Cover Letter

Dear Editor,
Computers and Fluids

We are submitting our research work in the form of a regular article in Computers and Fluids. In chemical applications and miniaturized systems, mixing samples and reagents is an important process. Mixing of two streams of fluids in a channel flow is traditionally achieved by geometrical variation of the channel and placing obstructions in the channel in various configurations. Inspired by the previous works in this field [1,2,3], we investigated mixing performance caused by flexible structures instead of rigid obstructions inside a channel flow, which acts as a passive stirrer. We systematically investigated the position of a single and two flexible structures in the channel under different flow Reynolds numbers (Re) so as to optimize the mixing in the channel. We have devised a cost-benefit analogy to estimate the mixing performance in terms of mixing and pressure drop in the channel. Our key findings suggest an optimum configuration of two wall-mounted flexible plates in the channel i.e. with no offset, which stands out and results in a maximum mixing effect much earlier in the channel. We conclusively presented the optimum conditions (i.e. Re~400) to use flexible structures as passive mixer assists. An efficient mixing device will significantly advance state-of-the-art developments in microfluidic devices and also mixing processes across the scales in different industries. We have attached additional supporting information in the Appendix section of the manuscript and a video animation file as supplementary for better understand and to ease the review process.
Kindly consider the research work for a further peer review in the journal and let us know should any more information is required.

Thank you.

Regards
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[1] Derksen, J., 2010. Simulations of lateral mixing in cross-channel flow, Computers & Fluids 39, 1058–1069.
[2] Evegren, P., Revstedt, J., Fuchs, L., 2011. Pulsating flow and mass transfer in an asymmetric system of bifurcations. Computers & Fluids 49, 46–61
[3] Grosshans, H., Szász, R.Z., Fuchs, L., 2015. Enhanced liquid–gas mixing due to pulsating injection. Computers & Fluids 107, 196–204.