



**SPring-8 control system “MADOCA II”**

The SPring-8 accelerator and beamline control system have been successfully migrated to the Message And Database Oriented Control Architecture (MADOCA) II control framework, which is the new version of MADOCA in fiscal year 2014.

MADOCA II executes control processes by exchanging asynchronous messages between processes.

The main features of MADOCA II are as follows. Any size and structured data, such as waveform or images, can be sent with a message, whereas MADOCA can exchange simple text messages up to 255 ASCII characters. Multiple device control programs can now run on a front-end computer. The log data acquisition system has scalability (over 1 M inserts/s), reliability (no single point of failure), and flexibility in data format. The system was implemented on the newest information technologies, namely, ZeroMQ for messaging, Redis for data caching, Messagepack for data serialization, and Apache Cassandra for perpetual data archiving. The new control system has been working since the

beginning of this year with no major problems.

MADOCA-II system runs not only on UNIX-like system but also on Windows and implemented on various programming languages including LabView. It will be applied to the SPring-8 experiment control system and other non-synchrotron radiation experiment controls.

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