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Modelling flux variability from internal shocks in relativistic jets

Particle acceleration at stationary and moving internal shocks is one of the principal mechanisms to explain the variable synchrotron emission, seen from the radio to the X-ray band, from relativistic jets in radio-loud active galactic nuclei. To reproduce the light curves associated with these shocks, we perform SRMHD simulations of magnetised relativistic
transverse-structured jets using the AMRVAC code.
Perturbations are injected at the base of a jet that carries stationary shocks, to study the interaction between the moving and the stationary shocks. Synchrotron emission and radiative transfer are simulated in post-treatment. The model is applied to the radio core and inner jet of the radio-galaxy M87 to study the multi-wavelength flux evolution from such perturbations and compare it against archival data.

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