

# KIC 005217288

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005217288-01	OBS	No	0.936057	131.856586	45.3	6.813	8.3	9.6	0.70	5825	0.49	1705.69
005217288-02	OBS	No	21.230421	139.450177	967.0	1.607	12.3	13.5	0.70	5825	2.27	26.57
005217288-03	OBS	No	28.406012	144.686705	832.5	1.710	11.0	11.8	0.70	5825	2.20	18.02
005217288-04	OBS	No	18.360603	147.173848	798.9	0.982	11.5	8.4	0.70	5825	2.03	32.24
005217288-05	OBS	No	46.587378	153.342544	790.5	1.932	9.7	10.3	0.70	5825	2.10	9.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005217288-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005217288-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005217288-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005217288-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005217288-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

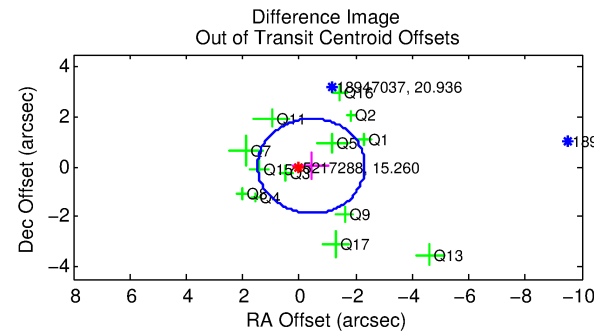
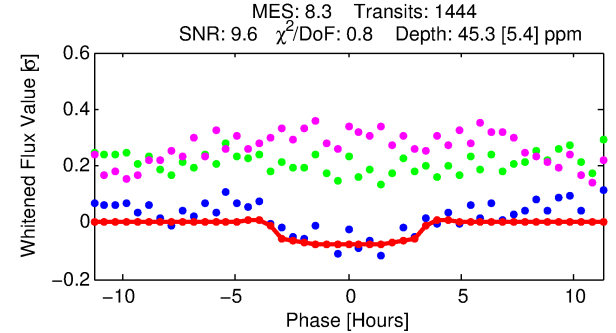
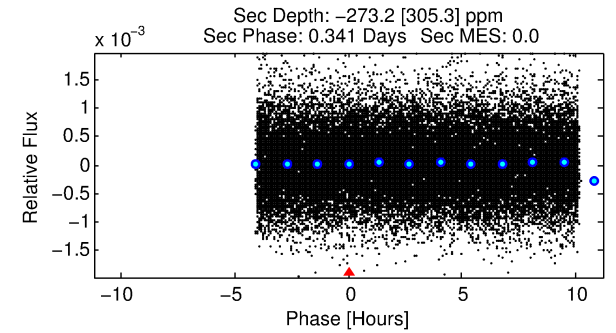
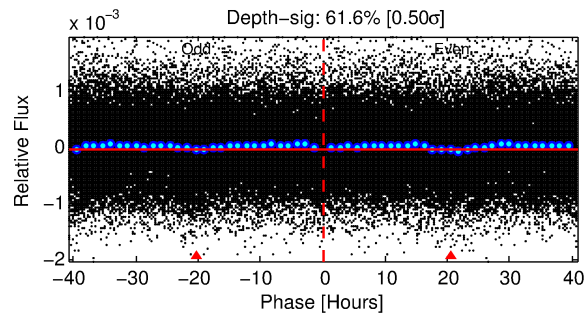
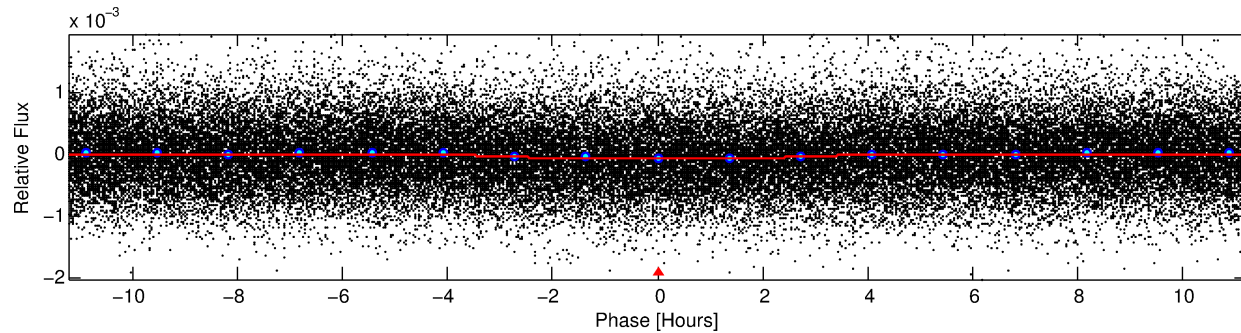
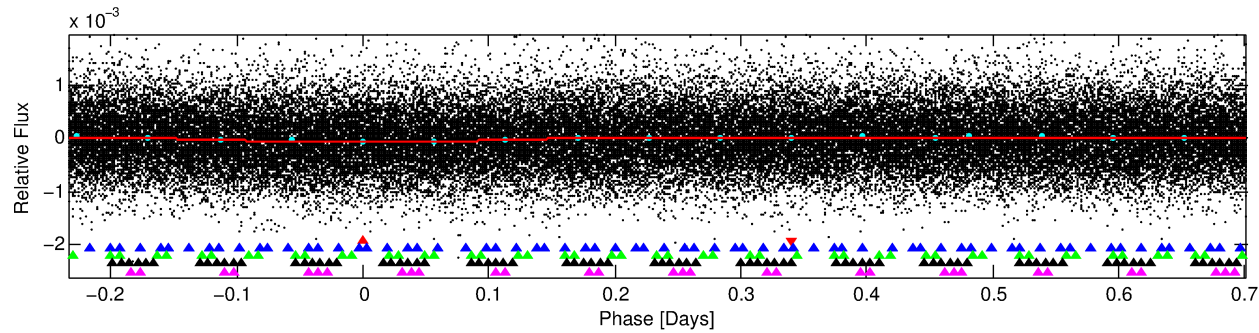
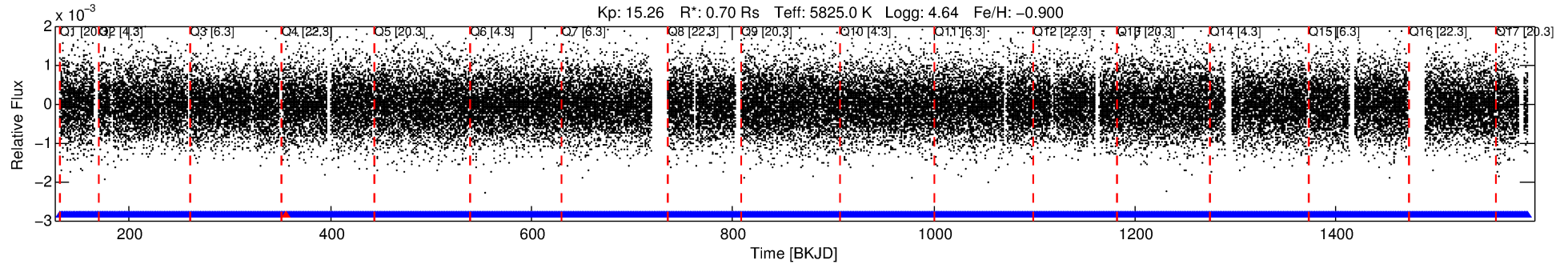
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005217288-01

No Significant Match Found

# DV One-Page Summary

KIC: 5217288 Candidate: 1 of 5 Period: 0.936 d



## DV Fit Results:

Period = 0.93606 [0.00002] d  
Epoch = 131.8566 [0.0072] BKJD  
Rp/R\* = 0.0065 [0.0085]  
a/R\* = 1.16 [2.03]  
b = 0.60 [7.46]  
Seff = 1705.69 [439.95]  
Teq = 1639 [106] K  
Rp = 0.49 [0.66] Re  
a = 0.0173 [0.0026] AU  
Ag = N/A  
Teffp = N/A

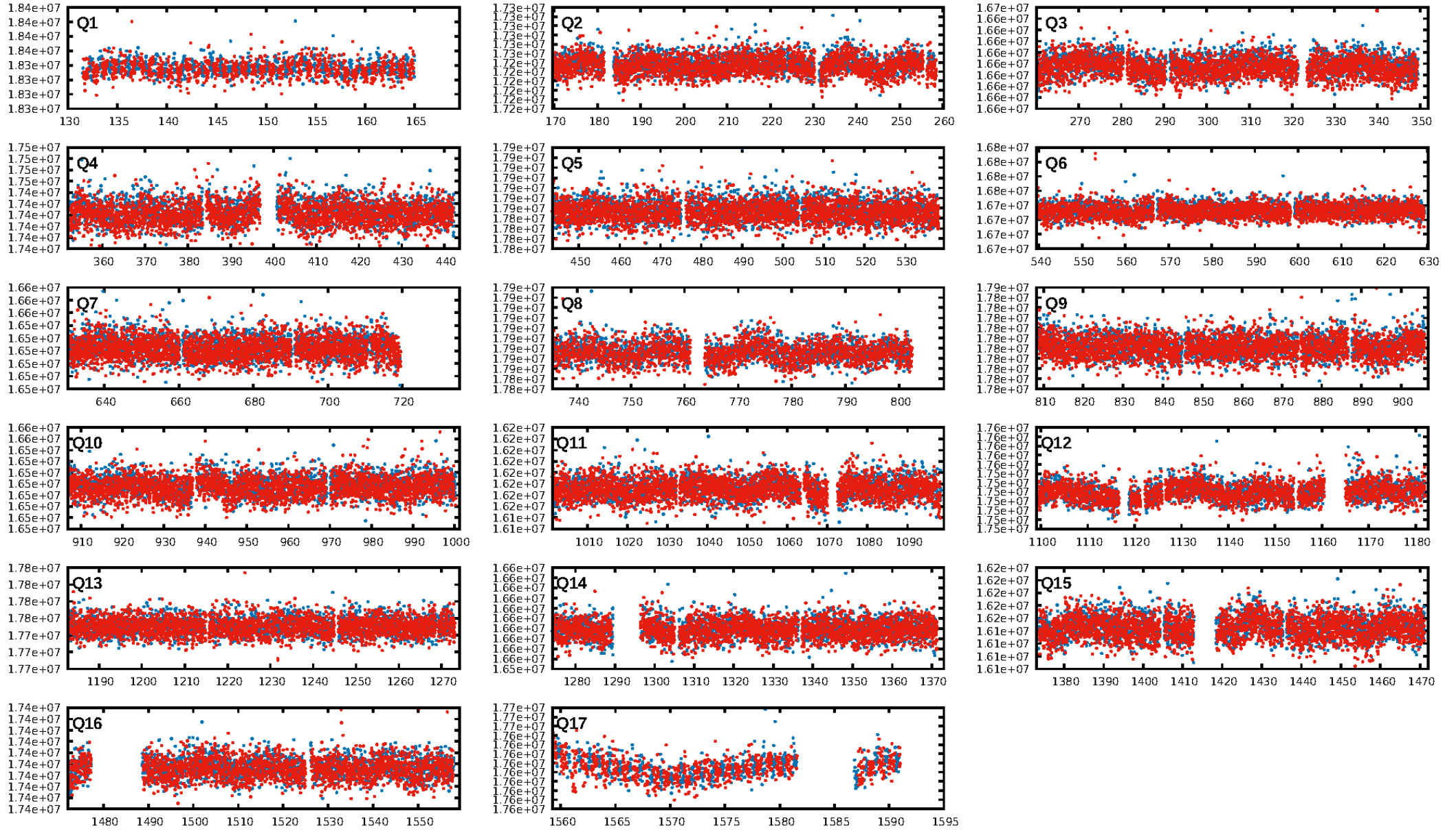
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [60.75 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.02e-22  
RollingBand-fgt: 1.00 [1379/1380]  
GhostDiagnostic-chr: 1.676  
Centroid-sig: 0.3%  
Centroid-so: 1.465 arcsec [1.31 $\sigma$ ]  
OotOffset-rm: 0.425 arcsec [0.67 $\sigma$ ]  
KicOffset-rm: 0.247 arcsec [0.47 $\sigma$ ]  
OotOffset-st: 1/4/3/5 [13]  
KicOffset-st: 1/4/3/5 [13]  
DiffImageQuality-fgm: 0.77 [10/13]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:52:59 Z

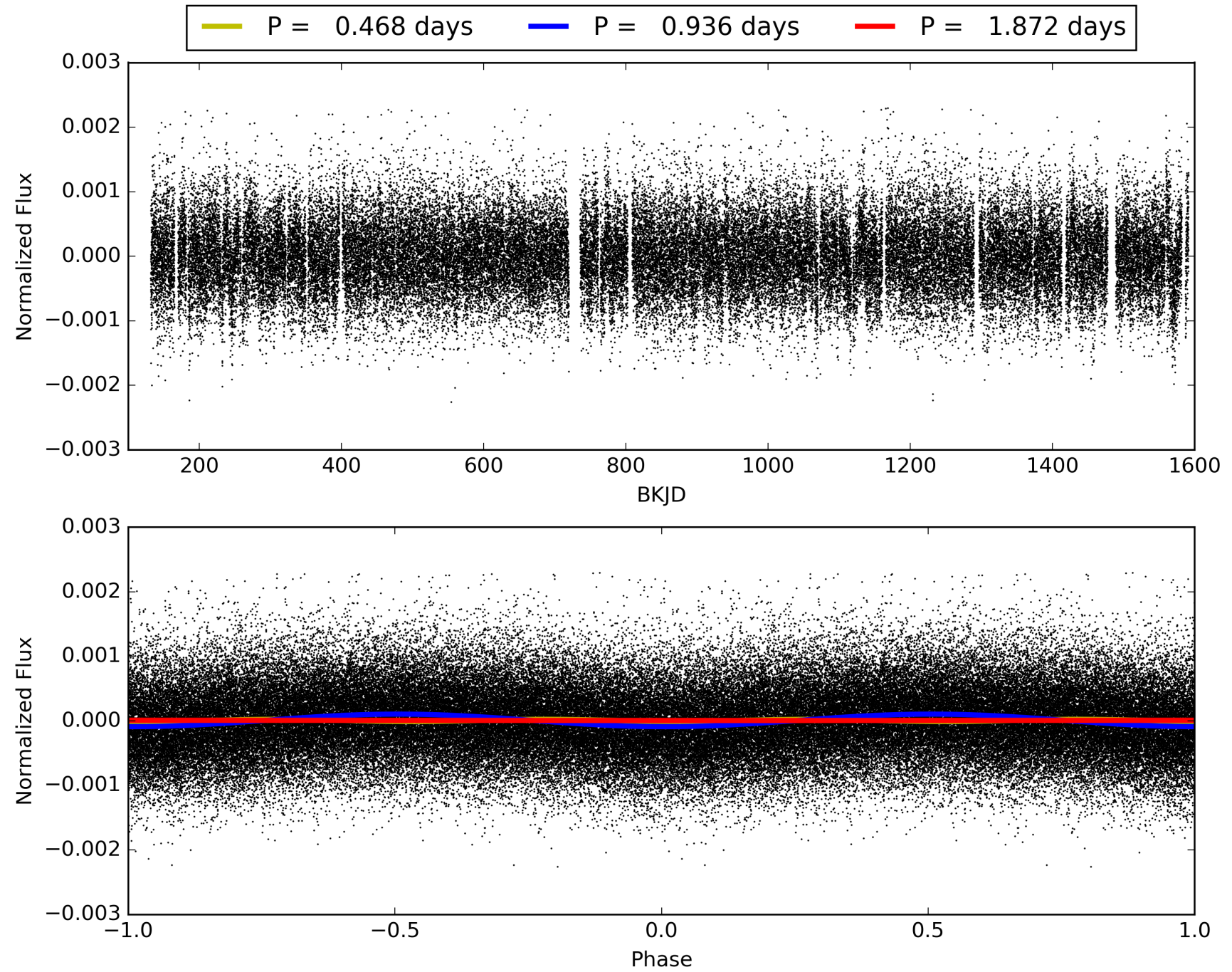
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005217288-01, PDC Light Curves





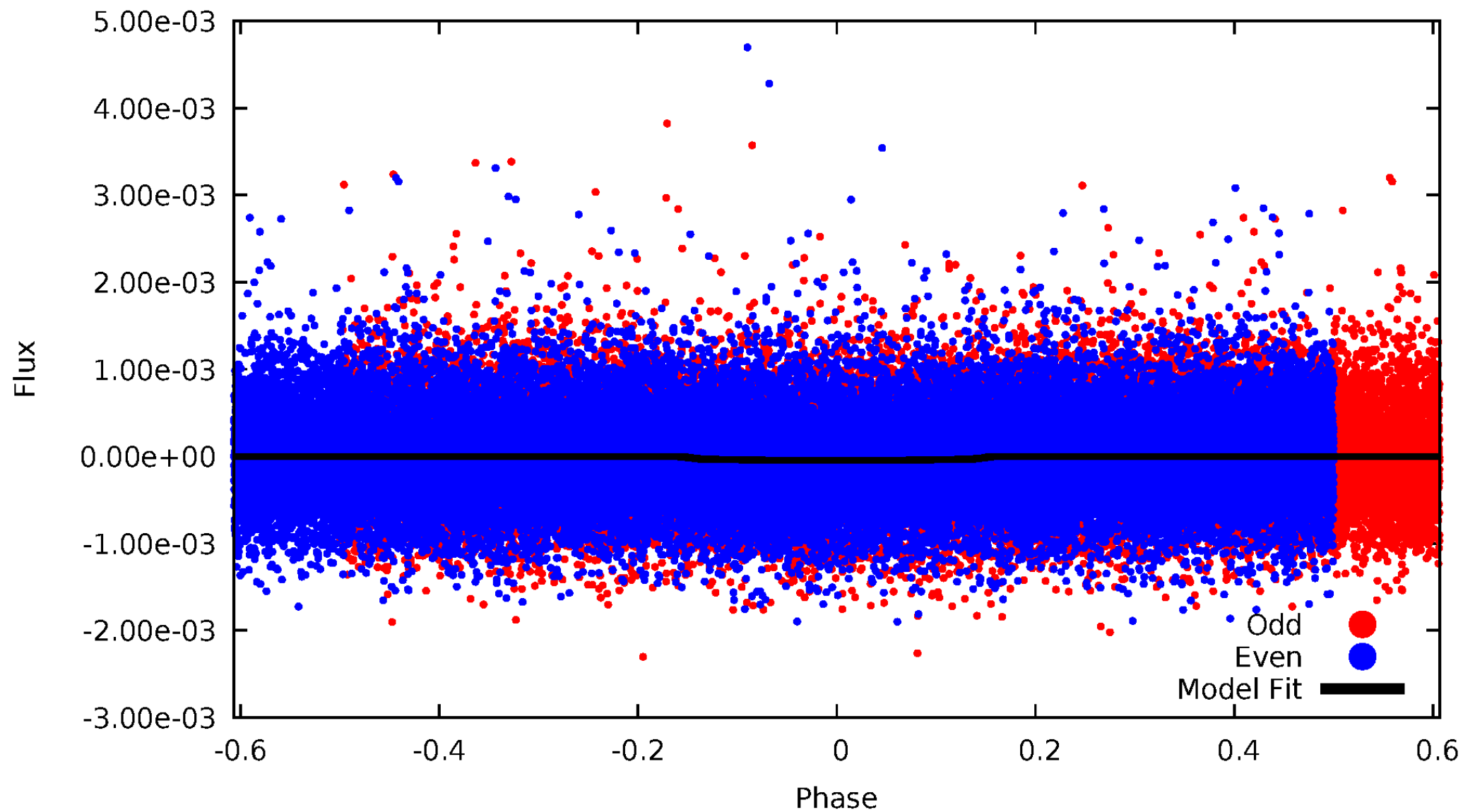
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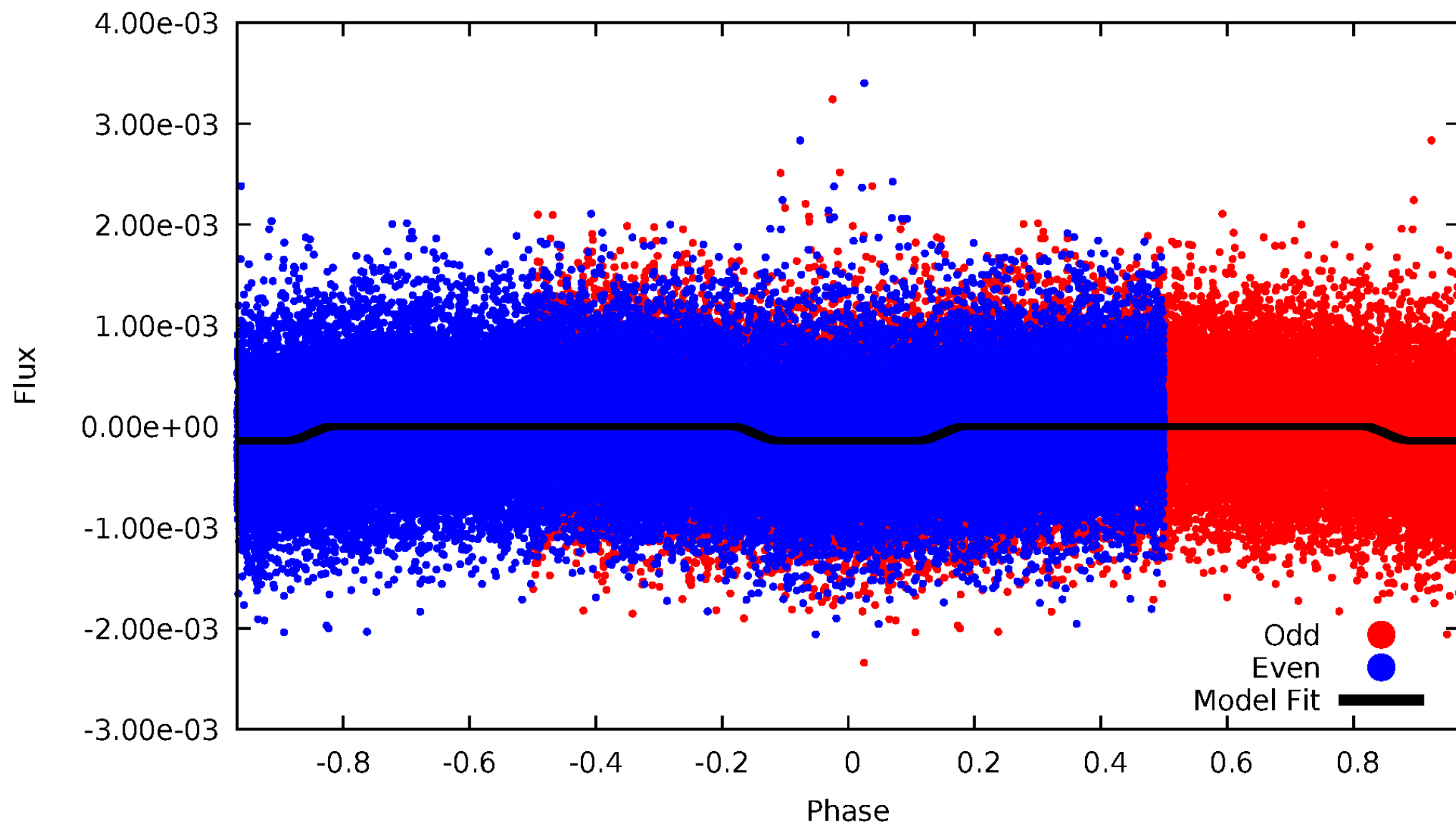
# DV Odd/Even

TCE 005217288-01

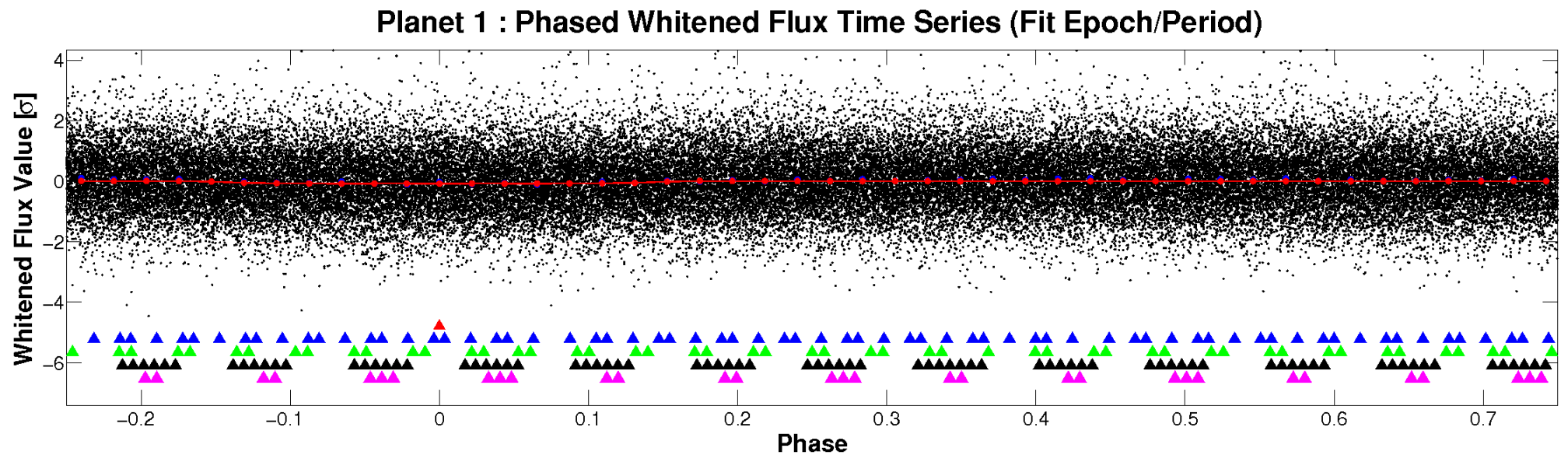
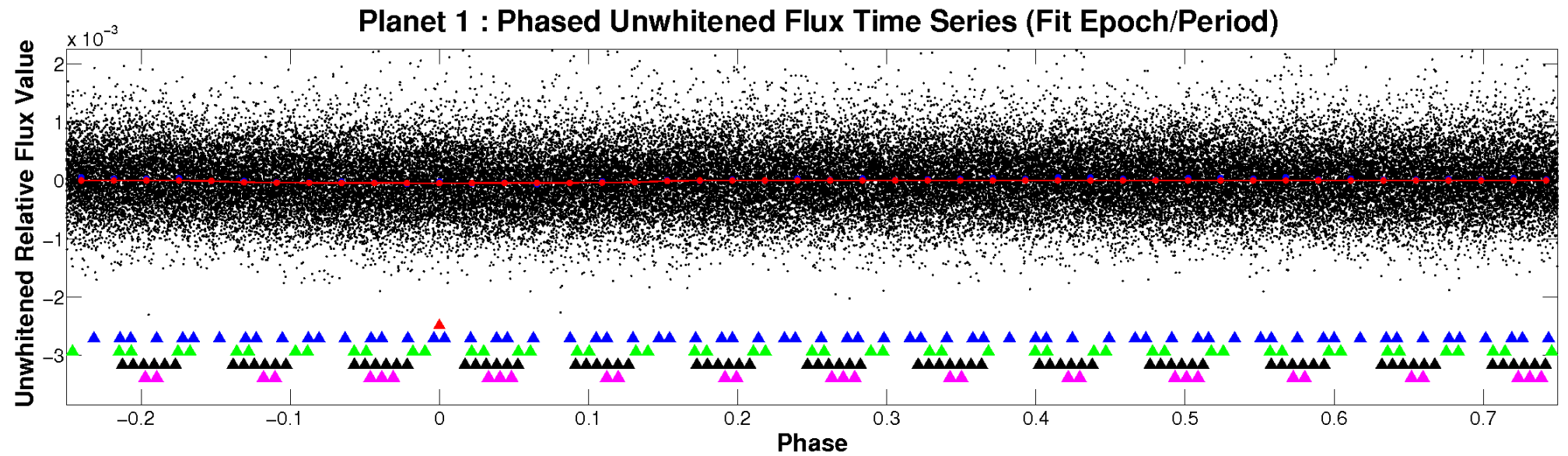


# ALT Odd/Even

TCE 005217288-01



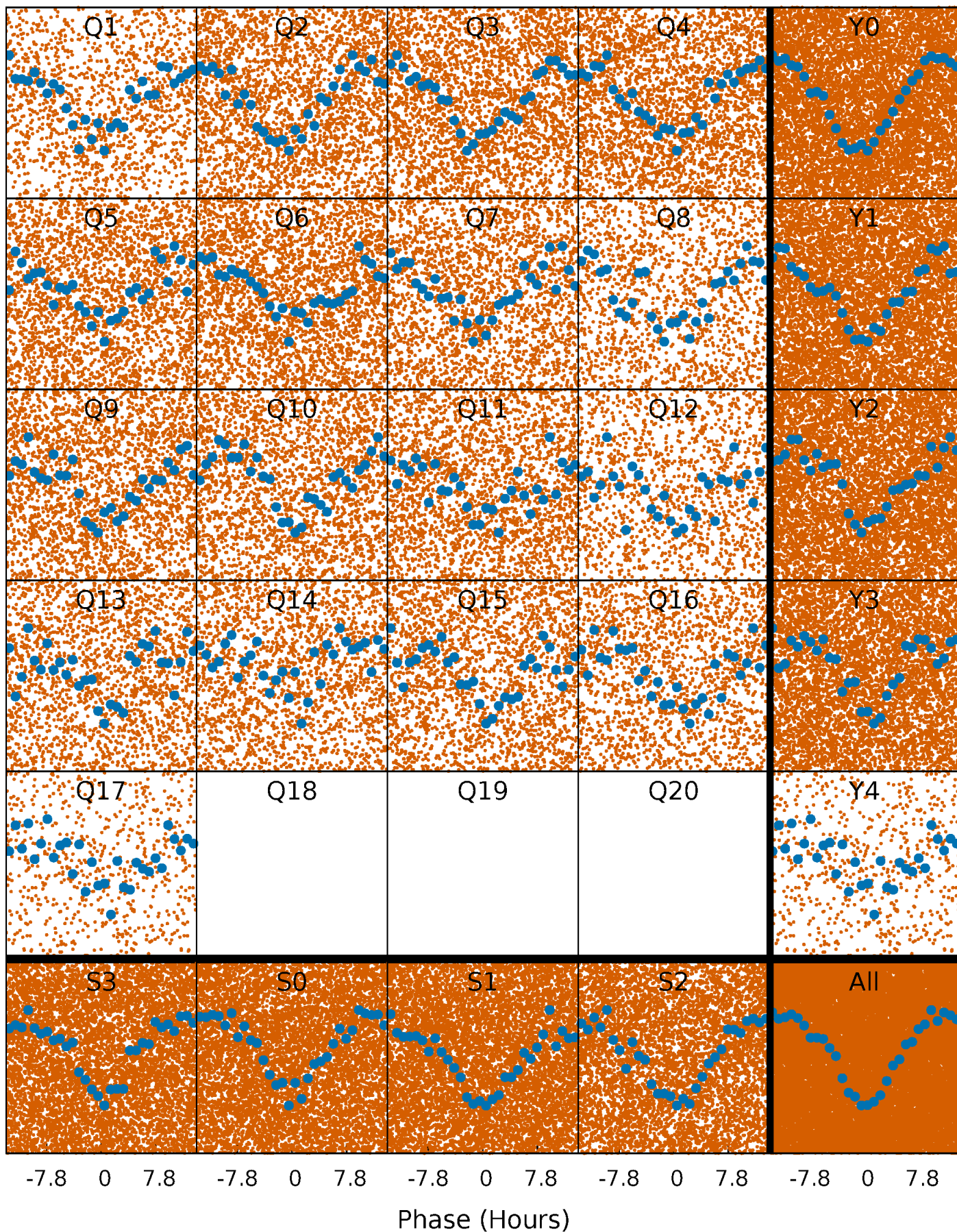
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

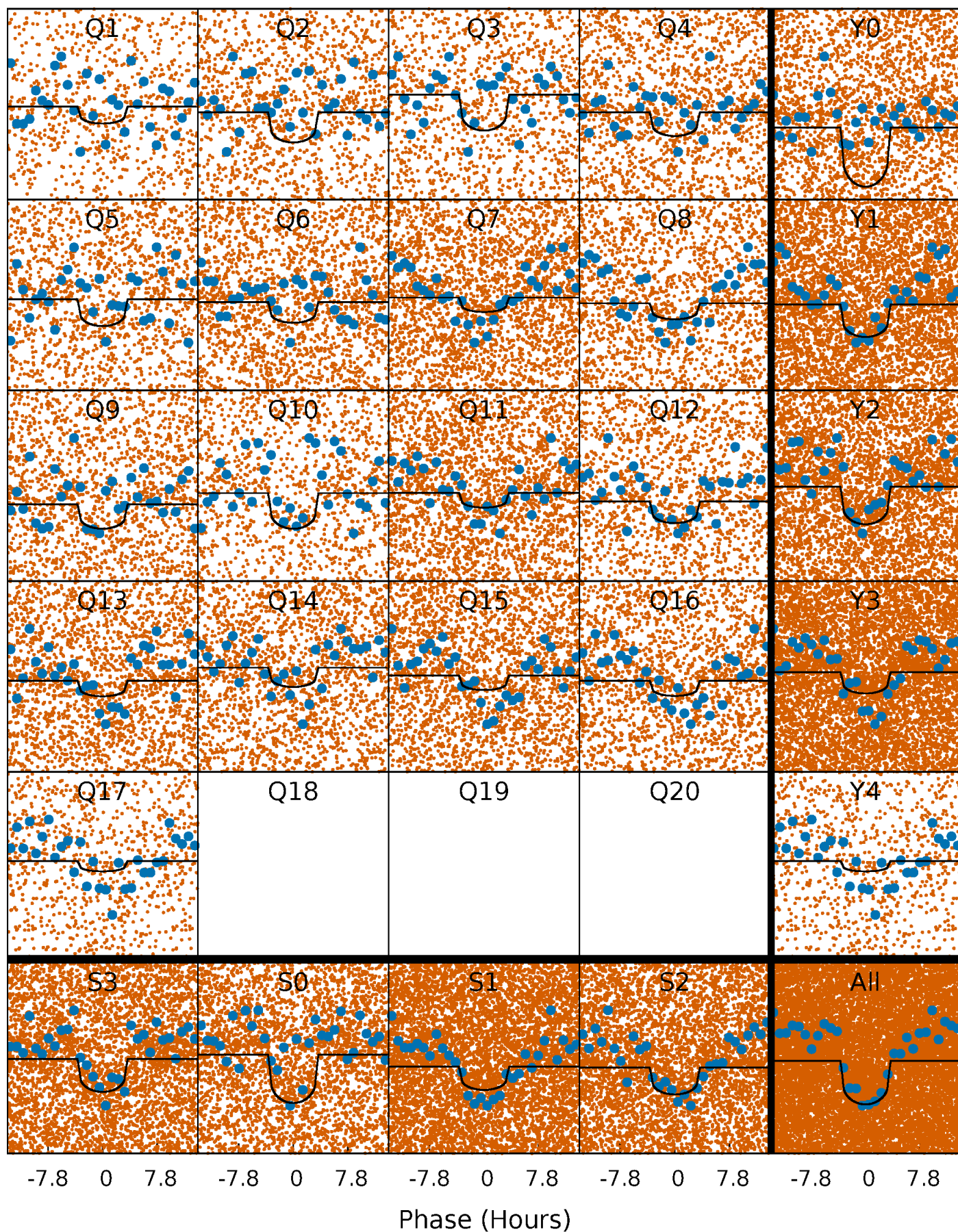
TCE 005217288-01 P= 0.936057 Days  $T_0=131.856586$  (BKJD)





# DV Quarter-Phased Transit Curves

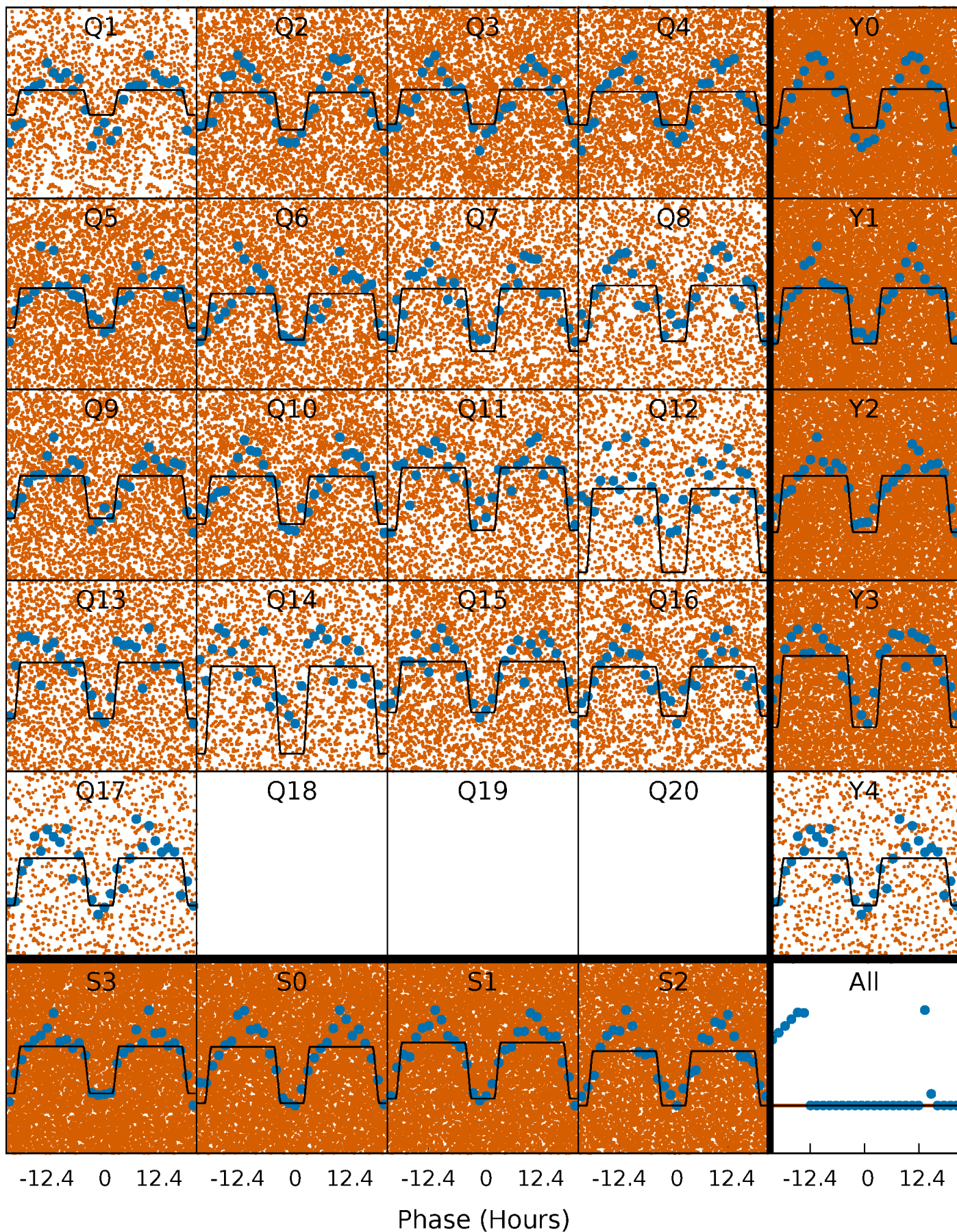
TCE 005217288-01 P= 0.936057 Days  $T_0=131.856586$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005217288-01 P= 0.936150 Days  $T_0=131.799827$  (BKJD)

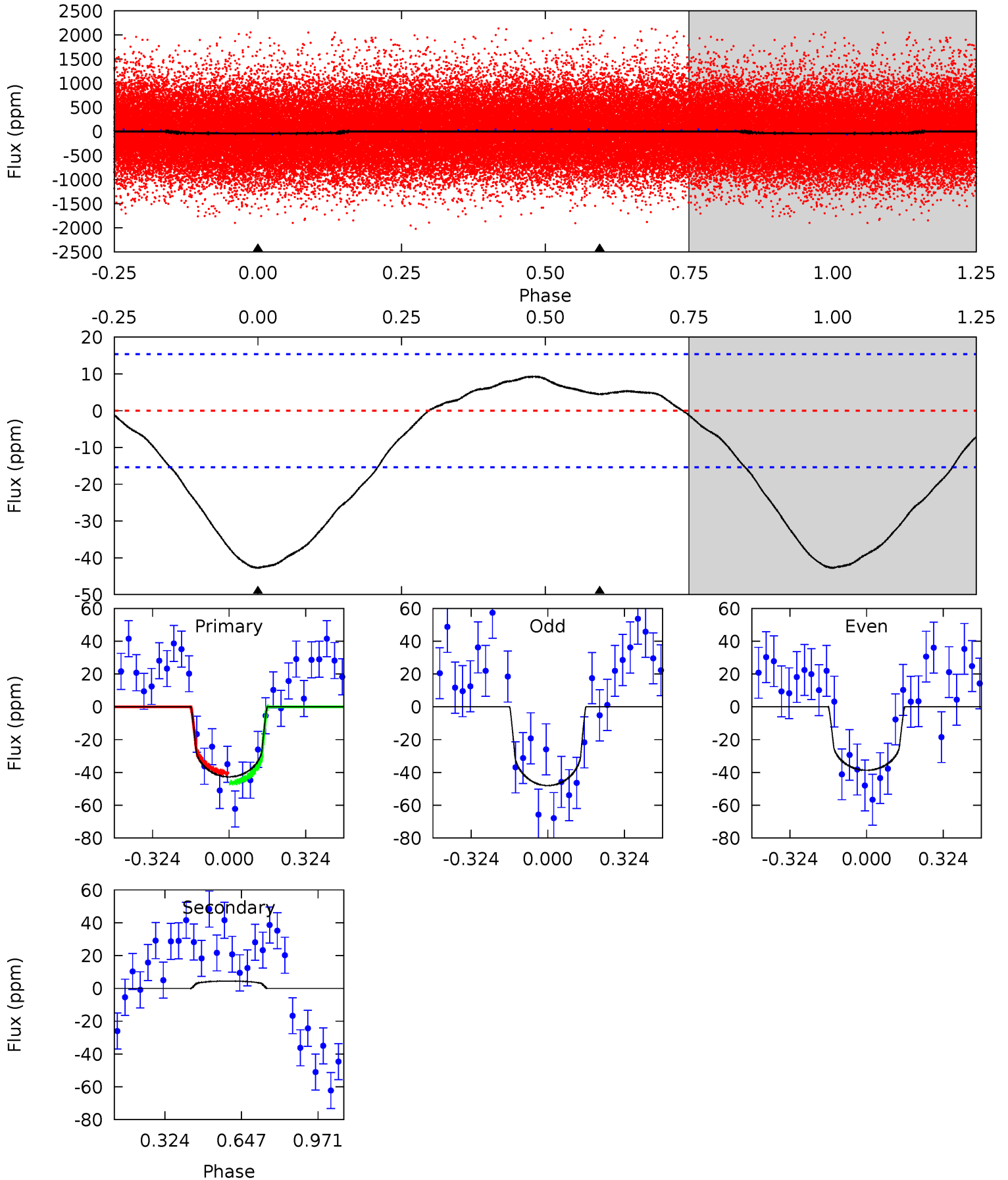




# DV Model-Shift Uniqueness Test

005217288-01, P = 0.936057 Days, E = 130.920529 Days

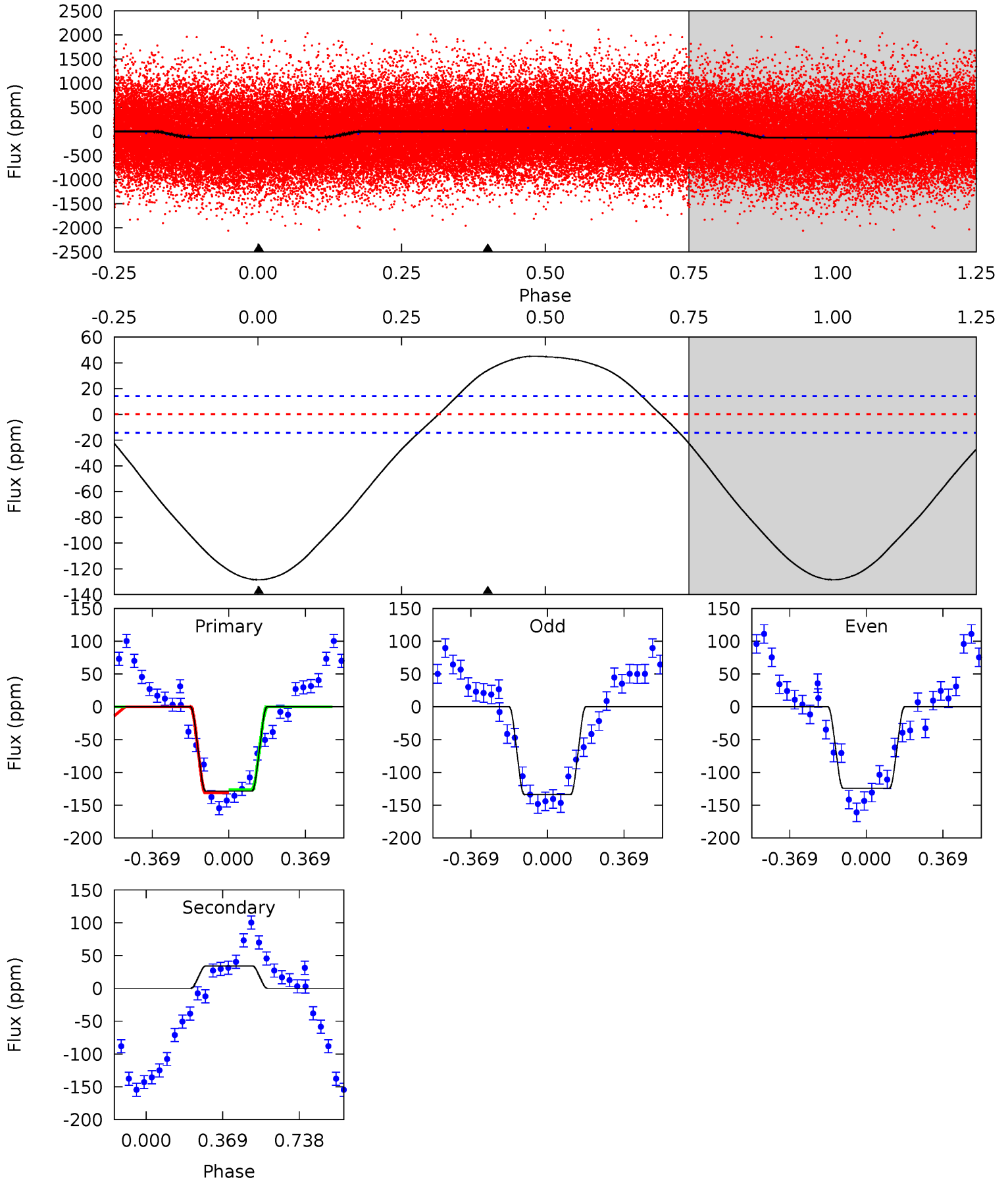
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	-1.26	0	0	4.31	0.99	0.92	12.0	12.0	-1.26	-1.26	1.30	1.06	0.18	0.84



# Alt Model-Shift Uniqueness Test

005217288-01, P = 0.936150 Days, E = 130.863677 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.4	-10.2	0	0	4.28	0.90	3.89	38.4	38.4	-10.2	-10.2	1.41	1.00	0.26	0.70



### Stellar Parameters For KIC 005217288

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5825^{+174}_{-174}$	$4.639^{+0.032}_{-0.128}$	$-0.900^{+0.300}_{-0.300}$	$0.702^{+0.123}_{-0.044}$	$0.792^{+0.062}_{-0.075}$	$3.229^{+0.389}_{-1.177}$
	+3%/-3%	+1%/-3%	+33%/-33%	+18%/-6%	+8%/-9%	+12%/-36%
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 005217288-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$4\pm4$	$0.68^{+0.60}_{-0.44}$	$2333^{+109}_{-93}$	$-3394^{+557}_{-1322}$	$-1.250^{+1.112}_{-8.685}$
Alt.	$34\pm3$	$0.99^{+0.62}_{-0.56}$	$2324^{+116}_{-93}$	$-4289^{+642}_{-1807}$	$-5.756^{+3.616}_{-23.385}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

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

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



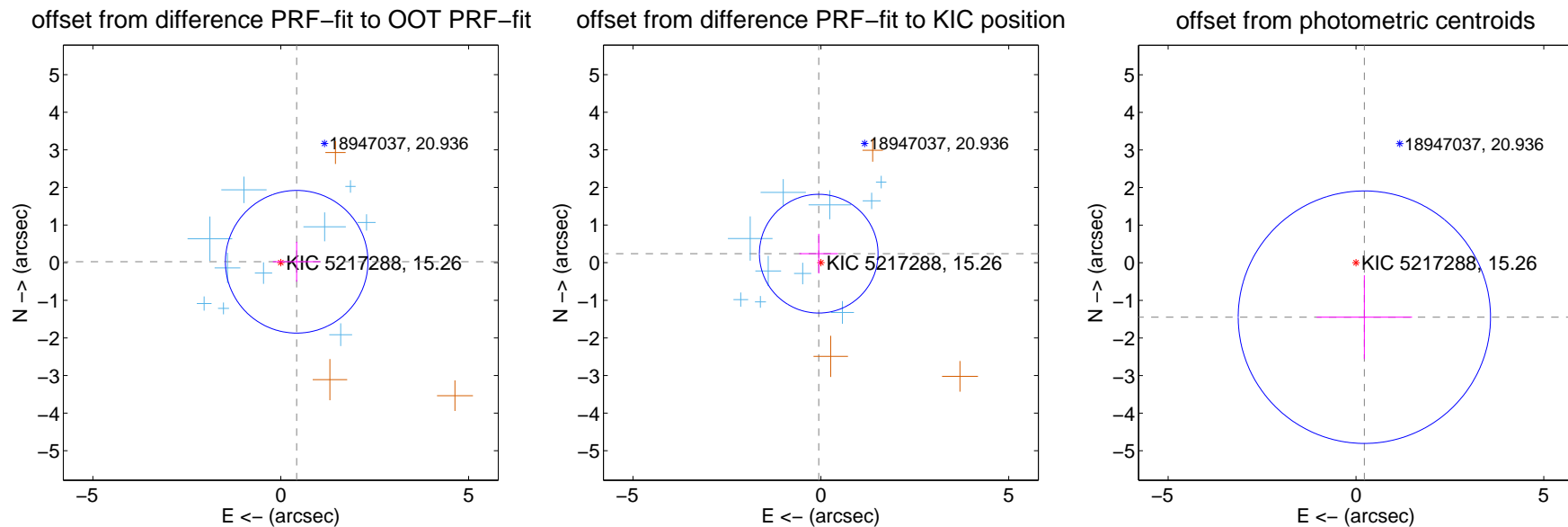
## DV Centroid Data

Supplemental centroid analysis for 005217288-01. Kepler magnitude: 15.26. Transit SNR 9.60

