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In-situ observation of blistering during irradiation of metals by protons

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The work is devoted to an experimental investigation of the radiation blistering observed during irradiation of metal targets by a proton beam with an energy of 2 MeV. The proton beam is generated by the vacuum-insulated tandem accelerator, which allows to produce a beam with a direct current up to 5 mA. Experimental samples made of copper with different purity (M0 GOST 859-2014, 99.996%, 99.99996%) and tantalum were installed in the way of the passing accelerated proton beam. Each metal target was irradiated up to the fluence of $3.4 \pm 0.3 \cdot 10^{19}$ cm^{-2}. The state of samples surface was observed with the use of the CCD-camera and a remote microscope. The report describes technical means, which were used to monitor the state of the targets during the experiment, the results of the research and its comprehension. Above all things, the investigation has been carried out to find out which of the researched materials is the most appropriate for the lithium neutron generating target applied in boron neutron capture therapy as a source of neutrons. As a conclusion the relevance of the results in the development of the lithium target is discussed.

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