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## **Electrical pollution and perturbations on a Circe electrons Accelerator**

### **Abstract:**

Radiation processing technology started in Tunisia by the installation of a pilot plant gamma irradiator in 1999 and an electrons beam accelerator in 2009 at the National Centre for Nuclear Science and Technology (CNSTN). These facilities are established with the support of the International Atomic Energy Agency (IAEA) in the frame of the technical co-operation assistance program.

The electrons-beam facility is equipped with CirceIII Linac accelerator and high-cavities and with a conveyor system for industrial applications like sterilization of pharmaceutical single use products.

This work objects is to explore and study different possible electrical pollutions and perturbations in the electrical and electronic networks of a Linac accelerator and to study different solutions, especially in the case of the Tunisian facility.

First of all, we will present all the electrical problems that can arise in this type of system, problems can be from external electrical power supply or generated by the accelerator and his peripherals. Then, a study has been elaborated about various solutions for different electrical problems, it can be traditional or modern ones such as active filtering.

Finally, theoretical study was reinforced by a simulation to validate solution proposed between passive filtering and active filtering.

**Key-words:** Accelerator electrical networks, electrical perturbations, harmonics, passive filtering, active filtering.