

Scanning force microscopy of heavy-ion induced damage in lithium fluoride single-crystals

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This report presents measurements on ion-irradiated single-crystals of lithium fluoride (LiF) by means of scanning force microscopy (SFM), complementing studies performed with optical spectroscopy, small-angle X-ray scattering, and surface profilometry. Freshly cleaved crystals were irradiated at room temperature with Au-, Bi- and U-ions (kinetic energies up to 11.4 MeV/u) at the linear accelerator UNILAC, and with 1.4 MeV/u Ni-, Sn-, Xe- and Au-ions at the high-charge injector HLI, both operated at GSI. Continuing previous SFM studies of small hillocks induced by single-ion impact, the hillock diameters vs. energy loss were reexamined with special regard to systematic errors arising from the finite sensor tip radius. Furthermore, on LiF (1 0 0) surfaces irradiated at grazing incidence, SFM images show linear latent tracks exhibiting a pearl chain of hillock-like protruding zones. They are reminiscent of the sequences of etch pits found by SFM after etching a LiF surface exposed by cleavage parallel to the ion trajectories.