

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Gamma Reaction History on Sandia's Z Machine KEVIN YATES, YONGHO KIM, HANS HERRMANN, Los Alamos National Laboratory, GORDON CHANDLER, PAT LAKE, MICHAEL JONES, CHRIS BALL, Sandia National Laboratory, MORRIS KAUFMAN, JAMES CORCORAN, Mission Support and Test Services, KEVIN MEANEY, Los Alamos National Laboratory, MICHAEL SPRINGSTEAD, Los Alamos National Laboratory, LOS ALAMOS NATIONAL LABORATORY TEAM, SANDIA NATIONAL LABORATORY TEAM, MISSION SUPPORT AND TEST SERVICES TEAM — A Gamma Reaction History (GRH) diagnostic has been fielded successfully at the OMEGA laser facility and the NIF for several years to measure fusion reaction history in ICF experiments. Recently, the OMEGA GRH was removed and is currently being modified to field on Sandia's Z machine to demonstrate the ability to measure gamma ray reaction history. The introduction of tritium into the z-pinch experiments provides the necessary gammas for analysis of the reaction history. We will outline the proposed experiments which include mixtures of deuterium (99%) and tritium (1%) as well as deuterium (50%) and helium 3 (50%) with the ultimate goal of diagnosing the evolution of the fusion plasma on Z. D3He also has a steep dependence on ion temperature, making the reactivity ratio between DT and D3He a sensitive ion temperature indicator. D3He is also highly sensitive to non-thermal beam reactions and can provide an indication of the degree of thermalization of the fusion plasmas. X-ray backgrounds are currently being assessed with Aerogel Cherenkov Detectors (ACD) to determine the feasibility of measuring DT and D3He gammas above the background.

Kevin Yates
Los Alamos National Laboratory

Date submitted: 01 Jul 2019

Electronic form version 1.4