

## The Curnamona Cube, new data and insights

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### SUMMARY

The Curnamona Province is a Paleoproterozoic to Mesoproterozoic domain that hosts the Broken Hill Pb-Zn ore body and a number of IOCG type Cu-Au deposits, but is mostly covered in Neoproterozoic to Quaternary cover from a few tens of meters to thousands of meters with much of the province remaining unknown. Three-dimensional resistivity modelling of 55-km gridded long-period magnetotelluric data collected as part of the Australian Lithospheric Architecture Magnetotelluric Project (AusLAMP) previously revealed the presence of the Curnamona Conductor that exhibits extremely low resistivities  $<1 \Omega.m$  at upper-crustal depths ( $<15$  km) which has a lateral extent of  $>200$  km in a north–south orientation. The conductor appears to dip to the west, centred under the large igneous province Benagerie Suite Volcanics with resistivity  $\sim 10\text{--}100 \Omega.m$  in a broader lower crustal region.

Here, we present 3D resistivity models of the Curnamona Cube, with approximately 200 magnetotelluric stations over the Curnamona Province. The AuScope funded program, the Curnamona Cube, was designed to collect approximately 150 broadband magnetotelluric and ambient noise tomography stations to characterise the crust and upper mantle from the surface down to several hundred kilometres in such a way as defining a cube of the physical properties of the Curnamona Province. This cube is designed to provide a physical model of the Curnamona Province in terms of its electrical resistivity and seismic velocity covering an area of around  $400 \times 400 \times 400$  km's.

**Keywords:** Curnamona Province, Undercover, Curnamona Cube, Magnetotelluric, Ambient Noise Tomography

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