Abstract Submitted
for the APR06 Meeting of
The American Physical Society

A Search For Two-Neutrino Double-Beta Decay of ^{130}Te To The First Excited 0^+ State in ^{130}Xe With The CUORICINO Detector[1] IULIAN BANDAC[2], University of South Carolina, CUORICINO COLLABORATION — We will discuss the results of an experimental search for two-neutrino $\beta\beta$ decay of ^{130}Te to the first excited 0^+ state in ^{130}Xe using the data from the CUORICINO detector. The CUORICINO array consists of 44 cubic crystals of TeO_2 $5\times5\times5$ cm^3 of natural concentration 33.8% and 18 crystals $3 \times 3 \times 6$ cm^3 four of them being isotopically enriched, two in ^{130}Te and the other two in ^{128}Te. The detector is operated in the Gran Sasso Underground Laboratory in Assergi, Italy at a depth of about 3500 m.w.e. We are considering different scenarios by searching for coincidences between different neighboring detectors. First we look for all events that are between the threshold and the maximum energy for the two emitted electrons 739.5 keV and for which there is one or more coincidences. Then among these select those for which their energy summed to 1793.5 ± 100 keV. These will include all events in which both gamma rays completely escape from the detector. Then we demand a triple coincidence leading to a background almost zero. In this way we can put a best bound on, or measure the half life.

[1]NSF Grants Phy-0139294 and Phy-0500337
[2]CUORICINO Collaboration

Frank Avignone
University of South Carolina

Date submitted: 13 Jan 2006 Electronic form version 1.4