

**Wilson, Kenneth G.**

**Renormalization group and critical phenomena. I: Renormalization group and the Kadanoff scaling picture.** (English) [Zbl 1236.82017](#)

*Phys. Rev. B* (3) 4, No. 9, 3174-3183 (1971).

Summary: The Kadanoff theory of scaling near the critical point for an Ising ferromagnet is cast in differential form. The resulting differential equations are an example of the differential equations of the renormalization group. It is shown that the Widom-Kadanoff scaling laws arise naturally from these differential equations if the coefficients in the equations are analytic at the critical point. A generalization of the Kadanoff scaling picture involving an “irrelevant” variable is considered; in this case the scaling laws result from the renormalization-group equations only if the solution of the equations goes asymptotically to a fixed point.

For part II, cf. *Phys. Rev. B* (3) 4, No. 9, 3184–3205 (1971; [Zbl 1236.82016](#)).

**MSC:**

**82B20** Lattice systems (Ising, dimer, Potts, etc.) and systems on graphs arising in equilibrium statistical mechanics

**82B28** Renormalization group methods in equilibrium statistical mechanics

Cited in **3** Reviews  
Cited in **191** Documents

**Full Text:** [DOI](#)

**References:**

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