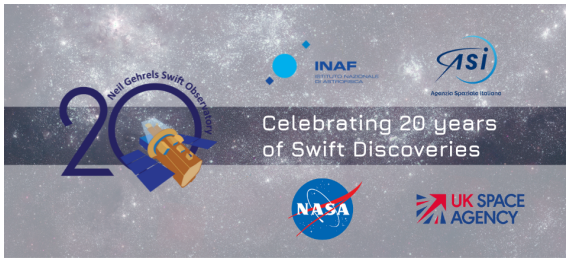

Contribution ID: **113** Type: **Poster**

3D Simulations of sGRB Jets: Ballistic Regime and Afterglow Emission

Tuesday 25 March 2025 14:29 (1 minute)

I will present 3D relativistic magnetohydrodynamic simulations of incipient Gamma-Ray Burst (GRB) jets piercing through realistic binary neutron star merger environments.
Applying the methods we developed to extend the 3D jet evolution up to tens of seconds without loss of resolution, we are able to reach a nearly ballistic expansion regime, with most of the jet energy converted into kinetic form and an angular structure that is no longer evolving. The final outcome of the evolution provides reliable input for afterglow emission modeling, allowing us to compare the corresponding light curves with the rich dataset of GRB 170817A.
By varying jet injection parameters such as luminosity, engine duration, magnetization, and jet launching time with respect to merger, we explore a range of models and study how the different parameters affect the jet breakout, larger scale propagation, and afterglow emission.

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Session Classification: Poster Session