

ASPECTS OF THE CONTROL SYSTEM OF THE LINEAR ELECTRON ACCELERATORS BUILT IN ROMANIA

A. Jianu, Nilprp-Bucharest; D. Martin, Nilprp-Bucharest; S. Marghitu, Nilprp-Bucharest;
C. Oproiu, Nilprp-Bucharest; M. Toma, Nilprp-Bucharest

The paper presents the control system of the linear electron accelerator ALID-7 of 5.5 MeV and 0.7 kW built in Romania. The system provides: personnel and sensitive devices protection against dangerous events; programmed interlocking and warning signals during accelerator operation; single electron pulses or electron pulse trains; control of high voltage on magnetron and electron gun, electron pulses length and repetition rate, electron beam intensity, magnetron frequency, sweeping amplitude and frequency, conveyor velocity, irradiation time and electron pulse counting. An important feature of the system is an original control technique for obtaining programmed beam single shots and pulse trains with programmed pulse number, pulse repetition frequency and pulse duration by discrete pulse temporal position modulation of the gun electron pulses and magnetron microwave pulses. Another facility, which showed new results in the material processing field, was designed to permit simultaneous electron beam and microwave irradiation. The PC-based control methods are used in parallel with classical techniques in order to increase the personnel and accelerator safety.