

**High Current, Low Voltage Power Converter [20 kA, 6 V] - LHC Converter Prototype,**  
H.E JORGENSEN Danfysik, and F. BORDRY,  
A. DUPAQUIER, G. FERNQVIST, CERN - The superconducting LHC accelerator requires high currents (~12.5 kA) and relatively low voltages (~10 V) for its magnets. The need to install the power converters underground is the driving force for reduced volume and high efficiency. Moreover, the LHC machine will require a very high level of performance from the power converters, particularly in terms of DC stability, dynamic response and also in matters of EMC. To meet these requirements soft-switching techniques will be used. This paper describes the development of a [20 kA, 6 V] power converter intended as a stable high-current source for DCCT calibration and an evaluation prototype for the future LHC converters. The converter is made up using a modular concept where five current sources [4 kA, 6 V] are placed in parallel. The 4 kA sources are configured in plug-in modules: a diode rectifier on the AC mains with a damped L-C passive filter, a Zero Voltage Switching inverter working at 20 kHz and an output stage (high frequency transformers, Schottky rectifiers and output filters). The obtained performance (DC stability, bandwidth, efficiency, EMC, ...) is presented and discussed.