

## Lepto-hadronic jet-disc model for the multi-wavelength SED of M87

The low-luminosity Active Galactic Nuclei M87, archetype of Fanaroff-Riley I radio-galaxies, was observed in a historically quiet state in 2017. While one-zone leptonic jet models cannot explain the radio-to-gamma-ray spectrum, we explore a hybrid jet-disc scenario. In this work, we model the overall spectral energy distribution of M87's core with a dominating one-zone lepto-hadronic jet numerical emission model, coupled with the contribution from an advection-dominated accretion flow. We find sets of parameter values for which the jet component fits the radio-to-optical data as well as the gamma-ray band. These imply that a mildly relativistic  $\delta_{\text{jet}} = 2.3$  compact emission region of  $\sim 5 r_g$  is suitable to model the contribution of the jet. Given the jet component that we found, we are able to model the remaining X-ray observations with the accretion flow described by a set of parameters that we explored thoroughly. The crucial observational difference between purely leptonic models and lepto-hadronic ones such as ours is the production of neutrinos associated with photo-meson interaction. Thus we also calculate the predicted neutrino flux produced by such scenarios, although it remains below the current instruments' sensitivity.

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