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The Hydrogen Intensity and Real-time Analysis eXperiment (HIRAX) - Commissioning

Monday, 27 January 2025 16:30 (20 minutes)

The Hydrogen Intensity and Real-time Analysis eXperiment (HIRAX) radio interferometer array aims to observe neutral hydrogen (HI) through intensity mapping (IM) in the redshift range of 0.775-2.55. It is currently being built at the South African Radio Astronomy Observatory (SARAO) Square Kilometer Array (SKA) site in South Africa. HI IM makes it possible to tomographically probe large, cosmological volumes, enabling constraints on, for example, the dark energy equation of state. In this talk, we will present an overview of the HIRAX instrument and its science goals. Systematics are a significant concern in deriving cosmological constraints from HI IM due to the presence of strong foreground signals, therefore we need to carefully control the systematics and calibration. We will discuss the design, instrument characterisation and analysis challenges that this presents, focusing on the commissioning of the test array as well as the main dish production.

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