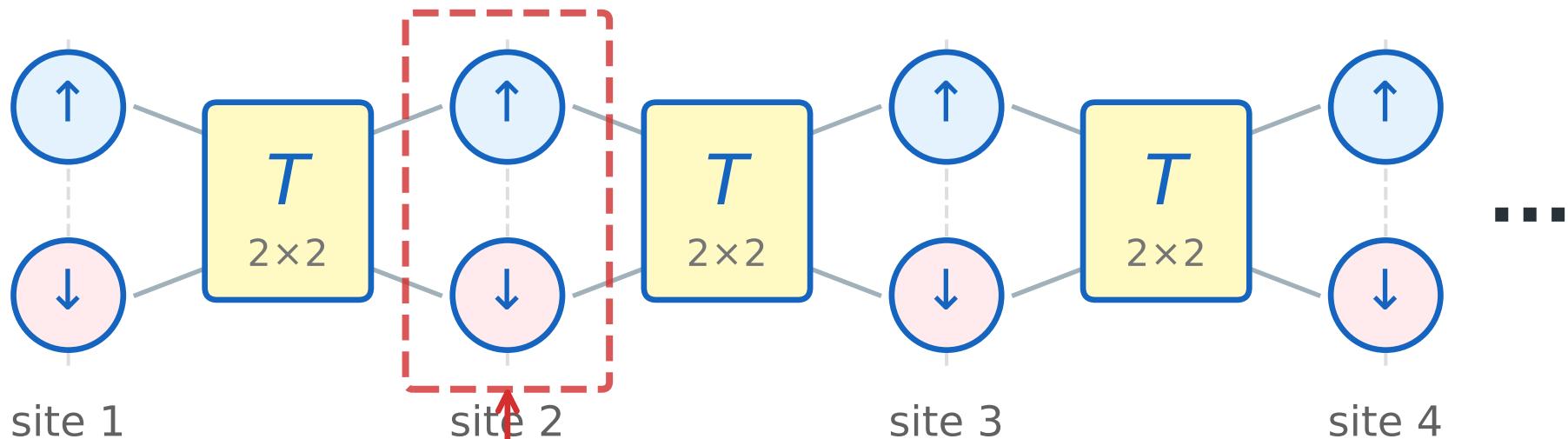


All  $T$  identical  $\Rightarrow$  commute  $\Rightarrow$  diagonalize once!



$$Z = \text{Tr}(T \cdot T \cdot T \cdots T) = \text{Tr}(T^N)$$

$$f(\uparrow, \downarrow)$$

$$\langle \sigma_k \rangle = \frac{\text{Tr}(T^{k-1} \cdot f \cdot T^{N-k})}{\text{Tr}(T^N)}$$