



## **The Miocene-Pliocene unconformity in the North Betic corridor. The expression of the reflector “M” in the Atlantic**

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The Miocene Pliocene boundary is associated in the Mediterranean to a major flooding of Atlantic water that terminated with the Messinian salinity crisis. In many seismic profiles all over the Mediterranean margins this event is linked to an erosion surface that separates the Messinian evaporitic units from the overlying open marine Pliocene sediments. This unconformity originally identified as reflector “M” can be traced to the deep basins as a paraconformity / local erosional surface that has been usually named as Horizon M. This erosive surface in Mediterranean continental margins has been linked to a pronounced drawdown of base level triggered during the Messinian. In consequence, this unconformity should be only expressed in the Mediterranean. However, a significant unconformity has been recognized in the Guadalquivir basin and in the Gulf of Cadiz in the Atlantic side of Iberia that is identified as a Messinian canyon deepening towards the Atlantic. Recently, the cyclostratigraphic and biostratigraphic analyses of various logs recovered by different oil and gas exploration companies over the last decades allowed us to accurately date this major discontinuity in the Guadalquivir basin and the Gulf of Cadiz, as well as to compare sedimentary cycles in the Atlantic with those of the Mediterranean. The astronomical tuning of these cycles unambiguously links this discontinuity in the Atlantic with the Miocene Pliocene boundary, raising important questions about the origin of this major event. We explore the potential origins for this discontinuity, including the tectonic vertical motions of the Betic-Guadalquivir system, or the presence of a seaway undergoing intense bottom-current circulation between the Mediterranean and the Atlantic.