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P-04. Marko Kaasik: Tracing the aerosol nucleation events with atmospheric transport model SILAM

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This paper is intended to clarify the geographical extent of processes leading to a nucleation event and the role of atmospheric transport in it. The study is based on the inverse (adjoint) runs of atmospheric advection-diffusion model SILAM and general knowledge on basic mechanisms and time scales of nanometer-sized particle formation in the atmosphere. Results of two aerosol measurement campaigns were used as sensitivity source data for backward tracing:

- in Värriö, Finland, Eastern Lapland, April – May 2003;
- in Preila, Lithuania, Kura isthmus, May – August 2006.

The footprint areas of seven observed nucleation events suggest that spatial scale of a nucleation event may reach about 1000 km and impact of atmospheric transport to the aerosol processes recorded by an Eulerian (ground-based) observer may be significant. The nucleation events tend to be related with high-pressure areas and outbreaks of air masses from the north. Formation of an intense event over extensive forested areas supports the theory on the role of biogenic VOC emissions. Need for coupling the models of atmospheric transport and aerosol dynamics was stressed.