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Antarctica crust similar to South India, Mozambique: study

Ahmedabad, Nov 25, 2013, (PTI):



The crust of Antarctica, the earth's southernmost continent of which 95 per cent is covered with thick ice, is similar to that of south India and Mozambique, which indicates that the three were joined together in the past, researchers have found.

The results of the study titled 'Electrical Structure Beneath Schirmacher Oasis, East Antarctica: a magnetotelluric study' published in international journal Polar Research earlier this month, have found that the deep crust is untouched by any morphological features and thus gives unequivocal evidence to prove that India, Antarctica and South Africa were together in geological past.

The results have also shown that the crust (top 20 kms) is thick towards the eastern part as compared to western side.

The thick crust was found near Schirmacher Oasis, the eastern part of Antarctica. The research was done over several years by Gujarat Energy Research Management Institute (GERMI) director T Harinarayana, when he was with CSIR-run National Geophysics Research Institute (NGRI) at Hyderabad, along with researchers D N Murthy, K Veeraswamy, M Santosh and U K Singh.

"Understanding the deep crust in Antarctica is a major problem in the continent and doing measurements to know this information involves large logistical problems. We have used very economical way from the measurements of natural electromagnetic signals to map the earth's deep structure," Harinarayana said.

"We also found evidence of continuity of the Mozambique mobile belt in east Antarctica on the western side of Schirmacher Oasis," the paper states.

The results were collected during the 24th Indian Antarctic Scientific Expedition.

The research paper states that the highly resistive upper crustal structure supports the existing notion that western Dronning Maud Land is a stable, cratonic platform. Results of free-air gravity, seismic, geomagnetic and surface wave dispersion investigations in east Antarctica also indicate a cratonic-type crust.

Schirmacher Oasis is a coastal ice-free plateau extending for about 35 km in the north-central part of the Dronning Maud Land in east Antarctica.

According to Harinarayana, they faced challenges in making the measurements in open land exposed to severe atmospheric conditions for over a month.

The study was conducted using an experimental technique known as 'magnetotellurics', which has the advantage of shallow to deeper level overage, permitting different penetration depths depending on the frequency and conductivity of the layer under investigation.

Using the method, one can image the earth to a depth of about 50 to 100 kms.

Polar Research, in which the study has been published, is the international journal of the Norwegian Polar Institute, Norway's central institution for research, environmental monitoring and mapping of the polar regions.

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