Preparation and Testing of the SRF Cavities for the CEBAF 12 GeV Upgrade

A. Reilly, T. Bass, A. Burrill, K. Davis, F. Marhauser, C.E. Reece and M. Stirbet

Jefferson Laboratory, Newport News, VA 23606, U.S.A.

Eighty new 7-cell, LL cell-shaped cavities are required for the CEBAF 12 GeV Upgrade project. In addition to ten pre-production units fabricated at JLab, the full set of commercially produced cavities have been delivered. An efficient processing routine, which includes a controlled 30 micron EP, has been established to transform these cavities into qualified 8-cavity strings. This work began in 2010 and will run through the end of 2011. The realized cavity performance consistently exceeds project requirements and also the maximum useful gradient in CEBAF: 25 MV/m. We will describe the cavity processing and preparation protocols and summarize test results obtained to date.

CEBAF 12 GeV Upgrade

State-of-the-art production SRF cavity
7-cell CEBAF 12 GeV Upgrade Cavity

Qualified Cavities for 12 GeV Upgrade
Cryomodule C100-3

C100-1 string assembly

Production clean room activities

Vertical test Area (VTA): Dewars and control room

Summary:
- 86/86 cavities received
- 60/86 cavities electropolished
- 40/86 cavities VTA tested
- 38/86 cavities qualified in helium vessel
- 32/86 cavities ~ 4/10 strings completed, ready for #5
- Procedure suite established and tracked
- No SRF cavity performance issues currently open

Acknowledgments: JLAB SRF Institute Team

Funding Agency: Authorized by Jefferson Science Associates, LLC under U.S. DOE Contract No. DE-AC05-06R23177

100 years of superconductivity