

Abstract Submitted
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A Buffer-Gas Positron Trap for the NEPOMUC High-Flux Positron Facility.¹ J. R. DANIELSON, University of California San Diego, E. V. STENSON, University of California San Diego, Max Planck Institute for Plasma Physics, S. NIßL, Max Planck Institute for Plasma Physics, C. L. MANSON, S. GHOSH, University of California San Diego, C. HUGENSCHMIDT, Technical University München, T. SUNN PEDERSEN, Max Planck Institute for Plasma Physics, C. M. SURKO, University of California San Diego, APEX COLLABORATION — The goal of the APEX collaboration is to study electron-positron pair plasma phenomena in a superconducting levitated magnetic dipole. This is made possible by exploiting the NEPOMUC high-intensity positron beam located at the FRM-II high-flux research reactor at the Technical University of Munich, which can provide a positron current up to 10^9s^{-1} . The pair plasma experiment, however, requires pulses of positrons with $N > 1 \times 10^{10}$. This requires conversion of the DC NEPOMUC beam into a pulsed beam and necessitates the use of a positron trap and accumulator. Here we describe plans to reconfigure and upgrade an existing buffer-gas trap (BGT) for installation in the NEPOMUC beamline to provide the large positron pulses required for the pair plasma experiment and useful for other experiments at NEPOMUC as well. We present a mechanical design that accommodates the severe space requirements of the beamline. The traps will be inserted close to large amounts of iron radiation shielding. Magnetic modelling and a plan for correction coils to maintain (the required) uniform fields in the positron traps will be discussed. The results of using electron plasmas to test the BGT before the upgrade will also be presented.

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