processes. In particular one can conclude the flux of B^8 neutrinos from the sun is less than or equal to 2×10^6 cm^{-2} sec^{-1}. Also, if the CNO cycle is dominant in the sun, the flux-cross section product is 35×10^{-36} sec^{-1}. This value[5] is determined by knowing the fraction of the energy radiated as neutrinos in the CNO cycle, the solar constant, and the cross section for neutrinos from N^{13} and O^{15}. One may then conclude from the experimental limit, that less than 9 percent of the sun's energy is produced by the CNO cycle. This conclusion is in agreement with current solar model calculations. For example, the fluxes given in Table I would infer that 0.7 percent of the sun's energy is produced by the CNO cycle.

The limit on the neutrino capture rate in Cl^{37} may also be used to set limits on the total extra-terrestrial electron neutrino flux. This is of interest for various cosmological considerations.[12] Table III summarizes the limits on the flux for neutrinos of energy 1, 5, 10, and 100 MeV energy, and the corresponding limits on the energy density of neutrino radiation. The limits are not very low at low energy, but at 100 MeV the energy density is approaching the range of that observed for total cosmic radiation, that is 1 eV cm^{-3}. Above a few hundred MeV the cross section will be affected by nucleon loss from the resulting Ar^{37} nucleus, and therefore the cross section is not well known.

Improvements in Sensitivity

The apparatus as described here was designed to measure a solar neutrino capture rate of 30×10^{-36} sec^{-1} Cl^{37} $atom^{-1}$, or in the event that the solar neutrino flux is lower than expected the apparatus would be sufficiently sensitive to be able to search a factor of ten below this rate. These initial aims have been achieved, and one may now ask whether the sensitivity of the apparatus can be increased. From the foregoing discussion