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Studies of the temperature dependence of SiPMT of MINERvA Test Beam detector

To study the temperature effect in the gain of the SiPMTs two “thermometers” were used. One was placed near the Test Beam Detector, and used as a first approximation assuming the Test Beam Detector was in thermal equilibrium. The other one is a chip built-in the PMT so that can tell the temperature at all times, and it showed a more realistic distribution of temperatures throughout the time the data was taken.

Finally, plots of Gain vs Temperature are shown and, indeed, tell the temperature effect over the data that was considered in this work. We observed, and measured, that the temperature increase effect causes a decrease of less than 1% in gain of the data analyzed. Nevertheless, in high-accurate measurements this effect should not be neglected if one pursues to get as close as possible to that number that nature tries to hide.

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