

# A hole-spin qubit

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I will discuss our recent theoretical work on hole-spin qubits in gated Si quantum dots. I will focus on the differences between the results calculated with the standard lowest-order model, known as the Luttinger model, and its extension by the next-order terms in the k-dot-p expansion. In other words, I will discuss the adequacy of using the Luttinger model to analyze spin-related properties of holes confined in semiconducting quantum dots.

I will also advertise that the data in the review of gated spin qubits [2] can be accessed online.

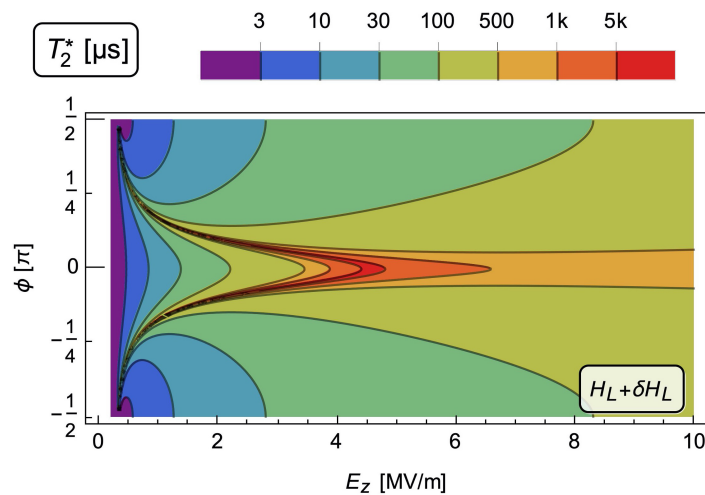


Figure: Inhomogeneous dephasing time of a gated p-Si quantum dot as a function of the magnetic field orientation and vertical electric field of a triangular heterostructure confinement [1].

- [1] O. Malkoc, P. Stano, D. Loss, *Charge-noise induced dephasing in Silicon hole-spin qubits*, arxiv:2202.06181
- [2] P. Stano, D. Loss, *Review of performance metrics of spin qubits in gated semiconducting nanostructures*, Nat. Rev. Phys. (2022); see also <https://github.com/PeterStano/ReviewOfSpinQubits>