



## **A Doppler Radar Analysis for a Severe Tornado Event over Southern Ontario, Canada**

**Zuohao Cao** (1), and **Huaqing Cai** (2)

**1 (1) Meteorological Service of Canada, Ontario,  
Canada, [zuohao.cao@ec.gc.ca](mailto:zuohao.cao@ec.gc.ca) / phone:  
416-739-4551**

(2) National Center for Atmospheric Research, Boulder, CO 80301, USA, [caihq@ucar.edu](mailto:caihq@ucar.edu)

Tornado has high impacts on Canadian society in terms of loss of life and damage of property. In Canada, during an average year about 80 tornadoes have been reported that result in, on average, 2 deaths, 20 injuries, and tens of millions of dollars in property damage. Because of its small-scale nature, tornado is a localized short-lived phenomenon and it is therefore difficult to detect and predict. One of the challenges confronting with the meteorological community today is how to distinguish tornadic mesocyclones from nontornadic mesocyclones and how to detect/predict bow echo tornadoes. As one of the efforts to resolve this scientific and operational issue, we have investigated a severe tornado event that occurred in Hamilton, Ontario, on November 9, 2005. This event was responsible for removing the roof of an elementary school in Hamilton, Ontario, slightly injuring two students of the school, removing parts of 3-4 home roofs, knocking out power of 4,000 homes and uprooting trees in the city. The occurrence of this tornado in November is very rare in Ontario. Only 2 other such tornadoes were observed during the last 88 years. With the aid of Doppler data and other observations, we have analyzed this unique tornado event to understand some of the physical processes responsible for the tornado formation. We have also attempted to use the vorticity line technique to detect/predict this event. The detailed diagnostic results will be presented in the conference.