Abstract Submitted
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Towards the determination of nuclear matrix elements for $2\nu\beta\beta$ decays at TRIUMF's TITAN facility[1] THOMAS BRUNNER, TRIUMF, Vancouver, Canada, TUM, Munich, Germany, MAXIME BRODEUR, STEPHAN ETTENAUER, ALAIN LAPIERRE, RYAN RINGLE, JENS DILLING, TRIUMF, Vancouver, Canada, TITAN COLLABORATION — To unveil the neutrino's mystery, sensitive experiments in underground laboratories are presently searching for $0\nu\beta\beta$ decay. If this decay was observed, the effective neutrino mass could be derived from its half-life and a complex nuclear matrix element. This later is entirely based on theoretical calculations with guidance from $2\nu\beta\beta$-decay matrix elements deduced from experimental data. Unfortunately, such elements often disagree from those of single β-decays. Measuring electron capture branching ratios (EC-BR) of odd-odd intermediate transition nuclei in $\beta\beta$-decays represents an independent approach to determine $2\nu\beta\beta$ matrix elements. A new technique for measuring these EC-BRs is being developed at the TRIUMF's Ion Trap system for Atomic and Nuclear physics (TITAN), using at the heart of the experiment an open access Penning ion trap. I will present this new method and the results of a proof-of-principle experiment carried out recently with In^{107} which shows its feasibility.

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