**Internal Note Date: 2018-08-21 Version: 0.1**

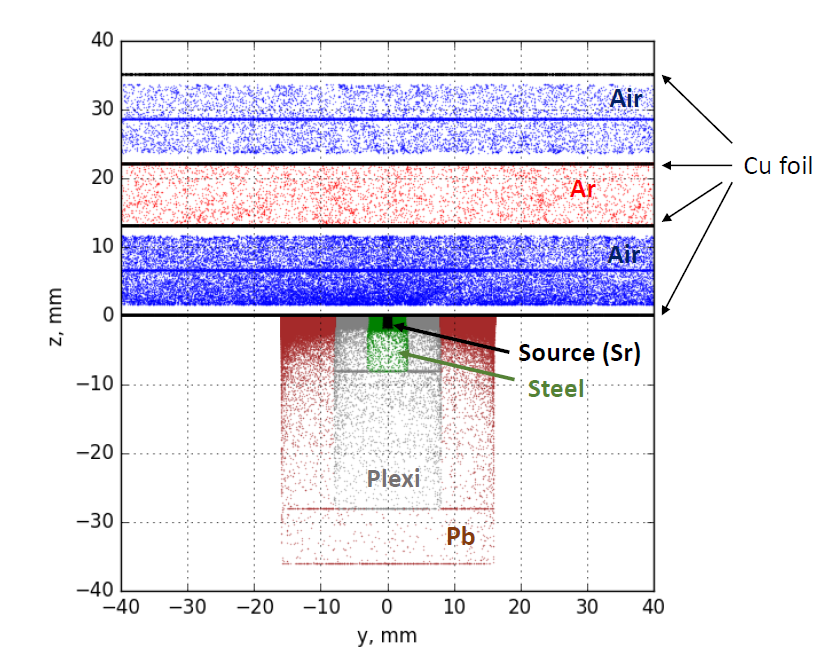
Monte-Carlo simulation of multi wire chamber radiation damage

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Using GEANT-4 package the dose in the multi wire chamber was investigated.

