2.05 AN OBJECTIVE METHOD OF THE OF STABILITY-SEGMENTED WIND ROSES CONSTRUCTION IN COMPLEX TERRAIN

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SYMOS Gaussian dispersion modeling system has been laid down as a reference model for the regulatory purposes by the Czech environmental legislation. Among others, a stability-segmented wind rose is used as a standard model input. For this class of models, a wind rose from the nearby airport or meteorological station is commonly used. Owing to complex orography of the Czech Republic territory, this approach is inapplicable over the majority of the country area. These roses should be modified by qualified expert with respect to the distinguished structures of the terrain shape.

In quest to find an unbiased approach to the wind roses construction, an objective method based on the CALMET preprocessor application has been proposed and tested in Czech Republic. One-year time series of hourly data from the nearby meteorological stations, profile data from the Prague radio-sounding station an detailed digital terrain model of the area of interest enter into CAMET model. For the each grid point covering the area, CALMET provides a one-year series of hourly wind and temperature data in suitably set of height levels. After evaluation of vertical temperature gradients and arranging the modeled wind data according to SYMOS stability classes, stability-structured wind roses for three wind speed categories can be derived from the wind direction class-frequencies.

The procedure described above has been applied in the region with the complex terrain where meteorological station is located. The wind data from the station, having been assumed as "unknown" for the CALMET model, enabled to construct a real wind rose for comparison with this created using the CALMET output. Another wind rose, constructed according to existing "expert-guess" approach, was compared to both previous ones as well. The results of wind roses comparison are presented and possible causes of differences among them are briefly discussed.