

Title

Searching for a radio minihalo in the vigorously sloshing, but low-mass, galaxy cluster A496

Abstract

Faint, diffuse radio minihalos are found in cool cores of many massive galaxy clusters. Their radio emission likely arises from reacceleration of old relativistic particles by plasma turbulence in "sloshing" cores. The cluster A496 hosts one of the most spectacular sloshing cool cores seen in the X-ray, and yet it shows no minihalo. The central cluster galaxy shows evidence for repeated episodes of past AGN activity in the form of two pairs of steep-spectrum radio lobes --- an abundant source of seeds for reacceleration. An X-ray cavity is seen at one of the lobes with a distinct mushroom-head shape, suggesting that it is buoyantly rising in the cluster atmosphere. We request a deep MeerKAT L-band 9-hour observation to search for a possible faint minihalo in this cluster. We aim to verify the core sloshing / minihalo connection and probe it for clusters of lower masses. We will also image the central extended radio galaxy with unprecedented sensitivity and detail. By resolving the morphology of the lobe that fills the mushroom-head cavity, we will constrain the ICM magnetic fields and viscosity.