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Insights into high-energy emission from kpc-scale jets launched from black holes

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The origin of X-ray emission from >kpc-scale jets and very high energy (>GeV) emission in radio-loud AGN are highly underconstrained. This work brings together the relevant open questions and ways to answer them by considering two particular cases: a unusual TeV LSP BL Lac AP Librae and an FR-I radio galaxy 3C 78, both having a >kpc-jet and a very broad spectral energy distribution (SED). For the former, we find that the very-high energy emission needs to be explained by a combination of inverse Compton scattering of CMB and ALMA-detected dust photons. For the latter, we develop a *new* physically motivated two-zone model to partially explain its broad SED. For each of these cases, we compute the corresponding jet power and provide prescriptions to link real observations of jet Lorentz factor with spectral modelling. Our work throws new light on inspecting spectral energy distributions of radio-loud AGN to investigate the origin of high-energy emission.

Primary author: Mr ROYCHOWDHURY, Agniva (University of Maryland, Baltimore County)

Co-authors: Prof. MEYER, Eileen (University of Maryland, Baltimore County); Prof. GEORGANOPOULOS, Markos (University of Maryland, Baltimore County)

Presenter: Mr ROYCHOWDHURY, Agniva (University of Maryland, Baltimore County)