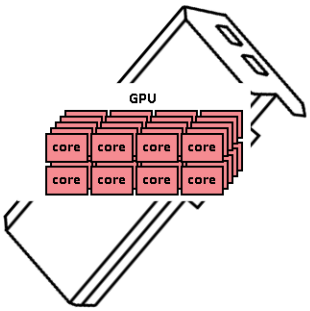
GPU COMPUTING
QW-GPUSIM, QW-MultiGPUSIM

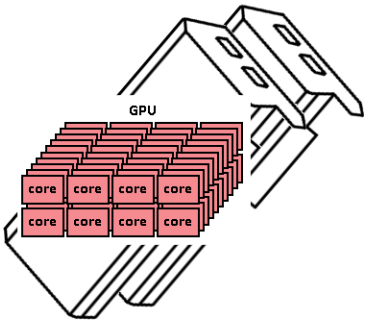
QW-GPUSIM

QW-GPUSim is a very fast version of *QW-Simulator* designated for massive parallel computing hardware. It incorporates parts of *QW-Simulator* code re-written by QWED in OpenCL, which allows using parallel processing and high memory bandwidth that GPU cards can provide.
QW-GPUSim is currently optimised for application on modern PC graphic cards of a massively parallel architecture and significantly reduces the simulation time with the speedup of 14 for 3D applications and 28 for V2D applications.

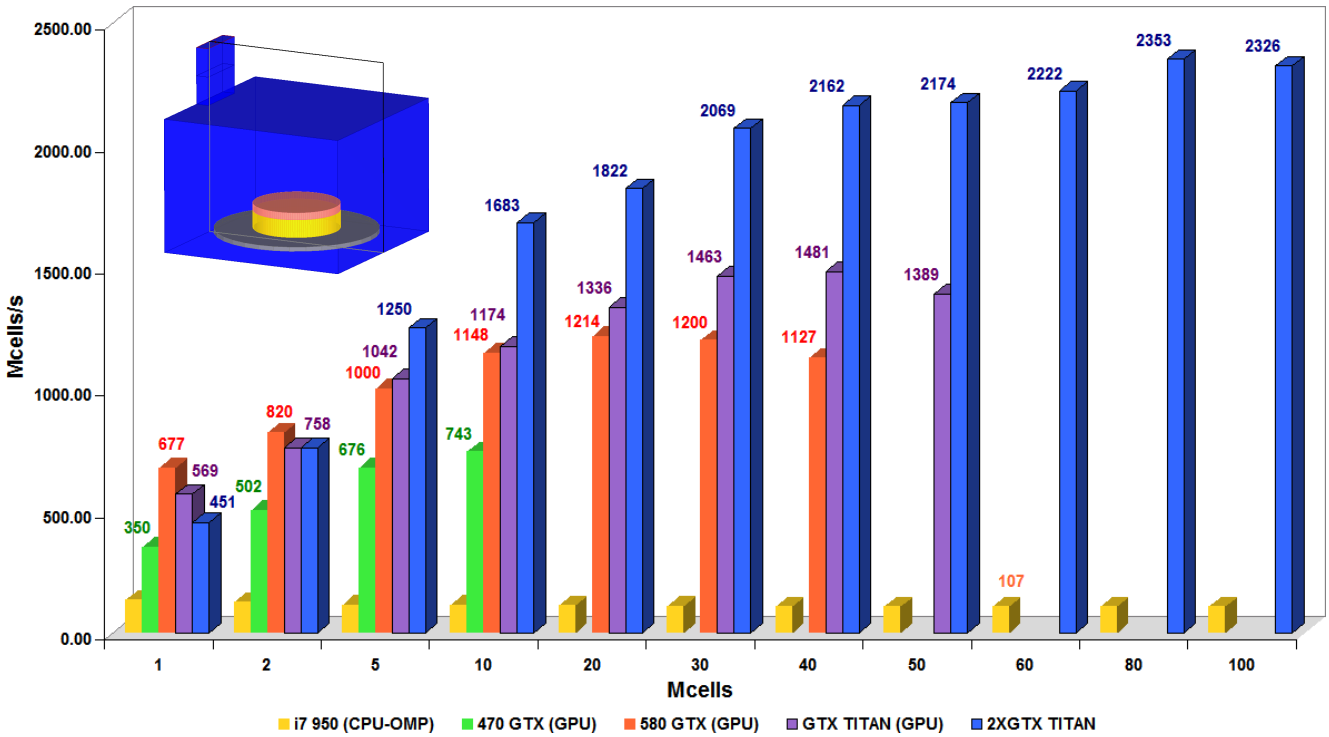


QW-MultiGPUSIM

QW-MultiGPUSim is a very fast version of *QW-Simulator* designated for multiple massive parallel computing hardware. It uses multiple GPU cards for a single simulation. It performs spatial decomposition and divides analysed circuit into subregions, which are simulated on separate GPU card.
Using multiple GPU cards of a massively parallel architecture extends the available memory and significantly reduces the simulation time.



