**Long-range atmospheric transport and transformation of PAHs, PCBs and PBDEs over the Aegean in summer 2012**

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The eastern Mediterranean is a receptor area for pollutants originating from central and eastern Europe. Analyses of long-range atmospheric transport can reveal source-receptor relationships. During transport, photochemistry can significantly alternate substance or congener patterns of polycyclic aromatic hydrocarbons (PAHs) or persistent organic pollutants (POPs), such as polychlorinated biphenyls (PCBs) and polybrominated diphenylethers (PBDEs). Photochemistry of selected PAHs, PCBs and PBDEs is studied by simulation of transport episodes and comparison with observations at the ground.

In July 2012 low pollutant levels were determined at the remote site Finokalia, northern coast of Crete, i.e., 0.5 ng m-3 Σ15PAH, 50 pg m-3 Σ7PCB and 1.4 pg m-3 Σ10PBDE, using high-volume air sampling and off-line chemical analysis (GC-MS). With the Lagrangian particle dispersion model FLEXPART-WRF, several episodes were identified during which the air sampled had passed over major source areas in the region i.e., Athens or Izmir). In these source areas air was sampled simultaneously as part of the same field campaign. For these two transport paths, the chemical and physical degradation processes are simulated by a Lagrangian travelling box model (1 hour and 1 km resolutions). The inputs of the model include meteorological parameters along a clustered trajectory, from FLEXPART-WRF, and fields of relevant radicals and oxidants (OH, O3, NO2 and NO3), provided by an Eulerian model,the Community Multi-scale Air Quality (CMAQ) model. Oxidants precursor emissions are from the Sparse Matrix Operator Kernel Emissions for Europe (SMOKE-EU) model. For heterogeneous chemistry of PAHs, the availability for gas-particle partitioning and aerosol composition and mixing type will be accounted for.