There are 10 quarters with good PRF difference image offsets

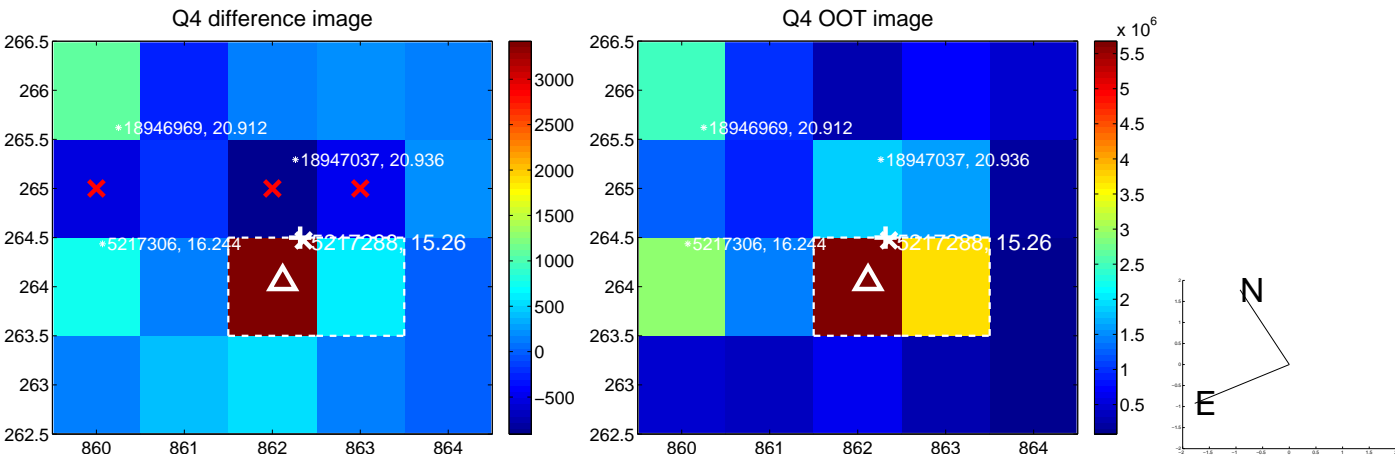
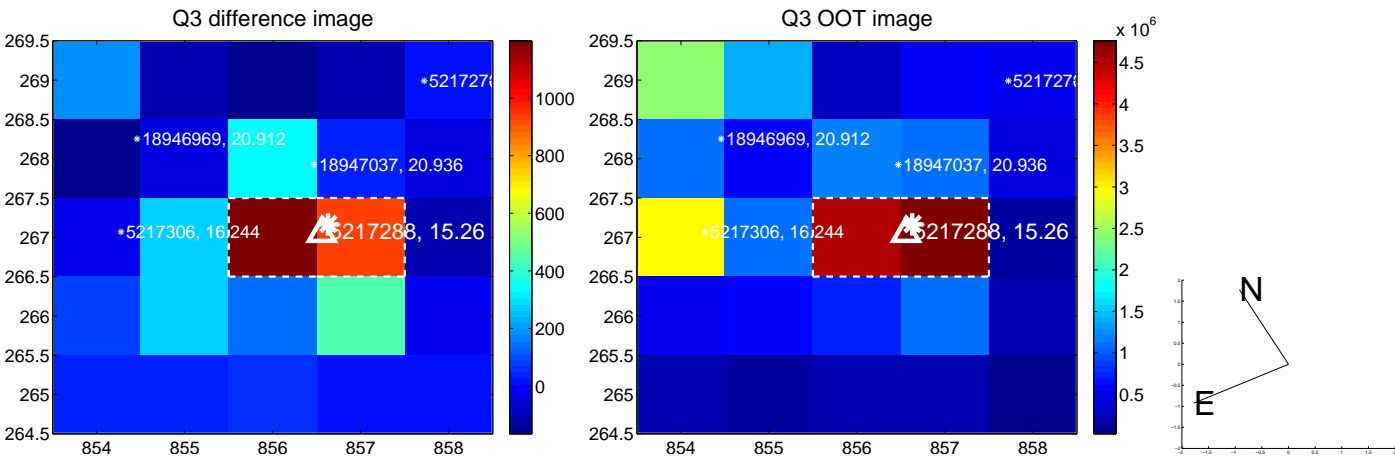
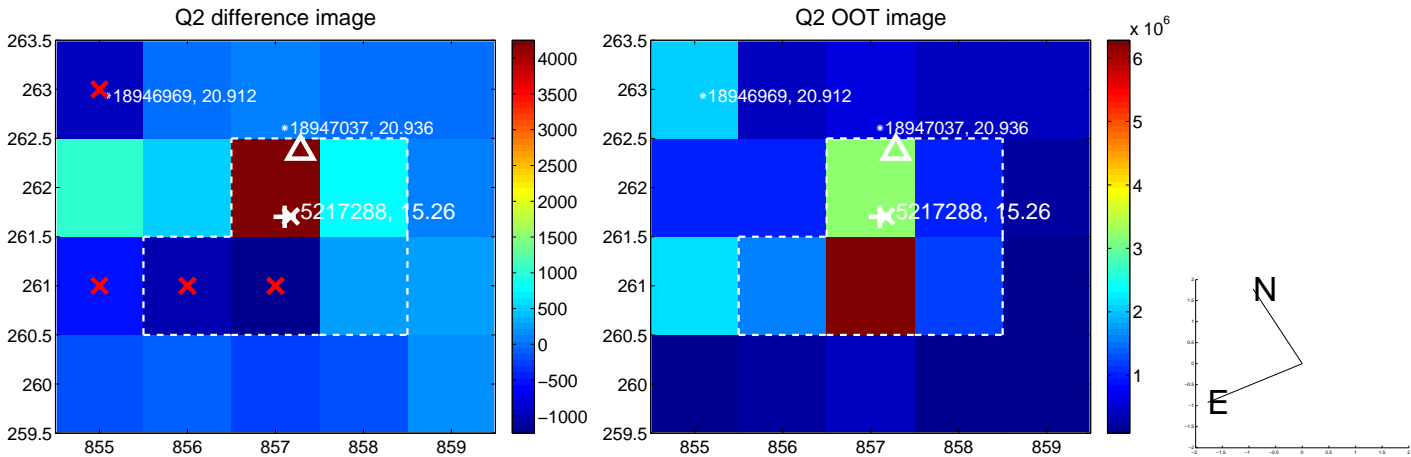
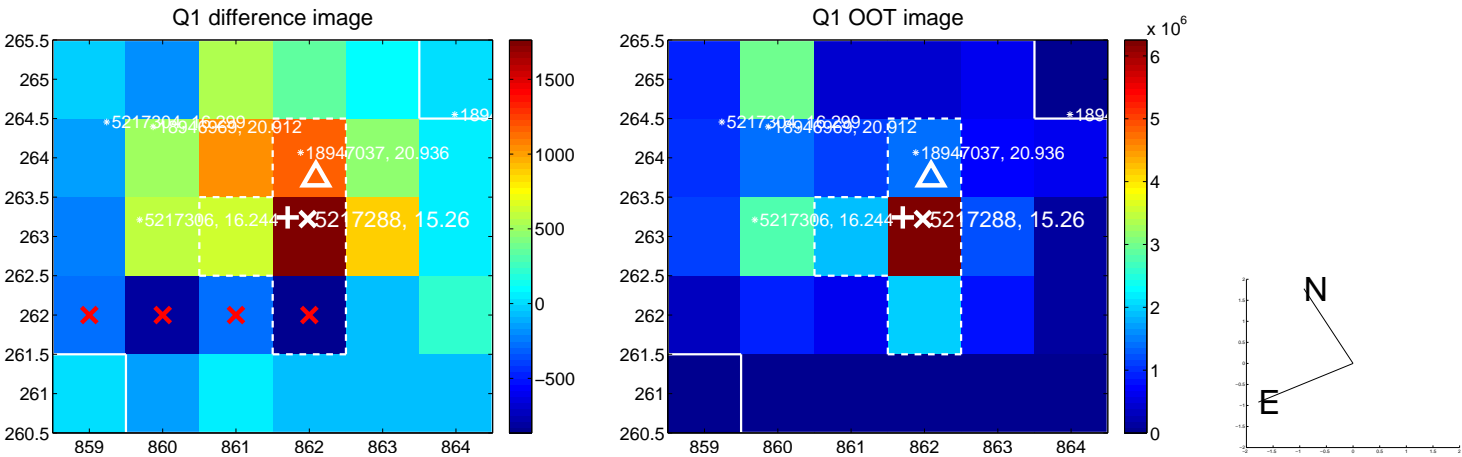
The direct PRF centroid is offset from the target star catalog position by about 1.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.425 \pm 0.632$	0.67	$-0.424 \pm 0.633$	$0.025 \pm 0.530$
PRF-fit source offset from KIC position	$0.247 \pm 0.526$	0.47	$0.057 \pm 0.514$	$0.240 \pm 0.527$
photometric centroid source offset	$1.47 \pm 1.12$	1.31	$-0.22 \pm 1.27$	$-1.45 \pm 1.12$

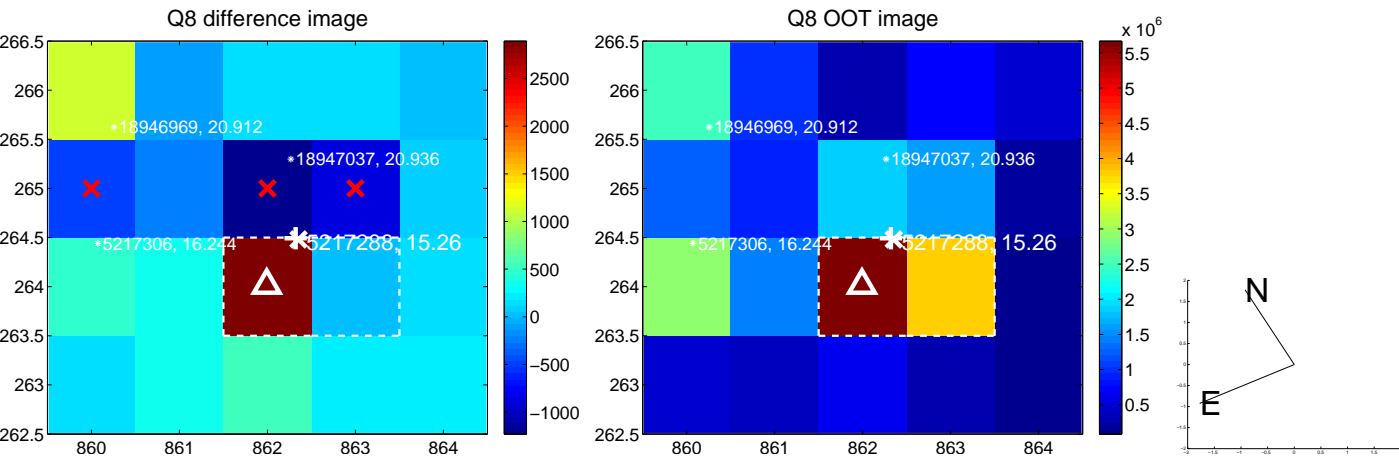
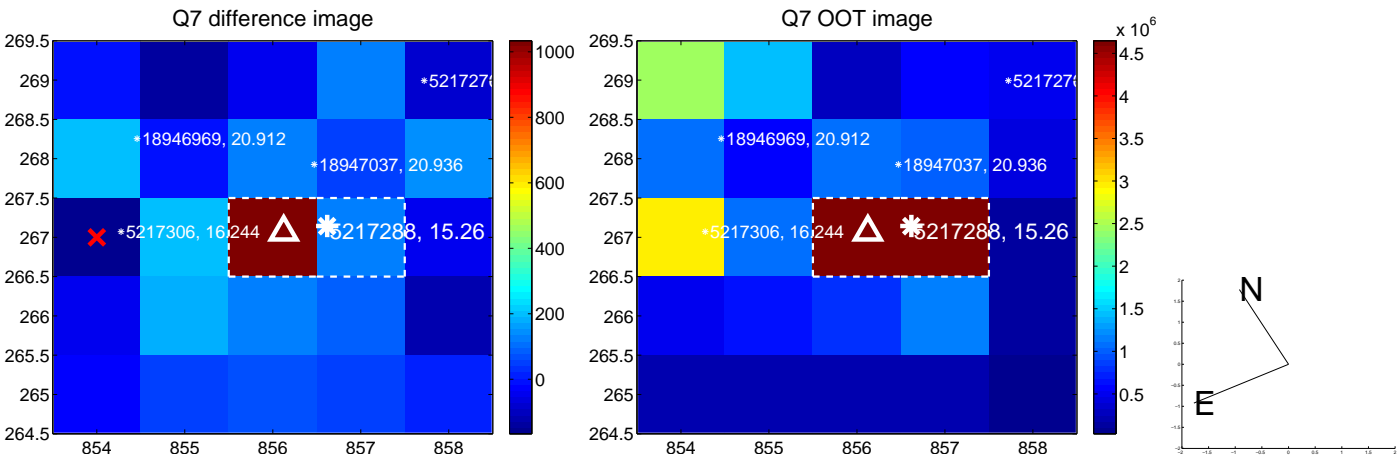
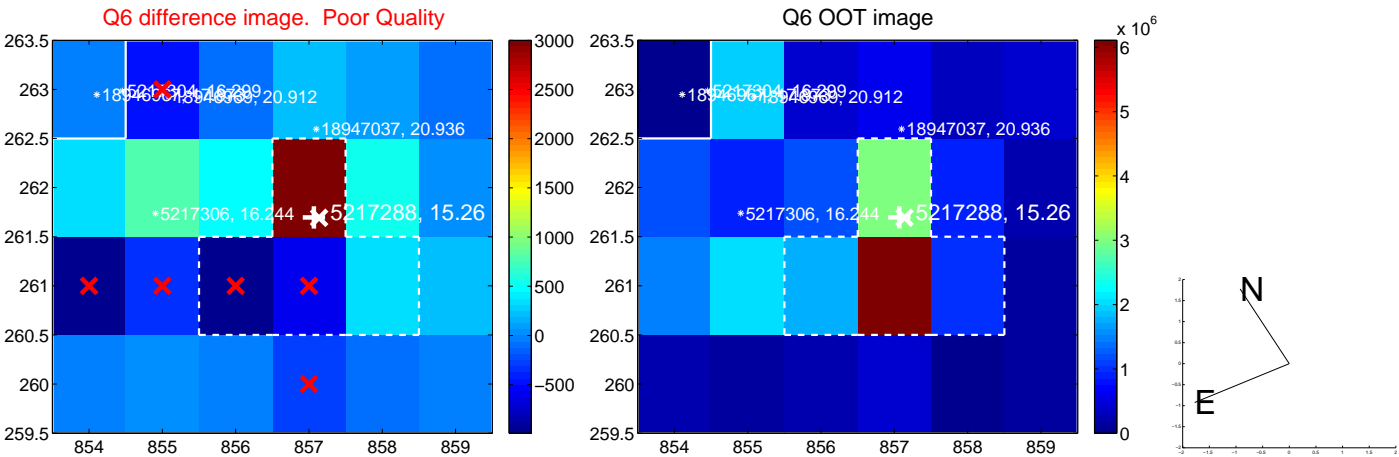
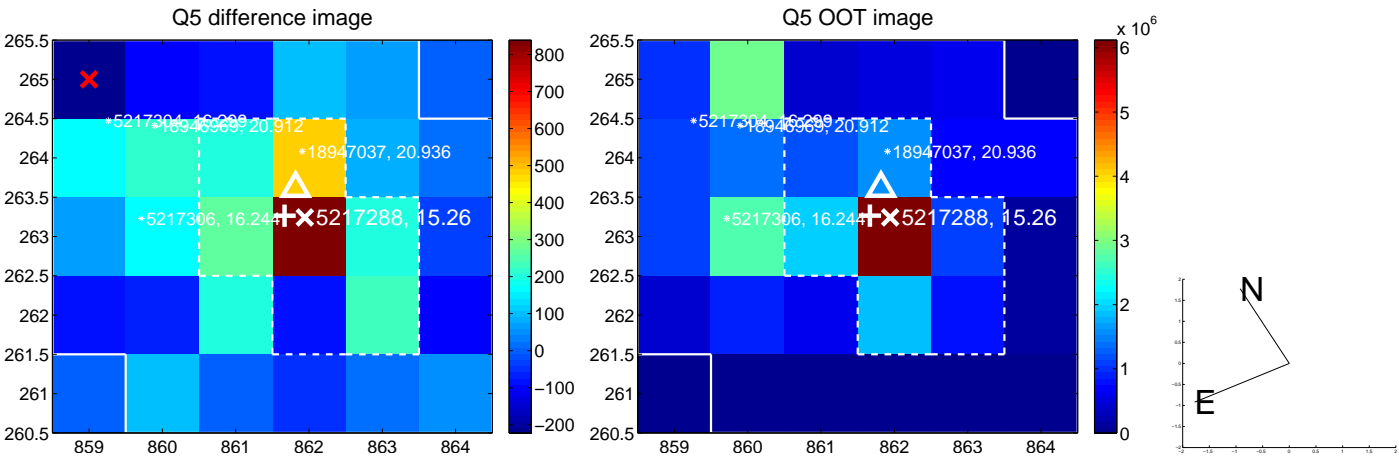


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

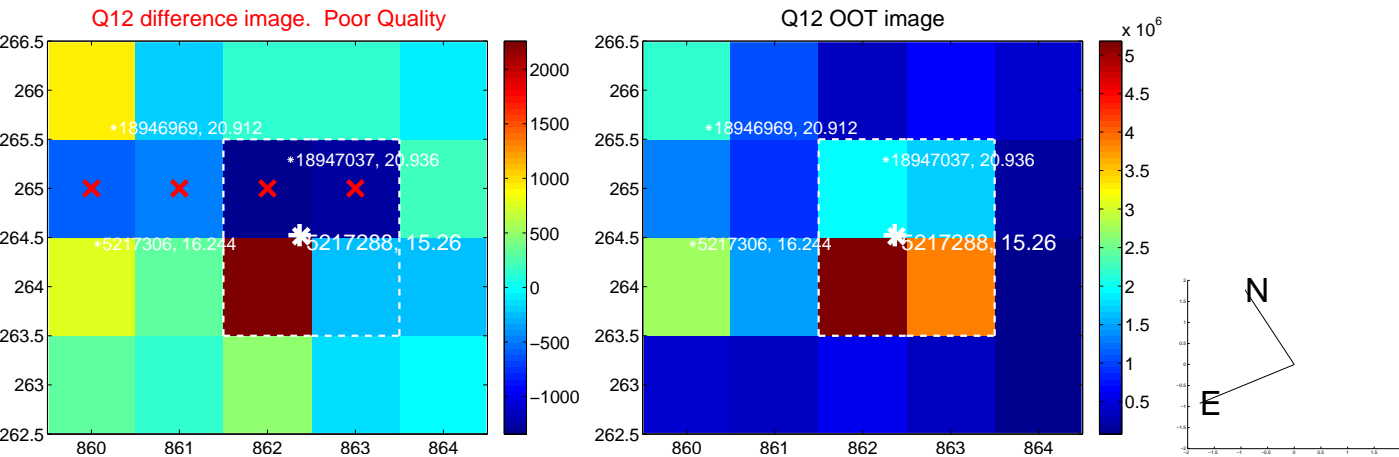
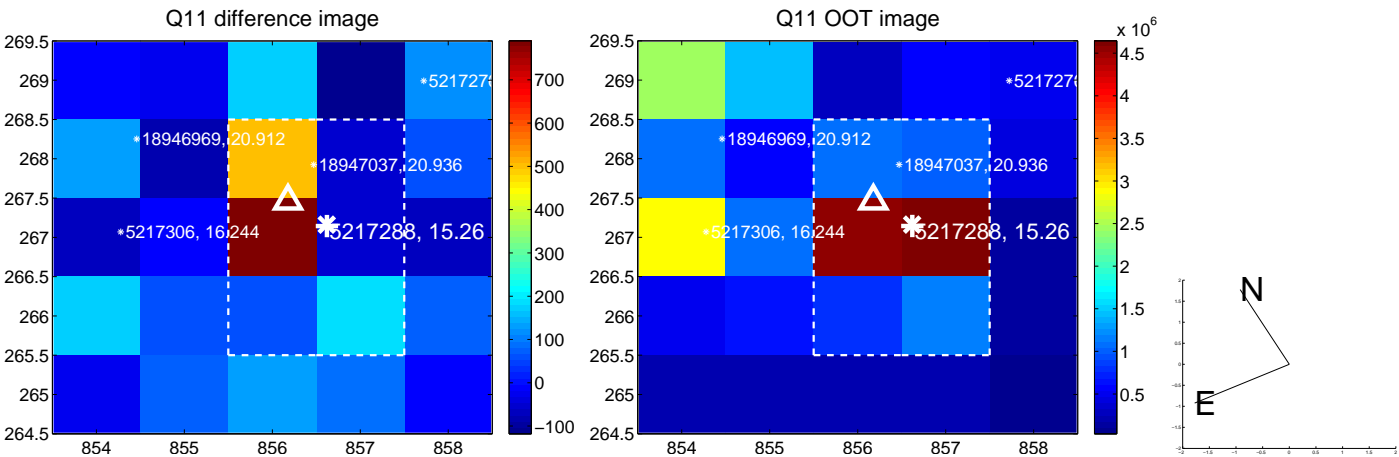
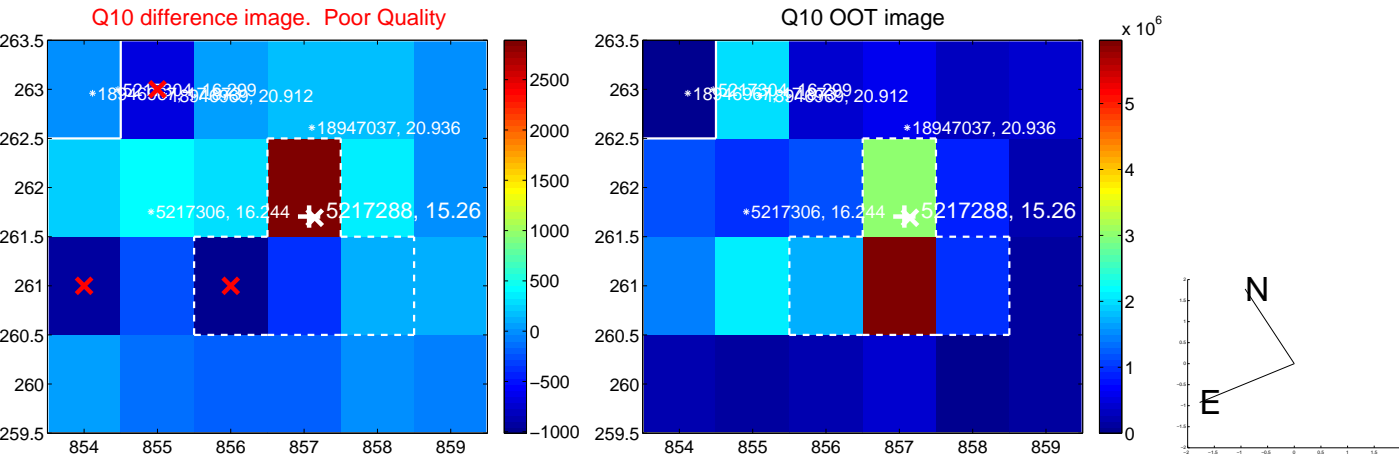
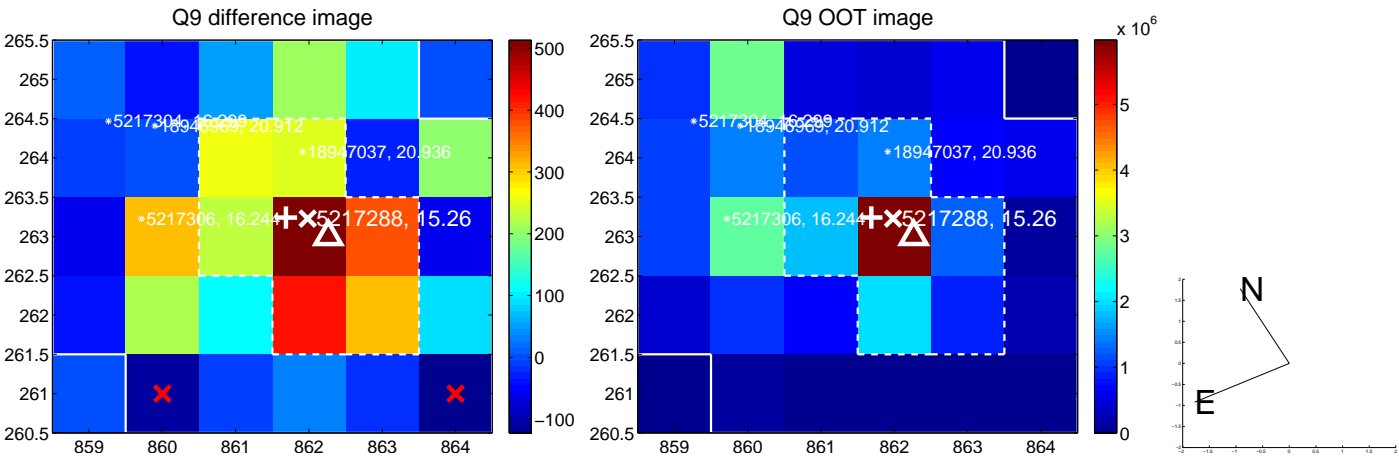


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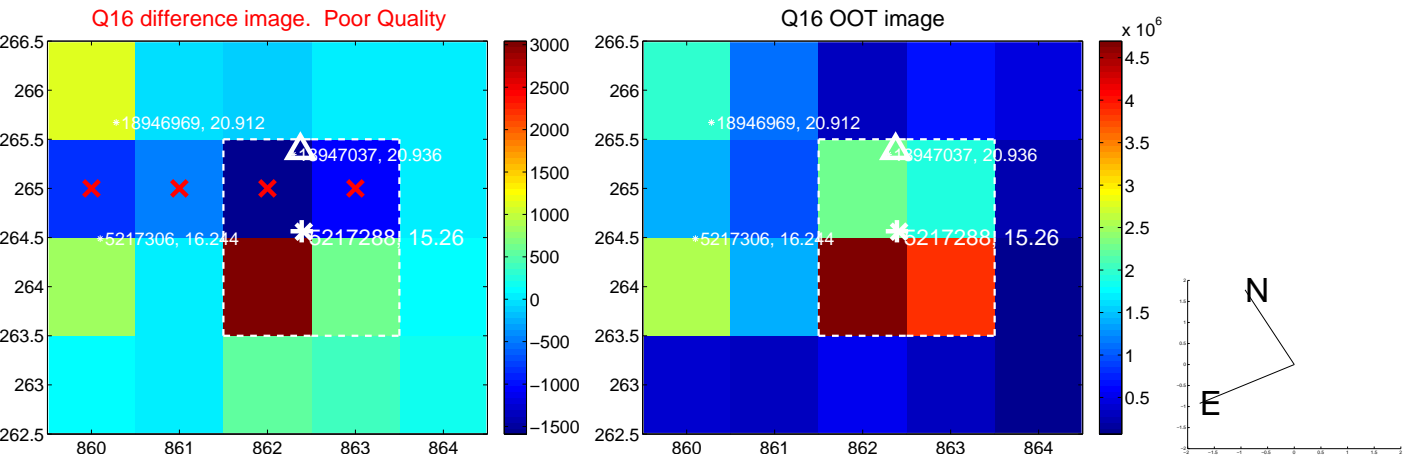
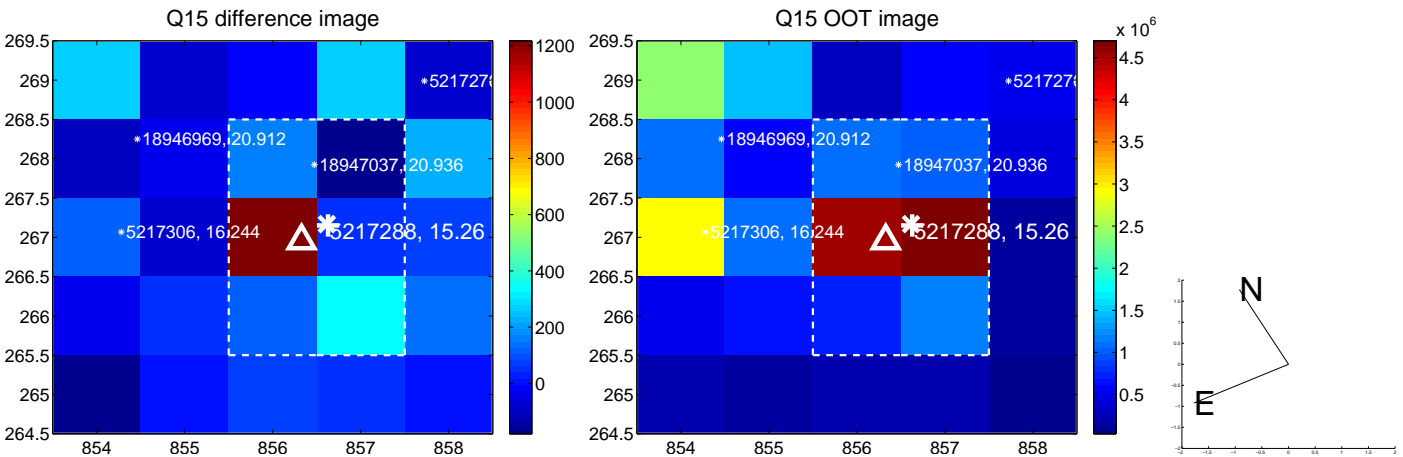
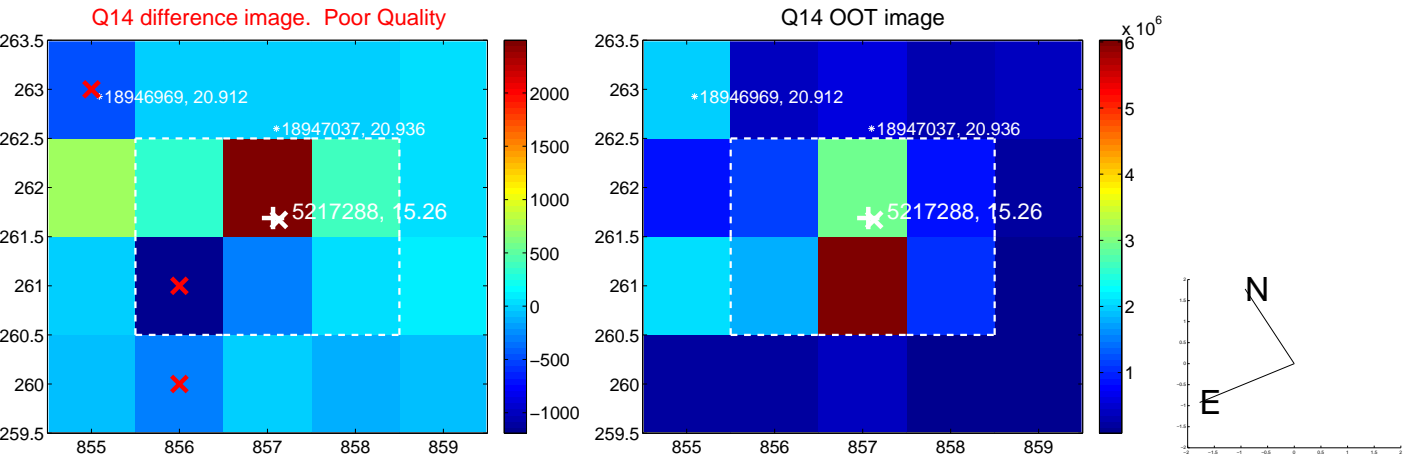
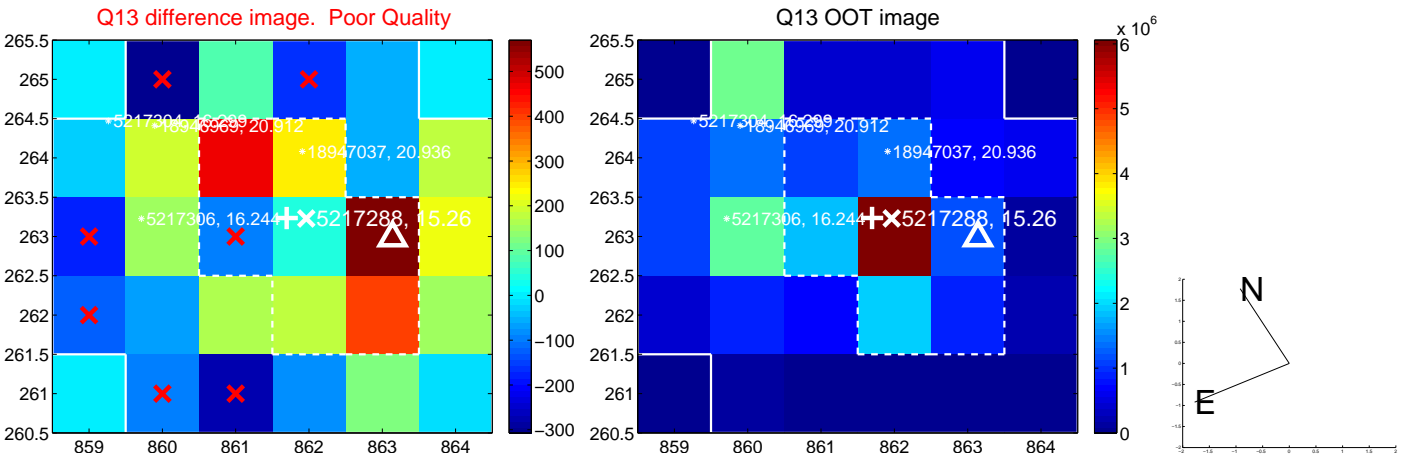




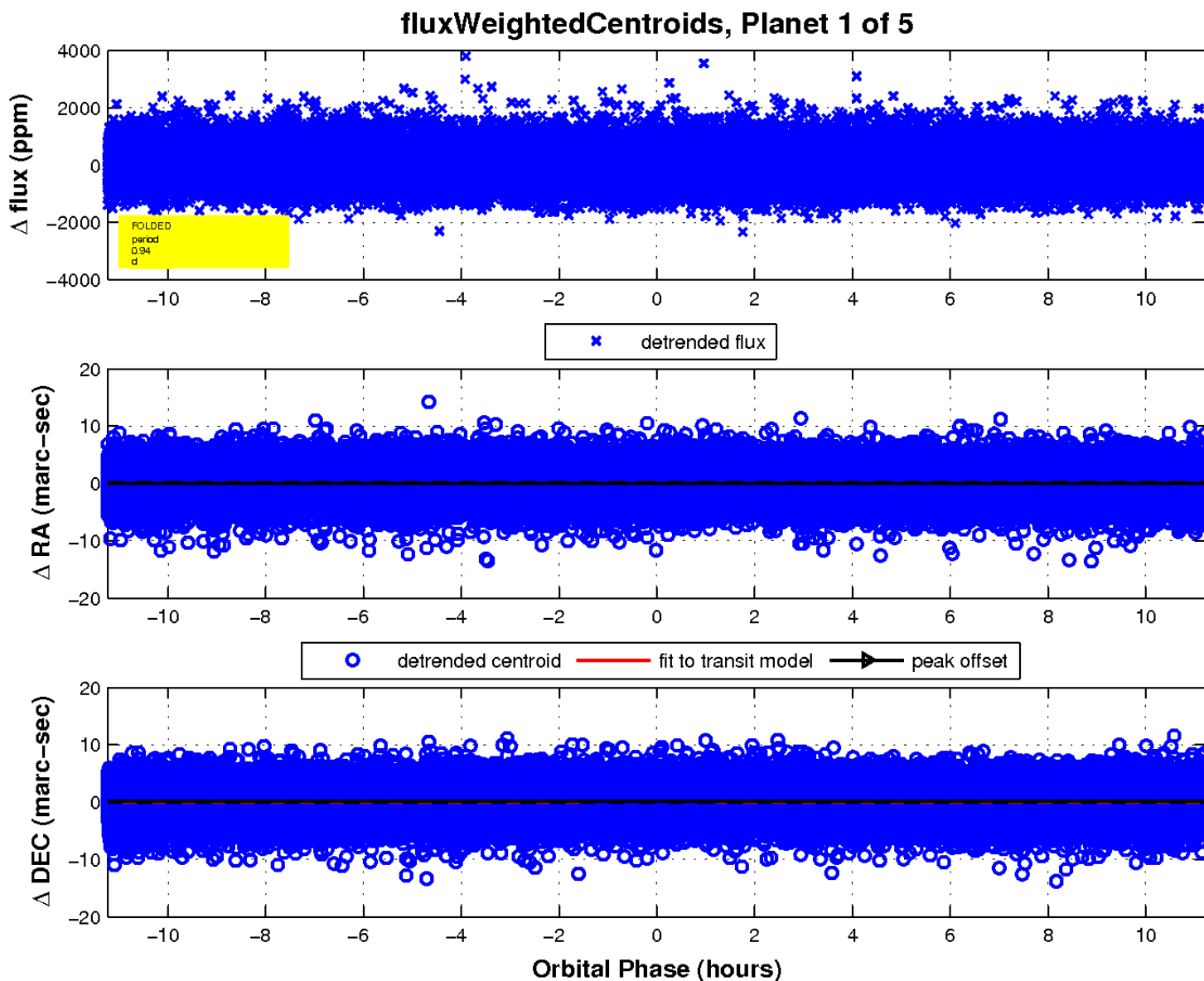
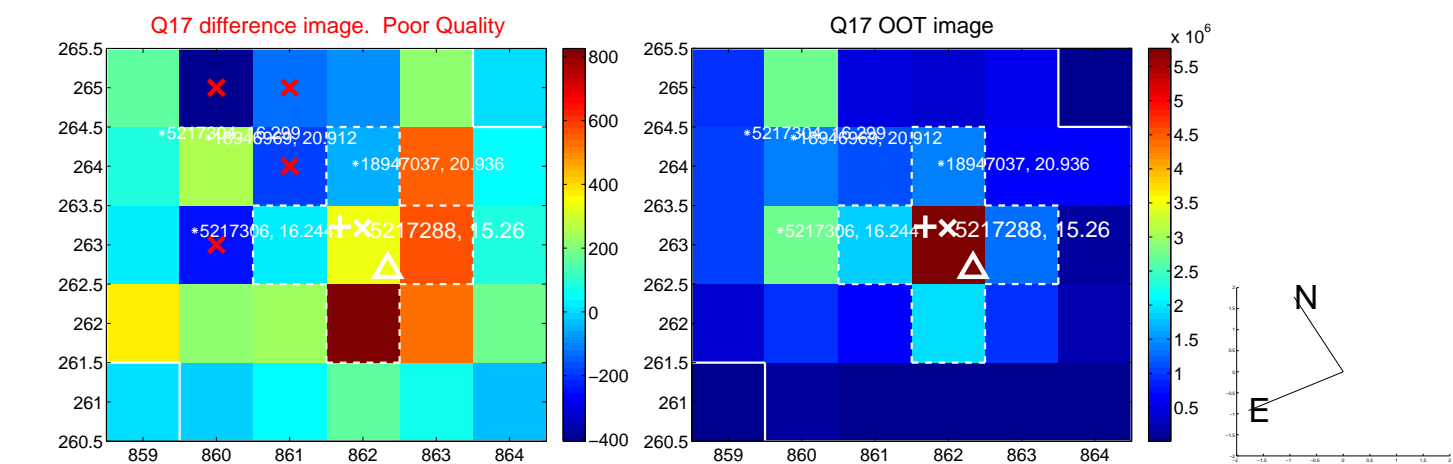
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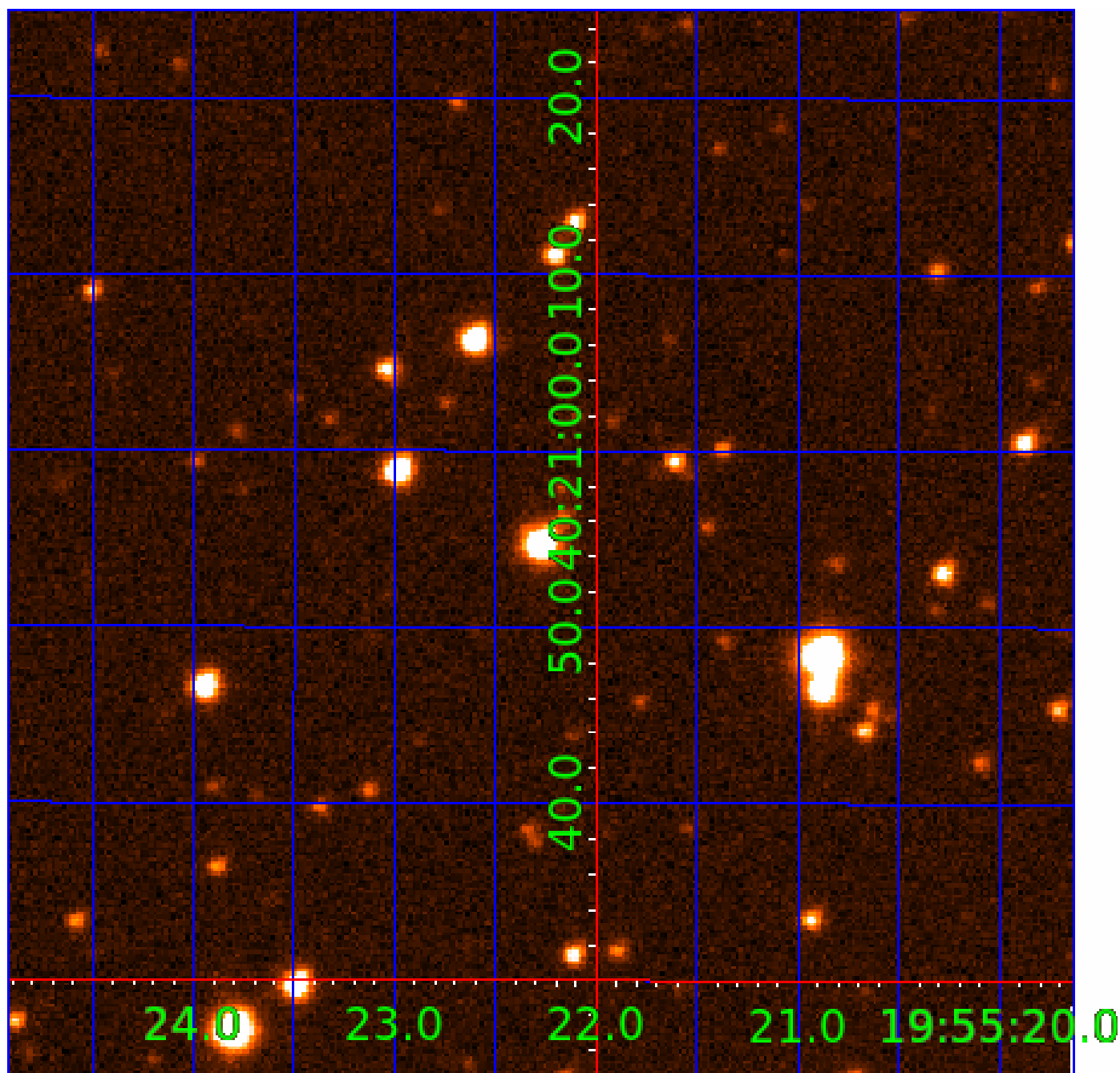


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UKIRT Image

Declination





# KIC 005217288

## Q1-17 DR25 TCE Parameters

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005217288-04	OBS	No	18.360603	147.173848	798.9	0.982	11.5	8.4	0.70	5825	2.03	32.24
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## Robovetter Results

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005217288-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
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N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

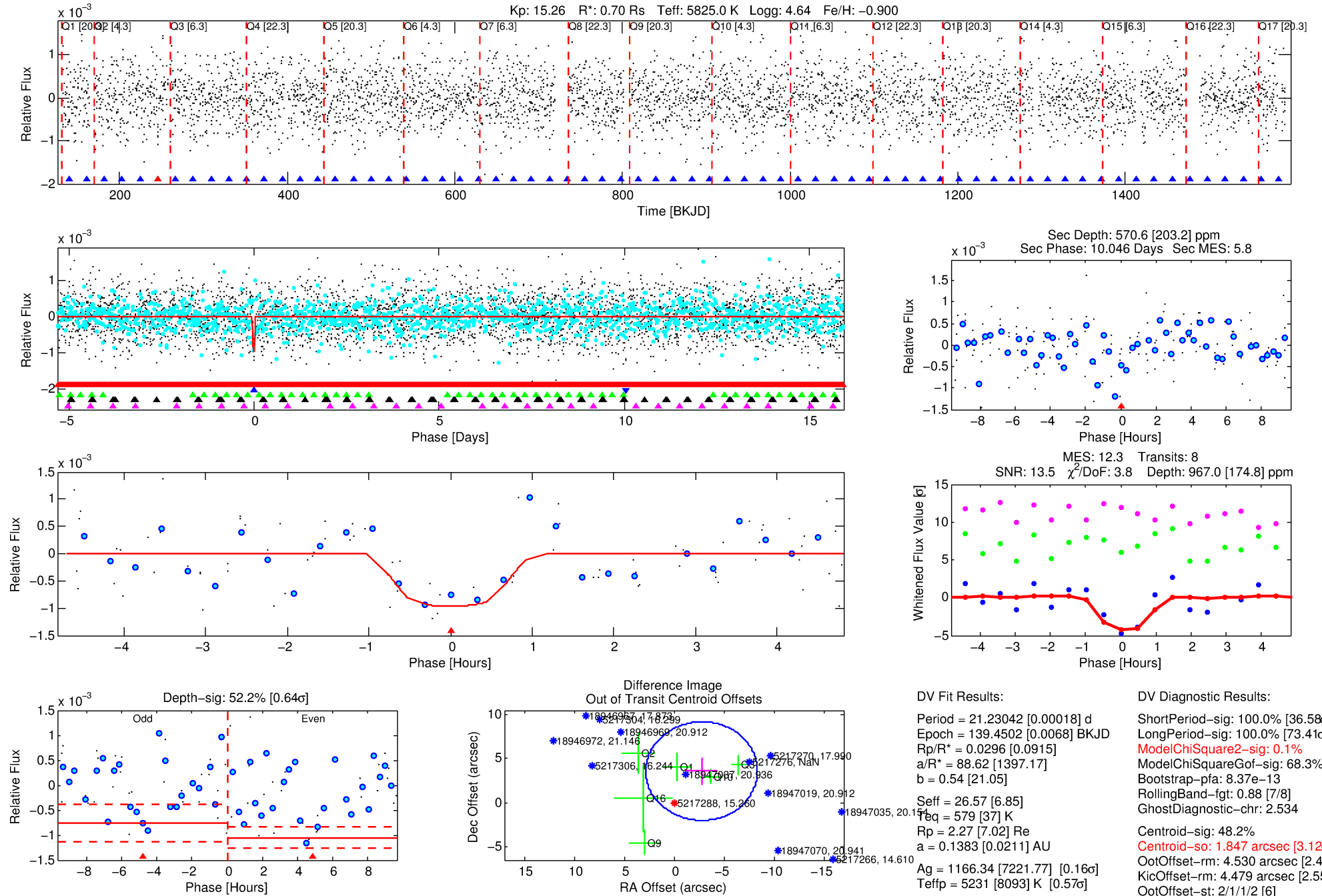
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005217288-02

No Significant Match Found

# DV One-Page Summary

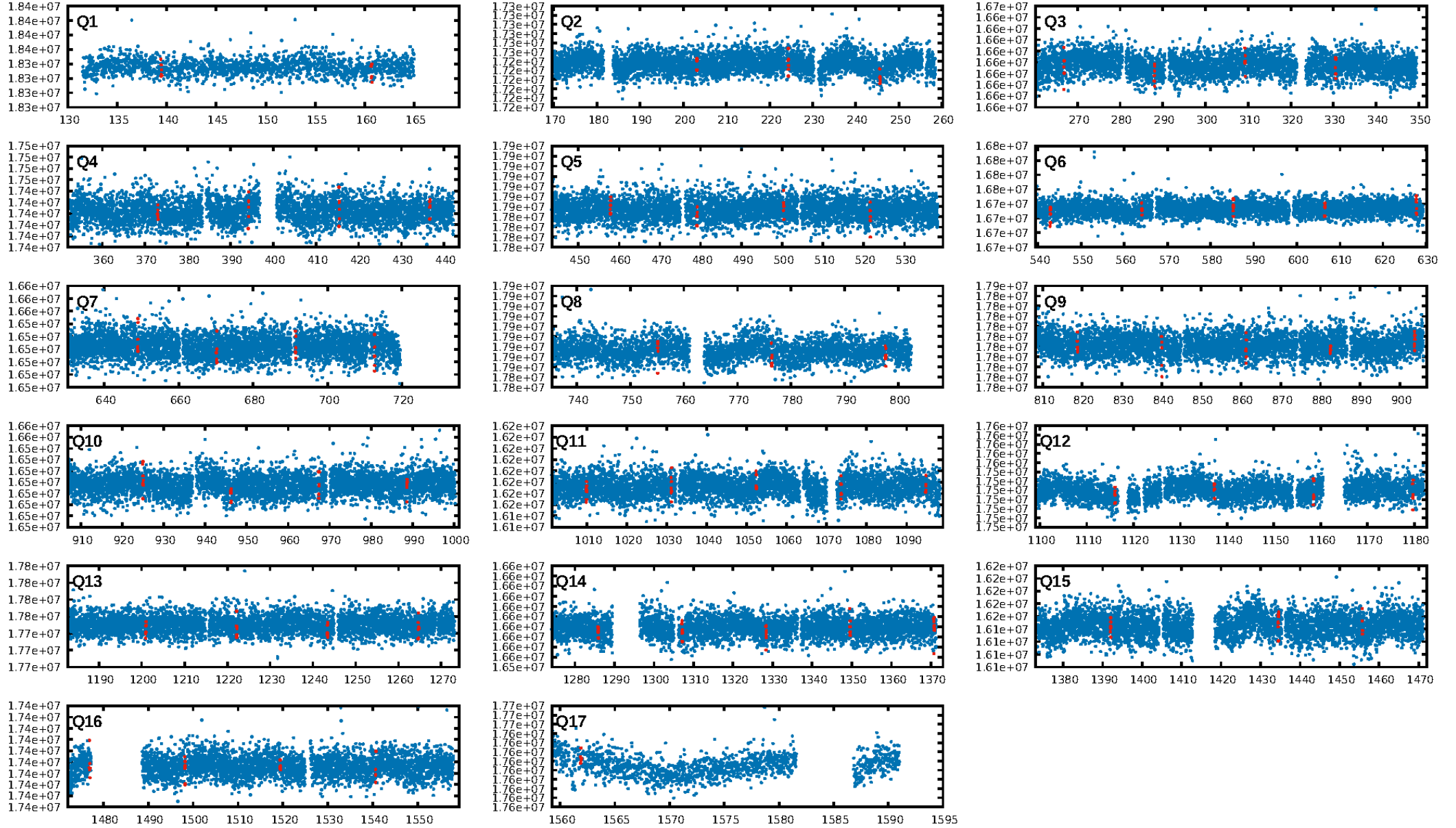
KIC: 5217288 Candidate: 2 of 5 Period: 21.230 d



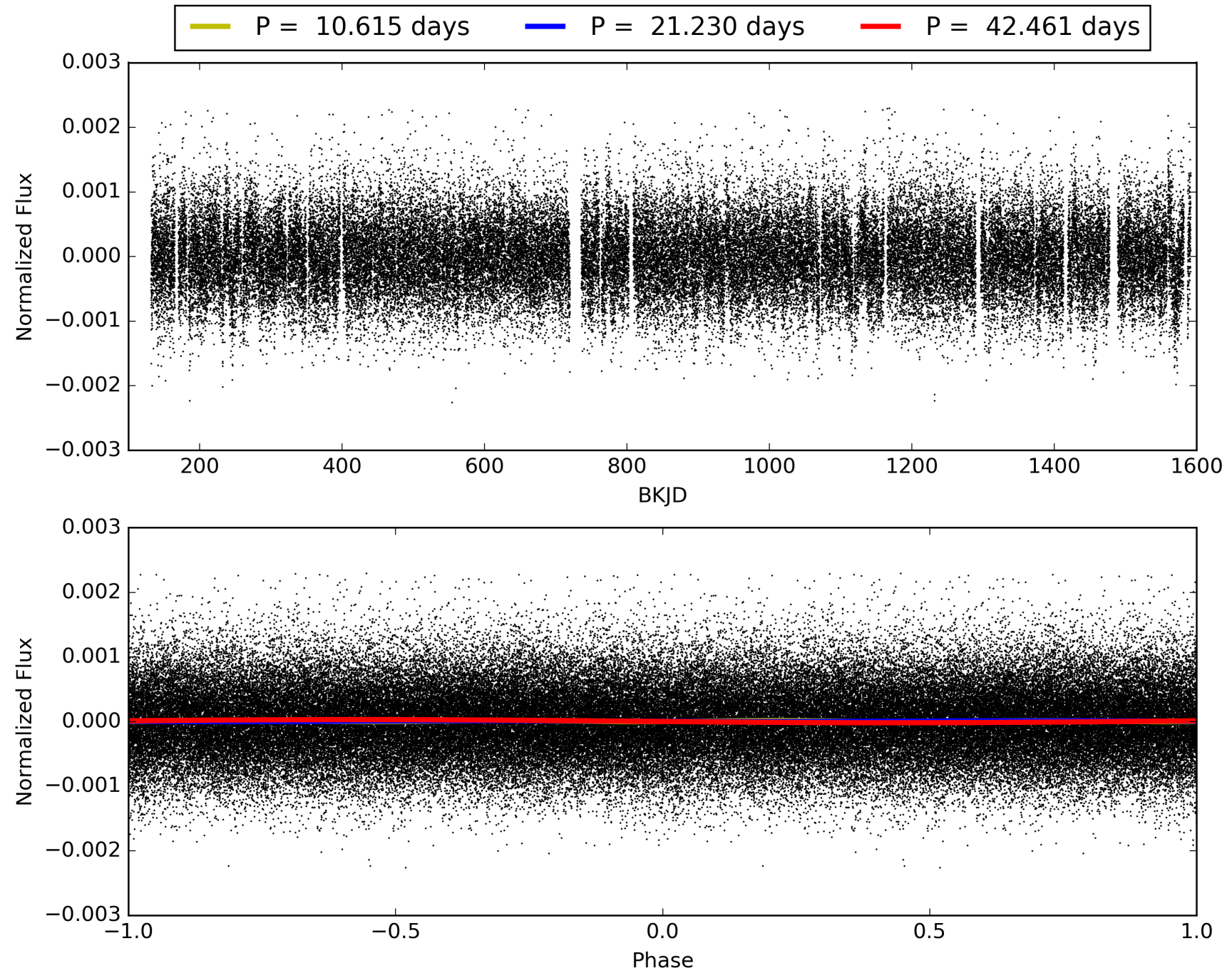
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:53:10 Z

