

Abstract Submitted  
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**Density and lifetime evaluation of weakly ionized plasma for laser-triggered lightning by means of laser absorption** MICHITERU YAMAURA, Institute for Laser Technology — The potential ability of lasers to control lightning can be improved by using a train of pulses with sub-millisecond separations [1-2]. Laser-triggered experiments in a small-scale (10 mm gap) atmospheric discharge facility show that the triggering is dramatically enhanced when a five-pulse train of sub-Joule energy is used instead of a single pulse. This effect increases rapidly as the pulse interval is reduced. It appears that at a sub-millisecond pulse interval, sufficient positive and negative ions survive in subsequent pulses, thus enabling easy deionization. Hence, significant plasma build-up occurs from one pulse to the next. However, this persistence of ions would appear to imply that the rate of recombination (effectively a charge transfer between ions) is considerably lower than previously believed.

- [1] M. Yamaura: Appl. Phys Lett. **88** 251501 (2006).
- [2] M. Yamaura: J. Appl. Phys. **98** 043101 (2005).

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