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## Injector design for the MariX-FEL project

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The MariX project (Multi-disciplinary Advanced Infra-structure for Research with X-rays) is a free electron laser (FEL) light source proposed by the INFN-Milan. It will produce highly coherent X-rays, in the range 0.2-8 keV, with ultra-short pulses (10-50 fs) and a repetition rate up to 1MHz. At the same time, MariX will host a compact monochromatic X-ray source, called BriXS, by using an inverse-Compton scattering scheme, with energies up to 180 keV and a repetition rate of 100 MHz (continuous-wave CW operation) that will generate fluxes up to  $10^{13}$  photons per second.

In this paper, the Radio-Frequency (RF) and beam dynamics designs of the electron injector for the MariX-FEL project are presented. The choice of the main devices, such as the electron gun and the accelerating linear accelerators, as well as the main parameters for CW operation are discussed in details.

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