

Performance Limitations of an X-Ray FEL,
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present a dimensionless analysis of a self amplified
spontaneous emission (SASE) FEL operating in an X-
ray wavelength band. Using similarity techniques we
have performed an analysis of the results of numerical
simulations and derived simple design formulae for
calculation of characteristics of the SASE FEL. We
have shown also that the growth of the energy spread
due to the quantum fluctuations of synchrotron
radiation imposes a limit on the minimal achievable
value of the wavelength in the X-ray FEL.