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Study of microdischarge arrays excited by DC or nanosecond pulsed discharges VIRGINIE MARTIN, GERARD BAUVILLE, VINCENT PUECH, LPGP-CNRS Universite Paris Sud Orsay — The spatio-temporal behavior of the optical emission of microdischarge arrays was studied through fast imaging technique. The device basically consisted of a metal/dielectric/metal sandwich drilled with many microholes, and was powered either by direct current or by nanosecond high voltage pulses. Microdischarges operating in DC mode were widely used for producing VUV emission from rare-gas excimers. However for biological applications, pulsed UV sources emitting in the range 200-280 nm, corresponding to the DNA absorption band, are required. Thus the electrical and optical characteristics of discharges operating either in pure rare-gas (argon) or in rare gas/halide mixtures (Kr/Cl_2), in which intense UV-C emissions could been achieved, were studied . It will be shown that the DC excitation induces a progressive ignition of the different micro-cavities, but the maximum number of ignited microplasmas is limited. On the other hand, nanosecond high-voltage pulses, applied at high repetition frequency, allow the simultaneous ignition of all the microcavities even in absence of ballasting resistors.

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