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Testing the intrinsic spatial efficiency method for homogeneous and without matrix sources using MC simulation

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The intrinsic spatial efficiency method is a general and absolute method to determine the efficiency of any extended source. This was experimentally demonstrated and validated only for cylindrical sources and the gamma photons emitted by ^{137}Cs (661,65 keV).
Also, we carried out a research to tested the method for different shapes and sizes. Due to the difficulty that the preparation of sources with any shape represents, the simplest way to do this is by the simulation of the spectroscopy system and the source. We simulated the spectroscopy system and the sources using the FLUKA code. The shapes of the sources were: rings, discs, cylindrical shells, spheres and spherical shells. In such work we only considered gamma photons with an energy of 661.65 keV.
In this work we present a test of the intrinsic spatial efficiency method for sources with the shapes already mentioned and for energies different to 661.65 keV. The gamma energies considered in this new work will be: 59.54 keV (^{241}Am), 351.93 keV (^{214}Pb), 911.19 keV (^{228}Ac), and 1460.65 keV (^{40}K).
Until this moment we have applied the method by simulation for ring sources emitting 1460.65 keV gamma photons, and located coaxially on different positions along the axial axes.
The preliminary results shown an excellent agree between the absolute efficiencies determined by the standard relative method (statistical count) and the intrinsic spatial efficiency method. The relative bias in all cases are lesser than 1.1%.

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