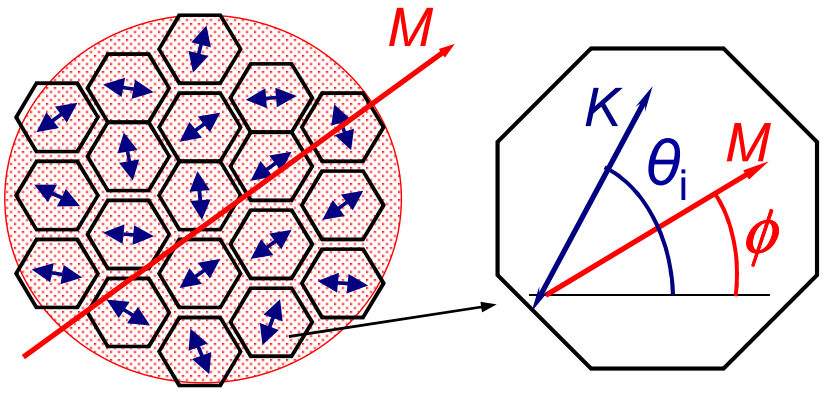
Averaging Random Anisotropies

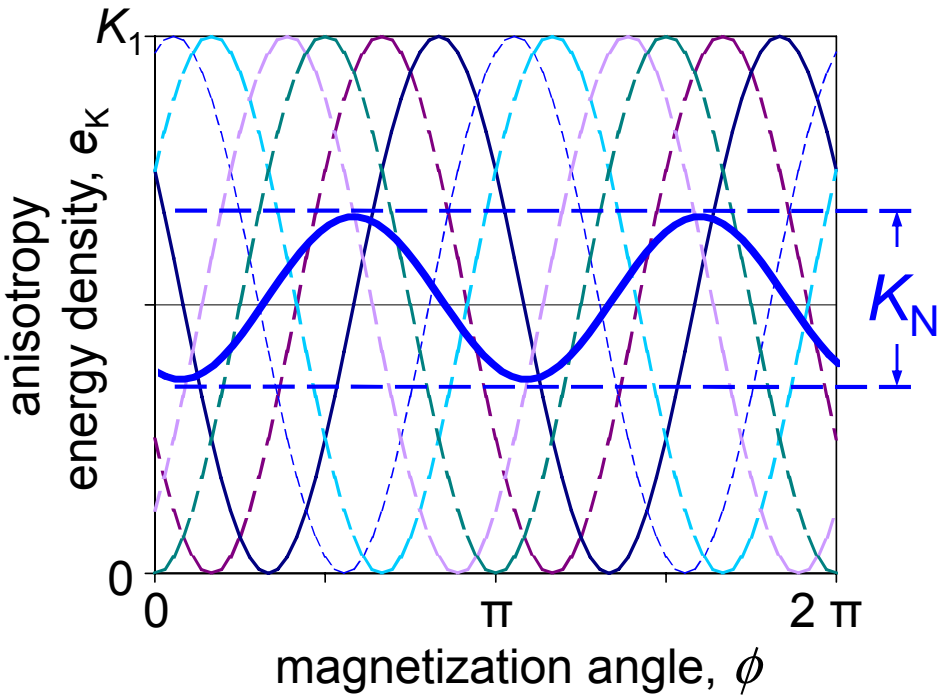


anisotropy energy density

$$\langle e_K \rangle = \frac{1}{N} \sum_i K_1 \cdot \sin^2(\phi - \theta_i)$$

magnetization constant orientation ϕ

anisotropy random orientation θ



$$= \frac{K_1}{\sqrt{N}} \cdot \sqrt{1 + \frac{1}{N} \sum_i \sum_{j(\neq i)} \cos\left(2(\underbrace{\theta_i - \theta_j}_{\text{random phases}})\right)}$$

$$< K_N > = \frac{\beta K_1}{\sqrt{N}}$$

β = 0.90