

INTRODUCTION TO THE JCMT-CSO INTERFEROMETER

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The James Clerk Maxwell Telescope (JCMT) and the Caltech Submillimeter Observatory (CSO) are located 160m apart on Mauna Kea, Hawaii. Recently they have been linked together to allow the first submillimetre interferometric observations (between 300GHz and 490GHz, soon to 690GHz). Submillimetre observations can be used to probe the physical conditions of molecular clouds and dust in starforming regions. Lines from rotational transitions of molecules such as CO, HCN and HCO⁺ trace densities, temperatures and masses of molecular gas. The thermal emission of cold dust, typically found in dense clouds, also peaks in the submm regime.

The interferometer has a resolution of 0.5 arcsec at 345GHz with which we would be able to observe the central 100pc of a galaxy at $z=0.01$. The sensitivity of the instrument is 16mJy at a bandwidth of 1GHz for continuum observations and 50mJy for a linewidth of 100km/s for line observations when integrating over 1000 seconds at 345GHz (Carlstrom *et al.*, 1994). Continuum and line emission of starburst galaxies are greater at submillimetre than at millimetre wavelengths: continuum emission of optically thin dust is proportional to $\sim \nu^3$, the intensity of line emission is proportional to ν^2 to ν^4 . The combination of the resolution and the sensitivity obtainable with the JCMT-CSO Interferometer is clearly very valuable for investigating the nature of starburst galaxies and of their energy sources.

References

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