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Self-similar compression flows in spherical geometry: numerical calculations and implementations JEAN GERIN-ROZE, CEA/DAM/DIF — During the previous APS-SCCM meeting(2007) we exhibited a set of theoretical solutions for the implosion of a sphere initiated by a strong shock. We assumed that: 1. The sphere contains a perfect gas with a polytropic coefficient γ=5/3. 2. The shock follows the equation: $r_s/r_0=(-t/t_{foc})^\alpha$ where α is a positive constant and where $-t_{foc} <t<0$ The well known G.Guderley solution corresponds to $\alpha = \alpha_{ref}= 0.6883$ and we showed that one other self-similar solution exists for each value of α between 0 and α_{ref}. In this paper, we continue this work by solving numerically two particular problems with shock parameter α=1/2 and α=2/3. The theoretical solutions are obtained with a very good accuracy. For example, the relative gap on the focalization time is less than 1/10000. Then, we use one of these implosions (α=2/3) to generate thermonuclear neutrons in DT gas. These neutrons are obtained very early, before the focalization of the initial shock.

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