

KIC 009047284

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})
009047284-01	OBS	No	0.653173	131.611056	6.6	3.448	9.0	3.5	3.85	5047	1.03	0.00
009047284-02	OBS	No	84.211067	188.768810	225.6	2.183	8.0	8.3	3.85	5047	6.62	48.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009047284-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009047284-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT

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

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

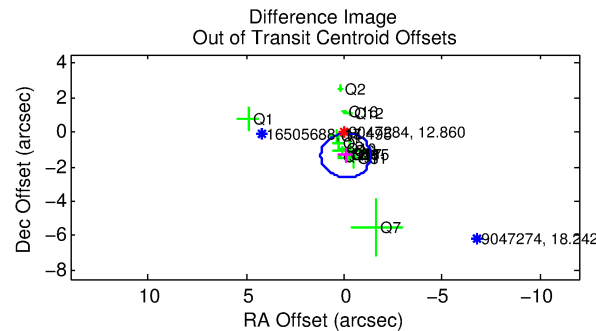
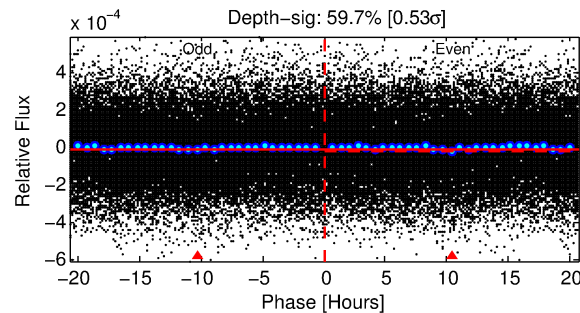
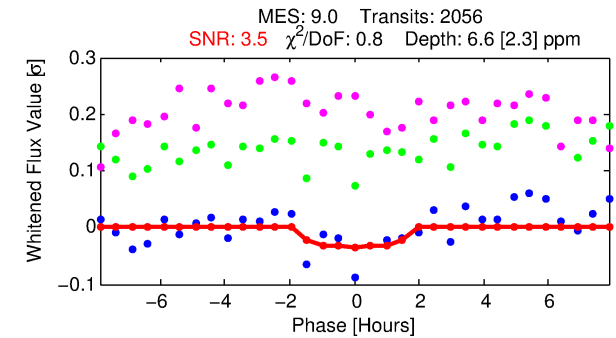
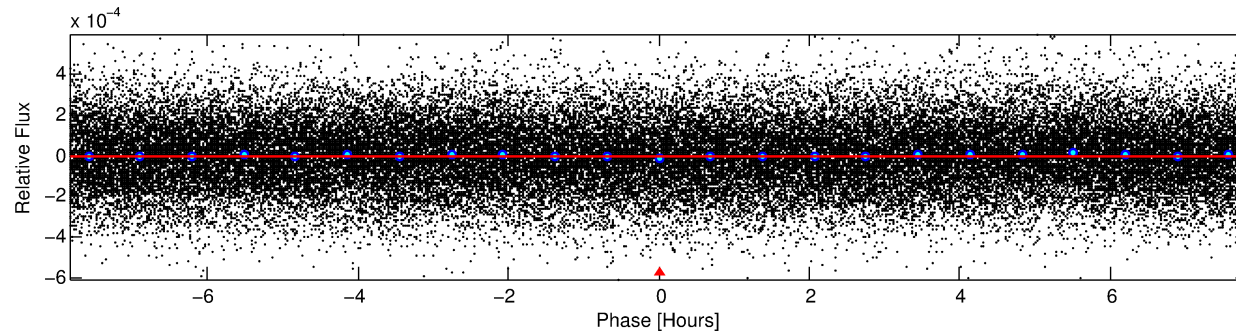
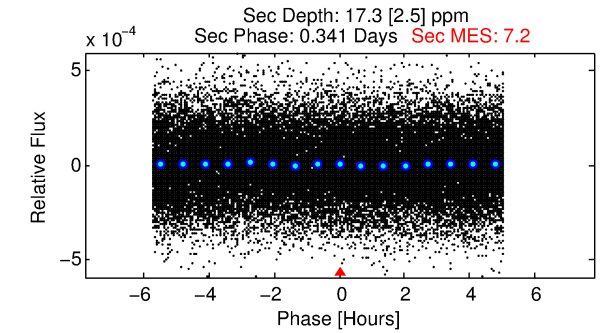
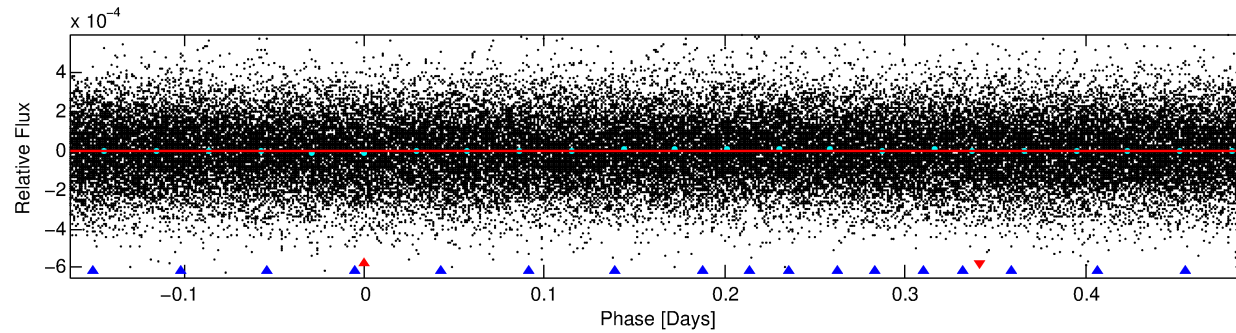
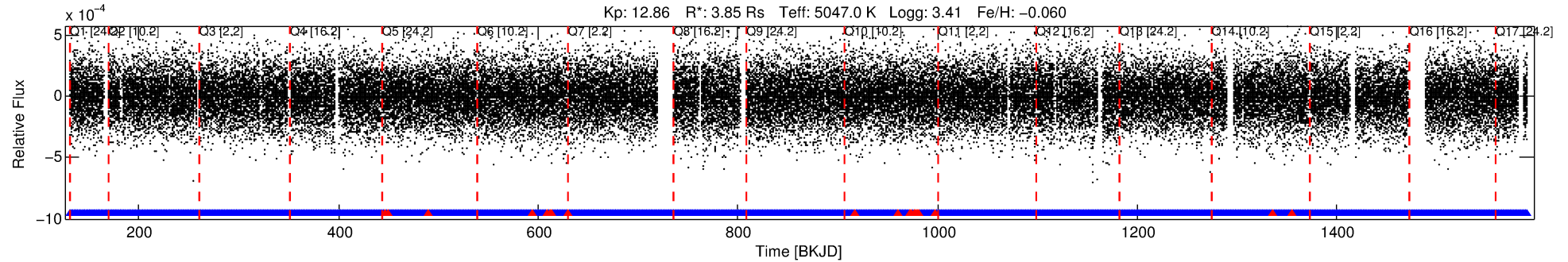
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009047284-01

No Significant Match Found

DV One-Page Summary

KIC: 9047284 Candidate: 1 of 2 Period: 0.653 d



DV Fit Results:

Period = 0.65317 [0.00003] d
Epoch = 131.6111 [0.0107] BKJD
Rp/R* = 0.0024 [0.0021]
a/R* = 1.38 [2.02]
b = 0.62 [3.07]
Seff = N/A
Teq = N/A
Rp = 1.03 [0.92] Re
a = N/A
Ag = N/A
Teffp = N/A

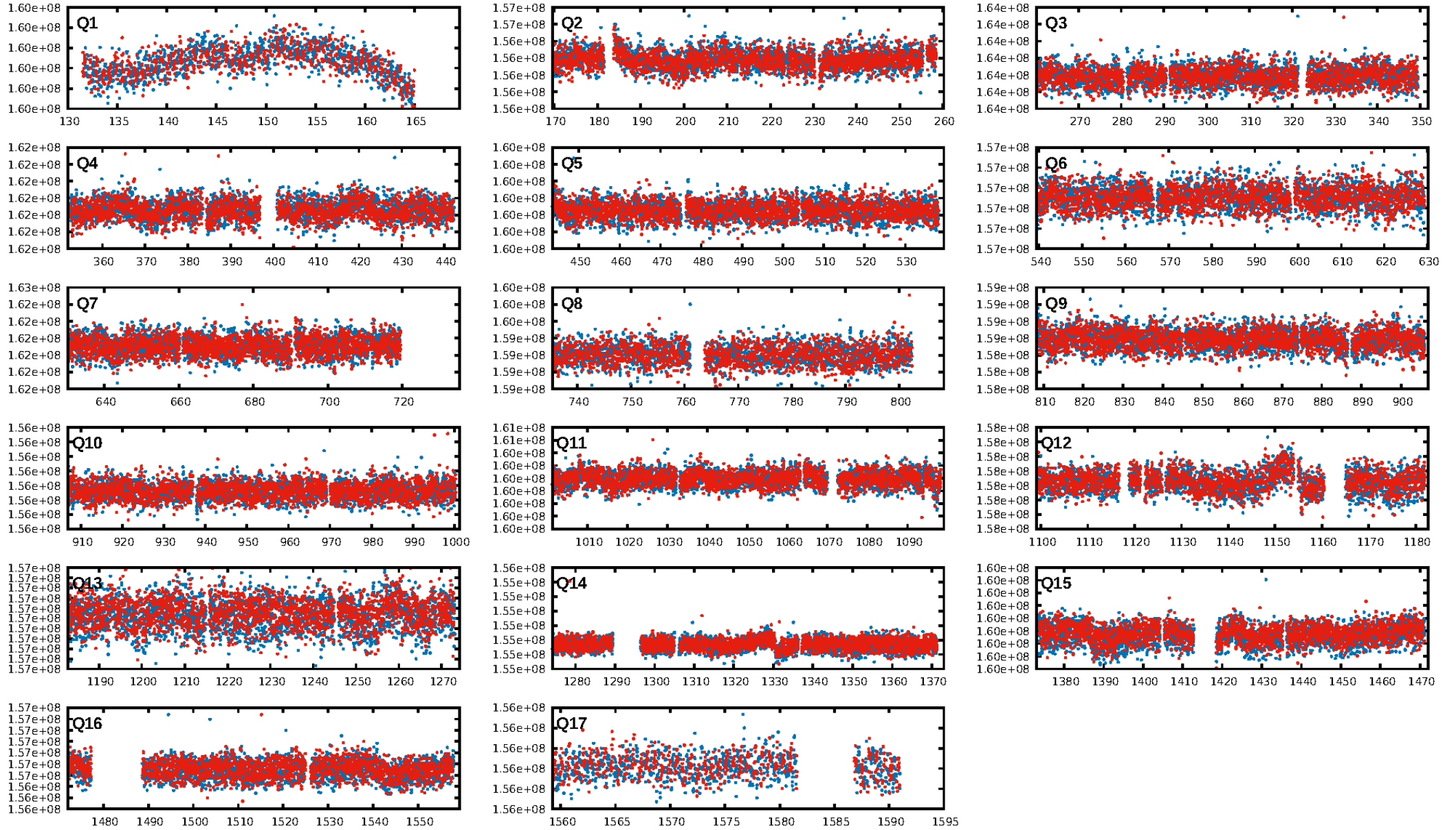
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [491.37σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.48e-11
RollingBand-fgt: 0.99 [1940/1962]
GhostDiagnostic-chr: -1.576
Centroid-sig: 35.8%
Centroid-so: 2.750 arcsec [0.99σ]
OotOffset-rm: 1.352 arcsec [3.16σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-rm: 1.238 arcsec [2.90σ]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.25 [4/16]
DiffImageOverlap-fno: 1.00 [17/17]

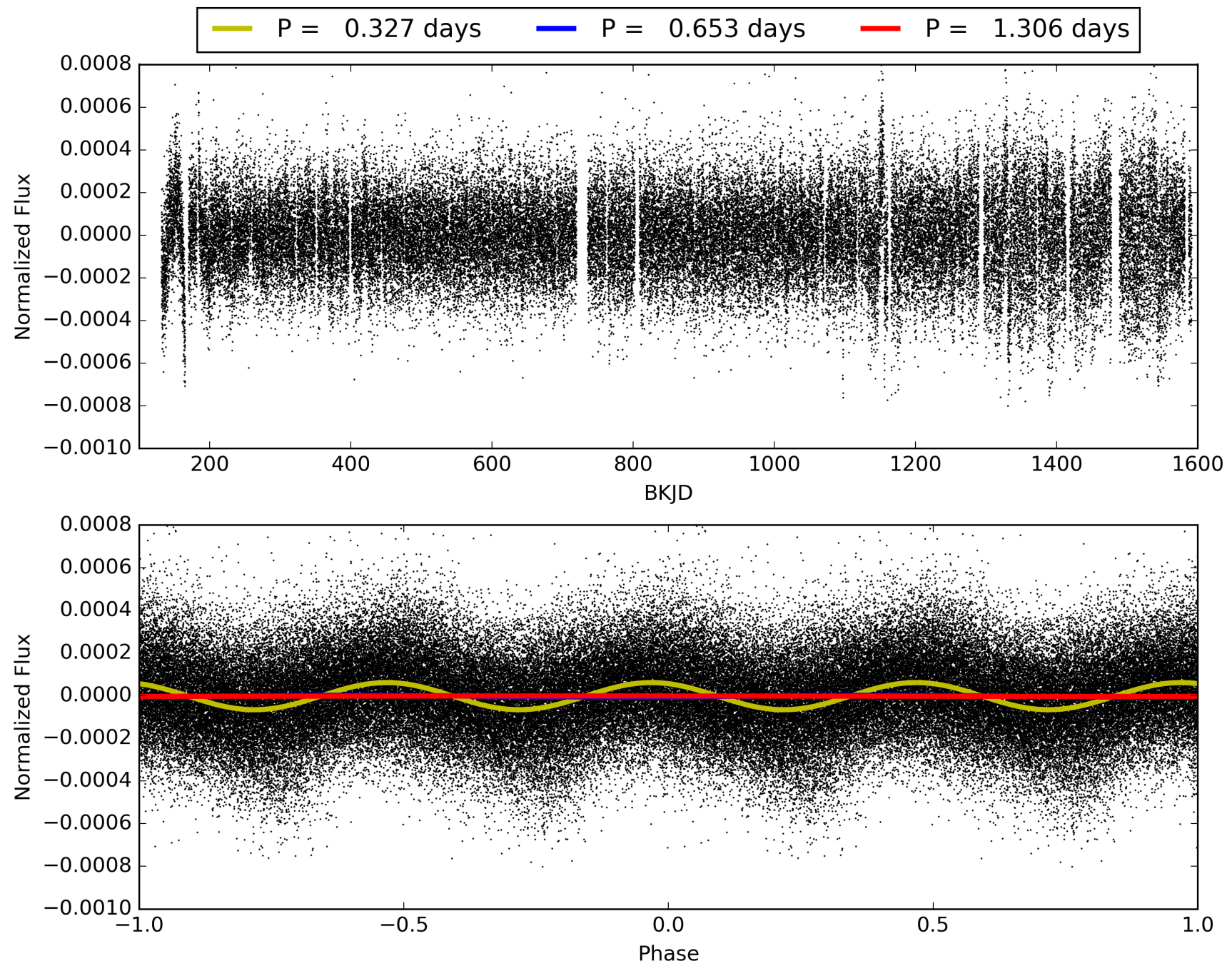
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:05:54 Z

