

Concentric Ring Colliding Beam Machine with Dual Aperture Quadrupoles*, A. MIKHAILICHENKO and D. RUBIN - In the Cornell Electron Storage Ring, the orbits of electrons and positrons are separated horizontally. The trajectories of the beams intersect as the horizontal betatron phase advances through half wavelengths, limiting to 45 the number of bunches that can be stored in each beam. If the CESR quadrupoles are replaced by double bore, side by side magnets, then the counter-rotating beams travel concentric orbits that intersect only at the interaction point. The separation of the centres of the side by side lenses defines the separation of the beams which is uniform through the arcs of the machine. The bunches can be spaced evenly about the circumference of the ring and as many as 180 bunches accommodated. The distance between the centres of the side by side lenses is limited by the aperture of the CESR bending magnets. A superconducting dual bore magnet with twin full apertures of 54 mm and axes separated by 81 mm has been designed and a prototype fabricated. We report details of the concentric ring scheme and properties of the magnet.

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