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A Silicon Photomultiplier (SiPM) Based Readout for the sPHENIX Upgrade

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Conceived and constructed over a decade ago, the PHENIX detector was designed to discover the Quark-Gluon Plasma (QGP). Following on this discovery, the PHENIX collaboration has embarked on a number of upgrades to study the QGP properties in detail, with the next step being a significant overhaul of the PHENIX detector called sPHENIX. sPHENIX includes upgrading the central detector with a compact solenoid, electromagnetic and hadronic calorimetry to study jets produced in p+p, p+A, and A+A collisions at RHIC. The location of the calorimetry in vicinity of the solenoid requires an optical readout that is compact and immune to magnetic fields. For this reason, the sPHENIX calorimetry will use a Silicon Photomultiplier (SiPM) based readout system for both the electromagnetic and hadronic calorimeters. In this presentation, we present the current design status and performance of the prototype analog readout for the sPHENIX calorimetry based on SiPMs.

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