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Accession number:WOS:000306094600036
Title:USE OF RAMPED BUNCHES FOR AN ENHANCING OF TRANSFORMER RATIO IN COAXIAL DIELECTRIC STRUCTURES
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Source title:PROBLEMS OF ATOMIC SCIENCE AND TECHNOLOGY
Abbreviated source title:PROBL ATOM SCI TECH
Issue:3
Issue date:2012
Pages:164-168
Language:Russian
ISSN:1562-6016
Document type:Article
Publisher:KHARKOV INST PHYSICS & TECHNOLOGY, NATL SCIENCE CTR, 1 AKADEMICHESKAYA ST, KHARKOV, 61108, UKRAINE
Abstract:A main parameter of the dielectric wakefield accelerator is the transformation ratio. To in-crease it was suggested to use ramped bunch trains (so-called the RBT-technics) or multizone dielectric structures (CDWA). We demonstrate the possibility of use of RBT-technics to increase the transformer ratio in two channel dielectric structures. Two channel dielectric structure is two concentric dielectric tubes, mounted in metal casing. Axial vacuum channel is the acceleration channel for witness bunch, and the second vacuum channel is the transport channel for drive bunches. We show that for a significant increase in the transformer ratio in coaxial dielectric structures the conventional RBT technics should be modified. We report a modified algorithm of the charge distribution between bunches of train and spacing between them. Improved algorithm for the RBT-technics has been demonstrated for 30 GHz CDWA and 0,44 THz CDWA. In the first case it is possible to increase the transformer ratio from 3,8 to 20, while in the second case it was possible to increase the transformer ratio from 5,5 to 17. Also we study the transverse stability of the ramped drive bunch train in coaxial dielectric structures and compare this stability with single-channel dielectric structures.
Number of references:11
Main heading:Nuclear Science & Technology; Physics