

KIC 009458754

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})
009458754-01	OBS	No	0.970683	132.228528	7.4	6.237	9.0	4.6	1.62	6986	0.45	11727.45
009458754-02	OBS	No	104.146073	147.332925	219.9	5.394	8.5	8.3	1.62	6986	2.66	23.00
009458754-03	OBS	No	33.717281	139.707074	130.2	3.664	8.5	8.0	1.62	6986	2.05	103.47
009458754-04	OBS	No	486.308250	543.165610	275.3	9.252	8.1	7.4	1.62	6986	3.01	2.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009458754-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009458754-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009458754-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009458754-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

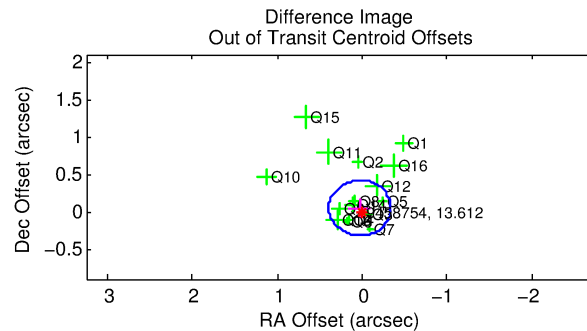
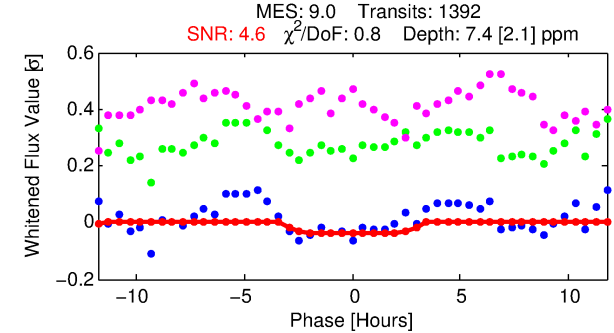
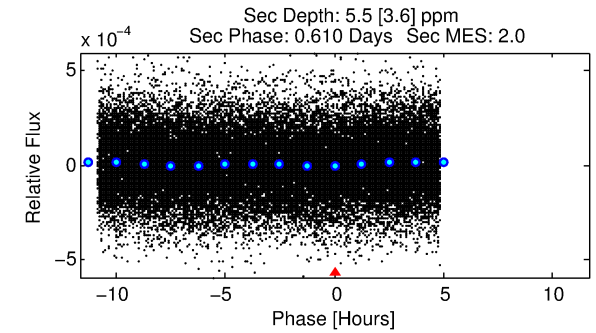
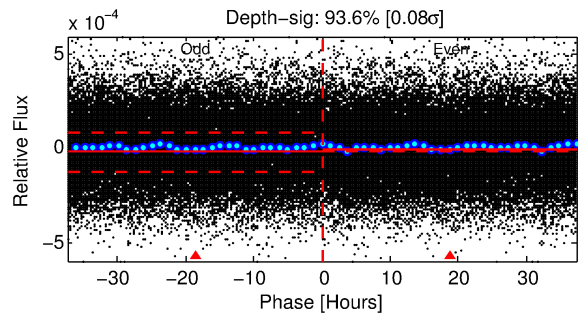
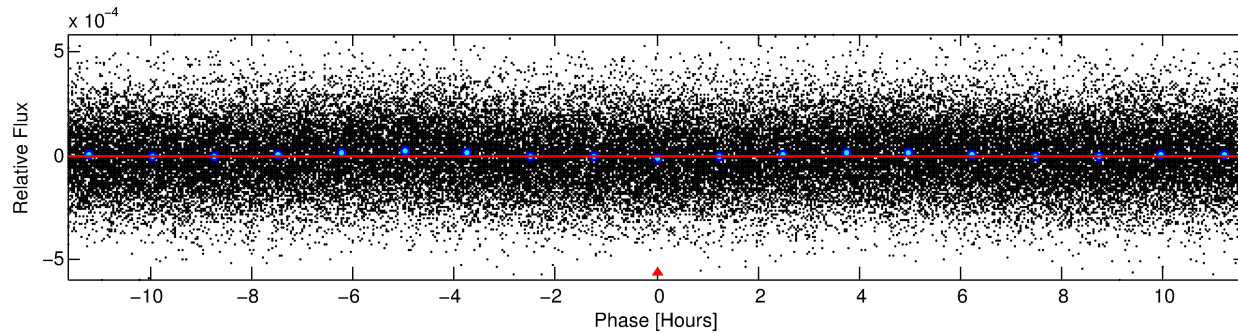
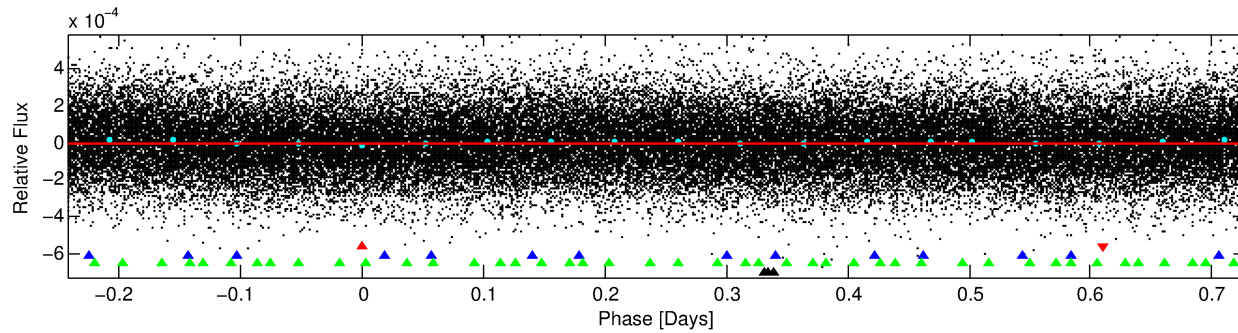
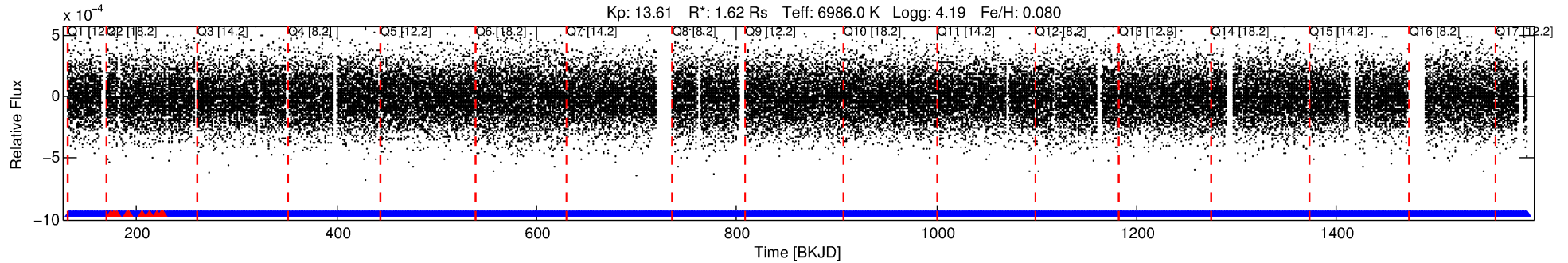
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009458754-01

No Significant Match Found

DV One-Page Summary

KIC: 9458754 Candidate: 1 of 4 Period: 0.971 d



DV Fit Results:

Period = 0.97068 [0.00003] d
Epoch = 132.2285 [0.0123] BKJD
Rp/R* = 0.0025 [0.0060]
a/R* = 1.34 [7.99]
b = 0.14 [97.53]
Seff = 11727.45 [5053.79]
Teq = 2654 [286] K
Rp = 0.45 [1.07] Re
a = 0.0218 [0.0061] AU
Ag = 7.31 [35.07] [0.18 σ]
Teffp = 6747 [8066] K [0.51 σ]

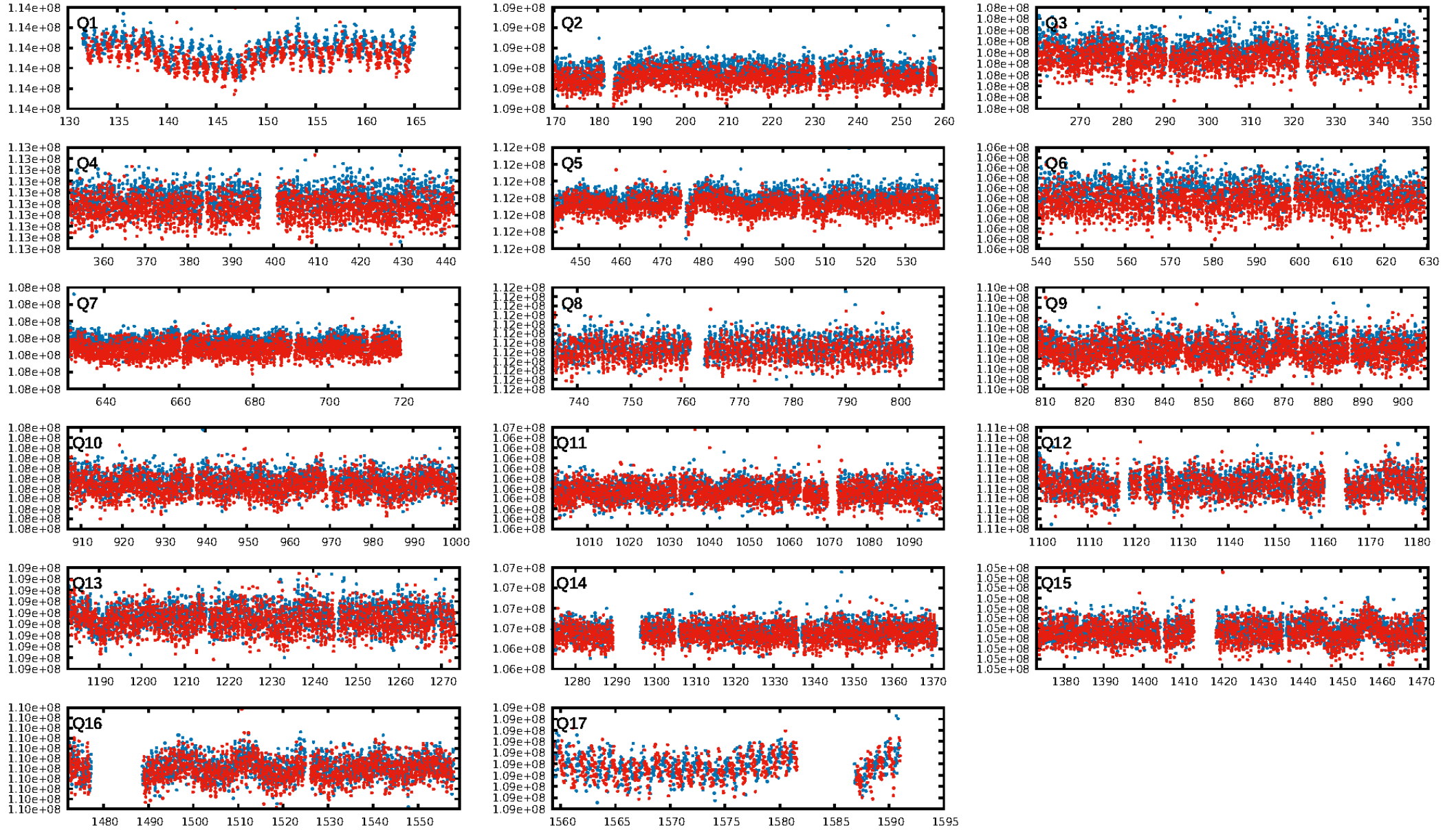
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [108.66 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.69e-15
RollingBand-fgt: 0.99 [1319/1330]
GhostDiagnostic-chr: 0.7562
Centroid-sig: N/A
Centroid-so: 1.909 arcsec [0.96 σ]
OotOffset-rm: 0.053 arcsec [0.44 σ]
KicOffset-rm: 0.199 arcsec [1.52 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [17/17]

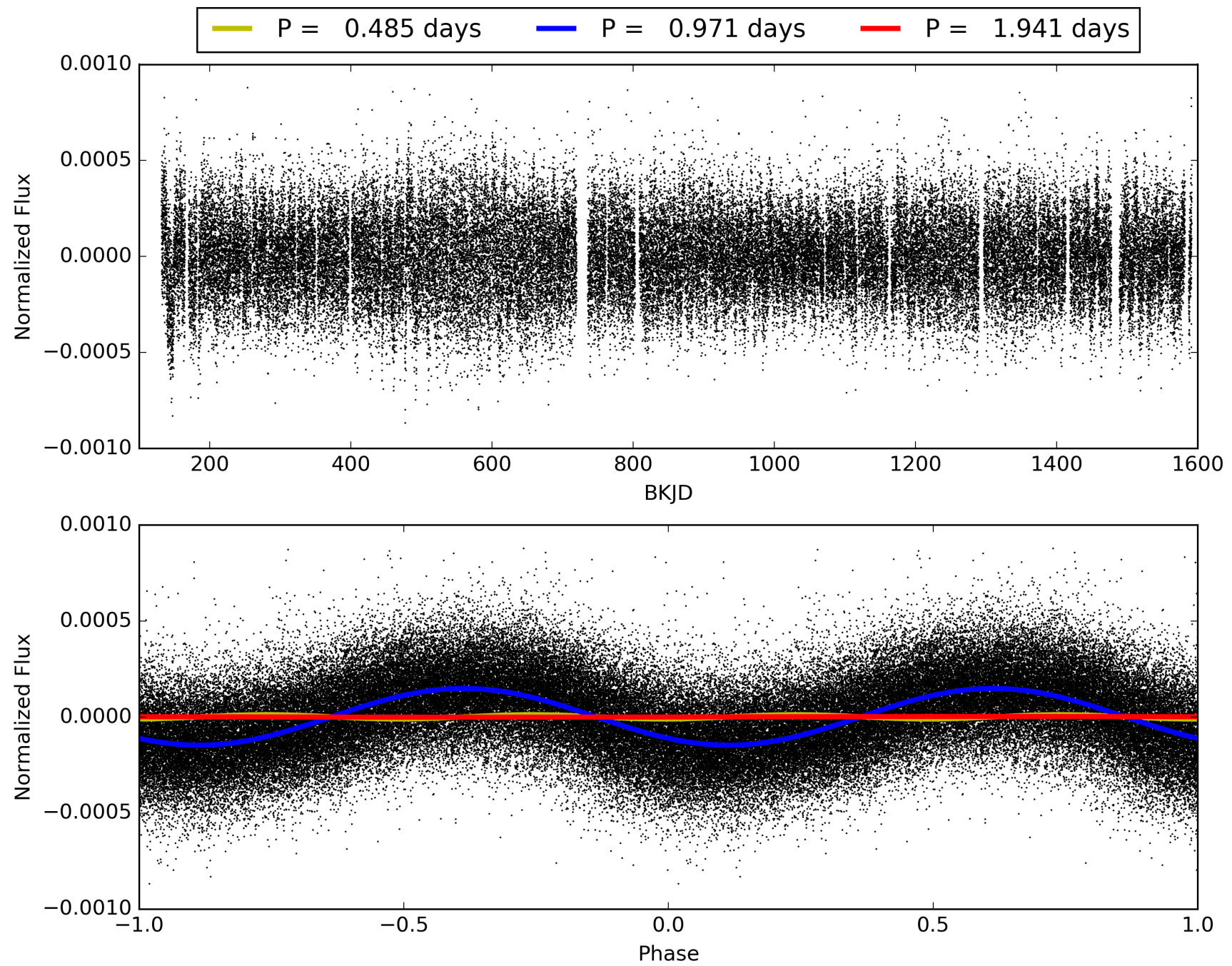
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:19:17 Z

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

TCE 009458754-01, PDC Light Curves

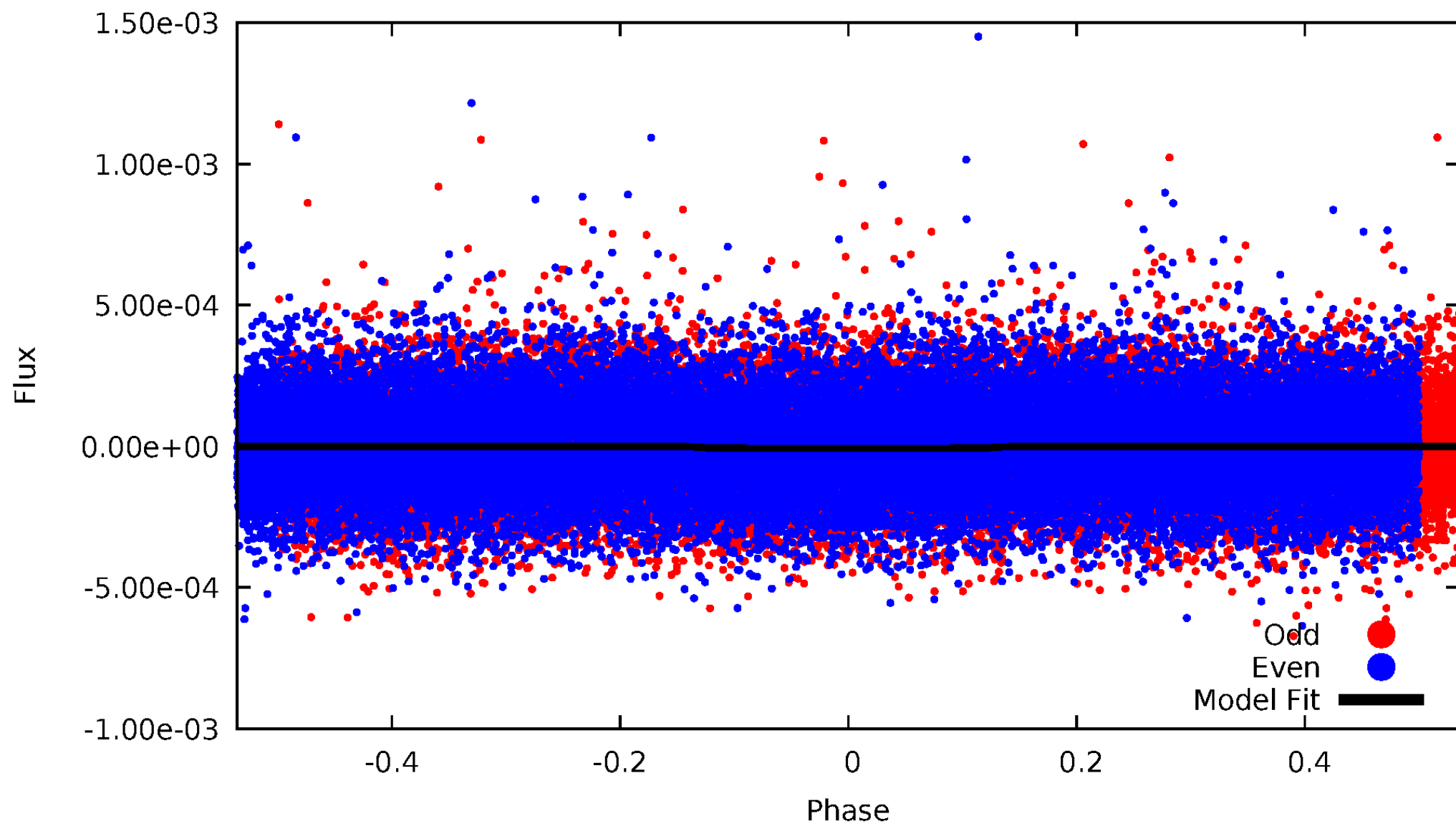


TCE 009458754-01



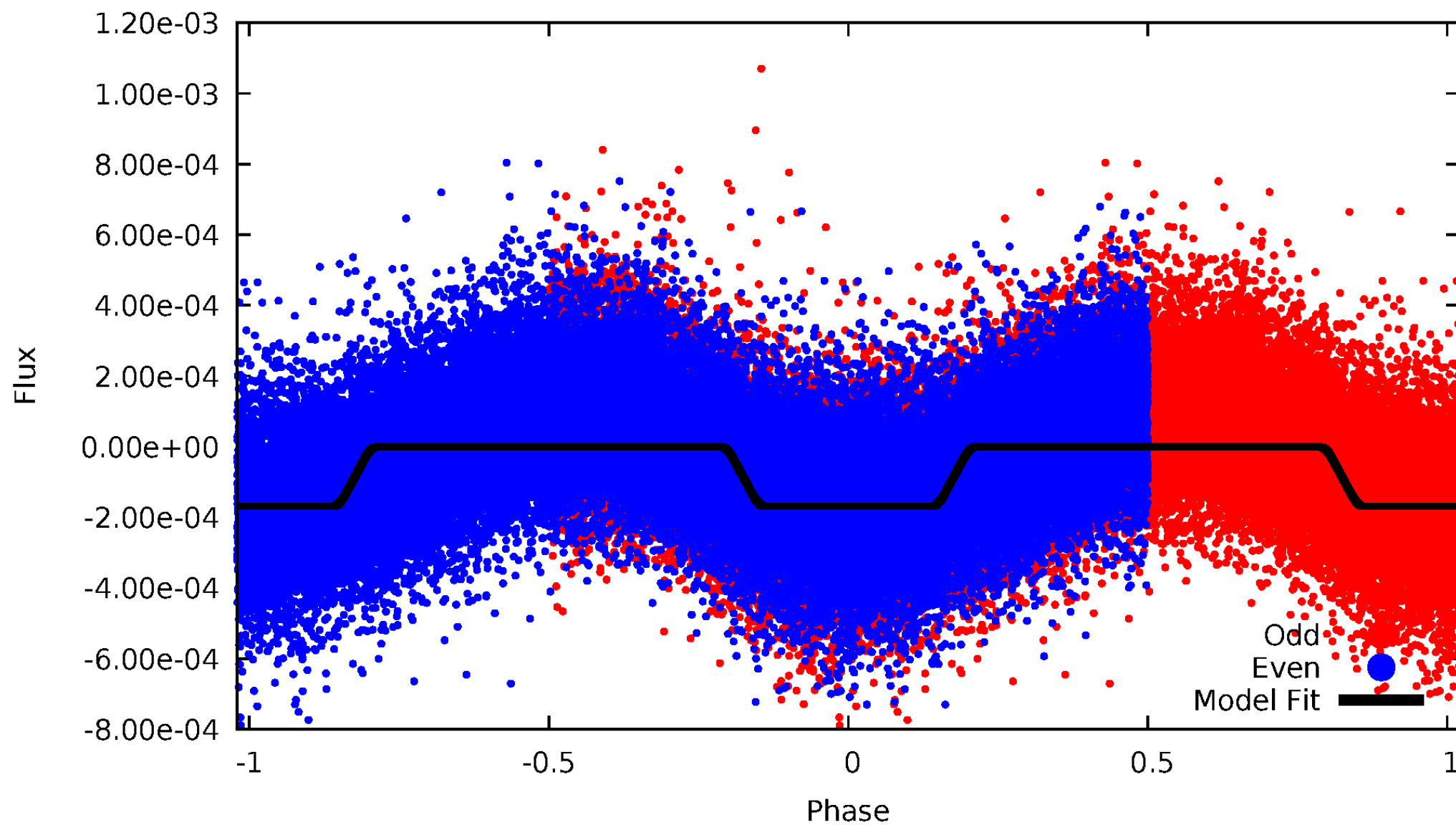
DV Odd/Even

TCE 009458754-01



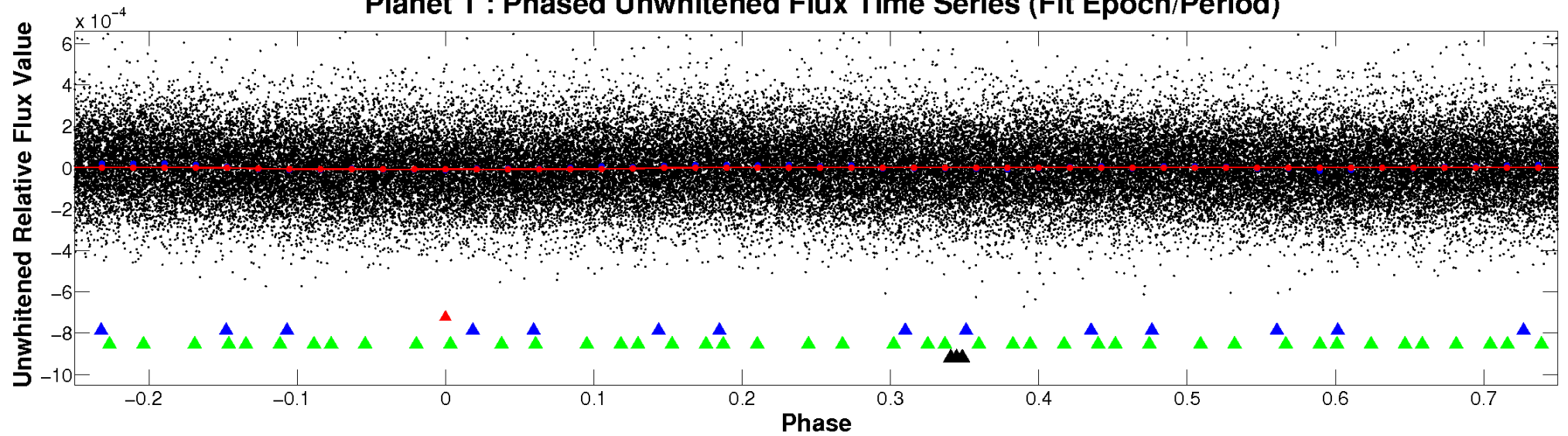
ALT Odd/Even

TCE 009458754-01

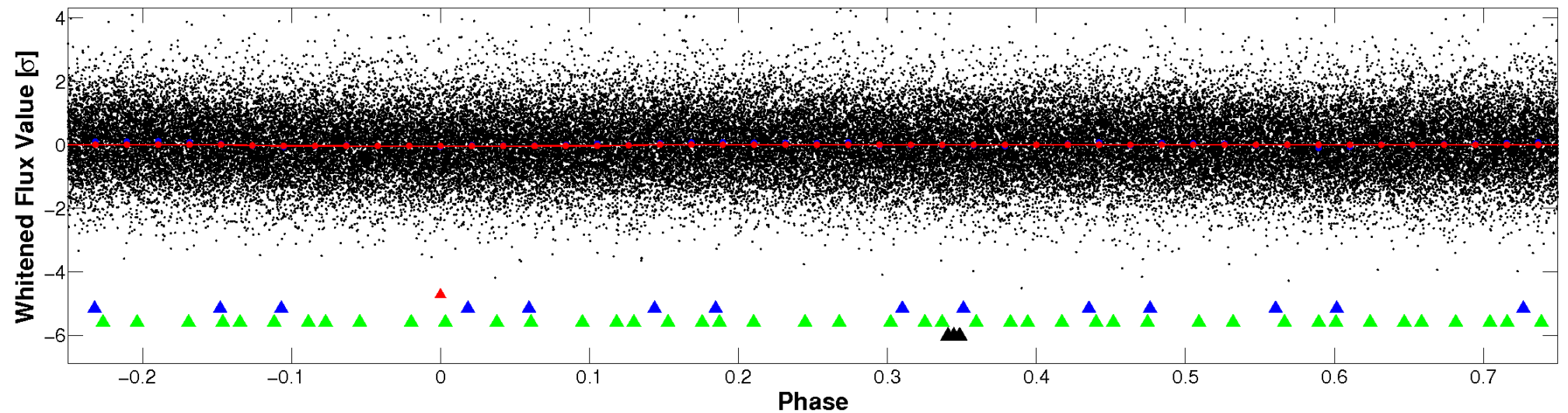


Non-Whitened Vs. Whitened Light Curve

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

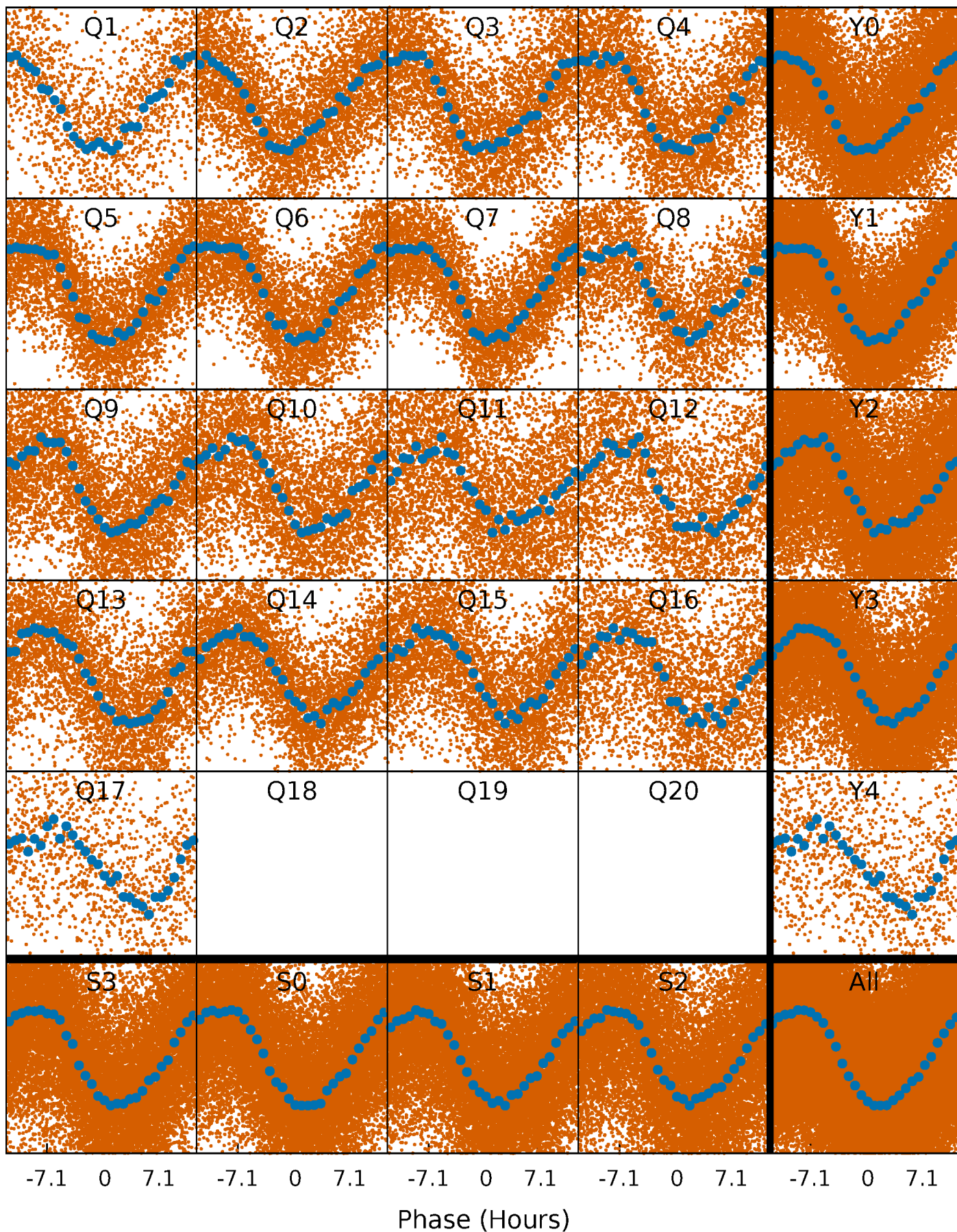


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



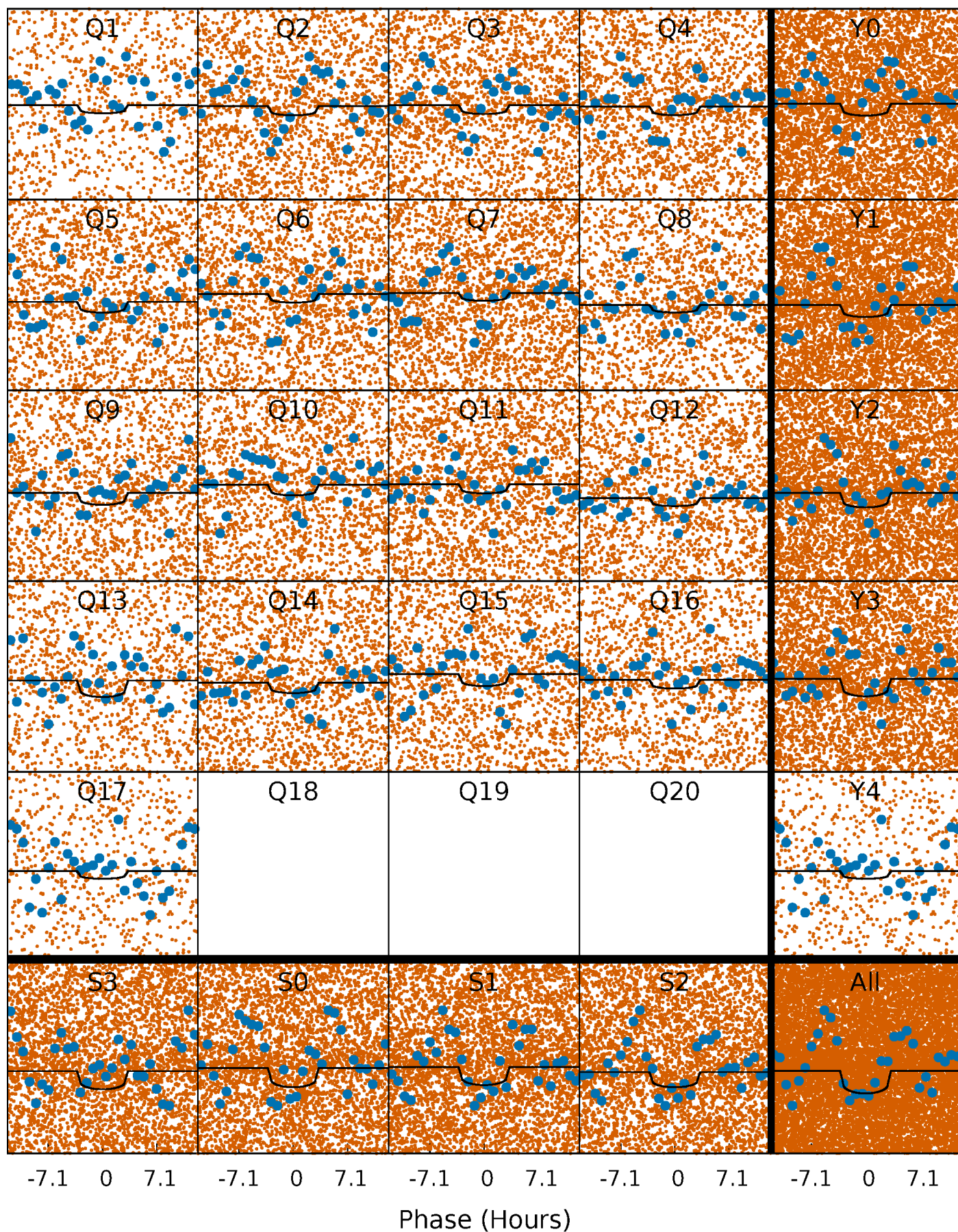
PDC Quarter-Phased Transit Curves

TCE 009458754-01 P= 0.970683 Days $T_0=132.228528$ (BKJD)



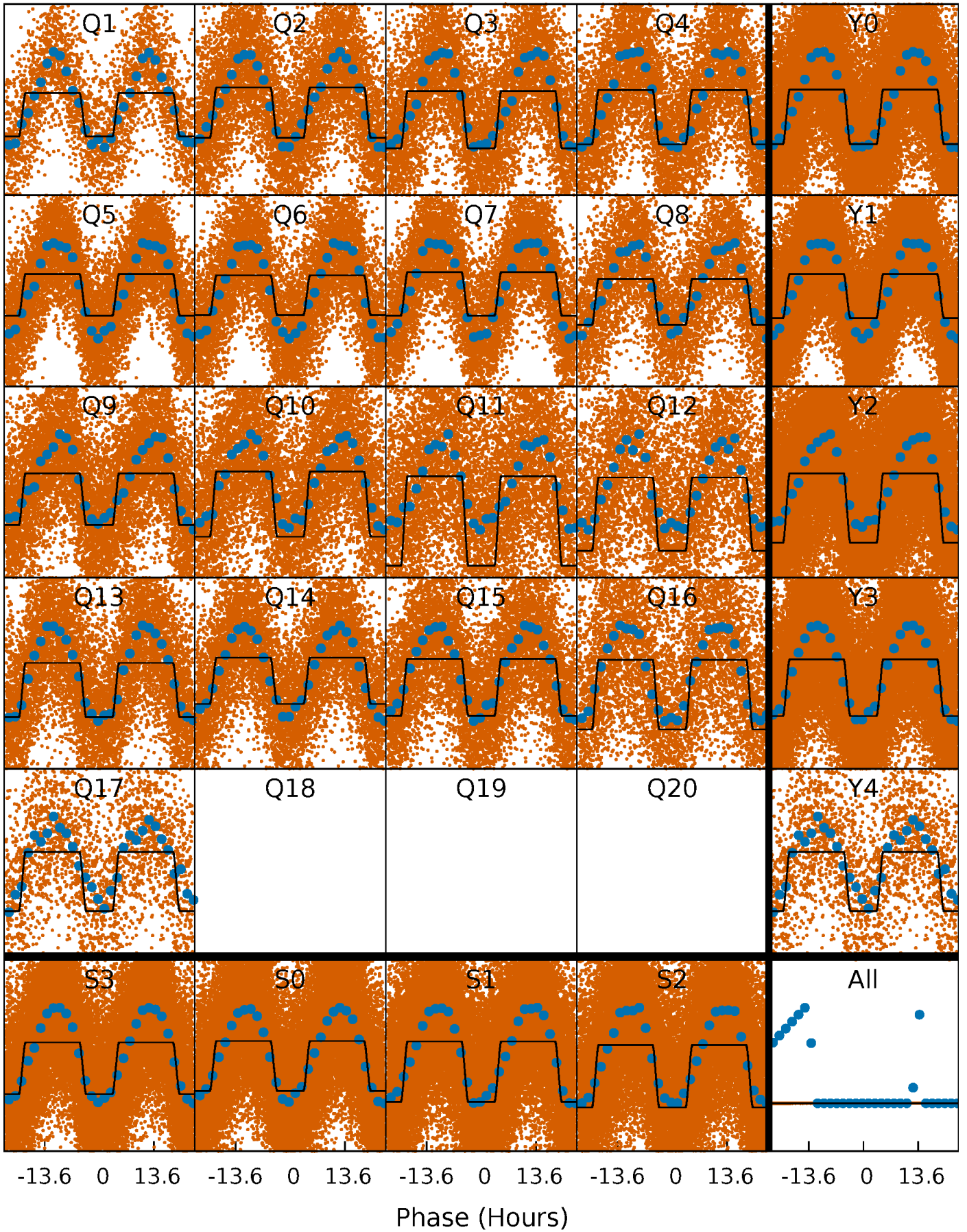
DV Quarter-Phased Transit Curves

TCE 009458754-01 P= 0.970683 Days $T_0=132.228528$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

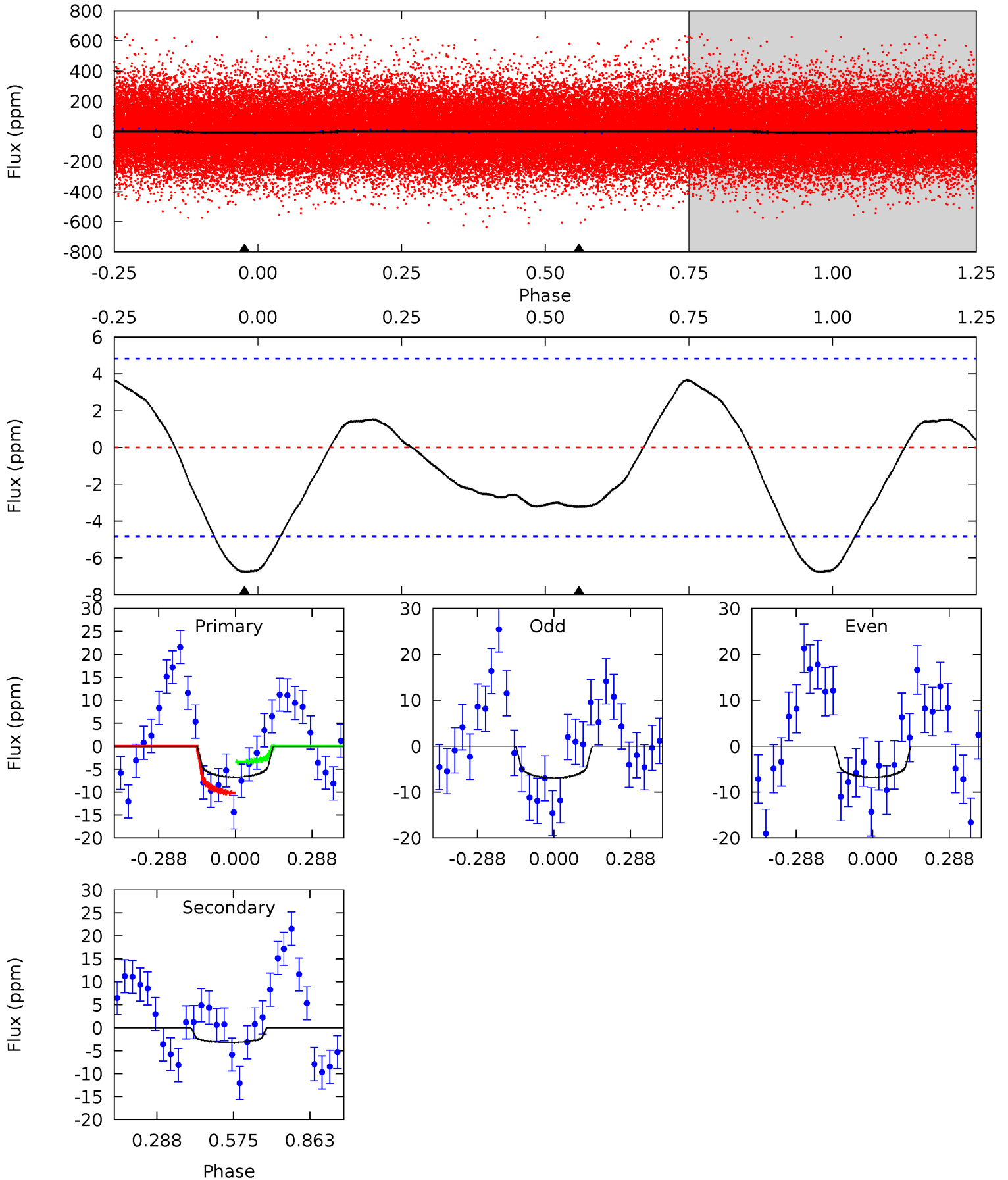
TCE 009458754-01 P= 0.970833 Days $T_0=132.209358$ (BKJD)



