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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Introduction: European Integrated project on Aerosol Cloud Climate and Air Quality interactions (EUCAARI) – integrating aerosol research from nano to global scales" *by* M. Kulmala et al.

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General comments:

The EUCAARI aims at understating at the interactions of climate and air pollution from nano- to global scale. This is a very ambitious project and is highly commendable. The project brings together leading European research groups and infrastructure to investigate the role of aerosol on climate and air quality. Improved understanding of nanoscale processes has been implemented in global models. The research methods, organization, operations and results obtained so far are presented in this manuscript.

Specific comments: The 1st objective of the project is clear: to reduce the current uncertainty of the impact of aerosol particles on climate by 50

Since the study on atmospheric nucleation is one of the major efforts, the authors need to elaborate what8217;s the relative importance of new particles generated due to nucleation events to the total aerosol number, surface area and mass concentrations resulted from other processes. The contribution of primary gaseous and particulate pollutants emitted from the anthropogenic and natural sources, and the secondary aerosols resulted from these sources could well be far more important to the total aerosol loading in the atmosphere. Given the inadequacy of the chemical speciation of gaseous and particulate components in the emitted pollutants, the uncertainty due to the contribution of emissions to the climate is by no means small.

Transport of pollutants across European boundaries is of great importance. It is not clear why four particular locations in the developing countries in India, China, Brazil and South Africa, were selected. Are the data collected going to be used to calibrate the model results, or used to compute the flux across the boundaries?

Besides many advanced instruments and atmospheric models that have been developed or under development in this project, many important atmospheric aerosol models (for example, Extended AIM aerosol thermodynamic model, http://www.aim.env.uea.ac.uk/aim/aim.php), global atmospheric model (for example, GFDL global atmosphere and land model AM2/LM2, http://www.gfdl.noaa.gov/ jjp/GAMDT/GAMDT.html), advanced in-situ monitoring of size and chemical analysis (for example, Aerosol mass spectrometer), real-time monitoring instruments for OC/EC (for example, Sunset laboratory), for sulfate, nitrate and soluble OC (for example, ADI particle-in-liquid sampler), for density (for example, Aerosol Particle Mass Analyzer), sampling and analysis methods of organic particulate mass (for example, FTIR), and major campaigns and studies (for example, ACE-Asia, Asian yellow dust, Interagency Monitoring of Protected Visual Environments, US PM supersite etc) have been developed or conducted by scientists US, Japan, Korea,

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Taiwan and European countries. Since particles in Europe alone can8217;t be responsible for the global climate change, it becomes apparent that data collected in the past should be fully analyzed and incorporated into this endeavour. Networking with prominent scientists in these major countries is necessary to avail the models developed and valuable data collected in the past several decades. It is hope that through international incorporation and data exchanges and sharing, the negative forcing on global climate change due to particles can be estimated much more accurately than the current status.

Some editorial point: 1. In the title, project should be changed to Project 2. Pages 19430, 19431: some acronyms were not explained, such as CAARI, EMEP etc. It is better to prepare a table showing all these acronyms.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 19415, 2008.