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# C3Or2C-03: Analysis of temperature field and its total leakage of heat flow for cold compressor

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Cold compressor is the core component to develop the facility of large-capacity refrigeration at superfluid helium temperature. It is operated under extremely low temperature and low pressure which involves technical issues about temperature and heat flux such as failures of the actuating motor resulting from overheating and performance decrease due to heat leak to cryogenic side. To analysis the distribution of temperature field of the cold compressors, an integrated model including multi-parts was built on the basis of on the structure of cold compressor and was then simulated through computational fluid dynamics. The results showed that the internal flow field inside the cabinet of cold compressor was completely turbulent and the total leakage of heat flux was closely related to the rotating speed of the high-speed PM motor. At last, the actual temperature rise of the cold compressor was tested and its data of two temperature measuring points were compared with the simulated results which validated the accuracy of modeling and simulation results.

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