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Testing the SiPMs for the sPHENIX electromagnetic and hadronic calorimeters

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The electromagnetic (EMCal) and hadronic (HCal) calorimeters for the sPHENIX experiment will use about 100,000 Silicon Photo-Multipliers (SiPMs) as optical sensors (Hamamatsu S12572-33-015P). The effects of radiation damage in SiPMs from gamma rays has been measured and compared with the damage produced by neutrons. We designed and constructed an automated SiPM testing device that measures the breakdown voltage and gain curve with the IV scan and SPS (single photon spectrum) method. It is used to characterize the SiPMs for the sPHENIX calorimeters and prepare a database for SiPM sorting. We will report on the first few months of operational experience, including precision, stability and reproducibility of the measurements, consistency with the available factory data, and the projected effect of the SiPMs on the overall calorimeter performance in sPHENIX.

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