KIC 009117167

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 ($S_\oplus$)
009117167-02	OBS	No	407.972280	144.952659	753.3	4.288	13.4	7.4	0.55	4218	1.60	0.11
009117167-03	OBS	No	534.759249	451.586081	1035.9	10.733	12.1	7.6	0.55	4218	1.78	0.08
009117167-04	OBS	No	206.130332	321.621468	585.7	5.165	12.3	5.5	0.55	4218	1.48	0.28
009117167-05	OBS	No	453.446247	186.883113	614.2	5.138	9.7	5.9	0.55	4218	1.50	0.10
009117167-06	OBS	No	389.337133	453.257389	974.8	9.617	11.6	6.8	0.55	4218	2.23	0.12
009117167-07	OBS	No	431.706633	457.358164	561.4	4.500	11.8	-1.0	0.55	4218	1.27	0.10

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009117167-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV
009117167-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009117167-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009117167-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

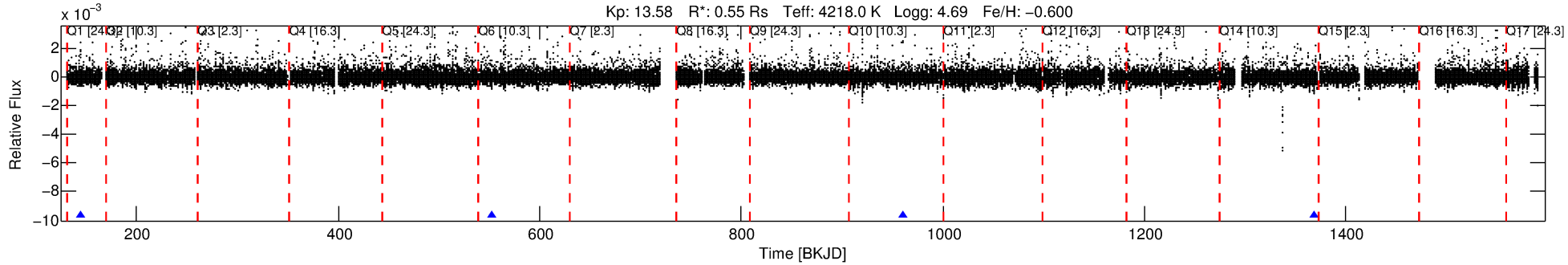
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

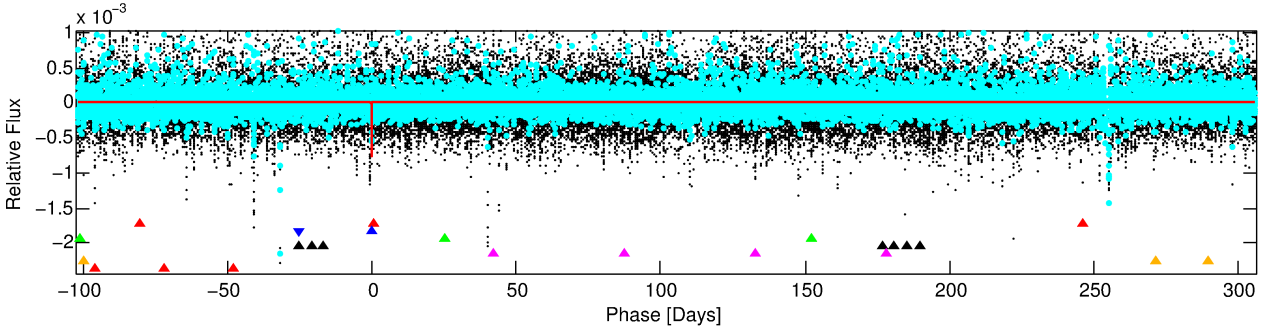
Ephemeris Match Information For 009117167-02

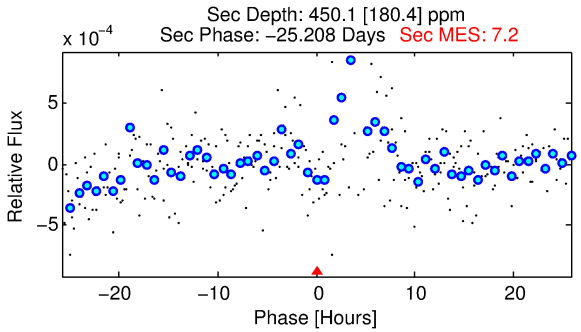
No Significant Match Found

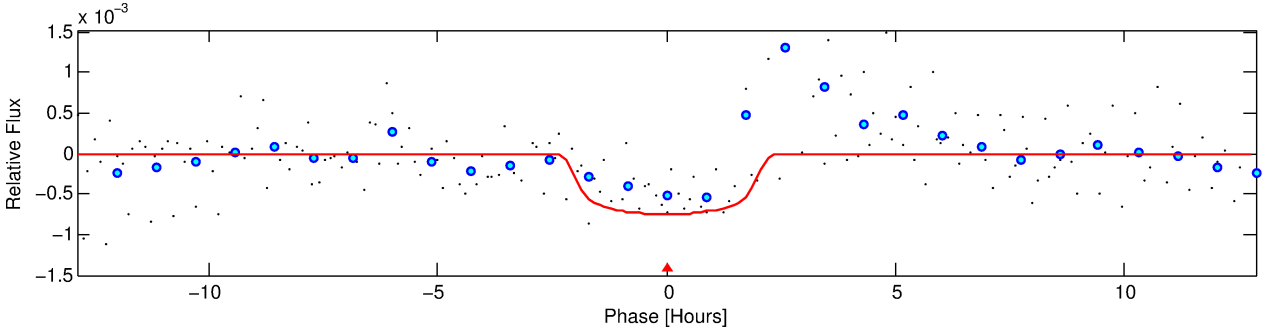
DV One-Page Summary

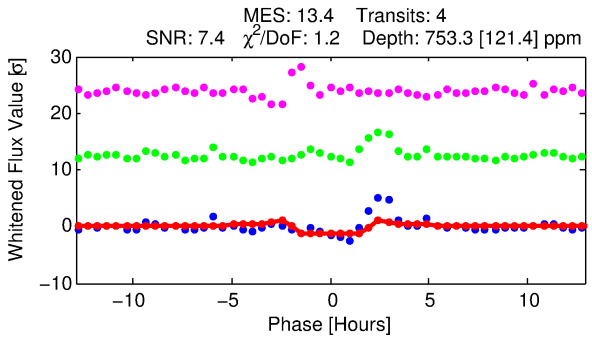
KIC: 9117167 Candidate: 2 of 7 Period: 407.972 d

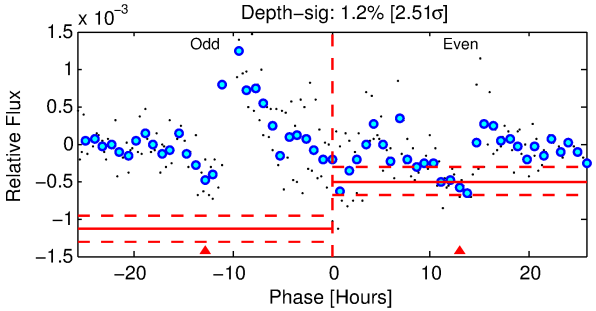


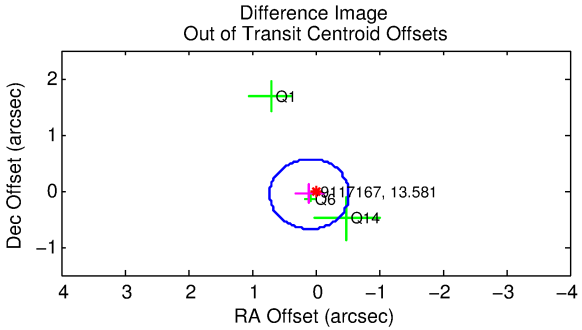












DV Fit Results:

Period = 407.97228 [0.00332] d
Epoch = 144.9527 [0.0058] BKJD
Rp/R* = 0.0268 [0.0242]
a/R* = 554.16 [2016.73]
b = 0.69 [2.83]

Seff = 0.11 [0.02]
Teq = 147 [7] K
Rp = 1.60 [1.46] Re
a = 0.8745 [0.0758] AU

Ag = 74188.13 [137786.46] [0.54σ]
Teffp = 3755 [1744] K [2.07σ]

DV Diagnostic Results:

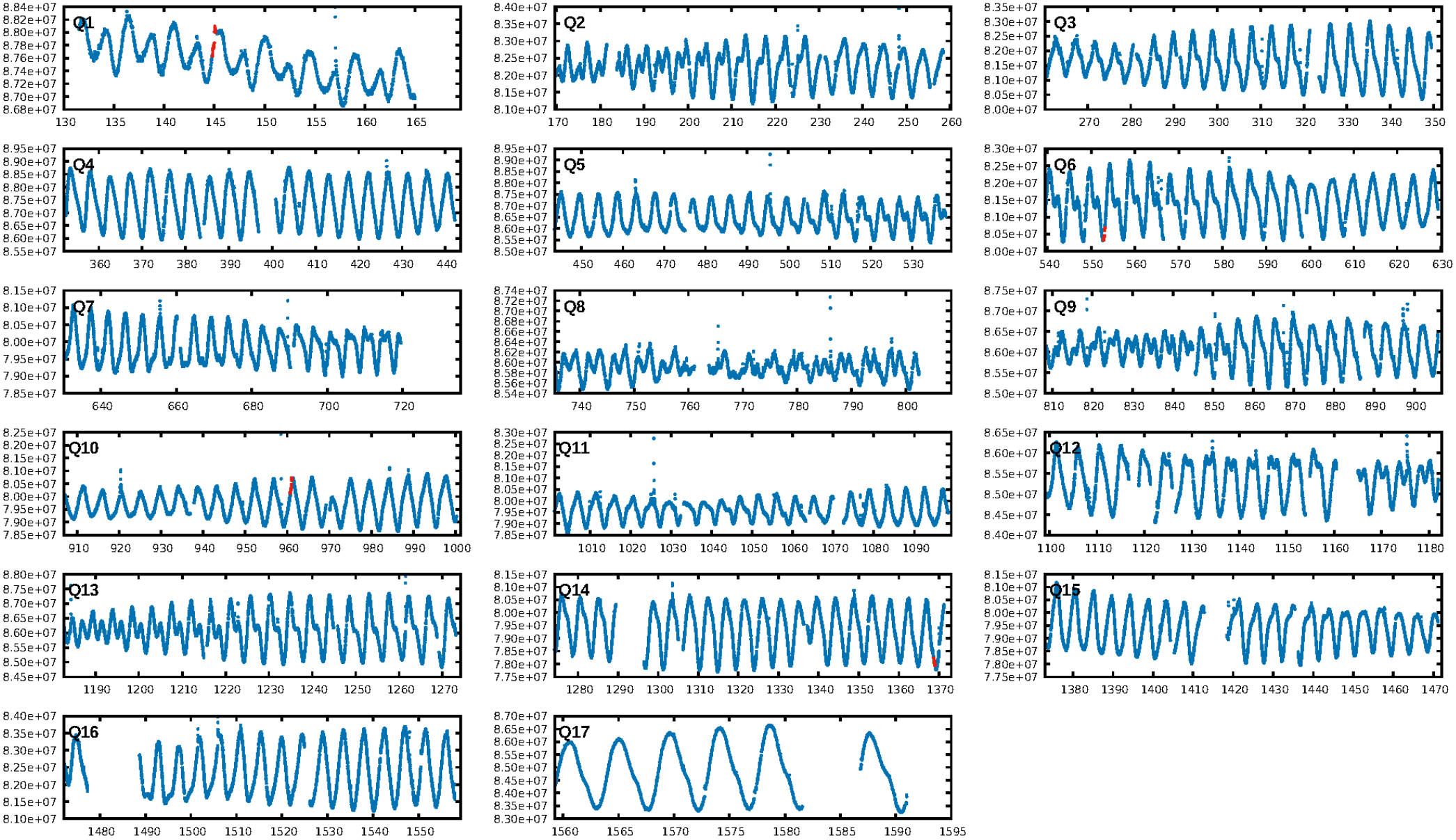
ShortPeriod−sig: 100.0% [42.47σ]
LongPeriod−sig: 100.0% [91.64σ]
ModelChiSquare2−sig: 16.1%
ModelChiSquareGof−sig: 80.5%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: 0.8553

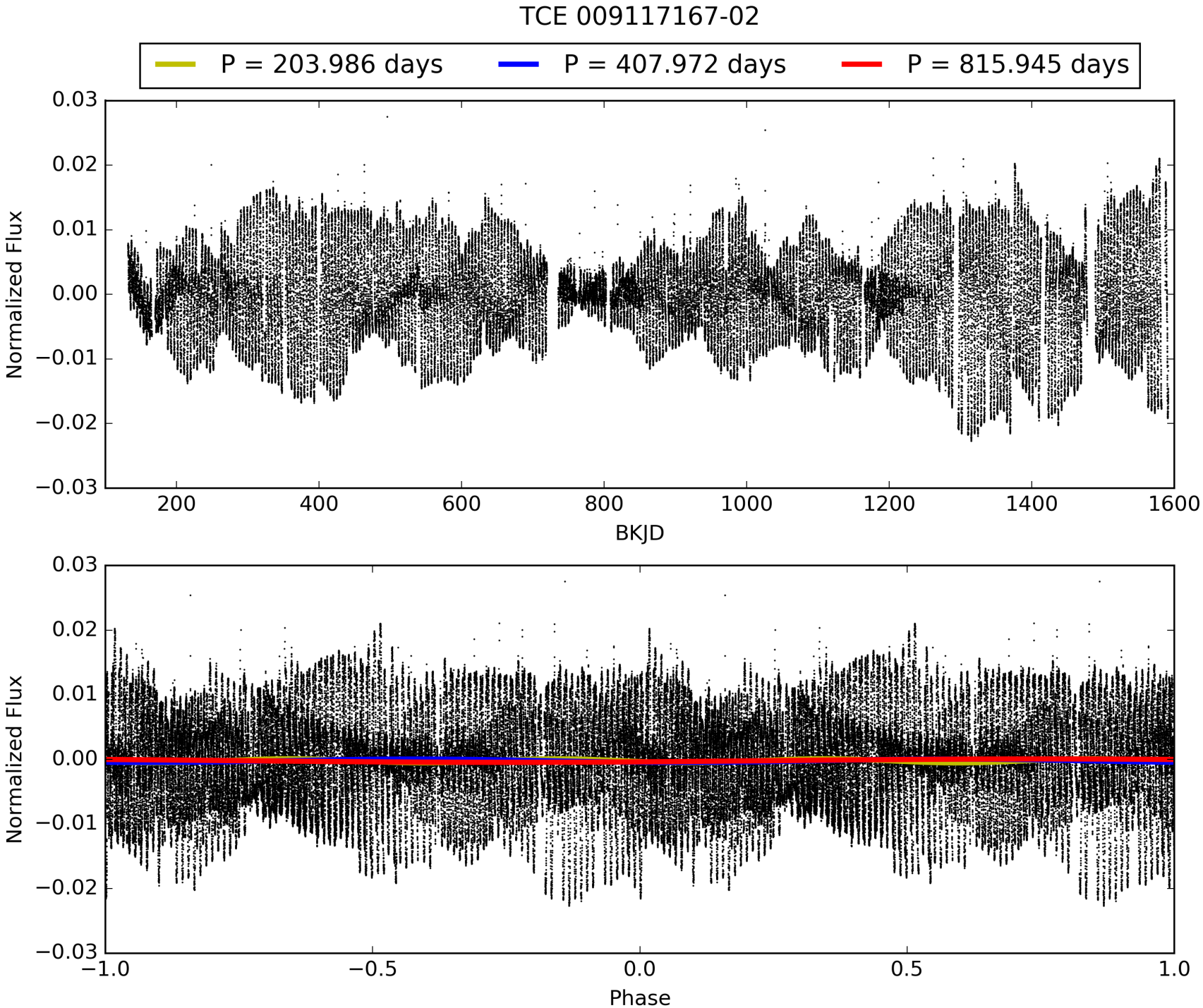
Centroid−sig: 94.5%
Centroid−so: 0.050 arcsec [0.07σ]
OotOffset−rm: 0.113 arcsec [0.54σ]
KicOffset−rm: 0.055 arcsec [0.12σ]
OotOffset−st: 2/0/0/1 [3]
KicOffset−st: 2/0/0/1 [3]
DiffImageQuality−fgm: 0.67 [2/3]
DiffImageOverlap−fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 13:36:43 Z

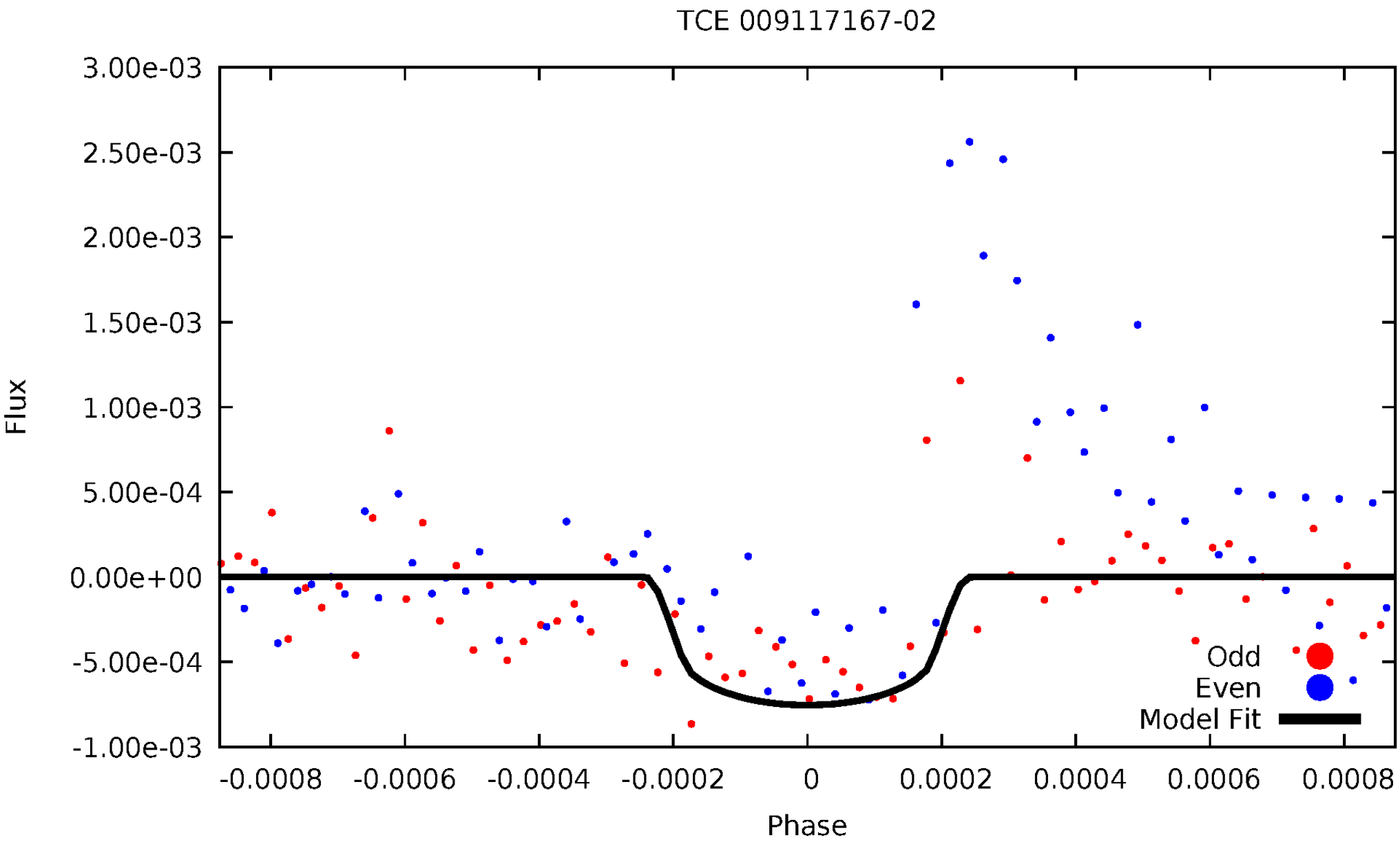
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009117167-02, PDC Light Curves

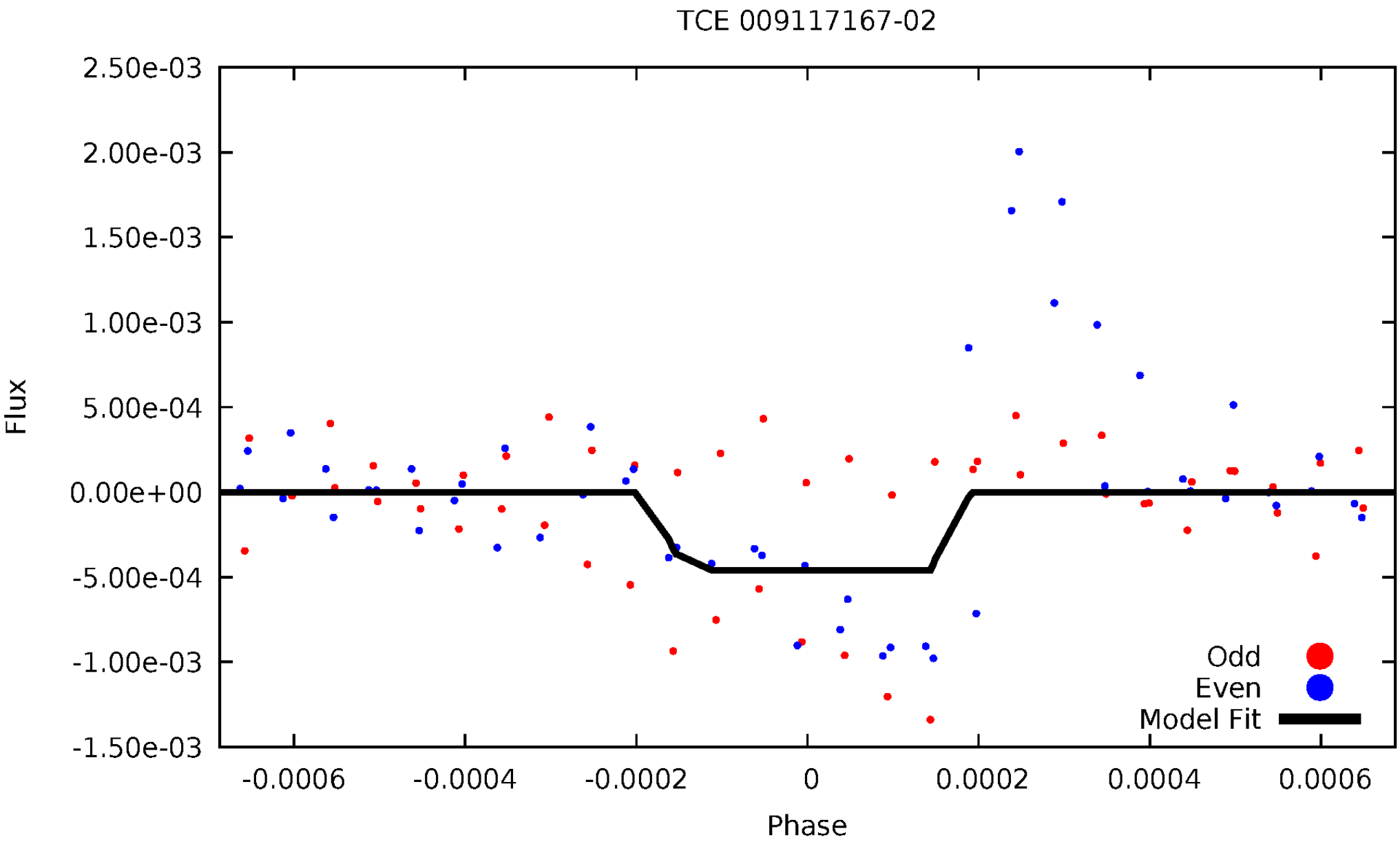



TCE 009117167-02
P = 203.986 days
P = 407.972 days
P = 815.945 days
Normalized Flux
BKJD
Phase
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
200
400
600
800
1000
1200
1400
1600
−1.0
−0.5
0.0
0.5
1.0

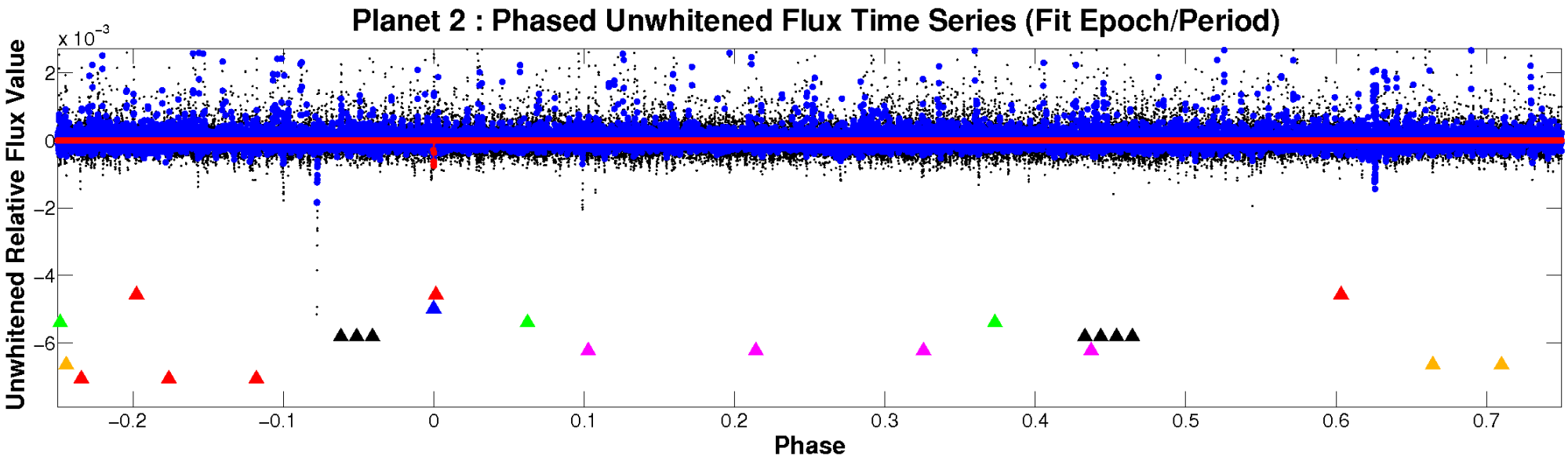
DV Odd/Even

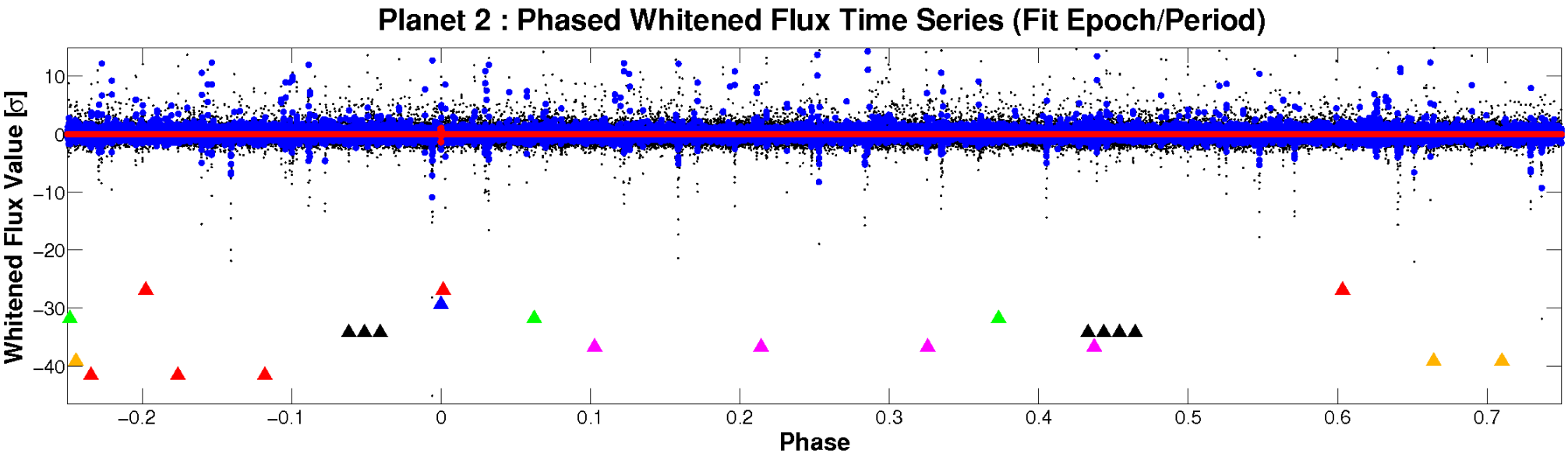

TCE 009117167-02
3.00e-03
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
Flux
-0.0008
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
0.0008
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009117167-02
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
Flux
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
Phase
Odd
Even
Model Fit

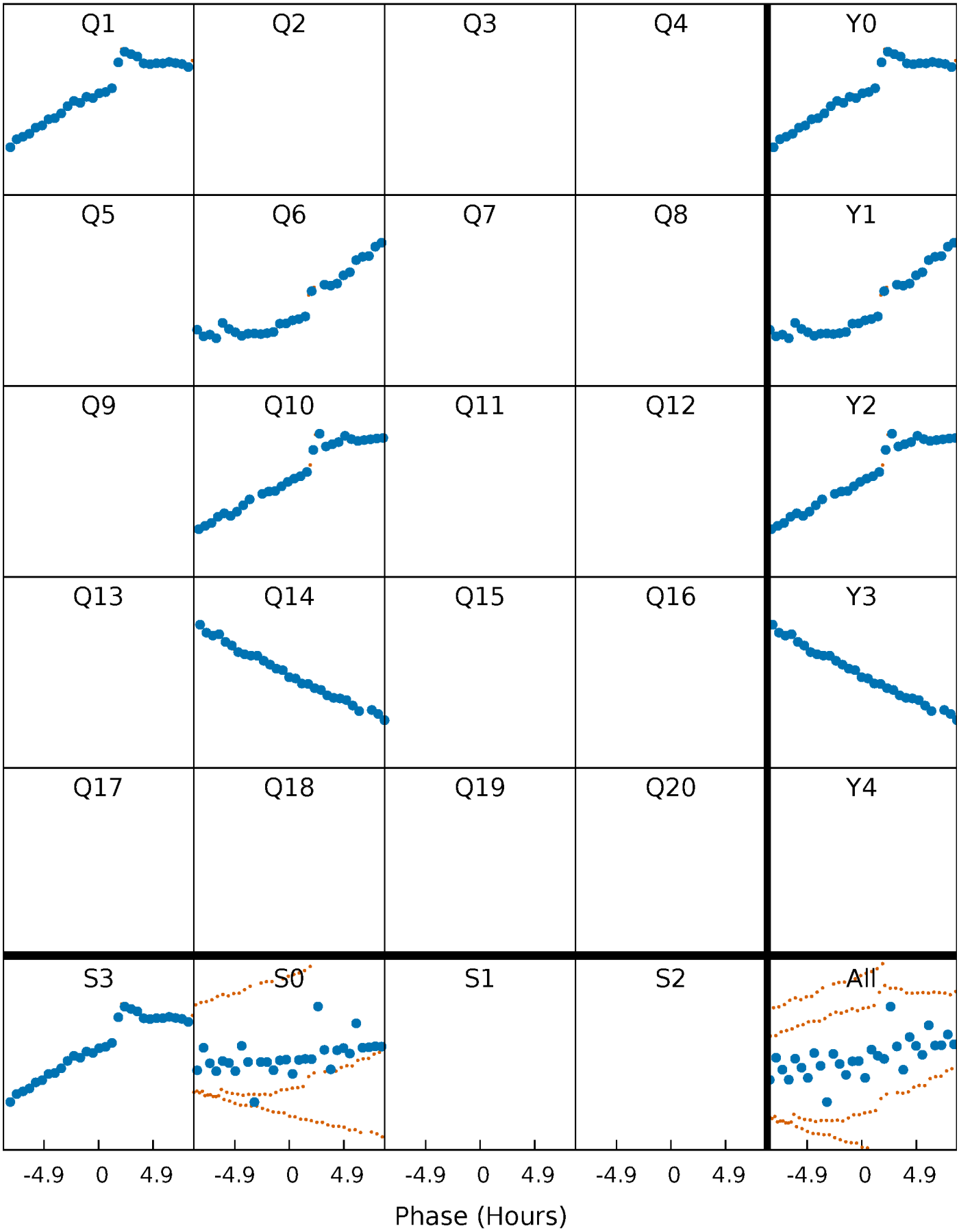
Non-Whitened Vs. Whitened Light Curve





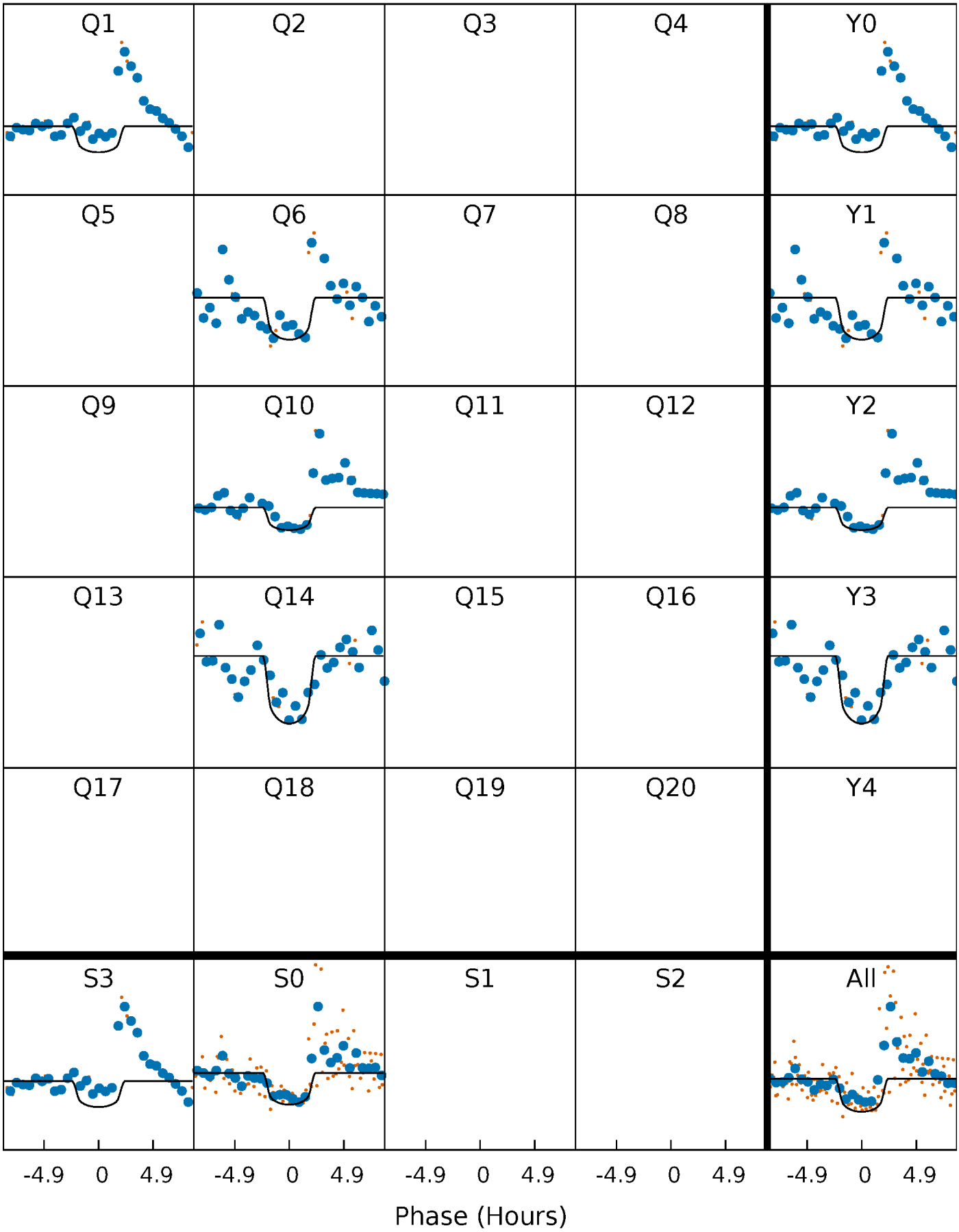
PDC Quarter-Phased Transit Curves

TCE 009117167-02 P=407.972280 Days T_0=144.952659 (BKJD)



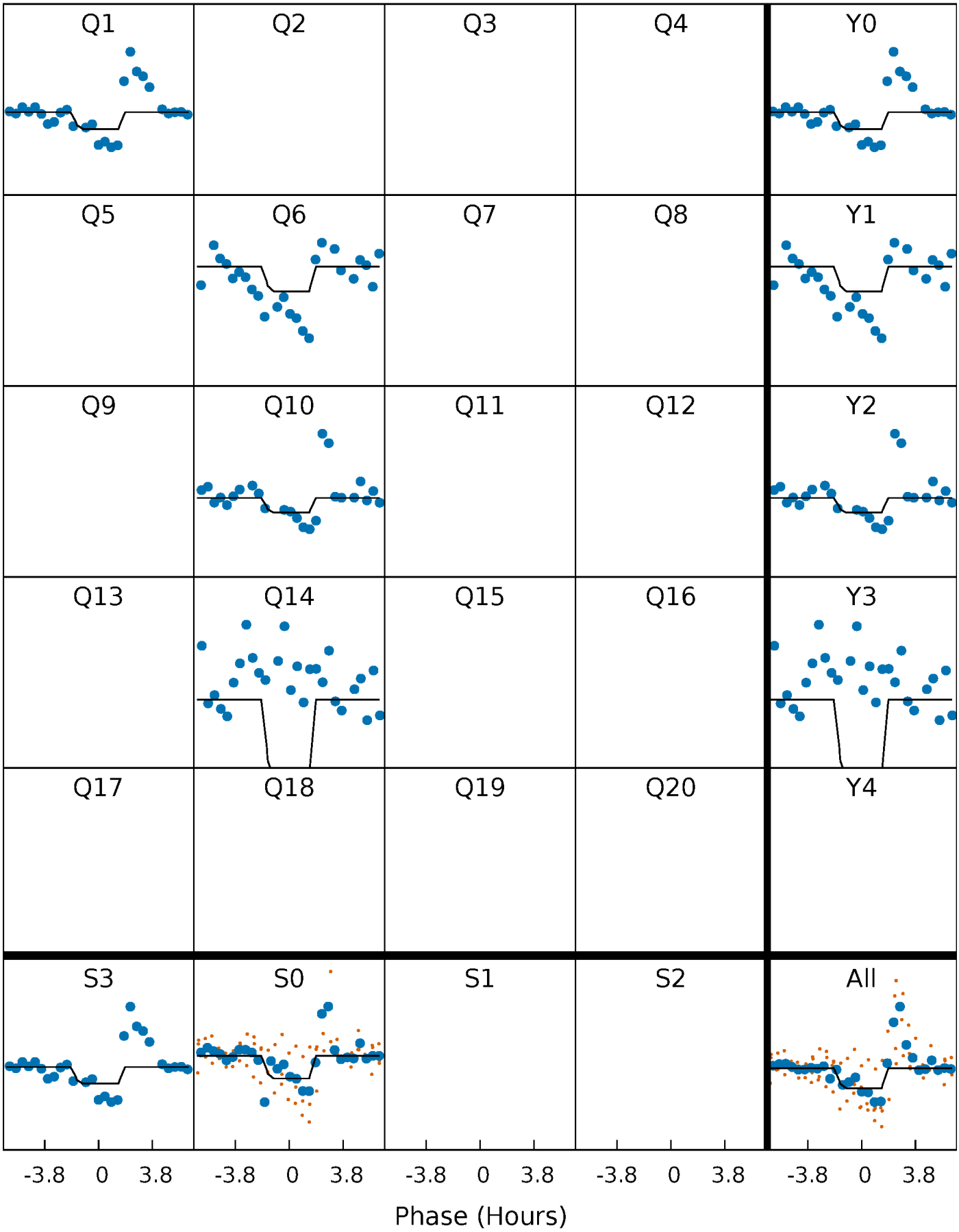
DV Quarter-Phased Transit Curves

TCE 009117167-02 P=407.972280 Days T_0=144.952659 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

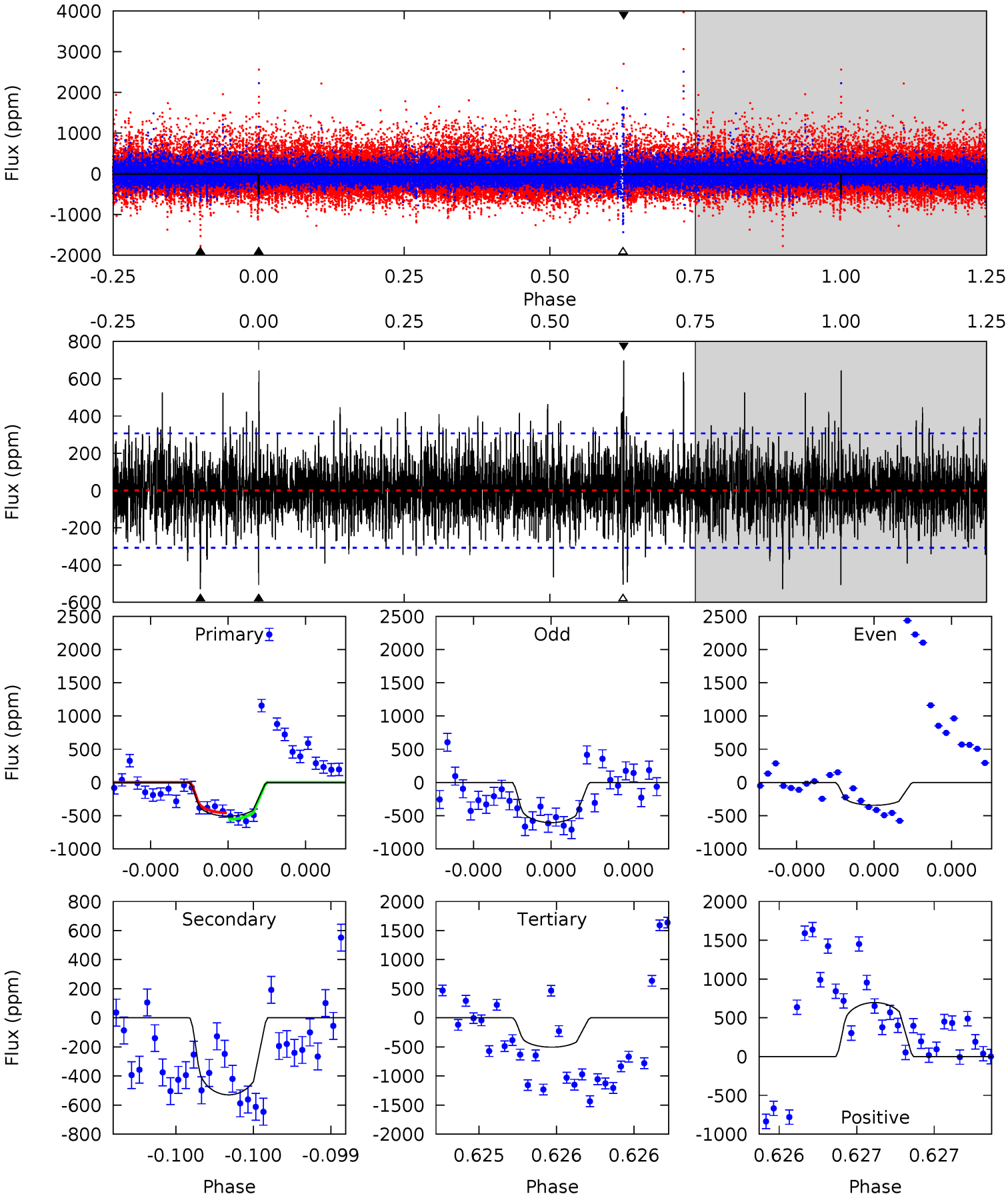
TCE 009117167-02 P=407.976459 Days T_0=144.941969 (BKJD)



DV Model-Shift Uniqueness Test

009117167-02, P = 407.972280 Days, E = 144.952659 Days

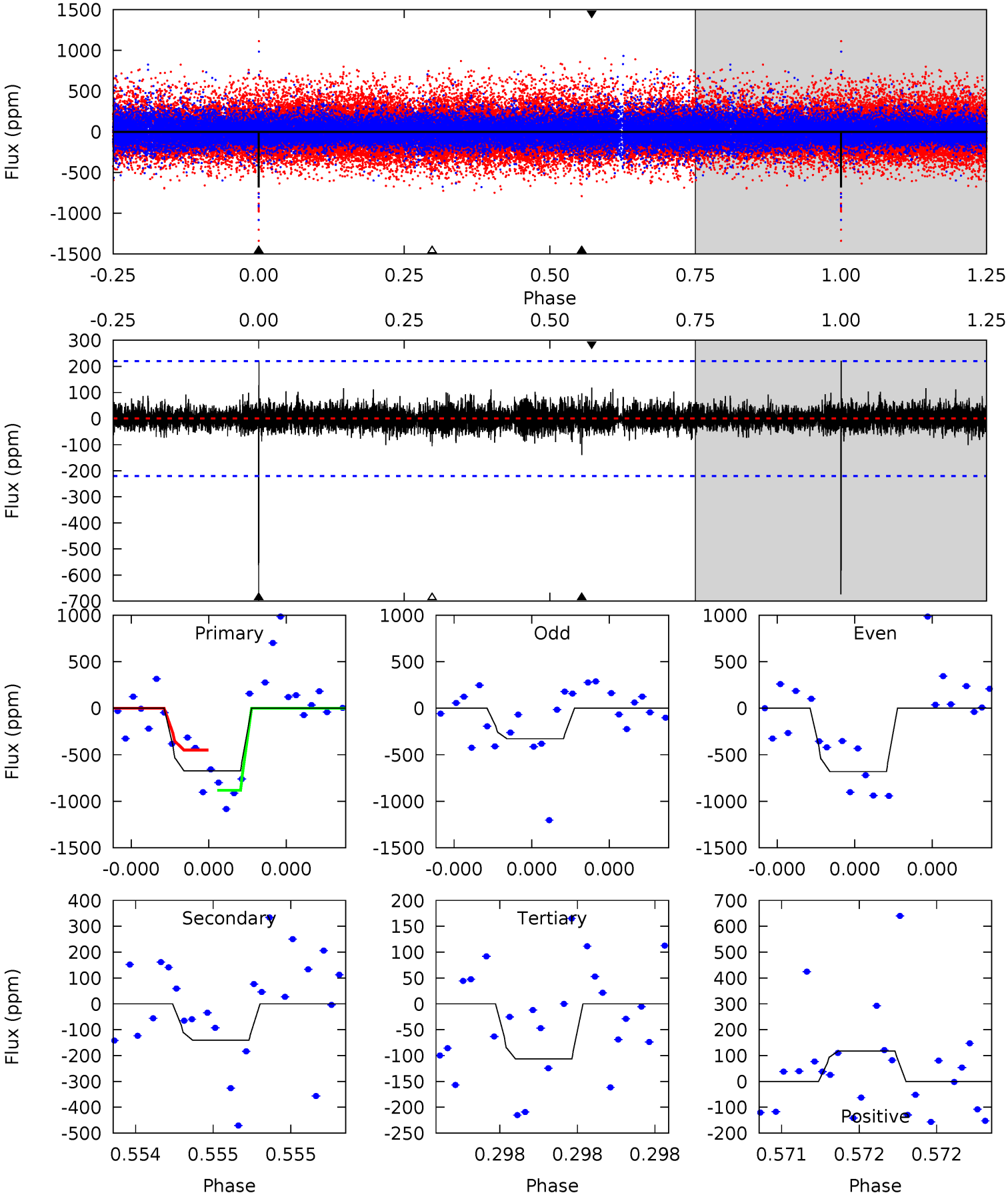
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.22	9.63	9.18	12.7	5.58	3.49	2.09	0.04	-3.46	0.45	-3.05	1.94	0.73	0.57	0.89



Alt Model-Shift Uniqueness Test

009117167-02, P = 407.976459 Days, E = 144.941969 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	3.58	2.72	3.02	5.63	3.57	0.63	14.5	14.2	0.86	0.56	4.72	0.80	0.25	5.68



Stellar Parameters For KIC 009117167

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	4218^{+115}_{-140}	$4.691^{+0.063}_{-0.032}$	$-0.600^{+0.300}_{-0.300}$	$0.547^{+0.049}_{-0.059}$	$0.535^{+0.056}_{-0.046}$	$4.609^{+1.422}_{-0.621}$
	+3%/-3%	+1%/-1%	+50%/-50%	+9%/-11%	+10%/-9%	+31%/-13%
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 009117167-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-530±55	$1.86^{+1.32}_{-1.11}$	204^{+7}_{-8}	3748^{+1553}_{-589}	$62557^{+317582}_{-40201}$
Alt.	-140±39	$1.61^{+1.38}_{-1.00}$	204^{+7}_{-8}	3185^{+1186}_{-514}	$22607^{+130824}_{-16449}$

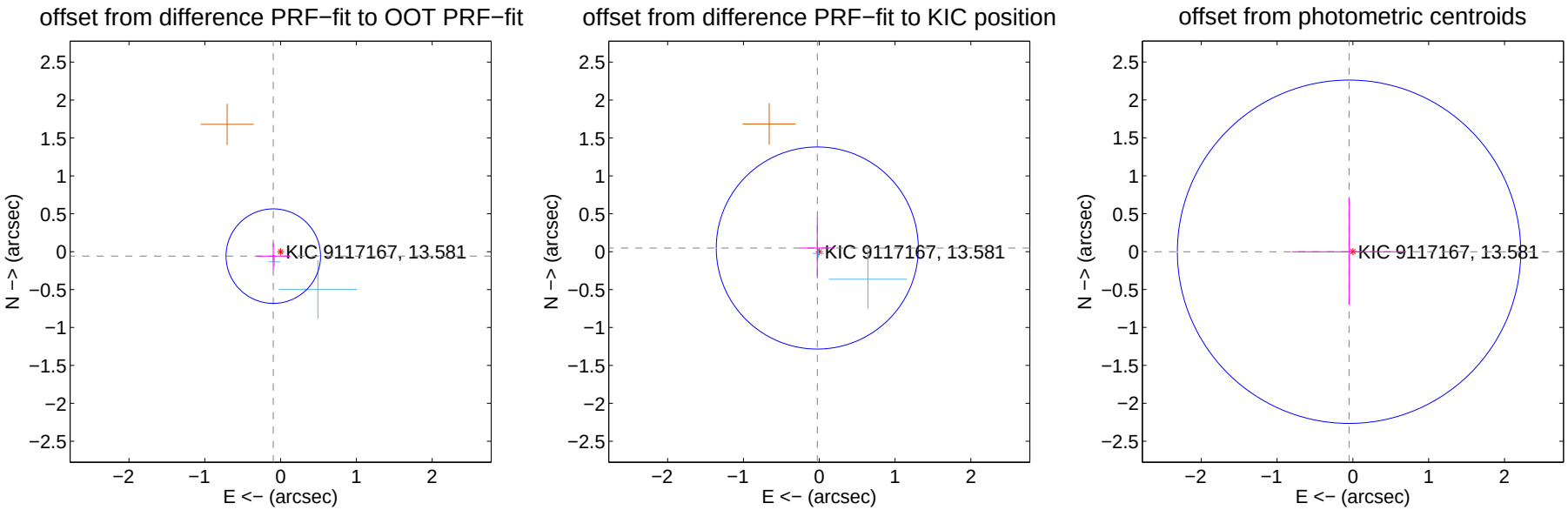
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

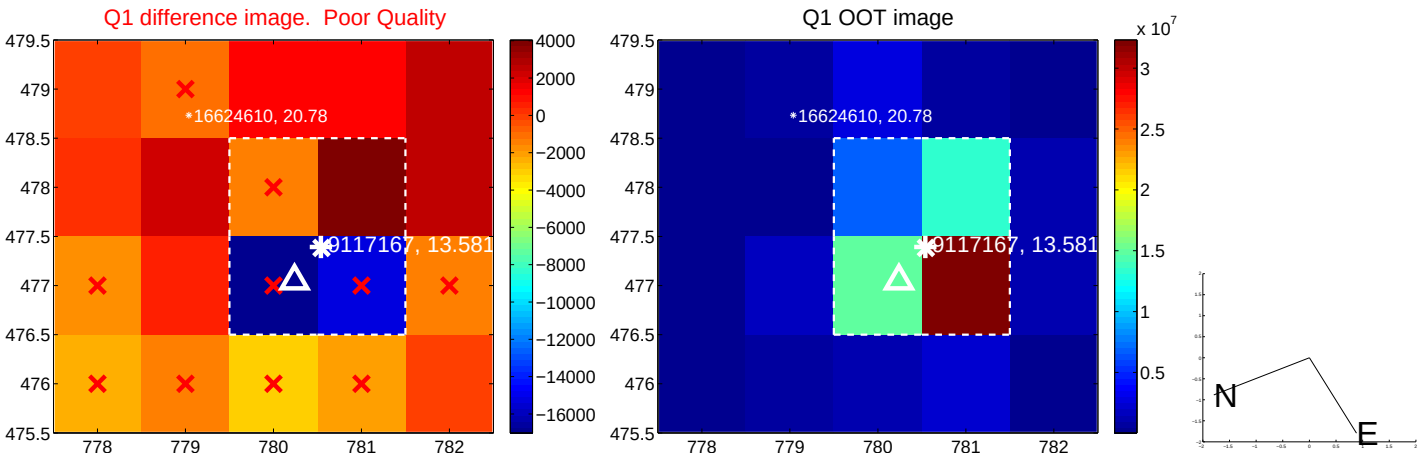
Supplemental centroid analysis for 009117167-02. Kepler magnitude: 13.58. Transit SNR 7.43
There are 2 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

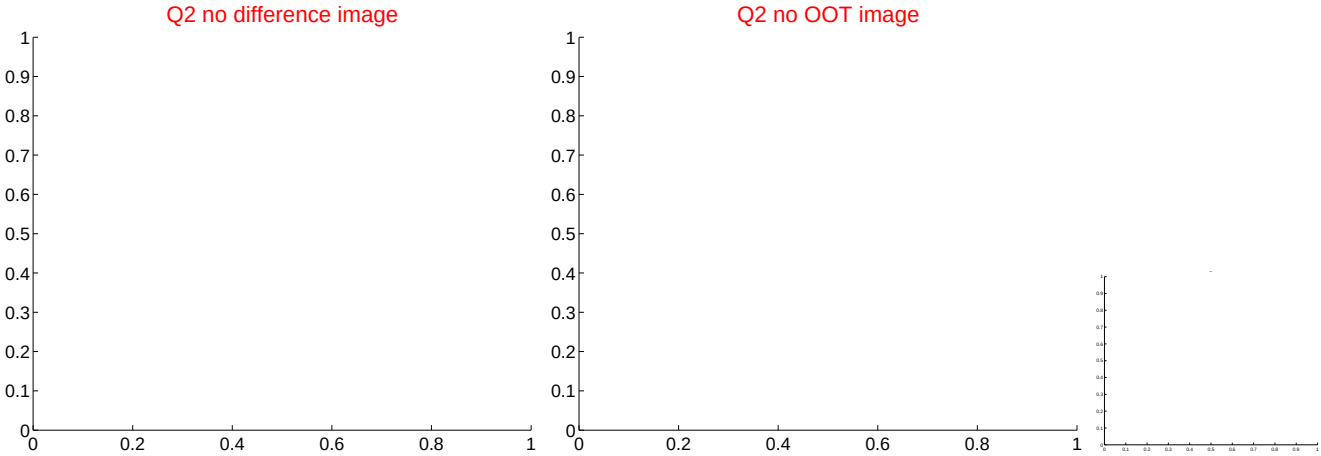
	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.113 ± 0.208	0.54	0.096 ± 0.219	-0.059 ± 0.172
PRF-fit source offset from KIC position	0.055 ± 0.444	0.12	0.026 ± 0.230	0.048 ± 0.400
photometric centroid source offset	0.05 ± 0.75	0.07	0.05 ± 0.75	-0.00 ± 0.70

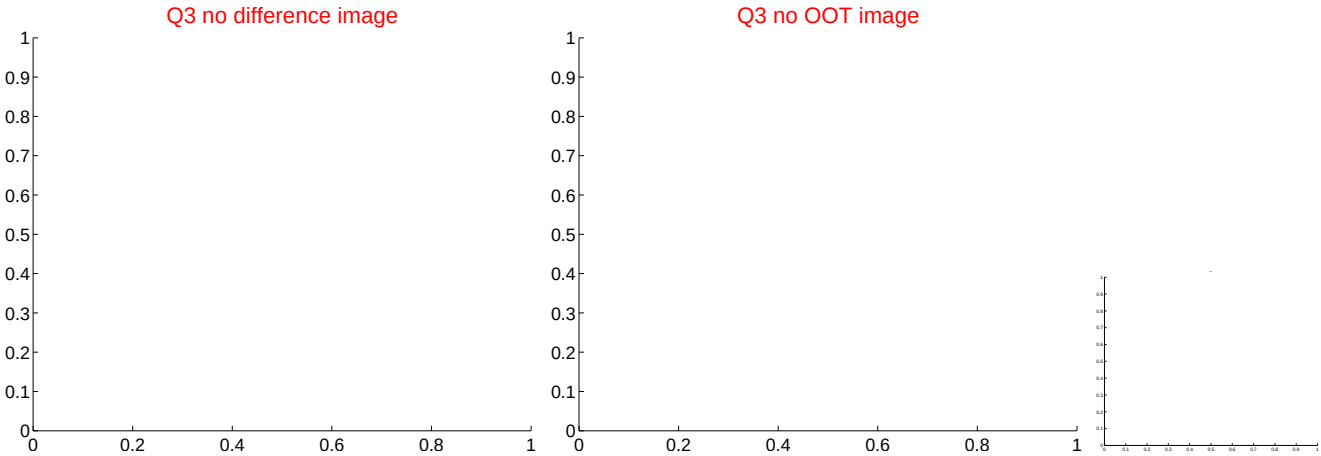


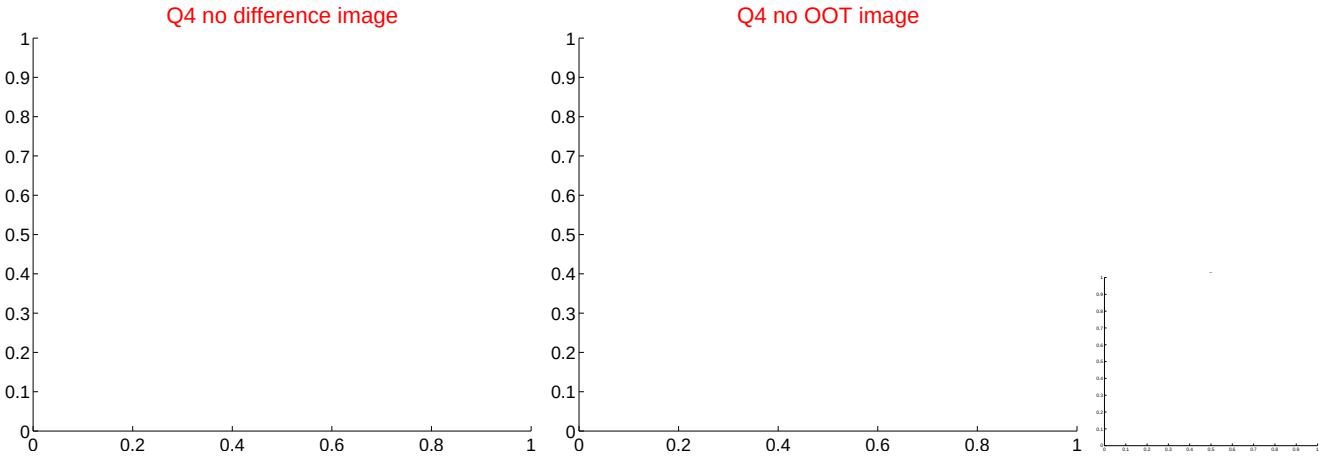
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red *: 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

