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Thunderstorm favorable conditions over Poland (1951-2018)

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The main goal of the study is to access the long-term variability of days with thunderstorm as well as days with atmospheric conditions favorable to its occurrence for Poland.
The analysis has been conducted with the use of two different data sources: 1) traditional manual thunderstorm observations over the territory of Poland (ca. 313 000 sq. km), i.e. daily observations from 42 high quality synoptic stations, 2) ERA-5 ECMWF reanalyzes, i.e. the Most Unstable Convective Available Potential Energy (MUCAPE) index variables.
As a threshold value determining possible thunderstorm occurrence, the value of MUCAPE >200 J kg^{-1} was selected. This choice was influenced by an analysis of thunderstorm occurrences in Poland as well as an analysis of studies that have addressed this issue.
It's been confirmed that the phenomena as well as the conditions favorable demonstrate quite similar tendencies over the period under consideration. However, some regional differences can be noticed. The results suggest the high possibility of using modeled data to describe long-term variability and to conduct trend analysis of thunderstorm occurrence in Poland, which is crucial in recent climate change research. Nevertheless the further research is desirable including remote sensing methods with special focus on lightning detection systems. It will enable to improve the parametrization of thunderstorm favorable conditions algorithm.