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**Thermal Convection on an Irradiated Target**[1] IGBAL MEHMEDAGIC, U. S. Army ARDEC, Picatinny Arsenal, NJ, SIVA THANGAM, Stevens Institute of Technology, Castle Point, Hoboken, NJ — The present work involves the computational modeling of metallic targets subject to steady and high intensity heat flux. The ablation and associated fluid dynamics when metallic surfaces are exposed to high intensity laser fluence at normal atmospheric conditions is modelled. The incident energy from the laser is partly absorbed and partly reflected by the surface during ablation and subsequent vaporization of the melt. Computational findings based on effective representation and prediction of the heat transfer, melting and vaporization of the targeting material as well as plume formation and expansion are presented and discussed in the context of various ablation mechanisms, variable thermo-physical and optical properties, plume expansion and surface geometry. The energy distribution during the process between the bulk and vapor phase strongly depends on optical and thermodynamic properties of the irradiated material, radiation wavelength, and laser intensity. The relevance of the findings to various manufacturing processes as well as for the development of protective shields is discussed.

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