

NuFact 2021: The 22nd International Workshop on Neutrinos from Accelerators

Contribution ID: 251

Type: **not specified**

The FCC project

Thursday 9 September 2021 16:00 (30 minutes)

The Future Circular Collider is at the heart of the future vision of the European Strategy for Particle Physics, who placed, as the highest priority for Europe and its international partners, a technical and financial feasibility study of the 100km infrastructure and of the colliders that would be installed in it. The physics programme is based on the sequence of a 90-400 GeV high luminosity and high precision e+e- collider, FCC-ee, followed by a 100 TeV hadron collider including also heavy ion and optionally e-p collisions. The physics opportunities of the two machines are remarkably complementary, both machines offering significant opportunities for discovery in their own right, with a strong neutrino program.

The presentation will address the opportunities and challenges that the project presents, beginning with the implementation of a 100km infrastructure around Geneva for a > 70 years long exploitation, and possible synergies with high energy muon storage rings. The main challenges in accelerator technology are the design of a high efficiency RF system (for FCC-ee) and the design of affordable and high quality high field (16T) magnets for the FCC-hh. Some challenging aspects of the accelerator design for FCC-ee will also be discussed: crab-waist collisions and IR design, high precision centre-of-mass determination and the challenge of designing a monochromatization scheme for ee → H s-channel production.

Working group

WG3

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Session Classification: WG 3