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## **MMC critical temperature switch development with an integrated heater**

*Tuesday, July 23, 2019 6:45 PM (15 minutes)*

We developed metal magnetic calorimeters (MMCs) having a critical temperature switch to inject a persistent current on the integrated planar Nb coil. A part of the Nb superconducting loop was fabricated with an alloy of 38% Nb and 62% Ta concentration. The NbTa switch showed a clear superconducting transition at 5.29 K. Persistent currents as large as 120 mA were successfully charged with the critical temperature switch. In addition, we fabricate a meander-patterned metal film on the MMC device. With the on-chip heater operation, only the MMC device can be heated to reach the temperature of the device at the  $T_c$  of the switch while keeping the system temperature unchanged. Moreover, a periodic supply of small current pulses on the heater can be used as a reference of gain stabilization signals. We report on the recent progress on this hybrid configuration with multi-channel application of the critical temperature switch.

### **Less than 5 years of experience since completion of Ph.D**

N

### **Student (Ph.D., M.Sc. or B.Sc.)**

N

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