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

TCE 009047284-01, PDC Light Curves

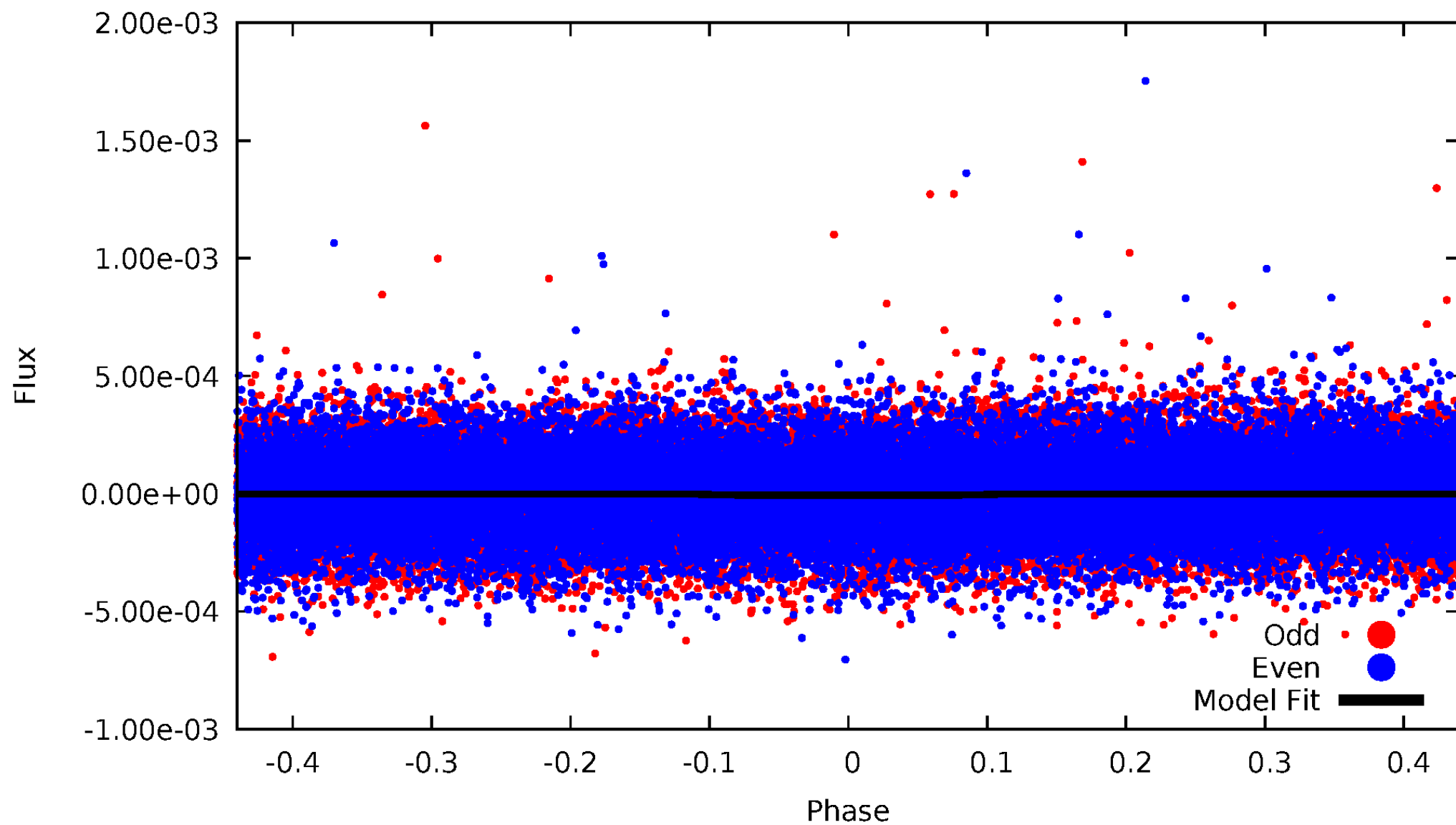


TCE 009047284-01



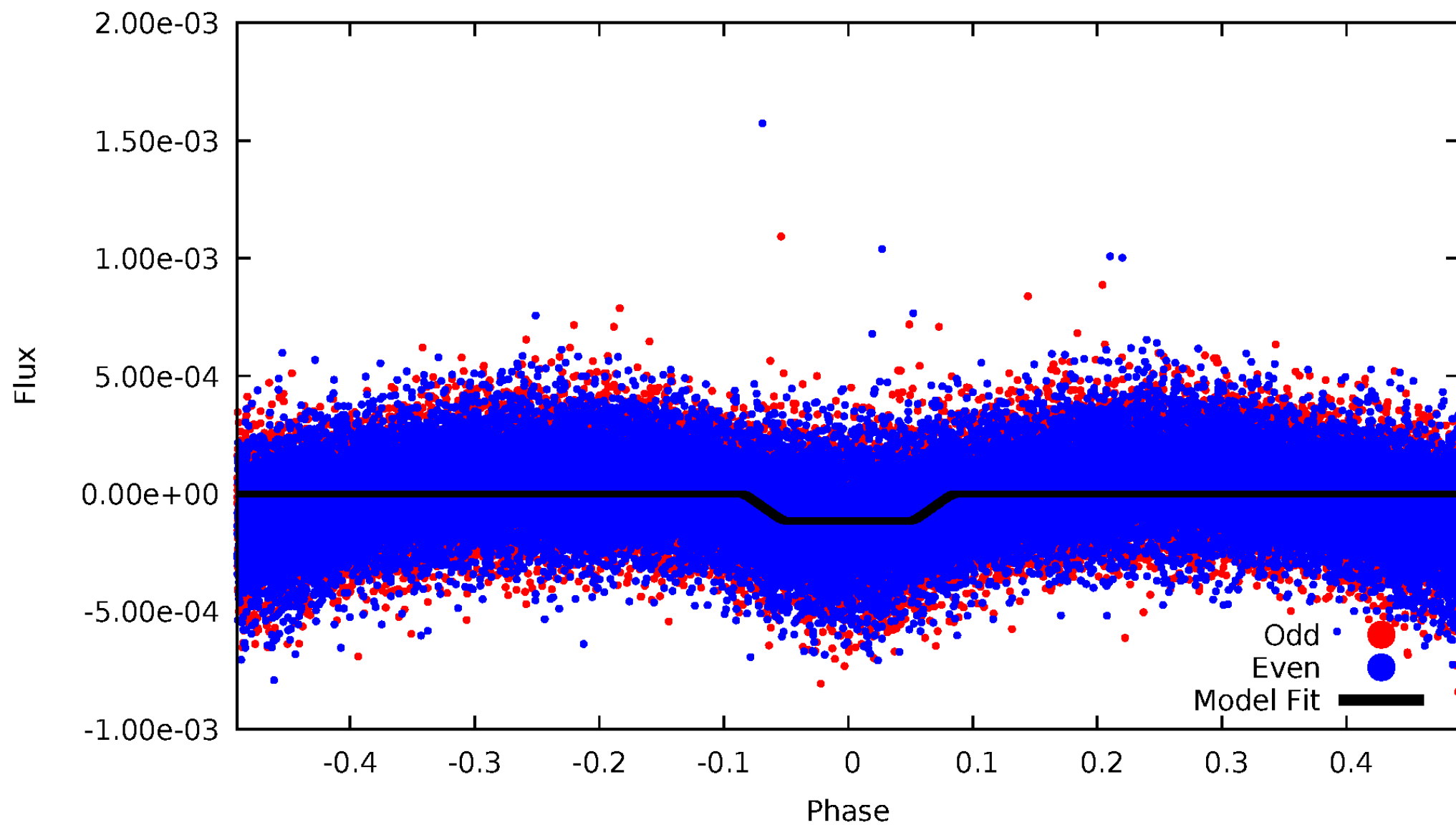
DV Odd/Even

TCE 009047284-01



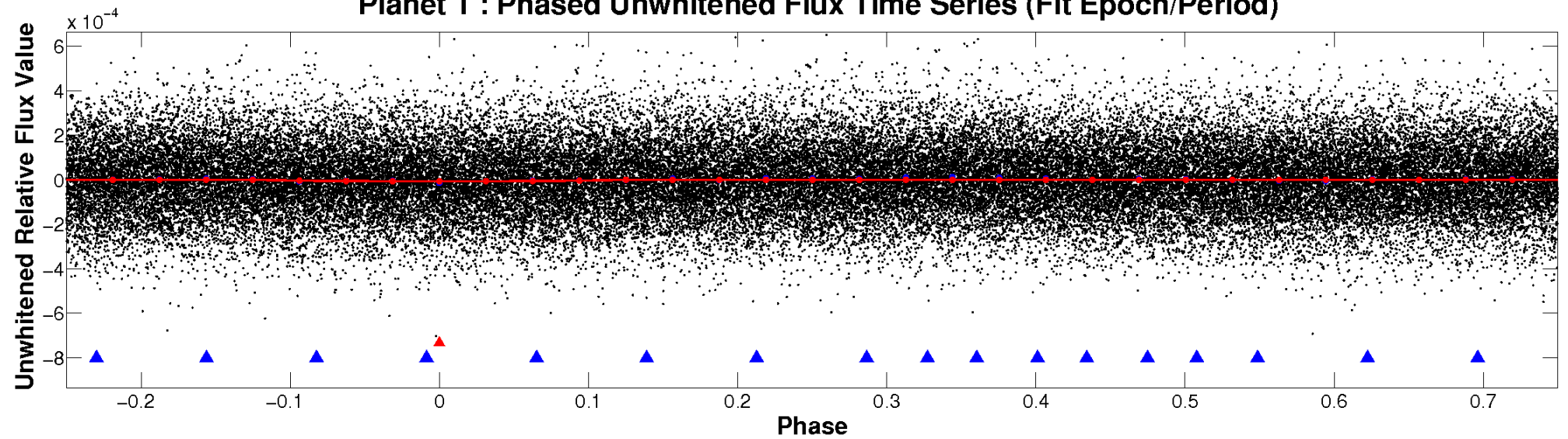
ALT Odd/Even

TCE 009047284-01

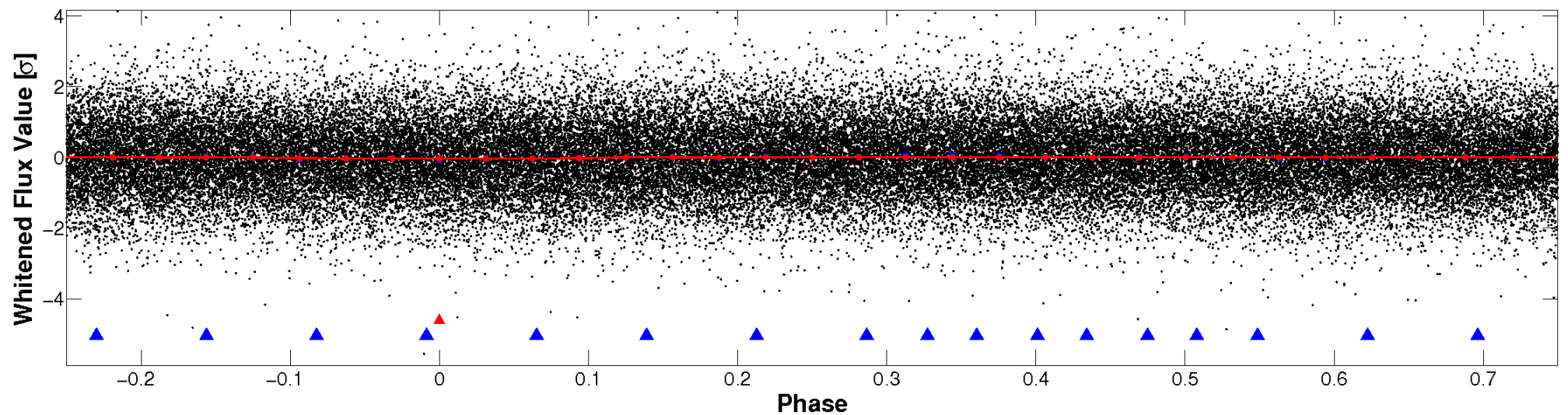


Non-Whitened Vs. Whitened Light Curve

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

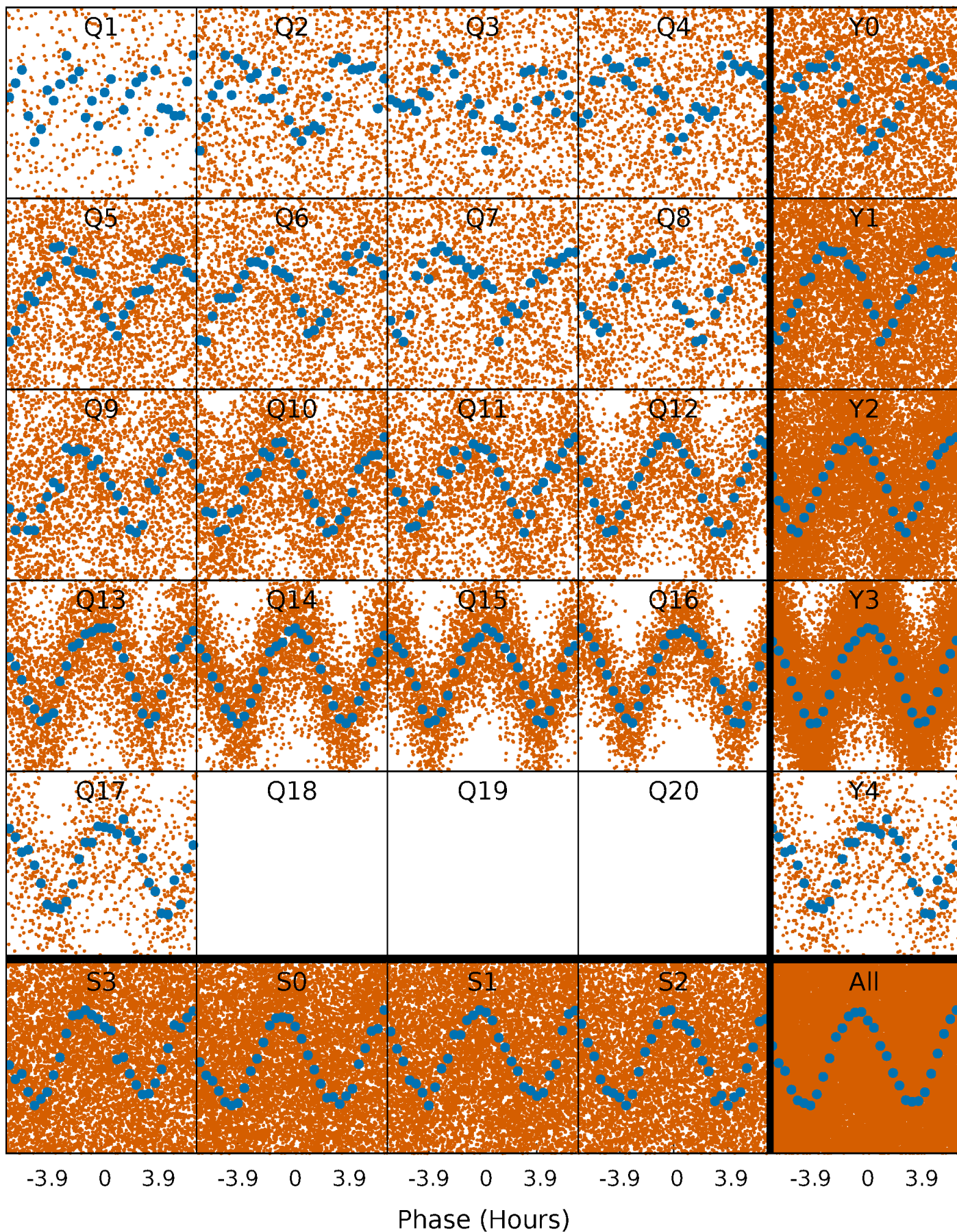


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



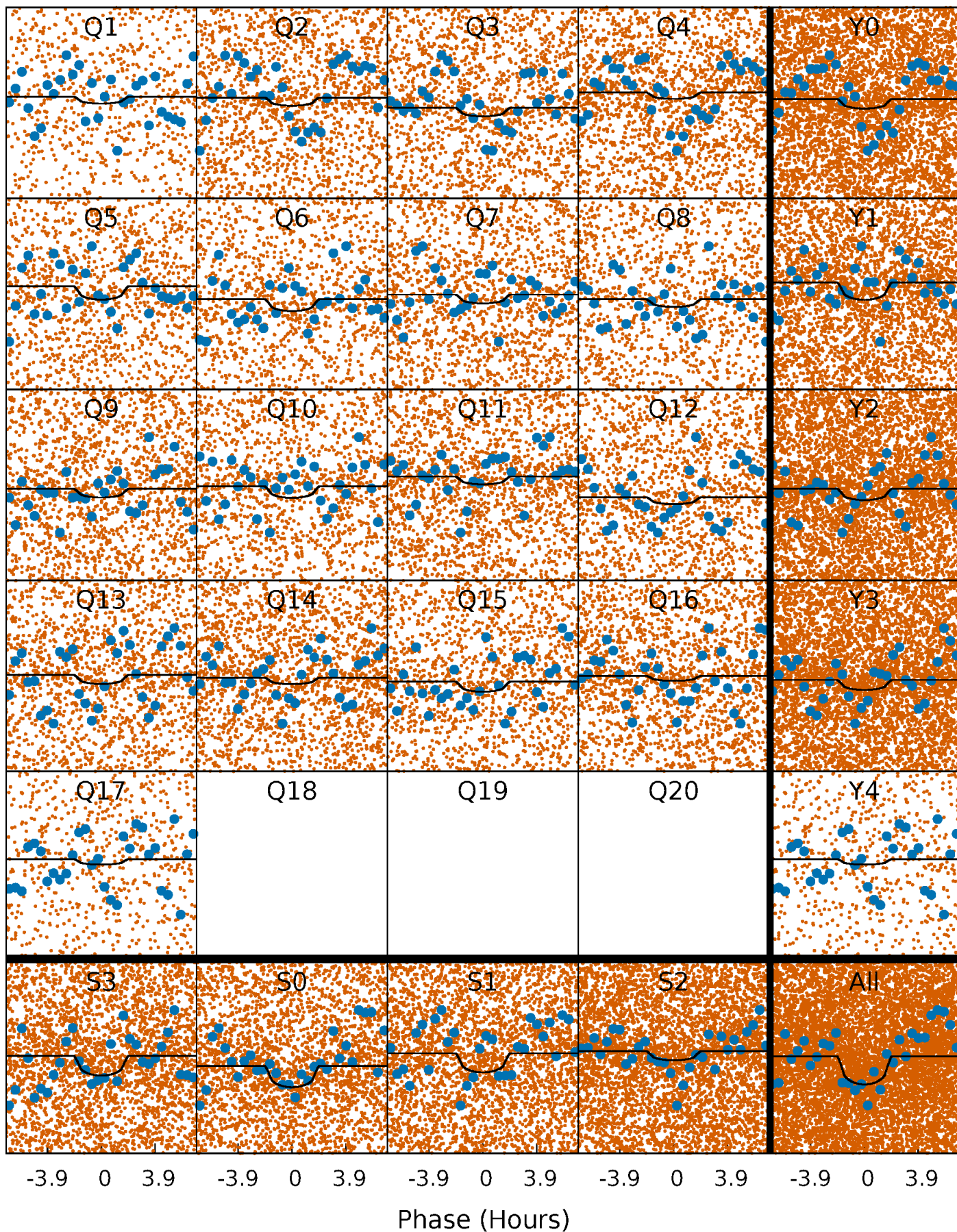
PDC Quarter-Phased Transit Curves

TCE 009047284-01 P= 0.653173 Days $T_0=131.611056$ (BKJD)



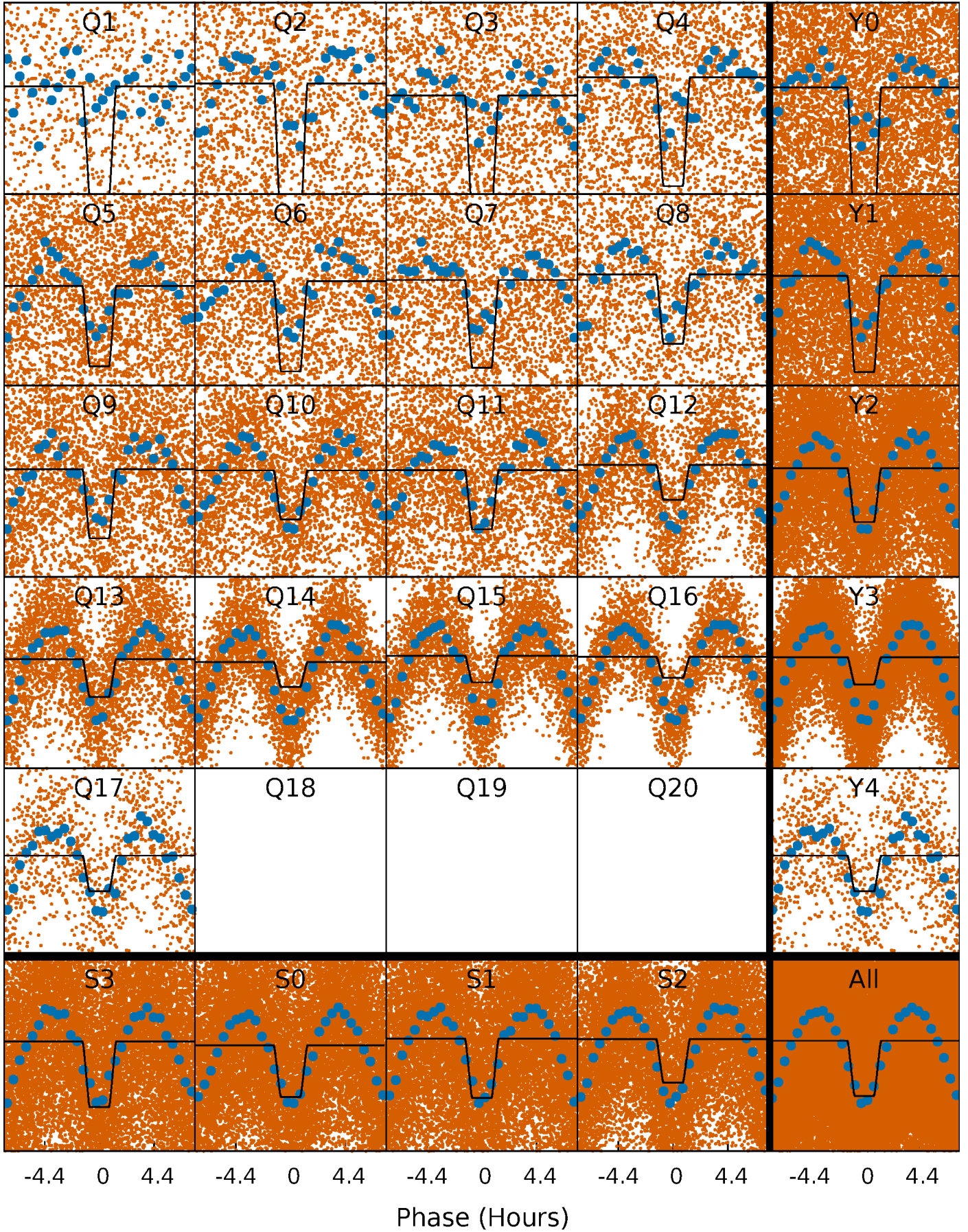
DV Quarter-Phased Transit Curves

TCE 009047284-01 P= 0.653173 Days $T_0=131.611056$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

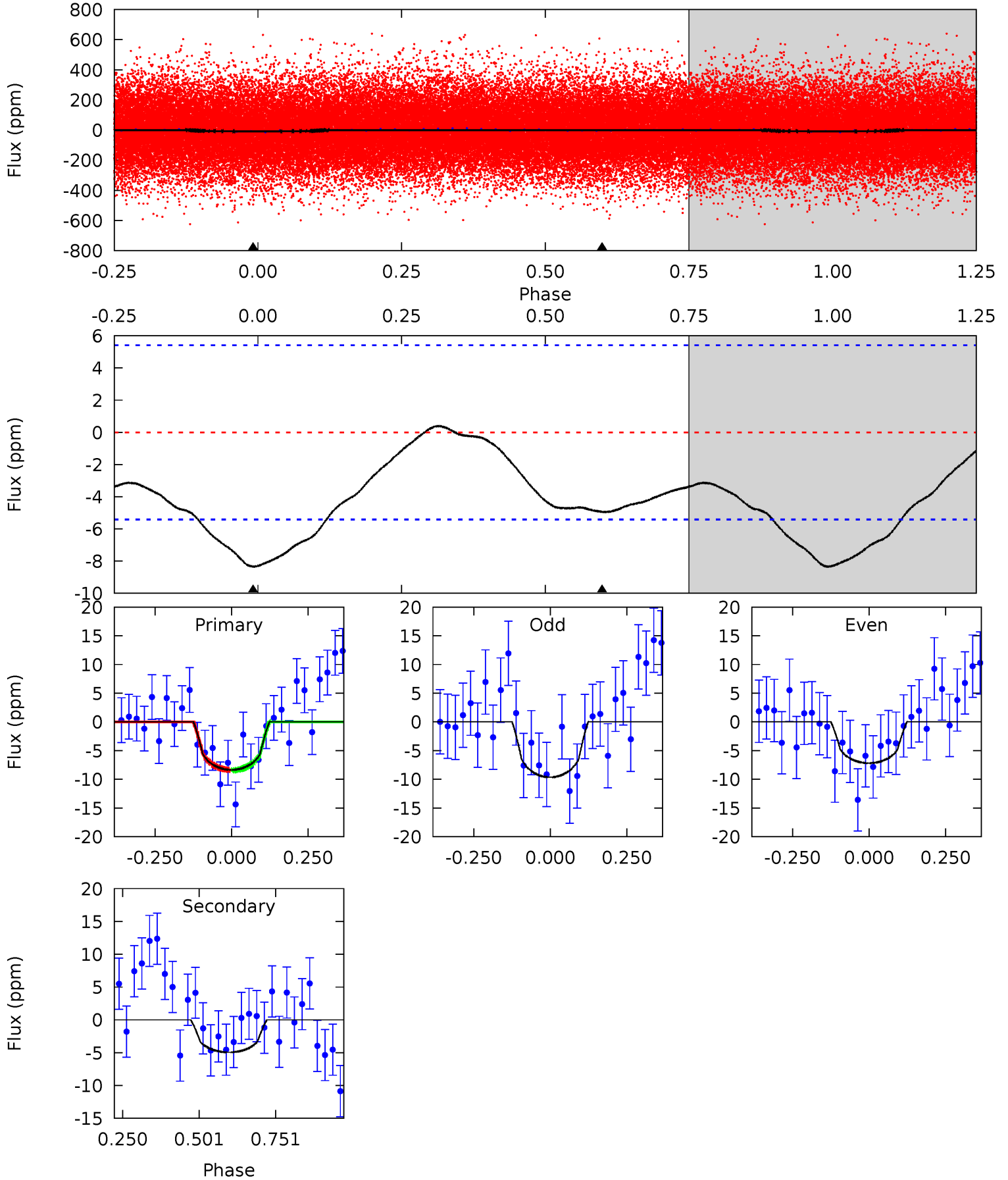
TCE 009047284-01 P= 0.653259 Days $T_0=131.613160$ (BKJD)



