

Beam Conditioning and FEL Studies Using MAD and Genesis

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Beam conditioning using a variety of lattices is explored using MAD in conjunction with Genesis. In particular, the conditioning effects of a simple FODO lattice are simulated in MAD and the resulting particle distribution is then used as an input to Genesis to examine the effects of a conditioner on FEL performance. Studies of a plasma-based conditioner have been performed. In this scheme conventional RF accelerating cavities are replaced by a plasma accelerator. The wavelength of the plasma wave is typically shorter than the longitudinal bunch length, resulting in regions of conditioned and unconditioned beam. Studies were also performed analyzing the sensitivity of FEL performance to changes in various system parameters.

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