Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Measurement of semi-rigid coaxial cables at cryogenic temperature -thermal conductance and attenuation- SOICHI KASAI, COAX CO., LTD., AKIHIRO KUSHINO, Asahikawa National College of Technology — We are developing semi-rigid coaxial cables for low temperature experiments which require fast readout with low noise. Coaxial cables used at low temperature are made of low thermal conductivity materials, such as stainless-steel, cupro-nickel and polytetrafluoroethylene to suppress heat penetration through cables. As the thermal conductivity of such alloys is affected by the thermal and mechanical treatment in forming process, we have to measure thermal property of coaxial cables after forming. The low thermal conductance of 5.5 cm specimen was measured by the steady-state heat-flow method with 1m long and thin niobium-titanium wiring for thermometers and heaters. Signal attenuation of coaxial cables was measured at 3K stage of an adiabatic demagnetization refrigerator. In order to cool center electrical conductor, the cables with 1m long length were coiled, and surrounded by copper blocks then attached to 3K stage. We successfully observed superconducting transition of center conductor of superconducting niobium-titanium coaxial cables with this method.

Akihiro Kushino
Asahikawa National College of Technology

Date submitted: 09 Nov 2012 Electronic form version 1.4