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FAST Observations toward M31 and Nearby Dwarf Galaxies

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Neutral hydrogen (HI) serves as an effective tracer of galactic internal dynamics, gas accretion, and feedback activity. Deep integrations of the nearby spiral galaxy M31 with the FAST telescope, when combined with interferometric data, reveal clear correlations between stellar feedback and both the kinematics and spatial distribution of atomic gas and the surrounding interstellar medium. For low-mass galaxies exhibiting either active galactic nuclei activity or vigorous star formation, high-sensitivity single-dish observations, supplemented by interferometric mapping, allow quantitative tests of the efficiency and physical mechanisms governing gas depletion and replenishment.

This presentation will highlight case studies of HI mapping in M31 and nearby dwarf galaxies, based on deep FAST integrations combined with interferometric data from the VLA and GMRT. In addition, I will emphasize the critical role of multi-wavelength diagnostics and continuum measurements in complementing HI spectral-line observations and interpreting the baryon cycle in these systems.

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