

Simulation and Parametric Study of a PDMS Based Valveless Micropump Using FSI Approach

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Abstract

In this paper simulation and parametric study of a PDMS valveless micropump using Fluid-Structure Interaction (FSI) approach is presented. The simulation for the valveless micropump were carried out in COMSOL Multiphysics software. In case of a valveless micropump diffuser/nozzle element is connected to a chamber with an oscillating diaphragm. To improve the flow rate of the valveless micropump, some important diffuser/nozzle parameters, such as the diffuser length, the diffuser angle, and the neck width, should be optimized. The results show that the flow rate of the valveless micropump depends on the diffuser geometrical dimensions.