DV Model-Shift Uniqueness Test

009458754-01, P = 0.970683 Days, E = 131.257845 Days

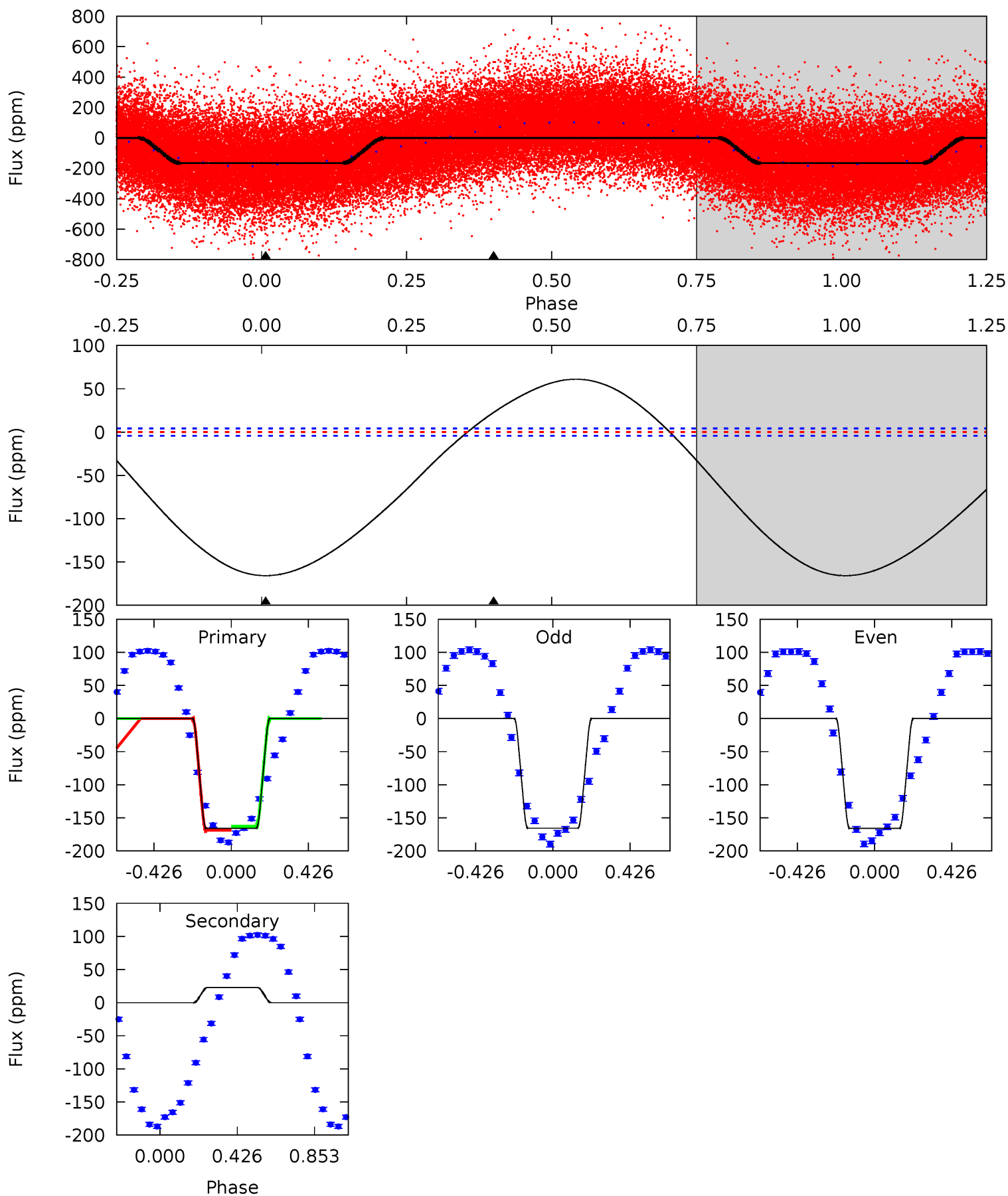
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.08	2.91	0	0	4.34	1.06	0.69	6.08	6.08	2.91	2.91	0.07	0.95	0.35	3.01



Alt Model-Shift Uniqueness Test

009458754-01, P = 0.970833 Days, E = 131.238525 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
167.8	-23.0	0	0	4.25	0.80	20.0	167.8	167.8	-23.0	-23.0	0.15	1.00	0.27	3.35



Stellar Parameters For KIC 009458754

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6986^{+194}_{-305}	$4.188^{+0.105}_{-0.210}$	$0.080^{+0.200}_{-0.350}$	$1.619^{+0.550}_{-0.254}$	$1.475^{+0.207}_{-0.231}$	$0.489^{+0.252}_{-0.262}$
	+3%/-4%	+3%/-5%	+250%/-438%	+34%/-16%	+14%/-16%	+51%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009458754-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3 ± 1	$0.94^{+0.86}_{-0.65}$	3745^{+298}_{-226}	3986^{+3516}_{-6783}	$0.926^{+9.820}_{-0.689}$
Alt.	23 ± 1	$2.35^{+1.15}_{-1.05}$	3751^{+289}_{-241}	-4623^{+464}_{-1214}	$-1.047^{+0.558}_{-2.433}$

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

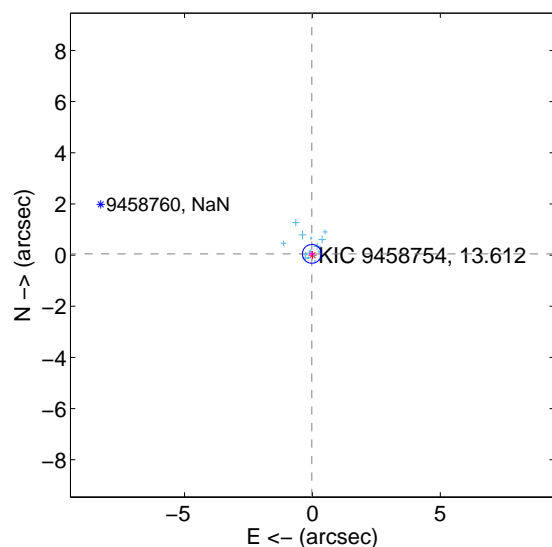
Supplemental centroid analysis for 009458754-01. Kepler magnitude: 13.61. Transit SNR 4.57

There are 16 quarters with good PRF difference image offsets

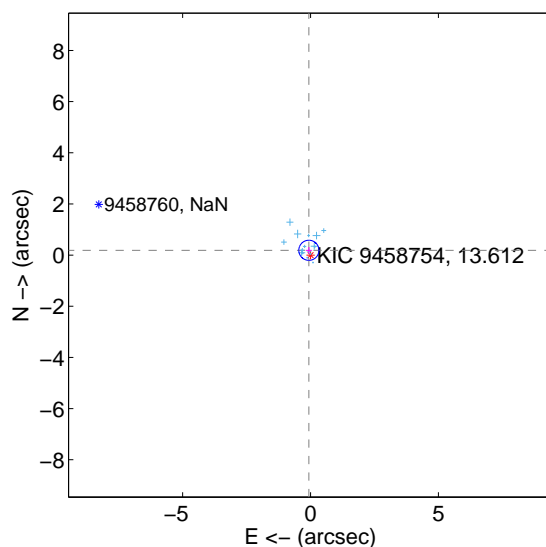
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.053 ± 0.122	0.44	0.023 ± 0.124	0.048 ± 0.115
PRF-fit source offset from KIC position	0.199 ± 0.131	1.52	0.064 ± 0.117	0.188 ± 0.126
photometric centroid source offset	1.91 ± 1.99	0.96	0.06 ± 2.22	-1.91 ± 1.99

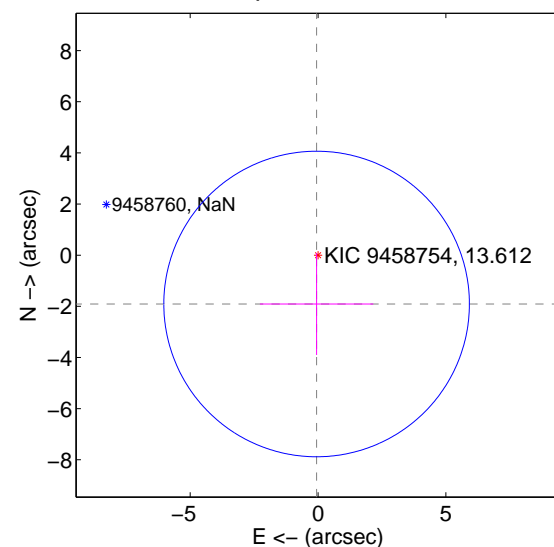
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

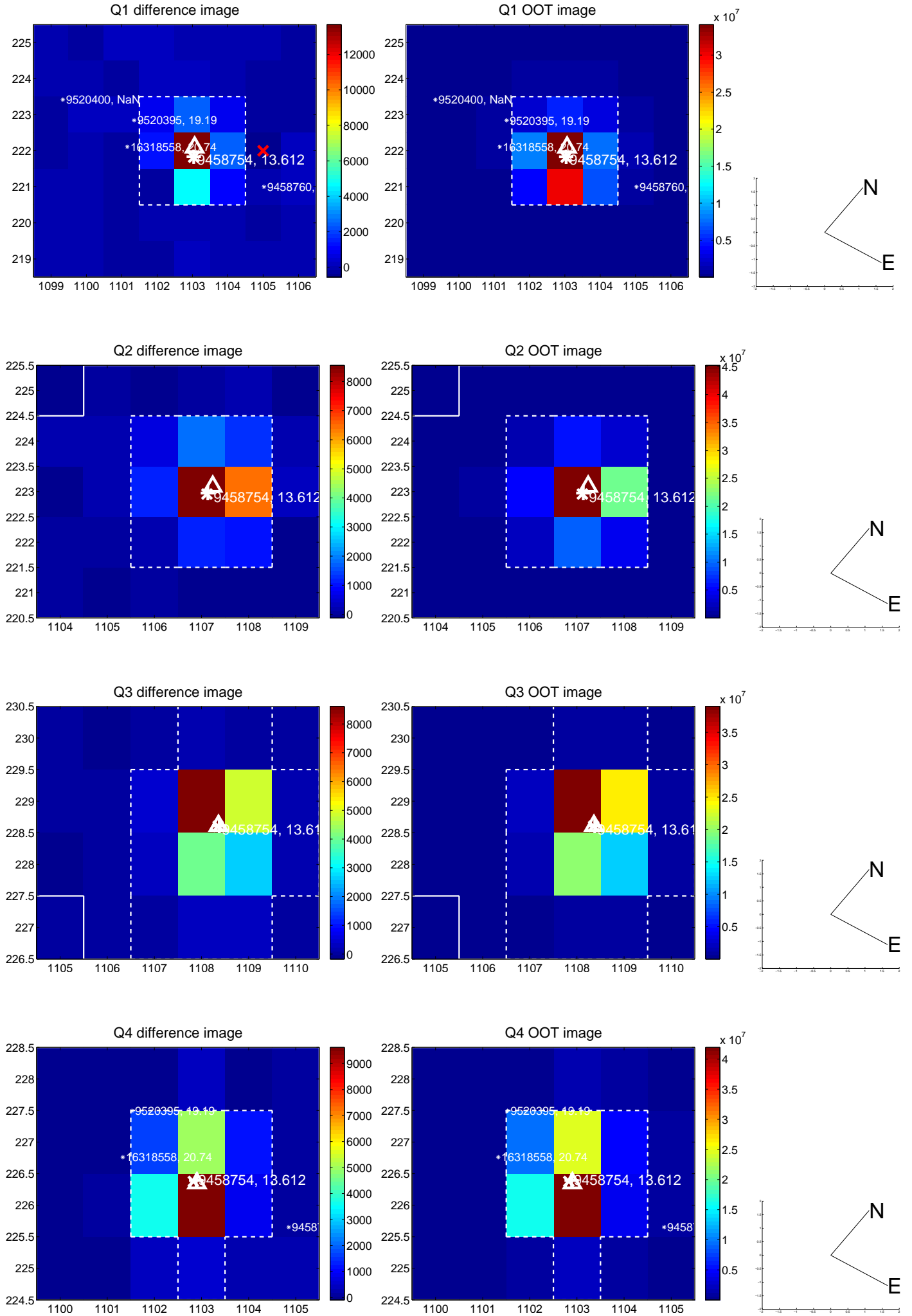


offset from photometric centroids

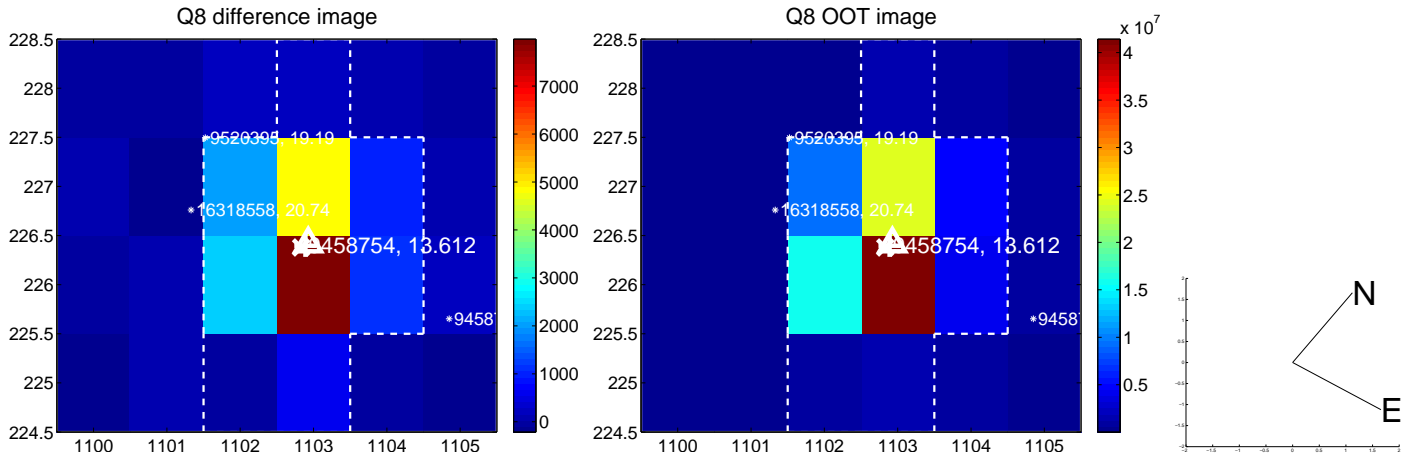
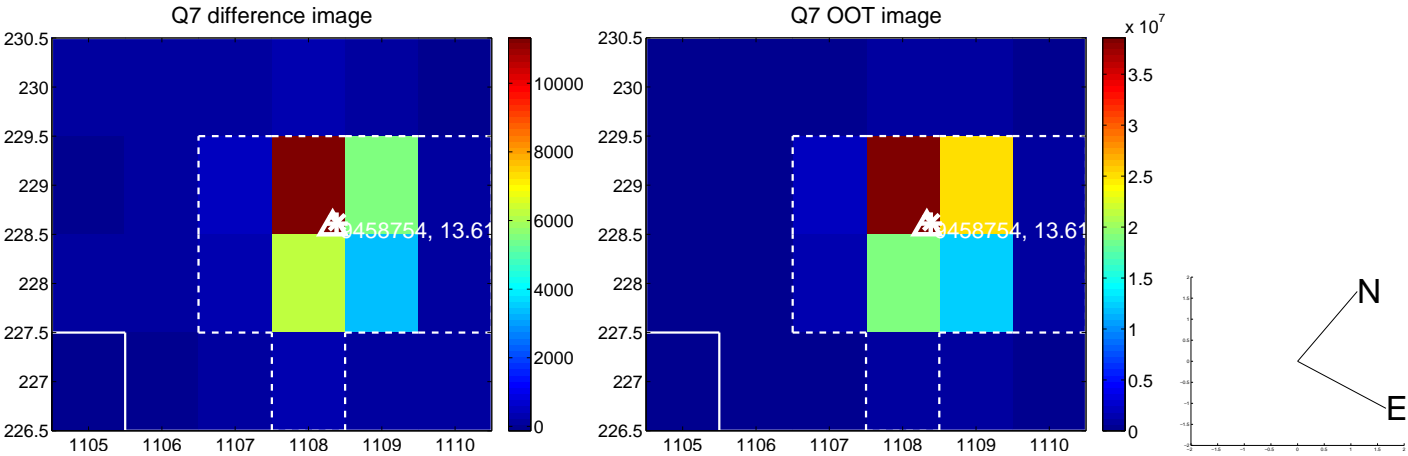
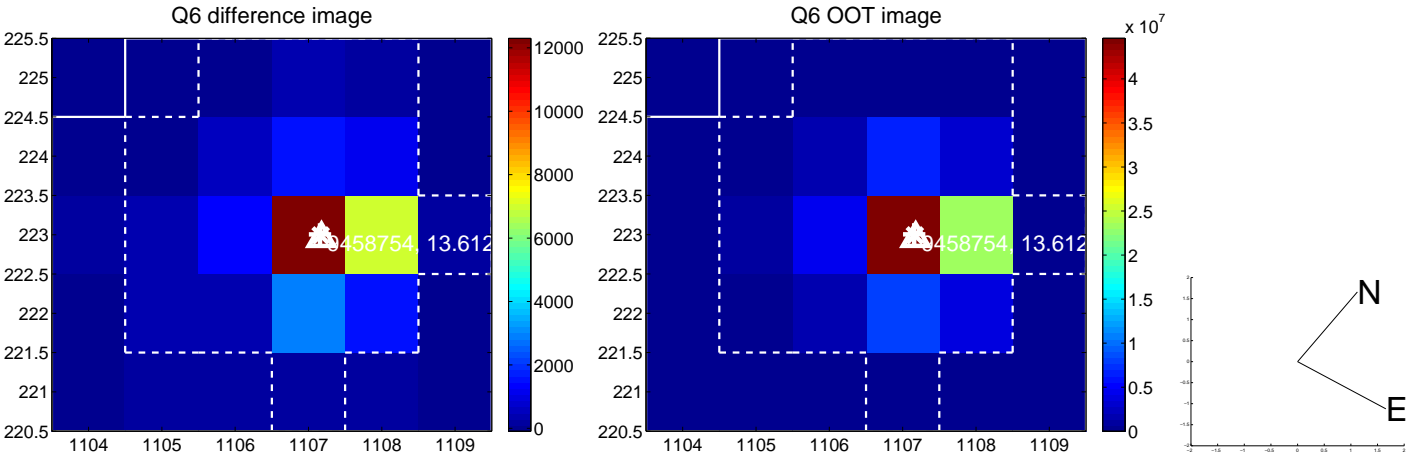
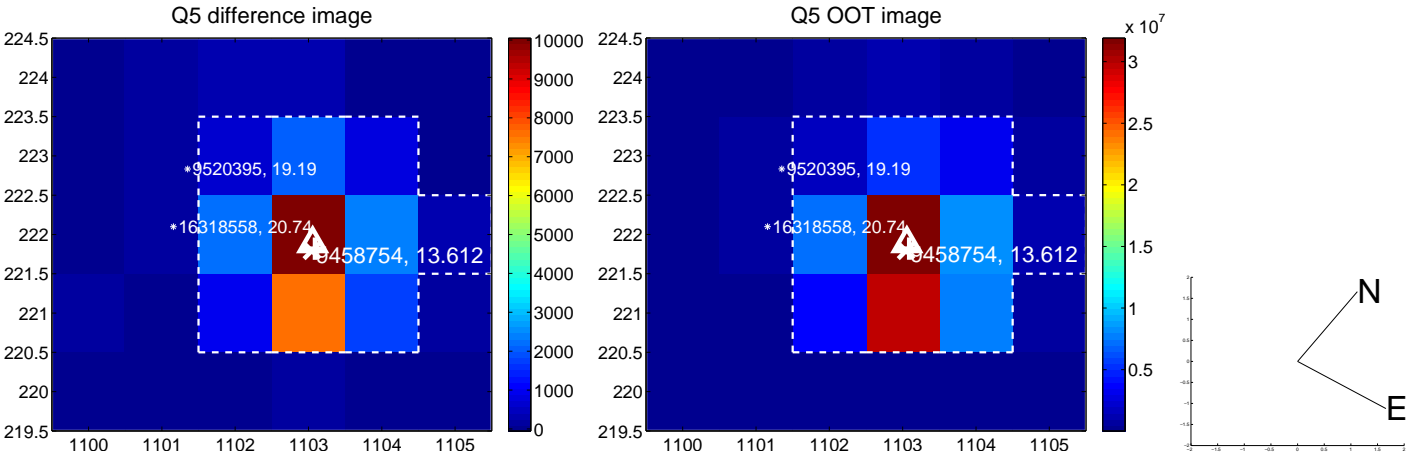


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

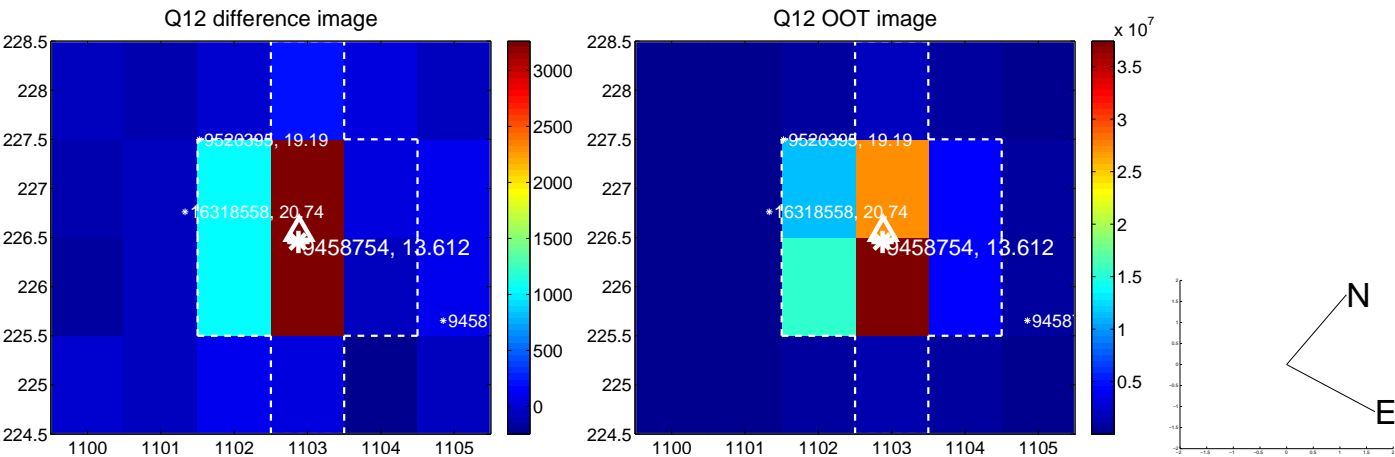
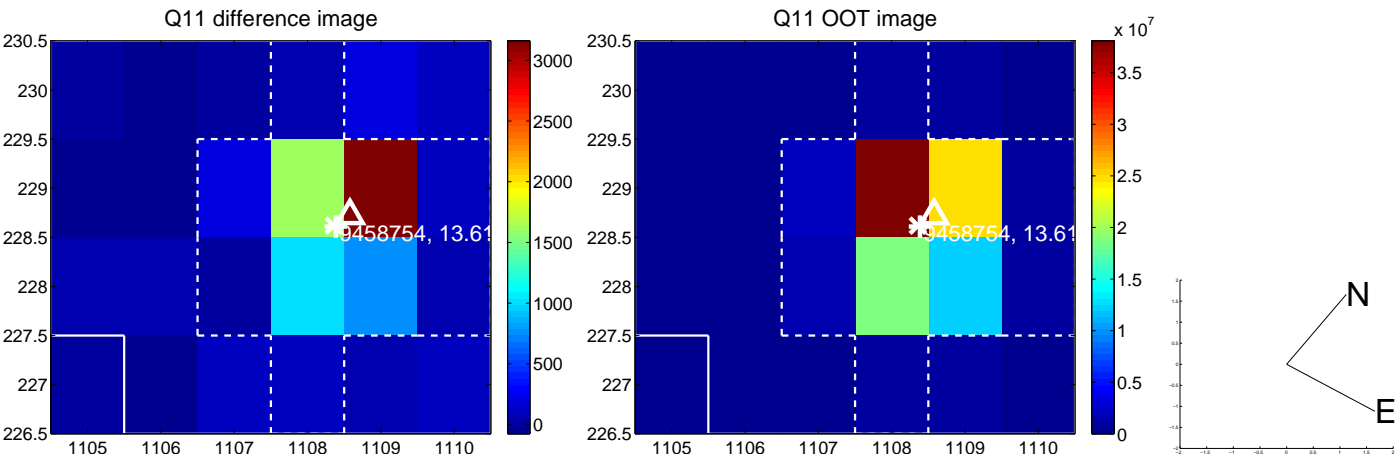
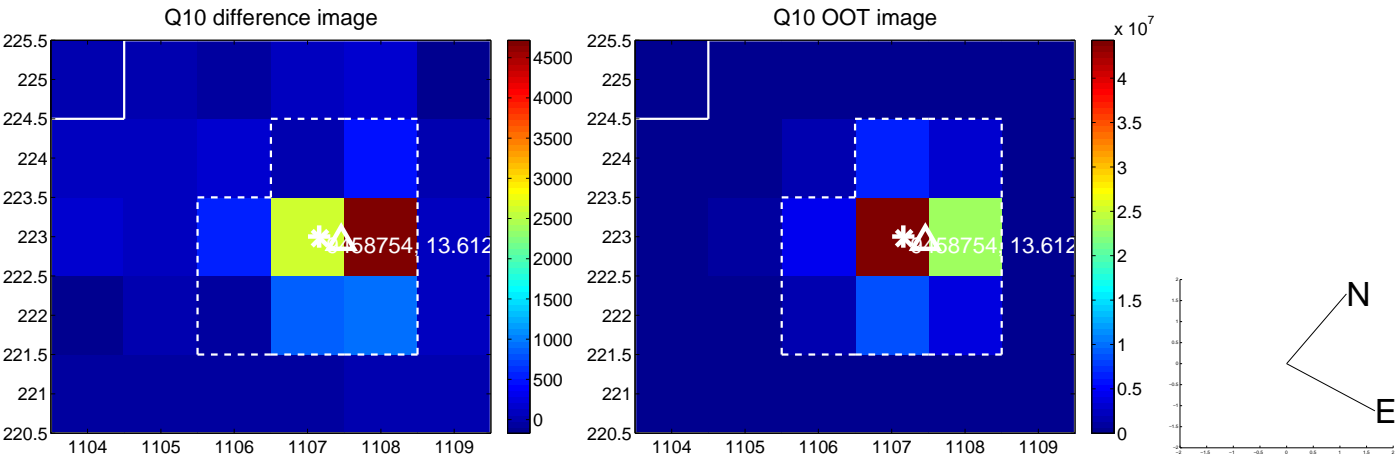
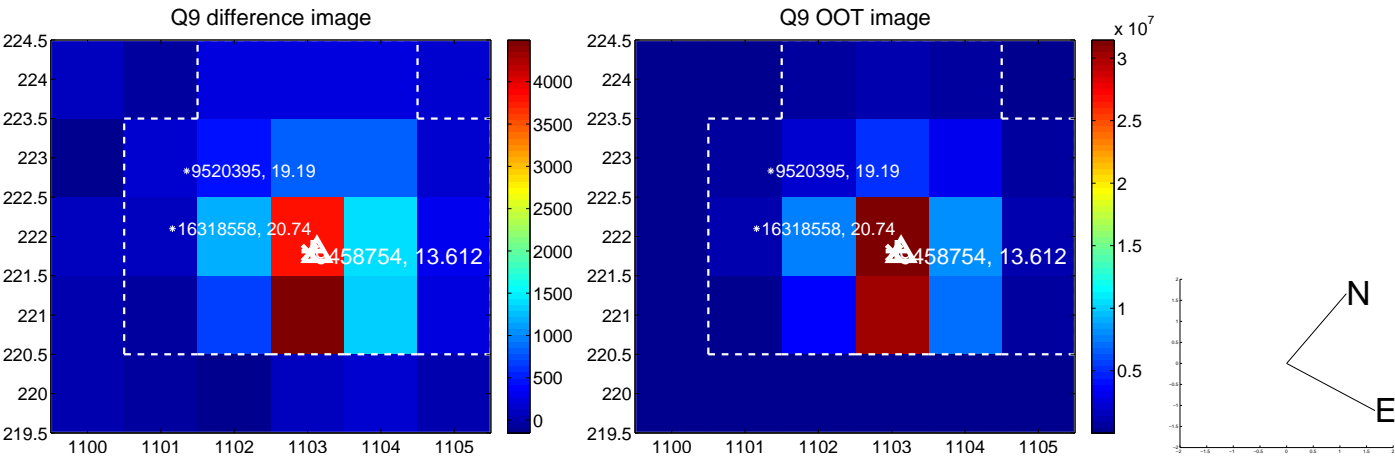
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



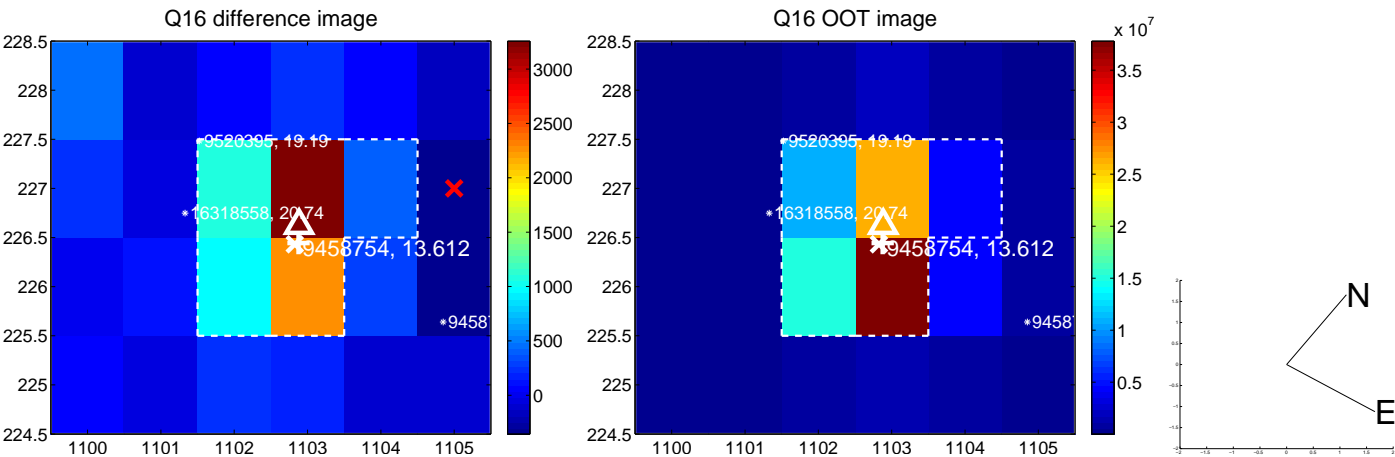
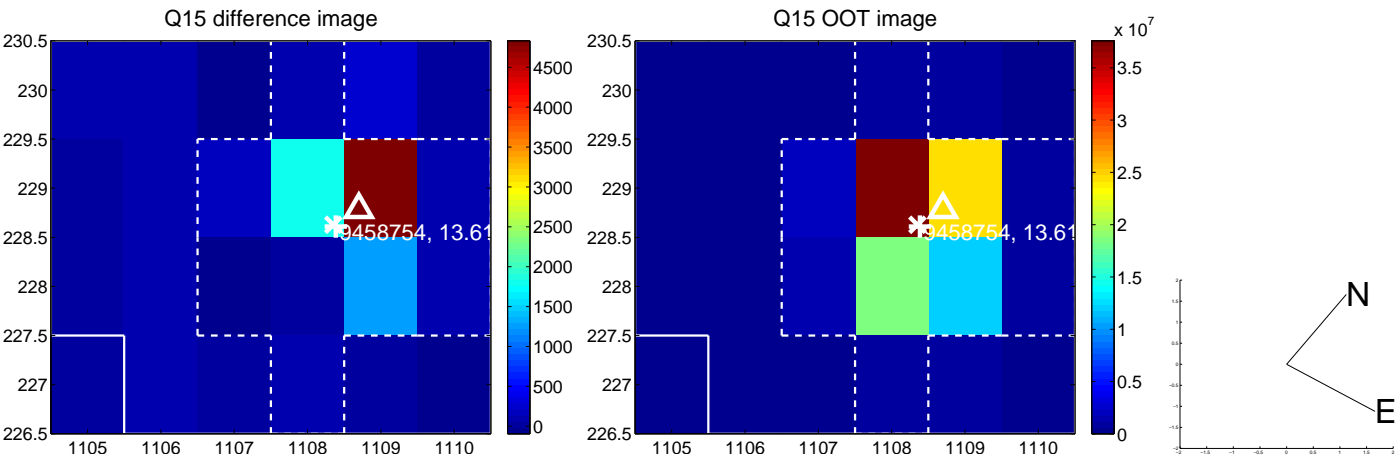
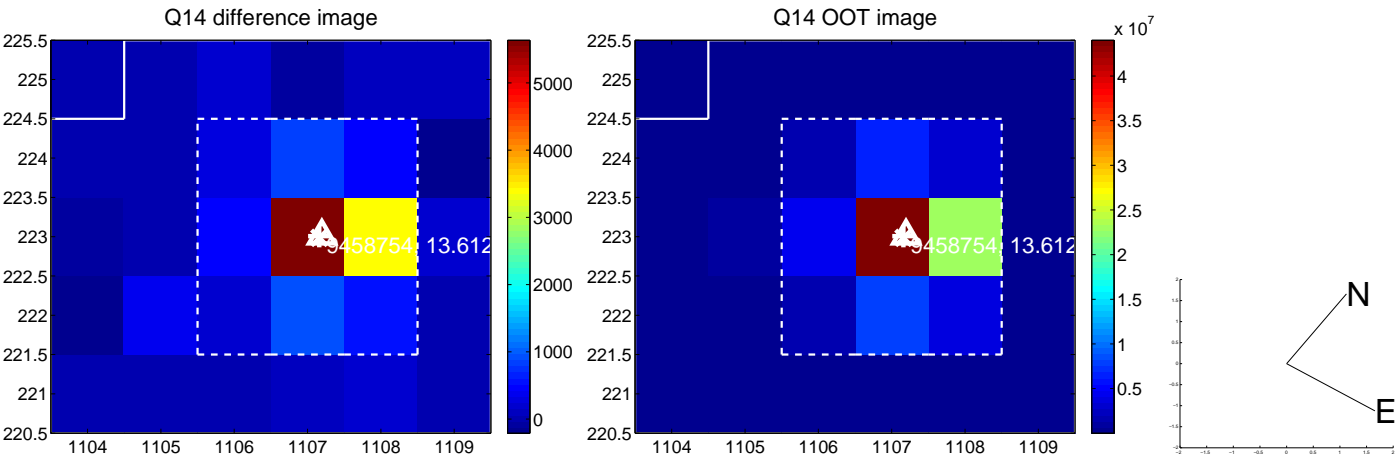
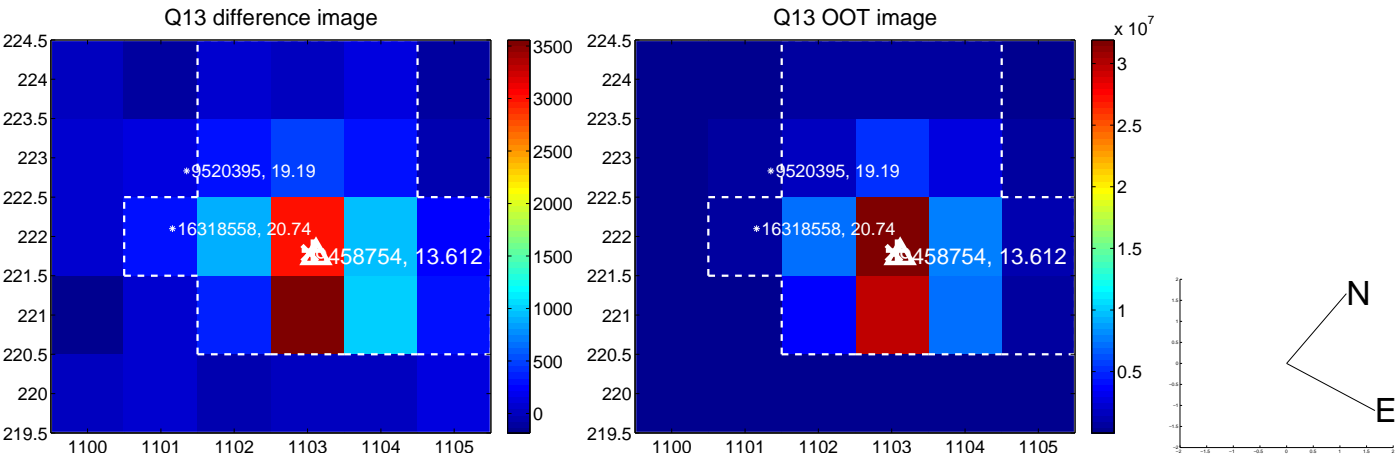
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



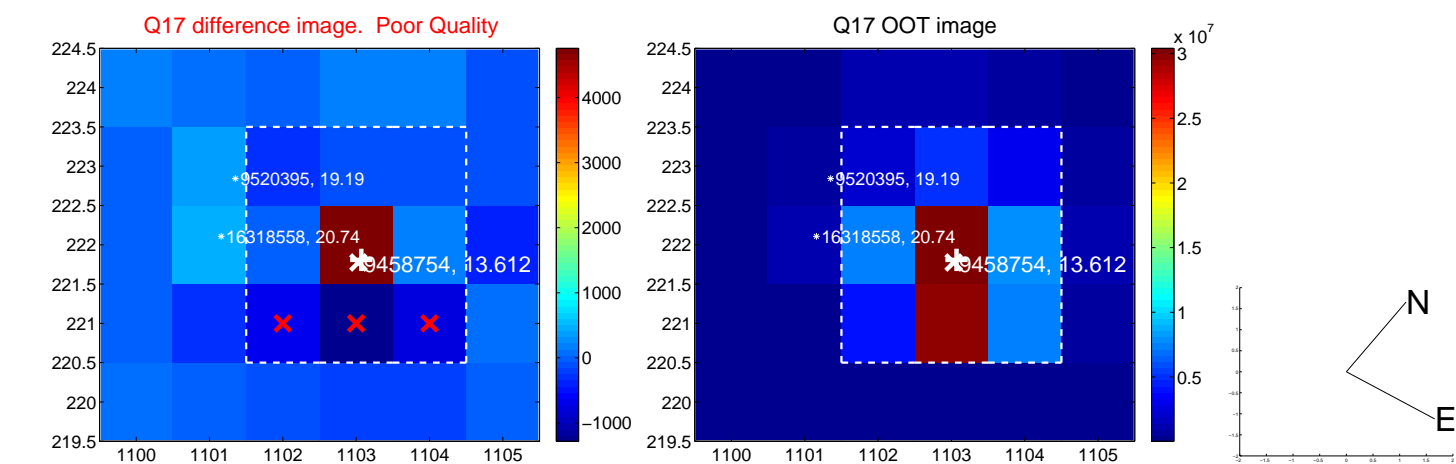
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



