

Preface

The fourth IAGA-ICMA-CAWSES Workshop “Long-Term Changes and Trends in the Atmosphere”

Global change in the upper atmosphere has turned out to be a challenge for scientific understanding. Although a multitude of different measurements of physical parameters at different altitude regimes were analysed for long-term trends, some of them even well established, the results are however partly controversial. A global pattern of global change in the upper atmosphere is still today just starting to emerge from the data. Some interpretations still seem to depend on a chosen strategy of data analysis. Global coupled models for the whole atmosphere do exist, but their current status does not yet allow to solve for the controversies. Increasing concentrations of greenhouse gases in the atmosphere, stratospheric ozone depletion, and long-term changes in solar and geomagnetic activity, all inevitably affect the long-term changes and trends in the stratosphere, mesosphere, thermosphere and ionosphere. Determination of the long-term trends in various data sets is essential when we want to quantify the role of anthropogenic changes in the atmosphere versus natural variations, such as the still partly unknown solar variability effects.

The fourth workshop “Long Term Changes and Trends in the Atmosphere” was organised 4–7 September 2006, at the Sodankylä Geophysical Observatory, located 130 km north of the Arctic Circle, in Northern Finland. The main goal of this workshop was to discuss progress in the above-mentioned theme and to try to advance our current observational and theoretical knowledge and understanding of the observed trends. The main focus was on the determination of long-term trends and changes, including discussion of the role of anthropogenic changes. The workshop was supported

by the IAGA/ICMA working group “Long-term trends in the mesosphere, thermosphere and ionosphere” and the CAWSES panel on long-term trends. Altogether 42 papers were presented, of them 20 solicited papers, 14 oral contributed papers, and 8 posters. Notably 8 papers were presented by young scientists. Three topical discussions were organized on unresolved key problems in trend investigations, as determined by the Programme Committee of the meeting: trends in dynamics, in water-related phenomena and in the ionospheric F2 region. Many papers presented at the workshop dealt with the present-day development of the ozone layer. Some signature of ozone recovery due to the Montreal protocol was presented, but more years of data are needed in order to see a statistically significant recovery on the background of normal meteorologically originated variations. One key issue for future studies was seen to be the trends in dynamics. The workshop recommended especially to concentrate research activities in the next two years towards deeper understanding of physics and chemistry behind the long-term trends, as a hint for the future analyses of observational results.

The workshop was attended by 40 participants, representing 4 continents and countries Argentina, Austria, Bulgaria, Czech Republic, Finland, Germany, India, Italy, Japan, Russia, Sweden, United Kingdom and USA. We would like to thank the members of the Programme Committee, the chair J. Lastovicka, G. Beig, R. Akmaev, M. Jarvis, J. Emmert and A. Danilov.

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Guest Editors