Contributed Talk

Splinter CCAT

CCAT-p: The Galactic ECology (GEco) Project

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The star formation rate is governed by the flow of gas from galactic scales down to individual star-forming cores. Once stars are formed, they provide feedback in form of winds, UV radiation and eventually supernova explosions, which self-regulate star formation.

Of particular observational importance are the far-infrared fine structure lines ([C I], [C II], [O I] and [N II]) as well as mid- and high-excitation CO lines, since they are agents of cooling in molecular cloud formation or star formation feedback, and therefore important tracers of these processes. The Galactic disk, but also in particular the Galactic Center and the Large and Small Magellanic Clouds, are important laboratories in this respect, since they allow to study, at high resolution, star formation in normal disk molecular clouds, a galaxy core and in both normal and low metallicity environments, all of which are ingredients of star formation in the early and contemporary universe.

In the local universe, some of the key spectral lines ([C I] and mid-J CO lines) can be observed from the ground. Even [N II] and high-J CO lines are accessible to ground-based observatories on mountain sites with better transmission than the Chajnantor plateau (ALMA site). The main objectives of the CCAT-p Galactic Ecology (GEco) programme are the study of the formation, growth, evolution and dispersal of molecular clouds. For this, we will use large format heterodyne arrays to survey [C I] 1-0 and mid-J CO lines over areas that are large enough to have a statistically significant sample for clouds in the Galactic plane and the Magellanic Clouds. These observations

will be complemented by zoom-ins in higher-frequency lines.