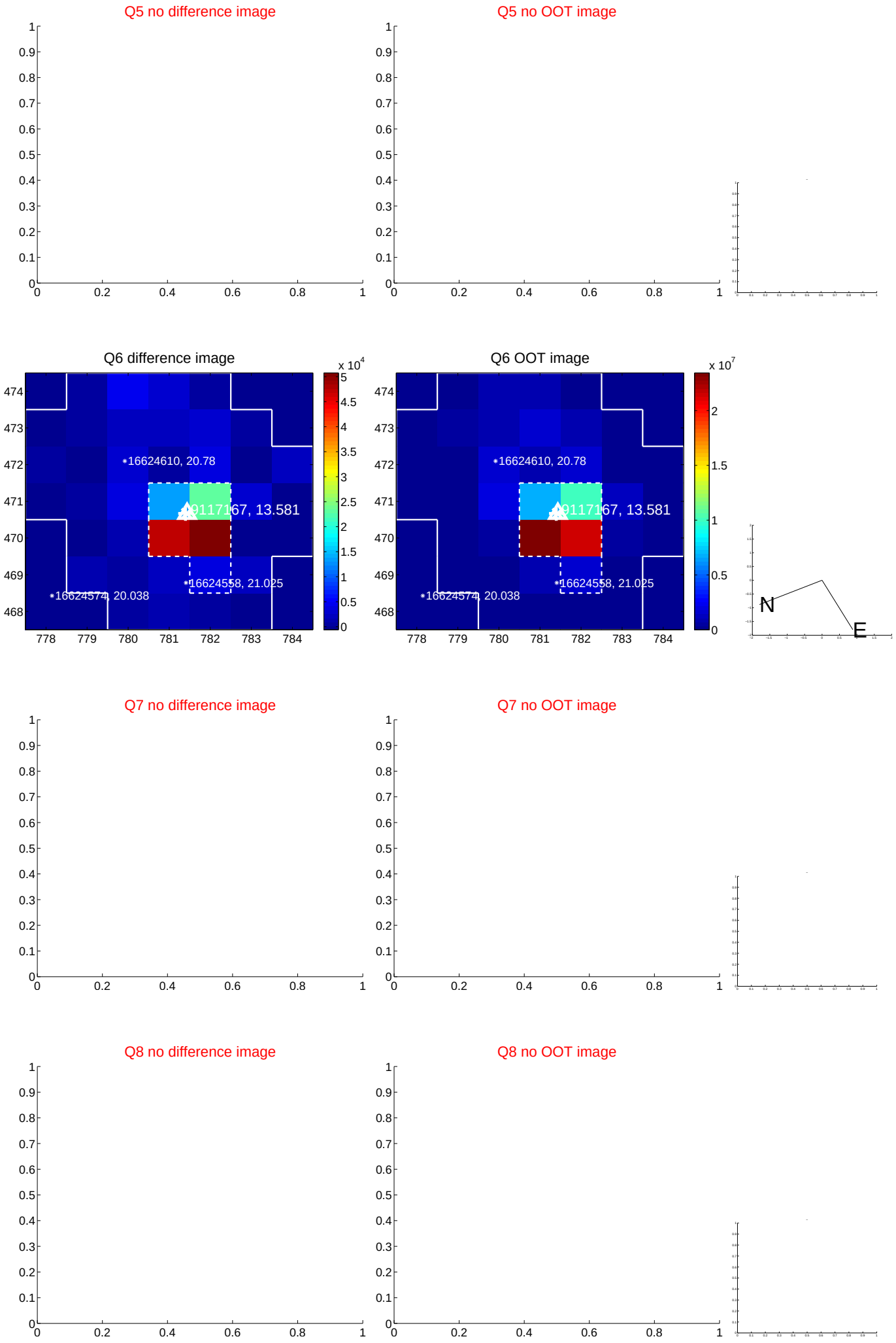








white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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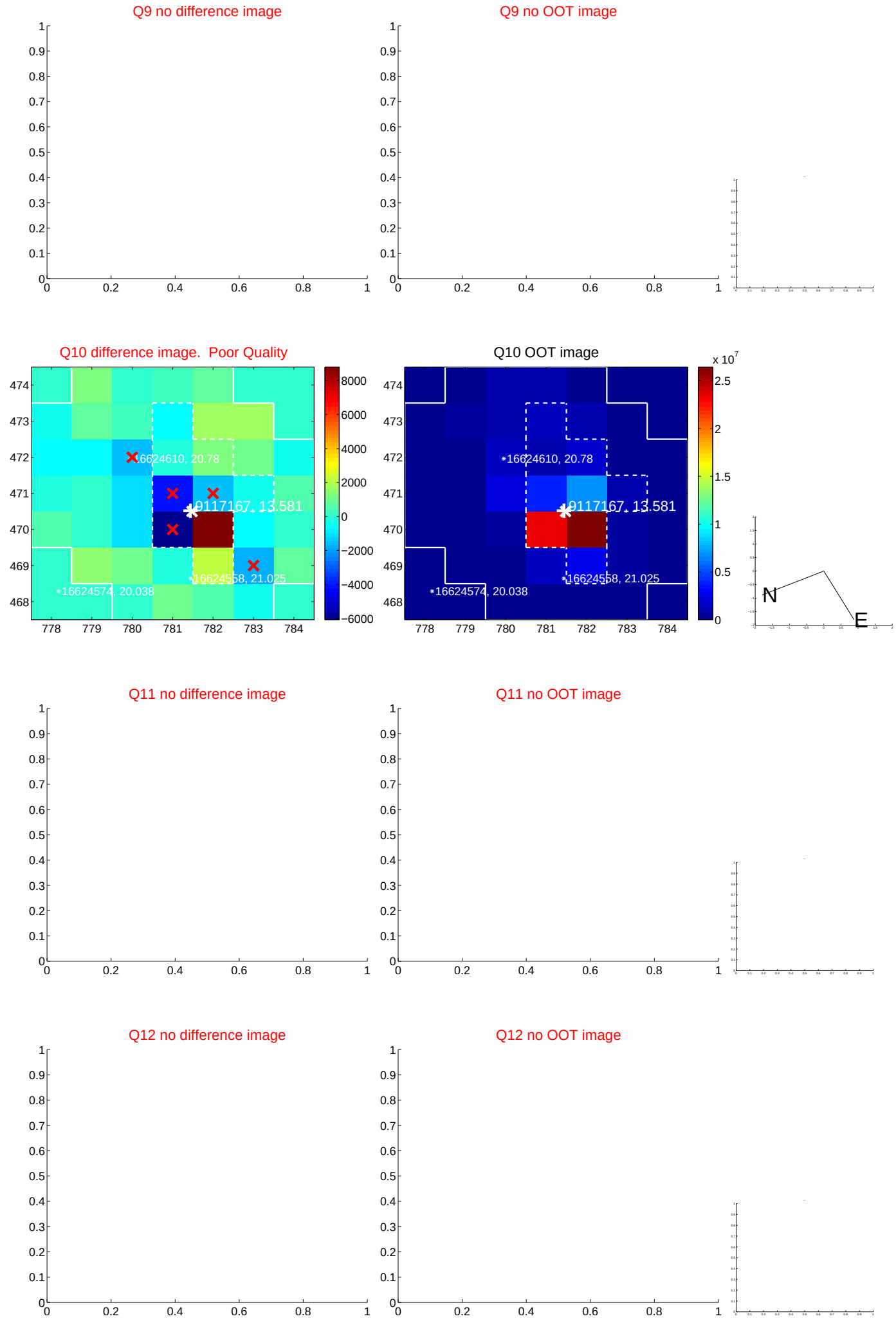

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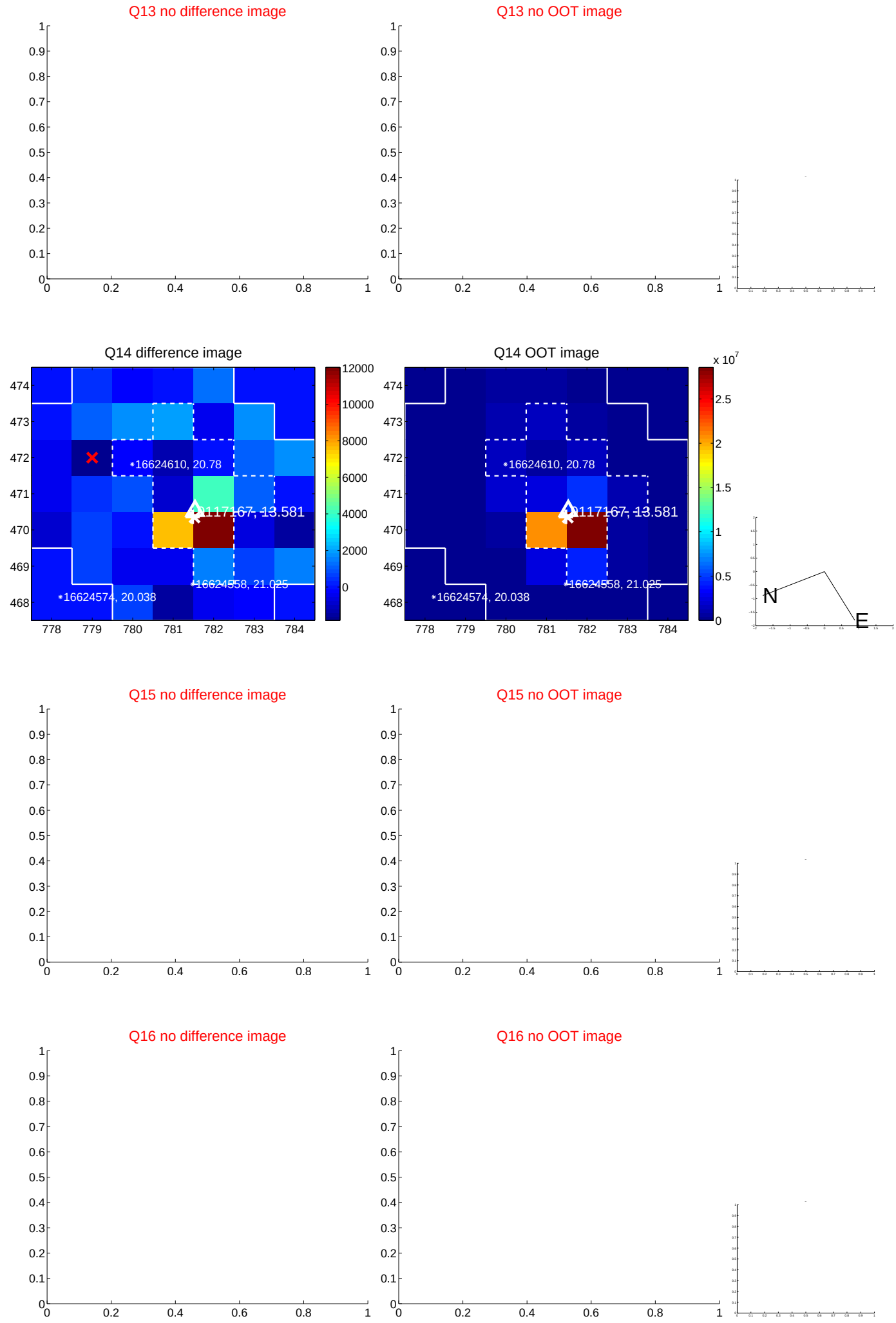

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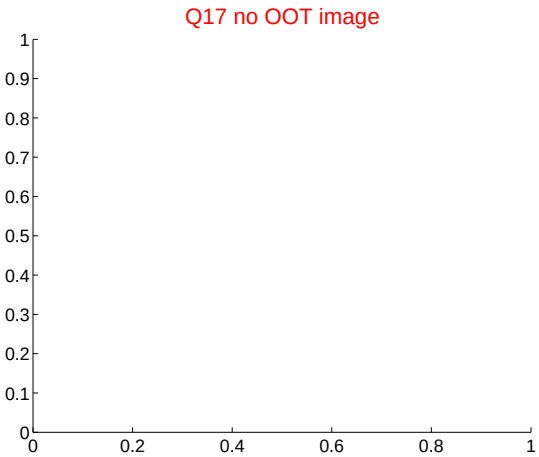
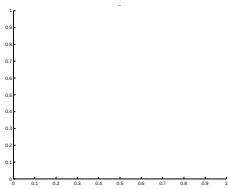
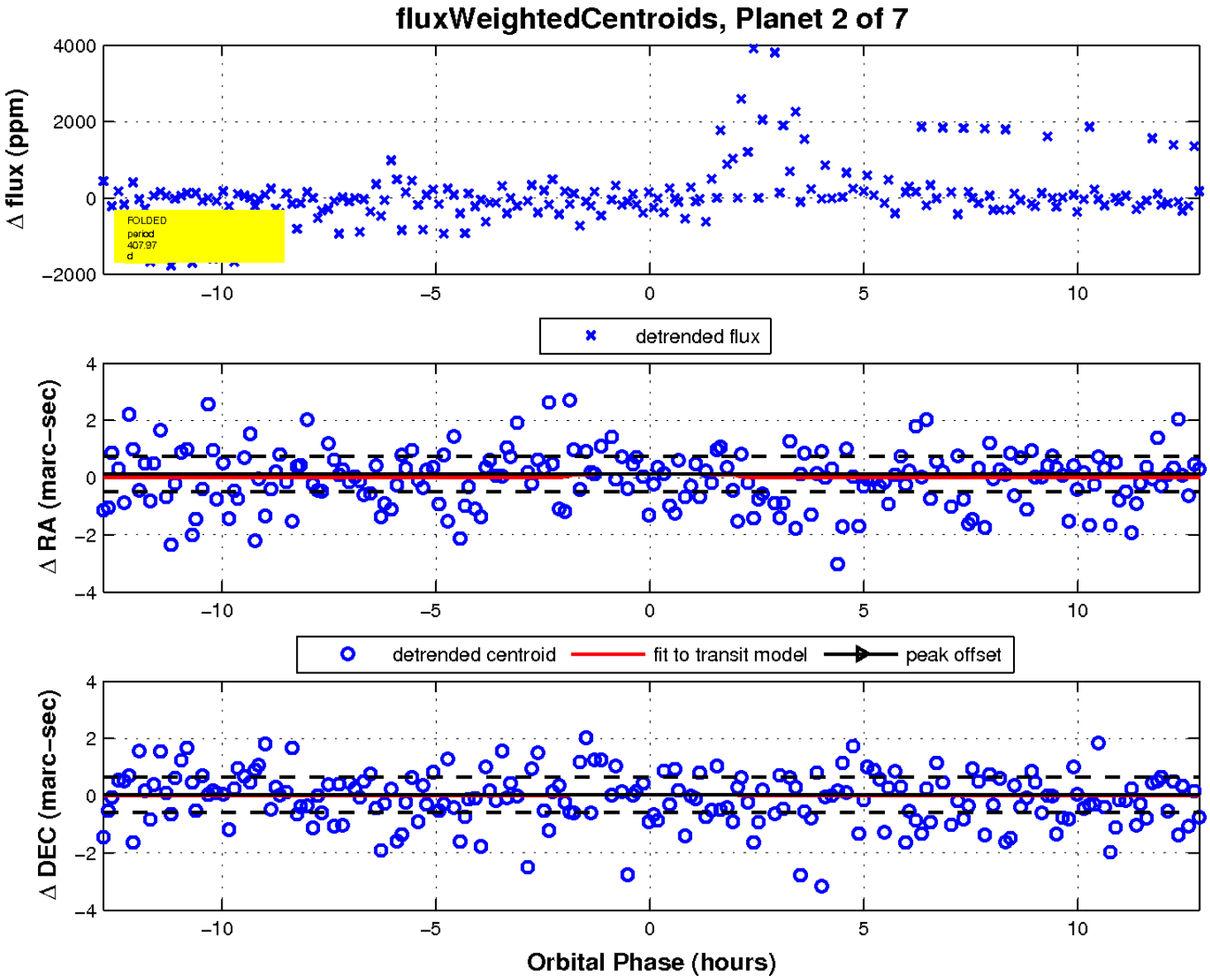
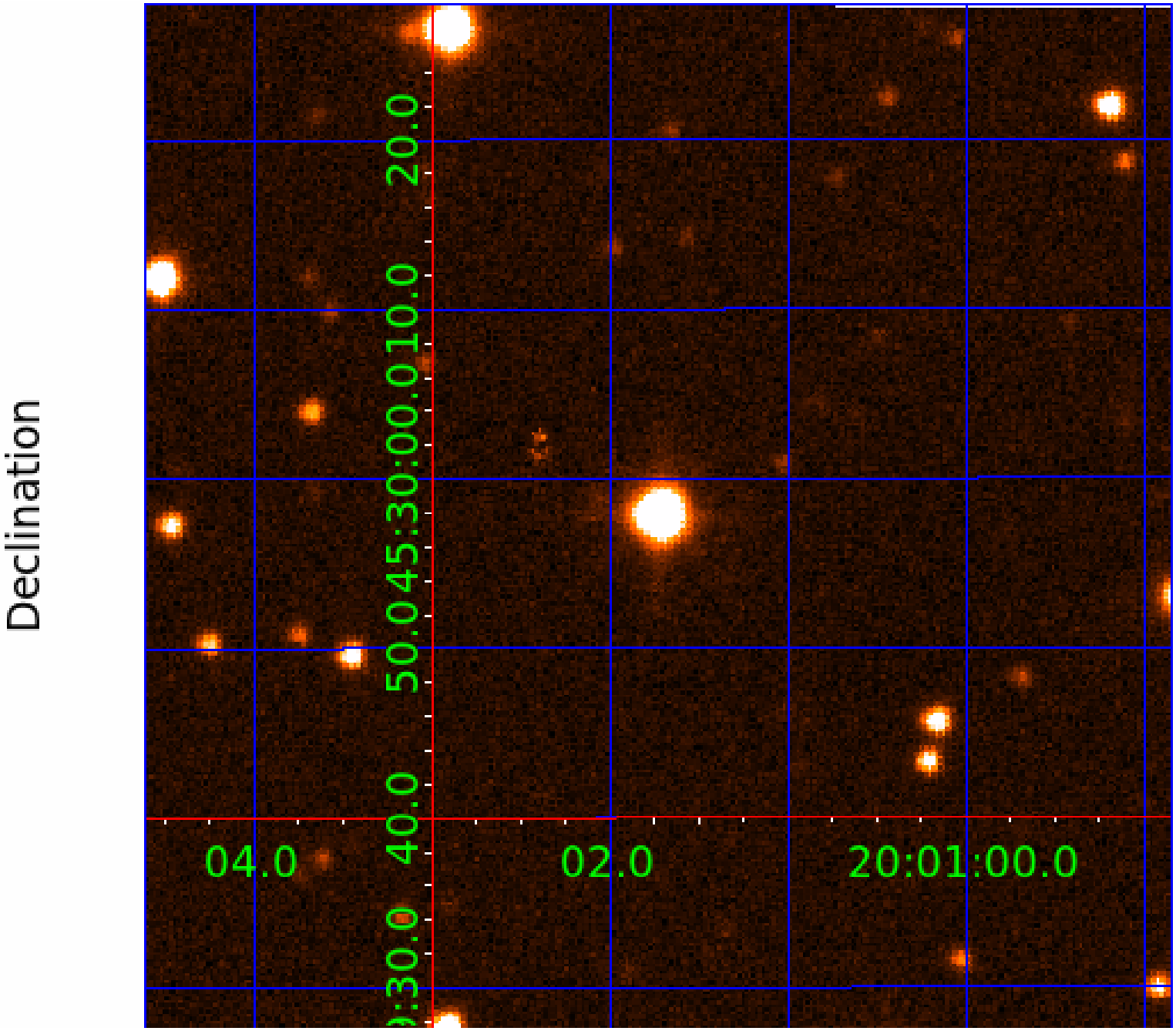






UKIRT Image



KIC 009117167

Q1-17 DR25 TCE Parameters

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

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009117167-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV
009117167-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009117167-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009117167-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

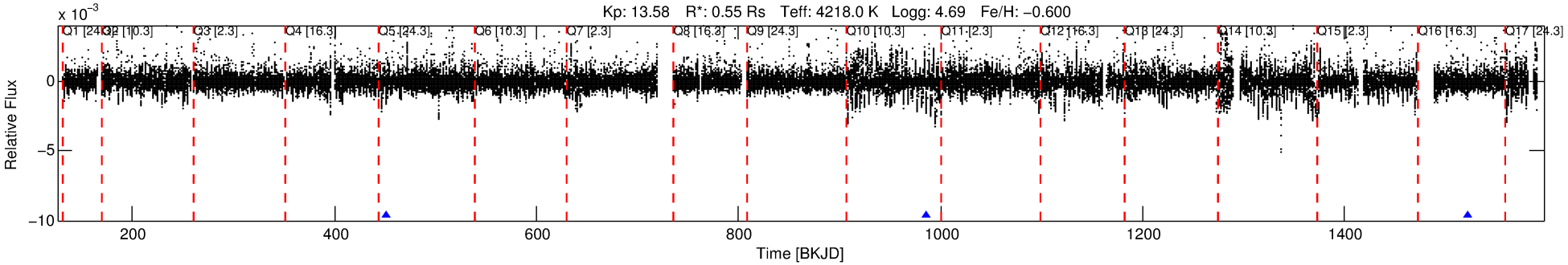
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

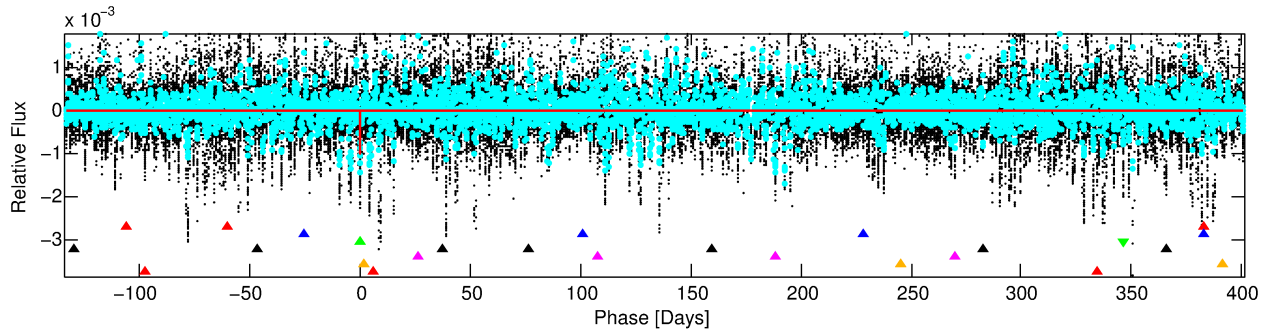
Ephemeris Match Information For 009117167-03

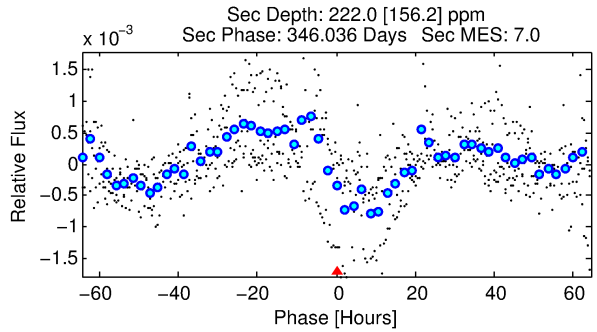
No Significant Match Found

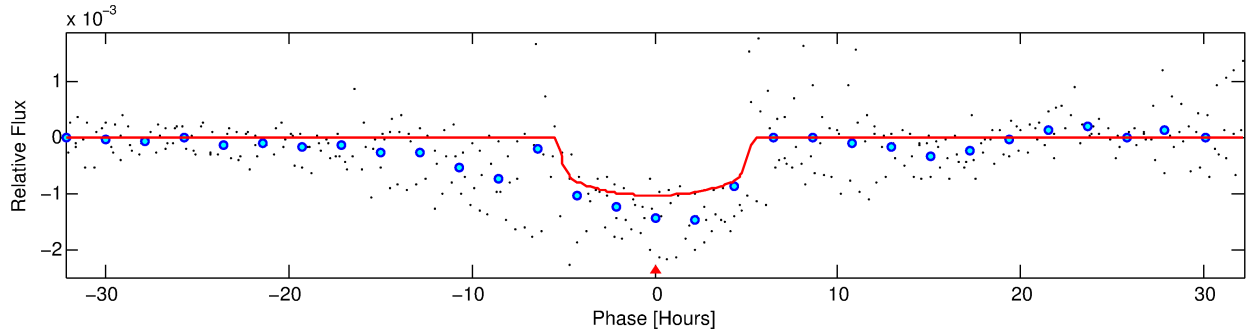
DV One-Page Summary

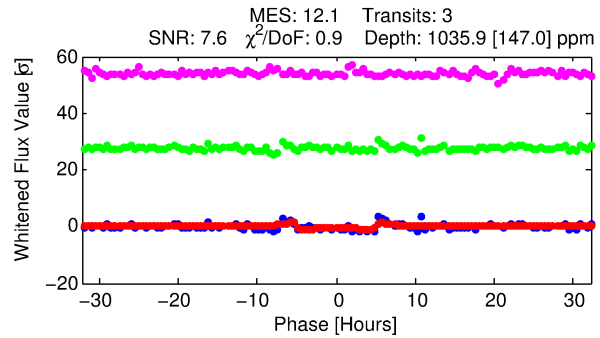
KIC: 9117167 Candidate: 3 of 7 Period: 534.759 d

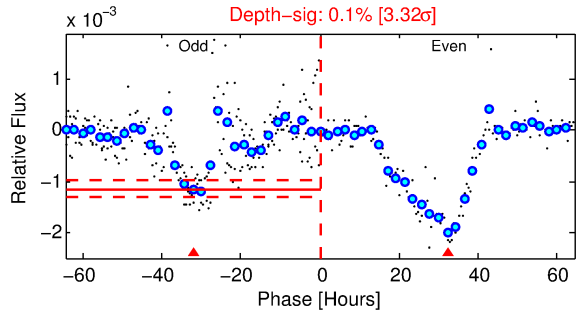


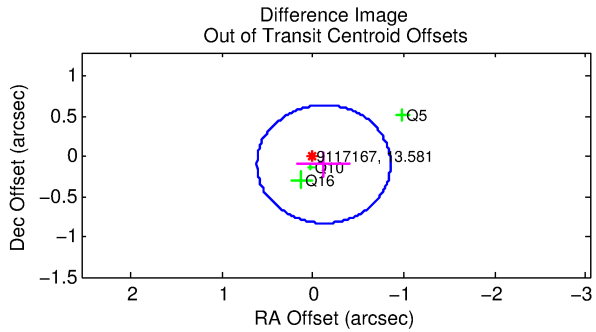












DV Fit Results:

Period = 534.75925 [0.00522] d
Epoch = 451.5861 [0.0075] BKJD
Rp/R* = 0.0299 [0.0131]
a/R* = 346.72 [599.76]
b = 0.48 [2.79]

Seff = 0.08 [0.01]
Teq = 134 [6] K
Rp = 1.78 [0.80] Re
a = 1.0474 [0.0908] AU

Ag = 42089.34 [47550.59] [0.89σ]
Teffp = 2978 [842] K [3.38σ]

DV Diagnostic Results:

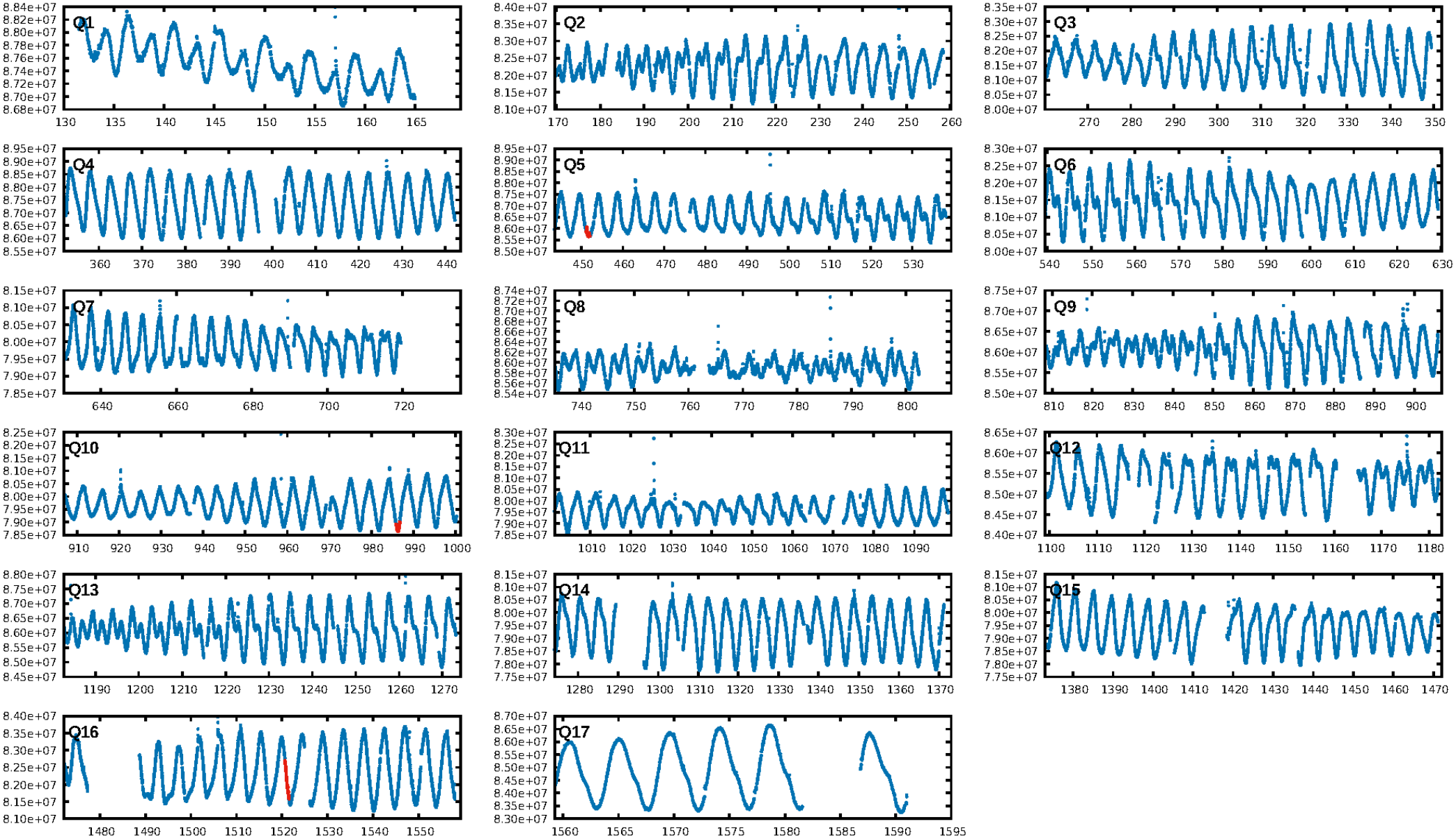
ShortPeriod−sig: 100.0% [96.73σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: 44.0%
ModelChiSquareGof−sig: 99.6%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: 2.361

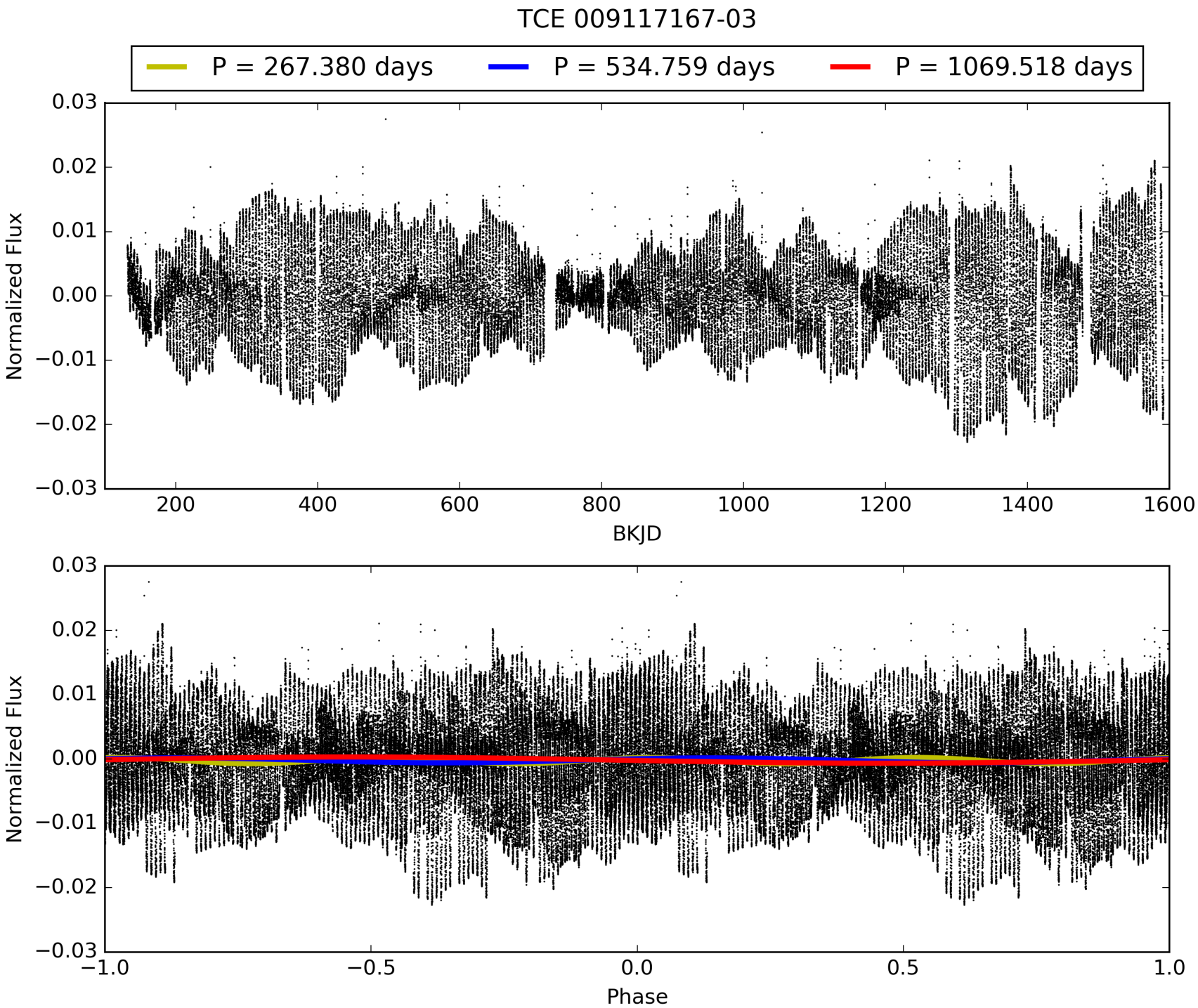
Centroid−sig: 30.8%
Centroid−so: 0.340 arcsec [0.72σ]
OotOffset−rm: 0.152 arcsec [0.62σ]
KicOffset−rm: 0.229 arcsec [0.78σ]
OotOffset−st: 1/0/1/1 [3]
KicOffset−st: 1/0/1/1 [3]
DiffImageQuality−fgm: 1.00 [3/3]
DiffImageOverlap−fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 13:36:54 Z

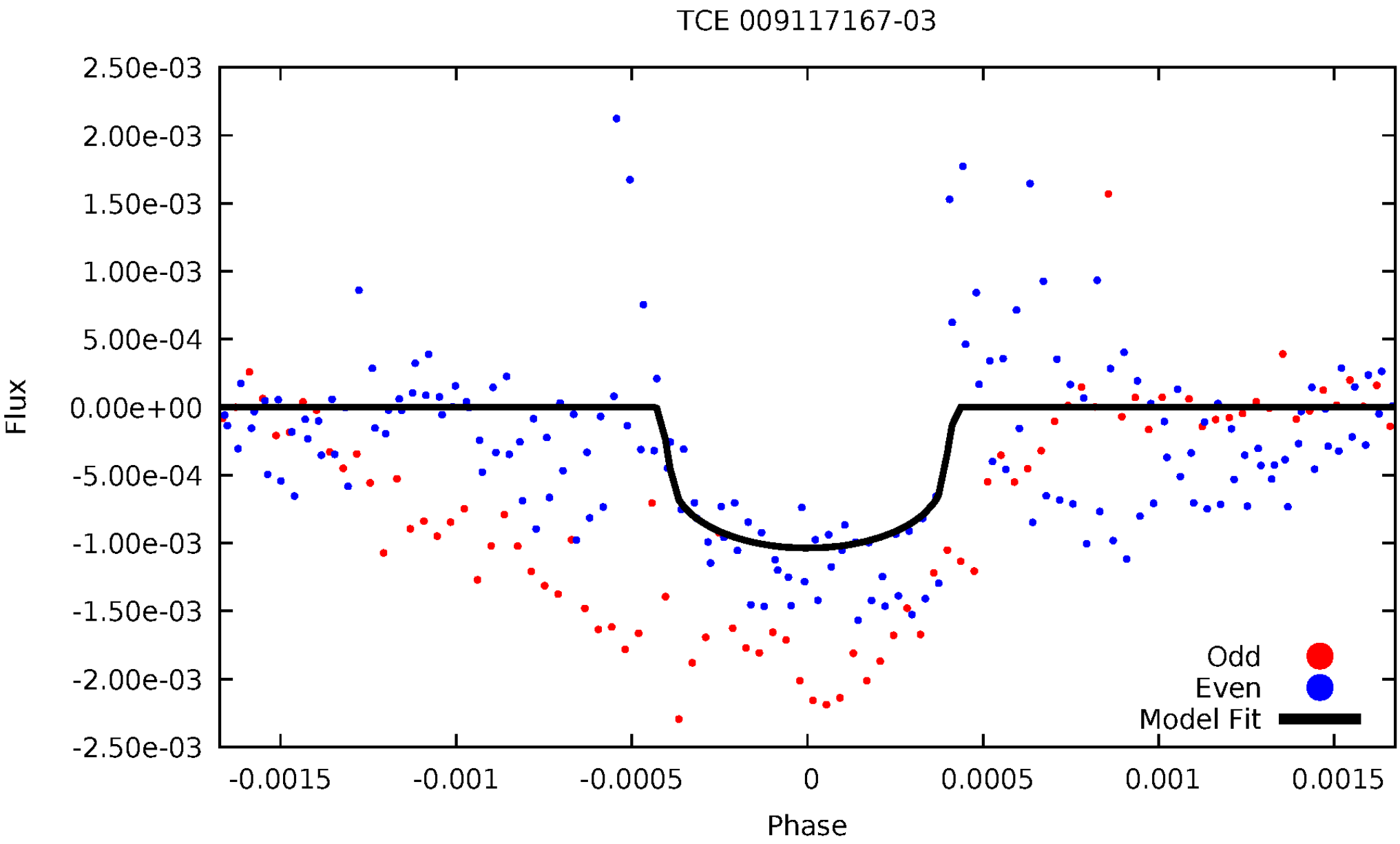
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009117167-03, PDC Light Curves

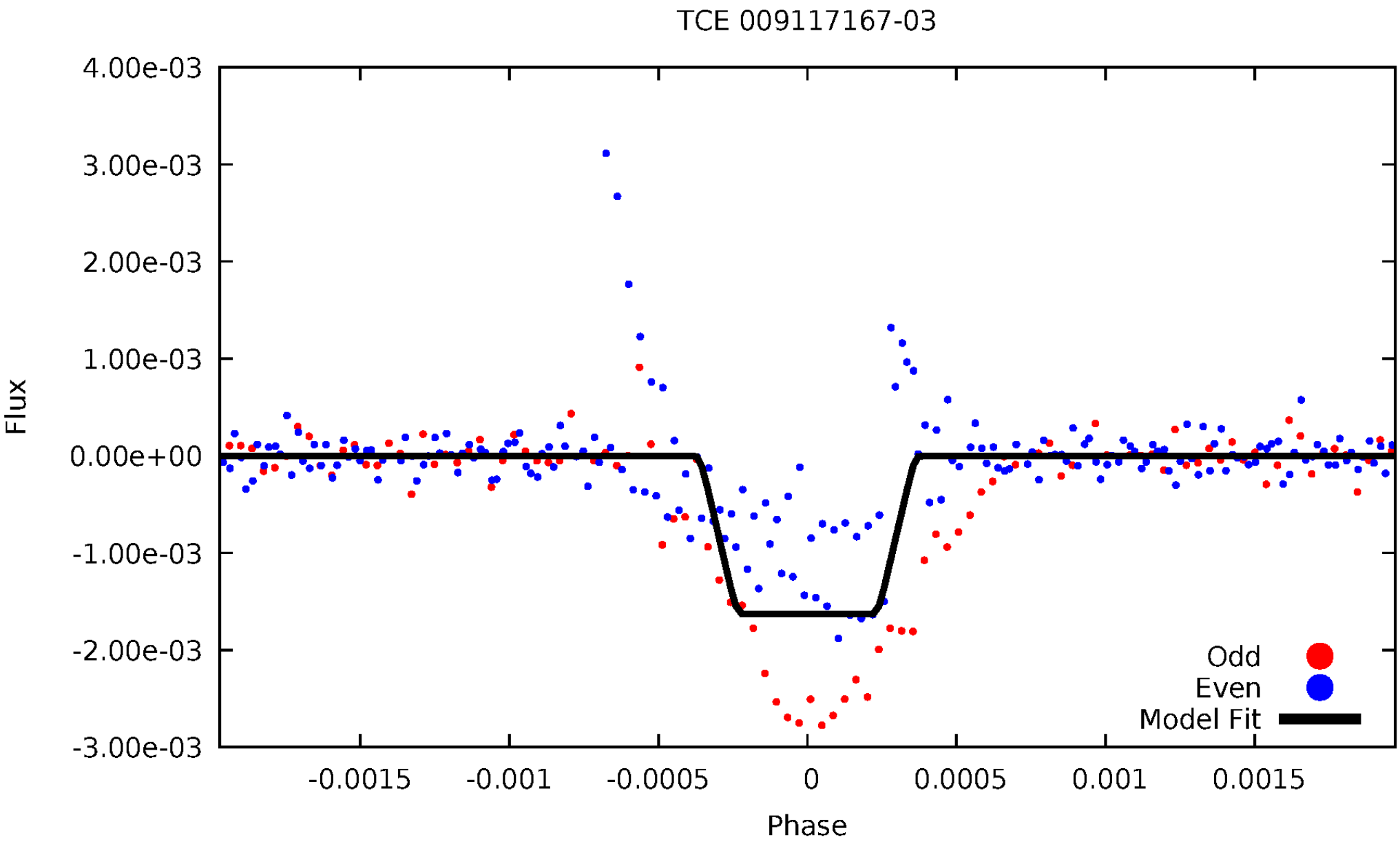



TCE 009117167-03
P = 267.380 days
P = 534.759 days
P = 1069.518 days
Normalized Flux
BKJD
Normalized Flux
Phase

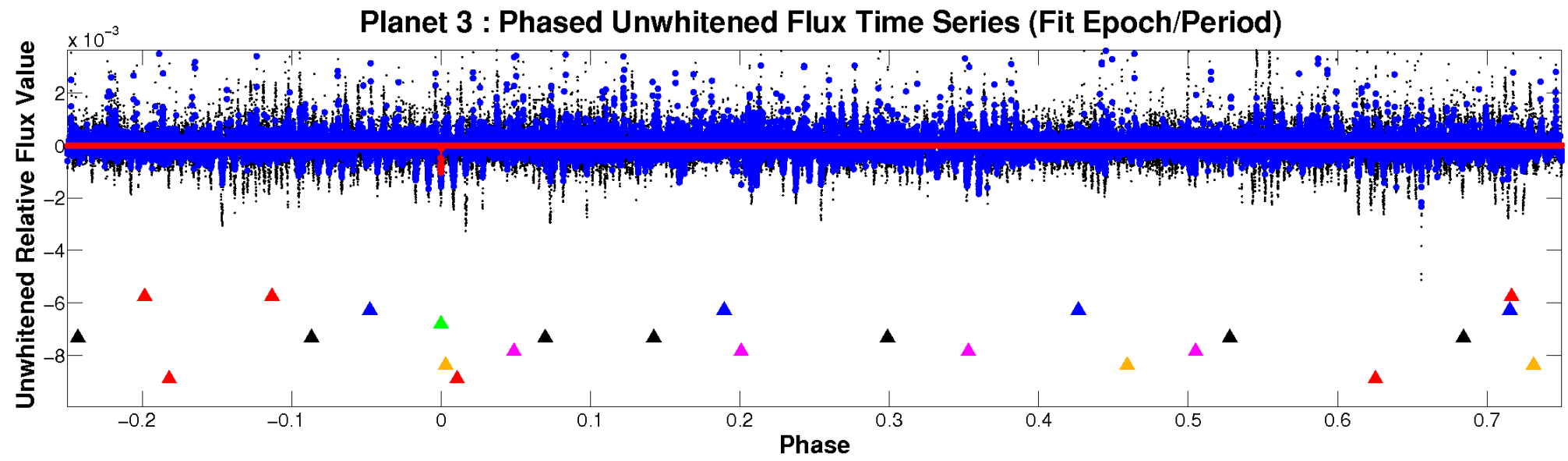
DV Odd/Even

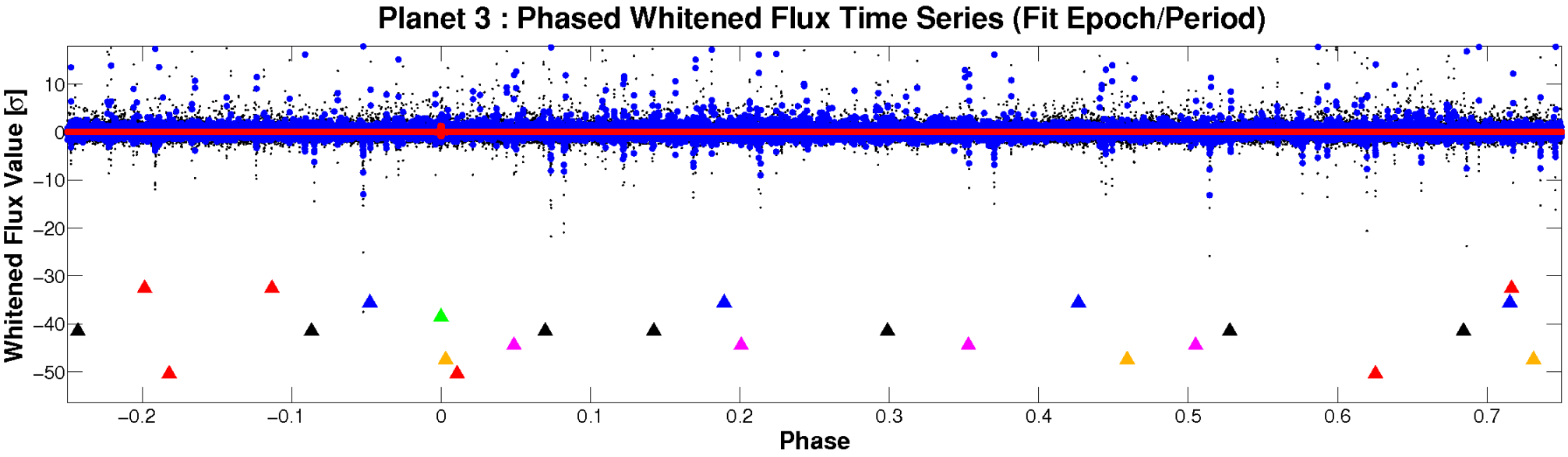

TCE 009117167-03
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
-2.50e-03
Flux
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009117167-03
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
Flux
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
Phase
Odd
Even
Model Fit

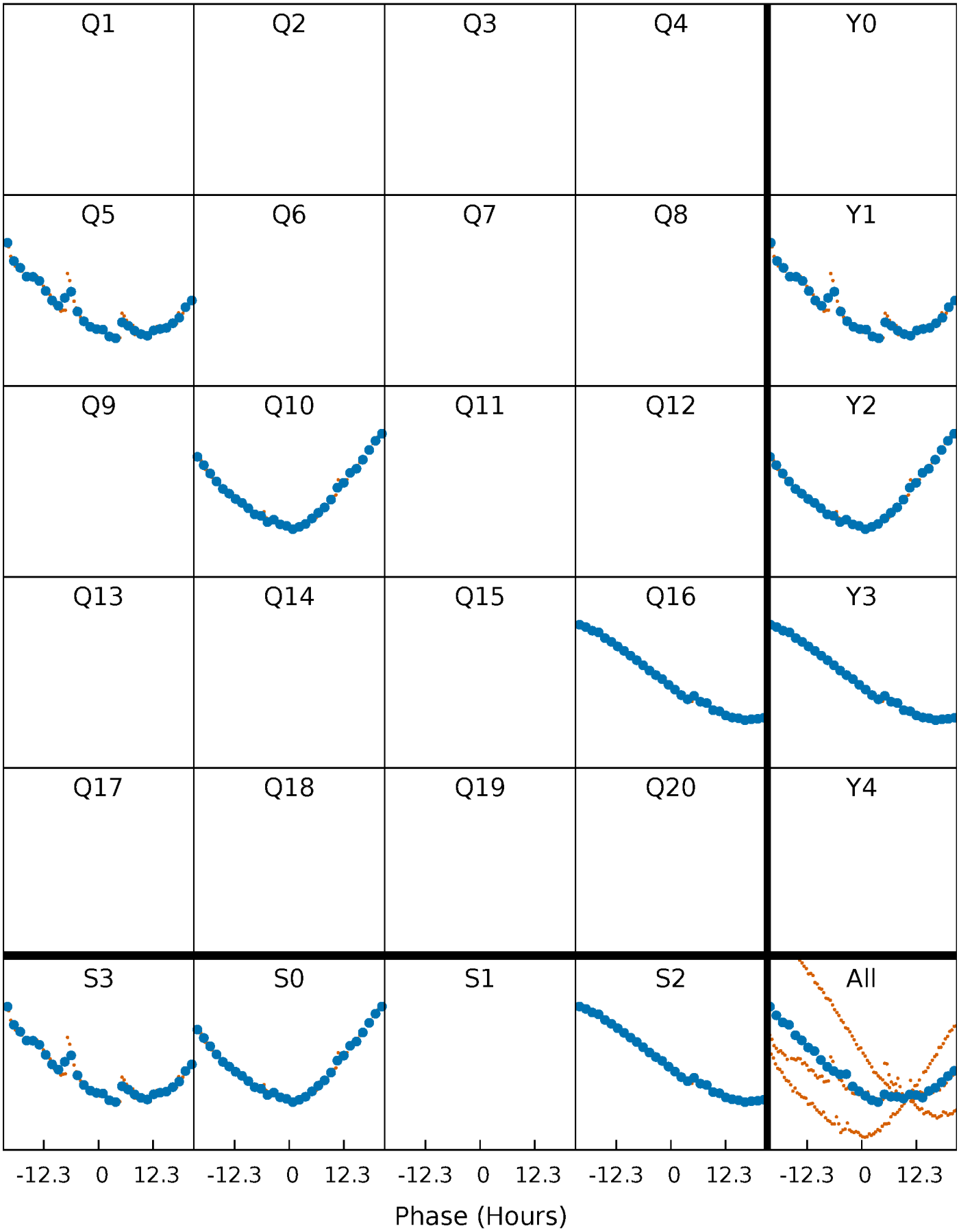
Non-Whitened Vs. Whitened Light Curve





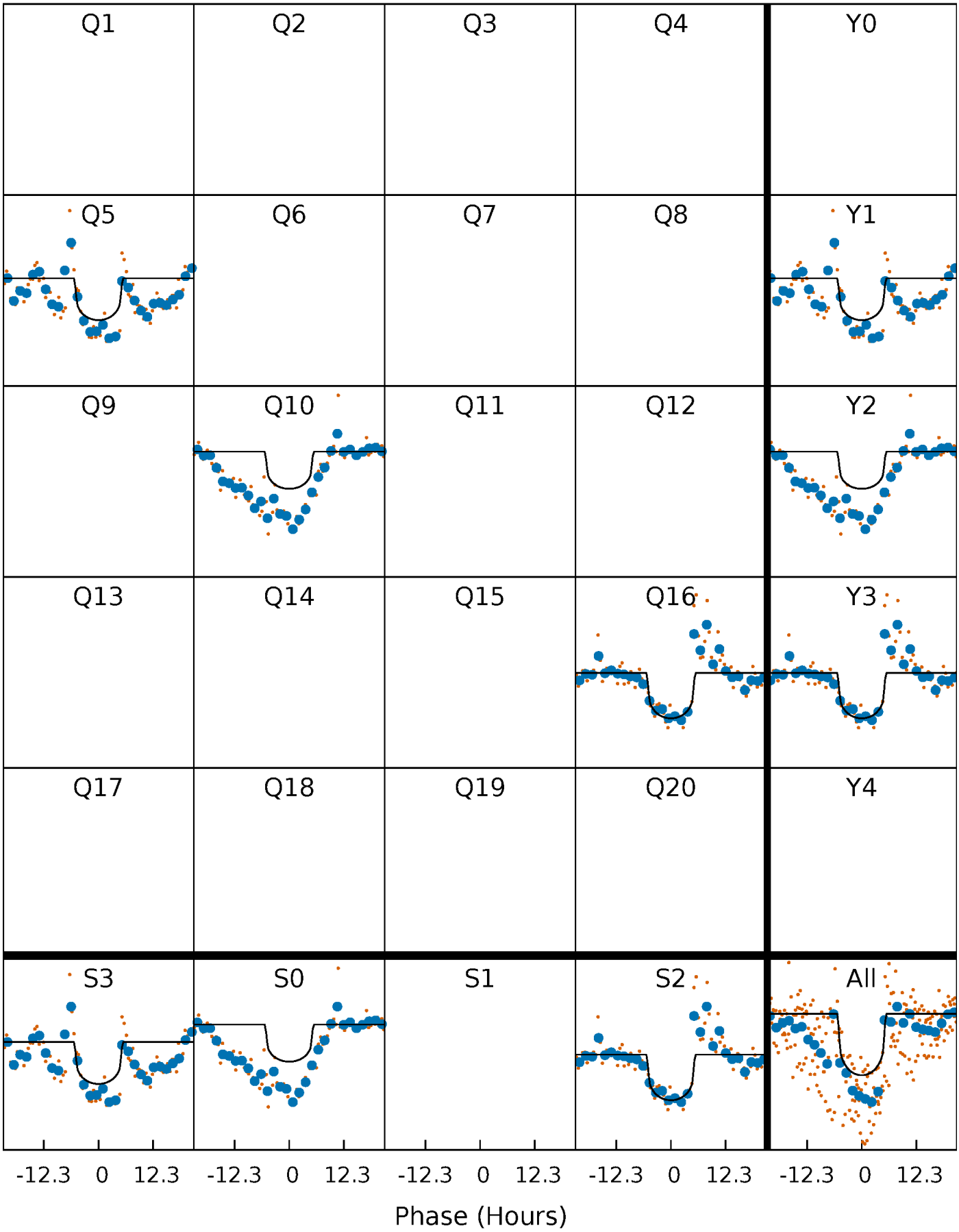
PDC Quarter-Phased Transit Curves

TCE 009117167-03 P=534.759249 Days T_0=451.586081 (BKJD)



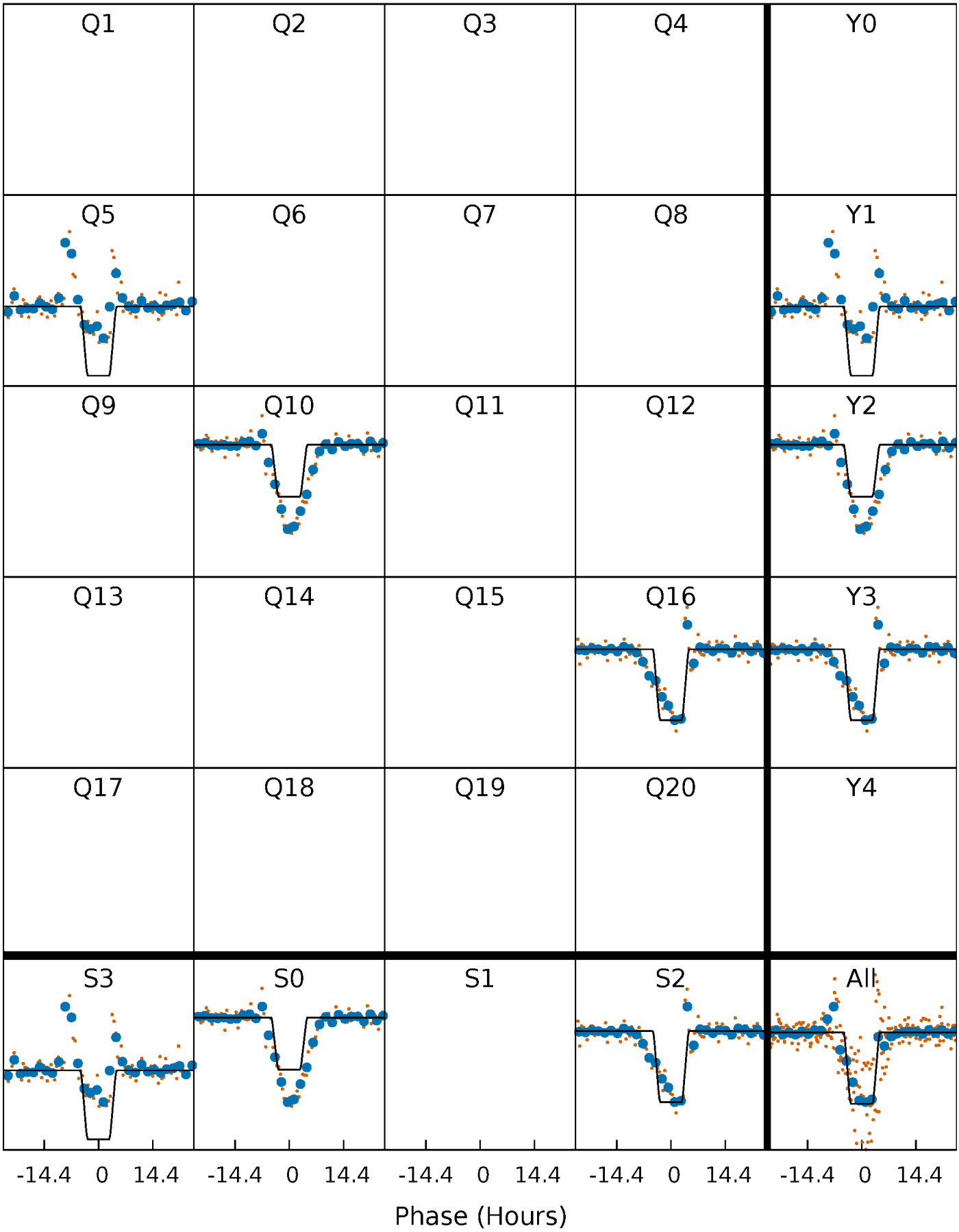
DV Quarter-Phased Transit Curves

TCE 009117167-03 P=534.759249 Days T_0=451.586081 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

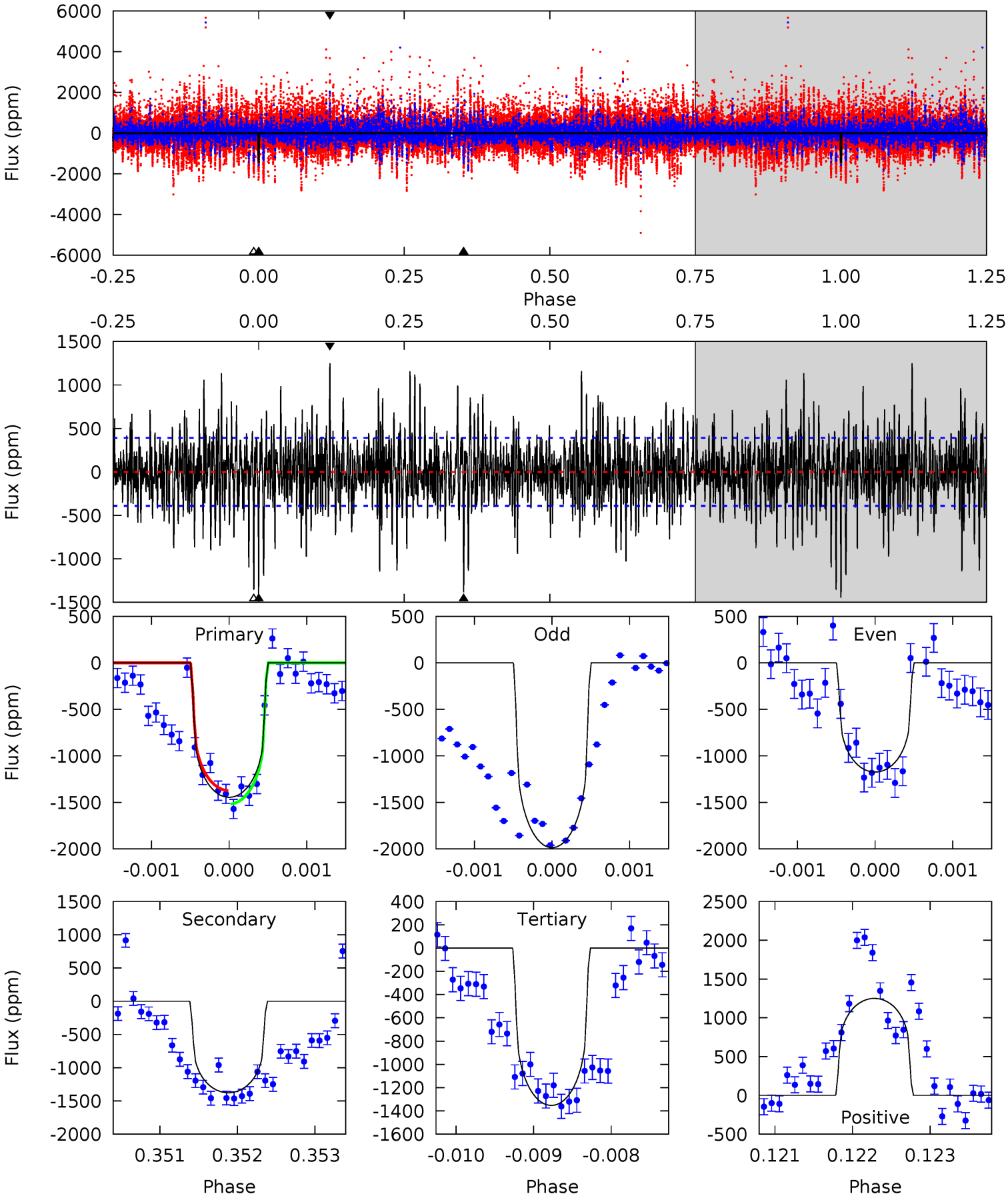
TCE 009117167-03 P=534.753076 Days T_0=451.656802 (BKJD)



