

Monte Carlo determination of the caloric specific heat in the 2d Potts model

Thomas Neuhaus

John von Neumann Institute for Computing,
Forschungszentrum Jülich, Germany

In a *microcanonical* description the fundamental quantity is the *density of states* $g(E)$ and the microcanonical entropy $S(E) = k_B \ln g(E)$ defines the temperature curve $T(E) = (\partial S(E)/\partial E)^{-1}$. Note that in mixed phase systems exist regions where the microcanonical temperature $T(E)$ decreases with increasing E . The resulting negative values for the caloric specific heat $C_V(E) = (1/V) \partial E / \partial T(E)$ at constant volume V are determined in a Monte Carlo simulation for the 2d Potts model.