

Stellar wind interaction around young star clusters: 3D MHD simulations

Tuesday 29 October 2024 09:40 (30 minutes)

The environments of young star clusters are shaped by the interaction of the powerful winds of massive stars and their feedback on the cluster birth cloud. Several such regions show diffuse TeV gamma-ray emission on the degree scale, which hints at ongoing particle acceleration. To date, particle acceleration and transport in star cluster environments are not well understood. A characterisation of magnetic fields and flow structures is essential to progress toward physical models. Due to the large extent of these regions on the sky and their low densities, magnetic field and flow are difficult to constrain from observations. Previous work employing simulations has mostly focused on stellar wind feedback on the surrounding medium, often modelling the energy injection from the star cluster as point-like. I will discuss our recent work on modelling the interaction of individual stellar winds in a young cluster with 3D ideal MHD, which underlines the complex, dynamic nature of young star cluster environments.

Presenter: HÄRER, Lucia

Session Classification: Particle acceleration and propagation