

## **Charge collection in GaAs MESFET circuits using a high energy microbeam**

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The mechanisms responsible for single event upsets can be studied more realistically in transistors that are part of an integrated test circuit than in single isolated test transistors with fixed biases on all the nodes. Both energetic, heavy ions and focused, pulsed laser light were used to generate transient voltages at a number of different nodes in a GaAs MESFET integrated test circuit. Three-dimensional maps of charge collection regions were generated with the use of the scanning ion microprobe at Gesellschaft für Schwerionenforschung (GSI). The results showed that charge was collected from all areas of the circuit, but with different efficiencies at different injection sites. Regions not covered with metal were exposed to pulsed laser light. The resulting transients had pulse shapes similar to those generated by ions and amplitudes that also depended on ion strike location. These results illustrate the usefulness of the ion microprobe technique for obtaining spatial and temporal information about SEU in integrated circuits