

2P42

Short-Period-Wiggler Free Electron Lasers with Sheet Electron Beams.* J. H. BOOSKE, T. M. ANTONSEN, JR., D. BENGTON, W. W. DESTLER, V. L. GRANATSTEIN, P. E. LATHAM, B. LEVUSH, I. D. MAYERGOYZ, D. J. RADACK, and E. T. ROSENBURY, University of Maryland, College Park, MD 20742 USA.

We will report on the progress of a program to develop a millimeter-wave free electron laser (FEL) oscillator using a short period wiggler ($\lambda_w \approx 0.5$ to 1.0 cm) and a moderate energy (~ 500 keV) sheet electron beam. The presentation will include a description of recent experimental and theoretical results regarding such issues as sheet beam generation, propagation, and stability; oscillator cavity design; wiggler magnet development, and nonlinear analysis and design of the FEL interaction regions. A near-future FEL experiment is being planned using a 450 kV thermionic Pierce electron gun and the University of Maryland's 200 MW, 500 kV, 1.5 μ sec modulator power supply. Applications of this type of FEL include space-borne radar, heating of magnetic fusion plasmas, and drivers for accelerator-based FELs.

*Work support in part by U.S. Department of Energy and by SDIO/IST through a contract administered by the Harry Diamond Laboratory.