

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Laboratory-Produced X-Ray Photoionized Plasmas for Astrophysics Exploration CLEMENT GOYON, SEBASTIEN LE PAPE, DUANE LIEDAHL, TAMMY MA, LAURA BERZAK-HOPKINS, Lawrence Livermore Natl Lab, CHARLES REVERDIN, CHRISTOPHE ROUSSEAU, PATRICK RE-NAUDIN, CHRISTOPHE BLANCARD, CEA, DAM, DIF, EDOUARD NOTTET, NIELS BIDAULT, LULI, ROBERTO MANCINI, University of Reno, MICHEL KOENIG, LULI — X-ray photoionized plasmas are rare in the laboratory, but of broad importance in astrophysical objects such as active galactic nuclei, x-ray binaries. Indeed, existing models are not yet able to accurately describe these plasmas where ionization is driven by radiation rather than electron collisions. Here, we describe an experiment on the LULI2000 facility whose versatility allows for measuring the X-ray absorption of the plasma while independently probing its electron density and temperature. The bright X-ray source is created by the two main beams focused inside a gold hohlraum and is used to photoionise a Neon gas jet. Then, a thin gold foil serves as a source of backlit photons for absorption spectroscopy. The transmitted spectrum through the plasma is collected by a crystal spectrometer. We will present the experimental setup used to characterize both plasma conditions and X-ray emission. Then we will show the transmitted spectra through the plasma to observe the transition from collision dominated to radiation dominated ionization and compare it to model predictions. This work was performed under the auspices of the U.S.Department of Energy by Lawrence Livermore Natl Lab under Contract No. DE-AC52-07NA27344.

Clement Goyon
Lawrence Livermore Natl Lab

Date submitted: 24 Jul 2015

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