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Title:THz-waves channeling in a monolithic saddle-coil for Dynamic Nuclear Polarization enhanced NMR
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Abstract:A saddle coil manufactured by electric discharge machining (EDM) from a solid piece of copper has recently been realized at EPFL for Dynamic Nuclear Polarization enhanced Nuclear Magnetic Resonance experiments (DNP-NMR) at 9.4 T. The corresponding electromagnetic behavior of radio-frequency (400 MHz) and THz (263 GHz) waves were studied by numerical simulation in various measurement configurations. Moreover, we present an experimental method by which the results of the THz-wave numerical modeling are validated. On the basis of the good agreement between numerical and experimental results, we conducted by numerical simulation a systematic analysis on the influence of the coil geometry and of the sample properties on the THz-wave field, which is crucial in view of the optimization of DNP-NMR in solids.
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