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Development of new high slew-put and high energy-efficient power supplies for J-Parc upgrade

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In J-PARC Main Ring (MR), the upgrade toward megawatt beam intensity is scheduled. To achieve megawatt beam, we need to increase the repetition rate of the accelerator from 0.42 Hz to 1 Hz. In this case, the total power variation in main grid is up to 100 MVA. This is because the magnets in MR should be driven much faster in 1 Hz operation. However, such power variation is not allowed by the electricity company. Therefore, we are planning to replace the current power supply of the magnets in MR for the new one with large capacitor energy storage. The capacitors used for such application must survive after 108 cycles of charging and discharging, which is corresponds to 10 years operation. We have developed the capacitors whose lifetimes are longer than 10 years with a manufacturer. In this talk, we will present about not only the capacitors but also the power supply under development

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