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**Renormalization group, normal form theory and the Ising model** ARCHISHMAN RAJU, LORIEN HAYDEN, COLIN CLEMENT, DANILLO LIARTE, JAMES SETHNA, Cornell University — The results of the renormalization group are commonly advertised as the existence of power law singularities at critical points. Logarithmic and exponential corrections are seen as special cases and dealt with on a case-by-case basis. We propose to systematize computing the singularities in the renormalization group using perturbative normal form theory. This gives us a way to classify all such singularities in a unified framework and to generate a systematic machinery to do scaling collapses. We show that this procedure leads to some new results even in classic cases like the Ising model and has general applicability.

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