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# Stacking geometry, internal Architecture, and Evolution of buried volcanic mounds in the Northern South China Sea

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Abstract: High-resolution seismic and borehole data were used to carry out the detailed characterization of the stacking geometry, internal architecture and evolutionary history of a volcanic mound in the northern South China Sea (SCS). In seismic profiles, the imaged mound penetrated by well BY7-1 is similar to isolated carbonate buildups in geometry. Ten seismic facies are identified to analyze the depositional geometry and internal architecture of the mound, under the constraint of borehole data. Lithologic analysis based on lithologic cuttings and thin sections of sidewall cores, reveals that the mound is a very complex volcanic-induced mixture of volcanics and basinal deposits, representing alteration of volcanics and siliciclastic/carbonate deposits. This is interpreted as the result of recurrent volcanic eruptions: with accumulation of volcaniclastics during eruptions and siliciclastic/carbonate being deposited during the inter-eruptive stages. The combination of seismic and well data allow to present the entire evolutionary history of the mound from its beginnings to its demise and burial. Alteration of processes formed a complex stacking geometry, internal architecture and high-frequency sequence stratigraphy of the mound. These findings not only provide an effective reference for detailed interpretation of similar structures, but also a significant case to evaluate the effects of volcanism on the basin filling process and sequence evolution.
Key words: Volcanic mounds; Volcanic sedimentology; High-frequency sequence