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STUDIES ON WATER VAPOR, AEROSOL AND SNOW CRYSTALS IN THE ARCTIC (WANTS-ARCTIC; CANADA) (ABSTRACT)

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The WANTS (Water vapor, Aerosol and Nuclei Transportation and Snow crystals) Arctic Experiment was carried out in Inuvik, NWT, Arctic Canada during the mid-winter of 1995/96. Many organizations participated in this research program.

A vertical pointing Doppler radar, and microwave radiometer were set up on the roof of the Inuvik Science Research Center, and precipitation and aerosol particle observations by microscope, replica method and filter method were also conducted on the ground surface. Valuable and successive data over 40 days were obtained in the Arctic mid-winter.

Two different major vapor routes were classified by synoptic weather analysis. One route was from the Gulf of Alaska across the mountainous region near the west coast of the North American Continent. The other was from the Arctic Ocean or Northern Alaska directly. Precipitation features between them were quite different. In the former the warm air mass was intruded aloft, a convective radar echo was observed and a high amount of liquid water was observed by microwave radiometer. Densely rimed dendrites, small graupel particles, needles and supercooled liquid water droplets were observed on the ground surface. The precipitation intensity was strong, however, the precipitation period was short. The latter was a windy and cold air mass, the radar echo was stratiform and the liquid water path was very small as observed by microwave radiometer. The crystal shapes of combination of bullets, columns and crossed plates type were observed. The precipitation intensity was characterized by weak intensity and long period.

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