



## **Connecting Tipping points in the climate; bridging models and paleoclimatic data**

Peter Ditlevsen

University of Copenhagen, Niels Bohr Institute, Centre for Ice and Climate, Copenhagen O, Denmark (pditlev@nbi.ku.dk)

There is rising concern that several subsystems of the Earth may respond highly nonlinearly at critical future levels of anthropogenic forcing; these levels have recently been associated with tipping points (TPs). It is paramount to identify safe operating spaces for humanity and the planet in terms of these critical forcing levels, in order to prevent harmful transitions to alternative, undesirable states of the Earth system. The mechanisms leading to such abrupt transitions are only partly understood, and further research in this regard is urgently needed. State-of-art Earth System Models appear to respond too smoothly at TPs and have difficulties in simulating abrupt transitions that occurred in the planet's history.