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# Simulating AGN light curves of blob injection in RMHD jet simulations

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Active Galactic Nuclei (AGN) are compact regions in the centre of galaxies exhibiting higher than normal luminosity. Radio loud AGN produce relativistic jets which exhibit variability over various time-scales. This has been attributed to the formation of blob/shock structures propagating along the jet. Using relativistic magnetohydrodynamic (RMHD) simulations we investigate how blob injection can result in variable light curves. Three-dimensional RMHD jets were simulated using PLUTO, an astrophysical fluid simulation software, and allowed to develop in time forming multiple re-collimation shocks. A quasi-spherical blob was then injected and allowed to propagate along the jet, interacting with the shocks. A post-processing code was used to find the integrated specific intensity of the synchrotron emission in the radio regime, accounting for relativistic effects such as Doppler boosting and light-crossing time correction. Light curves for various viewing angles were calculated to investigate how the emission generated from a single blob differed from a radio galaxy to a blazar-like AGN.

## Abstract field

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