Abstract Submitted
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New Results with the Ignitor Pellet Injector[1] A. FRATTOLILLO, S. MIGLIORI, S. PODDA, F. BOMBARDA, ENEA (Italy), L.R. BAYLOR, S.K. COMBS, C.R. FOUST, S. MEITNER, D. FEHLING, ORNL, G. ROVETA, CRIOTEC Impianti (Italy) — The Ignitor Pellet Injector (IPI) has been developed in collaboration between ENEA and ORNL to provide greater control over the density time evolution and the density peaking in plasmas produced by the Ignitor device. The four barrel, two stage injector has been designed to reach speeds up to 4 km/s, for effective low field side injection into ignited plasmas ($T_e \cong T_i \cong 11$ keV). The present arrangement accomodates both a two-stage gun and a standard propellant valve on each barrel, allowing seamless switching between standard and high speed operation on any or all gun barrels. The cryostat is actively cooled by a pulse tube refrigerator, equipped with supplemental cooling from a liquid He dewar. The injector has shown very good repeatability; however, intact pellets were not observed over 2 km/s, possibly due to a spinning effect on the pellets at higher speed. The cross sections of the guiding tubes have been increased and other design improvements have been implemented, aimed in particular at reducing leak rates and reducing the dispersion of the pellet trajectories, in preparation of the experimental campaign reported here.

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