Séminaire ven 6 Nov 2009 11h/ Seminar Fri Nov 6th 2009 11h

Conférenciers/Lecturers:	Jiming Sun
Sujet/Subject:	A new explanation for the cumulus cloud formation with cloud droplet spectral broadening and ice particle multiplication
Présentation/Presentation:	Anglais / English
Lieu/Room:	Salle des vents (Dorval)

Résume/Abstract

Explaining cumulus cloud formation is important for understanding rain formation and the atmospheric moisture cycling in the Earth's climate system. Currently the classical parcel theory and entrainment mixing mechanisms are still used to explain the formation of cumulus cloud droplets. The cloud base is believed to be the main source of cloud droplets and the cloud top is thought to be the sink of them since evaporation is always expected to occur at the cloud-environment interface. Some features of cumulus clouds obtained from observations cannot be explained by the current theory. In this presentation we will give a new explanation for the cumulus cloud formation. The current explanation does not consider the impact of ascending cloud air on the thermodynamic properties of its environmental air. The buoyancy is considered as the only driving force for the movement of air parcels even though the gradient forces of perturbation pressures have been recognized to play a role in their movement. In our new explanation, we show that the gradient force of dynamic pressure induced by the upward movement of cloud air will drive the cloud-free air upwards. Fresh activation of cloud droplets will occur at the cloud-environment interface. We will talk about the effects of this new cloud droplet formation mechanism on cloud droplet spectral broadening and ice particle multiplication.