Theoretisches Kolloquium

Universität Konstanz

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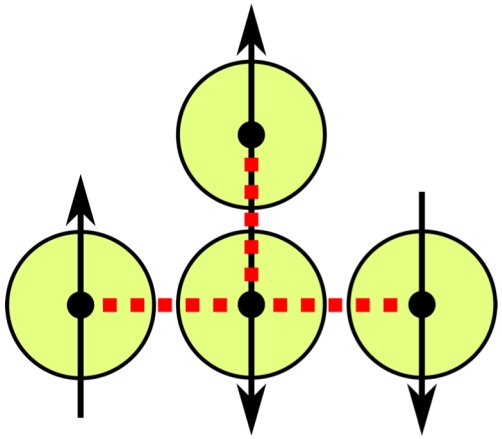

Decoherence-free singlet-only spin qubits

I will start this talk with a brief overview of the development of the quantum-dot-based spin qubit over the past two decades. I will highlight the main remaining challenges for creating reliable and scalable spin qubits, one of which is the magnetic noise caused by fluctuating nuclear spins, present in many popular host materials. I will then present an intrinsic solution to this problem: the four-electron singlet-only qubit, which lives in a so-called decoherence-free subspace. I will explain how an adapted version of such a qubit can conveniently be implemented in existing qubit designs, possibly yielding a significant improvement in the coherence time for certain types of spin qubits.