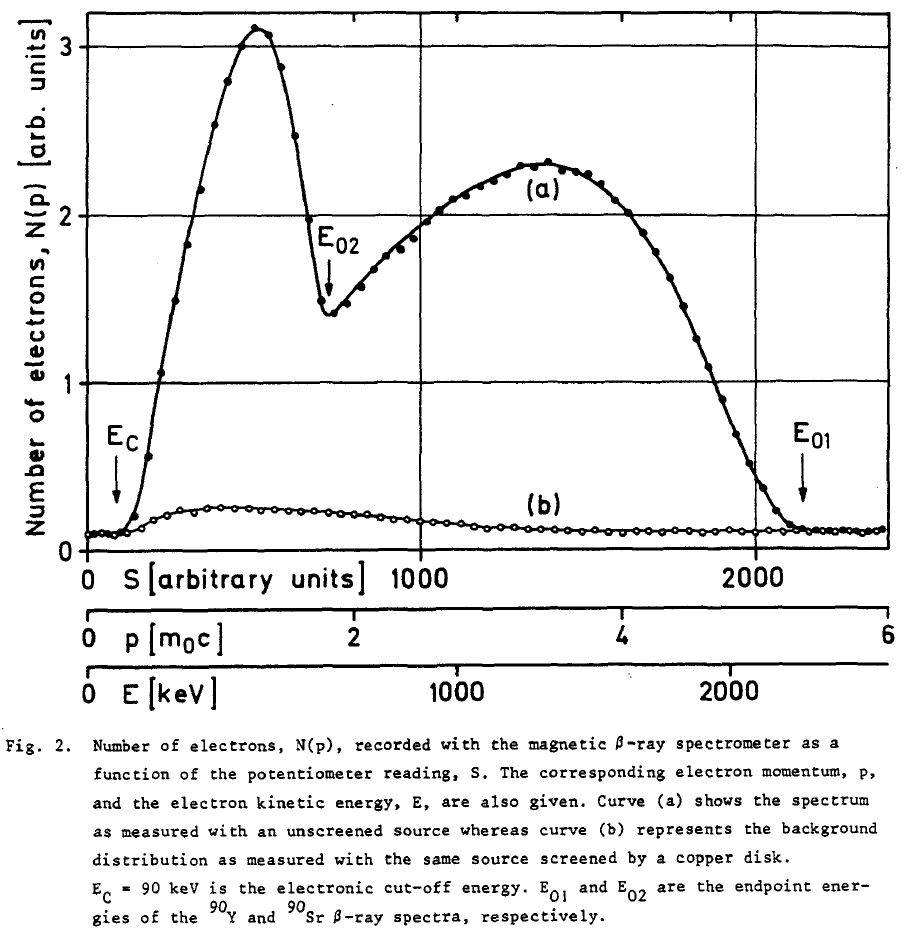
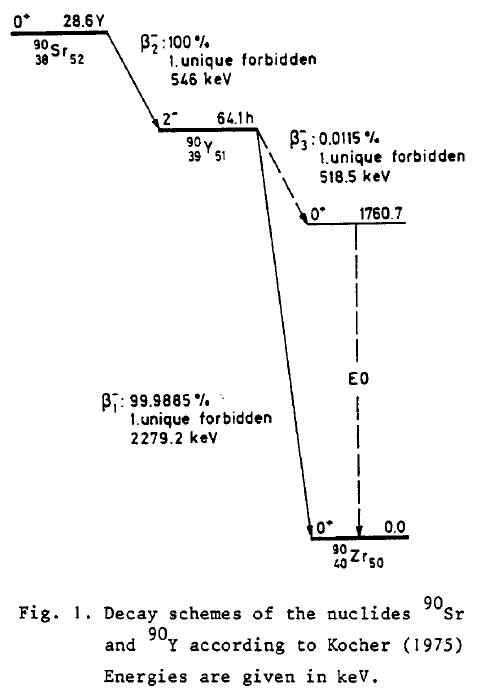
# Introduction and Monte-Carlo Model

The sketch of the model is presented on Fig. 1. This sketch was obtained from the simulation itself – the logical volumes was marked as sensitive ones and the hits were visualized. G10 layers are not presented on the sketch. Blue line in the center of the Air volumes corresponds to the GEANT steps, which cover full layer thickness. For visualization plot high energy electrons were used.

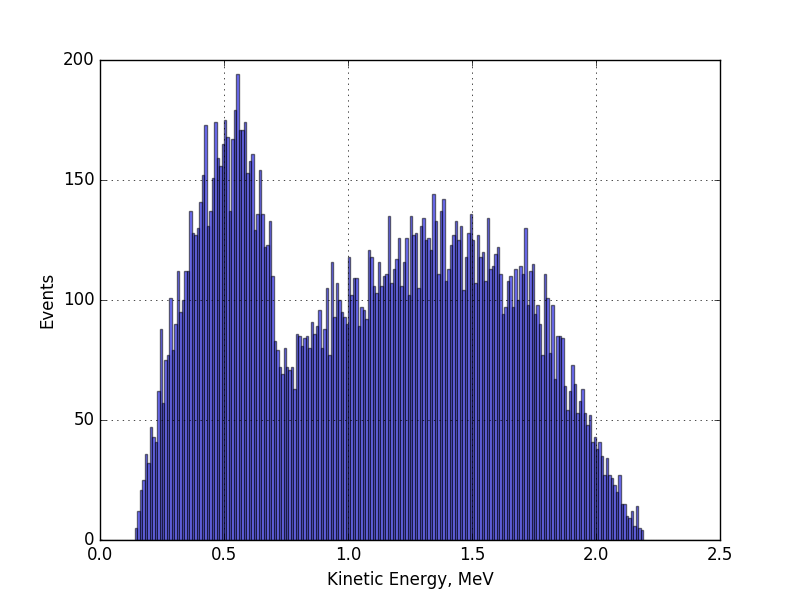
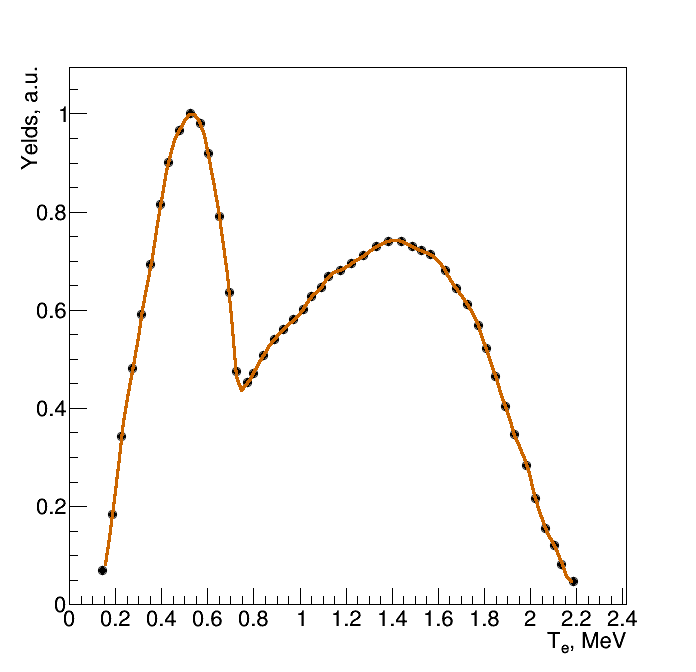


