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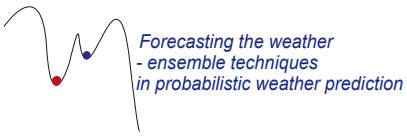

Meteorological conditions of ice and snow accretion in the southern and central regions of the Ukraine

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Atmospheric icing is a generic term for all types of accretion of frozen water substance, generally belonging to two main categories: (1) precipitation icing that results in glaze, wet or dry snow and (2) in-cloud icing, which generates hard or soft rime. Both may cause severe damage to various types of infrastructures such as power lines, wind turbines, telecommunication towers or high masts, ski lifts etc.

In this study the various ice accretions, namely glaze, hard and soft rime, dry, wet and frozen wet snow, from 1996 to 2009 over the southern and central regions of Ukraine, is examined on the basis of the hourly weather observation for 39 stations. All type of the atmospheric icing, except dry snow, take place from October to April with the maximum occurrences in December and January. Dry snow never occurs over the territory in question. The highest frequency of occurrence of atmospheric icing is obtained for the Kherson and Kharkov regions.

It is well known that the density and type of ice strongly depend on the air temperature and wind. Therefore for all stations the frequency distribution of icing events as dependent on surface air temperature and wind are obtained. The most glaze events (about 90%) are connected with the slightly negative temperature up to -4.0oC. Approximately 90% of the soft rime cases are related with the -20.0...-6.0 oC interval. Type of accreted ice as a function of wind speed and air temperature is derived. In case of presence of icing conditions aloft these relationships may be used for the purpose of forecast of ice accretion type.

In order to provide the information about the maximum expected amount of accreted ice at a certain site, in according to 'COST 727: Atmospheric Icing on Structures Measurements and data collection on icing: State of the Art' a site icing index is calculated by using icing frequency, duration and intensity. For all stations degree of severity of local icing conditions varies from 'occasional' to 'moderate'.