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Morphological studies of virgin and ion irradiated nanostructured BaF_2 thin films surfaces

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The surface roughness and fractal analysis of virgin and swift heavy ions (SHI) irradiated BaF_2 thin films were studied. Electron beam evaporation technique was used to deposit BaF_2 thin films on Si <1 1 1> substrate at room temperature of thickness 100 nm. The films were irradiated with 120 MeV Ag^{9+} ions at various fluences in the range 1×10^{11} to 3×10^{13} ions/cm^2. The virgin and irradiated films were characterized by atomic force microscopy (AFM). Fractal analysis on AFM images were performed using height-height correlation and autocorrelation functions to extract out roughness exponent, lateral correlation length and interface width. The computed results show that the surface roughness decreases with increase in ion fluence, while the fractal dimension increases initially followed by a decrease with ion fluence. The results show that the surface properties are greatly affected by the ion irradiation.

Biography

S N Pandey has completed his PhD from Avadh University. He is the Head of Department of Physics, Motilal Nehru National Institute of Technology, Allahabad, India. He has published more than 35 papers in reputed journals. He is recipient of UGC Research Award and many visiting fellowships. He is Life Member of many academic bodies/societies. He has supervised four PhD candidates.

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