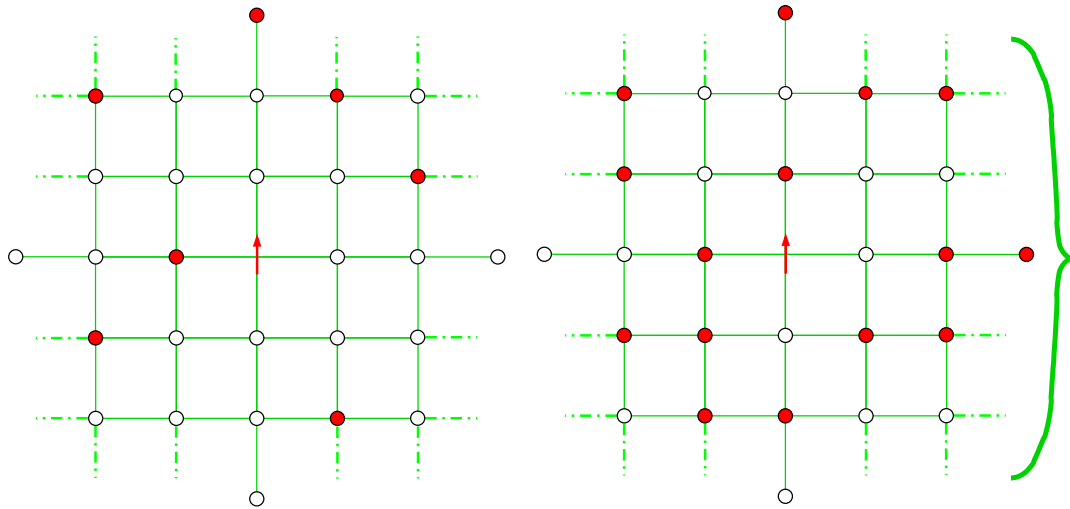


Disorder effects captured in a mean field treatment



- Due to strong disorder, different spins \mathbf{s}_i experience different couplings \mathbf{J}_i to thermally and spatially averaged $\langle\langle \mathbf{s}^z \rangle\rangle$


- At a **particular site**,

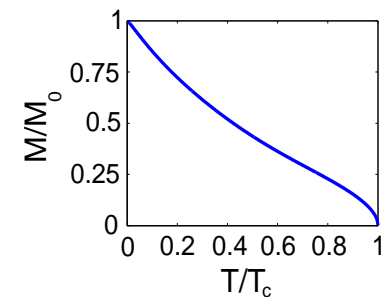
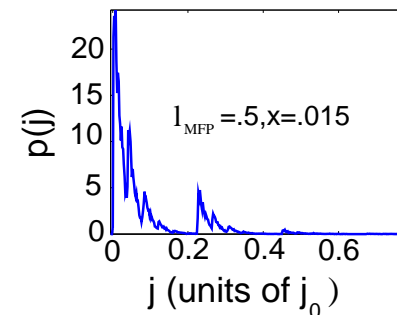
$$\langle S_i^z \rangle = SB_S (g\mu_B B_{eff}^i / T); B_{eff}^i = \frac{1}{g\mu_B} (J_i \langle\langle S^z \rangle\rangle)$$


Hence, averaging over **disorder**, one finds

$$\langle\langle S^z \rangle\rangle = \int p(j) SB_S (\langle\langle S^z \rangle\rangle J / T) dj$$

- To find $\langle\langle \mathbf{s}^z \rangle\rangle$ we average over all realizations of disorder, obtaining the **coupling probability distribution** $p(j)$.

 Small $l_{MFP} \rightarrow$ (concave) $M(T)$



 Large $l_{MFP} \rightarrow$ (convex) $M(T)$

