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Tue-Af-Po2.19-01 [42]: Instantaneous AC Loss Measurement of HTS Coil

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AC loss is one of the important considerations in the design and operation of high temperature superconducting (HTS) devices. Traditional method to measure AC loss generated in HTS coil is to measure the coil voltage' s resistive component by using a lock-in amplifier. This method has several limitations during application. In order to solve these problems, integration method and energy conservation theorem are used in this paper to measure HTS coil's AC loss. In this method, voltage and current of HTS coil are simultaneously acquired by data acquisition device and converted to digital signals. And then these data are processed in a computer to get the coil's instantaneous AC loss. Based on this method, a measurement platform is constructed. Details of the platform and algorithm of data processing have been introduced in this paper. Also model for calculating the AC loss of superconducting coil is built with the finite element software COMSOL. By comparing the measurement and calculating results, it is proved that this method can be applied to effectively measure the HTS coil's instantaneous AC loss.

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