

The Physics and Properties of Free-Electron Lasers

Samuel Krinsky

NSLS, Brookhaven National Laboratory, Upton, NY 11973

We present an introduction to the operating principles of free-electron lasers (FELs), discussing the amplification process, the properties of the electron beam and the tolerances necessary to achieve desired performance. A brief overview of the types of accelerators used for FELs is provided. We also discuss some of the diagnostics critical to FEL operation.