

Body biasing fault injection:
Enhancements, analysis, modeling, and simulation
PhD thesis defense

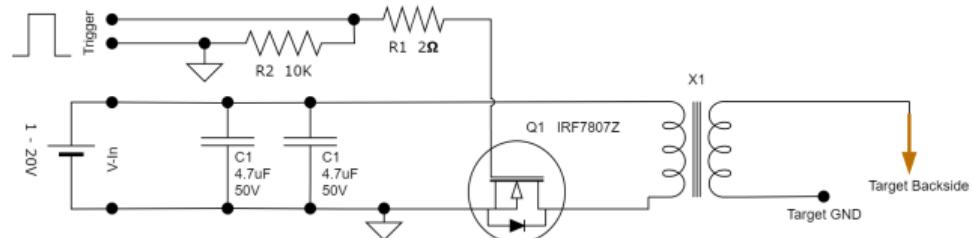
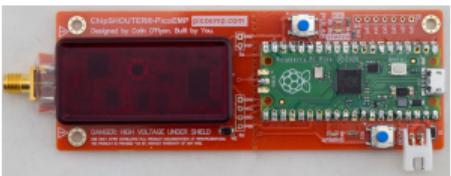
Geoffrey Chancel Jean-Marc Gallière Philippe Maurine

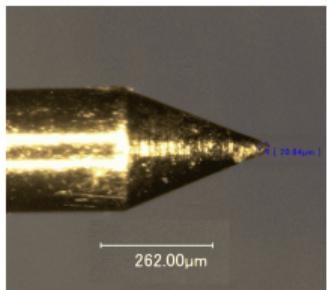
2023/12/06

INTRODUCTION



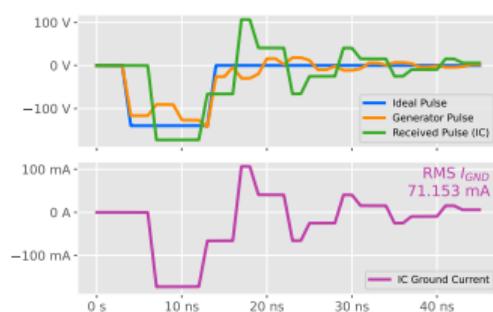
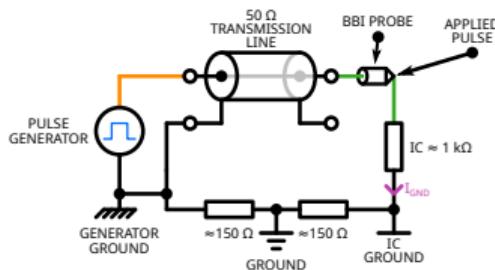
Figure caption.





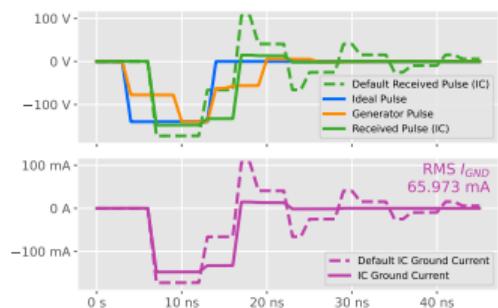
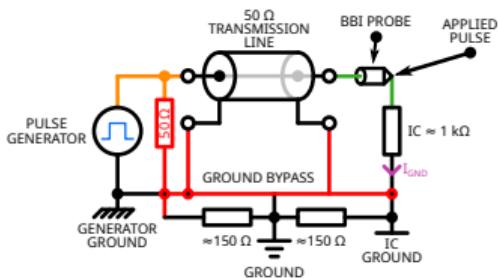
BBI IN PRACTICE

