

Connecting ground based in-situ observations, ground-based remote sensing and satellite data within the Pan Eurasian Experiment (PEEX) program

H.K. Lappalainen^{1,2}, T., Petäjä¹, J. Kujansuu¹, G. de Leeuw², D. Moiseev¹, E. O'Connor², V. Bondur³, N. Kasimov⁴, V. Kotlyakov⁵, H. Guo⁶, J.Zhang⁶, G. Matvienko⁷, A.Baklanov⁸, S. Zilitinkevich² and M. Kulmala¹

1Department of Physics, University of Helsinki, Finland

2Finnish Meteorological Institute, Helsinki, Finland

3AEROCOSMOS, Russia

4Geographical faculty, Moscow State University, Russia

5IG RAS, Department of Earth Sciences, RAS, Russia

6Institute of Remote Sensing and Digital Earth, CAS, China

7Institute of Atmospheric Optics, SB RAS, Russia

8World Meteorological Institute (WMO), Switzerland

E-mail: [hanna.k.lappalainen\(at\)helsinki.fi](mailto:hanna.k.lappalainen(at)helsinki.fi)

The new Pan-Eurasian Experiment (PEEX) program is aimed to understand the Earth system and the influence of environmental and societal changes in both pristine and industrialized Pan-Eurasian environments. Crucial part of the program activities is establish a process towards sustain long-term, continuous and comprehensive ground-based airborne and seaborne research infrastructures, and utilize satellite data and multi-scale model frameworks filling the gaps of the in-situ observational network especially in the Arctic-boreal region. PEEX will contribute to regional climate scenario development work and determine the relevant factors and interactions influencing human and societal wellbeing in these regions.

The development of research infrastructure in the Northern Pan-Eurasian region will be one of the first activities of PEEX. PEEX will find synergies with the major European land-atmosphere observation infrastructures (ICOS, ANAEE; ACTRIS) when designing, reorganizing and networking existing station networks. It is also important to connect the comprehensive ground-based data to satellite observations in order to understand the overall context and relevance of the ground based observations. Of particular interest in the context of PEEX are land, lake and atmospheric observations. The atmospheric observations are complementary to those from the stations described above in that they provide information on atmospheric concentrations of aerosols, trace gases and GHG. In this contribution, we underline general features of the satellite observations relevant to PEEX research program and how satellite observations connect to the ground based observations.
