

Channeling 2018



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Passage of 10 keV Electrons through Ceramic Macrochannels

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Possibility of charged particles beam manipulation by means of dielectric surfaces has been demonstrated earlier. This effect is caused by formation of a self-consistent charge distribution on the dielectric channel walls. The distribution provides the passage of a part of the charged particle beam without direct contact with the surface of the channel. Efficiency of controlling a beam passing through a dielectric channel is characterized by the magnitude of the transmitted beam current, the energy state of charged particles transmitted through the channel, and the angular characteristics of the transmitted beam.

The transmission of electron beam through ceramic cylindrical channels and plane channels made of two plates was studied. Method of estimation of transmitted electrons energy was suggested. The method is based on an analysis of X-ray spectrum generated by electrons in a copper plate placed in vicinity of the channel outlet. The results of experiments indicate the possibility of effective use of ceramic channels as autonomous elements of beam optics.

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