

Abstract Submitted
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Initial Findings and Proposal for a Pulsed Positronium Beam¹

DAN ENDEAN, JASON ENGBRECHT, St. Olaf College — To date, work with positronium (Ps) has required either indirect statistical measurements or analysis done with high (>10 eV) energy beams. Here we propose a low energy Ps beam that will allow for investigation of fundamental questions concerning Ps, such as gas scattering cross-sections and condensed matter surface interactions. These results may also improve material science analysis techniques by providing a better theoretical basis for pore analysis of materials. Our research has shown that a nanotube material should be capable of producing a directional Ps source with a room temperature velocity distribution. Analysis of this material has demonstrated that up to 10% of incident positrons form Ps and will likely diffuse through these nanotubes in a collimated beam. We outline the steps we have taken toward creating this Ps beam as well as offer insight into the nature and relevance of the measurements that could be made with such a beam.

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