

Résumé du séminaire du jeudi 20 octobre 2005 :

Pressure-dissolution processes: modeling the formation of stylolites.

par

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Stylolites (rough dissolution surfaces) are a very common feature in the Earth's crust. Even though stylolites have been studied by numerous scientists they are still not fully understood. Open questions include the dynamic development of the stylolite roughness, how the roughness is influenced by stress and initial heterogeneities in the rock and why the stylolites develop characteristic looking "teeth". In addition we will only be able to use stylolites and their roughness in an advanced tectonic or basin analysis if we can classify them qualitatively and fully understand their dynamics. We present a numerical model of stylolite development where a linear elastic solid represented by a lattice spring model dissolves at a stressed interface. The developing "stylolites" show characteristics of natural stylolites like "tooth" geometries and self affine scaling. We present a family Viscek scaling of the simulations and calculate characteristic growth and roughness exponents that are similar to those of natural stylolites. In addition we illustrate with a correlation function that two scaling regimes with different roughness exponents exist, a small scale regime that is surface energy dominated and a large scale regime that is elastic energy dominated. We propose that our model can be used as a basis to explore the full dynamics of stylolite development and that we will be able to use stylolites as new microtectonic tools in the future.