

# Ultra High Resolution NMR: Sustained Induction Decays of Long-Lived Coherences

Aurélien Bornet<sup>1</sup>, Sami Jannin<sup>1</sup>, J. A. (Ton) Konter<sup>2</sup>, Patrick Hautle<sup>2</sup>, Ben van den Brandt<sup>2</sup>, and Geoffrey Bodenhausen<sup>1,3,4,5</sup>

<sup>1</sup>Institut des Sciences et Ingénierie Chimiques, Ecole Polytechnique Fédérale de Lausanne (EPFL), Batochime, 1015 Lausanne, Switzerland | <sup>2</sup>Paul Scherrer Institute, CH-5232 Villigen, Switzerland | <sup>3</sup>Département de Chimie, Ecole Normale Supérieure, 24 rue Lhomond, 75231, Paris Cedex 05, France | <sup>4</sup>Université Pierre-et-Marie Curie, Paris, France | <sup>5</sup>CNRS, UMR 7203, Paris, France

Long-lived coherences (LLC's)[1] in homonuclear pairs of chemically inequivalent spins can be excited and sustained during protracted radio-frequency irradiation periods that alternate with brief windows for signal observation[2]. Fourier transformation of the Sustained Induction Decays (SID's) recorded in a single scan yields NMR spectra with line-widths in the range  $10 < \Delta\nu < 100$  mHz, even in moderately inhomogeneous magnetic fields. The resulting doublets, which are reminiscent of  $J$ -spectra, allow one to determine the sum of scalar and residual dipolar interactions in partly oriented media. The signal intensity can be boosted by several orders of magnitude by 'dissolution' dynamic nuclear polarization (DNP).

## REFERENCES:

1. R. Sarkar, P. Ahuja, P. R. Vasos, and G. Bodenhausen, *Phys. Rev. Lett.* 104, 053001 (2010).
2. A. Bornet, S. Jannin, T. Konter, P. Hautle, B. van den Brandt, and G. Bodenhausen, *submitted manuscript*

