

ESD2011: KACST ESRing - Status and outlook

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Electrostatic Storage Rings (ESRs) have attracted great attention, because of their unique features, which make them highly attractive tools for experimental research in atomic and molecular physics, as well as in biophysics and biochemistry. The success of the first ESRs ELISA and the KEK-ring prompted substantial interest in ESRs: several electrostatic storage rings have been or are being constructed using similar concept.

An ESR for beams at energies up to 30 keV·q is currently under construction at the National Centre for Mathematics and Physics (NCMP), King Abdulaziz City for Science and Technology (KACST). The ring, which uses a beam optics layout that is comparable to the preceding ESRs, is designed to be the core of a unique and highly flexible experimental facility that will combine many different, yet complementary beam manipulation techniques and experimental methods. This facility is conceived to allow for both storage ring and single-pass experiments. The lattice and the layout of the ring thus had to accommodate the different experimental techniques that the ring will be equipped with, such as for example electron-ion, laser-ion, ion-ion or neutral-ion beams, in both crossed-beam and merged-beam configurations. The construction of this facility is realized in a staged approach, in which a simple and early-run adaptation of the ring is built first. This basic version will then be upgraded to a higher symmetry of the ultimate version of the ring.

In this talk, an overview of the technical and particle optical design of this novel ESR will be given, the particular challenges in its layout will be described and the general project status will be summarized.

References

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