

WG1 Meteorological parametrization/applications

The overall aim of WG1 will be to provide a framework within which the state of the art of physical parametrization in mesoscale models can be advanced, with particular application to air pollution and dispersion applications. The integration of modules will be considered within WG2 and the performance of models as a whole will be covered in WG4; WG1 will cover purely the individual physical parametrizations and their interactions. To achieve this aim the following activities are planned within WG1:

- a) Extension of the model database established during the planning phase to include detailed documentation of physical parametrizations used within each model. This documentation will, where possible, include discussion of design criteria, applicability (e.g. to model horizontal or vertical resolution, specific flow regimes) and expected limitations.
- b) Documentation of methods and reference data that have been used to construct or validate individual model components. Where possible, data, or references thereto, will be made available to European model developers for comparison.
- c) Documentation and, more importantly, classification of known applications of mesoscale modelling applications in air quality and dispersion with respect to important physical processes.
- d) Identification of priorities for general and specific applications in air quality and dispersion. For example, treatments of deep convection are probably not of general importance to the nocturnal, urban, boundary layer but may be in very specific situations.
- e) By reference to existing results, establish the strengths and weaknesses of current approaches and common successes or failures (if any). This work will feed into WG4, and the model validation datasets established within WG4 (from, e.g. FUMAPEX, COST715, CITY-DELTA, ESCOMPTE, MESOCOM) and elsewhere (e.g. the EUMetNet Short Range Numerical Weather Prediction programme, SRNWP) will also be reviewed to highlight which model parametrizations are thought to be most critical in each case.
- f) Establish areas of parametrization which are universally poorly treated in comparison with requirements for air pollution and dispersion applications.

The internet, reports and papers (see section F) will be the primary tools for delivering outcomes from these activities, and it is anticipated that sites will remain live well beyond the lifetime of the Action as new documentation, results and datasets are added.

Inputs to the Activity

Inputs to the activities will be information on individual physical parametrization schemes from model developers, data- and/or metadata-sets describing reference physical or numerical results, and results from sensitivity or tuning experiments. Results from WG2 will also be used to link, where possible, performance of parametrization schemes to outputs required by transport models.

Deliverables

Key deliverables of WG1 will be:

- 1) Overview of physical parametrization schemes used within mesoscale models and their availability in specific models.
- 2) Establishment of a database of parametrization test data and results or references thereto and mechanisms for developers to use and add to this database.
- 3) Establishment of agreed ranges of applicability, strengths and weaknesses of existing parametrization schemes based on documented and reviewed experience.
- 4) Establishment of areas requiring further research and development common to all models to improve application to air quality and dispersion modelling, and proposals for future R&D.