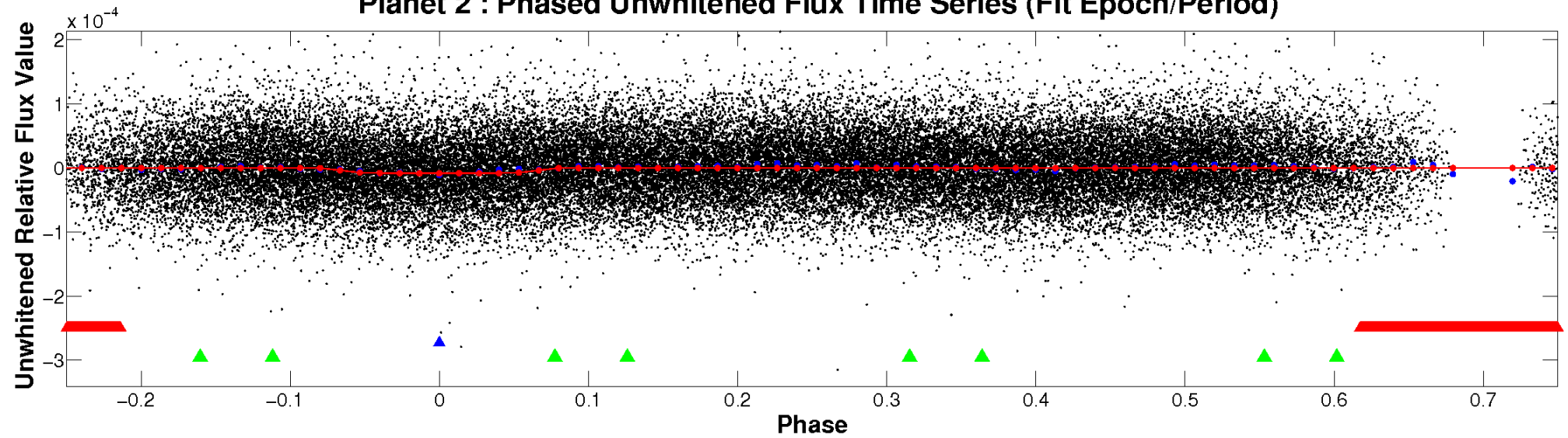
ALT Odd/Even

TCE 012069786-02

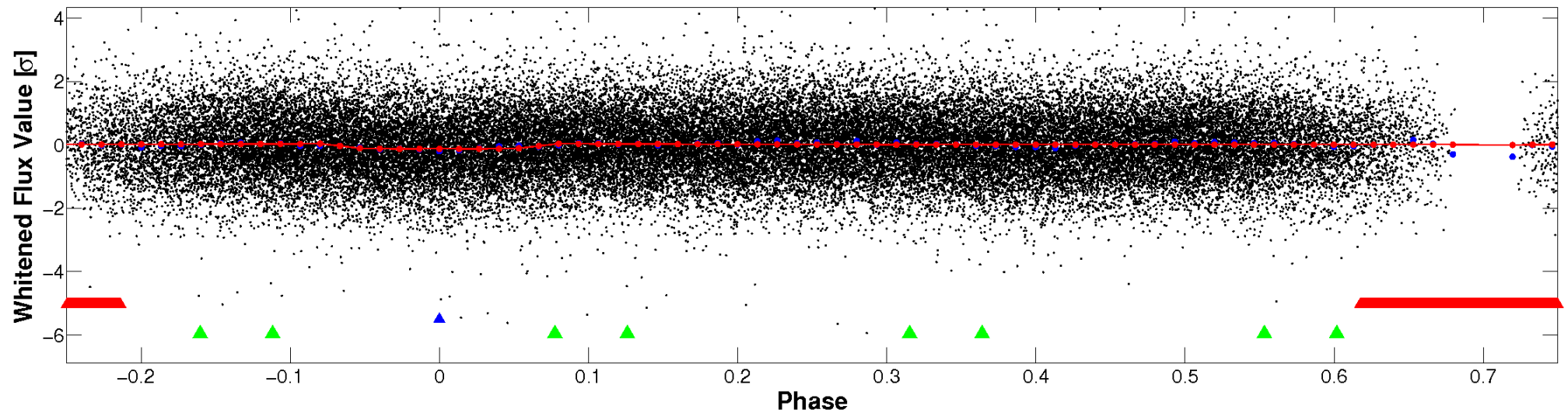


Non-Whitened Vs. Whitened Light Curve

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

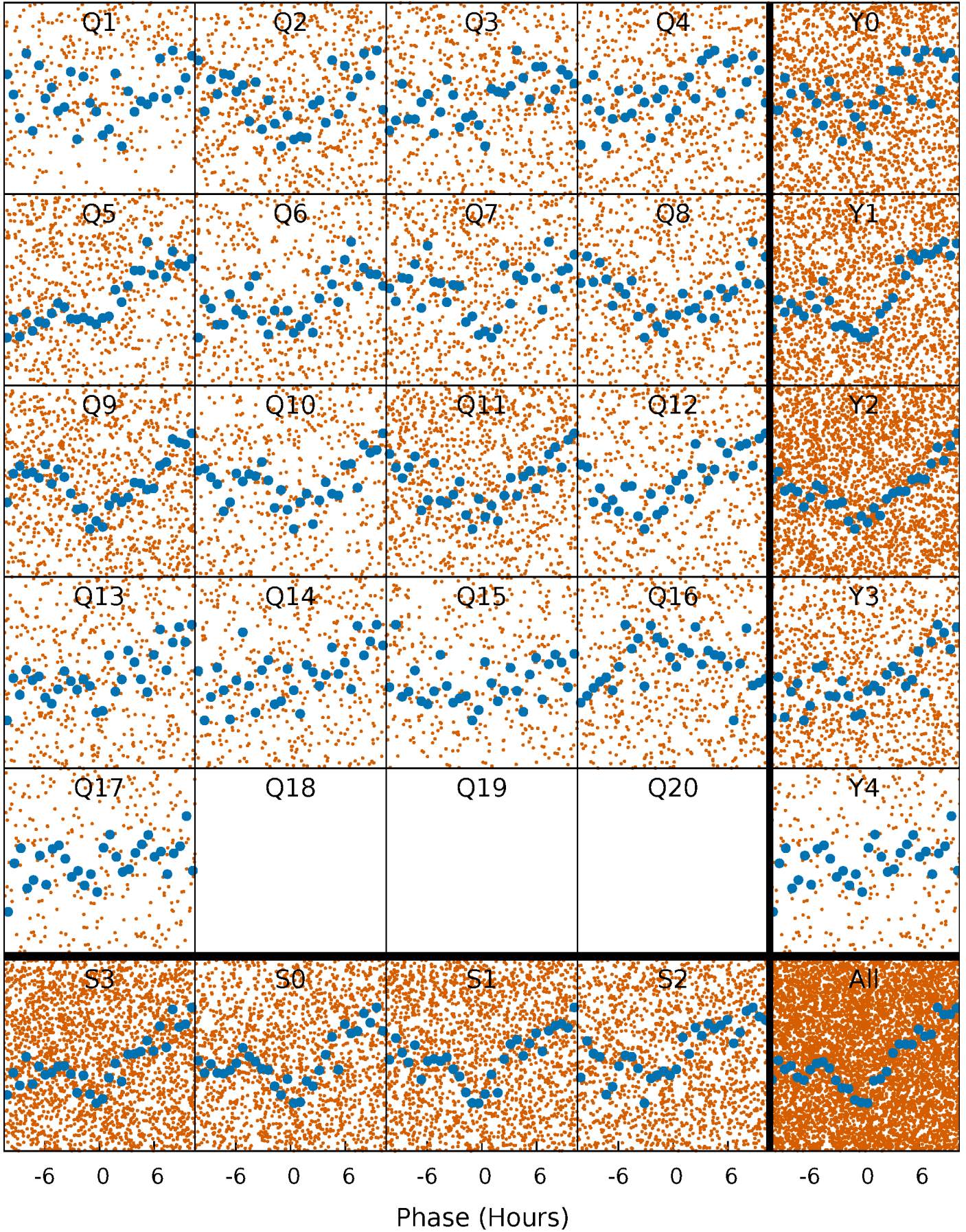


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



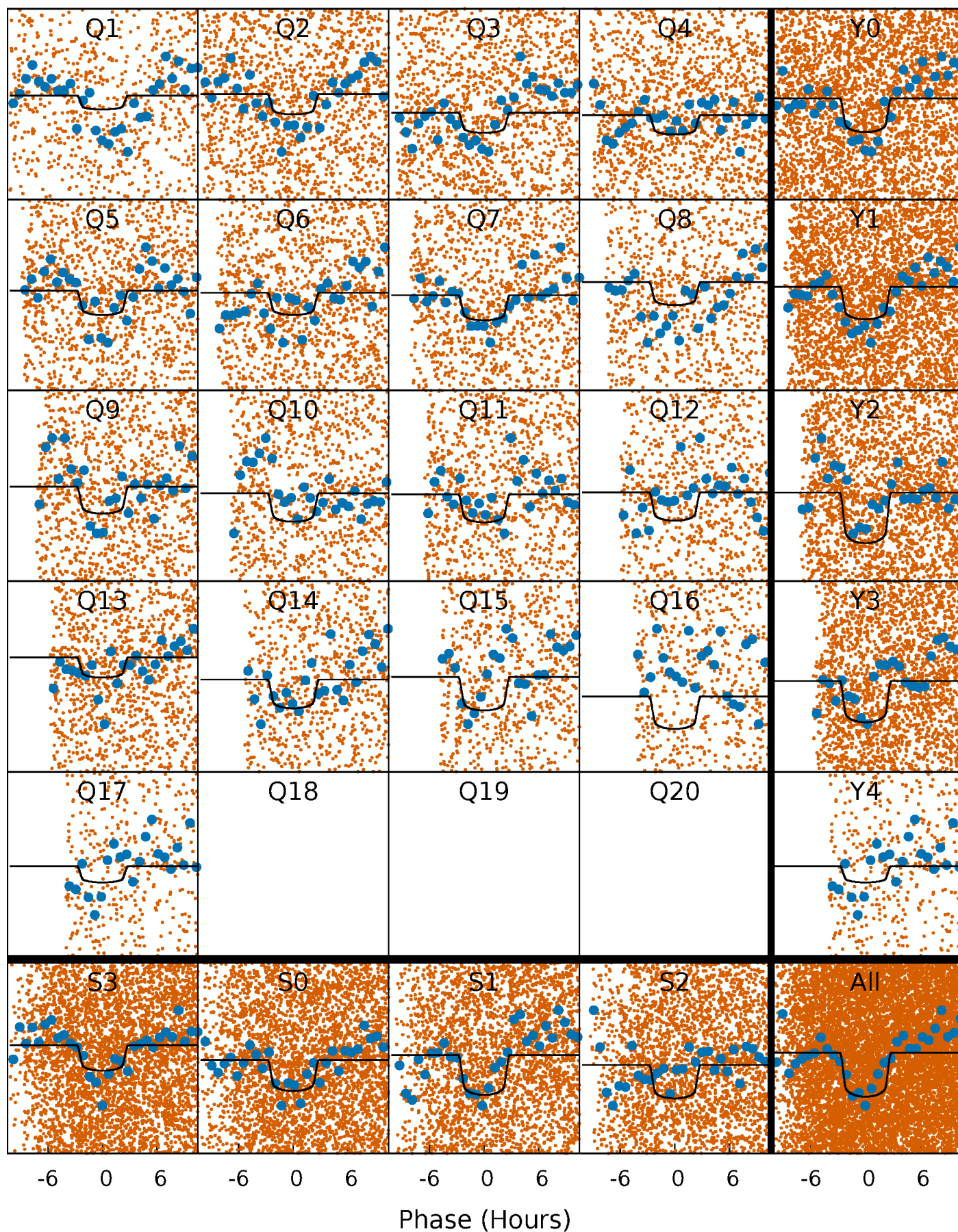
PDC Quarter-Phased Transit Curves

TCE 012069786-02 P= 1.533267 Days $T_0=131.886388$ (BKJD)



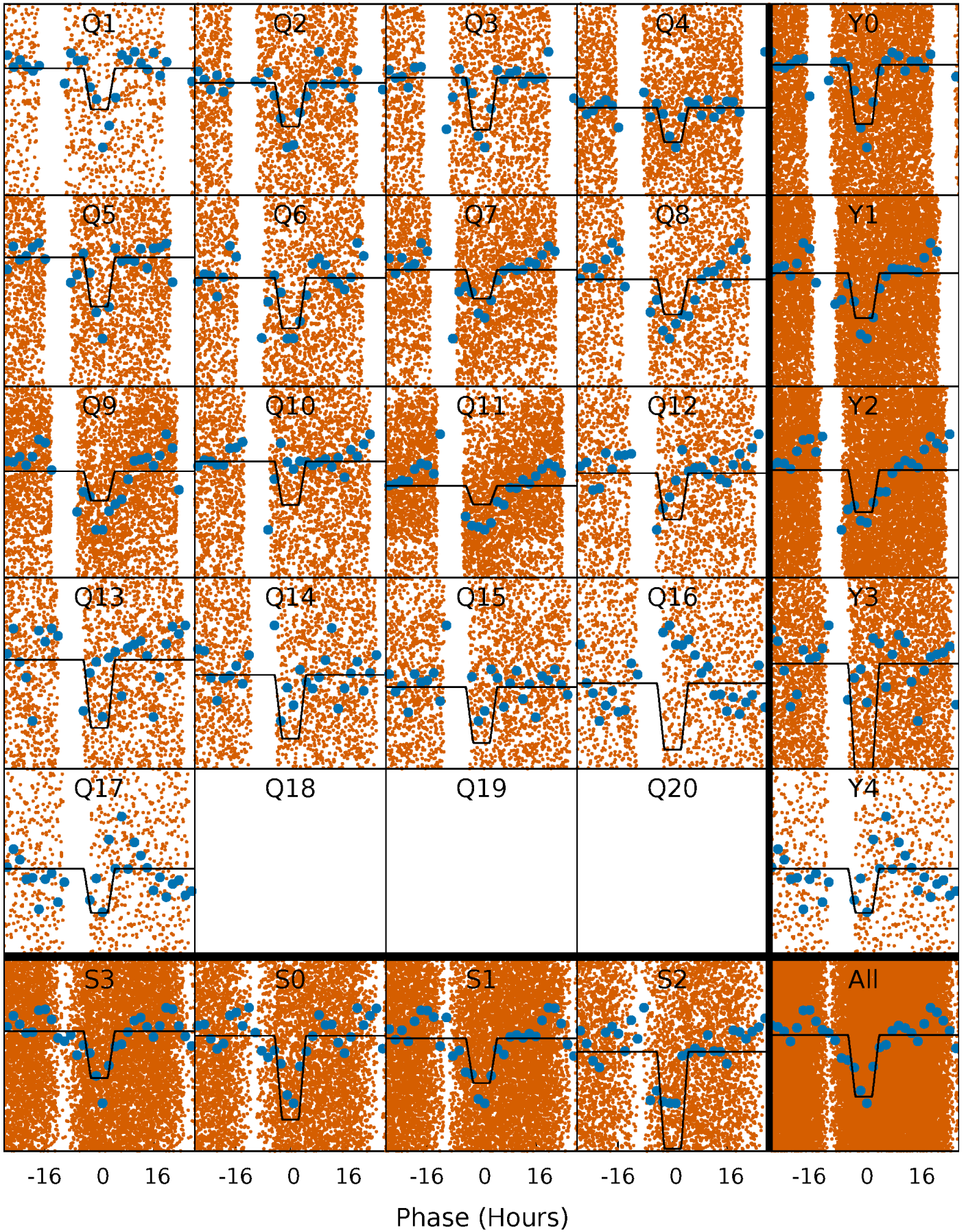
DV Quarter-Phased Transit Curves

TCE 012069786-02 P= 1.533267 Days $T_0=131.886388$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

