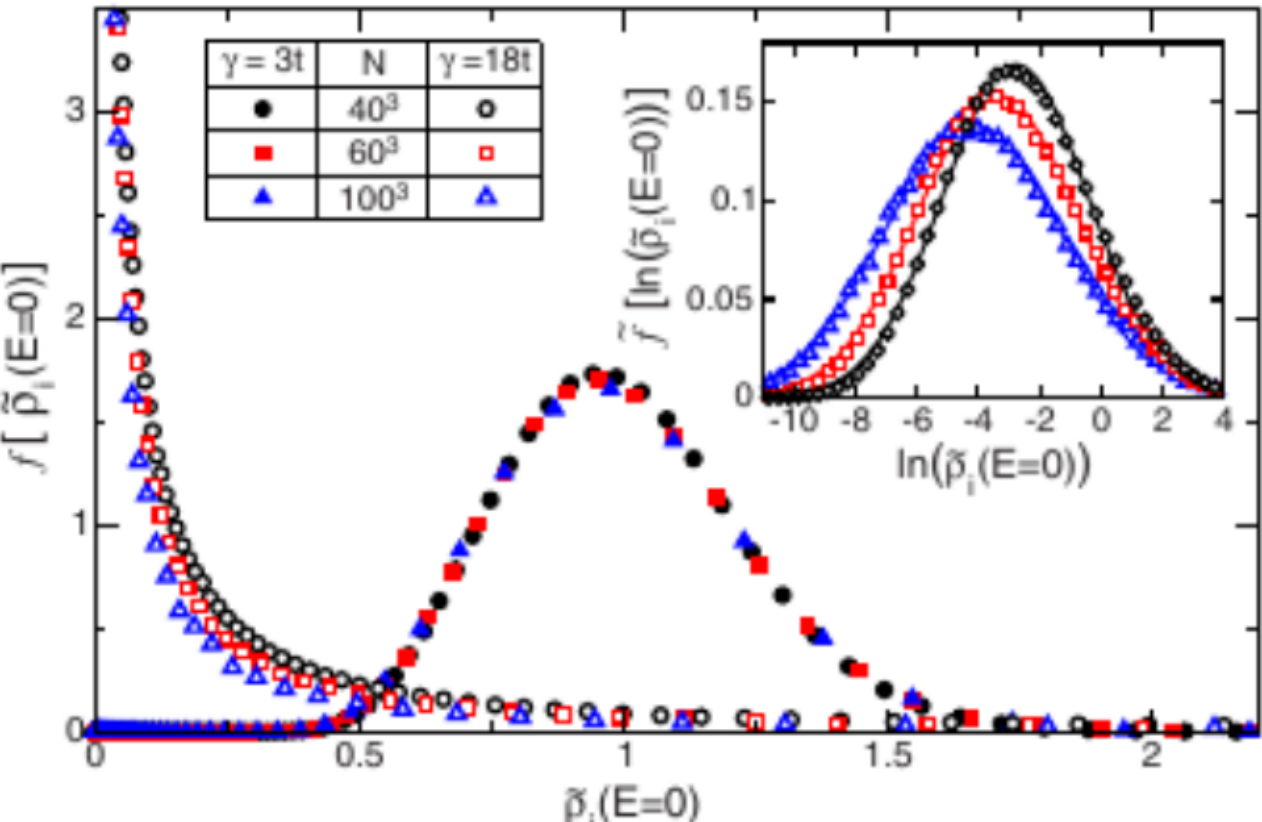$$\phi_0(\tilde{\rho}_i) = \frac{1}{\sqrt{2\pi\sigma_0^2}}\frac{1}{\tilde{\rho}_i}\exp\left[-\frac{(\ln\tilde{\rho}_i-\mu)^2}{2\sigma_0^2}\right] \qquad 2\mu=-\sigma_0^2$$