

**Results of the CESR Upgrade\***, D.L. RUBIN, CORNELL - The Cornell Electron Storage Ring operates with counterrotating beams of trains of bunches. The closely spaced bunches within each of the nine trains are separated at the parasitic crossings in the interaction region by a horizontal crossing half angle of about 2.3 mrad. In the machine arcs the beams are separated by a differential closed orbit distortion that is supported by electrostatic deflectors. CESR has achieved a peak luminosity of  $4.8 \text{ E}32/\text{cm}^2/\text{sec}$  with a total current of 350 mA and nine two-bunch trains in each beam. We measure a beam-beam tune shift of 0.043. For the 1997 calendar year a total of 3.4/fb was delivered to the CLEO experiment at energies on or near the Upsilon<sub>4s</sub> resonance, 5.3 GeV/beam. The first of four single cell 500 MHz superconducting accelerating cavities was installed in CESR in September 1997. The cavity operates routinely at an accelerating gradient of 6.3 MV/m at total beam current up to 390 mA. We have transmitted 140 kW to the beam through the cavity. We report details of the machine performance and work underway to increase beam current beyond the present limitations of longitudinal instabilities and cavity fundamental power coupler. We also describe efforts to eliminate optical errors and to increase the beam-beam tune shift parameter.

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