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Progress of Diamond Digital Low Level RF

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The first version of digital low level RF (DLLRF) for the Diamond Light Source storage ring and booster was developed with ALBA Synchrotron. Six systems have been built so far. Two of them are in routine operation controlling two normal conducting HOM-damped cavities in the Diamond storage ring. A third system is being used for cavity testing in the RF test facility. The fourth system is being commissioned to the control the second normal conducting booster cavity. The fifth DLLRF system is being prepared for the third normal conducting RF cavity in storage ring.

A new DLLRF system based on SIS8300-KU with RTM has been developed and tested in the last few years. We are aiming to develop a common platform for the different RF systems in Diamond, including the storage ring, the booster and the linac. It will also be our baseline design for the future Diamond II. Firmware, software and supporting hardware have been developed and tested. The linac version with arbitrary waveform generator mode was tested successfully to generate flat top pulse from SLED at high power test in the linac. The storage ring version was also tested successfully in the RF test facility.

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