A Heated Metal Plate

Initial Conditions

Final Steady State

Metal Plate

Heating Element
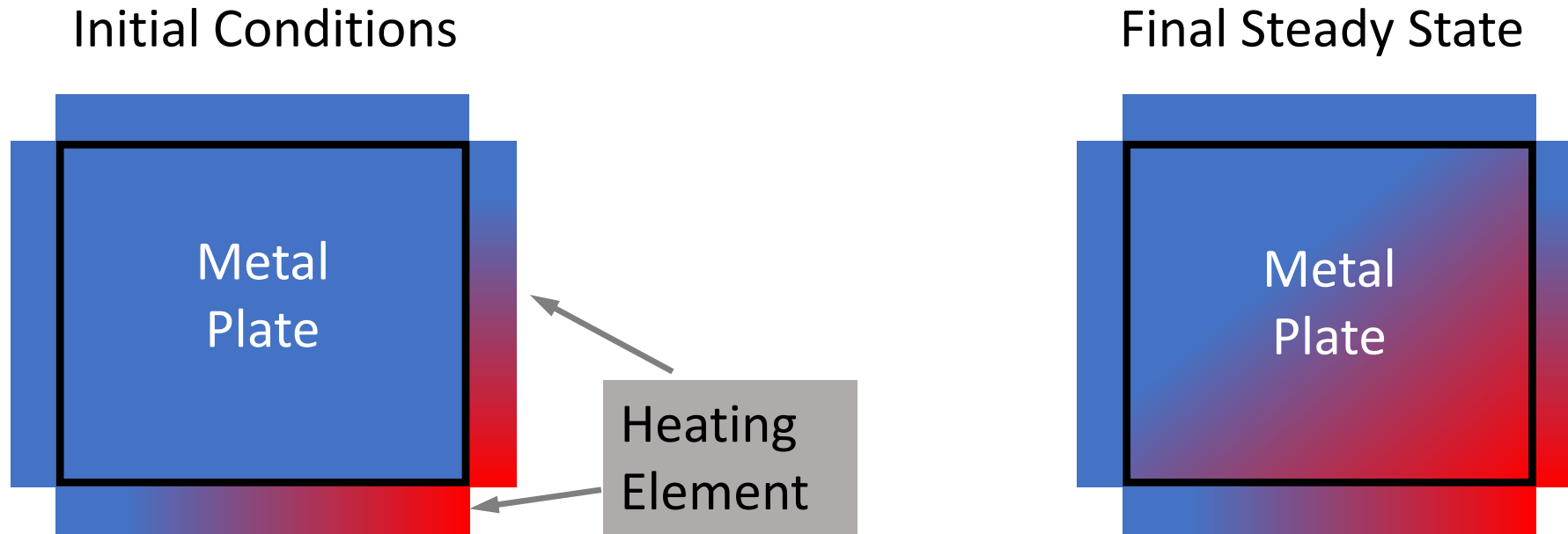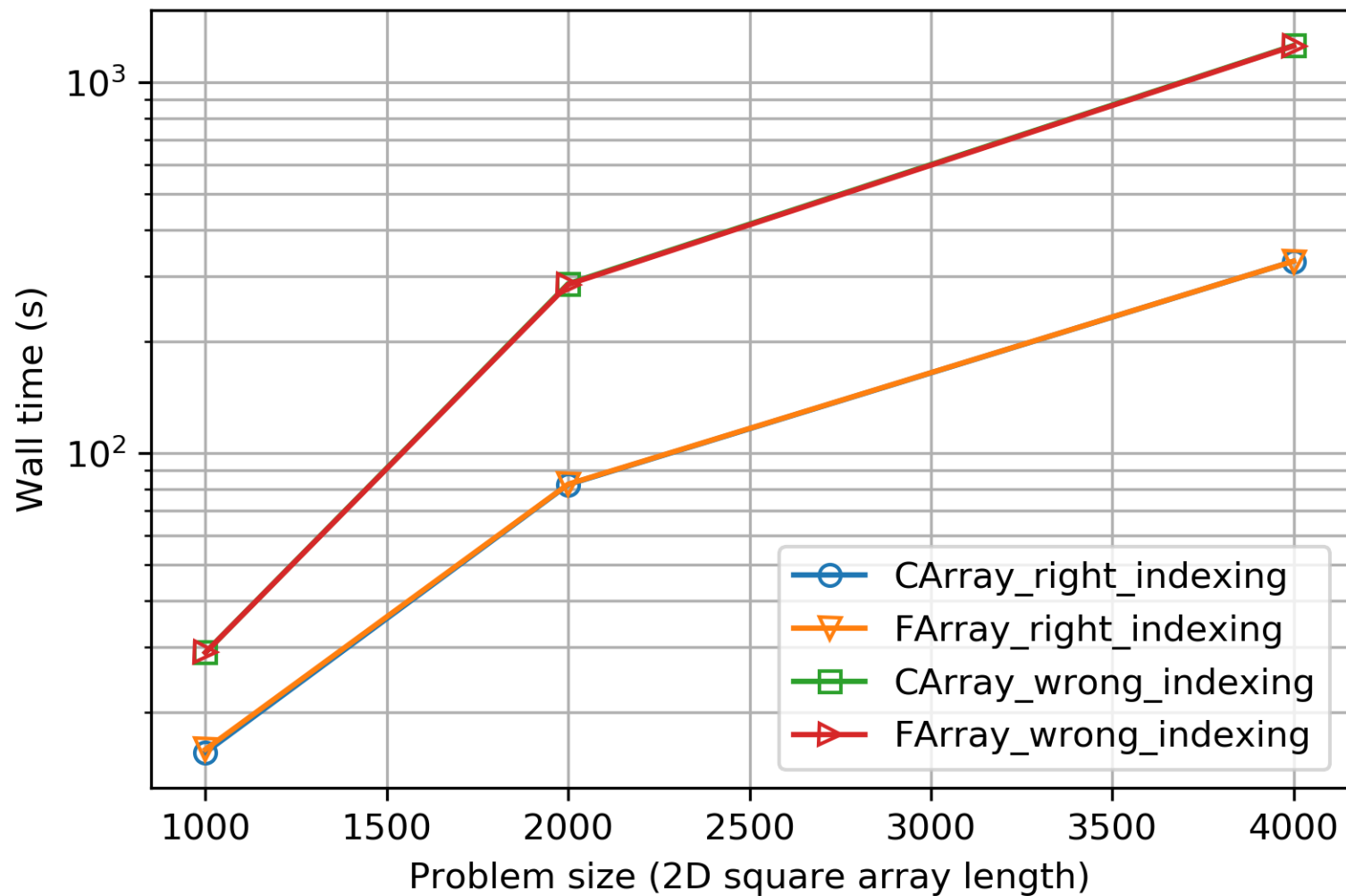
Metal Plate

