Usage

Use Linux.

Open a terminal in the directory of the project and run:

```
make install
make compile
```

To run the simulation, type:

```
make run
```

Open the input_parameters.par file in the input directory and modify the parameters of the simulation.

Theory

We simulate the SU(2) pure gauge field theory on a 4-dimensional lattice with volume $V = L^3 \times L_t$.

$U_\mu(x) \in \mathrm{SU}(2)$ is a link variable at lattice point x and direction μ defined in the gauge group SU(2). We use the standard Wilson plaquette action

$$S[U] = -\frac{\beta}{N} \sum_x \sum_{\mu<\nu} \mathrm{Re}\,\mathrm{Tr}\left[1 - U_{\mu\nu}(x)\right],$$

where $\beta = 2N/g_0$. For SU(2), $N = 2$ and g_0 is the gauge coupling.

The plaquette variable $U_{\mu\nu}(x)$ is defined as the ordered product

$$U_{\mu\nu}(x) = U_\mu(x) U_\nu(x + \hat{\mu}) U_\mu^\dagger(x + \hat{\nu}) U_\nu^\dagger(x).$$