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The liquid micro-jet from laser induced cavitation bubbles. JACK ABOUD, GHANEM OWEIS, American University of Beirut — A vaporous cavitation bubble grows spherically in an infinite medium to a maximum radius, collapses in a spherical manner to a minimum volume, and then may rebound one or more times or disintegrate. When the bubble collapses above a solid boundary, the asymmetry of the surrounding flow field will cause the upper bubble surface to cave in, resulting in a fast liquid jet that penetrates its lower surface and continues towards the solid boundary. This fast jet formation is one perceived mechanism for cavitation damage in hydro-machinery. If a hole is intentionally drilled in the solid boundary underneath the collapsing bubble, the fast micro-jet can continue its path and be cultivated for a variety of applications such as micro surgery of soft tissue. In this study, cavitation bubbles are generated by focusing the pulsed IR beam from an Nd-YAG laser above a solid surface. The forming liquid micro-jet is investigated in the cases of blank and drilled solid boundaries.

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