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## **Modeling of a horizontal circulation open loop in two-phase helium**

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Two-phase circulation loop are often used to cool large superconducting magnets since it has the advantage to eliminate the use of pressurization system such as pumps which dissipate power on the fluid and require a costly maintenance and operation at these temperatures. Most of these loops are designed for vertically oriented system to take advantage of the pressure head to create a stable flow. The superconducting magnet of the R3B spectrometer is horizontally oriented and will be cooled with a circulation loop with quasi-horizontal heat exchanger tubes. To assist the design of such cooling scheme, a horizontal loop has been tested experimentally and a predictive numerical model has been developed. In this paper we present the thermo-hydraulics modeling of such a flow configuration, and the comparison with experimental results.

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