

9.20 NOWCASTING THE FREEZING RAINFALL IN THE AUTOMATED SYSTEM “METEOTRASSA”

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The “MeteoTrassa” is an automated system of measuring, collecting, processing and dissemination of the specialized meteorological information for support of technological decisions on the maintenance of highways and runways. It includes meteorological and road sensors providing measurements of air temperature and humidity, wind parameters, rainfall intensity, temperatures of surface and of soil at a depth of 40 cm and present weather detectors. The system integrates weather radar information. Dual polarization radar data is used to obtain operational information about precipitation zones, their movement and phase state. The “MeteoTrassa” provides users with current weather information and forecasts with 4 hour ahead, including forecasts of freezing rainfall onset. The forecast of freezing rainfall is based on the following information: road or runway surface temperature, air temperature at a surface layer and at the AT-850 level; information on precipitation including its phase state, parameters of cloudiness movement.

Prognostic position of the cloudiness is estimated using relevant information on wind parameters. The regression analysis in which the current predictive values of wind speed and direction act as predictors is applied for calculation of speed and direction of cloudiness field. Forecasts are run automatically every 10 minutes. Prognostic values of air and surface temperature are based on the numerical model of atmosphere boundary layer, which is a part of the system. After the complex analysis of relevant meteorological information, the “MeteoTrassa” generates forecasts of the freezing rainfall with advance time up to 4 hours. This information allows users to take measures for prevention of a negative impact of the freezing rainfall on their technological processes of maintenance of highways or runways. The “MeteoTrassa” provides on-line validation of freezing rainfall nowcasting.

Results of verification of freezing rainfall nowcasts for 2 years of the “Meteotrassa” operation at the airport of Saint-Petersburg are presented.
