Progress report from the DESIREE assembly work.

P. Löfgren [1], G. Andler, L. Brännholm, M. Björkhage, M. Blom, H. Cederquist, F. Hellberg, A. Källberg, S. Leontein, L. Liljeby, A. Paal, P. Reinhed, K-G. Rensfelt, S. Rosén, A. Simonsson, H. T. Schmidt, R. D. Thomas.

Department of Physics, Stockholm University, S-106 91 Stockholm, Sweden

DESIREE is a cryogenic electrostatic double ring under construction at Stockholm University. The two rings in DESIREE have similar circumference, 8.8m, and they share a common straight section where ions in the two rings can merge. Each of the rings has two 160º cylindrical bends and four 10º parallel-plate deflectors where the two 10º deflectors on both ends of the merger section are common for the two rings. For focusing of the beam, each ring has four quadrupole doublets. The whole optical structure is contained in a single vacuum vessel where all optical elements are mounted directly on the bottom of this chamber. In order to cool the two rings, DESIREE is designed as a cryostat with an inner aluminum chamber and an outer steel vacuum chamber. In between the two vacuum chambers there will be a thermal copper screen and several layers of superinsulation. Cooling is achieved by four cryogenerators (Sumitomo RDK-415D) connected to the bottom plate of the aluminum chamber (2nd stage) and to the copper screen (1st stage) via flexible copper braids. In order to facilitate access from the top, all components like pumps, cryogenerators and electrical feedthroughs are mounted on the bottom of the vacuum chambers.

During the assembly work each of DESIREE "boxes" have been prepared more or less separately. The outer steel chamber has been degaussed and vacuum tested and installed on adjustable stands in its final position. After a series of vacuum tests of the inner chamber, most of the optical elements are now installed and aligned. In order to maintain a clean environment during the mounting of components inside the inner chamber, this work is performed in a temporary clean room built up around the chamber. Since access to the outside of the inner chamber is very limited once it has been installed into the copper screen, components like cryogenerators and pumping ports have also partly been installed at this stage. The next step will be to move the complete inner chamber and install it into the copper screen that has been built up on a temporary stand close to the inner chamber. The screen is constructed from 15 pieces of copper metal sheets (OFHC) that will form a 5mm shell that finally will enclose the complete inner chamber. Before installation into the outer vacuum chamber, 30 layers of superinsulation will be wrapped around the copper screen.

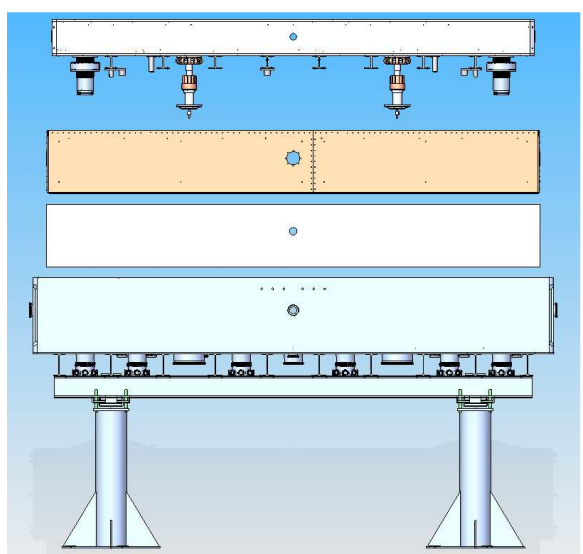

Figure 1. The four DESIREE "boxes". From top to bottom: Inner chamber, Cu-screen, superinsulation and outer vacuum chamber (top lid off).

DESIREE will be provided with two injectors, one for each ring, although it is planned that both injectors will be able to supply ions to both rings in the future. So far a major part of the low energy injector (25kV) and beam line system have been installed and some initial beam transport tests have started. Due to space limitation in the lab, installation of the high energy injection system (100kV) has to wait until the inner vacuum chamber and the screen have been installed into the outer vacuum chamber.

P. Löfgren [1] E-mail: patrik.lofgren@fysik.su.se