

**Effect of Longitudinal Space Charge in the SLC,
FTTB and NLC Final-Focus Systems***,
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In a final-focus system, space-charge forces can be significant even for very high beam energies. The reason is the inherent large chromaticity of such a system, which needs to be compensated to a high precision. The longitudinal space-charge force causes an energy variation along the bunch, which depends on beam size, beam-pipe radius, and bunch population. Since this energy variation is location-dependent, it may affect the chromaticity balance and, thereby, increase the IP spot size. The space-charge force then gives rise to a limit on bunch intensity beyond which the resulting spot-size increase will degrade the final-focus performance. In this paper, the effect of longitudinal space charge is evaluated and intensity limits are derived for three existing or proposed final foci.

* Work supported by the Department of Energy, contract DE-AC03-76SF00515.