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Pan Eurasian EXperiment (PEEX) - towards a new multinational environment and climate research effort in Eurasia

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Boreal forests are a substantial source of greenhouse gases, biogenic volatile organic compounds (BVOCs) and natural aerosols, the critical atmospheric components related to climate change processes. A large fraction of boreal forests of the world is situated in Siberian region. Representative measurements of carbon dioxide (CO_2) and methane (CH4) concentrations, BVOC emissions and aerosols production from Siberian are of special importance when estimating global budgets of climate change relevant factors.

The scope of a new concept of the Pan Eurasian Experiment (PEEX) is to set up a process for planning of a large-scale, long-term, coordinated observations and modeling experiment in the Pan Eurasian region, especially to cover ground base, airborne and satellite observations together with global and regional models to find out different forcing and feedback mechanisms in the changing climate.

University of Helsinki together with Finnish Meteorological institute are organizing the Pan-Eurasian Experiment and to gather all the European and Russian key players in the field of climate and Earth system science to plan the future research activities in the Pan-Eurasian region. In the European scale PEEX is part of the JPI Climate Fast Track Activity 1.3. “Changing cryosphere in the climate system – from observations to climate modeling”. PEEX research topics are closely related the NordForsk’s Top Research Initiative CRAICC – Cryosphere – atmosphere interaction in the changing Arctic climate. PEEX is also a central part of the ongoing the Finnish Cultural Foundation – Earth System modeling Working Group activity (2012-2013).

PEEX scientific aims and future actions to develop Pan Eurasian research infrastructure can be linked to several EC and ESA funded activities aiming to develop next generation research infrastructures and data products: EU-FP7-ACTRIS-I3-project (Aerosols, Clouds, and Trace gases Research InfraStructure Network-project 2011-2015); ICOS a research infrastructure to decipher the greenhouse gas balance of Europe and adjacent regions; EU-FP-7 e-infra ENVRI “Common Operations of Environmental Research Infrastructures” project. New Siberian research infrastructure and data products should be developed in line with the ACTRIS, ICOS and ENVRI approaches. Furthermore, The Pan-Eurasian Experiment will be supported iLEAPS (Integrated Land Ecosystem – Atmosphere Processes Study) bringing the PEEX under umbrella of the International Geosphere-Biosphere Programme (IGBP).

The permafrost regions and boreal forests of the Pan Eurasian area can be identified as a hot spot of climate change research in a global scale. PEEX experiment can be considered as a crucial part of the strategic aims of several international and national roadmaps for climate change research and the development of next-generation research infrastructures. In this work we present the overall Science Plan for the Pan-Eurasian Experiment and report on the progress made in two PEEX science workshops organized in Helsinki in October 2012 and in Moscow in February 2013.