

**PEEX Implementation Meeting**

Date:	23-24 April 2019
Place:	University of Helsinki, INAR Physicum in Kumpula, Finland
Minutes:	Hanna Lappalainen, Päivi Haapanala, Alexander Mahura, Univ:Helsinki INAR
Local organization:	Alla Borisova
Participants:	ANNEX-1
Agenda:	ANNEX-2
Presentations:	Intranet www.atm.helsinki.fi/peex/index.php/intranet-login

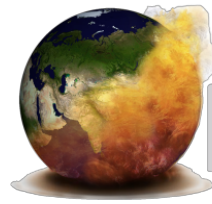
Aim of the PEEX Implementation Meeting was to have general overview of the PEEX activities in 2012-2019 and to discuss future upcoming activities together with the PEEX offices based at the Moscow State University (MSU) and Institute of Digital Earth and Remote Sensing (RADI), Chinese Academy of Sciences.

1. PEEX General overview and status

- PEEX kick off in Oct 2012 in Helsinki, since the annual meetings (8) and science conferences (3), network of 4000 researchers, established several PEEX offices in Finland, Russia and China.
- PEEX Science Plan published in 2015, PEEX scientific results published in the ACP PEEX Special Issue (www.atmos-chem-phys.net/special_issue395.html), GES, J. Big Earth Data and conference proceedings. Published papers include several concept papers on in situ component, on the research approach, the modelling concept paper is in progress for re-submission and the PEEX satellites paper in progress
- GlobalSMEAR, establishing / upgrading in situ stations based on SMEAR concept in the PEEX region, is a fundamental part of PEEX Research Infrastructure development. In 2018 PEEX HQ focused on the PEEX / GlobalSMEAR approach and published concepts and materials: www.atm.helsinki.fi/globalsmear/index.php/materials
- PEEX going towards multidisciplinary approach: new proposal / network / research concept for the Arctic region in progress. New openings, papers and proposals under evaluation on the PEEX socio-economic, including environmental health, research.

2. PEEX Arctic, Marine

- PEEX marine concept introduced Vihma et al "Towards an advanced observation system for the marine Arctic in the framework of the Pan-Eurasian Experiment (PEEX)" Atmos. Chem. Phys., 19, 1941-1970, 2019, doi.org/10.5194/acp-19-1941-2019
- Core project of the PEEX Marine is iCUPE coordinated by Tuukka Petäjä. New Arctic data products coming soon: www.atm.helsinki.fi/icupe/index.php/2-uncategorised/1-home
- Nordic collaboration build on collaboration with:
 - Igor Esau NERSC Norway, PEEX modelling with Alexander Mahura, applications is under preparation
 - Henrik Skov Univ. Århus: joint in-situ observations in Greenland at the field stations
 - Nina Kirchner, Ilona Riipinen, Stockholm University: Arctic Avenue. From UHEL Atte Korhola, Hanna K. Lappalainen are main contacts. www.helsinki.fi/en/news/life-science-news/arctic-avenue-to-boost-strategic-cooperation-between-stockholm-and-helsinki



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- New marine data products will soon available, a related papers to new data products published by Uotila, P., Goosse, H., Haines, K., Chevallier, M., Barthélemy, A., Bricaud, C., et al. (2018). An assessment of ten ocean reanalyses in the polar regions. *Climate Dynamics*, 1–38. <https://doi.org/10.1007/s00382-018-4242-z>