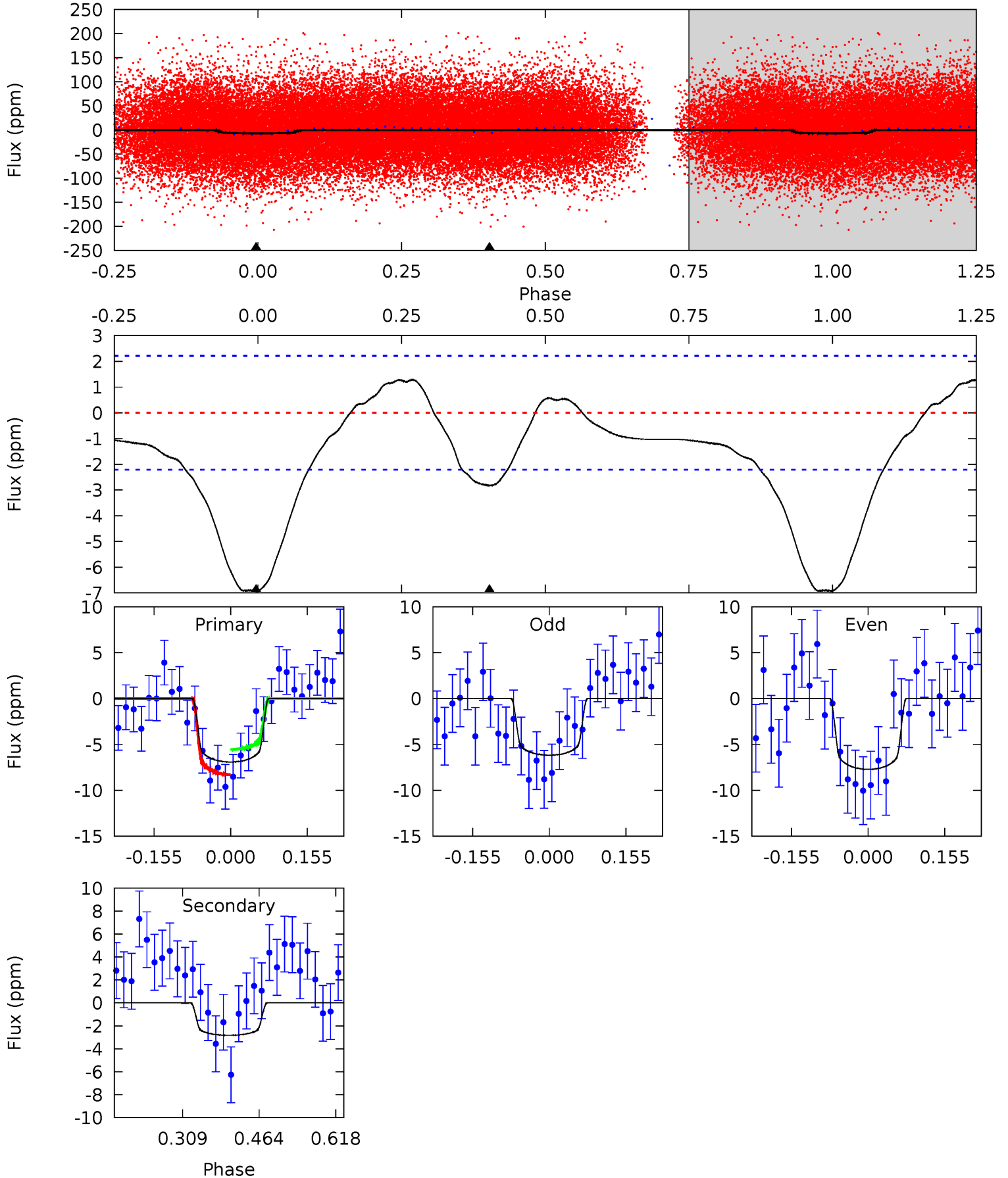
TCE 012069786-02 P= 1.533207 Days $T_0=131.882753$ (BKJD)



DV Model-Shift Uniqueness Test

012069786-02, P = 1.533267 Days, E = 130.353121 Days

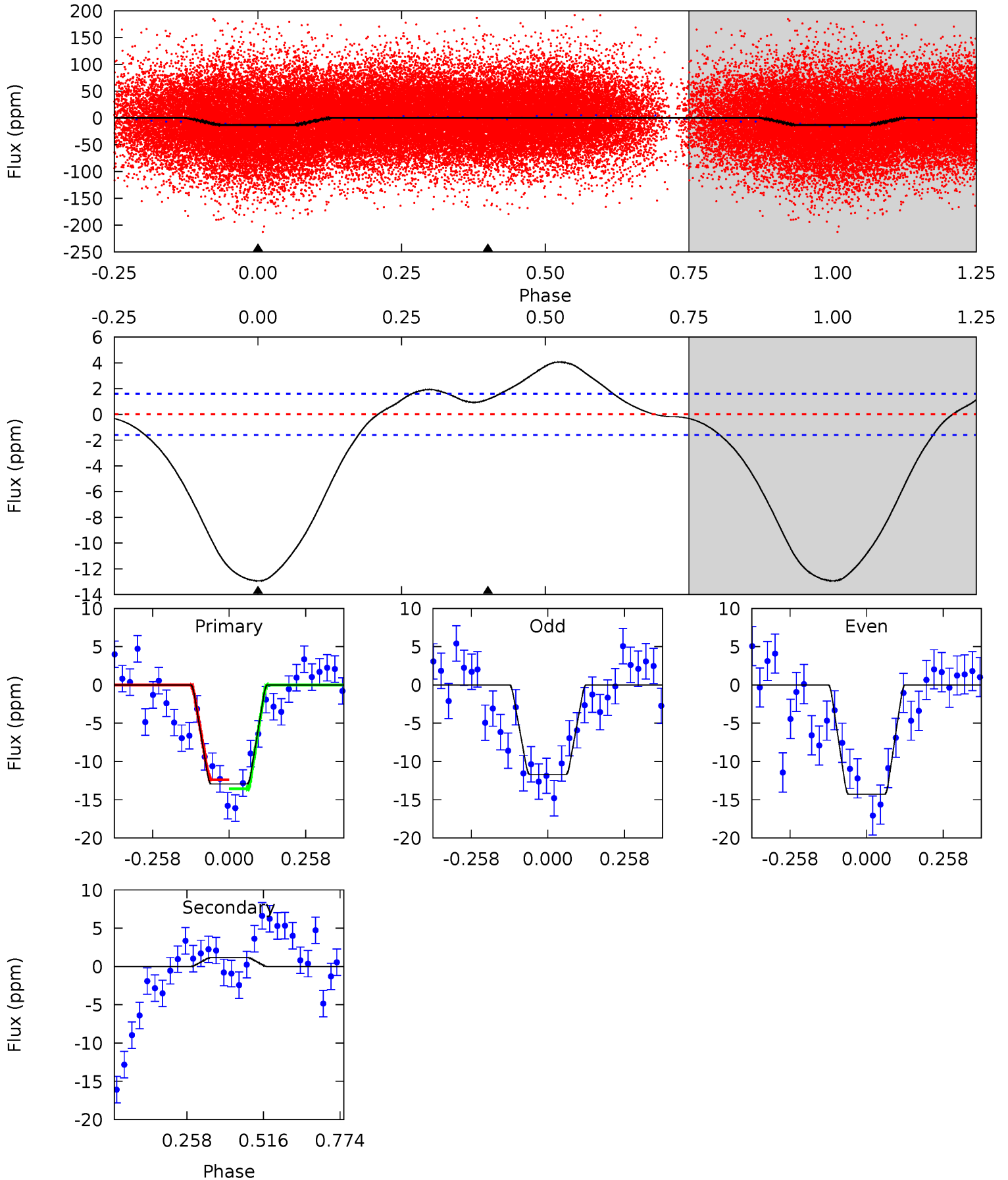
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	5.71	0	0	4.47	1.42	1.83	14.0	14.0	5.71	5.71	1.57	1.07	0.16	2.80



Alt Model-Shift Uniqueness Test

012069786-02, P = 1.533207 Days, E = 130.349546 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.1	-3.17	0	0	4.36	1.13	3.19	35.1	35.1	-3.17	-3.17	3.49	0.87	0.24	1.51



Stellar Parameters For KIC 012069786

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7542^{+75}_{-82}	$3.967^{+0.126}_{-0.084}$	$0.210^{+0.150}_{-0.100}$	$2.367^{+0.306}_{-0.374}$	$1.895^{+0.088}_{-0.155}$	$0.201^{+0.123}_{-0.061}$
	+1%/-1%	+3%/-2%	+71%/-48%	+13%/-16%	+5%/-8%	+61%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012069786-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3 ± 0	$0.85^{+0.15}_{-0.15}$	3977^{+139}_{-162}	5142^{+537}_{-423}	$2.241^{+1.063}_{-0.713}$
Alt.	1 ± 0	$0.98^{+0.15}_{-0.15}$	3969^{+145}_{-173}	-4504^{+264}_{-278}	$-0.691^{+0.267}_{-0.374}$

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

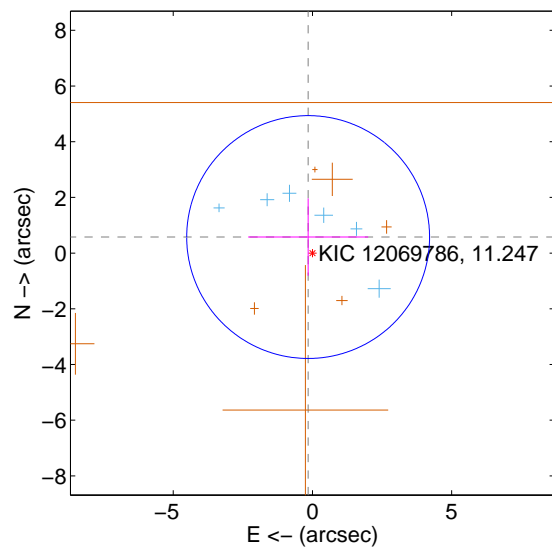
Supplemental centroid analysis for 012069786-02. **Kepler magnitude: 11.25.** Transit SNR 11.04

There are 6 quarters with good PRF difference image offsets

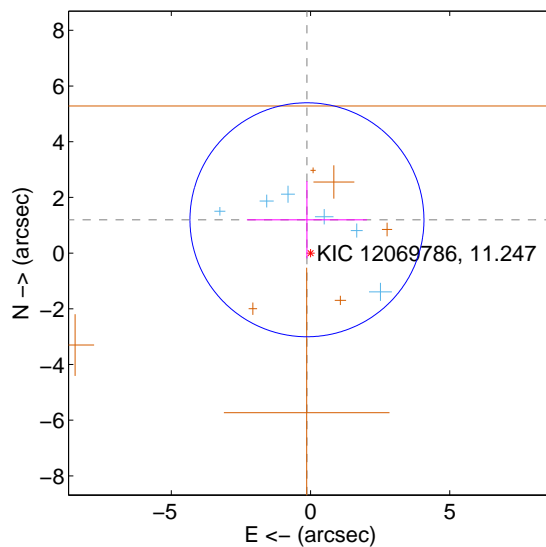
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.597 ± 1.453	0.41	0.155 ± 2.155	0.576 ± 1.389
PRF-fit source offset from KIC position	1.203 ± 1.400	0.86	0.128 ± 2.155	1.197 ± 1.389
photometric centroid source offset	3.09 ± 1.38	2.24	1.14 ± 1.26	-2.87 ± 1.40

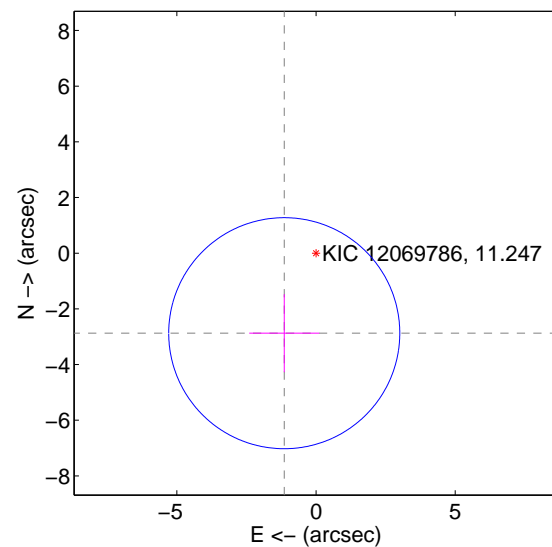
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

