

10th Beam Telescopes and Test Beams Workshop



Contribution ID: 17

Type: **Talk**

CERN North Area Multi-Purpose Superconducting Magnet Facility

Monday 20 June 2022 14:30 (20 minutes)

In the context of EP R&D, CERN is developing a multi-purpose superconducting magnet test facility to be used for future detector and electronic device testing at the North Area beam-test area. The facility will serve as a replacement of the existing M1 and Morpurgo magnets that have been in operation since the late 70s. The facility is envisioned to serve all the testing requirements for the following 50 years together with the proton beam of the Super Proton Synchrotron (SPS).

The magnet will have a central field of 4 Tesla with a free-bore volume of 1 cubic metre. The magnet will take either the form of a split solenoid, allowing dual use as a dipole or solenoid, or a skateboard tilted race-track design, allowing dipole function. It is envisioned to use Niobium Titanium Rutherford cables with a Nickel-Aluminium stabiliser. The operation temperature will be 4.5 K with liquid Helium cooling. The stray fields are being minimised to be below 12 mT at a distance of 5 m from the central point. The magnet will also incorporate bespoke Persistent Current Switches studied and developed in-house and well as possible inclusion of cryo-coolers.

The North Area Superconducting Magnet facility is an important project for the testing and development of future detectors and electronics at CERN, specifically components that will be utilised in the Future Circular Collider (FCC), the new 100 km collider to be built at CERN. This innovative facility therefore serves as an important step for the future activities of CERN and the future of colliders.

Authors: NERONI, Michela (Sapienza Università e INFN, Roma I (IT)); SINGH, Shuvay (CERN); GLUCHOWSKA, Weronika (University of Wrocław (PL))

Co-authors: DUDAREV, Alexey (CERN); CURE, Benoit (CERN); MALINOWSKI, Filip Maciej (The University of Edinburgh (GB)); MENTINK, Matthias (CERN)

Presenter: SINGH, Shuvay (CERN)

Session Classification: Facilities