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A new high-intensity facility at the CERN North Area

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With their roots in the Physics Beyond Colliders (PBC) Study Group at CERN, several ideas for exploiting the full scientific potential at the Super Proton Synchrotron (SPS) Fixed-Target complex have been brought forward. Amongst them, several proposals wish to utilise the full intensity potential that the accelerator can provide. The ECN3 cavern in the CERN North Area was identified as a candidate location for a future high-intensity experimental facility that will be able to host a selection of the proposed experiments. We report about the findings of the ECN3 Beam Delivery Task Force, which has been mandated to assess the feasibility of transporting the slowly extracted 400 GeV/c beam to ECN3. This includes an assessment of necessary infrastructure upgrades, ensuring compatibility with the North Area Consolidation project that aims to renovate the partly over 40-year-old complex.

One proposal aims at converting ECN3 to a beam dump facility that would host the Search for Hidden Particles experiment (SHiP), aiming at searches for weakly interacting long-lived particles such as heavy neutral leptons, dark photons, dark scalars, and axion-like particles, at the MeV to GeV scale. Another proposal, HIKE (High Intensity Kaon Experiments), aims at an upgrade of the existing charged Kaon beam line K12 that currently serves the NA62 experiment. The beam line upgrade for charged (Phase 1) and neutral kaons (Phase 2) has been studied in the PBC Conventional Beams Working Group together with a conceptual design for integrating an off-axis beam-dump experiment, SHADOWS (Search for Hidden And Dark Objects With the SPS), which would be compatible with parallel operation with HIKE in beam-dump mode.

Parallel Session

Future Facilities and Directions

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