**Fig.1 Model visualization.**

Source spectrum is presented on Fig.2.

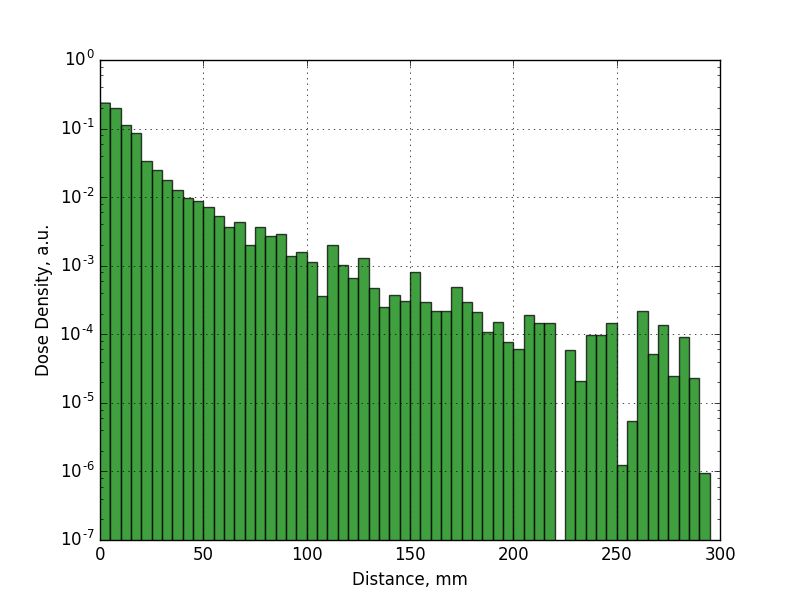


**Fig.2 Spectrum of the Sr-Y source [2].**



**Fig.3 Scan of spectrum and its interpolation by TSpline3 (left). Generated spectrum (right).**

The dose distribution is presented on Fig. 4.



**Fig.4 Distribution of the dose as function of distance from *z*-axis.**

# Analysis reproducibility

The analysis code is stored publicly [3].

# References

1. GEANT-4, Nuclear Instruments and Methods in Physics Research A 506 (2003) 250-303; IEEE Transactions on Nuclear Science 53 No. 1 (2006) 270-278; Nuclear Instruments and Methods in Physics Research A 835 (2016) 186-225.
2. Int. J. Appl. Radiat. Isot. 34 (1983) 1241
3. <https://github.com/aleksha/G4-Models>