DV Model-Shift Uniqueness Test

009117167-03, P = 534.759249 Days, E = 451.586081 Days

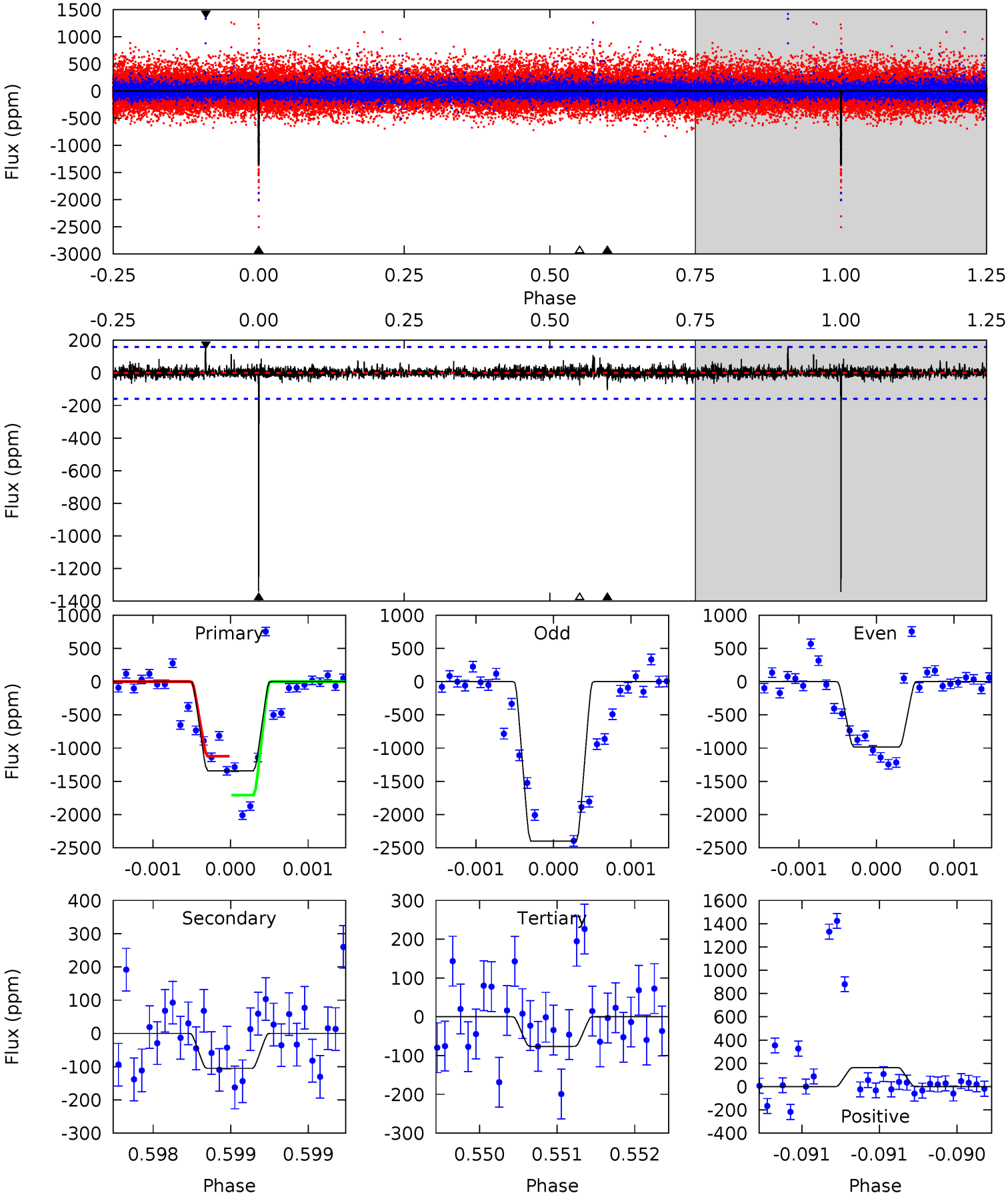
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	19.3	18.9	17.5	5.48	3.33	4.41	1.29	2.73	0.33	1.76	4.38	1.07	0.46	1.02



Alt Model-Shift Uniqueness Test

009117167-03, P = 534.753076 Days, E = 451.656802 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
46.4	3.64	2.64	5.66	5.50	3.37	0.59	43.8	40.8	1.00	-2.02	26.2	1.05	0.11	10.2



Stellar Parameters For KIC 009117167

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	4218^{+115}_{-140}	$4.691^{+0.063}_{-0.032}$	$-0.600^{+0.300}_{-0.300}$	$0.547^{+0.049}_{-0.059}$	$0.535^{+0.056}_{-0.046}$	$4.609^{+1.422}_{-0.621}$
	+3%/-3%	+1%/-1%	+50%/-50%	+9%/-11%	+10%/-9%	+31%/-13%
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 009117167-03 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1376±71	$1.82^{+0.74}_{-0.76}$	186^{+7}_{-7}	4537^{+1144}_{-564}	$259226^{+481353}_{-131522}$
Alt.	-105±29	$2.36^{+0.83}_{-0.78}$	186^{+7}_{-7}	2745^{+342}_{-220}	11096^{+14178}_{-5398}

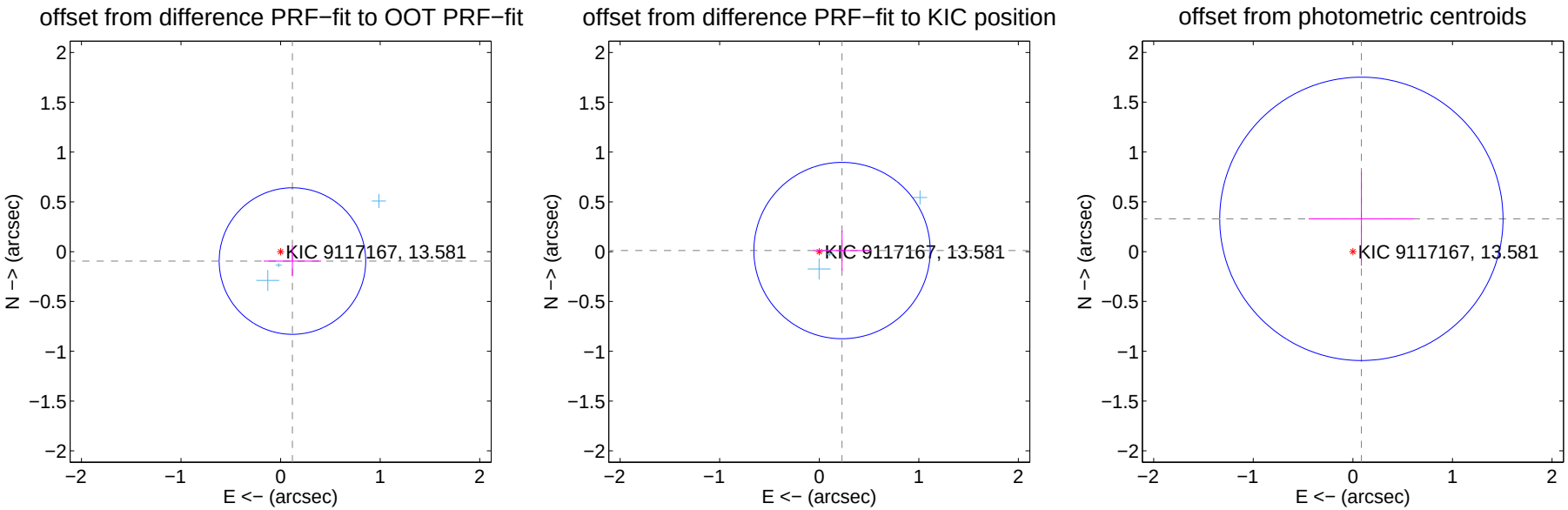
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

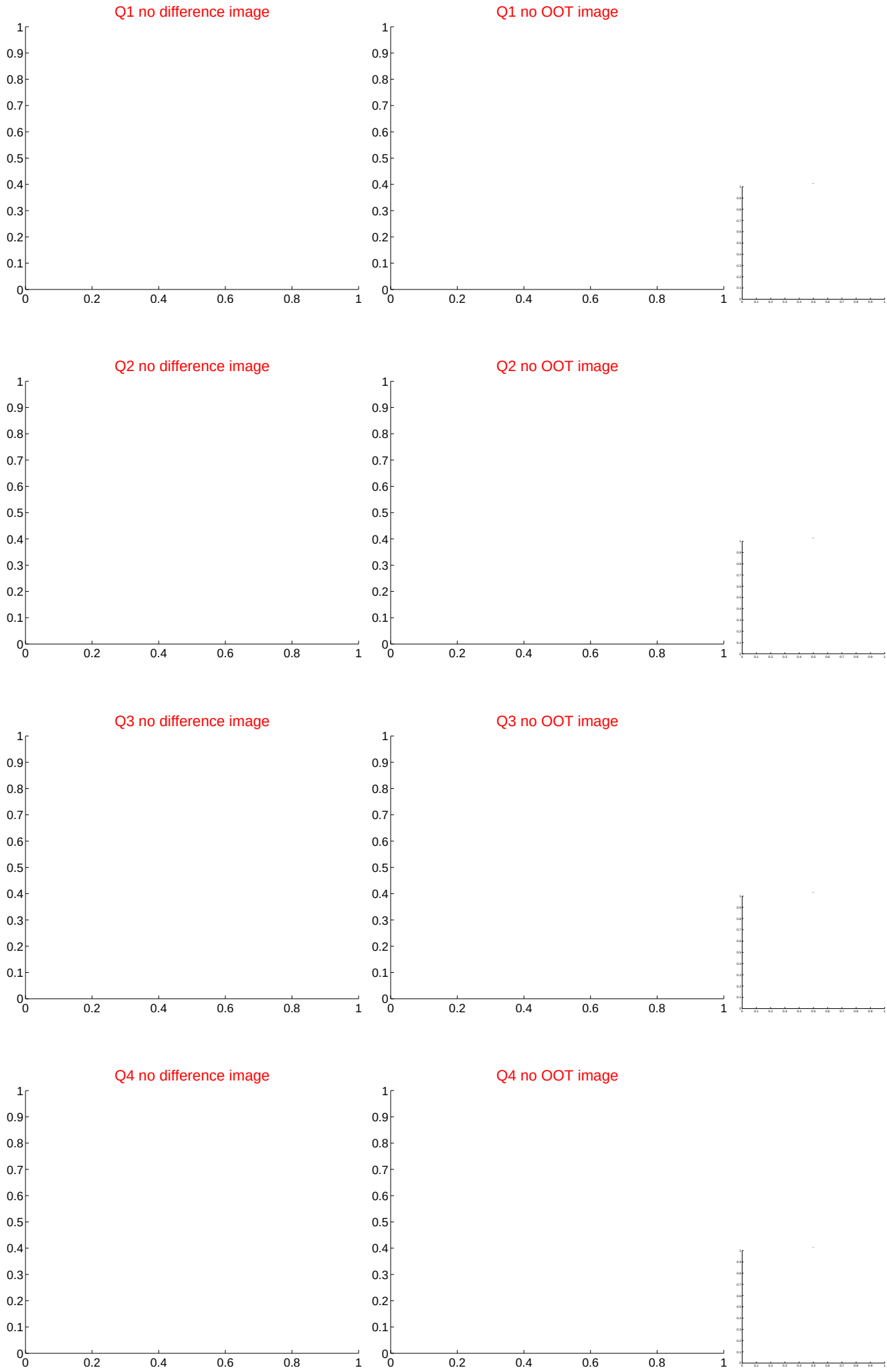
Supplemental centroid analysis for 009117167-03. Kepler magnitude: 13.58. Transit SNR 7.60
There are 3 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.152 ± 0.245	0.62	-0.119 ± 0.288	-0.094 ± 0.153
PRF-fit source offset from KIC position	0.229 ± 0.295	0.78	-0.229 ± 0.286	0.011 ± 0.201
photometric centroid source offset	0.34 ± 0.47	0.72	-0.09 ± 0.53	0.33 ± 0.47

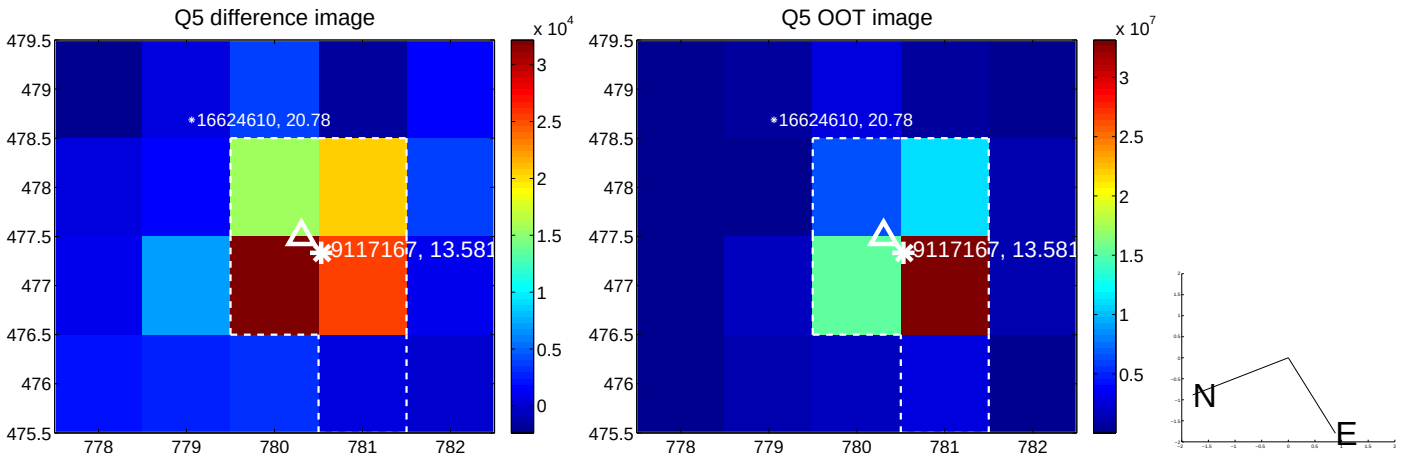


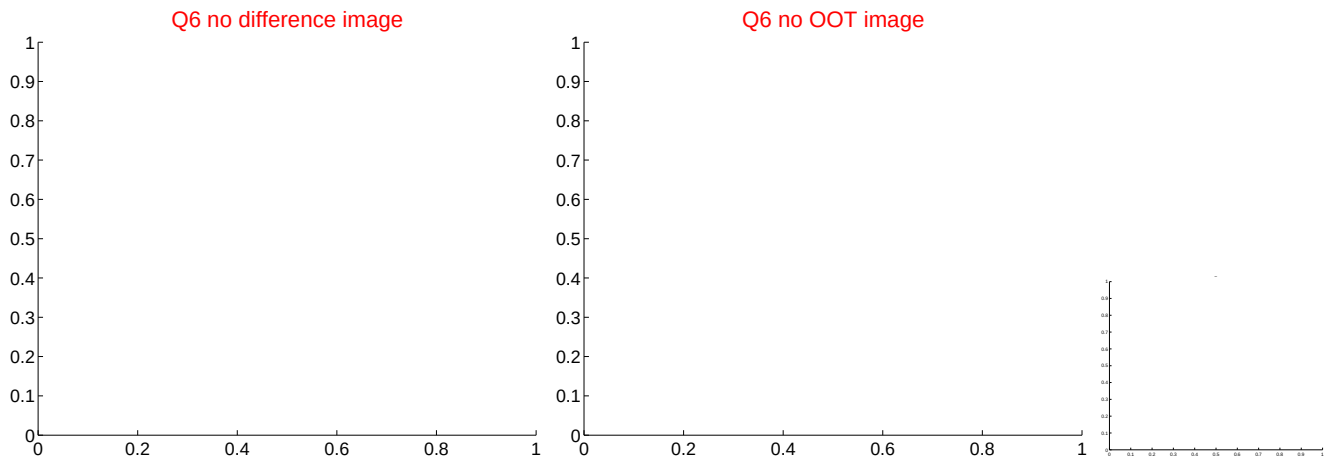
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

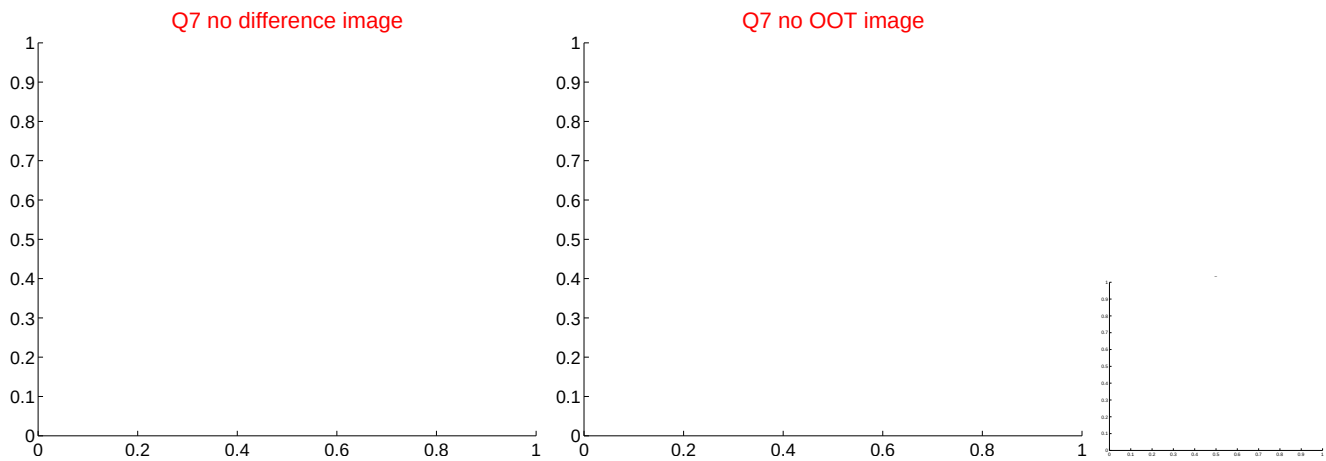
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

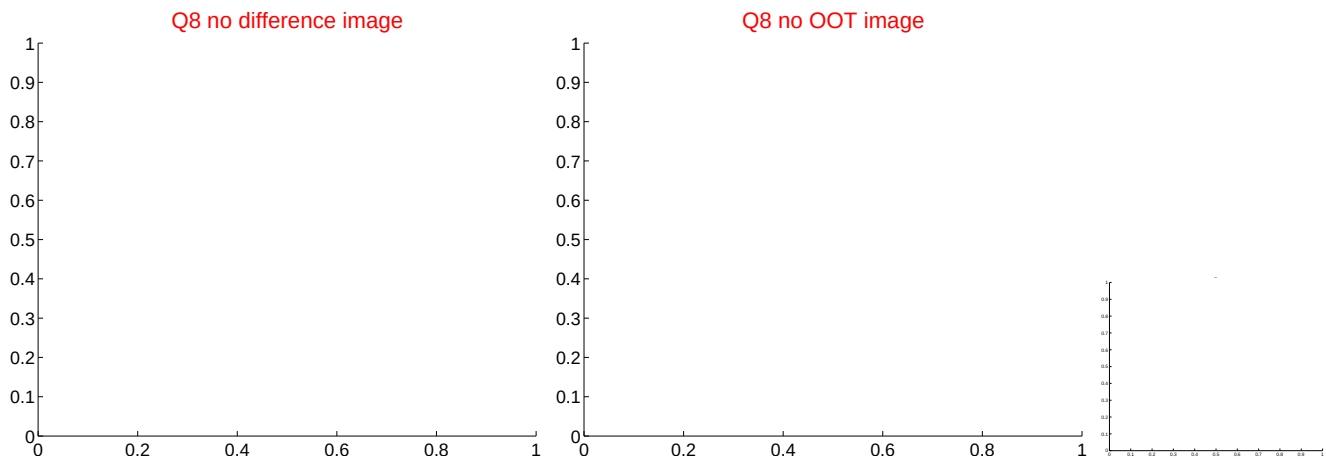


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

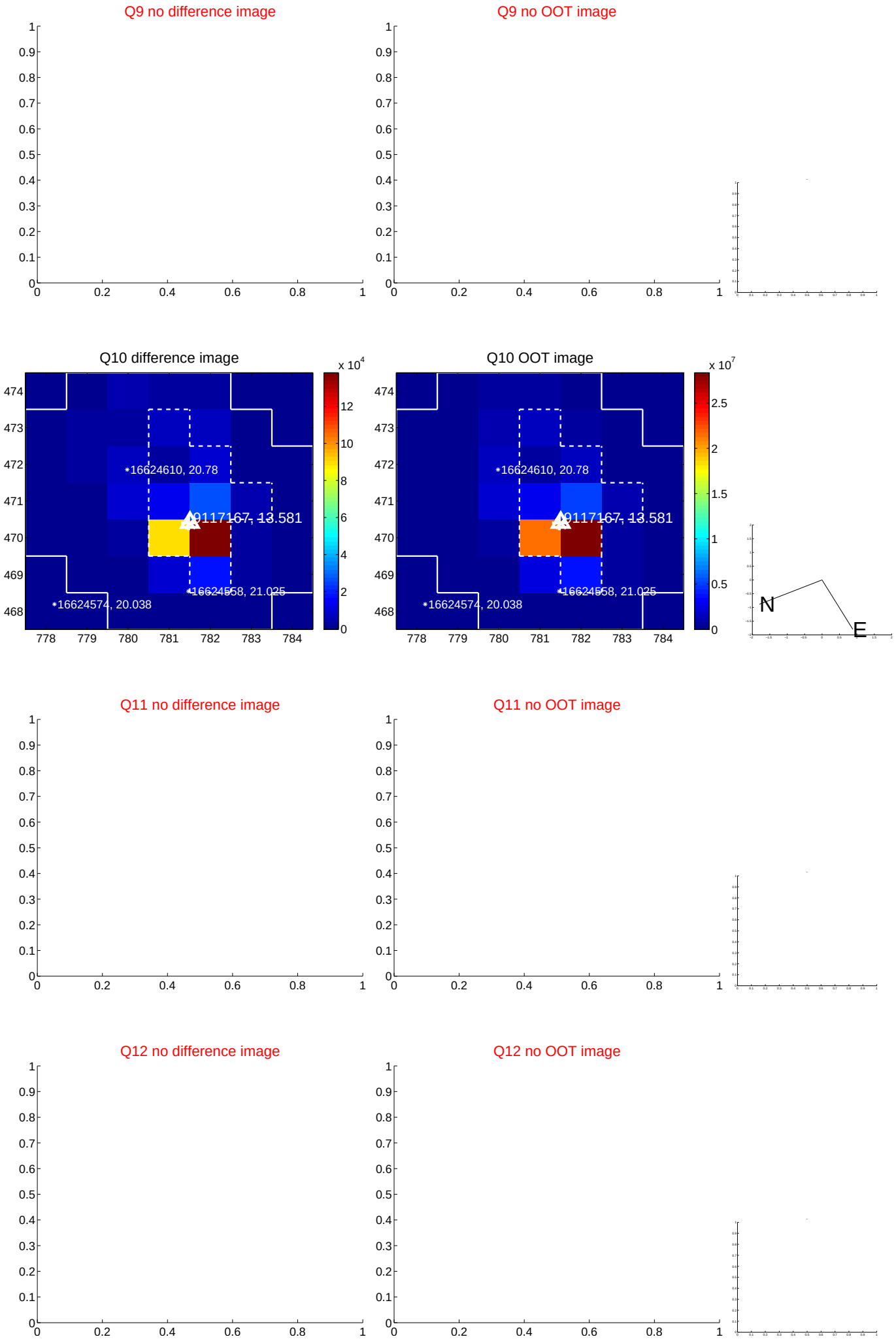




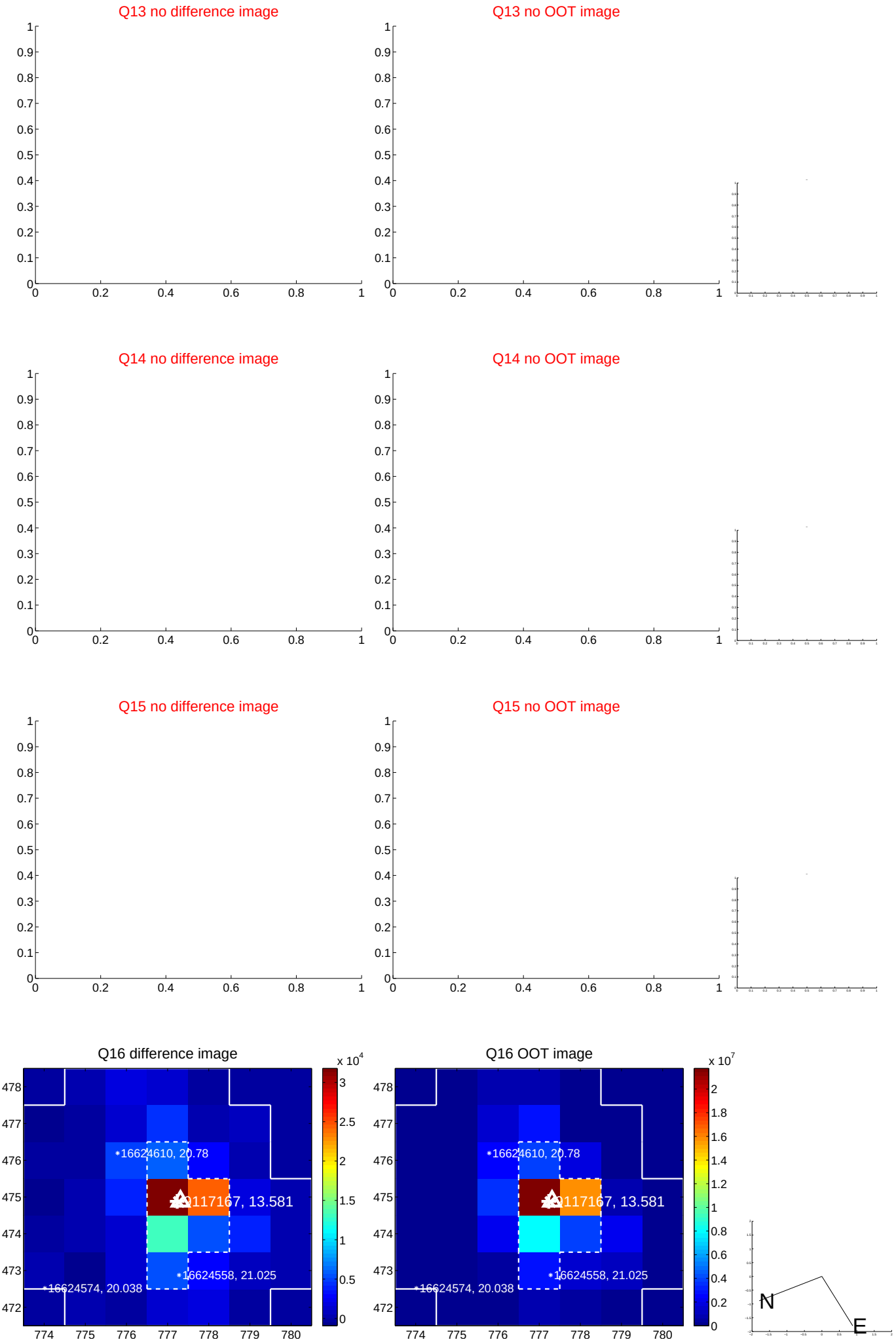




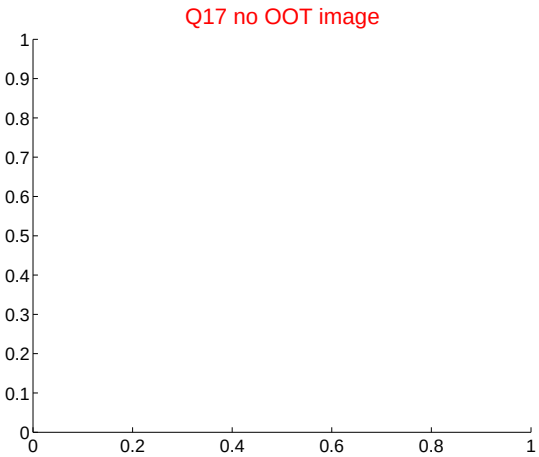
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

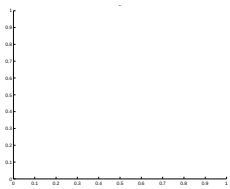


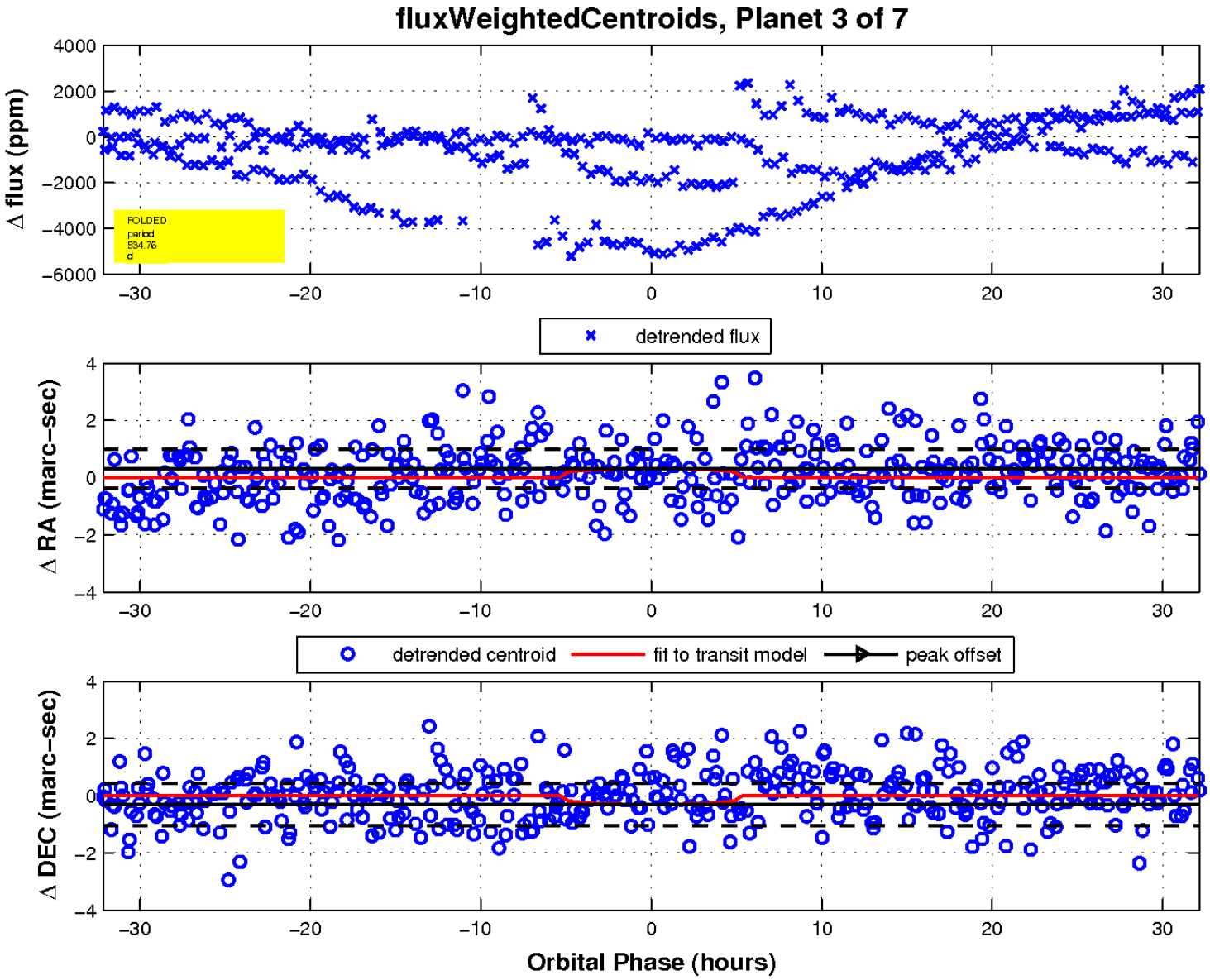
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



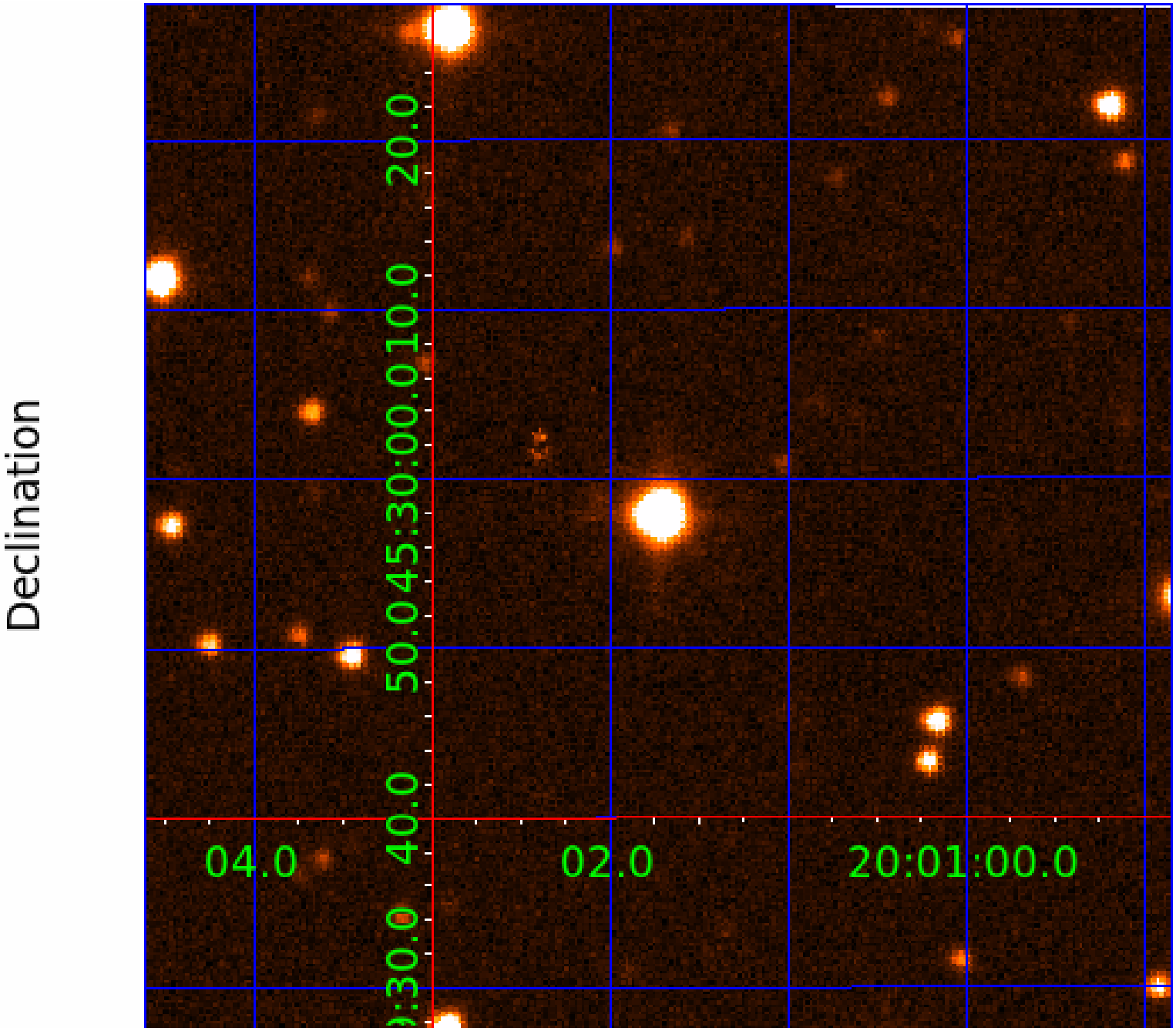
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image



KIC 009117167

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 ($S_\oplus$)
009117167-02	OBS	No	407.972280	144.952659	753.3	4.288	13.4	7.4	0.55	4218	1.60	0.11
009117167-03	OBS	No	534.759249	451.586081	1035.9	10.733	12.1	7.6	0.55	4218	1.78	0.08
009117167-04	OBS	No	206.130332	321.621468	585.7	5.165	12.3	5.5	0.55	4218	1.48	0.28
009117167-05	OBS	No	453.446247	186.883113	614.2	5.138	9.7	5.9	0.55	4218	1.50	0.10
009117167-06	OBS	No	389.337133	453.257389	974.8	9.617	11.6	6.8	0.55	4218	2.23	0.12
009117167-07	OBS	No	431.706633	457.358164	561.4	4.500	11.8	-1.0	0.55	4218	1.27	0.10

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009117167-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV
009117167-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009117167-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009117167-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

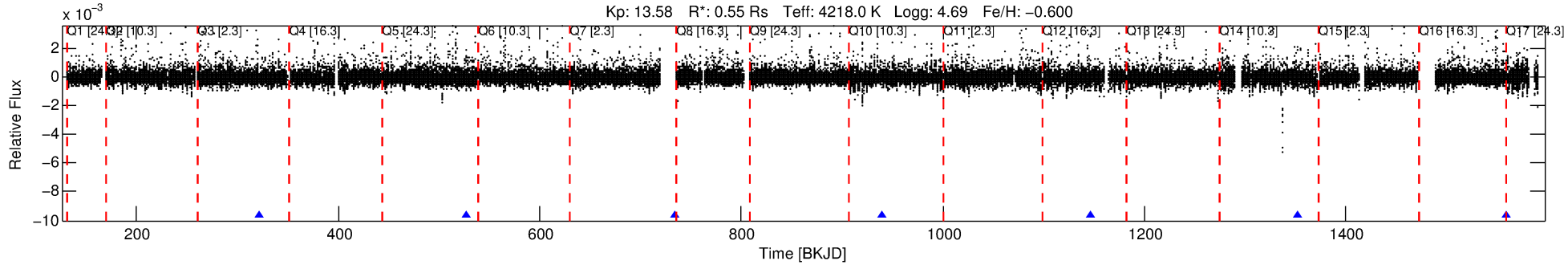
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

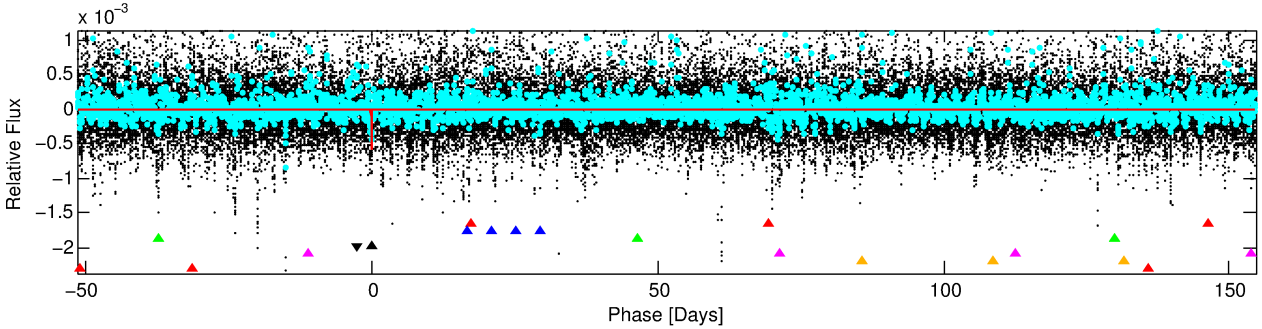
Ephemeris Match Information For 009117167-04

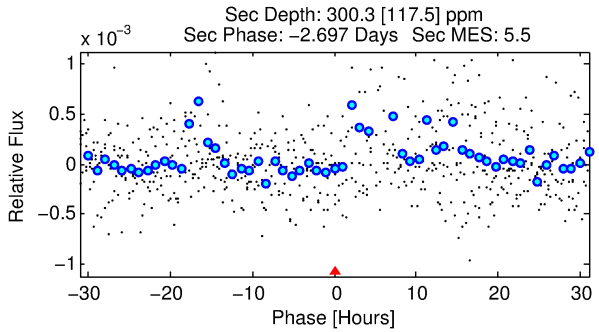
No Significant Match Found

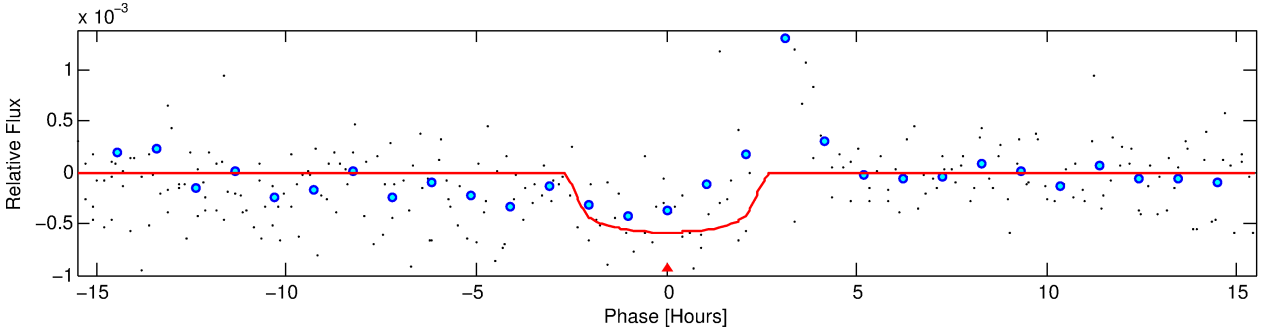
DV One-Page Summary

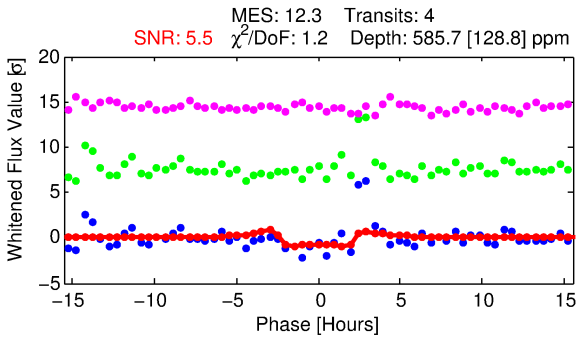
KIC: 9117167 Candidate: 4 of 7 Period: 206.130 d

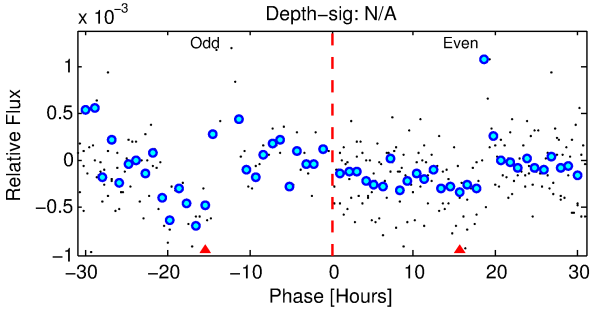


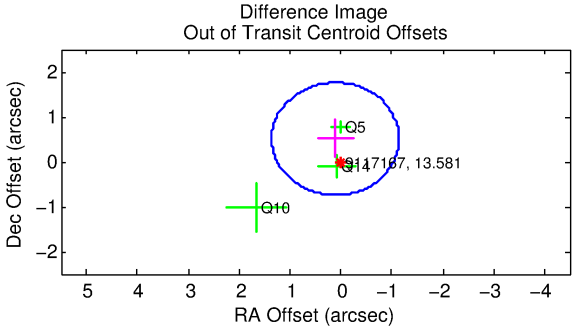












DV Fit Results:

Period = 206.13033 [0.00458] d
Epoch = 321.6215 [0.0172] BKJD
Rp/R* = 0.0247 [0.0176]
a/R* = 195.60 [572.69]
b = 0.80 [1.34]

Seff = 0.28 [0.05]
Teq = 185 [8] K
Rp = 1.47 [1.06] Re
a = 0.5548 [0.0481] AU

Ag = 23378.90 [34580.73] [0.68σ]
Teffp = 3533 [1307] K [2.56σ]

DV Diagnostic Results:

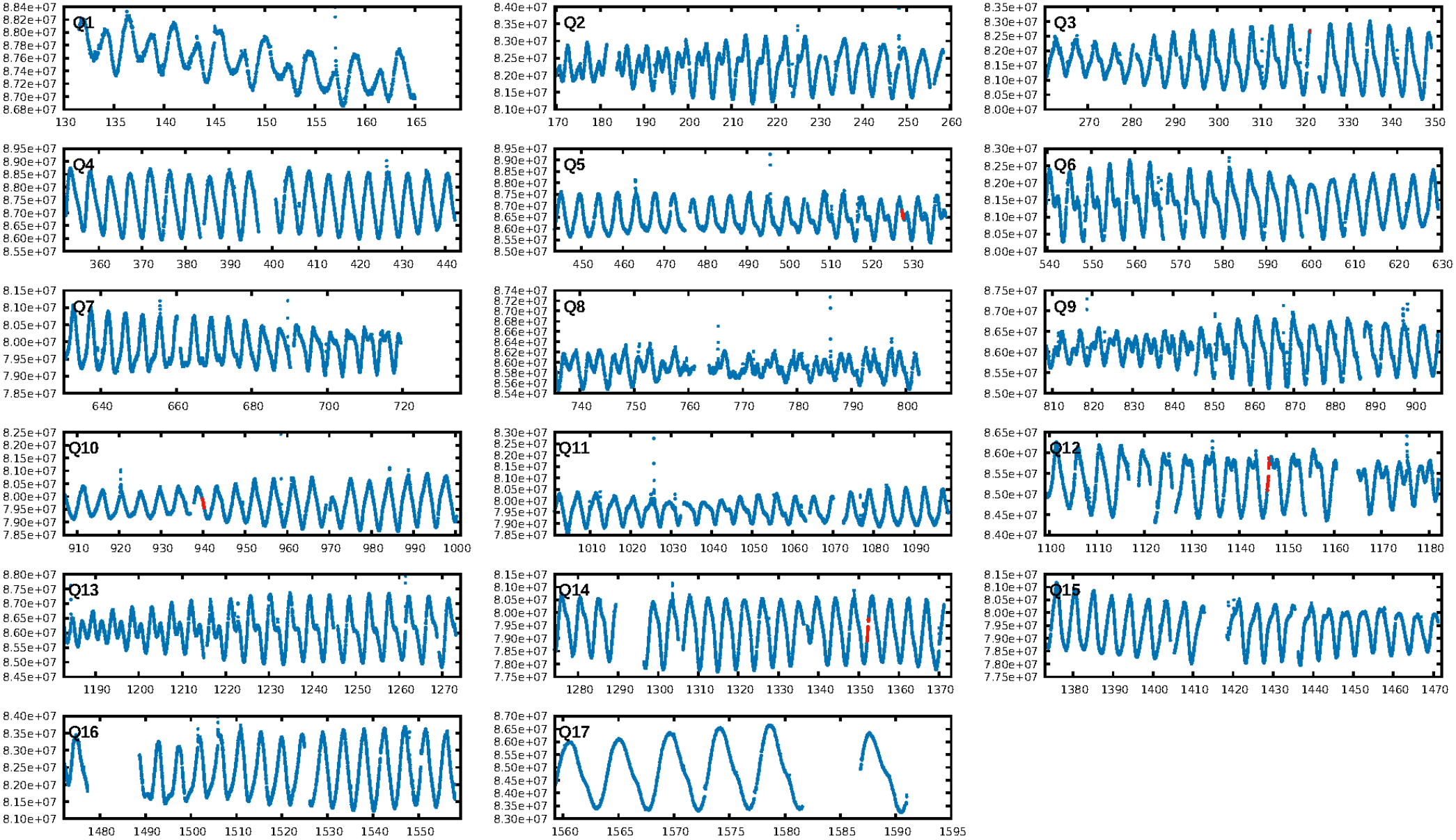
ShortPeriod−sig: N/A
LongPeriod−sig: 100.0% [402.80σ]
ModelChiSquare2−sig: 0.6%
ModelChiSquareGof−sig: 70.0%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [4/4]
GhostDiagnostic−chr: 0.9041

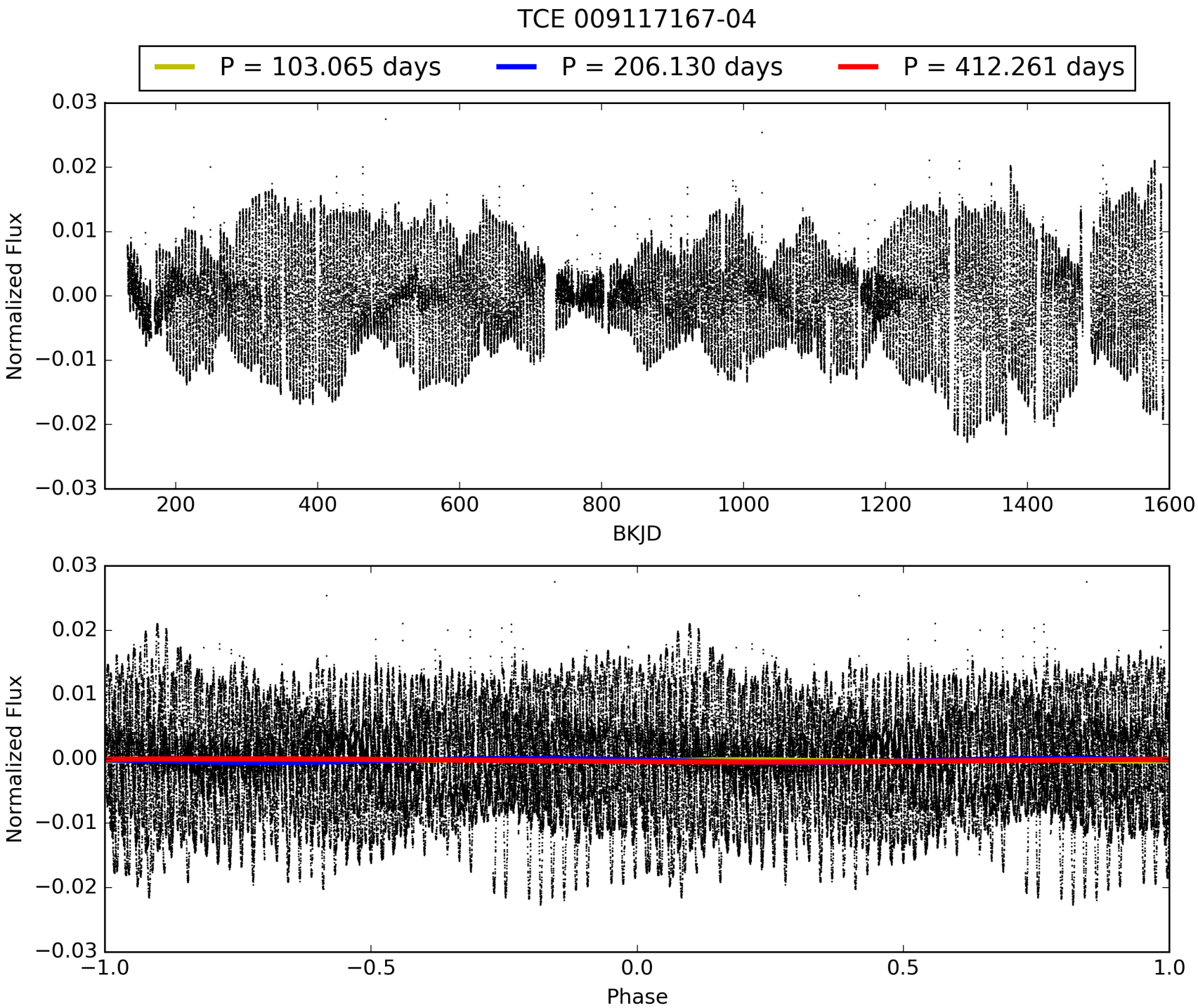
Centroid−sig: 79.3%
Centroid−so: 0.479 arcsec [0.42σ]
OotOffset−rm: 0.518 arcsec [1.24σ]
KicOffset−rm: 0.573 arcsec [0.85σ]
OotOffset−st: 2/0/0/1 [3]
KicOffset−st: 2/0/0/1 [3]
DiffImageQuality−fgm: 0.67 [2/3]
DiffImageOverlap−fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 13:37:04 Z

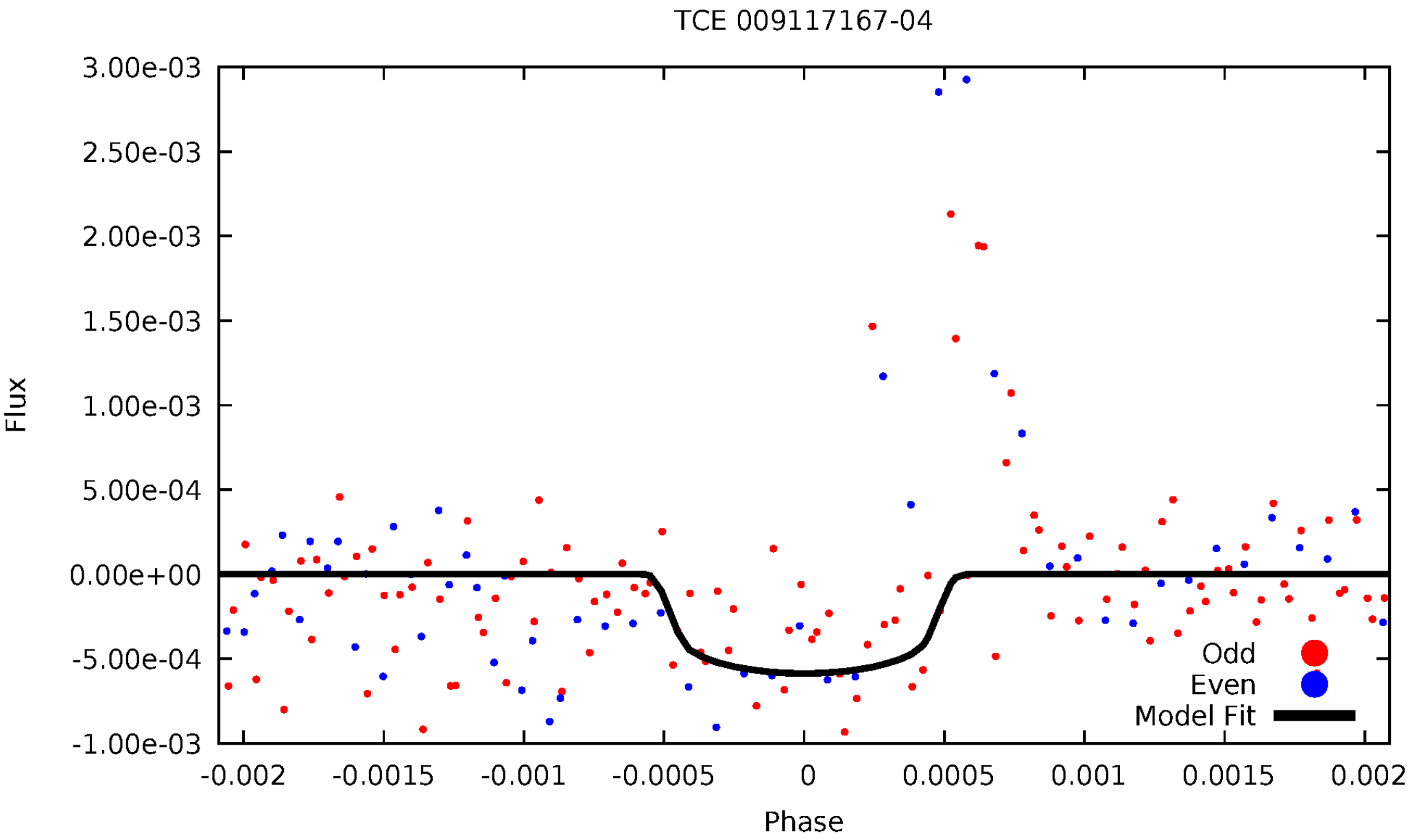
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009117167-04, PDC Light Curves

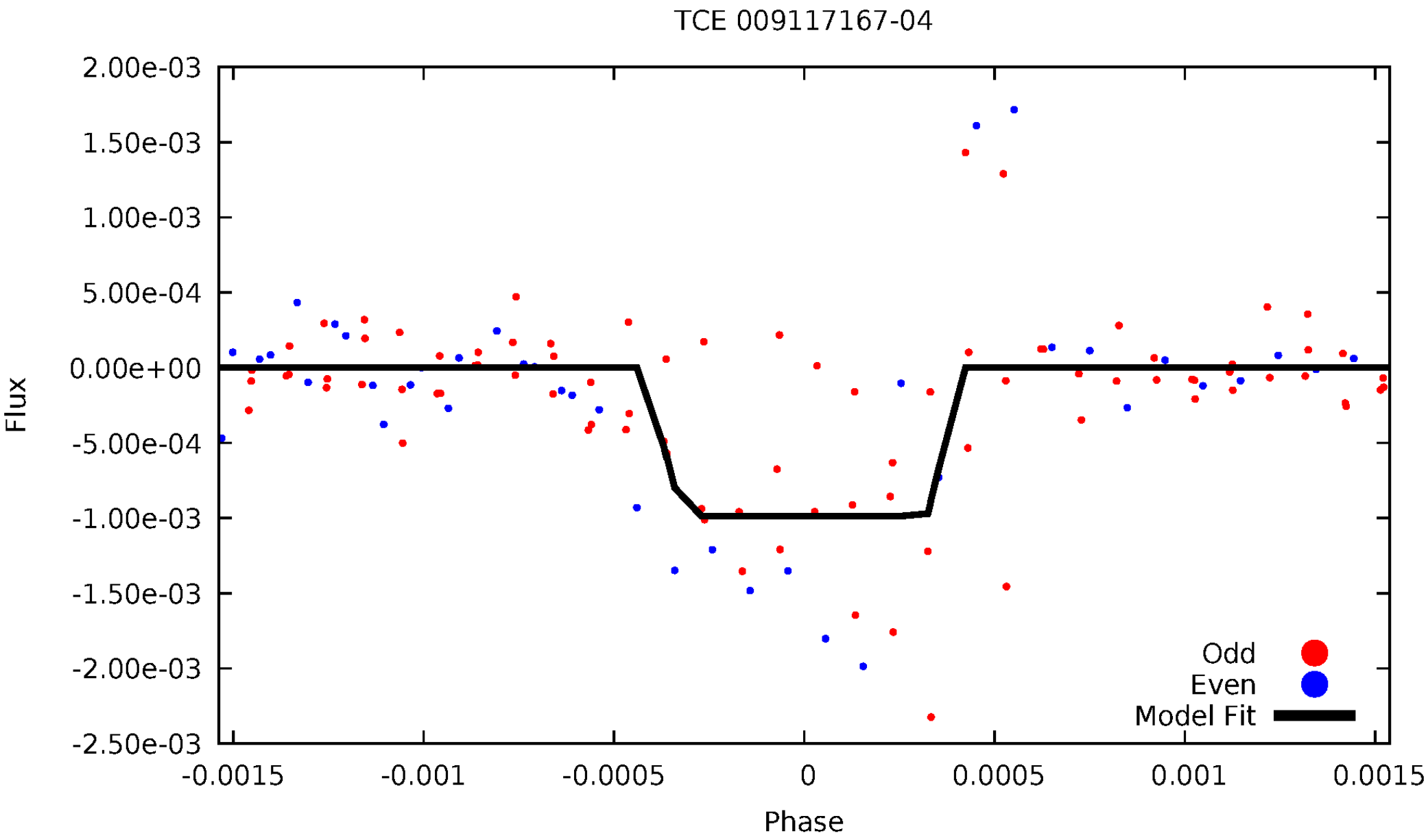



TCE 009117167-04
P = 103.065 days
P = 206.130 days
P = 412.261 days
Normalized Flux
BKJD
Normalized Flux
Phase

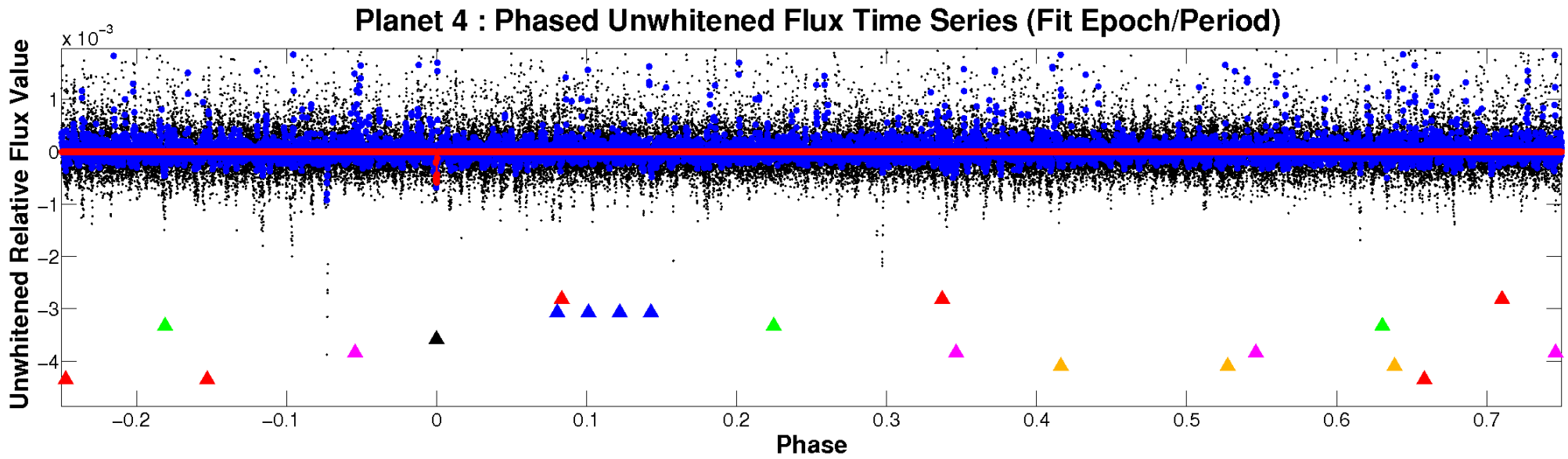
DV Odd/Even

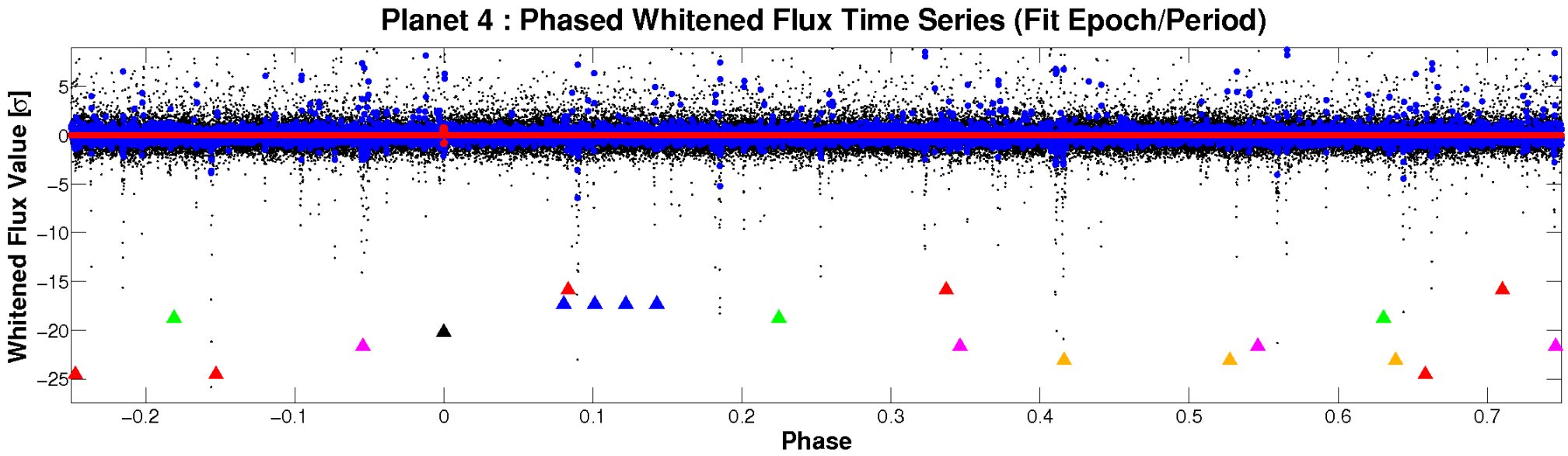

TCE 009117167-04
3.00e-03
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
Flux
-0.002
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
0.002
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009117167-04
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
-2.50e-03
Flux
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
Phase
Odd
Even
Model Fit

