

## 4.070 Climatological Study of Black Carbon Transport from European Major Population Centers..

Early Career Scientist

Presenting Author:

**Anna Beata Kalisz Hedegaard**, Institute of Atmospheric Physics, German Aerospace Center (DLR), 82234 Oberpfaffenhofen-Wessling, Germany; Institute of Environmental Physics (IUP), University of Bremen, 28359 Bremen, Germany, [annabeat@uni-bremen.de](mailto:annabeat@uni-bremen.de)

Co-Authors:

**Andreas Hilboll**, Institute of Environmental Physics (IUP), University of Bremen, 28359 Bremen, Germany; Center for Marine Environmental Sciences (MARUM), University of Bremen, 28359 Bremen, Germany

**Hans Schlager**, Institute of Atmospheric Physics, German Aerospace Center (DLR), 82234 Oberpfaffenhofen-Wessling, Germany

**Mihalis Vrekoussis**, Institute of Environmental Physics (IUP), University of Bremen, 28359 Bremen, Germany; Center for Marine Environmental Sciences (MARUM), University of Bremen, 28359 Bremen, Germany; Energy, Environment and Water Research Centre, The Cyprus Institute (Cyl), 2121 Nicosia, Cyprus

Abstract:

The offline Lagrangian transport and dispersion model FLEXPART will be utilized to simulate the climatological dispersion characteristics of air pollution plumes produced by major population centers (MPCs) in Europe. The simulations will use black carbon emissions from the MACCity emission inventory forced by ECMWF ERA-Interim reanalysis data. The main scientific question to be addressed is the quantification of the impact of the emissions from the selected European MPCs on air pollution levels at local, regional and hemispheric scales. Black carbon has been chosen as a tracer because it plays a significant role as a positive radiative forcer, impacts notably human health, and is well suited for transport studies due to its linear chemistry. The black carbon aerosol-like tracers are modeled subject to removal processes by dry and wet deposition. The anthropogenic black carbon emissions from the chosen MPCs are treated separately to allow the investigation of their individual but also their cumulative impact, compared to other black carbon sources, on local atmospheric composition, and regional sites of pollution accumulation. As an outlook, the MPCs emission outflow to the Arctic regions will be discussed as well as consequences for human health of the exposure to elevated black carbon concentrations.