

Abstract Submitted
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Positron Lifetime Spectroscopy JACOB MARTIN, HERBERT
JAEGER, Miami University — We have assembled a positron lifetime spectrometer
using two scintillation detectors in a slow-fast coincidence configuration. The decay
of ^{22}Na serves as a convenient source of positrons. Positron energies are sufficiently
high that positrons penetrate into the bulk of the surrounding material under study.
A 1275 keV gamma ray emitted less than 10 ps following the positron decay serves
as the lifetime start signal, while the detection of a 511 keV annihilation gamma
signals the end of life of the positron. The first version of our spectrometer em-
ploys NaI scintillators that have good detection efficiencies but with time resolution
of several nanoseconds are not particularly suitable for measuring sub-nanosecond
lifetimes of positrons in metals. Recently we have replaced the NaI detectors with
ones employing plastic scintillators, which offer a time resolution of better than 1
ns. First results of measurements performed with this apparatus will be discussed.

Herbert Jaeger
Miami University

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