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Development status of a NbTi conduction-cooled superconducting quadrupole magnet combined with dipole correctors for the ILC main linac

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In the International Linear Collider (ILC) main linac, superconducting quadrupole (SCQ) magnets combined with dipole correctors, together with superconducting radio frequency (SRF) cavities, will be used to transport and accelerate electron and positron beams to the collision point. The SRF cavity accelerates the beam up to 125 GeV per side, the SCQ focuses the beam, and the dipole correctors steer the beam and transport it along with the geoid.

A 5-year plan to manufacture one ILC-type cryomodule began at KEK in 2023 with international collaboration. A prototype SCQ is being manufactured currently. It consists of 4 sets of race-track coils and each set has three coils for quadrupole, vertical dipole, and horizontal dipole. An excitation test will be performed at cryogenic temperature with a newly fabricated stand-alone test cryostat by March 2026. In the poster, the status of SCQ fabrication and the stand-alone test cryostat will be reported.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

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