Design of crack morphology using memory of plastic deformation

Akio Nakahara
(Professor, Nihon University, Japan)

Abstract

Morphology of crack patterns can be controlled by using memory of plastic deformation. For example, densely packed colloidal suspension, called paste, remembers direction of its motion such as shear and vibration and, when it is dried, these memories in paste can be visualized as morphology of crack patterns, because directions of crack propagation strongly depend on what kind of memory the paste has.It is shown that plastic deformation of paste plays a key role in memory effect. By imprinting, rewriting and erasing these memories in paste, it becomes possible to design and produce crack patterns as you like.

Research area(s): Physics of Pattern Formation, Crack Formation, Rheology of Softmatter