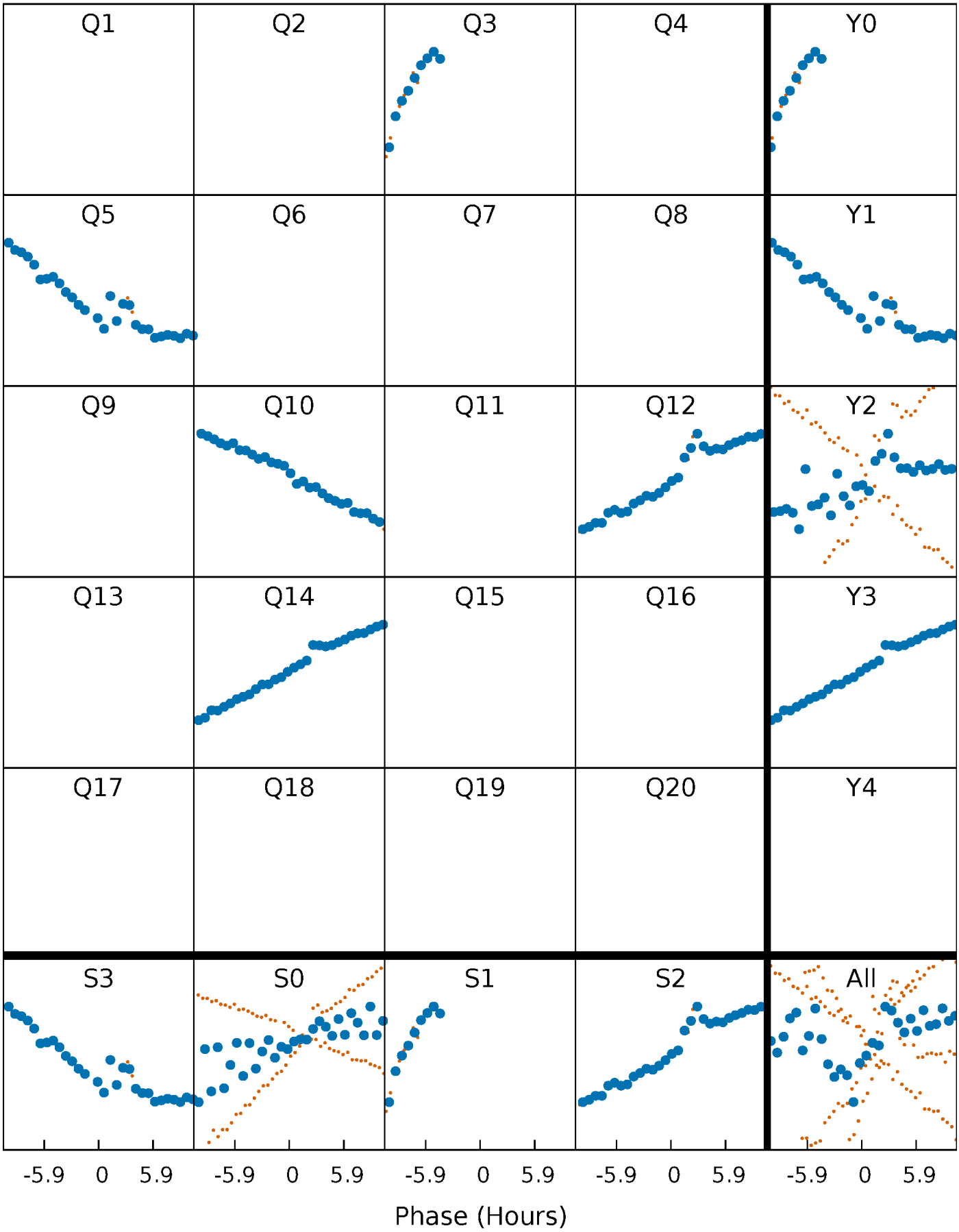
Non-Whitened Vs. Whitened Light Curve





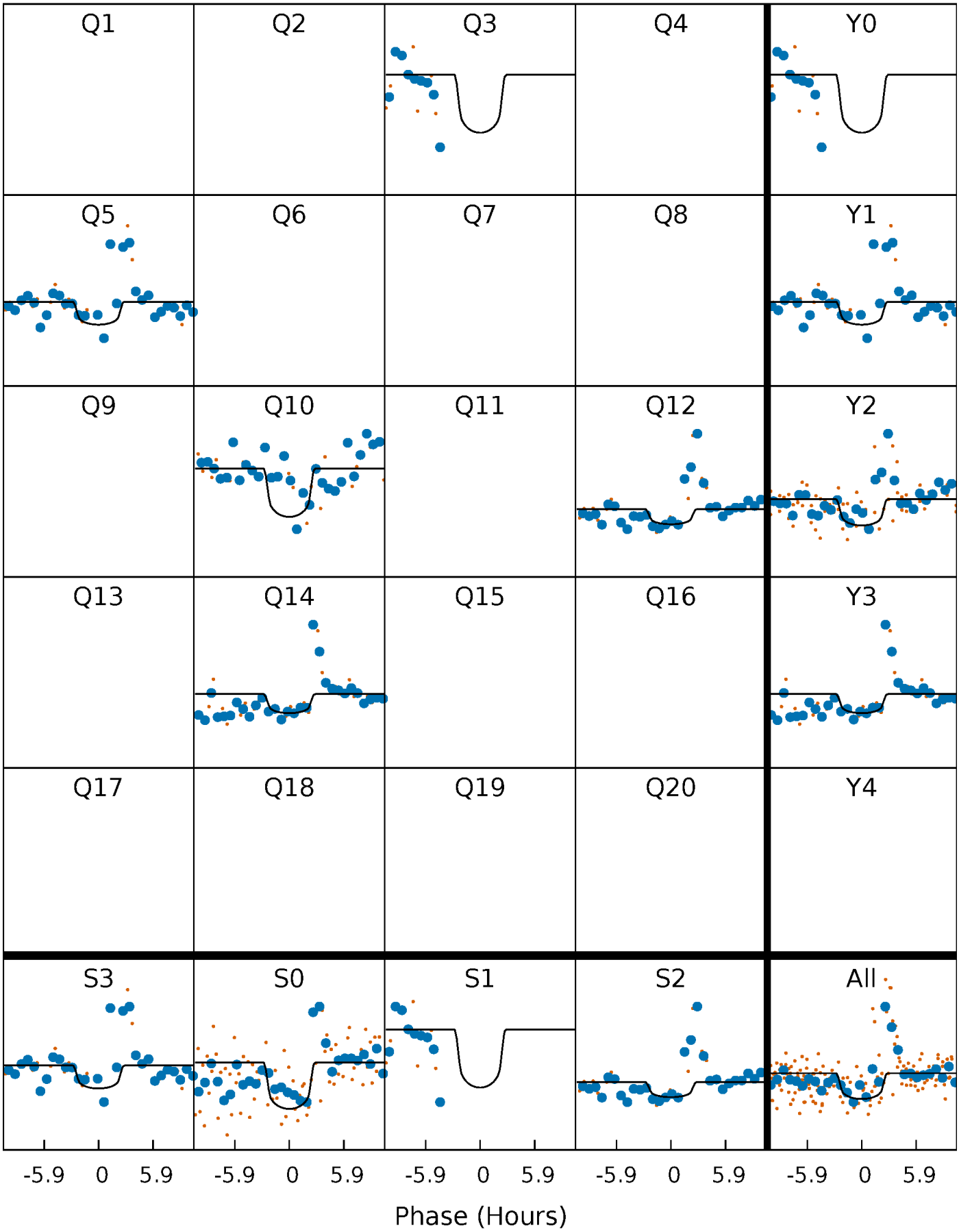
PDC Quarter-Phased Transit Curves

TCE 009117167-04 P=206.130332 Days T_0=321.621468 (BKJD)



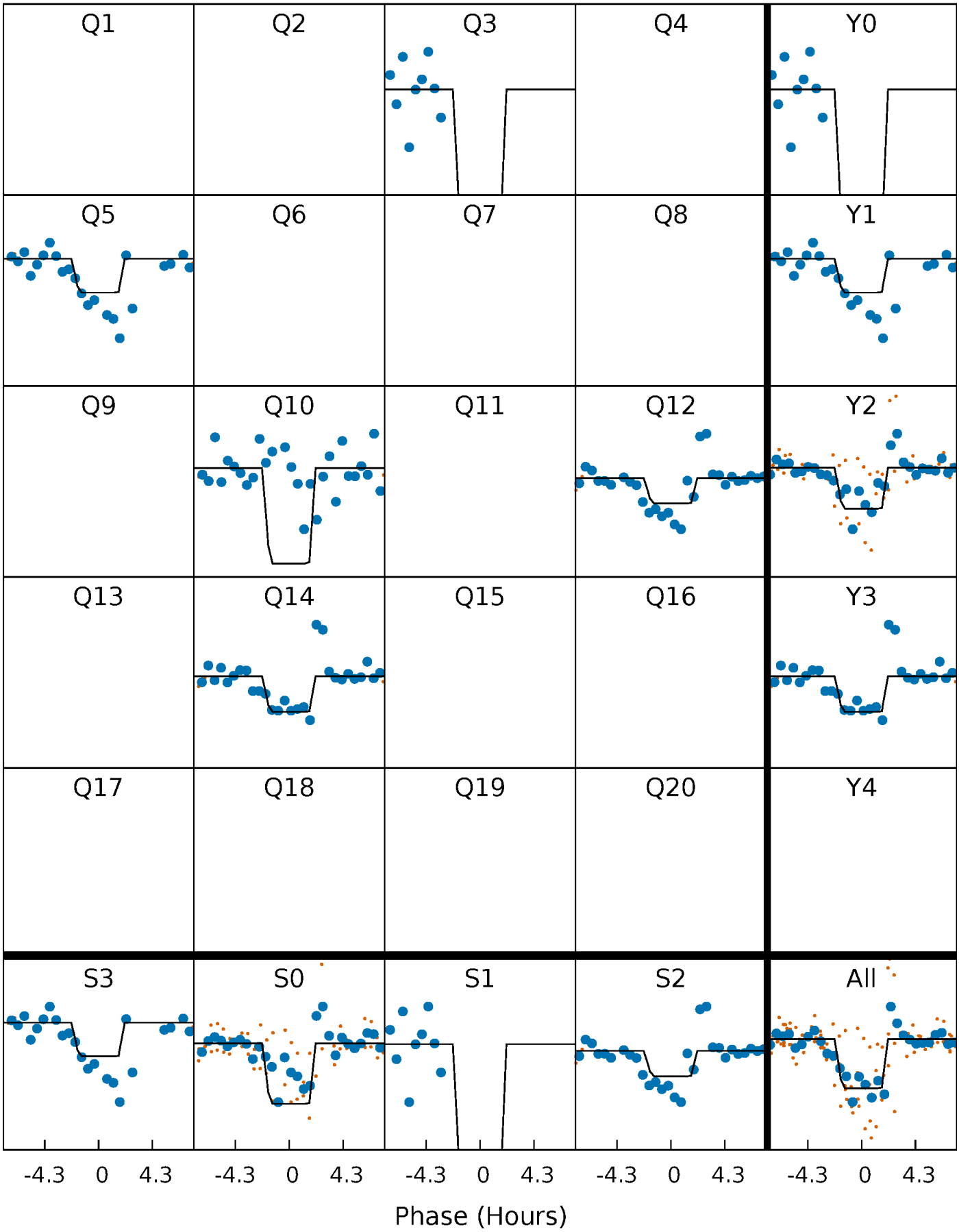
DV Quarter-Phased Transit Curves

TCE 009117167-04 P=206.130332 Days T_0=321.621468 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

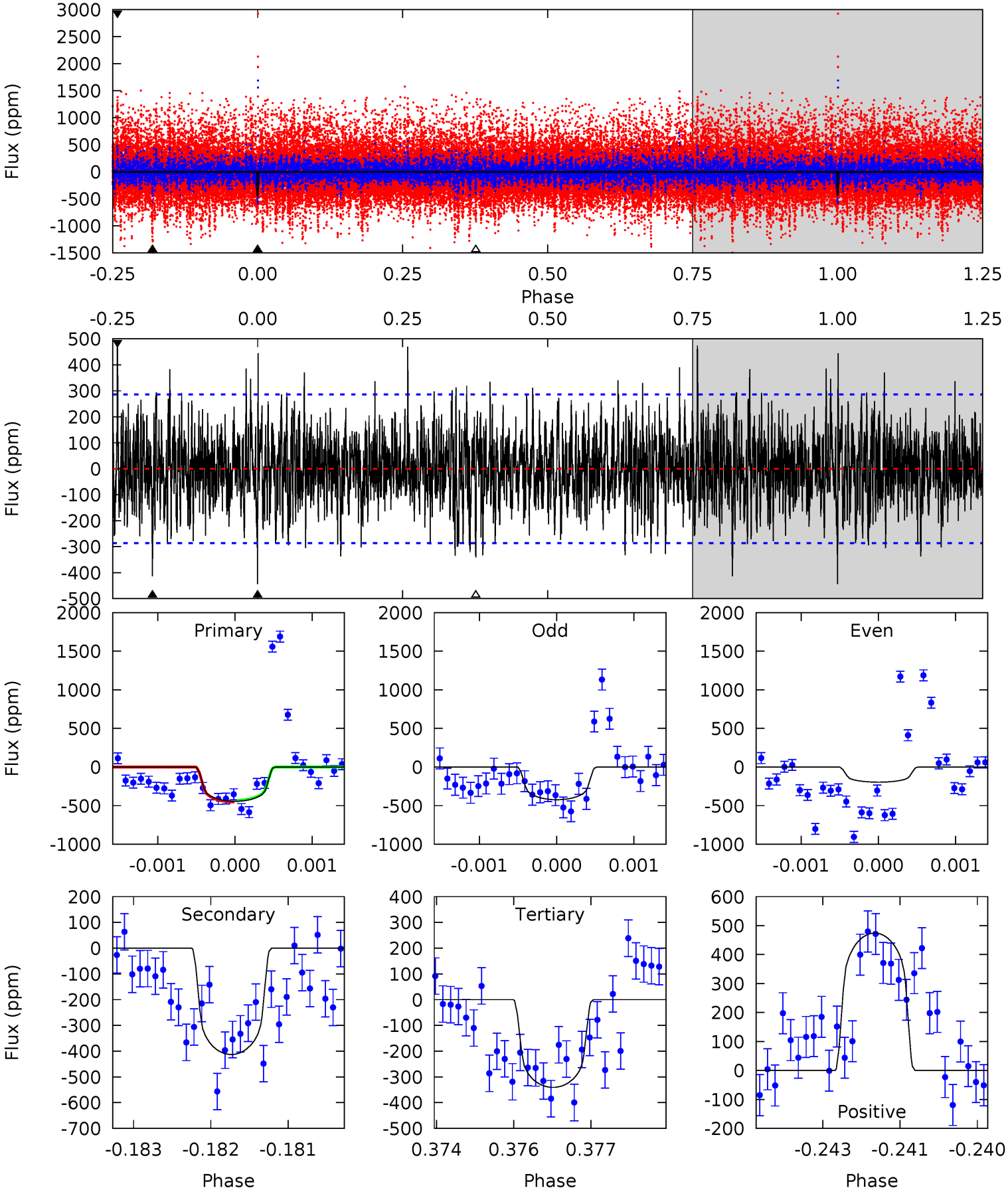
TCE 009117167-04 P=206.145187 Days T_0=321.567669 (BKJD)



DV Model-Shift Uniqueness Test

009117167-04, P = 206.130332 Days, E = 115.491136 Days

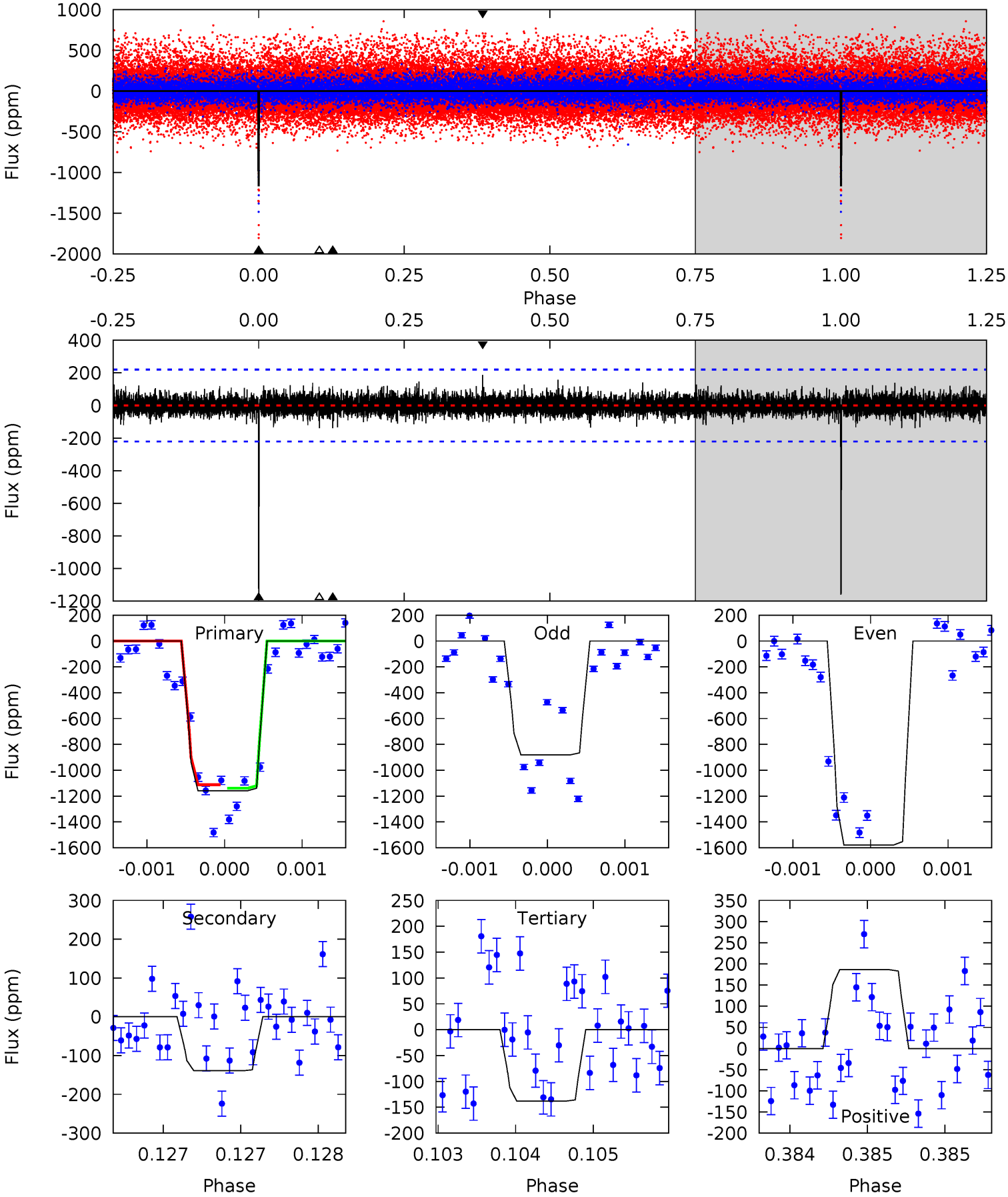
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.43	7.84	6.47	9.00	5.43	3.26	2.09	1.96	-0.58	1.37	-1.16	1.89	1.25	0.52	0.20



Alt Model-Shift Uniqueness Test

009117167-04, P = 206.145187 Days, E = 115.422482 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.8	3.46	3.43	4.63	5.49	3.36	0.85	25.4	24.2	0.03	-1.17	7.92	0.85	0.14	0.33



Stellar Parameters For KIC 009117167

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	4218^{+115}_{-140}	$4.691^{+0.063}_{-0.032}$	$-0.600^{+0.300}_{-0.300}$	$0.547^{+0.049}_{-0.059}$	$0.535^{+0.056}_{-0.046}$	$4.609^{+1.422}_{-0.621}$
	+3%/-3%	+1%/-1%	+50%/-50%	+9%/-11%	+10%/-9%	+31%/-13%
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 009117167-04 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-413±53	$1.57^{+0.98}_{-0.95}$	256^{+9}_{-9}	3850^{+1688}_{-593}	$28695^{+150391}_{-17948}$
Alt.	-139±40	$1.87^{+0.98}_{-0.97}$	257^{+9}_{-10}	3070^{+757}_{-375}	6837^{+21258}_{-4088}

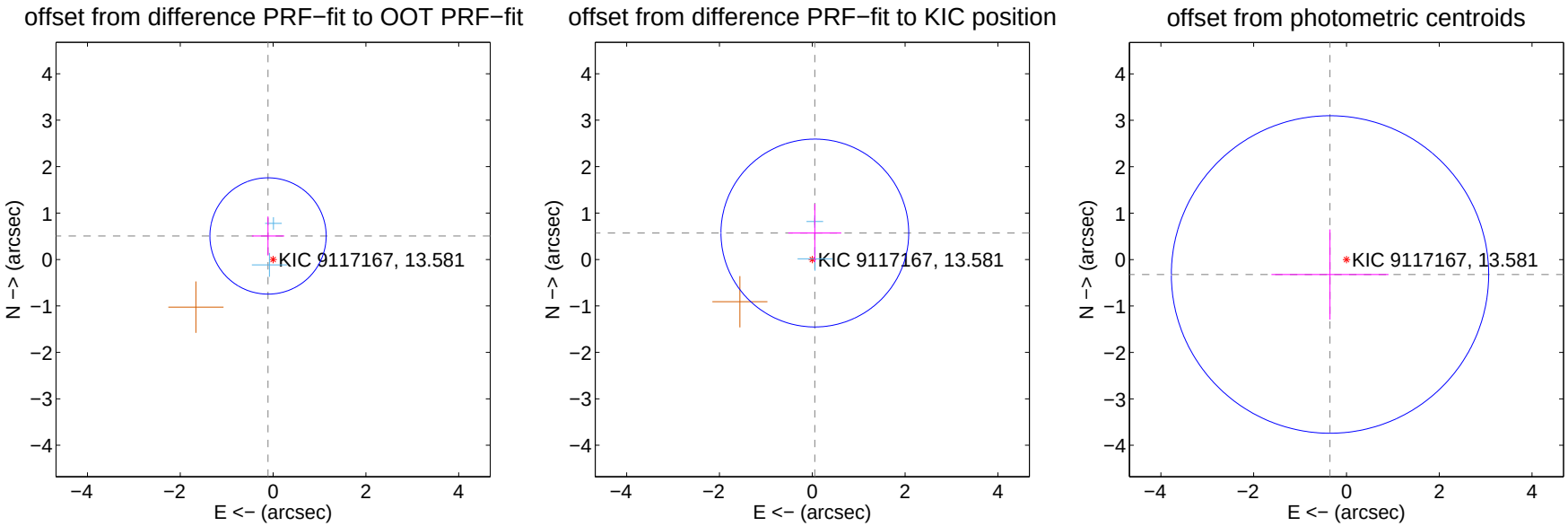
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

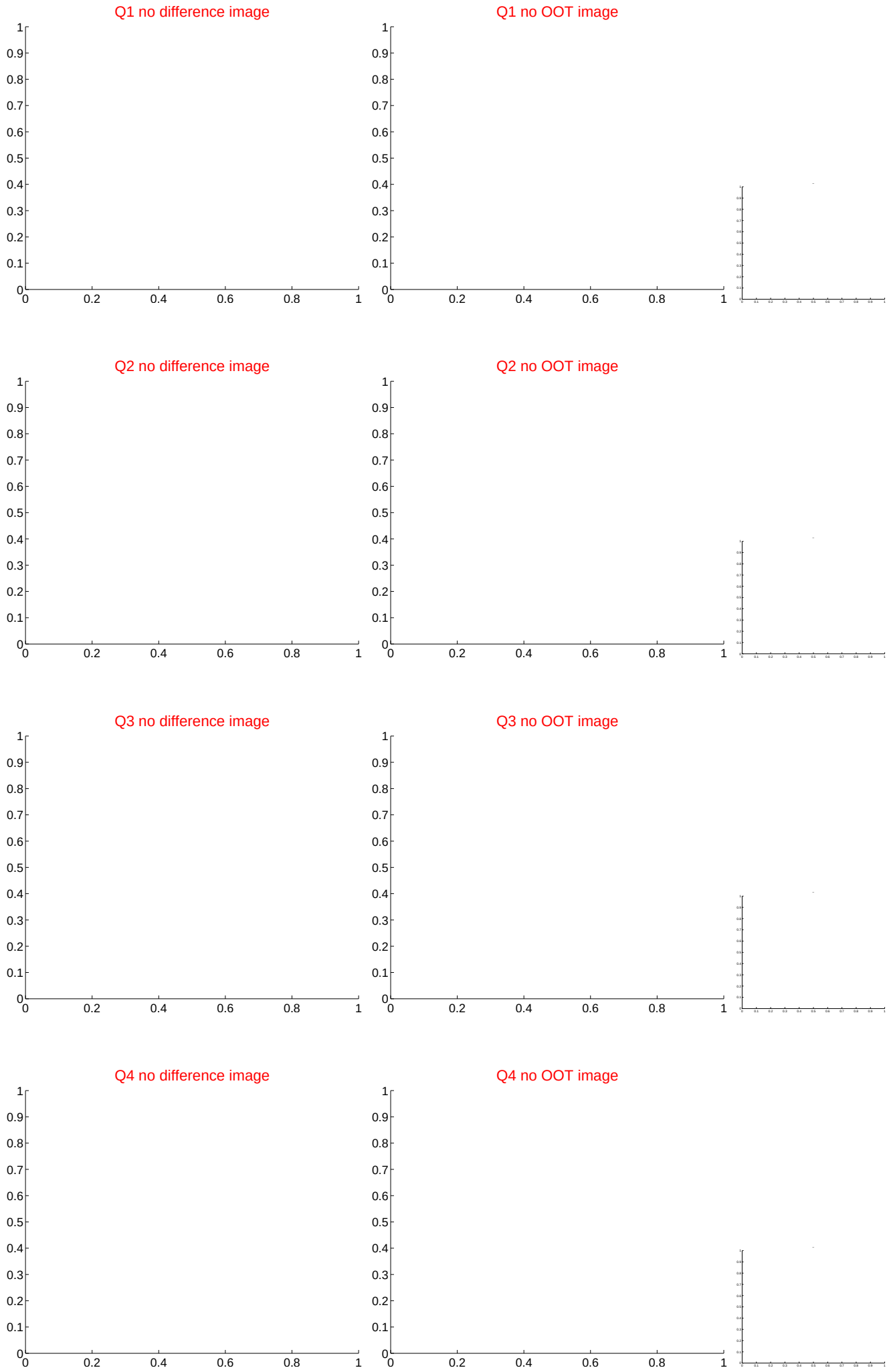
Supplemental centroid analysis for 009117167-04. Kepler magnitude: 13.58. Transit SNR 5.49
There are 2 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.518 ± 0.417	1.24	0.109 ± 0.349	0.507 ± 0.420
PRF-fit source offset from KIC position	0.573 ± 0.674	0.85	-0.055 ± 0.571	0.570 ± 0.626
photometric centroid source offset	0.48 ± 1.14	0.42	0.35 ± 1.26	-0.32 ± 0.97

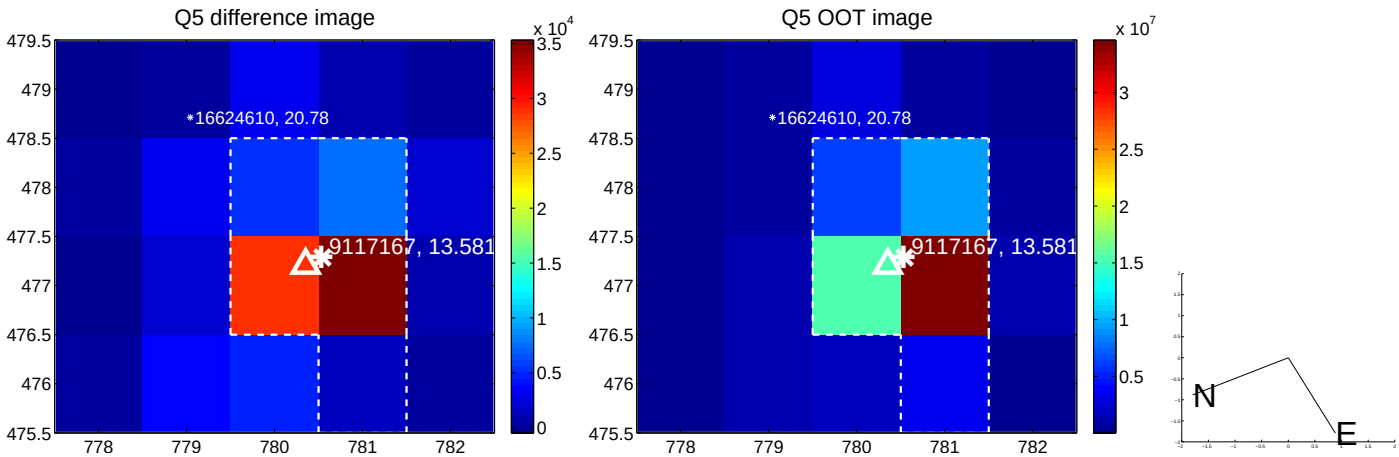


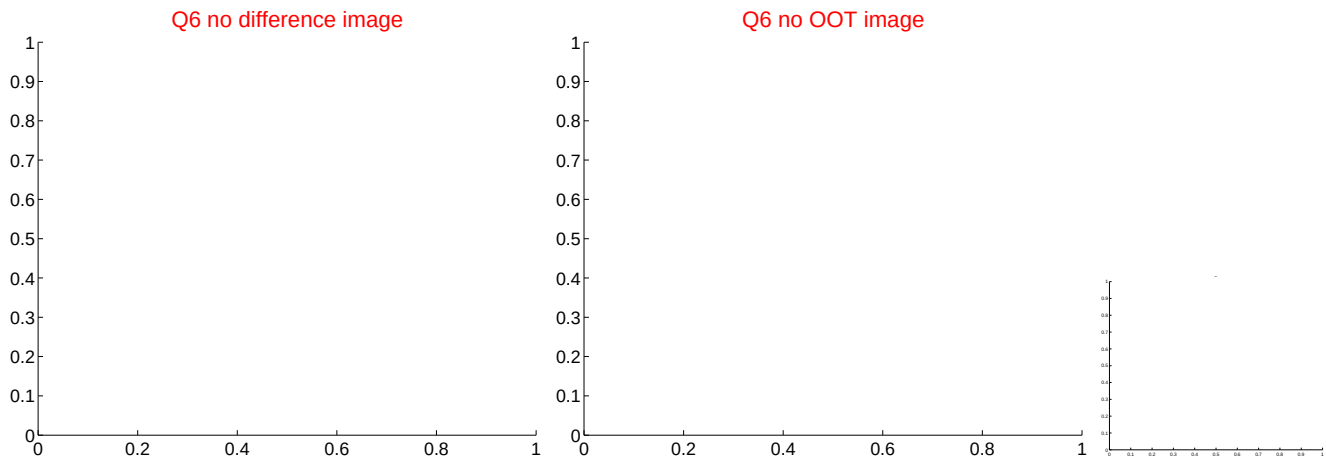
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

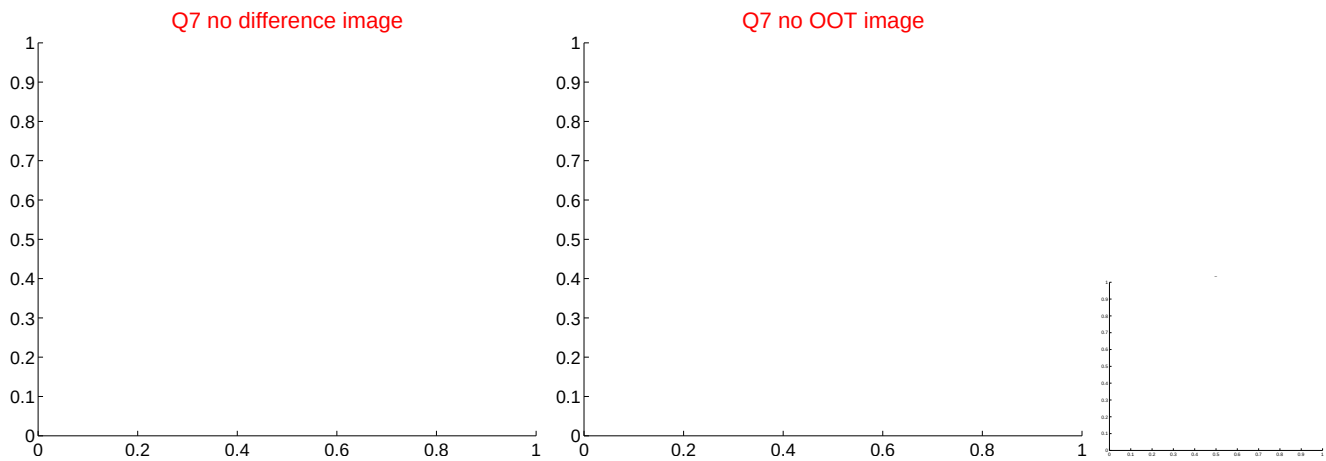
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

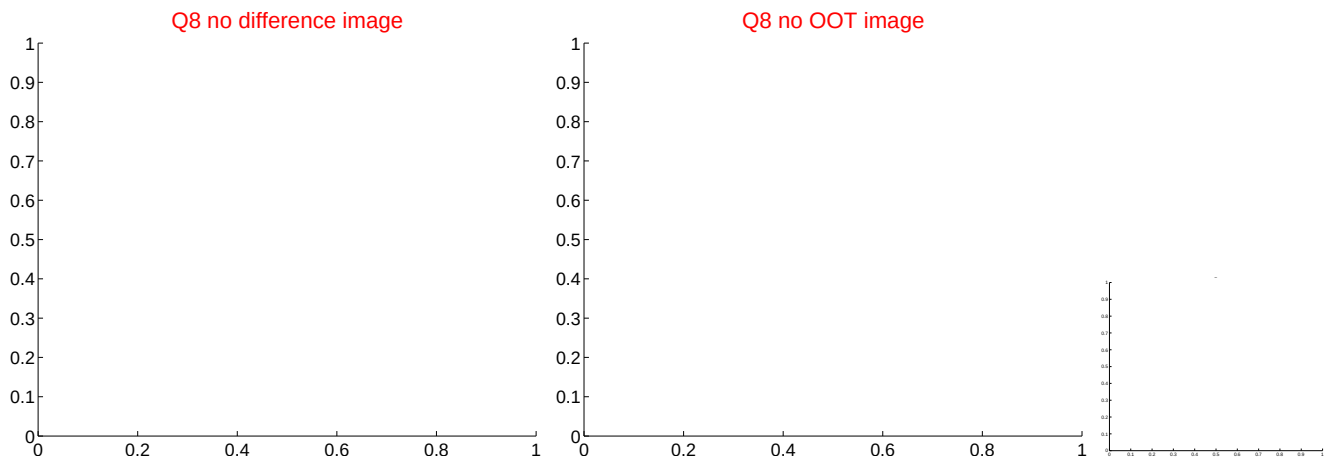


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

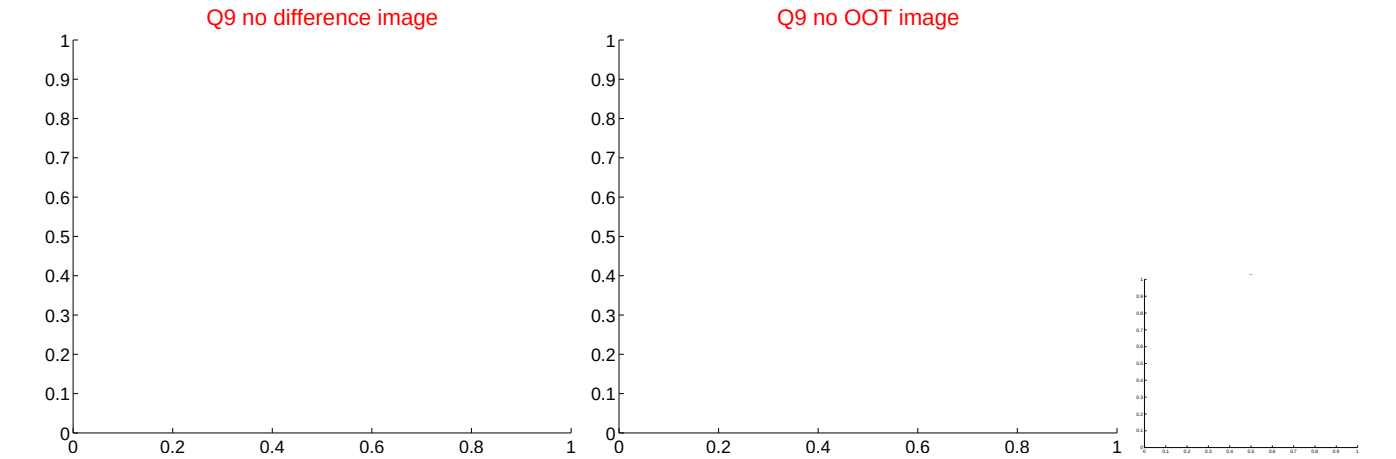


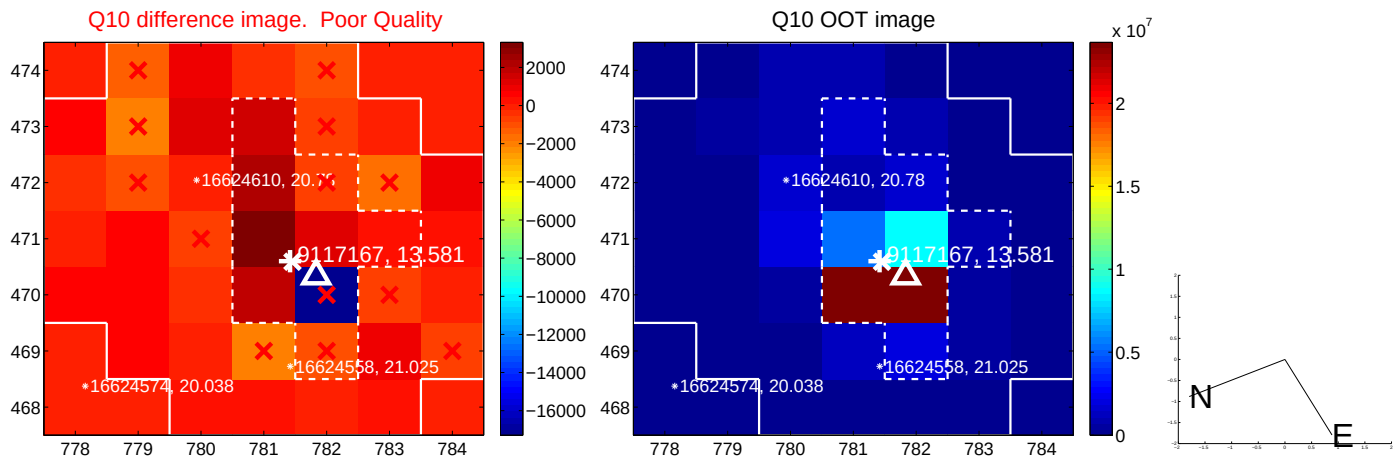


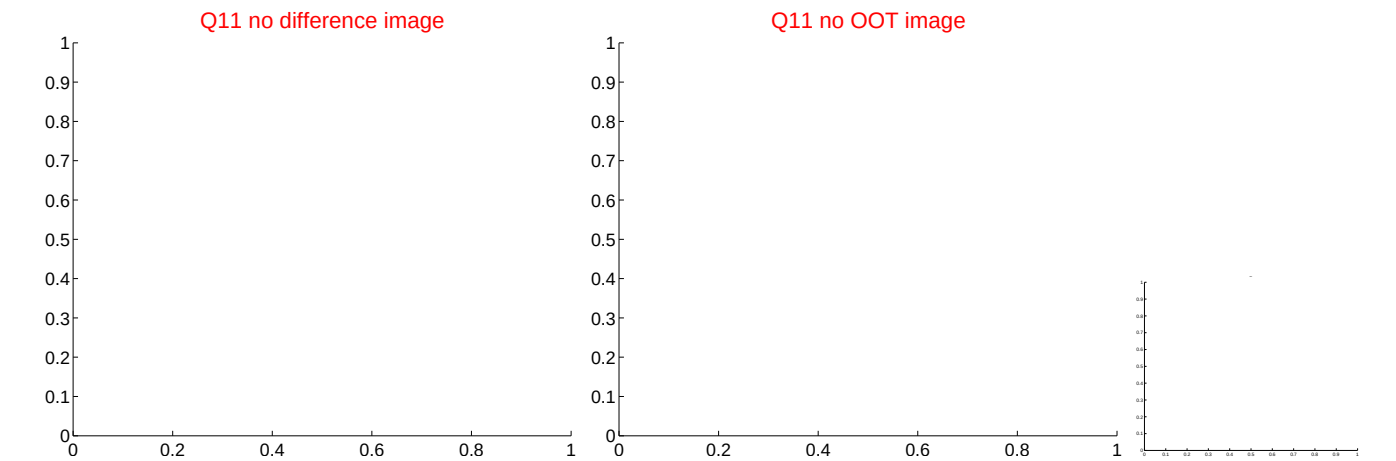


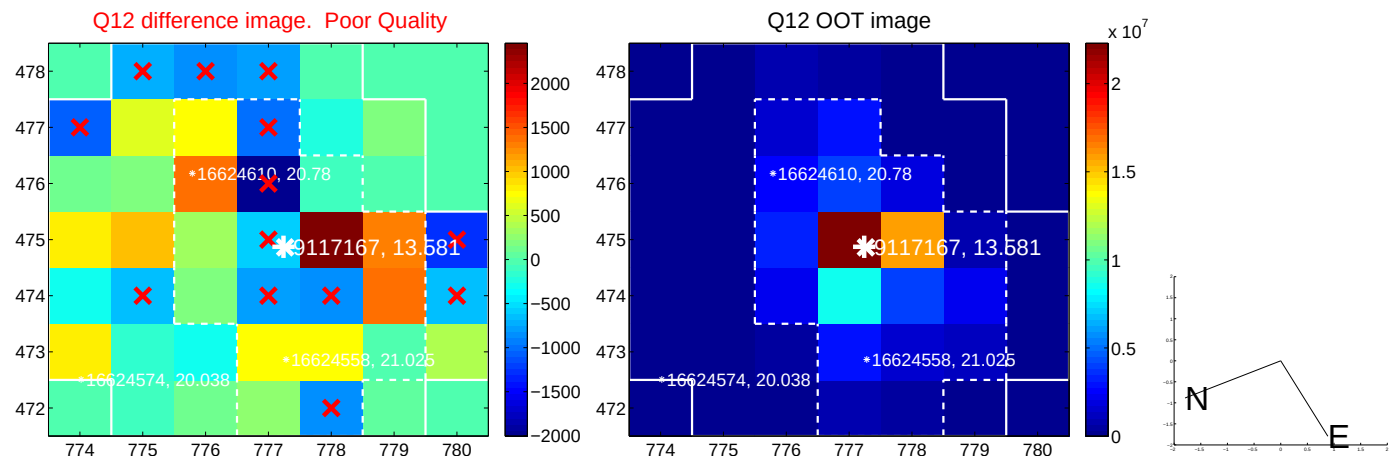


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

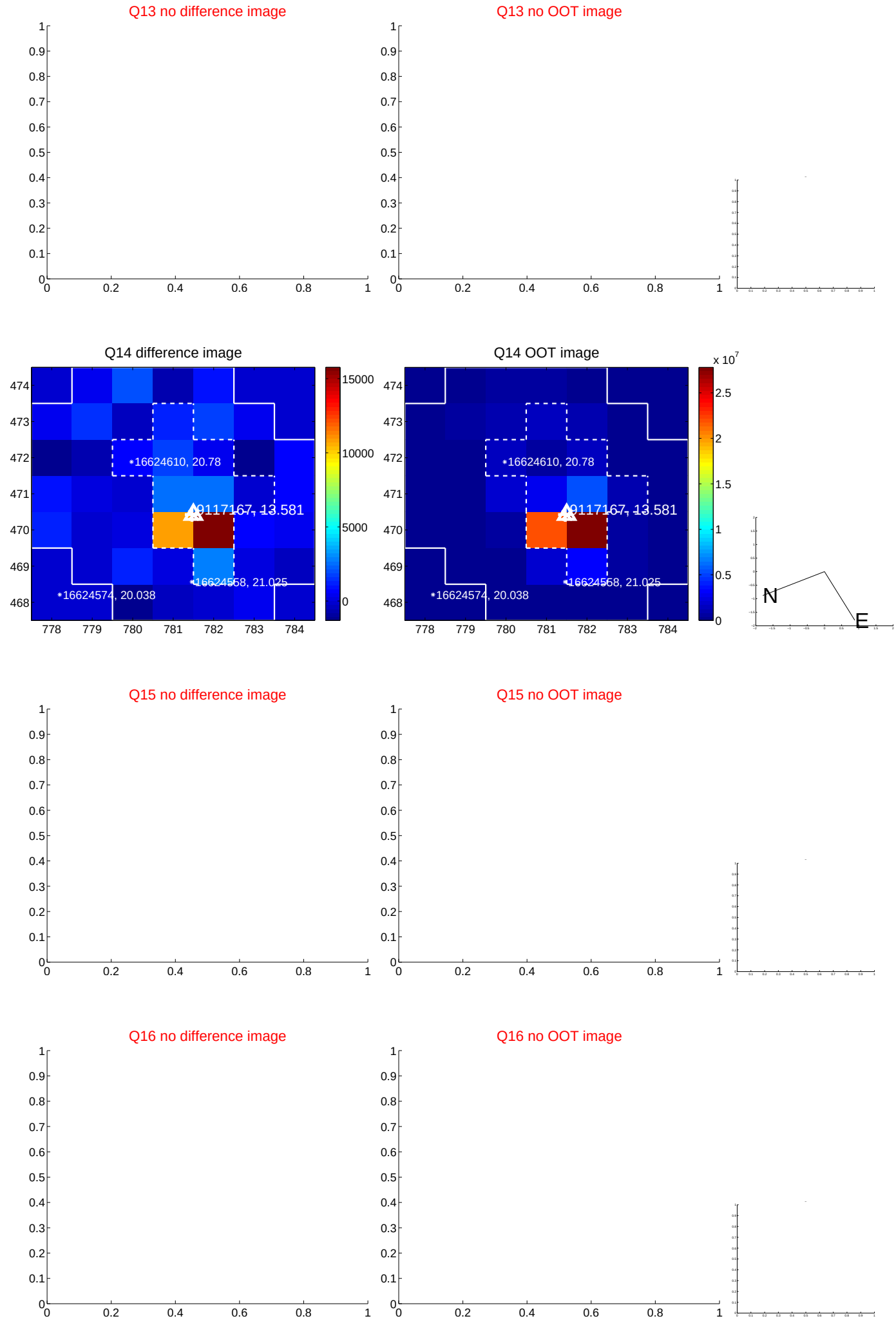




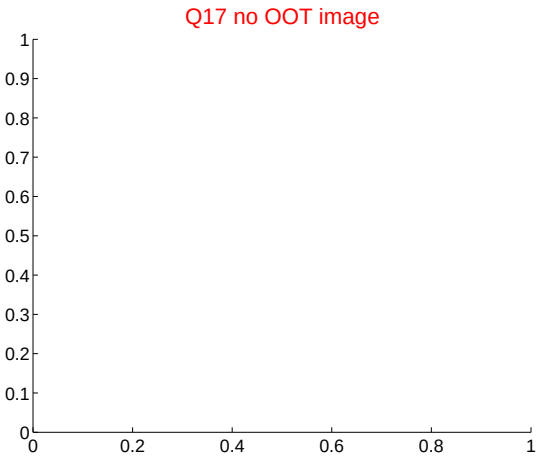


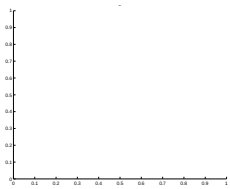


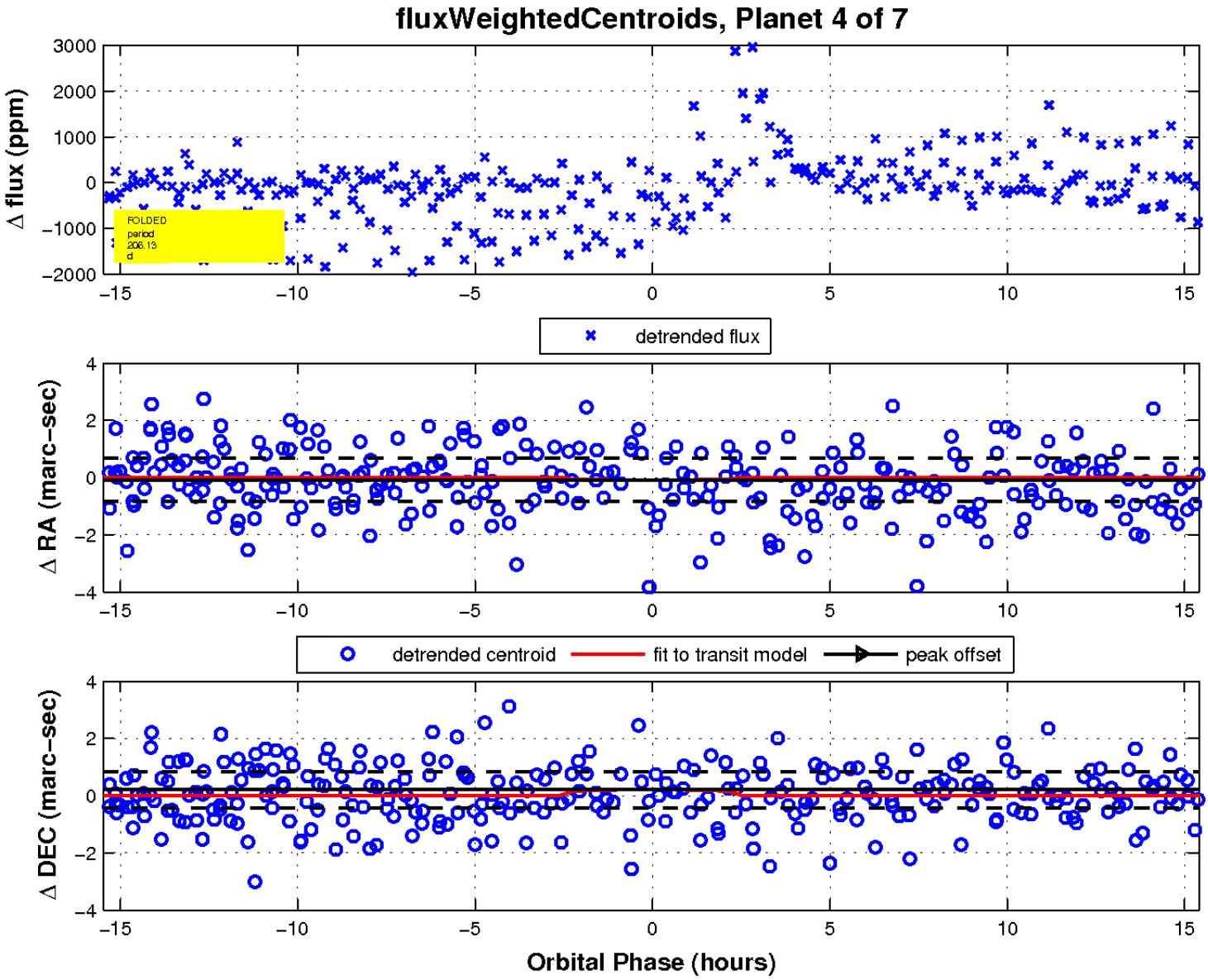
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



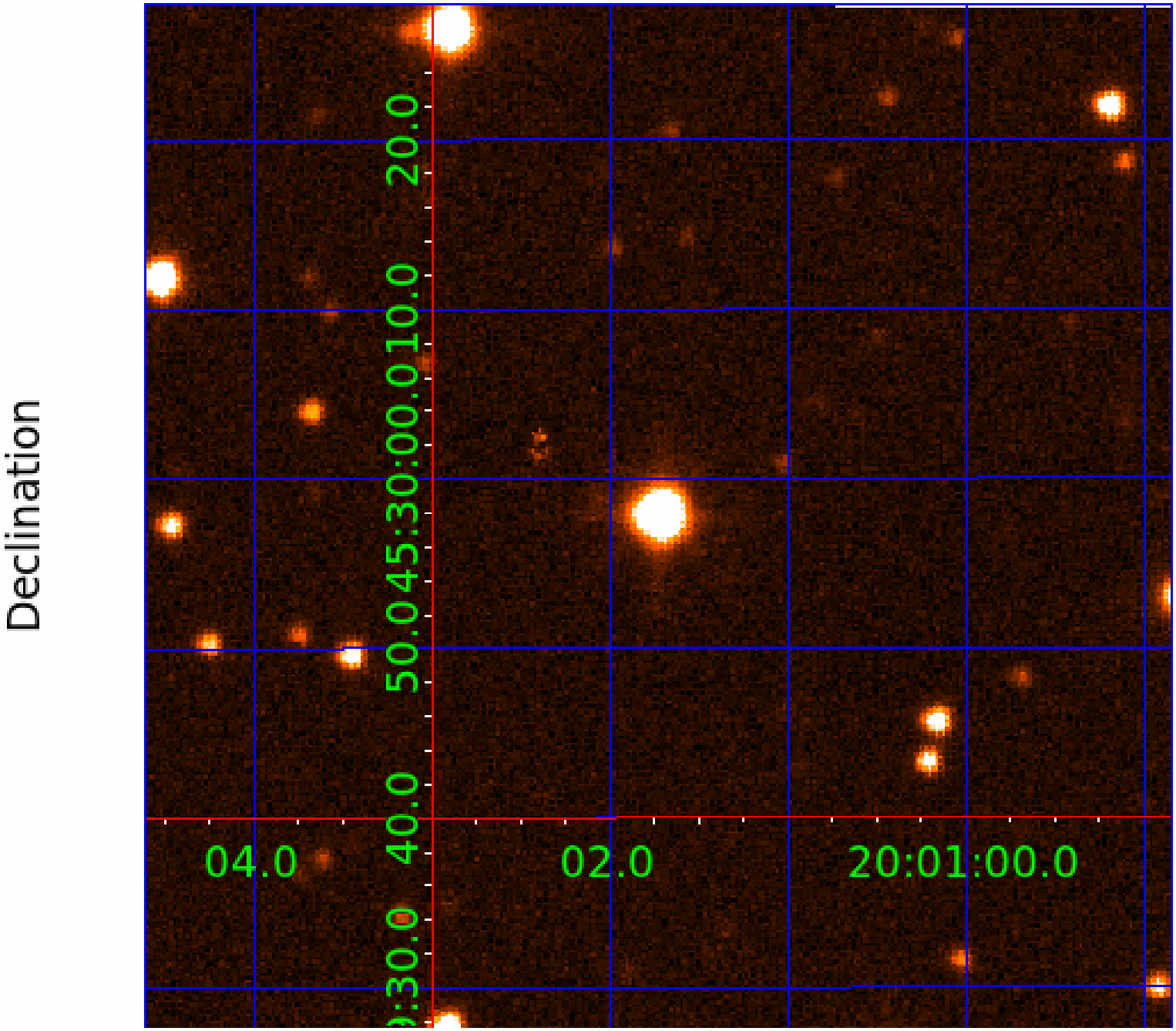
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image



KIC 009117167

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 ($S_\oplus$)
009117167-02	OBS	No	407.972280	144.952659	753.3	4.288	13.4	7.4	0.55	4218	1.60	0.11
009117167-03	OBS	No	534.759249	451.586081	1035.9	10.733	12.1	7.6	0.55	4218	1.78	0.08
009117167-04	OBS	No	206.130332	321.621468	585.7	5.165	12.3	5.5	0.55	4218	1.48	0.28
009117167-05	OBS	No	453.446247	186.883113	614.2	5.138	9.7	5.9	0.55	4218	1.50	0.10
009117167-06	OBS	No	389.337133	453.257389	974.8	9.617	11.6	6.8	0.55	4218	2.23	0.12
009117167-07	OBS	No	431.706633	457.358164	561.4	4.500	11.8	-1.0	0.55	4218	1.27	0.10

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009117167-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV
009117167-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009117167-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009117167-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

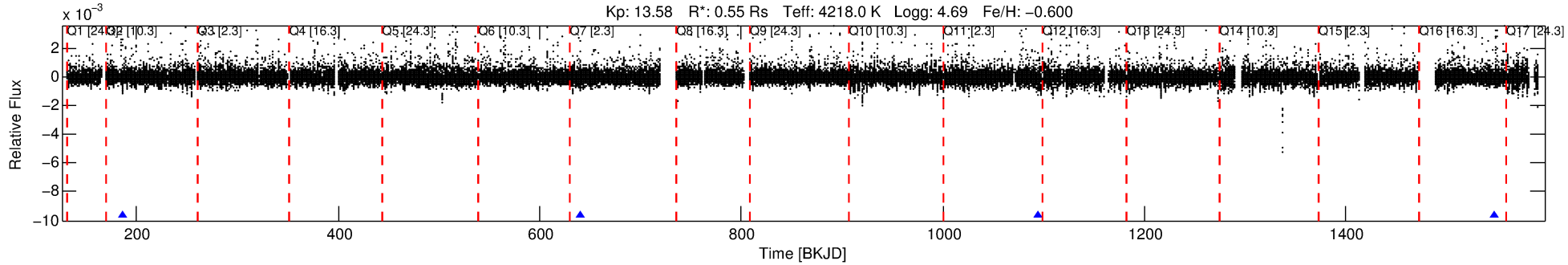
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

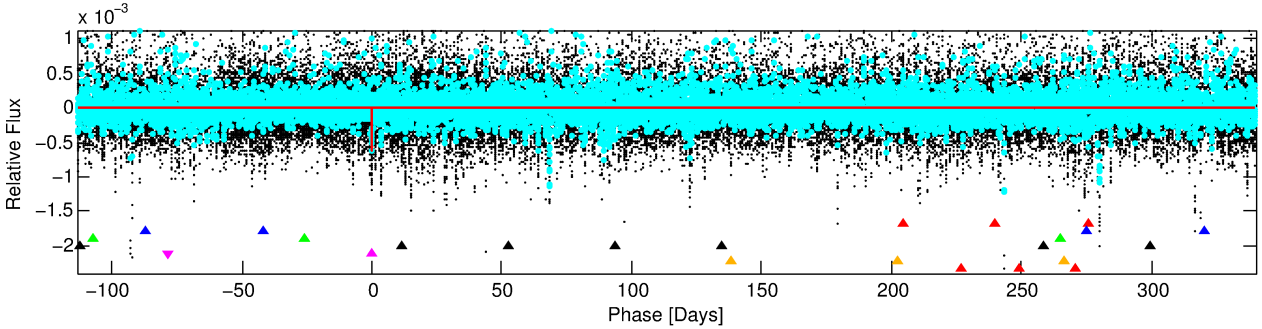
Ephemeris Match Information For 009117167-05

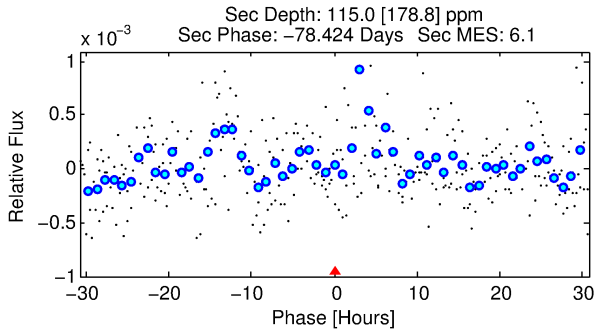
No Significant Match Found

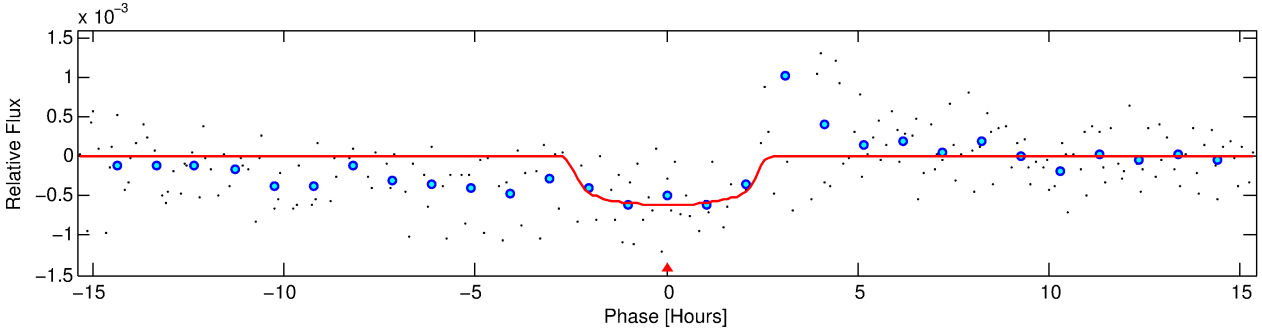
DV One-Page Summary

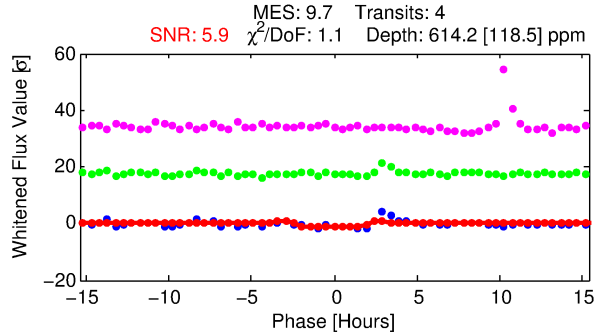
KIC: 9117167 Candidate: 5 of 7 Period: 453.446 d

