Bulletin of the AAS • Vol. 55, Issue 2 (AAS241 Abstracts)

Where do the Disks of Nearby, Massive Spiral Galaxies End?

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Published on: Jan 31, 2023

URL: https://baas.aas.org/pub/2023n2i279p08

The structure and properties of the circumgalactic medium (CGM) between R ~30–100 kpc around nearby, massive spiral galaxies remain largely unknown. One hypothesis is that large quantities of gas are held in rotationally-supported disks of neutral hydrogen (HI) that extend out to ~100 kpc. While observations of individual galaxies have detected HI out to distances of 80 kpc, a larger sample is necessary to determine the frequency and characteristics of extended HI disks. Using the Green Bank Telescope (GBT) we conducted a comprehensive survey mapping HI along the major and minor axes of 20 mass-selected galaxies to distances of 100 kpc and a limiting column density of 2×10^{18} cm^{-2}. We have determined the total extended HI mass and its distribution within each galaxy by fitting our data to HI distribution models. We have found rotationally-supported disks in ~50% of the sample that extend to distances between 40 and 100 kpc.