title: "Intense positron beam as a source for production of electron positron plasma."

Abstract Submitted
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Dipole configuration for confinement of positrons and electron-positron plasma E. V. STENSON[1], H. SAITOH[2], J. HORN-STANJA, U. HERGENHAHN, N. PASCHKOWSKI, T. SUNN PEDERSEN[3], Max Planck Institute for Plasma Physics, M. R. STONEKING, Lawrence University, M. DICKMANN, M. SINGER, S. VOHBURGER, C. HUGENSCHMIDT, Technische Universität München, L. SCHWEIKHARD, Ernst Moritz Arndt University of Greifswald, J. R. DANIELSON, C. M. SURKO, University of California, San Diego — Laboratory creation and confinement of electron-positron plasmas, which are expected to exhibit atypical plasma physics characteristics, would enable tests of many theory and simulation predictions (e.g., the stabilization of anomalous transport mechanisms). This is the goal of APEX/PAX (A Positron-Electron eXperiment/Positron Accumulation eXperiment). Following demonstration of efficient (38%) $\mathbf{E}\times\mathbf{B}$ injection and subsequent confinement (τ = 3–5 ms) of cold positrons in a dipole magnetic field (H. Saitoh, *et al.*, NJP **17**,103038 (2015)), the system is undergoing upgrades from a supported permanent magnet to a supported HTSC (high-temperature superconductor) coil, then to a levitated HTSC coil suitable for the simultaneous confinement of electrons and positrons. This contribution will report on the design and testing of the new systems and subsystems (e.g., for cooling, excitation, and levitation) and, if available, on results of upcoming experiments using a "rotating wall" to generate inward particle flux deeper into the confinement region.

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