

A satellite with large solar panels is shown in space, with the Earth's blue and white atmosphere visible in the background. The satellite has a complex structure with various instruments and antennas.

# The Iqaluit Calibration/Validation Supersite in Canada's Arctic

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# Proposal objectives

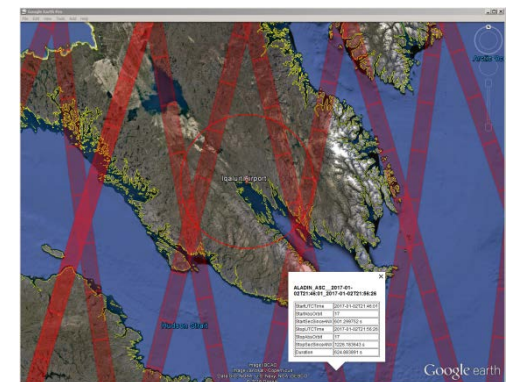
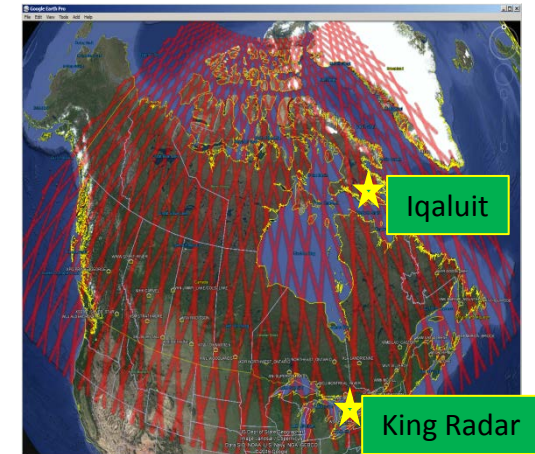
- ECCC is interested in proceed with Aeolus satellite data characterization and validation over the Canadian Territory, in particular over the Arctic region:
  - There is strong interest in assimilation of Aeolus wind measurements over Canada
  - Aeolus data quality depends on determination of the ground characteristics. The Canadian territory includes a mix of complex terrains, urban areas, large lakes, vast cultivated fields, forest areas, and snow/ice surfaces.
  - Within the project of enhance the meteorological observational capacity over the Northern areas of Canada, ECCC invested in two supersites with active remote sensing technology which can significantly contribute to Aeolus validation: Iqaluit (64N) and Whitehorse (60.7N)



# Description of CAL/VAL techniques applied

- Our team has strong expertise in validation of active remote sensing technologies from space from our active participation in the CloudSat and GPM validation teams.
- Iqaluit site: Doppler wind lidar, different frequency weather radars, aerosol and water vapour lidar, ceilometers, fog monitoring, precipitation measurement devices, all sky cameras, radiosonde launches,...
- Whitehorse site: complex terrain, x-band lidar, Doppler wind lidar, ceilometer, fog monitoring, precipitation, all sky camera, radiosonde launches.
- King City radar cite: south Ontario, urban area: C-band radar, wind profiler (nearby), meteorological sensors

Seven days cycle

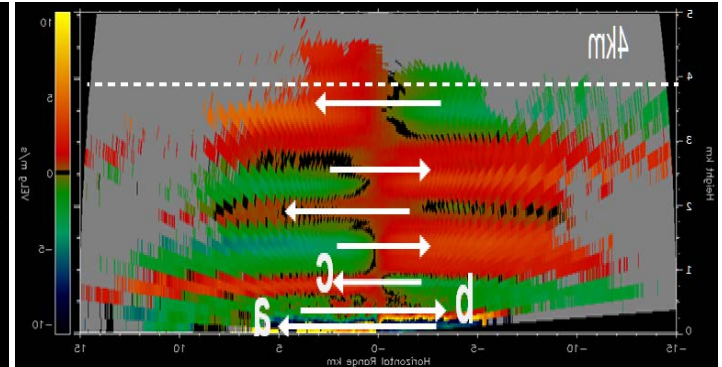
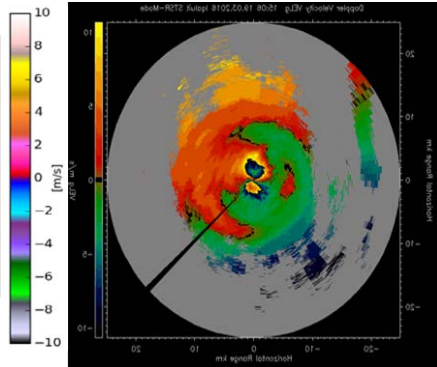
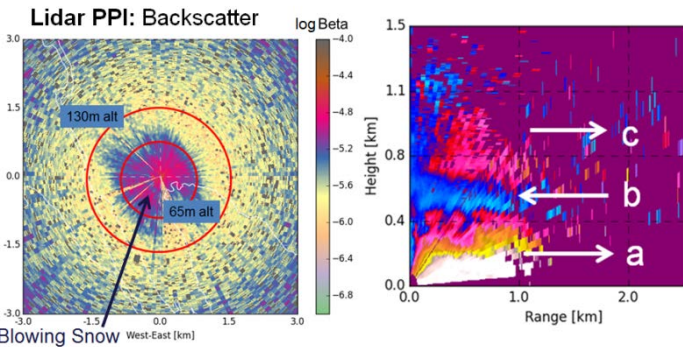




