

XFEL Session 3e: Seeded FELs (Stephen Milton)

Homework assignment

In class I went through the steps to determine the bunching coefficient b_k for the high-gain harmonic generation (HGHG) case. For this I followed step by step what was done by Stupakov in his paper, "Using Beam Echo Effect for Generation of Short-Wavelength Radiation". This paper is posted on line for you to read. Also posted is the original paper by L.H. Yu, "Generation of Intense UV Radiation by Subharmonically Seeded Single-Pass Free-Electron Lasers". This last paper is the original paper by Yu detailing the concept of HGHG. Stupakov goes further in his paper. In section III he calculates the coefficient c_k for the echo-enabled harmonic generation (eehg) case. For your homework I would like you to physically, i.e. with paper and pen, follow through his calculation step by step at a level of detail that would make it simple for someone else to read and understand what you have done without reference to the original paper.