

C13

Microfabrication of planar mm-wave cavity structures

Yoon W. Kang

Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL 60439

H. Henke

Technische Universitaet Berlin, Institut fuer institutions Theoretische Electrotechnik, Einsteinufer 17, 1000 Berlin 10, Germany

A.D. Feinerman

Department of Electrical Engineering and Computer Science, University of Illinois at Chicago, IL 60607

G.M. Wells and V. White

University of Wisconsin at Madison, Center for X-ray Lithography, Stoughton, WI 53589-3097

R.L. Kustom, F.E. Mills, A. Nassiri, and J.J. Song

Advanced Photon Source, Argonne National Laboratory, Argonne IL 60439

Construction and fabrication of planar mm-wave cavity structures have been investigated for use in linear accelerators and in radio frequency (rf) undulators. The mm-wave structures can be micromachined by the deep x-ray lithography process. A double-sided planar cavity structure has been used, since the conventional rotationally symmetric structure was not suitable for the micromachining process. Computer simulation of rf and beam properties and low power bench test of 10x scale models are shown in this paper. Both constant impedance and constant gradient structures have been investigated and their electrical characteristics are discussed. Ongoing effort on the fabrication and test of 60 ~ 120 GHz cavity structures is summarized.