

Magnetic Field Measurement Devices for Superconducting Undulator Coils at ANKA

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The performance of superconducting insertion devices (IDs) depends strongly on their magnetic field quality. It is of fundamental importance to characterize their magnetic field properties accurately before installation in synchrotron light sources. During the last years improvements in magnetic field measurement technology of conventional, i.e. permanent magnet based insertion devices, made significant progress. For superconducting IDs similar major developments are necessary to perform precise measurements of local magnetic fields and field integrals. At ANKA we follow this aim within our ongoing R&D program to develop superconducting IDs.

A vertical liquid helium bath cryostat to measure magnetic field distributions of superconducting undulator mock-up coils up to a length of 350 mm and 300 mm diameter is in operation at ANKA. To measure the local field and field integrals of long coils ranging from 1 to 2 m a horizontal measuring system for superconducting undulator coils is under construction. The cryostat was delivered in 2011 and passed the final acceptance test onsite KIT. It will allow field mapping with Hall probes as well as field integral measurements in a cold (4.2 K), cryogen-free environment.

In this contribution we describe the main characteristics, challenges and details of the cryostat and the measurement systems as well as some results.