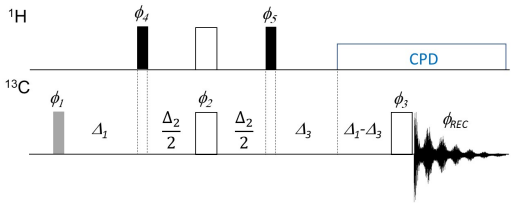
Broadband APT (BAPT): a Versatile APT Experiment with Improved *J*-Compensation and Optimal Suppression of Artifacts in C_q-only Spectra

P. Bigler[1], D. Chakif[1], I. Gjuroski[1], J. Furrer[1]*

[1]University Bern, Department of Chemistry, Biochemistry and Pharmaceutical Sciences

1D ^{13}C-NMR DEPT or APT experiments still belong to the most common experiments for assigning ^{13}C signals and for the elucidation of molecular structures on a routine level. The APT sequence[1] suffers from two main drawbacks, found long ago: (i) a low tolerance for wide ranges of $^1J_{CH}$ values, which in the worst-case cancels signals or produces signals with mistaken multiplicity. (ii) The frequent presence of intense artifacts in the Cq-only spectrum, especially if the range of coupling constants of the investigated molecule is large. Improved APT sequences[2] (Compensated Attached Proton Test, CAPT2 and CAPT3) have been designed by the group of McClung to improve the tolerance with respect to the wide range of $^1J_{CH}$ values. The CAPT3 sequence indeed leads to excellent tolerance over a wide range of one-bond *J* coupling constants.



In this report, we introduce a new APT sequence, the Broadband-APT (BAPT) sequence, which further improves the tolerance of the CAPT sequences to a wide range of $^1J_{CH}$ values and can provide ultra-clean Cq-only spectra, with CH_n artifact levels as low as those obtained using SEMUT, SEMUT-GL and *i*QCD sequences, known to provide the best Cq-only spectra.

[1] S. L. Patt, J. N. Shoolery, *J. Magn. Reson.* **1982**, *46*, 535–539.
[2] A. M. Torres, T. T. Nakashima, R. E. D. Mcclung, *J. Magn. Reson. A* **1993**, *101*, 285–294.