

微小重力場における PMMA のレーザー着火に与える レーザー照射角度の影響

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Effects of Tilted Laser Angle on PMMA Ignition in Microgravity

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Abstract

Effects of tilted laser angle on absorption-induced spontaneous ignition of PMMA sheet in microgravity are numerically investigated. Laser absorption via MMA vapor (produced by PMMA decomposed reaction) plays a key role to lead spontaneous ignition in this system. Laser exposure angle, total laser power, and laser profile are varied to discuss about the their roles on the ignition. Calculated results show that an ignition delay time is not solely controlled by laser power; imposed laser density on the surface can also be important. Multiple of 'laser density' and 'laser power' is found to predict the ignition delay time fairly well. This suggests that former one (related to PMMA heat up time) and latter one (related to MMA heat up time) gives equivalent effect on the ignition.