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Search for reaction-in-flight neutrons using thulium activation at the National Ignition Facility GARY GRIM, ROBERT RUNDBERG, ANTON TONCHEV, MALCOLM FOWLER, JERRY WILHELMY, TOM ARCHULETA, Los Alamos National Laboratory, RICHARD BIONTA, Lawrence Livermore National Laboratory, MITZI BOSWELL, Los Alamos National Laboratory, JULIE GOSTIC, Lawrence Livermore National Laboratory, JEFF GRIEGO, Los Alamos National Laboratory, KENN KNITTEL, Lawrence Livermore National Laboratory, ANDI KLEIN, Los Alamos National Laboratory, KEN MOODY, DAWN SHAUGHNESSY, Lawrence Livermore National Laboratory, CARL WILDE, Los Alamos National Laboratory, CHARLES YEAMANS, Lawrence Livermore National Laboratory — We report on measurements of reaction-in-flight (RIF) neutrons at the National Ignition Facility. RIF neutrons are produced in cryogenically layered implosion by up-scattered deuterium, or tritium ions that undergo subsequent fusion reactions. The rate of RIF neutron production is proportional to the fuel areal density (ρR) and ion-stopping length in the dense fuel assembly. Thus, RIF neutrons provide information on charge particle stopping in a strongly coupled plasma, where perturbative modeling breaks down. To measure RIF neutrons, a set of thulium activation foils was placed 50 cm from layered cryogenic implosions at the NIF. The reaction $^{169}\text{Tm}(n,3n)^{167}\text{Tm}$ has a neutron kinetic energy threshold of 14.96 MeV. We will present results from initial experiments performed during the spring of 2013. Prepared by LANL under Contract DE-AC-52-06-NA25396, TSPA, LA-UR-13-22085.

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