

The Integrated Beam Experiment – A Next Step Experiment for Heavy Ion Fusion*

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The U.S. Heavy Ion Fusion Virtual National Laboratory is proposing as its next experiment the Integrated Beam Experiment (IBX). All experiments in the U.S. Heavy Ion Fusion (HIF) program up to this time have been of modest scale and have studied the physics of selected parts of a heavy ion driver. The mission of the IBX, a proof-of-principle experiment, is to demonstrate in one integrated experiment the transport from source to focus of a single heavy ion beam with driver-relevant parameters-- i.e., the production, acceleration, compression, neutralization, and final focus of such a beam. Present preconceptual designs for the IBX envision a 5-10 MeV induction linac accelerating one K^+ beam. At injection (1.7 MeV) the beam current is approximately 500 mA, with pulse length of 250 ns. Design flexibility allows for several different acceleration and compression schedules, including the possibility of longitudinal drift compression of a factor of up to ten in pulse length after acceleration. The physics requirements for the IBX, preliminary physics and engineering design work, and the physics experimental program will be discussed in this paper.

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