

**Session: Atmosphere-Climate-Interactions and impacts**

*Chairs: Alexander Mahura, Nuria Castell, Jaakko Kukkonen*

***Open discussions***

**Atmospheric-Climate Interactions –  
Implications for Air Quality**

*with contributions from all participants*

**Session attended: 1<sup>st</sup> block – 60 & 2<sup>nd</sup> block - 47**

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# HIGH PRIORITIES

## FOR RESEARCH COMMUNITY

- **Ensemble (vs single model) approach & seamless/ online downscaling (resolving meteorology-chemistry-aerosols processes at all scales) -> for assessments on country, region/ community/ city levels;**
- **Emissions inventories/ scenarios/ bottom-up approach with more detalization on emissions, esp. in urban areas;**
- **Heterogeneity, esp. on finest scales (not seen on large-scales);**
- **Climate change (CC) on meteorology (for air pollution);**
- **Meteorological variables (temperature, humidity, wind, cloudiness, precipitation, ...) on air quality (O<sub>3</sub>, PM, ...);**
- **Different ways of impact (for example: O<sub>3</sub> – CC, PM – both CC & emissions);**

# **HIGH PRIORITIES**

## **FOR DECISION-MAKERS**

- **Implications for the air quality management and decision-makers, socio-economical consequences, etc.;**
- **Climate/ meteorology/ pollution on health (more heat waves, extreme events, pollen, ...);**
- **Health effect for regions in focus – China & India (most populated) & Arctic (most vulnerable & warming rapidly, incl. shipping traffic and increasing usage of natural resources);**
- **Recommendation for mitigation and adaption is urgently needed;**

# **MEDIUM PRIORITIES**

## **FOR RESEARCHERS**

- **More processes need to be accounted on all scales, esp. on finest;**
- **Revisions of physics parameterizations of Met/NWP models -> better prediction by ACT models;**
- **Probabilistic approach (with forecasts uncertainties);**

## **FOR DECISION MAKERS**

- **Impacts in future on health, agriculture, transport, etc.;**
- **Linkage AQ and CC plans -> be more efficient for society;**
- **Looking towards combining health and costs/ benefits analysis;**

# **MEDIUM PRIORITIES**

## **& EXTRA CONCERN FOR RESEARCHERS**

- **Although effects of oceans/sea/ice were not part of the session, but coupling will be important;**

## **Extras for climate/meteorology on chemistry/ aerosols**

- **Temperature -> rate of chemical reactions;**
- **Humidity -> production and destruction of chemical species;**
- **Cloudiness -> solar radiation -> photochemical activity**
- **Precipitation -> rate of removal & deposition;**
- **Wind -> dust particles from arid regions -> more aerosols;**
- **...**
  
- **General circulation -> long-range transport;**
- **Stable conditions -> dispersion -> more pollution events;**
- **Conv. conditions -> vert. transport -> compos. in up-tropo;**
- **Stratosphere-troposphere exchange -> abundance in up-tropo;**
- **...**