

Solving the curious case of ‘gigantic cloud’ of relativistic plasma in A1367

Abstract

It is an open question whether mildly relativistic electrons exist in the intracluster medium (ICM) and if they are essential to explain the phenomenon of radio relics. Abell 1367 shows an extended diffuse emission feature, which has, so far, been classified as a candidate radio relic. We have analysed an existing MeerKAT L-band observations, that confirms the extended emission and allows, for the first time, to constrain its morphological and spectral properties. We find that the so-called relic is coincident with very long tails of pressure stripped interstellar medium of a few infalling galaxies. We do not find the usual characteristics supporting the radio relic classification, and speculate that the emission is more likely related to the plasma deposited by the long tails. However, the large extent of the emission is perplexing. We therefore propose UHF- and S-band observations to perform a spatially resolved spectral age study to determine whether the diffuse emission is indeed related to the long tails, or if clear characteristics of a radio relic can be identified. If the diffuse emission is confirmed to be related to the tails, this would be the first evidence of infalling galaxies as substantial source of seed electrons that populates the ICM. We will also use the broadband data for polarisation studies to construct a detailed map of the Faraday depth of the ICM when observed against a plethora of diffuse emission structures in A1367, i.e. the long tails of AGN 3C264 and the infalling galaxies.