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Improving solid-state NMR sensitivity using instrumentation, fast acquisition and post-processing

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1 – Introduction
Solid-state NMR:
● Broad peaks
● Partial narrowing with MAS
● Low sensitivity

2 – Instrumentation
Singular Value Decomposition (SVD) [6-8]
Denoising
PSNR / sqrt(t) / g → x 8

3 – Acquisition
PSNRmax = H_{signal}/h_{noise}_{peak}/2

4 – Processing
Hydroxyapatite

5 – Conclusion
Complementary techniques:
● MACS: sensitivity increased by 8
● NUS: sensitivity increased by 2
● SVD: sensitivity increased by 2
Next step:
● Combining MACS + NUS + SVD: sensitivity increased by 32

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7 – References