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ESR-8., WP-2.

Radition
Test
Campains

Abstract

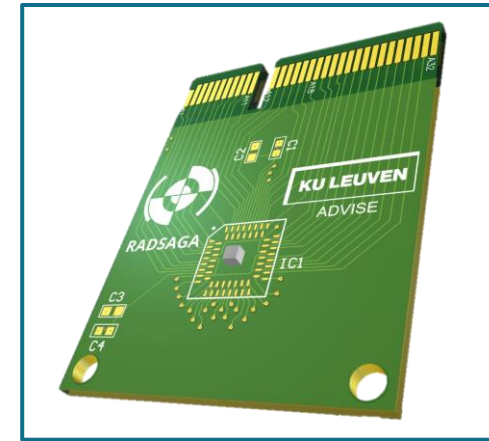
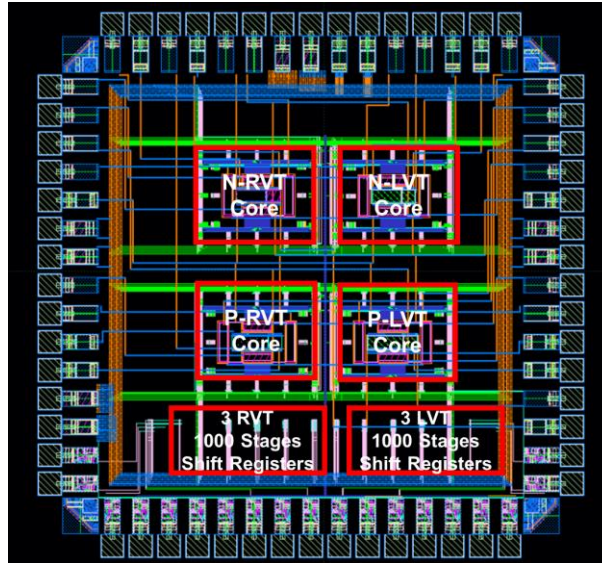
- The long-term reliability of recent CMOS technologies is impacted by different intrinsic degradation mechanisms that progressively alter their electrical characteristics (BTI, HCI).
 - Due to the ongoing aggressive scaling process, those mechanisms have stochastic nature of degradation and variability.
 - The parametric evolution induced by those mechanisms constitutes a reliability risk, both directly, by compromising the electronic functions, and indirectly, by weakening the circuit robustness to external perturbations like radiation.
- **To date, radiation testing standards are based on fresh devices characterization**

Goal of experiments

- This experiment investigates the impact of aging degradation mechanisms on the radiation susceptibility of complex integrated circuits for 28nm FD-SOI technology.
- Therefore, this experiment will answer the following question:
What is the effect of aging mechanisms on the single-event sensitivity of digital integrated circuits in 28nm FD-SOI technology?

Project & prototype status

- Design of the Test Structure IC (**Done**)
- Design of mini PCIE PBC as IC holder (**Done**)



- Design of main PCB board (**on progress, 2nd week of January**)
- Design of interface PCB for FPGA (**1st week of February**)
- Program the FPGA (**3rd week of February**)

Tests to be
done before
radiation tests

- Functional test (KU Leuven)
- Aging test (KU Leuven)

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Radiation effects & desired beams

- Radiation effect: SEU
- Desired beams:
 1. Ganil => Xe at 50 MeV/n (LET 26.4-64.3 MeV.cm²/mg)
 2. Chiplr => Atmospheric neutrons ($E_n > 10$ MeV, Flux= $5 \cdot 10^6$ cm⁻²s⁻¹)

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