Contribution ID: **26** Type: **Oral Presentation**

Measurements on 12.5/17.5 kV Inductive Adders with +/-200 ppm Pulse Flatness over 900 ns for CLIC Damping Ring Kickers at CERN

Monday 4 June 2018 16:45 (15 minutes)

The CLIC study is investigating the technical feasibility of an electron-positron collider with high luminosity and a nominal centre-of-mass energy of 3 TeV. Pre-damping rings and damping rings (DRs) will produce ultra-low emittance beam with high bunch charge. The DR kicker systems must provide extremely stable field pulses to avoid beam emittance increase. The DR extraction kicker system consists of a stripline kicker and two pulse modulators. Specifications for the electromagnetic field pulses require that the modulator generates pulses of 900 ns flattop duration, +/-12.5 kV and 305 A, with ripple and droop of not more than 200 ppm (+/-2.5 V) with respect to a reference waveform. Inductive adder topology has been chosen for the pulse modulators: the output waveform can be adjusted by applying analogue modulation methods. Two full-scale, 12.5 kV, 20-layer, prototype inductive adder have been designed, built and tested at CERN. One of these has also been tested with eight additional layers, to facilitate two operation modes: 12.5 kV pulses for extraction kicker operation and 17.5 kV for dump kicker operation. An automated control system for droop and ripple compensation, based on Labview software, has been designed and implemented for the prototype modulators. The prototypes are planned to be tested with a prototype stripline kicker, installed in a beamline, at ALBA Synchrotron Light Source in Spain. The results of laboratory tests, comparisons of results from different measurement techniques and an analysis of the limits of these techniques are presented.

Authors: HOLMA, Janne (CELLS (ES)); BARNES, Mike (CERN); WOOG, David (CERN)

Presenter: WOOG, David (CERN)

Session Classification: Oral 3 - Solid State Modulators

Track Classification: Solid State Power Modulators, Components, Switches, and Systems