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## Development of a Digital Model for the Dosimetry of the Cobalt 60 Irradiator at the National Polytechnic School of Ecuador

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This project presents the development of a digital model using the MCNP program to simulate the dosimetric distribution of the Cobalt-60 irradiation facility of National Polytechnic School of Quito-Ecuador, with a 100 kCi installed capacity. First, a map of absorbed dose was obtained with Fricke dosimeters distributed through the irradiation chamber, at five different distances fixed from the source (20, 40, 60, 100, 165 cm). A irradiation time based on the time required for a dose of 300 Gy at 20 cm from the source was set to measure the dose. This time was fixed for all the distances. The irradiation process was performed three times. To define the input data for the model it was necessary to establish the geometry, dimensions, materials and chemical compositions forming the irradiation chamber. To calculate the absorbed dose a quantizer data or "tally" was used to determine the energy deposited in a given area, called cell. In order to characterize the twelve pencils composed the Cobalt -60 source, the SDEF code was applied to simulate a fixed source and photons. Several changes at the starting model input data were needed to set and improve the performance. The final digital model was achieved with an error of less than 15% when compared with data obtained by Fricke dosimetry, therefore this model was validated.

### Country/Organization invited to participate

Ecuador

**Primary author:** Mr SALGADO, Francisco (Escuela Politecnica Nacional del Ecuador, Ecuador)

**Presenter:** Mr SALGADO, Francisco (Escuela Politecnica Nacional del Ecuador, Ecuador)

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