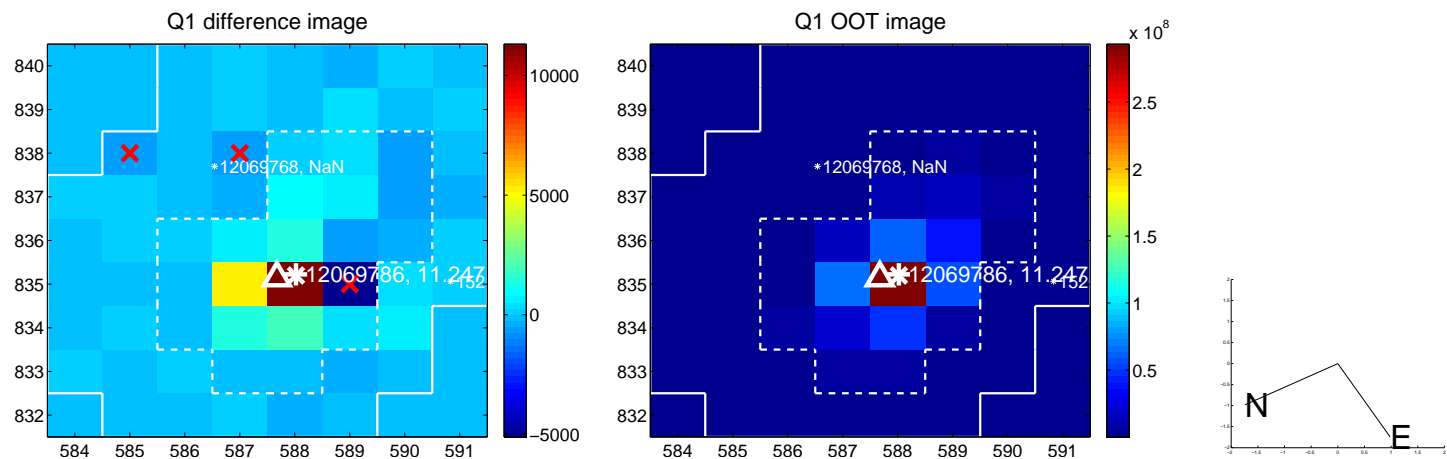


offset from photometric centroids

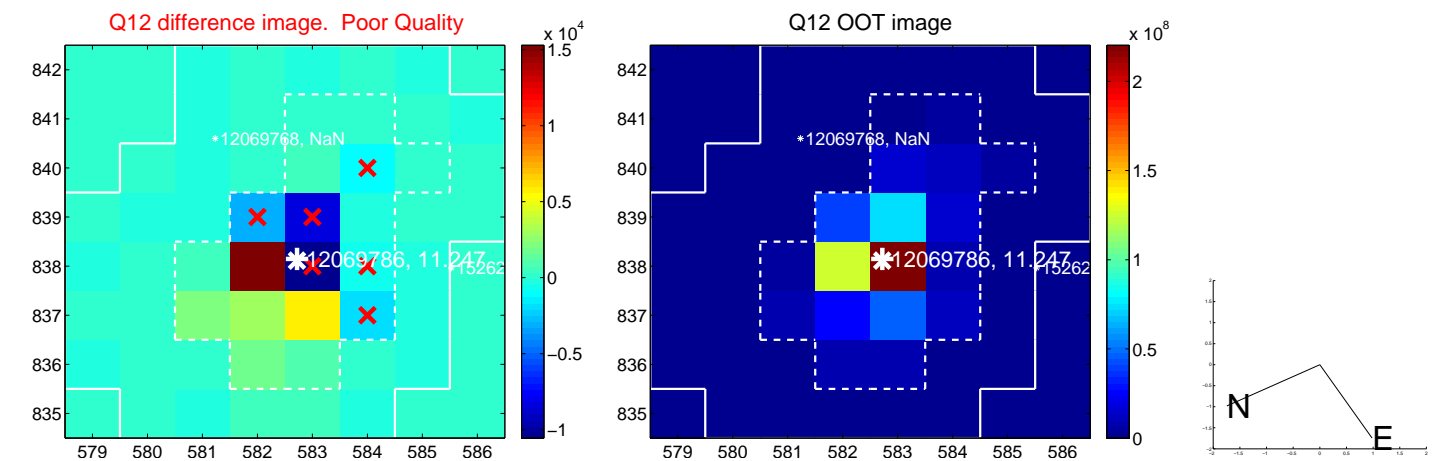
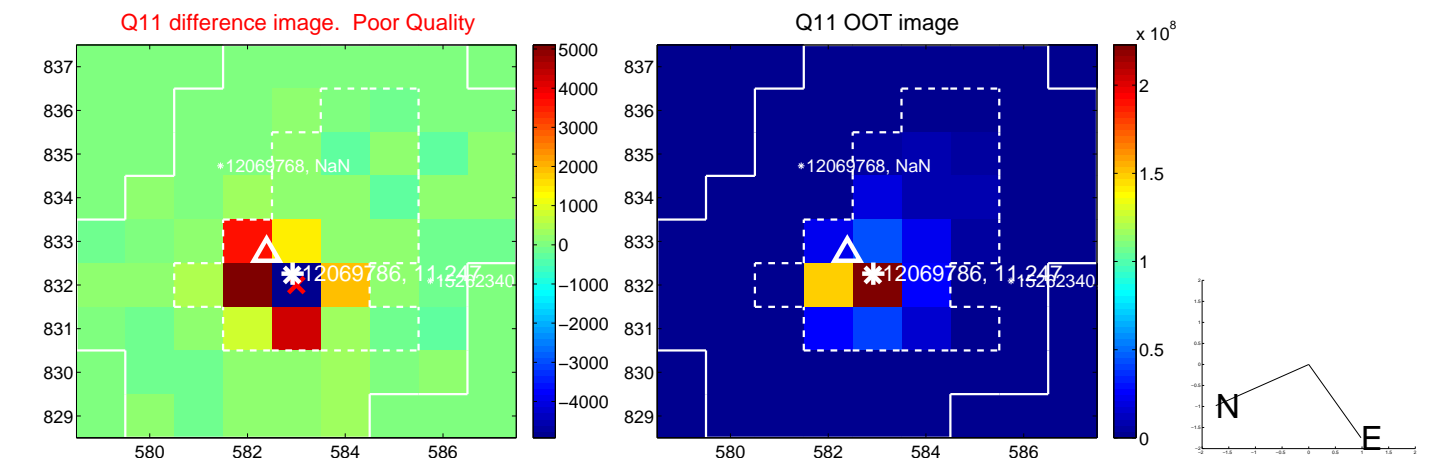
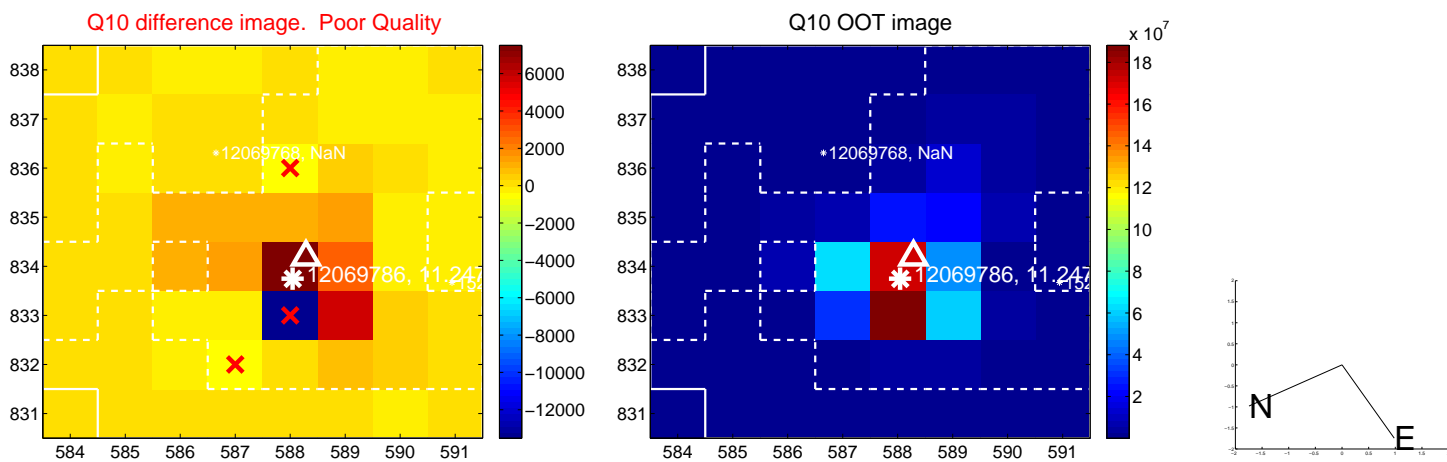
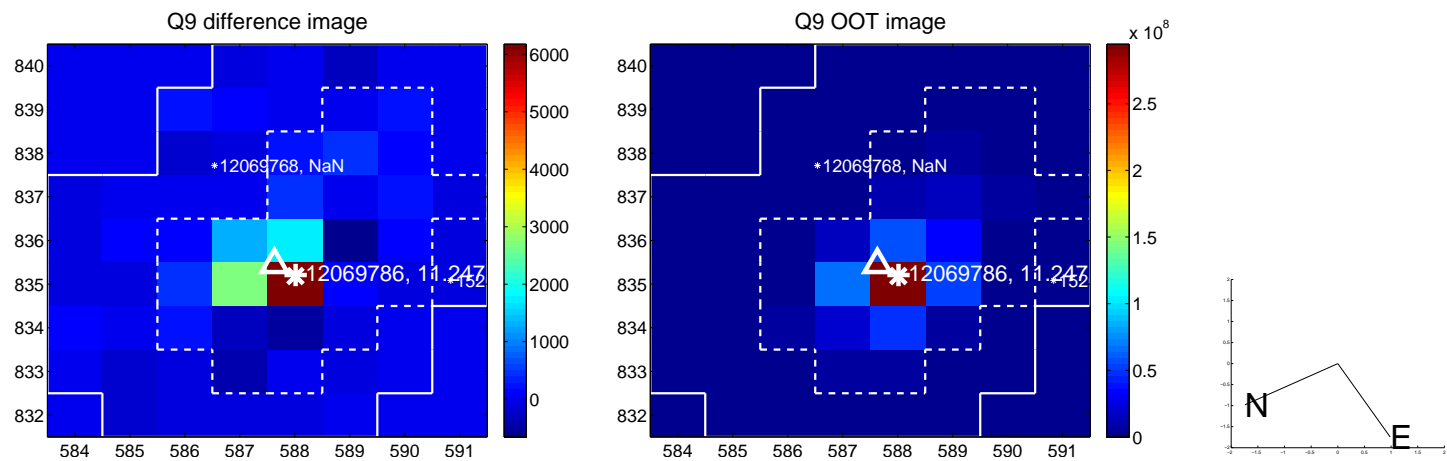


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

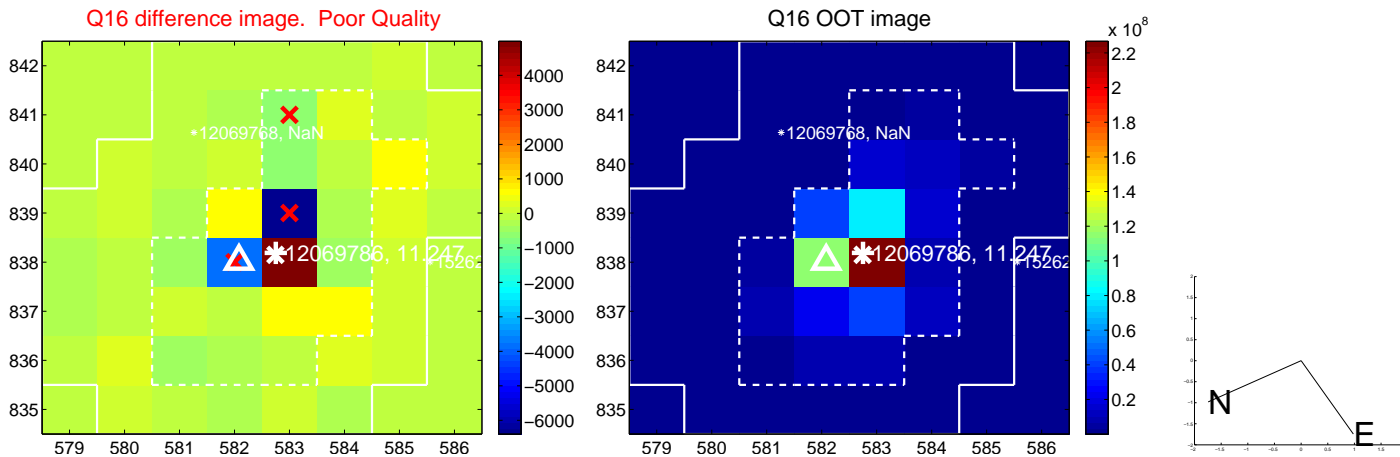
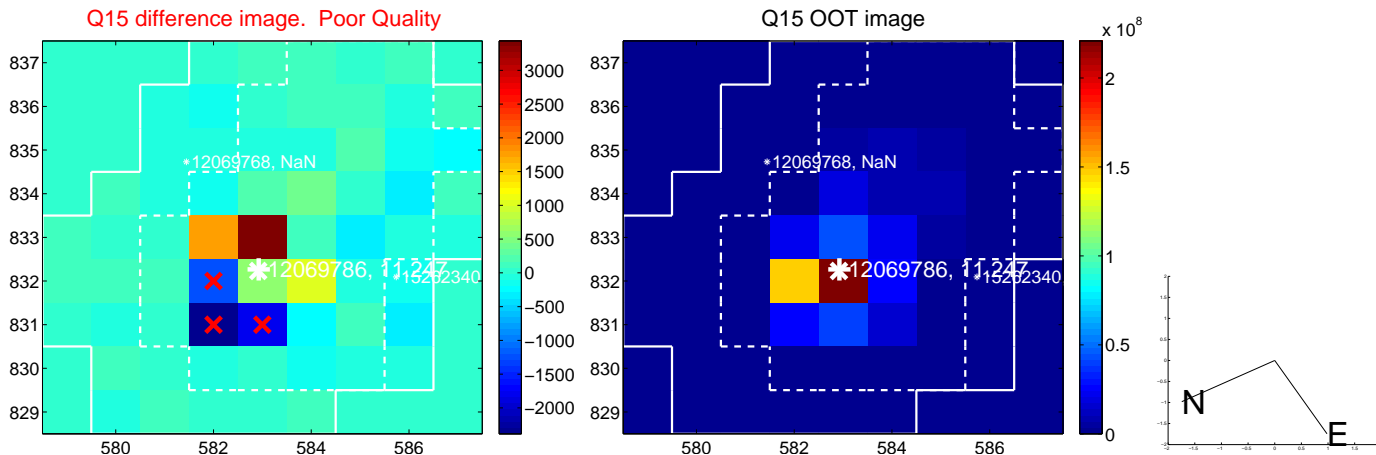
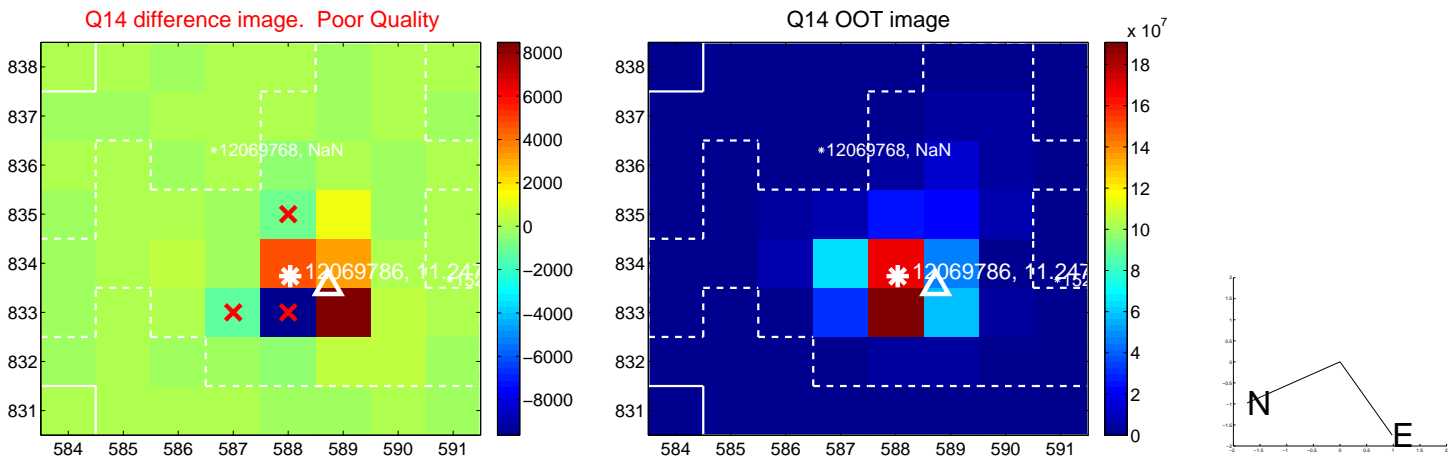
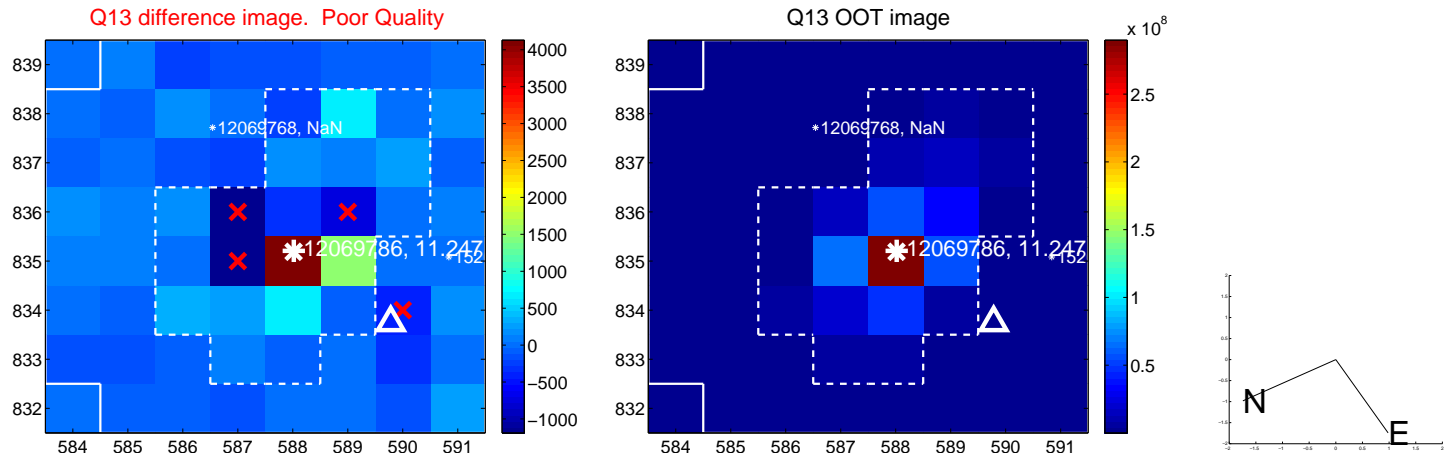
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



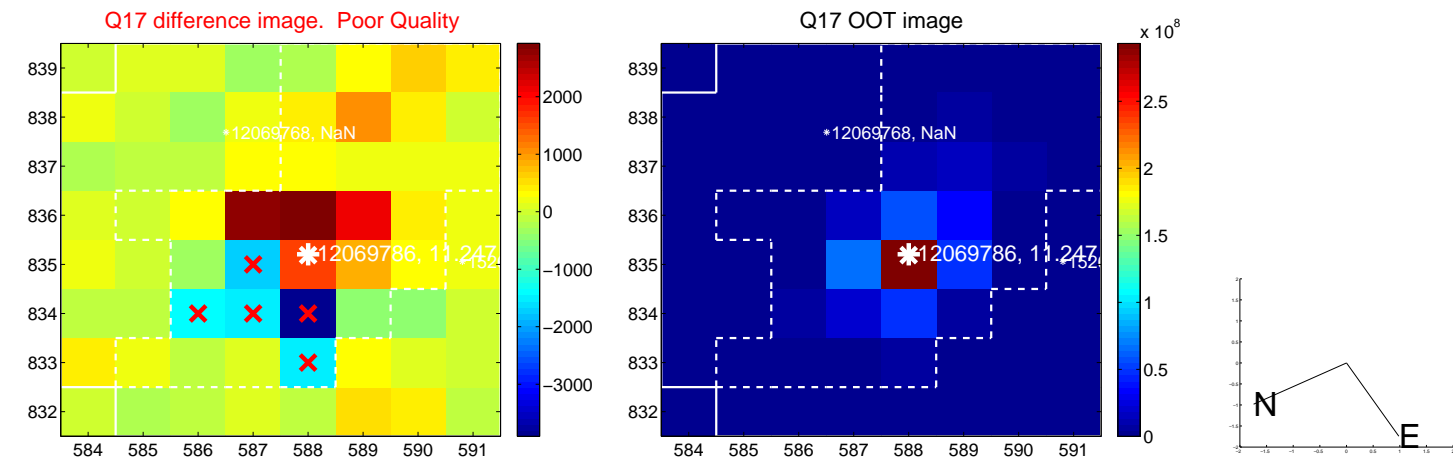
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



