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Field Performance of Photovoltaic Systems in the Tucson Desert SEAN ORSBURN, ADRIA BROOKS, DANIEL CORMODE, JAMES GREEN-BERG, GARRETT HARDESTY, VINCENT LONIJ, ANAS SALHAB, TYLER ST. GERMAINE, GABE TORRES, ALEXANDER CRONIN — At the Tucson Electric Power (TEP) solar test yard, over 20 different grid-connected photovoltaic (PV) systems are being tested. The goal at the TEP solar test yard is to measure and model real-world performance of PV systems and to benchmark new technologies such as holographic concentrators. By studying voltage and current produced by the PV systems as a function of incident irradiance, and module temperature, we can compare our measurements of field-performance (in a harsh desert environment) to manufacturer specifications (determined under laboratory conditions). In order to measure high-voltage and high-current signals, we designed and built reliable, accurate sensors that can handle extreme desert temperatures. We will present several benchmarks of sensors in a controlled environment, including shunt resistors and Hall-effect current sensors, to determine temperature drift and accuracy. Finally we will present preliminary field measurements of PV performance for several different PV technologies.

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