



How far facies and diagenesis control diffuse fractures in carbonates?

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Diffuse fractures are early-developed structures which form a background network in most rock. However, what controls these diffuse fractures occurrence remains badly known and, therefore badly quantified in reservoir modeling, especially in carbonates. To overcome this lack, carbonate rocks deposited in slope and in platform conditions have been investigated. Their susceptibility to diffuse fracturing is specific: stratabound in slope carbonates and non-stratabound in platform carbonates. Both the carbonate facies distribution and the early diagenetic imprint induced the mechanical stratigraphy when fractures formed and constrained fracture development. Additionally, we observed that late fractures related to late tectonic inversion were partly inhibited. Indeed, rock mechanical properties are changing through time, geodynamics and burial diagenetic events. Characterizing the temporal evolution of carbonate rocks has proved that diagenesis and sedimentary facies are the prime actors for brittleness and mechanical layering in carbonates.