

NV-Center in Diamond as a Qubit Platform

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1 Criteria for Qubit Platforms

Divicenzio's criteria

Universality of gates (Paulis and CNOT).

2 NV-Center in Diamond

Most likely referring to (-) NV-Center without detailed reference (this is the most researched).

2.1 Spin States

Center's spin state can be in singlet or triplet state.

3 NV-Center as a Qubit Platform

3.1 Gates/Control

Light pulses

4 Current State of Experiment (2023)

Recently, 10-qubit control was performed using the center's spin state and the surrounding nuclear spins!

Spin-photon entanglement has been demonstrated!

5 Conclusion & Outlook

6 Resources/Literature Review

For a good introduction and (somewhat outdated) overview of the experimental progress in the technique, see [1].

For an in-depth analysis of all defect systems in diamond, see this thesis

References

- [1] Lilian Childress and Ronald Hanson. Diamond nv centers for quantum computing and quantum networks. *MRS bulletin*, 38(2):134–138, 2013.