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CONTROL AND LOW LEVEL RF SYSTEM OF THE SOLEIL SYNCHROTRON

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In the SOLEIL storage ring, two cryomodules, each containing a pair of 352 MHz superconducting cavities, will provide the maximum power of 600 kW, required at the nominal energy of 2.75 GeV with the full beam current of 500 mA and all the insertion

devices. They will be supplied with liquid helium from a single cryogenic plant and each of the four cavities will be powered with a 190 kW solid state amplifier consisting in a combination of 315 W elementary modules (about 750 modules per amplifier).

The low electronic system that will be used in the first phase consists in “slow” amplitude, phase and frequency loops, complemented with a direct RF feedback. A fast digital, FPGA-based, I/Q feedback is currently under development, that should be implemented later on.

The control of the whole system is insured by several PLCs and a μ controller, which monitors the amplifier parameters through a multiplexing system. The PLCs are linked to the SOLEIL TANGO framework via Ethernet.

The control and low level RF system is described and the first operational/experimental results are reported in this paper.

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