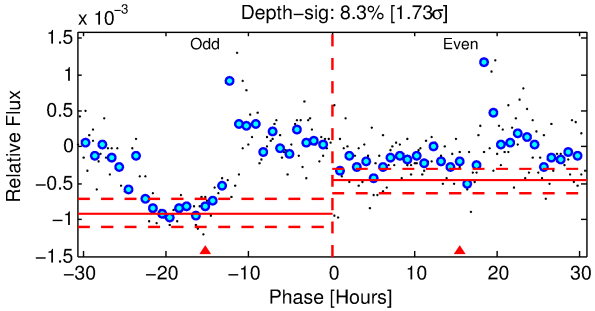


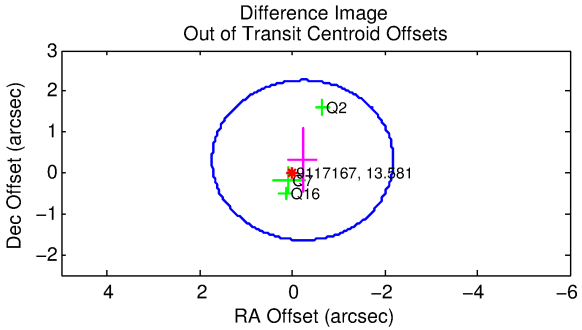












DV Fit Results:

Period = 453.44625 [0.00519] d
Epoch = 186.8831 [0.0092] BKJD
Rp/R* = 0.0251 [0.0148]
a/R* = 444.67 [1064.43]
b = 0.78 [1.19]

Seff = 0.10 [0.02]
Teq = 142 [6] K
Rp = 1.50 [0.90] Re
a = 0.9384 [0.0813] AU

Ag = 24793.33 [48402.60] [0.51σ]
Teffp = 2756 [1346] K [1.94σ]

DV Diagnostic Results:

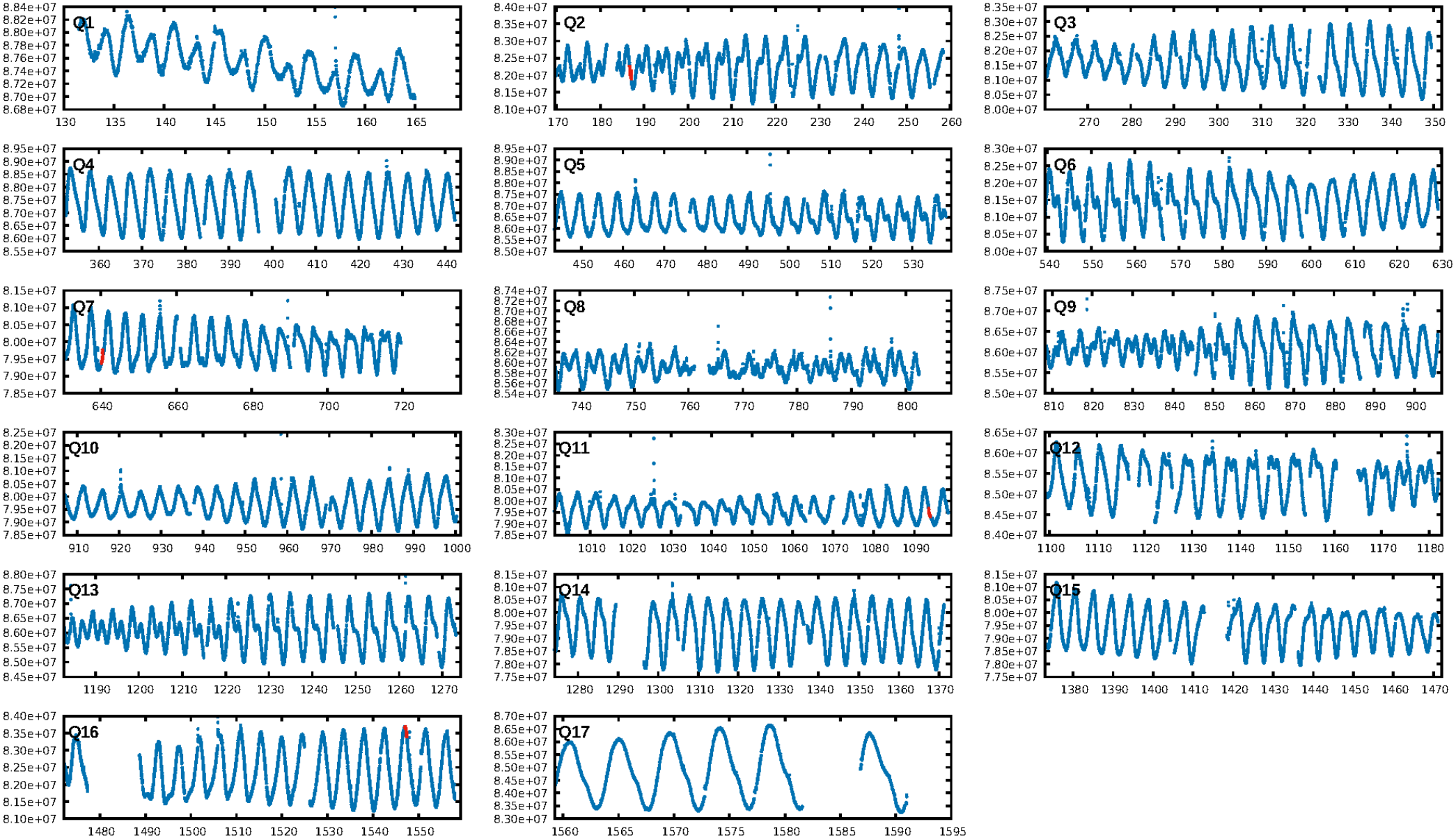
ShortPeriod−sig: 100.0% [76.39σ]
LongPeriod−sig: 100.0% [137.30σ]
ModelChiSquare2−sig: 0.6%
ModelChiSquareGof−sig: 86.3%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [4/4]
GhostDiagnostic−chr: 0.5343

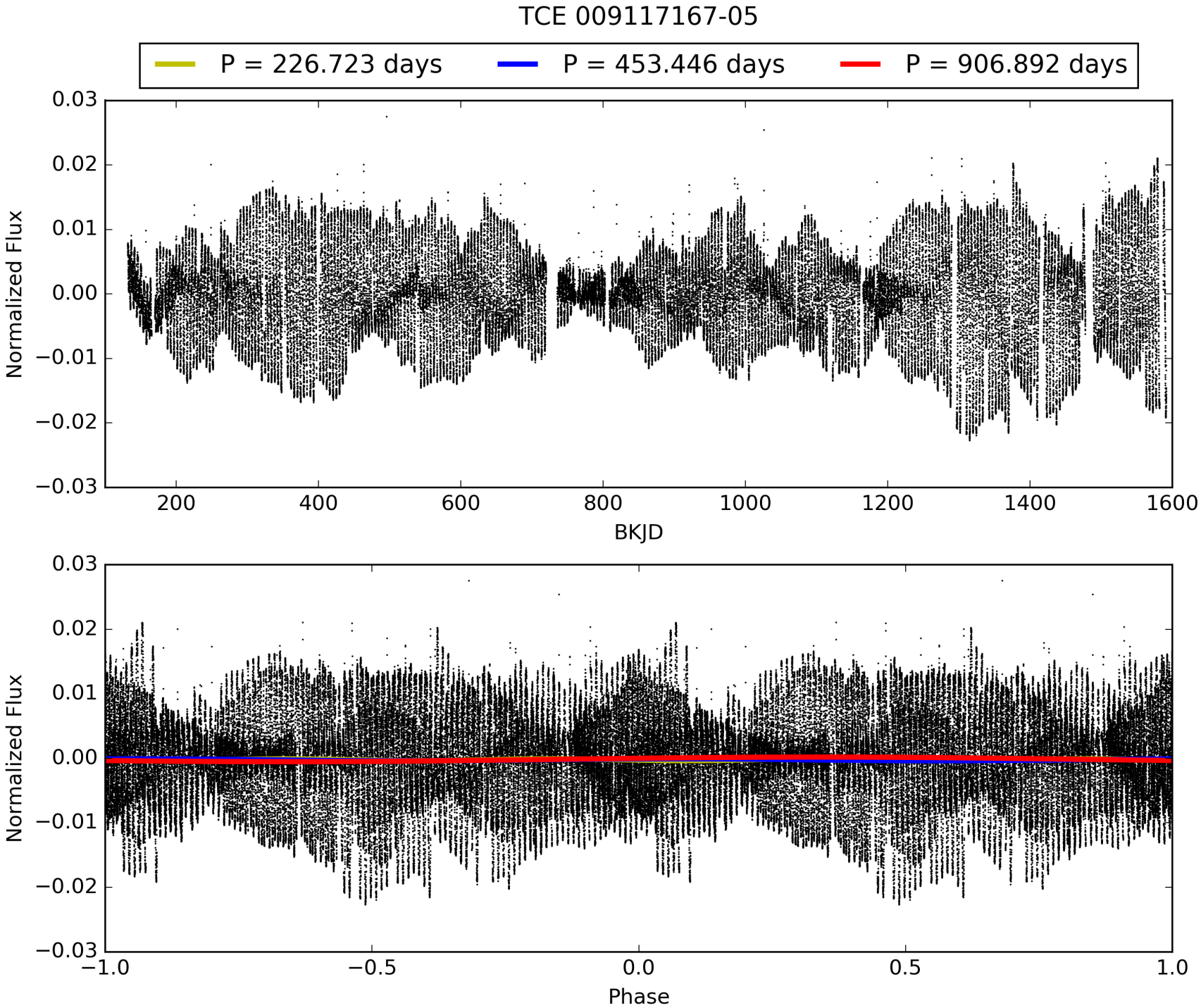
Centroid−sig: 95.9%
Centroid−so: 0.438 arcsec [0.38σ]
OotOffset−rm: 0.383 arcsec [0.59σ]
KicOffset−rm: 0.525 arcsec [0.83σ]
OotOffset−st: 1/1/1/0 [3]
KicOffset−st: 1/1/1/0 [3]
DiffImageQuality−fgm: 0.67 [2/3]
DiffImageOverlap−fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 13:37:18 Z

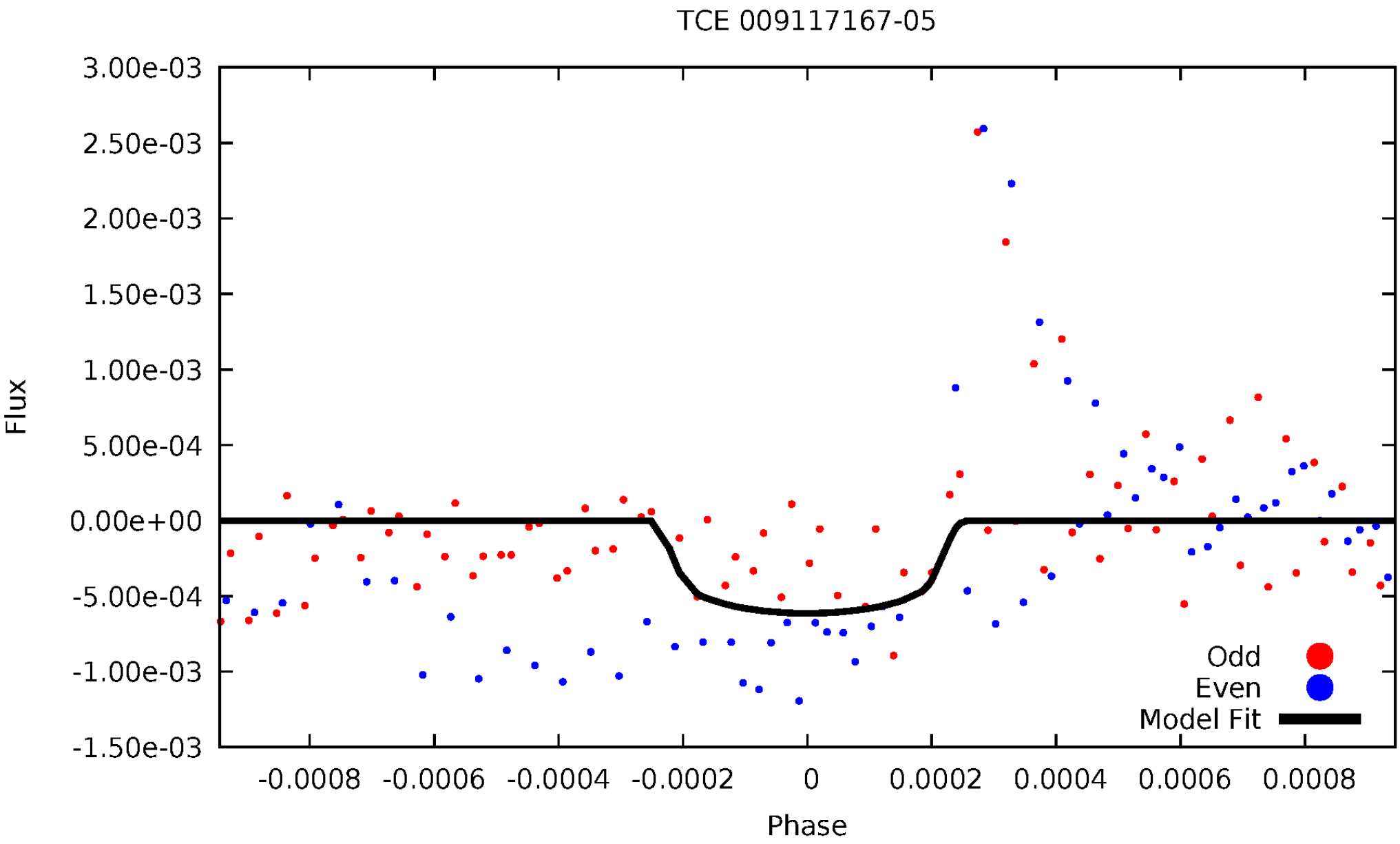
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009117167-05, PDC Light Curves

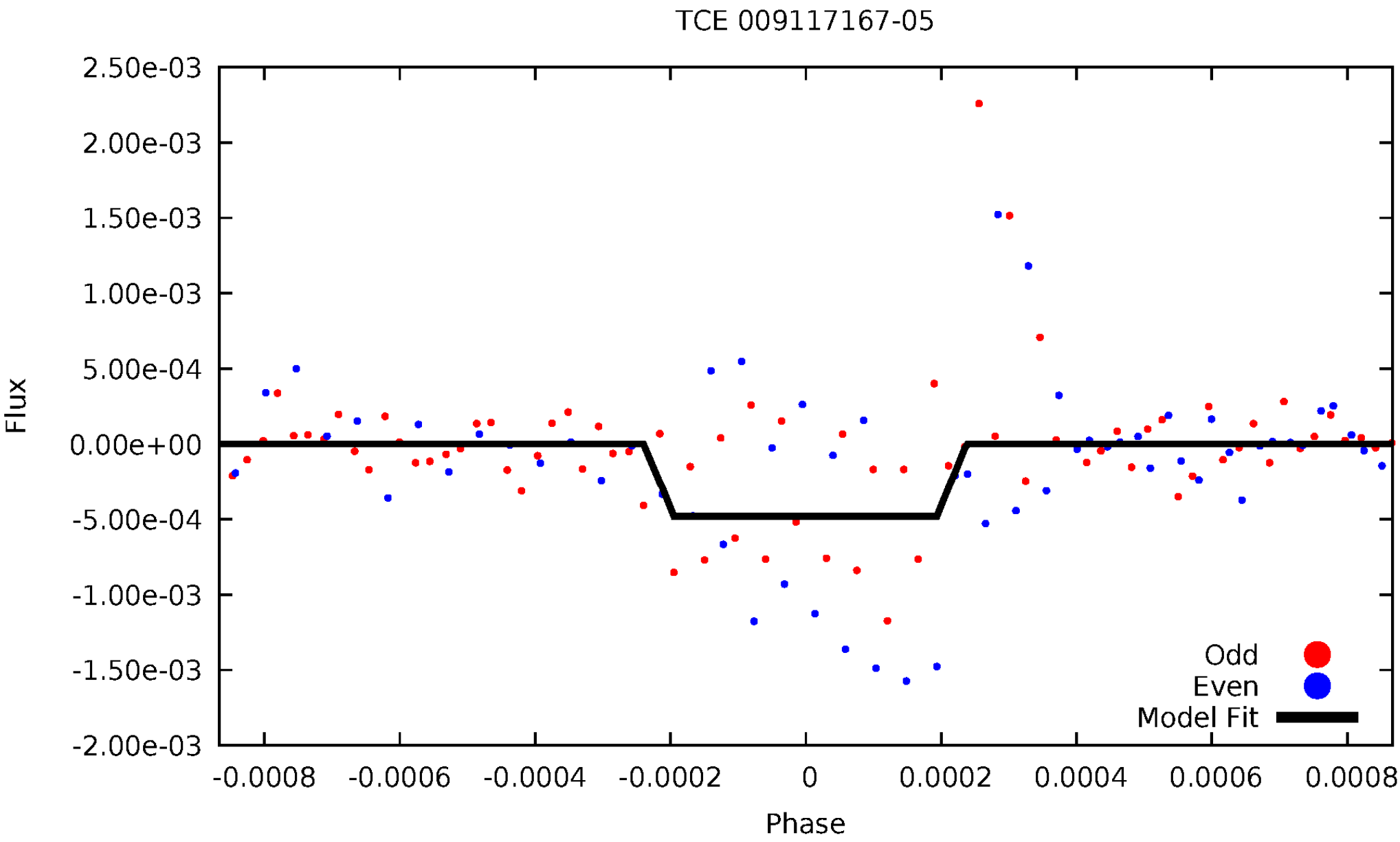



TCE 009117167-05
P = 226.723 days
P = 453.446 days
P = 906.892 days
Normalized Flux
BKJD
Normalized Flux
Phase

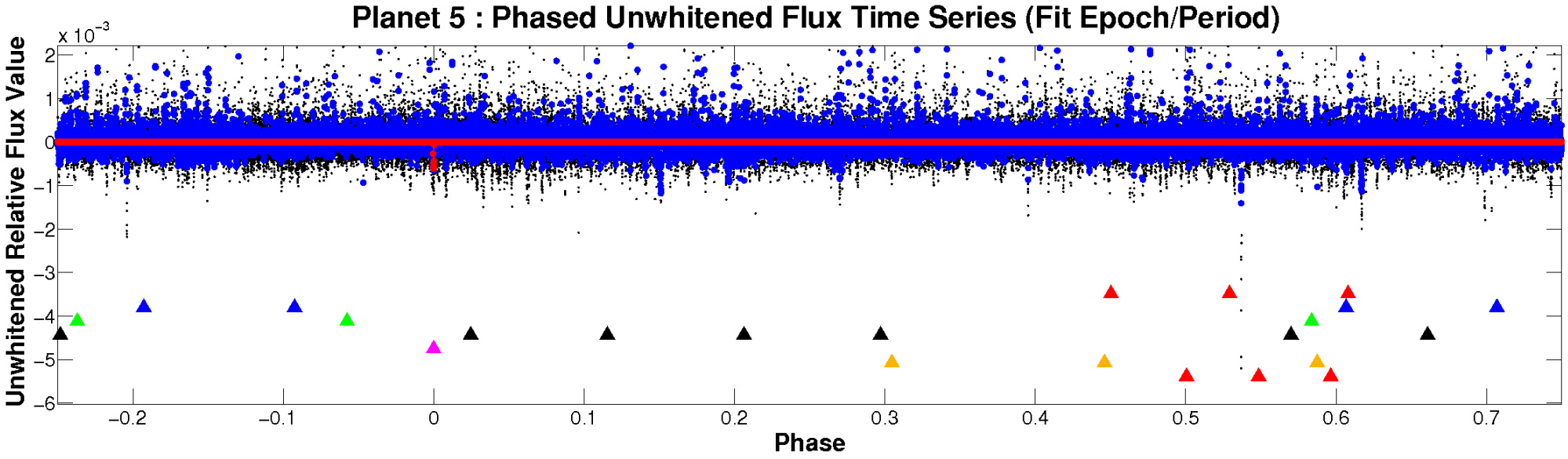
DV Odd/Even

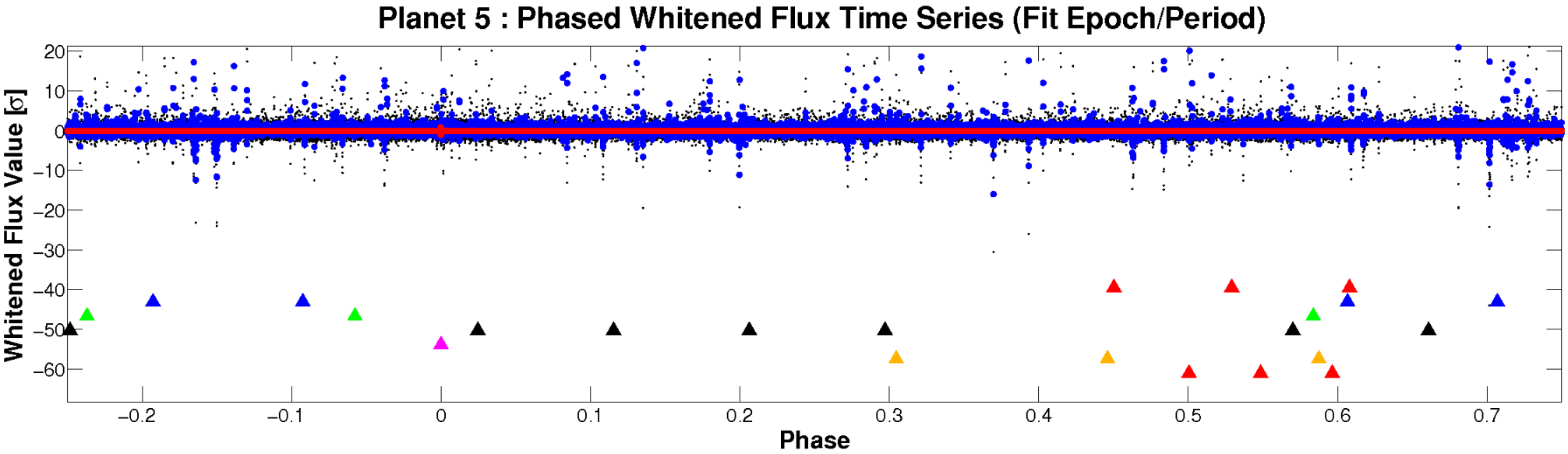

TCE 009117167-05
3.00e-03
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
Flux
-0.0008
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
0.0008
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009117167-05
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
Flux
-0.0008
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
0.0008
Phase
Odd
Even
Model Fit

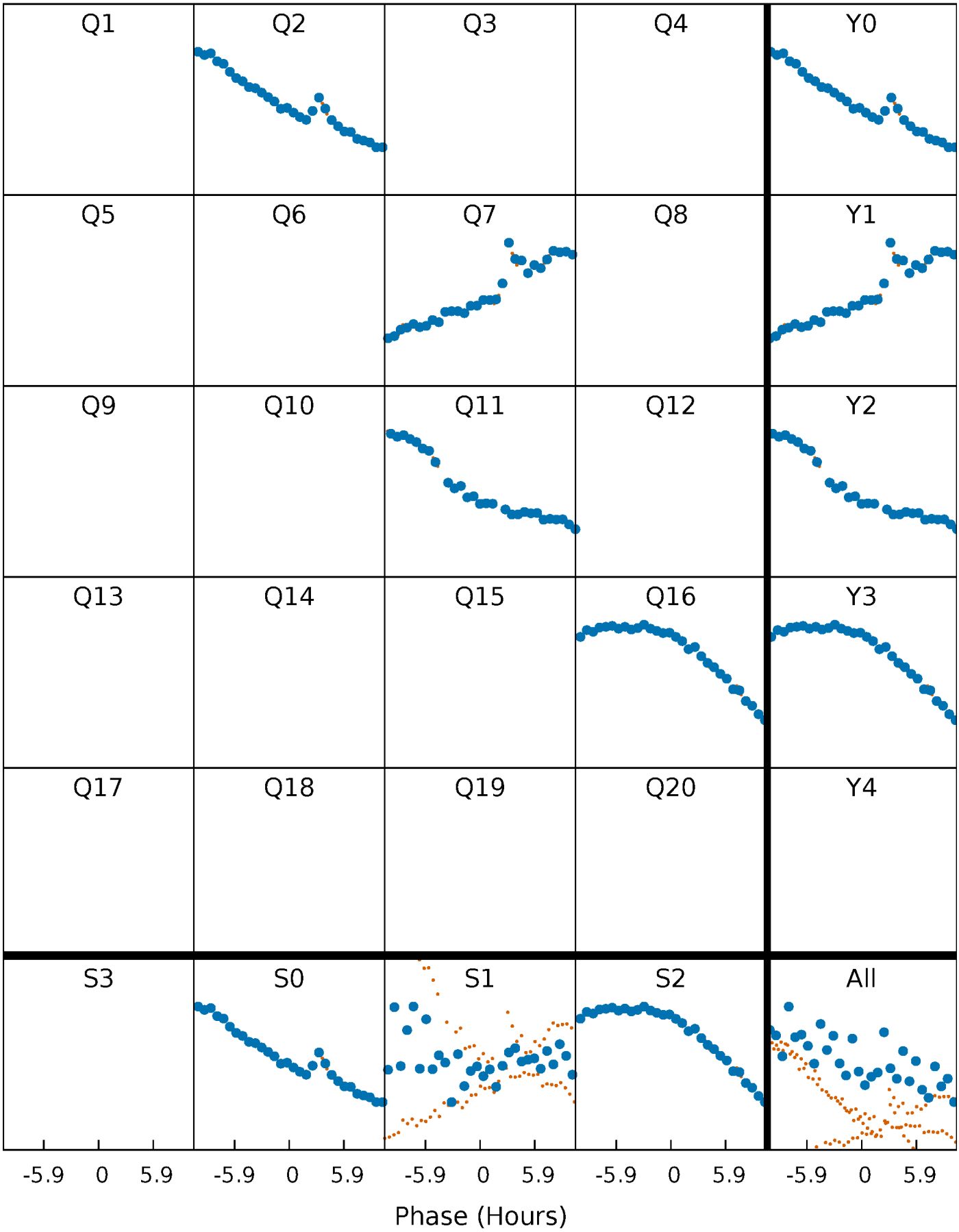
Non-Whitened Vs. Whitened Light Curve





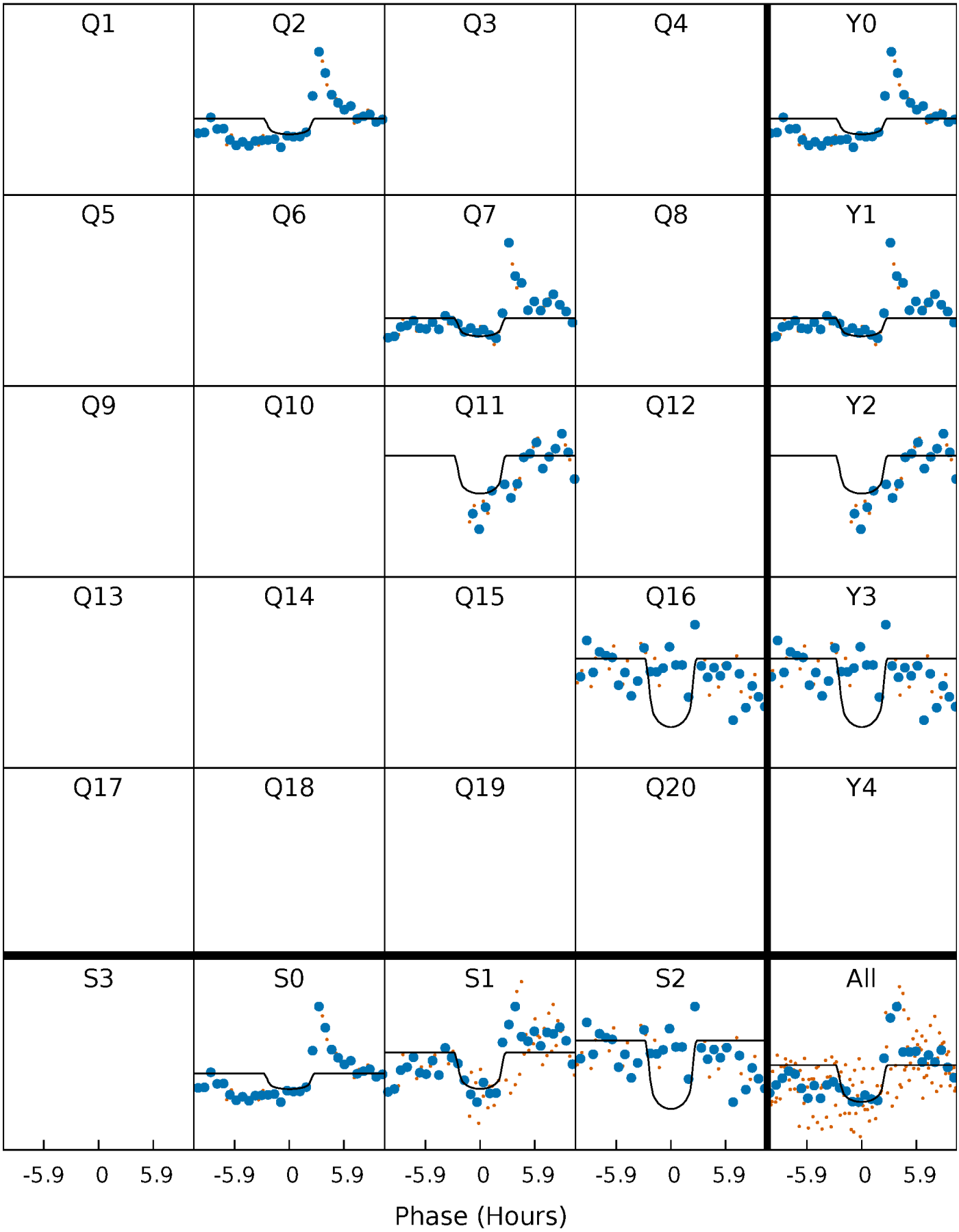
PDC Quarter-Phased Transit Curves

TCE 009117167-05 P=453.446248 Days T_0=186.883113 (BKJD)



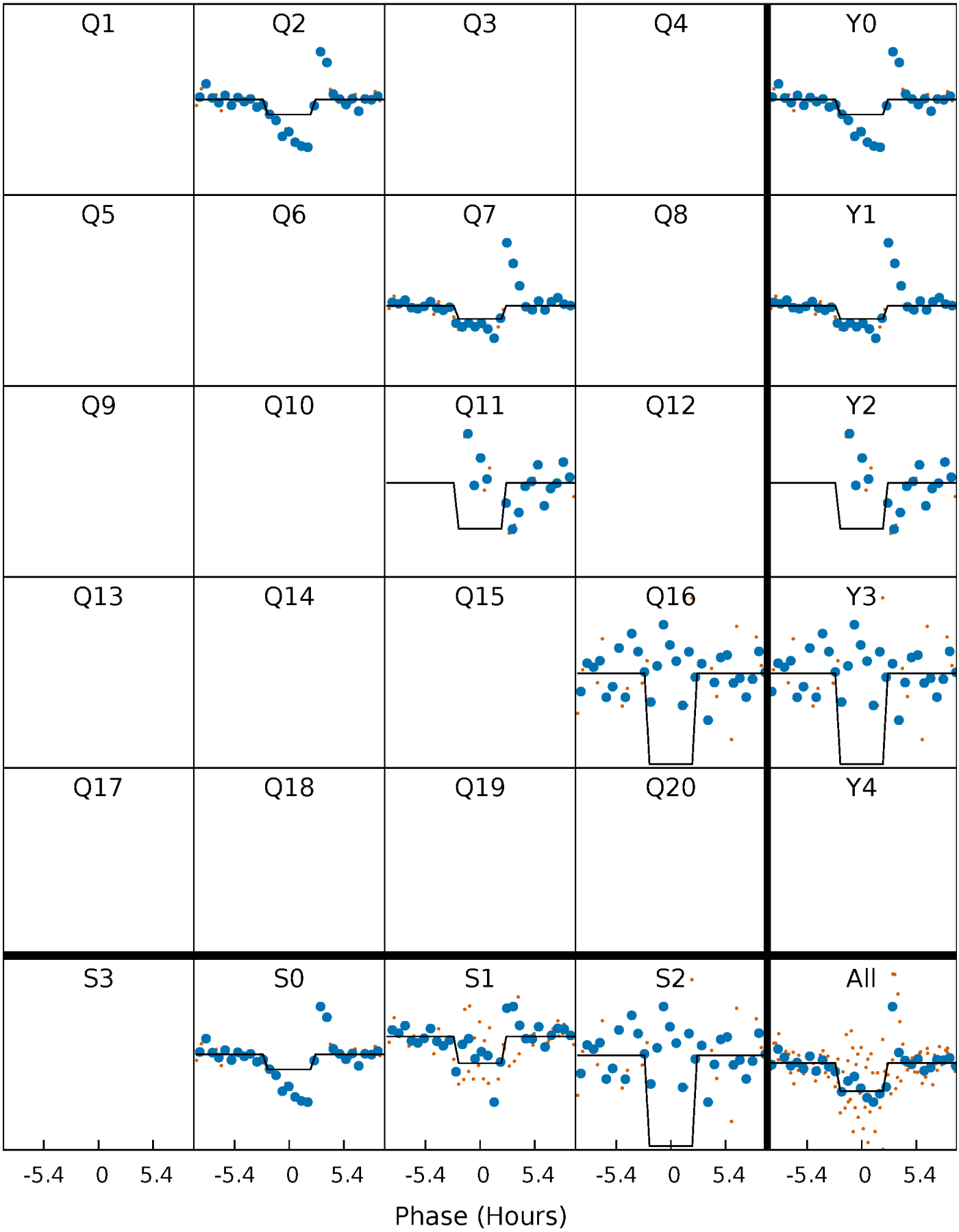
DV Quarter-Phased Transit Curves

TCE 009117167-05 P=453.446248 Days T_0=186.883113 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

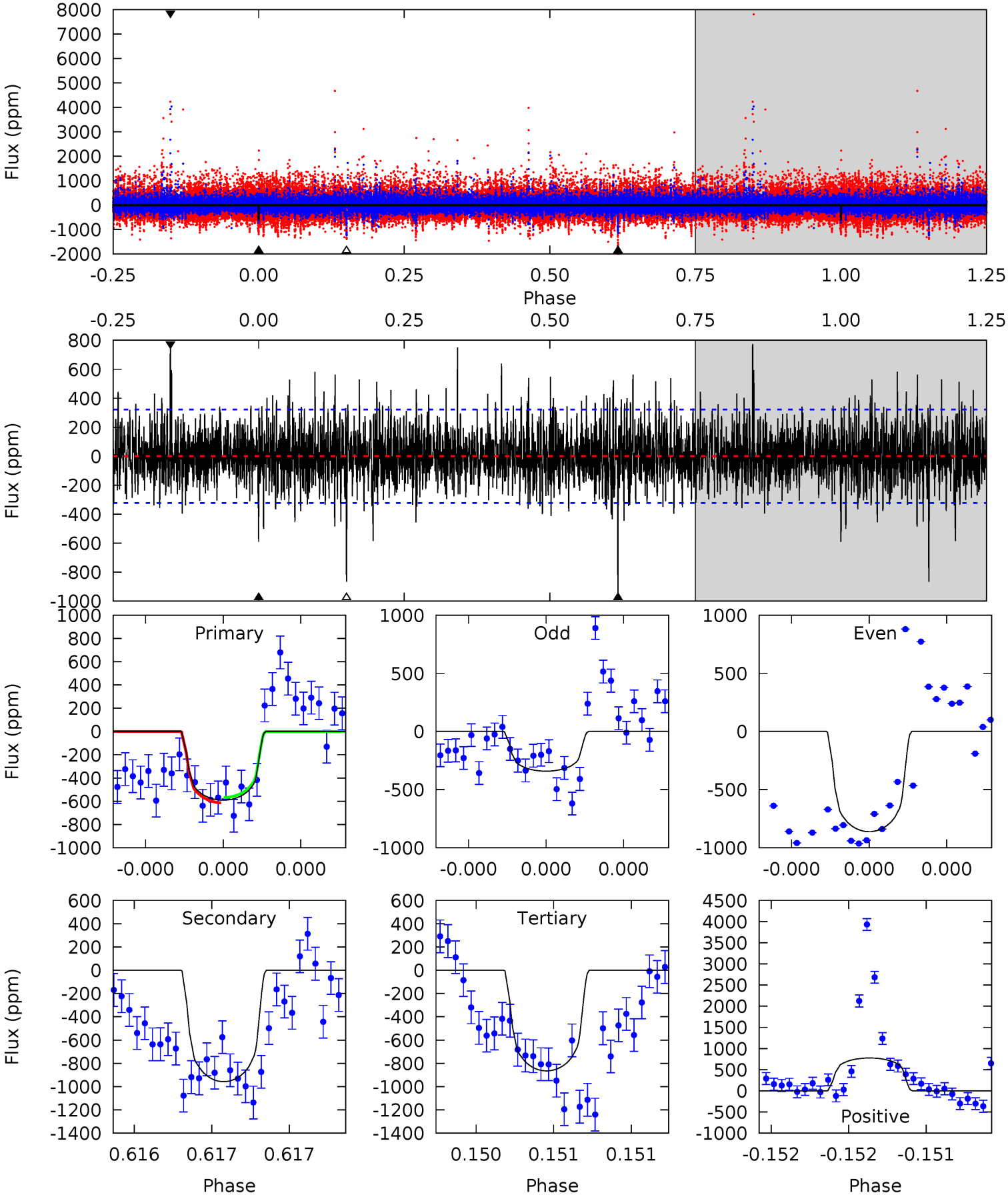
TCE 009117167-05 P=453.454752 Days T_0=186.882726 (BKJD)



DV Model-Shift Uniqueness Test

009117167-05, P = 453.446248 Days, E = 186.883113 Days

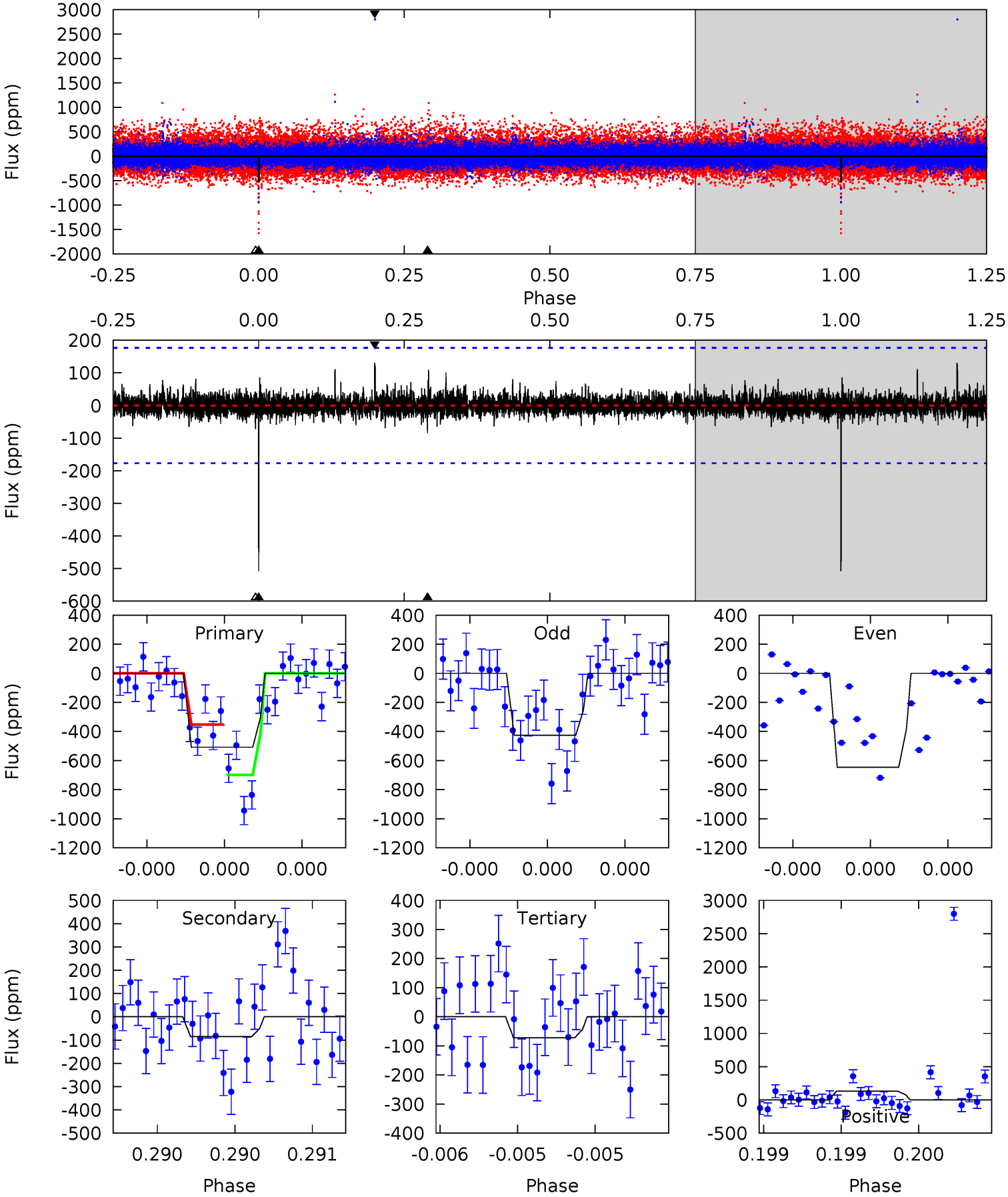
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	16.6	15.0	13.4	5.59	3.50	2.54	-4.76	-3.21	1.60	3.14	3.47	0.89	0.45	0.40



Alt Model-Shift Uniqueness Test

009117167-05, P = 453.454752 Days, E = 186.882726 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	2.67	2.28	4.12	5.59	3.51	0.55	13.8	11.9	0.39	-1.46	3.43	1.14	0.20	5.48



Stellar Parameters For KIC 009117167

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	4218^{+115}_{-140}	$4.691^{+0.063}_{-0.032}$	$-0.600^{+0.300}_{-0.300}$	$0.547^{+0.049}_{-0.059}$	$0.535^{+0.056}_{-0.046}$	$4.609^{+1.422}_{-0.621}$
	+3%/-3%	+1%/-1%	+50%/-50%	+9%/-11%	+10%/-9%	+31%/-13%
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 009117167-05 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-958±58	$1.50^{+0.85}_{-0.76}$	198^{+7}_{-9}	4539^{+1678}_{-717}	$206068^{+645306}_{-123995}$
Alt.	-84±32	$1.37^{+0.88}_{-0.75}$	197^{+7}_{-7}	3098^{+894}_{-410}	21011^{+88065}_{-13694}

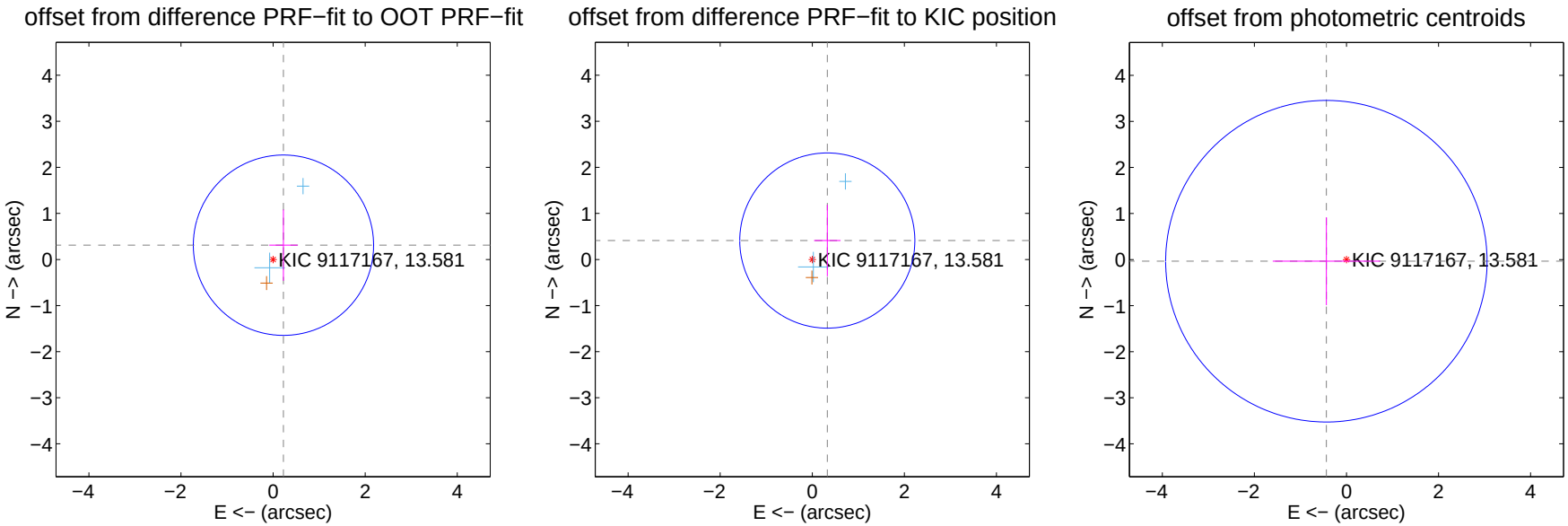
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

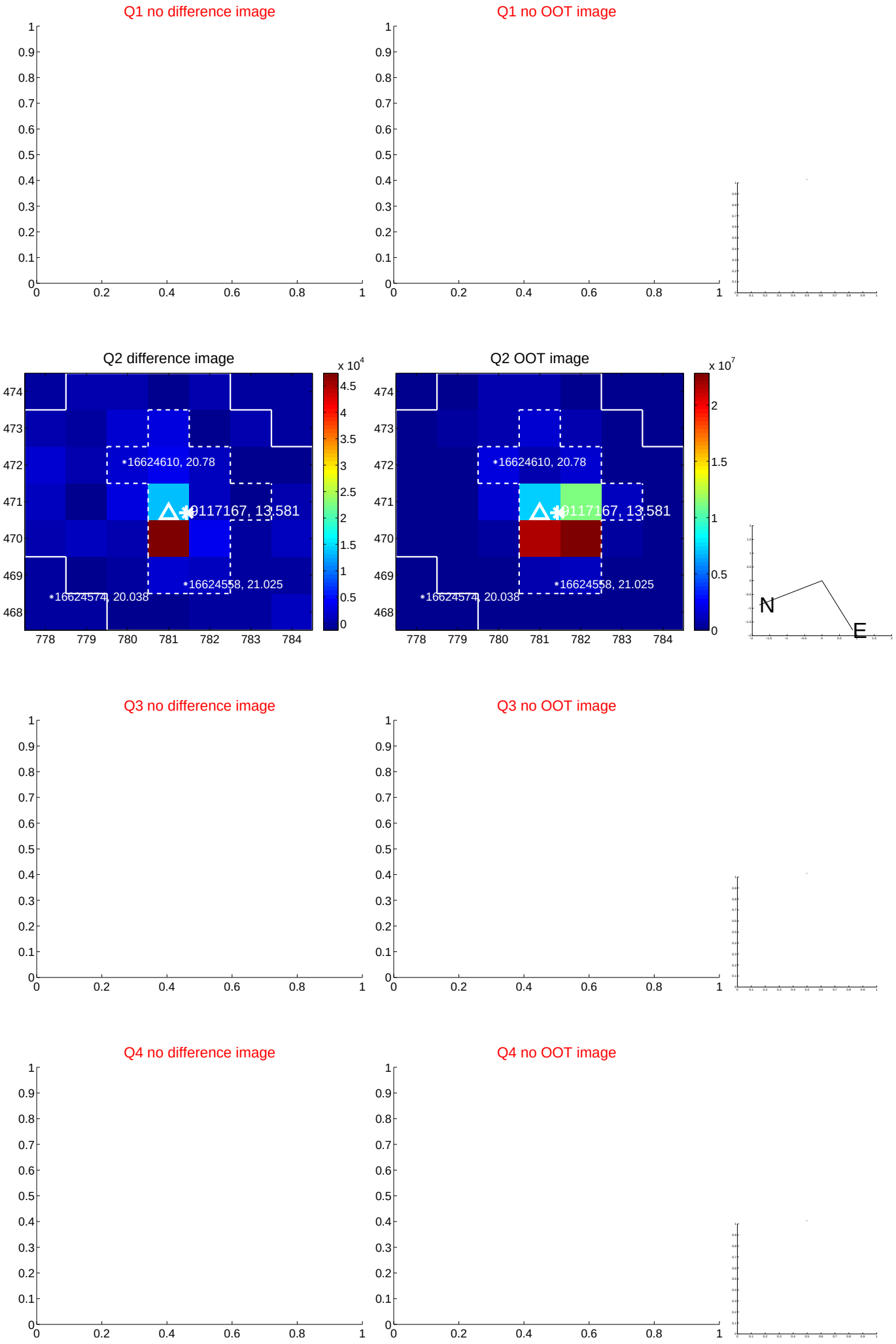
Supplemental centroid analysis for 009117167-05. Kepler magnitude: 13.58. Transit SNR 5.94
There are 2 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.383 ± 0.653	0.59	-0.225 ± 0.309	0.310 ± 0.774
PRF-fit source offset from KIC position	0.525 ± 0.634	0.83	-0.326 ± 0.288	0.412 ± 0.776
photometric centroid source offset	0.44 ± 1.16	0.38	0.44 ± 1.17	-0.04 ± 0.96

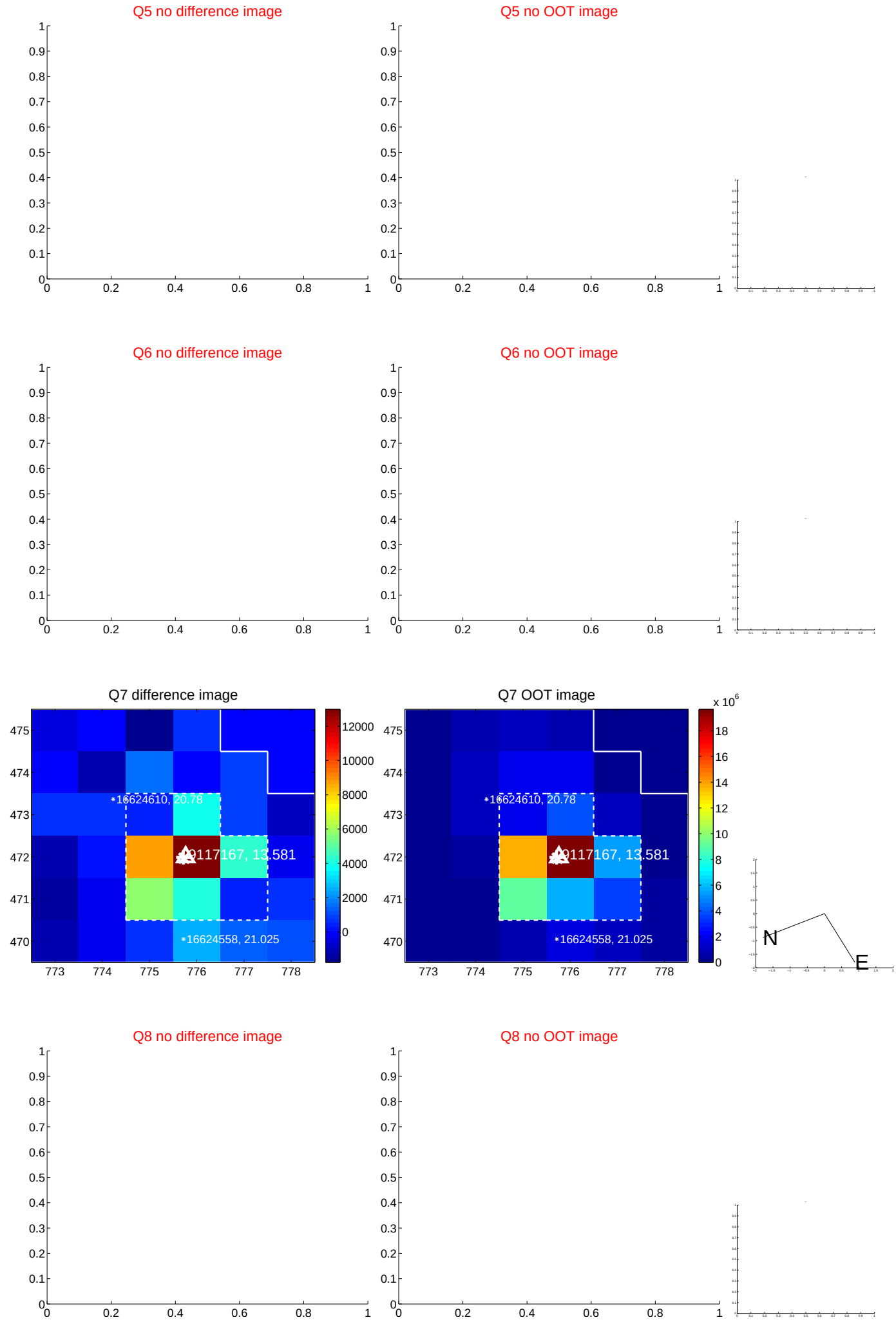


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

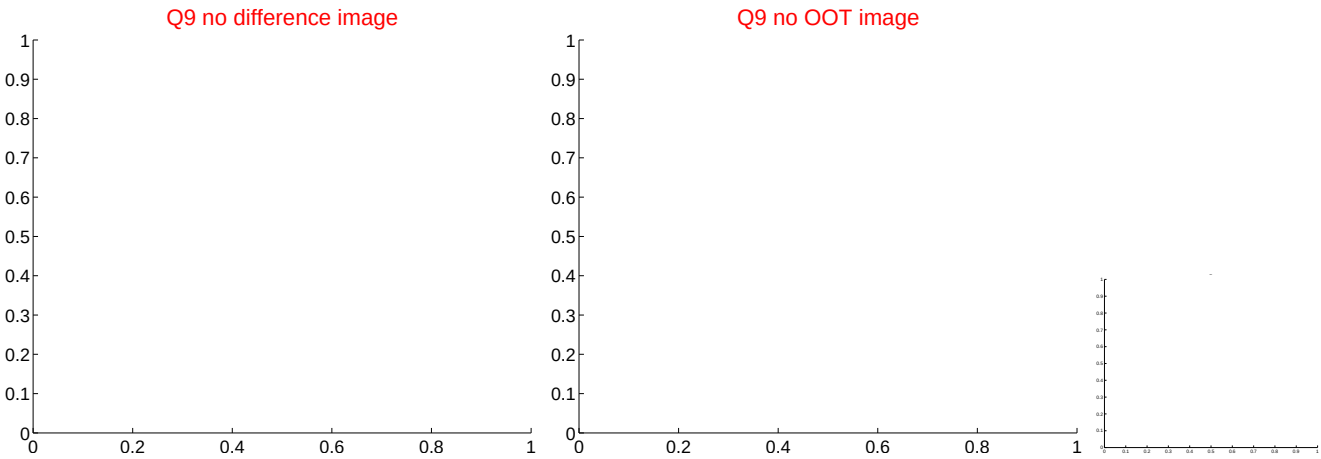
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

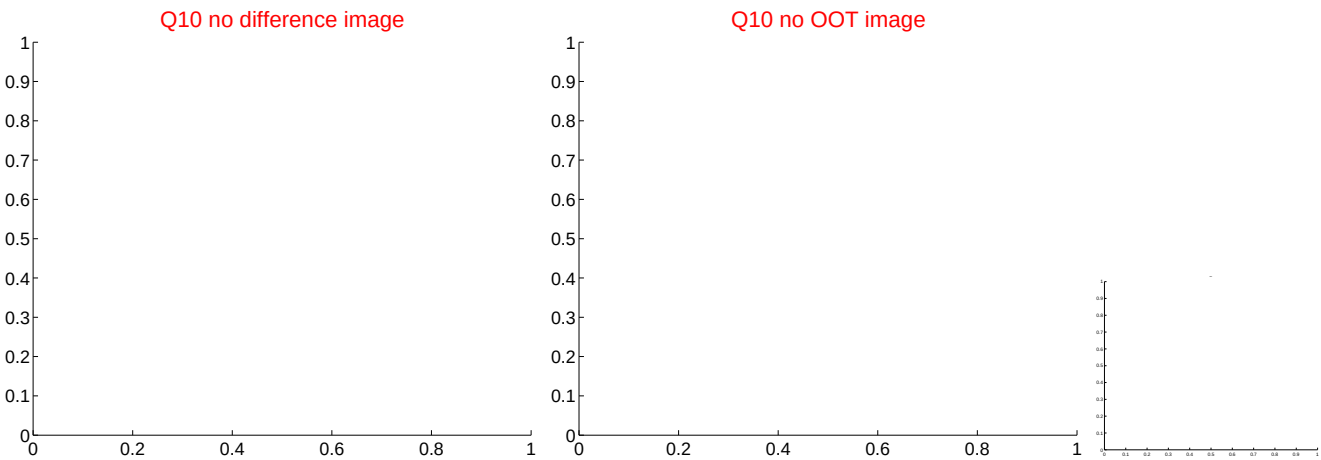


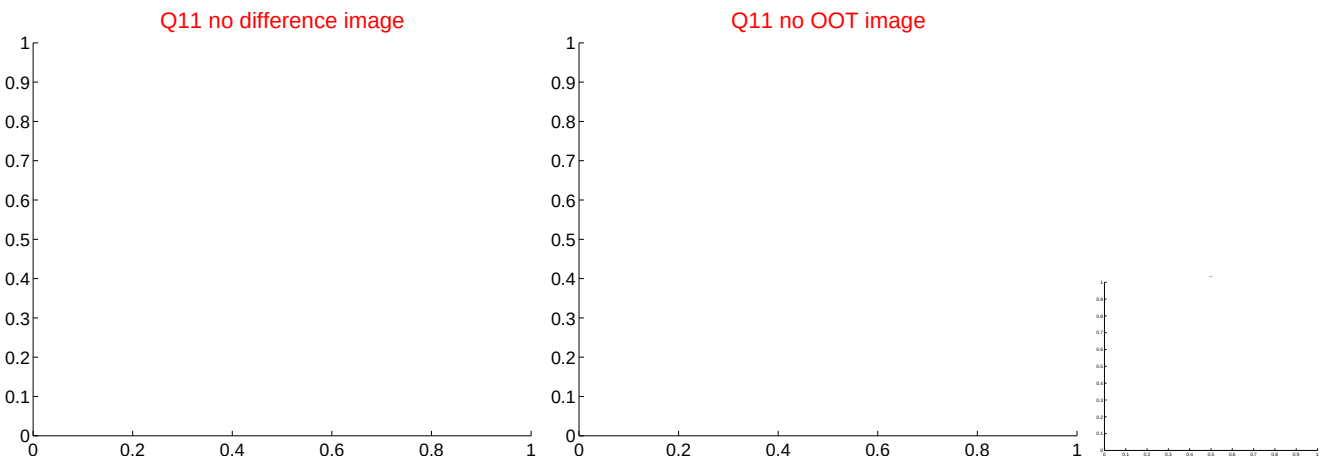
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

