Abstract Submitted
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Unusual self-similar spherical compression: theory and implementations JEAN GERIN-ROZE, CEA — We are showing a family of spherical implosions involving high compression rate. It depends on two parameters and we can work all of it out. **I Theory** What is an "unusual self-similar compression law"? Such a law is characterized by a classical self-similar law initiated by a convergent shock (cf Lazarus and Richtmyer LA6823MS-1977) followed by centred compression waves. We will explain completely the implosion given by this law. **II Implementations** We will apply such a law to a DT sphere (m=1.5 mug and ρ_0=0.003 g/cm3). We will describe the thermodynamical conditions obtained this way. Then we will compare these results to those obtained with a 1D hydrodynamical computational code under different hypotheses regarding outside conditions and gas EOS. We will discuss the agreement between model and computational code under the different hypotheses. **III Conclusion** Such a flow may be worth using: -It gives an accurate hydrodynamical benchmark with the difficult problem of spherical shock convergence. -It can be used to define laser experiments where very compressed matter is needed (spectroscopy experiments, thermonuclear ignition...). Indeed, it allows to build an optimized compression law for each problem. An interesting extension of this work will be to add a second medium surrounding the gas. By using the characteristic curves, we could obtain the outside conditions (pressure or speed versus time) for this more realistic geometry.

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