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Development and first measurement results of a 3.5-cells S-band RF gun with a photocathode for the SYLA synchrotron complex

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Currently, NRC «Kurchatov Institute» jointly with partners is developing the 4th generation synchrotron radiation source SYLA (Synchrotron + Laser) with an energy of 6 GeV [1]. This facility will consist of a source based on a storage ring and a free electron laser (FEL). As one of the options, an RF gun with a photocathode will be used to generate short high-brightness electron bunches for the FEL. The gun structure consists of 3.5 π -mode standing wave accelerating cells at operating frequency of 2800 MHz with a coaxial RF coupler.

Previously, beam dynamics simulation, optimization of electrodynamic characteristics and thermal processes analysis were performed [2,3]. At this point, the fabrication of the RF gun has been completed.

The report presents the results of measurements of the experimental sample (the operating frequency, the axis electric field, Q factor).

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References

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