

PHYSIKALISCHES KOLLOQUIUM

Sommersemester 2024

Das Kolloquium findet (soweit unten nicht anders angegeben) jeweils montags **jeweils montags um 16:15 Uhr online via Zoom** statt.

(Der jeweilige Link wird noch zur Verfügung gestellt.).

10.06.2024

Prof. Dr. Tiffany Shaw

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Fast upper level jet stream winds get faster under climate change

Abstract

Earth's upper-level jet streams influence the speed and direction of travel of weather systems and commercial aircraft. The fastest jet stream winds are also linked to severe weather occurrence. Here we combine our understanding of the fundamental physics governing the existence of the jet stream with daily data from physics-based numerical climate model projections across a hierarchy of physical complexity to show fast jet stream winds get faster under climate change. We also show the fastest winds increase substantially more than the average winds. We explain the physical mechanism underlying why fast winds get faster and show it follows from the non-linear Clausius-Clapeyron relation. The results show moist thermodynamics can explain projected future changes in commercial flight times and clear-air turbulence, including a potential increase in severe weather occurrence under climate change. We highlight that this combination of simulating and understanding the response to climate change gives us confidence in future predictions and also underlied the successful climate change predictions that were awarded part of the Nobel Prize in Physics in 2021.

Für die Dozentinnen bzw. Dozenten der Fakultät

Prof. Dr. Hinkov, Prof. Dr. Hinrichsen, Prof. Dr. Porod, Dr. Ünzelmann und Hr. Kuhr