

# Design and commissioning of a whole-body 0.2 T fast field-cycling MRI magnet

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$T_1$  relaxometry opens new avenues for medical research and early works by pioneers already showed interesting features at fields lower than 1 T by using FFC-NMR methods in breast cancer, multiple sclerosis and others [1,2]. However, their approach was limited to searching for a 'best field' that would maximize the  $T_1$  contrast for a given pathology. This was due to the lack of technological solutions for the application of FFC techniques in vivo.

Our lab has developed two whole-body scanners [3,4], the first one reaching a field of 59 mT and the most recent reaching up to 0.2 T. The design and commissioning of such scanners pose some original challenges and require particular considerations both at the magnet design and the control of the various units, field-cycling requires various modifications compared with the 'usual' MRI scanner hardware. This presentation will focus on the various aspects of the design and commission of the 0.2 T whole-body scanner developed in Aberdeen.



**Figure 1:** View of the whole-body 0.2 T FFC-MRI scanner with a home-made head coil inside the bore.

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## References:

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- [3] Lurie D.J. et al. Fast field-cycling magnetic resonance imaging. *C.R.Phys.* **11**, 136-148 (2010).
- [4] Lurie, D.J. et al. Design, construction and use of a large-sample field-cycled PEDRI imager. *Phys.Med.Biol.* **43**, 1877-86 (1998).