Семинар ИТПЗ РАН
(Профсоюзная 84/32, здание ИКИ РАН, эт.2(тех), к.207.)

Prantik Mandal
Senior Principal Scientist, CSIR-NGRI, Hyderabad
Email:prantik@ngri.res.in

Nature of Crustal-lithospheric structure and mantle anisotropy beneath the Eastern Indian Craton

25 May, Thursday, вторник, 11.00

During 2013-2016, a semi-permanent network of fifteen three-component broadband seismographs in the Eastern Indian Craton (EIC) has produced an excellent dataset of several thousands teleseismic events, which enabled us to study the nature of crust-Mantle structure and Mantle anisotropy, underlying the region, through modeling of P-receiver functions (P-RF), surface wave dispersion and SKS splitting parameters. We obtain the thinnest crust of 35 km overlying a thin lithosphere of 78 km, below the region near South Singhbhum Shear Zone, which could be attributed to the 1.6 Ga plume activity associated with Dalma volcanics. However, the thickest crust of 47 km overlying a thin lithosphere of 81 km is noticed below the region near the Singhbhum granite of 3.6 Ga. This thinning of lithosphere could be attributed to the delamination of lithospheric root due to the Himalayan orogeny with a shortening rate of 2 cm/year. This delamination model in SOC gets further support from the densification of the lower crust, which could result from repeated episodes of basaltic underplating associated with episodes related to Dalma (~1.6 Ga) and Rajmahal (~117 Ma) volcanisms. This led to relatively more mafic, heterogeneous and deformed crustal structure in SOC as well as EGMB (with an average crustal Vs of 4.0 km/s) in comparison to that in CGGT (with an average crustal Vs of 3.9 km/s), as seen through our modelling results. The thickest lithosphere of 100 km is observed in the southwestern SOC as well as northeastern CGGT. We also notice that a sharp and flat Moho in CGGT, which could be attributed to thermal reactivation and large volume melting of the mafic cratonic crust during the late Archean subduction process and associated volcanism episodes. This model gets further support from the estimated 169 km thick lower Vs zone in the upper mantle below CGGT. Our modelling results also support a northward subduction of Archean SOC under the Proterozoic CGGT during 1.0-1.6 Ga, as earlier proposed by the geological age data from the region.