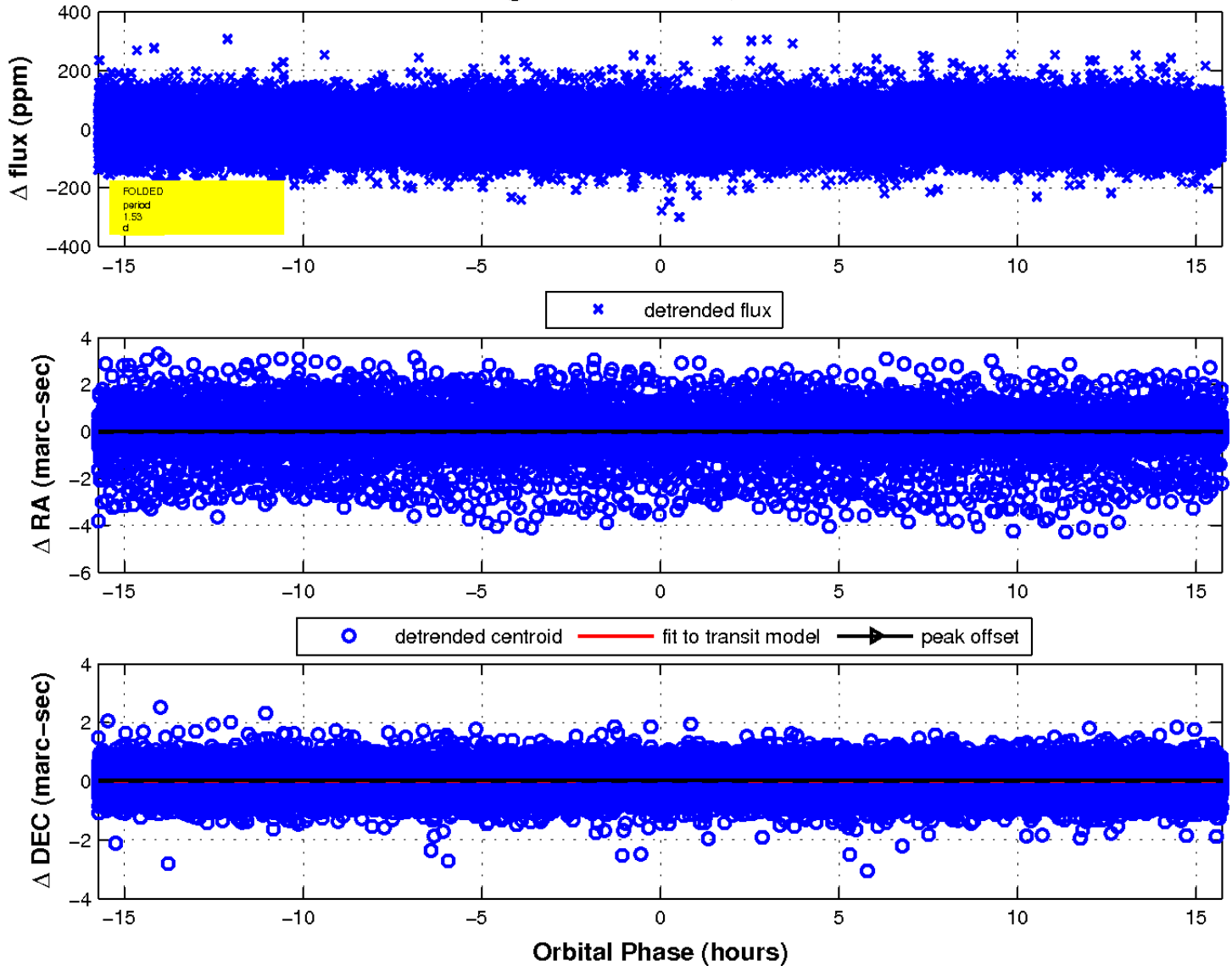
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



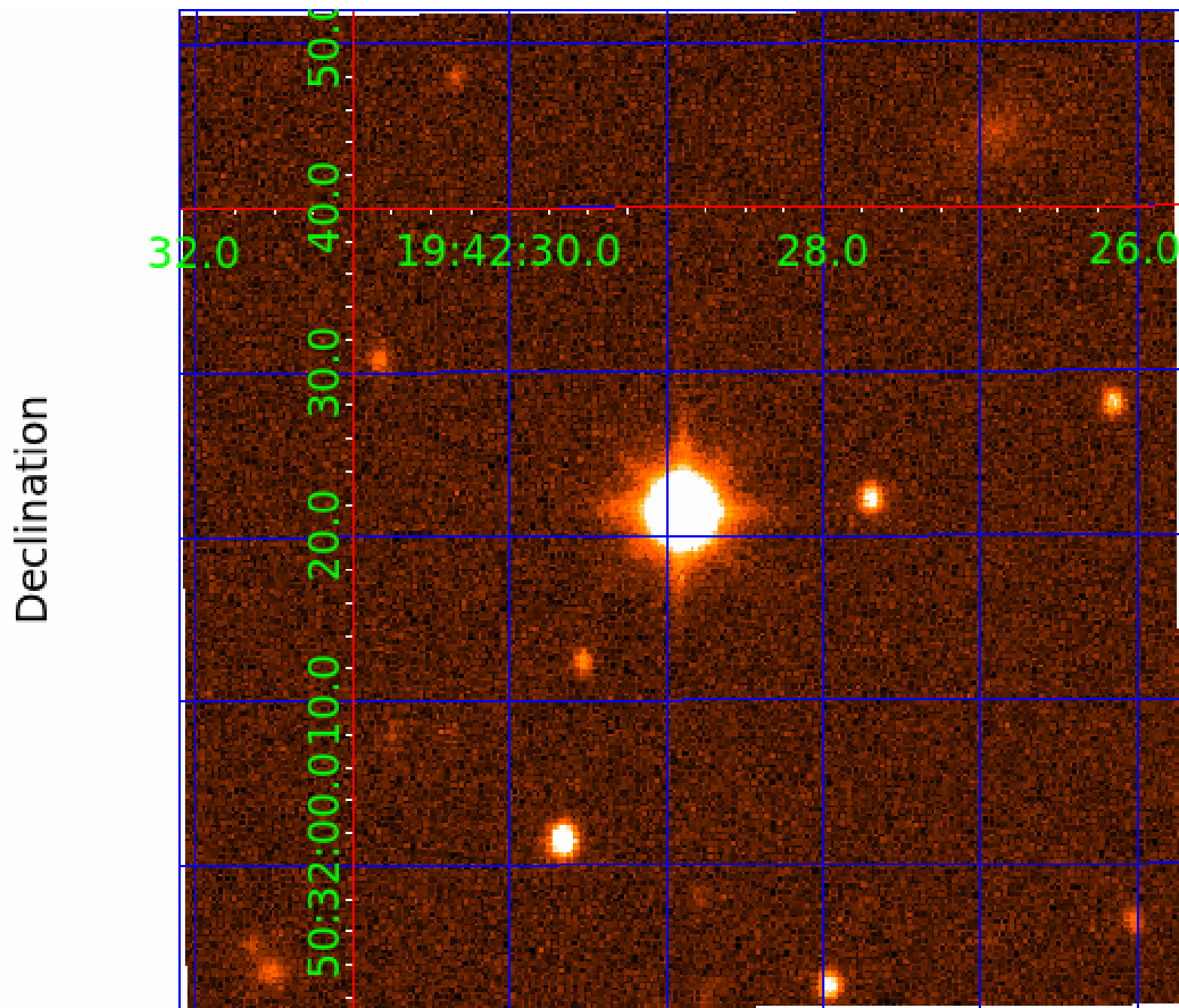
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 3



UKIRT Image



KIC 012069786

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})
012069786-01	OBS	No	1.533540	132.833065	5.8	2.391	8.0	5.8	2.37	7542	0.66	15657.15
012069786-02	OBS	No	1.533267	131.886388	8.3	5.245	9.5	11.0	2.37	7542	0.86	15660.86
012069786-03	OBS	No	191.293702	227.797196	117.7	10.764	14.0	10.1	2.37	7542	3.18	25.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012069786-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
012069786-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED
012069786-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_SATURATED—HALO_GHOST

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

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

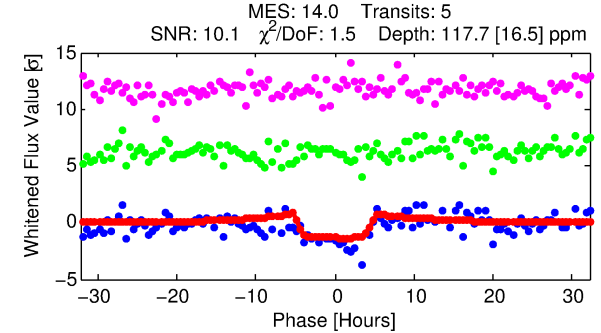
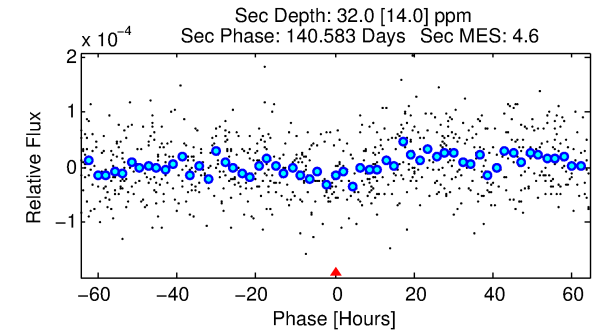
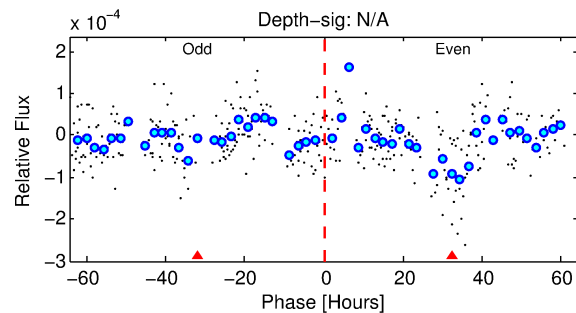
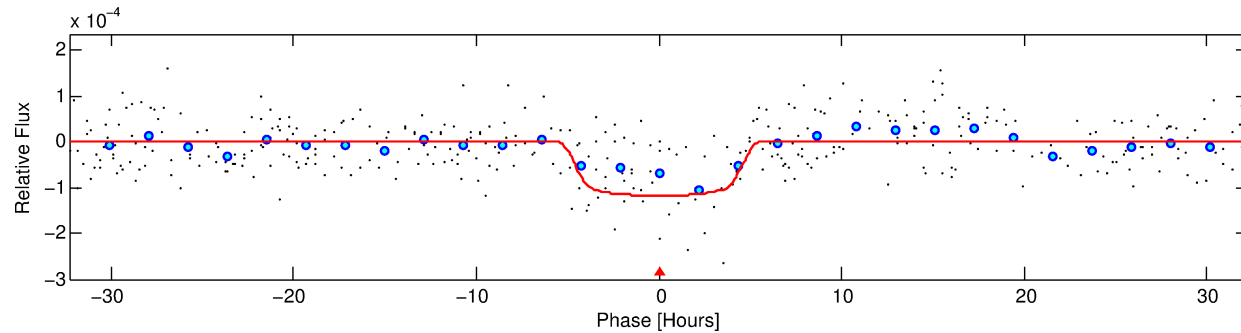
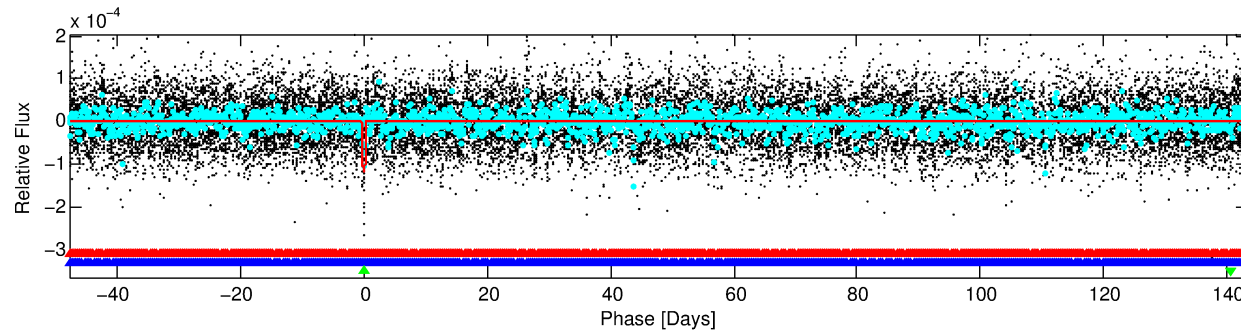
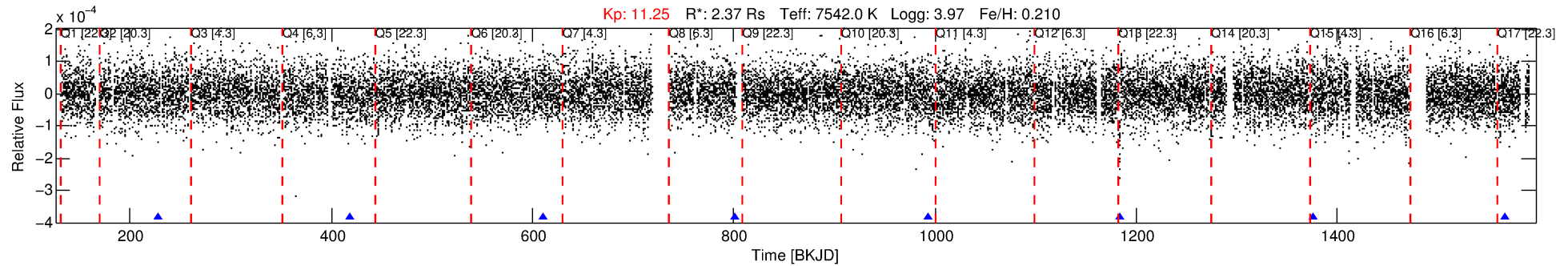
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012069786-03

No Significant Match Found

DV One-Page Summary

KIC: 12069786 Candidate: 3 of 3 Period: 191.294 d



DV Fit Results:

Period = 191.29370 [0.00475] d
Epoch = 227.7972 [0.0182] BKJD
Rp/R* = 0.0123 [0.0012]
a/R* = 42.51 [15.96]
b = 0.96 [0.03]
Seff = 25.12 [5.64]
Teq = 571 [32] K
Rp = 3.18 [0.59] Re
a = 0.8041 [0.1150] AU
Ag = 1123.76 [590.84] [1.90σ]
Teffp = 5110 [612] K [7.40σ]

