Contribution ID: **176** Type: **Poster supernova**

HALO-1kT –Helium And Lead Observatory for Supernova Neutrinos with High Sensitivity to ν_e.

Neutrinos from a CC supernova will shed light on astro- and particle physics processes that leave different signatures on the ν / $\bar{\nu}$ fluences. Existing detectors are most sensitive to $\bar{\nu}_e$, so a lead-based detector with high ν_e sensitivity would improve the characterization of the neutrino emission.

HALO-1kT, will be located at LNGS, and use 1kt of lead, instrumented with ^{3}He neutron counters. $^{208}Pb(\nu_e, e^-)^{208}Bi^*$ reactions emit one or two neutrons that thermalize and are captured by ^{3}He. The ratio of 1n to 2n events is sensitive to the neutrino temperature and spectrum. Comparing the HALO-1kT signal with a $\bar{\nu}_e$ detector signal may resolve the neutrino mass hierarchy. HALO-1kT will participate in SNEWS.

HALO-1kT is in design and development. Activities include simulations for optimizing the geometry, development of low background neutron counters and modeling of the physics signal. A final design is expected by the end of 2018.

Authorship annotation

for the HALO-1kT collaboration.

Session and Location

Wednesday Session, Poster Wall #5 (Robert-Schumann-Room)

Poster included in proceedings:

yes

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Track Classification: Poster (not participating in poster prize competition)