



Climate change and heat and cold wave frequencies for different locations in Europe

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Heat and cold waves are important meteorological events related to electricity production and consumption. Therefore, we developed a stochastic model for temperature able to correctly reproduce extreme events and this tool can be used to downscale climate model simulations. As a matter of fact, the stochastic model simulates the residues after removing trends and seasonalities in the mean and the variance of temperature time-series. Thus, once the model has been calibrated on an observed time-series, future time series can be re-constructed from the modelled residues and the trends and seasonalities given by any climate model simulation, suitably corrected. This technique allows increasing the number of temperature time-series in order to infer the significance of possible changes. When applied to study the frequency changes of heat or cold waves of different lengths, from 1 day to more than 15 days, preliminary results have shown that the changes are significant only for very long heat or cold waves in the near future. This first analysis will be extended to further locations in Europe and future time periods, using the CMIP5 simulation results of different climate models, in order to check the robustness of such results and to further investigate possible changes in the frequencies of heat and cold waves. The presentation will thus describe the used methodology and detail the main results obtained when applied for different temperature time-series.