Highlights from WG5 – the 1$^{\text{st}}$ week

Angeles Faus-Golfe, IJCLab; Frank Zimmermann, CERN

EPOL Workshop 2022, 23 September 2022

Tuesday

D. d'Enterria, CERN, Physics and operational requirements for monochromatization

- FCC-ee can provide the by far most precise measurement of the e- Yukawa coupling.

- Large background is a concern and can or must be suppressed by suitable cuts and algorithms (e.g. selection of gluon jets)

→ **further work on experimental side and detector simulations**

A. Blondel, U. Geneva, Measurement of monochromatization parameters

- Plenty of dimuon events contain superb information of collision energy spread with and without monochromatization, and mean energy difference between electron and positron beams

- Suggestion to test the monochromatization scheme early-on during highest-luminosity Z running (impact on optics design and question whether beamline footprint can be held constant)

→ **scenario(s) for test during Z operation ; compatibility studies**

Wednesday

A. Faus-Golfe, IJCLab, Towards monochromatization optics
- approach: modify the final-focus bending for all energies and add final-focus quadrupoles to achieve the monochromatization
- for operation with crab cavities need to reduce bunch length (different arc optics?) or need to increase betay* ?
-    one could also resonantly create dispersion from the arcs (P. Raimondi ; see A. Zholents & F. Ruggiero at LEP)
→ **study need for crab cavities**
→ **study potential of resonant generation**

H.-P. Jiang, IJCLab, First draft optics
- draft optics with IP dispersion created by addt'l bends and quad's in the final focus GP simulations
→ **check if synchrotron radiation photon energies would be OK for ttbar running**
→ **emittances need to be updated for each working point, and both bunch population and IP dispersion should be optimized**
→ **decreasing betax* should also be considered**

P. Raimondi, SLAC, Monochromatization with chromatic waist shift
- monochromatization with chromatic waist shift could be simulated with GuineaPig to explore useful parameter range and possible gain
- other alternative approaches include change of partition number and/or Robinson wigglers
→ **simulations and studies on these alternative approaches and combinations thereof**

Upcoming next week: Dmitry Shatilov