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Sedimentology and high-frequency sequence stratigraphy of Middle-Lower Ordovician Yingshan Formation, in the Tahe Oilfield of Tarim Basin, Northwest China

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The sedimentology of Yingshan Formation was analyzed in the Tahe oilfield using detailed outcrop and core observations and thin section descriptions,. On the basis of facies stacking, with well log curve and geochemical analysis, a high-frequency sequence stratigraphy of Yingshan Formation was identified. The results reveal that thickness of the Yingshan Formation is 855-925m in the study area. The facies mainly include tidal-flat facies, lagoon facies, shoal facies, and interbank sea facies.

Two sequence types are defined. The stacking pattern of sequence type A is characterized by a facies succession from tidal-flat facies, through lagoon, into shoal facies again in ascending order. The stacking pattern of sequence type B is characterized by a facies succession from interbank sea facies into shoal facies, showing upward-shallowing parasequences.

Through the Spectrum analysis of the GR curves in sequence type A and sequence type B, a good corresponding relationship with Milankovitch cycles can be found in sequence type A, but cannot be found in sequence type B. Therefore, sequence type A is controlled by the Milankovitch cycles. Fischer plots show that the cyclicity thickness is thinner in sequence type B, whose shoal development and changes are sensitive. That may be the cause of the poor corresponding relationship with Milankovitch cycles in sequence type B.