



For Details, Contact:

Petio Simeonov

National Institute of Meteorology and
Hydrology
Sofia-1784
Bulgaria

Conference on European Tornadoes and Severe Storms

Dynamics and synoptic conditions of development of some severe hailstorms and tornadoes over Bulgaria

Petio Simeonov, Rangel Petrov and Kiril Slavov, National Institute of Meteorology and Hydrology, Sofia-1784, Bulgaria

A brief overview of weak tornadoes (wind spouts) that occurred in the period 1904-1989 (recorded in the meteorological archive and described in scientific papers) has been carried out. On the basis of 12 such events, has been found that the probability of a given point "being struck" by a tornado, is about $9.177 \cdot 10^{-6}$ per year, according to Ivanov and Latinov (1992), who used the method for finding tornado characteristics described in Simiu and Scanian, 1978.

The meteorological conditions, dynamics, structure and evolution of several severe hailstorms (non-seeded from hail suppression program) have been analyzed using synoptic, aerological and radar (from the automated MRL-5 radar Center in Gelemenovo) data. On two of these occasions - on 20 June 1997 and on 15 May 1999, the tornado events inflicted significant damages on houses and properties. The synoptic analysis for the surface and 500 hPa height fields, is also applied to tornado cases. The supercell hailstorm from 18 June 1997 produced intensive hailfall, with its maximum size approaching that of an egg (weight about 300 grams), and of orange (weight about 600 grams).

The thunderstorms accompanied by extreme weather events (intensive hail, shower, windstorm or tornado) form as a result of deep convection. That takes place most frequently during a mesocyclon formation over South Bulgaria, Macedonia and North Greece (Mediterranean air masses), and on convergence of warm air mass with colder air mass penetrating with slow-moving cold front from NE, N, NW direction.

The problem (Dessens and Snow, 1989) with current registration and classification of severe thunderstorms with tornado, according to features and scales (territory and orography) of European countries, is also discussed. The research interests in these hazardous phenomena have been motivated by their likely, high

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frequency of occurrence in recent years, something not yet established.

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