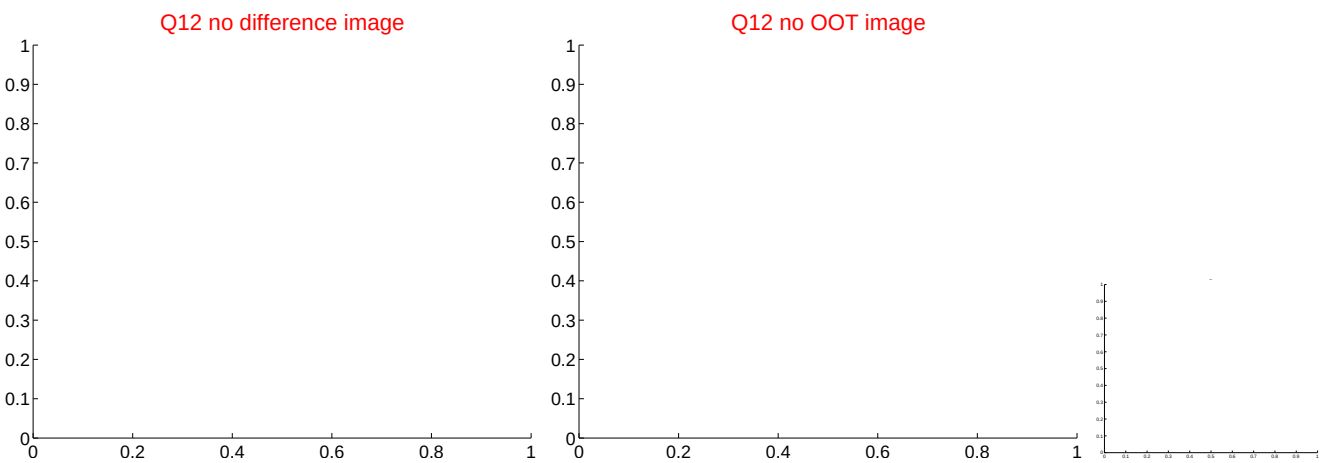


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

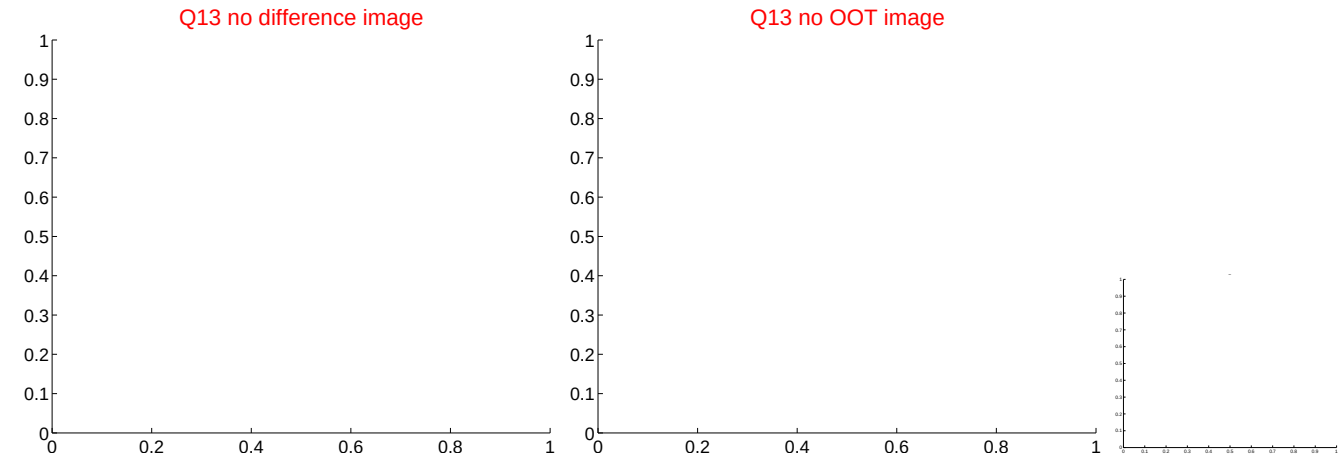


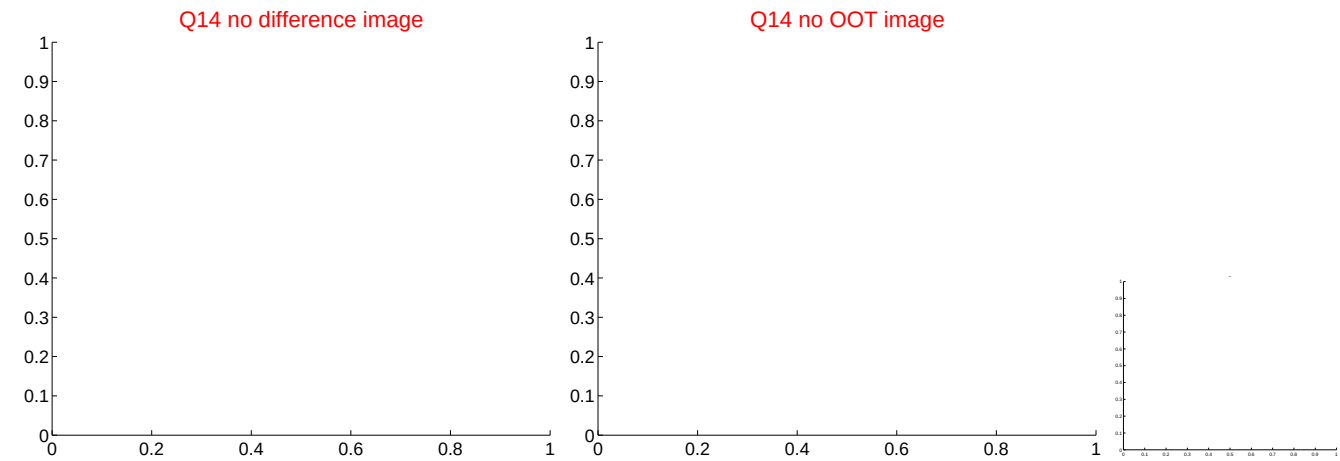


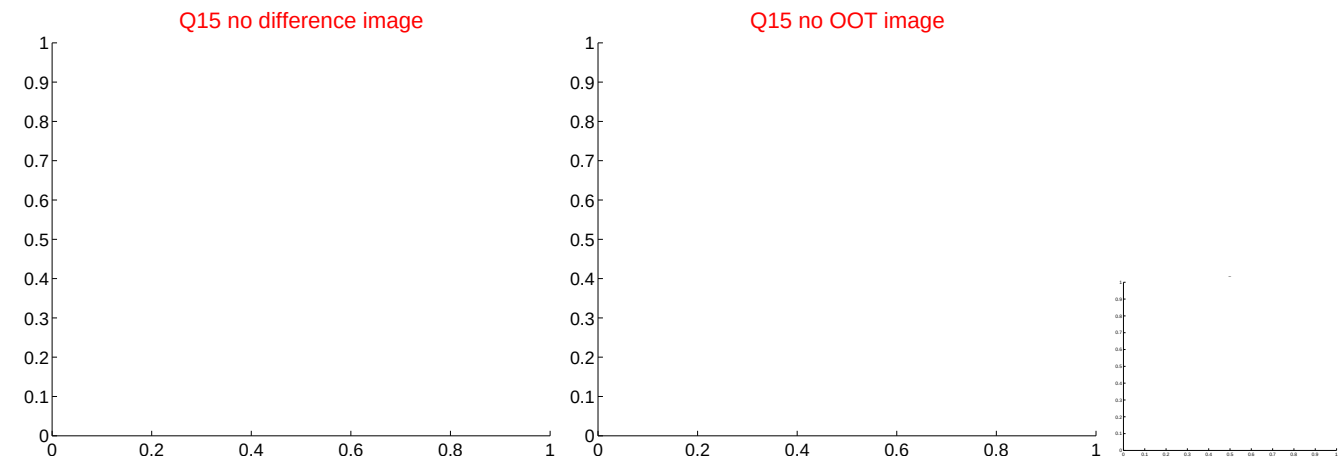


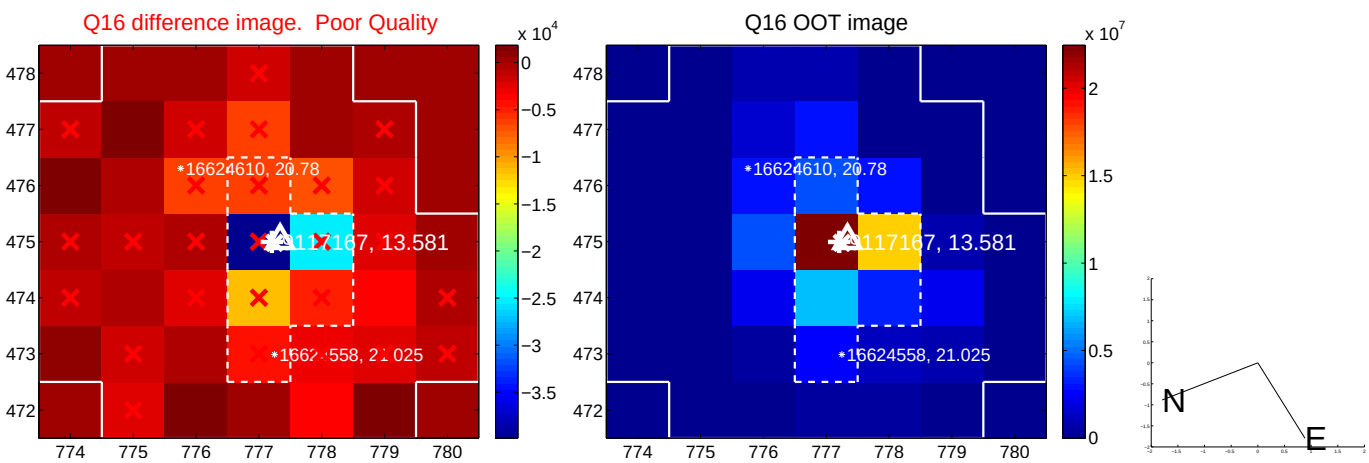


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

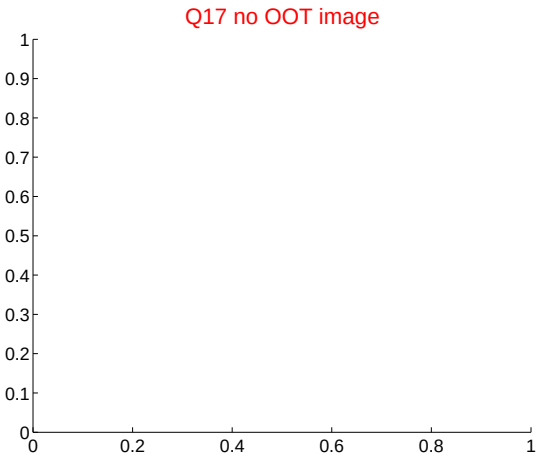


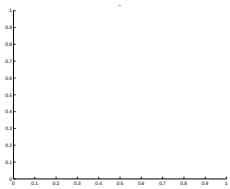


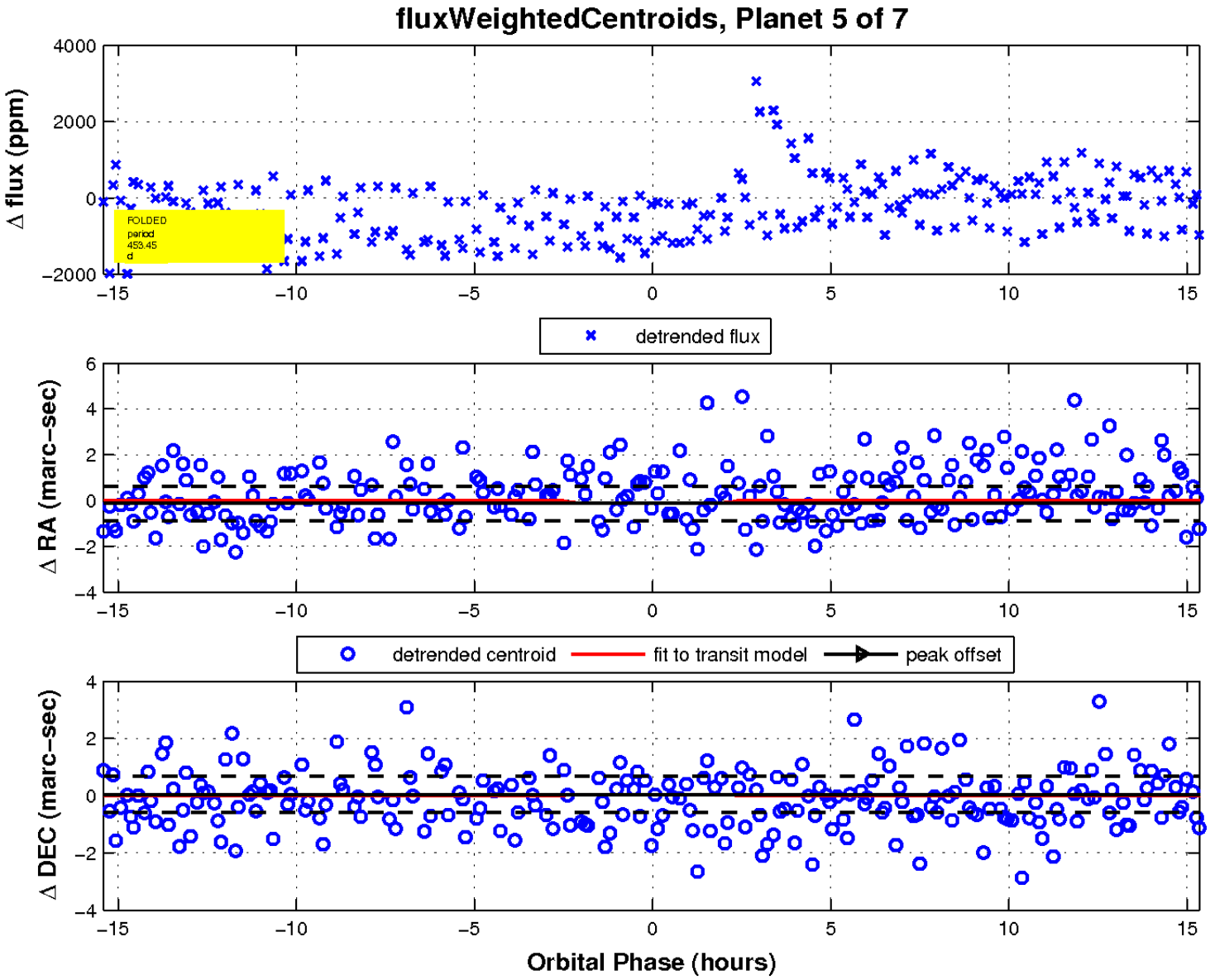




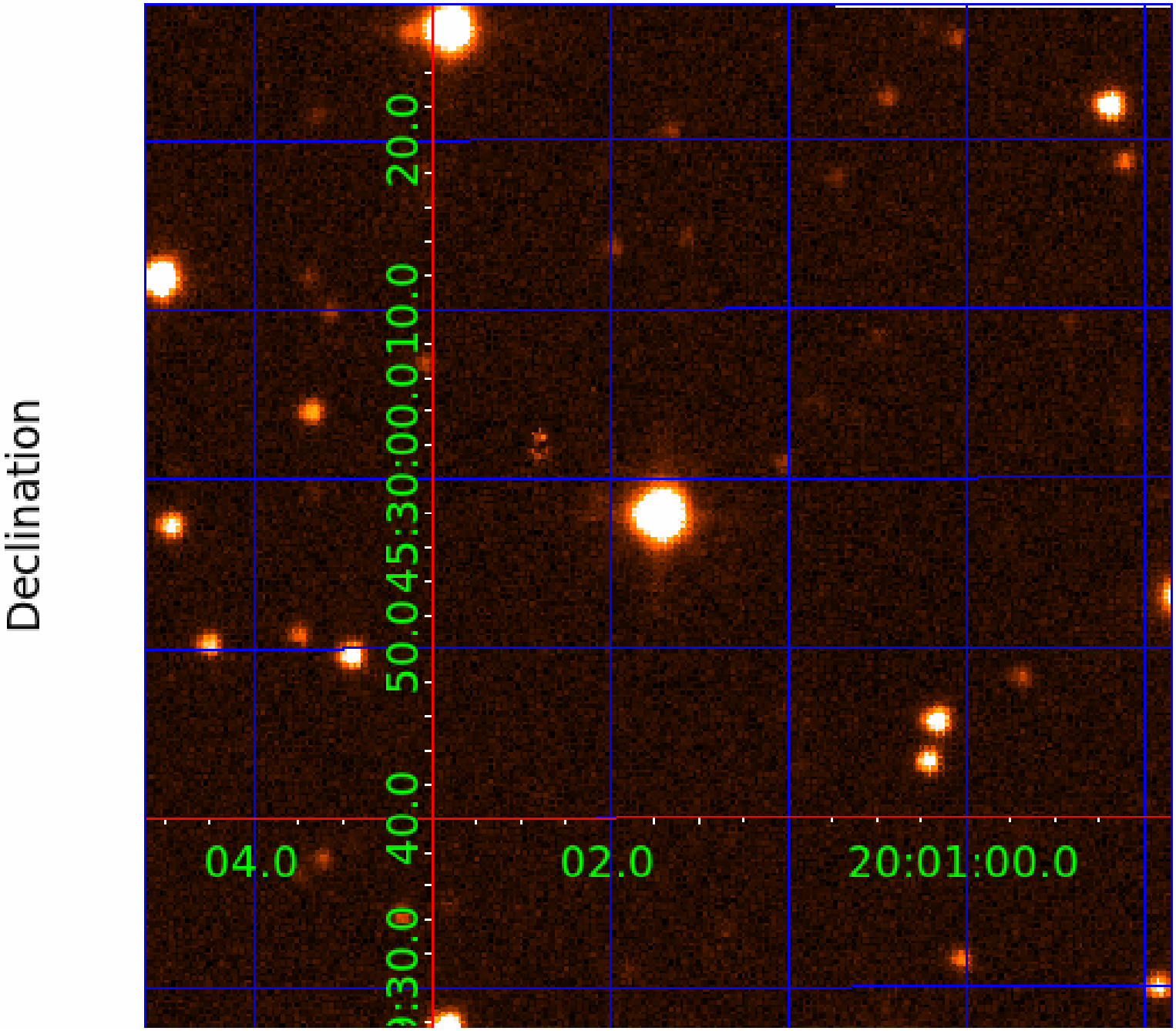
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image



KIC 009117167

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 ($S_\oplus$)
009117167-02	OBS	No	407.972280	144.952659	753.3	4.288	13.4	7.4	0.55	4218	1.60	0.11
009117167-03	OBS	No	534.759249	451.586081	1035.9	10.733	12.1	7.6	0.55	4218	1.78	0.08
009117167-04	OBS	No	206.130332	321.621468	585.7	5.165	12.3	5.5	0.55	4218	1.48	0.28
009117167-05	OBS	No	453.446247	186.883113	614.2	5.138	9.7	5.9	0.55	4218	1.50	0.10
009117167-06	OBS	No	389.337133	453.257389	974.8	9.617	11.6	6.8	0.55	4218	2.23	0.12
009117167-07	OBS	No	431.706633	457.358164	561.4	4.500	11.8	-1.0	0.55	4218	1.27	0.10

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009117167-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV
009117167-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009117167-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009117167-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

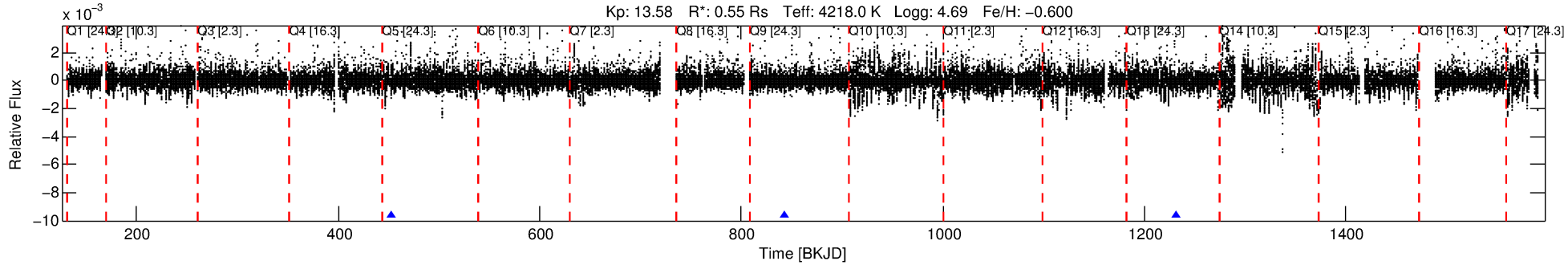
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

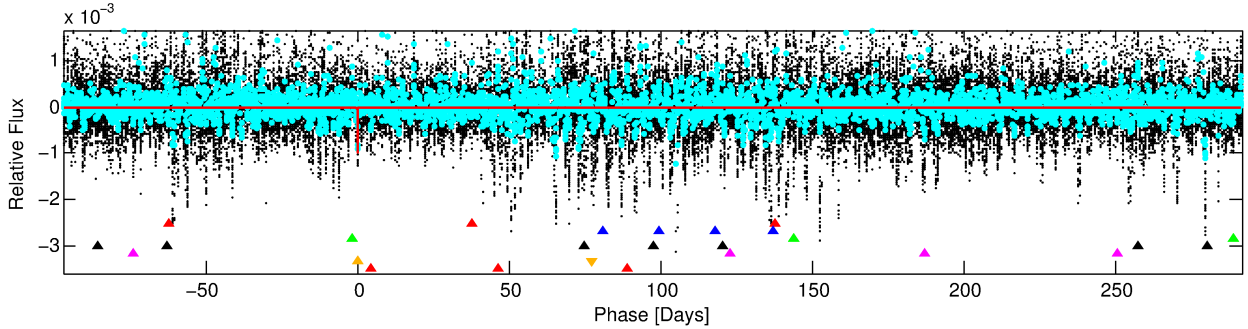
Ephemeris Match Information For 009117167-06

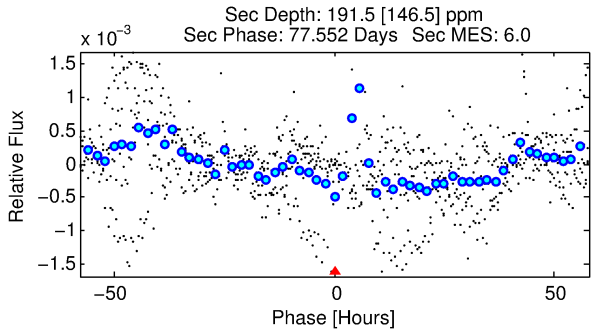
No Significant Match Found

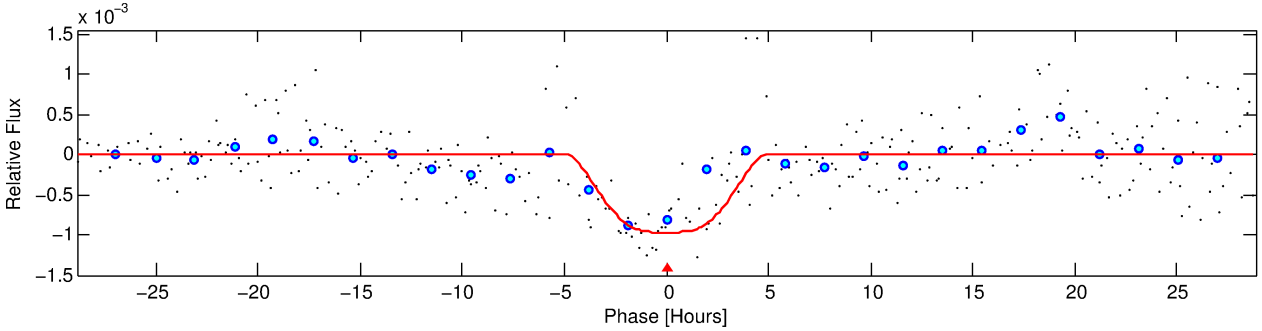
DV One-Page Summary

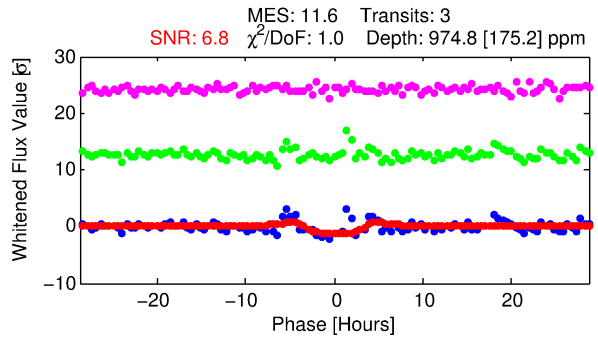
KIC: 9117167 Candidate: 6 of 7 Period: 389.337 d

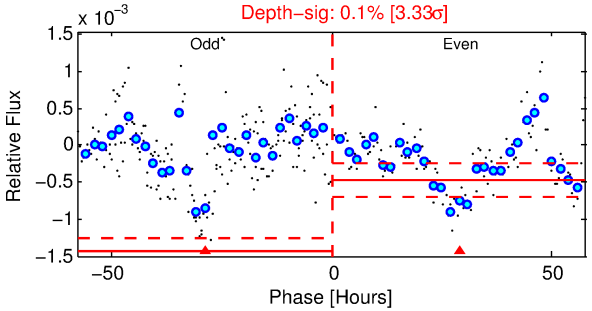


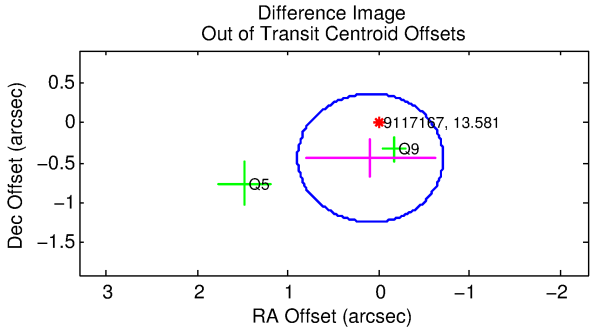












DV Fit Results:

Period = 389.33713 [0.01355] d
Epoch = 453.2574 [0.0165] BKJD
Rp/R* = 0.0373 [0.0040]
a/R* = 125.08 [18.34]
b = 0.96 [0.02]

Seff = 0.12 [0.02]
Teq = 149 [7] K
Rp = 2.23 [0.34] Re
a = 0.8477 [0.0735] AU

Ag = 15236.89 [12241.89] [1.24σ]
Teffp = 2568 [517] K [4.68σ]

DV Diagnostic Results:

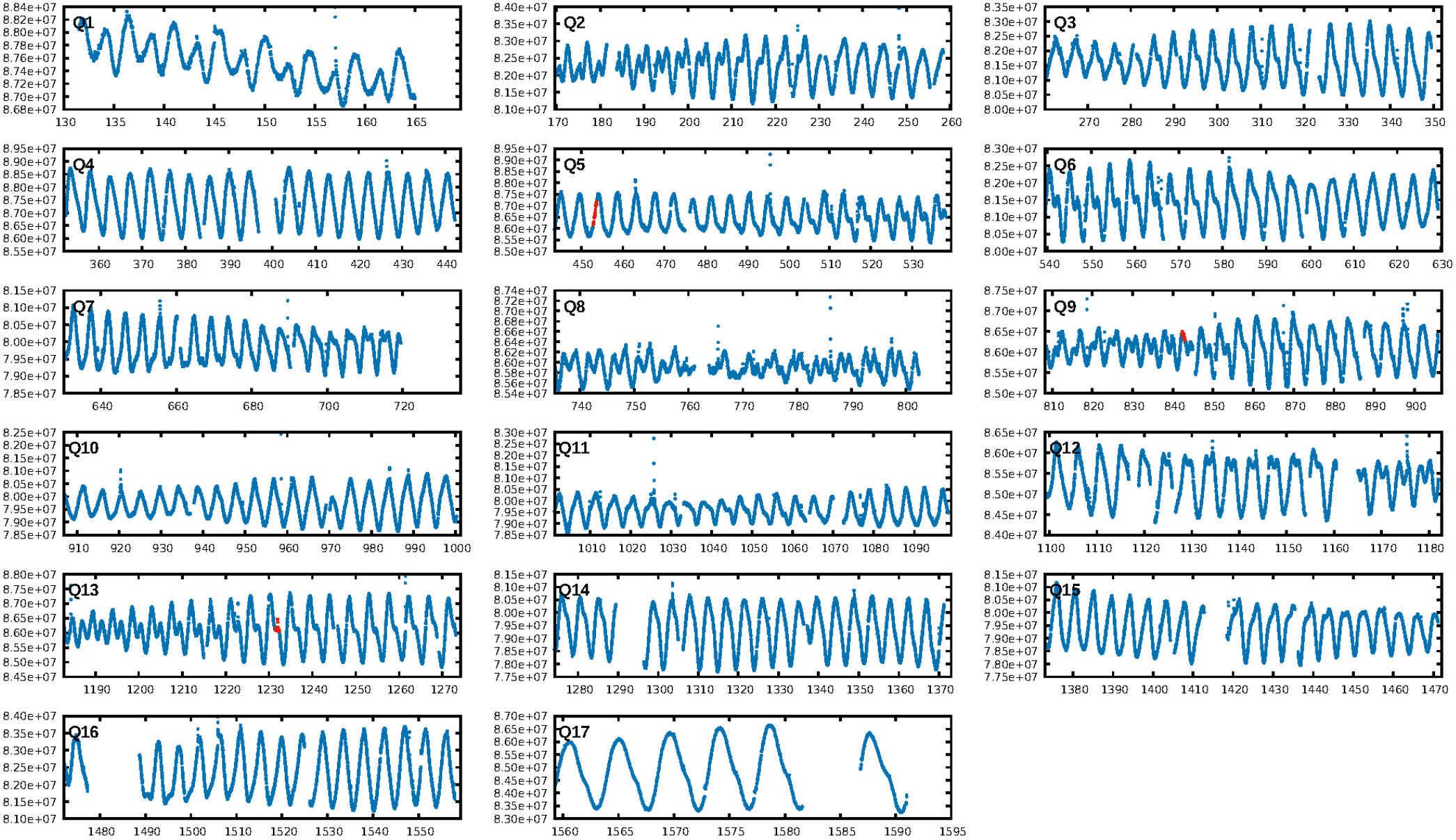
ShortPeriod−sig: 100.0% [402.80σ]
LongPeriod−sig: 100.0% [42.47σ]
ModelChiSquare2−sig: 1.1%
ModelChiSquareGof−sig: 99.1%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: −0.1671

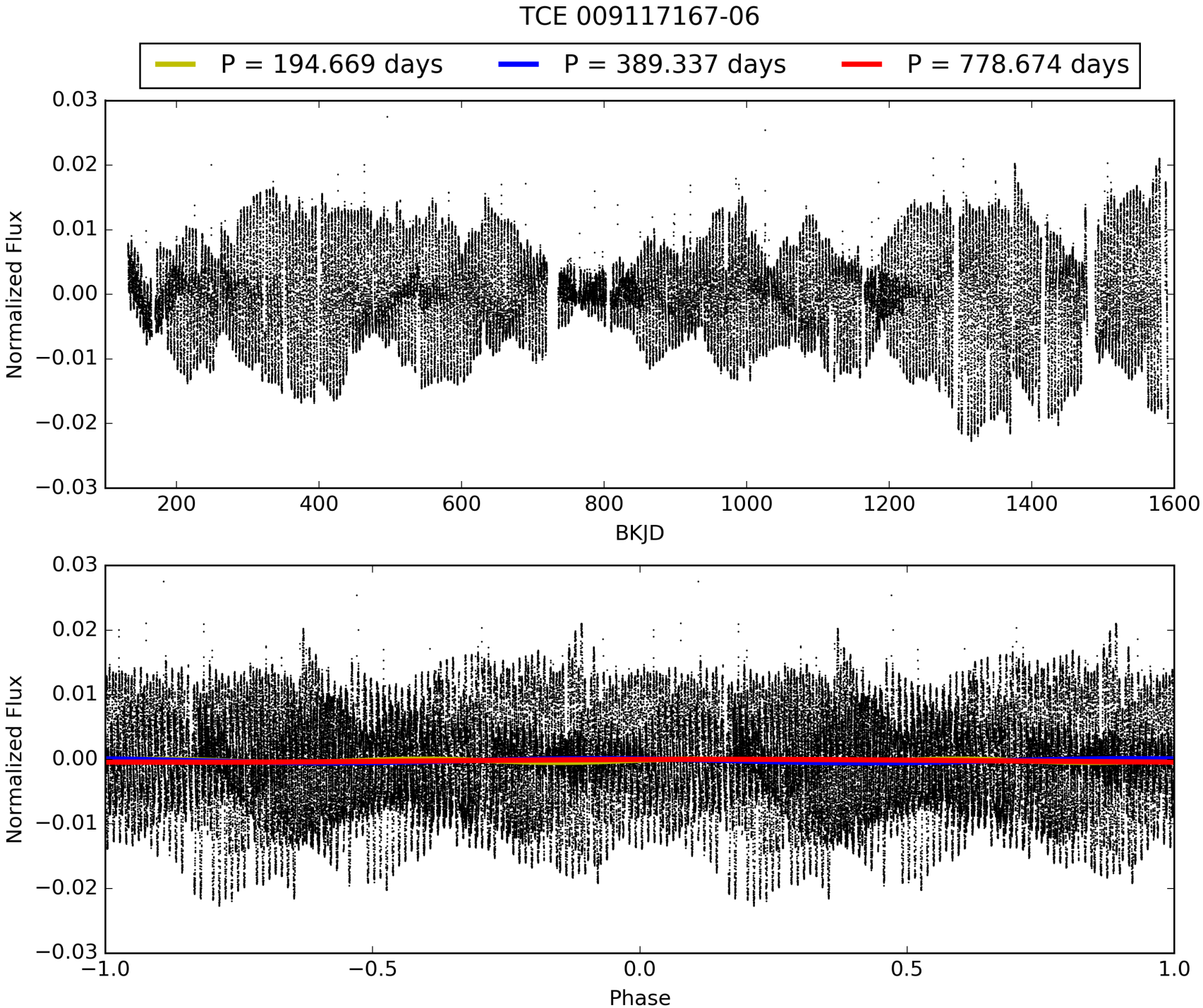
Centroid−sig: 97.7%
Centroid−so: 0.220 arcsec [0.41σ]
OotOffset−rm: 0.451 arcsec [1.69σ]
KicOffset−rm: 0.411 arcsec [1.71σ]
OotOffset−st: 0/0/0/2 [2]
KicOffset−st: 0/0/0/2 [2]
DiffImageQuality−fgm: 0.50 [1/2]
DiffImageOverlap−fno: 0.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 13:37:28 Z

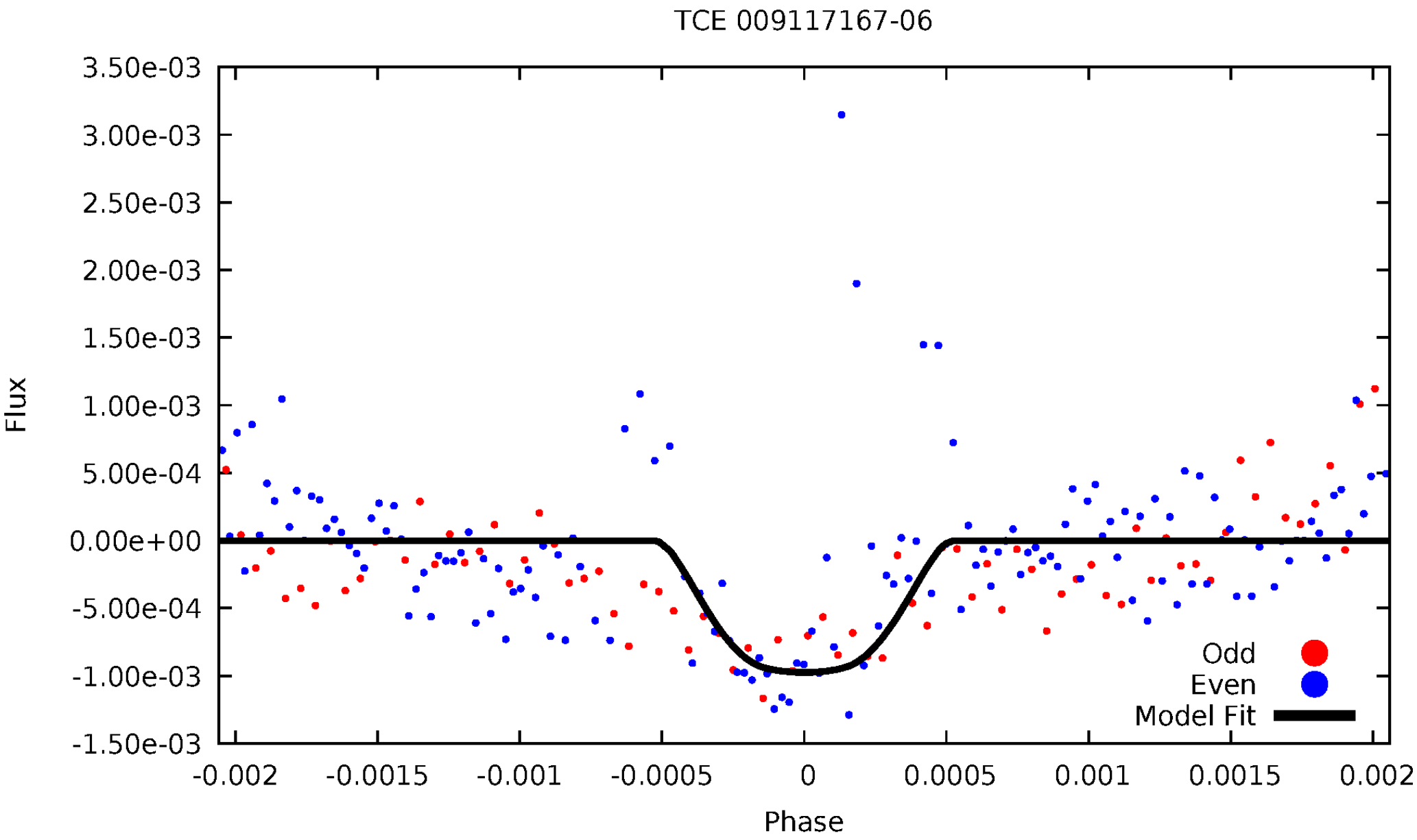
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009117167-06, PDC Light Curves

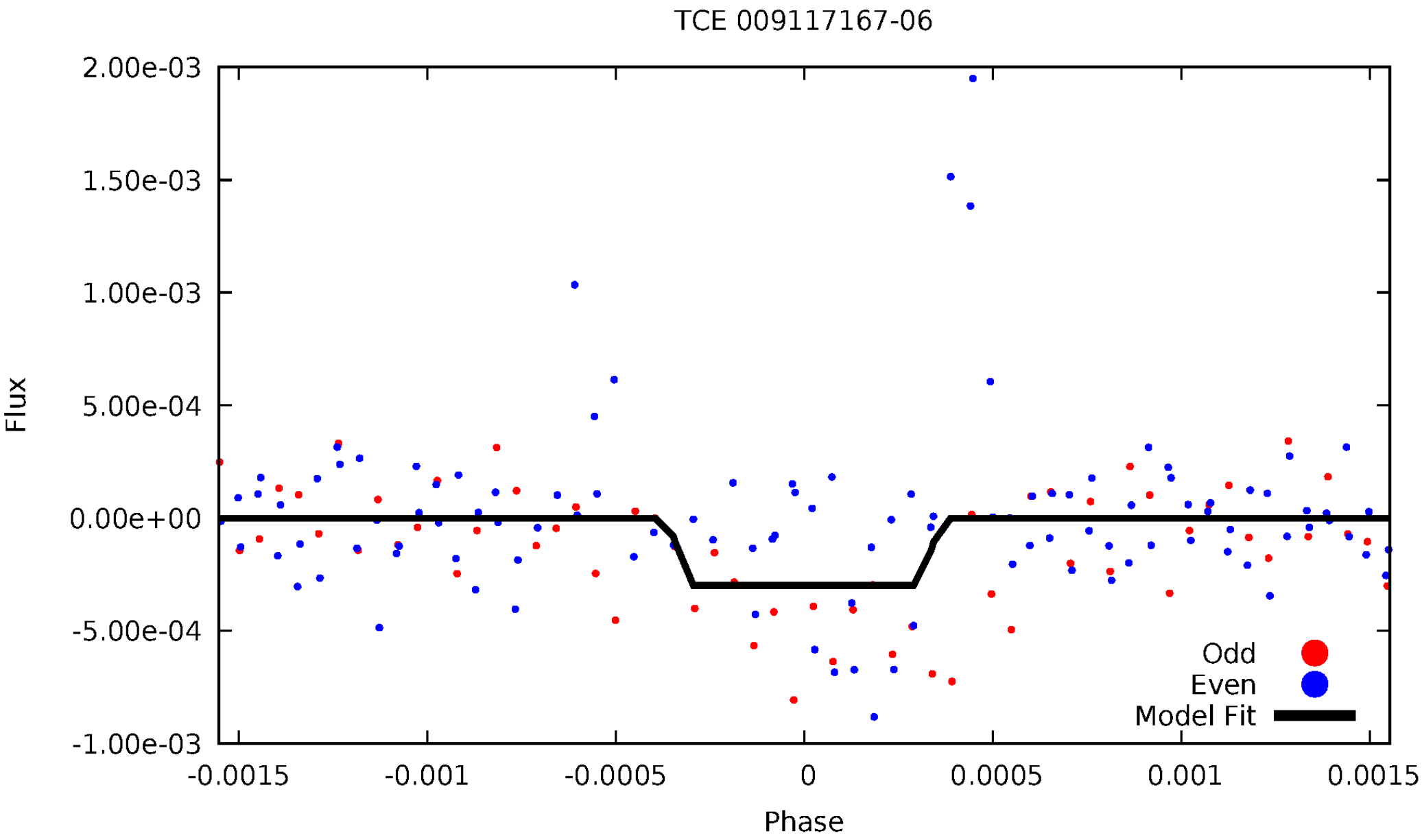



TCE 009117167-06
P = 194.669 days
P = 389.337 days
P = 778.674 days
Normalized Flux
BKJD
Normalized Flux
Phase

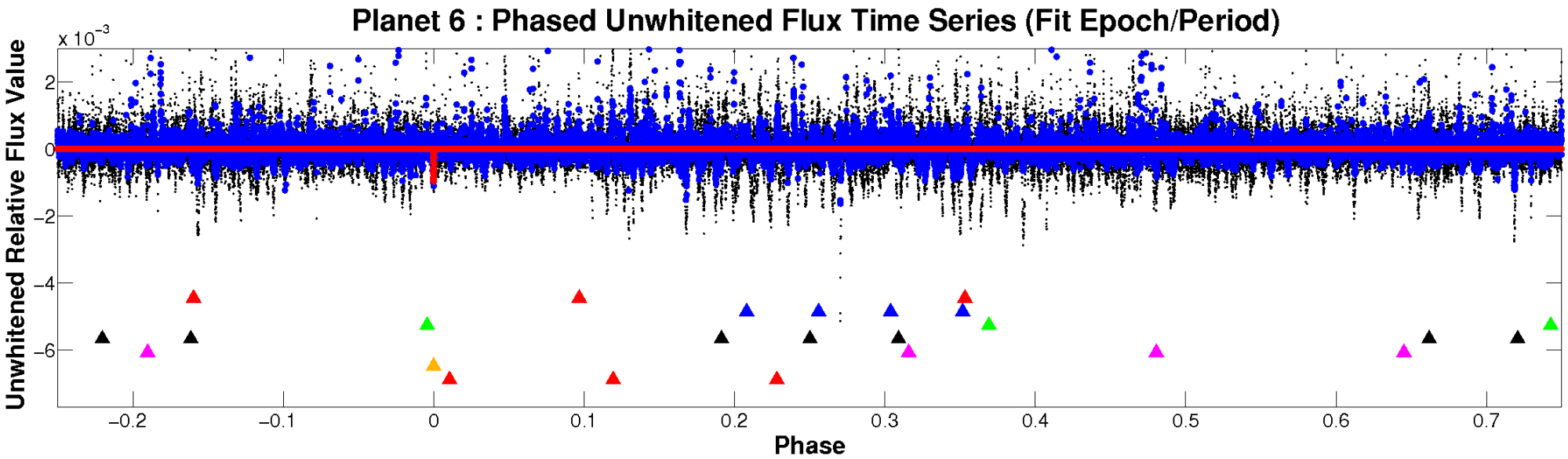
DV Odd/Even

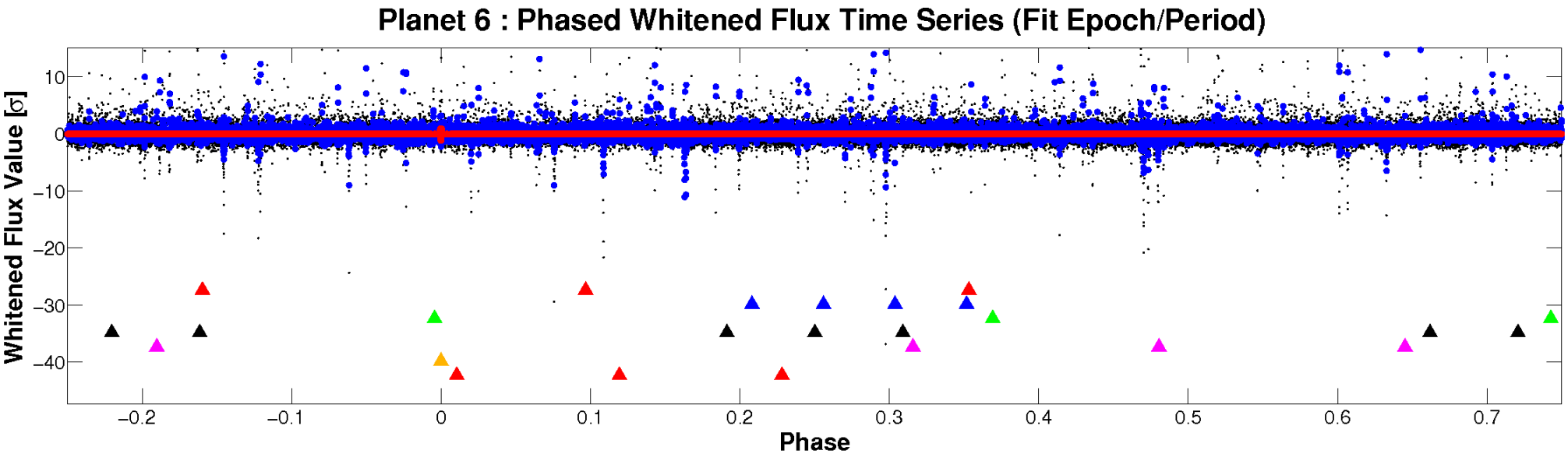

TCE 009117167-06
3.50e-03
3.00e-03
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
Flux
-0.002
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
0.002
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009117167-06
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
Flux
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
Phase
Odd
Even
Model Fit

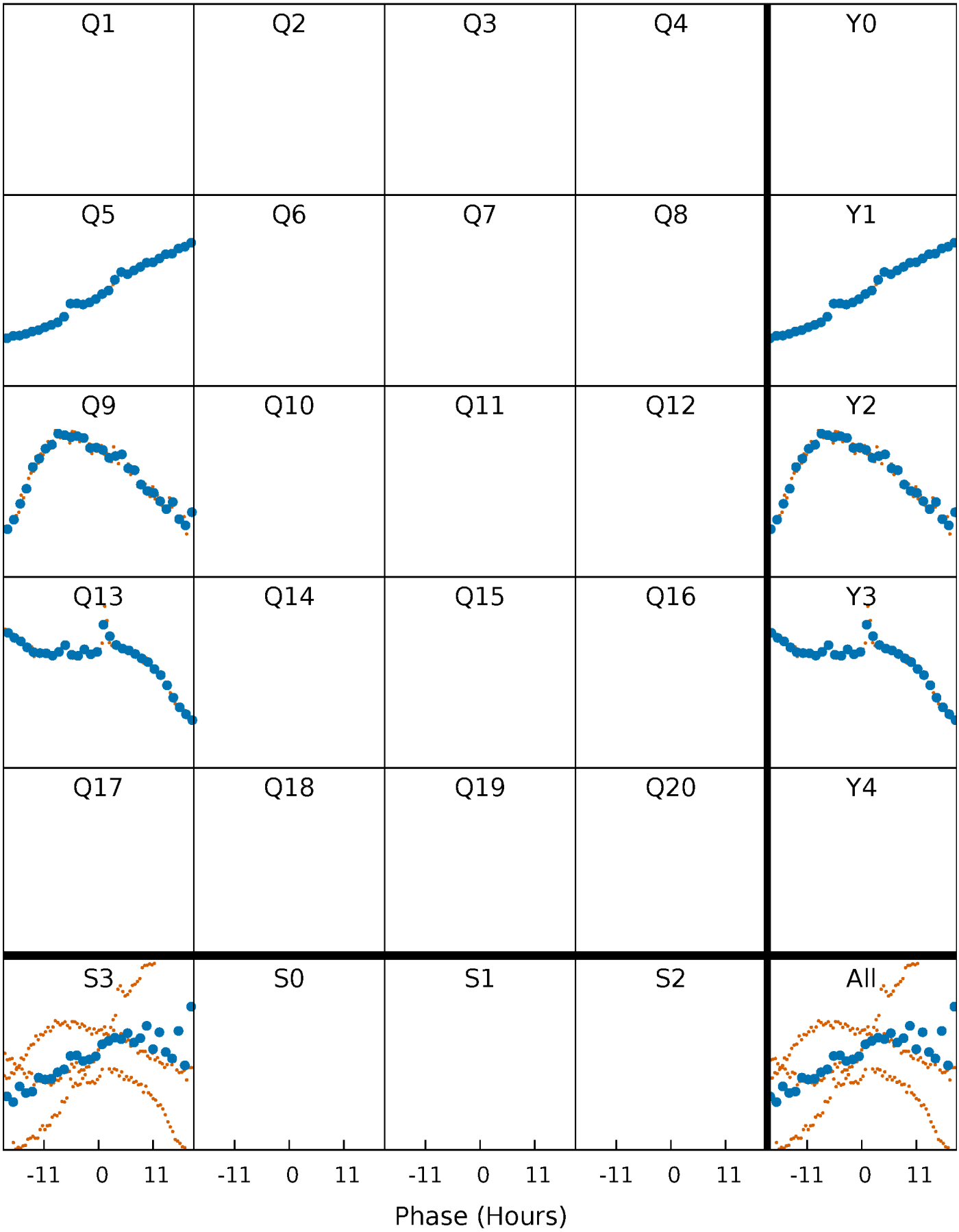
Non-Whitened Vs. Whitened Light Curve





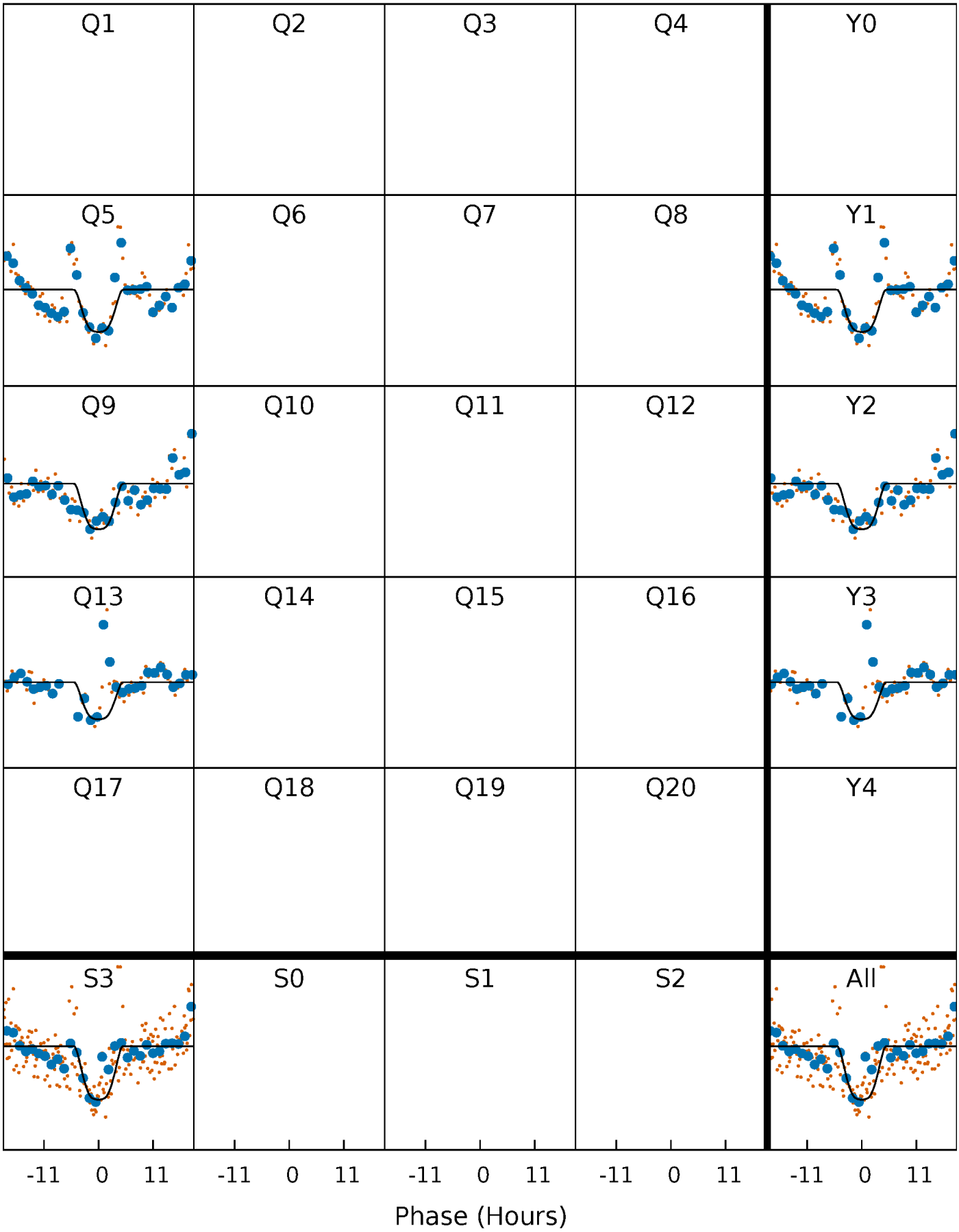
PDC Quarter-Phased Transit Curves

TCE 009117167-06 P=389.337133 Days T_0=453.257389 (BKJD)



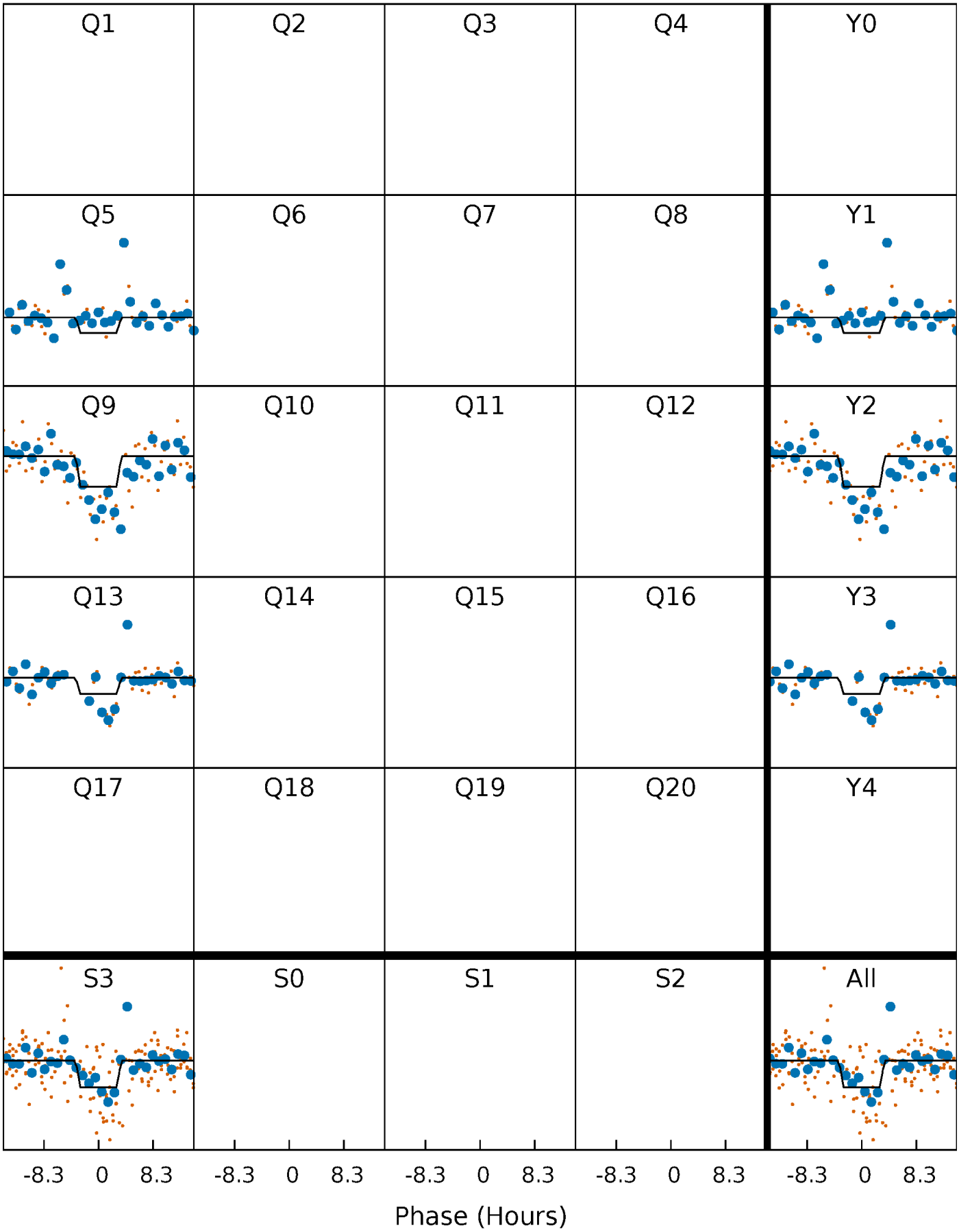
DV Quarter-Phased Transit Curves

TCE 009117167-06 P=389.337133 Days T_0=453.257389 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

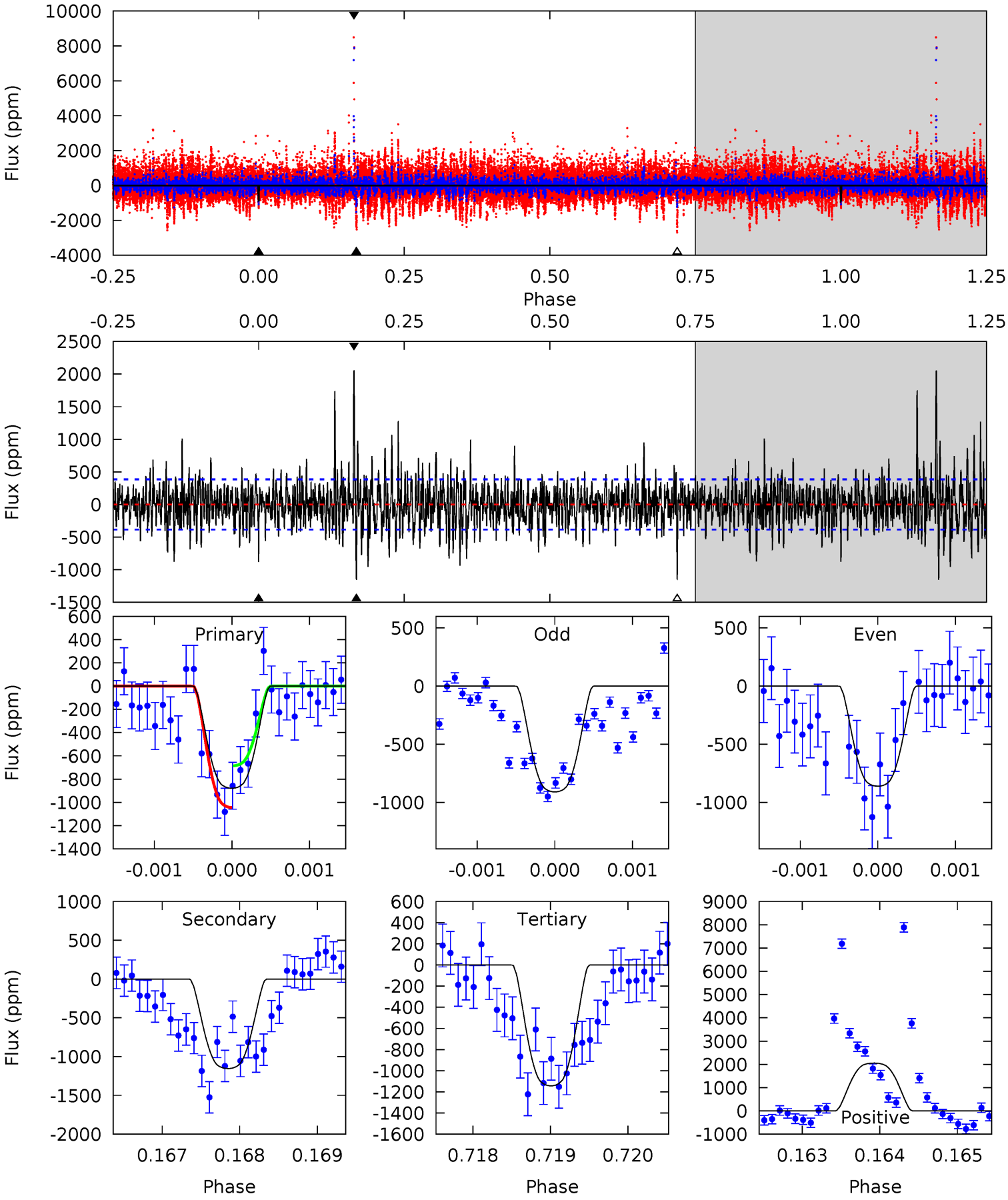
TCE 009117167-06 P=389.279751 Days T_0=453.269623 (BKJD)



DV Model-Shift Uniqueness Test

009117167-06, P = 389.337133 Days, E = 63.920256 Days

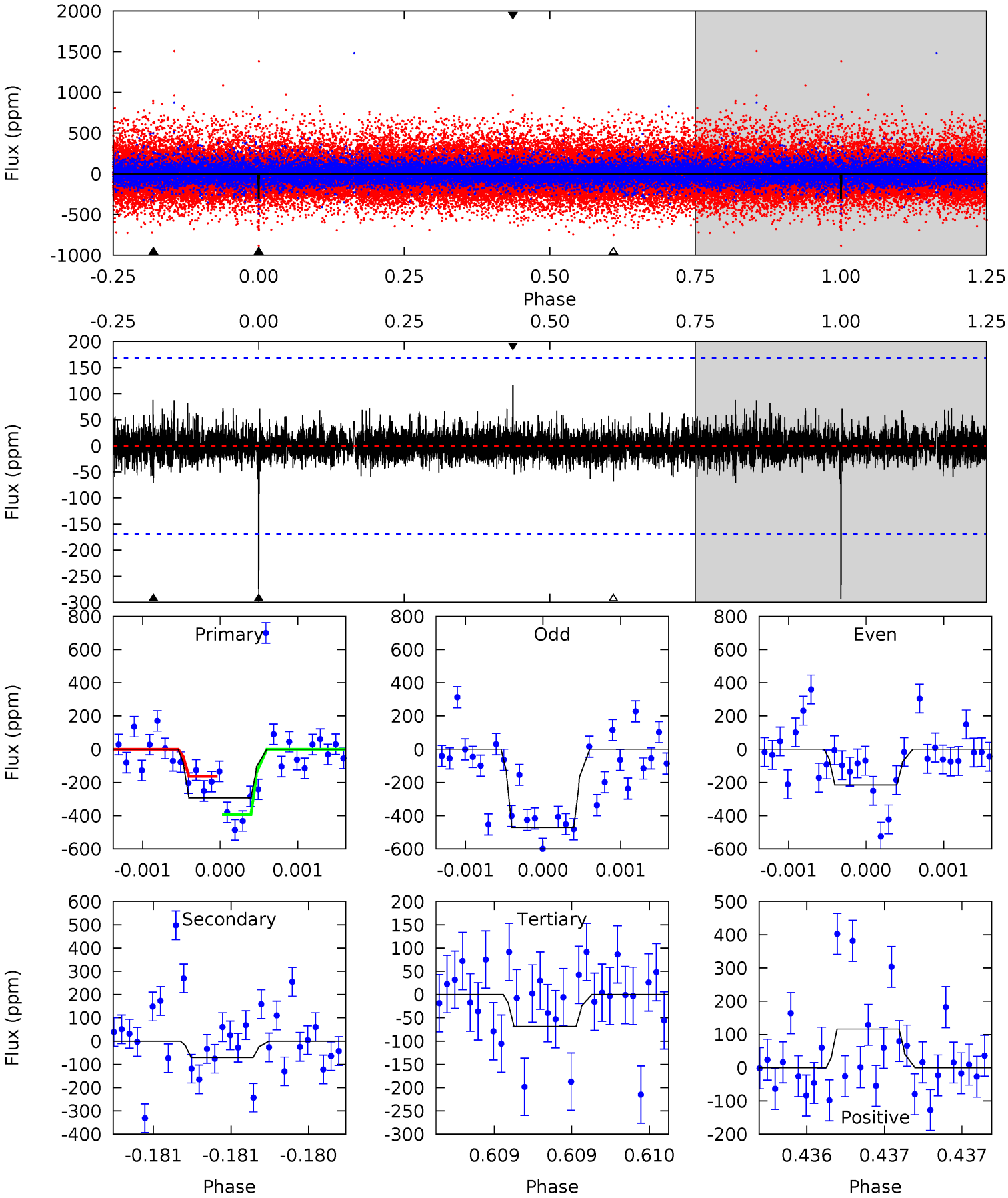
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	16.3	16.2	29.0	5.44	3.27	3.87	-3.74	-16.6	0.15	-12.7	0.30	0.75	0.64	2.55



