



Accessing extremes of mid-litudinal wave activity: methodology and application on a GCM

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A statistical methodology is proposed and tested for the analysis of extreme values of atmospheric wave activity at mid-latitudes. The adopted methods are the classical block-maximum and peak over threshold, respectively based on the Generalised Extreme Value (GEV) distribution and the Generalized Pareto distribution (GPD). The dataset consists of time series of various indexes of mid-latitude atmospheric wave activity at different spatial scales : the wave amplitude index (WAI) and the baroclinic activity index (BAI). The statistical significance of our results has been thoroughly assessed by standard diagnostic tools. The analysis of extreme values is complemented by an examination of composite maps of the extremes of the maxima. The time series are generated by the General Circulation Model ECHAM4.6, which is run under perpetual January conditions. A remarkably large sampling variability is found in the statistical estimations (carried out by maximum likelihood) of the GEV and GPD parameters. The consequences of this phenomenon in applications of the methodology to studies in climate change are discussed.