

Effect of Aftercooler Configuration on the Performance of Pulse Tube Cryocoolers

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The demand of performance improvement for miniature pulse tube cryocoolers (PTCs) recently increases. To increase the performance, we focus on an aftercooler. This is because an aftercooler is the main part connecting inside and outside of the system. The heat path in an aftercooler is based on the heat transfer between helium gas and the heat exchanger elements and the outside casing. It is important to enhance the heat transfer and to reduce the heat contact resistance. In this work, the some kinds of aftercooler were constructed and their thermal characteristics were experimentally obtained using DC and oscillatory (AC) flow. The obtained results show the difference between the thermal performance of the aftercoolers with DC flow and that with AC flow. Therefore, we performed numerical calculation to understand this difference and found important knowledge to improve the cooling performance of PTCs.