NASA's New High Intensity Solar Environment Test Capability

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Across the world, new spaceflight missions are being designed and executed that will place spacecraft and instruments into challenging environments throughout the solar system. To aid in the successful completion of these new missions, NASA has developed a new flexible space environment test platform. The High Intensity Solar Environment Test (HISET) capability located at NASA's Marshall Space Flight Center provides scientists and engineers with the means to test spacecraft materials and systems in a wide range of solar wind and solar photon environments. Featuring a solar simulator capable of delivering approximately 1 MW/m^2 of broad spectrum radiation at maximum power, HISET provides a means to test systems or components that could explore the solar corona. The solar simulator consists of three high-power Xenon arc lamps that can be operated independently over a range of power to meet test requirements; i.e., the lamp power can be greatly reduced to simulate the solar intensity at several AU. Integral to the HISET capability are charged particle sources that can provide a solar wind (electron and proton) environment. Used individually or in combination, the charged particle sources can provide fluxes ranging from a few pA/cm^2 to 100s of nA/cm^2 over an energy range of 50 eV to 100 keV for electrons and 100 eV to 30 keV for protons. Anchored by a high vacuum facility equipped with a liquid nitrogen cold shroud for radiative cooling scenarios, HISET is able to accommodate samples as large as 1 meter in diameter. In this poster, details of the HISET capability will be presented, including the wide-ranging configurability of the system.