Numerical modeling of some mesometeorological processes of the atmosphere

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The 2-D problem of the mezoscale boundary layer of the atmosphere (MBLA) in case of temperature nonhomogenouso underlying surface is set and solved. Such ecologically important processes as stratus clouds and radiation fogs are simulated (they are active "aggressors", accumulators of hazardous substances); space-time fields distributions of components of wind, temperature, pressure, specific humidity and water content are received.

This task is considered by us also as distribution of a thermal wave in the atmosphere. Periodic decisions in the conditions of the daily course of temperature of the underlying surface are received. This task contains the properties of synergy characteristic processes.

On the basis of matching of the corresponding initial-boundary and physical conditions a number of such abnormal processes as was simulated:

simultaneous existence of a cloud and fog;

mutual transformation of a cloud and fog;

daily-continuous cloudiness;

vertical complex of a cloud and fog.

Influence of horizontal and vertical turbulence on meteoprocesses was in details researched. They are responsible for forming of many processes. With their help becomes possible to explain distinction between a tropical cyclone and a tornado within even to the MBLA model.

The task about distribution of an aerosol in MBLA from an instant point source is set and solved. Space-time distribution of concentration against the background of MBLA thermohydrodynamics is received. At this stage interaction of an aerosol and water content isn't taken into account.

Results of the solution of the problem qualitatively well describe the considered process.