DV Model-Shift Uniqueness Test

009047284-01, P = 0.653173 Days, E = 130.957883 Days

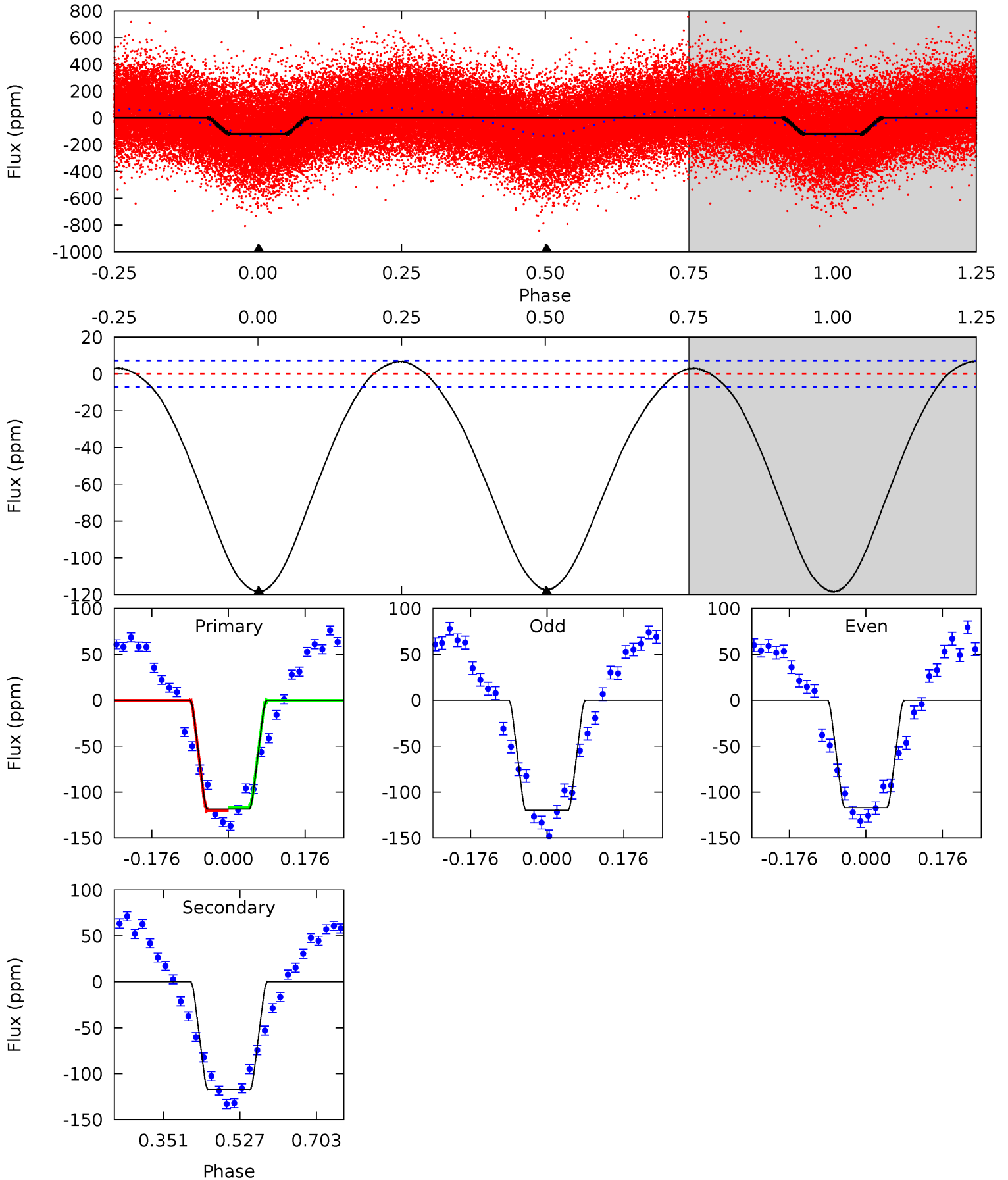
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.75	3.99	0	0	4.37	1.15	0.42	6.75	6.75	3.99	3.99	1.00	1.16	0.05	0.03



Alt Model-Shift Uniqueness Test

009047284-01, P = 0.653259 Days, E = 130.959901 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
73.5	72.9	0	0	4.45	1.35	3.56	73.5	73.5	72.9	72.9	0.95	1.12	0.05	1.12



Stellar Parameters For KIC 009047284

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5047^{+52}_{-90}	$3.414^{+0.149}_{-0.122}$	$-0.060^{+0.100}_{-0.150}$	$3.854^{+0.630}_{-0.866}$	$1.405^{+0.166}_{-0.332}$	$0.035^{+0.031}_{-0.011}$
	+1%/-2%	+4%/-4%	+167%/-250%	+16%/-22%	+12%/-24%	+88%/-32%
Source	SPE74	SPE74	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 009047284-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5 ± 1	$1.18^{+0.89}_{-0.72}$	4747^{+244}_{-273}	3865^{+2744}_{-7470}	$0.519^{+2.698}_{-0.362}$
Alt.	-117 ± 2	$4.43^{+1.06}_{-1.03}$	4728^{+234}_{-260}	4619^{+654}_{-516}	$0.887^{+0.542}_{-0.304}$

T_{max} = Theoretical Maximum Planetary Temperature

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

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

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

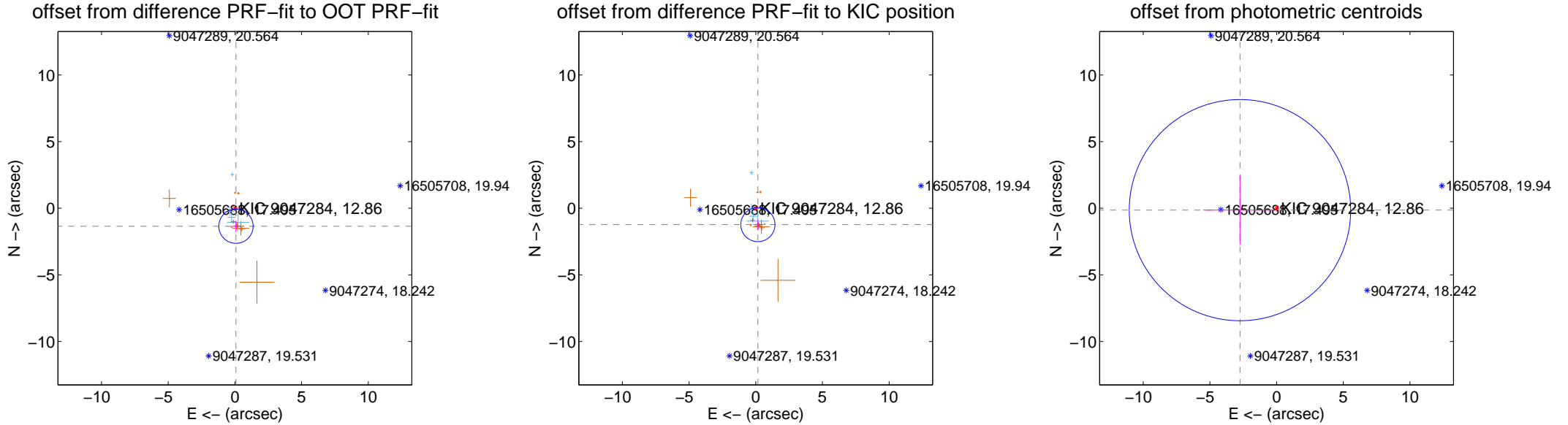
DV Centroid Data

Supplemental centroid analysis for 009047284-01. Kepler magnitude: 12.86. Transit SNR 3.49

There are 4 quarters with good PRF difference image offsets

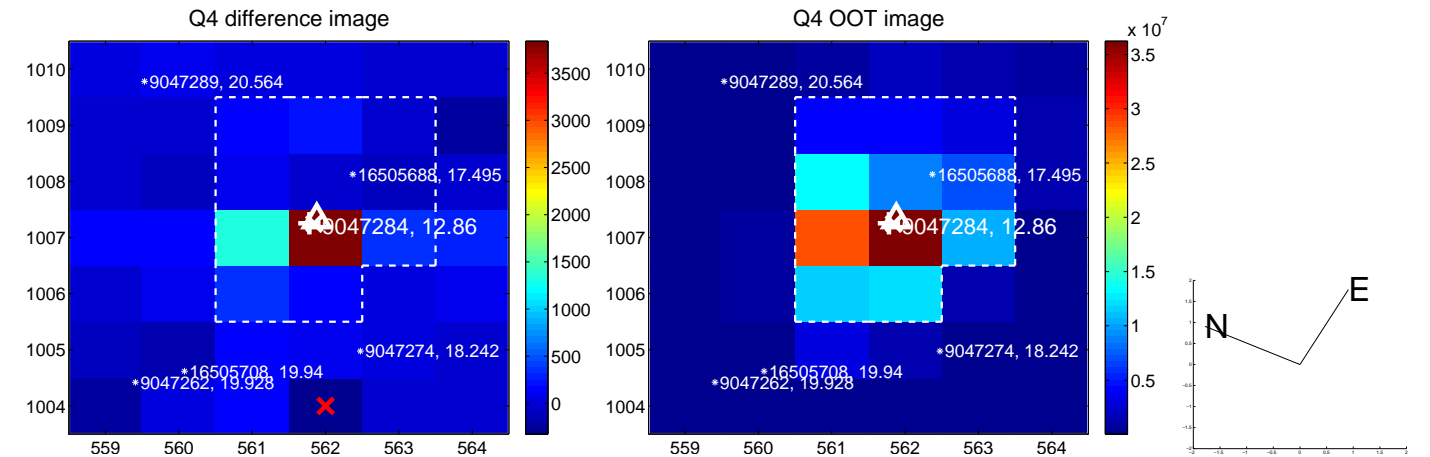
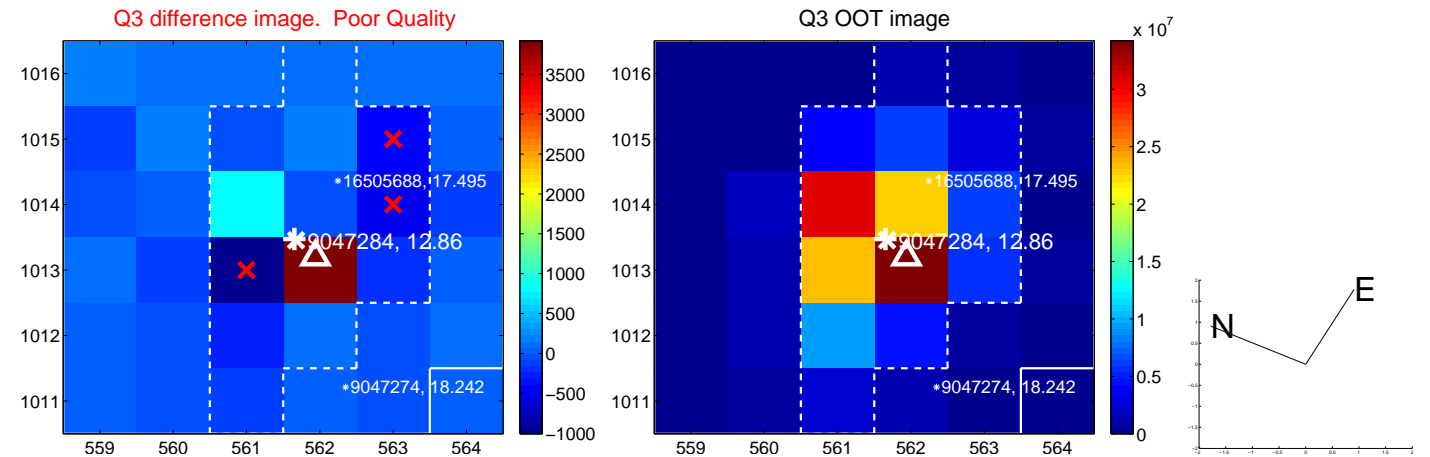
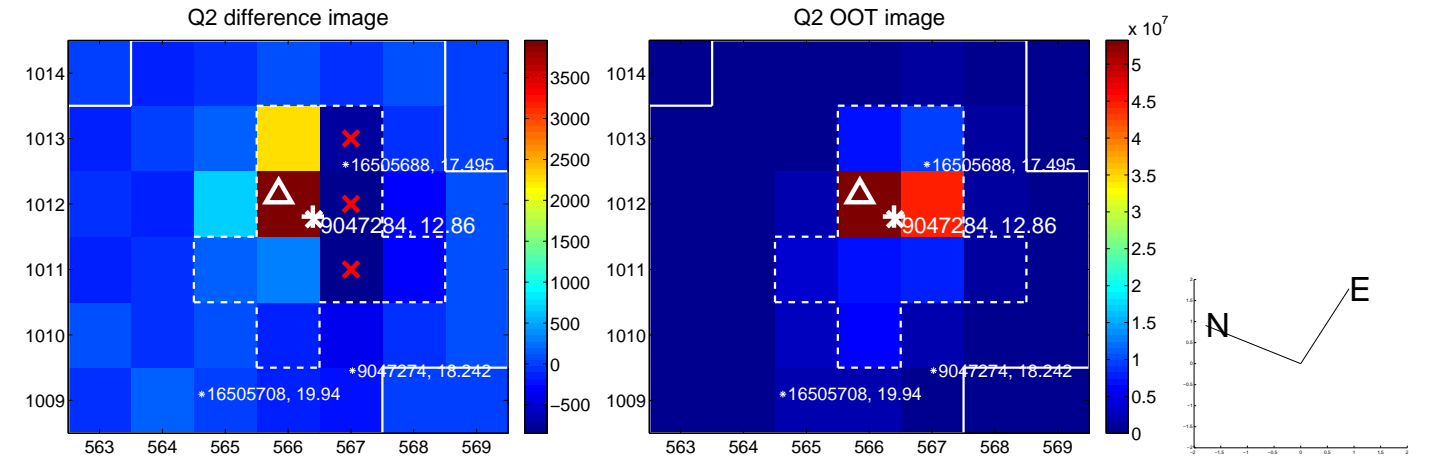
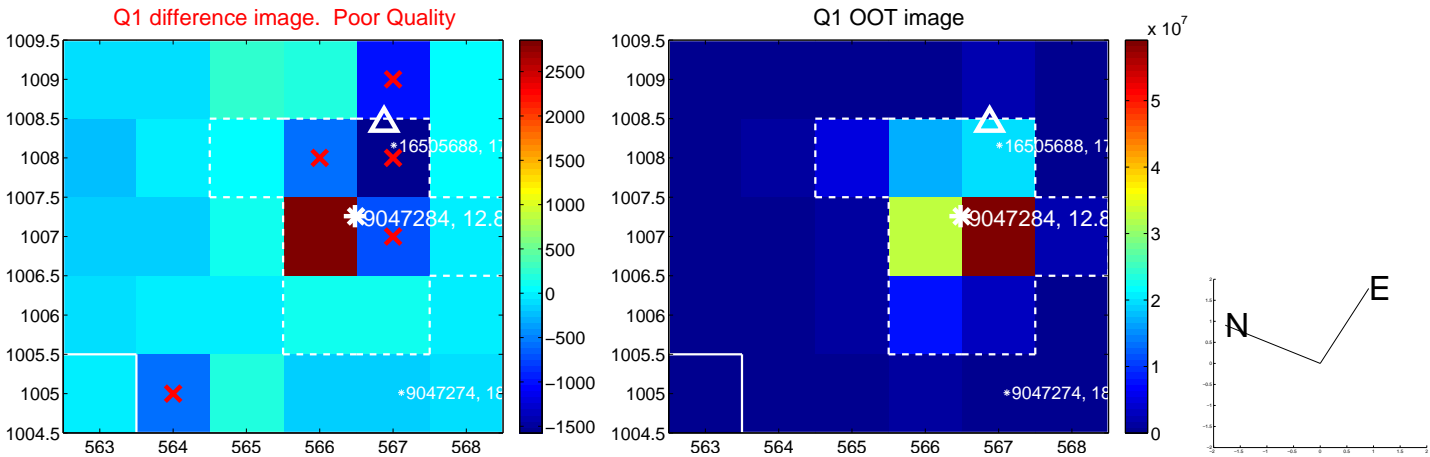
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.352 ± 0.428	3.16	-0.079 ± 0.339	-1.350 ± 0.421
PRF-fit source offset from KIC position	1.238 ± 0.427	2.90	-0.159 ± 0.331	-1.228 ± 0.405
photometric centroid source offset	2.75 ± 2.77	0.99	2.75 ± 2.77	-0.14 ± 2.60

