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A high-speed MTCA.4-based digitizer for the J-PARC MR

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J-PARC Main Ring (MR) delivers the 30-GeV protons to the particle physics experiment. Microwave instabilities have been observed in the J-PARC MR during both the acceleration for the beam to the neutrino experiment and the debunching process for the beam to the hadron experiment. Since the instability does not occur every shot, monitoring the waveform of the beam signal for every shot is desired to investigate the source of the instability. Currently, the oscilloscopes are used to monitor and record the waveform of the beam signal. Since the data acquisition from the oscilloscope via Ethernet is not fast enough for the fast repetition cycle of the MR, we introduced an MTCA-4-based high-speed digitizer to record the waveform. The large memory on the module and the data transfer via the PCI Express bus enable us to monitor and record the whole acceleration cycle. In this presentation, we present the current status of the new digitizer in the J-PARC MR.

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