

Development of the Electron string ion sources thermometry systems

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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

The ESIS KRION-6T is designed in order to produce the highly charged heavy ions for the NICA/MPD project at JINR. In the 55th Nuclotron (april 2018) run the C6+, Ar16+ and Kr26+ ion beams were produced and accelerated.

One of the most interesting parts of the KRION 6T slow control system is a thermometry system. The source temperature monitoring necessity is caused by the fact that one of the main elements is a superconducting solenoid 1.2 m long. A special measurement unit PKT-8 has been developed for these purposes. It includes functionality that has no analogues on the market: PoE standard supply, Modbus RTU interface, onboard precision current source and web-interface. The PKT-8 was used to monitor the cooling processes, maintain the superconductivity of the solenoid and its warming during the KRION 6T operation in the Nuclotron runs in 2014 and 2017, 2018.

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