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Storage Modes in a Passive Electrostatic Electron Recycling Spectrometer (*ERS*). D.R. TESSIER, T.J. REDDISH, Univerisity of Windsor, F.H. READ, University of Manchester, A.J. ALDERMAN, P. HAMMOND, University of Western Australia — A new type of electron spectrometer based around the storage of low energy (∼30 eV) electrons in electrostatically defined orbits has been recently reported [Phys Rev Lett **99**, 253201 (2007)]. The *ERS* consists of two hemispherical deflection analysers (HDAs) whose exits and entrances are connected by a series of electrostatic lenses to form a race-track structure of "desk-top" size. Electrons are injected into the ring in a pulse of length ∼ 50 ns through one of the HDA's onto the optical axis of the ERS and stored with lifetimes of ∼50μs (corresponding to ∼150 orbits of the ∼65cm circumference). We outline the theoretical description of the charged particle optics design leading to long term storage of electrons in the ring. Preliminary experimental results exploring storage as a function of different mean pass energies in the two HDA's will also be presented. Complex orbital behavior is observed under certain operating conditions, indicating the likelihood of the storage of electrons of well-defined kinetic energy.

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