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**Design of a Positron–Electron Pair-Plasma Production Experiment on OMEGA EP** J. MYATT, A.V. MAXIMOV, R.W. SHORT, D.D. MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester — It is shown that an $e^+e^-$ pair-plasma can be created on OMEGA EP, a feat yet to be achieved in the laboratory. Monte Carlo calculations show that a yield of between $10^{11}$ and $10^{12}$ positrons can be produced on OMEGA EP by a combination of the Bethe–Heitler conversion of hard-x-ray bremsstrahlung[1] and the trident process,[2] assuming a total laser energy of 5 kJ. For the expanding $e^+e^-$ cloud to be a plasma, there must be many particles in a Debye sphere, and the cloud must be many Debye lengths in size. Particle-in-cell calculations are used to demonstrate that a megagauss DC magnetic field, produced by a second OMEGA EP beam, can be used to provide the necessary confinement and, therefore, density of the cloud. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement DE-FC52-92SF19460.

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[2]E. P. Liang *et al.*, Phys. Rev. Lett. **81**, 4887 (1998).

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