Simulating galaxy surveys with FIRST (PACS & SPIRE)

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The next generation of submillimetre/millimetre instruments will provide us with a closer insight into the mechanisms that rule galaxy formation. As the brightest starbursts are thought to be heavily obscured at optical wavelengths, the opening of this new window will complement the present observations, and enable a detailed investigation of the hierarchical merging of galaxies at remote epochs. In this context, we will present preliminary results of simulations currently developed for deep galaxy surveys with FIRST.
N-body simulations of galaxy mergers are being developed to produce realistic morphologies and star formation histories. A Schmidt law is used to account for the evolution of the stellar and gas content of each particle. These simulations will be gathered in a library, including the temporal information with a timestep of 10 Myr. We then build consistent spectra, essentially based on the dust modelling of Desert et al. (1990), accounting for this star formation history at each resolution element of the simulations. These morphologies are included in the framework of the GALICS hybrid model of hierarchical galaxy formation, which reproduces the main observational constraints. We will present synthetic maps with the characteristics of the FIRST PACS/SPIRE instruments and discuss the optimal strategy for deep surveys complemented with the ground-based ALMA project.