EASY-GOING ON-SPECTROMETER OPTIMISATION OF PHASE MODULATED HOMONUCLEAR DECOUPLING SEQUENCES IN SOLID-STATE NMR


A global optimisation scheme for phase modulated proton homonuclear decoupling sequences in solid-state NMR is presented. Phase modulations, parameterised by DUMBO Fourier coefficients, were optimized using a Covariance Matrix Adaptation Evolution Strategies algorithm


Our method, denoted EASY-GOING homonuclear decoupling, starts with featureless spectra and optimises proton-proton decoupling, during either proton or carbon signal detection. On the one hand, our solutions closely resemble (e)DUMBO for moderate sample spinning frequencies and medium radio-frequency (rf) field strengths. On the other hand, the EASY-GOING approach resulted in a superior solution, achieving significantly better resolved proton spectra at very high 680 kHz rf field strength.