

## Introduction to MT-DIW1 Special Section

The following sixteen papers in this special issue of *JGG* form a section describing two magnetotelluric datasets and their interpretation. These datasets were discussed at the first magnetotelluric data interpretation workshop (MT-DIW1) held on the two days prior to the 11th Workshop on Electromagnetic Induction in the Earth, 24th and 25th August, 1992, at the Victoria University of Wellington, Wellington, New Zealand. The intent of the MT-DIW1 was to focus attention on the two-dimensional modelling of MT data ranging from simple to complex geological environments. Using the highly successful workshops organised by the Commission on Controlled Source Seismology (CCSS) as a model, the two MT datasets were distributed to participants some months prior to the MT-DIW1. One of these two was the *Coprod2* dataset of thirty-five sites along a 400 km profile in southern Saskatchewan across the Williston basin. In the basement beneath the basin is one of the world's longest and most enigmatic crustal conductivity features, the North American Central Plains (NACP) conductivity anomaly. These data are deceptively simple and require careful 2D modelling or inversion to fit them. In contrast, the other dataset, *BC87*, consists of twenty-seven sites along a 150 km profile across resistive terrains in southeastern British Columbia. These data are skewed, sheared, shifted and twisted, and require our most advanced processing tools to sort them out prior to two-dimensional modelling. However, even after galvanic distortion removal three-dimensional effects are apparent in the data from some sites at certain period bands. Twenty-five participants were present at the MT-DIW1; attendance was limited to those who had worked with at least one of the two datasets. There were a total of fifteen oral presentations made, and two posters on display from authors who were unable to attend. The novel feature of this workshop was the access to computing facilities (five SUN Sparcstations) and presentation software (GEOTOOLS), which meant that discussions about various aspects could be resolved virtually immediately by testing model hypotheses. In addition, many of the contributors were able to connect to their own machines, via Internet, and re-invert the data with different parameters, either on their own machine or by downloading their codes onto the available SUN Sparcstations. Two of the following papers describe the datasets in detail. Eleven present models of the *Coprod2* dataset; the models are compared in the *Coprod2* introductory paper. The other three discuss the distortions in the *BC87* dataset, with two of them presenting models of the distortion-corrected data. Much was learned by all participants prior to, at, and subsequent to the MT-DIW1. In particular, we realized that care must be exercised to ensure that the model found fits subtle but significant features of the data. One should not rely totally on a single misfit measure, such as RMS; the model responses must *always* be visually compared to the data on a sufficiently large scale that misfit residual trends are apparent. An innovative aspect about the publication of these papers is that the manuscripts were, with a single exception, handled electronically. The authors submitted their text, in  $\text{T}_{\text{E}}\text{X}$  or  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$  to Alan Jones by e-mail. In addition, the vast majority also submitted their figures electronically in PostScript form. The manuscripts were sent out for review, the referees reports received and transmitted to the authors, and the revised versions received, all electronically. Acceptance of the revised version, after comparison of the original and revised versions and consideration of the point-by-point responses to the referees criticisms, was simplified tremendously, as was all editorial tasks. The accepted manuscripts were transmitted to Dr. Y. Honkura, who prepared them for *JGG* and performed final quality control. This is, without doubt, the way that the manuscript submission and review process will become eventually for all major journals. Dave

Boerner is thanked for acting as Editor for those papers authored by Alan Jones. All contributors to this issue played a large role in ensuring that the papers came out in such a timely fashion within just over a year since the MT-DIW1. The editorial efforts of Yoshi Honkura were substantial. Finally, the publishers of *JGG* are thanked for their kind offer to accept these papers, and their patience waiting for the last few to be sent. The MT-DIW1 was acclaimed by all as a resounding success, for which a lot of the credit must go to Malcolm Ingham and the staff of the Physics Department of the Victoria University of Wellington. GEOTOOLS Inc. also contributed substantially by making available their software package, and the services of Ransom Reddig, gratis for the duration of the workshop. There will be a second magnetotelluric data interpretation workshop (MT-DIW2) in Cambridge on August 5th and 6th, 1994, prior to the 12th EM Induction Workshop. The *BC87* dataset will be examined again, and a second dataset from industry will be distributed to interested participants. If you wish for more information, please contact either Alan Jones (jones@cg.emr.ca) or Adam Schultz (adam@itg.esc.cam.ac.uk).

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