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Microfossil evaluation using X-ray computed tomography for petroleum exploration

Content

The application of micropaleontology in petroleum exploration is an essential tool with a pivotal role in the success of the oil and gas industry over the decade. In petroleum exploration, this subdivision of palaeontology is based on the taxonomical identification of microfossils to determine drilling casing and coring points by monitoring the biostratigraphy encountered and confirm the total drilling depth, reducing unnecessary drilling and expenses. The current bulk processing and identification of microfossils from drill cores for petroleum exploration are limited by traditional chemical and physical microfossil extraction and microscope inspection methods. These traditional methods of extracting microfossils are time-consuming and damage microfossils, affecting the evaluation and correlation with biostratigraphy reports. This study discusses and demonstrates the potential of X-ray tomography (Micro CT) to add value in the process chain of microfossil characterisation for petroleum exploration by subjecting drill core samples to microCT scans at different extraction stages. The results show that X-ray tomography can be used as a non-destructive technique to characterise microfossils in-situ while providing the 3D architecture and distribution. The additional 3D information is not only useful but is easily automated and recorded for future use.

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