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

# TCE 005217288-02, PDC Light Curves



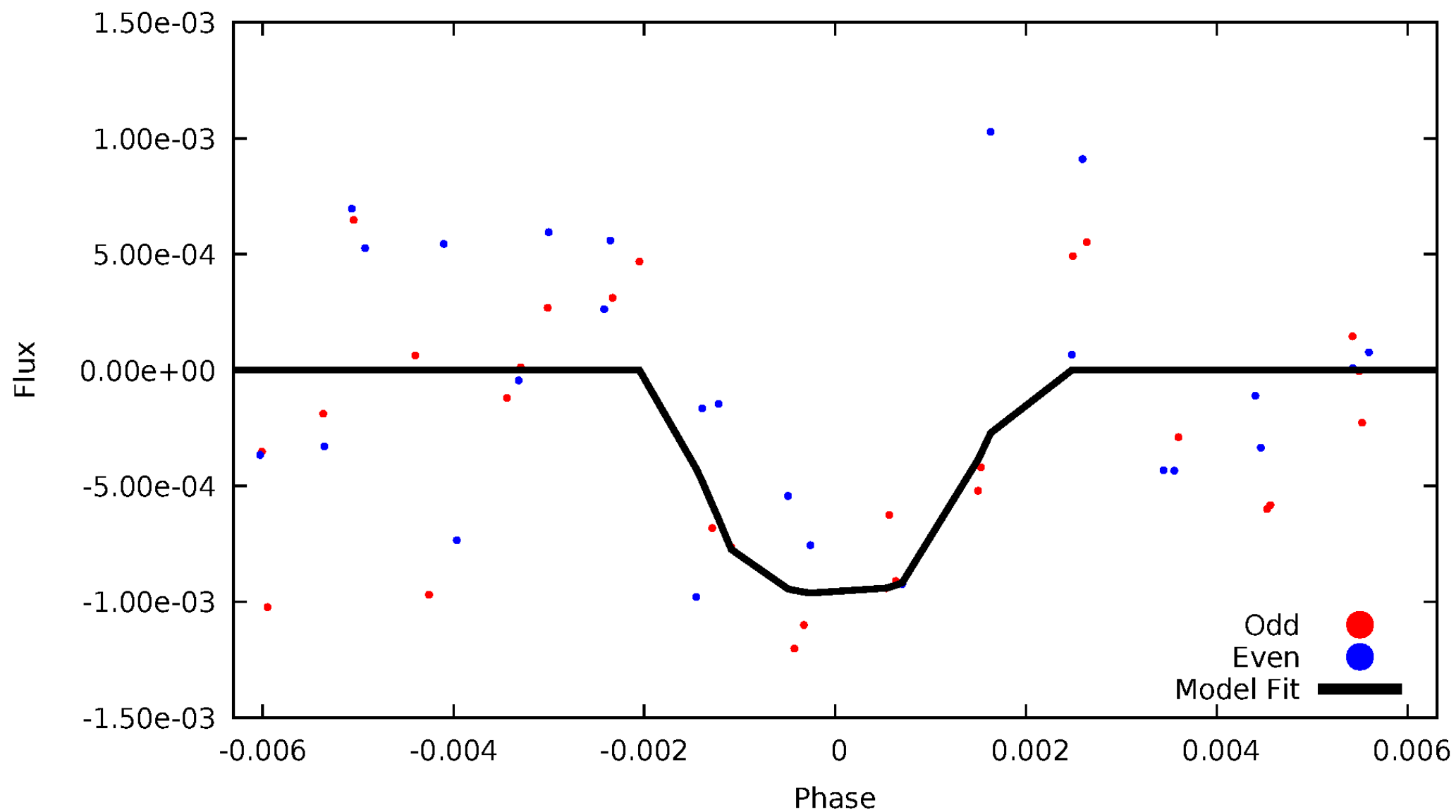
TCE 005217288-02





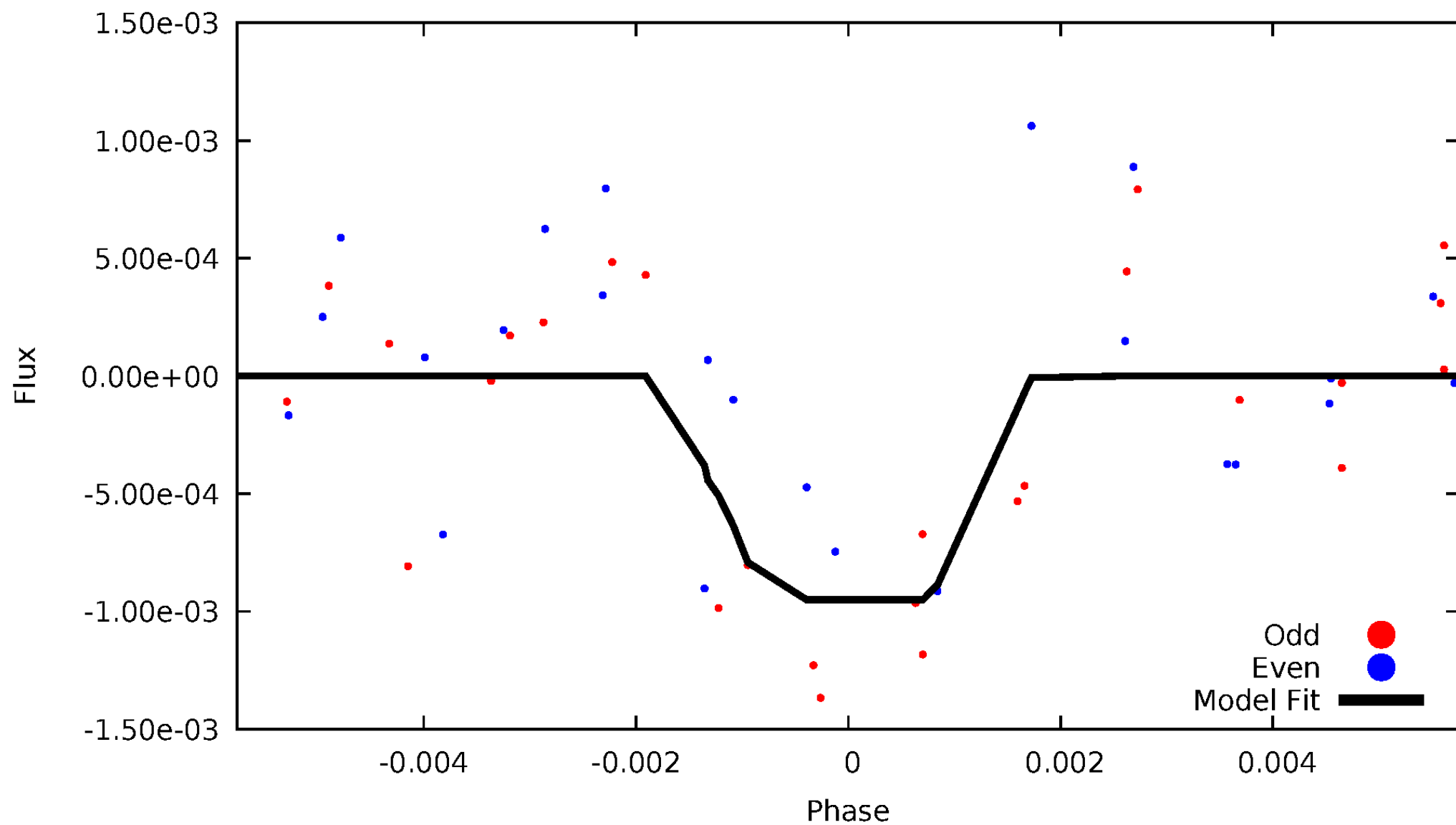
# DV Odd/Even

TCE 005217288-02



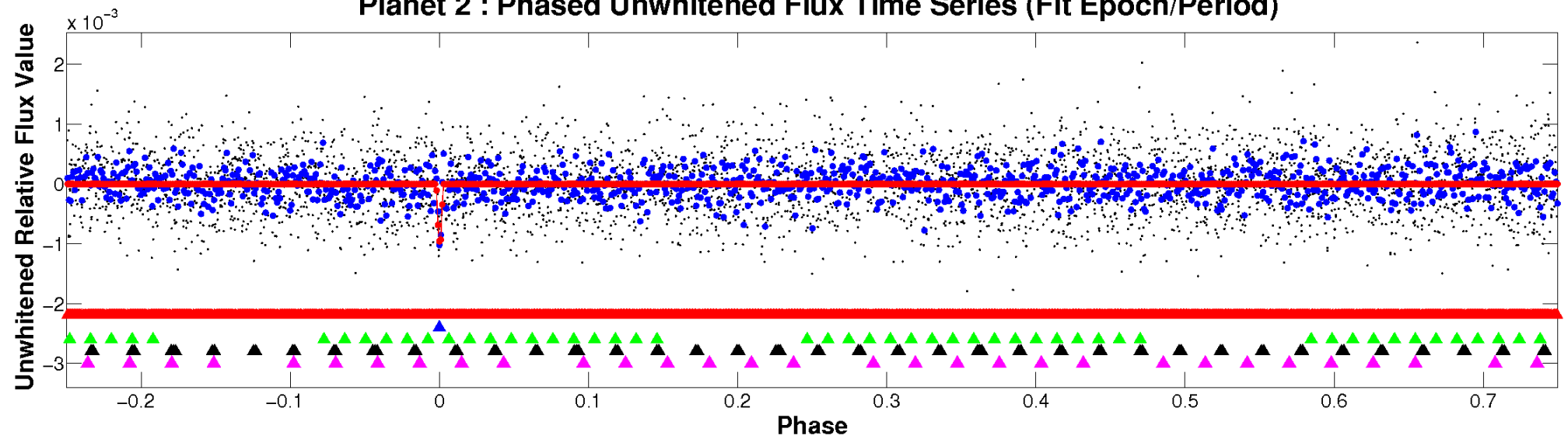
# ALT Odd/Even

TCE 005217288-02

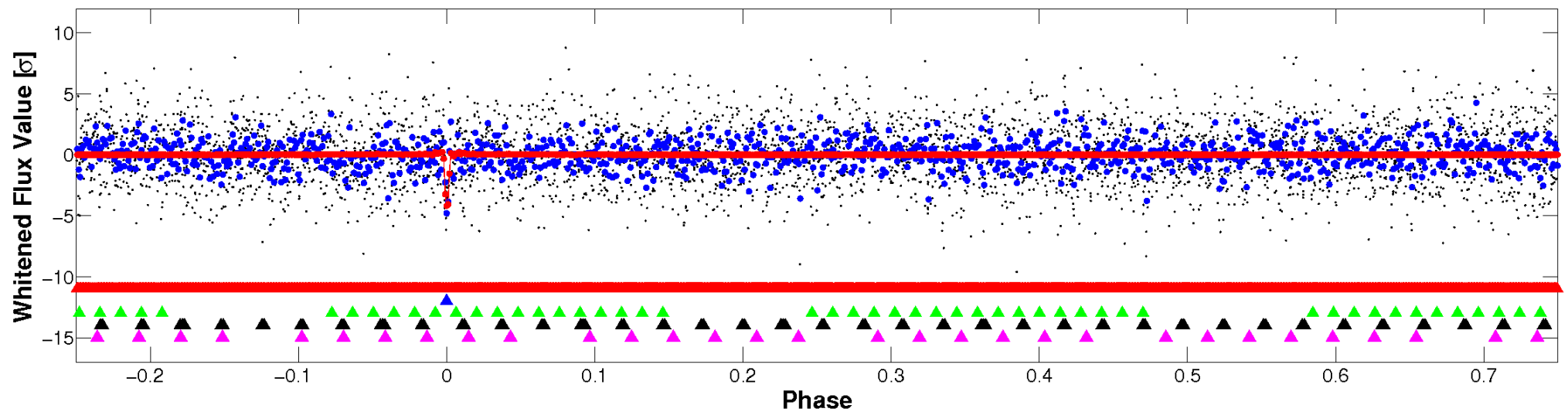


# Non-Whitened Vs. Whitened Light Curve

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

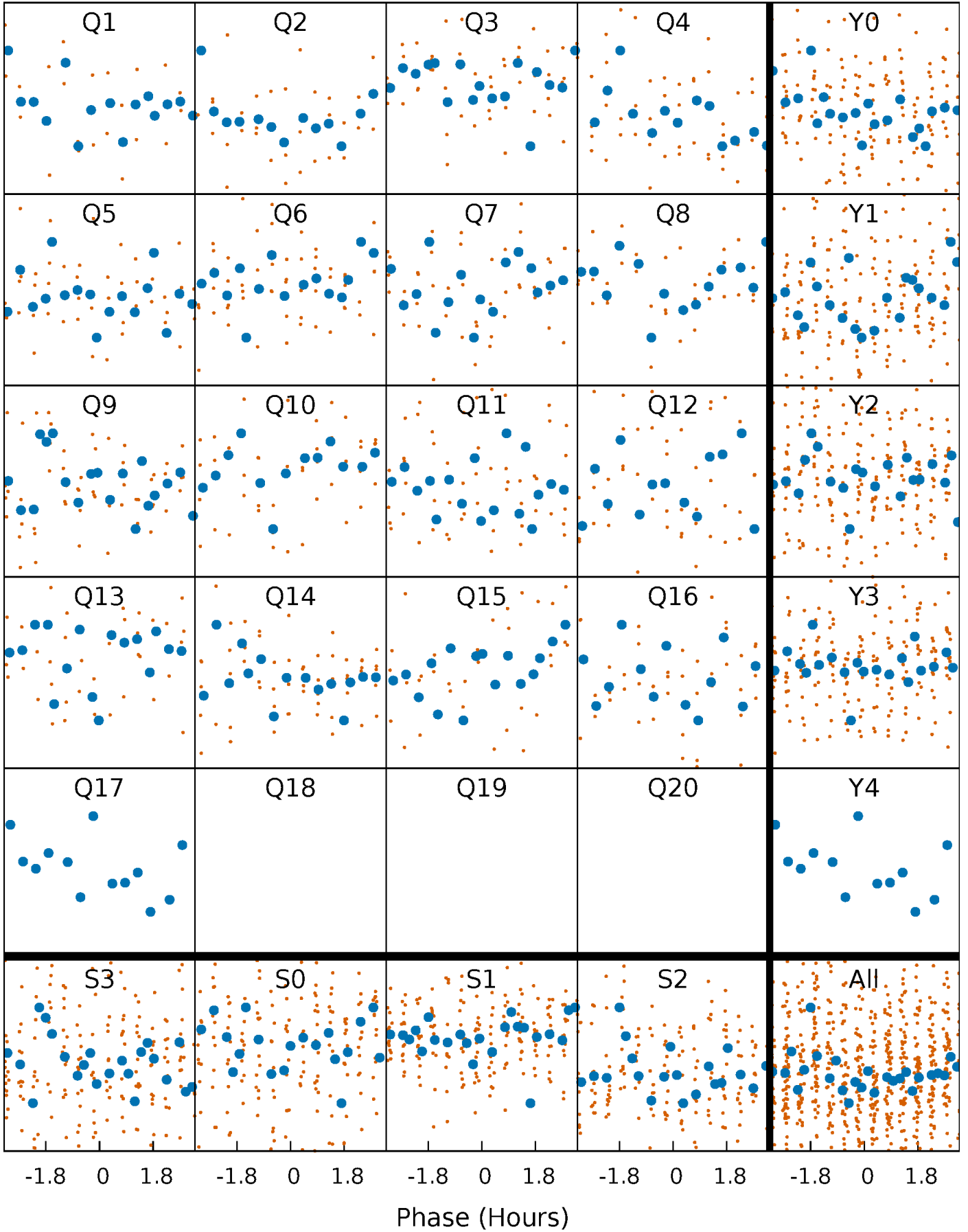


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

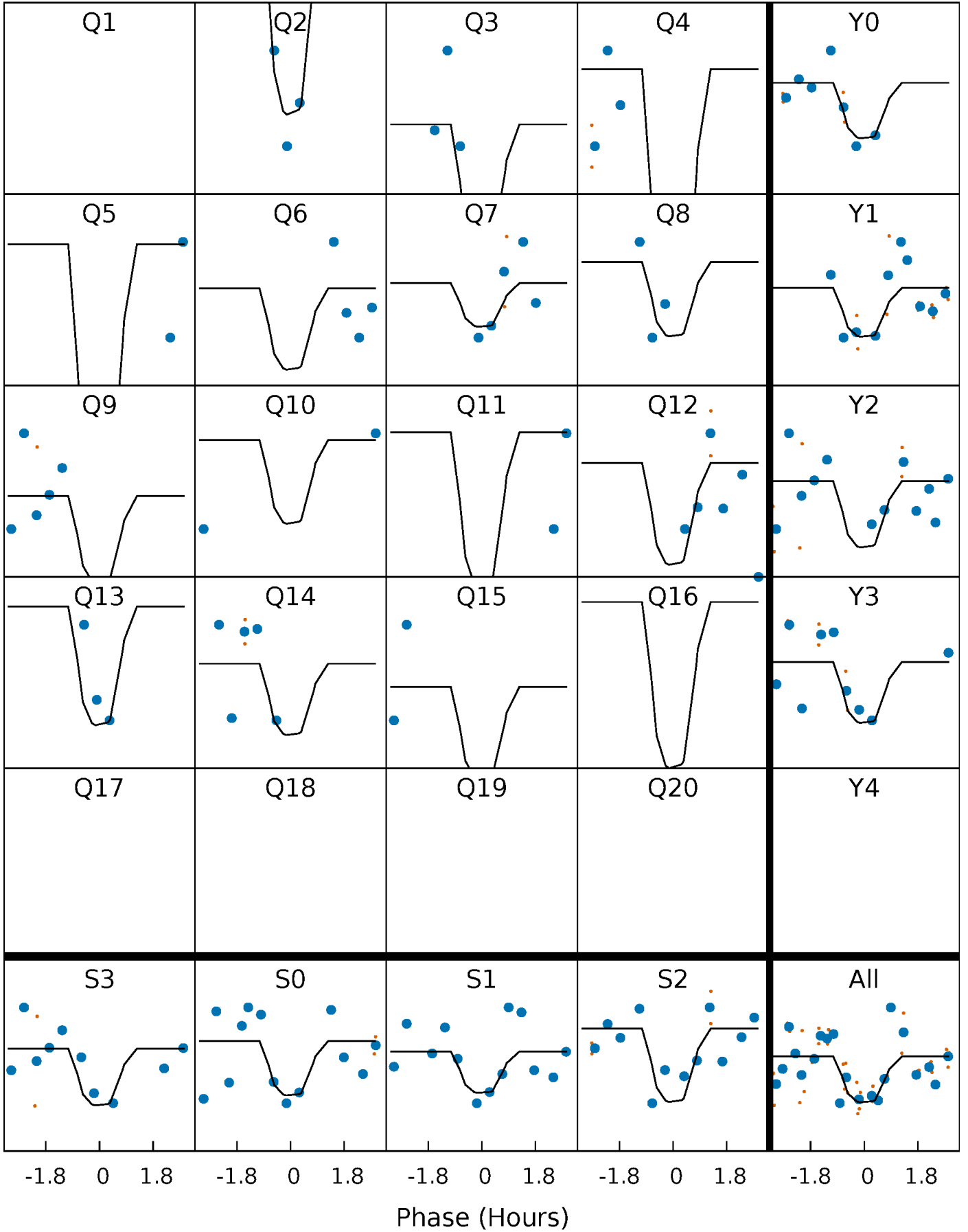
TCE 005217288-02   P= 21.230421 Days    $T_0=139.450177$  (BKJD)





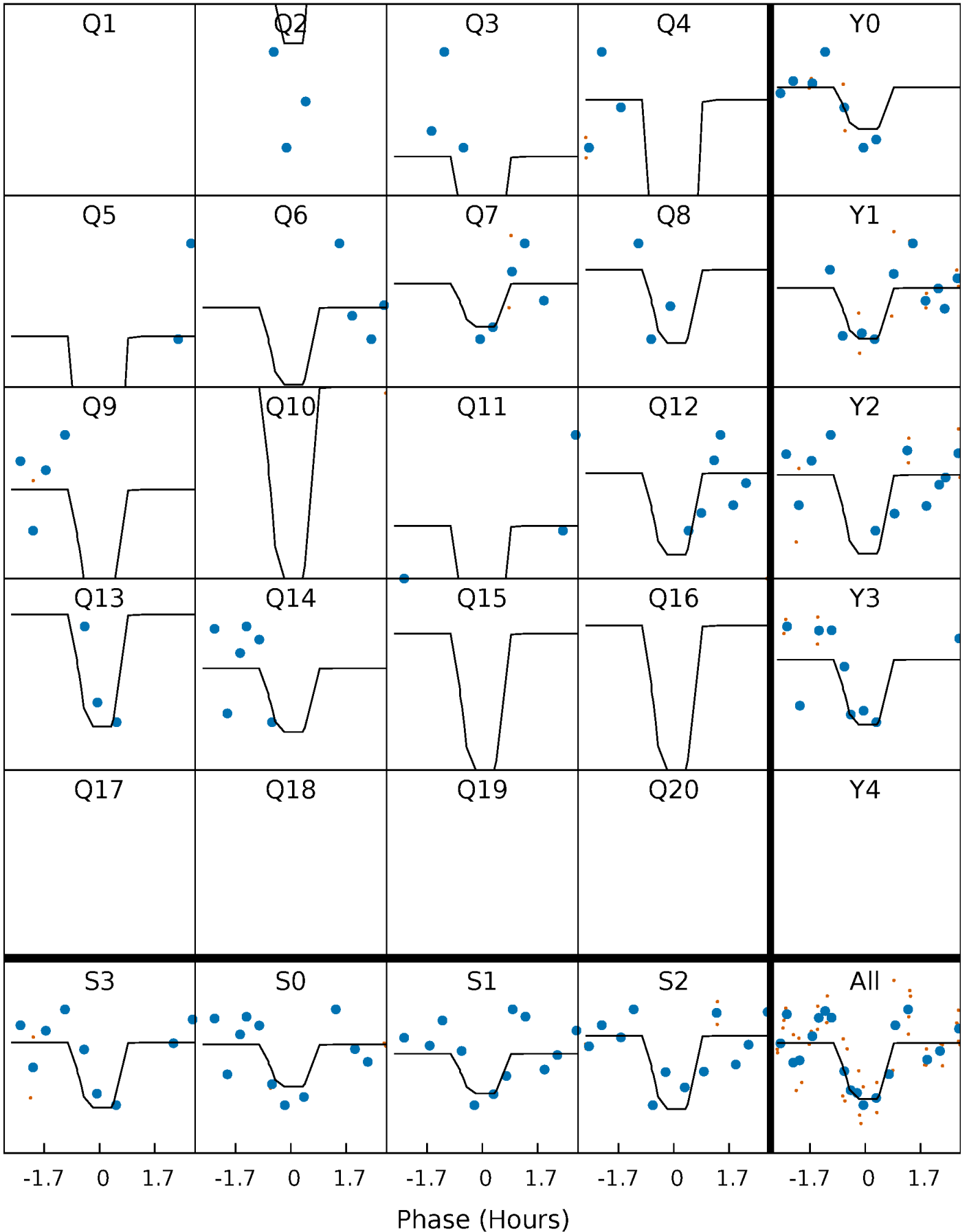
# DV Quarter-Phased Transit Curves

TCE 005217288-02   P= 21.230421 Days    $T_0=139.450177$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

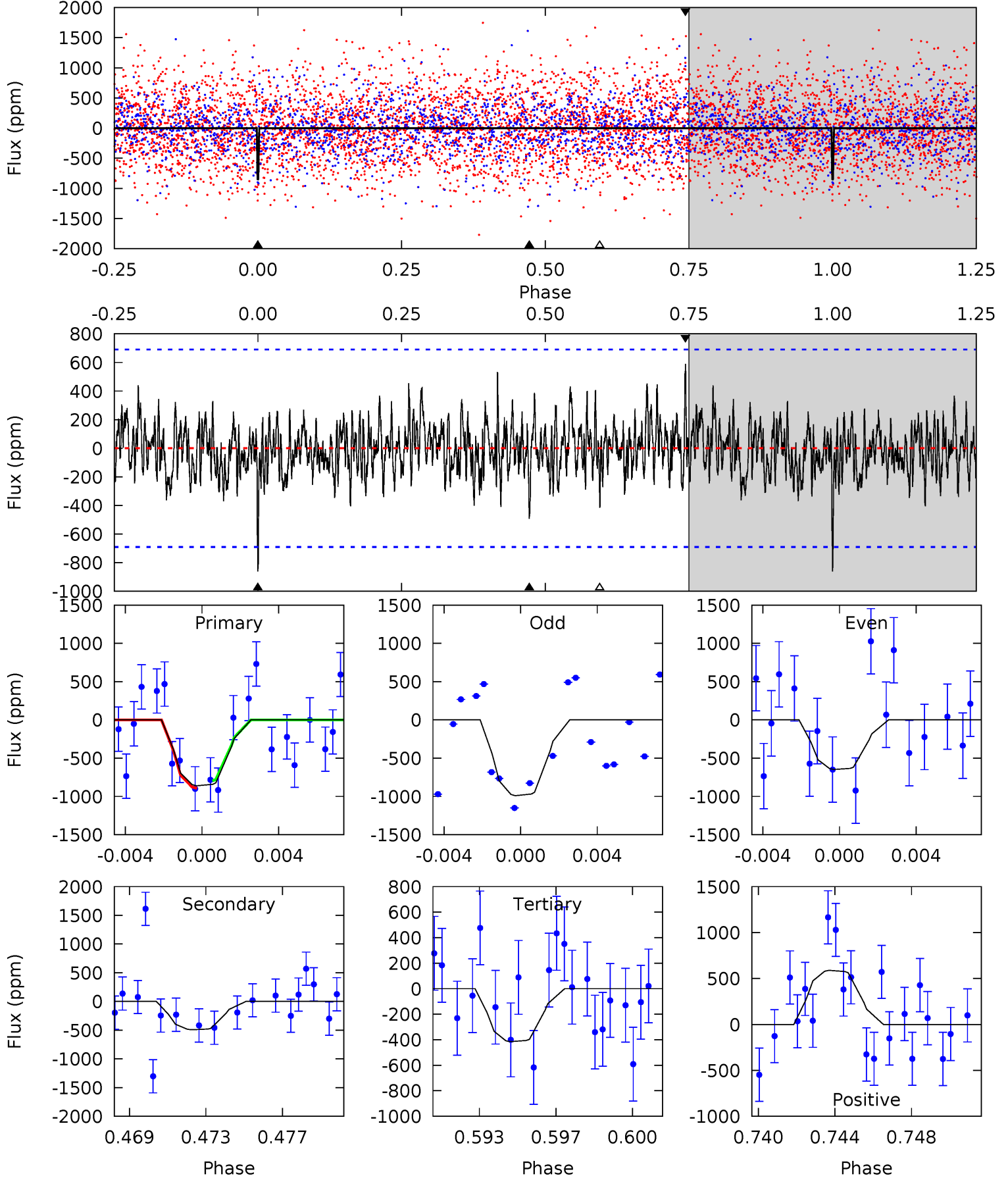
TCE 005217288-02 P= 21.230389 Days  $T_0=139.448951$  (BKJD)



# DV Model-Shift Uniqueness Test

005217288-02, P = 21.230421 Days, E = 118.219756 Days

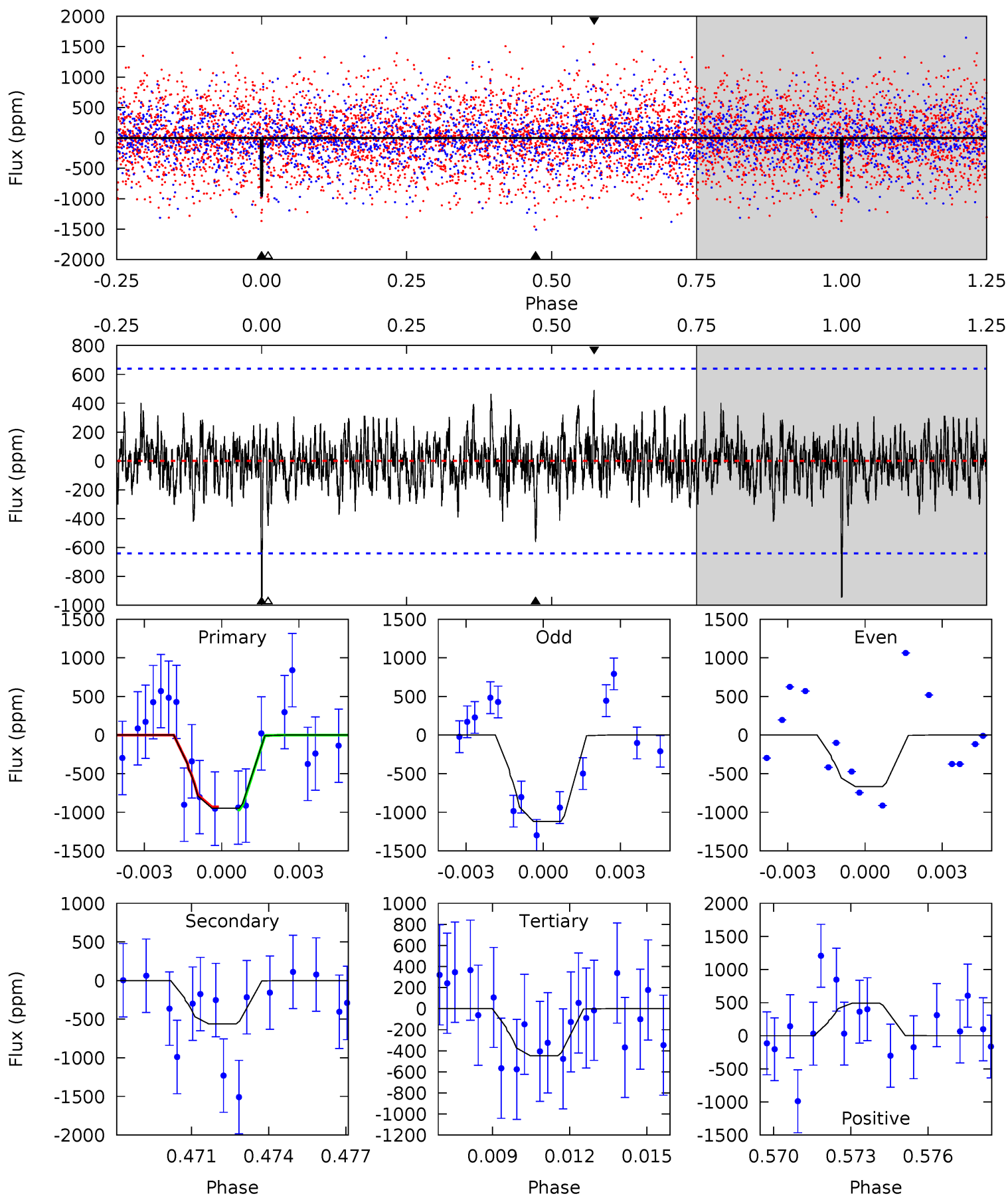
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.49	3.71	3.13	4.44	5.21	2.89	1.16	3.36	2.05	0.58	-0.73	1.24	1.06	0.41	0.36



# Alt Model-Shift Uniqueness Test

005217288-02, P = 21.230389 Days, E = 118.218562 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.76	4.60	3.67	4.03	5.25	2.96	1.11	4.09	3.73	0.93	0.57	1.90	1.28	0.34	0.15





### Stellar Parameters For KIC 005217288

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5825^{+174}_{-174}$	$4.639^{+0.032}_{-0.128}$	$-0.900^{+0.300}_{-0.300}$	$0.702^{+0.123}_{-0.044}$	$0.792^{+0.062}_{-0.075}$	$3.229^{+0.389}_{-1.177}$
	+3%/-3%	+1%/-3%	+33%/-33%	+18%/-6%	+8%/-9%	+12%/-36%
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 005217288-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-492 \pm 133$	$6.01^{+5.95}_{-4.05}$	$821^{+39}_{-31}$	$3585^{+1865}_{-660}$	$142^{+1182}_{-106}$
Alt.	$-561 \pm 122$	$5.80^{+5.35}_{-3.94}$	$821^{+37}_{-33}$	$3730^{+2222}_{-708}$	$177^{+1550}_{-131}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

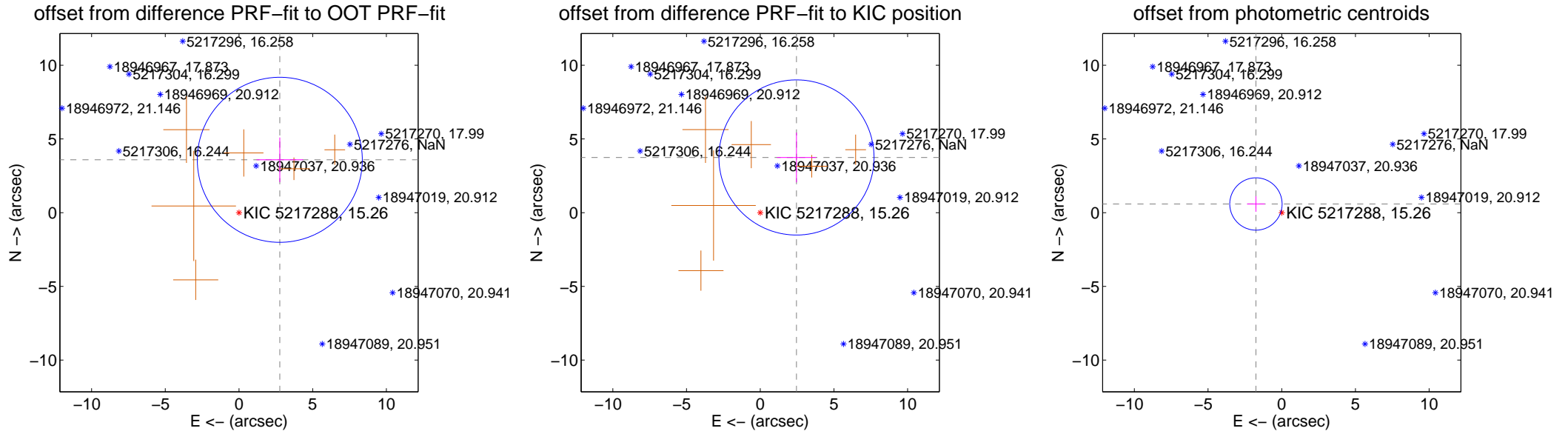
## DV Centroid Data

Supplemental centroid analysis for 005217288-02. Kepler magnitude: 15.26. Transit SNR 13.47

There are 0 quarters with good PRF difference image offsets

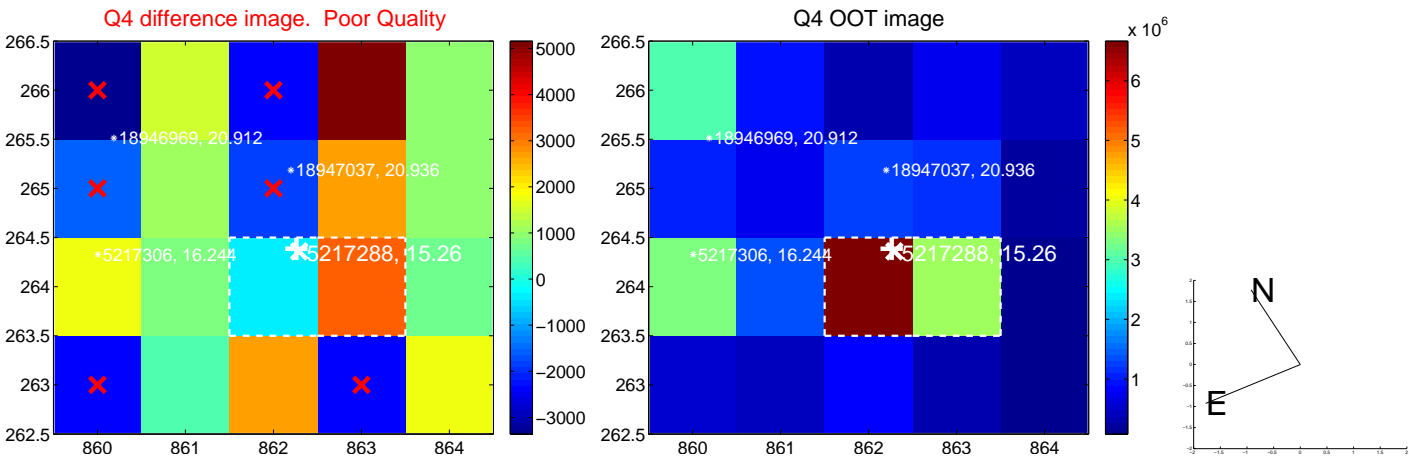
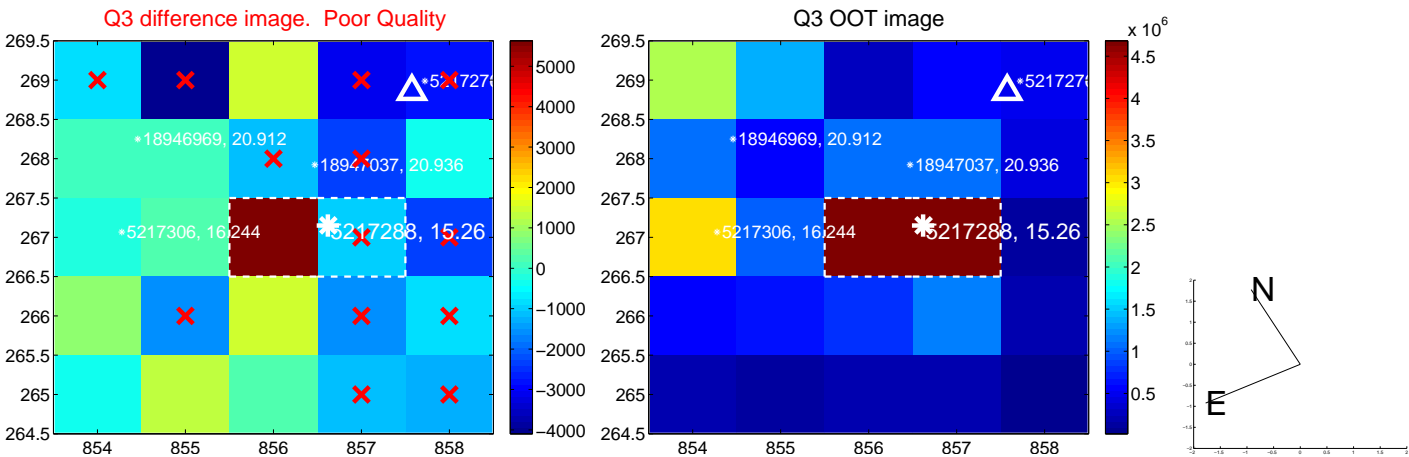
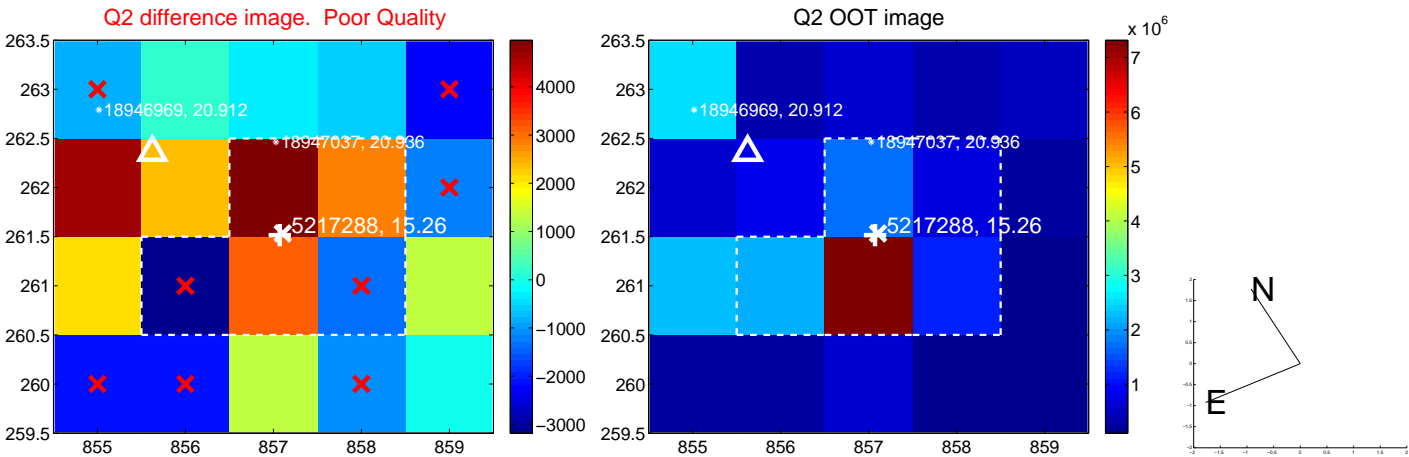
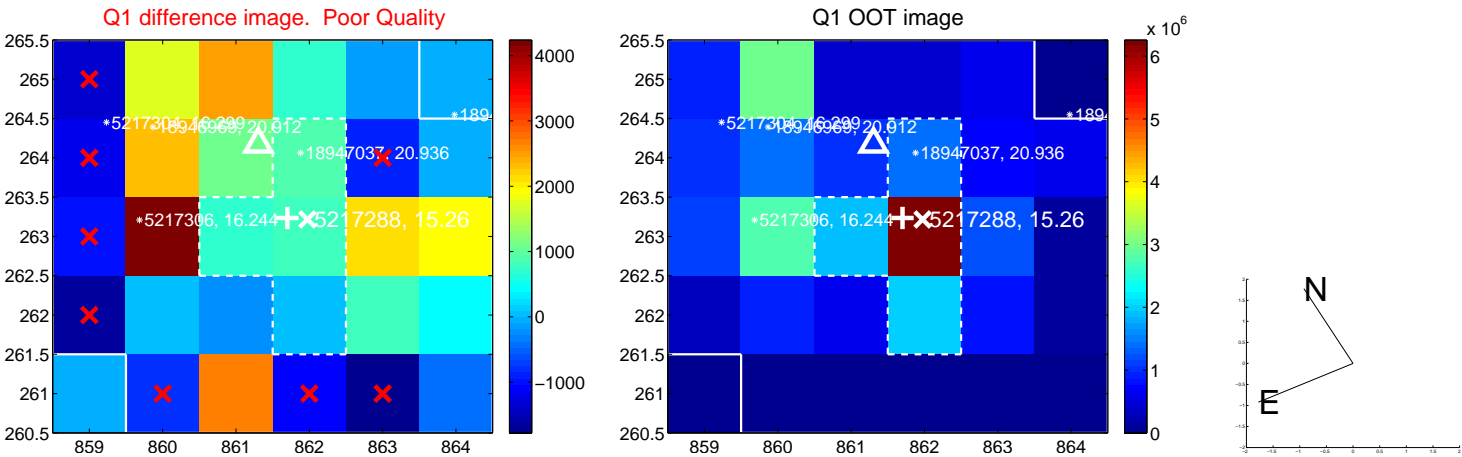
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.530 \pm 1.866$	2.43	$-2.770 \pm 1.580$	$3.585 \pm 1.512$
PRF-fit source offset from KIC position	$4.479 \pm 1.754$	2.55	$-2.459 \pm 1.328$	$3.744 \pm 1.690$
photometric centroid source offset	$1.85 \pm 0.59$	3.12	$1.75 \pm 0.60$	$0.59 \pm 0.53$

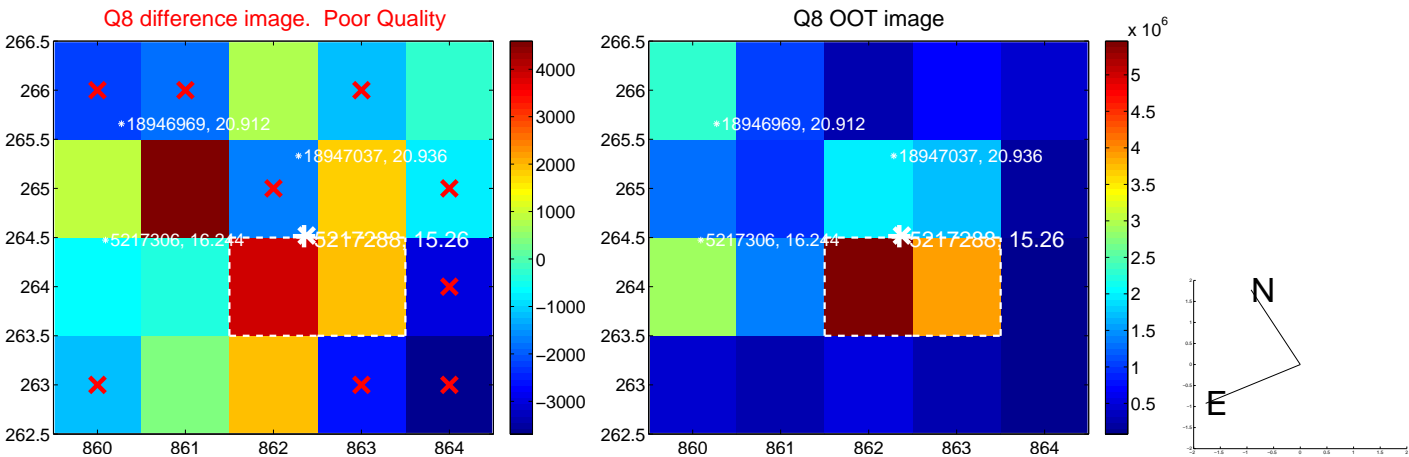
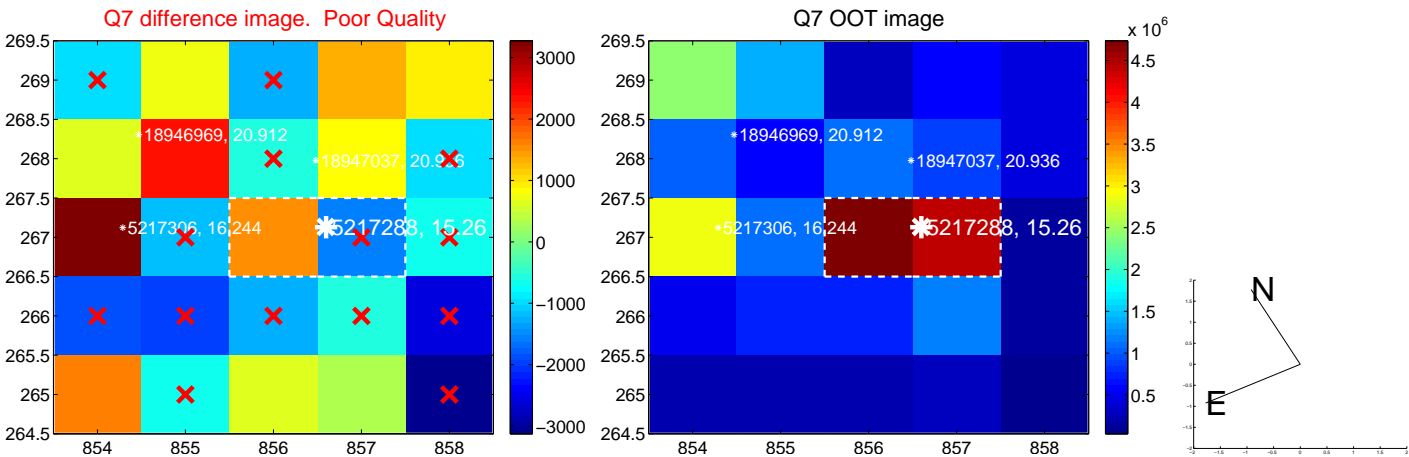
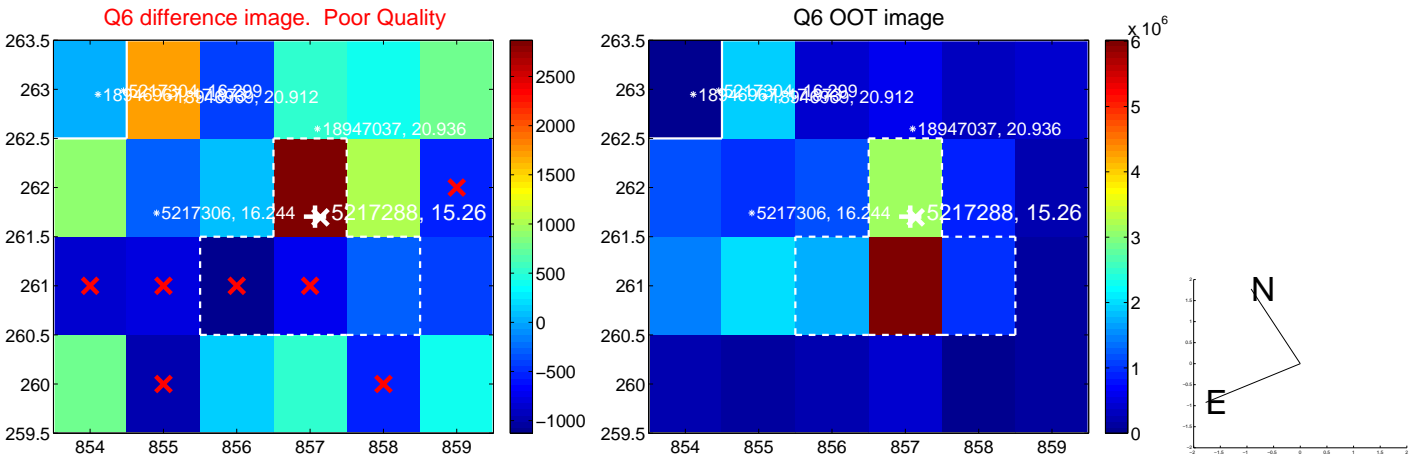
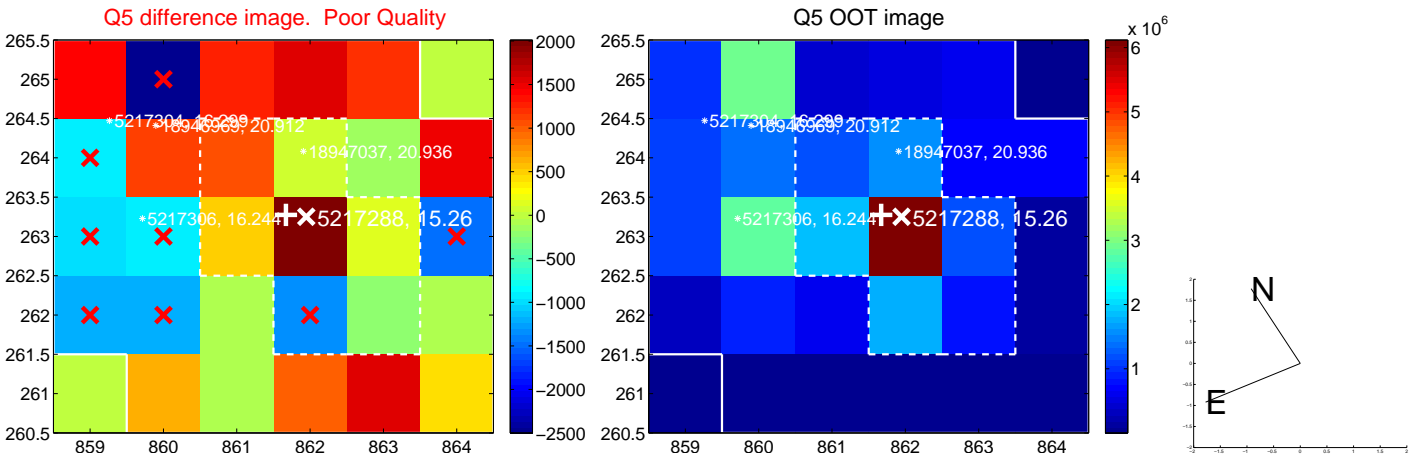


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

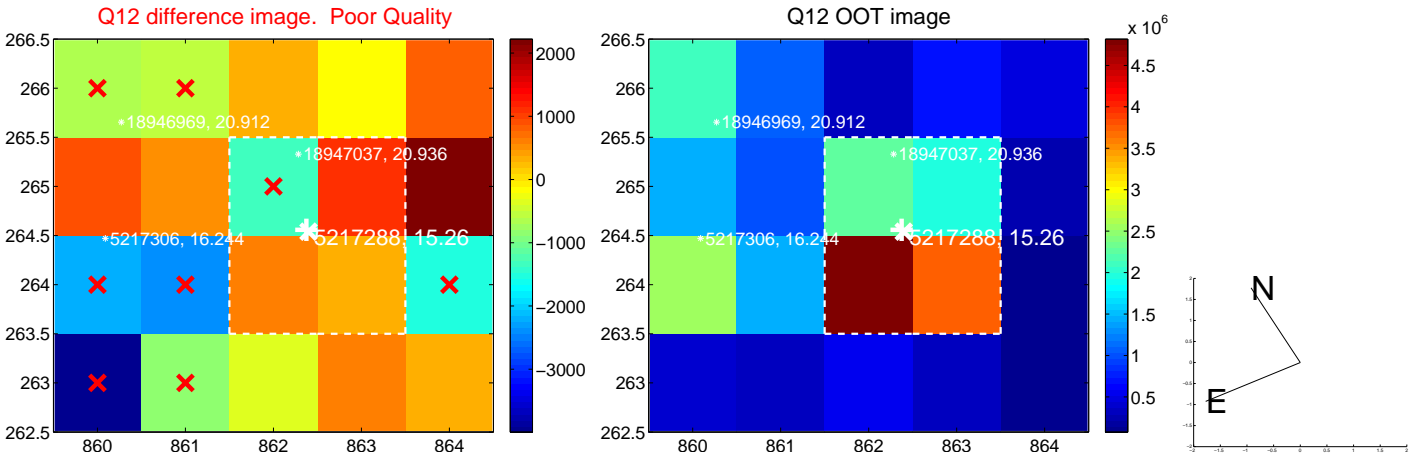
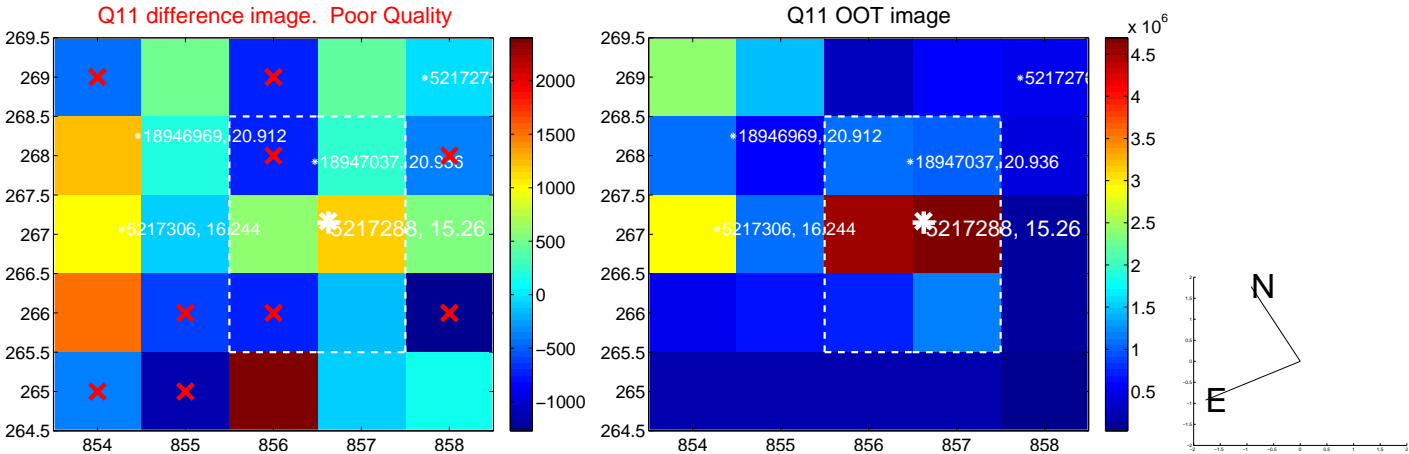
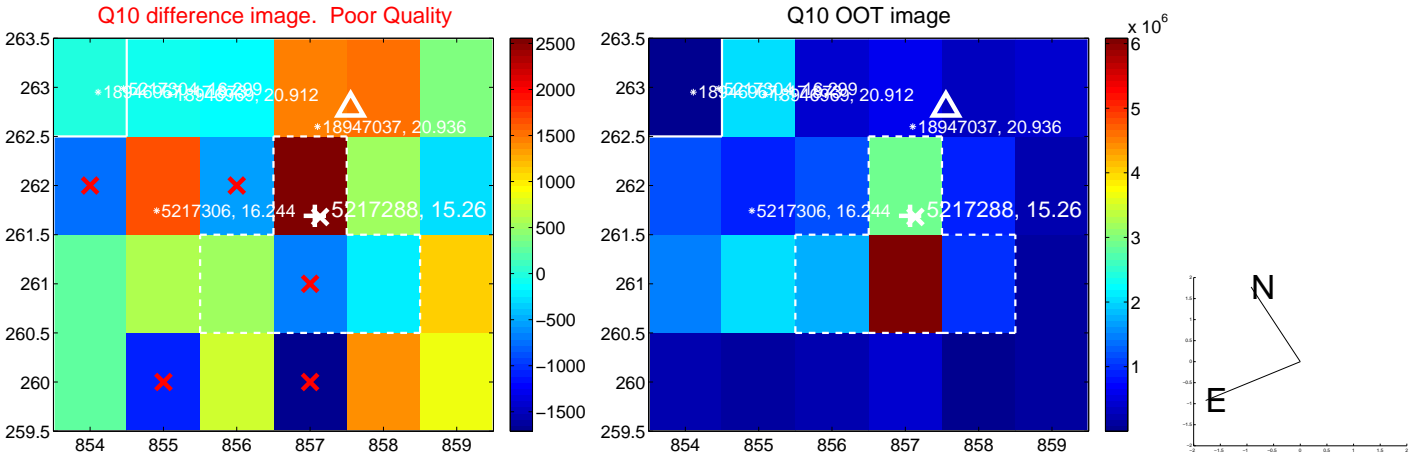
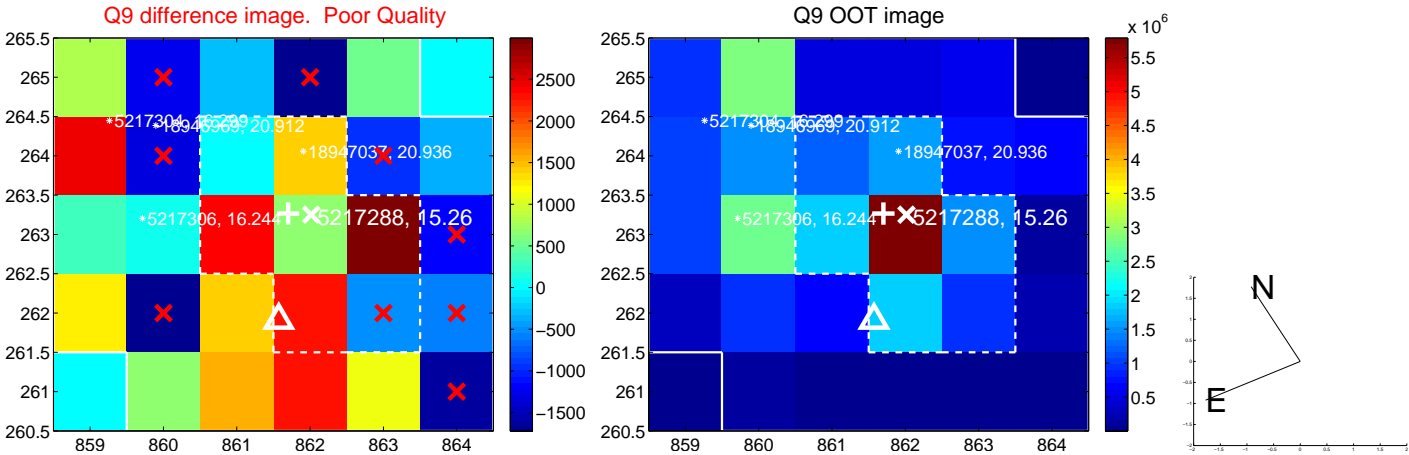
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

