Evolution of Neutral Hydrogen Properties of Galaxies Over One-Third the Age of the Universe With CHILES

Measurements of hydrogen are important in our understanding of the Universe. Following reionization at $z \sim 6$, most of the hydrogen outside galaxies is in an ionized state. Within galaxies, hydrogen passes through a neutral phase as it cools and collapses into stars. This work centers around how galactic reservoirs of neutral hydrogen (HI) evolve over cosmic time. We know that cosmic star formation peaks at $z \sim 2$ and sharply declines to the present, yet we know very little about gas reservoirs in individual galaxies that lead to star formation through these redshifts. The COSMOS HI Large Extragalactic Survey (CHILES) is a 1000-hour program, using the Karl G. Jansky Very Large Array, that images HI in a redshift range of $0 < z < 0.45$. We present new HI detections at high-redshift and combine these results with previously published CHILES samples. For the first time, this provides a continuous look at directly detected HI in emission, spanning five billion years back in time.