THE USE OF COMPLEX METHOD OF STORM DETECTION AND FORECASTING OF SEVERE CONVECTIVE STRUCTURES BASED ON MODELLING AND SATELLITE DATA FOR THE TERRITORY OF THE REPUBLIC OF BELARUS

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Abstract

The key goal of research was analyse method of diagnosis of severe convection structures (convective storms). The method of complex diagnosis and forecasting of severe convective structures (MSG_Stratification) was observed. The method is based on using of numerical model data with high spatial resolution and remote sensing data. The study period covered the time interval summer period of 2018. For verification radar and weather station data were used. The results showed that the method has more accuracy for severe convective structures, such as the mesoscale convective complexes and another mesoscale convective systems. Sometimes, in zones of active cyclones, along fronts, presumably in areas of large-scale removal of water vapor to the upper layers of the troposphere, there may be cases of false detection of areas of powerful convection. In this regard, to mask these false zones, an additional parameter was introduced into the methodology - the lifted index (one of convective instability index).

The Methods of MSG_Stratification

The algorithm includes parameters that produced from analyses IR 10.8 µm and WV 6.2 µm channels of satellites Meteosat-11 and numerical weather prediction fields. The first step of the algorithm is to analysis parameters on possibilities convection. The next step is calculating of intensity convection if it’s possible [1]. (Fig.1)

Results

On July 13, 2018, the weather in the Republic was determined by a small cyclone with the front of occlusion and the line of instability (convergence) (Fig.2).

Conclusion

The approach described can be advantageous for specialists to diagnostic severe convective storm. The results showed that the method has more accuracy for severe convective structures, such as the mesoscale convective complexes and another mesoscale convective systems.

BIBLIOGRAPHY