

Highlights from WG5 – the 1st 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 β_{t}^* ?
- 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 add'l bends and quad's in the final focus, launch of 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 β_{t}^* 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