

PREFACE

The 12th Workshop on Electromagnetic Induction in the Earth was organized by the Université de Bretagne Occidentale (Brest, France) from 8th to 13th August 1994. The meeting was exceptionally well attended with nearly 290 participants (including 60 students), representing a total of 42 countries. The scientific program was spread over 5 days and comprised the following sessions:

- environmental application of electromagnetics and electrical techniques;
- oceanic electromagnetic studies;
- borehole and controlled source studies;
- seismo-electric-magnetic effects;
- electromagnetic signature of mantle dynamics;
- new methods for modelling and inversion;
- modelling and inversion of data;
- electrical properties of rocks: laboratory and in situ;
- characterization and correcting for cultural noise;
- national and/or regional coordinated electromagnetic programs;
- electric and electromagnetic borehole measurements.

A special symposium on integrated interpretation of conductivity models with geology and geophysical data was also organized, in order to honor the memory of Louis Cagniard (1900–1971), one of the founders of our science.

In total some 270 papers were presented, including 5 reviews papers. In order to favor discussions during the workshop, we emphasized poster presentations by letting them on during the entire meeting. It was also decided to limit the number of oral presentations: only a few salient contributions were selected for oral presentation during each session.

Panel discussions were held at the conclusion of all sessions and ensured lively debate over topical issues currently steaming the induction community, such as electromagnetic data inversion, and interpretation with geology and geophysical data, environmental application of electromagnetics and electrical techniques, or electric-magnetic effects associated to seismic and volcanic events.

This special issue contains review papers, initially presented at the Workshop, which well illustrated the major advances which have occurred over the past few years in domains of basic interest for our community:

- increasing efficiency in noise elimination is essential to produce precise and accurate conductivity models. This should therefore come with increasing quality and reliability in data acquisition and processing. Various different types and sources of noise exist, which are sometimes difficult to identify and separate. Andreas Junge reviews the present state of the art in the characterization of, and correction for cultural noise which increases with the increasing

number of power consuming devices and is at present often the main source of noise in the data;

- environmental geophysics has grown enormously in the last five years. David C. Nobes reviews the contribution of electrical and electromagnetic methods, including radar and time-domain reflectometry in environmental geophysics. These methods play a central role in this relatively new subdiscipline, which is likely to become one of the major driver of progress in electrical and electromagnetic studies;
- oceanic electromagnetic studies are made for decades, and they play an important role in our community. Seafloor electromagnetic observations are dedicated to studies in solid earth geophysics and oceanography, with a large variety of objectives. Nick A. Palshin reviews the main results of oceanic electromagnetic studies over the last five years, during which technological and theoretical advances led to results of increasing quantity and quality;
- the question of precursors to natural disasters, and in particular to earthquakes, was a matter of inflamed debates during the past few years. Field observations are worth being made to clarify the debate, and base reliable interpretations. Stephen K. Park reviews the field measurements which have documented electromagnetic signals attributed to earthquakes precursory phenomena. He discuss the statistical significance of earthquakes predictions based on electric field changes, and sets out the present knowledge on the source of observed seismo-electro-magnetic signals;
- electrical and electromagnetic techniques are used in boreholes for decades. The high level of technological sophistication they reach at present made them essential for exploration, assessment and production of Earth resources, as well as for fundamental studies of the Earth. Brian R. Spies reviews the present state of the art in borehole electrical and electromagnetic methods over 17 decades of the electromagnetic spectrum, from 100 s geomagnetic studies to high resolution NMR and optical spectroscopy.

All induction workers are looking forward to meeting at the 13th Workshop, which is to be held from 12th to 18th July 1996 in Onuma, Japan.

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