Poster

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Mapping the ISM in nearby galaxies with CCAT-p: the case of M51

M. Ziebart[1], C. Buchbender[1], M. Röllig[1], R. Simon[1], J. Stutzki[1]

[1] *University of Cologne, Institute of Astrophysics*

Large scale spectral line mapping of a nearby galaxies in radio, sub-mm and far-infrared emission lines with a spatial and spectral resolution that allows separating the major structural features such as the spiral arms and the interarms-regions, as well as Giant Molecular Cloud complexes, is a powerful tool to study the star formation activity, including the cloud formation, and thus the galaxy evolution. One of the scientific goals for which the CCAT-p telescope has been designed is the study of the star forming interstellar medium in the Milky Way and in nearby galaxies. In this poster we discuss, as an example, the feasibility of sub-mm observations as a complementary data to the spectroscopic resolved full map of the M51 grand designed nearby spiral galaxy in the [CII] 158 μm line observed with upGREAT on SOFIA (we note that M51 is not necessarily the best target for the southern CCAT-p telescope; nevertheless we use it here as an example because of the available complementary data). We estimate the observing time for full maps of M51 in the emissions lines of [CI] 370 μm, [CI] 609 μm, CO J=4-3 650 μm and CO J=7-6 372 μm observed with the future 64 pixel CHAI receiver on the CCAT-p telescope. The 6 m diameter of the CCAT-p dish gives an angular resolution comparable to the SOFIA [CII] 158 μm observations and the mm-wave low-J CO mapping with e.g. the IRAM 30m telescope.