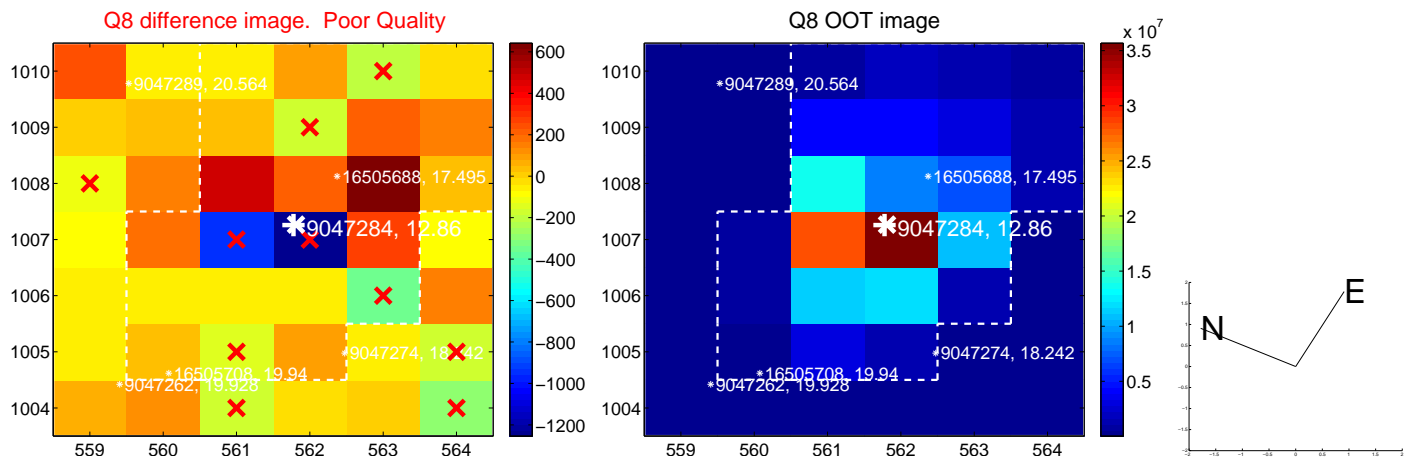
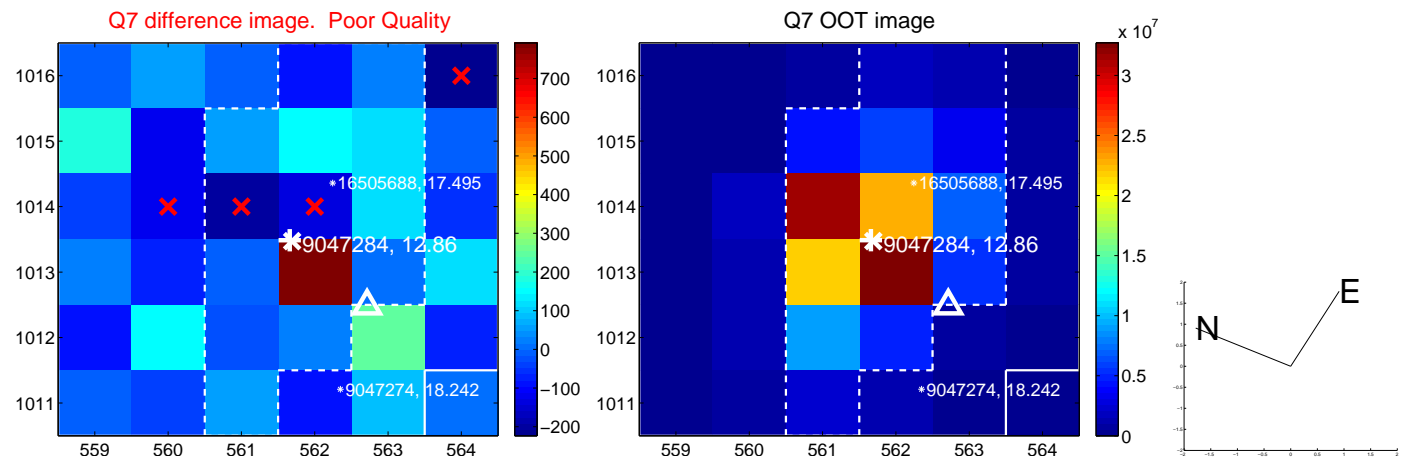
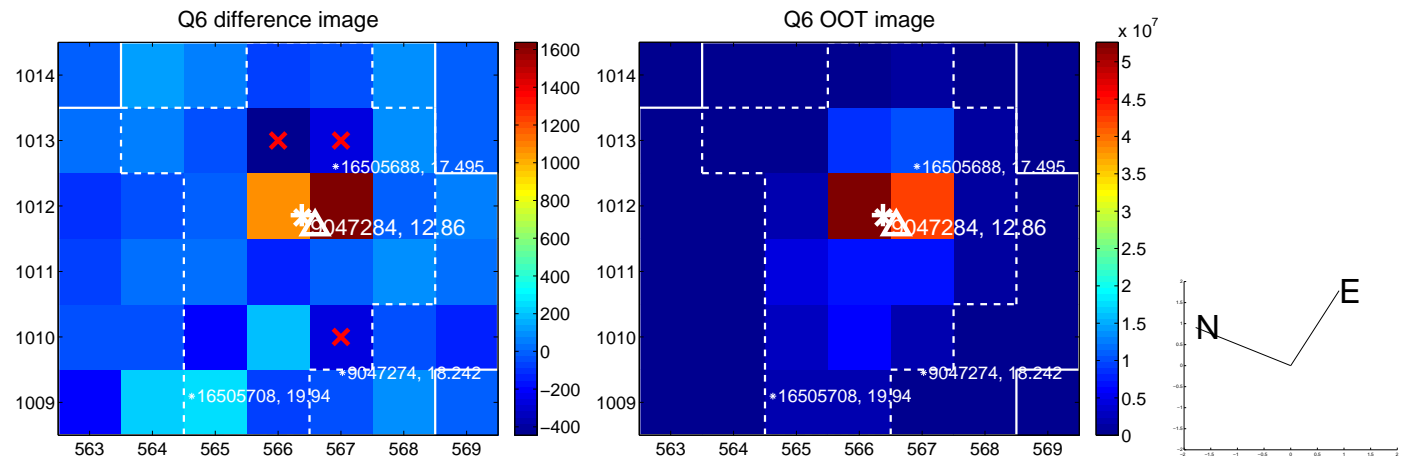
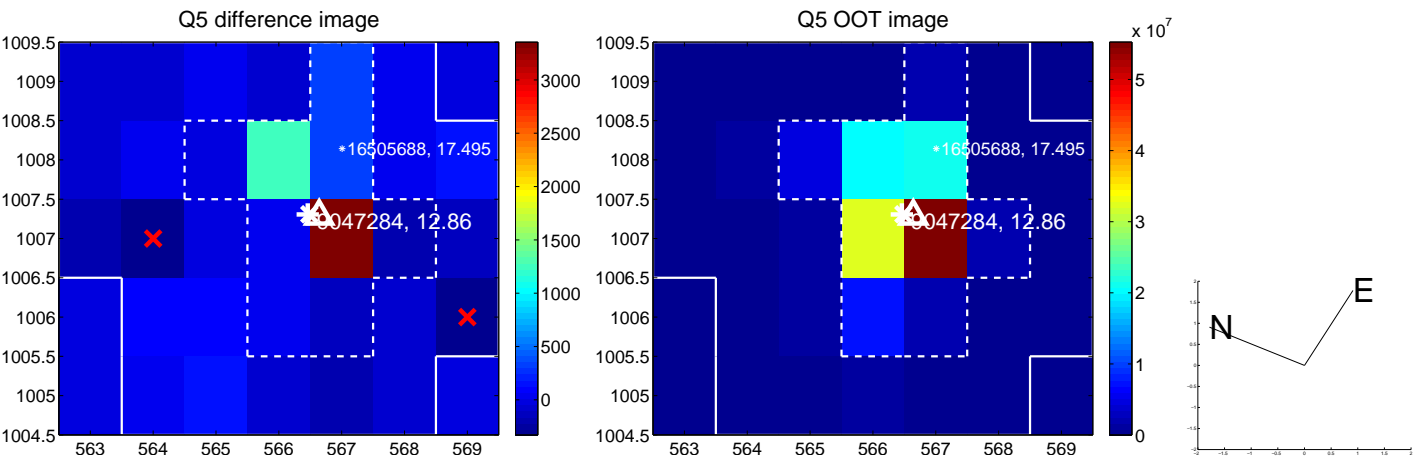


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

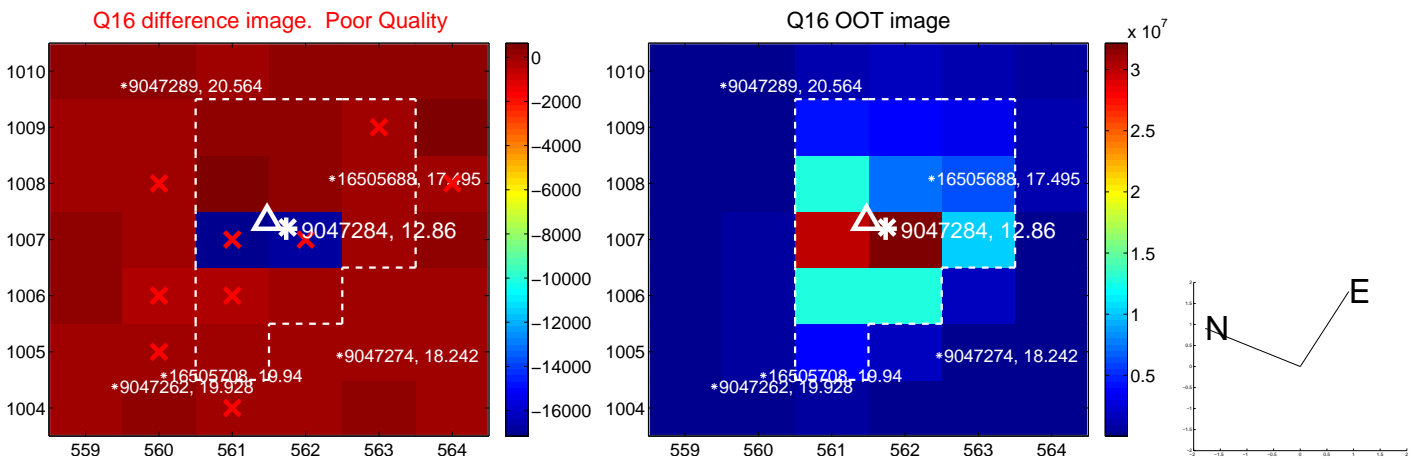
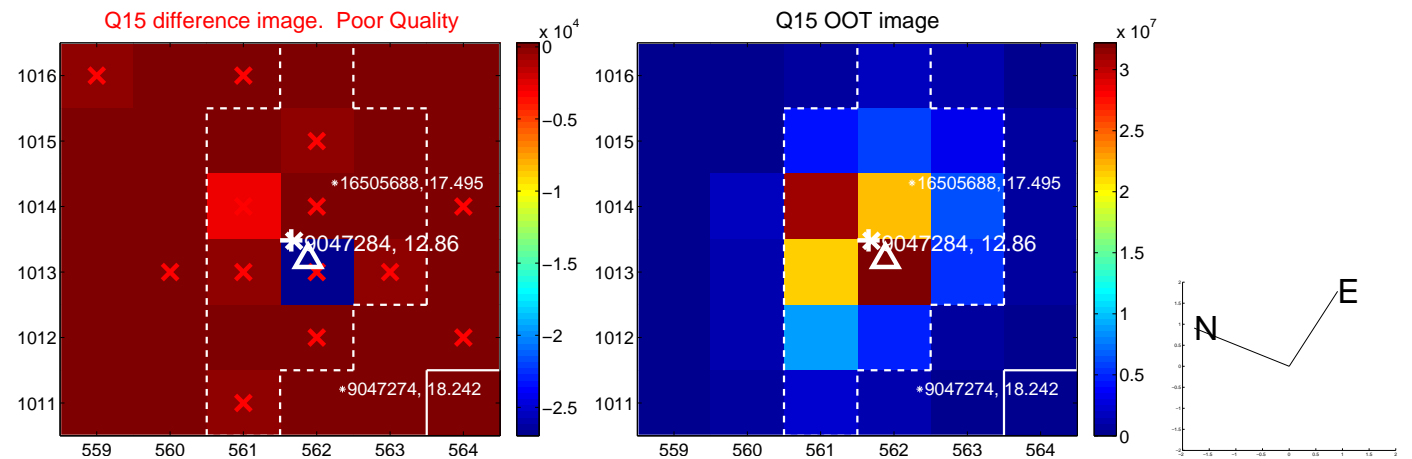
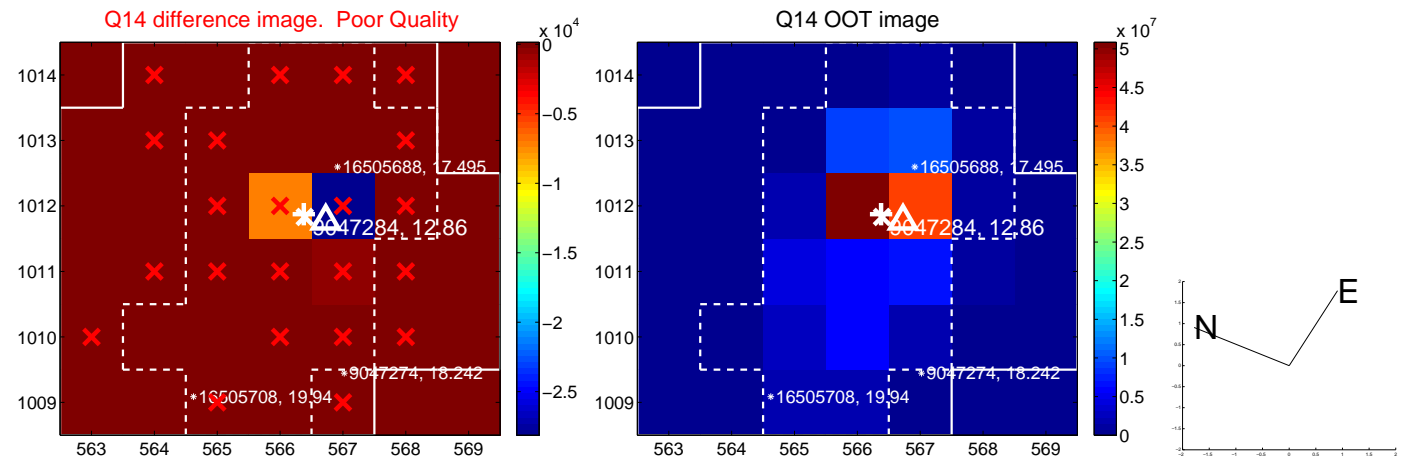
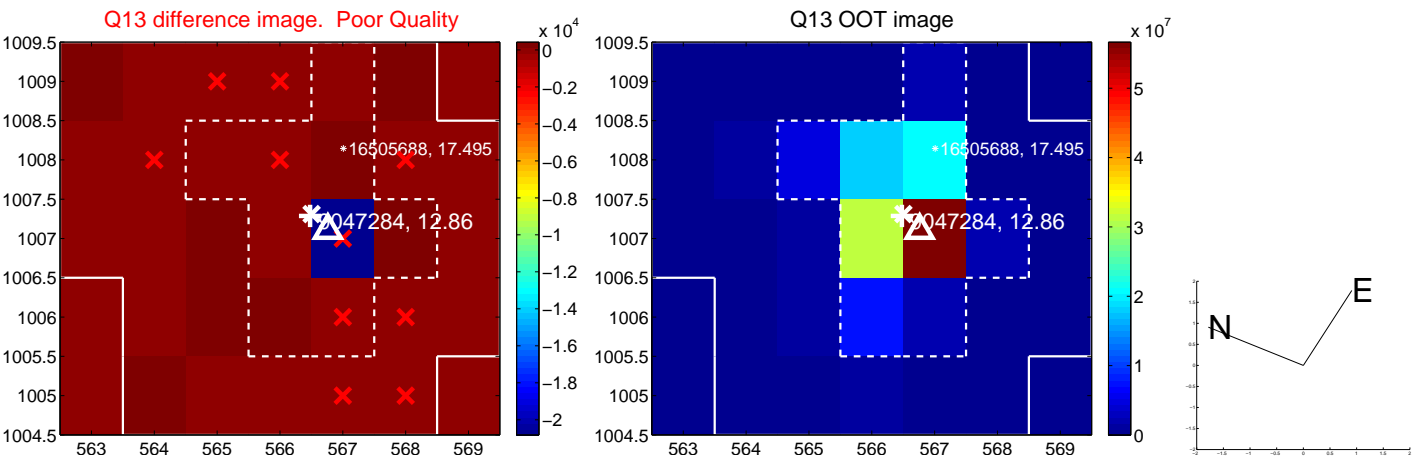
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



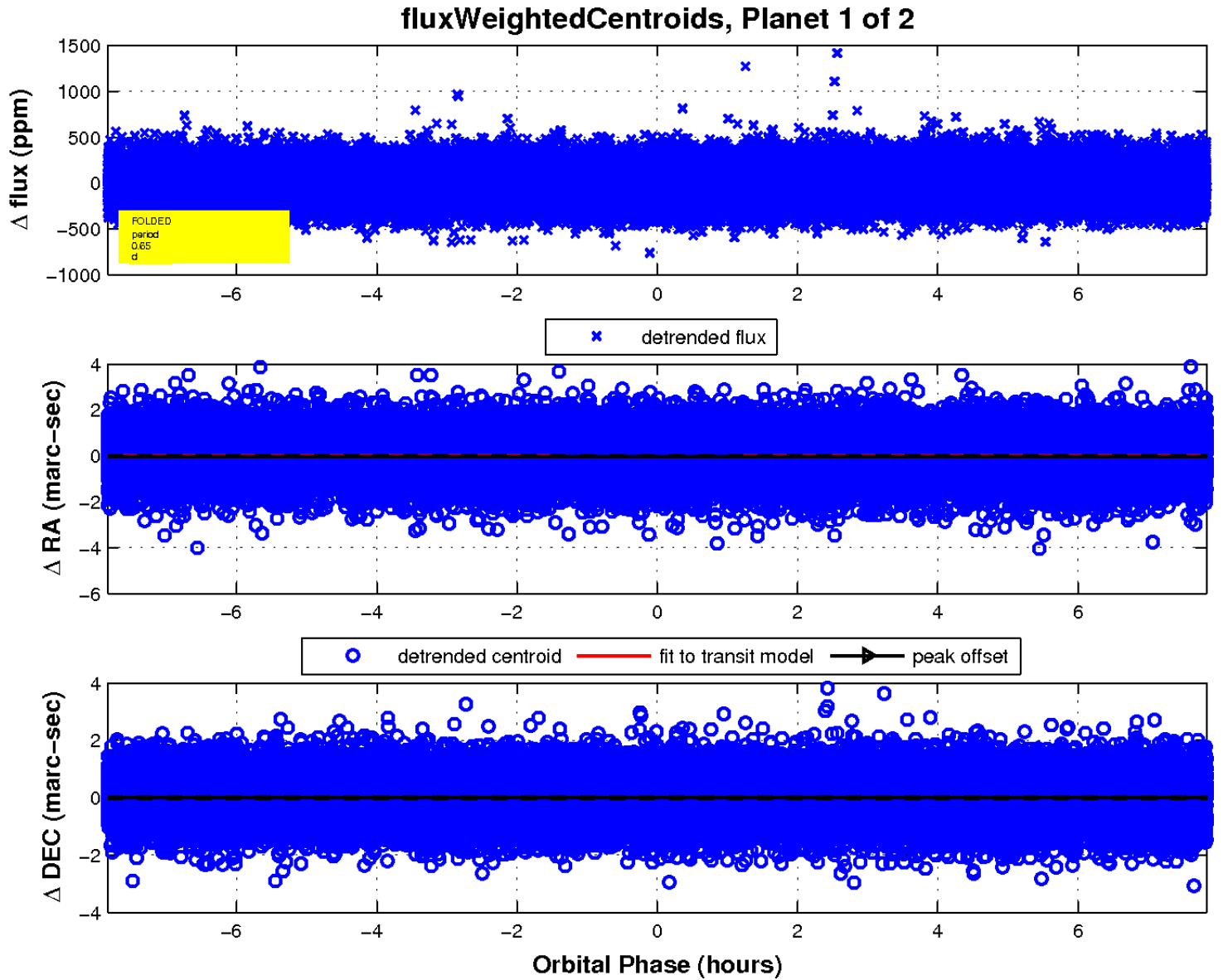
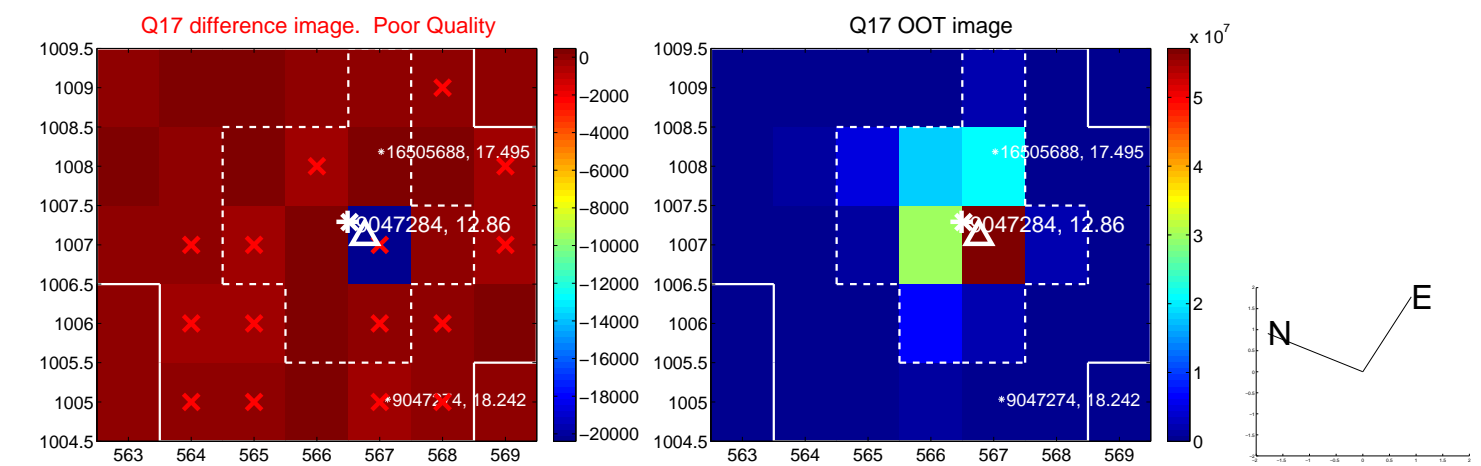
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



