香港浸會大學
HONG KONG BAPTIST UNIVERSITY

香港浸會大學理學院
HKBU Faculty of Science

The Institute of Computational and Theoretical Studies: Data Assimilation Program

Lecture 1: Introduction to Numerical Weather Prediction and Data Assimilation

Lecture 2: The Impact of Advanced Infrared and Microwave Soundings on Short-term Weather Forecast

Speaker	:	Dr. Chian-Yi Liu Center for Space and Remote Sensing Research National Central University Taiwan
Date	:	9 April 2015 (Thursday)
Time	:	10:00 a.m. - 11:00 a.m. (Lecture 1) 11:30 a.m. - 12:30 p.m. (Lecture 2)
Venue	:	FSC1217 Fong Shu Chuen Library HSH Campus Hong Kong Baptist University

Abstract:

Lecture 1: Numerical weather prediction (NWP) is an initial and boundary conductions problem. Provided an estimate of the atmospheric state, in terms of the variables of the NWP model, the model simulates the atmospheric state at later times. It also calculates precipitation and other important properties used by weather forecasters. With the increased observation not only from ground based instruments but also remote sensed sensors (e.g., radar and satellite) ranging from regional to global scales, these data improve the quality of the current state significantly and hence are supposed to advance the forecast performance. In this one-hour talk, a quick summary of NWP model and introduction to data assimilation techniques will be given. Audiences may have an idea about the production of the public weather forecasts.

Lecture 2: Earth atmosphere could be considered as a three dimensional non-uniform fluid. It is critical to understand the current state in order to forecast future through the assist from numerical weather prediction (NWP) model. It is also challenge to get the current state of atmosphere by using conventional surface observation data especially over the ocean, high mountains and polar region. On the other hand, the satellite observation could help to condition the three-dimensional atmospheric state globally in all-weather skies.   Therefore, we would like to evaluate the impact from the use of satellite retrieved soundings in the NWP model. Due to the nature of retrieval uncertainties are varies, and microwave sounder (MW) have bigger field-of-view (FOV) than infrared sounder (IR). We propose a series of experiments to quantify the optimal use of both MW and IR soundings in regional Weather and Research Forecasting (WRF) model through Three-Dimensional Variation (3D-var) data assimilation scheme. Two hurricanes cases were chosen to simulate the forecast. The results showed an improvement in the hurricane track due to the assimilation of satellite retrieved temperature profiles in the hurricane environment.

The Data Assimilation Program is organized by the Centre for Mathematical Imaging and Vision.

– All interested are welcome –

For further information, please visit **http://www.math.hkbu.edu.hk/**, or call 3411-5056.