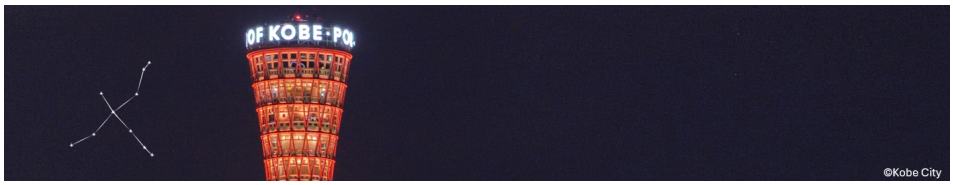

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Experimental requirements for probing geochemical heterogeneities via directional geoneutrino detection

Monday, 23 February 2026 16:25 (25 minutes)

Recent geophysical studies indicate that the Earth's interior is not homogeneous but contains various structures. Among these, the most prominent are the Large Low-Shear-Velocity Provinces (LLSVPs), anomalous mantle domains extending over more than a thousand kilometers. The origin of LLSVPs is uncertain, but one hypothesis is that they formed from radiogenic heating produced by enrichment of radioactive elements such as U, Th, and K. By observing geoneutrinos, which are electron antineutrinos produced by radioactive elements inside the Earth, we can obtain valuable information on its internal heat production, chemical composition, and structure. In this talk, I will present the calculation results of an evaluation of how much angular resolution and experimental exposure are required, assuming a liquid-scintillator detector with directional sensitivity, to probe large-scale geochemical structures in the mantle.

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Session Classification: Application