Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Physics Properties of High Ratio Compression Gases CHENG LI, YIAN LEI, Peking Univ — High ratio adiabatic compression of gasses can reach very high temperature. In a conical liquid metal compression device, very high compression ratio up to 10_9 to 1 can be quite easily achieved. Idea gas compression would give a temperature rise of 10_6 times of original room temperature, which is tens of keVs, reaching the realm of nuclear fusion. However, as the gas is dissociated and ionized by under high temperature, the real situation is not so optimistic. We analyzed the physics of the high ratio compression of normal gasses, taking account of dissociation, ionization, radiation loss, and possible energy loss due to gas (plasmas) and wall interaction, and try to find the formalism for the temperature and pressure in the process. The above mechanism drastically lowered the temperature of adiabatic compression. We also discussed the possibility of fusion by pure compression.

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Date submitted: 12 Sep 2014 Electronic form version 1.4