

Experimental study of the effect of laser contrast on the duration of an X-ray pulse

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The temporal characteristics of X-ray radiation generated in the laser plasma of aluminum targets in the energy range of 1, 5÷2, 1 keV were investigated on a femtosecond laser setup. The quanta with the required energy were separated using a total external reflection spherical mirror and an absorption filter. An X-ray streak camera with a picosecond time resolution was used as a recording device. A saturable absorber and plasma mirrors were used to increase the contrast of the laser pulse. Measured X-ray flash duration is 22 ± 7 ps without using a saturable absorber and plasma mirrors. The use of a saturable absorber reduces it to 11 ± 3 ps, and when both techniques are applied simultaneously the duration does not exceed 7 ps.