Abstract Submitted
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Investigating the Role of Transport in Uniaxially-Driven Conical Fusion Targets DAVE CHAPMAN, JAMES PECOVER, DAN VASSILEV, NICOLAS NIASSE, NATHAN JOINER, NICHOLAS HAWKER, First Light Fusion Ltd, JERRY CHITTENDEN, Imperial College London — First Light Fusion is exploring a unique route toward controlled inertial confinement fusion, a core part of which is the use of a uniaxial, projectile-based driver. An important example of a fusion target aligned with this configuration is that considered by Derentowicz et al. [1]. The fuel energetics in this target are influenced by numerous transport processes: thermal conduction, material interface transport, temperature relaxation, radiation transport, self-generated fields, kinetic reactivity reduction, strong shear flows and viscous shock damping. Preliminary results show that heat flow between the fuel and anvil is the strongest handle on the predicted yield. This is exacerbated by the prediction of warm, dense states of matter, wherein thermophysical properties remain broadly uncertain. This submission will present sensitivity study results from integrated simulations focusing on the influence of salient transport phenomena. The impact of widely-used, simplistic models on the predicted yield is examined in contrast to more detailed approaches. The way in which admixtures of high-Z dopants, and more generally multi-component materials, should be handled is also considered. References [1] H. Derentowicz, et al., Bull. L'Acad. Polon. Sci. Ser. Sci. Techn. 25, 135 (1977)

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