First FCC-ee MDI meeting

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N. Bacchetta (INFN-Pd & CERN)

29th February 2016

Mandate

1. **Synchrotron radiation and masking**
    - Provide estimates of the intensity, spectrum, spatial and angular distribution of the synchrotron radiation emitted by the beam passing through the various machine elements.
    - understand the limits imposed by experimental detectors sensitivity to synchrotron radiation and possibly establish a program of R&D needed to evaluate and possibly improve the resistance of detectors.
    - consider the impact of masking on the machine performance e.g. due to transverse impedance and aperture issues.

2. **Other accelerator backgrounds**
    - provide a list of accelerator-created backgrounds
    - develop the simulations of these processes in order to allow the assessment of their impact on detector performance

3. **Magnetic integration**
    - develop a concept for one magnetic system comprising the main detector magnet, the final focus elements, the necessary compensation devices.
    - consider the feasibility of such a system, the necessary R&D and prototyping, the possible issues with complexity and reliability.
    - consider the impact of the magnetic system on beam polarization and energy calibration

4. **Luminosity measurements and other desired particle detectors have to be integrated in the final design of the interaction region.**

people involved (initial proposal)

- Accelerator-born backgrounds: Manuela Boscolo (chair)
- Synchrotron radiation and masking: Helmut Burkhardt, Hiroyuki Nakayama
- Detector aspects and layout: Nicola Bacchetta (Co-chair)
- Luminosity measurements: Mogens Dam
- Solenoid field compensation: Sergey Sinyatkin
- L* and links to optics, coupling corrections: Eugene Levichev, Katsunobu Oide
- Technical infrastructure requirements and interfaces: John Osborne
- Effect of synchrotron radiation on particle detectors: ?
- Integration of magnetic systems: Herman Ten Kate

positive answer by everybody

Tentative roadmap

- first have a preliminary and rough IR constraint by SR (Helmut & Mike), provided an optics layout
  - very preliminary IR layout

to start working on:

- Shieldings, masks (Helmut)
- IR magnetic system design with detector geometrical constraints (Sinyatkin, H. Ten Kate)
- lumi background simulation (people from experiment Perez, N. Bacchetta, A.Kolano?)
  - bhabha, e+e- e+e-,e+e-μ+μ-
- beam backgrounds simulations (M. Boscolo)
- luminosity measurement (Mogens)
- determine detector contraints from SR and other backgrounds (people from experiment, N. Bacchetta, A. Kolano +?)

of course it will be an iterative procedure

Planning

- Next FCC-ee MDI meeting:

  Thursday 31th March? or Monday April 4th?

(just before FCC WEEK)