



Supercell tornadoes in Poland - case study

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Every year over the area of Poland we record several dozens of events which the media and the public tend to call tornadoes. The majority of such occurrences are connected with winds produced by another phenomena and only very few events are actually the consequences of a real tornado. Usually occur vortices, which are called landspout and waterspout. In 2000-2012 were noted no more than five cases of supercell tornadoes. Unfortunately, due to the lack of basic emergency warning system, even those few events happen to be highly destructive and pose threat to human life or well-being. This is mainly the outcome of selective monitoring of tornadoes performed in our country and no practical application of radars to detect them. The fact that no multi-faceted research on this topic has been carried out makes it difficult to specify potential conditions conducive to occurrence of severe tornadoes in this region of Europe. As a result, implementation operations aimed at safety improvement have been abandoned. The purpose of this paper is then to specify potential meteorological conditions characteristic for these days when dangerous supercell tornadoes occur in Poland, as well as to evaluate the possibility to detect them by means of available methods and devices. Based on ESWD reports, a set of tornado-type occurrences was selected. Several radar products were analysed in time intervals of 10 minutes. The following parameters were considered: maximum values of reflectivity, values of reflectivity at a height of 1-2 km above sea level, vertical wind profile, vertical wind shear, as well as echo height. Based on the damage in the forest stand, witnesses and film or photographic documentation, recreated the path of tornadoes in that day. Moreover, the type of storm formation and the altitude of storm cloud tops, was defined. Additionally, satellite images, synoptic maps and vertical aerological soundings were used. Among others the convective parameters and wind shear indications were calculated.

Key words: tornado, supercell, storm, mesocyclone, Poland