

Abstract Submitted
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Effects of Errors of Velocity Tilt on Maximum Longitudinal Compression During Neutralized Drift Compression of Intense Beam Pulses¹ IGOR D. KAGANOVICH, PPPL, EDWARD A. STARTSEV, SCOTT MASSIDDA, RONALD C. DAVIDSON, Plasma Physics Laboratory, Princeton University, Princeton, NJ 08543 USA — Neutralized drift compression offers an effective means for particle beam focusing and current amplification. In neutralized drift compression, a linear longitudinal velocity tilt is applied to the beam pulse, so that the beam pulse compresses as it drifts in the focusing section. The beam intensity can increase more than a factor of 100 in the longitudinal direction. We have performed an analytical study of how errors in the velocity tilt acquired by the beam in the induction bunching module limits the maximum longitudinal compression. It is found in general that the compression ratio is determined by the relative errors in the velocity tilt. That is, one-percent errors may limit the compression to a factor of one hundred. However, part of pulse where the errors are small may compress to much higher values determined by the initial thermal spread of the beam pulse. Examples of slowly varying and rapidly varying errors compared to the beam pulse duration are studied.

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