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INNOVATIVE KLYSTRON MODULATION ANODE VOLTAGE CONTROL SYSTEM AND VOLTAGE & CURRENT MEASUREMENT SYSTEM

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The counter-rotating proton beams in the Large Hadron Collider (LHC) are captured and then accelerated to their final energies by two identical 400 MHz RF systems. The RF power source required for each beam comprises eight 300 kW klystrons powered by two 100 kV, 40 Amp, AC/DC power converters. The klystron currents (and DC power) can be individually controlled by means of a klystron modulator. A solid state crowbar system protects the four klystrons of each unit. The performance of the high-voltage elements of this system are discussed, with emphasis on the new features of the klystron modulator system: the new Voltage and Current Measurement System, which uses sensitive electronics such as current transducers, Complex Programmable Logic Device (CPLD) and Analog-to-Digital Converter (ADC), that have to cope with huge current spikes in case of faults, is described. Ongoing developments for an innovative Klystron Mod Anode Voltage Control System, which will be used to regulate the klystron current, replacing the existing tetrodes, are also discussed.

Summary

Authors: RAVIDA, Gianfranco (CERN); LORENZO ORTEGA, Ruben (CERN)

Presenter: LORENZO ORTEGA, Ruben (CERN)

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