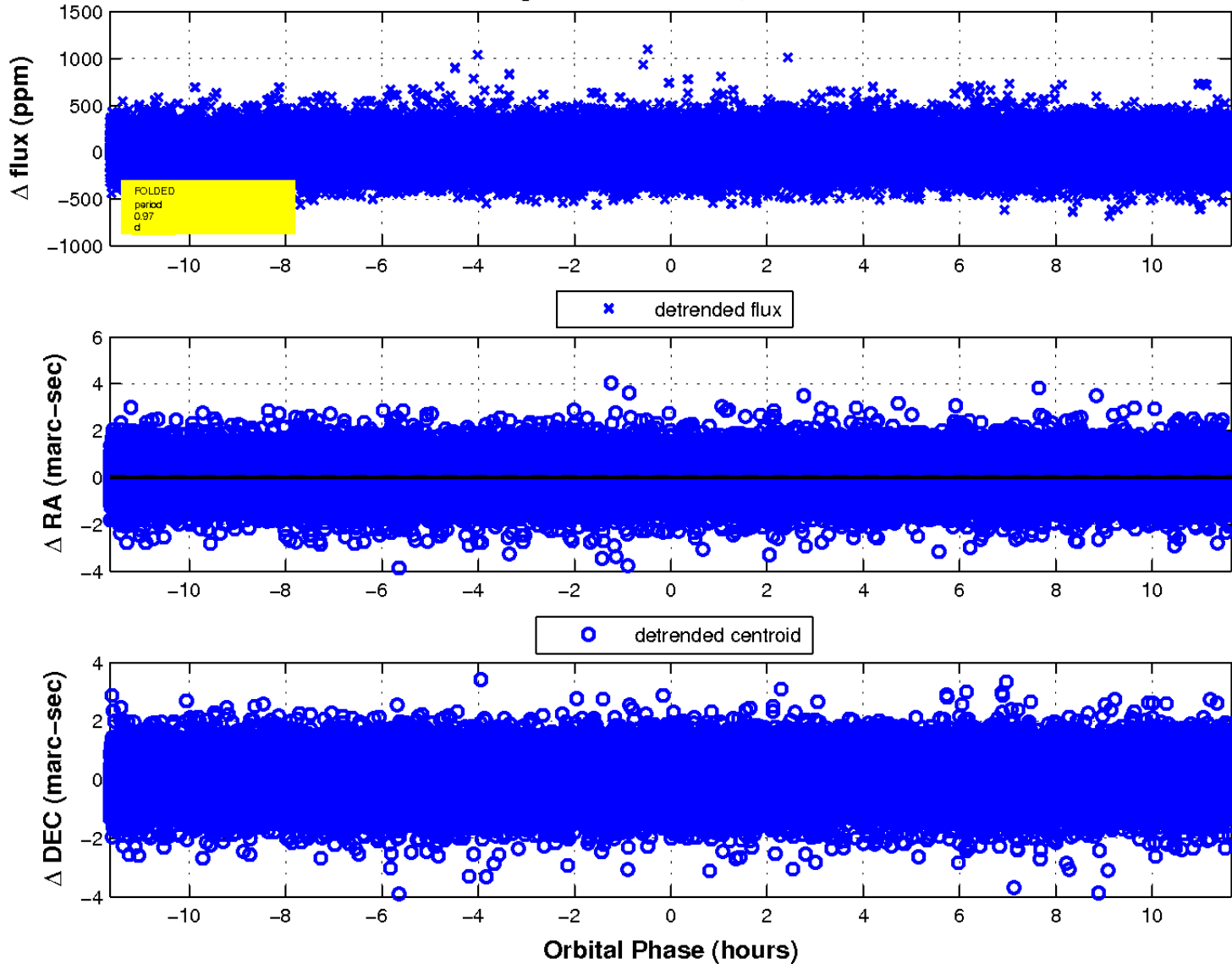
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

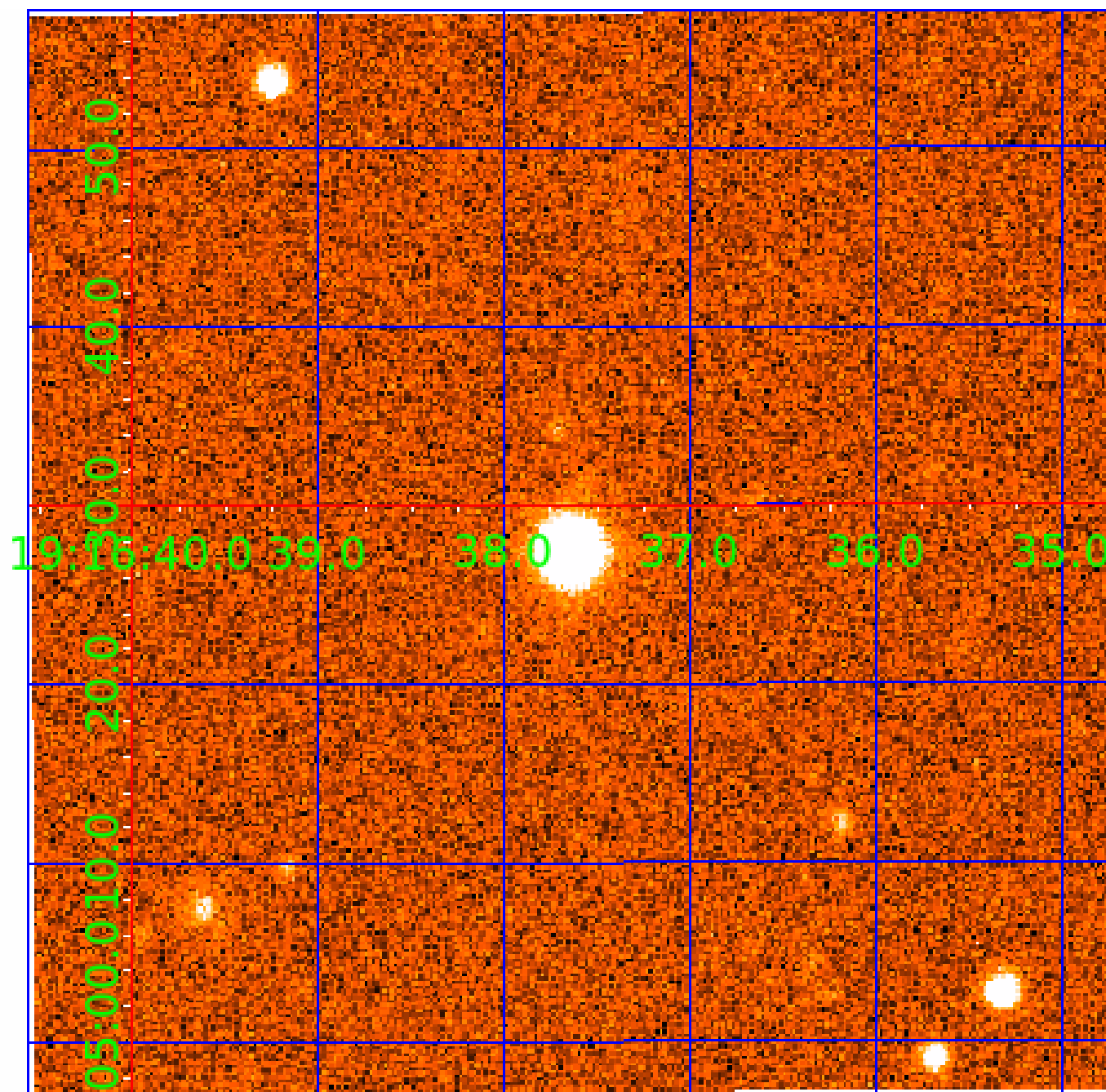


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 009458754

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})
009458754-01	OBS	No	0.970683	132.228528	7.4	6.237	9.0	4.6	1.62	6986	0.45	11727.45
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009458754-03	OBS	No	33.717281	139.707074	130.2	3.664	8.5	8.0	1.62	6986	2.05	103.47
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Robovetter Results

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009458754-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009458754-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

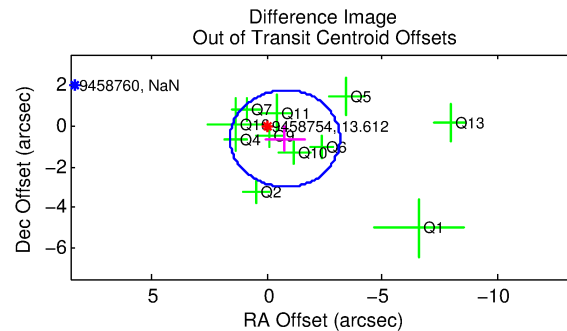
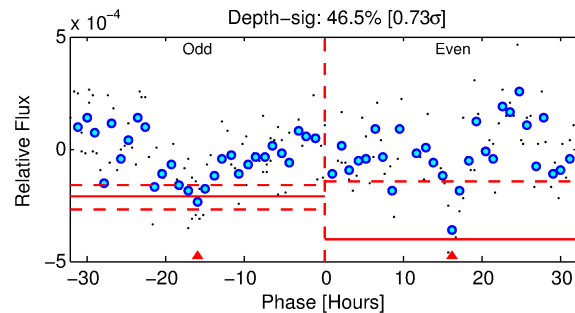
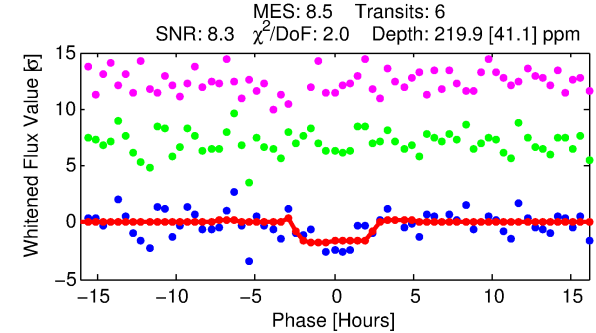
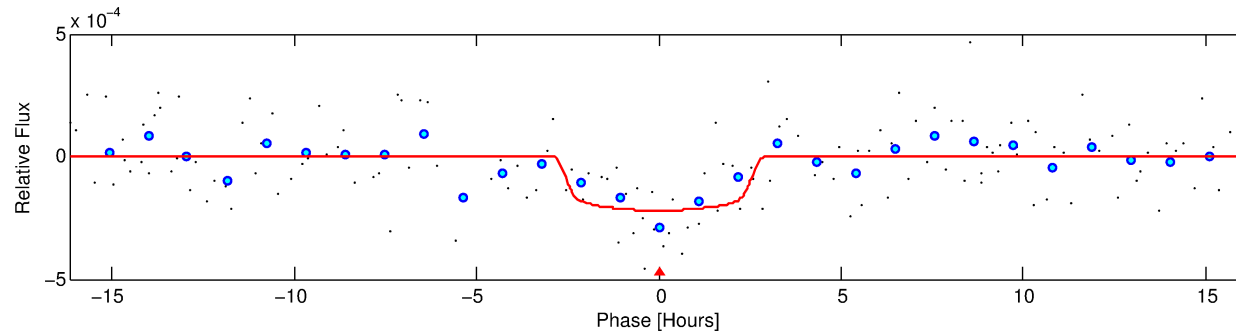
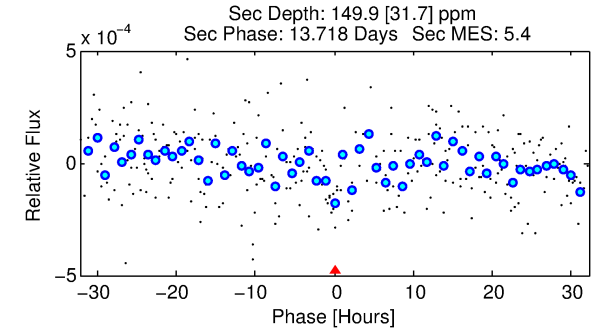
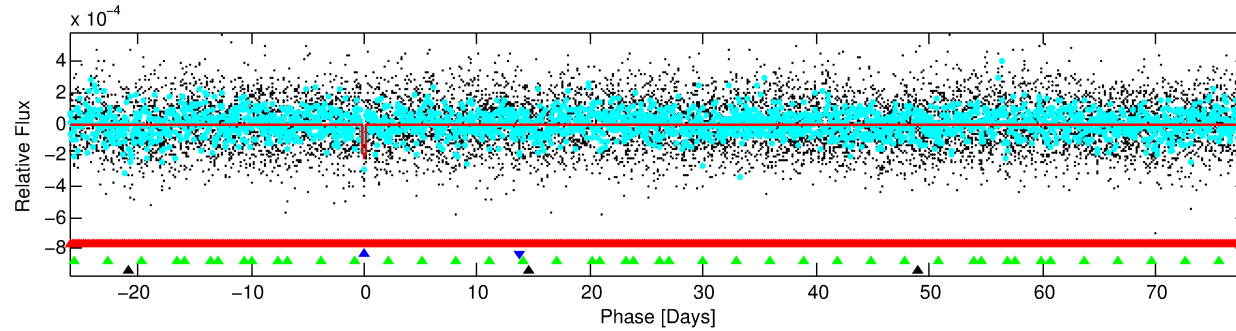
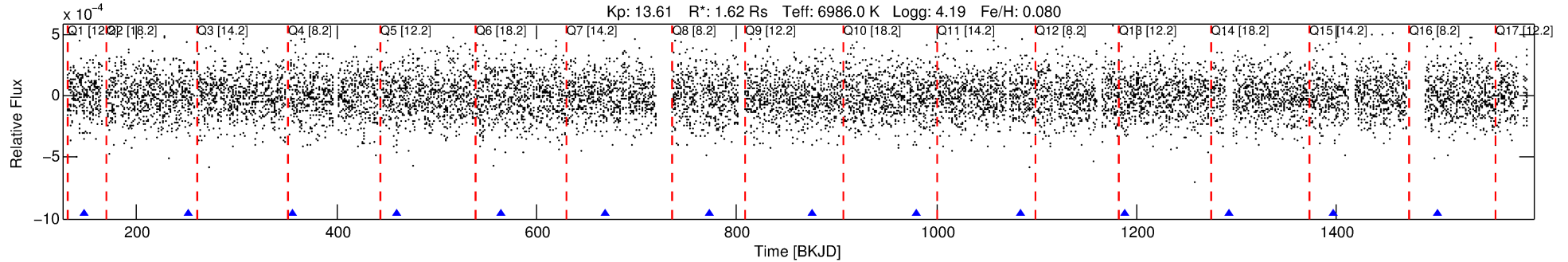
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009458754-02

No Significant Match Found

DV One-Page Summary

KIC: 9458754 Candidate: 2 of 4 Period: 104.146 d



DV Fit Results:

Period = 104.14607 [0.00214] d
Epoch = 147.3329 [0.0143] BKJD
Rp/R* = 0.0151 [0.0162]
a/R* = 89.26 [571.62]
b = 0.82 [2.65]
Seff = 23.00 [9.91]
Teff = 558 [60] K
Rp = 2.66 [3.01] Re
a = 0.4931 [0.1371] AU
Ag = 2827.60 [6219.69] [0.45 σ]
Teffp = 6296 [3417] K [1.68 σ]

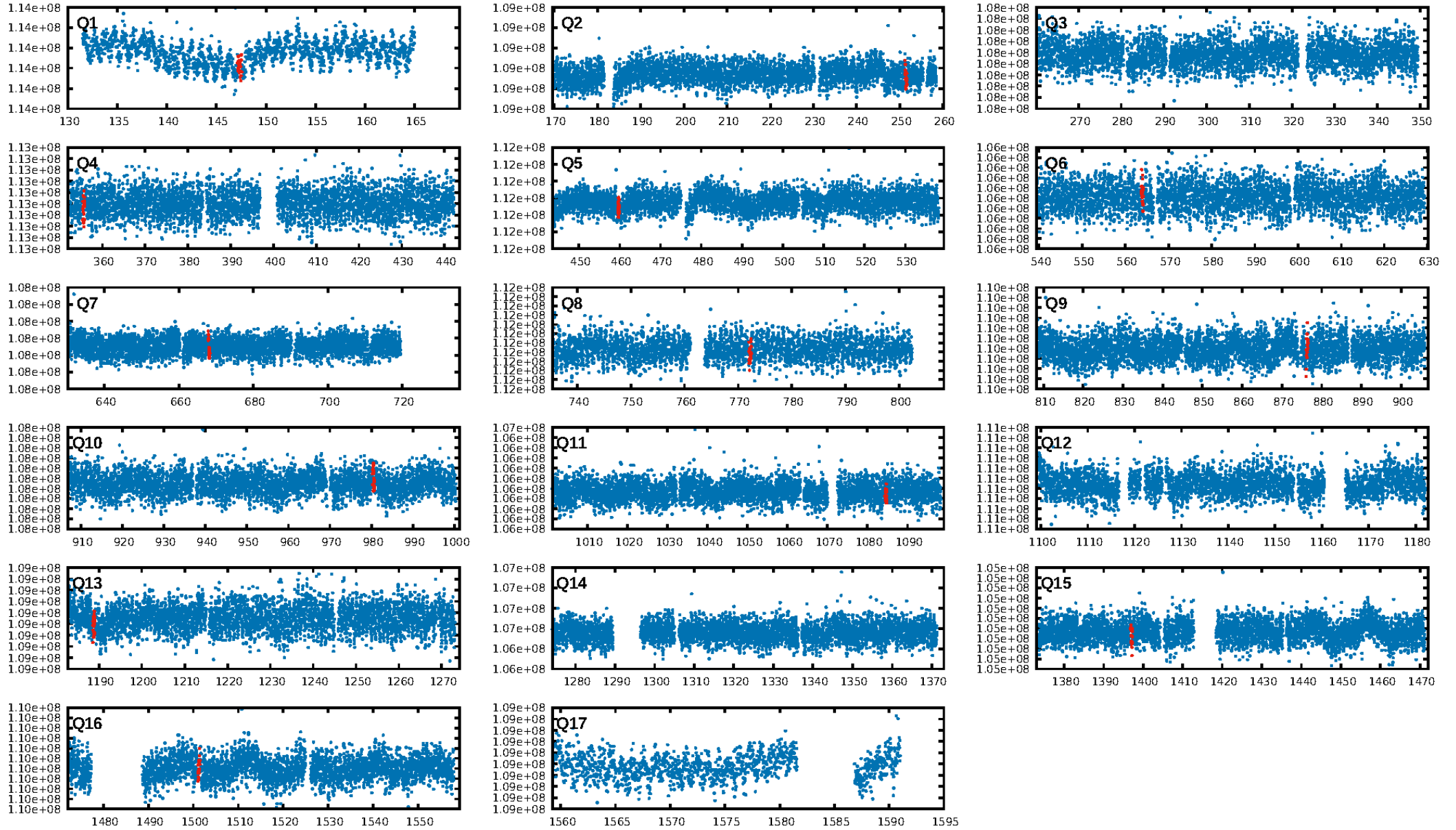
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [259.23 σ]
LongPeriod-sig: 100.0% [856.41 σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.56e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.6071
Centroid-sig: N/A
Centroid-so: 0.081 arcsec [0.10 σ]
OotOffset-rm: 1.007 arcsec [1.27 σ]
KicOffset-rm: 0.915 arcsec [1.01 σ]
OotOffset-st: 3/2/2/4 [11]
KicOffset-st: 3/2/2/4 [11]
DiffImageQuality-fgm: 0.36 [4/11]
DiffImageOverlap-fno: 0.00 [0/12]

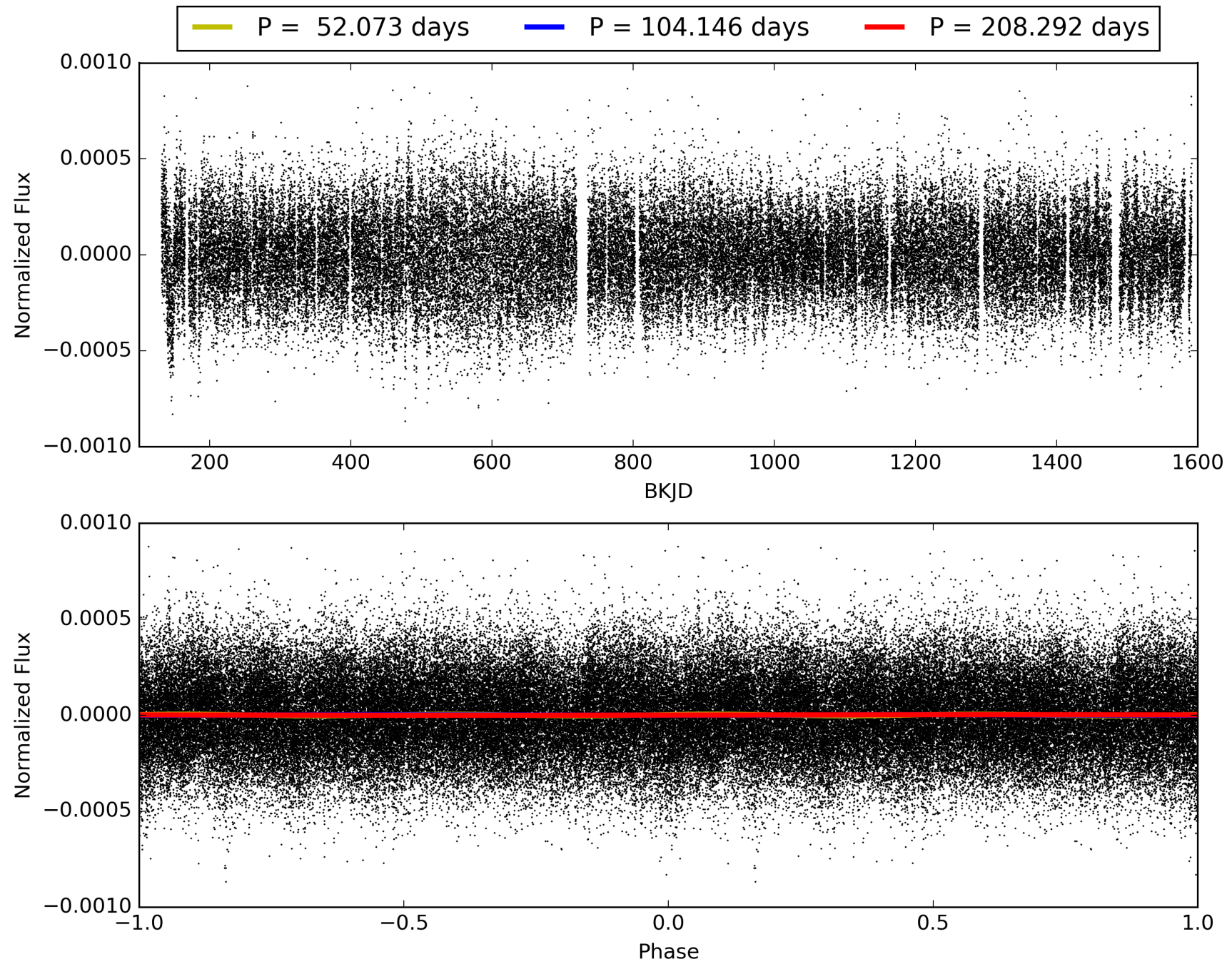
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:19:28 Z

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

TCE 009458754-02, PDC Light Curves

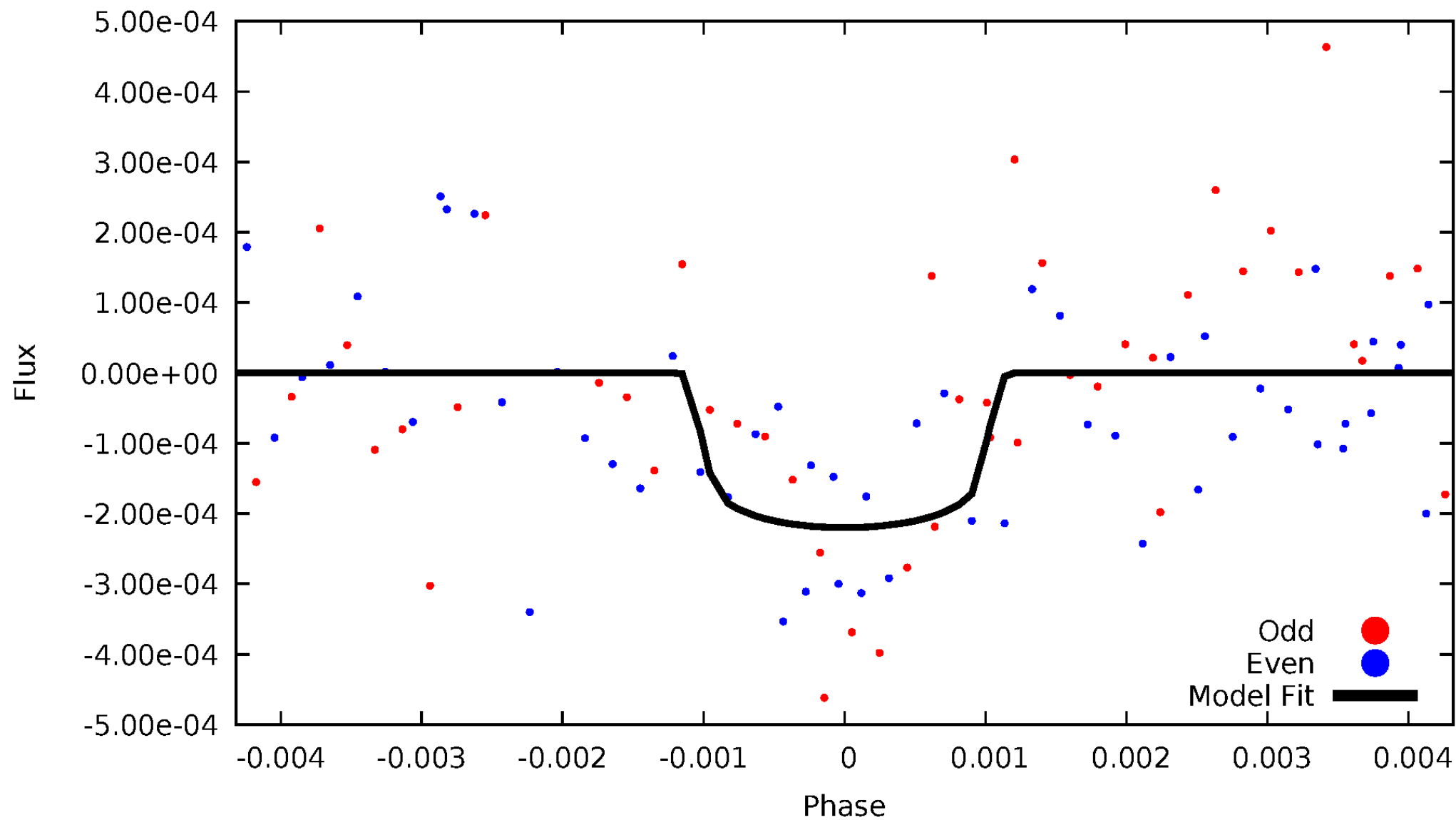


TCE 009458754-02



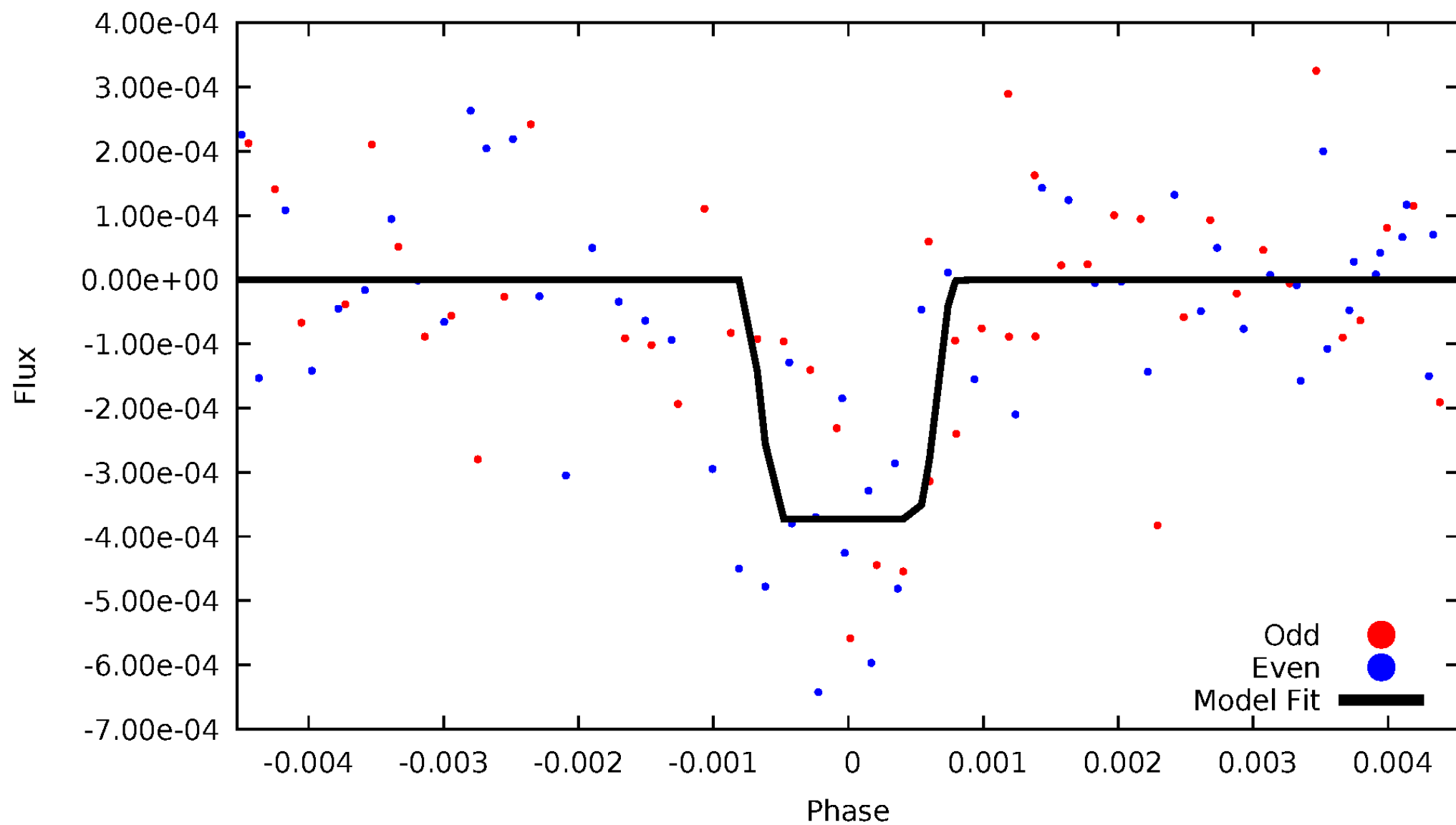
DV Odd/Even

TCE 009458754-02



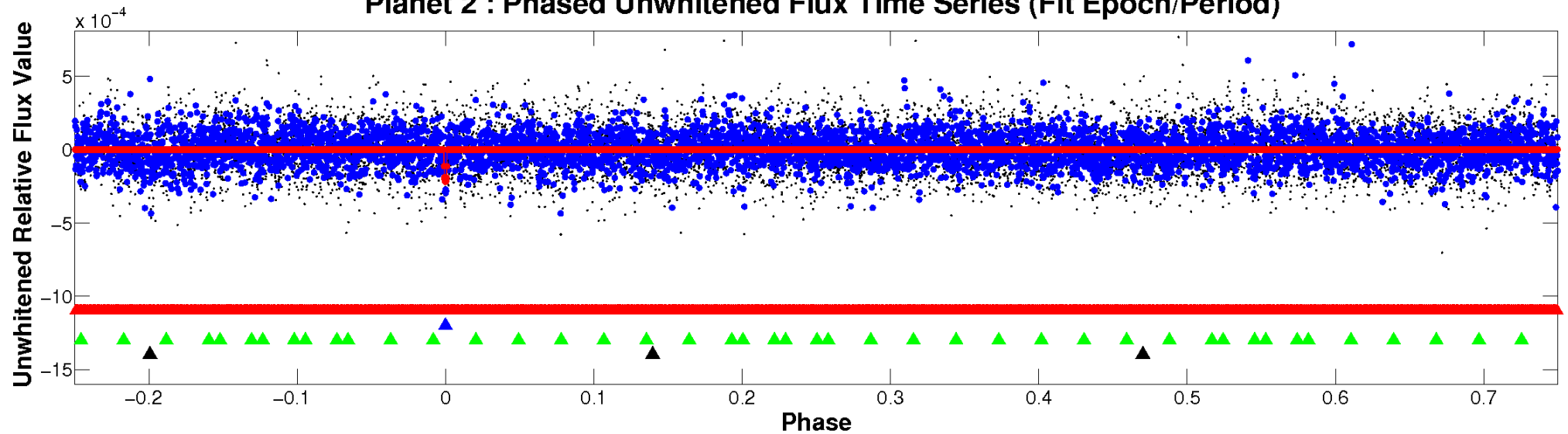
ALT Odd/Even

TCE 009458754-02

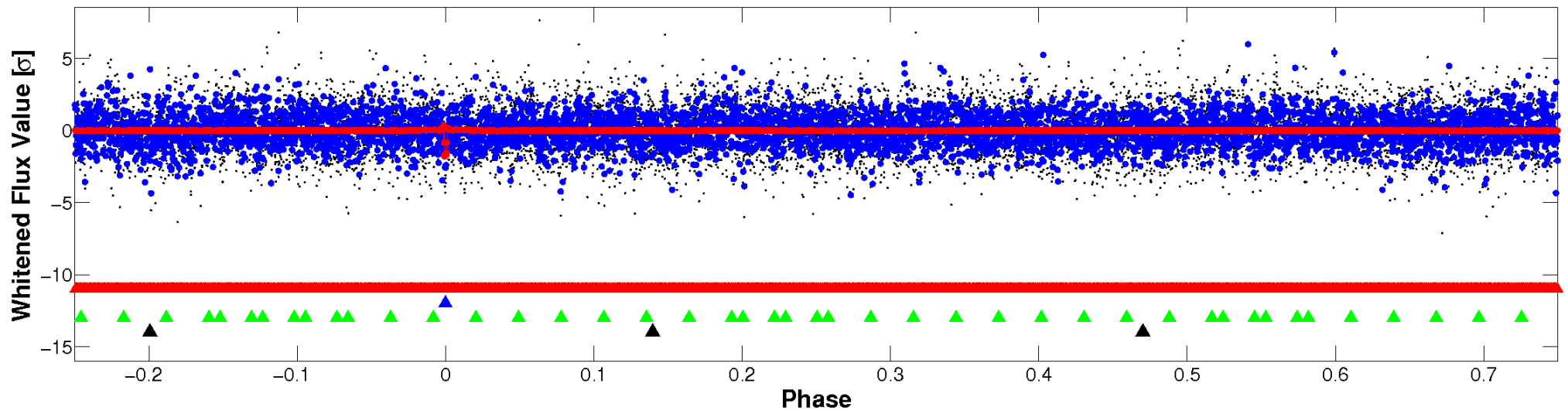


Non-Whitened Vs. Whitened Light Curve

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

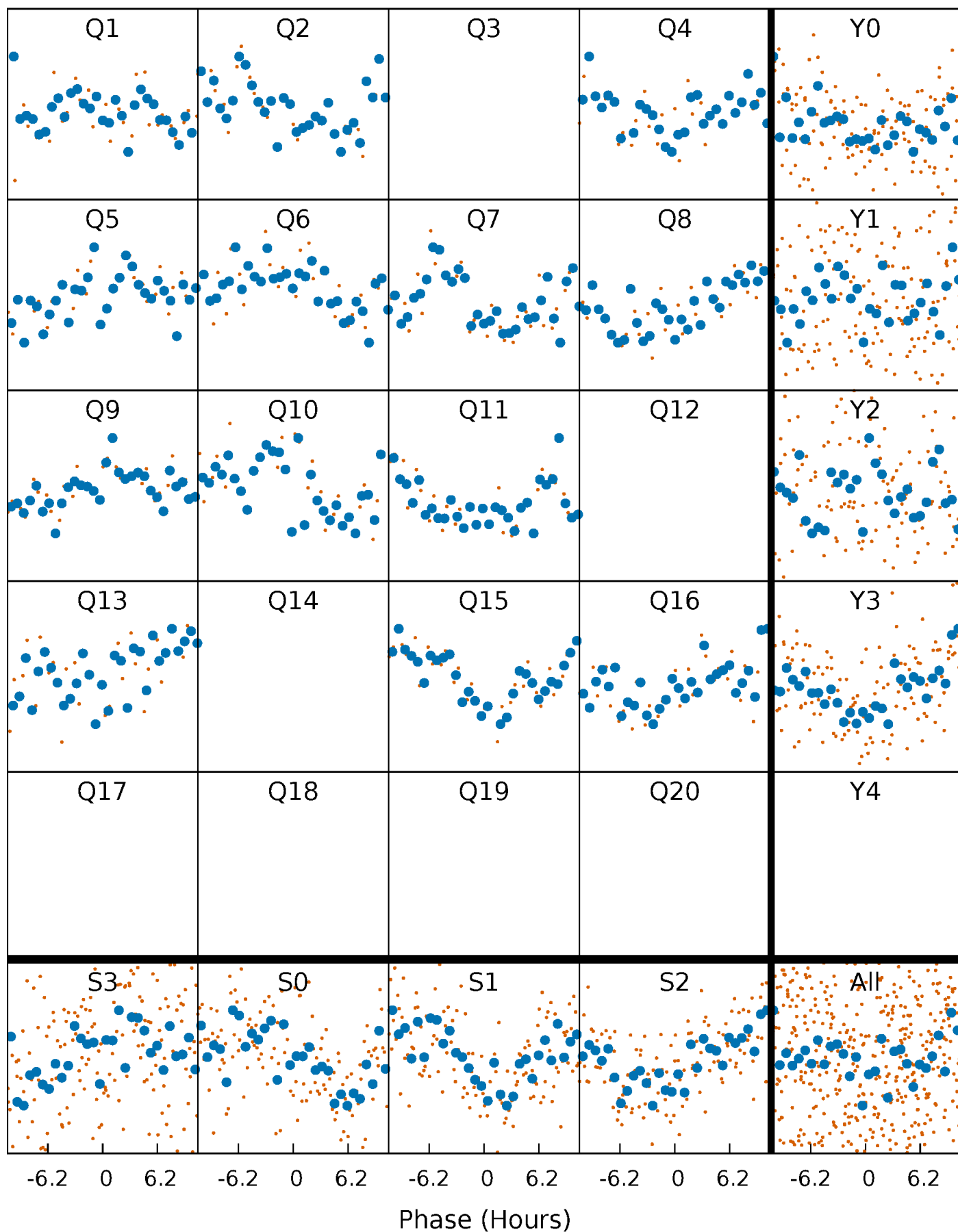


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



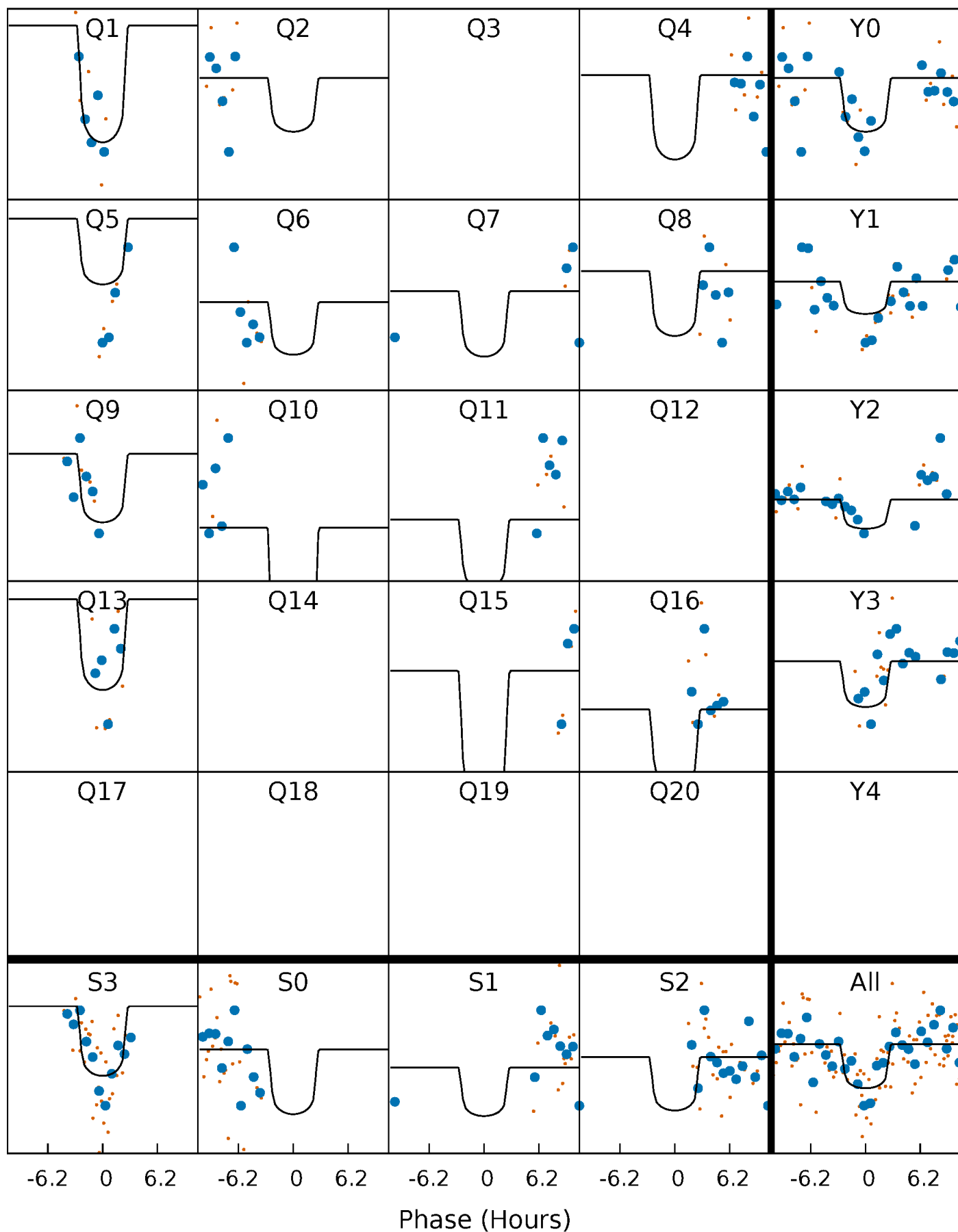
PDC Quarter-Phased Transit Curves

TCE 009458754-02 P=104.146073 Days $T_0=147.332925$ (BKJD)



