

Optimization of Collimator Jaw Locations for the LHC, D.I. KALTCHEV, M.K. CRADDOCK, R.V. SERVRANCKX, TRIUMF - A highly effective collimation scheme is required in the LHC to limit heating of the vacuum chamber and superconducting magnets by protons either uncaptured at injection or scattered from the collision points. The proposed system /1/ would consist of one set of primary collimators followed by three sets of secondary collimators downstream to clean up protons scattered from the primaries. Each set of collimators would consist of four pairs of jaws - horizontal, vertical, and 45-degree skew. A study is reported of the optimization of the longitudinal positions of these jaws with the aim of minimizing the maximum betatron amplitudes of protons surviving the collimation system. This is performed using an analytical representation of the action of the jaws and is confirmed by tracking.

/1/ T. Trenkler, J. Jeanneret, The principles of two stage betatron and momentum collimation in particle accelerators, Particle Accelerators, 50, 287 (1995).