The Messinian Salinity Crisis (MSC) deposits in the Balearic Promontory: An undeformed analog of the MSC Sicilian basins??

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The Messinian Salinity Crisis (MSC) is a prominent and still misunderstood event that influenced the Mediterranean basin in the late Miocene leaving behind a Salt Giant (SG) widespread all over the Mediterranean basin. More than 90% of the Messinian Evaporitic deposits are located offshore with reduced access via boreholes, and thus has been studied mainly by seismic imaging. Onshore-Offshore should be considered a key for a better understanding and answering some of the controversies on the MSC.

The Balearic Promontory (BP) contains a series of small perched basins presently lying at different water depths, stepped from the present-day coastline down to the deep basin. These topographic lows trapped sedimentary series up to 500m thick, interpreted as MSC in age. The reduced tectonic movements in the BP since the late Miocene (Messinian) till recent days favored the conservation of the MSC records in this area. Moreover, recent studies revealed the presence of a Salt layer in the Central Mallorca Depression (CMD).

Considering: 1- the bathymetry of the BP, classified as an intermediate perched basin; 2- the distribution of the MSC records accumulated in a series of sub-basins more or less connected between each other; 3- the geometries of the evaporitic formations, provided by how these records appear on the seismic data; this might recall similarities between the BP records (especially the ones in the CMD) and the MSC reference records outcropping in Sicily (especially in the Caltanissetta Basin).

We perform seismic interpretation of a wide seismic reflection dataset in the study area with the aim of refining the mapping of the Messinian evaporites covering the study area. Four seismic units were identified in the BP based on their seismic facies and their seismo-stratigraphic position. We try to match up these units to the consensus Messinian 3-stages chrono-stratigraphic model proposed during the CIESM in 2008.

We also attempt to find similarities in geometries, facies and distribution of the MSC between the sub-basins of the BP and those described in the Sicilian sub-basins.