

Title: GPU Acceleration of Computational Electromagnetics Software

Full day

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Abstract: In many types of computational electromagnetics codes, the simulation time increases rapidly as the problem size (number of unknowns) increases. As problems become larger, it is necessary to look to new approaches to improve performance. In this course, we present techniques for using relatively inexpensive, off-the-shelf graphical processing units (GPUs) for computation. For many applications, 20-100x or more speed-ups can be achieved over equivalent conventional CPU codes. Our focus will be on the NVIDIA CUDA framework and we will discuss acceleration techniques for the finite-difference time-domain (FDTD) method as well as the frequency-domain method of moments. The attendee will be given opportunities to write actual GPU code throughout the course and will walk away with an understanding of practical GPU concepts and software examples of accelerated CEM applications. NOTE: A laptop with SSH capability is required (no other special software or hardware is necessary) to participate in the lab portions of the course.