3. PEEX MSU activities in 2017-2018 and PEEX Roshydromet collaboration

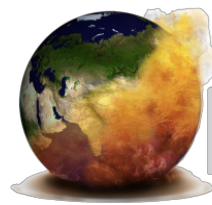
- Roshydromet connections to PEEX established via FMI-Roshydromet Protocol signed in April 2019 (PEEX addressed in the protocol) and via MSU-Roshydromet Collaboration Agreement signed in spring 2019.
- New plans for activating and facilitating the interaction with PEEX institutions in Russia including regular skypes with the contact persons hosted by the MSU-PEEX office. PEEX MSU has provided contributions to the PEEX eNewsletter, The PEEX Blog could be used a joint communication platform for the Russian contributions more actively in the future.
- Baikal Selenga Network (BaSeNet) is a separate subprogram in PEEX. A new atlas just released istina.msu.ru/publications/book/159214847/. Upcoming events: 4th UNESCO International Conference on the Status and Future of the World's Large Rivers **3-7 August 2020, Moscow, Russia** (worldslargerivers.boku.ac.at). CO-ORGANISATION Russian Geographical Society, Pan-Eurasian Experiment and Russian Hydrometeorological Society
- Recently completed and ongoing projects – NordForsk PEEX-CRUCIAL and TRAKT, H2020 iCUPE and INTAROS, Enviro-PEEX on ECMWF - with MSU (and other Russian PEEX partners involved) and in collaboration with UHEL/INAR; joint proposals submitted (for Call - 3rd Kolarctic, RSF, FIRST+, H2020, NRC) and in preparation for NordForsk and Belmont Forum.
- PEEX activities, research have been published in *Geography, Environment, Sustainability SI*, 2018 PEEX special issue (GES 2018, № 1)

4. PEEX Satellites

- Gerrit de Leeuw has been coordinating the PEEX satellites and the PEEX Satellites concept paper de Leeuw et al.
- Johanna Tamminen's team at FMI gave overview on the FMI satellite activities and projects: Overview of expanding satellite infrastructure /Evolution of aerosols and forest fires over the PEEX area /Satellite based proxy development for atmospheric chemistry /Carbon cycle observations at high latitudes.
- FMI is addressing the PEEX collaboration and is interested in the ground based data and validations. For example, PEEX could be facilitating the Roshydromet collaboration and PEEX in situ catalog work could also provide valuable overview and contacts to in situ data provides in a coordinated manner. From the European Space Agency (ESA) point of view the Copernicus evolution has high priority of CO2 monitoring missions.

5. DBAR, PEEX China activities in 2017-2018

- INAR is the official center of excellence of the DBAR program.
- a lot of scientific work in progress main based on satellite data and carried out by the Chinese DBAR framework. Topics under investigations are: Heat Wave and Urban Heat Island, Evaluation and inter comparison of water use efficiency- MODIS-derived with global eddy



covariance flux data and a process model, Toward evaluation and improvement of an ecosystem productivity simulation model in estimating gross primary productivity across Europe, Mediterranean Climate evapotranspiration estimating by integrating precipitation, vertical root distribution and satellite-retrieved vegetation information with a Penman-Monteith approach, Global Landcover--Sources of dust storms (SDS)

- DBAR journal = Journal on Big Earth Data. Addressed that the China's Belt and Road Initiative opens opportunities to PEEX / GlobalSMEAR program, The PEEX Silk Road agenda Lappalainen et al. published in J. BigEarth Data www.tandfonline.com/doi/full/10.1080/20964471.2018.1437704

6. INAR-China collaboration, Megasense and other activities

- PEEX/GlobalSMEAR aimed at establishing active collaboration in three cities: Beijing (BUCT), Nanjing and Shanghai. The focus would be on establishing new in situ stations.
- INAR / PEEX ongoing collaboration is carried out in a frame of JirLATEST; SORPES-NJU: Station in Nanjing, China. It is a Station for Observing Regional Processes of the Earth System. The station is operated in collaboration with Nanjing University and University of Helsinki under joint international research laboratory of Atmospheric and Earth System Sciences (JirLATEST). INAR is also a Center of Excellence of the DBAR Program.
- PEEX / GlobalSMEAR program has a lot of synergy with the ongoing Megasense-project: www.helsinki.fi/en/researchgroups/sensing-and-analytics-of-air-quality/about-megasense

7. High Mountain and Cold Regions (HiMAC) DBAR, China, Kazakhstan

- RADI, the PEEX main strategic partner in China, is active contributor to the GEOSS Cold Regions, especially in Tibetan Plateau region. RADI is chairing the GEO Cold Regions Initiative (GEOCRI)Activities, which is now entering into the next phase of 2020-2022. PEEX, especially its PEEX Arctic and Marine part are potential contributions.
- RADI's research carried out on ice melting processes using satellite data. However there is a need for in situ data and new station(s) in the 3rd Pole region. One potential joint activity in the future.
- PEEX could have the similar experiment at Sodankylä as RADI has done in China's lakes on lake ice and now approaching for forming a global lake ice monitoring.

