

Abstract Submitted
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The effect of expansion on high-energy emission from AGN jets

MARTIN POHL, Iowa State University — We study the radiation yield of relativistic particles in AGN jet that undergo expansion. For that purpose we use a specific model of particle acceleration (Pohl & Schlickeiser 2000) that is based on aborted relativistic shock acceleration and the direct conversion of bulk flow energy into particle energy. While jet expansion must be expected on account of the high pressure in the jet emission zones, the structure of radio galaxies suggests that the expansion is moderate. For various expansion profiles we solve the jet propagation equation and the continuity equations of energetic particles in parallel to derive observable signatures of expansion. A comparison with data suggests that expansion is very inefficient indeed, and we speculate on possible reasons why that is so. Though our study is based on a particular jet model, its results can – within limits – be extrapolated to other scenarios, provided they are based on jets being matter-dominated.

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