OPTICAL MICROVARIABILITY IN RADIO QUIET QUASARS

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Abstract. We have observed 11 radio quiet QSOs (RQQSOs) to see if they exhibit intra-night variability in the optical. The detection of such microvariability would support models in which fluctuations on accretion disks are dominant, while if it is never present, models based on relativistic jets would be favored. Although several of these RQQSOs show hints of microvariability, we cannot claim to have discovered this phenomenon in this class of objects. Several of the comparison stars have clearly shown rapid variability.

1. Observations and Results

By using CCDs as N-star photometers we have begun a search for small (1–2%) intra-night variations in QSO flux in RQQSOs. This microvariability is common in blazars (e.g., Carini et al. 1992), and most models attribute it to shocks propagating down relativistic jets. Another class of models explains these fluctuations in terms of flares on accretion disks. Since RQQSOs should lack relativistic jets, the detection of microvariability in one of these objects would support the latter hypothesis, while its consistent absence would support the former.

We have recently reported the first observations on 7 RQQSOs (Gopal-Krishna et al. 1993a,b). Here we summarize additional observations, made on the 2.3m Vainu Bappu Telescope in Kavalur, India, on 2 of those objects and on 4 additional objects. Observations were made in the V and R bands, with exposures ranging from 7 to 15 minutes. The following 7 RQQSOs showed no evidence of intra-night variations: 0530-379, 0540-389, 0838+35, 0946+301, 1248+401, 1338+416, and 1630+377. These four objects showed hints of optical microvaribility, but in none was this phenomenon clearly detected: 1206+459, 1254+047, 1352+011, and 1522+102. At least 6 of the comparison stars were found to be rapidly variable (by 4–5% over an hour or two), confusing the situation.

2. References

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