A Systematic Study on Pulsed Wire System for Magnetic Field Measurements on Long Undulator with High Field

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The pulsed wire method for magnetic field measurement has been developed and reported by several groups [1,3]. Most of the systems were applied to short undulators with low field. Using these systems, some extra regular signals deform the normal ones of the 1st integral field and made the measurements on long insertion with high field unfeasible. The sources of these regular signals were discussed [1,2,3]. The uniformity and stiffness of the wire was of concern. Applying a high tension to the wire was recommended.

To measure a small-gap superconducting multiple wiggler to be fabricated in SRRC, a pulsed wire system is required. Before this, a systematic study of this system has been done by testing on a short undulator and the U10p with a total length of 2m and a peak field of 1 Tesla. We identify that one of the main sources is the impurity in wire. Most of the other extra regular signals could also be further explained theoretically and demonstrated experimentally. The conditions to reduce the extra signals are optimized.

References


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