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Gamma ray emission from extended jets of low luminosity AGNs

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Despite occupying $\sim 40\%$ of the local Universe, Low Luminosity Active Galactic Nuclei (LLAGNs) are less explored due to their faintness. Detection of a few in gamma rays by Fermi-LAT allows us to constrain the physical parameters of the jet by modeling their spectral energy distributions from radio to gamma-ray energies. While a one-zone model explains the broadband emission up to a few GeV, another component is required to explain the excess. An extended jet for both NGC 315 and NGC 4261 has been seen in radio and X-ray. While the spectral index of X-ray emission implies a synchrotron origin, we find that the excess at GeV energies can be successfully explained by the inverse Compton scattering of the starlight from host galaxy by the same electron population, in both cases. This observation suggests that electrons can be accelerated to ultra-relativistic energies at extended scales.

Presentation Type

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