Vendredi 29 Septembre 2017 **11h** TE / **Friday September 29th** 2017 **11h ET**

Sujet/Subject: **A new look at Atlantic-European weather regimes: physical processes governing their life cycles and applications**

Conférencier/Lecturer: Christian M. Grams 1,2 and Jacobo Riboldi 1
1-Institute for Atmospheric and Climate Science, ETH Zurich, Switzerland
2-Institute for Meteorology and Climate Research (IMK-TRO), KIT, Karlsruhe, Germany

Langue/language : anglais/English

Résumé/Abstract:

The large-scale midlatitude flow is dominated by Rossby wave activity along the upper-level midlatitude wave guide and jet stream. In the Atlantic-European region this activity occurs in preferred quasi-stationary, persistent, and recurrent states, so-called weather regimes. Weather regimes explain most of the atmospheric variability on sub-seasonal time scales.

An extended definition of year-round Atlantic-European weather regimes based on 37 years of ERA-Interim reanalysis data helps to elucidate the physical processes governing their life cycles. A specific focus lays on the role of atmospheric blocking and of diabatic outflow driven by cloud-condensational processes at distinct weather regime life cycle stages. The impact of diabatic outflow on the large-scale midlatitude flow is explained based on examples of upper-level Rossby wave modification by tropical cyclones undergoing extratropical transition.

From a practical point of view weather regimes help to assess the potential for extreme weather as discussed for atmospheric river occurrence in Europe. Also they help to understand multi-day volatility in continent-scale, near-surface wind speed with important implications for the planning of wind farm deployment across Europe. Finally, a recent forecast bust demonstrates the challenges in predictability imposed by the multi-scale interactions governing weather regime life cycles