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# KlimaCampus Kolloquium

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## State-dependent cloud feedbacks make equilibrium climate sensitivities $> 5^{\circ}\text{C}$ plausible

For decades, global climate models (GCMs) have produced equilibrium climate sensitivities (ECSs) between  $2$  and  $4.5^{\circ}\text{C}$ , but interestingly that is now about to change: a subset of state-of-the-art GCMs participating in the 6<sup>th</sup> coupled model intercomparison project is producing ECSs well above  $5^{\circ}\text{C}$ .

Here, I present analyses based on one such high-ECS model. In the past, it has been assumed that such very high simulated ECSs would make it practically impossible for GCMs to reproduce the historical temperature record, but that turns out not to be the case. This is because the model in question has a net positive cloud-climate feedback that grows with warming – in other words: the warmer it gets, the more clouds change in a way that further amplifies the warming, while for modest warming the amplification is much smaller.

In this presentation I will explain the underlying physical mechanism responsible for the simulated state transition and discuss its general validity and broader implications.

**Trude Storelvmo, from the University of Oslo, Norway, is guest of Jochem Marotzke (MPI-M).**

**Bundesstraße 53, Room 22/23 (ground floor)**