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THE FIRST WORLD DEMONSTRATION USING PELTIER BASED THERMAL TESTING VACUUM
CHAMBER FOR TESTING CUBESAT.**Abstract**

The recent proliferation of Cubesat activities worldwide demands proper testing infrastructure. A thermal vacuum test requires special equipment especially to simulate the cold condition in space. However, limited access to space environment testing facilities and lack of know-how prevent many emerging space countries especially African nations from initiating space projects, much less building sustainable space or satellite countries. The use of liquid nitrogen to generate cryogenic temperature is difficult for emerging space countries. In the present paper, I have demonstrated an affordable way of conducting the thermal vacuum test even in resource-limited countries by using Peltier-based Thermal Testing device integrated in a simulated Vacuum Chamber to achieve -77oC to +80oC with no satellite and -20oC to +62oC with satellite. The system was designed and developed based on the standard of ISO 19683: Design Qualification and Acceptance Test of Spacecraft and Units: provides the minimum thermal vacuum test requirement range of -15oC to +50oC. The PeTT device components are easily available online and can be replicated everywhere in the world. The present paper shares the design, development and satellite test results.