

Electronic excitations and defect creation in LiF crystals

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A review of ion induced radiation damage processes in alkali halides is presented with special attention paid to Frenkel defect creation by the decay of excitons. The exciton mechanism is analysed for radiation damage creation in LiF crystals under heavy ion (^{209}Bi (136.7 MeV/u) and ^{238}U (11.4 MeV/u)) irradiation at fluences up to 5×10^9 ions/cm².

In both cases F- and F₂-centers are the dominant electronic defects in the track. Uranium tracks in LiF crystals can be etched, whereas after irradiation with Bi ions no track etching was observed.