

Abstract Submitted
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Evolution of streamers in sedimentation of fibre suspensions bounded by vertical walls¹ FENG ZHANG, ANDERS DAHLKILD, FREDRIK LUNDELL, Linne Flow Centre, KTH Mechanics, Royal Institute of Technology — The simulation, based on the Navier-Stokes equations coupled to a transport equation for the PDF of fibres, shows that a series of alternating structures of streamers and backflow regions emerge continuously from the walls until they converge in the midst of the domain. For moderate times, this agrees qualitatively with experimental and theoretical literature. In experimental literature, the evolution of the flow structure is restricted in time due to the finite height of the vessel and a steady state is not reached. However, our simulation in a vessel of infinite height obtained an increasing wavelength evolution due to the congregation of the streamers. In the end, there is constantly only one streamer left, and it drifts randomly to one side of the container until the evolution reaches a steady state. It also shows that the maximum number of streamers increases with increasing values of Re , fibres concentration, fibres aspect ratio, and container width.

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