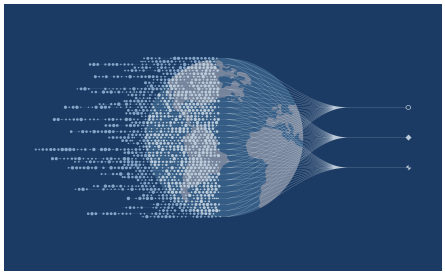

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Focal Depth Estimation Techniques: A Case Study from Mongolia

Focal depth is a critical parameter in earthquake monitoring, offering insights into seismic processes and tectonic behavior. This study employs the Depth Scanning Algorithm (DSA) to determine the focal depths of 3388 seismic events recorded between 19 December 2022 and 26 August 2024, in the Mogod fault area, Mongolia. As part of an international collaboration with KIGAM, 10 temporary seismic stations were strategically deployed to enhance spatial coverage and improve event localization accuracy. The DSA method identified depth phases (e.g., Pg, sPg) within waveform data, with focal depths ranging from 2 km to 29.7 km. Results revealed a predominance of shallow events (<10 km), reflecting active tectonic processes, alongside deeper events indicative of complex geological settings. Sub-cross sections along the Mogod fault system highlighted distinct fault geometries and behaviours, underscoring the heterogeneous nature of the region's seismicity. This research demonstrates the effectiveness of DSA in focal depth determination, providing a deeper understanding of the Mogod fault's seismic behavior and contributing to improved seismic hazard assessment. This study also highlights the critical role of regional and international collaborations in advancing seismological research. *Keywords: Focal depth, Depth Scanning Algorithm, seismicity, Mogod fault, tectonics, seismic hazard assessment*

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