Contribution ID: **51** Type: **Oral presentation**

The Mopra Southern Galactic Plane Molecular Gas Survey - why the CTA needs it

Thursday, 29 October 2015 17:55 (15 minutes)

The Mopra Southern Galactic Plane molecular gas survey is the next generation CO survey of the distribution and dynamics of the molecular gas along the southern galactic plane. Being conducted with 0.6 arcmin and 0.1 km/s resolution, it provides an order of magnitude improvement in both spatial and spectral resolution over the Dame et al 2001 survey, currently our standard source of reference on the distribution of the molecular gas in our Galaxy. It is also being conducted in three isotopologues of the molecule, not just one, so providing information on the optical depth (and hence the column density). Knowledge of the distribution of the molecular gas as a function of distance from the Sun is a key input for the interpretation of TeV gamma ray images, for molecules provide the greatest column densities of nuclei that high energy cosmic rays might collide with, in the hadronic scenario for TeV gamma ray production. With CTA's resolution approaching an arcminute, an order of magnitude improvement on the HESS, it will be essential to know the distribution of the gas on this scale in order to be able to fully interpret the gamma ray images it will produce. The Mopra CO survey is being conducted with the CTA's needs as a primary driver. This talk will describe the status of the Mopra CO survey, and illustrate the difference that the order of magnitude improvement in spatial resolution brings to the cartographic charting of the Galaxy's interstellar medium.

Further details at the project website: www.phys.unsw.edu.au/mopraco

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Session Classification: Gamma-Ray Astrophysics

Track Classification: Gamma-ray Astrophysics