Typical platform



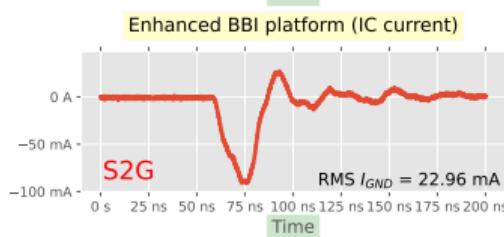
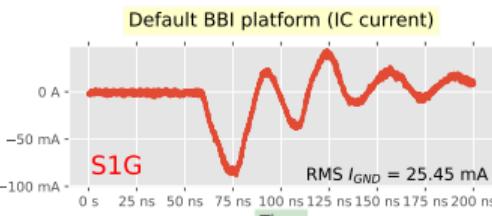
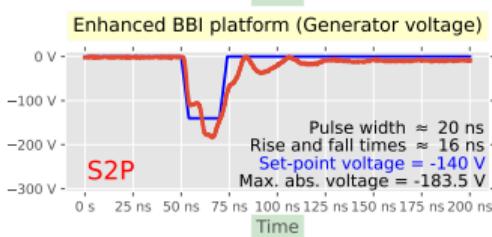
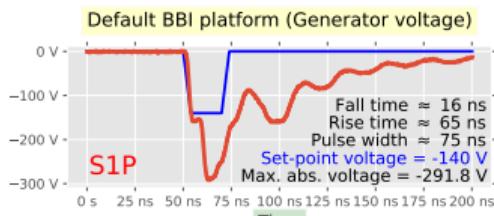
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Enhanced platform



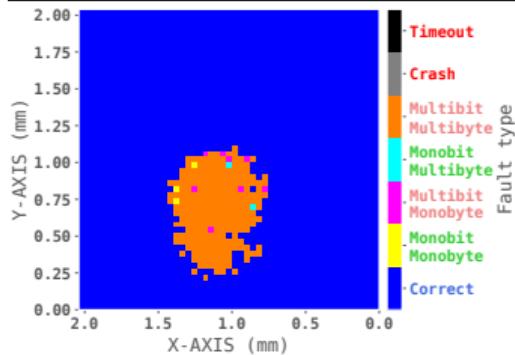
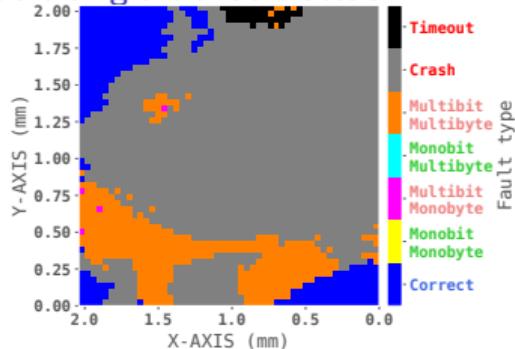
BBI in practice

Actual results



Actual benefits of the improvements

Giraud's single bit fault attack



Giraud's single bit fault attack

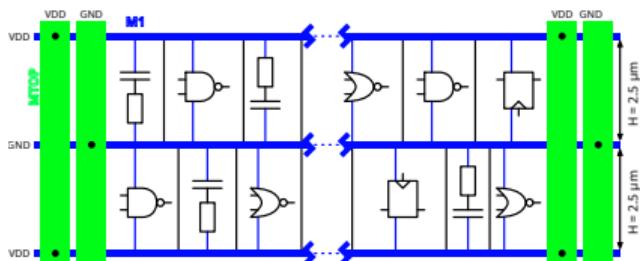
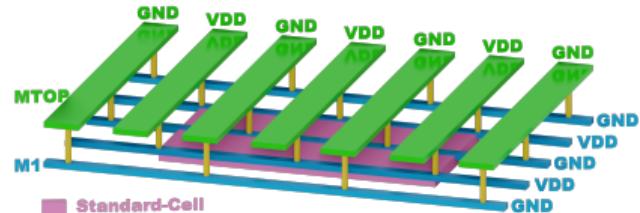
Results

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| K10 | 0xFF | 0x1F | 0x42 | 0xE8 | 0xEF | 0x44 | 0xA5 | 0x6A | 0xCA | 0xE7 | 0x55 | 0x3C | 0xFD | 0x65 | 0x39 | 0x26 |
| KEY | 0x01 | 0x23 | 0x45 | 0x67 | 0x89 | 0xAB | 0xCD | 0xEF | 0xDE | 0xAD | 0xBE | 0xEF | 0x12 | 0x34 | 0x43 | 0x21 |

