Séminaire ven 14 Jan 2011 11h / Seminar Fri Jan 14th 2011 11h

Conférencier/Lecturer:	Andrea Scott
Sujet/Subject:	Direct assimilation of AMSR-E and AVHRR data for the purpose of estimating sea-ice concentration
Présentation/Presentation:	Anglais / English
Lieu/Room:	Salle des vents (Dorval)

Abstract

Two different types of observations are assimilated directly within a three-dimensional variational data assimilation system with the goal of providing an accurate estimate of the sea ice state. The first type of observations are passive microwave brightness temperatures from AMSR-E. In this case a simple radiative transfer model (RTM) is used as the forward model. This allows brightness temperatures for all channels to be modeled as a function of the total ice concentration, surface wind speed, sea surface temperature, ice temperature, vertically integrated water vapor and vertically integrated liquid water. The second type of observations assimilated are albedos and brightness temperatures from a visible/infrared sensor, AVHRR. Here an empirical model based on tie-points for ice, open water, and cloudy conditions, is used as the forward model.

Results from assimilating both types of data are shown for an area along the east coast of Canada. Both methods provide benefits as compared to the assimilation of ice concentration retrieved from passive microwave brightness temperatures using the NT2 algorithm. The direct assimilation of brightness temperatures generates less spurious ice than when the retrieved ice concentration is assimilated, and performs better during the melt season when a seasonally varying sea-ice emissivity is used. The finer resolution of the AVHRR data provides small-scale details regarding the ice edge and open water within the ice as compared to when passive microwave data are used.