Contribution ID: **65** Type: **not specified**

# Measurements and signal processing of energy and time signals of 22Na using LaBr3:Ce scintillation detectors

Positronium (Ps) is a system consisting of an electron and its anti-particle, a positron, bound together into an exotic atom, specifically an onium. The system is unstable: the two particles annihilate each other to predominantly produce two or three gamma-rays, depending on the relative spin states. Even rarer decays (with branching ratios $<10^{-6}$) can be detected with a suitable array of sensitive detectors. Because of the small branching ratios, high count rates become imperative.

Measurements have been taken of a 10 $\mu$Ci $^{22}$Na radioisotopic source
using a pair of $LaBr_3$:Ce scintillation detectors. These detectors
combine good energy resolution with excellent timing resolution (~300 ps) which allow for quality time-of-flight measurements. Results focusing on the signal processing of both the timing (fast) and energy (slow) signals of these scintillation detectors will be presented, as well as the resulting energy and time spectra from $^{22}$Na.

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**Session Classification:** Posters