

Synergies between SKA and LSST surveys

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Next-generation radio surveys from the Square Kilometre Array (SKA) mid-frequency telescope and its precursors will observe the universe with high spectral precision. The 21-cm neutral hydrogen (HI) emission line detected from these surveys is ideal for obtaining more accurate constraints on cosmological parameters. However, the HI line is intrinsically faint and difficult to detect at high redshift. The Vera C. Rubin Observatory's Legacy Survey of Space and Time (LSST), forecast to observe the optical sky at large cosmic volumes with high spatial resolution, is a perfect candidate for complementing HI intensity mapping surveys. For this work, we present a new Bayesian framework for extracting redshift information by exploring the synergies between these major surveys. We update the methodology proposed by Harrison, Lochner and Brown (2017) to incorporate photometric redshift and spatial information from optical surveys such as LSST. We aim to determine the utility of such a technique in constraining the redshifts for distant type Ia supernova host galaxies in the LSST deep drilling fields and possibly providing a complementary training set for photometric redshift calibration.

Track

Future Missions/Instruments

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