Contribution ID: **297** Type: **not specified**

Magnetic core and semiconductor switch characterisation for an Inductive Adder kicker generator

Wednesday, May 31, 2017 2:42 PM (18 minutes)

For the FCC-hh injection kicker magnet system a highly reliable generator is needed. One promising technology to reach the challenging voltage, current, rise time and flat top stability values for this application is an inductive adder (IA) based on high-power semiconductor switches. A prototype IA will be built at CERN to validate the theoretical performance and identify technology limits. Many components influence the performance of the inductive adder, making it a complex device. The two components that have a significant influence are the magnetic cores, which are part of the output transformer, and the semiconducting switches, which allow the current to be both turned on and off. Hence detailed characterisation of samples, including both of these components, are necessary before selecting components for the final prototype. The presentation gives an overview of the IA technology, describes the testing of the magnetic cores and semiconductor switches and presents the results and preliminary decisions for component selection. An outlook is given for the upcoming activities in the next years.

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Session Classification: Special technologies