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Orientation Effects for the Grazing Interaction of Fast Electrons with a Dielectric Surface

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A series of experiments has been conducted to investigate the spectral and angular characteristics of the beam of fast electrons interacting with dielectric surfaces in a grazing mode. The cases of flat, conical and surface-structured targets were considered. The experimental results have shown the ability to control the angular characteristics of the electron beam when changing the orientation of the plane or the axis of the target relative to the axis of the electron beam.

The results make it possible to create a model of the processes occurring for grazing interaction of electrons with the dielectric surfaces and rely on the use of these processes to develop effective devices to manage spatial characteristics of electron beams with energy of 10 keV. Furthermore the experimental results show the possibility to "press" the beam of fast electrons towards the surface of the combined metal-dielectric sample (and increase the total time of interaction) in order to study more efficiently the radiation arising during electron movement above the periodically structured surface.

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