

## Study on Liquid Nitrogen Gravity Circulation Loop for Cryopumps in Large Space Simulator

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**Abstract :** Gravity circulation loop for the cryopumps of the space simulator is introduced, and two phase mathematic model of flow heat transfer is analyzed as well. Based on this model, the liquid nitrogen (LN<sub>2</sub>) gravity circulation loop including its equipment and layout is designed and has served as LN<sub>2</sub> feeding system for cryopumps in one large space simulator. With the help of control software and human machine interface, this system can be operated flexibly, simply, and automatically under four conditions. When running this system, the results show that the cryopumps can be cooled down and maintained under the required temperature, 120 K.

**Keywords :** cryopumps, gravity circulation loop, liquid nitrogen, two-phase

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