Tunable 13C/1H dual channel matching circuit for dynamic nuclear polarization system with cross-polarization

In this paper we report initial results of design and practical implementation of tuning and matching circuit to estimate a performance of Dynamic Nuclear Polarization (DNP) at a magnetic field of 6.7 T. It is shown that developed circuit for signal observation is compact, easy to make and provides low return loss (typically better than −45 dB) at a tuning range ±3 MHz for both resonant frequencies. In addition, transmission parameters measured between 13C and 1H channels are less than −17 dB and −50 dB for 71.8 MHz and 285.5 MHz, respectively showing a good isolation between the two channels. Measurement results with a tuning and matching circuit prototype are presented including obtained spectra (13C and 1H) and estimation of the signal-to-noise ratio.