Evidence for non-relativistic kpc-jet advance speeds form 4x10^3 MITVLA snapshots

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A small fraction of AGN emit powerful radio waves from component structures (cores, jets, lobes) with sizes ranging from parsecs to Megaparsecs. Our best guess as to the ultimate power source of these radio-loud AGN (RLAGN) is the gravitational accretion of galactic stars, dust and gas onto central massive black holes imprisoning 10^6 to 10^10 solar masses. VLA snapshot data on 10^4 extragalactic radio sources have been accumulated as a result of a successful 17-year MIT search for radio-loud gravitational lenses; from about 4x10^3 of these sub-arcsecond resolution images, the detailed jet angular size histogram has been extracted. Based on the simple idea that the jet lifetimes are comparable to the Eddington timescale for accretion growth of their parent massive black holes, and making various other identifiable assumptions, it is shown that the jet head advance speeds are mostly non-relativistic ($v < \sim 0.1c$; with $> \sim 90\%$ confidence) within this statistically large RLAGN imaging sample. A key lesson to be learnt from this study is that it should be possible, in principle, to constrain the cosmological evolution of RLAGN and of their central massive black holes, by comparing global Monte-Carlo models of the cosmologically evolving RLAGN population, with the large (and expanding) list of publicly available radio catalogs and imaging databases.