Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Temporal evolution of electron density in anomalously dense non-equilibrium plasma TAEMIN YONG, MARK CAPPELLI, Stanford university — This study investigates generating dense non-equilibrium plasma states in high presure (up to 10 bar) gas with two methods. In the first method, initial discharge plasmas are generated using high voltage nanosecond pulses (10 kV, 20ns) in argon gas followed by electron heating using a relatively low energy picosecond laser (˜1 mJ, 532 nm). The electrode configuration consists of a pin-to-pin geometry with short gap (˜200 um). In the second approach, the initial plasma is replaced by YAG laser-induced discharges (˜100 mJ, 532 nm) in air. The temporal evolution of electron density is measured by optical emission spectroscopy using a streak camera with 10 picosecond-resolution. The electron density is inferred from the Stark broadening of H_α line (656.2nm), Ar I line (696.5 nm), and O I line (777 nm).

Taemin Yong
Stanford university

Date submitted: 29 May 2019 Electronic form version 1.4