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## **C1Po1A-09 [17]: Development of a cryo-rotary joint for thermosyphon cooling system up to 1000 rpm**

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Electric propulsion systems with MW-class output power density are expected to reduce fuel consumption of the current passenger aircrafts. In this scheme, motors and generators should have an output of 4000-30000 hp and capable of high-speed rotation. A high-temperature superconducting motor fitted with an adequate cooling system has the potential to achieve the requested efficiency and high-power density. The cooling system is required to maintain the operating temperature under high-speeds, over 1000 rpm. The cryo-rotary joint is an integral part of the cooling system as it is necessary to provide refrigerant to the evaporator in the rotor. However, the cryo-rotary joint generates heat as a function of rotating speed. The heat is significant at high-speeds and it affects to both efficiency and the cooling system. To solve this problem, we developed the cryo-rotary joint which has a structure to suppress the heat generation. The new cryo-rotary joint was installed for a neon thermosyphon cooling system to evaluate its performance at speeds up to 1000 rpm.

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