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Order parameter statistics at a quantum phase transition
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Virginia and All Souls College, Oxford — Universality implies that at a second order
phase transition the probability distribution of the order parameter takes a universal
scaling form. This distribution is a natural way to characterize the quantum critical
properties of ultracold atomic gases, since its histogram may be readily obtained
by repeated 'single-shot' measurements. In this work we obtain the exact scaling
probability distribution for the simplest quantum critical point: that of the trans-
verse field Ising model in 1D. Using a novel identity for the Ising model correlation
functions, we map the problem to a particular case of the anisotropic Kondo model.

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