YORK UNIVERSITY
DEPARTMENT OF EARTH AND SPACE SCIENCE AND ENGINEERING
and
CENTRE FOR RESEARCH IN EARTH AND SPACE SCIENCE

S E M I N A R

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The Canadian Ensemble Kalman Filter System for Radar Data Assimilation

ABSTRACT

A High Resolution Ensemble Kalman Filter (HREnKF) system running at cloud-resolving scale (1-km resolution) has been developed for GEM-LAM, the limited-area version of Environment Canada's operational atmospheric forecast model. By using S-band radar observations provided by McGill University, we examine the impact of assimilating radar radial wind in the HREnKF system in an effort to improve convective-scale weather forecasts. Employing a cycling procedure which assimilates radar radial wind over a 1-hr period, we show that inclusion of radial wind allows the HREnKF to capture strong convection events and to correct precipitation phase errors. For very short-term ensemble forecasts, verification of the predicted radial wind component against observations illustrates that assimilation of radar data significantly improves both the bias and root mean square errors at all elevation angles, and such improvement tends to last at least for the first hour of the very short-term forecast. Furthermore, a comparison of the convective available potential energy (CAPE) with and without the radar data suggests that the HREnKF system is capable of modifying the instability of the atmosphere, thus triggering or inhibiting convection. Also, under some circumstances, the short-term forecast of precipitation can be improved significantly.

BIOGRAPHY

Dr Chung is an employee of the Data Assimilation and Satellite Meteorology Research Section Science & Technology Branch Environment Canada. He will soon move to a faculty position at the National Central University in Taiwan.

Refreshments will be served at 3:15 p.m. in Room 422 Petrie Science and Engineering Building.

DATE: **Wednesday, November 12th, 2014**
TIME: **3:30 p.m.**
LOCATION: **Room 422, Petrie**