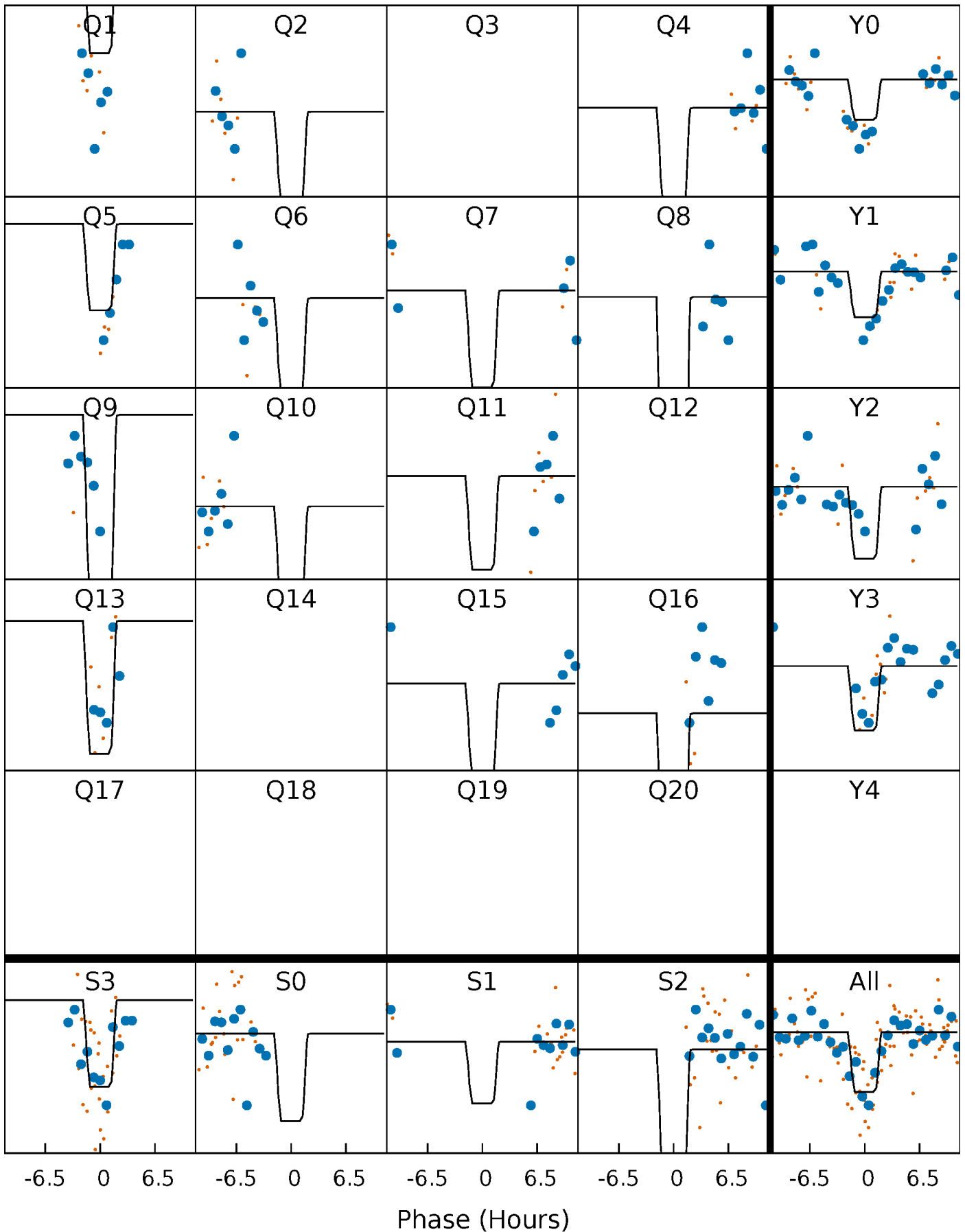
DV Quarter-Phased Transit Curves

TCE 009458754-02 P=104.146073 Days $T_0=147.332925$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

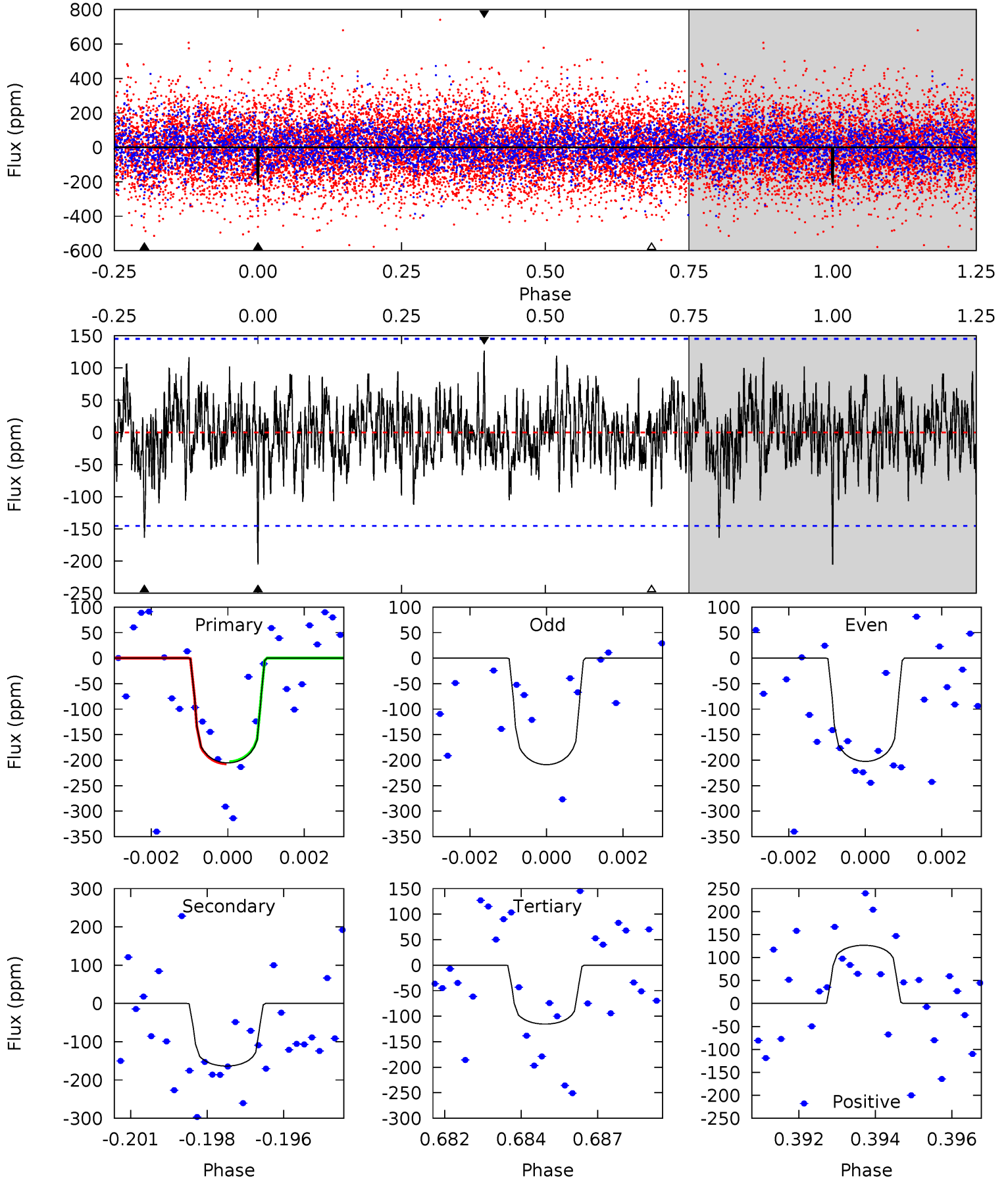
TCE 009458754-02 P=104.147953 Days $T_0=147.310783$ (BKJD)



DV Model-Shift Uniqueness Test

009458754-02, P = 104.146073 Days, E = 43.186852 Days

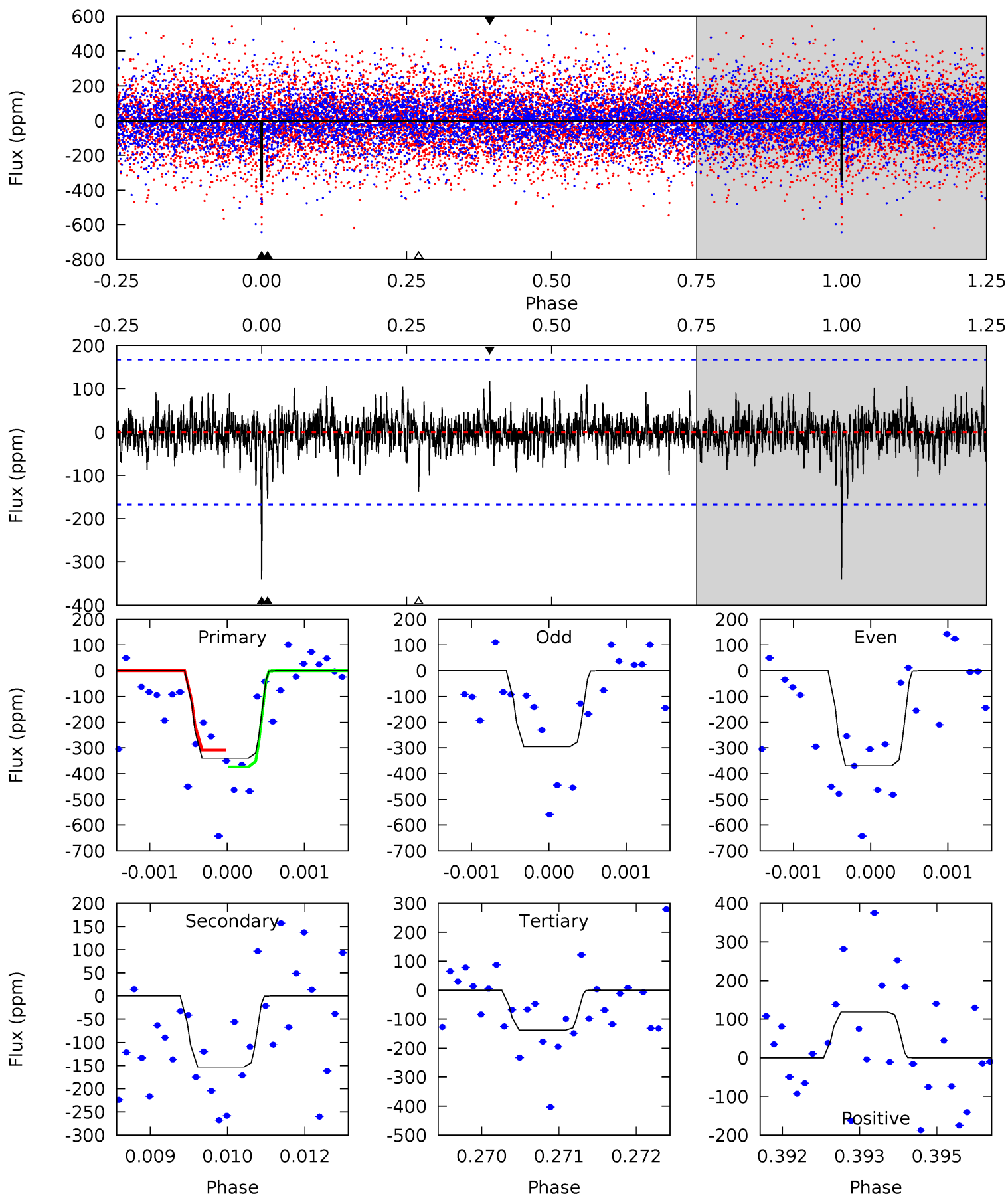
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.48	5.95	4.20	4.61	5.30	3.04	1.41	3.28	2.87	1.75	1.34	0.12	0.91	0.38	0.07



Alt Model-Shift Uniqueness Test

009458754-02, P = 104.147953 Days, E = 43.162830 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	4.92	4.44	3.81	5.38	3.18	0.99	6.48	7.11	0.48	1.11	1.17	1.15	0.26	1.06



Stellar Parameters For KIC 009458754

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6986^{+194}_{-305}	$4.188^{+0.105}_{-0.210}$	$0.080^{+0.200}_{-0.350}$	$1.619^{+0.550}_{-0.254}$	$1.475^{+0.207}_{-0.231}$	$0.489^{+0.252}_{-0.262}$
	+3%/-4%	+3%/-5%	+250%/-438%	+34%/-16%	+14%/-16%	+51%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009458754-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-163 ± 27	$3.33^{+2.83}_{-2.14}$	790^{+70}_{-47}	5744^{+4735}_{-1272}	1881^{+12291}_{-1324}
Alt.	-153 ± 31	$3.83^{+2.73}_{-2.31}$	787^{+64}_{-49}	5286^{+3218}_{-978}	1344^{+6899}_{-897}

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 $A_{obs} \gg 1.0$

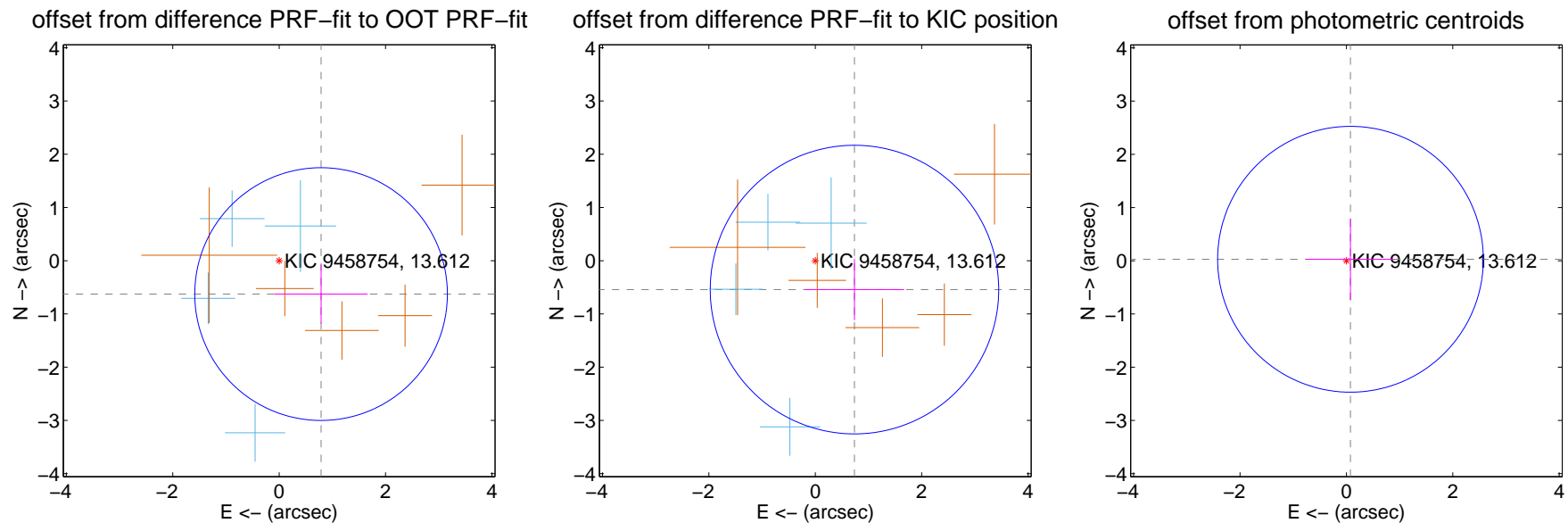
DV Centroid Data

Supplemental centroid analysis for 009458754-02. Kepler magnitude: 13.61. Transit SNR 8.34

There are 4 quarters with good PRF difference image offsets

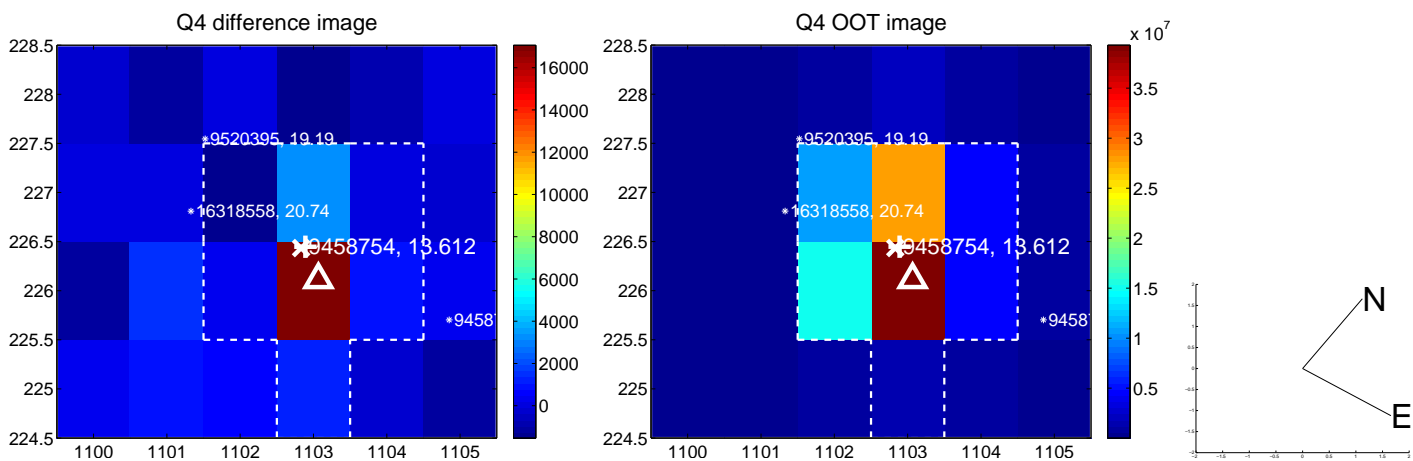
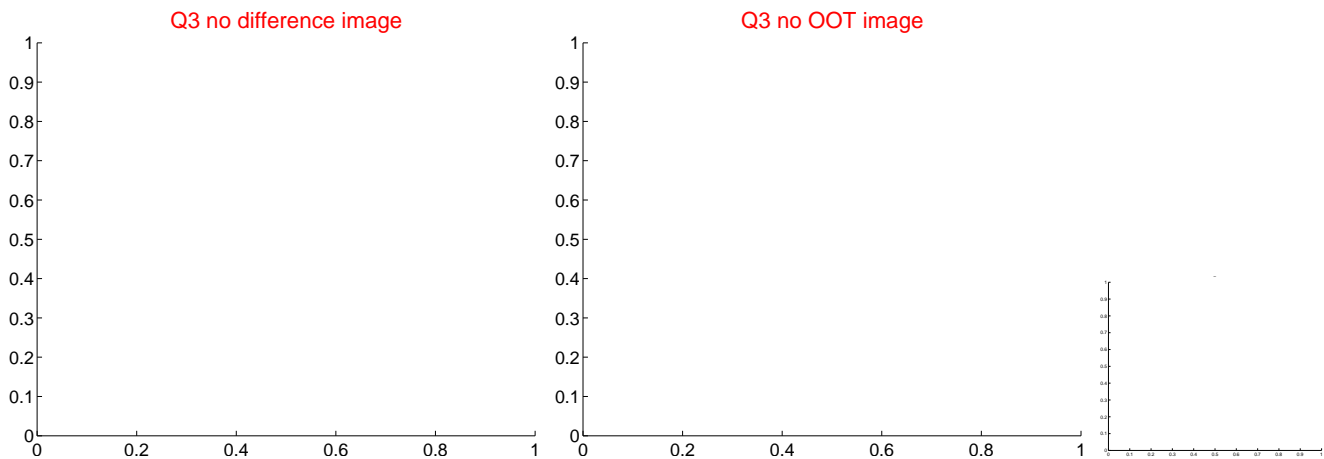
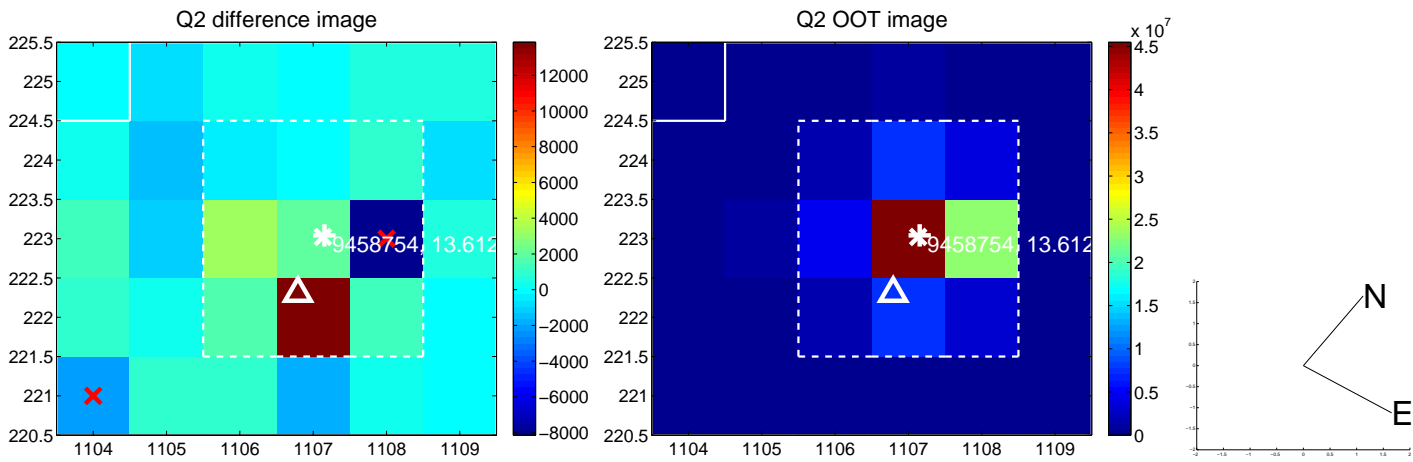
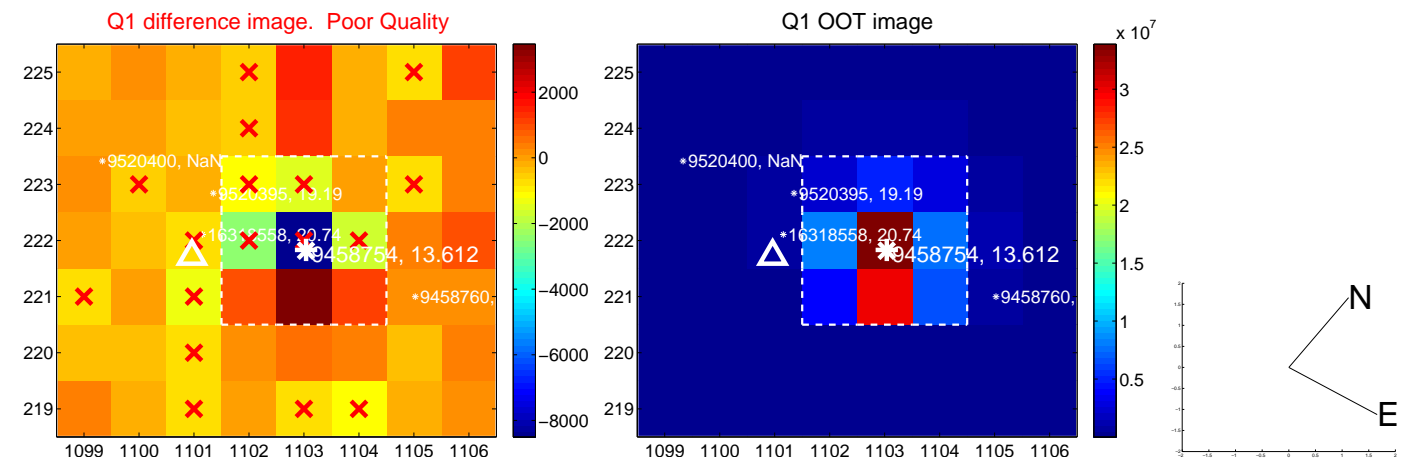
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.007 ± 0.791	1.27	-0.788 ± 0.875	-0.627 ± 0.553
PRF-fit source offset from KIC position	0.915 ± 0.903	1.01	-0.737 ± 0.933	-0.543 ± 0.576
photometric centroid source offset	0.08 ± 0.83	0.10	-0.08 ± 0.84	0.03 ± 0.77

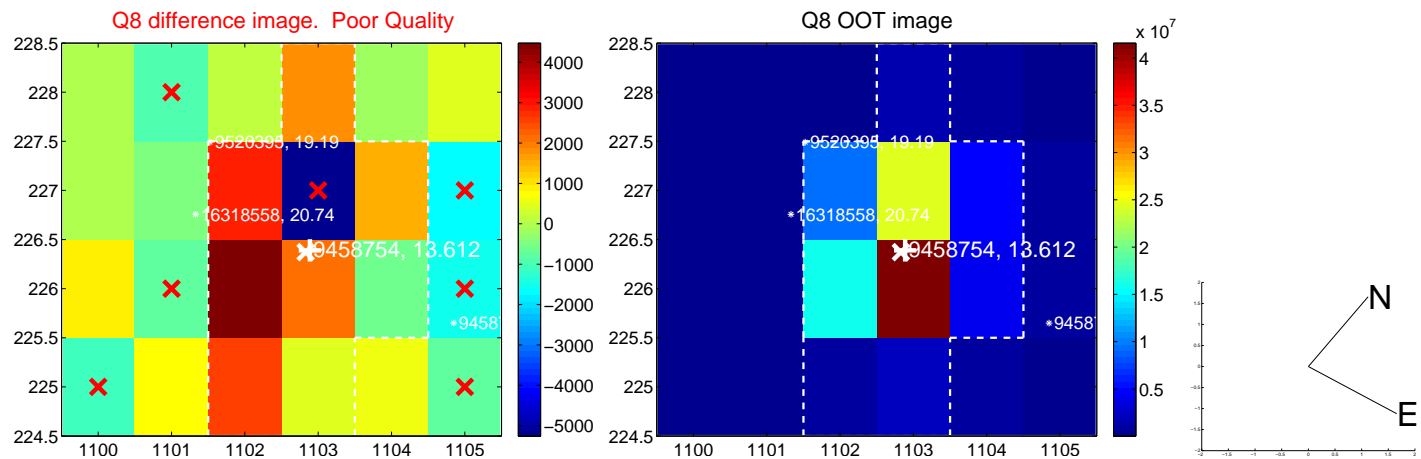
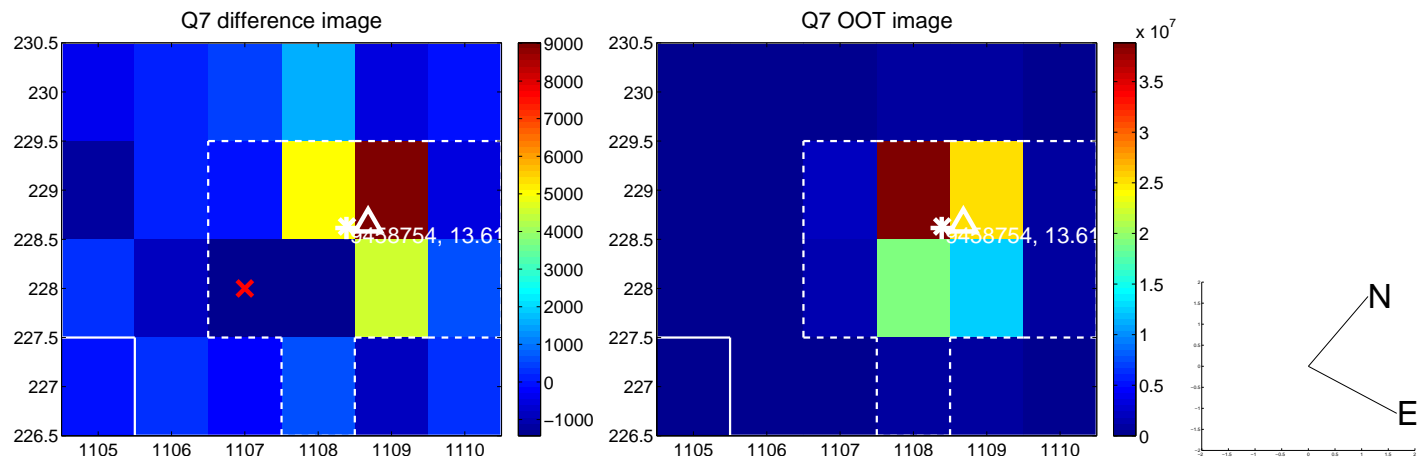
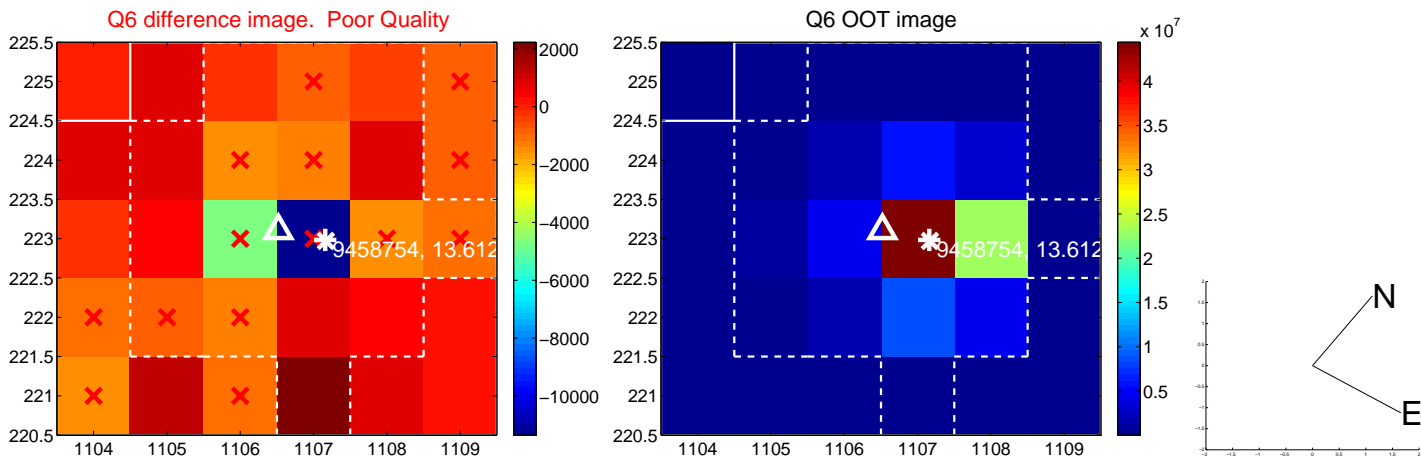
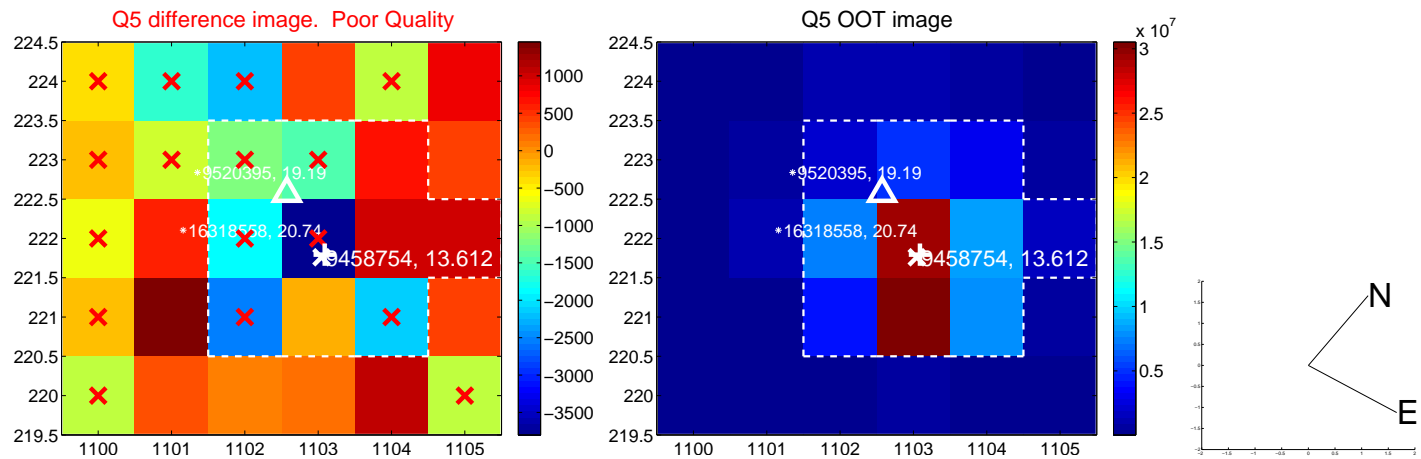


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

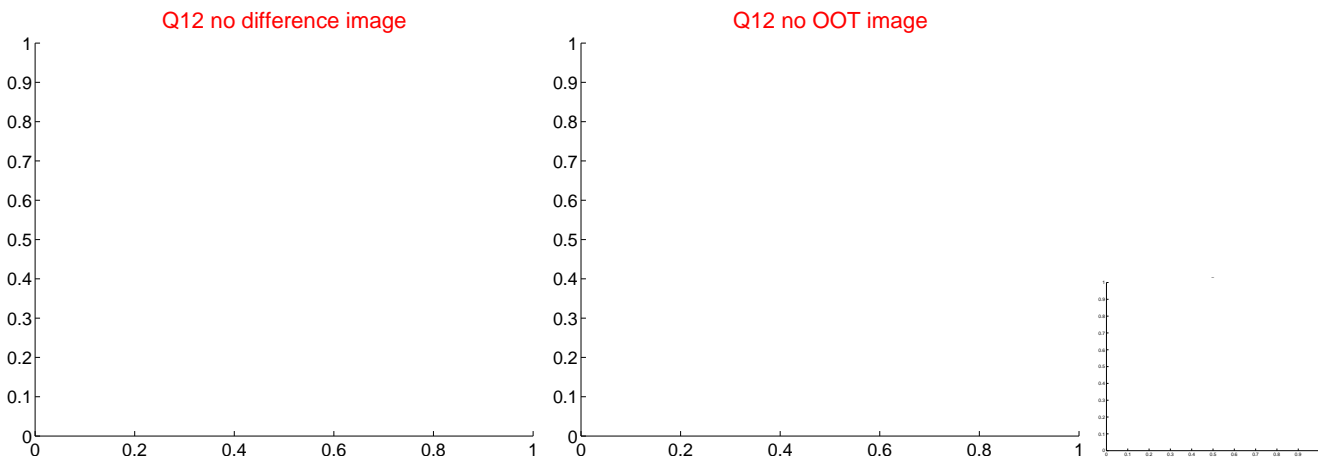
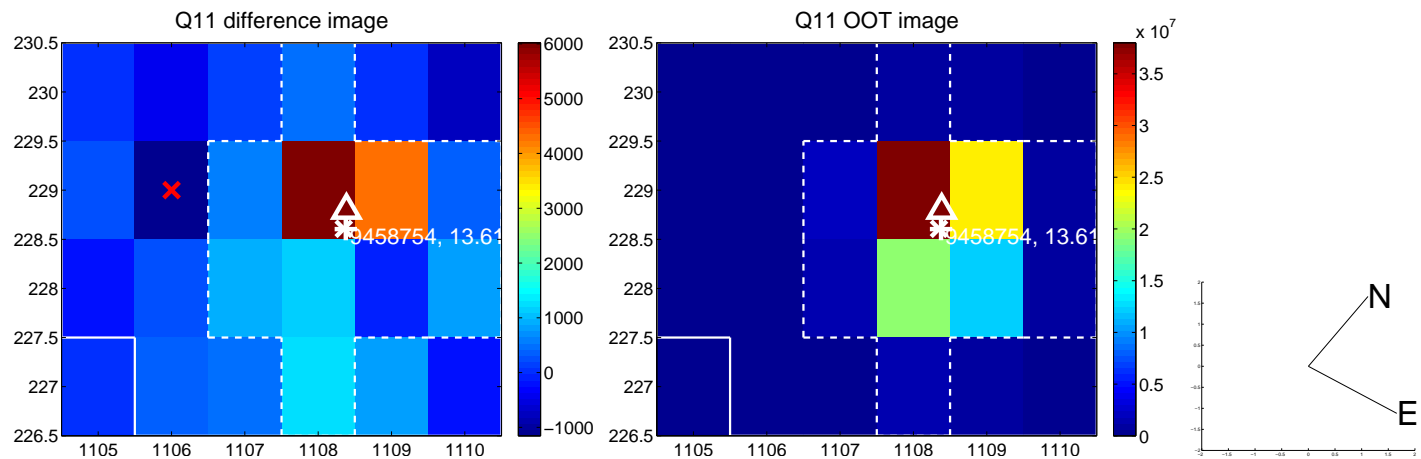
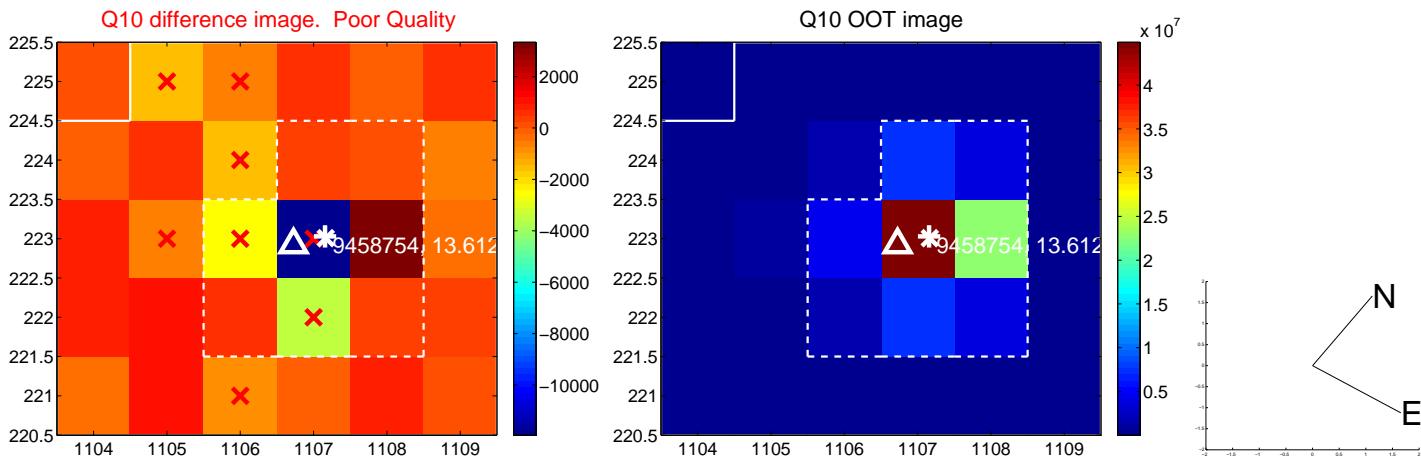
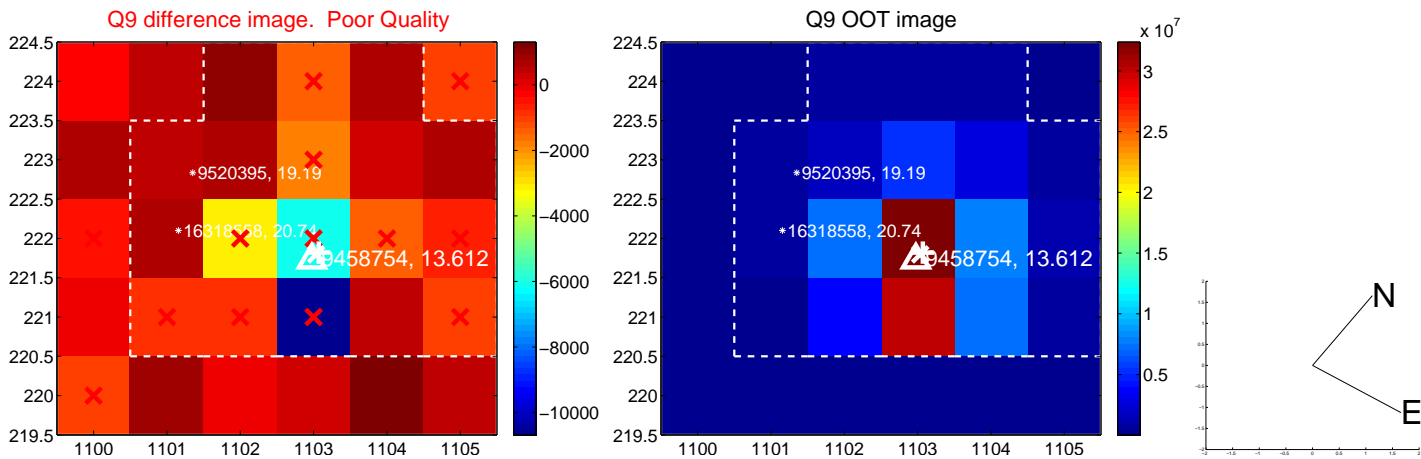
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



