

**The Modified Betatron Prototype Dedicated to Electron Cooling\***, I.N. MESHKOV, S.V. MIRONOV, A.O. SIDORIN, JINR - The use of an electron cooling system with a circulating electron beam for Fermilab Recycler permits to avoid the problems of a traditional electron cooling system and cool down the antiprotons at energy of 8 GeV. In this system the Recycler ring is equipped with an additional electron one, which is periodically filled up with new portion of cold electrons. The electron beam circulates in longitudinal (quasitoroidal) magnetic field, and the long term stability of the beam is provided with additional spiral coils, which form a quadrupole magnetic field. In the straight section, where the electrons cool the antiprotons this quadrupole field is absent. The acceleration of the electron beam without the distortions caused by RF system of linear accelerators is achieved by using of induction acceleration. Such a ring is similar to the modified betatron and its modification called "stellatron". The main limitations of the electron cooling system based on the modified betatron are discussed. The general parameters of the modified betatron prototype designed in JINR in order to test the medium energy electron cooling system are presented.

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