

Disk Superwinds Driven by Cosmic-Rays in NGC 1532

Abstract

Unique radio continuum loops extend ~ 8 kpc above and below the disk of the otherwise normal galaxy NGC 1532, connecting bright star-forming regions at the ends of the galactic bar with the nucleus. Unlike typical outflows, there are no detectable stars, dust, or gas associated with the radio emission. This suggests that these are purely cosmic-ray plumes inflating magnetic loops from the disk of the galaxy. We propose for 20 hours (including overheads) of L-band 32K wide mode observations to measure the polarization structure of the radio loops and increase the H I velocity resolution. Sensitive MeerKAT observations are needed (1) to rule out the presence of H I in the plumes by modeling the 3D H I kinematics and (2) to confirm the outflows are in fact magnetic field loops by tracing the polarization structure.