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Abstract for an Invited Paper  
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**The simulation basis for cryogenic layered implosion experiments on the National Ignition Facility<sup>1</sup>**  
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The National Ignition Campaign (NIC) uses non-igniting “THD” capsules to study and optimize the hydrodynamic assembly of the fuel without burn. These capsules are designed to simultaneously reduce DT neutron yield and to maintain hydrodynamic similarity with the DT ignition capsule. We will discuss nominal THD performance and the associated experimental observables. We will show the results of large ensembles of numerical simulations of THD and DT implosions and their simulated diagnostic outputs. These simulations cover a broad range of both nominal and off-nominal implosions. We will focus on the development of an experimental implosion performance metric called the experimental ignition threshold factor (ITFX). We will discuss the relationship between ITFX and other integrated performance metrics, including the ignition threshold factor (ITF), the generalized Lawson criterion (GLC; see Zhou and Betti, *Physics of Plasmas*, 15, 10, 2008), and the hot spot pressure (HSP). We will then consider the experimental results of the recent NIC THD campaign. We will show that we can observe the key quantities for producing a measured ITFX and for inferring the other performance metrics. We will discuss briefly the upcoming tuning campaign aimed at taking the next steps in performance improvement on the path to ignition on NIF.

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