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<u>A</u>tmospheric <u>C</u>irculation Patterns and Deep <u>C</u>onvective <u>C</u>louds over Poland in the Context of Recent Climate Change

Ongoing in the last few decades increase in tropospheric temperature influences changes in global atmospheric circulation. As a result, an increase in the frequency of extreme weather phenomena, such as storms, heavy rains or hail, which threaten humans and their properties, is being noted. This project focuses on determining the relationships between change in the frequency of deep convective clouds (which are a cause of developing all storms) over Poland and the changes in atmospheric circulation over Europe and North Atlantic.

The aim of the research is to determine, whether in the last 40 years the location of air masses, in which deep convective clouds form over Poland, has changed. Additionally, it will be analyzed, if those clouds had frontal or local regime type and how the ratio of those two had changed.

During the research, satellite data from geostationary Meteosat First Generation (Meteosat Visible Infra-Red Imager, MVIRI) and Meteosat Second Generation (Spinning Enhanced Visible Infra-Red Imager, SEVIRI) satellites will be used, in total over the 1983-2023 period. In the study, HYSPLIT model (HYbrid Single-Particle Lagrangian Integrated Trajectory) will also be used, and it will allow to determine backward trajectories of air masses, in which deep convective clouds developed.

The effect of the project realization will be a map showing the change of indicating individual regions as a source areas of air masses, in which deep convective clouds over Poland have shaped. The analyze performed in the study will allow to conclude whether changes in deep convective cloud frequency over Poland (if they exist) are associated with the changes of air masses that have been arriving in Poland or are a result of the changes in local factors.