

Numerical Simulation of SRF Gun Coupler Kicks



TECHNISCHE
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Proposal for a Bachelor's thesis | Master's thesis | HiWi job
Study field: Computational Engineering | Electrical Engineering
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Description

At DESY the currently available electron gun is based on a normal conductive copper cavity operated in pulsed mode. It will be replaced by a superconducting variant to enable also CW operation. The required electromagnetic field in the cavity is then excited by a dedicated input-coupler system originating from the well-known TESLA input power coupler. Additional HOM couplers are not considered in the current design phase but may be added if required. Due to the asymmetric coupling of the resonator fields to the external sources the extracted electron beam will observe a parasitic coupler kick which has to be minimized.

Task

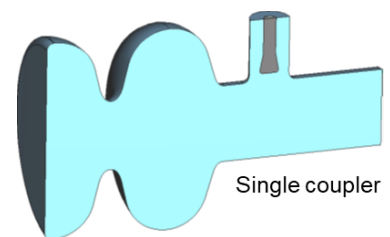
Numerical simulation of the electromagnetic field in the superconductive electron gun including the coupling to the external source. The field components have to be evaluated along the trajectories of the emitted charged particles and an optimal design with respect to a minimal coupler kick has to be identified. In contrast to the classical setup based on a single coupler there are many possible variants available which can be evaluated. Even further ideas to minimize the influence of the couplers to the beam can be realized and considered within this studies.

References

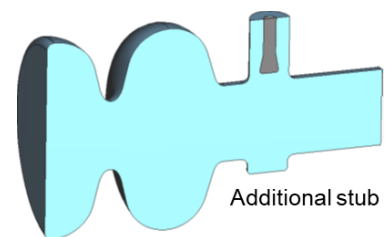
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Contact:

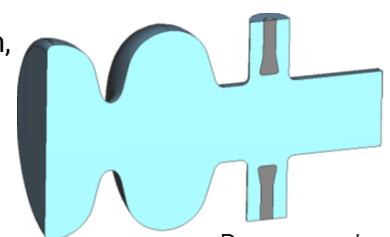
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Single coupler



Additional stub



Dummy coupler