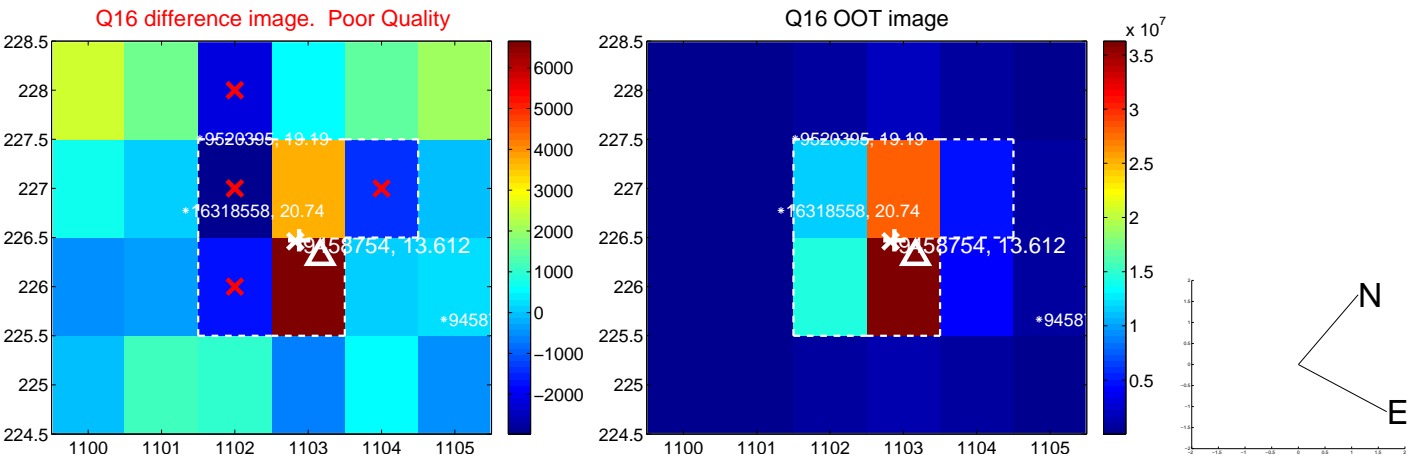
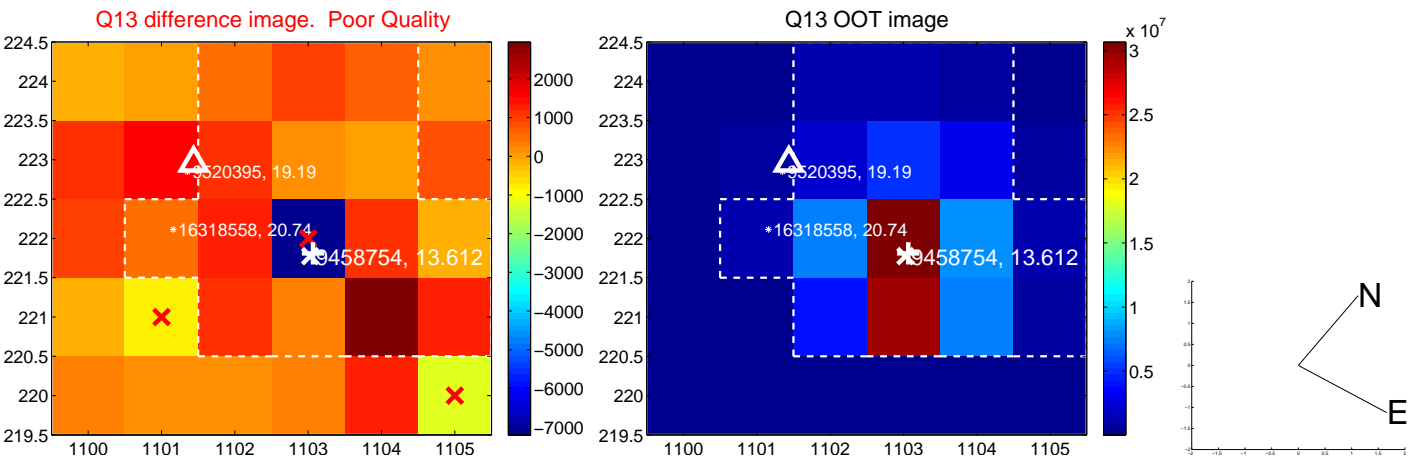
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



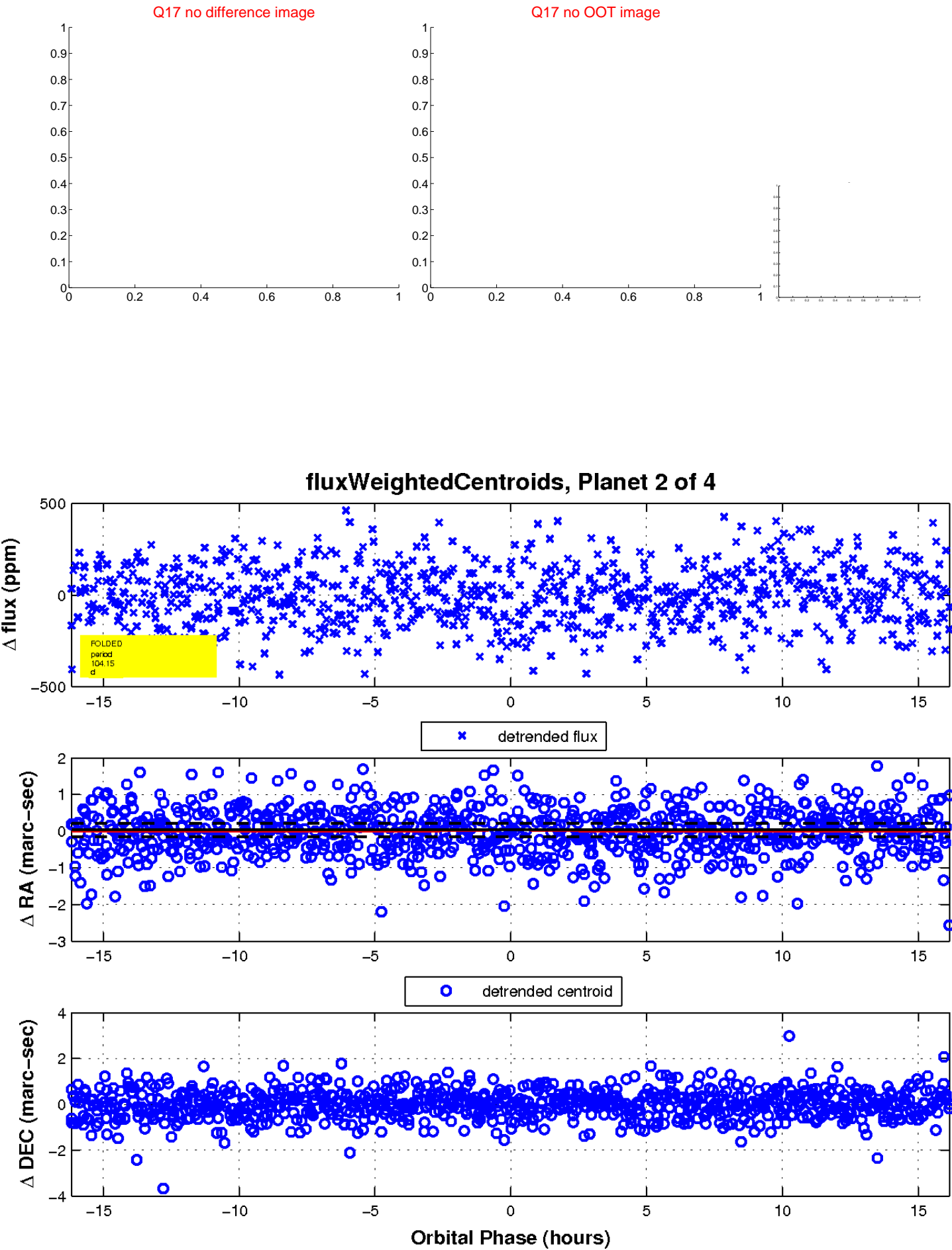
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

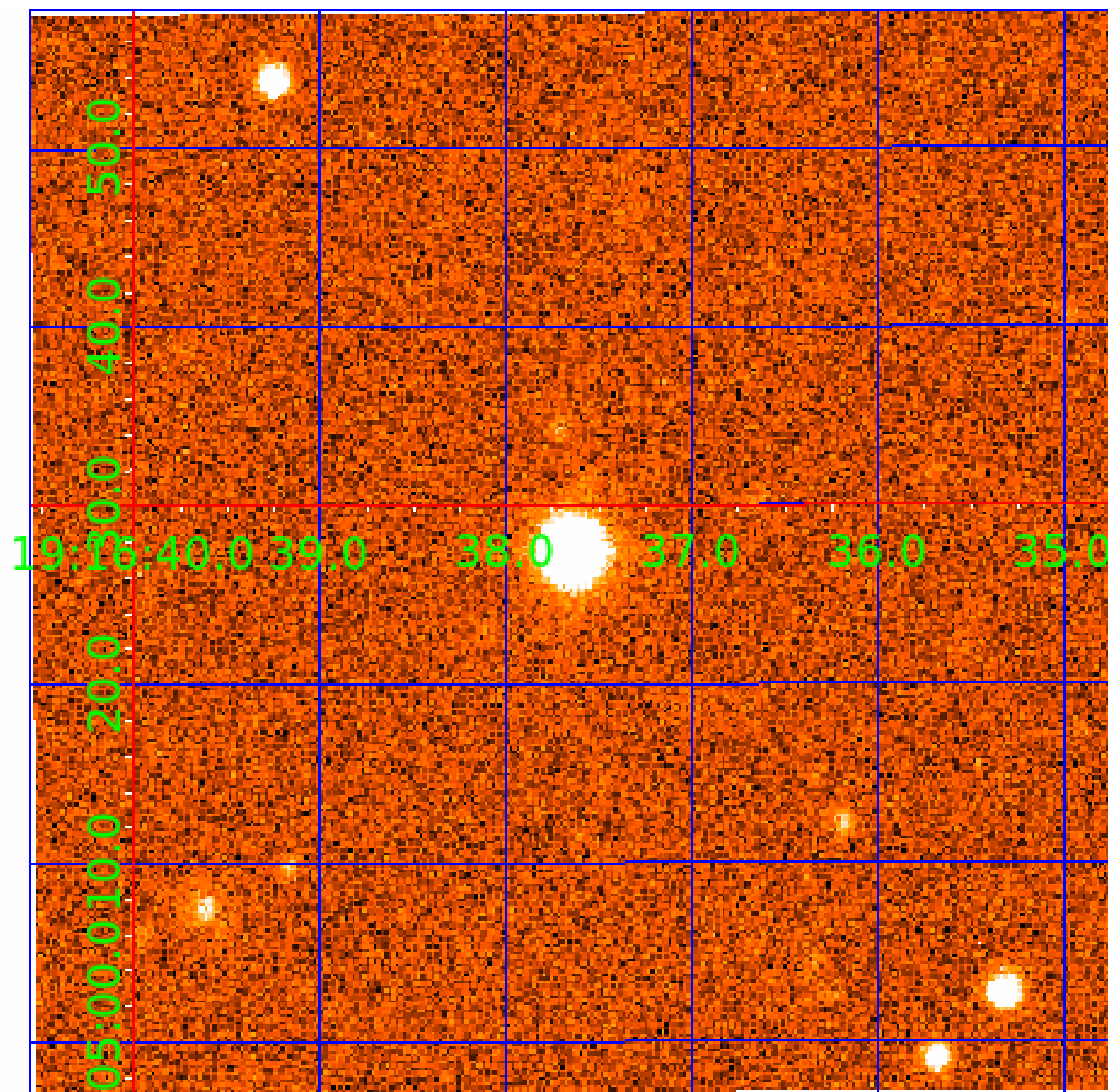


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009458754

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})
009458754-01	OBS	No	0.970683	132.228528	7.4	6.237	9.0	4.6	1.62	6986	0.45	11727.45
009458754-02	OBS	No	104.146073	147.332925	219.9	5.394	8.5	8.3	1.62	6986	2.66	23.00
009458754-03	OBS	No	33.717281	139.707074	130.2	3.664	8.5	8.0	1.62	6986	2.05	103.47
009458754-04	OBS	No	486.308250	543.165610	275.3	9.252	8.1	7.4	1.62	6986	3.01	2.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009458754-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009458754-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009458754-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009458754-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

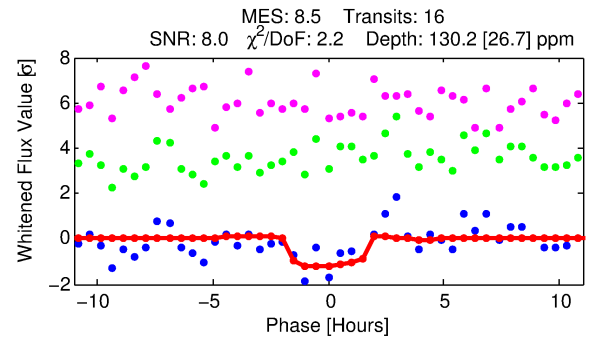
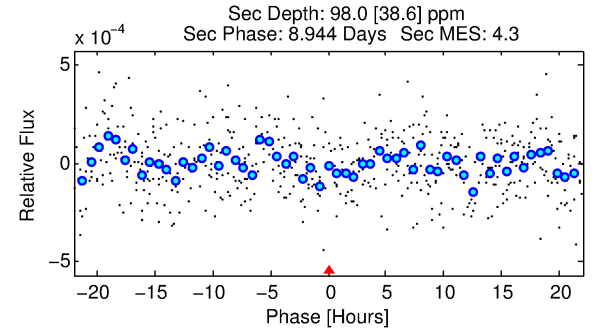
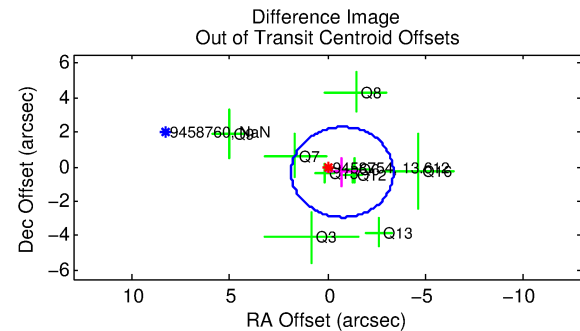
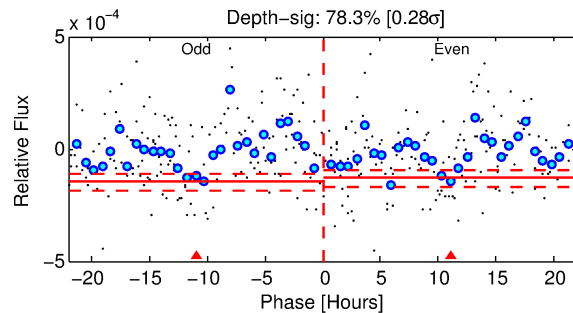
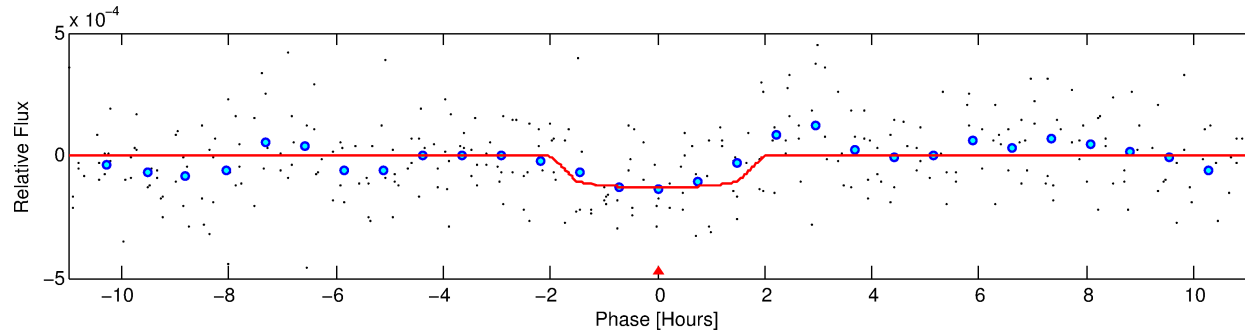
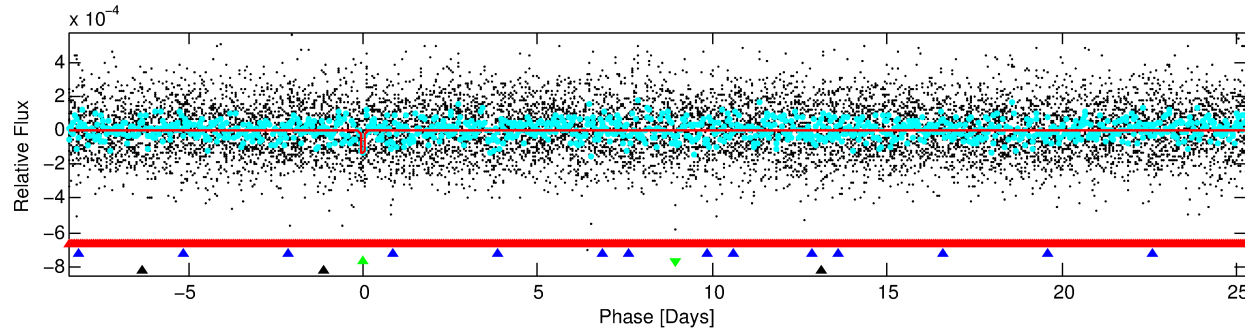
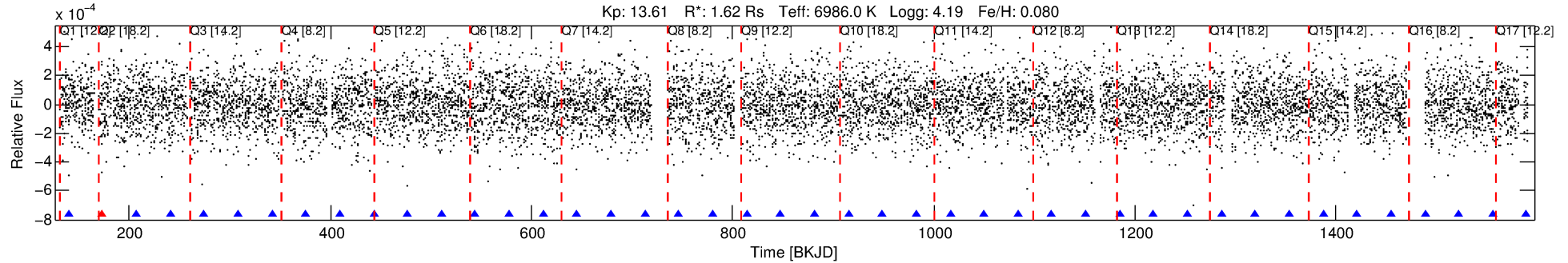
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009458754-03

No Significant Match Found

DV One-Page Summary

KIC: 9458754 Candidate: 3 of 4 Period: 33.717 d



DV Fit Results:

Period = 33.71728 [0.00057] d
Epoch = 139.7071 [0.0158] BKJD
Rp/R* = 0.0116 [0.0142]
a/R* = 42.37 [308.80]
b = 0.81 [3.07]
Seff = 103.48 [44.59]
Teq = 813 [88] K
Rp = 2.05 [2.60] Re
a = 0.2325 [0.0646] AU
Ag = 695.19 [1747.20] [0.40 σ]
Teffp = 6457 [4017] K [1.40 σ]

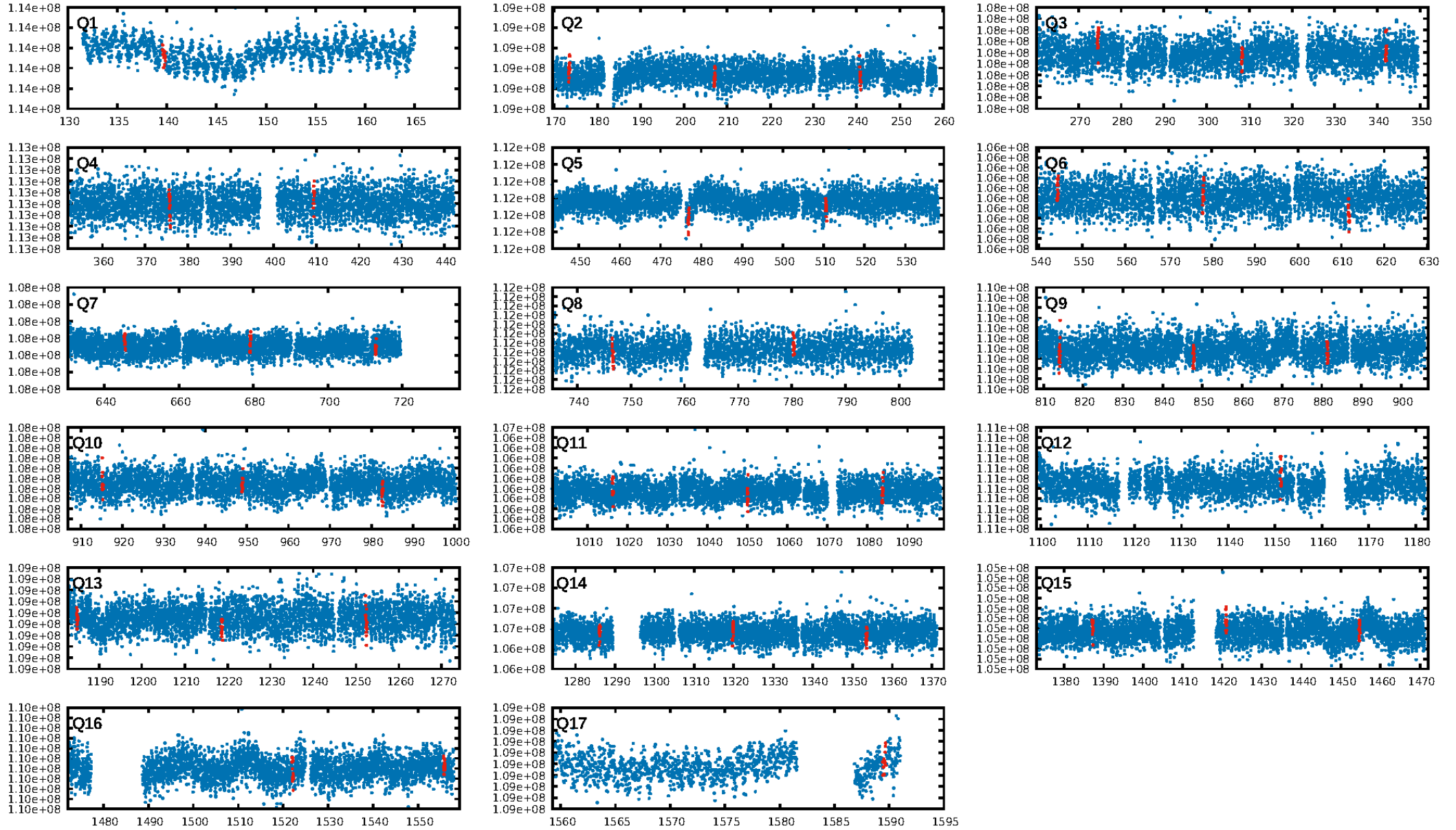
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [108.66 σ]
LongPeriod-sig: 100.0% [259.23 σ]
ModelChiSquare2-sig: 0.8%
ModelChiSquareGof-sig: 97.9%
Bootstrap-pfa: 6.04e-09
RollingBand-fgt: 0.93 [14/15]
GhostDiagnostic-chr: 1.498
Centroid-sig: N/A
Centroid-so: 0.757 arcsec [0.84 σ]
OotOffset-rm: 0.818 arcsec [0.94 σ]
KicOffset-rm: 0.772 arcsec [0.81 σ]
OotOffset-st: 1/3/3/2 [9]
KicOffset-st: 1/3/3/2 [9]
DiffImageQuality-fgm: 0.11 [1/9]
DiffImageOverlap-fno: 0.00 [0/17]

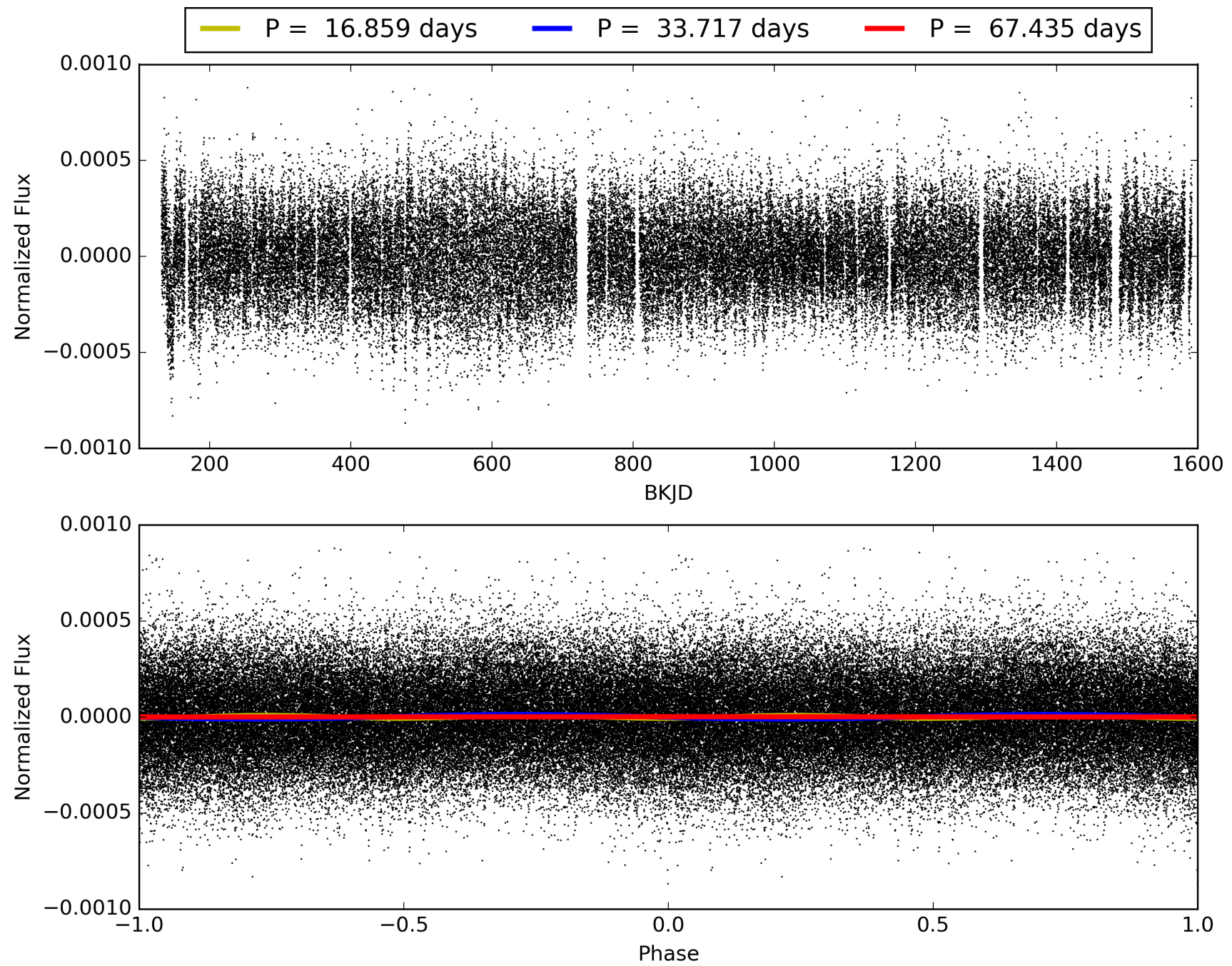
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:19:32 Z

