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Low temperature thermal conductivity of alloys used in cryogenic coaxial cables AKIHIRO KUSHINO, Asahikawa National College of Technology, SOICHI KASAI, COAX CO., LTD. — We have developed thin seamless coaxial cables applied for readout in low temperature experiments below liquid helium temperature. Stainless steel employed as the center and outer electrical conductors of the coaxial cable has adequately low thermal conductivity compared to pure metals and can be used when heat penetration into low temperature stages through cables should be lowered however it has large electrical resistivity which can disturb sensitive measurements. Superconducting NbTi alloy has good performance with rather low thermal conductivity and high electrical conductivity. Meanwhile coaxial cables using normal conducting copper alloys such as cupro-nickel, brass, beryllium-copper, phosphor-bronze are advantageous with their good electrical, thermal and cost performances. We investigated thermal conductivity of such alloys after the drawing process into coaxial cables, and compared to expected values without drawing.

Akihiro Kushino
Asahikawa National College of Technology

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