

Abstract Submitted  
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**Flow in wavy walled microchannels** RAGHAVI RAO, PUSHPA-VANAM S, IIT Madras — Improving the efficiency of mass transfer processes in microchannels is of significance in many applications. Here the flow is primarily laminar and mass transfer occurs by diffusion. Making the surface of the channel rough allows us to induce convection in transverse directions to the flow. In this work, we will study the effect of periodically varying surface of a channel wall using a perturbation solution. The modification in the velocity profile and its effect on improving mass transfer will be analyzed. The analysis will be illustrated for the case of extraction of a solute from one liquid phase to another. The effect of various parameters like surface tension, density ratio and viscosity ratio of the fluids will be studied and the regions in parameter space where a significant improvement in performance is expected will be determined. The results of the perturbation series solution will be compared with numerical results. Two cases, that of a constant and a deformed interface between the liquid phases, will be analyzed.

Raghavi Rao  
IIT Madras

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