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Experience with the various cleaning processes on Mg photocathodes for SRF gun

SRF Gun II With Mg photocathode at HZDR has successfully provided electron beams up to 200 pC/bunch in CW mode for ELBE users. To improve the quality of photocathode is one of the critical issues in enhancing the stability and reliability of the photoinjector system.

Magnesium has a low work function (3.6 eV) and shows a quantum efficiency of 10^{-3} after laser cleaning. In this poster, we will present our experience with the cleaning processes on Mg photocathodes. Different methods, such as cleaning with ps UV laser, heating treatment and cleaning with excimer laser, will be introduced and compared. The relationship of the material properties, surface topography and the photoemission efficiency will be studied as well.

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