

The **Lab-Tools Mk3 NMR Relaxation Spectrometer** is built around a credit-card sized Field Programmable Gate Array module for the digital RF, with attached custom surface mount low-noise receiver and linear transmitter. The extreme compactness and lightness of this precision research grade NMR relaxation spectrometer make it ideal for use in the field. The prototype has just been certified to international standards BS EN 61 326-1: 2013 & IEC 61326-1:2012.



Far more than just another liquids spectrometer, this device is targeted at samples that may be liquid, waxy, porous, polymer, tar .... , and is also capable of measuring  $T_2s$  and mobilities in brittle ice, for example.

There are many applications in Material Science where measurements of mobility / stiffness / viscosity / rigidity are very useful parameters, providing data on the physical state of the sample, particularly as a function of temperature.

Please see the following two links regarding the NMR Relaxation Spectrometer and a few example test measurements that have been made using it, and also two published papers :

[http://www.lab-tools.com/instrumentation/pdf/Lab-Tools\\_NMR\\_Relaxation\\_Spectrometer-Instrument.pdf](http://www.lab-tools.com/instrumentation/pdf/Lab-Tools_NMR_Relaxation_Spectrometer-Instrument.pdf)

[http://www.lab-tools.com/instrumentation/pdf/Lab-Tools\\_NMR\\_Relaxation\\_Spectrometer-Example\\_Measurements.pdf](http://www.lab-tools.com/instrumentation/pdf/Lab-Tools_NMR_Relaxation_Spectrometer-Example_Measurements.pdf)

References :

1. *Credit-card sized Field and Benchtop NMR Relaxometers using Field Programmable Gate Arrays.* J. Beau W. Webber, Pavel Demin, Magnetic Resonance Imaging Volume 56, February 2019, Pages 45-51, DOI: 10.1016/j.mri.2018.09.018 <https://doi.org/10.1016/j.mri.2018.09.018>
2. *Biological, Medical and Nano Structured materials - NMR done Simply.* J Beau W Webber. Archives in Biomedical Engineering & Biotechnology 1(4): 2019. ABEB.MS.ID.000517 <https://irispublishers.com/abeb/pdf/ABEB.MS.ID.000517.pdf>

Dr. Beau Webber 07805 437 241

<http://www.lab-tools.com/instrumentation/nmr@Lab-Tools.com>

Lab-Tools Ltd. (nano-science), Marlowe Innovation Centre, Marlowe Way, Ramsgate, CT12 6FA, UK  
2019-07-01