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Optimal RF-Photogun Parameters for the Compact XFEL Based on the New Linac-Injector Prototype

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The beam dynamics analysis of the RF-photogun as the LUCX facility at KEK, Japan, and new photo injector for the Russian 4th generation light source SSRS4 was done to choose the optimal length of the section and cell's number and also to define optimal accelerating gradient and injection phase. The simulation of electro-dynamics characteristics and fields distribution in the RF-gun based on 3.5-, 5.5- and 7.5-cell π -mode standing wave accelerating structure was done. The influence of the beam loading effect on the field amplitude and beam dynamics was the main purposes of study also. The beam dynamics simulation results will present in the report and optimal RF-gun parameters will discuss.

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