

Abstract Submitted
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On flow down a vertical fibre RICHARD CRASTER, OMAR K. MATAR, Imperial College London — The flow of a fluid down the exterior of a vertical, rigid fibre is considered. An evolution equation for the interface in the long-wavelength approximation is derived; this model is similar to those previously used to investigate the dynamics of slender viscous threads in the absence of a fibre. Numerical solutions of this evolution equation reveal the rich interfacial dynamics which manifests itself via the formation of beads that propagate down the fibre undergoing coalescence. Our results demonstrate the existence of different flow regimes depending on system parameters such as the fibre radius, liquid flow rate and physical properties. These are found to be in good agreement with available experimental data as well as those obtained as part of the present work. Connections with models already available in the literature are also established.

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