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Encasement and subsidence of salt minibasins: observations from the SE Precaspian Basin and numerical modeling.

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The SE Precaspian Basin is characterized by an assemblage of Upper Permian to Triassic minibasins. A recently acquired borehole-constrained 3D reflection dataset reveals the existence of abundant intrasalt reflection packages lying in between the Permo-Triassic minibasins. We propose that most of the mapped intrasalt reflection packages in the study area are minibasins originally deposited on top of salt that were later incorporated into salt by encasement processes. This makes the SE Precaspian Basin a new example of a salt province populated by encased minibasins, which until now had been mainly described from the Gulf of Mexico. Identifying salt-encased sediment packages in the study area has been crucial, not only because they provide a new exploration target, but also because they can play a key role on improving seismic imaging of adjacent or deeper stratigraphic sections.

Another remarkable feature observed in the seismic dataset is the widespread occurrence of distinct seismic sequences in the Permo-Triassic minibasins. Bowl- and wedge-shaped seismic sequences define discrete periods of vertical and asymmetric minibasin subsidence. In the absence of shortening, the bowl-to-wedge transition is typically associated with the timing of basal welding and subsequent rotation of the minibasins. Timing of minibasin welding has important implications when addressing the likelihood of suprasalt reservoir charging. We performed a set of 2D numerical simulations aimed at investigating what drives the tilting of minibasins and how it relates to welding. A key observation from the numerical models is that the bowl-to-wedge transition can predate the time of basal welding.