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Modelling of extreme precipitation over the North Atlantic Ocean

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A simulation for the North Atlantic was conducted for the special research project 512 using the regional climate model REMO. The ERA40 period (1958-2002) was covered to study water cycle components over the North Atlantic Ocean. The uncertainties were evaluated by a comparison of the model results with SSM/I satellite data. The comparison shows a small overestimation of precipitation due to a positive bias in wind speed that leads to higher evaporation. Special events with high precipitation are underestimated in the regional climate model simulation compared to satellite data and ship observations. These events are characterized by cold air mass outbreak from Greenland over the warm ocean behind a cold frontal system.

This work analyses the physical processes of this phenomenon to modify the regional climate model. The main changes are in the model itself and in the spatial resolution of the model domain.