8. Research stations, field campaigns in the PEEX region

- many bilateral campaigns and projects are going on: INAR is sending instruments to Tomsk, Siberia in summer 2019, PSI is sending instrument to up north, Russia (in 2019/2020), FMI is carrying out continuous field measurements at Tiksi station in the Russian Arctic and in Finland.
- PEEX continues with the PEEX-e-catalog, the latest extension will be the map of Roshydromet stations (under preparation)
- in China a new station in Beijing hosted by BUCT is based on SMEAR concept.
- INAR New particle formation studied at China done; campaigns at high altitudes. Discussion on potential new collaboration and contacting stations at west China at high altitudes. Ybao has contacts to the existing in situ station in the Western part of China which could be potential SMEAR-station collaborator.



9. IEAS Academy in collaboration with PEEX, Sofia Earth Forum process

- IEAS Academy is important contact network for PEEX and provides a contact network to Eurasian communities: www.atm.helsinki.fi/m/ieaseurope/index.php
- IEAS-European center has invited, nominated ca 70 European Academicians. This process continues
- an upcoming IEAS activity is a new Journal on Eurasian Science

10. Ongoing / Upcoming PEEX activities/projects and plans & discussion

- List of ongoing PEEX projects described here: www.atm.helsinki.fi/peex/index.php/projects
- Current ongoing PEEX core project funded by Academy of Finland (2018-2020) - "ClimEco" coordinated by Jaana Bäck and Sergej Zilitinkevich; reported on status/progress for workpackages' objectives, tasks, deliverables, publications; progress in collaboration with Russian partners involved; planned science education events (training course in June 2019 and school in August 2020; both in Russia); www.atm.helsinki.fi/peex/index.php/climeco
- continuation of the PEEX Science Plan is the upcoming PEEX Science Overview. Helsinki HQ will collect main results published on the PEEX region peer as peer reviewed papers. The editor Team Lappalainen, Altimir, Mahura, Kerminen, Chalov, Kulmala. Moscow PEEX office will coordinate the collection of information from Russia PEEX community.
 - e-mail to PEEX community "*We are collecting information on PEEX research to make an overview of the PEEX research results achieved during the last five years, in 2015-2019. We will analyze the main results and findings for the PEEX region, the Northern Eurasia, Arctic Ocean and China, and how well we have covered the PEEX Science Plan and answered on the large-scale research questions (pdf-file). We are highlighting the main findings published in peer-reviewed journals and scientific progress, including methodological, done by the PEEX community...*"
- PEEX will apply in June 2020 for EGU special session (SpS) and organize PEEX meetings in EGU-2020 (**3–8 May 2020**, Vienna, Austria; <https://www.egu2020.eu>). Kulmala, Zilitinkevich, Lappalainen are the conveners of the PEEX SpS. The key contact persons organizing SpS procedure - Alexander Mahura, Alexander Baklanov, Stephany Mazon, NN.
 - **PEEX Special Session (PEEX-SpS) at EGU-2020**
 - with several time-slots/blocks (as "sub-sessions") with separate focuses for PEEX related observations, modelling, assessment, educational, etc. activities;
 - about 100+ abstract need to be submitted for 3 time-slots;
 - PEEX-SpS, at least, 3-4 blocks & each block - 1h 45m;
 - with invited speakers in each block;
 - Max 1 abstract for pres (oral or poster) & 2nd is allowed only by special approval.
 - **Combined PEEX overall poster session** (posters from all blocks included); 1h 45m
 - **Co-organize a series of splinter meetings** (1 time-slot for each PEEX Working Group; with discussions): 3 rooms – 20 persons in each, 3 rooms – 28/ 37/ 40 each
 - WG observations (in-situ, satellite, etc. for projects linked with PEEX),
 - WG modelling (with focuses on different models, etc.),
 - WG impact on society/ assessment;
 - WG educational outreach;



