

Modelling Update

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Introduction

I don't have many results to show this week but progress has been on two fronts.

In the background:

Running Hall models. Returning the resolution to what was used in the 90 series models. Ensuring model runs with new PRY geometry. Tweaks to the model.

In the foreground:

I've been running a series of models with 90mm thick Virostek plates (VP) and 90mm thick end plates (EP) for comparison with 100mm thick VP + EP

Hall Model

As you are aware the hall model takes a very long time to solve so any changes to this model take a long time to be reflected at the other end...

A couple of months ago I increased the resolution of the hall model meshing to try and ascertain whether I was having an issue with mesh convergence. It turns out that this wasn't an issue but I ended up with a hall model that took 2-3 times longer to solve.

I have reversed some of these meshing changes as well as making some tweaks to the model, but to ensure that I don't break the hall model I've been making these changes one at a time and ensuring that the hall model solves.

I have run the following models:

Hall Model

Model 130 – Hall model (No SSB) with new PRY geometry for comparison with models with the older PRY geometry. (To see what effect changing the PRY geometry has had). This was done at the higher mesh resolution. 100 hours solve time.

Model 131 – As Model 130 but with the meshing resolution reverted to that used in the 90 series models. 40 hours solve time.

Model 132 – As model 131 but this includes some changes to the Quads which reduces their mass and changes their meshing slightly. I would like an estimate of the Quads mass to see if I'm closer but the model more closely follows the drawing. 41 hours solve time.

Model 133 – As model 132 (but with SSB) and the Floor plates on the South Shield Wall set to air. This is to see what effect removing the floor plates has on the field behind the SSW – Expect the effect to be minimal. – Model not yet solved.

Further models – To run the hall model with the shield walls set to air. We suspect that the shield walls are not going to be essential to the magnetic shielding with the PRY in place but I would like to see the predicted effect of removing them.

PRY Model

I haven't made much progress with converging my PRY model with Holger's as I understand he has not been well. I drew up a list of drawings that I had used as reference material for my PRY model and forwarded this to Holger. Holger has forwarded me a list of updated drawings this morning which I have not yet looked at.

Priority is to establish that Holger and I are working from the same (and correct) geometry.

I have been running a series of models looking at the effect of using 90mm VP and EP in the PRY model. There was some concern that using 100mm could be over-estimating the amount of steel in the model.

I'm currently at the stage where I have more results than I have been able to look at so I won't be going over all the results this week – but I have something to show...

PRY Models

Models run previously:

PRY Model 110 – Pry Model with 100 mm thick VP and EP (Sol 240 MeV/c)

PRY Model 111 – Pry Model with 100 mm thick VP and EP (Flip 240 MeV/c)

Models run since last meeting:

PRY Model 120 – Pry Model with 90 mm thick VP and EP (Sol 240 MeV/c)

PRY Model 121 – Pry Model with 90 mm thick VP and EP (Flip 240 MeV/c)

PRY Model 122 – Pry Model with 90 mm thick VP and EP (Sol 240 MeV/c) BH – 10%

PRY Model 123 – Pry Model with 90 mm thick VP and EP (Sol 240 MeV/c) BH – 20%

PRY Model 124 – Pry Model with 90 mm thick VP and EP (Sol 240 MeV/c) BH – Air

PRY Model 115 – Pry Model with 100 mm thick VP and EP (Sol 240 MeV/c) BH – 10%

PRY Model 116 – Pry Model with 100 mm thick VP and EP (Sol 240 MeV/c) BH – 20%

BH curve used for PRY, VP and EP is the standard OPERA AISI1010

PRY Models

For quick comparison of model 110/111 vs 120/121 we'll take a look at the second presentation.