Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Radiochemical Signatures of Interfacial Areal Density and Mix in NIF Implosions[1] CHARLES CERJAN, WILLIAM CASSATA, CAROL VELSKO, ROB HOFFMAN, SCOTT SEPKE, DONALD JEDLOVEC, WOLFGANG STOEFFL, DAWN SHAUGHNESSY, Lawrence Livermore National Laboratory
— Recent experimental results from the Radiochemical Analysis of Gaseous Samples (RAGS) diagnostic facility fielded at the National Ignition Facility (NIF) have demonstrated ^{13}N production from charged particle nuclear reactions. This radiochemical product is very sensitive to the fuel-ablator interface areal density. Two specific reactions dominate ^{13}N production: ^{12}C(d,n)^{13}N and ^{13}C(p,n)^{13}N. The short range of the energetically up-scattered deuterons from the cold DT fuel layer restricts the production to the proximate ablator interface thus providing high sensitivity to the interfacial configuration. Although the proton-mediated reaction is almost equally favorable, the small natural abundance of ^{13}C suppresses this contribution to ^{13}N production. Representative HYDRA simulations are used to illustrate these observed effects.

[1]This work was performed under the auspices of the U. S. Department of Energy by the Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Charles Cerjan
Lawrence Livermore National Laboratory

Date submitted: 10 Jul 2015 Electronic form version 1.4