# Contribution to Aeolus CAL/VAL requirements

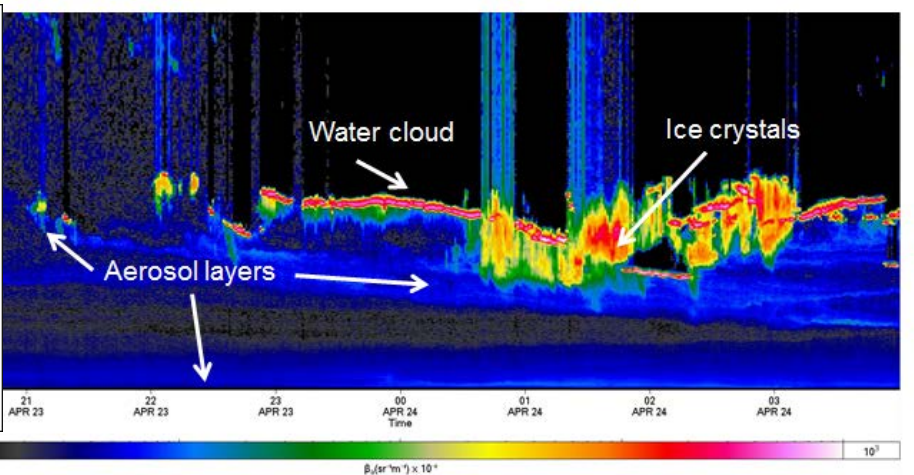
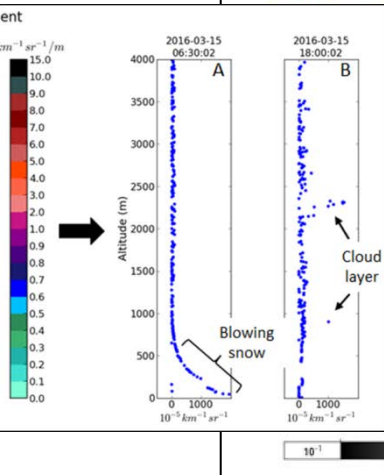
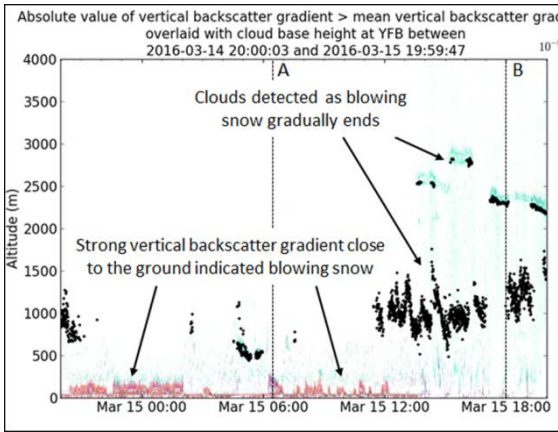
Doppler wind measurements March 19 2015

Ka band radar measurements March 19 2015



Ceilometer March 2016

Lidar system (not Iqaluit)



# Status of qualified personnel, tools and funding

- Infrastructure: Iqaluit and Whitehorse sites commissioning to be completed Fall 2107. Synergy with YOPP?
- Personnel:
  - Our team has strong expertise with cloud microphysics, weather radar and validation of satellite data. We need to enhance expertise in Lidar (wind).
  - In the process of advertising for a Research Scientist position on satellite and remote sensing active technology.
  - Work with Academia in Canada (York and UWO)

# Next steps

- Conclude infrastructure installation in Iqaluit and Whitehorse
- In deep ground based data analysis for data quality control
- Develop/adapt a forward model for the lidar and ceilometer: familiarize with Aeolus data and retrieval methodology
  - Applicability of Doppler lidar and ceilometer data for model verification (YOPP)
  - Scientific analysis
- Develop collaborations with other Arctic nations
- The data assimilation group (Stephane Laroche team) has interest in tests with assimilation system
- Wind is a critical information for the Northern communities: how can we best use Aeolus data in this context?
  
- Please see our poster for more details.