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Effects on jellyfish galaxies from crossing discontinuous environments

Ram pressure is directly related to the local density a galaxy interacts with, actively stripping its gas and forming the distinctive trails seen in jellyfish galaxies. Sloshing spirals are a common phenomenon observed in clusters that present significant density and temperature discontinuities that may impact the evolution of jellyfish galaxies crossing them. We aim to quantify how crossing discontinuities similar to those seen in sloshing spirals can alter galaxy properties, focusing on gas content, star formation rate and color index. We used {\sc Arepo}, a code designed for solving astrophysical hydrodynamical problems, for conducting a sequence of simulations. We set up a wind tunnel in a box with periodic boundaries, tailoring tunnel properties in order to simulate discontinuities. We began by defining two base environments with high and low gas density. From these, maintaining the center similar to the base high/low density environments, we used an analytical function in order to recreate discontinuities along the extent of the tunnel, producing different scenarios. Finally, an idealized galaxy was then relaxed and inserted at center of each environment and gas in the tunnel was set to typical velocities found in cluster-galaxy interactions, effectively introducing wind into the simulation and emulating the galaxy infalling. Preliminary results and simulations show that galaxies experience gas stripping proportional to the density in their environments, also showing an initial increase in star formation rate proportional to the size of the discontinuity. Color information is inconclusive, although there is a small decrease in color index in simulations with greater density and bigger discontinuities right after crossing the gradients in temperature and density. Future analysis and simulations with better resolution aiming at reducing current observed transients are expected to provide deeper insights into the effects of these discontinuities on galaxy evolution.

Author: MELLO, Elvis (UTFPR - Universidade Tecnológica Federal do Paraná)

Co-author: EDUARDO GARCIA MACHADO, Rubens (Universidade Tecnológica Federal do Paraná)

Presenter: MELLO, Elvis (UTFPR - Universidade Tecnológica Federal do Paraná)

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