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## **Radiant cooling of the rotator in a superconducting induction motor**

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We have been developing a cryogen-free superconducting induction motor, which is thermally insulated in a single vacuum vessel, which ensures a high thermal insulation and a short distance between stator and rotator. High temperature superconducting coils are embedded in both the stator and the rotator, and the stator is cooled below the critical temperature  $T_c$  with a compact cryocooler through solid state thermal conduction. On the other hand, the rotator is cooled below  $T_c$  by radiation. This radiant cooling is enabled by the structure that the stator and the rotator have a lot of coaxial fins whose surfaces are coated with ceramics to enlarge emissivity. In this work the efficiency and the validity of the radiant cooling which enables to produce closed superconducting currents on a rotator without current leads are reported.

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