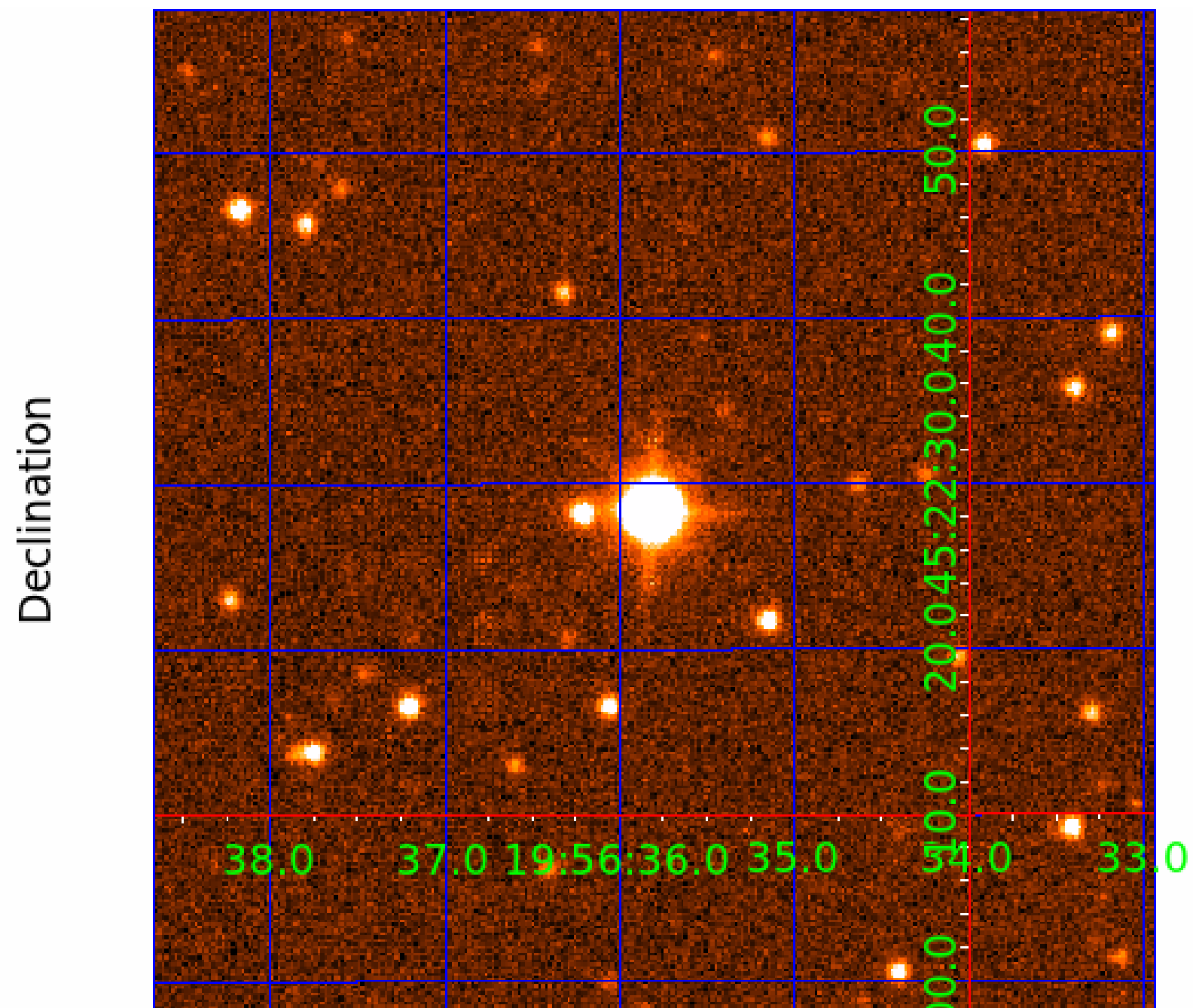
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009047284

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})
009047284-01	OBS	No	0.653173	131.611056	6.6	3.448	9.0	3.5	3.85	5047	1.03	0.00
009047284-02	OBS	No	84.211067	188.768810	225.6	2.183	8.0	8.3	3.85	5047	6.62	48.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009047284-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009047284-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT

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

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

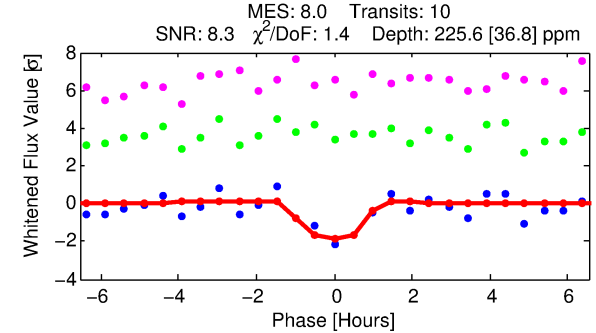
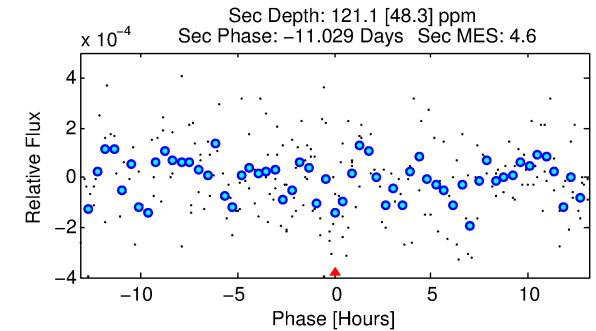
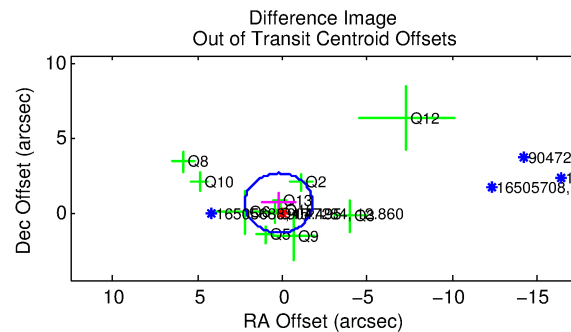
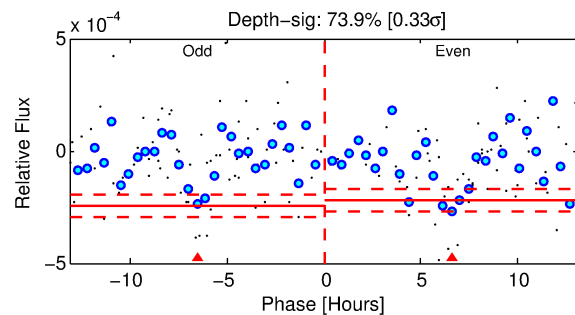
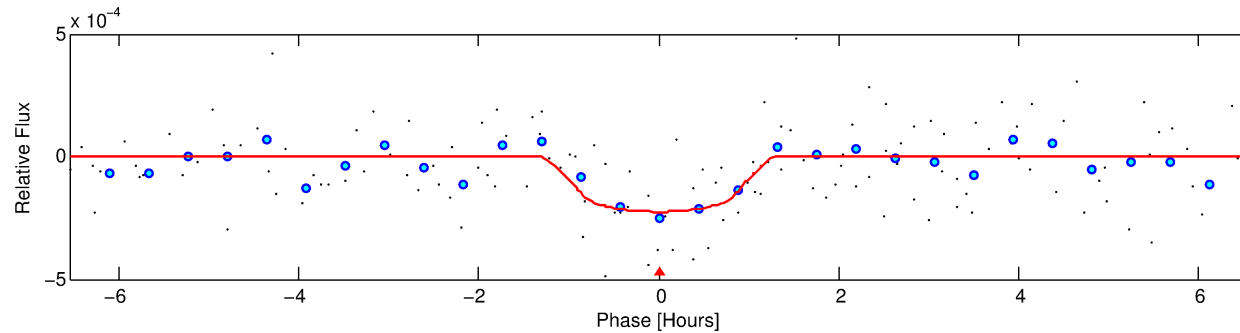
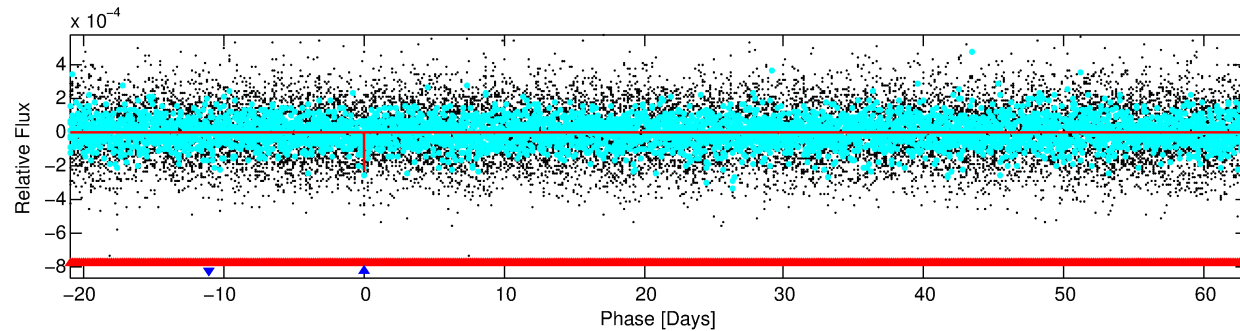
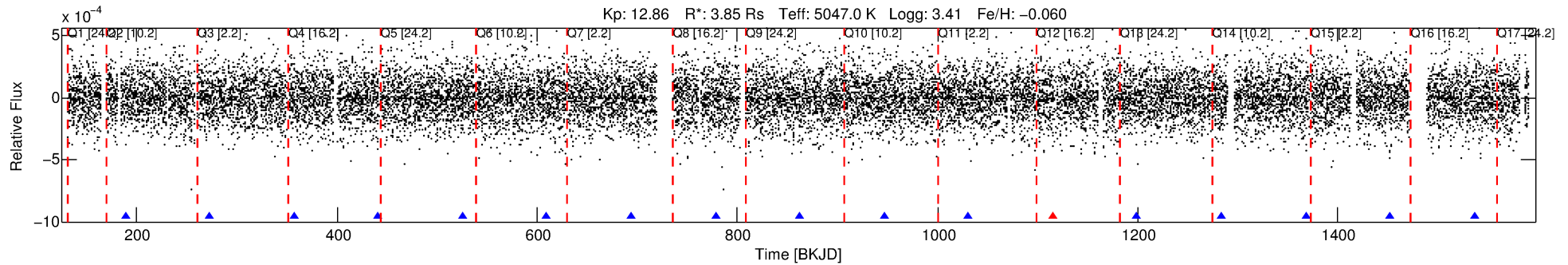
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009047284-02

No Significant Match Found

DV One-Page Summary

KIC: 9047284 Candidate: 2 of 2 Period: 84.211 d



DV Fit Results:

Period = 84.21107 [0.00067] d
Epoch = 188.7688 [0.0066] BKJD
Rp/R* = 0.0157 [0.0244]
a/R* = 172.20 [1022.58]
b = 0.83 [2.27]
Seff = 48.66 [13.75]
Teq = 673 [48] K
Rp = 6.62 [10.38] Re
a = 0.4213 [0.0794] AU
Ag = 270.12 [848.69] [0.32 σ]
Teffp = 4221 [3304] K [1.07 σ]

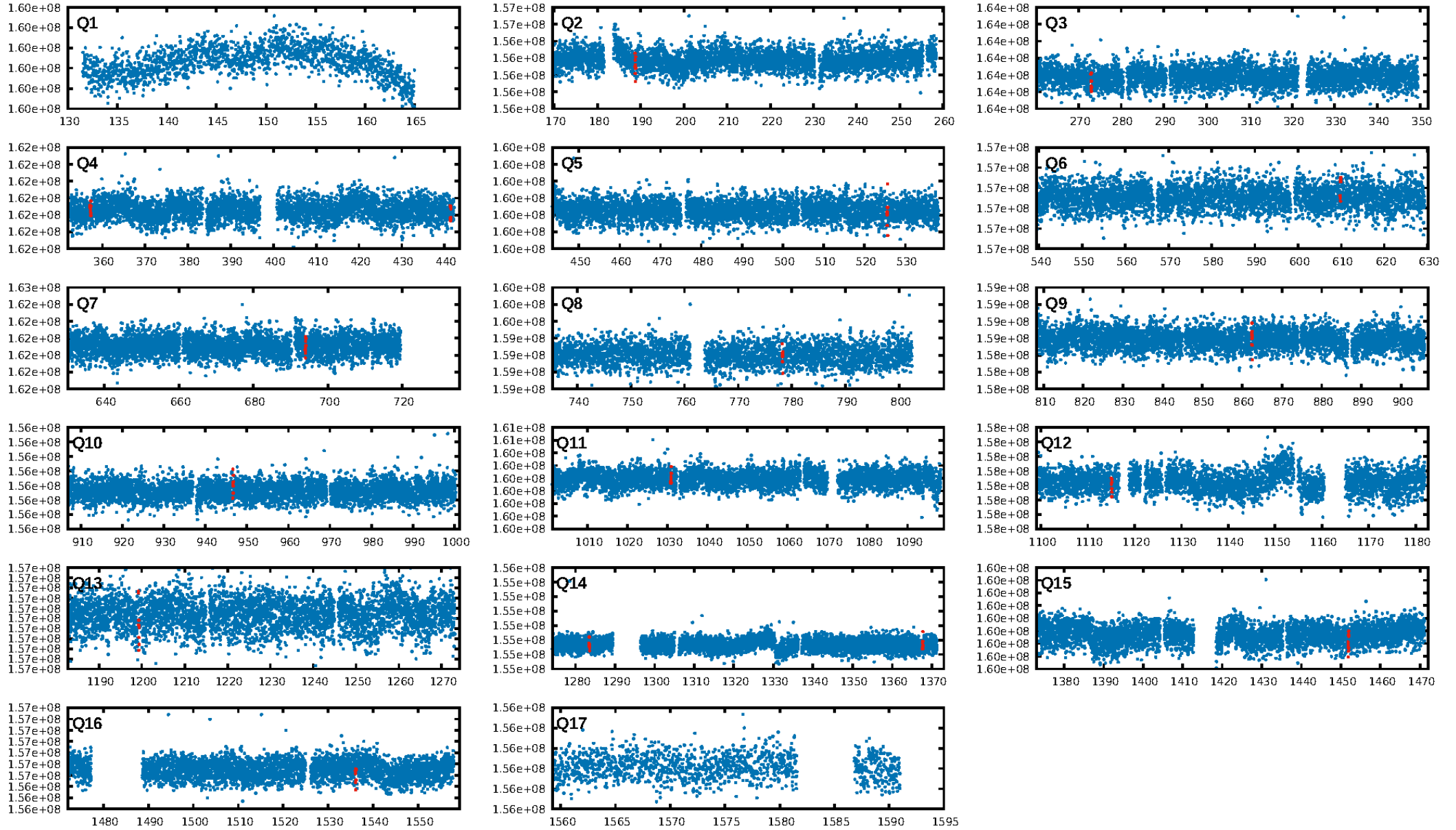
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [491.37 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 18.6%
ModelChiSquareGof-sig: 97.6%
Bootstrap-pfa: 1.28e-09
RollingBand-fgt: 0.90 [9/10]
GhostDiagnostic-chr: -3.117
Centroid-sig: 26.3%
Centroid-so: 0.930 arcsec [0.89 σ]
OotOffset-rm: 0.669 arcsec [1.01 σ]
OotOffset-st: 3/2/3/3 [11]
KicOffset-rm: 0.710 arcsec [1.19 σ]
KicOffset-st: 3/2/3/3 [11]
DiffImageQuality-fgm: 0.36 [4/11]
DiffImageOverlap-fno: 0.00 [0/15]

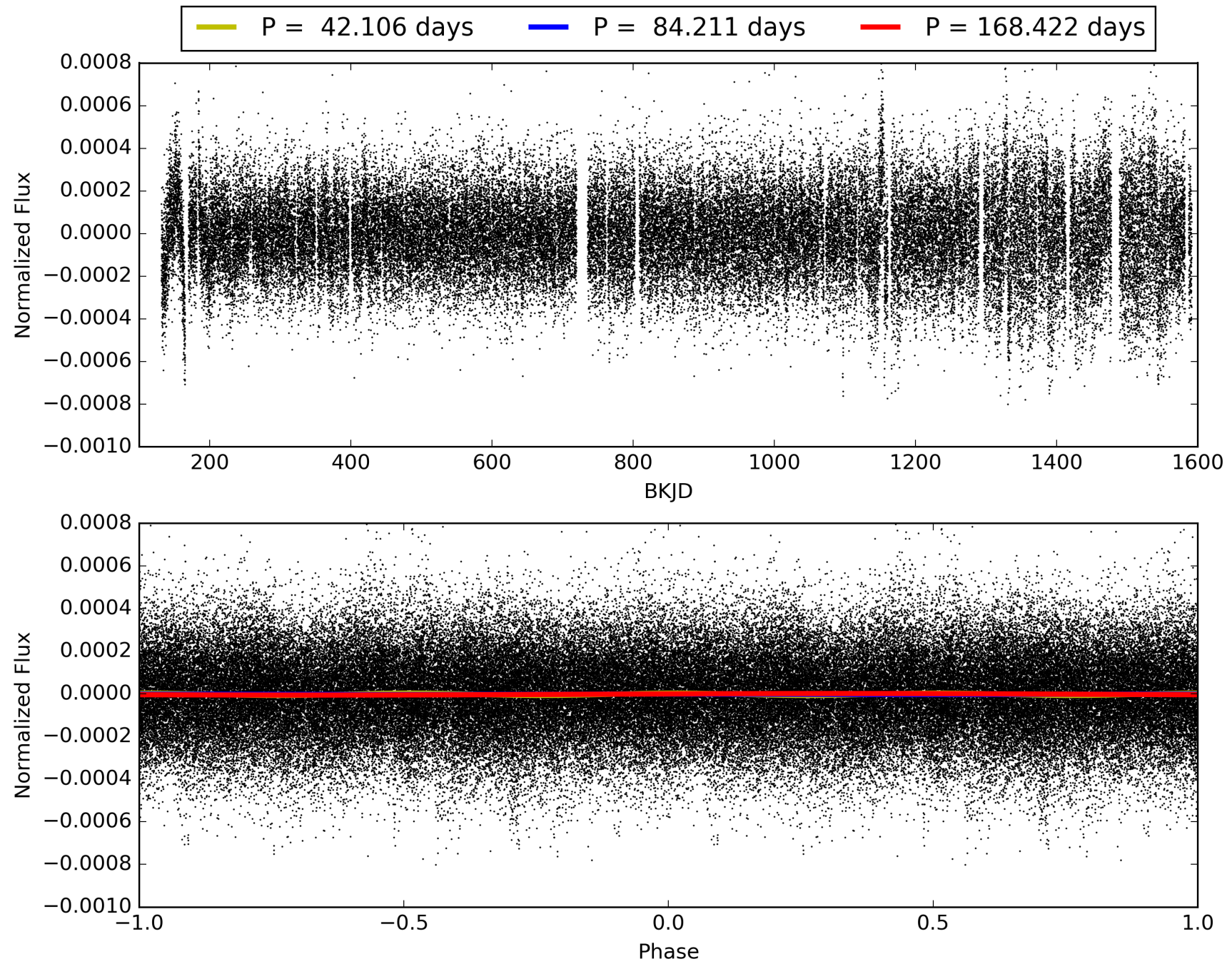
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:06:05 Z