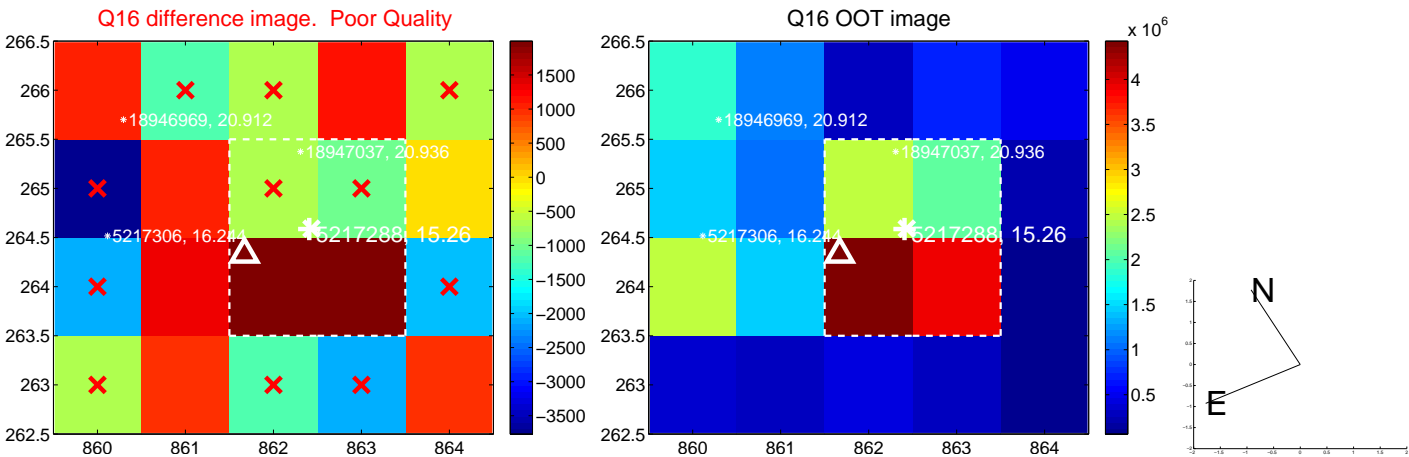
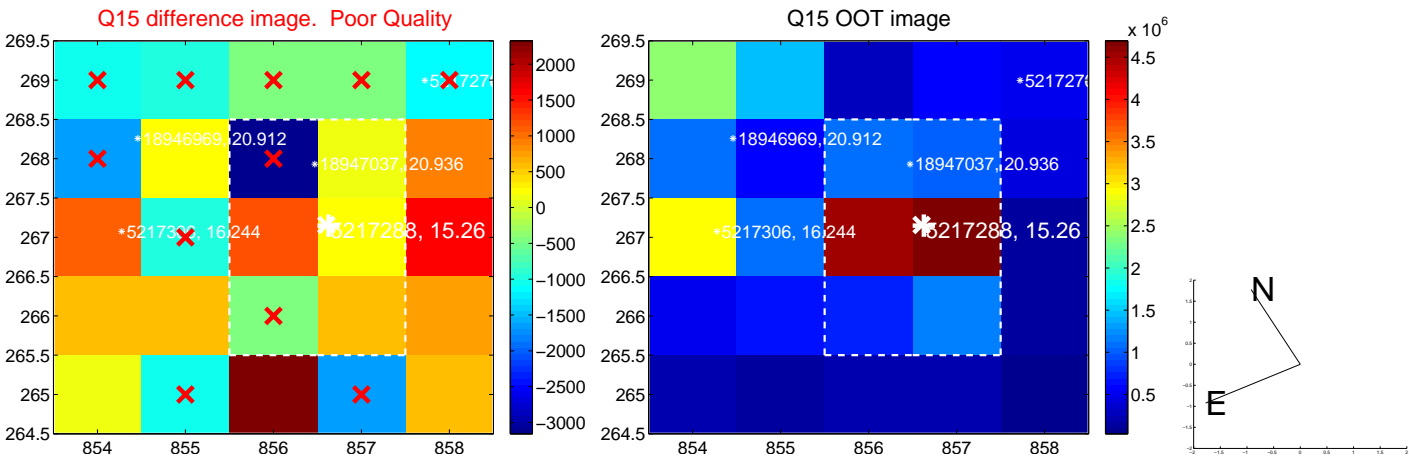
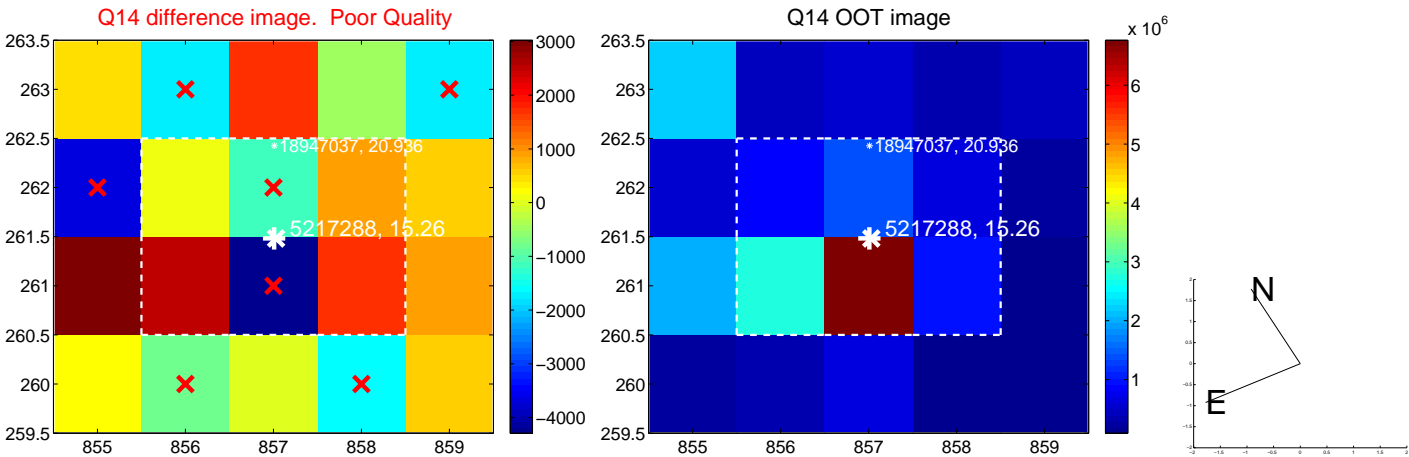
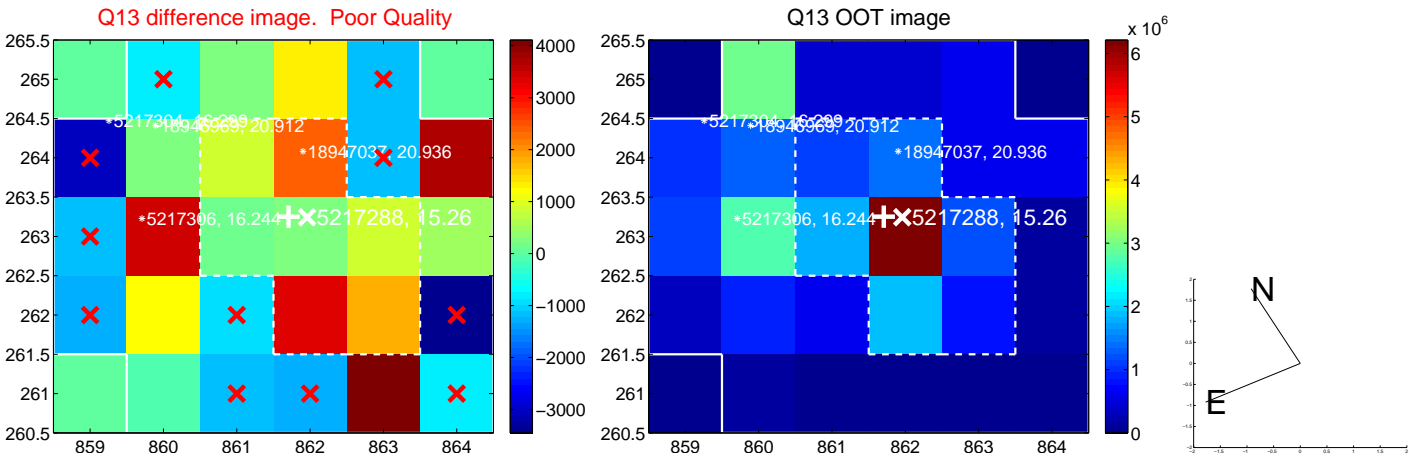


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

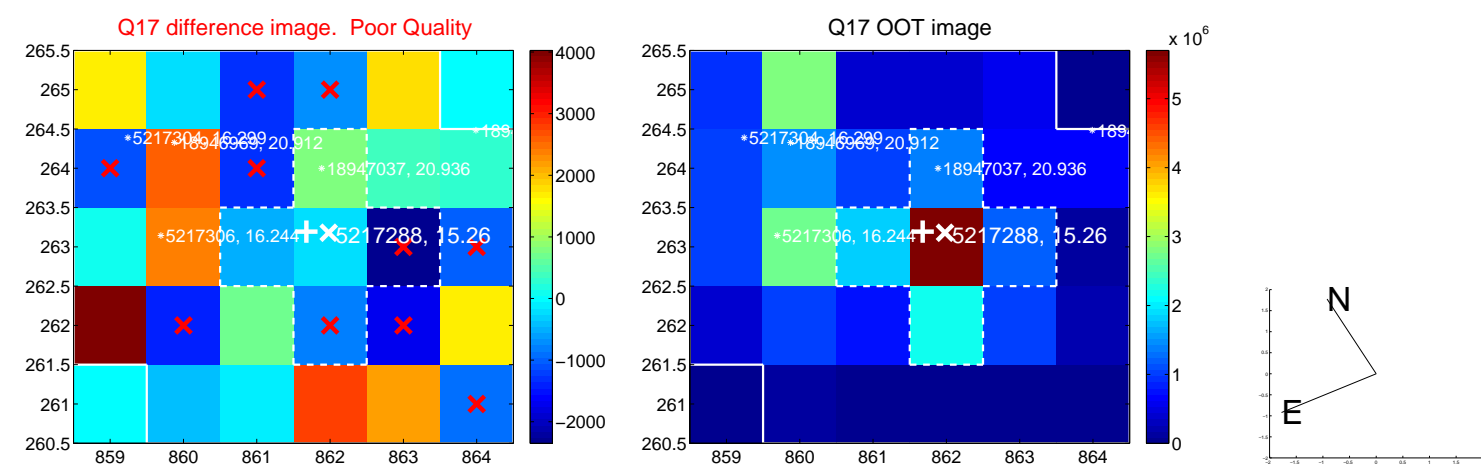




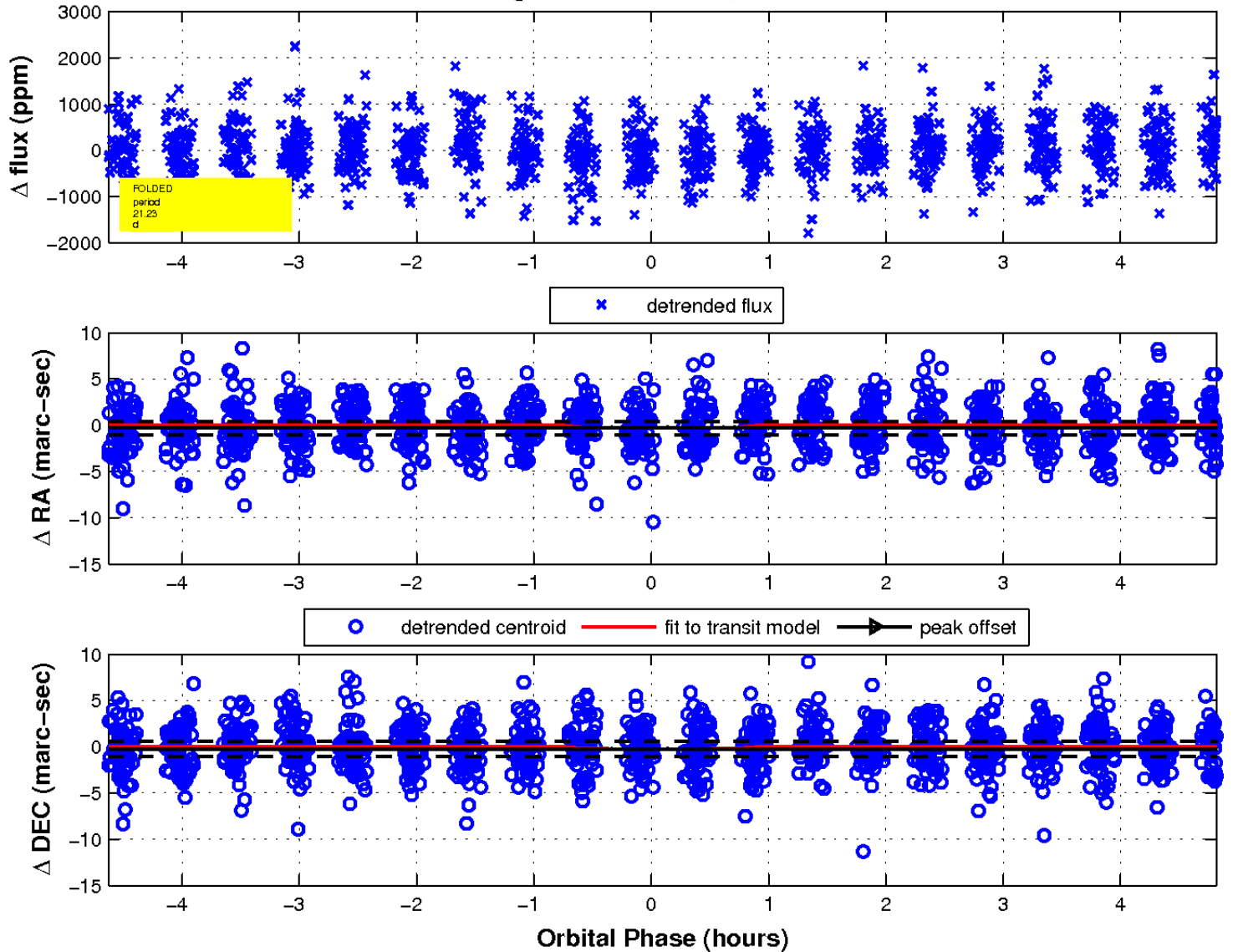
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

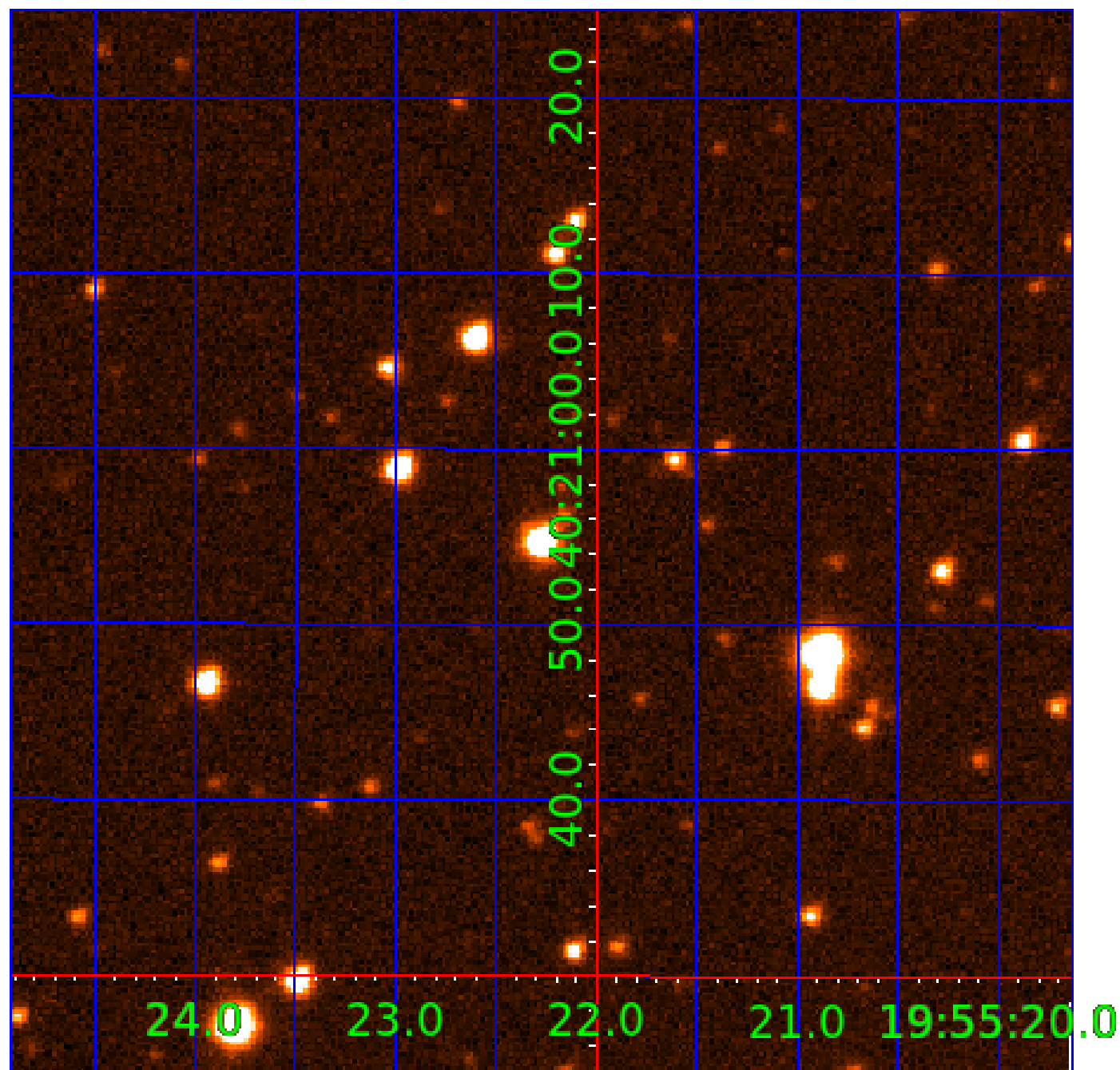


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination



# KIC 005217288

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005217288-01	OBS	No	0.936057	131.856586	45.3	6.813	8.3	9.6	0.70	5825	0.49	1705.69
005217288-02	OBS	No	21.230421	139.450177	967.0	1.607	12.3	13.5	0.70	5825	2.27	26.57
005217288-03	OBS	No	28.406012	144.686705	832.5	1.710	11.0	11.8	0.70	5825	2.20	18.02
005217288-04	OBS	No	18.360603	147.173848	798.9	0.982	11.5	8.4	0.70	5825	2.03	32.24
005217288-05	OBS	No	46.587378	153.342544	790.5	1.932	9.7	10.3	0.70	5825	2.10	9.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005217288-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005217288-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005217288-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005217288-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005217288-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

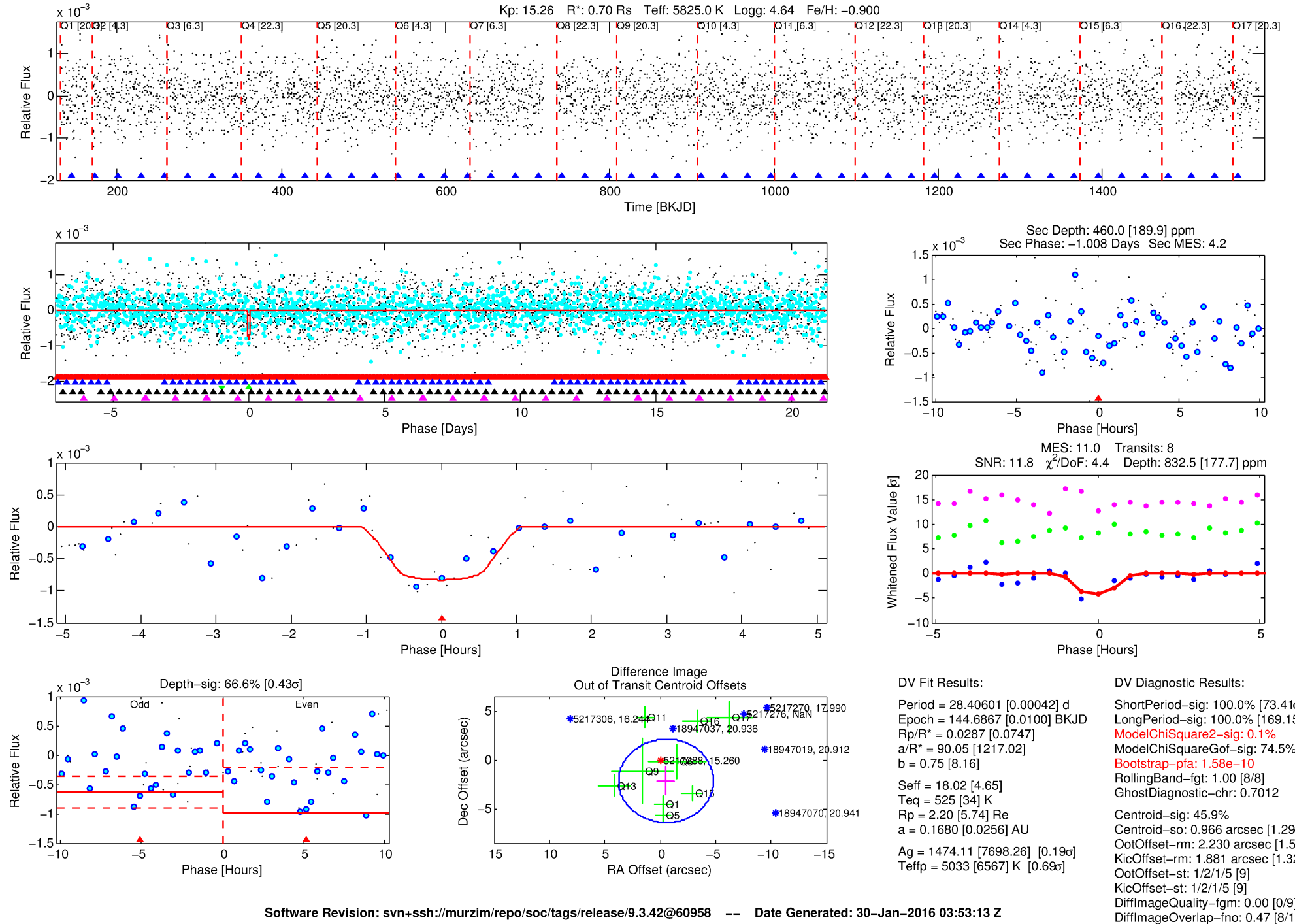
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005217288-03

No Significant Match Found

# DV One-Page Summary

KIC: 5217288 Candidate: 3 of 5 Period: 28.406 d

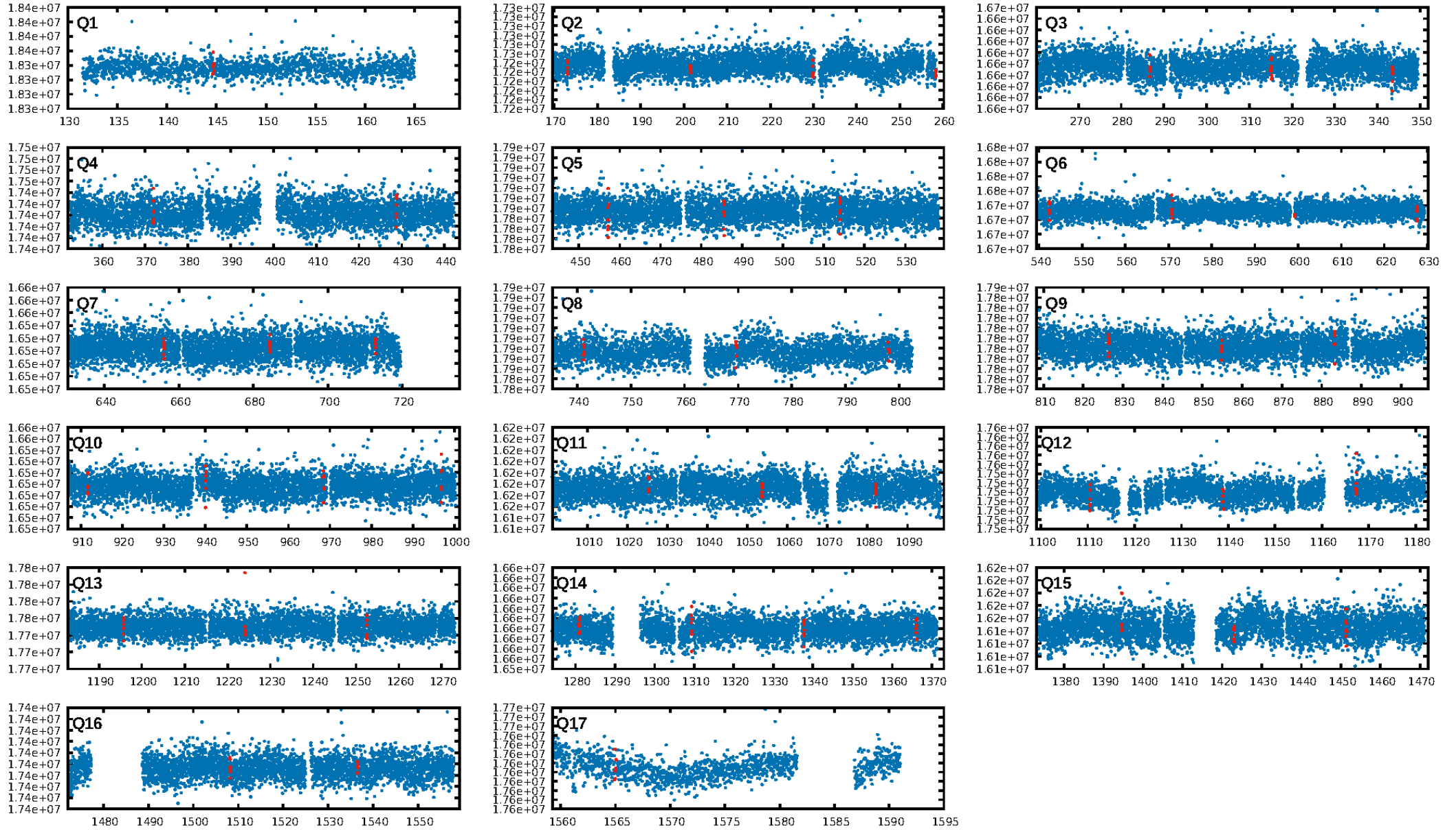


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:53:13 Z

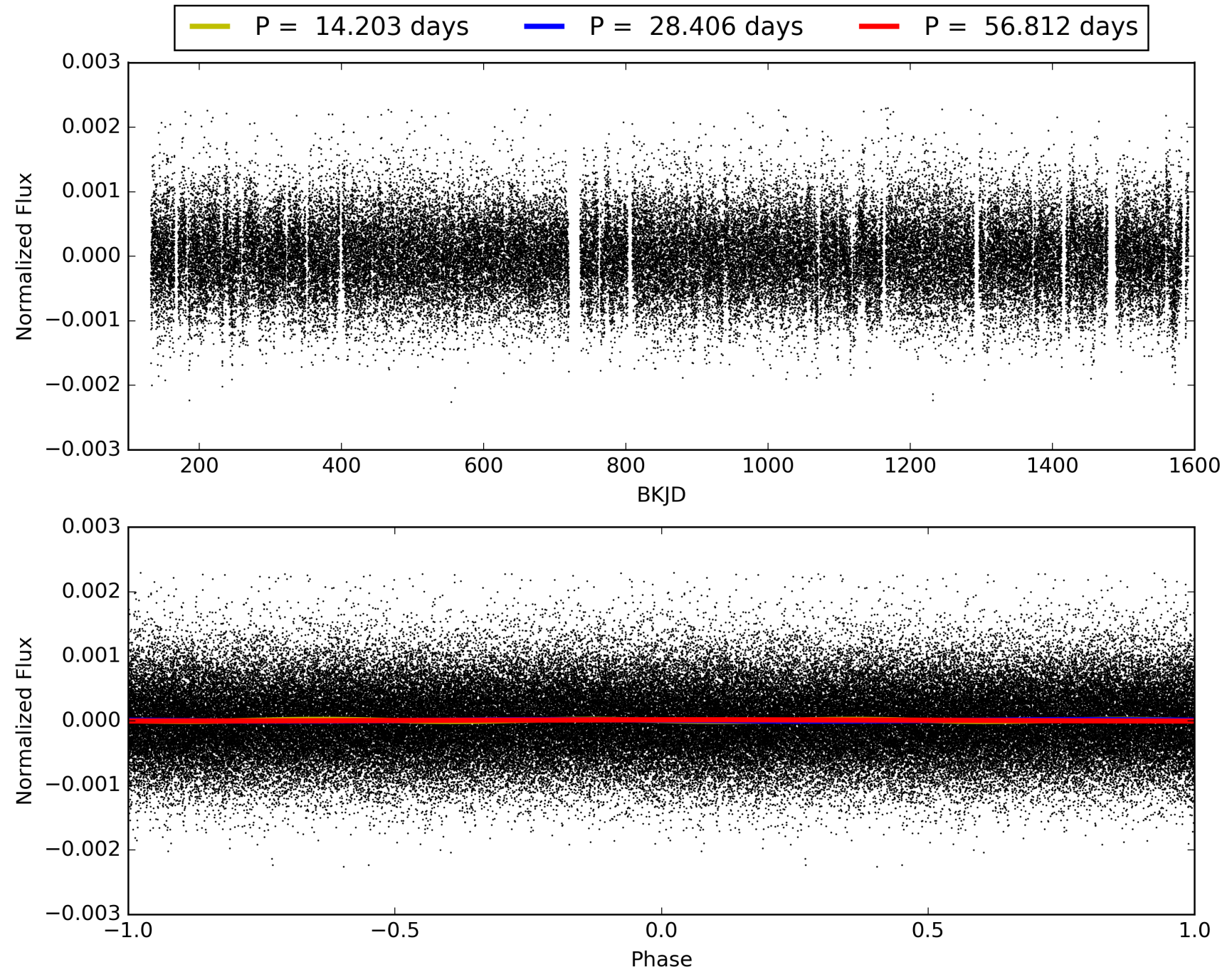
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005217288-03, PDC Light Curves

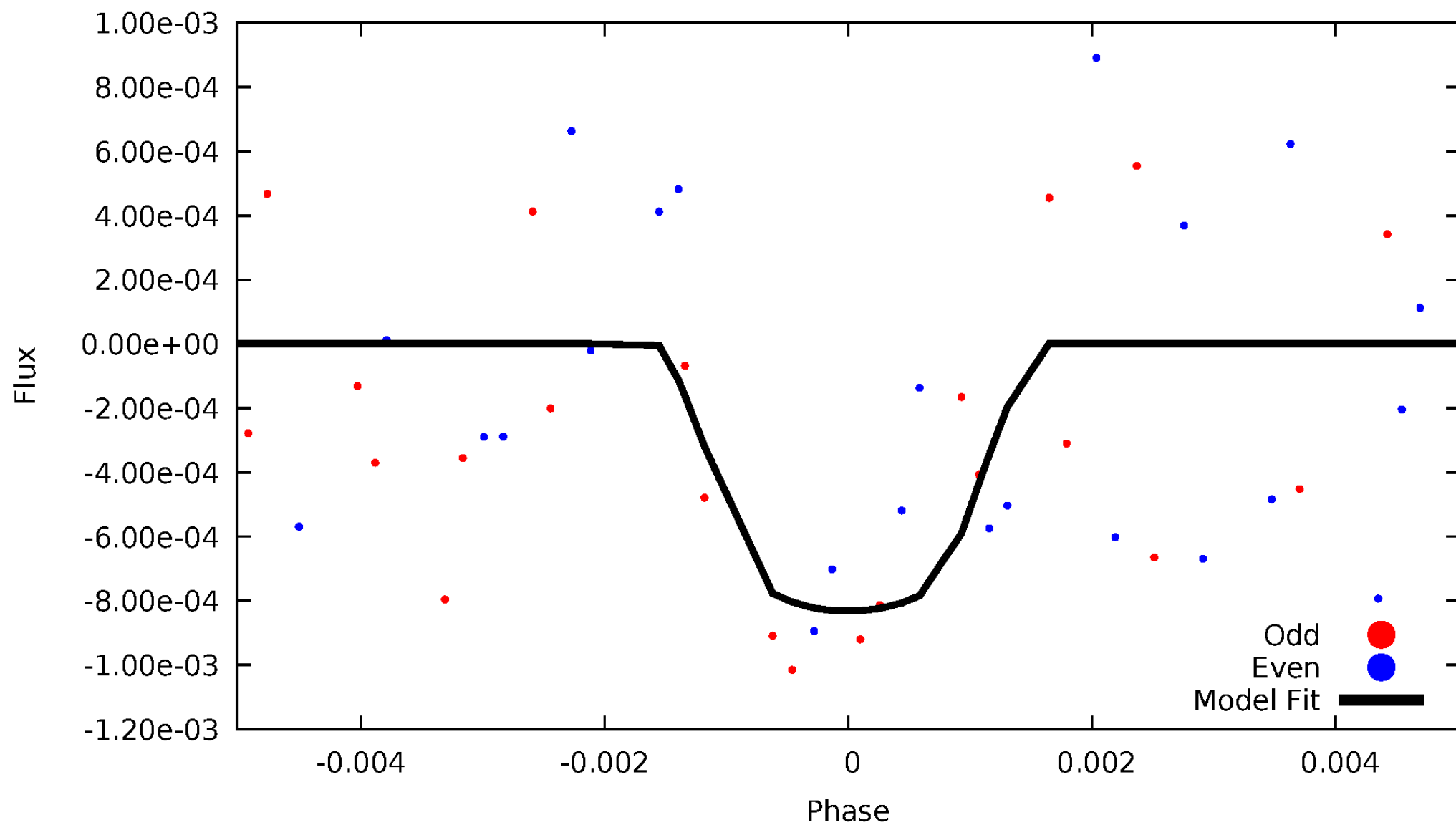


# TCE 005217288-03



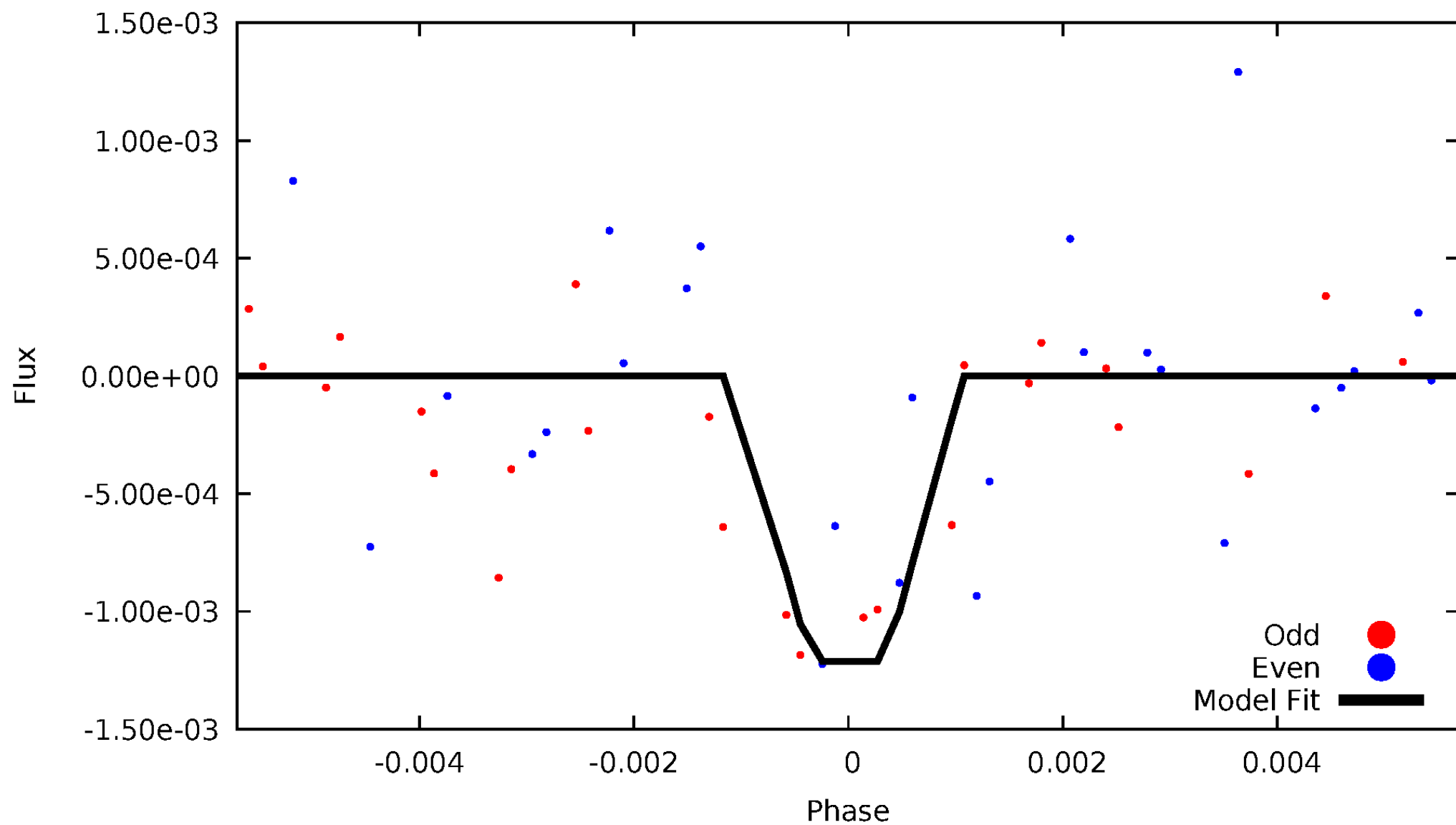
# DV Odd/Even

TCE 005217288-03



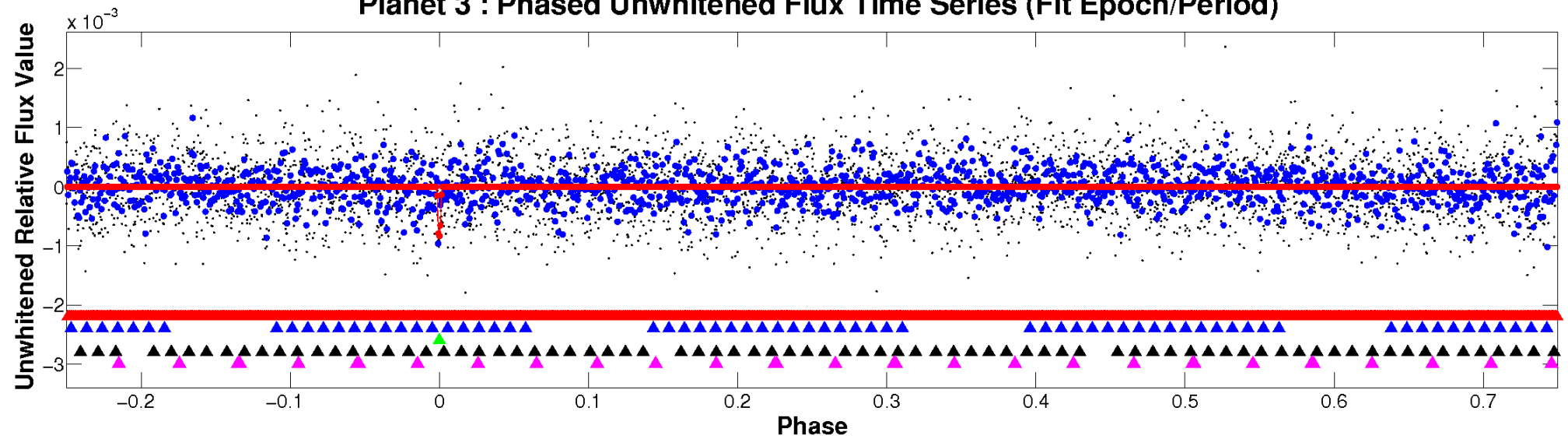
# ALT Odd/Even

TCE 005217288-03

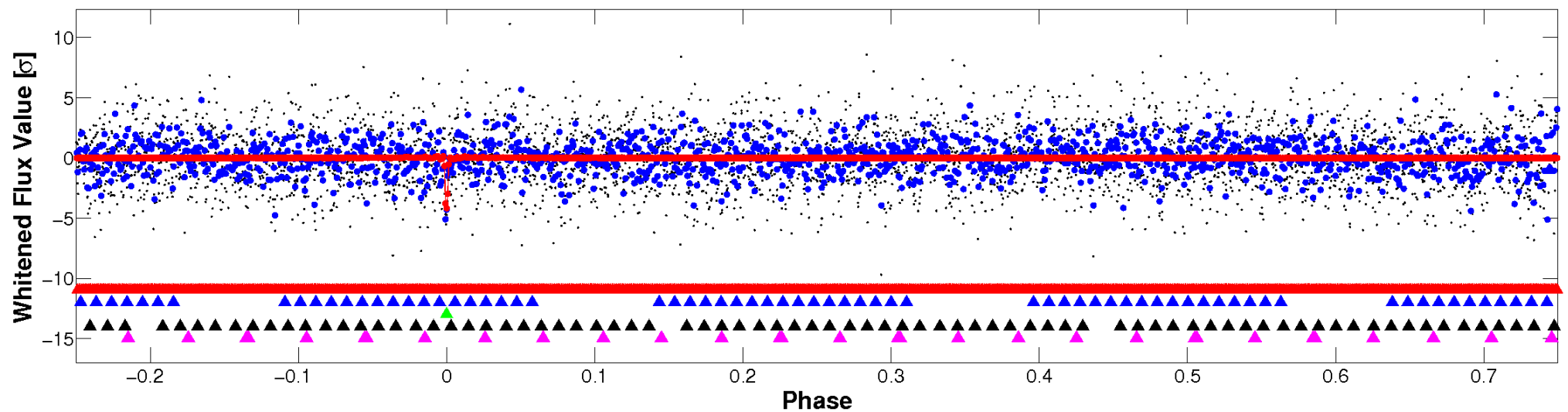


# Non-Whitened Vs. Whitened Light Curve

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



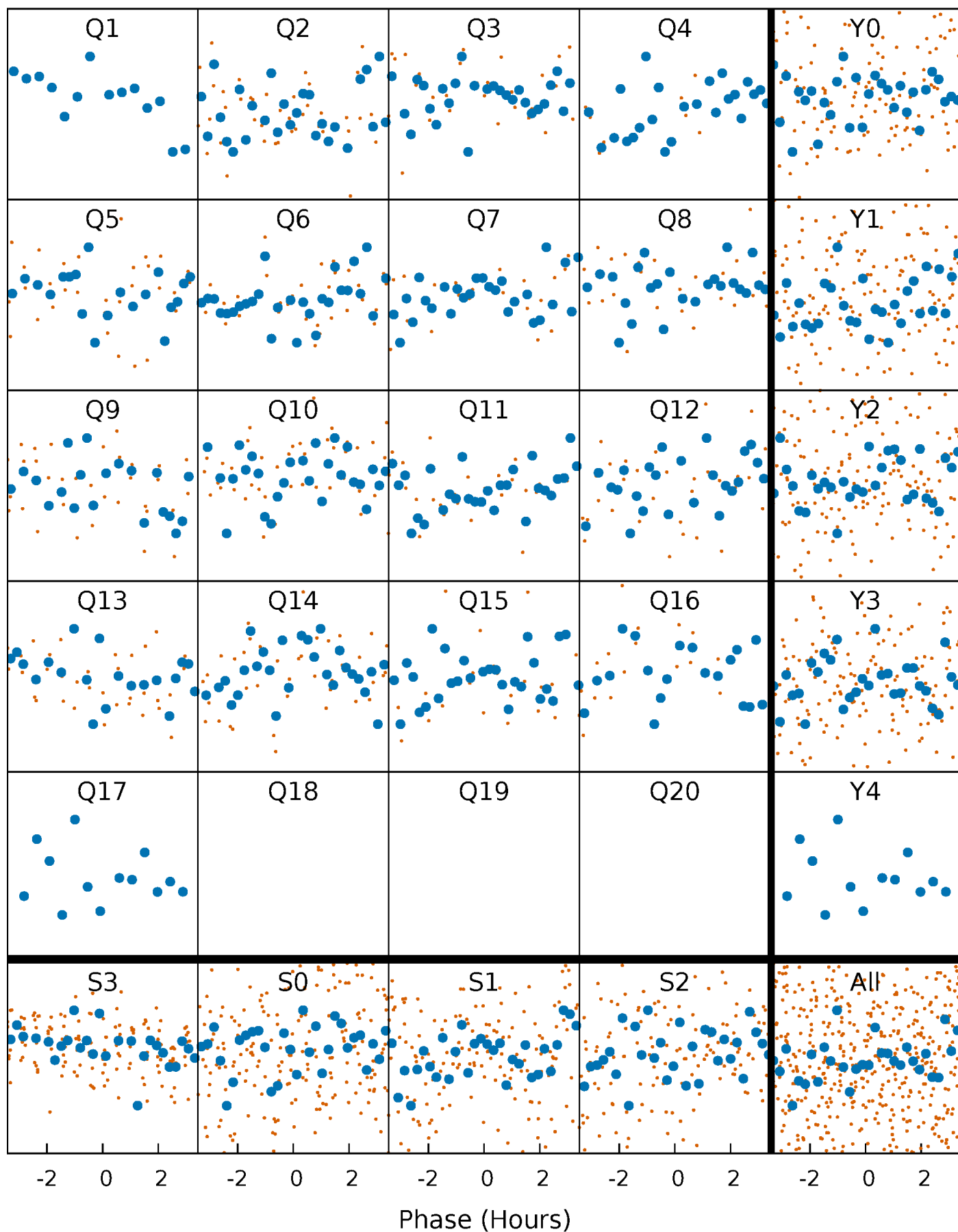
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





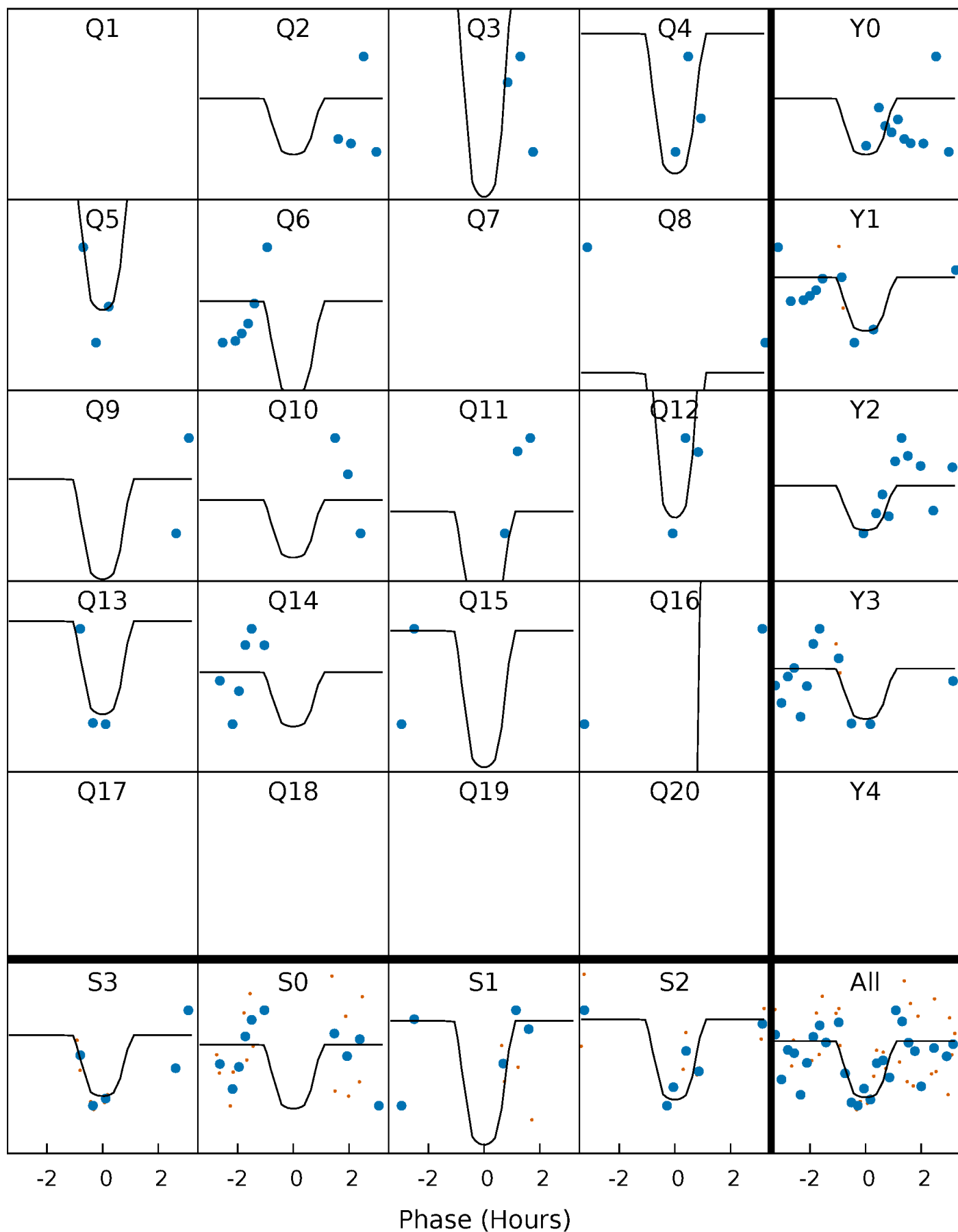
# PDC Quarter-Phased Transit Curves

TCE 005217288-03     $P = 28.406012$  Days     $T_0 = 144.686705$  (BKJD)



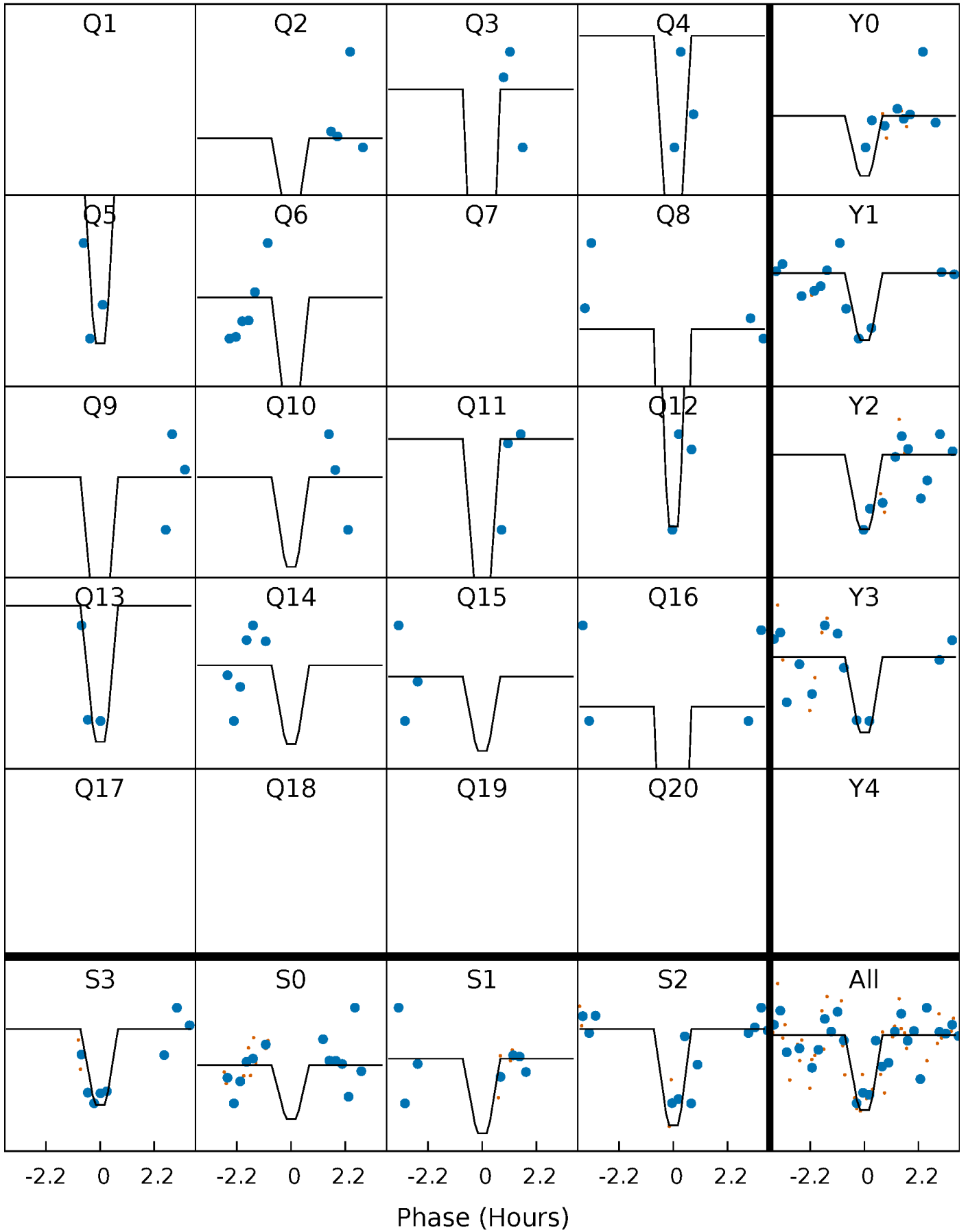
# DV Quarter-Phased Transit Curves

TCE 005217288-03 P= 28.406012 Days  $T_0=144.686705$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

