MAYORANA School II edition



ALPACA analysis chain in MONUMENT



OMC for $0\nu\beta\beta$ -decay NMEs

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Elizabeth Mondragón on behalf of the MONUMENT Collaboration

June 23rd 2025



Technical University of Munich





 $0\nu\beta\beta$ decay

- Beyond the SM physics
- Majorana nature of neutrinos^[1]



[2] M. Kortelainen and J. Suhonen, Ordinary muon capture as a probe of virtual transitions of double-beta decay, EPL, vol. 58, pp. 666–672, (2002).
[3] M. Kortelainen and J. Suhonen, Nuclear muon capture as a powerful probe of double-beta decays in light nuclei, J. Phys. G, vol. 30, no. 12, p. 2003, (2004).

$0\nu\beta\beta$ decay



- Beyond the SM physics
- Majorana nature of neutrinos^[1]



Ordinary Muon Capture ^[2,3]



- Similar momentum transfer
- Probe intermediate states
- Benchmark nuclear matrix element calculations

[4] M. Schwarz, Tracing impurities and illuminating their impact, Ph.D. Thesis, Technical University of Munich, (2024)

DAQ



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[4] M. Schwarz, Tracing impurities and illuminating their impact, Ph.D. Thesis, Technical University of Munich, (2024) [5] Agostini, M. and Pandola, L. and Zavarise, P. and Volynets, O., GELATIO: A General framework for modular digital analysis of high-purity Ge detector signals, JINST, vol. 6, P08013, (2011)

ALPACA^[4]



Full waveform digitisation, low and high frequency windows

- Offline analysis, takes longer...
- >150 TB data
- Analysis routines **based** on GERDA^[5]



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Thanks!

