



## **Episodic Fluid release during High-pressure Dehydration of Antigorite-serpentinite in Subducting Slabs**

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Subduction zones are the main sites of water recycling on Earth. At intermediate depth of subducting slabs, metamorphic devolatilization reactions are the principal source of fluids. A key devolatilization reaction is the discontinuous dehydration of antigorite serpentinite because it liberates the largest amounts of slab fluids. Despite their fundamental role in subduction dynamics, the timescales and nature of deserpentinization fluid release are poorly constrained. Here we show evidence from an exhumed subduction terrane (Almirez Massif, S. Spain) that fluid release during dehydration of serpentinite is episodic and driven by compaction. The discontinuous nature of fluid release is recorded by the alternation of lenses of chlorite harzburgite –the dehydration product of antigorite serpentinite– with granofels and spinifex textures. Detailed mapping shows that lens thicknesses are consistent with the compaction length of serpentinite dehydration. This exceptional natural record demonstrates that deserpentinization fluid release in a subducting slab is non-steady and likely accommodated by pulses of fluid-filled porosity waves.

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