Contribution ID: **214** Type: **Poster**

Computational approach of the interaction of gamma radiation coming from neutron capture on biomolecules via GEANT4

Since its discovery in 1935 by J. Chadwick, neutrons have been used in many fields, from power production to medical applications. In particular, G. L. Locher in 1936 came out with the idea of using neutron capture for cancer treatments. Currently the Neutron Capture Therapy (NCT) stands for a binary treatment method that combines a cancer specific Boron (^{10}B) or Gadolinium (^{157}Gd) labeled drug and a neutron beam of a low energy sufficient for neutron capture to take place within the treated tissues. The nuclear reaction that takes places into the cell releases gamma radiation of 0.478 MeV for ^{10}B and 2.2 MeV for ^{157}Gd. In this work we present a GEANT4 study of the interaction of this gamma radiation on bacterial DNA of "staphylococcus aureos".

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Session Classification: Poster Session - MP

Track Classification: Medical Physics