Université de Bretagne Occidentale

Ecole Doctorale

Sciences de la Mer et du Littoral

Laboratoire des Sciences de l'Environnement Marin

AVIS DE SOUTENANCE DE THESE

Le mardi 29 juin 2021 à 15h

à l'Université de Récife (Brésil).

Madame VIEIRA DE ASSUNCAO RAMILLA

soutiendra une thèse de doctorat sur le sujet suivant :

" Thermophaline stratification in the southwestern tropical atlantic : From physical processes to acoustic ecology ".

Le jury sera ainsi composé :

- M. BOURLES BERNARD, Directeur de recherche
IRD - PLOUZANE

- M. GUTIERREZ TORERO MARIANO SERGIO, Professeur associé
Univer. Nac. Federico Villarreal - LIMA - PEROU

- M. HERNANDEZ FABRICE, Chargé de recherche
IRD - TOULOUSE

- M. LENGAIGNE MATTHIEU, Directeur de recherche
IRD - Site de Sète - SETE

- MME LIMONGI CARMEN MEDEIROS, Professeure adjoint
University Federal of Pernambuco - RECIFE, PE - BRESIL

- MME SARTHOU GERALDINE, Directrice de recherche
Univ. de Bretagne Occidentale - PLOUZANE

- M. SILVA ALEX, Professeur associé
University Federal of Pernambuco - RECIFE, PE - BRESIL

invité(e) :

- M. BERTRAND ARNAUD, Directeur de recherche
IRD - SETE

- MME LEBOURGES-DHAUSSY ANNE, Ingénieure de recherche
IRD - PLOUZANE

A BREST, le 18 juin 2021

Le Président de l'Université de Bretagne Occidentale,

UNIVERSITÉ DE BRETAGNE OCCIDENTALE

M. GALLOU

Thermohaline stratification in the southwestern tropical Atlantic : from physical processes to acoustic ecology

Thèse en cotutelle entre l'Université de Bretagne Occidentale (UBO) et l'Université Fédérale de Pernambuco (UFPE), Brésil

Abstract

The thermohaline structure of the southwest tropical Atlantic (SWTA) has prime impact on global climate and plays a driving role in the vertical structuring of pelagic habitats. To fill information gaps on the thermohaline structure in the SWTA and to bring insights into the relationships between these physical processes and the distribution of the acoustic energy (proxy of organisms biomass), we took advantage of the two scientific surveys, ABRAÇOS, performed in austral spring 2015 and fall 2017. This thesis is organised over three main scientific objectives. First, we characterise the 3D thermohaline structure of the upper SWTA by applying a Functional Data Analysis (FDA) on temperature and salinity profiles. Our results reveal a clear spatial pattern with the presence of three areas with significantly different thermohaline characteristics.
Area 1, located along the continental slope corresponds to the western boundary current system. Area 2, located along the Fernando de Noronha chain corresponds to the South Equatorial Current system and Area 3 behaves as a transition zone between these areas. Second, we examined the feasibility of extracting the upper thermohaline structure from echosounder data. Our results show that, even if the thermohaline structure impacts the vertical distribution of acoustic scatters, the resultant structuring does not allow for a robust estimation of the thermohaline limits. However, studying the proportion of acoustic biomass within each layer provides insights on ecosystem structure in different thermohaline, which led us to investigate the fine-scale vertical relationships between acoustic biomass and other environmental factors, as the third objective. We show that fluorescence, oxygen, current and stratification are important drivers, but that their relative importance depends on the area, the depth range and the diel cycle.