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Modelling the cold dust in nearby spirals galaxies with radiative transfer

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Cosmic dust grains are one of the fundamental ingredients of the interstellar medium (ISM). Despite of their limited contribution to the total mass budget, dust grains play a significant role in the physical and chemical evolution of galaxies. Over the past decade, our knowledge on the cosmic dust in nearby galaxies has increased substantially thanks to the availability of observational data from UV to far-infrared wavelengths. However, one part of the spectrum, the mm range, has largely remained unexplored. We aim to take advantage of the new, high-resolution data in the mm range observed with the NIKA2 instrument. Combining these new observational data with our radiative transfer framework, would allow us to accurately model the interplay between starlight and dust in a sizeable sample of spatially-resolved nearby galaxies. I will present the methodology of our dust radiative transfer modelling and its application to a small group of face-on spiral galaxies. I will highlight which modelling steps need to be improved, and how the new NIKA2 data would allow us to firmly characterize the physical properties of the very cold dust (<15K), as well as to quantify the importance of different emission mechanisms in the mm.

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