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Investigating the Subsurface Geometry of the Mogod Fault System in Mongolia Through Earthquake Hypocenter Relocation

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The 5 January 5 1967 Mogod earthquake (M_s 7.5, M_w 7.1) in Mongolia caused significant surface faulting and has long been a focus of seismological studies. Recent collaborative research (2022–2024) between the Institute of Astronomy and Geophysics, Mongolia, and the Korea Institute of Geoscience and Mineral Resources (KIGAM) has advanced the understanding of this fault system. This study focuses on refining the geometry of the Mogod fault system in the Bulgan Province by reassessing earthquake hypocenters and exploring subsurface fault interactions.

A key area of investigation is the junction at 48.2°N , 103.05°E , where north-south (N-S) and north-northwest-south-southeast (NNW–SSE) fault systems intersect. Despite the lack of surface evidence linking these faults, subsurface structural interactions have been inferred by relocating seismic events using the SeisComP module. This approach has revealed four critical zones that merit further study, providing insights into fault behavior and seismic hazard potential.

This research holds significance for both regional and global seismic monitoring, particularly in advancing methodologies for analysing earthquake sources and improving fault system models. These contributions directly support the Comprehensive Nuclear-Test-Ban Treaty's mission of enhancing seismic event discrimination and understanding tectonic processes.

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