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2-Proton irradiation effects on nanomembranes and FETs based on h-BN

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Hexagonal boron nitride (h-BN) is a semiconductor with a very large bandgap of almost 6 eV. It can not only be used as a deep UV light emitter/detector, but its high thermal stability, mechanical strength, resistance to oxidation and high thermal conductivity make it an excellent dielectric material. Like in graphite, thin membranes can be mechanically exfoliated and used in nanodevices.
In this thesis, we will study the effects of proton irradiation on h-BN using techniques like Ion Induced Beam Luminescence, Thermoluminescence and X-ray Diffraction, analysing the creation of defects in the lattice and the appearance of intermediate levels in the bandgap, which are crucial for single photon emitters, used in quantum communications.
We will also produce FETs using h-BN nanomembranes as the dielectric and evaluate the performance of the devices under proton irradiation.

Author: FERNANDES, Tiago (IST)

Presenter: FERNANDES, Tiago (IST)