

# I'm back!

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First, I have a new email address: [jlanglands@sheffield.ac.uk](mailto:jlanglands@sheffield.ac.uk)

- Clean up Field Mapping Code!
- Give support to analyses involving the fields – Chris H+R et al

# Field Mapping Code

In the end, the mapping code evolved into 'thesis code' – a large collection of scripts with no structure. It needs to be cleaned up so that it is user friendly!

Plans and features:

- It will come with pre-fitted fields/FB<sup>1</sup> coefficients and the data taken in March 2018
- Convenience scripts so the pre-fitted stuff can simply be used to spit out field maps at a desired current setting
- The ability to only spit out only the FB contributions to the field as a g4blgrid format. These effectively represent the field deformation due to the PRY. These can then be used concurrently with the coil models in MAUS

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<sup>1</sup>Fourier-Bessel

- Access to the fitting procedures is still available to the user if they really want to give it a go.
- A bin/ directory will contain the convenience scripts that will (hopefully) cover all basic functionality as well as examples
- ANY features that people could want – let me know and I'll see what can be done

All this code will be available from my github repository at:  
<https://github.com/JoeLanglands/MICE-MagneticFieldMapping>

There is not much in there right now because I haven't committed the latest code, since I have been testing.

# Current Progress

- Right now I have been working on improvements to the Fourier-Bessel fitting methods since previously, I typed in each term and coefficient by hand because minuit is stubborn. This was very unmaintainable and inextensible.
- Instead, I have found a way to fool minuit into taking functions with a variable number of parameters so now it is simply a case of passing the 'order' of the terms desired. This was by far the biggest task since  $\sim 1000$  lines of code needed to be re-written completely as they were a hot mess.
- The inner workings and the script to spit out field maps – complete or only the FB contributions – will be completed by this time next week. This will be the bare minimum needed so that field maps can be produced by users.

# Future Work

Finish off the field mapping code so that it is a complete package to be used.

Analyses à la Chris Rogers + Chris Hunt.