

Coupling color centers into macroscopic quantum systems with an atomic nano-assembler (extension)

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch

Fortsetzungsanträge)

Bewilligung: 02.12.2013

Laufzeit: 3 Jahre

In the previous funding period the team has proved that an atomic nano-assembler can be realized and is capable of loading nitrogen atoms, delivering single ions deterministically with nanometer resolution. The consortium has proved that nitrogen vacancy color centers can be efficiently generated, coupled and read out with nano meter resolution on the quantum level. In this funding period it is planned to consequently combine the techniques for the first realization of a scalable quantum simulation and computation architecture realized with solid state systems. The atomic nano-assembler will be modified to realize real-time detection of generated spinspin interaction. This will enable spin bath design on the single particle level. Furthermore, it is planned to integrate implanted defects into control- as well as readout periphery such that a solid state spin quantum simulator with tailored solid state devices can be realized on a single diamond crystal. Extended by additional control electrodes, the device will be the perfect platform for the realization of a scalable architecture for solid state quantum information processing.

Projektbeteiligte

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