EUROPEAN VLBI NETWORK
14th EVN Symposium & Users Meeting
Granada, October 8-11 2018

Gamma-ray emission in radio galaxies under the VLBI scope

R. Angioni, E. Ros, M. Kadler, R. Ojha for the TANAMI and Fermi-LAT collaborations

We report on the first systematic VLBI and gamma-ray monitoring study of a representative sample of radio galaxies with strong compact radio emission, with the aim of exploring the intrinsic relationship between high-energy emission and pc-scale jet properties in active galactic nuclei (AGN). While a number of studies have firmly established a close relationship between the gamma-ray and radio properties of AGN in general, the samples considered are dominated by blazars, i.e. AGN featuring well-aligned, Doppler-boosting-dominated jets. This poses a challenge in disentangling the orientation-dependent effects from the intrinsic emission produced in AGN jets. Radio galaxies, on the other hand, have misaligned jets whose emission is much less affected by Doppler boosting. We find that the high-energy emission in the compact jets of radio galaxies is not strongly driven by orientation-dependent Doppler boosting effects, much unlike the situation in their blazar counterparts. However, a significant correlation between gamma-ray flux and radio flux still holds, suggesting a direct physical link between the intrinsic emission properties of AGN jets in the two wavebands. We base our study on the decade(s)-long VLBI monitoring provided by the TANAMI and MOJAVE programs, in combination with gamma-ray data from Fermi-LAT, and also report on the interplay between pc-scale jet kinematics and gamma-ray emission in key individual sources such as the classic FR II radio galaxy Pictor A and the peculiar AGN PKS 0521-36.