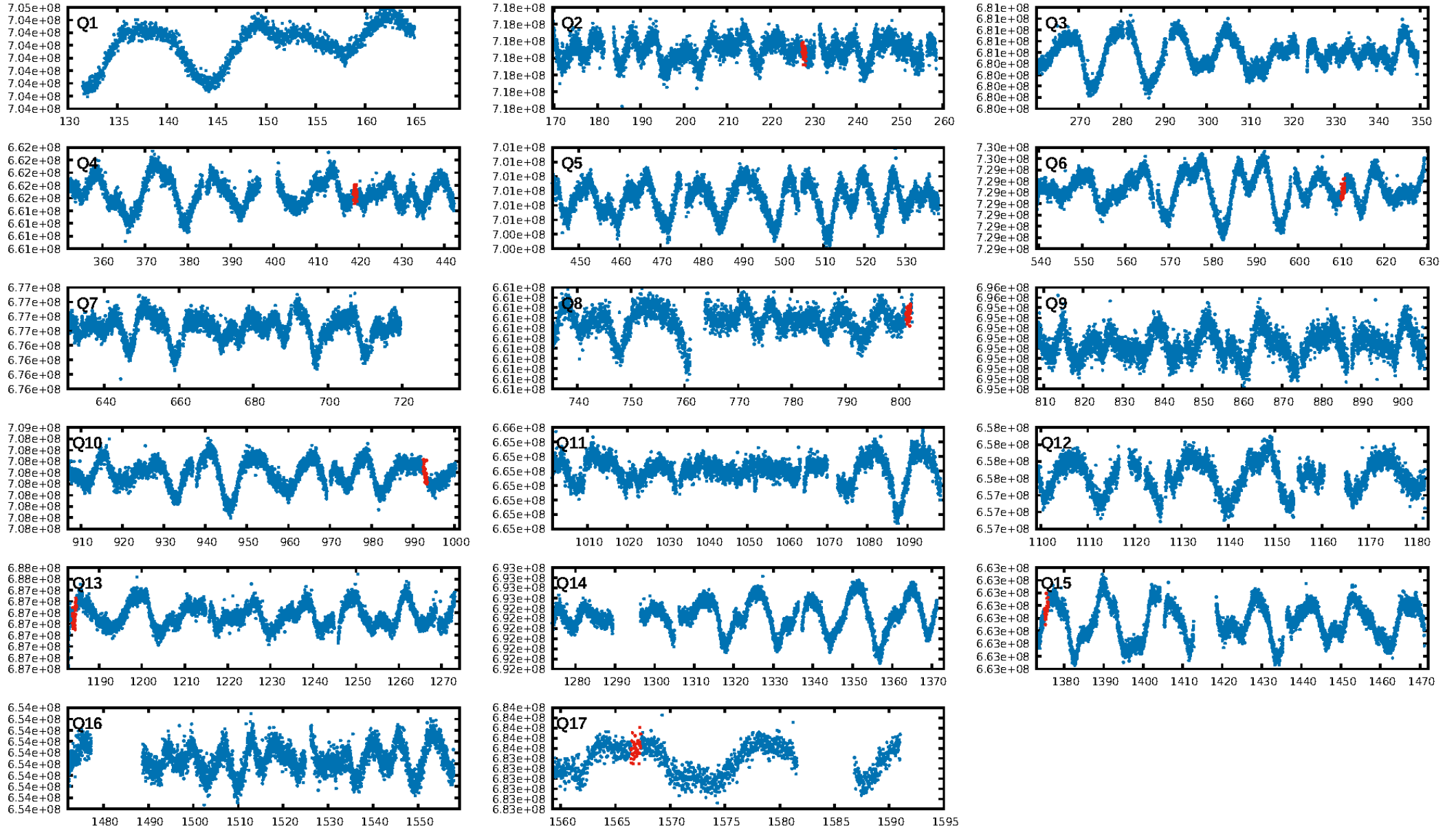
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [413.05σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 1.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.09e-22
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -0.1129
Centroid-sig: 2.2%
Centroid-so: 1.398 arcsec [1.58σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 0.00 [0/6]

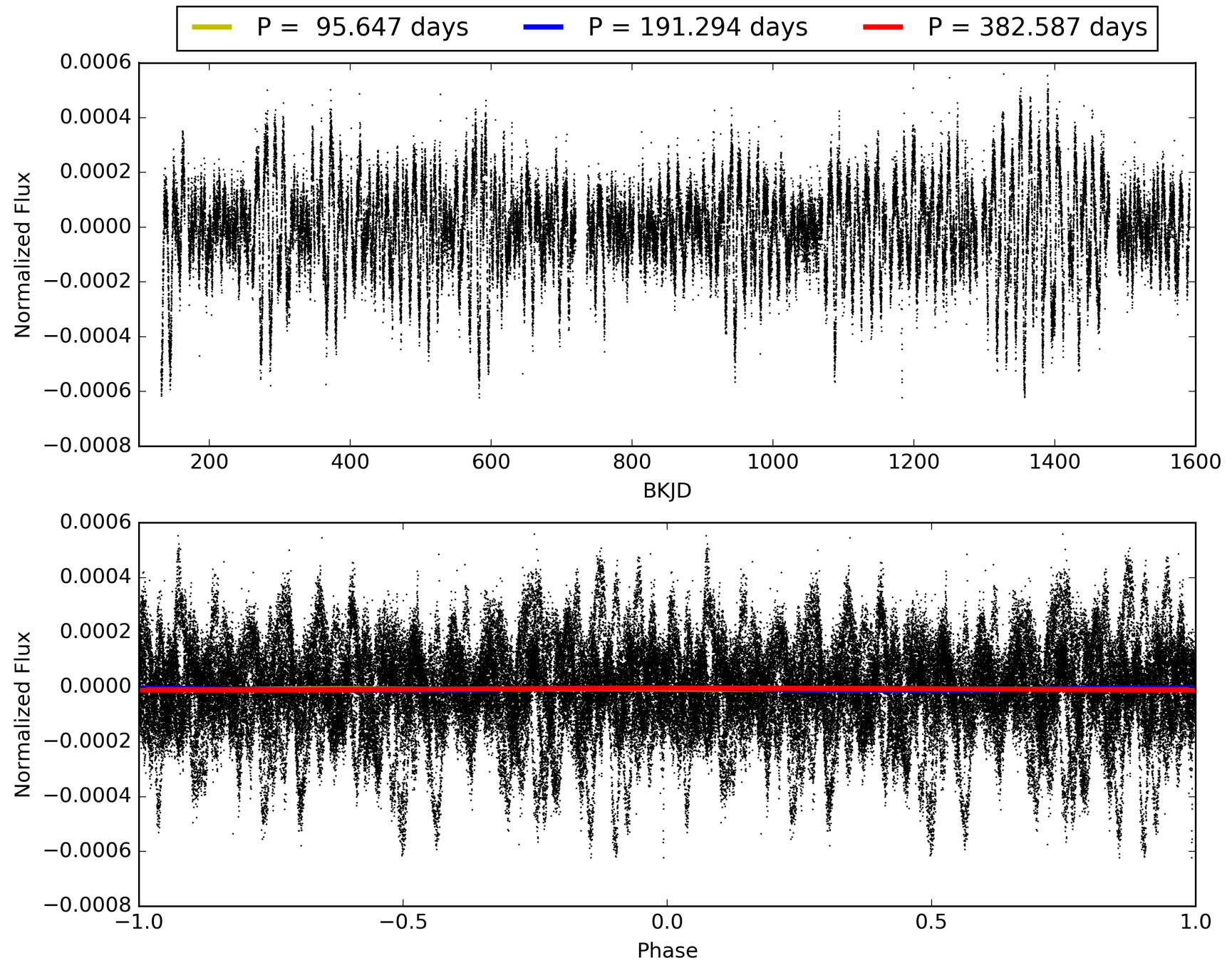
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:46:41 Z

