

# HOT-ELECTRON GENERATION BY LASER PLASMA INTERACTIONS IN UN HOHLRAUMS

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This paper firstly introduced experiments of hot-electron generation in UN hohlraums at SGIII-prototype laser facility. The experiments were undertaken with 8 laser beams smoothed by Continuous Phase-Plates (CPP) at 351nm wavelength, with 1ns square pulses, and 5.2kJ total energies. The hohlraums had a 1mm length and a 0.5mm radius equipped with a 0.4mm radius laser entrance hole (LEH), composed with materials of Au or UN. Filter-Fluorescer spectrometer (FFS) was calibrated to measure hard x-ray spectrum produced by hot electron interactions with hohlraums. It was observed in UN hohlraums hot electron population decreased to about 1/8 comparing with Au hohlraums, and hot electron temperature was also lower than in Au hohlraums. Numeric simulation explained this phenomenon mainly caused by combing high-Z materials with low-Z materials in hohlraums at a certain plasmas of density scale lengths ( $L_n=100\mu\text{m}$ ). Analysis showed UN hohlraums had lower population of hot electron because of N atom with a lower atomic number influencing the plasmas' states and restraining increase of non-liner interactions between laser and plasmas.

KEY WORDS: UN hohlraums, hot-electron, hard x-ray spectrum, Filter-Fluorescer spectrometer

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