Collimator Wake Fields in the SLC Final Focus[*], F. ZIMMERMANN, K. BANE, C. NG, SLAC - The SLC final-focus system accommodates 29 fixed or adjustable collimators for machine protection and background reduction. By amplifying pulse-to-pulse orbit variations and by generating emittance growth, collimator wake fields may degrade the beam quality at the IP. In the SLC final focus, collimator half-apertures are larger than the bunch length, so that the standard collimator-wake formula of Bane and Morton does not apply. Numerical wake-field calculations for SLC parameters agree quite well with the high frequency impedance of a step-out transition, derived by Gianfelice and Palumbo. Due to the peculiar final-focus optics, the wake-field contributions from all collimators add coherently, and the overall impact on luminosity can be significant. This paper suggests that collimator wake fields in the final focus provide a possible explanation for the 30% discrepancy between actual and measured luminosity in the 1994/95 SLC run.

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