

# Magnetic Modelling

## 28/05/2013

Opera 16 was released on Thursday (or at least I've got my hands on it!) so over the weekend I've been running some Hall models through Opera 16.

Prior to this I switched over to 15R3 for a couple of days to see if the Hall model would work with this version; recall it refused to mesh point blank last year with 15R3. This time I had no trouble at all getting the model to mesh. This is interesting as I think this is indicative of how many errors have been weeded out of the model over the past few months.

The tests with 15R3 did highlight a small meshing problem around the quads which was due to a mismatch between the geometry of the quads and a cut-out in the Hall air volume for the quads (this is of no significance to the model) but made a few funny shaped cells which 15R3 highlighted. This has been corrected. There are a few other minor meshing warning which I am working on but its like containing putty by squeezing it in a sieve...

Over the weekend I have run:

Model 91 – Step IV Solenoid 240MeV/c

Model 94 – Step IV Flip 240 MeV/c

Model 93 – Step VI Solenoid 240 MeV/c (still running)

	Current Set			Last Full Set		Last Equiv Model
	Model 91	Model 93	Model 94	Model 61	Model 64	Model 85
	OPERA 16	OPERA 16	OPERA 16	OPERA 15R2	OPERA 15R2	OPERA 15R2
Equations	21,331,827	23,349,508	21,322,980	19,460,512	19,460,512	15,825,450
Non-Zeros	318,009,737	347,850,654	317,874,698	305,884,118	305,884,118	317,338,588
1	06:46	06:35	08:05	07:05	07:21	11:24
2	03:20	In Progress	07:49	07:20	07:09	07:58
3	03:25	In Progress	07:49	06:59	07:05	05:09
4	05:57	In Progress	03:46	07:00	07:00	10:31
5	02:52	In Progress	04:44	06:58	06:52	04:34
6	01:35	In Progress	04:39	06:43	06:55	04:36
7	01:54	In Progress	07:22	06:38	06:43	02:52
8	03:41	In Progress	00:51	04:26	06:23	05:50
9	-		-	05:47	03:20	-
	1d 2h 24m	?	1d 21h 38m	2d 11h 36m	2d 11h 24m	2d 3h 24m

Table needs to be treated with care due to nature of changes.

- Mesh convergence criteria relaxed recently. (Reduction in iterations?)
- However the mesh density has changed moving the mesh density from areas of low interest to areas of high interest – unsure what effect this has on solve time.

We were hit hard for some time by the BH curve problem – this is not really shown in this table, so solve times were much longer for a period of time.

I think we're back on track with the Hall model. Apart from some very minor tweaking to the mesh to try and remove any further meshing warnings I don't really intend to do anything further with the Hall model until we have some feedback from Vector Fields.

I have realised this morning that the plot auto-generator needs a little attention as they've changed some of the instructions for that produce vector plots in OPERA 16.

Other than that my attention is to be turned to the Fry List.