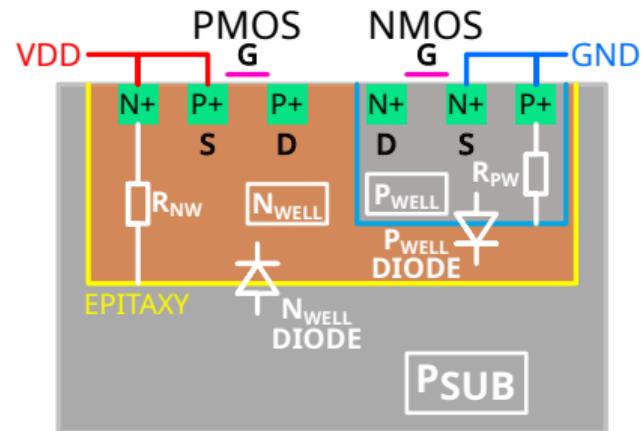
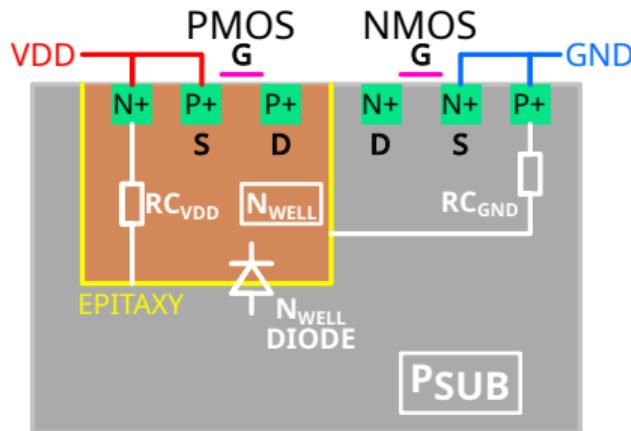
Text content.

BBI IC MODELING

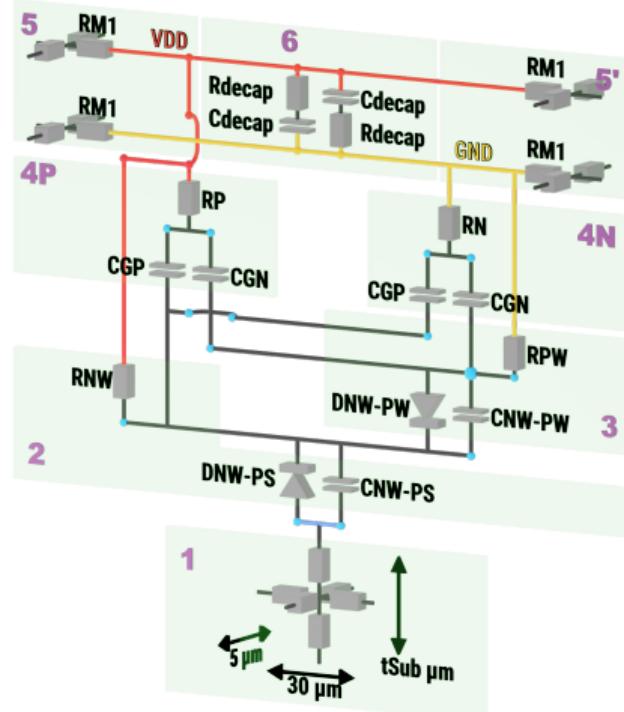
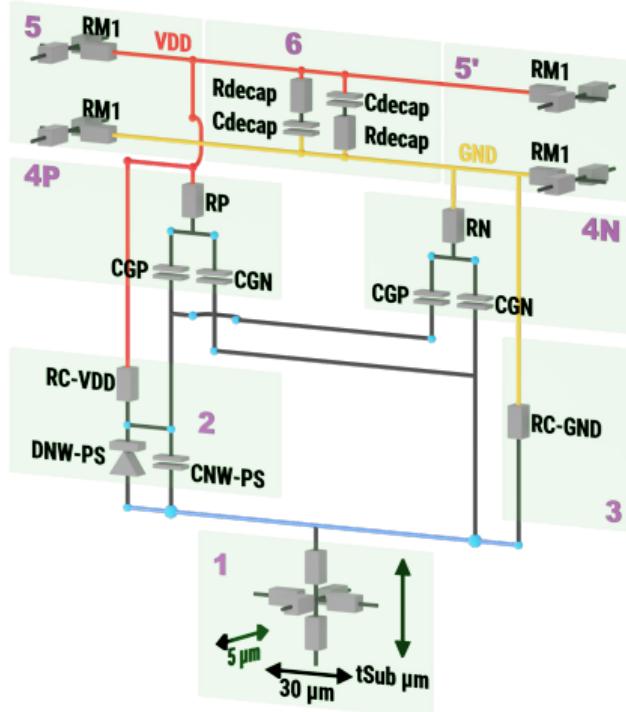
IC basic structure