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

TCE 009047284-02, PDC Light Curves

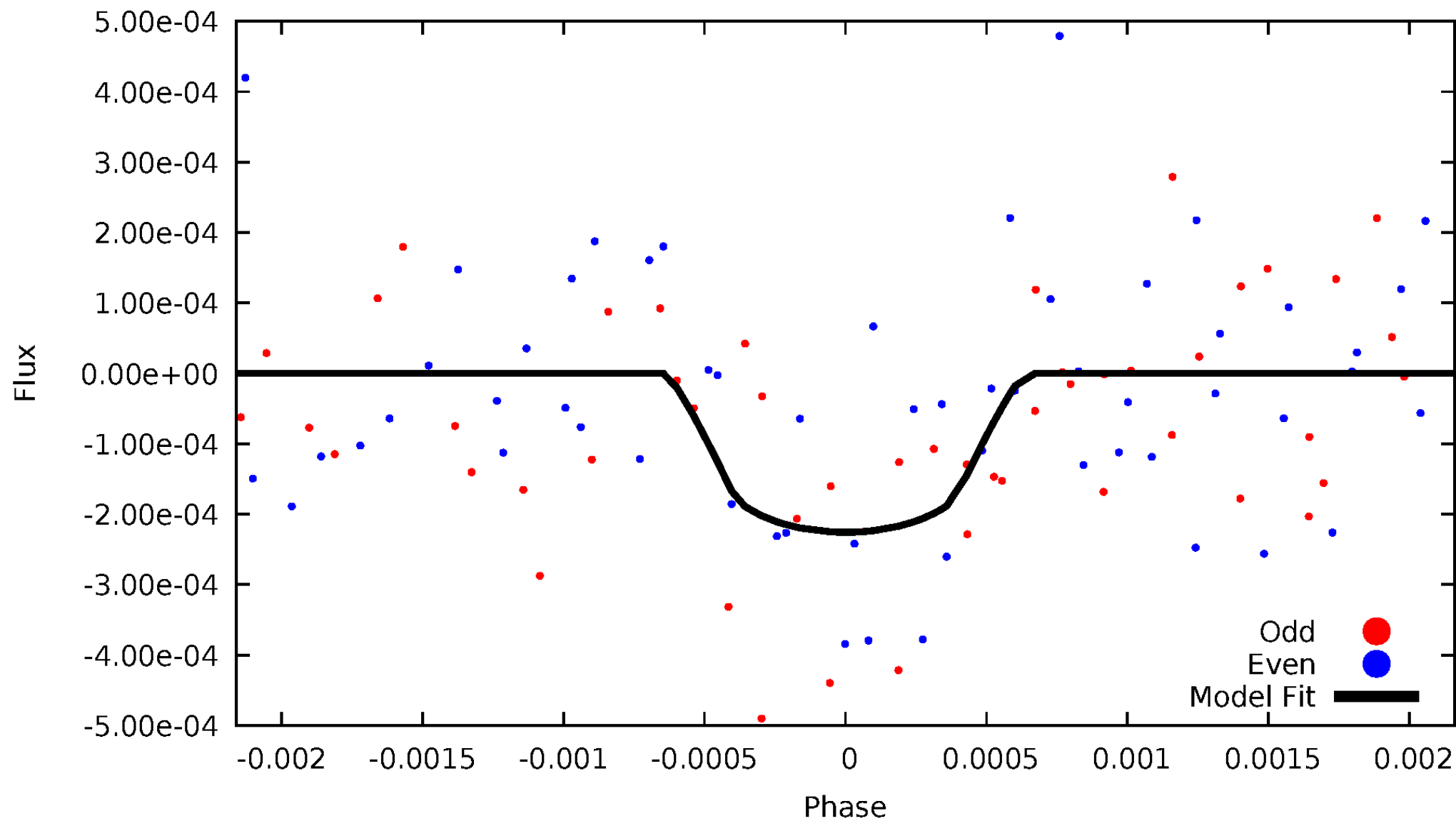


TCE 009047284-02



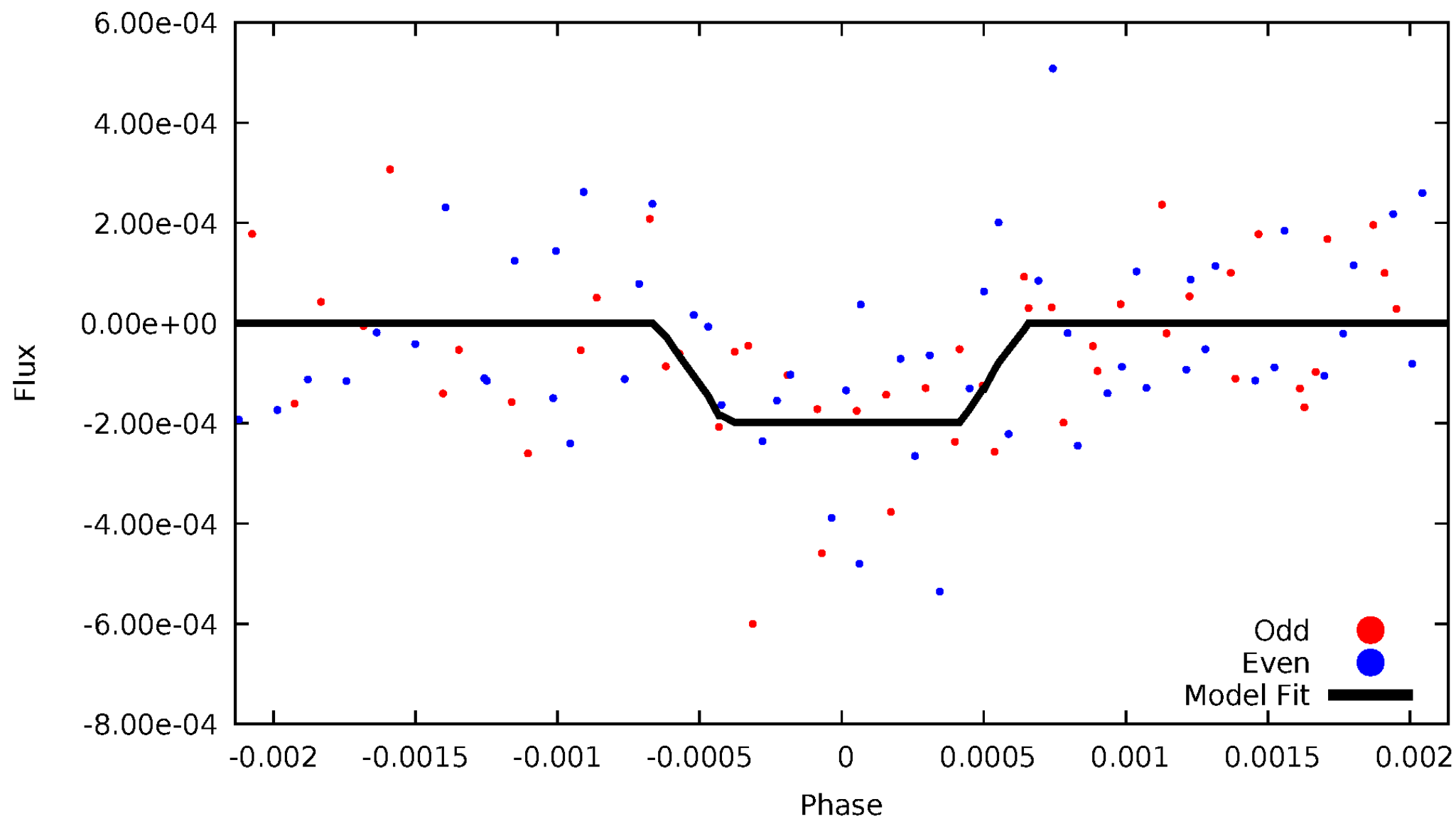
DV Odd/Even

TCE 009047284-02



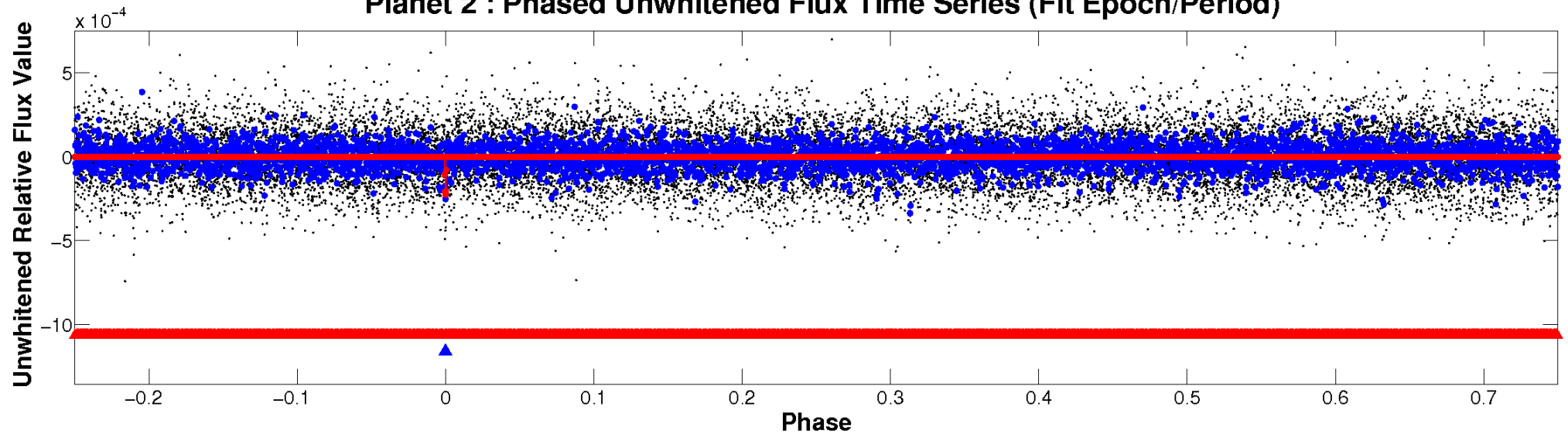
ALT Odd/Even

TCE 009047284-02

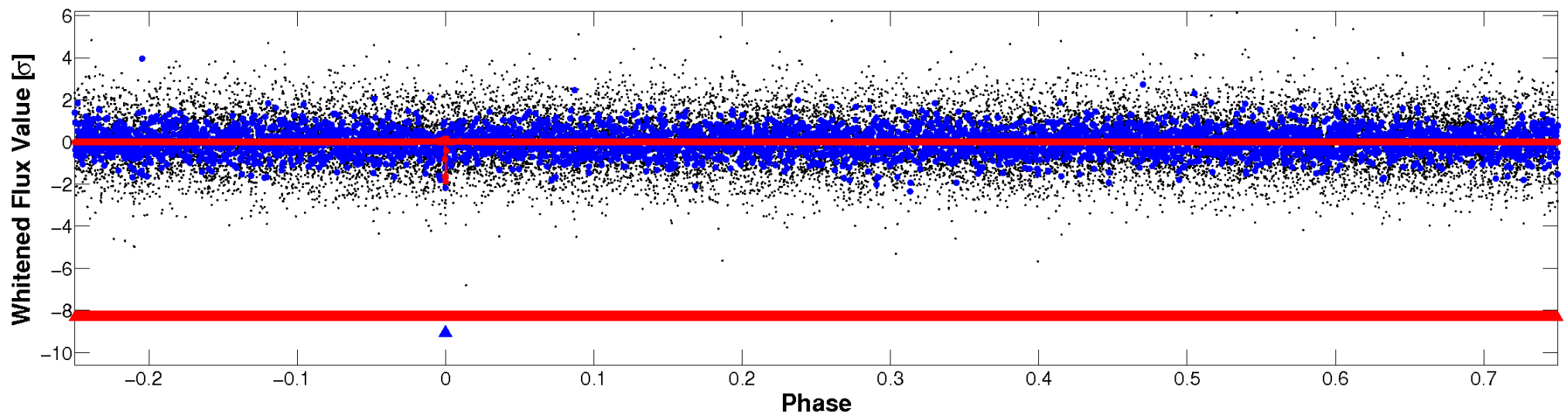


Non-Whitened Vs. Whitened Light Curve

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

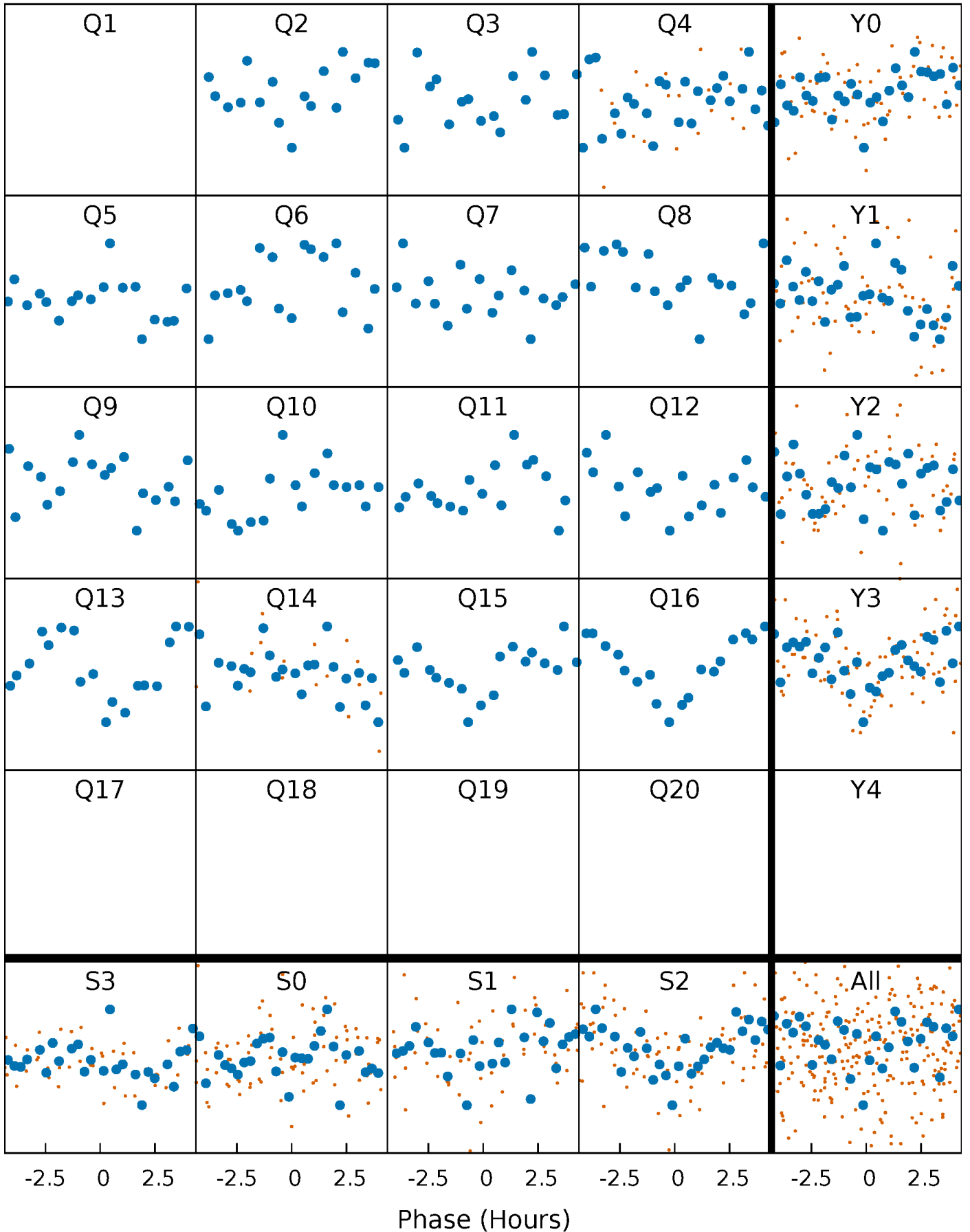


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



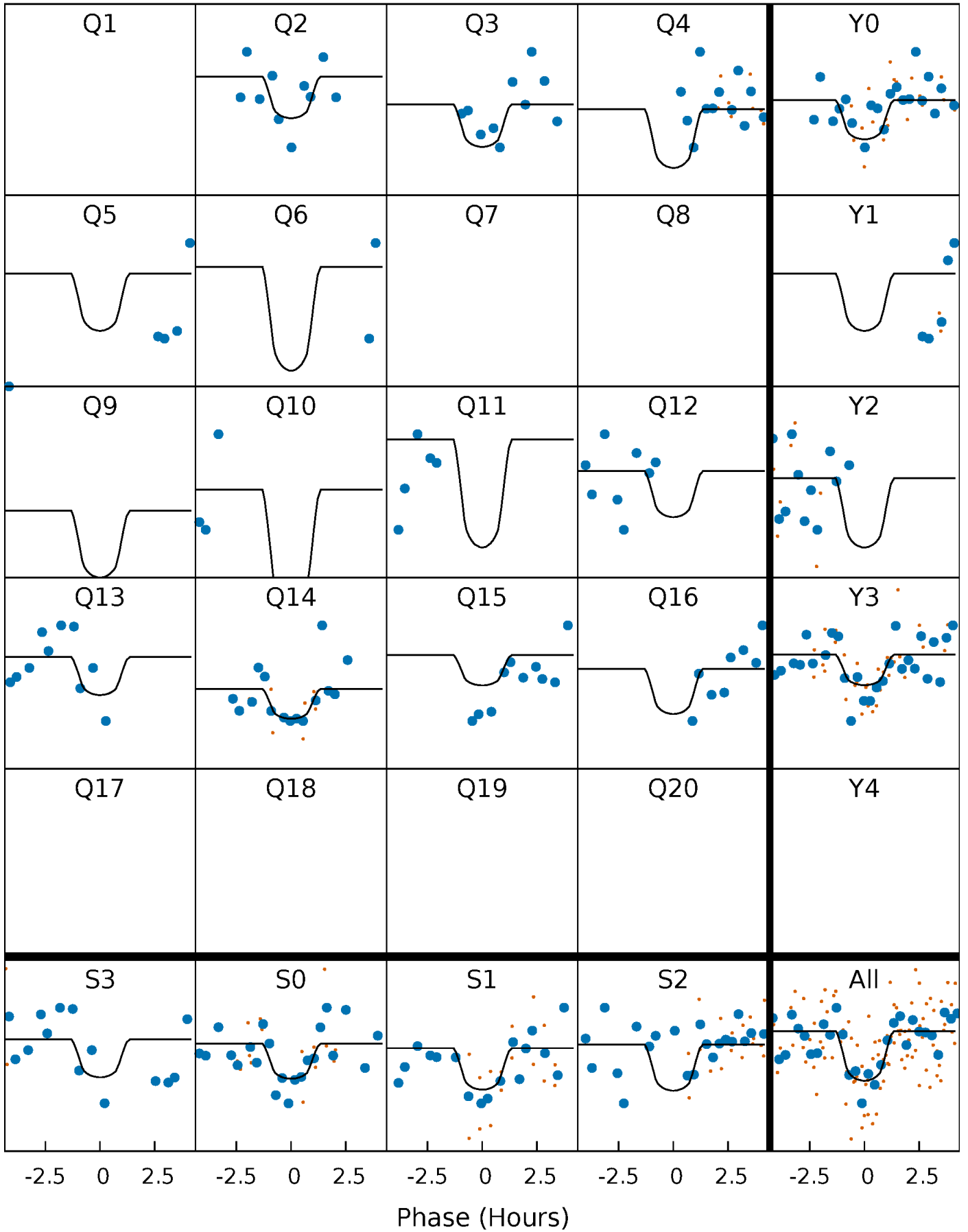
PDC Quarter-Phased Transit Curves

TCE 009047284-02 P= 84.211067 Days $T_0=188.768810$ (BKJD)



