



## **Late Messinian seismites from the Nijar Basin, SE Spain**

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The upper Messinian Feos Formation of the Betic Nijar Basin in SE Spain includes many deformational structures at various levels that are interpreted as seismites. During the late Messinian, a period characterized by almost total isolation of the Mediterranean, faulting and differential uplift started to shape the contours of the present Nijar Basin. In relation to the isolation of the Mediterranean the basin repeatedly flooded and dried-up. During flooding stages, the Mediterranean-wide occurring brackish Lago-Mare facies was formed, characterized by whitish chalky marls and intercalated sandy laminites. During drier episodes continental clastics, initially associated with reworked and sabkha like evaporitic strata, were deposited. Both the coarser and finer clastic sediment types, together forming the over 100 m thick Feos Formation, include various types of deformation structures, especially those characterized by liquefaction. These structures will be discussed and illustrated for both continental coarse clastics and Lago Mare facies. The many examples, suggest the recurrent seismic shocks, proving the relative importance of seismicity in the Betic region during this critical time interval with regard to the Messinian salinity crisis. Especially the presence of liquefied gravel injections in the marginal zone indicates that relatively strong earthquakes ( $M \geq 8$ ) did occur. Up to at least 4 seismites were observed within one of the Lago-Mare intervals. As these intervals are interpreted as probably

precession-controlled, this occurrence suggests a recurrence interval of major shocks on a millenium scale, which is consistent with the present day seismic activity in this part of the Trans-Alboran shear zone.