

Design of High Capacity Pulse Tube Cooler with C-Type Flexure for High Temperature Super Conductor Applications

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High-capacity Stirling-type pulse tube coolers (PTCs) are promising candidates for cooling High Temperature Superconducting device applications. A compressor for a cooler demands less vibration, high reliability, and low cost. The piston and cylinder are arranged to be non-contacts in order to improve reliability in the developed compressor. The moving element including the piston is supported with C type flexure bearings on one side of this piston and low cost have been realized. A clearance seal constituted with the piston and the cylinder is maintained by optimizing rigidity of flexure bearings and the distance between flexure bearings. Design of compressor has to be done by using SAGE and ANSYS structural analysis. Design and analysis of Stirling type pulse tube cryocooler to obtain 50K, at No load condition by giving 5W as input power to the compressor. SAGE and REGEN 3.3 software analysis has to be done for Regenerator and Pulse tube cooler to find out optimum parameters.