NMR Signal Enhancement Via A New Time-Frequency Transform

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IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, IEEE TRANSACTIONS ON MEDICAL IMAGING; pp: 1018-1025; Vol: 20
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Summary

In this paper, a reliable method to reduce the noise from nuclear magnetic resonance (NMR) signals using a recently developed linear critically sampled time-frequency transform is proposed. In addition to its low computational requirements, this transform has many theoretical advantages that make it a good candidate for NMR signal enhancement. NMR signals in the transform domain are concentrated in a few coefficients while the noise is well distributed. Performing a thresholding technique in the transform domain, therefore, significantly enhances the signal. A comparison with other signal enhancement techniques shows that this technique has a superior performance, thus confirming the theoretical expectations.

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