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## Process Simulation for the LCLS-II Cryogenic Systems

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The Linac Coherent Light Source II (LCLS-II), a 4 GeV continuous-wave (CW) superconducting electron linear accelerator, is to be constructed in the existing two mile Linac facility at the SLAC National Accelerator Laboratory. The first light from the new facility is scheduled to be in 2019. The LCLS-II Linac cryomodules consist of thirty-five, 1.3 GHz and two, 3.9 GHz superconducting cryomodules. The Linac cryomodules require cryogenic cooling for the super-conducting niobium cavities at 2.0 K, low temperature thermal intercept at 5.5-7.5 K, and a thermal shield at 35-55 K. The equivalent 4.5 K refrigeration capacity needed for the Linac operations range from a minimum of 11 kW to a maximum of 24 kW. Two cryogenic plants with 18 kW of equivalent 4.5 K refrigeration capacity will be used for supporting the Linac cryogenic cooling requirements. These cryogenic plants are based on the Jefferson Lab's CHL-II cryogenic plant which uses the "Floating Pressure" design to support a wide variation in the cooling load. In this paper we describe the cryogenic process for the integrated LCLS-II cryogenic system with the help of a simulation for a 4.5 K cryoplant in combination with a 2 K cold compressor box, and the Linac cryomodules.

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