Postdoctoral position au LSCE
(Research engineer or post-doc position up to 18 months)

Subject: Implementation of the isotopic species of water and carbon in the ORCHIDEE land surface model and analysis of simulations in Siberia.

Background: The project Megagrant WsibIso (collaboration LSCE-University of the Urals in Russia), aims to better quantify the water cycle and carbon components in the areas of peatlands and permafrosts in Siberia, and to study their response to climate change. For this purpose, we propose to use the land surface model ORCHIDEE coupled with the atmospheric model LMDZ. Both models are part of the IPSL climate model and in both models the carbon and water isotopes are represented for the large part. The ORCHIDEE model simulates, from local to global scale, the functionning of the vegetation, including mass (water, carbon) and energy transfers in the soil-plant-atmosphere continuum. The objective of the work is to develop and to implement this model on the Arctic zone and to analyze the contribution of isotopic water and carbon in the modeling of biogeochemical cycles.

Tasks: The tasks of the CSD will be among the following:

1) implementation of the isotopic species of water (H218O, HDO, H217O) in the new version of ORCHIDEE dedicated to high latitude processes, and based on a multi-layer soil, including snow , permafrost and flooded areas. This work will benefit from the isotopic developments already done in the standart version of ORCHIDEE.

2) implementation of carbon isotopes (13C) in the new version of ORCHIDEE. Similarly, this work will build on what has already been done in the standart version of ORCHIDEE.

3) development of the transport of carbon isotopes of different species (CO2, CH4) in LMDZ and coupling with the sources and sinks modeled in ORCHIDEE. The isotopic species of water, and transportation of passive tracers, are already represented in LMDZ.

4) production and analysis of ORCHIDEE LMDZ simulations with the scientific objective of exploiting the isotopic composition of water measured in the atmosphere (water vapor) and precipitation (liquid water) to provide constraints on the recycling in continental Siberia.

If the candidate profile is a research engineer, the work will focus on the development tasks: 1, 2 and 3. If the candidate's profile is post-doctoral work will focus on the task of developing a scientific task and 4, for which a first author publication is expected.

Qualifications:
The candidate must have a Ph.D. in the field of Environment, with experience in the development of physical models. Experience in hydrological modeling and biogeochemistry mainland is recommended. In addition the candidate must master the tools such as Fortran (ORCHIDEE and LMDZ are written in Fortran) and Unix.

Practical information:
The home institution is LSCE (Laboratoire des Sciences du Climat et de l'Environnement, a joint research unit of the Commissariat à l'Energie Atomique, CEA, the Centre National de la Recherche Scientifique (CNRS) and the Université de Versailles Saint Quentin-en-Yvelines (UVSQ)). The position is under the responsibility of Catherine Ottlé (LSCE / IPSL) and Camille Risi (LMD / IPSL). Salary follows national directives and is adjusted for work experience. Applications (including a curriculum vitae, statement of research interests and expertise and names, addresses, phone numbers and email addresses of at least 2 references) should be sent to Catherine Ottlé (catherine.ottle@lsce.ipsl.fr) and Camille Risi (crlmd@lmd.jussieu.fr).