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"The Modular Approach to Heavy Ion Fusion"

by
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We report on an ongoing study on modular Heavy Ion Fusion drivers. The modular driver is characterized by 10 to 20 nearly identical induction linacs, each carrying a single high current beam. In this scheme, the IRE can be one of the full size induction linacs. Hence, this approach offers significant advantages in terms of driver development path. For beam transport, these modules use solenoids which are capable of carrying high line charge densities, even at low energies. A new injector concept allows compression of the beam to high line densities right at the source. The final drift compression is performed in a plasma, in which the large repulsive space charge effects are neutralized. Finally, the beam is transversely compressed onto the target, using external solenoids or current-carrying channels, in the Assisted Pinch Mode of beam propagation. We will report on progress towards a self-consistent point design from injector to target. Considerations of driver architecture, chamber environment as well as the methodology for meeting target requirements of spot size, pulse shape and symmetry will also be described. Finally, some near-term experiments to address the key scientific issues will be discussed.