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Surface Roughness Impedance*

G. V. Stupakov
Stanford Linear Accelerator Center, Stanford University, Stanford, CA 94309

Abstract

The next generation of linac-based free electron lasers will use very short bunches with a large peak current. For such beams, the impedance caused by submicron imperfections in the vacuum beam tube may generate an additional energy spread within the bunch. A review of two mechanisms of the roughness impedance is given with the emphasis on the importance of the high-aspect ratio property of the real surface roughness.

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