Geophysical Research Abstracts,
Vol. 11, EGU2009-6708, 2009
EGU General Assembly 2009

Synoptic vortex passage through a city and baroclinical instability

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A possibility of the baroclinical instability development due to the interaction of the pressure gradient and the temperature gradient over a city is discussed. The pressure gradient is caused by a synoptic vortex while the temperature gradient is due to the fact that inside a city the temperature is higher than that in the suburbs. Since the characteristic size of the city is one–two orders of magnitude smaller that that of the synoptic vortex we assume that the pressure gradient is given by a linear dependence on the coordinate. We find conditions for the instability development and discuss the interaction of atmospheric dust particles with the vortex and their possible influence on the environment. This work was supported by the Russian Foundation for Basic Research.