FAIRMODE
Forum for air quality modelling in Europe

CT4 agenda

1. Last results of the intercomparison exercise
2. Is an unsteady simulation for a complete year better than the wind sector approaches? (results from SZE?)
3. Presentation of Felicita Russo (ENEA) about their modelling approach
4. Presentation of John Bartzis (UOWM) about their experiences.
5. Other related works beyond the CT4 exercise (presentation of Xavier Jurado, Strasbourg)
6. Are the draft recommendations written in summer good enough (feedback from participants)?
7. Discussion on next CT4 activitives (road map 2023-2025)

CT4 Conclusions so far…

- Micro-scale models are (or become, mainly for CFD) fit for AAQD-purpose
- Spatial patterns and temporal profiles at micro scale can be simulated rather well
- The RANS approach seems appropriate for CFD models in the context of the AAQD
  - Model results remain (very) sensitive to the Schmidt number (Sc)
- Good emission data suited for the micro scale are crucial
- Suitable validation data (high resolution in time and space!) is essential for proper model validation
  - Passive samplers are quite good spatial pattern (more dense network needed) but not for time profiles

CT4 Conclusions so far…

- Annual averages can be computed via a wind sector approach:
  - Simulation with only one reference wind speed could be sufficient
    → Use the 1/v scaling relation afterwards
  - 8 wind sectors seems to be a minimum
  - Annual means derived via the reconstruction of an hourly time series of concentration maps seems to give slightly better results.
  - Other approaches could be explored.

CT4 Open Question & challenges

- Can the minimum number of 8 wind sectors to derive a reliable annual mean be confirmed?
- Do the needed number of wind sectors or the model/methodology results depend on urban morphology?
- How to derive other AAQD indicators than the annual average (percentiles related with the limit values) in a wind sector approach?
- Can the NO_X-O_3 chemistry be taken into account?
- Is an unsteady simulation for a complete year better than the wind sector approaches? Is it worth the (CPU) effort?
- How many stations do we need for a proper validation at micro scale?

  Passive samplers? Sensors?
- Is the atmospheric stability relevant or depends on the urban area?

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CT4 – Achievements and next Steps

F. Martin (CIEMAT), S. Janssen (VITO)

October 19th, 2022

What did we achieve (2020-2022)?

- Identifying current uses of microscale AQ modelling, including challenges in their implementation

  and collecting best practices in relation to the assessment and management under the AAQD

- Determining how to derive an annual averaged concentrations

  (and other AQD statistics such as percentiles) with a micro-scale model

  as a first step to discuss how to use microscale models for air quality assessment or planning in the framework of AQ directives.

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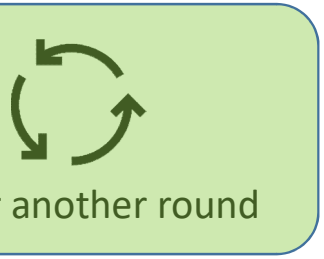
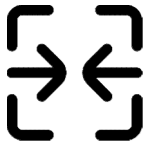
Priorities for 2023-2025

- Test robustness of the wind sector approach for all AAQD indicators (annual avg, percentiles…) and check new approaches
- Understand differences between unsteady full year simulations vs scenario (wind sector) approach.
- Specify requirements for microscale emissions (link with CT7)
- Specify requirements for observation data sets for validation (space & time, link with CT2/CT6)
- Provide Guidance & Recommendations for micro scale model applications in the context of the AAQD (link with CT8 Spatial representativeness and exceedance indicators)
- Setup a new intercomparison exercise at a new location (e.g. Gyor)?
- Preparation of scientific paper for publishing in early 2023
- XXX





Merge with other CT (existing/new)

Stop / hibernate