



Threshold dynamics: The case of Dansgaard-Oeschger rapid climate shifts

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Modelling the full range of the non-linear fluctuations in the climate observed in the paleoclimatic record has yet not been successful using state of the art climate models. These seem to be reacting more linearly to changing external forcing, such as increased greenhouse gas concentration or the slow orbital changes in insolation, than the observed climate history indicates. In order to gain insight into the behaviour of the climate system the most pronounced rapid changes observed, namely the Dansgaard-Oeschger (DO) events, are analysed. Timeseries analysis of paleoclimatic records are performed from the perspective of dynamical systems theory. The DO events have no known external causes. The regularity of the occurrences has been debated, and a simple threshold model is introduced to show that pseudo-periodicity can arise from the stochastic variations originating in the internal fast time scale chaotic variations of the system.