
pulses must be constant throughout this process, any phase difference is cancelled out over the course of the write-read process. In practice, this means that the microwave and radio-frequency sources need not be phase locked, but must have high phase stability. This is illustrated in calculations following the evolution of the density matrix, provided in the Supplementary Information.

Although the electron-spin qubit can be prepared in a state of high purity using experimentally accessible magnetic fields and temperatures, the small nuclear Zeeman energy results in the nuclear spin being initially in a highly mixed thermal state. However, for the purposes of this quantum memory scheme it is not necessary to perform any pre-cooling of the nuclear-spin resource.

This model is sufficient given a single electron-nuclear spin pair or a homogenous ensemble. However, in the experiment described here we must consider the effects of inhomogeneous broadening across

the radio-frequency refocusing pulse. The centre of the radio fre-

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