Seismic Ambient Noise Tomography of Dharwar Craton

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We present the seismic wave velocity variation beneath the Dharwar Craton crust using ambient noise. Stacked Rayleigh wave Green's function for 810 inter-station pairs from 31 broad band digital seismographs was computed through the crosscorrelation of the ambient noise recorded in the vertical component. Group velocity dispersion curves in the period range 5-25 s for each Green's function is then estimated. The Ambient noise Tomography images, at 5-20 s period, clearly distinguish the main geological terrain in the Dharwar Craton like Southern Granulite Terrain (SGT), Western Dharwar Craton (WDC), Closepet Granite (CG), Eastern Dharwar Craton (EDC) and Cuddapah Basin (CB).

At 5 s the SGT and northern part of CG exhibit higher group velocity of \sim 3.3-3.36 km/s, increasing from south to north, whereas the EDC and WDC show an average group velocity of \sim 3.22-3.28 km/s. At 10 s period, the CG show a group velocity of \sim 3.24-3.26 km/s, and EDC and WDC exhibit an average velocity of \sim 3.25 km/s, with the southernmost part of WDC and SGT are characterized with a peak velocity of \sim 3.36 km/s.

At 15 s, the CG continue to show the high group velocity of ~3.26 km/s, but significantly EDC exhibit 6% higher group velocity than WDC, with their peak velocities of ~3.16 km/s and ~2.98 km/s respectively. At 20 s, we find no observable velocity contrast between EDC and WDC with CG and its adjoining areas showing higher velocities. We analysed these seismic wave velocity variation in term of the material property and the rock composition.