

Feature-based perspectives on midlatitude cyclones in a warming climate

Stephan Pfahl (FU Berlin)

Abstract:

Future changes in the frequency and properties of midlatitude cyclones may have important consequences for society, but many of the mechanisms underlying such potential changes are not yet well understood. This presentation will provide a brief overview of the recent literature describing projected future changes in cyclone properties. Subsequently, the potential vorticity framework will be used to study the impact of future changes in atmospheric moisture content and associated latent heating during cloud formation on cyclone dynamics. Using both idealized and fully coupled climate simulations, it will be demonstrated that increased latent heating can be expected to lead to robust changes in the potential vorticity anomalies associated with cyclones in a warmer climate. Possible linkages of these potential vorticity changes to cyclone impacts in terms of precipitation and near-surface wind velocities will be outlined.