

Why choosing PAC-G for your SEE and radiation hardness testing?

Neutron-induced single event effects (SEE) and radiation hardness testing facilities of the PAC-G offer you a homogeneous and adjustable neutron flux, with a precise dosimetry and radioprotection to ensure your safety during the tests.

A broad spectrum of neutron's energy

from fast to thermal neutrons (14 MeV, 2.5 MeV and 25 meV) available on the same site, will allow you to test the robustness of your devices/systems to highly radiative environments.

Preparation of proton and heavy ion tests

High energy and thermal neutrons allow you to better prepare and anticipate the results from tests to be performed at proton or heavy ion facilities.

+ Complementary

Sample preparation and complementary neutron/X-ray 2D/3D imaging available to complement your device's characterisation. For example, 2D & 3D imaging with neutrons or synchrotron offer non-destructive measurements of packaged devices as well as device layout.

SERVICE SPECIFICATIONS	NEUTRON PAC-G FACILITIES		SYNCHROTRON PULSED X-RAYS
	LPSC	ILL	ESRF
Radiation type	High energy neutrons	Thermal/Epi-thermal	Hard x-rays
Energy range	14 MeV	10 meV - 100 eV	~ 5E8 photons/pulse @15 keV = 1.2 nJ / pulse
Maximum Flux	5x10 ¹⁰ .s.cm ²	2.4x10 ¹⁰ .s.cm ²	
Irradiation surface	From 1x1 mm ² to 1x1 m ²	50 x 50 mm ²	
2D/3D imaging		✓	
Pulse duration			100 ps pulse
Beam size			5-25 μm
Photon energy			12 to 24 keV
Repetition rate			Up to 1 kHz
Typical access delay	1 - 2 weeks	1 - 2 weeks	1 month

Key advantages

- ✓ Non-destructive testing requiring little or no sample preparation
- ✓ Possibility to test large samples in real time and under operating conditions
- ✓ Tunable neutron energy to select the conditions most appropriate for your needs

CNRS - UGA



14 MeV neutron source



Thermal neutron source 

Prompt feedback

- ✓ Quotation available upon request
- ✓ Expert advice
- ✓ Contact via support@pac-grenoble.eu

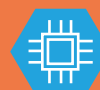
Industrial applications



High reliability electronic components



Aerospace



New semiconductors technologies



Failure analysis



Internet of Things



Automotive



Data centers

What is PAC-G?

The Platform for Advanced Characterisation Grenoble is a single entry point for characterisation services and non-destructive analysis, dedicated to the micro- and nano-electronics industry, offered by the European Synchrotron (ESRF), the Institut Laue-Langevin (ILL), the Laboratory of Subatomic Physics & Cosmology (LPSC) and Alternative Energies and Atomic Energy Commission (CEA).

We provide proprietary client services, and we are and open to open collaborative programmes partnerships.



Platform for Advanced Characterisation | PAC-G

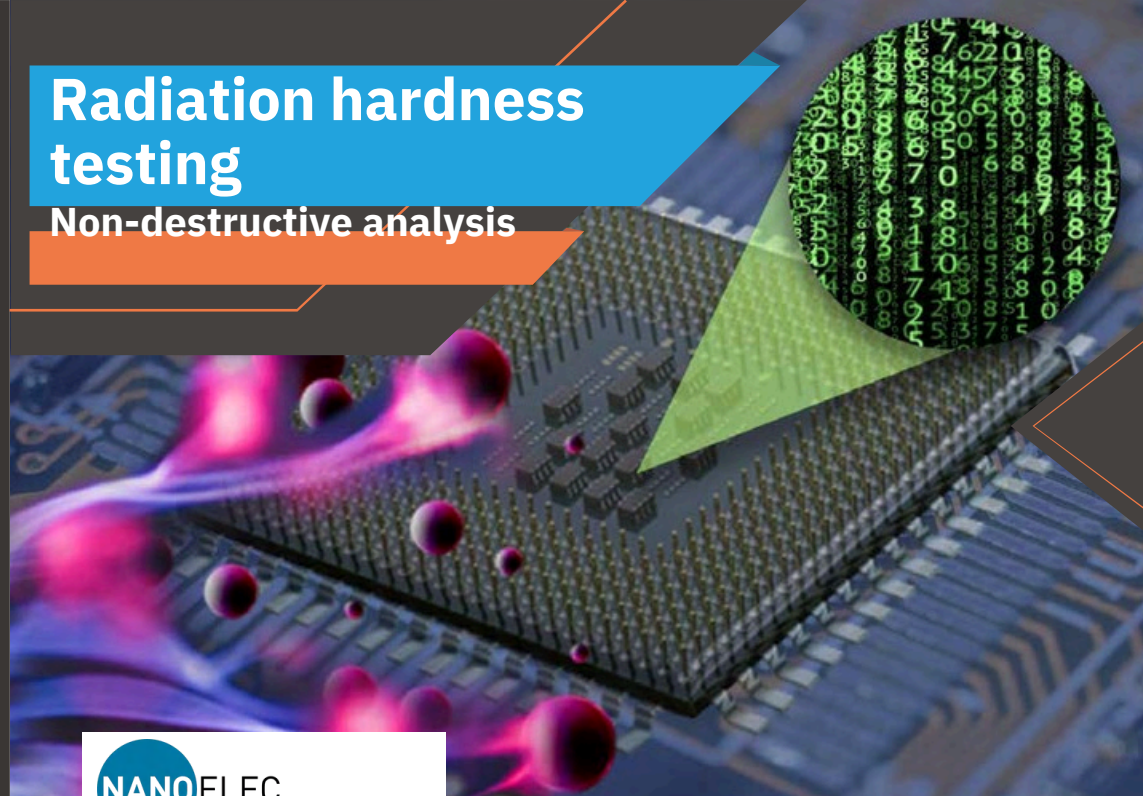
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- ✓ **Easy**
 - Flexibility, reactivity and customisation
 - Single entry point to access complementary large scale research infrastructures
 - Reactivity
 - Mail-in services
- ✓ **Confidential**
 - NDA/CDA and MTA as needed
- ✓ **Dedicated staff**
 - Multidisciplinary team
 - World renowned expertise
- ✓ **Dedicated equipment**
 - World class characterisation facilities
- ✓ **Tailored to your need**
 - One shot services
 - Long term collaboration agreements
 - Collaborative projects
 - Advice and training

Radiation hardness testing

Non-destructive analysis



Platform for Advanced Characterisation | PAC-G

World class characterisation services

Neutron irradiation to test new microelectronic technologies and devices

