

New layer of tectonic plates in Earth's mantle discovered

Houston: Scientists have found what appears to be an extra layer of tectonic plates lurking in the Earth's mantle, which may explain a mysterious series of earthquakes in the Pacific.

Jonny Wu of the University of Houston in the US and colleagues believe that the tectonic plates subducted into the Earth's mantle millions of years ago. Tectonic plates are pieces of Earth's crust and uppermost mantle, together referred to as the lithosphere.

The newly discovered plates slid horizontally inside a water-rich layer of the mantle known as the "transition zone," which lies 440-660kms below the surface. These subducted plates appear to travel horizontally for thousands of kilometres at speeds almost as fast as plates move at the surface, researchers said.

The plate movements may explain a mysterious series of very deep, large earthquakes known as the Vityaz earthquakes, which originated in the mantle between Fiji and Australia. Just as in conventional tectonic plates at Earth's surface, the bends and breaks in these subducted plates can generate earthquakes, *The Guardian* reported.

Researchers suggest that the Vityaz earthquakes could be due to the sliding of a subducted plate within the transition zone. "Basically, 90% of Earth's deep seismicity (more than 500km deep) occurs at the Tonga area where we have found our long, flat slab," said Wu.

The finding was made possible by recent advances in seismology, which allowed scientists to generate pictures of Earth's interior using vibrations from natural earthquakes. These seismological pictures can be used to locate subducted tectonic plates lurking within the mantle and then to reconstruct the configuration of plates on Earth's surface millions of years ago.

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