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Angular Distributions and Spectra of VUV Radiation Generated by 5.7 MeV Electrons in Multilayer

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Recently, in [1,2] radiation generated by the electron beam in a multilayer periodic structure was experimentally observed in the vacuum ultraviolet (VUV) range. The mechanism of this radiation is similar to the parametric X-ray radiation (PXR) of relativistic charged particles in crystals [3]

This report presents the results of an experimental study of the angular distributions and spectra of VUV PXR generated by 5.7 MeV electrons in a Mo/Si multilayer structure. A series of angular distributions were measured for several values of grazing angle of electron beam incidence on the multilayer surface in the range of 30° – 77° . The angular distributions were measured in the diffraction plane and at the angle $qDy = 1/g$ with respect to this plane. The spectrum of PXR from multilayer target was tested by other multilayer mirror using the Bragg diffraction. The experimental results are compared with the simulation using the theory [4,5].

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