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TITLE: From Outcrop to Reservoir: Improving Exploration in Diapiric Provinces

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ABSTRACT BODY:

Abstract Body: Hydrocarbon exploration in diapiric provinces has proved to be challenging. In this type of settings, vertical beds, steep and complex salt walls and subsalt domains make seismic imaging a complex exercise.

Moreover, the dynamic interaction between salt diapirism and deposition produces complex 3D reservoir geometry and distribution.

In this work, we present data from superbly exposed outcrop analogues from La Popa Basin in Sierra Madre Oriental (Mexico), the Central High Atlas diapiric province (Morocco), the Ribagorça Basin in the Southern Pyrenees and the Maestrat Basin in the Iberian Range (Spain). The studied areas provide examples of salt diapirs, salt welds, salt rollers, halokinetic strata, minibasins of different dimensions, megaflaps, allochthonous salt sheets, salt overhangs and rafts.

The study, based on a multidisciplinary approach that combines field mapping, remote sensing, structural, sedimentological and diagenetic analysis of the halokinetic sequences, improves the understanding of the geometries, extension, composition and facies distribution of the syndiapiric sediments, with special focus on the distribution of carbonate facies. Of particular interest are spectacular subsalt domains exposed in all the studied basins, where subvertical halokinetic hooks and wedge stacks consistently show facies deepening away from the diapir. Shallow water carbonates, reef patches, coral build ups, slope breccia and oolitic shoals are not rare in these domains.

The results of this work might be used to improve seismic processing, the interpretation of borehole data, and the evaluation of business opportunity in similar settings.

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