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Raman spectroscopy study of damages induced in polycrystalline Si3N4 by swift heavy ion irradiation

In this work the Raman spectroscopy method was used to study the radiation damage and associated internal mechanical stresses in polycrystalline silicon nitride (Si_3N_4). Si_3N_4 samples have been irradiated with swift heavy Xe and Bi ions with energies of 167 and 710 MeV, respectively, in the range of fluences from 1E11 to 4.87E13 $ions/cm^2$. The spectra of the cross-section of the irradiated region and the near-surface layer of the samples were registered at room temperature. The parameters of the FWHM - 205 cm^{-1} and peak position - 862 cm^{-1} were used to characterize the amorphization and mechanical stress level.

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