Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Nanosecond time resolved spectral characteristics of a pulsed discharge in water EMILE CARBONE, Institute for Plasma and Atomic Physics, Ruhr-University Bochum, 44780 Germany, BANG-DOU HUANG, YI-KANG PU, Department of Engineering Physics, Tsinghua University, Beijing 100084, Peoples Republic of China, UWE CZARNETZKI, Institute for Plasma and Atomic Physics, Ruhr-University Bochum, 44780 Germany — The dynamics of short pulsed plasmas generated directly inside liquids are still not well understood. Such discharges are highly collisional making them difficult to investigate experimentally. In this contribution, we present the experimental characterization of a stable nanosecond pulsed discharge in water with a pin to plate configuration. The peak applied voltage is 25 kV with a pulse duration of about 15 ns and 25 Hz repetition frequency. Although the discharge is intrinsically stable (breakdown jitter less than 5 ns), an optical delay line was constructed to couple the light into a spectrometer (1200 g/mm, 30 cm focal length). The plasma light is then spectrally resolved with (sub)-nanosecond temporal resolution using a streak camera. This allows us to measure without jitter the spectral characteristics of the discharge with nanosecond temporal resolution. The plasma emission is studied and no atomic lines or molecular bands are observed. Instead, a large continuum emission spectrum over the complete visible range is measured both during the discharge and afterglow periods. The possible origins of this continuum are discussed.

Emile Carbone
Institute for Plasma and Atomic Physics, Ruhr-University Bochum, 44780 Germany

Date submitted: 10 Jun 2016 Electronic form version 1.4