



Study of dust inflation mechanisms and processes of aerosol transport process in Siberia-Asian region

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The formation process of micro-scale circular cells like breeze and mountain-valley wind caused by temperature gradients on small space scales are united under the name of Thermo-convection. Though thermo convection causes low winds (about 3-5 m/s) it is enough for formation and maintenance of dust structures and therefore dusts transport.

Analysis of processes in sub ground atmospheric layer assisting the soil aerosol emission into atmosphere point to several possible mechanisms. First of them is aerodynamical one causing local exceeding of threshold value of dynamical speed. It may occur on time of sand dunes air flow or vortex formation in convective boundary layer. Possible mechanisms are soil particles electrization at time of moisture evaporation resulting in weakening of bonding between sub micron particles with larger ones. Erosion also may be possible because of ventilation processes in upper soil layer.

The evolution of the dust size distribution during the course of soil particle motion can be simulated by a sandblasting model as a function of major micrometeorological and soil parameters. Relations of saltation sand flux to wind stress for sand sheets is also can be described theoretically and experimentally. Less well known is the relation between sand flux and dust emission by sandblasting. It can be evaluated on the base of experimental data [1,2]. Using this knowledge, dust models have been constructed

which have in part been successful in predicting mineral dust concentration. However, for other more complicated dust producing areas, dust models are not adequate [3]. It is inadequate modeling of the effects of vegetation and dunes on dust fluxes especially during convective conditions. The quantification of defined source areas with regard to geographical extension, physical, mineralogical and chemical characteristics should be more and more subject of future research using satellite data and quantitative mineralogy by taking into account that different sources exist for different seasons.

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