

Abstract Submitted  
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**Propagation of pulsed discharges in water** PAUL CECCATO, OLIVIER GUAITELLA, ANTOINE ROUSSEAU, LPTP, CNRS, Ecole Polytechnique, France — The present discharge is a corona-like filamentary plasma at atmospheric pressure in water. Initiation and discharge propagation have been studied. Pulsed high voltage is applied in a point to plane electrode configuration for submicrosecond duration. In order to monitor the propagation of the discharge two ICCD camera are used with an adjustable delay. The discharge initiates at the positive electrode. A bright spot is formed at the point and can be interpreted as a gas bubble nucleation. Then several plasma filaments propagate radially and simultaneously from the electrode at a constant velocity of  $3.5 \times 10^6$  cm/s. No streamer head can be seen even with gate as short as 1 ns. After hundreds of nanoseconds branching occurs and the previous filaments become brighter as they supply more current. The propagation velocity does not depend on the applied voltage, the gap and the conductivity of the water. This propagation velocity remains constant during the propagation. The discharge stops when the applied voltage falls below a threshold voltage. The measured propagation velocity is one order of magnitude lower than gas phase streamers.

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