PHYSIK

PHYSIKALISCHES KOLLOQUIUM

UNIVERSITÄT DES SAARLANDES

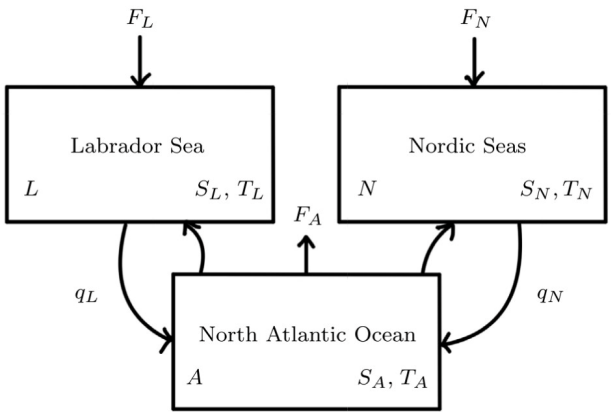
Donnerstag
5.12. um 16 Uhr
Studentinnen/Studenten
sind herzlich willkommen

Andrew Keane
School of
Mathematical Sciences
University College Cork, Ireland

Bifurcation analysis of a North Atlantic Ocean box model with two deep-water formation sites

Thursday, December 5rd, 2024, at 4.00 p.m. c.t.
Building C6.4, Lecture Hall II

The tipping of the Atlantic Meridional Overturning Circulation (AMOC) to a 'shutdown' state due to changes in the freshwater forcing of the ocean is of particular interest and concern due to its widespread ramifications, including a dramatic climatic shift for much of Europe. A clear understanding of how such a shutdown would unfold requires analyses of models from across the complexity spectrum. For example, detailed simulations of sophisticated Earth System Models have identified scenarios in which deep-water formation first ceases in the Labrador Sea before ceasing in the Nordic Seas, en route to a complete circulation shutdown. Here, we study a simple ocean box model with two polar boxes designed to represent deep-water formation at these two distinct sites. A bifurcation analysis reveals how, depending on the differences of freshwater and thermal forcing between the two polar boxes, transitions to 'partial shutdown' states are possible. Our results shed light on the nature of the tipping of AMOC and clarify dynamical features observed in more sophisticated models.



Philipp Hövel takes care of the speaker.
You can participate online via TEAMS: https://tinyurl.com/keane0512

Interested people are cordially invited.

Coffee and cookies are served at 4.00 p.m. in front of the Lecture Hall

PHYSIKALISCHES KOLLOQUIUM Naturwissenschaftlich – Technische Fakultät