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Alternative methods to characterize phase transitions in Ising systems[1] EUGENIO E. VOGEL, BERNARDO FIERRO, FERNANDO BACHMANN, Universidad de La Frontera, Temuco, Chile — The Binder cumulant (BC) is defined in terms of average values of second and fourth momenta of an order parameter q. Simulations for Ising systems show that the curves for BCs they all cross at the same temperature regardless of the size of the system. We present here two alternative and different methods to obtain the critical temperature after finding the time evolution of any order parameter q(t), after equilibration. First, we consider the time autocorrelation functions for the absolute value of a site order parameter, |q|, for different system sizes, showing that they also cross at the same temperature where BCs cross. Second, we show that the "weight" in bites of the compressed file containing vector q(t) maximizes at a temperature close to the critical temperature; a scaling analysis takes us back to the temperature of previous crossing. The main advantage of the new methods is its easy physical interpretation.

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