A Comprehensive Redshift Survey of the Brightest Herschel Galaxies

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Abstract: The Herschel surveys have enabled the detection of numerous dusty luminous sub-millimeter galaxies in the early universe. Follow-up observations of these sources are essential to determine their nature and the physical properties of their interstellar medium; reliable measurements of their redshifts are therefore crucial to explore the molecular and atomic gas of these objects. We will here present the results of a Large Program, using NOEMA, aimed at a comprehensive 3 and 2-mm spectroscopic redshift survey of a large (~135 sources) sample of the brightest ($S_{500\ \mu m}$>80 mJy) SMGs selected from the Herschel H-ATLAS and HerMES surveys, which probe the peak of cosmic evolution (2<z<4). The results highlight the nature of the sources, lenses and the rare hyper-luminous galaxies, as well as, in some cases, their multiplicity. We will describe the main results of the survey as well as complementary data, in particular, with NOEMA, ALMA and the HST, addressing aspects of feedback activity in selected sources, present a remarkable lensing configuration and, finally, outline future prospects.