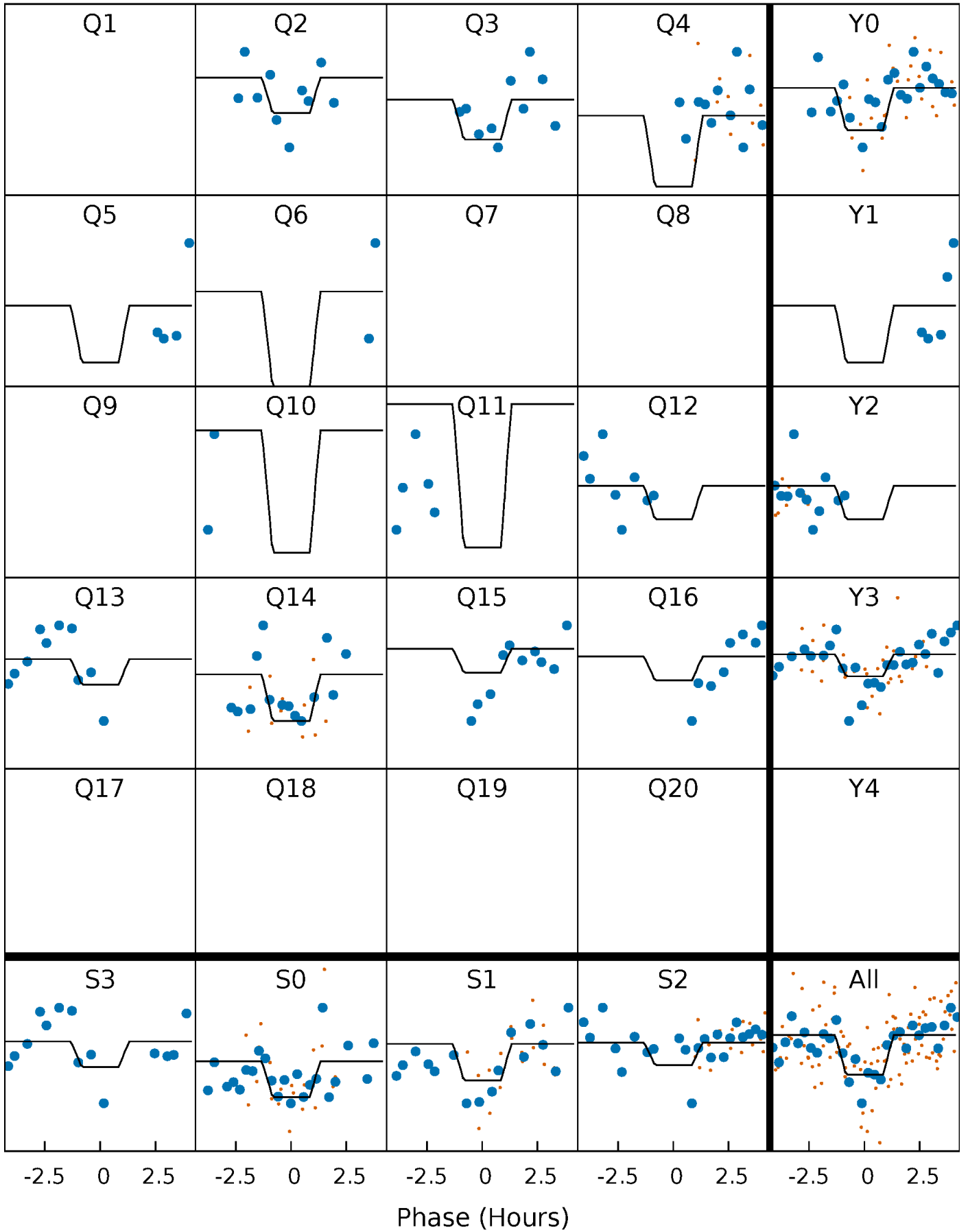
DV Quarter-Phased Transit Curves

TCE 009047284-02 P= 84.211067 Days $T_0=188.768810$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

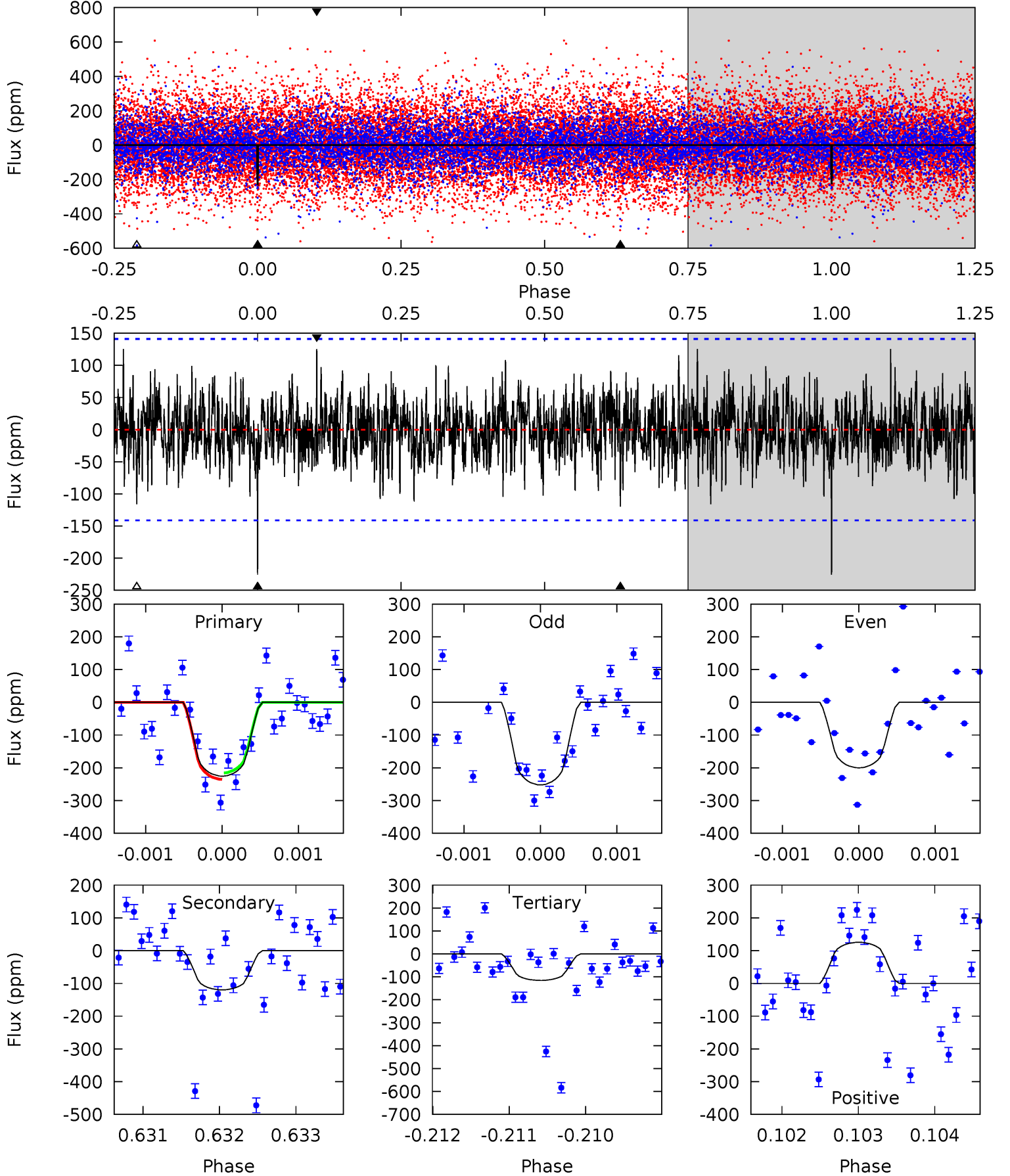
TCE 009047284-02 P= 84.210958 Days $T_0=188.771747$ (BKJD)



DV Model-Shift Uniqueness Test

009047284-02, P = 84.211067 Days, E = 104.557743 Days

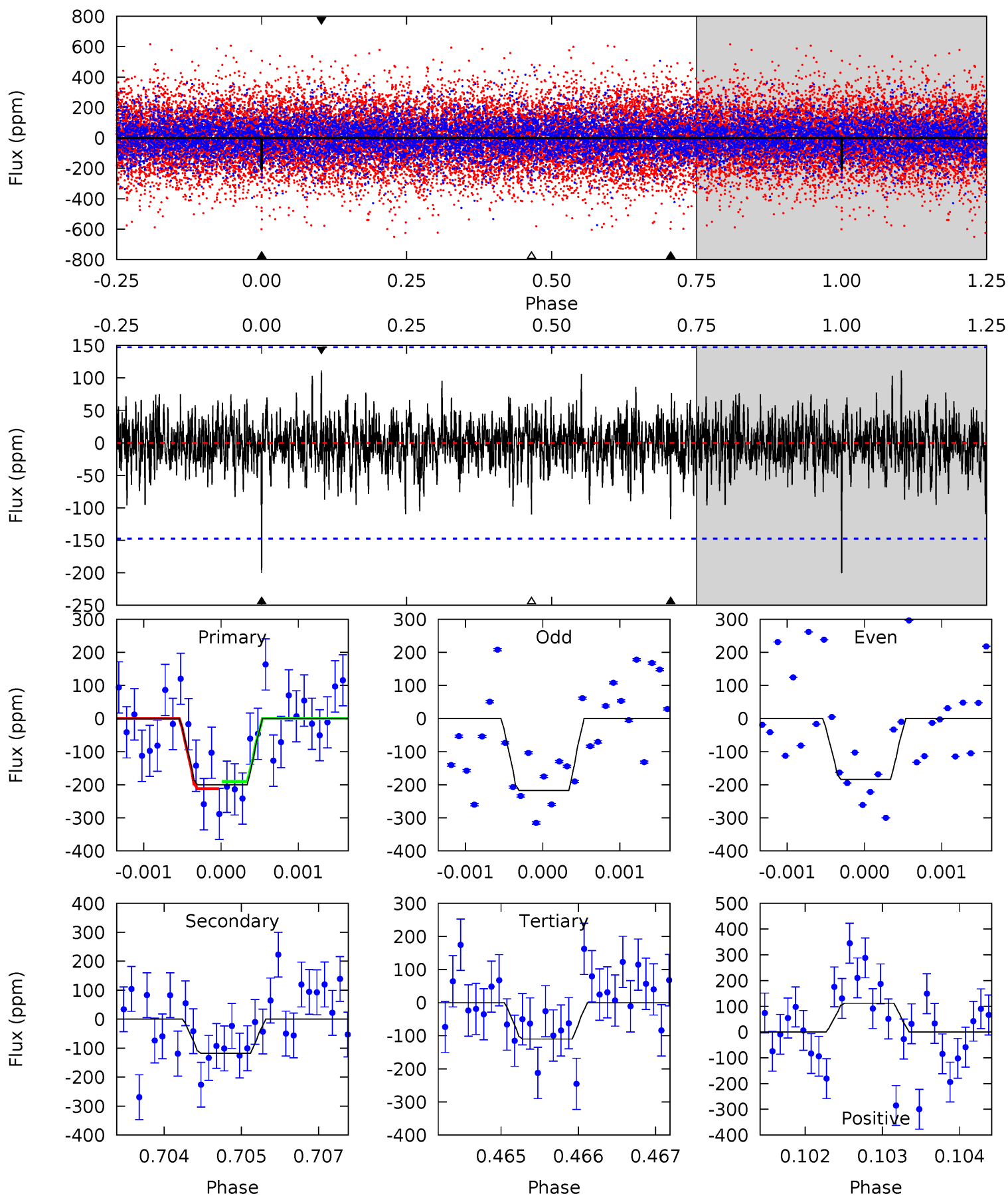
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.64	4.59	4.44	4.81	5.41	3.22	1.37	4.20	3.83	0.15	-0.22	1.00	0.84	0.36	0.37



Alt Model-Shift Uniqueness Test

009047284-02, P = 84.210958 Days, E = 104.560789 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.35	4.31	4.04	4.09	5.41	3.23	1.11	3.32	3.26	0.27	0.22	0.62	1.18	0.36	0.39



Stellar Parameters For KIC 009047284

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5047^{+52}_{-90}	$3.414^{+0.149}_{-0.122}$	$-0.060^{+0.100}_{-0.150}$	$3.854^{+0.630}_{-0.866}$	$1.405^{+0.166}_{-0.332}$	$0.035^{+0.031}_{-0.011}$
	+1%/-2%	+4%/-4%	+167%/-250%	+16%/-22%	+12%/-24%	+88%/-32%
Source	SPE74	SPE74	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 009047284-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-120 ± 26	$9.61^{+8.50}_{-6.47}$	938^{+45}_{-53}	3726^{+2236}_{-682}	120^{+991}_{-88}
Alt.	-117 ± 27	$9.48^{+8.39}_{-6.55}$	941^{+43}_{-51}	3780^{+2087}_{-671}	120^{+1094}_{-85}

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 $A_{obs} \gg 1.0$

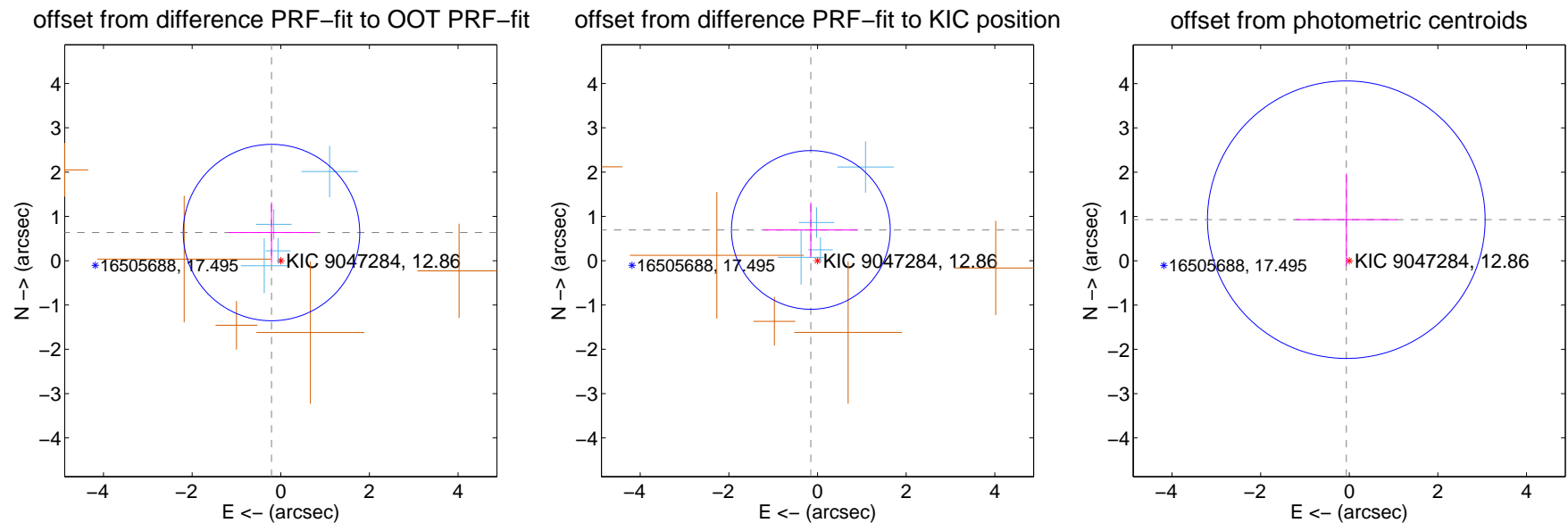
DV Centroid Data

Supplemental centroid analysis for 009047284-02. Kepler magnitude: 12.86. Transit SNR 8.26

There are 4 quarters with good PRF difference image offsets

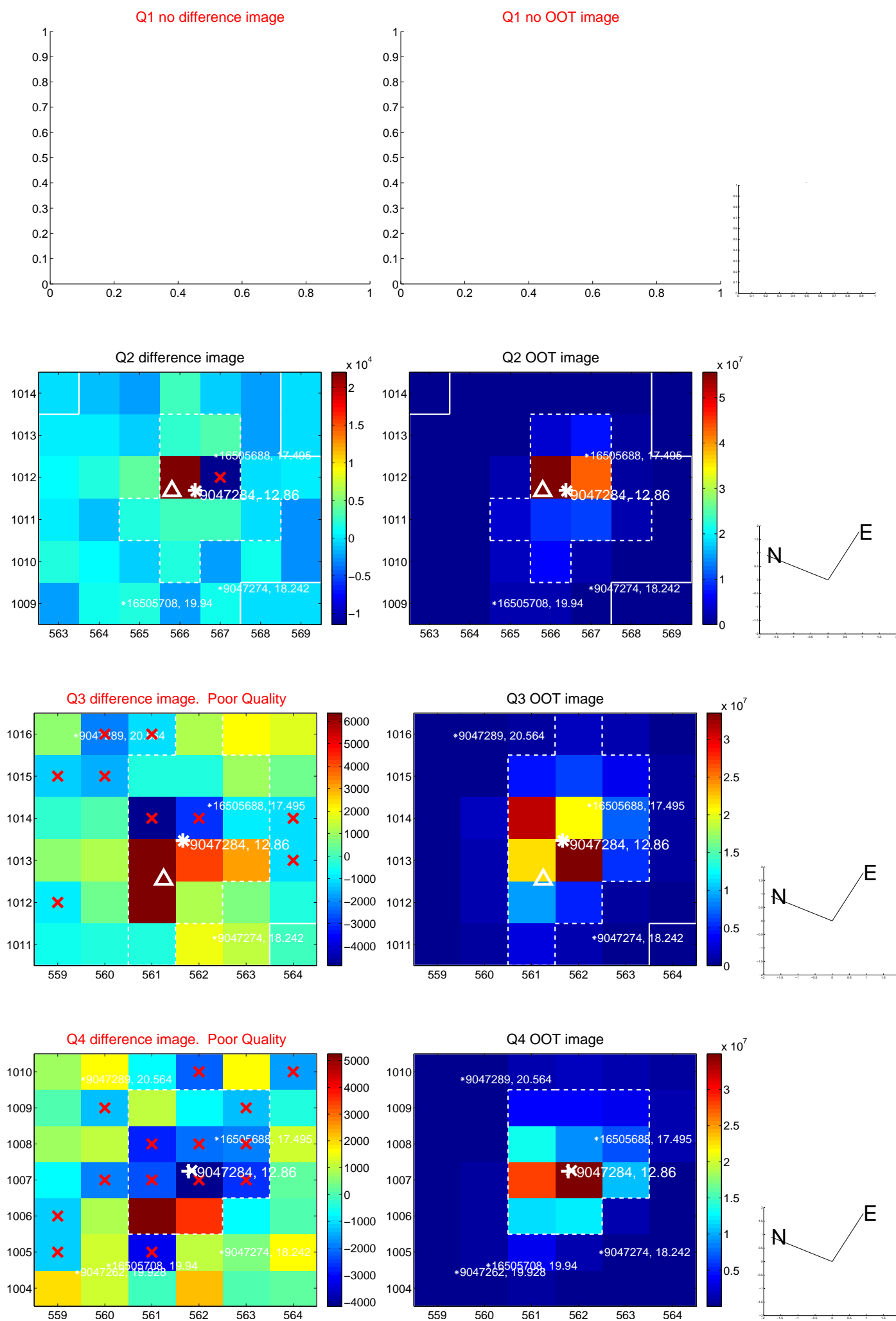
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.669 ± 0.663	1.01	0.209 ± 0.974	0.635 ± 0.684
PRF-fit source offset from KIC position	0.710 ± 0.597	1.19	0.150 ± 1.066	0.694 ± 0.623
photometric centroid source offset	0.93 ± 1.04	0.89	0.07 ± 1.15	0.93 ± 1.04

