

Abstract Submitted
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High fidelity readout of a single electron spin ANNA KESELMAN, YINNON GLICKMAN, NITZAN AKERMAN, SHLOMI KOTLER, YEHONATAN DALLAL, ROEE OZERI — We use the two spin states of the valence electron of a single trapped $^{88}\text{Sr}^+$ ion as a physical qubit implementation. For qubit readout one of the qubit states is shelved to a metastable D level using a narrow linewidth 674nm diode laser followed by state-selective fluorescence detection. Careful analysis of the resulting photon detection statistics allows for a minimal detection error of $2 \cdot 10^{-3}$, compatible with recent estimates of the fault-tolerance required error threshold.

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