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## Using In-situ Cryogenic Radiometers to Measure the Performance of a Large Thermal Vacuum Chamber

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The James Webb Space Telescope will operate in space at temperatures lower than 50 K. To test the major parts of the telescope and instruments on the ground requires a very large thermal vacuum chamber with a helium-cooled shroud operating below 20 K. This chamber and shroud are being subjected to a series of 4 preliminary tests to characterize the chamber and the ground support equipment before the telescope and instruments are tested. We have made measurements in the first of these preliminary tests using simple radiometers, which are located in the chamber and are pointed at various locations and items of interest within the chamber. The radiometers, which have been previously described[1], consist of a Cernox thermometer attached to an absorber suspended behind a Winston cone with an acceptance half-angle of 11 degrees. 9 of these radiometers were anchored to the chamber at temperatures between 17 and 25 K and were able to resolve 10 nanowatts over an area of 2 cm<sup>2</sup>. This level of sensitivity corresponds to a 60 K blackbody, which spans the radiometer field of view, changing in temperature by 0.04 K. The results of this test, and plans for future tests will be described.

[1] M. DiPirro, T. Hait, J. Tuttle, and E. Canavan, "A Low Cost, Low Temperature Radiometer for Thermal Measurements", Proc. of SPIE 7439, pp. 7439-1A-1-8 (2009).

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