Numerical study on nanofluid heat transfer and fluid flow within a micro-channel equipped with an elastic baffle	
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Publication Year	2024
Grant Number	
DOI link	10.1016/j.csite.2024.104247

Abstract: In this study, the incorporation of a flexible baffle structure at the base of a microelectronic channel is examined to determine its impact on thermal and fluid dynamics. The investigation covers two configurations: case 1, where the heat source is situated at the top section of the microchannel, and case 2, with the heat source placed at the bottom. To cool the electronic component, a nanofluid consisting of water with aluminum oxide (Al2O3) nanoparticles, in concentrations varying from 0% to 6%, is injected into the microchannel, exhibiting a periodic velocity profile at the inlet. The governing equations for the system are resolved using the finite element method for numerical simulation. The results show that the shape and curvature of the baffle significantly affect the heat dissipation efficacy. In particular, the setup with the heat source located at the bottom, adjacent to the flexible baffle, demonstrates the most