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Mid-circuit partial measurement on Yb171 using the OMG architecture

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Error correction is an important ingredient for achieving scalable and fault-tolerant quantum computing in the long term. Despite the recent experimental advances in error correction, however, mid-circuit partial measurement and reset of the physical qubit remains one of the main technical challenges on atomic platforms.

The existing approaches for achieving mid-circuit partial measurement and reset on trapped ion platforms mainly relies on the shuttling of the ions to avoid destroying the quantum information during the dissipative process, which are slow and could take up a significant portional of the runtime and causes the ion to heat up during shuttling. Here we present our recent progress on the implementation of mid-circuit measurement methods based on the optical-metastable-ground (OMG) architecture using the metastable states in Yb-171 ions.

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☐ This is an invited talk.
☒ This is a poster.