

Detection of climate trends from local time series using a Monte-Carlo-enhanced filtering process

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Forced by the 4th IPCC report the discussion about climatic change became very hot. Recently it's an extensive agreement that there is a temperature increase since pre-industrial time looking to the yearly mean temperature. But not overall the world the yearly mean temperature is clearly increasing. (And there are local monthly mean temperature time series showing a decreasing trend.) To understand the climate system and climate models it will be helpful to know the temperature trend depending on the locality or at least to latitude. Problems of filtering processes will be shown. A method to extract trends from time series (as new time series not as fitted functions) using a Monte-Carlo-enhanced filtering process was presented 2005 in Utrecht. The performance of the method will be demonstrated using simulated climate trend functions. The method will be applied at real climate series (1881 to 2008) of 40 stations. The calculations are made for yearly mean temperature and 12 monthly mean temperature. The results in temperature trends are compared with respect to the latitude. Using the temperature trend the change of net radiation energy input is calculated and discussed with respect to the latitude. The existence of Dansgaard-cycles is shown.