
理化学研究所・原子核グループ
東京大学・銀杏プロジェクト
共催

# 第 10 回 RIBF 核物理セミナー

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# Superconducting magnet development and operational experience at NSCL

## Dr. Al Zeller

(National Superconducting Cyclotron Lab.
Michigan State Univ., USA)

*Abstract*

In addition to the superconducting cyclotrons and beam transport system, the NSCL has constructed two devices for nuclear physics research that use large superconducting magnets. These are the S800 Spectrometer, in use since 1996, and the A1900 Fragment Separator, completed in 2000. The heart of the S800 is two 150 mm-gap dipoles that operate at a nominal 1.5 T and have a rigidity limit of 4 T-m. Precise magnetic field measurements were performed to allow aberration correction by software. A description of the design and how the actual spectrometer compared to it will be presented, as well as how the spectrometer has performed in the last decade. The A1900, with a rigidity limit of 6.3 T-m and limited space, required large-aperture quadrupoles and relatively high-field dipoles. Since all of the magnets are superferric, pole fields are limited to 2.5 and 2 T in the quadrupoles and dipoles, respectively. Magnetic field measurements were made to allow setting of the currents to reduce tuning time for separating out secondary fragments of interest. The design, construction and operation of the A1900 will be presented.

With increasing beam intensity radiation damage issues become important. Simply having spare magnets to replace damaged ones becomes expensive in terms of lost beam time, so ways of making the magnets more radiation resistant have been studied. Several ways of producing more radiation tolerant coils will be presented.

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*Contact: AOI, Nori*
*seminar@rarf.riken.jp*
*http://rarfaxp.riken.jp/~seminar*