1 Atmosphere stability favorable for fog formation in Poland

R. Bakowski, **A. Glowacka**, E. Olszewska, M. Paradowski, W. Wiazewski
Institute of Meteorology and Water Management, Poland

Stability of the lowest atmosphere layer, turbulence and moisture content are the elements important in the process of fog formation. The attempts of creating a complex index representing all those elements within a mathematic formula have been described in the literature (Analysis of..., 1999, Pasini, A., Pelino, V. and Potesta, S., 1999).

Among the objective methods of fog forecasting the most often used predictor is the index representing low troposphere stability known as Fog Stability Index (FSI) (Wantuch F. 2003).

FSI is a very strongly locally related index. Based on analyses of conditional probability of fog formation corresponding to each FSI value section for two main Polish airports (Warsaw-Okecie) and Krakow-Balice), verification has been made which led to narrowing the value sections in order to obtain more precise predictor for fog forecasting. The idea rose to undertake the attempt of constructing a specific index adequate for Polish conditions.

Vertical thermal gradient within the layer between ground and 850 hPa, inversion layers, thermal-humidity relations, wind speed within the layer, were examined in order to find the index describing conditions favorable for fog formation. Synoptic, aerological data as well as data from re-analyzes NCEP/NCAR was used.

References

Analysis of Rapidly Developing Fog at the Kennedy Space Center 1986 – 1990 Final Report, 1993, NASA, Kennedy Space Center, Under Contract NAS10-11844

Pasini, A., Pelino, V. and Potesta, S., 1999. A Neural Network model for visibility nowcasting from surface observations: results and sensitivity to physical input variables, submitted to Journal of Geophysical Research

Wantuch F. 2003: Visibility and fog forecasting based on decision tree method. COST-722: Very short range forecasting of fog and low cloud. Inventory phase of current, KNOWLEDGE AND REQUIREMENTS BY USERS AND FORECASTERS. 3.7 Hungarian report 61-71 pp 2003.