$$\begin{aligned}
\varepsilon^{\mathrm{wall}} &= \varepsilon \\
\sigma^{\mathrm{wall}} &= (0.5 + \mathrm{R_t}) \times \sigma \\
r_{\mathrm{cut}}^{\mathrm{wall}} &= (2^{1/6} + \mathrm{R_a}) \times \sigma^{\mathrm{wall}}
\end{aligned}$$

$$V^{\mathrm{wall}}(y; L_y) = \tilde{\phi}_{\mathrm{LJ}}(L_y - y; \varepsilon^{\mathrm{wall}}, \sigma^{\mathrm{wall}}, r_{\mathrm{cut}}^{\mathrm{wall}}) + \tilde{\phi}_{\mathrm{LJ}}(y; \varepsilon^{\mathrm{wall}}, \sigma^{\mathrm{wall}}, r_{\mathrm{cut}}^{\mathrm{wall}})$$

$$\tilde{\phi}_{\mathrm{LJ}}(r; \varepsilon, \sigma, r_{\mathrm{cut}}) = \left\{ 4\varepsilon \left[\left(\frac{\sigma}{r}\right)^{12} - \left(\frac{\sigma}{r}\right)^{6} \right] - 4\varepsilon \left[\left(\frac{\sigma}{r_{\mathrm{cut}}}\right)^{12} - \left(\frac{\sigma}{r_{\mathrm{cut}}}\right)^{6} \right] \right\} \theta(r_{\mathrm{cut}} - r)$$

- $N = 1250$
- $L_y = 80$
- $L_x : L_y = 1 : 2$

- $T_{\mathrm{L}} = 0.41$
- $T_{\mathrm{H}} = 0.45$
- $mg = 4.0 \times 10^{-4}$

$$\chi \equiv \frac{k_{\mathrm{B}}(T_{\mathrm{H}} - T_{\mathrm{L}})}{mgL_y} \simeq 1$$

$$Y_g \equiv \frac{1}{N} \sum_{i}^{N} y_i$$

$\mathrm{R_t} = 0.5, \mathrm{R_a} = 0.4694$

$\mathrm{R_t}$: 壁の厚み

$\mathrm{R_a}$: 濡れ具合

$\mathrm{R_t}$: 壁の厚み, $\mathrm{R_a}$: 引力幅

$$\sigma_y(t) = \sqrt{\frac{1}{N} \sum_{i=1}^{N} (y_i(t) - Y_g(t))^2}$$

$$0.0 \leq \mathrm{R_t} \leq 0.5$$

$$0.0 \leq \mathrm{R_a} \leq 3.0 - 2^{1/6}$$

$$H(\Gamma; g) = \sum_{i=1}^{N} \left[\frac{\boldsymbol{p}_i{}^2}{2m} + \sum_{j>i}^{N} \tilde{\phi}_{\mathrm{LJ}}^{\mathrm{pair}}(r_{ij}) + mgy_i + V^{\mathrm{wall}}(y_i) \right]$$