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# Dyke segmentation: an experimental approach

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Hydrofractures induced by a pressurized fluid inside a solid host material occur in nature as joints, veins, and dykes. Due to the heterogeneity of the material properties, rock structure, fluid rheology, and in-situ stress state, the process of hydrofracturing in nature is highly complex. As a result, it is difficult to measure and predict the behavior of natural hydrofractures in field conditions. Fracture segmentation is observed in most materials at every scale from microns to kilometres and dykes are not the exception. In particular, dykes not always emplace as individual, symmetric and planar structures in the host rock. In many cases even in homogeneous rocks, dykes exhibit segmentation of the type of en chelon-like structures and fingering. The causes of dyke segmentation have been associated with: (1) rock heterogeneity (i.e. pre-existing structures); (2) mixed-mode I+III loading; and (3) instabilities of dike growth process. However, there are still many open questions related to the origin of dyke segmentation, including at which level each of the mentioned processes influences its propagation. In order to have a first approach of study to this phenomenon, a series of laboratory experiments in transparent materials of dyke propagation have been performed. We present the results of experiments of analogue dykes that transport Newtonian and shear thinning fluids that lead to segmentation, in absence of rotational stresses and heterogeneity of the host media. We use these experiments as the most direct source of observations of dike geometry. These experiments allowed the visualization in real time of the developing geometry of the analog dykes and the direction of their propagation.