

FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Donnerstag, 26. Juni 2014, 16.00 Uhr

**Ort: Raum 108/109
Institut fuer Mathematik, Arnimallee 6, 14195 Berlin**

Disputation über die Doktorarbeit von

Herrn Tommaso Benacchio

**Thema der Dissertation:
A blended semi-implicit numerical model
for weakly compressible atmospheric dynamics**

**Thema der Disputation:
Features of the dynamical core
of an operational unified numerical model of the atmosphere**

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

Abstract: The wide range of temporal and spatial scales provides major challenges for mathematical techniques aimed at modelling atmospheric dynamics. Research in the field has gone along with increasing available computing power, which has allowed for increasing resolution and forecast accuracy in weather and climate simulations.

The legacy of operational models used at weather centres gives evidence of the long-standing quest for a balance between accuracy, stability and efficiency of the underlying numerical methods. In this presentation I will focus on the features of the dynamical core in use at the UK Met Office, where a unified model for numerical weather prediction and climate studies has been in use for more than twenty years.

The scheme currently in operation integrates the three-dimensional nonhydrostatic fully compressible equations of motion. In order to give insight into the numerical features, the details of the semi-implicit semi-Lagrangian method employed for the temporal integration of the system will be showcased in the simplified framework of a vertical column model. Challenges within the currently employed scheme and future perspectives will be discussed.

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. R. Klein