Simulation Studies of the Helium and Lead Observatory (HALO)
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HALO/SNOLAB COLLABORATION[1] — Simulation studies for were conducted
for the Helium and Lead Observatory (HALO), the supernova neutrino detector
at SNOLAB, Sudbury, Ontario. HALO consists of 79 tons of lead, with 128 ^{3}He
counters which detect the scattered lead neutrons resulting from incoming neutrinos.
Improvements were made to the Geant4 Monte Carlo simulation's geometry by the
addition of water boxes and plastic baseboards, which serve to reflect scattered
neutrons back towards counters, and shield against outside neutrons and gammas.
Several box designs were created, and the resulting event detection efficiencies and
labeling of 1n and 2n events were studied. It was found that these additions cause
a 2% efficiency increase, a slight improvement of correctly labeled events, and are a
significant improvement to the HALO simulation.

[1]http://www.snolab.ca/halo/index.html

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