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### **Benchmark solutions for simulations of capacitively coupled discharges**

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Benchmarks are an important element of Verification and Validation strategies. Such strategies define a process for increasing confidence in the fidelity of computer simulations, with the aim of making confident predictions of physical behaviour under conditions of practical interest. Such confidence can be increased by developing benchmark solutions for representative conditions. A benchmark solution is a high quality solution that is accepted to be correct. In this paper, we describe an attempt to develop such solutions for capacitive discharges, and we show that a number of independently developed particle-in-cell simulations can reproduce the benchmark solutions. These solutions are useful not only for particle-in-cell simulations, but also for other kinds of plasma simulations. We will show comparisons of fluid model solutions with the benchmarks.