

The low energy positron storage ring for positronium generation

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A method for the generation of intense antihydrogen and positronium streams using a low energy positron storage ring is considered. A longitudinal magnetic field for the focusing system and ...

At present time the Low Energy Positron Toroidal Accumulator (LEPTA) at JINR is under commissioning with circulating positron beam. The LEPTA facility is a small positron storage ring equipped with the electron cooling system and positron injector. The maximum positron energy is of 10 keV. The storage ring is aimed for generation of direct fluxes of ortho-positronium (o-Ps), ...

The project of Low Energy Particle Toroidal Accumulator (LEPTA) is dedicated to construction of a small positron storage ring with electron cooling of positrons circulating in the ring. The project has a few goals: to construct the LEPTA storage ring and to study its characteristics; to set up first experiments with Ps in flight; to study positron dynamics in the ring.

generation low energy storage ring for essentially all ion species from hydrogen ions up to molecular ions, macro- and biomolecules, clusters, atomic ions at extreme ... possible inclusion of a merged positron ring. Five electrostatic quadrupoles, two 8 R and two 37 electrostatic deflectors form an achromatic 90 R bend.

Low Energy Particle Toroidal Accumulator, which is under construction in JINR, is a storage ring with particle focusing provided by longitudinal magnetic field. The general goals of this installation are electron cooling of positrons, positronium generation and experiments with an intensive positronium flux. Current status of the project realisation is presented.

This ring also was proposed to be used as low-energy positron storage ring (5-20 keV) for positronium generation. The electron cooling of positrons is an essential property of this system.

Figure 1 The scheme of the GBAR experiment (AD=Antiproton Decelerator, ELENA= (Extra Low Energy

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Antiproton Ring). 3. The positronium target cloud A positronium target cloud with up to 10^{12} Ps/cm³ density is needed for the efficient formation of H⁻. Positronium will be formed from the intense positron pulse in a positron/positronium converter ...

The peculiarities of the proposed scheme [1] are the following: - relatively low particle energy, in the range of 500.5 MeV for antiprotons and 27-0.27 keV for positrons; - a focusing system for the positron storage ring with a longitudinal magnetic field so the positron beam is kept entirely in the ring.

The goal of the low energy particle toroidal accumulator (LEPTA) project is the construction of a small positron storage ring with electron cooling of positrons circulating in the ring. A cooling scheme enables it to generate positronium by the recombination of positrons with cooling electrons inside the cooling section of the ring. LEPTA is expected to produce Ps ...

The general parameters of the low energy positron toroidal accumulator (LEPTA) are presented. The ring circumference is about 18 meters. Positron energy can be varied from 5 to 20 keV. 1 INTRODUCTION The precision measurement of the ortho- and parapositronium characteristics is one of the fundamental problems of the modern quantum ...

1.. Introduction The ultra-low-energy storage ring (USR) will be a multi-purpose facility providing electron-cooled antiprotons in the energy range between 20 and 300 keV for both in-ring experiments and effective injection into traps and potentially also ion beams of energies in the range of 2-27.6 MeV (U⁹²⁺). The low-beam energies and high-beam quality to be ...

THE LOW ENERGY POSITRON STORAGE RING FOR POSITRONIUM GENERATION: STATUS AND DEVELOPMENTS V. Antropov, E. Boltushkin, A.Ivanov, Yu.Korotaev, V. Lohmatov, I.Meshkov, V.Pavlov, ... Positronium (Ps) - the bound state of an electron and its ... physics relates to the idea of antihydrogen generation [3]. Key point of this idea is an ...

The LEPTA installation: 1 - positron source, 2 - positron trap, 3 - septum coils, 4 - kicker; 5 - electron gun, 6 - electron collector, 7 - pick-up stations, 8 - decay channel, 9 - dipole magnet ...

Electron cooling of positrons is the essential peculiarity of the method of antihydrogen and positronium fluxes generation, which is based on low-energy positron storage ring. Such a ring, the Low Energy Positron Toroidal Accumulator (LEPTA), is under construction in JINR. The calculation algorithm of electron cooling of positrons is discussed. Electron cooling of positrons ...

Such a ring (called a modified betatron) has been designed in JINR and now is under construction. This ring also was proposed to be used as low-energy positron storage ring (5-20 keV) for positronium generation. The electron ...

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and generation of antihydrogen and positronium in flight [1÷5]. The LEPTA facility (Fig.1) includes small positron storage ring with circumference of 17.2 m equipped with electron cooling system and positron injector consisting of a low energy positron source based on ν^+ -active sodium isotope and penning-type trap for

ELSEVIER Nuclear Instruments and Methods in Physics Research A 391 (1997) 216-220 NUCLEAR INSTRUMENTS 8. METHODS IN PHYSICS RESEARCH Section A Conceptual design of the low energy positron storage ring I.N. Meshkov, A.O. Sidorin* Joint Institute for Nuclear Research, 141980 Dubna, Russia Abstract A method for the generation of ...

The LEPTA setup (Low Energy Particle Toroidal Accumulator) is being constructed at the Joint Institute of Nuclear Research. The main purpose of this setup is to generate intense fluxes of positronium ions and perform experiments in positronium physics. The main component of the setup is the low-energy positron accumulator with a electronic cooling system. A special ...

The low energy positron storage ring (Fig. 1) has 2 toroidal solenoids and 2 straight ones, connected together as a racetrack. The first of straight solenoids, so called "septum", is used ...

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