

Abstract Submitted  
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**Measurement of the Lifetime of Cosmic Ray Muons** IAN BRUBAKER<sup>1</sup>, DARREL SMITH<sup>2</sup>, Embry-Riddle Aeronaut Univ — In this experiment cosmic rays create scintillation light as they pass through a 5 gallon mineral oil/scintillator detector. Some of the low-energy cosmic muons come to rest in the detector and their subsequent decays ( $\mu^+ \rightarrow e^+ \nu_\mu \bar{\nu}_e + C.C.$ ) are observed as a second burst of light. The decay lifetime of 10,392 stopping muons were measured and the mean muon lifetime ( $\tau_\mu$ ) was calculated. The composition of cosmic muons includes both positive and negative muons; however, a small fraction of the  $\mu^-$  cosmic rays are captured by hydrogen atoms in the mineral oil ( $CH_2$ ) thus affecting the accepted lifetime of muon decays (2.197  $\mu s$ ). The muon lifetime measured in this experiment  $\tau_\mu = (2.092 \pm 0.019) \mu s$  does not differentiate between positive or negative muons and is consistent with the occurrence of  $\mu^-$  capture on hydrogen.

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