# Meeting Challenges in Extreme-scale Electromagnetic Modeling of Next

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The past decade has seen tremendous advances in electromagnetic modeling for accelerator applications with the use of high performance computing on state-of-the-art supercomputers. Under the support of the DOE SciDAC computing initiative, a comprehensive set of parallel electromagnetic codes based on the finite-element method, ACE3P, has been developed aimed at tackling the most computationally challenging problems in accelerator R&D. Complemented by collaborative efforts in computational science, these powerful tools have enabled large-scale simulations of complex systems to be modeled with unprecedented details and accuracy. This paper will summarize the efforts in scalable eigen- and linear solvers, in parallel adaptive meshing algorithms, as well as in visualization of large datasets to meet the challenges in electromagnetic modeling at the extreme scale for advancing the design of next generation accelerators.