

ITC CONFERENCE GRANT SCIENTIFIC REPORT

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

Action number: CA16202

Conference title: EGU General Assembly 2019

Conference start and end date: 07/04/2019 to 12/04/2019

Conference attendance start and end date: 07/07/2019 to 12/04/2019

Grantee name: Florin Unga

ACTIVITIES DURING YOUR ATTENDANCE AT THIS CONFERENCE:

I have attended the conference EGU General Assembly 2019 in Vienna, Austria started from 07 to 12 April 2019, where I held a talk on 10 April 2019 at 17h30 (local time) on the topic "Mobile ship-borne sun/sky/lunar photometer and ceilometer observations during the AQABA campaign". After the opening reception on 7 April, the networking between myself and former colleagues was extended to outside of the conference center, as can be seen in the Image 1. I have allocated a special attention to the talks on the mixing state of atmospheric aerosol particles from the disciplinary session Atmospheric Sciences (AS), such as "Mixing state and hygroscopicity of black carbon aerosol during severe haze events in the North China Plain", "Hygroscopic behavior of homogeneous and heterogeneous mixture particles" and "Radiative absorption enhancement of dust mixed with anthropogenic pollution over East Asia". Furthermore, the PICO's presentations on Aeolian Dust showed new insights on the atmospheric desert dust characterization and their microphysical and optical properties. The orals from the session "Atmospheric composition, aerosols and trace gases in the Mediterranean and Arabian basins" comprised mostly talks on the in-situ chemistry observations during AQABA campaign, where I have tried to fill the gap by presenting active and passive remote sensing observations in the Mediterranean Sea and Arabian Basin with a particularity to desert dust events. I have been promoting during networking dinners, the inDust and COST actions, especially to the young researchers looking for various funds, by pointing them to the inDust and COST websites. I have also advertised new job opportunities at The Cyprus Institute. Towards the end of the conference, an attention was paid to the companies that were proposing miniaturized instruments, which can measure atmospheric aerosol properties, especially during desert dust episodes frequently occurring in Cyprus, and that can be mounted on our drones from the USRL department at The Cyprus Institute.

IMPACT ON YOUR RESEARCH AND FUTURE COLLABORATIONS (if applicable)

The research for the talk about "Mobile ship-borne sun/sky/lunar photometer and ceilometer observations during the AQABA campaign" was achieved through a collaboration between researchers from The Cyprus Institute, Max Planck Institute, Laboratoire d'Optique Atmosphérique - Université de Lille, and a company CIMEL Electronique. Thanks to the financial support from inDust – COST program, which made possible the oral presentation of this work at EGU General Assembly 2019 in Vienna, Austria on 10 April 2019. A picture taken during the oral presentation can be seen in Image 2. During this talk I have presented first results of mobile measurements (from Toulon, France to Kuwait), performed with a new prototype of CIMEL sun/sky/lunar photometer, of fine scale spatial and temporal variability of column integrated spectral

AOD (aerosol optical depth) and Angstrom exponent 440-870 nm in areas where no measurements are available. The instrument was specially designed for mobile measurements and it was intercompared during movement with the manual sun-photometer MICROTOPS II, resulting in a correlation coefficient of 0.99 for the common wavelenghts. Much interest has been shown from the scientific community on the spatial distribution of aerosol particles, both during movement and on the vertical atmospheric column (seen from the Ceilometer), where I have shown the presence of desert dust even at 7000 meters altitude. The strong desert dust storms were evidenced in the Arabian Basin by a low Angstrom Exponent at 440-870 (<0.2) and a high AOD at 440 nm (reaching up to 2). This information can be used for assimilation in chemistry transport models and for sattelites products validation. The maritime boundary layer height derived from the ceilometer during mobile measurements from Toulon to Kuwait was also presented and intercompared with GDAS model (1 degree). The importance of such intercomparison was also appreciated, however more investigation is needed, due to the limitations of a ceilometer in having qualitatively data under ~500 m altitude and the presence of transported desert dust mixt in the boundary layer, which makes difficult the identification of the boundary layer height. In addition, a case study during a desert dust event in the Mediterranean Sea, on the vertical distribution of mass concentration derived from the synergy of ceilometer- sun-photometer and intercomparison with in-situ measurements performed with lightweight sensors mounted on UAV, was presented and received a special attention for the for the validation of the derived products from the synergy ceilometer-sun-photometer, in the lower part of the troposphere. The results, from a future measurements campaign presented in the perspectives, are expected by the lidar scientific community, which will deal with the intercomparison of the overlap correction applied to lidars and in-situ profiles performed with small sensors mounted on UAVs in various atmospheric conditions (temperature and relative humidity).

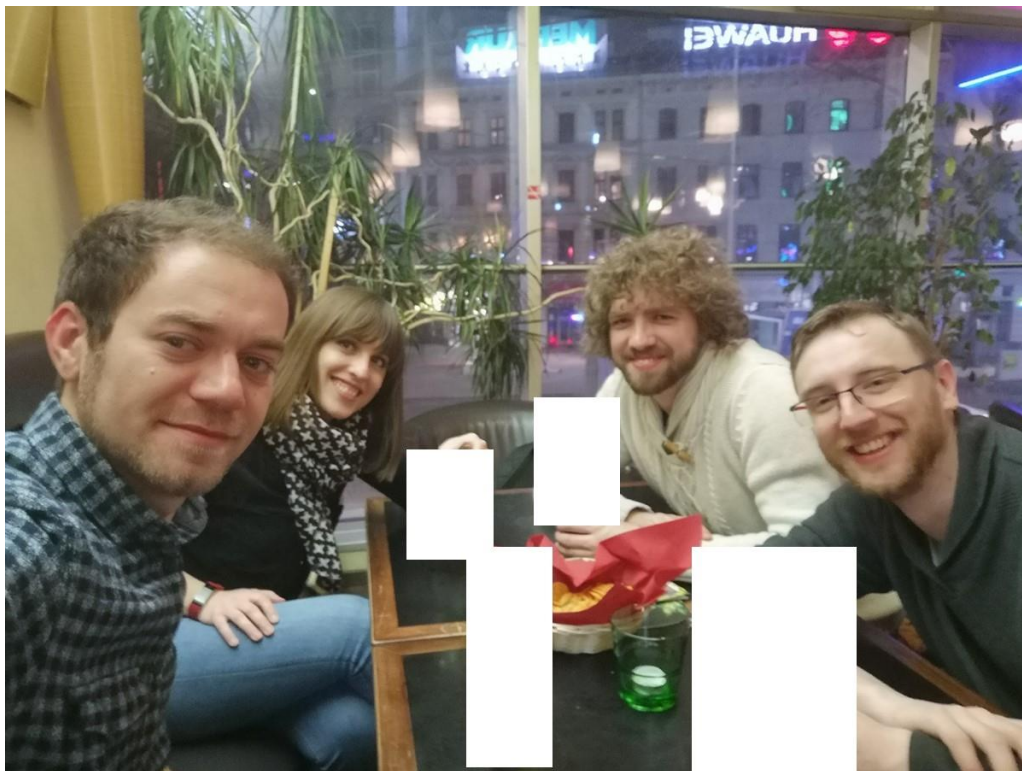


Image 1. Networking outside the EGU2019 conference



Image 2. Picture taken during the oral presentation (Florin Unga)