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Crustal structures of the southern Okinawa Trough

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The Okinawa Trough, with a depth increasing toward the south, is a backarc basin accompanying an arc-trench system. Previous studies proposed that the southern part of the trough has thinner crust and shallower Moho depth than the northern part has, and is the most developed section in the whole trough.
To obtain rifting structures, which give further information for estimating the formation process of the southern Okinawa Trough, Japan Coast Guard carried out seismic refraction and MCS reflection surveys on two survey lines along the rifting axis of the trough from October to November, 2008.

MCS profiles image thick sediment layers with 1-3 sec two-way travel time widely distributing in the southern part of the trough. Many faults cut the thick sediments and the acoustic basements, which are fairly rough compared to the smooth seafloor.
Two constructed velocity structures reveal that the large part of the igneous crusts has been divided into three distinct layers by reflecting interfaces. A characteristic feature of the structures is an existence of continuous 2-3 km thick layers with a P wave velocity of approximately 6.0-6.5 km/s. Although the minimum thickness of the igneous crusts is less than 10 km, their velocity profiles are different from that of a typical oceanic crust.