Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Evaluation of effects of bonding joint in machined capsules on ignition at the National Ignition Facility (NIF) JAMES COOLEY, DOUG WILSON, Los Alamos National Laboratory — The current point design for ignition capsules to be fielded at NIF is a beryillium capsule with a graded copper dopant made by a sputtering process. Although this fabrication process has been and continues to improve there is still a desire to provide an alternative capsule, should the sputtering process fail to meet all specified requirements. To this end, capsules made with uniform copper dopant and by a machining process are still a viable alternative to those made with sputtering. These capsules are made as two hemispheres and then bonded together with a small weld joint. However, one major risk for the viability of these machined capsules is the effect of this joint on the ignition performance of these capsules. To mitigate the expected effect of these joints on ignition the National Ignition Campaign (NIC), last year, specified that these joints would be 0.1 mm wide and only penetrate 1/3 of the ablator shell. These specifications were chosen for two reasons, the target fabrication was feasible, although at the very limit of expected capabilities, and the limited calculations we had performed to date indicated that with this specification we should not effect ignition. In this paper, we present further simulations using the code HYDRA, which help bound the requirements for the fabrication of this joint. These calculations further enhance our confidence that a machined capsule with a joint as specified is a viable alternative to the sputtered capsule, should an alternative design be required.

James Cooley
Los Alamos National Laboratories

Date submitted: 10 Jul 2006 Electronic form version 1.4