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(G*) Nuclear 2γ decay of ^{98}Mo and ^{98}Zr at the TITAN-EBIT

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Nuclear 2γ decay is a second-order electromagnetic interaction wherein two photons are simultaneously emitted during a nuclear de-excitation. This transition is uniquely sensitive to the electromagnetic polarizability of the nucleus and has been studied in non-competitive cases for $0_2^+ \longrightarrow 0_1^+$ transitions between the first excited and ground states of even-even nuclei. So far, observations of the non-competitive case have been limited to the closed-shell nuclei ^{16}O, ^{40}Ca, and ^{90}Zr. An important constraint to nuclear structure theories can be provided through experimental observations of 2γ transitions in nuclei that exist away from shell closures. However, such cases have eluded further experimental observation, among other reasons, because of a strongly competing internal conversion (IC) branch. We propose to use the TITAN Electron Beam Ion Trap (EBIT) at TRIUMF to selectively block the IC branch by stripping the atom of all electrons which will allow the observation of 2γ transitions in ^{98}Mo and ^{98}Zr. The experimental concept, status of development, and simulated results will be reported.

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