Measurements of the Electron Neutrino Mass\textsuperscript{1}

NICHOLAS POMATA, State Univ of NY- Stony Brook — The electron neutrino mass is a difficult and somewhat misleading quantity to ascertain. I will start by discussing the theory of leptonic mixing, which confounds the attempt to ascribe a mass to what is usually called the electron neutrino. This will lead naturally into a brief discussion of leptonic mixing, which has produced some of the most specific results concerning the mass eigenvalues of neutrinos, from KamLAND and MINOS. I will discuss these along some of the difficulties inherent in a direct measurement of neutrino masses. From there I will describe the concept of the Majorana mass, a revision to the Dirac masses inherited from ordinary standard-model Higgs coupling introduced to try to fix some of the peculiarities of neutrinos. Because a Majorana neutrino is its own antiparticle, its presence would allow the two neutrinos produced in a double-beta-decay event to annihilate with amplitude proportional to the neutrino mass, producing a distinctive signature that would simultaneously imply the existence of Majorana neutrinos and determine their mass. Thus far efforts to validate this process have been variously discredited or fruitless. I will compare these results to oscillation results above and to various cosmological results.

\textsuperscript{1}Expert: Robert Shrock


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