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Entanglement of neutral atoms using Rydberg blockade[1] XIANLI ZHANG, LARRY ISENHOWER, ALEX GILL, THAD WALKER, MARK SAFFMAN, University of Wisconsin — We report measurements of entanglement of two Rb atoms achieved with a Rydberg blockade mediated quantum gate. The entanglement fidelity is compared for two different gate protocols: one based on a Hadamard-C_Z-Hadamard sequence, and the other using a controlled amplitude swap operation. Entanglement fidelity $F > 0.5$ is achieved after correction for atom loss during the gate operation. Progress towards deterministic entanglement, without correction for atom loss, will be presented.

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