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## Recent Work

### Title

Theoretical Examination of the Transfer Cavities in a Relativistic Klystron and a Standing-Wave Free-Electron Laser Two-Beam Accelerator

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**Theoretical Examination of the Transfer Cavities in a Relativistic Klystron and a Standing-Wave Free-Electron Laser Two-Beam Accelerator\***, Richa Govil and Andrew M. Sessler, Lawrence Berkeley Laboratory, University of California, Berkeley, CA 94720.

Recent analysis of the Two-Beam Accelerator, by Wurtele, Whittum and Sessler<sup>1</sup> has shown that the transfer cavities, be it in the relativistic klystron version (RK/TBA) or in the standing-wave free-electron laser version (SWFEL/TBA), can be characterized by a simple coupling impedance. In the two cases the modes that couple to the electron beam are different, but there is no other difference. As a result, then, computer programs that are able to handle realistic cavities (with beam ports and coupling ports, etc.) can be employed to evaluate the performance of either version of the Two-Beam Accelerator. We have employed the computer program MAFIA<sup>2</sup> to evaluate the proper coupling impedance for a number of realistic cavities.

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1. J.S. Wurtele, D. Whittum, and A.M. Sessler, "Impedance-Based Analysis of the Relativistic Klystron and the Standing-Wave Free-Electron Laser Two-Beam Accelerator", submitted for publication in the Proceedings of the XV<sup>th</sup> International Conference on High Energy Accelerators, Hamburg, July, 1992.

2. T. Weiland, Particle Accelerators **15**, 245 (1984); M. Bartsch, et al, Proceedings of the 1990 Linear Accelerator Conference, Los Alamos Laboratory LA-12004-C,372 (1991).