



Development of Metallic magnetic calorimeters with a critical temperature switch

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We report the progress on the development of meander-shaped metallic magnetic calorimeters (MMCs) with a critical temperature switch. A meander-shaped coil in the MMC should form a superconducting loop to measure the magnetic signal and to apply a persistent field current to magnetize the sensor material of the MMC. In this work, a part of the superconducting loop is fabricated with another superconducting material with its transition temperature (T_c) lower than that of niobium. A persistent current can be injected in the loop while reducing the temperature from above to below T_c . Several materials were tested for the critical temperature switch, and compared with a conventional way of injecting a current in one niobium loop with a heater. These devices will be used in the AMoRE (Advance Mo-based Rare process Experiment) neutrinoless double beta decay search experiment that requires hundreds of MMC devices running with the same amount of persistent current.