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## Direct double beta-decay Q-value measurements at LEBIT

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Experimental searches for the neutrinoless double- $\beta$  ( $0\nu\beta\beta$ ) decay [1] have become of great interest after the confirmation of nonzero neutrino mass by neutrino oscillation experiments. This process is forbidden in the Standard Model and proposed to only occur if the neutrino is its own antiparticle. An observation of  $0\nu\beta\beta$ -decay would enable one to determine the absolute neutrino mass scale. The Q-value of the decay, which is defined as the difference between the masses of parent and daughter atoms, is an important parameter that enters into the equation.

The Low Energy Beam and Ion Trap (LEBIT) facility [2] at the National Superconducting Cyclotron Laboratory (NSCL) utilizes Penning trap mass spectrometry (PTMS) which has proven to be a powerful technique for performing high precision atomic mass measurement. We have recently performed precise Q-value measurements on some stable  $0\nu\beta\beta$ -decay candidates produced by the laser ablation source and the plasma ion source of the LEBIT facility. Our recent double beta-decay Q-value measurements of 48-Ca [3,4], 96-Zr [5], 82-Se [6] isotopes, and the neutrinoless double electron capture candidate 78-Se [7] and their contribution to direct decay searches will be presented.

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[3] M. Redshaw, G. Bollen, M. Brodeur, S. Bustabad, D. L. Lincoln, S. J. Novario, R. Ringle, S. Schwarz, *Phys. Rev. C* 86 (2012) 041306.

[4] S. Bustabad, G. Bollen, M. Brodeur, D. L. Lincoln, S. J. Novario, M. Redshaw, R. Ringle, S. Schwarz, A. A. Valverde, *Phys. Rev. C* 88 (2013) 022501.

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[7] S. Bustabad, G. Bollen, D. L. Lincoln, S. J. Novario, M. Redshaw, R. Ringle, S. Schwarz, *Phys. Rev. C* 88 (2013) 035502.

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