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Effects of ram pressure stripping on jellyfish galaxies

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Numerical simulations are an excellent tool to study astrophysical phenomena, considering the huge scales of time and space in which they occur. Ram pressure is an effect that galaxies crossing the intracluster medium (ICM) experience, causing the removal of the galaxy's gas, i.e. ram pressure stripping (RPS), and in more intense cases, a gas tail forms
behind it, characterizing the so-called "jellyfish galaxy", in which most or all of the gas is removed. Exploring such effects can help us understand certain galaxy evolution processes. Using the GADGET-2 and GADGET-3 codes, we ran hydrodynamical N-body simulations of a galaxy moving face-on or edge-on towards the center of a galaxy cluster, including star formation in some cases, with the aim of analyzing the effects of ram pressure in this scenario. Regarding these simulations, we characterize properties of the tail of the jellyfish galaxy, such as length and mass, investigate correlations between different variables related to the phenomenon, represent the position of the particles in a phase space, and verify characteristics of the star formation in the gas tail. We found similar gas masses in the tails of galaxies moving face-on to those moving edge-on, and this value is lower in galaxies with star formation. We identified strong correlations between the ram pressure and the gas density, for both face-on and edge-on cases, which is significant from an observational point of view, since the density can be obtained more easily than the gas velocity of the ICM gas, necessary to measure the ram pressure.

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