

SA $\mathcal{H} = -\sum_{\hat{i} < \hat{j}} J_{\hat{i}\hat{j}} s_{\hat{i}} s_{\hat{j}} - \sum_{\hat{i}} h_{\hat{i}} s_{\hat{i}}$

SQA

$$\mathcal{H} = \sum_m \left(\sum_{\hat{i} < \hat{j}} J_{\hat{i}\hat{j}} s_{m,\hat{i}} s_{m,\hat{j}} - \sum_{\hat{i}} h_{\hat{i}} s_{m,\hat{i}} \right) + \sum_{\hat{i}} J_{\perp} \frac{s_{m+1,\hat{i}} s_{m-1,\hat{i}}}{s_{m,\hat{i}}}$$

Suzuki Trotter

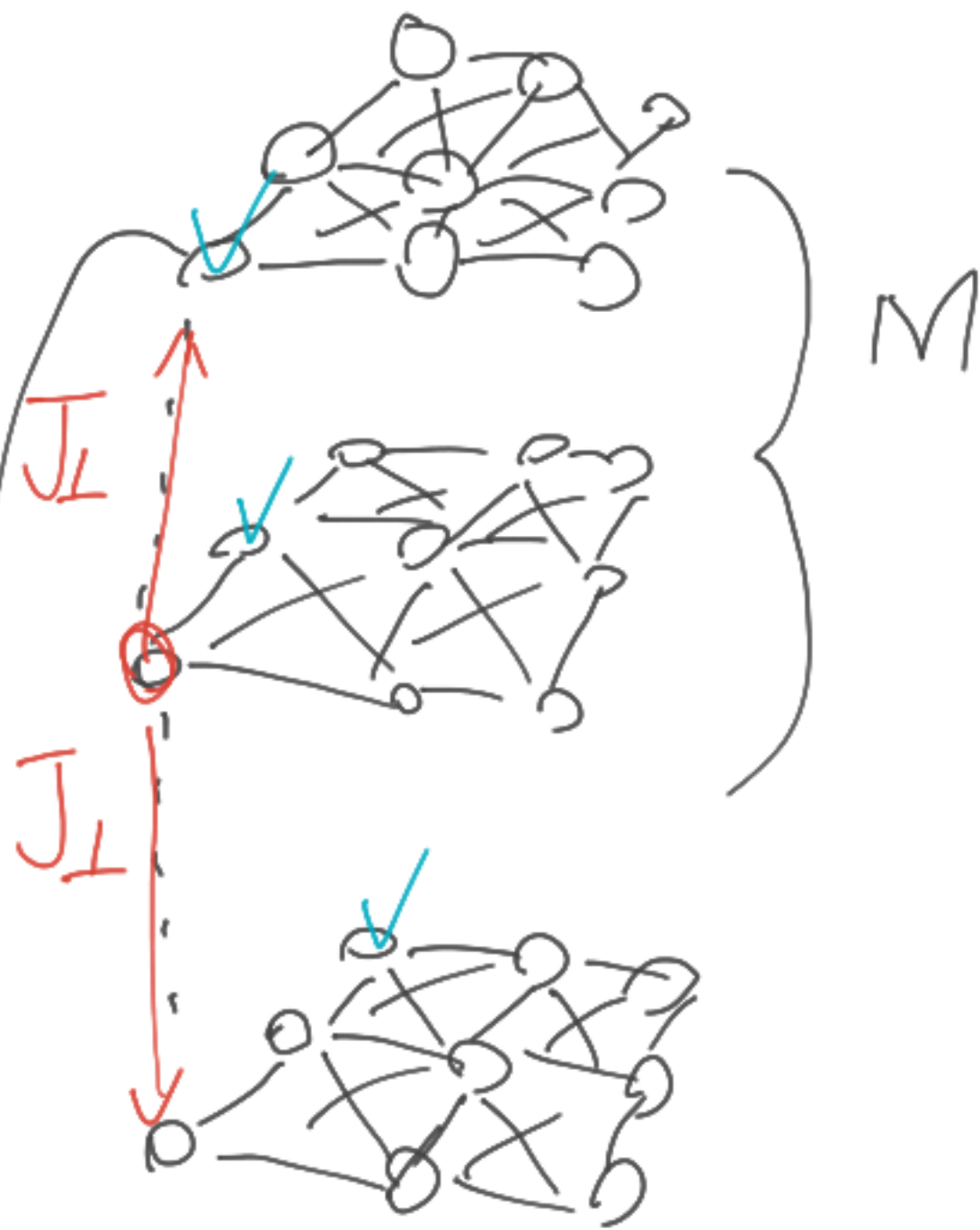
$$\begin{aligned} -1 &\rightarrow +1 \\ +1 &\rightarrow -1 \end{aligned}$$

$s_{m,\hat{i}}$

$$\Delta H = \left(\sum_j J_{\hat{i}\hat{j}} s_{m,\hat{j}} + J_{\perp} (s_{m+1,\hat{i}}, s_{m-1,\hat{i}}) \right) s_{m,\hat{i}}$$

$$e^{-\frac{\Delta H}{T}} > 1$$

$T \sim$



QUBO $0, 1$

J_{mg} $-1, 1$

$$\sum J_{ij} s_i s_j$$

↓



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for (int i =  
unroll ← for (int l = 0 ~ 3 )  
    if (i == 0  
        y = x[l-1][  
            x[l-2][  
            x[ ][  
            x[ ][  
    else
```

