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Title: The Survey of HI in Extremely Low-mass Dwarfs: A Multi-Wavelength Perspective on Low-Mass Galaxy Evolution

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Abstract

The “Survey of HI in Extremely Low-mass Dwarfs” (SHIELD) is a multiwavelength study of local volume low-mass galaxies drawn from the Arecibo Legacy Fast ALFA (ALFALFA) catalog. HST/Spitzer joint program GO-12658 revealed the stellar populations of the first 12 SHIELD galaxies (Cannon et al. 2011), allowing accurate distance measurements (McQuinn et al. 2014) and detailed studies of the patterns of recent star formation in each galaxy (McQuinn et al. 2015). These HST and Spitzer images are a critical interpretive benchmark for ground-based optical imaging and spectroscopy (Haurberg et al. 2015), as well as for sensitive VLA HI spectral line imaging of the SHIELD galaxies (McNichols et al. 2016; Teich et al. 2016). These results have furthered our understanding of the evolution of galaxies in a mass regime that was previously only sparsely populated. With the low-redshift ALFALFA catalog now complete, the scope of the SHIELD program has been expanded to include all 82 galaxies that meet distance, line width, and HI flux criteria for being gas-rich, low-mass galaxies. In HST program 13750, images of 18 more SHIELD galaxies have again set the physical scales for supporting HI spectral line imaging with both the VLA and the WSRT (Gordon et al. 2016). Taken as a whole, the ongoing SHIELD program is one of the most comprehensive multiwavelength studies of the physical properties of low-mass galaxies outside of the Local Group.

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