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Circulation types and related precipitation extremes in Southern Germany and Austria

Markus Homann (1), Jucundus Jacobeit (1), Christoph Beck (1), Andreas Philipp (1), Michael Hofstätter (2), and Barbara Chimani (2)

(1) University of Augsburg, Institute of Geography, Germany (markus.homann@geo.uni-augsburg.de), (2) Central Institute for Meteorology and Geodynamics, Vienna, Austria (michael.hofstaetter@zamg.ac.at)

This study refers to Southern Germany and Austria for which a gridded daily precipitation set with 6km horizontal resolution is available for the 1951-2006 period. Regions of similar precipitation variability are determined by a s-mode principal component analysis (s-PCA) and regional mean precipitation series are calculated. . Extreme regional precipitation events are defined by the 90th percentiles of daily precipitation on seasonal basis (DJF, MAM, JJA, SON). Large-scale atmospheric circulation types are derived by different statistical methods and variables by using the COST733 classification software and gridded daily NCEP1 Reanalyses-data. To evaluate the performance of particular circulation type classifications with respect to regional precipitation extremes, the Brier-Skill-Score (BSS) has been applied.

It becomes apparent that the regionalization of precipitation variability in southern Germany and Austria results in seasonally varying numbers and spatial extents of rainfall regions. Additionally, this area is characterized by heterogeneous surfaces with different large-scale, but also local influences. Thus that it is necessary to figure out the most suitable approach for circulation type classification separately for every single rainfall region and every season. Therefore, each classification has to be evaluated by the BSS and, in a second step, has to be cross-validated to verify the temporal stability.

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