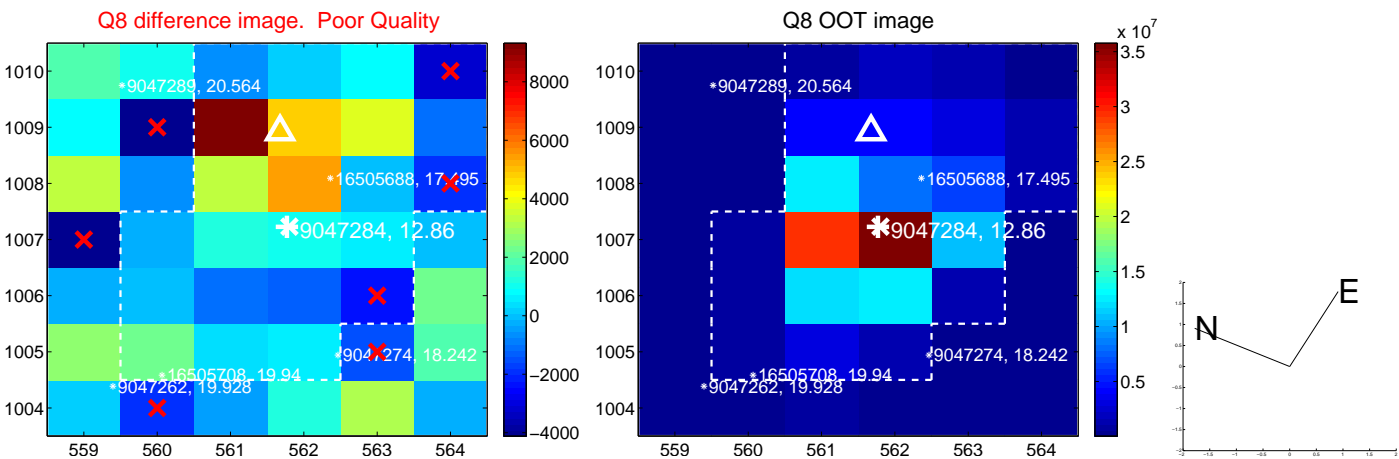
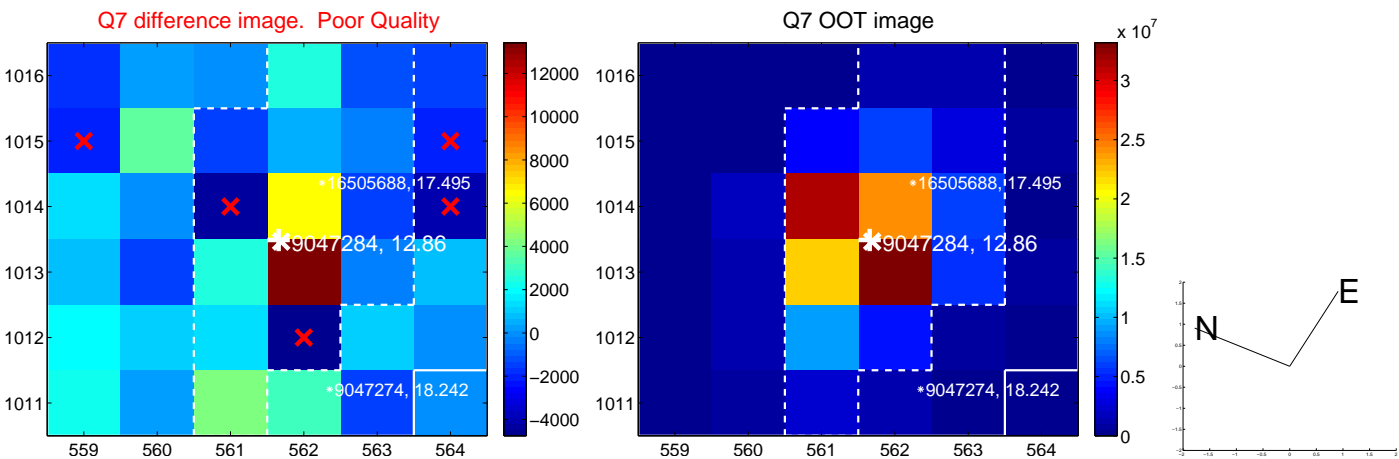
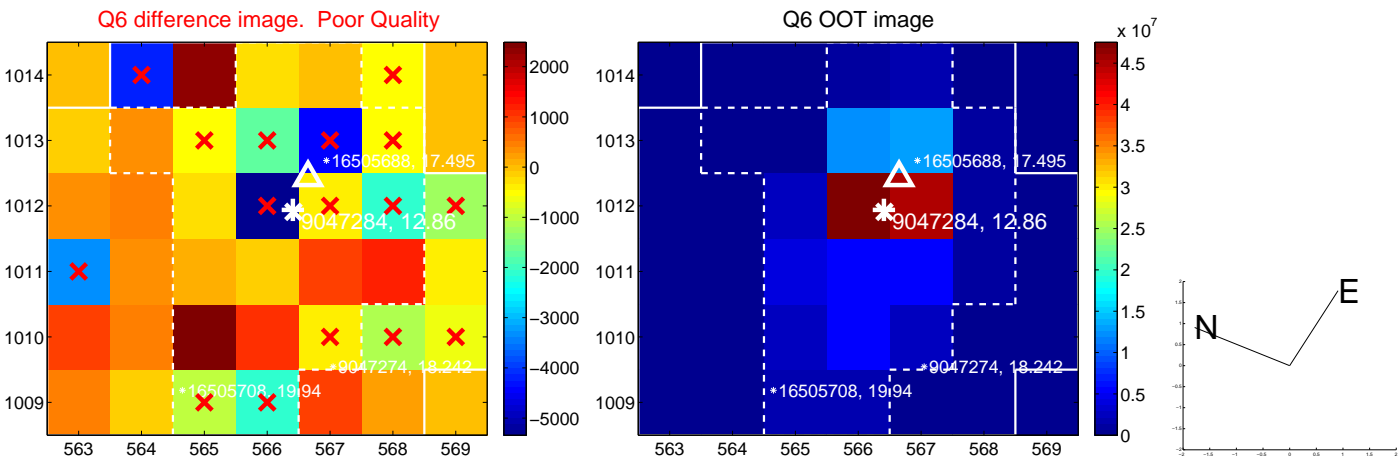
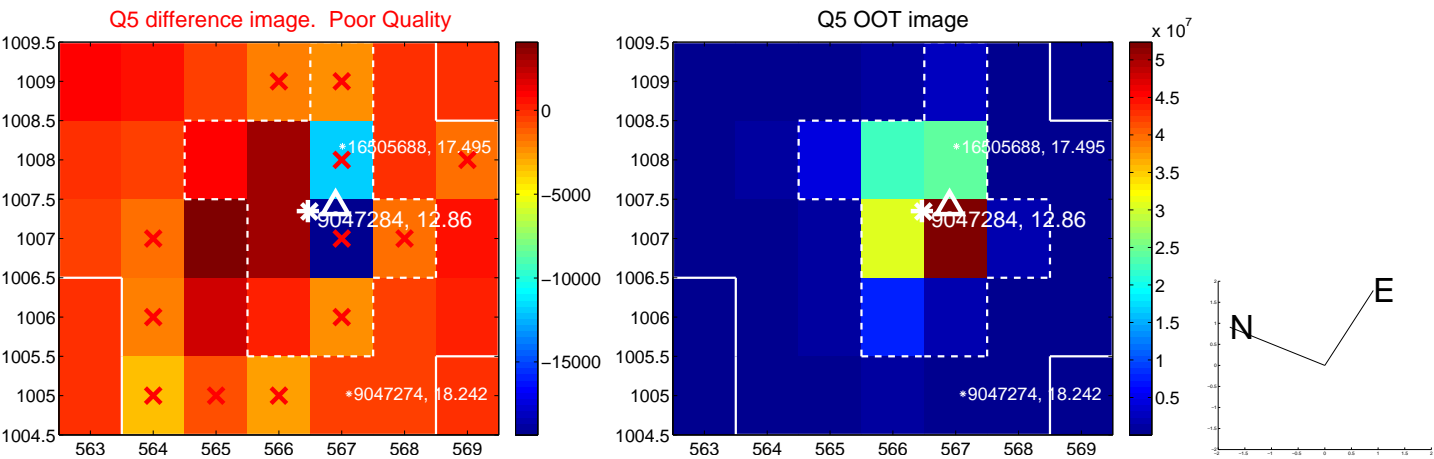


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

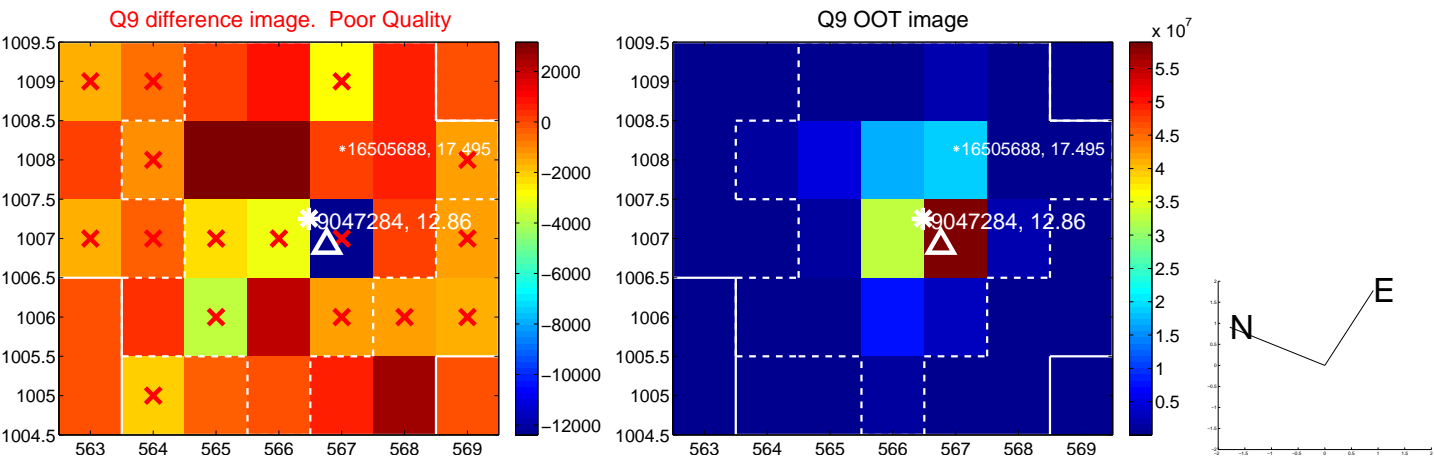
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



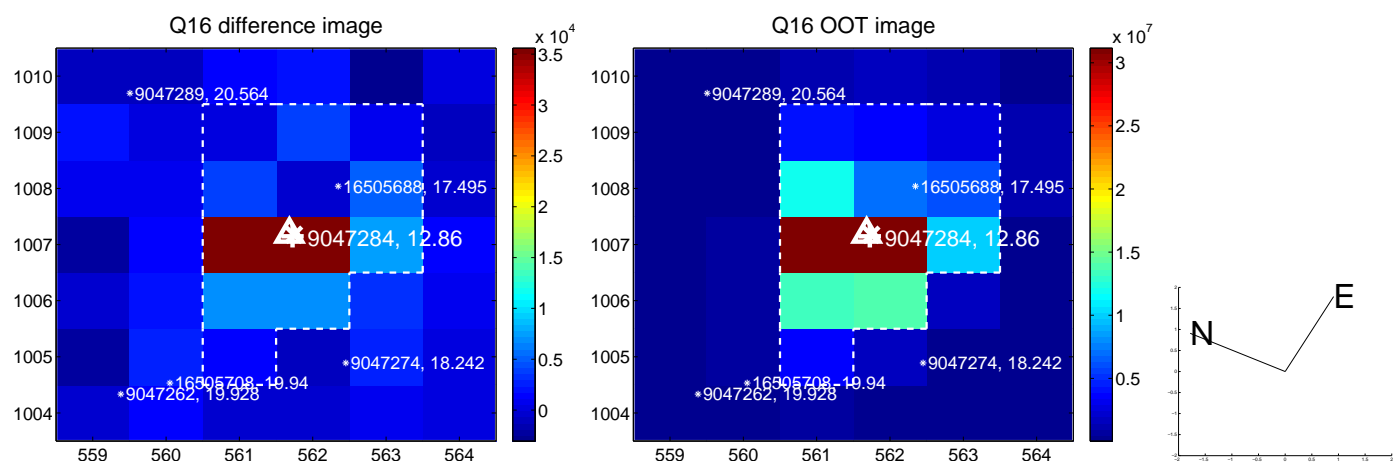
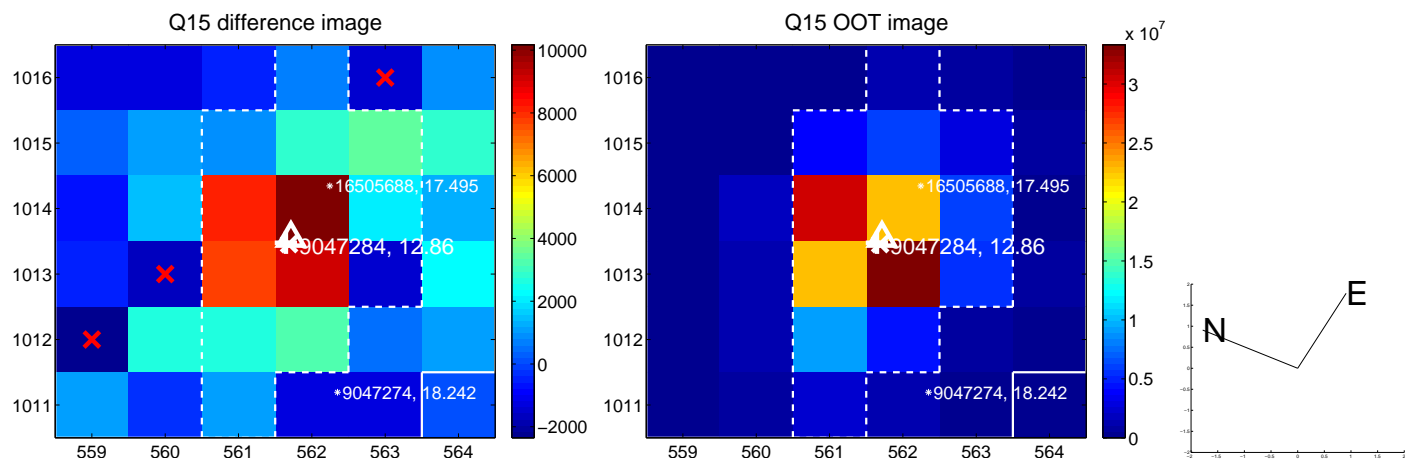
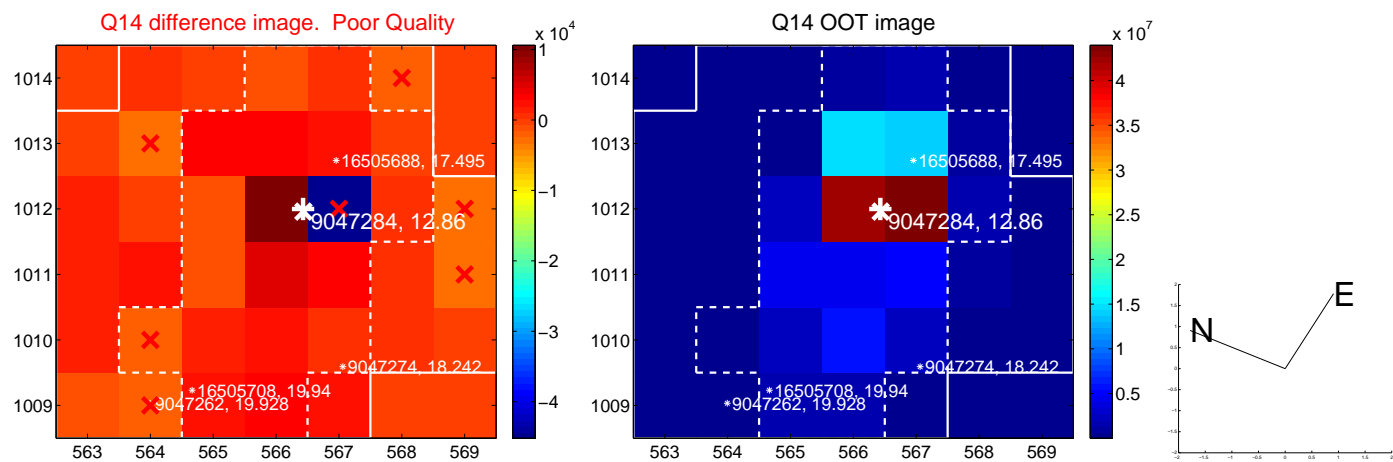
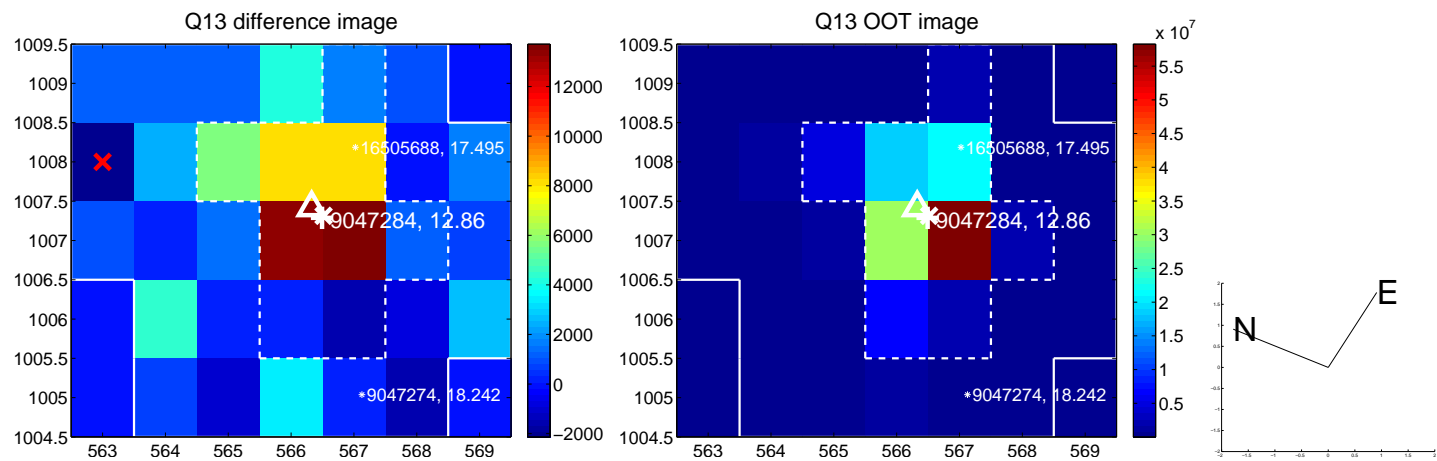
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



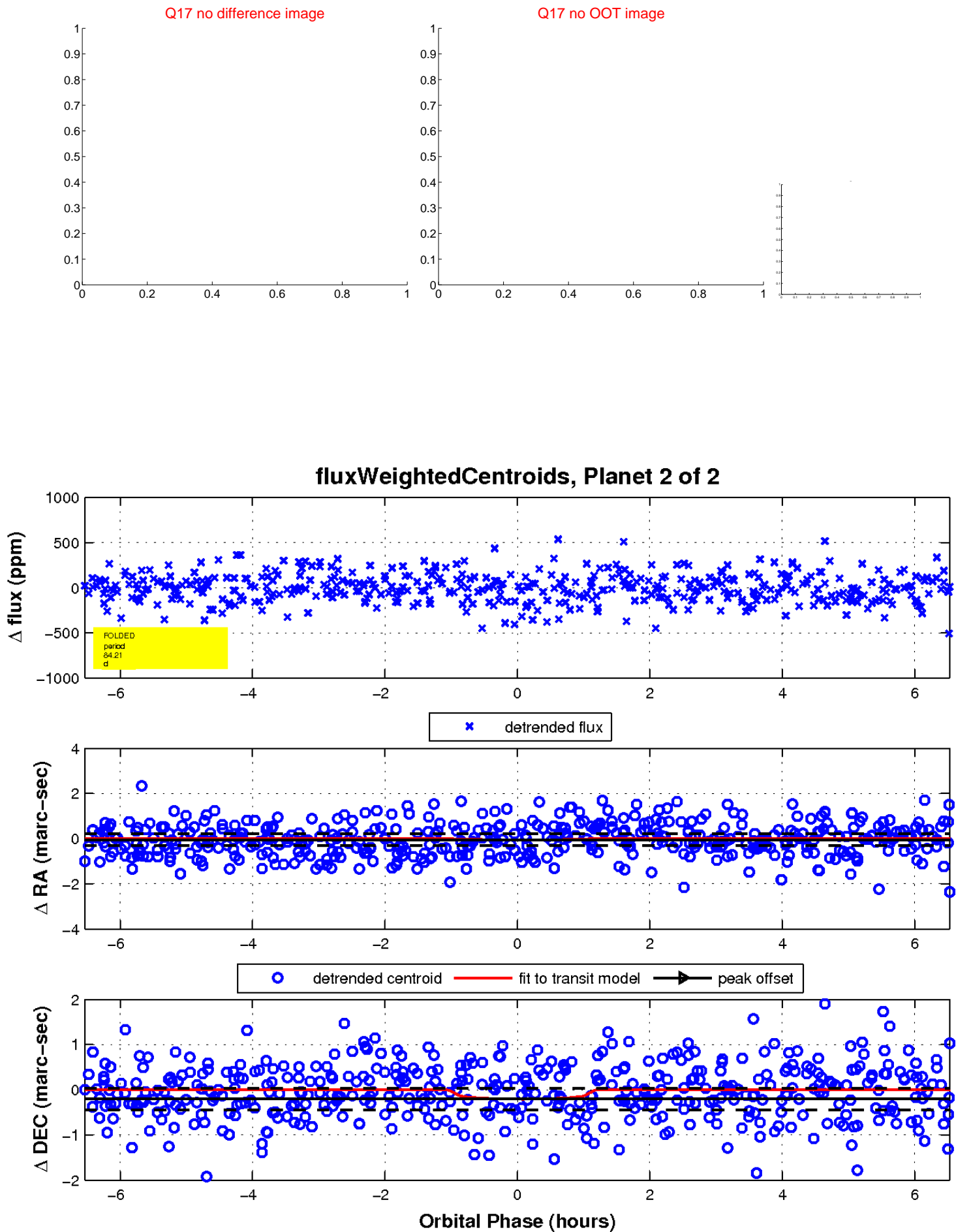
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

