

Radio emission in galaxy clusters

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Galaxy clusters exhibit spectacular elongated radio emission in their outskirts called radio relics. Recent high-resolution radio observations of radio relics reveal us new substructure and features. While this is a clear signature of cluster magnetic fields, the underlying plasma properties in these cluster regions remain unclear. In this work, we present results from three-dimensional magneto-hydrodynamical simulations of shocks propagating through a turbulent intracluster medium. We model the synchrotron emission coming from cosmic-ray electrons by assuming the diffusive shock acceleration mechanism. We study the role of turbulence in shaping the substructure of radio relics. We will discuss the impact on the observational counterpart and its relevance for studying magnetic fields in galaxy clusters outskirts.

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