Abstract Submitted
for the APR10 Meeting of
The American Physical Society

Higher Order Chromaticity Correction for ELIC HISHAM SAYED, Jefferson Lab/ Old Dominion University, ALEX BOGACZ, Jefferson Lab — The proposed electron collider lattice design with extremely low betas at the interaction Point IP ($\beta^*\sim$ 0.5cm) and the precedently large longitudinal acceptance of the collider ring (Δp/p = 0.005) [1], makes the chromatic corrections of paramount importance. Here the chromatic effects of the final focus quadruples are corrected with two families of sextuples in a dispersive region; one family per plane. Each family consists of two pairs of sextuples located symmetrically around the interaction point IP. A confined dispersion wave around the IP is generated by two bending magnets (one at each side of the IP with mirror reflected Polarities) which also develop the vertical staking design. The resulting spherical aberrations induced by the sextuples are mitigated by design; the matching section optics features an inverse identity transformation between sextuples in each pair. A dedicated optics is placed in the matching region to implement sextuple orthogonality in both planes, which in turns minimizes the required sextuple strength and eventually leads to larger dynamic aperture of the collider. The betatron phase advances from the IP to the sextuples are chosen to eliminate the second order chromatic aberration.

Hisham Sayed
Jefferson Lab/ Old Dominion University

Date submitted: 12 Nov 2009 Electronic form version 1.4