STUDY OF MULTICOMPONENT COMPOSITE MATERIALS BEHAVIORAL FEATURES UNDER EXPOSURE TO A HIGH-CURRENT RELATIVISTIC ELECTRON BEAM [[1]](#footnote-1)\*)

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In recent years, the development of technologies for creating complex multicomponent materials leads to their active implementation in the space and aviation industries. At the same time, the behavior of such materials under powerful pulsed loads has not been studied enough. In the case, mathematical models that reliably describe the behavior of complex composite materials are either absent altogether or require a large number of empirical constants. Previous studies have shown that when exposed to a high-current electron beam, nanostructures uncharacteristic for the created pressures and temperatures can form in composite materials [1], and the effect of the parameters of polymer binders on the general behavior of composites under pulsed action turns out to be much more significant than previously assumed [2]

This paper presents an experimental study of the behavior of several types of materials under the action of a high-current relativistic electron beam of the Calamary facility [3].

The main advantages of the Calamary high-current electron accelerator are: a wide range of exposure energy densities, as well as an extensive diagnostic complex, which allows with a sufficiently high accuracy to determine the parameters of the beam acting on the sample and observe the plasma dynamics both in its own light and in the laser shadow [4 ]. Also, in the experiment, the mass of material carried away from the samples was measured with high accuracy. Morphological studies of the fracture surface of samples after exposure to a beam of relativistic electrons from the Calamary accelerator were performed using a JSM-6490 scanning electron microscope.

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLIX/Pt/ru/GV-Kazakov.docx) [↑](#footnote-ref-1)