Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Measurements of the DT and DD Fusion Gamow Peak in High-Temperature Plasmas OWEN MANNION, CHAD FORREST, VLADIMIR GLEBOV, JAMES KNAUER, ZAARAH MOHAMED, SEAN REGAN, CHRISTIAN STOECKL, Laboratory for Laser Energetics, U. of Rochester, BRIAN APPELBE, AIDAN CRILLY, Center for Inertial Fusion Studies, Imperial College, PATRICK ADRIAN, JOHAN FRENJE, NEEL KABADI, MARIA GATU JOHNSON, PSFC, MIT, WILLIAM TAITANO, Los Alamos National Laboratory — The probability of a fusion reaction occurring within a plasma is determined by the product of the fusion cross section and the plasma ion-velocity distribution function. As the mean energy of the reacting ions increases, the fusion cross section increases while the ion velocity distribution rapidly decreases. The resulting fusion reaction probability therefore has a peak value referred to as the Gamow peak. The Gamow peak contains valuable information on the both the fusion cross section and the plasma ion-velocity distribution. Since the energy of the fusion products is determined by the mass and energy of the fusing ions, information on the Gamow peak can be inferred through measurements of the fusion products energy spectra. In this talk measurements of the first and second moments of the DT and DD neutron energy spectra are used to infer the Gamow peak in plasmas with ion temperatures from 2 to 20 keV. These measurements are compared to calculations using both Maxwellian and non-Maxwellian ion-velocity distributions. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

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Date submitted: 26 Jun 2020 Electronic form version 1.4