SpeedUp of the GPU and MultiGPU simulation scenario (project divided along Y direction into two symmetrical subregions) computation of a beefburger placed in a cavity oven (3D example) compared to *QW-OMP* version on Intel I7 950.



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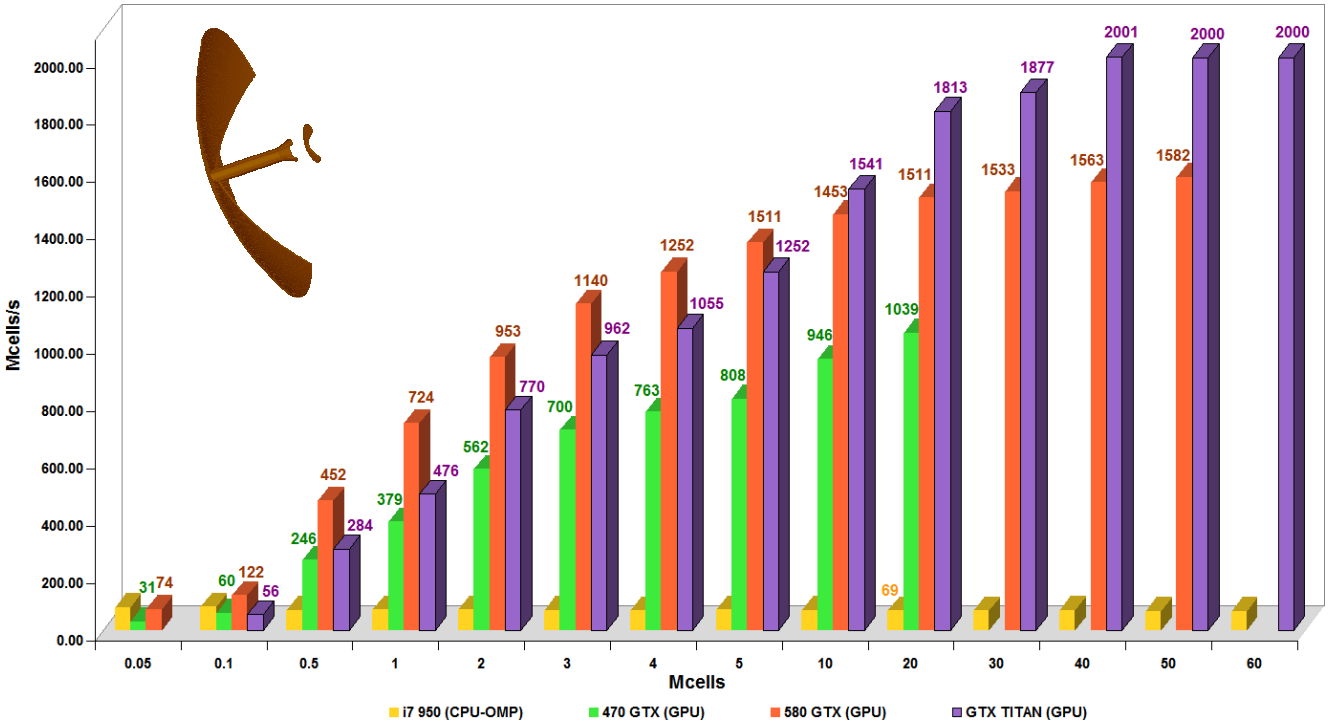
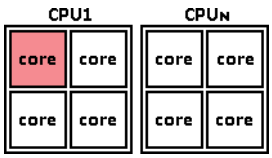
QUICKWAVE

GPU COMPUTING
QW-GPUSIM, QW-MultiGPUSIM

SpeedUp of the GPU computation of a two-reflector Cassegrain antenna model (V2D example) compared to QW-OMP version on Intel I7 950.



MULTIPROCESSOR/MULTICORE COMPUTING
QW-MULTISIM

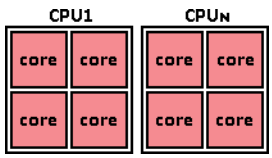


QW-SIMULATOR

Sequential version of *QW-Simulator* uses only one core during the simulation and for certain important problems of microwave and millimetre-wave engineering remains beyond reach because of long CPU times required.

QW-MULTISIM

QW-MultiSim contains two multithread versions of *QW-Simulator*:



QW-OMP: this version uses OpenMP programming standard to accelerate preprocessing and FDTD loop. Because of high parallel efficiency and no changes in the project required in comparison to standard version, the QW-OMP can become the main *QW-MultiSim* version. QWED recommends using this version as a very convenient, easy and efficient tool for speeding up preprocessing and FDTD calculations.

QW-MTGOMP: combines the advantages of separating the actual FDTD calculations from graphics, Windows event loop, etc. and QW-OMP approach. It is particularly recommended to the users, who need to watch dynamic field distribution, as is typically the case in microwave power applications.

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