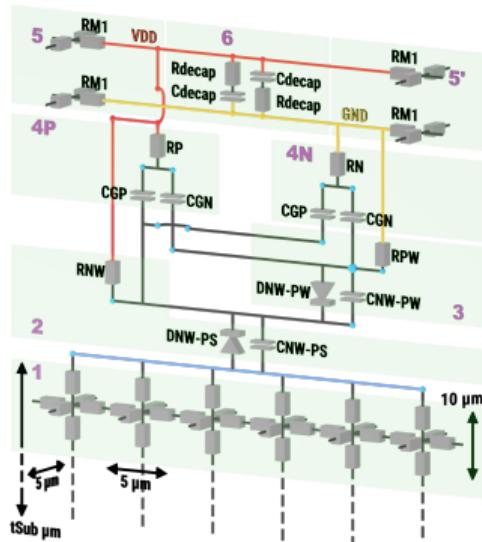
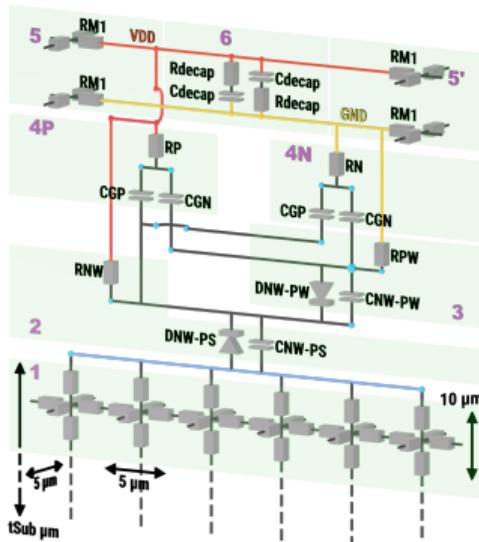
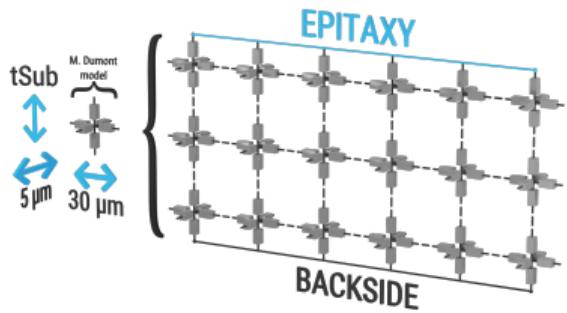
Bulk substrate types



