**OpenMP:**

Applying OpenMP on initialization, computationally distinct steps, collision and streaming. Our final goal is implementing OpenMP on 3D version of Lattice Boltzmann Method (LBM). Before implementing on 3D version, we test OpenMP on 2D version first. We test three size: 251x251, 501x501, 1001x1001 with 50, 100 and 200 standard deviation respectively.

After implementing OpenMP on data-independent sections, it successfully speed up the code. OpenMP performs better as we increasing the lattice size. OpenMP performs obviously on larger lattice size. If the number of threads exceeds the critical value, it stops speedup. Each for loop built with lattice size, the small iteration will not be efficient due to overheads. In parallel for construct, every iteration has the same computational cost, so that static scheduling can be used. Compared the results produced by OpenMP and serial version, both results are same. Hence, our application of OpenMP-implementing is correct.

Before applying OpenMP on original code, since many loops include dependency variableAfter implement OpenMP on