Université de Bretagne Occidentale

Ecole Doctorale

Sciences de la Mer et du Littoral

Laboratoire d'Océanographie Physique et Spatiale

AVIS DE SOUTENANCE DE THESE

Le mardi 15 décembre 2020 à 14h

à l'IUEM, Pôle Numérique Brest Iroise, Télé-amphithéâtre, Technopôle Brest-Iroise, Plouzané.

Monsieur LI KE

soutiendra une thèse de doctorat sur le sujet suivant :

Impacts interannuel-à-décennal des régimes de temps hivernaux etrêmes sur la stratification subtropicale en Atlantique Nord.

Le jury sera ainsi composé :

- M. CARTON XAVIER, Professeur des universités
Univ. de Bretagne Occidentale - PLOUZANE

- M. LAZAR ALBAN, Maître de conférences
Université P. et M. Curie - PARIS 05EME

- M. MAZE GUILLAUME, Chercheur
IFRMER - Centre de Bretagne - PLOUZANE

- M. MERCIER HERLE, Directeur de Recherche
IFREMER - Centre de Bretagne - PLOUZANE

- M. REVERDIN GILLES, Directeur de Recherche
Université Pierre et Marie Curie - PARIS 05EME

- MME SPEICH SABRINA, Professeur des universités
Ecole Normale Supérieure - PARIS 05EME

- MME TREGUIER ANNE-MARIE, Directrice de Recherche
Univ. de Bretagne Occidentale - PLOUZANE

invité(e) :

- M. KOLODZIEJCZYK NICOLAS, Chercheur
Univ. de Bretagne Occidentale - PLOUZANE

A BREST, le 07 décembre 2020

Le Président de l'Université de Bretagne Occidentale,

M. GALLOU

Abstract

The North Atlantic subtropical gyre was shown to have experienced warming since the 1970s. But this trend sits on top of a large interannual variability driven by mechanisms that are yet to be clarified, especially with regard to extreme winter events. In this research, we developed an observation-based ocean heat budget of the upper 800 m in the western subtropical North Atlantic, a region where heat is mostly stored in the Eighteen Degree mode Water (EDW).

In interannual time scale, the variability of geostrophic advection, mostly driven by the Gulf stream, is the most dominant factor to that of the ocean heat content (OHC) variability, 2.5 times as large as that of Ekman advection and almost four times as large as that of surface heat loss (which dominates at the seasonal cycle only). However, the annually ventilated EDW exhibits extreme values in 2008, 2013, and 2015 that correspond to opposite OHC anomalies. We will show that Ekman advection is the best indicator and driving mechanism explaining these extreme occurrences. We will further show that such extreme Ekman advection patterns can be linked to large scale atmospheric weather storms and that both storm intensity and duration have an impact on the extremity of EDW ventilation and North Atlantic heat content.