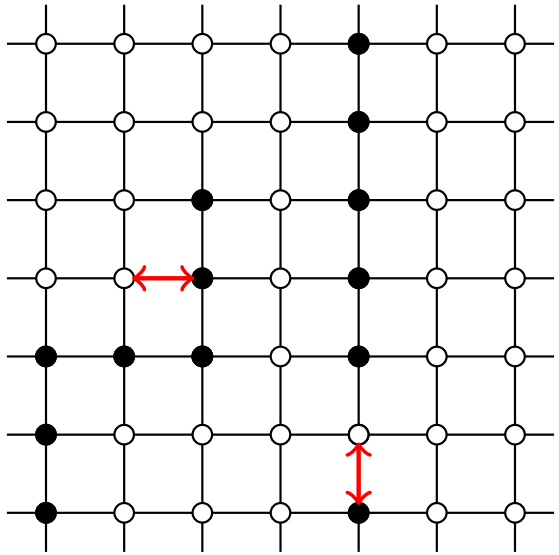
Optimal Bounds

Consider the square lattice $\mathbb{Z}^2$;
A spin variable defined on the lattice $u : \mathbb{Z}^2 \to \{\pm 1\}$;



We look at ferromagnetic energies of the form

$$E(u) = \frac{1}{8} \sum_{i,j} c_{ij} (u_i - u_j)^2$$

with $c_{ij} \in \{\alpha, \beta\}$ for $0 < \alpha < \beta$.