- Regional Nodes-Offices planning meeting (Nordic + Russia + China).
- see terms & conditions for splinter meetings:
egu2019.eu/abstracts_and_programme/splinter_meetings.html
- **24 June – 15 August 2019**: Call-for-session-proposals (incl. short courses), 9 Sep – 9 Oct 2019: Session programme finalization; 15 Oct 2019 – 15 Jan 2020: Abstracts submission
- see example at egu2019.eu/about_and_support/deadlines_and_milestones.html
- PEEX HQ is also waiting for final decision on the Arctic Arena funded by Prince Albert Foundation in June 2019.
- It was also discussed that China is investing a lot of money to bilateral China-EU Horizon Program. INAR will take actions to this direction, promote PEEX agenda, co-design the upcoming calls and use it's networks in the Commission in this task.

11. Education

- PEEX Education, a lot of bilateral projects
- MSU main education activity this year: International Summer Field School (29 Jul – 11 Aug 2019, Russia) "Anthropogenic and Natural Soil Landscapes in European Russia: from Sea to Sea: Monitoring, modeling and managing urban soils and green infrastructure"; read/apply at <http://3mugis.org>; opportunity to apply to this unique summer school and travel remote places. Pavel Konstantinov, kostadini@mail.ru, is the main contact.
- INAR Massive Open Online Courses (MOOC) provide an accessible tool for the international audience: <http://www.climatenow.fi/>
- UHEL/INAR: Analysis of atmosphere-surface interactions and feedbacks (Hyytiälä, Finland, 8-19 October 2019); read/apply at <https://www.helsinki.fi/en/inar-institute-for-atmospheric-and-earth-system-research/education/training-courses>. Katja Lauri the main contact.
- UHEL/INAR: Research training course on "Seamless / Online Integrated Meteorology-Chemistry-Aerosols Multi-Scale and –Processes Modelling" (24-29 Jun 2019, Tyumen, Russia); read/apply at <https://www.utmn.ru/en/media/news/research-and-innovations/693416>. Alexander Mahura main contact.
- UHEL/INAR/MSU/UTMN: YSSSchool on "Multi-Scales and –Processes Integrated Modelling, Observations and Assessment for Environmental Applications" (27 Jul – 7 Aug 2020, Moscow, Russia). More information to be available soon.

12. Outreach issues

- Newsletter/Blog, web, social media established and under development
 - <http://www.atm.helsinki.fi/peex/index.php>
 - <https://peexhq.home.blog/>
 - <http://www.atm.helsinki.fi/globalsmear/>
 - **PEEX Twitter: @PEEX_NEWS**
- future challenge to expand the list of contributors and followers. Already agreed that the network of Prof. Lassi Heininen (Arctic regions, geopolitics) will be integrated to PEEX communication flows asap.
- U-Arctic is important target audience in this context.



- discussion, how to develop PEEX / U-Arctic-Arctic-Boreal-Hub communications channels, outreach; Discussion to be part of Weibo and WeChat, a well-known Chinese media for individual and groups. PEEX will consider to create accounts.

Some concluding remarks and planning of the next steps

- INAR has two PEEX professors: Tuukka Petäjä and Federico Bianchi. Other Universities could investigate the possibility to have also PEEX professors.
- Prof. Sergey Zilitinkevich made a scientific statement about the importance of the atmospheric boundary layer (ABL) for all PEEX studies; to have more ABL and turbulence measurements and studies in PEEX domain
- PEEX Russian office:
 - Black Carbon meeting(s) in September 2019 (Moscow, Russia & Oslo, Norway)
 - PEEX at EGU-2020 (May 2020) provides good visibility and new contacts for the PEEX approach. Also the round table discussion and separate meeting is good to have for the strategic discussions.
 - will coordinate collecting replies from Russian partners to PEEX Science Overview.
- PEEX Chinese office:
 - China will be more active in PEEX issues, as example HiMAC project and its DBAR activities.
 - New in situ stations to be established within next 3 years
 - deepen the collaboration related to satellite / in situ data
 - In addition to EGU-2020 special PEEX session, proposal of having the next PEEX science conference in China
 - H2020 and EU FP9 and other funding possibilities should be searched in details, , this would be the main chance for more connecting with DBAR group, and its surrounding efforts.

