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Low Convergence path to Fusion I: Ignition physics and high margin design KIM MOLVIG, Los Alamos National Laboratory and MIT, M.J. SCHMITT, G.H. MCCALL, Los Alamos National Laboratory, R. BETTI, D.H. FOULA, E.M. CAMPBELL, Laboratory for Laser Energetic, Univ. of Rochester — A new class of inertial fusion capsules is presented that combines multi-shell targets with laser direct drive at low intensity (280 TW/cm^2) to achieve robust ignition. These Revolver targets [K. Molvig, et. al., *Phys. Rev. Letters,* **116**, 255003 (2016)] consist of three concentric metal shells, enclosing a volume of 10s of g of liquid deuterium-tritium fuel. The inner shell pusher, nominally of gold, is compressed to over 2000 g/cc, effectively trapping the radiation and enabling ignition at low temperature (2.5 keV) and relatively low implosion velocity (20 cm/micro-sec) at a fuel convergence of 9. Ignition is designed to occur well "upstream" from stagnation, with implosion velocity at 90% of maximum, so that any deceleration phase mix will occur only after ignition. Mix, in all its non-predictable manifestations, will effect net yield in a Revolver target – but not the achievement of ignition and robust burn. Simplicity of the physics is the dominant principle. There is no high gain requirement. These basic physics elements can be combined into a simple analytic model that generates a complete target design specification given the fuel mass and the kinetic energy needed in the middle (drive) shell (of order 80 kJ). This research supported by the US DOE/NNSA, performed in part at LANL, operated by LANS LLC under contract DE-AC52-06NA25396.

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