

Kicker Magnets and Modulators for Single-Pass RF Driver HIF

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Kicker magnets are used in the beam manipulations in the Single Pass RF Driver (SPRFD) HIF, which combine the beam output from the ion sources to the fuel target.

Kicker magnets are used in a set of converging beamlines that align the parallel beams from the injection RFQs into a common beam line. Then a coiled delay line, in which the beam is switched out by kickers after each turn of the coil delay line and back, further compress the beams. The incoming and delayed beams are separated into four parallel beam lines using additional kicker magnets. Finally, kicker magnets are used to direct the beams into two sides of the fuel target.

Kicker magnet design factors include field strength, good field volume, switch times, and waveform control. Optimization trade-offs regarding cost involve bore dimensions v. magnetic field quality are needed.

The type of the kicker magnets for their various uses will be described and assessed in light of existing magnet and modulator practice. The paper also will review the state of the art of kicker magnet applications, as relevant to the needs of the SPRFD

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