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PHYSICS DESIGN STUDIES OF A NC CW RF GUN FOR EUROPEAN XFEL

With the successful commissioning of European XFEL in the pulsed mode, continuous wave (CW) mode operation of European XFEL is under considerations. DESY is pushing R&D on CW electron sources. A full superconducting CW gun is under experimental development, and a normal conducting CW gun is under design studies at Photo Injector Test facility at DESY, Zeuthen site (PITZ) as a backup option. A 217 MHz normal conducting CW gun is developed from the LBNL 187 MHz VHF gun, with enhancement on both cathode gradient and gun voltages to further improve beam brightness. This paper presents the cavity RF design, multipacting simulations, beam dynamics simulations and thermal load analysis.

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