

Parsec-scale simulations of jet-star interaction : dynamical and radiative effects

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X-ray observations by Chandra reveal the presence of bright spherical regions within the kilo parsec-scale jet of Centaurus A. While several models have attempted to explain such high-energy emissions at this distance, a promising scenario involves interactions between the jet and AGB stars.

I will present my recent work on jet-star interactions using 2D/3D RHD and RMHD simulations. Our numerical set up focuses on the interaction between the relativistic jet in Centaurus A and an AGB star stellar wind. From the results of these simulations, we estimate the radiative output with a radiative transfert code and compare our results with Chandra observations. In the second part of my talk I will present our first simulations of a supernova explosion taking place inside a relativistic jet and discuss its dynamical and radiative implications.

Recent works suggest that triggered supernovae can occur inside a jet.

Even though this event would be rare, it could be the inset of a very important radiative output, in term of neutrino production and gamma-rays emission.

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