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C3Or2C-01: Results of a nitrogen-based pulsating heat pipe with varied configurations

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In this paper, the results of a nitrogen-based pulsating heat pipe (PHP) with the ability to change the number of turns are presented. The experiment assembly consists of two identical PHP subsections with their own fill lines. The condenser, the adiabatic section, and the evaporator section of each PHP are 90mm, 1000mm, and 60mm respectively. Because of the unique design of the condenser section of the PHP, it can change the configuration into 1-turn, 3-turn, 5-turn, and 7-turn PHP. The PHP was tested at the condenser temperatures 68.5 K, 77.3K, and 84.5K, which are below, at, and above the boiling point of the liquid nitrogen at ambient pressure. At each condenser temperature, the PHP was tested at three different initial fill ratios (38%, 50%, and 63%). The experimental results for the 1-turn and 3-turn setup of this nitrogen-based PHP assembly will be presented and analyzed in this paper.

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