where A_m is given by Eq. (71). When comparing Eqs. (74), (76), (77) and (80) with Eqs. (63), (65), (66) and (70), respectively, we note that $\tilde{C}_m$ and C_m have the reciprocal symmetry: $q \leftrightarrow 1/q$. Then q dependences of $\tilde{C}_m$ are given by those of C_m in Figs. 4 and 5 if we read $q \to 1/q$.

B. PDF in the superstatistics

The physical origin of the nonextensivity-induced correlation is easily understood in the superstatistics [32–34]. It is straightforward to apply a concept of the superstatistics to composite systems [10]. We consider the N-unit Langevin model subjected to additive noise given by [20]

$$\frac{dx_i}{dt} = -\lambda x_i + \sqrt{2D}\,\xi_i(t) + I \qquad \text{for } i = 1 \text{ to } N, \tag{81}$$

where λ denotes the relaxation rate, $\xi_i(t)$ the white Gaussian noise with the intensity D, and I an external input. The PDF of $\pi^{(N)}(\boldsymbol{x})$ for the system is given by

$$\pi^{(N)}(\boldsymbol{x}) = \prod_{i=1}^{N} \pi^{(1)}(x_i), \tag{82}$$

where the univariate PDF of $\pi^{(1)}(x_i)$ obeys the Fokker-Planck equation,

$$\frac{\partial \pi^{(1)}(x_i,t)}{\partial t} = \frac{\partial}{\partial x_i}[(\lambda x_i - I)\pi^{(1)}(x_i,t)] + D\frac{\partial^2}{\partial x_i^2}\pi^{(1)}(x_i,t). \tag{83}$$

The stationary PDF of $\pi^{(1)}(x_i)$ is given by

$$\pi^{(1)}(x_i) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x_i-\mu)^2}{2\sigma^2}\right), \tag{84}$$

with

$$\mu = I/\lambda, \;\; \sigma^2 = D/\lambda. \tag{85}$$

After the concept in the superstatistics [32–35], we assume that a model parameter of $\tilde{\beta}$ $(\equiv \lambda/D)$ fluctuates, and that its distribution is expressed by the χ^2-distribution with rank n [32, 33],

$$f(\tilde{\beta}) = \frac{1}{\Gamma(n/2)} \left(\frac{n}{2\beta_0}\right)^{n/2} \tilde{\beta}^{n/2-1} e^{-n\tilde{\beta}/2\beta_0}, \tag{86}$$