Parallel Large-Scale Power System Electromagnetic Transient Simulation

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Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | Massive-Threading Electro-Magnetic Transient Program (MT-EMTP) on Graphic Processor Unit (GPU) | Electromagnetic transients (EMT), which impact the operation, stability, reliability and economics of the power system significantly, are emphasized in energy system area. The EMT simulation tools are widely utilized to analyze these short, temporary electromagnetic phenomena. The method, massive-threading computing based on modern many core processor, proposed in this work obtains effective improvement to undertake the heavy computing loads of the sophisticated models used in EMT simulation, which overburden the traditional single-threading programs. The book covers main components, such as load, transmission line and machine, in power system; and typical solving methods, such as LU and Newton-Raphson, to solve linear and nonlinear problems. All parallel modules proposed in the work are fully implemented on NVIDIA® GPU, and verified with existed commercial EMT simulation tools. The design of study cases and competitive performance are depicted to show the substantial improvement. Additionally, the parallel algorithms and modules designed in this work are not restricted by the type of processors, the number of threads and the standards of parallel software developing platforms | Format: Paperback | Language/Sprache: english | 144 gr | 220x150x5 mm...

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