XVI. RELATIVISTIC BEAMS*

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RESEARCH OBJECTIVES

This new program on high-intensity relativistic beams has been made possible by a long-term loan of an EG and G facility that produces in excess of 20.000 A of electron current with electron energies in excess of 250.000 eV. At present, we are assembling the unit. Our major goal is to understand the physics of the relativistic beam and of the secondary plasma produced around it. A knowledge of this beam-plasma interaction has potential applications in the generation of microwave and x-ray power and in the acceleration of heavy ions. It may also be potentially useful in injecting plasma into high magnetic field geometries for the purpose of producing controlled thermonuclear fusion.

Our first experiment is related to a measurement of the electron density during the first 10 ns of the pulse-generated plasma produced by the relativistic beam. The measurement technique uses novel optical spectroscopy of the quantum transitions that are normally forbidden.

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