

Abstract Submitted
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Progress with the High Speed Pellet Injector for Ignitor* A. FRATTOLILLO, S. MIGLIORI, S. PODDA, F. BOMBARDA, ENEA, L.R. BAYLOR, S.K. COMBS, C.R. FOUST, S. MEITNER, D. FEHLING, ORNL, B. COPPI, MIT, G. ROVETA, CRIOTEC — The four barrel, two-stage Ignitor Pellet Injector (IPI) 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 IPI has been developed in collaboration between ORNL and ENEA, who have built and tested two independent subsystems each. Previous experimental campaigns at ORNL verified that the equipments matched properly, while their respective control systems interfaced correctly. The injector performed outstandingly well, showing very good repeatability. However, the pellet diagnostics expressly developed for this device did not observe intact pellets over 2 km/s. Recently a new arrangement was successfully tested, accommodating 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 cryogenic system was also improved with supplemental cooling by liquid helium. Injection speeds up to 2.6 km/s were obtained, but pellets seldom remained intact above 2 km/s. Optimization of power levels of the upstream and downstream heaters, which up to date have been used sparingly, in the next campaign could help in attaining integral pellets at higher speeds. *Sponsored in part by ENEA and by the D.O.E.

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