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UMASS AMHERST DEVICES DESTINED FOR OUTER SPACE TO BE TESTED WITH TEMPTRONIC THERMAL SYSTEMS

AMHERST, Mass. – Scientists from the University of Massachusetts Amherst have teamed up with Temptronic Corporation of Sharon, Mass. to test the temperature tolerance of some high-precision instruments that are destined for outer space.

Ultimately, the next generation of these devices will end up on NASA satellites, mapping tiny changes in the surface features of the Earth's oceans, rivers and frozen areas. The research will help scientists monitor changes in the planet's water resources and better understand long-term weather patterns and global climate change.

The instruments aboard NASA's satellites must withstand both the intense heat of the sun and the dark cold of space as they move in and out of the Earth's shadow during every roughly ninety-minute orbit. These temperature extremes can affect how some instruments operate, and devices with temperature-sensitive measurements must either compensate for these drastic temperature changes or go through an inefficient period of down time while components recover.

Led by Paul Siqueira of UMass Amherst's Microwave Remote Sensing Laboratory, a team of scientists has been building instruments known as radar interferometry (RF) microwave devices, which use radar data to map minute changes in the Earth's topography. Destined for NASA's Candidate Earth Observing Satellites, the instruments must operate without the moderating blanket of Earth's atmosphere and function properly in temperatures that range from minus 20 to 80 degrees Celsius.

To investigate how the microwave devices' signals will be affected by the extreme swings in temperature, the research team will use Temptronic's new ThermoChamber™ compact chambers and ThermoStream® temperature source to simulate the hostile environment of space. The ThermoChamber has a minus 65 degrees to 200 degrees Celsius range and provides precise temperature control to 0.1 degrees. It

will also provide the rapid temperature transition rates necessary to accurately simulate the extreme temperature changes that the instruments will encounter when in orbit.

The compact size and portability of Temptronic's ThermoChamber™ eliminates long test cables, optimizing test signal accuracy, says Siquira.

"This collaboration with Temptronic will provide us with tools and capabilities that are difficult to create otherwise," he says. "Testing of the interferometric devices at these temperature extremes must be performed in order to mature the instrument and engineering technology to the point that it can withstand the challenges of a spaceborne environment and perform as expected under these extraordinary conditions."

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"Temptronic's compact ThermoChamber™ and ThermoStream® temperature source will allow UMass. Amherst engineers to test their satellite instruments against the hostile temperatures of space."