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New insights into extragalactic jets: A combination of simulations and observations GIOVANNI LAPENTA, P. KRONBERG, LANL — Jets in active galactic nuclei (AGN) are very interdisciplinary laboratories, and still as enigmatic as they are remarkable plasma systems. Recent analyses of observations, and simulations by us are providing some important constraints on their physical parameters, and on computational models. This is leading to a better understanding of the physical constraints, and of the systems in which they are immersed. Expertise in plasma physics is required to understand their inner workings and to design a model of the physics behind them. In an attempt to bridge the gap between the fundamental plasma physics processes and these astrophysical "laboratories," we have pooled astrophysics and plasma physics expertise in an attempt to gain insight into two well-imaged kiloparsec-scale astrophysical jets in the radio galaxies 3C303 and 3C274. Our approach is intended to provide the two communities with a common language and common understanding of the range of numbers and physical properties typically involved [1]. We present the results of our investigation, listing specific numbers (or ranges) for all the quantities of interest to plasma physics. The new insights are used to constrain specific plasma physics models of jets. [1] G. Lapenta, P. Kronberg, Astrophys. J., 625, 37, 2005.

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