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Long-term meter wavelength variability of AGN J1415+1320

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AGNs are characterized by the variability in flux density at a large range of wavelengths. For instance, the radio variability is more pronounced in radio-loud AGNs, in particular Blazars show the largest as well as rapid variations. The flux density variation provides valuable information on the accretion and jet outflow physics. The variability, seen on timescales from days to years, is attributed to either intrinsic (with release of new relativistic components or creation of shocks in the downstream of the jet e.g., [1, 2]), Doppler boosting of a radio jet oriented at small angles to the line of sight [3], or due to propagation-induced effects such as interstellar scintillation and gravitational lensing of relativistically moving jet features in the AGN [4].

Long-term monitoring at high frequencies (> 15 GHz) of the BL Lac object, J1415+1320, have revealed the symmetric achromatic variability (SAV) in the radio intensity light curve [5]. This SAV, featured as a time-symmetric year-long 'U' shaped dip in the light curve, is attributed to gravitational lensing of relativistically moving jet components by $10^3 - 10^6$ $M_\odot$ subhalo condensates or black holes located in intervening galaxies. We compare the high frequency observations with the long-term observations of the flux density of this source at 327 MHz obtained from the interplanetary scintillation studies at the Ooty Radio Telescope.

References

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