

## Seismic characteristics of lower Kumano Basin in the Nankai Trough

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The Kumano Basin, located off the Kii Peninsula, Southwest Japan, is a forearc basin of the Nankai subduction system. The basin lies above the Kumano splay fault system and thus records the fault's influence on the development of the Nankai accretionary prism. A high-quality 3D seismic reflection dataset reveals the basin development. Seismic strata in the Kumano Basin can be divided into upper Kumano Basin (UKB) sediments and lower Kumano Basin (LKB) sediments, bounded by an angular unconformity. The UKB is ~800-1000 m thick within the 3D seismic area. The reflectors are tilted landward, progressively in the most seaward region, and the strata were cut by normal faults, which suggest that depositional history of the UKB is affected by the activity of mega-splay fault system underlying the Basin. The LKB is a distinct seismic facies from UKB. The LKB thins seaward and is difficult to identify in the seawardmost part of the Basin, but the LKB is widely visible throughout the landward side of the basin in the 3D volume. The thickness of LKB reaches its maximum of ~1300m 15-20 km landward from the southeastern edge of the basin, where a NE-SW trending depression was filled by earliest basin sediments. The LKB can be divided into two major seismic units. The upper part of the LKB (LKB-1) has semi-transparent acoustic character. LKB-1 drapes over the lower part of LKB (LKB-2) in the landward region and directly overlies the accretionary prism in the seaward area. We interpret the LKB-1 as relict slope-apron sediments. This unit has a fairly uniform thickness of 100-150 m. The base of LKB-1 is an unconformity marked with a consistent, high-amplitude reflector. LKB-2 is a sequence with high-amplitude reflections that infill various scales of depressions including the largest one mentioned above. This unit is interpreted to be composed of buried slope basin sediments. High-amplitude semi-horizontal reflectors are observed which cross-cut the dipping strata within some areas of the LKB-2 sequence at a depth of 1400-1500 mbsf. The reflectors have apparently positive polarity and are parallel to the seafloor, which suggests a diagenetic origin or presence of hydrocarbon. A dome-like structure at the base of the forearc basin is observed landward of the large-scale depression. Not only LKB but lower part of UKB was deformed above this area. Lense-shaped, high-amplitude reflection anomalies are also observed in the lower to middle UKB above this area. These anomalies can be connected to the BSR in the UKB and thus suggest the existence of fluid or gas.

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