

Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Evaluating the equation-of-state models of nitrogen in the dissociation regime: an experimental effort JIANGTAO LI, QIFENG CHEN, ZHIJIAN FU, YUNJUN GU, JUN ZHENG, CHENGJUN LI, Institute of Fluid Physics, CAEP — A number of experiments were designed so that pre-compressed nitrogen (20 MPa) was shock-compressed reverberatively into a regime where molecular dissociation is expected to influence significantly the equation-of-state and transport properties. The equation of state of nitrogen after each compression process was probed by a joint diagnostics of multichannel optical pyrometer (MCOP) and Doppler pin system (DPS). The equation of state data thereby obtained span a pressure-density range of about 0.02-130 GPa and 0.22-5.9 g/cc. Furthermore, based on the uncertainties of the measurements, a Monte Carlo method was employed to evaluate the probability distribution of the thermodynamic state after each compression. According to Monte Carlo results, a number of equation-of-state models or calculations for nitrogen in the dissociation regime were assessed.

Jiangtao Li
Institute of Fluid Physics, CAEP

Date submitted: 22 Feb 2017

Electronic form version 1.4