Geophysical Research Abstracts
Vol. 18, EGU2016-9139, 2016
EGU General Assembly 2016

Modelling Layer parallel stylolites

Daniel Koehn (1), Daisy Pataki Rood (2), and Nicolas Beaudoin (1)

(1) School of Geographical and Earth Sciences, University of Glasgow, United Kingdom (daniel.koehn@glasgow.ac.uk), (2) Emperial College London, UK

We modeled the geometrical roughening of mainly layer-dominated stylolites in order to understand their structural evolution, to present an advanced classification of stylolite shapes and to relate this classification to chemical compaction and stylolite sealing capabilities. Our simulations show that layer-dominated stylolites can grow in three distinct stages, an initial slow nucleation, a fast layer-pinning phase and a final freezing stage if the layer dissolves completely during growth. Dissolution of the pinning layer and thus destruction of the compaction tracking capabilities is a function of the background noise in the rock and the dissolution rate of the layer itself. Low background noise needs a slower dissolving layer for pinning to be successful but produces flatter teeth than higher background noise. We present an advanced classification based on our simulations and separate stylolites into four classes: rectangular layer type, seismogram pinning type, suture/sharp peak type and simple wave-like type.