Meeting Minutes of the
58th FCC-ee MDI meeting

Indico: https://indico.cern.ch/event/1463314/
When: 14.10.2024 16:00-18:00 CET

Agenda

Presenter	Title
M. Boscolo	**General Information, News**
F. Valchkova Georgieva	**3d integration models for the experimental areas**
A. Gaddi	**Detector integration options**
H. Burkhardt	**Vertical emittance in the non-local solenoid compensation scheme**
B. Francois and K. Andre	**Status of the synchrotron radiation studies on detectors**
F. Palla	**Highlights from the 3rd ECFA meeting**

1 M. Boscolo - General Information, News

M. Boscolo presents general information and news. The minutes of the previous meeting are approved and are available on the Indico page. The next MDI meeting is scheduled for 28 of October.

The deadline to submit the contribution for the accelerator volumen of the FCC feasibility study report has not been set yet.

Upcoming events:

- 2nd FCC Italy and France workshop in Venice in November 4-6
- FCC Physics week at CERN 13-16 January 2025.

2 F. Valchkova-Georgieva - 3D integration models for the experimental areas

F. Valchkova-Georgieva presents studies about the 3D integration models for the experimental areas.

The focus is on the underground structures at point A and point D.

M. Koratzinos asks if the small cavern can fit a FCC-hh detector. **A. Gaddi** answers that yes, this is possible, but at the minute there is not yet a proposal for this.

3 A. Gaddi - Detector integration options

A. Gaddi presents an overview on the options for the FCC-ee detector integration in the experimental caverns.

The main conclusions are that:

- Progresses have been made to solve some inconsistencies between the civil engineering design and the detector proposals. Nevertheless, discussions will continue on the layout of the service cavern and connecting tunnels
- Fruitful discussions are ongoing with K. Oide and G. Roy on the MDI layout between 5 m and 15 m from the IP.
- Studies have started for the details of the detector integration and opening sequence for both short and long machine shutdowns.

Being concerned about potential vibration and/or deformation issues, **K. Oide** asks what kind of elements the platforms placed under the detector are. **A. Gaddi** answers that they are reinforced concrete blocks. **A. Gaddi** adds that simulations to evaluate this type of effects need to be performed, nevertheless, he reminds that reinforced concrete is a good to act as vibration damper.

N. Bacchetta comments that it would be very good for the services if the detector structure will allow to reach the detector from below. **A. Gaddi** agrees with the comment, saying that this possibility can be included in the design idea of the detector structure.

4 H. Burkhardt - Vertical emittance in the non-local solenoid compensation scheme

H. Burkhardt presents considerations on the vertical emittance increase in the non-local solenoid compensation scheme, comaparing the results with those obtained with the local solenoid compensation scheme.

The main conclusions are that:

- The SR energy loss per turn at the Z operation mode is 39 MeV with the local solenoid compensation scheme and 34 MeV with the non-local one. If one docus over the IR region ($\pm$10 m from the IP), the SR energy loss is 64 keV with the local solenoid compensation scheme and 31 keV with the non-local one.
- The estimated emittances for the Z operation mode in an ideal machine without collisions are: ($\varepsilon_x = 707\ pm$, $\varepsilon_y = 362\ fm$) with the local solenoid compensation scheme and ($\varepsilon_x = 693\ pm$, $\varepsilon_y = 63\ fm$) with the non-local one.

During the discussion, it comes up that the non-local solenoid compensation scheme being studied by **A. Ciarma** and considered in the studies by **H. Burkhardt** uses additional correctors if compared to the model being studied by **K. Oide** to perform equivalent independent studies.

B. Parker commments that there should not be any fundamental limitation in placing such additional correctors.

5 B. Francois and K. Andre - Status of the synchrotron radiation studies on detectors

B. Francois and **K. Andre** present a status update on the study the impact of SR backgrounds in the detectors.

The main conclusions are that:

- A method to get the photons from BDSIM (i.e., output of K. Andre's simulations on SR backgrounds) in a readable input for DD4Sim (i.e., software used by B. Francois to evaluate the impact of backgrounds in the detectors) has been set up using the .hepevt file format.
- The generation of SR photons has been optimized the most relevant photons through a proper filtering in energy and transverse position. The filtering can be further refined.
- A first detector occupancy evaluation has been presented, showing the feasibility to perform this type of integrated studies.

Future studies will encompass: validation and refinement of the photon filtering method, further investigation of the ddsim crossing angle handling, further investigation on the optimal number of particles to simulate to get sufficient statistics vs. computing time, study different FCC-ee operation mode and migrate from the outdated .hepevt file format to the HEPMC3 file format.

6 F. Palla - Highlights from the 3rd ECFA meeting

F. Palla presents highligts from the 3rd ECFA meeting that took place in Paris from October 9th to October 11th.

The workshop was the last of the series of workshops on the physics, experiment and detectors for future e+e- factories before the ESPPU, and it was a very important opportunity for the community working on the future e+e- factories to gather and discuss the latest results and developments on these activities in view of the submission of an ECFA report as input to the next strategy update.

An overview of the various sessions of the workshop is presented along with highlights from selected talks.

33 Participants:
K. André, P. Azzi, N. Bacchetta, M. Boscolo, G. Broggi, R. Bruce, H. Burkhardt, C. Carli, A. Ciarma, M. Dam, C. Eriksson, F. Fransesini, B. Francois, A. Frasca, A. Gaddi, V. Gawas, A. Ilg, A. Lechner, G. Lerner, M. Marchand, G. Nigrelli, A. Novokhatski, K. Oide, F. Palla, B. Parker, G. Roy, J. Salvesen, V. Schwan, J. Seeman, M. Selvaggi, L. Watrelot, J. Wenninger, and F. Zimmermann

Minutes prepared by **G. Broggi**