

30-month post-doc position at LMD on convection, MJO and water isotopes

Project: CONV-ISO is a French project aiming at “*studying convective and cloud processes during the MJO and evaluating their representation in climate models by combining humidity, cloud and water isotopic measurements*”.

The Madden-Julian Oscillation (MJO) is the dominant mode of intraseasonal variability in the tropics. Climate models have persistent difficulties to simulate its characteristics. What processes are key to simulate the MJO? The novelty of this proposal is to address these questions by **combining humidity and cloud measurements with water vapor isotopic measurements** (HDO/H₂O ratio). We will use the isotope-enabled general circulation model (GCM) LMDZ and compare sensitivity tests to cloud processes to **identify critical processes in the MJO simulation**. We will design a framework to interpret joint humidity, isotopic and cloud distributions in terms of cloud processes. Model simulations will be compared with several datasets of collocated cloud, humidity and isotopic measurements. This should help us to identify the causes of model biases.

More details on ftp://ftp.lmd.jussieu.fr/pub/camille/proposals/doc_scientifique_CRisi.pdf

Post-doc tasks:

The post-doc will answer these specific science questions:

- 1) What controls the capacity of a model to represent the large-scale organization of convection ?
- 2) What processes make the MJO specific compared to other modes of intra-seasonal variability ?
What model biases appear more specifically during the MJO, and during which phase?

For (1), various sensitivity tests to convective/cloud parameters will be performed and compared. Simulations will be compared using a model-to-satellite approach to the IASI data (yielding tropospheric isotopic composition with unprecedented spatial resolution and coverage). The analysis will focus on the spatial distribution of isotopic composition around convective systems and on the link between the degree of organization of convection and environmental properties.

For (2), composites of MJO events will be compared for LMDZ simulations, for other isotopic GCMs and for several isotopic/humidity/cloud datasets: IASI, but also A-train (unprecedented vertical resolution), and Darwin ARM station (temporal coverage).

Qualification:

The candidate should have a PhD in climate or atmospheric sciences, with experience in numerical modeling and/or processing of large datasets. Knowledge on deep convection and/or water isotopes is recommended. The candidate should be familiar with UNIX and fortran.

Practical information:

The post-doc will work at the Jussieu site of the Laboratoire de Météorologie Dynamique, in the center of Paris. This is where most of the developments are done to the physics of the LMDZ GCM (atmospheric component of the IPSL climate model). The post-doc will be advised by Camille Risi, with interactions with other members of the project and/or model developers (e.g. S. Bony, C. Rio, J-Y. Grandpeix...).

The post-doc would start between February and April 2013.

Applications with letter, CV and contact for 2 references should be sent to C. Risi (crlmd@lmd.jussieu.fr).