

Notes on Shalizi Paper

Expression for q-exponential distribution

$$f(x; \beta, q) \propto (1 - (1 - q) \beta x)^{\frac{1}{1-q}}$$

Expression for coupled exponential distribution

$$f(x; \sigma, \kappa) = \frac{1}{\sigma} (1 + \kappa (x/\sigma))^{-\left(\frac{1}{\kappa} + 1\right)}$$

q-exponential using Shalizi notation

$$f(x; \sigma_{Sh}, \theta) = \frac{\theta}{\sigma_{Sh}} \left(1 + \frac{x}{\sigma_{Sh}}\right)^{-\left(\frac{1}{\theta} + 1\right)}$$

Thus the translations are

$$\theta = \kappa = \frac{-(1-q)}{2-q} = \frac{q-1}{2-q}$$

$$\sigma_{Sh} = \sigma D \kappa = \frac{\sigma}{\kappa} = \frac{1}{(q-1)\beta}$$