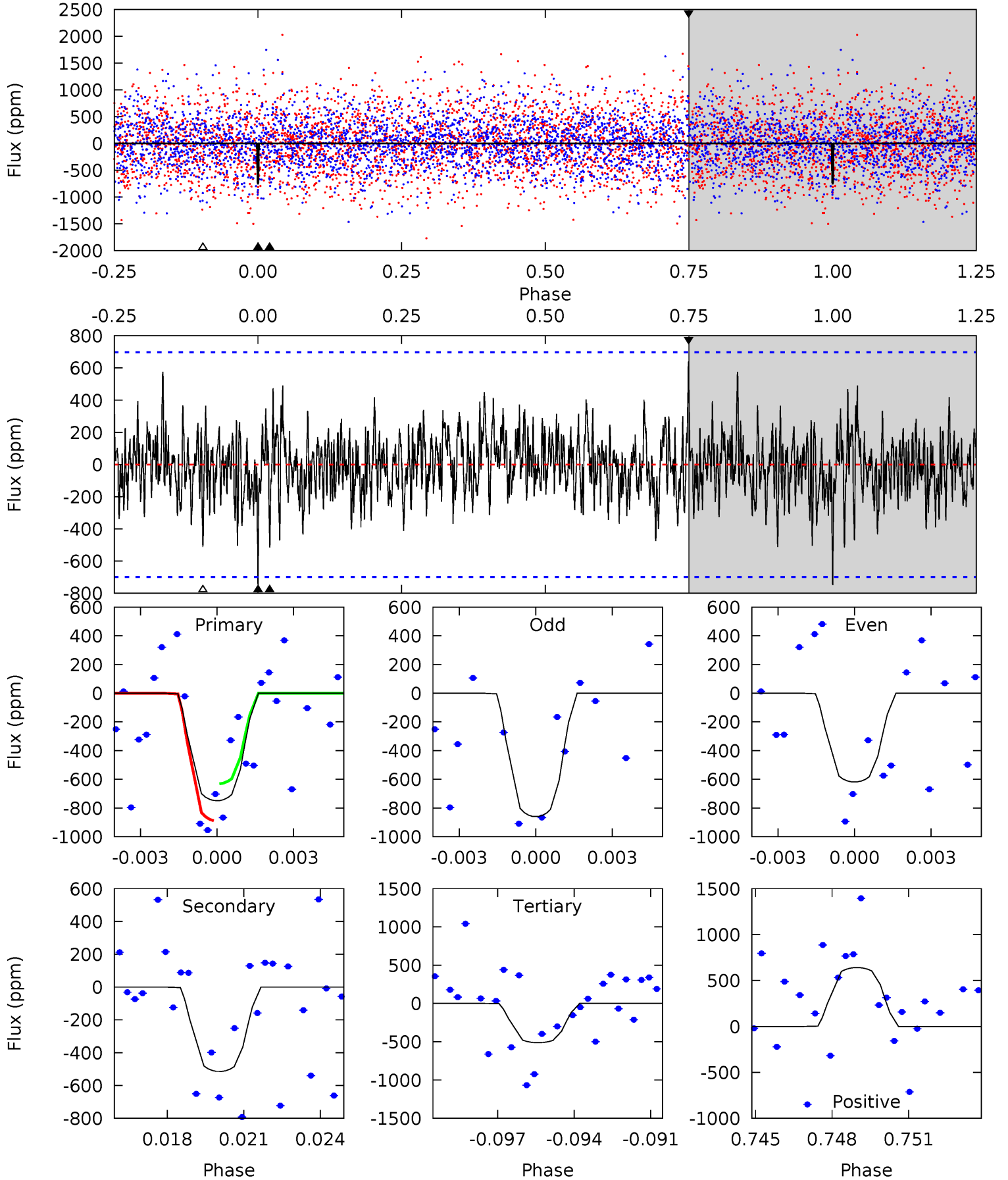
TCE 005217288-03 P= 28.405982 Days  $T_0=144.686627$  (BKJD)



# DV Model-Shift Uniqueness Test

005217288-03, P = 28.406012 Days, E = 116.280693 Days

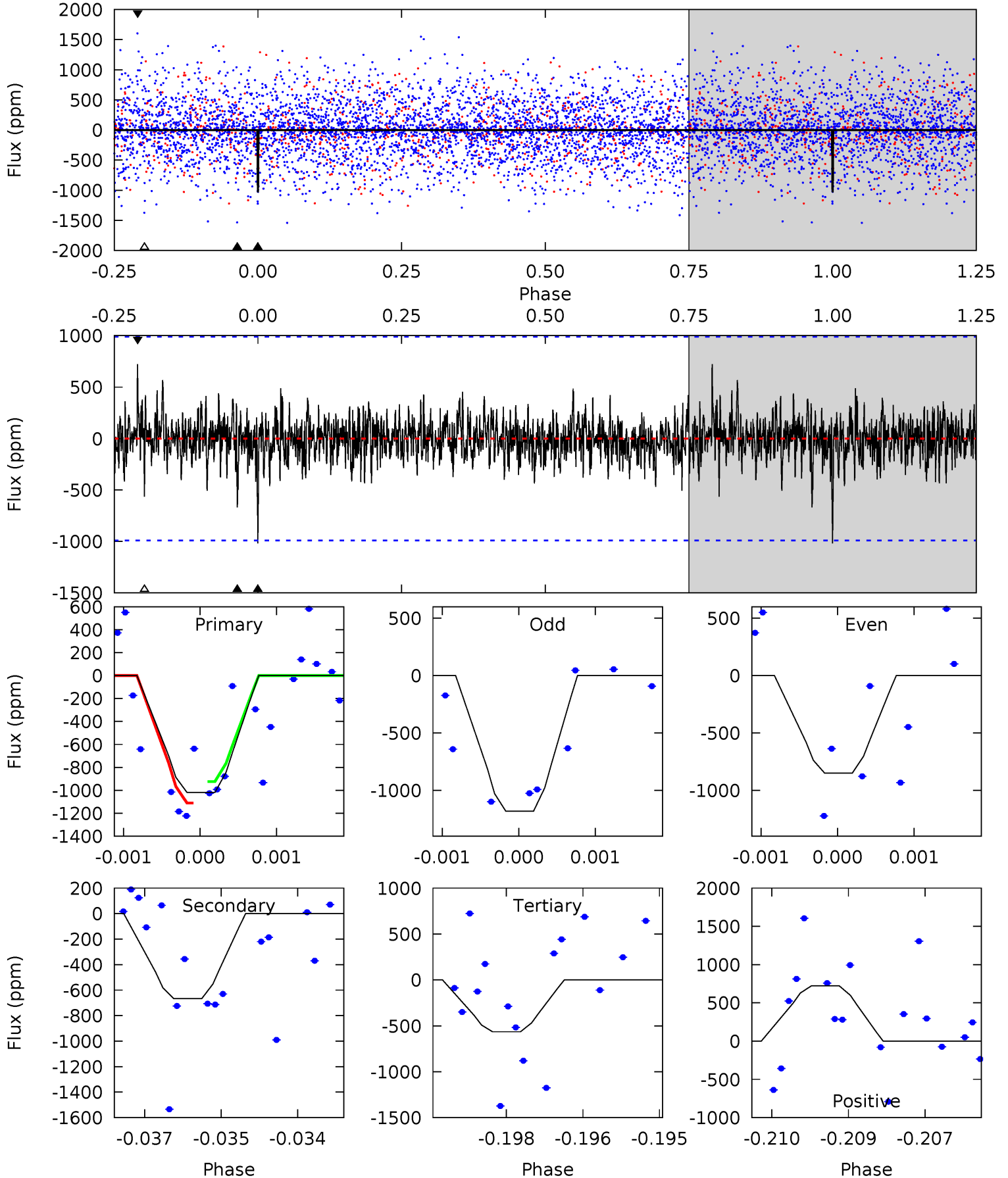
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.63	3.87	3.85	4.81	5.25	2.96	1.23	1.78	0.82	0.02	-0.95	0.91	0.92	0.46	0.96



# Alt Model-Shift Uniqueness Test

005217288-03, P = 28.405982 Days, E = 116.280645 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.55	3.63	3.08	3.93	5.39	3.19	0.86	2.47	1.61	0.56	-0.30	0.86	0.86	0.41	0.48





### Stellar Parameters For KIC 005217288

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5825^{+174}_{-174}$	$4.639^{+0.032}_{-0.128}$	$-0.900^{+0.300}_{-0.300}$	$0.702^{+0.123}_{-0.044}$	$0.792^{+0.062}_{-0.075}$	$3.229^{+0.389}_{-1.177}$
	+3%/-3%	+1%/-3%	+33%/-33%	+18%/-6%	+8%/-9%	+12%/-36%
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 005217288-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-514 \pm 133$	$5.09^{+5.04}_{-3.40}$	$747^{+35}_{-29}$	$3826^{+2217}_{-776}$	$300^{+2619}_{-229}$
Alt.	$-667 \pm 184$	$5.40^{+4.79}_{-3.74}$	$746^{+36}_{-29}$	$3963^{+2394}_{-773}$	$368^{+3042}_{-277}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

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

$A_{\text{obs}}$  = 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

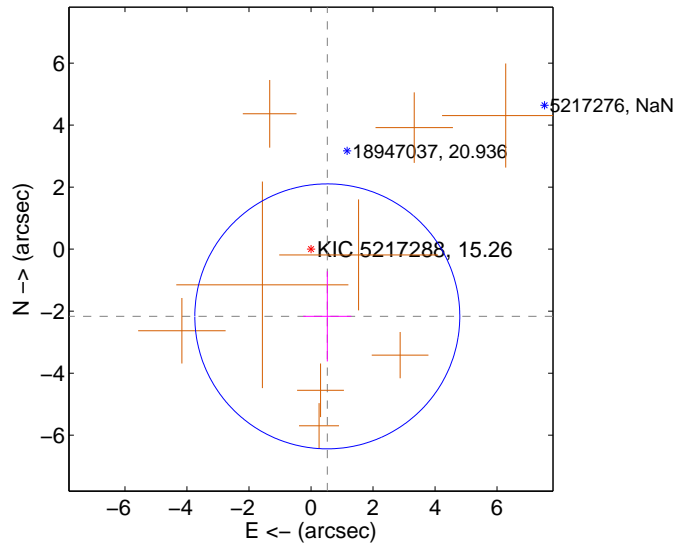
Supplemental centroid analysis for 005217288-03. Kepler magnitude: 15.26. Transit SNR 11.82

There are 0 quarters with good PRF difference image offsets

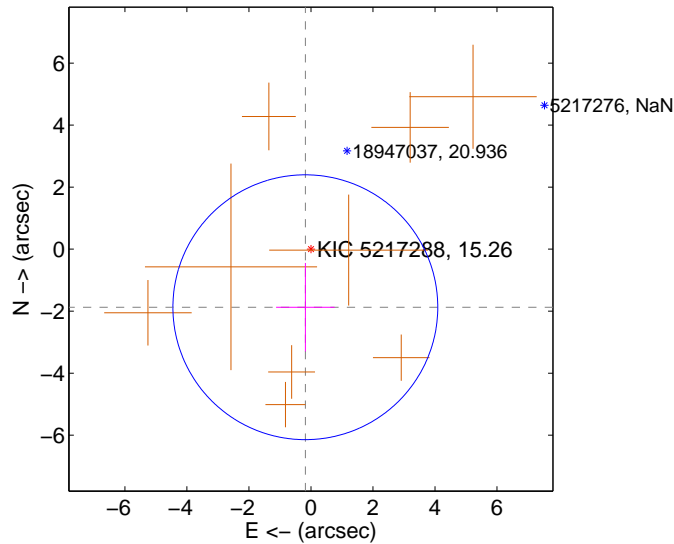
The direct PRF centroid is offset from the target star catalog position by about 1.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.230 \pm 1.424$	1.57	$-0.526 \pm 0.777$	$-2.167 \pm 1.453$
PRF-fit source offset from KIC position	$1.881 \pm 1.423$	1.32	$0.181 \pm 0.943$	$-1.873 \pm 1.427$
photometric centroid source offset	$0.97 \pm 0.75$	1.29	$0.81 \pm 0.78$	$0.53 \pm 0.67$

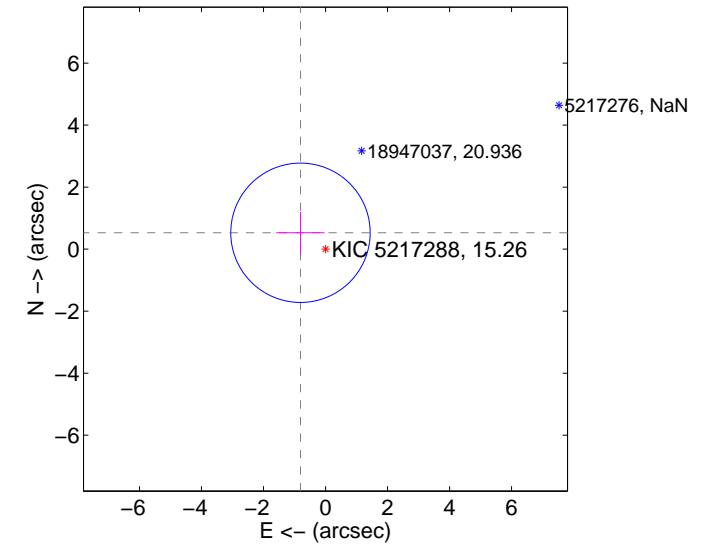
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

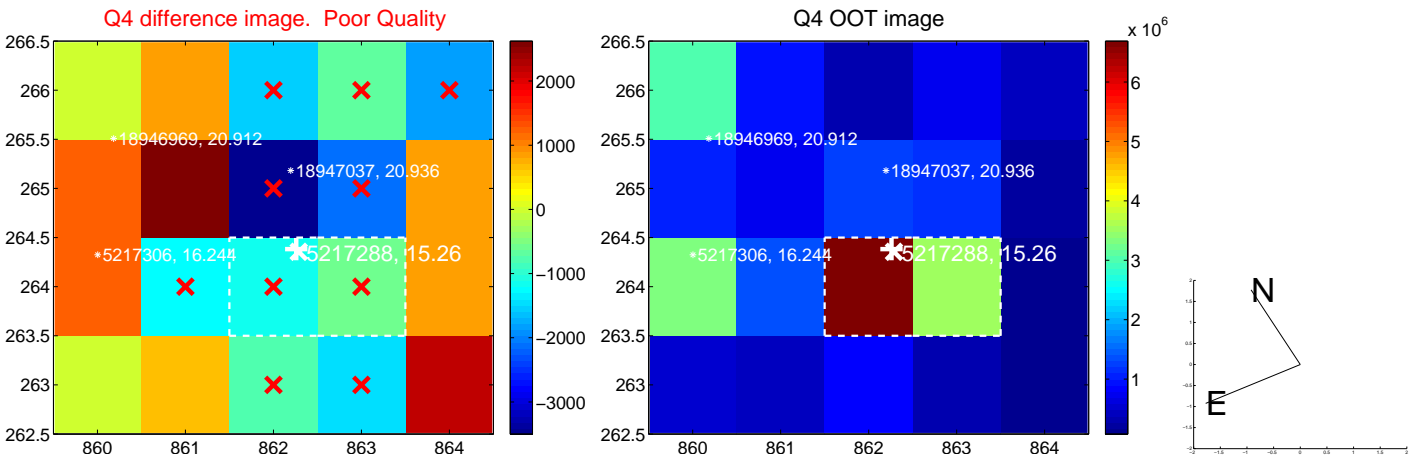
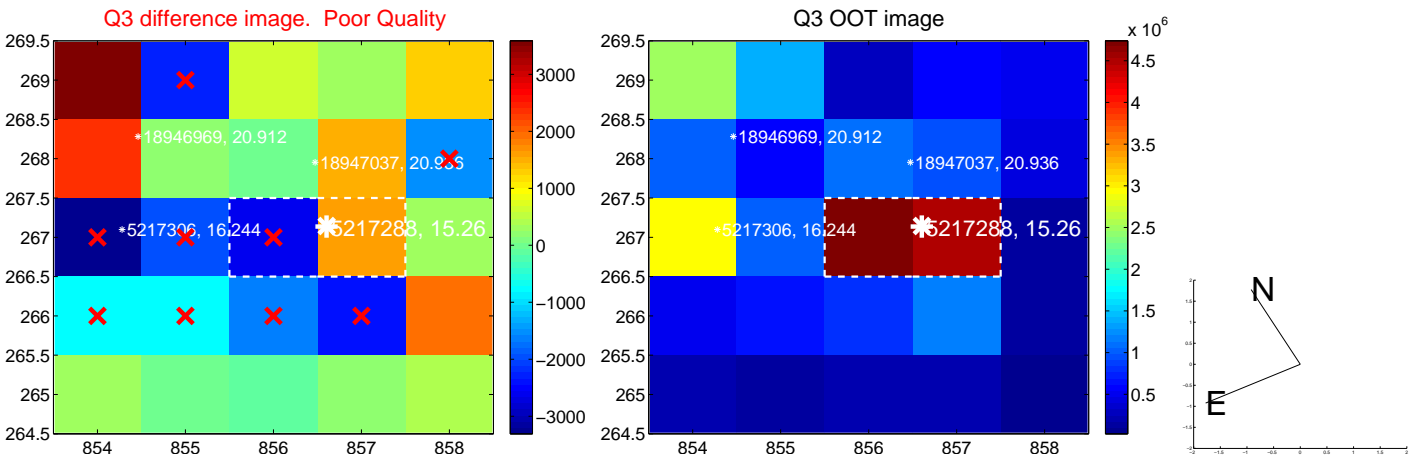
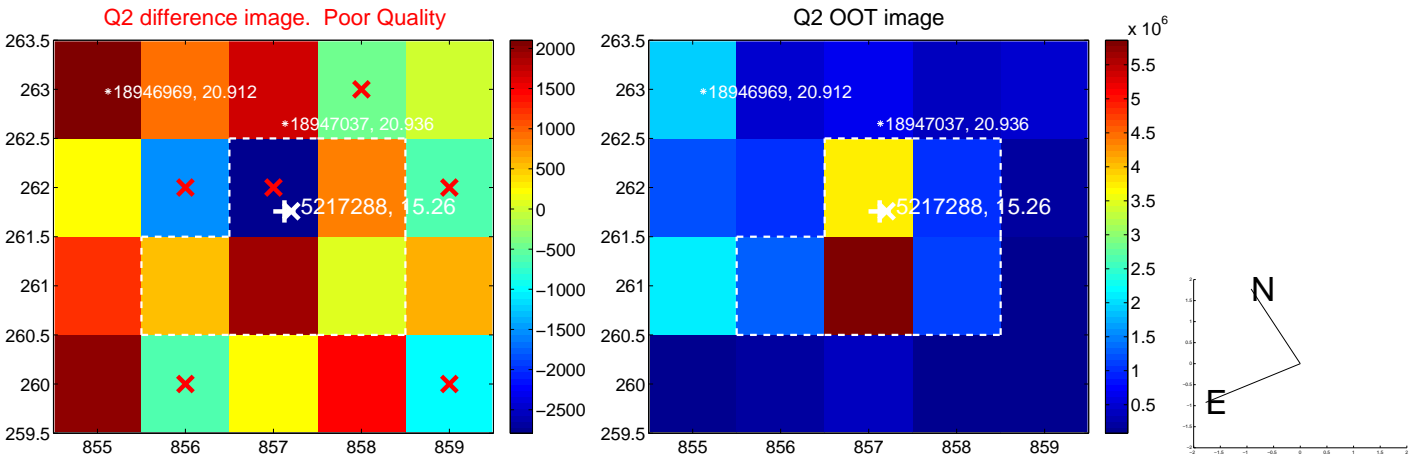
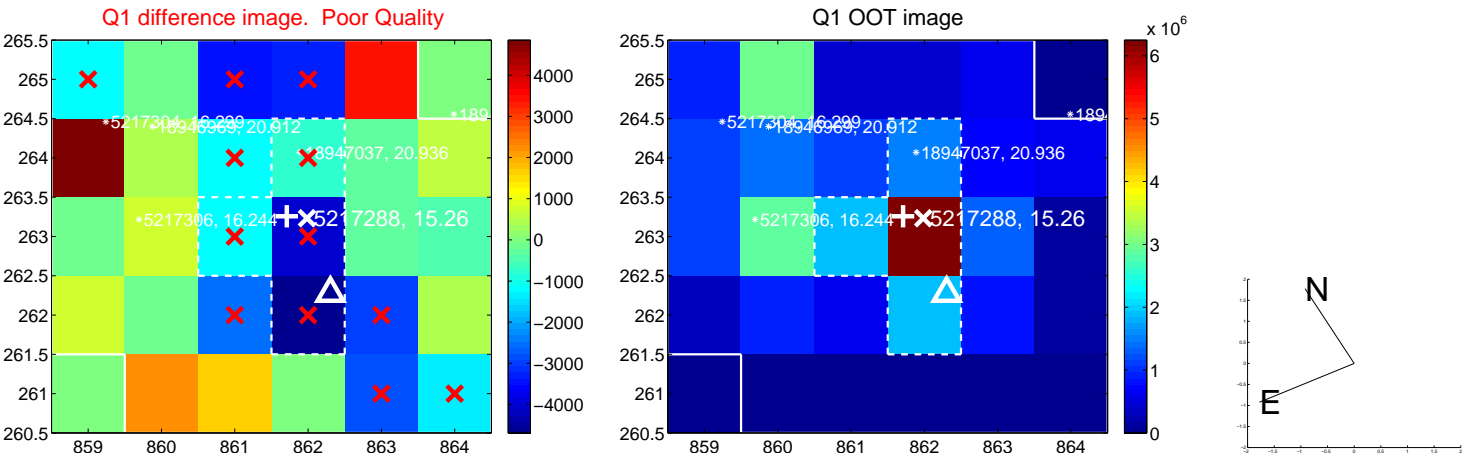


offset from photometric centroids

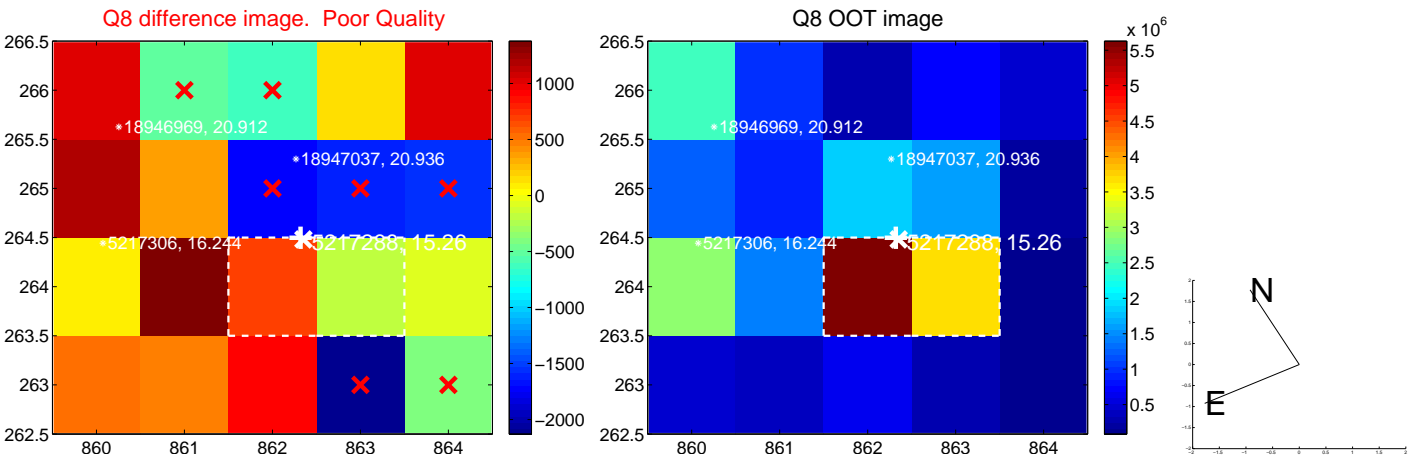
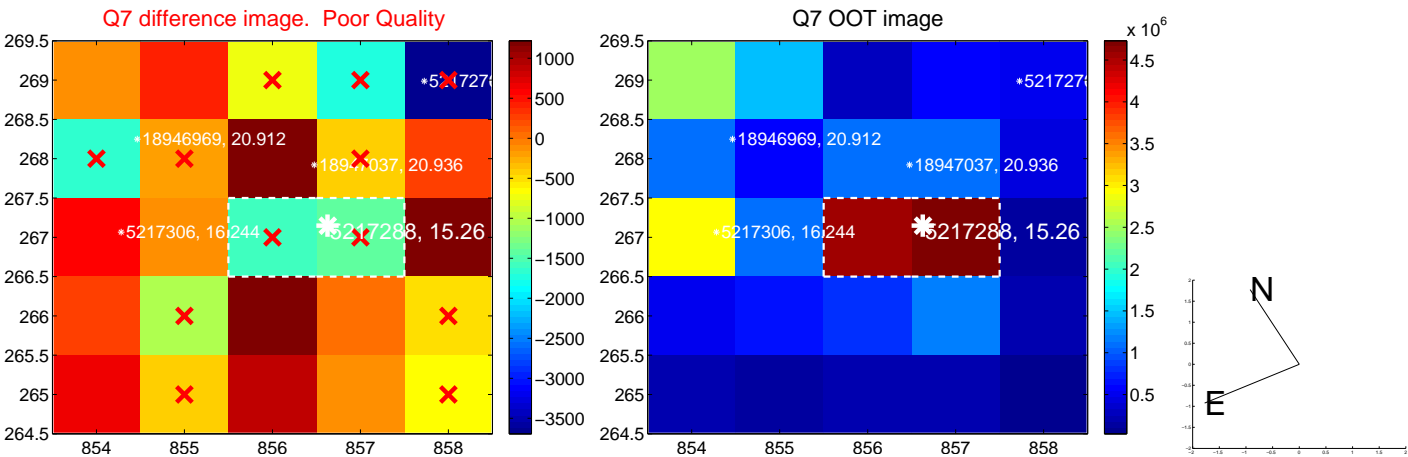
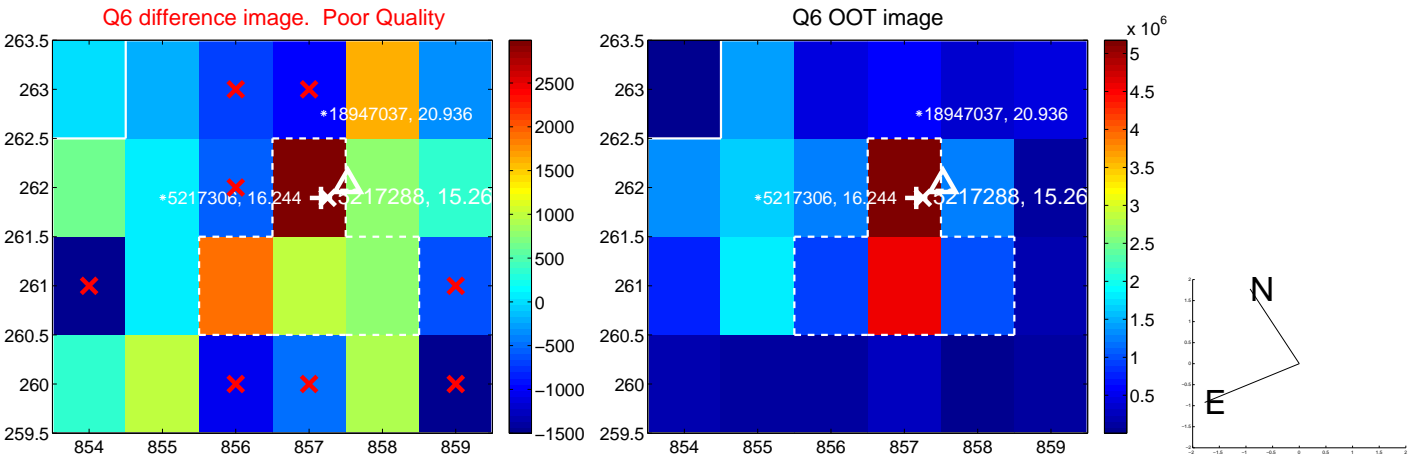
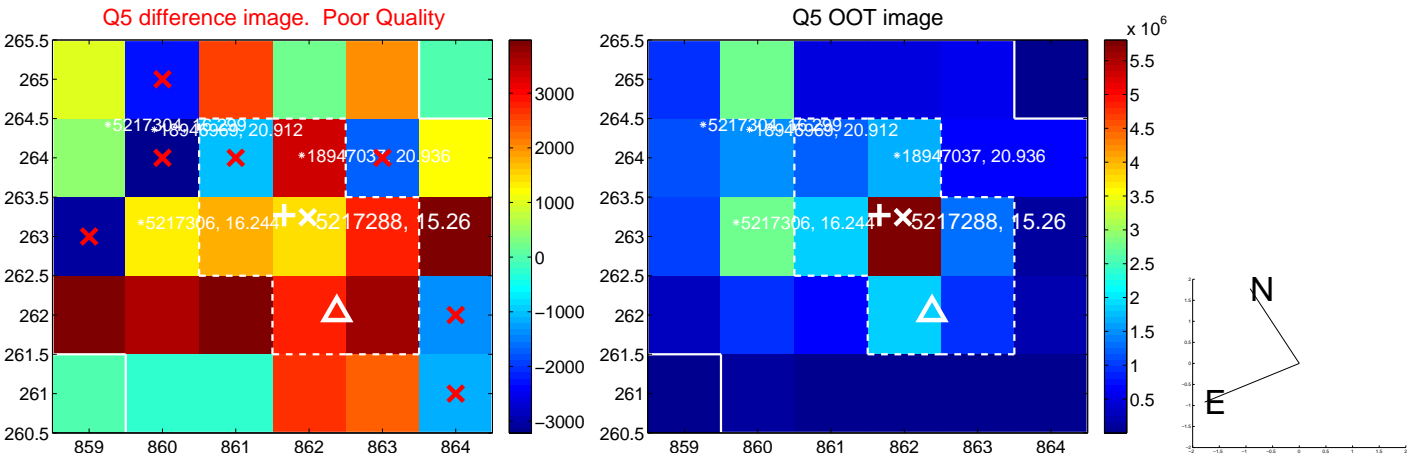


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

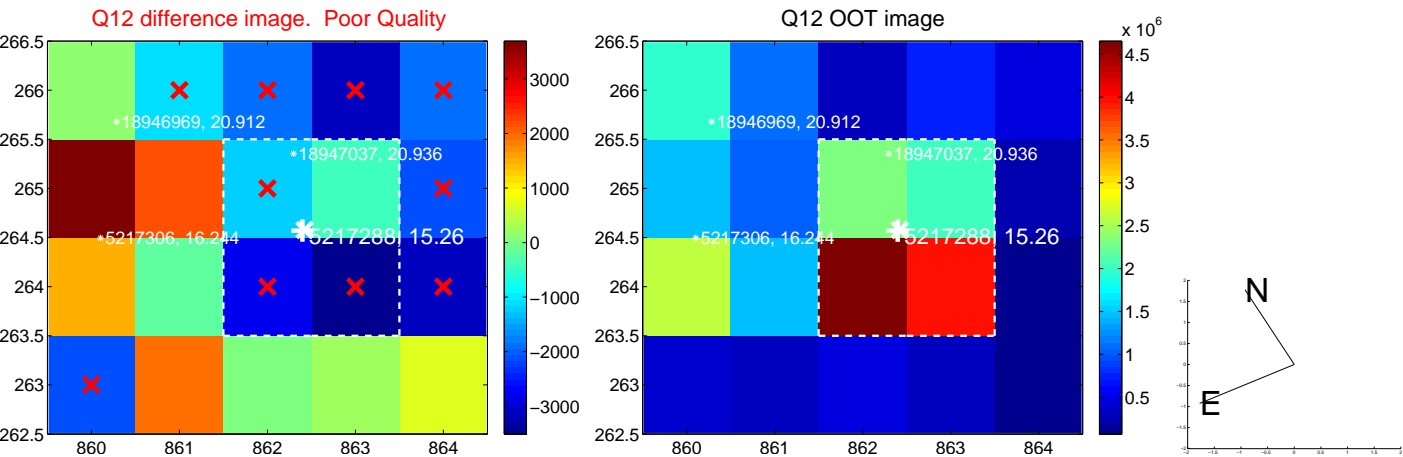
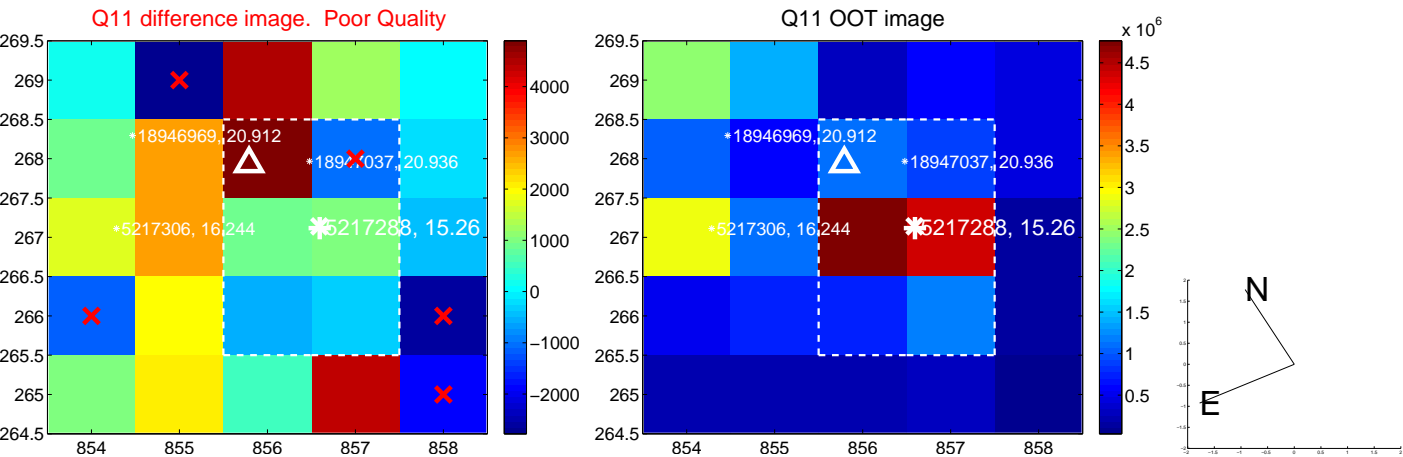
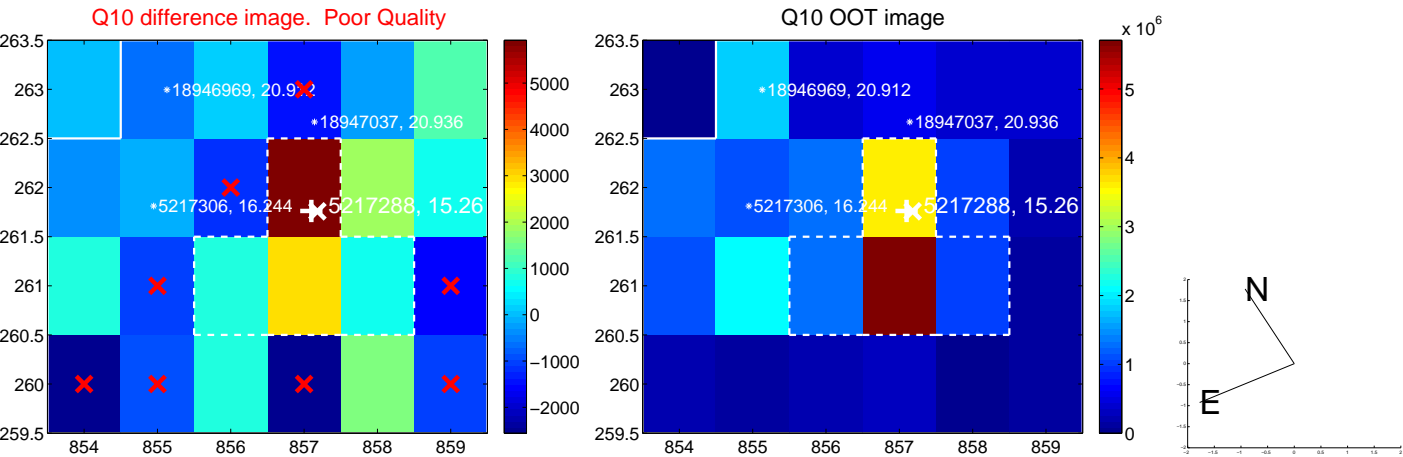
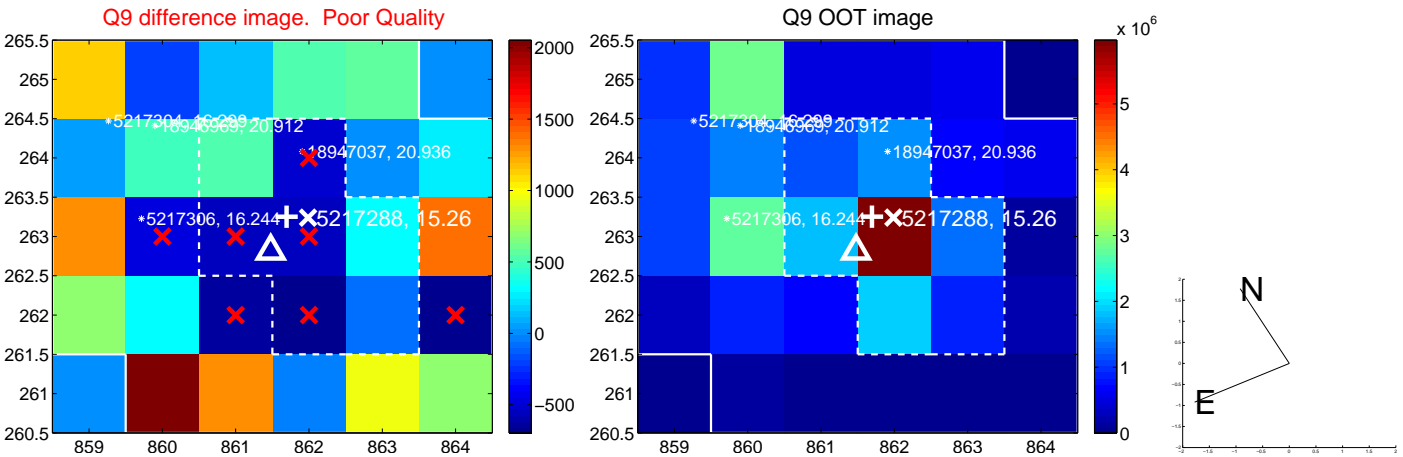
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



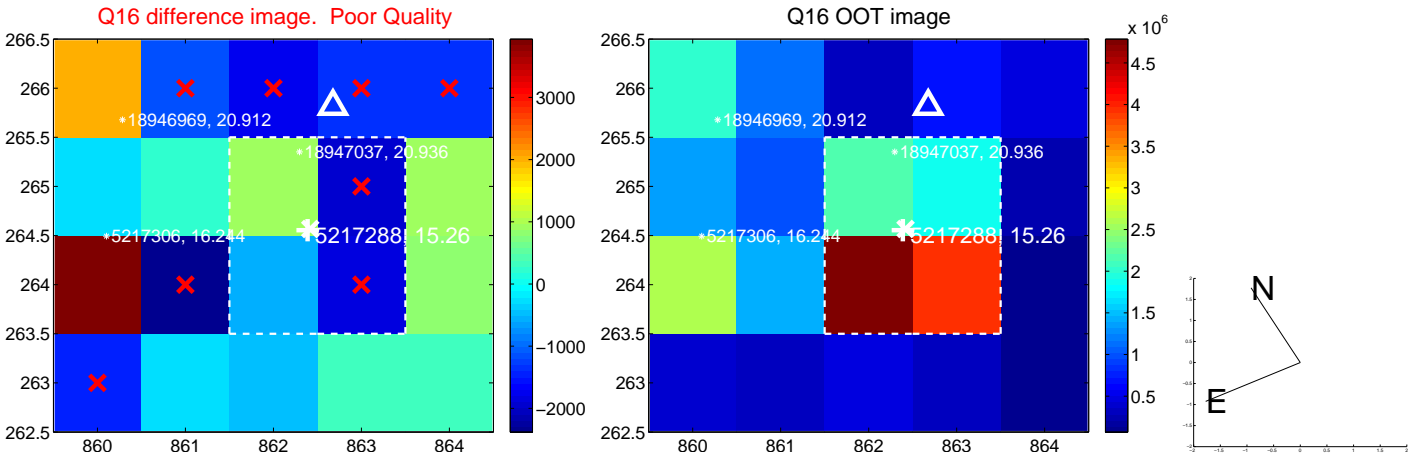
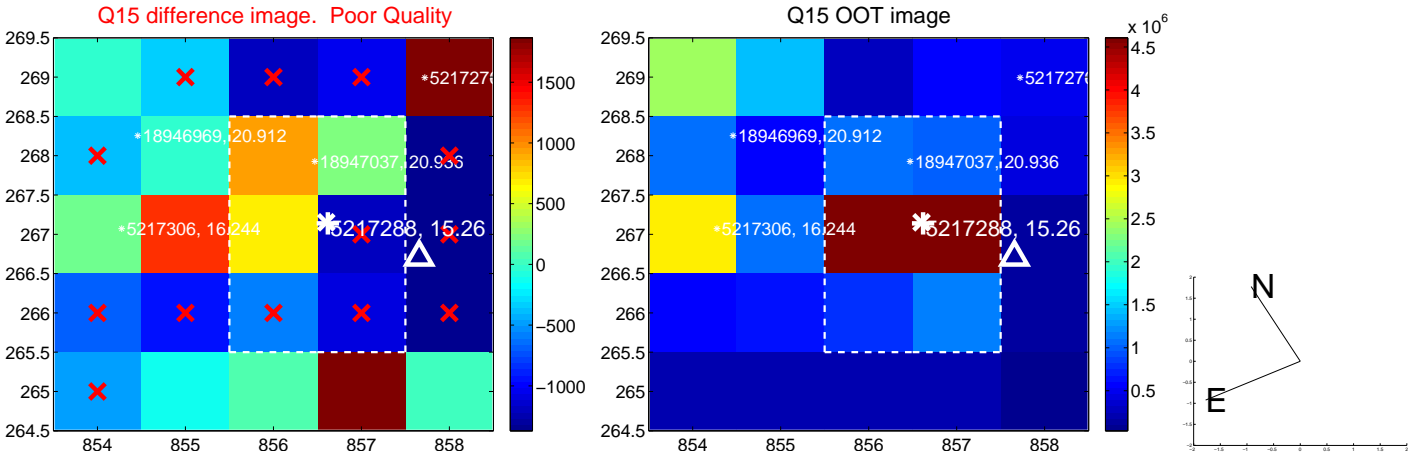
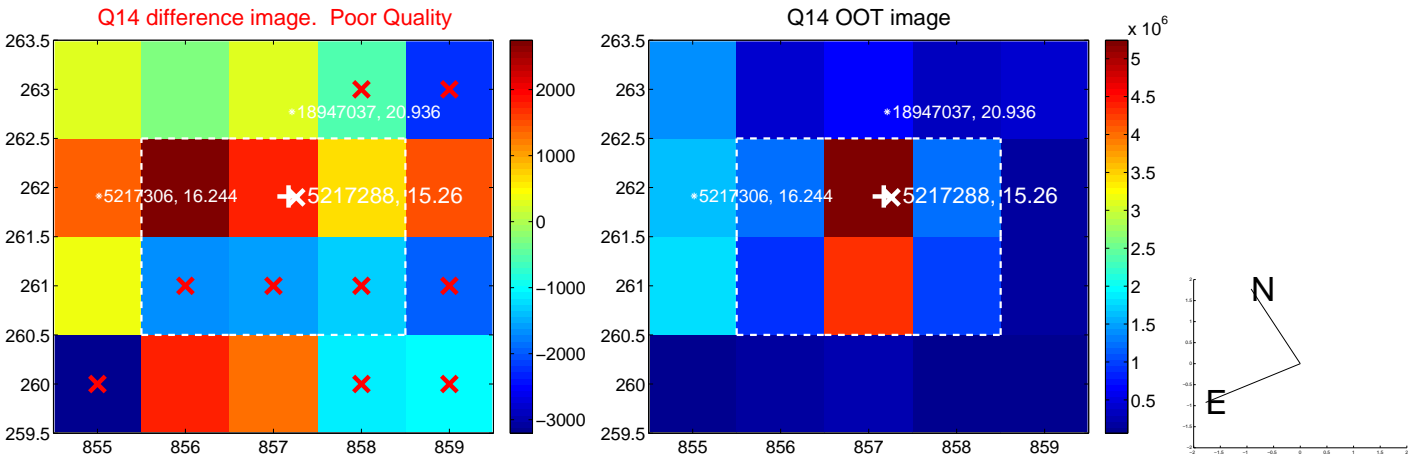
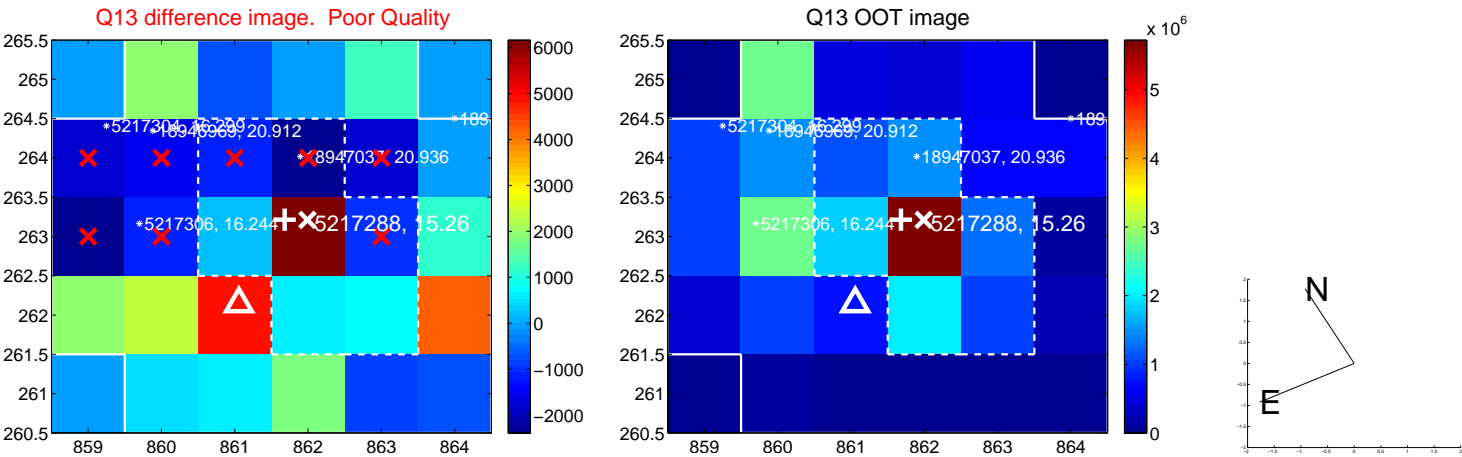
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

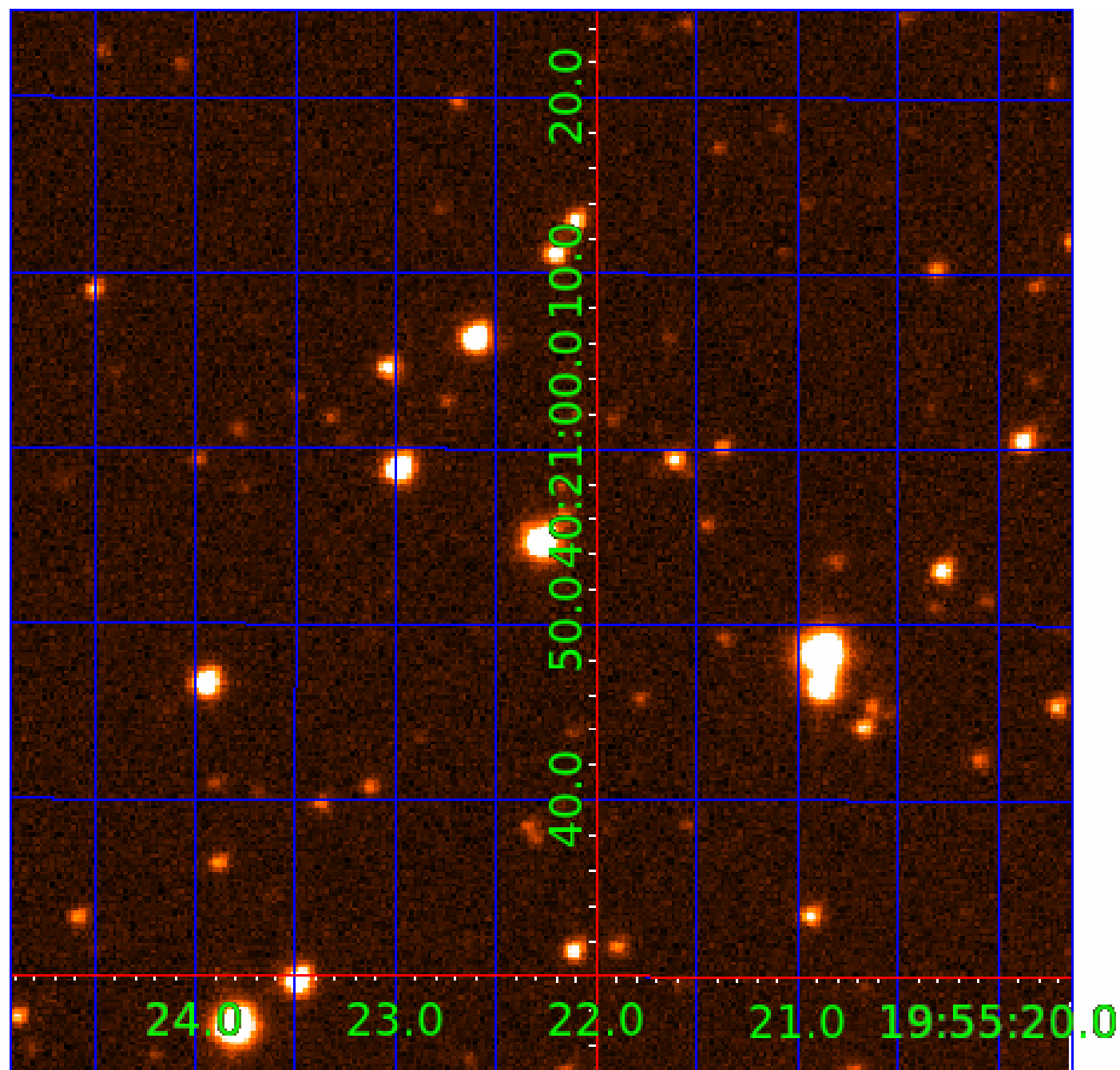






UKIRT Image

Declination



# KIC 005217288

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005217288-01	OBS	No	0.936057	131.856586	45.3	6.813	8.3	9.6	0.70	5825	0.49	1705.69
005217288-02	OBS	No	21.230421	139.450177	967.0	1.607	12.3	13.5	0.70	5825	2.27	26.57
005217288-03	OBS	No	28.406012	144.686705	832.5	1.710	11.0	11.8	0.70	5825	2.20	18.02
005217288-04	OBS	No	18.360603	147.173848	798.9	0.982	11.5	8.4	0.70	5825	2.03	32.24
005217288-05	OBS	No	46.587378	153.342544	790.5	1.932	9.7	10.3	0.70	5825	2.10	9.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005217288-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005217288-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005217288-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005217288-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005217288-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

