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## Recent Work

### **Title**

Multiple-beam ion guns for heavy ion fusion

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## Multiple-Beam Ion Guns for Heavy Ion Fusion\*

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Latest designs of ion guns for a Multiple-Beam-Injector (~50 A, ~1.6 MeV, ~100 beams) for Heavy Ion Fusion application have focused on two methods.

In the first approach each ion gun will deliver ~500 mA at full energy (~1.6 MeV) for each beam. In this case the accelerating column requires a rather large diameter channel, increasing the risk of electrical breakdowns in the injector. Our present design is based on a voltage holding capability of 1.6 MV in a 75-cm column.

In the second approach each ion gun will consist of multiple miniature beamlets (~20 mA) accelerated to an intermediate energy (~1 MeV) in their own channels and further accelerated while the beamlets are merged to produce the required current and energy (~500 mA, ~1.6 MeV). This method reduces the risk of electrical breakdowns but increases emittance due to beam merging.

We will present the ion gun designs and simulations based on these concepts.

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