

Studying the Origin of HI Clouds around M31

Abstract

In 2004, Braun & Thilker discovered a low column density HI filament apparently connecting M31 and M33. Higher resolution observations by Wolfe et al. revealed that this filament was actually composed of higher column density clumps. The origin of these features remains unclear, however, with the possibility of it representing tidal debris, condensing gas from the hot circumgalactic medium, or even HI in dark matter mini-halos. We are proposing to use MeerKAT to resolve the internal structure of the brightest HI cloud found by Wolfe et al.. These proposed higher spatial and spectral resolution data will allow us to search for signatures of a two-phase gaseous medium, ram pressure stripping, possible bulk rotation, and measure the nature of turbulence in this cloud. The results of these observations will allow us to discriminate between the possible origins of these clouds.