

# **TRT SOFTWARE AND TESTBEAM ANALYSIS STATUS**

**Fred Luehring**

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## **Talk Summary:**

- 1. Testbeam analysis**
- 2. Tuning GEANT3 code for release**
- 3. ToT paper**
- 4. GEANT4 geometry**
- 5. GEANT4 digitization / physics validation**

**I am impressed by the large amount of work that has been done by everyone - both for the test beam analysis and the simulation. My thanks go to Engin, Ketevi, Elisabetta, Dario, Serkant, Andrea, Vaso, Serge Mo, Mariuz, Serge Sm, and Vladimir...**

# TESTBEAM ANALYSIS

**We had four talks:**

- 1. Serge Sm presented the testbeam software status and the results of his high rate studies.**
- 2. Andrea presented the results of Mariuz's analysis of using time over threshold (ToT) for particle identification in the sector prototype.**
- 3. Serkant presented the results of the threshold and channel scans that he and Engin had done on the sector prototype**
- 4. Vladimir presented results of his analysis of the sector prototype. Vladimir then presented a promising method for improving the spatial resolution using ToT.**

# TESTBEAM STATUS

**The DMill ASDBLR looks good - it performs comparably to using discrete components up to the highest rates.**

**We still need to compare the two ASDBLR's for ToT**

**The ToT work on particle ID with the sector shows promise but naturally further work is needed.**

**The sector prototype analyses show the expected resolution and efficiency.**

**Additional work is needed to understand the noise**

**There was one DAQ problem (silicon-prototype data mismatch) but the new DAQ system worked great!**

**The work on improving resolution with ToT is very interesting.**

# GEANT3 SIMULATION

There has been A LOT of work on simulating the testbeam and extracting an improved tuning for the simulation. We had four talks on MC subjects:

1. Elisabetta presented a simulation of the new sector prototype that she and Vladimir worked on.
2. Anatoli showed Serge Mo's latest results which have improved agreement between the simulated and testbeam data energy deposition spectra.
3. Using a different set of tunings Elisabetta showed results with less agreement.
4. I showed my understanding of what the optimal simulation control parameter values are.

# MC CONCLUSIONS

The new sector prototype simulation runs (after a bug fix) and needs to be tested soon.

With Serge Mo's latest results there now are a set of tunings that make simulation and data match. We can thank Igor and Pavel for helping to correct problems in our implementation of PAI.

We need to understand the differences between Serge and Elisabetta's results.

I have asked Serge to make his latest code and jobs public so that everyone can study them.

Anatoli believes that we are seeing TR in the straw wall. This may need to be more clearly documented.

I would like to have a meeting soon (next week?) to approve a set of parameters for release.

Finally: It has been very difficult to follow the process of tuning the simulation. Improved communication is needed - one discussion per TRT week is not enough. Personally I also worry about how much the tunings have changed - their values never seem to stabilize to fixed values for long times.

# ToT Paper

**It is finally ready for release!**

**Paula has closed the period of comments and the paper will go to NIM as soon as the last comments are implemented.**

# GEANT4 WORK

Andrei and Yuri Zalite are working on the XML description of the TRT geometry for use in GEANT4. (Not part of our session but I show a few pictures anyway!)

We had two talks on work that continues what Dario began on confirming the correctness of the TRT-related parts of the GEANT4 physics package:

1. Vaso gave a talk on her first attempts to look at the TR models in GEANT4.
2. Ketevi gave a talk about developing the digitization to properly smear the energy of the clusters generated by the GEANT4 PAI model.

While GEANT4 is improving every day, there are still problems - both Ketevi and Vaso lost time to GEANT4 problems.

The work on the digitization is looking good. The energy smearing is in and Ketevi will begin looking at implementing the ASD part of the code soon.

To insure further progress Daniel, Pavel, Dario, and myself need to settle whether we generate energy of the PAI clusters privately or use information generated by the GEANT4PAI model.