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Seismic evidence for secular evolution and alteration of Archaean crust in Indian shield

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ABSTRACT

The mechanisms through which the Archaean continental crust evolved are debatable. The end member models advocate horizontal accretion of island arcs or vertical accretion due to differentiation of magmatic material above hotspots. Whether both the processes operated together or separately is hard to ascertain. Also, there is no consensus on the processes that govern secular change in the character of the crust in Archean, as revealed by the seismological and petrological data. In order to address these key issues, we use converted wave data to extract the bulk crustal properties of the Indian cratons. Our analysis dominated by data from the Dharwar craton, reveals that most of the crust is formed in the early Archean. Soon after its formation, it gradually altered, making it mafic -to-intermediate in bulk composition. Further, the present day heat-flow values, which are higher in late-Archaean compared to the early, correspond to regions of thinner crust, implying that the crustal

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