

Abstract Submitted  
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**Experiments with the Ignitor Pellet Injector (IPI)**<sup>1</sup> A. FRATTO-LILLO, S. MIGLIORI, S. PODDA, F. BOMBARDA, ENEA, Italy, L.R. BAYLOR, J.B.O. CAUGHMAN, S.K. COMBS, C. FOUST, D. FEHLING, J.M. MCJILL, S. MEITNER, ORNL, G. ROVETA, CRIOTEC Impianti, Italy — The four barrel, two-stage pneumatic injector for the Ignitor experiment (IPI), built by ENEA and ORNL, has been tested in the course of three experimental campaigns. The optimal shaping of the propellant pressure pulse to improve pellet acceleration is provided by specially designed Pulse Shaping Valves. These have been modified and tested on a new facility that allows operating pellet injector components in conditions close to those at which they will have to operate on the IPI. Fast closing ( $< 10$  ms) valves drastically reduce the expansion volumes needed to remove the propellant gas at the end of the guiding tube. The four barrel (2.1, 2.2, 3.0 and 4.6 mm bores) pipe-gun cryostat is cooled down by a closed cycle refrigerator, and pellet diagnostics for measuring speed and mass of the pellets, as well as for capturing in-flight pictures of all four pellets were developed for this application. The final impact target is equipped with a shock accelerometer. The injector is designed to deliver pellets with velocities up to 4 km/s (2 km/s already achieved): the results of the latest experimental campaign will be reported.

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Francesca Bombarda  
ENEA - Italy

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