

APPENDIX A
ARTIFACT DESCRIPTION APPENDIX: [NUMERICAL
SIMULATION OF A FLUE INSTRUMENT WITH
FINITE-DIFFERENCE LATTICE BOLTZMANN METHOD
USING GPGPU]

A. Abstract

This artifact contains the description of hardware and software environment.

B. Description

1) Check-list (artifact meta information):

- **Program:** C++,CUDA
- **Compilation:**gcc-4.8.5, nvcc (CUDA v.8.0.61)
- **Hardware:** ITO subsystem B at Research Institute for Information Technology, Kyushu University.
- **Output:** Evaluation results by profiler, simulation results.
- **Experiment workflow:** Compile and run the code on the ITO, and evaluated with Nvidia Profiler (v8.0.61) .
- **Publicly available?:** No.

2) *Hardware dependencies:* Nvidia GPU.

3) *Software dependencies:* CUDA 8.0.

C. Experiment workflow

The experiments are run with shell scripts and the results are stored in .nvprof and .dat(vtk) files.

```
#!/bin/bash
#PJM -L "vnode=1"
#PJM -L "vnode-core=1"
#PJM -L "rscunit=ito-b"
#PJM -L "rscgrp=ito-g-4"
#PJM -L "elapse=60:00"

module load cuda/8.0
nvprof -f --analysis-metrics --metrics
"flops_sp,flops_dp" -o data.nvprof ./build/fdlbm-cuda
```