



Dynamic extraction of trends from climate records

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Trends are ubiquitous features in climate time series. One of the most common approaches in the analysis of climate records is to fit a linear model to the observations in order to describe long-term variability by a deterministic linear trend. However, linear trends are often a very poor and sometimes even inadequate description of long-term variability. This issue is particularly sensitive in a climate change context, since a multitude of interacting physical factors is not expected to originate deterministic linear trends. Therefore, flexible approaches are required for characterising long-term variability in climate records and to assess physically relevant features, such as stochastic trends and teleconnections-related signatures. Here, an approach based on the dynamic linear model representation for an autoregressive process is considered for the dynamic extraction of trends from climate records. The method yields flexible, time-varying descriptions of long-term variability and is illustrated in the analysis of tide gauge records from Chesapeake Bay, and of the global sea surface temperature field.