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Shallow seismic activity of the offshore region southeast of Sri Lanka

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Although Sri Lanka is considered to be in an aseismic zone away from major plate boundaries or any active faults, during the last century there have been several hundreds of earthquakes reported in and around Sri Lanka. We therefore made an attempt to investigate earthquake activity of the offshore region of southeast Sri Lanka. Hypocentral data of a magnitude of 4.3, obtained from the Data Management Center at the Incorporated Research Institutions for Seismology for the period from January 1964 to December 2010, were used for the analysis. Spatial distribution of focal mechanisms was analyzed to investigate the geometry of faulting during earthquake fault slip using the data available from the Global Centroid Moment Tensor solution database for the period from January 1976 to December 2010.

Results of the analysis show that a large number of earthquakes take place at a belt that lies in southeastern parts of offshore Sri Lanka about 1000 km away from southeast coast of Hambantota although some events appear to be scattered probably due to location errors. Although different types of focal mechanism solutions exist in earthquakes of near coast events, we clearly noted that the earthquake belt in the southeastern part of Sri Lanka have mechanical solutions which are similar to that of strike slip fault mechanisms. More than 20 similar types of events were closely examined by dividing into several sub regions. A rotation of fault planes towards the direction of India-Capricorn pole of rotation can be seen from the analyzing results. Further, location analysis of earthquakes and the study of their mechanical solutions show that the earthquakes occurring in the identified belt in offshore southeast Sri Lanka may have originated in the boundary of the Indo-Australian plate.

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