

Abstract Submitted  
for the SES14 Meeting of  
The American Physical Society

**Single Event Effects from Ions Produced in Nuclear Reactions of Transistors with Cosmic Rays** WILLIAM ATKINSON, The Boeing Company, WILLIAM J ATKINSON TEAM — Single Event Effects (SEEs), disruptions in a microelectronic device caused by the passage of an energetic particle through the sensitive region of the device, are an increasing problem with advances in technologies. Two trends are responsible for the increased number of SEEs over the last decade. First, with the reduction of the operating voltages, devices have are susceptible to smaller amounts of radiations. Secondly, the data densities (bits per device) increased dramatically to meet the demand for more memory and faster processing time. This paper presents .models for generating typical near earth radiation environments in space as well as in the atmosphere, a model for transporting these radiations across the various materials of the device, and programs to compute the SEE rate of the device from data generated by the transport model using detailed structures available for the devices modeled. The results show that with the continued trends, nano size circuits become especially vulnerable to direct and indirect ionization (ions produced as a result of nuclear reactions with the circuit materials.

William Atkinson  
Boeing Company

Date submitted: 15 Sep 2014

Electronic form version 1.4