Saint Petersburg State University
V. A. Fock Institute of Physics

International Symposium and Summer School in Saint Petersburg

Nuclear Magnetic Resonance in Condensed Matter

4th meeting: "NMR in Life Sciences"
9–13 July 2007

Book of Abstracts

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an AMPERE event

Saint Petersburg, Russia
2007

where I_0 – current amplitude, $q = I_0 \tau_p$ is the rf-pulse moment, τ_p – pulse duration, f – free-water content. $M_\perp$, $B_{1\perp}$ – components of the magnetization and rf field.

4. Experimental proof of the Bloch-Siegert effect

Frozen in winter Ob reservoir (fig. 1) had been chosen as a model to prove experimentally the Bloch-Siegert effect (resonance frequency - 2514 Hz, Earth's field inclination - 74°, antenna radius R_o - 50 m).

Fig. 2 exemplifies a good agreement between measured and calculated data (100% water content, depth 1-11m).

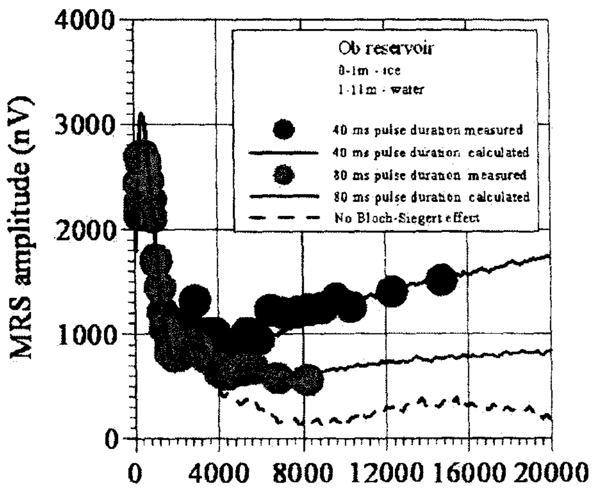

Figure 2: The MRS amplitude vs pulse moment at 40ms and 80ms pulse durations calculated (circles) and measured (lines). Dashed line – calculated without the Bloch-Siegert effect.

The inversion without the Bloch-Seigert effect gives additional nonexistent 80-95 m,100 % water-content layer.

Acknowledgements

The author is grateful to E.V. Kalneus, A.V. Andreevsky, V.B. Novoselov, V.M. Fomenko.

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