THE ORBIT SIMULATION CODE: BENCHMARKING AND APPLICATIONS

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Abstract

The contents, structure, implementation, benchmarking, and applications of ORBIT as an accelerator simulation code are described. Physics approaches, algorithms, and limitations for space charge, impedances, and electron cloud effects are discussed. The ORBIT code is a parallel computer code, and the scalabilities of the implementations of parallel algorithms for different physics modules are shown. ORBIT has a long history of benchmarking with analytical exactly solvable problems and experimental data. The results of this benchmarking and the current usage of ORBIT are presented.

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