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P1: Using Modified Dean Flow designs to Increase Mixing Performance

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Using Modified Dean Flow Designs to Increase Mixing Performance

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Abstract

We are using numerical solutions for the Navier-Stokes equations and the concentration - diffusion equation to model fluid flow and reactant distribution in serpentine type channels for micromixers/microreactors development. These mixers exploit centripetal forces on the fluid to induce cross-sectional fluid mixing, aka Dean flows. Various modifications are used to increase the mixing character of these cross-sectional flows. We found that the performance of these mixers exceeds that of unmodified channels and we currently assess their performance relative to other state of the art methodologies used to induce mixing on the microscale.