Microvariability of type 2 QSOs

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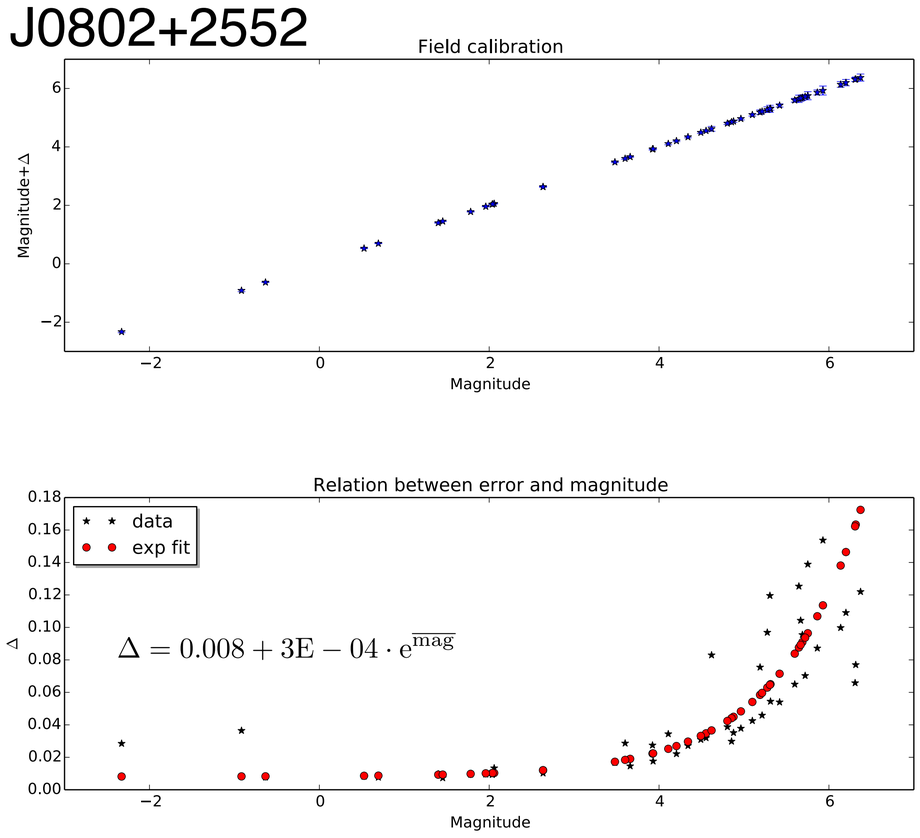
Motivation

Variability is considered to be one of the intrinsic behaviors of AGNs. However variability studies are often limited to optically unobscured type 1 targets and blazars. Obscured type 2 QSOs are believed to be non-variable in general. Nevertheless the same physical processes are believed to be present in both types of objects.

Microvariability, i.e. variability on hour time-scale on orders of hundredths of magnitude have been previously studied in blazars (i.e. de Diego 1998, Ramírez et al. 2004, Carini et al. 2007, …). Our study aims at detecting this phenomena in type 2 QSOs. As the variability phenomenon is expected to be very weak, special attention has to be paid to the precision of the photometry. We have relied on an approach developed by de Diego (2014).

J0802+2552



Observations & method

We have observed 4 targets during two nights.

- Relatively bright (g < 17 mag)
- Comparable in redshift (z<0.1)
- S/N > 100 @ 60s exposures

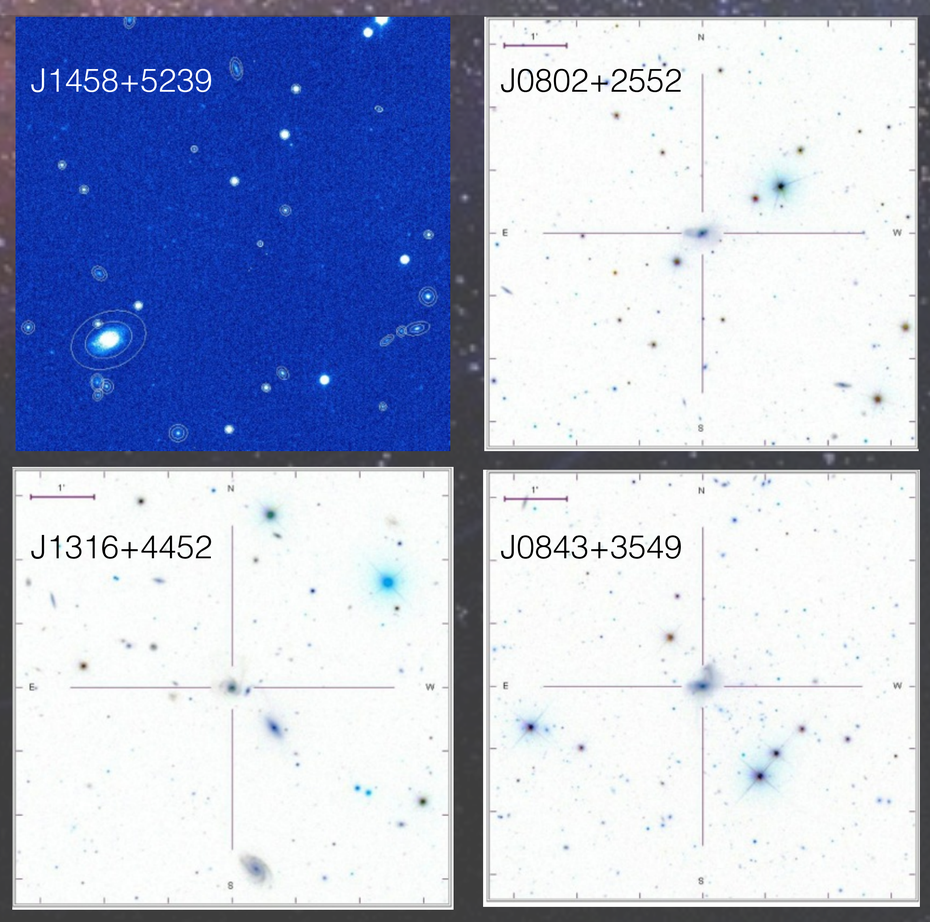
The whole field is photometricaly calibrated to estimate minimum error one can achieve using this set of data. All fields have photometric errors below 0.01 mag allowing us reliable detections of variations of order ~ 0.01 mag.
Variation are detected based on statistical F test.

Results

Target	J0802	J0843	J1258	J1316
F limit	1.7	1.66	1.6	1.58
F ratio	2.93	5.2	1.52	0.44
check	1.22	0.84	1.11	0.20
Var?	Y	Y	N	N

F limit gives the cutoff for detection of variability for the given degrees of freedom. Check* gives F ratio for check star.

The host galaxy is present. However as our targets have mostly disturbed morphologies, we preferred containing presumably constant host in the eliptical aperture as shown in the upper left panel.



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