

FREE ELECTRON LASER BEAM QUALITY RESEARCH

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Abstract

After the first lasing at Stanford University in the late seventies, the free electron laser became the conceptual alternative radiation source at wavelengths from microwave to Xl-lrays. The search for applications focused on those requirements that took advantage of the FEL's unique properties; tunability, wavelength accessibility and scalability to high powers. After the end of the cold war, the FEL has addressed the 'Angstrom challenge'. Lasing in the hard Xl-lray requires multi kiloampere electron beams that are obtained by beam compression. A major physics issue in scaling to short wavelengths is the free electron laser beam quality. The evolution of free electron laser beam quality concepts since the original Stanford experiments will be discussed*.

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