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## **C1Po1F-03: Heat load characterization: a cross-facility comparative study**

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Static heat load (radiation, conduction, and convection) characterization in cryogenic systems can account for a significant portion of the total heat load, directly influencing the sizing and specifications of cryogenic refrigeration capacity. Currently, there is no established industry standard for calculating static heat loads; these are often determined using proprietary formulas supplemented with safety factors to address potential design and manufacturing flaws and inefficiencies during operation. This paper compares heat load calculation methods from various institutions and evaluates the discrepancies between calculated and observed static heat loads in the SLAC LCLS-II cryogenic system. Key challenges and lessons learned are summarized to provide guidance for the design phase of large-scale cryogenic facilities.

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