



Sensitivity of a regional Mediterranean climate model to the lateral and lower boundary conditions

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Scale interaction is an important process in determining both the global climate and regional climate. In particular, the Mediterranean region is suspected to have complex interactions among atmospheric circulations at different spatio-temporal scales. This issue, also important for regionally-oriented projections of future climate change, is investigated through the utilization of the model LMDZ-Mediterranean. It is a global atmospheric general circulation model with a zoom over the Mediterranean Sea and used as a regional climate model. LMDZ-Mediterranean is nudged into the LMDZ-global every 6 hours for 30 years. The lateral-boundary conditions from the global model are artificially modified in order to investigate the effects of large-scale circulation at synoptic scales on the Mediterranean climate. Results show that the "external" component of the Mediterranean climate is important, for both the mean and standard deviation of climate variables. The external component of the Mediterranean climate is smaller in summer than in winter. Furthermore, the synoptic variations from the high and low latitudes are separately quantified. The interactive role of the Mediterranean Sea in the regional climate is also investigated through the utilization of a slab-ocean model which is coupled into the LMDZ-Mediterranean.