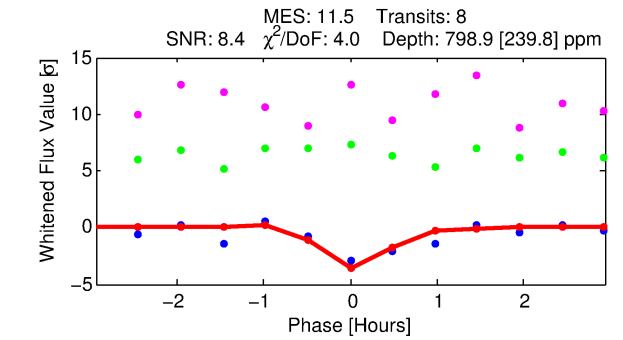
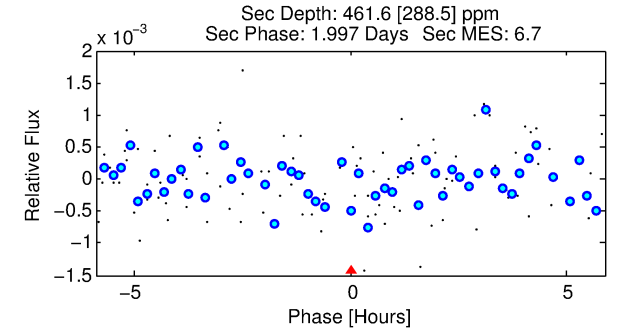
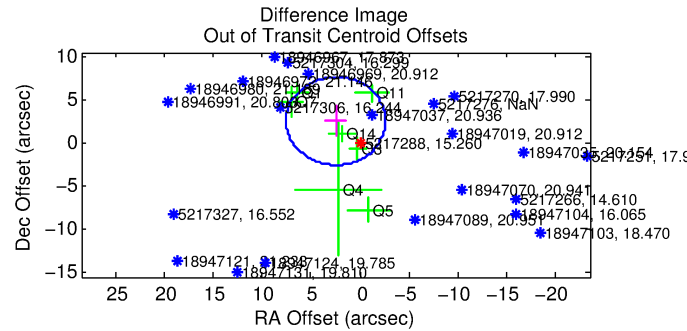
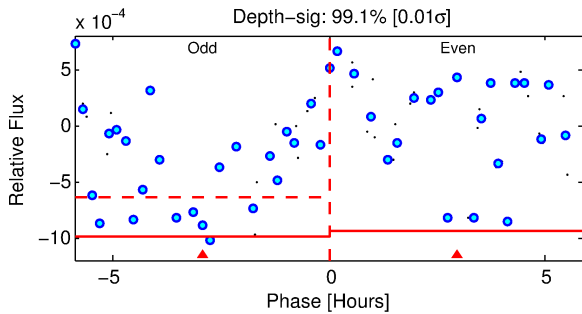
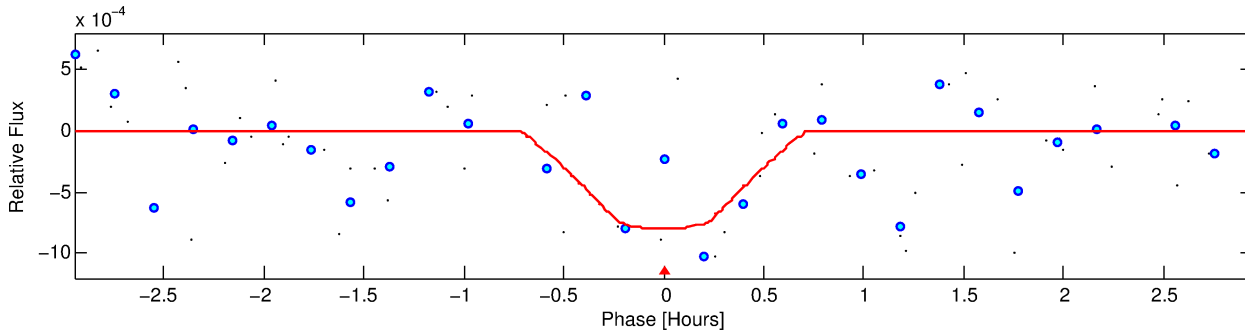
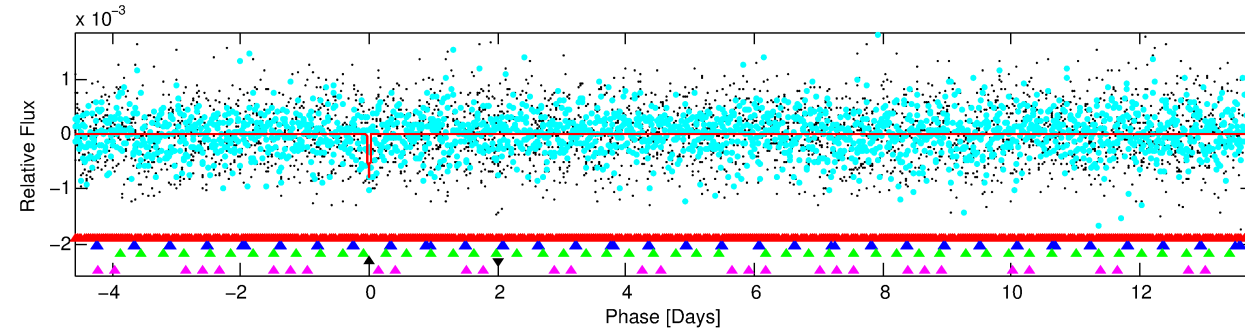
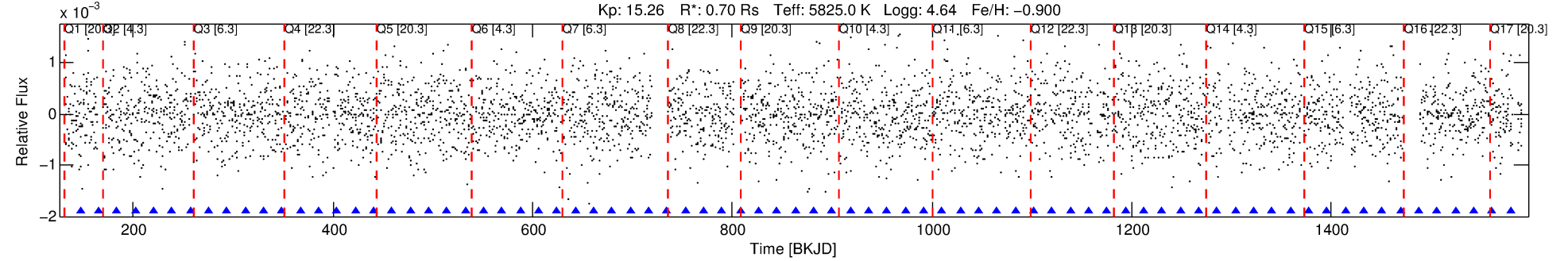
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005217288-04

No Significant Match Found

# DV One-Page Summary

KIC: 5217288 Candidate: 4 of 5 Period: 18.361 d



## DV Fit Results:

Period = 18.36060 [0.00020] d  
Epoch = 147.1738 [0.0070] BKJD  
Rp/R\* = 0.0265 [0.0842]  
a/R\* = 138.75 [2178.73]  
b = 0.33 [42.96]  
Seff = 32.24 [8.32]  
Teff = 608 [39] K  
Rp = 2.03 [6.46] Re  
a = 0.1256 [0.0192] AU  
Ag = 973.03 [6224.16] [0.16σ]  
Teffp = 5247 [8387] K [0.55σ]

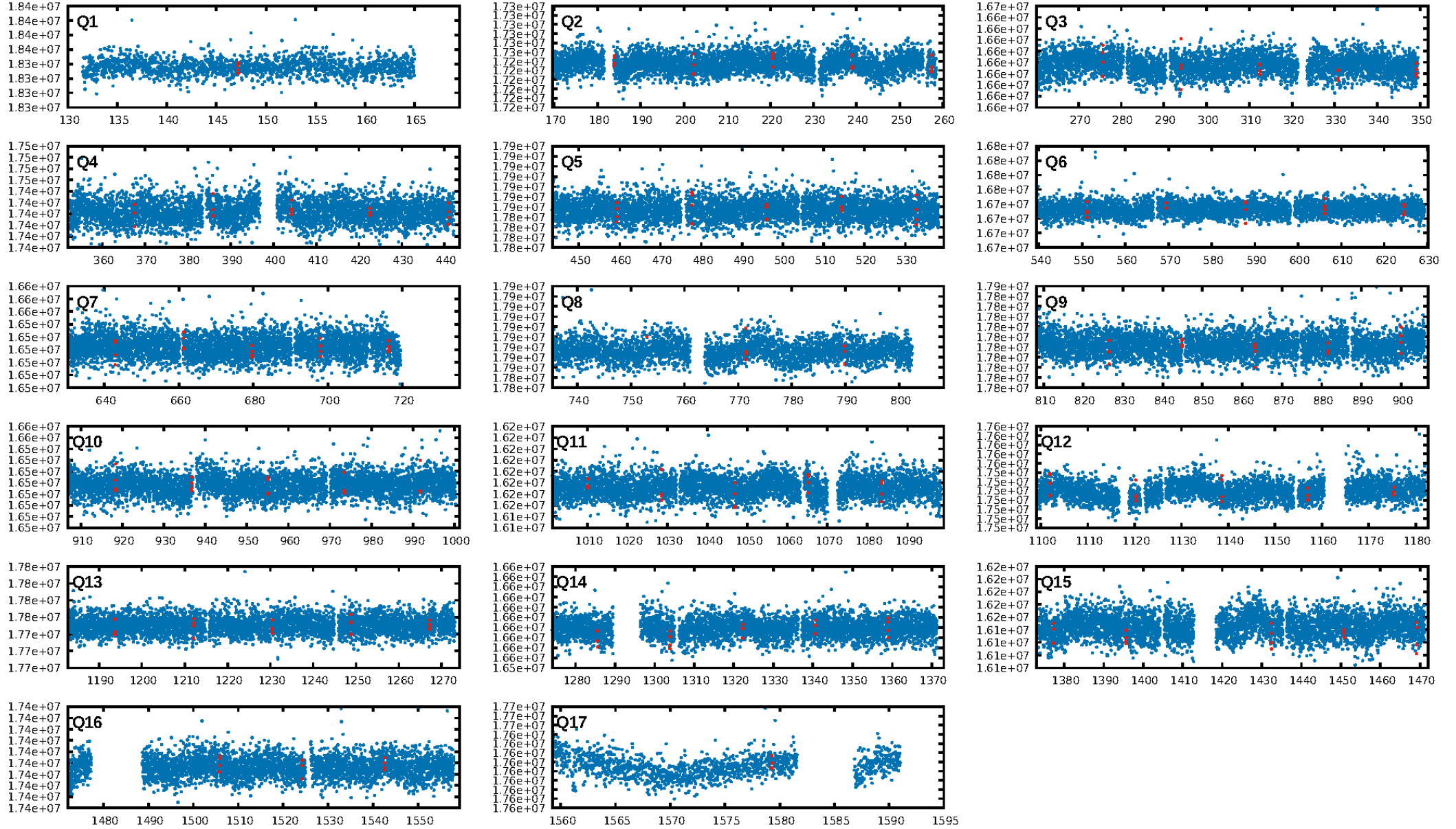
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [60.75σ]  
LongPeriod-sig: 100.0% [36.58σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 3.9%  
Bootstrap-pfa: 7.45e-10  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -0.2829  
Centroid-sig: 49.6%  
Centroid-so: 1.909 arcsec [2.22σ]  
OotOffset-rm: 3.563 arcsec [2.10σ]  
OotOffset-st: 1/3/1/2 [7]  
KicOffset-rm: 3.889 arcsec [2.23σ]  
KicOffset-st: 1/3/1/2 [7]  
DiffImageQuality-fgm: 0.29 [2/7]  
DiffImageOverlap-fno: 0.69 [11/16]

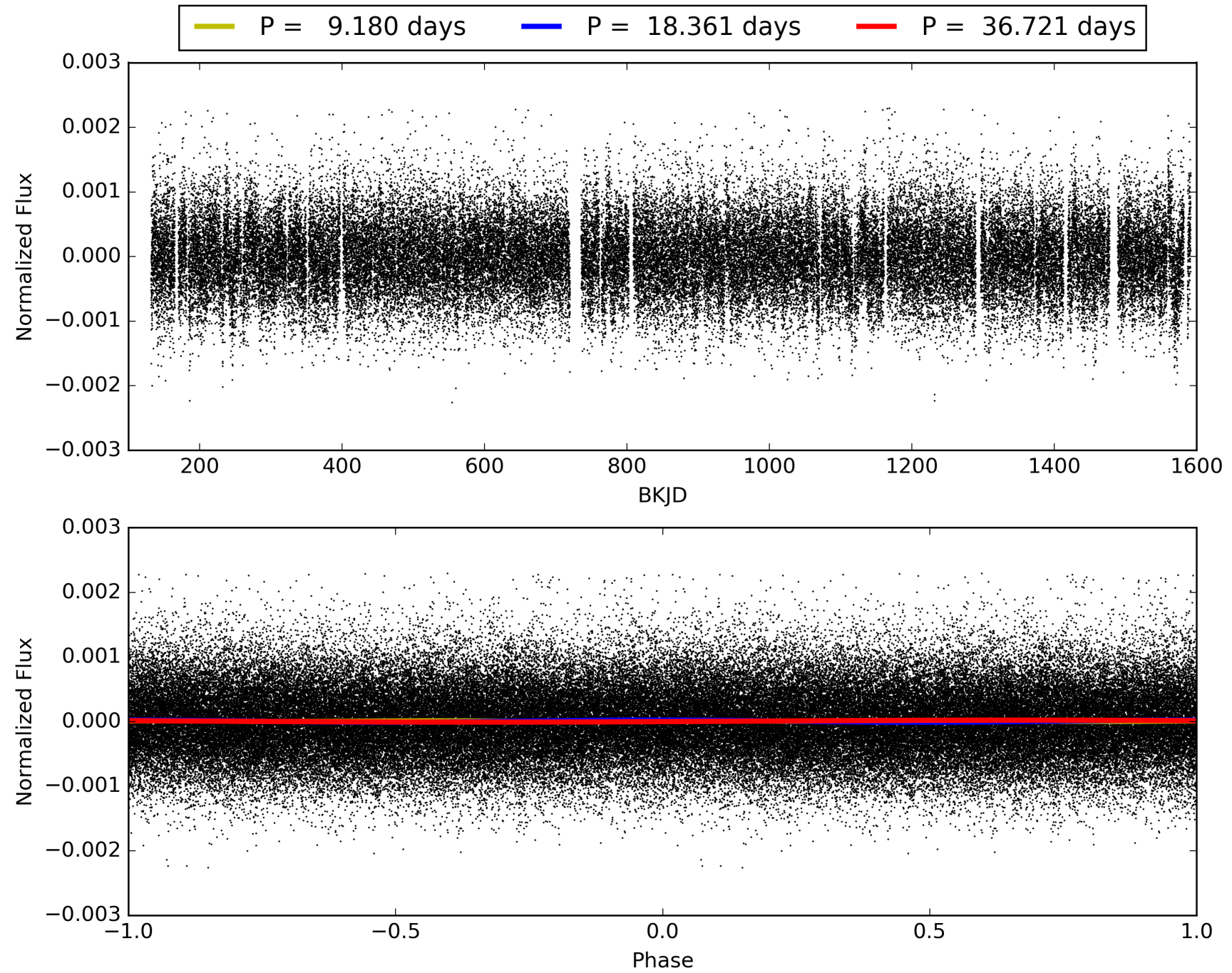
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:53:16 Z

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

# TCE 005217288-04, PDC Light Curves



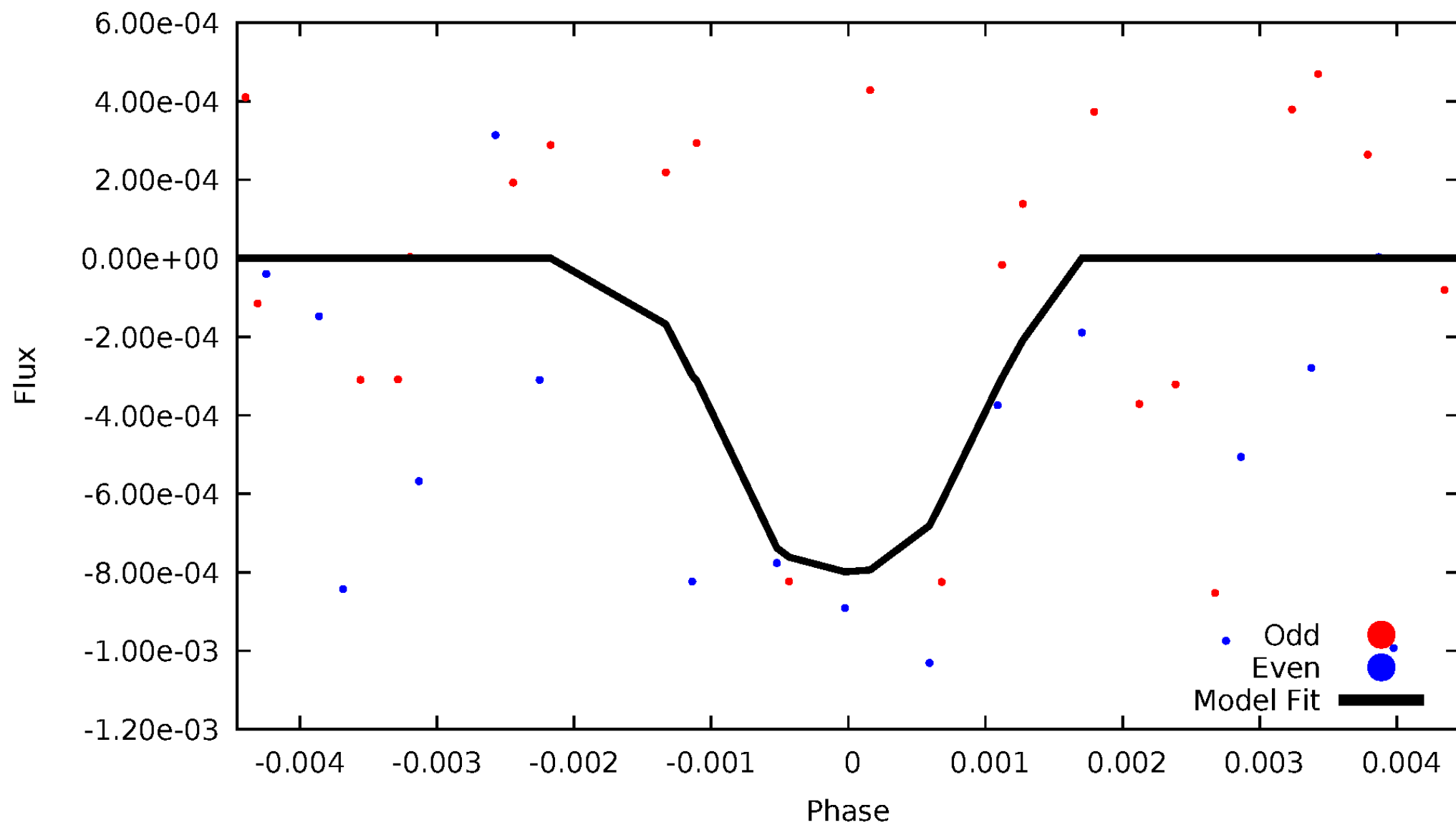
TCE 005217288-04





# DV Odd/Even

TCE 005217288-04



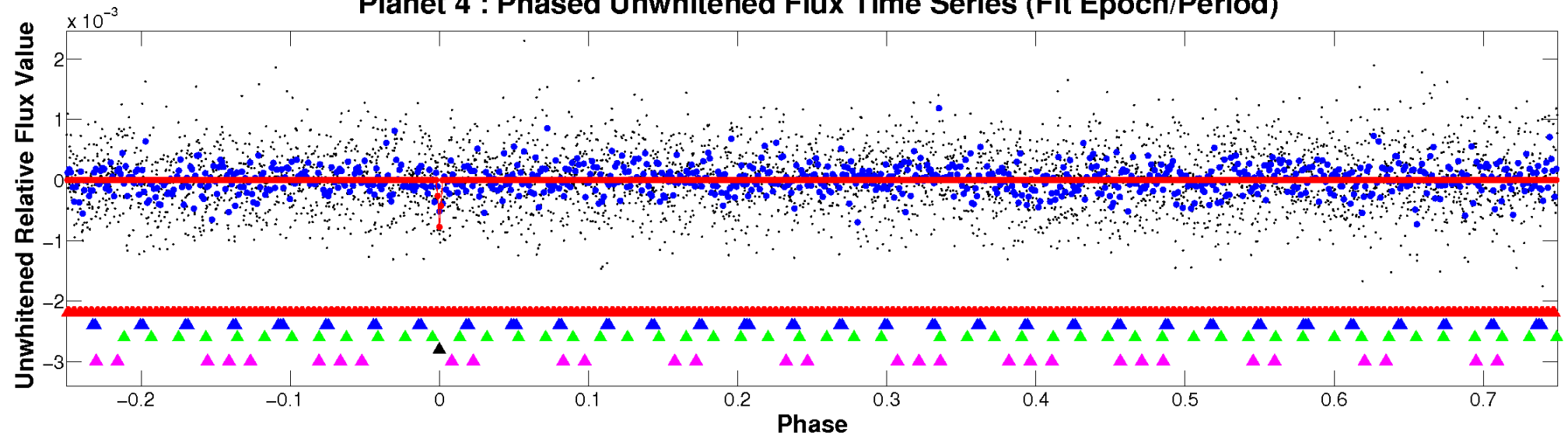


ALT Odd/Even

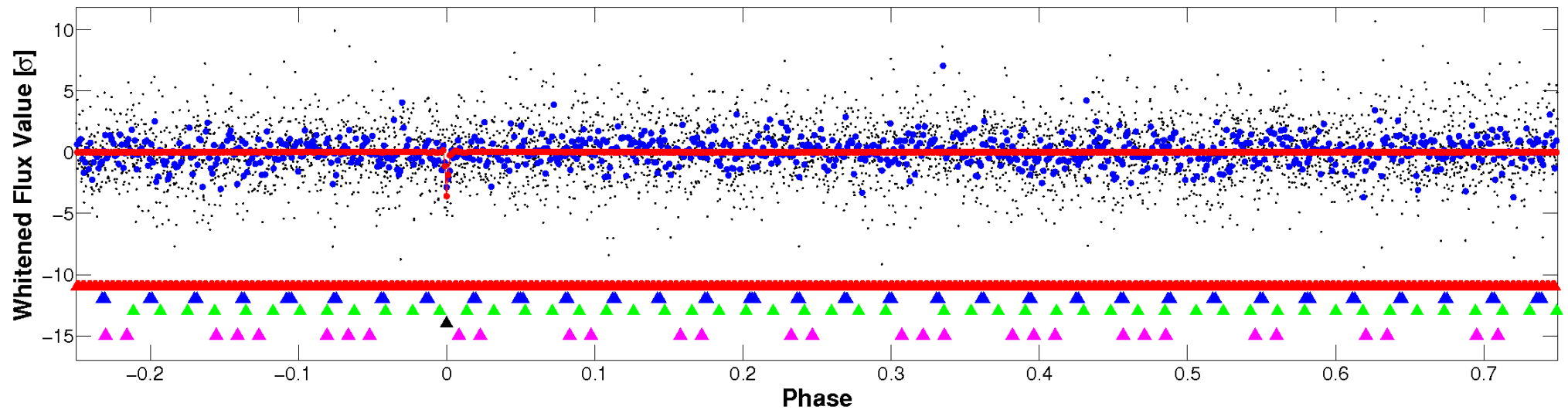
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

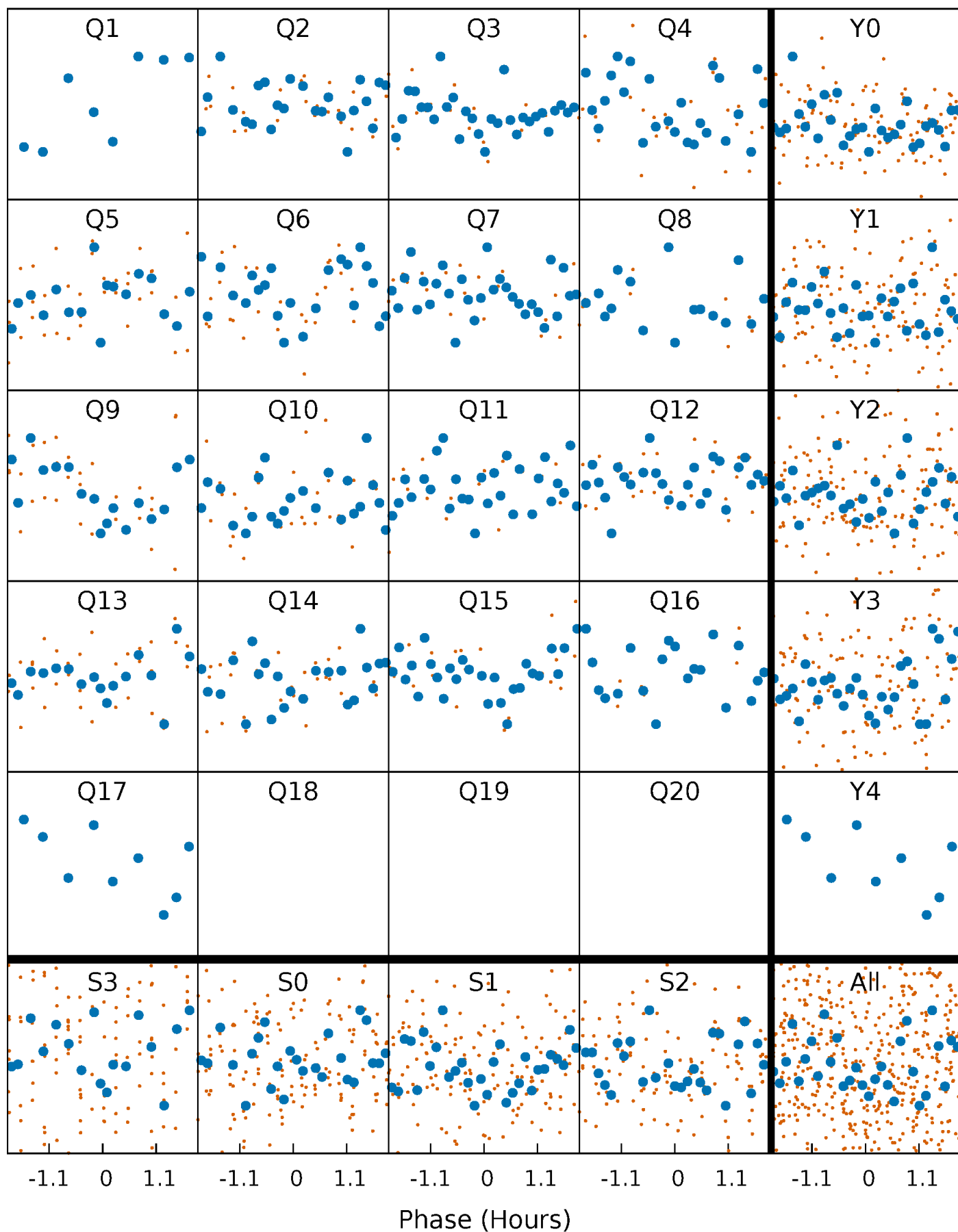


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



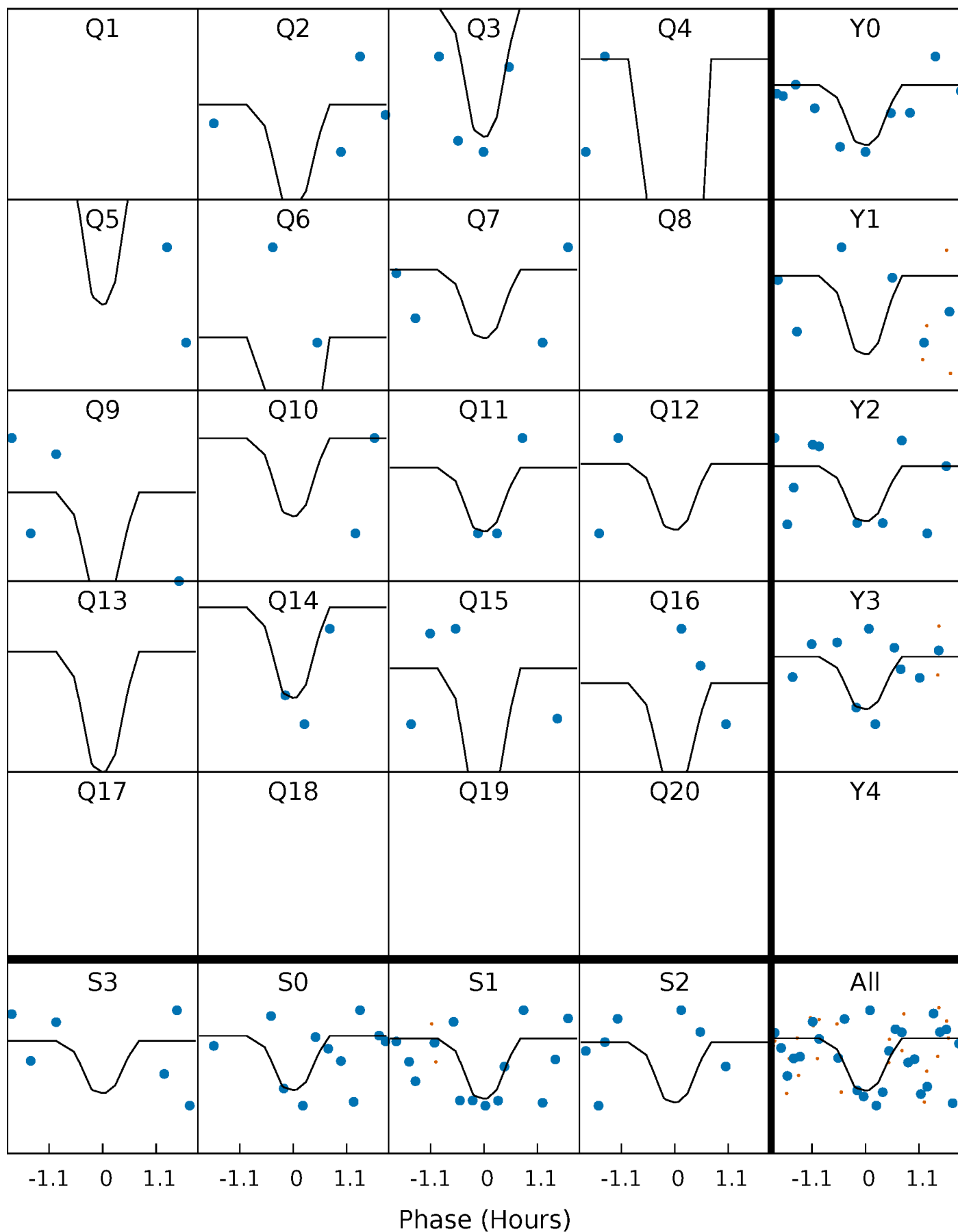
# PDC Quarter-Phased Transit Curves

TCE 005217288-04   P= 18.360603 Days    $T_0=147.173848$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 005217288-04   P= 18.360603 Days    $T_0=147.173848$  (BKJD)



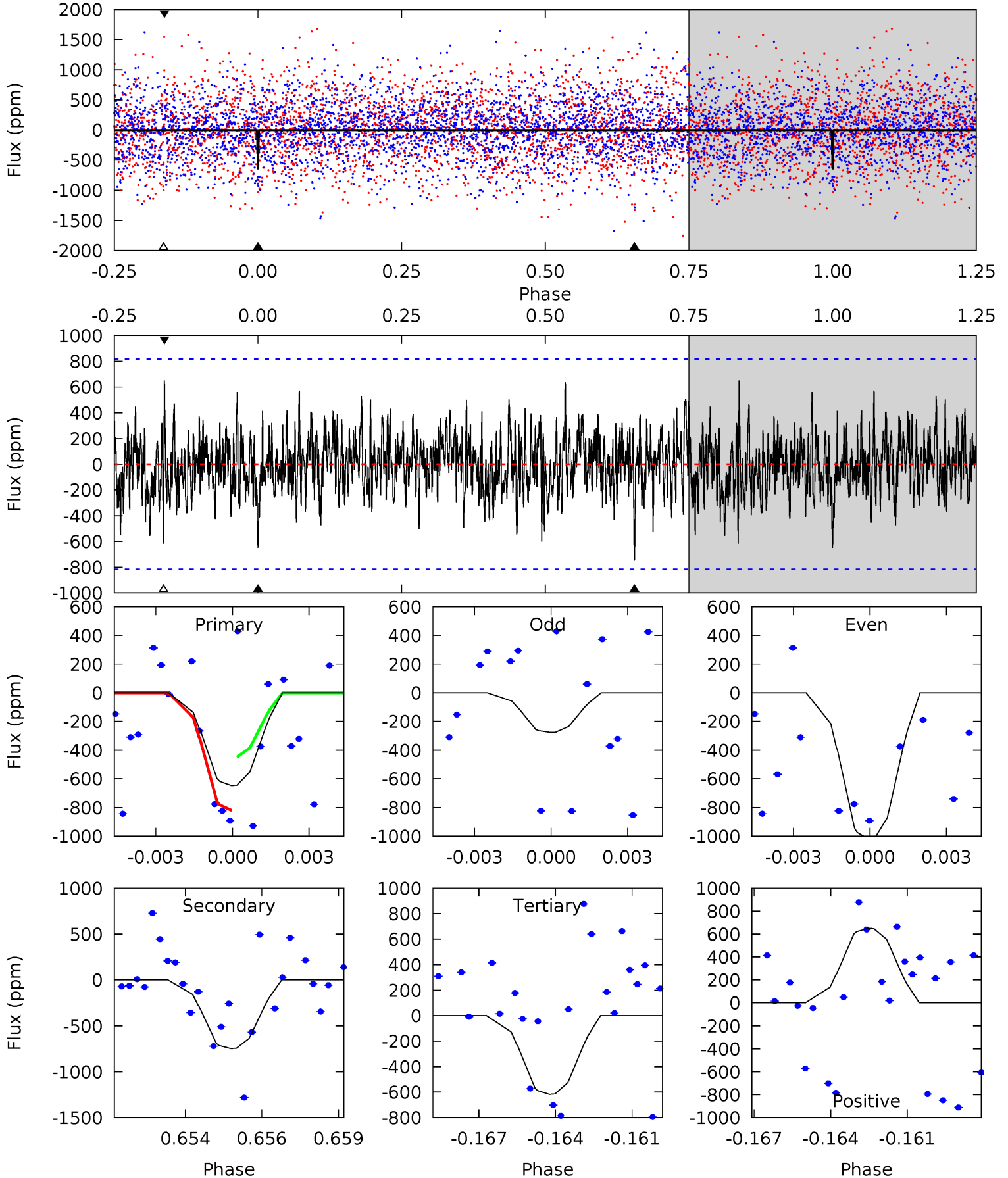


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

005217288-04, P = 18.360603 Days, E = 128.813245 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.19	4.83	3.99	4.20	5.28	3.01	1.25	0.20	-0.01	0.85	0.63	2.42	0.46	0.46	1.21



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 005217288

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5825^{+174}_{-174}$	$4.639^{+0.032}_{-0.128}$	$-0.900^{+0.300}_{-0.300}$	$0.702^{+0.123}_{-0.044}$	$0.792^{+0.062}_{-0.075}$	$3.229^{+0.389}_{-1.177}$
	+3%/-3%	+1%/-3%	+33%/-33%	+18%/-6%	+8%/-9%	+12%/-36%
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 005217288-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-748 \pm 155$	$5.34^{+5.69}_{-3.62}$	$862^{+43}_{-31}$	$4033^{+2551}_{-861}$	$229^{+2019}_{-178}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

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

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

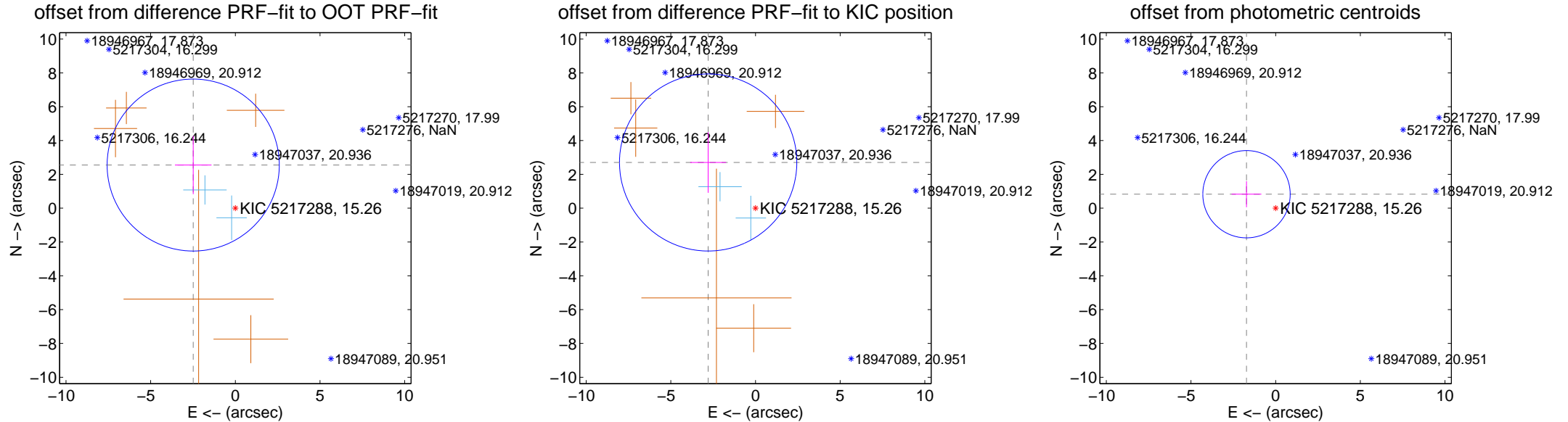
## DV Centroid Data

Supplemental centroid analysis for 005217288-04. Kepler magnitude: 15.26. Transit SNR 8.43

There are 2 quarters with good PRF difference image offsets

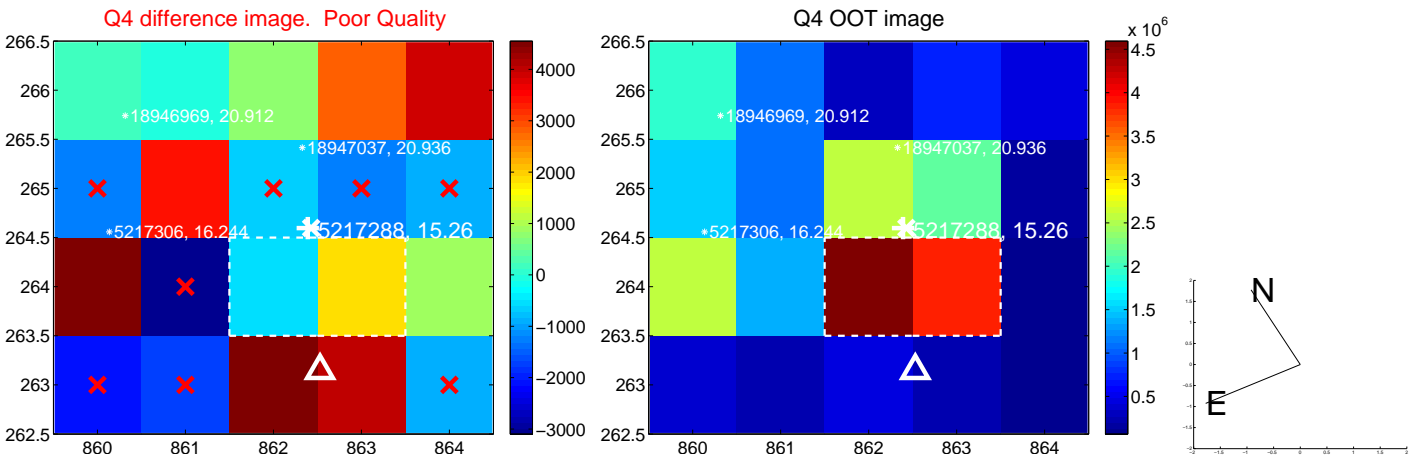
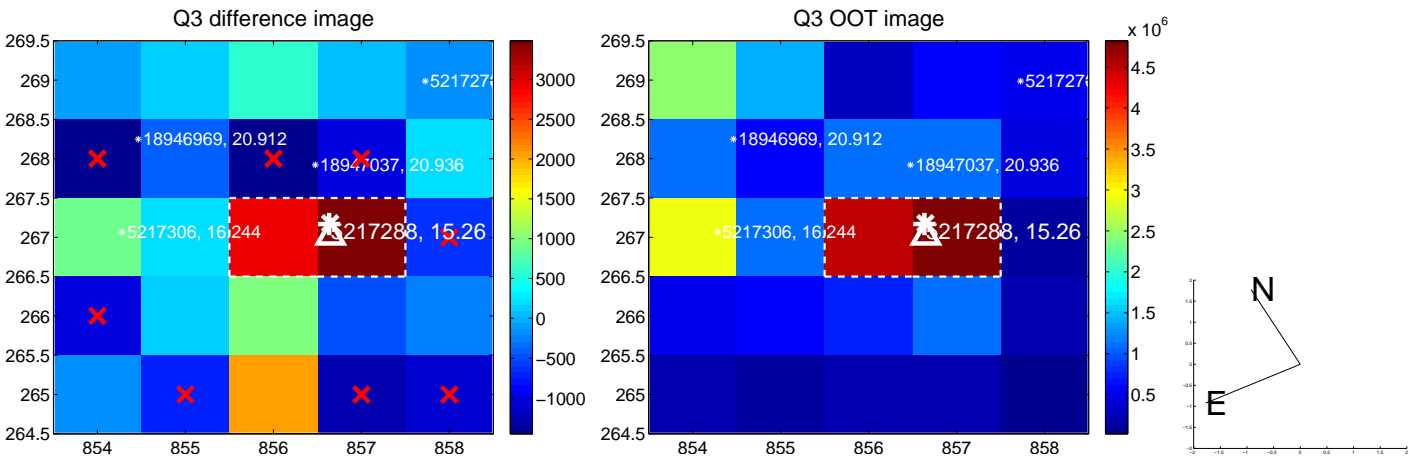
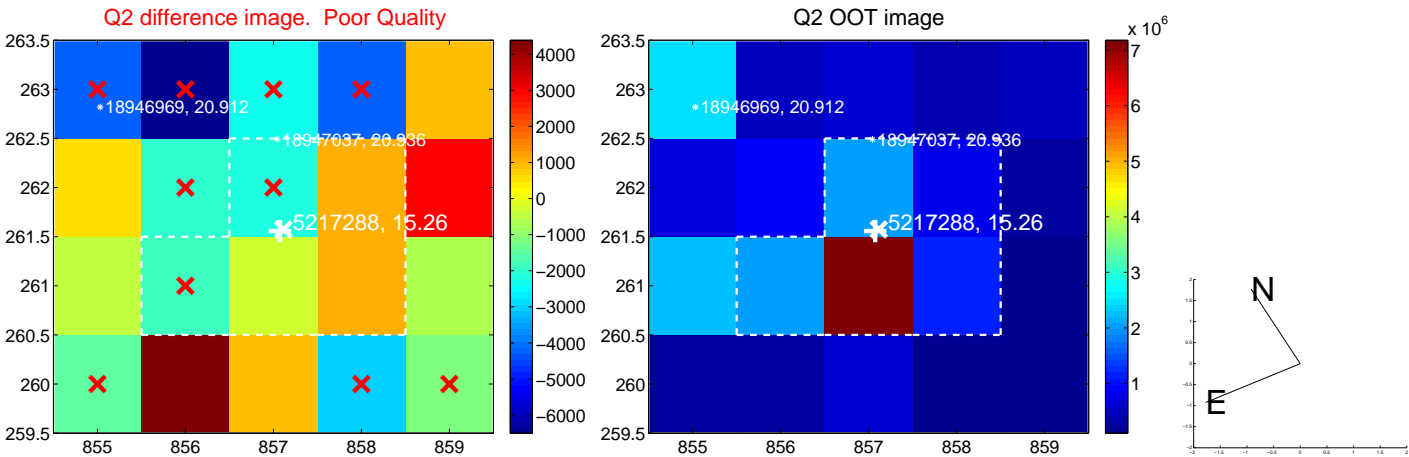
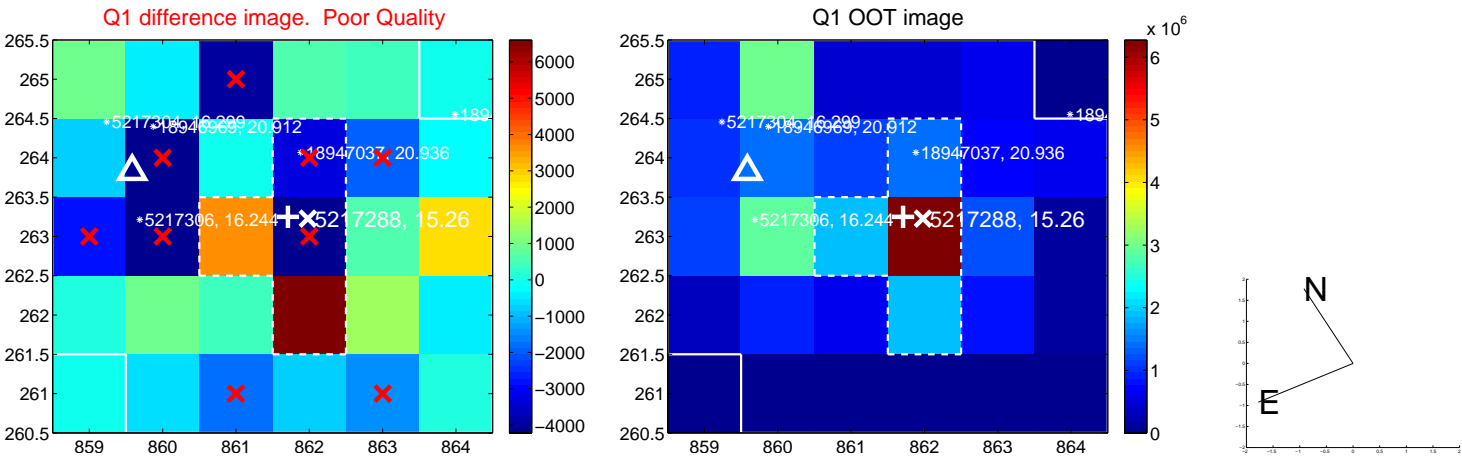
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.563 \pm 1.695$	2.10	$2.489 \pm 1.081$	$2.550 \pm 1.725$
PRF-fit source offset from KIC position	$3.889 \pm 1.746$	2.23	$2.796 \pm 1.061$	$2.703 \pm 1.792$
photometric centroid source offset	$1.91 \pm 0.86$	2.22	$1.72 \pm 0.88$	$0.83 \pm 0.77$

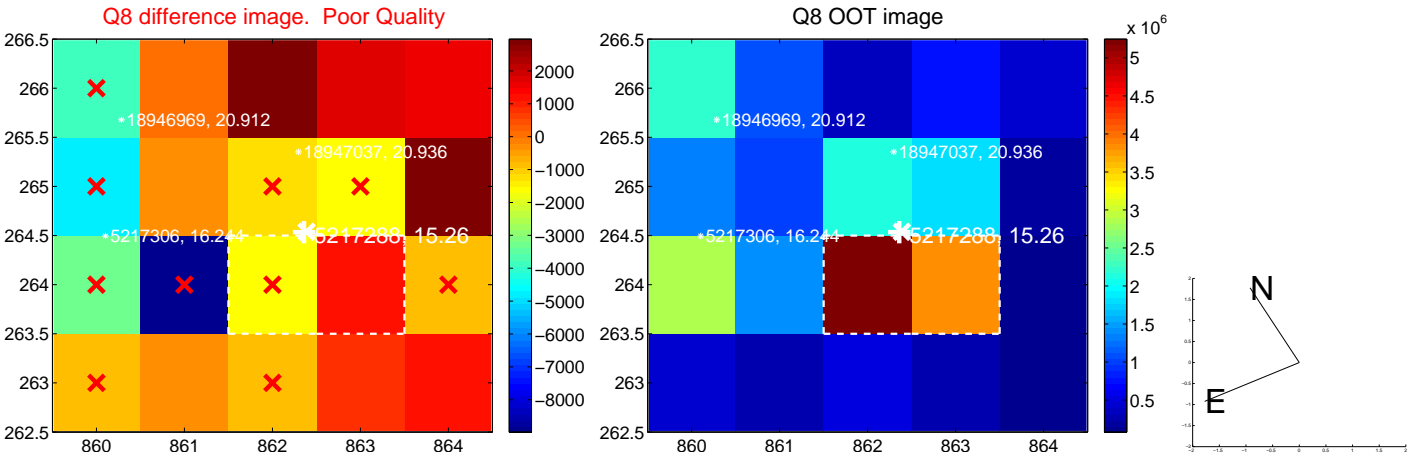
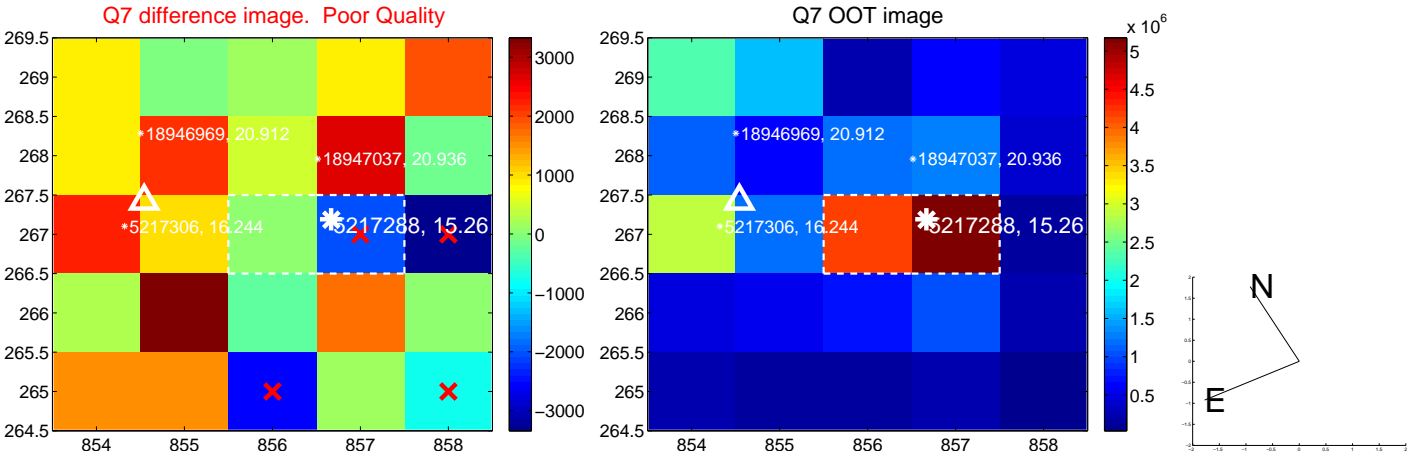
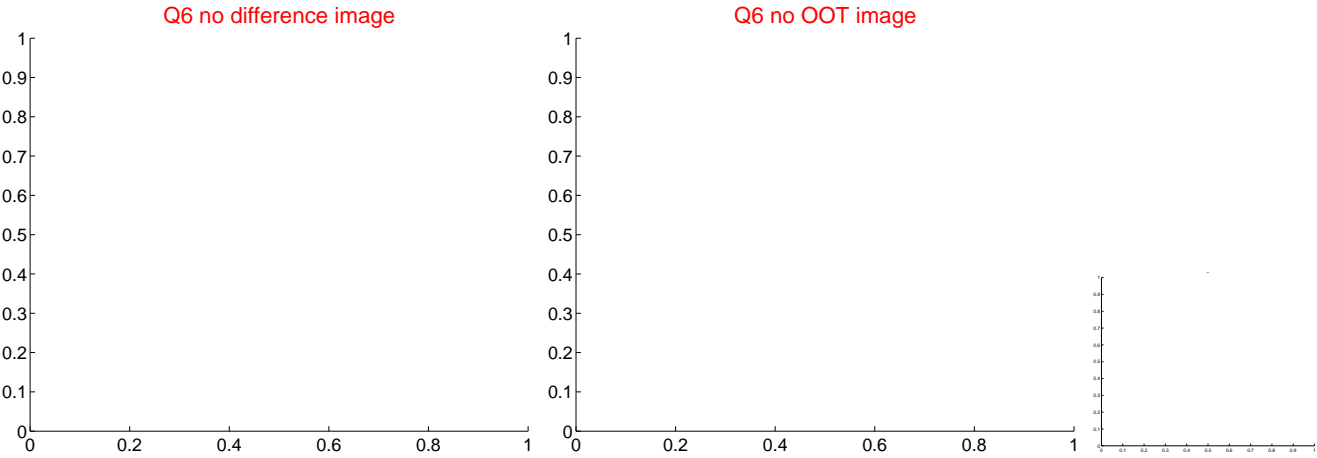
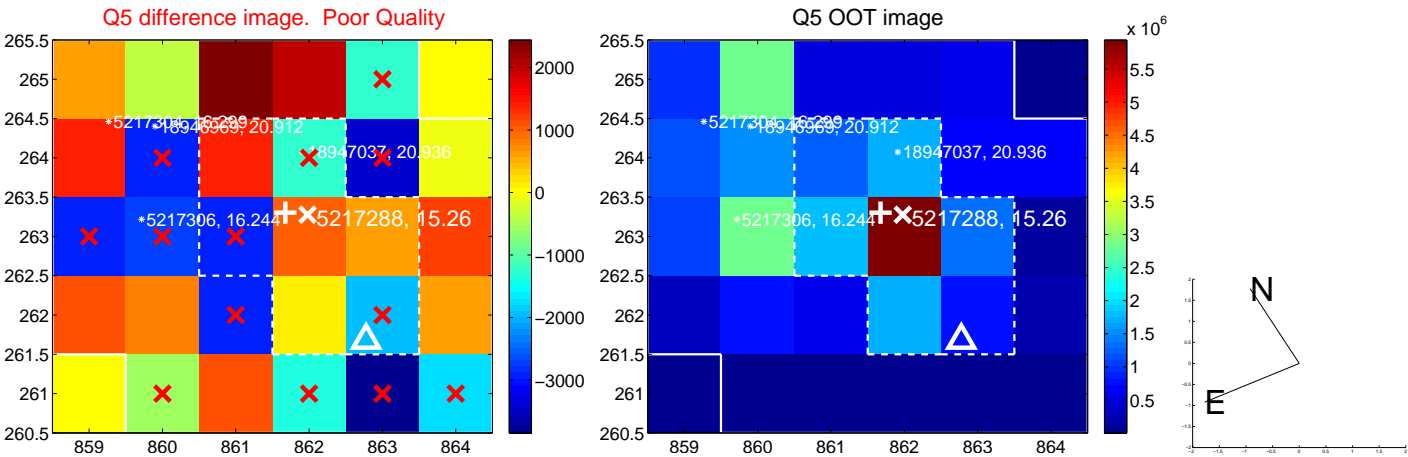


