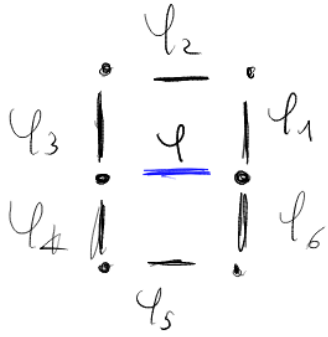
Fact sheet: Metropolis step

Metropolis proposal: $\varphi^n = \varphi + \delta \quad \delta \in (-1, 1)$

$S = \beta \sum_{\square} (1 - \mathrm{Re}\,\square)$

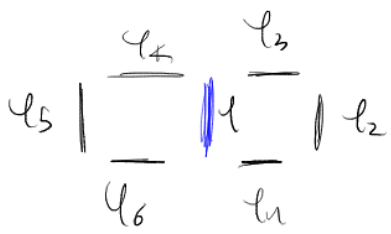


$$-\frac{\Delta S}{\beta} = \cos(\varphi^n + \theta_1 - \theta_2 - \theta_3) + \cos(\theta_5 + \theta_6 - \varphi^n - \theta_4) +$$
$$-\cos(\varphi + \theta_1 - \theta_2 - \theta_3) - \cos(\theta_5 + \theta_6 - \varphi - \theta_4)$$
$$= 2\left[\cos\left(\varphi^n + \underbrace{\frac{\theta_1 - \theta_2 - \theta_3 + \theta_4 - \theta_5 - \theta_6}{2}}_{\bar{\varphi}}\right) - \cos(\varphi + \bar{\varphi})\right]$$

$$= 2\left[\cos(\varphi^n + \bar{\varphi}) - \cos(\varphi + \bar{\varphi})\right] \qquad \bar{\varphi} = \frac{\theta_1 - \theta_2 - \theta_3 + \theta_4 - \theta_5 - \theta_6}{2}$$

Accept: $\xi < e^{2\beta[\cos(\varphi^n + \bar{\varphi}) - \cos(\varphi + \bar{\varphi})]} \qquad \xi \in [0, 1]$

$$-\frac{\Delta S}{\beta} = \cos(\theta_1 + \theta_2 - \theta_3 - \varphi^n) + \cos(\theta_6 + \varphi^n - \theta_4 - \theta_5) +$$
$$-\cos(\theta_1 + \theta_2 - \theta_3 - \varphi) - \cos(\theta_6 + \varphi - \theta_4 - \theta_5)$$



$$= 2\left[\cos\left(\varphi^n - \underbrace{\frac{\theta_1 + \theta_2 - \theta_3 + \theta_4 + \theta_5 - \theta_6}{2}}_{\bar{\varphi}}\right) - \cos(\varphi - \bar{\varphi})\right]$$

$$= 2\left[\cos(\varphi^n - \bar{\varphi}) - \cos(\varphi - \bar{\varphi})\right] \qquad \bar{\varphi} = \frac{\theta_1 + \theta_2 - \theta_3 + \theta_4 + \theta_5 - \theta_6}{2}$$

Accept: $\xi < e^{2\beta[\cos(\varphi^n - \bar{\varphi}) - \cos(\varphi - \bar{\varphi})]} \qquad \xi \in [0, 1]$