The Effects of Total Ionizing Dose on the Transient Response of SiGe BiCMOS Technology

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Key Question:

Is The Transient Response Affected by TID Exposure (SiGe HBT + CMOS)?

Device Test Structures:

- GlobalFoundaries' 8HP SiGe BiCMOS
- *npn* SiGe HBT (0.12 x 0.58 μm^2)
- nFET (W/L=10/0.12 μm)
- Biased to worst case conditions for TID

Experimental Details:

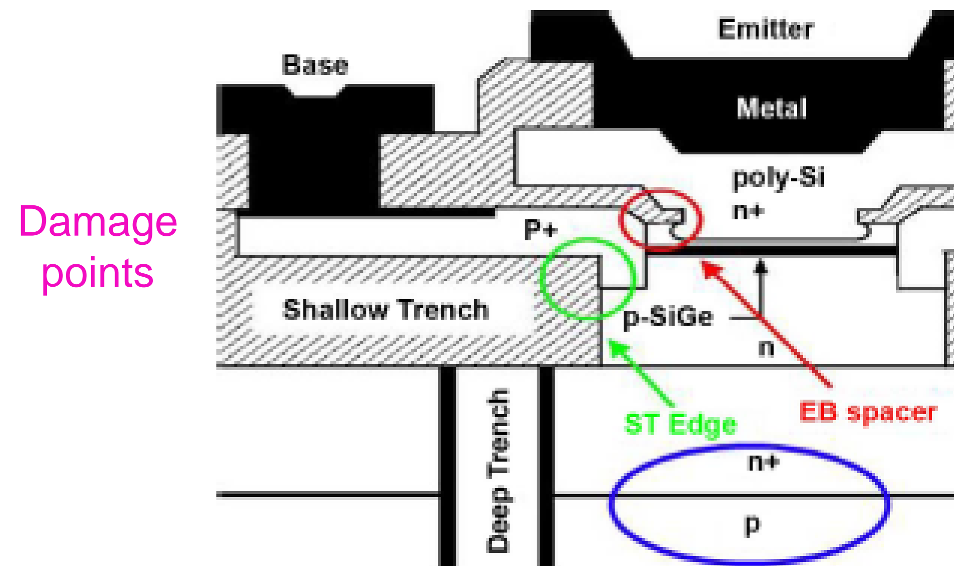
- Total Ionizing Dose (NRL)
  - ARACOR 10-keV X-ray source
- Pulsed-Laser TPA for SET (NRL)
  - Two Photon Absorption laser source

TCAD Modeling (Sentuarus):

- Illustrate leakage mechanism

2D NPN cross-section of SiGe HBT

Damage points



eDensity during Heavy Ion Strike Simulation