

Magnetotelluric survey of the Central
Australian Craton, with a focus on the
structural history of the Warumpi and
Musgrave Provinces and the Arunta
Complex.

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MAGNETOTELLURIC STUDY OF CENTRAL AUSTRALIA

ABSTRACT

In spite of the continent of Australia being the oldest and most tectonically stable on Earth, its structural history is still the subject of much conjecture. The final closure of the South Australian Craton with the North Australian Craton at roughly 1080 million years ago deformed much of Central Australia into the lithospheric arrangement observed today. Structural constraints have been developed in the last 30 years on the history of the Musgrave Province, Amadeus Basin, Warumpi Province and Arunta Complex in the southern part of the Northern Territory. In this study the resistivity structure of these four provinces was assessed through the use of a long-period magnetotelluric survey along the Stuart Highway from the South Australia-Northern Territory border to 90 kilometres north of Alice Springs. A key focus was to determine whether the structural arrangement, identified in a magnetotelluric survey conducted 100 kilometres to the east of this profile in 2006, is laterally consistent between the four provinces. In the Stuart Highway profile model the major structures present exhibit a different arrangement, particularly in the northern part of the profile, resulting in the conclusion that the mechanism for the lithospheric closure of the region was a more complex nature than was previously thought.

KEYWORDS:

MAGNETOTELLURIC, WARUMPI, MUSGRAVE, ARUNTA, RESISTIVITY, STRUCTURE

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