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Seismic Expression of the Basal Tertiary Slide Complex, Deepwater Tarfaya-Agadir Basin, Offshore Morocco

The Tarfaya-Agadir Basin in offshore Morocco, is a frontier exploration area with no deepwater well penetrations and limited well control in the updip shelfal equivalent. Several depositional sequences within the basin have been identified on 2D and 3D seismic as potential exploration targets, including the basal Tertiary sequence, which has been interpreted by previous workers as a deepwater turbidite fan. Recent detailed 3D seismic mapping and study by Shell has resulted in a better understanding of the nature and depositional history of the basal Tertiary sequence in the southern part of the basin.

The basal Tertiary depositional unit, named "Tejas A", is about 50ms to 400ms thick and on seismic records lies either directly on top of or up to 100ms above the T-K unconformity, depending on location within the basin. "Tejas A" comprises relatively high amplitude seismic reflectors and unusual "mound-like" depositional features. The "mound-like" features are associated with the basal chaotic seismic facies. The mounds and the chaotic facies are overlain by younger onlapping and draping units. Pronounced velocity sags have been observed below many of the smaller "mounds" on the seismic data. Several depositional models considered for the "mound-like" features include deepwater chemosynthetic reefs, erosional remnants and transported blocks within slides. Detailed 3D interpretation of the "Tejas A" depositional unit demonstrates it is mainly a massive slide complex, with huge, coherent transported blocks (up to 2 x 3 km) in the southern part of the basin.