FUSION FOR ENERGY

TECHNOLOGY OFFER

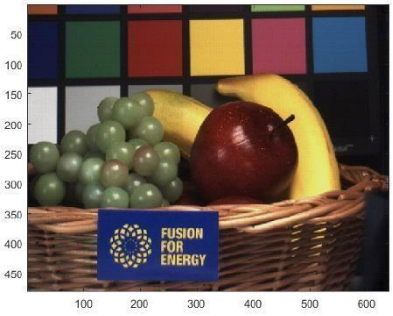
Light & compact image sensors resistant to radiation

Ultra-compact and ultra-light CMOS image sensor able to operate at levels of radiation up to 1 MGy without shielding, high temperature annealing treatment or image processing. It offers the possibility to develop a new generation of tiny rad-hard cameras in nuclear remote handling, deep space or particle physics/radiation facility monitoring.

- Basic RGB Color Demosaicing Algorithm (no correction)
- No shielding / No high temperature annealing

Test setup illustration

Image captured with a FURHI VGA chip exposed to 1 MGy(SiO_2), 10 keV X-ray ON



The technology

F4E and ISAE SUPAERO have developed a miniature radiation resistant image sensor that could withstand unprecedented levels of radiation. The chip will be part of the camera that will be used in the ITER fusion device for remote inspection and maintenance applications.

First silicon image sensor tolerant to 1 MGy without shielding

The radiation hardness of existing cameras is limited by the resistance of image sensor, especially due to radiation induced pixel leakage (i.e. dark current). Existing solutions on the market are either too big (due to shielding for example) or limited to about 100kGy. It's a world first to obtain such high quality images after irradiation of 100 Mrad (1 MGy) without shielding, high temperature annealing treatment or image processing. Based on VGA standards, the technology is ideal for miniaturised cameras thanks to its ultra-high compactness.

A game changer for nuclear, space and particle physics

These promising results open the door to future developments of ultra-compact radiation-hard cameras that can sustain demanding environments such as nuclear power plant inspections/monitoring/decommissioning and new applications in deep space missions,

Collaboration opportunities

The technology package is available for use and adaptation to new environments. The image sensor could be offered off the shelf product or integrated to new rad hard camera product with different specifications and new markets targets.

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