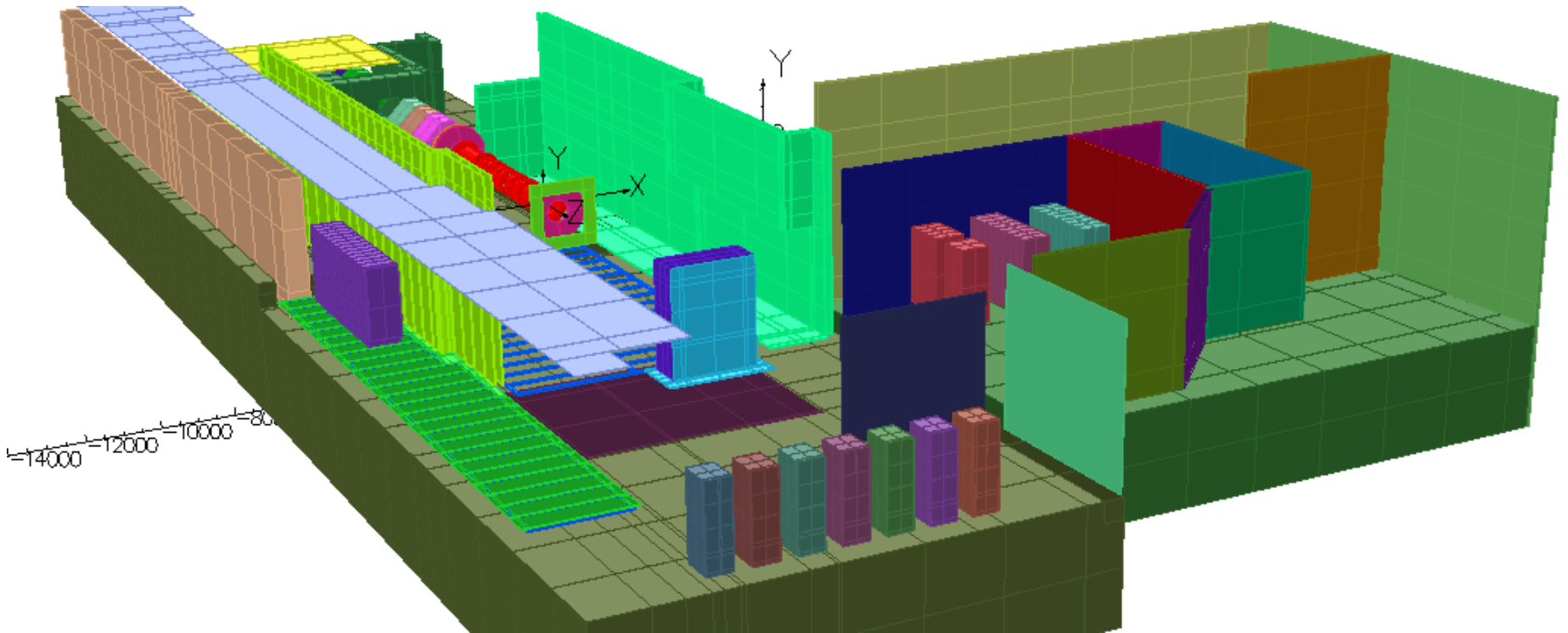


Modelling Update – 14/11/12



Model Updates

Addition of the Plant Room/MLCR. I have subsequently been informed that we will not be utilising the plant room but at least we now have the MLCR and the MLCR Racks in the model. It is quite clear that this part of the model will need extending to include the hydrogen room, store room, ISIS control room ,etc in the future.

I've written a piece of code that I've called a 'Rack Generator'. It's been built upon the code that I used to generate the racks behind the NSW. This permits rows and columns of racks to be built arbitrarily in the hall/MLCR etc

This works by generating a series of hollow cuboids with a settable wall thickness. We've been able to achieve meshable wall thicknesses that have exceeded original expectations... 1.5mm was thinnest achieved.

EMR finally updated. This has reduced the huge iron block into a plate with hole in the middle. The EMR model does not include any of the supporting framework which could possibly add a significant % of iron. Even with the framework missing this has probably reduced the largest source of structural error in the model.

Lots of other tweaks to the code...

Computing

As previously reported the faster computer has had a significant effect on improving the solve time. Before the plant room was put in it was taking about ~28 hours for a solve...

With the plant room and some racks it is about 39 hours. I think this is pretty good considering the addition of the plant room effectively doubles the volume of the model, albeit a lot of the additional air can be set at a reduced resolution which helps.

I upgraded to OPERA 15R3 earlier this week which uses a new matrix solving algorithm that claims to be up to 60% faster. I have done one run since Matt Robinson installed 15R3 . This model was run without the plant room (but with a significant number of racks in the hall) and it took 21 hours to solve so first indications are that it appears to have made a difference.

As an aside Craig's computer is now struggling to process the output from the analysis –perhaps he could do with an upgrade? The completed Model size is approximately ~4GB.

Moving to Production Models

I am currently focusing some of my time on moving the model from producing 'test models' to what I call 'production models'. In some respects its just a change of name but it is also an indication that we now believe that the model is sufficiently developed to be useful. It also means that we will be much more rigorous with describing and documenting the models.

To this end I have created a website at Sheffield in preparation to host the solutions and the documentation.

http://www.hep.shef.ac.uk/research/mice/opera_models/

(note underscore: opera_models)

This site links to model documentation, the repository, some of the test models we have produced so far and some other things. It's main purpose will be to house the large solution files that we generate. (Several GB per solved model)

At the moment the website is backed up but this could become a problem when we get to the point that there are a lot of solution files on there. Most of the solutions are also backed up on my machine but we may need to consider something else when we get >100GB.

Proposed Methodology

This is the way that I want to propose that the modelling is undertaken. This way we can both document what has been done and the results and code should remain persistent for future reference.

Upload Code to repository if there are structural changes to the code

∨

Snapshot of .comi into a zip file (.comi files are small)

∨

Run Model

∨

Post model solutions and .comi snapshot onto website with a description of the purpose of the model

∨

Update spreadsheet that lists what was turned on in the model

What do we want to tackle?

Before I 'really' ask this I have a few comments.

There are still a few issues/checks with the model that I want to perform before I move into full production mode.

I know that there is an error with the location of the East Wall.

I would like to do a final but thorough component location check with Jason.

Craig should present the first results on the compressor locations first as there is the potential for a good number of what-ifs that we need to do with this (and the geometry/locations need tightening up a bit)

...but perhaps this is something that we might want to discuss later on during the meeting.