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Steady streaming induced by a trapped oscillating microbubble SHAMBHU ANIL, OK SINGH, DR. S PUSHPAVANAM, Indian Institute of Technology, Madras — A sessile micro bubble oscillating under the influence of an ultrasound field creates strong steady microstreaming vortices. These induced vortices have been exploited by researchers in particle trapping, micromixing and particle separation. Analytical studies in the past have been conducted assuming the sessile bubble to be semi-cylindrical. However, experiments with applications in micro-mixing and micro-pumping often encounter an oscillating bubble interface which is relatively flat at steady state. Our focus in this study is to obtain an analytical solution to the steady two-dimensional flow field induced by an oscillating trapped interface of a slug in a micro channel. We consider three different boundary layers i.e., two close to the enclosing wall and one close to the oscillating gas-liquid interface separately, as Reynolds stresses are high in these regions. We obtain a composite solution to the flow using matched asymptotics.

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