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C2Or3A-05: Performance Test of a Light-Weight Linear Stirling Cooler with Active Vibration Controller

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In order to meet the requirements of weight, vibration, and size in the field of infrared imaging, Lihan Cryogenics has developed a lightweight and compact free-piston Stirling cooler, which weighs only 260g (with built-in electronic controller and active balancer). The cooler system consists of a gas-bearing moving magnet compressor and a low-temperature rod-less displacer. This is also designed to be integrated with industry-standard dewar. Furthermore, in order to reduce vibration, an active Vibration controller is developed, which uses an active motor on the same axis as the compressor piston to offset the vibration. The refrigeration performance under different heat dissipation and working temperatures is experimentally tested. The test results show that the cooler acquires 0.5W cooling capacity at 77K with 14W power consumption, and the power consumption of the active vibration controller is less than 1W.

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