



## **Mesoscale modelling for air pollution applications - advances and recommendations**

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Mesoscale modelling of meteorology and air pollution has grown into an essential tool for research and scientific investigation of atmospheric processes and to test emission control strategies to protect human health. Over the last four decades, sophisticated process models have been developed which include complex non-linear dynamical and chemical processes and interactions that affect air pollutants in the atmosphere. One motivation for these developments is the increasing recognition that air pollution is a multiscale problem on short and long time scales which affects communities all over the globe and hence require interconnected policies to protect human health and the environment.

A major effort to develop further harmonisation and common approaches has been undertaken by the international mesoscale modelling community from Europe and North America and represented by the COST 728 Action on Enhancing Mesoscale Meteorological Modelling Capabilities for Air Pollution and Dispersion Applications. This initiative has also been supported by the European Cooperation in Science and Technology (COST) and the World Meteorological Organisation through the GAW Urban Research Meteorology and Environment (GURME) Programme.

This presentation reviews the major advances in mesoscale modelling benefiting from higher resolution predictions, enhanced integration of offline and online coupling systems, more robust atmospheric parameterization and refined model evaluation methodologies. It also provides examples of complex international applications that demonstrate the applicability of advanced mesoscale modelling and where further research is required. Finally, it makes recommendations not only on the use of mesoscale models but also how their performances should be evaluated and how the support for the wider community can be strengthened.