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Copper activation signatures for ablation rate measurements in inertial confinement fusion targets¹ BRIAN SPEARS, MARK STOYER, HARRY ROBEY, DAVID MUNRO, DAVID BRADLEY, PETER AMENDT, Lawrence Livermore National Laboratory, DOUGLAS WILSON, Los Alamos National Laboratory, RICK OLSON, Sandia National Laboratory — Current NIF ignition designs employ an xray-driven Be(Cu) ablator to accelerate and compress the DT fuel. Ignition specifications require that the mass of unablated Be(Cu) be known to within 1% of the initial mass when the fuel reaches peak velocity. We describe here a diagnostic technique to measure the remaining unablated mass to this specification. The technique relies on the activation of Cu by neutrons escaping the imploded core. The fraction of activated Cu is proportional to the areal mass of Cu at the time of neutron yield. By capturing and analyzing debris from the implosion, we may measure the Cu activation fraction and thus the areal mass. This areal mass can then be used to infer the mass of remaining ablator. We will compare the performance of this measurement with other techniques for measuring ablation rate.

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