3D intensity mapping and 21 cm cosmology

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Résumé

Innovative and next generation radio instruments are opening new windows for observing the distant universe, promising significant advances in cosmology, structure formation and evolution. In recent years, intensity mapping has emerged as a promising technic for 3D mapping of matter distribution in the universe through the redshifted 21 cm radio emission of atomic hydrogen. This is a complementary approach to optical surveys for the study of the Large Scale Structures, in particular for measuring the BAO (Baryon Acoustic Oscillation) scale up to redshifts z $<$ ˜ 3 and constrain dark energy, without detection of individual galaxies. I will review the principle of this method, as well as the scientific and technical challenges that have to be adressed. I will briefly present some of the international initiatives in this field (CHIME, Tianlai), and the BAORadio project in France.

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