

**Numerical Studies of Wake Excitation in Plasma Channels**, B.A. SHADWICK and J.S. WURTELE, Department of Physics, UC BERKELEY, and Center for Beam Physics, LBNL - The wake fields produced by an intense, short laser pulse propagating in a plasma channel with an arbitrary density profile is investigated. Plasma channels, viewed as accelerating structures, have many desirable features that are not shared by a homogeneous plasma. They are also becoming experimentally realizable. As part of an overall program to analyze plasma channels as accelerating structures, a new fluid simulation code has been developed with the primary purpose of producing fast tools to explore parameter space for both theoretical investigation of accelerator performance as well as the modeling and design of experiments. This code has flexible physics content, for example, the laser either be fully resolved temporally or treated as ponderomotive force. An important feature, from the accelerator design point of view, is capability to study of beam propagation dynamics. We present preliminary results consisting of a detailed analysis of the transverse structure of the wake for a wide range of experimentally accessible channel profiles and characteristics of the corresponding accelerated beam.