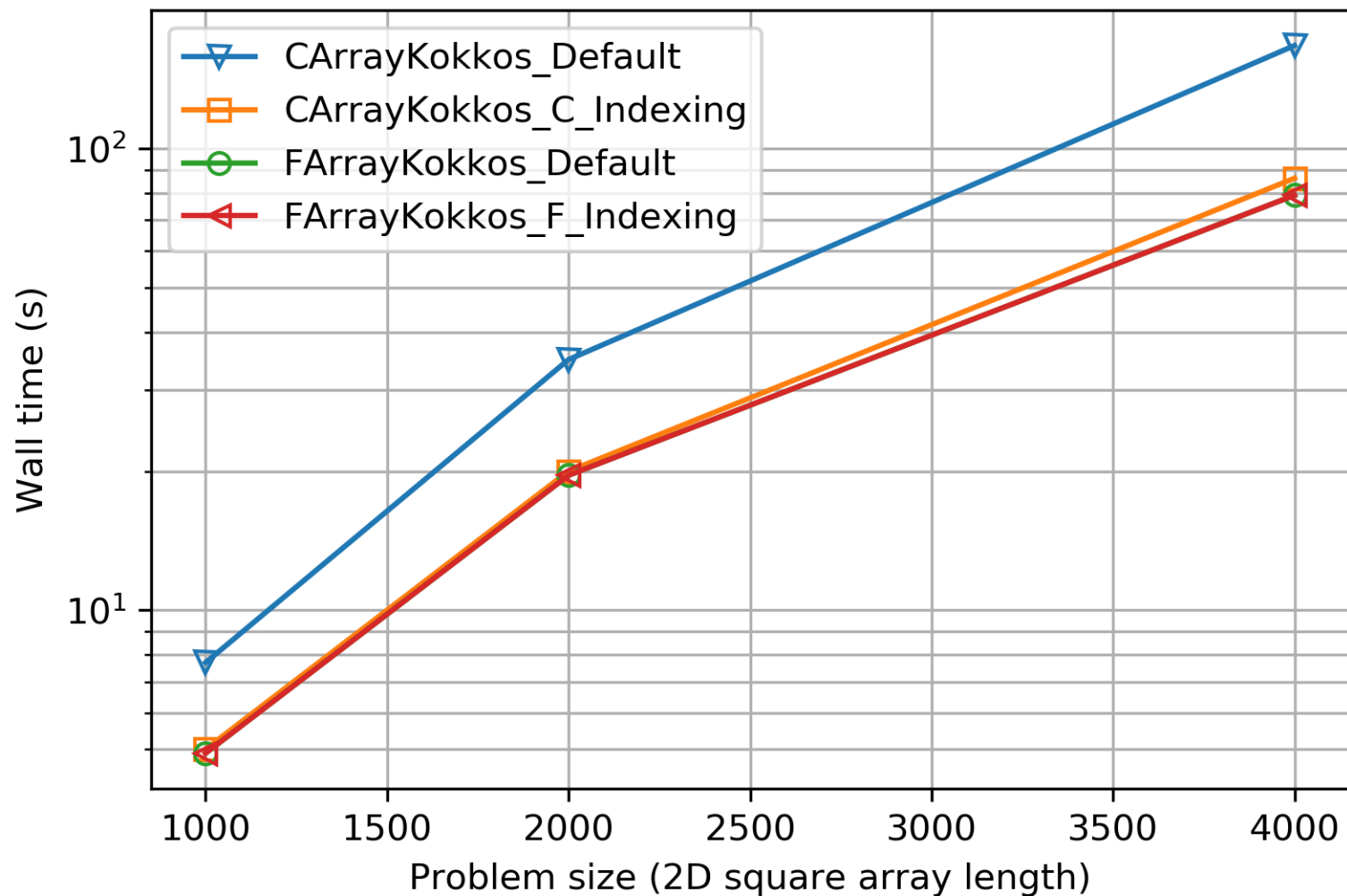Steady state heat distribution in governed by Laplace equation:

$$\nabla^2 T = 0$$

Effect of data layout and access pattern on performance on 1 CPU

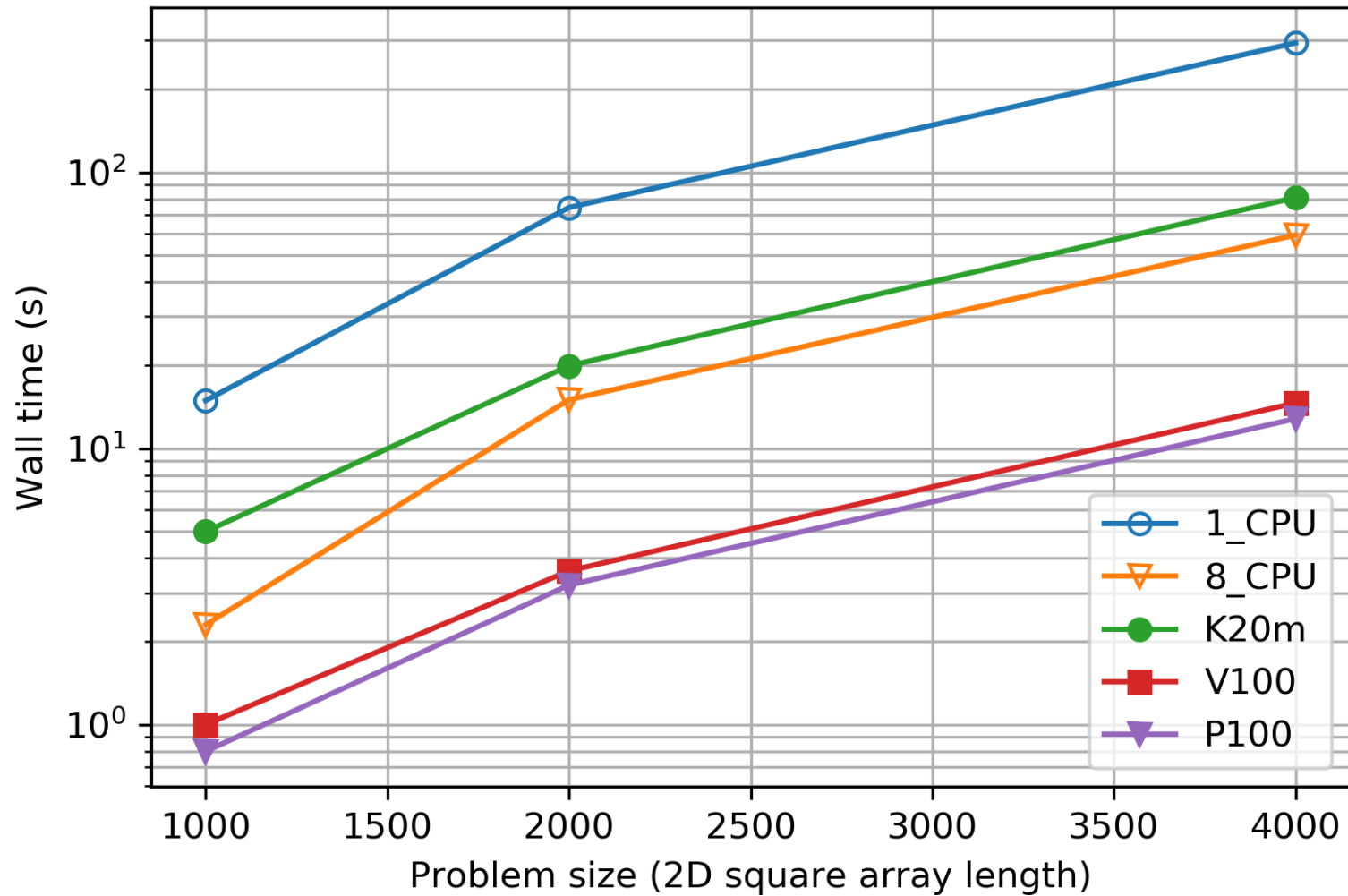CPU: Intel(R) Xeon(R) CPU E5-2680 0 @ 2.70GHz
Compilers: gcc/10.2.0

Effect of kokkos loop ordering on performance on 1 GPU

GPU: Tesla K20m
Compilers: gcc/10.2.0, cuda/11.2.1

Performance Portability using MATAR and Kokkos

CPU: Intel(R) Xeon(R) CPU E5-2680 0 @ 2.70GHz
GPU: K20m, V100, P100
Compilers: gcc/10.2.0, cuda/11.2.1