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## Accurate Measurement of the Superconducting Current in 2G HTS Coil with Rogowski coil in Cryogenic Environment

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This paper presents a Rogowski coil which is utilized to accurately measure the current value in second-generation (2G) high temperature superconducting (HTS) coil in cryogenic environment. We demonstrate the structure and key materials of this Rogowski coil. To ensure the accuracy measurement of superconducting current in cryogenic temperature, this Rogowski coil is fabricated into closed and rigid shape. Foamed plastic is used to fix the 2G HTS wire in the center of Rogowski coil. Silicon nitride ceramic is chosen to build the winding holder due its proper thermal contraction rate and mechanical strength in cryogenic environment. Experiments were carried out to demonstrate the potentials of the Rogowski coil in accurately measuring the current in 2G HTS coil. The performance of this Rogowski coil was evaluated in liquid nitrogen bath at 77 K. The results show the stability and accuracy of this current measurement method.

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