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Dynamics of flexible fibers in shear flow AGNIESZKA SLOWICKA, ELIGIUSZ WAJNRYB, MARIA EKIEL-JEZEWSKA, Institute of Fundamental Technological Research Polish Academy of Sciences — We consider dynamics and shape evolution of a flexible non-Brownian fiber in steady shear flow under low-Reynolds-number. Fibers are described by the bead-spring model. Their evolution is determined by solving the Stokes equations with the use of the multipole method, corrected for lubrication within the accurate numerical code HYDROMULTIPOLE. The fibers are initially aligned with the ambient flow. Owing to symmetry, their motion takes place in the plane perpendicular to vorticity direction. We investigate migration of fibers across the flow and quantify their shape evolution. Depending on the ratio of the fiber bending energy to its hydrodynamic energy, we find out different modes of the dynamics. Distinction between these modes is based on values of the fiber migration velocity, its tumbling frequency, curvature and length of the end-to-end distance.

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