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KlimaCampus Kolloquium

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What do we need to know about weather and climate extremes in a warming world?

One of today's major challenges in climate sciences is how to use our state-of-the-art models and climate system knowledge to inform decision making regarding societal responses to climate change. Among the five key reasons for concern, according to the Intergovernmental Panel on Climate Change (IPCC), are the risks from weather and climate extremes. Severe impacts could be prevented or alleviated through appropriate adaptation measures and better preparedness. Weather and climate extremes are influenced by a complex interplay of natural and anthropogenic factors that determine their occurrence, frequency, and intensity. Adaptation planning is challenged to take into account near- and long-term variability and changes in weather and climate extremes and associated uncertainties. Two different approaches will be presented to show how the influence of large-scale circulation patterns, such as atmospheric blocking and atmospheric rivers, can be utilized to improve our understanding and simulation of heatwaves and extreme precipitation events, respectively. The uncertainties related to simulations of heatwaves and their dynamical drivers is investigated using large ensembles of state-of-the-art global and regional climate models. For the case of extreme precipitation, a model chain approach from a high resolution Earth System Model to a convection permitting Numerical Weather Prediction model is employed. Different opportunities to provide impact-relevant information on changes in weather and climate extremes will be presented, which involves, for instance, finding appropriated indicators and incorporating process understanding in extreme value distributions.

Jana Sillmann from CICERO (Center for International Climate Research), Norway, is invited by Detlef Stammer (CEN).

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