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

TCE 009458754-03, PDC Light Curves

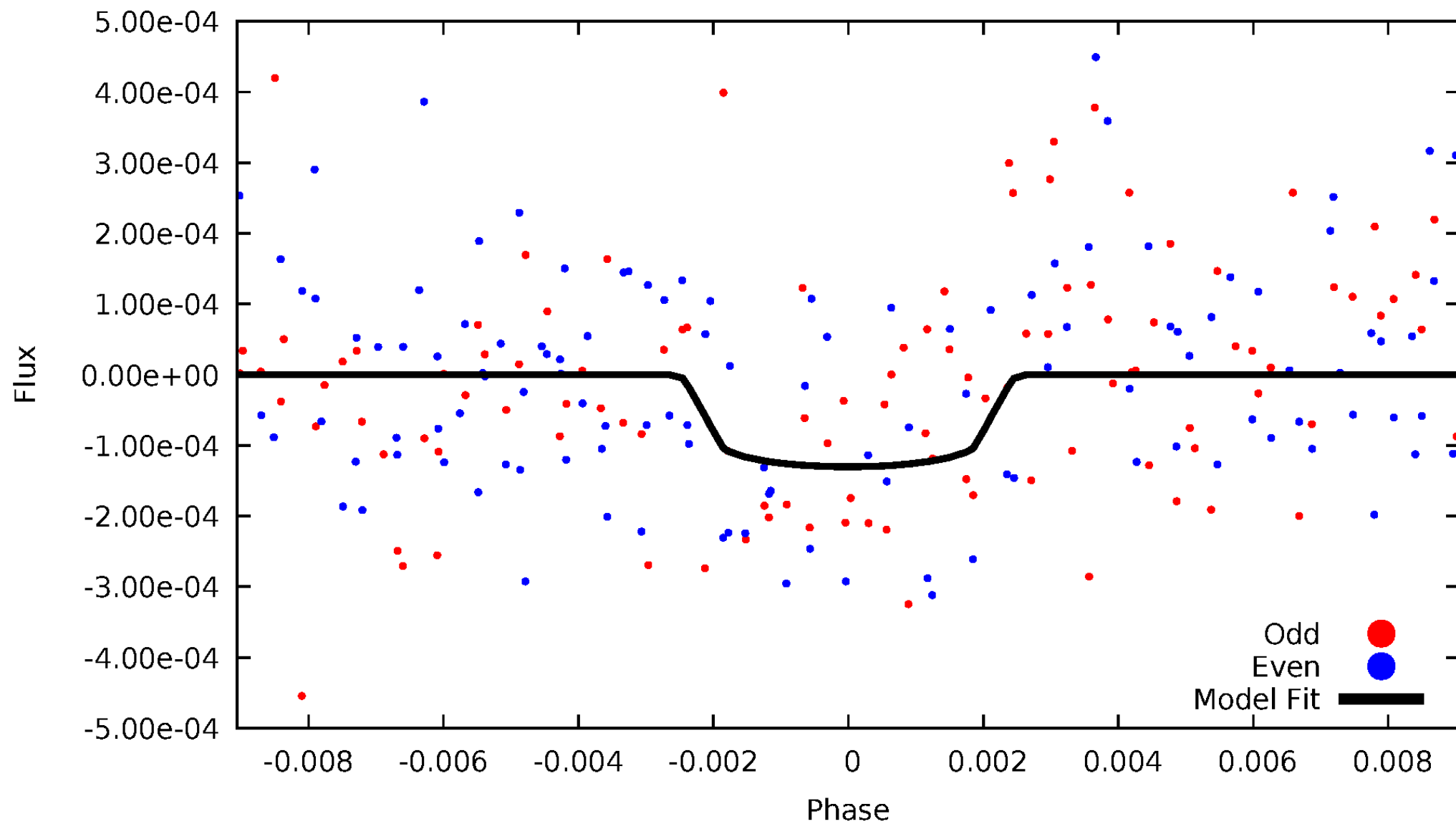


TCE 009458754-03



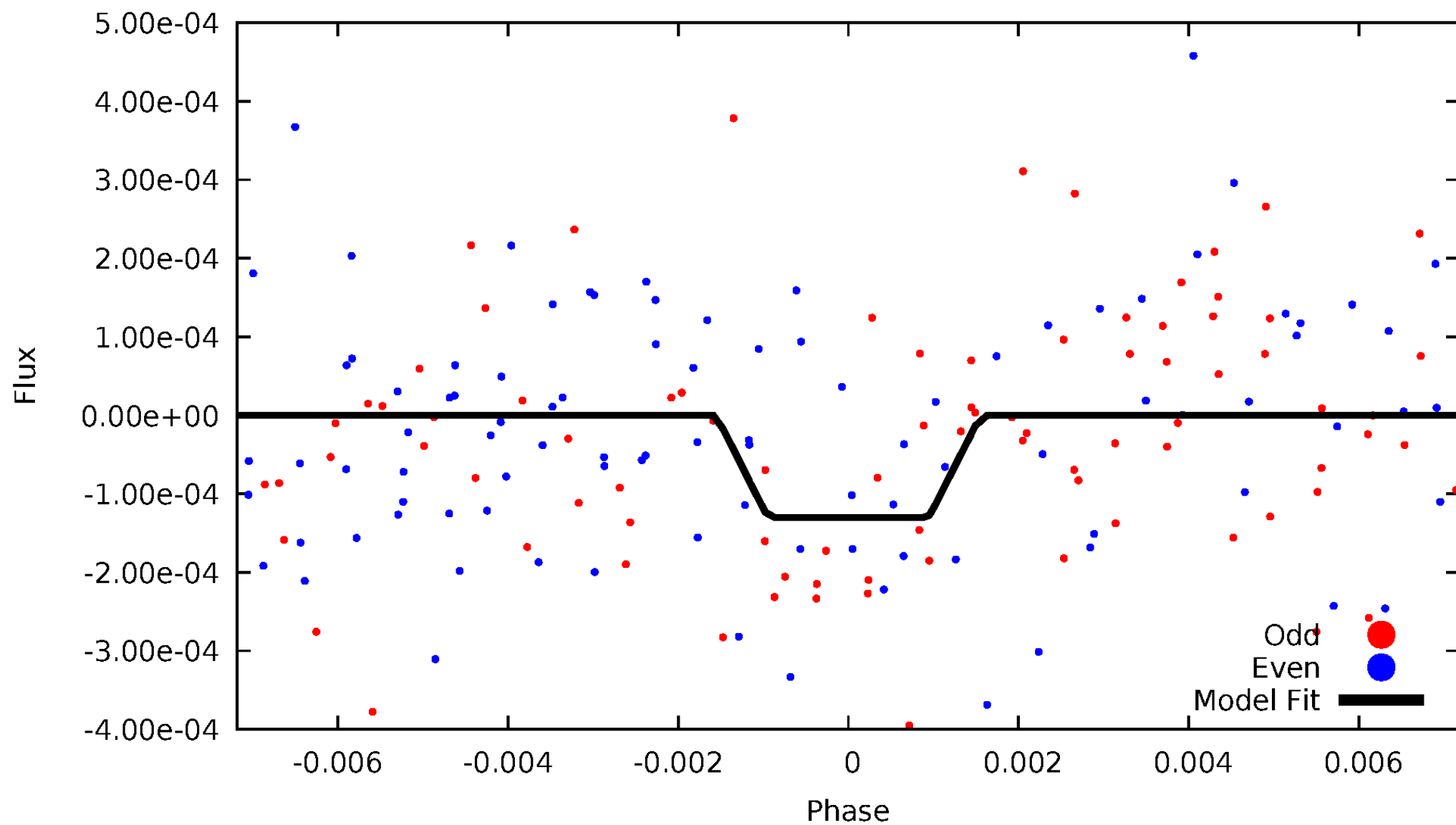
DV Odd/Even

TCE 009458754-03



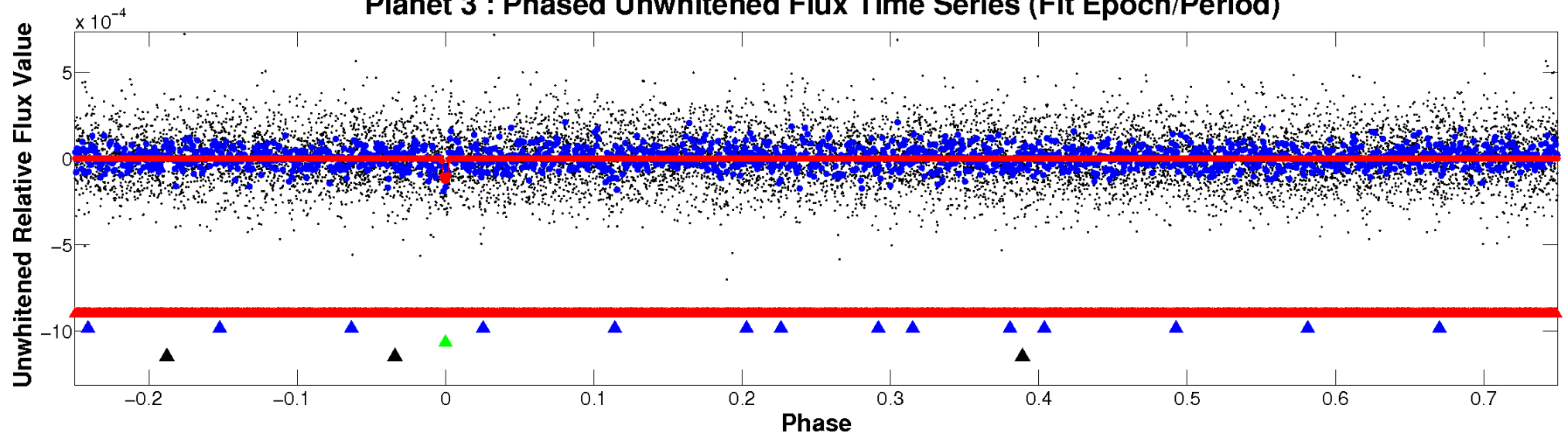
ALT Odd/Even

TCE 009458754-03

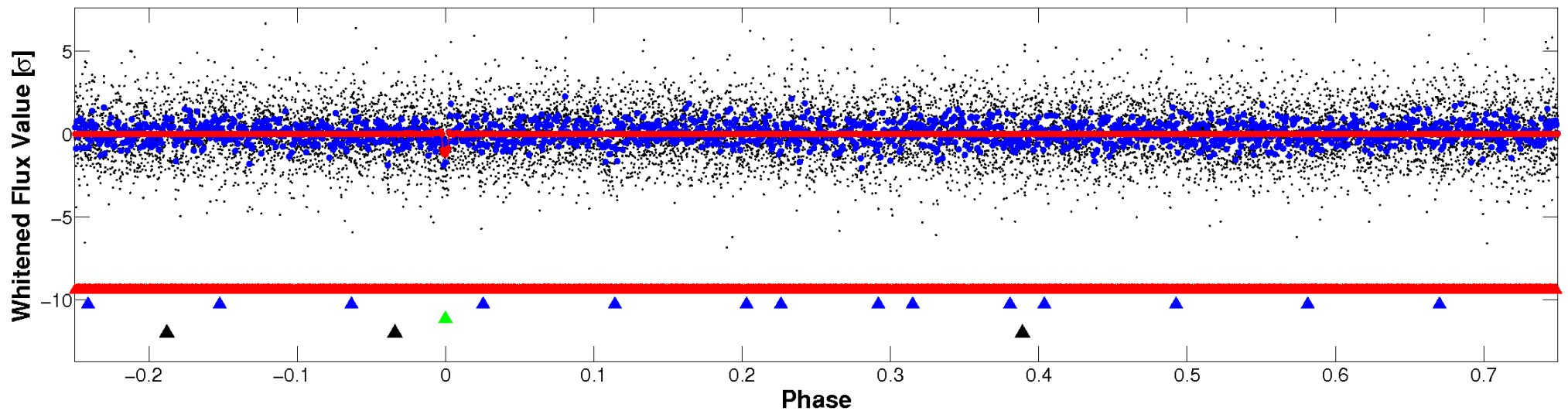


Non-Whitened Vs. Whitened Light Curve

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

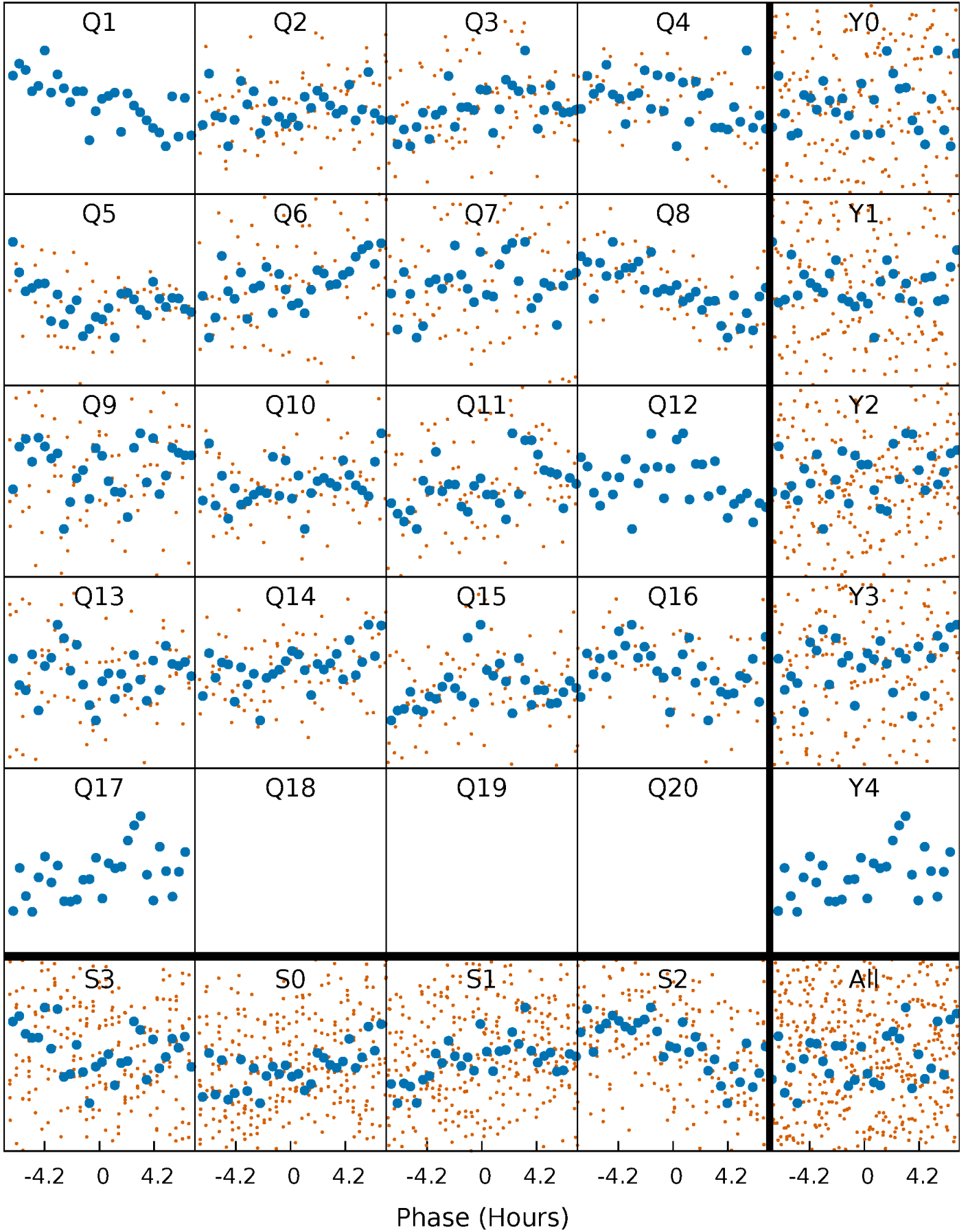


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



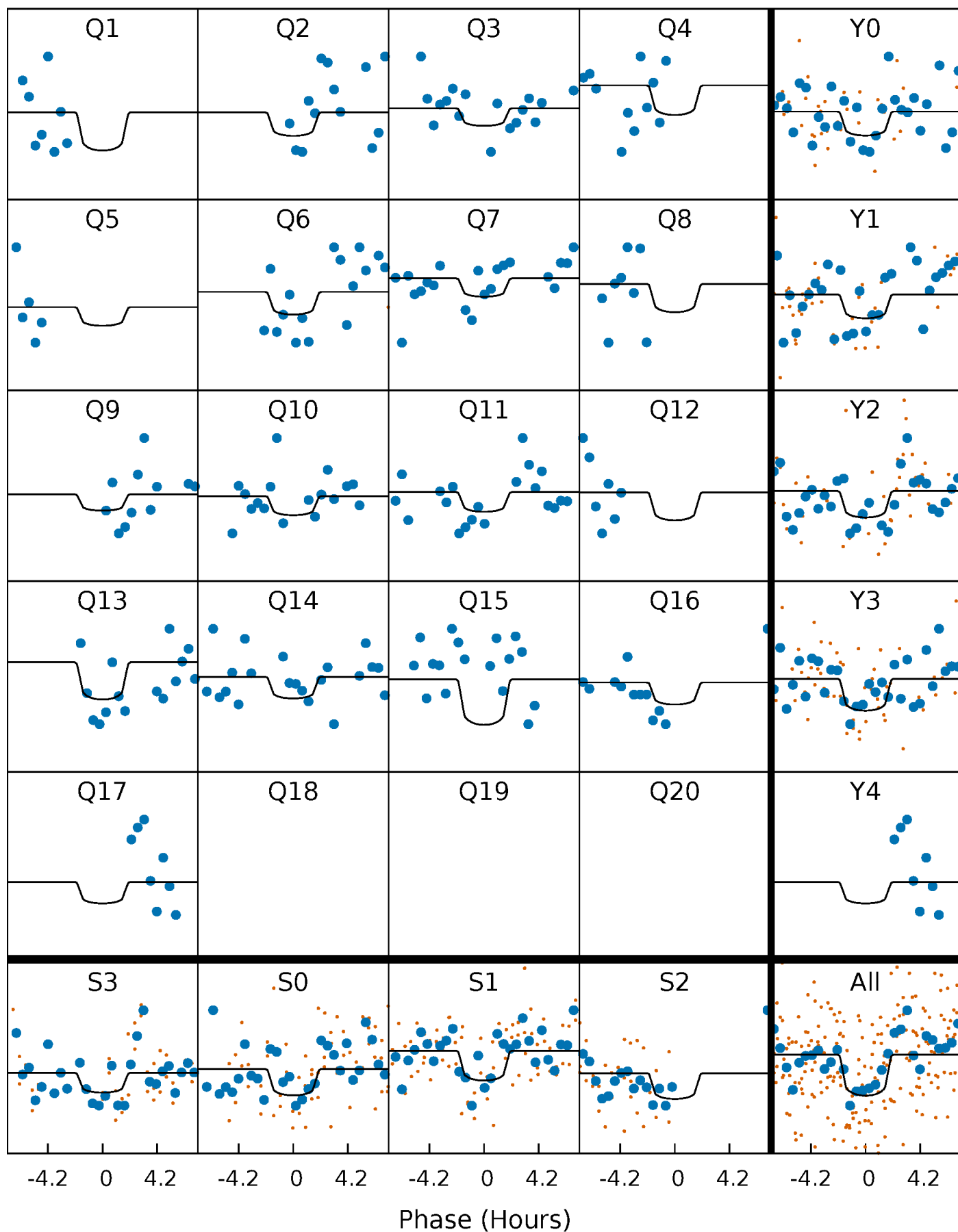
PDC Quarter-Phased Transit Curves

TCE 009458754-03 P= 33.717281 Days $T_0=139.707074$ (BKJD)



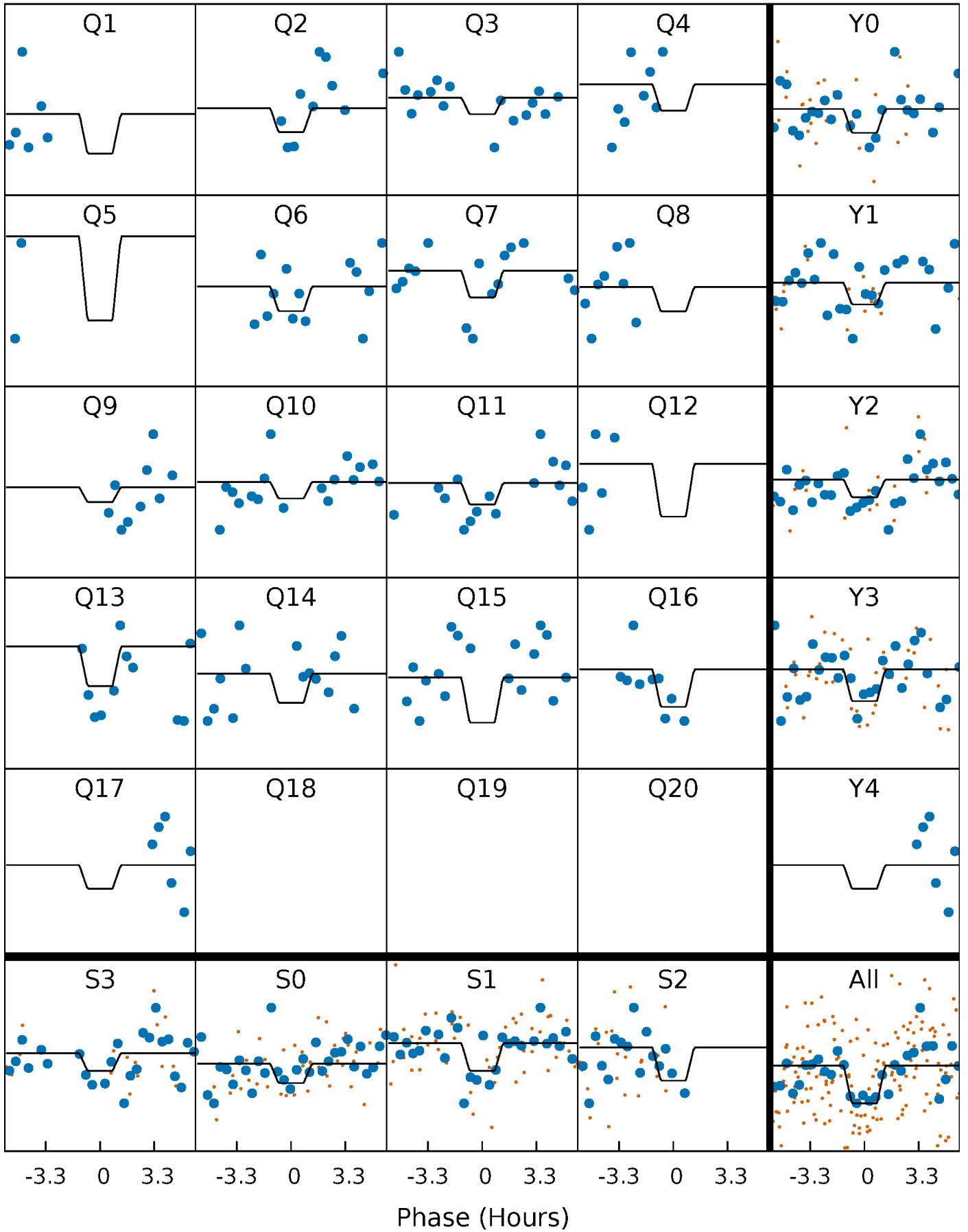
DV Quarter-Phased Transit Curves

TCE 009458754-03 P= 33.717281 Days $T_0=139.707074$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

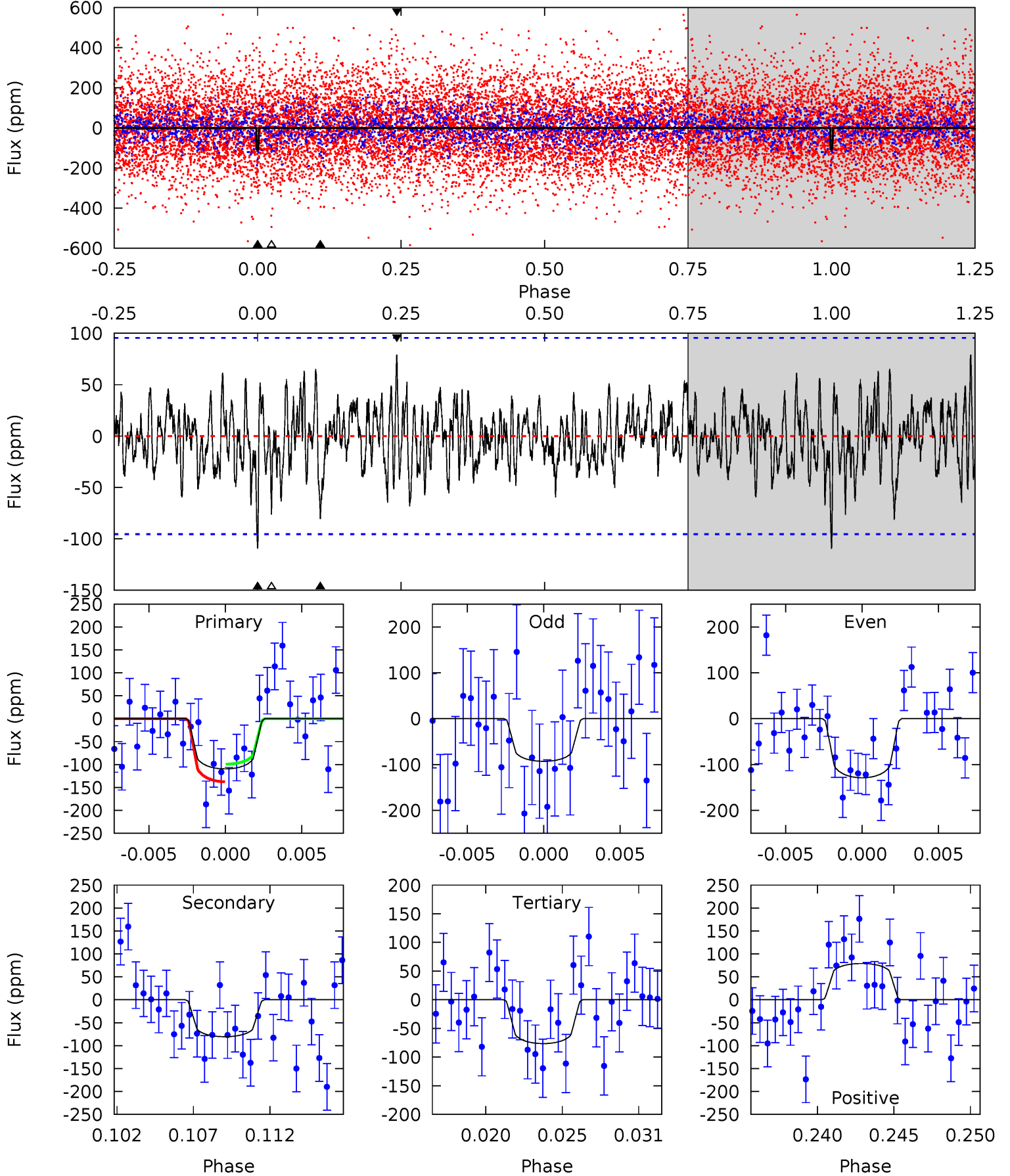
TCE 009458754-03 P= 33.716010 Days $T_0=139.719399$ (BKJD)



DV Model-Shift Uniqueness Test

009458754-03, $P = 33.717281$ Days, $E = 105.989793$ Days

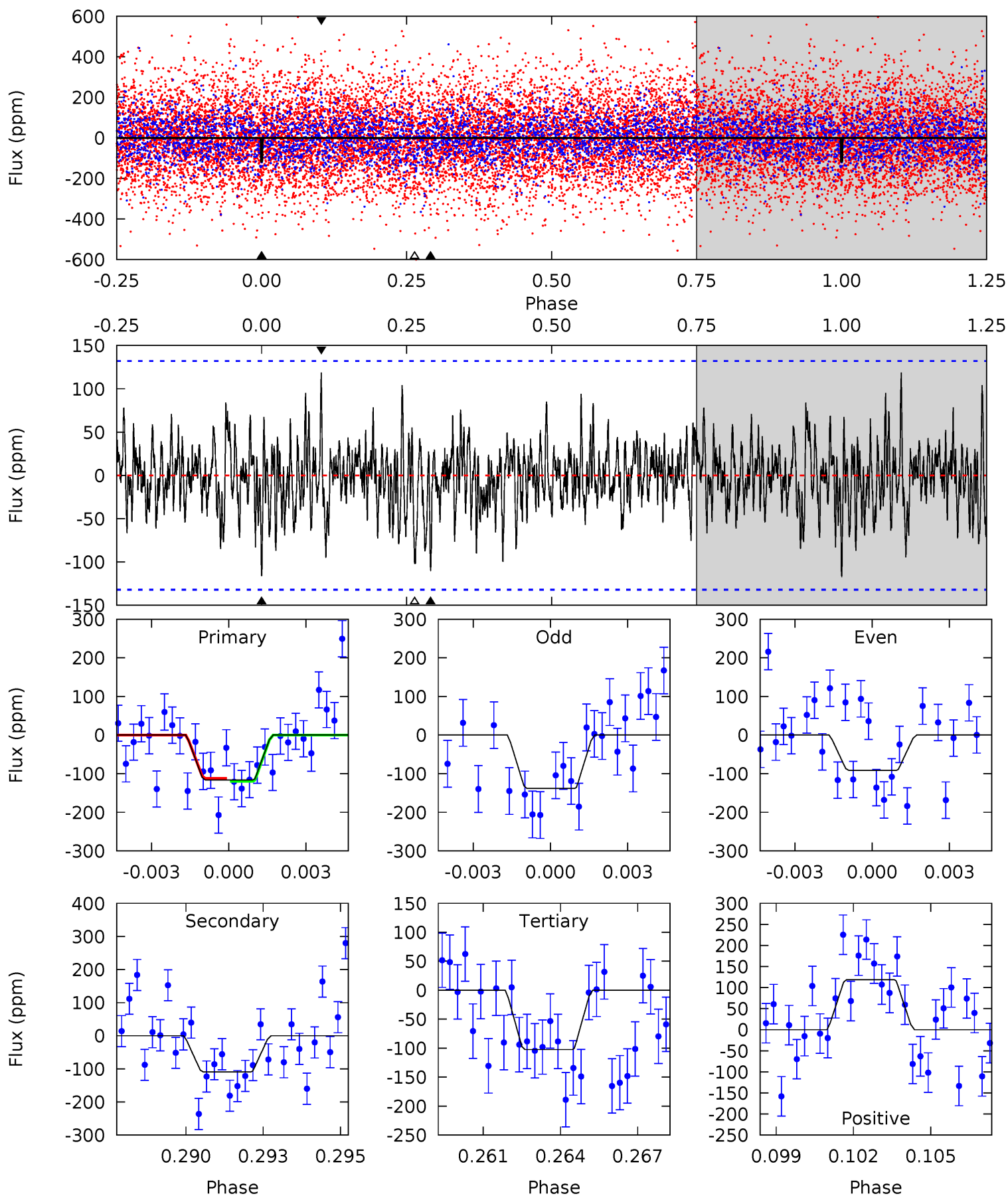
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.92	4.35	4.13	4.27	5.15	2.80	1.31	1.79	1.65	0.22	0.08	0.97	1.05	0.42	1.03



Alt Model-Shift Uniqueness Test

009458754-03, P = 33.716010 Days, E = 106.003389 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.63	4.35	4.08	4.73	5.26	2.98	1.28	0.55	-0.10	0.27	-0.38	0.94	0.96	0.51	0.14



Stellar Parameters For KIC 009458754

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6986^{+194}_{-305}	$4.188^{+0.105}_{-0.210}$	$0.080^{+0.200}_{-0.350}$	$1.619^{+0.550}_{-0.254}$	$1.475^{+0.207}_{-0.231}$	$0.489^{+0.252}_{-0.262}$
	+3%/-4%	+3%/-5%	+250%/-438%	+34%/-16%	+14%/-16%	+51%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009458754-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-81 ± 19	$2.95^{+2.17}_{-1.91}$	1144^{+89}_{-68}	5208^{+3767}_{-1092}	267^{+1813}_{-180}
Alt.	-109 ± 25	$2.78^{+2.37}_{-1.86}$	1146^{+104}_{-70}	5726^{+5467}_{-1370}	410^{+3254}_{-293}

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

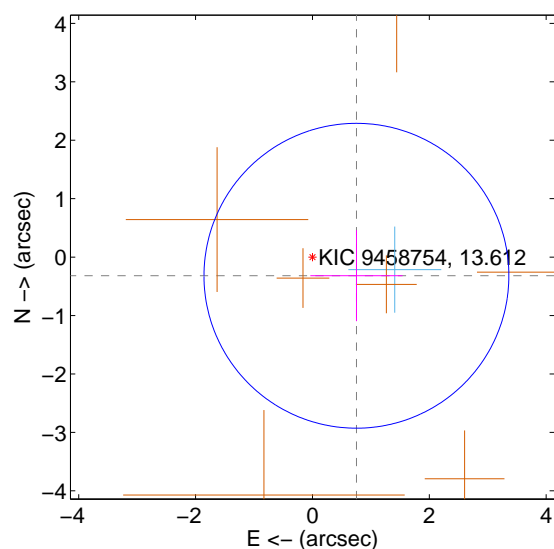
Supplemental centroid analysis for 009458754-03. Kepler magnitude: 13.61. Transit SNR 7.99

There are 1 quarters with good PRF difference image offsets

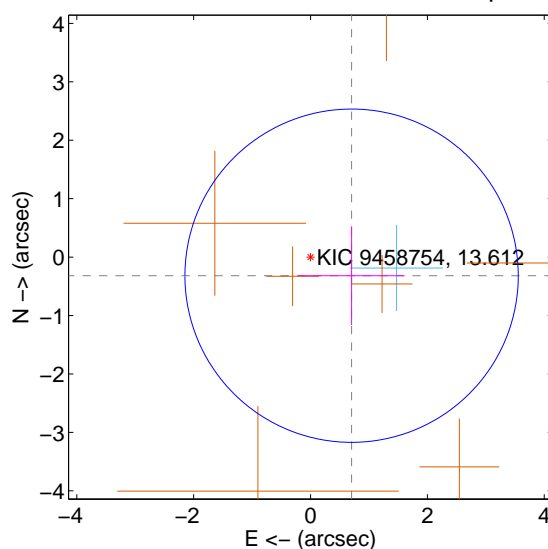
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.818 ± 0.870	0.94	-0.753 ± 0.789	-0.319 ± 0.778
PRF-fit source offset from KIC position	0.772 ± 0.951	0.81	-0.703 ± 0.905	-0.318 ± 0.845
photometric centroid source offset	0.76 ± 0.90	0.84	-0.44 ± 0.97	-0.62 ± 0.86

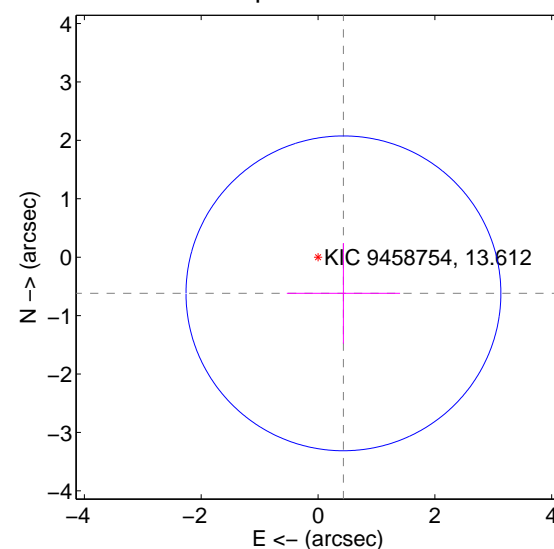
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

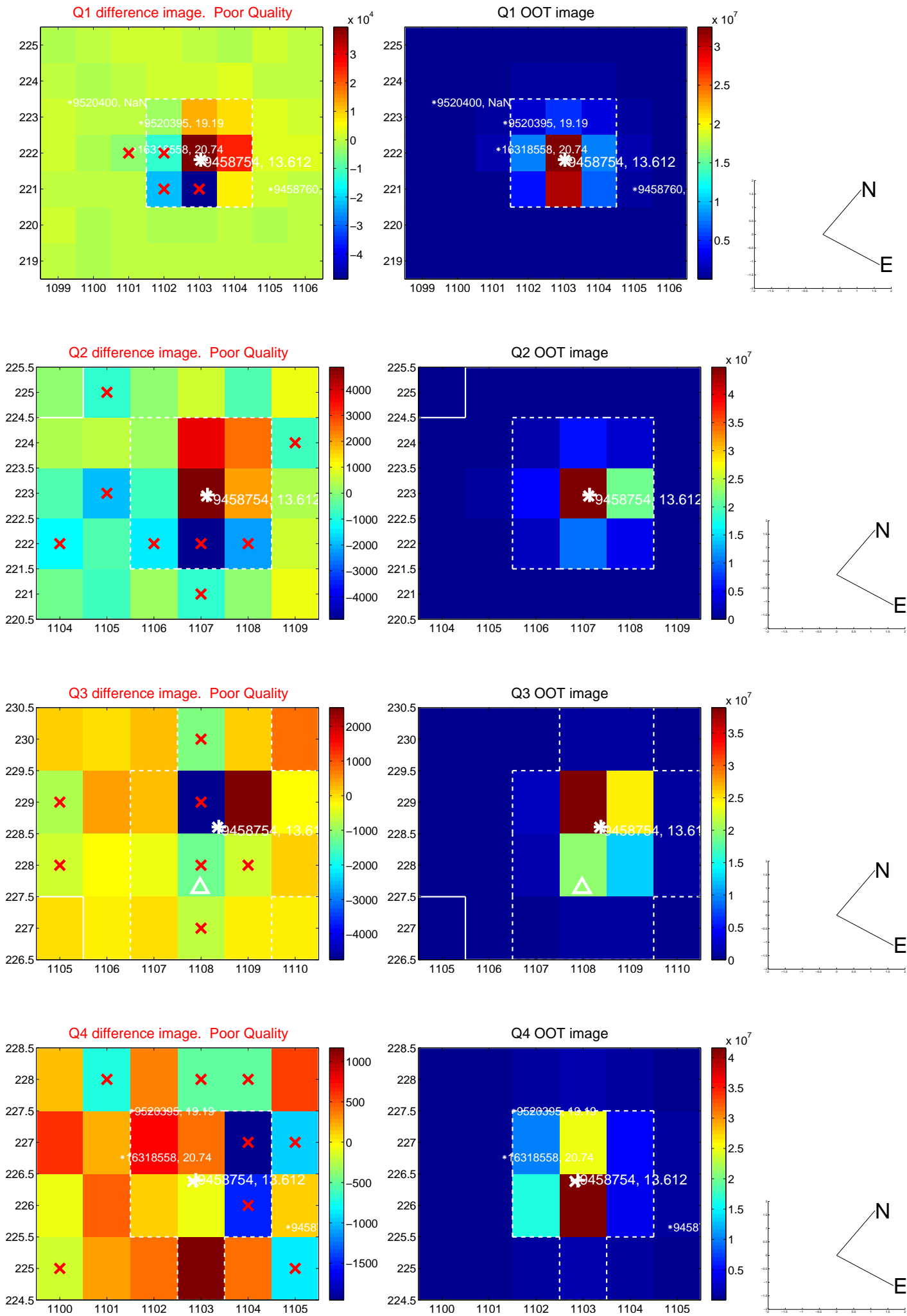


offset from photometric centroids

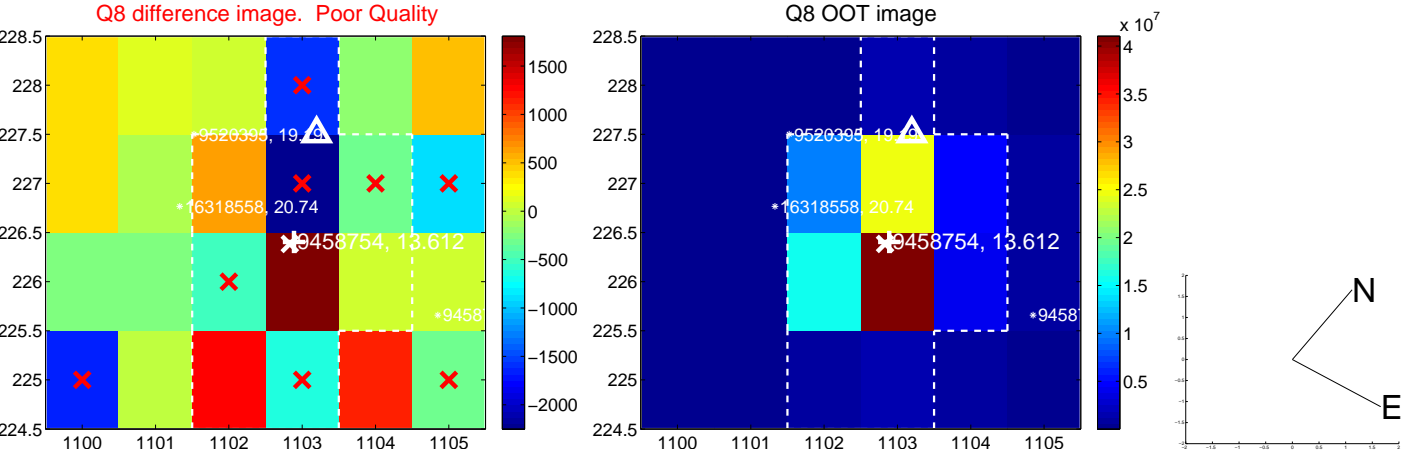
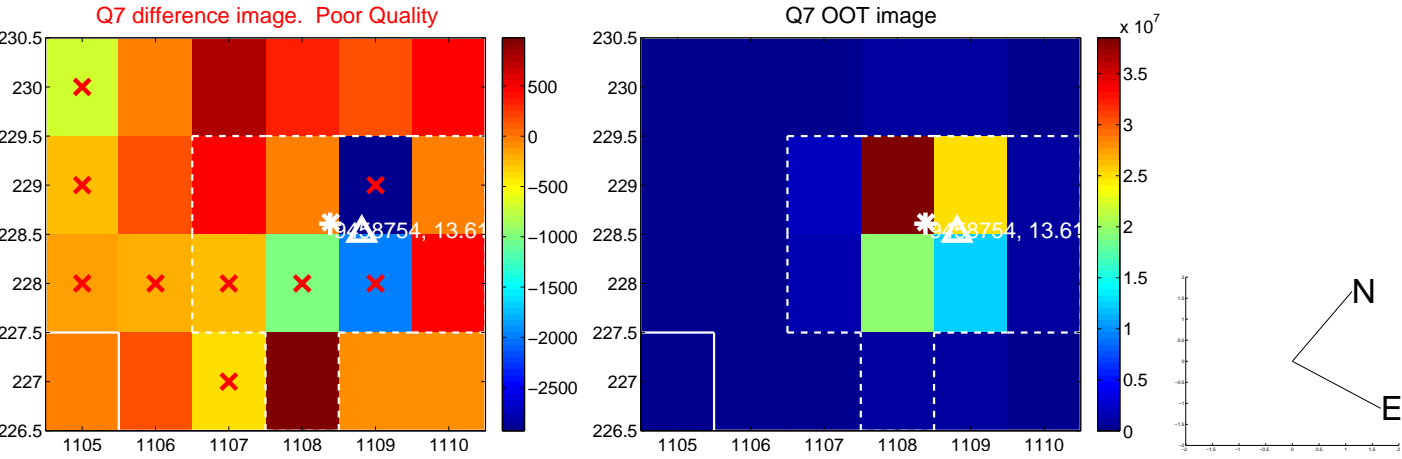
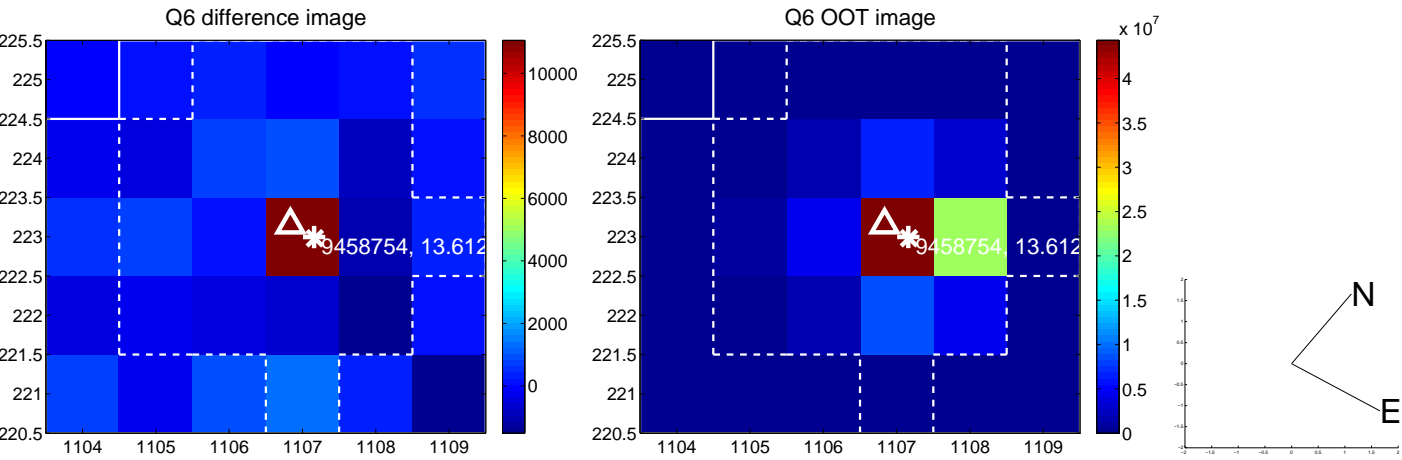
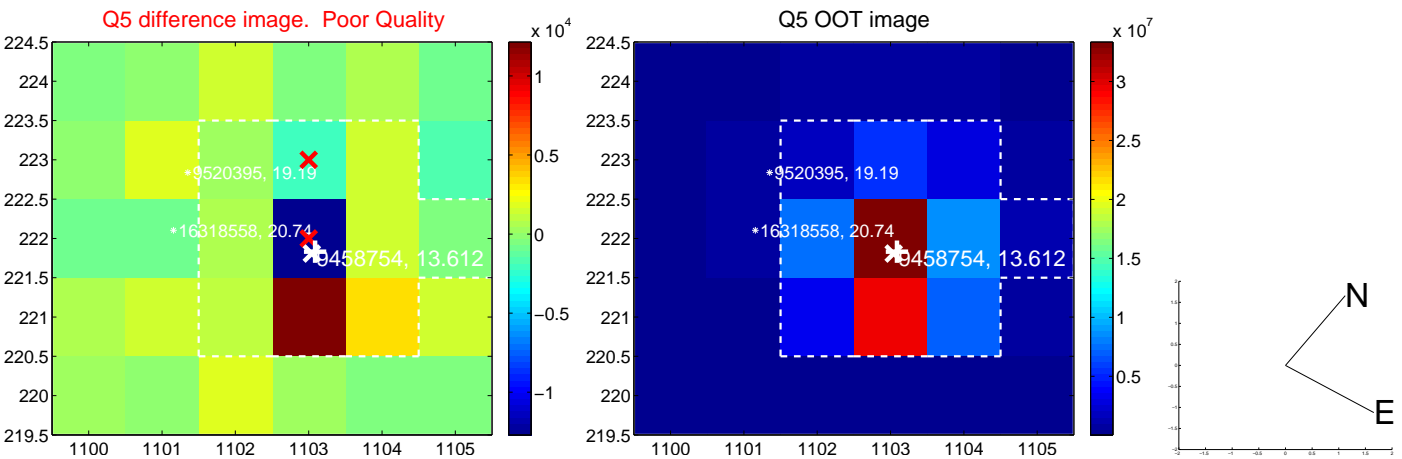


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

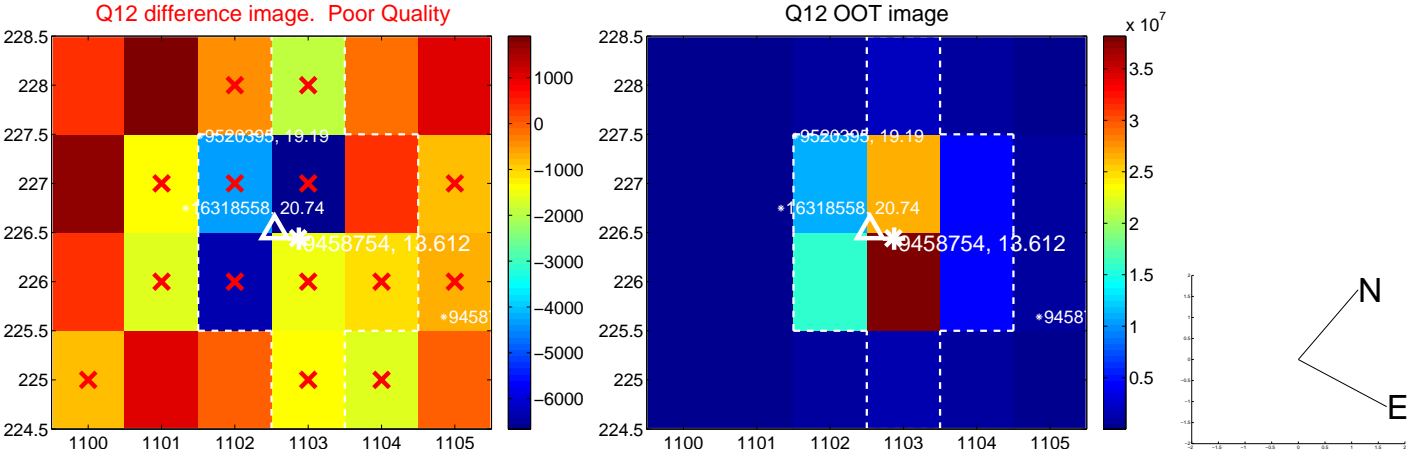
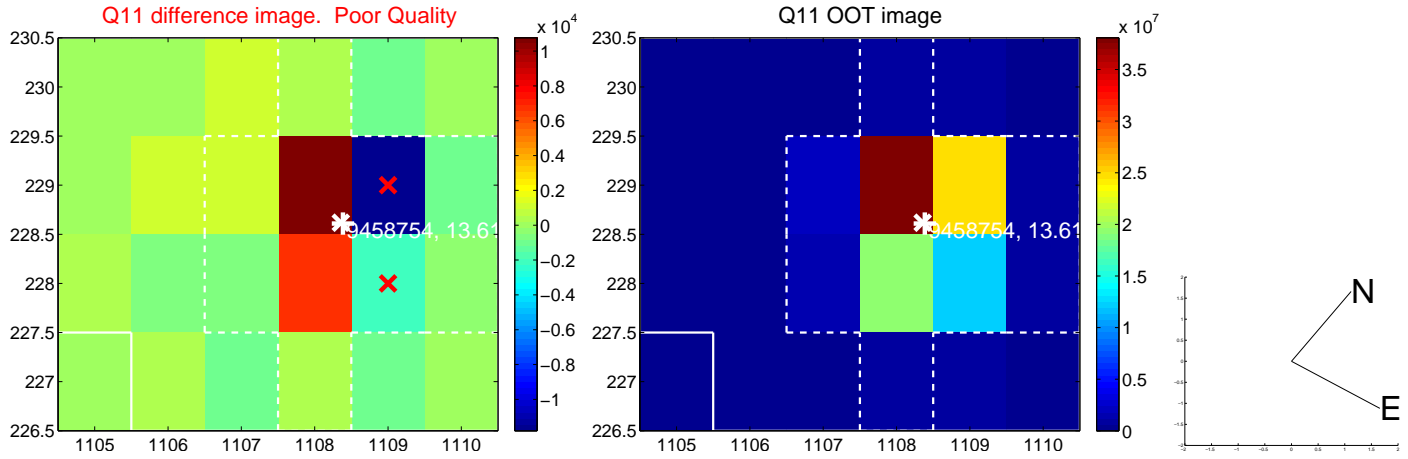
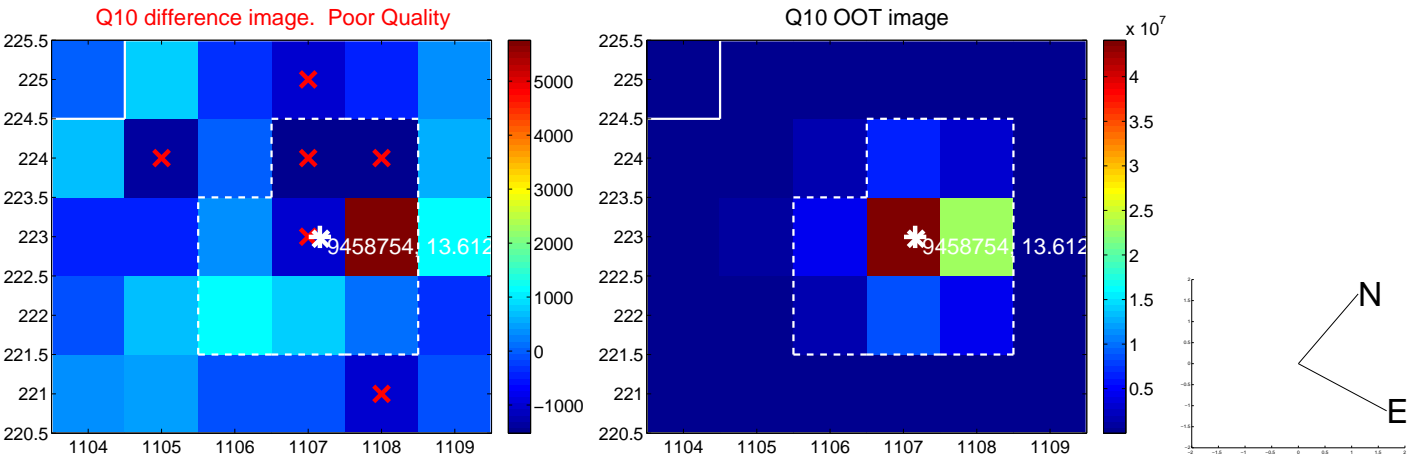
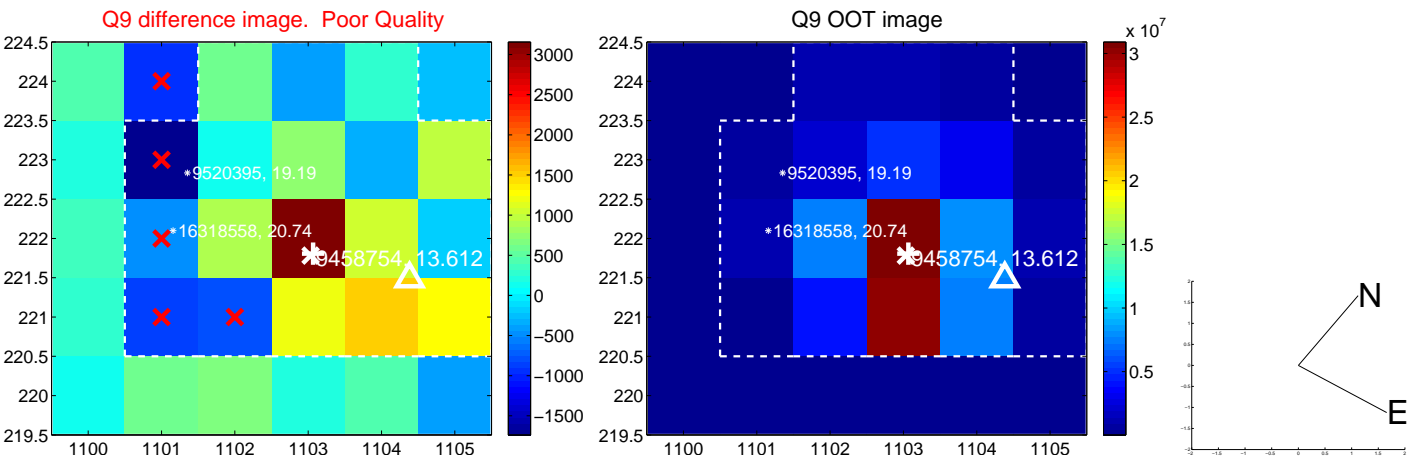
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



