

Solute uptake in vessels with oscillatory walls

Dr. Leonardo Espín

**Instituto de Matemática Pura e Aplicada,
IMPA**

lespin@fluid.impa.br

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Abstract

We study computationally the absorption of a passive solute through the walls of an oscillating channel of finite length. The channel is filled with an incompressible fluid which carries the solute. The channel walls pulsate in a prescribed manner and these pulsations generate a fluid flow that modifies the solute transference to the medium that surrounds the channel, and consumes solute at a constant rate. We investigate how this flow enhances the uptake of solute in the surrounding medium. We apply our numerical results to a two dimensional model of a surgical technique used for treating patients with coronary artery disease