

# Simulation of geometry and materials of the TH-GEM based detector for radiation dosimetry

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GEM based detectors have found applications in many areas due to their simplicity of construction, low cost, ruggedness and diversity of shape. A dosimeter with these qualities presents utility in several applications, as for example in diagnostic and therapeutic medicine and industrial radiography. Furthermore, the high sensitivity provided by GEM detectors may extend their applications in low dose dosimetry. With the aim of producing a prototype of a TH-GEM based detector with characteristics suitable for dosimetric use in low and medium energy X-rays, the components were simulated, using the code MCNP5, to determine the geometries and materials suitable for its use. Precise determination of the dosimeter characteristics is very important for instrument calibration laboratories as well as to determine how the various components of the detector may influence the energy deposited on the sensitive volume. The results obtained are presented on the influence of each of the components present in this type of detector in standard mammography beams. The results allowed the adaptation of the detector to the conditions of interest.

*Keywords:* TH-GEM, Radiation Dosimetry, Monte Carlo.