

EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Sensors and Technology (3)

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FOURIER-TRANSFORM SPECTROMETERS IN SPACE: OVERVIEW OF A CANADIAN
SIGNATURE TECHNOLOGY

Abstract

Scisat-1, the Suomi National Polar-orbiting Partnership and the Greenhouse Gases Observing Satellite (GOSAT) also known as Ibuki have several elements in common. All three spacecrafts carry payloads for the study of the atmosphere. Among their instruments, they each have a Fourier Transform Spectrometer and each of these spectrometers has at its heart, an interferometer built in Canada. Fourier Transform Spectrometry from space is recognised as a Canadian signature technology. The primary goal of Scisat-1 is the study of the atmospheric chemicals playing a role in the ozone cycle. Suomi NPP is an operational satellite that collects data in support of weather forecasting. The main role of its Fourier transform spectrometer is to obtain data for the retrieval of vertical profiles of temperature and humidity. The main mission of GOSAT is to measure total column density of atmospheric carbon dioxide and methane. We will present an overview of these three projects: a comparison of the different technologies used, the Canadian contribution to each mission and key results obtained with each instrument. We will also talk about potential future missions that are planning to use the same key technology.