

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

The New High Speed Pellet Injector for the Ignitor Experiment^{*1}

S. MIGLIORI, A. FRATTOLILLO, F. BOMBARDA, ENEA, Italy, L.R. BAYLOR, S.K. COMBS, D. FEHLING, C. FOUST, ORNL, G. ROVETA, CRIOTEC Impianti, Italy — A four barrel, two-stage pellet injector for the Ignitor experiment is under construction in collaboration between the ENEA Laboratory at Frascati and Oak Ridge National Laboratory. The goal is to reach pellet velocities of about 4 km/s, capable of penetrating near the center of the plasma column when injected from the low field side, in order to control the density profile, especially during the crucial phase of the initial current ramp, and as a possible method to fuel the discharge or to provide fast burn control during the ignited phase. The innovative concepts at the basis of the injector design are the proper shaping of the propulsion gas pressure front and the use of fast valves to considerably reduce the requirements on the expansion volumes necessary to prevent the propulsion gas to reach the plasma chamber. The complete propelling and gas removal systems have been built and tested at CRIOTEC. ORNL is responsible for the design, construction, and testing of the pellet injector vacuum chamber, the cryogenic systems, the gun barrels, and pellet diagnostics. Integrated testing at high pellet speeds with a wide range of operating parameters explored is also going to be carried out at ORNL.

¹Supported in part by ENEA of Italy and by the US DOE.

Francesca Bombarda
ENEA

Date submitted: 21 Jul 2005

Electronic form version 1.4