Fast integration of satellite movement with CUDA-based software

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Modelling of satellite movement for geodynamics purposes uses integration of ordinal differential equations routines. Our integration routine (VASOMI = VAriable Step and Order Method of Integration) for Adams method was re-designed to be able to work on massively parallel machines with CUDA. CUDA is acronym for Computer Unified Device Architecture from NVidia (r), which allow usage of graphical cards as a co-processors. It speeds up the integrating of the satellites equation in 20 - 60 times depending on the equations right sides. We report our methodology of the parallelization and comparison results of three VASOMI versions: original (Fortran), ported to C, and parallel for CUDA.