

FABRICATION AND TEST OF HIGH POWER COUPLERS FOR SUPERCONDUCTING ACCELERATORS

Submitted by:

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Abstract

Communications and Power Industries (CPI) and AMAC International have jointly developed window couplers for superconducting accelerators operating at 805 MHz. Three window couplers were delivered to Jefferson Labs in the spring of 2002. The couplers were conditioned at JLAB at room temperature and were successfully qualified as prototypes for the SNS in May 2002. The couplers reached 1 MW traveling wave at 1 ms pulse widths for 30 Hz and 2.8 MW standing wave at 0.15 ms for 60 Hz.

In this collaborative effort, AMAC was responsible for the design of the couplers and CPI was responsible for the coupler fabrication and cold test. CPI also provided design for manufacturability assistance. In this presentation we focus on the design, fabrication, and test of the window couplers. The SNS prototype window coupler contains an alumina disk window and a water cooled center conductor as shown in Figure 1. Standard microwave tube industry fabrication procedures were used to assemble the window coupler.

We will also discuss some lessons learned relevant to cost reduction which may apply to future window couplers.

CPI and AMAC have also collaborated on the development of novel window couplers funded by a US Department of Energy SBIR program. These window couplers utilize a unique compression ring technology previously demonstrated by AMAC. We will compare the compression ring window couplers with the SNS prototypes which contain the ceramic under tension.

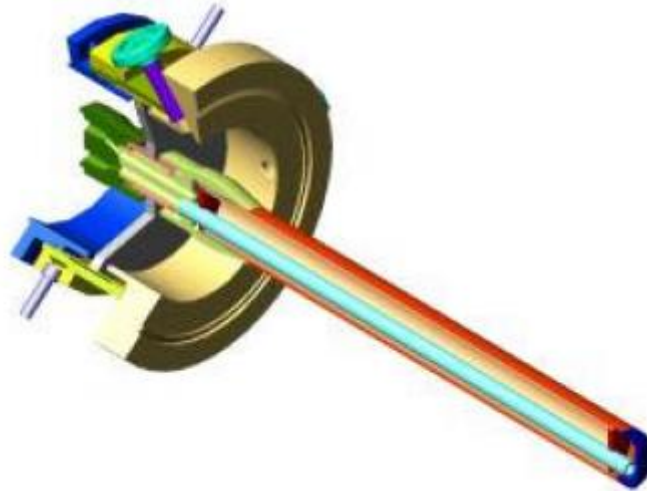


Figure 1. AMAC-CPI window coupler developed as SNS prototype.

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