

ON THE INSTABILITY OF THE ELECTRICALLY CHARGED BOUNDARY BETWEEN A TWO-PHASE THUNDERCLOUD AND TURBULENT ATMOSPHERE AND THE POSSIBILITY OF A TORNADO TRUNK FORMATION

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The stability of relatively small perturbations in the stationary state of a plane stationary interface between a two-phase thundercloud and a humid turbulent atmosphere (Fig. 1) has been analyzed with regard to medium viscosity. It has been indicated that two mechanisms could result in medium interface instability. The criteria characterizing the instability origination conditions have been obtained. It has been qualitatively indicated how the development of the instability could result in the formation of "a trunk" that forms a tornado funnel, if viscosity is taken into account. The obtained relationships make it possible to identify critical atmospheric conditions under which a tornado funnel can be formed [1 - 3]). The results can be used as an initial state in the numerical calculations of the flow characteristics within a tornado funnel and during laser and microwave sounding used to analyze an electromagnetic signal reflected from the mother cloud surface.

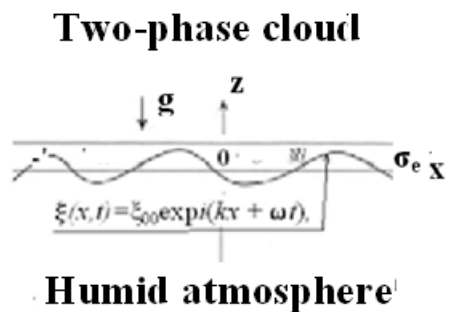


Figure 1. The horizontal boundary between a two-phase mother cloud and humid atmospheric air.

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References

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