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**Enhanced light collection from trapped ions** J.D. STERK, T.A. MANNING, L. LUO, P. MAUNZ, S. OLMSCHENK, D. HAYES, D. MATSUKEVICH, C. MONROE — We present progress towards an ion trapping system capable of enhanced light collection based on nearby reflective optics [1–3]. This may not only boost the fidelity and speed of trapped ion qubit measurement, but may also greatly improve probabilistic entangling schemes relying on the collection and interference of single photons [4]. Two proposed schemes will be realized by placing a trapped  $\text{Yb}^+$  ion either at the focus of a 5 mm spherical mirror or inside a one-sided optical cavity ( $\mathcal{F} \approx 4500$ ). Both experiments will utilize a double-endcap ion trap whereby the ion–electrode spacing can be varied *in situ* [5]. Additionally, we discuss several methods of generating entanglement within the context of the collection schemes.

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