



## **Cyclogenesis and severe weather in the vicinity of the Atlas Mountains: studies using a nonhydrostatic mesoscale atmospheric model**

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**ABSTRACT:** Northwest African climate is affected considerably by the Atlas Mountains. Several typical weather phenomena - as extra tropical fronts, orographically forced convection, mountain lee cyclogenesis - connected to rainfall variability in arid and semi-arid regions in the northern part of the Sahara and in the Mediterranean are enforced by the mountains. In the framework of the project IMPETUS West Africa a non hydrostatic mesoscale model - the numerical weather prediction model *Lokalmodell* (LM) of the German Weather Service - is used to enhance the knowledge about rainfall variability in the Drâa river valley, which is located on the southern slope of the High Atlas Mountains.

In order to focus on extreme events, two recent cases with severe damages and loss of lives - the Alger mud flood on Nov 9/10, 2001 and severe floodings in Morocco near Rabat in the week of Dec 3-7, 2002 - are investigated in more detail. The role of the Atlas Mountains is of great importance in these cases, since they act as barrier for maritime moist air and on the other hand as a source of potential vorticity for cyclogenesis. Sensitivity studies on land use characteristics, use of different physical parameterizations, corrections of the initial state of the atmosphere and a simple technique for model output statistics contribute to a substantial improvement of rainfall predictions.