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Implementation of Resilience Plans at the National Accelerator Center

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The National Accelerator Center (CNA) is a joint institution of the University of Seville, the Regional Government of Andalusia, and the Spanish National Research Council (CSIC). Together with the Center for Micro-Analysis of Materials (CMAM), it forms the Unique Scientific and Technical Infrastructure IABA (Accelerator-Based Applications Infrastructure), which provides advanced accelerator facilities to the international scientific and technological community. The national resilience plan has enabled significant upgrades to the CNA' s instrumentation through four coordinated sub-projects.

Sub-project 1.1, "Improvement and upgrade of the 3 MV Tandem and cyclotron accelerators at the National Accelerator Center for radiation detector studies,"has supported the acquisition of new instrumentation to enhance the production of ns pulsed ion beams, micrometric ion beams and to advance semiconductor detector research using the Ion Beam Induced Current (IBIC) technique.

Sub-project 1.2, "Accelerator Mass Spectrometry," has enabled the acquisition of a new injector for the CNA's 1 MV AMS system. This injector will significantly improve the instrument's sensitivity by allowing for better selection of the ions injected into the accelerator. This will result in a substantial reduction of background noise, making it suitable for applications in astrophysics.

Subproject 1.3, "Exploitation of European infrastructures in nuclear physics", has enabled the installation at the CNA of a magnetron-sputtering chamber for target production and improvements to the neutron line, relevant to enhance the participation of Spanish scientists in European facilities.

Sub-project 1.4, "Developments for ion beam therapy,"has enabled the design and acquisition of a beam pulsing system for the external cyclotron beam line. This new equipment will expand the capabilities of the 18 MeV proton line for radiobiology and dosimetry studies, including the possibility of performing experiments in FLASH mode.

This presentation offers a brief overview of the instrumental improvements achieved in the different sub-projects and will show selected results from sub-project 1.1, in particular the radiation damage studies in SiC detectors irradiated with alpha particles at high temperatures, with potential applications in nuclear fusion and high-energy physics.

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