

## Simulation of the Upgraded ALC Spectrometer

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The detector system of the Avoided Level Crossing (ALC)  $\mu$ SR spectrometer [1] installed at the Swiss Muon Source of the Paul Scherrer Institut was completely redesigned in 2007. One of the main motivations for the upgrade was to eliminate, or at least simplify, the dependence of the measured asymmetry base-line on the applied external magnetic field, leading to the higher sensitivity of the ALC detector.

To achieve this goal, the ALC design has been simulated and optimised using the GEANT4 package [2,3]. Several test measurements were performed after the ALC detector system had been completed. We will present the comparison of the simulated predictions with the measured data. We will also discuss the effect of the different geometry settings and of the muon beam properties on the simulated predictions.

The design and the first experience with new ALC spectrometer will be discussed in a separate presentation at this conference [4].

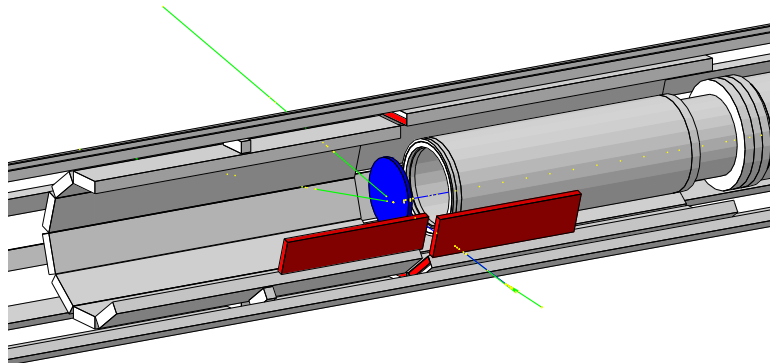


Fig. 1: ALC spectrometer as implemented in the simulation program. One simulated  $\mu^+$  decay event is shown.

- [1] <http://lmu.web.psi.ch/facilities/alc/alc.html>
- [2] S. Agostinelli *et al.*, Nucl. Instr. and Meth. A 506 (2003) 250-303.
- [3] J. Allison *et al.*, IEEE Trans. on Nuclear Science 53, No. 1 (2006) 270-278.
- [4] A. Stoykov *et al.* "A new detector system for the ALC spectrometer – first experience with G-APDs in  $\mu$ SR instrumentation",  $\mu$ SR conference 2008, Tsukuba.