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# Formation, transport and mixing of the Mediterranean Overflow Water

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The pathways and transformations of dense water overflows, which depend on small-scale interactions between flow dynamics and erosional-depositional processes, are a central piece in the ocean's large-scale circulation. A novel, high-resolution current and hydrographic data set highlights the intricate pathway travelled by the saline Mediterranean Overflow as it enters the Atlantic. Interaction with the topography constraints its spreading. Over the initial 200 km west of the Gibraltar gateway, distinct channels separate the initial gravity current into several plunging branches depth-sorted by density. Shallow branches follow the upper slope and eventually detach as buoyant plumes. Deeper branches occupy mid slope channels and coalesce upon reaching a diapiric ridge. A still deeper branch, guided by a lower channel wall marked by transverse furrows, experiences small-scale overflows which travel downslope to settle at mid-depths. The Mediterranean salt flux into the Atlantic has implications for the buoyancy balance in the North Atlantic. Observations on how this flux enters at different depth levels are key to accurately measuring and understanding the role of Mediterranean Outflow in future climate scenarios.