Spatially resolved characterization of heavy ion irradiated crystals using static field gradient nuclear magnetic resonance

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Static magnetic field gradient NMR has been used for one-dimensional spatial ^{19}F spin-lattice relaxation profile studies (resolution of the order of 10µm) in a LiF crystal irradiated with U ions. Technical aspects of the use of large static magnetic field gradients are discussed as well as a special data acquisition mode allowing for effectively measuring spatially resolved spin-lattice relaxation rates as low as $10^{-3}s^{-1}$. In addition to the expected enhanced spin-lattice relaxation rate within the ion range, also an enhanced rate beyond the ion range has been found.