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C2Po2B-03 [14]: The Theoretical Analysis and Test Technology of the Moving Magnet Linear Motor

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The SC100H linear Stirling cryocooler is designed by Kunming Institute of Physics. The characteristics of the magnetic circuit of the moving magnet linear oscillation motor used in SC100H was analyzed by the theoretical and experimental methods. In this study, a theoretical model of the motor was established, and its structure was simplified for easy analysis and calculation. Using the equivalent circuit methods and principle of electromechanical energy conversion, the relationship between the thrust characteristic and relative position of the mover in the motor was analyzed. The thrust characteristics of the motor at different input currents were tested by a tension test system. The results were consistent with that predicted from the theoretical analysis. Taken together, this study provided a good basis for the design and optimization for the structure and operation parameters of the motor.

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