



Contribution ID: 26

Type: Poster

Infrared spectroscopic studies of amorphous ice nanoparticles

Thursday, 20 November 2014 17:30 (1h 30m)

Ice plays an important role in the atmosphere of earth and the interstellar medium through interaction with radiation and hosting chemical reactions. Ice aerosols in the troposphere scatter and absorb radiation from sun and thus have substantial influence on the temperature of earth. Understanding ice's behaviour is believed to be essential for predicting the future of earth.

Due to its suitability for remote sensing Infrared Spectroscopy can be used to probe the physics and chemistry of aerosols in astrophysical and atmospheric context. This has been demonstrated by the data collected using satellite instruments, especially in the Far-IR region. Accurate laboratory measurements are needed in order to interpret these data.

In this study, the spectrum of amorphous ice nanoparticles of submicron size in the 10 –4000 cm⁻¹ spectral range is investigated utilising the Infrared Spectrometer at the Australian Synchrotron. The optimum condition to generate amorphous ice nanoparticles will be presented followed by discussions of change of spectral features with respect to phase, size and temperature.

Keywords or phrases (comma separated)

IR Spectroscopy

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Session Classification: Welcome Function, Poster Session, Exhibition

Track Classification: Earth and Environment