The EFLUM has the pleasure to announce the seminar

Tuesday, September 22\textsuperscript{nd} 2009
10h15 - Room GRA0435
(http://plan.epfl.ch/?lang=en&room=GRA0435)

\textbf{Mapping the abundance of the main greenhouse gases from pole to pole with a QC-laser spectrometer}

\textit{Rodrigo Jiménez}
Research Associate

\textit{Harvard University, Department of Earth and Planetary Sciences \& School of Engineering and Applied Sciences, Cambridge, MA USA}

The 3 most abundant long-lived greenhouse gases (GHG), CO\textsubscript{2}, CH\textsubscript{4} and N\textsubscript{2}O, account for about 2/3 of the positive radiative forcing. Despite their importance, there are still large uncertainties on the fluxes of these species at global, continental and regional scales. The uncertainty on the global distribution of fluxes appears to be associated not only to the scarcity of measurements in the tropics but also to inaccurate modeling of the atmospheric transport.

We present high precision and accuracy airborne measurements of CO\textsubscript{2}, CH\textsubscript{4}, N\textsubscript{2}O and CO over the Pacific Ocean obtained during the HIPPO Global mission (Phase I, January 2009) aboard of NCAR’s Gulfstream V. Our measurements with a QC-laser absorption spectrometer recently developed by us (QCLS), provide a set of finely resolved concentration cross sections over the Central Pacific from pole to pole and from the boundary layer to the tropopause. These cross sections reveal strong latitudinal gradients, particularly in the free troposphere near the equator and at 30 N, and comparatively weaker vertical gradients. Further details on the design, operation and performance of QCLS will be presented.

The high quality QCLS measurements obtained during HIPPO provide an exceptional dataset to test the current representation of the atmospheric transport in global models and will contribute to the improvement of inverse modeling derived estimates of continental-scale GHG fluxes.