# *hep* solar neutrinos



Solar Neutrino Spectrum ($\pm 1\sigma$)



- From the *pp* chain:

$$^3\text{He} + p^+ \rightarrow {}^4\text{He} + e^+ + \nu_e$$
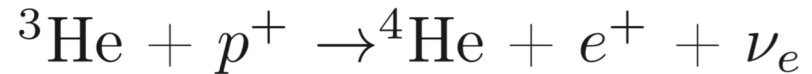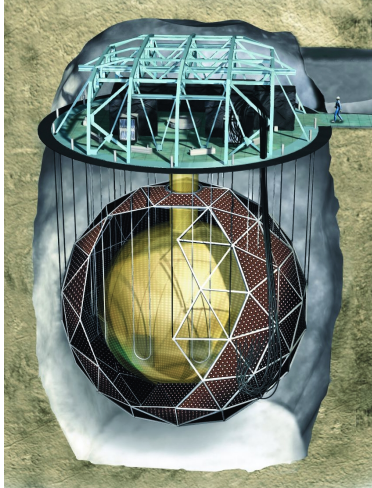
- No current observation:

$$\langle \Phi_{\text{hep}}^{\text{th}} \rangle = 7.93(1 \pm 0.155) \times 10^3 \ \text{cm}^{-2}\text{s}^{-1}$$

- Best current limit from 2006:

SNO Phase I Upper Limit (90% CL):
$$\langle \Phi_{\text{hep}}^{\text{full}} \rangle < 2.47 \times \Phi_{\text{hep}}^{\text{th}}$$
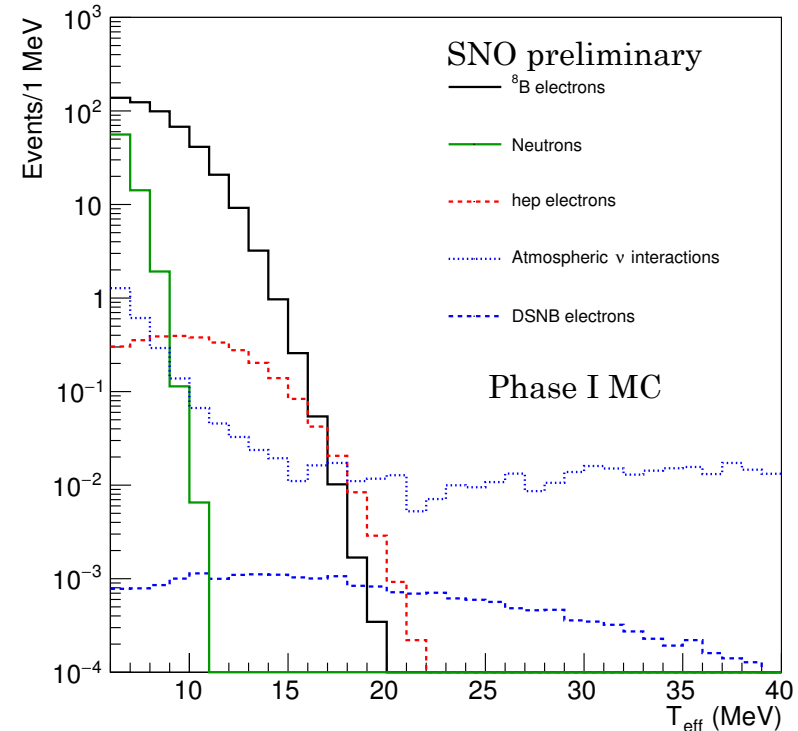
**Detector**:

- 1 kton $D_2O$
- 1170.3 days (~4x 2006)



**Analyses in development**:

- Counting analysis
  - 90% CL Predicted Sensitivity

$$\langle \Phi_{hep}^{full} \rangle < 2.39 \times \Phi_{hep}^{th}$$

- Markov Chain Monte Carlo analysis

**Major Improvements**:

- Atmospheric ν modeled by GENIE MC
- Improved reconstruction