

MRI Physics Basics

Nuclear magnetic resonance

Hydrogen protons align in magnetic field

Gradient fields

Spatial encoding of signal

K-space

Frequency domain data representation

Relaxation times (T1, T2)

Tissue-specific signal recovery

Signal equation

$$S \propto \rho \cdot (1 - e^{(-TR/T1)}) \cdot e^{(-TE/T2)}$$

