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Nuclear Structure, Double-Beta Decay, and Physics Beyond the Standard Model

Neutrinoless double-beta decay, if observed, would signal physics beyond the Standard Model that could be discovered at energies significantly lower than those at which the relevant degrees of freedom could be excited. Therefore, it might be difficult to further use the neutrinoless double-beta decay observations to distinguish between many beyond Standard Model competing mechanisms to this process [1]. Accurate nuclear structure calculation of the nuclear matrix elements (NME) necessary to analyze the decay rates could be helpful to narrow down the list of competing mechanisms, and to better identify the more exotic properties of the neutrinos. In my talk I will analyze the status of the NME shell model calculations [2-8], and their relevance to the discrimination of the possible competing mechanisms to the neutrinoless double-beta decay process.

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Primary author: Prof. HOROI, Mihai (Central Michigan University)

Presenter: Prof. HOROI, Mihai (Central Michigan University)

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