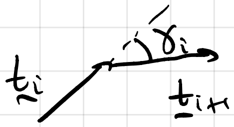
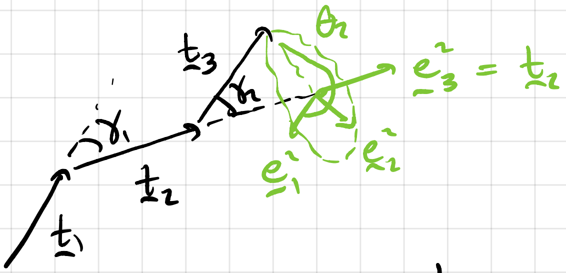
WLC $\quad \langle \underset{\sim}{t}_i \cdot \underset{\sim}{t}_{i+n} \rangle = \cos(\gamma_i + \gamma_{i+1} \cdots \gamma_{i+n})$ $\cancel{\ }$



prob. of config $= \dfrac{\exp(\lambda \sum \cos\gamma_i)}{\underbrace{\int d\Omega_1 \ldots d\Omega_n \exp(\lambda \sum \cos\gamma_i)}_{"Z}}$



in basis $\{ \underset{\sim}{e}_1^2, \underset{\sim}{e}_2^2, \underset{\sim}{t}_2 \}$

$$\underset{\sim}{t}_3 = \cos\gamma_2 \, \underset{\sim}{t}_2 + \sin\gamma_2 \left(\cos\theta_2 \, \underset{\sim}{e}_1^2 + \sin\theta_2 \, \underset{\sim}{e}_2^2 \right)$$

consider $\langle \underset{\sim}{t}_1 \cdot \underset{\sim}{t}_3 \rangle$ involves $\langle \sin\gamma_2 \cos\theta_2 \, \underset{\sim}{t}_1 \cdot \underset{\sim}{e}_1^2 \rangle$

$$= \frac{\int d\Omega_1 \ldots d\Omega_n \sin\gamma_2 \cos\theta_2 \, \underset{\sim}{t}_1 \cdot \underset{\sim}{e}_1^2 \exp(\lambda \sum \cos\gamma_i)}{Z}$$

$$\left[\int d\Omega_i = \int_0^{2\pi}\!\!\int_0^{\pi} \sin\gamma_i \, d\gamma_i \, d\theta_i \right]$$

$$\propto \int_0^{2\pi}\!\!\int_0^{\pi} \sin^2\gamma_2 \cos\theta_2 \exp(\lambda \cos\gamma_2) \, d\gamma_2 \, d\theta_2 = 0$$

Similarly, $\quad \langle \sin\gamma_2 \sin\theta_2 \, \underset{\sim}{t}_1 \cdot \underset{\sim}{e}_1^2 \rangle = 0$

$$\Rightarrow \langle \underset{\sim}{t}_1 \cdot \underset{\sim}{t}_3 \rangle = \langle \cos\gamma_2 \, \underset{\sim}{t}_1 \cdot \underset{\sim}{t}_2 \rangle = \langle \cos\gamma_2 \cos\gamma_1 \rangle$$

$$= \left(\frac{\int d\Omega_1 \cos\gamma_1 e^{\lambda\cos\gamma_1}}{\int d\Omega_1 e^{\lambda\cos\gamma_1}} \right) \left(\frac{\int d\Omega_2 \cos\gamma_2 e^{\lambda\cos\gamma_2}}{\int d\Omega_2 e^{\lambda\cos\gamma_2}} \right)$$

$$= \mathcal{L}(\lambda)^2$$

By recursion, $\langle \underset{\sim}{t}_i \cdot \underset{\sim}{t}_{i+n} \rangle = \left(\mathcal{L}(\lambda)\right)^{|n|}$