Supplementary Material:
^{14}N Overtone NMR Spectra under Magic Angle Spinning Experiments and Numerically Exact Simulations

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S1. Dependence of the ^{14}N overtone NMR signal on sample spinning frequency

The simulations in Figure S1 illustrate the dependence of the ^{14}N overtone NMR signal on the magic-angle-spinning frequency ω_r calculated for a powdered sample of glycine. All simulations were done employing an rf pulse of 0.1 μs duration with $\omega_{rf}^{^{14}\mathrm{N}}/2\pi = 161.5$ kHz. Figure S1a shows the simulated static spectrum and overtone sideband patterns. The positions of the centerband, +1 and +2 overtone sidebands are indicated by visual guides. Figure S1b depicts the center-of-mass frequency Ω_{CM} of the static powder pattern and +2 overtone sidebands as a function of the MAS frequency ω_r. The fitted value for the slope of the straight line is given by 2.

S2. Width of ^{14}N overtone MAS +2 sideband powder lineshape

Figure S2 depicts the width Δ of the simulated ^{14}N overtone MAS +2 sideband powder lineshape for $\eta_{\mathrm{Q}} = 0.0$ as a function of $\omega_{\mathrm{Q}}^2/(2\pi\omega_0)$. All simulations were done employing an rf pulse of 0.2 μs duration with $\omega_{rf}^{^{14}\mathrm{N}}/2\pi = 161.5$ kHz. The results can be fitted to a straight line with slope 42.3.

Figue S1.

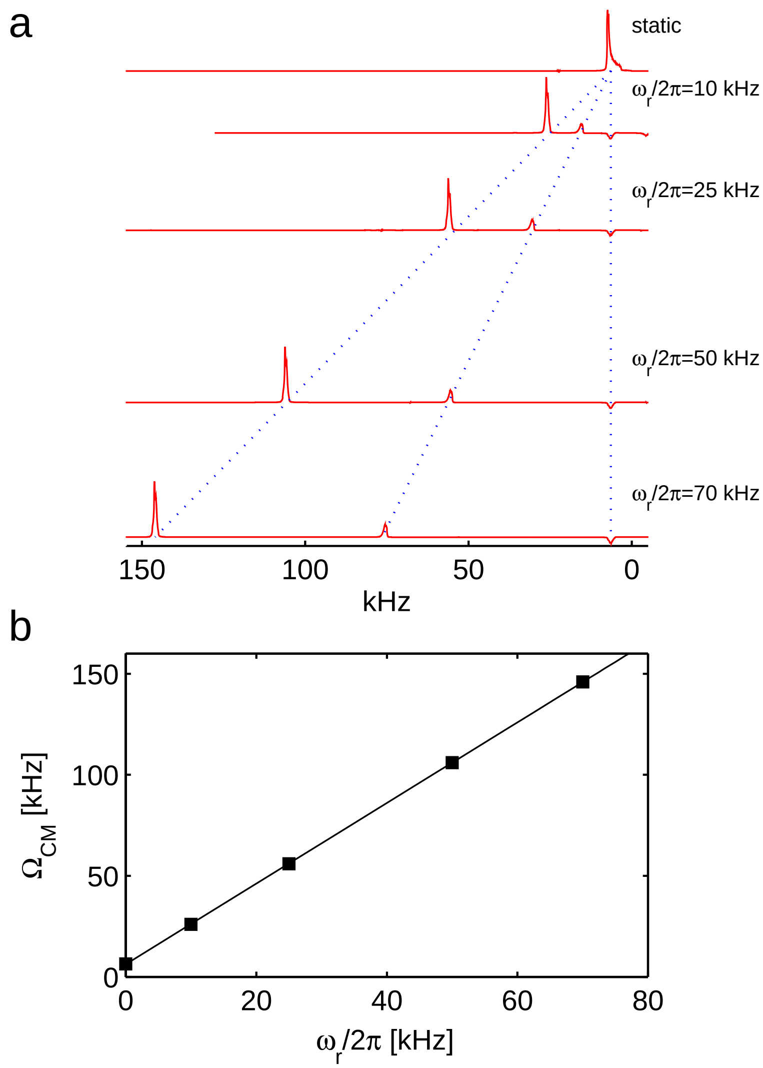

Figure S2.