Single-stretched wire and vibrating-wire measurements at CERN

(G. Deferne, P. Arapaia, J. Garcia Perez, C. Petrone, S. Russenschuck, L. Walckiers)

The Single Stretched Wire (SSW) systems have become a vital tool for the measurement of integrated fields, magnetic axis, and field direction of super and normal-conducting accelerator magnets. The systems used at CERN, built more than 10 year ago at Fermilab, have reached the end of their life cycle.

The development of new systems, equipped with present-day hardware and driven by the FFMM software framework has just begun. We present a review of the requirements and the equipment status of the new system. Moreover, we show results of tests performed on a new Cu-Nb wire and vibration response measurements of aluminum structures used for magnetic measurement benches.

The oscillating wire method, which uses the same transport hardware as the single stretched wire, has been further investigated in view of new applications: quadrupole magnetic-axis measurements with higher sensitivity, field strength measurements with compensation of higher-order field harmonics, axis measurements of solenoids, and integrated field harmonics on circular and elliptic trajectories.