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KlimaCampus Colloquium

Michael Riemer

Hurricanes and Rossby waves: Dynamics and predictability in the middle latitudes

The midlatitude climate is characterized by the ever-changing weather associated with the alternation of high and low-pressure systems. These surface pressure systems are associated with undulations of the midlatitude jet stream, so-called Rossby waves. Understanding the dynamics of Rossby waves is therefore fundamental to understanding the midlatitude weather.

In this presentation, we will first focus on the weather timescale. It will be demonstrated that moist processes play an important role in the amplification of the Rossby wave pattern. Tropical cyclones that interact with the jet stream and move into the midlatitudes are showcase examples of such amplification. At the same time moist processes have limited predictability, which may severely affect the larger-scale wave pattern within a few days. Processes that govern this upscale error growth will be examined. In the context of moist processes, we will then discuss the low bias in Rossby-wave amplitude of current global weather prediction models.

In a concluding discussion, I will attempt to link the insights gained on the weather timescale to current discussions of extreme events related to large-amplitude Rossby waves in a warming climate.

Michael Riemer, Institute for Atmospheric Physics, Johannes Gutenberg-Universität Mainz, invited by Stefan Bühler, Meteorological Institute.

Bundesstraße 53, Room 22/23 (ground floor)