The investigation of synoptic conditions of sandstorm formation and its thermodynamic characteristics

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Sandstorms is one of the most interesting and dangerous atmospheric phenomena. There were many not clear aspects despite of long-term interest to processes of their formation and evolution. Even the set of an empirical material is complicated with localness of the phenomenon. Therefore researchers frequently to have draw a conclusion about sandstorms characteristics only by results of their destructive activity and the eyewitness account.

In this work synoptic and thermodynamic conditions of sandstorm formation which was observed on July 22 2002 in Crimea are briefly submitted. With the purpose of studying occurrence, development and decay of overcast to which this atmospheric phenomenon has been connected, here are used 3-D nowcasting and forecasting models.

It has been received, that values of a vortical motion increase to some height, then start will decrease. Above this level the quantity of the centers with anticyclonic and cyclonic rotation has decreased, but thus the increase in their area was observed. Development of cumulus cloudiness was accompanied by increase in value of a vortical motion. At heights it occured more intensively and had the big size than at surface. Here were vertical movements with big intensity updraft and downdraft. Vertical extent of columns with updrafts not less than 11 km heigt under separate places.

Comparison of pseudo-potential temperature distribution with updrafts allows to contend, that almost always reduction of pseudo-potential temperature values is accompanied by intensive vertical movements. Zones of downdrafts can coincide with such areas also.

The values of rotor in receiving results exceed the values (0.01 1/s) of the vortex formation theory in the Cb (which was developed by Romov A.I. and based on application the vorticity equation) investigates the factors causing hazards. Diagnostic criteria and forecasting recommendations by hazard estimation are considered.