

Particle acceleration via magnetic reconnection in large scale jet simulations

The energy content and dissipation mechanisms leading to the observed spectra and variability properties in AGN jets are still debated. Magnetic reconnection (MR) is the most promising dissipation mechanism to account for acceleration of particles with a non-thermal energy distribution in magnetized jets. Kinetic simulations have shown how the resulting particle distribution depends on the surrounding plasma conditions. In this talk, a first step towards the implementation of MR in relativistic magnetohydrodynamic simulations on more realistic physical scales will be presented. The developed algorithm is able to identify reconnection sites and determine the local plasma parameters. I will concentrate on the results of a set of 2D and 3D simulations and discuss the implications on the predicted particle spectra for leptons and ions, which are continuously updated during the evolution. Finally I will present the planned developments of this work to study, for the first time, the spectral and variability properties of the radiative emission of AGN jets in large scale simulations.

Primary author: NURISSO, Matteo (SISSA)

Presenter: NURISSO, Matteo (SISSA)

Session Classification: Contributed posters