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Validation of Atmospheric Dynamics (VADY) – connections between planetary waves and atmospheric circulation types

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The climate research program "Medium-range Climate Predictions" (MiKlip), funded by the Federal Ministry of Education and Research in Germany (BMBF), has the aim to develop a climate model system (MPI-ESM) that can provide reliable decadal predictions of climate, including extreme weather events.

A substantial part of the development process is a comprehensive model validation. Within MiKlip, it includes comparisons of model simulations and observations in order to allow statements about the performance of the model and to give particular recommendations for the further development of the model. The research project "Validation of Atmospheric Dynamics" (VADY), conducted by the cooperation partners "Institute of Geography at the University of Augsburg" (IGUA) and the "German Aerospace Centre" (DLR), contributes to model validation within MiKlip with a special focus on atmospheric waves and circulation dynamics.

Within the framework of VADY, DLR validates the representation of atmospheric waves on different levels and scales based on suitable activity indices (e.g. the so-called large-scale dynamical activity index (LDAI), which is a measure for the activity of planetary waves). The focus of IGUA is on the model validation with respect to the representation of atmospheric circulation types, dynamical modes and the teleconnectivity of the atmospheric circulation.

Currently, the connection between LDAI and atmospheric circulation types on different levels and for different seasons in the North Atlantic-European region is analysed by considering, in particular, the North Atlantic Oscillation. Results will be shown for the connection between LDAI and atmospheric circulation types and subsequently for the representation of the identified connections in the decadal-prediction model system of MPI-ESM.