



Contribution ID: 5

Type: Oral

Design, characterization and commissioning of an atmospheric neutron beamline for the irradiation of microelectronics

The construction of ChipIr, a new beamline at the ISIS neutron and muon source in the UK, has been motivated by the very limited availability of fast neutron facilities, particularly in Europe, for testing of microelectronics for industry.

The fast neutron spectrum is generated by the spallation interaction of the ISIS accelerator 800 MeV proton beam on a tungsten target. The design of the beamline has been optimized for Single Event Effect testing at the device-level, board-level and system-level, which require a beam of high and uniform intensity over a selectable area from a few to hundreds of cm^2 .

Characterization measurements of the beam flux, spectrum and uniformity are presented. The methods that have been used are neutron activation foils analysis, solid state detectors (silicon and diamond detectors), and single event upset monitors with reference electronics. These methods provide complementary information and pro and cons will be discussed.

After the commissioning, ChipIr has now been used for about a year by industry. An overview of the main applications of ChipIr will give emphasis to the need of a further increase of worldwide availability of fast neutron test facilities.

Primary authors: Dr CAZZANIGA, Carlo (STFC); Dr FROST, Christopher (STFC)

Presenter: Dr CAZZANIGA, Carlo (STFC)