Radiation Detection Applications Based on Commercial CMOS Image Sensors

Martín Pérez[1, 2, 3, a)], Juan Jerónimo Blostein[1, 2, 3], Andres Cicuttin[4], María Liz Crespo[4], Miguel Sofo Haro[1, 3], Eduardo D. Martinez[2, 3], Fabricio Alcalde Bessia[2, 3], Luciano Marpegan[3], Mariano Gómez Berisso[1, 2, 3], and José Lipovetzky[1, 2, 3]

[1] *Comisión Nacional de Energía Atómica (CNEA), Av. E. Bustillo 9500, R8402AGP, San Carlos de Bariloche, Rio Negro, Argentina,*
[2]*Instituto Balseiro, Universidad Nacional de Cuyo, Argentina.*
[3]*Consejo Nacional de Investigaciones Cientficas y Técnicas (CONICET), Argentina*
[4]*The Abdus Salam International Centre for Theoretical Physics (ICTP), Strada Costiera 11, Trieste, Italy*

[a)] *Corresponding author: martin.perez@ib.edu.ar*

Abstract. Commercial Off-The-Shelf (COTS) CMOS image sensors (CIS), primarily designed for visible-light photography, have emerged as low-cost, high-spatial-resolution detectors for ionizing radiation. This work presents various applications of ionizing radiation detection using commercial CMOS image sensors. These applications include thermal neutron detection, neutron imaging, X-ray spectroscopy, and transmission and phase-contrast radiography. The results demonstrate that COTS CIS can complement and/or replace complex and expensive detectors in many applications, offering a cost-effective and accessible alternative for laboratories and educational institutions.