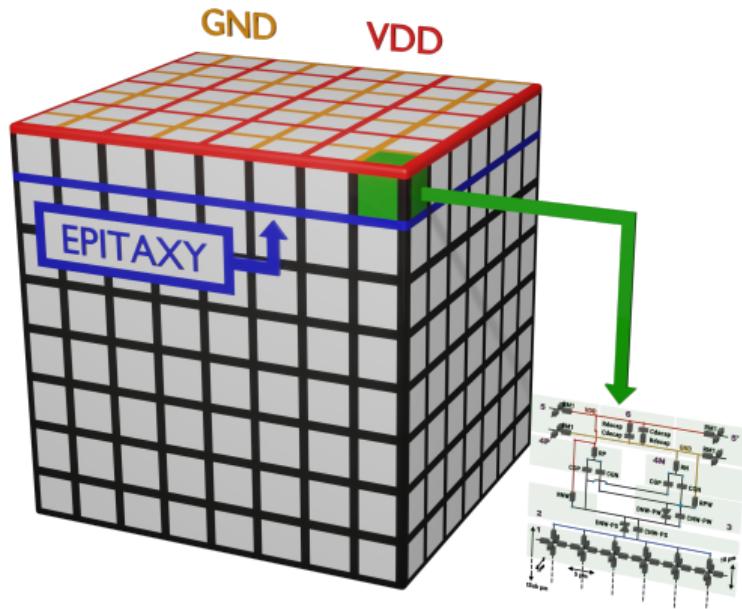
Standard-cell original models



Standard-cell model substrate improvement

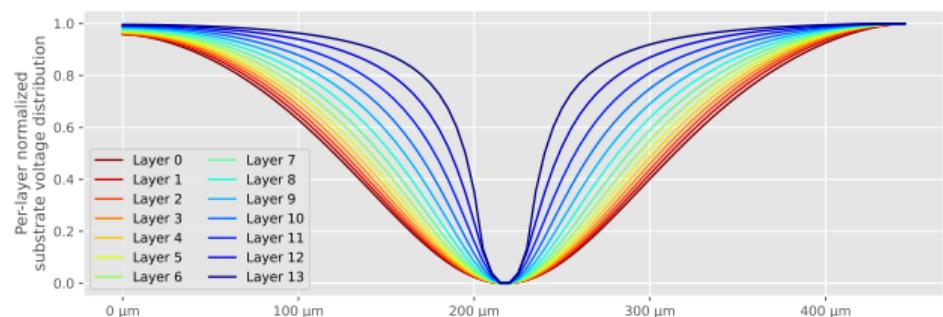
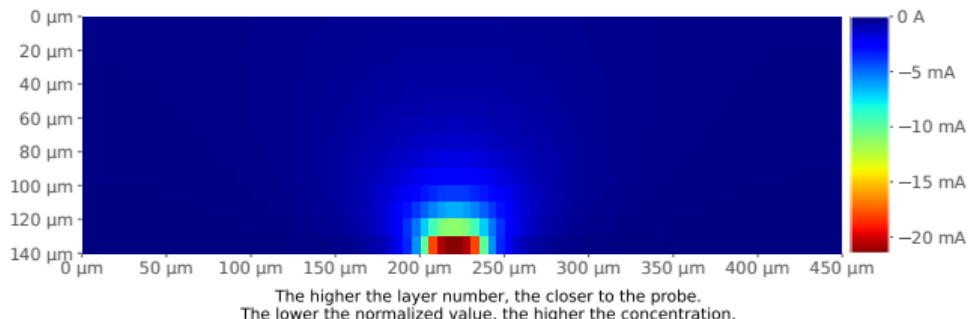
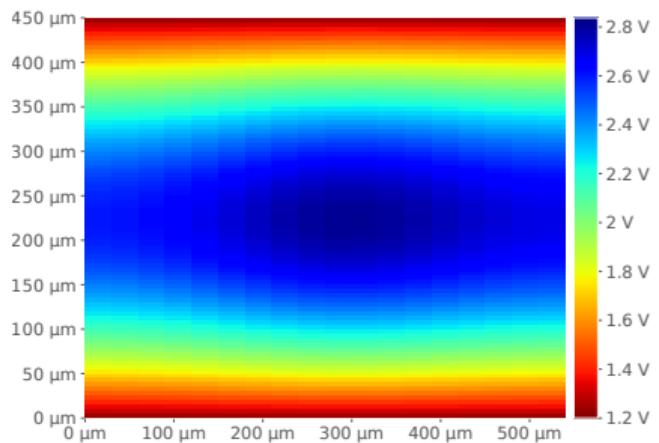


IC generation



Generator model

Simulation results: Dual-Well



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