# CPU AND GPU CONSOLIDATION BASED ON OPENCL

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The use of GPU for general-purpose computing is relatively new promising direction. GPUs can be regarded as vector accelerators - this approach becomes more and more popular. But different vendors offer their own API and languages. As a result, transition from one platform to another sometimes requires great code changes. The answer to this problem is OpenCL [1]. All major CPU and GPU manufacturers created its implementations for their devices. OpenCL is the open standard for parallel programming of heterogeneous computations.

This paper concerns questions about organization of computing with OpenCL. First, we will talk about advantages and disadvantages of CPU and GPU computing. Then test results will be shown, we will represent algorithms that have significant acceleration using GPGPU computations. At last, some examples of applications that use specified technique will be provided. All calculations were performed on hybrid cluster of SPbSU computing center. Its nodes contain NVIDIA Tesla S2050 system that was developed specifically as GPGPU unit. Such devices provide impressive acceleration of scientific calculations [2].

[1] Ryoji Tsuchiyama, Takashi Nakamura, Takuro Iizuka, Akihiro Asahara, Satoshi Miki. The OpenCL Programming Book.

[2] Degtyarev A., Gankevich I. Efficiency Comparison of Wave Surface Generation Using OpenCL, OpenMP and MPI // Proceedings of 8th International Conference «Computer Science & Information Technologies» — Yerevan, Armenia, — 2011. — P. 248-251.