

FOREWORD

The second Aerosol Characterization Experiment (ACE-2)

This special issue of *Tellus B* contains a set of papers describing the results of the second Aerosol Characterization Experiment (ACE-2), organized within the framework of the IGBP's International Global Atmospheric Chemistry project (IGAC). The experiment was carried out in the North Atlantic Ocean between Portugal, the Azores and the Canary Islands in June and July 1997. The predecessor of ACE-2, i.e., ACE-1 took place in November–December 1995 south of Australia and was focused on the natural aerosol occurring in a remote marine boundary layer. The main purpose of this second experiment was to study the characteristics of the atmospheric aerosols, both natural and those originating from man-made sources in Europe, as well as their transformation and removal processes. The ultimate aim was to acquire better estimates of the direct and indirect (cloud-related) impact of man-made aerosols on climate. Some 200 scientists were involved and the measurement platforms included about 10 ground-based stations, 5 aircraft and 1 ship. *Frank Raes* from the European Commission Joint Research Centre in Ispra, Italy, was the chairman of the Scientific Steering Committee, and he also directed the implementation of the field campaign.

As is evident from the overview chapter in this issue, as well as from the corresponding overview of ACE-1 (*J. Geophys. Res.* Vol. 103, July, 1998), a great deal has been learnt about the atmospheric aerosol in two regions: the physical, chemical, optical and cloud nucleating properties of the aerosol and the processes that control their formation and evolution. One of the major accomplishments of the ACE campaigns has been to bring the international atmospheric aerosol research community together in addressing aerosol-science issues of regional to global importance. A consequence of doing so is that the conclusions presented in this special issue do not reflect the views of a single group or nation, but rather the international community at large. However, in spite of all this progress, it is also obvious that uncertainties are still large and that important questions remain. Further research, through large international efforts like the ACEs, as well as through smaller-scale studies, all involving improved methodologies such as satellite-borne instruments, are required in order to further narrow the uncertainties in the estimates of the climate impact of aerosols.

I wish to thank *Frank Raes* and *Tim Bates* for the long hours of hard work they did as *Guest Editors* of this issue.

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