STORMS OCCURRENCE IN POLAND – ANALYSIS OF SYNOPTIC STATIONS OBSERVATIONS VS. PERUN LIGHTNING DETECTION SYSTEM MEASUREMENTS

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I. INTRODUCTION

The economy's sensitivity to natural disasters is continuously increasing due to increase of the infrastructure's technological level. One of the atmospheric phenomena which have substantial influence on proper functioning of many fields of economy is lightning which accompany storms. As a result, there is a growing demand for more detailed studies concerning both temporal and spatial variability of this phenomenon.

II. DATA AND GOALS OF RESEARCH

Previous climatological studies were mainly based on records of visual observations performed at meteorological stations. Detailed and continuous information on lightning from PERUN (SAFIR system) lightning detection system have been available in Poland for several years. With these data, it was possible to make an attempt to compare and verify storm days occurrence in Poland determined with the use of standard synoptic observations and measurements provided by Perun system. Data from 52 synoptic stations and 9 Perun system posts for the years 2004 – 2008 were used.

The analysis performed had mainly methodological character, but it also had a cognitive aspect. The level of agreement between synoptic stations observations and Perun system detections was tested. The methodology for determination of a storm day from Perun data was prepared, and preliminary verification of this method was done with the use of satellite data, which can prove deep convection. Basing on that, the areas of storm occurrence which can be represented by individual synoptic station observations were defined. The spatial distribution of storm days in Poland was determined on the basis of synoptical observations and lightning detection system, separately for earlier defined regions represented by existing synoptic stations and for entire Poland.

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