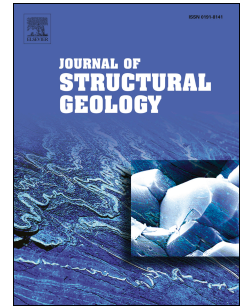


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The permeability of stylolite-bearing limestone

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1 The permeability of stylolite-bearing limestone

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13 14 **Abstract**

15 Stylolites are planar features that form due to intergranular pressure solution. Due to their
16 planar geometry and relative abundance in limestone reservoirs, their impact on regional fluid flow
17 has attracted considerable interest. We present laboratory permeability data that show that
18 stylolites can be considered as conduits for flow in the stylolite-bearing limestones measured. A
19 combination of analysis techniques shows that this is due to a zone that surrounds these stylolites
20 that is more porous and contains larger pores than the host rock. Our data also show that the water
21 permeability of a sample containing a stylolite parallel to fluid flow is typically lower than its
22 permeability to gas, explained here as a result of the expansion of minor amounts of clay found in
23 the stylolite, and that, due to their microstructural similarities, tectonic and sedimentary stylolites
24 affect sample permeability similarly. Finally, we show that the permeability anisotropy that

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