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THE ELECTRON STRING ION SOURCE KRION 6T ELECTRONICS AND CONTROL SYSTEM DEVELOPMENT

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The Electron String Ion Source (ESIS) is a relatively novel type of ion source, which is under development since 1994, when the electron string phenomenon was first observed. ESIS is a sophisticated modification of Electron Beam Ion Source (EBIS) working in a reflex mode of operation under specific conditions, the operation is based on step-by-step ionization of the ions by hitting with electrons of an electron string. ESIS is a complex facility, so the electronic control system is crucial. Globally, the KRION 6T source electronics systems can be divided into two parts – the slow control system and the ion motion control system. The slow control system combines the following monitoring and control elements: the electron gun and the ions extractor; the magnetic optics; vacuum and temperature monitoring; the locking system; the beam diagnostic. The basis of ionization process in ESIS is an electron beam produced by the cathode electronics assembly. The new cathode electronics assembly contains several interesting electronic modules which are designed by the JINR NICA accelerator division engineers. The topic describes the ESIS electronics development, production and operation process.

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