Alt Model-Shift Uniqueness Test

009117167-06, P = 389.279751 Days, E = 63.989872 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.58	2.30	2.24	3.80	5.51	3.38	0.55	7.34	5.78	0.06	-1.50	3.97	0.69	0.28	3.68



Stellar Parameters For KIC 009117167

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	4218^{+115}_{-140}	$4.691^{+0.063}_{-0.032}$	$-0.600^{+0.300}_{-0.300}$	$0.547^{+0.049}_{-0.059}$	$0.535^{+0.056}_{-0.046}$	$4.609^{+1.422}_{-0.621}$
	+3%/-3%	+1%/-1%	+50%/-50%	+9%/-11%	+10%/-9%	+31%/-13%
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 009117167-06 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1154±71	$2.20^{+0.27}_{-0.25}$	207^{+8}_{-8}	4075^{+211}_{-176}	94007^{+27520}_{-17480}
Alt.	-70±31	$1.03^{+0.25}_{-0.24}$	208^{+7}_{-8}	3280^{+391}_{-316}	25416^{+25438}_{-12571}

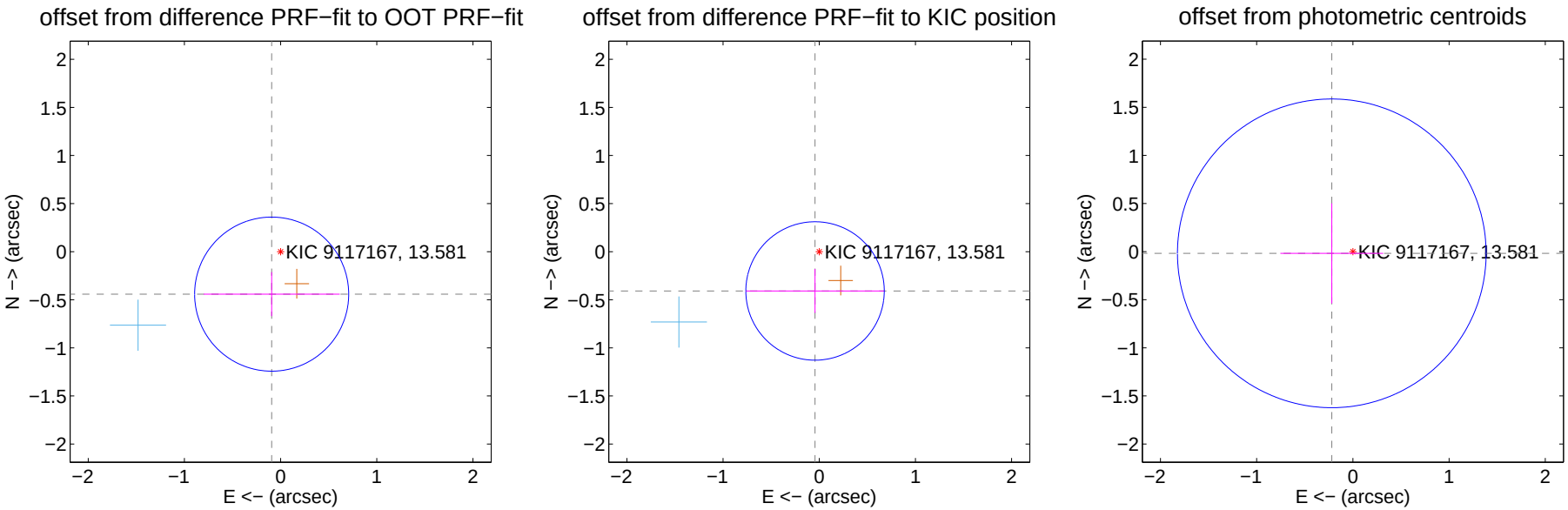
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

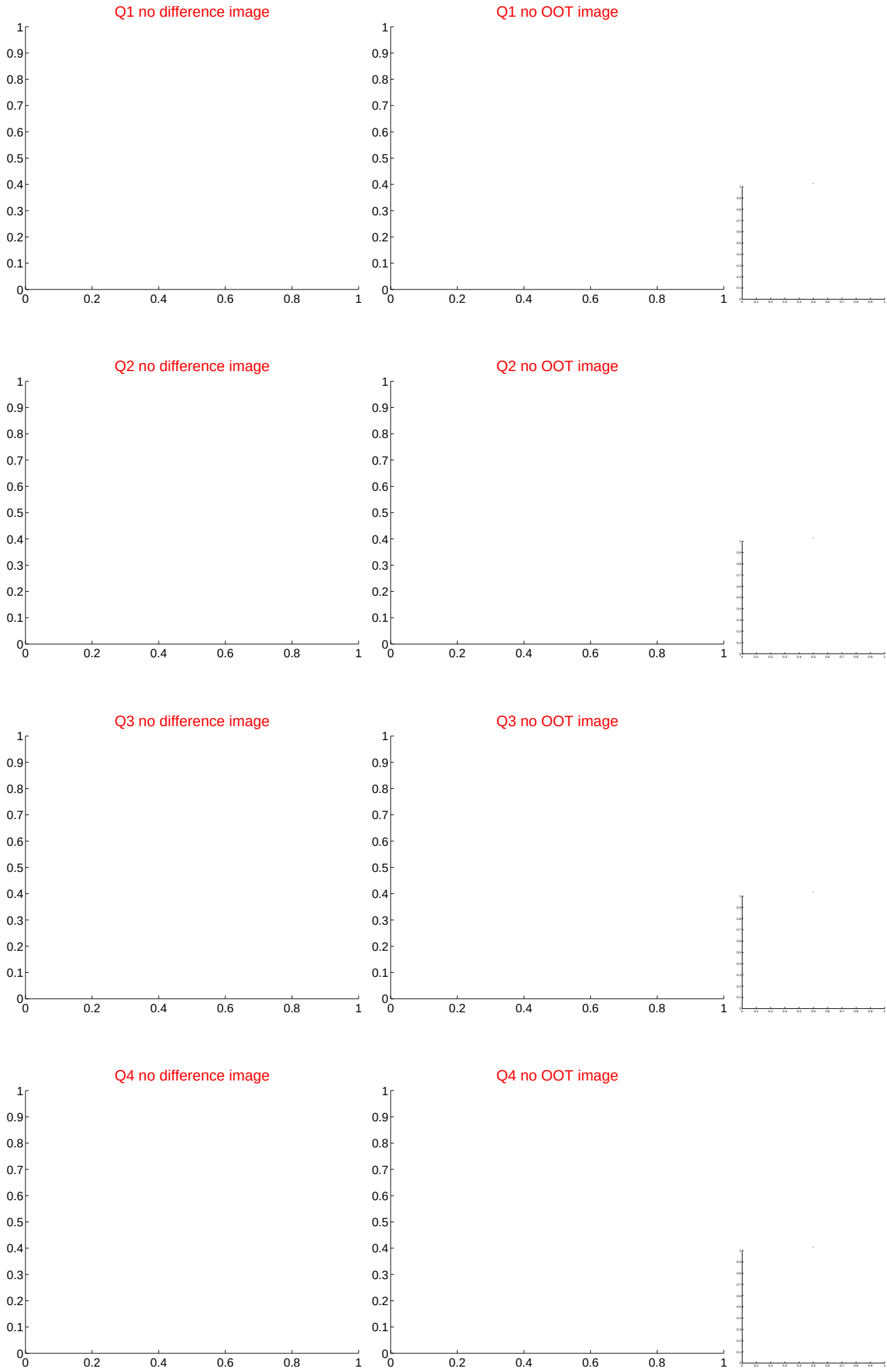
Supplemental centroid analysis for 009117167-06. Kepler magnitude: 13.58. Transit SNR 6.84
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.451 ± 0.267	1.69	0.093 ± 0.708	-0.442 ± 0.229
PRF-fit source offset from KIC position	0.411 ± 0.240	1.71	0.044 ± 0.721	-0.409 ± 0.229
photometric centroid source offset	0.22 ± 0.53	0.41	0.22 ± 0.53	-0.02 ± 0.52

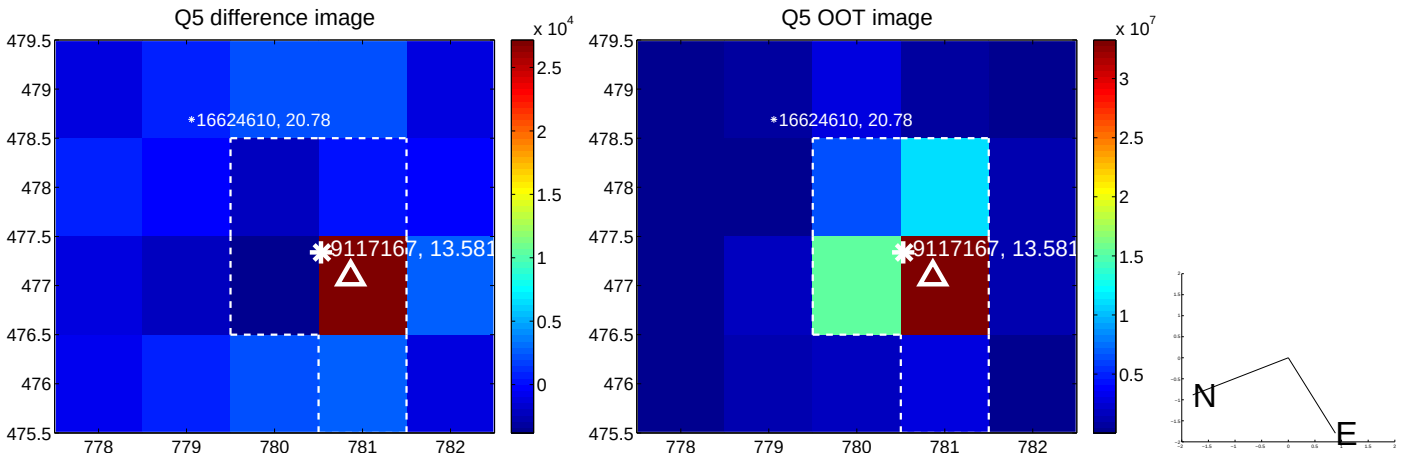


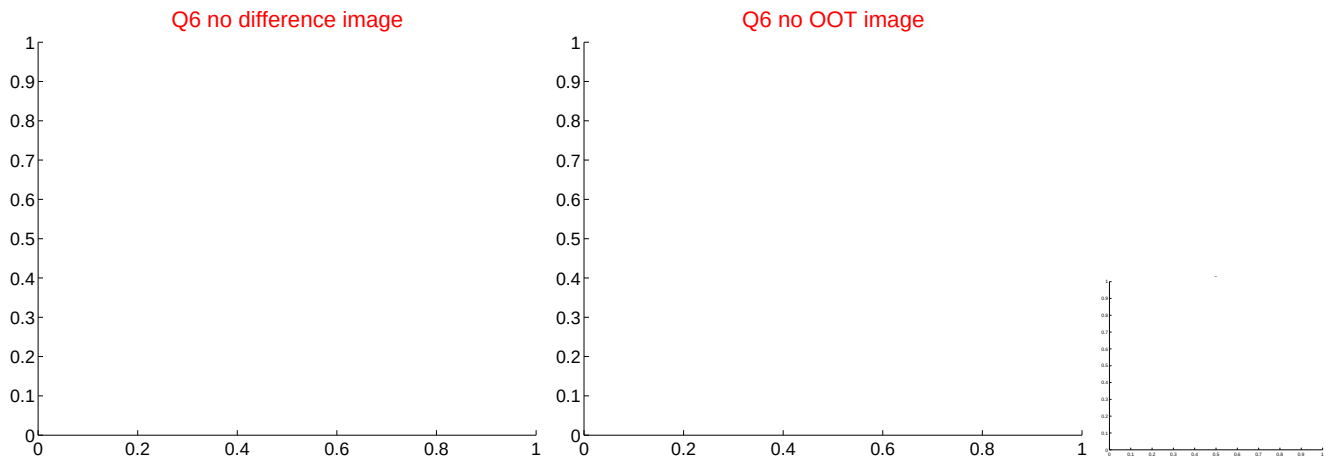
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

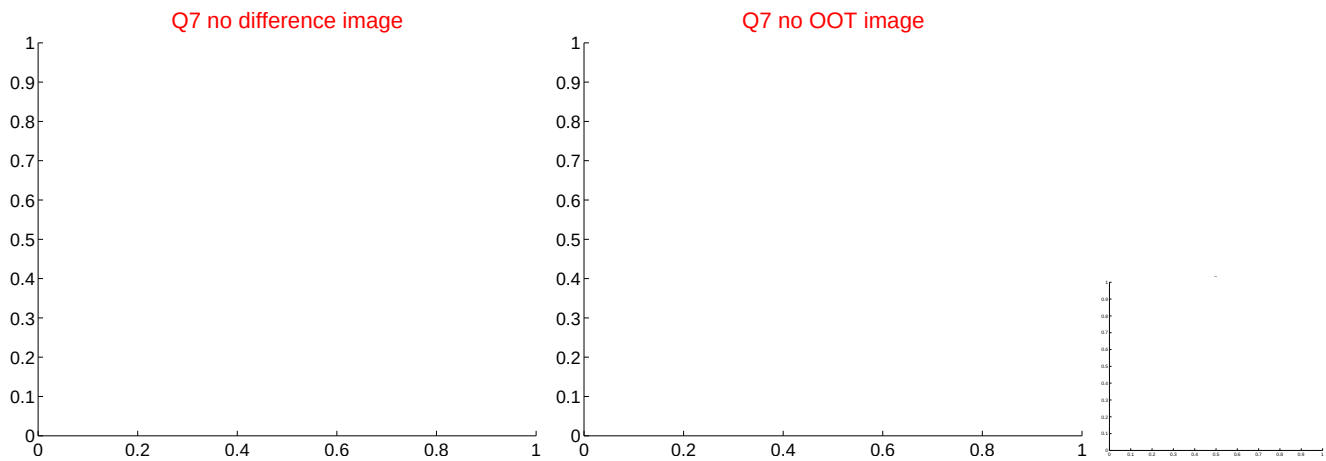
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

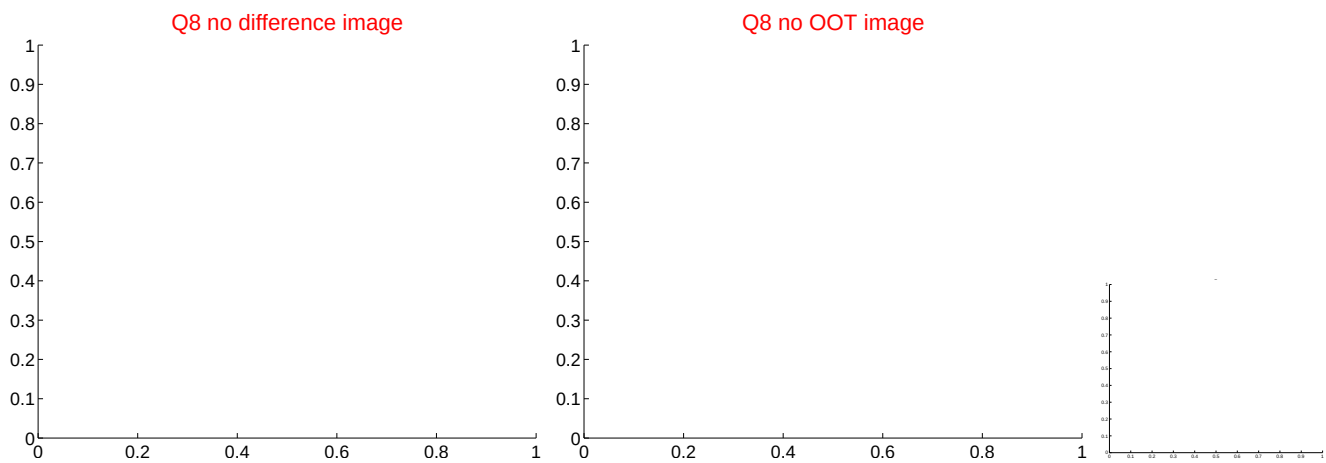


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

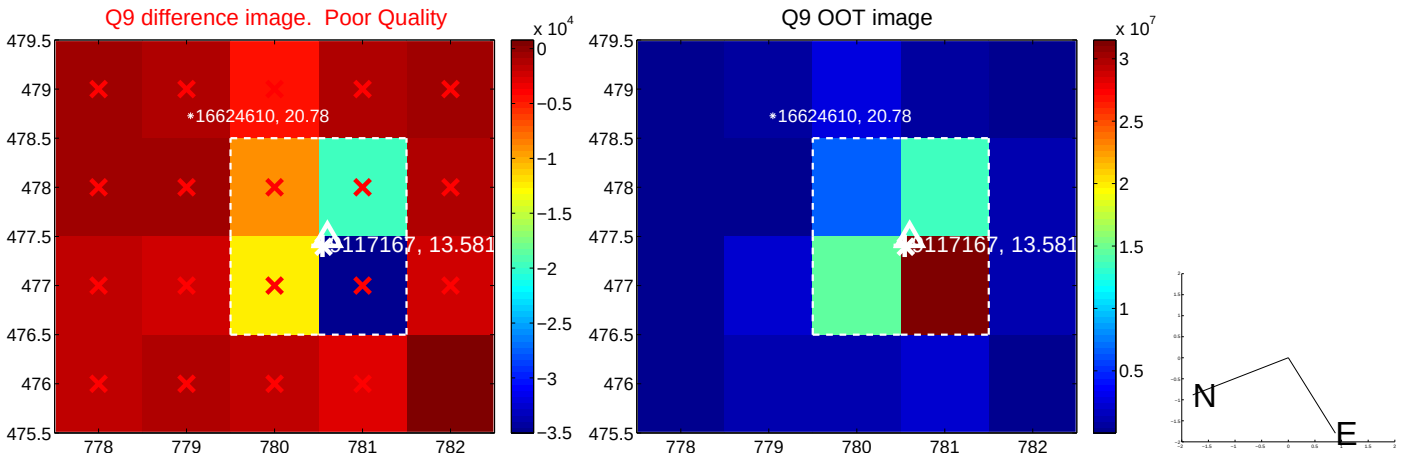


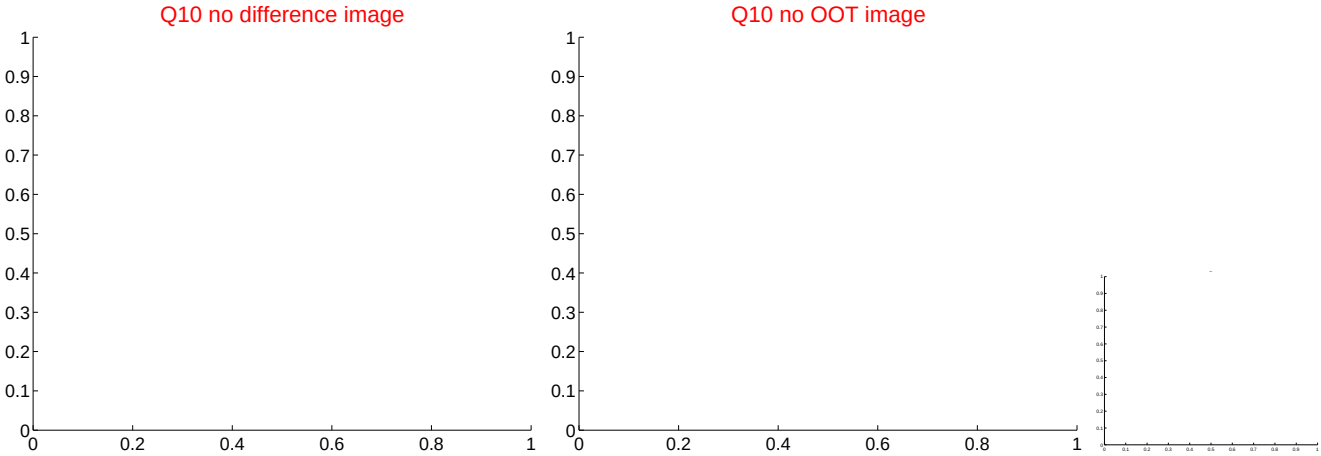


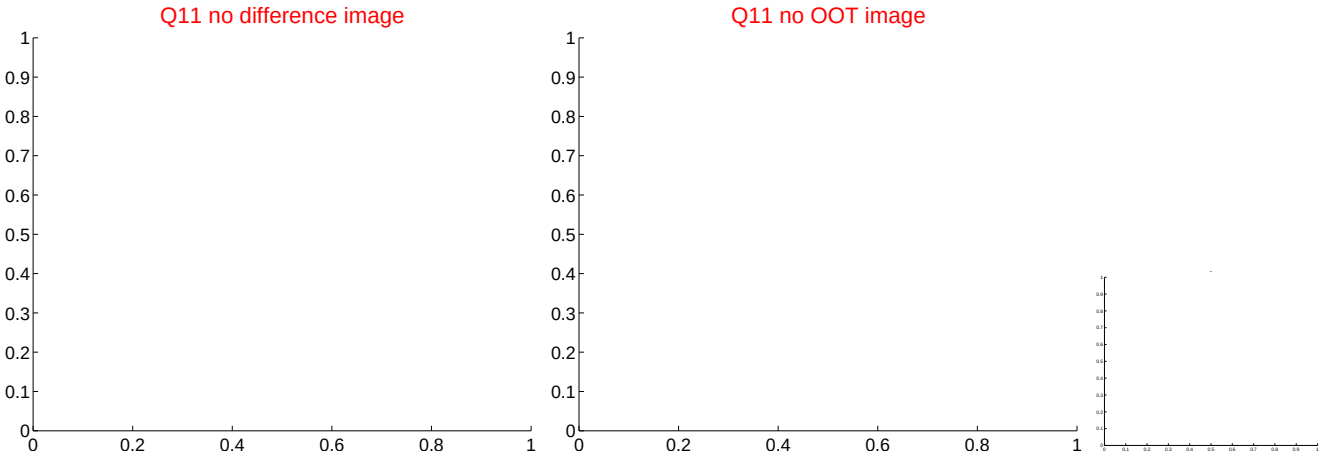


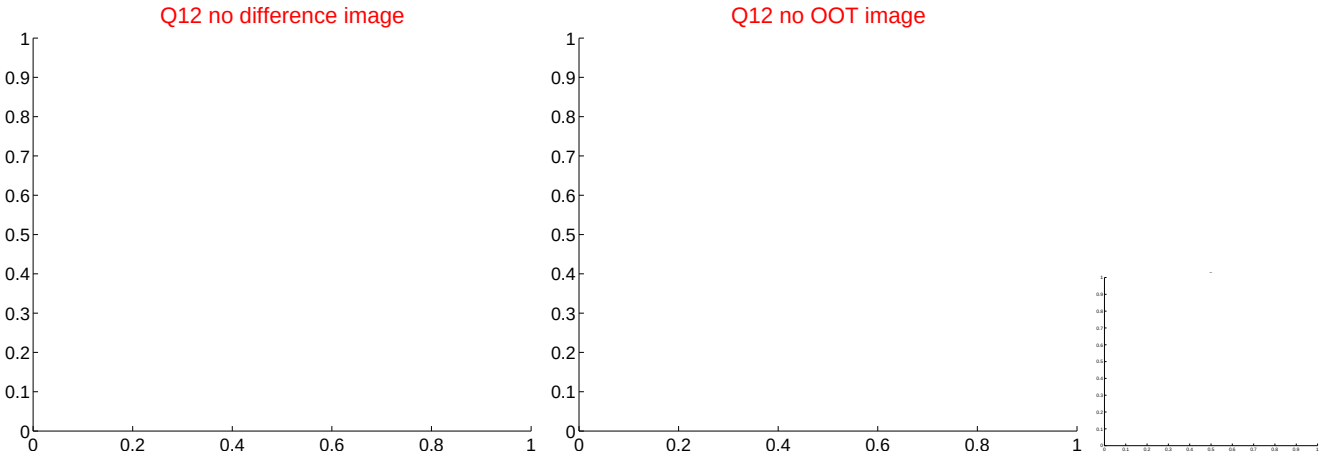


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

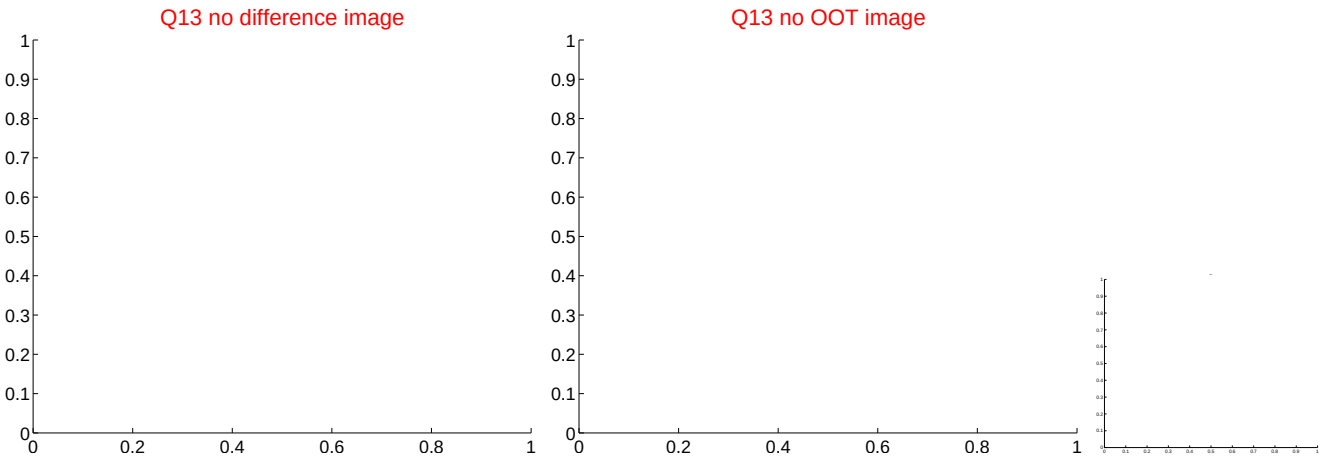


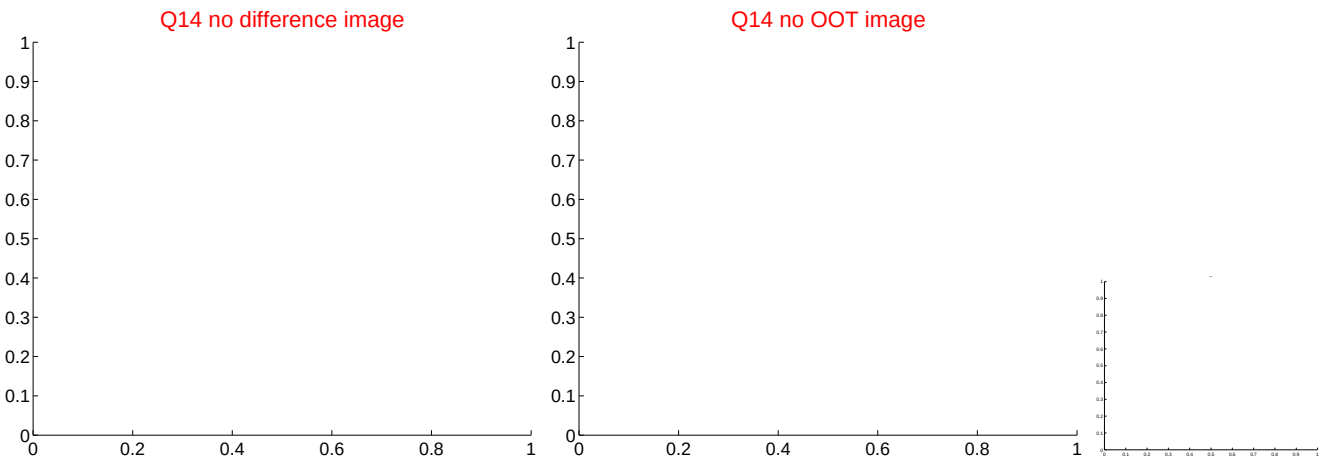


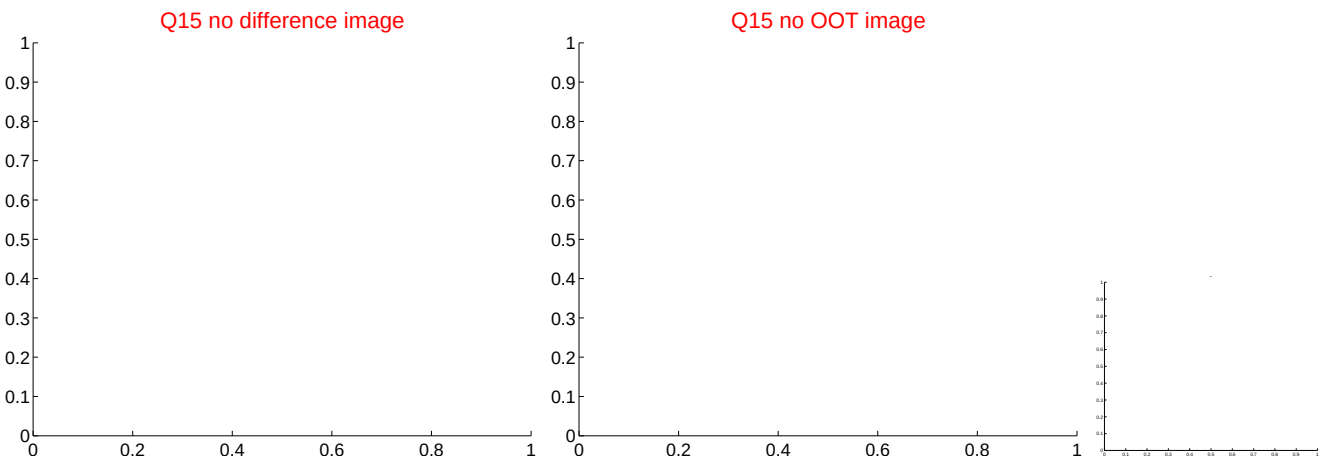


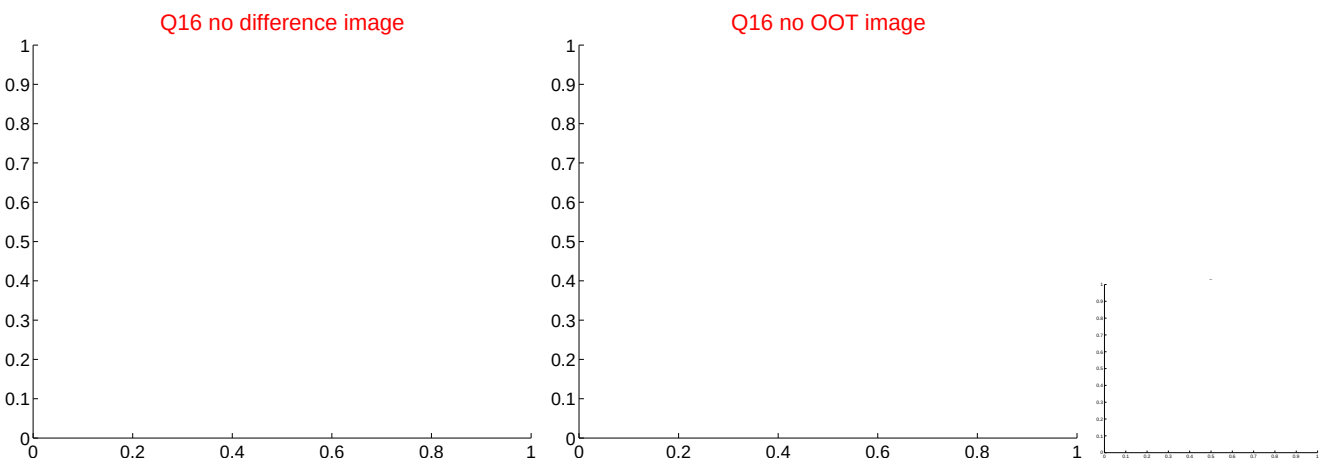


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

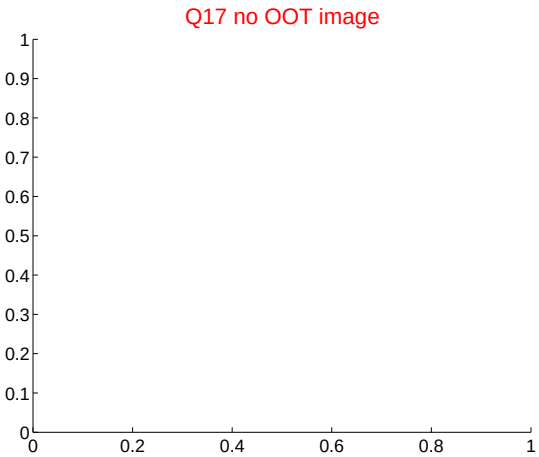


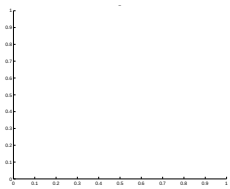


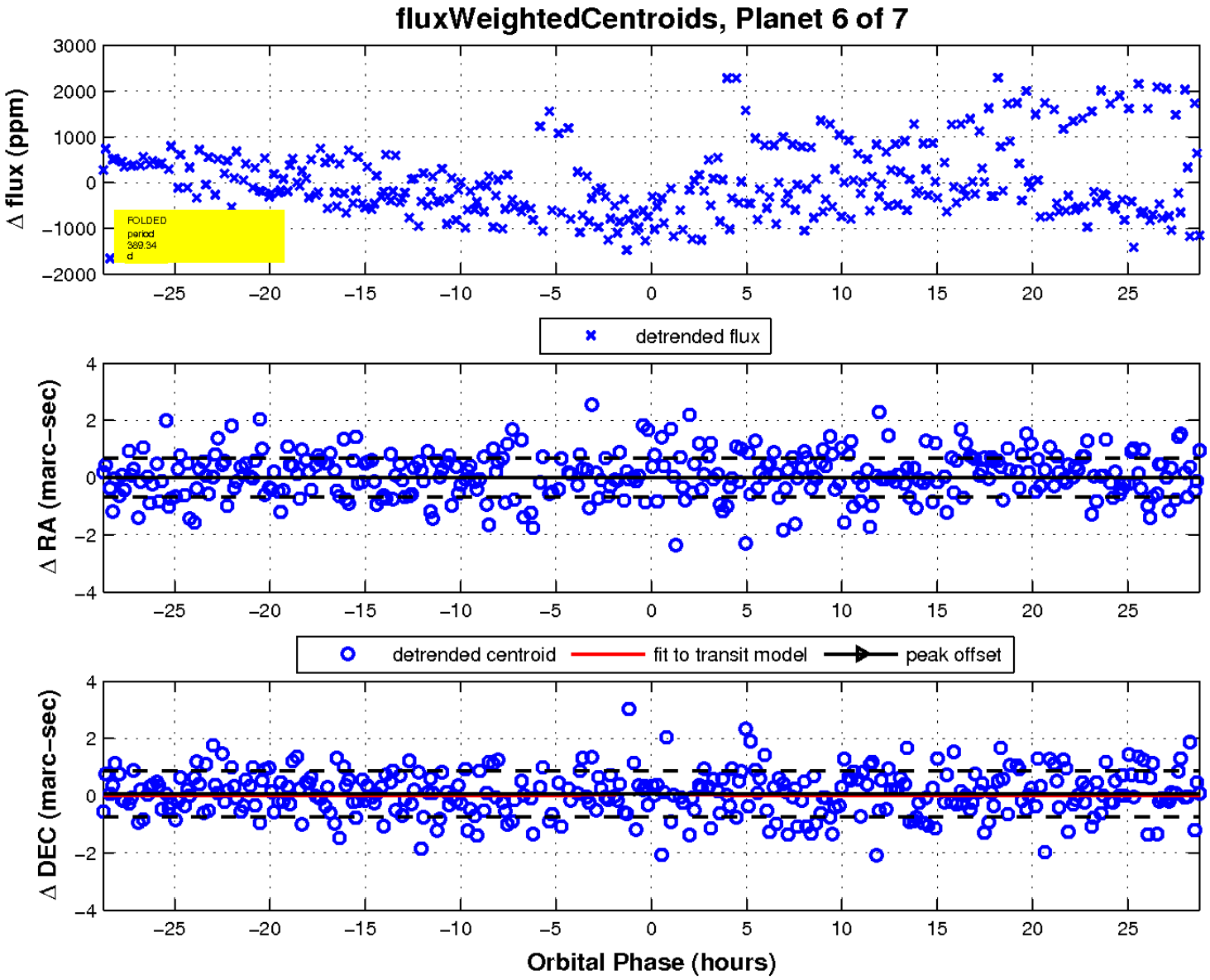




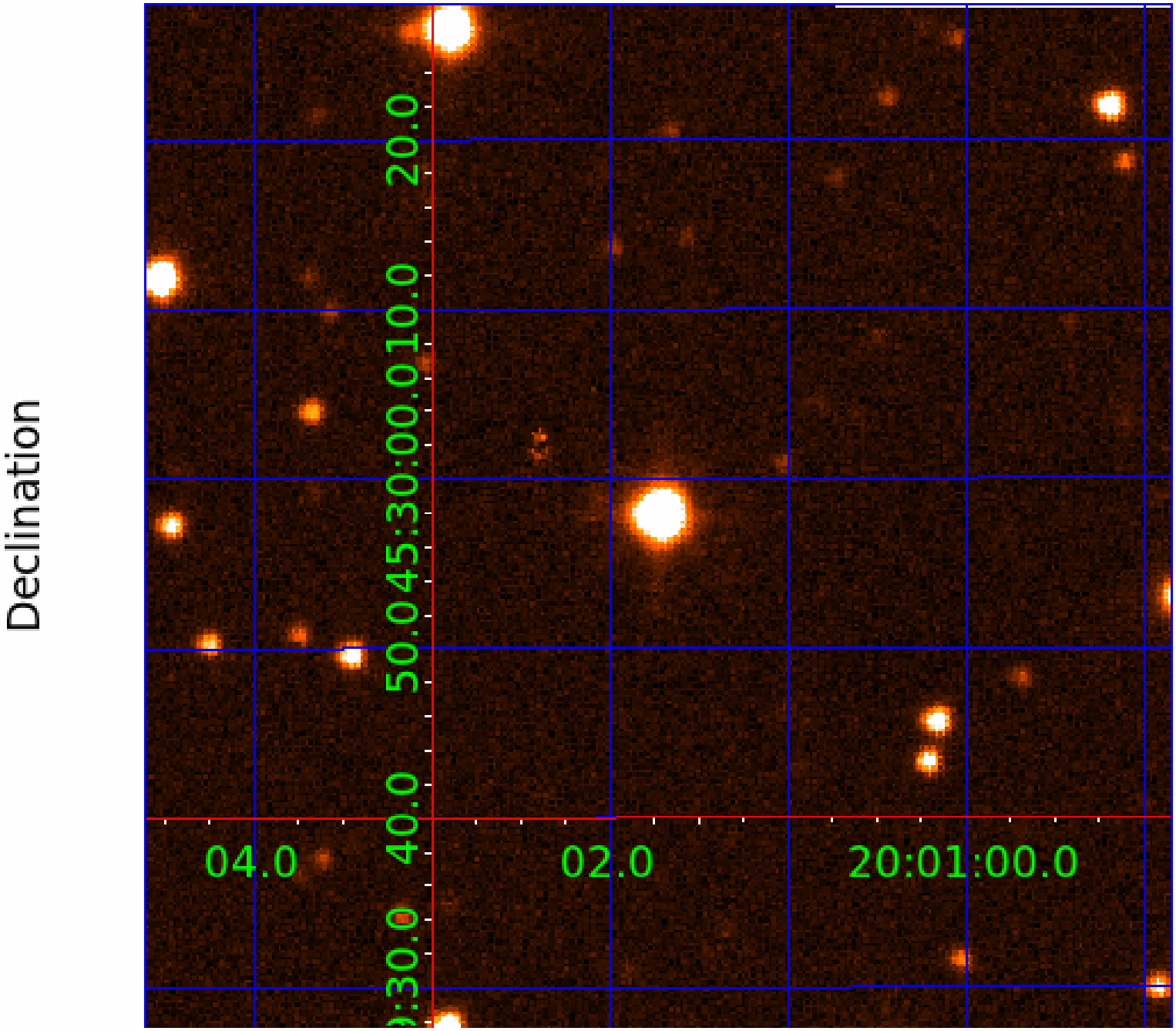
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image



KIC 009117167

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 ($S_\oplus$)
009117167-02	OBS	No	407.972280	144.952659	753.3	4.288	13.4	7.4	0.55	4218	1.60	0.11
009117167-03	OBS	No	534.759249	451.586081	1035.9	10.733	12.1	7.6	0.55	4218	1.78	0.08
009117167-04	OBS	No	206.130332	321.621468	585.7	5.165	12.3	5.5	0.55	4218	1.48	0.28
009117167-05	OBS	No	453.446247	186.883113	614.2	5.138	9.7	5.9	0.55	4218	1.50	0.10
009117167-06	OBS	No	389.337133	453.257389	974.8	9.617	11.6	6.8	0.55	4218	2.23	0.12
009117167-07	OBS	No	431.706633	457.358164	561.4	4.500	11.8	-1.0	0.55	4218	1.27	0.10

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009117167-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_TER_DV
009117167-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009117167-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009117167-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009117167-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS

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.

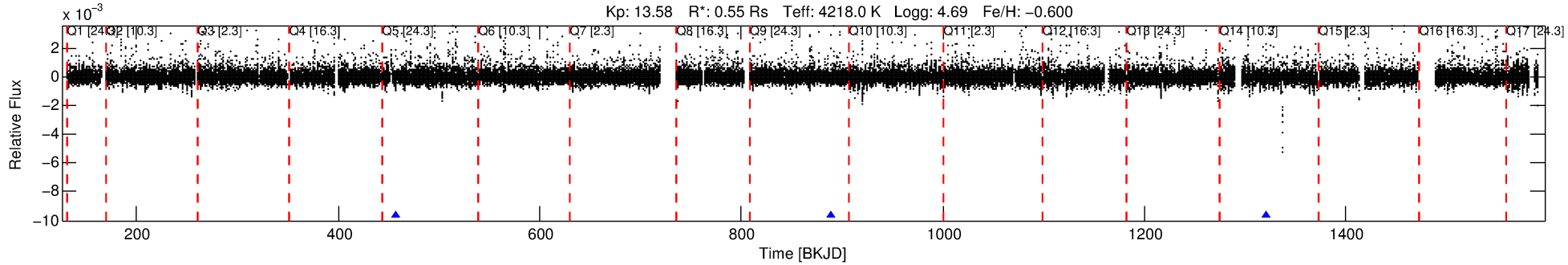
Ephemeris Match Information For 009117167-07

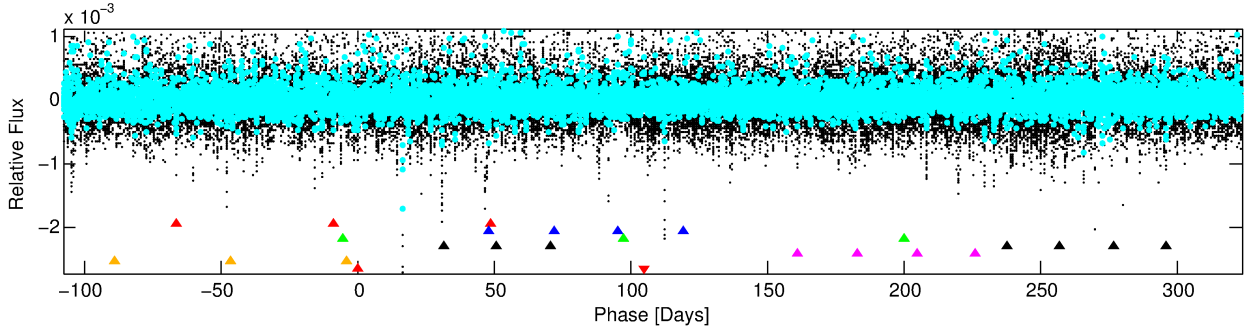
No Significant Match Found

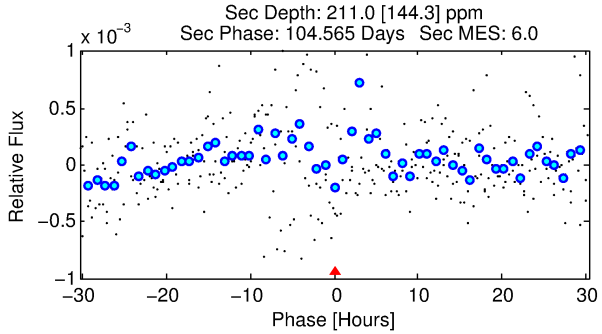
DV One-Page Summary

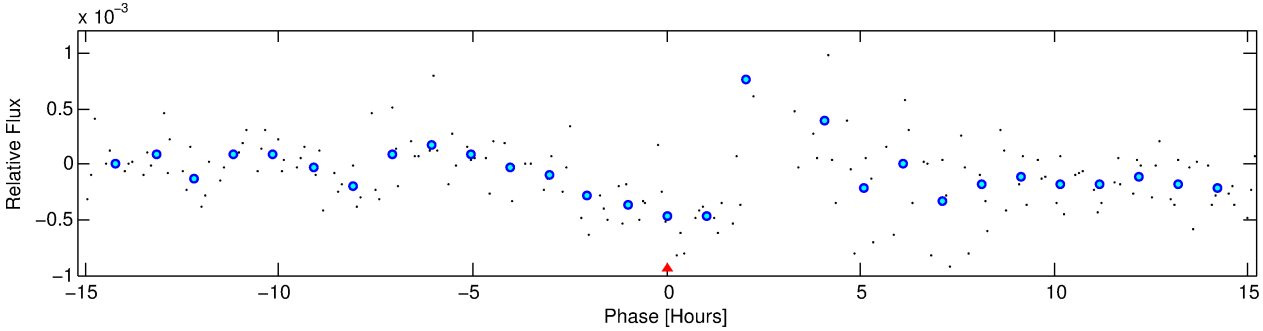
KIC: 9117167 Candidate: 7 of 7 Period: 431.707 d

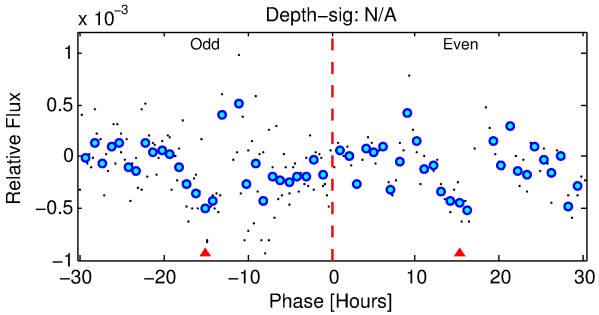
Kp: 13.58 R*: 0.55 Rs Teff: 4218.0 K Logg: 4.69 Fe/H: −0.600

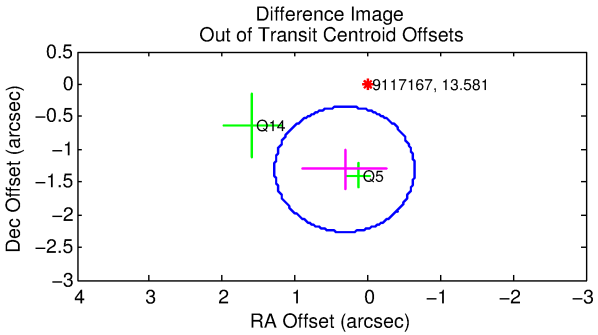












TPS TCE Results:

Period = 431.70663 d
Epoch = 457.3582 BKJD

DV fit results are unavailable

DV Diagnostic Results:

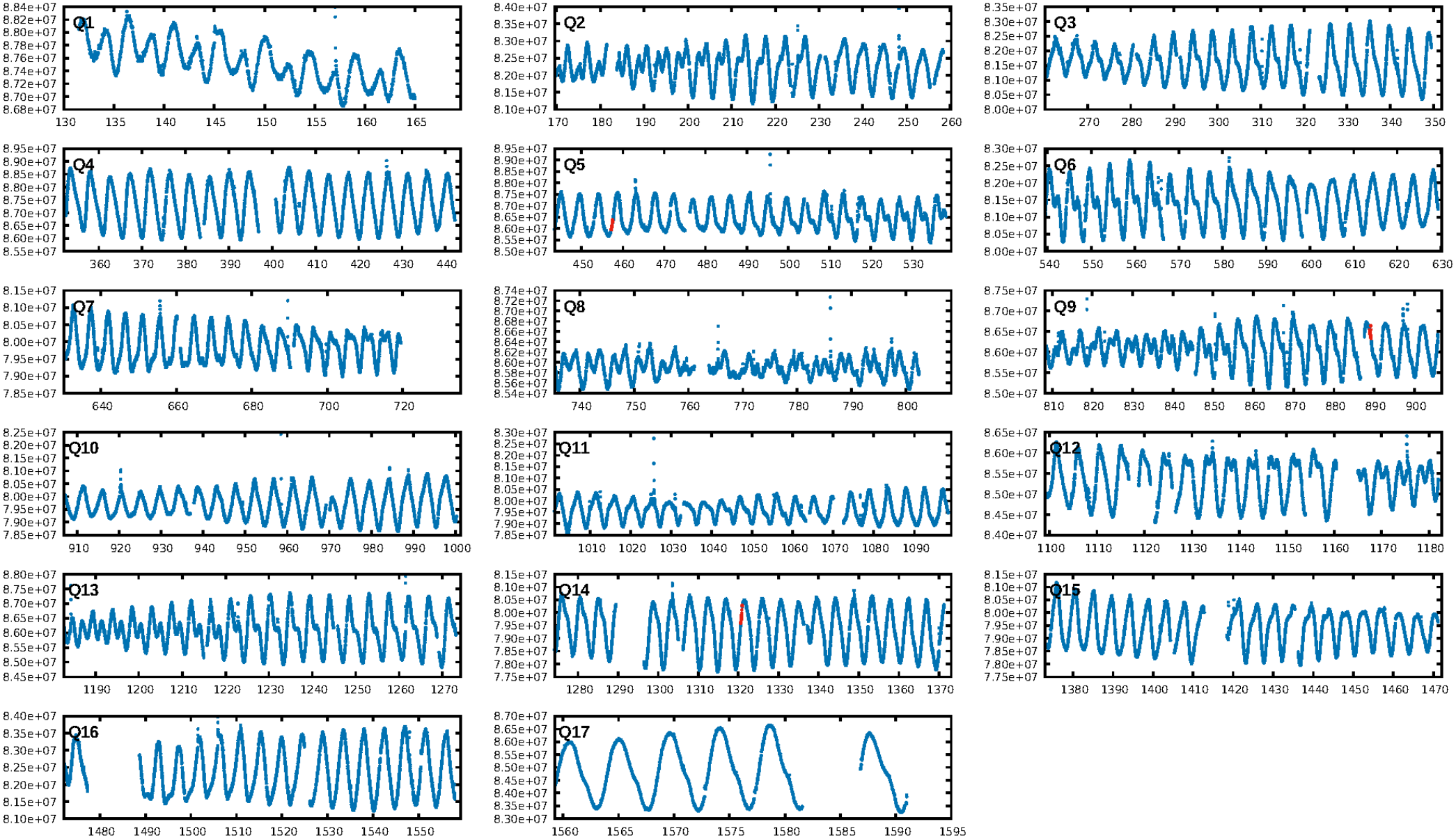
ShortPeriod−sig: 100.0% [91.64σ]
LongPeriod−sig: 100.0% [76.39σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: −6.285

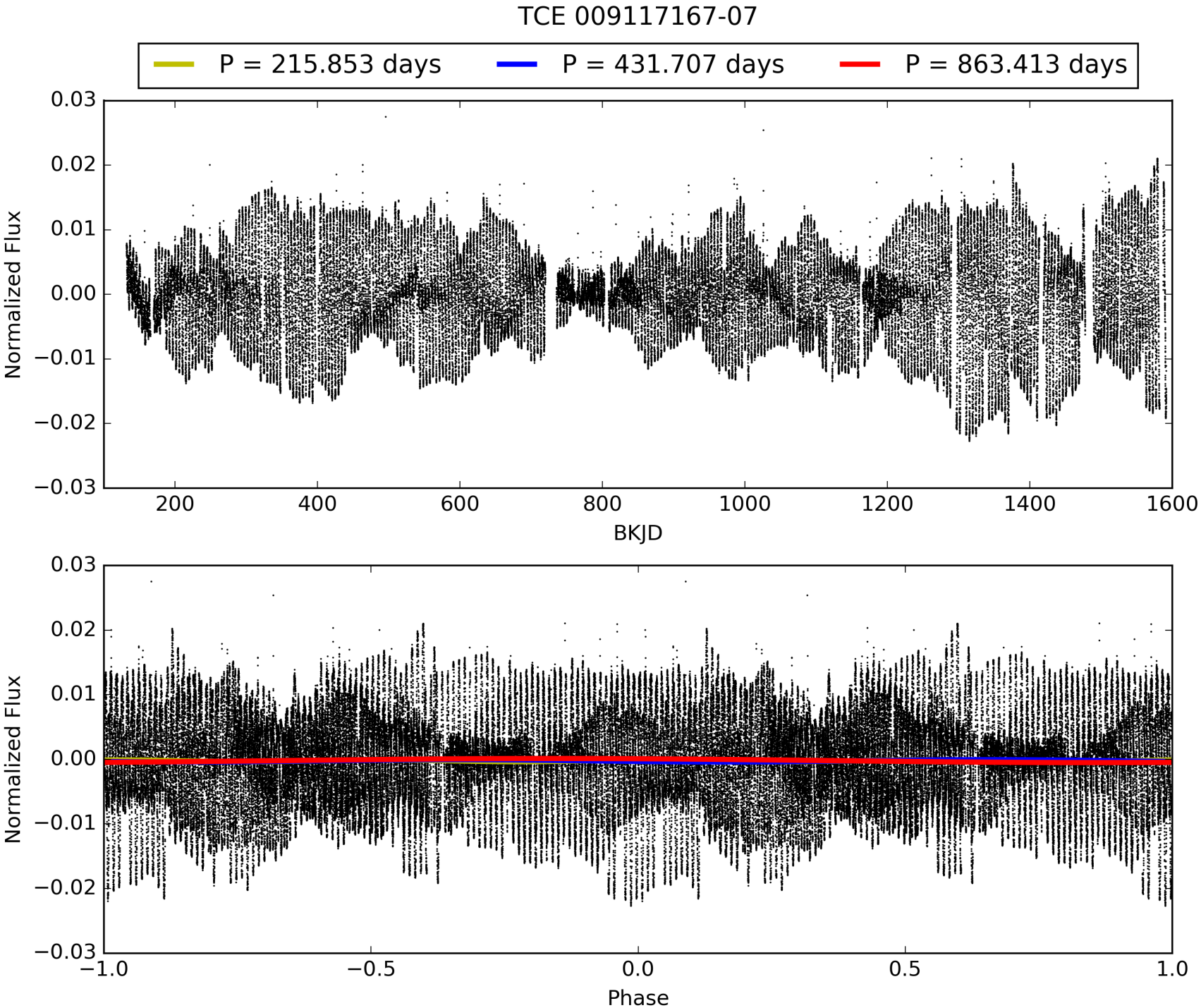
Centroid−sig: 6.9%
Centroid−so: 0.947 arcsec [1.43σ]
OotOffset−rm: 1.344 arcsec [4.20σ]
KicOffset−rm: 1.292 arcsec [3.75σ]
OotOffset−st: 1/0/0/1 [2]
KicOffset−st: 1/0/0/1 [2]
DiffImageQuality−fgm: 0.50 [1/2]
DiffImageOverlap−fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 13:37:42 Z

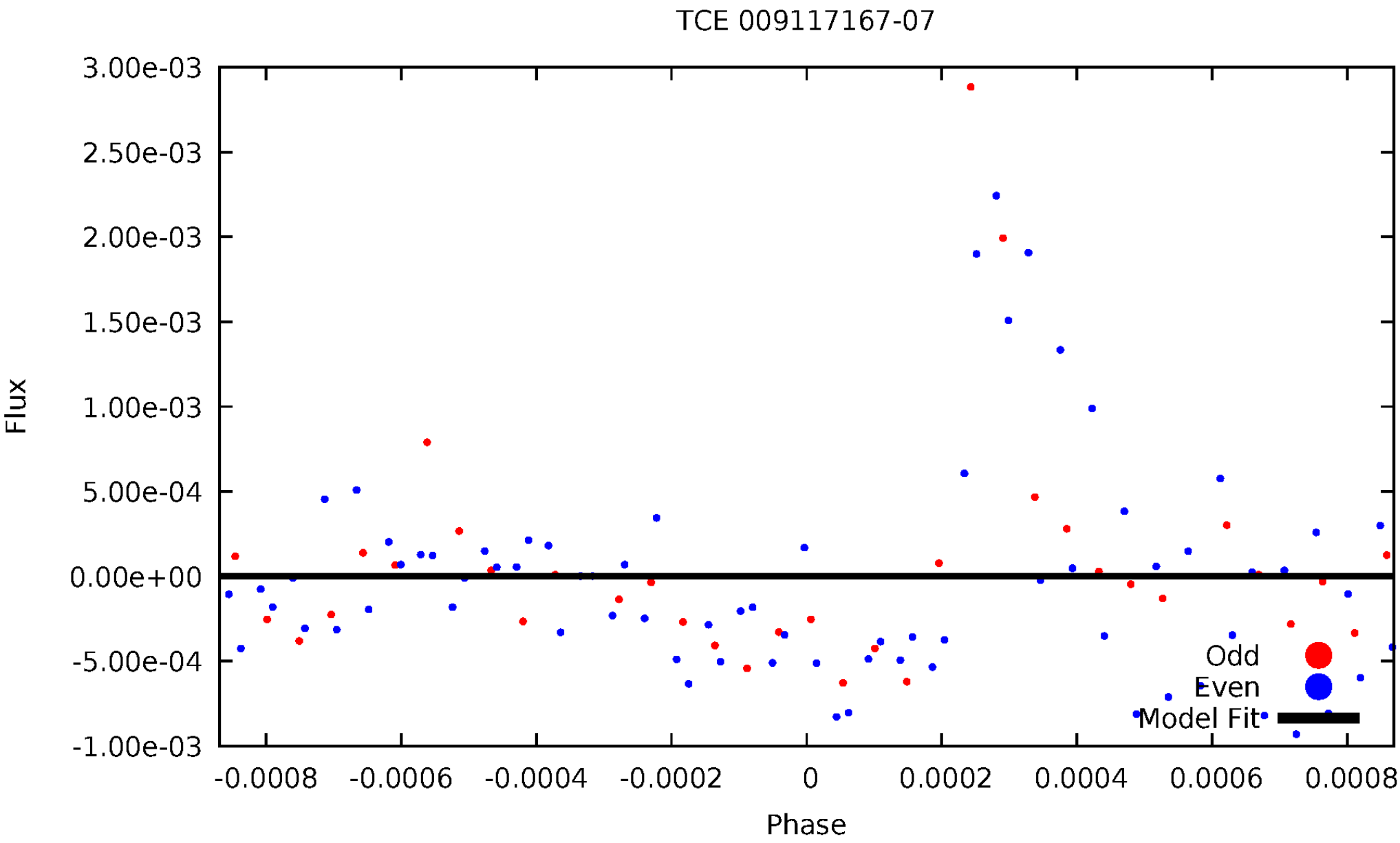
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009117167-07, PDC Light Curves

