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**Temporal evolution of diamagnetic cavity in laser produced plasma** NARAYAN BEHERA, Institute for Plasma Research, HBNI, Gandhinagar 382 428, India, RAJESH KUMAR SINGH, AJAI KUMAR, Institute for Plasma Research, Gandhinagar 382 428, India — Aluminum plasma has been generated by an Nd:YAG laser having pulse energy 150 mJ in a uniform transverse magnetic field varying from 0 to 0.57 T. The dynamical and geometrical behavior of the evolving plasma plume along and across the magnetic field lines have been studied using fast imaging technique. In the fast imaging technique, two internally synchronized ICCD cameras have been mounted in orthogonal directions to the plume propagation direction. At comparatively lower magnetic fields, a well defined cavity-like structure (diamagnetic cavity) has been observed at initial stage of plume propagation in a plane perpendicular to the direction of the magnetic field. After initial expansion, the cavity is tending to stagnation. This behavior is correlated to the plume expansion in diamagnetic limit. With further increase of the delay time the cavity started to collapse and became jet-like structure which again converted to slab-like structure and expanded freely. This feature of the plasma plume is correlated to  $E \times B$  drift in non-diamagnetic limit. An elliptical cylinder-like model has been developed to explain the collapse of the diamagnetic cavity.

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