

ITC CONFERENCE GRANT SCIENTIFIC REPORT

This report is submitted for approval by the grant to the MC Chair.

Action number: CA16202 - International Network to Encourage the Use of Monitoring and Forecasting Dust Products

Conference title: 6. Staubtag

Conference start and end date: 18/11/2019 to 19/11/2019

Conference attendance start and end date: 17/11/2019 to 19/11/2019

Grantee name: InDust

ACTIVITIES DURING YOUR ATTENDANCE AT THIS CONFERENCE:

The 6. Staubtag workshop was held on 18th and 19th November 2019 at the Karlsruhe Institute of Technology in Karlsruhe (KIT), Germany. This scientific meeting addresses in mineral dust. An overview of recent research questions on mineral dust, exchange of experience and knowledge, interdisciplinary discussions and networking was some of the main foci of the workshop.

The main topics of the meeting were Laboratory and field experiments, measurement campaigns, Monitoring, Sediment archives, Remote sensing, Numerical modelling on different spatial and temporal scales, Dust-related interactions and feedbacks, Dust as transport medium for bacteria and biogenic substances.

During the meeting 2 introduction talks was presented: „Impacts of High Latitude Dust on atmosphere and cryosphere“ by Pavla Dagsson-Waldhauserova, MC on COST InDust Action “International Network to Encourage the Use of Monitoring and Forecasting Dust“ and „Natural and anthropogenic contributions to mineral dust aerosol“ by Martina Klose of Barcelona Supercomputing Center, Spain. Also, there was 13 short lectures and 10 posters about work on the emission of mineral dust and its meteorological prediction, on the interaction of natural desert dusts with anthropogenic impurities and on the reduction of the efficiency of photovoltaic systems by high atmospheric dust concentrations.

My contribution to the conference was an oral presentation. The title of my talk was „Saharan dust transport, synoptic situations and aerosol properties at BEO Moussala in 2016“. The work presented synoptic situations during Saharan dust transport and no-dust period over Bulgaria. It also includes chemical analyses of aerosols and concentration of cloud condensation nuclei (CCN) during both period.

Moussala is the highest peak of Rila Mountain, Bulgaria, and the Balkan Peninsula - 2925.4 m. Basic Environmental Observatory (BEO) Moussala belongs to the Institute for Nuclear Research and Nuclear Energy at the Bulgarian Academy of Sciences. Synoptic situations at BEO Moussala was presented via geopotential at 700 hPa (<http://www1.wetter3.de>), closest isobaric height to the Moussala's height, relative humidity and wind rose, which shows wind's direction and velocity. The wind rose data are from the National Institute of meteorology and hydrology.

Aerosol particles were collected by Continuous Light Absorption Photometer (CLAP) and CCN – by Cloud condensation nuclei counter at BEO Moussala. Aerosol's chemical analysis were performed by Scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM/EDX) at Faculty of physics, Sofia University "St. Kliment Ohridski".

The main conclusions of the research are as follow: 1) During Saharan dust transport at 700 hPa atmosphere over Bulgaria was influenced by high pressure from North Africa with axis over Balkan Peninsula; strong west/southwestern wind was registered – result of high geopotential; 2) On most of the cases with Saharan dust transport an increased level of fine particulate matter was registered. 3) The basic chemical element in most if the particles is oxygen; 4) There are iron and sulfur in all particles during dust

period, which are missing during non-dust period; 5) The aluminum is relative low, but has similar content during dust and non-dust period - around 2-4 percent; 6) We noticed correlation between Saharan dust transport and CCN in winter and we are still looking for correlations in this direction.

IMPACT ON YOUR RESEARCH AND FUTURE COLLABORATIONS (if applicable)

After the workshop short news about the 6. Staubtag meeting were published on KIT's webpage.

By participating at the workshop, I was able to meet people inDust, to learn more from the presented contributions and to discuss the possibility for future collaborations. I met Dr. Ottmar Möhler and Dr. Romy Fösig from KIT. They work in a project ACTRIS, in which I work too. Dr. Ottmar Möhler will be visit our observatory next summer and we are looking for an opportunity to work together in near future.

Thus, my participation at conference, which was possible only due to the inDust ITC conference grant, has allowed me to improve my scientific knowledge, to be able to share the results within the research community and to make connections for future collaborations.