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

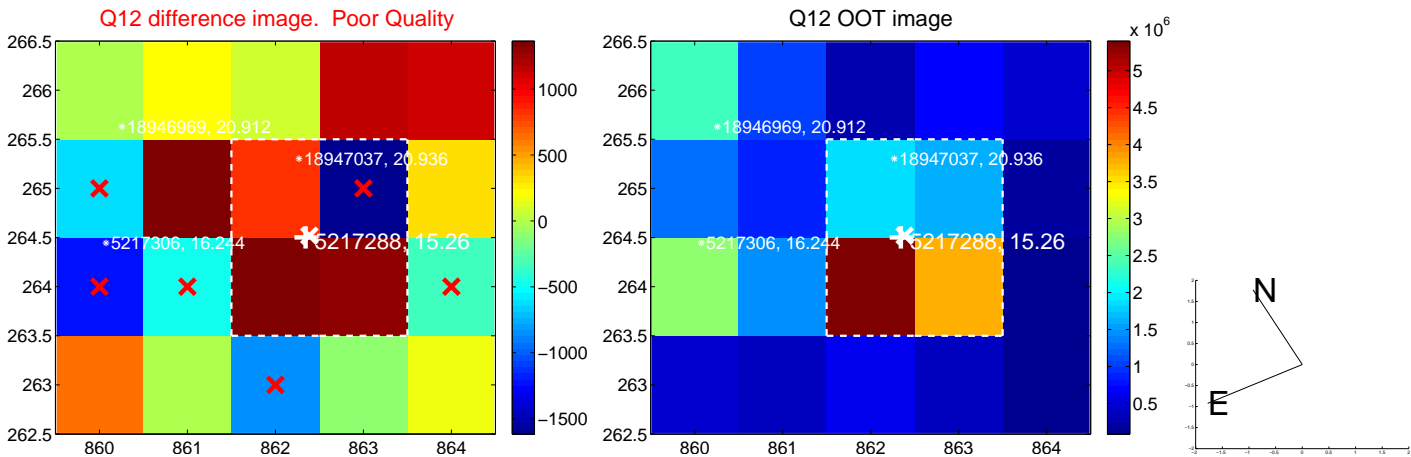
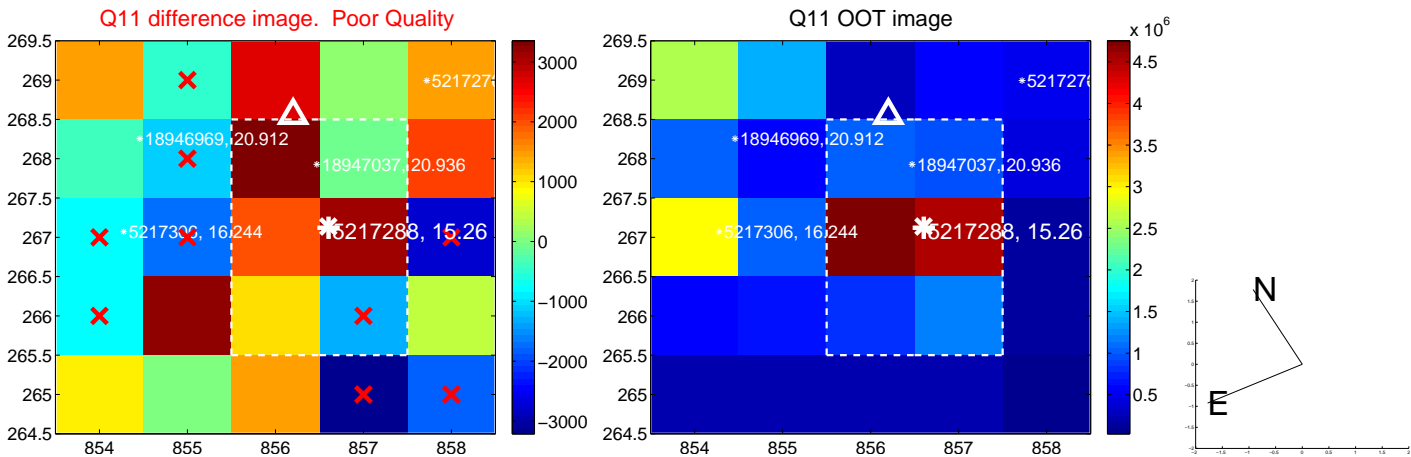
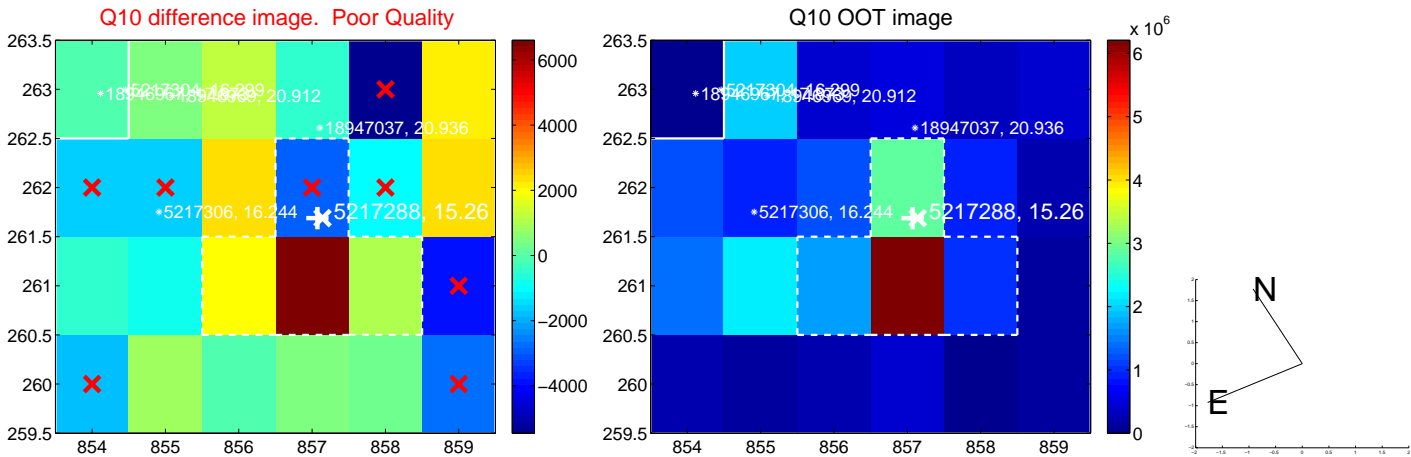
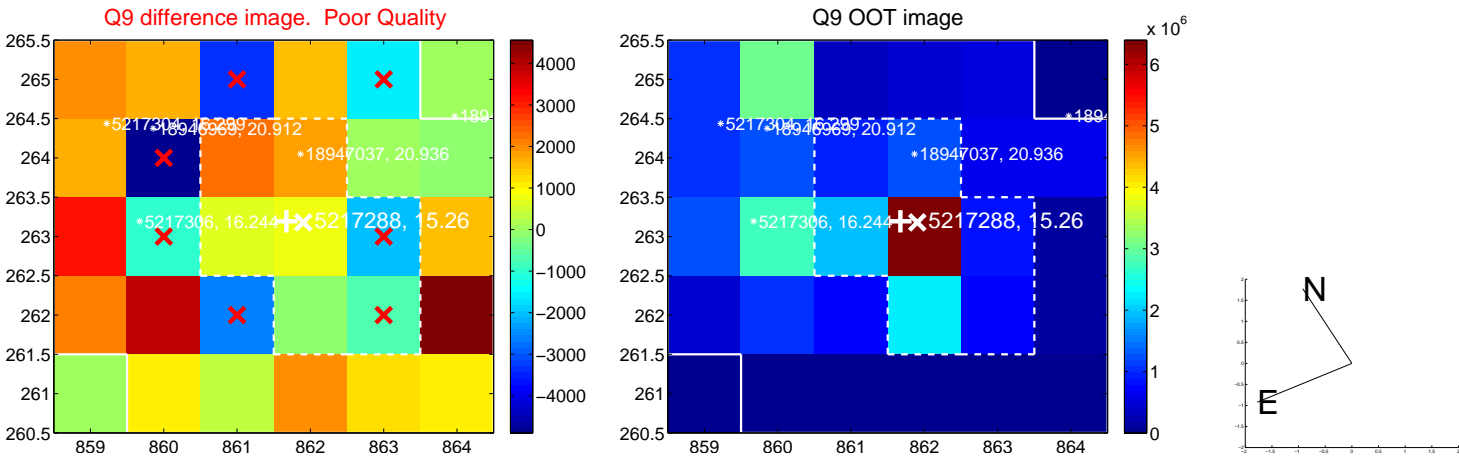


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

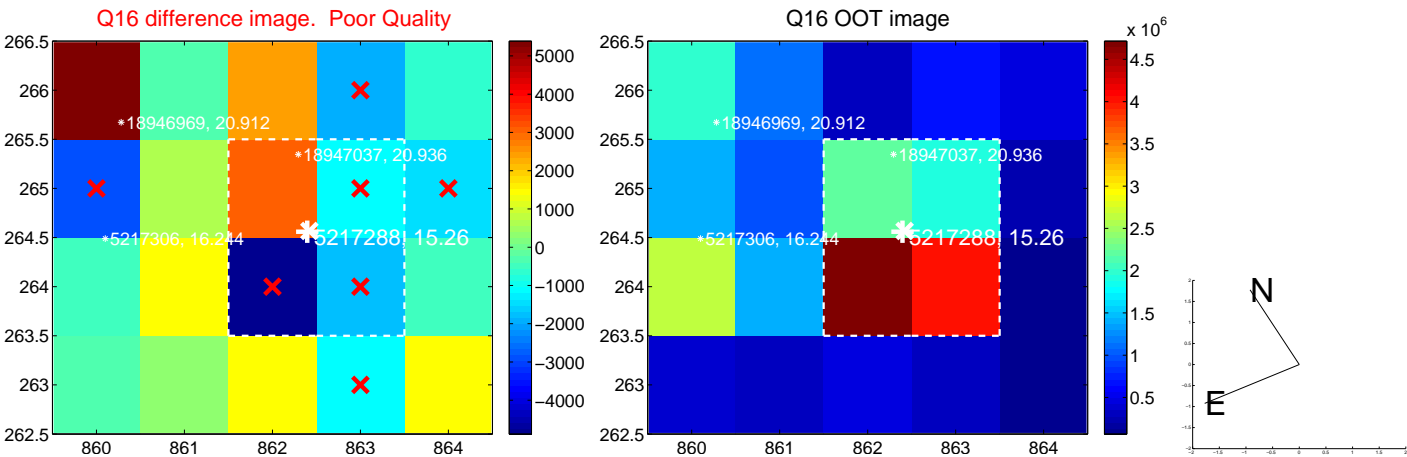
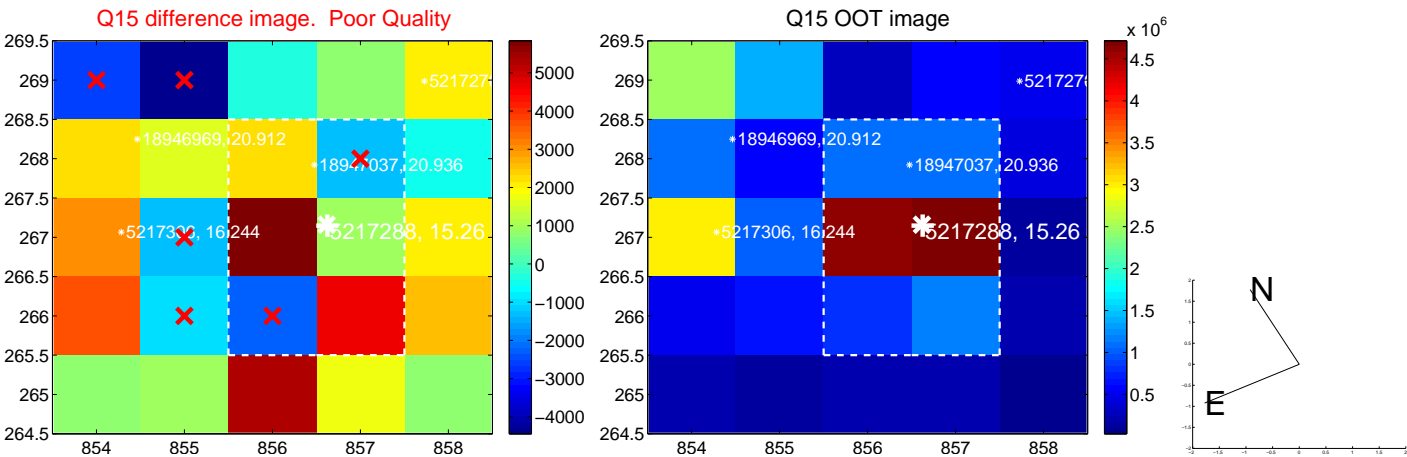
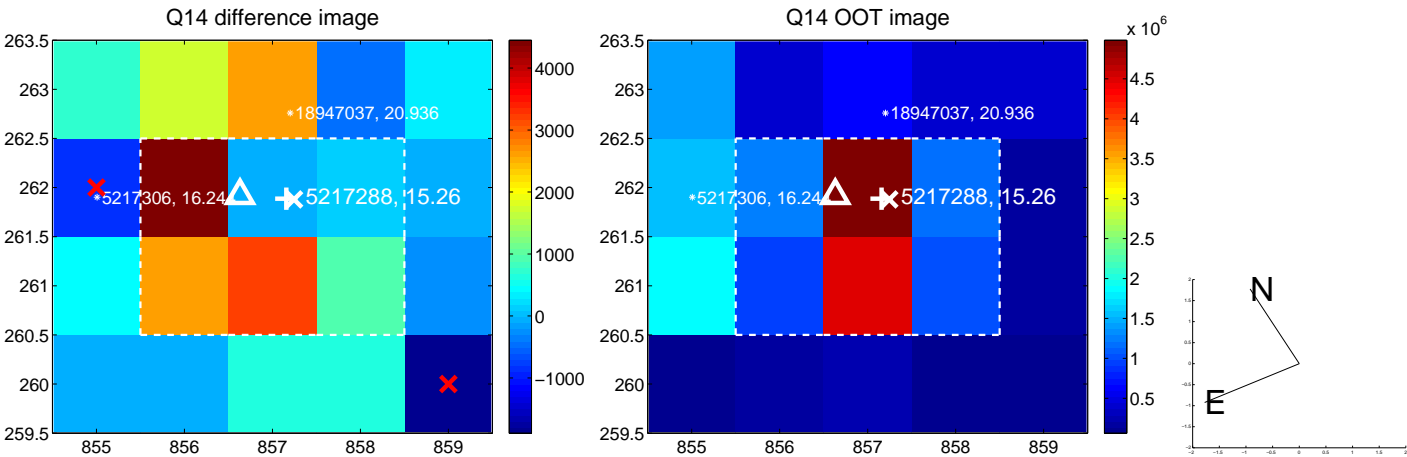
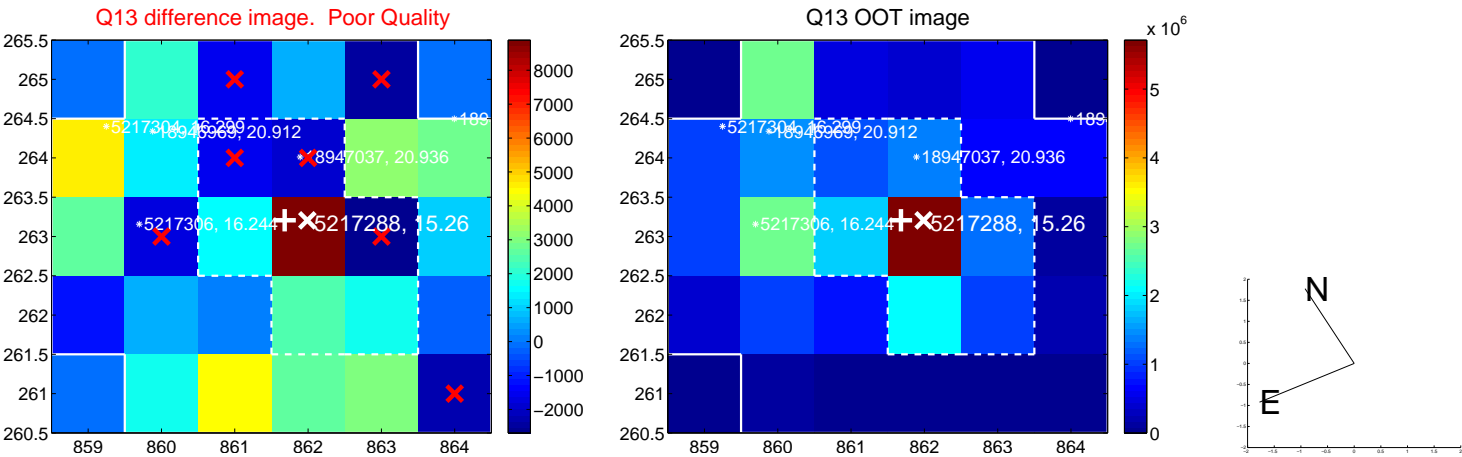




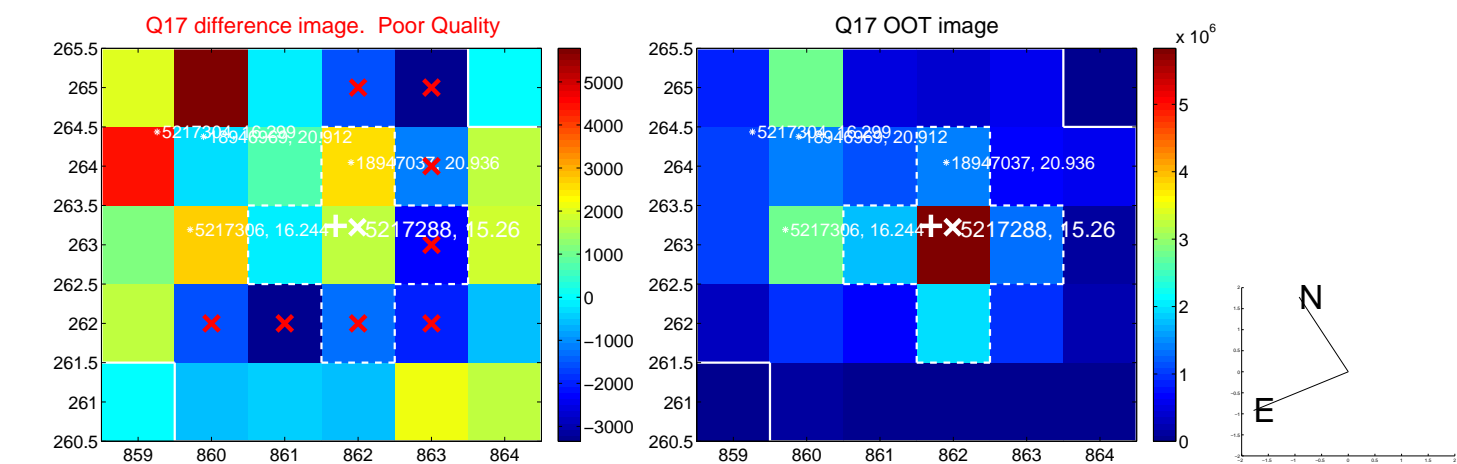
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



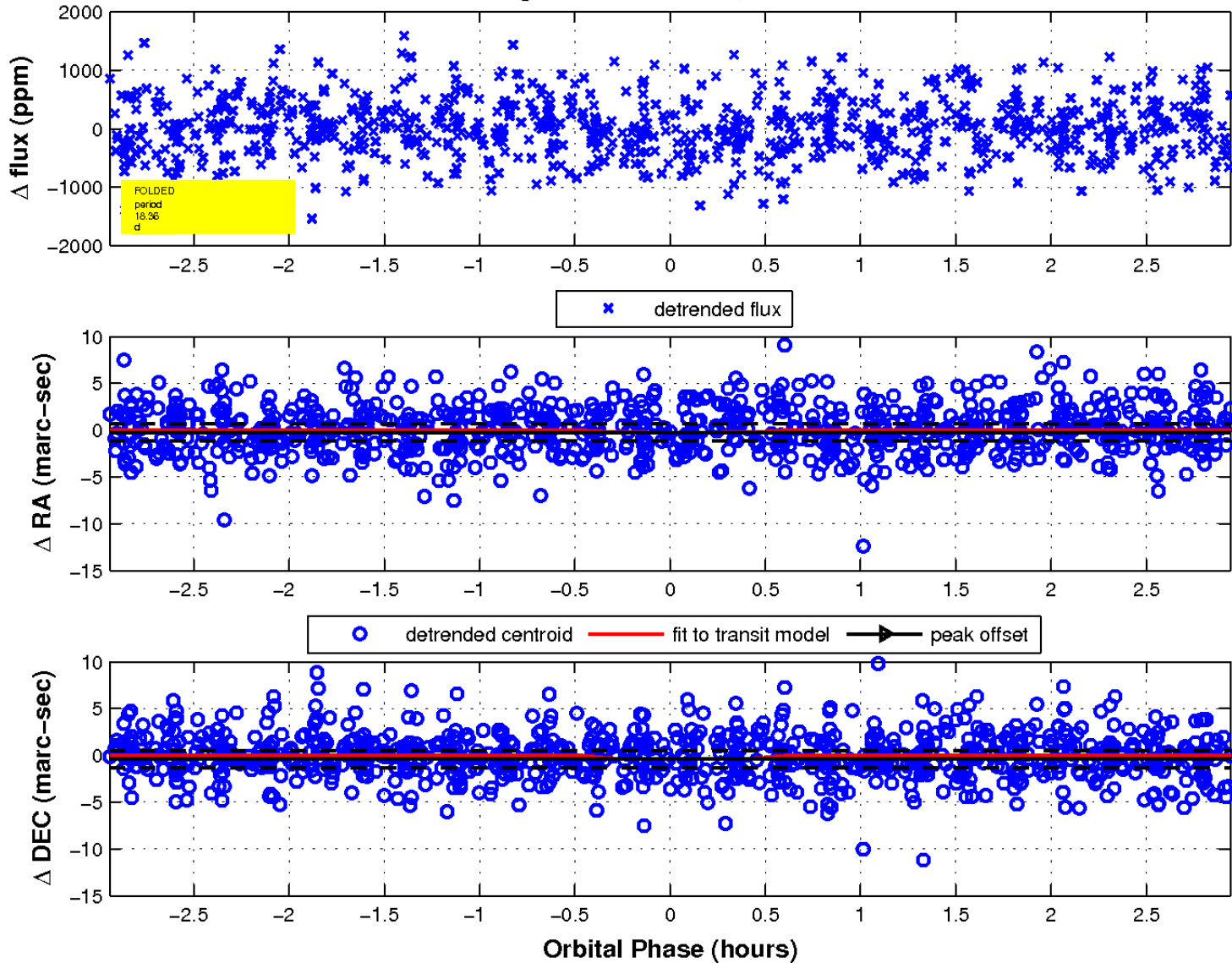
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

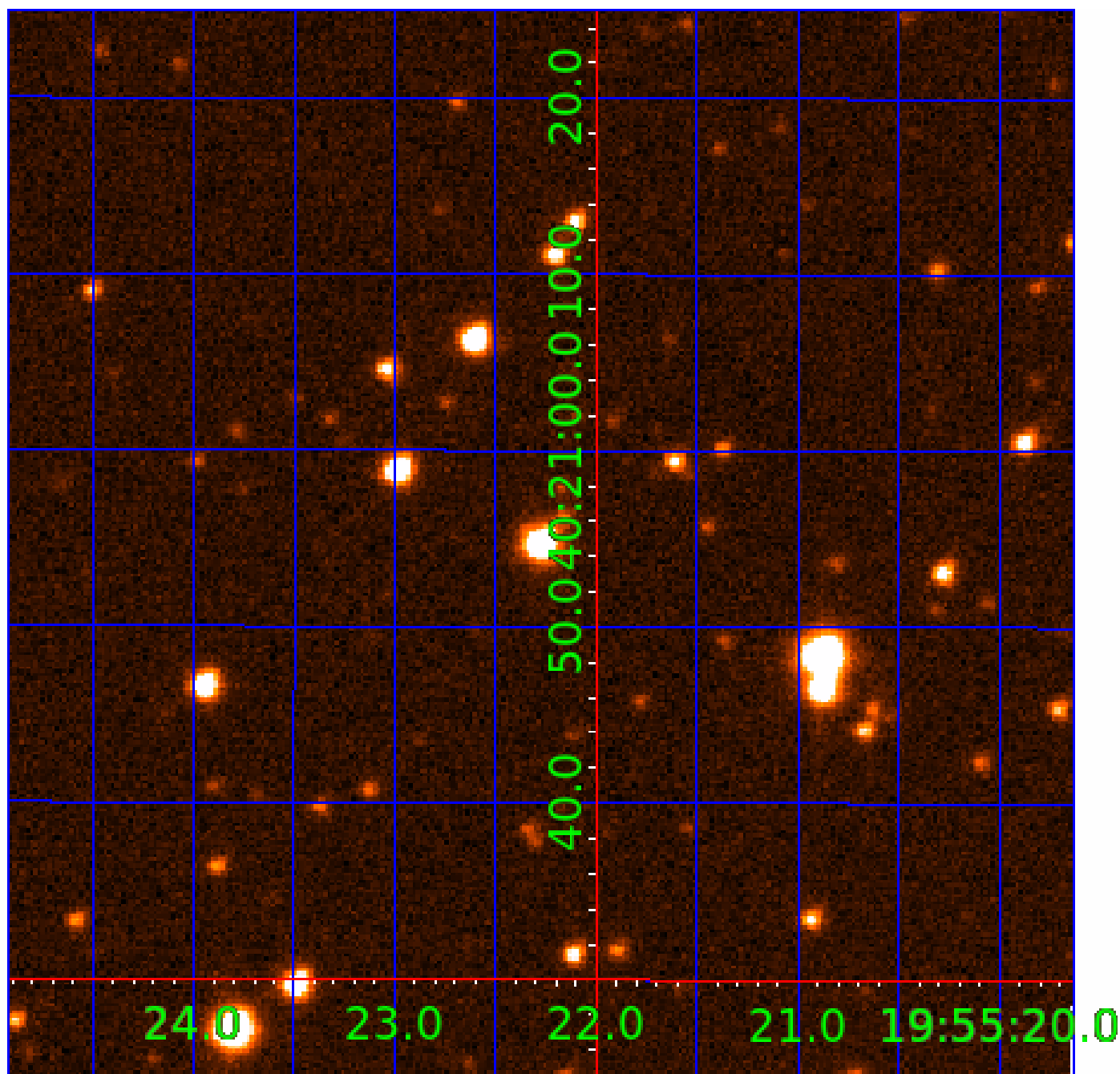


fluxWeightedCentroids, Planet 4 of 5



UKIRT Image

Declination



# KIC 005217288

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005217288-01	OBS	No	0.936057	131.856586	45.3	6.813	8.3	9.6	0.70	5825	0.49	1705.69
005217288-02	OBS	No	21.230421	139.450177	967.0	1.607	12.3	13.5	0.70	5825	2.27	26.57
005217288-03	OBS	No	28.406012	144.686705	832.5	1.710	11.0	11.8	0.70	5825	2.20	18.02
005217288-04	OBS	No	18.360603	147.173848	798.9	0.982	11.5	8.4	0.70	5825	2.03	32.24
005217288-05	OBS	No	46.587378	153.342544	790.5	1.932	9.7	10.3	0.70	5825	2.10	9.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005217288-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005217288-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005217288-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005217288-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_FEW_DIFFS
005217288-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

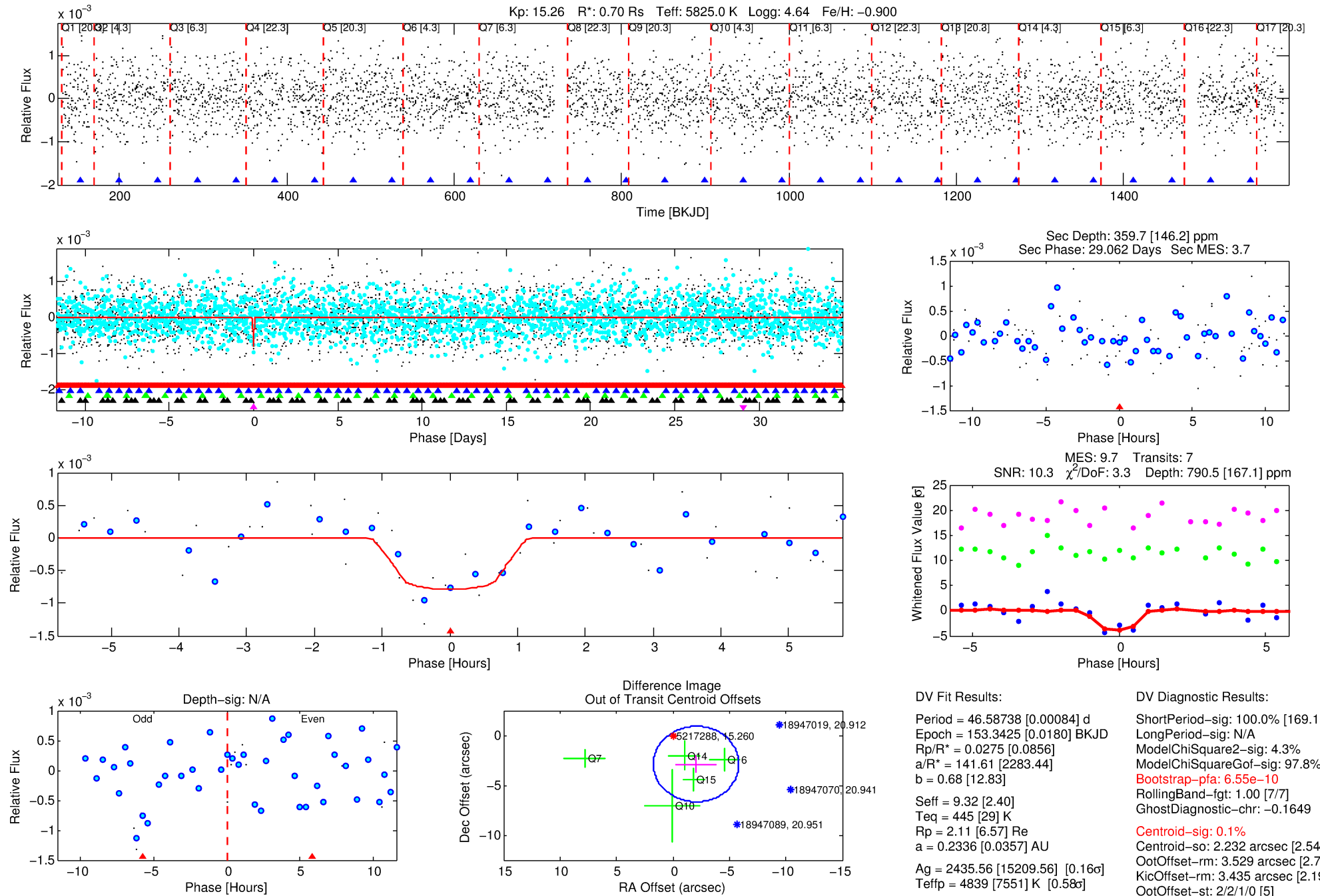
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005217288-05

No Significant Match Found

# DV One-Page Summary

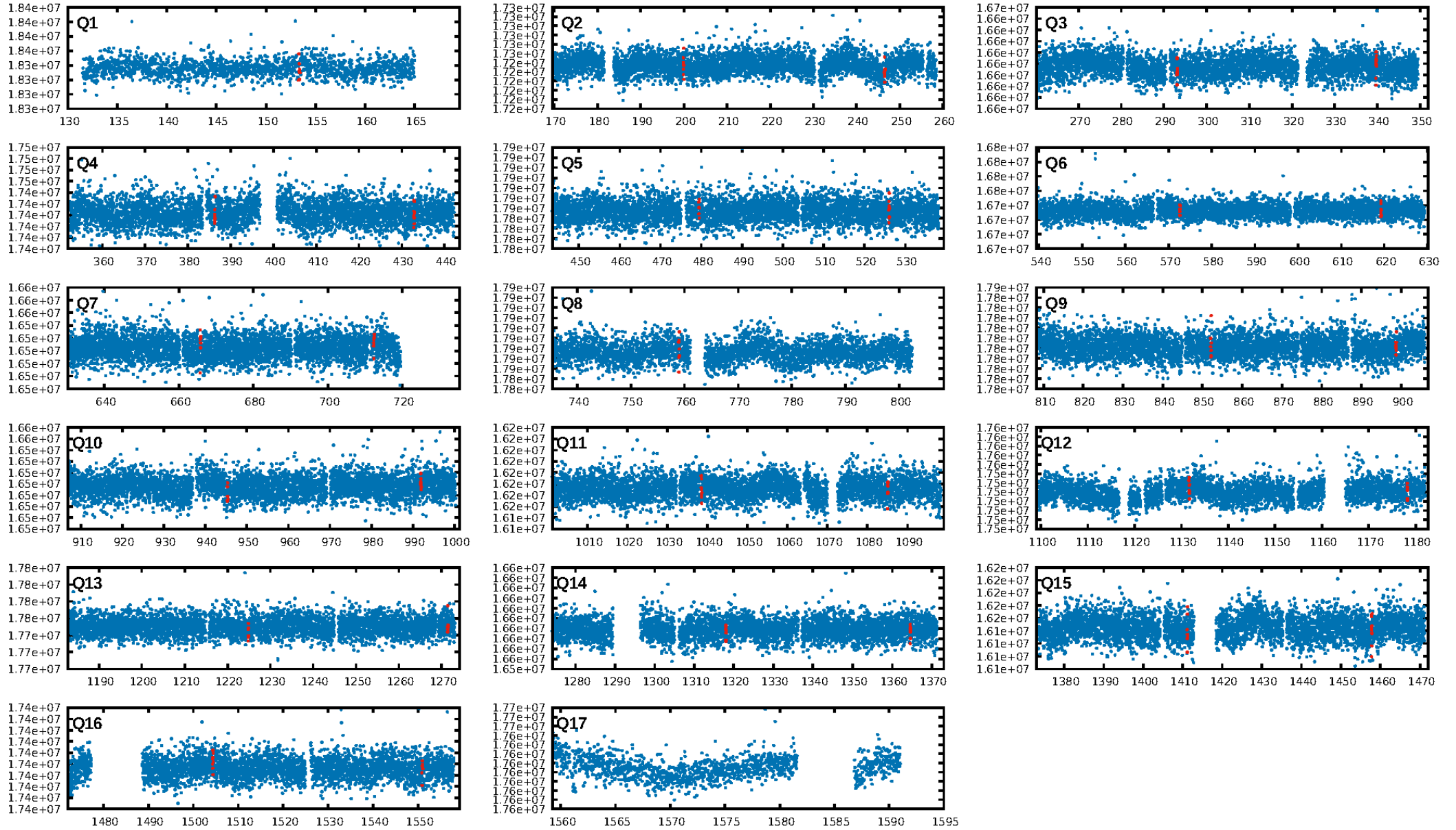
KIC: 5217288 Candidate: 5 of 5 Period: 46.587 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:53:19 Z

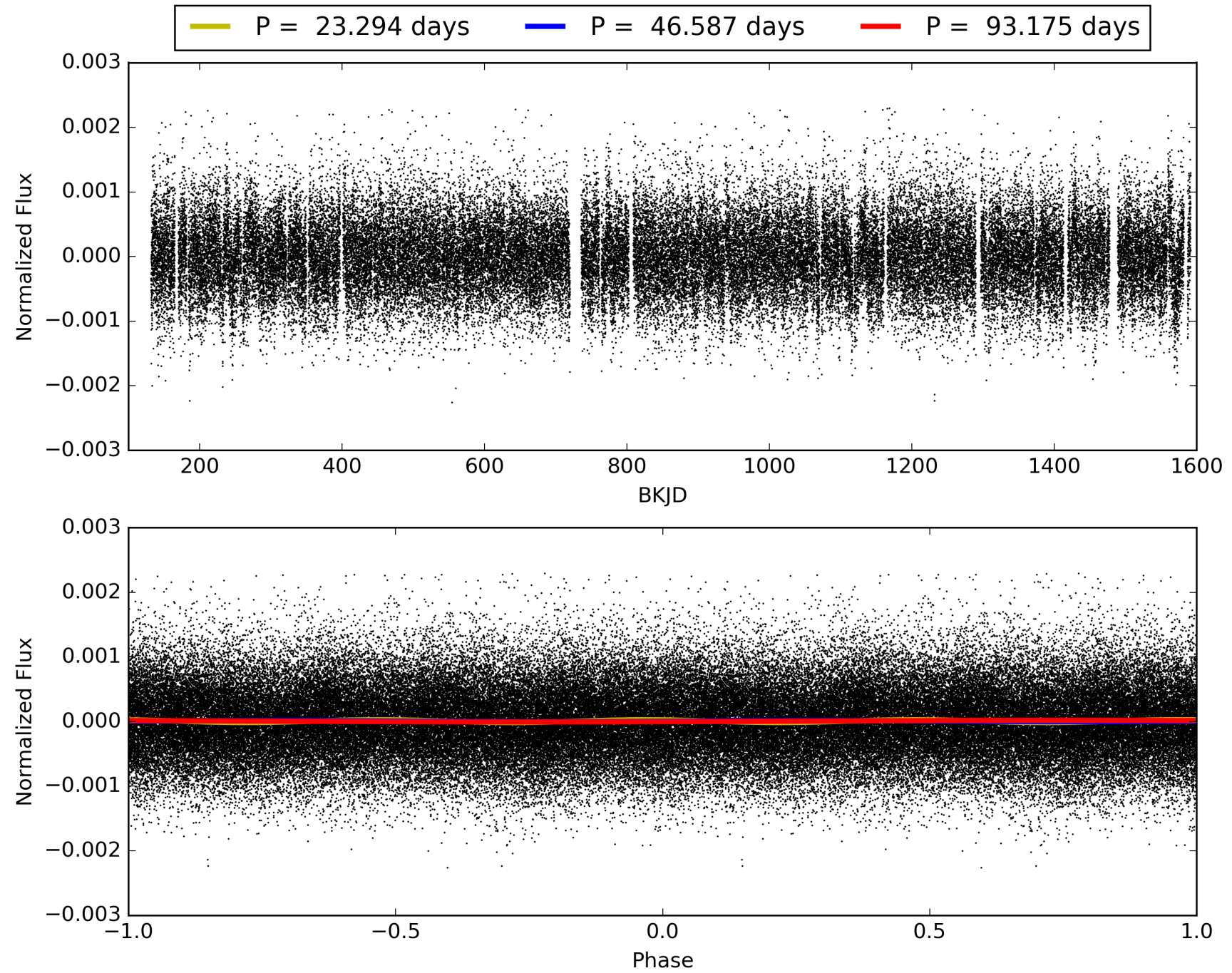
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005217288-05, PDC Light Curves



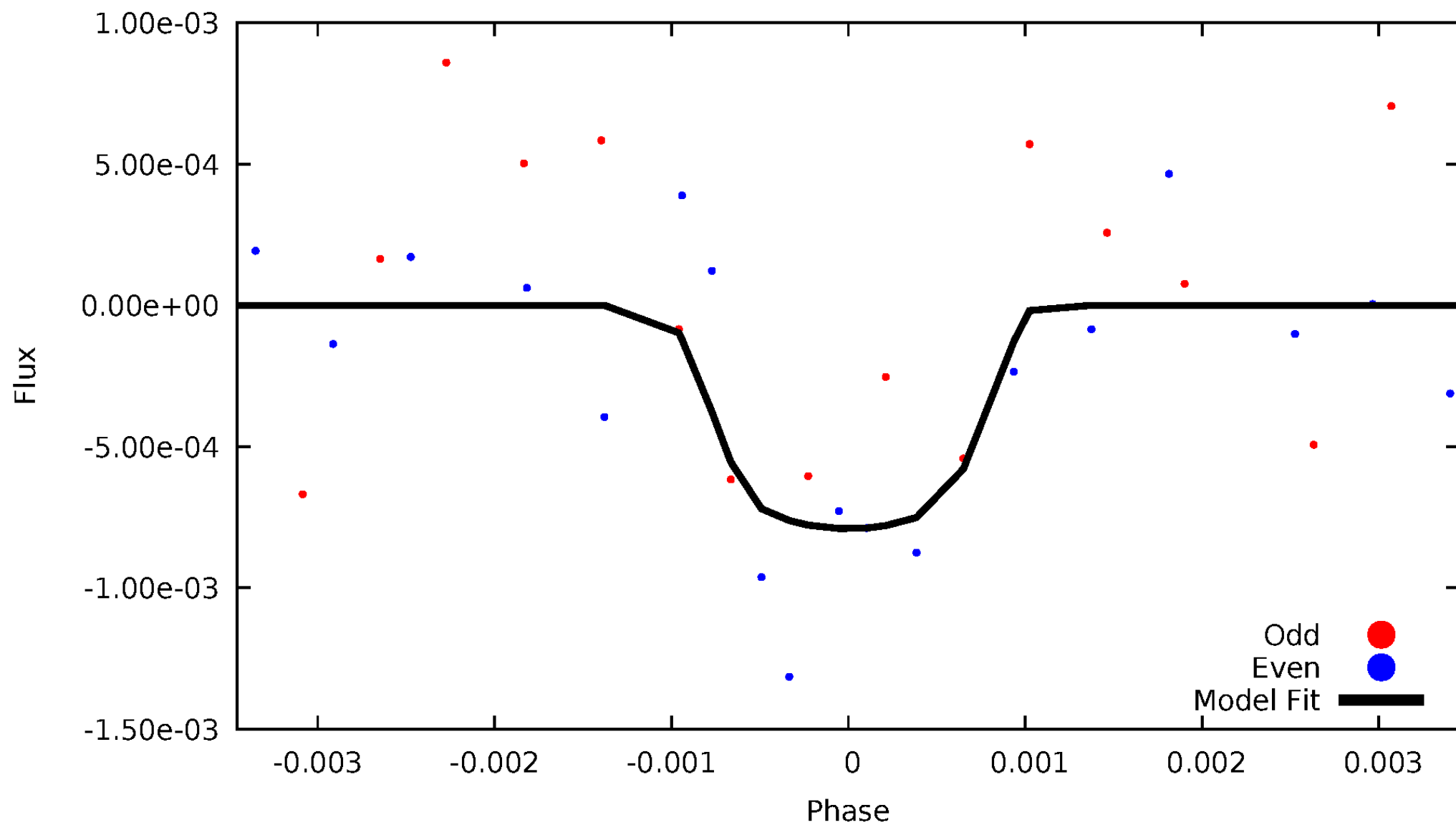


TCE 005217288-05



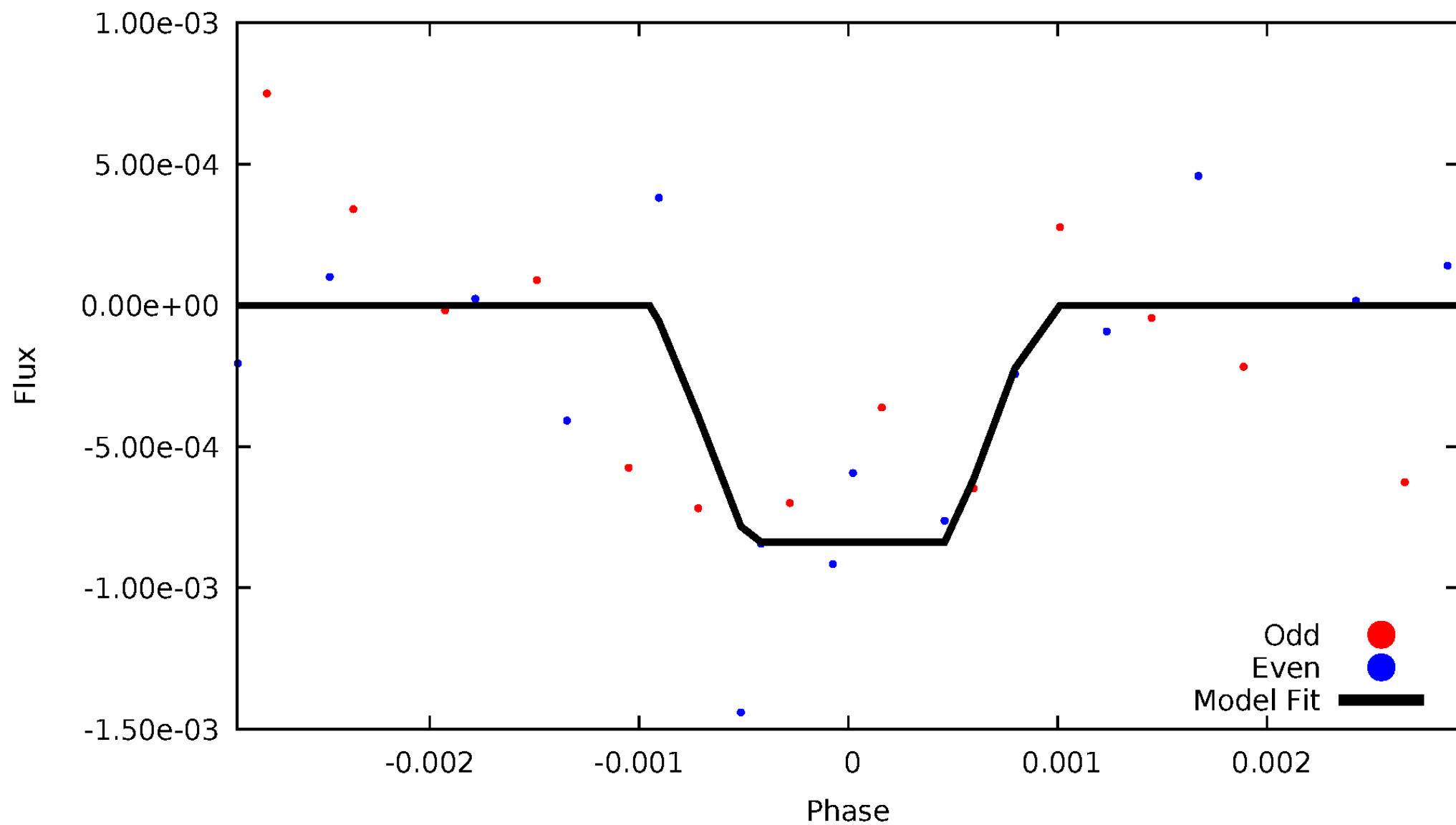
# DV Odd/Even

TCE 005217288-05



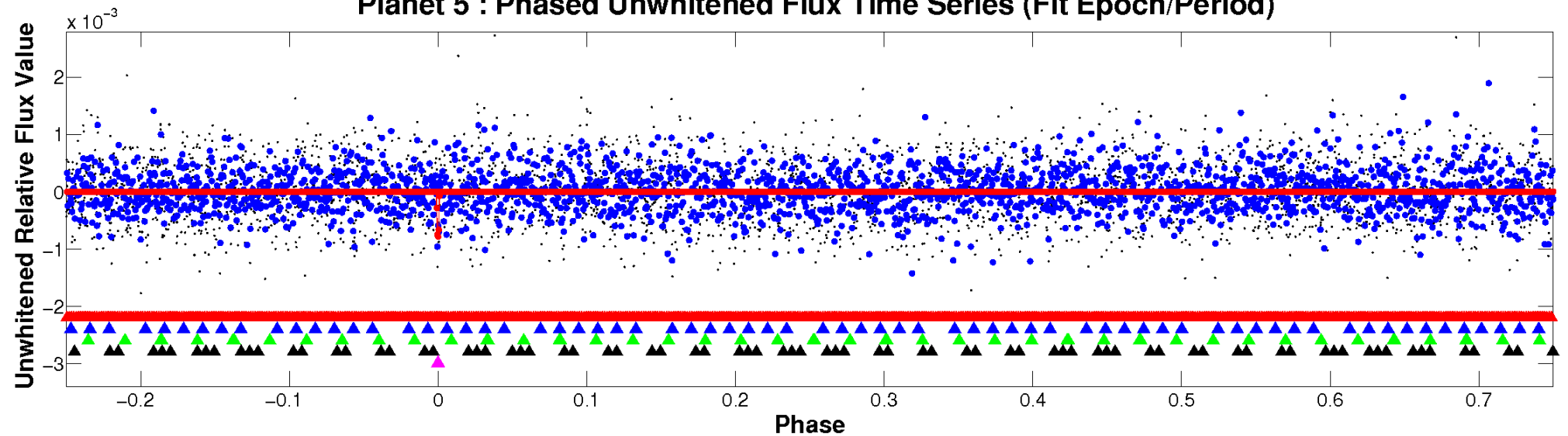
# ALT Odd/Even

TCE 005217288-05

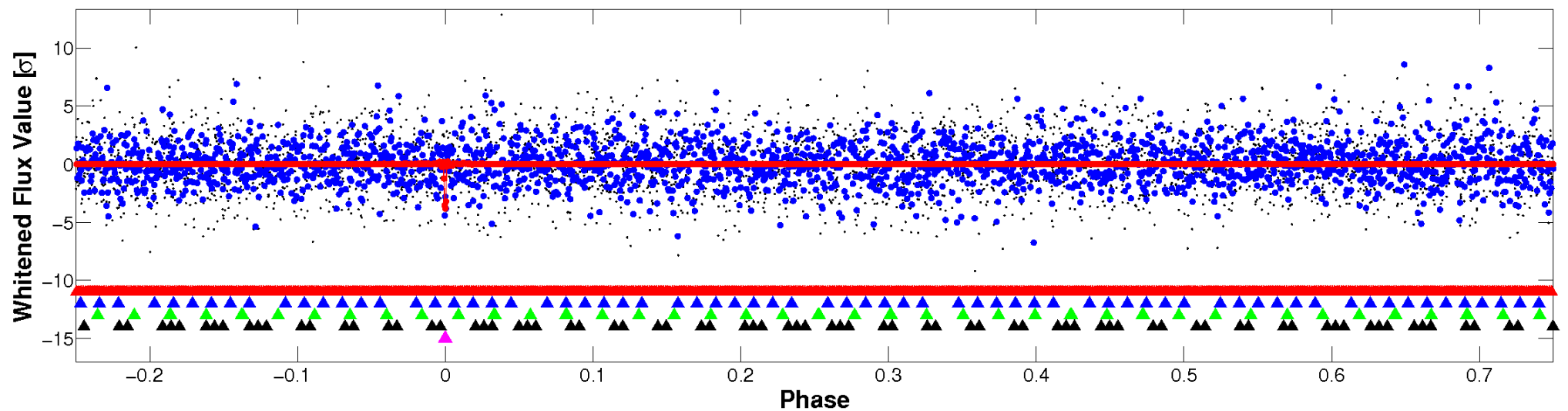


# Non-Whitened Vs. Whitened Light Curve

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

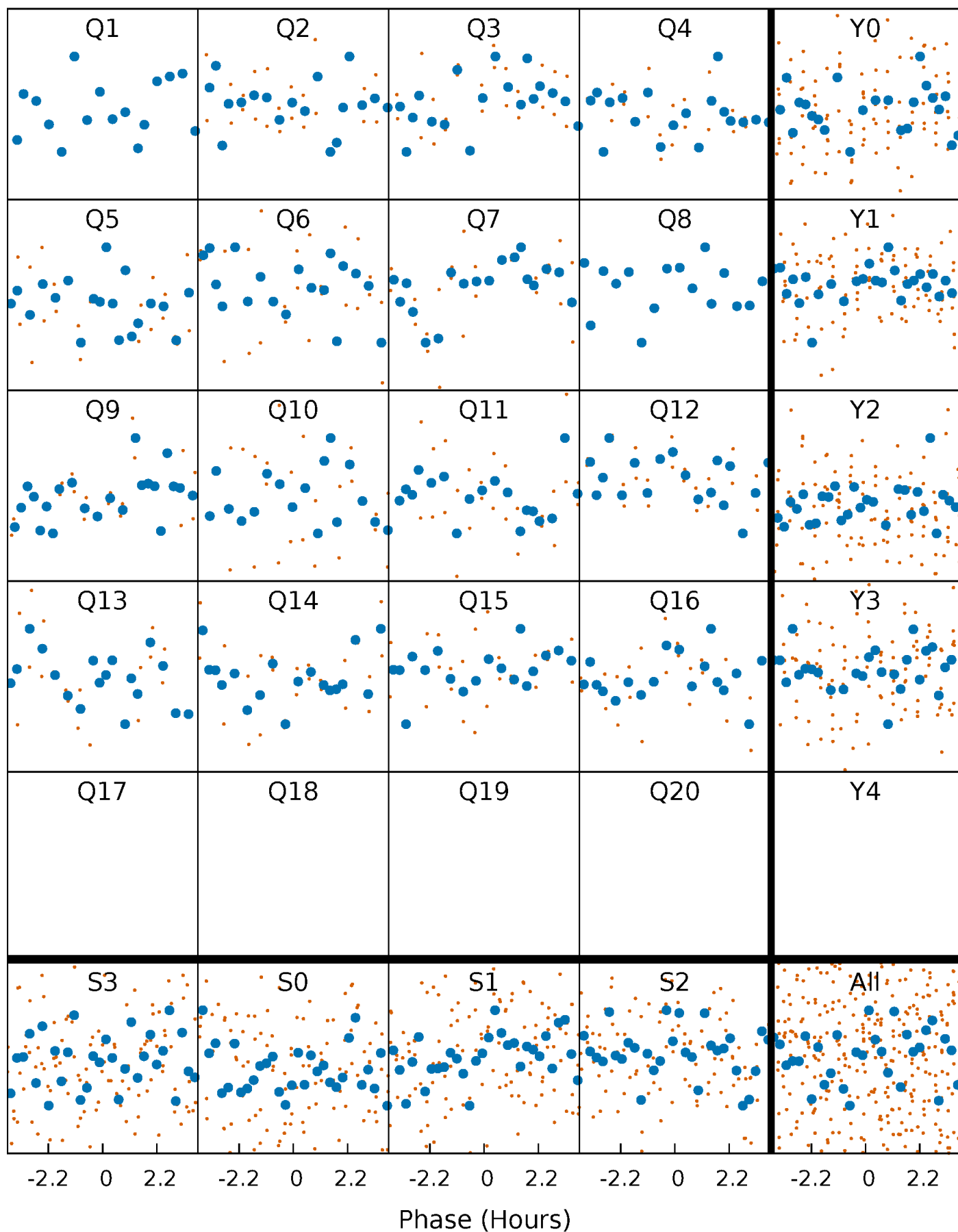


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



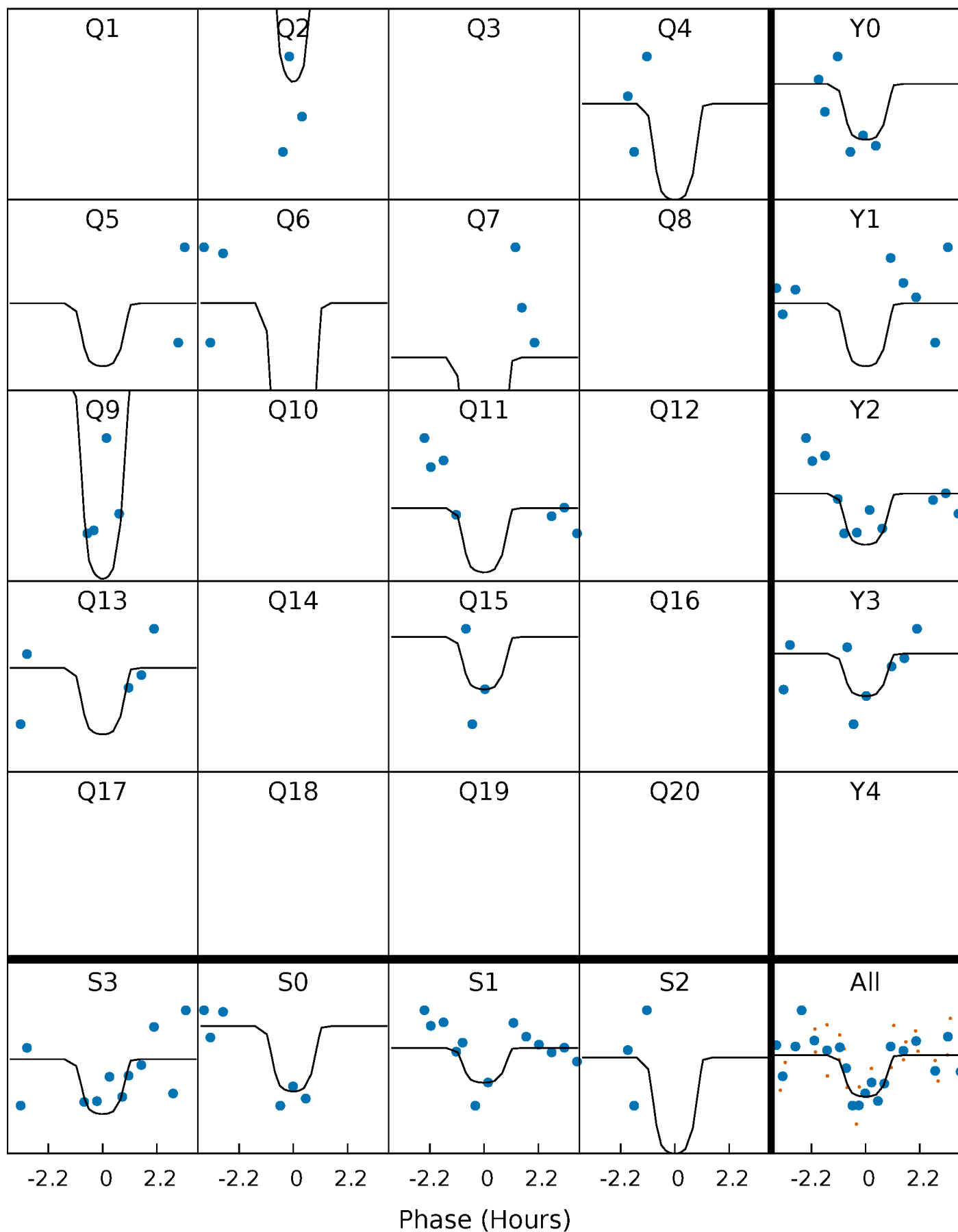
# PDC Quarter-Phased Transit Curves

TCE 005217288-05   P= 46.587378 Days    $T_0=153.342544$  (BKJD)



