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## Detecting regime transitions in the stable boundary layer

**Nikki Vercauteren**<sup>1,2</sup>, Amandine Kaiser<sup>1</sup>, Vyacheslav Boyko<sup>1</sup>, Davide Faranda<sup>3</sup>, and Sebastian Krumscheid<sup>4</sup>

<sup>1</sup>Department of Mathematics and Computer Sciences, Freie Universität Berlin, Berlin, Germany (nikki.vercauteren@fu-berlin.de)

<sup>2</sup>Department of Geosciences, University of Oslo, Oslo, Norway.

<sup>3</sup>LSCE-IPSL, CEA Saclay l'Orme des Merisiers, CNRS UMR 8212 CEA-CNRS-UVSQ, Université Paris-Saclay, Gif-sur-Yvette, France

<sup>4</sup>Department of Mathematics, Rheinisch-Westfälische Technische Hochschule Aachen, Aachen, Germany

Predictability of the atmospheric boundary layer is impaired by possible rapid transitions between fully turbulent states and quiescent, quasi-laminar states. Such rapid transitions are observed in Polar regions or at night when the atmospheric boundary layer is stably stratified, and they have important consequences in the strength of mixing with the higher levels of the atmosphere.

In some cases, perturbations of the flow can play an important role in triggering transitions. Using different randomised models of the stable boundary layer, we will investigate the role of natural fluctuations of atmospheric processes to trigger regime transitions.

We then apply a combination of methods from dynamical systems, statistical modelling and information theory to study and detect those regime transitions. A statistical-dynamical indicator is developed as an early-warning signal of regime transitions that can be applied to highly non-stationary field data.