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Waveguide system for SRF cryomodule in KEK

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A superconducting radio frequency (SRF) cryomodule (CM) for the International Linear Collider (ILC) Technology Network (ITN) is being developed at KEK. In the scope of this, a waveguide system is being designed. Its main features are a low center of gravity, a reduced number of corners and waveguide elements, and a compact bellow for connecting it to the input power coupler. Furthermore, the waveguide layout was designed to stay within the CM. This will avoid interference between components in the case of a multi-CM assembly. It is planned to adapt both the waveguide system and the installation process for the ITN.

Analytical calculations and simulations have shown that most of the reflected power is dissipated in the load of the variable hybrid on removing the circulator. Thus, in the initial layout of the waveguide, the circulator is strategically installed to allow a future replacement with an H-corner integrated with a directional coupler, without disrupting the other waveguide components. Furthermore, a low-power test on a similar waveguide system showed that analytical calculations and simulation matched the measured values well.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Asia

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