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Uncertainty range of simulated air temperature at surface and upper air levels over central Europe

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For almost 20 years the regional climate models (RCMs) have been widely used as a downscaling tool of global climate models to provide information on smaller scales. RCM simulations are used for various purposes. The analysis of sources and magnitude of the uncertainties in RCM outputs is a very important task and significant amount of basic research remains to be done in this field. The uncertainty in RCM outputs can be estimated by the spread of simulations in a multi-model ensemble. We present an analysis of how does the range of uncertainty in RCM outputs develop in time. We also pay attention to subsets of RCM simulations driven by different GCMs to analyze the influence of the driving fields. To quantify the overall uncertainty we use the standard deviation and its differences between time periods are tested using bootstrap confidence intervals. We also show that the standard deviation is more appropriate for our purposes than median absolute deviation and inter-quartile range. Results are shown for 30year seasonal means of 2-meter air temperature as well as air temperature in selected upper air levels simulated by ENSEMBLES RCMs for selected geographical areas with different topographical characteristics over central Europe. Preliminary results are shown for the Euro-CORDEX simulations as well.