

A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Mittwoch, 23. November 2022, 14:00 Uhr

[WebEx](#)

Disputation über die Doktorarbeit von

Herrn Tom Dörffel

Thema der Dissertation:

Moisture-Induced Dynamics of Tilted Tropical Cyclones

Thema der Disputation:

Tipping Points in the Climate System

Die Arbeit wurde unter der Betreuung von **Prof. Dr.-Ing. R. Klein** durchgeführt.

Abstract: In the context of climate change, tipping points are often considered critical for understanding the dynamics of the climate system under changing conditions. Tipping points are explained as threshold values of indicators, once crossed, causing the system to irreversibly and abruptly change its dynamics. Examples are the polar ice cover, which is responsible for Earth's radiation balance, or water temperature and salinity gradients, which are driving global ocean circulations.

Intuitively, tipping point intuitively seem to be associated to bifurcation points, where the system's stable sub-manifold alters its character, or with meta-stable transitions in the presence of stochastic perturbations. From a mathematical point of view, however, the situation is more complex. Depending on the dynamics of the parameters shift, these tipping points are described as bifurcation-, noise-, or rate-induced. Especially the latter type may cause the system to tip without crossing a bifurcation point or noise-induced transitions between meta-stable states. In this talk, I will discuss recent developments in the characterization of these tipping points and their importance for climate system predictability and vulnerability.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr.-Ing. R. Klein