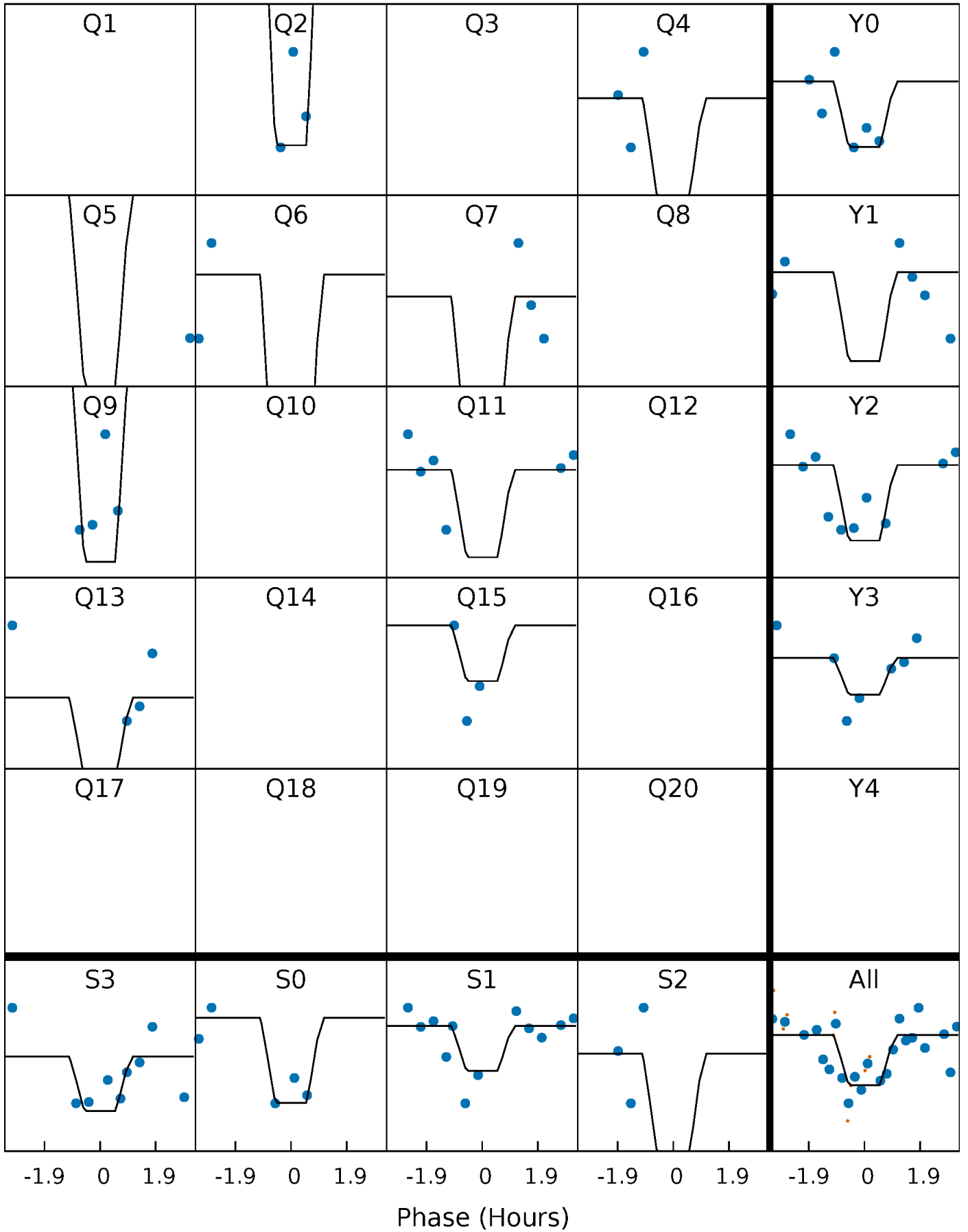
# DV Quarter-Phased Transit Curves

TCE 005217288-05   P= 46.587378 Days    $T_0=153.342544$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005217288-05 P= 46.587834 Days  $T_0=153.338144$  (BKJD)

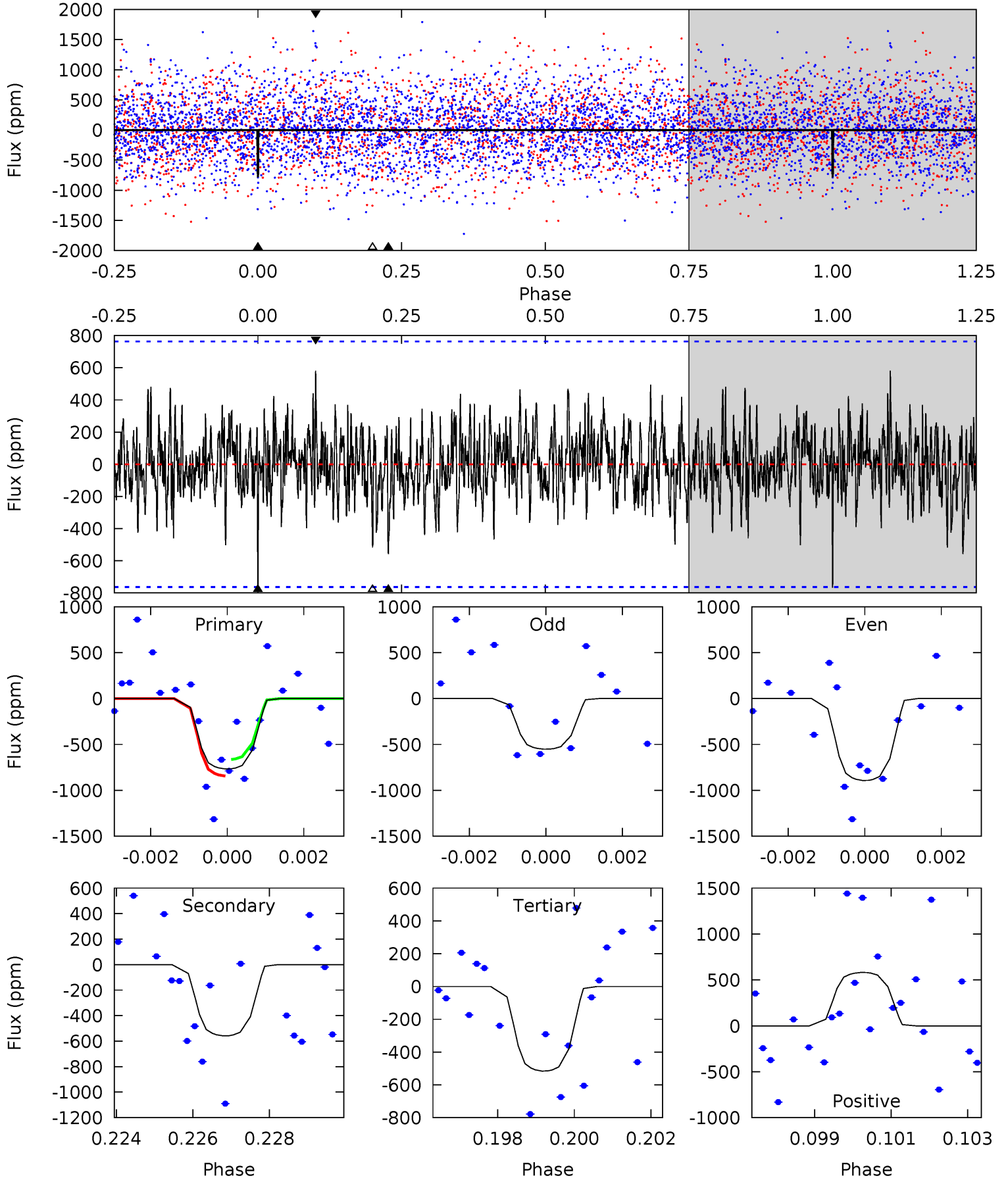




# DV Model-Shift Uniqueness Test

005217288-05,  $P = 46.587378$  Days,  $E = 106.755166$  Days

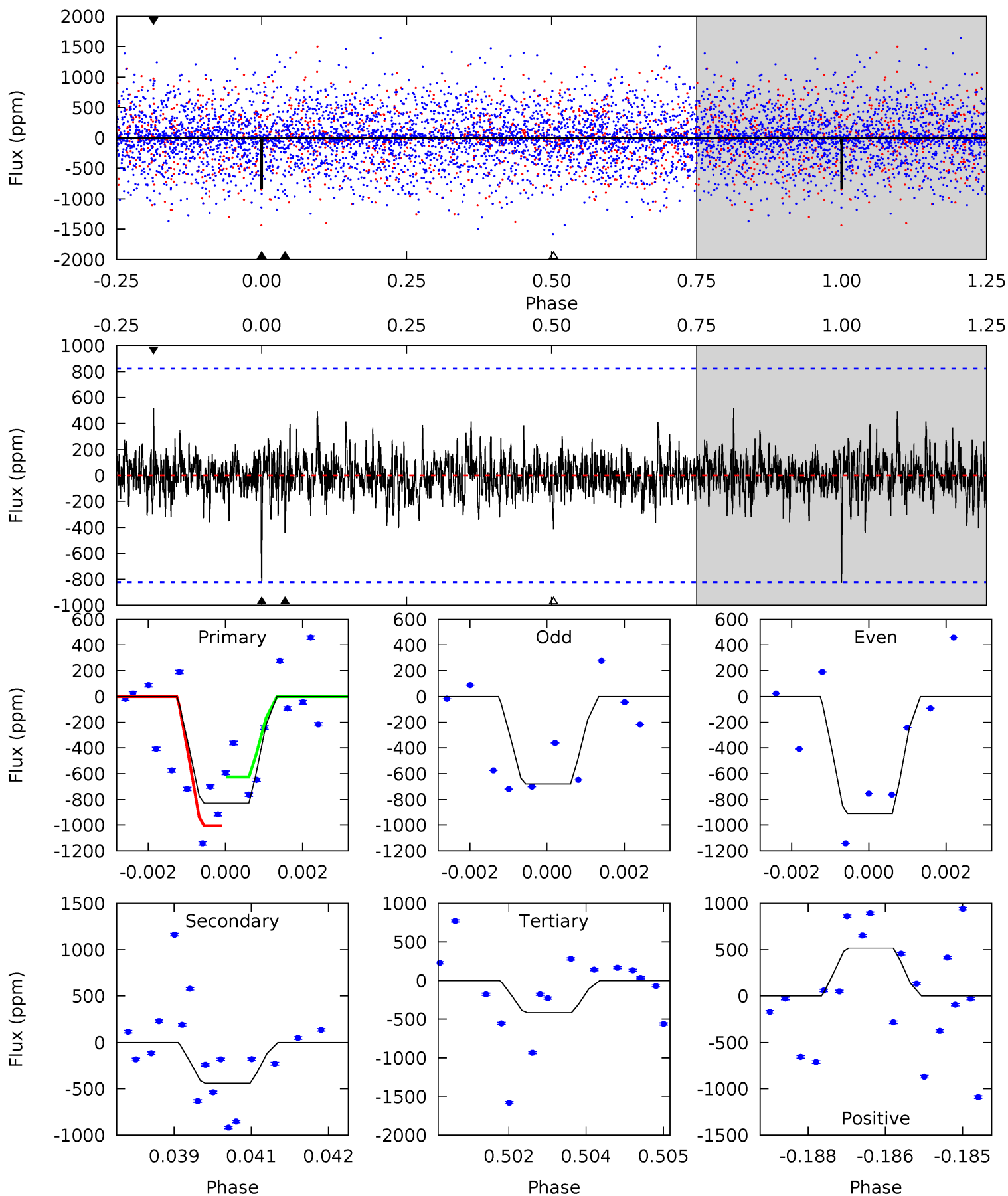
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.35	3.90	3.60	4.06	5.33	3.09	1.18	1.75	1.30	0.29	-0.16	1.11	0.89	0.43	0.62



# Alt Model-Shift Uniqueness Test

005217288-05, P = 46.587834 Days, E = 106.750310 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.41	2.89	2.71	3.38	5.38	3.17	0.81	2.69	2.02	0.18	-0.49	0.74	1.19	0.38	1.25



### Stellar Parameters For KIC 005217288

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5825^{+174}_{-174}$	$4.639^{+0.032}_{-0.128}$	$-0.900^{+0.300}_{-0.300}$	$0.702^{+0.123}_{-0.044}$	$0.792^{+0.062}_{-0.075}$	$3.229^{+0.389}_{-1.177}$
	+3%/-3%	+1%/-3%	+33%/-33%	+18%/-6%	+8%/-9%	+12%/-36%
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 005217288-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-558 \pm 143$	$5.38^{+5.45}_{-3.68}$	$631^{+32}_{-23}$	$3846^{+2321}_{-800}$	$581^{+5387}_{-437}$
Alt.	$-443 \pm 153$	$5.47^{+5.38}_{-3.61}$	$632^{+29}_{-26}$	$3622^{+1878}_{-702}$	$422^{+3323}_{-325}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

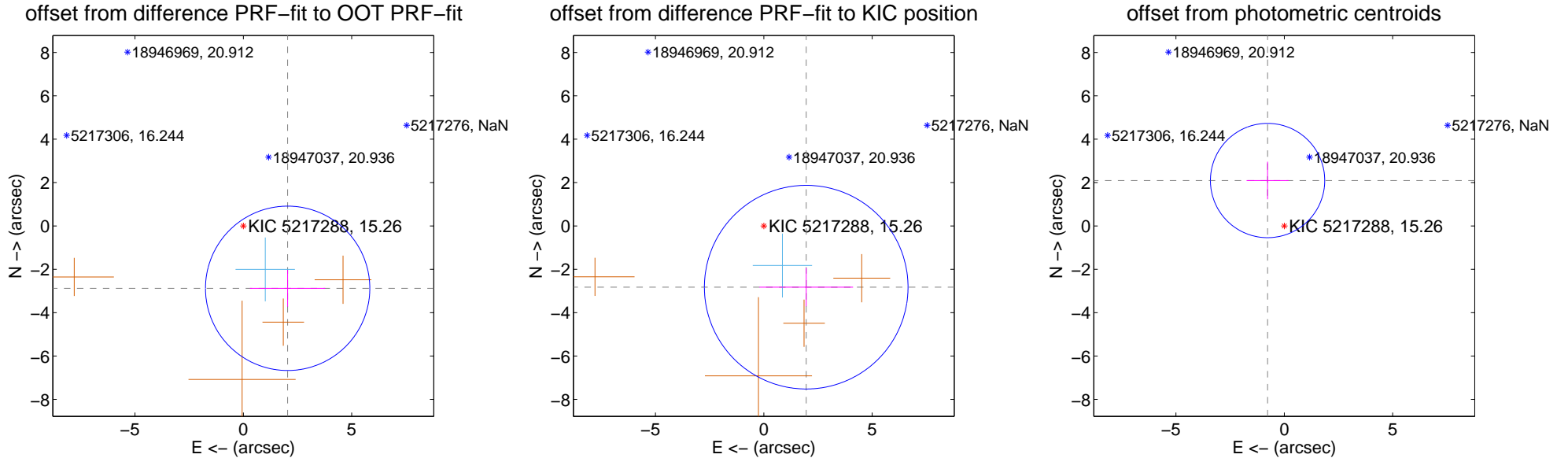
## DV Centroid Data

Supplemental centroid analysis for 005217288-05. Kepler magnitude: 15.26. Transit SNR 10.35

There are 1 quarters with good PRF difference image offsets

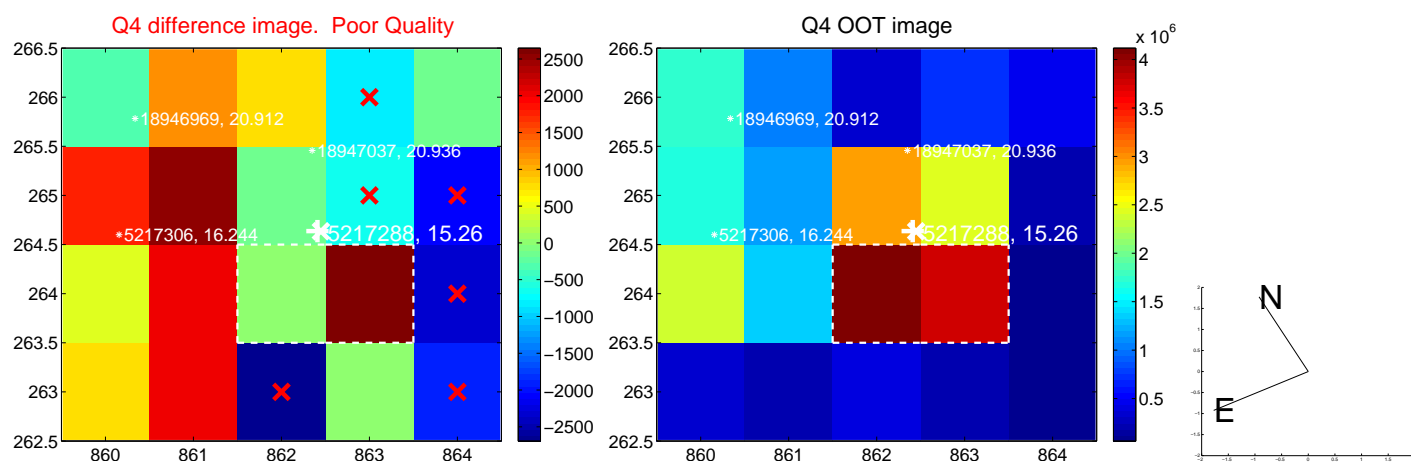
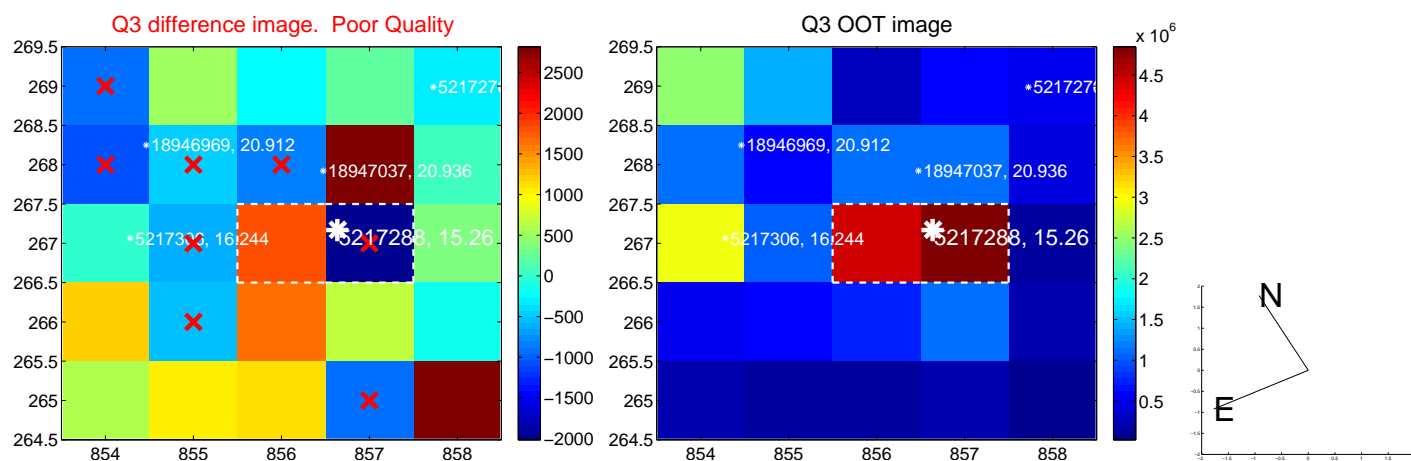
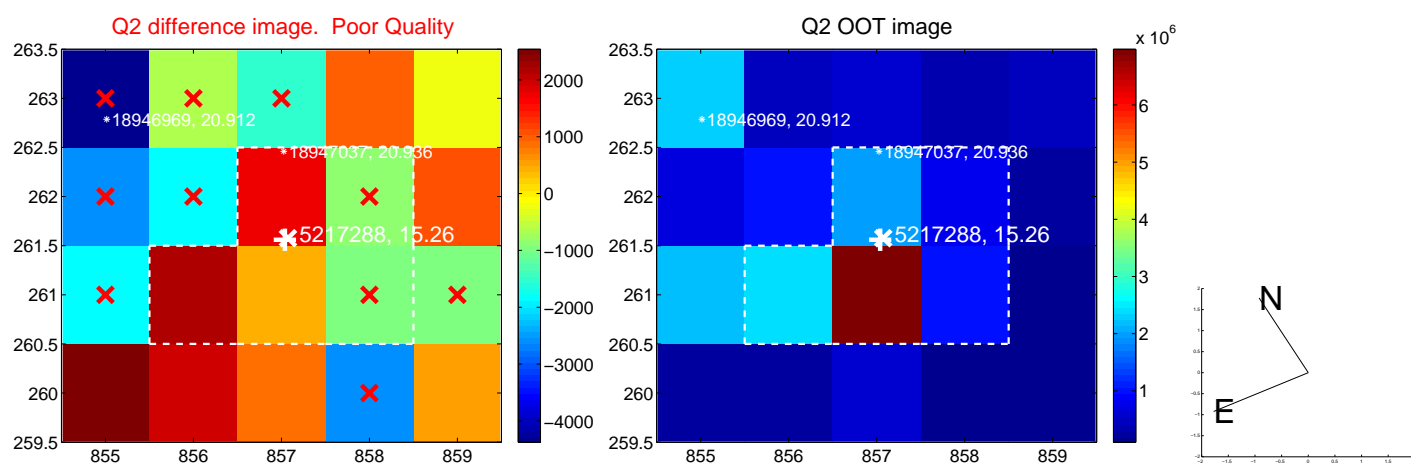
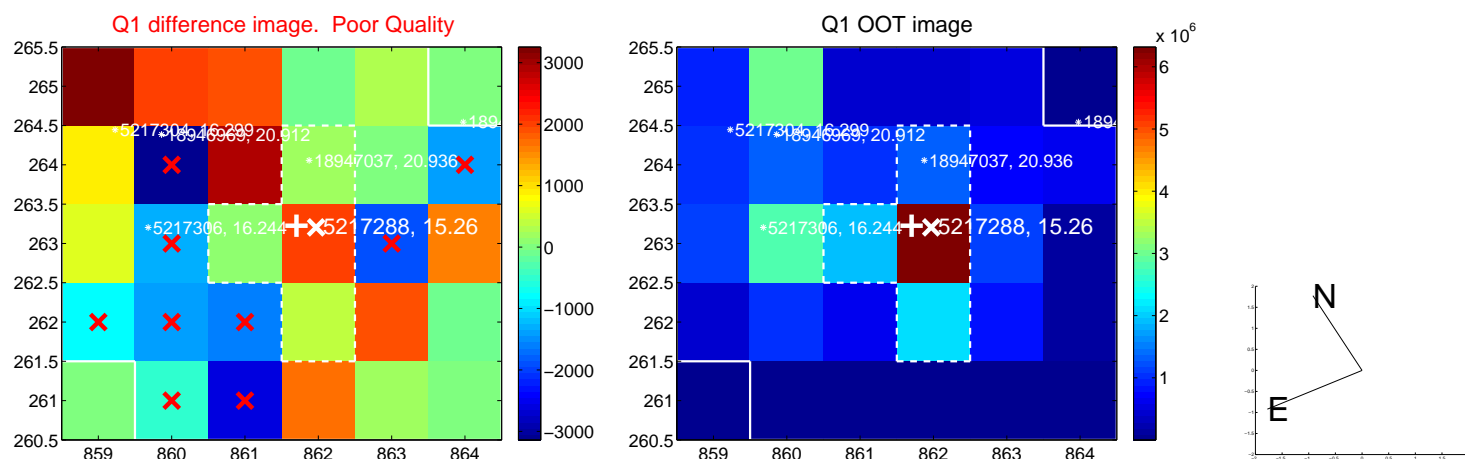
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.529 \pm 1.263$	2.79	$-2.044 \pm 1.737$	$-2.876 \pm 0.844$
PRF-fit source offset from KIC position	$3.435 \pm 1.565$	2.19	$-1.956 \pm 2.162$	$-2.824 \pm 0.884$
photometric centroid source offset	$2.23 \pm 0.88$	2.54	$0.77 \pm 0.97$	$2.09 \pm 0.87$

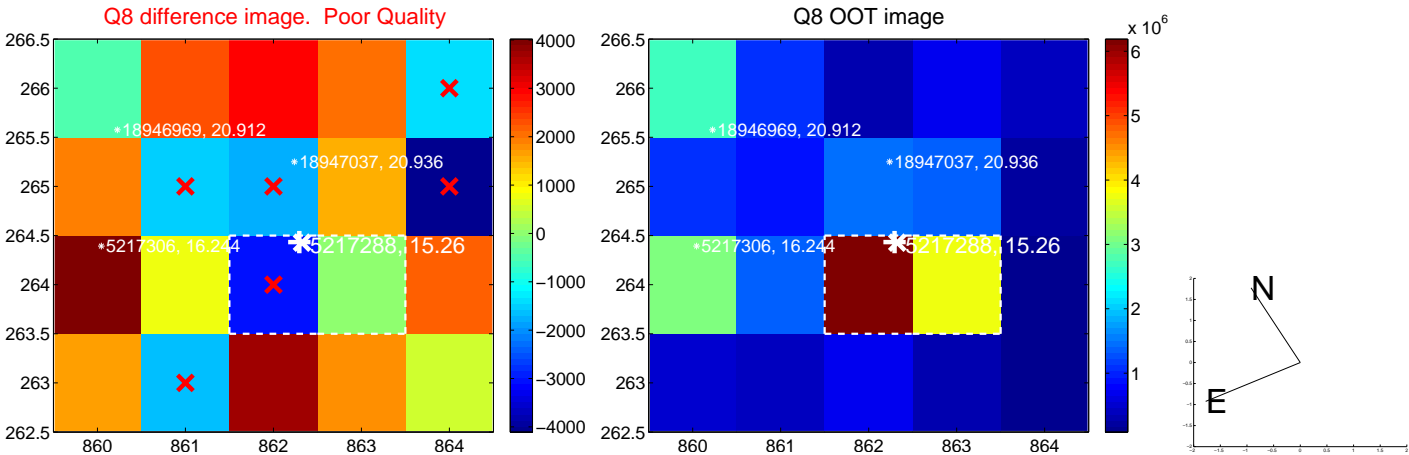
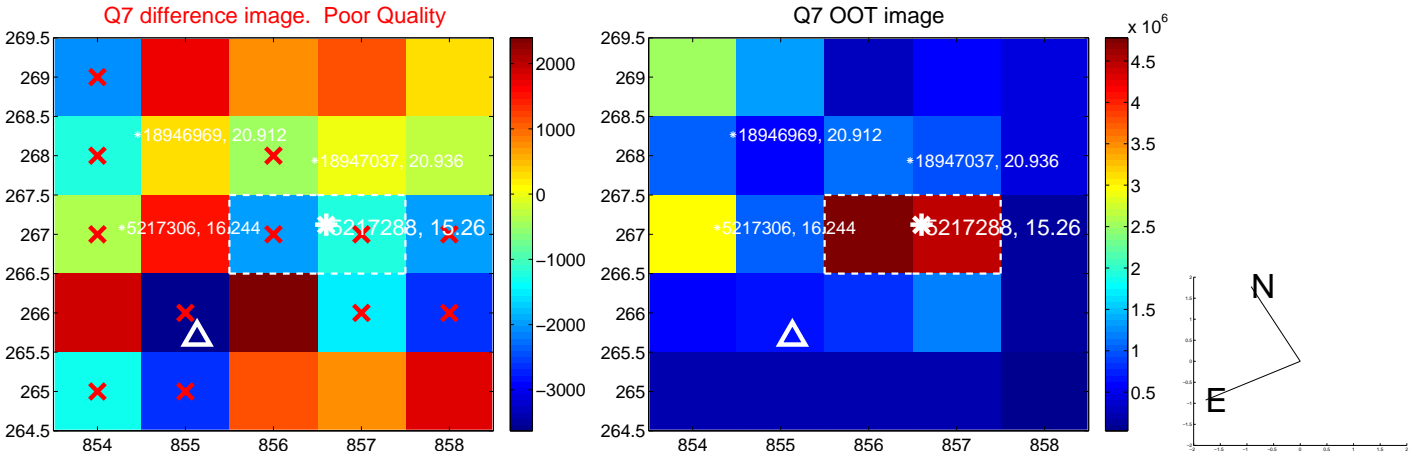
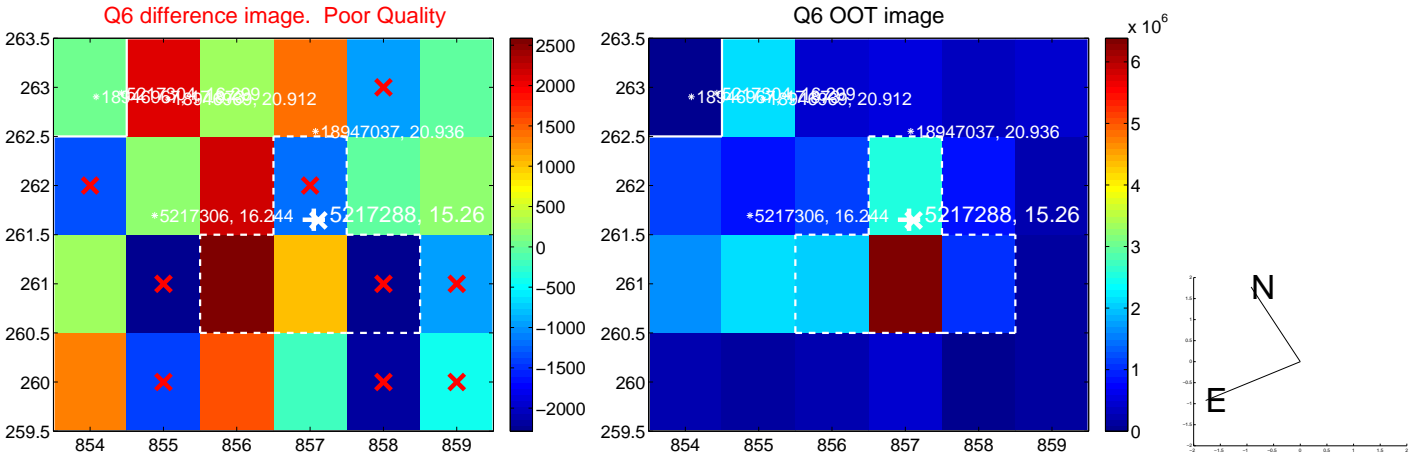
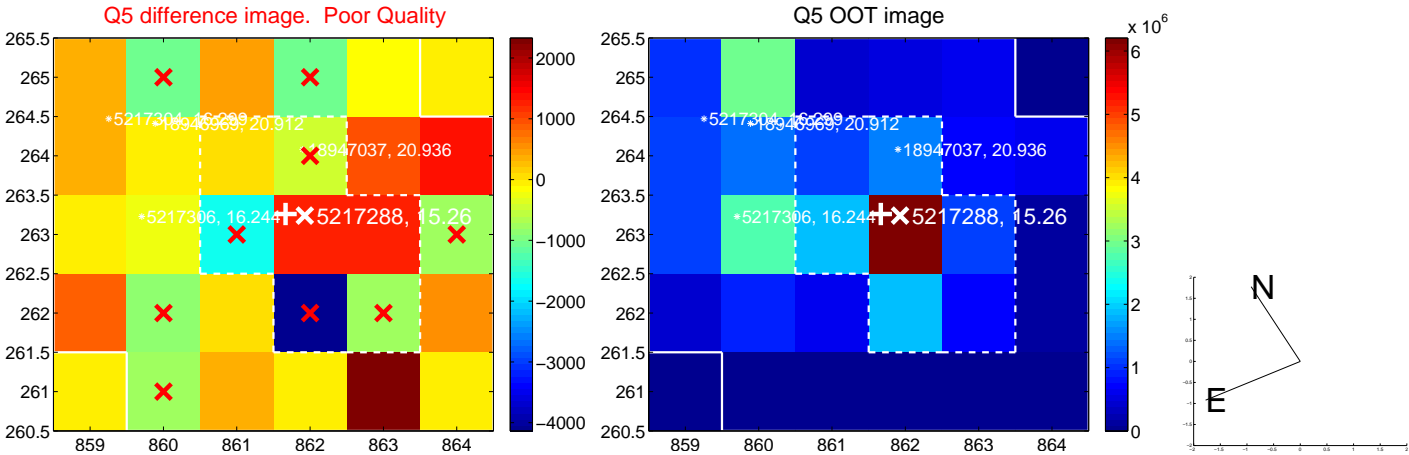


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

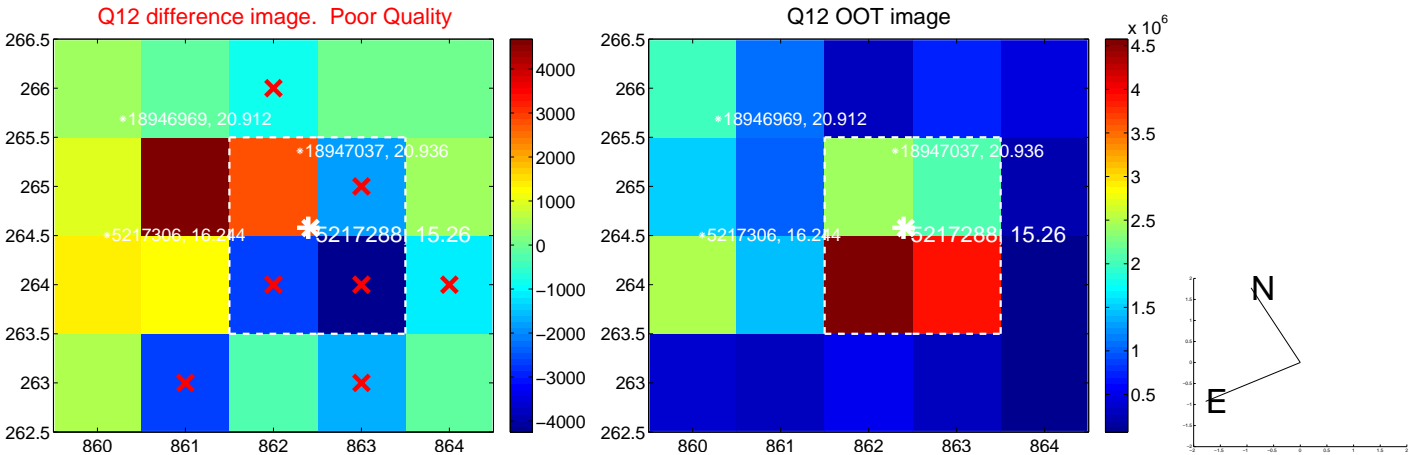
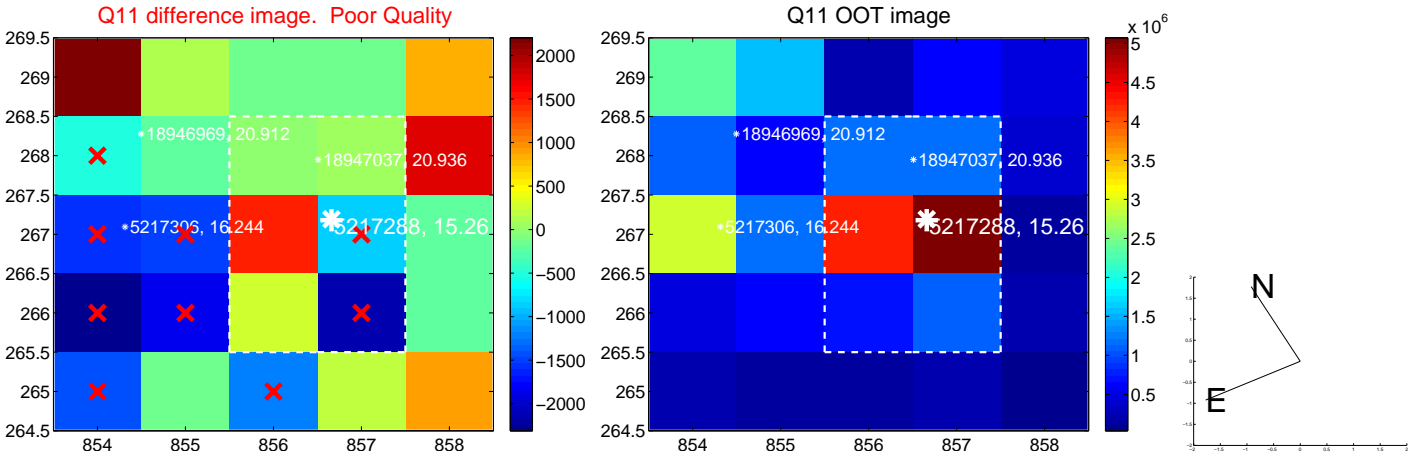
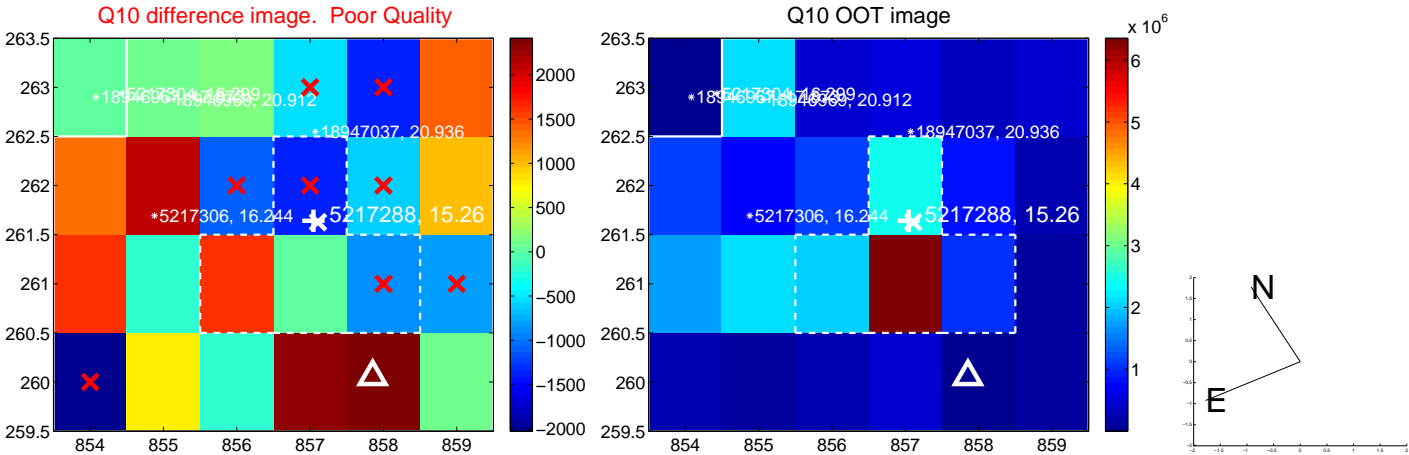
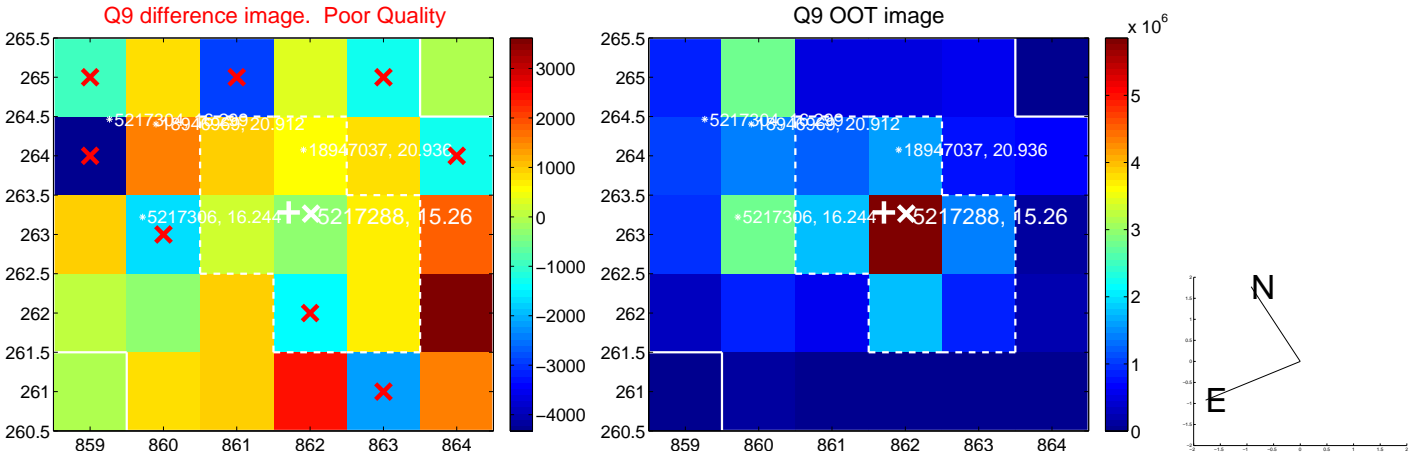
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

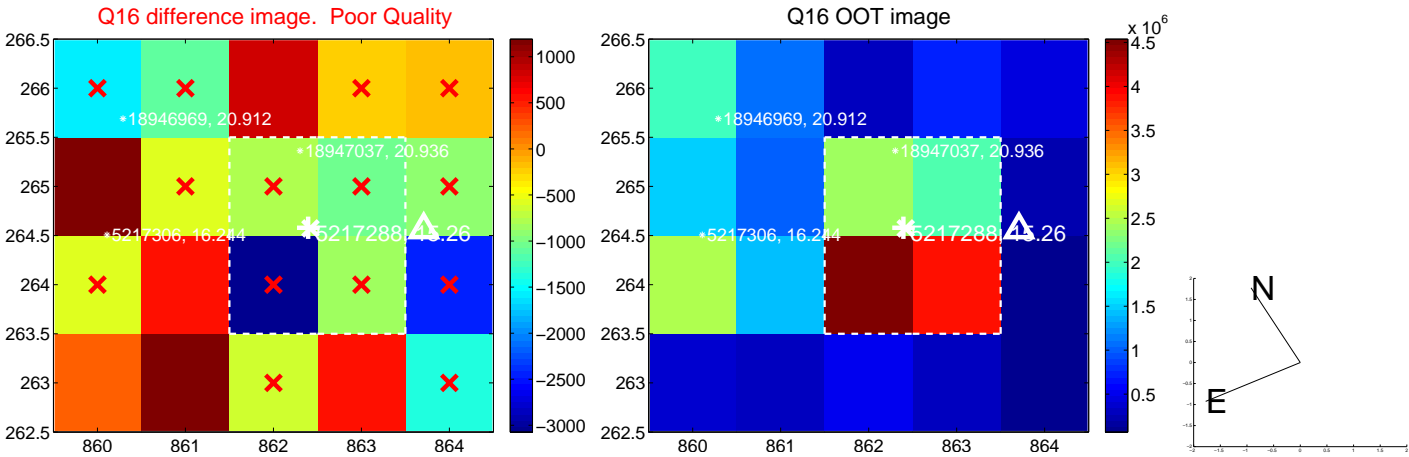
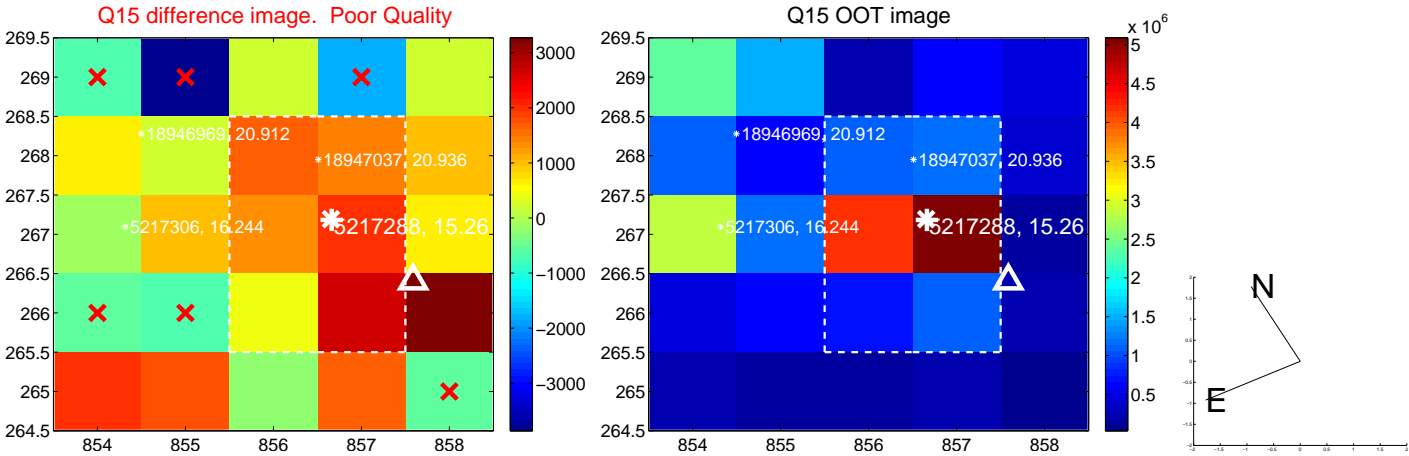
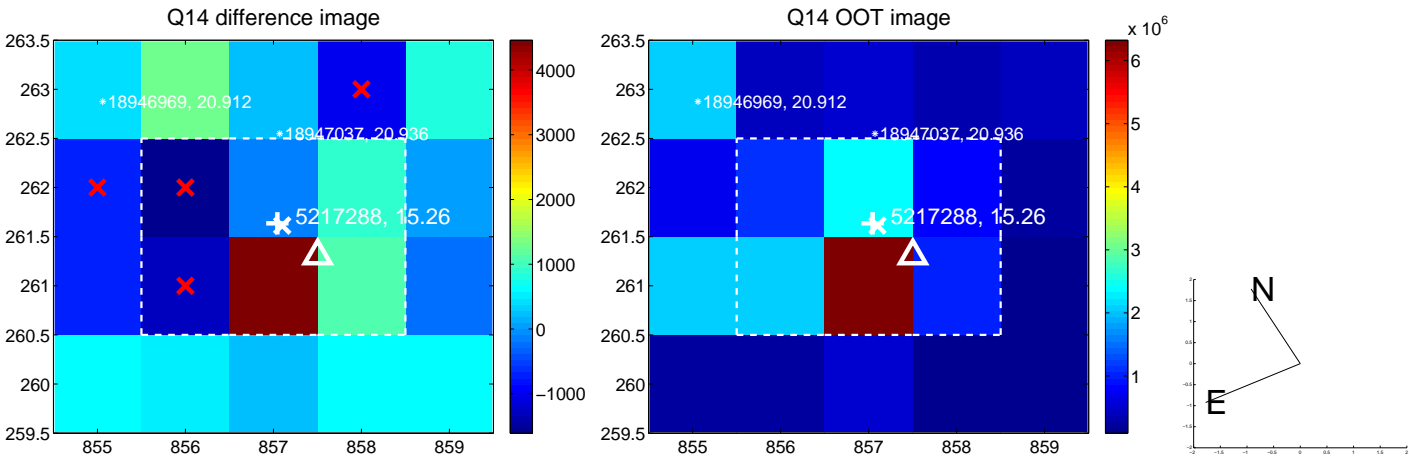
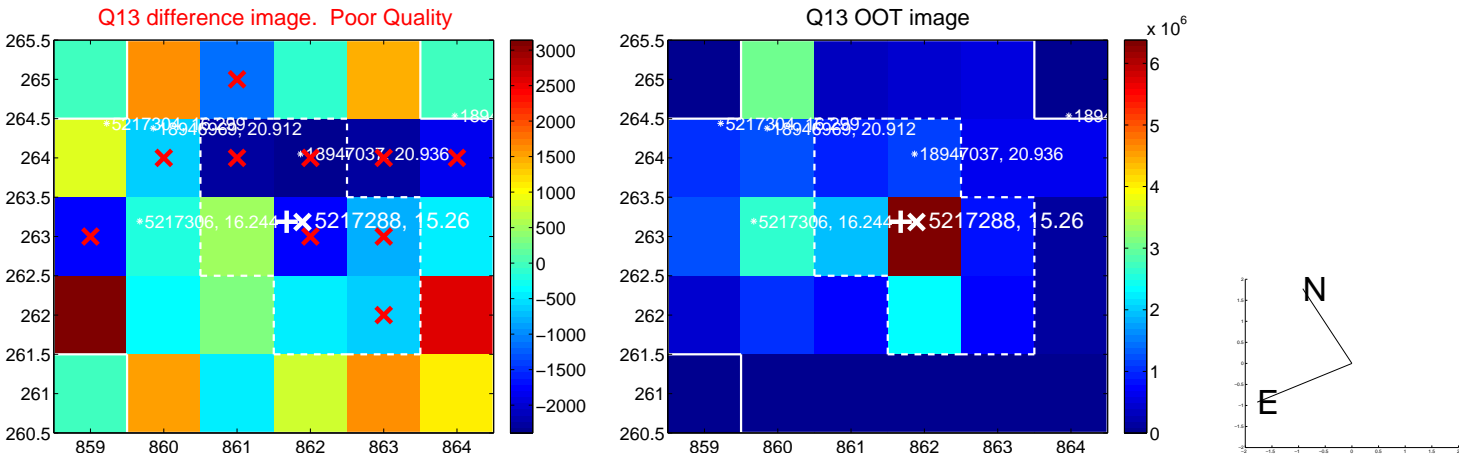


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

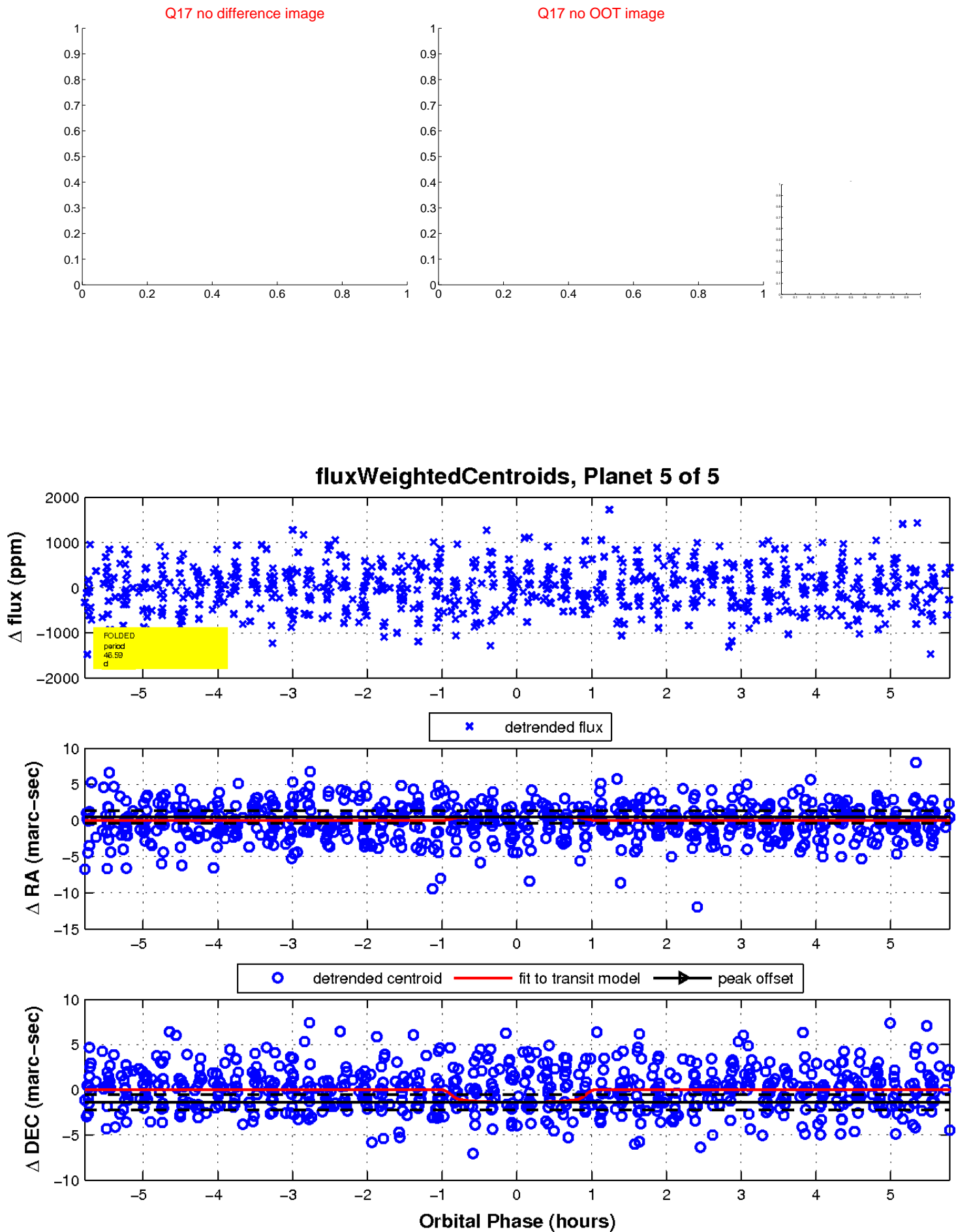




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