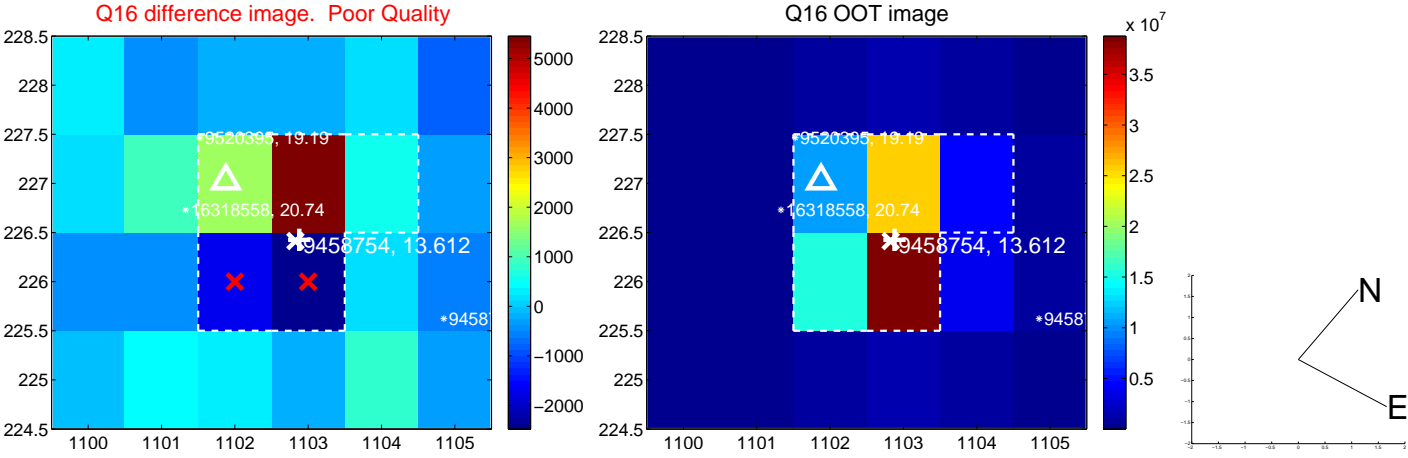
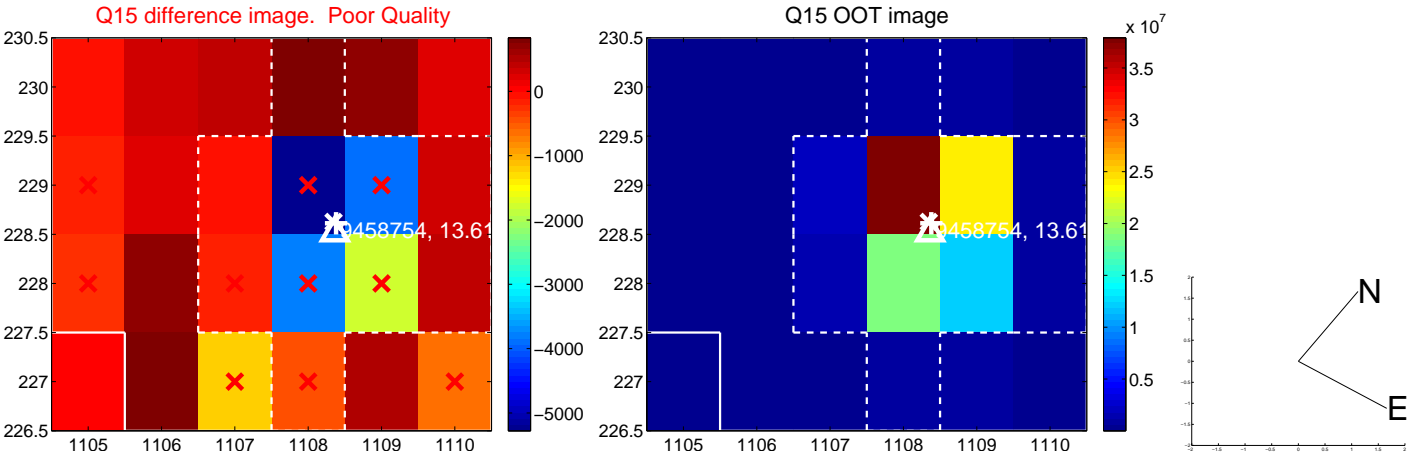
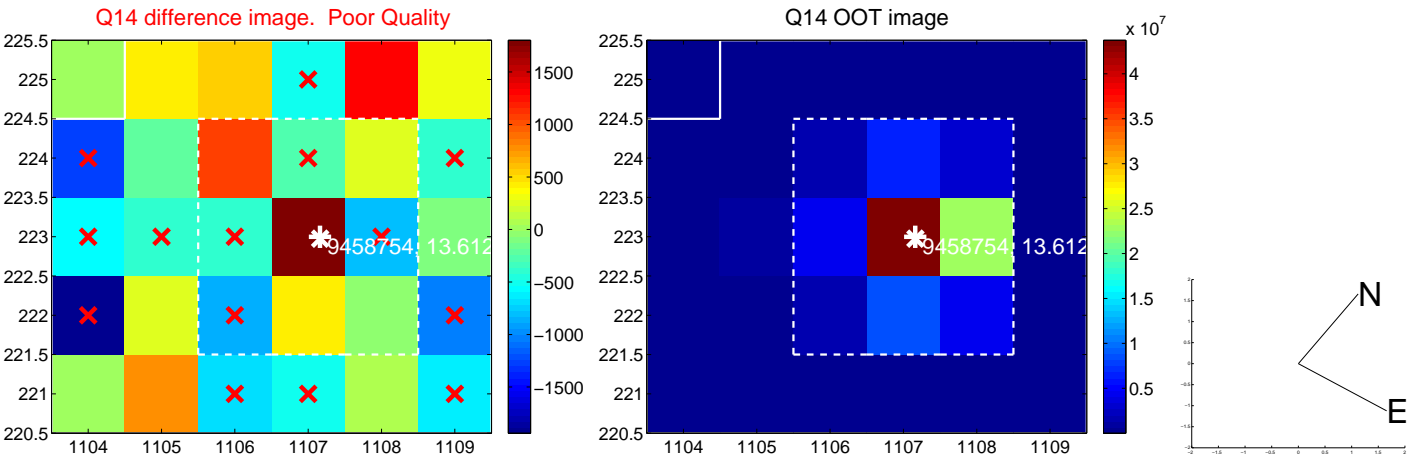
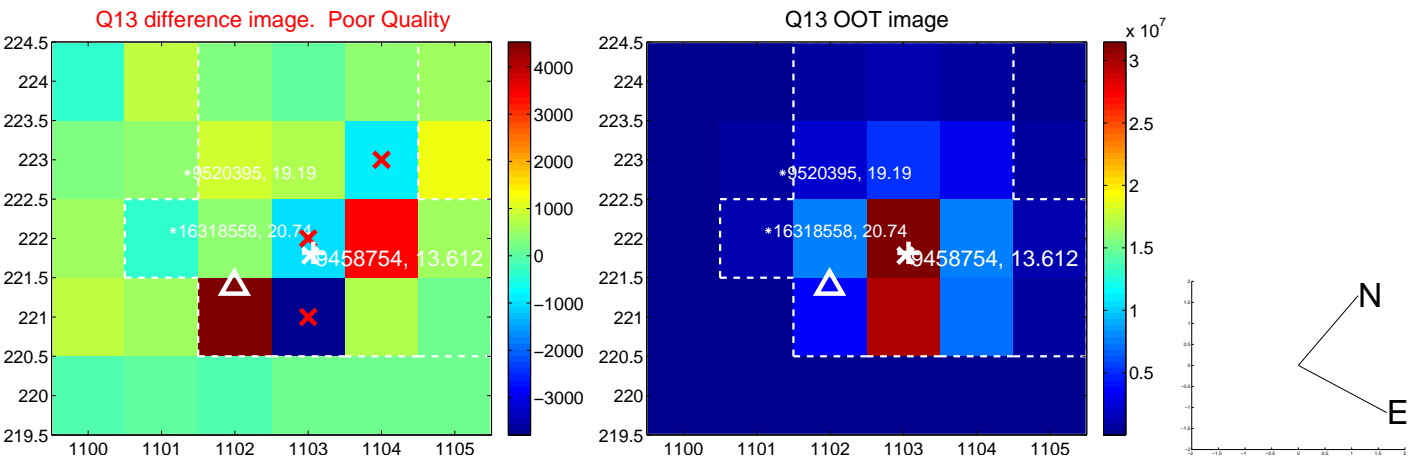
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



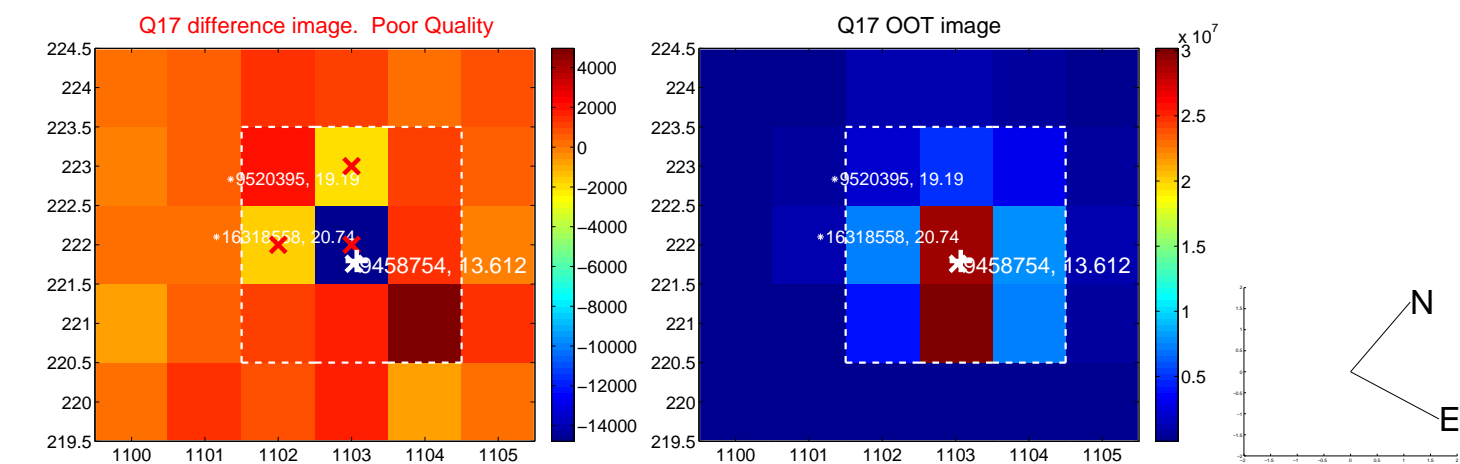
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



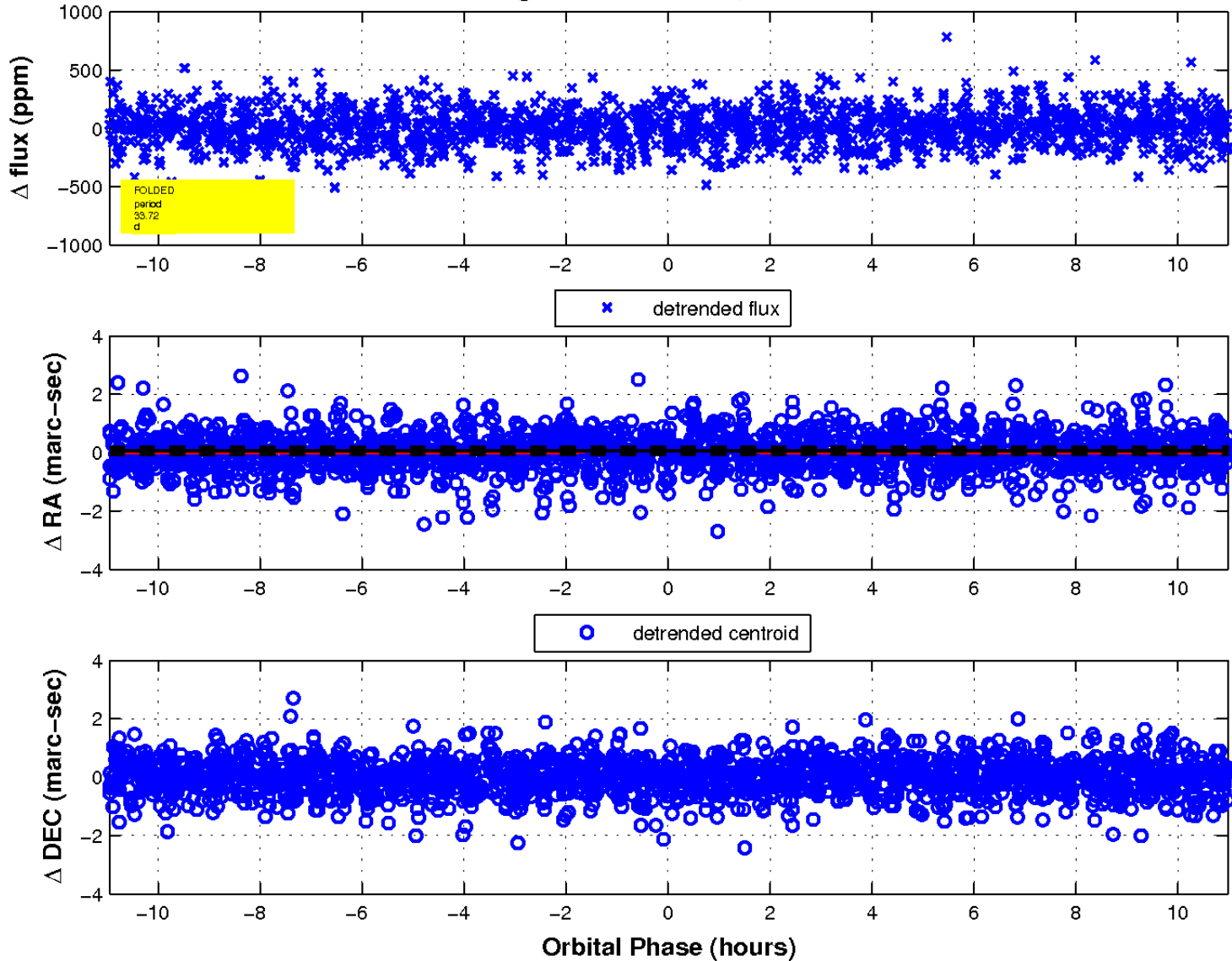
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

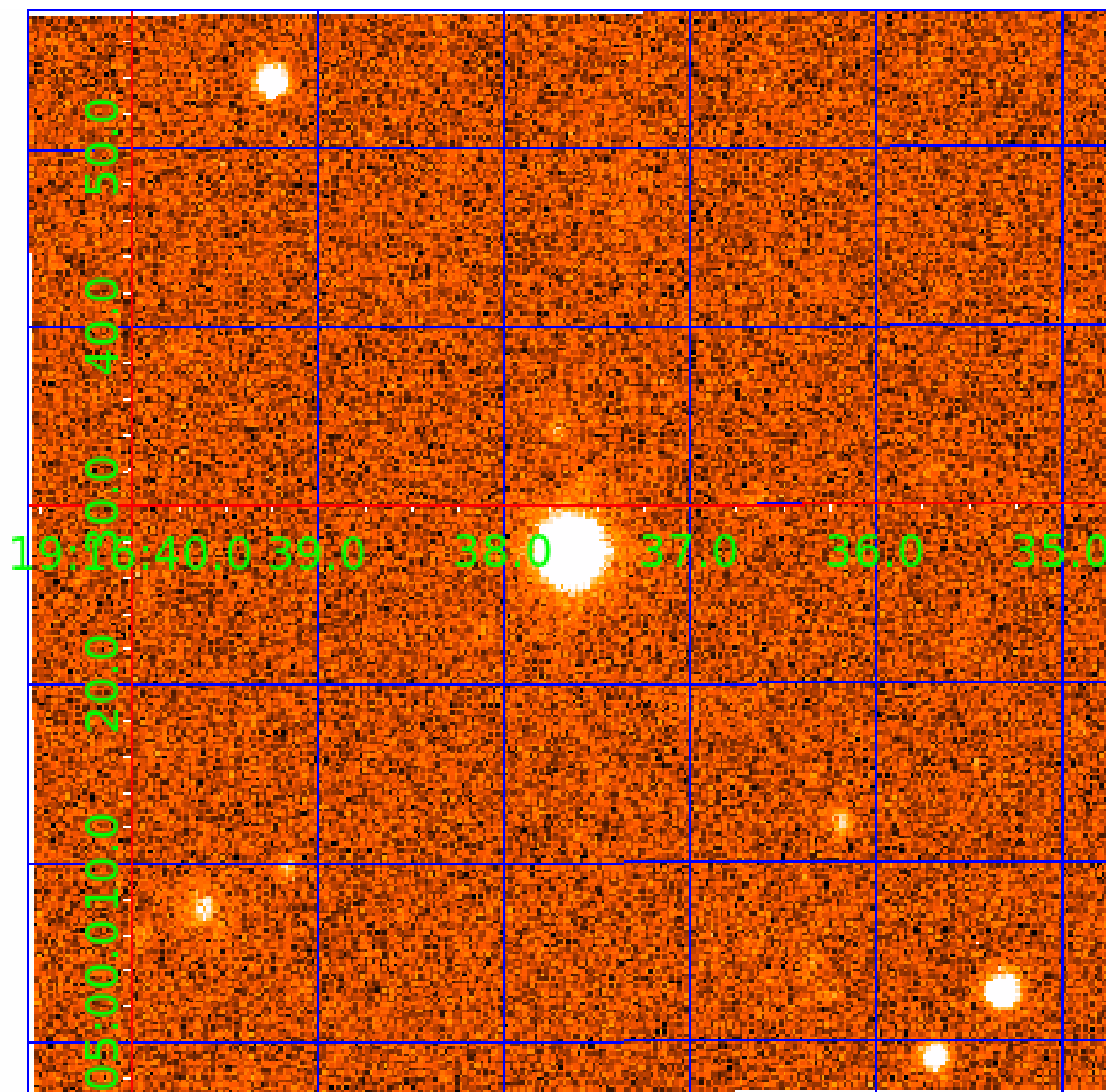


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 009458754

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})
009458754-01	OBS	No	0.970683	132.228528	7.4	6.237	9.0	4.6	1.62	6986	0.45	11727.45
009458754-02	OBS	No	104.146073	147.332925	219.9	5.394	8.5	8.3	1.62	6986	2.66	23.00
009458754-03	OBS	No	33.717281	139.707074	130.2	3.664	8.5	8.0	1.62	6986	2.05	103.47
009458754-04	OBS	No	486.308250	543.165610	275.3	9.252	8.1	7.4	1.62	6986	3.01	2.95

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009458754-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009458754-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009458754-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009458754-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS

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

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

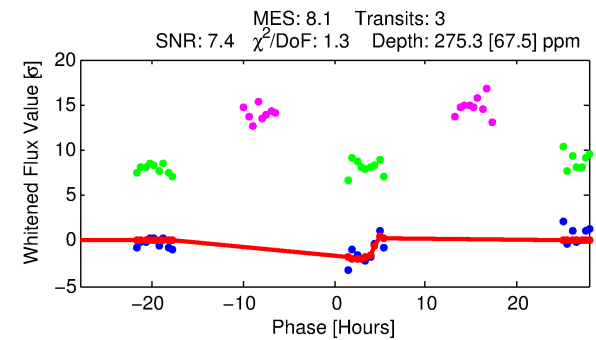
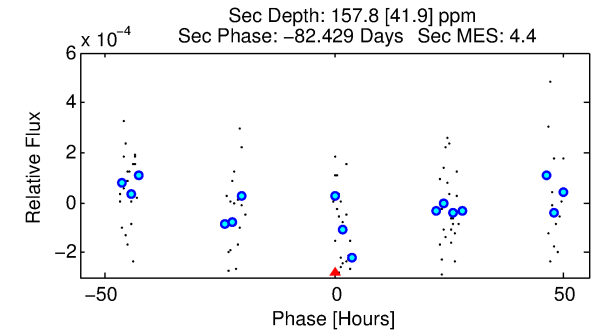
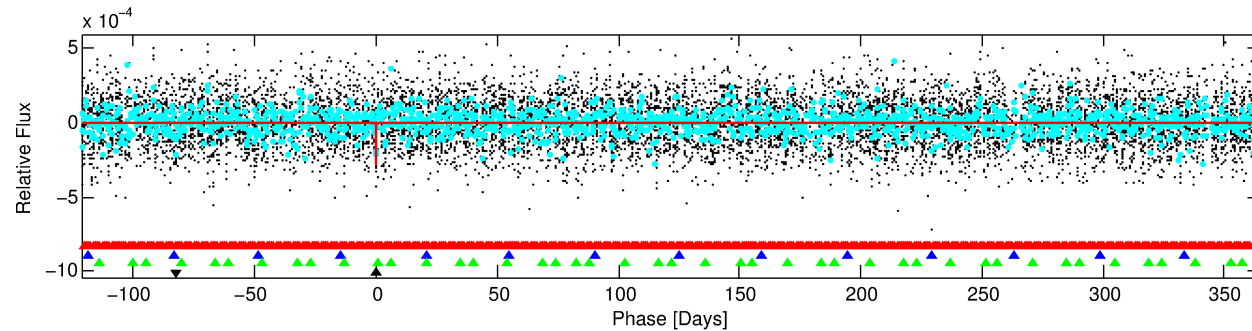
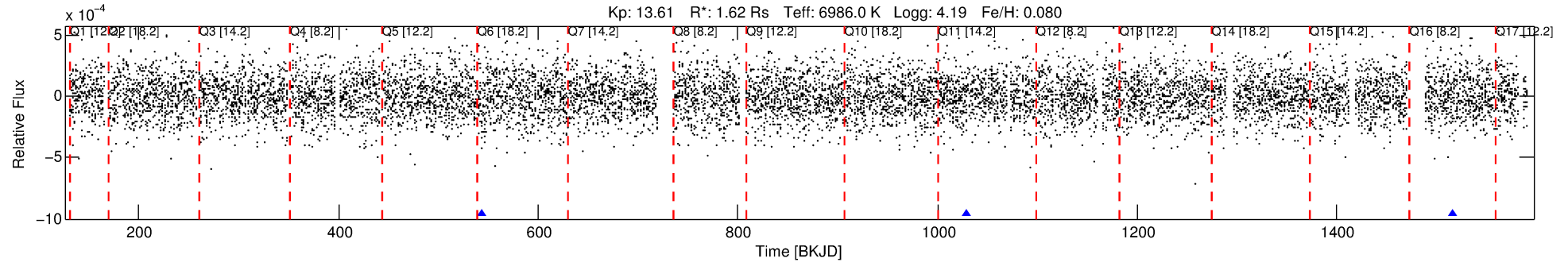
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009458754-04

No Significant Match Found

DV One-Page Summary

KIC: 9458754 Candidate: 4 of 4 Period: 486.308 d

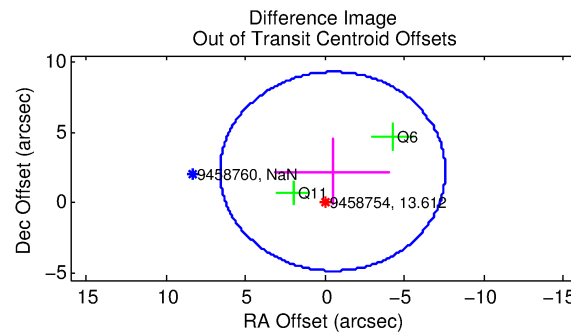
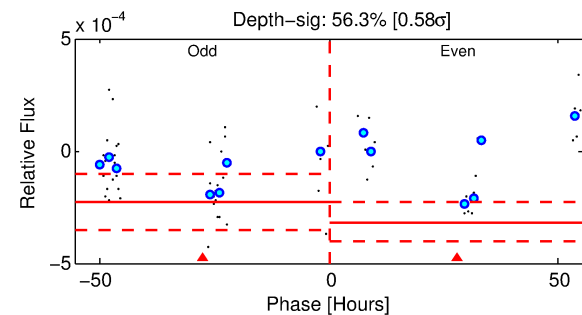
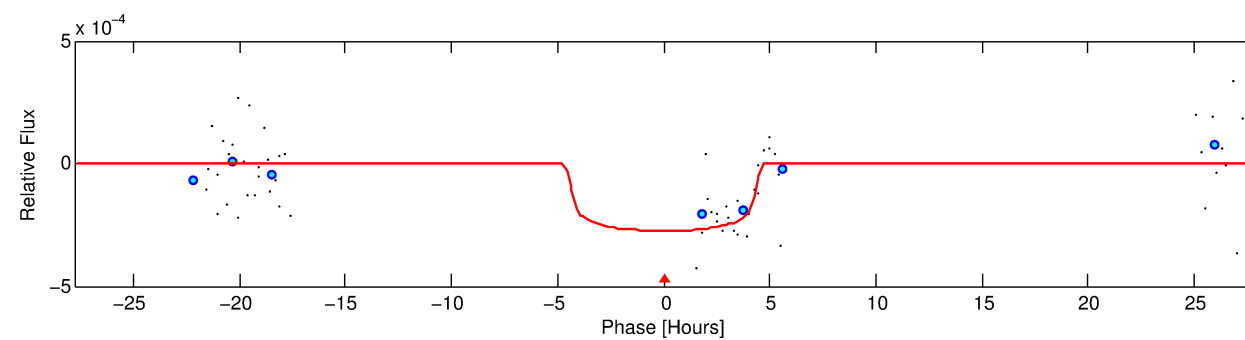


DV Fit Results:

Period = 486.30825 [0.01119] d
Epoch = 543.1656 [0.1594] BKJD
Rp/R* = 0.0170 [0.0142]
a/R* = 232.12 [1242.30]
b = 0.84 [1.63]
Seff = 2.95 [1.27]
Teff = 334 [36] K
Rp = 3.01 [2.70] Re
a = 1.3776 [0.3830] AU
Ag = 18212.95 [31499.82] [0.58σ]
Teffp = 6001 [2540] K [2.23σ]

DV Diagnostic Results:

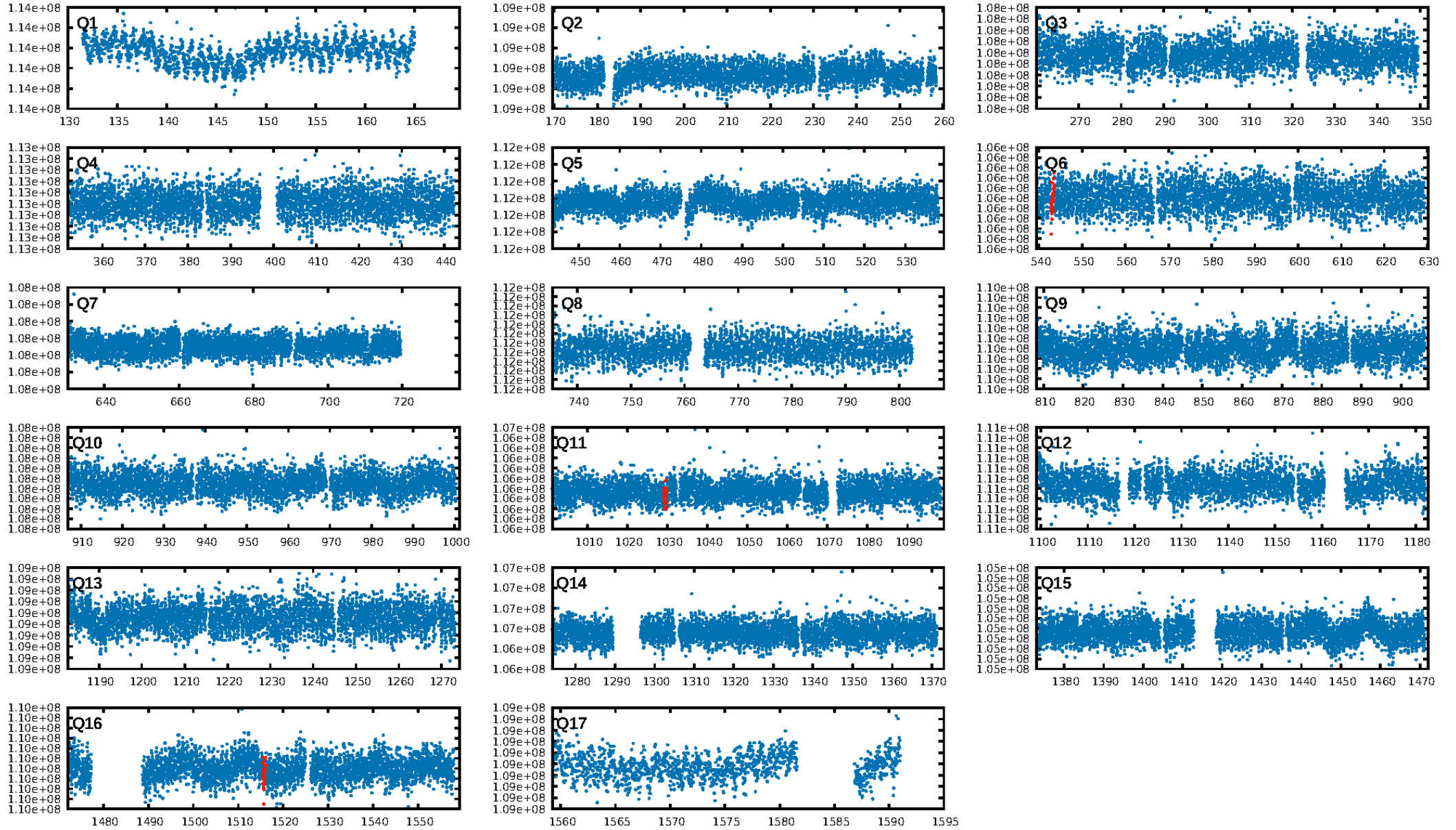
ShortPeriod-sig: 100.0% [856.41σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 76.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.09e-07
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.386
Centroid-sig: N/A
Centroid-so: 1.638 arcsec [1.78σ]
OotOffset-rm: 2.288 arcsec [0.97σ]
KicOffset-rm: 2.298 arcsec [0.92σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 0.00 [0/2]



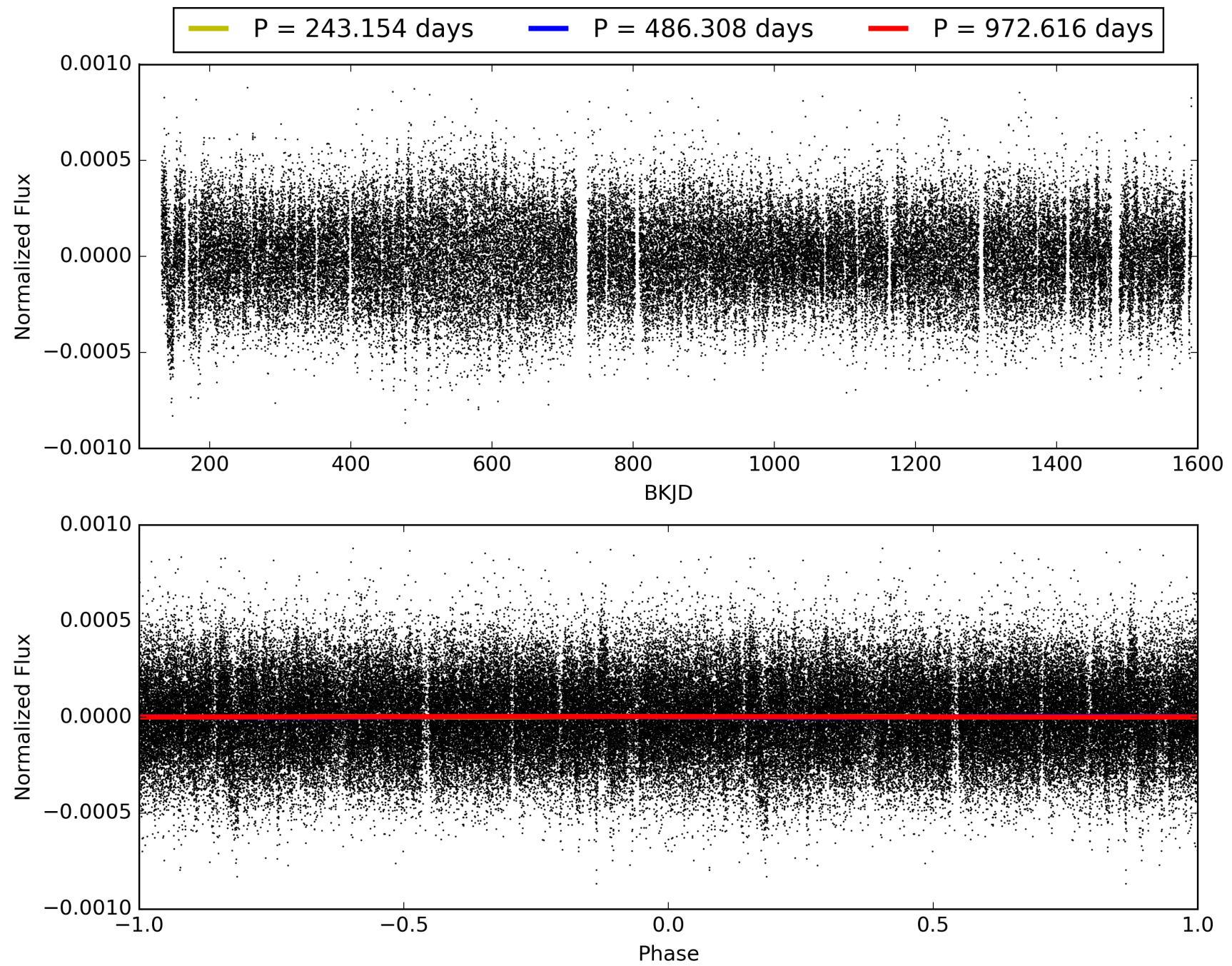
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:19:36 Z

