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Two-stage pulse tube refrigerator with step displacer as phase shifter

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Solid piston as phase shifter for the second stage of a two-stage pulse tube refrigerator is effective for getting higher performance. If a step displacer is used as the phase shifter, both stages can use higher performance phase shifter. In this paper, a gas separation type two-stage pulse tube refrigerator with the step displacer is discussed with numerical simulation. It is shown that the swept volume ratio of the displacer over the swept volume of the compressor, and phase angle difference between the displacer and the piston of the compressor is important for getting higher performance.

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