On the dynamics of polymer materials light erosion

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For determining the features of physico–chemical and gas–dynamic processes on the polymer samples surface when exposed with high–brightness coherent or broadband radiation and to study their ablation, a stand was created and an experimental technique for visualizing vapor–plasma flows was proposed. This technique allows us to establish the features of the gas–dynamic "response" from the surface of the irradiated target and determine the parameters of the generated plasma. The basis of the diagnostic complex consists of two–exposure laser holographic interferometry and Schlieren photographs [1, 2].

The Schlieren images and interferograms show the zones characteristic of the studied type of radiation exposure to materials. The gas–dynamic evaporation mode (plasma piston mode) is implemented, there is a shock wave in the gas, a contact boundary between the shock–compressed gas and the plasma. The distribution of plasma and compressed gas thermodynamic parameters in height above the target is obtained. It was found that the maximum temperature in the vapours is reached not at the contact boundary, but inside the "plasma piston". The report also discusses other features of light erosion of polimers when exposed to high–power density VUV radiation.

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[1] Pavlov A, Protasov Y, Shchepanyuk T and Telekh V 2019 *Scientific Visualization* **11** 111–125

[2] Pavlov A, Shchepanyuk T, Skriabin A and Telekh V 2022 *Polymers* **14** 3940