

10th Workshop on the Transport of Air Pollutants in Asia
(Model Intercomparison Study – MICS-Asia)

February 18-19, 2008

International Institute for Applied Systems Analysis (IIASA)

A-2361 Laxenburg, Austria

Minutes of the workshop

The tenth workshop on the Transport of Air Pollutants in Asia (Model Intercomparison Study MICS-Asia) was held on February 18-19, 2007 at the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria. The workshop was attended by 21 scientists from China, Japan, Korea, Thailand, the United States, France, Italy and IIASA (list of participants is attached). The workshop was organized in three sessions:

- Introduction to MICS-Asia
- Recent developments and international context of a model intercomparison
- Review of ongoing modelling activities in Asia
- Relevant other modelling activities
- Discussion on next steps

The first session of the workshop summarized the context of the MICS-Asia model intercomparison and recalled the activities undertaken so far. The main objectives of the 10th workshop were to present ongoing activities of participants that are of relevance for further steps of MICS, to discuss activities that should be undertaken in the next phase of MICS-Asia, and to plan the project preparation of phase 3.

The meeting was opened by IIASA's director Leen Hordijk who welcomed the participants to IIASA and emphasized IIASA's role in environmental analyses for Asia.

Prof. Ueda reminded the meeting that a model intercomparison needed to address multiple scales (global, regional, mesoscale and urban) and should address photochemical oxidants as well as aerosols. Preferably, future analyses should focus on city clusters, such as Tokyo and Osaka in Japan, Beijing and the Pearl river delta in China, and Bangkok in Thailand. Attention

should be paid to the increase in annual average ozone, which is of relevance for economic damage to crops and forests. For the future, MICS could consider collaboration with the WMO GAW Urban Research Meteorology and Environment (GURME).

EANET will increase its attention to emission inventory activities, with the aim of developing a common reporting system. For this, analysis should assess the features of the existing Asian-wide emission inventories, such as GAINS, ACCESS, REAS, EA-grid.

Mr. Sakurai introduced the recent monitoring activities of EANET, mentioning that, as a new element, EANET will extend its coverage with passive samplers. EANET monitoring data indicate significant increases in the levels of SO₂, sulfate and O₃ at many Asian sites since 2000. There was large public attention to ozone on Japan because it exceeded 120 ppb last May. ADORC's modeling framework includes now MM5 as the meteorological driver and the RAQM atmospheric chemistry and transport model, which is using emissions from the MICS-Asia database. Overall, the model system performs reasonably well for ozone, although further work is necessary to reproduce short-term peak events.

Mr. Frank Dentener (JRC) introduced the activities of the Task Force on Hemispheric Transport of Air Pollutants (HTAP) of the Convention on Long-range Transboundary Air Pollution. He indicated the possibility to interface with the work plan of the Task Force within the next months, especially since the selected period for modeling studies (2001) is overlapping with the time window of MICS Asia.

Greg Carmichael reported on a variety of ongoing activities that are of relevance to MICS-Asia. He reported that eight papers on MICS are now accepted for publication in the Special Section of Atmospheric Environment. For future air quality predictions, scientific challenges refer to the interlinkage of scales and the identification of the appropriate spatial resolution at which source-receptor relationships should be developed. Clarification on this issue is a priority before determining the work plan for the next phase of MICS Asia.

For the possible interaction with HTAP, Greg Carmichael identified the following tasks:

Task 1: Data mining, evaluate the effects of resolution and BV on regional ozone and PM predictions:

- further analyze O₃ and OM concentration metrics for GCTM and RCTM calculations, explore the spatial variability,
- calculate export fluxes across altitude and longitudes,
- utilize current MICS results and new simulations using subset of HTAP results.

Task 2: Evaluate the effects of resolution and boundary conditions on East Asian receptors:

- perform new model runs using HTAP simulations for delta emissions, domestic and import regions,
- analyze domestic response simulations for grid resolution effects and for subregions,
- analyze import contributions for grid resolution effects,
- explore subregional domestic perturbation experiments.

Task 3: Evaluate the effects of resolution and bc on EA-SA receptor relationships:

- perform new runs using HTAP simulations for emission runs, domestic and import regions, with SA and EA run with regional resolution (aerosols),
- analyze domestic response simulations for grid resolution effects,
- analyze import contributions.

Task 4: Perform simulations using different lifetime tracers:

- Further thoughts are needed to coordinate global and regional results, the analysis should include megacity tracers

Furthermore, the following important issues were identified for the design of MICS-Phase III:

- align regions
- identify global models that used TRACE-P Asia emissions
- Use of the HemiTAP analysis tool
- Naming convention
- Include SA and SEA components
- Adjoint component
- Tracer model experiments with diff lifetimes

The full list of presentations is attached.

The concluding discussion focused on the next steps of the MICS model intercomparison. It was felt important to continue the MICS collaboration for Phase 2.x to keep the momentum, with a special emphasis on producing scientific papers before Phase III would start.

Further, a stronger connection to the HTAP activity was proposed, especially to strengthen the connection to global scale analysis and to connect to global policy processes.

Task 1: Connection to HTAP

The following questions can be analyzed with existing data in the course of 2008 (data mining):

- impacts of spatial resolution and other effects
- compare O₃ and SO₂ statistics produced with the MICS ensembles with the ensemble results of HTAP
- quantify fluxes out of some surfaces

Greg Carmichael agreed to convene a working group consisting of Joshua Fu and Tracey Holloway.

Task 2: Prepare next steps of MICS as input to HTAP

This would follow up on the work conducted by T. Holloway and H. Hayami using boundary conditions and perturbations of the HTAP experiment.

Tracey Holloway will convene a working group consisting of Greg Carmichael, Karine Sartelet and Zifa Wang.

Task 3: Develop next steps for MICS:

This includes the analysis of source-receptor relationships for the urban and regional scales, as a follow up of four earlier studies. Work could build on Frank Dentener's perturbations for TM5 to test the RN-PM2.5 assumptions.

Meiyun Lin will convene a working group consisting of Frank Dentener, Tatsuya Sakurai, H. Hayami, Meiyun Lin, Yuanhan Zhang.

Task 4: Prepare for ensemble predictions and develop a common framework for model intercomparison.

This would extend earlier work of Zifa Wang's and Yuanhang Zhang's activities and complement the existing framework with additional models.

Zifa Wang will convene a working group with Karine Sartelet and Greg Carmichael.

Task 5: Design activities for MICS to address climate and AOD:

Han will convene a working group with Tracey Holloway, Song-Ung Park, Karine Sartelet, Joshua Fu.

Task 6: Studies related to emission scenarios

Studies should explore sensitivities to emissions as well as future changes, and they could include changes in SR relationships.

David Streets and Zig Klimont will convene a working group with Vanisa Surapipith, David Streets, Zig Klimont, Frank Dentener and Joshua Fu.

It was agreed that conveners should produce one-page write-ups before March 10 and send them to Tatsuya Sakurai.

In order to provide timely input, HTAP related work should be completed by end of year. Papers could be produced later after communication with the HTAP organizers. For HTAP activities a small meeting at Iowa/Wisconsin would be useful.

In his concluding remarks, Prof. Ueda thanked for the discussion and fruitful thinking on the future activities for MICS-Asia.