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Development of thin semi-rigid coaxial cables as low-pass filter using bilayer structure in center conductors AKIHIRO KUSHINO, Kurume University, YUSEI YAMAMOTO, TETSUYA OKUYAMA, National Colleges of Technology, Kurume College, SOICHI KASAI, COAX CO. LTD. — We have developed and evaluated thin semi-rigid coaxial cables as the noise filter for readout in low temperature experiments. The cables reported have 0.86 mm outer diameters consisting of seamless outer conductor, polytetrafluoroethylene (PTFE) dielectric, and center conductor made of superconducting niobium-titanium (NbTi). Each center conductor has surficial cladding made of normal conductor in different thickness. We had reported that we can adjust attenuation magnitude and cut-off frequency of the semi-rigid cable in the range about 100 ~500 MHz by controlling cable length and/or thickness of cladding. We newly manufactured this type of low-pass filter cables using stainless-steel (SUS304) as the material for cladding which has higher electrical resistivity than that of cupro-nickel (CuNi). It enables high filtering efficiency, i.e. large attenuation at the same frequency, compared to those made of conventional CuNi-based low-pass-filter cables.

Akihiro Kushino
Kurume University

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