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Phase-temperature stability measurement of various RF coaxial cables

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Phase stable coaxial cables are widely used for the transmission of reference signals, monitoring signals and control signals in accelerator low-level RF, beam measurement and control systems, especially for high requirements of time/phase stability. The change in ambient temperature will change the electrical length of the coaxial cables leading to the transmission time/signal phase drift, this effect is termed as temperature coefficient of delay(TCD). The TCD curves at room temperature (15~40deg) of various types of coaxial cables commonly used in particle accelerators and other industries are measured. Some cables are tested for the first time, the cables with lowest coefficients are CommScope LDF2-50A, Trigiant HCTAYZ-50-22, and Zhongtian HCAAYZ-50-12 for different cable diameters. According to attenuation, mechanical and TCD parameters, these three cables are chosen in the HEPS phase reference line system and Linac LLRF system respectively.

Footnotes

Funding Agency

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