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Passive sorting of capsules by deformability EDGAR HAENER, ANNE JUEL, University of Manchester — We study passive sorting according to deformability of liquid-filled ovalbumin-alginate capsules. We present results for two sorting geometries: a straight channel with a half-cylindrical obstruction and a pinched flow fractioning device (PFF) adapted for use with capsules. In the half-cylinder device, the capsules deform as they encounter the obstruction, and travel around the half-cylinder. The distance from the capsules centre of mass to the surface of the half-cylinder depends on deformability, and separation between capsules of different deformability is amplified by diverging streamlines in the channel expansion downstream of the obstruction. We show experimentally that capsules can be sorted according to deformability with their downstream position depending on capillary number only, and we establish the sensitivity of the device to experimental variability. In the PFF device, particles are compressed against a wall using a strong pinching flow. We show that capsule deformation increases with the intensity of the pinching flow, but that the downstream capsule position is not set by deformation in the device. However, when using the PFF device like a T-Junction, we achieve improved sorting resolution compared to the half-cylinder device.

Edgar Haener
University of Manchester

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