



## **Natural variability of the Arctic Ocean fresh water content: short- and long-range dependence**

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During the last decade a large pool of fresh water has been build up in the Arctic Ocean and the question arises whether this could lead to a rather abrupt release of a fresh water pulse into the Northern North Atlantic. Fresh water releases originating in the Arctic Ocean are believed to affect ocean circulation and climate in the North Atlantic area.

The dynamics of the Arctic Ocean fresh water pool is investigated by analyzing a 500 year unforced run with the EC-Earth coupled climate model. A rather strong autoregressive behavior is found in agreement with the paradigm of uncorrelated atmospheric fluctuations integrating the Arctic Ocean fresh water content with only a weak damping. In addition to this short-range dependence, also long-range dependence with a Hurst exponent close to 0.9 is found and implications of this finding are discussed. Two different methods for estimating the Hurst exponent are considered: the in geophysics widely applied detrended fluctuation analysis and ML fitting of the ARFIMA model, and the superiority of the latter is demonstrated.