



Global pathways of air pollution and the impact on Africa: A modelling study with the ECHMERIT model

G. Jung and N. Pirrone

CNR-IIA (National Research Council - Institute for Atmospheric Pollution), Arcavacata di Rende, Italy

Long-range transport of pollutants plays an important role for air quality in Africa. There is, for example, observational evidence of high ozone concentrations in northern Africa due to a combination of inflow of precursor substances from Europe over the Mediterranean sea and photochemically advantageous weather conditions in the region in summer. Nevertheless, depending on season and global circulation there is also a notable influence of air pollution transport from North and South America to Africa and southern Europe.

The global chemistry-meteorology model ECHMERIT has been used for passive tracer studies, to investigate global transport pathways to northern and central Africa from source regions in the northern and southern hemisphere. Passive tracer transport simulations were performed for tracers with different lifetimes, ranging from 5.6 days for VOC-like tracers to 360 days for Hg (or POP)-like tracers, following the tracer definition in the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP Convention), Task Force on Hemispheric Transport of Air Pollution (TF HTAP), model intercomparison initiative. Analysing the results for the different tracer types gives evidence of the importance of local emission compared to the inflow from remote source regions and demonstrates the influence of seasonally varying global scale circulation patterns.