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Verification of particle-in-cell simulations with Monte Carlo collisions M.M. TURNER, Dublin City University, Ireland — Verification is the process of accumulating evidence that a computer simulation code is correct. For computer simulations in the physical sciences, this is usually understood to mean demonstrating that the results of a simulation correctly correspond to a solution of the underlying physical model. A particularly powerful way to accomplish this is by comparison with an exact solution or solutions of the physical model. When no single solution that exercises every part of the simulation programme exists, one can seek to develop a suite of solutions that in combination exercise all parts of the code. When a code correctly reproduces such a suite of solutions, one can feel a high degree of confidence that no errors are present. This paper discusses the verification of a particle-in-cell simulation with Monte Carlo collisions using this approach.

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