

---

**BOUALEM KHOUIDER**, University of Victoria

*Convectively coupled waves in a simple multicloud model*

Organized convection in the tropics involves a hierarchy of spacial and temporal scales ranging from the individual clouds of a few kilometres and a few hours to the mesoscale cloud clusters and superclusters and their intraseasonal/planetary scale wave envelopes, known as the Madden–Julian oscillation (Nakazawa, 1988). Interactions between large scale dynamics (and thermodynamics) and small scale convective processes are believed to play a crucial role in the generation and maintenance of these organized features. The analysis of Wheeler and Kiladis (1999) and Heartel and Kiladis (2004) showed that the dynamical fields and the power spectral peaks of the synoptic scale superclusters—identified as the convectively coupled waves, are closely related to the first few equatorially-trapped linear waves of Matsuno (1966), but with a significantly reduced equivalent depth (*i.e.*, phase speed). Despite recent research efforts and significant progress in computing power, current general circulation models (GCM), used for long-term weather and climate predictions, often simulate poorly the dynamics and structure of convectively coupled waves, and particularly the MJO, due to an inadequate treatment of organized convection by the convective parametrizations currently used by the GCMs (Moncrieff, 2004). To study these interesting waves, from both a practical and a theoretical perspective, we designed and used an idealized multicloud model that captures many of the physical and dynamical features attributed to the large scale organized convective systems.

Joint work with Andrew J. Majda.