

## THE POSSIBLE USE OF HIGH ALTITUDE LAKES AS SOLAR NEUTRON DETECTORS

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It appears possible to exploit high altitude lakes as very large solar neutron detectors. In fact, a ground level enhancement associated with the solar flare of 6 November 1997 using Milagrito which is sensitive to muons as a result of their Cherenkov signals. The energy range of interest for solar neutrons is only 100-1000 MeV and produced protons via nuclear interactions between solar neutrons and water atoms (hydrogen and oxygen) cannot emit the Cherenkov light. It is necessary instead to install  $^3\text{He}$  counters in the lake in order to detect such low energy neutrons. We have investigated this concept by installing a  $^3\text{He}$  counter in the water tank at Mt. Norikura (2,770m) and taking data for a year. We have also investigated the possibility of exploiting the lake as a detector using GEANT. However we found that the neutrons were not spread widely (less than  $\pm 20$  cm) as initially expected and the detection efficiency was no better than that which we would be achieved with a traditional Simpson-type neutron monitor.