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

TCE 012069786-03, PDC Light Curves

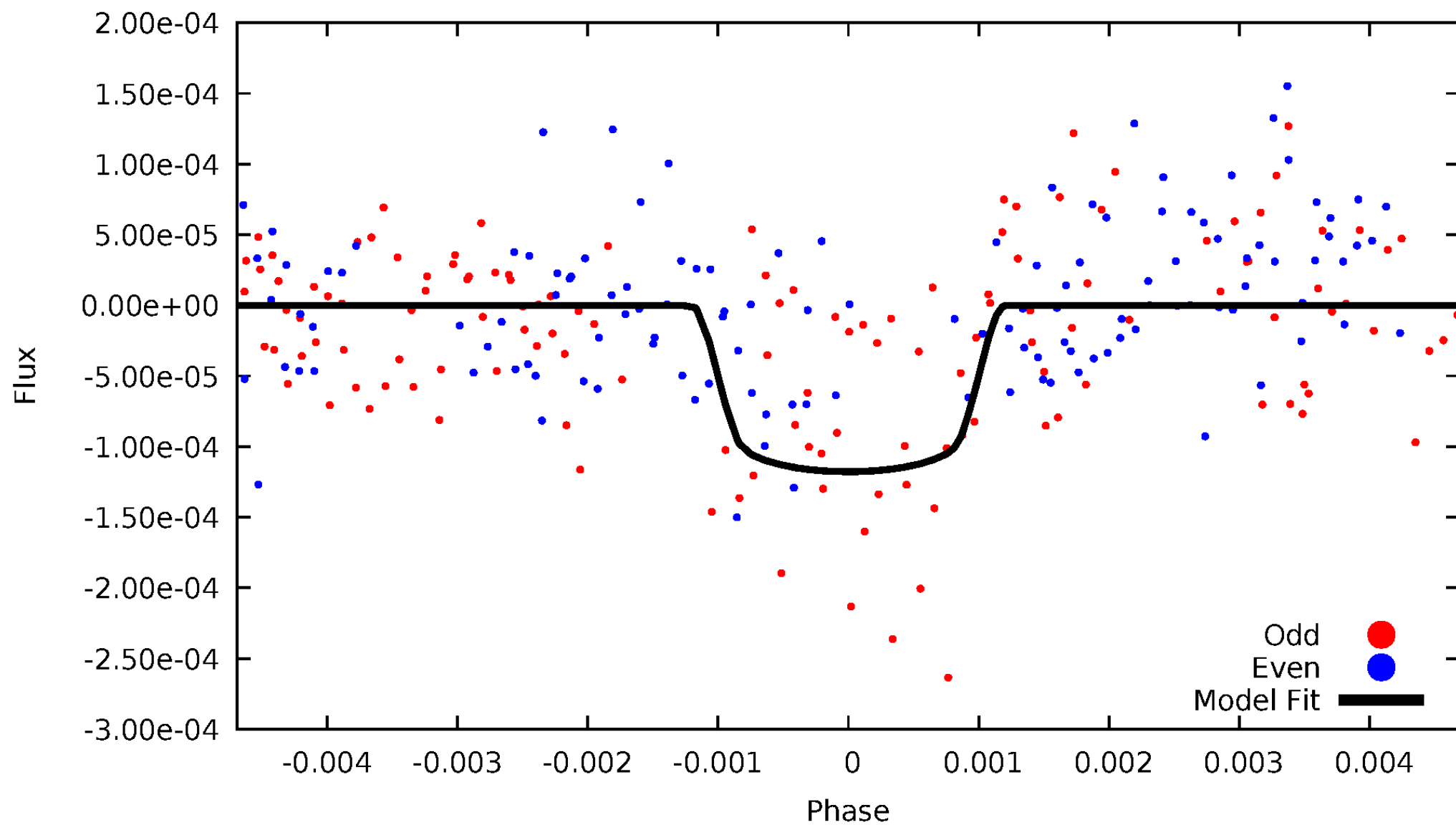


TCE 012069786-03



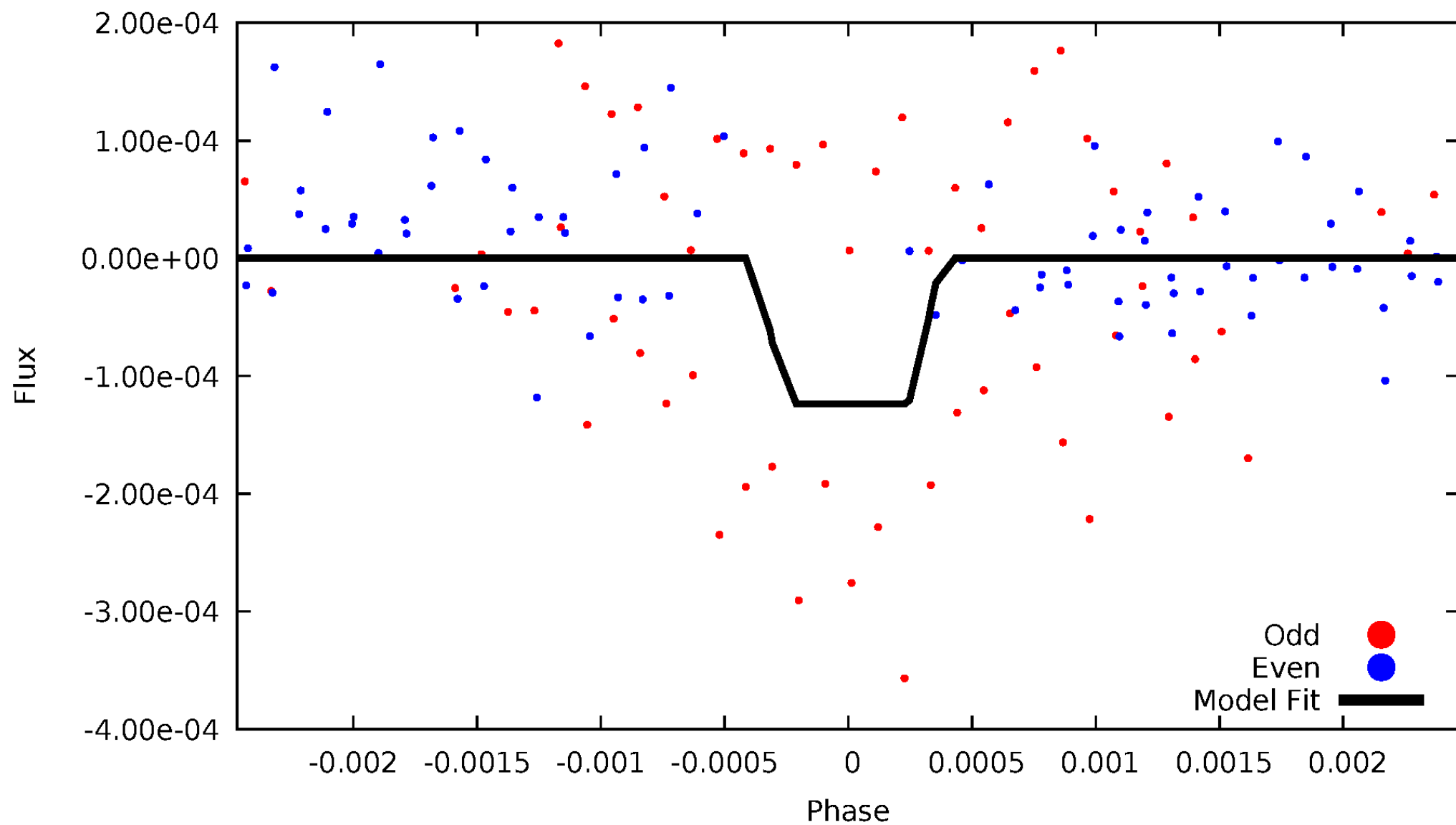
DV Odd/Even

TCE 012069786-03



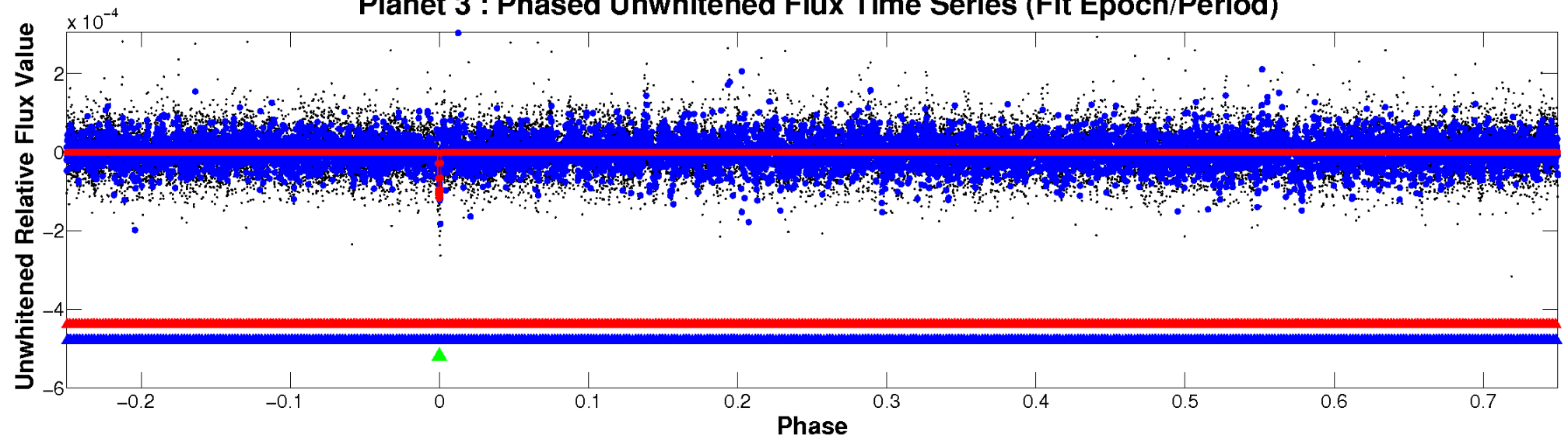
ALT Odd/Even

TCE 012069786-03

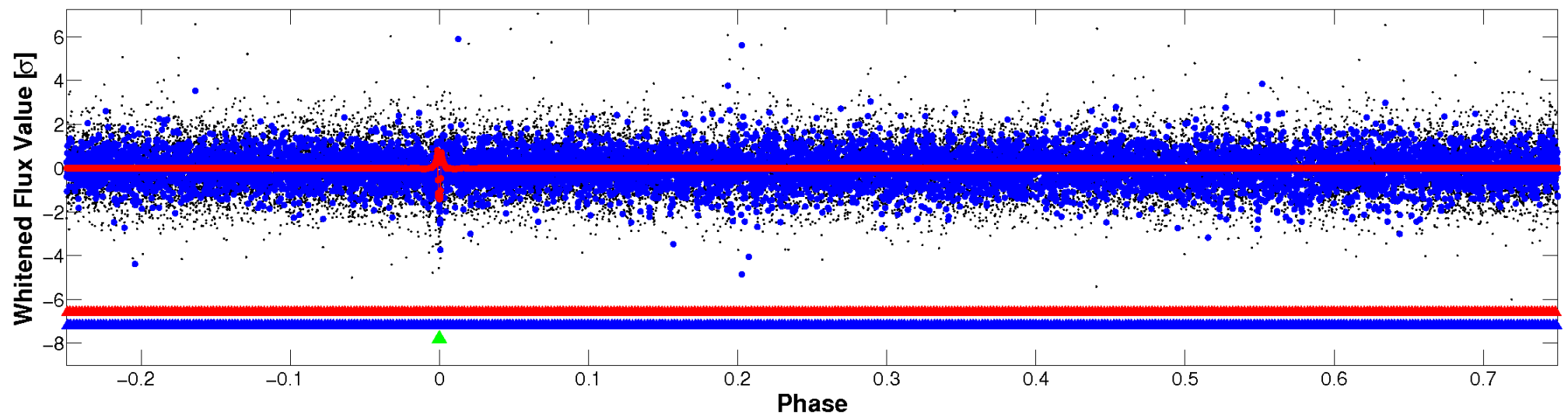


Non-Whitened Vs. Whitened Light Curve

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

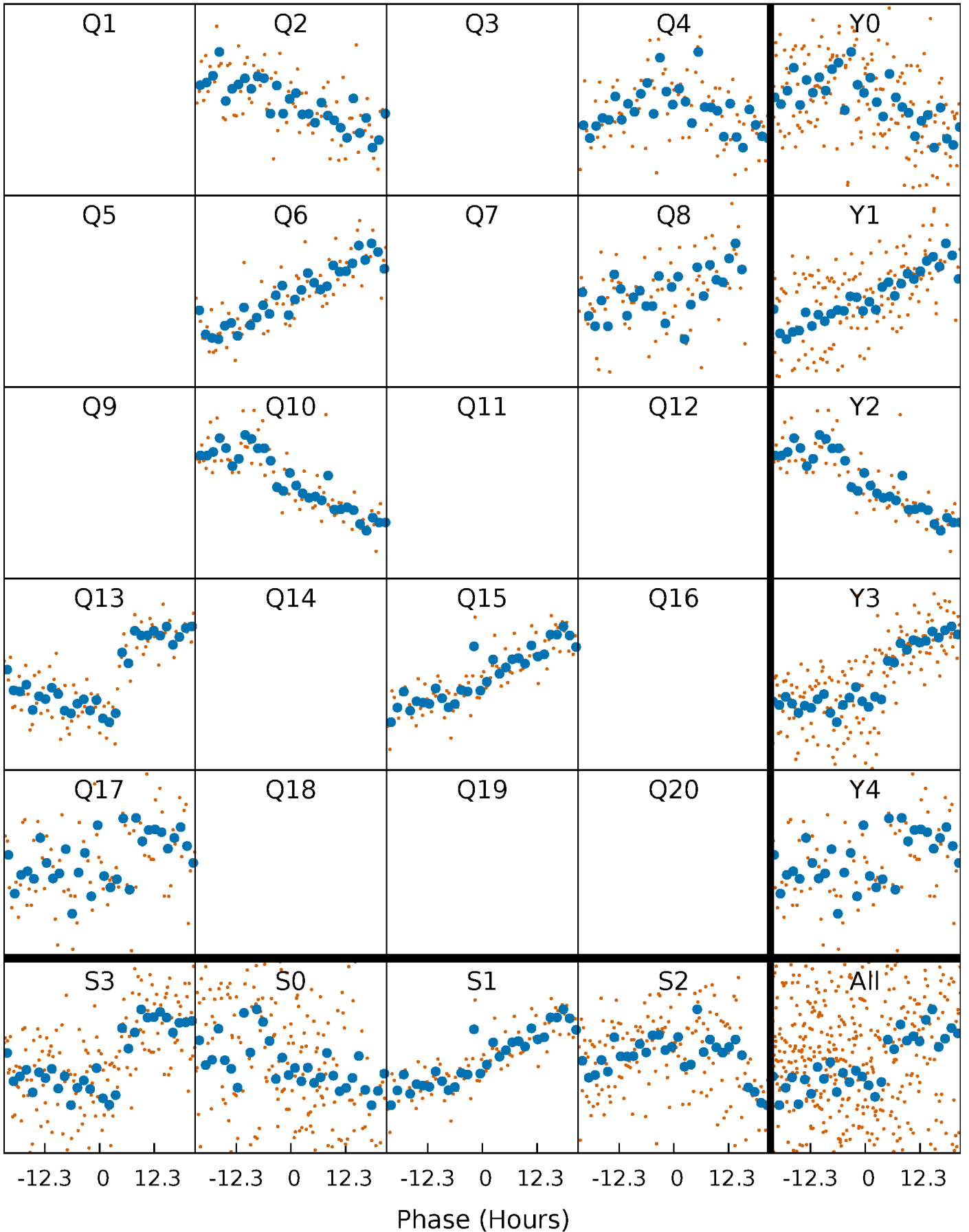


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



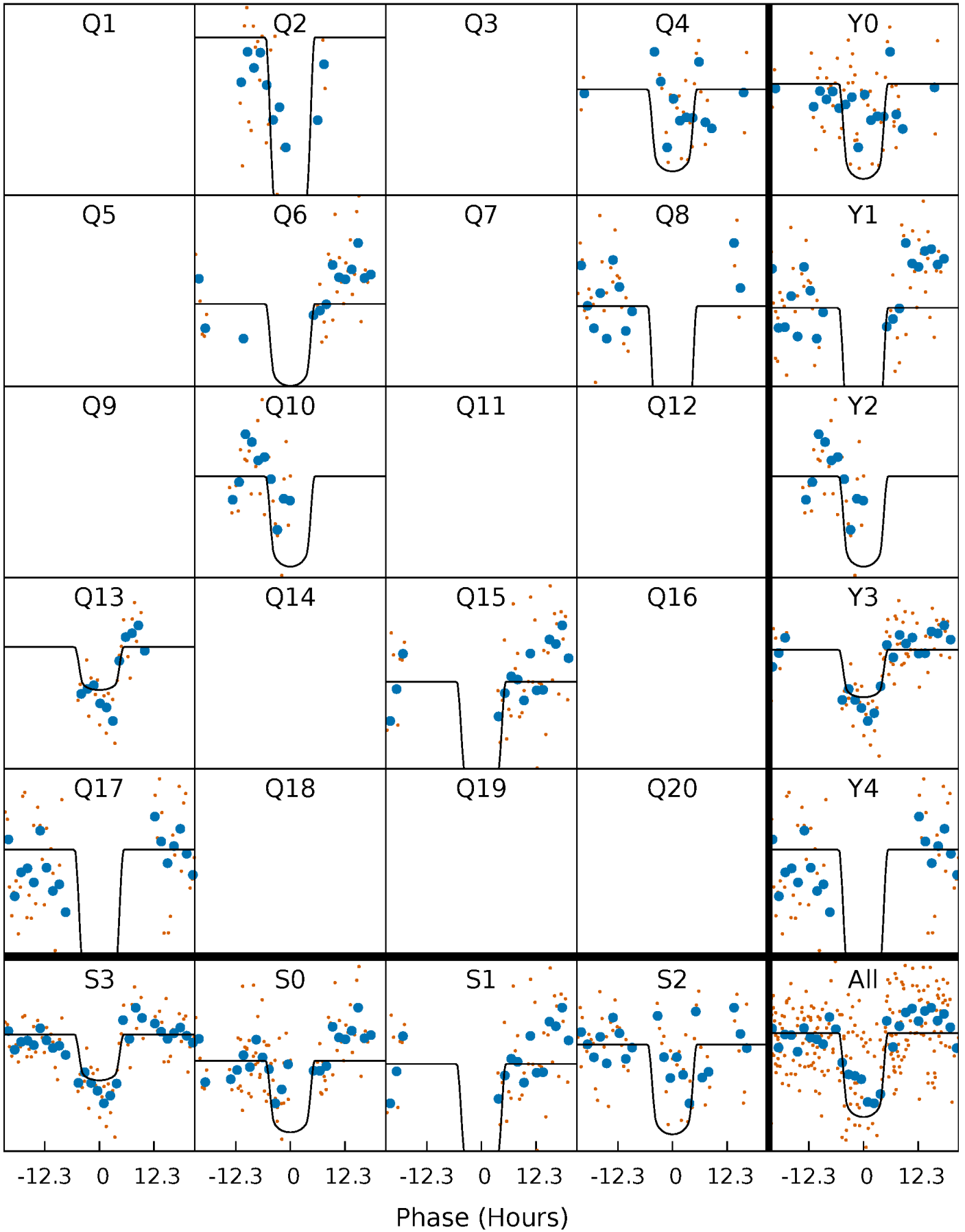
PDC Quarter-Phased Transit Curves

TCE 012069786-03 P=191.293702 Days $T_0=227.797196$ (BKJD)



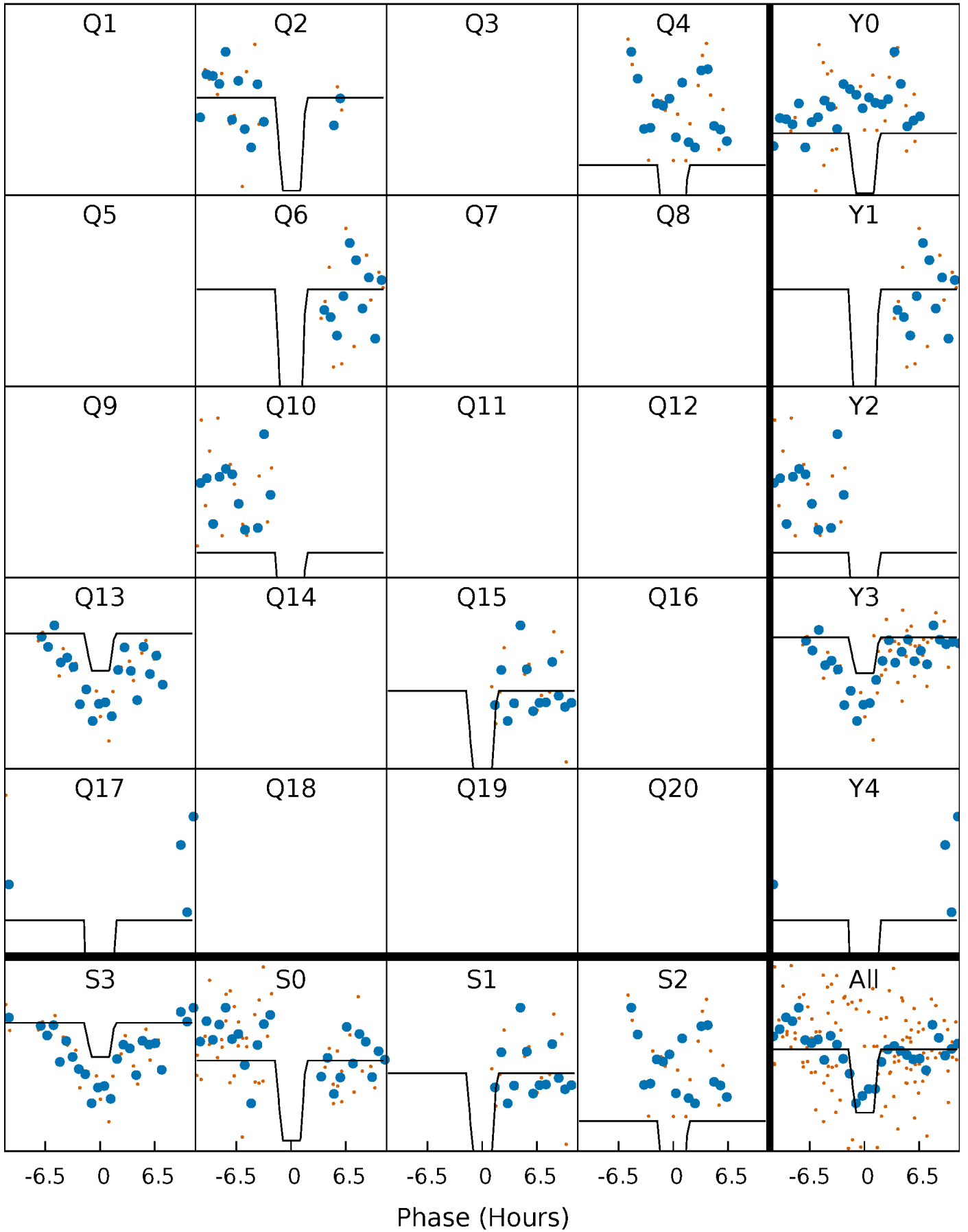
DV Quarter-Phased Transit Curves

TCE 012069786-03 P=191.293702 Days $T_0=227.797196$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

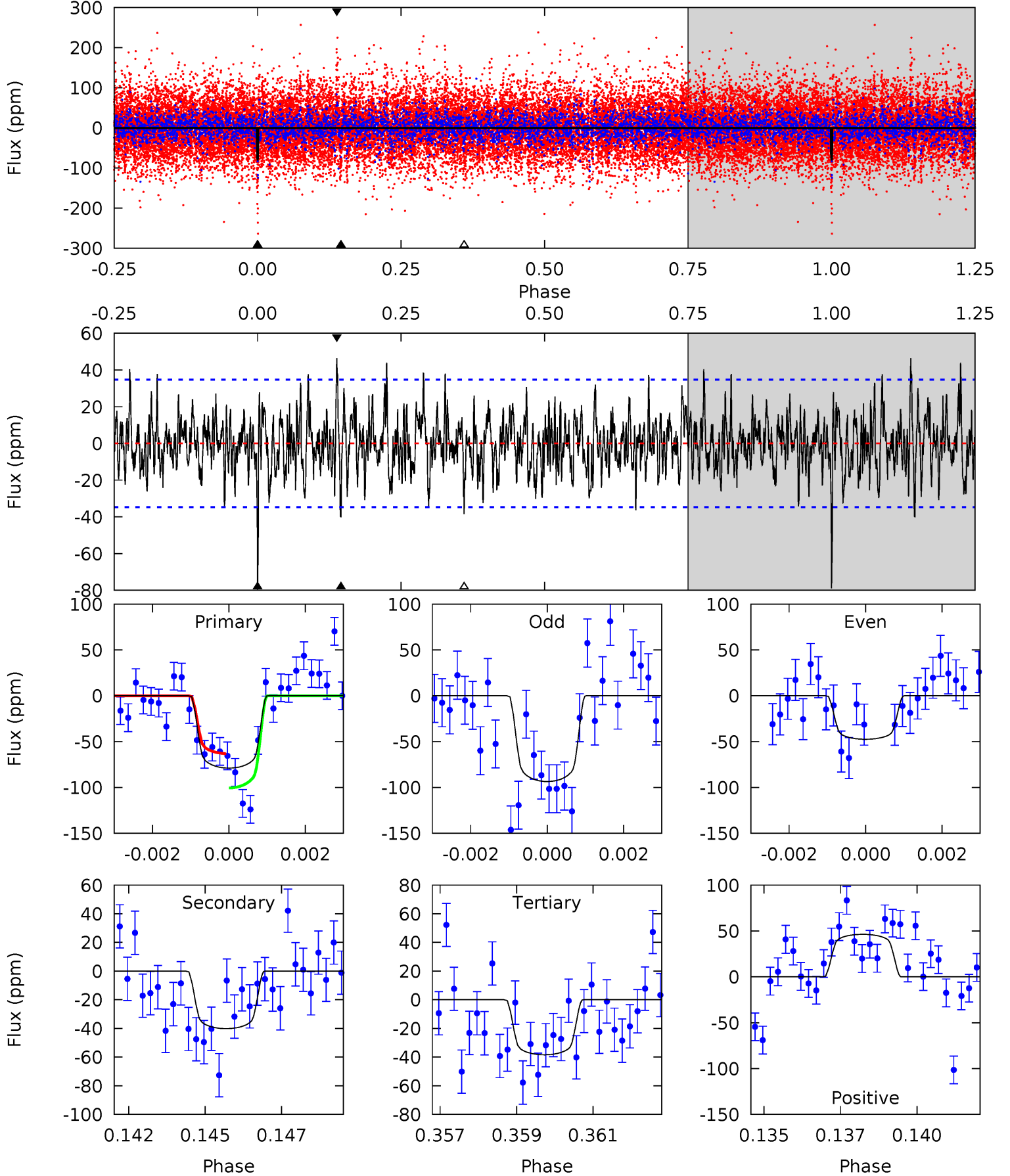
TCE 012069786-03 P=191.298989 Days $T_0=227.874142$ (BKJD)



