

# Large-scale CFD applications on multi-node GPU cluster

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Some of CFD applications are successfully accelerated on GPU and several-ten times speed-ups are often reported to compare with a CPU core. In order to execute large-scale CFD computations beyond local VRAM limitation, GPU-to-GPU communications are required over nodes through the PCI-Express bus and the interconnection. These communications cost comparable to GPU computation and the overlapping technique between computation and communication has to be introduced to sustain the linear strong scaling. We demonstrate the results of Lattice Boltzmann method, Tsunami simulation solving shallow water equation, compressible flow computations and show the multiple-GPU scalabilities on Tokyo Tech TSUBAME grid cluster.