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Development of intra-operative β - probe for cancer surgery

In this contribution I present the project of a probe aimed to the detection of tumor residuals during cancer surgery. Such a device is thought to be used in the framework of radio guided surgery. The developed technique couples a radio tracer injected in the patient and the use of a particle detector during surgery to scan the tissue and to achieve an efficient discrimination of healthy from damaged tissue.

The use of a beta-emitter as radio-tracer gives the needed spatial resolution, due to the short range of the electrons (order of \sim mm in tissue), and to a little background, thus resulting in high tumor residuals recognition and low dose injected.

To develop a detector specific for this application (probe) a great sensitivity to electron must be achieved, keeping, at the same time, the gamma detection efficiency as low as possible. Furthermore the probe must be of reduced size to be easily handled by the surgeon.

In this contribution will be presented the measurements and Monte Carlo simulations obtained for various scintillating materials and different geometries of the probe.

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