

The Nuclotron Main Magnet Power Supply Control System,

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superconducting synchrotron Nuclotron based on a miniature iron-shaped field SC-magnets was put into operation in March 1993 at the Laboratory of High Energies of JINR in Dubna. Twelve runs of the new accelerator have been performed by the present time. The Nuclotron Control System, which is in progress, has provided efficient support for the machine commissioning through all its phases. The dedicated control subsystem for the main magnets pulsed power supplies was designed, allowing the reproduction of the desired B and Q fields to better than 0.0005 at injection. The bending (BM), focusing (QF) and defocusing (QD) magnets are powered by three supplies. The BMs are driven by supply of 6.3 kA nominal current. The QFs and QDs are connected in series and powered by supply of 6 kA. Besides, an additional supply of 200 A for the QFs is used to keep required ratio I_{qf}/I_{qd} during the accelerator cycle. The BM magnetic field shape is set by pulse function generator which produces a reference burst (Bo-train) with 0.1 Gs resolution. This train increments pattern analog function generator based on a 16-bit DAC. A real B-train off the reference bending magnet and corresponding analog function are used for feedback loop. The current magnetic field of BM is used as reference function for the focusing and defocusing magnets, i.e. the BM power supply is a master and the QF and QD supplies are slave ones. The QF and QD trains are utilized for control as described above. The control algorithm enables the machine operators to adjust all necessary parameters of magnetic field within a few cycles.