Single Event Latch-up Testing Results of the Fluxgate Magnetometer Frontend ASIC

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*Abstract*— The magnetometer frontend ASIC (MFA-4) is a mixed signal system that comprises the necessary circuitry for operating a fluxgate sensor. This sensor technology has provided a high-quality standard for magnetic field measurements in space since years and require an extensive circuitry to operate a set of three coils per axis for magnetic excitation, sensing and compensation. This necessary circuitry includes components such as low noise amplifiers, an analog to digital converter, signal processing logic and a high-precision, low-noise delta-sigma digital to analog converter with a fully differential current output stage.

A reduced version of these components was implemented on a 180 nm process and was subject to single event upset and latch-up testing with heavy ions. We present the basic functionality of the ASIC and the results from heavy ion radiation testing up to 100 MeVcm²/mg.