

**MRS 2015 Short Course
Laboratory NMR
Prepared by Kristina Keating
Supplementary Materials**

Table 1: List of References Used in Lecture and other relevant references (pdf's provided)

File Name	Citation
03_Anand2008	Anand & Hirasaki (2008) Paramagnetic relaxation in sandstones: Distinguishing T1 and T2 dependence on surface relaxation, internal gradients and dependence on echo spacing. <i>Journal of Magnetic Resonance</i> , 190(1), 68–85.
04_Behroozmand2015	Behroozmand, Keating, & Auken (2015). A Review of the Principles and Applications of the NMR Technique for Near-Surface Characterization. <i>Surveys in Geophysics</i> , 36(1), 27–85.
05_Brownstein1979	Brownstein & Tarr (1979) Importance of classical diffusion in NMR studies of water in biological cells. <i>Physical Review A</i> , 19(6), 2446–2453.
06_Costabel2007	Costabel & Yaramanci (2013) Estimation of water retention parameters from nuclear magnetic resonance relaxation time distributions. <i>Water Resources Research</i> , 49(4), 2068–2079.
07_Dlugosch2013	Dlugosch, Günther, Müller-Petke, & Yaramanci, (2013) Improved prediction of hydraulic conductivity for coarse-grained, unconsolidated material from nuclear magnetic resonance. <i>Geophysics</i> , 78(4), EN55–EN64.
08_Dunn1999	Dunn, LaTorraca & Bergman (1999) Permeability relation with other petrophysical parameters for periodic porous media. <i>Geophysics</i> , 64, 470.
09_Flaum2004	Flaum, Chen, & Hirasaki (2004) NMR Diffusion Editing for D- T2 Maps: Application to Recognition of Wettability Change. <i>Petrophysics</i> .
10_Foley1996	Foley, Farooqui, & Kleinberg (1996) Effect of paramagnetic ions on NMR relaxation of fluids at solid surfaces. <i>Journal of Magnetic Resonance</i> , 123(1), 95–104.
11_Godefroy2001	Godefroy, Korb, Fleury & Bryant (2001) Surface nuclear magnetic relaxation and dynamics of water and oil in macroporous media. <i>Physical Review E</i> , 64(2), 1–13.
12_Grunewald2011	Grunewald & Knight (2011) The effect of pore size and magnetic susceptibility on the surface NMR relaxation parameter T2*. <i>Near Surface Geophysics</i> .
13_Istratov1999	Istratov & Vyvenko (1999) Exponential analysis in physical phenomena. <i>Review of Scientific Instruments</i> , 70, 1233.
14_Keating2007	Keating & Knight (2007) A laboratory study to determine the effect of iron oxides on proton NMR measurements. <i>Geophysics</i> , 72, E27.
15_Keating2008	Keating & Knight (2008) A laboratory study of the effect of magnetite on NMR relaxation rates. <i>Journal of Applied Geophysics</i> .
16_Keating2013	Keating & Falzone (2013). Relating nuclear magnetic resonance relaxation time distributions to void-size distributions for unconsolidated sand packs. <i>Geophysics</i> , 78(6), D461–D472.
17_Kenyon1988	Kenyon, Day, Straley & Willemsen (1988) A three-part study of NMR longitudinal relaxation properties of water-saturated sandstones. <i>SPE Formation Evaluation</i> , September, 622–636.
18_Kleinberg1990	Kleinberg & Horsfield (1990). Transverse Relaxation Processes in Porous Sedimentary Rock. <i>Journal of Magnetic Resonance</i> , 88, 9–19.
19_Kleinberg1994	Kleinberg, Kenyon & Mitra (1994) Mechanism of NMR relaxation of fluids in rock. <i>Journal of Magnetic Resonance</i> , 108(2), 206–214.

20_Mueller2005 Mueller, Kooman & Yaramanci (2005). Nuclear magnetic resonance (NMR) properties of unconsolidated sediments in field and laboratory. *Near Surface Geophysics*, 3(4), 275–285.

21_Mueller2015 Müller-Petke, Dlugosch, Lehmann-Horn & Ronczka (2015) Nuclear magnetic resonance average pore-size estimations outside the fast-diffusion regime. *Geophysics*, 80(3), D195–D206.

22_Song2000 Song (2000). Determining Pore Sizes Using an Internal Magnetic Field. *Journal of Magnetic Resonance*, 143(2), 397–401.

23_Song2010 Song (2010). Recent Progress of Nuclear Magnetic Resonance Applications in Sandstones and Carbonate Rocks. *Vadose Zone Journal*, 9(4), 828.

24_Weller2010 Weller, Nordsiek & Debschutz (2010) Estimating permeability of sandstone samples by nuclear magnetic resonance and spectral-induced polarization. *Geophysics*, 75(6), E215–E226.

25_Whitall1991 Whittall, Bronskill & Henkelman (1991) Investigation of analysis techniques for complicated NMR relaxation data. *Journal of Magnetic Resonance*, 95, 221–234.

Table 1: Recommended reference textbooks

Type	Reference Name
NMR Petrophysics	Dunn, Bergman & Latorraca (2002). <i>Nuclear Magnetic Resonance: Petrophysical and logging applications</i> . Elsevier Science. Coates, Xiao, & Prammer, (1999). <i>NMR Logging Principles and Applications</i> . Houston. Haliburton Energy Services.
Spin Dynamics	Levitt (2008) <i>Spin Dynamics: Basics of Nuclear Magnetic Resonance</i> . John Wiley & Sons.
Diffusion NMR	Callaghan (2011) <i>Translational Dynamics and Magnetic Resonance: Principles of Pulsed Gradient Spin Echo NMR</i> . Oxford.
General NMR	Callaghan (1994) <i>Principles of Nuclear Magnetic Resonance Microscopy</i> . Oxford Science Publications. Nishimura (2010) <i>Principles of Magnetic Resonance Imaging</i> . Stanford University. Hore (1995) <i>Nuclear magnetic resonance (Oxford Chemistry Primers, 32)</i> . Oxford Science Publications. (Also see other publications in this series.
