

The Interaction of NGC 4532/DDO 137 with the Virgo cluster

Abstract

As part of the pilot survey of the Widefield ASKAP L-band Legacy All-sky Survey (WALLABY), a 57 kpc-long bridge of gas has recently been discovered between the dwarf galaxies NGC 4532 and DDO 137. This is in addition to the extensive HI halo and the 0.5 Mpc tail previously discovered by the Arecibo telescope and implies that both tidal and ram pressure forces may play a role in the formation of this system. However, our study suggests that the origin of the ram pressure forces is probably the Virgo cluster, which is astonishing given the fact that the galaxies are well outside the virial radius of the cluster. We therefore propose to observe the NGC 4532/DDO 137 system with MeerKAT at much better resolution and column density sensitivity than possible with WALLABY to look for detailed signatures of ram-pressure stripping. We plan to feather the MeerKAT data with recently-obtained FAST data. Confirmation of the ram pressure model would have important consequences for our understanding of the density of the IGM around dynamically young galaxy clusters such as Virgo, and for the pre-processing of galaxies well before infall.