Ionization versus displacement damage effects in *proton irradiated CMOS sensors* manufactured in deep submicron process

- **Goal:**
  - Study of *proton irradiation* effects on *CMOS sensors* manufactured in a *deep submicron* technology *dedicated to imaging* applications

- **Test chip:**
  - **0.18 µm** CMOS CIS technology
  - Shallow trench isolations (*STI*)
  - *Dedicated photodiode* doping profiles
  - 128 x 128 pixel array, **3T**, 10µm pitch
  - Larges photodiodes (>10⁴ µm²)
  - Others tests structures (MOSFETs…)

- **Proton irradiation:**
  - Facilities: KVI, UCL, Isotron
  - Energies: **7.4 to 200 MeV**
  - Fluences: 5 x 10⁹ to 3 x 10¹¹ H+/cm²
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- **No photoresponse degradation**, no voltage shift, no gain reduction

- **Ionization induced dark current increase** is the main degradation

- **Displacement damages** still play a significant role in uniformity degradation