APPENDIX-1 Participants

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29	Sergej	Zilitinkevich	INAR, University of Helsinki / FMI	sergej.zilitinkevich@fmi.fi

APPENDIX-2

PEEX Implementation Meeting AGENDA

TUESDAY 23 April 2019

- 10:00 PEEX Program - General overview and status
- 13. Markku Kulmala, Sergej Zilitinkevich: opening words, aims of WS
 - 14. introduction of WS participants
 - 15. Hanna Lappalainen (15 min): program overview
- 10:30 PEEX Arctic, Marine
- 16. Tuukka Petäjä (10 min presentation + 5 min discussion): INAR Arctic activities in general
 - 17. Petteri Uotila (10 min + 5 min): PEEX Marine
- 11:00 Lunch
- 12:00 PEEX MSU activities in 2017-2018, PEEX Russia network, collaboration with Roshydromet
- 18. Sergey Chalov, Pavel Konstantinov (30 min + 15 min): MSU PEEX activities
 - 19. Iryna Bashmakova (10 min + 5 min): PEEX Roshydromet collaboration
- 13:00 PEEX Satellites
- 20. Johanna Tamminen (10 min): Overview of expanding satellite infrastructure
 - 21. Larisa Sogacheva (10 min): Evolution of aerosols and forest fires over the PEEX area,



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- 22. Anu-Maija Sundström (10 min): Satellite based proxy development for atmospheric chemistry
- 23. Hannakaisa Lindqvist (10 min): Carbon cycle observations at high latitudes
- 24. discussion
- 14:00 Coffee break
- 14:30 DBAR, PEEX China activities in 2017-2018, FMI collaboration
 - 25. Jiahua ZHANG (15 min + 15 min)
- 15:00 INAR-China collaboration, Megasense and other activities
 - 26. Joni Kujansuu (15 min + 15 min discussion)
- 15:30 High Mountain and Cold Regions (HiMAC) DBAR, China, Kazakhstan
 - 27. Yubao Qiu (15 min + 5 min): status overview
- 16:00 Research stations, field campaigns in the PEEX region
 - 28. Ekaterina Ezhova (15 min), Tuomas Laurila (15 min), Pavel Konstantinov (15 min) – in Russia
 - 29. Federico Bianchi (15 min) – in China
- 17:00 Summary of the day

WEDNESDAY 24 April 2019

- 08:30 IEAS Academy in collaboration with PEEX, Sofia Earth Forum process
 - 30. Iryna Bashmakova (10 min + 5 min): status overview
- 08:45 Ongoing / Upcoming PEEX activities/projects and plans & discussion
 - 31. Jaana Bäck (10 min + 5 min): ClimEco – open data pilot proposal
 - 32. Nuria Altimir (10 min + 5 min): PEEX science overview
 - 33. Alexander Mahura (5 min + 5 min): PEEX in EGU 2020
 - 34. Hanna Lappalainen (5 min + 5 min): Arctic Arena - Prince Albert Foundation
- 09:30 Joint research, ongoing projects, upcoming funding calls, mega grants, EU, Nordforsk (All)
- 10:00 coffee break
- 10:30 Education, outreach issues
 - 35. Katja Lauri (10 min + 5 min): PEEX Education
 - 36. Step Mazon (10 min + 5 min): Newsletter/Blog
 - 37. Päivi Haapanala (10 min + 5 min): web, social media
 - 38. discussion, how to develop PEEX / U-Arctic-Arctic-Boreal-Hub communications channels, outreach
- 11:30 Concluding remarks & next steps
- 12:00 End of the meeting