

Abstract Submitted
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Implementation of a RF pre-preionizer for FRCHX¹ MARK KOSTORA, SAIC, EDWARD RUDEN, Air Force Research Laboratory, Directed Energy Directorate — An RF pre-preionizer (applied prior to the main preionization discharge) has been implemented for the FRCHX experiment to increase plasma lifetime. The present 46 MHz system is based on one used on previous experiments such as LSX and TRAP at the University of Washington. RF from a 2.5 KW power supply charges conductors on either side of the quartz vacuum chamber, and capacitatively couple to the gas prefill to produce a weakly ionized plasma discharge. A new system is planned using an optimal frequency of 146 MHz to enhance the level of ionization, based on theoretical considerations presented. An important feature is the load match into a composite 50 ohm terminator and the plasma itself during and after gas breakdown. The previous configurations of the RF pre-preionizer resulted in a considerable improvement the lifetime of translated FRC. Changes in the lifetime of the FRC will be correlated with the application of the pre-preionizer circuit.

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