Contribution ID: **30** Type: **Poster Presentation**

Development of a test platform for high voltage ceramic capacitors based on magnetic compression

Abstract: The long lifetime, fast charging and discharging capabilities of high voltage ceramic capacitors are important for their application in pulsed power facilities. This paper presents a rep-rate platform for testing capacitors at several tens kilovolts with charging and discharging time in microsecond region. The platform consists of a high voltage power supply, a primary unit, a core-type pulse transformer, a magnetic compression network with reset unit and a test cavity. A detailed circuit model including the reset unit is presented to optimize the electrical parameters of each component. Then, the test platform is built and experimented based on magnetic compression technology. One pseudo-Spark Switches (PSS) is used as control switches in the primary unit for pulse charging and another PSS is used for discharging in the test cavity. Test results of the platform with dummy load and test cavity are presented to verify the design and capabilities of the platform.

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Session Classification: Oral 2

Track Classification: Repetitive Pulsed Power Systems, Repetitive Pulsed Magnetics, Accelerators, Beams, High Power Microwaves, and High Power Pulse Antennas