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Calibration of SiPM-based neutron detectors as a part of Bonner spectrometer

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Development of a distributed system of the neutron detectors is required to estimate the neutron spectra in the CMS experimental cavern. The proposed neutron detector is based on the ^6Li -enriched scintillator coupled to SiPM. During LHC Run 2, several detector samples were successfully commissioned at the CERN laboratory and tested in CMS environment with the set of Bonner spheres. To rescale collected data to the absolute value of the neutron flux the same SiPM-based detector samples with the set of Bonner spheres were calibrated at the CERN Radiation Protection calibration facility using Am-Be source. Afterwards, detector readings measured in the CMS radiation field can be deconvoluted to the neutron spectrum by means of the unfolding procedure.

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