

**X-rays Produced by Means of an Proton Beam  
for Analysis of the Multilayer X-ray Mirrors,**

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- We used the protons accelerators as the source of the monochromatic X-rays to perform comparative analysis the nickel-carbon (Ni/C) multilayer structure and new diamond-like carbon structure (DLC) in the long wavelength range. The monochromatic X-rays were induced by accelerated protons from solid targets: carbon, aluminium and copper. A Soller type X-ray spectrometer with the DLC and Ni/C mirrors as analyzers was used to measure the intensity of the K and L lines. To determine the reflection coefficient of the mirrors we measured the intensities of the X-ray lines without the mirror and with the different mirrors. The temperature and radiation influence on reflectivity and the bandwidth of the diamond-like mirror Bragg peak were investigated. We induced the characteristics X-rays from the quartz substrate by the protons passing through the multilayer structure in order to measure the transmission coefficient of X-rays for DLC mirror. The results of these measurements shown that the advantages of carbon structures over metal/carbon ones take place in the long wavelength range and that the PIXE (Particle Induced X-ray Emission) method can be employed for the investigation of the multilayer structures.