ISFV15-048-P5
15th International Symposium on Flow Visualization
June 25-28, 2012, Minsk, Belarus

FAST HOLOGRAPHIC FILMING OF LASER PLASMA EVOLUTION IN ELECTRIC FIELD

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A two-wavelength high-speed holographic cinematography, integral and time-resolved spectroscopy and splite unfolding methods were used in an investigation of a laser plasma initiated at the surfaces of metal samples by laser pulses in the external electric field. The temporal evolution of the electron densities and heavy particle concentrations was determined and a study was made of the nature of motion of shock wave and plasma fronts. A weak dependence of the evolution of the shock wave velocity on the target materials (aluminum, copper, zinc, led, indium) was observed in the average power density range (10^6 – 10^7W/cm^2). A faster increase in the dimensions of a refracting plasma region, compared to a luminous region, and strong expulsion of cold air by an erosion plasma were recorded.