Micro-fluid dynamics via laser metal surface interactions: Wave-vortex interpretation of emerging multiscale coherent structures

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Abstract

Lugomer and colleagues have discovered filamentary-like coherent structures in small (~3 mm diameter) laser-beam–metal-surface interactions. Experimental photographs of a small part of the laser spot area shows frozen “fossil” filament-like structures. We present reasonable arguments and preliminary computer results that suggest that these are due to vorticity deposited by accelerated flows due to blast and shock waves.

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