CRYOGENIC TEST OF A TWO-CELL PASSIVE SRF CAVITY FOR NSLS-II

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Abstract

In collaboration with Brookhaven National Lab (BNL), Niowave, Inc. has built and performed the first cryogenic test on a two-cell passive SRF cavity for controlling electron bunch lengths at NSLS-II, the new 3rd generation synchrotron under construction at BNL. The structure is resonant at 1500 MHz, the third harmonic of the accelerating RF frequency. Because the cavity is powered by the beam itself, however, many frequencies could potentially be excited and higher-order modes must be strongly damped. Further, only one of the two cavity fundamental modes is used for the bunch length control, and the other mode has been carefully tuned so that it will be minimally excited by the electron bunches. The first cryogenic test has been performed to demonstrate a successful cooldown of the cavity in its cryomodule and to show that the cavity can be tuned to its operating frequency while the proper spacing between the two fundamental modes is maintained. A brief discussion of the cavity design will be presented along with some results from the cavity tuning and cryotest.

CONTRIBUTION NOT RECEIVED