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Preliminary electron injector design for a steady-state microbunching light source

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The Steady-State Microbunching (SSMB) mechanism, which combines the benefits of high repetition rate of a storage ring and coherent radiation, has the potential to produce high average power short wavelength light. In order to generate kilowatt level radiation, the electron injector should have the ability to provide a 1 A average current, 100 ns long DC beam, with the requirements of small emittance (<1˜mm· mrad), and very small energy spread (<5×10^{-4}) for the SSMB storage ring. This paper presents an overview of the physical design of the electron gun, linac, and stretching ring components of the injector, as well as the beam loading compensation methods employed in the electron gun and linear accelerator.

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Footnotes

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