Single-sided Nuclear Magnetic Resonance for Physical and Chemical Analysis

Tyler Meldrum
tkmeldrum@wm.edu
Office: ISC 1060 Lab: ISC 1026
NMR is more than...
Open, Single-sided Magnets

- Magnetic field
- RF transmitter/receiver
- Sample

Cultural Heritage

Cultural Heritage
Methods Development

- Reduce acquisition time
- Improve signal-to-noise ratio

Methods Development

a) \( H_2 \)
- \( \beta\beta \)
- \( \alpha\beta + \beta\alpha \)
- \( \alpha\beta - \beta\alpha \)
- \( \alpha\alpha \)

\[ \rightarrow \]

b) \( \beta\beta \)
- \( \alpha\beta + \beta\alpha \)
- \( \alpha\beta - \beta\alpha \)
- \( \alpha\alpha \)

\[ \rightarrow \]

\( \beta\alpha \)
- \( \beta\beta \)
- \( \alpha\beta \)
- \( \alpha\alpha \)

\( \Delta E \)

Equilibrium polarization
\[ P \approx 10^{-6} \]

Pre-polarization
\[ P \approx 10^{-1} \]
Specifics

- NMR
- Electronics, soldering, circuits
- Building components
- Sample prep
- Work with data analysis techniques, coding
- Data analysis (Matlab)
- Writing, making figures
- Come talk to me