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Entanglement dynamics of capacitively coupled spin qubits in the presence of stray inductance MICHAEL WOLFE, SHAWNA CHISHOLM, JASON KESTNER, University of Maryland, Baltimore County — A pair of spin qubits formed by electrons confined in a pair of double quantum dots can be entangled at distances on the order of microns via a floating metallic top gate that mediates capacitive coupling [1]. The double-well biases, and hence the coupling through the top gate, can be controlled through voltage leads connected to an arbitrary waveform generator. We theoretically examine how the entanglement dynamics of the system are affected by inductance of the coupling element when the biases are driven at high frequencies. We numerically simulate the von Neumann entropy of the reduced density matrix as a function of time in various parameter regimes. In particular, we examine the behavior when the qubits are driven near the resonance frequency of the coupling element.

[1] L. Trifunovic et al., Phys. Rev. X 2, 011006 (2012).

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