DV Model-Shift Uniqueness Test

012069786-03, P = 191.293702 Days, E = 36.503494 Days

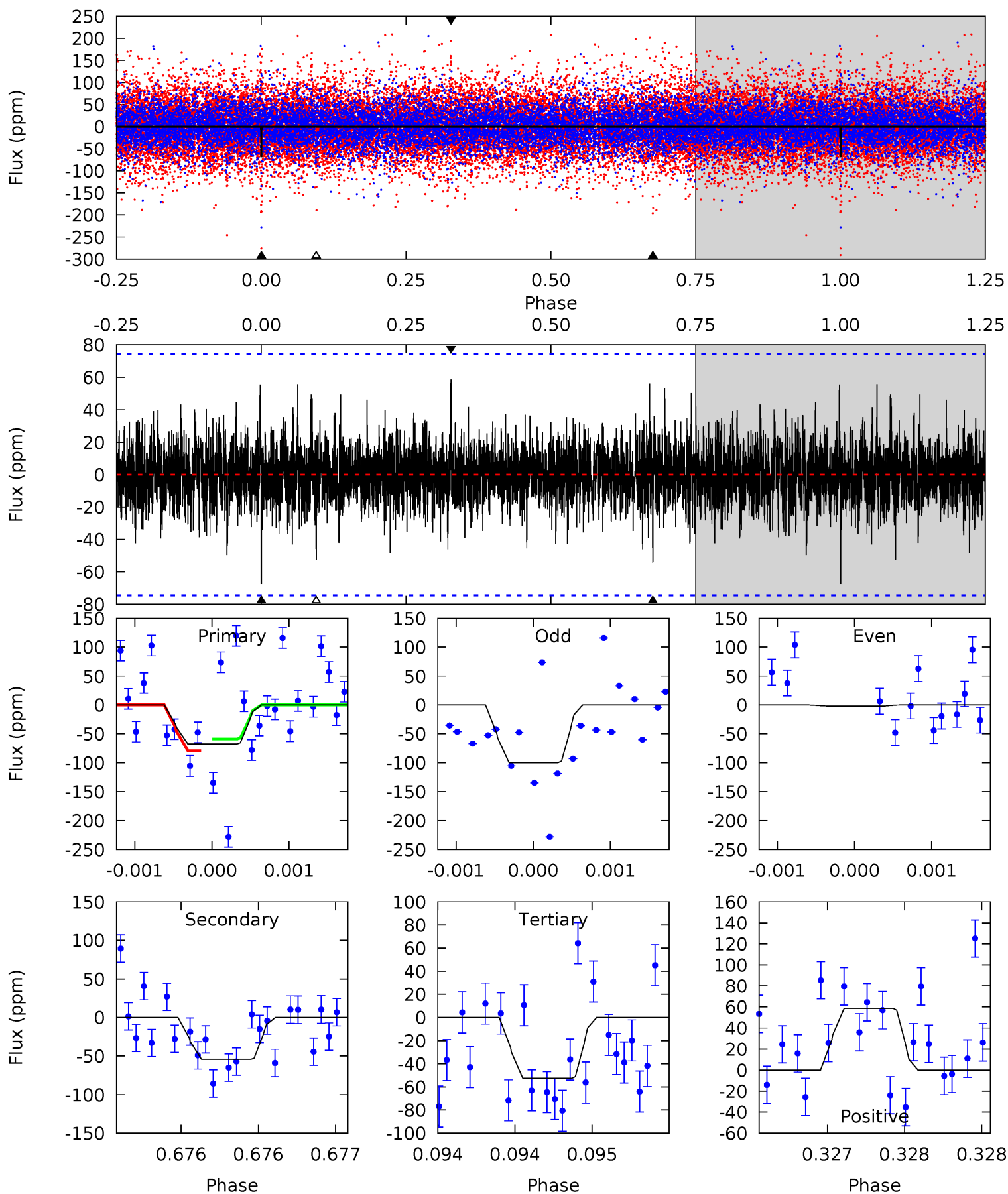
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	6.12	5.85	7.07	5.29	3.03	1.94	6.18	4.96	0.27	-0.94	3.37	1.51	0.37	2.84



Alt Model-Shift Uniqueness Test

012069786-03, P = 191.298989 Days, E = 36.575153 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.00	4.03	3.89	4.35	5.52	3.40	1.00	1.11	0.65	0.14	-0.31	1.95	29.0	0.46	0.73



Stellar Parameters For KIC 012069786

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7542^{+75}_{-82}	$3.967^{+0.126}_{-0.084}$	$0.210^{+0.150}_{-0.100}$	$2.367^{+0.306}_{-0.374}$	$1.895^{+0.088}_{-0.155}$	$0.201^{+0.123}_{-0.061}$
	+1%/-1%	+3%/-2%	+71%/-48%	+13%/-16%	+5%/-8%	+61%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012069786-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-40 ± 7	$3.13^{+0.43}_{-0.37}$	794^{+30}_{-31}	5358^{+326}_{-277}	1437^{+511}_{-378}
Alt.	-54 ± 13	$2.83^{+0.38}_{-0.37}$	795^{+28}_{-36}	6047^{+494}_{-487}	2399^{+954}_{-726}

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 $A_{obs} \gg 1.0$

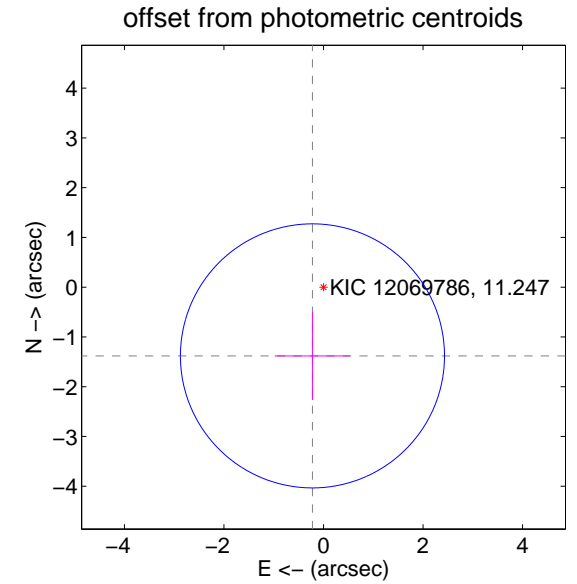
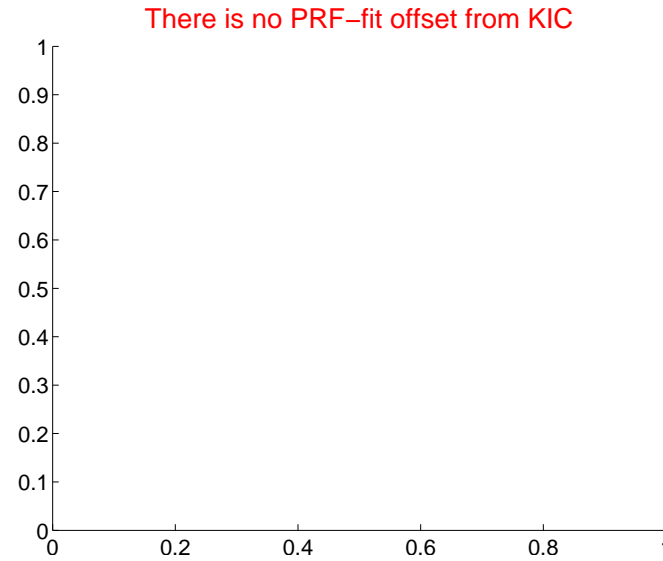
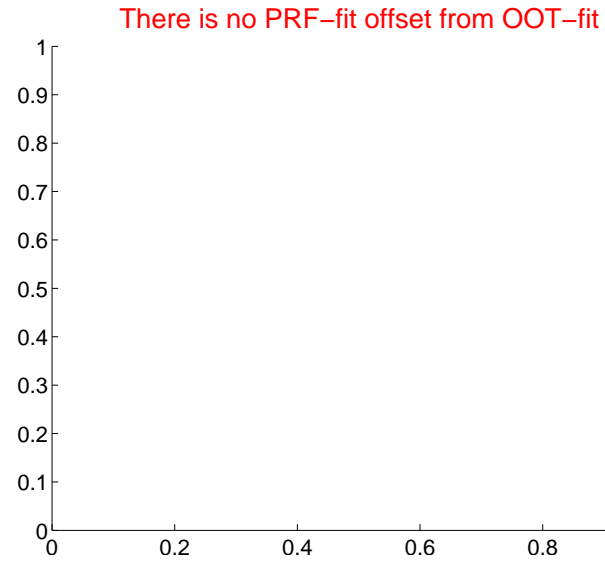
DV Centroid Data

Supplemental centroid analysis for 012069786-03. **Kepler magnitude: 11.25.** Transit SNR 10.06

There are 0 quarters with good PRF difference image offsets

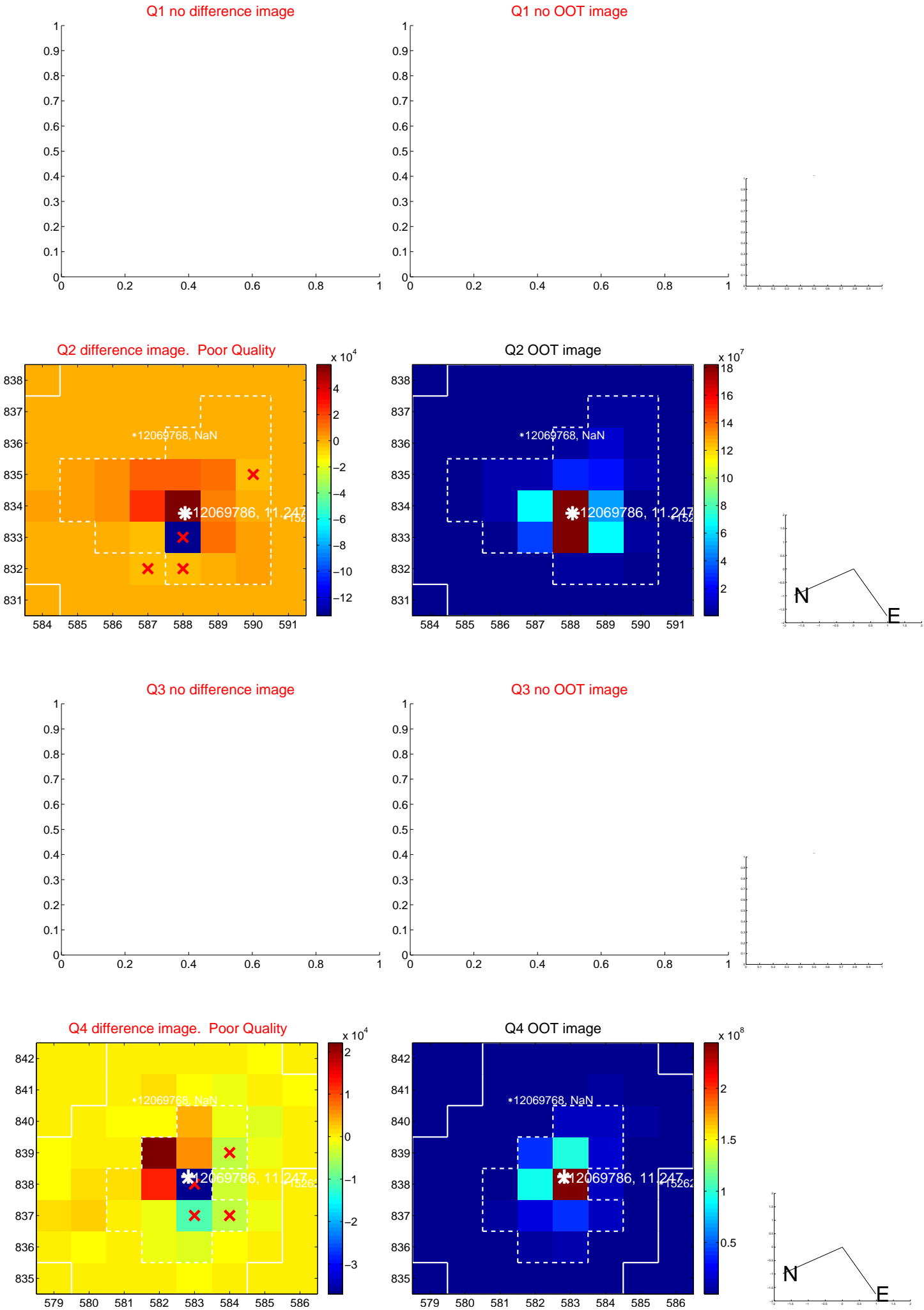
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	1.40 ± 0.88	1.58	0.22 ± 0.76	-1.38 ± 0.89



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

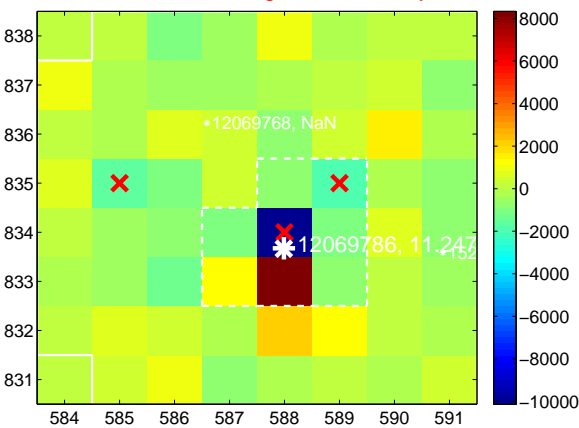
Q5 no difference image



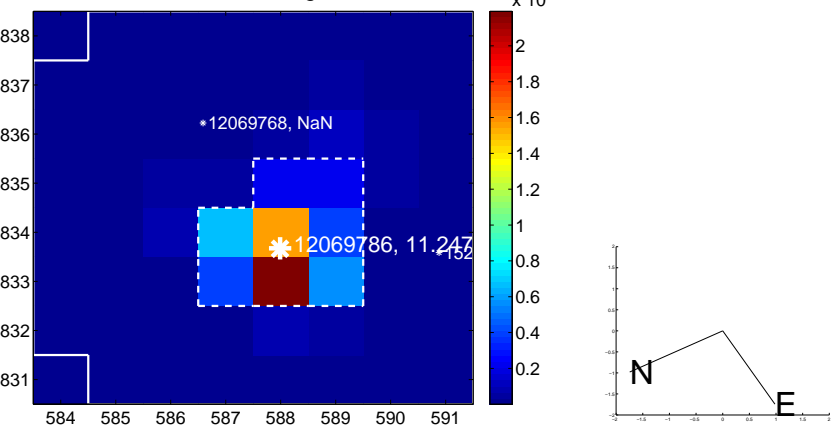
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



