Poster

Splinter CCAT

Simulation of Galactic disk PDRs line emission

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In star-forming regions the fractal structure of the interstellar medium suggests that much of the physical and chemical conditions can be described by using a clumpy approach representing a large fraction of the ISM in the Milky Way by photon-dominated regions (PDRs). We make predictions for the large-scale distribution of the CO 4-3 and CO 7-6 lines and the two [CI] fine structure lines that can be obscured with CCAT-prime. We model the structure of the ISM as a superposition of spherical clumps with different sizes using an extension of the KOSMA-τ 3D-Code. We build a 3D PDR-model of the Galactic disk with mass-, density-, velocity- and FUV-distributions as input parameters and perform radiative transfer computations for the IR continuum and various molecular, atomic and ionic emission lines. We fit the model parameters by comparing the simulated position-velocity map of CO 1-0, integrated line profiles of [CII] and CO lines from CO 1-0 to CO 8-7, as well as dust continuum emission in FIR. Comparison of CCAT-prime observations of the [CI] lines with the model predictions will allow to verify the underlying assumptions on the PDR physics and chemistry.