

# Low mass galaxies in the Apertif HI surveys

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Low mass galaxies present great challenges for the current leading cosmological model  $\Lambda$ CDM. Hydrodynamical simulations based on  $\Lambda$ CDM have been unsuccessful in reproducing a number of galaxy properties at these scales, such as the diversity in the shapes of rotation curves as well as the scatter seen in scaling relations such as the baryonic Tully-Fisher (BTFR) and stellar mass-size relation. Additionally, ultra-diffuse galaxies have been shown to deviate from the BTFR, which is considered a very tight scaling relation for rotating galaxies. In general, there is currently a poor understanding of how the baryonic content of galaxies connects to the dark matter content at low mass scales. In this work, we aim to contribute to this understanding by studying resolved neutral hydrogen (HI) content which allows us to conduct kinematic modelling of galaxy rotation using  $^3D$ Barolo. We select our sample using the first few months of observations from the Apertif HI surveys. By basing our selection on a blind HI survey, we are able to find galaxies independent of their stellar content, meaning we are able to easily find optically faint galaxies. To study the complete baryonic content, we complement our HI data with Pan-STARRS 1 photometric survey allowing us to explore the placement of our HI-selected low mass galaxies with regards to samples from the literature in both BTFR and stellar mass-size relation.

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