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Blazar emission from gradual magnetic dissipation: the jet as a multitude of communicating segments

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AGN jets are sprawling entities, with structures of differing size and magnetic field strength extending from very close to supermassive black holes up to over a hundred parsecs away. However, it has long been expedient to calculate their emission in one-zone models, which are effectively spheres. This is optimal for variability studies but also sidesteps the issue of irresolvable structure in what are, in the case of blazars, head-on jets. Here we treat blazar jets as a conical series of spherical segments, where energy is constantly being dissipated from magnetic reconnection in the current sheets that form from the alternating polarity of the jet's toroidal field. Within each segment we apply the LeHaMoC code to self-consistently calculate the photon emission from electrons that may be accelerated there, and we iteratively apply the effect of radiation spilling into the rest of the segments across the jet; that is, we treat radiation crossing through each segment from each other segment as an additional injection term in LeHaMoC's kinetic equations. In this way, we investigate the impact of such interactions between segments.

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