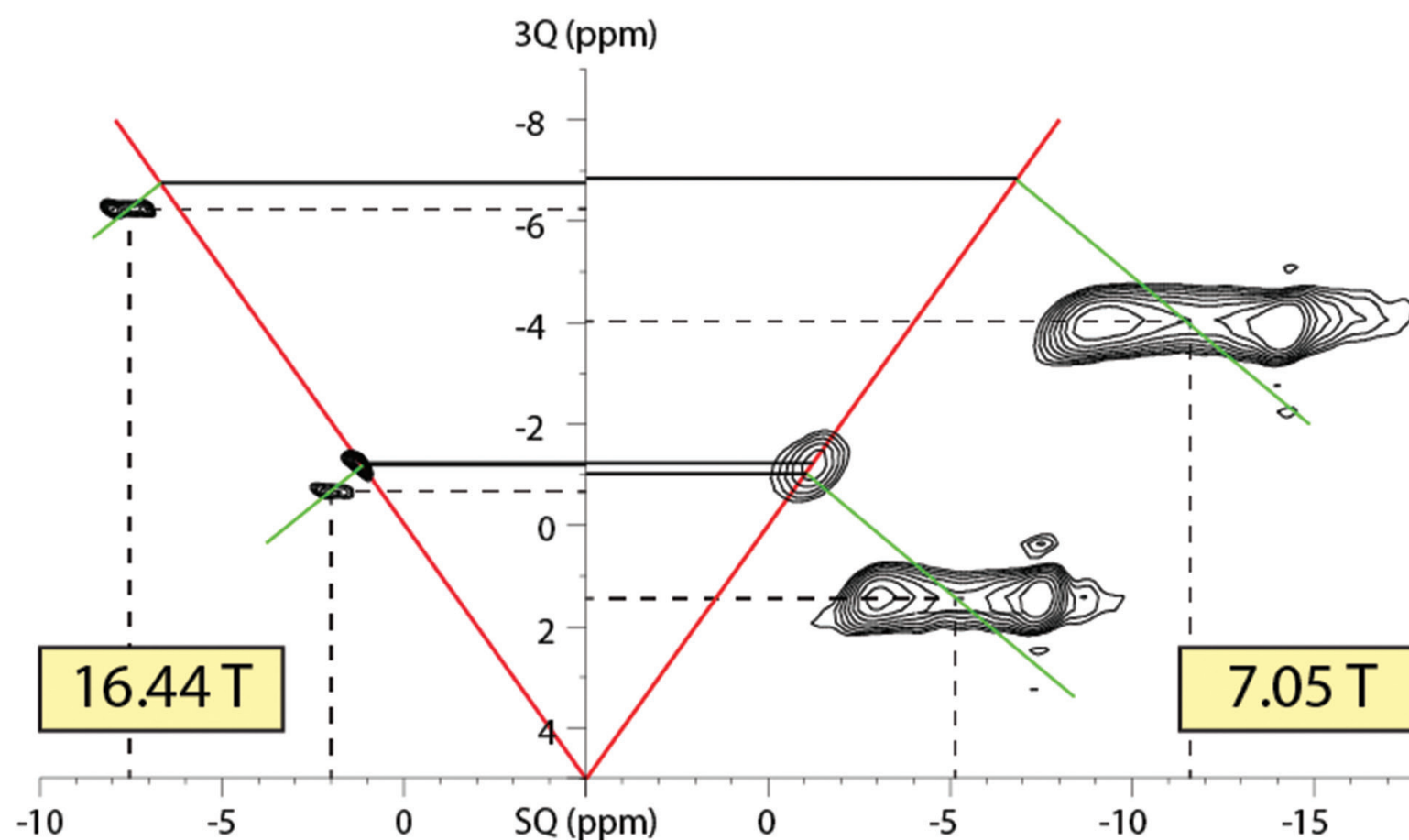




^{23}Na : anhydrous Na_2SO_3

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Field strength: 16.44 and 7.05 T

Why is this your favorite spectrum?

These were the first MQMAS spectra I acquired: anhydrous sodium sulfite, acquired using 16.44 and 7.05 T instruments. The two spectra have been mirrored and aligned to demonstrate the effect of field strength on MQMAS spectra, with the figure used in a manual of SSNMR techniques (currently under development). Three crystal sites are clearly resolved, with the two horizontal lozenges showing strong quadrupolar coupling. The mirrored image elegantly demonstrates the effect of increased magnetic field strength on an MQMAS spectrum: the 1Q and (here) 3Q shifts are shifted, but the projections along the isotropic chemical shift axis show that δ_{iso} is (as expected) invariant.

Before starting my PhD in March this year, I was working for the university NMR facility writing a manual of SSNMR. The only problem was, prior to starting this document my experience was purely with solution experiments. The learning curve was certainly impressive. This figure is intended to show how chemical shift information is obtained from MQMAS spectra. Coming to understand this experiment took me quite some time, and preparation is nontrivial: hard pulses are used to excite all possible transitions of the quadrupolar nucleus, and a carefully calibrated soft CT-selective pulse is used to “read out” the coherence for acquisition. To successfully be able to resolve the three sodium crystal sites, along with their isotropic chemical shifts and (not shown here) quadrupolar coupling parameters, was extremely satisfying.