



## **Orographic gravity waves in a time-dependent flow**

Peter Spichtinger (1) and Fabian Fusina (2)

(1) University of Mainz, Institute for Atmospheric Physics, Mainz, Germany (spichtin@uni-mainz.de, +49-(0)6131-39-23532), (2) ETH Zurich, Institute of Atmospheric and Climate Science, Zurich, Switzerland

In this study the impact of time-dependent large scale flows on the excitation and propagation of orographic gravity waves is investigated. Usually, orographic waves are investigated using steady-state flow conditions. However, this approach might be a kind of unrealistic, because flow conditions (e.g. wind speed, wind direction, wind shear etc.) could change in nature with time. We use a new method of transient environmental states as recently implemented into the Eulag model in order to investigate the formation and propagation of orographic waves under changing conditions. The results are compared with linear theory. The transition between different flow regimes leads to non-linear effects, which cannot be studied under quasi steady-state conditions. The strength of these effects crucially depends on the ratio of timescales of the excited wave packets and transitional timescales of the background flow.