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Experimental tests for the fundamental properties of the electron with COSINE-100

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The electron decay and its Pauli exclusion principle (PEP), being the basis of the quantum mechanics, have not been proved experimentally. Using the energy spectra of NaI(Tl) crystals in COSINE-100, the electron stability and the PEP violation process have been searched. We fit for X-ray signals in iodine that are emitted when the K- or L-shell electron decays into three neutrinos for the electron stability. For the PEP violation, we search for X-ray signals when an L-shell electron transitions to the already-filled K-shell. Sensitivities of year for the electron lifetime and year for the PEPV lifetime have been obtained.
The preliminary fits using COSINE-100 data of 38.62 kgyear for the electron lifetime and 44.77 kgyear for the PEP violation will be presented in this poster.

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