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The magnetic toroidal sector: a broad-band electron-positron pair spectrometer SIEGBERT HAGMANN, PIERRE-MICHEL HILLENBRAND, YURI LITVINOV, UWE SPILLMANN, GSI-Darmstadt — At the future relativistic storage-ring HESR at FAIR the study of electron-positron pairs from non-nuclear, atomic processes will be one of the goals of the experimental program with kinematically complete experiments focusing on momentum spectroscopy of coincident emission of electrons and positrons from free-free pairs and corresponding recoil ions. The underlying production mechanisms belong to central topics of QED in strong fields. We present first results on the electron-optical properties of a magnetic toroidal sector configuration enabling coincident detection of free-free electron-positron pairs; this spectrometer is suitable for implementation into a storage ring with a supersonic jet target and covering a wide range of lepton emission into the forward hemisphere. The simulation calculations are performed using the OPERA code [1].

1. OPERA-3D, Vector Fields Limited, Oxford, UK

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