

PRODUCTION 72 MHZ $\beta=0.077$ SUPERCONDUCTING QUARTER-WAVE CAVITIES FOR ATLAS

M.P. Kelly, Z.A. Conway, S.M. Gerbick, M. Kedzie, R.C. Murphy, B. Mustapha, P.N. Ostroumov, T. Reid [ANL]

Abstract

A total of eight 72 MHz $\beta=0.077$ superconducting quarter-wave cavities have recently been completed at Argonne National Laboratory. Seven of these will be installed into the ATLAS superconducting heavy-ion linac as part of a beam intensity upgrade, with one remaining for the purposes of continuing to push the performance limits in these structures. Cavities were fabricated using techniques adapted from the worldwide effort to push niobium cavities close to the material limits. Key developments include the use of electropolishing on the complete helium-jacketed cavity. Wire EDM has been used instead of traditional niobium machining in order to minimize performance-limiting defects near the weld seams. Hydrogen degassing at 600°C after electropolishing has also been performed. Initial test results show practical acceleration at 4 Kelvin with cavity voltages, $V_{acc} > 3$ MV/cavity and at 2 Kelvin with $B_{peak} > 120$ mT and $V_{acc} > 5$ MV/cavity.

**CONTRIBUTION NOT
RECEIVED**