Detection of Cosmic Muons using Kamiokannen – Air Shower

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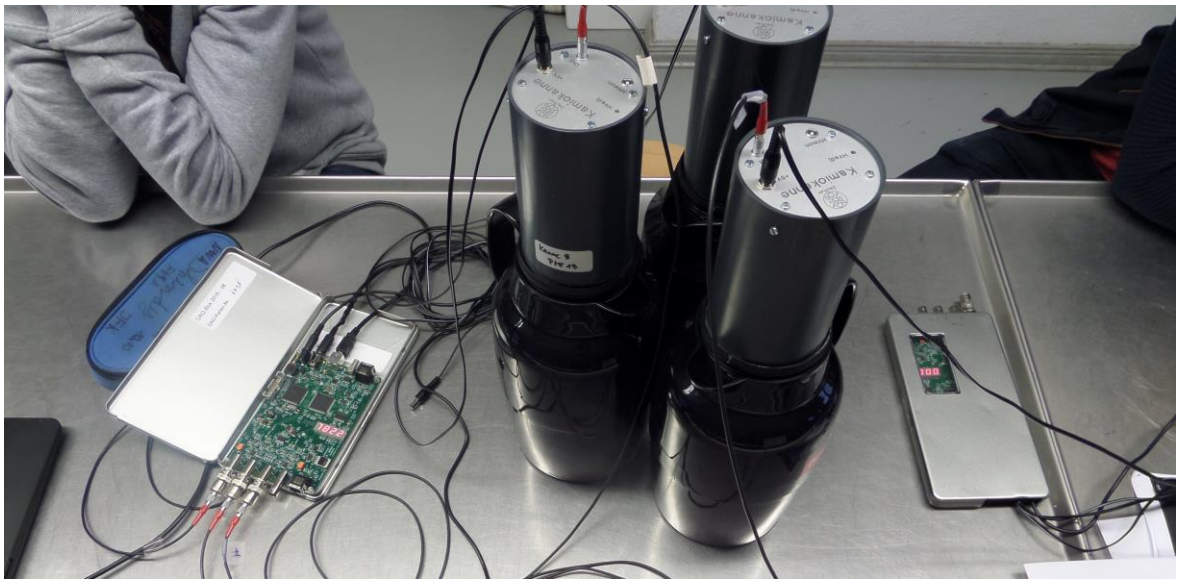
Materials and Methods

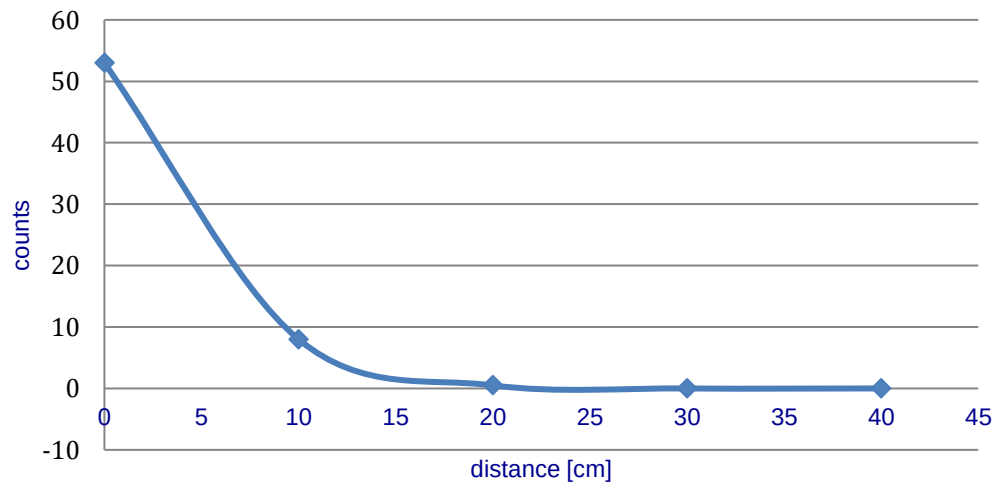
PC + Muonic software, 1 DAQ card, 2 or 3 or 4 muon detectors ("Kamiokannen"), 1 or 2 power adapters (2 x 5 V) and 1 or 2 splitters, 2 Lemo-BNC cables; destilled water.



Either 2 or 4 detectors were filled with distilled water and then covered with a black blanket to protect the detectors from direct light exposure. Detectors were calibrated to rates of approximately 2,00 s^{-1} and placed at different distances (0 to 100 cm) relative to each other. Varying thresholds were set and frequencies of coinciding events were measured. At optimum thresholds for each detector, measuring time was 20 min.

Results and Discussion

Fig. 1. Air shower - coincidence as a function of distance



Muon detection with Kamiokannen is lower than with CosMO detectors when using distilled water to fill the cans. It was clearly lower when the thermos jug contained no liquid (air) (data not shown). Events resulting from air showers resulted in a continuous decrease of measured counts. Subsequent measurements using 3 Kamiokannen resulted in more than fourfold higher rates at the lowest possible distance. Taken the measurements in different stories of the building revealed a continuous decrease of counts by 30% from the 2nd floor to the basement.