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## Morphology of scallop patterns in erosion by dissolution

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Erosion by dissolution is a decisive process shaping small-scale landscape morphology [1]. For fast dissolving minerals, the erosion rate is controlled by the solute transport [2] and characteristic erosion patterns can appear due to hydrodynamics mechanisms. Among the diversity of the dissolution patterns, the scallops are small depressions in a dissolving wall, appearing as cups with sharp edges. Their size varies from few millimeters to around ten centimeters. The scallops occur typically as the final steady form of ripple patterns created by the action of a turbulent flow on a dissolving surface [3,4]. Moreover, very similar shapes are also met, without imposed external flow, when the fluid motion results from the solutal convection induced by the dissolution [2,5,6]. Finally, scallop patterns resulting from similar mechanisms appear also on ice surfaces by melting in presence of a turbulent flow [7] or a convection flow [6].

Using three-dimensional surface reconstruction, we characterize quantitatively the scallop patterns mainly for experimental samples patterned by solutal convection. The temporal evolution of the scallop shape, of their spatial distribution and of the induced roughness are specifically investigated, in order to determine mechanisms explaining the generic aspects of dissolution patterns.

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