



Seismic characteristics and sedimentary record of the late Pleistocene Delta offshore southwestern Hainan Island, northwestern South China Sea

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Deltas form mainly at estuaries where a river empties into a sea, recording important palaeo-environmental information. Based on high-resolution seismic and core data, we investigated the stratigraphy, sediment provenance, evolution, and depositional environment of a late Pleistocene delta offshore Hainan Island (HNPD), and we conducted a preliminary analysis of the factors controlling the delta's formation and evolution. The seismic data show universal progradational configurations towards SW or SE, indicating that the Eastern slope provided sediments that were transported both south-westward and south-eastward, which resulted in two depocentres. The average thickness of the delta sediment is approximately 35 m, and it has an arcuate shape surrounding the Eastern slope. Therefore, the sediment provenances of the HNPD were mainly from the Hainan Island. The comparison between the core dating results and the global sea level curve shows that the delta formed mainly during Marine Isotope Stage (MIS) 4 (65-56 ka). We used stratigraphic contact relationships to divide the delta's internal sedimentary units in detail. The structural and lithological characteristics of the units all correlate well with sea-level changes. The topography of the basin, the relatively low sea level, and the southward oceanic currents driven by the glacial-period strong winter monsoon all contribute to the formation of the delta. As the development of the delta still required a large sediment input from a river, we speculate that the main reason that the delta's development stopped was the shift of the channel of the Changhua River on Hainan Island.

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