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Sensitivity analysis of expected wind extremes over the northwestern Sahara and High Atlas region

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A robust statistical framework in the scientific literature allows for the estimation of probabilities of occurrence of severe wind speeds and wind gusts, but does not prevent however from large uncertainties associated with the particular numerical estimates. An analysis of such uncertainties is thus required. A large portion of this uncertainty arises from the fact that historical observations are inherently shorter that the timescales of interest for the analysis of return periods. Additional uncertainties stem from the different choices of probability distributions and other aspects related to methodological issues or physical processes involved. The present study, focused on historical observations over the Ouarzazate Valley (Morocco), is aimed at providing extreme wind speed and wind gust return values and confidence ranges based on a systematic sampling of the uncertainty space for return periods up to 120 years.