

European Network on NMR Relaxometry

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NMR Relaxometry Hardware

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(oral contribution)

Since several decades, the record of dispersion profiles of the relaxation efficiency ($R_1 = 1/T_1$) of the longitudinal magnetization as a function of frequency (Nuclear Magnetic Relaxation Dispersion, NMRD profiles) is used to explore simple or complex fluid dynamics at micro, meso and macro scales [1-3]. In a first step, this presentation will review different types of relaxometer, instruments for recording NMRD profiles. A second step will detail the various constituent components of a relaxometer with a rapidly variable magnetic field cycle (FFC relaxometer) [4-9]. After having exposed the components common to the FFC relaxometer and the more conventional NMR spectrometer, we will analyze the constraints imposed by the generation of a rapidly variable magnetic field whose stability and spatial homogeneity must be compatible with the measurement of the evolution of the longitudinal magnetization at different frequencies. Finally, by describing the experiment on the basis of the three delays defined by the times of polarization, evolution and detection, we will describe some methods implemented to improve the recording of NMRD profiles. This presentation should enable all auditors to participate actively in the European action COST EURELAX.

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