

Abstract Submitted  
for the DFD11 Meeting of  
The American Physical Society

**Oscillations of a fiber flowing in a confined microchannel** HELENE BERTHET, ESPCI-PMMH, Schlumberger, MARC FERMIGIER, ESPCI-PMMH, GERARD DACCORD, Schlumberger, ANKE LINDNER, ESPCI-PMMH — Transport of slender bodies in confined geometries is of interest in various industrial applications. In the oil industry, fibers are widely used for stimulation or to prevent losses into the rock formations. Applications can also be found in biology systems such as targeted drug delivery. We present an experimental and numerical investigation of the flow of an advected fiber in a confined microchannel. The fiber is fabricated *in situ* using a photo-polymerization method to ensure an excellent control of its geometry and its mechanical properties. When imposing a constant flowrate, we observe that the fiber oscillates continuously between the lateral walls until it exits the channel. We characterize the oscillation period as a function of the flow velocity, the fiber length and channel width. This phenomenon can be used to generate efficient mixing at the microscale.

Helene Berthet  
ESPCI-PMMH

Date submitted: 01 Aug 2011

Electronic form version 1.4