We built a portable **0.05 ppm** resolution NMR spectrometer for the **price of a laptop**

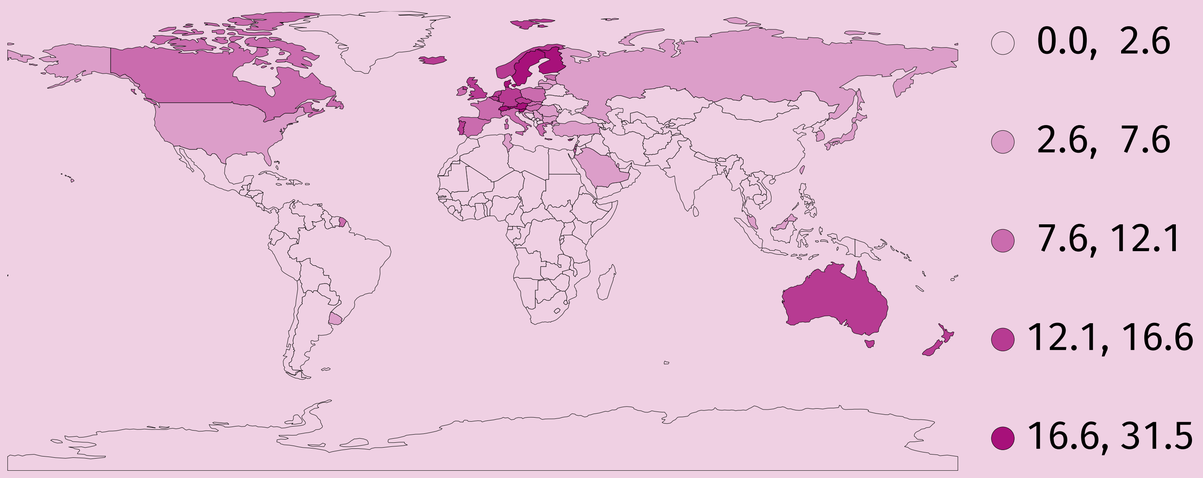
*magn**ETH**ical*: Democratizing NMR with an open-source low-field spectrometer

Background

High costs exclude the Global South from NMR research. We want easy access to NMR technology for everyone, everywhere.

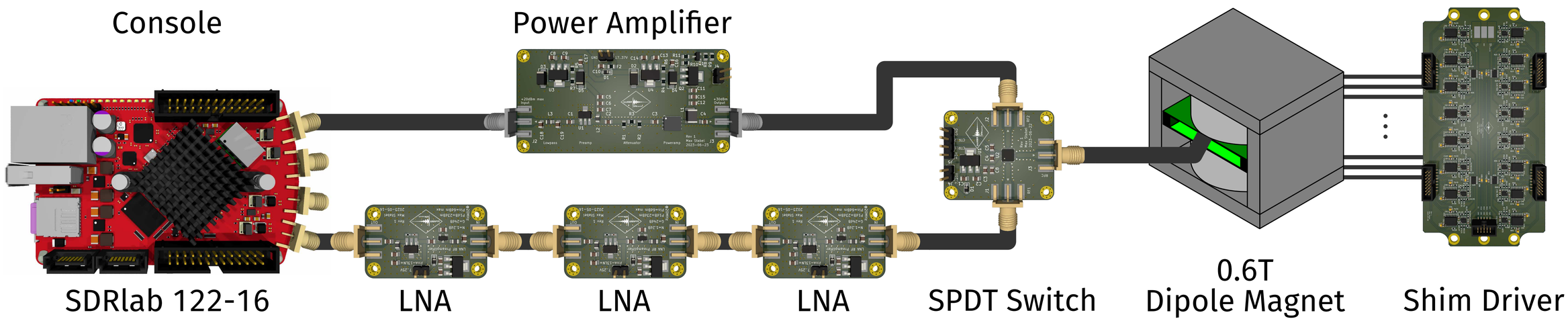
Goal

An open-source cryogen-free 25 MHz NMR spectrometer. Off-the-shelf components — Repairable. Accessible. Affordable.

