Transverse Splitting of Intense Heavy Ion Beams in the IRE and in an HIF Driver

C.M. Celata and A. Faltens

Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley, CA, USA

The final focus of intense heavy ion beams in a heavy ion inertial fusion driver limits the allowable perveance per beam. In the planned heavy ion Integrated Research Experiments (IRE), final beam kinetic energy will be low compared to a driver, increasing perveance significantly and making focus to a small spot comparatively much more difficult. Splitting of beams ahead of the final focus system would allow economical transport of large beams through the accelerator, while maintaining focusability. In this paper we consider the effects on beam quality of transverse beam splitting. The system of most interest consists of one or more consecutive magnetic septa. PIC simulations of this case will be shown, along with a discussion of engineering considerations. Since splitting decouples the number of beams transported in the accelerator from what is required at final focus, it should lower the cost of a driver. Extrapolation of the splitting system to a driver will also be discussed.

*This work supported by the Director, Office of Energy Research, Office of Fusion Energy, of the U.S. Department of Energy, under Contract No. DE-AC03-76SF00098.