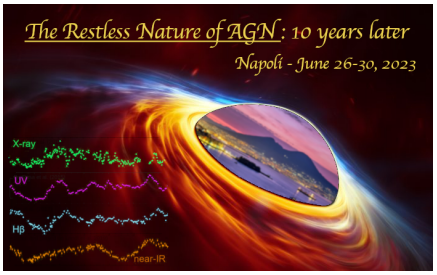

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Simultaneous observations of radio and X-ray variability in radio-quiet Seyfert galaxies

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Radio variability in some radio-quiet (RQ) active galactic nuclei suggests emission from regions close to the central engine, possibly the outer accretion disc corona. If the origins of the radio and the X-ray emission are physically related, their emission may be temporarily correlated, possibly with some time delays. We present the results of quasi-simultaneous radio and X-ray monitoring of three RQ Seyfert galaxies, Mrk 110, Mrk 766, and NGC 4593, carried out with the Very Large Array at 8.5 GHz over a period of about 300 days, and with the Rossi X-ray Timing Explorer at 2-10 keV over a period of about 2000 days. The radio core variability is likely detected in the highest resolution (A configuration) observations of Mrk 110 and NGC 4593, with a fractional variability amplitude of 6.3% and 9.5%, respectively. A cross-correlation analysis suggests an apparently strong (Pearson $r = -0.89$) and highly significant correlation ($p = 1 \times 10^{-6}$) in Mrk 110, with the radio lagging the X-ray by 56 days. However, a further analysis of the r values distribution for physically unrelated long time delays, reveals that this correlation is not significant. This occurs since the Pearson correlation assumes white noise, while both the X-ray and the radio light curves follow red noise, which dramatically increases the chance, by a factor of $\sim 10^3$, to get extremely high r values in uncorrelated data sets. A significantly longer radio monitoring with a higher sampling rate, preferably with a high-resolution fixed radio array, is required in order to reliably detect a delay.

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