
Forecasts of radio emission from the cosmic web

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Résumé

I will present our latest results concerning the forecast of synchrotron radio emission from the cosmic web. Using a set of high-resolution cosmological simulations, we simulated the acceleration of cosmic rays at shocks and the related emission in radio, from primary and secondary accelerated electrons. The observable level of radio emission from such structures will tell us about the range of cosmic magnetic fields on large-scale (> 10 Mpc) of the Universe. We simulated the visibility of the cosmic web for the planned arrays of SKA1 (LOW, MID & SUR) as well as for the LOFAR HBA and LBA arrays, and we studied the possibility of detection as a function of the average magnetic field on such scales. Our study highlights the pivotal importance of having small enough baselines in order to sample the large angular scales, since most of the detectable emission comes from scales of a few degrees on the sky, for the cosmic web at a low ($z < 0.5$) redshift. Work done in collaboration with C. Ferrari (OCA), A. Bonafede & M. Brueggen (Hamburg Observatory) and C. Gheller (CSCS).

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