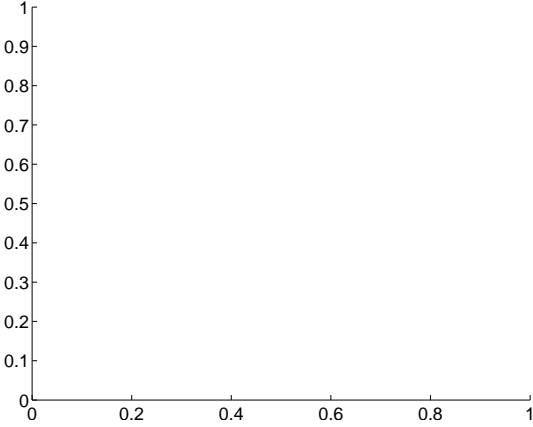
Q7 no difference image



Q7 no OOT image



Q8 no difference image



Q8 no OOT image

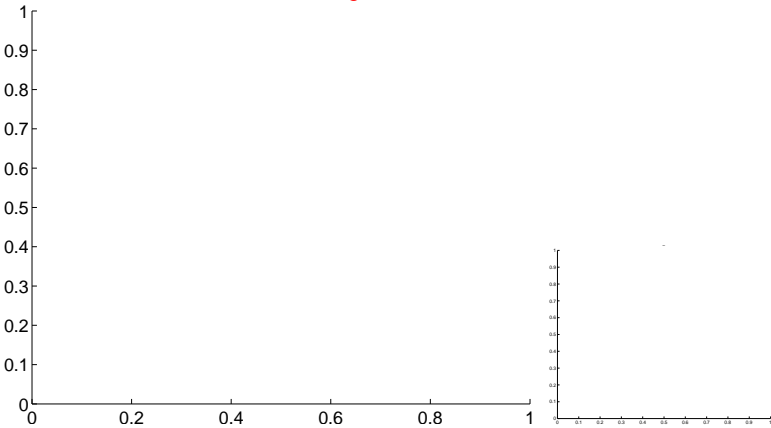


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

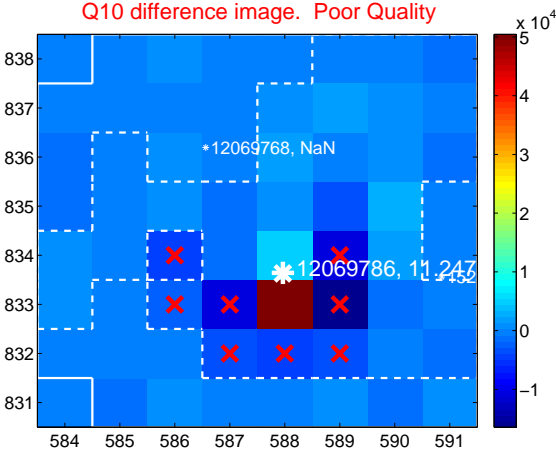
Q9 no difference image



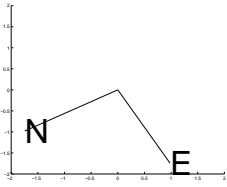
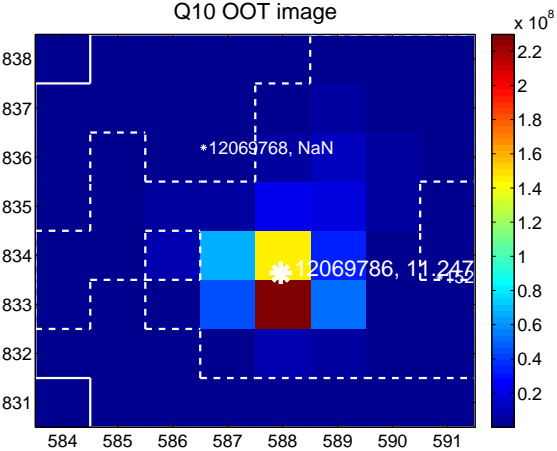
Q9 no OOT image



Q10 difference image. Poor Quality



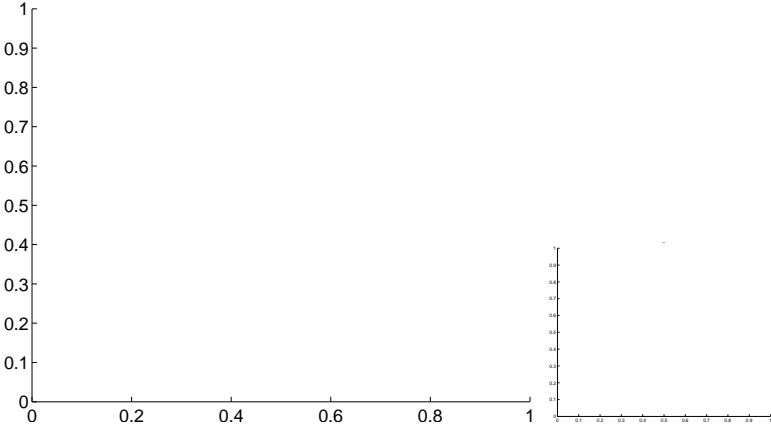
Q10 OOT image



Q11 no difference image



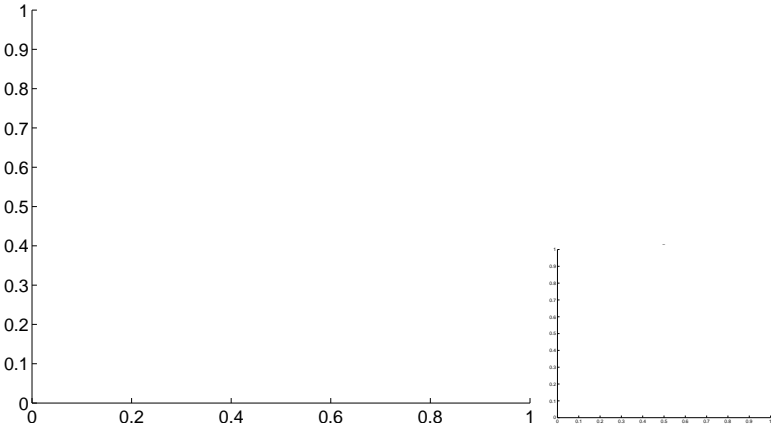
Q11 no OOT image



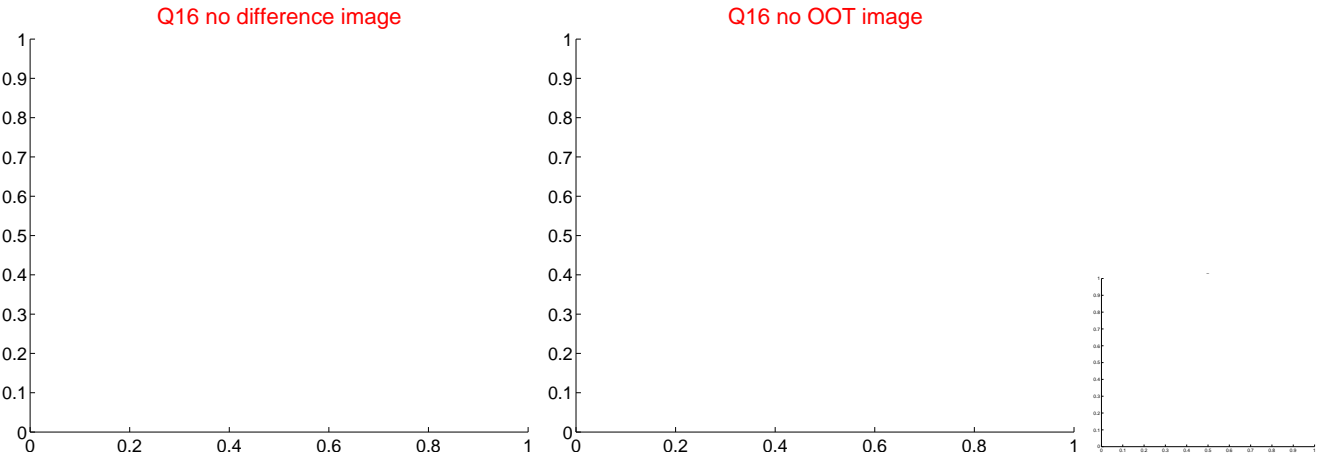
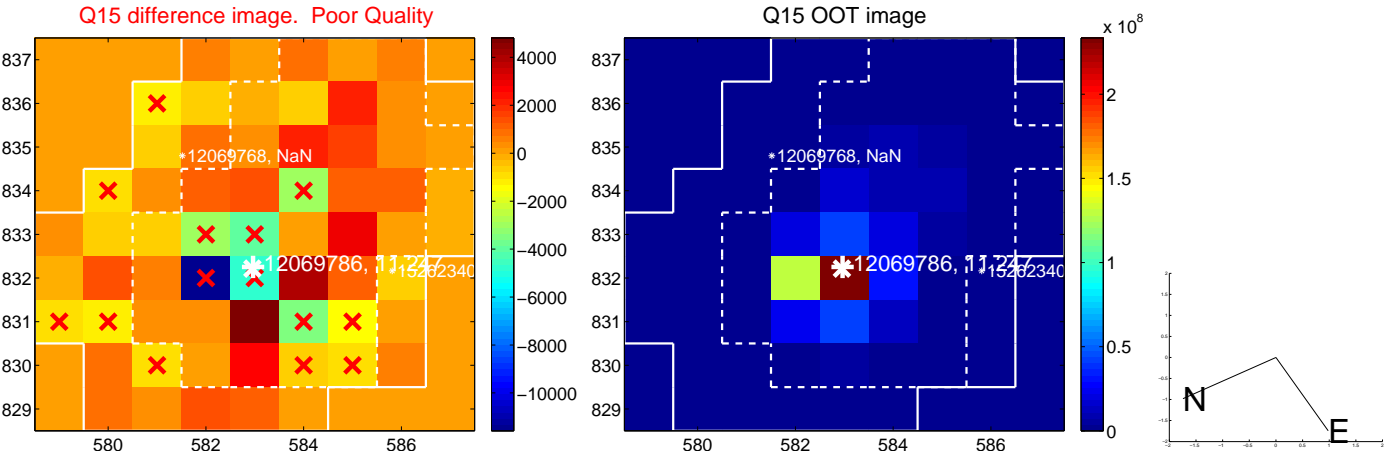
Q12 no difference image



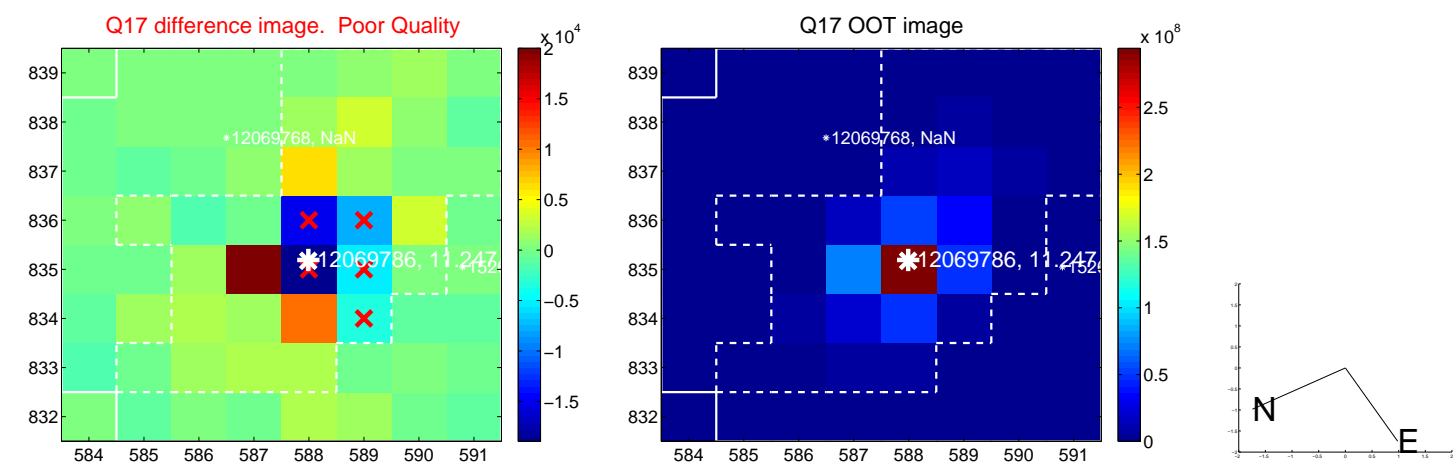
Q12 no OOT image



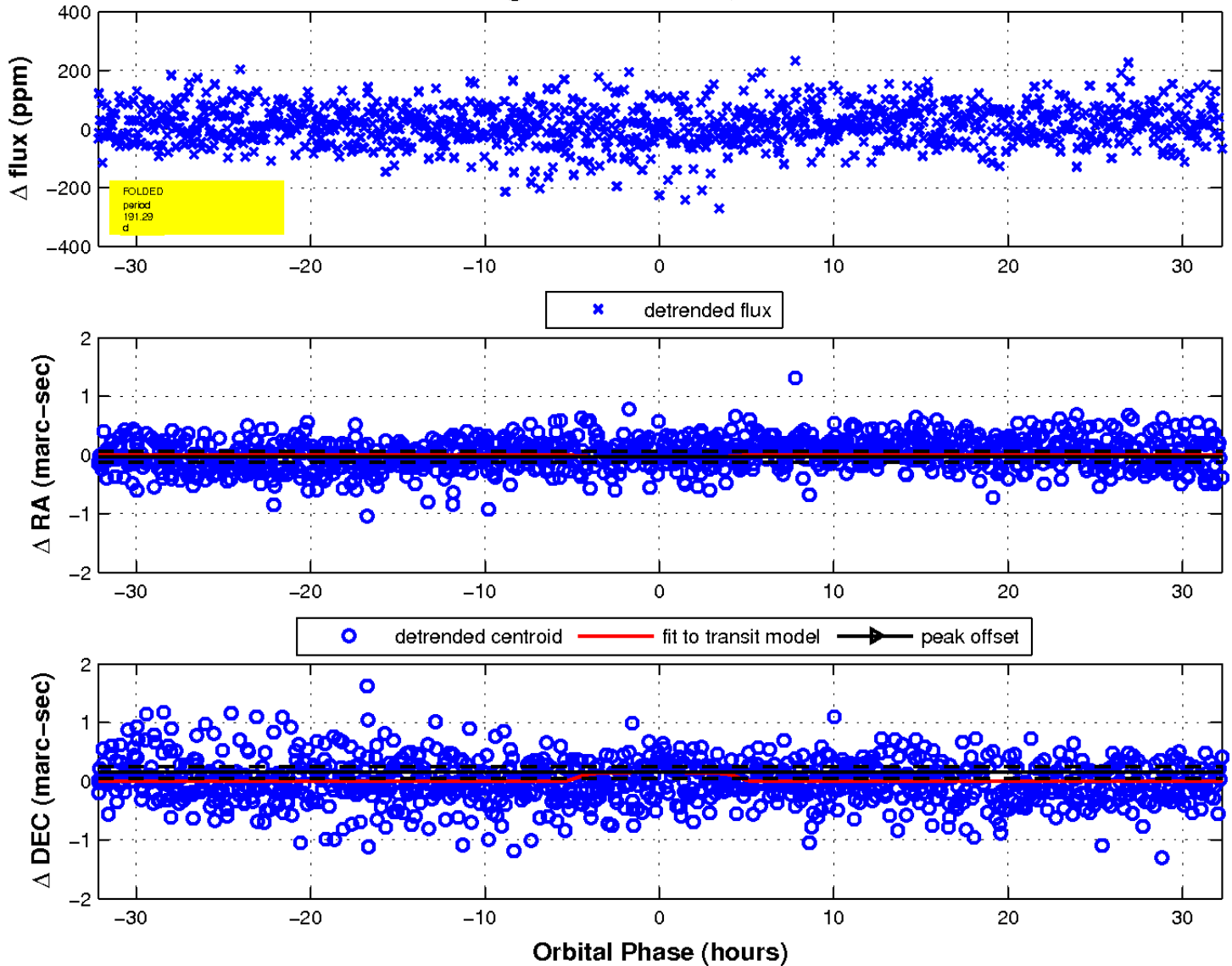
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