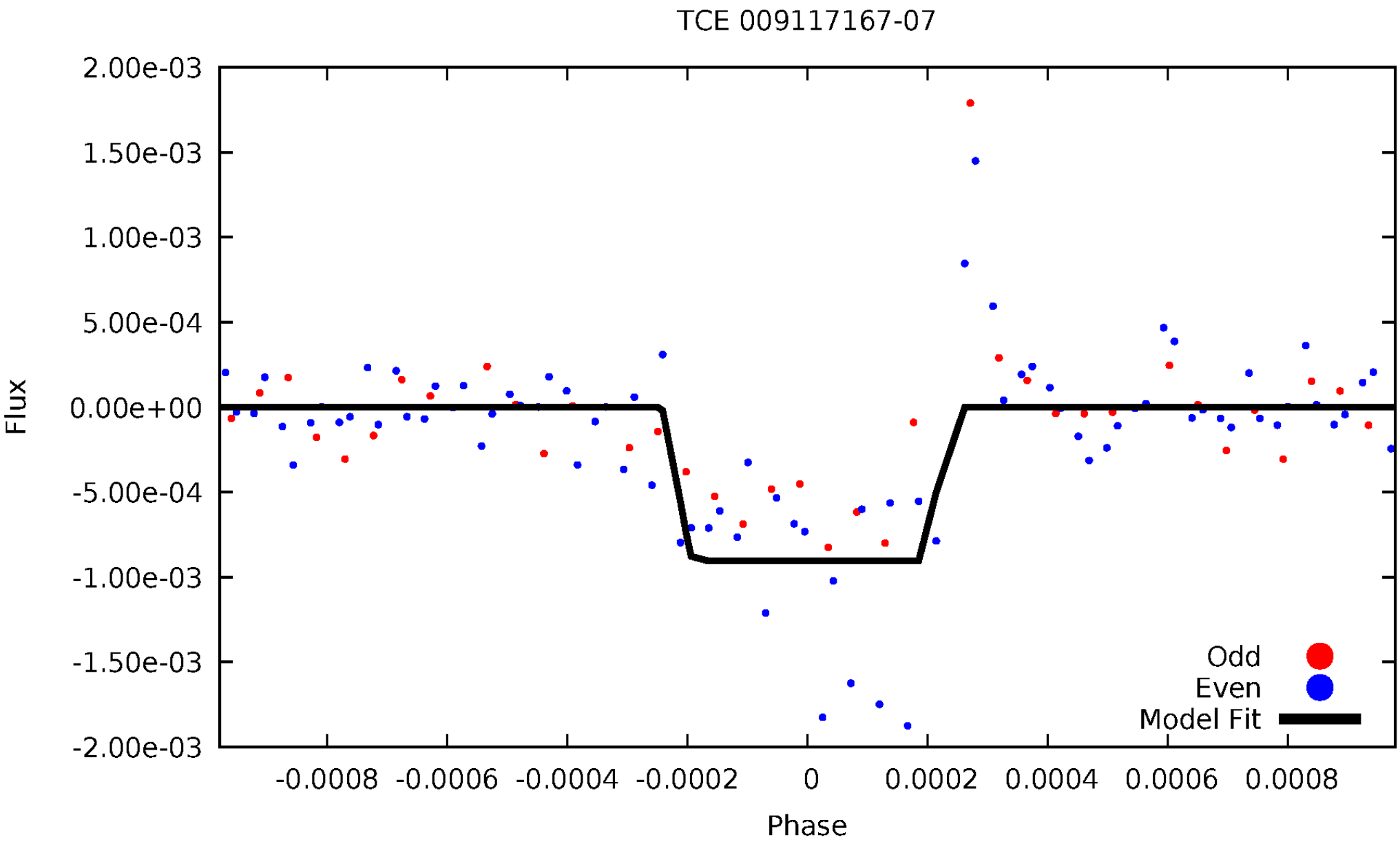



TCE 009117167-07
P = 215.853 days
P = 431.707 days
P = 863.413 days
Normalized Flux
BKJD
Normalized Flux
Phase

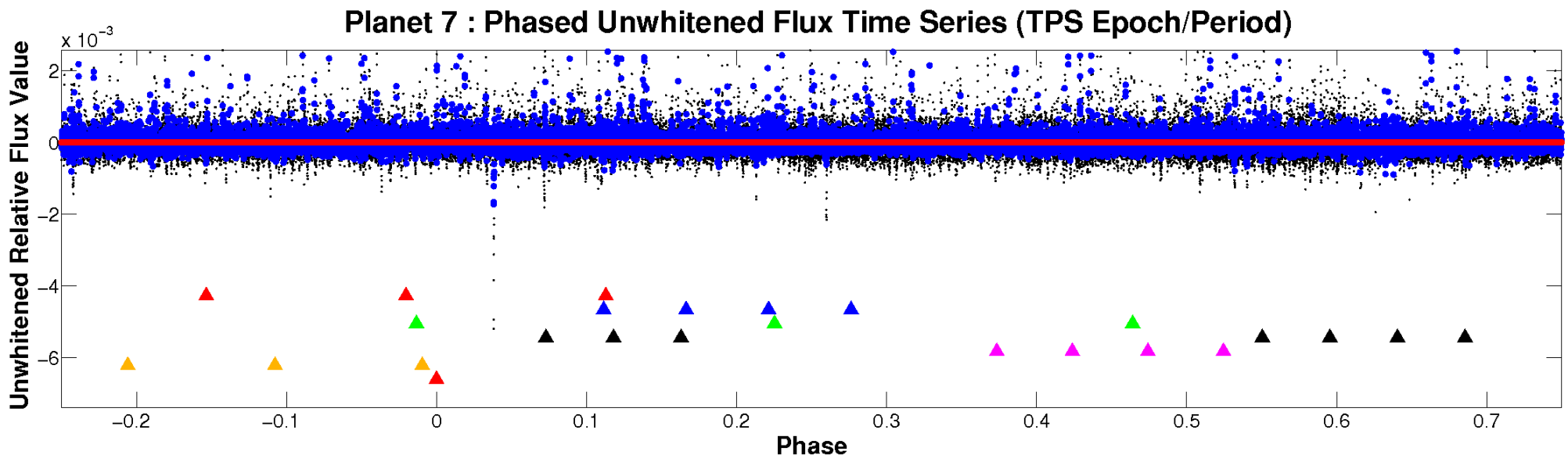
DV Odd/Even

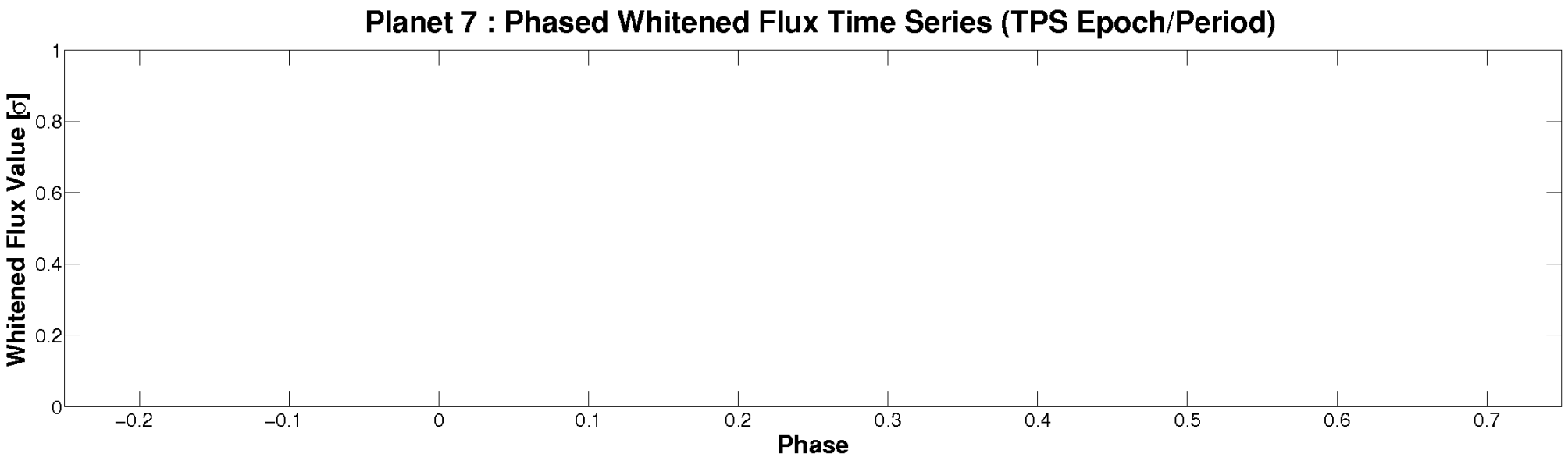

TCE 009117167-07
3.00e-03
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
Flux
-0.0008
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
0.0008
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009117167-07
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
Flux
-0.0008
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
0.0008
Phase
Odd
Even
Model Fit

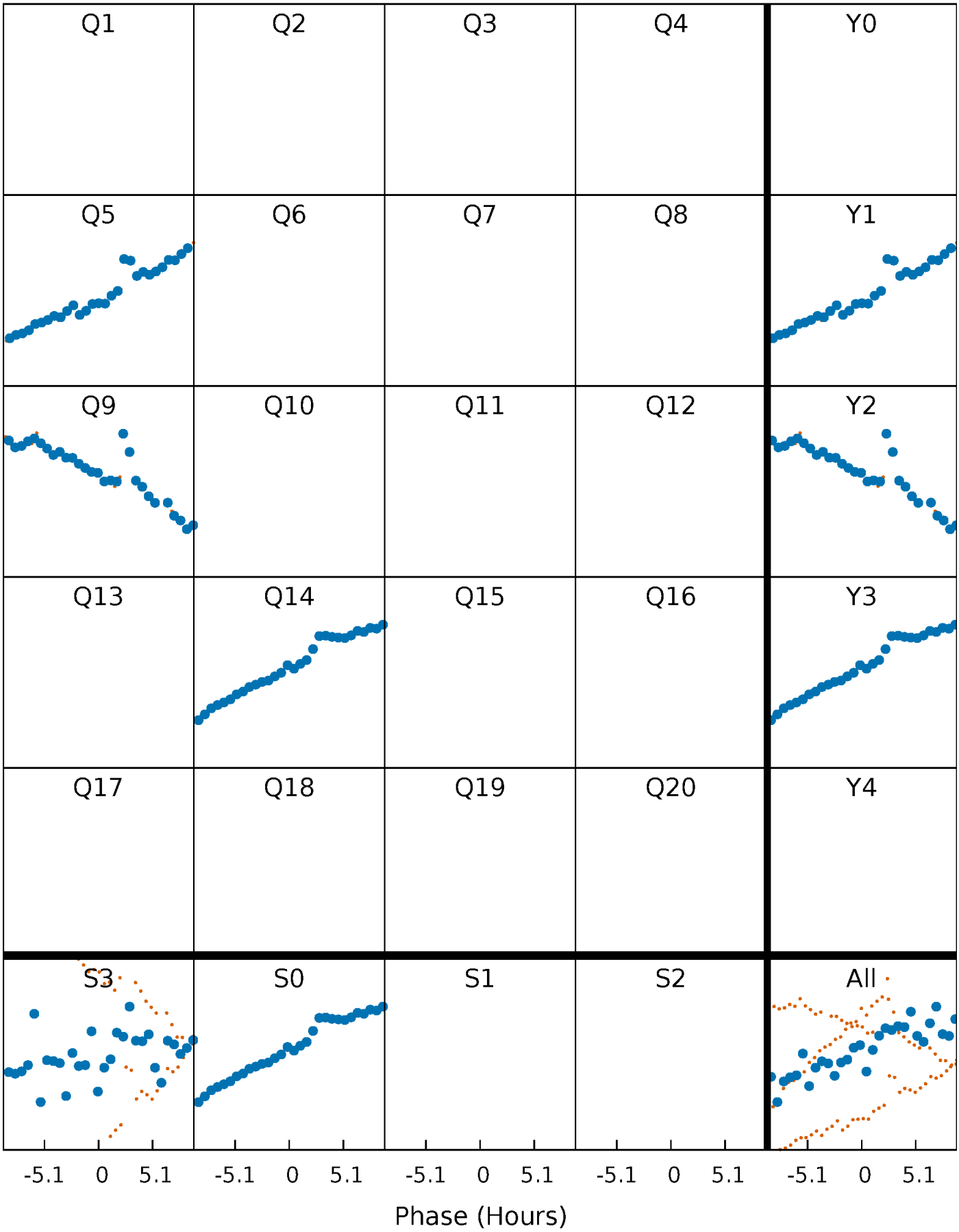
Non-Whitened Vs. Whitened Light Curve





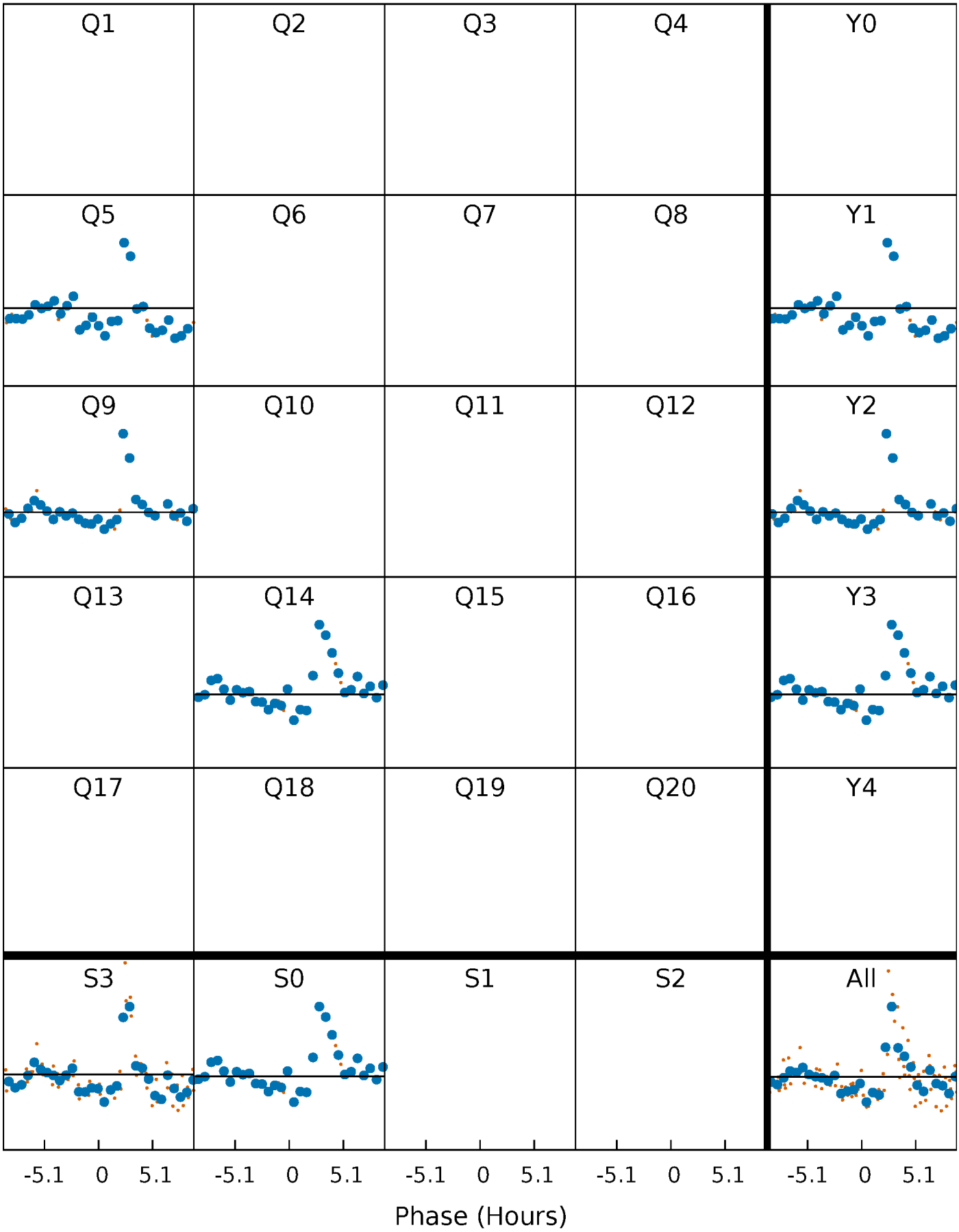
PDC Quarter-Phased Transit Curves

TCE 009117167-07 P=431.706633 Days T_0=457.358164 (BKJD)



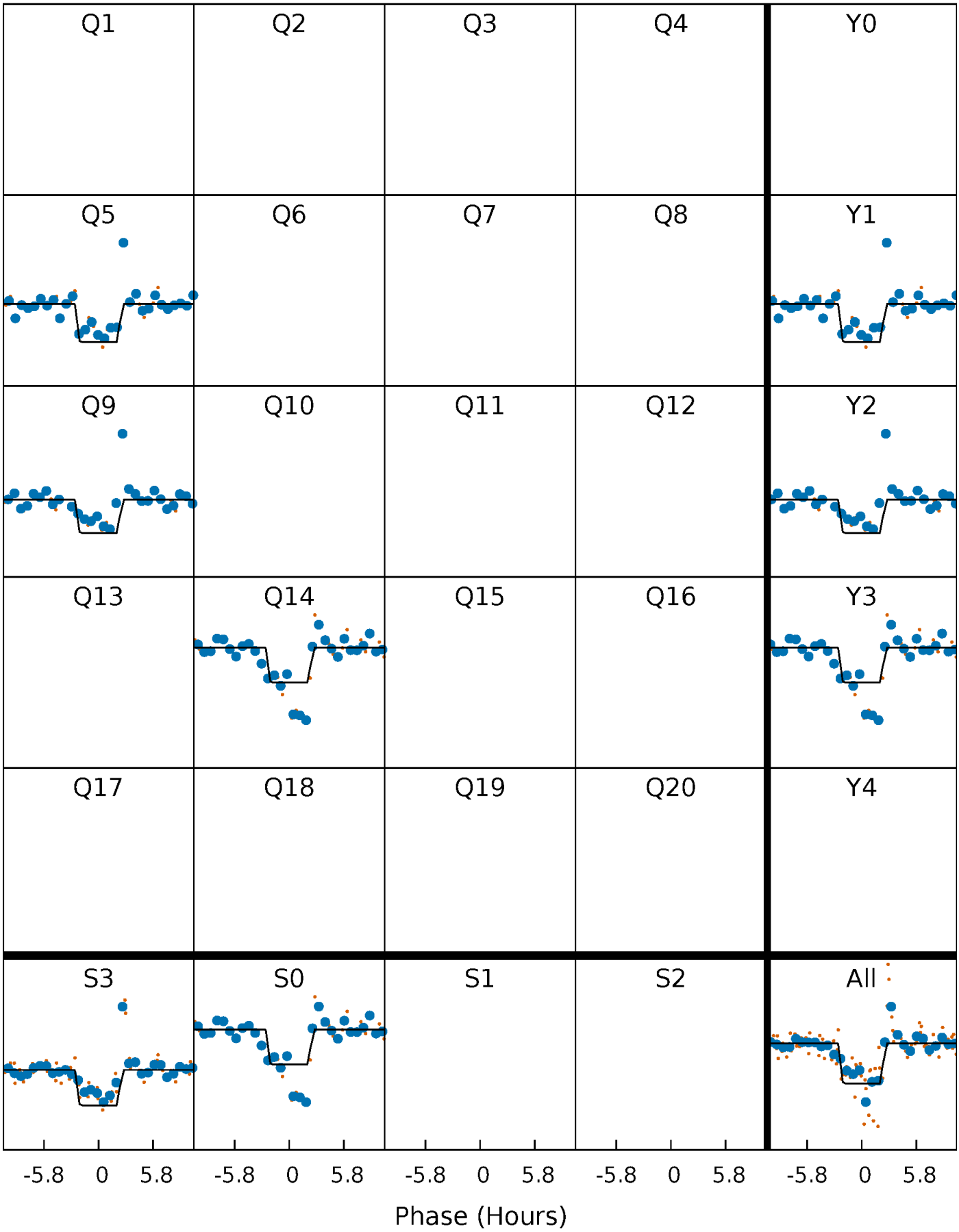
DV Quarter-Phased Transit Curves

TCE 009117167-07 P=431.706633 Days T_0=457.358164 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

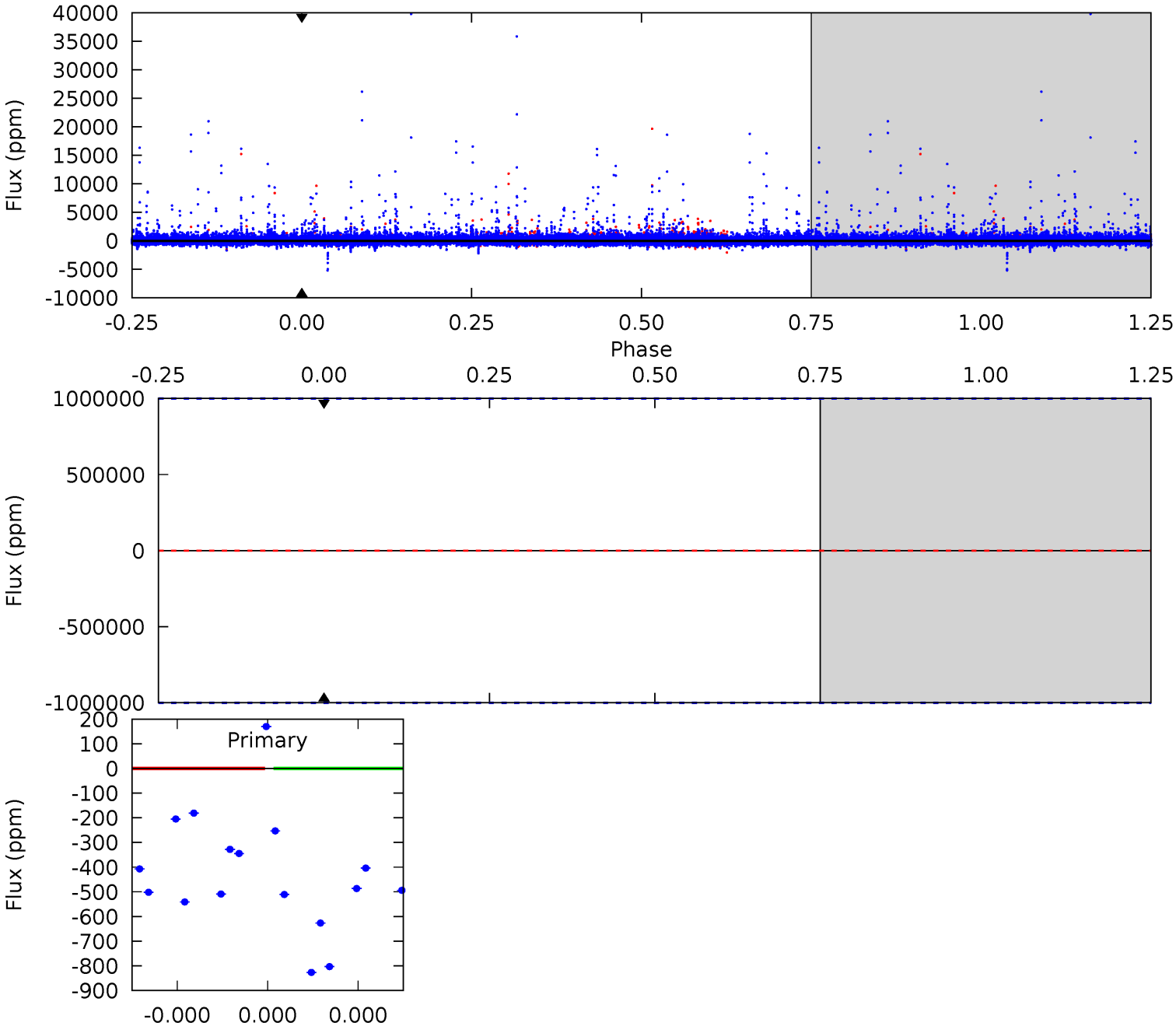
TCE 009117167-07 P=431.706633 Days T_0=457.366356 (BKJD)



DV Model-Shift Uniqueness Test

009117167-07, P = 431.706633 Days, E = 25.651531 Days

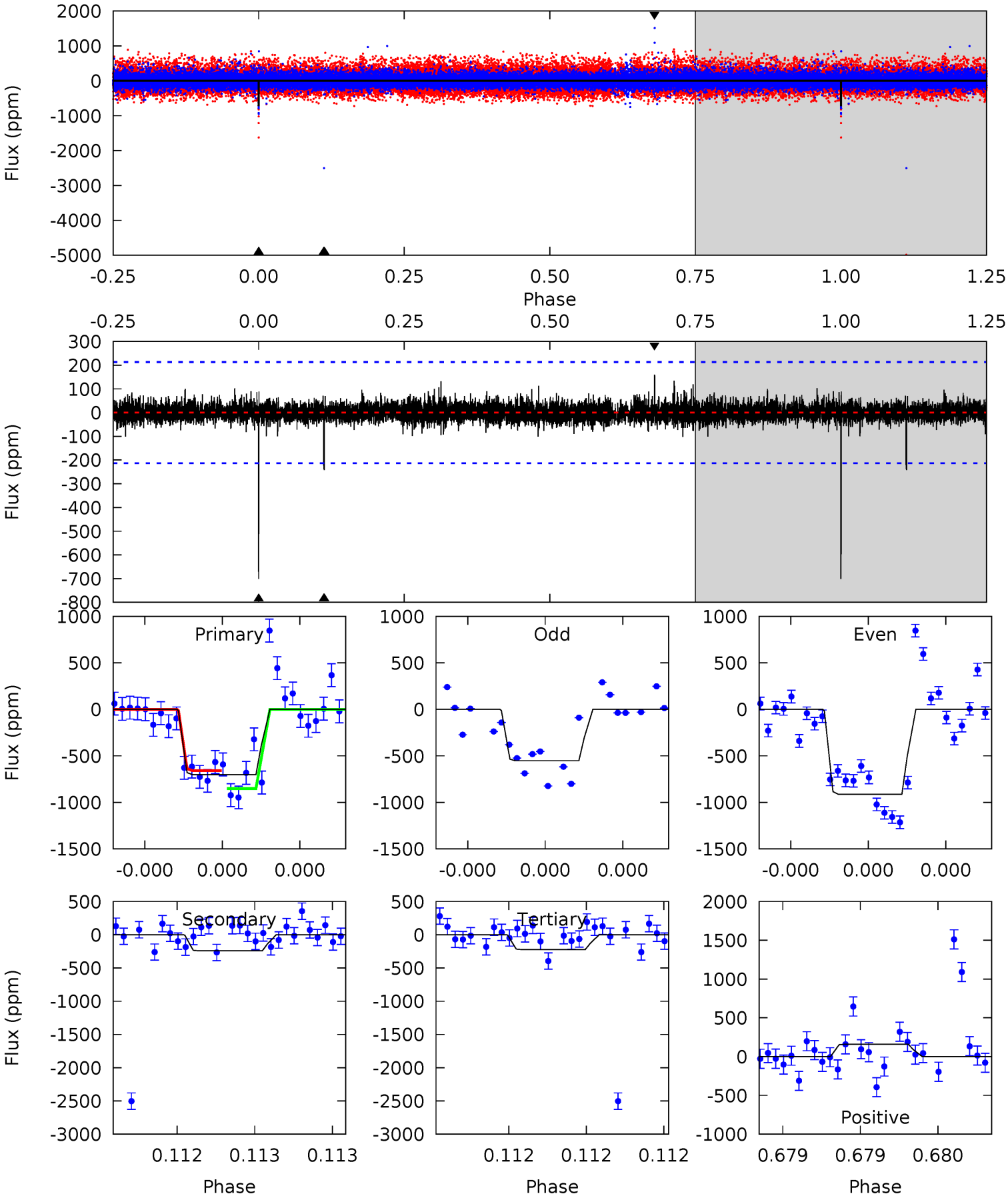
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009117167-07, P = 431.706633 Days, E = 25.659723 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	6.35	5.84	4.18	5.60	3.52	0.62	12.6	14.2	0.51	2.17	4.60	1.32	0.19	2.58



Stellar Parameters For KIC 009117167

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	4218^{+115}_{-140}	$4.691^{+0.063}_{-0.032}$	$-0.600^{+0.300}_{-0.300}$	$0.547^{+0.049}_{-0.059}$	$0.535^{+0.056}_{-0.046}$	$4.609^{+1.422}_{-0.621}$
	+3%/-3%	+1%/-1%	+50%/-50%	+9%/-11%	+10%/-9%	+31%/-13%
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 009117167-07 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0±1000000	$4.59^{+4.79}_{-3.03}$	201^{+7}_{-7}	-2291^{+12889}_{-7150}	$-1541.736^{+4403730.077}_{-3682276.929}$
Alt.	-242±38	$4.64^{+4.76}_{-3.20}$	200^{+7}_{-7}	2579^{+1043}_{-391}	5097^{+51319}_{-3845}

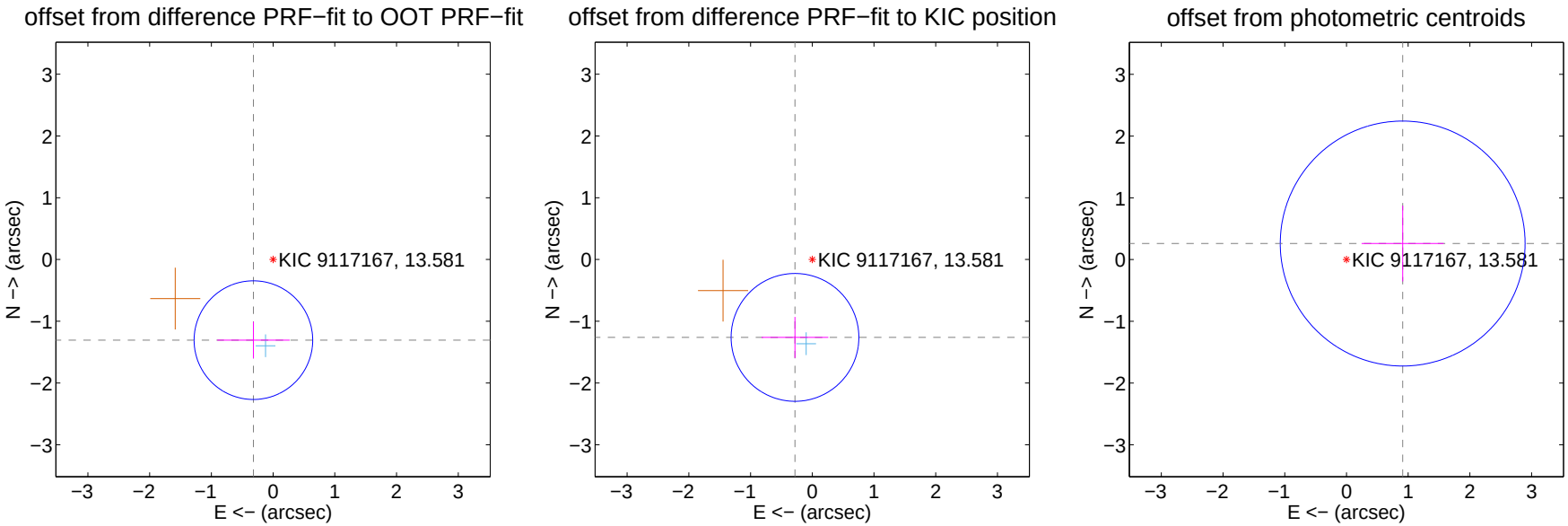
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

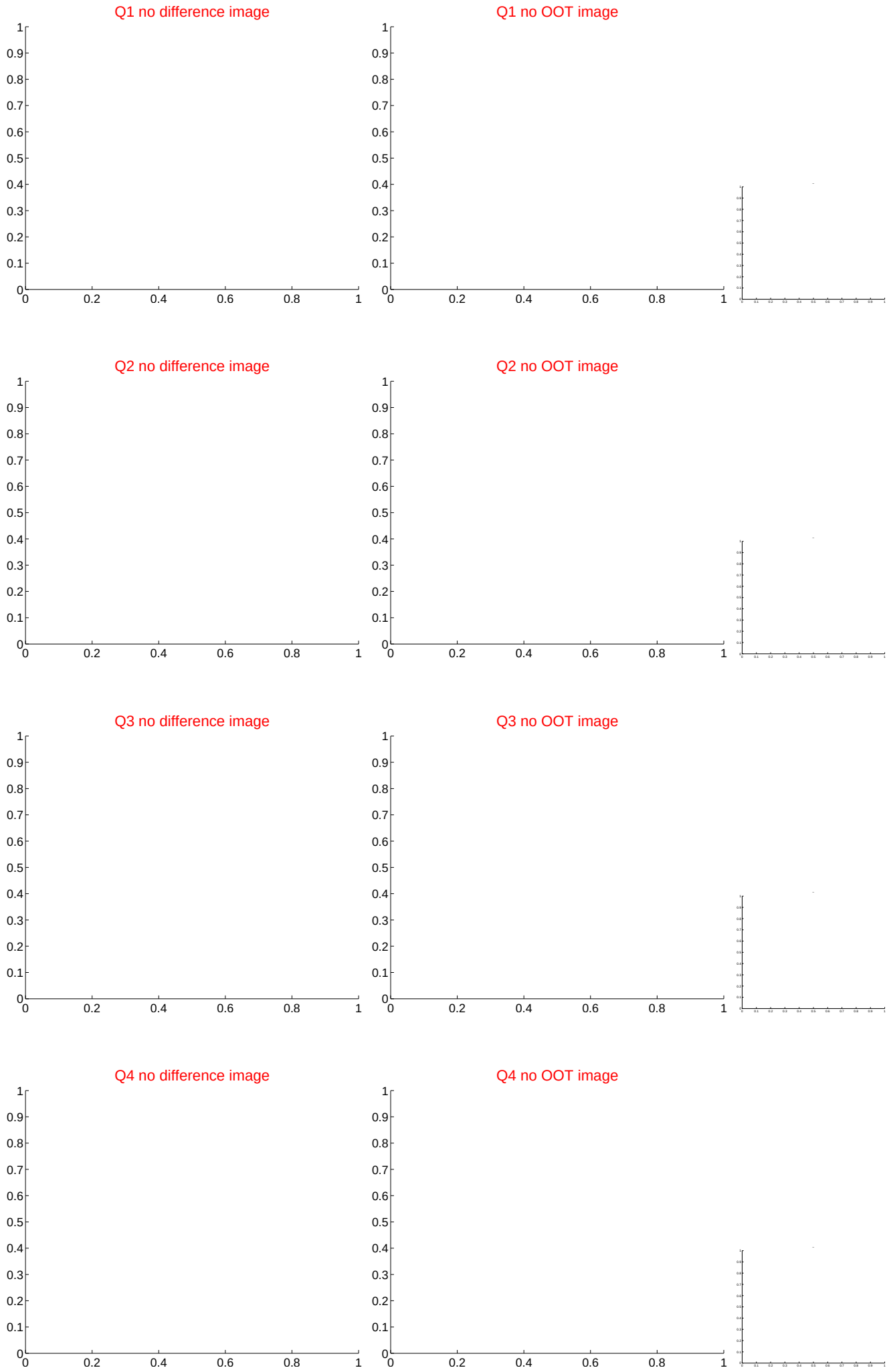
Supplemental centroid analysis for 009117167-07. Kepler magnitude: 13.58. Transit SNR -1.00
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.344 ± 0.320	4.20	0.319 ± 0.587	-1.305 ± 0.297
PRF-fit source offset from KIC position	1.292 ± 0.345	3.75	0.280 ± 0.541	-1.261 ± 0.332
photometric centroid source offset	0.95 ± 0.66	1.43	-0.91 ± 0.66	0.26 ± 0.61

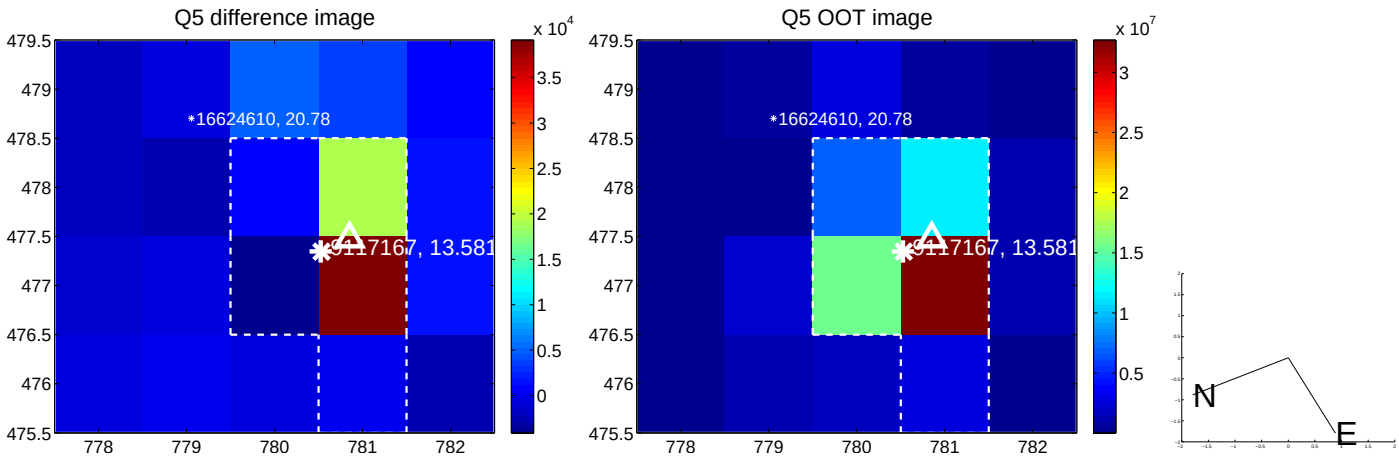


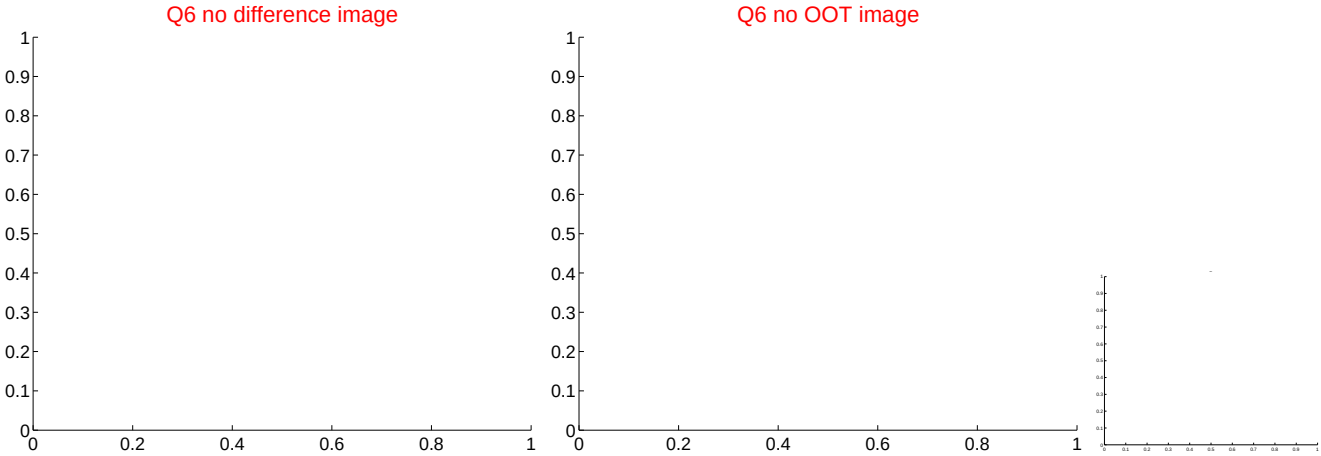
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

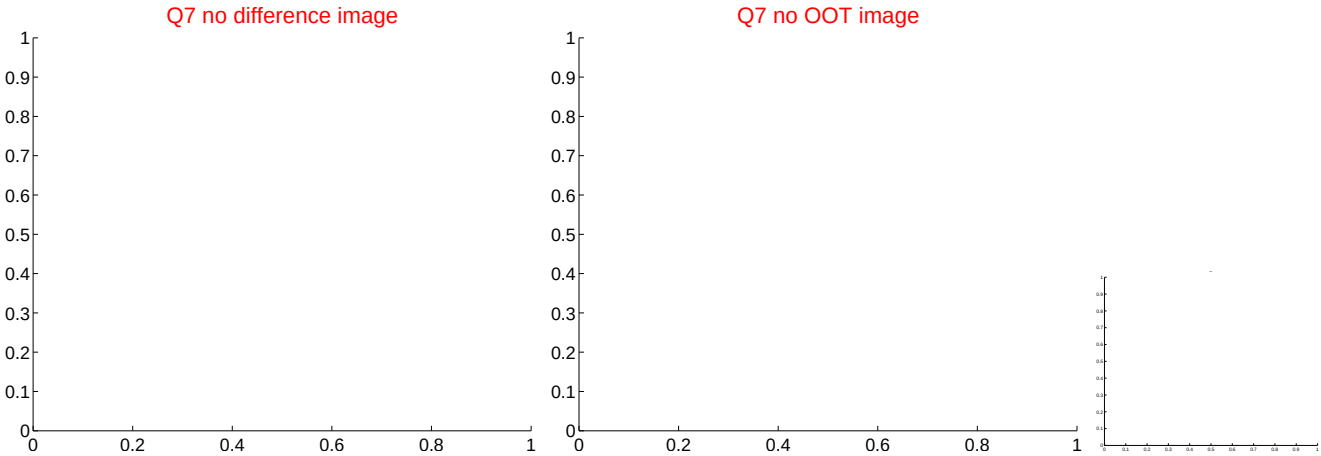
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

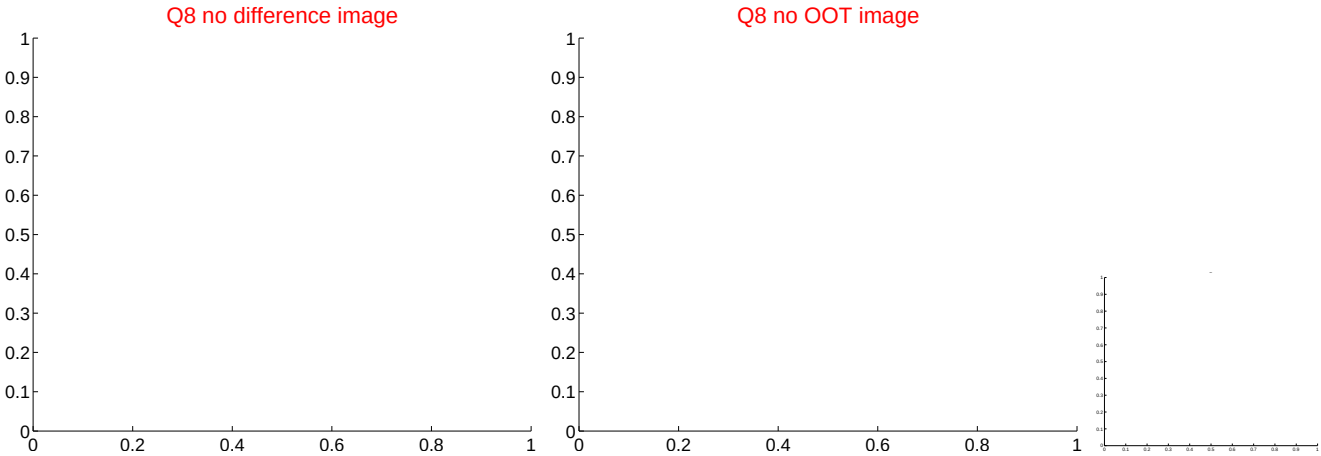


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

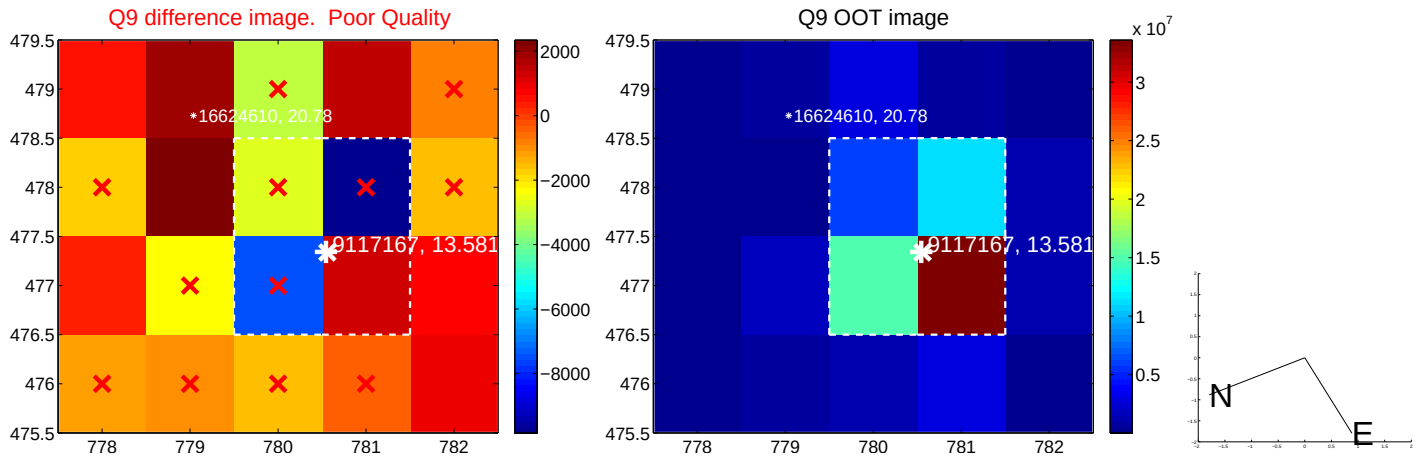


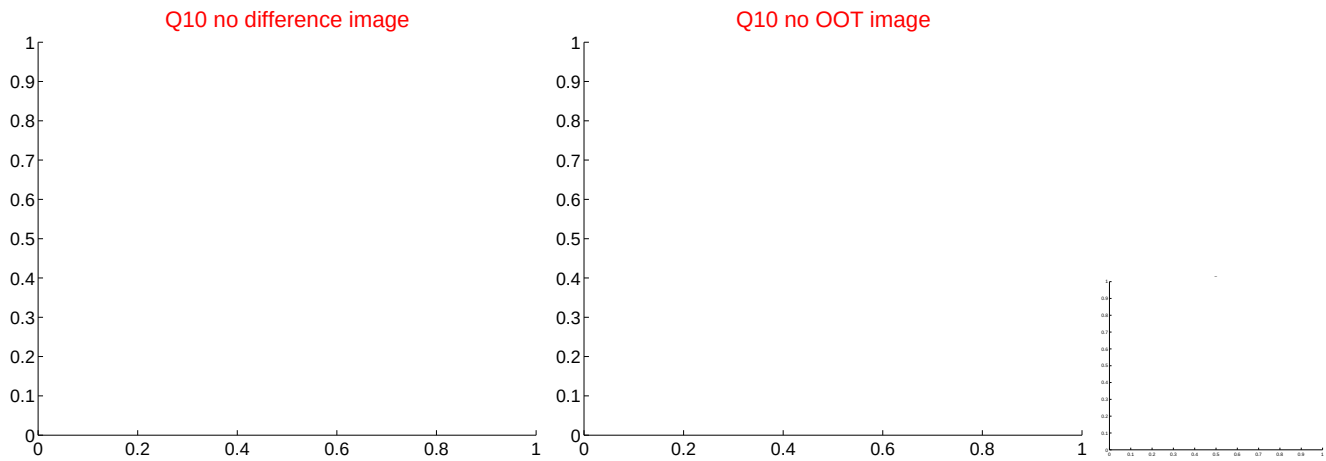


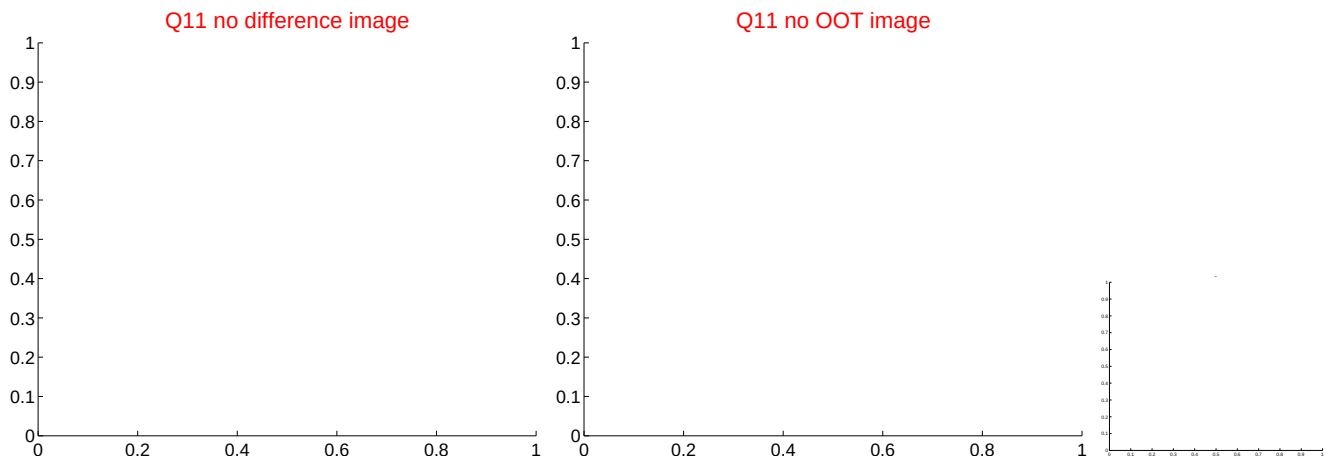


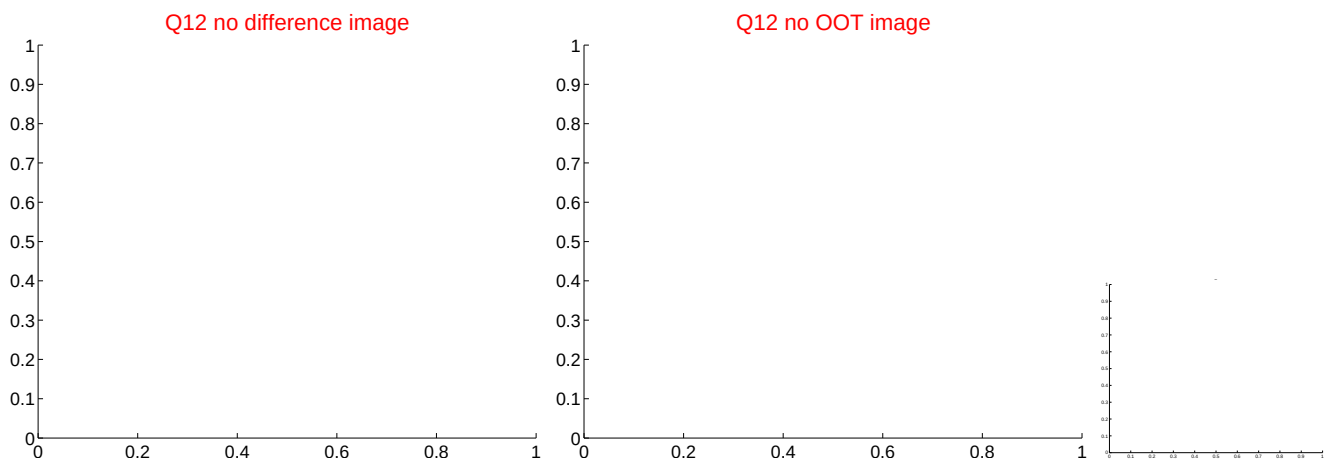


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

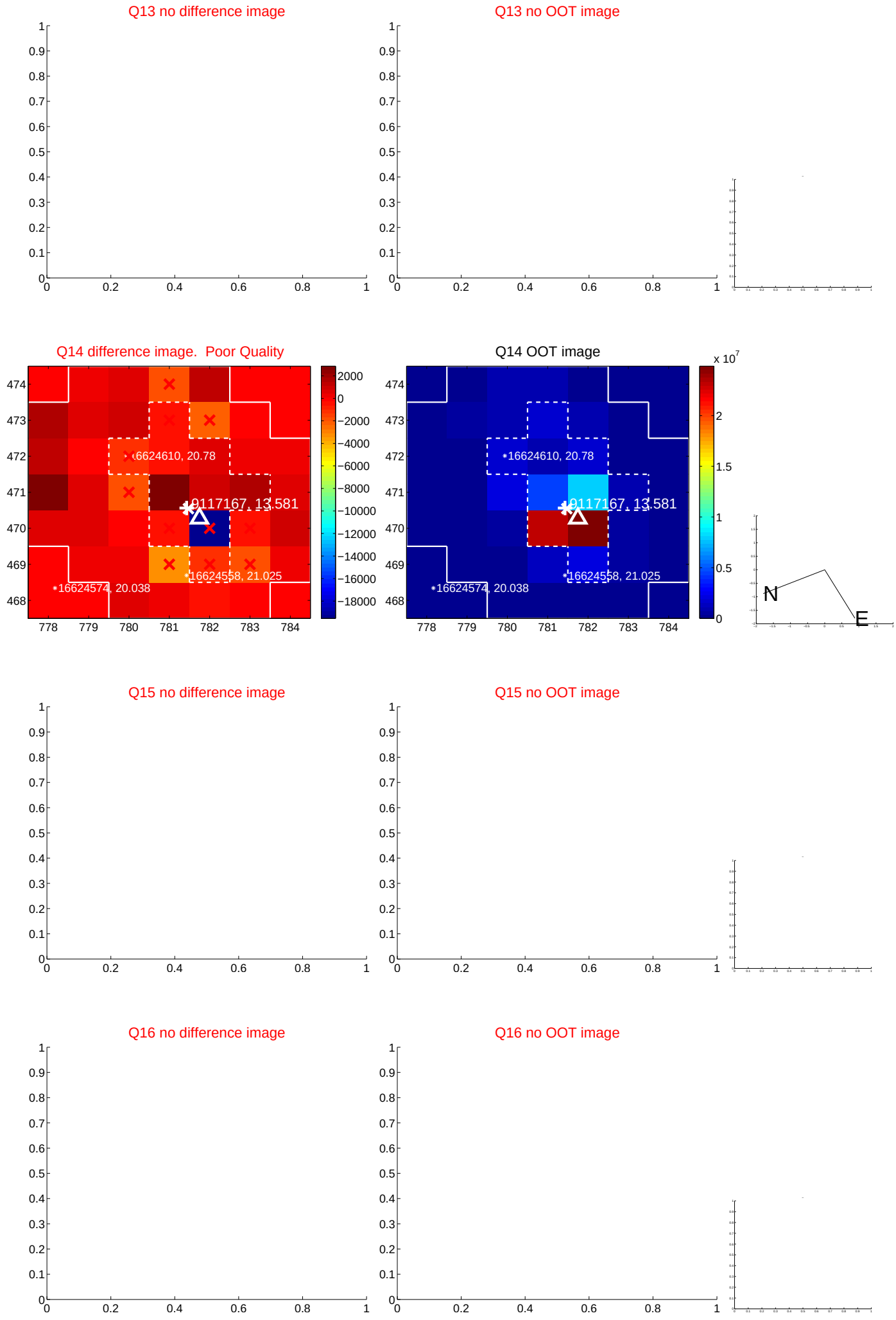




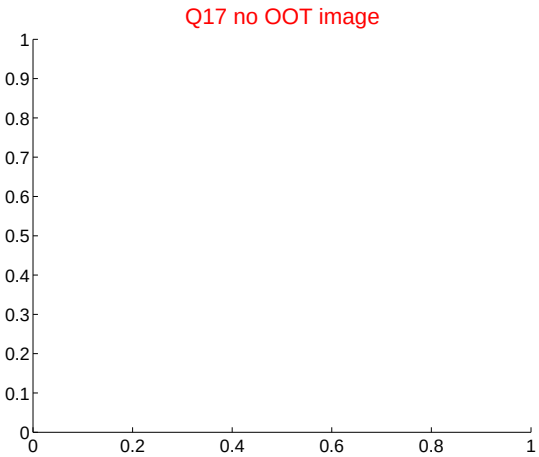


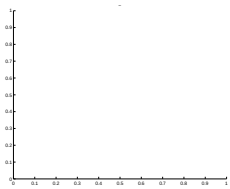


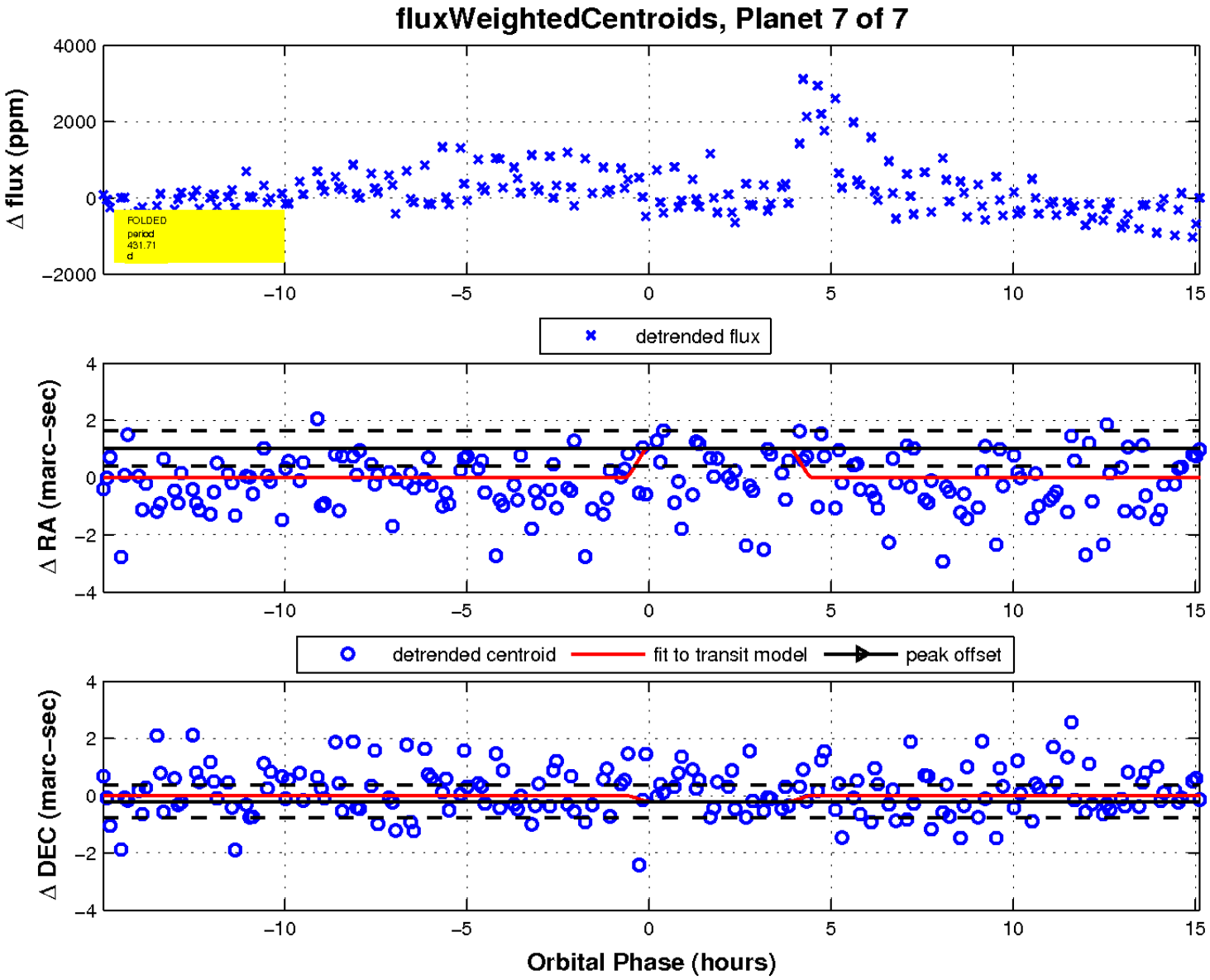
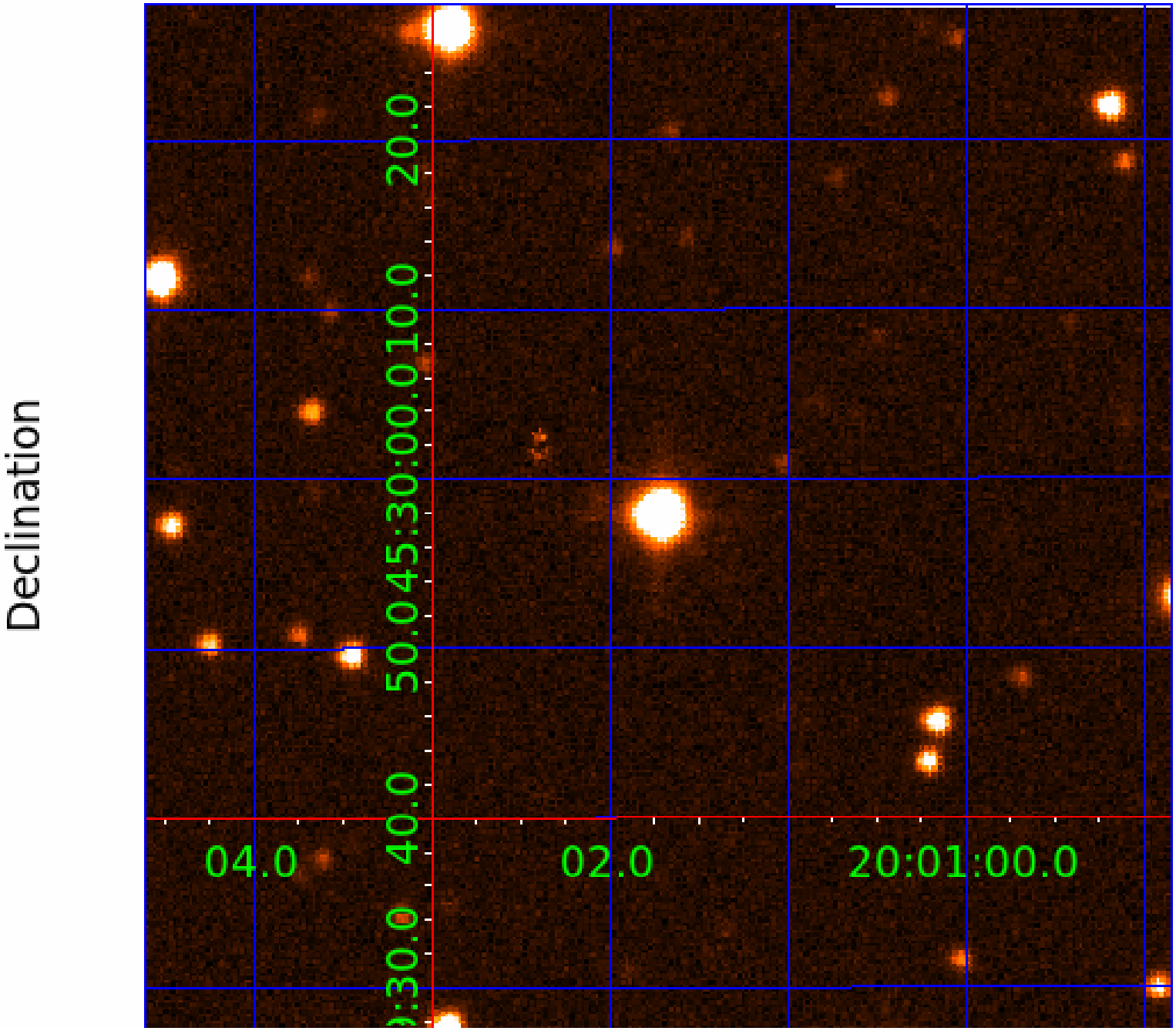
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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







UKIRT Image