

Preface

The observation of the Earth's magnetic field is destined to play a crucial role in understanding the Earth system. The great potential of ground magnetic observations allows an impressive coverage of a diverse range of topics in the modern "magnetic world", in particular (i) development of new technologies to measure the magnetic field, (ii) improvement of methods of observation and data processing, and (iii) use of data to understand the processes linked to our planet's interior and its environment. Even at this epoch, when magnetic satellites are orbiting the Earth (Ørsted, CHAMP, SAC-C) and magnetic missions are planned (ESA Swarm constellation), the role of magnetic observatories is demonstrated. In order to improve the ground data and products, the International Association of Geomagnetism and Aeronomy (IAGA), an association of the International Union of Geodesy and Geophysics (IUGG) organizes a workshop on Geomagnetic Observatory Instruments, Data Acquisition and Processing every two years.

The XIth IAGA workshop was hosted by the National Committee for Geomagnetism and Aeronomy of the Science Council of Japan, the Society of Geomagnetism and Earth, Planetary and Space Sciences, and the Kakioka Magnetic Observatory on November 9–17, 2004. During the first part of the workshop comparisons of geomagnetic instruments were carried out in the Kakioka observatory, and then the scientific symposium was held at the Tsukuba Center for Institutes (TCI).

The scientific symposium was divided into the following sessions:

1. Observatory instruments and measurements technology
2. Data acquisition, processing and distribution
3. Surveys
4. Global networks
5. Applications of observatory data
6. Magnetic observatories—the future, with special attention given to the following two key questions: (1) To which areas of research or societal activities can observatories contribute? (2) What uses can be made of observatory data?

The papers included in this issue represent only a fraction of the major presentations at the workshop, as well as a few additional contributions. However, these 13 selected papers cover a wide range of topics such as new findings obtained by geomagnetic data analysis, development of new observation technology on land and on the seafloor, data processing, and database management. The cooperation of all the authors and referees, which was indispensable in leading to the publication of this issue, is highly appreciated.

We hope that the publication of this special issue will help to improve the quality of both the science and technology related to geomagnetic observations. However, we must not forget how important are the efforts by the organizations running magnetic observatories around the world, sometimes in very difficult conditions. Here we would like to express our sincere thanks to them, from whom we hope to continuously receive magnetic data for many years to come.

Finally, we thank the editorial board and Terra Scientific Publishing Company for once again allowing the publication of this special issue in *Earth, Planets and Space*.

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