COMPUTATIONAL AND THEORETICAL STUDIES OF ALUMINUM K-LINE GENERATION IN EXPERIMENTS WITH EXPLOSIVE MAGNETIC GENERATOR

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Investigation of powerful fluxes of soft-X-ray radiation (SXR) at the implosion of multi-wire cylindrical arrays has been carried out in RFNC-VNIIEF for many years. The arrays are powered from laboratory and explosive current sources. In recent experiments to generate K lines of aluminum in experiments with an explosive-magnetic generator (EMG) with a helical diameter of 200 mm, equipped by an explosive opening switch (EOS), the SXR pulse energy in the full spectrum was 71 kJ, in the quantum energy range above 1keV - 23 $\pm$ 2 kJ or 32 percent of the total radiation energy, which is comparable to the best results obtained at world electrophysical facilities with current rise times of 100ns. This paper presents the verification results of the calculated radiation magnetohydrodynamic codes FLUX-3D and FLUX-rz for the generation of the aluminum K line in these experiments, as well as computational and theoretical studies of the SXR yield in different spectral ranges depending on the configuration of the load chamber and various types of load.