

ACCELERATOR SEMINAR

“The Mainz Energy Recovering Superconducting Accelerator (MESA) – A Versatile Experimental Arrangement Based on a Compact Accelerator”

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Many breakthroughs in particle physics have been achieved by creating an innovative, accelerator-based experimental regime. The purpose of MESA is to explore such an opportunity by using the recently established Energy Recovery Linac (ERL) technology which allows for high luminosities ($L \sim 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$) on internal targets at low electron beam energies of $\sim 100 \text{ MeV}$. The Mainz Energy Recovering Superconducting Accelerator (MESA) will provide a 100 MeV c.w. beam, a beam current of 10 mA and a geometrical beam emittance of $< 50 \text{ nm}$, the latter allowing for virtually lossless focusing through a windowless gas target.

Due to energy recovery, the installed rf-power can be reduced by a factor 20-40 if compared to a conventional accelerator. MESA will also provide a high intensity, spin polarized external beam at 150 MeV . MESA will be used for at least two different particle physics experiments. First, ERL operation will be exploited for “dark photon” (g') search in a region of the parameter space which adjoins the exclusion area covered by (g -2) muon, one of the most prospective hunting grounds for explorative experiments. Second, considering a precision measurement of the Weinberg Angle, the low energy, spin-polarized external beam of MESA creates significant advantages.

Monday, June 20, 2011

2:30 p.m.

MCC Conference Room

Coffee before seminar at 2:15 p.m.