



Contribution ID: 454 Contribution code: MOPCO26

Type: **Poster Presentation**

Compact NMR Magnet Design for In-Vivo Measurement Applications

Monday 8 September 2025 16:00 (2 hours)

This paper presents the design and simulation of miniaturized permanent magnet configurations for Nuclear Magnetic Resonance (NMR) applications capable of in-vivo measurements. Traditional NMR systems require large, expensive equipment with high field uniformity, making portable applications challenging. We compare various compact magnet geometries, including H-type and Halbach arrays, evaluating their field strength, homogeneity, and suitability for finger-scanning applications. Our work demonstrates that carefully designed permanent magnet arrays can achieve sufficient field uniformity for localized metabolite detection in a compact form factor. Through computational modelling, we establish a framework for quantifying and optimizing magnetic field homogeneity critical for accurate NMR measurements in portable diagnostic devices.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

Author: AFLYATUNOVA, Daliya (University of Liverpool)

Co-authors: WELSCH, Carsten (University of Liverpool; Cockcroft Institute); Mr GAO, Geoffrey (ViBo Health); Dr TRAVISH, Gil (ViBo Health)

Presenter: AFLYATUNOVA, Daliya (University of Liverpool)

Session Classification: MOP

Track Classification: MC08: Machine Parameter Measurements