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Electro-osmotic flows in rectangular cavities VIATCHESLAV MELESHKO, Dept Theoretical and Applied Mechanics Kiev National University, ALEXANDRE TROFIMCHUK, Dept Natural Resources Institute of Telecommunication and Global Information Space NAS Ukraine, ALEXANDRE GOURJII, Dept Vortex Motion Institute of Hydromechanicsnication and Global Information Space NAS Ukraine, ELINA BEZYM'YANA, Dept Theoretical and Applied Mechanics Kiev National University — The talk presents the results of investigation of the microfluidics mixing processes in a rectangular cavity flows induced by elctro-osmotic excitation. Enhanced mixing plays an important role in biological and chemical pharmaceutics analysis in microfluidics systems. Analytical solution is presented for the velocity field in the cavity under various electric potential distributions. The location of the periodic points in the flow are accurately established and the structure of stable and unstable manifolds is discussed. The optimal form of excitation is suggested in order to obtain most effective mixing regime in the cavity. The regular and chaotic regions are identified under various condition of excitation. Finally, we compare numerical and analytical solutions with the results of laboratory experiments for real microfluidic flows.

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