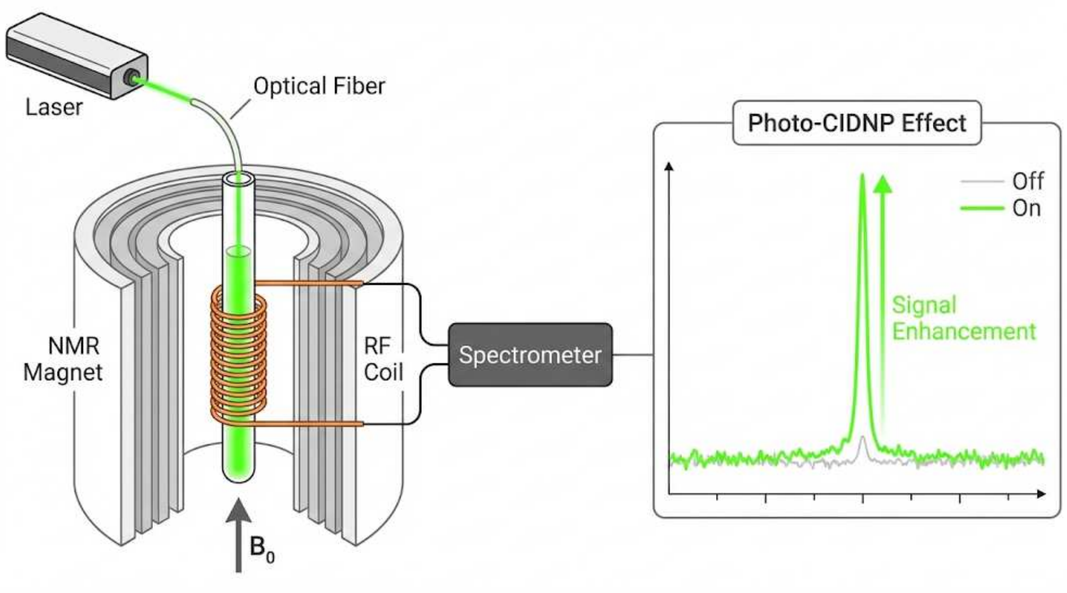


NMR affiliations per million people (2020)

~$3k Material Cost

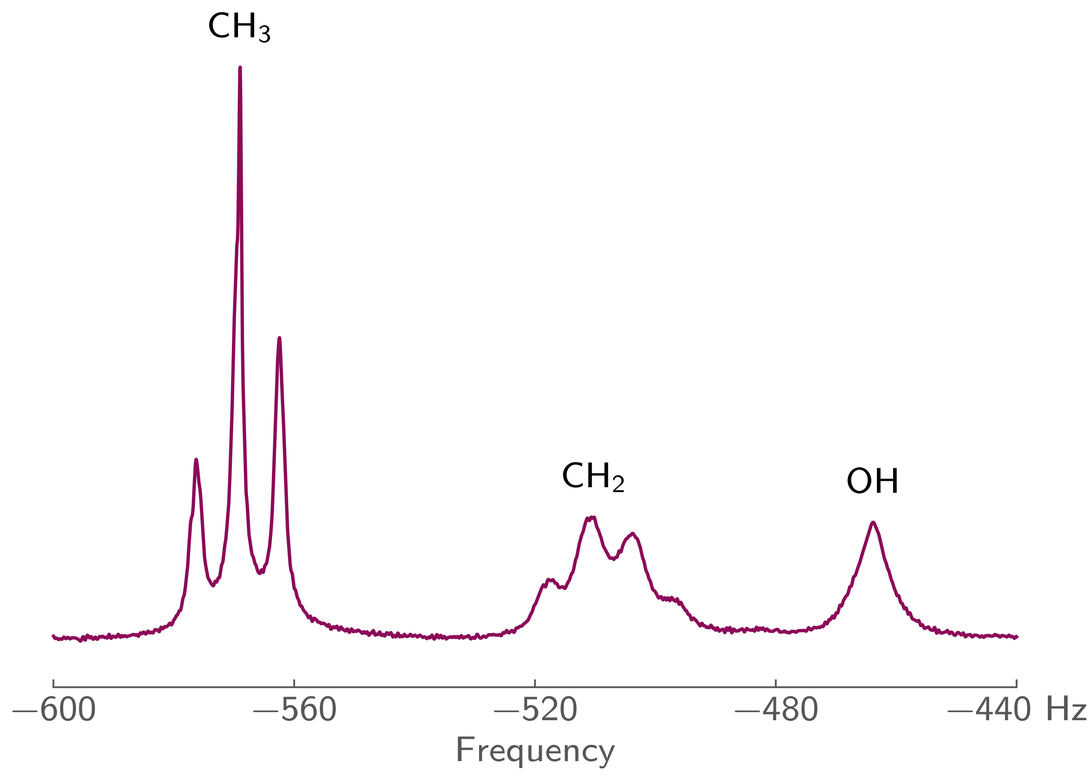


Future Steps



- photo-CIDNP
- NQR
- Fingerprinting
- Education
- Electronics Integration
- Software Optimization
- Temperature Stability
- Smartphone App

Scalar Coupling Visible



Ethanol Spectrum
5 mm NMR tube, 1 acquisition

magnethical.org

Max Stabel, Takuya Segawa,
Sebastian Kozerke, Roland Riek
ETH Zürich, Switzerland
2026

ETH zürich