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

TCE 009458754-04, PDC Light Curves

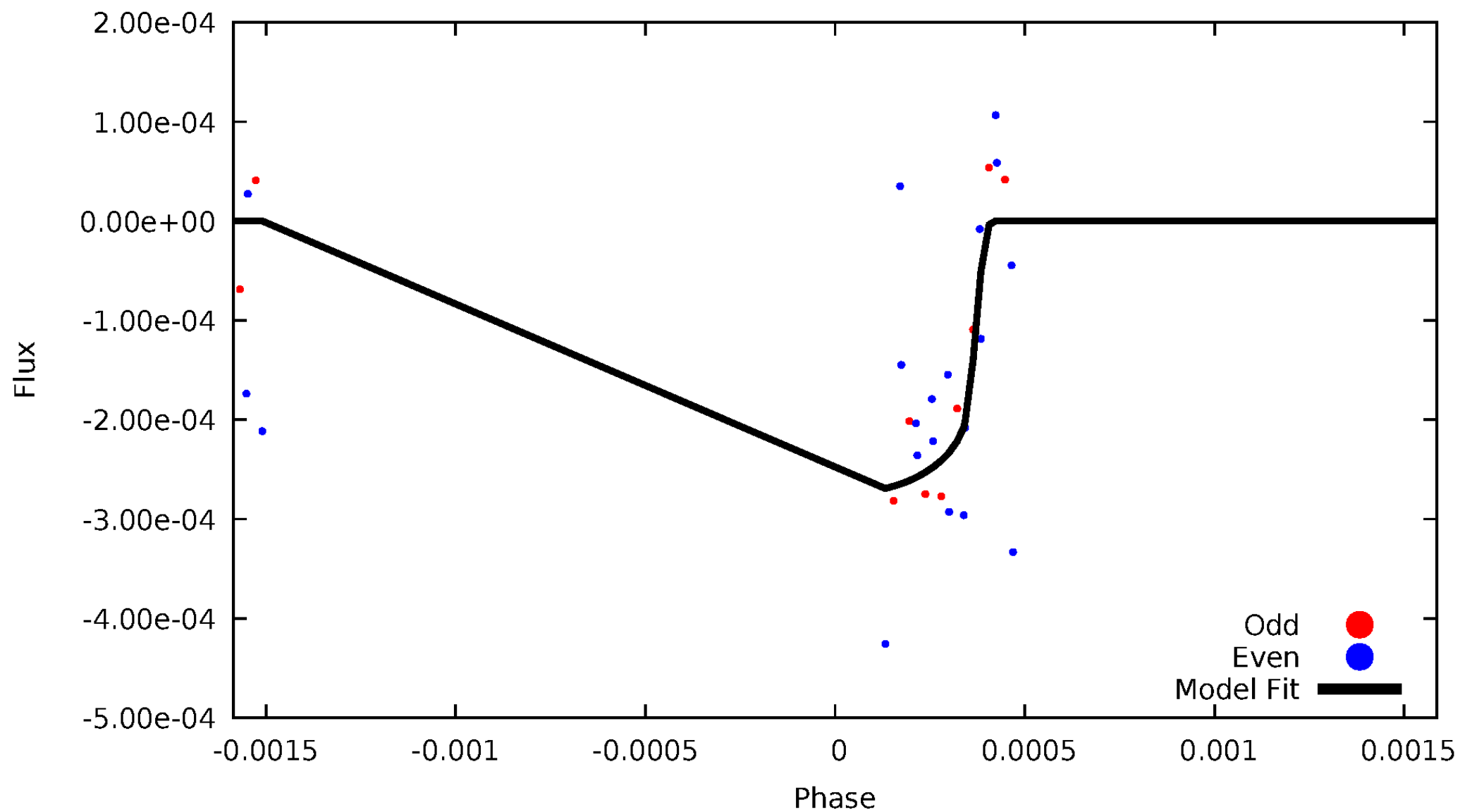


TCE 009458754-04



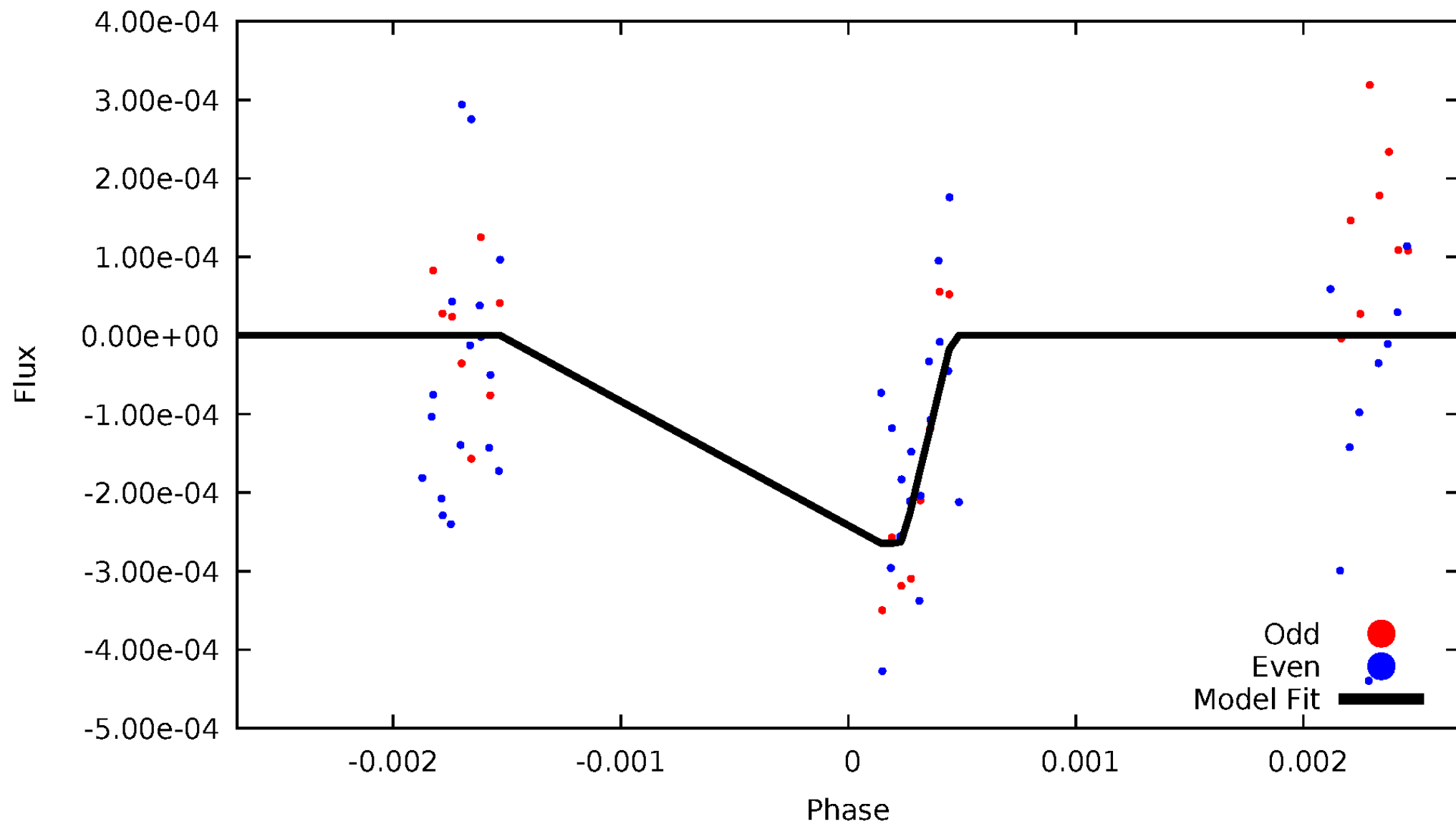
DV Odd/Even

TCE 009458754-04



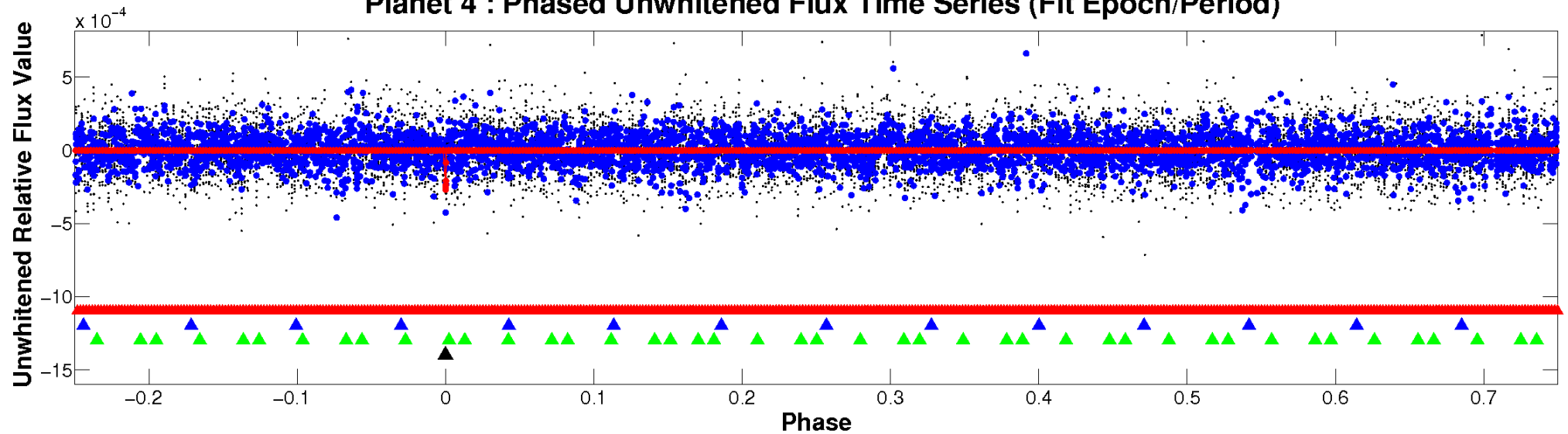
ALT Odd/Even

TCE 009458754-04

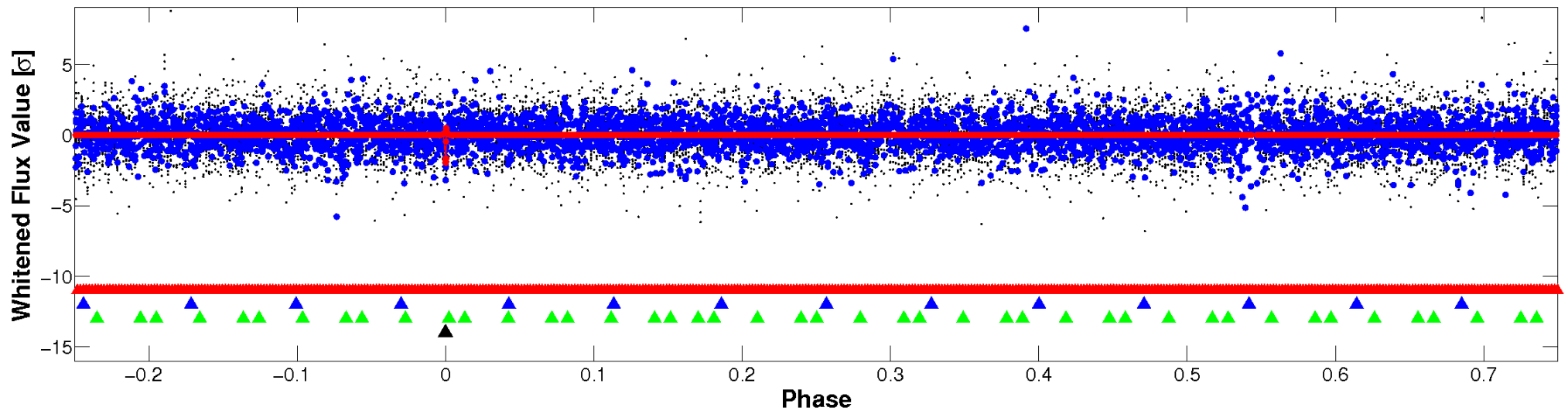


Non-Whitened Vs. Whitened Light Curve

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

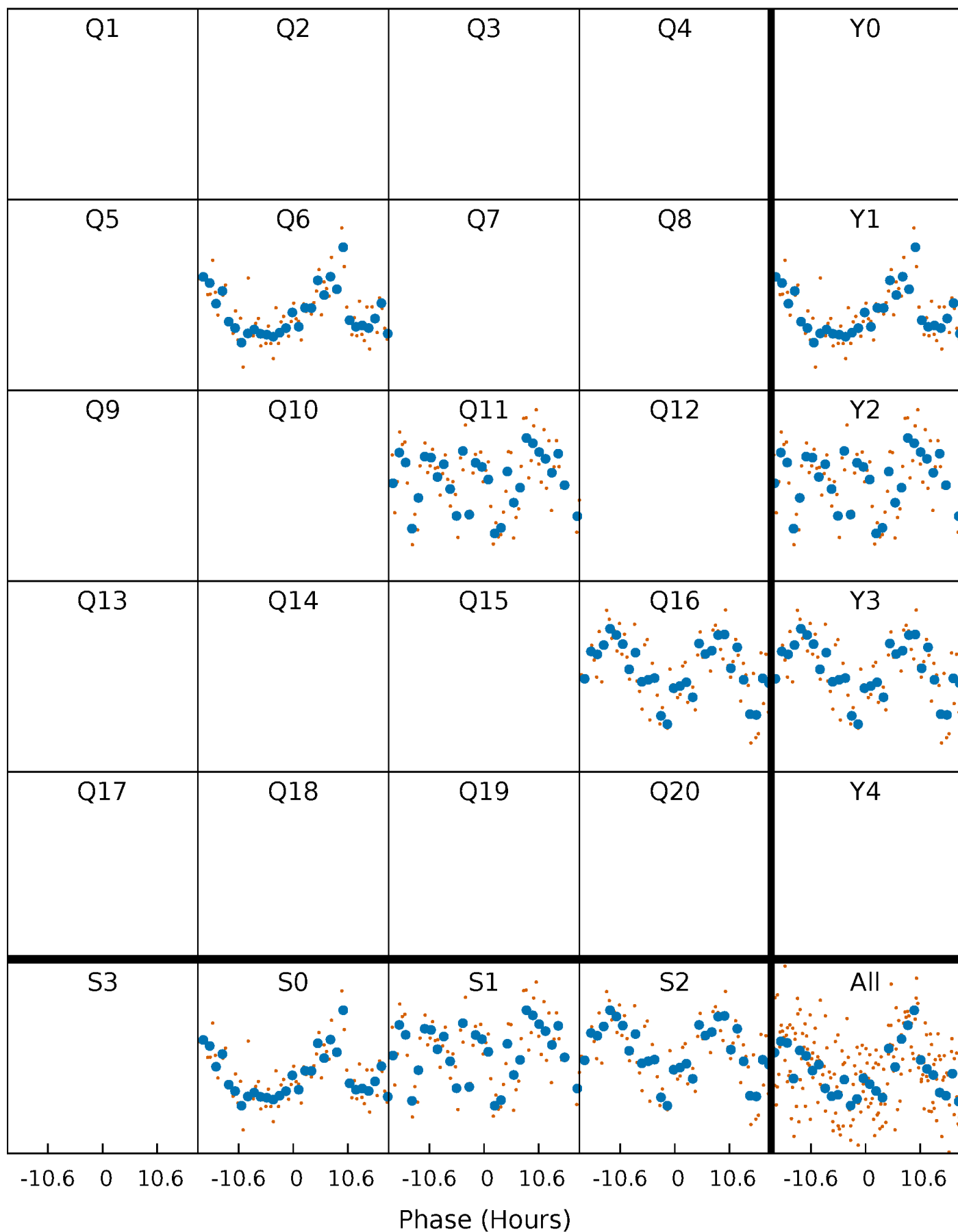


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



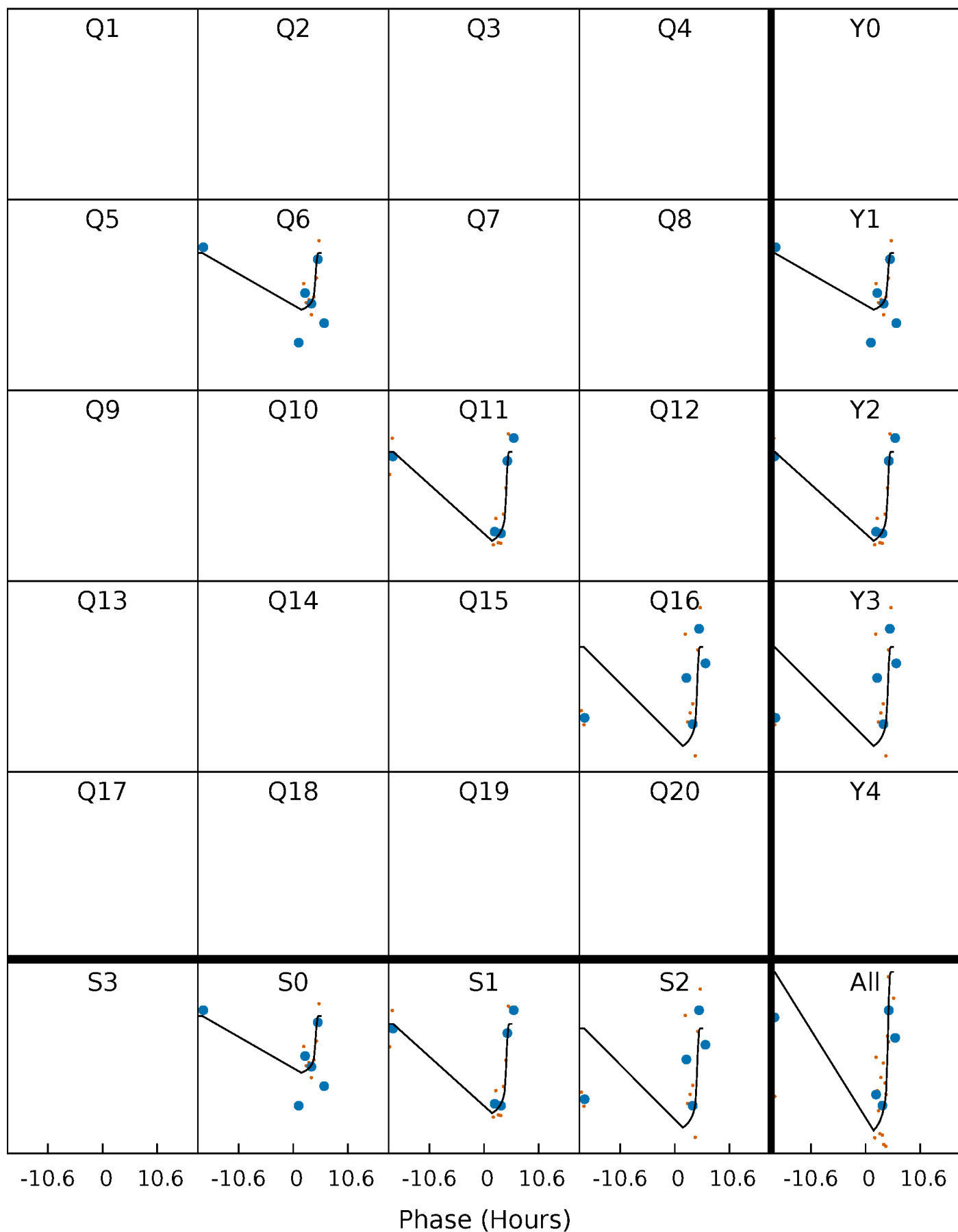
PDC Quarter-Phased Transit Curves

TCE 009458754-04 P=486.308250 Days $T_0=543.165610$ (BKJD)



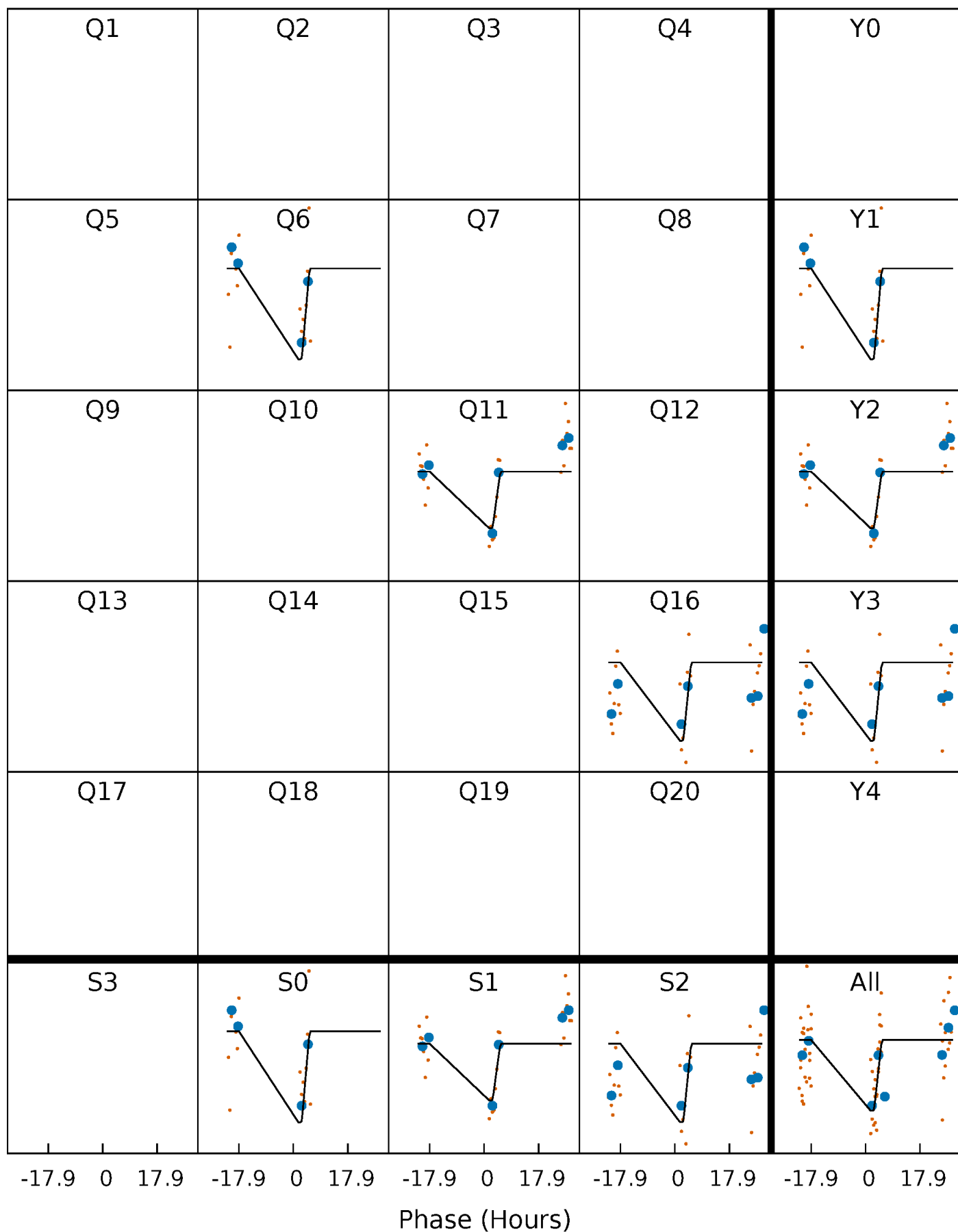
DV Quarter-Phased Transit Curves

TCE 009458754-04 $P=486.308250$ Days $T_0=543.165610$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

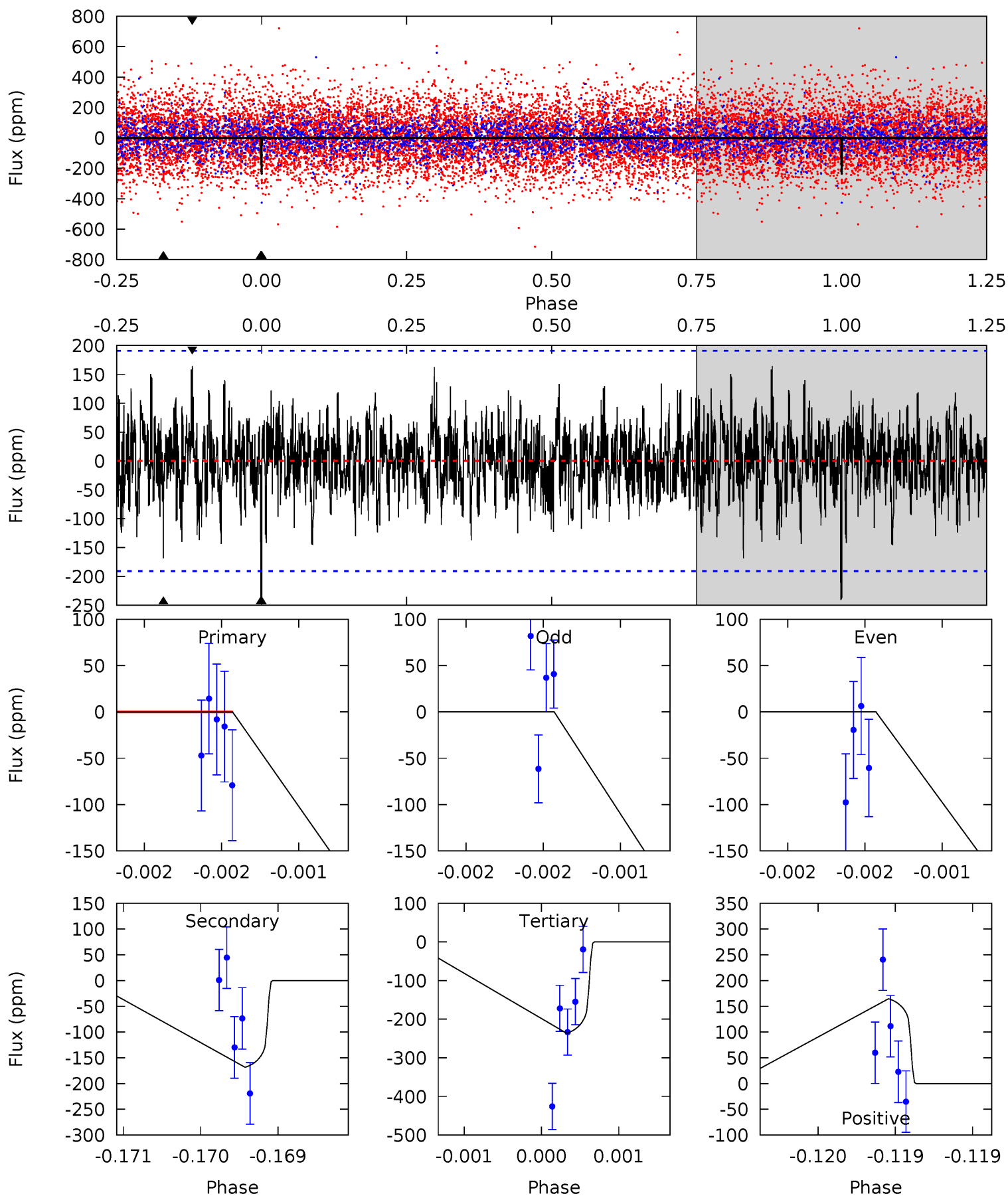
TCE 009458754-04 P=486.318927 Days $T_0=543.157256$ (BKJD)



DV Model-Shift Uniqueness Test

009458754-04, P = 486.308250 Days, E = 56.857360 Days

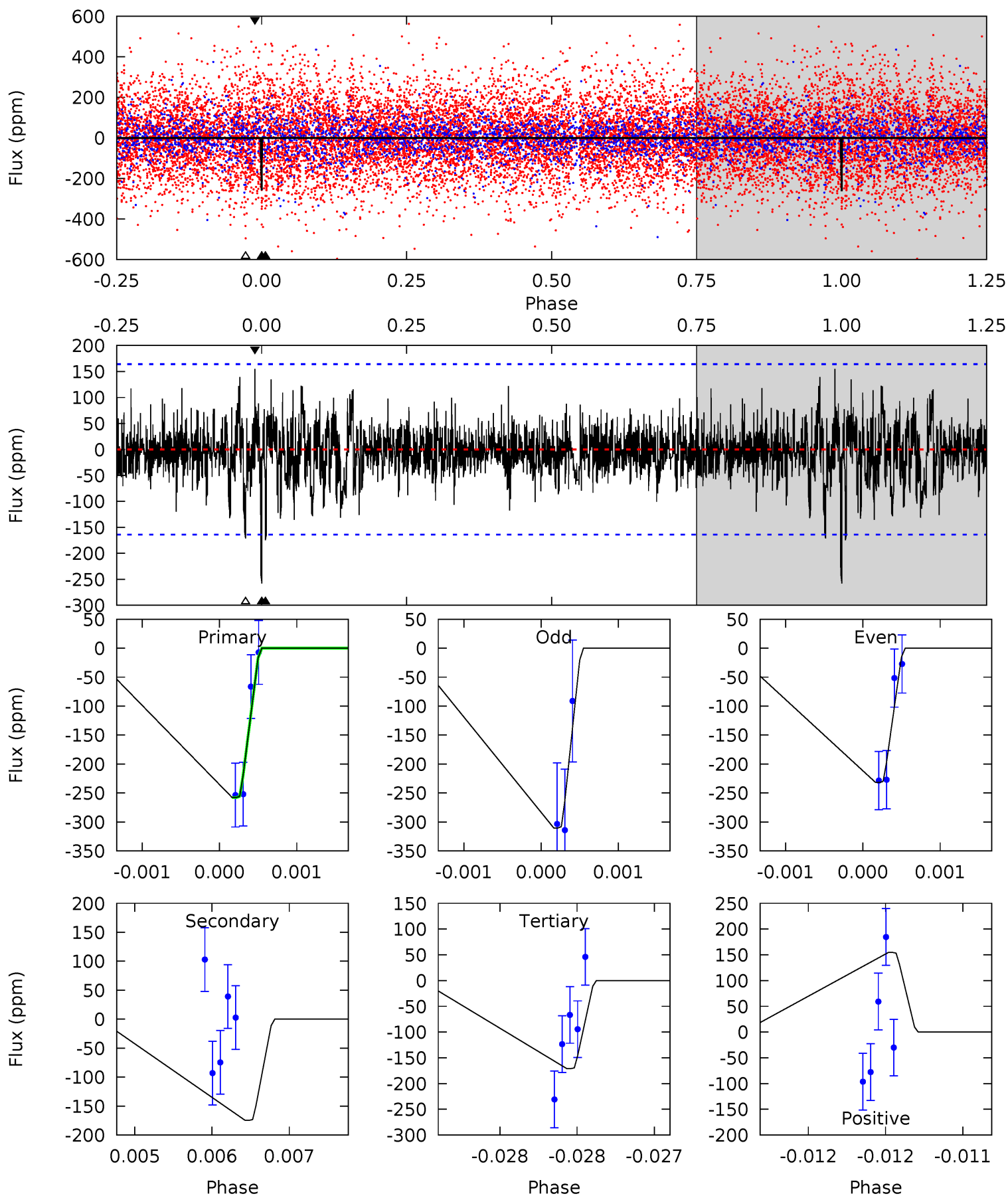
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.92	4.85	6.81	4.74	5.49	3.35	1.36	0.11	2.18	-1.96	0.11	0.40	0.90	0.41	0



Alt Model-Shift Uniqueness Test

009458754-04, P = 486.318927 Days, E = 56.838329 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.60	5.82	5.70	5.16	5.47	3.32	1.27	2.90	3.45	0.12	0.67	1.26	1.10	0.37	0



Stellar Parameters For KIC 009458754

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6986^{+194}_{-305}	$4.188^{+0.105}_{-0.210}$	$0.080^{+0.200}_{-0.350}$	$1.619^{+0.550}_{-0.254}$	$1.475^{+0.207}_{-0.231}$	$0.489^{+0.252}_{-0.262}$
	+3%/-4%	+3%/-5%	+250%/-438%	+34%/-16%	+14%/-16%	+51%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009458754-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-168 ± 35	$3.45^{+2.59}_{-2.06}$	471^{+38}_{-31}	5701^{+4004}_{-1209}	13855^{+78415}_{-9209}
Alt.	-175 ± 30	$3.41^{+2.41}_{-2.12}$	467^{+36}_{-27}	5796^{+4462}_{-1235}	15273^{+96981}_{-10161}

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

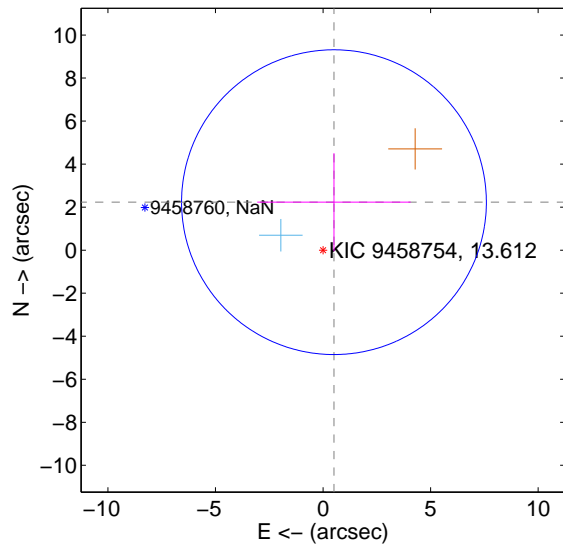
Supplemental centroid analysis for 009458754-04. Kepler magnitude: 13.61. Transit SNR 7.40

There are 1 quarters with good PRF difference image offsets

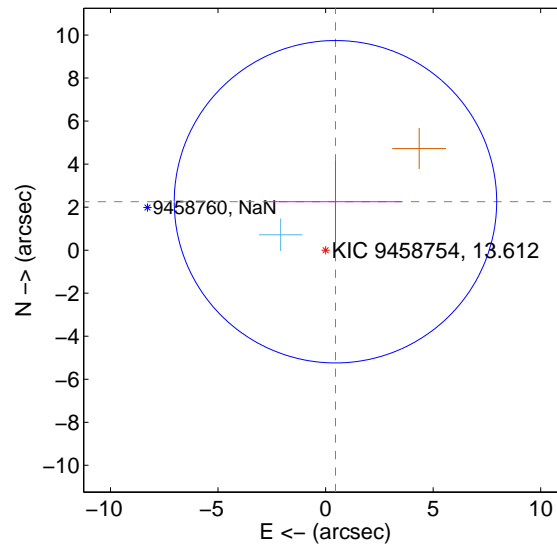
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.288 ± 2.361	0.97	-0.508 ± 3.568	2.231 ± 2.281
PRF-fit source offset from KIC position	2.298 ± 2.498	0.92	-0.459 ± 3.082	2.251 ± 1.921
photometric centroid source offset	1.64 ± 0.92	1.78	-0.04 ± 1.03	1.64 ± 0.92

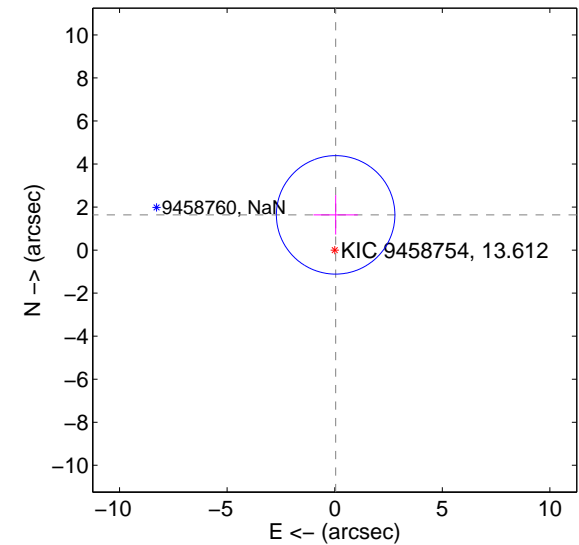
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

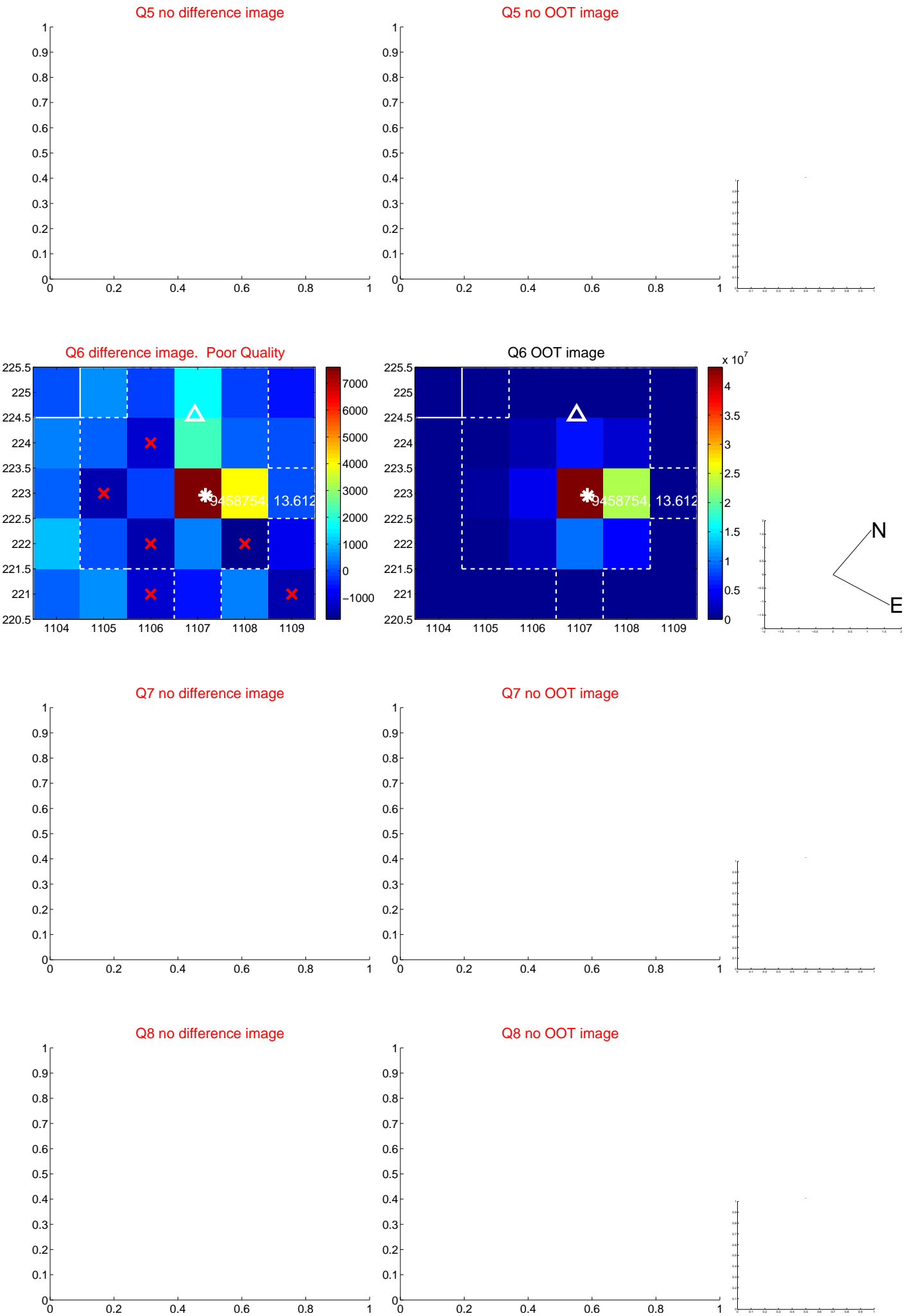


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

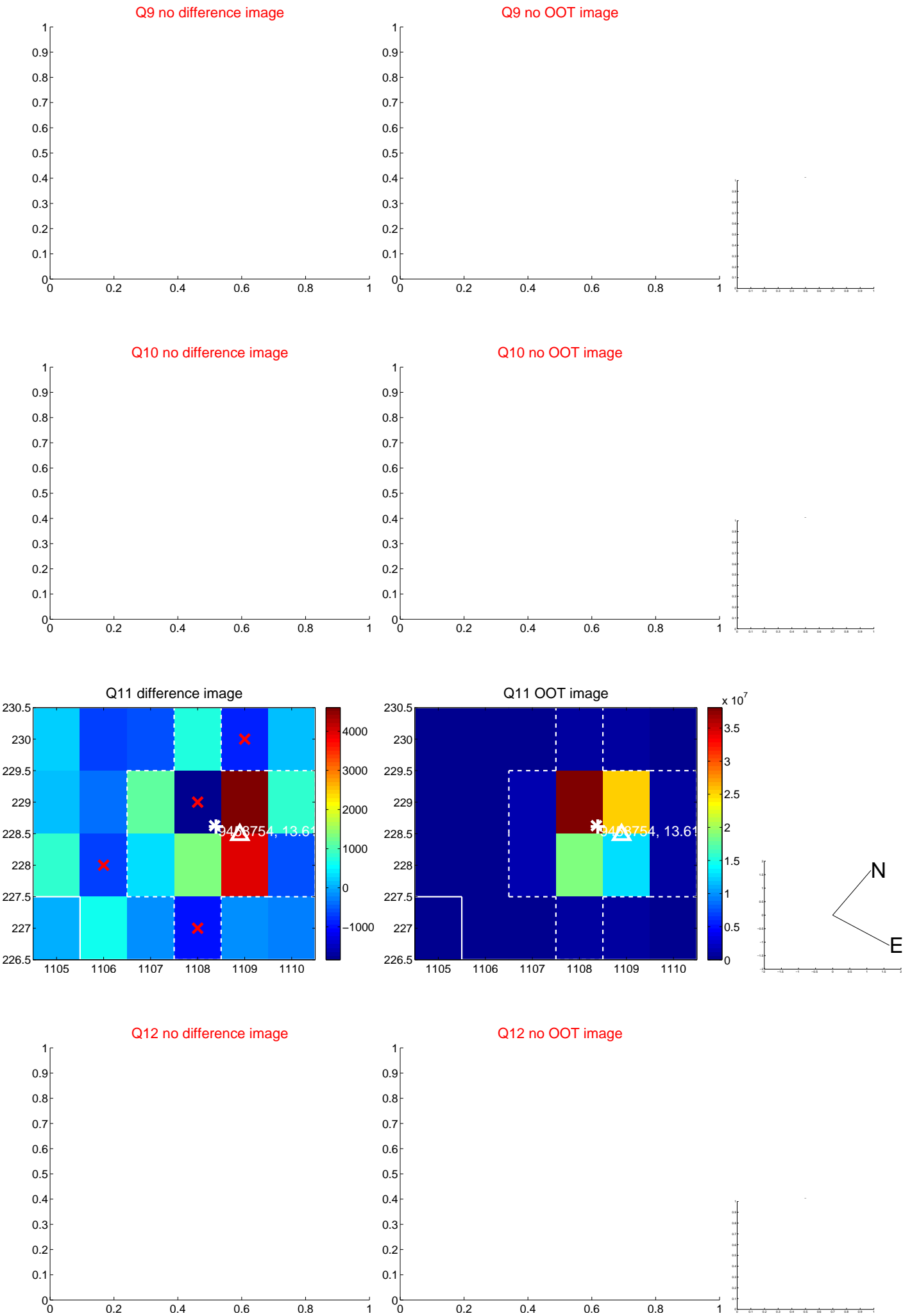
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



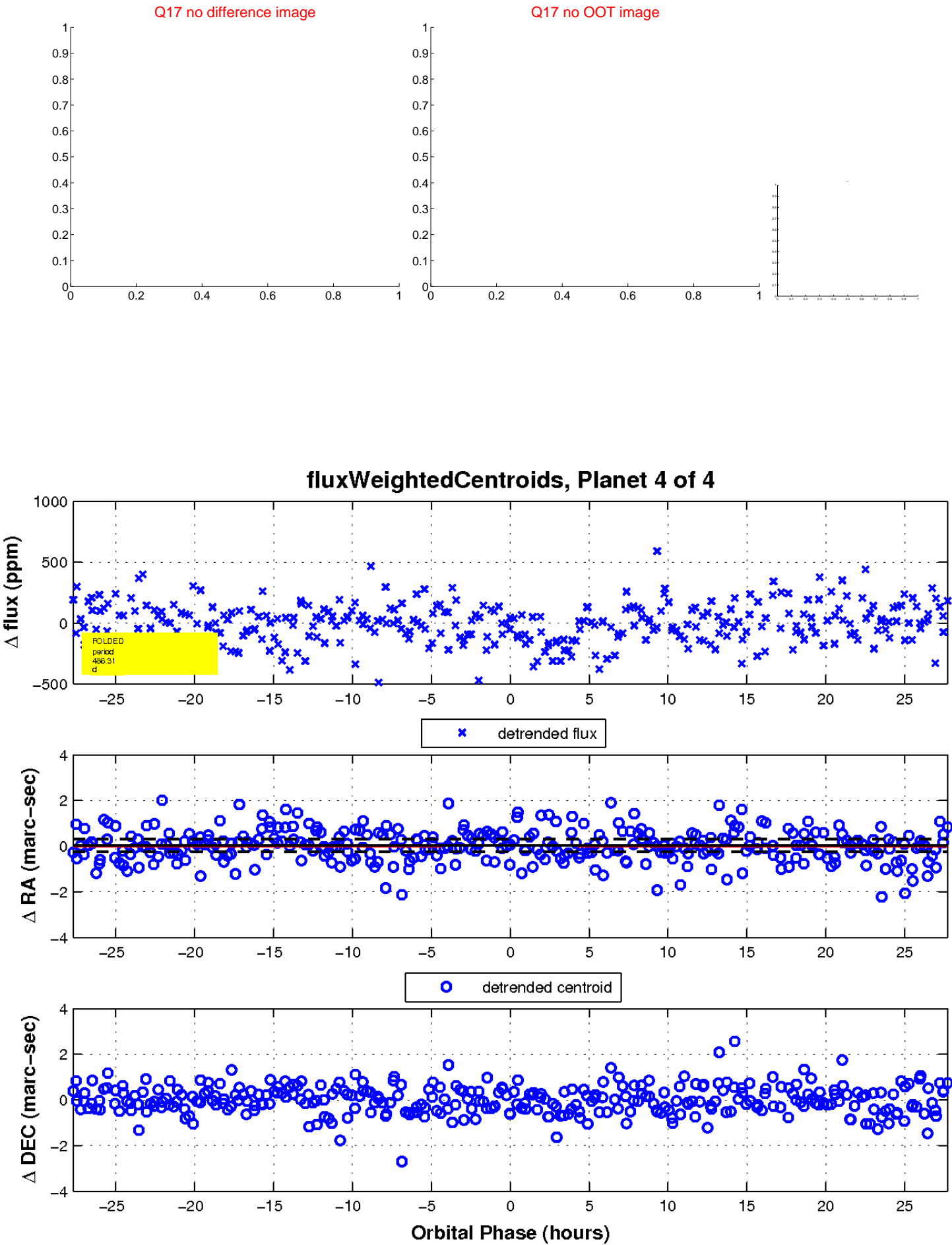
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

