A Study of the RHIC Crystal Collimation*, M. HARRISON, A. STEVENS, D. TRBOJEVIC, BNL; V. BIRYUKOV, IHEP, Protvino; A. DROZHDIN, N. MOKHOV, FNAL - The Relativistic Heavy Ion Collider (RHIC) will experience increasing longitudinal and transverse heavy ion emittances, mostly due to intrabeam scattering (IBS). The experiments in RHIC are expected to not only have reduced luminosities due to IBS but also an unwanted beam halo. Primary betatron collimators will be used to remove the large amplitude particles. The efficiency of the primary collimator in RHIC depends very much on the alignment of the jaws which needs to be within few micro-radians for the best conditions. As proposed by V. Biryukov \footnote{International Simposium on Near Beam Physics at Fermilab in September 1997.} bent crystals could be used to improve the efficiency of an existing collimation system by installing them upstream of the collimator jaws. Bent crystals have been successfully used in SPS, Protvino and Fermilab for extraction of the beam particles channeled through them. This study examines possible improvements of the primary collimator system for heavy ions at RHIC by use of bent crystals. Bent crystals will reduce the collimator jaws alignment requirement and will reduce the background at the detector.

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