Model A dyn. of Diluted Ising Model :

Weakly Dilut. Ising Mod. $\overset{\text{Harris}}{\underset{\text{Criter.}}{\rightsquigarrow}}$ RIM Univ. Class

$\sqrt{\epsilon}$ exp.

Model A dyn. with:

$$\mathcal{H}_\psi[\varphi] = \int d^d x \left[\frac{1}{2}(\nabla\varphi)^2 + \frac{1}{2}(r_0 + \psi(x))\varphi^2 + \frac{1}{4} g_0 \varphi^4 \right]$$

uncorrelated quenched randomness with

$$P[\psi] \propto \exp\left[-\frac{\psi^4}{4w}\right]$$

Quenched averages can be obtained by means of:

$$S[\varphi, \tilde{\varphi}] = \int_0^\infty dt \int d^d x \left[\tilde{\varphi}\,\partial_t \varphi + \Omega \tilde{\varphi} \frac{\delta \mathcal{H}_{\psi=0}[\varphi]}{\delta \varphi} - \tilde{\varphi}\Omega\tilde{\varphi} \right] +$$

$$- \frac{\Omega^2 v_0}{2} \int d^d x \underbrace{\left(\int_0^\infty dt\, \tilde{\varphi}\varphi \right)^2}_{\text{non-local in time}}$$

$v_0 \propto w$

Nonequil. dyn.: RG, Θ JOS '95, K '92

We find: $\epsilon = 4 - d > 0$

- $F_R(v) = 1 + O(\sqrt{\epsilon})$
- $X^\infty = \frac{1}{2}\left(1 - \frac{1}{2}\sqrt{\frac{6\epsilon}{53}}\right) + O(\sqrt{\epsilon})$

$\epsilon = 1 \quad \sim 0.416$

$\epsilon = 2 \quad \sim 0.381$