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The Rhône Interfluve Slide, Gulf of Lion – a large Glacial Maximum slide complex: its morphology, timing, emplacement and potential triggering mechanisms

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The Gulf of Lion (NW Mediterranean Sea) is a SW-NE oriented passive continental margin formed after the starting of the convergence between Europe and Africa in the Oligocene. It presents several small to large-scale mass movement features suggesting a long history of mass movements. Of particular interest are the two surficial giant mass transport deposits along the Rhône turbiditic levee, known as the Eastern and Western Mass Transport Deposits (EMTD and WMTD). With the help of the recently acquired multibeam bathymetric, sub-bottom profiler, high-resolution seismic and sedimentological data, we investigate the morphology, timing, kinematics and possible triggering mechanism of the source area of the EMTD, which we refer to as the Rhône Interfluve Slide (RIS). RIS has an estimated run-out distance of approximately 200 km, it covers an area of about 1000 km^2 and the volume of the mobilized material is calculated to approximately 200 km^3. Our data reveal four individual glide planes (HS1, 2, 3 and 4) within the RIS complex, which we believe were most likely generated due to retrogressive failures. The glide planes of the RIS coincide with high-amplitude reflectors interpreted as condensed sections, which acted as weak layers favoring the failures. AMS radiocarbon dating yields an age of approximately 21 ka for the failures, which falls within the Last Glacial Maximum. The toe area of the RIS is incised by several active listric faults rooted into the Messinian strata. The combination of several factors such as slope steepening, halokinesis, excess pore pressure generation due rapid turbiditic sedimentation during the Last Glacial Maximum are considered as the possible candidates for the triggering of the failures.

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