

## Imaging sedimentary basin along Palashi-Kandi profile in West Bengal, India using travel time inversion of seismic refraction data

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Seismic refraction data were acquired in north-south direction along an 80-km long palashi-Kandi profile in West Bengal basin. The data were interpreted by travel time inversion to delineate the basement configuration and overlying sedimentary formations. A six-layer velocity model down to a depth of about 7-km has been imaged. The first layer with a velocity of 1.8-2.0 kms<sup>-1</sup> and a thickness of 300-700m represents alluvium deposit. The second layer with 2.8-3.2 kms<sup>-1</sup> velocity and 1.2-1.4 km thickness variation is the shale formation. Since a thin (200 m) layer of Sylhet limestone (3.7 kms<sup>-1</sup>) is observed at nearby Palashi well that cannot be detected by the present data set, we assume the layer throughout the model. The fourth layer with velocity (4.5-4.6 kms<sup>-1</sup>) at a depth of 2.6 km corresponds to the Rajmahal Traps. The fifth layer with low velocity (4.0 kms<sup>-1</sup>) is inferred at a depth of 3.6 km below the Rajmahal Traps using the travel time skip. The sixth layer with velocity of 5.2-5.5 kms<sup>-1</sup> may represent the Singbhum group of rocks of the Proterozoic age. The layer with 5.9-6.2 kms<sup>-1</sup> velocity lying at variable depth between 6.5-6.9 km corresponds to the basement. The seismically derived shallow structure correlates quite accurately with the near by Palashi well and correctly explains the Bouguer anomaly observed along the seismic line.

Keywords: West Bengal basin; inversion; low-velocity layer; travel time; Rajmahal Traps.