TWIN SURFACE COILS FOR RABBIT DORSAL MUSCLE ^{31}P STUDIES

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Spatial localization with obtention of high resolution spectra is generally performed using a surface coil [1,2]. With this technique sensitivity is yet sufficient for quantitation of phosphate metabolites in human or animal [3]. For matter of comparison, heterolateral control spectrum is required in several experiments. An ideal situation is to operate such control without coil or sample repositioning. A pair of coils having identical electrical characteristics and equal sensitivity may be employed. In this note, we describe a double tuned (^{13}P, ^{1}H) pair of surface coils used to study diseases caused by irradiation of illiospinal rabbit muscles. Each coil is used both as a transmitter and a receiver and proton observation enables static magnetic field shimming of the region of interest. The pair of coils is designed for operation at 2.35 T in the inductive coupling mode [4] as indicated on Figure 1. The devices are mounted on the two dorsal sides of the rabbit and ^{31}P resonance spectra (Figure 2) are recorded in about 15 minutes. Applications are done for evaluation of (Pi) variations following acute localized irradiation with X rays [5].

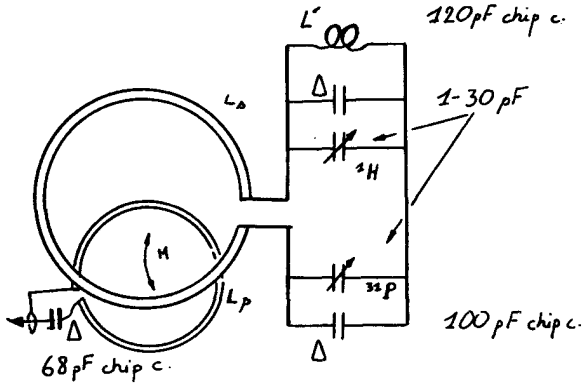

Figure 1. Electrical circuit of the two coil system (One side only).

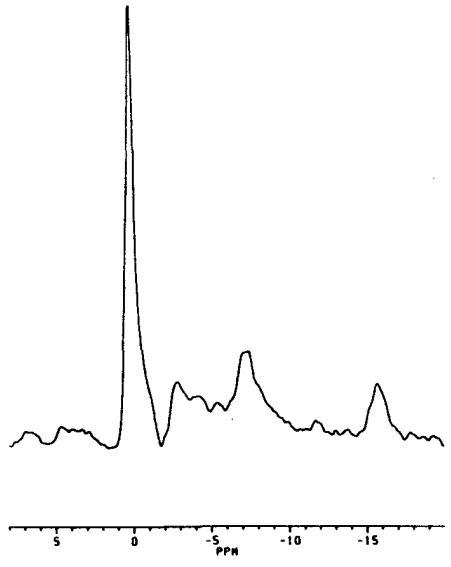

Figure 2. Typical ^{31}P spectrum of the illiospinal rabbit muscle.

[1] J.H. Ackerman et al. Nature 283, 167 (1980).
[2] A. Haase et al. J. Magn. Res. 56, 401 (1984).
[3] P.N. Venkatasubramanian et al. Magn. Res. Med. 6, 359 (1988).
[4] M. Decorps et al. J. Magn. Res. 65, 100 (1985).
[5] J.L. Lefaix et al. I.T.B.M. 9, 429 (1988).