



CNRM-GAME, UMR 3589

## SEMINAIRE CNRM-GAME

N° 2016\_03

*mardi 1<sup>er</sup> mars 2016 à 14h*

### ON POLAR-NONPOLAR LINKAGES: OBSERVATIONS AND MODEL DIVERSITY

**par Javier GARCIA-SERRANO (BSC)**

**en salle de conférences Joël Noilhan**

#### Résumé :

Satellite-derived sea ice concentration (SIC) and re-analysed atmospheric data are first used to investigate the potential influence of interannual variability in Arctic SIC on the Euro-Atlantic atmospheric circulation, and to explore the predictability of the European climate based on this covariability. SIC is considered in separate months from September to February. The period of study is 1979-2013, and all anomalies are detrended. In autumn, the observational results indicate that the most robust signal is found for SIC in November, with sea-ice reduction in the Barents-Kara Seas being accompanied by a negative NAO-like pattern in winter (particularly in December-January); yielding empirical prediction skill of surface climate over some regions of Europe, where the stratosphere appears to play a role in the teleconnection. In winter, the observed covariability is statistically significant for SIC in December, with sea-ice reduction in the Greenland-Barents Seas related to a negative NAO-like pattern established in two months (February), likely dominated by tropospheric dynamics – eddy/mean flow interaction.

Secondly, an assessment of how CMIP5 models capture (or not) the observed lagged relationships is performed. The same target period is used, and historical+rcp4.5 runs considered. Results indicate that most of the models show a link with sea-ice reduction over the eastern Arctic followed by a negative NAO-like pattern. Interestingly, if the simulated relationship is established one month, the results suggest that a stratospheric pathway could be at play; but, if the simulated relationship is established two months, the results suggest that tropospheric dynamics are dominant. The timing of the simulated covariability depends on the model. The performance of CNRM-CM5 will be described in detail.

Additionally, the DPETNA project (Dynamics and Predictability of the ENSO teleconnection to the Tropical North Atlantic), subject of my stay at CNRM, will be introduced at the end of the talk.

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