Progress on HIRAX, the Hydrogen Intensity and Real-time Analysis eXperiment

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The Hydrogen Intensity and Real-time Analysis eXperiment (HIRAX) is a 21 cm neutral hydrogen intensity mapping experiment to be deployed in the Karoo Desert near the SKA site in South Africa. It will consist of 1024 parabolic dishes, each six meters in diameter, and will map approximately 15,000 square degrees of southern sky over the course of four years. HIRAX will improve constraints on the Dark Energy equation of state through a measurement of large scale structure at high redshift. It will target the 100 h^{-1}Mpc Baryon Acoustic Oscillation scale at redshifts $0.8 < z < 2.5$ (corresponding to the radio band of 400-800 MHz) in 1024 frequency bins, providing spectroscopic redshift precision ($\delta Z/Z \sim 0.003$). Daily maps will be made that cover a few thousand square degrees, allowing us new opportunities to discover and monitor radio transients and pulsars, including Fast Radio Bursts (FRBs). On the order of 20 FRBs have been found at this time, and it is projected that HIRAX could detect them at a rate of dozens per day. HIRAX's southern location will allow us to make a variety of cross-correlation measurements with other large-scale surveys such as ACTPol, DES, LSST, and others. Currently, an 8 element prototype array has been deployed, with plans to develop a 128 element pathfinder array in the near future. This talk will discuss the experiment design, science goals, and development and deployment status, with a focus on the progress made in the year since the last National Radio Science meeting.