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A BCG with offset cooling: is the AGN feeding cycle broken in A2495?

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We present a combined radio/X-ray analysis of the poorly studied galaxy cluster Abell 2495 (z=0.07923) based on new EVLA and Chandra data. We also analyze and discuss Hα emission and optical continuum data retrieved from the literature. We find an offset of ~ 6 kpc between the cluster BCG (MCG+02-58-021) and the peak of the X-ray emission, suggesting that the cooling process is not taking place on the central galaxy nucleus. We propose that sloshing of the ICM could be responsible for this separation. Furthermore, we detect a second, ~ 4 kpc offset between the peak of the Hα emission and that of the X-ray emission. Optical images highlight the presence of a dust filament extending up to ~ 6 kpc in the cluster BCG, and allow us to estimate a dust mass within the central 7 kpc of 1.7 ·10^5 M⊠. Exploiting the dust to gas ratio and the L_Hα-M_mol relation, we argue that a significant amount (up to 10^9 M⊠) of molecular gas should be present in the BCG of this cluster. We also investigate the presence of ICM depressions, finding two putative systems of cavities; the inner pair is characterized by t_age ~ 18 Myr and P_cav ~ 1.2 ·10^43 erg s−1, the outer one by t_age ~ 53 Myr and Pcav ~ 5.6 ·10^42 erg s−1. Their age difference appears to be consistent with the free-fall time of the central cooling gas and with the offset timescale estimated with the Hα kinematic data, suggesting that sloshing is likely playing a key role in this environment. Furthermore, the cavities' power analysis shows that the AGN energy injection is able to sustain the feedback cycle, despite cooling being offset from the BCG nucleus.

Topic

Hot and diffuse baryons

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